August 2010

The Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

THE PROPOSED ROOKERY SOUTH (RESOURCE RECOVERY FACILITY) ORDER

6. Design

Volume I - Design & Access Statement

Document Reference Number 6.1

COVANTA ENERGY

The Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2)(q)

The Proposed Rookery South (Resource Recovery Facility) Order

Design and Access Statement

4 August 2010

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LDĀDESIGN

COVANTA ENERGY

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SUMMARY

0.1.1. This Design and Access Statement (DAS) accompanies Covanta's application for a Development Consent Order (DCO) for a Resource Recovery Facility (RRF) comprising an Energy from Waste Facility (EfW) and a Materials Recovery Facility (MRF).

0.1.2. The DAS records an iterative design process which commenced with the establishment of Operational and Design Principles which are described in the DAS and which ultimately developed into Design Objectives that underpinned the Project which forms the subject of this Application. The design of the Project has been subject to extensive consultation and development in response to matters raised by statutory consultees and by the public which is recorded in the Consultation Report also submitted with the Application.

0.1.3. This summary provides a brief overview of the DAS and records how the Design Objectives were met.

Site and Context

0.1.4. The design of the Project is based on a contextual analysis of the landscape and planning policy for the area. The context of the site is a landscape undergoing change and regeneration with significant new development of various types in relatively close proximity to the Application Site, set within the canvas of the Forest of Marston Vale.

The Design Principles and Objectives

0.1.5. 6 Design Objectives were established as the basis for the design and comprise:

1. To design the RRF to address the different audiences of the area;
2. The RRF should be a static building in the landscape;
3. The Project should be stitched into the landscape of the Marston Vale;
4. The masterplan for the RRF should have a strong landscape and ecological rationale;
5. Producing a bespoke masterplan and building design to suit operational requirements and site conditions/context; and
6. Designing a well organised masterplan for the RRF and ensure the design of the buildings is coherent and delivers worthy additions to the vale promoting a sustainable environment.

The Project

0.1.6. The RRF comprises an Operations Area that encompasses both the EfW Facility and MRF and wider works including: an access road; new and upgraded rights of way; an upgraded level crossing over the Marston Vale Line; a landscape strategy for wider woodland planting and wetland creation; a new entrance to the Millennium Country Park; and grid connection for outgoing electricity generated by the facility. The RRF has been designed to permit future rail connection should it become viable and also to provide CHP to identified users.

Design Development: Masterplan and Architectural Design

0.1.7. The key considerations influencing site layout comprise: site access; rail connection; site levels; level changes in Rookery South Pit; consideration of the overall attenuation strategy being promoted as part of the Low Level Restoration Scheme (LLRS) for Rookery South Pit; the ecological strategy; visual effects in relation to building location and orientation; and site layout relating to operational requirements.

0.1.8. The buildings are designed with a clear hierarchy comprising the primary building – the EfW Facility; secondary buildings comprising the MRF buildings; and tertiary buildings comprising general operational buildings. The DAS records the extensive design development of the primary building in particular. This process was continued through the consultation process, including consideration of scale, an explanation of its operational requirements including the effects of capacity of waste throughput, shape and material colours, concluding with a positive CABE review.

Access and Movement Framework

0.1.9. As explained elsewhere, activity and movement as part of the RRF is screened by the landscaping and planting proposed for the Project. As a facility processing waste delivered from its catchment area, the design for the RRF has considered vehicular access; the ability to make rail provision on site in future; junction setting and design; and proposals to upgrade Green Lane level crossing on the Marston Vale Line. The strategy meets the operational requirements of the Project; provides improvements to Green Infrastructure and other infrastructure such as Green Lane level crossing; and also looks to wider transportation impacts by proposing controls on lorry routes further afield.

0.1.10. The design of the RRF also respects airspace considerations for Cranfield airport and interfaces with Network Rail's railway line.

Design Development: Landscape and Ecology

0.1.11. The landscape strategy for the Project and masterplan address the context of the RRF in wider and more local views in the vale, and the resolution of a coherent design at a site-wide scale, underpinned by the Design Objectives. The DAS outlines the integration of the RRF with the LLRS. New planting will operate effectively to screen the RRF and a description of the planting provided and species selected is contained in this DAS. The ecology strategy is also described including details of the proposed brown roofs at the western end of the EfW Facility.

Design Development: Utilities and Services

0.1.12. The utilities and services strategy is outlined in the DAS. A combined services corridor extends parallel to and within the Access road and makes provision for services including electricity import and export, potable water, foul drainage and telecoms. Provision for future Combined Heat and Power connection is also addressed.

Design Development: Lighting Strategy

0.1.13. The lighting strategy is described in the DAS with reference to a schematic diagram for the Operations Area and highway junction. This respects the setting for the Project and has been developed to comply with Environment Zone E2 (low district brightness within rural /small village locations). The strategy establishes the lighting principles with more detailed layouts, which have informed the visual assessment and design for the Operations Area and highway junction.

Design Development: Hydrology and Land Drainage

0.1.14. The DAS outlines the LLRS drainage strategy and how flood risk matters have been addressed in the LLRS. A description of the drainage proposal is provided and how rainwater is to be harvested. The proposals operate successfully and provide infrastructure on site that assists in delivering the setting of the Project.

Climate Change

0.1.15. Climate change and adaptation measures embodied in the Project are described with reference to the planning context, flood risk and hydrology, land and water quality, building design matters and Green Infrastructure. The Project has taken account of the reasonably foreseeable effects of climate change.

Conclusion

0.1.16. Draft policy issued by the Government states in relation to EfW Facilities that the decision-maker must *"be satisfied that the design of the plant is of appropriate quality"*. Furthermore, *"Development proposals should consider the design of the plant, including the materials to be used in the context of the local landscape,"* not least because *"good design"* can *"go some way to mitigate adverse landscape and visual effects"*. The Design Objectives outlined below, as set out in the DAS, have been met by the iterative design process.

a) To design the RRF to address the different audiences of the area – the RRF, and the EfW Facility in particular, are viewed by 3 different audiences. This has influenced the design approach to address, long range elevated views, middle distance and short distance views from within the area. The audience strategy is detailed in Chapter 3;

b) A static building in the landscape – the RRF comprises the EfW Facility, including a large building and associated operational activity, as well as the MRF, which includes a number of lower level buildings and a walled aggregate storage area, with associated operational activity. The objective is to screen the MRF and operational activity. This has resulted in a single, well proportioned EfW building with carefully selected material colours, sitting in the landscape with no visual clutter;

c) A Project that is stitched into the landscape of the Marston Vale – the Marston Vale is a dynamic area where considerable change is planned through new development of various types and scales and where the landscape forms the canvas for this change. The landscape canvas is increasingly characterised by the Forest of Marston Vale, which seeks to establish a multi-use landscape as well as substantial tree cover within the vale. The RRF responds to this canvas with the provision of new woodland areas and the extension of recreational use through the provision of new rights of way. In addition, the response to the multi-use landscape is to propose a building for the RRF that houses an important energy production function with an equivalent power generation capacity to match the housing needs of the Marston Vale and Bedford.

d) The masterplan for the RRF should have a strong landscape and ecological rationale – the immediate landscape setting for the RRF is the LLRS for The Rookery and this has been subject to detailed consideration in the design of the Project. Key existing woodland areas are being retained and managed over time for screening and habitat benefit. Additional wetland is to be established in association with the LLRS attenuation pond and careful planting design supports the integration of the Project in long range views. The planting also provides a coherent design when viewed at close quarters, blending the engineering rigour of the operational masterplan with an organic wetland context. The building incorporates extensive brown roof areas which can be viewed from a visitor centre;

e) To produce a bespoke masterplan and building design to suit operational requirements and site conditions/ context – the form of the masterplan and design of the buildings has been tailored to the context of the site with height and form being important matters considered during design development. The building has been designed with consideration of views towards it and views from it through the provision of the visitor centre / education facility at high level affording views to the Forest Centre, the Stewartby chimneys and the Greensand Ridge; and

f) To design a well-organised masterplan for the RRF and ensure the design of the buildings is coherent and delivers worthy additions to the vale promoting a sustainable environment – the design of the main EfW building is an important matter and, in addressing the identified audiences (see above), the resulting building had to be coherent. To that end, the building has been subject to a CABE review and has been well received:

' The composition of smaller and taller building parts is successful and we welcome the fact that the visitor centre is at the heart of the plant. We also commend the careful analysis of the site and its understanding of its industrial heritage which has informed the design. We welcome the narrative of the proposed colour scheme and the proposed stacks which match the colour of the listed Stewartby Brickwork chimneys and fit successfully into the context….'

CABE 22 March 2010.

1.0 INTRODUCTION

1.1. BACKGROUND

1.1.1. Covanta Rookery South Limited ('Covanta') proposes to construct and operate a Resource Recovery Facility (RRF) at Rookery South Pit, a former brick clay pit, near Stewartby, Bedfordshire, together with other associated development (the 'Project'). The main components of the Project are an Energy from Waste (EfW) Facility with an average gross electrical output of 65 Mega Watts (MWe) Facility, and a post treatment Materials Recovery Facility (MRF) to recover/recycle bottom ash and metals. The nominal capacity of the EfW Facility is 585,000 tonnes per year of mixed residual municipal, commercial and industrial waste.

1.1.2. In order to obtain development consent to construct, and powers to operate the Project Covanta is applying to the Infrastructure Planning Commission (IPC). Covanta is seeking a development consent order (DCO) pursuant to the Planning Act 2008 (PA 2008).

1.1.3. This Design and Access Statement (DAS) accompanies Covanta's Application for a DCO (the "Application"). There is no legal requirement for a DAS to accompany an application for a DCO. However, Regulation 5(2)(q) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 requires that the Application must be accompanied by the submission of 'any other documents necessary to support the application'. This DAS is such a document.

1.1.4. The IPC is required, where it is the decision-maker, to determine applications in accordance with National Policy Statements (NPS) designated by the Secretary of State. Where an NPS has not yet been designated, a draft NPS may be an important and relevant consideration in the determination of an application by the Secretary of State. The most relevant emerging NPS to the application and to the DAS is draft NPS EN-3, Renewable Energy Infrastructure. At paragraphs 2.5.43 to 2.5.52 the draft NPS deals with design and visual impact of waste to energy projects such as the Project. The IPC has to *"be satisfied that the design of the plant is of appropriate quality."* Furthermore, *"Development proposals should consider the design of the plant, including the materials to be used in the context of the local landscape,"* not least because *"good design"* can *"go some way to mitigate adverse landscape and visual effects"*. Technical and statutory requirements will also inform the IPC decision making process.

1.1.5. As a result of the requirements set out above, this DAS is an important and relevant document to be taken into account in deciding the Application. The DAS records an iterative design process which commenced with the establishment of Operational and Design Principles, ultimately refined as Design Objectives.

Relationship of DAS to other Application Documents

1.1.6. The Project has involved extensive consultation which commenced in November 2008. The consultation process has been key to the design of the Project and the product of conversations with the technical consultees and the public. This has informed the development of the design of the RRF in conjunction with the Environmental Impact Assessment (EIA) process which has conditioned the design to reduce effects.

1.1.7. A detailed explanation of the consultation process and its interaction with the design process is to be found in the Consultation Report that accompanies the Application. This DAS also relies extensively on the products of Covanta's consultation exercise.

1.1.8. Importantly, the design objectives established in this DAS will be imposed upon the Project by requirements (conditions) attached to any DCO. For this reason the EIA of the Project and the Planning Statement also rely upon this DAS.

1.2. DESIGN PHILOSOPHY

1.2.1. The design philosophy of the Project is fundamentally underpinned by a contextual analysis of the landscape and planning policy and a sound understanding of the operational requirements of the RRF. The design process has been iterative and been shaped by extensive consultation with key stakeholders, the public and statutory authorities as the consultation process has progressed as recorded in the Consultation Report that accompanies the Application. The EIA process has explored potential effects and integrated design responses to reduce those effects. Design Objectives have been established as the Project has progressed and stem from early Design Principles (described in Chapter 3 of this DAS).

Design Objectives

1.2.2. The Design Objectives and outcomes of those objectives embodied in the Project comprise the following:

a) **To design the RRF to address the different audiences of the area** – the RRF, and the EfW building in particular, are viewed by 3 different audiences. This has influenced the design approach to address, long range elevated views, middle distance and short distance views from within the area. The audience strategy is detailed in Chapter 3;

b) **A static building in the landscape** – the RRF comprises the EfW Facility, including a large building and associated operational activity, as well as the MRF, which includes a number of lower level buildings and a walled aggregate storage area, with associated operational activity. The objective is to screen the MRF and operational activity. This has resulted in a single, well proportioned EfW building with carefully selected material colours, sitting in the landscape with no visual clutter;

c) **A Project that is stitched into the landscape of the Marston Vale** – the Marston Vale is a dynamic area where considerable change is planned through new development of various types and scales and where the landscape forms the canvas for this change. The landscape canvas is increasingly characterised by the Forest of Marston Vale, which seeks to establish a multi-use landscape as well as substantial tree cover within the vale. The RRF responds to this canvas with the provision of new woodland areas and the extension of recreational use through the provision of new rights of way. In addition, the response to the multi-use landscape is to propose a building for the RRF that houses an important energy production function with an equivalent power generation capacity to match the housing needs of the Marston Vale and Bedford;

d) **The masterplan for the RRF should have a strong landscape and ecological rationale** – the immediate landscape setting for the RRF is the LLRS for The Rookery and this has been subject to detailed consideration in the design of the Project. Key existing woodland areas are being retained and managed over time for screening and habitat

benefit, new wetland is to be established in association with the LLRS attenuation pond and careful planting design supports the integration of the Project in long range views. The planting also provides a coherent design when viewed at close quarters, blending the engineering rigour of the operational masterplan with an organic wetland context. The building incorporates extensive brown roof areas which can be viewed from a visitor centre;

e) **To produce a bespoke masterplan and building design to suit operational requirements and site conditions/ context** – the form of the masterplan and design of the buildings has been tailored to the context of the site with height and form being important matters considered during design development. The building has been designed with consideration of views towards it and views from it through the provision of the visitor centre / education facility at high level affording views to the Forest Centre, the Stewartby chimneys and the Greensand Ridge; and

f) **To design a well-organised masterplan for the RRF and ensure the design of the buildings is coherent and delivers worthy additions to the vale promoting a sustainable environment** – the design of the main EfW building is an important matter and, in addressing the identified audiences (see above), the resulting building must be coherent. To that end, the building has been subject to a CABE review and has been well received:

' The composition of smaller and taller building parts is successful and we welcome the fact that the visitor centre is at the heart of the plant. We also commend the careful analysis of the site and its understanding of its industrial heritage which has informed the design. We welcome the narrative of the proposed colour scheme and the proposed stacks which match the colour of the listed Stewartby Brickwork chimneys and fit successfully into the context….'
CABE 22 March 2010.

The application of the Design Objectives to the Project are recorded in Chapter 5 Masterplan and Architectural Design and Chapter 7 Landscape and Ecology of this DAS.

1.3. PROJECT OVERVIEW

1.3.1. The Project is proposed as an important source of renewable energy. Sufficient electricity will be generated to serve the needs of 82,500 homes. The Project will complement the Bedfordshire sub-region's existing waste management initiatives and contribute to realising national and regional targets for renewable energy.

1.3.2. The Project comprises a series of buildings associated with the EfW Facility and MRF. It also includes a new access road and upgraded junction from Green Lane; extensive landscape works (significantly increasing the extent of tree planting around Rookery South); ecological habitat creation; improvements to the rights of way network; provision of a visitor interpretation/ education centre within the main EfW Facility building; and underground electricity grid connection infrastructure. The nature of these elements has been informed by extensive design work and a detailed understanding of the surrounding environment so as to ensure successful integration of the Project into the Marston Vale.

1.3.3. Within this DAS two terms are used to describe the area of land needed for the Project: The 'Application Site' comprises the entire area of land over which powers to construct and operate the Project will be sought; and the 'Operations Area', which lies within the Application Site, and is where the EfW Facility and MRF will be located in Rookery South Pit.

1.4. THE RESTORATION OF THE ROOKERY

1.4.1. A separate but complementary planning process is underway in respect of proposals to restore both Rookery North and Rookery South Pits, which compromise a former mineral extraction area. This will provide for implementation of the LLRS. This proposal has been submitted to the Local Planning Authorities by O&H Properties Ltd, the freeholder of The Rookery Pits. The Application has been made in order to fulfil the requirements of a Review of Old Minerals Permissions (ROMP).

1.4.2. The LLRS has been developed with the objective of restoring the former clay workings at The Rookery to enable a low intensity agricultural end use with particular attention to biodiversity and landscape enhancement. The restoration scheme is focused predominantly on Rookery South Pit and will include slope stabilisation works; establishment of woodland planting; establishment of grassland and; the establishment of an attenuation pond and associated drainage channels. Once restored, the base of Rookery South Pit will be approximately 10m below surrounding ground level in the vicinity of the RRF, and will form the platform for the Project. Limited works are also being carried out in Rookery North Pit, focusing on nature conservation. These include lowering lake water levels to establish greater areas of wetland, localised slope stability / erosion control works, limited woodland planting, and the introduction of footpaths.

1.4.3. A more detailed description of the restoration works and how this informs the design of the Project is provided in Chapter 2 of the DAS.

1.5. THE DESIGN AND ACCESS STATEMENT

1.5.1. The purpose of this DAS is to explain the design principles and design rationale for the Project.

1.5.2. The DAS has been prepared in accordance with current Communities and Local Government policy and Commission for Architecture and the Built Environment guidance applicable to Applications under the Town and Country Planning Act 1990. Although this policy does not apply to the relevant statutory regime for the Project, it is pertinent to the preparation of design and access statements in general. As such, it is considered to be the most appropriate guidance for the Project.

1.5.3. The DAS illustrates how the Project design responds to the physical, policy and social context in relation to each of the following elements:

a) Use - the function of the RRF and surrounding landscape;

b) Extent - the amount of development required to meet the operational requirements for the RRF and wider development aspirations including landscape and ecological enhancement, rights of way provision, connection of incoming and outgoing power and transport access;

c) Layout – the layout of buildings, operational land, planting, utilities, access routes and open space and the relationship between all these elements and the surrounding land;

d) Scale – the height, width and length of the proposed buildings and public and private spaces within the curtilage of the development;

e) Landscape - how planting and earth bunding is used to limit visual impacts of the Project, to enhance the character of the restored site and wider landscape and to ensure integration into the landscape by design in association with careful masterplan design of the Operations Area and building design which seeks to minimise visual effects and produce a building and operation that is as well integrated in the landscape as possible; and

f) Appearance – how the design of the building, operational land and open spaces define the visual character and qualities of the site and wider setting.

1.6. THE REPORT STRUCTURE

1.6.1. This DAS provides an overview of the site and its context; outlines the Design Principles for the Project explaining the iterative design process undertaken from the inception of the Project and the key stages of design development; and provides a Project definition which describes the physical form of the Project and a non technical summary of how the RRF will operate. The DAS includes a full list of the drawings that relate to the Application and show the design of the Project. It then proceeds to describe each aspect of design development under the following topics:

a) Design Development: Masterplan and Architectural Design;

b) Access and Movement Framework;

c) Design Development: Landscape and Ecology;

d) Design Development: Utilities and Services;

e) Design Development: Lighting Strategy; and

f) Design Development: Hydrology and Land Drainage.

1.6.2. Following the description of the design development matters relating to each of these topics, an overview of climate change matters considered in the design is provided.

1.6.3. The DAS is supported by the Engineering Design Statement (EDS) and CHP Report that also accompany the Application. The EDS provides an overview of the engineering considerations that underpin the design of the EfW Facility providing an explanation of the EfW process and how throughput of waste and stream design influences the size of the building. The report presents a comparison schedule detailing the size and capacity of EfW Projects in the UK, illustrating the size of the RRF in its UK context. The report also explores the other forms of technology that process waste to produce energy. The CHP Report describes the CHP potential of the RRF, provides an explanation of the technology and identifies proposed development in the local area that is considered to have potential CHP demand.

1.7. THE DESIGN TEAM

Covanta	Operational Engineers
LDA Design	Masterplanning
	Landscape Architects
	Landscape and Visual Impact
	Rights of Way
Headland Archaeology	Archaeology
Royal Haskoning	Lighting Strategy
AEW	Architects
ERM UK	Planning
	Air Quality
	Waste and Energy
Baker Shepherd Gillespie	Ecology and Nature Conservation
Peter Brett Associates	Hydrology and Flood Risk
	Geology
Waterman Boreham Ltd	Transport
	Highway Design
Arup	Railway – Transport and Engineering
The English Cogger Partnership	Noise
Quantum PR	Community Engagement

2.0 SITE AND CONTEXT APPRAISAL

2.1. INTRODUCTION

2.1.1. The Project design has been informed by a number of processes, including careful understanding of the Application Site and its context. The following Chapter describes the principal features and characteristics of The Rookery and its context within the Marston Vale that have informed the design process.

2.1.2. The Chapter is separated into two parts:

a) an appraisal of the context within an approximate 10km radius of the Application Site; and

b) an appraisal of The Rookery and its immediate setting, which includes reference to the LLRS including a brief summary of the key features and characteristics of The Rookery and its setting which have influenced the design process.

Figure 1: Aerial Photograph

2.2. WIDER CONTEXT

Site Location and Context

2.2.1. The main portion of the Application Site is within The Rookery. It focuses on Rookery South Pit and extends to include: parts of Rookery North Pit, a length of Green Lane, Stewartby; and land straddling the new A421 alignment. It is situated in the Marston Vale between Milton Keynes and Bedford, immediately south of Stewartby at OS Grid Reference TL 017 414. Bedford (town centre) is located approximately 9km to the north east of The Rookery. Ampthill, a local market town, lies approximately 3km south east. The existing A421 and upgraded A421 lie approximately 2km to the west of The Rookery and the B530 lies to the east, running north-south between Bedford and Ampthill. Junction 13 of the M1 is located 6km to the south west. Two railway lines run adjacent to the Application Site comprising the Midland Mainline to the east and the Marston Vale Line to the west. The Marston Vale Millennium Country Park and Forest Centre lie immediately to the west of The Rookery.

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Figure 2: Application Site Location and Wider Context

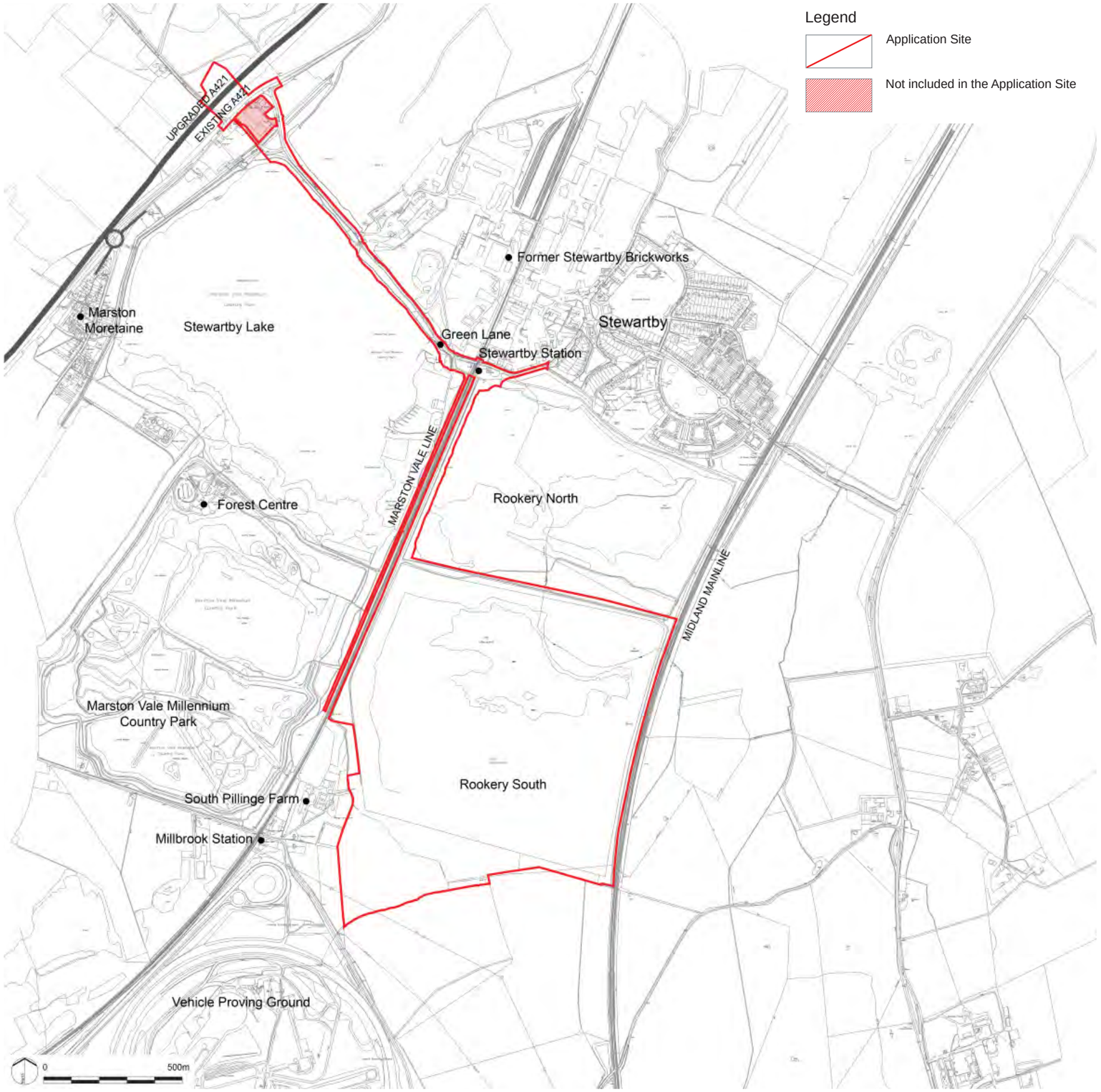


Figure 3: Application Site Location and Immediate Context

Topography, Land Use and Vegetation Cover

2.2.2. The Marston Vale forms the context of the site and is an extensive, predominantly flat landscape defined by the Greensand Ridge which rises to the south and extends to the north as an extensive, low escarpment. The vale lies at a level of approximately 30m AOD with the elevated Greensand Ridge extending from approximately 30m to 150m AOD.

2.2.3. The Marston Vale is characterised by a range of land uses, including scattered settlements, fractured tracts of farmland, active and restored landfill areas, and former claypits; it is a landscape undergoing change, and will continue to change as a result of other development and interventions taking place. Landfill operations will be completed; the new A421 road project is being completed; and committed and proposed developments are to be – or likely to be - built. In addition, the Forest of Marston Vale Plan, which is described in further detail in this Chapter of the DAS, is in the course of being executed and forms an important part of the context.

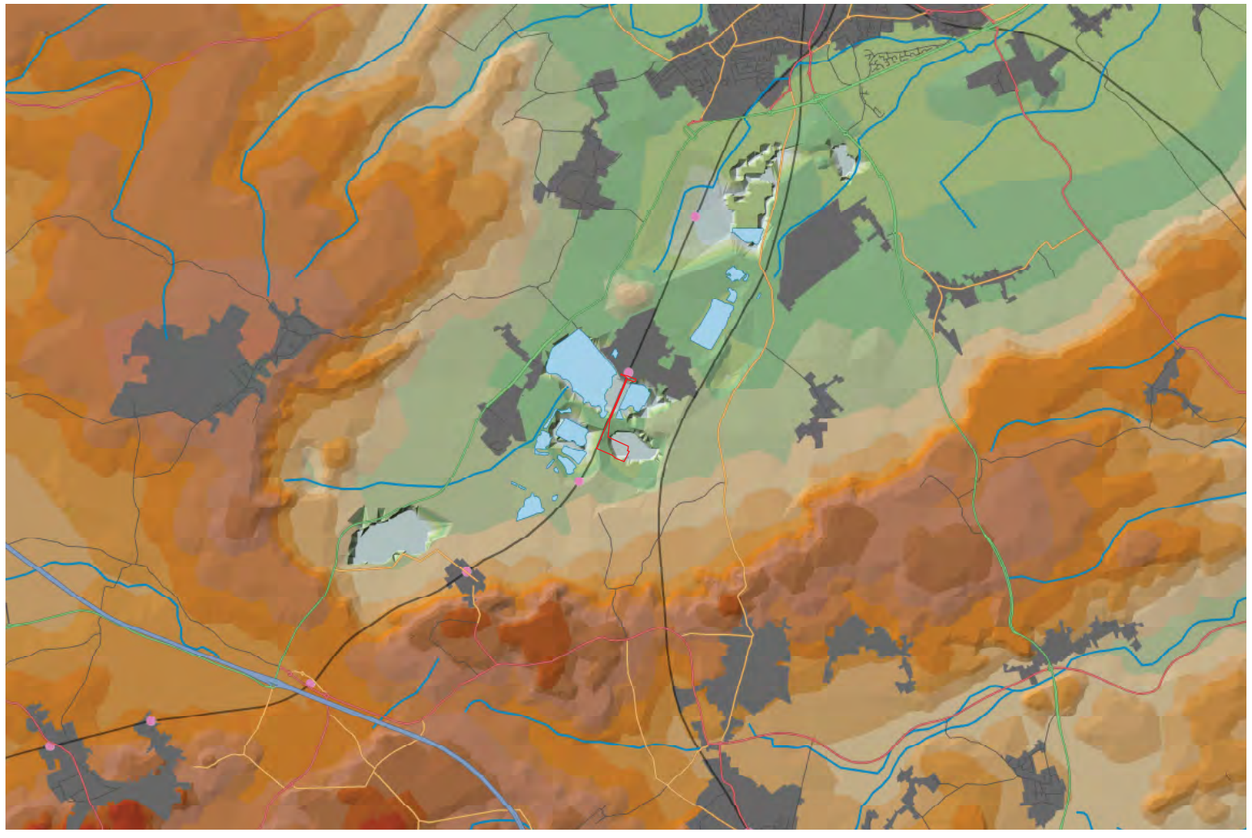


Figure 4: Topography

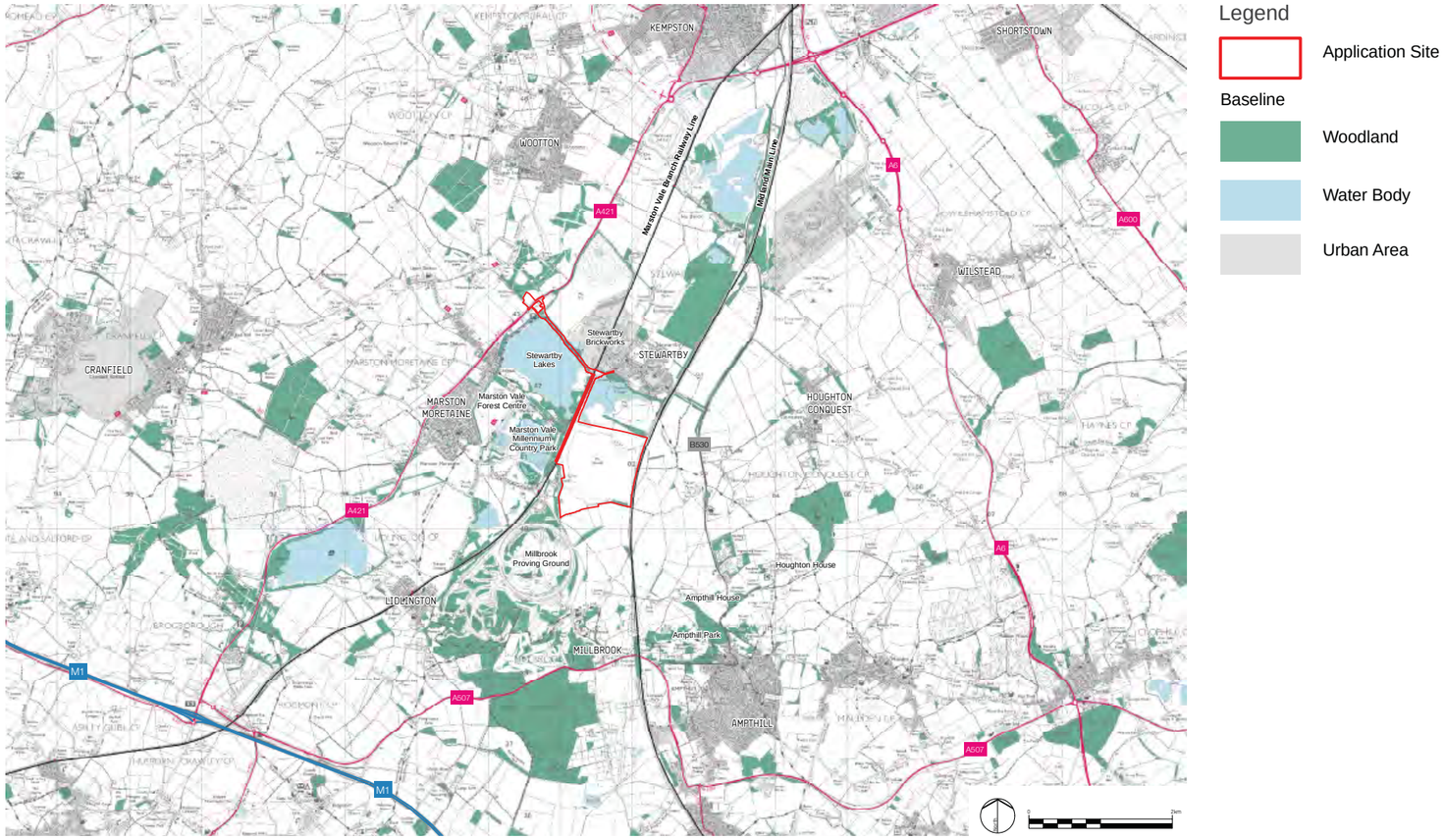
2.2.4. Brick making once dominated the landscape of the Marston Vale with extensive brickworks, working clay pits and associated infrastructure. The influence of the brickworks has largely disappeared from the Vale, but its legacy forms an important present day context. The presence of brickworks is marked most notably by brickworks artefacts at Stewartby and particularly by the four retained brick chimneys which are prominent features in the landscape. Much of the land in the immediate vicinity of the Application Site has been worked for clay to service the brickworks. This includes: the former Quest Pit, to the east of Stewartby, in respect of which planning permission has been granted for the development of the National Institute for Research into Aquatic Habitats – Nirah; Stewartby Lake, a former clay pit now used for recreational sailing; and The Rookery itself, which comprises one flooded and one unrestored clay pit.

2.2.5. Where agriculture has survived the impacts of brick-clay extraction it comprises the principal land use away from the major urban centres of Bedford and Milton Keynes. Arable farmland, with some pasture, extends across the vale and Greensand Ridge escarpment, punctuated by settlements and transport corridors.

2.2.6. Significant areas of commercial and maturing amenity woodland form the woodland areas of the Forest of Marston Vale. Central Bedfordshire Council (CBC) planning policy continues to promote, regeneration of this damaged landscape woodland creation, setting a target of 30% woodland cover in the Forest area by 2030.

2.2.7. The Project responds to the policy objectives with proposed woodland as part of the Project contributing to the 30% target as set by the Forest Plan and an additional 9% based on emerging shortfalls in woodland cover identified by the Forest of Marston Vale. The nature of the woodland planting proposal is subject to ongoing consultation with The Marston Vale Trust and is discussed in more detail in Chapter 7 of the DAS.

2.2.8. The Project responds to the topographic context of the site, and the related visual receptor audiences which have influenced the masterplan configuration, building orientation and design.



Legend

Application Site

Baseline

Woodland

Water Body

Urban Area

Figure 5: Woodland Cover

Landscape Character

2.2.9. The landscape character context of the Application Site is described in the Mid Bedfordshire District Landscape Character Assessment (2007) and has been subject to further analysis by LDA Design. The full analysis is recorded in the Environmental Statement accompanying the Application.

2.2.10. The Application Site is located within the North Marston Clay Vale, which is described as a large scale, flat and open clay vale with distant views to contrasting elevated landscapes of the Greensand Ridge to the south, and clay farmland predominantly to the west.

2.2.11. The assessment establishes the significance of change in defining the intrinsic character of the North Marston Clay Vale. The assessment highlights the legacy of clay extraction leading to *"extensive disturbance of the landscape and a strong industrial character throughout"*. Reference is also made to large scale restoration of previous extraction sites creating *"new landscape character".* The Forest of Marston Vale is cited, noting that it provides an important, multi-functional resource and an improved visual environment. Other past changes highlighted are the areas of significant modern housing growth, development of busy transport corridors, development of industrial estates creating a harsh interface with the open Vale, significant tracts of derelict land creating a pervading impression of decline, landfill creating 'domed' landforms in the vale and coniferous shelterbelt planting creating incongruous features. The significance of change in the landscape establishes the development and regeneration context for the Project. The landscape character is considered to be one that is essentially rural but with contemporary industrial reference, creating a modern landscape of change.

2.2.12. By contrast, the elevated landscape of the Greensand Ridge, to the south of the clay Vale, has a more intact and static character. The key defining features include a strong wooded context with extensive areas of deciduous woodland, mixed woodland and coniferous plantations; a strong underlying heathland character; a large number of historic parks and gardens, with parkland forming a dominant land use influencing the wider landscape; and far-reaching, clear views across the low clay Vale. The assessment promotes conservation of the landscape with a focus on positive features, notably the ancient woodland, estate parkland and areas of pasture.

2.2.13. The western and northern limits of the ridge are dominated by intensive farmed arable land, though important features such as blocks of ancient woodland and valleys and streams are also found. The assessment notes that this landscape is in a state of transition *"exemplified by significant development at Cranfield together with the development of roads, pylon lines and the frequent occurrence of other 'fringe' land uses"*. The assessment promotes a strategy to conserve the rural character of the area.

2.2.14. The character of the vale and the ridge and the reciprocal views between them is a key consideration in the design of the masterplan for the Operations Area and buildings and defines the audiences. The importance of a regeneration context in the vale is also recognised and that good design should be a feature of such regeneration.

Legend

Application Site

10 km radius around the Project

County Boundary

Borough Boundary

LANDSCAPE CHARACTER ASSESSMENTS
Within 10 km radius of the Project

MILTON KEYNES - Landscape Partnership (2007)
Milton Keynes Landscape Character Assessment
Draft Report

URBAN

CHICHLEY / CRAWLEY CLAYLANDS

MILTON KEYNES CLAYLAND FRINGE

BEDFORDSHIRE - Land Use Consultants (2007) Mid Bedfordshire District and Bedford Borough Landscape Character Assessments

URBAN

CLAY FARMLAND

WOODED WOLDS

LIMESTONE VALLEYS

CLAY VALLEYS

CLAY VALE

WOODED GREENSAND RIDGE

GREENSAND VALLEY

CLAY HILLS

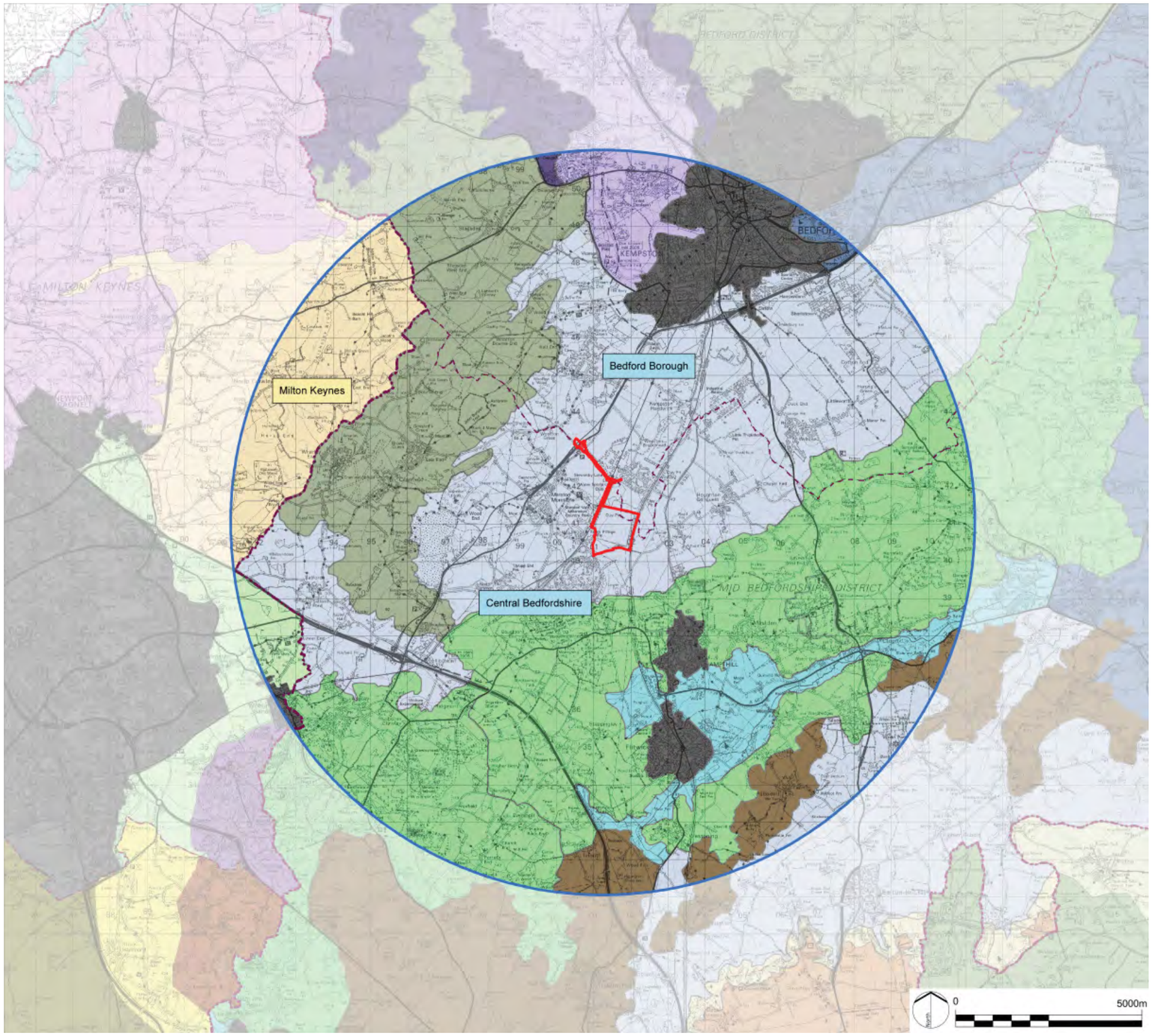


Figure 6: Landscape Character

Green Infrastructure

Policy Context

2.2.15. Green Infrastructure (GI) policy relating to the Project has been driven by the East of England Plan (EoEP), and promoted in the Bedfordshire and Luton Strategic Green Infrastructure Plan and the Forest of Marston Vale Plan policy objectives. Although the EoED no longer forms the part of the development plan its aspirations and objectives are referred to in this DAS pending replacement policy emerging. The former policies in the EoEP are not in conflict with local plan policy and as such this is an appropriate approach, in the absence of more compelling policy on such matters.

2.2.16. The retention, protection and enhancement of GI assets was regarded as vital to ensure that major planned growth within the region will be sustainable. A summary of relevant GI planning policy is provided below and within the Planning Statement accompanying the Application.

Existing Green Infrastructure Provision

2.2.17. Existing strategic and local GI assets within the Marston Vale are illustrated on Figure 7 and comprise:

a) open water bodies created within former quarry pits which have both recreational and ecological value (designated as County Wildlife Sites);

b) natural and semi-natural habitat for wildlife including large areas of woodland, parkland and remnant heathland;

c) a network of hedgerows and watercourses, including the Elstow Brook;

d) the Marston Vale Millennium Country Park;

e) historic parks and gardens and historic landscapes including Ampthill Park, a Capability Brown designed parkland and the biggest expanse of acid grassland in the County;

f) designated and undesignated cultural heritage assets which include Ampthill Castle and Houghton House (both Scheduled Monuments) and Stewartby Chimneys (Grade II Listed);

g) a network of public rights of way, cycleways and other recreational routes; and

h) a local, regional and national railway network.

Green Infrastructure Initiatives

2.2.18. The **Marston Vale Trust's Forest Plan** is the key local delivery document for GI across the Marston Vale. Working with local communities, government and businesses, the 40-year vision (now into its 10th year) is to deliver environmental regeneration that will act as a catalyst to social and economic regeneration of the area, whilst providing major recreation, landscape, biodiversity, cultural heritage and quality of life benefits.

2.2.19. Major potential development in the area, which includes the RRF, will be expected to contribute to delivering the trusts policy objectives.

2.2.20. There are major GI initiatives for wetland creation in relation to the proposed Milton Keynes to Bedford Waterway Park (see below) and restored brick pits together with significant new areas of accessible greenspace and woodland and other habitat linkages between the existing ancient woodlands on the wooded slopes surrounding the vale.

2.2.21. The Milton Keynes and Bedford Waterway comprises construction of a broad waterway which will link the Grand Union Canal in Milton Keynes to the River Great Ouse in Bedford through a series of waterways parks. The waterway will provide the opportunity to enhance strategic bridleway, cycle and footpath links and will create natural and semi-natural habitat for wildlife.

2.2.22. The Project responds to delivery of these GI initiatives by recognising the changing context of the site and the key role The Rookery plays in securing repair and enhancement to the rights of way network east of the Forest Centre linking the Millennium Country Park to the Greensand Ridge, planting of woodland and provision towards the Trust Fund proposed by Covanta to further support the objectives of the Forest of Marston Vale.

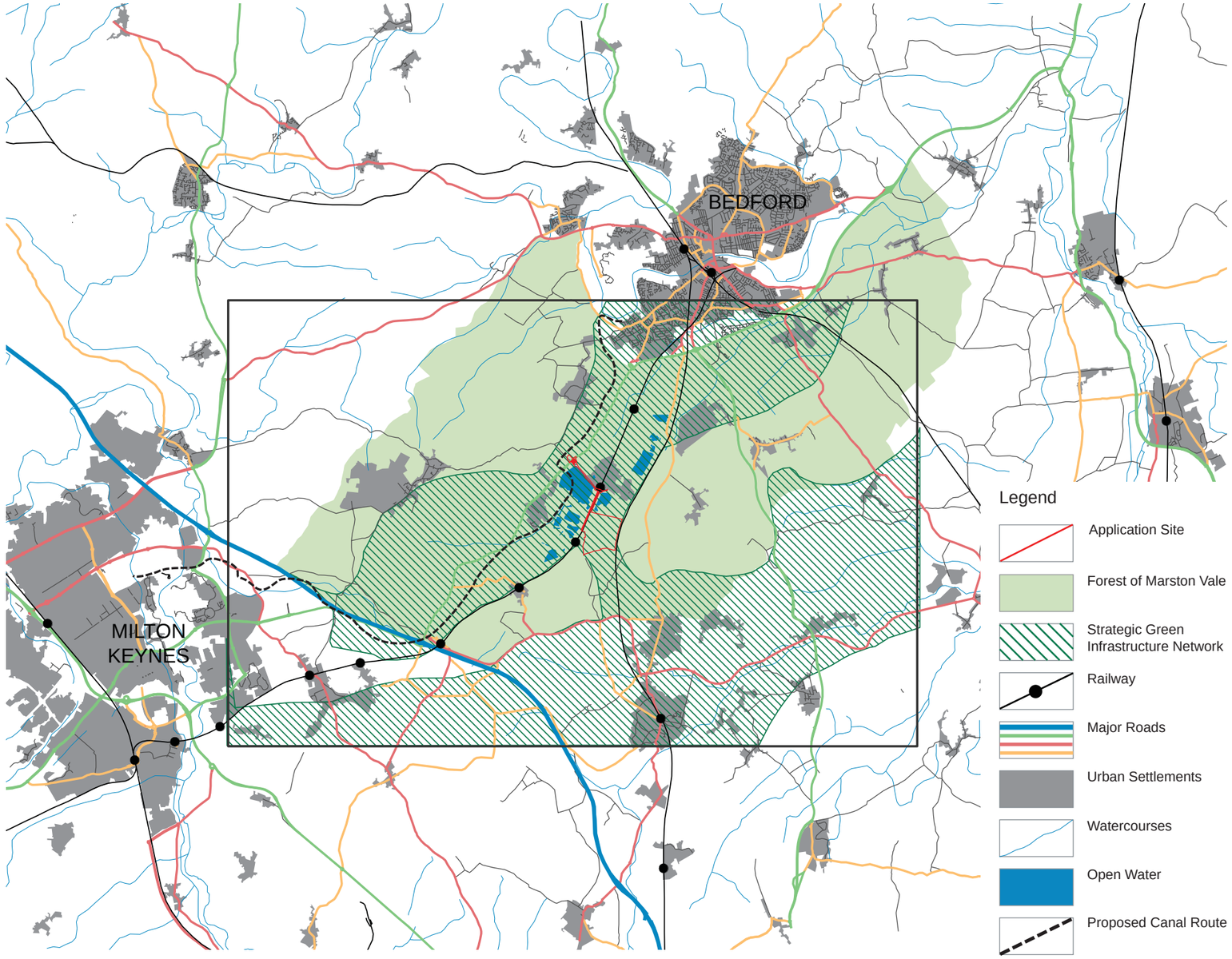


Figure 7: Regional Green Infrastructure Context

Landscape Designations

2.2.23. Land to the immediate south of The Rookery has previously been designated as an Area of Great Landscape Value (AGLV). The AGLV policy is no longer saved in either the Central Bedfordshire Council or Bedfordshire Borough Council Core Strategies or the South Bedfordshire Core Strategy Preferred Options (April 2009).

2.2.24. Green Belt lies to the south of the A507 some 2km distant from the Application Site, with a narrow belt extending northwards separating the settlements of Maulden and Ampthill illustrated in Figure 8.

2.2.25. Whilst there are no landscape designations that exert policy considerations on the design of the Project, the inherent character of the landscape around the site, recorded in paragraphs 2.2.9 – 2.2.14 is recognised and has driven the design response for the Project.

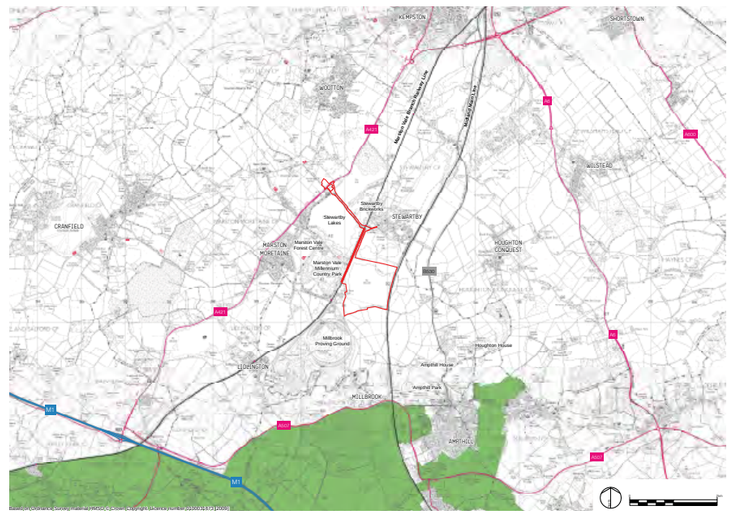


Figure 8: Extent of Green Belt

Settlement Pattern

2.2.26. Settlements cluster around the major road (A421, A507, A6 and M1) and rail corridors with dispersed hamlets and individual plots spread across the vale floor and escarpment. The nearest villages to the site comprise Marston Moretaine, Stewartby, and Mill Brook with Houghton Conquest, Lidlington, Wootton and Maulden lying at a greater distance.

2.2.27. The major settlement of Bedford lies 9km to the north (centre) and Milton Keynes is 16km to the west (centre). The small town of Ampthill is 3km distant.

2.2.28. The location of the site between two major conurbations and between 3 villages defines a countryside context for the site that is shared by these settlements. The design response seeks to propose a single development in the landscape that responds to this context, screening off operational activity and the wider Operations Area permitting the countryside character between these settlements to prevail albeit with a new object within it.

2.2.29. To the north of The Rookery is Stewartby village, which is part of a designated Conservation Area. The village dates back to 1926 and was built to house the workforce of Stewartby Brickworks and was dedicated to the London Brick Company. The location and setting of Stewartby has informed key aspects of the Project, particularly with reference to building design and orientation, establishing rights of way connections and informing the approach to localised screening of the EfW Facility through planting.

2.2.30. To the immediate west of The Rookery is Marston Vale Millennium Country Park and Forest Centre. The Park is located on restored clay workings and characterised by large bodies of open water and significant woodland planting. The proximity of the Country Park has informed the architectural treatment of the EfW Facility and has been an important consideration in establishing recreational links between the Park and the Application Site.

2.2.31. Marston Moretaine lies further to the west of the Application Site, situated between Marston Vale Millennium Country Park and the existing A421 and has views toward the site. The location of the village has informed the building design and its orientation.

2.2.32. South Pillinge Farm and its associated cottages lie to the south west of the Operations Area and lie behind existing tree cover. The location and orientation of the existing dwellings have been important considerations in the design of the RRF having particular regard to noise screening. The existing tree cover is to remain.

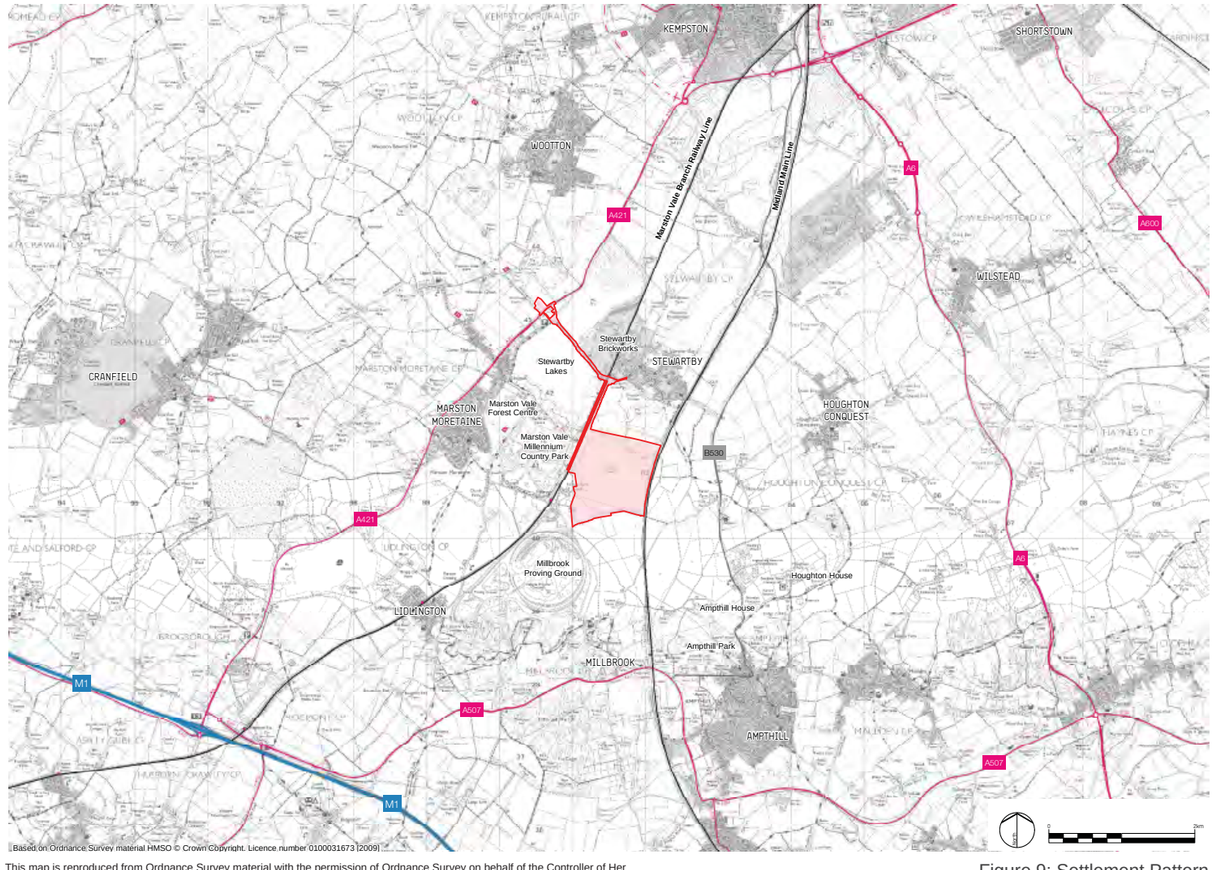


Figure 9: Settlement Pattern

Ecology Context

2.2.33. The vale encompasses a significant and varied number of open waterbodies. The largest of these were created following cessation of clay extraction from the base of the vale and are now designated as County Wildlife Sites. The heavy clay soils explain the existence of these permanent waterbodies as well as the many seasonal ponds throughout the vale. These waterbodies support a range of species, most notably very high numbers of great crested newts which are present in suitable terrestrial and aquatic habitat throughout the vale.

2.2.34. Large fields dominate the remainder of the floor of the vale bound primarily by hawthorn-dominated hedgerows and linked by a network of drainage ditches which are seasonally inundated. Woodland cover is limited to small copses and maturing woodland associated with the Marston Vale Community Forest. Several of the existing mature woodland copses are ancient semi natural broadleaved woodland and designated as County Wildlife Sites: one woodland, Marston Thrift, to the west of the Application Site some 4km distant is of greater nature conservation value and designated as a Site of Special Interest (SSSI). Additional SSSI are located to the east and south of the Application Site at Houghton Conquest, Ampthill and Maulden.

2.2.35. Arable fields, pasture, scrub and copses occur on the gently sloping sides of the vale. Some of these areas comprise species rich neutral grassland and are designated as County Wildlife Sites for their botanical interest and for supporting the butterflies, Dingy and Grizzled Skipper.

2.2.36. The ecological context of the Application Site is an important consideration in the design of the Project and also relates to the topography of the area. In particular, the dispersal of flue particulates and potential effects on protected habitats is an important matter regulated by environmental legislation and is influenced by prevailing winds, topography and the proximity and location of protected habitats. The design of the internal operation of the EfW Facility and height of the stack have responded to the ecological context in relation to flue particulate dispersal.

2.2.37. Whilst the Project does not result in the significant loss of any protected habitat or wildlife, opportunities for enhancement of the ecology of the Application Site have been sought.

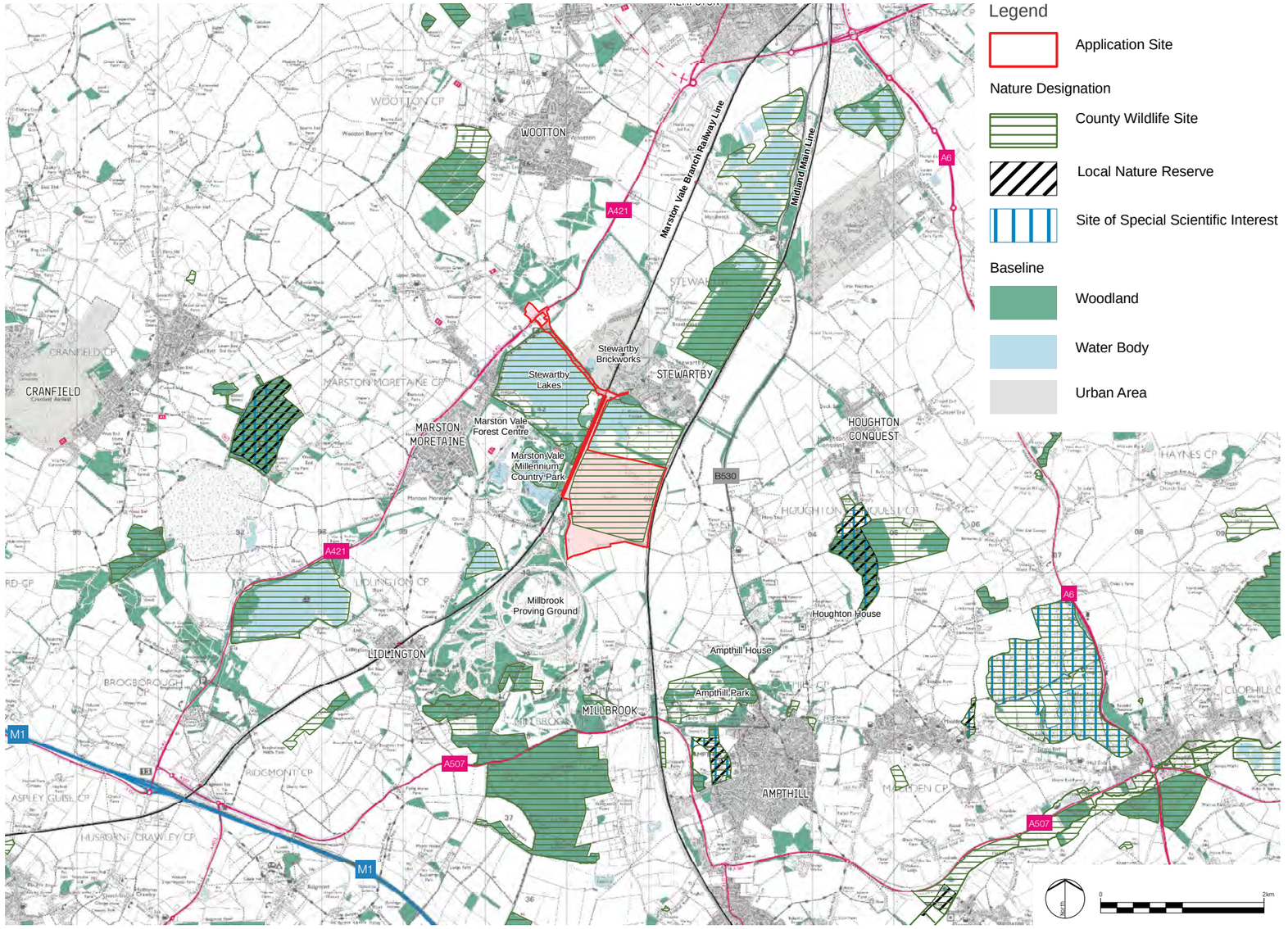


Figure 10: Ecological Context

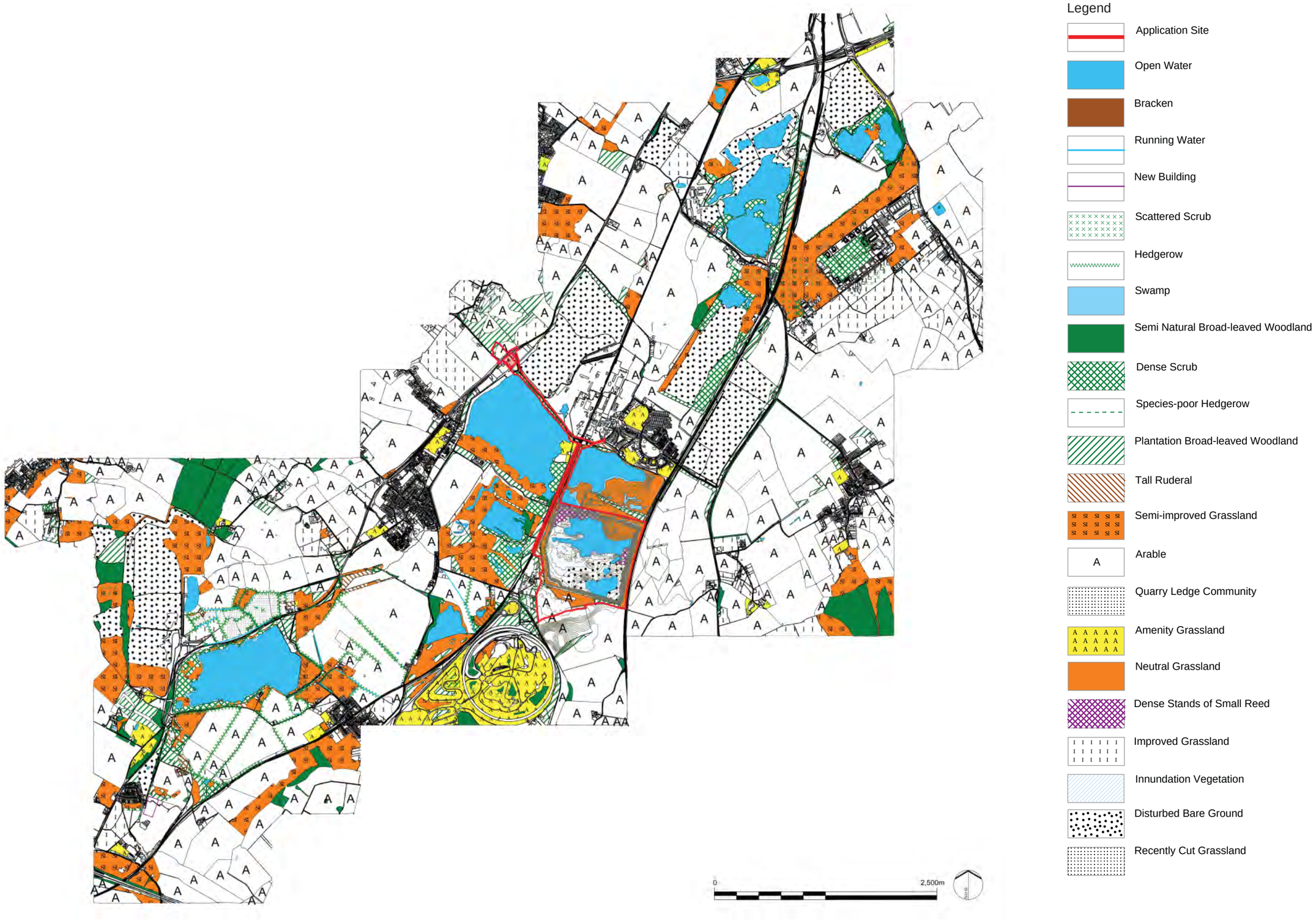


Figure 11: National Vegetation Classification in the Marston Vale

Visual Context

2.2.38. There is significant intervisibility between the distant elevated Greensand Ridge landscape and the flat, low lying, clay vale in which the RRF is to be located.

2.2.39. The nearest residential dwellings and settlements to the Operations Area comprise South Pillinge Farm to the south west (an isolated farm and associated cottages), Stewartby to the north and Marston Moretaine to the west. From these locations views of the Application Site and towards the RRF are substantially screened in many views by built development, woodland areas, tree belts and hedges. Where there are views towards the RRF these have been controlled where possible to minimise the proportion of new building visible, ensure that the design of that building portion within the view is understood and addressed and the operational floor is screened from view.

2.2.40. The Marston Vale Millennium Country Park is located immediately to the west of the RRF Operations Area. Views towards the RRF from the rear elevation of the Forest Centre are in areas screened by intervening woodland within the Country Park. There are currently views above the existing vegetation towards the distant Greensand Ridge and towards the proposed site of the RRF. The extent of view from the Country Park is likely to change over time as young woodland planting matures. From footpath FP72 within the Park, there are open views towards where the RRF will be located, although views into the base of the pit are screened by low level scrub planting along either side of the Marston Vale Line.

2.2.41. The views from the Country Park are an important consideration addressing amenity considerations and cultural associations. The Forest Centre promotes sustainable environmental initiatives and recreation and the Project promotes sustainable energy production. It is acknowledged that there is a dialogue between the two that has influenced the design of the Project.

2.2.42. From the elevated Greensand Ridge to the south and east of the Application Site, there are views towards the RRF Operations Area. Key viewpoints comprise Houghton House, located just below the crest of the ridge with north-west facing views; Ampthill Park House located close to the foot of the northwest-facing scarp of the Greensand Ridge with views out over the vale to the north and west; Ampthill Park, located on the north side of Ampthill and extending from the crest of the ridge down into the Vale; and Mill Brook village, located on the steep, north-facing scarp of the ridge.

2.2.43. The western extent of the ridge is defined by raised landform running between Cranfield and Stagsden. From here, there are panoramic views east towards the RRF Operations Area. Key viewpoints comprise the edge of Cranfield itself and the John Bunyan Trail, which extends from Cranfield in a north easterly direction towards Kempston. The elevated ridge establishes inclined views into the vale and the Application Site which are important design drivers in seeking to control views into the floor of the Operations Area. To the north-east, from within the flat landscape of the vale itself, there is limited intervisibility with the Application Site. However, the association with the Cardington Hangars and other cultural heritage is a consideration.

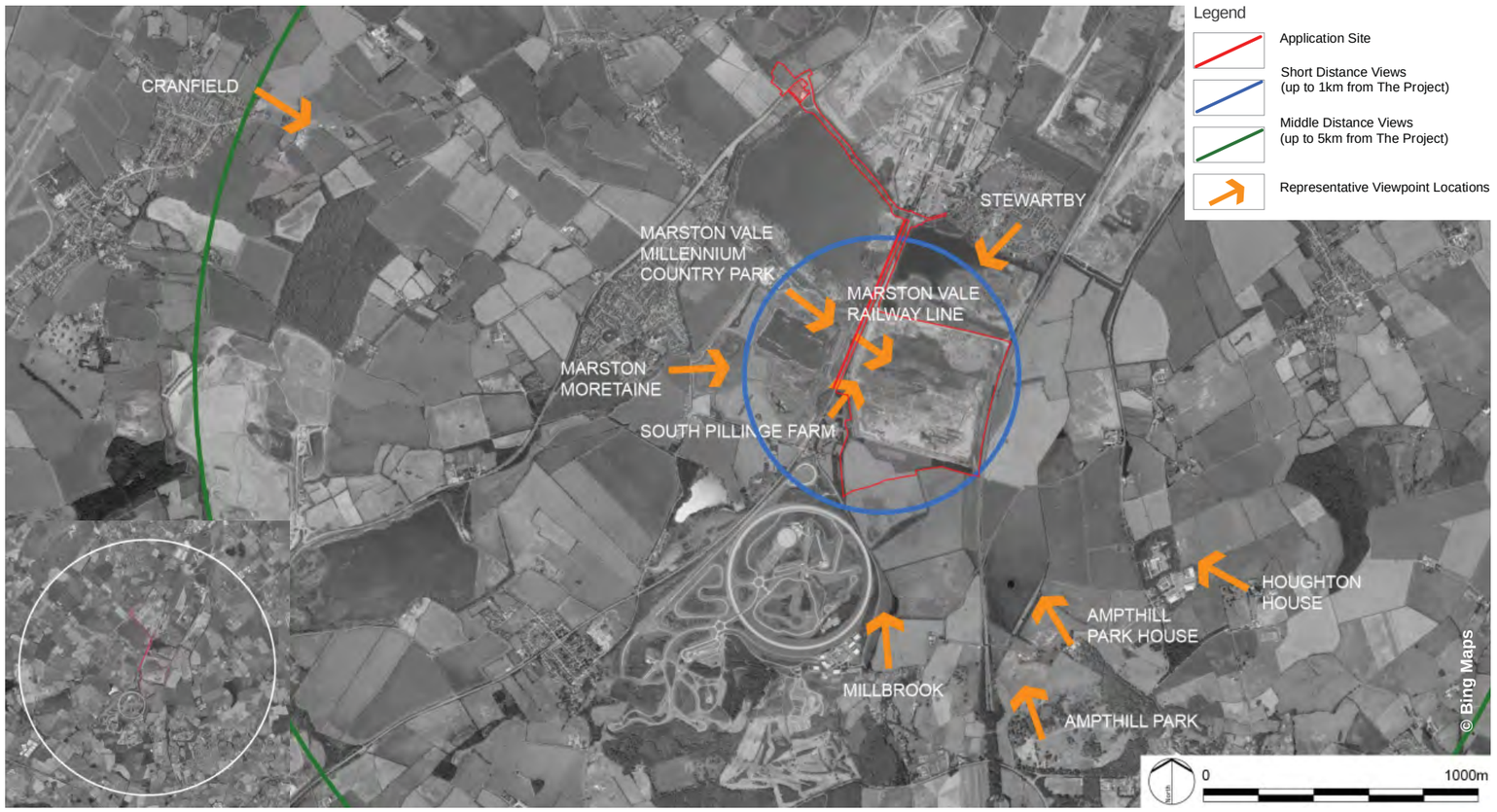


Figure 12: Viewpoint Locations

View from Stewartby

View from Marston Vale Forest Centre

View from Marston Moretaine

View from Millbrook

View from Ampthill Park House

View from Ampthill Park

View from Houghton House

View from Cranfield

View from South Pillinge Farm

View from the Marston Vale Line

Cultural Heritage

2.2.44. All designated and undesignated cultural heritage assets within a 3km radius of the site together with selective sites of greatest cultural heritage merit within a 10km radius of the site are illustrated in Figure 13.

2.2.45. The rapid expansion of the brick industry in the 20th century affected the settlement pattern of the vale but it is still possible to identify older (medieval) villages at Wootton, Marston Moretaine, Houghton Conquest and Lidlington. All of the villages have been greatly enlarged by 20th century house building, but there is a small historic core to each settlement. Only Church End, Wootton and Stewartby are designated as Conservation Areas within the immediate vicinity of the site. The villages are associated with medieval churches, many of which are Grade I or II* Listed which tend to be located on the edge of the village with towers that form local landmarks in the Vale. A number of smaller hamlets and isolated farmsteads certain remnants of medieval moated sites, some designated as Scheduled Monuments. Others have Grade II and II* Listed farmhouses.

2.2.46. Key cultural heritage assets of relevance to the design of the Project comprise:

a) Ampthill Park - lies to the south east and is a Grade II Registered landscape located on the north side of Ampthill and extends from the crest of the ridge down into the Vale. The park encompasses Ampthill Castle, (a Scheduled Monument, which is now marked by an 18th century memorial cross to Katherine of Aragon (Grade II Listed). The Park is now a public park;

b) Ampthill Park House - lies to the south east and is a Grade II* Listed building located towards the foot of the scarp with views over the vale to the north-west. The house is now detached from the surviving portions of its 18th century designed landscape of the Park and is a private house in multiple ownership. The house overlooks the Application Site at a lower elevation than Ampthill Park;

c) Millbrook village - lies to the west of Ampthill Park and is a Conservation Area. The village has good examples of estate houses built for the Duke of Bedford which are strung along the main village road. The medieval church (Grade II* Listed) is sited in a prominent high point above the village and is a landmark on the scarp when viewed from the vale below. The northern end of the main village road joins Station Road and looks towards the Application Site across intervening undulating farmland;

d) Houghton House - lies to the east and is a Grade I Listed building and a Scheduled Monument and was built in the early 17th century as a hunting lodge and survived until 1794 when it was partially dismantled. The house is located in a commanding position just below the crest of the ridge with north-facing views over the Vale. The house is a publicly accessible monument and overlooks the Application Site;

e) Stewartby - lies to the north of the site and within the vale and is in part designated as a Conservation Area. The village is generally inward facing with a tree screen separating it from the Application Site; and

f) Cardington Hangars - which are former air ship hangars, lie to the north east of the Application Site and some 8km distant. The buildings are Grade II* listed and lie within an flat open former airfield outside Bedford.

2.2.47. Of particular local importance is Stewartby brickworks and the four remaining chimneys to the west of the village. The chimneys and two Hoffman Kilns of the former brickworks are Grade II Listed. The scale and character of the chimneys has informed the design of the EfW Facility specifically in terms of the number of stacks, material colours and proportions of the stack.

2.2.48. Other listed buildings in close proximity to the Application Site include South Pillinge Farm (Grade II Listed).

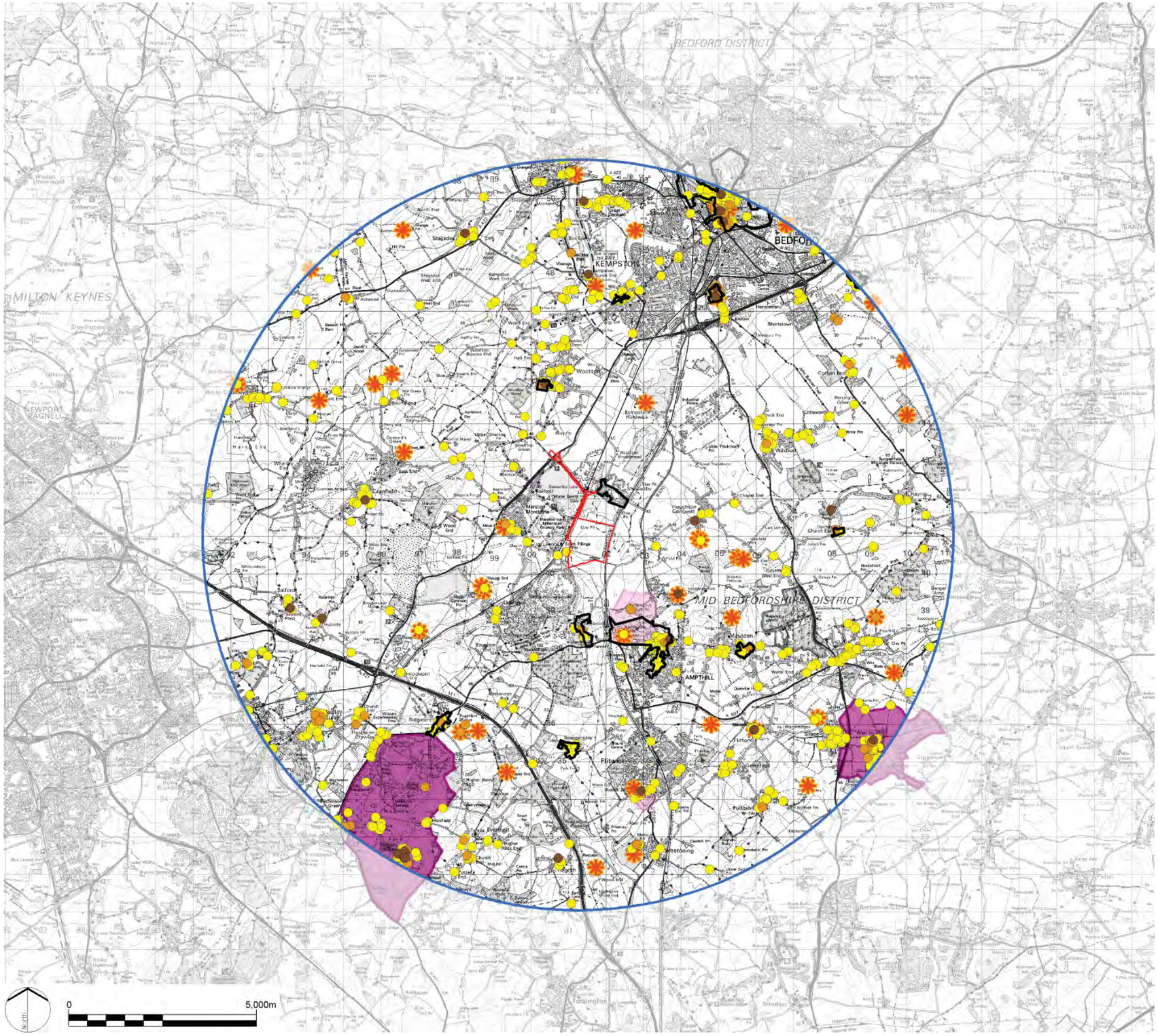
2.2.49. The existing decommissioned conveyor over the Marston Vale Line is to be partially demolished.

2.2.50. The proximity of the cultural heritage assets identified above has been a major influence driving the design of the Project giving consideration to siting of buildings, landscape integration strategy and building design. In many instances the design of the Project has been tested during the iterative process in assessment view points from these cultural assets.

2.2.51. According to the Bedfordshire Historic Environment Record (HER) there are 15 recorded undesignated assets within, or close to the Application Site including The Rookery itself. However, the excavation of the pit led to the destruction of assets where clay extraction occurred.

2.2.52. Within The Rookery, evidence of past land uses remain in the form of brick piles and other detritus, and include the decommissioned conveyor which crosses the Marston Vale Line to the north west of Rookery North Pit.

2.2.53. These cultural heritage assets referred to above did not significantly affect the development of the RRF design, apart from the presence of a crop mark ring ditch adjoining Station Road which also limited consideration of planting south east of South Pillinge Farm to avoid potential damage to this asset.



Legend

- Application Site
- Application Site exclusion zone
- 10km radius around site boundary
- Listed Building (Grade Indicated) — I II* II
- Scheduled Monument
- Registered Park or Garden (Grade Indicated) — I II* II
- Conservation Area (within 10km radius of site) (Central Beds and Bedford Borough only)

Designated Parks and Gardens information derived from English Heritage data dated 24.07.09. © Crown Copyright. (English Heritage)

Scheduled monument area information derived from English Heritage data dated 24.07.09 © Crown Copyright (English Heritage)

Listed Building data provided by English Heritage dated 24.07.09 © Crown Copyright (English Heritage)

Conservation Areas were digitized by LDA Design from CA Appraisals/ maps supplied by the relevant LPAs

Figure 13: Cultural Heritage - The Rookery and Immediate Context

Existing Watercourses and Land Drainage

2.2.54. Existing watercourses and waterbodies are illustrated in Figure 14. Mill Brook flows along the western boundary of the Application Site and drains a predominantly rural catchment of approximately 4.5km2. A tributary watercourse joins Mill Brook in the vicinity of South Pillinge Farm. Mill Brook passes beneath the Marston Vale Line and outfalls to Stewartby Lake a further 400m downstream.

2.2.55. The existing Green Lane drainage system drains to ditches on the south side of the road and into a linked pipework route that eventually drains north into the Elstow Brook.

2.2.56. The Mill Brook is utilised by the LLRS receiving water from the attenuation pond and conveying it into Stewartby Lake. Following implementation of the LLRS, Rookery South Pit itself will be drained by series of drainage ditches, one lying immediately south of the RRF. The flood risk associated with Mill Brook as it passes under the Marston Vale Line in a 1:1000 year flood scenario, was a consideration in the detailed layout of the Operations Area.

2.2.57. The proposed Green Lane junction drainage system will connect to the existing pipe work below the highway.

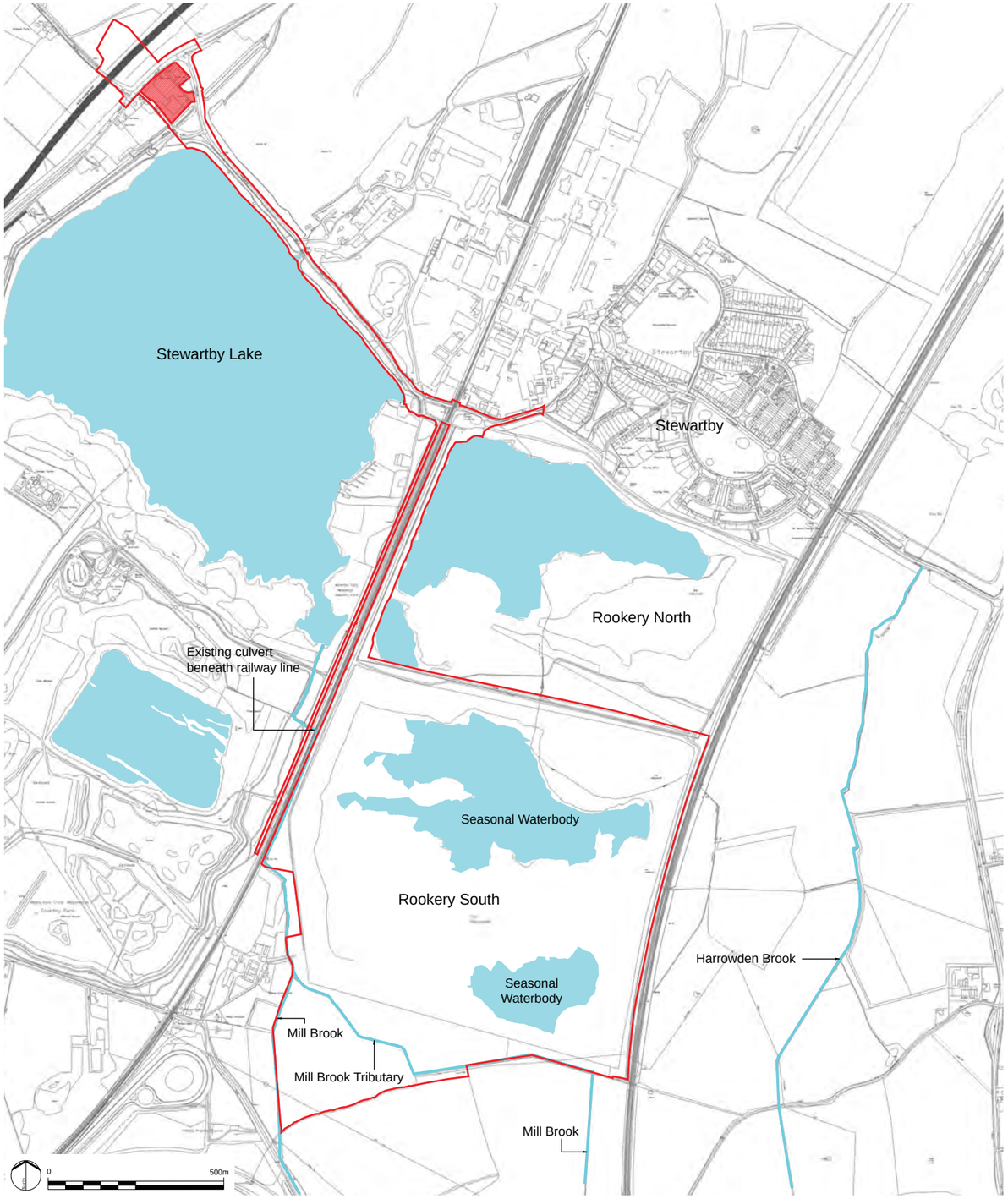


Figure 14: Existing Watercourses and Waterbodies

Transport and Access

Highway Network

2.2.58. The principal highway network is illustrated in Figure 15. The A421 forms the principal local transport corridor close to the site extending north-south and linking the A1 at Sandy with the M1 at junction13. The A507 by passes Ampthill to the south east; and the A6 extends north-south into Bedford. The existing A422 connects Bedford and Milton Keynes; and the M1 lies some 5km distant to the south of The Rookery site.

2.2.59. The existing A421 is currently subject to major improvement works, which will create a new A421 dual and 3-lane carriageway between Bedford (at the southern by-pass) and the M1. Works include re-routing of the carriageway to the west of Marston Moretaine, new junctions provided at Marston Moretaine and at Marsh Leys and major improvements to junction 13 on the M1. This work is due to be completed by the end of 2010.

2.2.60. The RRF will be accessed from the existing A421 via Green Lane, which is an unclassified road providing access to the former Stewartby brickworks site and Stewartby, connecting with the B530. The road crosses the Marston Vale Line at a level crossing and passes under the Midland Mainline to the east of the village via a low bridge with a height restriction where Stewartby Way meets the B530.

2.2.61. Access to the RRF will be provided from Green Lane via a new junction and will require modification to the existing highway alignment. The detailed design of this junction is addressed in Chapter 6 of the DAS.

2.2.62. The local highway network forms a key consideration in the design of the Project. Green Lane provides a link to the strategic road network to the west without passing through any settlements.

2.2.63. The existing railway level crossing and site access have been reviewed as part of the design process and upgrades and enhancements are proposed. These are set out in Chapter 6.

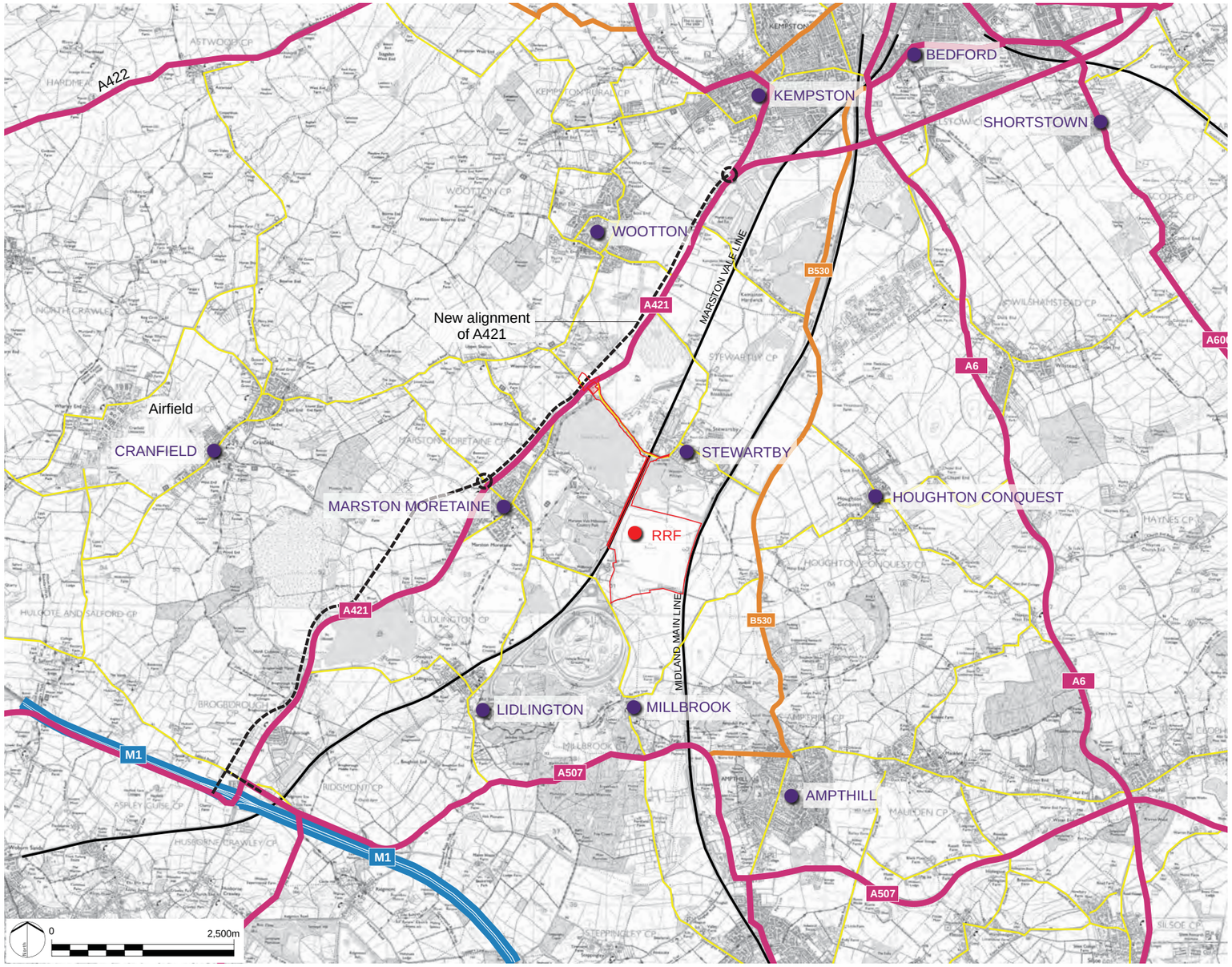


Figure 15: Principal Highway Network

2.2.64. There are existing bus stops on Green Lane located near Stewartby Village Hall, north of the Application Site. There is pedestrian access to Stewartby Station via a footway on the north side of Green Lane.

2.2.65. A potential station car park scheme associated with the Section 106 undertaking provided as part of the new Hanson HQ building on Green Lane has been prepared. However, it does not have any formal status at the time of writing and the proposed is understood to have been abandoned or delayed as Network Rail require the land for maintenance vehicles.

2.2.66. In addition to the station car park the Hanson HQ Project also includes a new vehicular site access to Green Lane with related footway improvements. It is assumed for the purposes of the Project that these improvements would be undertaken and would be connected to footway and lighting works associated with the Project.

Rail Network

2.2.67. The Marston Vale Line lies to the west of Rookery South. There are a number of local stations along the Line to the west, including those at Lidlington, Millbrook, Stewartby and Kempston Hardwick. The Marston Vale Line interacts the main Application Site boundary and crosses Green Lane at a level crossing in the vicinity of Stewartby Station.

2.2.68. The Marston Vale Line is principally a passenger line with limited freight movement and historically had halts associated with Stewartby brickworks. Stewartby Station straddles Green Lane with the south-bound platform abutting the Application Site. The level crossing has an automatic half barrier operating system. The line forms part of the east west rail proposal, which seeks to provide a high speed rail freight route from Bristol to Felixstowe via Oxford and Cambridge.

2.2.69. The Marston Vale Line has an important bearing on the design of the Project, providing opportunities for future rail connection for the RRF for waste deliveries. There are also potential opportunities for the realignment of pedestrian access from the east side of the south bound platform to improve accessibility and connection with the RRF and the Country Park, as well as presenting issues for the design of the access junction into the site to address. The consideration of potential conflict between train and vehicle movements on the proposed access road is also a design consideration.

2.2.70. The Marston Vale line to the west of the Application Site has a discontinuous fence line and a ditch that drains the ballast. The line is slightly elevated above the Application Site, with a near continuous narrow tree and scrub belt separating. There are some maturing trees straddling the fence line. The adjoining Rookery access track comprises crushed brick and other material with some disused manhole chambers to the west. The Conveyor over the rail line and south of Green Lane comprises a number of parts in what appears to be fixed sections with an inclined section anchored within the Application Site.

2.2.71. It is anticipated that the new boundary fence will define the boundary to the Marston Vale Line as part of the Project.

2.2.72. The Midland Mainline lies to the east of the RRF and forms the eastern site boundary. Under the LLRS a new boundary fence is to be erected.

2.2.73. The majority of vegetation within the Application Site and east of the Marston Vale Line will be removed for the access road construction and consideration of retention of trees straddling the ownership boundary will be required.

Strategic Rights of Way Network

2.2.74. An extensive, but in places fractured, rights of way network surrounds the Application Site. The LLRS includes the provision of a number of additional rights of way which are discussed in more detail in Chapters 4 and 6. The principal footpath and cycle routes within a 10km radius of the Application Site are described below and illustrated in Figure 16.

2.2.75. The Marston Vale Timberland Trail is recognised as an important route and comprises a circular walking route originating at the Forest of Marston Vale Centre at the Millennium Country Park, providing links to the settlements of Stewartby, Kings Wood, Ampthill, Mill Brook, Lidlington and Marston Moretaine.

2.2.76. Significant regional and national routes include Bedfordshire Cycle Route 3, which extends to the west and south of The Rookery and through the village of Marston Moretaine; and National Cycle Route 51, which passes the site to the west via the eastern side of Marston Moretaine along the boundary of the Marston Vale Millennium Country Park. Cycle routes within the Marston Vale Millennium Country Park operate on a permissive basis.

2.2.77. The provision of new or enhanced rights of way is considered to be an important opportunity that the Project can seize. A more detailed description of the local rights of way network is provided in the section of this DAS entitled The Rookery and its Immediate Setting paragraphs 2.5.9 - 2.5.14.

Airports

2.2.78. Cranfield Airport lies 6km west of the Application Site and is a local Facility for corporate, private and charter aircraft. Other flight paths relating to Luton and Old Warden are not of relevance to the Project.

2.2.79. En route obstructions are a consideration in the design of the EfW Facility and relate to both stack height and the nature of the stack plume. Airport related matters are addressed in Chapter 6 of this DAS.

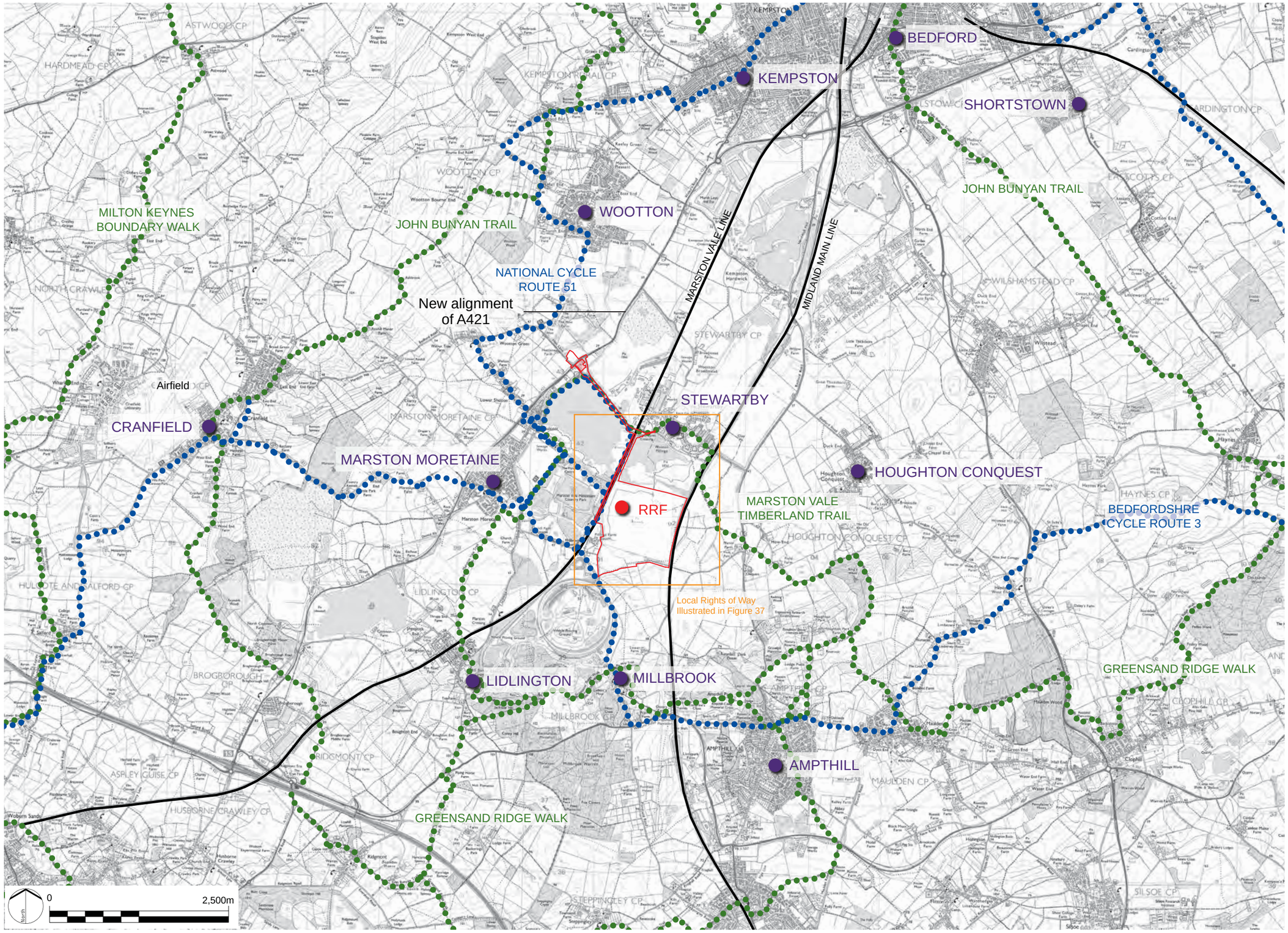


Figure 16: Strategic Rights of Way Network

2.3. DEVELOPMENT AND PLANNING CONTEXT

2.3.1. The following section provides a summary of the relevant design policy background and explains the dynamic development context for the Project. Figure 17, on page 34, illustrates the main areas of development defined in policy or already consented. A summary of other relevant national and regional planning policy is provided more the Planning Statement that accompanies the DCO Application.

Draft National Policy Statements

2.3.2. Draft Overarching National Policy Statement for Energy (EN-1), sets out the Government's proposed energy policy, explains the need for new energy infrastructure and instructs the IPC on how to assess the impacts of energy infrastructure development in general. The other draft NPSs contain supplementary information for specific types of infrastructure. For the Application, the draft NPS for Renewable Energy Infrastructure (EN-3) will be considered in conjunction with EN-1.

2.3.3. The draft National Policy Statement for Renewable Energy Infrastructure (NPS – EN3) makes reference to design. It states in Section 4.5 (Criteria for "good design" for energy infrastructure) that:

'good design is about ensuring attractive, usable, durable and adaptable places and contributing to sustainable development. The expectation should be that good aesthetic and functional design can go together although the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.'

2.3.4. NPS-EN1 further states that:

'The development should be as visually attractive as possible as a result of good architecture and appropriate landscaping. Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, such as electricity pylons, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area.'

2.3.5. In commenting on design criteria, draft NPS - EN3 refers back to the contents in NPS EN1, Section 4.5. However, it does provide a summary that states that the principles for good design should be applied to all energy infrastructure. It continues by saying that IPC should expect applicants to demonstrate good design in respect of landscape and visual amenity and in the design of the Project to mitigate impacts such as noise, and effects on ecology.

Planning Policy Statements

2.3.6. Planning Policy Statement (PPS) 1: Delivering Sustainable Development, published in 2005, sets out the overarching planning policies on the delivery of sustainable development through the planning system. In relation to design PPS 1 (paragraph 35) requires *'carefully planned and high quality buildings'*. It goes on to state that *'visual appearance and the architecture of individual buildings'* are factors in achieving this, along with *'addressing the connections between people and places'* and ensuring integration with the natural and built environment.

2.3.7. PPS 5: Planning for the Historic Environment, published in March 2010, identifies the Government's overarching aim, that the historic environment and heritage assets should be conserved and enjoyed for the quality of life they bring to this and future generations. Policy, HE1: Heritage Assets and Climate Change, emphasises the relationship between heritage assets and the need to mitigate, and adapt to, the effects of climate change. It also identifies that when assessing the potential effects of a development, the public benefit of mitigating the effects of climate change should be weighed against any harm to the significance of heritage assets in accordance with the development management principles in PPS 5 and national planning policy on climate change.

2.3.8. PPS 7: Sustainable Development in Rural Areas, published in 2004, makes explicit reference to development in the countryside and to local landscape designations. It states that planning authorities should continue to ensure that the quality and character of the countryside is protected and where possible enhanced, and that particular regard should be given to areas that have been statutorily designated for their landscape, wildlife or historic qualities. In relation to design, development should be of appropriate design and scale for its location, and that regard should be given to innovative, high-quality contemporary designs that are sensitive to their setting.

2.3.9. Planning Policy Statements give a strong direction to the consideration of design and context and the balance of good design with energy security. Good and appropriate design, consideration of scale and connections with the natural and built environment are all highlighted.

The Development Plan

2.3.10. A strategy for regeneration within the Northern Marston Vale is underpinned by planning policy objectives of the development plan which comprises:

a) Milton Keynes and South Midlands Sub Regional Strategy, March 2005;

b) Bedfordshire and Luton Minerals and Waste Local Plan First Review, January 2005;

c) Central Bedfordshire Core Strategy and Development Management Policies, November 2009; and

d) Bedford Borough, Core Strategy and Rural Issues Plan, April 2008.

2.3.11. The Bedfordshire and Luton Minerals and Waste Local Plan views the Marston Vale as a significant mineral and waste resource for the county. The extraction of clay for brick making and the subsequent use of the voids created for waste disposal are of continuing regional significance. Whilst these activities are currently less intensive than they may previously have been thought, they will continue to influence the environment of the vale.

2.3.12. In addition to the development plan, the Bedfordshire Waste Core Strategy Preferred Options Consultation Document 2010 states that the use of potential landfill capacity in the Marston Vale should reduce over time. Further, policy 2 states that new landfill development in the Marston Vale should not compromise proposals for environmental regeneration and housing development.

2.3.13. The Central Bedfordshire Adopted Core Strategy and Development Management Policies (covering the former Mid Bedfordshire area) presents the Council's vision, objectives and policies for the plan area. The Rookery lies within the Northern Marston Vale Strategic Area (policy CS1), which is identified for planned growth that will bring about: environmental regeneration; support the urban renaissance of Bedford; and make the vale a more attractive place to live, do business and enjoy leisure time. This policy also states that sites for the development of new homes, jobs and key infrastructure will be identified in a forthcoming Development Plan Document. The Inspector's 2009 report on the Core Strategy, Central Bedfordshire Council and Development Management Polices DPD describes The Rookery as a site for waste uses and is expected to be considered in the Waste and Minerals Local Development Framework. Policies CS13 and DM1 of these documents seek to enable an increase in local renewable energy production, both on the large and small scale.

2.3.14. The dynamic and changing character of the Marston Vale and wider area provides the regeneration context for delivering The Rookery South RRF.

The Forest of Marston Vale - A Canvas for Development

2.3.15. The Forest of Marston Vale extends over a considerable portion of the Vale, forming the canvas for future development. There is a strong emphasis in policy and the Forest objectives, on landscape restoration, addressing the legacy of mineral extraction, brick production and landfill. An increase in forest cover of the area with a target of 30% in development areas is encouraged through the Forest of Marston Vale Plan 2000 policy objectives. The Forest Strategy forms a backdrop for sustainable development as well as recreation pursuits.

Consented and Policy Driven Development

2.3.16. Major proposed and consented development is shown on Figure 17 and includes:

a) The National Institute for Research into Aquatic Habitats (Nirah), a consented project north east of The Rookery and within views from the elevated Greensand Ridge. It comprises a large research and tourism development for water ecology with a main structure in the order of 48m high;

b) The Wixams, a proposed large new settlement and mixed use scheme north of Stewartby for several thousand homes with supporting services and employment centres and extensive green infrastructure including 150 acres of parkland and open space;

c) Center Parcs at Millbrook;

d) Settlement growth of a number of villages, including Stewartby and Marston Moretaine;

e) The realignment and dualling of the A421 trunk road to accommodate the growth in traffic in the region and facilitate growth in the vale in the future;

f) A new canal to the west of the A421; and

g) A wind turbine located with the Marston Vale Millennium Country Park.

2.3.17. This variety of development has a complementary and common theme of sustainability with the provision of new infrastructure to facilitate future plans which is complemented by the RRF proposals it includes: a new settlement based on sustainable principles; existing settlement growth; major new tourism and employment stemming from the pursuit of an understanding of the environment; the existing Forest Centre promoting access to the Millennium Country Park and the wider landscape acting as the catalyst for the provision and promotion of green infrastructure; a new road to ease congestion and facilitate new development in the area; and the promotion of a new canal for tourism. These developments all form constituent parts of the future evolution of the landscape of the vale and some are also potential users of CHP.

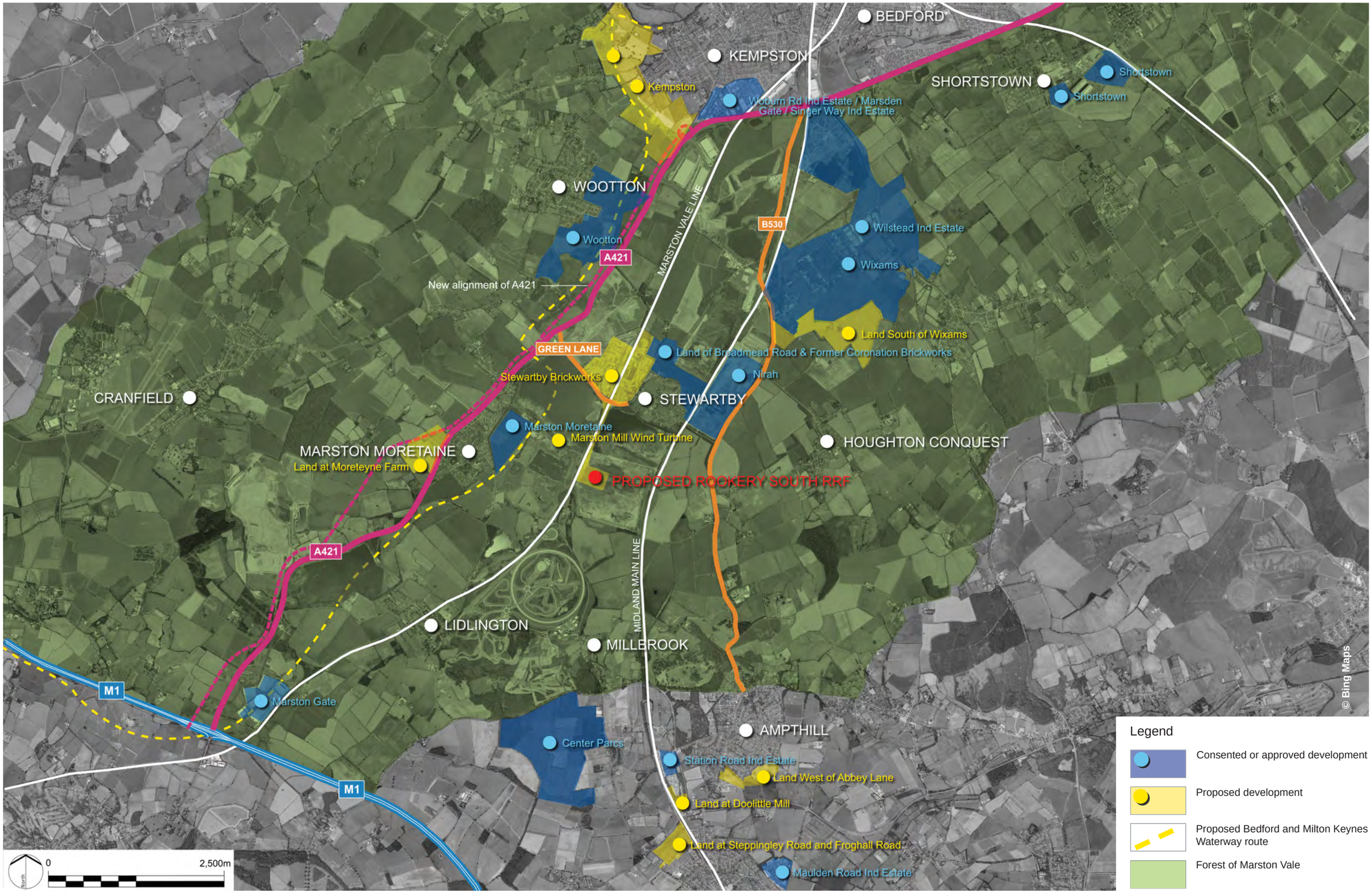


Figure 17: Development Context

Stewartby 2 Ecological Mitigation Scheme

2.3.18. This proposal is being promoted in order to provide translocation habitat for the LLRS. The translocation of four protected faunal species (great crested newt, common lizard, grass snake and water vole) will be implemented prior to commencement and for the purposes of the LLRS.

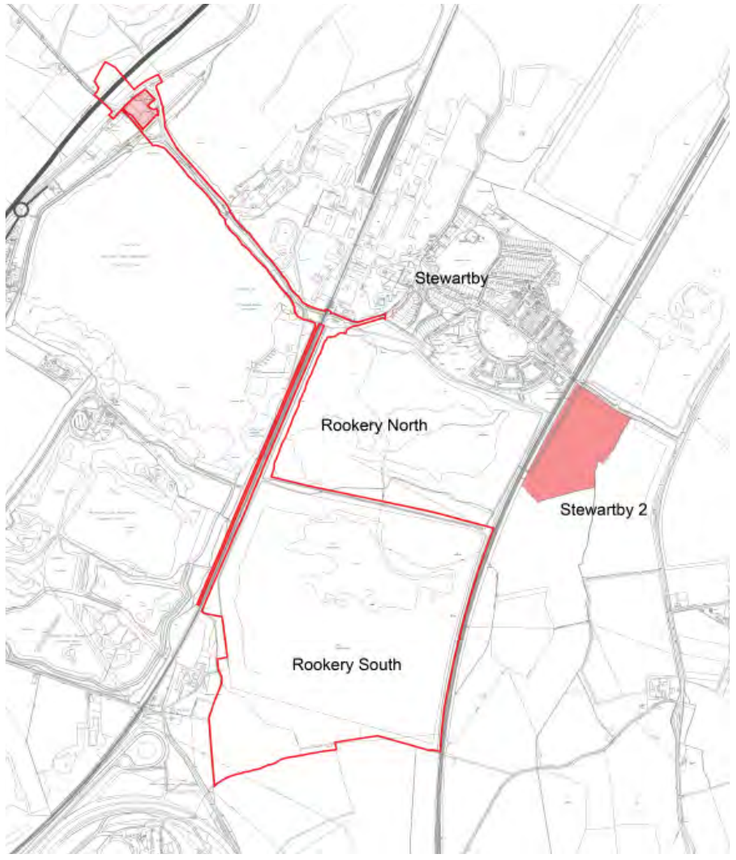


Figure 18: Stewartby Way 2 Location Plan

2.3.19. A suitable receptor site (referred to as Stewartby Way 2), located to the east of Rookery North Pit, will be developed to accommodate these species in addition to some receptor areas in Rookery North Pit which were prepared in early summer 2010. The Stewartby Way 2 site, will include ponds, grassland, scrub and broadleaf woodland and will be created in advance of translocation to allow habitats to develop. The Stewartby Way 2 scheme location is illustrated in Figure 18.

2.4. WASTE AND ENERGY CONTEXT

Requirement for diversion from landfill

2.4.1. To comply with the European Waste Framework Directive, the UK government has set a target to divert 67% of household waste from landfill by 2015 and 75% by 2020. This can be partly delivered by increased recycling and composting. The residual waste (the waste left after recycling and composting) can be used as a fuel to generate electricity and/or heat.

2.4.2. The use of EfW technology significantly reduces the mass of material which goes to landfill and entirely eliminates biodegradable waste from landfill. EfW reduces the input material to approximately 2% by mass. Approximately 20 – 21% of this is incinerator bottom ash (IBA) an inert material, which after processing on site is reused in the construction industry. 4% to 5% of this is ferrous and non ferrous metals, which are recovered from the IBA for recycling. The remaining 4% is the Flue Gas Treatment residue and which is disposed of in specialist landfill facilities.

Requirement for recovery of waste

2.4.3. The Waste Framework Directive (WFD) also prioritises the methods of waste treatment in the waste hierarchy. The waste hierarchy states that the aim should be to deal with waste in accordance in the following order, starting with the most favourable and ending with the least favourable:

a) Reduction;

b) Reuse;

c) Recycling/Composting;

d) Recovery; and

e) Disposal.

2.4.4. The Rookery South RRF would recover energy from the residual waste remaining after the application of source separation and other recycling techniques. In order to be classified as "recovery" under the Waste Framework Directive (WFD), an EfW Facility must meet an energy efficiency criterion prescribed in the Directive. The Rookery South EfW Facility would qualify as recovery under the WFD as explained in the Engineering Design Statement that accompanies the Application.

Energy Context

2.4.5. Government policy on energy and climate change recognises the importance of renewable energy production in contributing to future energy demands in the UK. Draft NPS EN-3 and Draft NPS EN-1 provide the principal planning policy context for renewable energy production. Draft NPS EN-1 states that the UK will need approximately 43GW of new capacity by 2020 and 60GW by 2025. It is expected that 30% of this electricity will be drawn from renewable sources by 2020. Draft NPS EN-3 makes specific reference to renewable energy infrastructure and recognises that;

'recovery of energy from the combustion of waste, where in accordance with the waste hierarchy, will play an increasingly important role in meeting the UK's energy needs. … Further, the recovery of energy from the combustion of waste, form an important element of waste management strategies in both England and Wales.'

2.4.6. Overall, the proposed EfW Facility will positively contribute to the Government's recognised need for a diverse, decentralised and secure energy supply. It will help to deliver a reduction in greenhouse gas emissions as part of the overall energy production mix.

2.5. THE ROOKERY AND IMMEDIATE SETTING

2.5.1. This section of the DAS describes the existing condition of The Rookery and provides further detail on the local rights of way network. This section also describes how the LLRS works will modify the existing physical character of The Rookery to establish the baseline conditions for the Project.

An Overview of The Rookery

2.5.2. The Rookery comprises two large clay pits, Rookery North Pit and Rookery South Pit, separated by an east-west spine of unexcavated clay, covering an area of approximately 210 hectares. The Application Site comprises approximately 130 hectares in total and the Operations Area, which is primarily within the north western quadrant of Rookery South Pit, extends to cover an area of approximately 9.3 hectares within the total area of Rookery South which extends to approximately 116ha.

2.5.3. The Rookery has a long history of clay working, supplying Oxford Clay for brick manufacture at the London Brick Company works at Stewartby. The winning and working of clay was originally permitted in 1952. Since then, clay extraction has taken place over the majority of the permitted area at The Rookery. Some reserves remain, being largely confined to land within the south western corner of Rookery South.

2.5.4. The existing physical characteristics of both Rookery North and Rookery South Pits, which are described in the following paragraphs, will be subject to change as the approved LLRS works are implemented. These works would return The Rookery to low intensity agricultural land (in large part) and will provide additional ecological and amenity benefits.

Rookery North Pit

2.5.5. Rookery North Pit is approximately 70ha in area and presently encompasses a deep lake in the central / western area fringed by extensive stands of reed-swamp which extend into a coarse and relatively species-poor grassland. There is a backfilled area in the east and south east part of Rookery North comprised largely of mineral (clay) waste deposited under a Waste Management Licence. The base of the flooded pit sits approximately 20m below surrounding ground level at circa 17.5mAOD at its deepest, with a berm along the western edge at circa 32AOD. The smaller water body located at the south western corner of Rookery North has a base level of 28m AOD. A continuous belt of trees along the northern boundary provides a buffer between Rookery North Pit and Green Lane, Stewartby. The elevated portions of Rookery North Pit include species-poor neutral grassland, immature broadleaved plantation woodlands, scattered broadleaved trees and shrubs, and both dry and seasonally-wet ruderal communities. The North Pit abuts Green Lane and Stewartby. Under the LLRS The Rookery North Pit lake will be partially drained to improve lake-edge habitat and areas of habitat created as translocation habitat for protected species removed as part of the lake draining works in the Rookery South Pit.

Rookery South Pit

2.5.6. Rookery South Pit is approximately 116ha in area. The majority of the pit is approximately 10-24m below surrounding ground levels and is currently bounded by steep clay banks, which have a stepped profile to the west and southeast corner with instability observed in many areas principally to the south, east and northeast of the pit. The base of the pit comprises large, ephemeral waterbodies which are fringed by extensive stands of reed-swamp and coarse, relatively species-poor, grassland. The land around the periphery of the pit that remains at the original ground level, approximately 42m AOD, is primarily grassland with scattered scrub and maturing woodland to the southeast. In addition, there are seasonally parched areas of bare ground (predominantly on the exposed slopes) which support a ruderal botanical community. The Pit is accessed from Green Lane by a track, some 700m long, which extends along the western boundary of the Application Site adjacent and parallel to the Marston Vale Line.

2.5.7. Jointly, Rookery North Pit and Rookery South Pit presently support an assemblage of protected species and species groups, most notably great crested newts, aquatic and terrestrial invertebrate assemblages and stonewort communities. In addition, several species of bat forage extensively over the waterbodies and use the linear vegetated features for commuting. The Rookery, like many other remnant clay pits in the area, is designated as a County Wildlife Site.

2.5.8. Under the LLRS proposals the base level of Rookery South Pit and the existing bank profiles will be altered with slacker slopes and a re-graded pit base including drainage ditches draining to an attenuation pond including access tracks extending down the pit embankment face. Protected species will be translocated to Rookery North Pit and the receptor site at Stewartby Way 2.

Legend

Application Site

Not included in the Application Site

Access track

Soft Landscape Features

Permanent waterbodies and watercourses

Seasonal waterbodies

Trees, scrub and woodland

Amenity grassland

Marsh/species poor grassland

Embankments

East - West spine of unexcavated clay

Land Use

Arable agriculture

Industrial/commercial

Residential

Infrastructure

Local roads

Railway

Overhead electricity cables & pylons

Public Rights of Way

Public footpath

Long distance footpath

National cycle route 51

Local cycle route

Designations

Conservation area

Listed buildings

Figure 19: The Rookery and Immediate Context

Public Rights of Way

2.5.9. A network of dedicated footpaths, some with permissive cycle rights, extends around and outside the Application Site with several located around Stewartby Lake and Marston Vale Millennium Country Park. These are illustrated in Figure 20.

2.5.10. The existing rights of way network is fractured around the perimeter of The Rookery with a number of paths apparently stopped up to enable mineral extraction permissions to be implemented.

2.5.11. At present, there is limited public access to The Rookery. A footpath extends from Station Road to pass under the Midland Main Line, passing along the eastern side of South Pit and a short section of footpath extends towards the Application Site east over the Marston Vale Line. A fractured series of footpath sections occur in the north east corner of the North Pit extending from the edge of Stewartby but are not recognisable on the ground.

2.5.12. The LLRS will extend the current rights of way provision and provide new permissive and dedicated footpath routes within The Rookery. These are described in more detail in later sections of this DAS.

2.5.13. A footway extends along the southern side of Green Lane at a width of approximately 1.2m over the railway line with no pavement connection to the east or west. A 1.4m wide footway extends along the north side of Green Lane including a footway over the rail line. Footpath 4 terminates on the south side of Green Lane adjacent to the last house on Stewartby Way.

2.5.14. The existing network, and that proposed under the LLRS, form the basis for enhancement of connection and provision detailed in later Chapters of this DAS including consideration of the level crossing and highway junction design.

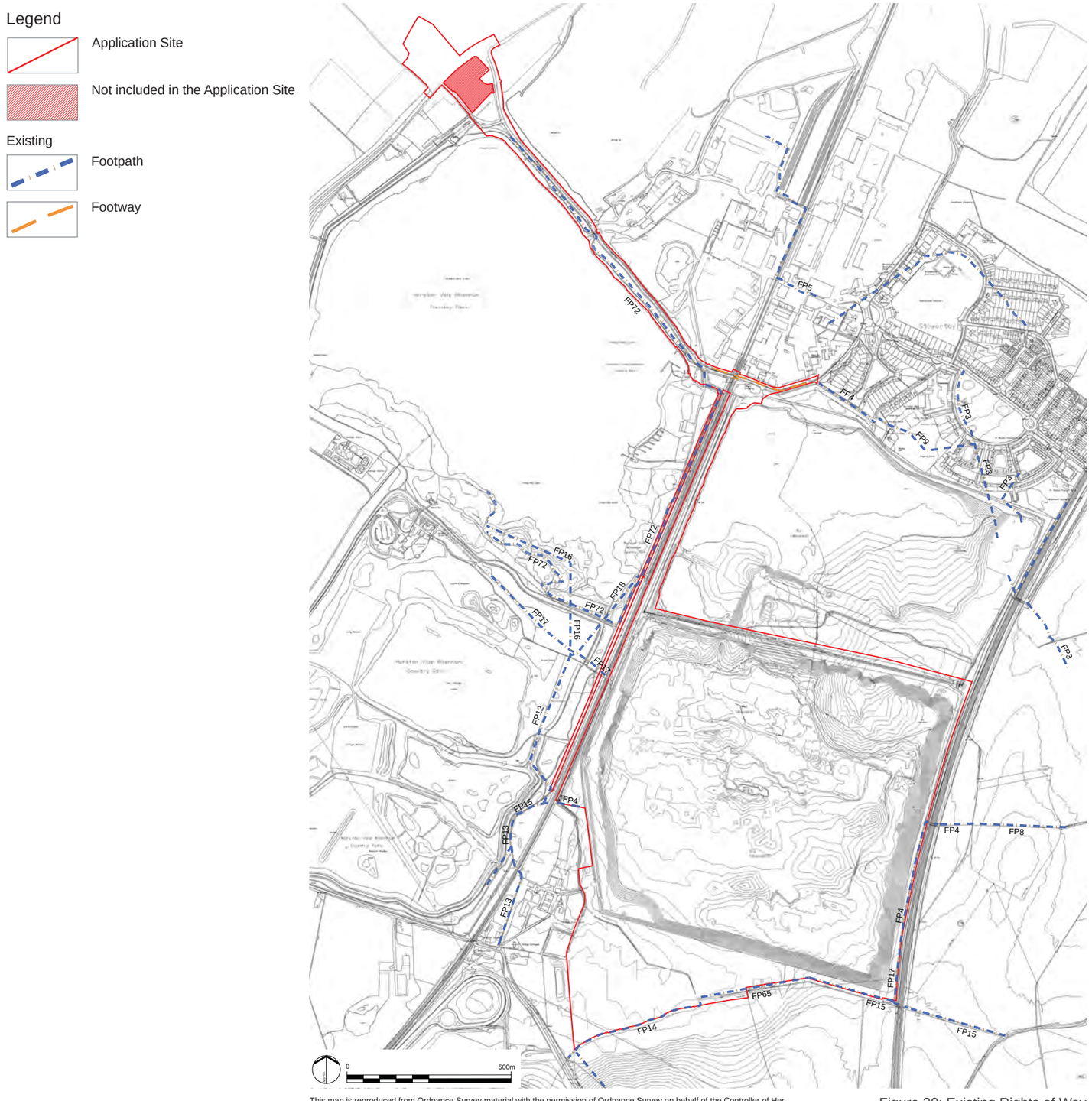


Figure 20: Existing Rights of Way

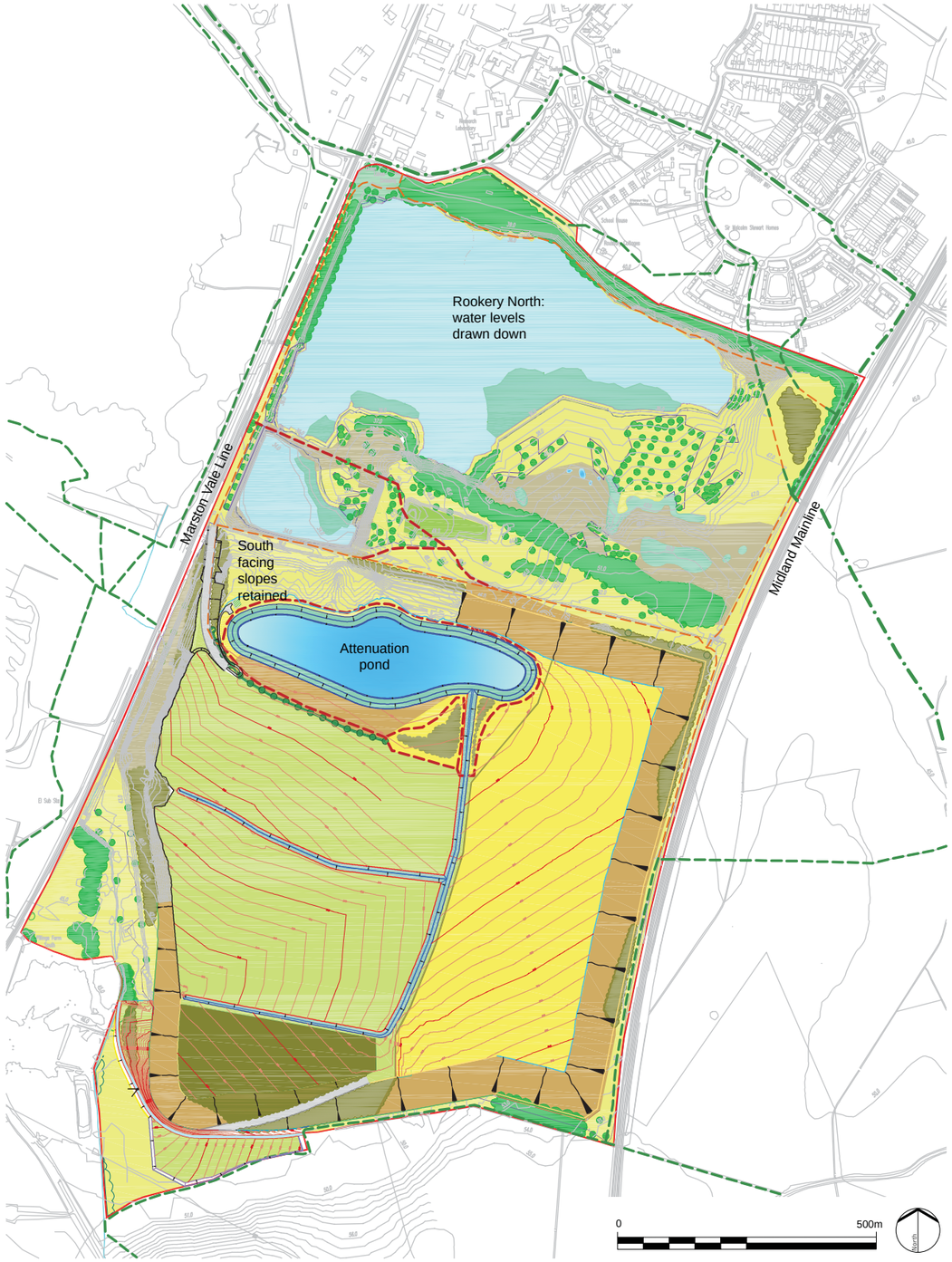
2.6. RESTORATION OF THE ROOKERY: THE LOW LEVEL RESTORATION SCHEME (LLRS)

An Overview

2.6.1. The LLRS is shown in Figure 21. The key aspects of the strategy are outlined below. A more detailed description of the LLRS can be found in the Environmental Statement accompanying the Application.

Legend

- Waterbody (Existing)
- Waterbody (Proposed)
- Existing Watercourses
- Surface Water Drainage
- Species Translocation
- Woodland Planting
- Rights of Way
- Embankment Stabilisation



Legend

Existing Features

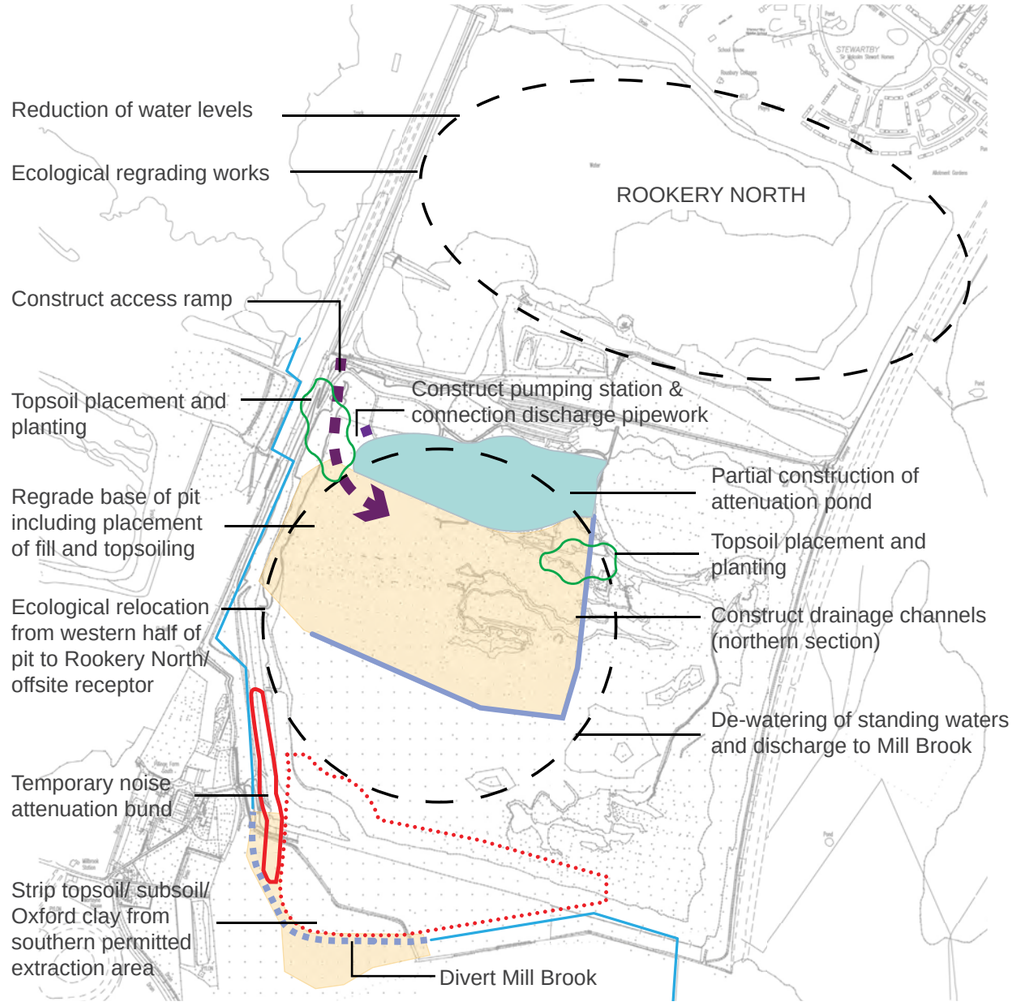
- Existing Contours
- Trees, scrub & woodland
- Neutral grassland
- Semi-improved grassland
- Grassland and bare ground
- Lake
- Watercourse
- Public footpath
- Long distance footpath

LLRS Features

- Restoration contours
- Base of pit levelled, graded & grassed
- Neutral grassland established on regarded/restored areas
- Amenity grassland
- Natural regeneration on regraded slopes
- Marsh, marginal aquatics
- Pond, open water
- Proposed tree, scrub planting
- Proposed hedgerow
- Proposed grass verge with tree avenue
- Proposed new dedicated footpaths
- Proposed new permissive footpaths

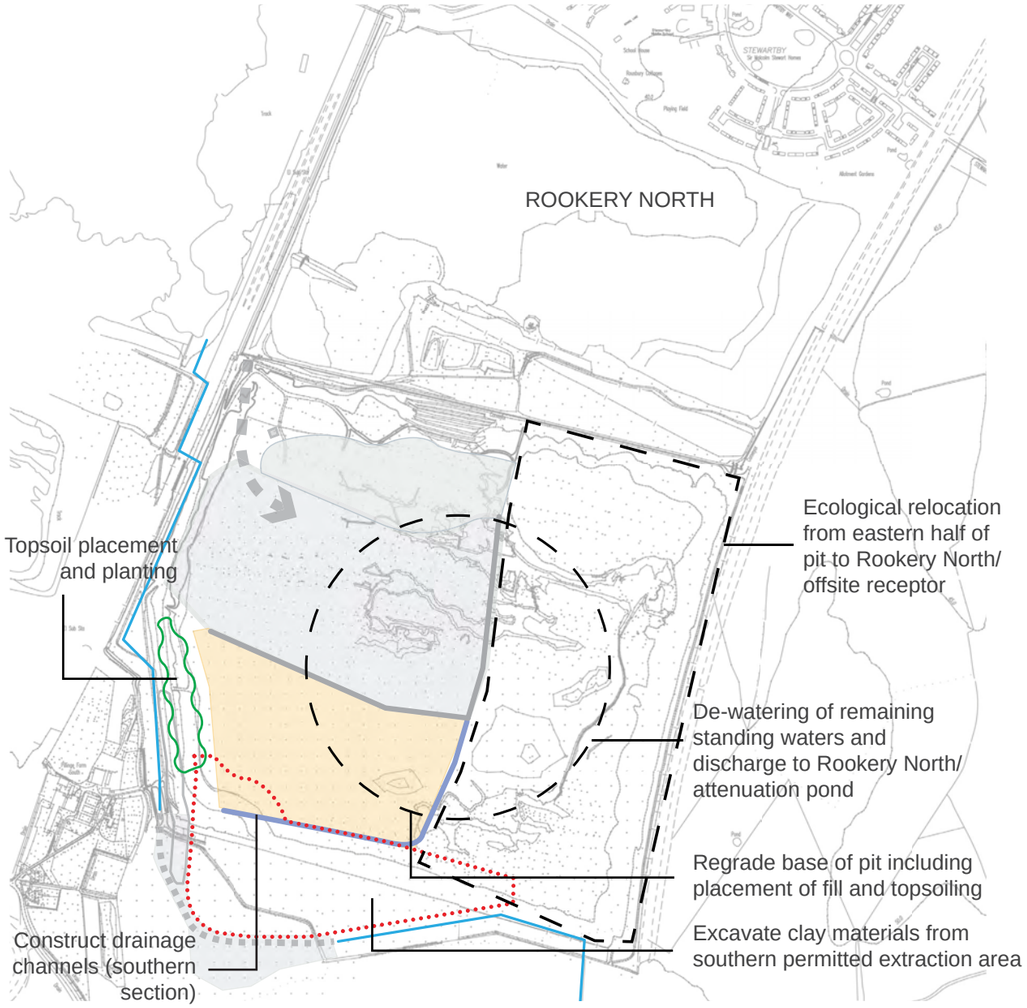
Figure 21: LLRS Proposals

2.6.2. The LLRS will be implemented on a phased basis. It is anticipated that preparatory works will commence during 2010 and that restoration will be completed in or about 2014 (the RRF would be constructed in parallel with later phases of the LLRS). In general terms, to deliver the LLRS, the works to the base of Rookery South will be undertaken by splitting the site into quadrants (northwest, southwest, southeast and northeast). Work will progress from the north-western quadrant (the proposed location of the Operations Area) followed by the south-western quadrant. The eastern half of Rookery South Pit will then be similarly worked to complete the restoration works. The remaining permitted extraction area on the southern side of Rookery South will not be fully worked and completed until the completion of all the earthworks in Rookery South. The phasing strategy and associated works are illustrated in Figure 22.

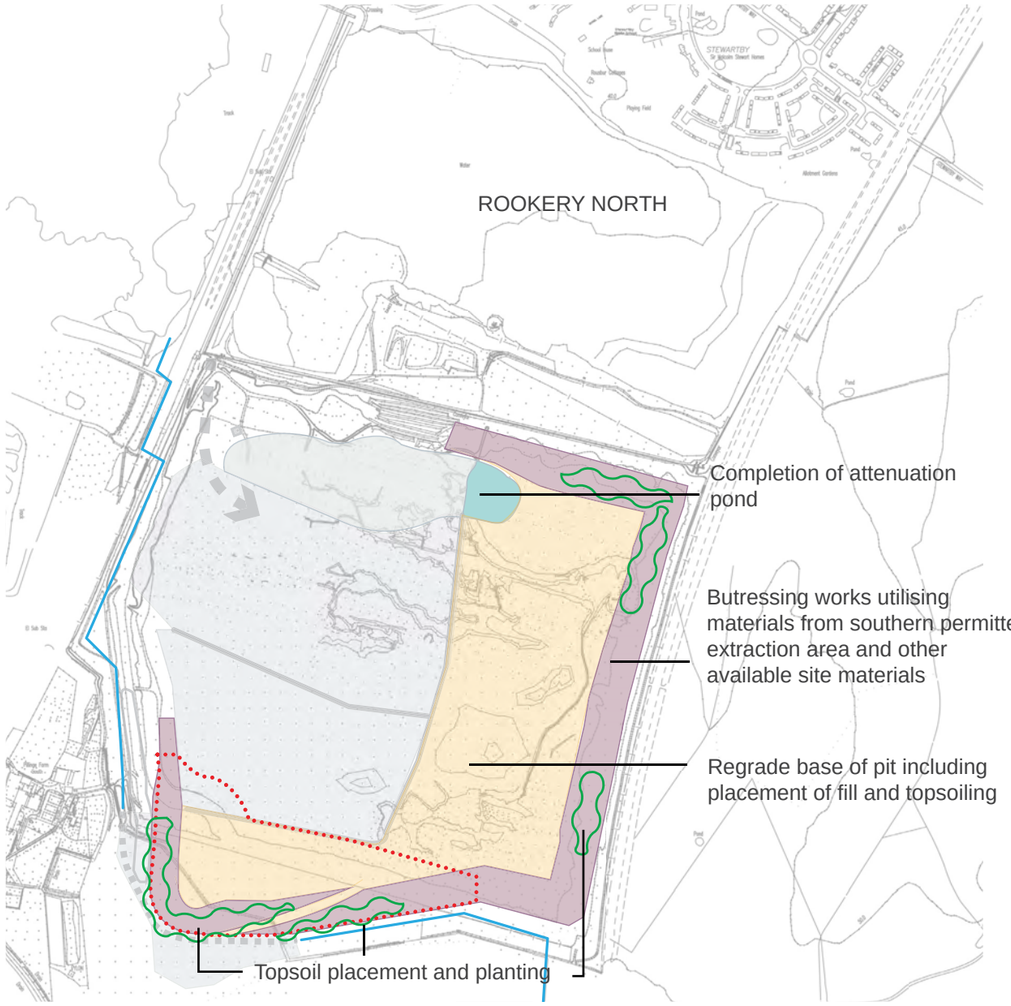


Phase 1 (2010-2012)

Figure 22: The Low Level Restoration Scheme Phasing Strategy



Phase 2 (2011 - 2013)



Phase 3 & 4 (2013 - 2014)

2.7. SUMMARY OF KEY FEATURES OF CHARACTER AND CONTEXT WHICH HAVE INFLUENCED THE DESIGN

2.7.1 Physical Context

a) The topographic context of the Marston Vale and Greensand Ridge and the related visual receptor audiences and settlement pattern;

b) The extent of woodland cover in the Marston Vale which collectively forms the Forest of Marston Vale; and

c) The legacy of brick making on the landscape in the form of extraction pits and brickworks.

2.7.2 Landscape Character

a) The significance of character of the Clay Vale and the Greensand Ridge; and

b) The importance of change and regeneration in defining the character of the North Marston Clay Vale and establishing the development and regeneration context for the Project.

2.7.3 Green Infrastructure

a) The Forest of Marston Vale is the primary GI initiative in the vale which establishes, through the Forest Plan, design objectives for the Project including woodland creation and management, public rights of way improvements and habitat creation.

2.7.4 Settlement Pattern

a) The location of the Application Site between two major conurbations and between 3 villages defines a countryside context for the Project that is shared by these settlements.

2.7.5 Ecology

a) The proximity and location of protected habitats and designated sites, which include County Wildlife Sites and SSSIs are a consideration particularly in relation to the dispersal of particulates from the EfW Facility.

2.7.6 Visual Context

a) There is intervisibility between the distant, elevated Greensand Ridge landscape and the flat, low lying clay vale in which the RRF is located. The ridge establishes inclined views into the vale and the Application Site which are important design drivers in seeking to control views into the operational floor; and

b) From within the flat landscape of the vale itself, the views from the Country Park are an important consideration addressing amenity considerations and cultural associations.

2.7.7 Cultural Heritage

a) The proximity of cultural heritage assets in the Marston Vale and on the Greensand Ridge have informed the design response for the Project. Of particular significance are Ampthill Park, Ampthill Park House, Mill Brook Village, Houghton House, Stewartby Stacks and Stewartby Conservation Area and the Cardington Hangars.

2.7.8 Transport and Access

Highway Network:

a) Green Lane provides a link to the strategic road network to the west with connection to the upgraded A421.

Rail Network:

a) The Marston Vale Line provides opportunities for future strategic rail connection for the EfW Facility for waste deliveries.

Airports:

a) Cranfield Airport lies 6km west of the Application Site. En route obstructions are a consideration in the design of the EfW Facility and relate to both stack height and the nature of the stack plume.

Rights of Way:

a) The existing strategic network forms an important basis for enhancement of connections.

2.7.9 Planning and Development Context

Planning Policy Context:

a) Draft National Policy Statements (principally NPS – EN1, and NPS – EN3) and relevant Planning Policy Statements and Guidance are the principal overarching planning documents which influence the Project;

b) At a regional and local level, the Development Plan provides the strategy for regeneration within the Northern Marston Vale; and

c) In addition, the Forest of Marston Vale Plan presents more detail regarding the development within the Forest of Marston Vale area.

Development Control Context:

a) The Development Plan provides the development control context for Northern Marston Vale;

b) The Northern Marston Vale landscape character is also changing significantly. This changing landscape provides the context for delivering the Project; and

c) There are a significant number of major consented developments within the Northern Marston Vale. These have a complementary and common theme of sustainability.

2.7.10 Energy Context

a) The energy context is set through national and regional policy documents that recognise the importance of renewable energy production in contributing to the future energy demands in the UK.

2.7.11 Waste Context

a) The waste context of the Project is driven by a requirement for diversion of waste from landfill and a requirement for recovery of waste. Both are underpinned by UK Government targets in order to comply with the European Waste Framework Directive.

2.7.12 Adjacent Settlement and Development

a) Stewartby – location and setting informed EfW Facility design and orientation, rights of way connections and localised screening;

b) Marston Vale Millennium Country Park – proximity to the RRF informed the architectural treatment of the EfW Facility and rights of way provision;

c) Marston Moretaine – location informed building design and orientation; and

d) South Pillinge Farm and its associated cottages - The location and orientation of the existing dwellings informed design of the RRF having particular regard to noise screening.

2.7.13 Cultural Heritage

a) Stewartby brickworks and the four remaining chimneys to the west of the village – the proximity to the Application Site informed the scale and character of the EfW Facility stack.

2.7.14 Highway Context

a) The existing highway provision on Green Lane provides the basis for connection to the RRF; and

b) In addition to the car park the Hanson HQ Project also includes a new vehicular site access on to Green Lane with related footway improvements.

2.7.15 Local Rail Provision

a) Stewartby Station comprises two platforms to the immediate north and south of Green Lane and is accessible from Green Lane via an at-grade level crossing. The level crossing is a matter for design consideration;

b) The potential connection of the RRF to the rail network is a consideration; and

c) The potential conflict of train and vehicles lights on the proposed RRF access road is a consideration.

2.7.16 Public Rights of Way

a) The existing rights of way network is fractured around the perimeter of The Rookery with a number of paths stopped up pursuant to mineral extraction permissions. The existing network together with improved provision through the LLRS (see below) forms an important basis for enhancement of connection;

2.7.17 Low Level Restoration Scheme

The LLRS will create the baseline site conditions upon which the RRF will be constructed. The important features of the restoration strategy which have informed design comprise:

a) The regraded pit floor which forms the subgrade level for the RRF;

b) The works dictated the strategy for the location of the building within the pit and more detailed location work on the western embankment as well as being a consideration for planting and associated soiling works;

c) Slope stabilisation works have partly informed the alignment of the RRF access road into The Rookery South Pit utilising the LLRS access track and attenuation pond embankment works;

d) The retained southern slopes dictated a restricted approach to planting on the southern slopes north of the RRF affording views from the new rights of way;

e) The design of the drainage scheme for the RRF Operations Area was dictated by the LLRS drainage strategy and partly informed the location of the EfW Facility offices and the definition of front and back of house locations in the Operations Area;

f) Excavations from the southern permitted extraction area combined with the Stewartby Way 2 scheme will provide topsoil for The Rookery South restoration, way shortfall being made up by topsoil manufacture of subsoil mixed with ameoleriorants; and

g) The rights of way proposed under the LLRS and Section 106 will extend the current rights of way provision and provide new permissive and dedicated footpath routes within The Rookery.

3.0 THE DESIGN PRINCIPLES AND OBJECTIVES

3.1. INTRODUCTION

3.1.1. This Chapter describes the iterative design process undertaken from the inception of the Project in 2008. It summarises the key stages of design development which comprise:

a) The early establishment of Operational and Design Principles which would inform the design response;

b) The establishment of Design Objectives;

c) The preparation of context and design studies; and

d) The iterative process of design refinement and testing leading to the design which will be submitted in the DCO Application.

3.1.2. The Chapter also briefly describes interaction with Covanta's consultation process. This has informed design decisions throughout all stages of Project development. Consultation is addressed in detail in the Consultation Report submitted in support of the Application.

3.2. THE CONSULTATION PROCESS

3.2.1. A comprehensive programme of consultation has been integral to the design process from the Project's inception in 2008. Consultation took place with members of the public and key stakeholders and groups, together with key advisors and statutory and regulatory organisations. The Application is required to be accompanied by the Consultation Report. This sets out the consultation undertaken in relation to the Project and how the representations and comments received during the pre-Application consultation stage have influenced the Application. A commentary on the key design decisions which have been informed by consultation are discussed within the design development Chapters 5-10 of this DAS.

3.2.2. The consultees that have particularly influenced the design of the Project include the following:

a) English Heritage (EH);

b) Central Bedfordshire Council (CBC);

c) Bedford Borough Council (BBC);

d) The Marston Vale Trust;

e) The Commission for Architecture and the Built Environment (CABE);

f) The Community Liaison Panel (CLP) established by Covanta;

g) Network Rail; and

h) The Environment Agency.

3.2.3. Whilst these bodies have been particularly influential in design development, members of the public have also played a very important part in the process. Their views have influenced the building form and the colour treatment of certain elements in particular.

3.3. AN OVERVIEW OF THE DESIGN PROCESS

3.3.1. Figure 23 summarises the structured and iterative approach to design development. This process started with the establishment of high level Operational Principles. These were informed by an understanding of operational requirements leading to the establishment of Design Principles and subsequently as the process moved forward, the Design Objectives. These informed a series of early design studies, which guided and recorded design development. Guided by Design Objectives, the early design studies formed the basis of consultation with key stakeholders and statutory bodies including CABE, English Heritage, CBC and BBC and resulted in the design code for the EfW Facility. The emerging design of the Project was then subject to ongoing development and refinement (again informed by consultation), leading to the design that is the subject of the Application.

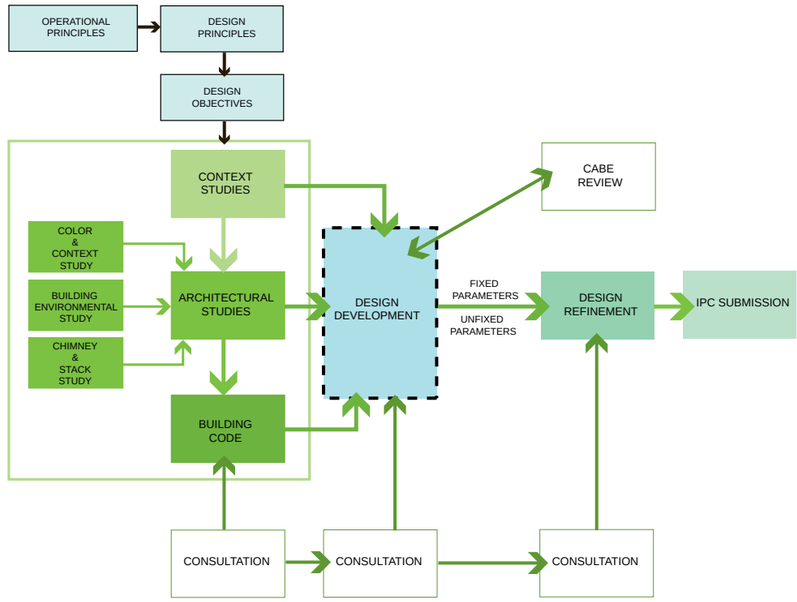


Figure 23: Design Development and Consultation Process

Operational Principles

3.3.2. The design process has been underpinned by establishing, a series of Operational Principles for the RRF. The RRF should be:

a) Environmentally Sound – it should operate within relevant environmental guidelines and Regulations and in terms of environmental impacts should seek to minimise these through good design;

b) Fit for purpose – the RRF should be appropriately scaled to permit the defined waste throughput to be processed and the resulting residual materials to be appropriately treated, in this instance through the provision of a MRF working in conjunction with the EfW Facility;

c) Safe - the design of RRF and its operational layout should work to best practice, relevant guidance and regulations;

d) Efficient - the operational layout of the RRF should be efficient giving consideration to matters including materials selection and performance in the detailed design of each building and during operation minimising transportation within the Operations Area and recycling water. The scale of the EfW Facility is in part dictated by the selection of technology and capacity of waste throughput – an economy of scale is identifiable which favours 200,000 tonne per annum stream design. This permits relatively high throughput whilst keeping the height of the boiler arrangement relatively low;

e) Reliable – the materials selected for enclosure finishes to the buildings should have an appropriate design and performance life and surface finishes be adequately robust in their specification. The selection of the technology for the RRF Facility should be proven and reliable; and

f) Compliant with Regulatory Requirements – Relevant legal requirements should be complied with and are addressed through the provision of key documents and information for the construction and operation phases of the Project.

Waste Catchment Area

3.3.3. The design of the EfW Facility, in terms of its physical size and configuration of plant is, to a large extent, determined by the volume of waste that it is intended to process and by the technologies selected. The Engineering Design Statement (EDS) which accompanies the Application provides further detail on the interaction between waste throughput and stream design as well as its influence on the size of the EfW Facility. The EDS explains how Covanta has:

a) Determined the required capacity of the Facility based on a waste catchment area that is identified in the Planning Statement which supports the Application;

b) Selected the technology for the EfW Facility - Covanta has selected a system that recovers thermal energy in waste and convert it to heat so as to produce electricity based upon an inclined reciprocating grate system; and

c) Selected the preferred stream capacity – Covanta has selected a three stream EfW Facility that permits an efficient design for a throughput of approximately 200,000 tonnes per annum per stream providing a total nominal throughput of 585,000 tonnes of waste per annum. This approach brings economies of scale permitting large flexible throughput but also keeps the overall of the facility low. As a comparison a two stream EfW Facility with the same throughput would be in the order of 6m higher based on the stream size.

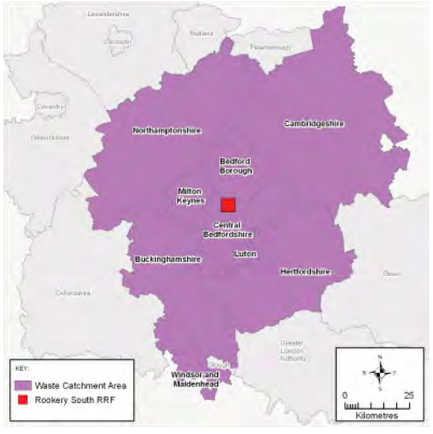


Figure 24: Rookery South RRF Waste Catchment Area

3.4. DESIGN PRINCIPLES

3.4.1. Drawing upon the Operational Principles key Design Principles were defined at the outset of the Project and informed the subsequent Design Objectives.

3.4.2. The Design Principles comprise:

a) An appreciation of the surrounding landscape and its ecological and historic contexts. The Project philosophy, site masterplan and building design response is based on a thorough understanding of the context of the Application Site that should shape the nature of the design;

b) The Project should reflect:

i) Recognition of the Project's role as part of a multifunctional environment promoting sustainable living;

ii) Involvement in coordinated initiatives to promote landscape-scale enhancement that assists in managing change;

iii) Conserving and enhancing remnant landscapes and features whilst promoting the establishment of new features and assisting in their interpretation; and

iv) Respect for the local industrial legacy;

c) Quality of materials and construction should give durability and visual coherence and provide visual integration at a variety of scales; and

d) Sustainability – the environmental performance and impact of the buildings, their longevity and adaptability to climate change, flexibility and efficiency.

3.5. DESIGN OBJECTIVES

3.5.1. The Design Objectives were identified in Chapter 1 and are repeated here for clarity. The Objectives represent a development of more specific design drivers and are the outcome of further testing, refinement and interpretation within the subsequent design studies recorded below.

3.5.2. The Design Objectives for the Project comprise the following:

a) **To design the RRF to address the different audiences of the area** – the RRF, and the EfW building in particular, are viewed by 3 different audiences;

b) **A static building in the landscape** – the RRF comprises the EfW Facility including a large building and associated operational activity as well as the MRF, which includes a number of lower level buildings and a walled aggregate storage area with associated operational activity. The objective is to screen the MRF and operational activity. This should result in a single, well proportioned EfW building with carefully selected material colours, sitting in the landscape with no visual clutter;

c) **A Project that is stitched into the landscape of the Marston Vale** – the Marston Vale is a dynamic area where a lot of change is planned through new development of various types and scales and where the landscape forms the canvas for this change. The landscape canvas is increasingly characterised by the Forest of Marston Vale, which seeks to establish a multi-use landscape characterised by substantial tree cover within the vale;

d) **The masterplan for the RRF should have a strong landscape and ecological rationale** – the immediate landscape setting for the RRF is the Low Level Restoration Scheme (LLRS) for The Rookery and this has been subject to detailed consideration in the design of the Project;

e) **To produce a bespoke masterplan and building design to suit operational requirements and site conditions/ context**; and

f) **To design a well-organised masterplan for the RRF and ensure the design of the buildings are coherent and worthy additions to the vale promoting a sustainable environment** – the design of the main EfW building is an important matter and, in addressing the identified audiences (see above) the resulting building must be coherent.

The application of the Design Objectives to the Project are recorded in Chapter 5 Masterplan and Architectural Design and Chapter 7 Landscape and Ecology of this DAS.

3.6. CONTEXT AND DESIGN STUDIES

3.6.1. Having established the Design Principles, a series of focussed design studies was undertaken. These studies formed the basis for future design development for the team, underpinning design as it moved forward to more detailed resolution, ultimately defining the Design Objectives for the Project and Building Code for the EfW Facility. The studies also formed the basis for detailed consultation with members of the public and key stakeholder groups, together with key advisors and statutory and regulatory organisations. A summary of the content and purpose of each of these studies is outlined below:

Context Study (March 2009):

3.6.2. The context study identified the important characteristics and qualities of the Marston Vale and Greensand Ridge landscape, which established the context (‘canvas’) for the emerging design response at a strategic scale. The analysis of the landscape and spatial planning context of the area surrounding the Application Site identified that the vale had undergone significant change over time, was still changing and that this was underpinned by planning policy. The Forest of Marston Vale forms a wooded and ecological framework for new development and regeneration in the area and forms the overarching vision for the Vale.

3.6.3. The overall aim is that the EfW Facility expresses the EfW process and it responds to its location. It does not seek to be iconic in its design, but rather to be a well-proportioned and conservative design response that is fit for purpose. The RRF should also be accessible so people can understand the energy production process.

3.6.4. The report included a record of the Application Site context, including:

a) Topographical context – the elevated Greensand Ridge wrapping round the Vale;

b) Landscape character – the disturbed vale and the preserved ridge reflected in the Green Infrastructure initiative for the area;

c) Major habitat – the low lying vale with new wooded areas, fragmented farmland , sterile land areas for landfill and open water bodies of former clay pits;

d) Heritage assets – the historic assets that stand on the ridge and overlook the changing scene of the vale including Houghton House, Ampthill Park House and Ampthill Park;

e) Key audiences with short, medium and long distance views of The Rookery including The Forest of Marston Vale Forest Centre, Stewartby itself and Houghton House on the ridge;

f) The development context for the Project within the vale with reference to future major development such as Nirah and the Wixams; and

g) The Green Infrastructure context with emphasis on GI Projects within the Forest of Marston Vale.

Architectural Studies (August 2009):

3.6.5. The Architectural Studies document (August 2009) recorded the early design progression of the RRF through a series of building studies that explored how building form, architectural detailing and site configuration responded to site context (established in the Context Study) and operational requirements. The suite of studies comprised:

a) A Building Envelope Study, which considered options to restrict the building envelope in order to reduce building height and volume;

b) A Building Modelling Study which considered alternative building forms based on an interlocking box concept;

c) A Stack Study which considered the form, scale and appearance of the EfW Facility stack;

d) A Materials and Colour Study which identified dominant colours in short, mid and long distance views. These in turn provided a colour reference for building materials; and

e) A Comparison Study which considered the scale of the building in relation to the nearby Cardington Hangars.

3.6.6. These studies led to the production of a Building Code as a basis for the architectural design for the Project. The architectural study defined an approach to the design of the Project permitting more meaningful, detailed and wider consultation to be undertaken including with the Marston Vale Trust, the CLP and Bedford Borough Council, English Heritage, Central Bedfordshire Council and the public.

The Building Code

3.6.7. The Building Code set out in the Architectural Studies document is subordinate to the Design Objectives and is more specifically related to the EfW Facility. The code was adopted, following consultation with The Marston Vale Trust, the CLP, Bedford Borough Council, English Heritage, Central Bedfordshire Council and has been informed by responses from the public. It formed the basis for ongoing development and refinement of the building design and layout of the Operations Area.

3.6.8. The Building Code comprises the following 7 statements, which have been developed to provide a full explanation of its application:

a) **The building for the EfW Facility should express its function and process.** Principally, this is the generation of electricity (the majority of which is renewable energy) and the recovery of value from residual waste as an alternative to landfill;

b) **The EfW Facility building envelope should fit close to, and organise the process within it.** Bringing the building envelope tightly to the internal processes reduces the bulk of the building, its visual impact, and gives it meaning. The main functional subdivisions of the EfW Facility should be expressed in simple terms with changes in articulation of cladding or materials. This articulation provides opportunities for well integrated ventilation and natural lighting where required. The casting of shadows is important. A form comprising a series of simple but differing “shells” will contribute to expressing the process, fragmenting and reducing the visual impact, and provides opportunities for natural light and ventilation to enter the building at articulations between them;

c) **The EfW Facility and Operations Area including the MRF, should integrate to with its context, address its audiences in terms of visual receptors, and respond to the Application Site.** The EfW Facility and Operations Area including the MRF, address several differing visual contexts and viewing distances, but the building must be a coherent design and the Operations Area resolved in views through screening. Overall the masterplan for the Operations Area must clearly organise the site expressing the linear nature of the process from ‘waste in’ to electricity export and minerals recycling out;

d) **A datum line should be used as an organising element.** The datum line represents the original ground level. The pit floor of Rookery South is to be expressed as an “industrial platform”. The datum forms a line above which the EfW Facility enclosure sits over the internal functions. Below the datum level operations are expressed through ancillary elements including tanks, silos etc . The low level operations including traffic movement, the MRF enclosure and storage areas will be located below the datum level. This will assist in screening these aspects, especially vehicle movements and ground lighting from for more distant viewpoints. The datum helps to reduce the apparent height of the building (providing some visual elongation), forms the basis for the control of the aggregate storage height and defines the Operations Area to be screened, removing the visible activity in elevated views emphasising the scale of the building in the landscape;

e) **The datum separates functions.** People (staff and visitors) should enter at approximately datum level. Waste vehicles should enter and exit the site at industrial platform level. The “front of house” of the EfW Facility should be on the north side of the building to face Stewartby, providing views

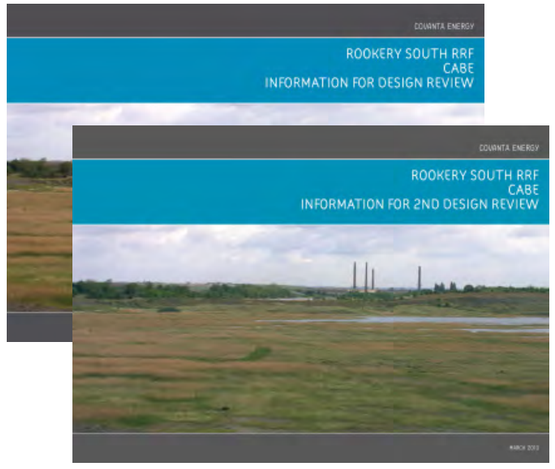
over the attenuation pond from the building. In the case of the MRF, the north side of the enclosure complements this strategy with complete wall enclosure and strong planting framework to the north. The north elevation of the RRF is the direction of approach for all visitors and vehicles. This front of house strategy also allows a visual connection to the Forest Centre via a potential east-west footpath / cycle route from where the building can be interpreted. The datum is echoed by a proposed internal earthwork to the south and east of the Operations Area which provides containment to views from the south and east permitting the planting to once established to screen the low level activity over time producing a static building in the landscape;

f) **Materials should be appropriate to the industrial nature and scale of the EfW Facility and address the context.** Finishes, form and colour should respond to context and views towards the building and be non-reflective. They should also relate to the basis of working with an efficient structure, i.e. the support structure for the internal plant also carries the building envelope where possible. Detailing should reflect the scale of the EfW building and the distance from which it is viewed. The perception of the building from the south is from middle and longer distance viewpoints. Therefore, the scale of apertures and articulations needs to reflect this avoiding detail that would permit the scale of the building to be easily read. From the north, the EfW Facility will be viewed at closer range, and has more human scale activity. The detailing can and should be more “finely grained” to reflect this. Colours, particularly to the south side, should relate to the colours of the surrounding landscape. The use of more natural and “recessive” colours will contribute to better integration as demonstrated by the listed Stewartby stacks; and

g) **The EfW Facility presents opportunities for visitors to understand the EfW process, but also appreciate the site context.** Opportunities will be sought to permit interaction with existing areas of interest including the Forest Centre, views to the Greensand Ridge and views back towards the listed Stewartby chimneys.

3.6.9. The design for the RRF was informed by the study and was submitted to CABE in December 2009 as a pre-Application consultation. After feedback, further consultation and further design development the RRF design was formally submitted to CABE in March 2010. CABE are a prescribed consultee in the PA 2008 process and provide specialist advice on architecture and related design disciplines.

CABE Design Review Documents (December 2009/ March 2010)



3.6.10. The RRF design and masterplan have been subjected to two formal CABE design reviews leading up to the Application to the IPC. Two design review documents were prepared to provide a snapshot of building design and masterplan development and to demonstrate design progression over a period of time. The CABE submissions assisted in focusing on the design resolution of the EfW Facility as an element in the landscape addressing in the main, the short distance views and audiences. The refinement of the building was anchored in the initial integration study which addressed the long and medium distance views and context of the building which set the framework for the more detailed design resolution which was also issued to CABE. The submissions also addressed the design of the other RRF buildings placing them in a hierarchy of design language and also considered the landscape integration strategy with reference to colour studies and the effects of screen mounding and more localised landscape masterplan design matters.

CABE Review Document December 2009

3.6.11. This document demonstrated a progression in building design from the context study. The principal design progression contained within this report included:

a) Further changes to the EfW building showing a modified roof profile;

b) Progression of the Masterplan showing planting proposals within the wider site;

c) Further information showing the application of the colour study and corresponding materials; and

d) Further information on the strategy for the integration of the Project with reference to the application of materials and proposed planting.

3.6.12. CABE responded by requesting further testing and refinement of the EfW building form; development of the landscape and rights of way strategy; and further consideration of the EfW building and stack colour. These matters were addressed in the second CABE Review Document (March 2010) which is summarised below.

CABE Review Document March 2010

3.6.13. Following the December 2009 CABE submission, the second design review document introduced a distilled version of the Building Code which had been developed as the design had undergone further development in response to both CABE and other consultee feedback as well as further operational and design team work. The design changes recorded in the second document included:

a) A simplification of the EfW building form, removing curved roof profiles to produce a more coherent building response;

b) A reworking of the western elevation of the EfW building to address views from the Forest Centre and Country Park;

c) Refinement of the north elevation of the EfW building to provide a coherent design of the building envelope that wrapped around the process;

d) Modification of the ancillary buildings within the MRF forming part of a suite of buildings; and

e) A distillation of the building colours and materials to be considered.

At the conclusion of consultation with CABE they noted:

' The composition of smaller and taller building parts is successful and we welcome the fact that the visitor centre is at the heart of the plant. We also commend the careful analysis of the site and its understanding of its industrial heritage which has informed the design. We welcome the narrative of the proposed colour scheme and the proposed stacks which match the colour of the listed Stewartby Brickwork chimneys and fit successfully into the context….' CABE 22 March 2010.

3.7. LANDSCAPE INTEGRATION AND 'AUDIENCE' STRATEGY

3.7.1. The CABE submissions provide snapshots of progress during the RRF design development process. The design of the RRF was ongoing throughout 2009 and up to June 2010 It was an iterative process including consultation with those organisations, technical refinement with the client engineering and operations team and the design team's continuous refinement of the design in response to matters raised.

3.7.2. The Design Objective to address different audiences, is key to meeting all the other Design Objectives. The audiences comprise:

a) Elevated views from the Greensand Ridge;

b) Medium distance views within the floor of the Vale; and

c) Short distance views within the floor of the Vale.

3.7.3. The issues to be addressed for each audience are illustrated in the three annotated sketches.

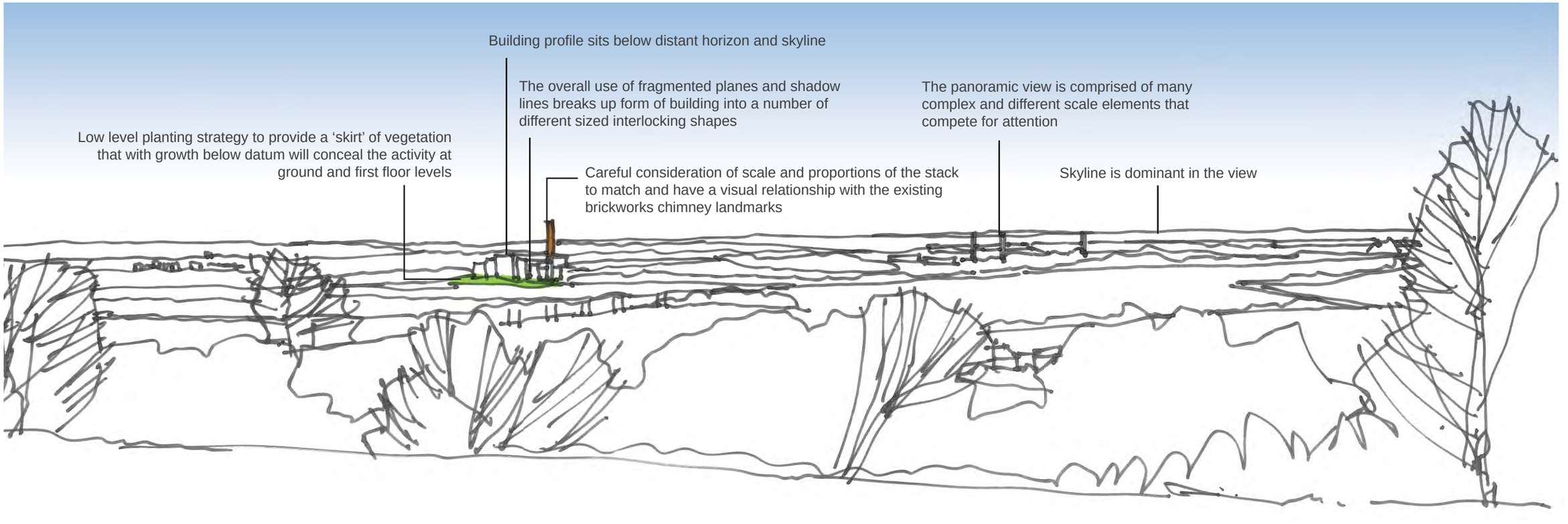


Figure 25: Integration and Audience Strategy - Elevated Views from the Greensand Ridge

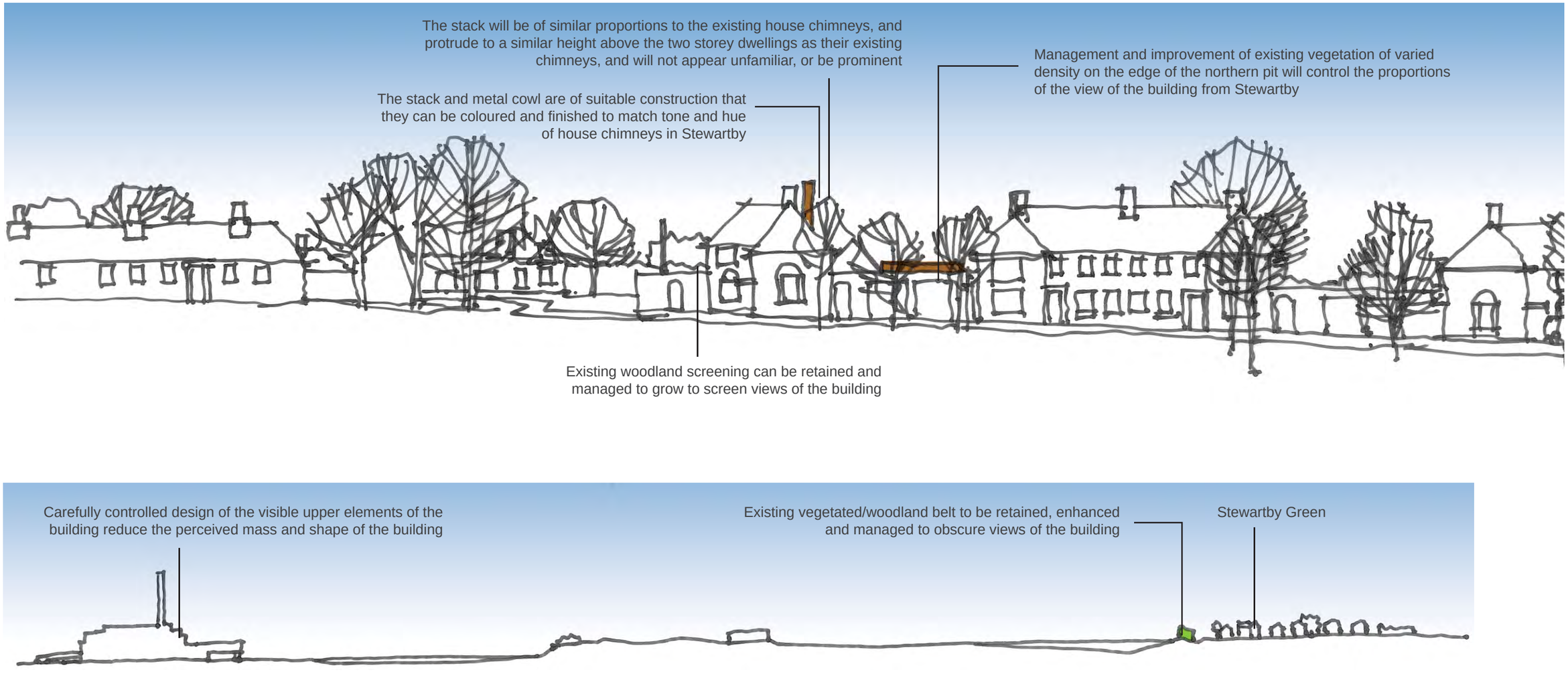


Figure 26: Integration and Audience Strategy - Medium Distance Views

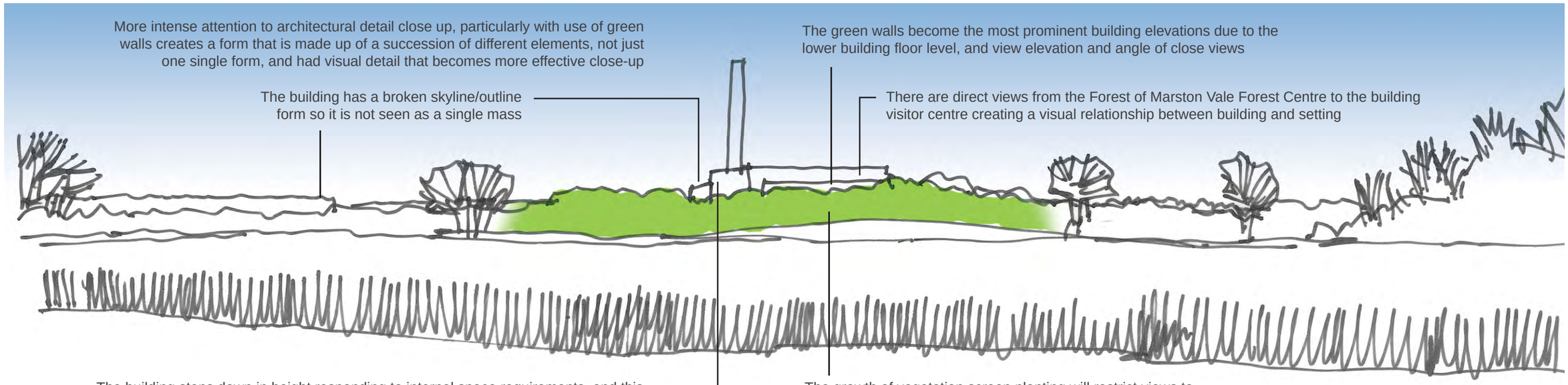


Figure 27: Integration and Audience Strategy - Short Distance Views

3.8. DESIGN FIX

3.8.1. During consultation on the Preliminary Environmental Report (PER) in March 2010 the design and operational characteristics of the RRF had reached a certain level of resolution with many aspects of the RRF Project defined as fixed parameters upon which the Environmental Impact Assessment would be based. Certain design and operational matters had not been fixed and formed the subject of part of the PER consultation. Those unfixed parameters are recorded below, along with an explanation as to how and why final parameters were fixed.

3.8.2. At the conclusion of the design process the character and content of the design and operation of the RRF was fixed to permit the Environmental Impact Assessment to be completed and recorded in the Environmental Statement. The design and operational fix represents the conclusion of an iterative process over many months that addresses many issues and embodies key mitigation outlined above. This section records the fixed design and relevant operational matters.

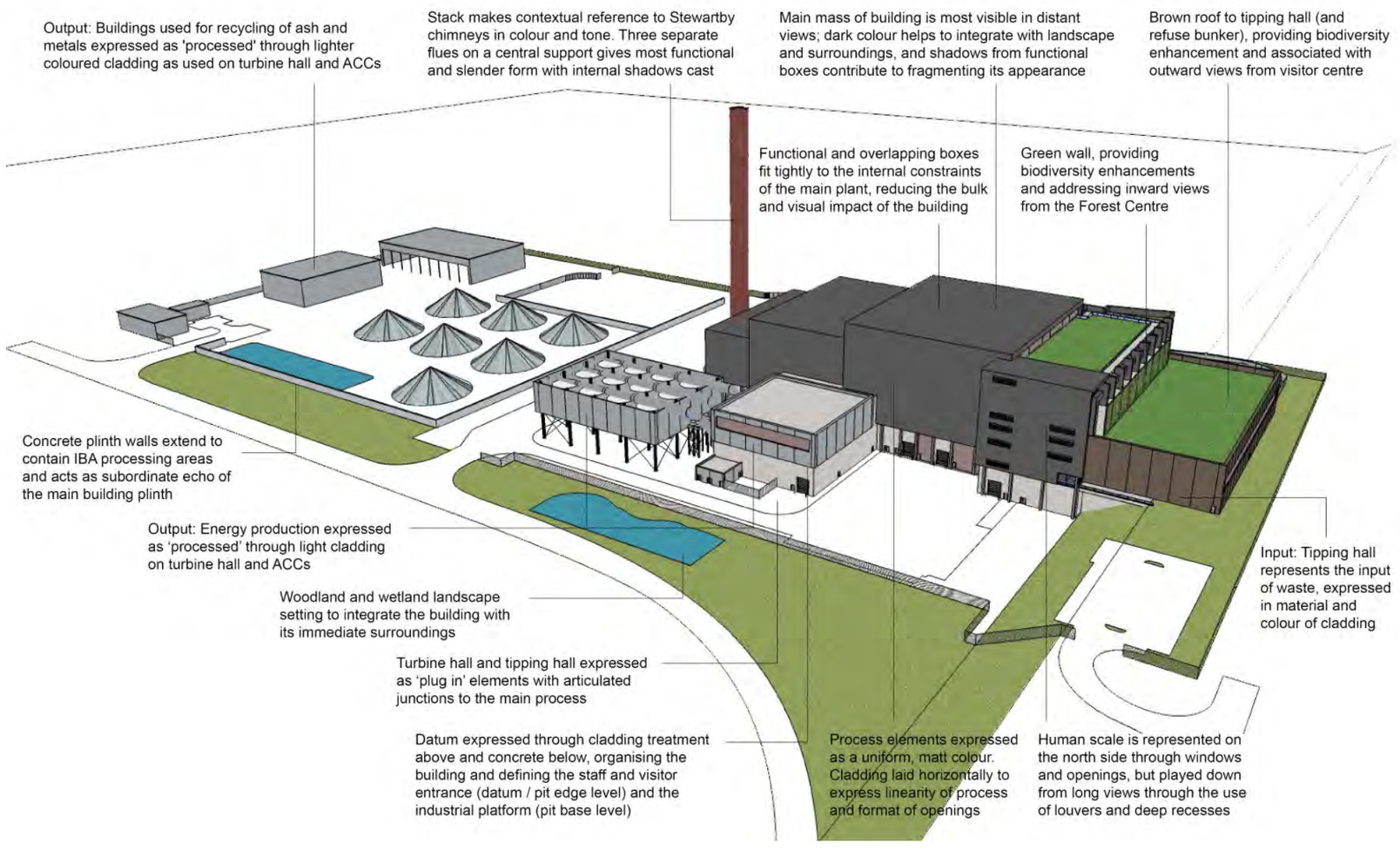


Figure 28: The Concept

3.9. UNFIXED DESIGN PARAMETERS

3.9.1. The unfixed parameters consulted upon during the PER consultation are listed below and a brief explanation of the final fixed parameters. A record of the comments raised on the unfixed parameters by the public identified at the PER exhibition are detailed in the Consultation Report.

Hours of proposed vehicle deliveries

3.9.2. Response: No alteration to the delivery hours detailed in the PER is proposed. Following consultation with operators, the scope of operational hours has been confirmed as critical with the hours relating to the anticipated operational movements from the relevant waste sources which have also been confirmed during further discussions with Covanta's operational team. The hours of operation and the vehicular movement associated with the operation are detailed in Chapter 6 of the Design and Access Statement (DAS). Many of the responses expressed concern about vehicle movements outside of 'normal working' hours. 75 % of the movements are predicted to occur between these 'normal working' hours with a relatively limited quantity of vehicle movements outside of these hours. The site has been designed to allow future rail connection should it be considered feasible to bring waste via the rail network at a future point and this matter is addressed in Chapter 6 of the DAS.

Provision of footbridge crossing over the Marston Vale Line

3.9.3. Response: The provision of the footbridge was welcomed by some consultees. However, the proposal for a combined foot and cycle bridge is not considered to be justified by anticipated use and will not be progressed. Discussions with the Marston Vale Trust who are recognised as the principal amenity organisation in proximity to the site, have confirmed that the scale of the structure prohibits further consideration and that the anticipated use would not justify the high levels of cost when viewed in the balance. In addition, CBC's rights of way officer whilst welcoming the proposal does not consider it to be essential. Both organisations considered that a well designed, at grade crossing over the railway line at Green Lane in conjunction with an improved entrance setting to the Millennium Country Park would be at least as appropriate and should be explored further. The proposals for the level crossing and associated links are included in the Application and are detailed in Chapter 6 of the DAS.

Enhancements to rights of way

3.9.4. Response: The rights of way proposals detailed in the PER are to be provided as an identified enhancement to the right of way network with portions of that provision to be carried out as part of the LLRS. The form of agreement on maintenance of the routes will be subject to agreement at a future date. The routes are all generally flat or at a shallow gradient such that they will be accessible to all users groups. No provision is to be made for bridleways - the routes are intended to form an extension to existing patterns of use in the Country Park. There are no bridleways in the immediate area to link to.

Proposed tree planting areas

3.9.5. Response: The planting areas proposed as part of the landscape strategy and detailed in the PER are to be retained and have been developed as the Project has moved forward including the provision of additional planting within the Country Park, which is expected to achieve 30% cover. The species and size of stock has been developed in discussion with the Forest Centre based on the success of planting undertaken within the Country Park. Larger stock is proposed to the south west in what is considered to be one of the most sensitive areas of the site. The long term management of planted areas will be subject to agreement and is identified as a future undertaking. The planting proposals are detailed in Chapter 7 of this DAS.

Choice of material colours for the buildings

3.9.6. Response: The general strategy for selection of colours for the buildings is to be remain unaltered but has been subject to further refinement. In particular the colour of the chimney stack has been revised to represent a closer match to the Stewartby brick stacks and the range of colours appropriate for use on the buildings developed. The final palette of colours is illustrated in Chapter 5 of this DAS.

Roof form

3.9.7. Response: The design of the building illustrated in the PER is to be retained. It is considered to be the design that keeps the building height to a minimum and is a simple design resolution that integrates in distant views. The design approach is supported by the Commission for Architecture and the Built Environment. Detail on the consultation and iterative design process that underpins the final building form is detailed in Chapters 3 and 5 of this DAS.

Approach to drainage of the site

3.9.8. Response: No change to the drainage design illustrated in the PER is proposed apart from minor design development since the consultation. The main drainage works form part of the approved LLRS scheme and the assessment of flooding risk has been fully assessed and recorded in the ES including consideration of climate change. The LLRS scheme includes a pump house which pumps water form the attenuation pond to Stewartby Lake. The RRF issues any water into the attenuation pond that cannot be recycled and stored for reuse in the RRF. Detail on the drainage design is provided in Chapter 9 of this DAS.

Approach to lighting of the site

3.9.9. Response: No change to the lighting design illustrated in the PER is proposed, as feedback suggested that it has been accepted in principle. Further detail is provided in the application regarding the proposed operational hours for certain areas of the site and a more detailed lighting layout is provided as part of the application, with night time montages from agreed locations. Certain operational areas do not require illumination during the hours of darkness and this has been clarified. Low level lighting has been provided on the ramp approach to the tipping hall to minimise effects and all column lighting will be downward facing and hooded. The lighting design has been coordinated with the project ecologists. The lighting has been design in accordance with the appropriate lighting standard for the countryside context. Detail on the lighting design for the RRF is provided in Chapter 9 of this DAS.

Lorry routing plan

3.9.10. Response: No alteration to the lorry routing plan is proposed. Careful attention has been paid to the routing of vehicles and operators regularly using the site will be monitored for routing compliance. The proposed site access junction design has been designed having regard for both safe level crossing use and existing traffic movement patterns. The site has been configured to permit future rail connection should the feasibility of such transportation of waste be considered viable at a future date.

Sources of waste for the Facility

3.9.11. Response: The proposed waste catchment area for the Facility has been considered by Covanta and is a suitable catchment reflecting a sustainable source of waste sufficient to supply the Facility and is not to be altered for the Application. This will be kept under review as waste procurement proceeds. Waste is not being imported to the RRF.

Rail Connection

3.9.12. Response: The Project does not include the provision of a rail connection for the importation of waste material. Waste is not presently transported around this region and catchment by rail. The location of the building does however permit future consideration of rail connection should the transportation of waste transfer to the rail network in due course. The passive provision for rail connection is considered detailed in Chapter 6 of this DAS.

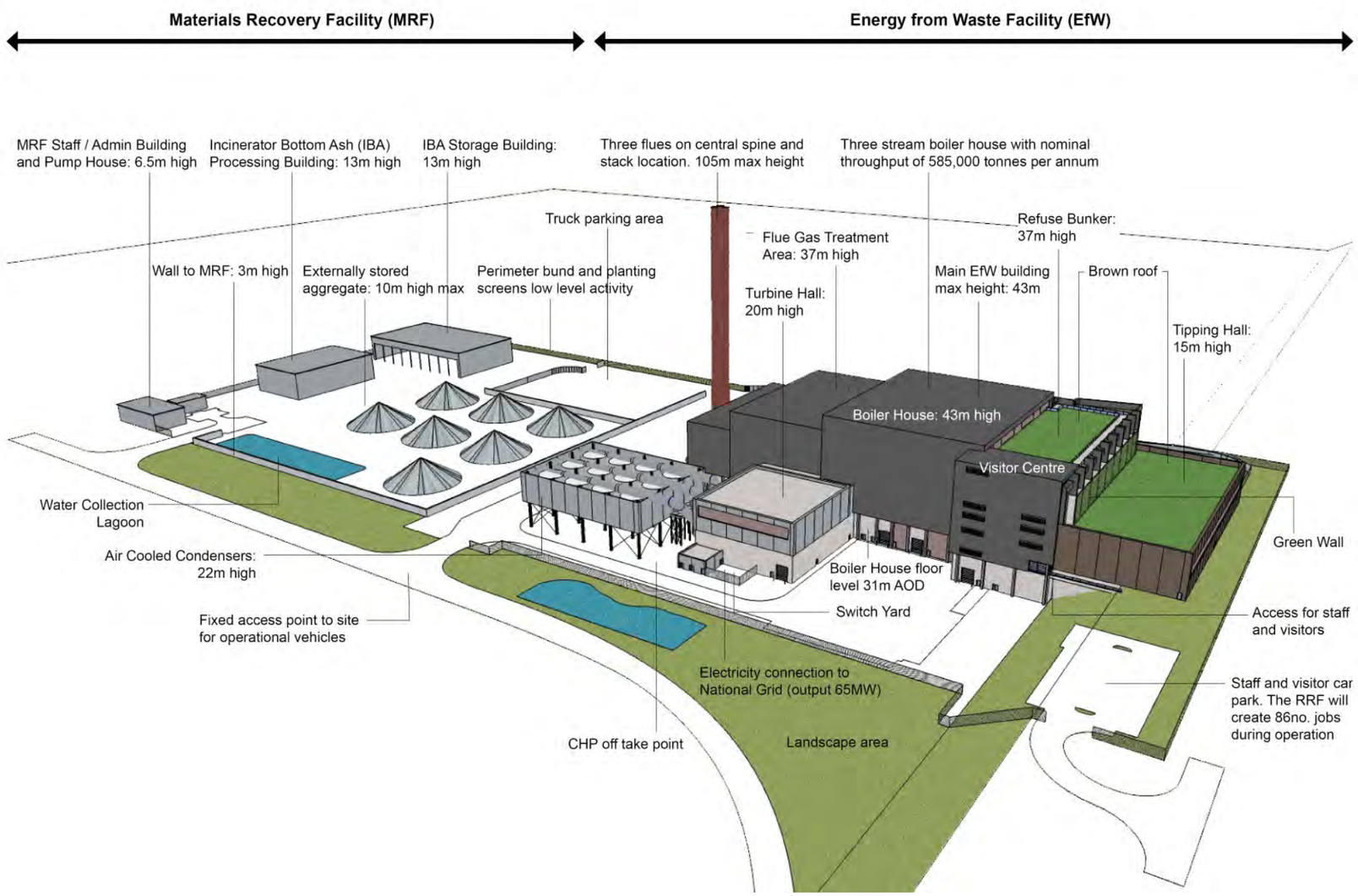


Figure 29: Fixed Design Parameters

3.10. FIXED DESIGN PARAMETERS AND MEETING THE OBJECTIVES

3.10.1. The RRF design concept is illustrated in Figure 28. The fixed parameters for the RRF are fully detailed in Chapter 3 of the ES and the principal design parameters for the RRF are illustrated in Figure 29.

3.10.2. The Design Objectives outlined in section 3.5 have been met by the iterative design process outlined above and are recorded below.

a) To design the RRF to address the different audiences of the area – the RRF, and the EfW Facility in particular, are viewed by 3 different audiences. This has influenced the design approach to address, long range elevated views, middle distance and short distance views from within the area. The audience strategy is detailed in Chapter 3;

b) A static building in the landscape – the RRF comprises the EfW Facility, including a large building and associated operational activity, as well as the MRF, which includes a number of lower level buildings and a walled aggregate storage area, with associated operational activity. The objective is to screen the MRF and operational activity. This has resulted in a single, well proportioned EfW building with carefully selected material colours, sitting in the landscape with no visual clutter;

c) A Project that is stitched into the landscape of the Marston Vale – the Marston Vale is a dynamic area where considerable change is planned through new development of various types and scales and where the landscape forms the canvas for this change. The landscape canvas is increasingly characterised by the Forest of Marston Vale, which seeks to establish a multi-use landscape as well as substantial tree cover within the vale. The RRF responds to this canvas with the provision of new woodland areas and the extension of recreational use through the provision of new rights of way. In addition, the response to the multi-use landscape is to propose a building for the RRF that houses an important energy production function with an equivalent power generation capacity to match the housing needs of the Marston Vale and Bedford;

d) The masterplan for the RRF should have a strong landscape and ecological rationale – the immediate landscape setting for the RRF is the LLRS for The Rookery and this has been subject to detailed consideration in the design of the Project. Key existing woodland areas are being retained and managed over time for screening and habitat benefit. Additional wetland is to be established in association with the LLRS attenuation pond and careful planting design supports the integration of the Project in long range views. The planting it also provides a coherent design when viewed at close quarters, blending the engineering rigour of the operational masterplan with an organic wetland context. The building incorporates extensive brown roof areas which can be viewed from a visitor centre;

e) To produce a bespoke masterplan and building design to suit operational requirements and site conditions/ context – the form of the masterplan and design of the buildings has been tailored to the context of the site with height and form being important matters considered during design development. The building has been designed with consideration of views towards it and views from it through the provision of the visitor centre / education facility at high level affording views to the Forest Centre, the Stewartby chimneys and the Greensand Ridge; and

f) To design a well-organised masterplan for the RRF and ensure the design of the buildings is coherent and delivers worthy additions to the vale promoting a sustainable environment – the design of the main EfW building is an important matter and, in addressing the identified audiences (see above), the resulting building must be coherent. To that end, the building has been subject to a CABE review and has been well received:

‘ The composition of smaller and taller building parts is successful and we welcome the fact that the visitor centre is at the heart of the plant. We also commend the careful analysis of the site and its understanding of its industrial heritage which has informed the design. We welcome the narrative of the proposed colour scheme and the proposed stacks which match the colour of the listed Stewartby Brickwork chimneys and fit successfully into the context….’ CABE 22 March 2010.

3.10.3. Chapter 4 of this DAS provides a description of the fixed Project design and its constituent parts.

3.10.4. Subsequent Chapters of this DAS provide further detail on the design development of key aspects of the RRF under the following Chapter headings:

Chapter 5: Design Development :Masterplan and Architectural Design

Chapter 6: Access and Movement Framework

Chapter 7: Design Development: Landscape and Ecology

Chapter 8: Design Development: Utilities and Services

Chapter 9: Design Development: Lighting Strategy

Chapter 10: Design Development: Hydrology and Land drainage

Chapter 11: Climate Change

4.0 THE PROJECT

4.1. DESCRIPTION OF THE PROJECT

4.1.1. The physical form of the Project is described in this Chapter together with a non-technical summary of how the RRF will operate. A more detailed account of design development is described in Chapters 5 to 10 of this DAS.

4.1.2. A full Project description is provided in Chapter 3 of the Environmental Statement.

4.1.3. Reference should be made to the Application drawings, some of which are included in this DAS. The full suite of Application drawings is provided in the Appendix.

Legend

- Trees
- Woodland
- Shrub planting/ understorey
- Hedgerow
- Grassland
- Meadow grassland
- Reeds/aquatic vegetation
- Water body
- Access Road
- Internal road
- Hard surface
- Security fence
- 3m high acoustic fence
- Wall
- Brown Roof
- Operations Area
- INDICATIVE LAYOUT ONLY further design development to be undertaken with relevant consultees

Proposed EfW Facility

1: Admin and visitor car park (48 no. spaces)
2: Forecourt (inc. coach turning)
3: Operational staff car park (32 no. spaces)
4: Transformer Compound
5: Admin building and visitor centre / education facility
6: Tipping hall
7: Refuse bunker
8: Boiler house
9: Flue gas treatment area
10: Workshop and stores
11: Stack
12: Weigh bridge and security gatehouse
13: Turbine hall
14: Air cooled condensers
15: Surface water attenuation
16: Automatic gates
17: Access to EfW Facility
18: Steep retained inner slope
19: Silo Area

Proposed MRF

20: Screened aggregate storage yard
21: Indicative aggregate storage piles
22: HGV parking
23: IBA storage
24: IBA processing
25: Security Fence
26: Water Collection Lagoon
27: Staff admin block
28: Staff car park (10 no. spaces)
29: Aggregate weigh bridge
30: Access to MRF
31: Foul water pumping station
32: Access to pumping station
33: Wall to storage yard

External to Operations Area

34: Perimeter Bund

Figure 30: Masterplan (Operations Area)

4.2. OPERATIONS AREA

4.2.1. The Operations Area is where the principal built elements of the Project are located. The wider Application Site includes highway and infrastructure works and landscape and recreational elements.

4.2.2. Figure 30 shows the proposed layout of the Operations Area and component elements comprising:

An Energy from Waste Facility (EfW)

4.2.3. The EfW Facility is the largest structure proposed to be constructed as part of the RRF. The principal component elements of the EfW Facility comprise a tipping hall, refuse bunker, boiler house and turbine hall with connecting air cooled condensers and a stack. The EfW Facility also includes a Visitor Centre, incorporating meeting rooms and amenity facilities which will be accessed from the main entrance to the building. The location and general form of the EfW Facility is illustrated in Figure 31.

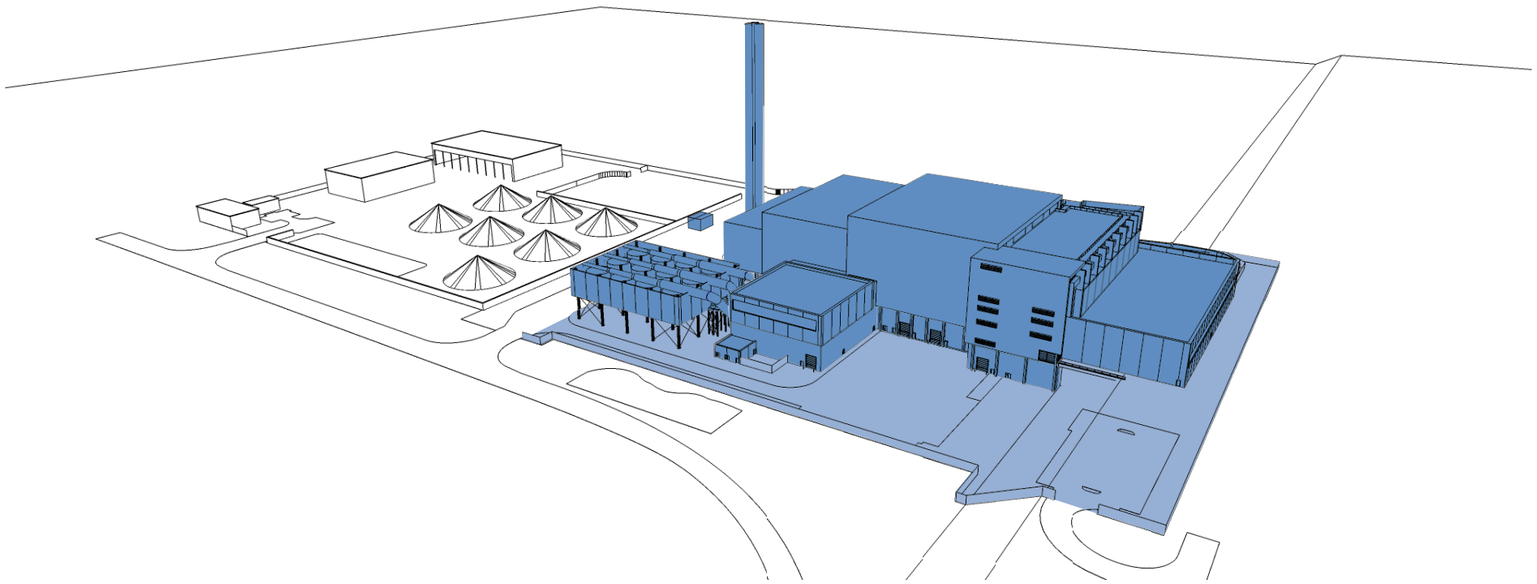


Figure 31: The EfW Facility

4.2.4. The plant will comprise three waste processing streams, as illustrated in Figure 32, each consisting of a reciprocating grate, furnace, boiler and associated air pollution control system in each stream.

4.2.5. A car park for operational staff is provided at the lower pit level (32 spaces). An upper car park lying at datum level provides parking for staff and visitors. The car park provides 48 car parking spaces, 20 covered cycle parking spaces and room for one 53 seater coach.

4.2.6. The EfW Facility will, for the most part, sit within the base of the pit, approximately 10m below surrounding ground level. The Tipping Hall will be constructed on the pit embankment for operational reasons which are explained in Chapter 5.

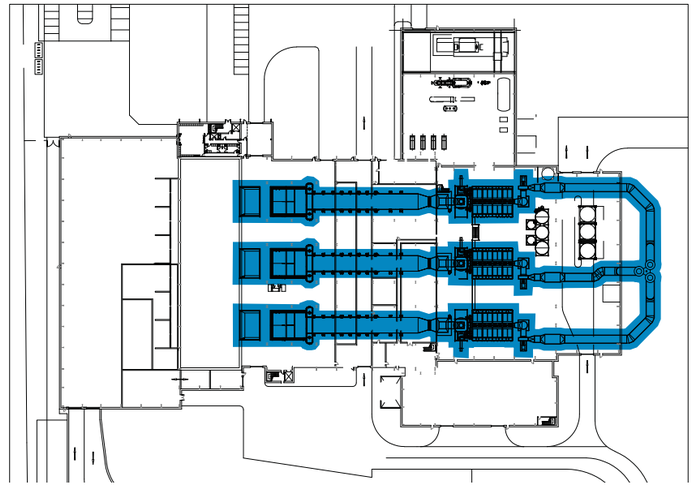


Figure 32: Waste Processing Streams

A Materials Recovery Facility (MRF)

4.2.7. The MRF area includes two buildings, one for the storage of incinerated bottom ash (IBA) and co-mingled metals and the other to house the IBA processing plant and equipment. The processed aggregate is stored in a large yard area which is enclosed to the north and west by a 3m high wall. In addition, a staff administration building is also provided in the MRF area. The MRF area drains towards a concrete catch-pit, where rain water and water draining from the IBA is collected. Solids carried over with this water are captured by falling to the bottom of the catch pit. Water discharges from the catch pit over a weir and into the larger water collection lagoon, here and remaining solids settle out of the water, which passes over a further weir and is pumped back to the EfW Facility process water tank and used to quench the bottom ash. The general form of buildings and arrangement of elements is illustrated in Figure 33.

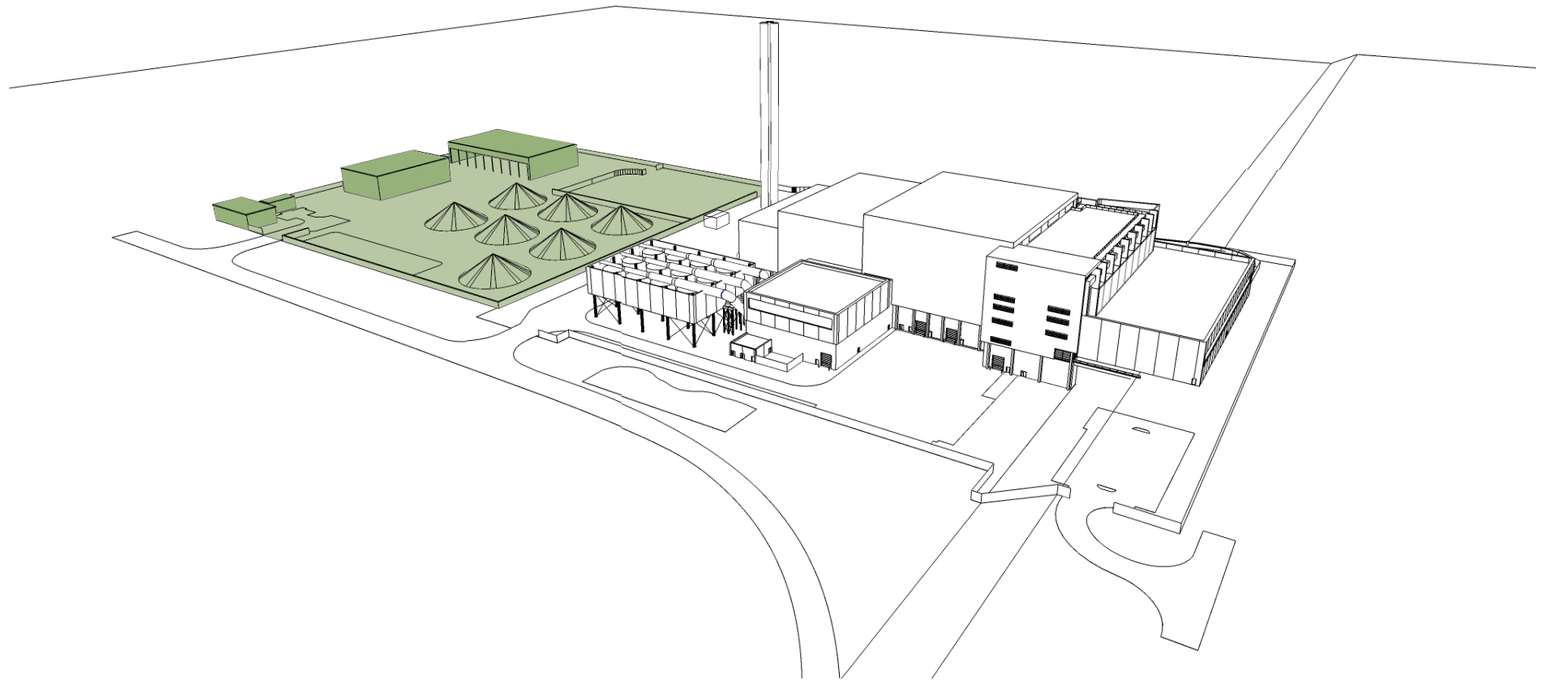


Figure 33: Materials Recovery Facility (MRF)

HGV and staff parking

4.2.8. HGV parking for deliveries and secure overnight parking is located to the south west corner of the aggregate storage yard and is accessed from the southern service road. Staff parking is provided in the north west corner of the yard north of the EfW Facility.

Ancillary Plant and Equipment

4.2.9. Ancillary Plant and Equipment includes a transformer building and switch yard, gatehouses and weighbridges to serve the EfW Facility and MRF; staff welfare facilities; and a foul water pump house.

Vehicle Access

4.2.10. A clearly defined HGV route to the EfW Facility and MRF is designed to separate heavy vehicle and service vehicle movements from car-borne traffic and visitors. Vehicle access to the base of the pit and the Operations Area is via a ramped approach leading from the access road. There are three access points provided for operational vehicles from the access road within the pit:

a) Entrance to the EfW Facility (occupying the western half of the Operations Area) is positioned centrally on the northern side of the Operations Area;

b) Access to the MRF (occupying the eastern half of the Operations Area) is located further to the east; and

c) A small, dedicated access to the Foul Water Pump House, situated in the north eastern corner of the Operations Area.

4.2.11. A further entrance and road is located along the pit embankment to provide access to the staff and visitor car park which serves the EfW Facility. The layout of the road network within the Operations Area and the associated turning movements and routes for materials etc are described in detail in Paragraphs 4.4.38 and Figure 45.

Planting and Bunding

4.2.12. A perimeter bund extends around the south and east of the EfW Facility and incorporates native woodland planting on the top, inner and outer face. The planting, in combination with earth bunding to the south and east of the EfW and MRF, provides screening of the lower portion of the EfW Facility and operational activities such as vehicle movements and storage areas. Elsewhere, the proposed landscape treatment is more formal in character and is designed to soften the built form and ‘anchor’ the buildings in the landscape. A detailed description of the planting and habitat creation works is provided in Chapter 7 of this DAS.

External Lighting

4.2.13. The EfW Facility will be operational for 24hours per day and will therefore require external lighting to allow safe working. External lighting will also be provided elsewhere within the Operations Area though this will be controlled according to operational and safety needs. A detailed description of the lighting strategy for the RRF is provided in Chapter 9 of this DAS.

Site Security Fencing

4.2.14. A 3m high, weld mesh security fence will be erected around the perimeter of the Operations Area to prevent unauthorised entry. The south western portion of this fence takes the form of an acoustic barrier comprising a heavy metal framed fence with timber panels . The fencing will, for the most part, be set within planting. However, where it is visible it will reflect the clean lines and industrial character of the building. A detailed description of the fencing and other means of enclosure are provided in Chapter 7 of this DAS.

4.3. WIDER WORKS

4.3.1. Figure 34 shows the proposed layout of the wider RRF area comprising site access works, surface water attenuation, and landscape and ecological enhancement. The rights of way strategy is illustrated in Figure 37.

Figure 34: RRF Layout

Vehicle Access

4.3.2. The Operations Area will be connected to Green Lane in Stewartby via a new access road which will extend along the western boundary of Rookery North Pit. An upgraded junction will be constructed on Green Lane to accommodate HGV and other traffic approaching the site from the A421 to the west. Figure 36 illustrates the general arrangement of the junction and Chapter 6 provides detail on the access arrangements. The access road will include a dedicated 3m wide, shared use cycle and pedestrian pavement on its eastern side. This route will also be used as a utilities service corridor.

Level crossing

4.3.3. An upgrade of the existing level crossing on Green Lane is proposed providing a full barrier crossing. The upgrade includes the provision of new road signage. Two footway options across the level crossing are being pursued; one allows for the existing footway to the south of Green Lane to remain at its present width and the second option seeks the widening of the route to the required width of a combined footway and cycleway. The proposed level crossing upgrade is illustrated in Figure 35. Full details of the level crossing works are described in Chapter 6 of this DAS.

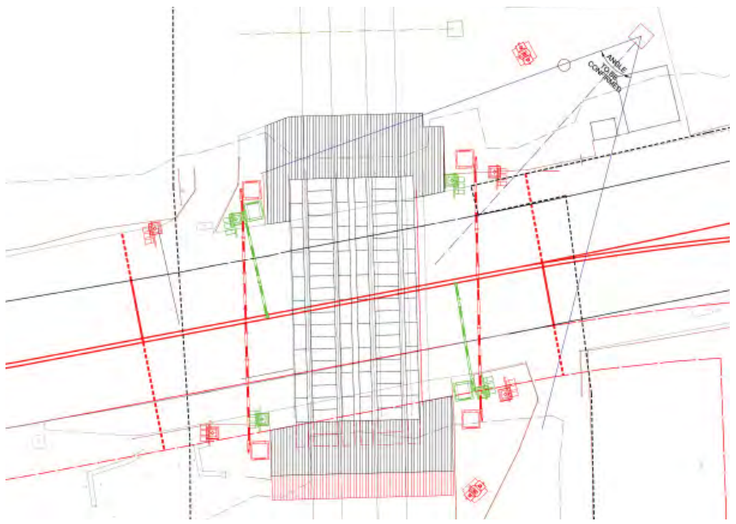


Figure 35: Green Lane Level Crossing Enhancement

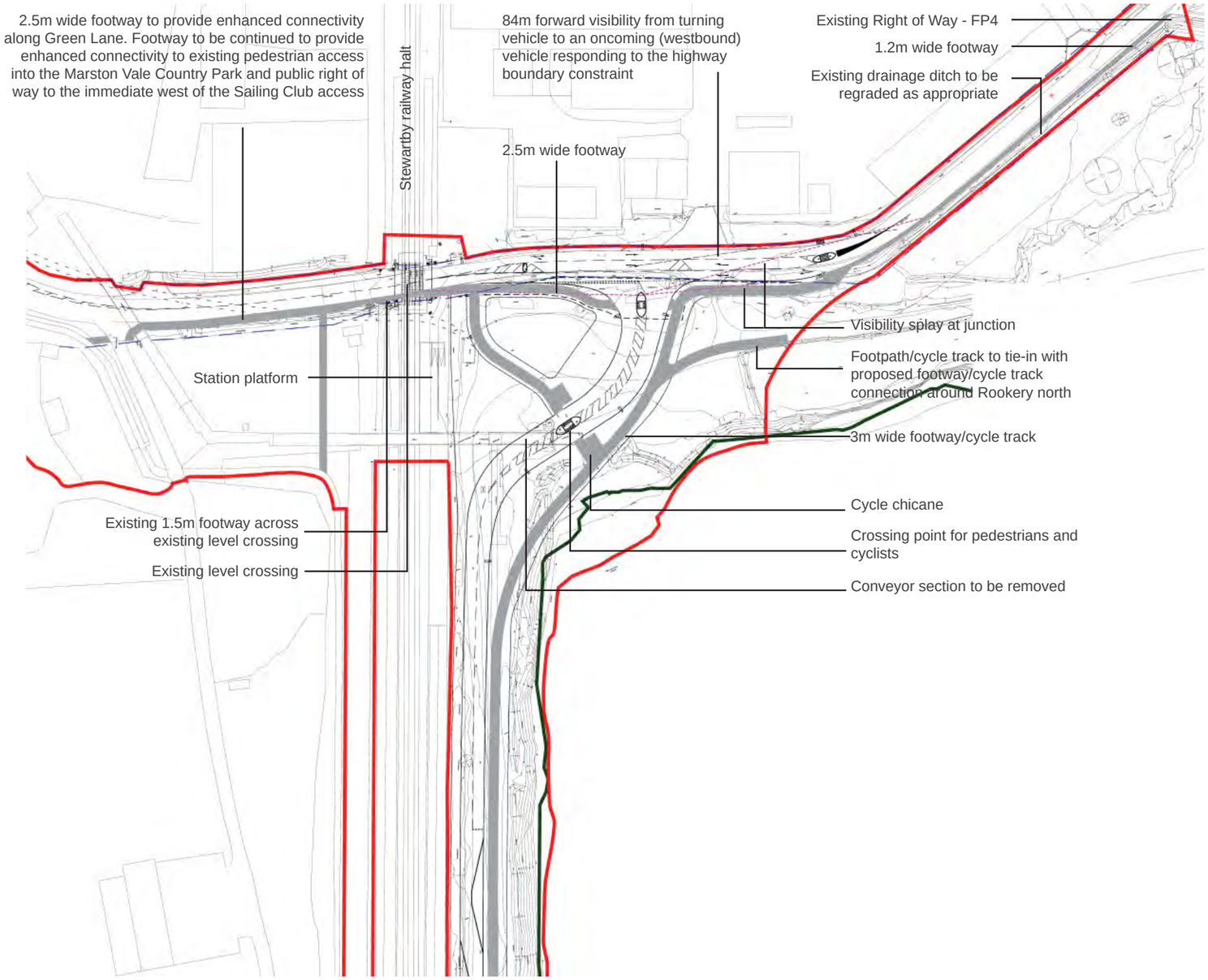
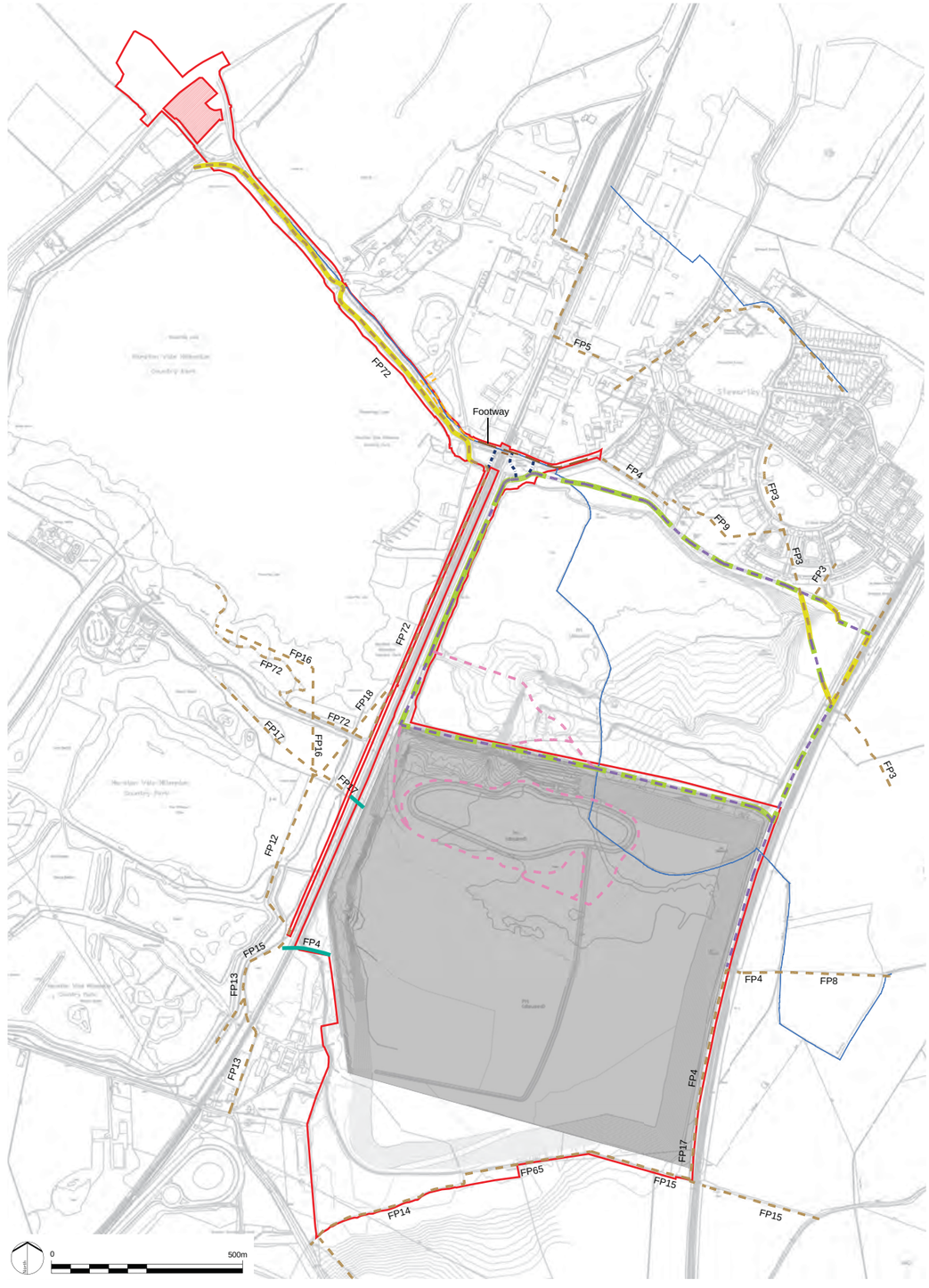


Figure 36: Green Lane Priority Junction Upgrade

Rights of Way Provision

4.3.4. A rights of way strategy is proposed that builds on the rights to be established in the approved LLRS which is detailed in Chapter 6. The strategy will establish the upgrade of all dedicated rights within The Rookery for cyclists and provide improved connections to the Marston Vale Millennium Country Park and Stewartby. The strategy is illustrated in Figure 37. Full details are provided in Chapter 6 of this DAS.



Legend

Application Site

Not included in the Application Site

Existing

RoW

Footway

RoW to be stopped-up

Proposed (as part of LLRS)

Dedicated RoW (pedestrian rights only)

Permissive RoW

Proposed (as part of RRF)

Dedicated RoW (pedestrian and cycle rights)

Upgrade of Dedicated RoW by ROMP to incl cycle rights

Upgrade of Existing Dedicated RoW to include cycle rights

Rights of Way Extinguishment area within Rookery Pit South

Other

Proposed footway by Hanson HQ (Committed)

Boundaries

Boundary between Central Beds and Beds Borough

Figure 37: Rights of Way Strategy

Landscape Enhancement

4.3.5. The landscape strategy for the wider site comprises new blocks of native woodland located around the perimeter of Rookery South Pit and the management of existing wooded area illustrated in Figure 38 and described in detail in Chapter 7 of this DAS.

4.3.6. A new entrance is to be established to the Millennium Country Park in association with the proposed entrance to the RRF off Green Lane. The detail landscape design for this area is subject to ongoing design development and discussions with the Marston Vale Trust and Network Rail.

4.3.7. On and off site planting is proposed within the Millennium Country Park to enhance the amenity of views where the proposed RRF may be visible. The extent of this planting, which is illustrated in Figure 38, is subject to ongoing design development and discussions with the Marston Vale Trust.

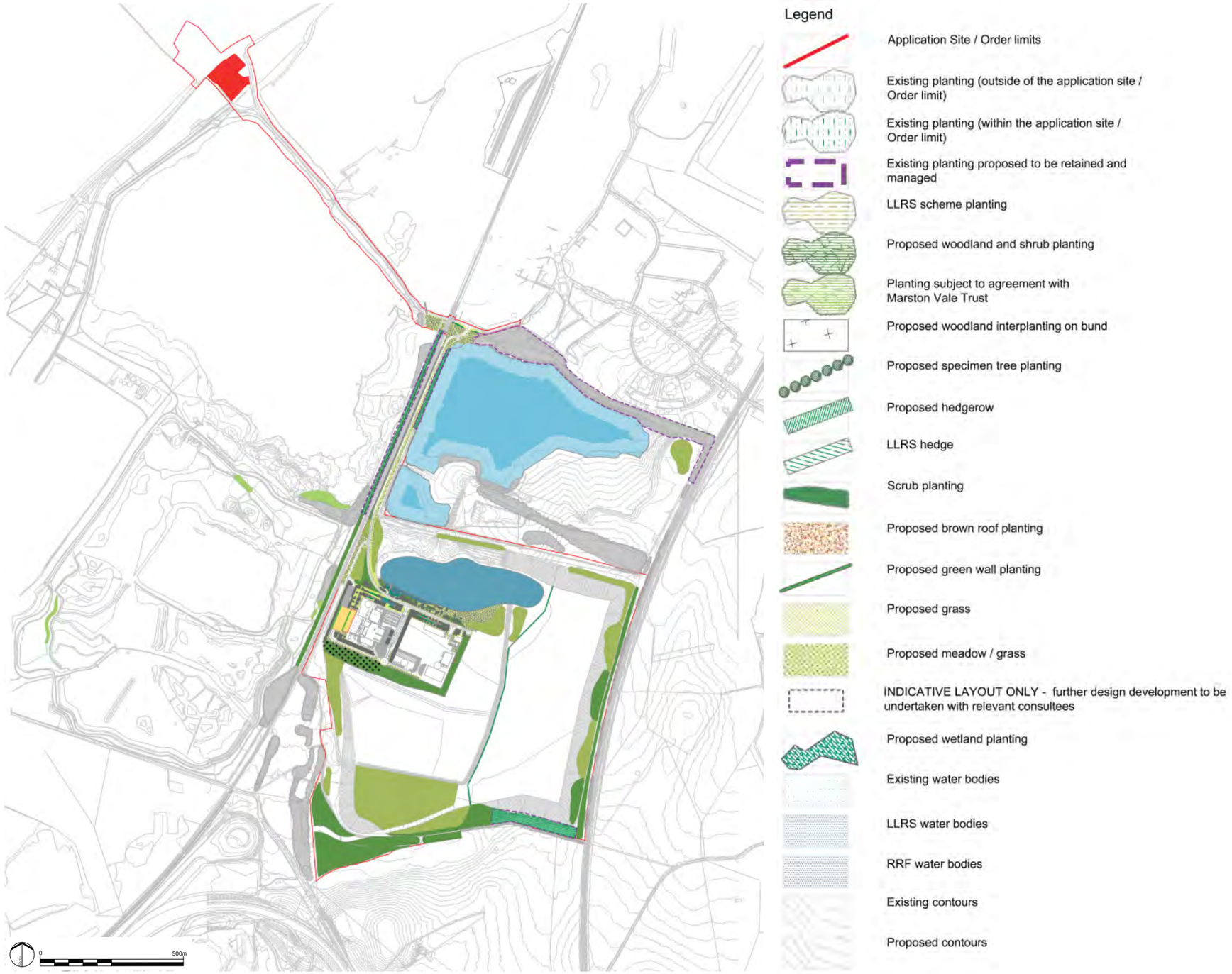


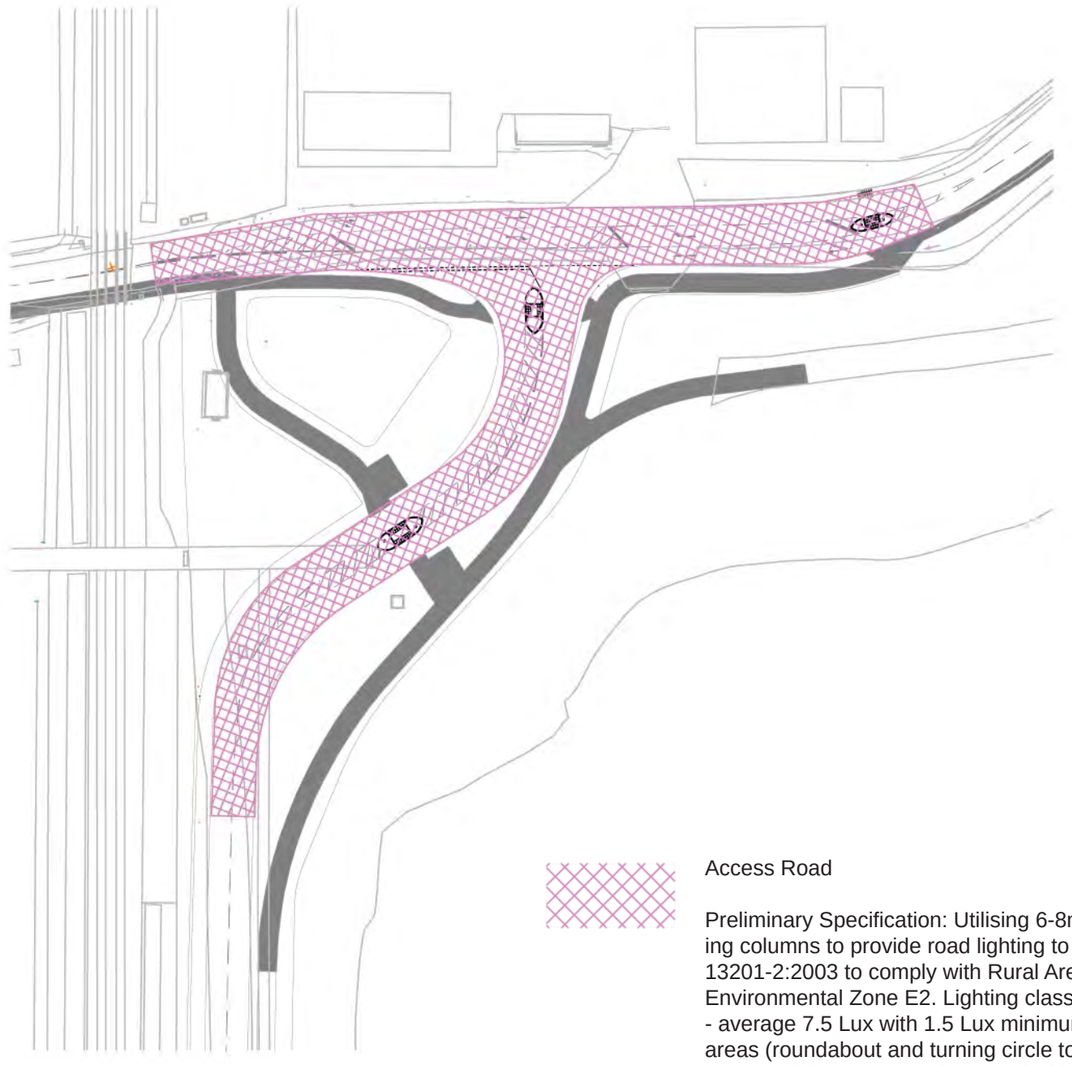
Figure 38: Landscape Strategy

Surface Water Drainage

4.3.8. A surface water drainage system for the RRF will be constructed adopting the LLRS baseline as appropriate. This will include provision of an alternative drainage channel south of the earth bunding and modifying the edge of the attenuation pond to provide shallow water for enhanced wetland habitat. Additional surface water drainage will be incorporated within the Operations Area to capture run off from hard standing areas and access roads. This will include provision of a swale at the toe of the pit embankment (adjacent to the lower level staff car park) which will discharge to the attenuation pond, together with a water collection lagoon located along the eastern boundary of the MRF. A detailed description of the drainage strategy is provided in Chapter 10 of this DAS.

Lighting Strategy

4.3.9. Highway lighting will be provided at the Green Lane site entrance to tie in with existing highway provision and is illustrated in Figure 39. Lighting is not proposed along the western access road. A lighting strategy for the Operations Area has been prepared and developed into a preliminary lighting layout to support the modelling of lighting effects illustrated in photomontages. A detailed description of the lighting strategy is provided in Chapter 9 of this DAS.



Access Road

Preliminary Specification: Utilising 6-8m (h) lighting columns to provide road lighting to BS EN 13201-2:2003 to comply with Rural Areas and Environmental Zone E2. Lighting classes to be S3 - average 7.5 Lux with 1.5 Lux minimum. Conflict areas (roundabout and turning circle to be CE5 - average 7.5 Lux with uniformity of 40%).

Figure 39: Green Lane Lighting Strategy

Grid Connection

4.3.10. As part of the Project Covanta is seeking powers to enable it to connect to the national electricity Grid. This is set out in greater detail in the Grid Connection Statement, which accompanies the Application. The proposed cable alignment and grid connection is illustrated in Figure 40.

4.3.11. The connection would comprise a 33KV cable which would link the proposed transformer and switch yard adjoining the EfW Facility to a new substation to be constructed by EDF, which does not form part of this Project. The link comprises some 2.7 km of cable in trench, which will extend along the proposed access road in a combined services trench east of the road before passing under the Marston Vale Line and extend along the Green Lane corridor and under the existing and new A421 road corridors before connecting with the substation. An 11kv cable link will also be provided to EDF's existing Marston Road Primary substation.

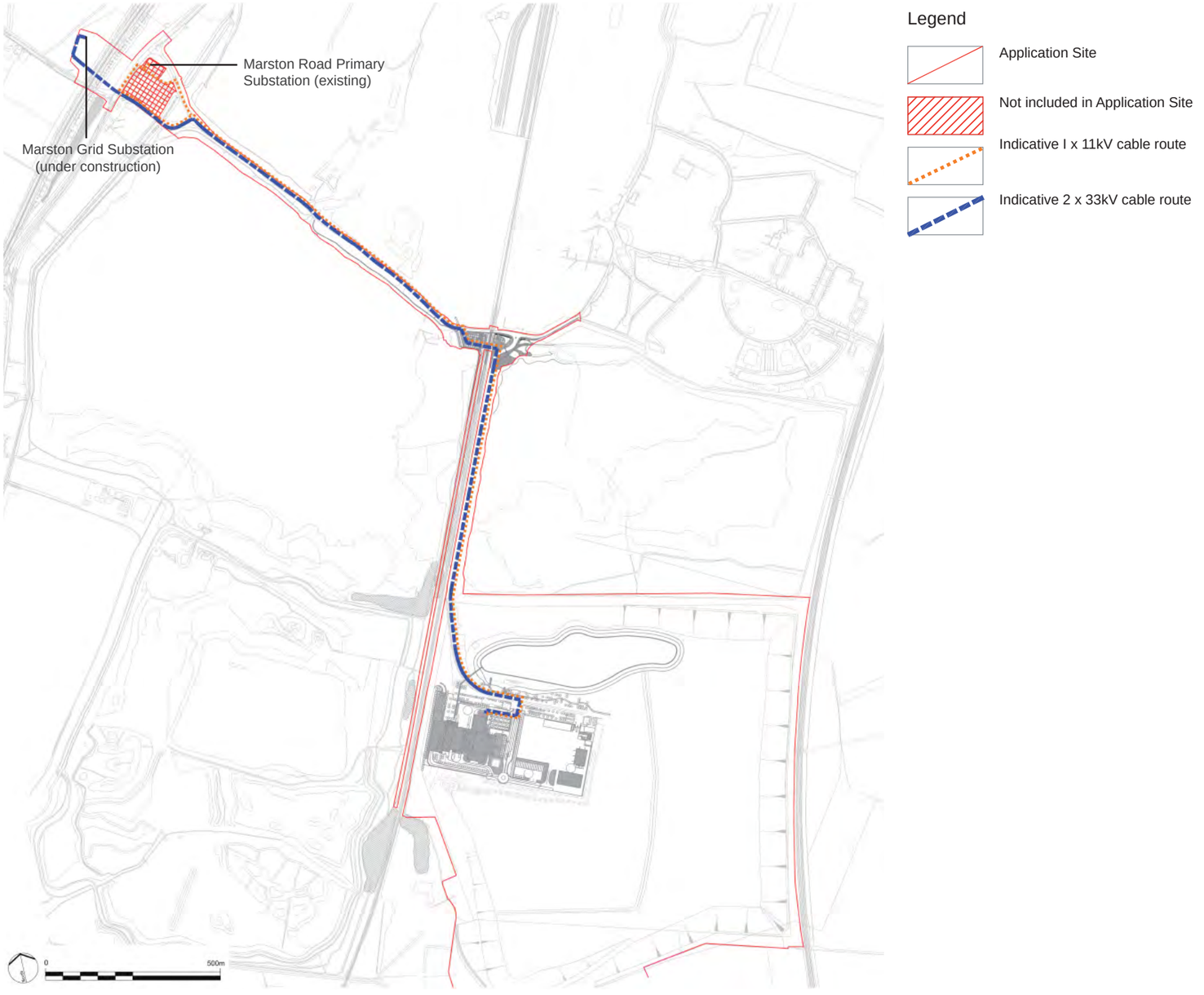


Figure 40: Proposed Grid Connection

4.4. THE OPERATIONAL PROCESS

Overview

4.4.1. The proposed EfW Facility will generate heat from the combustion of residual household and business waste. This is turned to steam and passed through a turbine that continuously generates electricity for export to the national grid. In addition, the steam can be used to provide an efficient source of heat for local domestic and industrial needs. The residues from the combustion process (metals and bottom ash) will be recycled at the adjacent, proposed MRF.

4.4.2. Prior to the residual waste being delivered to the EfW Facility, it will have been separated to exclude that component which is capable of being recycled or composted. Where hazardous wastes such as cement bonded asbestos, car batteries or fluorescent tubes are found during the inspection procedure, these will be segregated and sent for treatment/disposal at a suitably licensed waste management facility.

4.4.3. The EfW Facility will have a nominal waste processing capacity of 585,000 tonnes per annum (tpa) of residual waste, based on an assumed plant availability of 89% (the allowance for planned and unplanned maintenance shutdowns) and a waste calorific value (CV) of 10.20 MJ/kg.

4.4.4. The EfW process is essentially waste combustion that recovers energy in the form of heat and electricity. As such the EfW Facility must meet the requirements of the Waste Incineration Directive (WID) and the Environmental Permit (England and Wales) Regulations 2007. The WID sets the most stringent emission controls for any thermal process regulated in the EU and are significantly higher than those for conventional, coal-fired power stations.

4.4.5. Key Stages

The process comprises the following key stages shown on Figure 41:

a) waste reception and handling;

b) combustion process;

c) energy recovery plant;

d) flue gas treatment plant; and

e) ash handling.

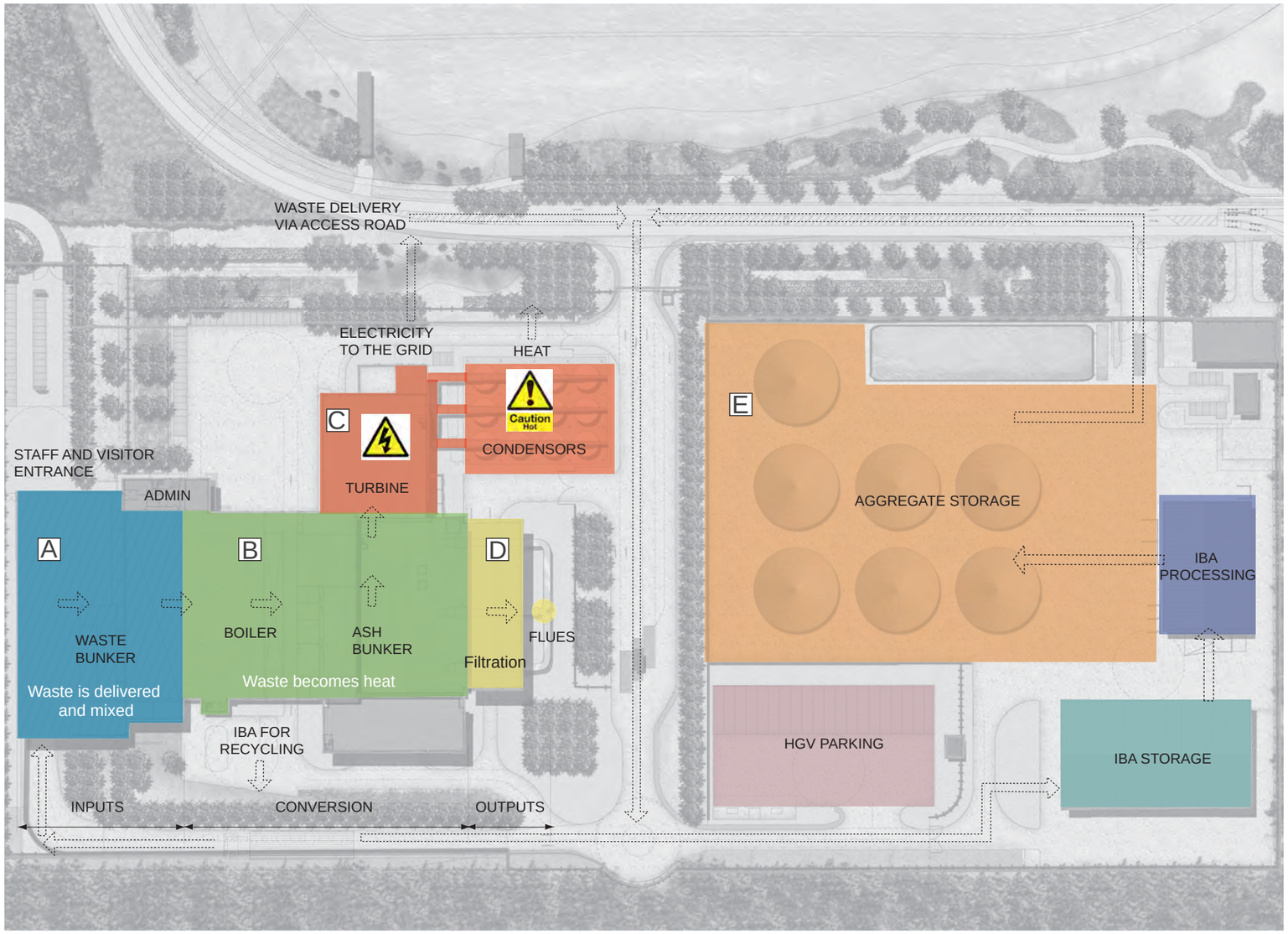


Figure 41: The Operational Process

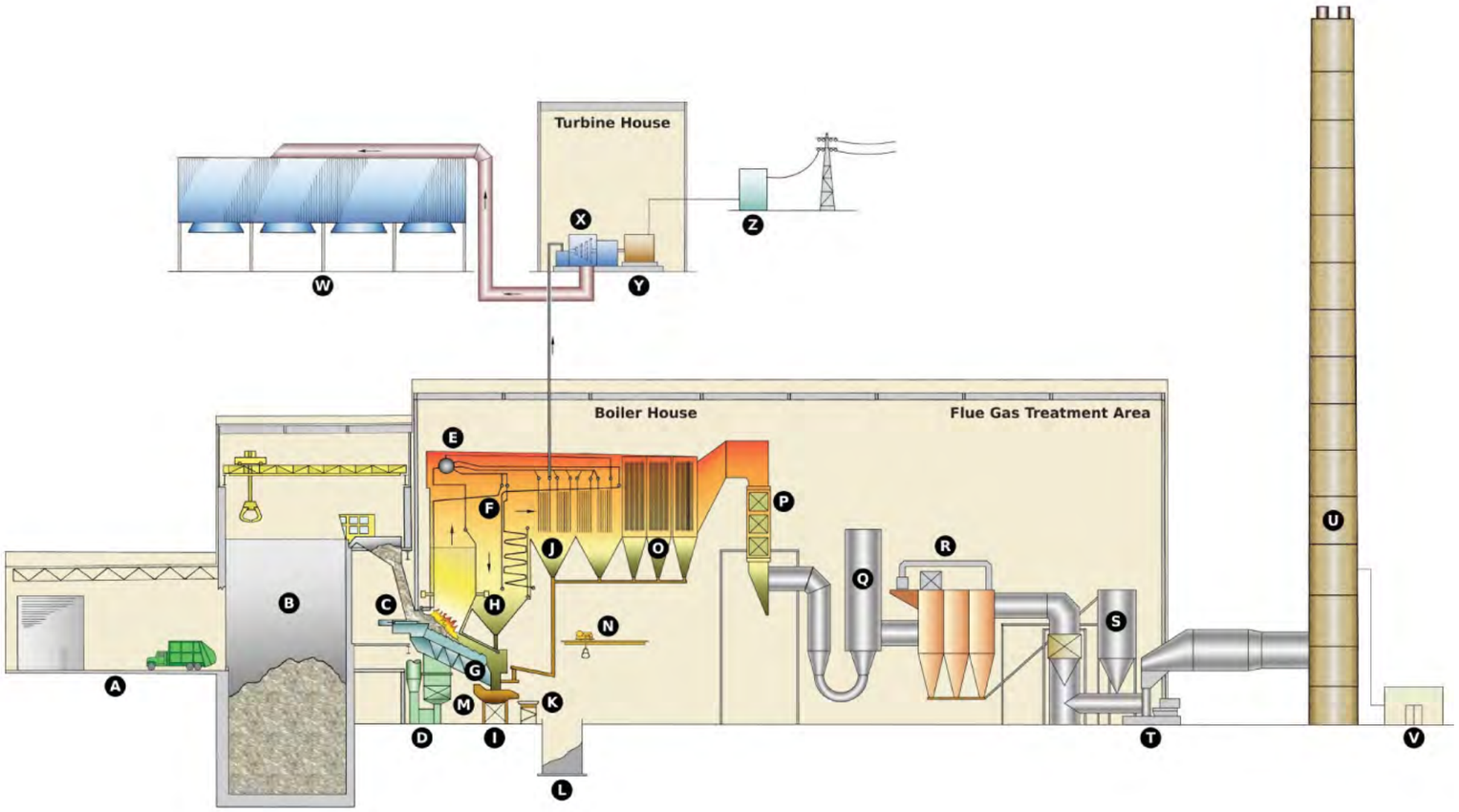


Figure 42: EfW Facility Schematic

Schematic Diagram Commentary

4.4.6. The various items of plant and equipment in Figure 42 are numbered and referred to in brackets throughout the description.

4.4.7. The overall EfW process comprises the following main steps:

1) waste reception;
2) combustion process;
3) steam production;
4) electricity generation;
5) flue gas treatment; and
6) IBA (including co-mingled metals) handling.

4.4.8. **Waste reception:** After weighing the vehicles will climb the ramp (which has a 3m high acoustically treated fence along its southern edge) and enter the enclosed tipping hall (A), where they will be directed to a vacant tipping bay to discharge into the refuse bunker (B) in a controlled and scheduled manner on arrival at the RRF.

4.4.9. Radioactive detectors would be installed at the weighbridge to detect any loads which contain radioactive material. Any such loads will be rejected and returned to the source.

4.4.10. Commercial and Industrial waste deliveries will be accompanied by a waste transfer note which will identify the wastes in each delivery. If unacceptable wastes are listed on the waste transfer note, the delivery will be rejected, Similarly, if the waste, on inspection, does not match the waste transfer note then the delivery will be rejected.

4.4.11. Vehicles entering the tipping hall will be selected on a random basis for inspection of their waste load. The degree of inspection will depend on the type of waste.

1) direct deliveries of MSW will be subject to random inspection;

2) MSW delivered from transfer stations will be inspected at the transfer stations and unacceptable items will be removed. Therefore, there will be no further inspection at the RRT; and

3) C&I waste would be subject to random inspections. New customers would be subject to additional inspections, as would any customers who have given cause for concern.

4.4.12. The selected loads will be discharged onto the tipping hall floor and visually inspected. Any unacceptable items will be separated and stored in either a designated quarantine area or bulky storage bay within the tipping hall.

4.4.13. Once vehicles have deposited waste into the refuse bunker they will exit the tipping hall and pass over a second weighbridge where the vehicle will again be identified and weighed as part of measures to monitor the quantities and sources of waste being delivered to the EfW Facility.

4.4.14. The refuse bunker will have sufficient storage capacity for approximately four to five days waste supply for the EfW Facility. Consequently, even complete, short-term plant shutdown would not necessarily prevent vehicles continuing to deliver waste. The storage capacity would also be able to accommodate brief interruptions to the supply of waste.

4.4.15. Once waste delivery vehicles have discharged their loads into the refuse bunker, large refuse handling cranes mix and turn the waste to create a more uniform fuel. This also prevents it from becoming anaerobic and hence reduces the production of odour. The crane loads the waste into the feed hopper (C), which feeds waste into the combustion process. The crane will be capable of fully automatic operation and will not be manned during the quieter periods.

4.4.16. **Combustion process:** The combustion process takes place on the grate (G), where the waste is burnt. The combustion of the waste requires air, which is drawn via the primary air fan (D) from above the refuse bunker located in the tipping hall and through the grate to support the combustion process. Drawing air from the tipping hall creates a flow of air from outside of the building towards the combustion process via louvers in the wall through the tipping hall. The movement of air takes with it any odours and dust from within the tipping hall and refuse bunker, together with vehicle emissions. These odours are destroyed in the combustion process. The flow of air creates a slight negative pressure in the tipping hall ensuring that odours and dust do not escape from the building.

4.4.17. The furnace design ensures that combustion gases are subjected continuously to a minimum temperature of 850°C for a period in excess of two seconds, as specified in the WID.

4.4.18. **Steam Production:** The heat released in the combustion process is in the form of combustion gases and these pass through the furnace located directly above the grate and the boiler (F) which comprises banks of water tubes. As the gases pass through the boiler they give up their heat to the water within these tubes, converting it to steam. The steam is collected in a steam drum located at the top of the boiler (E). In the steam drum, water trapped in the steam is removed and this drier steam is passed through the superheater (J) where the steam is heated further to remove any traces of moisture, creating a high-pressure superheated steam in a condition suitable to pass through the steam turbine.

4.4.19. As the superheated steam passes through the steam turbine (X), causing the rotor to rotate, it gives up its energy and changes its state back to low pressure steam. The system is a closed loop and, therefore, the steam has to be converted back to water to allow it to be pumped back into the boiler. This is done via the Air Cooled Condenser (ACC) (W). The steam is passed through the ACC which comprises banks of finned tubes. Large, slow-speed fans blow cooler air over these tubes, cooling the steam and causing it to condense back to water. The water can then be pumped back into the boiler. Prior to the water entering the boiler it is passed through the boiler economiser (O), where the water is heated by the hot combustion gases that are exiting the boiler superheater. This increase in temperature improves the efficiency of the system.

4.4.20. **Electricity Generation:** The combustion process produces steam in the boiler. This steam will pass through a turbine and drive a generator to produce electricity.

4.4.21. The energy recovery plant comprises the steam turbine described above (X) and generator (Y). The superheated steam drives the turbine which in turn rotates the generator. Although some electricity is used to operate the facilities such as driving motors and fans, the majority of the electricity produced will be transmitted into the nearby electricity grid system. The EfW Facility will generate an expected average gross output of approximately 65MWe of electricity, of which approximately 10MW will be required to operate the EfW Facility itself.

4.4.22. The electricity, which, based on currently available waste characteristics, would be over 50% renewable, would be transmitted to the new Marston Grid substation via a new underground connection at a voltage of 33kV. The turbine-generator unit generates power at a voltage of approximately 11kV which is stepped up to a voltage of 33kV by an on-site step up transformer (Z).

4.4.23. **Flue Gas treatment (FGT)**: To ensure that the combustion gasses meet the stringent requirements of the WID before they are discharged up the stack (U), they have to be treated. This treatment starts in the furnace which is designed to ensure that the combustion gasses have at least 2 seconds at a minimum 850°C, thereby ensuring that dioxins and furans are destroyed in compliance with the WID. The configuration of the furnace and the injection of ammonia into the gas stream reduce the production of Nitrous Oxide (NOx).

4.4.24. After combustion, the gasses are rapidly cooled in the boiler which minimises the risk of dioxin reformation before they are discharged to the FGT plant for further treatment to ensure compliance with the WID. This FGT plant requires the gasses to pass through dry gas cleaning system.

4.4.25. The final stage of the treatment process is the bag filter, where particulate matter is removed. These residues, which comprise spent and unspent lime and active carbon, together with the substances they have neutralised and captured, are carried over

in the gas stream from the FGT with the particulate matter (dust) from the combustion process, and captured in the bag filter. The whole process ensures that the combustion gasses are treated to a level that does not exceed the stringent requirements of the WID. The gases are drawn through the boiler and the gas treatment plant by the Induced Draft fan (T) and discharged up the stack (U). The stack is designed to ensure that the treated combustion gasses are dispersed at a height and a velocity such that they have no significant impact on the surrounding area.

4.4.26. The treated emissions are monitored by emissions monitoring equipment (26). The emissions which will be monitored continuously include the particulates, SO2 and NOx, This provides readings of emissions to demonstrate that they do not exceed the WID limits and if there is adverse trending in the levels of emissions. Should this take place, alarms are raised and corrective action is taken. The emissions that are not able to be monitored continuously are periodically extracted and taken away for testing.

4.4.27. The residues from the bag filter are stored in the FGT residue storage silo (S). This quantity of residue equates to approximately 4% of input waste by weight. The FGT residue will be transported off site in an appropriate, sealed-tanker, road vehicle to a specialist treatment/landfill facility.

4.4.28. **Incinerator Bottom Ash (IBA) with Co-mingled Metals:** After combustion of the waste, IBA remains which contains metals. Of the incoming waste, approximately 20% would remain as IBA and a further 5% would be the co-mingled metals. The IBA with comingled metals are discharged from the grate, quenched with water for cooling to prevent dust emerging, and then discharged into the ash bunker (L). The water used to quench the IBA is waste process water from the water collection lagoon and harvested rainwater. The IBA with co-mingled metals will be removed from the ash bunker by an overhead crane (N) and placed into a tipper truck for transfer to the MRF for separation and grading.

Figure 43: Indicative CHP Network Route

Combined Heat and Power (CHP)

4.4.29. The EfW Facility has been designed to be CHP-enabled, which will allow the export of heat/steam to future heat users. CHP is a highly fuel-efficient energy technology that utilises the waste heat produced as a by-product of the electricity generating process. The EfW Facility is to be fitted with a CHP pass out facility to serve local heat demand when identified and secured. This is described in greater detail in the Combined Heat and Power Development Strategy (CHPDS) and Engineering Design Report that accompany the application.

4.4.30. After exploring several potential opportunities for customers in respect of CHP including Nirah, The Wixams and Center Parcs, Covanta is currently in negotiations with a number of potential users of the heat. The CHPDS has been submitted to accompany the DCO application. It present's Covanta's commitment to delivering CHP and evidence and progress of relevant negotiations.

MRF Process

4.4.31. At the MRF, the IBA with co-mingled metals is separated into various grades to produce Incinerator Bottom Ash Aggregate (IBAA). This is then sold to the construction industry for road construction and other civil engineering uses. In addition, metals are recovered during the processing. These recovered metals are sold into the market for further recycling. The separation processes are focussed upon handling IBA/IBAA and do not alter its nature, save by the recovery of the co-mingled metals from the IBA.

4.4.32. The IBA with the co-mingled metals will be delivered from the EfW Facility to the MRF by truck, where it is stockpiled within the IBA storage building. It is maintained in this state for two to three weeks before it is ready to be processed. The stockpiling allows for a reduction of moisture content and stabilisation to occur within the material.

4.4.33. The 'aged' IBA and co-mingled metals are transferred to the IBA processing building where it is fed into the processing equipment which consists of a series of screens and conveyors. These initially remove the larger elements and grade the end product into the usually required sizes of 50mm to 10mm and 10mm to 0mm. The first trommel comprises circular rotating screens that break up and remove larger size material. Further screens grade the material into the range of sizes required. The IBA and co-mingled metals pass under magnets to remove ferrous metals and over an eddy current separator to extract non-ferrous metals.

4.4.34. The resultant IBAA is stored within the open aggregate storage yard in stockpiles of 8 to 10m in height (maximum 10m). It is stored in this area until it is exported off site for use in construction projects. The storage area has been sized to accommodate up to six months of aggregate. The aggregate is removed from the Operations Area to end-users in HGVs. The recovered metals are stored in skips besides the IBA processing building and removed from the MRF by an appropriate vehicle and taken to a metal processing facility.

4.4.35. The use of the IBAA as a construction material is approved by the Department for Transport and European EN standards as a Manufactured Aggregate for Road Construction.

4.4.36. Covanta's chosen subcontractor for the MRF is Ballast Phoenix Ltd (BPL), which is the UK's leading bottom ash and co-mingled metals business. BPL currently operate on 6 sites and process around 435,000 tonnes of IBA and co-mingled metals per annum.

4.4.37. The post-treatment MRF would not be used for the processing of IBA from any other facility than the Project's EfW Facility.

Internal vehicle circulation within the Operations Area

4.4.38. Figure 45 shows the detailed movement of vehicles into and within the Operations Area, which is also described in Chapter 6 of this DAS.

Hours of Operation

4.4.39. The RRF will be operational for 24 hours per day, 365 days per year. Deliveries of residual waste will be restricted to between 05.00 and 23.00. No waste will be accepted on Sundays, Christmas Day, New Years Day or Easter Day except under exceptional or emergency circumstances.

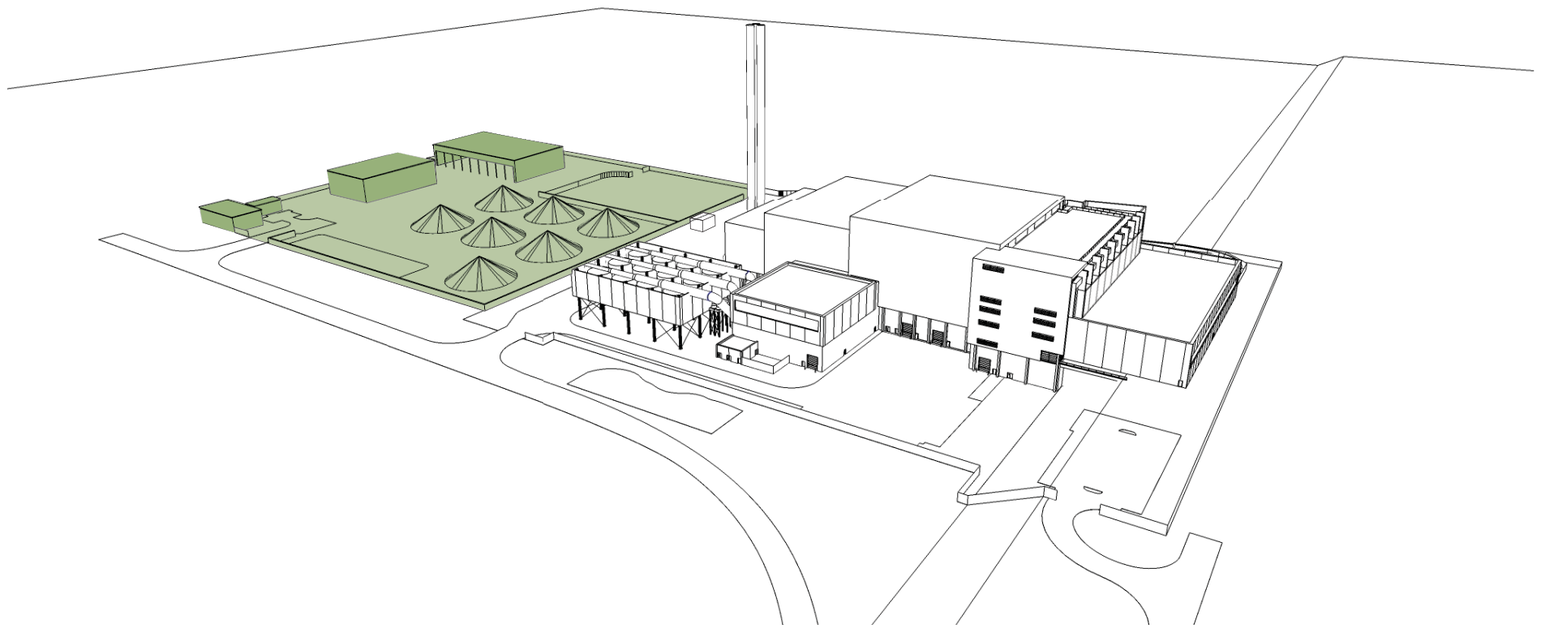


Figure 44: The MRF

4.4.40. The operational hours of the MRF will be:

a) Monday to Friday: 07.00 to 18.00;

b) Saturday: 07.00 to 14.00; and

c) Sunday: Closed, except under exceptional circumstances or for emergency circumstances.

4.4.41. The ES describes the type and number of predicted vehicle movements associated with the Project for the nominal throughput and maximum throughput scenarios. Details of the daily profile and distribution are included within the Transport Assessment accompanying the ES.

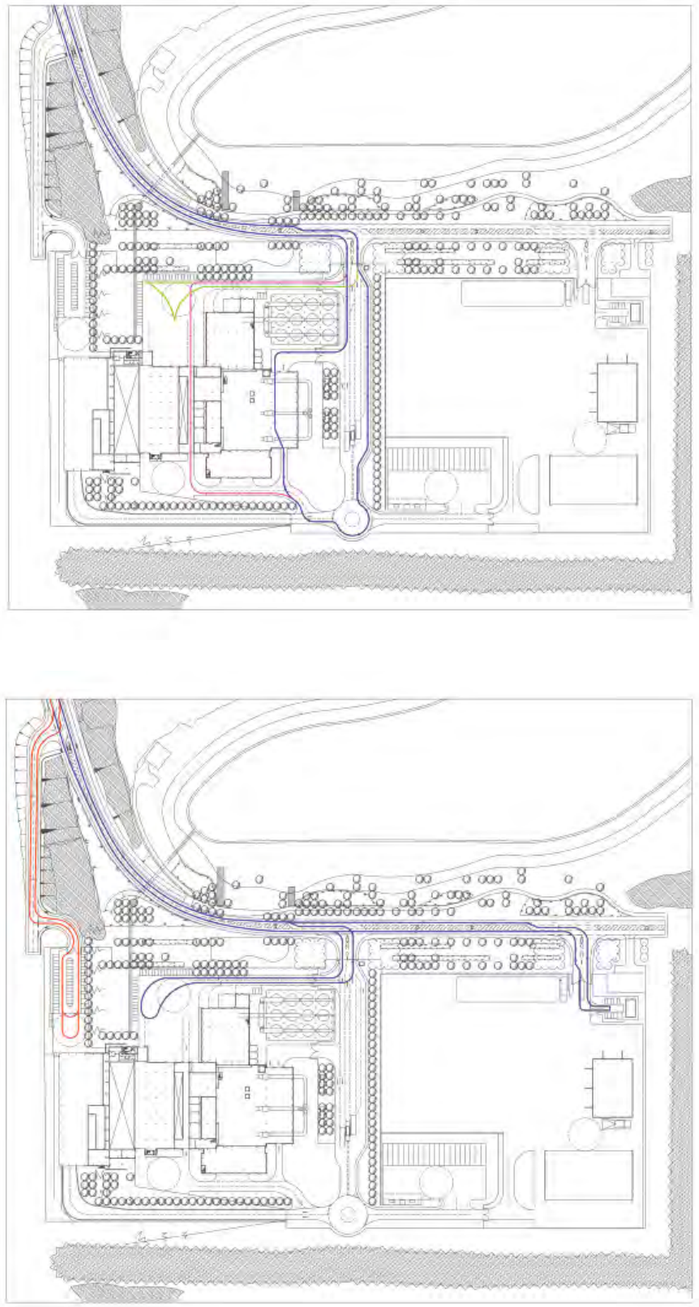


Figure 45: Operations Area Vehicle Circulation Plan

5.0 DESIGN DEVELOPMENT: MASTERPLAN AND ARCHITECTURAL DESIGN

5.1. INTRODUCTION

This Chapter describes the following:

a) Overall design philosophy;

b) Site configuration and layout;

c) Building design philosophy - building design, form and scale

   i. EfW Facility – primary building (including stack);

   ii. MRF – secondary buildings; and

   iii. General operational buildings – tertiary buildings ; and

d) Design references.

5.2. OVERALL DESIGN PHILOSOPHY

5.2.1. The design philosophy of the RRF is described in Chapter 3 of this DAS leading to the identified evolution of the Design Objectives for the Project. They are a direct response to the site context which has shaped the design response, which has a clear structure with well defined boundaries and areas of operation and circulation.

5.2.2. The masterplan for the Operations Area is addressed in this Chapter having regard to the location of the buildings in relation to The Rookery South Pit, and the order of buildings relating to their process. The description of the circulation patterns of vehicles in the Operations Area and associated site access is described in Chapter 6 and the landscape rationale which ties the elements together is described in Chapter 7 of this DAS.

5.2.3. The architectural response of the EfW Facility and all other buildings in the Operations Area follows the Building Code and Design Objectives outlined in Chapter 3. The sensitivity of introducing the new built structures of the RRF and the associated operational activity into the landscape of the Marston Vale, has been fully understood and has influenced all aspects of the RRF design. The perception and experience of the buildings and operational activity varies subject to the distance for which they are viewed.

5.2.4. The buildings have been designed with a clear hierarchy relating to their function described in this Chapter.

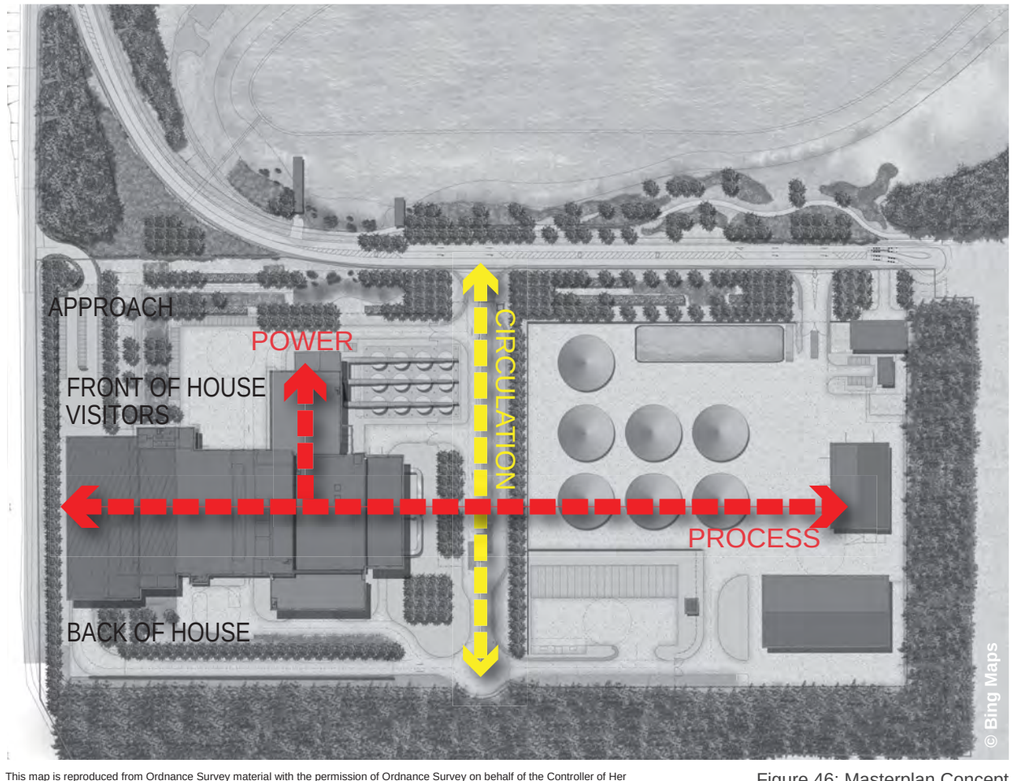


Figure 46: Masterplan Concept

Legend

- Trees
- Woodland
- Shrub planting/ understorey
- Hedgerow
- Grassland
- Meadow grassland
- Reeds/aquatic vegetation
- Water body
- Access Road
- Internal road
- Hard surface
- Security fence
- 3m high acoustic fence
- Wall
- Brown Roof
- Operations Area
- INDICATIVE LAYOUT ONLY further design development to be undertaken with relevant consultees

Proposed EfW Facility

1: Admin and visitor car park (48 no. spaces)
2: Forecourt (inc. coach turning)
3: Operational staff car park (32 no. spaces)
4: Transformer Compound
5: Admin building and visitor centre / education facility
6: Tipping hall
7: Refuse bunker
8: Boiler house
9: Flue gas treatment area
10: Workshop and stores
11: Stack
12: Weigh bridge and security gatehouse
13: Turbine hall
14: Air cooled condensers
15: Surface water attenuation
16: Automatic gates
17: Access to EfW Facility
18: Steep retained inner slope
19: Silo Area

Proposed MRF

20: Screened aggregate storage yard
21: Indicative aggregate storage piles
22: HGV parking
23: IBA storage
24: IBA processing
25: Security Fence
26: Water Collection Lagoon
27: Staff admin block
28: Staff car park (10 no. spaces)
29: Aggregate weigh bridge
30: Access to MRF
31: Foul water pumping station
32: Access to pumping station
33: Wall to storage yard

External to Operations Area

34: Perimeter Bund

Figure 47: Masterplan (Operations Area)

5.3. SITE CONFIGURATION AND LAYOUT

5.3.1. The location of the Operations Area and position of the EfW Facility is fixed within the north west quadrant of Rookery South Pit with the EfW Facility and MRF, orientated along an east - west axis. The RRF has an organised Operations Area masterplan illustrated in Figure 47 this arranges the various elements of the RRF in the direction of process aligned along an east west axis.

5.3.2. The key considerations influencing site layout are outlined below, with an explanation in each case as to why alternatives were not provided.

Transport Connection

5.3.3. The RRF is positioned in the north west quadrant of Rookery South Pit at the closest point to the Green Lane entrance and abuts the proposed western access road which utilises an existing corridor alongside Rookery North Pit. Locating the RRF in any other position within Rookery South Pit would require additional highway construction extending across The Rookery South Pit or in raised land separating North and South Pit resulting in increased traffic movements and a more remote location for the Operations Area.

Rail Connection

5.3.4. The ability to secure a future rail connection to the RRF is via the Marston Vale Line and is best served by locating the RRF to the west of Rookery South Pit. The design considerations for rail connection are described in Chapter 6 of this DAS.

Site levels

5.3.5. The RRF is located in Rookery South Pit which benefits from the low lying pit floor which permits operational activity to be contained from many of the views in the surrounding area – a matter described in Chapter 7 of this DAS. The pit levels also provide important benefits in the arrangement of the RRF and most especially the EfW Facility, which is an important determining factor in the arrangement of the masterplan. The EfW Facility requires the tipping hall to be perched above the tipping bunker to establish sufficient capacity for the waste bunker itself. It should also lie above the general floor level of the EfW Facility in order that the reciprocating grates of the EfW Facility can be fed by gravity. The EfW Facility utilises the pit embankment to support the tipping hall and establish the base of the main waste bunker at a lower level within the pit. The change in level of approximately 10m, working in conjunction with localised reduction in pit level, enables this important operational requirement to be accommodated. The existing topography provides sufficient depth without the need to import additional fill material to construct the elevated tipping hall platform.

Level Change in Pit

5.3.6. The requirement for a perched tipping hall has influenced the location of the building in The Rookery South Pit itself. The height of existing ground levels surrounding Rookery South Pit above the pit floor vary from a minimum of 10m to the west to approximately 20m to the east. The embankment profile and the level change of the embankment to the west permits the tipping hall to be located on a stable berm at an operationally optimal level. This arrangement is shown illustrated in Figure 48. The eastern pit embankment has significant stability problems that are to be addressed as part of the LLRS, but would require further costly engineering interventions to ensure slope stability should the EfW Facility be 'attached' to it. In addition, given that the slope profile is relatively steep and high with no intermediate berm, any ramp requirement to facilitate access from lower to upper levels would require additional import of material and bank construction works. It would not represent a suitable alternative to locating the RRF on the western margins of Rookery South Pit.

5.3.7. A technical study was undertaken, in response to consultation feedback, to investigate the feasibility of lowering the EfW Facility within the pit in order to reduce visual impact. The study assessed the effect of lowering the building into the ground by 4 and 8 metres. The study concluded that lowering the building, whilst technically feasible in engineering terms, would be inappropriate for a number of reasons principally relating to operational considerations and other geotechnical and hydrological constraints.

5.3.8. The key issue relating to the lowering of the building is the risk of flood and the control of ground water, particularly within the EfW Facility. The engineering solutions required to overcome the geotechnical and hydrological constraints relating to the lowering of the building and the related retaining wall, drainage and foundation strategy would significantly increase Project costs and result in a longer construction programme.

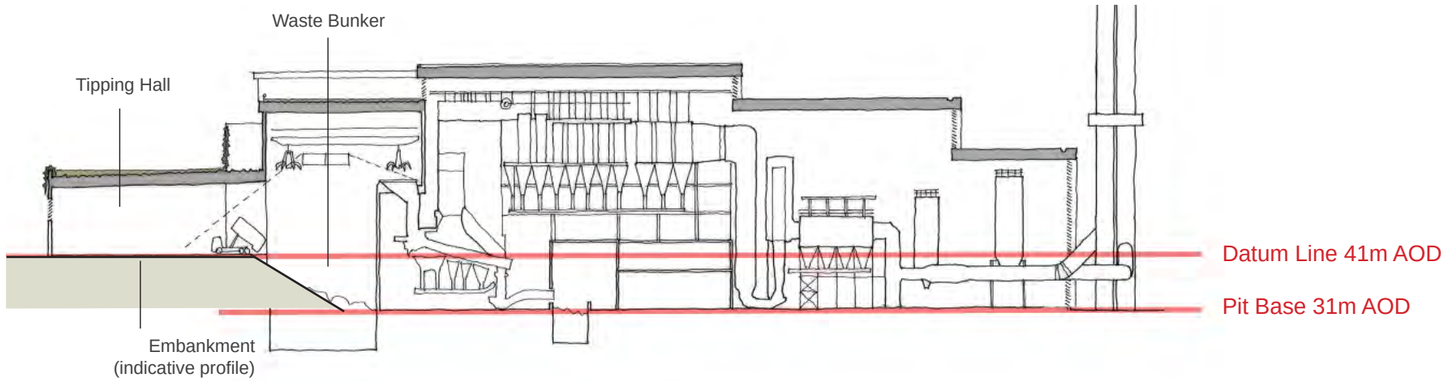


Figure 48: Illustrative Arrangement of Tipping Hall on Pit Embankment

Consideration of LLRS attenuation strategy

5.3.9. The position of the RRF within the north west quadrant of Rookery South Pit ensures that connection to the drainage channels and attenuation pond, constructed as part of the LLRS can be delivered in an efficient and cost-effective manner, requiring only minimal alteration to the proposed LLRS drainage infrastructure as well as providing an attractive front of house for the RRF on approach – a matter addressed in this section and Chapter 7 of this DAS.

Ecology

5.3.10. The south-facing slopes of The Rookery South Pit have been identified as important habitat for invertebrate assemblages. The location of the RRF to the south and distant from these slopes ensures that they remain intact.

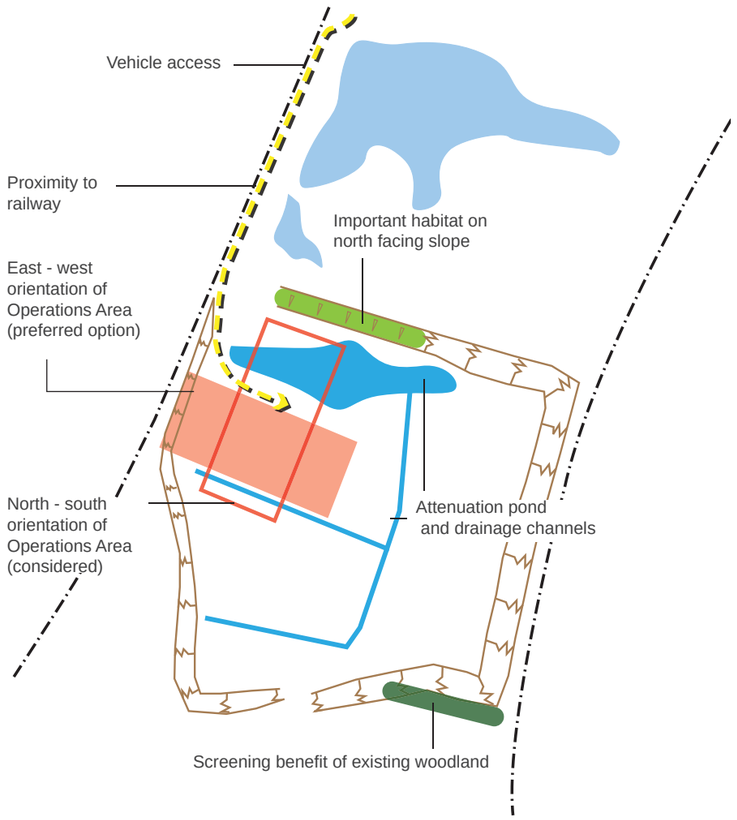


Figure 49: Site Configuration and Layout Schematic

Visual effects - Building Location

5.3.11. The proposed position of the EfW Facility assists in limiting the visual impact of the RRF on sensitive receptors at South Pillinge Farm and Ampthill Park House. If the EfW Facility were to be located further south within the pit, the visual impact would significantly increase particularly for the residents of South Pillinge Farm. A more easterly location would move the EfW Facility closer to Houghton House and whilst distancing the Facility from the Forest Centre would also distance the Facility from an existing wooded edge upon which it could be anchored in views.

Visual effects - Building Orientation

5.3.12. The arrangement of the RRF along an east-west axis places the narrowest elevation within view of the nearest and most sensitive receptors - the Forest Centre within the Millennium Country Park to the west, and Houghton House to the east. These views are represented in Figure 50. This orientation, in relation to the sun path, also maximises the shadow effects created by the form of the building resulting in a more fragmented and recessive feature in the landscape.

5.3.13. Building orientation was considered along a north-south axis, but this was discounted as it resulted in a long elevation facing the closest visually sensitive receptor at the Forest of Marston Vale Forest Centre and increased effects on views from the elevated Greensand Ridge, notably Houghton House.

View from Houghton House

View from the Forest Centre

Figure 50: The Narrow Ends

Site Layout

5.3.14. The site layout is driven the Design Objectives and by Operational Principles requirements which are focussed on delivering a safe and efficient working environment. The layout is also conditioned by environmental considerations including limiting noise and light emissions from buildings and external spaces.

5.3.15. The site layout primarily seeks to achieve the separation of people (staff and visitors) and cars from operational (waste in/ aggregate out) operations and vehicles. The 'populated' elements of the EfW Facility, such as offices and the visitor centre, are located to the north of the building, with staff and visitors entering at the higher level from the arrivals car park located on the pit embankment. The offices benefit from views which overlook the lake to the north.

5.3.16. Operational activities, including waste arrival, are focussed on the lower level pit floor where they are more easily screened by the pit datum. This layout sets up a "front" and "back" of house arrangement.

5.4. BUILDING DESIGN, FORM, MASS AND SCALE

5.4.1. Figure 51 illustrates the component buildings of the RRF comprising the EfW Facility – the primary building; the MRF – the secondary buildings; and General Operational Buildings – the tertiary buildings. Each building relates to the hierarchy in form, material use and colour finishes. A description of design for each building in the hierarchy is detailed below with a section addressing material finishes and colour and design references principally relating to the EfW Facility included in that section. The colour study has also influenced the design of the other buildings but has been primarily a driver for the EfW Facility.

The EfW Facility – The Primary Building

5.4.2. The EfW building is a structure that 'sits in the landscape'. It is not designed an overt or iconic landmark response that seeks to draw attention to itself. Instead it represents a logical expression of function and a building that is well proportioned, conservative, well considered and conditioned by its context. The building sits below the horizon and is subservient to its landscape and the audiences identified in Chapter 3 of this DAS.

5.4.3. The main building comprises the operational 'machine' which is formed by a series of interlocking 'box' enclosures, or shells, which are wrapped around the internal functions with their differing height requirements producing a stepped profile. The internal functions comprise: the waste bunker, the boiler house, ash bunker and flue gas treatment area. Ancillary elements in the form of 'cassettes' that plug into the 'machine', have a differing treatment and comprise the tipping hall (a 'waste in' cassette) and the turbine hall (electricity out) and condensers (hot water) expressed as an energy 'cassette' and the workshop that keeps the engine running. The Facility includes the flue stack. The treatment of this building and the flue stack is detailed in this Chapter.

MRF – the secondary buildings

5.4.4. The simple box form of the EfW Facility is similarly expressed in the box-like secondary buildings within the MRF comprising the IBA storage and IBA processing building. The treatment of these buildings is detailed in this Chapter.

General Operational Buildings – the tertiary buildings

5.4.5. A number of other tertiary buildings occur within the Operations Area comprising: the electrical transformer building, security gate house, MRF staff administration block and foul pump house. The treatment of these buildings is detailed in this Chapter.

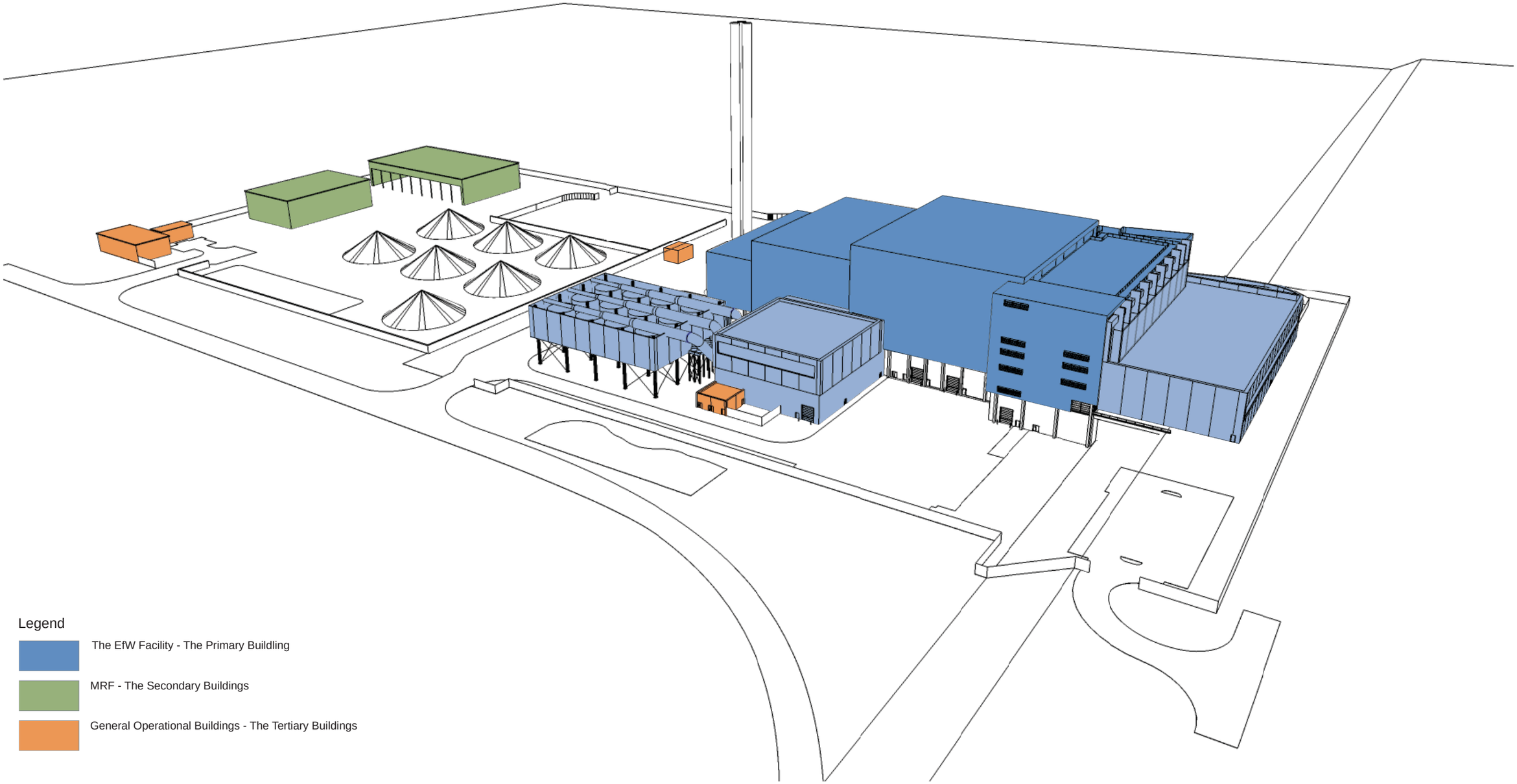


Figure 51: Component Buildings Arrangement

EfW FACILITY - THE PRIMARY BUILDING DESIGN

5.4.6. The development of the building design starting with the initial curved form and more formally based on the boxed enclosure form following context studies, is recorded in Chapter 3 and in Figure 53 which illustrates the design progress. Chapter 3 records the benefits of the consultation process in distilling the design and anchoring the concept as the design progressed. The design development stemming from context studies which recommended a boxy form, produced a building with a generally angular approach to the building enclosure but included curved elements and a number of angled building portions. This design was subsequently refined in response to both internal design discussions and to comments of CABE following their first review.

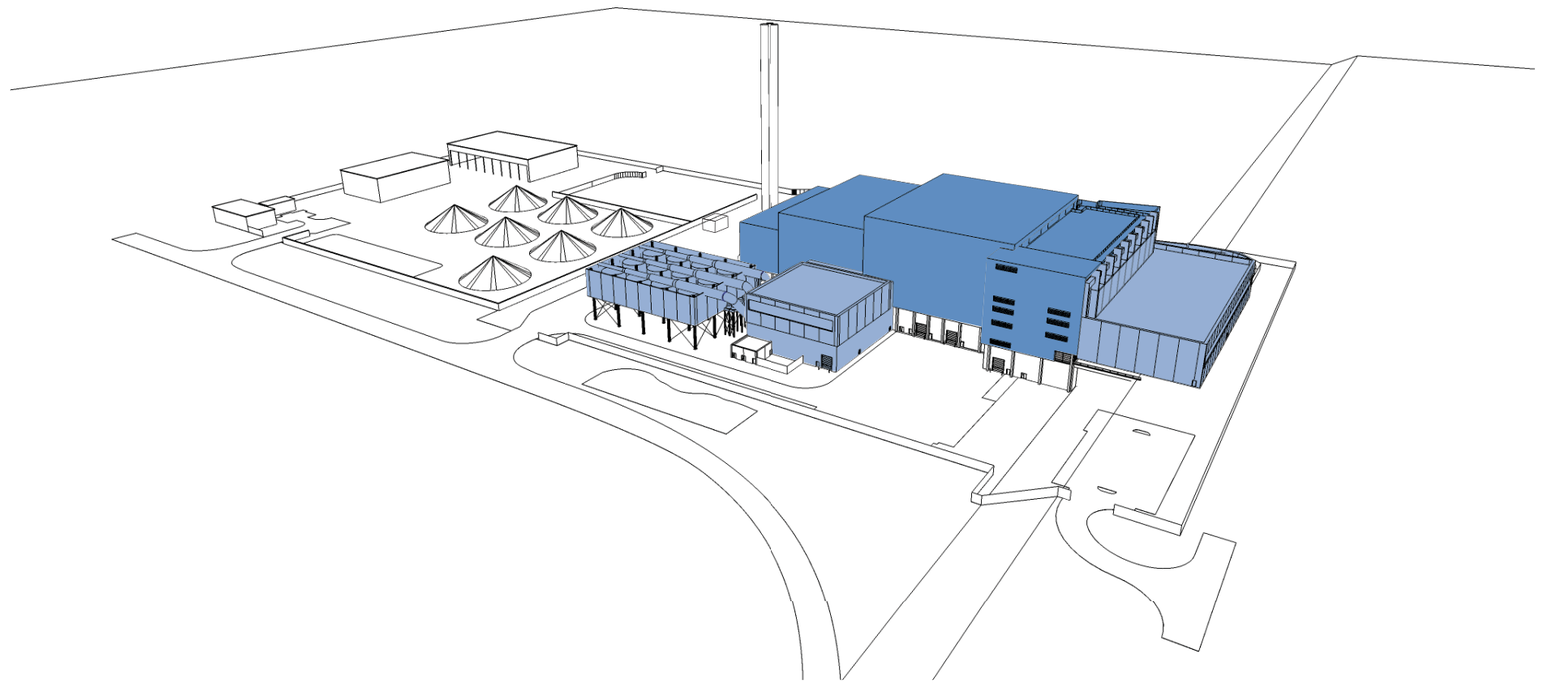


Figure 52: EfW Facility - The Primary Building

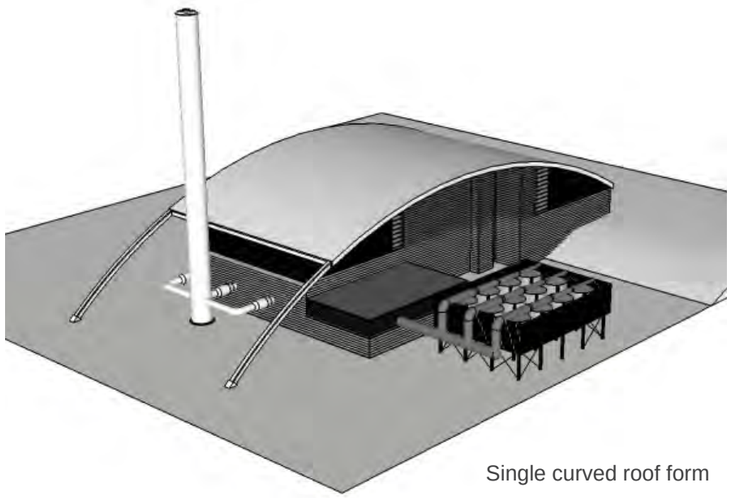
Building form and mass

5.4.7. The form of the EfW Facility has evolved through a series of design iterations. A single curved structure was illustrated as part of early published dialogues for the RRF, including those used for waste procurement bids. Subsequently, two building forms were considered at the start of the formal design development process comprising:

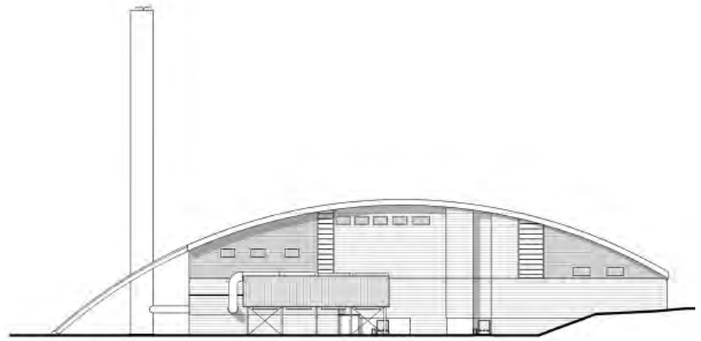
1) a large, single curved structure, and

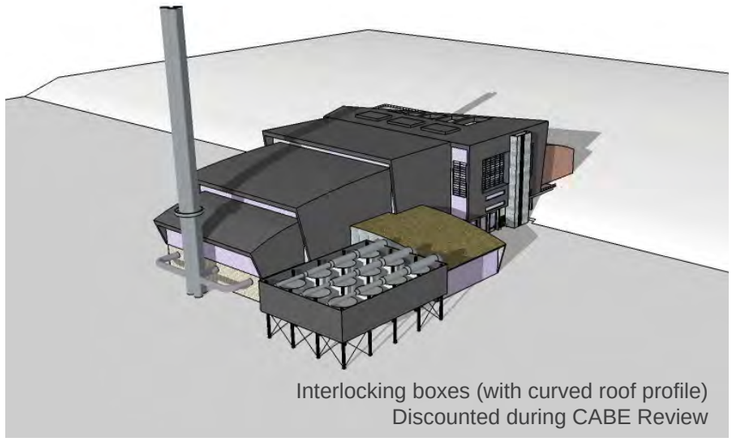
2) a more angular form comprising a series of interlocking boxes which was developed following an initial landscape appraisal of the area. Figure 53 shows early computer modelling of both forms.

5.4.8. The curved roof option was discounted in favour of the interlocking ‘box’ concept following a period of consultation with English Heritage, CBC and other consultees. The thinking behind this is discussed below.

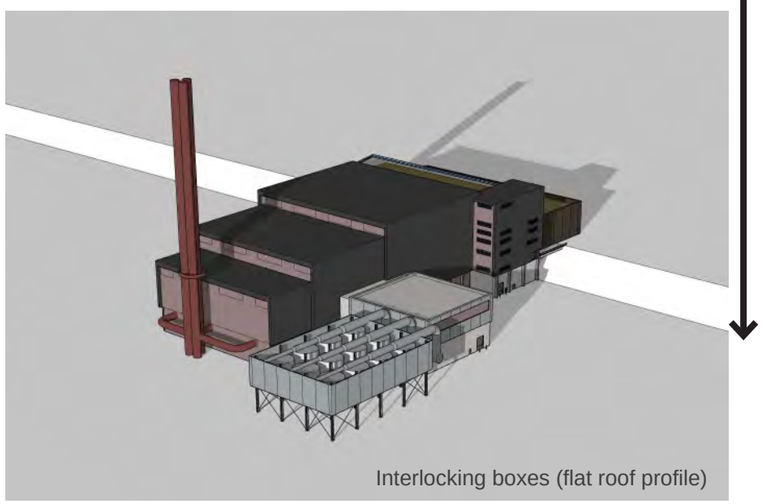


Single curved roof form





Interlocking boxes (with curved roof profile)
Discounted during CABE Review



Interlocking boxes (flat roof profile)

Design Evolution

Figure 53: Evolution of Building Form

5.4.9. Initial photomontage studies reproduced in Figure 54 demonstrated that the curved building form would produce a dominant ‘gesture’ which did not integrate successfully with the landscape. It introduced not only large elevations, but a roof which increased the extent of built form in views. In early consultation CBC advised that with the presence of Nirah in the elevated views towards The Rookery South Pit the building response from the EfW Facility should not seek to be iconic, but seek a more simple built response. It should not challenge or compete with the curvilinear Nirah form. Photomontages produced subsequently demonstrated that the RRF does not challenge the Nirah building and these are reproduced in Figure 55. It was also apparent in early discussions with EH that the curved form lacked justification because it did not reflect a built response that related to the internal plant or to the landscape context. In subsequent joint meetings with CBC and EH, the curved form was agreed to be an approach that offered less opportunity for integration, it was too strong a gesture in the landscape demonstrated in the composite wireframe modelling in local views reproduced in Figure 54.

Figure 54: Curved Building Composite Wireframe

Figure 55: Nirah Photomontage

5.4.10. The curved roof form and large unbroken elevations also provided limited scope to control the reflective effects of sunlight through the casting of shadow and the use of coloured finishes to assist in integration. By comparison, the interlocking box concept created a more articulated building form which allowed shadow to be cast resulting in a more recessive building in medium and long distance views. This would permit material colours to be used to assist in the integration of the building in the landscape, as illustrated in Figure 57. It was also demonstrated that the curved form required a taller building as the curve extended over the internal plant effectively 'capturing' more landscape or sky in views in the process as illustrated in Figure 56.

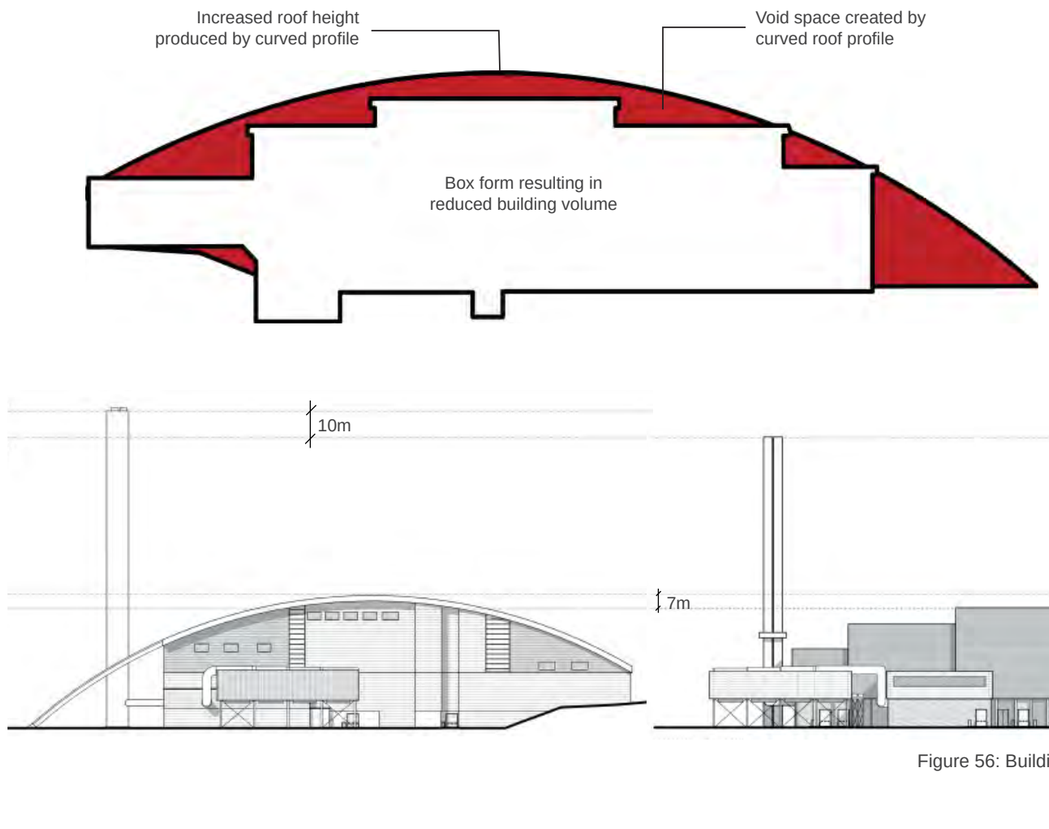
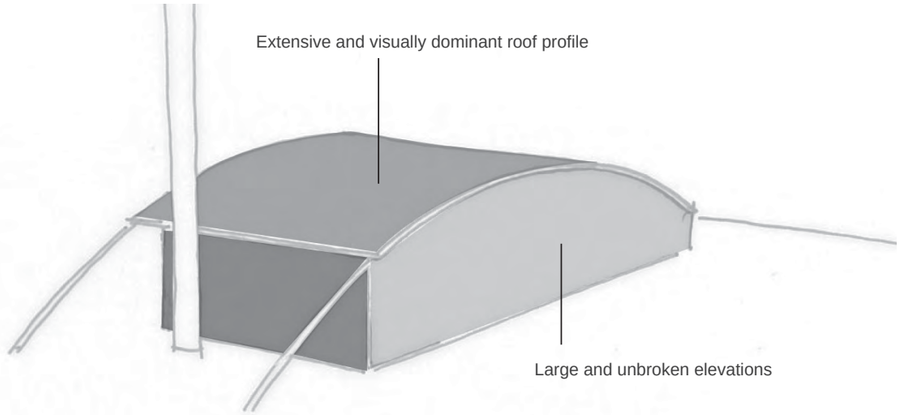


Figure 56: Building Volume and Scale Comparison



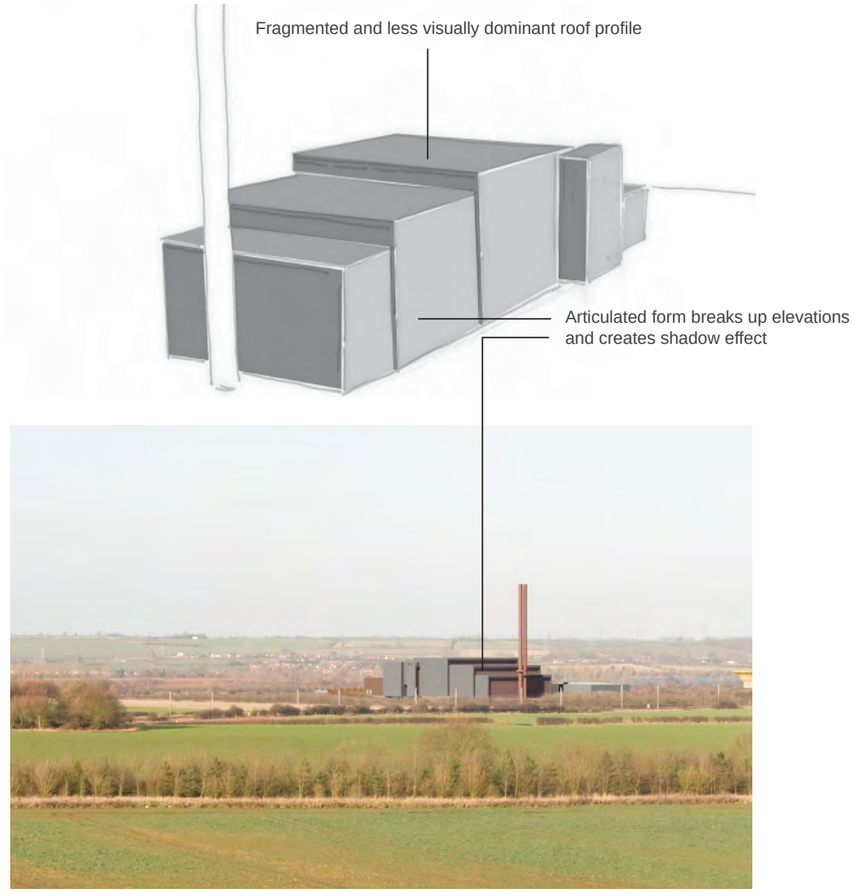


Figure 57: Building Form and Shadow Effect

5.4.11. In summary, the box form allowed the building envelope to fit more tightly to the internal processes of the main plant resulting in a less bulky building. The ‘box’ form had other advantages which included:

a) a less dominant roof profile and less visible roof in medium and elevated views as illustrated in Figures 58 and 59;

b) a reduction in the overall height and volume of the building as illustrated in Figures 56 and 60; and

c) an articulated building which produced shadow providing opportunities to develop a more ‘recessive’ building as illustrated in Figures 57.

Figure 58: The ‘Box’ Form in Medium Distance Views

Figure 59: The ‘Box’ Form in Elevated Views

Figure 60: Comparative montage

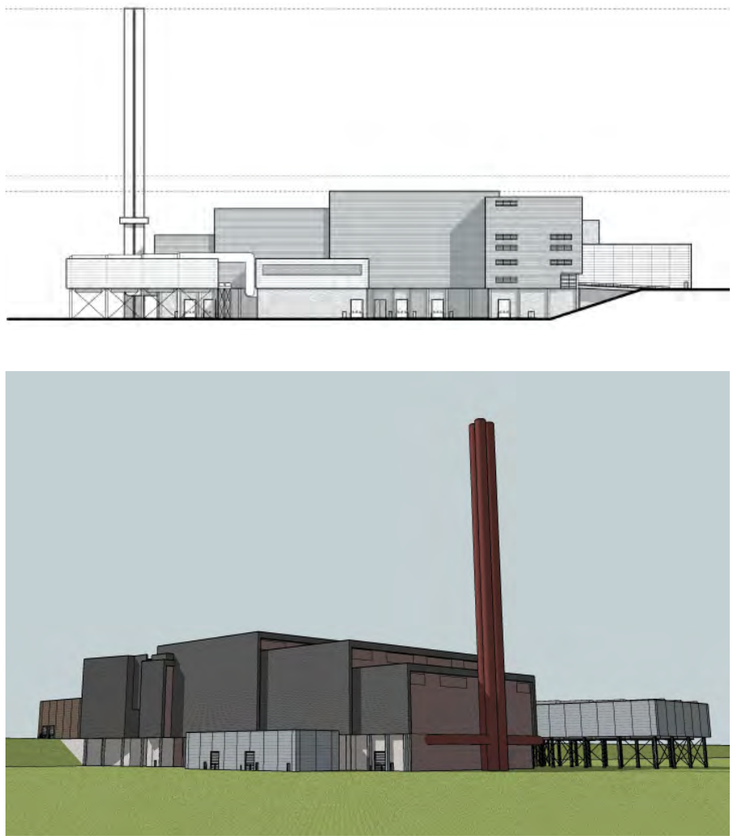


Figure 61: Articulated Building Form

5.4.12. Opportunities were taken to maximise the use of natural light and ventilation within the building using the space between the interlocking box shells as a ‘natural’ location for such elements as part of a coherent building design. Shrouding of louvers by shells further improves acoustic performance and casting of shadows to fragment the building form. These design principles are illustrated in Figures 61 and 62.

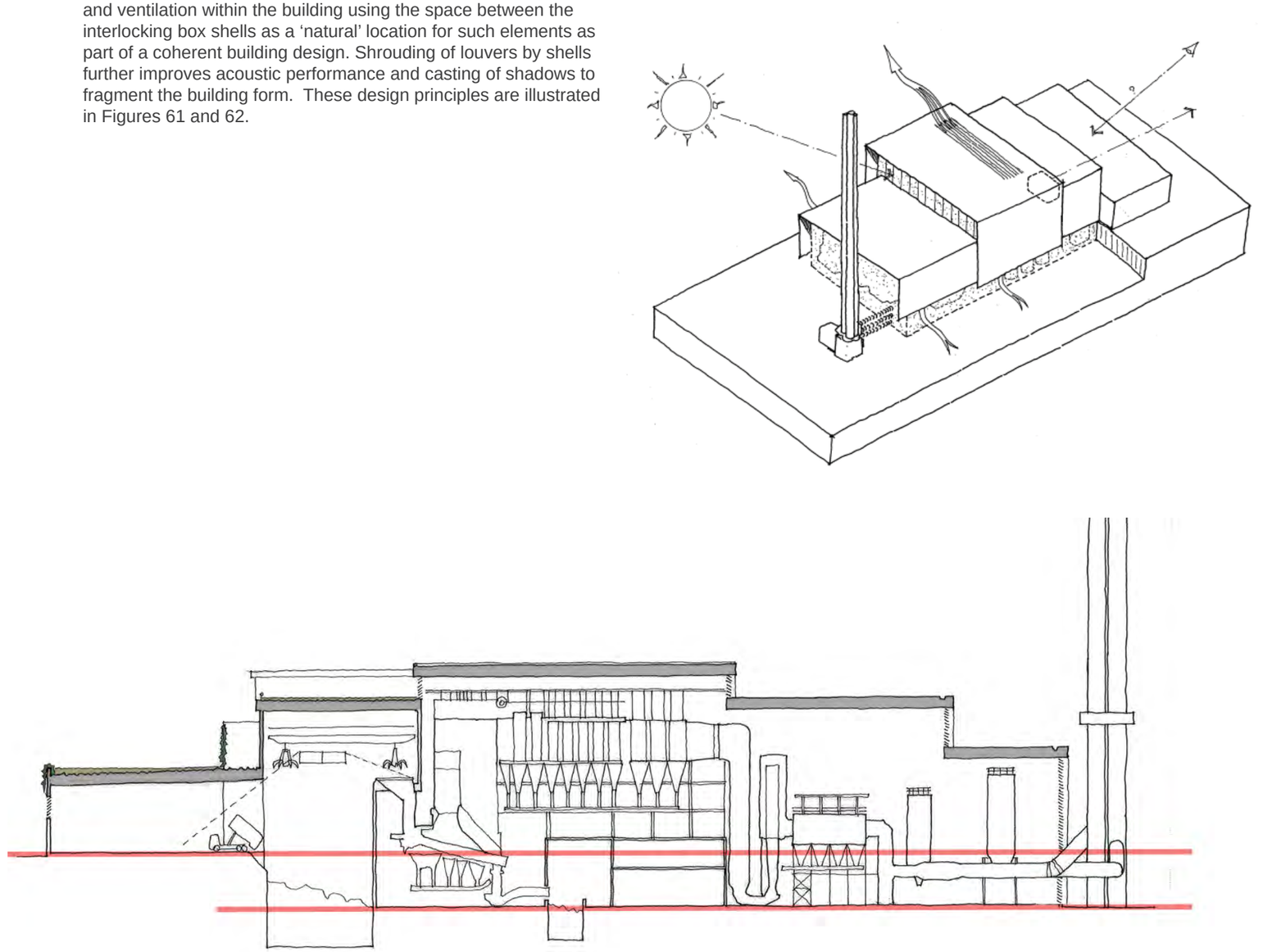


Figure 62: Natural Light and Ventilation

5.4.13. Figures 63 to 66 show the proposed EfW building form as the logical conclusion of the design process.

NORTH ELEVATION

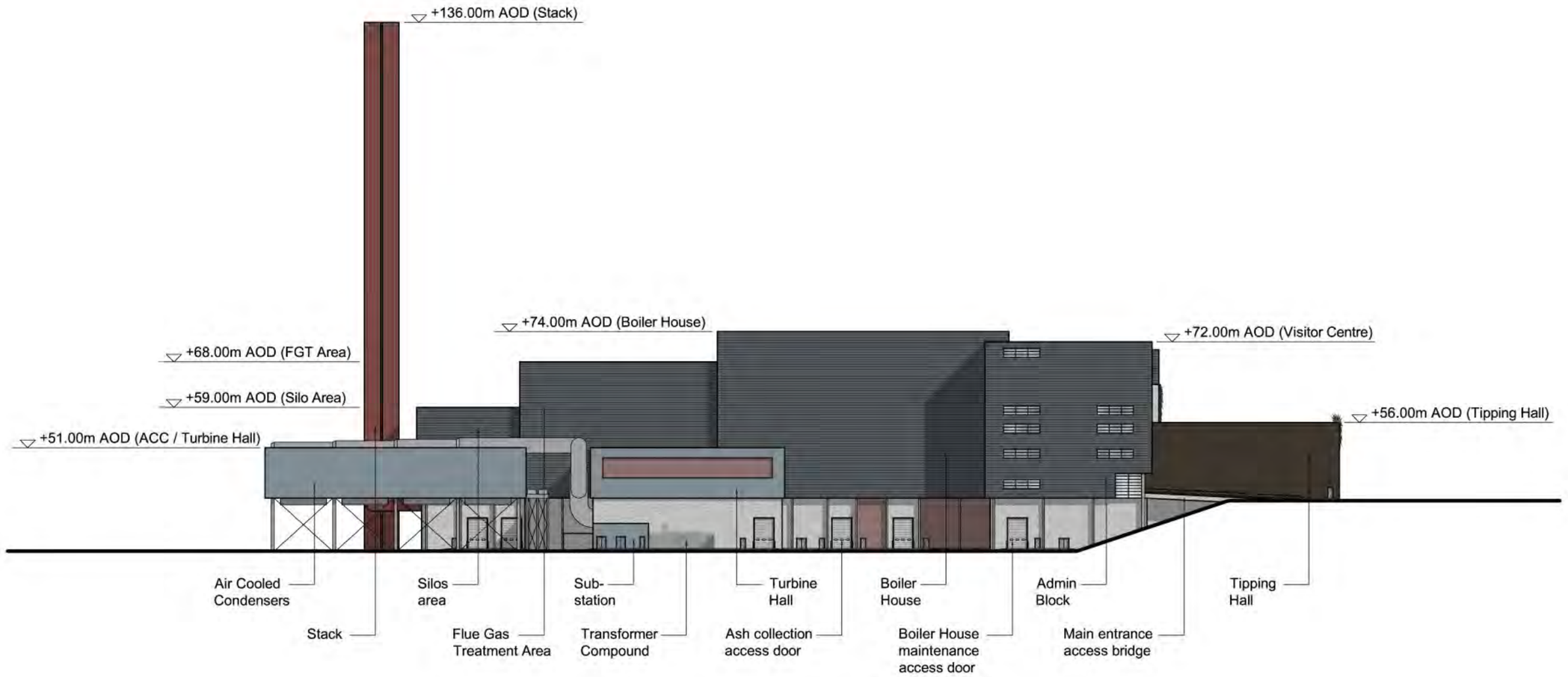


Figure 63: EfW Facility - North Elevation

SOUTH ELEVATION

Figure 64: EfW Facility - South Elevation

EAST ELEVATION

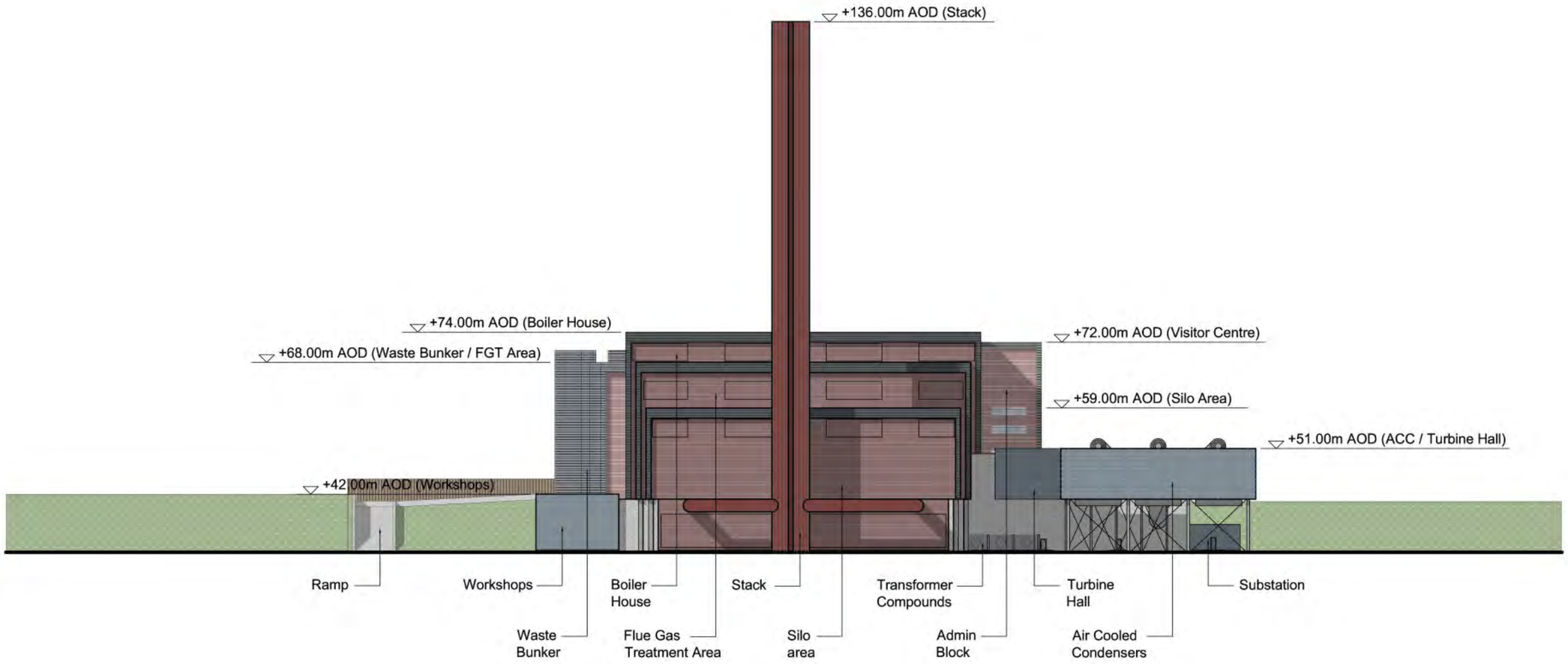


Figure 65: EfW Facility - East Elevation

WEST ELEVATION

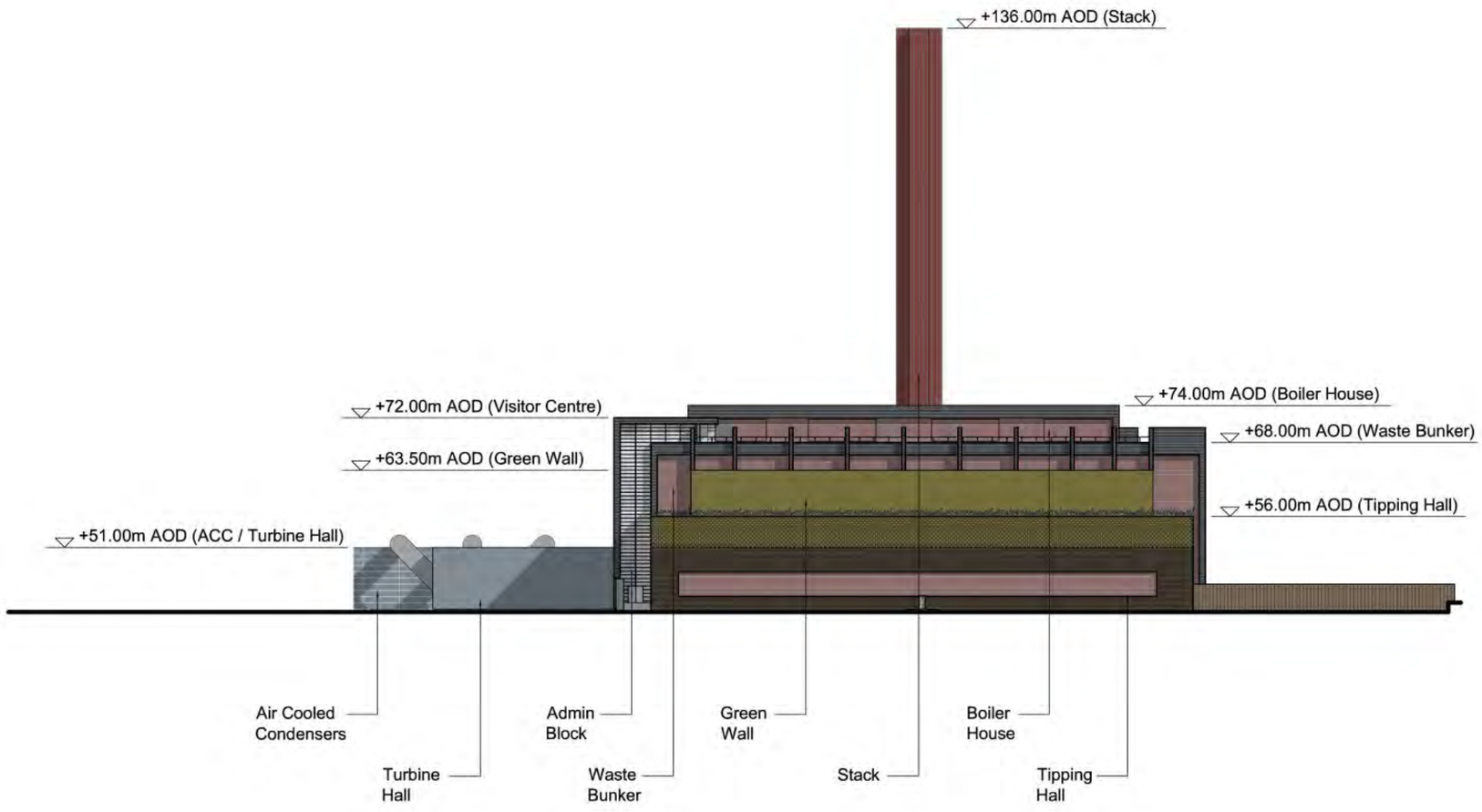


Figure 66: EfW Facility - West Elevation

Building scale

5.4.14. The separate EDS prepared in support of the Application, addresses a number of matters raised during the consultation process relating to the justification of the building scale. The report audits the proposed EfW Facility to consider the following issues:

a) how the scale of the building relates to the generating and waste to the capacity of the EfW Facility;

b) the leanness is the building solution and its need to be of the scale consulted upon; and

c) how it compares in terms of scale with other EfW Facilities.

5.4.15. This DAS provides a brief summary of these issues and provides additional design response information on building design matters. The scale of the EfW Facility is driven largely by three factors: (i) the capacity of the Facility; (ii) constraints imposed by technology; and (iii) the architectural design. These factors are summarised below:

Capacity

5.4.16. The capacity of each stream of the Facility has been determined by Covanta in response to the identified waste catchment area. In that area, waste arising are forecast to be in the order of 2,000,000 tonnes per annum of residual waste. The capacity of The Rookery South EfW Facility is 585,000 tonnes per annum equating to approximately 25% of the catchment waste volume. The Rookery South EfW Facility has three streams, each with a capacity of 195,000 tpa.

5.4.17. The capacity of each stream is related to boiler height and therefore to building height. However, the height of the boiler does not increase in proportion to the processing capacity of the boiler. The reason for this lies in nature of the technical process that drives the stream design. The EDS confirms that were smaller processing capacities to be are considered, the most economic solution would simply be to reduce the number of streams rather than the size of each stream. The height of the building would therefore remain unchanged. Even if smaller individual streams to be considered (which would lead to a more resource hungry solution with a larger footprint), the reduction in height would not be proportional to the reduction in capacity.

5.4.18. The minimum equipment height of a stream is dictated by requirements relating to the efficient and complete combustion of waste in accordance with the Waste Incineration Directive and the required processing capacity of each stream. The three stream configuration of the RRF leads to a lower overall equipment height than a two-stream plant of the same capacity. This is because waste is incinerated within three smaller combustion chambers rather than two larger ones producing more compact response to processing capacity. This configuration provides additional flexibility and does not incur an excessive premium in terms of the capital and operating costs of the Facility when compared with a two-stream alternative.

5.4.19. The number of streams does affect the width of the Facility in direct proportion to their number with each stream equating to approximately 30m wide. However, it does not affect the length of the Facility with each stream having in principal a fixed length. The number of streams does not influence the scale of the air cooled condensers, whose sizing is determined by the total quantity of turbine exhaust steam to be produced by the Facility as a whole.

5.4.20. Each stream requires a flue. The height of the flue is determined by a number of factors. The stack height above the base of the pit would reduce if there were fewer streams, but this would only be in the order of 10-15m per stream, subject to a detailed air quality assessment being carried out.

5.4.21. Associated building elements would only reduce marginally if fewer streams were provided with the turbine hall dimensions, for example, being reduced by only approximately 2m in length and 1m in width for each stream removed. The IBA processing buildings would reduce in size in relation to the lower amount of bottom ash received.

Leanness

5.4.22. The concept of ‘leanness’ addresses two areas; the selected technology and the efficiency of the building design in addressing scale. The EDS provides an overview of the selected technology; it confirms that it is proven and efficient; and compares favourably with alternative technologies.

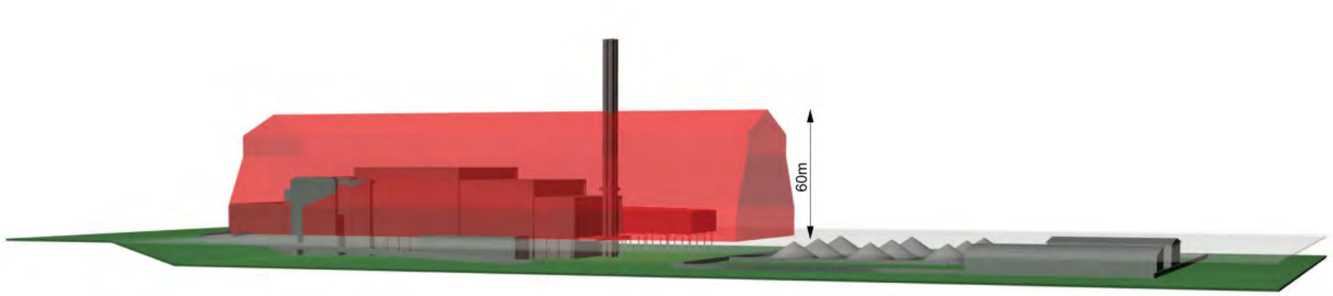
5.4.23. The architectural form of an EfW facility can add significantly to the final building height over and above the minimum required height to contain the plant equipment. The proposed height of the main building is 43m (measured from the boiler house floor on the base of The Rookery South Pit) and is fixed by the boiler design. As part of the iterative design process, building envelope studies looked at how the building form could be kept as low as possible. This work included fitting the enclosure of the plant as tightly to the internal process as possible and by a review of internal plant arrangement undertaken by the Covanta’s operational engineers. This review secured the compression of the internal dimensions of space around the boiler through discussions with the boiler manufacturer and by utilising the structure of the internal plant where possible to support the building envelope. This contributed to the reduction of overall building height. As a comparison the early curved structure concept required an arched steel structure in the order of 4m deep to the roof adding to its overall height.

5.4.24. Figure 56 illustrates that by adapting the building form from a curved roof to a flat roof and compressing the height of the space around the boiler the building height has been reduced by 7m.

Comparison

5.4.25. The EDS schedules a size comparison with other EfW facilities across the UK and demonstrates many of the EfW facilities in the UK are of a similar scale to this proposal, that the operational design of the Facility and that its architectural response produces a building that compares favourably in terms of height when compared with other facilities and demonstrates that the selected stream design provides a high waste throughput and high energy output when compared to other facilities of a similar height.

5.4.26. In addition to a comparison of other facilities addressed in the EDS, a request was made during the consultation for a comparison to be made with the scale of Cardington Hangars. Information was also produced to correct allegations about the scale of the Facility in comparison to Wembley Stadium. Figure 67 illustrate these comparisons.



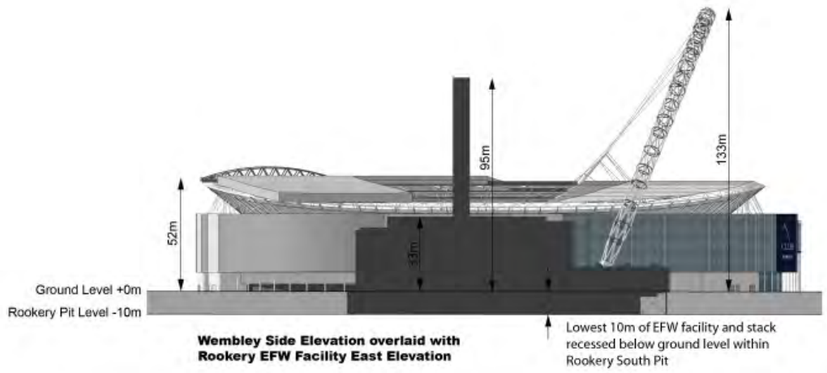


Figure 67: Cardington Hangars and Wembley Stadium Comparison

Design response to minimise noise effects

5.4.27. The EfW Facility has been designed to mitigate noise levels produced by normal plant operation. A reduction in noise levels has been achieved through a combination of the following:

a) the turbine hall and air cooled condensers are located on the northern side of the building to minimise impact on nearest receptors at South Pillinge Farm;

b) the turbine is to be fitted with an acoustic hood;

c) the openings in the main building are kept below datum level on the south elevation closest to South Pillinge Farm;

d) shrouding of louvres on the east and west elevations by the building envelope improves acoustic performance; and

e) induced Draft fans located within the building envelope to ensure that noise emissions are controlled through the acoustic performance of the building shell.

Design response to reduce light emissions

5.4.28. Light emissions from the EfW Facility are controlled to minimise the effect on receptors, whether human or ecological. There are no windows on the southern elevation of the plant that would be visible at night from the elevated Greensand Ridge to the south. Louvres are located on the east and west elevation to aid natural ventilation and also to restrict light emissions and the main windows of the administration section of the building on the north elevation are louvered fracturing views of lit rooms during the hours of darkness.

5.4.29. Chapter 9 of this DAS addresses the external lighting design.

Accessibility

5.4.30. The principal visitor and staff entrance is located adjacent to car parking facilities with an at grade approach to the main entry doors.

5.4.31. Appropriate signage will be placed within the site and buildings to identify circulation routes clearly. Inclusive access may be limited by health and safety considerations in certain operational areas of the site.

EfW Stack

5.4.32. Following early discussions with English Heritage and CBC, a Chimney Options Study was carried out to explore the potential benefits of three separate, more slender chimney stacks rather than three flues in a single enclosure, as recorded in Chapter 3.

5.4.33. Separate stacks were considered to examine the potential to reflect the separation and arrangement of the four retained and listed stacks at Stewartby Brickworks. The technical requirements of the stacks limited the extent of separation that could be achieved. Wire line modelling was used to test the stack options from key viewpoints and compared with the single option. The 3 stack option tended to appear as a tightly packed group, especially from Stewartby and Katherine's Cross in Ampthill Park. It generally emphasised the chimney in the landscape. The single stack appeared as a more elegant feature. The 3 stack option was recommended for rejection and was discounted by both consultees. The comparisons are illustrated in Figure 68.

Figure 68: Stack Comparison

5.4.34. A further refinement of the single stack involved the organisation of the 3 flues required for the three waste streams. The concept was to fix the 3 flues to a central spine rather than being held in a single cylinder. This has two benefits. The first is that such a solution created shadows between the flues and the spine, adding to its perceived slenderness. The second is that it provides more flexibility in material selection and colour treatments. Three flues in one enclosure would in principle have needed to be encased in concrete limiting potential colour treatment.

5.4.35. Following a request from English Heritage further work was carried out on the single stack option to compare its proportions to the Stewartby chimney stacks. This illustrated in Figure 68. The study demonstrated that the brickwork stacks have a height to diameter ratio of 1:14 and that this ratio is also a characteristic of the proposed EfW flue stack. The setting of the Stewartby brick chimneys which are listed structures, was an important consideration for EH and the slenderness and colour considerations assisted in demonstrating the complementary character of the EfW stack during consultation.

5.4.36. The final height of the stack has been determined by public health / emission requirements related to dispersal, balanced with the requirements of the Cranfield airport flight paths, recorded in Chapter 6 of this DAS and the general objective of keeping the stack as low as possible limiting its visibility. The stack has been lowered through technical review from 115m to 104.25m (measured from the level of Operations Area ground level)

5.4.37. The stack incorporates functional elements which are necessary to meet both operational and safety requirements. One static red aircraft warning light will be located at the top of the stack and is necessary to meet aviation safety standards. An additional two lights face towards Cranfield airport and 180° from the airport and are installed at a level of between 52m and 45m from the top of the stack. There have been agreed in lieu of a string of lights commonly employed in situations such as this so as to minimise night time effects. It is deemed that there is no requirement for painted safety markings on the external faces of the stack or for safety lighting to access stairs – this helps to limit the visual night time impact of the stack.

5.4.38. The final design for the stack is illustrated in Figure 70. The final colour has been selected for the flues it will a close match for the brick colour of the Stewartby chimneys assisting in its integration in the landscape.

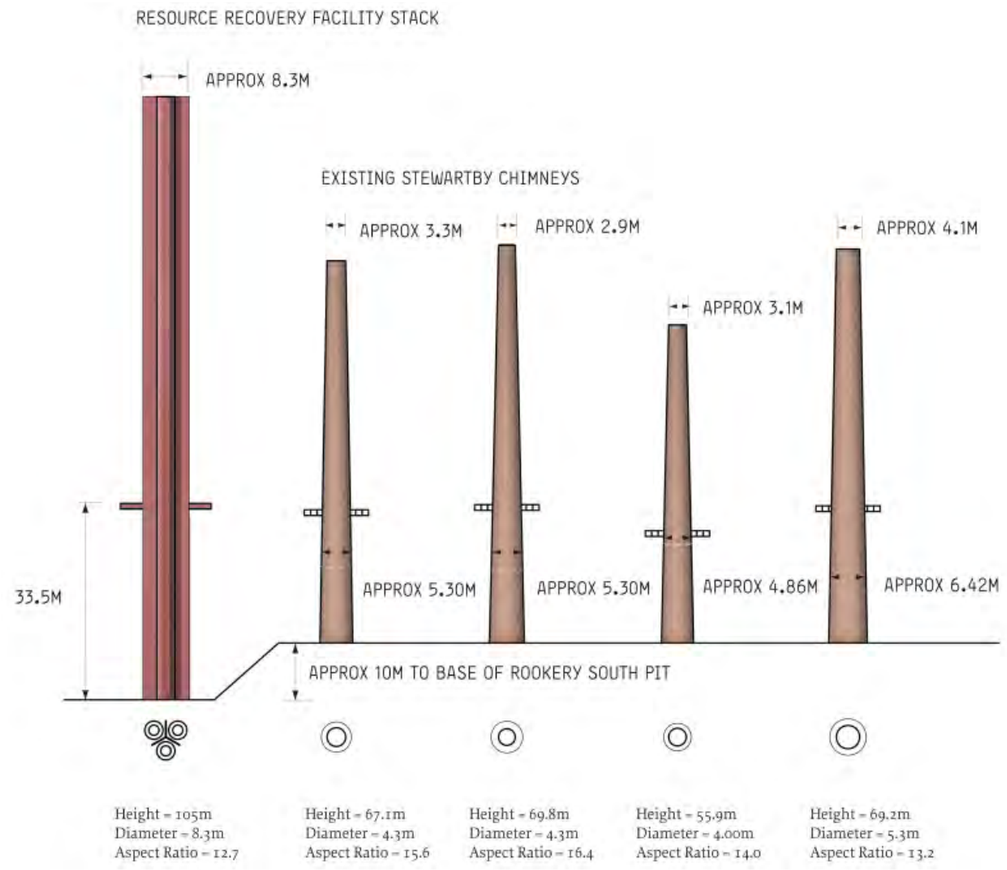


Figure 69: RRF Stack Comparison with Stewartby Chimneys

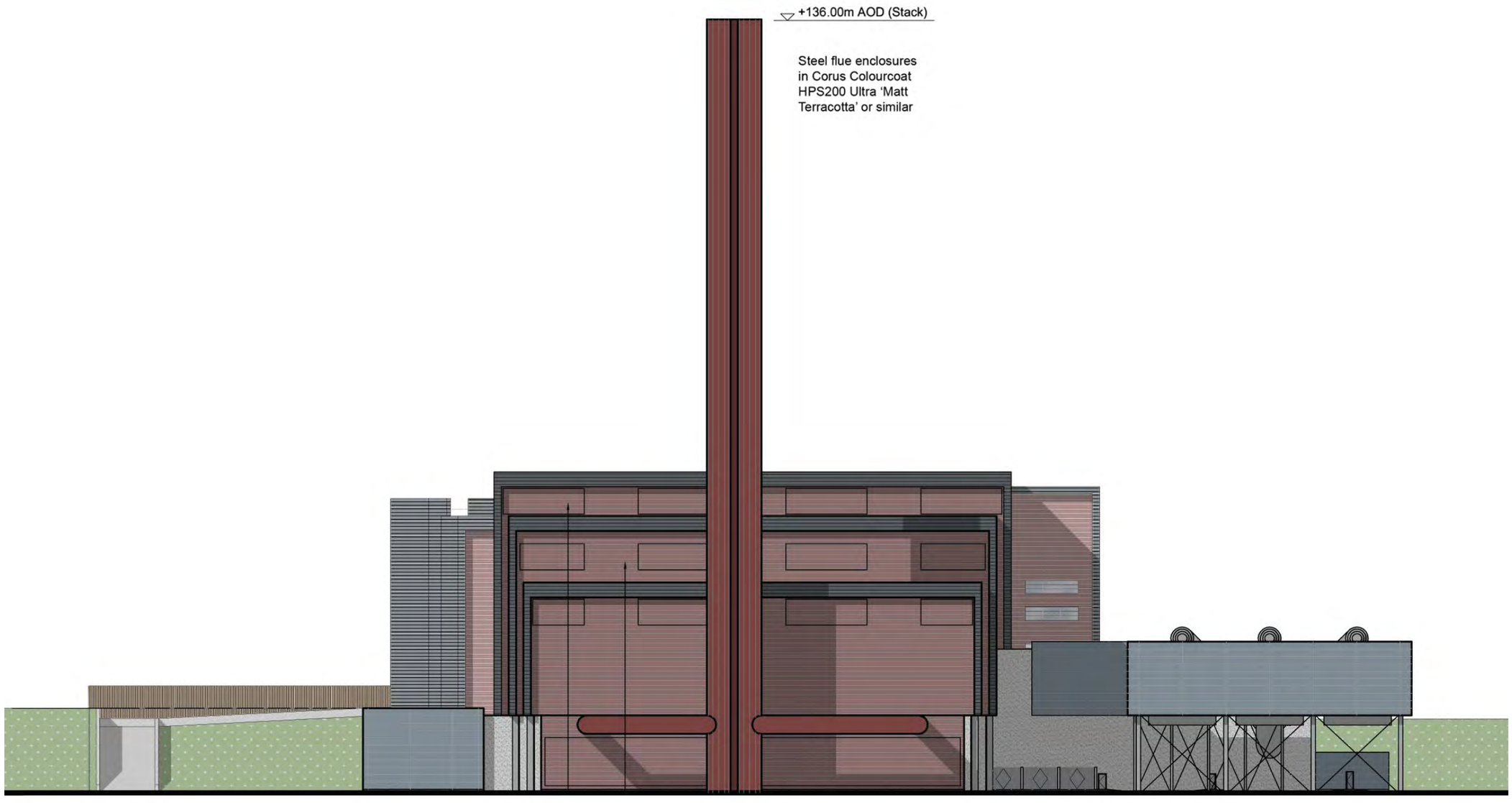


Figure 70: Final Stack Design (East Elevation)

5.4.39. During the assessment process a number of consultees requested information on the nature of the flue plume. This information was provided based on technical information recorded in the Environmental Statement which formed the basis for the modelling. The general characteristics of the plume are illustrated in Figure 71.

5.4.40. The direction in which the visible plume will travel will depend upon the wind direction. Figure 72 illustrates the wind roses for 2003 to 2007 for the meteorological data used in the assessment. These illustrate that for the large majority of the year visible plumes will be formed to the northeast or southwest of the plant.

5.4.41. On the basis of the analysis visible plumes will only occur for a small distance around the plant itself and will occur primarily in either a northeasterly direction, and less frequently southwesterly direction. Visible plumes are more prevalent in colder conditions and are therefore more likely to occur aat night and in the winter. Plumes of greater than 50m will only occur for a small percentage of the year, and for close to half the year no visible plume will be generated.

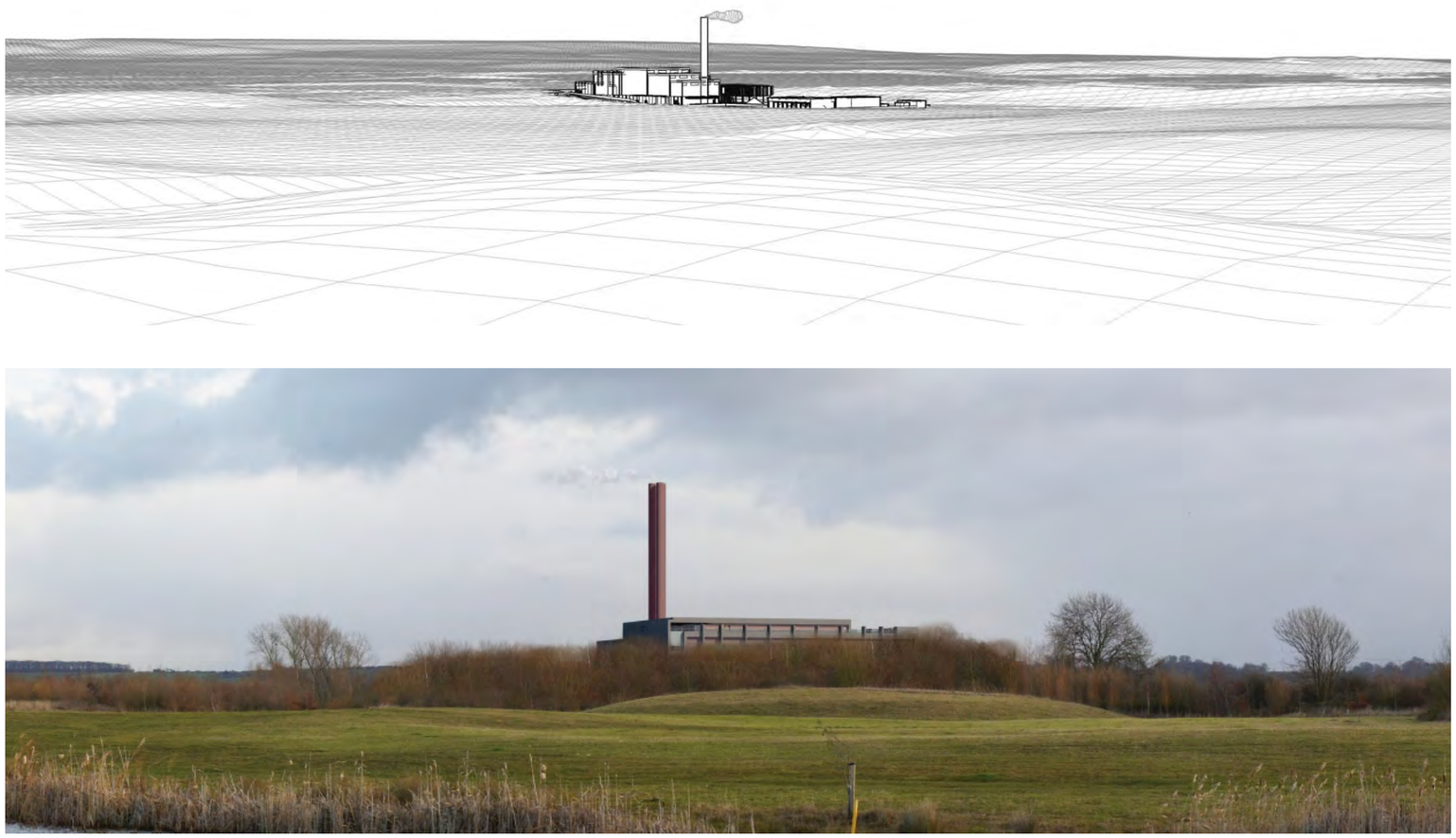


Figure 71: Photomontage Model and Wireframe of Plume

Esbjerg, Denmark

Flanders, Belgium

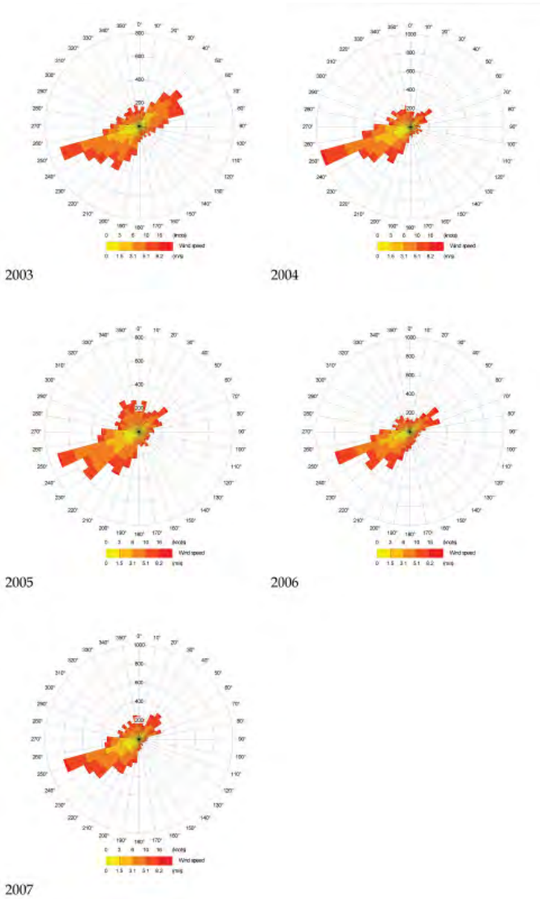


Figure 72: Wind Rose (Meteorological data, 2003-2007)

Materials and colour

5.4.40. Colour studies were undertaken early in the design process to inform choice of cladding materials and colour selection. The studies helped to identify the dominant colour characteristics within three types of view: long range, mid-range and short range.

5.4.41. The following photographs are used to illustrate the three view types, and colour swatches extracted from those views identify the dominant hues.

Long Distance Views

5.4.42. The colours seen in long range views are affected by the atmospheric conditions. The significant hue is blue, which causes elements to recede within in the landscape.

Mid Range Views

5.4.43. The dominant colours seen in mid range views are those of the existing geology, such as the exposed clay workings, and the existing chimneys at Stewartby Brickworks.

Short Range Views

5.4.44. The landscape elements adjacent to the proposed RRF create a more vivid colour palette. Once an initial colour palette had been established further computer modelling was used to refine the palette and test colours in different views and according to specific light levels taking into account the distance from the viewer. During consultation with CBC, BBC, EH and CABE the issue of colour and finish was raised and has formed an important part of the design development. Later consultation responses sought some refinement of the initial colours recommended and further detailed analysis has provided a restricted range of colours that are considered appropriate. The colours and their application are illustrated in Figure 73.

Long Range Views

Mid Range Views

Short Range Views

Figure 73: Colour Study

5.4.45. The success of the colour studies and the integration of the buildings in the landscape are illustrated in the rendered photomontages that are provided in the ES, extracts of which are provided in this report.

5.4.46. The principle of integrating the building into its landscape setting has been carried through to the selection of materials and colours. The choice of colours draws on the initial colour studies illustrated and is based on precedent studies where darker coloured buildings are generally considered to be more successfully integrated than lighter structures.

5.4.47. The proposed building materials are typically industrial in character with metal cladding forming the building envelope above the pit datum and precast concrete panels characterising the below datum elevations. Where material colours are given below, similar colours according with the DAS and the objectives and principles that it contains would be equally suitable.

Below Datum

5.4.48. The area below ‘datum’ forms the base of the building, such it needs to be solid and robust to withstand the day to day processes of the building. Precast concrete panels will be used to provide a functional and adaptable material, and create a contrasting ‘band’ when seen from closer up views within the pit. Loading and personnel doors within this concrete datum zone will be RAL 000 55 00 (mid grey), to tone in with the concrete panels. The datum is also expressed with the overhang of the lighter weight metal cladding of the upper building casting shadow.

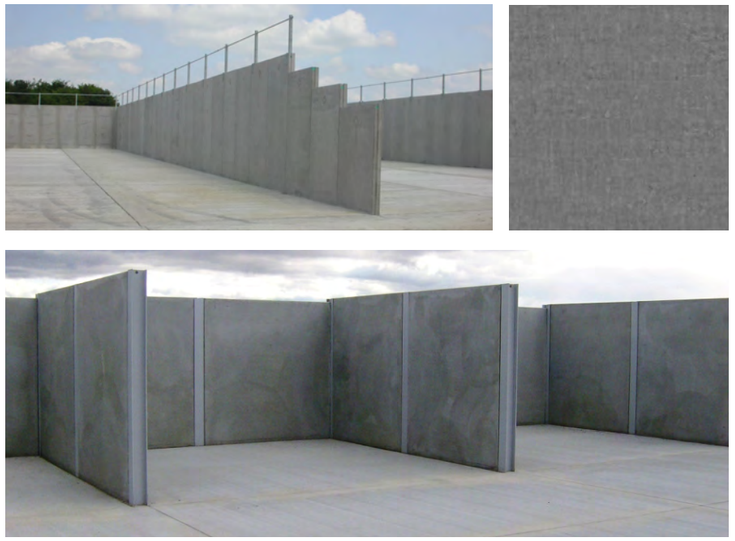


Figure 74: Below Datum Materials and Colour Treatment

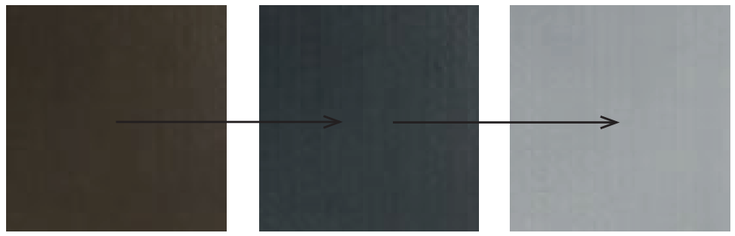
Above Datum Envelope

5.4.49. The main stepped shells of the building envelope lying above the datum are the largest and most visible proportions of the Facility. As such, they need to integrate with the colours of their backdrop when seen from afar and also work in views at closer proximity. The colours applied to each portion of the building are further rationalised by the actual process of the plant, with the concept of the main ‘machine’ being of one colour and material, with the input of waste (the tipping hall ‘cassette’) being ‘raw’ and the output of electricity (the turbine ‘cassette’ and air cooled condensers) being ‘processed’ and reflected in colour selection.

5.4.50. The main process elements are to be clad in horizontally laid profiled metal cladding, to maximise shadows cast and to reflect the format of openings and direction of process. The colour of these will be in Corus Colourcoat HPS200 Ultra “Matt Anthracite”. The louvre zones facing east and west will use a consistent profile and colour for ‘live’ and ‘dummy’ zones. These zones will be in Corus Colourcoat HPS200 Ultra “Matt Anthracite”. The ancillary elements will utilise a larger format of composite panel size with expressed horizontal joints.

5.4.51. The tipping hall is to be clad in metal composite cladding panels, in Corus Colorcoat Urban ‘Oxidised’ (brown). This colour is used to express the ‘raw’ nature of the incoming waste to the Facility. The turbine hall and air cooled condensers are to be clad at high level in composite panels, in Corus Colorcoat Urban ‘Alaska Grey’ (light grey), with this light colour representing the ‘processed’ output of electricity and heat. The workshop will be entirely clad in Corus Colorcoat Urban ‘Alaska Grey’ composite panels, and the doors within the workshop will be the same colour to create the impression of a single ‘box’. In addition to this, both the turbine hall and workshops will have a ‘joining’ element clad in concrete, to further express them as ancillary components for the main building.

5.4.52. The coherence of the building is partially founded on the simplicity of the enclosure which includes the use of large louvre blades fronting the windows of the administration offices on the north elevation giving a high level of uniformity to the elevation but with subtle textural changes. Figure 75 illustrates the nature of the effect.



Inputs = Raw
Colourcoat Urban ‘Oxidised’
Tipping Hall

Process = Industrial
Colourcoat Urban
‘Anthracite’
Boiler House and Flue Gas
Treatment

Outputs = Processed
Colourcoat Urban ‘Winter Sky’
ACC and Turbine Hall

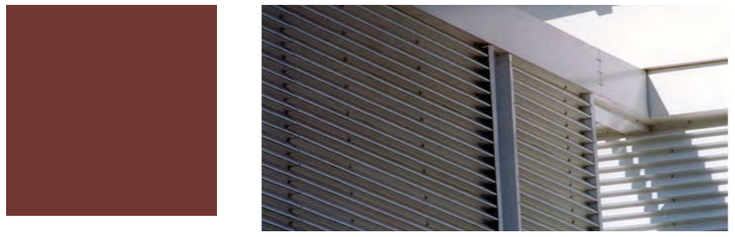


Figure 75: Louvres

Figure 76: Above Datum Materials and Colour Treatment

5.4.53. The flue stack takes its contextual reference from the nearby listed Stewartby Brickwork chimneys nearby, and is to be clad in Corus Colorocoat HPS200 Ultra ‘Matt Terracotta’ finished metal cladding. This will give it a similar tonal appearance to the Stewartby chimneys, whilst maintaining a functional and efficient material for the use of the building. Furthermore, the stack is the only element to break the horizon from key viewpoints, so is expressed in a similar manner to its historical neighbours.

Contextual response of elevations

5.4.54. The form and treatment of the building enclosure has been derived from an understanding of the audiences and site context:

1) To the north the building addresses its approach and the proposed rights of way network with the front face of the building and offices overlooking the attenuation pond and the process expressed in the long section with visible tipping bunker (incoming) and turbine hall (outgoing) elements.

2) To the east and south, the building envelope has no openings apart from east-facing louvred areas, removing an appreciation of identifiable human scale in more distant views. The building massing, shadow and colours combine to minimise the visual impact and assist in integration.

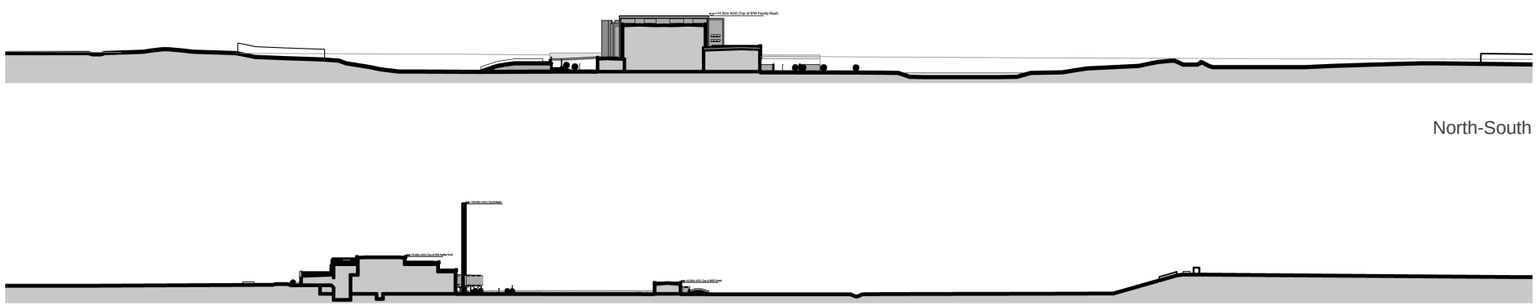
3) To the west, the design of the tipping apron roof and the expression of the rooftop visitor centre, establishes a visual dialogue with the Forest Centre. The skyline profile of the building is deliberately stepped reducing its mass and the green wall provides a means of integrating the building in views. It also ‘sends messages’ about the responsive nature of the building to its setting and environment at large.

Figure 77: Contextual Response of the Elevations

5.4.55. The contextual elevations and the selection of material and colours is expressed in the detailed consideration of brown roofs and green walls to address the specific audience of the Forest Centre and Millennium Country Park at close quarters and the views from the EfW Facility visitor centre. Green walls provide a means of integrating the building in views from the more immediate landscape of the Forest of Marston Vale and Marston Moretaine and extend along the western elevation of the tipping hall using the structural wall and support fins of the bunker. A section through the park towards the building, illustrated in Figure 79, demonstrates the nature of the view and Figures 80 and 81 illustrates the nature of the elevational treatment and its appearance in the view from the Forest Centre.

5.4.56. There is a design precedent for naturally occurring ‘brown roofs’ on buildings in the former industrial area, where material build up on the roofs can support flora and fauna. The design response develops that character applying it to a new building. Brown roofs provide ecological habitat creation opportunities as well as a foreground to views out of the visitor centre. Brown roofs will provide biodiversity enhancements and will contribute in other ways to sustainability objectives through rain water attenuation and use of recycled site aggregates in construction.

5.4.57. Chapter 7 of this DAS provides further detail on the design of these elements.



North-South

East-West

Figure 78: Context Sections

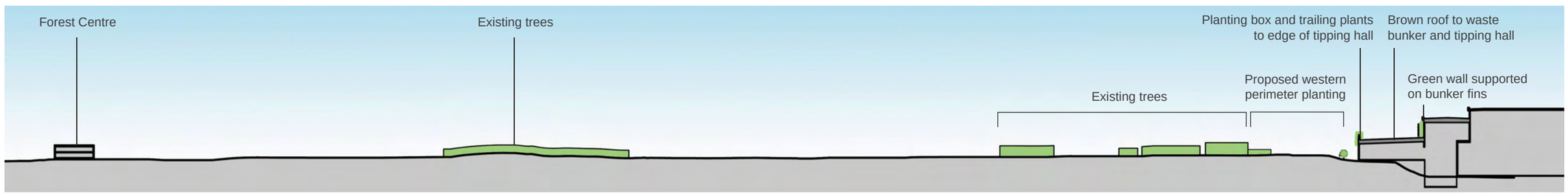


Figure 79: EfW in relation to Forest Centre

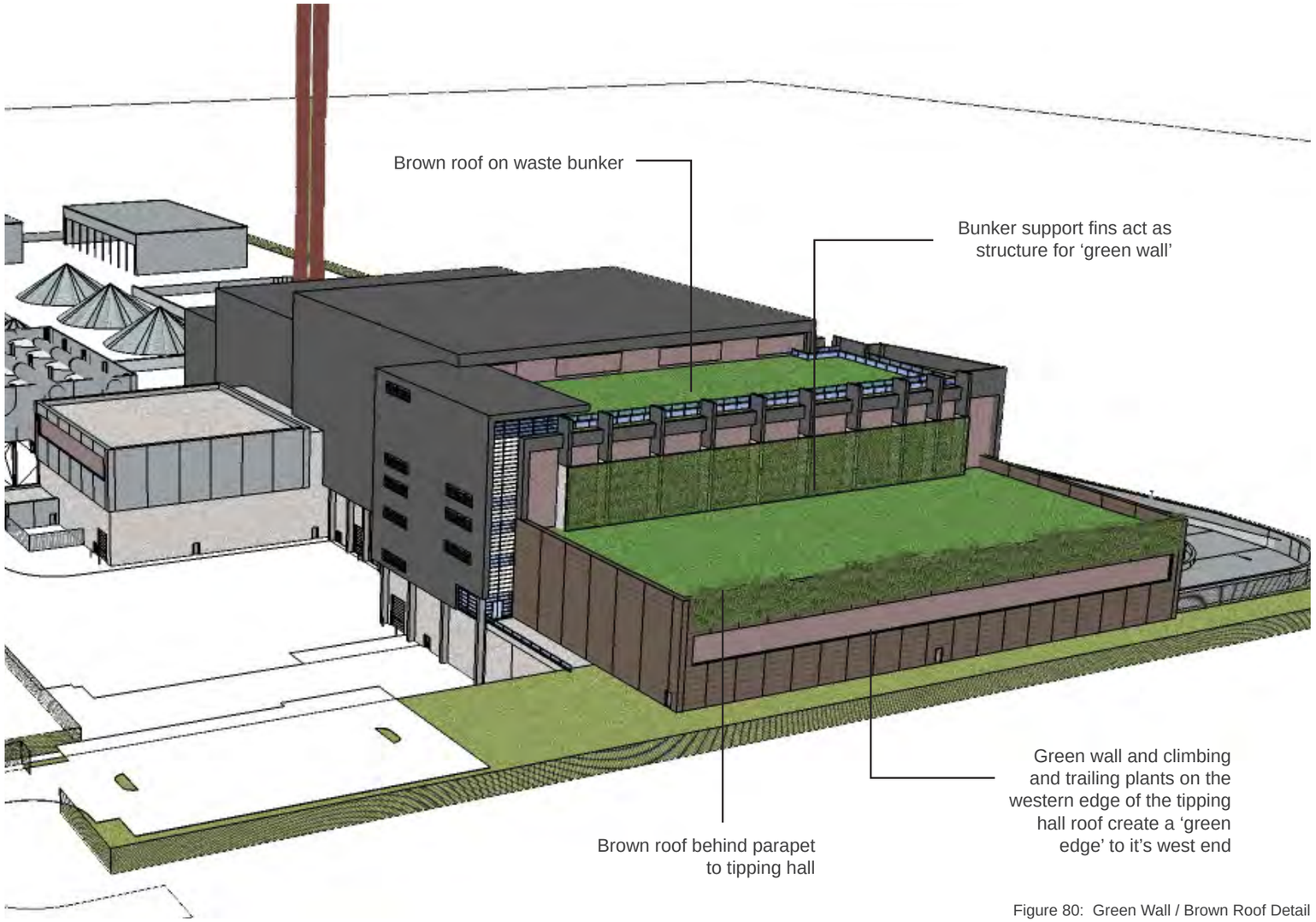


Figure 80: Green Wall / Brown Roof Detail

Figure 81: Western elevation in view from Forest Centre

MRF – THE SECONDARY BUILDINGS

5.4.58. Figures 82 to 84 illustrate the location and design of the proposed MRF buildings. The Materials Recovery Facility will comprise 13 m high, steel-clad buildings sitting on a concreted yard. The buildings are rectangular in plan and have a square parapet wrapped around a low pitched roof associated with their portal frame. The larger building is proposed for the storage of IBA and co-mingled metals and the small building is for plant and equipment. The buildings are expressed as 'processed' through lighter coloured cladding as detailed on the turbine hall and air cooled condensers.

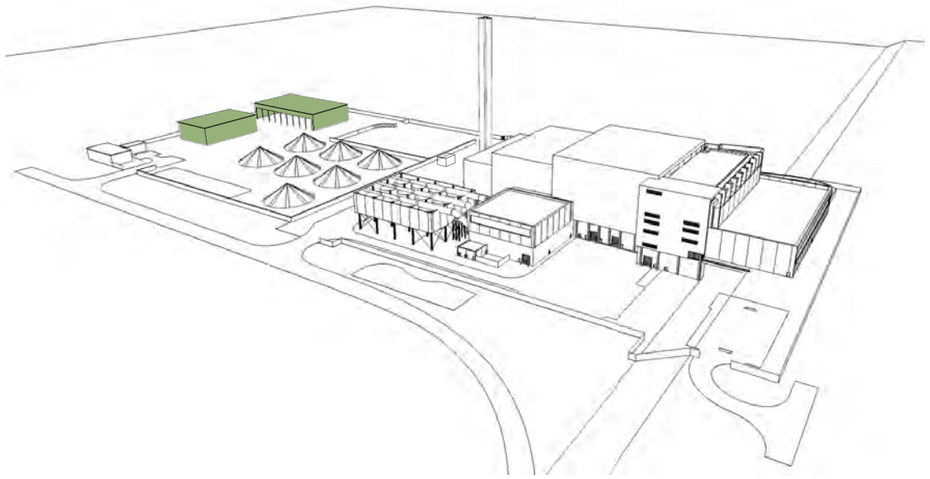


Figure 82: MRF - The Secondary Buildings

IBA Storage Building

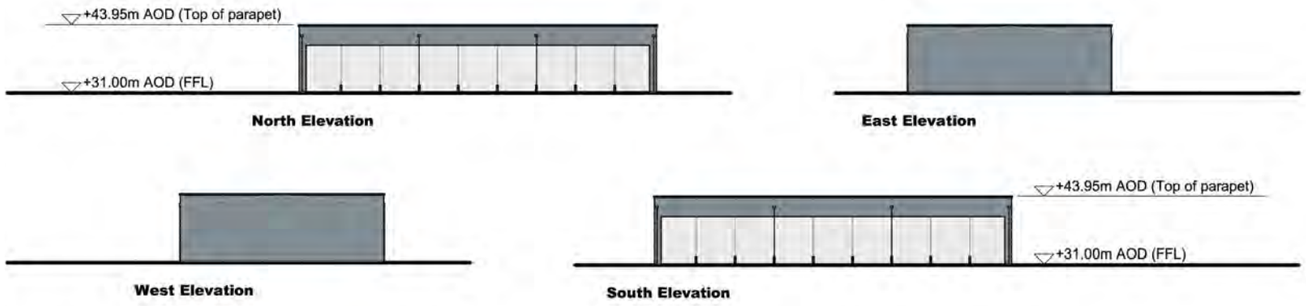


Figure 83: IBA Storage Building Elevations

IBA Processing Building

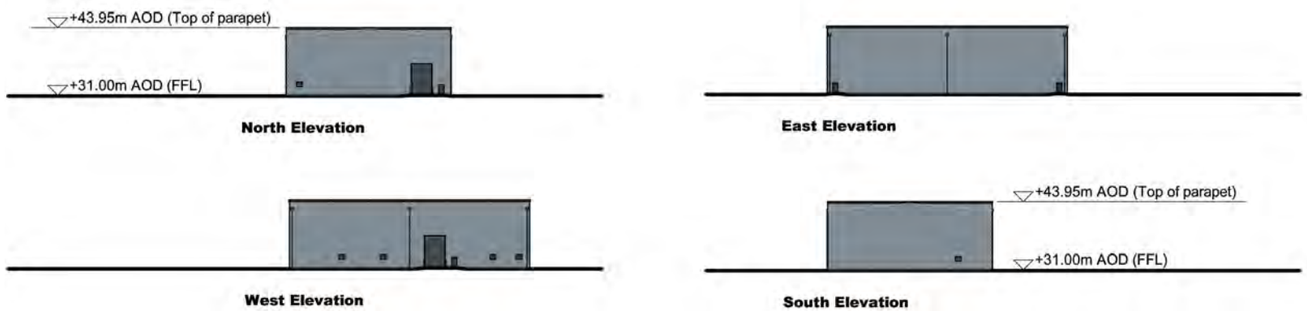


Figure 84:IBA Processing Building Elevations

GENERAL OPERATIONS BUILDINGS – THE TERTIARY BUILDINGS

5.4.59. Figures 85 to 88 illustrate the locations of these tertiary structures and the proposed design of the general operations buildings.

a) The Security Gatehouse will be a purpose-built Facility, incorporating an office, staff toilet, separate drivers toilet and small kitchen.

b) The transformer building and switchyard, which are expressed as small extensions ancillary to the turbine hall.

c) MRF staff administration block, which is a small footprint, two story building, clad in the same manner as the other MRF buildings.

d) Foul water pump house, located at the north eastern corner of the Operations Area, with elevation principles and cladding as proposed for the MRF buildings.

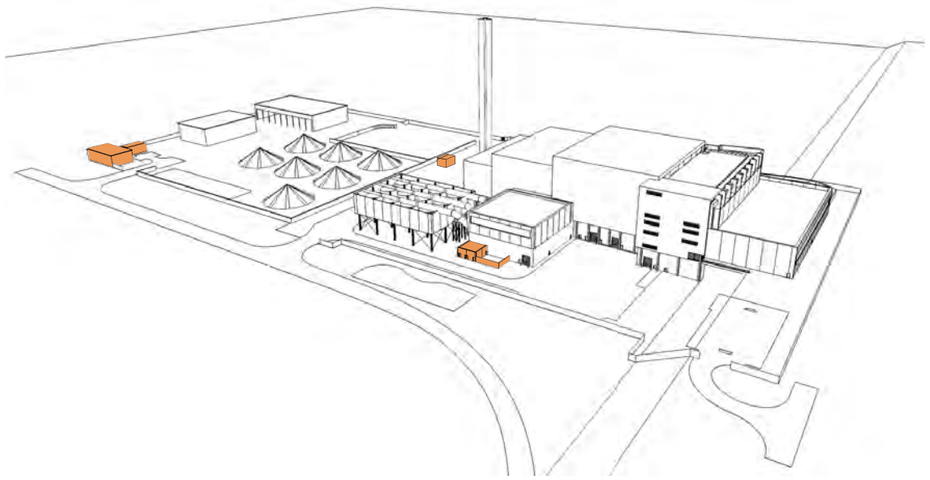


Figure 85: General Operations Buildings - The Tertiary Buildings

Pump House Building

Figure 86: Pump House Building Elevations

Staff Administration Building

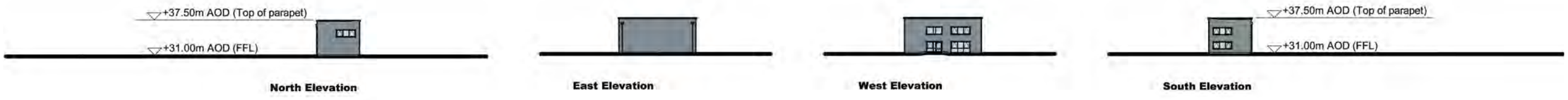


Figure 87: Staff Administration Block Elevations

Gatehouse Building

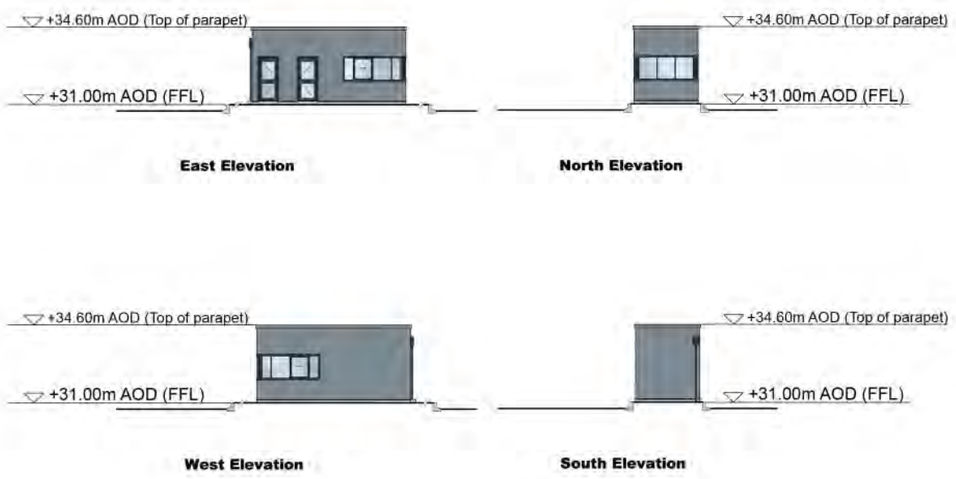


Figure 88: Gatehouse Building Elevations

5.5. DESIGN REFERENCES

5.5.1. A number of design references have been used during the design development process which are illustrated in this Chapter and comprise the following:

a) a building, which is ‘of the land’ where Datum is used as the organising element;

b) a contextual response: a settled, elevated landscape forms the backdrop to development on low lying ground;

Municipal Stadium, Italy

c) a simple building form, which is expressive of function;

d) a building envelope, which fits tightly to the main plant to reduce bulk and visual impact;

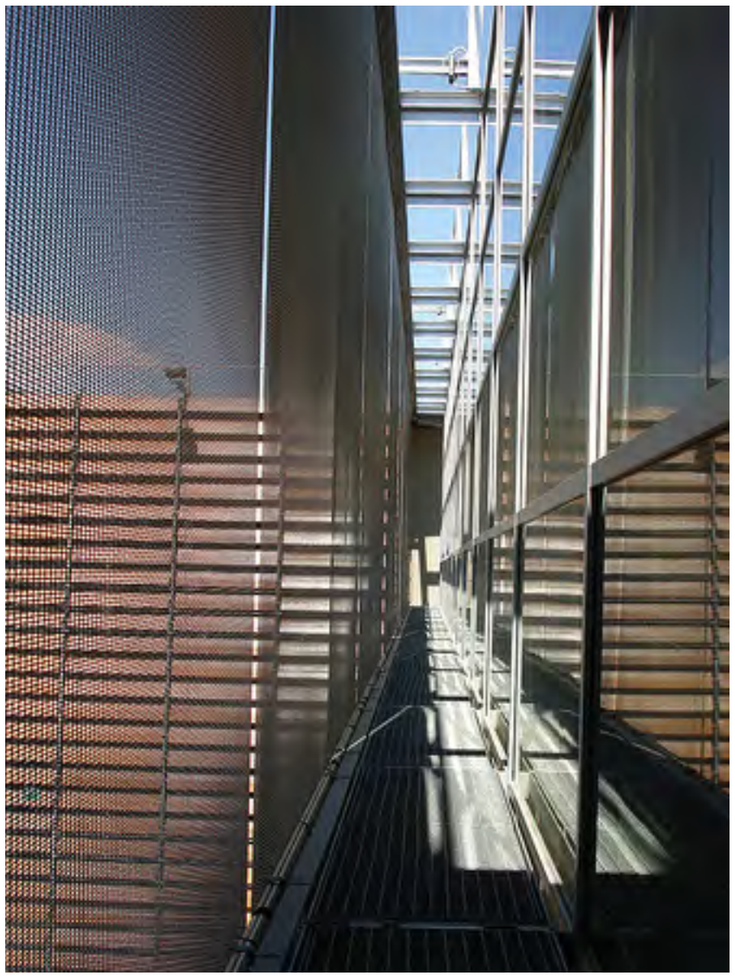
e) a logical arrangement of well proportioned boxes, which reflect process;

EGL Power Station, Italy

f) an articulated building form, which allows casting of shadow to reduce visual impact.; and

Corten Steel Cladding

g) A perforated building to allow natural light and ventilation to penetrate.



Ventilation and daylight

6.0 ACCESS AND MOVEMENT FRAMEWORK

6.1. OVERVIEW

6.1.1. This section describes the access and movement strategy for the Project with reference to vehicle access and transport links, rail connection and pedestrian and cycle rights of way. The proposals for the Project are informed by:

a) An understanding of operational requirements and constraints (i.e. an initial dependence on road haulage, and therefore the local highway network, to deliver waste to the RRF);

b) Safety considerations arising from site processes and activities (requiring the a separation of people and cars from operational vehicles);

c) Commitments to support green infrastructure initiatives, including reconnection of severed footpaths and creation of new footpaths and cycleways; and

d) The potential future provision of a rail connection to serve the RRF.

6.1.2. The access and movement strategy is guided by relevant national, regional and local planning policy relating to transport and rights of way provision. It is also guided by a statutory requirement to provide inclusive access. Finally, a separate assessment has been carried out which considers the environmental effect of road traffic and transportation generated by the Project. Design development measures identified in this assessment form part of the access proposals described in this Chapter of this DAS.

6.2. ACCESS PROPOSALS

6.2.1. Figure 89 shows the principal elements of the access and movement framework for the Project. The following section describes these proposals with reference to:

Green Lane access proposals - including:

- the vehicle priority junction;
- pedestrian/ cycle circulation;
- the level crossing enhancement over the Marston Vale Branch Line; and
- the potential Marston Vale Community Rail Partnership car park proposals

Western Access Corridor (vehicle and pedestrian / cycle access);

Operations Area (on site circulation including parking provision);

Emergency Access Arrangements;

Pedestrian and Cycling facilities within the Application Site (not covered by Green Lane Access Proposals or Western Areas Corridor);

Additional Traffic Movement Controls - a summary of traffic management measures explaining the use of the site Travel Plan to manage the impact of traffic generated by the Project. A summary of the rail feasibility study is provided which considers future rail connection opportunities; and

Routing of Air Traffic - A summary of the design considerations to ensure that the construction and operation of the proposed RRF will not have any adverse effect on the safe operation of Cranfield Airport.

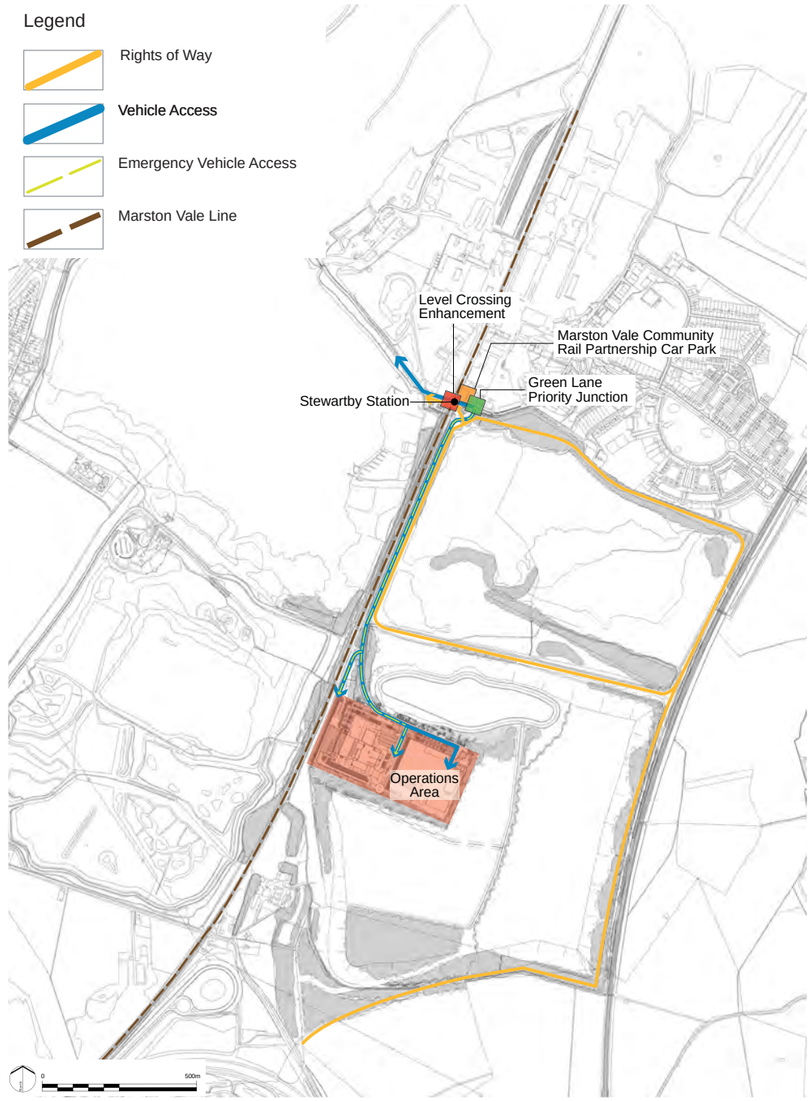


Figure 89: Access and Movement Framework

6.3. GREEN LANE ACCESS PROVISION

Site Access Priority Junction

6.3.1. A new, illuminated, vehicular access will be constructed into The Rookery and RRF from Green Lane. The proposed arrangement includes a right turn lane and a ghost island on the public highway, and provision of visibility splays in both directions to the appropriate speed of traffic. The junction is designed to reduce the likelihood of queuing traffic in the vicinity of the adjacent railway level crossing. The design for this junction is illustrated in Figure 90 and has been coordinated with the rail transport engineers responsible for the upgrade design for the level crossing.

6.3.2. The junction design includes an at grade unsignalled crossing over the access road within the site to allow pedestrian and cycle crossing including a central island to assist such movements in light of the proximity and aspirations of the Marston Vale Trust. A central island is also provided for pedestrians crossing at the junction on the proposed south side footway. An additional island is proposed east of the junction to support pedestrians crossing the road at this location to connect with the existing footpath to the north of Green Lane.

6.3.3. A safety audit has been undertaken on the junction design and forms part of the Transport Assessment Report.

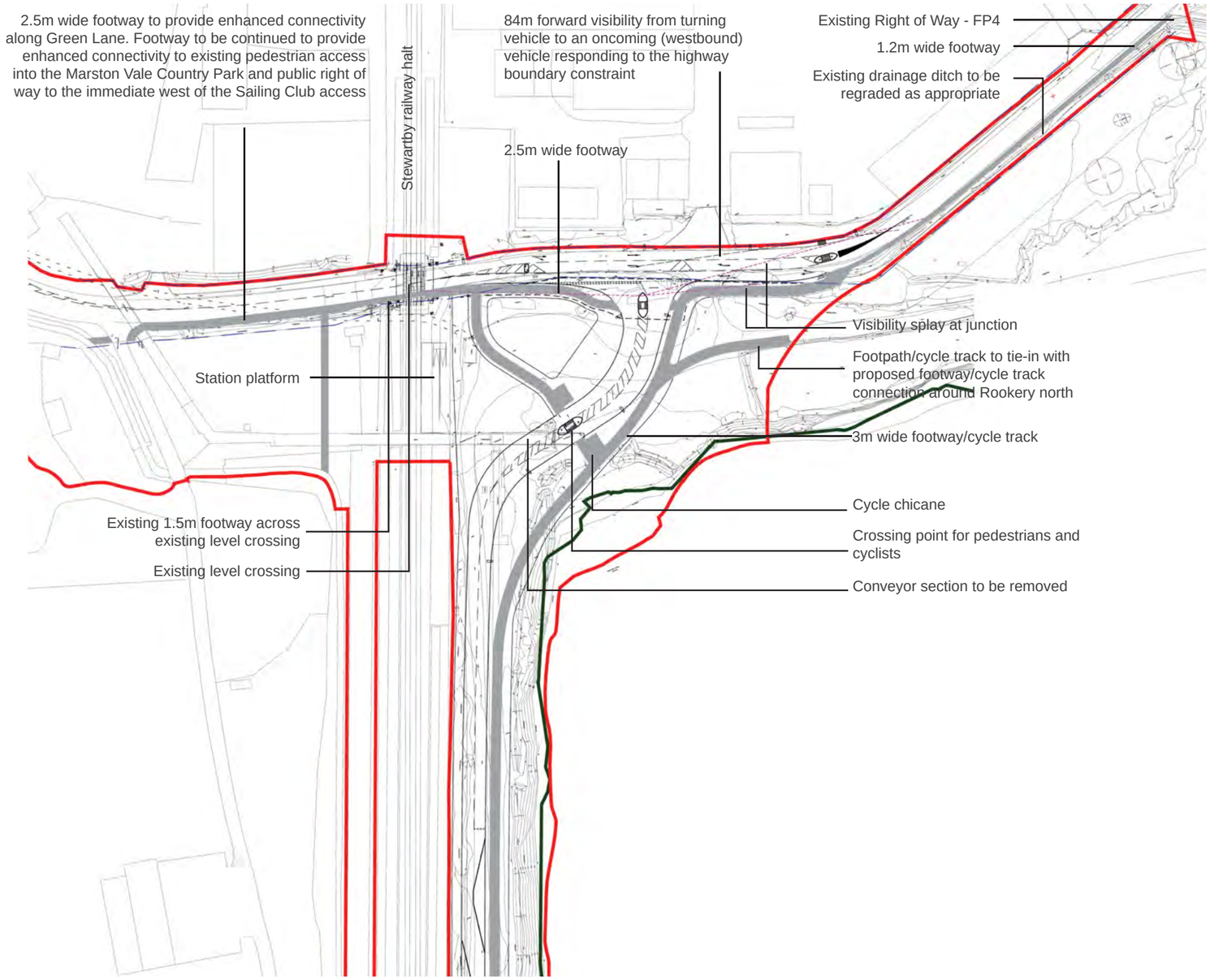


Figure 90: Green Lane Priority Junction

Pedestrian and Cycle Circulation

6.3.4. A series of footway works are planned along the southern side of Green Lane to improve local rights of way and reinforce connections between the Marston Vale Millennium Country Park, The Rookery and Stewartby. These proposals are identified on Figure 91 and comprise (from east to west):

A) a 1.2m wide footway along the southern side of Green Lane which connects to existing an existing footpath within Stewartby east of the junction and a 2m wide footway west of the junction; an at-grade crossing of Green Lane to the east of the ghost island;

B) a 2.5m wide combined cycleway / footway which runs along the southern side of Green Lane and extends to cross the new access road to connect a dedicated footpath proposed as part of the LLRS;

C) the dedicated footpath route parallel to the access road would be upgraded to be dedicated with cycle rights as a 2.5m wide route and this dedication extended around the entire Rookery North Pit Lake to form a circular cycle route;

D) a potential 2.5m wide combined footway and cycleway along the southern side of Green Lane between the RRF access road and over the railway level crossing. This is proposed as an alternative to the retention of the existing footway of approximately 1.5 wide and is subject to discussions with Network Rail;

E) a 2.5m wide combined footway/ cycleway on the south side of Green Lane and west of the level crossing providing a link to the extended and upgraded FP72 within the Millennium Country Park (presently with permissive cycle rights);

F) An upgrade to the status of FP 72 on the north side of Stewartby Lake to provide permanent cycle rights; and

G) a 2.5m wide footpath extending from the new Country Park entrance to the access to the Stewartby Water Sports Club.

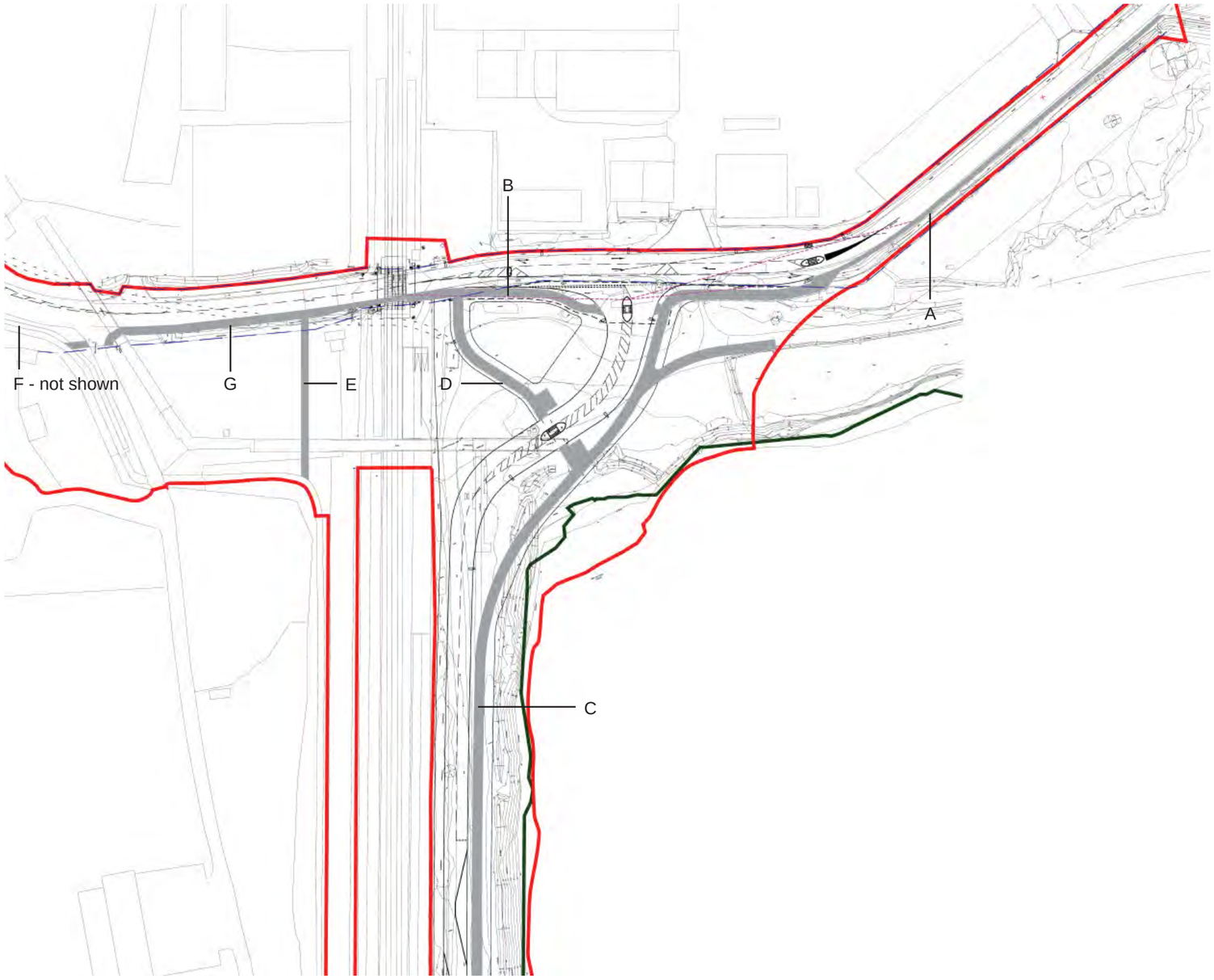


Figure 91: Pedestrian and Cycle Circulation at Green Lane

Green Lane Level Crossing Enhancement

6.3.5. A key aspect of the access arrangements for the RRF is the upgrade of the existing Green Lane Level Crossing. Network Rail has undertaken a Level Crossing Risk Assessment based on predicted traffic flows through the crossing resulting from the RRF. This assessed the level of health and safety, risk to rail and road users in the light of the predicted level crossing usage, road geometry and proposed protection system. They have confirmed that a full barrier level crossing will satisfactorily mitigate the increased risk resulting from the RRF proposals.

6.3.6. Network Rail have a defined process of analysis and design development known as GRIP stages (Guide to Railway Investment Projects) which must be followed in order to finalise the detailed design for any work to the railway network, including a level crossing upgrade. The GRIP stages are summarised below.

6.3.7. In order to minimise and mitigate the risks associated with delivering such projects on an operational railway, Network Rail has developed an approach to managing investment schemes which is set out in the Guide to Railway Investment Projects (GRIP). The approach is based upon best practice within Network Rail and other industries that undertake major infrastructure projects as well as best practice recommended by major professional bodies including the Office of Government Commerce (OGC), and the Association of Project Management. It covers the investment lifecycle from inception through to the post-implementation realisation of benefits. This investment lifecycle is set out below:

6.3.8. Key stages in the GRIP process for investment in the nations railway network are:

a) Output definition;

b) Pre-feasibility;

c) Option selection;

d) Single option selection;

e) Detailed design;

f) Construction test & commission;

g) Scheme hand back; and

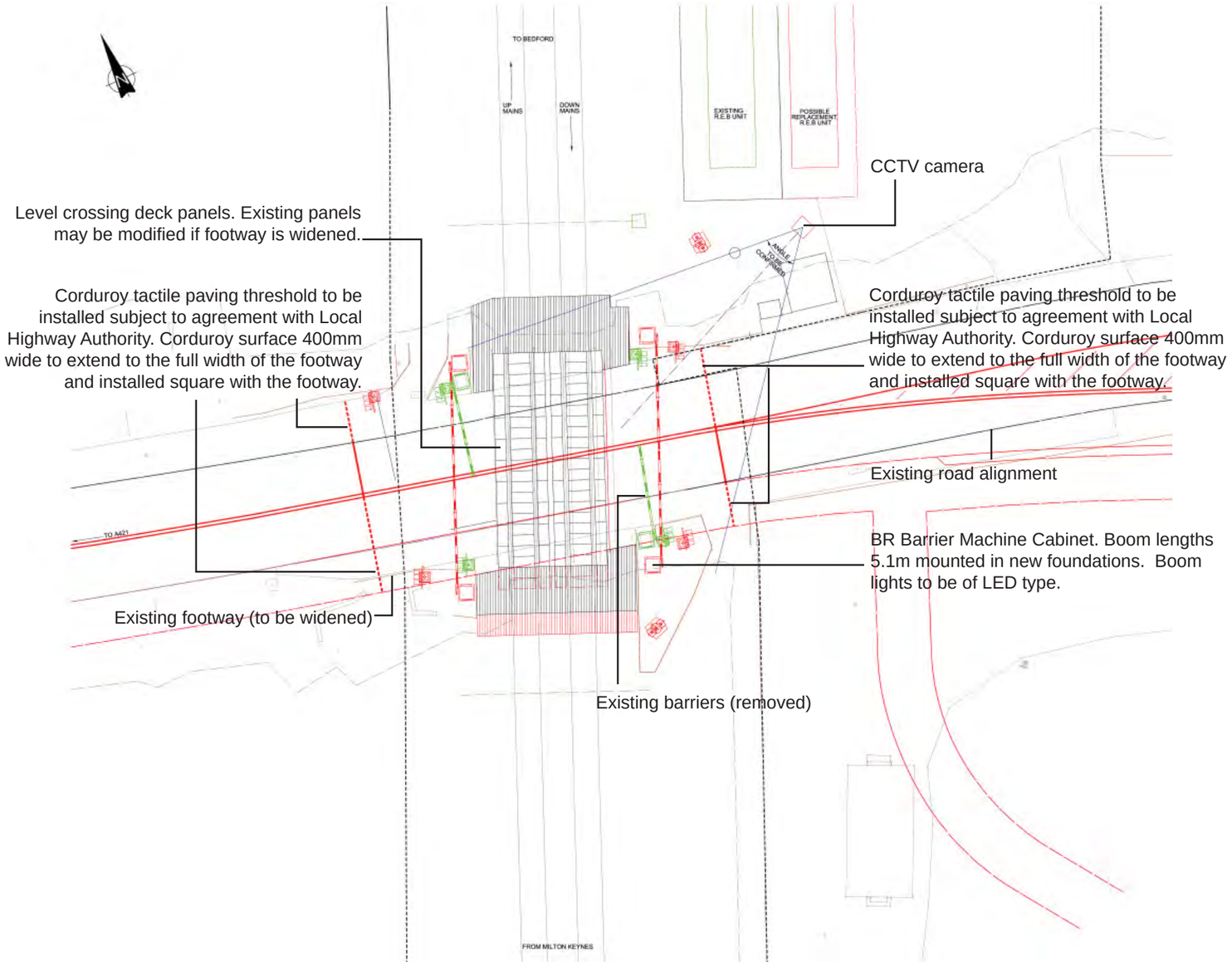
h) Project close out.

6.3.9. The Investment lifecycle shows how a project is broken down into eight stages. The overall approach is product rather than process driven and each stage is required to deliver an agreed set of “products” to defined quality criteria.

6.3.10. At each stage of the investment lifecycle, GRIP defines all of the “products” which should be produced within that stage. Within each GRIP document the products are summarised in a product matrix which lists all the products which could be produced and at which stage in the investment lifecycle they should be produced.

6.3.11. Formal reviews are held throughout the process. The reviews examine a project at critical stages in its lifecycle to provide assurance that it can successfully progress to the next stage. The review is concerned with the completeness of products and in assessing risk associated with any variance or derogation.

6.3.12. Figure 92 is a drawing of the type normally sufficient for GRIP Stage 3. This has been prepared in advance of the formal GRIP stages to inform the Application. Network Rail confirmed that this shows an appropriate level of detail. The development of designs for the works will continue to advance at the same time as addressing the requirements of Network Rail. The design for the level crossing illustrates the location of relevant elements. It presents a coordinated highway junction, lighting, level crossing and footway/cycleway crossing design. It should be noted that two options for the level crossing are proposed addressing the two footway /cycleway options extending over the level crossing. The layout is based on Network Rails single possible solution (full barriers) suggested in the risk assessment. This layout will be subject to internal and external rail industry consultees and implications of realising the full barrier solution and any others to be considered, developed and consulted on. This will identify a preferred solution, implications and form the basis of further consultation.



For detailed drawing annotation refer to Arup drawing IPC Doc Ref 2.29

Marston Vale Community Rail Partnership

6.3.13. Hanson has recently completed the construction of a new headquarters building on Green Lane but has not yet constructed the agreed access into the site and nor has it undertaken the agreed Section 106 works including pavement upgrades and the funding of station improvement works. It is understood that certain station improvement works were also proposed by the Marston Vale Community Rail Partnership for the provision of an upgraded station car park north of Green Lane and to the east of the Marston Vale Line, but have been rejected for reasons already recorded in this DAS.

Figure 92: Green Lane Level Crossing Enhancement

6.4. WESTERN ACCESS CORRIDOR

6.4.1. The access road layout is illustrated on Figure 93. It will extend along the western boundary of The Rookery (alongside the Marston Vale Line) to provide access from Green Lane to the Operations Area. The new access road is of more than sufficient length (approx 700 metres) to ensure that any HGVs queuing at the entrance to the RRF do not back on to the public highway and level crossing. The access road will be a standard macadam surface designed to meet the relevant Highways standards and include horizontal traffic calming through the provision of chicanes.

6.4.2. A separate pedestrian/cycle access will be constructed, to the west of the vehicular access route. This route (3 metres wide) will also be used as a utility services corridor, as well as providing a discrete link for pedestrians/cyclists joining the public highway.

6.4.3. A 3 metre wide footway/cycleway is proposed alongside the access road (on the eastern side) for its entire length to the Operations Area. In addition, a 3 metre wide verge is provided between the footway/cycleway and the access road on the western side. In discussion with Network Rail consideration is being given to the provision of screening between the access road and the Marston Vale Line to ensure that headlights of vehicles accessing the RRF do not affect the drivers of oncoming trains.

6.4.4. An antidazzle screen fence may be required by Network Rail between the access road and the Marston Vale Line as a result of the removal of existing vegetation along the rail corridor. Network Rail has confirmed that the provision of such fencing and its specification should be conditioned, but that its installation would only be undertaken if feedback from train drivers report conflicts with oncoming traffic headlights from vehicles on the access road.

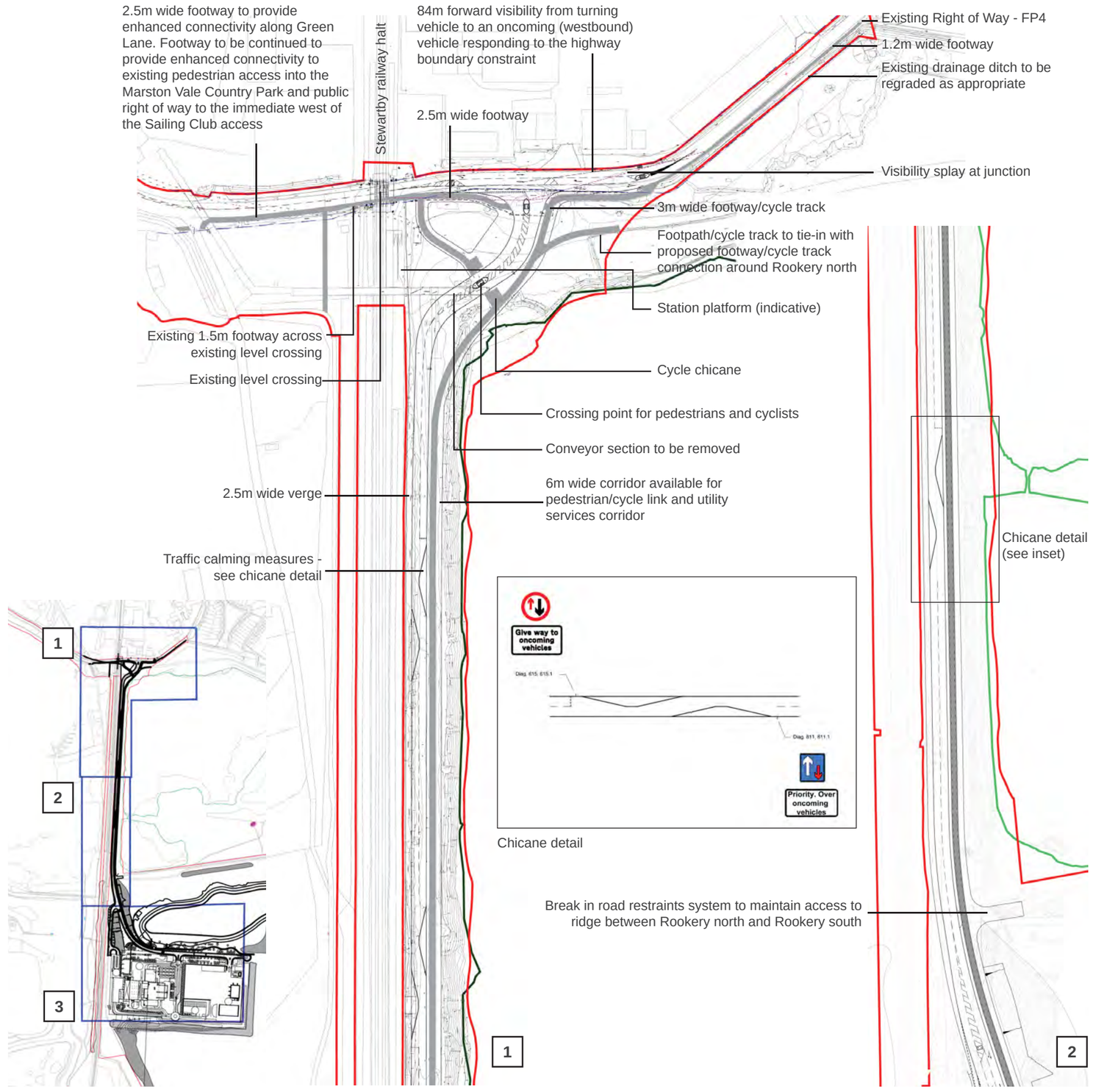


Figure 93: Western Access Corridor, Northern and Central Section

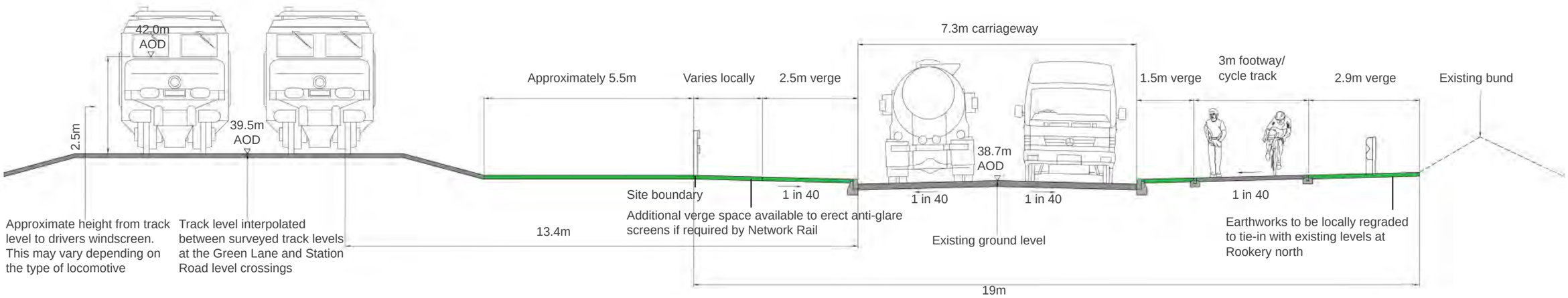


Figure 94: Section Through Western Access Corridor

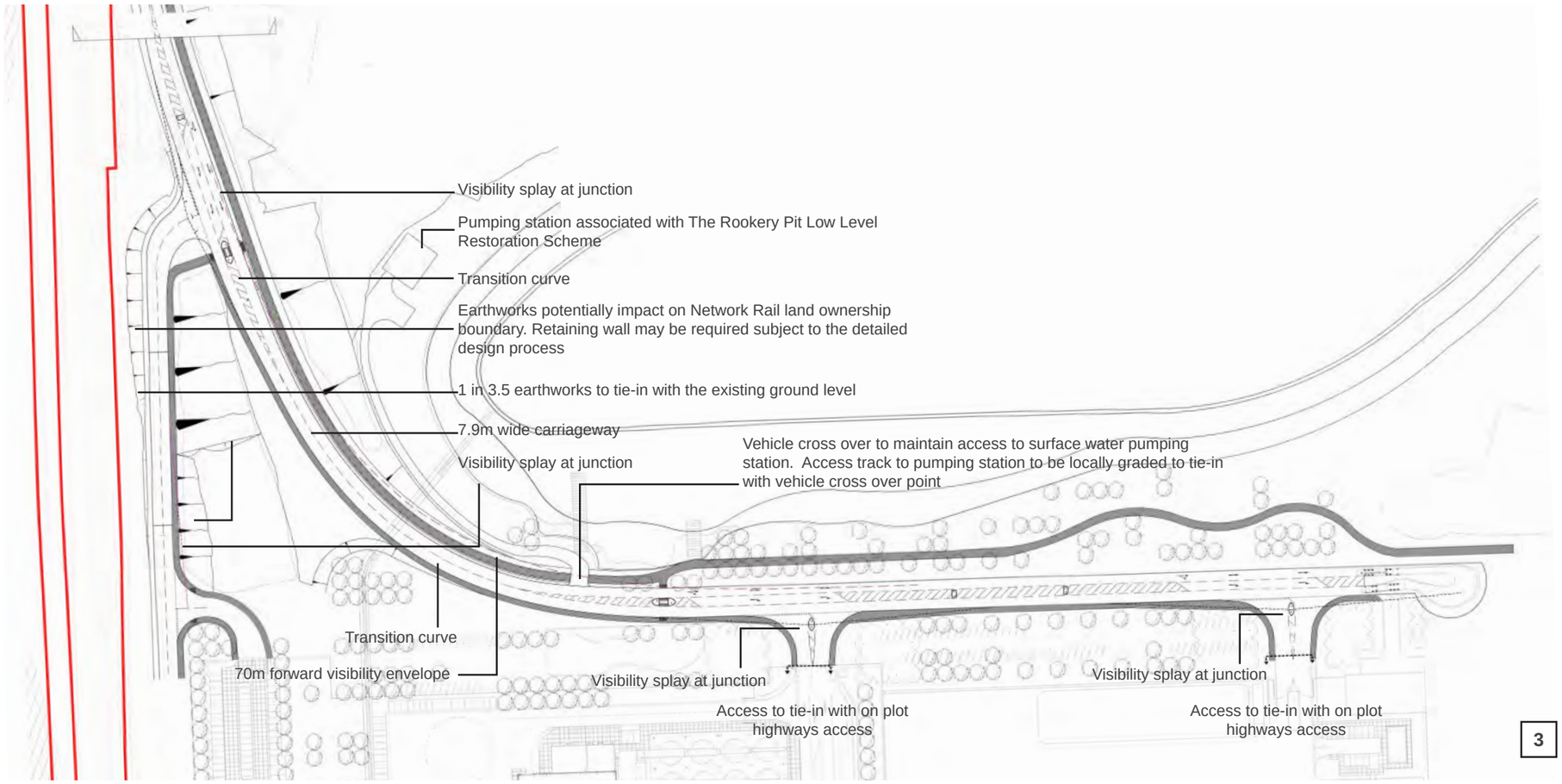


Figure 95: Western Access Corridor, Southern Section

6.5. OPERATIONS AREA

6.5.1. Figure 45, in Chapter 4, illustrates the detailed movement pattern of vehicles within the Operations Area. Reference should be made to Figure 96 which provides the reference points for the commentary below.

6.5.2. There are three access points into the Operations Area provided for operational vehicles from the access road within the pit:

a) The entrance to the EfW Facility is positioned centrally on the northern side of the Operations Area (1);

b) The access to the MRF is located further to the east (2); and

c) A small, dedicated access to the Foul Water Pump House, situated in the north eastern corner of the MRF.(3)

6.5.3. Visitors and administration staff turn west off the access road (4) and continue to follow the western boundary of Rookery South Pit turning into a dedicated car park and forecourt (5). This is situated to the northwest of the EfW Facility where there are 48 staff car parking spaces, 20 covered cycle parking spaces and an allocated space for one 53-seater coach. This forecourt will have a manually operated gate. From here, visitors and administration staff have separate pedestrian access into the visitor centre/ education facility and administration block.

6.5.4. These access arrangements separate heavy vehicles, service vehicles and operational staff vehicle movements from visitor and administration traffic. They also separate vehicles associated with the EfW Facility from those of the MRF or servicing the Foul Water Pump House. The separate access routes and entrances provide safe traffic management, thereby avoiding the potential for traffic conflicts.

6.5.5. The EfW Facility entrance will have automated gates (6) that are remotely controlled from the Security Gatehouse. Queuing lanes lead to the weighbridge and Security Gatehouse (7), which are located centrally within the Operations Area. This area has been designed to provide sufficient on-site waiting area to ensure queuing is kept to a minimum. Vehicles will be weighed on entering and exiting the Operations Area to enable the taking of accurate records of residual waste deliveries to the EfW Facility.

6.5.6. The Security Gatehouse is located with a clear view of the vehicular and pedestrian entrance and operational parts of the EfW Facility. Access through the electrically operated main gates will be controlled, as are the weighbridges for vehicles entering and leaving the EfW Facility. These gates are likely to be left open during main delivery hours, with both vehicles and pedestrians entering the gates being channelled by fencing to the Security Gatehouse where their entry will be monitored.

6.5.7. A third vehicle lane on approach to the Security Gatehouse will allow operational vehicles to park without causing congestion at the site entrance. This will allow visits to be made for signing in, orientation or to use the separate visitor's toilet facility.

6.5.8. From the weighbridge, waste delivery vehicles will access the tipping apron of the EfW Facility via a ramped access (8). Waste is tipped into the refuse bunker, and the empty vehicles exit the tipping hall via the same route, and are weighed again at the weighbridge prior to exiting the site along the access road.

6.5.9. A separate route is used by service vehicles (e.g. deliveries of lime, maintenance vehicles, etc.) which turn off prior to the start of the ramp, and follow a separate access to forecourts constructed along the south of the EfW Facility. An internal road, positioned along the southern boundary of the Operations Area (9), enables IBA and co-mingled metals to be delivered to the MRF without the need to use the main access road and weighbridge.

6.5.10. The IBA and co-mingled metals are delivered from the EfW Facility to the MRF, by truck, via the internal road network.

6.5.11. An area for HGV parking (10) (waste delivery vehicles) is located to the south west corner of the area dedicated to the MRF. This ensures that vehicles can be parked in a secure and appropriate location.

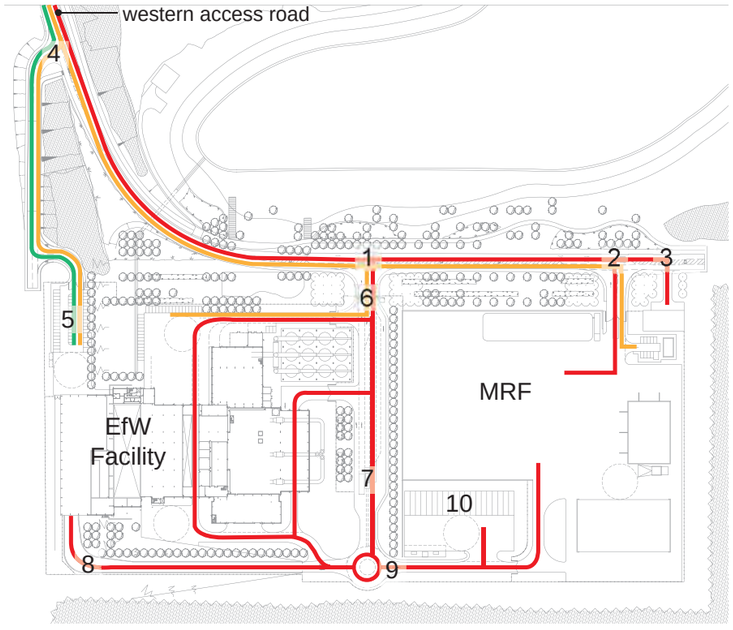


Figure 96: Vehicle Movement Pattern, Operations Area

Legend

Operational vehicles

Staff vehicles

Visitor vehicles

6.6 EMERGENCY ACCESS ARRANGEMENTS

6.6.1. Bedfordshire and Luton Fire and rescue service have been consulted on this proposal. They have concluded that an alternative emergency access route was not necessary and that adequate access was provided by the access from the north with the opportunity for emergency vehicles to use the verge and footpath and cycleway route in the event of a blockage on the access road.

6.6.2. Further detail relating to operational activity including vehicle movements is detailed in Chapter 4 of this DAS.

6.7 PEDESTRIAN AND CYCLING FACILITIES

6.7.1 The proposed rights of way forming part of the Project are described in Chapter 4 of the DAS and for reference are illustrated again in Figure 97. The rights of way proposals related to the Green Lane Junction and level crossing have been described in paragraph 6.3.4 above. The proposals also include the comprehensive upgrade of footpaths established as part of the approved LLRS surrounding North Pit Lake, to dedicated footpaths with cycle rights and establish a comprehensive linked network in the local area.

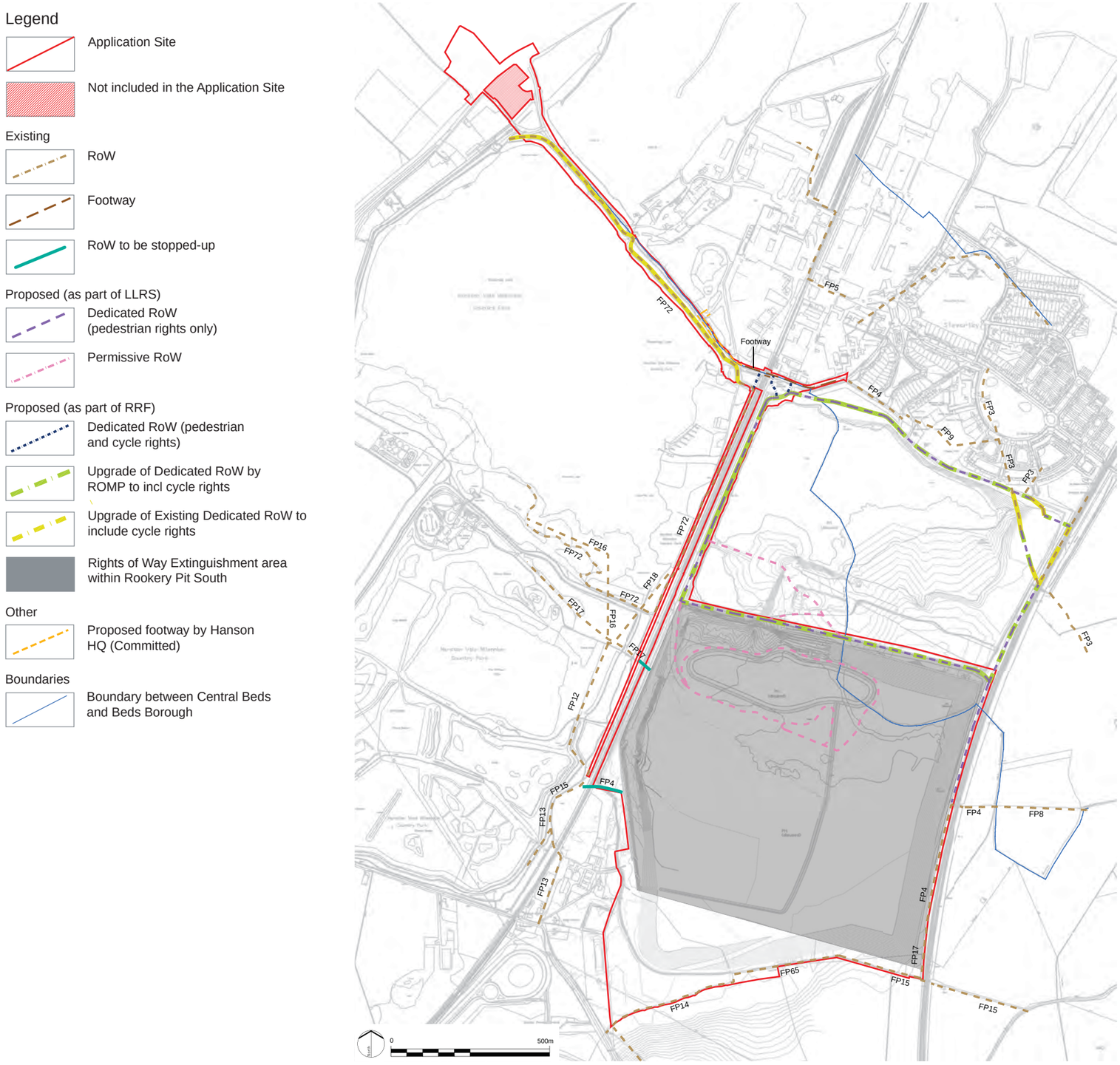


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Figure 97: Rights of Way Strategy

6.8 ADDITIONAL TRAFFIC MOVEMENT CONTROLS

6.8.1. To mitigate anticipated impacts arising from increased vehicle movements, a series of measures will be put in place which will formalise delivery routes and restrict delivery hours.

6.8.2. A HGV routing plan has been produced which will prevent lorries form using routes through the residential areas of Stewartby. The route is illustrated in Figure 98 and includes the following restrictions:

A) RRF HGV traffic travelling from the RRF to the south (A) would route along Green Lane through the existing Green Lane / A421 junction, then route along existing section of the A421 as far as the new grade-separated Marston Moretaine Junction, where it would gain access to the new dual carriageway south to the M1 Junction 13. Traffic to the RRF would use the same route in reverse; and

B) RRF HGV traffic travelling from the RRF to the north (B) would route along Green Lane through the existing Green Lane / A421 junction, then route along the existing section of the A421 as far as the new grade separated Marsh Leys Junction, when it would gain access to the new A421 dual carriageway.

6.8.3. In addition, delivery hours would be restricted to minimise the effects of traffic volume and associated noise. Covanta will also implement a Workplace Travel Plan which will aim to maximise non-car travel amongst its employees.

6.9. ROUTING OF AIR TRAFFIC

6.9.1. An Aviation Assessment produced in support of the Application, considers the effect of the Project on the operation of Cranfield Airport and is reported in the ES.

6.9.2. The assessment considers need for physical safeguarding, which protects operations at the airport; technical safeguarding, with reference to the use of communication, navigation and surveillance equipment; and operational safeguarding, concerned

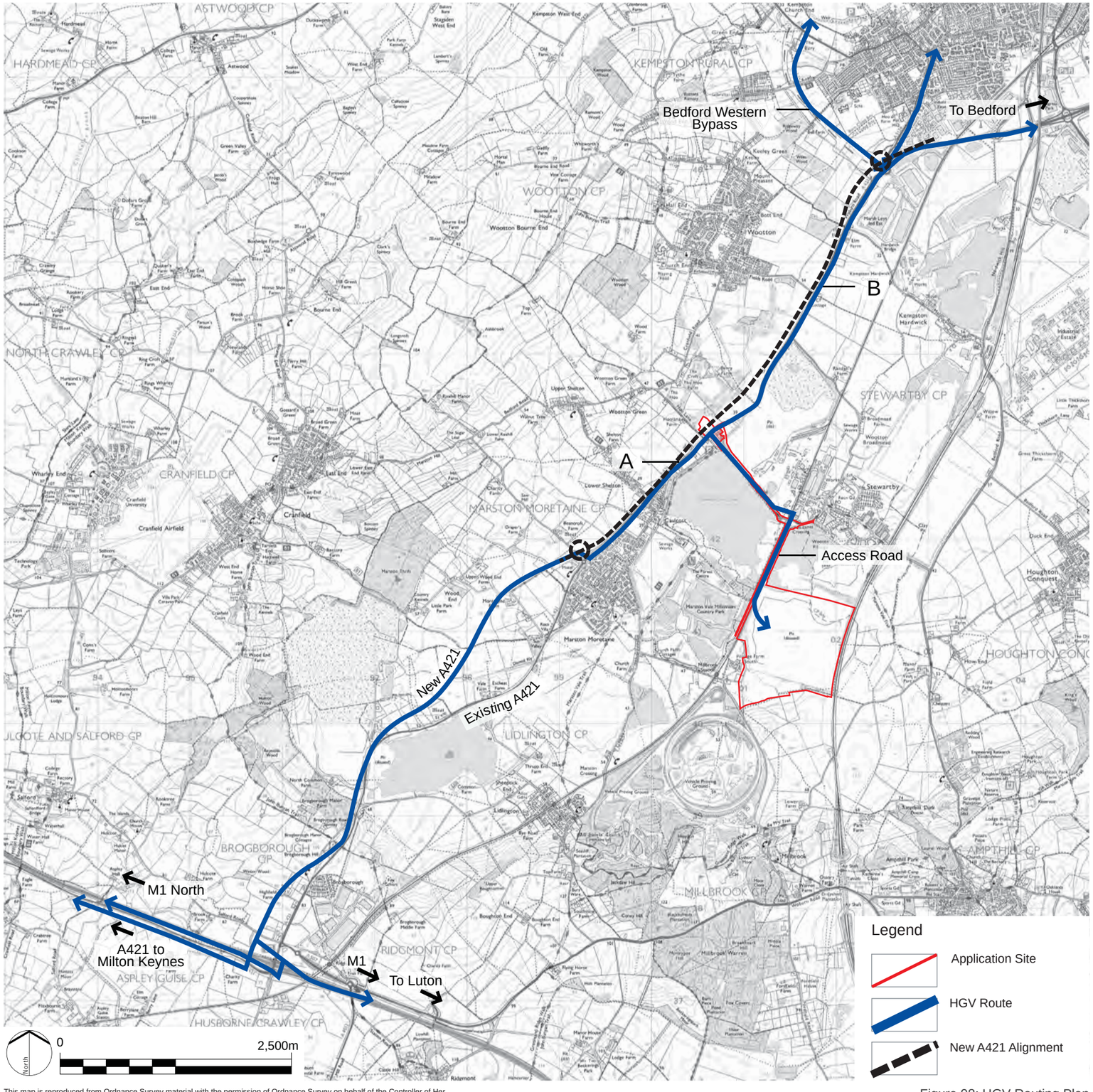


Figure 98: HGV Routing Plan

with routing of air traffic and flight procedures. In each case it has been determined that there is sufficient clearance or separation between the airport and the stack of the EfW Facility so that the construction and operation of the proposed RRF will not have any adverse affect on the safe operation of Cranfield Airport.

6.9.3. The Aviation Assessment has informed the design of the Project, and compliant obstruction lighting will be provided via a single, medium intensity red light at the top of the stack. Additionally, two low intensity steady red lights are located at mid-level, in line with the most prevalent flow of air traffic.

6.10. CONSIDERATION OF ALTERNATIVES

Access to The Rookery

6.10.1. The choice of access route is based on an assessment of the distance to the strategic highway network (the A421) together with the potential impact of additional traffic on the routes to it.

6.10.2. Due to the proximity of The Rookery to the railway lines to the east and west, access route options to the north and south were considered. An access to the south, to Station Road in the vicinity of Mill Brook Station, was not considered acceptable as traffic would be routed through the centre of Marston Moretaine to access the A421 as a result.

6.10.3. A primary access route to the east of Green Lane was also rejected, due to the impact on Stewartby, and reflecting existing height and weight restrictions through the village towards the B530.

Green Lane Junction Design

6.10.4. The provision of a roundabout was considered for the access, but an appropriate design, particularly relating to size, cannot be provided within the constraint of the Application Site and land ownership, at the same time as maintaining existing access arrangements to land to the north. In any event the volume of traffic predicted to use the junction would not warrant such a proposal.

Subway under access road

6.10.5. The side access priority junction is the subject of ongoing discussions with stakeholders including the Marston Vale Trust. A study on the feasibility of a subway under the access road has been undertaken to inform discussions. The at grade crossing proposed as part of the RRF may be substituted by a subway and would be the subject of a separate consultation process and planning application.

Level crossing and bridge options

6.10.6. As part of Network Rail safety assessment the consideration of a bridge crossing over the Marston Vale Line was suggested and recorded in their response to the PER. A separate report has been prepared for issue to Network Rail as part of the GRIP work discounting consideration of an over bridge. The main conclusions from the report are:

a) any structure would require significant third party land north of Green Lane;

b) likely road levels would require considerable embankment retention to the north west corner of Rookery North and require the grading of the access into The Rookery on a difficult alignment in relation to the North Pit Lake;

c) the bridge would have a significant impact on the existing highway access to the brickworks (presently redundant), Stewartby Lake Sailing Club entrance as well as The Rookery access;

d) there would be effects on the operation and accessibility of Stewartby Rail Halt;

e) the utility services under Green Lane would be effected as well as the existing substation north of Green Lane;

f) the provision of access into The Rookery used by HGVs on a 5% gradient is likely to create highway safety concerns;

g) construction would require temporary closure of Green Lane;

h) the structure would adversely affect the approach to the village of Stewartby; and

i) the ease of establishing right of way links east –west and between The Rookery and the Millennium Country Park would be affected.

6.10.7. Two options for the level crossing upgrade are submitted to the IPC and are detailed in this Chapter providing two footway widths.

Rail Option

6.10.8. Covanta has investigated the viability of using rail transport as a means to deliver waste to the RRF. In reaching a decision, Covanta has considered a number of factors which include:

a) the extent and condition of existing railhead provision within Covanta's proposed waste catchment areas;

b) the likely implications for site layout and configuration in order to accommodate rail infrastructure; and

c) the potential need to acquire land from third parties.

6.10.9. Covanta has concluded that, at the present time, the provision of rail infrastructure on site is not practical in light of the intended Application Site configuration; economic, given the origins of waste and the availability of suitable rail transfer sites and facilities to transport to the RRF; or justified given the interference with the rights of third parties that would be required.

6.10.10. Nevertheless, Covanta's site selection and site configuration allow the later provision of rail access facilities. As and when rail served waste contracts became available Covanta would be able to justify rail access works, including the use of third party land where needed.

7.0 DESIGN DEVELOPMENT: LANDSCAPE AND ECOLOGY

7.1. INTRODUCTION

7.1.1. This Chapter provides:

a) an overview of the masterplan;

b) an overview of the landscape strategy;

c) the relationship to the LLRS;

d) a description of the landscape proposals;

e) a description of the planting;

f) a description of fencing enclosure

g) a description of existing management vegetation;

h) a description of the ecology strategy; and

i) a description of the integration of proposed rights of way.

7.2. LANDSCAPE STRATEGY AND THE OPERATIONS MASTERPLAN - AN OVERVIEW

7.2.1. The landscape strategy illustrated in Figure 99 and masterplan for the RRF, illustrated in Figure 100, have been driven by the consideration of landscape matters. The strategy and masterplan address the context of the Project in the wider and more local views and the resolution of a coherent design at a site wide scale which are all underpinned by the Design Objectives identified in Chapter 1 and 3 . This DAS has already described the different audiences that the design has considered and the way in which those audiences have been addressed.

Figure 99: Landscape Strategy

Legend

- Trees
- Woodland
- Shrub planting/ understorey
- Hedgerow
- Grassland
- Meadow grassland
- Reeds/aquatic vegetation
- Water body
- Access Road
- Internal road
- Hard surface
- Security fence
- 3m high acoustic fence
- Wall
- Brown Roof
- Operations Area
- INDICATIVE LAYOUT ONLY further design development to be undertaken with relevant consultees

Proposed EfW Facility

1: Admin and visitor car park (48 no. spaces)
2: Forecourt (inc. coach turning)
3: Operational staff car park (32 no. spaces)
4: Transformer Compound
5: Admin building and visitor centre / education facility
6: Tipping hall
7: Refuse bunker
8: Boiler house
9: Flue gas treatment area
10: Workshop and stores
11: Stack
12: Weigh bridge and security gatehouse
13: Turbine hall
14: Air cooled condensers
15: Surface water attenuation
16: Automatic gates
17: Access to EfW Facility
18: Steep retained inner slope
19: Silo Area

Proposed MRF

20: Screened aggregate storage yard
21: Indicative aggregate storage piles
22: HGV parking
23: IBA storage
24: IBA processing
25: Security Fence
26: Water Collection Lagoon
27: Staff admin block
28: Staff car park (10 no. spaces)
29: Aggregate weigh bridge
30: Access to MRF
31: Foul water pumping station
32: Access to pumping station
33: Wall to storage yard

External to Operations Area

34: Perimeter Bund

Figure 100: Masterplan (Operations Area)

7.2.2. The Design Objectives of particular relevance to the landscape strategy comprise: developing a static building in the landscape; stitching into the landscape of the Vale; producing a bespoke masterplan and building design to suit operational and site conditions/context and the need for a strong landscape and ecological rationale, which are all reflected in the strategy concept diagram illustrated in Figure 101 which illustrates the following:

a) The tying in of the Operations Area to the existing wooded edge on the Application Site's western boundary by woodland planting along two lines, each providing a portion of the required screening to the operational floor producing a static building in the landscape free from clutter;

b) The establishment of an extension to the South Pit berm in the form of a new earth bund to form a new enclosure to the Operations Area to the south and east;

c) The enclosure of the MRF with a subservient enclosing wall returning within the wider enclosure of the earth bund;

d) The use of the new bund to support the access ramp into the EfW Facility and the enclosing noise attenuation fence parallel to this; and

e) The establishment of a fractured but robust planting area to the north of the Operations Area that stitches with the attenuation pond and wider Rookery North Pit Lake forming a 'front of house' and a building in a local landscape.

7.2.3. In recognition of the site's context an opportunity to achieve/ progress Green Infrastructure (GI) initiatives and policy compliance in the Marston Vale as well as the need for a comprehensive landscape strategy has been seized, stitching the Project into the Vale.

Figure 101: Landscape Strategy Concept

7.2.4. The landscape strategy:

a) Provides visual integration with the landscape of the Marston Vale and Greensand Ridge;

b) Minimises the predicted visual impact of the built form from key locations;

c) Seeks opportunities to enhance the ecological value of the site by retaining or recreating valued habitat features;

d) Enhances rights of way improvements and connection in the area;

e) Promotes improved linkages with the Forest Marston Vale Millennium Park through the provision of a new Millennium Country Park entrance and associated rights of way links; and

f) Further advances the principals brought forward as part of the LLRS promoted via the ROMP.

7.3. INTEGRATION WITH LOW LEVEL RESTORATION SCHEME

7.3.1. The landscape strategy takes into account planned landscape and habitat creation works associated with the LLRS described in Chapter 2. The baseline conditions created by the LLRS which have relevance to The Rookery landscape and ecology proposals comprise:

a) large deep waterbodies;

b) numerous small permanent and ephemeral ponds;

c) marginal vegetation and reedbed;

d) neutral grassland;

e) broadleaved plantation woodland;

f) scrub habitats; and

g) bare ground and ruderal plant communities.

7.4. LANDSCAPE PROPOSALS

7.4.1. An integrated landscape scheme has been developed from the Design Objectives through consultation with CBC, the Marston Vale Trust and CABE, to create an appropriate context for the EfW Facility and MRF, whilst providing screening or filtering of views to operational activities in the base of the pit from elevated vantage points on the Greensand Ridge.

7.4.2. The landscape strategy is illustrated in Figure 99 and examples of some of the section analysis work undertaken to inform the bunding and planting design illustrated in Figure102. The sections demonstrate the effects of planting at the perimeter of the pit and on the proposed earth bunding.

7.4.3. The planting proposals complement the Forest of Marston Vale 'Forest Plan' in providing additional woodland cover equating to approximately 39% of the development area, which has been explored and agreed with the Marston Vale Trust and CBC.

7.4.4. The landscape strategy comprises the following elements which assist in delivering some of the Design Objectives :

a) New planting to establish two distinct lines of vegetation cover located around the perimeter of the pit and within and around the Operations Area to screen low level operational activity and stitch the development into the landscape;

b) New planting within the Millennium Country Park to address views from within the Park and enhance amenity ;

c) Wetland establishment and enhancement associated with the attenuation pond constructed as part of the LLRS and drainage channels providing localised integration of the RRF within the site; and

d) Management of key existing woodland vegetation and LLRS planting to support long term screening requirements.

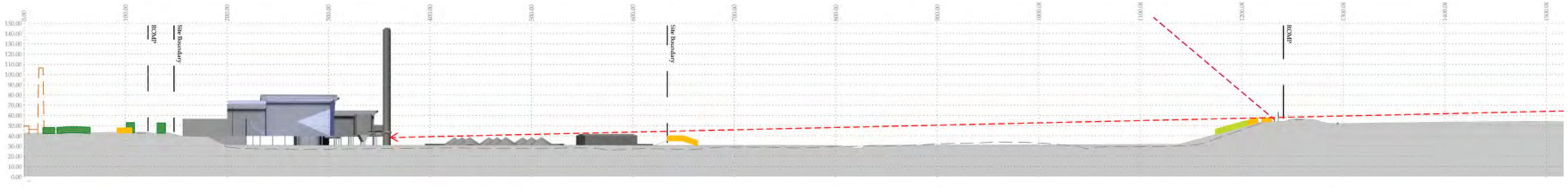


Figure 102: Section through Rookery South Pit from Ampthill House

7.5. DESCRIPTION OF THE PLANTING

Perimeter Planting

7.5.1. Significant areas of new woodland will be established around the southern and eastern perimeter of The Rookery South Pit. The primary purpose of this planting is to establish, an appropriate setting for the buildings and operations in the wider context. Additional planting within the Application Site and existing retained planting within the will also provide localised screening of the EfW Facility in views from the Millennium Country Park and Forest Centre.

7.5.2. The perimeter planting strategy is illustrated in Figure 103 and comprises the following:

a) **Area 1 & 2 Southern and Eastern Pit Embankments (Rookery South Pit):** woodland planted along the southern and eastern pit embankments and adjoining flat ground will link existing fragmented woodland cover and woodland provided by the LLRS. The substantial perimeter woodland will enhance the landscape setting for the RRF particularly when viewed from elevated areas to the south and east screening operational activity;

b) **Area 3 Western Boundary:** a narrow woodland belt will be planted to the west of the Marston Vale Line to link existing areas of tree and scrub vegetation within the Marston Vale Millennium Country Park. This planting, in conjunction with existing vegetation within the Park, will screen lower portions of the EfW building when viewed from the Park and Forest Centre. Views to the EfW from the railway line will be permitted;

c) **Area 4 Green Lane Junction and entrance to Marston Vale Millennium Country Park:** An illustrative landscape scheme has been prepared to enhance the character of both the Green Lane entrance and the entrance to the Marston Vale Millennium Country Park. The scheme is subject to ongoing discussion and design development with relevant consultees including the Marston Vale Trust and Network Rail; and

d) **Area 5 Marston Vale Millennium Country Park:** An illustrative landscape scheme comprising a series of small copses and extensions to the forest cover in the Country Park is proposed in liaison with the Marston Vale Trust to redirect views which are considered to focus on the RRF. The scheme is subject to ongoing discussion and design development in conjunction with the Marston Vale Trust.

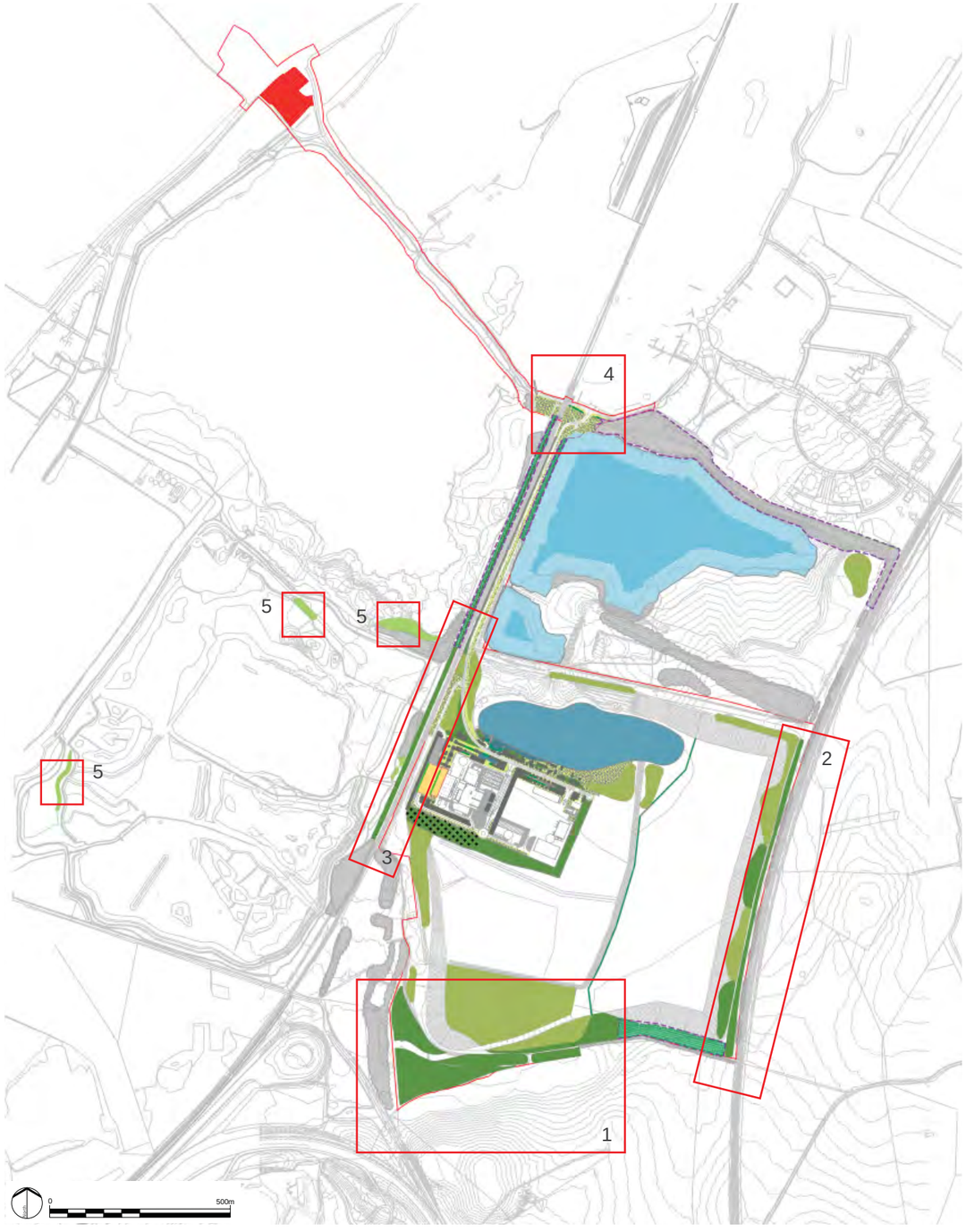


Figure 103: Perimeter Planting Strategy

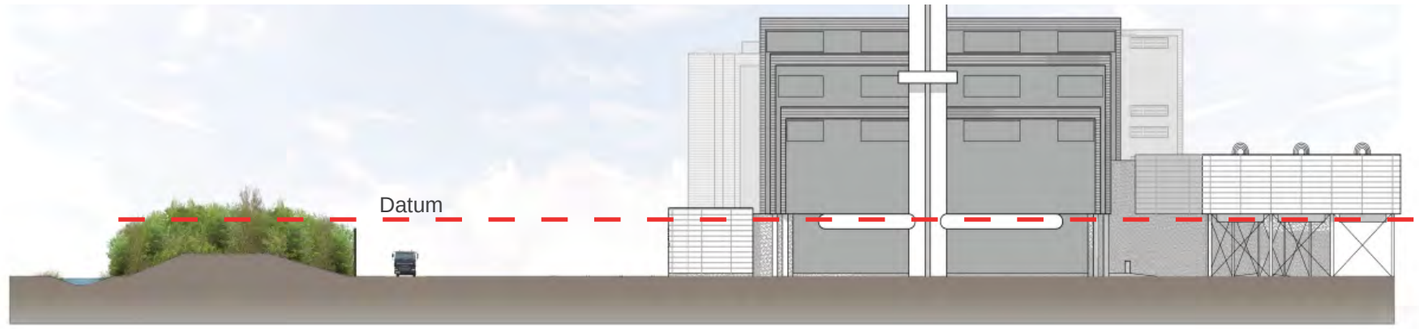


Figure 104: Section Through Southern Perimeter Bund

Operations Area

7.5.3. Planting within the Operations Area serves a number of purposes:

a) it helps to knit together, and to define, the principal areas of activity and transport movement corridors;

b) it provides screening of the lower portions of the building and operational activities; and

c) it helps to 'anchor' the building in the wetland landscape to the north of the RRF and provide reinforcement to the proposed woodland fringe.

7.5.4. Planting immediately to the north of the EfW building and MRF establishes the 'front of house' landscape outside the fenced Operations Area providing an attractive wooded and wetland setting for the footpaths within Rookery South. The linear arrangement of trees and shrubs extends along the northern boundary of the Operations Area to reflect the strong geometric lines of the building. The introduction of a pond to the northern edge of the Operations Area reinforces the integration of the building with the extensive wetland areas to the north. Formal planting also extends into the site to define the main activity zones and access routes. Planting along the northern edge of the Operations Area merges with the more organic forms of the reconfigured attenuation pond and additional wetland established as part of the RRF. Planting in this area is subject to ongoing design development through discussions with the Marston Vale Trust.

7.5.5. To the south and east of the Operations Area, woodland planting will be established in association with an engineered earth bund. The bund will be constructed to a maximum height of 5m above the site levels, including the access ramp into the tipping hall, using site-won materials and topsoils sourced from off-site locations (refer to Figure 104). The drainage ditch along the southern boundary (constructed as part of the LLRS) will be provided in a slightly different alignment realigned along the base of the southern bund.

Green Lane Illustrative Landscape Proposals

7.5.6. The illustrative landscape scheme at Green Lane serves to establish the new 'face' to Green Lane for the Country Park and the RRF site entrance.

7.5.7. The illustrative scheme, which is subject to further consultation with the Marston Vale Trust and Network Rail, will complement new footpaths and a cycleway and provide an appropriate landscape setting for a new level crossing, a new entrance to the Country Park, the existing station and the approach to the village of Stewartby.

Green Walls

7.5.8. The purpose of the green wall located on the west elevation of the refuse bunker has been described and illustrated in Chapter 5 as a means of providing visual integration of the EfW Facility in views from the Marston Vale Millennium Country Park. The planting strategy for the proposed green wall system will be the subject of detailed design development. There are a number of factors which have informed the choice of species. These include the aesthetic requirement; aspect; location; exposure and maintenance requirements. The wall would be watered from rain water harvested from the building.

7.5.9. A provisional planting palette has been selected which comprises species likely to be tolerant of the west facing aspect and which will provide seasonal colour and texture and is detailed below. The anticipated green wall system is a compost based design that is proven and provides a more significant 'fail safe' in the event of irrigation failing.

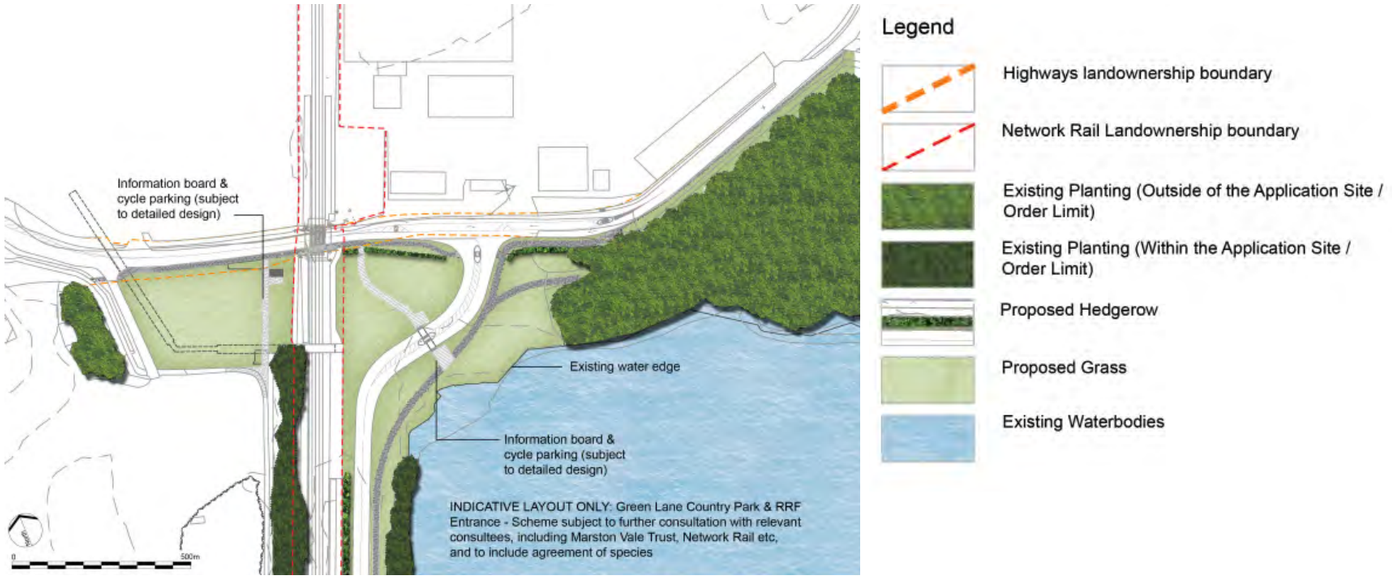


Figure 105: Illustrative Landscape Proposals, Green Lane

Provisional Green Wall Planting Palette

Species	
Green wall planting	
Climbing Plants	
Climbing ivy	Hedera helix
Traveller's joy	Clematis vitalba
Greater periwinkle	Vinca major
Clematis montana	Anemone clematis
Honeysuckle	Lonicera periclymenum
Hop	Humulus lupulus
Dewberry	Rubus caesius
Herbs	
Common bird's-foot trefoil	Lotus corniculatus
Tufted vetch	Vicia cracca
Spreading bellflower	Campanula patula
Hedge bedstraw	Galium mollugo
Common rock-rose	Helianthemum nummularium
Creeping Jenny	Lysimachia nummularia
Hart's-tongue fern	Phyllitis scolopendrium
Narrow everlasting-pea	Lathyrus sylvestris
Twin-flower everlasting pea	Lathyrus grandifolius
Ivy leaved Speedwell	Veronica hederifolia
Germander speedwell	Veronica chamaedrys
Strawberry	Fragaria vesca
Biting stonecrop	Sedum acre
Salad burnet	Sanguisorba minor subsp. minor
Bladder campion	Silene vulgaris

Species Selection

a) Woodland Planting

7.5.10. Woodland planting will comprise predominantly native and indigenous species which are known to thrive locally and in similar growing conditions. The species mix has been prepared in conjunction with the Marston Vale Trust using their experience of plant establishment in the Vale. It will be broadly consistent with the approved LLRS planting scheme and the National Vegetation Classification W8 woodland community, which is characteristic of Marston Vale woodlands. All planting would be specified in accordance with the HTA National Plant Specification: 1997 and sourced where possible from the Community Tree Trust.

7.5.11. Woodland establishment will be by traditional methods of planting, predominantly using forestry transplants. Larger, feathered trees will be planted along the southern bund of the Operations Area to assist in screening vehicle movements along the tipping hall access ramp from visual receptors to the south and east.

All woodland species to be native and sourced from the Community Tree Trust and based on the mix outlined below (working to standard Forestry Commission parameters of 90% trees and 10% woody shrubs):

%	Species		Form/Age	Height (cm)
Woodland Planting Mix 1				
30	Oak	Quercus robur	Transplant 1 + 1	40-60
30	Ash	Fraxinus excelsior	Transplant 1+ 1	60-80
15	Field Maple	Acer campestre	Transplant 1 + 1	40-60
8	Birch	Betula pendula	Transplant 1 + 1	40-60
5	Wild Cherry	Prunus avium	Transplant 1 + 1	40-60
4	Hazel	Corylus avellana	Transplant 1 + 1	40-60
2	Crab Apple	Malus sylvestris	Transplant 1 + 1	40-60
2	Hawthorn	Crataegus monogyna	Transplant 1 + 1	40-60
1	Dogwood	Cornus sanguinea	Transplant 1 + 1	40-60
1	Wild Privet	Ligustrum vulgare	Transplant 1 + 1	60-80
0.5	Guelder Rose	Viburnum opulus	Transplant 1 + 1	40-60
0.5	Wayfaring Tree	Viburnum lantana	Transplant 1 + 1	40-60
0.5	Spindle	Euonymus europaeus	Transplant 1 + 1	40-60
0.5	Blackthorn	Prunus spinosa	Transplant 1 + 1	40-60
Trees to be planted at 1.5m centres				

%	Species		Form/Age	Height (cm)
Woodland Planting Mix 2				
20	Birch	Betula pendula	Transplant 1 + 1	40-60
20	Hawthorn	Crataegus monogyna	Transplant 1 + 1	40-60
18	Oak	Quercus robur	Transplant 1 + 1	40-60
15	Ash	Fraxinus excelsior	Transplant 1+ 1	60-80
12	Field Maple	Acer campestre	Transplant 1 + 1	40-60
5	Wild Cherry	Prunus avium	Transplant 1 + 1	40-60
4	Hazel	Corylus avellana	Transplant 1 + 1	40-60
2	Crab Apple	Malus sylvestris	Transplant 1 + 1	40-60
1	Dogwood	Cornus sanguinea	Transplant 1 + 1	40-60
1	Wild Privet	Ligustrum vulgare	Transplant 1 + 1	60-80
0.5	Guelder Rose	Viburnum opulus	Transplant 1 + 1	40-60
0.5	Wayfaring Tree	Viburnum lantana	Transplant 1 + 1	40-60
0.5	Spindle	Euonymus europaeus	Transplant 1 + 1	40-60
0.5	Blackthorn	Prunus spinosa	Transplant 1 + 1	40-60
Trees to be planted at 1.5m centres				

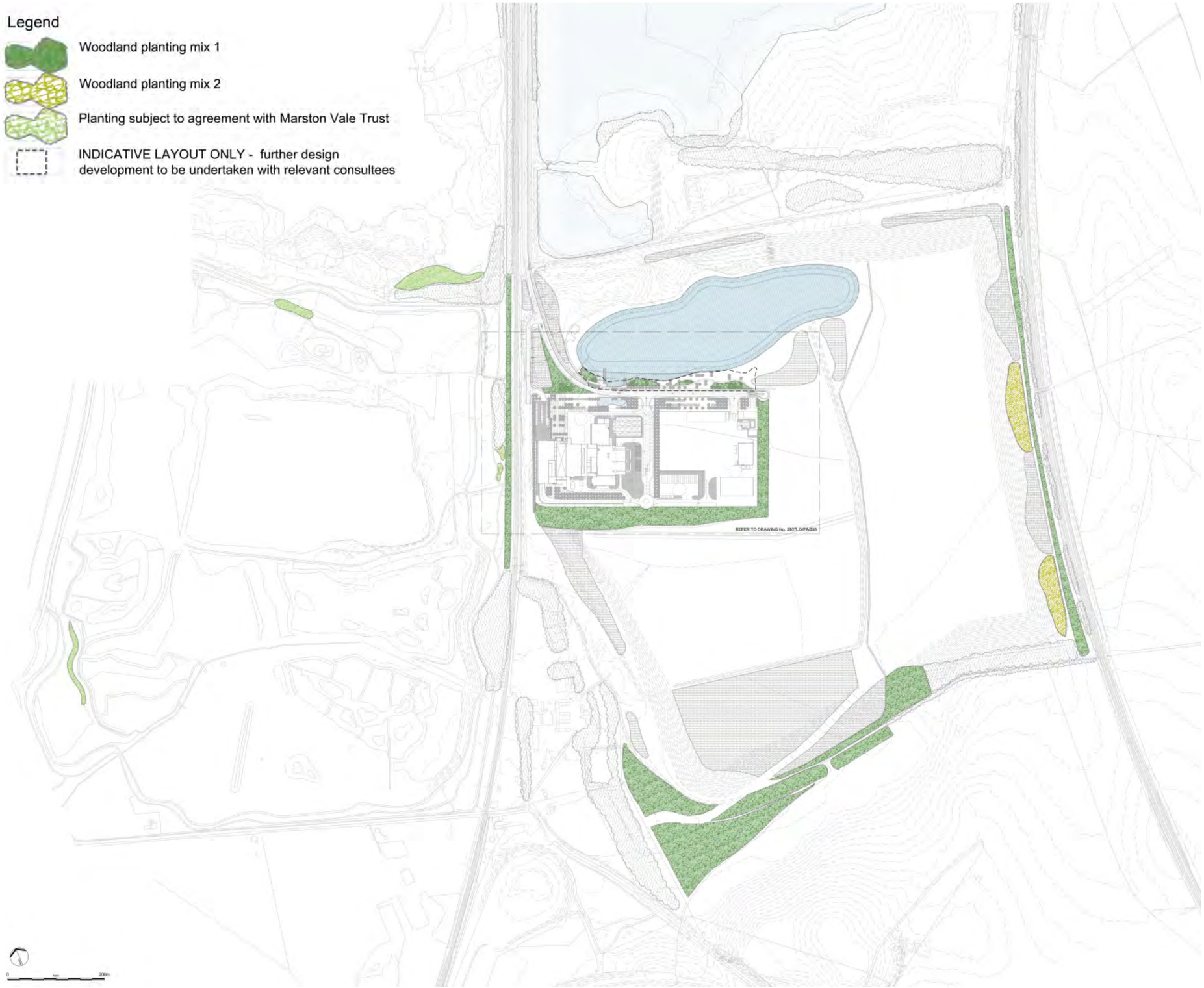


Figure 106: Woodland Planting Proposals

b) Avenue Trees and Shrubs (Operations Area)

7.5.12. Trees will be planted as Extra Heavy Standards (14-16cm girth) in tree pits with appropriate staking. Shrub planting will comprise predominantly native species supplied either as containerised stock or as bare root plants. All woodland species to be native and sourced from the Community Tree Trust and based on the mix outlined below (working to standard Forestry Commission parameters of 90% trees and 10% woody shrubs)

c) Amenity Grassland and Meadow (Operations Area)

7.5.13. Amenity grassland will comprise species which require minimal maintenance and are capable of tolerating low nutrient soil conditions. Wildflower meadows will similarly comprise species which are tolerant of the prevailing soil and environmental conditions.

%	Species		Form/Age	Height (cm)
Woodland Inter-planting on bund				
25	Silver Birch	Betula pendula	Feathered 2x	125-150
20	Hawthorn	Crataegus monogyna	Feathered X2	175-200
15	Oak	Quercus robur	Feathered 2x	150-175
10	Field Maple	Acer campestre	Feathered 2x	175-200
10	Hazel	Corylus avellana	Feathered 2x	250-300
10	Grey Willow	Salix cinerea	Feathered 2x	125-150
8	Ash	Fraxinus excelsior	Feathered 2x	200-250
4	Crab Apple	Malus sylvestris	Feathered 2x	175-200
3	Wild Cherry	Prunus avium	Feathered 2x	150-175
3	Rowan	Sorbus aucuparia	Feathered 2x	125-150
2	Guelder Rose	Viburnum opulus	1 + 2	60-80
Trees to be inter-planted within bund planting at 2m centres in staggered rows				

Species		Form/Age	Height (m)/Girth (cm)
Tree Planting within Operations Area			
Whitebeam	Sorbus aria	EHS	4.25-6.00/14-16
Rowan	Sorbus aucuparia	EHS	4.25-6.00/14-16
Common White Birch	Betula pubescens	EHS	4.25-6.00/14-16

Species		Form/Age	Height (m)/Girth (cm)
Tree Planting within Green Lane			
Whitebeam	Sorbus aria	EHS	4.25-6.00/14-16
Rowan	Sorbus aucuparia	EHS	4.25-6.00/14-16
Common White Birch	Betula pubescens	EHS	4.25-6.00/14-16

%	Species
Amenity Grass Mix (British Seed Houses A4 Mix)	
40	Aniset Strong Creeping Red Fescue
30	Raisa Chewings Fescue
25	Mentor Hard Fescue
5	Highland Bent Grass

Species	
Shrub, Woodland & Hedgerow planting	
Hazel	Corylus avellana
Hawthorn	Crataegus monogyna
Wild Privet	Ligustrum vulgare
Blackthorn	Prunus spinosa
Buckthorn	Rhamnus catharticus
Forsythia	Forsythia x intermedii 'Spectabilis'
Rosa	Rosa rugosa
50% of shrub planting: 2/3litre pots, planted at 1-1.5m spacings 50% of shrub planting: open grown stock at 900mm	

Meadow Mix - Grasses	
29	Chewings Fescue
9	Common Bent
35	Crested Dogstail
5	Meadow Fescue
5	Meadow Foxtail
15	Smooth Meadow Grass
1	Sweet Vernal Grass
1	Meadow Barley

%	Species
Meadow Mix–Wild Flowers (Charles Flower, Wildflowers, Mix II. Clay/Acid Meadows)	
1	Betony
5	Birdsfoot Trefoil
7	Common Vetch
9	Cowslip
7	Field Scabious
10	Lady's Bedstraw
9	Lesser Knapweed
5	Meadow Buttercup
1	Meadow Cranesbill
1	Meadow Vetchling
5	Musk Mallow
6	Oxeye Daisy
1	Ragged Robin
8	Ribwort Plantain
10	Self Heal
6	Sorrel
2	Yarrow
7	Yellow Rattle

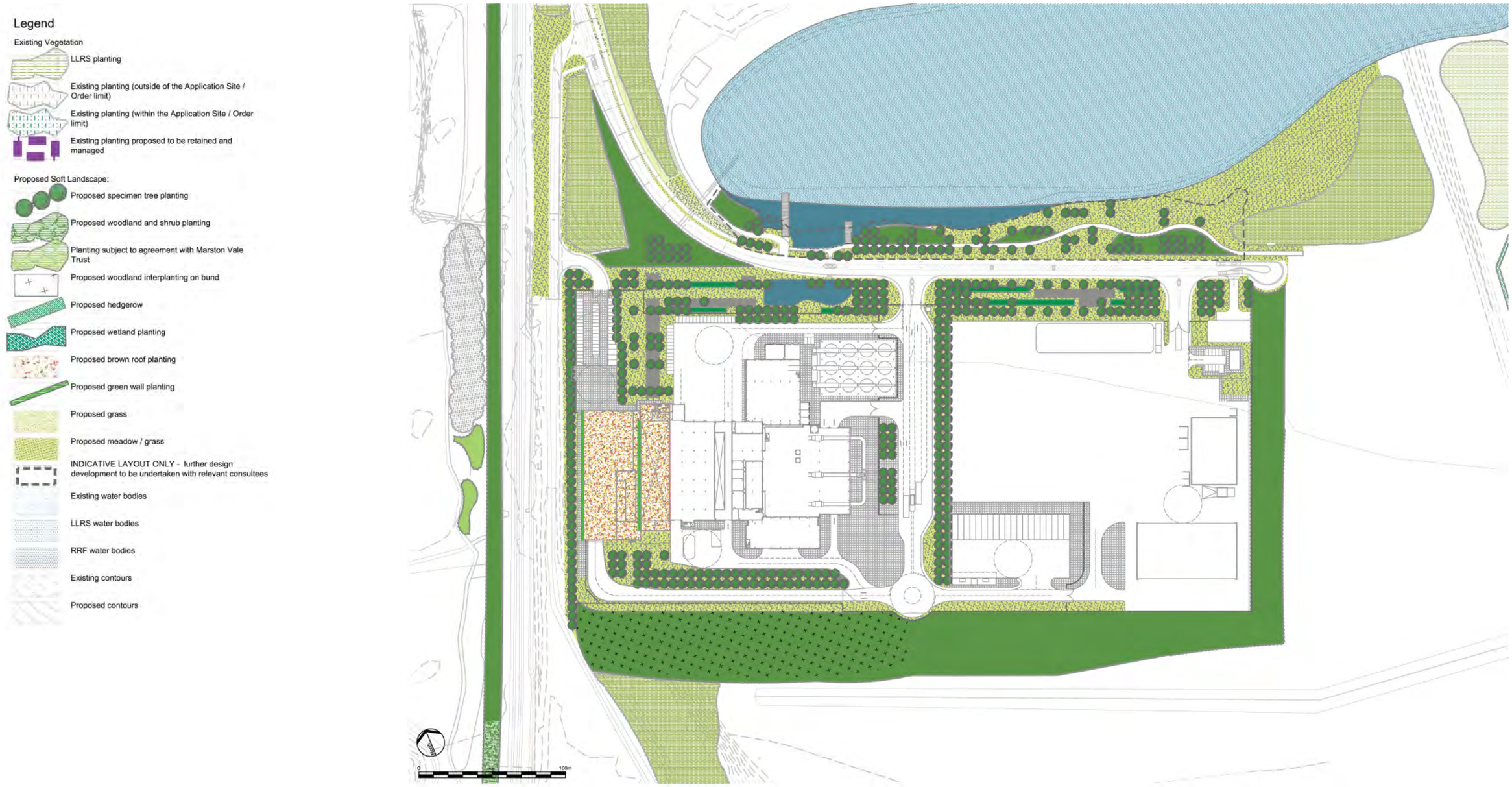


Figure 107: Operations Area Planting Proposals

Screening Impact of Vegetation

7.5.15. The effectiveness of the landscape proposals and strategy in mitigating visual effects has been rigorously tested through section analysis, wire line modelling and zone of theoretical visibility testing. This has used a complex 3D model of the area and photomontage production.

7.5.15. The following Photomontages illustrate the anticipated effects of screening from key locations and the impact that this is likely to have over a 10 year period as new and existing planting matures.

7.5.16. Where existing planting will continue to grow and affect visibility between the time of publication of this report and the ES in 2010 and the opening of the RRF in 2014 the planting at year one has been illustrated as having grown in accordance with anticipated growth rates. This matter is relevant to the views from Stewartby and Forest of Marston Vale where there is extensive maturing woodland within the view and to a lesser extent in the elevated views from Ampthill and Ampthill Park where the existing copse on the south east corner of the site provides screening to the MRF.

View from Stewartby: Planting at Year 10

View from Marston Vale Millennium Country Park: Planting at Year 10

View from Ampthill Park: Planting at Year 10

View from Houghton House: Planting at Year 10

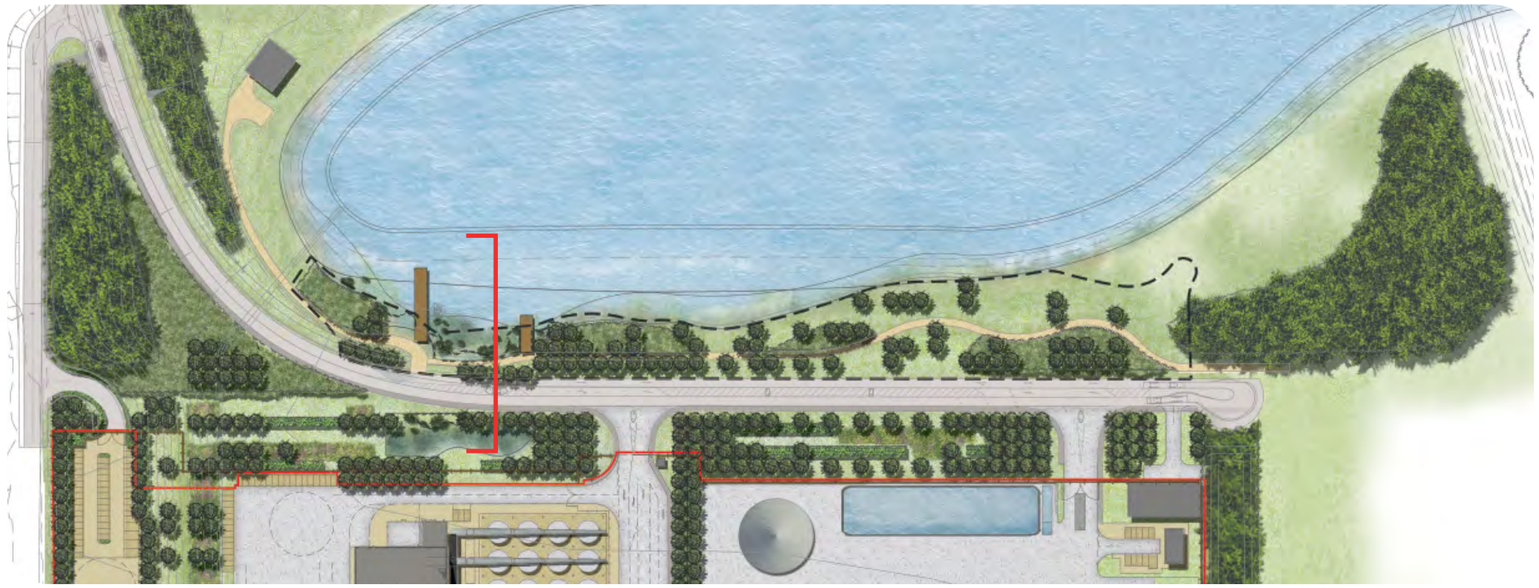
View from Ampthill Park House: Planting at Year 10

Figure 108: Screening Impact of Vegetation

Wetland Creation

7.5.17. The attenuation pond created by the LLRS will be extended along its southern shore to bring water and wetland vegetation closer to the EfW Facility. Planting on land to the south of the pond is subject to further discussion and design development with the Marston Vale Trust. The illustrative scheme comprises trees and understorey shrubs with marginal and aquatic vegetation established along the fringes of pond. The planting knits together the fragmented woodland belts created by the LLRS to form an integrated landscape which addresses views from public footpaths to the north and establishes an appropriate setting for the EfW Facility.

Species	
Wetland Planting	
Water mint	Mentha aquatica
Common club-rush	Scripus lacustris
Water plantain	Alisma plantago-aquatica
Common spike-rush	Eleocharis palustris
Water forget-me-not	Myosotis scorpioides
Yellow flag iris	Iris pseudacorus
Meadowsweet	Filipendula ulmaria
Marsh marigold	Caltha palustris
Brooklime	Veronica beccabunga
Arrowhead	Sagittaria sagittifolia



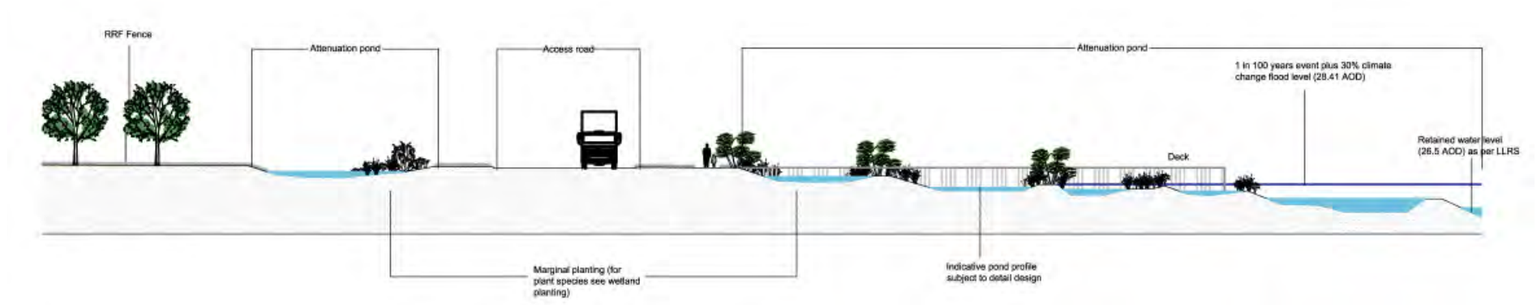


Figure 109: Section Through Proposed Wetland Habitat

7.6. FENCING ENCLOSURE

7.6.1. Figure 110 illustrates the proposed types of fencing enclosure for the Operations Area. The general strategy is to provide a secure 3m high boundary. Fencing to the majority of the perimeter will be powder coated mesh type finished in black that permits views from the north and west into the Operations Area through and between tree cover. To the east and south the strategy is to loose mesh and noise attenuation and screen fencing within perimeter woodland areas.

7.7. MANAGEMENT OF EXISTING VEGETATION

7.7.1. There are three areas of existing planting that are identified for retention and long term management as part of the Project and are illustrated in Figure 111. Each area will require specific management prescription to be developed.

7.7.2. All new planting undertaken as part of the LLRS or RRF will be subject to an agreed management plan.

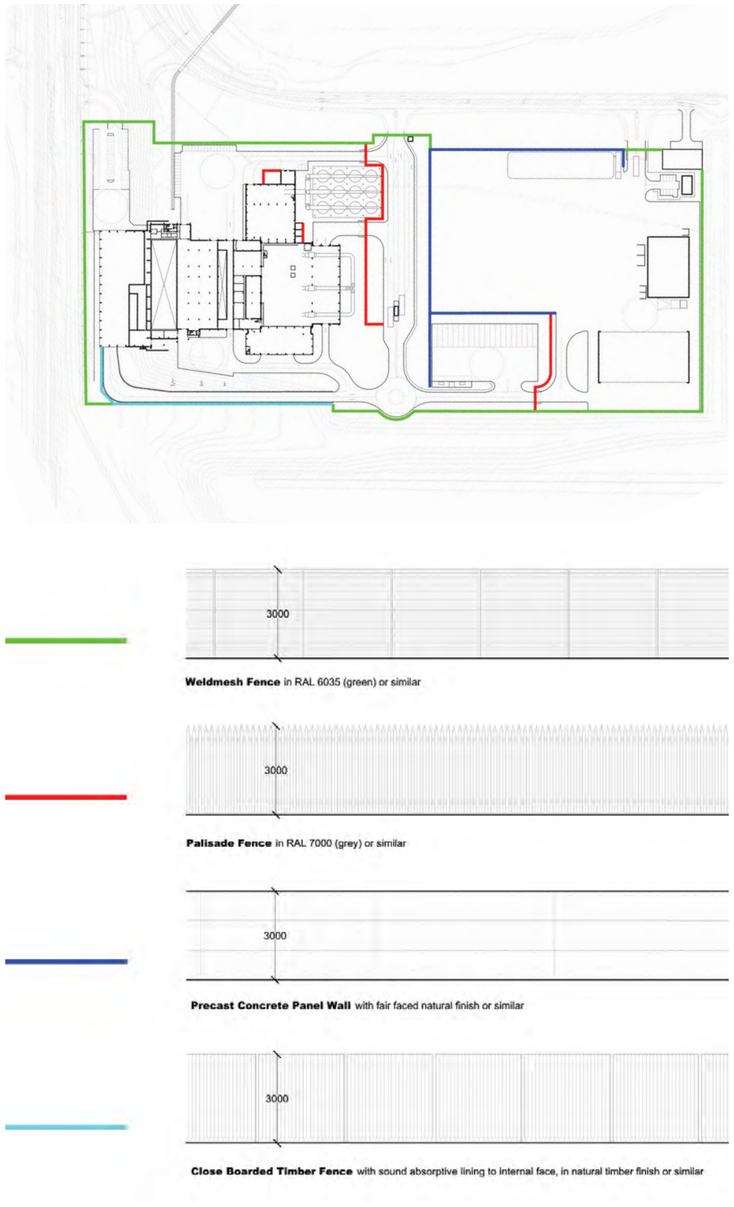
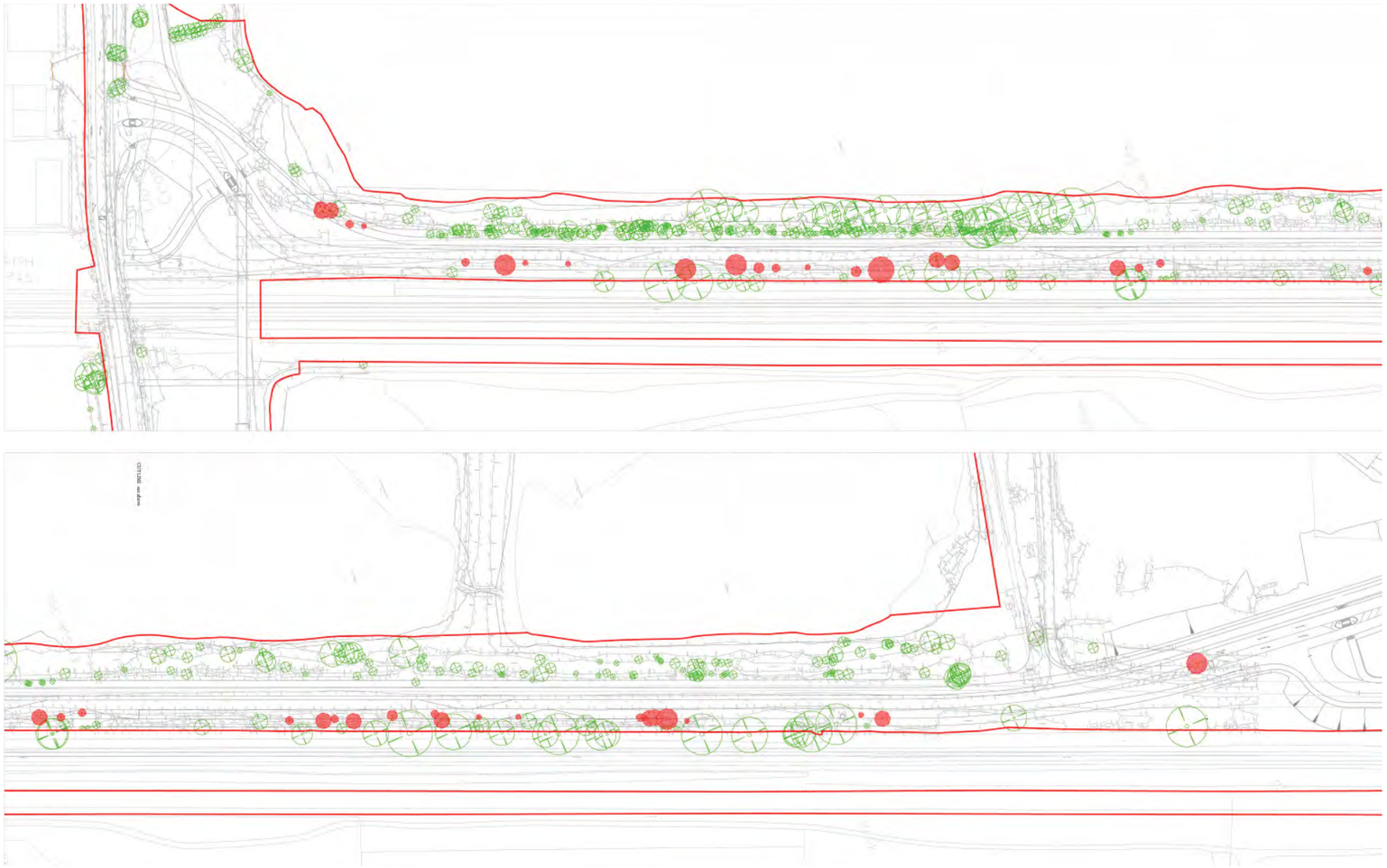


Figure 110: Perimeter Fencing Details

Figure 111: Woodland to be Retained and Managed

7.7.3. Figure 112 illustrates the very limited extent of vegetation to be lost as a result of the RRF which focuses on the vegetation east of the Marston Vale Line. A specific survey has identified vegetation to be lost as a result of the access road. The survey includes consideration of trees within Network Rail's land control.



Legend

Application Site / Order limits

Trees to be retained

Trees to be removed

Figure 112: Trees to be Removed/ Retained

7.8. ECOLOGY STRATEGY

7.8.1. The ecology strategy for the Project positively addresses the habitats and species that are important both within The Rookery Pits and the wider Marston Vale. It seeks to ensure features with a key role in sustaining the movement and dispersal of protected species within and through the wider vale are safeguarded. It does this by enhancing key habitat corridors.

7.8.2. Potential ecological impacts resulting from the construction and operation of the RRF identified in the ES are identified below - in no instance are these habitats lost entirely:

a) Permanent loss of low grade agricultural grassland from the base of Rookery South Pit within the Operations Area;

b) Loss and/or disturbance of semi natural grassland and other vegetation from peripheral areas of the western edge of Rookery South Pit, including along the access road;

c) Loss and/or disturbance to scrub habitats at peripheral areas of the western edge of Rookery South Pit, including along the access road;

d) Permanent loss of bare ground and short ephemeral/short perennial habitats from the western slope of Rookery South Pit;

e) Potential changes to profile and/or location of surface water drainage channels adjacent to the Facility;

f) Lighting effects during the operational phase along access routes and within the RRF; and

g) Changes to air quality and acid/nitrogen deposition at designated sites in the wider area.

7.8.3. Effective mitigation measures have been incorporated into the Project to address the impacts and will be delivered through increasing the overall coverage of tree and scrub cover; by establishing and maintaining grassland; by enhancing the integrity and continuity of habitats including integrating existing fragmented woodland blocks; by extending the wetland habitat; and by ecological interventions in the architectural detailing such as brown roofs and green walls.

Woodland establishment

7.8.4. The woodland planting proposed as part of the Project contributes to and enhances the extent of this key habitat. This has consequent benefits for species that, in the context of the Vale, have a characteristic association with woodland and scrub habitats.

7.8.5. Species of local provenance have been selected and identified above and will be integrated with the phased planting scheme to be delivered by the LLRS.

Continuity of habitat

7.8.6. The pit edges and the dividing ridge are important for dispersal of a number of protected species and species groups associated with The Rookery and the wider Marston Vale.

7.8.7. The proposed planting will not only have important screening effects but will also enhance the connectivity of existing woodland and the new woodland planting provided by the LLRS. This will enhance the ecological functionality of the habitat corridors which are known to be important to commuting routes for bats and badgers and to play a role in the dispersal of great crested newts, reptiles, small mammals and invertebrates through the wider Vale.

Extending wetland habitat

7.8.8. The proposed reprofiling of the LLRS attenuation pond along its southern edge will increase the drawdown zone (area revealed when the water level drops) and vary the depth of the pond margins. These enhancements will diversify the microhabitats within the waterbody and marginal areas and so enhance conditions for great crested newts, stoneworts and invertebrates.

7.8.9. Rookery North will continue to support one of the most expansive single waterbodies in the base of the Marston Vale, with associated reed bed, marginal vegetation, neutral grassland, scrub and woodland habitats all of which will be managed to maximise their nature conservation value.

Brown Roofs and Green Walls

7.8.10. The brown roof areas will be carefully specified with a view to recreating the low nutrient conditions currently offered by the bare ground habitats on the western slope of Rookery South Pit in order to contribute to mitigating for the effects of habitat loss on high value invertebrate assemblages. The green wall system will incorporate nesting boxes for bird and bat species as appropriate.

Meadow Cranesbill

Cowslip

Ox-eye Daisy

Betony

7.9. INTEGRATION OF RIGHTS OF WAY

7.9.1. The landscape strategy promotes the enhancement of the rights of way network to deliver wider GI benefits. This section considers the integration of footpaths and cycleways within the landscape setting. A more detailed account of the rights of way provision is provided in Chapter 6.

7.9.2. A number of principles have been established in respect of rights of way provision which will ensure integration with the landscape setting. These include:

a) Limiting the loss of vegetation as a result of path construction. This is achieved, in part, by utilising (and upgrading) existing footpaths and trackways, and by co-locating pedestrian and cycleways within the western vehicle access corridor to reduce the area of land take;

b) Providing safe access to wetland areas through appropriate routing of paths and installation of boardwalks along the southern edge of the attenuation pond;

c) Ensuring that the ecological resource is not threatened by insensitive routing of footpaths resulting in loss of or disturbance to habitats; and

d) Providing public information and interpretation of at key locations across the footpath network in accordance with relevant accessibility legislation and guidance.

7.10. DESIGN FIX

7.10.1. The landscape strategy for the RRF and approach to landscape integration has been agreed with CBC landscape officers in a meeting of 19 May 2010, the Marston Vale Trust and received positive comment from CABE, which are recorded in the Consultation Report. The detail of the landscape proposals has been developed in the light of this approved strategy and consulted upon where appropriate and coordinated with the LLRS landscape strategy as it has progressed through planning negotiations. As noted within this DAS, there are ongoing discussions with the Marston Vale Trust to finalise landscape proposals in specific locations, namely at the RRF and Country Park entrances on Green Lane; to the south of the attenuation pond; and, within the Country Park.

7.10.2. The rights of way strategy has been explored with the Marston Vale Trust and CBC's rights of way officer who is also coordinating BBC's response. The rights of way strategy for the RRF is illustrated in Figure 97 and described in Chapter 6 presented during consultation has developed over time in response to issues raised but also as Application negotiations by O and H Properties have developed and altered rights of way offered as part of the LLRS. Enhancement to these rights and connection improvements are proposed as part of the Project that have been taken into full account in the design of the RRF permitting the EfW building in particular to be viewed, appreciated and understood in an attractive landscape setting.

8.0 DESIGN DEVELOPMENT: UTILITIES AND SERVICES

8.1. UTILITIES PROVISION

8.1.1. This Chapter provides a description of the utilities and services required to serve the RRF and those utilities that provide for the export of energy from the RRF. Specifically, it refers to electricity import and export, potable water, foul water drainage, and telecoms. It is not proposed to procure a gas supply for the RRF. This Chapter also provides detail on the CHP strategy for the RRF. The utilities and services strategy has been developed by the Covanta engineering team in consultation with the main services providers who have been consulted throughout the design development process.

Combined Services Corridor

8.1.2. All new export / import cables, ducting and pipe work within The Rookery linking the Operations Area with existing networks will be located within a common services corridor in the eastern verge of the proposed access road leading from the RRF to Green Lane, they will then be routed within the existing corridor of existing roads. A combined corridor controls the routing of services through The Rookery and minimises disturbance of the existing landscape and habitats as well as controlling the constraints that such services can place on new planting. Figure 113 shows a typical section through the common services corridor which will accommodate all the necessary infrastructure. The trench will also be capable of accommodating CHP infrastructure.

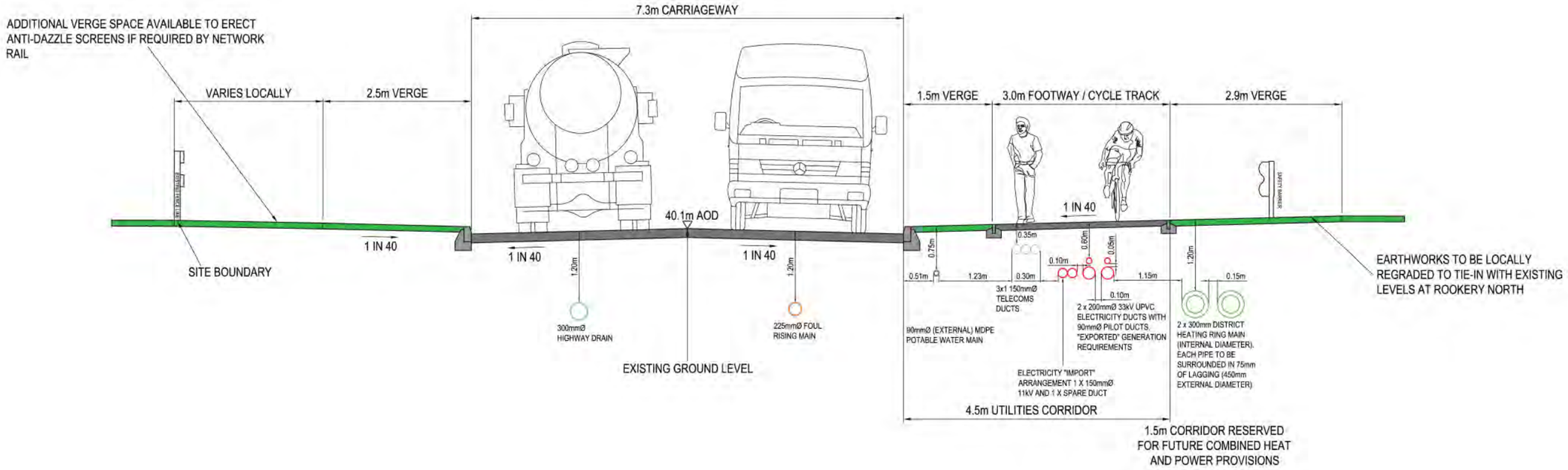


Figure 113: Section Through the Combined Services Corridor

Electricity

8.1.3. The proposed RRF will generate approximately 55MW of electricity for export to EDF Energy's grid network. This export power is the equivalent demand for the Marston Vale and Bedford equating to approximately 82,000 homes. Consultation with EDF Energy has confirmed the point of connection into the new Marston Grid 132KV/33KV substation, currently under construction on the north side of the A421 to the west, illustrated in Figure 114.

8.1.4. Approximately 2.8km of underground 33kV electricity cable will be installed along Green Lane from the RRF into the new Marston Grid Substation to export the generated electricity. The indicative location of the proposed cabling is illustrated on Figure 114.

8.1.5. In addition to the export of electricity, the RRF will need the ability to import electricity during construction and this will be provided by temporary 11KV power supply or through on site diesel generators. And also during operation and maintenance periods, when the electricity grid is not available and/or the EfW Turbine generator is unavailable.

8.1.6. Consultation with EDF Energy has identified that the proposed RRF can be supplied from the existing Marston Road 33kV/11kV Primary substation (PSS), situated at the junction of the A421 and Green Lane to the northwest of the site. The proposed RRF will be supplied by an 11kV underground cable, approximately 2.7km long installed along Green Lane, from the PSS.

8.1.7. The existing PSS currently has insufficient capacity and a transformer upgrade will be required as part of the new supply infrastructure requirements.

8.1.8. During the construction period a temporary 11kV incoming power supply cable will be required, or a lower voltage power supply using diesel generators.

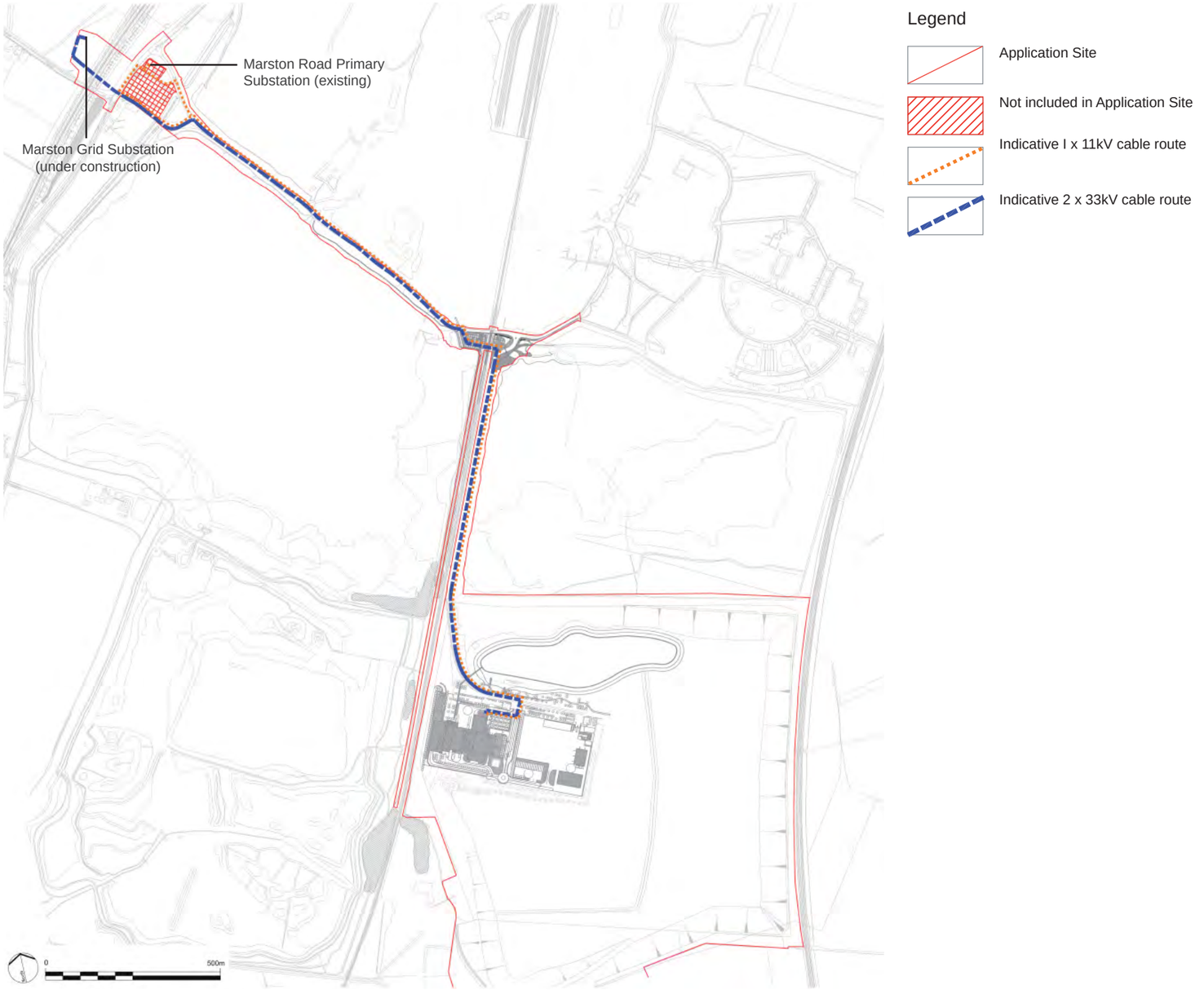


Figure 114: Proposed Grid Connection

Potable Water

8.1.9. Water is required for a number of purposes within the plant such as domestic, boiler water make-up, the fire water system and storage, plus other process requirements such as bottom ash quenching. A dry flue gas treatment system will be used in the EfW process. This system uses very little water compared to the alternative semi dry system and therefore, will reduce the overall RRF water requirements. Rain water harvesting will be employed, whereby rain water from the main building roofs, will be collected in a storage tank, some of which will be pumped to a dirty water process tank for use in the bottom ash quench. The water required for quenching the bottom ash will be approximately 40% of the overall RRF water requirements. Thus this is the potential towns water savings by utilising these water conservation techniques.

8.1.10. The overall water requirement for the RRF will be of the order of 170m3/day (2 litres/sec). The overall water requirement can be met by the existing system, supplied by Anglian Water Services Ltd (AWS) if existing capacity is not consumed by other projects.

Foul Water Drainage

8.1.11. Foul water drainage in the Bedfordshire area is maintained by AWS. There are no foul water sewers located within or adjacent to Rookery South. The nearest public sewer is located within Stewartby Way, Stewartby, to the north of Rookery North.

8.1.12. The location of the RRF within Rookery South is such that foul water drainage would need to be pumped to the nearest public sewer within Stewartby Way. The indicative route for this connection is illustrated in Figure 115

8.1.13. The EfW and MRF sites will each be drained by separate gravity foul water drainage systems. Domestic foul water generated by the EfW, and both domestic foul water and trade effluent from the MRF will be discharged to a foul water pumping station located to the northeast of the RRF site. Foul water will then be pumped from Rookery South to an existing public sewer in Stewartby Way, which eventually discharges to the existing Stewartby Sewage Treatment Works.

8.1.14. Anglian Water have confirmed that the EfW and MRF facilities will be classed as two separate curtilages. On this basis the foul water pumping station and associated rising main will be constructed to adoptable standards and brought forward for adoption by the incumbent drainage undertaker Anglian Water (AW).

8.1.15. The RRF foul water drainage strategy will comprise the following:

a) A private gravity foul water sewer network within the RRF out-falling to a foul water pumping station; and

b) A rising main land within the verge of the access road, along Green Lane with an outfall to the existing public sewer within Stewartby Way.

8.1.16. Anglian Water has been consulted throughout the development of the above foul water drainage strategy. Discussions are currently ongoing with AW with respect to the potential future upgrade of foul water sewerage infrastructure in Stewartby as result of other consented development. It is understood that AW will provide sufficient foul water sewage infrastructure to accommodate both domestic and trade effluent flows from the RRF through either upgrade of the existing Stewartby Sewage Treatment Works or pumping to an alternative Sewage Treatment Works.

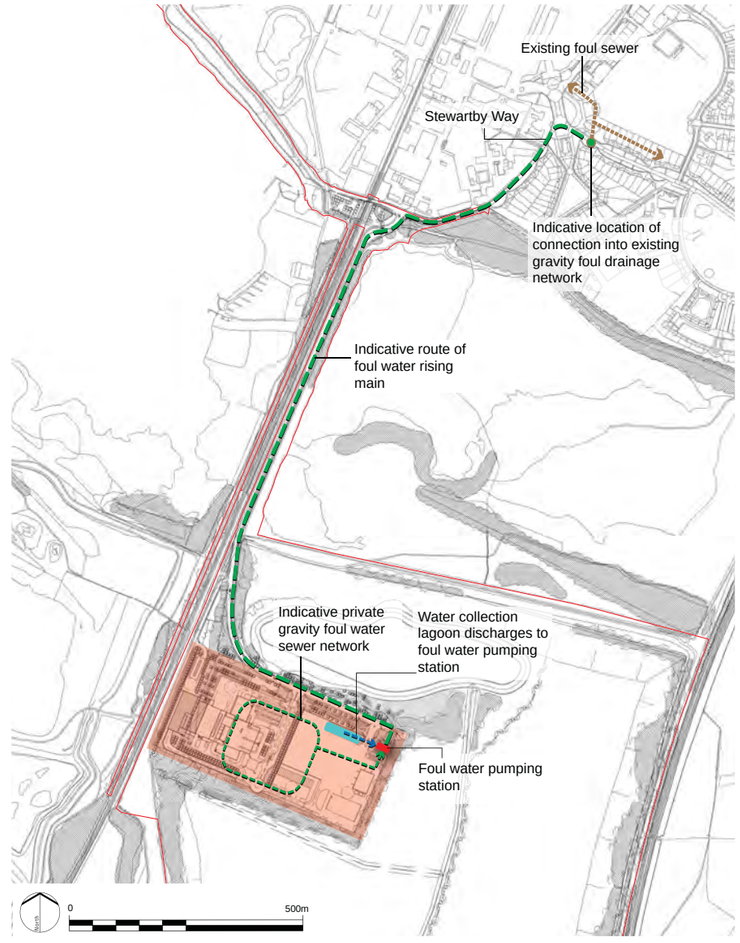


Figure 115: Indicative Foul Water Drainage Route

Telecoms

8.1.17. There are existing BT cables which run along Green Lane from Stewartby to the east, past the Green Lane access, to the west towards Stewartby Lake Sailing Club and the A421. BT Openreach has confirmed that infrastructure within the area to serve the proposed RRF.

Combined Heat and Power

8.1.18. The EfW Facility is being designed such that future CHP infrastructure can be brought online without major alteration to the Facility. Figure 116 illustrates the indicative primary network routes for CHP and the potential end users.

8.1.19. The CHP Strategy for the Project is included within the IPC submission. This strategy forms the starting point for the delivery of CHP as part of The Rookery South RRF. Consultation, the identification, and the development, of partnerships with potential heat users are ongoing and iterative processes that will continue throughout the development and delivery of the Project.

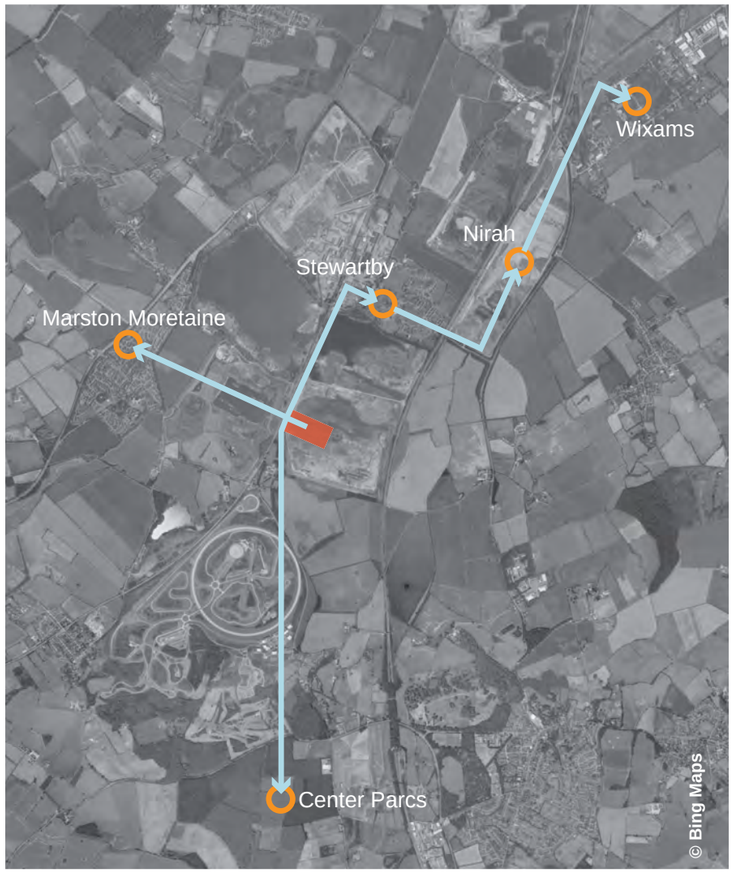


Figure 116: Indicative CHP Network Route

9.0 DESIGN DEVELOPMENT: LIGHTING STRATEGY

9.1. DESCRIPTION OF THE PROPOSAL

9.1.1. A purpose-designed external lighting scheme is proposed for the RRF to provide adequate illumination for safe operation whilst limiting the impact of lighting on local receptors. The effect of lighting was raised on a number of occasions during consultation with the public and statutory consultees, who are aware that the RRF is essentially a 24 hour operation.

9.1.2. Clear definition of working hours involving traffic and staff movements has been provided to inform the lighting design and the assessment of its effects in the ES and is also detailed in Chapter 4 of this DAS as part of the operational description.

9.1.3. A lighting strategy has been developed with Covanta's operations team and is illustrated as a strategy diagram in Figure 117. Initial lighting design proposals have been developed from this strategy to inform the assessment of lighting effects in the ES and the production of night time montages agreed during consultation. The lighting proposals will be subject to further refinement as detailed design of the RRF progresses. Figure 119 illustrates the height of lighting columns within The Rookery South pit relative to surrounding ground levels and proposed buildings, bunding and planting.

9.1.4. Lighting within the Operations Area has been zoned to focus the required lighting for specific tasks and functions outlined as follows:

a) Internal Site Access Roads;

b) Staff/Visitor Car Parking;

c) Lorry Parking;

d) IBA Processing Yard;

e) Tipping Hall Ramp;

f) Building Perimeter security and access for pedestrians;

g) Weigh Bridge Area; and

h) Other separate units, e.g. air cooled condensers, transformer yard, foul water pump house and MRF staff/administration block.

9.1.5. The lighting of the Operations Area will be lit by column lighting with full cut off lantern fittings. The Operations Area will be lit during the hours of darkness and operate on a time clock. The MRF zone will be lit during the hours of darkness up to 6pm only. The proposed column height will vary across the area. The general height ranges in zones from 6m to 8m with a small area of 8m to 10m column lighting. Lighting of the ramp to the tipping hall would be side lit with low level barrier mounted fittings.

9.1.6. The flue stack will be illuminated with obstruction lights which have been agreed in consultation with the CAA and Cranfield Airport. The proposals provide for a single static medium intensity light to towards the top of the stack likely to be on the east side of the stack and a second obstruction light not more than 52m down from the top light – a position 30.6m down from the top light has been suggested. The mid level lights will face west towards Cranfield and the other light will face east.

9.1.7. In order to minimise the impact of lighting, the lighting strategy has been designed, in accordance with the Institute of Lighting Engineers' Guidance Note for the reduction of obtrusive lighting GN01 (2005), the lighting and illumination impacts of the Project are designed to comply with Environment Zone E2 (low district brightness within rural/small village locations). Whilst providing adequate illuminance for the various tasks which occur on the development, the lighting strategy is proposed to minimise local effects. Where operational activity does not require full illumination during the hours of darkness this has also been taken into account. The main areas of control on lighting and the key mitigation features embodied in the lighting design are summarised below. The strategy seeks to reduce lighting effects through a number of specific measures including:

a) No illumination of the main access road extending alongside Rookery North pit with upgraded illumination provided at the proposed access road junction with Green Lane and within the Operations Area;

b) Control of column height within the Operations Area to lie below the surrounding ground levels; and

c) No lighting to the elevations of the building with the datum level generally operating as the control line for operational access into the building

d) Target lighting levels for the site are set according to the local Health and Safety requirements, but one kept to a minimum to limit the effects of reflected upward light.

9.1.8. All lighting equipment will utilise flat glass luminaires, set horizontally, to eliminate any direct upward light and maximise control of spill light. Further for areas of the site not used operationally throughout the night, the opportunity will be taken to use dim fittings or switch off lighting not required for health and safety purposes.

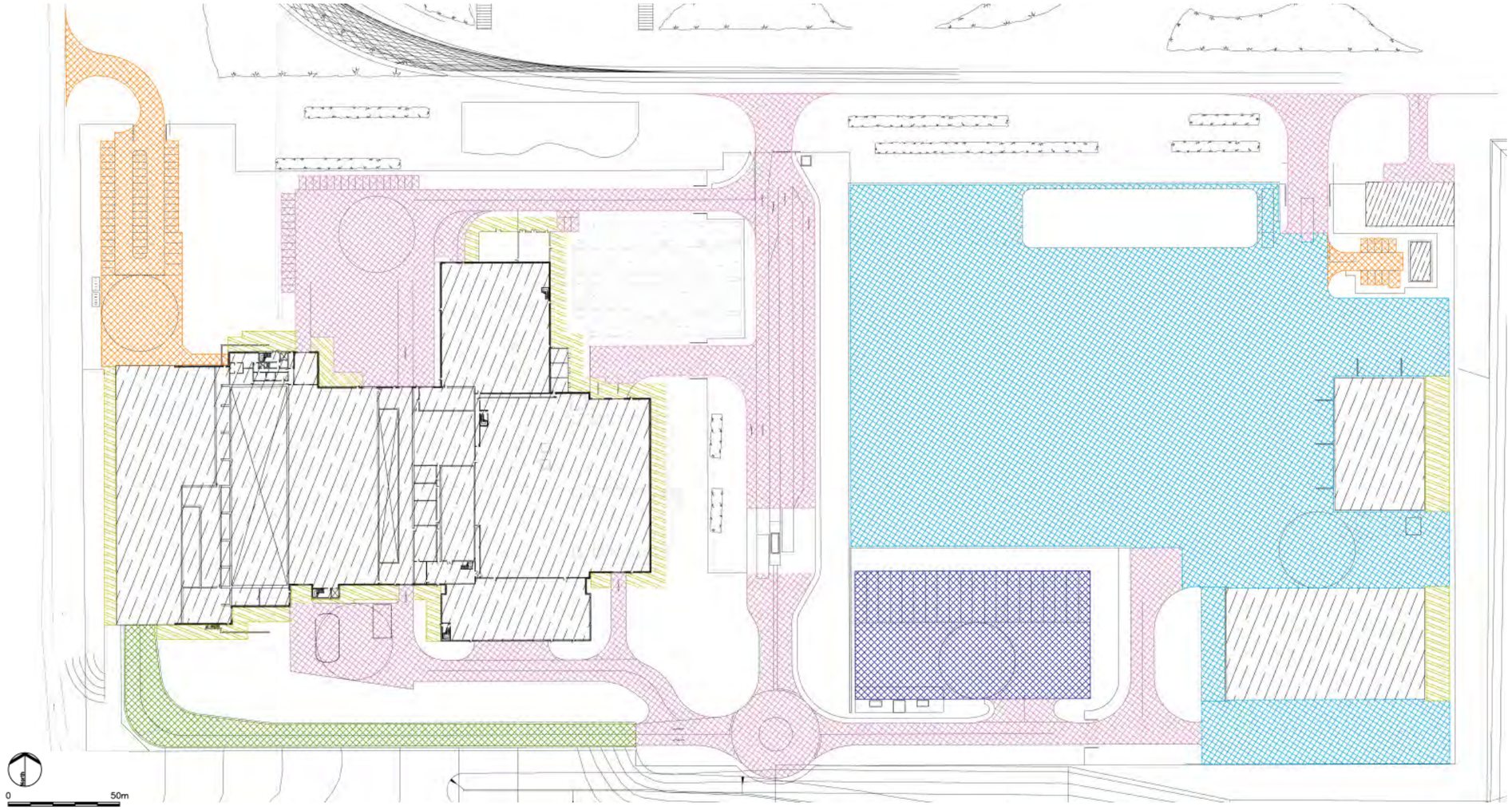
9.1.9. Key areas of operational control comprise:

a) Side lighting to the tipping hall access ramp avoiding tall column lighting as the ramp emerges from the pit floor;

b) Lighting within the MRF controlled to be extinguished out of working hours; and

c) Service access lighting to key plant activated on use only including lighting access to the condenser units and flue stack.

9.1.10. The development of a controlled lighting environment reduces the effects of lighting in the landscape during the hours of darkness to a minimum. The effects are demonstrated in the montages prepared for the ES which are illustrated in Figures 120 and 121. The strategy controls both point source light and upward light spill, measures which seek to sustain the known use of The Rookery Pits by valued nocturnal species/species groups, including bats, badgers, invertebrates and occasionally otter.



Legend

IBA Processing

Preliminary Specification: Utilising flat glass floodlighting mounted on 8m columns - BS EN 12464-2:2007. Average maintained illuminance. 20 Lux Floodlights to be provided to the perimeter of the yard.

Ramp Lighting

Preliminary Specification: Based upon utilising low level barrier mounted lighting - BS EN 12464-2:2007. Average illuminance 20 Lux with uniformity of 40%. Luminaires to be mounted on underside of ramp barriers.

Access Road

Preliminary Specification: Utilising 6-8m (h) lighting columns to provide road lighting to BS EN 13201-2:2003 to comply with Rural Areas and Environmental Zone E2. Lighting classes to be S3 - average 7.5 Lux with 1.5 Lux minimum. Conflict areas (roundabout and turning circle to be CE5 - average 7.5 Lux with uniformity of 40%).

Car Parks

Preliminary Specification: Based upon utilising 5-6m (h) lighting columns c/w amenity lanterns/ luminaires - BS EN 12464-2:2007. Average maintained illuminance5 Lux based upon light traffic. Uniformity -25% of average illuminance.

Lorry Parks

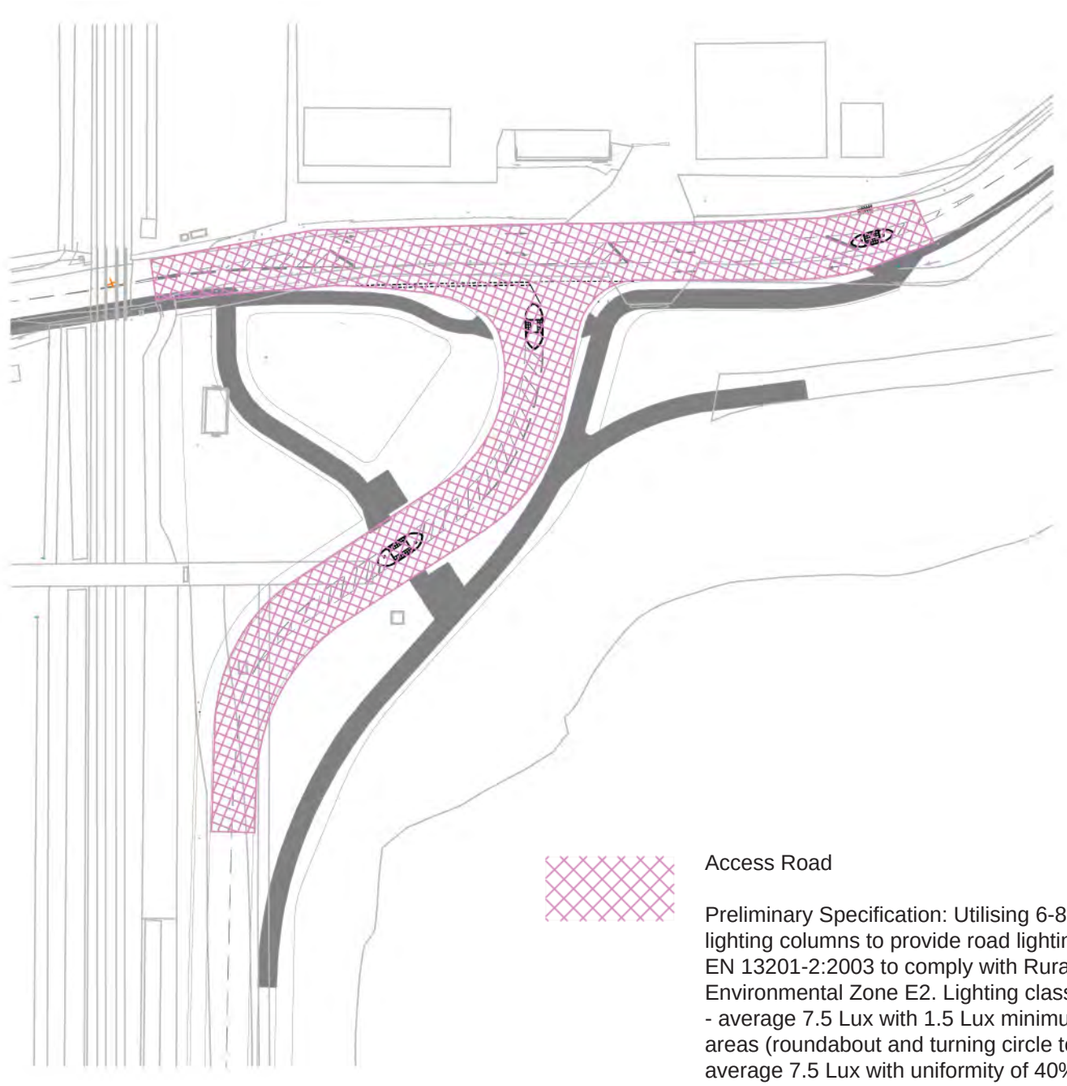
Preliminary Specification: Based upon utilising 8-10m (h) lighting columns to provide lighting to CIBSE LG6 (outdoor environment). Average maintained illuminance of 20Lux average with 5 Lux minimum. This is based upon Lorry Park being classified as ‘Low Risk’.

Building Perimeter

Preliminary Specification: Based upon utilising building mounted luminaires to provide adequate security / pedestrian lighting to CIBSE LG6 (outdoor environment). Average maintained illuminance of 5 Lux average with 1 Lux minimum.

Figure 117: Lighting Layout and Strategy, Operations Area

9.1.11. Lighting outside the Operations Area has been limited to the enhancement of lighting within the vicinity of the new junction with Green Lane and to encompass level crossing lighting requirements, and is illustrated in Figure 118. The column lighting will be 6 – 8 m high. The access road will not be lit.



Access Road

Preliminary Specification: Utilising 6-8m (h) lighting columns to provide road lighting to BS EN 13201-2:2003 to comply with Rural Areas and Environmental Zone E2. Lighting classes to be S3 - average 7.5 Lux with 1.5 Lux minimum. Conflict areas (roundabout and turning circle to be CE5 - average 7.5 Lux with uniformity of 40%).

Figure 118: Lighting Strategy, Green Lane Entrance

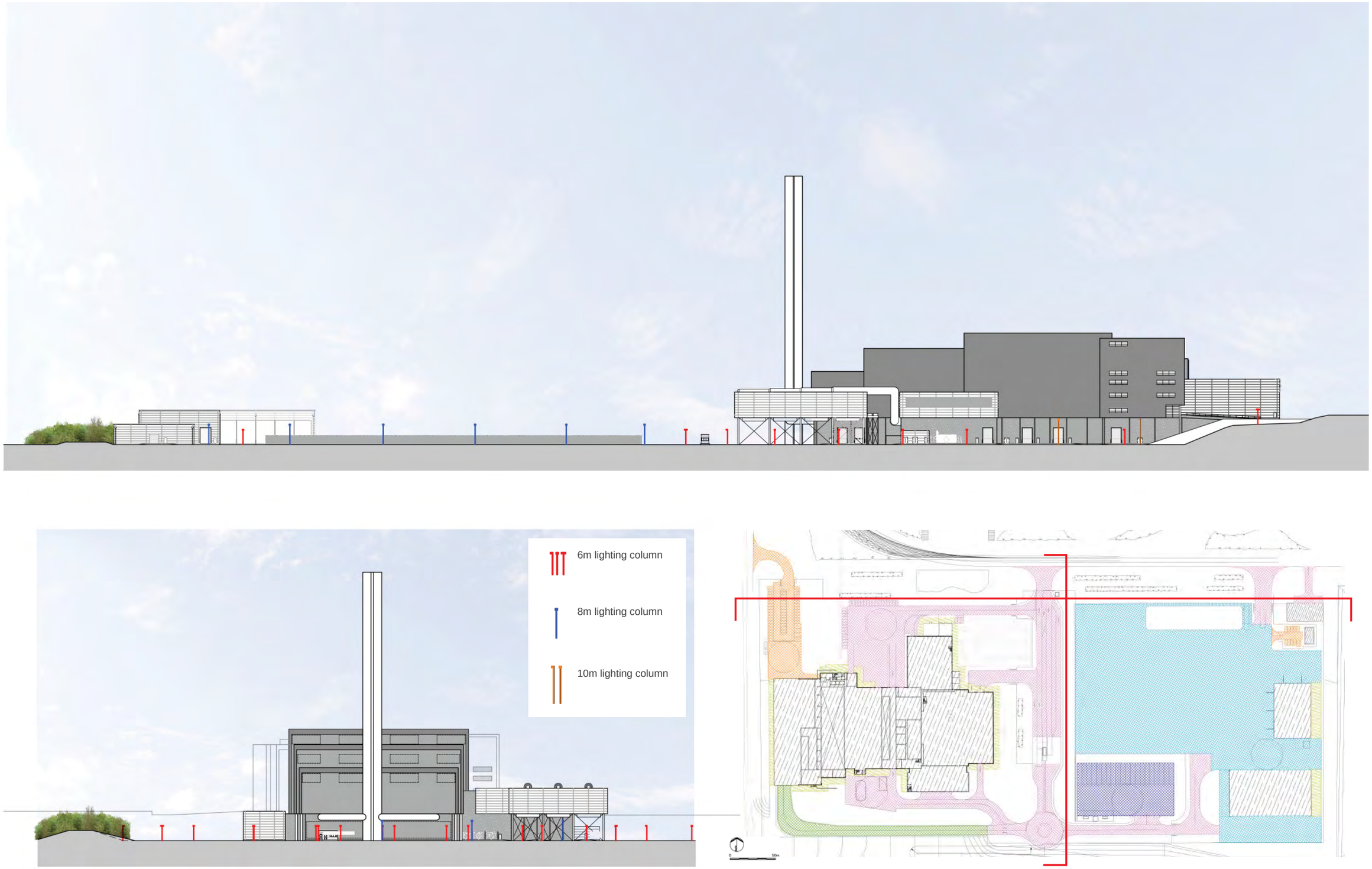


Figure 119: Relative Height of Lighting Columns

Figure 120: Night time photomontage from Katherine's Cross, Ampthill Park

Figure 121: Rendered lighting model

10.0 DESIGN DEVELOPMENT: HYDROLOGY AND LAND DRAINAGE

10.1. OVERVIEW

10.1.1. The Rookery North and South Pits represent a disturbed landscape where the natural ground has been interrupted by mineral workings. These works have altered the hydrology of the land area and its pattern of drainage. The existing pattern is described in Chapter 2 of this DAS and in further detail in the ES.

10.1.2. The drainage strategy for the LLRS has been agreed with the EA and the Bedfordshire and River Ivel Internal Drainage Board and the design of the RRF strategy consulted upon throughout the design process and formed an important part of the design process.

10.2. LLRS DRAINAGE STRATEGY

10.2.1. As outlined in Chapter 2, the LLRS drainage strategy will have been implemented (or be in the course of implementation) prior to construction of the RRF. The LLRS drainage strategy provides the baseline for the development of the RRF drainage strategy. Embodied in the LLRS are works that:

1) safeguard Rookery South Pit against flood risk arising from the Mill Brook; and

2) intercept, store and control surface water run-off such that the rate of discharge to the receiving watercourse is maintained at existing levels.

10.3. FLOOD RISK

10.3.1. Flood risk to the Project is solely associated with Mill Brook. The nature of flood risk associated with Mill Brook has been assessed using a hydraulic model. The hydraulic model provides a series of design flood levels for the 1 in 100 year and 1 in 100 year plus climate change events. The modelling analysis suggests that floodwater may spill into the south east corner of Rookery South during the 1 in 100 year event.

10.3.2. However, the proposed landform associated with the LLRS is such that (i) the Operations Area of the RRF is elevated above existing levels and (ii) any floodwater spill will be intercepted and routed to the attenuation pond. The Operations Area will not be affected by flooding associated with either the 1 in 100 year or 1 in 100 year plus climate change events. On this basis, the Operations Area will be classified as Flood Zone 2 within the context of Annex D, Table D.1 of PPS25.

10.4. RRF DRAINAGE PROPOSALS

10.4.1. Additional drainage infrastructure will be required to capture surface water run off arising from the RRF and convey it to the attenuation pond constructed as part of the LLRS. The proposed drainage scheme is shown on Figure 122 and summarised below:

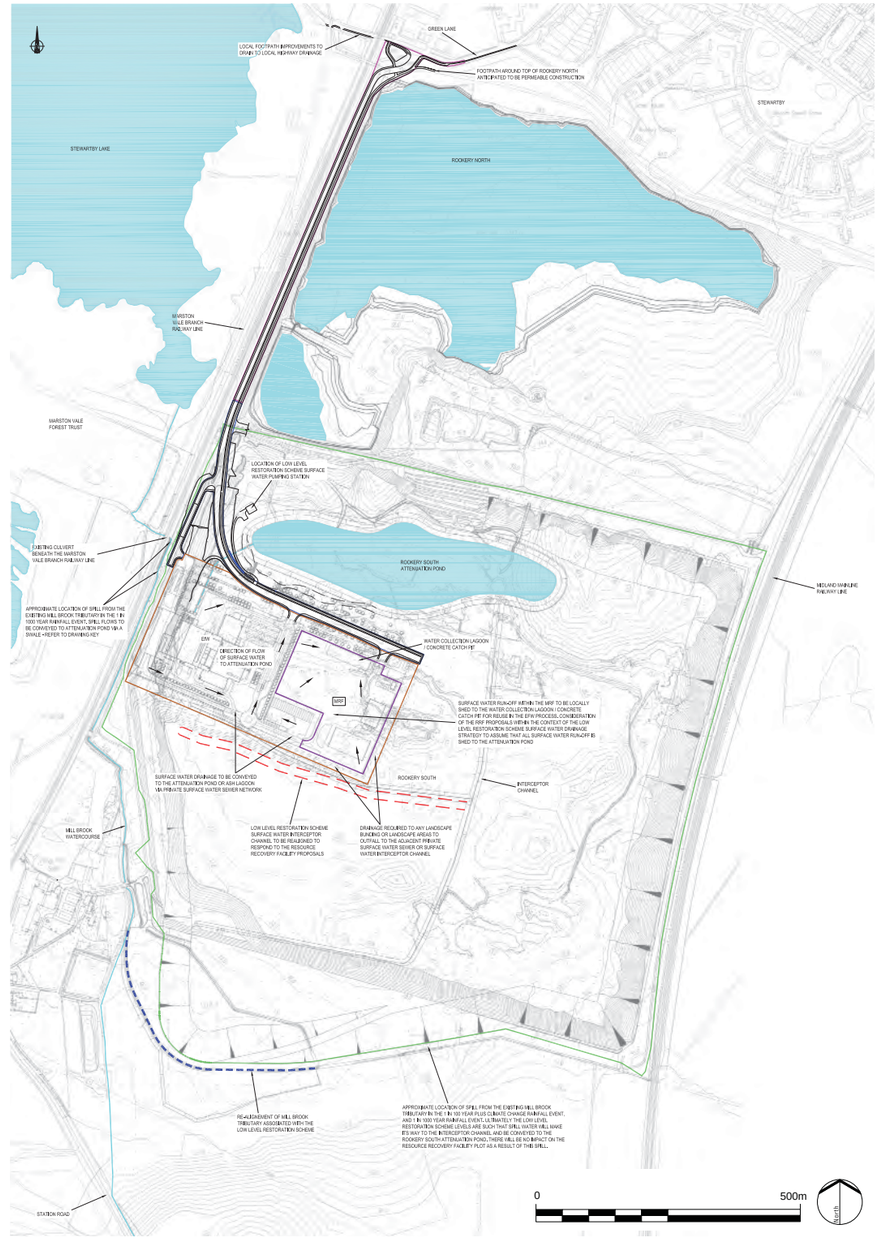


Figure 122: Drainage Strategy

a) Surface water run-off from the EfW Facility and surrounding service yards, car parks, and internal highways will be conveyed by a private gravity surface water drainage network and will outfall to the surface water attenuation pond. The gravity surface water drainage system will be designed to accord with the requirements of the Building Regulations and BS EN 752. Surface water run-off which may mobilise as overland flows during peak rainfall events will be conveyed via the on-site car parks and roads and the main access road (within the base of the pit) to the LLRS surface water attenuation pond. Levels associated with the on-site car parks and roads, and the main access road, will be designed accordingly as part of the detailed design.

b) All requirements for surface water attenuation storage will be provided by the attenuation pond. A wetland water feature will be provided within the northeast corner of the EfW Facility and will have a connection to the surface water drainage system.

c) The southern bank of the attenuation pond will be reprofiled as part of the RRF for habitat enhancement and landscape design reasons without any detrimental impact on the surface water drainage strategy, and will in effect increase the storage volume within the attenuation pond.

d) In respect of the MRF, the yard will be set to fall towards a concrete catch-pit and an open tank arrangement, referred to as the water collection lagoon. The water collection lagoon is located along the northern boundary of the MRF. Surface water run-off from the aggregate storage yard will be conveyed through overland flows to the water collection lagoon, and discharged as trade effluent to the foul water drain.

e) The majority of surface water run-off which collects within the water collection lagoon will be pumped back to the grey water storage tank within the EfW Facility for use in the EfW process. For the purposes of assessing the impact of the RRF proposals on the LLRS surface water drainage strategy, it is assumed that all impermeable area associated with the MRF will shed run-off to the surface water attenuation pond.

f) Surface water drainage from the access road from Green Lane will be conveyed via a gravity highway drainage network and will outfall to the surface water attenuation pond. Highway drainage will be designed to the additional requirements of the Design Manual for Roads and Bridges.

g) Surface water run-off which may mobilise as overland flows during peak rainfall events will be conveyed within the highway cross-section to either the surface water attenuation pond, or to the additional waterbody within the Operations Area.

h) The surface water interceptor channel located on the southern boundary of the Operations Area will be locally realigned from that proposed in the LLRS to accommodate the proposed Operations Area Layout. This minor realignment will have no detrimental impact upon the LLRS surface water drainage strategy.

i) Any toe of bank drainage associated with landscape bunds or landscape areas will be designed in accordance with the Design Manual for Roads and Bridges (as a source of best practice guidance), and will outfall into the adjacent private surface water sewer or surface water interceptor channel.

j) The Operations Area drainage strategy will include the use of pen stocks in gullies to control the escape of potential contaminants. This is likely to be required in the event of a fire where significant volumes of water (used to control fire) will inundate the Operations Area.

10.4.2. The RRF is located within a clay pit that lies in close proximity to a watercourse and modelling analysis indicates that floodwater may discharge from the watercourse and into the pit during the 1 in 100 year event.

10.4.3. In view of both the nature and location of the development, the implications of severe/extreme flood conditions should be considered so that measures to safeguard the development can be incorporated into the site layout/scheme design.

10.4.4. During the 1 in 1,000 year event, modelling analysis indicates that floodwater may discharge from the upper reach of the Mill Brook tributary. The analysis also indicates that floodwater would discharge over the eastern bank of the Mill Brook immediately upstream of the culvert beneath the Marston Railway Line.

10.4.5. Floodwater discharge over the east bank immediately upstream of the railway will be routed to the north along the highway access and to the east into the car-parking area. Through appropriate design of the car-park, floodwater will be routed east, via the earthworks embankment, to a swale/ditch. The swale/ditch will convey floodwater north to the surface water attenuation pond via a culvert beneath the highway access road.

10.4.6. Overland floodwater routing has been assessed using the Microdrainage (WinDes) FloodFlow software. This analysis indicates that

a) flood depths along the highway and in the vicinity of the car-park are generally in the order of 50-150mm; and

b) flood flow velocities along the highway and in the vicinity of the car-park are generally in the order of 0.1-0.3 metres per second.

10.4.7. On this basis, and within the context of Table 13.1 of Defra/ Environment Agency R&D Technical Report FD2320/TR2 (Flood Risk Assessment Guidance for New Development) overland flood flow associated with the 1 in 1,000 year event presents a “very low hazard” and would not compromise access by either vehicles or pedestrians.

10.4.8. With respect to the proposed Green Lane access and the associated widening of Green Lane, it is envisaged that the small increase in impermeable area within Green Lane will be addressed by the provision of additional trapped gullies which would outfall to the existing below ground highway drainage provision within Green Lane. The upgrading of the Green Lane Level Crossing, and widening to provide enhance pedestrian crossing facilities, may require the existing highway drainage which passes under the existing Level Crossing to be aligned to accommodate full barrier crossing infrastructure.

10.4.9. Drainage from the access road from Green Lane and to the west of Rookery North will be conveyed via a gravity highway drainage network and will outfall to the surface water attenuation pond. Highway drainage will be designed to the will be additional existing highway drainage will be modified to addition to the requirements of the Design Manual for Roads and Bridges.

10.4.10. The water collection lagoon will be provided along the northern boundary of the aggregate storage yard. It will be a straight sided concrete tank, measuring approximately 80m x 20m x 3m, approximately 1590m2 in plan area. Final levels across the aggregate yard will be developed as part of the detailed design process.

Rainwater Harvesting

10.4.11. The Project will employ rainwater harvesting to minimise the overall amount of towns water used on daily basis by the RRF. The anticipated quantity of water collected throughout the year an average year in the water collection lagoon is anticipated to be 18,815m3 and will discharge water to the waste process water tank. When full and if necessary this will over flow into the foul sewer. The EfW Facility will have a capacity to store 825m3 of harvested rainwater. There are two principal systems to collect, store and discharge rainwater. See Figure 123.

a) Rainfall within the MRF (aggregate storage and processing area) will be captured in a water collection lagoon, and pumped back to the process of dirty water storage tank located within the EfW Facility, and will be used to quench the bottom ash as it discharges from the grate. This quench water acts as dust suspension and cools ash.

b) There will be a rain water storage tank located under the tipping hall, which will store water collected from the main plant building roofs. This water will be used to irrigate green walls and brown roofs and also be pumped to the dirty water storage tank located in the EfW building where it will be used for quenching the ash.

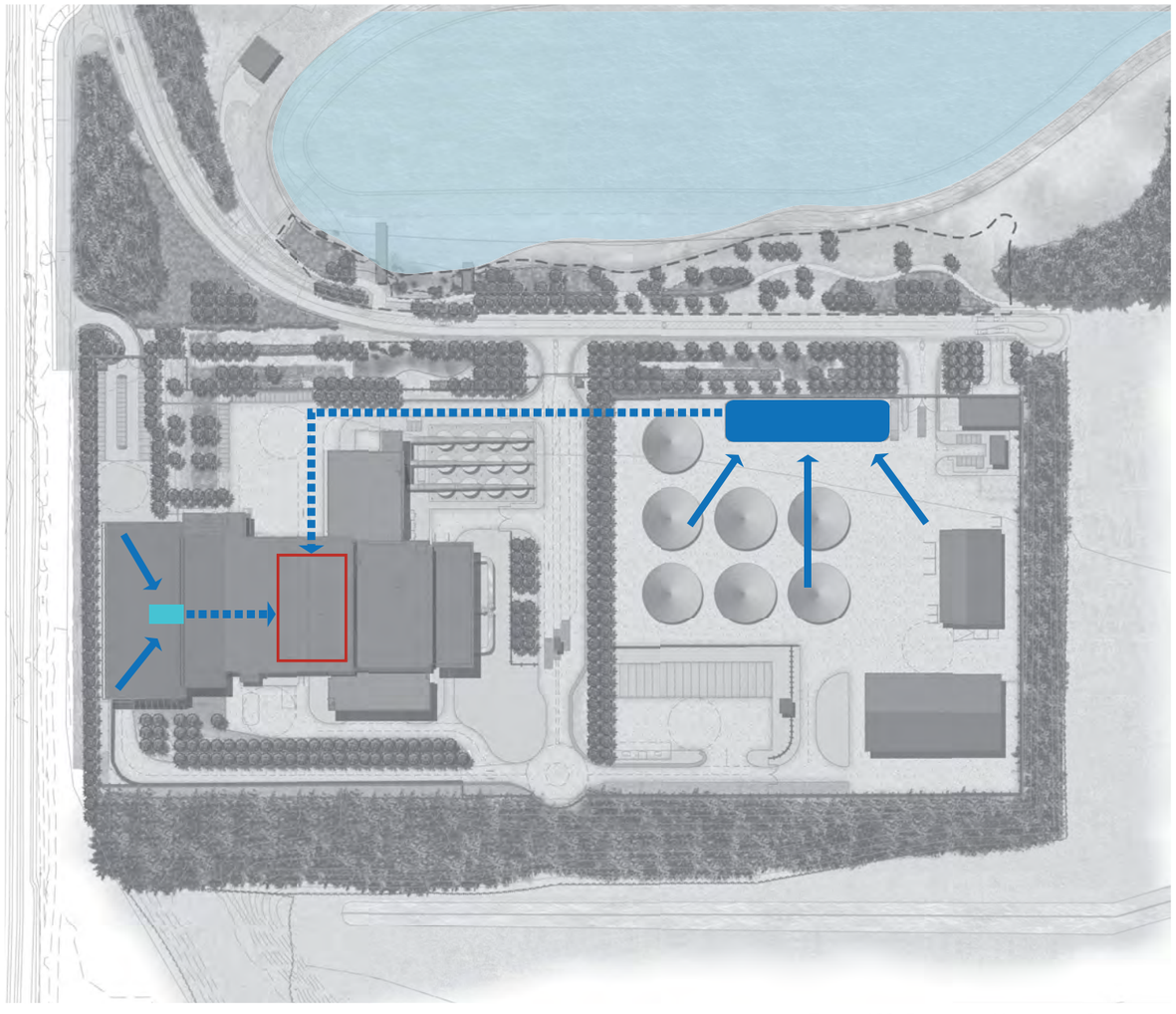


Figure 123: Rainwater Harvesting Schematic

10.4.12. The ash quench water equates to approximately 40% of the overall site water requirements emphasising the importance of rain water harvesting.

10.4.13. Fire Fighting water will be drawn from a storage tank to be located under the tipping hall. This tank will be filled with rainwater and replenished using mains water as required.

Effects of ground water and flooding and related matters on Operations Area level and EfW building finished floor level

10.4.14. Covanta considered lowering the building during the design iteration process as a result of consultation with the public, CLP, EH, the Forest Trust and CBC. This exercise reviewed the following:

a) The flood risk assessment;

b) Ground water conditions;

c) Surface water drainage;

d) Geotechnical conditions;

e) Topography;

f) The operations of the plant;

g) The layout of the plant and access roads;

h) The extent of the civil and structural works required to achieve this;

i) The capital expenditure;

j) The impact on the Project programme; and

k) The Environment Agencies considerations.

10.4.15. The report set out a number of solutions and impacts for consideration in determining the feasibility of lowering of the building. The report concluded that whist lowering of the EfW Facility below the proposed ground level was technically feasible, there were a number of issues that have to be considered. Covanta's conclusion was that the EfW building should not be lowered below the current ground level. The report concluded the following:

a) Following the completion of the Flood Risk Assessment it was determined that the position the EfW building zero level should be located above the finished ROMP level to prevent risk of flood. The lowering of the building by 4.00 m would negate these flood mitigation measures;

b) The increased risk of residual flooding resulting from lowering of the building by 4.00m would compromise the safety of the personnel in the building and compromise the operation of the EfW Facility and is therefore unacceptable;

c) Lowering of the building in an area with high water table would place significant hydraulic pressure on the structure, which will require special design consideration. The water pressure and potential movement of water may affect the sub structure and drainage system and therefore could create additional operational and maintenance problems; and

d) The EA have concerns regarding the disturbance of sub aquifers and cross contamination of these water courses.

10.4.16. Covanta consider that lowering of the building by 4m at this particular site where the water table levels are high and the risk of flooding is greater than other sites, is unacceptable. Covanta's objective during design is to remove or reduce risk, not to design in risk. In addition, the increased cost and the impact on the programme is also unacceptable.

11.0 CLIMATE CHANGE

11.1. INTRODUCTION

The IPC Scoping Opinion, issued in respect of the proposed EIA for the project, has highlighted the need to take account of climate change with specific reference to relevant National Policy Statements (NPS) and to deal with these within individual topic chapters within the ES. In addition recent guidance from DCLG recommends the inclusion of information on how the design of a project has taken into account climate change and adaptation.

Planning Context

11.1.1. The following NPS have been reviewed as part of this approach:

a) Overarching NPS on Energy (EN-1). This Statement sets out how applicants should demonstrate that they have considered and planned for the impacts of climate change (i.e. design, build, operation and decommissioning of the infrastructure) and how the IPC should determine whether the applicant has properly taken account of future long-term impacts of climate change, and

b) The NPS on Renewable Energy (EN-3) requires that applicants set out how a proposal will be resilient to the effects of higher temperatures, increased flood risk and increased drought.

11.1.2. EN-1 requires applicants to take into account the effects of climate change when developing infrastructure. It states that the effects of climate change are likely to mean that:

"....the UK will experience hotter, drier summers and warmer, wetter winters. There is a likelihood of increased flooding, drought, heat waves, intense rainfall events and other extreme events such as storms, as well as rising sea levels".

11.1.3. Mitigation and adaptation is therefore necessary to deal with the potential impacts of these changes. This chapter describes the approach taken to address climate change in both the design and layout of the Project.

Flood Risk and Hydrology

11.1.4. The drainage strategy for the Project is founded on the strategic drainage proposal for the LLRS designed for The Rookery South Pit. The Project includes the provision of drainage channels that feed into a proposed attenuation pond in the north west corner of South Pit and a general restoration profile that drains the pit floor to the north west in the vicinity of the attenuation pond permitting any piped drainage from the Operations Area to be fed into the attenuation pond. The design has included an allowance to cater for (i) additional floodwater discharge from the Mill Brook tributary and (ii) additional surface water run-off from within the pit itself which may result from climate change.

Land and Water Quality

11.1.5. The potential impacts on land and water quality resulting from climate change have been assessed to be relatively minor. No significant alterations to the design and layout of the RRF have therefore been made in response to climate change. It is recognised, however, that ongoing design of all infrastructure that interacts with both soils and waters will be undertaken following industry standards and guidelines, which include appropriate factors of safety to ensure that design is suitable and conservative where necessary.

Building design

11.1.6. The proposed EfW Facility forms the principal building of the RRF. The building incorporates a number of elements that assist in addressing climate change. These elements comprise the following:

a) **Natural ventilation** - the building is naturally ventilated employing louvered panels on the east and west elevations to cool the plant, minimising the need for assisted cooling and unnecessary energy consumption;

b) **Natural Lighting** – where possible natural day lighting is used employing louvered panels in the east and west elevations to assist in lighting the operational plant areas with the main administration area located on the outside north face of the building permitting day lit office space to be provided and avoiding over heating through solar gain. In addition the roof mounted smoke vents can be translucent to allow natural light to be provided to operational areas where practical and beneficial to staff use;

c) **Insulation** – the building envelope largely insulated as a means of condensation control, and will perform beyond the requirements of the Building Regulations. The use of built up cladding allows the insulation to be upgraded or altered during the lifetime of the building in response to technological advances (such as improved residual heat recovery), and to make the envelope easier to recycle on demolition. In a built up cladding solution the insulants are likely to be mineral wool and glass fibre, avoiding the use of fossil fuel derived products is insulated;

d) **Rain water collection** – the roof area of the main EfW building has been designed to permit rain water to be harvested and stored below the tipping apron of the building in a 825m^3 tank to provide water for green wall irrigation and for ash quenching. In addition water from water collection lagoon will be collected and piped to the EfW Facility and used for ash quenching. The use of brown roofs and green walls assists in slowing the run off of water from the building, in addition to the ecological benefits outlined below;

e) **Dry Flue** - A 'dry flue' system has been specified that uses less water than a semi dry system reducing potable water demand; and

f) **External Lighting** – an efficient lighting strategy has been developed with the operations team that permits certain areas of the Operations Area to be unlit when not in operation saving on both energy consumption and reducing potential light pollution.

Transport

11.1.7. The Project has been designed to permit future connection to the rail network off the Marston Vale Line and as such reduce road based traffic and related carbon emissions. In addition the Application Site lies close to Stewartby Station providing employees with the opportunity to travel to work by train walking the length of the access road to reach the Operations Area.

Green Infrastructure

11.1.8. The Bedfordshire and Luton Strategic Green Infrastructure Plan and Mid Bedfordshire Green Infrastructure Plan both highlight the potential of green infrastructure (GI) projects in mitigating and adapting to the impacts of climate change. Specifically, the Bedfordshire and Luton Strategic Green Infrastructure Plan highlights the importance of *"suitable species for planting that can thrive in likely future conditions, and in embracing sustainable maintenance practices and use of natural resources"*.

11.1.9. Both plans refer to the role of GI assets (which includes green spaces, access routes, wildlife habitats, landscapes and historic features) in providing flood storage, buffering and linking wildlife sites, and increasing levels of carbon sequestration. The aims and objectives of these GI strategies and the specific project proposals have been used to inform the landscape, ecology and rights of way strategies for the Project.

11.1.10. The planting strategy utilises species of tree and shrub that have established successfully in the vale and are anticipated to be tolerant of reasonable alterations in climate over time.

11.1.11. The ecological strategy includes brown roofs and benefits from the provision of green walls to the tipping hall and refuse bunker of the EfW Facility. The design for these elements will enhance biodiversity and a woodland fringe to the Application Site, create new wildlife habitats and aid connectivity providing opportunities for the migration and dispersal of species.

11.1.12. The creation of woodland will also increase the amount of carbon dioxide sequestered, reducing the accumulation of greenhouses gases in the in the atmosphere and assist in limiting the amount and character of run-off.

11.1.13. The Project includes additional rights of way and enhancements to existing rights of way that will permit a more extensive pattern of movement for pedestrians and cyclists in the area expanding the opportunities afforded by the Forest Centre for UK based tourism and recreation and will also provide additional recreational resources, reducing visitor pressure on outdoor sites that are particularly vulnerable or sensitive. The RRF itself has a complementary visitor centre that also seeks to promote a better understanding of the EfW process and the benefits that relate to the direct response to climate change.

Conclusion

11.1.14. The Project has taken account of the reasonably foreseeable effects of climate change and demonstrated how the proposals have embodied adaptation in the design.

A	B			C
IPC DOC REF	**DOCUMENT**	**IPC ELECTRONIC CATEGORY**	**IPC ELECTRONIC TYPE**	**RULE REF**
2.12	EfW Facility South Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.13	EfW Facility North Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.14	EfW Facility East Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.15	EfW Facility West Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.16	EfW Facility East Sectional Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.17	EfW Facility West Sectional Elevation	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.18	MRF Building Elevations	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.19	RRF Tertiary Building Elevations	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.20	RRF North and South Elevations	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.21	RRF East and West Elevations	Plans	Elevations (Part 23)	Regulation 5(2)(o)
2.22	RRF Site Section	Plans		Regulation 5(2)(o)
2.23	RRF Boundary Details	Plans		Regulation 5(2)(o)
2.24	RRF Elevation & Section Key Plan	Plans		Regulation 5(2)(o)
2.25	RRF Roof Plan	Plans		Regulation 5(2)(o)
2.26	Proposed access road existing footpath width at level crossing	Plans		Regulation 5(2)(o)
2.27	Proposed access road with proposed 2.5m footpath at level crossing	Plans		Regulation 5(2)(o)
2.28	Proposed access to The Rookery Resource Facility Proposed cross section	Plans		Regulation 5(2)(o)
2.29	Level Crossing	Plans		Regulation 5(2)(o)
2.30	Lighting Layout & Strategy Operations Area	Plans		Regulation 5(2)(o)
2.31	Landscape Strategy	Plans		Regulation 5(2)(o)
2.32	Operations Area Masterplan and Green Lane Country Park & RRF Entrance	Plans		Regulation 5(2)(o)
2.33	Planting Strategy - Wider Application Site and Operations Area	Plans		Regulation 5(2)(o)
2.34	Planting Strategy - Operations Area and Green Lane Country Park & RRF Entrance	Plans		Regulation 5(2)(o)
2.35	Trees to be removed / retained	Plans		Regulation 5(2)(o)

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