Medworth Energy from Waste
Combined Heat and Power Facility

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Environmental Statement Chapter 3: Description of the Proposed Development

Regulation reference: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

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Contents

3. Description of the Proposed Development

3.1 Introduction

3.1.1 This chapter provides an overview of the Proposed Development and sets out the main components of the EfW CHP Facility, CHP Connection, Access Improvements, Grid Connection, Water Connections and Temporary Construction Compound (TCC). In writing the description of the Proposed Development, consideration has been given to the requirements of Schedule 4 of the EIA Regulations in which paragraph 1 states that the description should include:

a) "a description of the location of the development;

b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; and

d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases."

3.1.2 Requirements (a) to (c) are addressed in the sub-sections below with information on relevant residues and emissions (d) provided within the relevant environmental topic chapters.

3.1.3 A list of terms and abbreviations can be found in **Chapter 1: Introduction, Appendix 1F Terms and Abbreviations (Volume 6.4)**.

3.2 Consultation and Stakeholder engagement

3.2.1 A summary of the relevant responses received in the EIA Scoping Opinion, subsequent engagement with key Stakeholders and during the non-statutory and statutory consultation exercises in relation to the description of the Proposed Development, are presented in **Appendix 3A: Consultation and Stakeholder Engagement (Volume 6.4)**.

3.3 Description of the site location

3.3.1 The Proposed Development is located in the town of Wisbech within the administrative areas of Cambridgeshire County Council (CCC) and Fenland District Council (FDC) (**Figure 3.1: Local Authority Boundaries, Volume 6.3**). The Grid

Connection also extends into the administrative areas of Norfolk County Council (NCC) and the Borough Council of King's Lynn and West Norfolk (KLWN).

3.3.2 A detailed description of the site location is provided below and split into two geographical areas, which cover the:

- EfW CHP Facility, CHP Connection, TCC, Water Connections and Access Improvements; and
- Grid Connection.

3.3.3 The site location is illustrated in the Environmental Statement (ES) on **Figure 1.1: Site location (Volume 6.3)** and on the Order limits plan **Site location (Volume 2.1)**.

Energy from Waste Combined Heat and Power Facility

EfW CHP Facility Site (Works No. 1 to 3)

3.3.4 This element of the Proposed Development is approximately 5.3 hectares in area and is located south-west of Wisbech, centred at National Grid Reference TF 45564 07955. It is within the administrative areas of FDC and CCC. The location of the EfW CHP Facility Site is illustrated on **Figure 3.2i-viii: Project Components (Volume 6.3)**.

3.3.5 The EfW CHP Facility Site consists of Works No. 1 and 2 and forms part of a wider industrial estate centred on Algores Way. The location of the Works No. 1 and, in part, Works No. 2 components of the Proposed Development would be located on an area of land currently operated by Mick George Ltd as a waste and aggregates recycling facility and Waste Transfer Station, (the WTS). The WTS is accessed from Algores Way. The EfW CHP Facility Site in its current form includes a Waste Reception Building (WRB), approximately 30m in width, 50m in length and 11.5m in height. Located adjacent to the WRB are office and welfare facilities. These facilities consist of secure portable buildings, approximately 3m in width, 8m in length and between 3m (single storey) and 6m (two storey) in height. There is a raised gatehouse and single weighbridge control for vehicle access into and out of the WTS. A vehicle parking area is located off the site's entrance on Algores Way and adjacent to the office and welfare accommodation. To the west of the WRB, various types of primary aggregates are stored in an open yard. To the south of the WRB, secondary aggregate storage and processing, including crushing, takes place in an open yard.

3.3.6 The topsoil that previously covered the WTS was scraped back from the working area when its current use was first established and now forms perimeter bunds. The surface of the WTS is predominantly hardstanding/compacted surfaces, including a concrete apron, approximately 25m by 50m, immediately to the south of the WRB.

3.3.7 Drainage ditches maintained by the Hundred of Wisbech Internal Drainage Board (HWIDB) run through and around the perimeter of the EfW CHP Facility Site, notably ditch 33 which separates the north-east from the south-west of the WTS. Ditch 33 is partially culverted to provide vehicular access to the south-western part of the WTS.

3.3.8 The existing entrance off Algores Way is gated and fenced with a 1.8m high metal palisade fence. The operational area immediately south-east of the WRB is partly bounded by a 4m tall mesh litter fence.

3.3.9 The south-east section of the EfW CHP Facility Site is unoccupied scrubland owned by FDC. It is separated from the existing WTS by an earth bund and trees.

3.3.10 The EfW CHP Facility Site is located within the southwest corner of the Algores Way industrial estate. The land to the north and east comprises industrial units and land to the south comprises vacant land which is allocated in the Fenland Local Plan (2014) as an urban extension (Policy LP8) for predominantly business purposes and, to a lesser extent, residential development. The EfW CHP Facility Site is bounded directly to the north by land occupied by BJ Books, a commercial direct mailing book vendor, and Floorspan Contracts, an industrial concrete block and beam manufacturer. To the east of the WTS's existing entrance, occupiers of the industrial units include James Mackle (UK) Ltd, a commercial supplier of processed apple products, Hair World UK Ltd, a wig retailer, and Lineage Logistics, an international frozen food warehousing and logistics business, which includes a cold store approximately 90m in width, 160m in length and 33m in height.

3.3.11 Approximately 200m and 500m away, respectively, to the north-east of the EfW CHP Facility Site and within Algores Way industrial estate, Cambian Wisbech School occupies a unit along Anglia Way, and TBAP Unity Academy occupies a unit on Algores Way. Other notable schools within the wider area, but outside the Algores Way industrial estate, include the Thomas Clarkson Academy approximately 750m to the north-east off Weasenham Lane.

3.3.12 The southern end of the EfW CHP Facility Site is bounded by New Bridge Lane. This connects with Cromwell Road to the west which provides direct access to the A47 via a four-arm roundabout. New Bridge Lane is currently closed to through-traffic at the point at which it crosses the disused March to Wisbech Railway. This is immediately to the west of the EfW CHP Facility Site's frontage. To the east, New Bridge Lane terminates after the junction with New Drove Lane.

3.3.13 The closest residential properties to the EfW CHP Facility Site consist of isolated properties along New Bridge Lane. 9 and 10 New Bridge Lane are located approximately 20m to the west and south respectively, of the EfW CHP Facility Site. 10 New Bridge Lane includes land currently used as a smallholding. A residential property known as 'Potty Plants' with associated farmland is located approximately 300m to the south-east of the EfW CHP Facility Site along New Bridge Lane. This property is bordered by the A47 along its southern and south-eastern perimeter. 2 New Bridge Lane is located approximately 300m west of the EfW CHP Facility Site. Further afield, New Bridge Lane Travellers Site is located south-east of the intersection of New Bridge Lane and the A47, at distances of 400m and 500m, respectively. The principal residential areas and town centre of Wisbech lie beyond the industrial estate approximately 1.7km to the north and 1km to the east.

3.3.14 Land to the west of the EfW CHP Facility Site is boarded by scrubland and a mature strip of vegetation, comprising self-set trees and undergrowth. This land includes the disused March to Wisbech Railway, known locally as the 'Bramley Line'. West of the disused railway, an industrial estate extends for a further 300m until it reaches Cromwell Road, after which there is a retail park comprising a cinema, Tesco superstore and restaurants. The retail park is bordered to the west by South Brink (road) and then the River Nene.

3.3.15 To the south and beyond the A47 the landscape becomes predominantly agricultural in nature, interspersed with small villages such as Begdale (approximately 1.6km to the south), Friday Bridge (approximately 3.4km to the south) and Elm (approximately 1.7km to the south-east).

CHP Connection (Works No.3A to 3B)

3.3.16 The proposed CHP Connection Corridor would run north, along the route of the disused March to Wisbech Railway, from the EfW CHP Facility Site crossing Weasenham Lane via a pipe-bridge and terminating at the Nestlé Purina pet food manufacturing factory, which is accessed from Coalwharf Road/Somers Road. The CHP Connection Corridor includes a section a pipe-bridge section immediately south of Weasenham Lane into the Lamb Weston factory, which produces and processes frozen potato products. The CHP Connection Corridor currently includes disused infrastructure from the March to Wisbech Railway, including track and self-setting vegetation. The CHP Connection Corridor is bounded on both sides by industrial users, other than at its north-eastern end where the rear gardens of residential properties on Victory Road, Great Eastern Road, Burdett Road, Hillburn Road and Oldfield Lane back onto it. The location of the CHP Connection Corridor is illustrated in **Figure 3.2i-viii: Project Components (Volume 6.3).**

Access Improvements (Works No.4)

3.3.17 The Access Improvements consist of two proposals:

- New Bridge Lane Access Improvements (Works No.4A) – It is proposed to create a new access/egress to the EfW CHP Facility Site for HGVs from New Bridge Lane, located on the southern boundary of the EfW CHP Facility Site.
- Algores Way Access Improvements (Works No.4B) – The existing WTS on the proposed EfW CHP Facility Site is accessed from Algores Way. This access point will be reconfigured to provide staff and visitor car and pedestrian access/egress to the EfW CHP Facility Site.

3.3.18 The Order limits for the New Bridge Lane Access Improvements extend west from the EfW CHP Facility to the junction of Cromwell Road (see **Figure 3.2i-viii: Project Components, Volume 6.3).** Cromwell Road provides direct access to the A47 via a four-arm roundabout. Direct vehicular access to Cromwell Road along New Bridge Lane from the proposed New Bridge Lane site access is not currently possible. New Bridge Lane crosses the disused March to Wisbech Railway and in this location the road narrows and bollards are in place to prevent vehicular access. Improvements to, and the reopening of, this road for vehicular access are required to facilitate access off New Bridge Lane, along with dropped kerbs to assist pedestrians crossing.

3.3.19 New Bridge Lane is bounded mainly by industrial premises. A single residential property (9 New Bridge Lane) lies approximately 20m to the south-west boundary of the EfW CHP Facility Site on the opposite side of the disused March to Wisbech Railway. Further residential properties are located close to the New Bridge

Lane/Cromwell Road Junction (93 and 97 South Brink, 25 Cromwell Road and 2 New Bridge Lane), adjacent to the location of the potential New Bridge Lane Access Improvements.

3.3.20 The Order limits also extend up the existing Algores Way until it reaches Weasenham Lane (see **Figure 3.2i-vii: Project Components, Volume 6.3**). No highway improvement works are currently proposed on Algores Way, other than works to reconfigure the existing access to provide staff and visitor car and pedestrian access to the EfW CHP Facility. However, Algores Way has been included within the Order limits because, although it is openly in public use, it is an unadopted highway from a point south of 19 Algores Way and therefore powers relating to street works (for example relating to the installation of services for the EfW CHP Facility), traffic management and compulsory acquisition powers for access are being sought as part of the DCO application.

Temporary Construction Compound (Works No. 5)

3.3.21 The land allocated for construction compound/laydown area associated with the Proposed Development is illustrated in **Figure 3.2i-viii: Project Components (Volume 6.3)**.

3.3.22 The TCC for staff parking, offices and welfare facilities associated with the construction of the Proposed Development would be located adjacent to the eastern boundary of the EfW CHP Facility Site, separated by a drainage ditch. The land is currently undeveloped, vegetated, grass scrubland and forms part of the South Wisbech (broad location for growth) allocation in the Fenland Local Plan 2014 (Policy LP8). This area of land measures 1.8 hectares.

3.3.23 The TCC would be bounded by James Mackle (UK) Ltd to the north, Boleness Road to the east with the Lineage Logistics cold store beyond and further vacant grassland to the south.

3.3.24 The TCC for staff parking, offices and welfare facilities would be accessed from the north via Algores Way.

3.3.25 The remainder of the construction compound requirements would be provided on the southern or northern portion of the EfW CHP Facility Site; see **Figure 3.11: EfW CHP Facility Temporary Construction Compound Layout (Volume 6.3).**

3.3.26 HGV construction traffic would initially access the EfW CHP Facility Site via Algores Way, and once the Access Improvements are implemented, both New Bridge Lane and Algores Way would be used for the duration of construction works. Further details are provided in **Chapter 6: Traffic and Transport (Volume 6.2)**.

Water Connections (Works No. 6)

3.3.27 The Water Connections consist of two proposals:

- Water Connections (potable) (Works No. 6A) – A new water main would be required to connect the EfW CHP Facility into the local network. The water main would run underground from the southern boundary of the EfW CHP Facility Site southeast along New Bridge Lane before either entering a commercial orchard and then crossing underneath the A47 by horizontal directional drilling (HDD) or crossing the A47 and the southern end of New Bridge Lane by an open cut and fill arrangement, to join an existing water main. The water main would be constructed by the Applicant or Anglian Water.

- Water Connections (foul) (Works No. 6B) – A foul sewer connection is required from an existing pumping station operated by Anglian Water, located north-east of the Algores Way site entrance, and into the EfW CHP Facility. The foul water connection would be constructed by the Applicant or Anglian Water.

3.3.28 The area of land proposed for the route of the Water Connections is illustrated on **Figure 3.2i-viii: Project Components (Volume 6.3).**

Grid Connection (Works No. 7 to 9)

3.3.29 From the onsite substation located in the southern area of the EfW CHP Facility Site, the Grid Connection would run underground for its entire length to a point of connection (POC) to the National Electricity Transmission Network distribution system at UKPN's substation, (hereafter referred to as the Walsoken DNO Substation) off Broadend Road, Walsoken.

3.3.30 The underground route would exit the EfW CHP Facility Site at New Bridge Lane then head east to the A47. Here the underground route would head north following the western verge of the A47 to Broadend Road. At Broadend Road the route would head west within the highway/verge to the Applicant's proposed substation (hereafter referred to as the Walsoken Substation). The Walsoken Substation is to be located to the front of the Walsoken DNO Substation on land belonging to UKPN and will include equipment owned and operated by UKPN and by the Applicant. This land is vacant grass scrubland with a tree and hedge line adjacent to Broadend Road and an area to the south of the existing internal road is used for temporary storage of wooden poles used by UKPN.

3.3.31 The location of the Grid Connection and the Walsoken Substation is shown on **Figure 3.2i-viii Project Components (Volume 6.3).** The route which the underground electrical cable connection would take is shown on **Figure 3.3i-ix Underground Cable Connection (Volume 6.3),** while an indicative layout of equipment at the Walsoken Substation and the equipment itself is shown on **Figure 3.4 Walsoken Substation** and **Figure 3.5 Walsoken Substation equipment (Volume 6.3),** respectively.

3.4 EfW CHP Facility (Physical Development)

EfW CHP Facility (Works No.1 to 3)

3.4.1 An indicative EfW CHP Facility Site Layout figure (see **Figure 3.6: EfW CHP Facility Site Layout (Volume 6.3)**) has been produced to illustrate where the various project components described below would be sited. Each of these components are assigned an identification number which can be cross-referenced to **Figure 3.6: EfW CHP Facility Site Layout (Volume 6.3)** and are described below.

3.4.2 All heights are referenced from the Finished Floor Level (FFL) i.e., 0m. Unless otherwise stated, FFL for the purposes of the EIA is set at 3.0m Above Ordnance Datum (AOD). The EfW CHP Facility Site layout figure is accompanied by **Figure 3.7i-iv EfW CHP Facility elevations** and **Figure 3.8 Air cooled condenser, turbine hall, water treatment plan and ancillary buildings elevations (**both **Volume 6.3).**

3.4.3 A number of the component parts of the EfW CHP Facility would be located within a single main building; these are identified and described below.

3.4.4 The main building has been designed to enable the majority of plant items within it to be maintained and replaced as necessary throughout the life of the EfW CHP Facility. The maximum parameters of the main building are 52m in height, 177m in length and 102m in width.

The external appearance of the EfW CHP Facility has been informed through consideration of the site and its immediate surroundings and by the functional requirements of the buildings. The design evolution is explained within **Chapter 2: Alternatives (Volume 6.2)** and within the **Design and Access Statement (Volume 7.5).** The external elevations of the buildings would be clad in flat panels of contrasting bands and will adopt a palette of grey tones with lighter grey cladding used for the highest parts of the EfW CHP Facility.

Tipping hall (ID02)

3.4.5 Located within the main building, the tipping hall would be fully enclosed within the main building, adjacent to the northern boundary of the EfW CHP Facility Site. The tipping hall would comprise a hardstanding and seven tipping bays. HGVs (refuse collection vehicles (RCVs) and walking floor articulated lorries) would enter the tipping hall to deposit waste into the tipping bays. A welfare cabin would be provided inside the tipping hall for staff. The tipping hall would measure approximately 16.5m in height, 58.5m in length and 38m in width. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter of the tipping hall of 18.5m has been used for the purposes of the assessment.

3.4.6 Waste odours are contained within the main building by maintaining negative internal air pressure within the tipping hall and waste bunker. Air from the tipping hall and waste bunker is drawn into the primary combustion air system and used as under fire air in the combustion plant, which ensures the removal and destruction of odorous compounds. Shutdown of each furnace will be staggered where possible. During periods of maintenance or repair, when both furnaces are not operating, the air from the ventilation system would be passed through the dust and activated carbon filters of the shutdown exhaust system before being emitted into the atmosphere and/or a permanently installed odour neutralisation spray system will be deployed to neutralise odours. The system and management procedures employed will comply with the requirements of the Environmental Permit (EP) to demonstrate Best Available Techniques (BAT).

Graphic 3.1: A typical tipping hall

Fire water tank and fire water pump building (ID03)

3.4.7 The fire water tank (ID03a) and fire water pump building (ID03b) would be located adjacent to the main building immediately to the east of the tipping hall in the northern portion of the EfW CHP Facility Site. The fire water tank would hold water ready to pump through the fire suppression systems when required. The capacity of the tank would be determined during detailed design; however, it is likely to measure approximately 8m in height and 16m in diameter. The fire water pump building would measure 3.5m in height, 12.5m in length and 9m in width. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter of the fire water tank and fire water pump cabin are 10m and 5.5m, respectively. These heights have been used for the purposes of the assessment.

Graphic 3.2: A typical fire water tank

Waste bunker building (ID04)

3.4.8 Located within the main building, a number of elements would be located in the waste bunker building, which would measure approximately 36.5m in height, 102m in length and 36.9m in width. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the waste bunker building of 38.5m has been used for the purposes of the assessment.

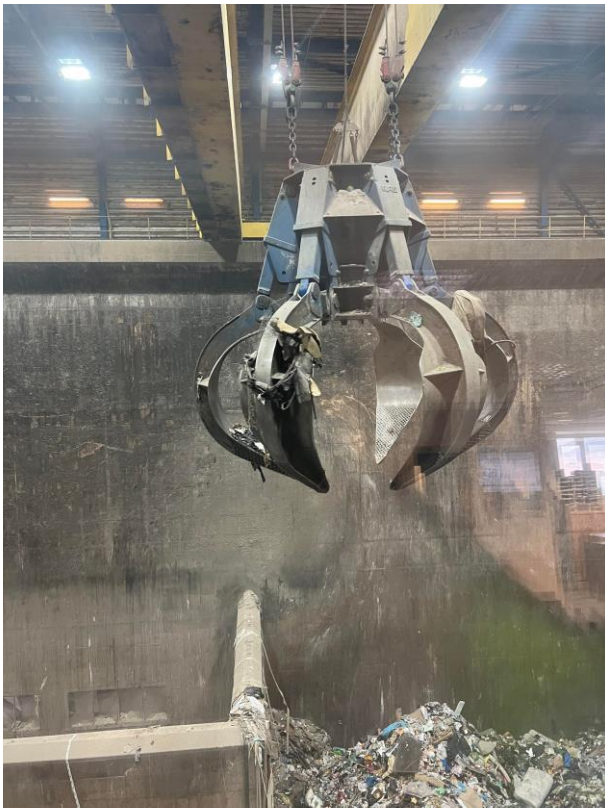
Tipping bunker (ID04a) and main waste bunker (ID04b)

3.4.9 The tipping bunker and main waste bunker would be located adjacent to the tipping hall (ID02). The waste is initially deposited into the tipping bunker by HGVs in the tipping hall. Mechanical cranes above the bunkers transfer the waste from the tipping bunker to the main waste bunker for mixing and temporary storage prior to incineration.

3.4.10 Prior to being loaded into the furnace, waste would be stored and mixed within the main waste bunker to improve waste homogeneity and obtain, as far as possible, a consistent CV of the waste, thus ensuring stable combustion and emissions control. The waste bunker would have a storage capacity of approximately 11.5 days (46,000m^3).

3.4.11 The floor and foundations of the bunkers would be approximately 10m and 12m below FFL, respectively, with a maximum limit of deviation up to 14m below FFL. The bunkers will be a watertight construction and built to standard industry practices. This approach maximises the capacity of the EfW CHP Facility for internal waste storage while maintaining full capacity for receiving waste. Internal to the waste bunker building, the tipping bunker would measure approximately 25m in height above FFL, 43m in length and 10.7m in width. The main waste bunker would measure approximately 29m in height above FFL, 80m in length and 26m in width (including the width of the reception bunker).

Graphic 3.3: A typical waste bunker crane



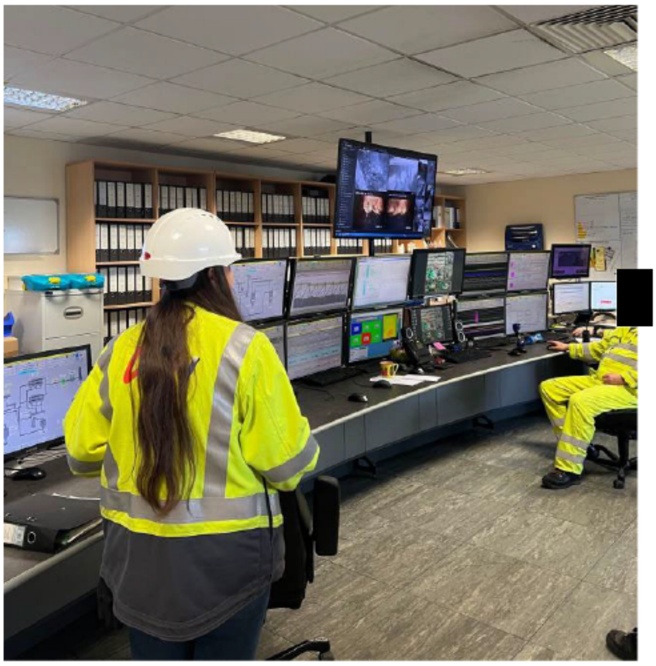
Waste chute platform (ID04c)

3.4.12 The waste chute platform would be within the waste bunker building (ID04). The waste chute platform would comprise two waste chutes, a clearance device for waste blockages, a shredder chute, two bunker "ears" with openings to remove crane grabs and bulky items, plus maintenance areas to maintain and change grabs. The mechanical cranes located above the waste bunker would transfer waste from the tipping bunker (ID04a) and main waste bunker (ID04b) to the waste chutes. The waste chute platform is internal to the waste bunker building (ID04) and would measure approximately 70m in length and 10.7m in width.

Control room (ID04d)

3.4.13 Internal to the waste bunker building (ID04), the control room would be located at the waste chute platform (ID04c) level and overlooking it. The EfW CHP Facility would be monitored and controlled by personnel from here. The control room would measure approximately 21m in length and 14m in width.

Graphic 3.4: A typical control room



Crane maintenance areas (ID04e)

3.4.14 Internal to the waste bunker building (ID04), the crane maintenance areas would be located on the eastern and western elevations at opposite ends of the main waste bunker. The maintenance areas would be used for waste crane parking, grab changes and to facilitate periods of maintenance. Each maintenance area would measure approximately 36.5m in height, 36.9m in length and 11m in width. Other maintenance areas will be located at various locations within the boiler house building (ID05).

Incinerator bottom ash (IBA) storage bunker and loading areas (ID04f)

3.4.15 Internal to the waste bunker building (ID04), the IBA storage bunker would sit below the waste chutes at ground level in between the IBA loading areas and measure approximately 10.6m in height, 80m in length and 10m in width.

Graphic 3.5: A typical IBA bunker

3.4.16 A drive-through lane would be located either side of the IBA storage bunker to enable vehicle loading via two overhead cranes. The loading area on the eastern elevation of the waste bunker building would measure approximately 10m in height, 37m in length and 11m in width. The loading area on the western elevation of the waste bunker building would measure approximately 10m in height, 36.9m in length and 11m in width.

3.4.17 Two IBA loading enclosures would extend from the drive-through lane within the waste bunker building (ID04), from the east and west elevations. The IBA enclosure east (ID11a) would measure approximately 14m in length, 11m in width and 12m high. The IBA enclosure west (ID11b) would measure approximately 11m in length, 6m in width and 12m high.

Boiler house building (ID05)

3.4.18 Located within the main building, the boiler house building would be to the south of the waste bunker building (ID04). The boiler house building would contain two incineration grates and boilers, two feed water tanks, a boiler water tank and process water tank, de-ashing systems for the second/third boiler passes, horizontal pass and IBA de-slaggers, primary and secondary combustion air systems and an assortment of lifting equipment for maintenance activities. Each boiler line would be equipped with auxiliary burners for controlled start-up, shut down and load support, a Selective Non-Catalytic Reduction (SNCR) system for NOx control, online boiler cleaning systems and a combustion control system.

Graphic 3.6: A typical incinerator grate

3.4.19 The boiler design would be Industrial Emissions Directive (IED) compliant, ensuring a flue gas residence time of two seconds at 850ºC for the destruction of dioxins and furans. Atmospheric steam vents would be located on the top of the boiler house building for both routine and emergency steam release. The boiler house building would measure approximately 50m in height, 55m in length and 47.6m in width. Taking account of the need for design flexibility and roof-mounted equipment, a maximum height parameter of the boiler house building of 52m has been used for the purposes of the assessment.

Air pollution control (APC) storage area (ID06)

3.4.20 Located within the main building, the APC storage area is adjacent to the boiler house building's (ID05) southern elevation. This storage area provides a drive-through road to enable the delivery of consumables (hydrated lime and Activated Carbon (AC)) and removal of APC residue (APCr) used in, and generated by, the processes in the APC building (ID07). Since APCr is classified as a hazardous waste, it is stored in contained silos. Above the loading area, four APCr silos are located, each measuring approximately 22m in height and 3.8m diameter. The APCr silos (ID06b) will be screened by an enclosure measuring approximately 33.3m in length, 11m in width and 35m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the APCr silos area is 37m. This height has been used for the purposes of the assessment.

3.4.21 Located to the west and east of the APCr silos (ID06b) enclosure are two covered loading areas, both measuring approximately 12.2m in length, 11m in width and 10m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the loading areas (ID06a and ID06c) is 12m. This height has been used for the purposes of the assessment.

Graphic 3.7: A typical air pollution control storage silos and loading entrance

Air Pollution Control (APC) building (ID07)

3.4.22 Located within the main building, the APC building is connected to the APC storage area (ID06) and by ducts to the boiler house building (ID05). Flue gases which have passed through the boilers would enter the APC building, where the gases are cleaned by two processes:

- The APC plant, silos and reactors (ID07a), including two hydrated lime and two AC silos, each measuring approximately 22m in height and 3.8m in diameter, and two reactor units; and
- Two bag filter houses (ID07b).

3.4.23 The APC building will be screened by an enclosure measuring approximately 33.2m in length, 28.6m in width and up to 35m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the APC storage area is 37m. This height has been used for the purposes of the assessment.

Induced draft fan buildings (ID08)

3.4.24 Located within the main building, the two bag filter houses (ID07b) connect, by ducts, to two Induced Draft (ID) fans located within buildings to the south. The ID fan buildings each measure approximately 10m in height, 10m in length and 10m in width. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the ID fan buildings is 12m. This height has been used for the purposes of the assessment.

Graphic 3.8: A typical (insulated) induced draft fan within cabin

Chimneys & continuous emissions monitoring systems (CEMS) (ID09)

3.4.25 Located to the south of the main building, the ID Fans (ID08) would connect to two chimneys (ID09a) emitting treated flue gases. The two chimneys would each have a minimum height of 84m and maximum height of 90.0m and a maximum diameter of 3.2m. The actual height of the chimneys will be determined by the air emissions assessment (see **Chapter 8: Air Quality (Volume 6.2)**) in compliance with the EP for the EfW CHP Facility. Taking account of the above, the maximum height of 90m has been used for the purposes of the assessment.

3.4.26 A static infra-red light would be fitted at the highest practical point of each chimney to satisfy the Defence Infrastructure Organisation's request for aviation warning lighting.

3.4.27 To monitor emissions within the chimneys (an EP requirement), a CEMS will be installed within each chimney and accessed via a common platform connecting to the APC building (ID07). The approximate height of the CEMS platform (ID09b) above FFL is 18m.

Graphic 3.9: A typical CEMS platform

Switchgear building (ID10)

3.4.28 Located within the main building, the switchgear building housing the electrical switchgear would be located externally to the boiler house building (ID05) on its eastern elevation. The building is split into two components:

- Switchgear building north (ID10a). This part of the switchgear building would measure approximately 35.2m in length, 10m in width and approximately 33m in height.
- Switchgear building south (ID10b). To accommodate steam and condensate pipework above it, this part of the switchgear building has a reduced height, measuring approximately 12.4m in length, 10m in width and approximately 16m in height.

3.4.29 Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the switchgear building north is 33m and south is 18m. These heights have been used for the purposes of the assessment.

Diesel tanks and urea tanks building (ID12)

3.4.30 Located within the main building, this component of the EfW CHP Facility would be located externally to the west of the boiler house building (ID05) and comprise three diesel tanks of approximately 3m in diameter and 18m in height and one urea tank of approximately 3.5m in diameter and 15m in height. The diesel tanks provide fuel primarily to each boiler line's auxiliary burners and to the emergency diesel generator and diesel fire pump, plus the operational mobile plant, via a fuel transfer pump. The urea storage tank provides urea to the SNCR systems. The diesel and urea tanks would be enclosed within a building measuring approximately 33m in height, 25.9m in length and 9.1m in width. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for diesel tank and urea tanks building is 35m. These heights have been used for the purposes of the assessment.

Gatehouse and weighbridges (ID01)

3.4.31 The gatehouse would be located at the New Bridge Lane entrance to the EfW CHP Facility and would be used by personnel monitoring vehicles entering and exiting the site during operational hours. The gatehouse would measure up to 3m in height, 9.5m in length and 2.4m in width. Two weighbridges would be located adjacent to the gatehouse to allow the weighing in and weighing out of all waste delivery vehicles, vehicles delivering consumables and vehicles removing residues. **Figure 3.9 Gatehouse/weighbridge (Volume 6.3)** illustrates the proposed building; a photograph of a typical gatehouse/weighbridge is shown below.

Graphic 3.10: A typical gatehouse/weighbridge

Mobile crane slab (ID26)

3.4.32 The mobile crane slab is an area of hardstanding with a firm footing measuring up to 15m in length and 14m in width, located externally and to the west of the boiler house building (ID05). The mobile crane slab facilitates maintenance of the EfW CHP Facility using a mobile crane.

Compressed air station (ID13)

3.4.33 Located within the main building, the compressed air station would be west of the APC building (ID07). The compressed air station would produce clean and dry compressed air, connected to separate instrument and service air distribution systems. The instrument air would be used site-wide throughout the process and the service air would be used for cleaning and maintenance activities. The compressed air station building would measure approximately, 13m in length, 8m in width and 8m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the compressed air station building is 10m. This height has been used for the purposes of the assessment.

Main transformer (ID14)

3.4.34 The main transformer would be located to the west of the water treatment plant (ID18). The transformer would step up the voltage of the electricity generated on site to 132kV to facilitate its export via the Grid Connection. This component would measure approximately 11m in length and 6m in width and 10m in height. Taking account of the need for design flexibility, a maximum height parameter for the main transformer is 12m. This height has been used for the purposes of the assessment.

Graphic 3.11: A typical mains transformer compound

Private wire transformer (ID22)

3.4.35 The private wire transformer would be located adjacent to the main transformer (ID14) and would facilitate the private wire supply offered by the EfW CHP Facility to surrounding business users as part of the CHP Connection. The private wire transformer would measure approximately, 11m in length, 5m in width and 10m in height. Taking account of the need for design flexibility, a maximum height parameter for the private wire transformer is 12m. This height has been used for the purposes of the assessment.

Private wire switchgear compound (ID23)

3.4.36 Located adjacent to the main transformer (ID14), the private wire switchgear compound also facilitates the private wire supply offered by the EfW CHP Facility to surrounding business users as part of the CHP Connection. The private wire switchgear compound would measure approximately 7m in length, 6m in width and 10m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the private wire switchgear compound is 12m. This height has been used for the purposes of the assessment.

Emergency diesel generator (ID15)

3.4.37 The emergency diesel generator would be located adjacent to the main building to the west of the boiler house building (ID05). The generator would be powered by a low sulphur diesel or Hydrotreated Vegetable Oil (HVO) fuelled engine and would supply sufficient electricity to ensure a controlled shut down in the event the EfW CHP Facility was disconnected from the electricity distribution network and island mode operation had failed. The requirement for, and operation of, the emergency diesel generator would accord with the requirements of the EP.

3.4.38 This component would measure approximately 13.5m in length, 5.5m in width and 10m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the emergency diesel generator is 12m. This height has been used for the purposes of the assessment.

Graphic 3.12: A typical emergency diesel generator

Air cooled condenser (ACC) (ID16)

3.4.39 The ACC would be located on the eastern boundary of the EfW CHP Facility Site and north of the turbine hall (ID17), connected by pipes. It would accept exhaust steam from the turbine, condensing this into warm water using a finned tube heat exchanger and cooling fans before being transferred back to the condensate system within the turbine hall (ID17). The ACC would measure approximately 37m in length, 37m in width and 27m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the ACC is 30m. This height has been used for the purposes of the assessment.

Graphic 3.13: A typical ACC

Turbine hall (ID17)

3.4.40 The turbine hall would be located on the eastern boundary of the EfW CHP Facility Site and south of the ACC (ID16). Steam from the boiler house building (ID05) would be transferred by pipework (the steam and condensate pipelines (ID25a)), suspended approximately up to 23m above ground level to the turbine hall where it would be used to drive the turbine and generator, thus producing electricity. The turbine hall would measure approximately, 47m in length, 34m in width, 25m in height. Taking account of the need for design flexibility and roof-mounted equipment, a maximum height parameter of the turbine hall of 27m has been used for the purposes of the assessment.

Graphic 3.14: A typical turbine hall

3.4.41 A second steam and condensate pipeline (ID25b) would be connected to the turbine hall to facilitate the transfer of steam along the CHP Connection, also suspended above ground and running adjacent to the southern elevation of the boiler house building (ID05), before crossing above the internal access road on the western boundary of the EfW CHP Facility Site and descending to the CHP Connection Corridor.

3.4.42 The turbine hall would be designed with a concrete slab and steel structure, with an insulated façade and roof.

Water treatment plant (WTP) (ID18) and water re-cooling system (ID24)

3.4.43 The WTP would be located on the eastern boundary of the EfW CHP Facility Site, adjacent to the turbine hall (ID17). The WTP would treat water used within the EfW CHP Facility to ensure it is free of contaminants that may harm equipment. The WTP would measure approximately 30m in length, 22m in width and 16m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the WTP is 18m. This height has been used for the purposes of the assessment.

Graphic 3.15: A typical water treatment plant

3.4.44 The water re-cooling system (ID24) would sit on top of the WTP and supply cooling water to any systems requiring it before receiving it back and re-cooling it using a number of fans. It would measure up to 18.5m in length, 7.5m in width and up to 9m in height.

Workshop and stores (ID19)

3.4.45 Located within the main building, a workshop and stores building would be located adjacent to the eastern elevation if the APC building (ID07). It would be used for the storage of spare parts and equipment and incorporate a dedicated workshop where some repair and fabrication works would take place. The building would measure approximately 34m in length, 15m in width and 16m in height. Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the workshop and stores is 18m. This height has been used for the purposes of the assessment.

Graphic 3.16: A typical workshop and stores building

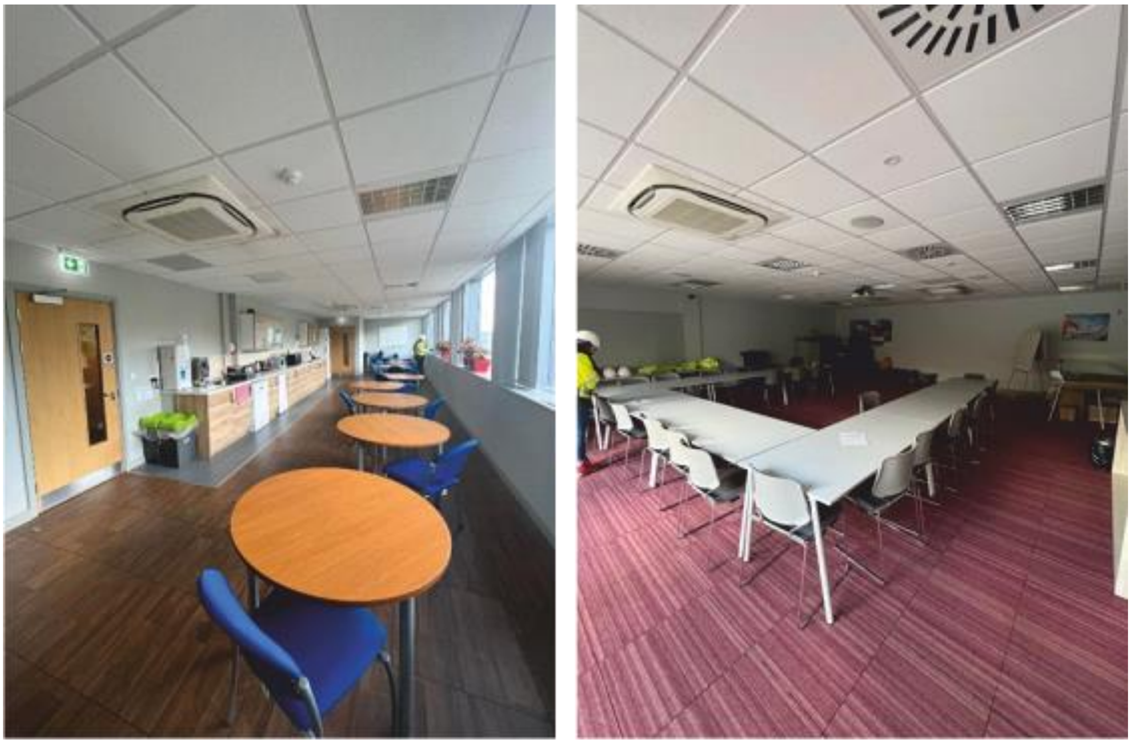
Administration building (ID20)

3.4.46 An administration building would be located in the north-east corner of the EfW CHP Facility Site, adjacent to the Algores Way entrance. The administration building would contain staff welfare facilities, offices and meeting rooms. A dedicated visitor area would be provided within the administration building. The visitor area would be used to accommodate visiting education and community groups, including disabled visitors. The administration building would be designed to attain a minimum BREEAM rating of 'Excellent'. Sustainable features incorporated into the administration building's design include:

- Roof-mounted photovoltaic panels to supplement power use within the administration building, delivering approximately 50kWh (0.05MW) of electricity;
- 'Brown' roof and 'living (green) walls' – to support biodiversity;
- Natural cooling using brise soleil to western elevation;
- Bat and bird boxes boxes which could be built into the building and would provide for a range of bat and bird species; and
- Rainwater water recycling – to reduce potable water use.

3.4.47 The building would measure approximately 34m in length, 12m in width and 11m in height, excluding the staircase onto the roof (see **Figure 3.26 Administration building elevations, Volume 6.3**). Taking account of the need for design flexibility and any roof-mounted equipment, a maximum height parameter for the administration building is 15m. This height has been used for the purposes of the assessment.

Graphic 3.17: Typical welfare facility and dedicated visitor area



132kV switching compound (ID21)

3.4.48 The switching compound would be located west of the gatehouse and weighbridges (ID01) in the southern portion of the EfW CHP Facility Site. The fenced compound would accommodate electrical equipment to facilitate the connection of the EfW CHP Facility to the Grid Connection. This compound measures up to 23m in length and 13m in width. Within the compound, air insulated switchgear up to 6.5m in height would be positioned along with a GRP kiosk measuring up to 2.7m in length and 2.7m in width and 3.5m in height. See **Figure 3.10 132kV Switching Compound (Volume 6.3)** for general arrangements.

Laydown maintenance area (ID31)

3.4.49 A laydown maintenance area would be provided in the southern portion of the EfW CHP Facility Site to the west of the 132kV switching compound (ID21). This area of land would comprise permeable hardstanding and measure approximately 64m in length and 44m in width. It would be used for the temporary storage of plant and materials required to facilitate maintenance of the EfW CHP Facility.

Internal access and circulation, and parking

3.4.50 Vehicle circulation and parking arrangements within the EfW CHP Facility Site are presented on **Figure 3.6 EfW CHP Facility Site Layout (Volume 6.3).**

3.4.51 Waste vehicles would enter the EfW CHP Facility Site from New Bridge Lane on the southern boundary of the site and enter a vehicle queuing area (ID30) or lay by (ID29), if required, before reaching the gatehouse and weighbridges. Sufficient space within the vehicle queuing area prevents vehicles queuing on the public highway. Vehicles that do not need weighing would use the weighbridge bypass lane.

3.4.52 After the weighbridge, vehicles would travel along a two-lane, single-direction internal access road running clockwise along the western boundary of the EfW CHP Facility Site to reach the tipping hall (ID02). Upon exiting the tipping hall, vehicles would continue travelling clockwise along the northern and eastern boundaries of the EfW CHP Facility Site, passing the gatehouse and weighbridge before exiting back onto New Bridge Lane by turning right. Vehicles that do not need weighing, would use the weighbridge bypass lane. The same two-lane circular internal access road would be used by onsite operational vehicles and other vehicles accessing the site to deliver and collect materials (e.g., fuel, IBA). Vehicles delivering lime and AC and collecting APCr would also be able to travel through a secondary access route which runs underneath the APCr loading area.

3.4.53 Staff vehicles and visitors would access the site at the Algores Way entrance on the north-east boundary of the EfW CHP Facility Site, before entering the staff and visitor car parking area (ID27) to the south of the administration building (ID20). Based on the anticipated demand for staff and visitor car parking, 50 spaces will be provided. A minimum of five of these spaces will provide electric vehicle charging and two will be allocated for disabled users. In addition, there would be 10 covered spaces for motorcycles and bicycles. The level of parking provision reflects standards stated for a sui generis use in Appendix A of the Fenland Local Plan 2014.

3.4.54 The internal road and pedestrian area layout are designed to allow the safe movement of vehicles and pedestrians with regard to relevant health and safety legislation and good industry practice.

3.4.55 Detailed calculations have been made of the vehicle movements expected to arrive at, and depart from, the EfW CHP Facility. These calculations can be found in **Chapter 6: Traffic and Transport (Volume 6.2).**

Drainage

3.4.56 The key principles of the drainage strategy are set out below.

3.4.57 During the construction phase, surface water runoff (and any pumped groundwater from the excavations) would be collected by temporary French drains and perimeter swales and attenuated in three detention basins (EfW CHP Facility Site) and an underground tank (TCC). A SuDS system would be established to meet the treatment requirements set out in the CIRIA SuDS Manual C753. This is achieved by using a number of SuDS features including swales and detention basins. Attenuated and treated runoff (and any pumped groundwater) in SuDS features will be discharged into the HWIDB network at greenfield runoff rates. An oil interceptor would also be used for runoff collected in the car parking area to remove any fuel/hydrocarbon contamination prior to discharge into the IDB drains. **Figure 3.11i-**

iv EfW CHP Facility Temporary Construction Compound Layout (Volume 6.3) identifies the drainage measures proposed.

3.4.58 During the operational phase, surface water runoff would be collected and attenuated underground with further attenuation occurring in SuDS features (swale, detention basin and filter strip) in the southern part of the site which would meet the treatment requirements set out in the CIRIA SuDS Manual C753. Surface water from the northern part of the site would need to be pumped into the attenuation tanks located in the southern part of the site. Attenuated and treated runoff would be discharged into the HWIDB network at greenfield runoff rates. Runoff from the car park will be attenuated beneath the permeable paved surfaced area, before discharging into the HWIDB drain at greenfield runoff rates**. Figure 3.12 Outline Drainage Strategy (Volume 6.3)** illustrates the operational drainage strategy.

3.4.59 Further information on the water management at the site can be found in **Chapter 12: Hydrology, Appendix 12F: Outline Drainage Strategy (Volume 6.4)**.

Utilities and Other Infrastructure

3.4.60 The proposed EfW CHP Facility has a number of utility requirements, as outlined below, and the works have been designed to include all the necessary connections to these utility services, including connections to the water and foul sewerage networks operated by Anglian Water.

Sewerage

3.4.61 The rainwater collection system from building roofs, roads and hard standings would be discharged by means of a separate surface water drainage system whilst sanitary and process wastewater would be discharged to foul sewer.

3.4.62 In normal operation, there is no continuous discharge to foul sewer from the process part of the EfW CHP Facility as any wastewater generated is reused to make up the water lost in the IBA quenching system. Therefore, in normal operation, the only discharge to foul sewer is from the sanitary and domestic facilities. If steam is supplied to customers who do not return the condensate, then additional water from the Applicant's dedicated supply will be treated to make up the lost water volumes. In this instance, additional discharges from the water treatment plant may have to be discharged to the foul sewer (part of the Water Connections).

3.4.63 Occasionally, there would be the need to discharge process water from the EfW CHP Facility (e.g., during shutdowns and following water treatment plant regeneration) and for this purpose a neutralisation tank and water quality testing are provided, with a controlled discharge to the foul sewer to ensure compliance with the requirements of the trade effluent discharge consent for the EfW CHP Facility.

3.4.64 The EfW CHP Facility would have an estimated foul water discharge rate of approximately 0.417 l/s, discharging into the network, with a peak flow rate of 2.502 l/s. Anglian Water has confirmed that the Algores Way pumping station can accommodate these flows, and no additional utility upgrades would be required (see **Appendix 12B Stakeholder engagement (Volume 6.4)** to **Chapter 12: Hydrology (Volume 6.2)**).

Water

3.4.65 A water supply is required to provide water for the process requirements, the fire protection systems and for domestic and potable requirements. The Applicant has given consideration to the use of water entering the surface water drainage system for process requirements; however, there is limited demand, and such water could not be used without extensive filtration and treatment. The administration building will, however, operate a rainwater recycling system.

3.4.66 Through engagement with Anglian Water (see **Appendix 12B Stakeholder engagement (Volume 6.4)** to **Chapter 12: Hydrology (Volume 6.2)**), the need for a dedicated water supply for the EfW CHP Facility has been identified because the existing network cannot accommodate the proposed maximum potential water requirement of 80m^3/h or 22.22 l/s. The solution is to lay a dedicated 225mm HPPE water main from the existing 450mm diameter water mains from a point east of the A47 (part of the Water Connections).

3.4.67 It is noted that the water demand of the EfW CHP Facility appears high because it allows for the full 63t/h CHP steam supply with zero condensate return as a worst-case scenario. In typical operating conditions without any CHP steam supply, the water demand is significantly lower, in the approximate range of 2.5t/h to 5t/h, and there is limited demand for reuse of rainwater in the process (as collected by the proposed surface water drainage system and rainwater harvesting for the weighbridge gatehouse and administration building). With CHP steam supply this range would increase by an amount approximately equal to the mass flow of steam supplied, e.g., 10t/h CHP steam supplied would increase the EfW CHP Facility water demand by approximately 10t/h. Furthermore, it should be noted that any increased demand due to CHP steam supply is likely to be met by an equal reduction in water demand from the receiving CHP steam customer, i.e., the net increase in local water demand due to CHP steam supply is likely to be zero.

Electricity

3.4.68 In order to start up the EfW CHP Facility it is necessary to import electrical power from the electricity distribution network. With the EfW CHP Facility in operation electrical power would be generated at a voltage level of 11kV or 15kV with the plant power requirement (parasitic load) being supplied via the internal power distribution system and transformers at the required auxiliary voltage levels of 700V and 400V.

3.4.69 The plant is able to operate in island mode such that the generator provides the parasitic load requirement only without exporting power, in the event that the electricity distribution network is in outage or the connection to the electricity distribution network is lost. An emergency diesel generator is provided to shut down the plant safely in the event of total power loss (failure of the Grid Connection coinciding with failure of the turbine generator). For export, the power is transformed to 132kV by the main transformer.

3.4.70 A description of the proposed Grid Connection and associated works is provided in **Section 3.9.**

Telecommunications

3.4.71 The EfW CHP Facility would be provided with a digital telephone system with the requisite number of internal extensions to serve the various areas of the facility and the administration building. In addition, separate direct lines would be installed to critical locations in the facility such as the control room and lifts. The telephone line connections would be supplied from the local network.

3.4.72 The EfW CHP Facility would require sufficient high speed fibre optic internet connections for remote monitoring of process parameters and general communication requirements of the operation and management of the facility. The internet connection provider would be selected at the time of plant construction in order to ensure that the most favourable option can be secured.

3.4.73 The telecommunications services would be located in either Algores Way or New Bridge Lane.

Landscaping and Boundary Treatments

3.4.74 A new security fence would be installed along the boundary of the EfW CHP Facility Site (ID28). It would be either a welded mesh or palisade fence measuring up to 2.4m in height. Secure site access points would be provided on New Bridge Lane and Algores Way. The proposed boundary fence and gates are illustrated on **Figure 3.13: Boundary gates and fences (Volume 6.3)**.

3.4.75 To maintain access for maintenance purposes, the security fence is set back a minimum of 6m from the top bank of IDB drainage ditches. Outside of these maintenance areas and within the EfW CHP Facility Site, landscaping will be undertaken with the objective of improving the biodiversity at the EfW CHP Facility Site while recognising the future effects of climate change. Species-rich meadow mixes will be the predominant land cover, incorporating a wetland mix within or adjacent to SUDs features. Shrubs and trees planted on the site will be native species resilient to climate change that reflect the ground conditions that will vary from a periodically wet attenuation basin to drier conditions along the edge of the access roads where drought-tolerant trees with tighter canopies will include cultivars of native Field Maple and Rowan. Further detail is provided within **Figure 3.14 Outline Landscape and Ecology Strategy (Volume 6.3).**

Lighting and CCTV

3.4.76 The **Outline Operational Lighting Strategy** (**Appendix 3B Outline Lighting Strategy (Volume 6.4)**) establishes the design objectives and parameters for the lighting of the EfW CHP Facility. Outside of the operational hours for the acceptance of waste, external lighting requirements would be limited to security and safety only. The lighting strategy aims to minimise lighting on the site; for example, through the use of lighting standards along main access route and the car park that have luminaires with full horizontal cut-off in order to minimise light spill and sky glow. Minimising light levels and spillage also mitigates effects upon wildlife.

3.4.77 A high definition (1080p) Closed-Circuit Television (CCTV) monitoring system would be provided to cover and record key areas including the weighbridge, queuing area, access routes, pedestrian routes, un-loading and loading areas. The system would also cover unauthorised access to the EfW CHP Facility Site and be operational 24 hours a day. Space would be provided for storing the recorded material and information for 90-days.

BREEAM

3.4.78 The EfW CHP Facility will be constructed to achieve a minimum BREEAM rating of 'Good', except for the administration building (ID20) where the minimum rating will be 'Excellent'.

Acoustic fence

3.4.79 To mitigate the potential noise impacts associated with HGV movements during construction of the New Bridge Lane Access Improvements and construction and operation of the EfW CHP Facility, an acoustic fence will be erected within the curtilage of 10 New Bridge Lane. An existing 50m section of a 1.2m high wooden fence and metal gates would be replaced with a 3m high acoustic fence. The acoustic fence will include a solid automated door from the property's egress onto New Bridge Lane and a solid door (if required) to maintain access to a grassed field to the west of the property. Further details and the technical specifications are reported in **Section 7.10, Chapter 7: Noise and Vibration (Volume 6.2)**.

Carbon Capture

3.4.80 There is currently no legal or policy requirement for the EfW CHP Facility to include Carbon Capture and Storage (CCS) apparatus or to be Carbon-Capture Ready (CCR). The Proposed Development does not therefore include the construction and operation of any carbon capture technology.

As set out in the 2020 Energy White Paper, the Department for Business, Energy and Industrial Strategy (BEIS) issued a call for evidence on an expansion to the 2009 CCR requirements to generation facilities under 300MW in July 2021. The consultation closed in September 2021, but the outcome of this consultation has not yet been published by BEIS. As the outcome of the consultation is unknown, the layout of the EfW CHP Facility Site has been designed to allow sufficient space for the plant and equipment for a CCS facility if required in the future (including plant and equipment to capture carbon dioxide (CO_2) from the flue gas emissions of the EfW CHP Facility and transport this to a storage facility). Furthermore, the steam turbine will be designed so as to be ready for installation of controlled low pressure steam extraction; space will be available for condensate return to the main condensate system, diversion of flue gas through the CCS facility and installation of an additional 11/15kV circuit breaker, plus a pre-installed duct from the switchgear building to the future CCS facility. The area proposed for the laydown maintenance area (ID31) as part of the Proposed Development in the south-east portion of the EfW CHP Facility Site could accommodate a future CCS facility.

Biodiversity Net Gain

3.4.81 The Environmental Act 2021 was enacted in November 2021 and this, together with emerging Government policy in the form of the Consultation Draft National Policy Statements for Energy, indicate that Nationally Significant Infrastructure Projects will be required to meet biodiversity objectives which are yet to be set. It is noted that the provisions in the Environment Act 2021 relating to compulsory biodiversity net gain (BNG) for NSIPs are not currently in force. However, in light of these provisions and emerging policy, the current layout of the Proposed Development provides areas of land, primarily in the south of the EfW CHP Facility Site, which will be landscaped to create habitats that will contribute towards BNG. The habitats are shown in **Figure 3.14 Outline Landscape and Ecology Strategy (Volume 6.3)** and include neutral and mixed grasslands, mixed scrub, ponds and wet woodland. The Applicant's approach to BNG is set out within **Chapter 11: Biodiversity Appendix 11M Biodiversity New Gain Assessment (Volume 6.4), Section 5** of which sets out the options available to the Applicant to deliver the net gain. The obligation to deliver BNG, whether via the delivery of habitats on and/or off site or by other appropriate means, will be subject to a DCO Requirement.

March to Wisbech Railway

3.4.82 The reopening of the disused March to Wisbech Railway is a proposal being explored by Network Rail and Cambridgeshire and Peterborough Combined Authority (CPCA) with the support of CCC and FDC. Although there are currently no confirmed and funded plans for the reopening of the disused railway, the layout of the EfW CHP Facility Site has been designed so that the Proposed Development would not prevent the reopening of the March to Wisbech Railway.

3.4.83 For example, the siting of the access road to the EfW CHP Facility Site from New Bridge Lane and adjacent landscaping area has been designed to accommodate a road bridge embankment, should the reopening of the March to Wisbech Railway require a vehicle crossing in the form of a bridge as opposed to an at-grade crossing.

3.4.84 The reopening of the disused March to Wisbech Railway would provide a potential, alternative means of waste delivery to the EfW CHP Facility. An area of landscaping in the western part of the EfW CHP Facility Site, alongside the disused March to Wisbech Railway, could accommodate a potential future rail siding unloading area.

3.4.85 The potential location of a future road bridge embankment and rail siding unloading area is illustrated in ES **Chapter 2: Alternatives** (**Graphic 2.4 EfW CHP Facility Site Layout 'futureproofing' (Volume 6.2)**). However, any works to facilitate a future road bridge embankment or a rail siding unloading area do not form part of the Proposed Development.

3.4.86 To commence discussions on the implications of the Proposed Development, the Applicant first contacted Network Rail in December 2019. Following Network Rail's responses to the statutory consultation, in September 2021 Network Rail and the Applicant scheduled monthly project update meetings to progress discussions and undertake the business and technical clearance process. In April 2022, Network Rail confirmed the Proposed Development received business clearance. At the time of writing, the Applicant is in discussions with Network Rail regarding the technical clearance, protective provisions and heads of terms for an agreement to facilitate the reopening of the railway.

Rochdale Envelope

3.4.87 The description of the EfW CHP Facility above outlines the likely size and scale of each project component. However, the detailed design of the EfW CHP Facility would be determined post-consent once the Applicant has appointed an Engineering, Procurement and Construction Contractor (EPC Contractor). The draft DCO submitted with this Application includes a requirement for details of the final design to be submitted and approved by the relevant planning authority prior to construction. The assessment of the Proposed Development is therefore based on a set of parameters, commonly referred to in undertaking an EIA as a Rochdale Envelope or Limits of Deviation (LoD).

3.4.88 PINS Advice Note Nine: Rochdale Envelope (July 2018) (Version 3) sets out advice for using the Rochdale Envelope approach for the assessment of Nationally Significant Infrastructure Project applications.

3.4.89 The ES sets out the findings of an assessment of the Rochdale Envelope and the key parameters as described further below.

3.4.90 To provide a robust assessment, each topic specific assessment presented in **Chapters 6 – 18 (Volume 6.2)** has been undertaken on a reasonable worst-case scenario for that given topic. The reasonable worst-case scenario for each topic differs depending upon the particular assessments being undertaken and the chapters set out the scenario for that topic. However, all assessments have been undertaken within the broadest reasonable parameters, to ensure the assessment is precautionary in its approach.

Parameters for the Assessment

3.4.91 Maximum dimensions that have been assumed for particular key components of the EfW CHP Facility are set out below in **Table 3.1 EfW CHP Facility Limits of Deviation** and illustrated on **Figures 3.6 EfW CHP Facility Site Layout** and **Figure 3.15 EfW CHP Facility vertical Limits of Deviation (**both **Volume 6.3).** The LoD for the key components of the EfW CHP Facility Site are required to accommodate the detailed design phase and any consequential adjustments to building(s)/structure(s) dimensions and ancillary roof-mounted equipment and enclosures for these.

3.4.92 To allow for minor variations in the final positioning of buildings and structure, a lateral LoD of 5m is proposed and illustrated on **3.16 EfW CHP Facility lateral Limits of Deviation (Volume 6.3)**.

Table 3.1: EfW CHP Facility Limits of Deviation

Works No.	Description	Figure 3.6 ID Reference	Maximum length	Maximum width	Maximum height (above FFL)	Lateral deviation	Comment
2A	Gatehouse/weighbridge	ID01	9.5m	2.4m	3m	Up to 5m	2 x weighbridge to be positioned to align with gatehouse
1	Tipping hall	ID02	58.5m	38m	18.5m	Up to 5m	
2A	Fire water tank & fire water pump building	ID03	-	-	-	Up to 5m	For dimensions see ID3a and ID3b
2A	Fire water tank	ID03a	-	16m(Ø)	10m	-	
2A	Fire water pump building	ID03b	12.5m	9.5m	5.5m	-	
1	Waste bunker building	ID04	102m	37m	38.5m	Up to 5m	
1	Tipping bunker	ID04a	-	-	-14m	-	Internal to ID04
1	Main waste bunker	ID04b	-	-	-14m	-	Internal to ID04
1	Waste chute platform	ID04c	-	-	-	-	Internal to ID04
1	Control room	ID04d	-	-	-	-	Internal to ID04

Works No.	Description	Figure 3.6 ID Reference	Maximum length	Maximum width	Maximum height (above FFL)	Lateral deviation	Comment
1	Crane maintenance areas	ID04e	-	-	-	-	Internal to ID04
1	IBA storage bunker and loading areas	ID04f	-	-	-	-	Internal to ID04
1	Boiler house building	ID05	55m	47.6m	52m	Up to 5m	
1	Air pollution control storage area	ID06	-	-	-	Up to 5m	For dimensions see ID6a to ID6c
1	Loading area	ID06a	12.2m	12.2m	12m	-	
1	APCr silos	ID06b	33.3m	12.2m	37m	-	
1	Loading area	ID06c	12.2m	12.2m	12m	-	
1	Air pollution control building	ID07	33.2m	28.6m	37m	Up to 5m	
1	APC plant, silos and reactors	ID07a	-	-	-	-	Internal to ID07
1	Bag filter houses	ID07b	-	-	-	-	Internal to ID07
1	Induced draft fans buildings	ID08	10m	10m	12m	Up to 5m	2 x Induced Draft Fans building
1A	Chimney and continuous emissions monitoring systems (CEMS)	ID09	-	-	-	Up to 5m	For dimensions see ID09a and ID09b

Works No.	Description	Figure 3.6 ID Reference	Maximum length	Maximum width	Maximum height (above FFL)	Lateral deviation	Comment
1A	Chimneys	ID09a	-	3.2m(Ø)	90m	-	2 x chimneys
1A	CEMS platform	ID09b	-	-	18m	-	To base of platform
1	Switchgear building	ID10				Up to 5m	
1	Switchgear building north	ID10a	35.2m	10m	35m	-	
1	Switchgear building south	ID10b	12.4m	10m	18m	-	
1	IBA loading enclosures	ID11	-	-	-	Up to 5m	
1	IBA enclosure east	ID11a	14m	11m	12m	-	
1	IBA enclosure west	ID11b	11m	6m	12m	-	
1	Diesel tanks and urea tanks building	ID12	25.9m	9.1m	35m	Up to 5m	
1	Compressed air station	ID13	13m	8m	10m	Up to 5m	
2A	Main transformer	ID14	11m	6m	12m	Up to 5m	
1	Emergency diesel generator	ID15	13.5m	5.5m	12m	Up to 5m	

Works No.	Description	Figure 3.6 ID Reference	Maximum length	Maximum width	Maximum height (above FFL)	Lateral deviation	Comment
1	Air cooled condenser	ID16	37m	37m	30m	Up to 5m	
1	Turbine hall	ID17	47m	34m	27m	Up to 5m	
1	Water treatment plant	ID18	30m	22m	18m	Up to 5m	
2A	Workshop and stores	ID19	34m	15m	18m	Up to 5m	
1B	Administration building	ID20	34m	12m	15m	Up to 5m	
2A	132kV switching compound	ID21	23m	13m	6.5m	Up to 5m	
2A	Private wire transformer	ID22	11m	5m	12m	Up to 5m	
2A	Private wire switchgear compound	ID23	7m	6m	12m	Up to 5m	
1	Water re-cooling system	ID24	18.5m	7.5m	27m	Up to 5m	Roof mounted on ID18. Height of ID24 alone is 9m.
3	Steam and condensate pipelines	ID25	-	-	23m	Up to 5m	Maximum height for ID25a and ID25b.
Note: lateral Limits of Deviation displayed on the Works Drawings include the 5m deviation allowance							

CHP Connection

3.4.93 The EfW CHP Facility has been designed to allow the export of steam and electricity from the facility to surrounding business users via dedicated pipelines and private wire cables. Potential end users of the heat and power have been identified along the line of the disused March to Wisbech Railway, and discussions have been held with these users.

3.4.94 As described in **Section 3.3**, the CHP Connection Corridor runs along the eastern edge of the disused March to Wisbech Railway, to Weasenham Lane with a spur enabling a CHP Connection to potential customers south of Weasenham Lane, including Lamb Weston. A pipe bridge would then take the CHP Connection over Weasenham Lane and the CHP Connection Corridor continues until it reaches the Nestlé Purina site (see **Figure 3.2i-viii: Project Components (Volume 6.3)**).

3.4.95 The CHP Connection arrangements are illustrated on **Figure 3.17i-ii: CHP Connection general arrangements (Volume 6.3)**. The Steam Pipeline would be located on a steel structure with a 1:500 gradient therefore approximately 1.6m to 1.7m in height, with a return Condensate Pipeline and Private Wire Connections and data cables running underneath. The Steam Pipeline would have a diameter of approximately 0.75m and the return Condensate Pipeline would have a diameter of approximately 0.25m. For health and safety and operational reasons, the Applicant proposes to locate the CHP Connection above ground.

3.4.96 At distances of 50m to 60m along the route, expansion loops would be required to allow small movements of the pipeline as it expands due to heat from the steam, to ensure the safe operation of the pipeline. The expansion loops would raise the Steam Pipeline, Condensate Pipeline and Private Wire Connections and data cables to a height of 6.7m for a distance of 5m, before returning to a 1.6m or 1.7m height. At a point south of the rear of properties fronting Victory Road, the use of expansion loops would be replaced with expansion bellows. These perform a similar function to the expansion loops and consist of a section of corrugated pipe in the same alignment and at the same height as the rest of the pipeline.

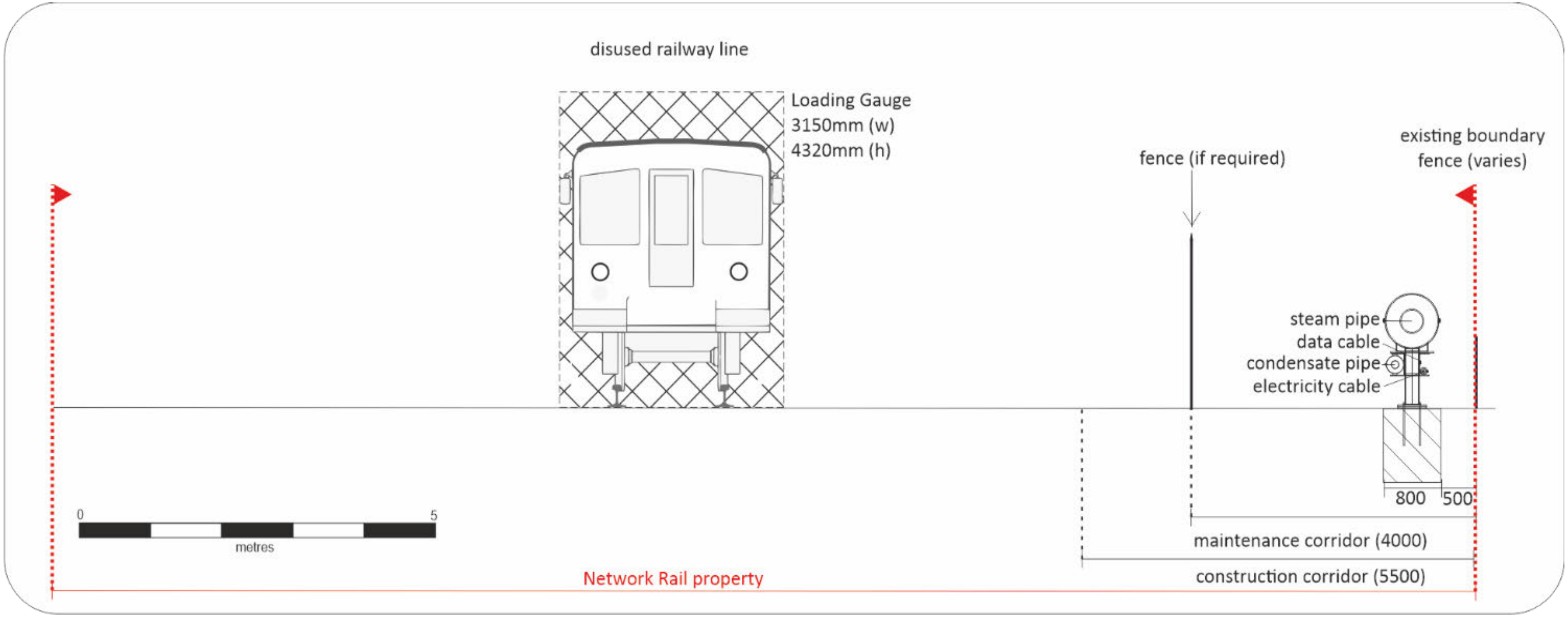
3.4.97 A pipe bridge measuring approximately 25m in length would be constructed over Weasenham Lane, allowing traffic to pass underneath. The pipe bridge would have an approximate height of 7m, with a 5.5m clearance from the highway. Concrete foundations extending up to 2m below the ground would form the footings of the pipe bridge.

3.4.98 A spur from the CHP Connection would cross the disused March to Wisbech Railway on a pipe bridge to Lamb Weston. This bridge would be approximately 25m in length and with an approximate height of 7m, giving a 5.5m clearance from the rail track. The Steam Pipeline would have a diameter of approximately 0.75m and the return Condensate Pipeline would have a diameter of 0.25m. The Private Wire Connections and data cables would sit underneath the steam pipe.

Graphic 3.18: A typical CHP pipe and cable arrangement

3.4.99 **Graphic 3.19 Illustrative CHP Corridor cross-section** below provides an illustrative cross section demonstrating how the CHP Connection would be accommodated within the railway corridor without hindering the ability for others to reopen the disused March to Wisbech Railway, as illustrated on the following page.

Graphic 3.19: Illustrative CHP Corridor cross-section



3.4.100 The CHP Connection would be predominately constructed in steel and the pipes would be insulated, in accordance with industry standards.

3.4.101 The CHP Connection is designed to provide future end users within the neighbouring industrial area with the opportunity to take low carbon steam and electricity. **Figure 3.17i-ii CHP Connection general arrangements (Volume 6.3)** also provides an example of a blank T-connection which would allow for a future customer offtake from the CHP Connection. The detailed design of the future connection spurs to end users will be consistent with the design for the CHP Connection and good utility practice and would be the subject of a separate consent.

Limits of Deviation

3.4.102 The LoD for the placement of the CHP Connection are illustrated in **Figure 3.2i-viii: Project Components (Volume 6.3)** and comprise the whole width of the disused March to Wisbech Railway between the EfW CHP Facility Site and Nestlé Purina factory.

3.4.103 Within the disused March to Wisbech Railway LoD, for the purpose of construction of the CHP Connection, a 5.5m corridor is proposed except when adjacent to the EfW CHP Facility and a section north of Weasenham Lane. Here it is reduced to between 1.3m to 2m and 3m respectively; see **Figure 3.27 CHP Connection Construction Limits of Deviation (Volume 6.3)**.

3.4.104 Within the disused March to Wisbech Railway LoD, for the purpose of operation and maintenance a 4m corridor width is proposed except when adjacent to the EfW CHP Facility. Here, most of the maintenance will be undertaken from the EfW CHP Facility Site side. Therefore, the land required is between 1.3m to 2m; see **Figure 3.28 CHP Connection Operational Limits of Deviation (Volume 6.3)**.

Access Improvements

3.4.105 The primary site access to the EfW CHP Facility Site would be from New Bridge Lane, with access from Algores Way used for staff and occasional light vehicles during operation.

3.4.106 To facilitate the Access Improvements for the EfW CHP Facility, a highway improvement scheme is required along New Bridge Lane. Minor improvements to the existing site access off Algores Way will also be required.

3.4.107 The highway improvement scheme for New Bridge Lane would widen the road from a point east of the junction with Salters Way to the proposed access over a distance of 172m. The road would be widened to 7.3m to allow for a two-lane carriageway with centre lines. The alignment of the road has been based upon the initial proposals for the WAS Southern Access Road (SAR) 1 scheme, which provided an at-grade crossing over the disused March to Wisbech Railway.

3.4.108 The SAR 1 scheme provided for a 6m-wide carriageway. The Applicant proposes a widened carriageway of 7.3m and to reduce the road speed from the national speed limit to 30mph, considering that this would be more appropriate for HGV access into the EfW CHP Facility, the surrounding industrial estate and isolated residential properties along New Bridge Lane. The carriageway widening works would start east of Salters Way and extend east across the disused March to Wisbech Railway to the entrance of the EfW CHP Facility. At this point the carriageway would narrow into a bollard-controlled chicane before connecting to the existing width and alignment of New Bridge Lane so as to prevent HGVs turning left out of the EfW CHP Facility. The existing access into 10 New Bridge Lane would be retained. The proposed carriageway works include the provision of dropped kerb crossings either side of New Bridge Lane, to the west of Salters Way.

3.4.109 The widening of the carriageway also requires the provision of new dropped kerbs to provide access into a builder's yard to the rear of, and a residential property at, 9 New Bridge Lane.

3.4.110 To accommodate the carriageway widening, an existing UKPN Compact Substation measuring approximately 0.9m(w), 0.9m(l) and 1.1m(h) would be relocated north of the proposed carriageway.

3.4.111 An IDB culvert and associated headwall are located under the existing carriageway and shall be replaced or extended to the same size requirements, to accommodate the works details which are shown on **Figure 3.18i-vi: IDB Culvert general arrangement (Volume 6.3)**.

3.4.112 A single 2m-wide footway, with street lighting at approximately 30m intervals, would be provided along the northern side of the extended carriageway.

3.4.113 The proposals are shown in **Figure 3.19: New Bridge Lane access proposals (Volume 6.3).**

3.4.114 **Figure 3.6: EfW CHP Facility Site Layout (Volume 6.3)** illustrates the design of the proposed bellmouth access onto New Bridge Lane and includes the internal layout of the site and the access arrangements for the weighbridge. The bellmouth access has been designed with a visibility splay for a 30mph road (70m). The access radius has been designed to accommodate the largest design vehicle and to allow such vehicles to enter and exit from the west onto New Bridge Lane only.

3.4.115 It should be noted that the Order limits include the entirety of New Bridge Lane, from the EfW CHP Facility Site entrance to the junction with Cromwell Road. It is not proposed to undertake highway widening works to the remaining section of New Bridge Lane, which is an existing two-lane carriageway. However, it is proposed to install a pedestrian crossing at this junction comprising tactile paving at dropped crossings.

3.4.116 In addition to New Bridge Lane Access Improvements, the existing Algores Way access to the EfW CHP Facility Site would need to be reconfigured to facilitate the internal layout of the EfW CHP Facility Site. **Chapter 6: Traffic and Transport, Figure 6.19 Algores Way Operational Access Design (Volume 6.3)** illustrates how the existing site access off Algores Way would be redesigned to accommodate the requirements of the EfW CHP Facility. The Algores Way site access would be located approximately 20m to the south of the existing site entrance but would retain the same design parameters.

3.4.117 The road widening and access arrangements have been designed to the relevant Design Manual of Roads and Bridges (DMRB) design standards.

3.5 EfW CHP Facility (Operation)

3.5.1 This section of the ES provides a summary of the proposed operation of the Proposed Development.

Overview

3.5.2 The EfW CHP Facility would be capable of handling approximately 523,500 (nominal) tonnes of residual (non-recyclable) waste per annum at 10.9MJ/kg at an availability of 7884 hours/year (approximately 625,600 tonnes per annum at 9.8MJ/kg and 8500 hours/year). It is intended that the EfW CHP Facility would be able to export up to 55 Megawatts electrical (MWe) net (60 MWe gross) and potentially up to 63 tonnes per hour of steam (heat) energy.

Description of waste to be processed

3.5.3 The EfW CHP Facility will be designed to accept residual Household and Industrial and Commercial (HIC) waste streams. Such waste will be loose residual material including Refuse Derived Fuel (RDF) and will comprise:

- Material which is presently exported from the UK for final treatment; and
- Those parts of the HIC waste stream that are presently managed at domestic landfill sites and EfW facilities further away.

3.5.4 However, because HIC waste covers a wide cross-section of waste types, inevitably, parts of this stream will not be suitable for use as a fuel source at the EfW CHP Facility e.g., rubble and soils. Instead, it is recognised that only specific elements of the HIC waste stream will be suitable for treatment at the EfW CHP Facility.

3.5.5 All waste is classified by the Waste Framework Directive into specific 'types' of material using a set of established classification codes. These codes are referred to as LoW (List of Waste) or EWC (European Waste Catalogue) code. The specific 'type' of waste that would be accepted by the EfW CHP Facility will be from the following categories:

- 02 – waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing;
- 03 – waste from wood processing and the production of panels and furniture, pulp, paper and cardboard;
- 04 – wastes from the leather, fur and textile industries;
- 09 – wastes from the photographic industry;
- 15 – waste packaging, absorbents, wiping cloths, filer materials and protective clothing not otherwise specified;
- 17 – construction and demolition wastes (including excavation soil from contaminated sites);

- 19 – waste from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use; and
- 20 – municipal waste (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions.

3.5.6 The focus will be on categories 19 and 20 with an anticipated 90-95% of the EfW CHP Facility's fuel coming from waste streams within these categories.

Operational process

3.5.7 The operation of the EfW CHP Facility would be in accordance with an EP. The key stages of the operational process are described below and illustrated in **Graphic 3.20: Operational Process Diagram**.

Start up

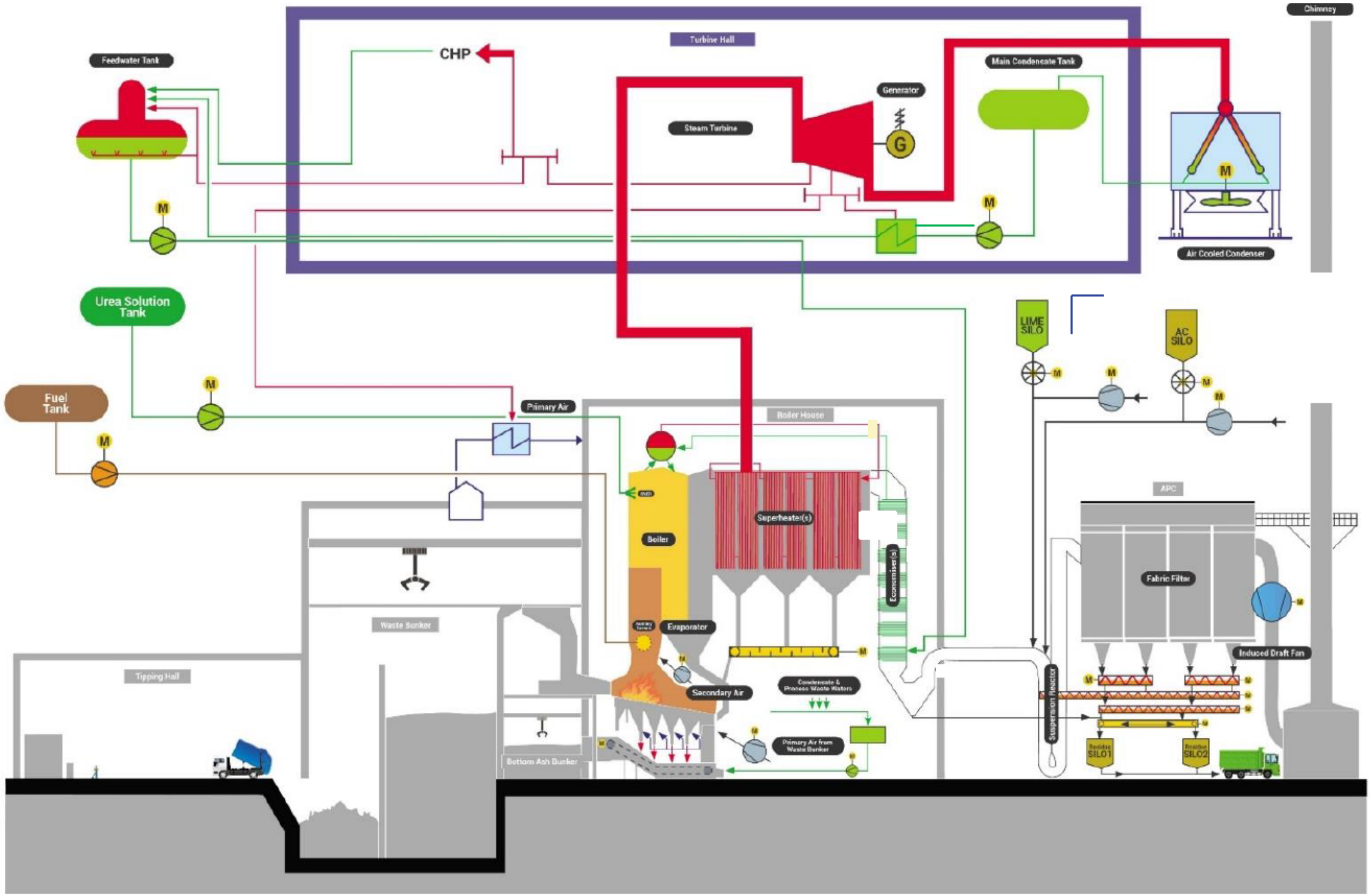
3.5.8 The EfW CHP Facility would use low sulphur light oil or HVO (hydrotreated vegetable oil) for start-up; there is no gas used on site. Auxiliary burners are fitted in the furnace which are used to bring the system up to the required temperature before waste is fed onto the grate. The start-up process is carefully controlled to raise the temperature in the furnace and boiler gradually to avoid adverse thermal impact on the system. The start-up takes 10 to 12-hours from cold and during this time small quantities of steam would be vented from the boiler house building (ID05) roof vent as the systems are warmed up and filled with steam over a period of around four hours during the start-up process. Following this, a continuous flow of steam would be vented for around another four hours as sufficient steam pressure is generated to divert to the ACC (ID16) and close the start-up valve. As the vent silencer is designed for 110% maximum load there would be no abnormal noise emissions. No waste is introduced until the furnace has reached >850°C and there is sufficient flue gas flow through the boiler for the flue gas cleaning systems to be fully operational. There is no bypass to the filter system.

Waste deliveries and storage

3.5.9 Waste would be delivered to the EfW CHP Facility in HGVs such as RCVs and walking floor articulated lorries. These vehicles would enter the enclosed tipping hall (ID02), reverse up to the bunker edge and tip the waste into the tipping bunker (ID04a).

3.5.10 Mechanical cranes transfer waste from the tipping bunker (ID04a) to the main waste bunker (ID04b). The waste would be mixed and stored in the main waste bunker waiting to be loaded into the furnace by a mechanical crane. The main waste bunker would be able to store up to 11.5-days' worth of waste.

Graphic 3.20: Operational Process Diagram



Waste Combustion

3.5.11 Waste would be fed from the main waste bunker (ID04b) into the furnace using mechanical cranes. Under operator supervision, the automatic cranes would mix the waste in the bunker to maximise, as far as possible, the homogeneity of the waste. This mixing would also help to identify any items that should not have been disposed of at the EfW CHP Facility and which, under normal circumstances, should not be fed into the furnace – for example, used butane gas canisters – and would enable them to be removed from the bunker and stored in an on-site skip outside and adjacent to the tipping hall (ID02), for disposal off-site at a suitably licenced facility. However, the EfW CHP Facility is designed to safely combust such items should they inadvertently be fed into the furnace.

3.5.12 The combustion of the waste would take place on an inclined reciprocating grate. Waste would be fed via a waste feed hopper and a set of feed rams onto the grate, which would have a drying and ignition zone, a combustion zone and a burn-out zone. The primary combustion air would be supplied from under the grate through small holes in the grate bars. Primary combustion air would be drawn from above the waste bunker. Furnace temperatures will range from 850°C to 1,250°C.

3.5.13 The combustion system would be equipped with auxiliary burners fired by low sulphur light fuel oil or HVO used for start-up/shutdown and combustion support to ensure combustion compliant with IED conditions. The walls of the combustion chamber would be water cooled and lined with a combination of refractory materials and Inconel cladding (a highly corrosion-resistant nickel-chromium alloy). IBA generated from combustion would drop off the end of the grate directly into a water bath equipped with a mechanical ash discharge conveyor. This would quench the hot ash and act as an air seal to prevent uncontrolled ingress of air into the primary combustion zone. The IBA, a non-hazardous waste, would then be conveyed to the IBA storage bunker (ID04f) before being taken away for recycling (see further details below).

3.5.14 Combustion gases would pass into a secondary combustion zone lined with a combination of refractory materials and Inconel cladding, equipped with secondary air injection and distribution nozzles, and configured to achieve good mixing of the secondary air with combustion products from the primary combustion zone. The zone is sized so that the products of combustion, after the injection of secondary air, remain at a temperature of at least 850°C for a minimum of two seconds. This is to ensure the efficient destruction of organic compounds including dioxins, furans and carbon monoxide. In the unlikely event that the temperature arising from the combustion of the waste on its own is insufficient (e.g., when burning very low calorific value waste) the auxiliary burners are used to maintain this temperature.

3.5.15 The waste feed rate, the supply of primary and secondary combustion air and the grate speed would be regulated by a combustion control system which measures steam flow rate, flue gas oxygen concentration, combustion temperature and waste depth on the grate and controls the combustion process to keep the rate of steam generation constant. This ensures that:

- The boiler and generator operate at their optimal efficiency; and

- Over-firing of the boiler, with the consequent increase in thermal stress and corrosion as well as the risk of increased CO emissions, is avoided.

3.5.16 The amount of heat released by the waste would vary according to its net calorific value (NCV). This is the amount of thermal energy released in the complete combustion of a given quantity of the waste and, due to the inconsistent nature of MSW, constantly varies. The automatic control system would respond to this variation by modifying the waste feed rate and the grate speed to maintain a constant heat release from combustion and hence a constant steam flow rate. The cranes would mix the waste in the bunker to homogenise the NCV of the waste fed to the boiler.

3.5.17 In addition to conventional combustion control (e.g., with temperature sensors), infrared cameras would be provided to record and control the fire length and the burnout on the grate.

3.5.18 The combustion process generates oxides of nitrogen (NOx). To not exceed the emission limit for these substances, the secondary combustion zone would be equipped with a NOx reduction system. The oxides of nitrogen would be reduced to nitrogen by injecting urea solution into the secondary combustion zone of the furnace. As the reaction is sensitive to temperature, the injection nozzles would be installed at several levels within the combustion zone to enable the injection of urea or ammonia solution to be precisely adjusted to the temperature conditions within the zone.

3.5.19 Urea (ammonia) acts as a reducing agent which decomposes during injection in the hot flue gas stream, primarily to ammonia. The hydrogen in the ammonia reacts with the oxygen in the oxides of nitrogen to produce molecules of water vapour and nitrogen. This is a Selective Non-Catalytic Reduction (SNCR) process, which is optimised at temperatures of between 850°C and 1,000°C. The gases would pass through a combination of water-cooled radiant chambers and an evaporator tube bundle which would reduce the temperature of the gases to around 600°C before coming into contact with the steam super-heaters. This serves to minimise corrosion and also to ensure that the majority of the small ash particles entrained in the combustion gases are below their melting point and are therefore less likely to adhere to the heat transfer surfaces.

3.5.20 The geometry of the furnace and boiler is designed to minimise areas where excessive corrosion could occur. In certain areas of the combustion chamber and the second pass of the boiler, which cannot be protected by refractory lining, the metalwork of the boiler would be protected by layers of Inconel, applied under carefully controlled conditions to ensure full bonding between the parent metal of the tubes and the alloy.

Steam Generation

3.5.21 High pressure (up to 47 bar) and temperature (380°C) steam would be created by the evaporation of the water, which circulates by natural buoyancy through the evaporator sections and the water tube walls of the combustion chamber. The steam from the evaporators is saturated – it is in equilibrium with the water and would condense immediately heat is removed. In order to minimise condensation of steam within the steam turbine and to maximise the efficiency of the turbine, the saturated steam would be further heated in the super-heaters.

3.5.22 The combustion gases would cool rapidly as they pass over the super-heaters. This would maintain heat transfer efficiency, minimise erosion and also minimise the presence of ash deposits on the tubes. The economiser sections would reduce the gas exit temperature to the optimum required for the flue gas treatment process and preheat the boiler water for increased efficiency. The rapid cooling coupled with minimal ash deposits would help minimise the reformation of dioxins and furans.

Air Pollution Control

3.5.23 The process would use a dry APC system using hydrated lime and activated carbon, which would be delivered in sealed bulk powder carriers that are pneumatically loaded and emptied.

3.5.24 Acid pollutants HCl, SO_2 and HF would be removed by a dry scrubbing and filtration system, using hydrated lime as the reagent.

3.5.25 A controlled amount of hydrated lime would be injected into the flue gas duct upstream of the reactor. Hydrated lime would mix with the flue gases in the flue gas duct and the downstream reactor, which is designed with sufficient residence time to ensure that the necessary chemical reactions are completed. A controlled amount of powdered activated carbon would also be injected into the flue gas upstream of the reactor or fabric filter. The purpose of this is described below.

3.5.26 The flue gases would pass through the fabric filter in which the entrained particles are trapped in the filter cake which covers the filter bags. The neutralisation reaction would be completed as the flue gases pass through the filter cake. The filter cake would be removed at regular intervals by reverse air pulses and fall into the filter discharge hoppers. A proportion of this residue would be re-circulated into the reactor. This increases the neutralisation reaction efficiency, thereby reducing the final quantity of un-reacted lime in the APC residue. The SO_2 and HCl concentrations at the boiler outlet and at the emission monitoring points in the chimneys would be continuously monitored and the quantity of hydrated lime injected would be adjusted in accordance with the difference in the concentrations of the acid gases at the two measurement points to achieve the permitted emission limits.

3.5.27 The primary method of minimising the release of dioxins would be by careful control of the combustion conditions. The gas residence times and the temperatures in the combustion system are such that dioxins/furans are efficiently destroyed.

3.5.28 For additional removal of dioxins and furans, an activated carbon injection system would be used. The activated carbon adsorbs mercury and organic compounds including dioxins and furans. Other heavy metals such as copper and cadmium are filtered out as particulates by the fabric filter.

3.5.29 Once the flue gas has been cleaned, it would be analysed using a comprehensive system of continuous emissions monitoring equipment and periodic manual sampling. The treatment process would be adjusted to ensure that the emissions meet the strict emission limits set out in the EP. Finally, the treated flue gases would be discharged to the atmosphere, via the chimneys.

The Fabric Filter

3.5.30 The filter bags in the bag filter houses act as a foundation for the formation of a filter cake, which protects the filter bags and serves as a reaction medium for both the acid gas neutralisation and the adsorption of heavy metals and organic compounds and provides particulate filtration.

3.5.31 The filter cake would be periodically removed from the bags by the automatic cleaning system, to control the filter cake build up and hence the pressure drop across the bags. The bags are cleaned in rows by reverse jet pulses from compressed air nozzles. The cleaning sequence is triggered automatically when a pre-set pressure drop across the bags has been reached. The bag filters may be provided with an electrical preheating system. The preheating system is used to preheat the bag filters at start-up and maintain the filter temperature in the event of a short-term operational shutdown.

3.5.32 The differential pressure across the filter bag is measured as an indication of the build-up of filter cake on the bags. The material that falls into the ash hoppers during the cleaning process is removed from the system by conveyors. A proportion is re-circulated as described above.

Turbine Generator and ACC

3.5.33 The superheated steam from the boiler would be transferred by pipework to the steam turbine in the turbine hall (ID17). The expansion of the steam would deliver energy in the form of shaft power which, in turn, would be used to drive an electrical generator (alternator). Provision has been made in the design of the steam turbine for steam extraction (bleed) which can then be sent via the steam and condensate pipelines (ID25b) along the CHP Connection to users in the surrounding industrial estate.

3.5.34 The EfW CHP Facility would use a high efficiency, single shaft condensing steam turbine. The turbine would drive a water-cooled synchronous generator possibly via a reduction gearbox. The system would be complete with all necessary auxiliary water steam system equipment, valves, pipework and fittings. The turbine would be provided with oil systems for lubricating the turbine, reduction gearbox (if required) and generator main and subsidiary bearings and for the high-pressure hydraulic operation and servo control of the governing and emergency shut off valves. The oil systems would have main, secondary and emergency pumps and filtration and cooling systems as required.

3.5.35 The EfW CHP Facility would use a finned-tube ACC (ID16) to condense the exhaust steam from the steam turbine. In the ACC, the steam would be condensed under vacuum to extract the maximum practical mechanical energy from the expansion in the steam turbine.

3.5.36 The ACC would consist of several sections as follows:

- Tube bundles in carbon steel with aluminium or galvanised steel fins;

- A cooling fan system including adjustable blade pitch, frequency regulated electric motors and direct drive reduction gear;
- Screening of the air intake and exit openings to reduce visual impact; and
- A steel support structure.

Emissions to Water

3.5.37 In normal operation, the EfW CHP Facility would produce virtually no liquid effluent. Clean water such as boiler blowdown water or backwash water from the WTP (ID18) would be returned to the ash quench system on the boiler. However, some regeneration water from the WTP would be periodically discharged to the foul sewer via the neutralisation tank. Dirty water such as the run-off from the IBA conveying system would be returned to the ash quench system.

Incinerator Bottom Ash

3.5.38 The wet IBA remaining after combustion equates to approximately 26.5% by weight of the input waste. This equates to approximately 165,600tpa assuming a maximum waste throughput of 625,600tpa.

3.5.39 IBA including metals, which represent approximately 3.5% by weight of the IBA, would be discharged from the end of the combustion grate directly into the ash quench bath. From there, the IBA would be transferred by means of IBA extraction conveyors into one storage bunker with a storage capacity of seven days minimum (>2,800m^3). The bunker would have a drainage system so that surplus quench water runs back into a collection sump and can be returned to the quench bath from time to time. The ash retains approximately 20%, by weight, of the water from the quench bath.

3.5.40 Within an enclosed area (ID04f), the IBA would be loaded by means of a semi-automatic travelling overhead grab crane into a collection vehicle. The collection vehicle would be an enclosed or sheeted HGV.

3.5.41 The IBA would be sent to a suitably licenced facility in the UK for recycling, where metals contained within the IBA would be extracted and the remainder reclaimed for use as secondary aggregate.

APC Residues

3.5.42 The residue from the bag filters, which contains fly ash – the reaction products from the acid gas neutralisation process and activated carbon with the adsorbed metals and organic compounds – is considered hazardous waste. The APC residues are not dissimilar to powdered cement in this respect, which is routinely transported by road in the same type of vehicles that would transport the APC residues.

3.5.43 The APC residues would be conveyed from the filter hoppers to an intermediate storage silo. This part of the APC residues would be returned to the reactor to improve the utilisation of hydrated lime.

3.5.44 The balance is conveyed to one of four closed APC residue storage silos. Combined, the silos would have a capacity of 720m^3 which allows a minimum of seven days' storage. The silos would be insulated, and the lower cone would be electrically heated to prevent agglomeration of the residue and to ensure a free flow during the discharge process. The APC residues have a very low moisture content. The silo is vented through a bag filter to ensure there are no fugitive emissions from the system.

3.5.45 The APC residues amount to approximately 5% of the total waste by volume. This equates to approximately 31,280tpa assuming a maximum waste throughput of 625,600tpa. The APC residues would be sent to a suitable licenced facility and in the UK where possible, for disposal.

3.5.46 The APC residues would be transported on the road in sealed bulk powder carriers which are pneumatically loaded and emptied. It is the intention to arrange for some of the APC residue loads to be transported in the bulk powder carriers which have delivered hydrated lime to the EfW CHP Facility, which would reduce vehicle movements.

Pest and Vermin Control

3.5.47 To monitor and control pests, insects and vermin, specialist firms will be contracted to undertake regular inspections of the EfW CHP Facility Site. Bait boxes will be maintained around the perimeter of the EfW CHP Facility if required.

Electricity

3.5.48 The EfW CHP Facility will have a generating capacity of more than 50MW. On average, approximately 60MWe is generated by the steam turbine, of which approximately 5MWe is consumed by the plant as the parasitic load, leaving up to approximately 55MWe as the net electrical output for export to local users and the electricity distribution network.

3.5.49 In order to give the amount of energy generated by the Proposed Development context, it can be helpful to compare it to the amount of electricity used by an average household using data on domestic electricity usage provided by BEIS[1]. Generating 55MW of electricity net and using the average mean household electricity consumption figure of 3,700kwh the Proposed Development would generate electricity sufficient to power 118,918 homes per annum based upon its assumed level of efficiency (load factor). This is almost sufficient to meet the electrical demand of all homes in Fenland and Kings Lynn West Norfolk (45,640[2] and 74,240[3] respectively).

Steam

3.5.50 Approximately 50MWth of usable steam (heat) energy would be available for export via the CHP Connection to users in the surrounding industrial estate. The steam would be transported via the Steam Pipeline to its destination and a smaller

[1] BEIS. National Energy Efficiency Data-Framework (NEED): Summary of Analysis, Great Britain, 25 June 2020
[2] CCC. Cambridgeshire Insight. Cambridgeshire and Peterborough Population and Dwelling Stock Estimate Mid-2011 to Mid 2020.
[3] NCC. Norfolk Insight Housing and Households Area Report. Kings Lynn West Norfolk. 2021.

diameter Condensate Pipeline would carry the condensate back to the boilers for reuse (ID25b).

Operational hours

3.5.51 Once operational, the EfW CHP Facility would be capable of processing up to 625,600 tonnes of residual commercial, industrial and household waste 24-hours a day, up to 365-days a year. Operational hours for the acceptance of waste would be limited to 07:00 to 20:00 during the 365-days. Outside of these hours, to ensure the EfW CHP Facility's continued operation, and for security purposes, a shift team would be present.

3.5.52 There may be some occasions when waste deliveries are accepted outside the normal opening hours; for example, in the case of an emergency or to accommodate the delivery of waste where vehicles have been unavoidably delayed, or in other similar circumstances. It is therefore proposed that the EfW CHP Facility be able to accept waste outside the operating hours stated above in these circumstances.

Operational workforce

3.5.53 It is anticipated that up to 40 Full-Time Equivalent (FTE) jobs would be created as a result of the Proposed Development. These would include direct employment opportunities for the operation of the EfW CHP Facility, in a mixture of skilled and unskilled roles, as well as indirect employment opportunities for local services such as cleaning and catering. Direct employment opportunities include a shift team of 18 skilled operators, working in shifts of three at a time, to cover 24-hour operation of the power generation aspect. These teams would be overseen by an Operations Manager who reports directly to the Facility Manager. Also reporting to the Facility Manager will be a QHSE Manager, Electrical Engineer and two Mechanical Engineers. On the waste acceptance side, there will be six Waste Acceptance Operatives and a Waste Acceptance Supervisor reporting to the Waste/Contract Manager. In terms of business support, there will be an administration/HR Manager, Finance Manager and Assistant, Account Manager, IT Support Technician, Community Liaison Manager and a Commercial Support Manager. In addition, indirect employment opportunities include (as a minimum) cleaning services, electrical engineering services, mechanical engineering services and other maintenance-related roles such as scaffolding teams.

Operational waste management

3.5.54 Solid residues in the form of IBA would be transported off site and recycled, and residues from the APC system would require disposal off site at a suitably licensed facility. The processes for these residues have been described above.

Operational maintenance

3.5.55 There would be periods when the EfW CHP Facility needs to be shut down for maintenance purposes and these shutdowns would always be planned in such a way that a single boiler would be offline whilst the other remained online; this is expected to last for a maximum period of 21 days per boiler each year. There will be periods where both boilers must be offline at the same time, but it is anticipated that such periods will last for a maximum of 10 days.

3.5.56 Sufficient storage capacity for waste is provided to cover the planned maintenance periods where both boiler lines are shut down together. Some of the waste streams would be stopped from delivering during these outages to maintain storage capacity.

3.5.57 During periods when the EfW CHP Facility is not operating, the air from the ventilation system is passed through the dust and activated carbon filters of the shutdown exhaust system and/or a permanently installed odour neutralisation spray system to avoid malodorous compounds being emitted.

3.6 Grid Connection (Physical Development)

3.6.1 The Applicant has accepted a capacity connection offer from UK Power Networks (UKPN – the Distribution Network Operator (DNO)) to connect to the DNO's Walsoken Substation. Further details are provided in the **Grid Connection Statement (Volume 7.2**).

3.6.2 The Grid Connection (Works No. 7 and 8) would comprise a 132kV electrical connection using underground cable (UGC) and be located in the Grid Connection Corridor. The design for the underground cable has been developed by the Applicant's Independent Connection Provider on the basis of UKPN's connection offer, known UKPN and industry standards, consultation with National Highways, the local highway authority and professional experience in building other connections of this nature.

Cables

3.6.3 The proposed cable design complies with UKPN's Engineering Construction Standard ECS 02-0019 Installation of Underground Cables – LV to 132kV.

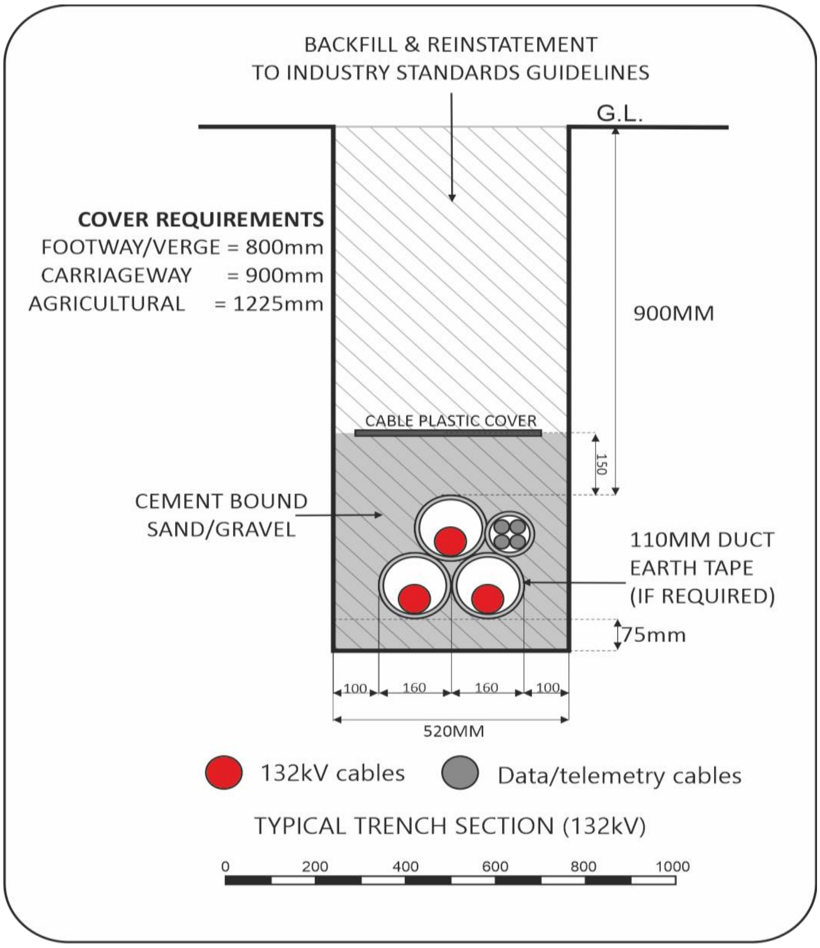
3.6.4 The UGC would comprise three insulated single core cables, each with a 300mm aluminium conductor and aluminium wire screen. This would be confirmed during the detailed design phase and through agreement with UKPN. In addition, a fibre optic cable would be laid for telemetry purposes. The UGC would connect into the Walsoken Substation. From here it would run underground to the above ground substation infrastructure at the Walsoken DNO Substation. This connection would be via a cable termination mounted on a terminal structure and cable sealing end.

3.6.5 The cables would be installed using an open cut trench method, or within pre-installed conduits. For open cut trenching, the cable would be set in a trench up to 1.6m in depth, but which could extend to 2.0m at the Broadend Road and A47 junction to allow CCC to construct a proposed roundabout in the future (see below) or to account for unforeseen circumstances. Two metres is the upper limit for the purpose of the assessment. A typical cross-section of a trench is provided in **Graphic 3.21 Typical cable trench cross section (132kV)** below**.**

3.6.6 CCC is proposing road improvements at the A47/A1101 Elm High Road junction and the A47/Broadend Road junction (see **Chapter 6: Traffic and Transport (Volume 6.2)**). The Applicant has been in discussions with CCC regarding the potential for CCC to install conduits as part of their road improvements. This would allow the UGCs to be pulled directly underneath the roads without the need for open cut trenching, thus minimising the environmental effects of these works. The ability to commit to conduits will depend on the technical feasibility of installing them, and the timescales of the road improvement schemes in comparison to the Proposed Development as it is understood (as of January 2022) that CCC currently has insufficient funding for the junction improvements, Therefore, it is unlikely the Grid Connection works will coincide with CCC road improvements scheme on the A47.

3.6.7 The cables would be positioned to meet the required depths and separations from any existing underground utility apparatus.

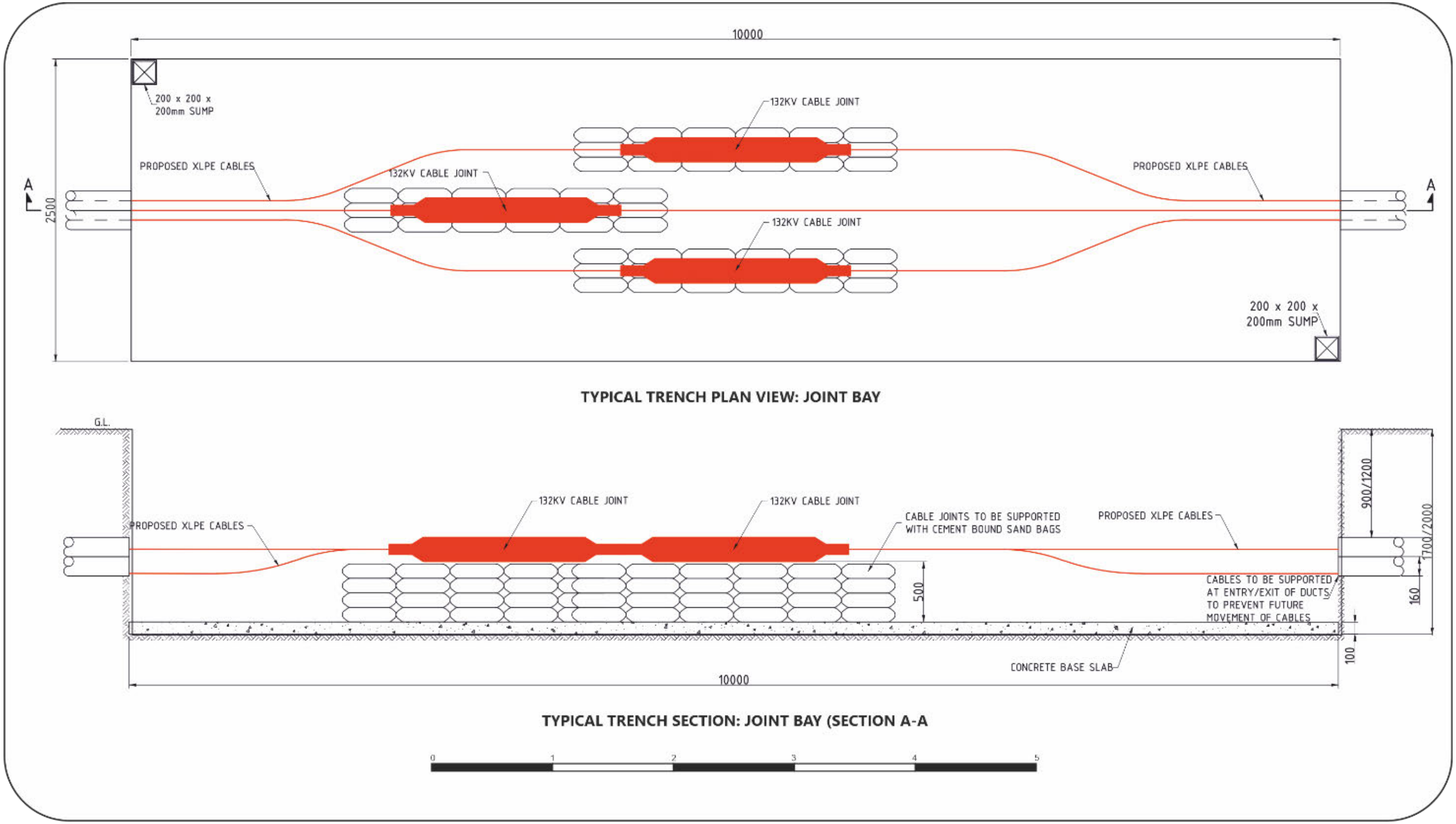
Graphic 3.21: Typical cable trench cross section (132kV)



Joint bays

3.6.8 Up to seven joint bays would be located along the Grid Connection Corridor. One joint bay would be required along New Bridge Lane with six in the western highway verge of the A47. The locations of the joint bays are illustrated on **Figure 3.3i-ix: Underground Cable Connection (Volume 6.3)**. The joint bay excavations would measure approximately 10m in length and 2.5m in width with a depth of between 1.7 – 2.0m. An illustration of a typical joint bay is provided in **Graphic 3.22 Typical joint bay illustration (132kV)** below. After the joint is completed, the excavation will be filled in and reinstated to its former condition.

Graphic 3.22: Typical joint bay illustration (132kV)



Underground Cable Limits of Deviation

3.6.9 The Grid Connection Corridor has been aligned with the adopted highway along New Bridge Lane, Broadend Road and the western verge of the A47. Therefore, to account for minor alignment variations, the lateral LoD reflects the width of New Bridge Lane and Broadend Road along the length at which the cable would be laid and the width of the A47 verge in the control of National Highways, see **Figure 3.2i-viii Project Components (Volume 6.3)**. The LoD for the bottom of the cable trench would allow for a maximum depth of 2.0m. **Table 3.2 Grid Connection Cable Trench Limits of Deviation** presents the LoD for the UGC trenches for the Grid Connections and where appropriate consideration of the Water Connections within New Bridge Lane.

Table 3.2: Grid Connection Cable Trench Limits of Deviation

Works No.	LoD Grid Connection UGC trench	Maximum construction corridor width for works*	Maximum depth of trenches	Maximum length of trenches	Maximum width of trenches
7	New Bridge Lane	3.0m	2.0m	See Figure 3.2*	0.6m
7 & 6A	New Bridge Lane including Water Connections	4.0m	2.0m	140.0m	1.4m
7 & 8	A47	3.0m	2.0m	See Figure 3.2*	0.6m
8	Broadend Road	3.0m	2.0m	See Figure 3.2*	0.6m
7 & 8	Joint bays	5.0m	2.0m	10.0m	2.5m

** Located within the Grid Connection Corridor identified on **Figure 3.2i-viii Project Components.***

Fibre optic cable

3.6.10 A fibre optic cable would be installed as part of the Grid Connection. The final details of the fibre optic cable would be agreed with UKPN. It would run alongside the power cables (separately ducted but within the same trench). The fibre optic cable would be used to transmit data along its length in relation to the operation of the Grid Connection, including fault detection during operation and to operate protection equipment in the event of a fault occurring.

Substation Connection

3.6.11 The connection to the Walsoken DNO Substation would be via an UGC connection from the Walsoken Substation (Works No. 9). The Walsoken Substation compound will consist of two clean air insulated switchgears measuring up to 5.5m in length, 1.5m in width and 3.2m in height. The substation compound covers an area of approximately 190m^2 and will be surrounded by a 2.4m high palisade fence and gates. Up to two GRP control kiosks are attached to the substation compound, measuring 3.5m in height, 2.7m in length and 2.7m in width. Vehicular access to Broadend Road would be via the existing UKPN access road immediately to the west. The access road will be extended to connect to the proposed Walsoken Substation compound. Site drainage will be provided by permeable surfaces and soakaways. Accommodating a pedestrian/fire escape route, replacement landscape planting south of the compound will be provided. The general arrangements of the Walsoken Substation compound and associated development are displayed on **Figure 3.4 Walsoken Substation** and **Figure 3.5 Walsoken Substation equipment (**both **Volume 6.3)**

3.6.12 The lateral LoD for the placement of the Walsoken Substation and associated equipment, access and landscaping are presented on **Figure 3.4 Walsoken Substation (Volume 6.3)**. Vertical LoD for substation equipment extend to 3.2m and the GRP kiosk to 3.5m. The fenced compound's LoD dimensions are 14.0m in length and 13.5m in width.

3.6.13 The UGC from the Walsoken Substation will come above ground to a cable sealing end and connecting to UKPN equipment at the Walsoken Substation.

Operational maintenance

3.6.14 The maintenance of the Grid Connection will be the responsibility of the Applicant.

3.6.15 UGCs are not physically inspected as they are below ground. However, and in accordance with relevant industry requirements, the UGCs are tested regularly during their lifespan which is typically 50-60 years.

3.7 Construction

3.7.1 This section provides a description of the approach to construction for the Proposed Development.

Construction programme

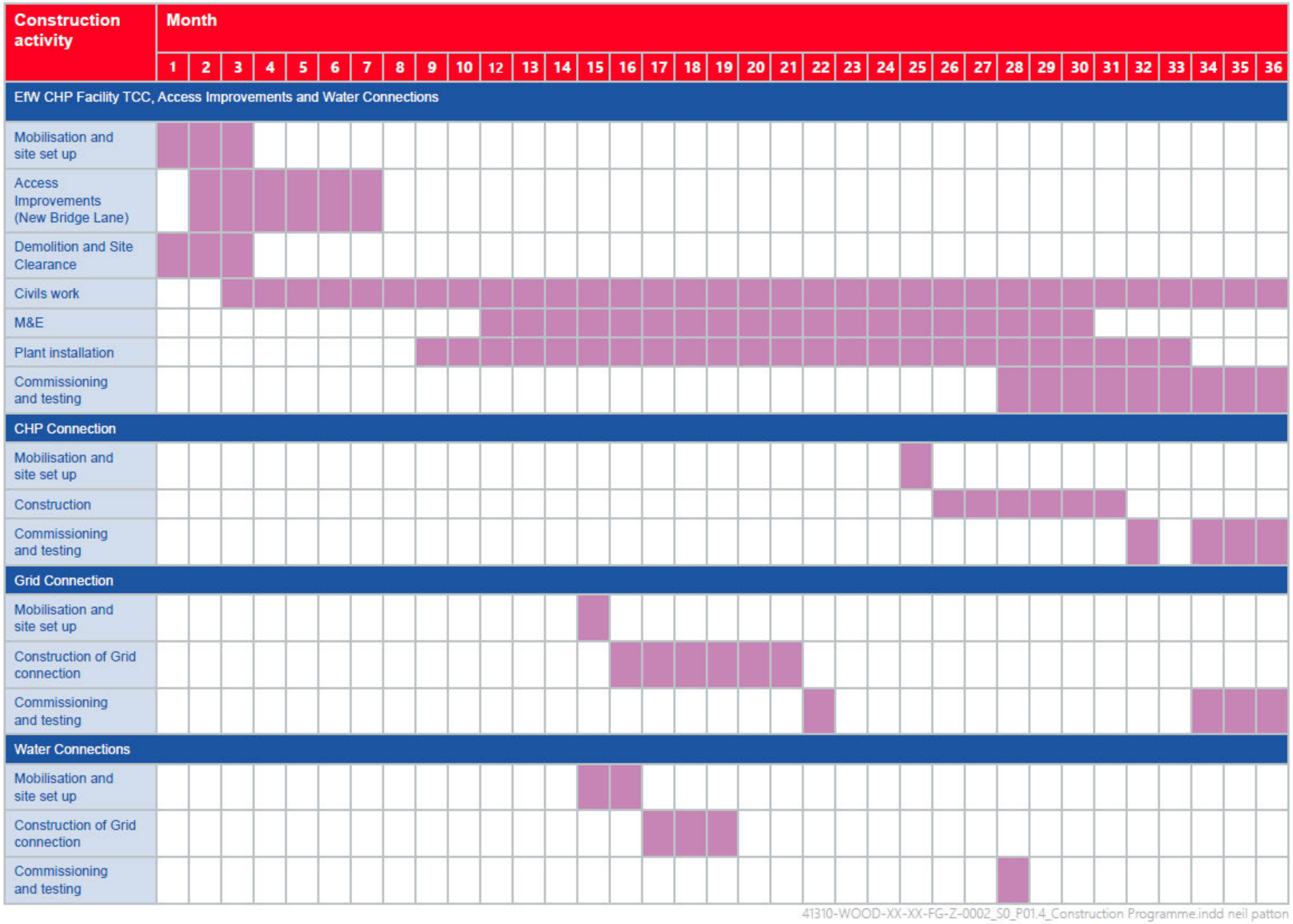
3.7.2 Should consent be granted in Q3 or Q4 2023, it is anticipated that construction of the Proposed Development will commence the same year and take approximately 36 months to complete. The Proposed Development would therefore be operational in 2026. An indicative construction programme is set out **Graphic 3.23** below.

3.7.3 For the purpose of the environmental assessment, a peak month of activity has been defined within the 36-month construction programme:

- Total construction peak (EfW CHP Facility) – month 14

3.7.4 This month represents the likely worst-case in relation to traffic movements.

Graphic 3.23: Construction Programme Summary



Construction working hours

3.7.5 Proposed core working hours would be 07:00 to 19:00 Monday to Friday, 08:00 to 16:00 on Saturdays, and no work on Sundays or Public Holidays, other than the limited number of works which may be required outside of the core working hours which are listed below. Other works would require prior approval from the relevant planning authority. The limited works to be permitted are:

- EfW CHP Facility:
  - Continuous and over running concrete pours;
  - X-ray weld testing;
  - Mechanical and electrical fit out;
  - Abnormal load deliveries;
  - Abnormal lifts; and
  - Pipe bridge works over Weasenham Lane (CHP Connection).
- Grid Connection:
  - Works within the A47 verge; and
  - UGC road crossings.
- Water Connections:
  - HDD or open-cut trenching across the A47.

3.7.6 During the one hour before and one hour after the core working hours, some mobilisation activities would occur and include;

- Arrival and departure of the workforce at the site and movement to and from areas across the project;
- Site inspections and safety checks; site meetings (briefings and quiet inspections/walkovers);
- Site clean-up (site housekeeping that does not require the use of plant); and
- Low-key maintenance including site maintenance, safety checking of plant and machinery (provided this does not require or cause hammering or banging).

3.7.7 Mobilisation activities would not include HGV movements into and out of the TCC.

3.7.8 The process to be followed when carrying out works other than those set out above, outside of the core working hours would be subject to prior agreement from the relevant planning and highway authority. The process of doing so is set out in Appendix F to the **Outline Construction Environmental Management Plan** (**Outline CEMP, Volume 7.12**).

3.8 Construction (EfW CHP Facility)

3.8.1 The description of the EfW CHP Facility construction phase provided below includes the CHP Connection and the Access Improvement works unless otherwise specified. The Grid Connection and Water Connections construction arrangements are described in **Section 3.9** and **Section 3.10** below.

Temporary construction compound and laydown areas

3.8.2 A site layout for TCC and laydown areas is provided in **Figure 3.11i-iv: EfW CHP Facility Temporary Construction Compound Layout (Volume 6.3)**. The TCC and laydown areas would accommodate the construction of the EfW CHP Facility, the CHP Connection, Grid Connection, Water Connections and the Access Improvements. The compound would be in place for the construction period.

3.8.3 Work would commence with the removal of the existing topsoil and sub-soil surface, which would be placed in bunds around the site for use in the final reinstatement of the land. Roadstone aggregate material would be brought to site to provide a compacted surface upon which the construction materials, cabins and associated equipment would be placed. Temporary drains would be installed. The southern portion of the EfW CHP Facility Site would be used as a storage area (measuring approximately 1,500m^2) and a pre-assembly area (measuring approximately 9,000m^2). It would also include a temporary single or two storey building for construction equipment storage, measuring approximately 7m in height, 30m in width and 15m in length (see **Figure 3.20: Temporary workshop/store building (Volume 6.3)**). ISO containers would also be located adjacent to the building in the storage area (see **Figure 3.21i-ii: Temporary ISO storage container (Volume 6.3)**).

3.8.4 An additional area adjacent to the eastern boundary of the EfW CHP Facility Site would be used as a car park and office accommodation facilities for construction workers. This compound would have an approximate total area of 1.6ha. The car park would have a tarmac surface and would measure approximately 6,700m^2, with the ability to accommodate up to 228 vehicles, although workers would be encouraged to share vehicles and to use public transport. Additional motorcycle and cycle parking would be provided on the western boundary of the compound.

3.8.5 Three temporary prefabricated buildings would be provided on the southern boundary of the construction compound. Two of these buildings would be used for offices and would be single or two storeys, measuring approximately 30m in width, 15m in length with a maximum height of 7m. The third building would be used as a mess/welfare building, either single or two storeys, and would measure approximately 30m in width, 30m in length and would have a maximum height of 7m. An illustrative drawing of the temporary mess and welfare cabin, and office cabins are shown in **Figure 3.22i-vii: Temporary mess and welfare cabins and site offices (Volume 6.3)**. ISO containers would be located adjacent to these buildings.

3.8.6 Construction workers would access the EfW CHP Facility site via two temporary footbridges constructed over existing drainage ditches on the south-west boundary of the construction compound. The locations of all footbridges are illustrated on **Figure 3.23i-ii: Temporary pedestrian bridge illustrative design (Volume 6.3).**

3.8.7 Four temporary soil bunds would be located on the site: one on the eastern boundary of the TCC and of approximately 1,350m^3; two southern bunds of approximately 300m^3 and one on the western boundary of the EfW CHP Facility Site of approximately 3,000m^3, adjacent to the disused March to Wisbech Railway. These bunds would store soil stripped from EfW CHP Facility and TCC site and would be a maximum height of 4m and maximum gradient of 1.75. Temporary drainage measures would be in place to prevent untreated run-off into the surrounding ditch network.

3.8.8 Following the end of the construction period, the TCC would be vacated, and the land restored to its original condition.

Construction traffic and access

3.8.9 All staff and visitor vehicles would access the TCC via Algores Way. A tarmac surfaced access track would be installed for vehicles entering the car park in the TCC.

3.8.10 It is anticipated that 65% of construction vehicles (mostly HGVs) would enter and exit the EfW CHP Facility Site via New Bridge Lane. A wheelwash facility would be located at the exit.

Graphic 3.24: A typical temporary wheelwash facility

3.8.11 A further access point for construction vehicles (including some HGVs) would be retained at the current site access off Algores Way to facilitate the Access Improvement works along New Bridge Lane and access to the northern portion of the EfW CHP Facility Site. It is anticipated that 35% of HGVs would use this entrance and exit. A wheelwash facility would be located at the exit.

3.8.12 Estimated construction HGVs and staff vehicle movements are presented and assessed in **Chapter 6: Traffic and Transport (Volume 6.3)**. There would be a need for abnormal load deliveries to the site; these are also quantified in **Chapter 6: Traffic and Transport (Volume 6.2)**.

Graphic 3.25: a typical example of an abnormal load delivery (a silo)

3.8.13 An **Outline Construction Traffic Management Plan (CTMP)** has been provided as **Appendix 6A Outline CTMP (Volume 6.4)** to illustrate how impacts associated with the movement and access for construction vehicles would be mitigated.

3.8.14 It will be necessary to undertake a temporary road and footpath closure of a 172m section of New Bridge Lane between the EfW CHP Facility Site's entrance and Salters Way. This will be to facilitate the Access Improvements. Information on the management measures is provided in the **Outline CTMP (Appendix 6A Outline CTMP (Volume 6.4)).**

Construction phasing and activities (EfW CHP Facility)

3.8.15 The construction phase for the EfW CHP Facility Site (including the TCC and Access Improvements) is set out below. The overlap of these phases, and the relationship with the Grid Connection construction programme is provided in **Graphic 3.23 Construction Programme Summary** above.

Phase 1: Mobilisation and site set up (3 months)

3.8.16 Any pre-commencement surveys (for example ecological and geo-technical surveys) would be undertaken prior to, or during the mobilisation period, subject to compliance with the DCO.

3.8.17 Phase 1 would include the set-up of the TCC including site offices, stores and car parking, utility supply set up, boundary creation and the Algores Way Access Improvements, to include the Water Connections (foul) to the Anglian Water rising main.

3.8.18 The TCC would be prepared by stripping off and storing the topsoil, installing geotextile matting, 300mm of compacted hardcore and 100mm of compacted type 1 aggregate.

3.8.19 The existing WTS operation will cease, and the land vacated to enable site clearance. The waste transfer and other building, structures and hardstanding remaining on site would be demolished and removed during this phase.

3.8.20 Tree and hedgerow removal, as identified on **Figure 3.24 Trees and hedges to be removed (Volume 6.3)** would take place between October and March unless it can be undertaken to the satisfaction of the Ecological Clerk of Works and in line with the commitments made within the **Outline CEMP (Volume 7.12)**.

Phase 2: Access Improvements (New Bridge Lane) (6 months)

3.8.21 It will be necessary to undertake the Access Improvement works on New Bridge Lane which would then be followed by works to create a bellmouth access as well as a relocated access from Algores Way, including construction of the foul Water Connections to Anglian Water's existing pumping station.

3.8.22 Initially a small period of site investigation would be undertaken to inform the start of a site clearance period, which would involve the removal of the existing road surface and any elements of the verge that need to be cleared for the provision of the new road surface. During this time, safety fencing or barriers would be installed. The existing UKPN Compact Substation would be relocated, and other services identified and either protected in situ or relocated.

3.8.23 Following site clearance, a period of drainage works would be required to allow for the new road surface drainage and works to the existing drainage ditch on the northern side of the road that will need to be modified. This work may require the culverting of some stretches of these ditches and a replacement headwall and will be confirmed during detailed design and secured by a DCO Requirement.

3.8.24 Once preliminary works have been undertaken, the base and upper road surfaces will be laid, footpaths constructed and services installed. Street lighting will be provided.

Phase 3: Civils Work (34 months)

3.8.25 Following completion of mobilisation and site set up, the EfW CHP Facility Site earthworks and piling would be carried out by the appointed civil engineering contractor. At this stage, the level of the site would be created in accordance with the measurements determined as part of the Flood Risk Assessment (FRA). The culvert over the ditch running across the centre of the EfW CHP Facility Site would also be constructed at this stage.

3.8.26 The deepest areas of the main building are the waste bunkers. The floor for the waste bunkers and base of the foundation slab would be approximately 10m and 12m below FFL respectively. Dewatering (if required) would be undertaken at this stage via overground pumping from the excavation to the IDB drain via a siltbuster system. The rate of discharge would be at or below greenfield runoff rates. The waste bunkers would be created with piled retaining walls. The material excavated from the waste bunkers would be re-used on site where possible or exported to a suitable licenced facility in the UK.

3.8.27 It is proposed to found the majority of the EfW CHP Facility buildings on piled foundations. Other ancillary buildings on the site may also have piled foundations. The method of piling will be continuous flight auger.

3.8.28 The external hardstanding areas of the site would take the form of a concrete hardstanding founded on compacted granular material. Transition slabs would be provided at all level access points into the building.

3.8.29 Grading of the site access routes would be required to provide a constant grade across the site and a FFL of 3m AOD.

3.8.30 The erection of concrete structures and steelwork framing, and roof and wall cladding for the main building and ancillary buildings identified, would then take place.

3.8.31 Final landscaping works would be carried out after the civils works in accordance with an approved Landscaping Strategy (in accordance with **Figure 3.14 Outline Landscape and Ecology Strategy (Volume 6.3)**). The landscaping of the land occupied by the TCC would follow on from the removal of the temporary structures which would take place during Phase 5 (below).

3.8.32 The Water Connections to the Anglian Water potable supply would be made in parallel with works to install the Grid Connection, see below.

Phase 4: Mechanical and Electrical Works and Plan Installation (24 months)

3.8.33 Mechanical, electrical and plant installation would partly overlap with the civils works and would include the installation of grate and boiler works, ACC, the turbine, a water treatment plant and APC system.

Phase 5: Commissioning and Testing (9 months)

3.8.34 Following the completion of civils works and plant installation, there would be a period of start-up and testing known as ‘commissioning’. This phase would also include the removal of any temporary buildings and surfaces that would have been retained at the TCC, following the completion of the main construction activities. Material from the earth bunds would be used to dress back the site and the ground would be seeded prior to its return to the landowner.

Construction phasing and activities (CHP Connection)

Phase 1: Mobilisation and site set up (1 month)

3.8.35 Any pre-commencement surveys (for example ecological and geo-technical surveys) would be undertaken prior to, or during the mobilisation period, subject to compliance with the DCO. Vegetation clearance would be required along the route of the connection to facilitate access for construction vehicles and plant.

3.8.36 The CHP Connection construction would utilise the TCC arrangements described earlier in this section.

Phase 2: Construction of the CHP Connection (6 months)

3.8.37 The foundation type for the pipe frame structures would be determined following geo-technical investigations. It is not expected that the foundation installation would require piling.

3.8.38 Following the installation of the foundations, the steel framework for the pipeline would be constructed. At the Weasenham Lane crossing point, works to construct the pipe bridge would take place over a single night period when a temporary road closure and diversion would be in place. The pipe bridge would be prefabricated and lifted into position at night from the public highway.

3.8.39 Following the construction of the steel pipe framework, the various steam pipes and cables would be attached to the structure as illustrated on **Figure 3.17i-ii: CHP Connection general arrangements (Volume 6.3)**.

3.8.40 At points along the CHP Connection, future connection points to potential end users within the surrounding industrial estate would be accommodated. Typical details are illustrated in **Figure 3.17i-ii: CHP Connection general arrangements (Volume 6.3)** and their final position(s) will be influenced by the future commercial discussions held between the Applicant and potential end users. The pipework and cables from the CHP Connection to future, potential end users would be subject to a separate consent(s), if required.

Phase 3: Commissioning and Testing (4 months)

3.8.41 Following the completion of the construction works there would be a period of start-up and testing known as commissioning.

Construction plant

3.8.42 Mobile and fixed plant would be used during the construction of the EfW CHP Facility, Access Improvements and CHP Connection. **Table 3.3 General List of Construction Plant and Equipment** is representative of the tools and equipment that will be used but is not an exhaustive list. The quantities of each item of plant and equipment used will vary over the various stages of construction.

Table 3.3: General List of Construction Plant and Equipment

Phase and primary works	Plant and equipment
EfW CHP Facility **Mobilisation and site set-up** • **Site preparation** • **Vegetation clearance** • **Demolition of existing buildings and structures** • **Construction/set-up of TCC1 and related works** • **Water Connections**	Articulated dump trucks Articulated dump trucks (tipping fill) Backhoe mounted hydraulic breakers Diesel generators Dozers Dust suppression unit trailers Lump hammers

Phase and primary works	Plant and equipment
	Mobile telescopic cranes
	Petrol driven chain saws
	Pulverizers mounted on excavator
	Rollers (rolling fill)
	Tipper lorries
	Tracked excavators
	Tracked crushers
	Water pumps
	Wheeled backhoe loaders
	Wheeled loaders
EfW CHP Facility **Civils work** • **Earthworks** • **Piling and dewatering** • **Site grading** • **Concrete pour for foundation and hardstandings** • **Erection of concrete structures, steelwork framing, roof and wall cladding for main and ancillary buildings/ structures** • **Erection of chimneys** • **Water Connections**	Asphalt pavers (and tipper lorry)
	Concrete pumps and cement mixer trucks (discharging)
	Compressors for hand-held pneumatic breaker
	Concrete pumps and concrete mixer trucks
	Continuous Flight Augur piling rigs
	HDD rig
	Dozers
	Horizontal directional drill rigs
	Large lorry concrete mixers
	Power Floats
	Road planers
	Tracked excavators
	Tracked mobile cranes
	Vibratory plates (petrol)
	Vibratory rollers
	Water pumps
EfW CHP Facility **M&E** • **installation of mechanical and electrical equipment**	Angle grinders
	Compressors for hand-held pneumatic breaker
	Generators for welding

Phase and primary works	Plant and equipment
	Hand-held welders
	Lifting platforms
	Lorries
	Telescopic handlers
	Tracked Mobile cranes
	Wheeled mobile cranes
EfW CHP Facility **Plant installation** • **Installation of grate and boiler works, ACC, turbine, water treatment plant and APC system**	Angle grinders
	Compressors for hand-held pneumatic breaker
	Generators for welding
	Hand-held welders
	Lifting platforms
	Lorries
	Telescopic handlers
	Tracked Mobile cranes
	Wheeled mobile cranes
Access Improvements • **Site preparation** • **Vegetation clearance** • **Construction of AI**	Articulated Dump Trucks
	Asphalt pavers (and tipper lorry)
	Compressors for hand-held pneumatic breaker
	Large lorry concrete mixers
	Road planers
	Tracked Excavators
	Vibratory plates
	Vibratory rollers
CHP Connection **Mobilisation and site set-up** • **Site preparation** • **Vegetation clearance** • **Construction of TCC1 and related works** • **Demolition of existing buildings and structures**	Articulated dump trucks
	Backhoe mounted hydraulic breakers
	Petrol driven chain saws
	Tracked excavators
	Wheeled loaders

Phase and primary works	Plant and equipment
CHP Connection Construction • **Civils works** • **Earthwork** • **Concrete pour for foundations** • **Erection of structures**	Angle grinders
	Breakers mounted on wheeled backhoe
	Concrete pumps and cement mixer trucks (discharging)
	Dozers
	Generators for welding
	Hand-held welders (welding piles)
	hydraulic hammer rigs
	Lorries
	Lump hammers
	Telescopic handlers
	Tracked excavators
	Tracked mobile cranes
	Wheeled mobile cranes
CHP Connection Bridge at Weasenham Lane crossing • **Lifting and installing steel framework bridge for CHP pipeline.**	Angle grinders
	Generators for welding
	Hand-held welders (welding piles)
	Lorries
	Lump hammers
	Telescopic handlers
	Wheeled mobile cranes

3.8.43 At the peak of construction, approximately 15 cranes would be present at the EfW CHP Facility Site. This would include up to three tower cranes, measuring 75m in height, around six mobile cranes and six crawler cranes. To erect the chimneys, a temporary crane capable of extending approximately 5m above their height above finished floor level would be required. This would be on site for three to five days. The height of this temporary crane will increase in line with the erection of the chimney such that it will only achieve its maximum operational height at the point at which the final section for each chimney is fitted.

Graphic 3.26: Typical cranes used to construct a EfW CHP Facility

3.8.44 A mobile crane would be required to lift and position the CHP Connection bridge over Weasenham Lane and the pipe bridge across the disused March to Wisbech Railway to Lamb Weston.

Construction utilities

3.8.45 The existing site operates as a WTS and therefore water, foul drainage and electricity are already provided at the site. Where required, these will be used for the construction phase. The suitability of these connections to accommodate the construction of the EfW CHP Facility has been confirmed with Anglian Water and UKPN.

Construction waste management

3.8.46 The **Outline CEMP (Volume 7.12)** sets out the measures that would be in place to manage waste during the construction of the EfW CHP Facility.

3.8.47 This establishes processes to identify the type of material to be demolished and/or excavated, opportunities for reuse and recovery and to demonstrate how off-site disposal would be minimised and managed.

3.8.48 The building layout has been designed to make best use of the site and its topography and cut and fill would be balanced where practicable to minimise removal of material. Modelled estimates suggest that approximately 70,000m^3 would need to be removed from the site and this has been factored into the traffic assessment. Materials arising from demolition and excavation activities would be re-used on site as far as practicable, including, for example, as backfill and for landscaping. Concrete and tarmac arising from demolition can be treated to produce high quality aggregates and, where practicable, re-used on site.

3.8.49 The quantity of waste anticipated to be generated as a result of demolition, excavation and construction which cannot be re-used on site is defined as being 71 tonnes of steel to be recycled off-site, 2,700m^2 of cladding and 17 HGV-loads of ancillary waste that cannot be reused on-site.

Construction site security and lighting

3.8.50 The necessary infrastructure and personnel to provide a secure and safe construction site would be provided and equipment to control unauthorised access to the site would be installed.

3.8.51 This includes:

- Site security fencing around the entire site perimeter, comprising 2.4m high solid hoarding to New Bridge Lane, with other boundary fences either to be solid or wire; as confirmed with the appointed contractor;
- Appropriately positioned CCTV system;
- Full-time (24-hour, 7-days a week) attendance of security personnel;
- Access control at all entrances to and exits from the site;
- Adequate temporary mobile lighting; and
- Acoustic and visual fire and emergency alarm system.

3.8.52 Before the commencement of the construction works on-site, the Applicant would, in close cooperation with the local fire, emergency, and Police authorities, develop adequate Safety and Security Plans for the construction site in accordance with BS9999.

3.8.53 A first step would be the Fire Risk Assessment, followed by a Fire Risk Audit. The identified fire risks in the Fire Risk Assessment and the Fire Risk Audit would be addressed appropriately and fire prevention measures would be developed and made accessible to the site personnel.

3.8.54 The construction site would be adequately lit to ensure safe working conditions. All lighting would be positioned and adjusted so that it does not cause a nuisance to neighbouring properties. Night-time illumination, outside of working hours, would be reduced to a minimum, commensurate with the need to maintain the site's security requirements to reduce the environmental impact and reduce light pollution.

3.8.55 All systems would be regularly inspected and maintained through:

- Daily visual inspections of the fence line;
- Daily inspections of the CCTV;
- Regular testing of the audible and visual emergency warning system; and
- Any identified faults or damage would be repaired promptly.

Construction workforce

3.8.56 The EPC Contractor for the Proposed Development has yet to be determined. It is expected that a variety of international, national and local subcontractors would be required to construct the Proposed Development and the Applicant’s commitments to supporting local businesses and residents to work on its construction are set out within **Chapter 15: Socio economics, Tourism, Recreation and Land Use (Volume 6.2)**.

3.8.57 Over the duration of construction, there are likely to be around 700 construction personnel from a range of disciplines. During the peak periods of construction for all elements of the Proposed Development, there would likely be up to 500 construction personnel present on-site at any one time.

3.9 Construction (Grid Connection)

Construction traffic and access

3.9.1 The contractor appointed to construct the Grid Connection will operate from a dedicated location within the TCC. Vehicular, pedestrian and cycle access will be the same as that for the rest of the construction compound.

Construction phasing and activities

3.9.2 The construction phase for the Grid Connection would comprise four key overlapping phases, as described below.

3.9.3 The construction of the Grid Connection would be carried out in accordance with the relevant statutory legislation and technical standards and guidance including Energy Network Association documents, UKPN standards, National Joint Utilities Group Publications and the relevant British and International Standards.

Phase 1: Mobilisation and site set up (1 month)

3.9.4 A compound specific to the Grid Connection contractor would be demarcated within the TCC. Any soil strip and regrading would have taken place as the TCC was created. Geotextile matting would be placed upon 300mm of compacted hardcore and 100mm of compacted type 1 aggregate.

Phase 2: Construction of the UCG to Walsoken DNO Substation (7 months)

3.9.5 All cable design and installation work would be compliant with the adopting DNO, UK Power Networks' (UKPN) Engineering Construction Standard ECS 02-0019 Installation of Underground Cables – LV to 132kV.

3.9.6 The underground cable would be installed via open cut trenching. Prior to commencement, records of existing underground services would be inspected and CAT scans undertaken to identify live cables. Each evening, New Bridge Lane would be closed from the EfW CHP Facility Site entrance for 200m to enable the cable trench to be dug, duct installed and trench reinstated. This process of limited length night-time closure and daytime opening would continue as the construction process moves into the verge of the A47. When constructing within the verge of the A47 to its junction with Broadend Road, the following specification and activities would be followed:

- The maximum length of A47 road closure (northbound carriageway) would be 300m each night, between 20:00 and 06:00, subject to detailed design and agreement with National Highways. The carriageway reopened each day.

- Prior to commencing night-time working, advanced signage of construction, traffic management and a means of closing the relevant section of the northbound carriageway would be put in place, in accordance with a scheme to be agreed with National Highways.
- The three existing A47 lay-bys would be closed consecutively and used for daytime plant storage.
- The trench would be excavated from the carriageway ensuring National Highways infrastructure is protected at all times.
- The maximum length of excavation works would be 200m per night.
- Any spoil that could not be stored within the verge would be transported to the TCC and stored, each night.
- If ducts are to be installed at a reduced depth (such as IDB culvert crossings), additional mechanical protection, such as steel plates, would be installed to protect the cable with the prior agreement of National Highways and the IDB.
- The joint bays would be located within the verge as far away from the carriageway edge as possible and would remain open for the duration of the cabling pulling and jointing activities. They would be fenced during the daytime with the location and type of fencing agreed by National Highways.

3.9.7 Occupiers of properties fronting New Bridge Lane, in 10 New Bridge Lane and ‘Potty Plants’ would be notified in advance of night-time working. Measures will be put in place to maintain access to property and minimise disruption where possible, under the supervision of the contractor.

3.9.8 The following general methods of construction apply across the full length of the Grid Connection.

3.9.9 The trench would typically be dug to a depth of between 1.2m and a maximum depth of 2m (under land associated with CCC proposals for Broadend Road/A47 junction). The width of the trench would be typically 450mm to 600mm.

3.9.10 Once the trench is dug for the length of a section, it would be laid with a suitable bedding material. The cables would then be lowered into the trench using mechanical winches, fill laid on top and compacted around them. A marker tile would then be placed on top, and the trench would be backfilled in reverse order using thermally suitable indigenous material and topped with the excavated topsoil, to provide a minimum depth of cover above the cables of 900mm in highway verges.

3.9.11 The buried sections of cable are to be connected at up to seven joint bays, each measuring approximately 10m in length, 2.5m in width and up to 2m deep. The bays will be installed at approximately 500m intervals. The joint bays would be buried with no access covers or link boxes required.

3.9.12 All excavations within or alongside the highway associated with the Grid Connection would be fenced for health and safety reasons, should a situation arise whereby they could not be closed during the daytime.

Phase 3 Construction of the Walsoken Substation and the subsequent connection to the Walsoken DNO Substation (1 month, overlap with Phase 2)

3.9.13 This phase consists of the required works to connect the UGC into the Walsoken Substation and from that into the Walsoken DNO Substation. An area of land (the LoD) for the positioning of the Walsoken Substation and associated infrastructure is identified on **Figure 3.4 Walsoken Substation** and **Figure 3.5 Walsoken Substation equipment (Volume 6.3)**. The final location for the Walsoken Substation will be agreed with UKPN during detailed design. Once the location is confirmed, the land will be soil stripped and any existing vegetation and topsoil scraped back with temporary earth bunds subsequently created.

3.9.14 A 4.5m-wide access road and turning area leading from the existing UKPN access is designed to have a permeable surface and sub-base constructed with 150mm road chippings and a Type 1 Sub-base below. This will be free draining but founded upon an impermeable membrane, which will direct water to a soakaway.

3.9.15 Other than concrete foundations for the switchgear equipment and 2.4m-high palisade fence posts and gates, the compound will have a permeable shingle surface.

3.9.16 A small GRP kiosk, to be located outside the compound, will have a concrete foundation of approximately 7.3m^2. Connecting to a meter box at the entrance to the Walsoken DNO Substation, an underground data cable will be laid no deeper than 600mm below ground level.

3.9.17 Once construction is complete, the land immediately adjacent to, and disturbed by, the construction activities will be landscaped to a scheme to be agreed with the relevant host local authority.

Phase 4: Commissioning and testing (1 month)

3.9.18 Final quality inspections and confirmation of Electrical, Safety, Quality and Continuity Regulation (ESQCR) clearances would be made with reference to UKPN's specification and guidance documents.

3.9.19 Once the work is complete or at a stage where work would be suspended for the safety document to be cleared, pre-commissioning inspections will be made to ensure the network is safe to energise and that all portable earths, tools and equipment have been removed. Anti-climbing devices, Danger of Death plates and structure ID number plates would be fixed as per UKPN's specification.

3.9.20 Once the permit recipient(s) are satisfied that all work is complete and tools and equipment have been removed, team members will be instructed that that no further access to the network shall be made and the network will be deemed LIVE. The safety document would be signed off with the document recipient.

3.9.21 All surplus materials will be removed and disposed of appropriately.

Construction site security and lighting

3.9.22 The necessary infrastructure and personnel to provide a secure and safe construction site would be provided along with equipment to control unauthorised access to Grid Connection construction compound which will be sited within the TCC.

3.9.23 This may include:

- Site security fencing around the temporary Grid Connection construction compound sited to demarcate this area from the rest of the TCC;
- Remote security cameras, unless the TCC cameras can be used;
- Access control at all entrances to and exits from the Grid Connection construction compound site;
- Adequate temporary mobile lighting; and
- Fire and emergencies protocol.

3.9.24 The Grid Connection construction compound and working areas would be adequately lit to ensure safe working conditions. All lighting would be positioned and adjusted so that it does not cause a nuisance to neighbouring properties. Mobile lighting would be used along the working area and removed each day.

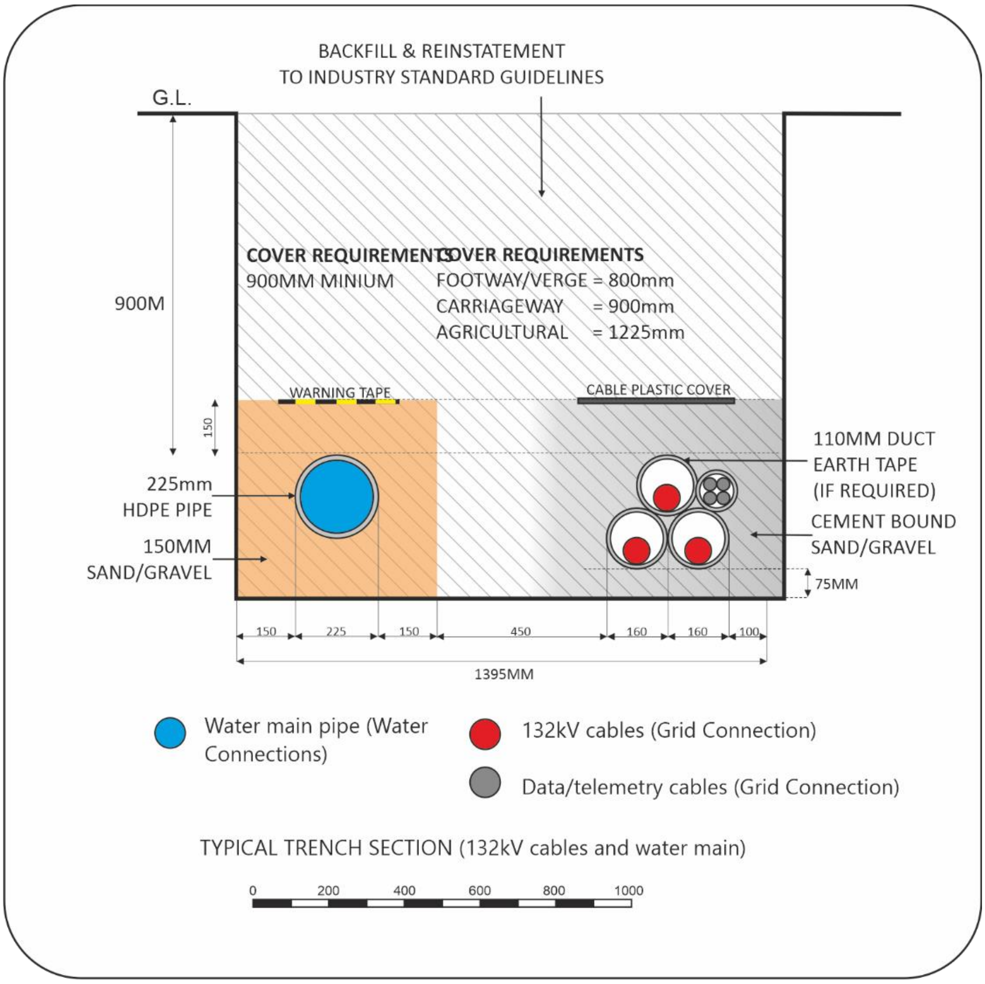
3.10 Construction (Water Connections)

3.10.1 The Proposed Development includes the construction and operation of a potable water connection from Anglian Water's existing water main which runs to the east of the A47. The Water Connection may be implemented by the Applicant or Anglian Water and would consist of a 225mm-diameter HDPE, potable water main running from a new connection point created within the existing water main to the EfW CHP Facility Site.

3.10.2 The water main would pass under the A47 and emerge within either the existing orchard located on the northern side of New Bridge Lane for HDD or in the A47 verge (northside) for an open cut construction technique. From this point, the pipe would pass into New Bridge Lane and continue within the highway until it reaches the frontage of the EfW CHP Facility Site at which point it would enter and connect.

3.10.3 Two options for crossing the A47 are included within the Proposed Development and the final design will be subject to further discussion with National Highways. With a minimum depth for the water pipe to be 0.9m below ground level, the open cut methodology along New Bridge Lane is consistent with that described for the Grid Connection above. **Figure 3.25: Water Connections (potable) (Volume 6.3)** illustrates the two options which have been assessed for connection to the existing potable water supply at the A47 and the LoD associated with the works. **Graphic 3.27 Typical trench illustration along New Bridge Lane for Water Connections and Grid Connection** displays a typical section of the Water Connection and how it would be placed adjacent to the Grid Connection along New Bridge Lane.

Graphic 3.27: Typical trench illustration along New Bridge Lane for Water Connections and Grid Connection



Potable Water A47 Open Cut Option

3.10.4 The open cut works across the A47 would be carried out during the Grid Connection traffic management exercise and in accordance with National Highways regulations and approved NRSWA codes of practice. A single night-time lane closure will be in place and the use of traffic controlling measures such as lights, cones, barriers and convoys may be used. Works to be carried out at night to minimise disruption to the local area.

3.10.5 At the beginning of the night shift the traffic management control measures will be installed by an approved NRWSWA contractor, closing off one lane of the A47 to allow works to commence safely.

3.10.6 Once the traffic management control measures are in place, a road saw will be used to cut through the existing tarmac road surface, creating a work zone large enough to allow the installation of two 225mm-diameter HDPE water pipes. The saw cut zone would be approximately 1.0m wide.

3.10.7 With use of an excavator, a trench will be dug within the saw cut work zone to a depth of around 1.6m and ensuring National Highways infrastructure is protected. Excavated material will be removed to the TCC for disposal.

3.10.8 Once excavated, a gravel bedding layer will be installed and the two water pipes (including a redundancy pipe) laid alongside each other, a 150mm gravel surround will be installed before installing marker protection boards. Backfill material will be then imported to the work area and installed and compacted as per the required standards and recommendations from National Highways to the underside of the tarmac road construction. Quality control checks and monitoring will be in place to ensure the reinstatement of the full road capping layer is completed to the required design and specifications.

3.10.9 Once complete, the traffic management measures will be removed and carriageway reopened to traffic.

3.10.10 The works across the A47 will be split into two single carriageway activities, each to be completed during a one-night single carriageway road closure, ensuring the A47 lanes are fully operational during the morning traffic. A further two nights have been assigned to the completion of the connection to the potable water main and would involve traffic management at the A47/New Bridge Lane (south) junction.

Potable Water A47 HDD Option

3.10.11 An alternative approach is to HDD under the A47.

3.10.12 The HDD works under the A47 would be carried out during the Grid Connection traffic management exercise and in accordance with National Highways regulations and approved NRSWA codes of practice. Temporary traffic management measures such as lights, cones, barriers and convoys may be used on the southern carriageway of the A47 at New Bridge Lane (south) to maintain access to the New Bridge Lane Travellers Site.

3.10.13 The HDD launch and receive sites will be accommodated within the Water Connections limits of deviation, see **Figure 3.25: Water Connections (potable)**.

3.10.14 The launch site compound would be set up on the north side of the A47, within an existing orchard located to the north of New Bridge Lane. The launch site would comprise the drill rig, power units mounted on skids, bentonite storage tanks and mixing tanks, a filter for separating cuttings from the used drilling mud, control cab and ancillary equipment. To accommodate the compound, those commercial orchard trees within it shall be excavated and removed by a competent contractor. These trees, including a suitable root ball, will be protected and stored until the land is reinstated. The receive site will typically comprise the reception pit, a power unit mounted on skids, mud pits, an excavator and ancillary equipment.

3.10.15 The mobile drill rig will drill a predetermined angled pilot hole, to a depth suitable to navigate under the A47 and adjacent field drains: approximately 4m below ground level. Once the required depth is achieved, drilling continues horizontally under the A47 and then rises on the south side of the A47.

3.10.16 Once the pilot hole has been completed, the borehole is enlarged to a suitable diameter for the pipeline. This is by “prereaming.” Generally, the reamer is attached to the drill string on the opposite end of the borehole from the drill rig and pulled back into the pilot hole. A viscous drilling fluid, a mixture of water and bentonite is pumped to the cutting head. The drill fluid assists the removal of cuttings and stabilising of the bore hole prior to pipe installation. All drill fluids are contained within storage tanks.

3.10.17 Once the directionally drilled hole is enlarged to the correct size, the pipe is pulled through. The pipeline is prefabricated at the end of the bore opposite the drill rig. A reamer is attached to the drill string, and then connected to the pipe by a pulling head and swivel. The swivel allows for the reamer to turn without the pipe turning. The HDD rig then begins the pullback operation, rotating and pulling on the drill string as well as circulating drilling fluids. The pullback continues until the reamer exits the bore path by the directional drill rig and the pipeline is in place.

3.10.18 Except for unforeseen circumstances that may require extending the hours of working, the HDD process would be undertaken during daytime construction hours (see Section 3.7) and take approximately three weeks to complete. Once complete, the HDD equipment will be removed from site and the land restored.

Foul Water Algores Way

3.10.19 A foul water connection from the EfW CHP Facility Site to the existing Anglian Water pumping station located on Algores Way will be constructed during the Access Improvement works (see **Section 3.4**). The works involve laying a 225mm foul water pipe at a depth of approximately 1.2m below ground level and includes two access covers within the highway.

Construction and Operational Management Plans

3.10.20 The ES is accompanied by a suite of outline management plans, schemes and strategies, which describe how the embedded environmental measures and additional mitigation measures would be delivered; summarised in **Chapter 19: Schedule of Mitigation and Monitoring (Volume 6.2)**. These documents would be finalised prior to the commencement of development with the agreement of the relevant host local authorities and other statutory bodies.

3.10.21 The list of outline management plans submitted as part of the DCO application and secured in the DCO are:

- **Outline CEMP (Volume 7.12)**, which also incorporates sub-management plans to address dust, water, soil, site waste, noise and vibration, landscape and ecology;
- **Outline Construction Traffic Management Plan (Outline CTMP) (Volume 6.4)**; and
- **Outline Drainage Strategy** (Construction and operation) (**Volume 6.4**).

3.10.22 The Outline CTMP accompanies **Chapter 6: Traffic and Transport** (see **Appendix 6A Outline CTMP (Volume 6.4**) whilst the Outline Drainage Strategy accompanies **Chapter 12: Hydrology** as **Appendix 12F (Volume 6.4).**

Construction Environmental Management Plan

3.10.23 An approved CEMP for the EfW CHP Facility and the Grid Connection would be implemented by the respective contractors to cover all aspects of construction during the construction works.

3.10.24 The CEMP would provide an overview of the standard construction management measures that would be implemented as part of the Proposed Development. As such it aims to ensure that construction activities for the Proposed Development are carried out in accordance with legislation and best practice for minimising the effects of construction on the environment and local communities.

3.10.25 The key objectives of a CEMP are to:

- Provide a mechanism for delivering many of the embedded environmental measures described in the ES;
- Ensure compliance with legislation through setting out the need for consultation with consultation bodies (see Regulations 2 and 19(3)(c) in the EIA Regulations), and by obtaining necessary consents and licences from relevant bodies;
- Provide a framework for monitoring and compliance auditing and inspection to ensure the environmental measures included in the scheme are being implemented;
- Ensure environmental best practices are adopted throughout the construction stage;
- Provide a framework for dealing with adverse effects as they occur; and
- Ensure a prompt response should unacceptable adverse effects be identified during the works.

3.10.26 Further information on the embedded environmental measures and additional mitigation measures proposed to be included with the CEMP to manage construction effects is provided in the individual topic chapters (**Chapters 6 to 17**). An **Outline CEMP (Volume 7.12)** is provided as part of the DCO Application.

Operational management plans

3.10.27 Operational management plans will be developed to cover certain aspects of the operational processes. Forming part of the DCO Application the following draft operational plans have been provided:

- Operational Travel Plan **(Volume 6.4)**; and
- Operational Noise Management Plan **(Volume 6.4)**.
- In addition to the above plans, operational plans will be prepared to support the EP application. Outline versions of these operational plans are:
- Outline Flood Emergency Plan **(Volume 7.9)**;
- Outline Fire Prevention Plan **(Volume 7.10)**; and
- Outline Odour Management Pan **(Volume 7.11)**.

3.11 Decommissioning

3.11.1 For the purpose of the assessment, a working assumption has been made that the Proposed Development has an operational lifespan of approximately 40 years. However, it should be noted that it is common for such developments to be operational for longer periods. It is anticipated that the process of decommissioning would involve the termination of operational activity, following which there would be electrical and process isolation and demolition activities.

3.11.2 The EfW CHP Facility site (excluding any ecological mitigation works), CHP Connection and the above ground elements of the Grid Connection (excluding any elements that form part of the DNO’s network) would be left in a clear and secure condition in accordance with a Decommissioning Plan to be agreed with the relevant host local authority prior to decommissioning. The decommissioning process is anticipated to last for one year.

3.11.3 Unless otherwise indicated in the environmental topic chapters in this ES, the environmental effects associated with the decommissioning phase would be of a similar level to those reported for the construction phase works, albeit with a lesser duration of one year.