Medworth Energy from Waste
Combined Heat and Power Facility

PINS ref. EN010110

Preliminary Environmental Information Report

Chapter 3: Description of the Proposed Development

June 2021

We inspire
with energy.

Report for

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3. Description of the Proposed Development

3.1 Introduction

3.1.1 This chapter provides an overview of the Proposed Development as at the date of statutory consultation, and it sets out the main components of the EfW CHP Facility, CHP Connection, Access Improvements and Grid Connection infrastructure. It also describes the site location and the key activities that would be undertaken during construction, operation and maintenance, and includes key parameters along with indicative timescales.

3.1.2 In writing the description of the Proposed Development, consideration has been given to the requirements of Schedule 4 of the Environmental Impact Assessment (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."*

3.1.3 These requirements are addressed in the sub-sections below.

3.2 Stakeholder engagement and public consultation

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 consultation exercises in relation to the description of the Proposed Development, are presented in **Appendix 3A: Stakeholder engagement and consultation**.

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 and Fenland District Council (**Figure 3.1: Local Authority Boundaries**). The Grid Connection also extends into areas of Norfolk County Council and the Borough Council of Kings Lynn and West Norfolk.

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

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

3.3.3 The site location is illustrated on **Figure 1.1: Site Location.**

Energy from Waste Combined Heat and Power Facility

EfW CHP Facility Site

3.3.4 This element of the Proposed Development is approximately 5.3 hectares in size and is located south-west of Wisbech, centred at National Grid Reference TF 45564 07955. It is within the administrative areas of Fenland District Council and Cambridgeshire County Council. The location of the EfW CHP Facility Site is illustrated on **Figure 3.2: Project Components**.

3.3.5 The site forms part of a wider industrial estate centred on Algores Way. The location of the main EfW CHP Facility would be predominantly located on an area of land currently operated by Mick George Ltd/Frimstone Ltd as a waste and aggregates recycling facility and waste transfer station (WTS). It is accessed off Algores Way. The 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. A raised gatehouse and single weighbridge control vehicle access into and out of the site. Vehicle parking 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 which previously covered the site was scraped back from the working area when its current use was first established and now forms perimeter bunds. The surface of the site is predominantly hardstanding, 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 site. Ditch 33 is partially culverted to provide vehicular access to the south-western part of the site.

3.3.8 The 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 Fenland District Council. It is separated from the current waste and aggregates recycling and transfer station 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 Plan13 (2014) as an urban extension (Policy LP8) for predominantly business purposes and residential development. The EfW CHP Facility Site is bounded directly to the north by land occupied by BJ Books and Floorspan Contracts. To the east of the site's existing entrance, occupiers of the industrial units include James Mackle (UK) Ltd, Hair World UK Ltd and Lineage Logistics, which includes a cold store approximately 90m in width, 160m in length and 36m 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 of 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. To the east, New Bridge Lane terminates after the T-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. Numbers 9 and 10 New Bridge Lane are located approximately 20m to the west and south respectively of the EfW CHP Facility Site. Number 10 New Bridge Lane includes land currently used as a smallholding. One 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. Number 2 New Bridge Lane is located approximately 300m west along New Bridge Lane. Further afield, Oakdale Place Travellers Site and Caravan Site are located south-east of the intersection of New Bridge Lane and the A47, at 400m and distance 500m respectively. The principal residential areas and town centre of Wisbech lie beyond the industrial estate further to the north and the east.

3.3.14 To the west the EfW 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 Line, known locally as the 'Bramley Line'. West of the railway line, an industrial estate extends for a further 300m until it reaches Cromwell Road, after which there is a retail park comprising a cinema, Tesco Extra superstore and restaurants. The retail park is bordered to the west by 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 1.71km to the south-east).

CHP Connection

3.3.16 The proposed CHP Connection would run north, along the route of the disused March to Wisbech Railway Line, from the EfW CHP Facility Site crossing

Weasenham Lane and terminating at the Nestlé Purina factory, which is itself accessed from Coalwharf Road/Somers Road. The CHP Connection Site includes disused infrastructure from the disused March to Wisbech Railway Line, including track, and self-setting vegetation. The CHP Connection Site is bounded on both sides by industrial uses other than at its north-eastern end where the rear gardens of residential properties on Victory Road, Hillburn Road and Oldfield Lane back onto it. The location of the CHP Connection is illustrated on **Figure 3.2: Project Components.**

Access Improvements

3.3.17 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 to the EfW CHP Facility. 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 site.

3.3.18 New Bridge Lane connects to Cromwell Road to the west which provides direct access to the A47 via a four-arm roundabout. Direct vehicular access to Cromwell Road along New Bridge Lane from the proposed site access is not currently possible. New Bridge Lane crosses the disused March to Wisbech Railway Line 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 would be required to facilitate access off New Bridge Lane.

3.3.19 New Bridge Lane is bounded mainly by industrial premises. A single residential property (Number 9 New Bridge Lane) lies approximately 20m to the south-west boundary of the site on the opposite side of the disused March to Wisbech Railway Line. Further residential properties are located close to the New Bridge Lane/Cromwell Road Junction (93 & 97 South Brink, 25 Cromwell Road and Number 2 New Bridge Lane), adjacent to the location of the potential Access Improvements.

3.3.20 The red line boundary also extends up the existing Algores Way until it reaches Weasenham Lane (see **Figure 3.2: Project Components**). No highway improvement works are currently proposed on Algores Way, other than at the site access, but it has been included within the red line boundary because, although it is openly in public use, it is an unadopted highway and therefore powers relating to street works (for example relating to the installation of services for the EfW CHP Facility) and compulsory acquisition powers for access may be sought as part of the DCO.

EfW CHP Facility Temporary Construction Compound

3.3.21 The Temporary Construction Compound (TCC1) for staff parking and offices and welfare facilities associated with the construction of the EfW CHP Facility 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, greenfield land that is allocated for future business use (see paragraph 3.3.9 above). This area of land measures 1.6 hectares.

3.3.22 The TCC1 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.

3.3.23 The TCC1 for staff parking and offices and welfare facilities would be accessed from the north via Algores Way.

3.3.24 The remainder of the construction compound requirements would be provided on the southern or northern portion of the EfW CHP Facility Site.

3.3.25 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 **Section 6.6 of Chapter 6: Traffic and Transport**. The land allocated for construction compound/laydown area associated with the EfW CHP Facility Site, the Access improvements and the CHP Connection is illustrated on **Figure 3.2: Project Components**.

Utility Upgrades

3.3.26 A new water main would be required to connect the EfW CHP Facility into the local network. At this stage, it is envisaged that the water main would run from the southern boundary of the EfW CHP Facility Site southeast along New Bridge Lane before crossing underneath the A47 to join an existing water main.

3.3.27 The area of land proposed for the route of the water main is illustrated on **Figure 3.2: Project Components.**

Grid Connection

3.3.28 At this stage there are two options for the Grid Connection:

- Option 1: Connection to Walpole Substation; and
- Option 2: Connection to Walsoken Substation.

3.3.29 These options are illustrated on **Figure 3.3: Grid Connection Options**.

Common Grid Connection Route (Options 1 and 2)

3.3.30 Both Grid Connection options would begin from a substation on the EfW CHP Facility Site following a route which would pass along the edge of the south-eastern outskirts of Wisbech, initially heading east to the Elm High Road roundabout on the A47 then heading north. The route would cross from the administrative boundary of CCC/FDC into NCC/KLWN.

3.3.31 From the onsite substation, the Grid Connection would run east underground along New Bridge Lane before crossing an existing IDB drain across New Drove. The route would then follow a parallel course along the western side of the A47 and head north, remaining underground through arable land until it reaches Elm High Road. The cable would pass underneath Elm High Road either using Horizontal Directional Drilling (HDD) or in conduits installed as part of an unrelated junction improvement project by CCC. It would then continue through land adjacent to Elm Hall Hotel and through agricultural land until it reaches Meadowgate Lane. At this point, the cable would cross underneath the A47 and into land on the eastern side of the road. A former petrol station currently operating as a car wash and truck wash is located adjacent to the red line boundary in this location. The nature of the crossing of the A47 in this location remains the subject of discussion and consultation with statutory undertakers such as the Kings Lynn IDB and Highways England. The options currently under consideration include either a HDD or open-cut across the highway.

3.3.32 After the crossing of the A47 the Grid Connection would transition to an overhead line and would pass north through agricultural land. At the proposed location of pole 15 (see description of the Grid Connection in **Section 3.8**), the two options would take differing routes as described below. The Common Grid Connection Route, and the underground section relating to the section of cable that would be installed along Mill Road and Walpole Bank (see below) is illustrated in **Figure 3.4i: Underground Cable and HDD Route (Common Connection Corridor)**.

Option 1: Walpole Substation route

3.3.33 Once the common Grid Connection route reaches Pole 15, the Option 1 Connection to Walpole Substation would continue as an overhead line heading north across Broadend Road across agricultural land within the vicinity of isolated residential properties and farmsteads. The route would cross over Fengate Road.

3.3.34 The route would cross back over the A47 to the south of the roundabout which connects the A47 with the B198 and Light Lane. The southern boundary of St Paul's Road Services is located adjacent to the A47 crossing. At this point, the route continues in a north-westerly direction across further agricultural land before crossing over the B198 adjacent to Wheatley Bank road.

3.3.35 The route heads further north through a gap in residential properties on School Road to the west of Walton Highway. The route continues north through agricultural land, crossing both Salts Road and Dixons Road. Beyond Dixons Road the route would pass through an area of orchard before turning north-west and heading through further agricultural land along the boundary of a solar farm. The route would then continue north until it reaches Mill Road.

3.3.36 At Mill Road, the overhead line would transition back to an underground cable and would run north adjacent to Mill Road and Walpole Bank until it reaches Walpole Substation. Some residential properties are located along this road and the settlement of Walpole St Peter is located further to the east of the substation.

3.3.37 The preliminary route for Option 1 (Walpole) is illustrated in **Figure 3.4ii: Option 1 Walpole Grid Connection Route**) and is illustrated in profile in **Appendix 3B: Line Profile Drawing**.

Option 2: Walsoken Substation route

3.3.38 The preliminary route for Option 2 (Walsoken) is illustrated on **Figure 3.4iii: Option 2: Walsoken Grid Connection Route.**

3.3.39 Once the common route reaches pole 15, for the Walsoken Option the overhead line would subsequently terminate and transfer to an Underground Cable (UGC), running east along Broadend Road. Broadend Road is bounded by residential properties, small parcels of agricultural land, trees, and vegetation.

3.3.40 At the end of Broadend Road, the UGC would cross underneath the A47. The route would continue as an UGC along Broadend Road further west of the A47 until it reaches Walsoken Substation. This section of Broadend Road is bounded by residential properties, commercial premises and agricultural land. The means by which the UGC would cross the A47 at Broadend Road is subject to ongoing consultation with CCC. The two approaches currently under consideration are HDD or in conduits installed as part of an unrelated junction improvement project by CCC.

Grid Connection Temporary Construction Compound

Option 1: Walpole

3.3.41 Two locations from three options are currently being considered for the main Grid Connection TCC. The three locations are illustrated on **Figure 3.2: Project Components.**

3.3.42 TCC2 is located in a proportion of a field used for agricultural purposes to the north of Lynn Road on the western side of the A47. TCC2 would be accessed from the A47 at the Lynn Road roundabout, and just beyond a smaller mini roundabout, and would utilise the existing field access. The compound would be bound by Lynn Road and hedgerows to the south which offer a degree of screening.

3.3.43 The nearest residential property would be located on the opposite side of Lynn Road, approximately 35m from the boundary of the TCC2. A small commercial/industrial estate is located further to the east, on the opposite side of Lynn Road. Two additional residential properties are located approximately 135m to the north-east and 125m to the west of the TCC.

3.3.44 TCC3 is located in a proportion of a field used for agricultural purposes to the north of Lynn Road on the eastern side of the A47. TCC3 would be accessed from the A47 at the Lynn Road roundabout, utilising the existing field access. TCC3 is located opposite the entrance to a Shell petrol station and a Starbucks coffee retail premises and is bound by Lynn Road and the A47, with hedgerows to the east and south offering a degree of screening. The nearest residential property would be located approximately 130m to the north.

3.3.45 The selection of TCC2 or TCC3 will be determined as part of the detailed design process and the impacts assessed and presented in the ES.

3.3.46 In addition to the main Grid Connection compound at either TCC2 or TCC3, one satellite compound for the Grid Connection would be located within the EfW CHP Facility Site construction site (see **Figure 3.2: Project Components**). A further satellite compound would be located adjacent/within the Walpole substation; TCC4. The precise location of this satellite compound will be determined as part of the detailed design process and the impacts assessed and presented in the ES. An indicative area of search for this satellite compound, TCC4 can be seen on **Figure 3.2: Project Components**).

Option 2: Walsoken

3.3.47 At this stage it is assumed that a separate TCC for the Walsoken Substation Connection route would not be required. This Grid Connection Option would be accommodated by TCC1 and the EfW CHP Facility Site construction site.

3.4 Description of the Proposed Development

3.4.1 The Proposed Development is an Energy from Waste Combined Heat and Power Facility with a combined thermal capacity of 200 Megawatts (MW) thermal in two separate boiler lines. Depending on its calorific value (CV), the actual throughput of waste will vary.

3.4.2 The EfW CHP Facility would be designed to handle approximately 523,500 tonnes of residual (non-recyclable) waste per annum at 10.9MJ/kg (approximately 625,600 per annum at 9.8MJ/kg). It is intended that the EfW CHP Facility would have a generating capacity of more than 50MW and aims to generate up to $53MW_e$ of electricity (net) and up to $50MW_{th}$ of usable heat (steam) energy.

3.4.3 Under low CV and high availability conditions the mechanical throughput could be up to 625,600 tonnes of waste per annum. This preliminary assessment therefore considers this tonnage as the worst case scenario, specifically the vehicle movements in the transport assessment (**Chapter 6: Traffic and Transport**) and the noise and air quality assessments which use these data (**Chapters 7 and 8 respectively**).

3.4.4 The key elements of the Proposed Development are:

- EfW CHP Facility;
- CHP Connection;
- Access improvements and utility upgrades; and
- Grid Connection.

3.4.5 The project components (**see Figure 3.2: Project Components**), including the temporary development during construction, are described in the sections below. The size and scale of the project components referenced in this PEIR are based on current design assumptions and will continue to evolve.

3.4.6 The DCO will define Limits of Deviation (LoD) applied to the Proposed Development to provide a degree of design flexibility. The LoD will also be defined in the ES, and the maximum extent or the worst case assessed. The justification for seeking flexibility through the use of LoD will be provided in both the ES and the Explanatory Memorandum accompanying the draft DCO. The potential LoD defined for the purpose of the preliminary environmental assessment are described in the sections below where relevant.

3.5 Embedded Environmental Measures

3.5.1 The Proposed Development also includes embedded environmental measures, to avoid or reduce environmental effects, which have been directly incorporated into the design. **Chapter 4: Approach to the EIA** explains the approach to environmental measures that has been applied in the PEIR. The environmental assessments presented in **Chapters 6** to **17** provide details of how the embedded environmental measures are proposed to avoid or reduce environmental effects.

3.5.2 The embedded environmental measures will evolve over the design development process as the EIA progresses and in response to consultation. They will be fed iteratively into the assessment process. As there will be a commitment to implementing these embedded environmental measures, and also to various standard sectoral practices and procedures, they are considered inherently part of the design of the Proposed Development and are set out in this PEIR. The ES will be accompanied by a Mitigation Commitments Register setting out all of the mitigation measures and it will confirm how these would be secured in the DCO.

3.6 EfW CHP Facility (Physical Development)

EfW CHP Facility

3.6.1 A preliminary EfW CHP Facility Site Layout drawing (see **Figure 3.5: Preliminary EfW CHP Facility Site Layout**) has been produced to illustrate where the various project components described below would be sited. Each of these components are described in turn below. All heights are referenced from ground level (AOD).

3.6.2 A number of these components would be located within the main building which comprises a number of separate elements. 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.

3.6.3 Components within the main building are identified below.

Tipping hall

3.6.4 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 in the tipping hall for staff. The tipping hall would measure approximately 16.5m in height, 58.5m in length and 38m in width.

3.6.5 Waste odours are contained within the main building through the use of a combustion air system to maintain negative internal air pressure. 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. Shutdowns 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 or a permanently installed odour neutralisation spray system will be deployed to neutralise odours. The system to be installed would take account of feedback received from ongoing engagement with the Environment Agency.

Fire water tank and fire water pump building

3.6.6 The fire water tank and fire water pump building would be located immediately to the south of the main building 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 if required. The capacity of the tank would be determined during the detailed design, however it is likely to measure approximately 8m in height with a 16m diameter. The fire water pump building would measure 3.5m in height, 9.5m in length and 12.5m in width.

Waste Bunker

3.6.7 A number of elements would be located in the waste bunker which would measure approximately 36.5m in height, 102m in length and 36.9m in width. Taking account of the need for design flexibility, a maximum height of the waste bunker of 41.5m has been used for the purposes of the preliminary assessment.

Tipping bunker and main waste bunker

3.6.8 The tipping bunker and main waste bunker would be located adjacent to the tipping hall. The waste is initially deposited into the tipping bunker by refuse collection vehicles in the tipping hall. Mechanical cranes attached above the bunkers transfer the waste from the tipping bunker to the main waste bunker for mixing and temporary storage prior to incineration.

3.6.9 Prior to being loaded into the furnace, waste would be stored and mixed within the 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).

3.6.10 The floor and foundations of the bunkers would be approximately 10m, and 12m below finished floor level (FFL), respectively, with a limit of deviation up to 15m below FFL. The bunker will be a watertight construction and built to standard industry practices. This approach maximises the capacity of the facility for internal waste storage whilst maintaining full capacity for receiving waste. The tipping bunker would measure approximately 25m in height, 43m in length and 10.7m in width. The main waste bunker would measure approximately 29m in height, 80m in length and 26m in width (including the width of the reception bunker).

Waste chute platform

3.6.11 The waste chute platform would be within the waste bunker area. 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 chute platform would transfer waste from the tipping bunker and main waste bunker to the waste chutes. The waste chute platform would measure approximately 70m in length and 10.7m in width.

Incinerator bottom ash (IBA) storage bunkers and loading area.

3.6.12 Two enclosed IBA loading areas would be located adjacent to the main building on the eastern and western elevations at ground level. 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.

3.6.13 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 main building would measure approximately 10m in height, 51m in length and 11m in width. The loading area on the western elevation of the main building would measure approximately 10m in height, 42.9m in length and 11m in width.

Boiler house

3.6.14 The boiler house would be located in the southern extent of the main building adjacent to the waste chute platform. The boiler house would comprise two boilers, two feed water tanks, a boiler water tank and process water tank, de-ashing systems for the 2nd / 3rd boiler pass, horizontal pass and incinerator bottom ash 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 state of the art combustion control system. The boiler design would be Industrial Emissions Directive (IED) compliant, ensuring a flue gas residence time of 2s at 850^{o}C for the destruction of dioxins and furans. Atmospheric steam vents would be located on the top of the boiler house for both routine and emergency steam release. The boiler house would measure approximately 50m in height, 55m in length and 47.6m in width.

Control Room

3.6.15 The control room would be located in the main building, situated at the waste chute platform 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.

Maintenance areas

3.6.16 Maintenance areas would be located within the waste bunker 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, 11m in length and 36.9m in width. Other maintenance areas will be located at various locations within the main boiler house building.

3.6.17 In addition to the main building the following ancillary buildings and plant would be provided.

Air Pollution Control (APC)

3.6.18 The APC system would be located externally to the main building adjacent to the southern elevation. Flue gases which have passed through the boilers would enter the APC area, where the gases would be cleaned using a dry reagent injection system before they are released into the atmosphere via the chimneys.

3.6.19 The APC system would comprise an APC residues (APCr), hydrated lime and Activated Carbon (AC) loading area measuring approximately 10m in height, 55.3m in length and 10.7m in width. Four APCr silos would sit on top of the loading area each measuring approximately 22m in height and 3.8m in diameter. The APC plant would sit adjacent to this with two hydrated lime and two AC silos each measuring approximately 22m in height and 3.8m in diameter. An internal access road would pass underneath the APCr, hydrated lime and AC loading area.

3.6.20 Two bag filter houses would be located adjacent to the APC plant, which connect to two Induced Draft (ID) fan cabins. In total the bag filter houses and APC system areas would measure approximately 25m in height, 33.2m in length and 28.6m in width. The ID fan cabins would measure approximately 10m in height, 10m in length and 10m in width.

3.6.21 The ID Fans would connect to two chimneys emitting treated flue gases. The two chimneys would each have a height of no more than 90.0m and a diameter of 3.2m. The height of the chimneys will be determined by the air emissions assessment (**see Chapter 8 Air Quality**) and confirmed in the Environmental Permit for the EfW CHP Facility. A static infra-red light would be fitted at the highest practical point of each chimney to satisfy the MoD's request in the EIA Scoping Opinion for aviation warning lighting, or should they be required by other aviation consultees.

Switch gear building

3.6.22 The switch gear building housing the electrical switch gear circuit protection devices would be located externally to the main building on its eastern elevation. The building would measure approximately 33m at its highest point, 47.6m in length and 10m in width.

Diesel tank and urea tanks

3.6.23 This component of the Proposed Development would be located externally to the main building adjacent to the western elevation 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. This component would measure approximately 25m in height, 25m in length and 9.1m in width. 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.

Gatehouse and weighbridges

3.6.24 The gatehouse would be located at the entrance to the EfW CHP Facility and would be used by personnel monitoring vehicles entering and exiting the site during operational hours. The gate house would measure approximately 3m in height, 9.4m in length and 2.2m in width. Two weighbridges would be located adjacent to the gate house to allow the weighing in and weighing out of all waste delivery vehicles, vehicles delivering consumables and vehicles removing residues.

Mobile crane slab

3.6.25 The mobile crane slab is an area of hardstanding with a firm footing measuring approximately 15m in length and 14m in width located externally to the main building where mobile cranes would be located to facilitate any required maintenance of the EfW CHP Facility.

Compressed air station

3.6.26 The compressed air station would be located externally to the main building, adjacent to the bag filter houses on the southern elevation. 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. This component would measure approximately 8m in height, 13m in length and 8m in width.

Main transformer

3.6.27 The main transformer would be one of the ancillary structures located on the eastern boundary of the EfW CHP Facility Site. 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 10m in height, 11m in length and 6m in width.

Private wire transformer and switch gear

3.6.28 These elements would be located adjacent to the main transformer and would facilitate the private wire supply offered by the EfW CHP Facility to surrounding business users. The private wire transformer would measure approximately 10m in height, 11m in length and 5m in width. The private wire switch gear would measure approximately 10m in height, 7m in length and 6m in width.

Emergency diesel generator

3.6.29 The emergency diesel generator would be located externally to the main building adjacent to the western elevation. The generator would be powered by a low sulphur diesel supplied engine and would be required to supply sufficient electricity to ensure a safe 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 Environmental Permit.

3.6.30 This component would measure approximately 8m in height, 13.5m in length and 5.5m in width.

Air cooled condenser (ACC)

3.6.31 The ACC would be located separately to the main building on the eastern boundary of the EfW CHP Facility Site. It would accept exhaust steam from the turbine, condensing this into warm water using fans before being transferred back to the condensate system within the turbine hall. The ACC would measure approximately 25m in height, 37m in length and 37m in width.

Turbine hall

3.6.32 The turbine hall would be located separately to the main building on the eastern boundary of the EfW CHP Facility Site. Steam from the boiler house would be transferred by pipework suspended approximately 21m 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 25m in height, 47m in length and 34m in width.

3.6.33 A second steam pipeline would also be connected to the turbine hall to facilitate the transfer of steam along the CHP pipeline, also suspended above ground and running adjacent to the southern elevation of the main building before crossing above the internal access road on the western boundary of the site and dropping down to the CHP Connection route north up the disused March to Wisbech Railway Line.

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

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

3.6.35 The WTP would be located separately to the main building on the eastern boundary of the EfW CHP Facility Site, adjacent to the turbine hall. The WTP would treat water used within the Facility to ensure it remains pure and free of contaminants which may harm equipment. The WTP would measure approximately 16m in height, 30m in length and 22m in width.

3.6.36 The water re-cooling system 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 approximately 9m in height, 18.5m in length and 7.4m in width.

Workshop and Stores

3.6.37 A workshop and stores building would be located separately to the main building, on the eastern elevation of the boiler house. 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 16m in height, 34m in length and 15m in width.

Administration building

3.6.38 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 community area would be provided within the administration building. It would be able to accommodate visiting education and community groups, including disabled visitors. The building would measure approximately 16m in height, 34m in length and 10m in width.

132kV switching compound

3.6.39 The switching compound would be located adjacent to the gate house on the eastern elevation in the southern portion of the EfW CHP Facility Site. The fenced compound would accommodate electrical equipment to facilitate the connection to the 132kV Grid Connection. It would measure approximately 10m in height, 35.1m in length and 20m in width.

Laydown maintenance area

3.6.40 A laydown maintenance area would be provided in the southern portion of the EfW CHP Facility Site to the east of the weighbridges. This area of land would comprise of hardstanding and measure approximately 63.6m in length and 43.9m in width. It would be used for the temporary storage of plant and materials required to facilitate maintenance of the Facility.

Internal access and circulation, and parking

3.6.41 Waste vehicles would enter the EfW CHP Facility Site from New Bridge Lane on the southern boundary of the site and enter a stacking area to accommodate onsite vehicle queuing before reaching the gate house and weighbridge. Sufficient space within the site prevents vehicle queuing on the public highway. Vehicles that do not need weighing, would use the weighbridge bypass lane.

3.6.42 After the weighbridge, vehicles would travel along a two lane, single direction internal access road running clockwise along the western boundary of the Site to reach the tipping hall. Upon exiting the tipping hall, vehicles would continue travelling clockwise along the northern and eastern boundaries of the Site, exiting back onto New Bridge Lane. The same two-lane circular internal access road would be used by onsite operative vehicles and other vehicles accessing the site to deliver and collect materials (e.g fuel, IBA removal). These vehicles would also be able to travel through a secondary access route which runs underneath the APCr loading area.

3.6.43 Staff vehicles and visitors would access the site at the Algores Way entrance on the north-east boundary of the Site before entering the staff and visitor car parking area to the south of the administration building. Based on the anticipated demand for staff and visitor car parking, 50 spaces shall be provided. 5 of these spaces shall provide for electric vehicle charging and 2 allocated for disabled users. In addition, there would be 10 spaces for motorcycles and bicycles. The level of parking provision reflects standards stated in the Fenland Local Plan 2014 (Appendix A) for a sui generis use.

3.6.44 The internal road and pedestrian area layout has been designed to allow the safe movement of vehicles and pedestrians and has had regard to relevant health and safety legislation and good industry practice.

3.6.45 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.**

Drainage

3.6.46 The proposed drainage strategy for the EfW CHP Facility remains under discussion with Anglian Water. The key principles of the drainage strategy are set out below, however these will be confirmed within the final ES.

3.6.47 During the construction phase, surface runoff (and any pumped groundwater from the excavations) would be collected in perimeter ditches and discharged into the adjacent Hundred of Wisbech IDB drains after attenuation on site in SuDS basin(s). Flow through straw bales in the perimeter ditches and sediment settlement in the ditches and SuDS basin(s) would reduce the sediment loading of the discharge. 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.

3.6.48 During the operational phase, surface runoff would be collected and attenuated on site before discharge into the adjacent Hundred of Wisbech IDB drains. Due to space constraints the attenuation storage would be provided in underground tank(s). The discharge rate into the IDB drains would be attenuated to greenfield runoff rate.

3.6.49 Further information on the drainage strategy can be found in **Chapter 12: Hydrology.**

Oil interceptor

3.6.50 An oil interceptor would be installed below ground underneath the staff car parking area adjacent to the Algores Way Site entrance on the north-east boundary. This oil interceptor would sit approximately 3m below ground level with a length of 9m and a width of 1.6m.

Utilities and Other Infrastructure

3.6.51 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 Anglian Water.

Sewerage

3.6.52 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.

3.6.53 In normal operation, there is no continuous discharge to foul sewer from the process part of the EfW CHP Facility as any waste water 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 (see paragraph 3.6.59) 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.

3.6.54 Occasionally there would be the need to discharge process water from the 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.

3.6.55 The EfW CHP Facility would require a foul water discharge rate of 0.417 l/s, discharging into the network on a 24/7 basis, with a peak flow rate of 0.417 l/s. At this stage it is assumed that the Algores Way pumping station can accommodate these flows, and no additional utility upgrades would be required. This has been confirmed through engagement with Anglian Water (see **Appendix 12B** in **Chapter 12: Hydrology**).

Water

3.6.56 A water supply is required to provide water for the process requirements, the fire protection systems and for domestic and potable requirements.

3.6.57 Through engagement with Anglian Water (see **Appendix 12B** in **Chapter 12: Hydrology**), the need for a dedicated water supply for the EfW CHP Facility has been identified because the existing network cannot accommodate the proposed water requirement of $80m^3/h$ or 22.22 lps. The preferable solution is to lay a dedicated 225mm HPPE water main from the existing 450mm diameter water mains where it crosses the A47.

Electricity

3.6.58 In order to start up the EfW CHP Facility it is necessary to import electrical power from electricity distribution network. With the EfW CHP Facility in operation electrical power would be generated at an estimated 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.

3.6.59 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 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.

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

Telecommunications

3.6.61 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.

3.6.62 The EfW CHP Facility would require redundant 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.

Landscaping and boundary treatments

3.6.63 A new security fence would be installed along the boundary of the EfW CHP Facility Site. 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 3.6: Boundary fence and gates**.

3.6.64 The buildings are set back 6m from the top bank of IDB drainage ditches to enable access to the ditches for maintenance. Opportunities will be sought for planting and landscaping which may soften the perimeter fence, and to provide for biodiversity mitigation and enhancement. An outline Landscape Strategy will also be provided as part of the DCO application.

Lighting and CCTV

3.6.65 A full description of the operational lighting will be provided in the ES. Outside of the operational hours for the acceptance of waste, lighting requirements would be limited to security and safety only. The lighting strategy will seek to minimise lighting on the site, for example, from the use of lighting standards along main access route and the car park that have luminaries with full horizontal cut-off in order to minimise light spill and sky glow.

3.6.66 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 site and be operational 24 hours a day. Space would be provided for storing the recorded material and information for 90 days.

Future Environmental Requirements

3.6.67 In developing the site layout, the Applicant has taken into account the need to ensure that the Proposed Development can deliver future environmental requirements relating to carbon capture and storage, biodiversity net gain and third-party proposals in the surrounding area.

3.6.68 Such future environmental requirements may take the form of additional plant and equipment such as a Carbon Capture Storage (CCS) Facility, (including plant and equipment to capture carbon dioxide (CO_2) and transport this to a storage facility). The proposed layout provides for a central location on the south-east portion of the EfW CHP Facility Site for Future Environmental Requirements (see **Figure 3.11: Future Environmental Requirements**).

3.6.69 Future legislation or policy may extend the requirement for biodiversity net gain to NSIP projects. The current layout therefore provides for an area of land on the south-east portion of the EfW CHP Facility Site which could accommodate future environmental requirements for biodiversity net gain.

3.6.70 The reopening of the disused March to Wisbech Railway Line is a proposal being explored by CPCA with the support of CCC. The site layout for the EfW CHP Facility has been reconfigured to accommodate a railway bridge embankment should the disused March to Wisbech Railway Line be reopened in the future (**see Figure 3.11: Future Environmental Requirements**).

3.6.71 At present, the Applicant does not intend to include the construction and operation of the potential future environmental requirements described above as part of the Proposed Development and therefore it does not form part of the EIA. For the purpose of the DCO application, it is currently proposed that the land described above and illustrated on the Preliminary EfW CHP Facility Site Layout drawing (**Figure 3.5: Preliminary EfW CHP Facility Site Layout**) would comprise landscaping and an additional area of hardstanding for laydown of mobile machinery and equipment.

3.6.72 In addition, land remains in the current red line boundary as a 'Potential Mitigation Area' (see **Figure 3.2: Project Components**). This land has been included within the red line boundary for statutory consultation should the outcomes of the ongoing environmental assessment indicate that mitigation is required in this location to minimise the effects of the construction and operation of the Proposed Development on sensitive receptors. This may include the residential receptors located along New Bridge Lane. The requirement for mitigation and the nature of the mitigation proposed will be confirmed within the ES.

Limits of Deviation

3.6.73 The preliminary description of the EfW CHP Facility provided above outlines the likely size and scale of each project component. **Table 3.1** below identifies where LoD may be required to provide some design flexibility. The LoD may be refined prior to the DCO submission following further detailed design. The preliminary lateral and vertical LoD are also illustrated in **Figures 3.7 and 3.8 EfW CHP Facility Lateral Limits of Deviation and EfW CHP Facility Vertical Limits of deviation).** The LoD, along with any requirements for building maintenance, have been assessed as part of this preliminary environment assessment and they will be confirmed and assessed in the ES.

Table 3.1: Preliminary Limits of Deviation

Component	Vertical LoD	Lateral LoD	Justification
Main building	+5m (maximum height of 55m)	+5m (maximum length of 187m and width of 112m)	Vertical – the main building is 50m high the LoD allows for an additional 5m to accommodate ancillary equipment (e.g pipes and vents and associated parapets.

Component	Vertical LoD	Lateral LoD	Justification
			Lateral – the main building is 182m x 107m with an LoD of 5m to respond to ground conditions.
Tipping Hall (Reception building)	+5m (maximum height of 21.5m)		The Tipping Hall is 16.5m with an LoD of 5m to accommodate any ancillary roof mounted equipment.
Tipping bunker and main waste bunker	+5m (maximum depth of bunker slab would be 15m below FFL)		The bunker floors are 10m below FFL with an LoD of 5m to respond to ground conditions.
Boiler house	+5m (maximum height of 55m)		The boiler house is 50m high with an LoD of 5m to accommodate any ancillary roof mounted equipment.
Chimneys	+10.1m (maximum height of 90m)		The chimneys are 79.9m high with an LoD of 10.1m to ensure the height is set at a level complying with legal air emissions.
Turbine Hall	+5m (maximum height of 55m)	+5m (maximum length of 187m and width of 112m)	Vertical – the turbine hall is 50m high with an LoD of 5m to accommodate ancillary roof mounted equipment Lateral – the turbine hall is 47m x 34m with an LoD of 5m to respond to ground conditions.

CHP Connection

3.6.74 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 Line, and discussions have been held with these users.

3.6.75 As described in **Section 3.3**, the CHP Connection would run along the eastern edge of the disused March to Wisbech Railway Line before crossing Weasenham Lane and continuing until it reaches the Nestlé Purina site (see **Figure 3.2: Project Components**).

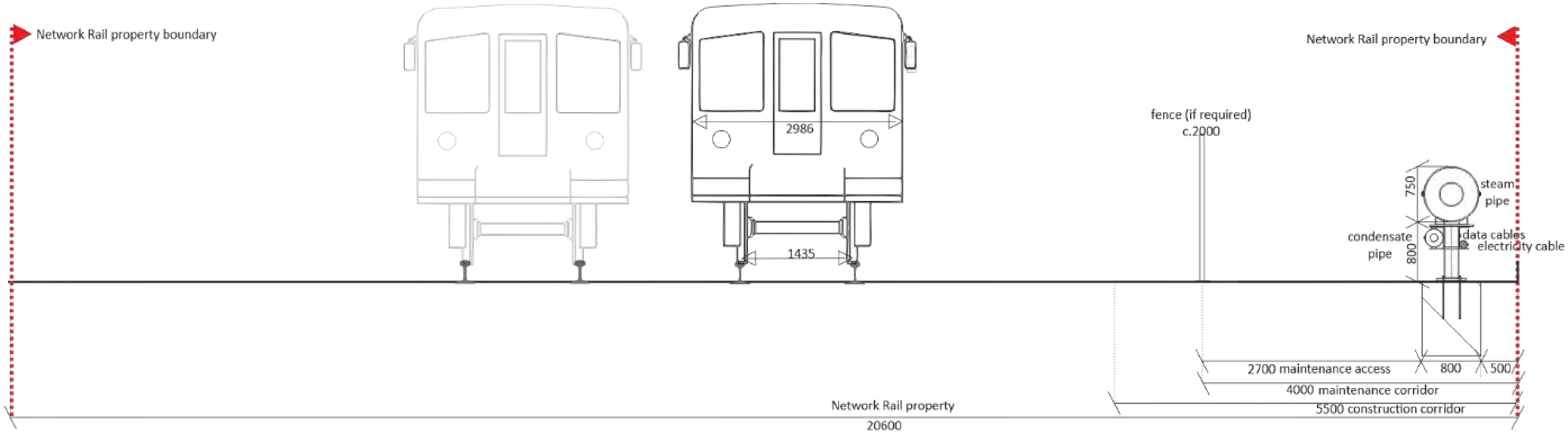
3.6.76 The preliminary CHP arrangements are illustrated on **Figure 3.9: Preliminary CHP Connection General Arrangement**. The pipeline would be located on a steel structure with a 1:500 gradient therefore approximately 1.6m to 1.7m in height, with an electricity and data cable running underneath. The steam pipe would have a diameter of approximately 0.75m and the return condensate pipe would have a diameter of 0.25m. The data and electricity cable would sit underneath the steam pipe and condensate pipe. For health and safety and operational reasons the Applicant proposes to locate the CHP Connection above ground.

3.6.77 At distances of 50 - 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 pipeline to a height of 6.7m for a distance of 5m, before returning to a 1.6m or 1.7m height. The expansion loops require a vertical alignment for health and safety and operations reasons.

3.6.78 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.

3.6.79 **Graphic 3.1** 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 Line.

Graphic 3.1: Illustrative CHP Corridor cross section



3.6.80 The CHP Connection would be predominately constructed in steel and the pipes would be insulated, all in accordance with good utility practice.

3.6.81 The design of the connection points to end users for either steam or electricity has yet to be confirmed but will be consistent with the design for the CHP Connection and good utility practice.

Limits of Deviation

3.6.82 The preliminary LoD for the CHP connection are illustrated in **Figure 3.2: Project Components.** The LoD may be refined prior to the DCO submission following further detailed design.

Access Improvements

3.6.83 The Applicant intends that the primary site access to the EfW CHP Facility Site would be from New Bridge Lane, with Algores Way used primarily for staff and occasional light vehicles during operation. CCC has advised that it would prefer Algores Way be used for all operational traffic. This is not the Applicant's preferred option for reasons explained within **Chapter 2: Alternatives**.

3.6.84 To facilitate the Applicant's intended access arrangements for the EfW CHP facility a highway improvement scheme is required beyond the new site access proposed from New Bridge Lane. Minor improvements to the existing site access off Algores Way will still however be required.

3.6.85 The improvement scheme for New Bridge Lane would widen the road from a point east of the junction with Salters Lane 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 Line.

3.6.86 The SAR 1 scheme provided for a 6m wide carriageway. The Applicant proposes a widened carriageway of 7.3m considering that this would be more appropriate for access. The SAR 1 scheme also provided for footways on both sides of the carriageway, this is replicated but with footpaths widened from the SAR 1 proposal to 2m. The current speed limit on New Bridge Lane is subject to the national speed limit, but given the nature of the road and the users along the Applicant considers that it should be reduced to 30mph. The proposals are shown in **Figure 3.5: Preliminary EfW CHP Facility Site Layout.**

3.6.87 **Figure 3.5: Preliminary EfW CHP Facility Site Layout** also illustrates the design of the proposed bellmouth access onto New Bridge Lane. This also 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.

3.6.88 It should be noted that the red line, subject to the preliminary environmental assessment, includes for the entirety of New Bridge Lane from the main EfW CHP facility Site entrance to the junction with Cromwell Road. It is not proposed to undertake works to the remaining section of New Bridge Lane which is an existing two-lane carriageway however it is assumed that an improvement scheme will be needed at the junction of Cromwell Road and New Bridge Lane and highways powers will be included in the DCO. Work to identify any potential impacts at this junction and to present any mitigation measures will be set out in the Transport Assessment that will be provided with the DCO application. Any mitigation scheme that is provided for this junction in the DCO application will make reference to the WAS Cromwell Road (CR) 2 initial but uncommitted scheme which has been proposed in this location.

3.6.89 In addition to access improvements on New Bridge Lane the existing Algores Way Access would need to be revised to respond to the internal layout of the EfW CHP Facility Site. **Chapter 6: Traffic and Transport, Figure 6.21 Algores Way Operational Access Design** illustrates how the existing site access off Algores Way would be redesigned to accommodate the requirements of the EfW CHP Facility. The site access would be located slightly to the south of the existing site entrance but would retain the same design parameters.

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

3.7 EfW CHP Facility (Operation)

3.7.1 This section of the PEIR provides a summary of the proposed operation of the Proposed Development.

Description of waste to be processed

3.7.2 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.

3.7.3 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.

3.7.4 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.

3.7.5 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

3.7.6 The operation of the EfW CHP Facility would be in accordance with an Environmental Permit. The key stages of the operational process are described below and illustrated in **Graphic 3.2: Operational Process Diagram**.

Start up

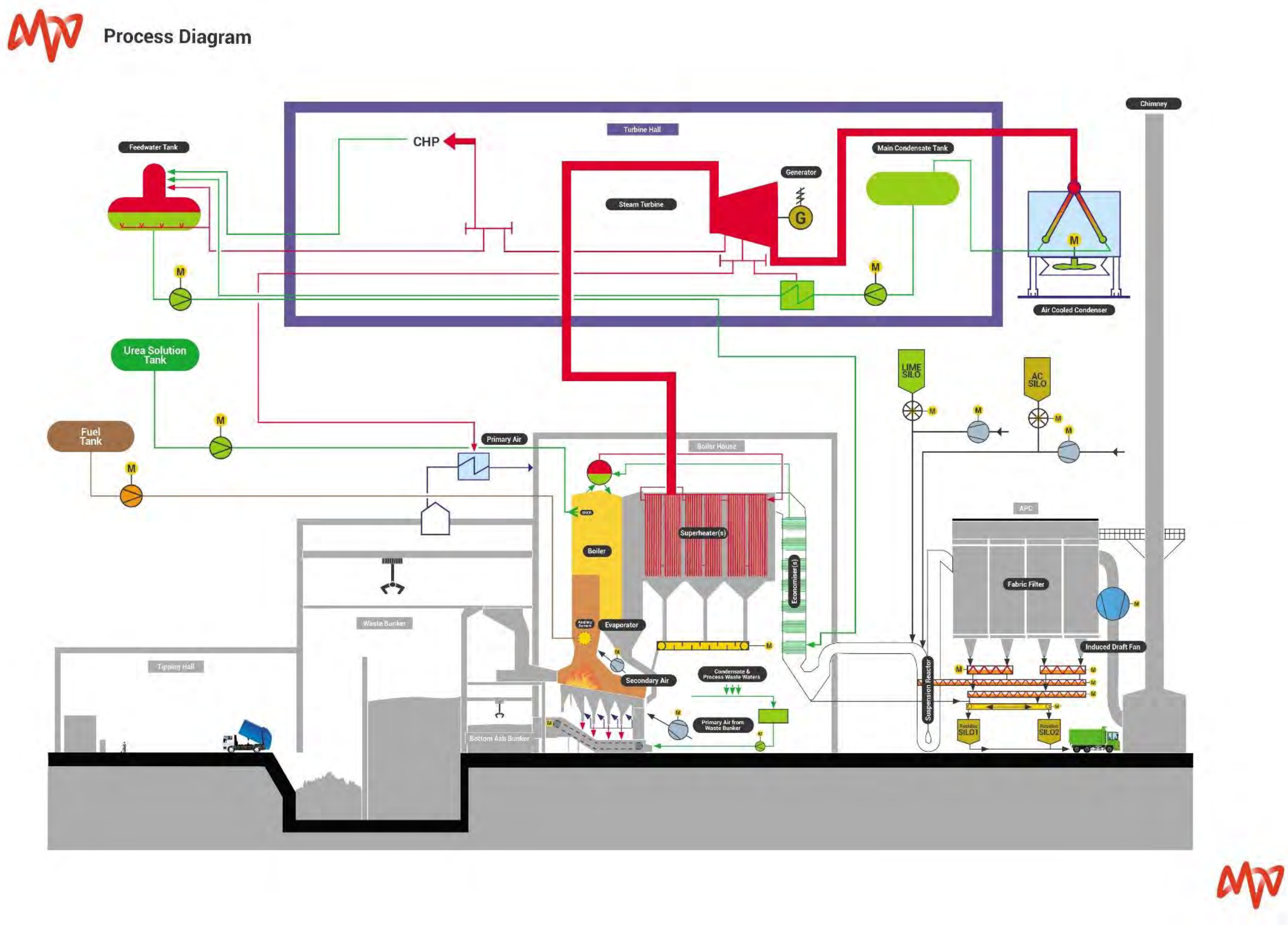
3.7.7 The facility would use low sulphur light oil (diesel oil) for start-up; there is no gas used on site. Auxiliary burners are fitted in the furnace which are used to bring the system up to the required temperature before waste is fed onto the grate. The start-up process is carefully controlled to 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 roof vent as the systems are warmed up and filled with steam over a period of around 4 hours during the start-up process. Following this, a continuous flow of steam would be vented for around another 4 hours as sufficient steam pressure is generated to divert to the ACC 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^{o}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

3.7.8 Waste would be delivered to the facility in HGVs (RCVs and walking floor articulated lorries). These vehicles would enter the enclosed tipping hall, reverse up to the bunker edge and tip the waste into the tipping bunker.

3.7.9 Mechanical cranes transfer waste from the tipping bunker to the main waste bunker. 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 3.2: Operational Process Diagram



Waste Combustion

3.7.10 Waste would be fed from the main waste bunker into the furnace using mechanical cranes. The crane operator 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 for appropriate disposal off site. However, the EfW CHP facility is designed to safely combust such items should they inadvertently be fed into the furnace.

3.7.11 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.

3.7.12 The combustion system would be equipped with auxiliary burners fired by low sulphur light fuel oil 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 refractory lined. 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 would then be conveyed to the IBA storage bunker before being taken away for recycling (see further details below).

3.7.13 Combustion gases would pass into a secondary combustion zone lined with a combination of refractory materials and Inconel cladding (a highly corrosion resistant alloy metal), 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 not sufficient (e.g. when burning very low calorific value waste) the auxiliary burners are used to maintain this temperature.

3.7.14 The waste feed rate, the supply of primary and secondary combustion air and the grate speed would be regulated by a state of the art 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.

3.7.15 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.

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

3.7.17 The combustion process generates oxides of nitrogen (NOx). In order not to 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 solution to be precisely adjusted to the temperature conditions within the zone.

3.7.18 Urea 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 process (SNCR), 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.

3.7.19 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 a nickel-chromium alloy (Inconel) applied under carefully controlled conditions to ensure full bonding between the parent metal of the tubes and the alloy.

Steam generation

3.7.20 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.

3.7.21 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

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

3.7.23 Acid pollutants HCl, SO2 and HF would be removed by a dry scrubbing and filtration system, using hydrated lime as the reagent.

3.7.24 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.

3.7.25 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.

3.7.26 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.

3.7.27 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.

3.7.28 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 Environmental Permit. Finally, the treated flue gases would be discharged to the atmosphere, via the chimneys.

The Fabric Filter

3.7.29 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.

3.7.30 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 filter would 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.

3.7.31 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 Air Cooled Condenser (ACC)

3.7.32 The superheated steam from the boiler would be transferred by pipework to the steam turbine in the turbine hall. 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 along the CHP connection to users in the surrounding industrial estate.

3.7.33 The EfW CHP Facility would use a high efficiency single shaft condensing steam turbine. The turbine would drive a water-cooled synchronous generator 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 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.

3.7.34 The EfW CHP Facility would use a finned-tube ACC 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.

3.7.35 The ACC would consist of several sections as follows:

- Tube bundles in carbon steel with aluminium 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

3.7.36 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 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

3.7.37 The 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 625,600 tpa.

3.7.38 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 a 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.

3.7.39 Within an enclosed area, 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.

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

APC Residues

3.7.41 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 as would transport the APC residues.

3.7.42 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.

3.7.43 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.

3.7.44 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.

3.7.45 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

3.7.46 To monitor and control pests, insects and vermin, specialist firms shall be contracted undertake regular inspections of the EfW CHP Facility Site. Bait boxes shall be maintained around the perimeter of the EfW CHP Facility.

Electricity

3.7.47 On average approximately $58MW_e$ is generated by the steam turbine, of which approximately $5MW_e$ is consumed by the plant as the parasitic load, leaving up to $53MW_e$ as the net electrical output for export to local users and the electricity distribution network.

Steam

3.7.48 Approximately $50MW_{th}$ 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 a pipe to its destination and a smaller diameter pipe would carry the condensate back to the boilers for reuse.

Operational hours

3.7.49 Once operational, the EfW CHP Facility would be capable of processing 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.

3.7.50 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

3.7.51 It is anticipated that up to 40 full time 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 are 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 Manager, Finance Assistant, Account Manager, IT Support Technician, HR 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 and rescue teams.

Operational waste management

3.7.52 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 licensed hazardous waste landfill. The processes for these residues have been described in more detail above.

Operational maintenance

3.7.53 There would be periods when the EfW CHP Facility needs to be shut down for maintenance purposes and these shut downs 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 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.

3.7.54 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.

3.7.55 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 or a permanently installed odour neutralisation spray system before being emitted to the atmosphere to avoid malodorous compounds being emitted.

3.8 Grid Connection (Physical Development)

3.8.1 As outlined in **Section 3.3**, two Grid Connection Options remain under consideration. These are:

- Option 1: Connection to Walpole Substation; and
- Option 2: Connection to Walsoken Substation.

3.8.2 These options are illustrated on **Figures 3.2: Project Components to Figures 3.4i - iii.**

3.8.3 Option 1 to Walpole Substation would provide the Applicant with an unconstrained capacity to export more than 50MWe to the National Grid. This has been confirmed in a connection offer from UK Power Networks (UKPN), the Distribution Network Operator for the region.

3.8.4 UKPN have also offered the Applicant a constrained capacity offer to connect to Walsoken substation (Option 2). In this context "constrained" means that for a small and limited number of hours per year the EfW CHP Facility may have to reduce its electrical output by a few percent. This potential constraint would not reduce the maximum export capacity below 50MWe. At this stage discussions remain ongoing with UKPN to confirm the terms of the constrained capacity.

3.8.5 A decision on which Grid Connection Option will be selected will be made prior to submission of the DCO application and will be informed by feedback received from statutory consultation. Both Grid Connection options are currently being assessed as part of the EIA and the preliminary outcomes of the assessment are presented in the PEIR.

3.8.6 A description of both Grid Connection options is provided in this section of the PEIR. Both Grid Connection options would comprise a 132kV electrical connection using both an underground cable (UGC) and an overhead line (OHL). At this stage, the design assumptions for the underground and overhead sections of the route have been made by MVV's Independent Connection Provider (ICP) on the basis of UKPN's original connection offer, known UKPN and industry standards, and professional experience in building other connections of this nature. The final design of the Grid Connection presented in the ES as part of the DCO application will take account of feedback received from ongoing engagement with UKPN, stakeholders and the statutory consultation. The design of the Grid Connection described below is based on indicative but worse case design assumptions.

Underground Cable (Common Route)

3.8.7 The initial 2.5km UGC route from the EfW CHP Facility Site would be the same for both Grid Connection Options and therefore the description below applies to both Options.

Cables

3.8.8 The proposed cable design complies with UK Power Networks (UKPN) Engineering Construction Standard ECS 02-0019 Installation of Underground Cables – LV to 132kV. It is anticipated to be a 300mm aluminium conductor which would be confirmed during the detailed design phase and through agreement with UKPN.

3.8.9 The UGC would be insulated and is constructed using different materials to that used for the overhead line conductor. The UGC would comprise three insulated single core cables, each with a copper conductor and lead sheath (for armouring). In addition, a fibre optic cable would be laid for telemetry purposes. The UGC and the OHL conductors would be joined together above ground via a cable termination mounted on a terminal structure and screened with a cable guard.

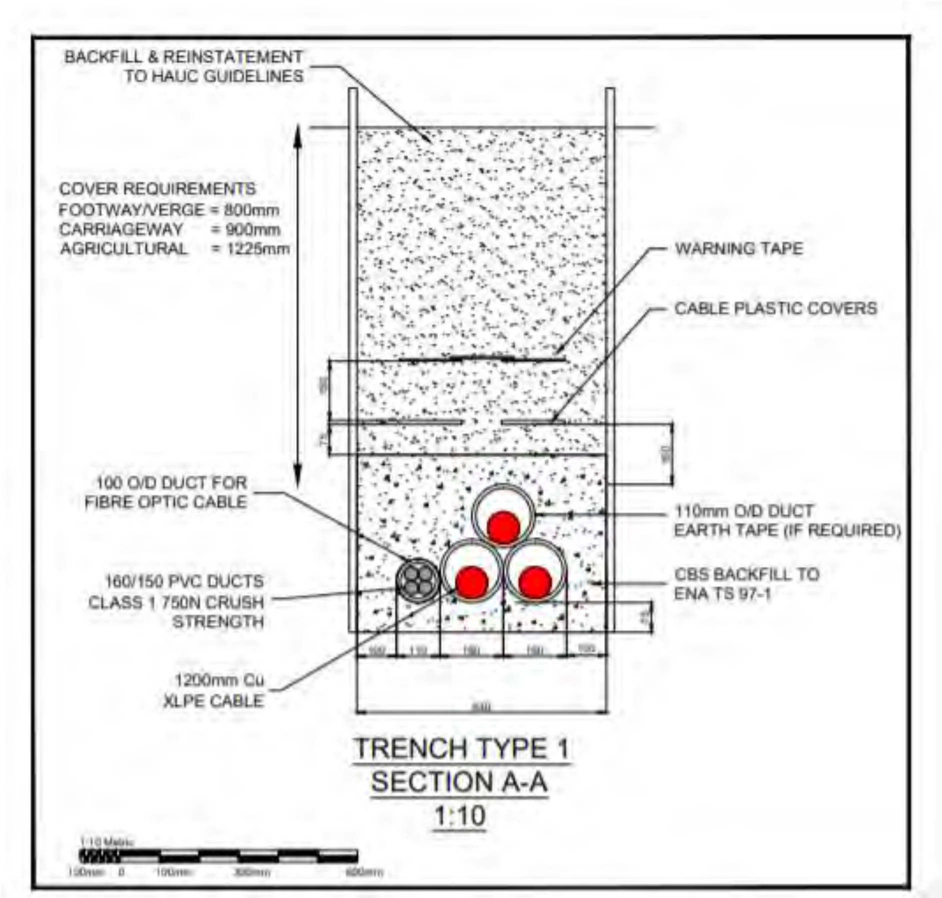
3.8.10 The cables would be installed in either an open cut trench, or in ducts within a driven bore, driven by Horizontal Directional Drilling (HDD) or by a hydraulic auger, also called thrust boring, or within pre-installed conduits. For open cut trenching, the cable would be set in a trench up to 1,596mm in depth, which is the worst case scenario for the purpose of the assessment. A typical cross section of a trench is provided in **Graphic 3.3 below.**

3.8.11 In the case of HDD bores the cable would be installed in polyvinyl chloride (PVC) or polyethylene (PE) tubes/pipes, called ducts, which would be pulled through the bore. Each cable would then be pulled through its own duct. In a trench the insulated underground cables would be laid either with or without ducts. The ducts/cables would be laid in either a 'trefoil' (triangular) or 'flat' formation with the fibre optic cable alongside.

3.8.12 Cambridgeshire County Council (CCC) are proposing road improvements at the A47 / A1101 Elm High Road junction and the A47 / Broadend Road junction (see **Chapter 6: Traffic and Transport**). The Applicant and MVV have 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 or HDD techniques, thus minimising the environmental effects of these works. The ability to commit to conduits will depend on the technical feasibility tof installing them, and the timescales of the road improvement schemes in comparison to the Proposed Development. These discussions are ongoing and the final design will be presented in the ES.

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

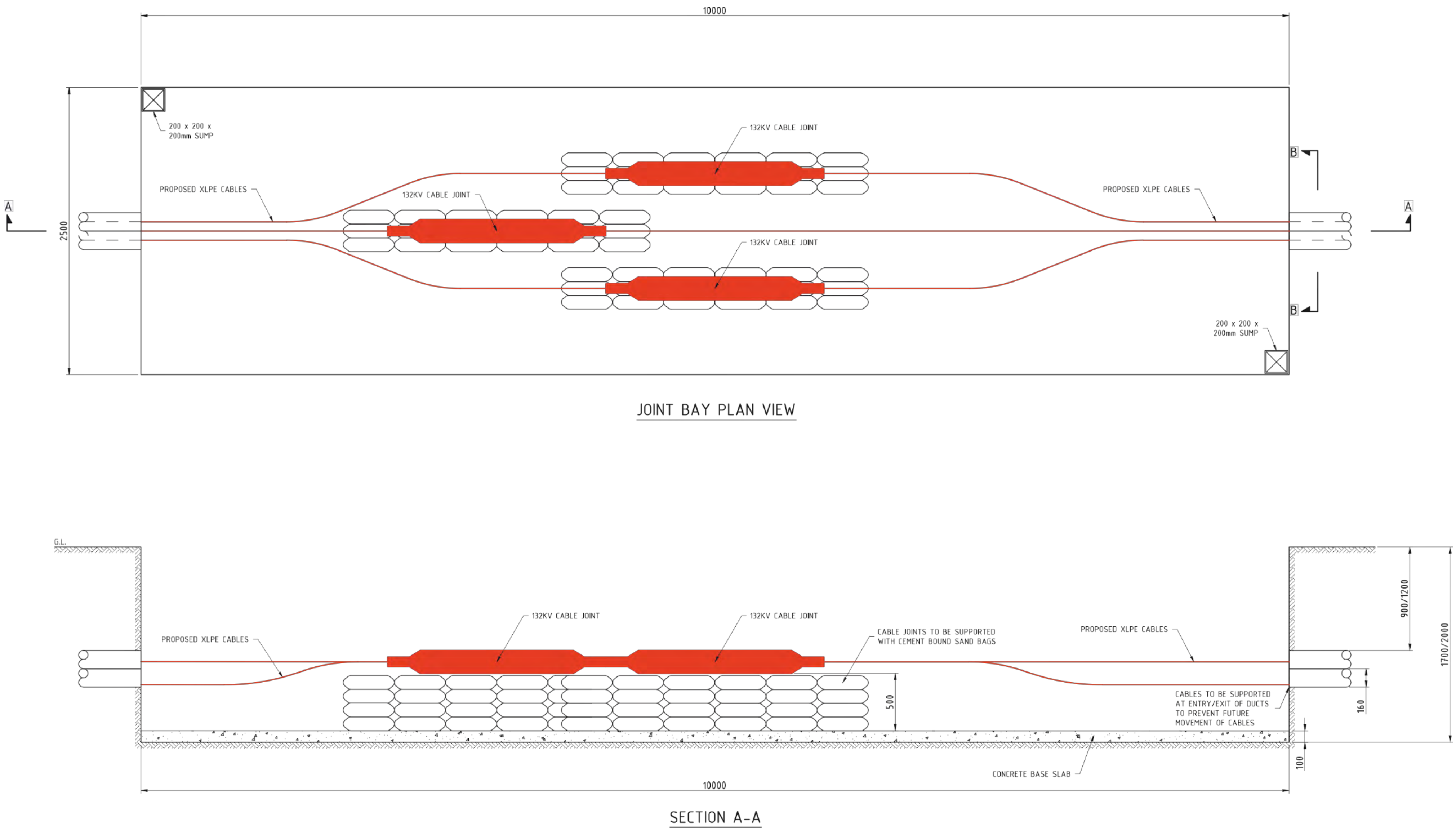
Graphic 3.3: Typical cable trench cross section



Joint bays

3.8.14 Five joint bays would be located along the route of the underground cable up to Meadowgate Lane. One joint bay would be required along Mill Road. The locations of the joint bays are illustrated on **Figure 3.4i: Underground Cable and HDD Route (Common Connection Corridor)**. The joint bay excavations would measure approximately 10m in length and 2.5m in width with a depth of between 1700 – 2000mm. A typical illustration of a joint bay is provided in **Graphic 3.4** below. After the joint is completed, the excavation will be filled in and reinstated to its former condition.

Graphic 3.4: Typical joint bay illustration



Overhead Line

3.8.15 The OHL has been designed in accordance with Energy Networks Association Technical Specification (ENA TS) 43 50, BS EN 50341-1:2012 and the associated National Normative Aspects for Great Britain BS EN 50341-2-9:2017.

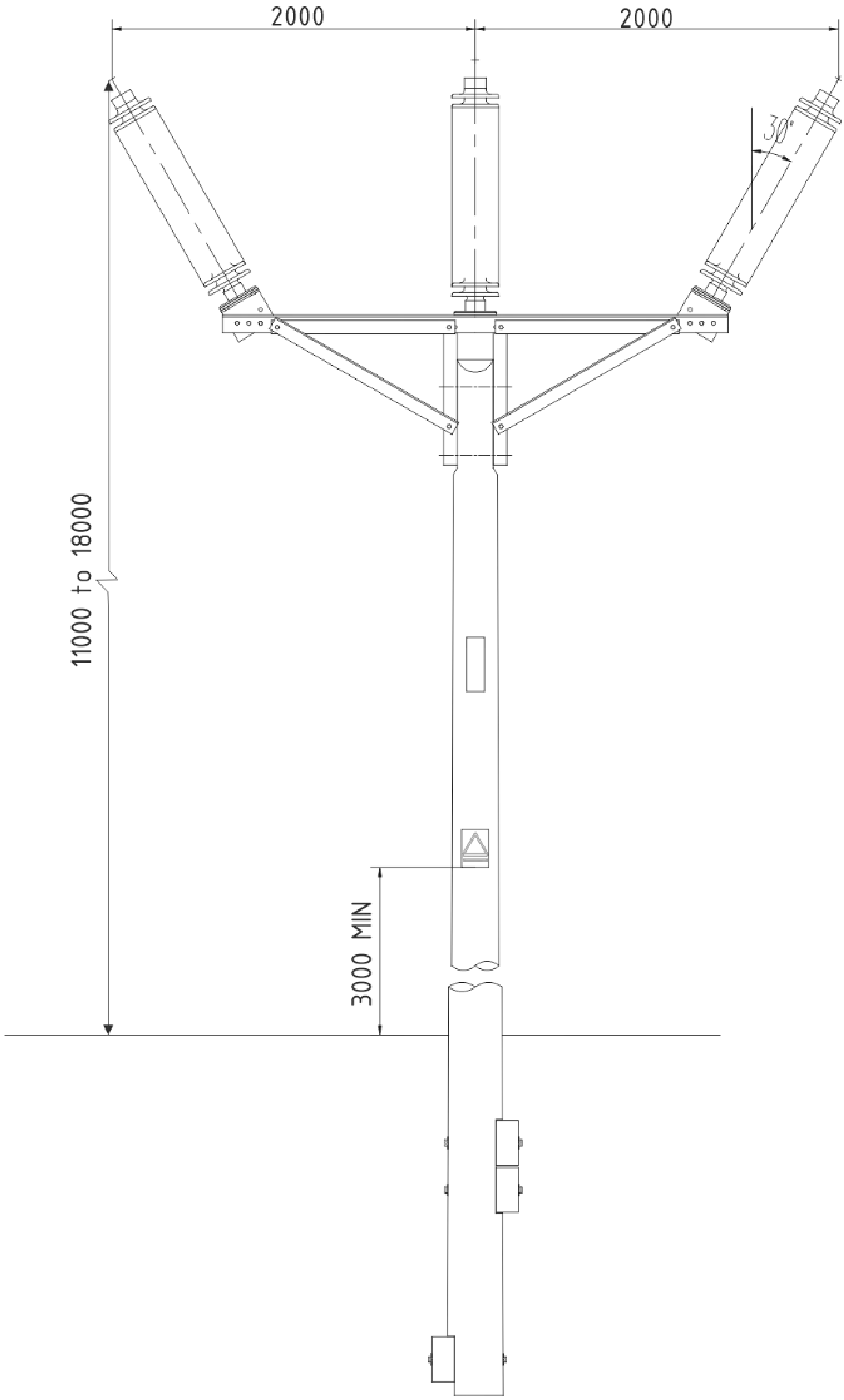
Wooden poles

3.8.16 The conductors would be carried on wooden pole structures. The three conductor wires would be supported on insulators mounted on galvanised steel cross-arms above the wooden pole. The wooden poles would be designed to the ENA TS specification but with polymeric post and tension insulators.

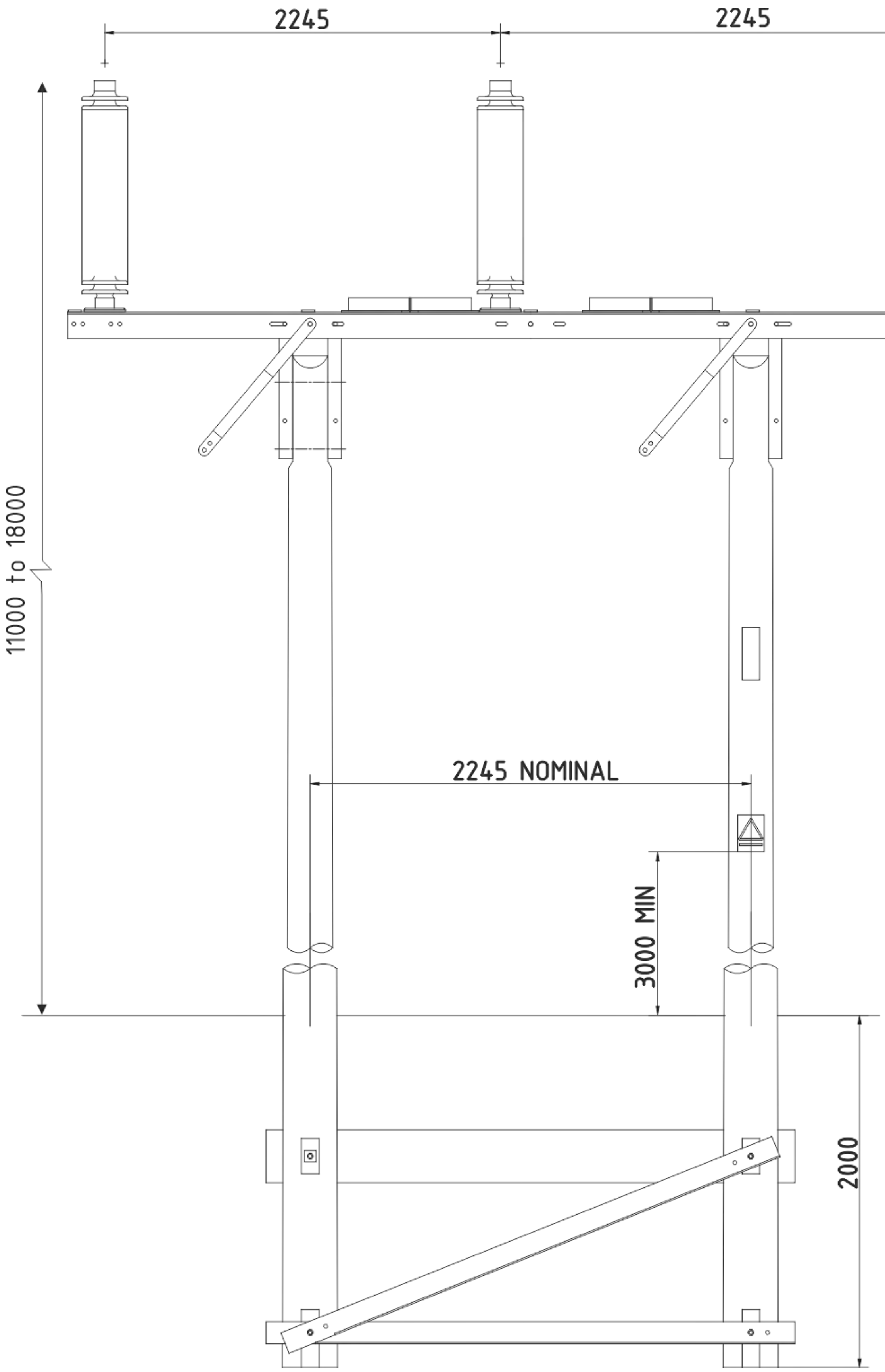
3.8.17 The pole types are as follows:

- Intermediate single (see **Graphic 3.5**) or H pole structures (see **Graphic 3.6**); used where the OHL alignment is straight;
- At angle locations single or ‘‘H’ pole angle structures; used where the alignment changes direction and the structure is positioned on the bisect of the angle of deviation. Up to four insulated wire stays per pole would be required to balance the effect of tension and deviation angle; and
- Terminal ‘H’ pole where the OHL connects to the UGC and, for Option 1 only, where the OHL ends and connects to the Walpole substation.

Graphic 3.5 Typical single span pole structure



Graphic 3.6 Typical ‘H’ pole structure



3.8.18 The indicative pole heights for Option 1 (Walpole) (Poles 1 to 82) and Option 2 (Walsoken) (Poles 1-15) are provided in **Appendix 3C: Preliminary Pole Schedule**. For the purpose of the PEIR, the majority of the poles are assumed to have a height of 11m to 14m with a 2m LoD, therefore a maximum height of 16m above ground level. Other poles, including poles 1 and 82 (termination poles), and anywhere a significant crossing or statutory clearance is required, would have a maximum height of 18m above ground level, taking account of the LoD. Planting depths range from between 2.0m and 3.0m buried underground, this will be subject to site soil investigations to confirm foundation design at detailed design stage.

3.8.19 Subject to the detailed design stage and discussions with landowners, poles or stays will be sited so as to avoid hedgerows. All poles, construction equipment and working areas would be a minimum of 9m from any watercourse unless otherwise agreed with the relevant drainage authority and, subject to the appropriate bylaw consent, this may be reduced to 5m.

Conductors and insulators

3.8.20 In line with UKPN specifications, the conductors would be an all-aluminium alloy conductor (AAAC). These are bare bundles comprising one or more concentric layers of helically arranged round or profiled wires composed of aluminium alloy. UKPN's Overhead Line Rating standard EDS 01-0045 Table A1 gives a summer rating for 150mm^2 AAAC 'ASH' conductor of 343Amps at an operating temperature of 50^{o}C. At 132kV this gives a capacity for the single circuit OHL of 78MW which would comfortably accommodate the proposed generating capacity of the EfW CHP Facility.

3.8.21 For intermediate structures the conductor wires are each fixed upon a pin or post insulator set mounted on a galvanised steel cross-arm connected to each pole. The vertical height of the cross-arm structure and post insulator would add another approximately 1.8m to the total height of the pole structure. This has been factored into the maximum heights stated above. It is expected that polymeric insulator sets would be used, but the type of insulator would be subject to detailed design.

3.8.22 For section, angle and some terminal type structures where loading requirements dictate a stronger pole type is needed, the insulator sets are made from a combination of metal fittings and isolators assembled together to form an insulator string. The conductor is clamped using standard terminations to hold the conductor and these are then attached to the insulator set and mounted horizontally on the structures. The conductors continue via a jumper loop which is held in position using pilot insulators placed vertically above the structure.

OHL alignment

3.8.23 The preliminary line profile for Option 1 (Walpole) and 2 (Walsoken) (poles 1-15) is provided in **Appendix 3B: Preliminary Line Profile** and **Figure 3.4ii: Option 1 Walpole Grid Connection Route**. The final alignment of the poles will be confirmed in the DCO application, taking into account relevant feedback received during the statutory consultation, and in response to the ongoing environmental assessment. An allowance for micro-siting of the OHL alignment shall be included in the DCO application.

3.8.24 The LoD for the alignment would be set to allow for the micro-siting of infrastructure, including the lateral deviation for poles and to allow for conductor swing.

3.8.25 The span distance between each pole is set out in **Appendix 3B: Preliminary Line Profile**. This varies to take account of topography, the conductor loading (depending on conductor number/type) and climatic loadings.

3.8.26 Statutory clearance distances would be maintained along the OHL route in accordance with Specification ENA TS 43-8. This includes the following:

- Clearances to ground and roads;
- Clearances to objects;
- Clearances to power lines;
- Railway crossings;
- Waterway crossings; and
- Telecommunications lines.

Fibre optic cable

3.8.27 A fibre optic cable would be installed as part of the circuit. The details of the fibre optic cable would be agreed with UKPN. At this stage, it is assumed that for the OHL this would be embedded in one of the phase wires and on the UGC it would run alongside the power cables (separately ducted but within the same trench or bore). The fibre optic cable would be used to transmit data along its length in relation to the operation of the line, including fault detection during operation and to operate protection equipment in the event of a fault occurring.

Substation Connections

Option 1: Connection to Walpole

3.8.28 The connection to the Walpole substation would be via an UGC connection into the substation.

3.8.29 A description of the works required to connect the 132kV UGC to Walpole substation remains under discussion with UKPN. The works would require a new bay within or adjacent to the existing substation to accommodate the Grid Connection. The additional equipment would be similar in appearance and height to the existing infrastructure at the Walpole substation. The equipment is likely to consist of circuit breakers, transformers, earth connections and insulators. Details of the works required will be provided and assessed in the final ES.

Option 2: Connection to Walsoken Substation

3.8.30 The connection to the Walsoken substation would be via an UGC connection into the substation.

3.8.31 A description of the works required to connect the 132kV UGC line to Walsoken substation remains under discussion with UKPN. The works require a new bay within the existing substation to accommodate the Grid Connection. The additional equipment would be similar in appearance and height to the existing infrastructure at the Walsoken substation. The equipment is likely to consist of circuit breakers, transformers, earth connections, and insulators. Details of the works required will be provided and assessed in the final ES.

Operational maintenance

3.8.32 The maintenance of the Grid Connection (UGC and OHL) would be the responsibility of either UKPN, the Applicant, MVV or an iDNO, to be decided at a later date.

3.8.33 An annual inspection of the OHL would be undertaken to identify any damage or deterioration of the components, such as can occur from storm events and lightning strikes. Annual inspection would be undertaken by foot patrol.

3.8.34 Where faults occur or components become damaged, they would need to be replaced. A line would only be replaced if its condition requires it and may only involve part of the line. Conductors and insulators are typically replaced after some 40 years of operation.

3.8.35 If a line fault occurs it would be repaired. It is envisaged that such work would be infrequent, small scale and localised, and would entail less, if any, environmental impact than the construction phase work.

3.8.36 UGC are not physically inspected as they are below ground. However, and in accordance with relevant industry requirements, the UGL is tested regularly during their lifespan which is typically 50-60 years. Hedgerows and trees in proximity to the OHL would be added to a tree and hedgerow cutting schedule. This seeks to maintain appropriate clearances from the overhead line, typically done every five years. A minimum of 5m clearance from the conductor to the top of hedgerows would be maintained.

3.9 Construction

3.9.1 This section of the PEIR provides a description of the approach to construction for the EfW CHP Facility, the CHP Connection, the Access Improvements and the Grid Connection. Any differences between the two Grid Connection Options are outlined where necessary.

Construction programme

3.9.2 Should consent be granted in 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 3.7** below.

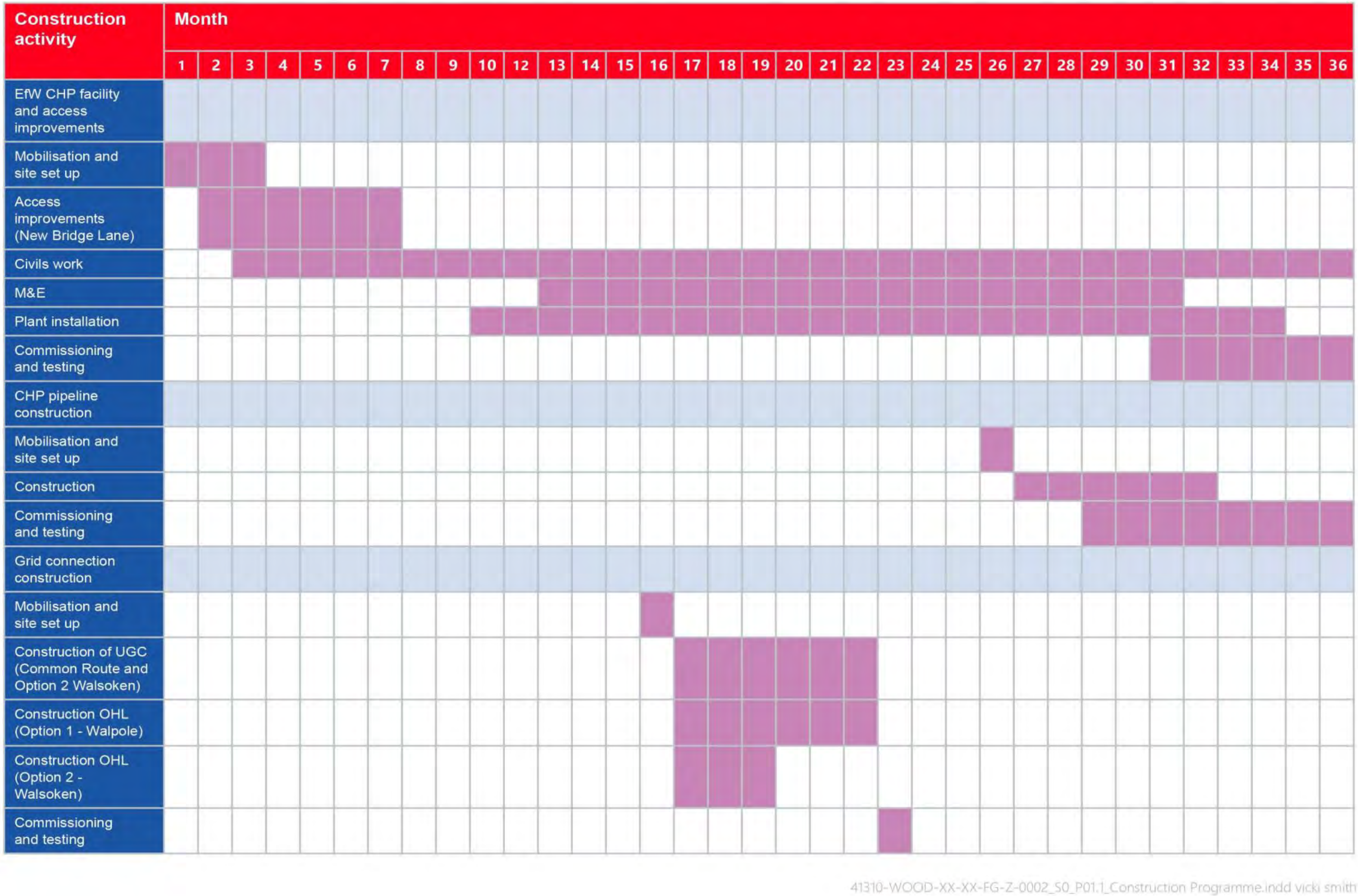
3.9.3 For the purpose of the preliminary assessment, two peak months of activity have been defined within the 36 month construction programme:

- EfW CHP Facility construction – month 14

- Total construction peak (EfW CHP Facility and Grid Connection) – month 20

3.9.4 These two months represent the likely worst case in relation to traffic movements.

Graphic 3.7: Construction Programme Summary



Construction working hours

3.9.5 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 without prior approval from the relevant planning authority. A limited number of works may be required outside of the core working hour, including:

- 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
  - Horizontal directional drilling; and
  - UGC/OHL road crossings.

3.9.6 During the 1-hour before and 1-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).

3.9.7 Mobilisation activities would not include HGV movements into and out of the TCCs.

3.9.8 Any need to carry out works outside of the core working hours would be subject to prior agreement from the relevant planning authority. The process of doing so would be set out in the outline Construction Environmental Management Plan (CEMP). The impact of works which may take place outside of the standard working hours has been assessed within the relevant chapters in the PEIR.

3.10 Construction (EfW CHP Facility)

3.10.1 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 construction arrangements are described in **Section 3.11** below.

Temporary construction compound and laydown areas

3.10.2 A preliminary site layout for TCC1 and laydown areas is provided in **Figure 3.12: EfW CHP Facility Temporary Construction Compound Layout**. TCC1 and laydown areas would accommodate the construction of the EfW CHP Facility, the CHP Connection, Grid Connection Option 2 (Walsoken) and the Access improvements. The compound would be in place for the 3 year construction period.

3.10.3 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 7,000m^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 3.13: Temporary workshop/store building**). ISO containers would also be located adjacent to the building in the storage area (see **Figure 3.14i-ii: Temporary ISO storage container**).

3.10.4 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 1.6 hectares. The car park would have a tarmac surface and would measure approximately 5,500m^2, with the ability to accommodate up to 218 vehicles. Additional motorcycle and cycle parking would be provided on the western boundary of the compound.

3.10.5 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 storey 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 storey 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 3.15i-vii: Temporary mess and welfare cabins and site offices**. ISO containers would be located adjacent to these buildings.

3.10.6 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 location of the footbridges are illustrated on **Figure 3.16i-ii: Temporary pedestrian bridge illustrative design.**

3.10.7 Two temporary soil bunds would be located on the site; on the eastern boundary of the construction compound, and the western boundary of the EfW CHP Facility site on the southern portion, adjacent to the disused March to Wisbech Railway Line. These bunds would store soil stripped from site. The volume of the soil that would be stored in these bunds has yet to be determined and will be confirmed in the ES.

3.10.8 Following the end of the construction warranty phase, TCC1 would be vacated and the land restored to its original condition.

Construction traffic and access

3.10.9 All staff and visitor vehicles would access TCC1 via Algores Way. A tarmac surfaced access track would be installed for vehicles entering the car park in TCC1.

3.10.10 It is currently 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 3.8 Typical wheelwash facility

3.10.11 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.

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

3.10.13 A draft Construction Traffic Management Plan (CTMP) has been provided in **Appendix 6A** to illustrate how impacts associated with the movement and access for construction vehicles would be mitigated.

3.10.14 Any temporary road closures and public rights of way diversions would be defined in full within the ES. This will include the Public Rights of Way (PRoW) diversion arrangements on New Bridge Road to facilitate the Access Improvements. Outline details of the management measures are provided in the draft CTMP and PRoW Management Plans (**Appendices 6A and 6B** respectively)

Construction phasing and activities (EfW CHP Facility)

3.10.15 The construction phase for the EfW CHP Facility Site (including the Access Improvements) is set out below. The overlap of these phases, and the relationship with the Grid Connection construction programme is provided in **Graphic 3.7** above.

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

3.10.16 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.

3.10.17 Phase 1 would include the set up of TCC1 including site offices, stores and car parking, utility supply set up, boundary creation and access arrangements from Algores Way.

3.10.18 TCC1 to the east of the EfW CHP Facility Site would be prepared by stripping off and storing the topsoil, installing geotextile matting, 300mm of compacted hardcore and 100mm of compacted type 1.

3.10.19 The existing waste transfer building and any other structures remaining on site would be demolished and removed during this phase.

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

3.10.20 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.

3.10.21 Initally 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.

3.10.22 Following site clearance a period of drainage works would be required to allow for the new road surface drainage and works to existing drainage ditches on both sides of the road that will need to be modified. This work may require the culverting of some stretches of these ditches.

3.10.23 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)

3.10.24 Following completion of mobilisation and site set up, the EfW CHP Facility Site earthworks and piling would be carried out by the appointed civils 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. The culvert over the ditch running across the centre of the EfW CHP Facility Site would also be constructed at this stage.

3.10.25 The deepest areas of the main building are the waste bunkers. The floor for the the waste bunkers and base of the foundation slab would be f approximately 10mm and 12m below FFL respectively. Dewatering (if required) would be undertaken at this stage. 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.

3.10.26 It is proposed to found all areas of the main buildings on piled foundations. Other ancillary buildings on the site may also have piled foundations. The method of piling has yet to be determined, but is likely to be driven precast or continuous flight auger (CFA). The piling method will be confirmed and assessed in the final ES submitted with the DCO application.

3.10.27 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.

3.10.28 Grading of the site access routes would be required to provide a constant grade across the site.

3.10.29 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.

3.10.30 Final landscaping works would be carried out after the civils works in accordance with an approved Landscaping Strategy that would be in accordance with the outline Landscaping Strategy provided as part of the DCO application.

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

3.10.31 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)

3.10.32 Following the completion of civils works and plant installation there would be a period of start-up and testing known as 'commissioning'.

Construction phasing and activities (CHP Connection)

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

3.10.33 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.

3.10.34 The CHP Connection construction would utilise the TCC1 arrangements described earlier in this section.

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

3.10.35 The foundation type for the pipe frame structures would be determined following geo-technical investigations. At this stage it is not expected that the foundation installation would require piling.

3.10.36 Following the installation of the foundations, the steel framework for the pipeline would be constructed. At the Weasenham Lane, works to construct the pipe bridge would take place over a single night period when a temporary road closure would be in place. The pipe bridge would be pre-fabricated and lifted into position at night. A temporary crane pad measuring 15m by 15m would be required adjacent to the pipe bridge location.

3.10.37 Following the construction of the steel pipe framework, the various steam pipes and cables would be attached to the structure as illustrated on **Figure 3.9: Preliminary CHP Connection General Arrangement**.

3.10.38 At various points along the CHP Connection, connection points to end users would be accommodated. The locations of these connection points have yet to be determined and will be influenced by the commercial discussions held between the Applicant, MVV and potential end users.

Phase 3: Commissioning and Testing (4 months)

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

Construction plant

3.10.40 Mobile and fixed plant would be used during the construction of the EfW CHP Facility, Access Improvements and CHP Connection. **Table 3.2**. 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 3.2: 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**	Articulated dump trucks
	Articulated dump trucks (tipping fill)
	Backhoe mounted hydraulic breakers
	Diesel generators
	Dozers
	Dust suppression unit trailers
	Lump hammers
	Mobile telescopic cranes
	Petrol driven chain saws
	Pulverizers mounted on excavator
	Rollers (rolling fill)
	Tipper lorries
	Tracked excavators

Phase and primary works	Plant and equipment
	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** • **HDD for Anglian 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
	Dozers
	Horizontal directional drill rigs
	Large lorry concrete mixers
	Power Floats
	Road planers
	Tracked excavators
	Tracked mobile cranes
	Vibratory piling rigs
	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
	Hand-held welders
	Lifting platforms
	Lorries
	Telescopic handlers
	Tracked Mobile Cranes
	Wheeled mobile cranes

Phase and primary works	Plant and equipment
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
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)

Phase and primary works	Plant and equipment
	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

3.10.41 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 and around six mobile cranes and six crawler cranes. A temporary crane capable of extending approximately 5m above their height above ground level would be required to erect the chimneys. The chimneys height and consequently that of the temporary crane will be confirmed at the DCO submission.

3.10.42 A mobile crane would be required to lift and position the CHP Connection bridge over Weasenham Lane.

Construction utilities

3.10.43 The existing site operates as a WTS and therefore water, foul drainage and electricity are already provided for at the site. The suitability of these connections to accommodate the construction of the EfW CHP Facility will be determined and confirmed within the ES.

Construction materials and quantities

3.10.44 Details of the types of construction materials and anticipated quantities will be confirmed in the ES.

Construction waste management

3.10.45 The CEMP (see **Section 3.12**) will set out the measures that would be in place to manage waste during the construction of the EfW CHP Facility.

3.10.46 This would 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.

3.10.47 Sustainable waste management methods to be applied when dealing with the construction waste arising will be set out in the CEMP.

3.10.48 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. 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 were practicable re-used on site or processed offsite at a suitable licenced facility to create secondary aggregate.

3.10.49 The quantity of waste anticipated to be generated as a result of demolition, excavation and construction, the amount proposed to be re-used on site and the amount to be recycled will be defined in the ES.

Construction site security and lighting

3.10.50 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.

3.10.51 This includes:

- Site security fencing around the entire site perimeter;
- 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.

3.10.52 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.

3.10.53 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.

3.10.54 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.

3.10.55 All systems would be regularly inspected and maintained:

- 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

3.10.56 The engineering, procurement and construction (EPC) contractor for the Project has yet to be determined. It is expected that a variety of international, national and local subcontractors would be required to construct the EfW CHP Facility.

3.10.57 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 onsite at any one time.

3.11 Construction (Grid Connection)

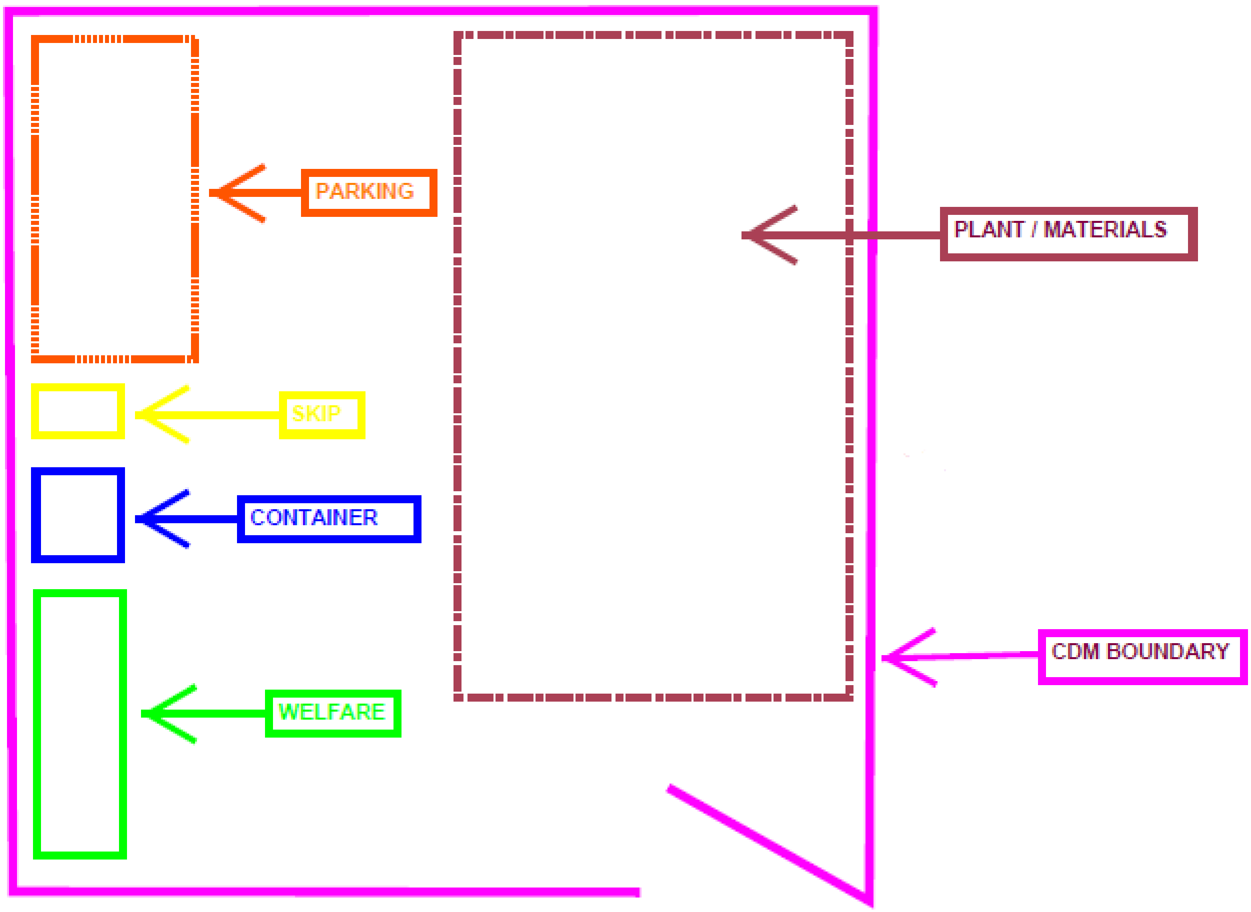
Temporary construction compounds and layout areas

Option 1: Connection to Walpole Substation

3.11.1 For Option 1 (Walpole) two TCCs would be required along the length of the Grid Connection route to facilitate the construction phase. The location of the construction compounds is described in **Section 3.3**. The TCCs would be in place for the entirety of the 8 month construction period of the Grid Connection.

3.11.2 The main Grid Connection TCC will be either TCC2 or TCC3 and would measure up to 80m by 80m. A “Heras” type perimeter fence would be installed along the boundary of the TCC with lockable gates. The TCC would contain welfare units, containers, skips, a parking area for construction worker 10 vehicles and a plant and material storage areas, including for poles. A typical layout of a Grid Connection TCC is provided in **Graphic 3.9** below.

Graphic 3.9 Typical Grid Connection Temporary Construction Compound



3.11.3 Both satellite compounds on the EfW CHP Facility Site construction site and at Walpole Substation (TCC4) would measure approximately 20m by 20m. They would be used for the storage of plant and materials, some of which will be in ISO containers.

Option 2: Connection to Walsoken Substation

3.11.4 The same satellite compound on the EfW CHP Facility Site as described above would also be used **for Option 2.** No other TCCs would be required.

Construction traffic and access

3.11.5 The location of each construction access point and route for both Grid Connection options is provided on **Figure 3.4i-iii.** At this stage it is not anticipated that any temporary access tracks would be required because the Proposed Development would be constructed in the summer months.

3.11.6 Any temporary road closures and public rights of way diversions to facilitate the Grid Connection will be defined in full within the ES. Outline details of the management measures are provided in the draft CTMP and PRoW Management Plans (**Appendix 6A and 6B respectively**).

Construction phasing and activities

3.11.7 The construction phase for Grid Connection would comprise of four key overlapping phases, as described below. The differences for each Grid Connection Option are described where relevant.

3.11.8 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)

3.11.9 The TCCs would be established during Phase 1. This would involve stripping off and storing the topsoil, installing geotextile matting, 300mm of compacted hardcore and 100mm of compacted type 1 aggregate.

3.11.10 The construction of the UGC and OHL would not require the formation of new permanent access tracks. Farm or field entrances would be used wherever possible, and the majority would not require modification. It is possible that new temporary access tracks may be required. The construction team would access the working areas with construction plant, machinery and vehicles used to deliver, assemble and erect individual wood poles. Any required tree and vegetation clearance would also take place.

3.11.11 **Graphic 3.10** illustrates a typical access track.

Graphic 3.10 Typical use of existing access track

Phase 2: Construction of the UGC (6 months)

3.11.12 Phases 2 and 3 would be carried out at the same time.

3.11.13 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.

3.11.14 The majority of the underground cable would be installed via open cut trenching. When laying the 132kV UGC in an open cut trench the working area would be fenced off. The construction working area would be approximately 10m in width (restricted in some areas), although this is subject to confirmation from UKPN. Within this working width a trench, typically 2m in width, would be excavated with one 5m haul road alongside the trench. The existing top and sub-soil would be removed and temporarily stored before being used to backfill the trenches.

3.11.15 After the cable trench has been backfilled the growth of vegetation over the trench can be managed to avoid damage occurring to the cable from deep rooted plants. The requirement to remove any hedgerows will be confirmed in the ES. If any are removed for open cut cable laying they would be temporarily moved, stored and replaced back over the reinstated trench, known as translocation.

3.11.16 The trenches would typically be dug to a depth between 1.2m and a maximum depth of 1.6m and the width would vary depending on the kind of installation but typically would be typically 450 – 600mm in width at the top. The final depths and widths will be confirmed in the ES. For the Proposed Development, the UGC would be installed in an open cut trench, or in ducts if HDD is required.

3.11.17 The trenches would be dug for the length of a section, approximately 500m. The trench is laid with a suitable bedding material. The cables are then lowered into the trenches using mechanical winches, fill is laid and compacted around them. A marker tile is placed on top of this and the trenches are back filled 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 1000mm in agricultural land.

3.11.18 The buried sections of cable are connected at joint bays, measuring 10m by 2.5m and up to 2m deep. The bays will be installed in approximately 500m lengths. The joint bays would be buried with no manhole covers or link boxes required. Joint bays are required on all underground sections.

3.11.19 All excavations associated with the Grid Connection would be fenced overnight for health and safety reasons and to prevent animals from becoming trapped.

3.11.20 The PEIR has assumed that there will be the following road crossings that would require the use of Horizontal Directional Drilling (HDD):

- Crossing of Elm Hall High Road (both Grid Connection Options);
- Crossing of the A47 nr Meadowgate Lane (both Grid Connection Options); and
- Crossing of the A47 nr Broadend Road (Option 2 Walsoken only).

3.11.21 The locations of the HDD sections, including the locations of the launch and receive pits are illustrated on **Figure 3.4i Underground Cable and HDD Route (Common Connection Corridor)**. Discussions are underway with CCC to understand whether there are opportunities to include space for ducting as part of their proposals to undertake improvements to the Elm High Road/A47 and Broadend Road/A47 junctions.

3.11.22 It is anticipated that HDD would also be used in two locations where the route crosses drainage ditches, but this will be confirmed in the ES following additional consultation with the relevant IDB.

3.11.23 A typical installation by HDD would involve the following; drilling a pilot hole from an entry pit, reaming (to make the hole bigger), pulling a ducting pipe through the reamed hole, and then pulling the cable through the duct. The depth of the cables under the carriageway will be confirmed in the ES following discussion and agreement with the relevant stakeholders. The cable depths for HDD sites are determined depending on the ground conditions, available area, location of the drive site and bending radius of the ducts.

3.11.24 A HDD launch site would be set up on one side of each crossing and would contain the plant associated with directional drilling. The launch sites would be approximately 30m by 20m. The launch sites would comprise the drill rig, two 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.

3.11.25 HDD exit locations would be set up on the other side of the crossings and contain the plant associated with the reception pits. The exit location sites would measure approximately 20m by 10m. They would typically comprise the reception pit, one power unit mounted on skids, mud pits, an excavator and ancillary equipment.

3.11.26 This phase would also include any required works to connect the UGC into Walpole substation (Option 1) or Walsoken Substation (Option 2) once agreed with UKPN. Such works will be confirmed as part of the ongoing design process and will be confirmed in the ES.

Phase 3: Construction of the OHL (6 months)

3.11.27 The working area around each pole location is typically a 20m radius. Installation of the wooden poles would require excavation of a pole hole, generally from 2m to 3m depending upon ground conditions. Excavation would be carried out by a 360^{o} tracked excavator. The steel cross-arms, which would support the insulators and overhead wires, are attached while the pole is laid on the ground. The pole is then lifted into position.

3.11.28 For wooden pole construction, there is typically no requirement for concrete foundations and excavated earth is used as backfill material. An initial desk top geological study has been undertaken and confirmed that shallow natural soils in the upper 15m level are likely to be similar in strength to Soil Category 1 as specified in ENA TS 43-50, which is poorest soil strength at 100kN/m2. This is common along the entire route of the OHL. In order to achieve suitable span lengths for the OHL imported material (such as crushed rock) or a soil additive may be needed to achieve the required soil strength. This may have to be combined with increased pole planting depths (up to 3.0m) and additional foundation baulks or brace blocks. The depth and design of the foundations will be confirmed in the final ES. Surplus excavated soil would typically be spread out in the vicinity of the pole locations.

3.11.29 Once all the poles are in place, the cables can be strung between the poles. Pulley wheels are attached to the steel structure at the top of the poles and lighter temporary wire called a pulling bond is first strung between the poles. The pulling bonds are then attached to the main conductors which are pulled into place using winches. Once the conductors are in place the pulley wheels are removed and the conductors attached to the insulators.

3.11.30 A triple drum winch or tractor winch would be used to string the conductors. Temporary stays with sufficient holding capacity would be fitted to control cross arm alignment at section and terminal positions.

3.11.31 Running out blocks would be established to ensure the transfer of conductors to their respective insulators. Once the conductors have passed through the final running blocks toward the winch, the conductor tension can be confirmed via the winch dynamometer, the winch can be locked via the ratchet and the conductor drum brakes secured.

3.11.32 Where conductors would pass under or over other conductors, the appropriate clearance distances would be maintained in accordance with the relevant ENA standards (Technical Specification 43-08). The location of any conductor crossings will be confirmed in the ES.

3.11.33 Where the OHL crosses roads there would be either traffic management or temporary scaffolding and netting. There are no rail crossings along the Grid Connection.

Graphic 3.11 Typical temporary scaffolding

3.11.34 Hedgerows are not typically removed during construction of an OHL as it is able to span over them. Hedgerows may be pruned to ensure sufficient clearance of 5m from conductors where required.

3.11.35 Removal, coppicing or pruning of some trees may be required to ensure no trees that pose a risk to the OHL are within toppling or contact distance of the overhead line. Where necessary, within a 5m wide strip underneath the OHL, trees would be cleared down to the ground level and exceptionally root clearance may also be required. Other trees that could contact the OHL or pose a risk to the OHL should a tree (or tree limb) fall onto it, would be assessed and suitable action taken (which may include pruning, crowning or felling) to reduce the risk to an acceptable level. The requirement for any tree removal will be confirmed in the ES.

3.11.36 Inspections along the route of installation would be made to ensure that the conductors have not been damaged during stringing. Poles would be plumbed, and the construction specifications confirmed. Conductor sag checks would be made prior to final termination of the conductors with reference to the construction specifications. Stays can be tensioned and cross arms will be checked for alignment and any twisting corrected by adjusting stay tensions and conductor tensioning.

3.11.37 Following satisfactory inspections, any recommended conductor pre-stressing tensioning will be accounted for and a calibrated dynamometer and thermometer will be used to confirm construction sag specification standards.

3.11.38 The conductors can finally be terminated and secured to insulator fittings and attached to cross arms. Stays can be terminated onto stay anchors and temporary stays removed with caution.

3.11.39 Reinstatement of the land would take place on a phased basis as the construction is undertaken. Reinstatement on agricultural land would be carried out in consultation with the landowners.

Phase 4: Commissioning and testing (1 month)

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

3.11.41 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.

3.11.42 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.

3.11.43 All surplus materials, redundant conductor, poles and fittings will be removed and disposed of properly.

Construction plant

3.11.44 Typical construction plant and vehicles would include:

- Wheeled or tracked excavator to dig the holes in which the poles would sit;
- Winch to pull through ducts and cables
- Drilling rig (for HDD);
- Support vehicles to deliver the poles to site: either a short wheel base lorry or tractor and trailer; and
- Vans and 4x4 vehicles used by construction teams travelling to the site.

Construction utilities

3.11.45 Details of the set up and use of utilities to facilitate the construction of the Grid Connection, including water, waste water and electricity will be provided in the ES.

Construction materials and quantities

3.11.46 The following materials are anticipated to be used to construct the Grid Connection:

- Wooden poles, steel cross-arms, aluminium conductor cables, polymeric insulator sets, wire cable stays and associated hardware for the OHL;
- Insulating and protective materials (including plastics) for the underground cable;
- Equipment lubricants and fuels;

- Packaging materials, pallets and cable drums;
- Sand/limestone dust for bedding cables and packing cable trenches; and
- bentonite drilling mud (a natural clay product) for HDD.

3.11.47 Details on the source and quantities of the construction materials, and how these would be transported to the Site will be provided in the ES.

Construction waste management

3.11.48 The CEMP (see **Section 3.12**) will set out the measures that would be in place to manage waste during the construction of the Grid Connection.

3.11.49 This would identify the type of material to be excavated, opportunities for reuse and recovery and to demonstrate how off-site disposal would be minimised and managed.

3.11.50 Sustainable waste management methods to be applied when dealing with the construction waste arising would be set out in the CEMP and/or its associated management plans. The quantity of waste anticipated to be generated as a result of the Grid Connection construction is anticipated to be very low and, in most cases, will consist of top soil and subsoil and will be dressed back on site. An estimate of the amount proposed to be re-used on site and the amount of any which may be need to be recycled will be defined in the ES.

Construction site security and lighting

3.11.51 The necessary infrastructure and personnel to provide a secure and safe construction site would be provided and equipment to control unauthorised access to the Grid Connection TCCs and the working areas would be installed.

3.11.52 This may include:

- Site security fencing around the temporary Grid Connection construction compounds;
- Remote security cameras;
- Access control at all entrances to and exits from the site;
- Adequate temporary mobile lighting; and
- Fire and emergencies protocol.

3.11.53 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.

3.11.54 Daily visual inspections of the fence line would take place and any identified damage would be repaired promptly.

Construction workforce

3.11.55 At this stage it is assumed that one team would be used to construct the Grid Connection. This would comprise of a project manager, supervisor, charge hand linesman, up to 10 LE1 linesmen, a senior authorised person, lorry driver and a plant operator.

3.12 Construction and Operational Management Plans

3.12.1 The ES will be 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. These documents would be finalised prior to the commencement of site works with the agreement of the relevant host local authorities and other statutory bodies.

3.12.2 The final list of outline management plans submitted as part of the DCO application and secured in the DCO will be informed by comments received during the statutory consultation and other engagement, but at this stage it is anticipated that the following plans will be required:

- CEMP; which may also incorporate sub-management plans to address site waste, odour, noise and vibration, biodiversity etc;
- Construction Traffic Management Plan (CTMP)
- PRoW Management Plan;
- Drainage Strategy;
- Landscape Strategy; and
- Archaeological Written Scheme of Investigation.

3.12.3 The Preliminary CTMP and PRoW Management Plan accompanies **Chapter 6: Traffic and Transport Assessment** (**see Appendix 6A and 6B**).

Construction Environmental Management Plan

3.12.4 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.

3.12.5 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.

3.12.6 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.

3.12.7 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 (**Chapter 6** to **17**). A draft Outline CEMP is provided alongside the PEIR.

3.13 Decommissioning

3.13.1 For the purpose of the preliminary 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. For the purposes of the preliminary assessment it has been assumed that 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 planning authority prior to decommissioning. The decommissioning process is anticipated to last for one year.

3.13.2 Unless otherwise indicated in the environmental topic chapters in this PEIR, 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.