2 PROPOSED DEVELOPMENT

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2.1 Need for the Proposed Development

2.1.1 Tata Steel UK Limited (hereafter 'Tata Steel') is the largest steel producer in the UK and a significant employer in the communities it operates within. The business and the steelworks at Port Talbot is of strategic importance in South Wales, Wales and the UK. It is one of only two integrated steelworks in the UK.

2.1.2 Much of the infrastructure at the site is however dated and in need of renewal to support efficient production. Additionally, the steelworks is a heavy carbon user and greenhouse gas emitter. To remain competitive and ensure the long-term viability of UK produced steel as an integral element of the economy, the facility is in critical need of structural investment.

2.1.3 Steel is an essential core industry in the UK. Steel production makes a direct Gross Value Added (GVA) contribution to the UK economy of around £2bn per annum. The expenditure from this activity also has a significant indirect economic impact across a range of sectors through supply-chains.

2.1.4 The drive to reduce greenhouse gas (GHG) emissions is significant on a national (UK and Wales) basis. In April 2021, the UK Government accepted the target to reduce emissions by 78% by 2035 compared to 1990 levels. It has committed to reduce emissions from ore-based steelmaking to near zero by 2035. The Welsh Government has introduced legislation amending the 2050 emissions target to net zero, increasing the 2030 target to 63% and the 2040 target to 89%.

2.1.5 The need for the Proposed Development is therefore two-fold:

- To ensure Wales and the UK has a sustainable, efficient and modern steelmaking industry.
- To support Wales and the UK Governments in meeting legally binding national GHG emissions reduction commitments.

2.1.6 Similar issues apply to the European steel sector in general, with transition to electric arc furnace (EAF) based production emerging as the industry response to the twin challenges of decarbonisation and modernisation of assets.

2.1.7 Steel will be needed in significant volumes for renewable energy, low-CO_2 transportation such as electric vehicles, large-scale hydrogen and carbon capture, use and storage (CCUS) infrastructure. The UK will need steel to meet its net-zero targets.

2.1.8 The decarbonisation of steel is also an imperative for almost all of Tata Steel's customers. This market force is driving change, and it is critical that the UK maintains pace with that change if it is to remain competitive. The Tata Steel / UK Government joint investment in a new EAF will significantly decarbonise Tata Steel's operations and cement the UK's position as a world-leader in tackling climate change.

2.2 Objectives of the Proposed Development

2.2.1 The Applicant has the following objectives for the Proposed Development:

- To ensure the continuity of the steel industry in the UK by creating a financially and environmentally sustainable business; and

- To support the decarbonisation needs of the industry and UK Government commitments to reduce CO_2 emissions to near zero by 2035 and to net zero by 2050 respectively.

2.2.2 Various options were considered against these objectives by the Applicant, further details of which are Provided in **ES Chapter 3 Environmental Context and Alternatives**.

2.3 Proposed Development overview

2.3.1 The Proposed Development will require the demolition of existing buildings and structures, and the construction of a new EAF steel production facility. The Proposed Development also includes a scrap metal handling facility and associated scrap yards, slag processing facility, chemical and material storage structures, buildings, handling systems, electrical control rooms and power infrastructure, laboratories, offices and ancillary facilities, together with new and amended transport infrastructure, landscaping and associated development. The Proposed Development's location is shown in **Figure 1.1**. Layout plans of the Proposed Development are provided in **Figure 2.1a–d**.

2.3.2 Components of the Proposed Development are summarised as follows:

- Full planning element:
  - Alterations to existing basic oxygen steelmaking (BOS) and secondary refining building (collectively comprising 'the EAF');
  - Water cooling systems and water treatment plant (including emergency backup power up systems and diesel generator rooms);
  - Fume and dust extraction systems with stacks;
  - Lime handling facility;
  - Slag processing facility;
  - Storage areas/buildings with material handling system;
  - Ancillary plant equipment and pipework;
  - Electrical control rooms with cable carrier systems;
  - Preparation and storage areas;
  - Compressor rooms;
  - Offices and ancillary facilities;
  - Partial infill of the BOS lagoon;
  - New and amended rail track and associated infrastructure;
  - New access roads with gates and parking areas;
  - Landscaping and green infrastructure;
  - Firefighting pump house;
  - Oxygen and argon vessels; and
  - Upgraded laboratories.
- Outline planning elements:
  - Scrap metal reception, handling and processing facilities and associated scrap yards;
  - Underground and overground electrical infrastructure;
  - New access roads and parking areas; and
  - New and amended rail track and associated infrastructure.

2.3.3 The outline planning elements of the Proposed Development have been assessed on the basis of minimum/maximum parameters which are illustrated in the parameter plans in **Figure 2.2**. Built infrastructure heights vary across the outline planning element of the Proposed Development, up to a maximum of parameter of 20m above ground level.

2.4 Safety, health and environmental requirements

Statutory requirements affecting the existing Site

2.4.1 The UK's National Risk Register of Civil Emergencies (2020) provides an overview of the key risks that have the potential to cause significant disruption in the UK. These risks include consideration of environmental hazards such as flooding and severe weather, and major industrial accidents.

2.4.2 At a local level, Neath Port Talbot Council (NPTC) Local Risk Register highlights risks that could impact on the local area. Potential risks include industrial accidents, transport accidents and severe weather. NPTC is a partner in the South Wales Local Resilience Forum (SWLRF). The Forum is made up of organisations working together to ensure that preparations and plans are in place to respond to emergencies.

2.4.3 At a site level, the existing steelworks site is a control of major accident hazard (COMAH) upper tier site. This is due primarily to gas storage on site previously used for the blast furnaces. The COMAH Regulations 2015 implements Directives 96/82/EC and 2003/105/EC on the control of major accident hazards involving dangerous substances. The aim of the COMAH Regulations is the prevention of major accidents and limitation of their consequences for people and the environment. The competent authority for the purposes of the COMAH Regulations in Wales is the Health and Safety Executive and Natural Resources Wales.

2.4.4 Under the COMAH Regulations, the Applicant is required to:

- Take all measures necessary to prevent major accidents and limit their consequences for persons and the environment;
- Prepare an on-site emergency plan;
- Demonstrate to the competent authority that all measures necessary to comply with the COMAH Regulations are in place; and
- Notify any major accidents to the competent authority.

2.4.5 The Applicant is obliged to hold and maintain a 'Safety Report' for the current steelworks site under the COMAH Regulations. The Port Talbot Safety Report (2018) sets out evidence to confirm the safety and integrity of the activities within the Port Talbot steelworks site. One of the requirements of the Safety Report is to describe on-site and off-site resources which can be mobilised by the operator to show that the necessary measures have been taken to limit the consequences of a major accident to people and the environment.

2.4.6 The arrangements and guidance for emergency arrangements for environmental incidents/scenarios are outlined in an environmental contingency plan (ECP)/environmental emergency plan (EEP) which documents the steps to be taken in the event of an incident that has the potential to cause environmental harm. The ECP/EEP also describes general guidelines for evaluation of significance and identifying the appropriate level of action and communications that should be adopted in the event of an incident. In addition to this, a major emergency plan (MEP) and local emergency plans (LEP) are in place as part of emergency planning and require liaison and interface with local authority services.

2.4.7 The existing steel works is also covered by an environmental permit (EPR/BL7108IM) from Natural Resources Wales (NRW).

Statutory requirements affecting the Proposed Development

2.4.8 The Proposed Development may continue to be an upper tier COMAH site. Where this is the case, safety report requirements would still apply. Studies would also be undertaken to determine whether hazardous substances consent (HSC) may be required for the Proposed Development under the Planning (Hazardous Substances) Regulations 2015.

2.4.9 The Proposed Development would also require a new environmental permit from NRW. The environmental permitting process aims to protect the environment and to ensure best practice in the operation of regulated facilities. Emergency response plans and contingency measures will be a requirement of the environmental permit. A climate change adaptation risk assessment and adaptation plan would be required as part of the environmental permit.

2.4.10 Various risk management legislation would also apply to the Proposed Development including the Construction (Design and Management) Regulations 2015. As part of the detailed project design, risk assessments would be undertaken including hazard identification studies (HAZID) and hazard and operability studies (HAZOP) to ensure that potential hazards are recorded and actioned in order that they can be avoided, mitigated or highlighted for further risk reduction measures during detailed design.

2.4.11 The Applicant has a number of internal standards relating to safety risk management which apply to the Proposed Development. These include a standard on process safety risk management which commits to a high level of performance with regard to major accident hazard control, such that all reasonably practicable measures are taken to prevent major accidents involving dangerous substances and to limit their consequences to people and the environment. The Applicant’s Major Accident Prevention Policy recognises that the nature of the Applicant’s activities could give rise to major accident hazards for employees, contractors, visitors, members of the public, and the natural and built environment, and details obligations that will apply to the Proposed Development.

2.4.12 Further consideration of potential vulnerabilities to Major Accidents and Disasters of the Proposed Development is provided in **ES Chapter 4 Environmental Assessment Methodology**.

2.5 EAF development components

2.5.1 The detailed part of the development proposal is to install an EAF, ladle furnaces (LF) with common fume extraction system (FES), material handling system and associated auxiliaries like electrics, instrumentation & automation system, water, and utilities in the existing basic oxygen steelmaking (BOS) plant. This would maintain the present liquid steel production capacity. The existing Ruhrstahl Heraeus (RH) degasser and slab casters will be retained.

2.5.2 The facilities proposed are illustrated in **Figures 2.1** and **2.2**. The proposed steelmaking process from raw material to slab is illustrated in **Image 2.1** below (note that ‘HSM’ is an abbreviation of hot strip mill).

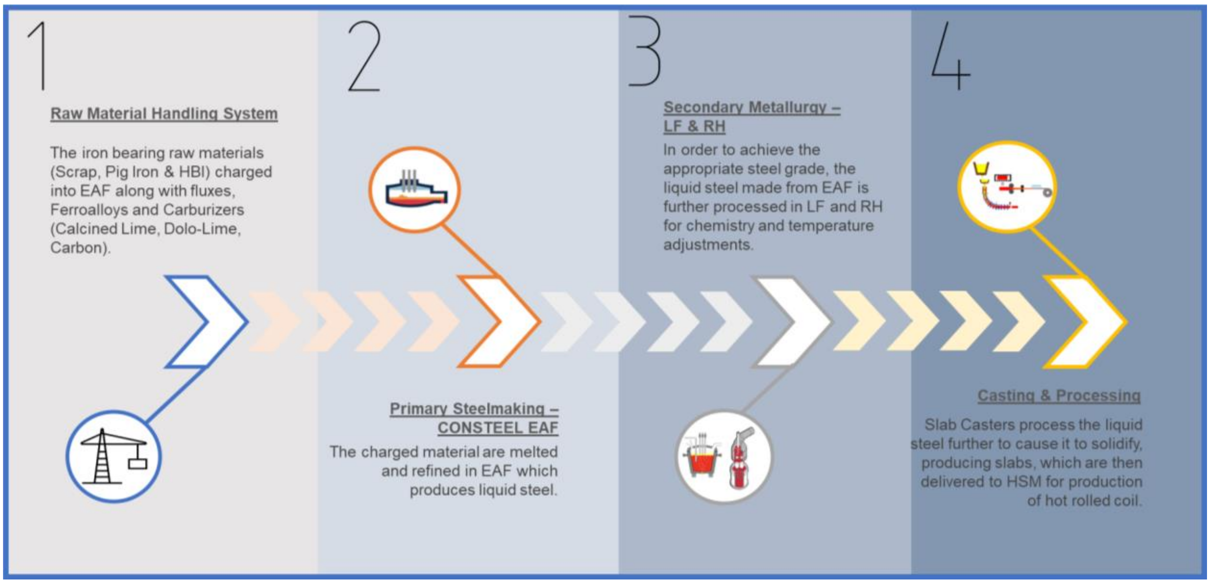

Image 2.1. The proposed steelmaking process from raw material to slab.

2.5.3 The proposed new steelmaking facilities would comprise the following:

- Process Equipment
  - 1 x EAF
  - 2 x LF
- Auxiliary Systems
  - Material handling system
  - Fume treatment plant
  - Water treatment plant
  - Power distribution system
  - Compressed air station

Material handling system

2.5.4 The in-plant raw material handling system has been designed for handling the raw materials like scrap metal, hot briquetted iron (HBI), coal (lumps & fines), lime (lumps & fines) & do-lime (mix of burnt dolomite and lime) and ferroalloys.

2.5.5 The different storage and handling systems envisaged are as follows:

- Scrap storage and handling,
- HBI storage and handling,
- Coal storage and handling,
- Lime & do-lime storage and handling,
- Ferro alloy handling,
- Material charging system.

2.5.6 A block flow diagram of the material handling system for the electric arc furnace is illustrated in **Image 2.2**.

Image 2.2. Block flow diagram of the material handling system for electric arc furnace.

2.5.7 A block flow diagram of the material handling system for the ladle furnaces is illustrated in **Image 2.3**.

Image 2.3. Block flow diagram of the material handling system for ladle furnaces.

Main shop/ plant configuration

2.5.8 A block flowsheet for the steel melt shop facilities is illustrated in **Image 2.4** below.

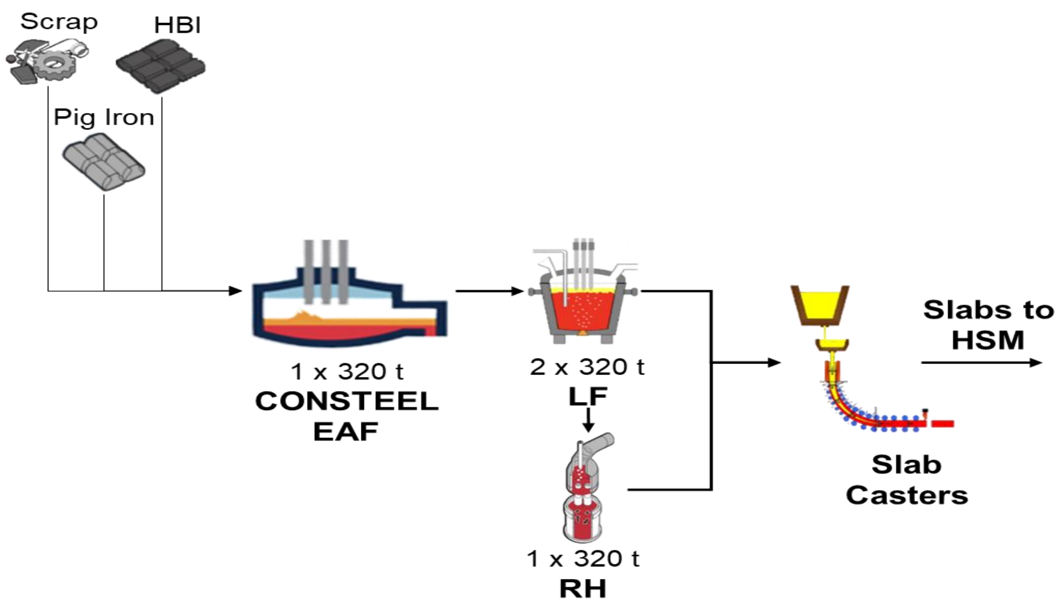

Image 2.4. A block flowsheet for the steel melt shop facilities.

Fume treatment plant

2.5.9 The proposed system will serve for suction and cleaning of the fumes coming directly from primary off gas and from the canopy hood installed in the roof structure of the melt shop and the material handling system.

2.5.10 The following suction areas are proposed:

- Suction of EAF + consteel primary off gas,
- Suction of secondary fumes caused by EAF + consteel during the charging and de-slagging phase,
- Suction of fumes caused by the EAF material handling system (MHS) including ferroalloys and HBI feeding system.

Power distribution system

2.5.11 In order to power the new facility upgrades are required to the existing electrical distribution network.

2.5.12 The existing Port Talbot power supply is currently received at 66 kV from the National Electricity Transmission System 275 kV/66 kV substation designated as 'Margam 275 kV'. This forms a 'Bulk Supply Point' feeding the Western Power Distribution 66 kV distribution network at Grange 66 kV substation.

2.5.13 However, for the Proposed Development, a power sourcing arrangement is proposed separately by National Grid from its existing Margam Substation, with no additional interconnection from the existing system.

2.5.14 Two 33 kV feeder cables will be provided from the National Grid Margam Substation, to meet the fluctuating power requirement of the EAF. Transfer of power from the grid would take place at the proposed main power centre, and power will be distributed at 33 kV and 11 kV. There would also be a number of new power distribution buildings described in further detail in the EAF process flow description provided in Section 2.6 below.

2.5.15 The power distribution upgrades required within Tata Steel's boundary are part of the current planning application and therefore are assessed through this ES. Development outside of Tata Steel's boundary, including upgrade of the Margam substation and laying up cables up to the Tata Steel boundary is subject to separate planning processes by National Grid. This development is considered in the cumulative assessment section of the ES (chapter 15).

Utility systems

2.5.16 Utility systems comprise various industrial gases like oxygen, argon, nitrogen, compressed air and fuel gases like natural gas. These industrial and fuel gases are generally used in the steelmaking process as well as for general purpose cutting/heating applications. Dry compressed air shall be used for various pneumatic operations and atomisation of cooling water at the hot quenching tower.

2.5.17 Salient features of the proposed industrial and fuel gas circuits are set out in **Table 2.1**. below.

Table 2.1 Proposed industrial and fuel gas circuits

Items	Description
Source of oxygen, nitrogen, argon, and natural gas	Existing network at Tata Steel, Port Talbot
Compressed air [6 barg. with pressure dew point (-) 40°C.]	A new central compressed air station

Water systems

2.5.18 Water is required in the steel melt shop mainly for cooling of electro-mechanical equipment and auxiliaries. In addition, it is used for reducing off-gas temperature in the hot quenching tower of the EAF, water cooled cables, lens cooling of CCTV, drinking and sanitation purposes of working personnel in the plant, office, etc. and for firefighting and other miscellaneous purposes.

2.5.19 Salient features of the proposed water circuits are set out in **Table 2.2** below.

Table 2.2 Proposed water circuits

Items	Description
Type of cooling circuit	Primary (closed type) and secondary (open type)
Water quality in primary circuit	Soft water
Water quality in secondary circuit	Industrial water
Raw and fire water source	Existing River Afan network
Drinking water	Existing drinking water network
Soft water source	Existing soft water network
Type of treatment of raw water	Pressure sand filtration
Source of wastewater	Cooling tower blow-down
Usage of wastewater	In the direct contact circuit of hot quenching tower and electrode spray (lost water)

Plant general layout & logistics

2.5.20 The proposed site layout is shown on **Figure 2.1a-d**.

2.6 EAF process description

2.6.1 This description is meant to be read in combination with **Figure 2.1a-d** showing the main elements of the Proposed Development.

Raw materials

2.6.2 The main raw materials for the EAF process are scrap metal, HBI, and pig iron, which would be transported on to site via the existing rail network. The HBI and pig iron will be stored on a new concrete temporary storage pad (equipment label 30 on **Figure 2.1a**).

2.6.3 HBI would be transported to the HBI bunker and pig iron to the shredded scrap yard, equipment labels 5 and 4 respectively on **Figure 2.1a**. Scrap metal would be transported in containers to the main scrap storage and processing area (area 25 on **Figure 2.1c)** where each container will be removed from the train and replaced with an empty container for return.

2.6.4 As the trains enter the area the load will pass over the weigh bridge and under a radioactivity scanning facility (equipment labels 28 & 29 respectively on **Figure 2.1c**). This is to ensure that no radioactive sources, such as pacemakers or smoke detectors, are accidentally melted within the EAF. The containers would be tipped into the correct bay containing graded scrap ready for use or for further processing. Empty containers would then be stacked ready for the next train.

2.6.5 The overflow scrap yard (area 26 on **Figure 2.1c)** would be used during periods where additional stocks of scrap metal are required or if additional processing or reject is required. Reject materials will be segregated and, wherever possible, recycled (e.g. plastics, non-ferrous metals, rubber etc. The separation and processing would be completed in the non-ferrous processing area. Once the materials have been segregated and made furnace-ready they can be transported to the EAF.

Production of steel

2.6.6 As part of the development, a new road network would be created. This would be a combination of existing roads to be widened and new roads to facilitate the movement of super heavy vehicles from the scrap handling areas to the EAF. The metal is moved to the shredded scrap yard for temporary storage before it is charged on to the Consteel Conveyor (equipment label 2 on **Figure 2.1a**). Scrap would be continuously fed onto this conveyor, which will run through a pre-heating process to prevent cooling of the furnace and evaporate any water contained within the scrap. This process would be operated from the control room, allowing for changes to speed of charging and other factors.

2.6.7 Once heated, the scrap would be charged into the EAF. Unlike many EAFs this is proposed to be on a continuous basis rather than a batch charging process. The EAF will be located within the existing basic oxygen steelmaking (BOS) building, which would be renovated to allow for electric arc steel making equipment.

2.6.8 Carbon electrodes within the furnace will create an electrical arc, which passes through the metal causing rapid heating and eventually melts the charge scrap. With the continuous process the scrap is charged into a furnace with molten metal already in the vessel, which reduces noise, emissions and electricity usage compared to a batch process. The EAF would be operated from a control room located in the roof of the BOS building that collects data and allows for optimisation of the process. Lime and dololime from the external bunker (equipment label 5 on **Figure 2.1a**) will be added to the melt in order to remove impurities and to help form the slag layer.

2.6.9 The molten metal will be tapped from the EAF vessel and transferred into one of two LFs, also located within the BOS plant building. This is where the chemistry of the steel is refined to obtain the desired grade of steel for the customer. Ferro-alloys from the bunker are added at this stage as appropriate to the application for which the steel is being produced.

2.6.10 Once the steel is fully refined in the LFs it can be transported to the existing continuous casting plant (concast). Molten metal is poured from a hopper known as a tundish high in the roof of the building into the cooled aperture which rapidly solidifies the surface of the metal and forms a thick continuous steel block, which is cut with plasma torches to the correct length. These are known as steel slab, and these are the feedstock for the cold and hot rolling mills on-site. Once sufficiently cooled, these slabs would be transferred to existing stockyards to the west of the rolling mills.

Waste production

2.6.11 There are two major waste streams from the steel making process, which are EAF slag and EAF dust (also known as red dust).

2.6.12 EAF slag is produced from the EAF and contains elements that are detrimental to steel quality. Quick lime and/or dololime is added to the furnace to help create a slag layer that floats on top of the molten metal. This slag layer removes impurities such as phosphorus, silicon and aluminium. Slag can be tapped separately from the molten metal and taken to the existing on-site slag processing area, where it is cooled. The slag can be further processed to create a very hard-wearing aggregate which is often used as road stone.

2.6.13 EAF dust is a mix of three extracted dusts generated as part of the process. Primary dust is generated directly from the EAF and will be captured by a hood and transferred into the ducting above the plant and into the fume extraction plant (FEP), labelled 3 on **Figure 2.1a**. Fugitive dusts, often called secondary dust, within the BOS building will be extracted via a canopy located in the roof of the BOS plant (equipment label 1 on **Figure 2.1a**). This extraction will also be transferred to the FEP and mixed with the primary dust. The auxiliary dusts are generated from the materials handling system, which are transferred to the FEP. This FEP contains bag filters that remove dust from the air with a very high efficiency. The dust can then be recycled externally in furnaces to create secondary products for use in other industries.

Electrical distribution

2.6.14 In order to power the new facility, upgrades will be required to the existing electrical distribution network. This will require a new substation to be installed by National Grid and units to stabilise power draw and further distribution via the main power centre (equipment label 21 on **Figure 2.1a**). There would also be a number of new power distribution buildings for the scrap facility, water treatment plants, fume extraction plant, HBI bunker, Consteel, EAF and LFs. Installing this new electrical distribution network is key to the efficient running of the EAF and associated activities.

Staff facilities

2.6.15 A new office building (equipment label 15 on **Figure 2.1a**) will be constructed on the eastern side of the BOS plant to house construction staff and, eventually, operators of the EAF facility. There would be a new car parking facility (equipment label 14 on **Figure 2.1a**) to allow workers to travel to and park at the Site, change into their work wear, and use the extended covered walkway, which would be retained into the operational phase of the Proposed Development, to enter directly into the main construction area.

2.7 Environmental design

Dust emissions

2.7.1 The best available techniques (BAT)[1] associated emission levels at the chimney stack are as provided in **Table 2.3** below.

Table 2.3 BAT associated emission levels

Sr. No.	Pollutants	mg/Nm3	BAT associated emission level basis
1	Dust	<5	Determined as a daily mean value
2	Mercury	<0.05	Determined as the average over the sampling period (discontinuous measurement, spot samples for at least four hours)
3	Dioxin (ngI-TEQ/Nm3)	<0.1	Based on a 6 – 8 hour random sample during steady-state conditions

2.7.2 Good operating practices like use of raw materials, fluxes and additives of specified size, use of consteel for scrap charging, minimum handling of HBI and fluxes before transfer to the charging system along with the proposed fume extraction system with dust drop-out-box, hot quenching tower and bag filter of appropriate specification ensures emissions are within the above stipulation.

2.7.3 The workplace dust level at 1 m from a dust source would be ≤ 2 mg/Nm^3. Workplace exposure limits would be <10 mg/m3 for 8 hours' time-weighted average (TWA) of PM_{10}.

Effluent emission

2.7.4 There would be no effluent discharge from the system provided for the Proposed Development.

[1] Best available techniques: environmental permits - GOV.UK (www.gov.uk)

Remediation Strategy

2.7.5 Preliminary information from the site investigation at the time of writing indicates soil and groundwater quality as might be expected for a former industrial site of this kind with contaminants present that can be addressed via standard remedial techniques.

2.7.6 Remediation measures could include, if required, removal of shallow hotspots of soil contamination and associated earthworks, localised groundwater remediation, installation of gas/vapour membranes beneath buildings and selection of appropriate concrete and infrastructure materials. Remedial works (if required) would be expected to achieve target criteria (in soils and or groundwater) set out in a Remediation Strategy (RS) which would demonstrate an improvement in soil and / or groundwater quality from baseline conditions. Remedial actions would also be expected to mitigate against potential effects during construction (e.g. removal of near surface contamination, preventing mobilisation of contaminants during the installation of foundation piles). A Remediation Validation Report would be prepared to demonstrate the works had been completed in accordance with the RS.

Landscape design

2.7.7 The Landscape and Ecology Management Plan (LEMP) and Biodiversity Management Plan (BMP) is provided in **Appendix 2.2** and the Landscape and Habitat Mitigation Proposals are illustrated in **Figure 2.4**.

2.7.8 The landscape design proposals are primarily ecology and hydrology led, focusing on measures to restore and enhance retained areas of brownfield and greenfield habitats within the coastal floodplain. Ecology and hydrology inputs have been integral in developing the landscape strategy to uplift habitat value and increase biodiversity through means of landscape and wetland restoration and habitat creation. This would result in an overall substantially improved quality of the green and blue infrastructure within the Site.

2.7.9 The southern grazing fields within the application area are the focus for much of the enhancement proposals. The fields are currently unmanaged and have become overgrown with low value, species poor scrub and rank grassland. The scrub has encroached into the drainage ditches making them inaccessible to wildlife and inhibiting waterflow causing silt to build up.

2.7.10 The open landscape character and unique ecology of the Margam Moors and Site of Special Scientific Interest (SSSI) located south of the Site, has informed the landscape strategy for the southern fields. This has led to the proposal for scrub clearance to open the ditch network with any new scrub replacement planting kept to a minimum and managed to retain this open character. The new cable route to the Margam substation is also proposed through this area and requires excavation and restoration once the cable is installed and fully operational.

2.7.11 The uplift to the site’s ecology would be through means of creating conditions that would accommodate self-colonising plant species. This would be achieved by leaving bare ground where areas have been excavated. These would be unseeded areas, allowing natural colonisation from within the existing soil seed bank and by migration from the neighbouring SSSI.

2.7.12 The principle of self-colonising habitats would be extended beyond the southern grazing fields, across the wider site with additional landscape features including spoil filled gabion baskets around the lagoon to the north. In addition, site won spoil heap mounds and an extensive site wide 'rain garden' style drainage system along roadside edges would be developed as part of the wider integrated landscape, ecology and drainage strategy.

2.7.13 In summary, whilst the mitigation proposals for this area are intended to develop a more managed and pleasing appearance to the most visible elements of the Site to the south of the Proposed Development, the primary focus is on improvements to green and blue infrastructure, rather than aesthetic appearance alone. Whilst this would somewhat improve the setting of the steel works from certain locations, particularly recreational users on Longlands Lane, these improvements are not intended to screen the Proposed Development, which would form part of an established view of large scale industrial works within the coastal plain. The landscape proposals are however, designed to support, enhance and expand the flora and fauna of the SSSI grazing marshes and enhance the wetland habitats allowing nature to thrive in this unique industrial, coastal setting.

Other embedded mitigation measures

2.7.14 Embedded (primary) mitigation measures are considered to be an inherent part of the Proposed Development, i.e. the project design principles adopted to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment. These embedded mitigation measures are considered to be part of the Proposed Development and should not be confused with any additional (secondary and tertiary) mitigation measures proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment that are set out in the assessment chapters. Assessment of the environmental impacts of the Proposed Development is therefore undertaken with these embedded mitigation measures included. Further information is provided in **ES Chapter 4 Environmental Assessment Methodology**.

2.8 Outline elements

2.8.1 The outline facilities proposed are illustrated **Figure 2.1b and c** and **Figure 2.2**.

Scrap metal reception, handling and processing facilities and associated scrap yards

2.8.2 An open scrap yard facility adjacent to the EAF is proposed to service the scrap demand of the EAF. The proposed layout of the scrap yard is shown **Figure 2.1b and c.** The scrap yard would receive 90% of material by rail, with the balance delivered to site by road.

2.8.3 The facility would have shredding, shearing and waste processing capability in order to process material, whilst some would be sourced from the market in a finished state.

2.8.4 Due to the lay-down area required for the EAF construction, the scrap yard facility must be developed in two phases. Phase One, ready for EAF-commissioning, provides the facilities for receipt of furnace-ready scrap and processing of internal arisings. Phase

Two, completed after EAF-commissioning, provides the scrap shredding and waste processing equipment required.

2.8.5 The facilities required in Phase One (**Figure 2.1b**) are as follows:

- Rail receipt facilities for weighing, inspecting and unloading trains;
- Scrap bays for segregation and storage of scrap;
- Road network to provide access around scrap yard facility;
- Relocation of existing Harsco shredder to new scrap yard for processing internal scrap arisings;
- Installation of a shear to process internal arisings;
- Office and amenity provision for scrap yard workers;
- Dedicated scrap overflow yard;
- Scrap lorry unloading area; and
- Associated mobile equipment for scrap handling.

2.8.6 Phase Two (**Figure 2.1c**) would be as for Phase One set out above, but with the addition of:

- Shredder and associated plant for production of high-quality shredded scrap; and
- Non-ferrous processing plant for processing waste generated by the shredder.

2.8.7 The following flow diagrams provide an overview of how the scrap process would operate relating specifically to scrap arrivals and unloading (**Image 2.5**), pre-shredder and shredder operation (**Image 2.6**) and pre-shredder and shredder operation (**Image 2.7**).

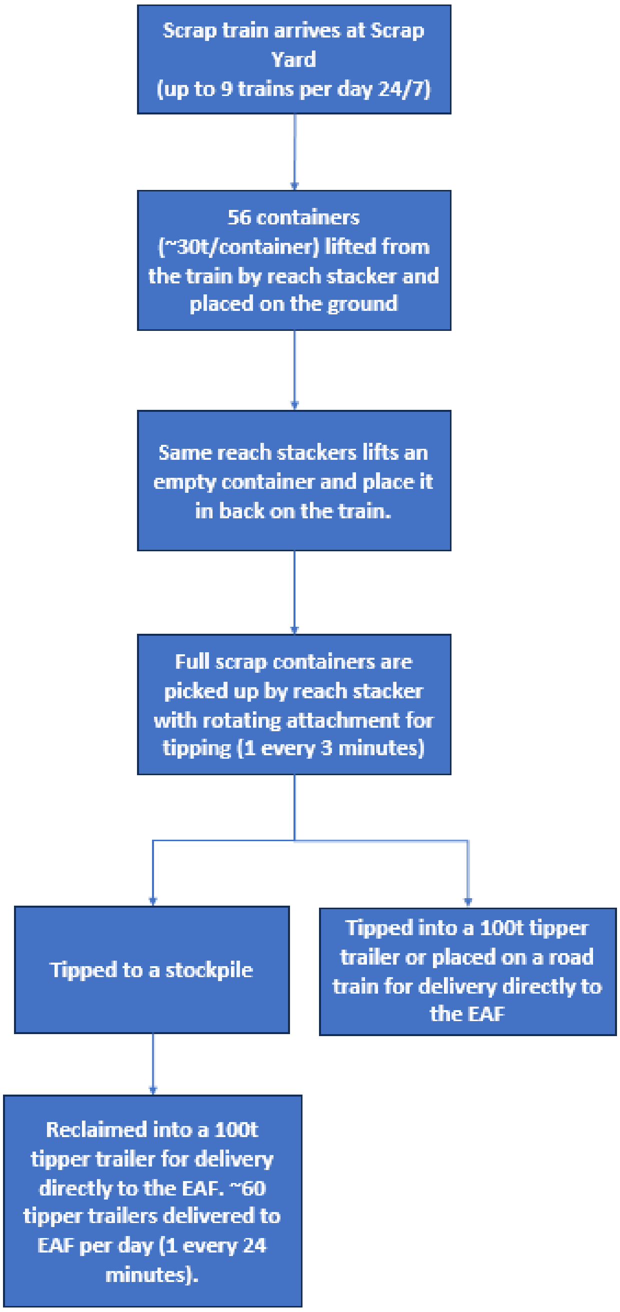

Image 2.5. Scrap arrivals and unloading.

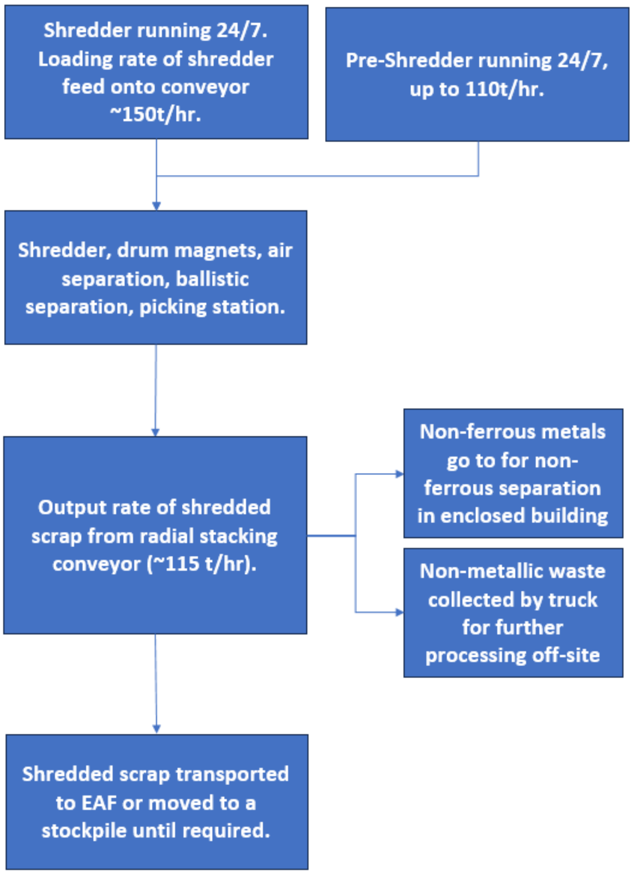

Image 2.6. Pre-shredder and shredder operation.

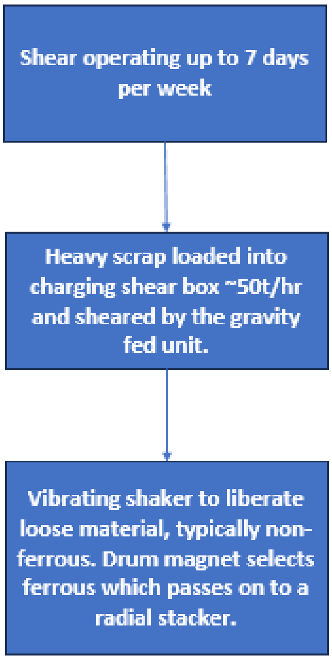

Image 2.7. Pre-shredder and shredder operation.

Mobile plant requirements

2.8.8 A variety of mobile plant would be used to meet the scrap handling needs in both phases. This would include:

- Approximately three reach stackers for scrap container movements from the train to the yard;
- Approximately four tipper trailers for scrap delivery to the EAF;
- Approximate six front end loaders for scrap piling and loading of tipper trailers;
- Approximately twelve material handling excavators for scrap piling and shredder feed;
- Approximately three magnet excavator for material movements and yard maintenance; and
- Approximately four fork lift trucks.

Acoustic Barrier

2.8.9 To provide sufficient protection to residents in the vicinity of the Site an acoustic barrier is proposed around the southern and eastern boundaries of the scrap handling area. The assumed location is indicated on drawings **Figure 2.1b and c**.

2.8.10 For the purposes of the acoustic assessment presented in **ES Chapter 7, Noise and Vibration** of this ES the barrier is assumed to be 15m high. This is consistent with the height indicated by modelling as being required to adequately mitigate a worst-case assessment of the noise generated by the scrap handling process.

2.8.11 It is anticipated that as further information emerges around the outline elements of the scheme, and the acoustic benefit provided by closure of the 'heavy end' processes is available for full quantification, there may be opportunity to reduce the height of the barrier whilst remaining compliant with required noise limits at off-site receptors. Any such change will be subject to consultation with NPTC and NRW and addressed through the appropriate stage of the planning and permitting processes.

Environmental Considerations

2.8.12 All equipment would be designed and supplied to meet current legislation.

2.8.13 Noise would be reduced using sound enclosures on the equipment. Further details are provided in **ES Chapter 7, Noise and Vibration.**

2.8.14 Air emissions would be minimised with a dedicated shredder dust extraction and treatment system in line with best available techniques (BAT)[1]. Fugitive emissions of dust would also be managed with targeted technologies.

2.8.15 Unprocessed scrap and shredder non-ferrous by-products would be stored on impervious concrete with a sealed drainage system and directed to appropriate water treatment facilities.

2.8.16 An approved fire prevention plan would be generated including preventative measures, fire detection sensors including ultraviolet and thermal imaging sensors and fire suppression systems are planned to be installed.

2.8.17 Lighting towers would be installed to provide appropriate lighting levels for the activities undertaken in the area. The proposed lighting scheme is illustrated in **Figure 2.5**.

Underground and overground electrical infrastructure

2.8.18 A new substation will be installed by National Grid. It would be housed within a compound (equipment label 23 on **Figure 2.1b and c**) and would accommodate a range of electrical infrastructure necessary to provide electricity supply to the Proposed Development.

2.8.19 Two 33 kV feeder cables would be laid within the Site, providing a connection from the Margam Substation to the new National Grid substation to be installed within the Sie boundary. It is expected that the new cables would predominantly be laid underground at a depth of approximately 1.2m below ground. Onwards connection from Tata Steel's boundary to the Margam substation, including the horizontal directional drilling under the railway to facilitate connection will be subject to National Grid's separate planning application.

2.8.20 Other ancillary above and below ground electrical infrastructure (including cable bridges) would be required to connect the new electrical infrastructure to the wider site.

New access roads and parking areas

2.8.21 New internal estate roads would be provided to serve the scrap facility and provide access to the proposed electrical infrastructure. The new access roads would connect to the existing network of internal estate roads serving the steelworks. Ancillary parking areas, laid down as hardstanding, would be provided to serve the scrap facility and to provide maintenance access to the new National Grid Substation.

New and amended rail track and associated infrastructure

2.8.22 In order to serve the new scrap handling facility the existing private rail network needs to be expanded, this involves modifying a dual rail line that reduces to a single track just before the scrap yard so that it is a double track all the way to the terminus. This involves installing approximately 750m of new rail track and associated infrastructure.

2.9 Construction of the Proposed Development

Construction management

Health, safety and environment

2.9.1 The Applicant has a strong commitment to provide a safe and healthy workplace, protecting the environment, and local communities that could be influenced by project development. Guidelines for project execution would be produced to plan, manage, monitor, and coordinate health and safety matters to ensure that so far as reasonably practicable the project is carried out without the risk to health and safety. In the pre-construction phase health and safety file would be prepared and it would be ensured that all construction activities will be complying with the Construction (Design and Management) Regulations 2015.

2.9.2 The Applicant would formally appoint the Principal Designer and Principal Contractor for the project or engineering construction period as it is foreseeable that more than one contractor (or sub-contractors), involved in the project.

2.9.3 An outline Construction Environmental Management Plan (CEMP) has been prepared (provided in **Appendix 2.1**), taking into account the construction related commitments that are set out in the ES. It is intended that this document would form a basis for the Principal Contractor's detailed CEMP during the construction stage, which would be secured by a planning condition.

Construction logistics

Construction materials management

2.9.4 During construction of the Proposed Development, construction materials, equipment, spares, consumables, etc. would be received at site progressively. The materials are to be stored at different locations based on the nature of the materials. The goal of site materials management is to ensure that construction materials are available at their point of use when needed. The materials management system attempts to ensure that the right quality and quantity of materials are appropriately selected, purchased, delivered and handled on site in a timely manner and at a reasonable cost.

2.9.5 Material management goals would be achieved through the project materials management system, which would be established by:

- Materials requirements planning
- Purchasing procedures
- Inventory planning and control
- Ascertaining and maintaining the incoming and outgoing of materials
- Quality control of materials

2.9.6 Closed and open storage facilities would be established for all relevant materials, particularly mechanical, electrical equipment, reinforcement bars, prefabricated structural steel etc. as set out in **Image 2.8**.

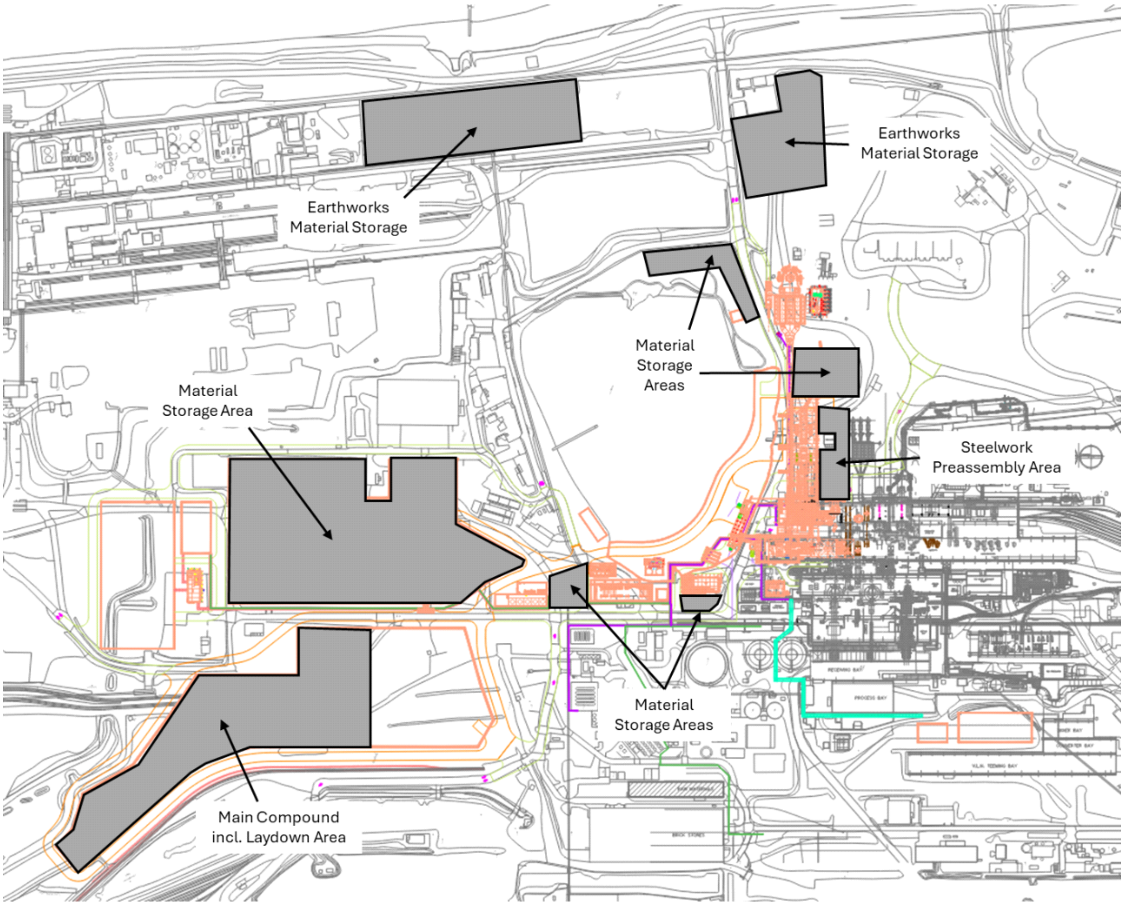

Image 2.8. Proposed location of construction material storage locations.

2.9.7 A Materials Management Plan (MMP) and Soil Management Plan (SMP) would be developed, which would include good practice methods for the management and storage of materials and soil resources. Further information is provided in **ES Chapter 10 Land, Soil and Groundwater**.

Earthworks

2.9.8 The main volume of earthworks for would arise from the removal of the Harsco Bank down to the level of the existing BOS Plant building ground floor slab. The Harsco Bank removal would in turn enable the consteel building and fume extraction plant to be constructed at the same level as the BOS plant building.

2.9.9 For the scrap yard, scrap storage yard, and National Grid substation earthworks, the final platform level would be designed to minimise the cut and fill volumes of the earthworks. For the proposed scrap yard and scrap storage yard sites, large areas are currently laid to stone which has been well trafficked and will be suitable to be reused as permanent works to reduce the volume of earthworks.

2.9.10 Part of the existing works lagoon would be infilled to provide space to construct roads, buildings and plant. The perimeter of the infill would be retained with a tied, twin-wall sheet pile wall to be piled from pontoons above the water. The affected areas of operational lagoon would be dredged and a stone platform will then be infilled with site-won materials that is infilled as a wet medium on top of the dredged bed. The sheet pile wall will act as a physical barrier to prevent contamination of the remaining operational lagoon during the infilling operation.

Demolition of existing facilities

2.9.11 There are some existing facilities in the identified area for the proposed plant. Those existing facilities would be demolished by Principal Contractor maintaining all safety standards. The facilities to be demolished are indicated on **Figure 2.3**.

2.9.12 The dismantling of the structures undertaken following Health and Safety Executive (HSE) guidelines in accordance with the requirements of the Construction (Design and Management) Regulations 2015. Before the start of demolition of the main structures, all electrical and other utilities would be isolated by the Principal Contractor. After isolation the following sequence would be followed:

- Asbestos removal in the building after necessary investigation;
- Removal of mechanical, electrical and control and instrumentation equipment;
- Soft stripping work which includes removal of non-structural elements like fittings and fixtures, false ceiling, fixtures etc;
- Superstructure demolition of the building;
- Substructure demolition of the floor slab, foundations, trenches etc;
- Underground piping and cables carried out simultaneously if they are away from the buildings under consideration for dismantling; and
- Disposal of demolished materials to designated areas.

Fabrication, assembly and erection of structural steel

2.9.13 Structural steelwork, comprised building envelopes, trestles and plant supports, would be pre-assembled off site where feasible and would be limited by the length and size that can then be transported to site. Once on site, the steelwork will be delivered and further pre-assembled as close to its final location as possible, where it will then be erected.

2.9.14 For the large truss sections of the EAF canopy roof, an assembly yard would be required to the north elevation of the consteel building. Sections would be pre-assembled and stored here ready for lifting into place. Telescopic crawler cranes or heavy-duty transporters will transport the pre-assembled sections to the main crawler crane.

2.9.15 A fully equipped testing laboratory providing radiography, ultrasonic, dye penetration, magnetic particle test facilities would be established adjacent to the assembly and fabrication yard to enforce strict quality control.

Construction power

2.9.16 Power supply to different construction facilities, construction machinery, area light, etc. would be required to carry out the construction work.

2.9.17 Construction power will be fed from existing 11 kV power distribution system at two points to ensure ring system easy and fast restoration in case of any failure. Further distribution (including maintenance of the distribution lines) beyond this point will be arranged by the contractor. Any other voltage, if required, shall be arranged by the Principal Contractor.

Construction water

2.9.18 Construction water will be supplied via site water supply from abstraction with distribution arranged by the Principal Contractor.

Drinking water.

2.9.19 Potable water shall be provided for all persons at work in the workplace. All supply points will be readily accessible and be noticeably marked by a suitable sign for reasons of health and safety.

Access roads

2.9.20 Existing site access roads would be utilised by cars, vans, HGVs and other specialist equipment to access the main works compound. Proposed construction site access roads are illustrated in **Image 2.9**.

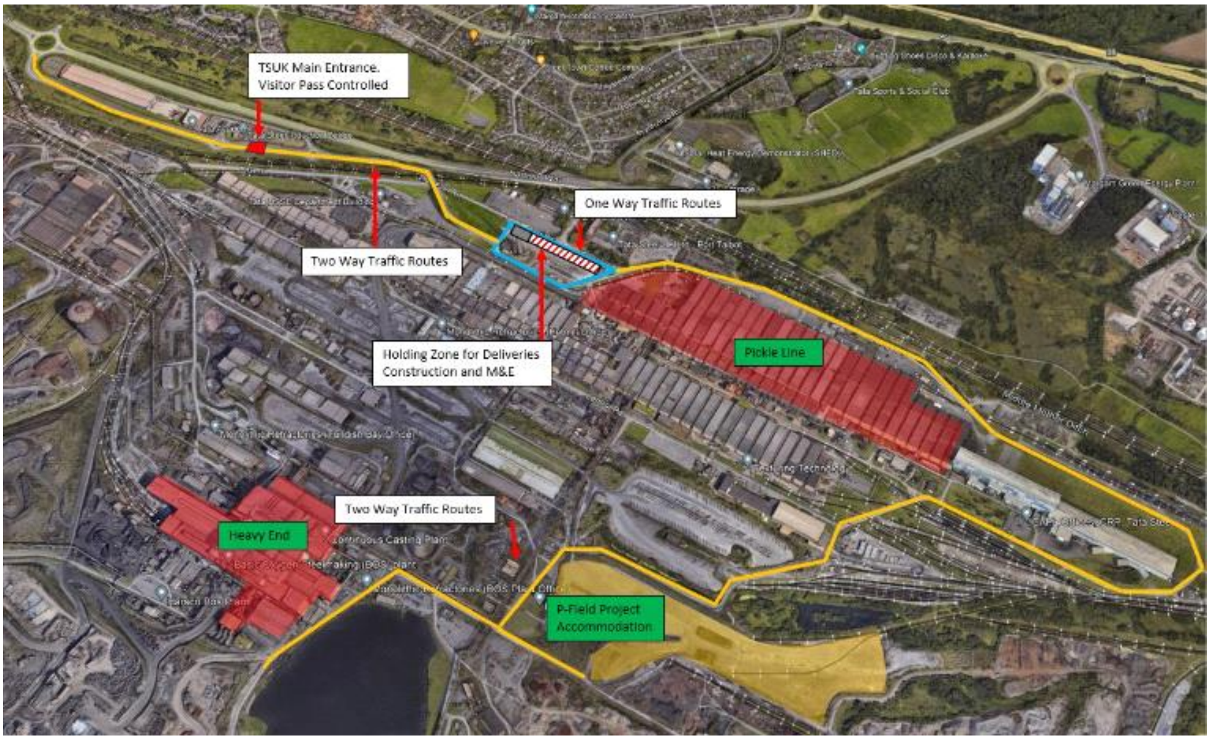

Image 2.9. Proposed construction site access roads.

2.9.21 All major facilities are well served by the existing site access roads. It is envisaged that construction access to within the BOS plant and all activities west of the BOS plant would navigate around the western perimeter of the operational lagoon. Balance of plant and materials handling work areas would be accessed by the main existing road to the south and east of the existing BOS plant. Once the operational lagoon is partially infilled, a new site access road can be built to provide dedicated access around the operational lagoon.

Temporary drainage

2.9.22 Permanent storm water and foul water drainage systems would be required for the new facilities. Wherever temporary drainage is required for working platforms and temporary access roads, it would be aligned to the permanent works drainage as much as possible. Otherwise, temporary drainage consisting of local filter drains and earthworks channels would be used to manage surface water runoff. Siltbusters and interceptors would be used to protect existing drainage outfalls from silt and other site debris.

Project Site offices

2.9.23 The main project offices, parking and laydown areas would be established in the compound location as illustrated in **Image 2.10**. This area is designated as the primary scrap yard as part of the permanent works, which is envisaged to be constructed early in the programme to establish the offices and parking on top of the permanent works.

2.9.24 The project site offices would provide accommodation for site managers, provide space for meetings and storage for site documentation. The site offices would be of prefabricated modular construction and have the ability to be redeployed at the end of the project as a permanent office building if required. The site offices would include, reception spaces, offices, meeting rooms, kitchens, toilets, showers, changing facilities, lockers, storage as per requirement.

Parking area

2.9.25 Car parking area would be provided for the project staff and visitors within the compound location. The car parking areas shall be:

- clearly signposted;
- firm and levelled;
- well drained;
- not slippery;
- well lit (where possible);
- as close as possible to the site office area; and
- Easily connected to the plant roads.

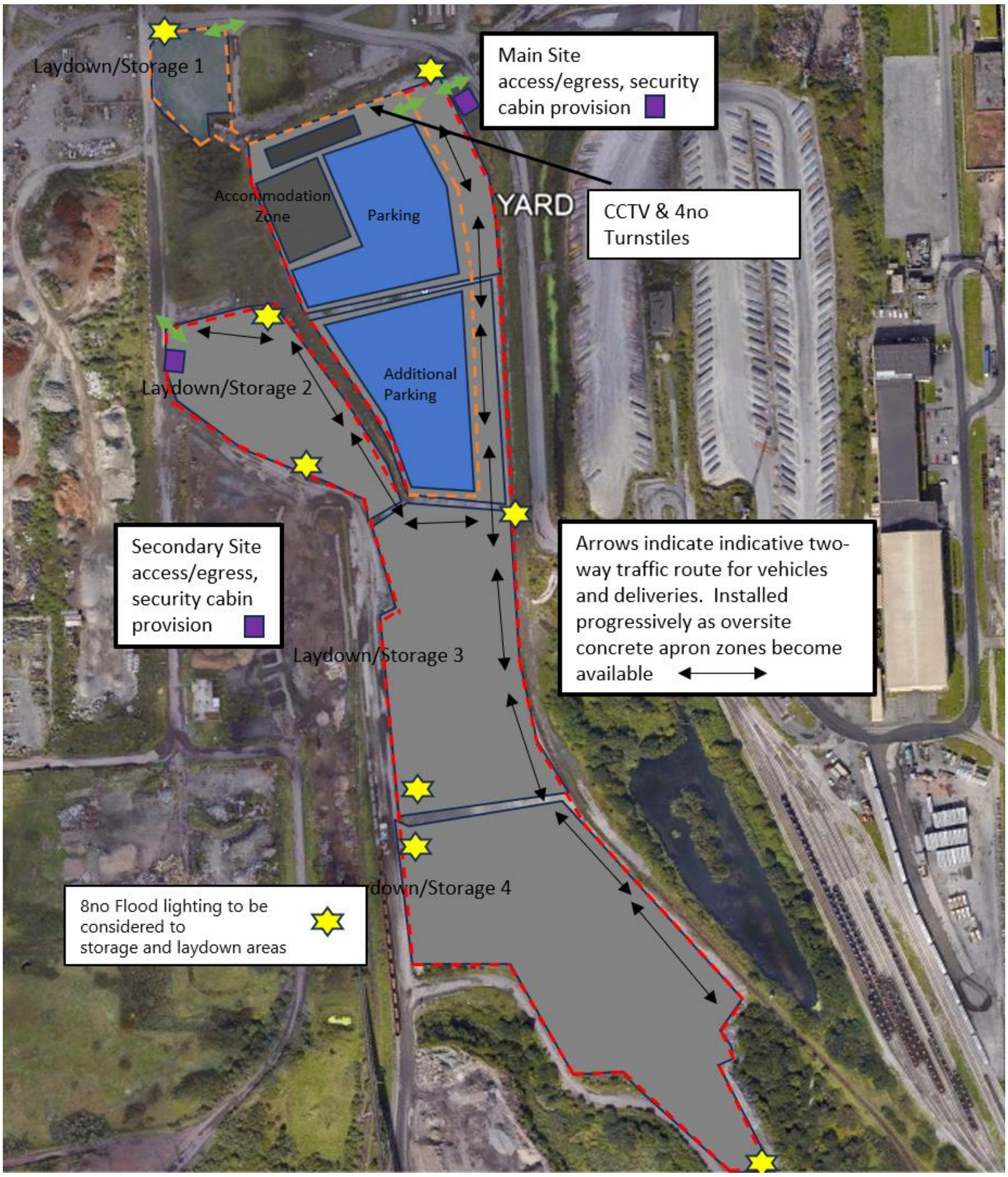

Image 2.10. Proposed construction compound arrangement.

Laydown areas

2.9.26 Equipment laydown areas as illustrated in **Figure 2.4** would be provided for equipment storage, repairs, maintenance and re-fuelling of earthmoving equipment.

Construction processes

Piling

2.9.27 Based on the soil investigation data, foundations of buildings and facilities are considered as pile foundation. The total number of piles are estimated as 3,000 no. of precast concrete and bored cast in-situ piles. The length of the piles is estimated up to 30 m.

2.9.28 The precast concrete piles would be manufactured off site and delivered to the laydown areas on site. The precast concrete piles would be manufactured in lengths suitable to transport and handle as well as to ensure minimum splicing during installation. For installing the piles, the plant and machineries generally used for driving precast concrete piles will include; a crane, vibro hammer, hydraulic hammer with power pack or drop hammer, leaders or guide frame.

Excavations

2.9.29 Excavation work is required for construction of substructures, underground tunnels, laying of pipelines and electrical cable etc. The excavation depth for foundations is generally shallow, up to 3 m depth. The hoppers designed as part of the materials handling facilities would require excavation depths of up to 9 m.

2.9.30 All excavation shall be done to the minimum dimensions as required for safety and working facility. In cases like non-availability of sufficient space to make open excavations with required slopes or excavation close to existing structures or collapsing nature of soil, options of provision of sheet piles, contiguous piles or diaphragm walls need to be considered. Heavy construction equipment should not be allowed within 3 m of deep excavation, unless otherwise authorised through temporary works design.

2.9.31 The proposed plant area being adjoining the sea, the ground water table is envisaged to be between 1 m to 2 m below the existing ground level. Proper dewatering system like deep bore wells would be installed at site to ensure that the groundwater level is maintained at least 2 to 3 m below the excavation level.

Concreting

2.9.32 There is an estimated 65,000 m^3 of reinforced concrete works as part of the project.

2.9.33 Reinforced concrete is formed from steel reinforcement bars that are fixed in-situ and surrounded with fresh concrete. The concrete is cured in-situ to the designed shape by means of timber or metal formwork panels. Once fully cured, the formwork is removed to leave a hardened, reinforced concrete foundation.

2.9.34 The resources that would be used for concrete are concrete pumps, boom placer, Transit mixer, off-site batching plant, vibrator for compacting concrete, and manpower.

Structural steel erection

2.9.35 After the civil foundation handover, the structural steel for superstructure of the building would be erected. The erection of steel structure would be undertaken as follows:

- Structural steel erection at any location shall be taken up after completion of civil foundation and level has been marked.
- The area in which erection activity is to be carried out shall be properly levelled, dressed and compacted.
- Different parts of the structure to be erected shall be transported from the fabrication yard to the erection site on trailer and assembled on a levelled structural bed, having adequate capacity to bear the load of the assembled materials.

- Once the structure material is assembled, levelled and welded, weld test shall be undertaken.
- For tall, assembled structures, cranes of adequate capacity shall be used with SWL of crane not exceeding 75% as per the load chart of crane.
- A second crane is to be used for tailing the structure until it is lifted in vertical position.
- Once the structure is in vertical position, the tailing crane is removed and the structure is placed on the civil foundation.
- Sequence of column erection is to be maintained such that each erected column can be tied with connecting beam to the adjacent column for stability.
- Erection sequence is to be maintained from inside to outside.
- After completion of column erection on two grids, roof truss of the same shall be erected with roof purlins.
- In same sequence, columns, tie beams and roof truss with purlin shall be erected.
- Simultaneously from start point crane girders shall also be erected and roof sheeting can be started.
- After completion of crane girder & rail alignment and roof sheeting, electric overhead traveling cranes (EOT) can be erected to perform the erection of equipment inside the building.
- For small buildings, assembly of two column and roof truss/rafter can be done on the ground on bed and the assembly can be erected.

Mechanical erection

2.9.36 The mechanical erection would follow the civil and structural work. The mechanical erection work would consist of erection of equipment, machinery, vessels, pump erection and alignment, underground and over ground pipelines etc. Materials, received and unloaded at the stores would be taken to the erection site. Some equipment may be erected directly on receipt. Most of the equipment would be erected by the EOT crane installed inside different buildings.

Electrical

2.9.37 The electrical work would be done to provide power to the plant. The major electrical work would consist of:

- Laying of cable underground and over ground over cable trays and termination;
- Erection of panels in Electrical buildings;
- Transformer installation;
- Illumination work in buildings and external illumination;
- Plant earthing;
- Installation of instrumentation/automation and communication equipment; and
- Installation of instrumentation/automation and communication equipment would include installation of on-board and independent instruments, erection of panels, laying of fibre optic cables, interconnecting cabling etc.

Construction equipment

2.9.38 Construction equipment would be mobilised for executing the construction work. Different construction equipment would be utilized for specific jobs. An indicative list of construction equipment and their uses are provided in **Table 2.4** below.

Table 2.4 Indicative construction equipment

Construction Equipment	Uses	Average per Month	Maximum Per Month
Excavators	Excavate soil	6	10
Dump trucks	Transporting of earth and raw materials for civil work	12	20
Backhoe	Minor excavation and general civils and roadworks operations	2	2
Bulldozer	Earth moving and preparing surface	1	2
Skid steer loader	Earthmoving in constrained locations	1	1
Roller	Compacting earthworks	4	6
Piling Rigs	Driving/ casting piles	7	9
Mixer truck	Transportation of fresh concrete	12	24
Mobile concrete pump	Placing of concrete	2	4
Formwork system	Forming concrete structures	N/a	N/a
Scaffolding	Higher level work	N/a	N/a
Poker vibrator	Concrete compaction	N/a	N/a
Dewatering pumps	Dewatering	N/a	N/a
Cranes	Shifting, loading, unloading and erection of materials, structures, equipment	10(plus an additional tower crane)	15(plus an additional tower crane)

Construction Equipment	Uses	Average per Month	Maximum Per Month
Hoist	Personnel access to EAF roof canopy	1	1

2.10 Programme of works

2.10.1 Indicative programme milestones from commencement of construction to operation are illustrated in **Table 2.5**.

Table 2.5 Indicative programme milestones

Milestone Description	Date
Commencement of construction	Mid 2025
Construction complete	Late 2027
Commissioning	Mid to late 2027
Operation (first melt)	Early 2028

2.11 Decommissioning phase

2.11.1 Schedule 4 (Information for inclusion in environmental statements) to The Town & Country Planning (Wales) EIA Regulations 2017 (as amended) requires an environmental statement to contain 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. Whilst there is no reference to the end of use of a development, good practice EIA is often applied to the construction, operation and decommissioning phases of a project.

2.11.2 In the case of the Proposed Development, the permission being sought is not time-bound. Whilst operational maintenance of assets to be constructed as part of the Proposed Development would be required, decommissioning of the assets is not envisaged until many years into the future. At that point in the future, any works would need to be undertaken in accordance with the legislation and guidance that applies at such time.

2.11.3 Decommissioning stage demolition is de-construction or in effect construction in reverse. Therefore, it is considered that any impacts likely to occur during decommissioning stage demolition would be similar to and managed in a similar way to that assessed in this EIA for the during construction phase of the Proposed Development.