

2 PROPOSED DEVELOPMENT

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Image 2.2 A block flowsheet for the steel melt shop facilities

APPENDICES

Presented in Volume 3 of this Environmental Statement:

Appendix 2.1 Outline Construction Environmental Management Plan (CEMP)

Appendix 2.2 Landscape and Ecology Management Plan (LEMP) and Biodiversity Management Plan (BMP)

FIGURES

Presented in Volume 4 of this Environmental Statement:

Figure 2.1a–d Layout plans, outline and full

Figure 2.2 Parameter plan

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2.1 Need for the Proposed Development

- 2.1.1 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.
- 2.1.2 The Applicant (Tata Steel UK Limited (Tata Steel)) is the largest steel producer in the UK and a significant employer in the communities it operates within. Until the recent closure of the 'heavy end', the Applicant met approximately 54% of the UK's steel demand. 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, and the Applicant's only such UK asset.
- 2.1.3 Much of the infrastructure at the Site is however dated and in need of renewal to support safe and efficient production. The steelworks is a heavy carbon user and greenhouse gas (GHG) emitter. Port Talbot steelworks was the single biggest emitting installation in the UK in 2020 with direct (Scope 1) emissions of approximately 6 million tonnes of carbon dioxide, rising further when Scope 2 (electricity generation & supply) and Scope 3 (procurement & delivery of raw materials) emissions were taken into account. Customer demand however is increasingly focused on 'green steel'; produced without fossil fuels. This creates a very challenging investment position for continued operation of the steelworks in its established form. To remain competitive and ensure the long-term viability of UK and Welsh produced steel as an integral element of the economy, the facility is therefore in critical need of structural investment.
- 2.1.4 The drive to reduce 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 Industrial Decarbonisation Strategy published by the UK Government in 2021 identified the decarbonisation of the UK's two integrated steel making sites at Port Talbot and Scunthorpe as crucial to the broader goal of de-carbonisation of the UK's strategic industries. In January 2023 the UK Government announced a 'green steel fund' to offer financial support to decarbonisation initiatives to the two sites identified.
- 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 In September 2023, the UK Government and the Applicant announced a £1.25bn joint investment in the development of an EAF at Port Talbot to replace the coal fired blast furnaces. In April 2024, following consultation with its staff and trade unions, the Applicant confirmed its intention to proceed with the EAF project, and to correspondingly close the blast furnaces and associated 'heavy end' of the steelworks.

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 Port Talbot, and Wales, by creating a financially and environmentally sustainable business; and
 - To support the decarbonisation needs of the industry and UK Government commitments to reduce CO₂ emissions to near zero by 2035 and to net zero by 2050 respectively.
- 2.2.2 A number of alternative 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 Relationship with existing processes and steelworks

- 2.3.1 The Proposed Development is entirely within the boundary of the existing steelworks and will see the established steel-making that has occurred at the site for much of the past 60 years plus, replaced with EAF based processes.
- 2.3.2 The planning application boundary includes the following parts of the extant steelworks:
- The continuous casting plant, slab yards and part of the basic oxygen steelmaking (BOS plant),
 - Operational works lagoon, steel service centre and Margam colliery memorial,
 - Haul roads and railway tracks,
 - Coal yards,
 - Open storage yards, scrap processing facilities and other steel-making and processing infrastructure.
- 2.3.3 Whilst the Proposed Development entails creation of significant new infrastructure, it should be viewed in the context of replacement and renewal of these existing elements of the works. The Proposed Development will re-use some elements of the steelworks including the BOS plant, internal roads and railway tracks. This is described in more detail in the remainder of this chapter.
- 2.3.4 The 'heavy end' of the steelworks comprises the existing stockyard, sinter plant, coke ovens, blast furnaces and steel converter. The majority of these elements are outside of the current planning application boundary. The Applicant has previously announced that the closure of the 'heavy end' will occur irrespective of the EAF proposals; this process commenced on a phased basis in early 2024 and was completed in September 2024.
- 2.3.5 It is the Applicant's current intention that the existing hot and cold rolling mills at the steelworks (not within the application boundary) will remain operational during the interim period between 'heavy end' closure and EAF operation, focused on secondary processing of products sourced from other Tata Steel UK Limited (Tata Steel) locations. The cold rolling mill will require upgrade prior to EAF operation, any planning related requirements of this upgrade will be dealt with outside of the current application. There is likely to be a period of shutdown for the cold mill prior to EAF operation whilst these improvements are carried out. The continuous annealing processing line (CAPL) is also

outside the planning application boundary for the Proposed Development and is proposed to close in 2025.

- 2.3.6 ES Figure 2.6 shows the planning application boundary in the context of the existing uses at the steelworks.

P-Fields

- 2.3.7 Tata Steel UK Limited (Tata Steel) recently completed pre-application consultation (PAC) for the proposed installation and retention of hardstanding at land within the steelworks boundary known locally as 'P-Fields'. This falls entirely within the planning application boundary for the EAF. Subject to planning approval the P-Fields application will provide additional laydown space to support the works required with both decommissioning of existing structures not forming part of the current planning application, and facilitation of works associated with the Proposed Development.
- 2.3.8 Once the area subject to the P-Fields application has served its purpose as described, it will be incorporated into the scrap handling area as described in full elsewhere in this chapter.

2.4 Safety, health and environmental requirements

Statutory requirements affecting the existing Site

- 2.4.1 In addition to the planning permission required for the Proposed Development, the following additional consents, licences and permits are anticipated to be required. These are described further in the following paragraphs. Not all of the information required to support these additional consents is available at the time of submitting the planning application for the EAF and hence some will be applied for subsequent to rather than concurrently with the planning application. This is typical of industrial processes of this nature, with operation only being allowed to commence once all required licences, permits and consents are in place.
- 2.4.2 These include:
- Environmental Permitting:
 - Control of Major Accident and Hazards (COMAH), including Hazardous Substances Consents,
 - Greenhouse Gas Emissions Permitting,
 - Sustainable Drainage Approval.

Environmental Permitting

- 2.4.3 The Proposed Development will require a new environmental permit from NRW. The environmental permitting process aims to protect the environment through adoption of Best Available Techniques (BAT) 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 plan would be required as part of the environmental permit.

COMAH

- 2.4.4 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 previously required 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.

- 2.4.5 The Proposed Development is anticipated to remain subject to the requirement of COMAH, albeit with more limited scope than at present. The use of flammable gases and liquids which currently exceed COMAH thresholds will cease. The storage of eco-toxic materials, specifically dust from the fume extraction plant, is expected to exceed the COMAH threshold. Direct testing will be required once the EAF is operational to determine the exact chemical composition of the dust and therefore to allow full assessment against COMAH requirements.
- 2.4.6 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.
- 2.4.7 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.
- 2.4.8 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. Such activities and measures relate primarily to the established operation of the steelworks. A new or updated Safety Report will be required for the EAF in due course.
- 2.4.9 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.
- 2.4.10 Full assessment against the requirements of the Planning (Hazardous Substances) Regulations 2015 will be completed once a full inventory of process substances and quantities is available. If required, Hazardous Substance Consent (HSC) will be managed under the associated COMAH and environmental permitting requirements, which is as case for the established operation. The range and quantities of hazardous substances required is expected to be generally reduced for the Proposed Development compared with the existing operation.

Greenhouse Gas Emissions Permitting

- 2.4.11 A variation to the Site's existing GHG Emissions Permit will be required to allow the EAF to operate under the UK Emissions Trading Scheme.

Sustainable Drainage Approval

- 2.4.12 A sustainable drainage approval application has been prepared alongside the planning application and will be submitted for approval to the Sustainable Drainage Approval Body (SAB).

Tata Steel UK Limited (Tata Steel) internal safety standards

- 2.4.13 In addition to the permitting, consenting and licencing requirements described, the Applicant has a number of internal standards relating to safety risk management which apply to the Proposed Development, and which will be varied to meet the changed circumstances of the Site's operation. These include internal standards and policies 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.
- 2.4.14 Further consideration of potential vulnerabilities to Major Accidents and Disasters of the Proposed Development is provided in **ES Chapter 15: Major Accidents and Disasters**.

2.5 Proposed Development overview

- 2.5.1 The Proposed Development is for an EAF steel production facility and a scrap metal handling facility and associated elements as described in the 'description of development'; in **ES Volume 2, Chapter 1: Introduction**.
- 2.5.2 The Proposed Development's location is shown in **Figure 1.1**. Layout plans of the Proposed Development are provided in **Figure 2.1a-d**.
- 2.5.3 Components of the Proposed Development are summarised as follows, and are as shown on **Figures 2.1a-d**:
- Full planning element:
 - o Alterations to existing basic oxygen steelmaking (BOS) and secondary refining building (collectively comprising 'the EAF');
 - o Water cooling systems and water treatment plant (including emergency backup power up systems and diesel back-up generator rooms);
 - o Fume and dust extraction systems with stacks;
 - o Lime handling facility;
 - o Storage areas/buildings with material handling system;
 - o Ancillary plant equipment and pipework;
 - o Electrical control rooms with cable carrier systems;
 - o Preparation and storage areas;
 - o Compressor rooms;
 - o Offices and ancillary facilities;
 - o Partial infill of the BOS lagoon;
 - o New and amended rail track and associated infrastructure;
 - o New and amended roads with gates and parking areas;
 - o Landscaping and green infrastructure;
 - o Firefighting pump house;

- o Oxygen and argon vessels;
 - o Upgraded laboratories,
 - o Lighting,
 - o Hardstanding,
 - o CCTV.
 - Outline planning elements:
 - o Scrap metal reception, handling and processing facilities and associated scrap yards;
 - o New substation and underground and overground electrical infrastructure;
 - o New and amended access roads and parking areas;
 - o New and amended rail track and associated infrastructure;
 - o Lighting.
- 2.5.4 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 parameter of 20m above ground level.
- 2.5.5 The ES is based on the Proposed Development as shown on the planning drawing pack, and as described in the Planning Statement. The principal planning drawings used to inform this ES are provided in **ES Volume 4** and are as summarised in **Table 2.1**. For conciseness, not all plans are reproduced as part of this ES, but where they are, the corresponding ES figure reference is also provided.

Table 2.1: Planning Drawings informing the ES

Drawing Title	Drawing Reference and ES Figure Reference (if applicable)
Site Location Plan	EAF-LAW-X-X-DR-A-900001 ES Figure 1.1
Proposed Site Plan – Hybrid Planning Application	EAF-LAW-X-X-DR-A-900009 ES Figure 2.1a
Proposed Site Plan – Indicative Outline Phase 1	EAF-LAW-X-X—DR-A-900010A ES Figure 2.1b
Proposed Site Plan – Indicative Outline Phase 2	EAF-LAW-X-X—DR-A-900010 ES Figure 2.1c
Proposed Site Plan – Full and Outline Application Areas Laydown Areas	EAF-LAW-X-X-DR-A-900013 ES Figure 2.1d
Parameter Plan – Build Zones & Max Height	EAF-LAW-X-X-DR-A-900200 ES Figure 2.2
Demolition Site Plan	EAF-LAW-X-X-DR-A-040001 ES Figure 2.3
Site Sections	EAF-LAW-X-X-DR-A-063001
Existing Site Uses	EAF-LAW-X-X-DR-A-900002 ES Figure 2.6

EAF inputs and outputs

2.5.6 The main inputs and outputs of the EAF steel-making process are summarised in the below table. Where available data exists to compare to the established operation, this is also provided in the 'Notes' column.

Table 2.2: EAF inputs and outputs

Inputs	Form / State and Estimated Quantum (per annum)	Notes
Raw Materials (70% scrap, 20% pig iron, 10% HBI)		
Ferrous scrap metals	2,479,300 tonnes per annum (tpa)	Main raw material input, sourced predominantly from the UK via rail. The established baseline is ~200,000 tonnes per annum via the road network.
Pig iron	700,800 tpa	Required in order to achieve a full portfolio of products, likely to be imported by ship and rail. Whilst pig iron is used in the established baseline, it is a by-product of blast furnace operation so there is no need to import from elsewhere.
Hot Briquetted Iron (HBI)	354,200 tpa	Required in order to achieve a full portfolio of products. Anticipated to be brought into site by rail.
Ferro-alloys	36,000 tpa	Required in order to achieve correct steel chemistry for a specific product.
Calcined Dolomite (do-lime or dololime)	62,900 tpa	Used in order to create the EAF slag layer to remove impurities. Not required on the Established Baseline (though other equivalent materials are)
Calcined Limestone (Quick Lime or Burnt Lime)	46,600 tpa	Used in order to create the EAF slag layer to remove impurities.
Carbon Injection	39,500 tpa	Used to reduce iron oxides in the furnaces to metallic iron.
Other Inputs		
Abstracted Water	13,500,000 m ³ per annum	Extracted from the River Afan and Point B, which is a mix of River Kenfig, Castle Stream and Lower Mother Ditch. The established

Inputs	Form / State and Estimated Quantum (per annum)	Notes
		baseline for water use is 42,500,000 m3 per annum.
Electricity	1,205 GWh per annum	Based on standard mix of input materials., 372 KWh of electricity is required to produce 1 tonne of liquid steel.
Mains Gas	16,800 nm3/hr (97,000 tpa)	Approx. 3,400 nm3/hr would be required for the EAF operation, with the remainder for the operation of the rest of the plant. The established baseline uses an average of 20,300 nm3/hour.
Oxygen	14,800 nm3/hr	Used predominantly to control metallurgy within the EAF. Established baseline use is ~45,200 nm3/hr.
Argon	85 nm3/hr	The argon is used in the ladle furnace to achieve a non-reactive environment. The established baseline does not utilise argon.
Hydrogen	114 nm3/hr	The established baseline is 539 nm3/hr. It should be noted that the hydrogen is predominantly required in the rolling mills and not the EAF meltshop.
Nitrogen	3400 nm3/hr	The established baseline is 19,700 nm3/hr. Nitrogen is used for purging and creating a non-reactive atmosphere.
Outputs		
Molten Steel	3.2 million tonnes per annum	Key output of the electric arc furnace, which is refined in the Ladle furnaces and then cast into steel slab before processing in the Hot or Cold Rolling Mills.
Waste and by-products		
Dust from fume extraction plant (red dust)	83,000 tonnes per annum	Produced from primary and secondary fume extraction in the EAF plant. To be recycled in an external facility in order to recover zinc and iron components.
EAF Slag	255,000 tonnes per annum	Produced from the furnaces to remove impurities in the steel.

Inputs	Form / State and Estimated Quantum (per annum)	Notes
		Predominantly used as an aggregate in asphalt, but there are other recycling opportunities in the construction industry
Refractory Bricks	3,000 tonnes per annum	These line the furnace vessels and are partially worn away due to the conditions. The majority can be sent for recycling or regeneration but some may be required to be disposed of via the on-site landfill.
Foreign Materials in Scrap	Phase 1 : 0 tonnes per annum Phase 2 : 220,000 tonnes per annum Light Fraction 88,000 tonnes per annum Heavy Fraction	In Phase 1 all scrap would be furnace ready and any contaminated scrap would be rejected. In Phase 2 scrap would be shredded on site and generate a light fraction, which would be processed off-site to recover, plastics, glass, textiles and metals. The heavy fraction would be processed on-site. Of the 88,000 tonnes, it is predicted that 25,000 tonnes would potentially require landfilling and the remainder is ferrous and non-ferrous metal that can be recycled.
Trade Effluent	~1,000 m3/hr	This volume includes the operational mills and new EAF facility. The EAF uses water predominantly for cooling and much is evaporated. The established baseline is ~2,000 m3/hr
Other materials		
Water treatment chemicals	Not available	Predominantly Sodium Hypochlorite used for dosing cooling towers but also flocculants for use in the water treatment plant. Requirement has reduced from the established baseline as the discharge volume has reduced and the requirement for cooling across site.
Fuels and lubricating oils	Not available	Similar to the existing facility there is a requirement for lubricating oils, mainly in the rolling mills and diesel for refuelling on site vehicles. It should be noted that the number of vehicle movements has reduced significantly, and fuel requirement is lower, whereas the lubricating

Inputs	Form / State and Estimated Quantum (per annum)	Notes
		oils for rolling and products will be similar to the established baseline.

- 2.5.7 This table provides a summary of the main inputs and outputs to EAF steelmaking. The new or increased inputs such as scrap metal, pig iron and HBI effectively substitute materials used in the established baseline, principally coal and iron ore. Similarly, do-lime and calcined limestone substitute the use of quick lime in the established process. The overall quantities of raw material input are expected to be similar between the established and EAF scenarios.
- 2.5.8 Non-electrical utility usage is expected to be much reduced for EAF steelmaking with the required quantities of natural gas, process water and oxygen, hydrogen and nitrogen all substantially reduced.
- 2.5.9 The quantity of steel produced, together with the level of waste and by-products is expected to be similar to that of the established baseline. A Waste Management Plan is provided as part of the planning application documents.

Staffing and Shift Patterns

- 2.5.10 The EAF will operate continuously on a 24 hours a day, 7 days a week basis, with two 12-hour shift patterns per day. Office workers would continue to work no more than 8 hours per day, during daytime hours, between 7:30am to 6pm. These shift patterns are as those used in the established baseline.
- 2.5.11 Further information on employment related effects is provided in **ES Chapter 14: Socio-Economics and Health**.

2.6 EAF development components

- 2.6.1 The facilities proposed are illustrated in **Figures 2.1** and **2.2**.
- 2.6.2 The main elements of the Proposed Development, inclusive of full and outline elements are summarised as follows:
- New and upgraded transport infrastructure.
 - Scrap and raw materials importation, handling and processing facilities.
 - The installation of the EAF, within the existing BOS plant building, together with the necessary modifications to this building.
 - Installation of associated plant and equipment to support the operation of the EAF.
 - Car parking and office facilities.
 - Electrical connection to the National Grid's transmission network within the Site boundary. Onwards connection beyond the Site boundary is the responsibility of National Grid with separate planning permission being sought.

New and Upgraded Transport Infrastructure

- 2.6.3 The principal raw materials for the EAF process are scrap metal, HBI and pig iron. These materials will be transported to site, predominantly by rail. The Proposed Development involves dualling of the existing rail track to allow two trains to service the

scrap facility at the same time. This will entail installing approximately 750m of new rail track and associated infrastructure.

- 2.6.4 New internal access roads will be created, and existing roads widened to allow for safe and efficient transfer of materials within the steelmaking process. The Proposed Development entails approximately 1.8km of new and improved internal roadways (inclusive of both full and outline elements).
- 2.6.5 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.

Scrap and Raw Materials

- 2.6.6 The existing steelworks already entails handling, storage and processing of scrap but this will increase significantly as a result of the Proposed Development. A new scrapyard facility is proposed as part of the application, equipped to receive, store and process approximately 2.5 million tonnes of scrap per annum.
- 2.6.7 The proposed layout of the scrap yard is shown on **Figure 2.1b and c**.
- 2.6.8 The scrap yard would receive 90% of material by rail, with the balance delivered to site by road. Rail movements will operate round the clock, six days per week, as already occurs in the established baseline. The estimated volume of night-time movements is an average of 1.83 trains per hour, this compares to an average of 0.92 trains per hour under established operation.
- 2.6.9 Several options remain under consideration for scrap handling which could entail scrap being processed off-site and delivered 'furnace ready', or for this processing to take place at Port Talbot, or for a hybrid of these options with some processing taking place off site and some on-site. To allow for flexibility in which option(s) are adopted, the outline part of the application for the scrap handling entails two phases:
 - Phase 1 will provide the facilities required to receive and handle 'furnace ready' scrap.
 - Phase 2 will provide additional shredding and processing capacity for this to be completed on Site.
- 2.6.10 The ES reflects all of the options under consideration to ensure that a 'reasonable worst case' is assessed.
- 2.6.11 The proposed Phase 1 scrap handling as shown on **Figure 2.1b** will include:
 - 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 facilities,
 - Relocation of existing Harsco shredder to new scrap yard for processing,
 - Office and amenity provision for scrap workers,
 - Dedicated scrap overflow yard,
 - Scrap lorry unloading,
 - Associated mobile plant and equipment for scrap handling and processing,
 - Lighting across the scrap yard to allow safe operation.
- 2.6.12 Scrap metal will be delivered by train in containers to the main scrap storage and processing area, where each loaded container will be removed from the train and

replaced with an empty container. As the trains enter the area, the load will pass over the weighbridge and under a radioactive 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. Such sources of scrap are not suitable for use in the EAF, but do not present a hazard if appropriately stored and handled. These materials will be segregated and securely stored prior to removal from the Site for treatment and disposal elsewhere.

- 2.6.13 The containers will 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.
- 2.6.14 Scrap segregation and processing will take place within the main ferrous processing area. Once the materials have been segregated they will be transported to the EAF.
- 2.6.15 The overflow scrap yard will be used for periods where additional stocks of metals are required, or where additional processing is required.
- 2.6.16 If implemented, the Phase 2 scrap handling will additionally include:
 - Shredder and associated plant for production of shredded scrap,
 - Non-ferrous processing plant for processing of waste generated by the shredder.

Mobile plant requirements

- 2.6.17 A variety of mobile plant would be used to meet the scrap handling needs in both phases. For the purposes of the assessments provided in this ES, a reasonable worst case estimate of plant items operating simultaneously is as below:
 - Three reach stackers for scrap container movements from the train to the yard;
 - Four tipper trailers for scrap delivery to the EAF;
 - Six front end loaders for scrap piling and loading of tipper trailers;
 - Twelve material handling excavators for scrap piling and shredder feed;
 - Three magnet excavators for material movements and yard maintenance; and
 - Four forklift trucks.
- 2.6.18 Further information on assumed plant items and operation is provided in **ES Volume 2, Chapter 7: Noise and Vibration**.

Acoustic Barrier

- 2.6.19 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**.
- 2.6.20 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.
- 2.6.21 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.

Other Raw Materials Handling and Storage

- 2.6.22 The proposed EAF will see similar quantities of steel produced at Port Talbot to recent production levels at the extant works. However, raw material inputs will change to reflect the differing requirements of the respective processes.
- 2.6.23 Traditional steelmaking at Port Talbot until recently used three main raw materials; iron ore, coal and lime. Iron ore will not be required in EAF steelmaking, and lime use will be much reduced. Coal or carbon will still be required as a reductant but in much reduced quantities compared to the established operation.
- 2.6.24 In addition to scrap as described above, inputs required for the EAF process will include pig iron, dololime (do-lime) and hot briquette iron (HBI). These will effectively substitute the materials used in the existing process, with similar overall quantities. Further information of estimated quantities is provided in Table 2.2.
- 2.6.25 Small quantities of ferro alloys will be used in the EAF as an additive to the molten scrap, with quantities depending on the type of steel being produced.
- 2.6.26 The main raw materials will 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**).
- 2.6.27 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**. Ferro alloys will be stored in a dedicated bunker to the south of the BOS plant building (equipment label 6 on **Figure 2.1a**).

Installation of EAF and associated plant and equipment

- 2.6.28 The Proposed Development seeks 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.
- 2.6.29 In the process description that follows, the EAF operation is referred to as 'primary steelmaking' and the LF is referred to as 'secondary steelmaking'.
- 2.6.30 The BOS plant is one of the largest and most prominent structures within the existing steelworks, measuring approximately 60m in height and over 100m in width and 150m in length. Existing vessels, gantries and control rooms will be removed from the BOS plant to facilitate the Proposed Development. These will be replaced by the EAF and LF and associated structures.
- 2.6.31 **ES Figure 2.1a** shows the relationship of the BOS plant with the Proposed Development. The Canopy Hood and Consteel Conveyor (items 1 and 2 as indicated on the plan) will be constructed to the west of the BOS plant, replacing the existing scrap storage shed which will be demolished (item 1a on the Demolition Site Plan). The EAF Charging Bay (item 31 as indicated on **Figure 2.1a**) will be constructed at the southern

extent of the BOS plant, the maximum dimensions for this are 43.34m in height, 34,95m in length and 14.65m in width.

- 2.6.32 Scrap metal and raw materials will be loaded into the EAF using the Consteel Conveyor (item 2 on **Figure 2.1a**).
- 2.6.33 Inside the EAF, carbon electrodes will create an electrical arc, which will pass through the metal causing rapid heating, eventually melting the charge scrap. With a continuous process, the scrap will be charged into the furnace with molten metal already in the vessel. The EAF will 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 dolomite stored in an external bunker will be added to the melt to remove impurities and to help form a slag layer.
- 2.6.34 The molten metal from the EAF will be transferred into one of two new ladle furnaces, both housed within the BOS plant. The chemistry of the steel will be refined in the ladle furnaces to obtain the grade required by the customer. Ferro-alloys will be added at this stage in the quantities required for the final product.
- 2.6.35 Molten metal will be tapped from the EAF at a production rate of 320 tonnes of steel every 42 minutes, creating an annual production capacity of approximately 3.2 million tonnes per annum.
- 2.6.36 The Proposed Development entails enhanced acoustic cladding to the BOS plant for the purpose of ensuring compliance with required noise standards. Full details of this are provided in **ES Chapter 7: Noise and Vibration**.
- 2.6.37 Other than as described here, the BOS plant building will remain unaltered from the structure already present.
- 2.6.38 Metal from the ladle furnaces will be transported to the existing continuous casting (Concast) plant by hopper for onwards processing and to produce steel slabs which will be the feedstock for the hot and cold rolling mills.
- 2.6.39 The Concast plant and hot and cold rolling mills are extant and do not form part of the planning application. They are nevertheless described here to aid understanding of the purpose of the Proposed Development.
- 2.6.40 The location of the concast plant and hot and cold mills is indicated on **ES Figure 2.6**.

Car Park and Office Facilities

- 2.6.41 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.

Electrical Connections

- 2.6.42 The Proposed Development requires a new high voltage electrical connection to the National Grid Margam substation which is based outside of the Site boundary. The power distribution upgrades required within Site boundary are part of the current planning application and therefore are assessed through this ES. Development outside

of the Site boundary, including upgrade of the Margam substation and laying of cables up to the Tata Steel UK Limited (Tata Steel) boundary, is subject to separate planning processes by National Grid. This development is considered in **ES Chapter 16: Cumulative effects**.

- 2.6.43 The proposed cable(s) will enter the Site from the east, cross the fields at the southern extent of the Applicant's land ownership and then turn north into the area of the extant steelworks.
- 2.6.44 The cable will be laid predominantly in open trench, up to 1.5m in depth with sections tunnelled beneath areas of trees to minimise the potential damage on green and blue infrastructure. Water courses will be temporarily over pumped and then re-instated once the cable has been laid. The Proposed Development plans show a 30m 'corridor' for the cabling works, this is to allow micro-siting of the cable route within that corridor and for associated temporary development such as establishment of construction accesses and stockpiling of excavation spoil; it is not anticipated the full extent of the corridor will require development.
- 2.6.45 Transfer of power from the grid would take place at the proposed main power centre and the proposed power compensation building (items 21 & 22 as shown on **ES Figure 2.1**), and power will be distributed to downstream processes at 33 kV and 11 kV.
- 2.6.46 There would also be a number of new power distribution buildings shown on **ES Figure 2.1a** as follows:
 - Melt Shop Power Distribution Building, equipment label 10,
 - Melt Shop WTP Electrical Building, equipment label 11,
 - Melt Shop FTP Electrical Building, equipment label 12,
 - HBI Electrical Building, label 32.
- 2.6.47 For the outline area, the illustrative location of the scrap yard electrical building is indicated by equipment label 24 on **Figure 2.1b**.
- 2.6.48 Electrical connection between the identified elements will be by underground cable and overground cable bridge, depending on the ground conditions and extant and proposed structures.

Demolition

- 2.6.49 The Proposed Development will require the demolition of some existing buildings to facilitate construction of the development as described. The structures requiring demolition are shown on the Demolition Site Plan, and include (all descriptions as those shown on the Demolition Site Plan):
 - Scrap storage shed,
 - Pump house,
 - Harsco baler plant,
 - Weighbridge,
 - Harsco frag plant,
 - Electrical room,
 - Mechanical / electrical workshop,
 - RH penthouse,
 - RH cooling tower,

- RH pump house,
- Slag splashing compound,
- Storage shed,
- HAA coal unloading station,
- Coal conveyor superstructure,
- Inlet structure,
- BF gas pipe rack (partially removed),
- Existing compressor house with MCC room,
- Concrete abutments.

2.7 EAF process description

2.7.1 This description should be read in combination with **Figure 2.1a-d** showing the main elements of the Proposed Development.

Production of steel

2.7.2 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).

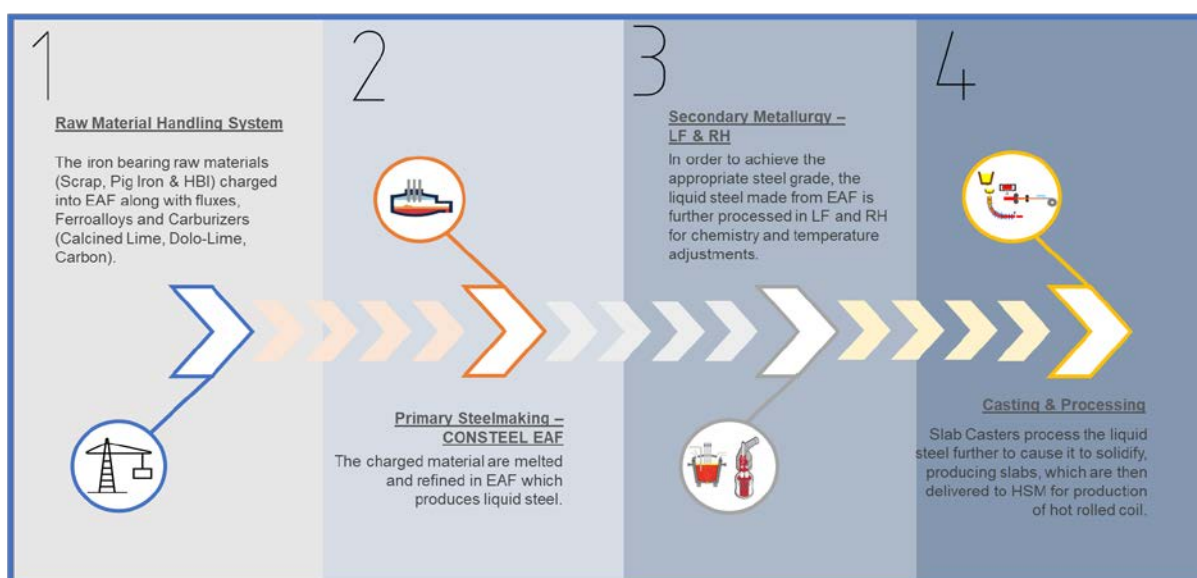


Image 2.1. The proposed steelmaking process from raw material to slab.

- 2.7.3 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 estimated length of new and widened roads incorporating both the full and outline areas is 1.8km. This increase associated with the EAF will be offset at least partially by other existing internal roads associated with the 'heavy end' operation becoming redundant.
- 2.7.4 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**). This conveyor itself will be enclosed, with open bays for vehicles to access and deliver material. 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. Heating demand will be provided by waste heat from the EAF. This process would be operated from the control room, allowing for changes to speed of charging and other factors.

- 2.7.5 Once heated, the scrap would be charged into the EAF. This is proposed to be on a continuous basis rather than a batch charging process.
- 2.7.6 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 will be charged into a furnace with molten metal already in the vessel, which reduces noise, emissions and electricity usage compared to a batch process. Lime and dolomite 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.
- 2.7.7 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 will be refined to obtain the desired grade of steel for the customer. Ferro-alloys from the bunker will be added at this stage as appropriate to the application for which the steel is being produced.
- 2.7.8 Once the steel is fully refined in the LFs it will be transported to the existing continuous casting plant (concast). Molten metal is poured from a hopper 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.
- 2.7.9 A block flowsheet for the steel melt shop facilities is illustrated in **Image 2.2** below.

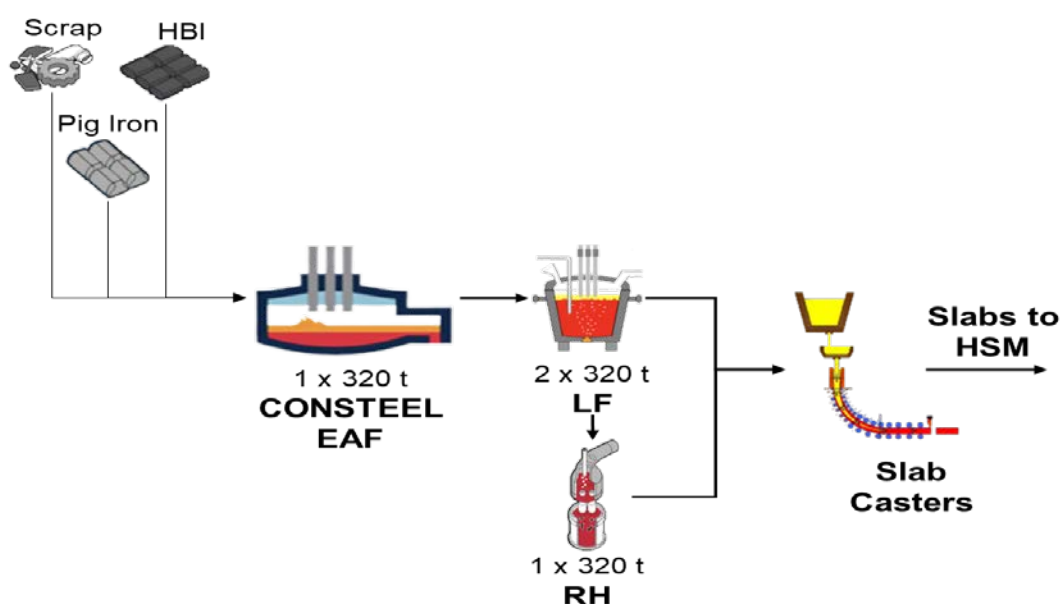


Image 2.2. A block flowsheet for the steel melt shop facilities.

Utility systems

- 2.7.10 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.
- 2.7.11 Salient features of the proposed industrial and fuel gas circuits are set out in **Table 2.3** below.

Table 2.3 Proposed industrial and fuel gas circuits

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

Water systems

- 2.7.12 Water will be required in the EAF steel making process for cooling and quenching, and for sanitation and cleaning of staff personnel working in the plant and offices. Sources of water will remain as those for the existing plant; principally by abstraction licence from the River Afan network, and capture and storage of rainwater.

Waste production

- 2.7.13 There will be two major waste streams from the EAF steel making process, which are EAF slag and EAF dust (also known as red dust).
- 2.7.14 EAF slag will be produced from the EAF and will contain elements that are detrimental to steel quality. Quick lime and/or dolomite 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 in preparation for further processing both on and off-site. The location of this area is shown on **Figure 2.6**. The slag can be further processed to create a very hard-wearing aggregate which is often used as road stone.
- 2.7.15 The slag processing proposed in connection with the Proposed Development is a continuation of that occurring in the established baseline; with quantities and composition of slag expected to be similar to that previously generated.
- 2.7.16 EAF dust will be 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. The FEP will contain bag filters that remove dust from the air

with a very high efficiency. The residual air stream post removal will be emitted via the FEP stack.

- 2.7.17 The dust can then be recycled externally to create secondary products for use in other industries. Further dust processing where required will take place off-site with removal by rail or road. This process for dust handling is as that in the established baseline, albeit the composition of EAF dust, and therefore the range of secondary products it will be used in are likely to change.

2.8 Environmental design

Dust emissions

- 2.8.1 The best available techniques (BAT)¹ associated emission levels at the chimney stack are as provided in **Table 2.4** Table 2. below. Assessment of emissions from this, and other identified emission sources is provided in **ES Chapter 6: Air Quality**.

Table 2.4 BAT associated emission levels

Sr. No.	Pollutants	mg/Nm ³	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 (ngl-TEQ/Nm ³)	<0.1	Based on a 6 – 8 hour random sample during steady-state conditions

- 2.8.2 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.
- 2.8.3 The workplace dust level at 1 m from a dust source would be $\leq 2 \text{ mg/Nm}^3$. Workplace exposure limits would be $<10 \text{ mg/m}^3$ for 8 hours' time-weighted average (TWA) of PM₁₀.

Effluent emission

- 2.8.4 Effluent from the amenity and welfare block will be discharged to the Site's existing connection to the public sewerage system. Overall discharge of foul water effluent will be reduced in comparison with the established baseline due to the reduced number of staff working at the Site.

Remediation Strategy

- 2.8.5 **ES Chapter 10: Land, soil and groundwater**, and the associated **Volume 3, Appendix 10.1** indicate that ground conditions at the Site are as would be expected at

¹ [Best available techniques: environmental permits - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/best-available-techniques-bat)

a large industrial site of this nature. Made ground is present across much of the Site, of varying composition and thickness.

- 2.8.6 Localised remediation is likely to be required to create a suitable and stable platform for development. A site investigation and remediation strategy will be completed and submitted in fulfilment of planning conditions.

Landscape design

- 2.8.7 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**. Compliance to these would be secured by way of a planning condition. All land required to implement the LEMP and BMP proposals is within the Applicant's control as shown by the 'blue line' boundary on the planning drawings. Some of the measures extend outside of the planning application 'red line' boundary, where those works do not in themselves require planning permission.
- 2.8.8 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.
- 2.8.9 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.
- 2.8.10 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.
- 2.8.11 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.
- 2.8.12 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.

Other Environmental Considerations

- 2.8.13 The transition to EAF based operation provides opportunity to significantly reduce emissions to air from the steelmaking process. Emission quantities of the majority of key pollutants including nitrous oxides, sulphur dioxide and particulate matter are reduced in comparison with the established baseline with resultant benefits for human health and ecological based receptors. This is discussed further in **ES Chapter 6: Air Quality**.
- 2.8.14 The closure of the 'heavy end' is anticipated to bring environmental benefits in terms of reduction of road transport movements, and noise emissions. Noise from the Proposed Development would be further reduced using sound enclosures on the equipment. Further details are provided in **ES Chapter 7: Noise and Vibration** and **ES Chapter 12: Transport and Access**.
- 2.8.15 Where relevant, all mobile plant will be specified and operated in accordance with application of BAT, compliance with which will be regulated under the amended environmental permit,
- 2.8.16 Unprocessed scrap and shredder non-ferrous by-products will be stored on impervious concrete with a sealed drainage system and directed to appropriate water treatment facilities.
- 2.8.17 An approved fire prevention plan will be generated including preventative measures, fire detection sensors including ultraviolet and thermal imaging sensors and fire suppression systems are planned to be installed.
- 2.8.18 Lighting towers will be installed to provide appropriate lighting levels for the activities undertaken in the area. The proposed lighting scheme is illustrated in **Figure 2.5**. The proposed lighting shown in the outline element of the Proposed Development is indicative only and will be addressed at the detailed design stage.
- 2.8.19 Light pollution and nuisance from light spillage resulting from the proposed lighting scheme has been a consideration during the design process. For further details, refer to the Light Pollution Study (eb7, 25 October 2024), which has been submitted as a supporting document with the planning application. This reports a night time illuminance study which was undertaken to consider the proposed lighting scheme. It included the identification of sensitive receptors, the results from a site survey to record illuminance levels, and the expected lighting levels from the proposed lighting scheme. It is considered that the proposed lighting scheme would not have a detrimental effect on nearby sensitive receptors.

2.9 Construction of the Proposed Development

Construction management

Health, safety and environment

- 2.9.1 The Applicant has a strong commitment to providing 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. 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 **ES Figure 2.1d**.
- 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 partial removal and re-profiling 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 t to be constructed at the same level as the BOS plant building.
- 2.9.9 The material removed due to the Harsco Bank re-profiling will be temporarily stockpiled on-site, screened and tested to identify different applications of the material on-site. Depending on the properties, re-use will include; geotechnical fill, re-processing as slag,

landscaping and re-use in habitat creation. Any material not suitable for retention will be disposed of in the Applicant's own landfill, or used as cover material.

- 2.9.10 For the scrap yard, scrap storage yard, and National Grid substation earthworks, the final platform level would be circa. 7mAOD, and designed to minimise the cut and fill volumes of the earthworks. Plans showing existing and proposed site levels have been submitted with the planning application. 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.
- 2.9.11 Part of the existing works lagoon would be infilled to provide space to construct roads, buildings and plant. The material required to infill will be site-sourced, predominantly from site stockpiles of furnace slag. No importation of materials is anticipated.
- 2.9.12 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 the lagoon would be dredged and a stone platform will then be infilled with site-won materials. 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

- 2.9.13 There are some existing facilities in the identified area for the proposed plant. Those existing facilities would be demolished by the Principal Contractor maintaining all safety standards. The facilities to be demolished are indicated on **Figure 2.3**.
- 2.9.14 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 inspection and, where necessary, removal;
 - 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

- 2.9.15 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.
- 2.9.16 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.

- 2.9.17 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

- 2.9.18 Power supply to different construction facilities, construction machinery, area lighting, etc. would be required to carry out the construction work.
- 2.9.19 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, will be arranged by the Principal Contractor.

Construction water

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

Drinking water.

- 2.9.21 Potable water will 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

- 2.9.22 Existing site access roads would be utilised by cars, vans, HGVs and other specialist equipment to access the main works compound.
- 2.9.23 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

- 2.9.24 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

- 2.9.25 The main construction project offices, parking and laydown areas would be established in the compound location. 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.
- 2.9.26 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.

Construction Parking Area

- 2.9.27 A new permanent car park will be established (as shown by label 14 on **ES Figure 2.1a**) to the east of the BOS plant to house initially construction staff and then EAF operational staff. The proposed car park entails approximately 180 spaces, including 9 disabled bays and 10% EV bays.
- 2.9.28 A construction compound will be established in phases to meet the requirements of construction, and which will include parking, as well as office and welfare space. The compound will accommodate 395 spaces, with opportunity to expand to the south if required providing up to 1,160 spaces. This would be additional to the space in the main car park, providing a total of 1,340 spaces. Car parking area(s) would be provided for the project staff and visitors within the compound location.
- 2.9.29 Further information on car parking provision is provided in Section 3 of the Transport Assessment which forms **ES Appendix 12. 1 (Part 1)**.

Laydown areas

- 2.9.30 Equipment laydown areas as illustrated in **ES Figure 2.1d** will be provided for equipment storage, repairs, maintenance and re-fuelling of earthmoving equipment.

Construction processes

Piling

- 2.9.31 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.
- 2.9.32 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

- 2.9.33 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.
- 2.9.34 All excavation will be completed 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 will be utilised as required. Heavy construction equipment will not be allowed within 3 m of deep excavation, unless otherwise authorised through temporary works design.
- 2.9.35 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. A dewatering system such as deep bore wells will be installed to ensure that the groundwater level is maintained at least 2 to 3 m below the excavation level.

Concreting

- 2.9.36 The proposed works require an estimated 65,000 m³ of reinforced concrete.
- 2.9.37 Reinforced concrete is formed from steel reinforcement bars that are fixed in-situ and surrounded with fresh concrete. The concrete will be cured in-situ to the designed shape by means of timber or metal formwork panels. Once fully cured, the formwork will be removed to leave a hardened, reinforced concrete foundation.
- 2.9.38 The resources that will be used for concrete are concrete pumps, boom placer, Transit mixer, on site batching plant, vibrator for compacting concrete, and manpower.

Structural steel erection

- 2.9.39 The erection of steel structures will be undertaken as follows:
- Structural steel erection at any location will be taken up after completion of civil foundation and level has been marked.
 - The area in which erection activity is to be carried out will be properly levelled, dressed and compacted.
 - Different parts of the structure to be erected will 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 will be undertaken.
 - For tall, assembled structures, cranes of adequate capacity will 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 will be erected with roof purlins.
- In same sequence, columns, tie beams and roof truss with purlin will be erected.
- Simultaneously from start point crane girders will 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

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

Electrical

- 2.9.41 The electrical work will 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

- 2.9.42 Construction equipment would be mobilised for executing the construction work. Different construction equipment would be utilised for specific jobs. An indicative list of construction equipment and their uses are provided in **Table 2.5** below.

Table 2.5 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

Construction Equipment	Uses	Average per Month	Maximum Per Month
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)
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 2.6**, subject to planning permission.

Table 2.6 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.