HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project
Volume 8: Other Documents (Part 3/19)

8.2.2 Design and Access Statement - Volume 2 - Power Station Site

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HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Design and Access Statement: Volume 2

Power Station Site

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1 INTRODUCTION

Introduction

1.1 OVERVIEW

1.1.1 This Wylfa Newydd Power Station Design and Access Statement (Power Station DAS) sets out the process of design evolution for the operational development within the Power Station Site and will be a certified document under the Development Consent Order ("DCO").

1.1.2 Design details relating to the remainder of the Wylfa Newydd Development Area (WNDA) are set out in other documents as described later in this section.

1.1.3 The geographical terms listed above are shown on Figure 1-2 and defined as:

- **Power Station Site:** the indicative areas of land and sea (146 hectares) within which the majority of the permanent Power Station, Marine Works and other on-site development would be situated; and,
- **Wylfa Newydd Development Area:** the indicative areas of land and sea (463 hectares) including the areas surrounding the Power Station Site that would be used for the construction and operation of the Power Station, the Marine Works, the Site Campus and other on-site development.

1.1.4 The WNDA described in this document includes the Ecological Mitigation Sites and is consistent with the Order Limits. This is in comparison to the Environmental Statement which excludes the Ecological Mitigation Sites from the description of the WNDA, but includes consideration of those sites in the assessment.

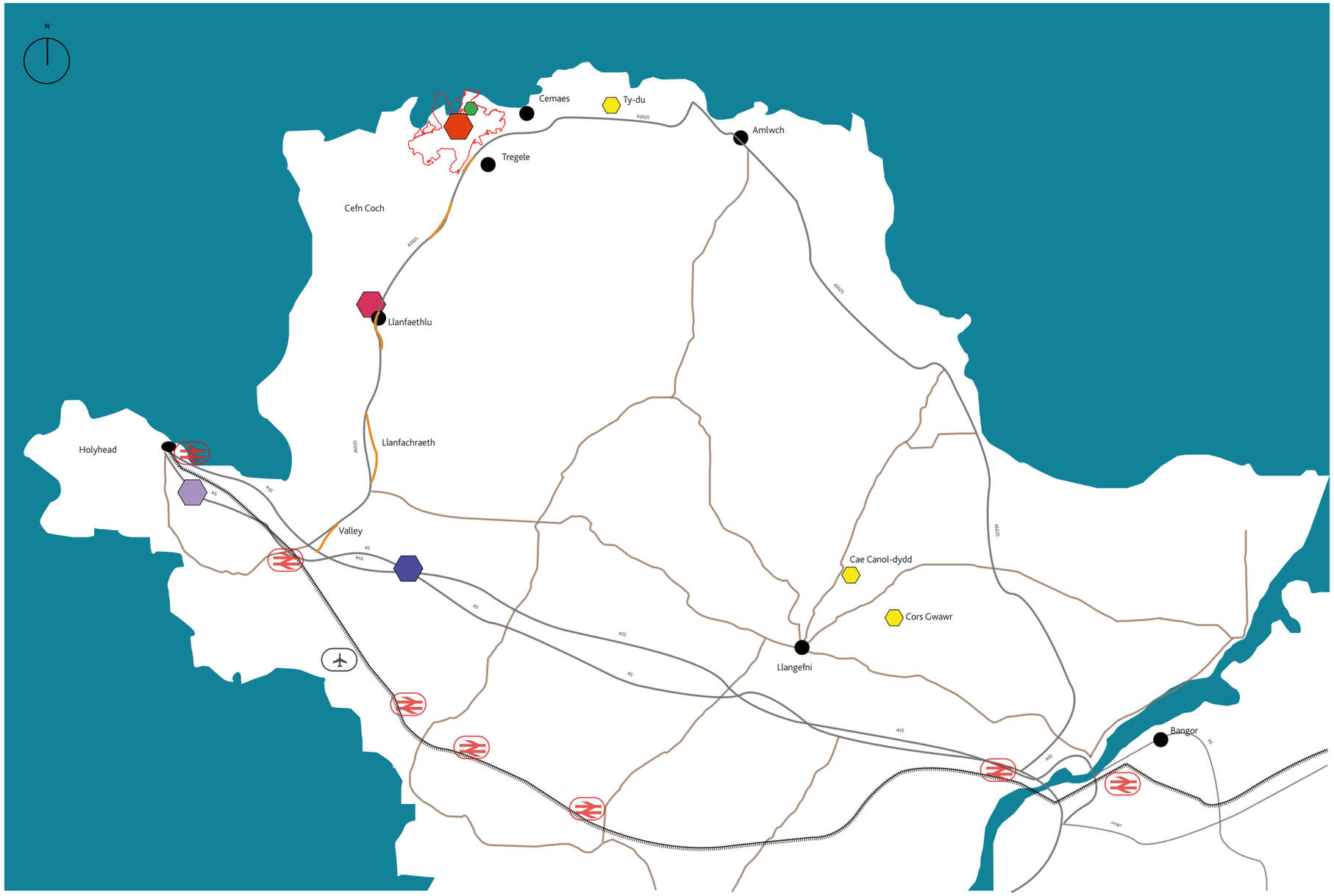
1.1.5 Development within the WNDA is referred to as WNDA Development:

- **Power Station:** the proposed new nuclear power station at Wylfa, including two UK Advanced Boiling Water Reactors, the Cooling Water System, supporting facilities, buildings, plant and structures, radioactive waste and spent fuel storage buildings and the Grid Connection (apparatus to transfer electrical energy to the National Grid high voltage electricity transmission network).
- **Marine Works:** comprising:
  - **Permanent Marine Works:** the Cooling Water System, the Marine Off-Loading Facility (MOLF), breakwater structures, shore protection works, surface water drainage outfalls, waste water effluent outfall (and associated drainage of surface water and waste water effluent to the sea), fish recovery and return system, fish deterrent system, navigation aids and Dredging; and
  - **Temporary Marine Works:** temporary cofferdams, a temporary access ramp, temporary navigation aids, temporary outfalls and a temporary barge berth.
- **Site Campus:** a temporary facility that would house up to 4,000 construction workers in modular type accommodation blocks, providing an independent living space for each worker, with shared campus-style amenities.
- **Other on-site development including:**
  - landscape works and planting;
  - drainage / surface water management systems;
  - public access works including temporary and permanent closures and diversions of Public Rights of Way (PRoWs);
  - new Power Station Access Road and internal site roads;
  - car parking;
  - construction compounds and temporary parking areas;
  - laydown areas;
  - working areas and temporary works and structures;
  - temporary construction viewing area;
  - diversion of utilities, electricity connections; and
  - perimeter and construction fencing.

1.1.6 This document applies to the Power Station Site during the operation period only. Therefore, the Power Station Site during the construction period is excluded. This is covered in the Landscape and Habitat Management Strategy ("LHMS") (Application Reference Number: 8.16) as construction works will occur across the WNDA as a whole.

1.1.7 The construction and operation of the Site Campus is considered separately in Design and Access Statement - Volume 3 - Associated Developments and Off-Site Power Station Facilities (Application Reference Number: 8.2.3).

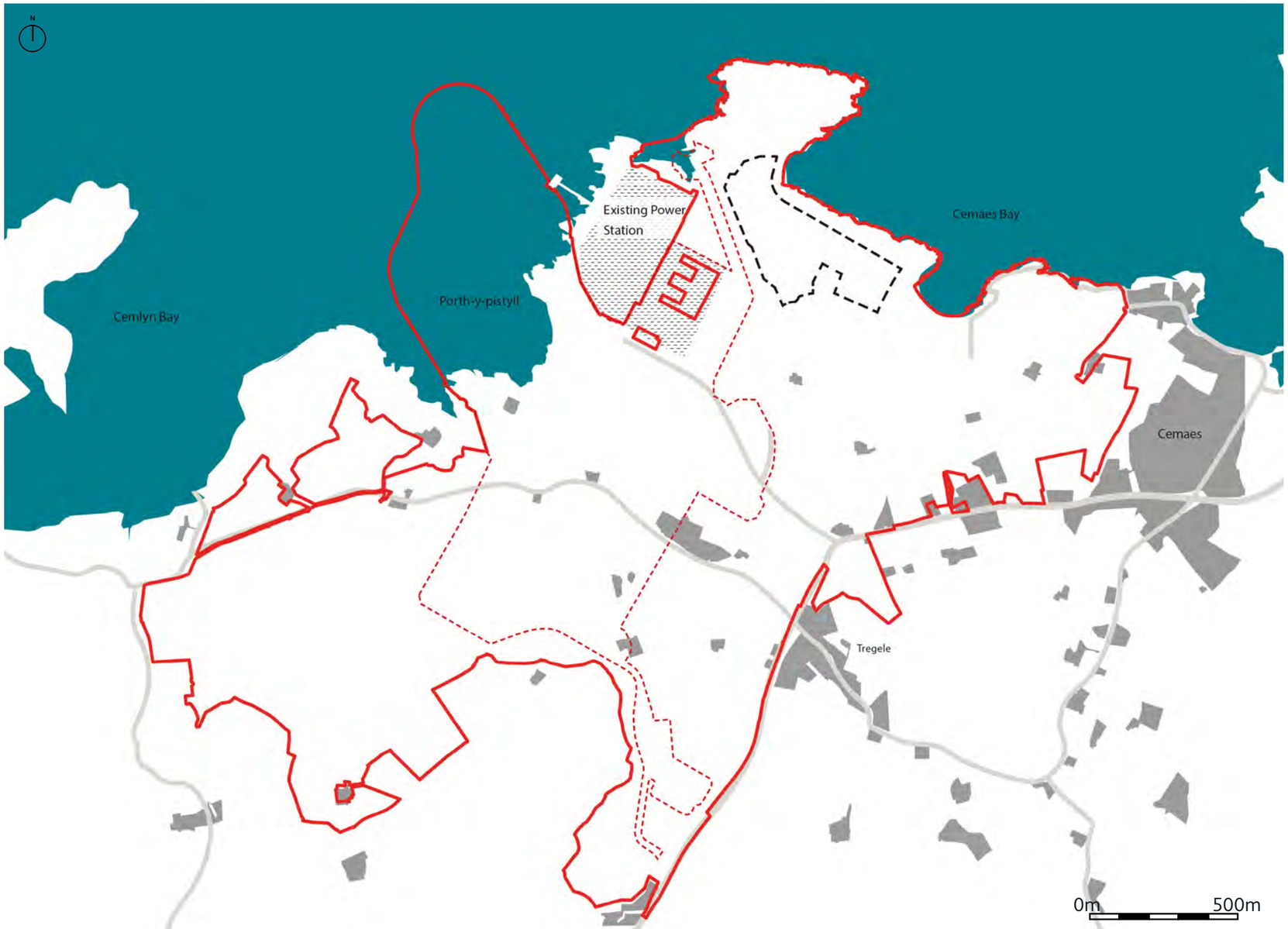
1.1.8 The location and extent of the Power Station Site, Site Campus and WNDA are shown on Figures 1-1 and 1-2 below.



Legend

Wylfa Newydd Development Area	Power Station Site
Railway Line	Parc Cybi Logistics Centre
Railway Station	Off-site Power Station Facilities
Airport	Dalar Hir Park and Ride facilities
A5025 Off-line Highway Improvements	Site Campus
	Ecological Compensation Sites

Figure 1-1 Location plan – County



Legend

- Wylfa Newydd Development Area
- Settlements
- Power Station Site
- Site Campus boundary

Figure 1-2 Location Plan - Local

1.2 APPLICATION OF THIS DOCUMENT

1.2.1 The Power Station DAS contains design principles and parameters, and subsequent detailed designs for which the Power Station Site will need to be in accordance with.

1.2.2 As explained in Section 3 of this document, detailed designs for the Power Station Site will need to be in accordance with the parameters set by the following approved drawings and DCO requirements:

- Power Station Site (WN0902-HZDCO-MSP-DRG-00002);
- Marine Works – permanent works (WN0902-HZDCO-MRN-DRG-00001);
- Marine Works – temporary works (WN0902-HZDCO-MRN-DRG-00002); and,
- Marine Works – dredging (WN0902-HZDCO-MRN-DRG-00003).

1.2.3 The design principles that subsequent detailed designs for the Power Station Site will need to be in accordance with are set out in Section 4. This will be secured by DCO Requirement.

1.2.4 The DAS also presents illustrative design proposals that demonstrate how the Power Station could be delivered in accordance with these principles and parameters.

1.2.5 Design and access considerations for the Wylfa Newydd DCO Project are split across three Design and Access Statement Volumes:

- **Volume 1** provides an overview of the entire Wylfa Newydd DCO Project including the Associated Development (Application Reference Number: 8.2.1);
- **Volume 2** (this document) relates to the Power Station Site; and,
- **Volume 3** relates to the Off-site Power Station Facilities and Associated Development, including the Site Campus, Logistics Centre, Park and Ride facility and Off-line Highway Improvements (Application Reference Number: 8.2.3).

1.2.6 Design principles for the remainder of the WNDA are contained within the Landscape and Habitat Management Strategy.

1.3 CONFORMITY WITH DAS GUIDANCE

1.3.1 The Power Station DAS has been prepared in the light of Technical Advice Note 12 [RD1] and Design and Access Statements in Wales – Why, What and How [RD2].

1.3.2 Further details on how the DAS conforms with this good practice and relevant guidance are set out in Volume 1.

1.4 STRUCTURE OF THIS DOCUMENT

1.4.1 This DAS is structured as follows.

- **Section 1:** introduces the development within the Power Station Site; describes how this document relates to Volumes 1 and 3 of the DAS; and defines how the design has to be based around meeting functional, operational maintenance, safety and security requirements in the Site Brief section.
- **Section 2:** provides a baseline description of the WNDA and the Power Station Site, for contextual purposes.
- **Section 3:** reviews design-related consultation feedback and explains how the proposed development has evolved in response to this and Horizon's optimisation process. This section also contains details of the development of the parameters. Future development on the Power Station Site must be in accordance with the parameters explained in section 3, as secured by DCO Requirement.
- **Section 4:** sets out the design concepts, which are based on the site context and consultation feedback, and inform the design principles, for indicative purposes only.
- **Section 5:** defines the design principles that Horizon will adhere to. Relevant detailed design will need to be in accordance with the principles set out in this section, as secured by DCO Requirement.
- **Section 6:** illustrates how the principles could be delivered, for indicative purposes only.
- **Section 7:** illustrates how the principles could deliver environmental sustainability and community safety, for indicative purposes only.
- **Section 8:** illustrates how accessibility and movement could be achieved, including car parking, servicing and highways, for indicative purposes only.
- **Section 9:** outlines the approach that could be taken to preparing a decommissioning strategy and managing spent fuel, intermediate level waste and low level waste, for indicative purposes only.

1.5 VISION AND OBJECTIVES

1.5.1 Horizon's vision for the Wylfa Newydd DCO Project is as follows:

- "We believe there is a compelling requirement for new nuclear power in the UK to help tackle the vital and complex challenge of delivering a sustainable energy future. As part of this vision Horizon will deliver secure affordable, low carbon energy for present and future generations."

1.5.2 In order to realise this vision, Horizon has set a series of objectives which are applicable to the Power Station:

- help to meet the energy challenge in the UK, by providing a reliable source of low carbon electricity;
- to be delivered in a safe and efficient manner;
- reflect the importance of its setting in Anglesey;
- uphold the unique culture and language of Anglesey;
- integrate sustainability into all physical designs;
- develop a green and sustainable approach in the development and management of the buildings and operational activities;
- be a good neighbour; keeping local disruption to a minimum throughout the Project life cycle;
- build on the legacy of the Existing Power Station, and help to create a positive legacy for Anglesey; thinking about each significant investment and how it can create a positive future for the area, where appropriate;
- ensure that all the elements are designed to connect with the varied beauty and character of Anglesey and conserve and enhance the natural environment as far as possible; and
- respect our communities and ensure that the effect of the Project on them is minimised and that opportunities to provide enhancements are taken, as far as possible.

1.5.3 The vision and objectives reflect the importance of the Power Station's setting on Anglesey. The Power Station will sit alongside the recently decommissioned Existing Power Station, and the two power stations will share the landscape setting on the northern coastline of Anglesey.

1.6 POWER STATION

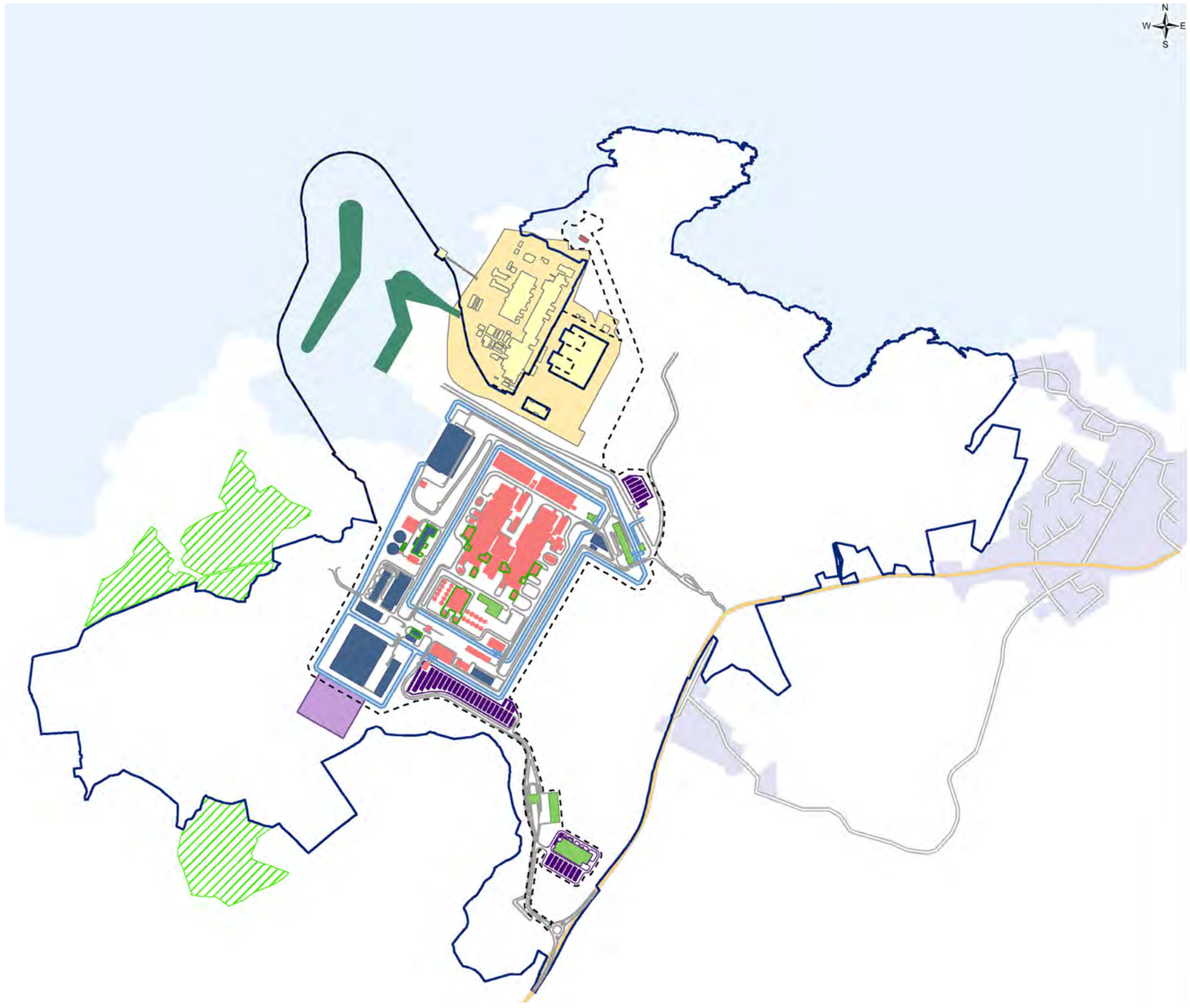
OPERATIONAL SITE LAYOUT

1.6.1 A description of the main buildings and structures is provided in this section. The Power Station would comprise a range of buildings, structures, facilities and features.

- **Main plant** – buildings that are located in and around the single power island and contain the plant that is particularly important for safe generation of electricity.
- **Common plant** – comprising those parts of the Power Station that support the process of generation of power and are shared between the two UK ABWRs (hereby referred to as the two "Units").
- **Supporting facilities, buildings, structures and features** – including those parts of the Power Station necessary to support the operation and maintenance of the Power Station, including offices and security facilities.
- **Grid Connection** – apparatus to transfer electrical energy to the National Grid high voltage electricity transmission network.

1.6.2 The illustrative locations of these components of the Power Station are shown on Figure 1-3:

1.6.3 The key buildings and structures are described below.



Legend

- Wylfa Newydd Development Area
- Power Station Site
- Existing Magnox Power Station
- Existing Magnox Power Station Buildings
- A5025
- Existing and new road layout
- Settlements
- Ecology Mitigation

Power Station

- Main plant
- Common plant
- Supporting facilities, buildings, structures and features
- Preffered location of decommissioning waste storage and processing fascilities
- Combustion installation Boundary
- Power Station internal road layout
- Marine off-loading facility and breakwaters
- Power Station fences
- Cooling Water System Outfall
- Car parking

*The Wylfa Newydd Development Area and the Ecology Mitigation Areas collectivley encompass the Order Limits

Figure 1-3 Indicative Power Station layout

MAIN PLANT

REACTOR BUILDINGS AND MAIN STACKS

1.6.4 The reactor buildings are a critical part of the Power Station and would be the tallest buildings on the Power Station Site. Each reactor building would have an discharge stack above the reactor building. The main stacks would provide the discharge point for the off-gas system (see turbine building description) and for the main ventilation system that would service the main buildings (reactor building, turbine building and radioactive waste building).

1.6.5 Each reactor building would house:

- A nuclear reactor;
- Main steam supply and part of the steam supply tunnel;
- Various safety systems;
- Fuel handling equipment;
- Suppression pool; and
- Spent fuel pool.

1.6.6 The spent fuel pool would be used for the storage of new nuclear fuel and the storage of spent fuel immediately after it has been removed from the reactor, prior to transfer to the spent fuel storage facility after a period of cooling.

1.6.7 The plant in the reactor buildings would be supported by safety and auxiliary systems. Each Unit would be served by a number of auxiliary systems, notably water cooling systems, which remove heat from the plant auxiliaries in order to preserve the required functions during all modes of operation.

TURBINE BUILDINGS

1.6.8 The two turbine buildings would house all equipment associated with the main steam turbine generators. This includes part of the steam supply system that feeds into the steam turbines, as well as the turbine power generators, the main steam condensers and the off-gas system. The off-gas system processes gases from the steam that do not condense in the condenser. The system includes processes to reduce radioactivity in the gaseous phase prior to discharge via the main stack.

CONTROL BUILDINGS

1.6.9 The control buildings would contain the main control room for the Units, as well as some of the electrical switchgear and support systems needed to supply electrical power to the Power Station's auxiliary systems. The main steam tunnels from the reactor buildings to the turbine buildings would be located on the ground floor of the control buildings.

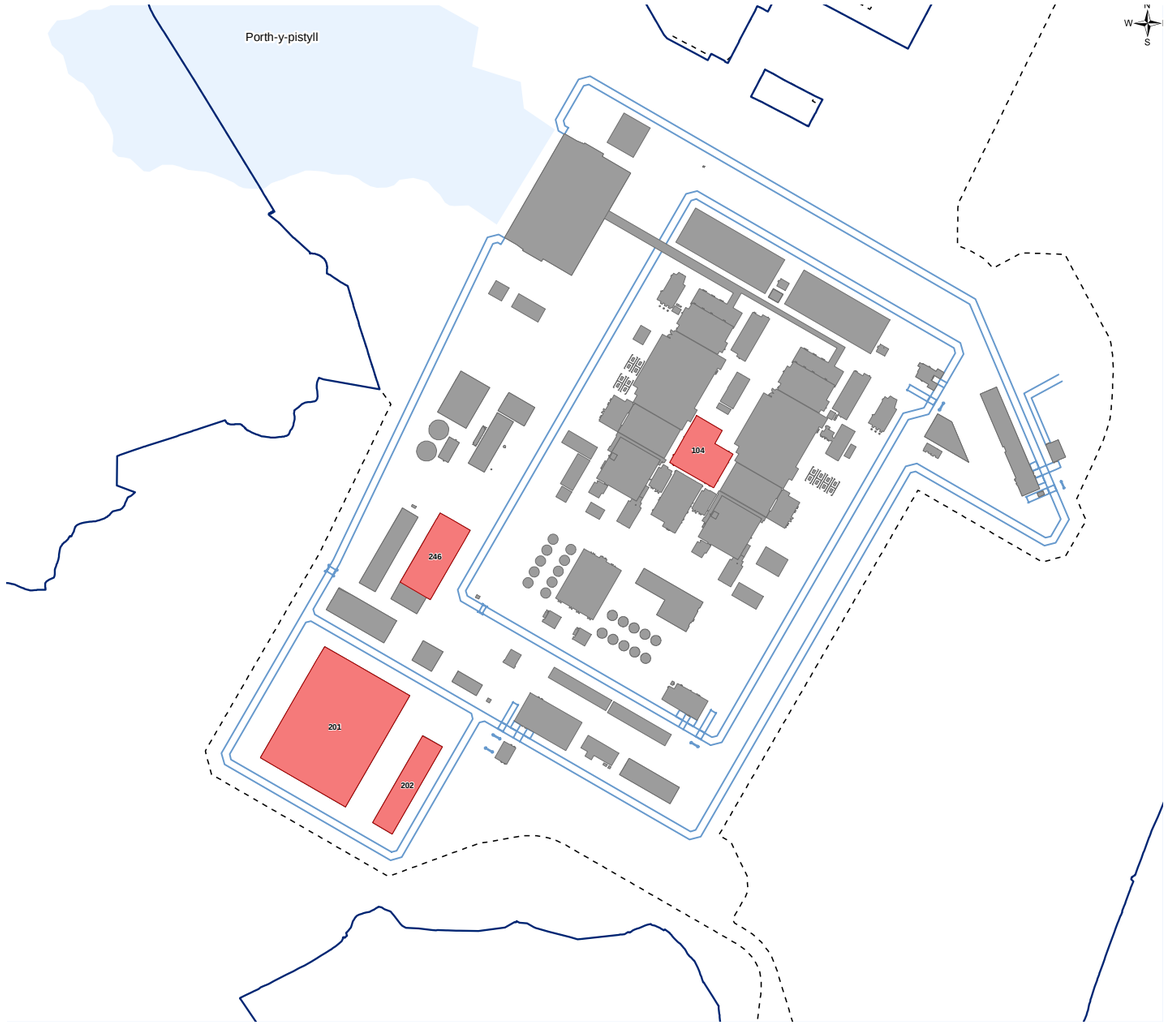


Figure 1-4 Indicative location of radioactive facilities

HEAT EXCHANGER BUILDINGS

1.6.10 The heat exchanger buildings would contain parts of the reactor building Cooling Water system and the turbine building Cooling Water system. The Systems would use seawater to cool essential plant and equipment, including the turbines and generators.

FILTER VENT BUILDINGS

1.6.11 The filter vent buildings would contain the filtration and monitoring equipment necessary to ensure that gases arising within the reactor buildings in emergency situations would be vented from these areas and released into the environment in a safe manner. In particular, in the extremely unlikely event of abnormally high pressure within the reactor primary containment vessels, safety systems would automatically relieve the pressure by venting gases and steam to the atmosphere via the filtered vent system, which would protect against harmful releases to the atmosphere.

BACK-UP BUILDING

1.6.12 The back-up building would provide alternative safety management capacity during an emergency if the control buildings and associated safety systems were not operational. This would include a diverse means of cooling the reactor cores and spent fuel pools.

EMERGENCY DIESEL GENERATOR BUILDINGS

1.6.13 Emergency alternating current power generation would be required to provide power to the Power Station safety systems that would support shut down and cooling the reactor in the event of loss of power. Three Emergency Diesel Generators (EDGs) per Unit would be required in addition to the back-up building to perform this function. One EDG would be located in each of the six EDG Buildings. Each EDG would be powered by a diesel engine and rated at 10.4MW (megawatts electrical output).

SERVICE BUILDING

1.6.14 The service building would contain functions essential to the operation of the Units, for example the personnel monitoring and welfare facilities. It would also contain other support functions for operation of the Power Station that must be located close to the Unit, such as chemistry and environmental laboratories.

RADIOACTIVE WASTE BUILDING

1.6.15 The radioactive waste building is part of the main power block, and serves both Units. The building would provide the following functions:

- Location for radioactive liquid effluent management systems. Operation and maintenance of the Units and associated systems would generate quantities of radioactive liquid effluent. The effluent management systems would clean the effluent to restore it to the Units' water quality specification and the effluent would be sent to storage tanks for re-use. The systems would comprise collection tanks, treatment systems, sample tanks and storage tanks.
- Location for wet solid ILW and Low Level Waste (LLW) storage and processing systems. Operation and maintenance of the reactors and associated systems would generate quantities of radioactive wet solid wastes in the form of spent resins and filter sludges (comprising particulate removed from the reactor coolant and condensate systems). Dependent on their source and the amount of radioactivity contained the wastes would be either ILW or LLW. The building would contain separate storage tanks for each category of waste to enable their efficient management. The building would also house processing capabilities for both ILW and LLW that would solidify the wastes in cement in approved containers that were compatible with their respective disposal requirements. For wet solid ILW, the waste packages would then be stored on-site until a national disposal facility (termed the Geological Disposal Facility (GDF)) became available. For wet solid LLW, the waste packages would be transported off-site to the Low Level Waste Repository (LLWR) in West Cumbria.

1.6.16 The radioactive waste building would be available for use during commissioning, operation and decommissioning.

1.6.17 The facility would vent any radioactive gaseous discharges via the main stack of Unit 1, in accordance with the limits established through the Environmental Permit that Horizon would need to hold. In general, processed effluent would be returned to storage tanks for re-use, but on occasion, it would be necessary to discharge small quantities of excess water. This would be discharged to sea via the Cooling Water System outfall after sampling and monitoring to demonstrate that it was within discharge limits specified in the Environmental Permit that Horizon would need to hold.

1.6.18 The indicative location of the radioactive waste building is shown on Figure 1-4.

MAIN PLANT GENERATOR AND AUXILIARY TRANSFORMERS

1.6.19 The electricity produced by each Unit would be transferred to the National Grid extra high voltage transmission network via the existing 400kV substation adjacent to the existing Power Station. The electrical power generated by the new power station would be transferred through either Gas Insulated Lines or cross-linked polyethylene cables. The connection equipment may be installed above ground, buried below ground or would be a combination of above and below ground.

COMMON PLANT AND SUPPORTING FACILITIES

MAKE-UP WATER TREATMENT BUILDING

1.6.20 The make-up water treatment building would comprise the water treatment systems used to make the demineralised water required for various plant systems including the auxiliary steam boilers. The building would be designed to accommodate the pumps, tanks, vessels and secondary equipment required to process mains water into demineralised water in a covered, controlled, internal environment. Mains water sourced from an upgraded local mains water supply would be processed into demineralised water. The demineralised water from this plant would be stored in purpose built tanks for use within the Power Station process.

1.6.21 The treatment process and its equipment would be based on the quality of the input and output water and the volume of throughput to the process system.

FIRE WATER PUMP HOUSES

1.6.22 The two fire water pump houses would accommodate four fire water pumps and electrical equipment required to supply pressurised water to the fire water main for the Power Station Site. Bulk water storage tanks would be located adjacent to the buildings and would be fed from the local mains water supply system, with at least two independent supply routes to give flexibility and redundancy, should one source of water fail.

EMERGENCY RESPONSE CENTRE

1.6.23 Personnel, equipment and vehicles intended to respond to an incident within the Power Station Site, including fire response, would be housed within the emergency response centre.

GARAGE FOR MOBILE EMERGENCY VEHICLES

1.6.24 This would house mobile vehicles and equipment that would provide emergency cooling, fire control and emergency power supply (in case the back-up building or EDGs are unavailable).

AUXILIARY BOILER BUILDING

1.6.25 The auxiliary boiler building is a facility to house the auxiliary steam supply boilers and associated equipment that would be used for plant start-up and operation of various loads requiring conventional steam supply. There would be six fuel oil fired boilers in the combustion installation, located in the auxiliary boiler building. Four boilers would discharge emissions through a shared stack containing four flues (north stack), and two boilers would discharge through a shared stack containing two flues (south stack). The auxiliary boiler building serves both Units.

1.6.26 The building would be designed to accommodate the boilers, secondary equipment and would provide a covered controlled internal environment to house the equipment.

1.6.27 The building would have a number of associated support facilities located in the vicinity of the boiler house including:

- fuel oil storage tanks;
- purified water storage tanks; and
- ancillary equipment inside the building.

COOLING TOWERS

1.6.28 The cooling towers comprise wet cell cooling towers, arranged in two sets (one for each Unit). These cooling towers would be used during certain emergency events and support routine operational testing. They would remove decay heat from the core and all other auxiliary systems in the event of an impairment of auxiliary service water flow.

1.6.29 The cooling towers would be connected directly to the reactor building Cooling Water system in the heat exchanger building.

1.6.30 The cooling towers would automatically be deployed to effect the safe shutdown of the reactor.

OTHER GENERATORS

1.6.31 There would be four Back-up Building Generators (BBGs), located in the back-up building. Each BBG would be powered by a diesel-fuelled compression ignition engine rated at 4.8 Megawatt electric (MWe).

1.6.32 There would be two Auxiliary Standby Generators (ASGs), which would be housed in the auxiliary standby generator building, located in the south of the installation. Emissions from both ASGs would be via a twin-flue stack in a common windshield. Both ASGs would be powered by a diesel-fuelled compression ignition engine rated at 3.6MWe, situated within acoustic enclosures.

CONVENTIONAL WASTE STORAGE

1.6.33 The waste and recycling facility (conventional and hazardous waste building and conventional waste storage compound) would be for conventional waste and hazardous waste streams (such as fluorescent tubes, batteries, flammable liquids, paints, or aerosols), including a specific area for the storage of hazardous waste. It would provide facilities for the collection, sorting and temporary holding of waste and recyclable materials generated within the Power Station Site. Collection and removal of sorted waste would occur on a regular basis.

ADMINISTRATION BUILDING

1.6.34 The administration building would provide office accommodation for up to 300 permanent personnel and up to 50 visitors. The building would form the main reception for invited visitors to the Power Station, as well as including restaurant facilities, a dosimetry office and the primary document control centre for the Power Station.

MAINTENANCE FACILITY

1.6.35 The maintenance facility would incorporate workshop spaces for heavy and light mechanical, electrical, control and instrumentation activities, and a laboratory. It would also provide office, welfare and occupational health space for maintenance staff, as well as meeting facilities, a permit office, stores and maintenance planning facilities.

SIMULATOR AND TRAINING BUILDING

1.6.36 The simulator and training building would house two full scope simulators of the Power Station Units, as the primary tool for training operators. The building would also house classrooms and related training facilities. The facility would be used as soon as it is available during Main Construction for staff training. The facility may be required for use 24 hours a day.

OUTAGE BUILDING

1.6.37 The outage building would provide canteen facilities, changing room facilities and welfare for day and night shift personnel. It would also house an outrage control centre, maintenance control centre, permit office, store and management office. It would only be brought into use during periods of outage and planning, implementation and close out; however, the building would be permanently manned, including times between outages.

CYLINDER STORAGE HOUSE

1.6.38 A gas storage house would be located on the Power Station Site in order to store gases that would be used routinely in operational processes. These gases would be stored in suitably sized tanks or cylinders depending on the specific technical requirements.

SWITCHGEAR BUILDINGS

1.6.39 There would be one switchgear building per Unit that would house the 6.9kV switchgear; and heating, ventilation, and air conditioning (HVAC) plant.

PLANT LOGISTICS WAREHOUSE

1.6.40 A warehouse provided for receiving deliveries.

FUELLING STATION

1.6.41 The fuelling station would contain a fuel pump for refuelling site vehicles.

FOUL WATER PUMPING STATION

1.6.42 The foul water pumping station would comprise a buried chamber with package pumps for the pumping of foul water from the WNDA Development to the existing Dŵr Cymru Welsh Water (DCWW) Cemaes waste water treatment plant.

INTAKE SCREEN STRUCTURE FOR AUXILIARY SERVICE WATER SYSTEM

1.6.43 The auxiliary service water system provides cooling to auxiliary systems in the Power Station and also removes the heat generated within related equipment and rooms.

BIOCIDE PLANT

1.6.44 Facilities to enable on-site generation and dosing of Cooling Water with biocide or facility to store biocide delivered in bulk.

GRID CONNECTION

1.6.45 The Power Station would be connected to the 400kV National Grid system via the existing National Grid 400kV substation at the Existing Power Station. There are two circuits per generating unit, therefore a total of four circuits for the Power Station. Responsibility for the 400kV connection between Power Station and the substation and the termination within the substation, including any associated planning consents, rests with Horizon. Responsibility for the substation, including wider transmission network reinforcements, and associated planning consents, rests with National Grid.

RADIOACTIVE WASTE MANAGEMENT

1.6.46 Radioactive waste would be generated during the operation of the Power Station, primarily due to nuclear fission of the fuel, activation of impurities in the reactor water and activation of corrosion products in the reactor circuit. In the UK, radioactive wastes are classified in terms of the nature and quantity of radioactivity they contain and the heat they produce. The categories are broadly divided into Higher Activity Radioactive Waste (HAW) and Lower Activity Radioactive Waste (LAW) as explained below.

HIGHER ACTIVITY RADIOACTIVE WASTE

1.6.47 HAW is made up of High Level Waste (HLW) and ILW. HLW is waste that is sufficiently radioactive for its decay heat to significantly increase its temperature and the temperature of its surroundings, such that heat generation has to be taken into account in the design of storage and disposal facilities.

1.6.48 ILW is waste exceeding the upper boundaries for LLW but which does not require heat generation to be taken into account in the design of storage or disposal facilities.

1.6.49 There is currently no available UK disposal facility for HAW and therefore it is required to be managed on-site in the interim. The Power Station design will therefore need to incorporate facilities and capabilities to manage the production, processing and storage of HAW.

LOWER ACTIVITY RADIOACTIVE WASTE

1.6.51 Lower Activity Waste (LAW) has a radioactive content not exceeding 4GBq (Giga Becquerels) per tonne of alpha activity, or 12GBq per tonne of beta/gamma activity.

1.6.52 Very Low Level Waste (VLLW): VLLW is a sub-set of LAW with lower levels of radioactivity which enable its disposal to specific landfill sites that hold appropriate Environmental Permits.

1.6.53 LAW would be transported from site to treatment and/or disposal facilities that hold appropriate Environmental Permits. The waste would generally be removed from site shortly after being produced and therefore on-site storage is limited to the collation of transportable quantities of waste, with some in-built contingency should any off-site route be temporarily unavailable. The design incorporates facilities and capabilities to manage the production, processing and buffer storage of LAW.

LOWER ACTIVITY WASTE MANAGEMENT FACILITY

1.6.54 The LAW management facility would provide the capability for management of dry solid LAW. Dry solid LAW would arise from operational and maintenance activities within the radioactive facilities on the site. The wastes would be sorted, segregated and containerised at source into suitable approved metal containers. These would then be transferred across site to the LAW management facility.

1.6.55 The facility would also include floor space to enable the construction of modular containment systems to support any ad-hoc small scale waste processing that may be required during the operational phase of the site.

1.6.56 There would be one shared LAW management facility for the two Units and this would be constructed during the Main Construction phase of the Power Station, available for use during commissioning, operations and decommissioning.

1.6.57 The facility would vent any radioactive gaseous discharges via a small ventilation stack above the ridgeline of the roof, in accordance with the limits established through the Environmental Permit that Horizon would need to hold.

1.6.58 The indicative location of the Lower Activity Waste Management Facility is shown on Figure 1-4.

INTERMEDIATE LEVEL WASTE STORAGE FACILITY

1.6.59 The ILW storage facility would provide long-term on-site storage for packages of solidified wet solid ILW produced in the radioactive waste building. The facility would comprise a concrete shielded store in which the packages would be remotely handled using an overhead crane. The design would incorporate a shielded ILW transporter to transfer the packages from the radioactive waste building to the storage facility.

1.6.60 There would be one shared ILW storage facility for the two Units and this would be constructed after the Main Construction phase of the Power Station, to be available for use approximately ten years into the operations phase. The store would not be required at commencement of operations, as it would take a number of years to accumulate the first quantity of wet solid ILW for processing.

1.6.61 The facility may require a small ventilation stack above the ridgeline of the roof, to support ventilation of the facility to control environmental conditions. There would be no radiological gaseous discharge from this facility.

1.6.62 The store would remain in operation until the waste packages could be disposed of to the GDF.

1.6.63 The indicative location of the Intermediate Level Waste Storage Facility is shown on Figure 1-4.

SPENT FUEL STORAGE FACILITY

1.6.64 The spent fuel storage facility would provide long-term storage for shielded dry storage casks containing spent fuel and HLW. Spent fuel and HLW would be stored in separate purpose designed cask types. The facility would comprise a simple overbuilding to provide environmental and security protection for the casks. Radiological shielding of the spent fuel and the HLW would be provided by the storage casks.

1.6.65 The spent fuel would arise as a result of reactor operations and would be removed from the reactors during outages. The spent fuel would undergo cooling in the spent fuel pools in the reactor buildings for approximately 10 years before being transferred into the dry storage casks.

1.6.66 The HLW would arise in the form of activated reactor components (spent control rods etc.) and would be removed from the reactors during outages. The HLW would undergo cooling and radiological decay in the spent fuel pools in the reactor buildings for approximately 10 years before being transferred into the dry storage casks.

1.6.67 The facility would comprise a simple overbuilding to provide environmental and security protection for the casks. Radiological shielding of the spent fuel and the HLW would be provided by the storage casks.

1.6.68 There would not be any aerial or liquid discharges from this facility.

1.6.69 There would be one shared spent fuel storage facility for the two Units and this would be constructed after the Main Construction phase of the Power Station, to be available for use approximately 10 years into the operations phase. The store would not be required at commencement of operations as the spent fuel and HLW is stored in the spent fuel pool for up to 10 years prior to transferring to dry storage casks.

1.6.70 The indicative location of the Spent Fuel Storage Facility is shown on Figure 1-4.

MARINE WORKS

PERMANENT MARINE WORKS COOLING WATER SYSTEM

1.6.71 The Cooling Water System is comprised of three individual components, all of which share a common intake structure:

- circulating water system;
- reactor building service water system; and
- turbine building service water system.

1.6.72 The circulating water would be used primarily to condense the steam leaving the steam turbine as well as the reactor. The Cooling Water System incorporates the following.

- Cooling water intake structure and pump house (to draw Cooling Water in from the sea), including screening and Fish (and invertebrate) Return and Recovery systems.
- Circulating water system pipes from the intake structure and pump house to the turbine buildings, which would be routed underground – there would be a set of these for each Unit.
- Reactor building service water system/turbine building service water system pipes from the intake structure to the heat exchanger building where both the pumps and heat exchangers are located.
- Seal pits (required for the hydraulic system design and mixing), one for each Unit where the Cooling Water would be returned after cooling prior to discharge back to the sea.
- Outfall tunnels, to transfer Cooling Water from the seal pits to the outfall structure. These structures would be buried – there would be a set of these for each Unit.
- Cooling Water outfall (to return Cooling Water to the Irish Sea).

1.6.73 Horizon has elected for a once-through circulating water system, using seawater abstracted from the Irish Sea.

1.6.74 The closed loop reactor building service water system and the turbine building service water system use heat exchangers to remove heat from a number of plant operational and safety critical systems.

COOLING WATER INTAKE

1.6.75 The Cooling Water Systems require the construction of an intake channel and forebay structure with screening and acoustic fish deterrents. The Cooling Water intake would be located in the south-east corner of Porth-y-pistyll.

1.6.76 The Cooling Water intake forebay would be situated within the Cooling Water intake channel. It would comprise coarse raked bar screens and a concrete lined water pit. The raked bar screens would collect organic debris (e.g. seaweed) and other floating debris. The water pit would collect deposited sediment and other sunken debris. The coarse raked bars are located in front of fine mesh drum screens (for the main Cooling Water intake) and band screens (for the service water intake).

COOLING WATER SYSTEM OUTFALL

1.6.77 A Cooling Water outfall structure would be constructed in Porth Wnal adjacent to the Existing Power Station outfall within the boundary of the Porth Wnal Dolerite Regionally Important Geological/Geodiversity Site. The Cooling Water outfall would take the form of a reinforced concrete open spillway channel sloping down from two tunnel outlets.

1.6.78 The Cooling Water outfall would be fed by two discharge tunnels (one tunnel per Unit) which would be approximately 1.1km in length from their respective seal pits to their outlets into the Irish Sea. Seal pits are required for the hydraulic system design and mixing within the Cooling Water System prior to pumping to sea.

1.6.79 The Cooling Water outfall has been designed to help propel the thermal plume, promote mixing and dispersal of associated biocide products to the north of Wylfa Head where the offshore currents would aid decay and dispersion, and reduce the risk of recirculation.

MARINE OFF-LOADING FACILITY (MOLF)

1.6.80 The MOLF would provide two purpose-built quays (see figure D1-12; Application Reference Number: 6.4.101):

- a bulk quay (with two berths); and
- a Roll-on Roll-off (Ro-Ro) quay.

1.6.81 The MOLF use would offset the need for the delivery of a considerable quantity of construction materials by road and, therefore, would reduce the volume of road traffic.

1.6.82 The bulk quay would extend between the eastern breakwater and the Ro-Ro quay and comprise two berthing platforms, each with four mooring dolphins (i.e., eight in total). The area between the two platforms would be either a revetment or a continuous quay wall, and for the purposes of modelling and assessment, a revetment has been assumed. The bulk quay would provide berthing facilities for bulk vessels and unloading facilities for bulk materials. The area behind the platforms and dolphins would be filled to a platform level of between +5mAOD or +6mAOD, and would be protected by a rock armour revetment.

1.6.83 The Ro-Ro quay would extend eastwards from the southern end of the bulk quay (i.e., towards the shoreline) and comprise a quayside used primarily for Ro-Ro vessels and Lift-on Lift-off (Lo-Lo) vessels, incorporating a ramp for ship-to-shore transfer of AILs and Lo-Lo of equipment and materials by cranes. Its quay wall would be approximately 100m in length and its quay surface would be set at a platform level of between +5mAOD or +6mAOD. The quay wall for the Ro-Ro ramp would be set at the same level as the bulk berth quay surface level, with the toe of the sloping ramp used to receive AILs being at approximately +3.5mAOD, thereby providing a shallow gradient up to the general quay level. The quay wall would continue towards the Cooling Water intake, and the base of the wall would match the level required for the Cooling Water intake.

PONTOON

1.6.84 A pontoon would also be required for mooring tugboats, pilot vessels, safety boats and other small workboats during the construction of the Power Station. It would be a floating structure located between the Ro-Ro berth and the Cooling Water intake structure.

BREAKWATERS

1.6.85 There would be two breakwaters extending out into Porth-y-pistyll that would provide protection and create acceptable wave conditions for operation of the Cooling Water intake equipment; hereafter referred to as the western breakwater and the eastern breakwater. The breakwaters would also provide sheltered conditions for vessels accessing and berthing at the MOLF.

1.6.86 The western breakwater would not be connected to the shore. From its landward end it would be aligned approximately south-west to north-east and then kinked approximately south to north. The eastern breakwater would be connected to the shore. From its landward end, it would be aligned approximately south-east to north-west.

SHORE PROTECTION

1.6.87 Adequate shore protection would be provided where dredging or excavation could lead to shore erosion and/or unacceptable wave overtopping discharges.

1.6.88 Shore protection would take the form of rock revetments or seawalls and would be tied in with the adjacent structures (e.g., breakwaters, quay walls and Cooling Water intake channel).

DRAINAGE OUTFALLS

1.6.89 There are a number of surface water discharges direct to the marine environment during construction and during operation of the Power Station. Construction surface water drainage would discharge, following treatment, at two locations into Porth-y-Pistyll. In addition, the cofferdam structures would be drained of both surface water and ground water ingress via a pumped discharge, following treatment, at the centre of the cofferdam. The cofferdam drainage would operate during the period required for construction.

1.6.90 The construction surface water would discharge through a headwall structure with an appropriate valve or gate to minimise seawater intrusion when the outfall is submerged.

FISH RECOVERY AND RETURN SYSTEM AND FISH DETERRENT

1.6.91 Measures to reduce the entrapment of marine organisms into the Cooling Water System are described in volume D, chapter 1 of the Environmental Statement (Application Reference Number: 6.4.1).

AIDS TO NAVIGATION

1.6.92 Aids to navigation would be installed to provide safe navigation for vessels during both construction and operation.

OTHER ON-SITE DEVELOPMENT

1.6.93 During the operational phase of the Power Station, the following will be required:

ACCESS ROADS

1.6.94 A new Power Station Access Road would be required to connect to the existing A5025 highway via a new roundabout.

CAR PARKING

1.6.95 On-site car parking would be available for the Power Station and will comprise approximately:

- 200 parking spaces at the simulator and training building;
- 200 permanent parking spaces and a maximum 650 temporary spaces located on grasscrete or similar surfacing, in the northern car park; and
- 700 parking spaces (including 20 disabled parking spaces) in the southern car park.

INTERNAL ROADS

1.6.96 A network of internal roads and pedestrian walkways would be provided to facilitate the safe and efficient movement of staff and equipment around the Power Station Site. Certain roads will be designed to accommodate AILs associated with the replacement of large components of the Power Station or the transfer of spent fuel to the spent fuel storage facility.

SECURITY FENCING

1.6.97 There will be an inner security fence and an outer security fence. Both fence arrangements comprise double fences and will comply with the UK Government standards.

LIGHTING

1.6.98 External lighting would be required at the Power Station Site with lighting levels generally at the minimum necessary level to enable safe and secure operation.

1.6.99 During operation, it is likely that lighting would be required for the main stacks (aviation warning lights), the site access road, permanent site roadways and car parks, office buildings and perimeter lighting of the inner and outer security fences, which is a statutory requirement for nuclear sites. In addition, there would be a low level of pedestrian amenity lighting required across the Power Station Site to aid safe pedestrian movement.

DRAINAGE

1.6.100 The surface water drainage design for the Power Station Site is based on the collection of storm water from rooftops and impermeable road surfaces and discharge to sea. Between the inner and outer fences, storm water would be drained via interceptors and monitoring to sedimentation ponds prior to discharge to Porth-y-pistyll, at locations north and south of the Cooling Water intake structure.

1.6.101 Appropriate collection systems would be designed which would include drainage pipes, ditches and channels. The ditches/swales would be connected to natural settlement ponds to attenuate and treat surface water. Drainage from areas of the site containing environmental hazards would be designed accordingly and would not connect to the storm water drainage system unless intercepted and suitably treated (e.g. via oil/petrol inceptor) or diverted to a treatment system (if there is a possibility of contamination).

DEWATERING

1.6.102 During the operation of the Power Station, no active groundwater dewatering outside of basements would be required. However, a passive (gravity) drainage system at approximately 6mAOD would be installed around the deep basements with this water being directed to the sea.

WASTE WATER DISPOSAL

1.6.103 A new waste water pumping station is required in the Power Station Site to pump waste water from the Power Station to the Cemaes waste water treatment works.

1.7 SITE BRIEF

1.7.1 The design of the Power Station, Marine Works and other on-site development has to be based around meeting functional, operational, maintenance, safety, security and environmental requirements, achieving the construction and operation of a cost-effective and efficient Power Station.

1.7.2 Horizon have identified the requirements set out below with which the design will have to accord. Consultees were unable to influence these specific elements of the scheme, as set out in the consultations described further in section 3 of this document.

POWER STATION

- Provide a platform height which supports the categorisation of the site as a "dry site" in respect of coastal flooding.
- Provide direct access to the Irish Sea to provide a ready supply of cooling water.
- Limit interference with the Existing Power Station access road to help coordinate with the planned decommissioning of the Existing Power Station.
- Maintain the potential for National Grid to continue using the existing 400 kilovolt overhead transmission lines and substation, to reuse existing infrastructure.
- The siting and orientation of the main plant should create direct and efficient connections with the National Grid substation and the Cooling Water System intake and outfall for safety and functional reasons.
- Geographically cluster the service building, control buildings, radioactive waste building, reactor buildings, filter vent building, emergency diesel generator buildings and turbine buildings to allow for a single area to be provided for radiation control and additional access restrictions access to all the buildings within the cluster should be possible without leaving the building once you have entered through the service building.
- The two UK ABWRs are required to be set apart to allow for safe operation and maintenance. The radioactive waste building and service building should be located between them for efficiency as they are shared facilities.
- The distance between the generator transformer and the National Grid substation should be as low as reasonably practicable to minimise cost.
- The auxiliary service water system intakes and screening should be located either side of the Cooling Water intake with the pumping installation for these systems located in the heat exchanger building.
- The back-up buildings should be located separate from the reactor buildings and should have separate power and water supplies for safety purposes.
- Locate the heat exchanger buildings close to the turbine and reactor buildings in order to reduce pipe runs and response time between them.
- Locate the fire water pump house and make-up water treatment building close to the main plant to minimise losses of water and for pumping efficiency in case of fire.
- Locate the emergency response centre with good access to the main plant to facilitate a quick response in an emergency situation.
- Locate the auxiliary boiler building close to the main plant for efficiency and economy.
- Locate the cooling towers close to the heat exchanger buildings for operational and safety reasons.
- Locate the conventional waste storage close to the main plant to facilitate the sorting and temporary storage of conventional waste generated at the Power Station before onward recycling or disposal.
- The maintenance facility should be adjacent to the main plant as it is required to serve the main plant 24 hours per day.
- The simulator and training building should be located outside the outer site security fence and with convenient access to the A5025 so that it can be fully developed early in the construction programme to facilitate training.
- The outage building should be located where high numbers of outage (contractor) staff can be managed and controlled through an independent access route, and should facilitate the efficient movement of people between the outage building and the turbine buildings.
- Radioactive waste management facilities should be clustered together for constructability and safety benefits, and with good access to the main plant to minimise the distance of transfer routes for radioactive waste.
- The administration building, outage building and emergency command and control facilities should be located near to the Power Station entrance points to minimise the need for staff and visitors to access other parts of the Power Station and allow internal and external emergency responders to coordinate at the earliest point.
- The roads within the boundary fencing should allow for maximum expected loads during construction and operation.
- The road layout within the Power Station Site will facilitate appropriate emergency access.

MARINE WORKS

- The footprint of the Marine Works should be as small as reasonably practicable, because this will typically minimise adverse environmental impacts.
- The breakwaters should utilise interlocking modular concrete blocks.

LANDSCAPE DESIGN

- There shall be no soft landscaping within the inner security fences for operational reasons.
- Soft landscaping beyond the inner security fence and within the outer security fence should generally not comprise planting taller than 1m in height. Dense areas of planting that restrict sightlines should be avoided.
- There should be no soft landscaping in the void between the inner security fences and in the void between the outer security fences.
- There should be no soft landscaping, street furniture or paths within 10m of any security fence on the Power Station, with the exception of security fencing for the simulator and training building. Stock fencing, or similar, should define the outer edge of the 10m zone for the outer security fence. The 10m clear zones to the nuclear site should be finished with gravel. The clear zone to the simulator and training building fence may be grass.
- All tree planting should be set a minimum of 10m clear from the Power Station Access Road for security reasons.
- Trees within parking areas should be carefully selected and should not be located where they obscure CCTV sightlines.

OTHER ON-SITE DEVELOPMENT

- A three-arm at grade roundabout should be provided at the junction of the A5025 and the Power Station Access Road, because the site has to be accessible from the A5025 by road and the volume of traffic requires the provision of a roundabout.
- The junction should be sited where it provides an appropriately level platform for the junction, given the existing topography, and affords suitable visibility on all approaches for highway safety purposes.
- The Power Station access road should provide the most efficient route between the A5025 and Power Station, whilst conforming to highway safety and technical requirements.
- Car parks are required, adjacent to: the main site entrance, simulator and training building; the outage building; and, the administration building, for operational purposes.

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2 CONTEXTUAL ASSESSMENT

Contextual Assessment

2.1 PHYSICAL ASSESSMENT

2.1.1 This section describes the key features of the WNDA and surrounding context that have the potential to inform the design of the Power Station Site. A more detailed description can be found in volume D, chapter 10 of the Environmental Statement (Application Reference Number: 6.4.10).

ISLE OF ANGLESEY

2.1.2 The Power Station is proposed to be located on the Isle of Anglesey, to the west of Cemaes and south-west of the Existing Power Station, as shown on Figure 2-1.

2.1.3 The main road to the WNDA and Power Station Site is the A5025, which connects to Valley (located on the A5) and the A55, approximately 18km to the south. To the east, the A5025 runs to Cemaes and other settlements on the northern and eastern coasts of Anglesey. Outside the settlements, this road passes through areas that are predominantly rural in nature.

2.1.4 The North Wales Coast Railway Line serves Anglesey. It links the railway stations on the west side of the island between Holyhead and the mainland and onwards along the north Wales coast towards Chester, including occasional direct trains from Holyhead to London and connections to other destinations on the UK network. The nearest station to the WNDA and Power Station Site for passengers is at Valley.

2.1.5 The principal port on Anglesey is Holyhead, which handles large volumes of freight and passenger traffic. The closest airport is at Valley (Anglesey Airport), which is used by a small number of scheduled and charter flights and is an operational base for the Royal Air Force (RAF Valley).

2.1.6 The location of Associated Development and Off-site Power Station Facilities in relation to the Power Station is shown on Figure 1-1.

WYLFA NEWYDD DEVELOPMENT AREA

2.1.7 The WNDA stretches over 3km from west to east. From the coast, it extends southwards up to 3km from Wylfa Head, occupying an undulating lowland landform ranging from sea level at Porth-y-pistyll, up to approximately 42m Above Ordnance Datum (AOD) south of Cemlyn Road. The extent of the area is shown on Figure 2-1.

2.1.8 The Existing Power Station bordering the WNDA to the north, along with the associated overhead lines and pylons, comprise an important component of the existing local landscape context.

2.1.9 To the north, the WNDA adjoins the Existing Power Station on three sides and encompasses Wylfa Head and the coastal cliffs that extend eastwards towards Cemaes, which define part of the northern boundary of the WNDA. South-west of the Existing Power Station, the northern boundary of the WNDA adjoins the small bay at Porth-y-pistyll. At Porth-y-pistyll, part of the WNDA boundary extends inland, and west alongside Cemlyn Road.

2.1.10 To the east of the WNDA lies the village of Cemaes, separated from it by a narrow band of agricultural land. The A5025 follows much of the boundary of the WNDA to the south-east, except where interspersed by residential properties between the Existing Power Station access road and Cemaes. The small settlement of Tregele lies on the east side of the A5025 adjoining the WNDA. The south-western boundary of the WNDA adjoins agricultural land and Cae Gwyn SSSI.

2.1.11 Wylfa Head is a rocky area of headland which forms the northern extent of the WNDA. This area is rural in nature and provides views of the Irish Sea and views across the headland towards Llanbadrig Point.

2.1.12 The WNDA can be accessed from the A5025 via the Existing Power Station access road, Cemlyn Road or Nanner Road.

POWER STATION SITE

2.1.13 The Power Station Site (PSS) sits within the WNDA, as shown on Figure 2-1. It represents a third of the WNDA area and covers an area of approximately 146 hectares. It ranges from sea level at Porth-y-pistyll to 42m Above Ordnance Datum (AOD) south of Cemlyn Road.

2.1.14 The PSS includes Porth-y-pistyll on the West, a section of the Dame Sylvia Crowe designed woodland adjacent to the east of the Existing Power Station, part of the Cemlyn road and Existing Power Station access road, the existing treatment facilities near Wylfa Head, along with land for the proposed access road stretching along the south of the WNDA to the A5025, south of Tregele.

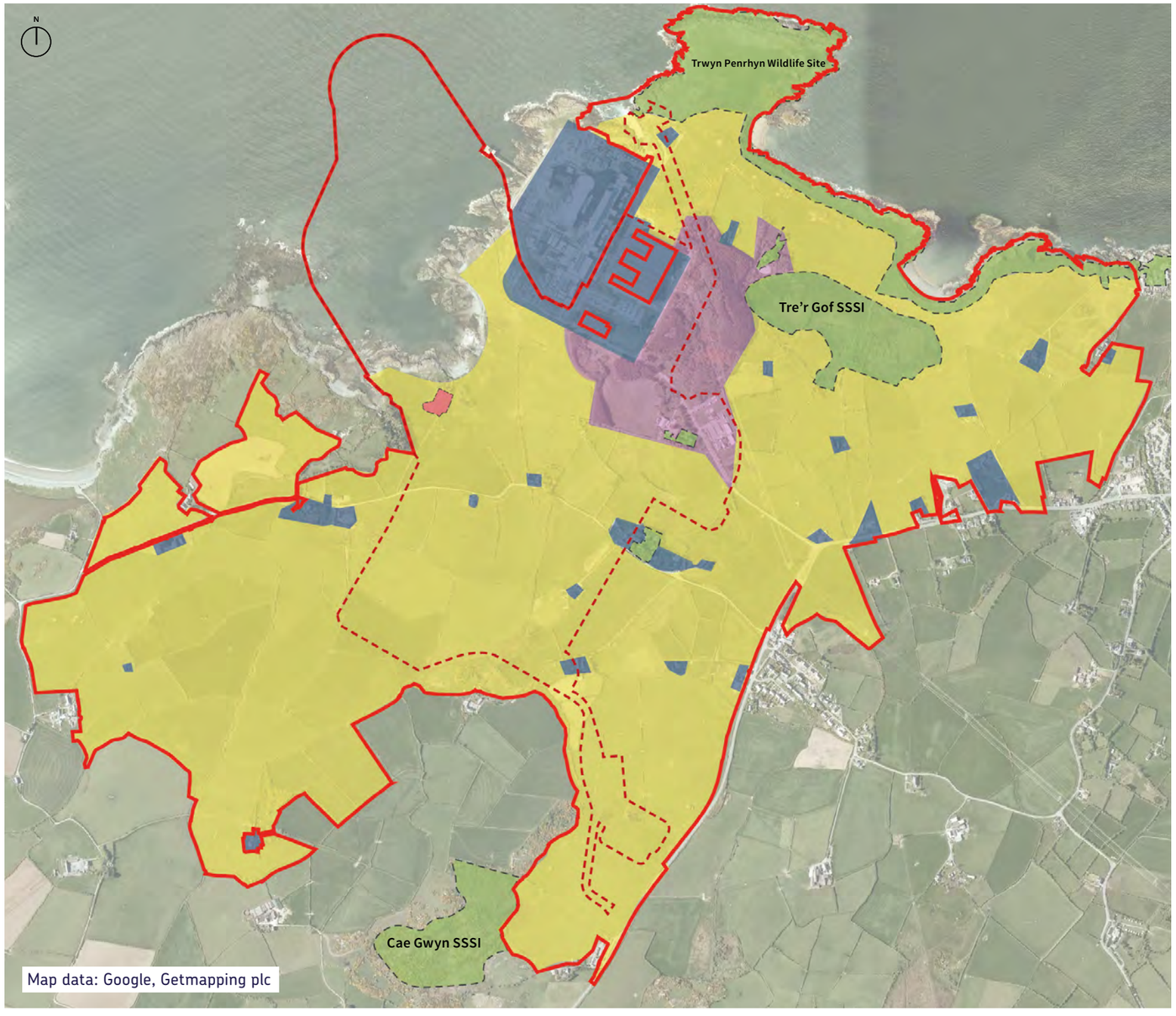
2.1.15 The PSS is directly adjacent to Cestyll Gardens on the west but is set back from the Tre'r Gof SSSI and Cae Gwyn SSSI.

LAND USE AND LOCAL CHARACTER

2.1.17 The existing land use of the WNDA and Power Station Site is predominantly agricultural as shown on Figure 2-1, being given over to pasture grazed by sheep and cattle. The irregular field pattern is sub-divided by a variety of hedgerows, traditional cloddiau (a stone-faced earth bank) or dry stone walls, and post and wire fencing. Field boundaries are in variable condition, with a concentration of dry stone walls in the western part of the WNDA, hedgerows in the central part (including the PSS) and cloddiau in the eastern part, possibly reflecting past differences in land ownership or micro-climate.

2.1.18 The WNDA encompasses the bases of a number of former properties, with a concentration along Cemlyn Road. Many of these properties, which were vacant for a number of years, have recently been demolished for health and safety reasons. The existing Horizon site offices and Wylfa Sports and Social Club are located a short distance from the Existing Power Station, to the south-east, and are included in the PSS boundary.

2.1.19 Figure 2-2 shows the Existing Power Station within the Drumlin landscape.



Legend

Wylfa Newydd Development Area	Existing Power Station setting
Power Station Site	Land managed for agricultural use
Existing Power Station	**Protected habitat**
Built Areas : houses and gardens	**Kitchen Garden**

Figure 2-1 Land use

EXISTING POWER STATION

2.1.20 The Existing Power Station is a major land use within the WNDA and is a prominent feature, immediately adjacent to the PSS.

LANDSCAPE DESIGN STRATEGY

2.1.21 The landscape design for the Existing Power Station was led by Dame Sylvia Crowe, an eminent landscape architect, author and pioneer in the field of large scale landscape planning. The design sought to minimise the effects of the Existing Power Station on the surrounding landscape and to provide a sympathetic transition between the Existing Power Station and the landscape. Key principles of the original landscape design included the use of large scale mounding and tree planting to soften views of the Existing Power Station and maintain a natural landscape setting as close to the Existing Power Station as possible.

EXISTING POWER STATION: LANDSCAPE MOUNDS APPROACH

2.1.22 Two mounds were designed to the east of the Existing Power Station using excavated material from the site in order to conceal the substation and to help integrate the Existing Power Station refer to Figure 2-3. The wooded mounds also made provision for recreational use, through incorporation of a nature trail and viewing platform. In order to achieve the recommended design height, steeper slope gradients than typically seen in the locality were required. However, the steeper gradients were mainly concealed, especially in more distant views, by mass tree planting.

EXISTING POWER STATION: PLANTING APPROACH

2.1.23 The planting strategy involved returning the Existing Power Station construction site as closely as possible to its natural state. The mounds were planted with trees to increase the apparent height of the mounds and to link the Existing Power Station to the surrounding landscape.

2.1.24 The planting design utilised a mixture of non-native and native species, balancing the need to respond to the local coastal conditions with the need to provide an effective visual screen. Species included pine and sycamore with the addition of Leyland cypress, alder, hawthorn, blackthorn and willow.

2.1.25 The Dame Sylvia Crowe woodland today provides a valuable visual screen to the Existing Power Station however it is in relatively poor condition. It is split into two blocks comprising a block of mixed pine species to the north, which has been surveyed as being in poor structural condition with no understorey and largely absent ground flora due to dense canopy cover and close planting spaces. To the south of this is a block of mixed broadleaved woodland comprising ash and sycamore with an under-story of hawthorn and gorse. There are some small sections of recently felled trees in both blocks. The broadleaved woodland is in better condition than the coniferous plantation however the ground flora was found to be species poor. Some potential for wind throw was identified along recently felled sections in both blocks.

EXISTING POWER STATION: PUBLIC ACCESS AND RECREATION APPROACH

2.1.26 Public access and recreation were considered in the strategy, acknowledging the nearby Wylfa Head as an important and frequented viewpoint. Signposted grassy paths including the current Wales Coast Path alignment and a nature trail cross the slopes of the mounds, offering a route from dense woodland to more open glades with occasional glimpses of the surrounding landscape. The circular viewing platform at the top of the northern mound offers a vantage point from which to look over the Existing Power Station and out to sea.

EXISTING POWER STATION: VISUAL MITIGATION APPROACH

2.1.27 In distant views, the Existing Power Station is seen within the context of the broader landscape. Being of such significant scale, the form of the Existing Power Station interplays with similarly scaled objects, such as the skyline and other massed elements, such as woodland. Tall woodland planting is used adjacent to larger buildings and structures to balance horizontal weight and screen ancillary buildings. This approach is based on the rationale that a large building with a broken silhouette fades into the background more readily than a similar structure with an unbroken outline. The intention was not to disguise the buildings, but to offset their scale against similarly scaled natural elements, and use strategic massed planting to break the angular forms, which are traditionally associated with man-made structures, thereby maintaining the flow and rhythm of the skyline.

2.1.28 In local views, the detail of the structures themselves become apparent and the perception of the scale of the Existing Power Station is unavoidable. The focus therefore shifts towards use of planting to soften the transition between the industrial and agricultural landscapes

LANDSCAPE

2.1.29 Photographs illustrating the current landscape are shown on Figures 2-4 to 2-7.

Figure 2-2 View towards the Wylfa Newydd Development Area from the south west showing the Existing Power Station within the drumlin landscape

Figure 2-3 Existing Power Station landscape design

Legend

Dame Sylvia Crowe's mounds

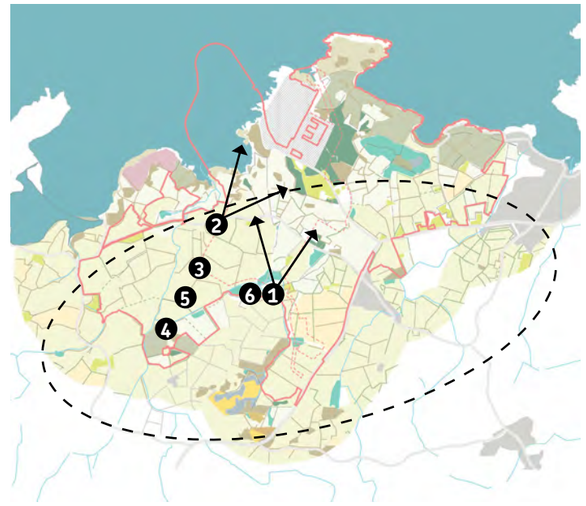
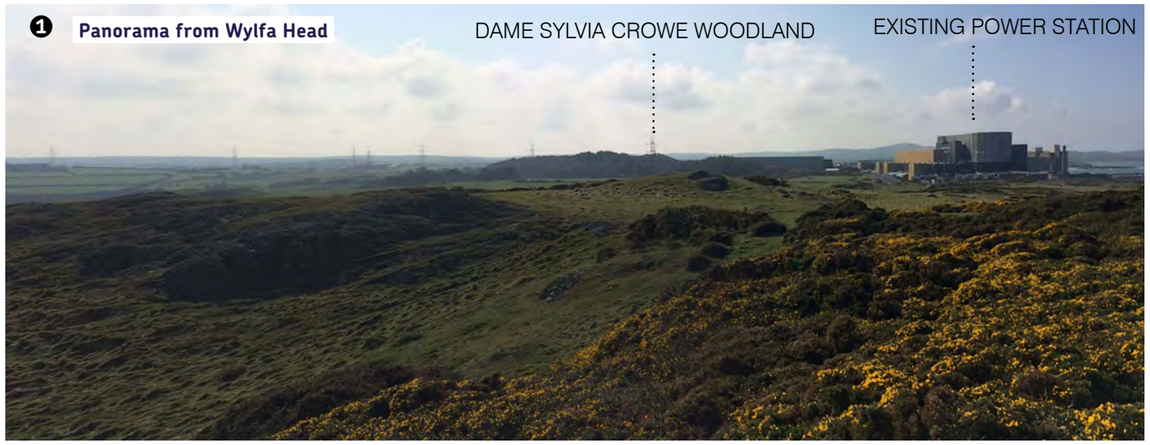
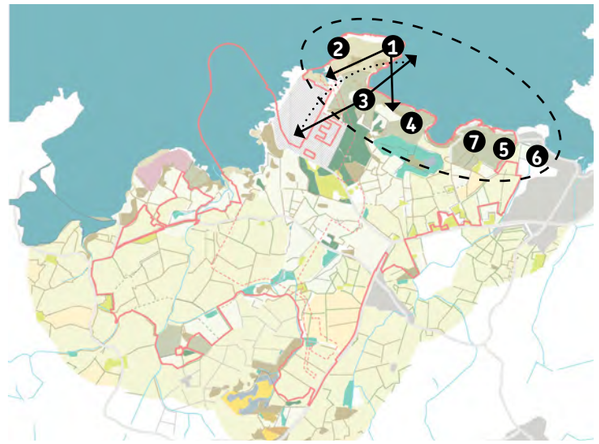


Figure 2-4 Current landscape setting 1 of 4





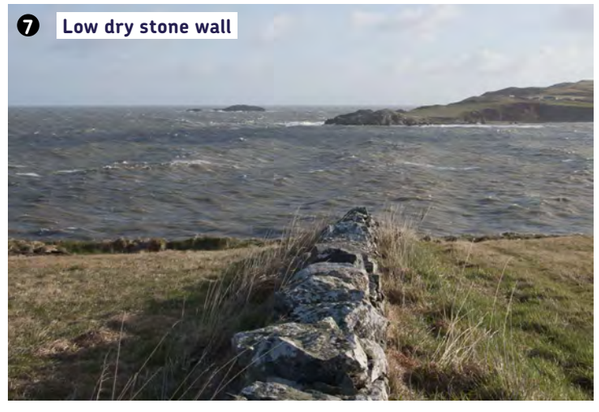
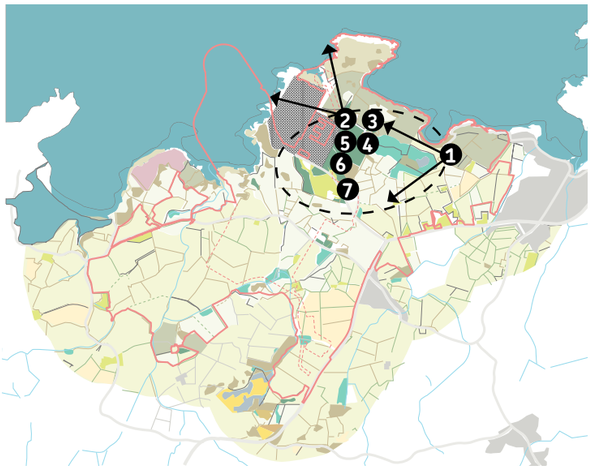
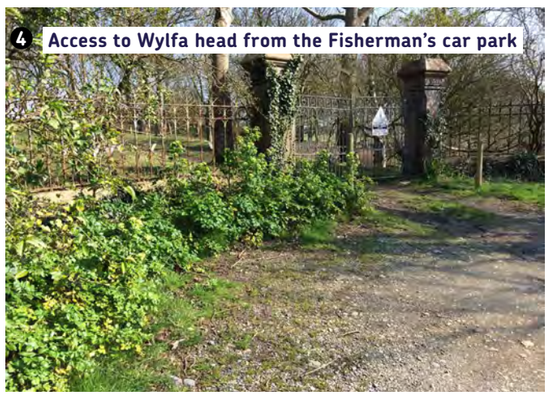


Figure 2-5 Illustrative sections through landform on restoration 2 of 4





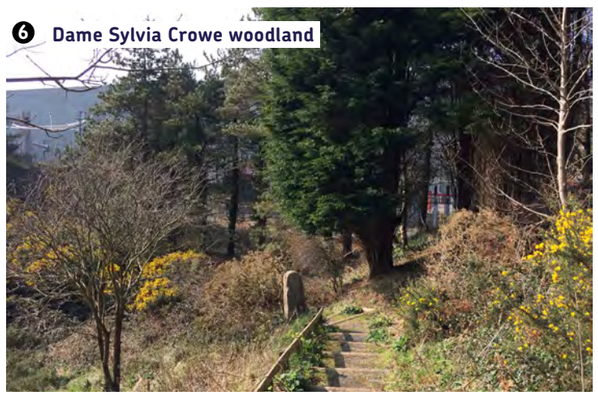
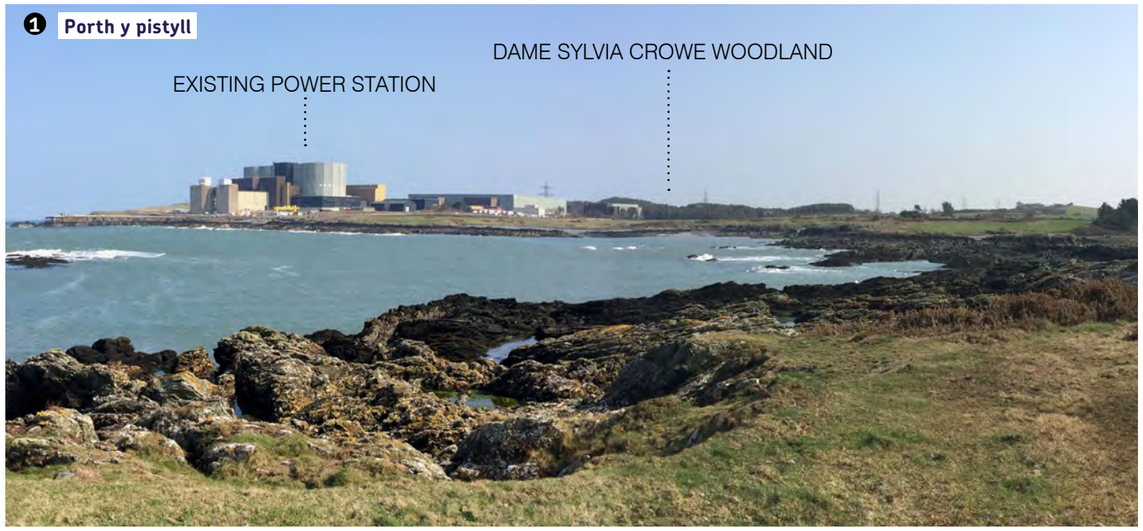
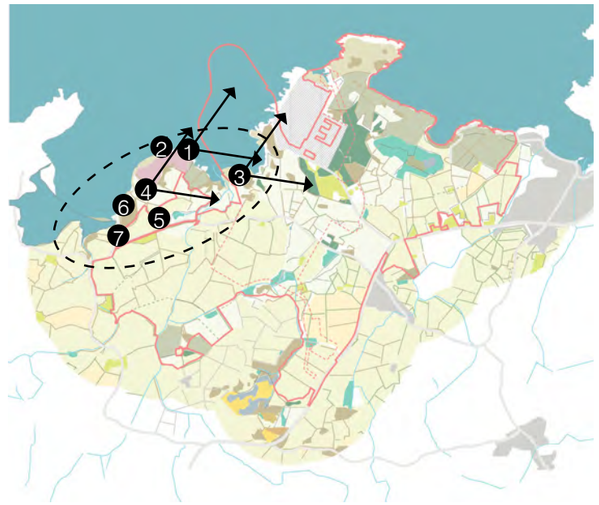


Figure 2-6 Illustrative sections through landform on restoration 3 of 4





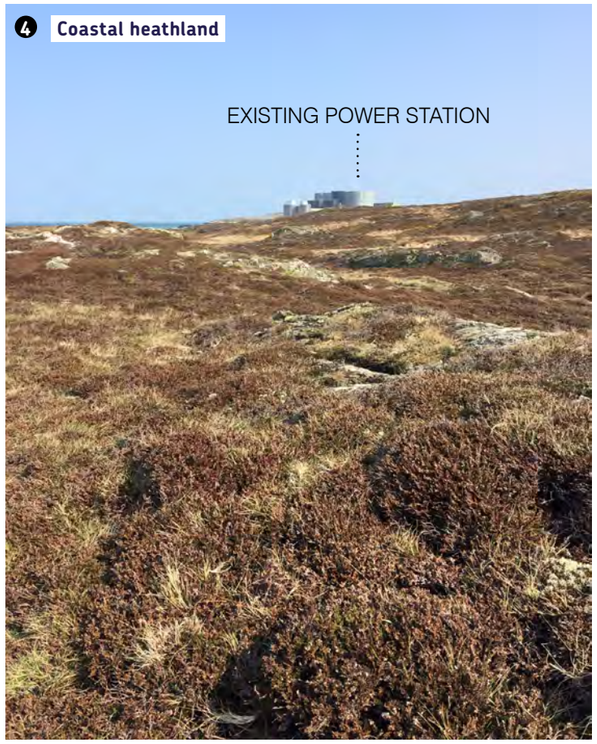


Figure 2-7 Illustrative sections through landform on restoration 4 of 4

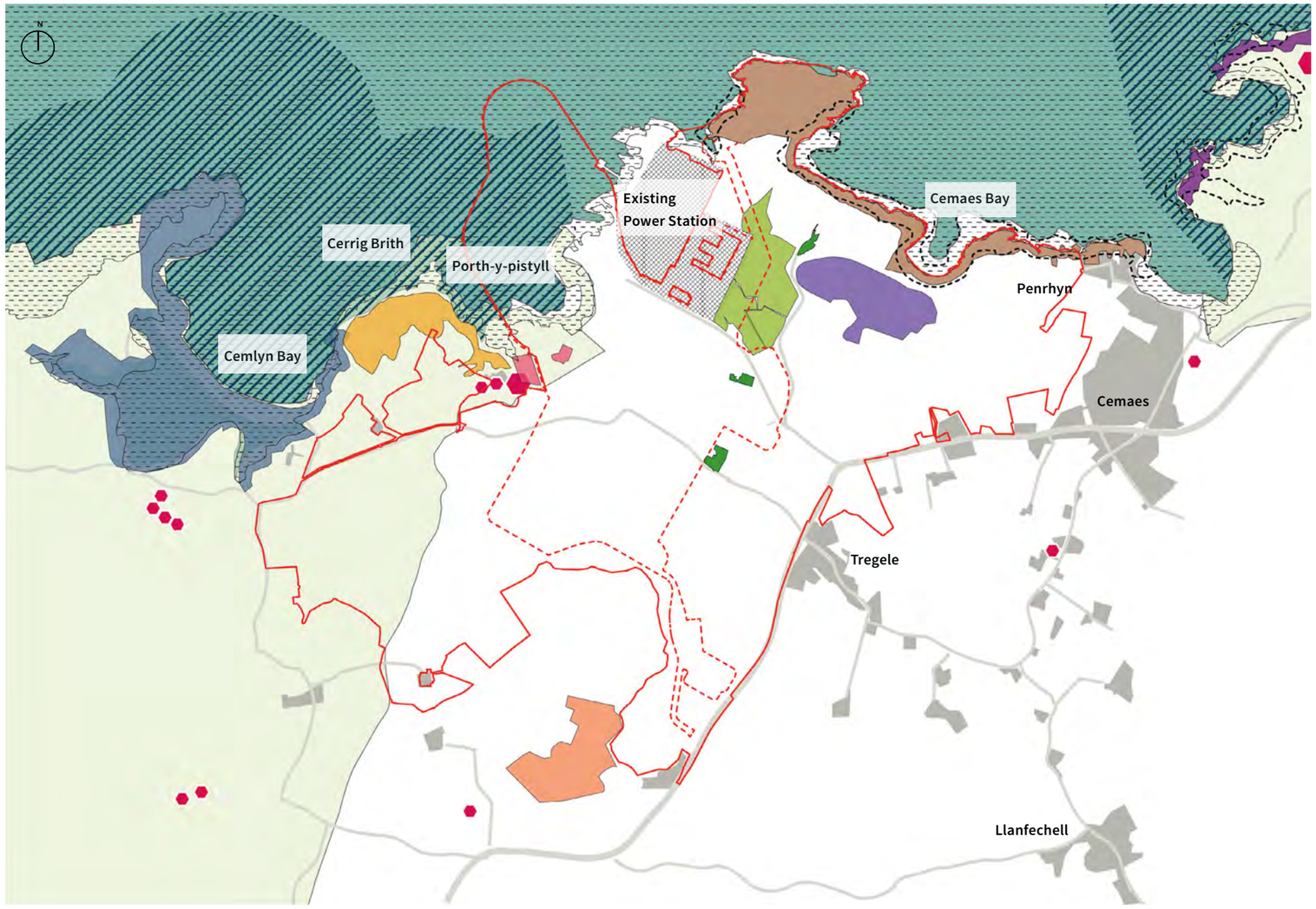
ANGLESEY AREA OF OUTSTANDING NATURAL BEAUTY

2.1.30 The WNDA largely lies outside of the Anglesey Area of Outstanding Natural Beauty (AONB), with the exception of its western margin. A small section of the Power Station Site on the western margin at Port-y-Pistyll falls within the AONB. The AONB abuts coastline that is designated as part of the North Anglesey Heritage Coast, which comprises the coastal setting of the AONB. Landscape designations are shown on Figure 2-8.

LOCAL LANDSCAPE CHARACTER

2.1.31 The most relevant published source on landscape character is provided in the Anglesey Landscape Strategy Update (IACC, 2011), which defines two areas encompassing the WNDA and PSS; the north-west Coast and the north-west Anglesey landscape character areas as follows:

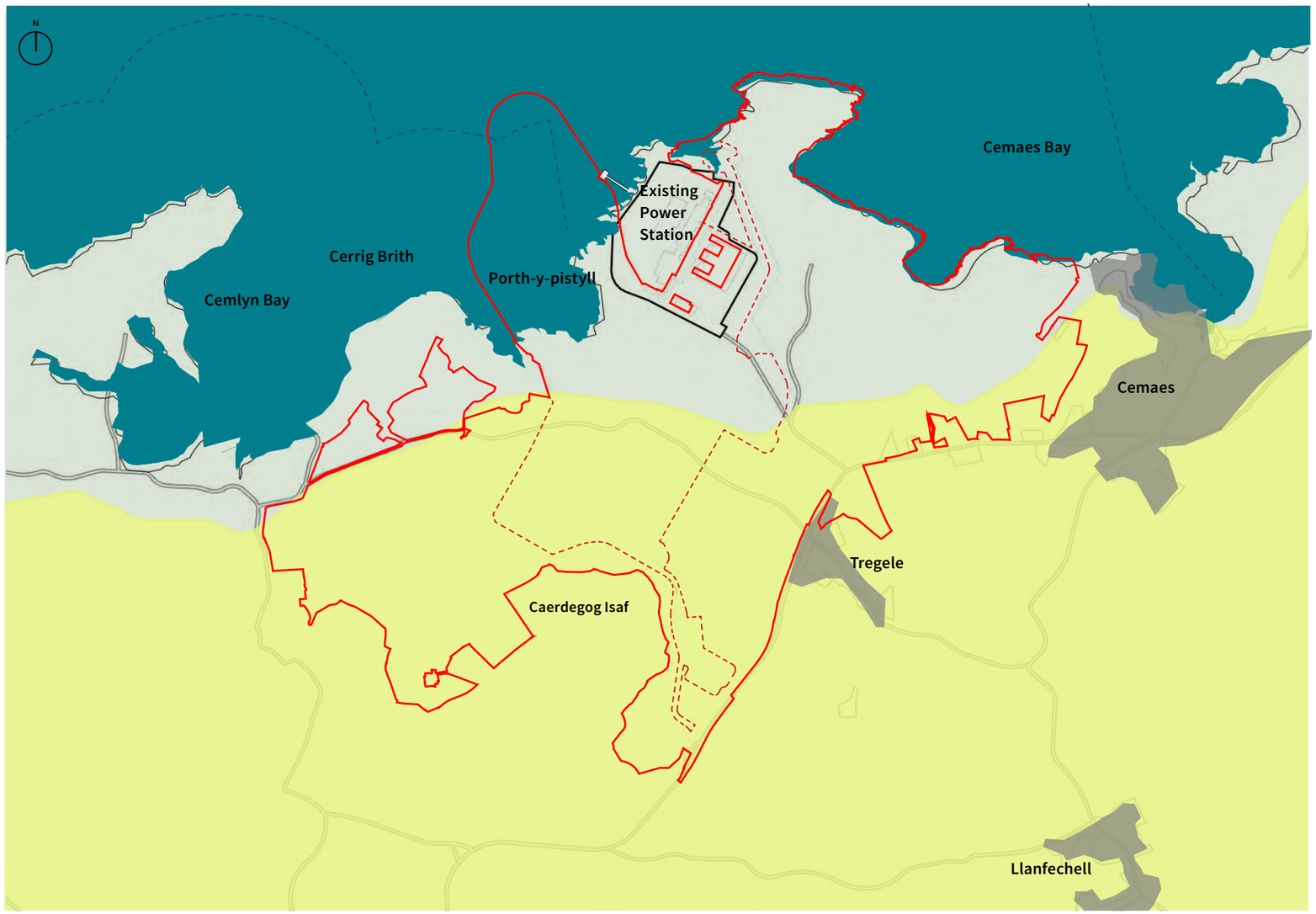
- North-west Coast: Rocky and convoluted coast but with a sandy beach and brackish lagoon at Cemlyn Bay. The area is quiet, but accessed by the Wales Coast Path and contains evidence of man-made activity such as (the existing) Wylfa Power Station; and
- North-west Anglesey: Described as having an extensive drumlin field, shown on figure 2-10g, resulting in a "classic basket of eggs" description for the landscape. The hillocks run south-west to north-east and the majority have a land cover of improved grassland. There are also areas of marsh, scrub and rocky outcrops. Wind farms form a distinctive feature in the landscape.



Legend

Wylfa Newydd Development Area	Tre'r Gof SSSI
PSS Boundary	Cemlyn Bay SAC & SSSI
Arfordir Mynydd y Wylfa – Trwyn Penrhyn Wildlife Site	Llanbadrig- Dinas Gynfor SSSI
Trwyn Pencarreg Wildlife Site	Grade II* listed building
Cae Gwyn SSSI	Grade II listed building
North Anglesey Heritage Coast	Cestyll Gardens Registered Historic Park & Garden
Regionally Important Geodiversity Site (RIGS)	Anglesey AONB
Dame Sylvia Crowe Woodland	Ancient Woodland
Settlements	North Anglesey Marine SAC
	Anglesey Terns SPA

Figure 2-8 Environment, landscape and heritage designations



Legend

Wylfa Newydd Development Area | LCA4 North West Coast | LCA5 North West Anglesey | Power Station Site

Figure 2-9 Landscape character assessment

2.1.32 There are three areas of ancient woodland within the WNDA. One of these is included in the PSS. These comprise two areas of ancient semi-natural woodland (ASNW) and one restored ancient woodland site (RAWS), shown on Figure 2-8.

2.1.33 Further to the above, woodland and trees in the WNDA are relatively sparse, with the main concentration of woodland forming part of the landscape design for the Existing Power Station, as shown on Figure 2-10f. Other areas of existing trees tend to be associated with former buildings, such as to the north of Cemlyn Road, where The Firs Hotel used to stand, or at Fisherman's Car Park. There are a number of scrub areas, which are principally concentrated in the central part of the WNDA, at Wylfa Head and Tre'r Gof SSSI.

2.1.34 The principal native hedgerow species present in the vicinity of the WNDA comprise:

- Hawthorn (Cratageus monogyna); and
- Blackthorn (Prunus spinosa).

2.1.35 Gorse is also frequently found in hedgerows but largely due to uncontrolled natural colonisation; it is not therefore proposed to replant gorse, which is a highly invasive species and prone to combustion in hot dry conditions.

2.1.36 The most frequent native tree species present in the vicinity of the WNDA comprise:

- Sessile oak (Quercus petraea);
- Ash (Fraxinus excelsior);
- Common lime (Tilia x europaea) and
- Alder (Alnus glutinosa).

2.1.37 Sycamore (Acer pseudoplatanus) is also an abundant tree species in the area, to the extent that it is referred to locally as the Anglesey Maple. Although naturalised, this species is not native to the UK, having been introduced from Europe in the 15th or 16th century.

2.1.38 Within the WNDA, agricultural land is generally sub-divided by an irregular pattern of field boundaries comprising a mix of hedgerows, dry stone walls and the locally distinctive cloddiau, as shown on Figure 2-10e.

Figure 2-10a Satellite

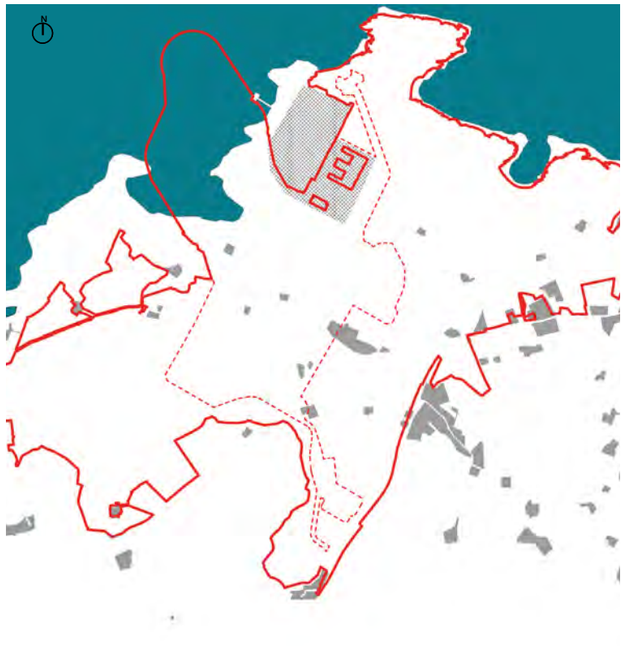


Figure 2-10b Settlements & Built Development

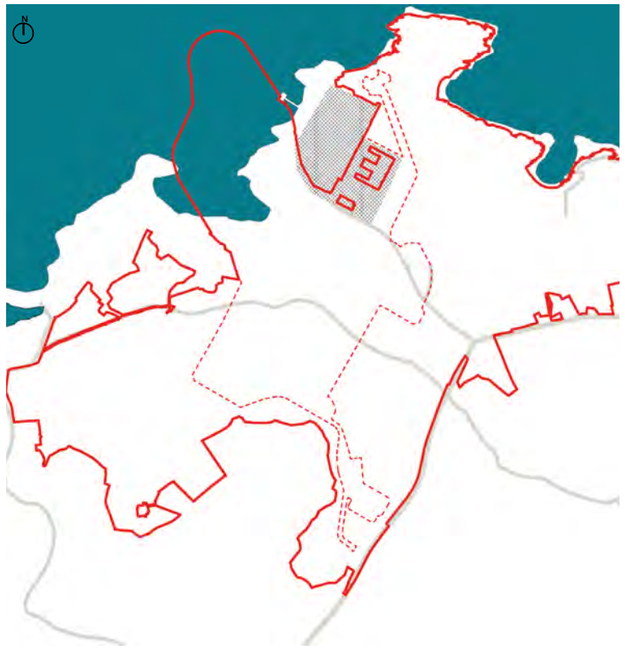


Figure 2-10c Road Network

Legend

- Wylfa Newydd Development Area
- Power Station Site Boundary
- Settlements
- Roads
- Water course
- Hedges
- Walls
- Fences
- Riparian vegetation
- Woodland
- Scrub
- Drumlin Patterns

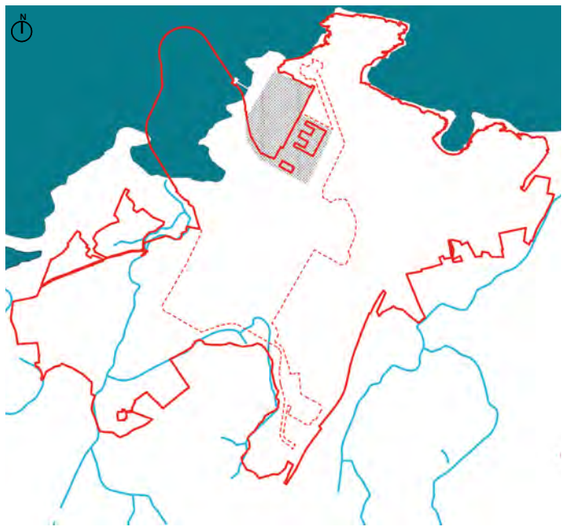


Figure 2-10d Rivers and Coast

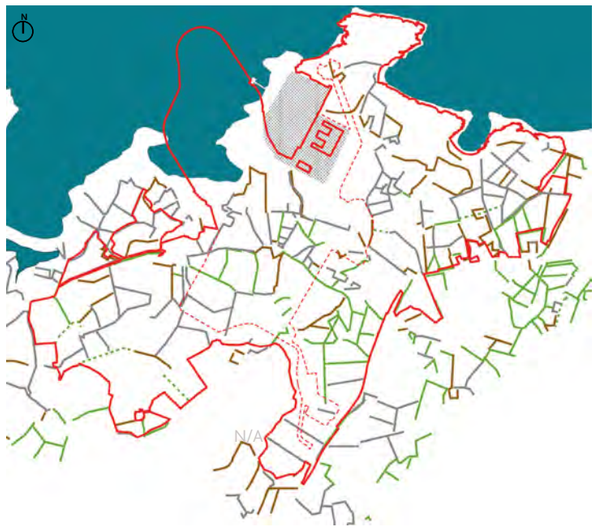


Figure 2-10e Field Boundaries

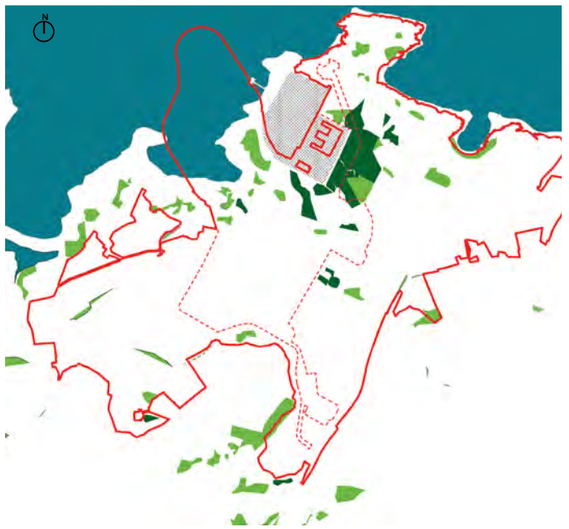


Figure 2-10f Woodland and Scrub

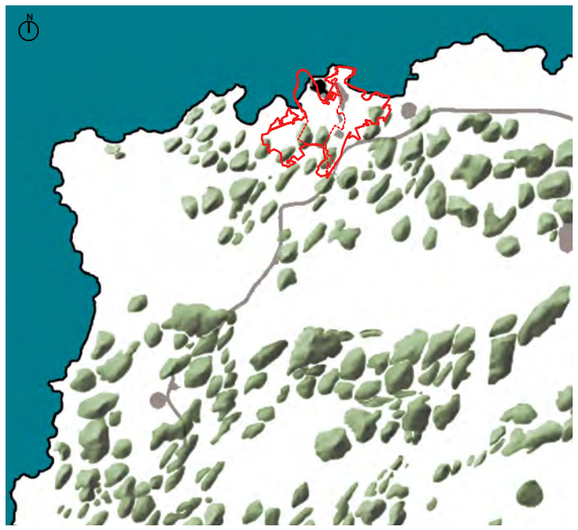


Figure 2-10g North Anglesey—Drumlin Patterns

Figure 2-10 Landscape characteristics

2.1.39 Hedgerow species are found predominantly along the boundaries of fields, roads and adjoining residential properties. Hedgerows form a key element of the local landscape fabric. The principal indigenous hedgerow species present on the WNDA comprise:

- Hawthorn (Cratageus monogyna);
- Holly (Ilex aquifolium);
- Privet (Ligustrum vulgare); and
- Gorse (Ulex spp.) frequently occurs on field boundaries.

2.1.40 A network of roads and footpaths further sub-divide the locality, although since footpaths often follow field boundaries and are un-surfaced, it is the road network which influences landscape pattern most, including the A5025, Cemlyn Road and the Existing Power Station access road, as shown on figure 2-10c.

2.1.41 Overhead electricity infrastructure also contributes to the pattern of the landscape, with the most notable features being the overhead lines and associated support pylons extending south-eastwards from the Existing Power Station, electricity sub-station.

CULTURAL HERITAGE

2.1.42 There are no listed buildings within the WNDA. Part of Cestyll Gardens, which is a Grade II registered historic park and garden, is within the WNDA and the PSS on its western edge.

2.1.43 Felin Cafnan Corn Mill (Porth-y-Felin) is a Grade II* Listed Building located immediately to the west of the WNDA. It is adjoined by an associated corn drying house and mill house, which are both Grade II listed buildings. They are themselves adjoined by Cestyll Gardens, which is mentioned above. The cluster was originally associated with Cestyll House, however the main house was demolished in 1991. Cafnan House and outbuildings is a Grade II listed building that is located opposite to Felin Cafnan and is therefore also close to the proposed development. Heritage designations are shown on Figure 2-8.

Figure 2-11 a. View towards Cestyll Gardens from Porth-y-Pistyll

Figure 2-11 b. View from Cestyll gardens towards Porth-y-Pistyll

Figure 2-11 Existing views of the Cestyll Gardens

PUBLIC ACCESS

2.1.45 A total of 40 PROWs plus 6 permissive paths provide over 10km of trails across the WNDA, most of which are located adjacent to Cemaes. This includes numerous PRoW across the PSS as shown on Figure 2-12.

2.1.46 The Wales Coast Path (WCP) provides access along the northern margin of the WNDA from Cemaes to a loop at Wylfa Head. At Wylfa Head, the WCP heads inland to skirt the Existing Power Station, within the PSS, before re-joining the coast at Porth-y-pistyll on the western boundary of the PSS. The WCP within the WNDA is unsurfaced for much of its length and primarily made up of connected local PRoWs.

2.1.47 The Copper Trail/ National Cycle Network Route 566 is routed north-westwards across the WNDA and the PSS, from Tregele along Cemlyn Road, which continues eastwards beyond Cestyll Gardens to Cemlyn Bay.

2.1.48 The Existing Power Station access road provides access to the former Magnox visitor centre.

TOPOGRAPHY AND LANDFORM

2.1.49 The pronounced undulating landform of the WNDA reflects the drumlin landform of the surrounding area, as shown on Figure 2-13. It comprises a series of five main drumlins, ranging in height from 25m AOD to 42m AOD, with gradients of approximately 1:8 to 1:10. The drumlin landforms are predominantly oriented to the north-east. A sixth drumlin landform up to 40m AOD was created for the Existing Power Station and falls partly within the PSS.

2.1.50 The A5025, which borders the WNDA to the south-east, follows two ridgelines: one descending from 40m AOD in the south-west to Tregele at 25m AOD; and the other at 35m AOD at its highest point to the north-east of Tregele before descending to Cemaes at 20m AOD. The two highest drumlins on the WNDA are located within the PSS, near its centre at the site of The Firs Hotel (now demolished) (40m AOD), and south of Pennant, a former residential property (now demolished) to the west (42m AOD). The east ridgeline, along which the A5025 runs, turns northwards just before reaching Cemaes, separating low ground on the western edge of Cemaes from low ground on the WNDA to the west, including Tre'r Gof SSSI at around 10m AOD.

2.1.51 The main topographical and landform features comprising the landscape setting therefore are:

- the rocky coastal shoreline to the north;
- The artificial wooded drumlins associated with the Existing Power Station; and
- The natural drumlin landscape, supporting the undulating agricultural fields that typify much of the WNDA beyond the immediate vicinity of the Existing Power Station.

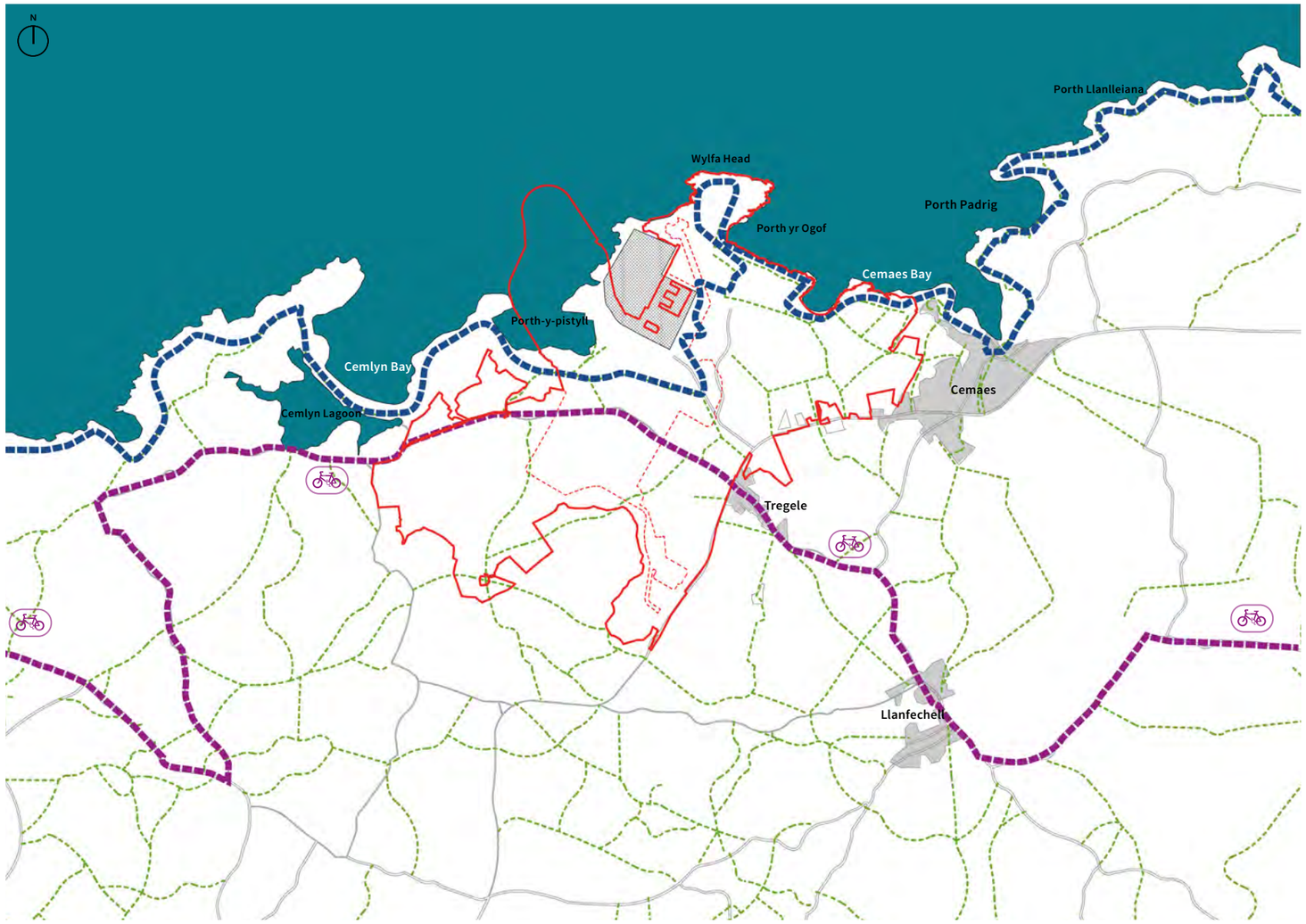


Figure 2-12 Public access

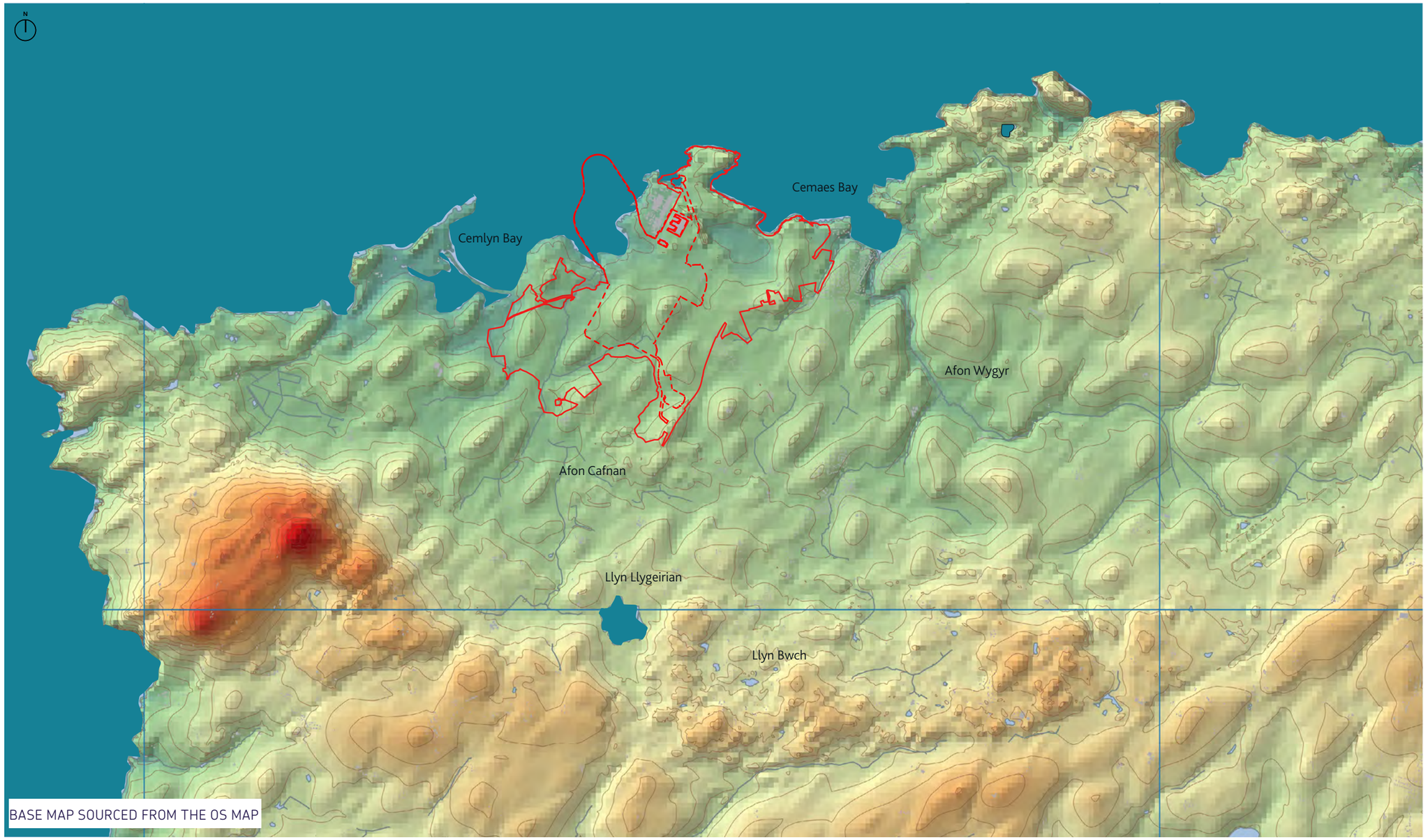


Figure 2-13 Local topography

SOILS AND GEOLOGY

2.1.52 The Agricultural Land Classification (ALC) of land within the WNDA compared with Anglesey as a whole is set out in Table 2-1 and shown on Figure 2-14. The vast majority of land within the Power Station Site is grade 3b (moderate quality), grade 5 (very poor quality) or non-agricultural. None of the site comprises "best and most versatile agricultural land", which is defined as grade 3a or higher.

There are three Regionally Important Geodiversity Sites (RIGS) within the WNDA as shown on Figure 2-8: Porth Wnal Dolerite RIGS; Porth Wnal Granite RIGS; and, Cemaes Bay RIGS

Grade/ Subgrade	Description	Wylfa Newydd Development Area		Anglesey	
		Area (ha)	Percentage (%)	Area (ha)	Percentage (%)
1	Excellent quality	0	0	0	0
2	Very good quality	6.5	2.0	1,117	1.6
3A	Good quality	18.0	5.6	27,559	38.6
3B	Moderate quality	224.3	69.5		
4	Poor quality	0.1	<0.1	27,214	38.1
5	Very poor quality	38.0	11.8	10,398	14.6
-	Non-agricultural	35.8	11.1	5,073	7.1

Legend

- Wylfa Newydd Development Area
- Wylfa Newydd Power Station Site
- Settlements and Buildings

Site-specific Agricultural Land Classification (ALC) data

- Grade 2 – very good quality
- Subgrade 3a – good quality
- Subgrade 3b – moderate quality
- Grade 4 – poor quality
- Grade 5 – very poor quality
- Non-agricultural

Provisional ALC

- Grade 3 – good to moderate quality
- Grade 4 – poor quality
- Grade 5 – Very poor quality

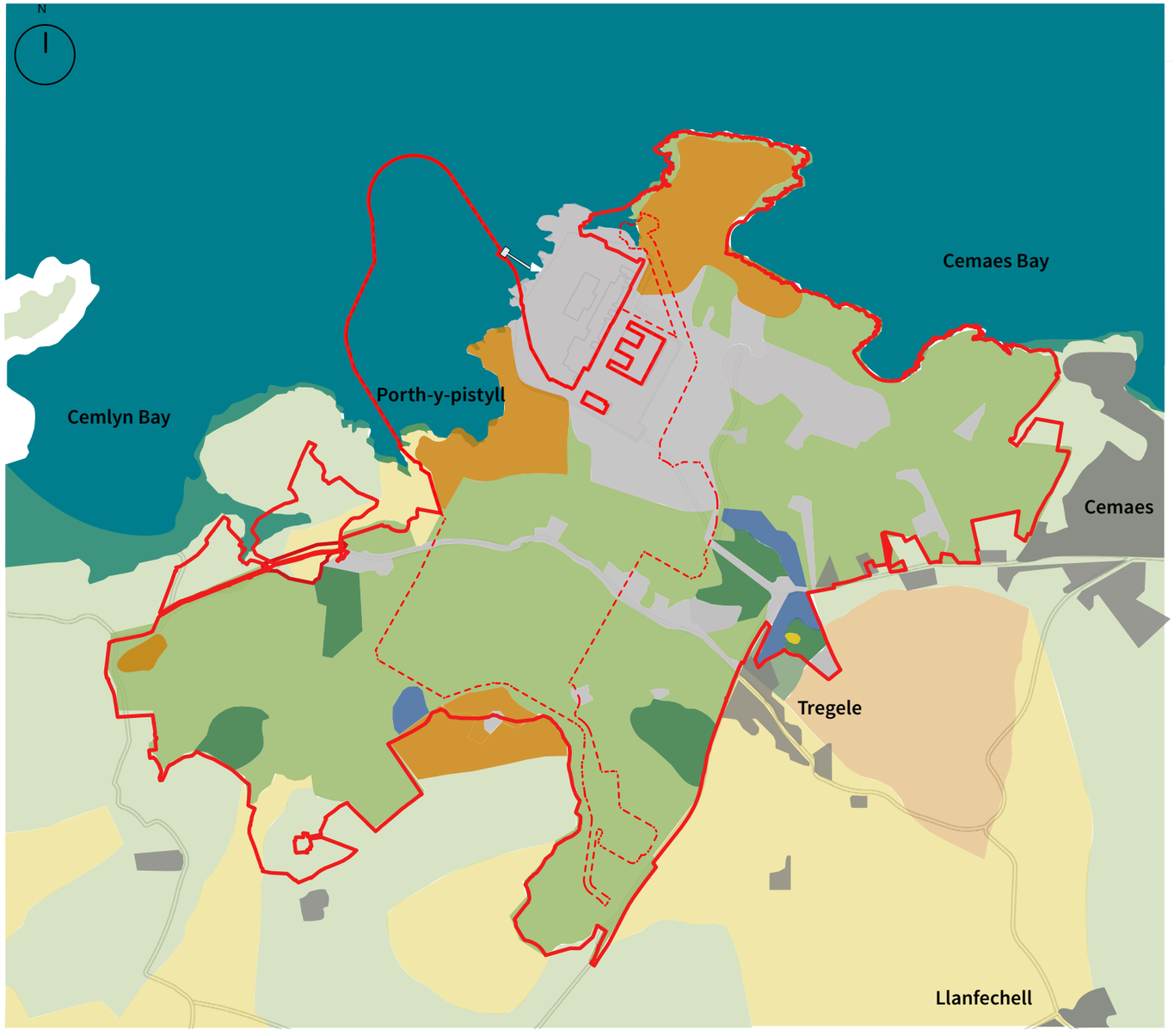


Figure 2-14 Agricultural land Classification

SURFACE WATER AND GROUNDWATER

2.1.53 As shown on Figure 2-15, a meandering watercourse initially flowing northwards (from Cae Gwyn SSSI) borders part of the southern WNDA boundary, along the PSS boundary, eventually flowing into the Afon Cafnan, a waterbody designated under the Water Framework Directive. Only a tributary of this watercourse sits within the PSS. The Afon Cafnan flows northwards across the WNDA between the existing drumlin landforms into Porth-y-pistyll. Two further watercourses border the WNDA, at the western boundary with Nanner Road and at the eastern boundary with Cemaes.

2.1.54 The WNDA is within five small surface water catchment areas with watercourses within them, which are:

- Tre'r Gof Catchment;
- Afon Cafnan Catchment;
- Power Station Catchment.
- Cemaes Catchment; and,
- Cemlyn Catchment;

2.1.55 The PSS is situated within the first three of these catchment areas only.

2.1.56 Bedrock groundwater generally flows from the south to the north-west, north and north-east, discharging into the Irish Sea.

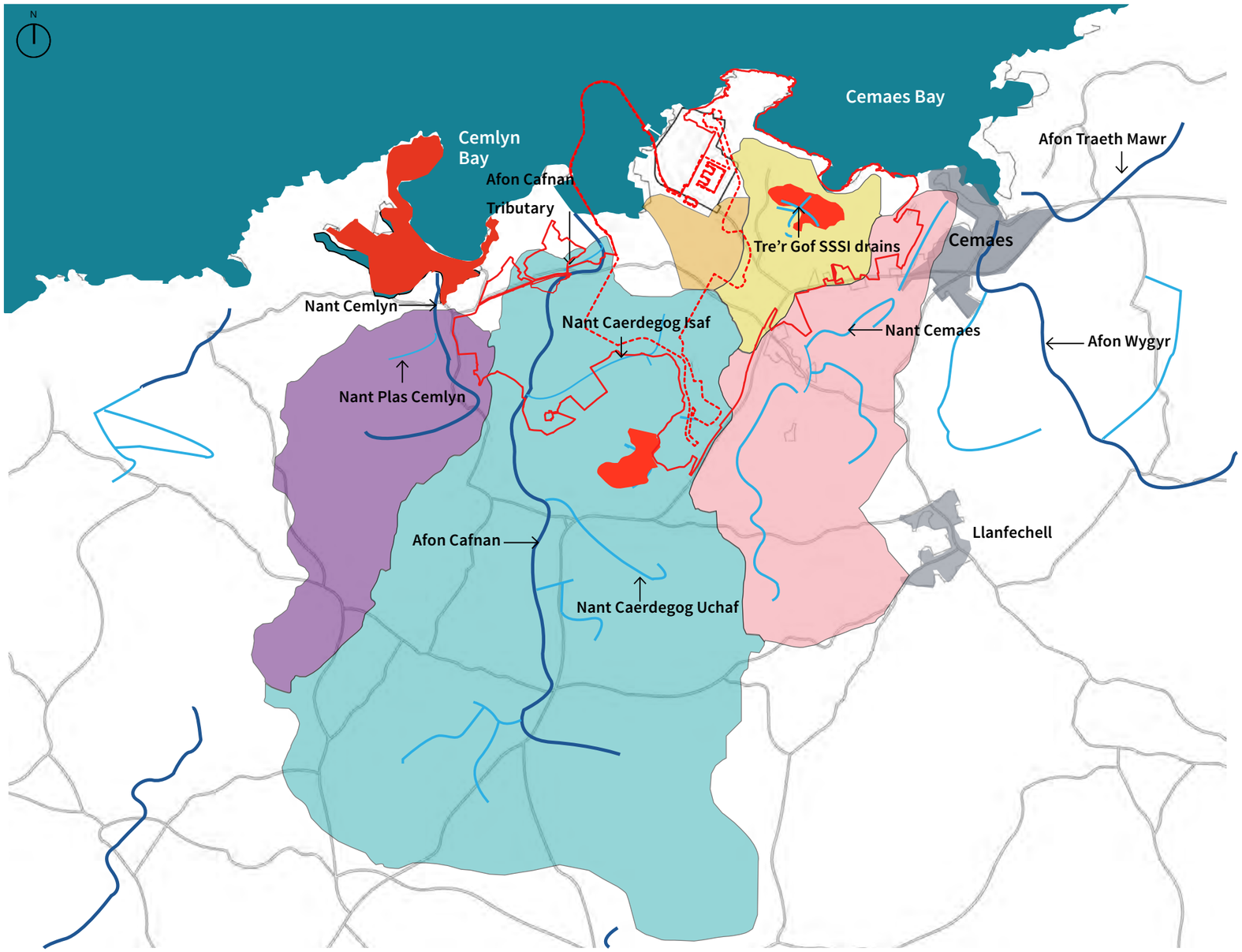


Figure 2-15 Surface water and groundwater

FLOOD RISK

2.1.57 Figure 2-16 shows that the vast majority of the WNDA, PSS and surrounding area is located in Flood Zone A, which indicates a very low risk of tidal or fluvial flooding in response to flood events with a frequency of greater than 1:1,000 years.

2.1.58 Low lying areas inland of Porth-y-pistyll and Porth Wylfa fall in Flood Zones B and C and extreme sea levels could result in a relatively greater risk of inland flooding in these peripheral locations of the WNDA and PSS.

2.1.59 Only small coastline areas bordering the WNDA lie at levels below the highest maximum credible sea water level. The lowest area within the WNDA is Tre'r Gof, which lies at between 5m AOD and 10m AOD (above ordnance datum). The elevation at which sea levels would breach the high ground to the north of Tre'r Gof is approximately 11m AOD, therefore, still-water tidal inundation of Tre'r Gof or anywhere else outside of the coastal margins of the WNDA is not expected during the construction phase. The wave modelling report indicates that simulated wave heights for the 2023 present day scenario at the low-point access to Tre'r Gof do not exceed 0.4m, therefore, wave assisted overtopping of Tre'r Gof is also not expected.

2.1.60 For decommissioning the tidal flooding levels given for 2187 have been taken as the maximum sea levels likely to affect the site. The majority of the land at the decommissioned Power Station Site would be above 18m AOD and as such, there is no reasonably foreseeable flood risk to the land from coastal flooding for up to the 0.01% AEP (annual exceedance probability) flood event. However, lower lying areas such as the platform around the CW intake tunnels and the onshore elements of the MOLF would be at risk of tidal flooding, but this would be to a limited area and as these areas would no longer be in use, it is only the flooding of the land that is of concern. Land along the coastal edges of the WNDA is therefore considered to be of medium sensitivity to flooding during decommissioning.

2.1.61 Extreme wave heights locally have been assessed and combinations of extreme tide levels and wave heights with a joint annual probability of up to 1 in 10,000 have been considered. Tre'r Gof SSSI was highlighted as the sole location where there was thought to be a substantial risk of inundation under these conditions. Due to the topography of Tre'r Gof SSSI, any flooding from overtopping is likely to be contained and not travel further into the WNDA from the coast.

2.1.62 Further details on how climate change has been factored into the modelling that has informed the Landscape and Habitat Management Strategy, and volume 2 of the Design and Access Statement (Application Reference Number: 8.2.2), are set out in volume D, appendix D8-4 of the Environmental Statement (Application Reference Number: 6.4.29).

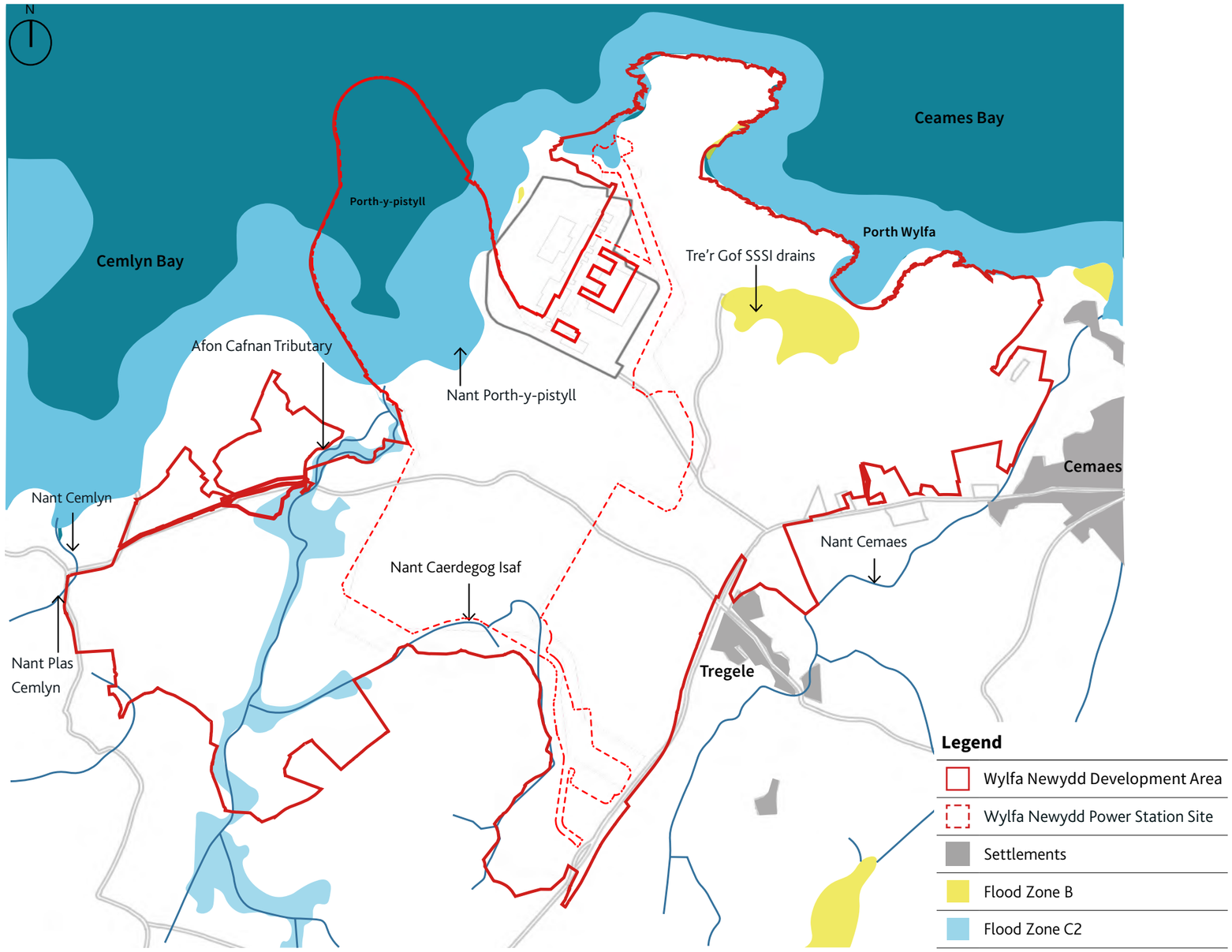


Figure 2-16 Risk of flooding from rivers and sea

HABITATS

DESIGNATED SITES

2.1.63 There is a single statutory designated site for nature conservation that is wholly within the WNDA; the Tre'r Gof Site of Special Scientific Interest (SSSI) (see Figures 2-8). This site is located to the east of the Existing Power Station in the northern part of the WNDA. The WNDA is also adjacent to Cae Gwyn SSSI, which is situated on the southern boundary. Both of these sites are wetlands designated for their botanical interest.

2.1.64 Arfordir Mynydd y Wylfa – Trwyn Penrhyn Wildlife Site is also located within the WNDA, along its northern boundary. It comprises a mosaic of coastal grassland, heath and cliff habitats which support a diverse range of species.

2.1.65 Trwyn Pencarreg Wildlife Site is located 50m west of the WNDA. This site comprises coastal and semi-improved grassland adjacent to Porth-y-pistyll and Cemlyn Bay.

2.1.66 Cemlyn Bay Special Area of Conservation (SAC) and SSSI is located approximately 110m west of the WNDA. This site is designated for its coastal lagoon habitat and perennial vegetation of stony banks. Cemlyn Bay also supports breeding colonies of four species of tern and forms part of the Anglesey Terns Special Protection Area (SPA), which also includes all of the marine parts of the WNDA. North Anglesey Marine candidate SAC (cSAC), which is proposed for harbour porpoise (Phocoena phocoena), also includes all the marine parts of the WNDA.

2.2 SOCIO-ECONOMIC CONTEXT

2.2.1 The WNDA is located on the boundary of two electoral wards, namely Llanbadrig and Mechell in the County of Isle of Anglesey. The population of these electoral wards in 2011 was 1,357 and 1,545 respectively.

2.2.2 Cemaes and Tregele are the nearest communities to the WNDA; where both communities are located within 100m of the site boundary, as shown on Figure 2-20. Both settlements predominantly consist of residential properties and also possess a range of commercial, community and amenity facilities, such as a heritage centre, Post Office, and community centre. Ysgol Gynradd Cemaes is located approximately 470m to the east of the site.

2.2.3 The village of Llanfechell is located approximately 2km to the south-east of the WNDA. The village is predominantly residential in nature, possessing a limited range of facilities including schools, churches and commercial units.

2.2.4 For the wards of Llanbadrig and Mechel, 57.1% of the population (aged 3 and over) were able to speak Welsh in 2011, which is similar to the percentage for Anglesey. Variation is seen in the percentage of Welsh speakers between the wards of Llanbadrig and Mechell with a higher percentage of Welsh speakers living within the ward of Mechell (61.1%) compared to Llanbadrig (52.4%) in 2011.

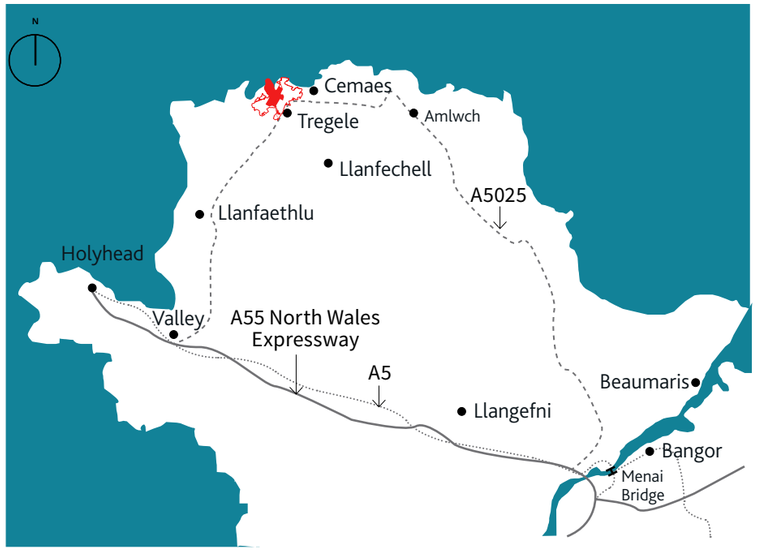


Figure 2-17 Local towns and villages

Figure 2-18 Local settlement of Cemaes

Figure 2-19 Local settlement of Tregele

2.3 RELEVANT LEGISLATION AND PLANNING POLICY

2.3.1 Details of legislation and planning policy that are relevant to all of the Design and Access Statements prepared for this DCO application are contained in Volume 1 of the Design and Access Statement (Application Reference Number: 8.2.1).

2.3.2 Planning policy that is specifically relevant to the Power Station DAS is set out below.

2.3.3 Strategic Policy PS 9 of the JLDP (Joint Local Development Plan) [RD3] states that the scheme layout and design and the scale of open spaces, landscaping, planting (including hedging and tree belts), waterways and similar features proposed should avoid, minimise, mitigate or compensate for visual, landscape and ecological impacts on the local and wider area, as well as on cultural and historic aspects of the landscape, both in the short and longer term. Proposals will be expected to be commensurate with the scale of the development, and the extent of its impact.

2.3.4 GP 7 (Guiding Principle) of the Wylfa SPG [RD4] encourages proposals to provide measures to protect health, including "the physical design of new development (including consideration of screening, containment and layout to minimise impacts on sensitive receptors).

2.3.5 GP 18 of the Wylfa SPG (Supplementary Planning Guidance) encourages a number of measures to enhance sustainable design and construction.

- The re-use of buildings and materials, including at the existing Magnox nuclear power station.
- The use of sustainably sourced construction materials with low embedded carbon.
- Incorporation of energy efficiency measures in the layout and design of new buildings.
- Retrofitting of existing buildings to enhance energy efficiency, where appropriate.
- Facilities which encourage the re-use and recycling of wastes.
- The use of water efficient products and design.

2.3.6 GP 19 of the Wylfa SPG [RD2] encourages proposals that incorporate appropriate design, layout and building methods that will withstand the effects of climate change.

2.4 SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

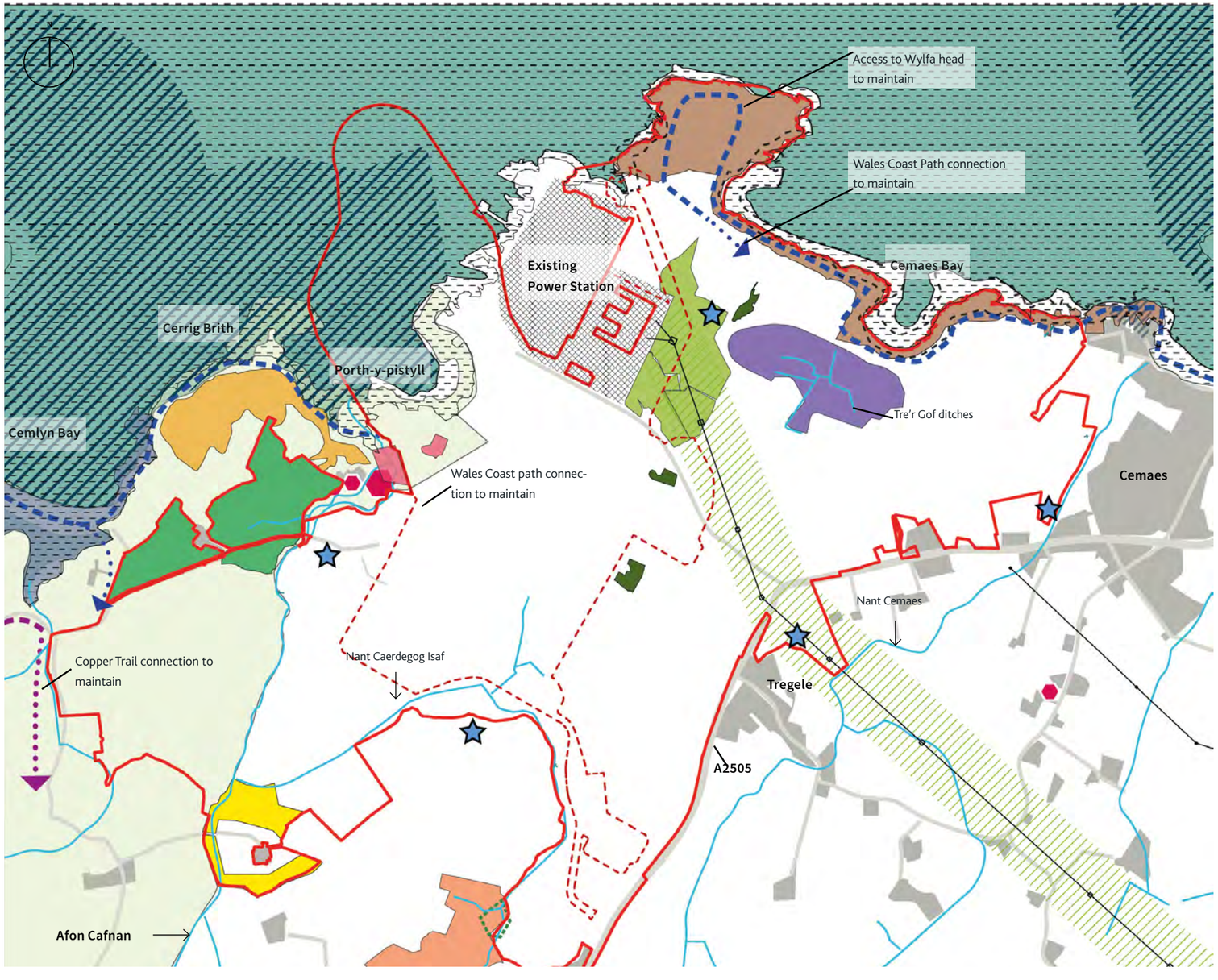
2.4.1 The proposals for the WNDA and PSS will be developed to avoid, minimise, mitigate or compensate for visual, landscape and ecological impacts on the local and wider area, as well as on cultural and historic aspects of the landscape, both in the short and longer term. The contextual assessment identifies a number of opportunities and constraints, which have informed the development of the design principles (see section 5) for both the PSS and WNDA (refer to Landscape and Habitat Management Strategy). These include features which should be retained, protected or reinstated as well as opportunities to develop a strategy for the new Power Station which is in keeping with the existing local Drumlin landscape character. These are summarised below (refer to figure 2-20).

OPPORTUNITIES

- Reference the existing landscape character in the selection of materials for the new PSS landscape design;
- Retain existing features where possible including the Dame Sylvia Crowe designed mound and woodland which provides screening around the Existing Power Station and part of the existing shoreline at Cestyll Bay;
- Use plant species and planting typologies characteristic of the habitats elsewhere in the locality;
- Increase biodiversity through both the reinstatement and creation of a mosaic of habitat types which could also facilitate movement of species through the landscape as much as possible during construction and in operation;
- Opportunity to provide a new network of footpaths to replace those impacted by the Power Station development, to serve local communities and other footpath users, and seeking to maintain access to the coast where appropriate and practicable within Power Station constraints.

CONSTRAINTS (REFER TO FIGURE 2-20)

- Incorporate the operational and security requirements of the existing power station and associated overhead powerline infrastructure including offsets for easements for the power lines.
- Minimise harm to the setting of the AONB through the implementation of a landscape strategy which sensitively responds to the existing local landscape character;
- Protect and conserve sites designated for their nature conservation value;
- Provide buffer zones where necessary, for example, between the proposed landscape mounds and Tre'r Gof SSSI and other sensitive ecological sites;
- Provide habitats and corridors to maintain favourable conservation status of European protected species (i.e. bats, otter and great crested newt);
- Minimise impacts on the sites cultural heritage and designated sites;
- Minimise impacts on local settlements adjacent to the site notably Cemaes and Tregele;
- Retain the existing Dame Sylvia Crowe designed woodland and artificial drumlin which provides screening for the existing power station;
- Maintain public access to the two existing national trails the Wales Coast Path and Copper Trail which pass through the site during construction and operation;
- Seek to maintain public access to Wylfa Head which is an important local view point during construction and operation;
- Minimise impacts on the existing watercourses and the flood risk areas.



Legend

- Wylfa Newydd Development Area
- Power Station Site Boundary
- Water course
- Trwyn Pencarreg Wildlife Site
- Cae Gwyn SSSI
- Cestyll Gardens Registered Historic Park & Garden
- Ancient Woodland
- Dame Sylvia Crowe woodland
- Arfordir Mynydd y Wylfa – Trwyn Penrhyn Wildlife Site
- North Anglesey Marine Candidate SAC
- Wildlife tower, bat barns and owl barn
- Reptile Receptor site
- Notable Wildlife Enhancement Site
- Tre'r Gof SSSI
- Cemlyn Bay SSSI & SAC
- Anglesey AONB
- Grade II* listed building
- Grade II listed building
- North Anglesey Heritage Coast
- Regionally Important Geodiversity Site (RIGS)
- Anglesey Terns SPA
- Copper trail
- Wales coast path
- Great Crested Newt receptor site
- Wayleave for overhead line
- Settlements and buildings

Figure 2-20 Constraints summary

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3 CONSULTATION AND DESIGN EVOLUTION

Consultation and Design Evolution

3.1 CONSULTATION

INTRODUCTION

3.1.1 Volume 1 of the DAS (Application Reference Number: 8.2.1) provides an introduction to the consultation process for the Wylfa Newydd DCO Project and full details are provided in the Consultation Report (Application Reference Number: 5.1).

3.1.2 This section of the Power Station DAS provides a summary of pre-application consultation that has been undertaken and how this has influenced proposals for the Power Station, Marine Works and other on-site development:

- Stage One Pre-Application Consultation (September - December 2014);
- Project Update Consultation (January – March 2016);
- Stage Two Pre-Application Consultation (August - October 2016);
- Stage Three Pre-Application Consultation (May - June 2017); and,
- Consultation on Additional Land (January – February 2018).

3.1.3 Horizon has also engaged in significant pre-application consultation with Design Commission for Wales (DCfW) in the form of design reviews:

- December 2014, Power Station Gateway;
- August 2016, Power Station Site; and
- May 2017, Power Station Site.

3.1.4 Three additional design reviews took place in relation to off-site associated development and are therefore considered in Volume 3 of the Design and Access Statement (Application Reference Number: 8.2.3).

3.1.5 It is considered that consultation has provided consultees with a proportionate level of information that has allowed them to make informed comments on the proposals and influence the design as it has evolved.

3.1.6 There are certain elements of nuclear power stations that are controlled by legislation and regulations. Horizon has sought to be transparent with consultees about matters that can and cannot be influenced by consultation.

3.1.7 The progression of the Project through consultation can be summarised as set out below.

- The Stage One Pre-Application Consultation identified broad principles showing the potential range and locations of the facilities.
- The Stage Two Pre-Application Consultation marked a further evolution of the proposals and design, including a draft masterplan document for development within the WNDA, as well as a 3D model and visuals to provide an impression of the likely scale and massing of the various development sites.
- The Stage Three Pre-Application Consultation reflected the legislative changes brought in by the Wales Act 2017 and project optimisation that took place between Stage Two and Stage Three as described later in this section.

3.1.8 Horizon has also carried out further informal consultation since the Stage Three Pre-Application Consultation with IACC and other consultees such as Welsh Government and Natural Resources Wales to provide the opportunity for further refinement to the proposals set out in this document.

3.1.9 At all stages the feedback from consultees has been an important consideration that Horizon has had regard to and fed into the iterative design process.

3.1.10 Details of how the proposals have evolved to avoid or reduce adverse environmental impacts are set out in volume D, chapter 2 of the Environmental Statement (Application Reference Number: 6.4.2), entitled "alternatives and design evolution".

3.1.11 Detailed justification for the specific locations of key elements within the WNDA is set out in the volume 2 of the Site Selection Report (Application Reference Number: 8.24.2).

STAGE ONE PRE-APPLICATION CONSULTATION (2014)

3.1.12 The Stage One Pre-Application Consultation included early design proposals for the Power Station and development within the WNDA, as shown on Figures 3-1 to 3-2.

ARCHITECTURAL DESIGN AND DETAILING

3.1.13 Three main concepts were consulted on that could be adopted for designing and detailing the structures and buildings at the Power Station, recognising that the architectural approach adopted would be a key influence on the way in which the Power Station buildings and structures affect the character of this part of Anglesey

- Blend in: this concept would seek to use natural colours and materials to minimise the prominence of the Power Station in the landscape. For example, colours of external cladding for parts of the Existing Power Station designed to respond to natural colours present in the surrounding landscape; or
- Make a bold statement: this concept would use architectural detailing, bold colour and contemporary materials that contrast with the surrounding environment to create buildings designed to become distinctive and highly visible new features in the landscape; or
- Selective use of bold architecture: this concept would combine the two approaches above by selecting certain buildings, or parts of buildings, that could be landmark structures. These would contrast with other buildings, which could be designed to blend in as far as reasonably practicable.

3.1.14 The majority of feedback welcomed the "blend in" approach.

3.1.15 Contrary to this, a handful of respondents suggested that buildings should incorporate a bold, architectural feature. Tref Alaw Community Council was the only statutory consultee that preferred the use of a bold, striking design. It was also noted by some that the Power Station should be able to both blend in with the landscape and contribute a striking architectural feature to the landscape.

3.1.16 The design has progressed with the commitment to develop a colour scheme based on natural colours to break down the scale and massing of the Power Station buildings and help integrate them into the landscape, whilst meeting safety, operational and business requirements, thereby using a similar approach to the Existing Power Station.

3.1.17 It was generally considered that buildings should be sustainable and make use of local materials where practicable. A restricted natural palette was therefore chosen that would help to link the buildings visually and be unimposing with their surroundings. Materials would aim to complement the character of the site's location.

3.1.18 It was recognised throughout consultation that there are engineering design requirements that need to be adhered to for many of the Power Station buildings and therefore the scope to "blend-in" these buildings was limited.

3.1.19 A number of buildings including and directly associated with the main reactor and turbine buildings would need to be constructed from concrete due to their technical function. A wider range of materials would be possible for ancillary buildings and support facilities, which would be constructed from both concrete and steel with a range of potential cladding material options.

WYLFA GATEWAY COMPLEX

3.1.20 The initial proposals also included the development of a number of facilities that would need to be relocated from their existing locations on the WNDA to the Wylfa Gateway Complex. The location of this two-hectare parcel of land adjacent to Tregele to the east of the A5025 as shown on Figure 3-1.

3.1.21 Following engagement with the public and key stakeholders, the Wylfa Gateway Complex was removed from the proposals, alongside the replacement of additional housing proposed at Tregele with on-site temporary workers accommodation during the construction period.

3.1.22 DCfW had also expressed concern over the selection of the site for the Wylfa Gateway Complex at design review in December 2014, noting that the site is large and close to neighbouring Tregele.

OPTIONS FOR ONSHORE COOLING WATER OUTFALL

3.1.25 Horizon consulted on preferred and alternative options for the location of the CW outfall structure, as shown on Figure 3-3.

3.1.26 The preferred option involved the construction of a new CW outfall structure that would discharge to the same location as the Existing Power Station outfall and would re-use the channel already cut into the sea bed.

3.1.27 The alternative location was proposed due to ongoing discussions with Magnox Limited and the Nuclear Decommissioning Authority about the potential opportunities and constraints associated with using and developing the Existing Power Station outfall channel for use within Horizon's proposals, particularly in relation to the compatibility of the decommissioning timescales with Horizon's project programme.

3.1.28 Following the consultation, discussions confirmed that the new outfall structure would discharge in the same location as the Existing Power Station outfall and would use the channel already cut into the sea bed.

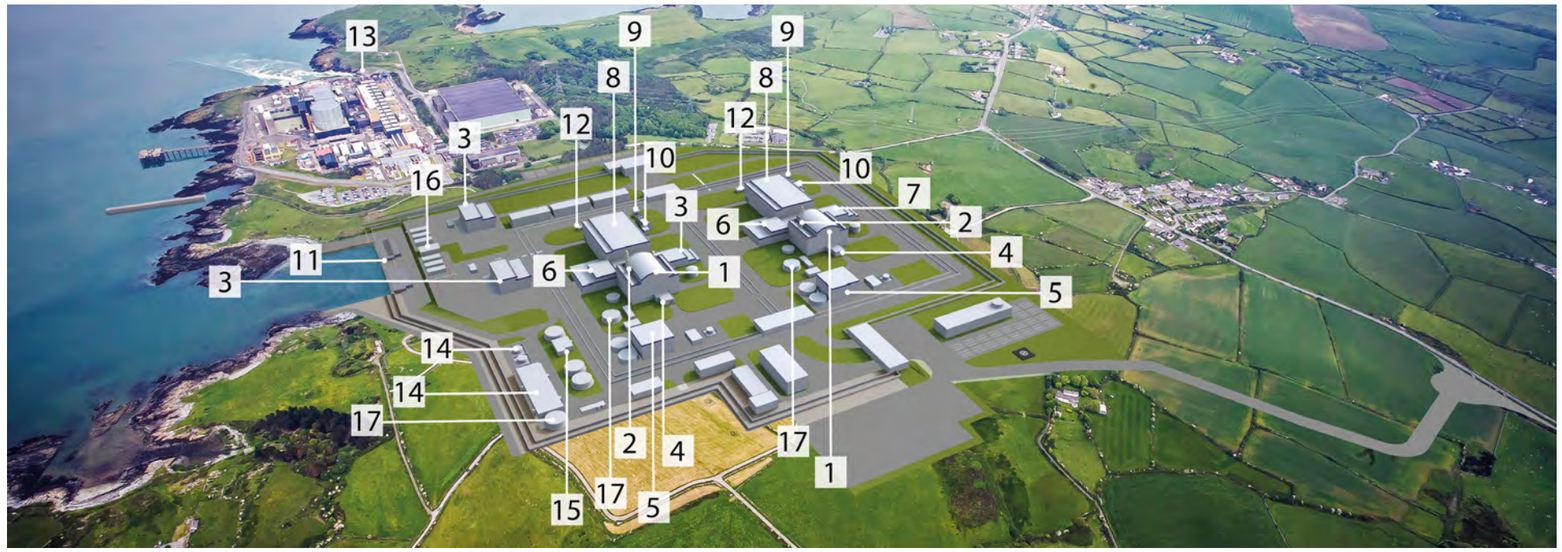

Figure 3-2 Indicative site layout – Stage One Pre-Application Consultation

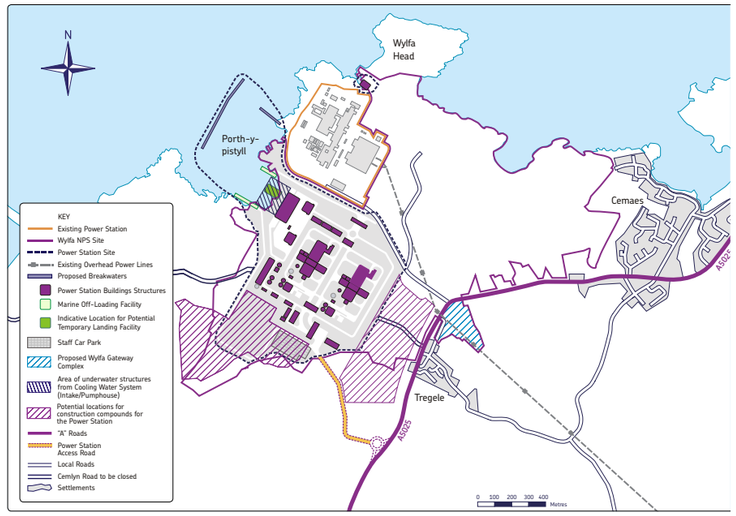

Figure 3-1 Indicative site layout: Stage One Pre-Application Consultation

Figure 3-3 Cooling water outfall options – Stage One Pre-Application Consultation

Legend

1	The reactor building	11	CW System (pumphouse structures, pumping plant and equipment
2	The control building	12	Seal pits
3	Heat exchanger building	13	Discharge tunnels and CW outfall
4	Filter vent building	14	Auxiliary boiler and tanks
5	Back-up building	15	Demineralised water treatment plant (and associated water and chemical storage tanks)
6	Radioactive Waste Building	16	Biocide treatment plant
7	Service building	17	Firefighting buildings (and associated water storage tanks)
8	Turbine building, containing steam turbine, condenser, electrical generator, various auxiliary plant and connecting systems		
9	Generator transformer and auxiliary transformers		
10	Gas storage facilities (e.g. hydrogen and carbon dioxide)		

POTENTIAL LOCATIONS FOR RADIOACTIVE WASTE STORAGE FACILITIES

3.1.29 Horizon consulted on two potential locations for radioactive waste storage facilities, as shown on Figure 3-4.

3.1.30 The location within the Power Station Site was chosen as it was close to and easily accessible from nuclear facilities and would therefore allow the safe and efficient transfer and secure storage of spent fuel and intermediate level waste.

3.1.31 The alternative site within the curtilage of the Existing Power Station was being considered to reduce the amount of land Horizon would require for operational purposes and was subject to ongoing discussions with Magnox Limited.

3.1.32 The decision was driven principally by technical design refinement and engagement with the nuclear regulators, so there was limited scope for consultation responses to influence the final proposals. The preferred location for radioactive waste storage facilities is in the southwest corner of the Power Station Site. The following factors have influenced the preference for this location:

- Ensuring risk to workers and the public from exposure to ionising radiation is As Low As Reasonably Practicable (ALARP);
- Availability and suitability of access routes for the transport of waste packages from the reactor building and ILW processing facility to the storage facility;
- Reduced feasibility of the alternative location being incorporated into the existing Wylfa Newydd licensed site; and
- Environmental impact findings, as set out in the Environmental Statement.

3.1.33 Strict permitting and regulatory regimes control radioactive materials and releases to ensure that the generation of radioactive gaseous, liquid and solid wastes requiring discharge or disposal cannot give rise to harm to humans or the environment. The controls and restrictions to be applied to disposal of radioactive waste will be such that resultant doses would be within prescribed limits and below regulatory concern.

MARINE OFF-LOADING FACILITY

3.1.34 Consultees generally supported the MOLF and the use of sea transport, particularly as it relates to relieving road congestion. Whilst IACC expressed support, they noted that it should be ensured that the facility is designed to be able to handle the projected volume of bulk materials and AILs.

3.1.35 In response to consultation, the design of both the MOLF and breakwater would have where practicable within operational and safety requirements, regard for seascape character and views from Cestyll Garden.

PROJECT UPDATE CONSULTATION (2016)

3.1.37 Horizon continued to evolve the Wylfa Newydd Project proposals both during and subsequent to the completion of the Stage One Pre-Application Consultation in 2014. Feedback from consultees influenced changes to these proposals as set out above.

3.1.38 Horizon had completed a number of strategies on important aspects of the proposals by early 2016 that were considered to be of particular interest to the community and so elected to undertake a non-statutory consultation to keep consultees well informed of the emerging scheme.

3.1.39 These strategies included an architectural strategy, which aimed to promote sustainable design by:

- Using material locally where possible;
- Considering how to conserve water within the buildings' designs;

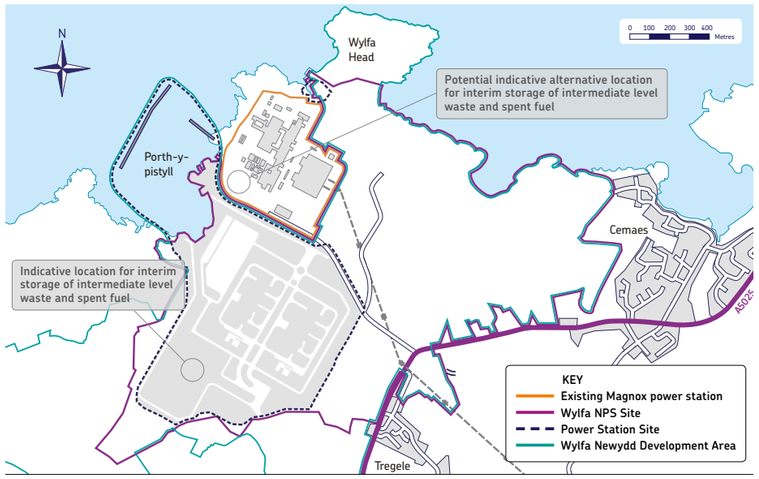

Figure 3-4 Potential locations for radioactive waste storage facilities – Stage One Pre-Application Consultation

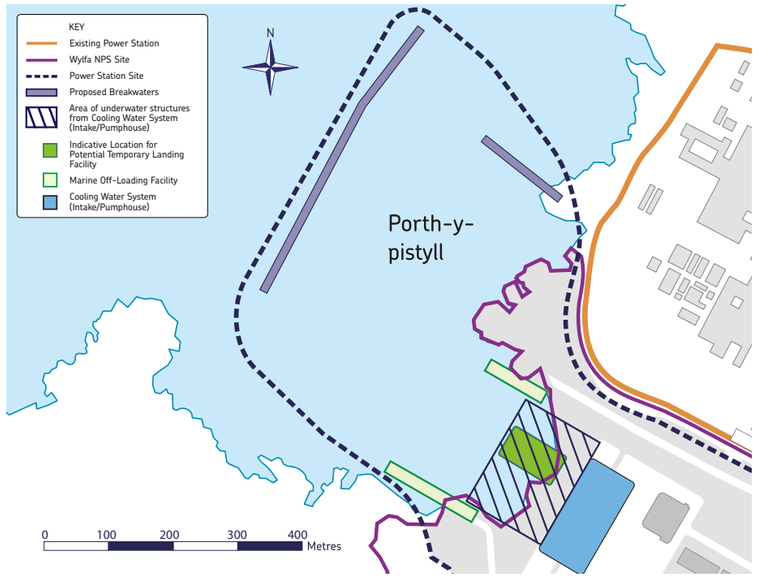

Figure 3-5 Marine Off-Loading and breakwater configuration – Stage One Pre-Application Consultation

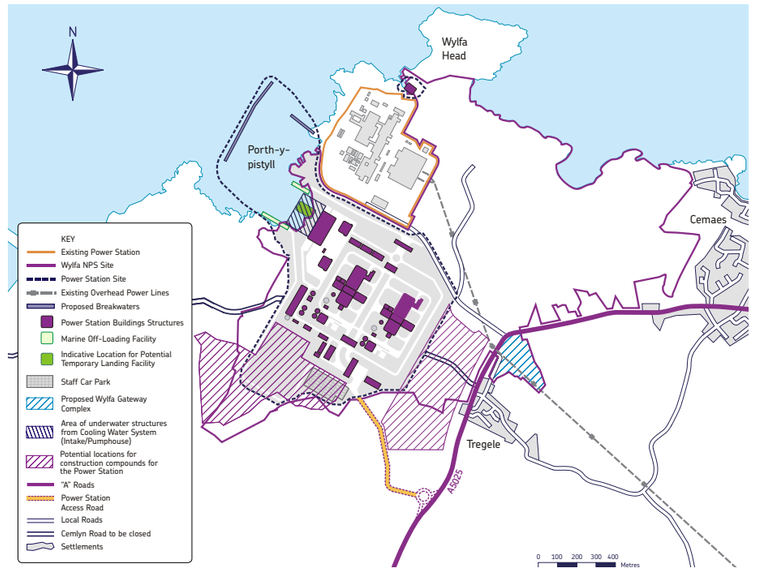

Figure 3-6 Indicative site layout – Stage Two Pre-Application Consultation

- Making use of technology that helps buildings hold their heat in winter and stay cool in summer; and
- Designing for the whole life of the building (relevant mainly to temporary buildings proposed as Associated Development).

3.1.40 The strategy also encouraged future detailed design to be suitable to the use of the building, such as simple designs for functional buildings and more creative use of materials and colours in public-facing buildings.

STAGE TWO PRE-APPLICATION CONSULTATION (2016)

3.1.41 Later in 2016, Horizon followed the Project Update Consultation with the significantly more detailed statutory Stage Two Pre-Application Consultation. The indicative site layout for Stage Two is shown on Figure 3-6.

3.1.42 The proposals at this stage were also informed by the Project Update Consultation and contained considerably more technical material, which had been informed by:

- the Generic Design Assessment (GDA) process, which Hitachi-GE as designer is responsible for;
- technical stakeholder requirements and engagement, undertaken by Horizon; and
- Environmental Impact Assessment (EIA) processes, undertaken by Horizon.

Stage Two Pre-Application Consultation consulted on further developed and optimised proposals for the Power Station, with a refined positioning and layout of the various structures and buildings taking into account regulatory and technical design requirements, as illustrated on Figure 3-6:

SITE VISION MASTERPLAN

3.1.43 As part of the Stage Two Pre-Application Consultation, Horizon prepared and consulted on an overarching site vision masterplan for the Power Station Site, to provide an integrated explanation of the proposed Power Station buildings and plant, together with the site infrastructure, landscape and ancillary buildings.

3.1.44 The site masterplan recognised the issue of scale and the relative impact of the development on views of the area from a distance, where only the shape and profile of the site would be visible, and the impact of the buildings from closer perspectives, where the detail of individual buildings would be important.

3.1.45 By 2016, the environmental appraisals of the site had significantly influenced the evolution of the scheme with extensive use of mounds to the landward side of the Power Station, reflecting the natural landscape of this part of Anglesey. This recognised the size and visual mass of the main Power Station structures and considered the impact on the views from further afield. The detailed views of the Power Station Site itself, which would then be shielded on a number of sides by the landscape and mounds, would only be possible from close proximity from a small number of locations compared with the proposals in 2014.

3.1.46 At this stage in the design evolution particular consideration was being given to the detail of the Power Station facilities in order to achieve the desired built environment experience by those up close to and amongst the Power Station facilities, with the aim of integrating the landscape and external building finishes. At the design review in August 2016, DCfW advocated key worker buildings at the entrance to the site having a 'human scale', which has informed the evolution of the proposals and the design principles in section 5.

3.1.47 The overall masterplan sought to develop a coherent language for the Power Station which is readbale from both close up and from a distance.

3.1.48 This was informed by the design review in August 2016, where the following conceptual options were presented and discussed with DCfW and agreed as potentially suitable:

- **Option 1:** an organisational approach based around a kit of parts whereby different sets of buildings would be approached differently; or
- **Option 2:** A city with a collection of individual buildings which are unique and different.

Figure 3-7 Option A: Use of natural colours

Figure 3-8 Option B: Use of greys and light colours

Figure 3-9 Option C: Use of graduating scale

3.1.49 Horizon went on through Stage Three Pre-Application Consultation and this DCO submission to indicatively develop the first of these two options, creating a coherent masterplan based around sets of buildings or plant and a kit of parts, as described in section 1 of this document.

COLOUR AND MATERIALS

3.1.50 As noted above, following the Stage One Pre-Application Consultation the use of materials with colours that blended into the natural landscape had become the preferred option.

3.1.51 Further details were provided at the Stage Two Pre-Application Consultation in relation to the overall colour and materials palette for the Power Station to create a coherent language for the site:

- **Option A:** Reflection of the colours of the surroundings environment with the use of natural colours, mirroring the Existing Power Station colour scheme.
- **Option B:** Use of greys and light colours in a scale to reflect the mass of the buildings.
- **Option C:** Graduating scale of colour and pattern to blend the buildings in the landscape.

3.1.52 These options are illustrated on 3-7 to 3-9.

ARCHITECTURAL LANGUAGE

3.1.55 Horizon consulted on proposals to use a range of materials, colours and finishes across the Power Station buildings and associated supporting facilities which coherently draw together the development as a whole, whilst being appropriate for each facility's technical function and siting. An important objective was to create a safe and attractive working environment, reflecting the operational importance of the site, which sits well in its environmental surroundings.

3.1.56 Buildings types were sub-divided as follows:

- Main Power Station block
  - The consultation was clear that the reactor building, turbine building, service building and the balance of plant and building structures would be constructed from concrete, as required for their technical function.
- Ancillary buildings
  - A wider range of materials would be used in the ancillary buildings and the associated support facilities, which would be constructed from both concrete and steel with a range of cladding materials. The architectural language would be further developed through a common palette of materials, with some buildings using higher quality materials within the palette depending on their function and location within the site.

GRID CONNECTION

3.1.57 Horizon consulted on the options for connecting the Power Station transformers to the existing substation. A number of routes were still under consideration, and the final choice of route and installation method would depend on space considerations and interactions with other services and features such as the 132kV cables owned by SP Manweb and National Grid, new and existing 400kV overhead lines, site roads, security fences, cooling water infrastructure, drains and telecommunications.

3.1.58 Horizon was clear in the consultation that the consideration of options offers limited scope for consultation comments to influence the outcome. In their consultation response IACC favoured an underground connection, which was noted. However, the grid connection would be taken mainly on the following design criteria: safety; impact on the environment; visual impact; deliverability and maintenance. A key consideration for an underground route would be the number of below ground services in these areas that could represent a hazard during construction and operation.

PROJECT OPTIMISATION PROCESS

3.1.59 In the period between the Stage Two Pre-Application Consultation and the Stage Three Pre-Application Consultation, the Project went through an important period of review.

3.1.60 While many aspects of the Project remained the same, other elements were updated. This review reflected key stages in the on-going development of the Project:

- Horizon's consideration of the feedback from Stage Two Pre-Application Consultation and other engagement with stakeholders;
- Reducing the environmental impact of the proposals as far as practicable;
- Horizon's appointment of a joint venture partner and various consultants to take forward its proposals for project design and deliverability; and
- Ongoing input from regulators about the technical design of the Power Station.

3.1.61 This is consistent with the iterative approach to design and consultation that is set out in "Planning Act 2008: guidance on the pre application process for major infrastructure projects" [RD3].

3.1.62 Horizon consulted on the outcome of this process as part of the Stage Three Pre-Application Consultation. The outcomes of this process as set out in section 3.2 below.

STAGE THREE PRE-APPLICATION CONSULTATION

POWER STATION

3.1.63 Prior to the Stage Three Pre-Application Consultation, the Power Station site layout comprised a twin cruciform design for the UK ABWR Units. This was replaced with a singular design that relocated the main plant to the north-west of the site and the ancillary buildings generally adjacent and to the south, as shown on Figure 3-10.

3.1.64 In addition, buildings and structures were combined where practicable to realise efficiencies within the design and during the construction works, including:

- the radioactive waste building, which was previously designed as two separate facilities (one for each reactor),
- the spent fuel interim storage facility and dry High Level Waste (HLW) decay storage facility being combined into one building; and
- the radioactive waste building was moved closer to the service building to allow for the provision of common access and security arrangements for accessing these facilities.

3.1.65 The optimisation process has resulted in a more compact and efficient design, which was welcomed by the IACC, that that will help to improve the construction schedule and will be more cost effective. Importantly, it increases the distance between the Power Station Site, the A5025 and local communities, as was generally supported by consultees through previous consultations.

3.1.66 The proposed location for the simulator and training building also moved from the east of the Power Station to a location to the south of the Power Station. The revised location was further from the village of Tregele and would benefit residents of Tregele in a similar way to relocating the Wylfa Gateway Complex, as described above following Stage One Pre-Application Consultation.

3.1.67 The third stage of consultation focused on the key changes to the proposals since the Stage Two Pre-Application Consultation. The consultation was clear that at this stage of the process there would be very little scope to influence the proposed changes to the Power Station itself as the design has already been informed by consultation to date and the current changes are largely driven by technical requirements and the need to deliver and operate the Power Station in a timely, safe and efficient manner.

MATERIALS

3.1.68 In response to the Stage Three Pre-Application Consultation, IACC stated three main preferences in terms of the visual appearance of the Power Station:

- The use of relatively dark shades for smaller buildings and a limited palette of materials, to make the buildings appear more recessive within the landscape and to help reduce low level visual "clutter".
- Careful consideration prior to specifying a strong expression of colour on the reactor buildings. IACC recognised that an appropriate colour(s) could make these buildings iconic features, whilst an inappropriate colour(s) could over-emphasise their scale and visibility.
- The provision of further details on the external appearance of the Power Station as both plans and elevations, together with photomontages from nearby locations to give a better understanding of the scale and appearance of the Project.

3.1.69 DCfW considered that ideas regarding simplification, the colour strategy and overall expression of the buildings appeared to be heading in a positive direction and welcomed the provision of additional detail to explore this further. Detailed indicative plans and elevations of the main buildings are provided as stand-alone drawings as part of the application package and the design basis is set out in section 6 of this document. Verified photomontage views are provided in volume D, appendix D10-8 of the Environmental Statement (Application Reference Number: 6.4.65) and are replicated in this document as Figures. Please refer to the Environmental Statement reference for the verified versions of the photomontages.

DESIGN CONCEPTS AND PRINCIPLES

3.1.70 Horizon presented the "grid concept" set out in section 4 of this document to DCfW at design review at the outset of the Stage Three Pre-Application Consultation, which was considered to be potentially strong if it is deliverable and works at ground level.

3.1.71 DCfW emphasised the importance of clear and coherent design principles for the buildings, which are now set out in section 5 of this document.

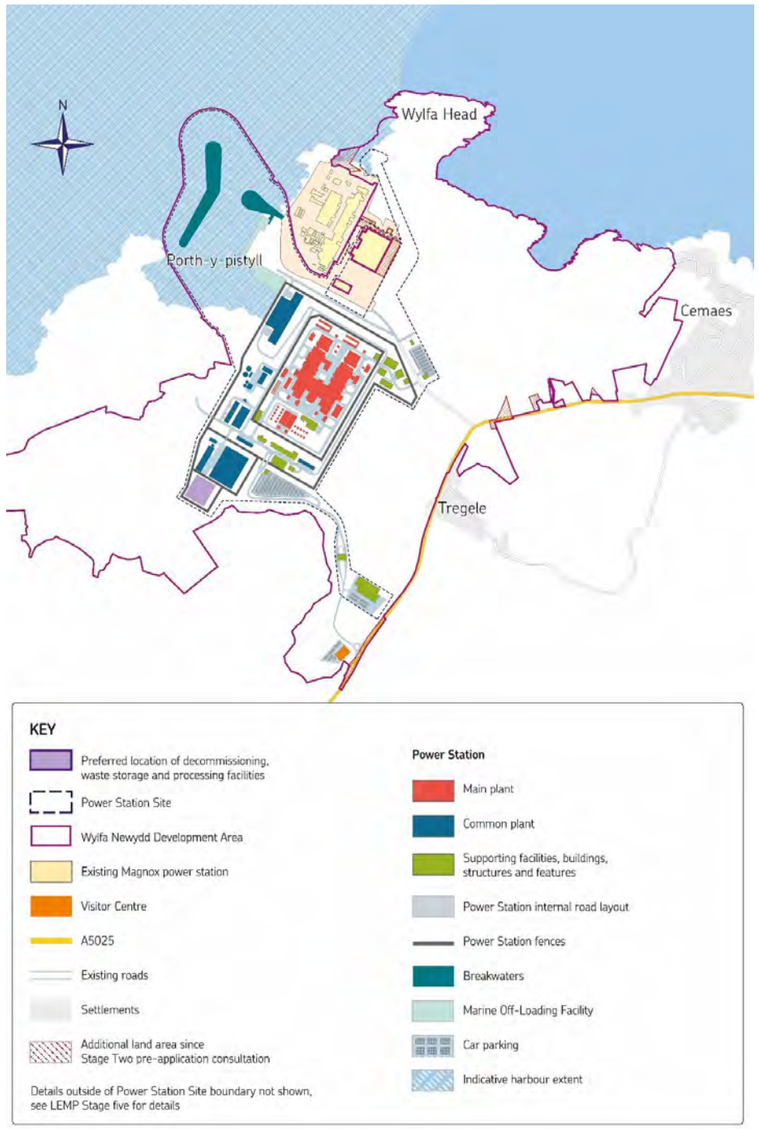

Figure 3-10 Indicative site layout – Stage Three Pre-Application Consultation

MARINE WORKS

3.1.72 Horizon refined the design of the MOLF to reduce the amount of seabed that is required to be excavated, avoid the need for underwater blasting and improve the safety and control of construction activities.

3.1.73 Horizon proposed long-term dewatering of basements in its Stage Two Pre-Application Consultation, which was cancelled at Stage Three. Volume D, chapter D9 (Application Reference Number: 6.4.9) of the Environmental Statement does still predict a major adverse residual effect on Tre'r Gof SSSI as a result of hydrological changes, based on a precautionary approach, however it was considered to be a beneficial change to make to the proposals as it slightly reduces the likelihood of a significant effect.

3.1.74 Since the Stage Three consultation, Horizon has been working further with IACC (Isle Anglesey County Council), NRW (Natural Resources Wales), NWWT (North Wales Wildlife Trust) and RSPB (Royal Society for the Protection of Birds) to further understand the potential impact on the SSSI (Site of Special Scientific Interest). As a result of this, Horizon is proposing compensation sites to offset potential effects on Tre'r Gof SSSI and carried out a further consultation on this (and other land matters) in January-February 2018. Further details are contained within the Consultation Report (Application Reference Number: 5.1) and the Landscape and Habitat Management Strategy (Application Reference Number: 8.16).

3.1.75 Horizon continue to engage with NWWT, NRW, IACC and the National Trust to seek to understand these concerns and address them through the Statement of Common Ground process.

CONSULTATION ON ADDITIONAL LAND

3.1.76 Between January and February 2018, Horizon held a consultation about additional land needed for the Wylfa Newydd Project. None of this land related to the Power Station Site and therefore did not influence the design evolution for the operational development of the Power Station Site.

3.2 DESIGN EVOLUTION

3.2.1 This section seeks to provide a clear summary of the key technical and operational requirements of the site brief in section 1.7 and the Design evolution taking into account the findings from consultation and the contextual assessment set out earlier in this document.

MAIN PLANT

3.2.2 The location of the main plant was selected on the basis of the following considerations:

- It creates a compact development envelope and positions the generating units within the area designated as potentially suitable for a nuclear power station in NPS EN-6 (RD4).
- The area is the largest uninterrupted and unconstrained space close to the Existing Power Station.
- A large part of the area is the lowest lying land within the WNDA. This is important for setting the Power Station development platform levels, which need to be optimised relative to sea level to minimise cooling water pumping costs.
- The area is on the south side of the Existing Power Station to Cemaes and is partially screened from Cemaes by the existing topography, the Existing Power Station and its associated screening mounds.
- It avoids utilising land within the Tre'r Gof SSSI (Site of Special Scientific Interest), Wylfa Head, and pre-existing screening mounds created by Dame Sylvia Crowe.
- It provides access to cooling water directly from the Irish Sea, for intake and discharge.
- It reduces interference with the access route to the Existing Power Station, which assists in enabling Horizon's proposals to coordinate with the planned decommissioning of the Existing Power Station.
- It maintains the potential for National Grid to continue using the existing 400kV overhead transmission lines and substation.
- The orientation optimises the grid connection and circulating water connections between the intake, condenser and outfall.

COMMON PLANT

3.2.3 The location of the common plant is largely defined by technical requirements, in that the components need to be appropriately located to serve the main plant.

RADIOACTIVE WASTE MANAGEMENT BUILDINGS

3.2.4 Horizon originally proposed six potential locations for the storage facilities as part of a feasibility study. Of the six options originally proposed, two were deemed feasible, as set out earlier in this section.

3.2.5 The location to the south-west of the main plant was selected primarily because the land within the Existing Power Station would not be available for use when required, as a consequence of decommissioning (depending on the decommissioning programme). This would have resulted in unacceptable commercial and programme risks to the Project if the option to the north of the main plant were selected.

3.2.6 Two options were also considered for the building configuration: the first option comprised separate buildings for each storage facility, whilst the second option comprised a two-building configuration, with one building storing both Spent Fuel and dry HLW. The second option was chosen such as it would result in a smaller overall construction footprint.

EMERGENCY RESPONSE CENTRE

3.2.7 The emergency response centre would be located to the south of the main plant. Alternative sites to the east of the main plant were ruled out on the basis of potential landscape and visual impacts on the local community as they were closer to Tregele. There is insufficient land to the north and the remaining land to the south is required for other facilities associated with the Power Station.

AUXILIARY BOILER AND TANKS

3.2.8 The auxiliary boiler and tanks would be located to the west of the main plant. Alternative sites to the east of the main plant were ruled out on the basis of potential noise and visual impacts on the local community as they were closer to Tregele. There is insufficient land to the north and the land to the south is required for other facilities associated with the Power Station.

ADMINISTRATION BUILDING

3.2.9 The administration building would be located to the south of the main plant. Alternative sites to the east of the main plant were ruled out on the basis of being closer to Tregele due to potential visual impacts, whilst there is insufficient land to the north. Sites on the western side of the plant would be further away from the Power Station Access Road and therefore less convenient to access from the main plant.

OUTAGE BUILDING

3.2.10 The outage building would be located to the north-east of the main plant. An alternative option of locating the building to the south of the main plant was discounted on the basis of the requirement to position other buildings to the south of the main plant, and inefficiencies (most outage workers would be within the turbine hall and this would be closer to the northern end of the main plant). In addition, the separation of operational resources from resources supporting outages may reduce the potential for accidents.

SIMULATOR AND TRAINING BUILDING

3.2.11 The simulator and training building would be utilised by operational staff on a regular basis. An operational requirement is the ability of these to staff to move efficiently between the simulator building and the main plant. Therefore, having considered options for locating the building in a number of locations on Anglesey, it was concluded that a location within the WNDA would be necessary for operational reasons.

3.2.12 Another factor influencing the location of the buildings is that the simulators would be used to train operational staff prior to the Power Station becoming operational. The simulators would therefore need to be operational early enough in the construction programme to allow sufficient time for the first set of operational staff to be fully trained in readiness for the commissioning activities in the final stages of construction.

3.2.13 The need for the building during construction means that there is a requirement for it to be located outside of the main construction areas, whilst providing convenient access to the A5025. These requirements dictated the options considered in locating the building.

3.2.14 During the Stage Two Pre-Application Consultation it was proposed to locate the building in the north-eastern corner of the WNDA, to the east of the village of Tregele. For the Stage Three Pre-Application Consultation the location was revised to the south of Tregele. This location allows for the building to be protected to a greater degree from the noisiest and potentially most disruptive aspects of the construction activities. The location is also further away from Tregele.

3.2.15 Other locations within the WNDA were considered but rejected due to interference with other construction activities, difficulty of access during the Power Station construction, being too close to the existing and proposed National Grid high voltage power lines, accessibility for operational workforce travelling from the south, or insufficient land being available.

MARINE WORKS

MARINE OFF-LOADING FACILITY (MOLF)

The location of the MOLF during stage one is shown on Fig 3-5.

3.2.16 Horizon undertook a strategic study in 2010 of the potential delivery options in the WNDA for both Abnormal Indivisible Loads and bulk material loads by road, rail and sea. The study identified four potential sites for a MOLF, including:

- site 1 – at Porth-y-pistyll, within the western part of the Power Station Site;
- site 2 – at Porth-y-Gwartheg, to the west of the Existing Power Station;
- site 3 – at Porth yr Ogof to the east of Wylfa Head; and
- site 4 – at Porth Wylfa, approximately 500m to the east of Porth yr Ogof.

3.2.17 Site 1 was presented as the preferred option at the Stage One Pre-Application Consultation and the location was marginally revised for the Stage Two Pre-Application Consultation. This was as a result of the configuration of the proposed breakwaters, which resulted in the MOLF site moving to the northern side of Porth-y-pistyll.

3.2.18 As part of the design optimisation process for the MOLF, the bulk material quay was relocated to between the Roll-on Roll-off quay and the eastern breakwater and reoriented. This revised location improved the relationship with a proposed concrete batching plant, reducing the transfer distance for bulk materials.

BREAKWATERS

3.2.19 Horizon has considered the construction sequence and methodology for the Marine Works and reviewed the range of potential breakwater structures. For instance, the use of caisson structures was considered; however, it was determined that rubble mound structures would allow the re-use of suitable material excavated from within the WNDA. This would reduce the requirement for importing construction materials and reduce the potential waste material.

3.2.20 The broad location of the breakwaters has not changed significantly since the Stage One Pre-Application Consultation. However, the configuration of the breakwaters (size and length) was altered as part of a package of measures to reduce the environmental effects on the coastline in locating the cooling water intake. In addition, after the Stage Two Pre-Application Consultation there has been:

- an increase in length of the eastern breakwater; and
- a reduction in length of the western breakwater and a movement of it approximately 20m to the west (further out to sea).

3.2.21 The armour to be used to cap the breakwater structures was also subject to appraisal. Natural rock armour was originally preferred to concrete armour (formed of pre-cast concrete) for visual purposes, so as to be better in keeping with the coastal setting. However, concrete armour offered advantages in terms of the higher structural stability, such that this was determined to be the most appropriate solution.

SITE LEVELS

3.2.22 Minimum site levels (ground elevation) for the buildings/facilities were selected based on the height of extreme flood event levels. As part of the design optimisation process, the proposed building platform levels were reviewed in terms of operational efficiency, construction methodologies, costs and environmental implications.

3.2.23 This resulted in an overall increase in platform height which reduced the overall quantity of material to be excavated, managed and moved during site levelling and grading.

SITE ACCESS

INTERNAL ACCESS ROADS

3.2.24 The current access to the Existing Power Station has to be maintained, and in order to enable vehicular access to land either side of the Existing Power Station access road a new road crossing would be provided. The crossing would incorporate all necessary signage (in both Welsh and English) to ensure safe passage of vehicles and pedestrians and would be controlled by a system of traffic lights.

3.2.25 An alternative option for a temporary bridge over the Existing Power Station access road was considered during the design process, however this was discounted because the above approach was deemed to be sufficient for traffic management purposes.

3.3 PARAMETERS FOR IMPLEMENTATION

3.3.1 As set out in Section 1 of this document, the design evolution explained in this section has informed the maximum parameters identified in the DCO Requirements and the following parameter plans:

- Power Station Site (WN0902-HZDCO-MSP-DRG-00002);
- Marine Works (WN0902-HZDCO-MRN-DRG-00001);
- Marine Works – temporary (WN0902-HZDCO-MRN-DRG-00002); and
- Marine Works – dredging (WN0902-HZDCO-MRN-DRG-00003).

3.3.2 Development within these areas will be designed and constructed in accordance with these parameters, as well as the design principles set out in Section 5, as secured by DCO Requirement.

POWER STATION

3.3.3 The DCO application will be based on bounded parameters for the Power Station rather than a defined design. These parameters are sufficiently flexible to accommodate a reasonable level of change.

3.3.4 Parameters (such as limits on height and location of buildings) are set by DCO Requirement, in order to keep the development within the defined envelope.

3.3.5 The broad approach is to divide the Power Station Site into zones within which certain buildings can move, where this would not result in materially different likely significant environmental effects. Likewise, for those buildings where the location is sensitive in terms of Environmental Impact Assessment the location has been fixed, with relatively modest limits of deviation.

- Parameter plans – Identify the 'zones' within which buildings, structures and works identified in the parameter tables (see below) must be located.
- Parameter tables – Identify maximum and minimum building dimensions (e.g. heights) and zones within which specific buildings, structures and works must be located (as shown on the Parameter Plans). They also identify final dredging depths and volumes (table D1-10).
  - Buildings and structures – These are able to move within the identified zones and may be sized up to the maximum dimensions provided in the parameter tables. Only certain buildings and structures have minimum parameters stated, as these were required for modelling purposes.
  - Stacks: these are fixed in terms of their general location, but could move within a defined circle radius of 5 metres. The main stacks have a modest variation in height of +/- 2 metres AOD. Combustion plant stacks would not be as tall as the main stacks and a greater variation in potential heights is provided;

- Platform heights: Each building zone has a maximum and minimum platform height parameter, with the extent of the variation dependent on the sensitivity of the zone in EIA terms.
- Marine Works - maximum and minimum parameters are proposed for the majority of structures. Parameters are also proposed for maximum dredging depths and maximum dredging volume.

RATIONALE FOR FLEXIBILITY REQUIREMENT AT THE POWER STATION SITE

3.3.6 The primary drivers for flexibility at the Power Station Site are to address two key design requirements that cannot be resolved until post DCO submission, which are "demonstration of As Low As Reasonably practicable (ALARP)" and "turbine optionality", which are explored further below.

3.3.7 In addition, experience from Hinkley Point C nuclear power station is that there will inevitably be some change to the Power Station post Generic Deisgn Assessment (GDA). It is sensible therefore to allow for some flexibility now, as long as it enables a robust assessment of likely significant effects, rather than needing to go back and apply for those changes later.

DEMONSTRATION OF ALARP

3.3.8 The Power Station, which comprises the two UK ABWRs and associated support facilities, has to be designed to comply with nuclear, environmental and conventional safety legislation. Demonstration of compliance is an ongoing process from early design stages through to the operational stage.

3.3.9 Prior to operations, a nuclear safety case will be prepared (Nuclear Site Licence Condition 23) that demonstrates that risks and planned radiological doses are As Low As Reasonably Practicable (ALARP). Demonstration of ALARP requires the licensee to show that all reasonable measures have been taken to reduce harm to workers and the public. Any ALARP assessment requires a balance between the reduction in harm versus the time, cost and difficulties in achieving the reduction. Whilst it is acceptable on an operational power station to be constrained by existing structures, for a new power station the robustness of any ALARP justification is likely to be affected by overly restricting buildings to a fixed size or location during the design.

3.3.10 The requirement to demonstrate Best Available Techniques under Environmental Permitting Regulations requires a similar balance of benefits when considering harm to the environment and may be difficult to justify if building size or location is overly restricted.

3.3.11 An example of how a fixed building size or location could affect the ALARP justification is where during detail design a component is specified that requires a different maintenance regime to what was previously assumed. This maintenance regime puts the operator in an area of an elevated radiological dose rate. The ALARP solution is to simply separate the component from the source of radiation, however this may require the building size to be altered or building location to change (with a consequential impact on neighbouring buildings) and hence, if there is no flexibility in size or location, it would not be possible to demonstrate the ALARP solution had been implemented.

3.3.12 It is important to note that when managing planned radiological doses the three key design principles are to limit exposure time, increase distance and incorporate shielding (typically by the addition of thick concrete walls). The inability to vary building sizes or locations significantly affects the ability to implement these design principles.

TURBINE OPTIONALITY

3.3.13 Due to turbine procurement, which is linked to the final investment decision, turbine selection will be made post DCO application. At least two different suppliers could be used. Each potentially requires slightly different turbine building sizes, internal arrangements and potential consequential changes to ancillary building locations. It is therefore necessary to incorporate flexibility around the power island (comprising reactor building, turbine building, control building, service building and heat exchanger building).

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4 DESIGN CONCEPTS

Design Concepts

A NATURALISTIC SETTING TO THE POWER STATION

4.1.1 The design of the Power Station has, and will continue to, evolve in tandem with the landscape setting within the WNDA. It is therefore relevant to set out here the design concept for the landscape setting also contained within the Landscape and Habitat Management Strategy (Application Reference Number: 8.19).

4.1.2 The design concept is to restore the naturalistic setting to the Power Station where possible, through the re-provision of land for sympathetic agricultural use interwoven with areas of appropriate semi-natural habitats. Earth mounds will also seek to visually 'anchor' the Power Station within the existing landscape, as well as provide important mitigation.

4.1.3 This concept is based on Horizon's understanding of the current context and the consultation feedback considered earlier in this document.

4.1.4 Areas of landscape restoration should seek to enhance areas for biodiversity using a mix of landscape typologies such as species rich grassland, marshy grassland, coastal heath and pockets of woodland linked by a mix of hedgerows, stone walls and cloddiau, to provide new habitat areas, facilitate movement of species through the landscape and promote sustainable biodiversity. The combination of these primarily nature conservation focused areas with sympathetically managed pasture fields gives the opportunity for a balanced landscape that contributes both to local social and economic factors as well as providing positive benefits for wildlife and plants.

4.1.5 Within the WNDA are reminders of human intervention on a coastal stretch that is seemingly timeless. Artefacts and walls, gate posts and planting, boundaries and tree plantations all point to activity that has shaped the area over hundreds of years. Construction and operation of the Power Station would be the latest in a series of events that have caused the landscape to change and adapt. The evidence of weathering and 'bedding in' of foreign artefact's provides an approach as to how we could implement new design proposals.

4.1.6 Light, façade and ordered orientation should be used to create a balanced proposal that provides the necessary screening to reduce visual impact, but also seeks to provide a sense of place that appears intended.

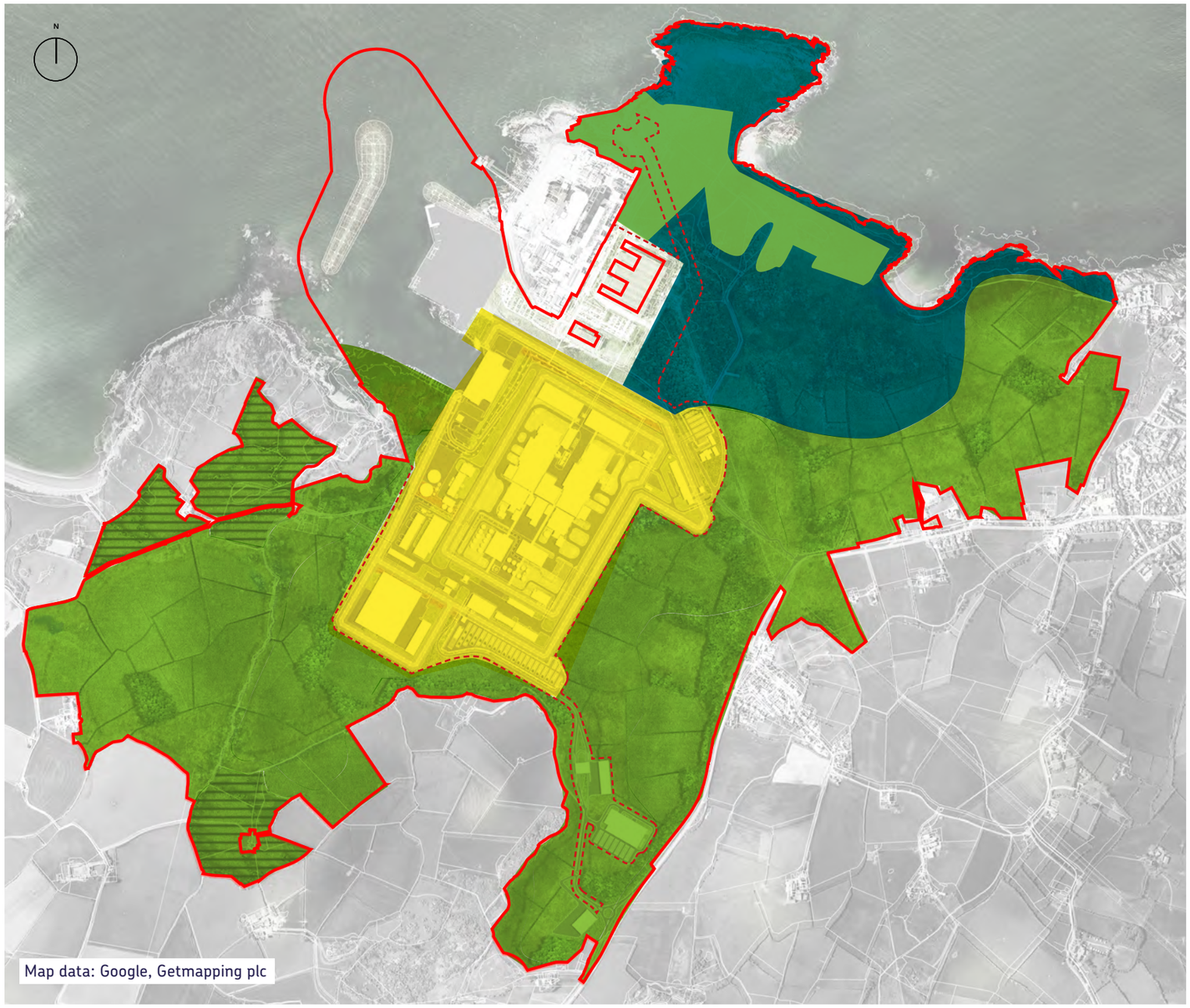
4.1.7 The approach to landscape design and the level of intervention will vary across the WNDA as illustrated in Figure 4-3, reflecting the context and functional constraints of each area.

4.1.8 Further details relating to landscape design and ecology outside the Power Station Site are set out in the Landscape and Habitat Management Strategy (Application Reference Number: 8.16).

Figure 4-1a Restoring a naturalistic setting

Figure 4-1b Restoring a naturalistic setting

Figure 4-2 landscape setting to many industrial interventions



Legend

- Wylfa Newydd Development Area
- Wylfa Newydd Power Station Site
- Landscape Preservation
- Landscape Restoration
- Landscape Variation

Figure 4-3 Landscape concept

A GRID FRAMEWORK FOR THE POWER STATION

4.1.9 Positioning principal buildings and structures to define an overlaid grid, within which movement patterns and security measures can be set out, would help to establish a visual structure for both architecture and landscape. This would increase legibility and sense of place within the Power Station if it is made to be relevant at ground level rather than from a more elevated position.

4.1.10 The Power Station landscape should be designed to facilitate the functional and operational requirements for security, maintenance and access to the buildings.

4.1.11 This concept was discussed with Design Commission for Wales in May 2017 and it was considered to be potentially strong if it is deliverable and works at ground level.

4.1.12 Given the operational requirements, a landscape grid would need to be expressed through a range of mainly hardscape materials, with planting included wherever it can meet the functional requirements. This industrial character could be softened through a palette of materials that reflect the local landscape through colour and texture. As the functional requirements generally lessen towards the outer areas of the Power Station Site, the landscape can include more planting, features and materials referencing the local landscape character, to soften the transition to the wider WNDA, as illustrated on Figure 4-4.

4.1.13 The grid concept should extend beyond the boundary fencing and into the car parks. These axes provide the framework for the site layout and also bring a structure to vehicular routes.

4.1.14 Figure 4-5 illustrates how the industrial grid concept of the Power Station Site will integrate with the drumlin landforms and agricultural character of the WNDA landscape.

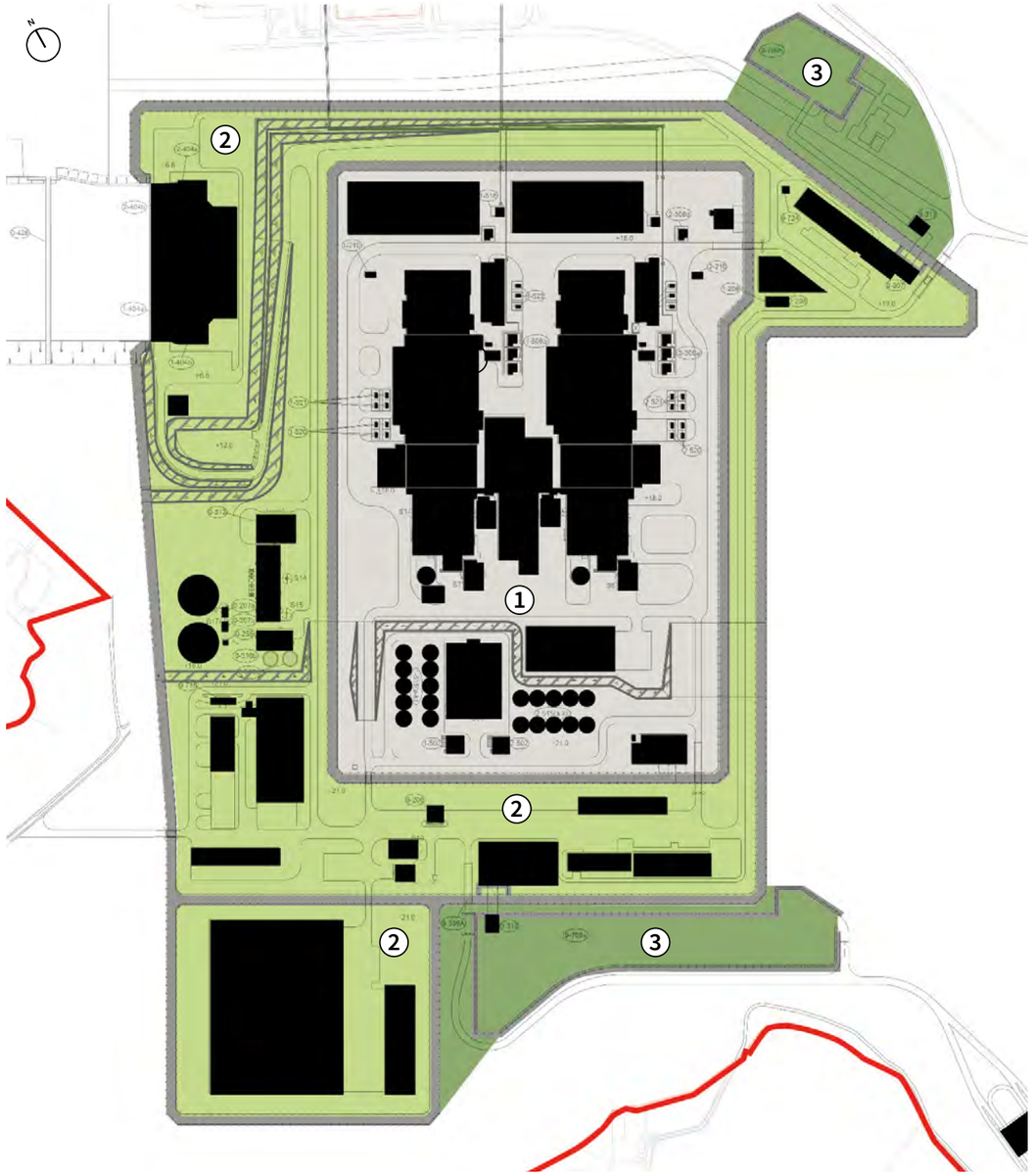
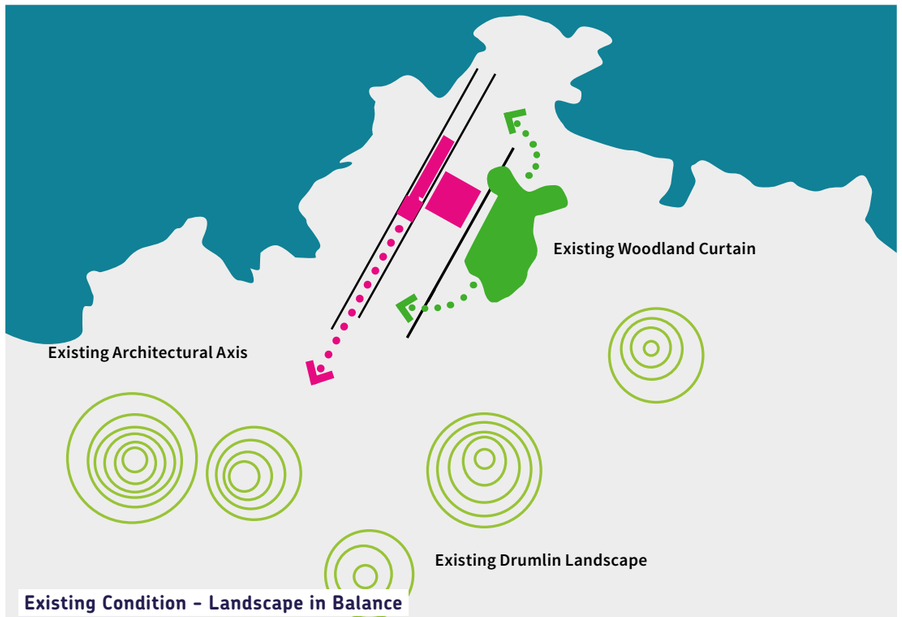


Figure 4-4 Landscape opportunities – Power Station



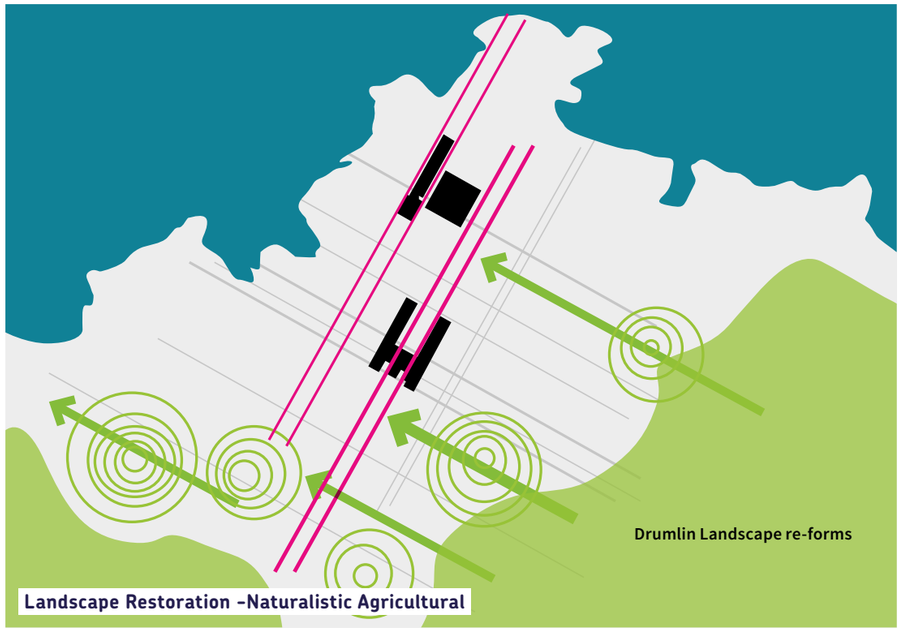


Figure 4-5 Landscape concept – integration into the wider landscape

ARCHITECTURE WITH A HUMAN SCALE

4.1.15 The Power Station should demonstrate an appropriate human scale despite the considerable heights and widths of individual buildings and structures. This should be achieved through the careful siting and design of buildings, light and shade and the avoidance of unnecessary structure or ornamentation.

4.1.16 This concept was advocated by Design Commission for Wales in August 2016 for key worker buildings at the entrance to the site.

VARIED SURFACE TEXTURES

4.1.17 Parts of the Power Station with the highest footfall under normal circumstances would be viewed and experienced close-up by a significant number of employees, visitors, and observers more often at sunrise, dusk or in darkness due to its latitude and worker shift patterns. The choice of surface textures are therefore important and should complement a simple palette that creates a coherent architectural language well-suited to a power station and its engineering constraints.

4.1.18 This concept was presented to Design Commission for Wales in August 2016 for key worker buildings at the entrance to the site and no concerns were raised in response.

DISTINCT GEOMETRIC FORMS

4.1.19 There are no clear architectural references that are directly relevant to the scale and form of the Power Station, with the exception of the Existing Power Station which is currently being decommissioned.

4.1.20 Nonetheless, Anglesey has a long history of significant built developments where distinct geometric forms have been introduced into an otherwise natural landscape, as shown on Figure 4-8. In addition to the Existing Power Station, examples include Beaumaris Castle, Menai Suspension Bridge, Britannia Bridge and South Stack Lighthouse. Within operational and engineering requirements, this geometric concept should be explored in future detailed designs.

4.1.21 This concept was presented to Design Commission for Wales in August 2016 for key worker buildings at the entrance to the site and no concerns were raised in response.

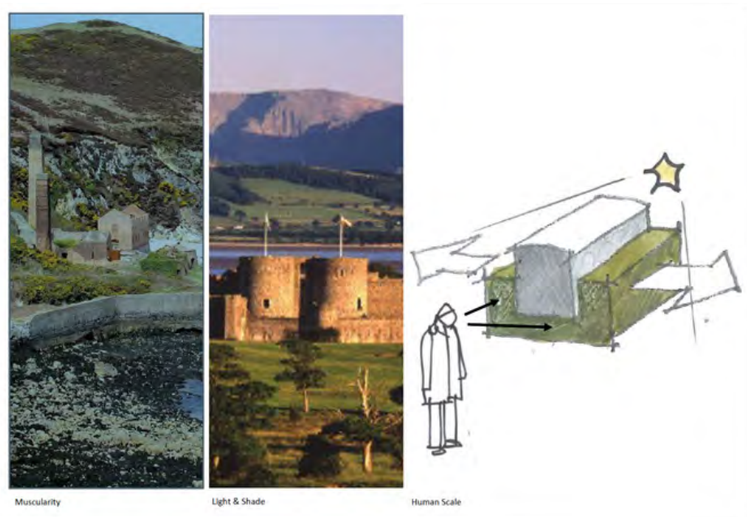


Figure 4-6 Human Scale

Figure 4-7 Varied surface textures

Copyright: Stephen Tucker

Figure 4-8 Geometric forms

BLENDED COLOURS WITH A STRONG EXPRESSION FOR THE REACTORS

4.1.22 The Existing Power Station adopts a clear strategy of using both bold and subtle colour cues, reflective of the surrounding countryside to emphasise certain buildings relative to others. Horizon also considers that colour is an important tool to help bring a coherent architectural language to the Power Station, as has been evidenced through Pre-Application Consultation.

4.1.23 Consultation feedback generally expressed a preference to try to "blend-in" many parts of the Power Station, with a strong expression of colour being identified as potentially appropriate for the reactor building to create an iconic feature.

4.1.24 Anglesey's natural landscape is a strong contextual references for colour, particularly given the Power Station's location along the exposed coastline, as shown on Figure 4-9.

4.1.25 Colour should be used to strengthen the connection between the Power Station and its green landscape setting. Darker hues that reflect the local landscape could be applied to lower height buildings and structures to define a loose physical plateau across the Power Station that blends into the local landscape, as shown on Figure 4-10.

4.1.26 As a clear contrast, taller buildings and/or structures, such as the reactor buildings, should be made more visible through a high-quality concrete finish or painted concrete finish, such as white, to help highlight the significance of the Power Station.

4.1.27 Colour should be applied to all buildings and structures, where practicable within operational and engineering constraints, to give order and cohesion to the Power Station. Inspiration is taken from the colours of the surrounding landscape, to create a development that feels connected and integrated.

Figure 4-9 Natural colours within the surrounding landscape

Deep hues define a building plinth and also used for accent walls.

Walls are painted concrete or clad with coloured metal panels. All ancillary structures will be coloured to achieve coherence.

Vibrant, brilliant white employed to the reactor enclosure.

Figure 4-10 Bold and blended colours

4.1.28 Whilst the architectural approach is one of shielding some of the more significant building impacts from the surrounding areas, there is at the same time a desire that the Power Station will present to the world a clear and honest expression of the raw industrial and muscular forms of the industrial processes contained within and will be a celebration of the context of this particular landscape of the north coast of Anglesey. The reactor buildings are by far the most dominant structures proposed and the concept is to give expression to this iconic feature of the power generation process by potentially adopting a light or painted finish to the otherwise raw concrete forms.

4.1.29 This concept was included in the Stage One Pre-Application Consultation and Stage Two Pre-Application Consultation and, whilst a variety of views where expressed, the majority of respondents favoured a blend-in approach.

4.1.30 Horizon has considered its position for the reactor buildings further to inform this design concept. Design Commission for Wales considered in August 2016 that it may be preferable to celebrate the functional necessities of the materiality of certain buildings rather than try to hide or disguise them.

4.1.31 IACC considered in response to the Stage Three Pre-Application Consultation that, in principle and following careful consideration, the use of an appropriate strong expression of colour could make these buildings iconic features.

4.1.32 Horizon has therefore proposed a concept that seeks to balance the views of respondents and limit visual impact, whilst also celebrating the raw industrial form of the industrial processes contained within the nuclear power station.

Colour and texture are employed to give a coherent architectural form

Single dark blue tones are employed to give a coherent approach to the various structures and ancillary buildings, with a very clear architectural expression of the white of the reactor itself.

A similarly bold approach to colour has been employed to embed the development within its semi-rural location. Colours reflect the underlying colour of the landscape and pattern is used to respond to the surrounding trees. There is a clear expression of the reactor silhouetted against the sky.

Figure 4-11 Examples of varying uses of colour and texture

5 DESIGN PRINCIPLES

5.1 DESIGN PRINCIPLES

Design Principles

5.1.1 The DCO Requirements will require detailed design and landscape schemes associated with development within the Power Station Site to be submitted and approved in accordance with the design principles set out below. The design principles have been informed by the findings within sections 1-4 of this Design and Access Statement

DELIVERING GOOD DESIGN

5.1.2 As set out in Volume 1 of the DAS (Application Reference Number: 8.2.1), the Planning Act (2008) [RD1] places importance on good design. Policy relating to good design for energy infrastructure is set out in NPS EN-1 [RD10] and policy relating to good design specifically for nuclear power generation is set out in NPS EN-6 [RD11]. These policies are set out in detail in the Planning Statement (Application Reference Number: 8.1).

5.1.3 While there is no hierarchy in the principles of good design, both NPS EN-1 and EN-6 recognise that the nature of energy infrastructure developments can limit the choice an applicant may have in respect of the visual appearance of buildings. For these reasons, the policies recognise that the achievement of good design goes beyond visual aesthetics and that the functionality of infrastructure is just as important. In this respect, the Planning Inspectorate needs to be satisfied that energy developments are functional and sustainable, and having regarding to regulatory and other constraints, are as attractive, durable and adaptable as possible. In making this assessment, paragraph 2.8.1 of EN-6 confirms that the need to ensure the safety and security of a nuclear station and to control the impacts of its operation, should be given substantial weight in determining whether or not the principles of "good design" under EN-1 have been achieved.

5.1.4 For the purposes of this DAS, policy relating to good design has been grouped into the six themes set out in Table 5-1. Grouping them in this way does not seek to alter the meaning of policy and is applied to help demonstrate how the design principles in this chapter underpin the delivery of good design.

GOOD DESIGN	CORRESPONDING THEMES
The applicant should take into account functionality including fitness for purpose (NPS EN-1, Para 4.5.1). The need to ensure the safety and security of the power station, and the need to control the impacts of its operations, must be given substantial weight given the importance of these factors to the operation of a nuclear power station (NPS EN-6, Para 2.8.1). The GDA, site licensing and environmental permitting processes will consider certain aspects of design, which the IPC should not replicate (NPS EN-6, Para 2.8.4).	Functionality
Applying good design to nuclear power stations means giving substantial weight to the need to control the impacts of its operations (NPS EN-6, Para 2.8.3). Good design can act to mitigate the impacts of nuclear power stations, such as landscape and visual impacts (NPS EN-6 Para 2.8.3). Good design can help mitigate adverse impacts through use of appropriate technologies. (NPS EN-1, Para 4.5.2).	Mitigation
The appearance should demonstrate good aesthetic as far as possible (NPS EN-1, Para 4.5.3) Energy infrastructure developments should be sustainable and, having regard to regulatory and other constraints, should be as attractive, durable and adaptable as they can be (NPS EN-1, Para 4.5.3). The applicant should take into account aesthetics, including its contribution to the quality of the area in which it would be located (NPS EN-1, Para 4.5.3). The applicant may not have any or very limited choice in the physical appearance of some energy infrastructure (NPS EN-1, Para 4.5.3).	Appearance
Applying good design to energy projects should produce sustainable infrastructure that is sensitive to place (NPS EN-1, Para 4.5.3). There may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation (NPS EN-1, Para 4.5.3).	Character
Applying good design to energy projects should produce sustainable infrastructure that is efficient in the use of natural resources and energy used in their construction and appearance. (NPS EN-1, Para 4.5.3).	Sustainability
For some structures where the functional requirements may change over the lifetime of the structure, such as sea defences, they should be capable of being adapted if the need were to arise in future without major re-design or significant physical disruption (NPS EN-6, Para 2.8.2).	Adaptability

OVERACHING PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
1. Detailed design will not prohibit the ability to obtain and comply with Environmental Permits and the Nuclear Site Licence.	Functionality	To ensure the detailed design of the Power Station is fit for purpose.
2. The design of the Power Station, Marine Works and other on-site development has to be based around meeting functional, operational, maintenance, safety, security and environmental requirements, achieving the construction and operation of a cost-effective and efficient Power Station.	Functionality	To ensure the detailed design of the Power Station is fit for purpose.

POWER STATION

SITE BRIEF PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
3. A platform height will be provided which supports the categorisation of the site as a "dry site" in respect of coastal flooding.	Functionality	Increases the safety of the Power Station.
4. Direct access to the Irish Sea will be provided.	Functionality	Allows for a ready supply of cooling water to be provided in an efficient way.
5. Obstructions to the Existing Power Station access road will be as limited as reasonably practicable.	Functionality	Co-ordinates with planned decommissioning of the Existing Power Station.
6. The potential for National Grid to continue using the existing 400 kilovolt overhead transmission lines and substation will be maintained.	Sustainability	Provides the potential for existing infrastructure to be re-used.
7. The siting and orientation of the main plant will create direct and efficient connections with the National Grid substation and the CW System intake and outfall	Functionality	Increases the safety and operational efficiency of the Power Station. Reduces the amount of materials and energy required to construct the Power Station.
8. The service building, control buildings, radioactive waste building, reactor buildings, filter vent building, emergency diesel generator buildings and turbine buildings should be geographically clustered together to allow for a single area to be provided for radiation control. Internal access between all buildings within the cluster should be possible once you have entered through the service building	Functionality Sustainability	Increases the safety, security and operational efficiency of the Power Station. Reduces the amount of materials and energy required to construct the Power Station.
9. The two UK ABWRs will be set apart from each other with the radioactive waste building and service building located between them.	Functionality	Increases the safety and operational efficiency of the Power Station.
10. The auxiliary service water system intakes and screening will be located either side of the CW intake with the pumping installation for these systems located in the heat exchanger building.	Functionality	Increases the safety and operational efficiency of the Power Station.
11. The back-up buildings will be located separate from the reactor buildings and will have separate power and water supplies.	Functionality	Increases the safety of the Power Station.
12. The heat exchanger buildings will be located close to the turbine and reactor buildings.	Functionality	Increases the safety and operational efficiency of the Power Station.
13. The fire water pump house and make-up water treatment building will be located close to the main plant.	Functionality	Increases the operational efficiency of the Power Station.
14. The emergency response centre will be easily accessible to the main plant.	Functionality	Increases the safety, security and operational efficiency of the Power Station.
15. The auxiliary boiler building will be located close to the main plant.	Functionality	Increases the operational efficiency of the Power Station.
16. The cooling towers will be located close to the heat exchanger buildings.	Functionality	Increases the safety and operational efficiency of the Power Station.
17. Locate the conventional waste storage close to the main plant to facilitate the sorting and temporary storage of conventional waste generated at the Power Station before onward recycling or disposal.	Functionality	Increases the operational efficiency of the Power Station.
18. The maintenance facility will be adjacent to the main plant as it is required to serve the main plant 24 hours per day.	Functionality	Increases the operational efficiency of the Power Station.
19. The simulator and training building will be located outside of the outer site security fence and with convenient access to the A5025 and Power Station Access Road.	Functionality Mitigation	Allows the building to be fully developed early in the construction programme to facilitate training. Increases the distance from Tregele.
20. The outage building will be located where high numbers of outage (contractor) staff can be managed and controlled through an independent access route, and where the movement of people between the outage building and the turbine buildings will be efficient.	Functionality	Increases the operational efficiency of the Power Station.
21. Radioactive waste management facilities will be clustered together with easy access to the main plant.	Functionality	Increases the safety, security and operational efficiency of the Power Station. Minimises the distance of transfer routes for radioactive waste.
22. The administration building, outage building and emergency command and control facilities will be located near to the Power Station entrance points.	Functionality	Increases the safety, security and operational efficiency of the Power Station. Minimises the need for staff and visitors to access other parts of the Power Station and allows internal and external emergency responders to coordinate at the earliest point.
23. The roads within the boundary fencing will allow for maximum expected loads during construction and operation.	Functionality Adaptability	Increases the operational efficiency of the Power Station. Provides flexibility in the future operation and maintenance of the site.
24. The road layout within the Power Station Site will facilitate appropriate emergency access.	Functionality	Increases the safety and security of the Power Station.

ADDITIONAL DESIGN PRINCIPLES

MASTERPLANNING

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
25. The footprint, scale and massing of buildings and structures on the Power Station Site will be as small as reasonably practicable, including temporary buildings and structures.	Functionality. Mitigation. Character. Sustainability	Increases the operational efficiency of the Power Station. Reduces adverse landscape and visual effects. Results in a design that is more sensitive to place by minimising physical impacts. Efficient in the use of natural resources used in construction.
26. The layout of the Power Station should provide a basis for a cohesive and legible development with a sense of identity, which may comprise a grid framework.	Appearance. Character.	Improves the aesthetic of the Power Station.
27. Office space will be located close to the outer boundary of the site.	Functionality	Increases the security and operational efficiency of the Power Station by limiting the need for high numbers of staff to travel further into the Power Station Site.
28. Buildings that will have the highest footfall under normal circumstances should generally be located in the most accessible parts of the site.	Functionality. Appearance.	Increases the security and operational efficiency of the Power Station by limiting the need for high numbers of staff to travel further into the Power Station Site. Buildings with less regulatory constraints provide greater opportunities to demonstrate good aesthetic.
29. The spent fuel storage facility, Lower Activity Waste management facility, Intermediate Level Waste storage facility and radioactive waste building will be constructed within the Power Station surface water catchment area and will be sited a minimum of 15 metres from any watercourse.	Mitigation	Reduces adverse environmental effects.

BUILDING DESIGN

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
30. Building design should consider emphasising horizontal elements where practicable to contribute towards a sense of identity for the Power Station.	Appearance	Contributes towards a common design language across the Power Station.
31. A palette based on natural colours found in the landscape or seascape setting will be developed for the Power Station buildings where this is compatible with operational and safety requirements. The palette will seek to: • break down the scale and massing of the Power Station buildings; and, • help integrate the Power Station buildings into the landscape using a similar approach to that used for the Existing Power Station.	Mitigation. Character. Appearance.	Reduces adverse landscape and visual effects. Demonstrates a sensitivity to place through integration. Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
32. Contrasting colours should be selected and used in small quantities where appropriate to provide interest and support wayfinding around the site, where this does not detract from the design principle of blending the Power Station into the landscape, as far as reasonably practicable.	Appearance. Character.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints. Ensures the use of contrasting colours remains sensitive to place.
33. The reactor buildings should be distinctive structures within the Power Station, to celebrate the presence of the Power Station and the primary role of the reactors within the electricity generating process	Appearance.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
34. Where colour is adopted then darker colours may be used at low levels to reduce massing.	Appearance. Character.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints. Complements the transition of colour shades typically found in nature and locally.
35. The following buildings are likely to be located along or near to the Power Station Access Road: simulator and training building; plant logistics warehouse; vehicle inspection bay; administration building; main gatehouse for outer fence; emergency response centre; and, search building main entrance. They should therefore generally be designed with higher quality materials for parts of the building that will be experienced in close view, compared with other buildings on site. These buildings are those support facilities with higher footfall that are likely to be located in the most prominent parts of the site.	Functionality. Appearance.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
36. Where practicable, there should be a generally consistent approach to construction detailing on buildings with the highest footfall. Elevational treatments should be designed at a human scale.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
37. Industrial plant attached to buildings with high footfall under normal circumstances should be enclosed or screened where practicable.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
38. Communal areas within buildings and office spaces should seek to maximise natural daylight as far as reasonably practicable.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
39. Building entrances should be located in a legible location in relation to circulation routes where practicable.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
40. Building entrances for the simulator and training building, search building main entrance, main gatehouse for outer fence and the administration building should be clear and welcoming in design terms.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
41. The long-term appearance, including exterior finishes, of new or existing buildings which will remain during the care and maintenance period will be maintained until demolished.	Appearance	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.

MARINE WORKS

SITE BRIEF PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
42. The footprint of the breakwaters, Cooling Water Intake and Outfall structures, temporary causeway and associated Dredging activities will be designed to be as small as practicable.	Functionality. Sustainability. Mitigation.	Increases the operational efficiency of the Power Station. Reduces the amount of materials and energy required to construct the Power Station. Reduces adverse effects on coastal and marine processes and effects on coastal geomorphology receptors.
43. The breakwaters will use interlocking modular concrete blocks on the external surface of the breakwaters to dissipate wave energy.	Functionality. Mitigation.	Increases the operational efficiency of the Power Station. Reduces adverse effects on the Esgair Gemlyn shingle ridge from changes to wave reflection.

ADDITIONAL DESIGN PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
44. New structures within the marine environment will seek to integrate into the existing seascape character, as far as reasonably practicable, through the selection of appropriate materials.	Mitigation. Character. Appearance.	Reduces adverse visual effects. Demonstrates a sensitivity to place through integration. Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
45. The Cooling Water outfall will be designed to: • propel the thermal plume; • promote mixing and dispersal of the discharge flow to the north of Wylfa Head where offshore currents will aid decay and dispersion; and • reduce the risk of recirculation.	Mitigation.	Reduces adverse effects on the marine environment.
46. The Cooling Water outfall and its associated temporary cofferdam will be designed to avoid the dolerite dyke intrusion which forms the key feature of the Porth Wnal Dolerite RIGS.	Mitigation	Reduces adverse effects on a designated RIGS site.
47. The Cooling Water system will be designed to have a maximum intake velocity of 0.3m/s in front of the intake opening at Lowest Astronomical Tide (LAT).	Mitigation	Reduces adverse effects on coastal and marine processes by reducing erosion and scour within the inner harbour area.
48. Cooling water intake filtration will comprise of a coarse bar screen located at the front of and spanning the full width of the intake structure with fine mesh drum screens serving the Main Circulating Water System and band screens serving the Auxiliary Service Water Systems both located within the intake structure.	Mitigation	Reduces adverse effects on the marine environment.
49. An acoustic fish deterrent will be located in front of the Cooling Water intake and will be designed in line with Best Available Techniques. The sound field will be located in the most appropriate location within the intake entrance; it will be specified to allow redundancy in the system and will be supported by modelling to demonstrate a uniform sound field. It will also be designed to avoid adverse effects on marine mammals.	Mitigation	Reduces adverse effects on the marine environment.
50. An effective fish recovery and return system will be provided within the Cooling Water system, with a discharge point located below LAT, and will be designed in line with Best Available Techniques. The system will remove fish impinged on all screens and return them to sea.	Mitigation	Reduces adverse effects on the marine environment.
51. The western breakwater will be located and designed to limit the impact of changes to hydrodynamic flows and wave climate to minimise long term physical disturbance to habitats located to the west of the breakwater.	Mitigation	Reduces adverse effects on the marine environment.
52. The design of the breakwater structures will introduce new hard surfaces which could potentially have the capacity to function as an artificial rocky reef, providing new colonisation opportunities for species dependent on hard substrate.	Mitigation.	Reduces adverse effects on the marine environment.
53. The design of the permanent breakwaters will provide intertidal areas for grey seals to haul out. The development of habitats and species on the breakwater structures could also potentially provide habitat, food and refuge resources for seabirds.	Mitigation.	Reduces adverse effects on the marine environment.

OTHER ON-SITE DEVELOPMENT

LANDSCAPE WORKS AND PLANTING

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
54. There will be no soft landscaping within the inner security fences.	Functionality.	Increases the security and operational efficiency of the Power Station.
55. Soft landscaping beyond the inner security fence and within the outer security fence will generally not comprise planting taller than 1m in height. Dense areas of planting that restrict sightlines will be avoided.	Functionality. Appearance.	Increases the security of the Power Station. Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
56. There will be no soft landscaping in the void between the inner security fences and in the void between the outer security fences.	Functionality	Increases the security of the Power Station.
57. There will be no soft landscaping, street furniture or paths within 10m of any security fence on the Power Station, with the exception of security fencing for the simulator and training building. Stock fencing, or similar, should define the outer edge of the 10m zone for the outer security fence. The 10m clear zones to the nuclear site should be finished with gravel. The clear zone to the simulator and training building fence may be finished with grass.	Functionality	Increases the security of the Power Station.
58. All tree planting will be set a minimum of 10m clear from the Power Station Access Road.	Functionality	Increases the security of the Power Station.
59. Trees within parking areas will be carefully selected and will not be located where they obscure CCTV sightlines.	Functionality	Increases the security of the Power Station.

ADDITIONAL DESIGN PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
60. Landscape design should provide a visual amenity for employees of the Power Station.	Appearance.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
61. Landscape design within the outer and inner security fences and in the surrounding car parks will generally seek to enforce the Power Station Layout which may comprise a grid framework creating a strong contemporary landscape setting.	Appearance.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
62. In general, and where practicable, the landscape design of the Power Station Site should be inspired by the wider landscape, by using traditional materials, native planting, or a colour palette inspired from the local landscape.	Character	Demonstrates a sensitivity to place through the use of design that is informed by the wider landscape.
63. Soft landscape design should incorporate a high proportion of native plants, suitable for the different areas of the site and requiring low maintenance.	Character	Demonstrates a sensitivity to place through the use of native plants.
64. Amenity space should be provided around the simulator and training building and administration building to provide power station site workers with an outdoor space.	Appearance. Character.	Contributes towards the creation of an attractive development whilst having regard to regulatory and other constraints.
65. The landscape setting to the simulator and training building (located away from the rest of the Power Station building and structures) should be more naturalistic than other buildings to help blend the development into the restored landscape.	Character	Demonstrates a sensitivity to place through integration.

DRAINAGE

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
66. Surface water drainage will discharge to the sea, subject to the specific requirements of the relevant Environmental Permit.	Mitigation	Reduces adverse effects through compliance with the requirements of the relevant Environmental Permit.

LIGHTING

SITE BRIEF PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
67. Lighting designs will: • be developed to meet operational, safety and security purposes; • limit light spill onto sensitive receptors to below thresholds where significant adverse effects are predicted; and • limit visibility of new lighting at distant receptors.	Functionality. Mitigation.	Increases the safety, security and operational efficiency of the Power Station. Reduces adverse visual effects.
68. Best Available Techniques will be used and will include: sympathetic design, automatic sensors for street lights, use of LED lighting to achieve lower lighting levels whilst maintaining the same level of effective lighting	Mitigation	Reduces adverse effects through the use of appropriate technologies.

ADDITIONAL DESIGN PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
69. Lighting designs will maintain a uniform lighting solution to reduce dark and light spots.	Functionality. Mitigation.	Increases the safety, security and operational efficiency of the Power Station. Reduces adverse visual effects.

CONVENTIONAL WASTE MANAGEMENT

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
70. All conventional wastes generated at the Power Station Site will be handled at the waste handling and treatment facility (Conventional & Hazardous Waste Building and Conventional Waste Storage Compound) which will be located on the Power Station Site. This will be a fenced facility designed to be compliant with and will operate in accordance with Natural Resources Wales's waste permit regime. The facility will have sealed drainage, and waste will be suitably contained to prevent any spillages entering the drainage system. The design will also incorporate the industry guidance on fire prevention by providing suitable distances between wastes stored within the waste handling and treatment facility. It will also be designed to accommodate increasing levels of segregation, reuse and recycling. All skips will be weighed prior to transport in and out of the Power Station Site.	Functionality. Mitigation. Sustainability.	Increases the safety and operational efficiency of the Power Station. Reduces adverse effects on the surface water and groundwater. Encourages the efficient use of natural resources and energy through reuse and recycling.

ACCESS AND CAR PARKING

SITE BRIEF

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
71. A three-arm at grade roundabout will be provided at the junction of the A5025 and the Power Station Access Road. The junction will be located where it provides an appropriately level platform for the junction and affords suitable highway visibility on all approaches.	Functionality. Mitigation.	Increases the safety and operational efficiency of the Power Station and the highway network. Reduces adverse effects on the highway network.
72. The Power Station access road will provide the most efficient route between the A5025 and Power Station, whilst conforming to highway safety and technical requirements.	Functionality	Increases the safety and operational efficiency of the Power Station.
73. Car parks will be provided adjacent to: the main site entrance, the simulator and training building; the outage building; and, the administration building	Functionality	Increases the operational efficiency of the Power Station.

ADDITIONAL DESIGN PRINCIPLES

DESIGN PRINCIPLES (FOR APPROVAL)	GOOD DESIGN THEME(S) (ILLUSTRATIVE)	JUSTIFICATION (ILLUSTRATIVE)
74. The primary vehicular access to the Power Station should be via the Power Station Access Road, a proposed new road linking the A5025 to the Power Station Site to the south of Tregele.	Functionality. Mitigation.	Increases the operational efficiency of the Power Station. Reduces adverse traffic effects at Tregele when compared with use of the Existing Power Station Access Road.
75. The secondary vehicular access to the Power Station should be via the Existing Power Station access road.	Sustainability.	Increases the safety and security of the Power Station. Uses existing infrastructure efficiently.
76. Electric vehicle charging points will be provided in the southern car park to incentivise the use of sustainable transport.	Sustainability.	Encourages the efficient use of energy.
77. Temporary car parking in the northern car park will comprise grasscrete or a similar surfacing material.	Character. Mitigation.	Demonstrates a sensitivity to place through integration. Reduces adverse landscape and visual effects.

6 ILLUSTRATIVE DESIGN PROPOSALS

Illustrative Design Proposals

6.1 INTRODUCTION

6.1.1 The DCO Requirements will require detailed design and landscape schemes associated with development within the Power Station Site to be submitted and approved in accordance with the design principles in this document.

6.1.2 This section identifies one way that the scheme could be developed in accordance with the parameters set out in the DCO Requirements and the design principles set out in section 5 of this document.

Figure 6-1 Power Station – Indicative site layout

6.2 POWER STATION

OVERARCHING LAYOUT

6.2.2 Within this framework, the illustrative design has been developed to:

- Meet the site brief including the functional and operational requirements (as set out in Section 1);
- Create a sense of identity and provide a legible development in accordance with the design concepts (as set out in Section 5);
- Locate main plant buildings and structures that are heavily constrained by functional requirements on a lower platform level at the centre of the site and in the least visible locations from the majority of viewpoints. For the purposes of this document this area is defined as the "power island" and is delineated by an inner security fence;
- Locate buildings that are less functionally constrained and will be used by a greater number of people at the periphery of the site close to the site entrances. They will therefore typically be more prominent in their surroundings and provide greater design flexibility. For the purposes of this document these buildings are categorised as either "security buildings" or "office buildings"; and,
- Locate common plant buildings and structures that are heavily constrained in design terms, but are not required to be on the power island, outside of the inner security fence and in less prominent parts of the site.

6.2.3 This process has led to an illustrative layout as set out on figure 6-1.

6.2.4 The remainder of this section focuses on a selection of key areas that are collectively considered to be indicative of the entire Power Station in design terms:

- Overarching landscape;
- Interface with the wider landscape setting;
- Power island;
- Office-type buildings;
- Site entrances and gatehouses; and,
- Industrial buildings.

OVERARCHING LANDSCAPE

6.2.5 Landscape within the Power Station Site would have to be, by the nature of the development, particularly controlled. Large areas of the Power Station Site are required to be given over to hard surfaces, tarmacadam, and concrete, to allow for the heavy vehicles that have to manoeuvre around the site. Further to the development of the on-site facilities and the associated hard landscape, areas of soft landscape would be introduced to break up the hard surfaces in between. As shown indicatively on Figure 6-2b.

6.2.6 The illustrative landscape layout is based on the grid structure, as illustrated on Figure 6-2a. The grid provides an ordered arrangement within which the architecture, movement routes and security measures can be laid out. The grid is expressed through a range of materials, to provide legibility and a sense of place, to soften the industrial nature of the development and provide visual amenity for workers and visitors to the site.

Figure 6-2a Overarching landscape strategy

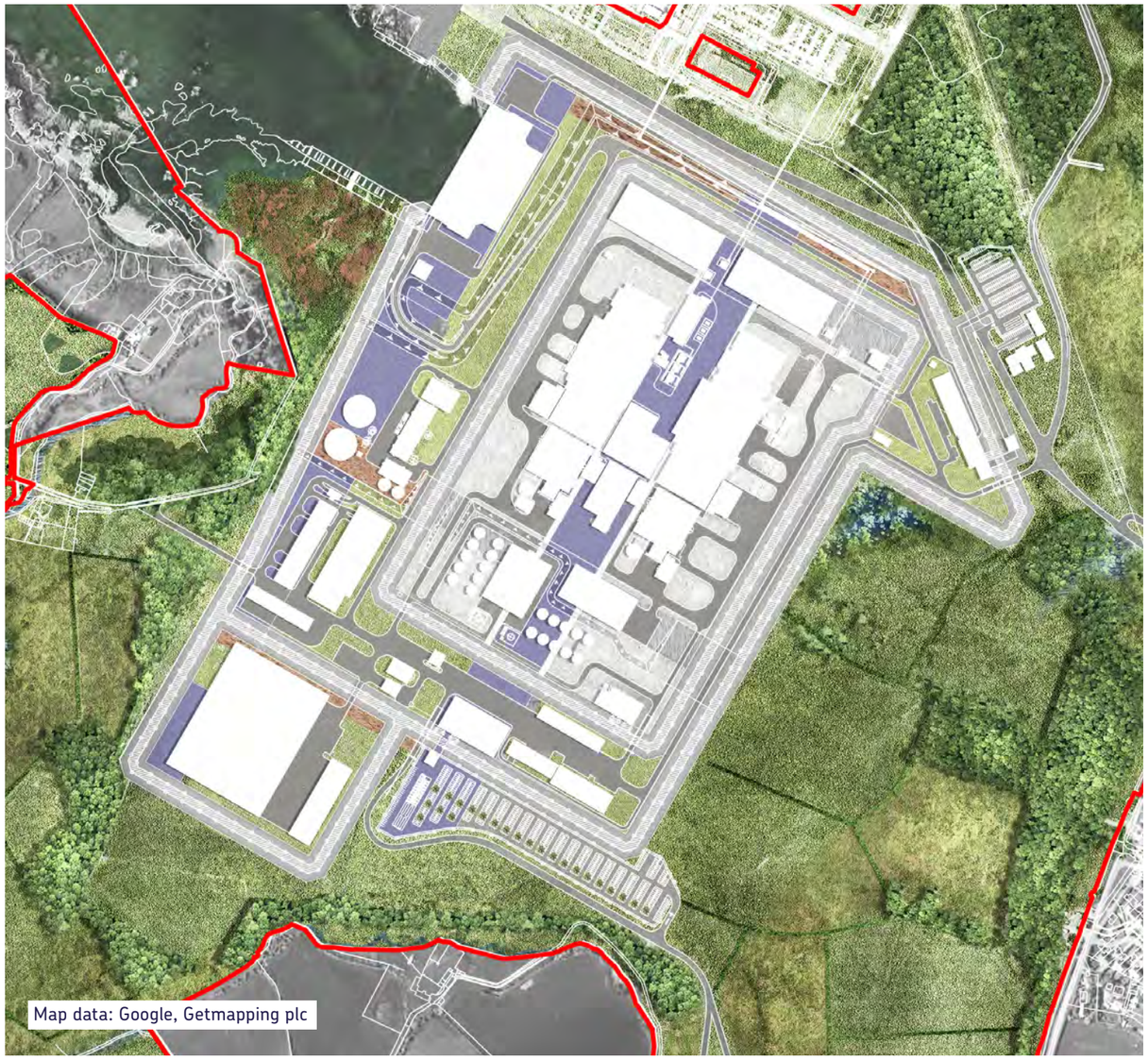


Figure 6-2b Overarching landscape strategy

LANDSCAPE MATERIALS WITHIN THE POWER STATION SITE

The Power Station Site materials would consist of a coordinated palette of robust street furniture, paving and planting, as illustrated on Figures 6-3, 6-4, and 6-5 below.

Whilst large areas of the Power Station Site within the inner security fence will need to be hard landscape for operational requirements, a range of hardscape materials are illustrated below that are sympathetic to the coastal location, through the use of colours that reflect the colour of the sea, sky and the colour of local materials such as slate and coastal pink rocks together with the use of a variety of textures and colours for the concrete. These elements are used to express the overall ordered grid layout as illustrated on Figure 6-3.

This range of hard materials can be widened where operational requirements permit, in areas outside the inner security fence. Here the palette can be softened with extensive areas of low growing planting, such as mown amenity grass, wildflower meadow and heather. This planting will provide links to the wider landscape setting, evoking the heathland mosaic between Porth-y-Pistyll and Cemlyn Bay (shown on Figure 2-7) as well as the grassland of the surrounding landscape (shown on Figures 2-4, 2-5 and 2-6), whilst expressing the overall ordered grid layout.

6.2.7 In the areas outside the outer security fence, including the two car parks, the access road and the simulator and training building, operational requirements are less onerous, and the landscape palette can be further expanded and integrated within the wider landscape. The planting can include taller elements including standard native trees, to filter the wind and provide shade. Walls can be constructed to reference the locally found cloddiau. The hardscape palette can include unit paving, including concrete flag paving, stone flag or stone sett paving and slate cobbles, to soften the industrial scale and reference the location. Street furniture could be contemporary style, made from a range of robust materials, to harmonise with the ordered grid layout.

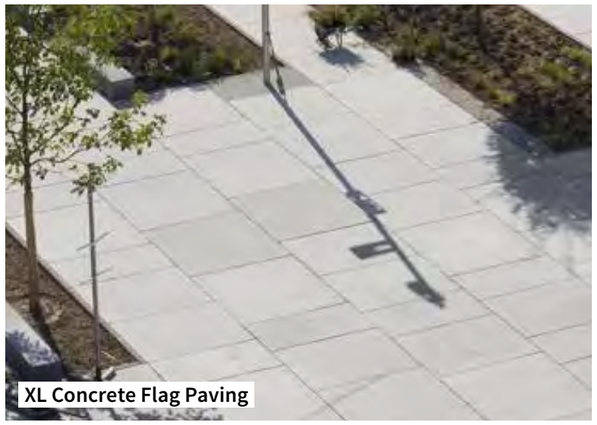
STONE


Stone Flag Paving


Stone Sett Paving


Stone Cobble Paving

CONCRETE


XL Concrete Flag Paving


Textured concrete


Exposed aggregate concrete

COLOURED PAVING


Asphalt


Asphalt


Gravel

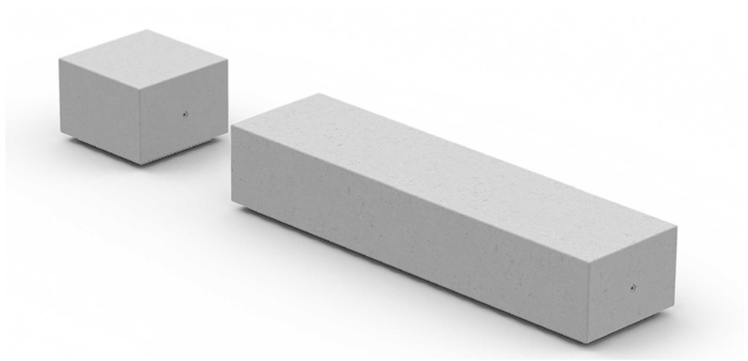
WALLS


Cloddiau


Slate wall

Figure 6-3 Indicative landscape palette – hardscape

SEATING



Concrete

Concrete Cantilever

Solid Timber

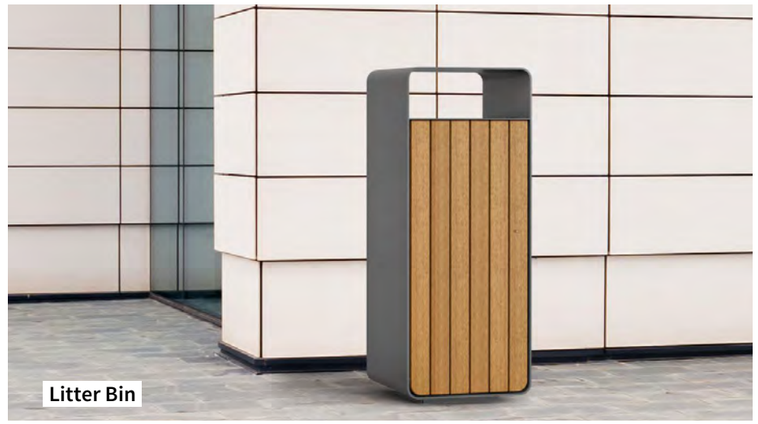
TREE GRILLES AND PLANTERS

Resin bound Tree Grille

Square Tree Grille

Metal Planter

BINS/BOLLARDS/CYCLE PARKING



Litter Bin

Bollards

Cycle Shelter

Figure 6-4 Indicative landscape palette – street furniture

Zone 1 - Hardscape

Zone 2 - Lawn and Low Planting

Calluna vulgaris

Ulex gallii

Erica cinerea

Wildflower meadow
Emorsgate Seeds EM5 – Meadow Mixture for Loamy Soils

Low perennial Planting (common to zones 2 and 3)

Armeria maritima

Potentilla erecta

Anemone nemorosa

Luzula sylvatica

Persicaria affinis

Stachys oficinalis

Trees

Zone 3 - Low Planting, Shrubs, and Trees

Sorbus aucuparia “Sheerwater seedling”

Pinus nigra

Betula pendula

Quercus Petraea

Shrubs

Hippophae rhamnoides

Rosa canina

Rosa rubiginosa

Low hedges

Ligustrum vulgare

Carpinus betulus

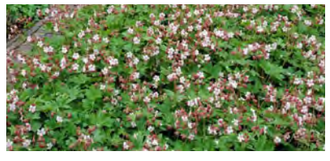
Fagus sylvatica

Asplenium scolopendrium

Vinca minor

Lamium maculatum

Dryopteris affinis



Geranium maccrorizhum

Ajuga reptans

Hedera helix

Figure 6-5 Indicative landscape palette – planting

6.3 INTERFACE WITH THE WIDER LANDSCAPE SETTING

6.3.1 Whilst details of the wider landscape setting are set out in the LHMS, illustrative details of the interface are set out in this section. An illustration of the Power Station within its setting is shown on Figure 6-6

6.3.2 The functional requirements for the Power Station are key drivers for any design solution. Subtle changes in material and texture could be used in this location to convey the grid framework and transition to an agricultural landscape as shown on Figures 6-6 and 6-7.

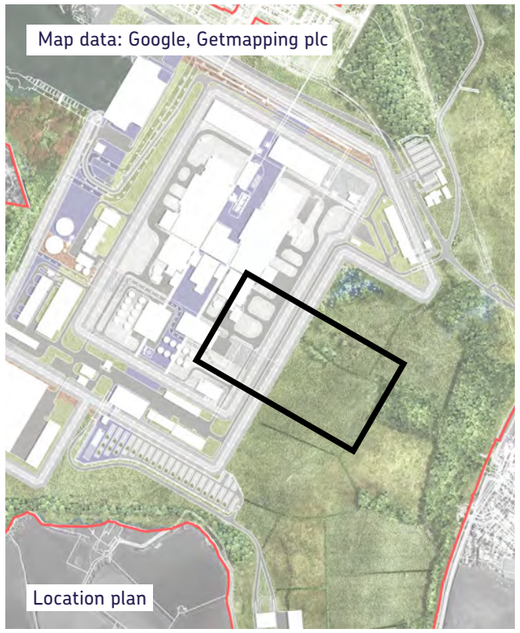
6.3.3 The open rolling drumlin landscape character of the wider WNDA would approach as close to the Power Station Site as security requirements allow. Site security requires a 10m wide uniform band of gravel around the outside perimeter of the outer security fence, with a cattle fence to keep the gravel zone clear of grazing stock. On the eastern boundary, a planted security ditch would reinforce the cattle fence, as shown on Figure 6-8. Beyond this, the landscape would soften and reflect the local landscape character of rolling drumlin landform with woodland screen planting, traditional field boundaries, scrub, coastal heath, ponds, and grazed grassland.

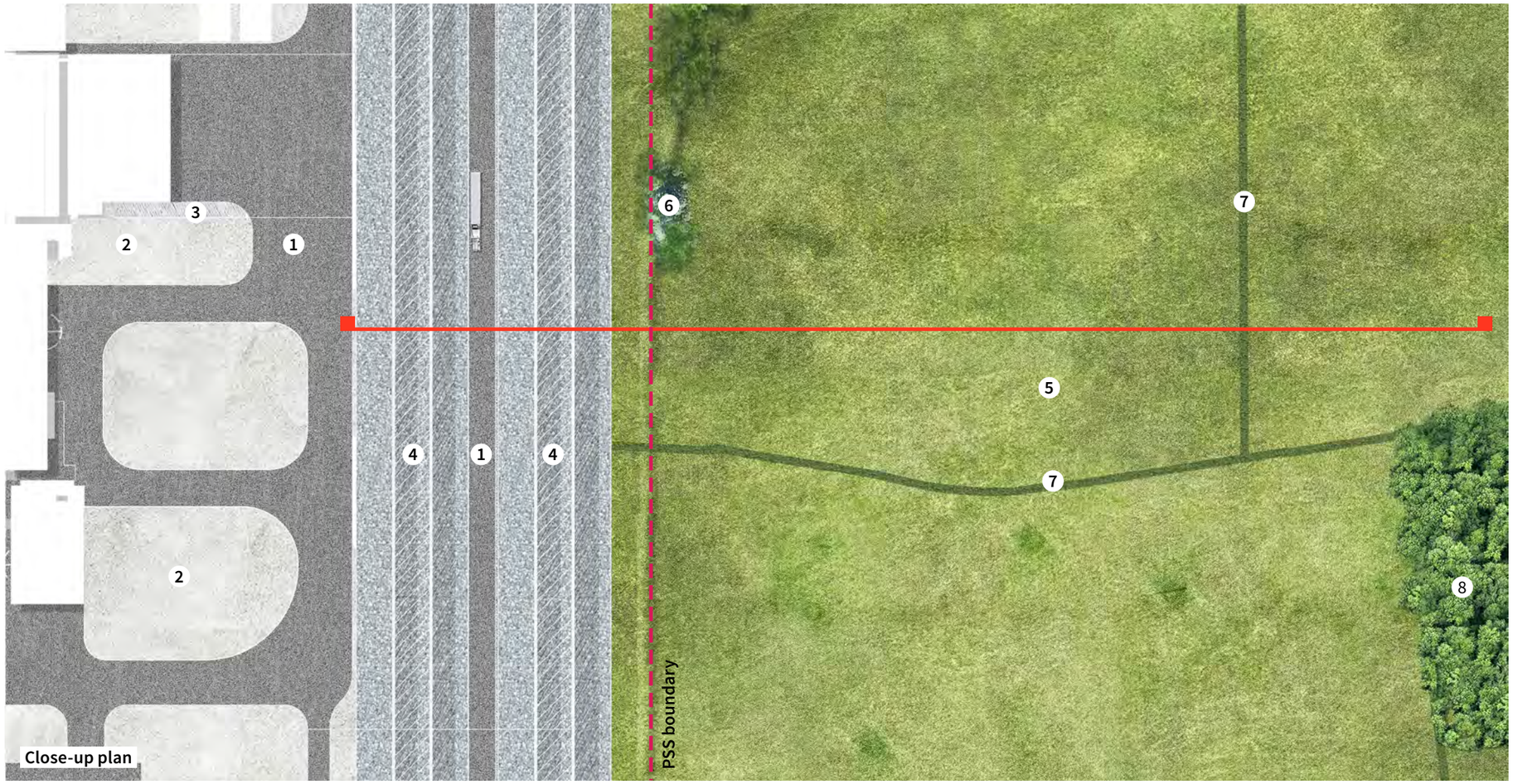
6.3.4 On the West, near Cestyll gardens, an effective native woodland screening would be planted on the back of the existing trees belt, to reduce the visual impact on the gardens. This would respect the 10m gravel offset from the fence and be set back further away with a grass buffer, as shown on Figure 6-9

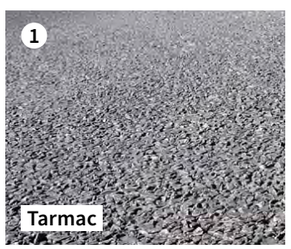
6.3.5 On the south-west boundary, the woodland wrapping around the Power Station Site would have an offset of 10 metres to leave a clear view along the fence, as shown on Figure 6-10.

Figure 6-6 Power Station Site layout in context

Figure 6-7 View from agricultural fields over the Power Station Site







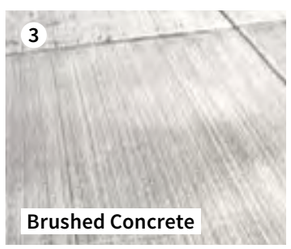
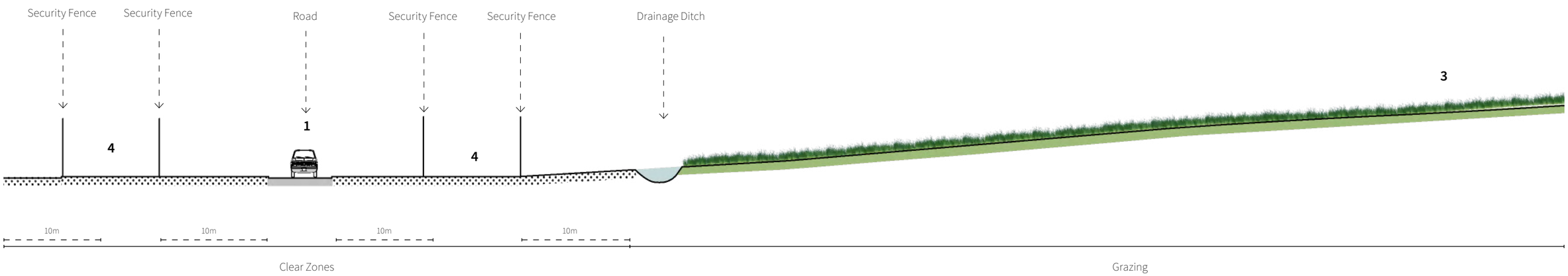


Figure 6-8a Indicative landscape proposals at the Power Station boundary: east



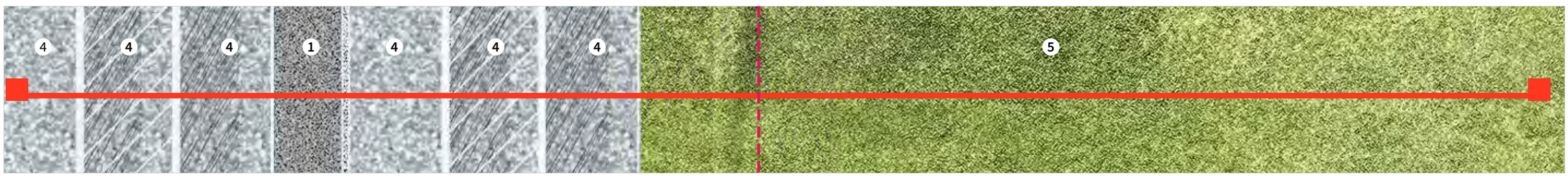
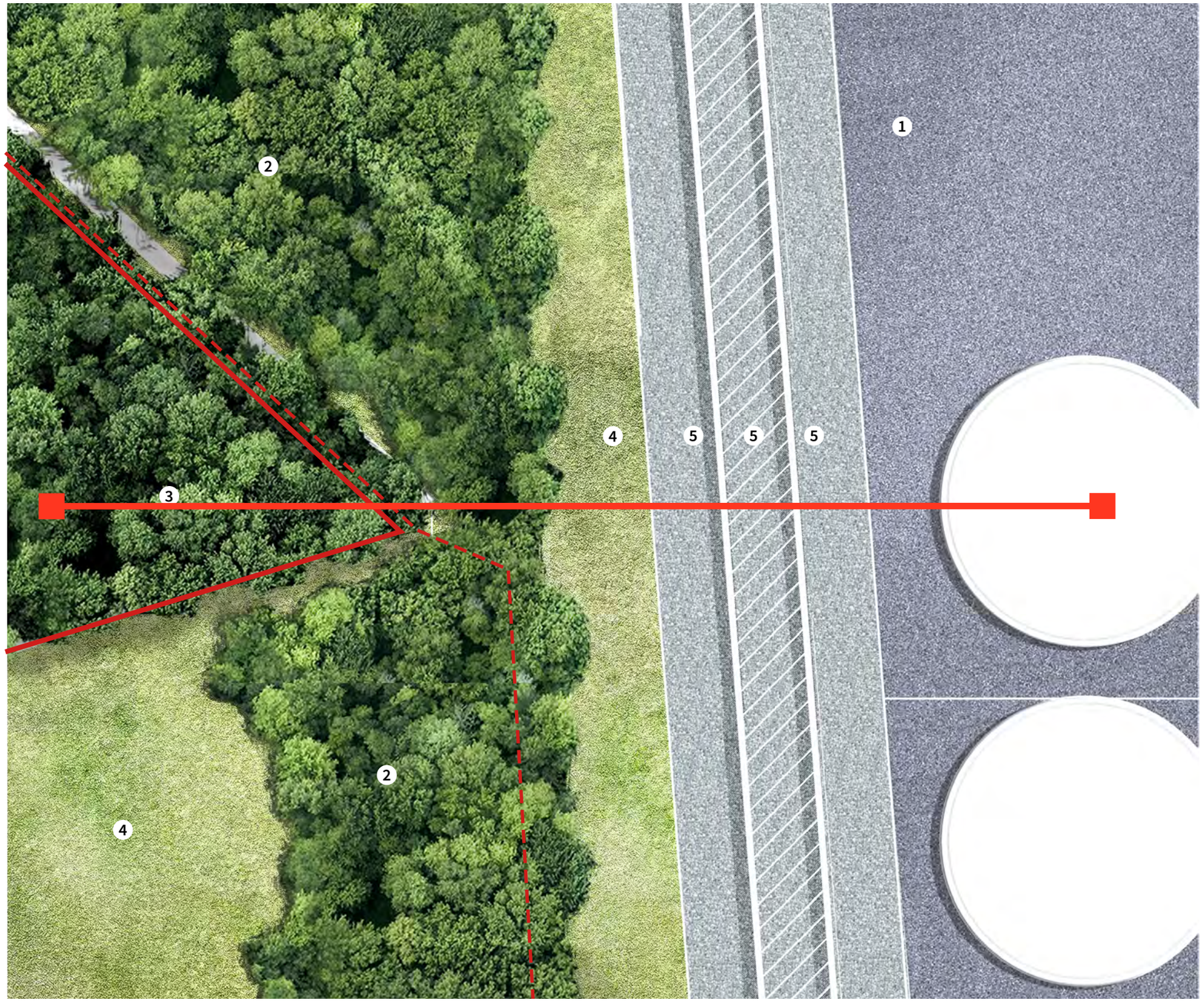


Figure 6-8b Indicative landscape proposals at the Power Station boundary: east



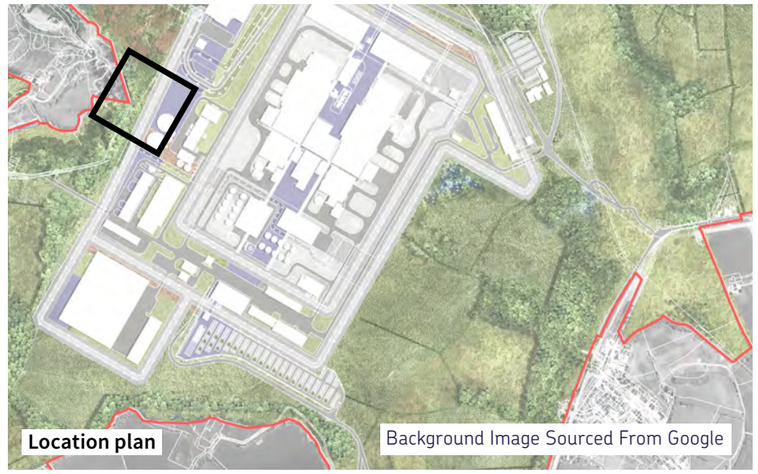


Figure 6-9 Indicative proposals at the site boundary: Cestyll gardens

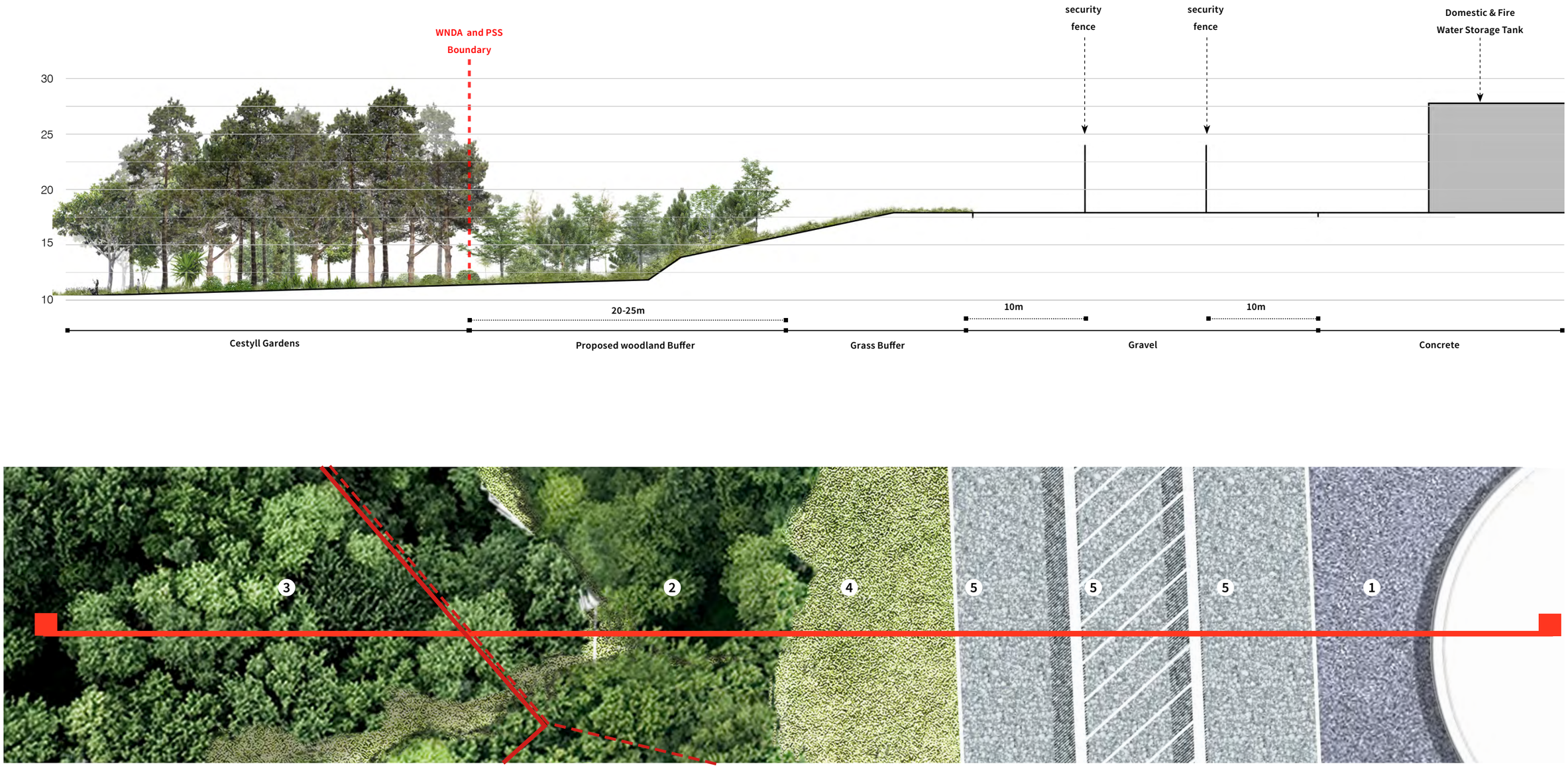


Figure 6-10 Indicative proposals at the site boundary: south west

6.4 OVERARCHING MATERIALS PALETTE

6.4.1 Buildings and structures would be subject to a relatively simple overarching palette of materials that would be applied consistently across throughout the entire site to a present a clear sense of a homogenous whole. The architectural approach is for the creation of a collection of built elements sited so that they reflect the technical and operational processes within and which are subject to a very clear and honest expression of the raw industrial processes housed.

6.4.2 Materials would be applied with a common and limited palette with a hierarchy applied depending upon the level and degree of human and public interaction, as illustrated on Figure 6-11.

6.4.3 Those buildings that house the key generating processes and which require little in the way of human interaction would typically be constructed and clad in simple metal cladding panels or simply be concrete where technical considerations demand a concrete only exterior.

6.4.4 Those buildings that by their nature demand a greater level of human interaction, would include a much broader palette of better quality materials that would create a more attractive human experience. Curtain walling and larger areas of glazing would be introduced to bring natural light into buildings and allow for views out. Stone cladding would be used, particularly at or around pedestrian entrances to give a more tactile experience that is welcoming and at the same time reflective of traditional and contextually relevant materials

6.4.5 Away from principal entrance and human facing elements, the same metal cladding or painted finish would be used to create a consistent backdrop.

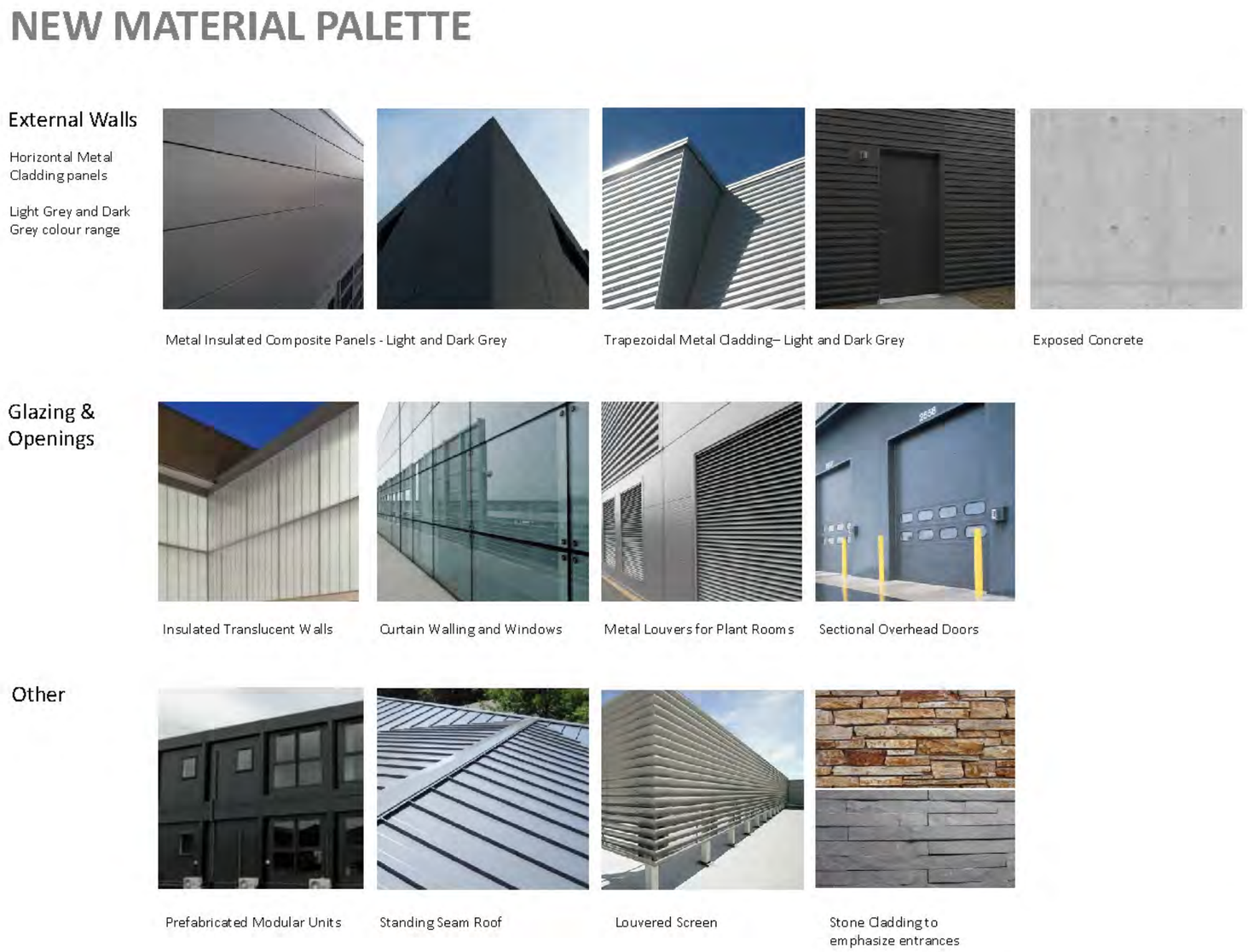


Figure 6-11 Indicative materials palette: buildings

6.5 POWER ISLAND

6.5.1 The reactor buildings and surrounding facilities comprise predominately the main plant set out in Section 2 and include some of the largest and most visually dominant structures in the Power Station.

6.5.2 Due to the high degree of security and operational requirements, in addition to the minimal level of human interaction with the buildings at close range, design choices should be less influenced by detailed issues such as building texture and architectural detailing, and more influenced by overall form and colour.

6.5.3 Typically, buildings and structures within the power island, where there are no overriding safety or operational requirements for the use of concrete could be clad or painted shades of green to give clear definition to the forms proposed and to blend the structures into the landscape.

6.5.4 In contrast, the reactor buildings could subject to operational requirements have a painted finish to create a bold and iconic structure set against the natural landscape. The curving roof form and concrete finish are operational requirements; lighter coloured surfaces should be used as they absorb less heat than darker surfaces. These taller curving forms with their light colours would be very distinct when set amongst an array of darker coloured buildings and structures that would be overwhelmingly lower in scale and featuring typically flat roof forms.

6.5.5 An illustrative image of how this part of the Power Station could look is shown on Figure 6-12. Coloured cladding is employed to give definition to the building volumes and to give visual coherence to the many structures. The white reactor housing is used to give emphasis to the primary/iconic functions of the reactor within the electricity generating process that are housed within and when viewed across a backdrop of either the green landscape or the blue sky.

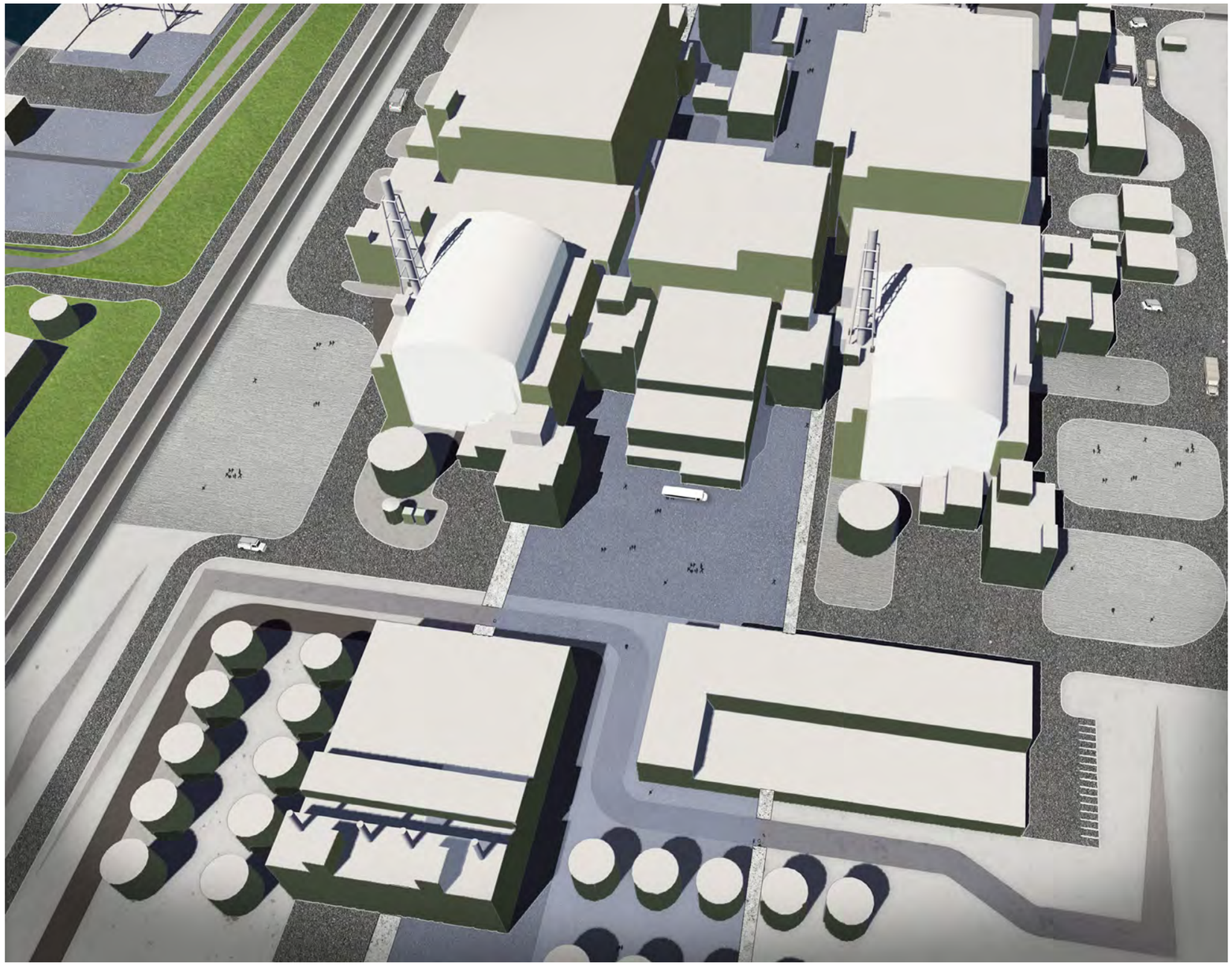
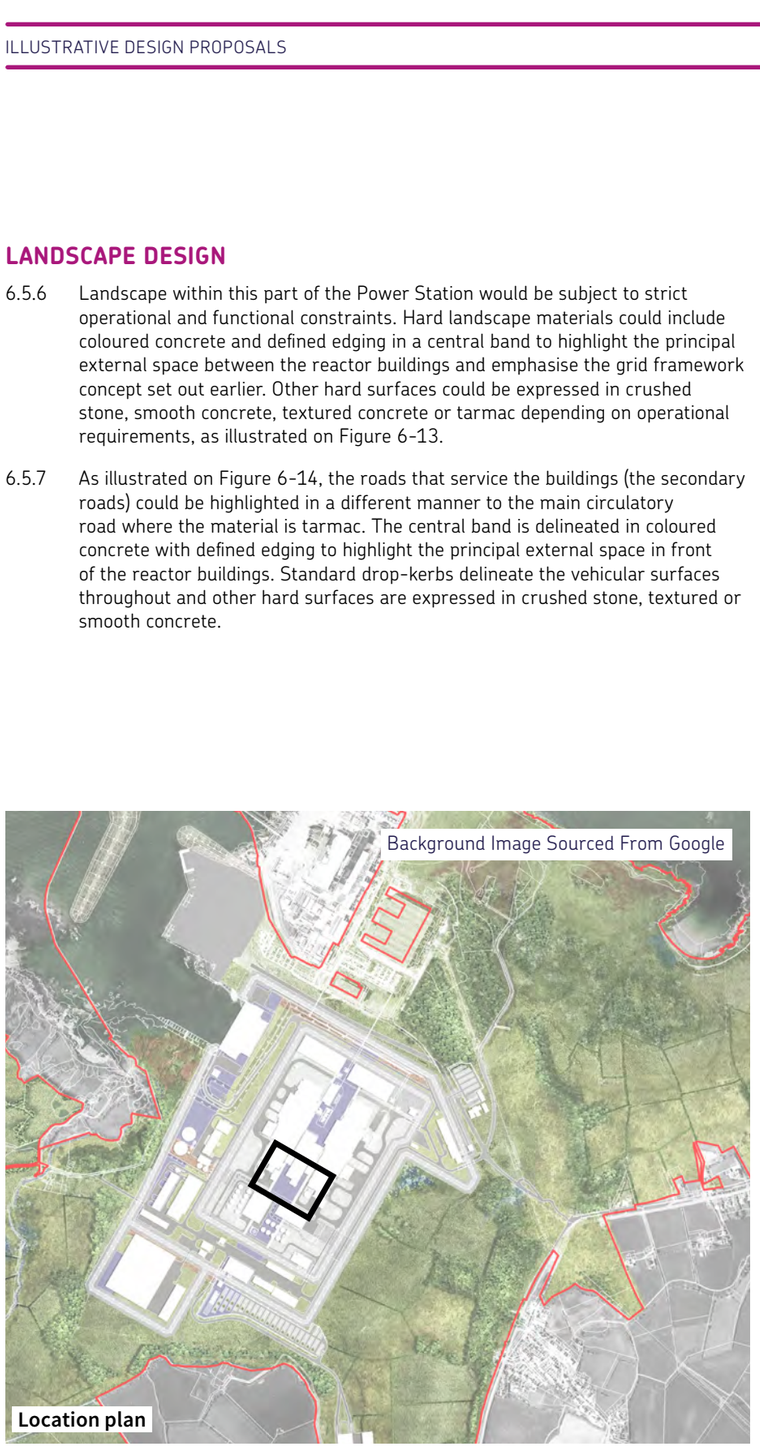


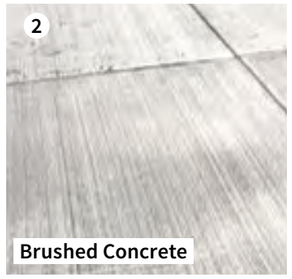
Figure 6-12 Indicative view of reactor buildings and surrounding facilities

LANDSCAPE DESIGN

6.5.6 Landscape within this part of the Power Station would be subject to strict operational and functional constraints. Hard landscape materials could include coloured concrete and defined edging in a central band to highlight the principal external space between the reactor buildings and emphasise the grid framework concept set out earlier. Other hard surfaces could be expressed in crushed stone, smooth concrete, textured concrete or tarmac depending on operational requirements, as illustrated on Figure 6-13.

6.5.7 As illustrated on Figure 6-14, the roads that service the buildings (the secondary roads) could be highlighted in a different manner to the main circulatory road where the material is tarmac. The central band is delineated in coloured concrete with defined edging to highlight the principal external space in front of the reactor buildings. Standard drop-kerbs delineate the vehicular surfaces throughout and other hard surfaces are expressed in crushed stone, textured or smooth concrete.





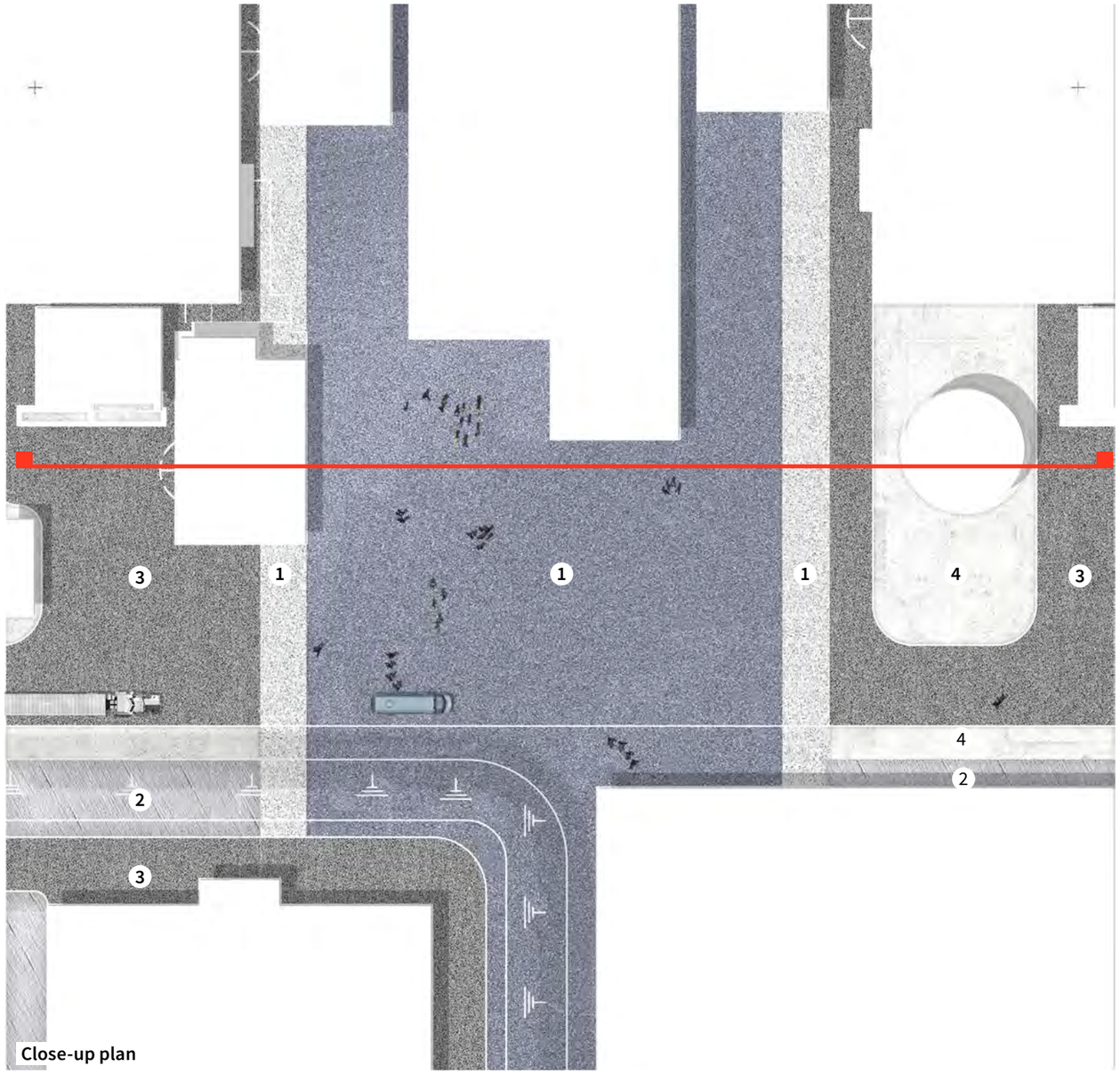


Figure 6-13 Indicative landscape materials palette on the power island

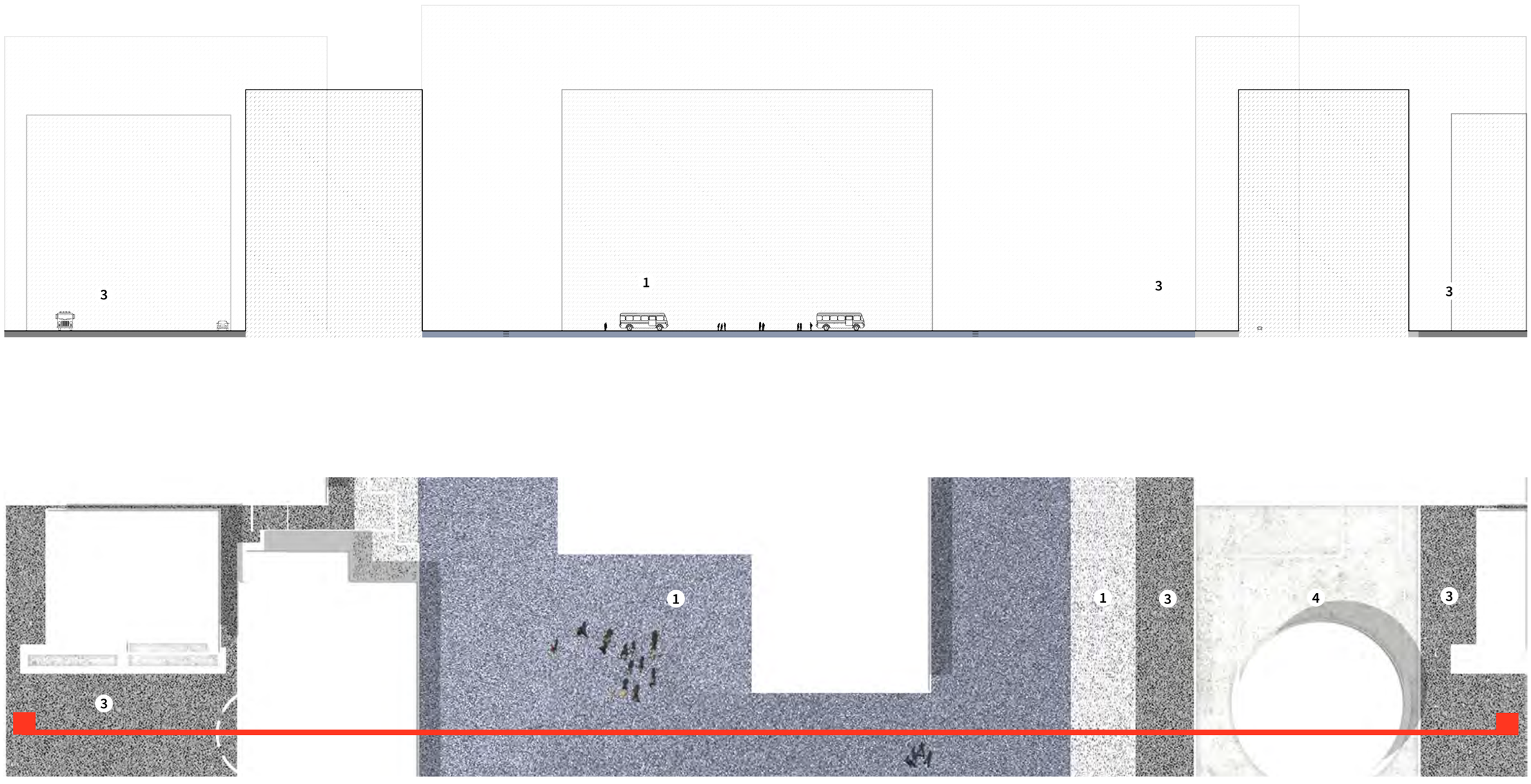


Figure 6-14 Indicative section – power island

6.6 OFFICE TYPE BUILDINGS

INTRODUCTION

6.6.2 The office-type buildings would be key focal buildings for the development as they would contain some of the largest occupancies and would also be the most accessible to visitors and all on-site staff. These buildings therefore need to respond to this and reflect a more human scale than many of the other buildings. The materials palette for these facilities should therefore have more variance and texture. Setbacks and brise soleil could be used to provide relief and break down the mass of the buildings. Higher specification materials could be concentrated around key focal points and the lower levels of the buildings where they can be experienced and appreciated. The colour palette for these buildings should match those of the overall development to provide a cohesive visual effect from both on-site and the distant views. Contrasting colours could also be selected and used in smaller quantities to provide interest and support wayfinding around the Power Station.

SIMULATOR AND TRAINING BUILDING

6.6.3 The simulator and training building would be located in close proximity to the A5025 and would be particularly visible on the A5025 northbound from Valley towards Tregele. It has therefore been selected here to show how the design could respond to the operational requirements, which are for the building to accommodate two full size simulators, associated plant and multipurpose training facilities.

6.6.4 A material palette including flat metal cladding, engineering brickwork and glass could be appropriate for this more prominent location. The architectural language that could be adopted for the simulator and training building would mirror that used to the main development area to create an underlying consistency in colour, approach and construction detailing across all buildings and structures.

6.6.5 Due to its location away from the rest of the Power Station buildings and structures, the landscape surrounding the simulator and training building could suit species-rich grassland, woodland to provide screening, hedgerows and agricultural land. The car parking area outside of the building could include tree planting and hedgerows to help to soften the hard materials and integrate the site into its surroundings.

6.6.6 An illustrative image of how the simulator and training building and surrounding area could look is shown on Figure 6-15.

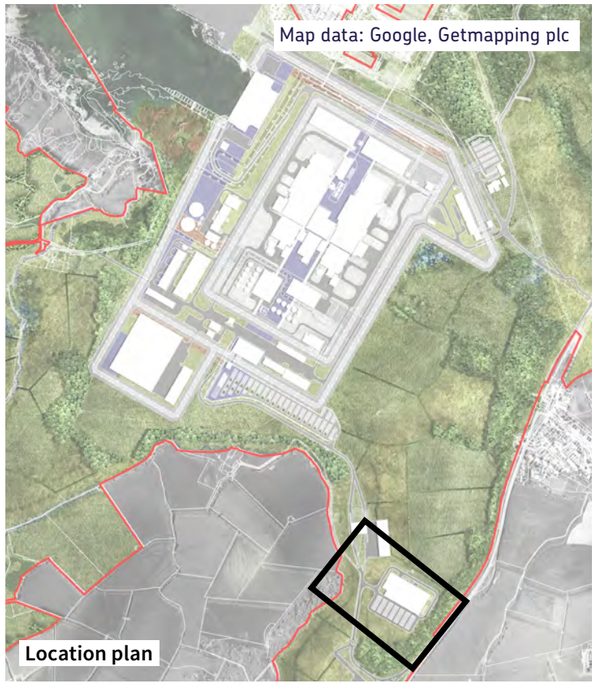
Figure 6-15 Indicative view of Simulator and Training building

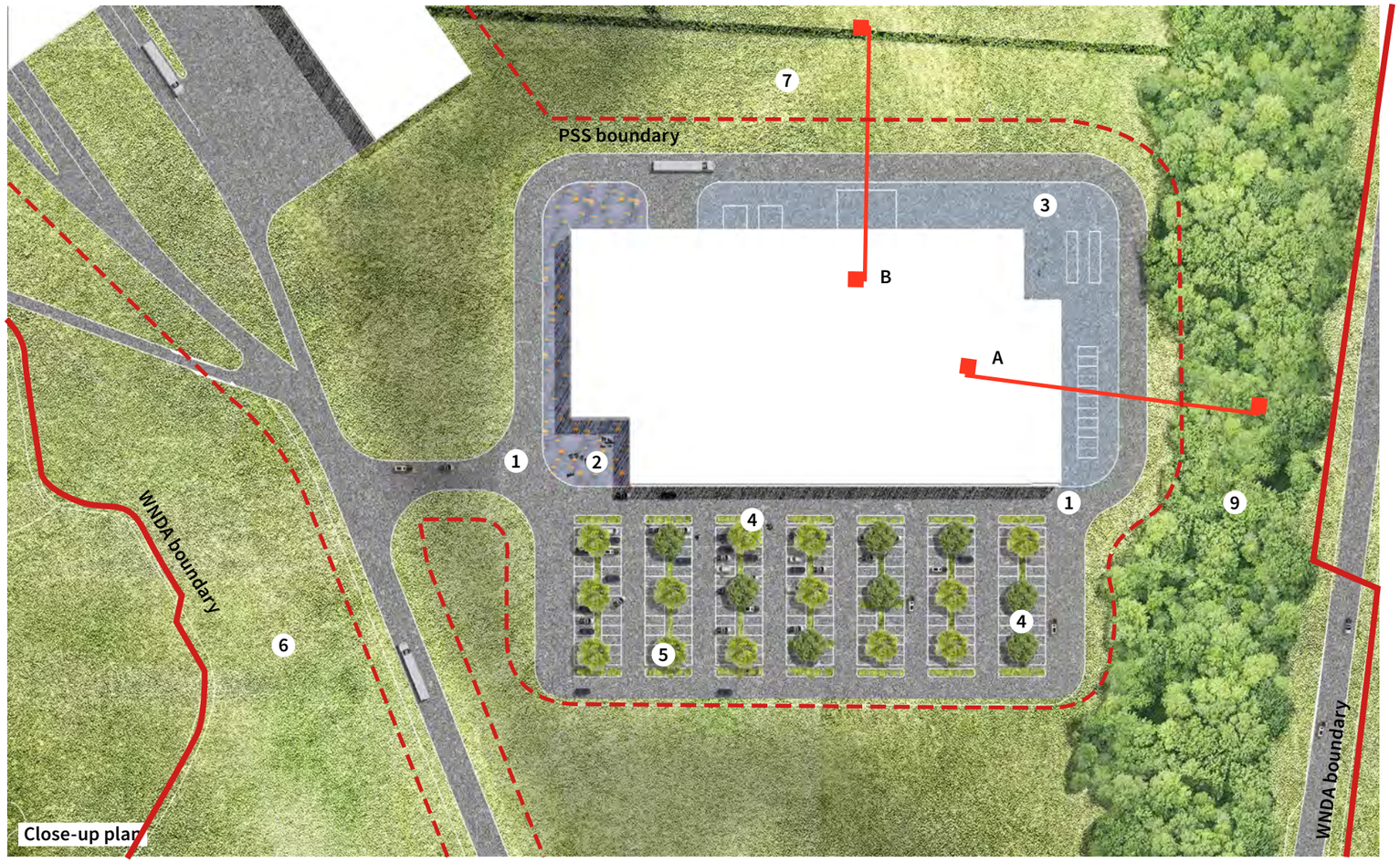
LANDSCAPE DESIGN

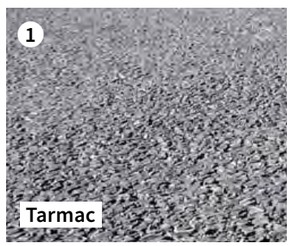
6.6.7 To minimise the visual prominence of the Power Station Access Road, from which the simulator and training building is accessed, the approach could be a simple intervention into the landscape with minimal lighting, no unnecessary signage and deliberately unstructured verge planting. Measures such as a dedicated avenue of tree-lined planting might appear too formal in this largely agricultural landscape and so should be avoided.

6.6.8 Due to its location within the WNDA, the landscape surrounding the simulator and training building would suit species-rich grassland, woodland to provide screening, hedgerows and agricultural land. The landscape design here would evoke the inland grazed landscape rather than the coastal rocky cliffs and heather mosaic. The car parking area outside of the building could therefore include native tree planting and hedgerows to help soften the hard materials and integrate the site into its surroundings. An illustrative palette is shown on Figure 6-16.

6.6.9 A security fence would surround the simulator and training building and its car park, with a 10 meters grass offset on the outside perimeter, to transition with the grazed fields and native woodland screen on the east described in the Landscape Habitat and Management Strategy (Application Reference Number: 8.16).







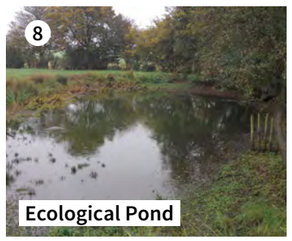


Figure 6-16 Indicative landscaping palette – Simulator and Training building

Illustrative Section A – Simulator and Training building – screening berm

Illustrative Section B – Simulator and Training building – grazing

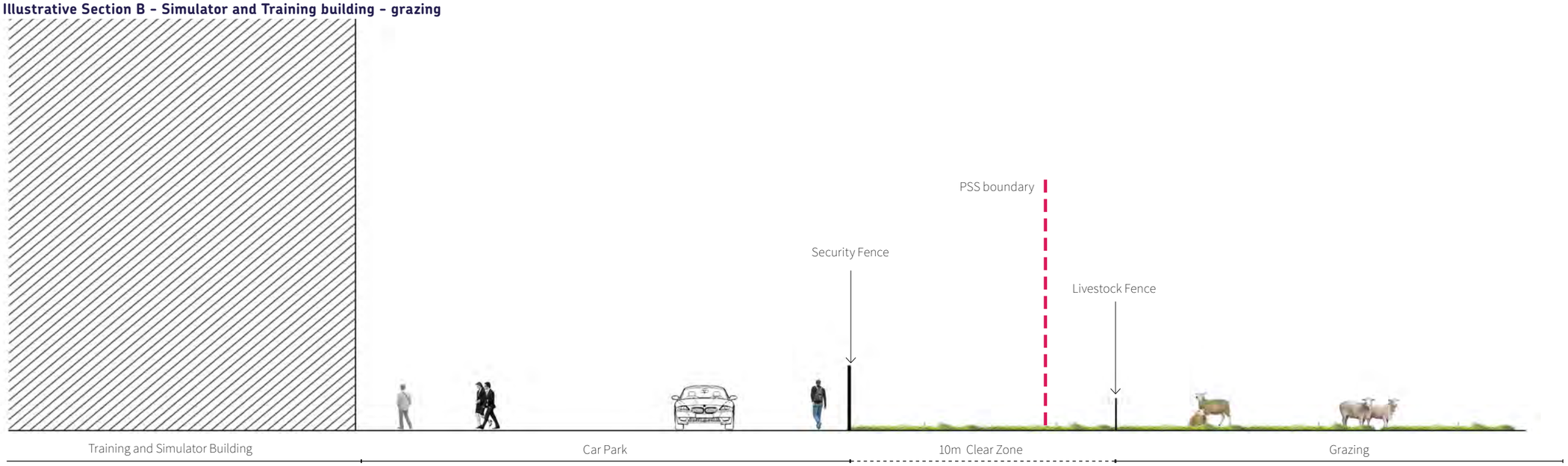


Figure 6-17 Illustrative sections – Simulator and Training building

BUILDING DESIGN

ENVIRONMENTAL DESIGN

6.6.11 There are aspirations for an energy efficient building which is reflected in the indicative environmental approach to it:

- Sustainable Urban Drainage System (SuDS);
- Central heat recovery system;
- Use of local materials;
- Brise soleil;
- Photovoltaics; and,
- Grey water harvesting.

INTERIOR LAYOUT

6.6.12 The building concept is for a centralised 'street' that links the principal circulation spaces to the main accommodation. Three double height voids could be located over the main circulation area to maximise daylight and provide a sense of openness to the facility. Training rooms, offices and welfare facilities could be located to the front of the building, with full scope simulator halls and other simulator areas located to the rear.

6.6.13 The main entrance to the building could be located at the left hand end of the centralised street. A 'front of house' secure area would need to be provided for visitors which includes a reception area and access to the trainee mess room.

6.6.14 Plant enclosures could be located to the rear of the building so as to be screened from view and to the visitors to the building.

6.6.15 The first floor layout could accommodate open plan offices, training rooms and welfare and mess facilities.

6.6.16 Daylight could be maximised through glazed roof lights. This would help to provide an open, modern look and feel to the workplace and allow the area to become a space for collaboration and engagement following training seminars.

Figure 6-18 Indicative view of entrance area

EXTERNAL APPEARANCE

6.6.17 Given its proximity to the A5025 the views afforded to this prime viewpoint would need to be carefully considered and higher specification materials would be utilised on these key vista. The materials and their positioning and use on the building have therefore been selected to support a high level of visual aesthetic whilst being functional and representative of the operations/ functions happening within the building i.e., the simulator halls being a much more industrial operation and larger in scale than those of the offices and training accommodation.

6.6.18 The main entrance is announced with full high projecting stone flanking walls and curtain walling set back into the building, the rear pedestrian entrance also benefits full height glazing to flood the centralised street with natural light. Roof lights to the atrium slots to the first floor street allow the natural light to penetrate further into the building floorplate. Flat panel cladding and ribbon windows encapsulate the remainder of the offices and training room accommodation. The large rear simulator halls could be given a more industrial feel with exposed concrete to a height of 3m and trapezoidal cladding above reflected of the finishes used on the Outer Main Gatehouse and industrial facilities on the main operational site.

6.6.19 Overhead sectional doors with vision panels are shown for the vehicle doors at the simulator halls to the rear of the building along with louvered screens to the external plant enclosures.

MATERIAL PALETTE

6.6.20 Whilst the simulator and training building would be located away from the rest of the Power Station buildings and structures, there would still be intervisibility between them. Therefore, the materials selected for the building should be similar to those utilised on the administration and main outer gatehouse buildings. The building should also look to take its colour choices from the range selected for the main site, so that when viewed from a distance the building would sit well with the Power Station.

6.6.21 Materials which are considered to be potentially suitable for the building are: stone walling flanking the main entrance, chosen for its tactile qualities and to reflect potential equivalents on the administration building and gatehouses; exposed concrete walls to the base of the simulator halls and multipurpose room as per their construction on the main site; flat panel cladding; curtain walling and ribbon windows to reflect the more human scale and higher quality of finish to the office and training elements; and trapezoidal cladding to the more industrial higher elements of the simulator halls in potential alignment with industrial style facilities within the Power Station.

6.6.22 Where it can be accommodated, glazing could be optimised to provide a light, bright open feel to the reception, offices, training, mess rooms and break out spaces. Accent colours may be used to highlight key elements and support way finding, supplementing an overall site colour palette.

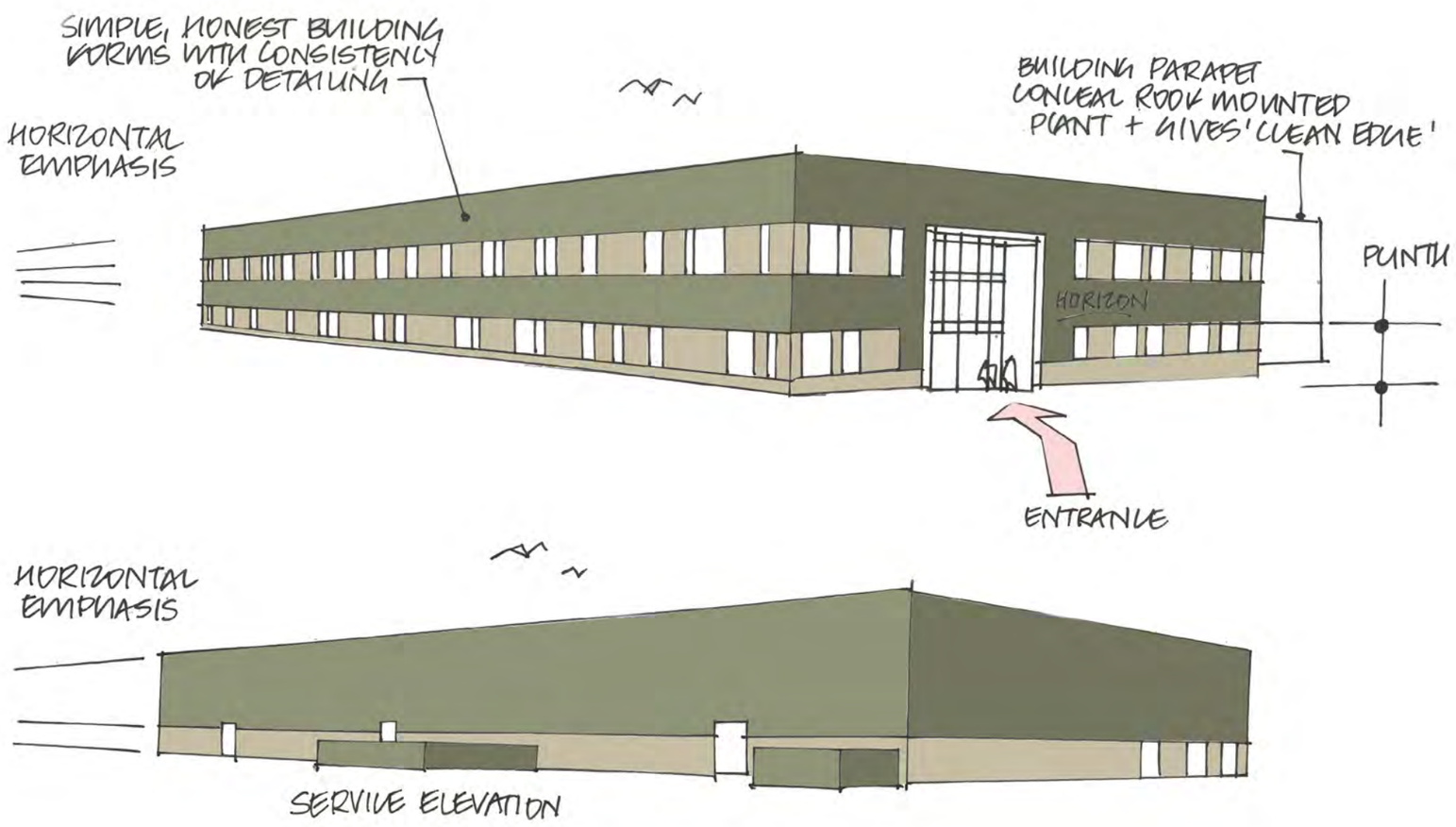


Figure 6-19 Indicative view of external appearance – Simulator and Training building

ADMINISTRATION BUILDING

6.6.23 The administration building is likely to be a three storey building providing office space for support staff (plant engineering, reactor physicists, project management, communications, finance, management, etc.), a canteen facility, a dosimetry office and a reception area. This building would also contain the primary document control centre.

6.6.24 This building is likely to accommodate a total of up to around 300 staff and visitors and so could be designed with an open plan office arrangement with meeting rooms and supporting break-out hubs.

6.6.25 The administration building would form the working environment for a significant number of staff as well as providing the main reception for visitors to the Power Station. The layout of the facility is therefore likely to be fairly unique in the context of the Power Station in that the organisation and layout of the building is a direct response to human as opposed to industrial processes. The building may best be configured as a simple building that follows the common architectural language of colour, form and construction detailing employed across the rest of the Power Station. The administration building could be situated with a long frontage facing onto the main visitor car parking area with the main gatehouse for a positive sense of arrival.

LANDSCAPE DESIGN

6.6.26 The administration building would be located within the area with low opportunities for landscape, as set out on Figure 6-19. However, its landscape setting should be unique in the Power Station Site, providing an amenity and social space for the staff and visitors.

6.6.27 This building is located at one intersection of the landscape grid established thorough the Power Station Site. The landscape design would show a more refined interpretation of the grid and reflect the intersection of hard and soft elements. The landscape would emphasize the building entrance.

6.6.28 Throughout the site, the materials would evoke both the local landscape and the industrial nature of the site. The material palette around the administration building would however be more refined, using pennant stone paving, timber and concrete seating. The low planting would provide shelter from the coastal winds to the social spaces and would offer a more ornamental and diverse palette.

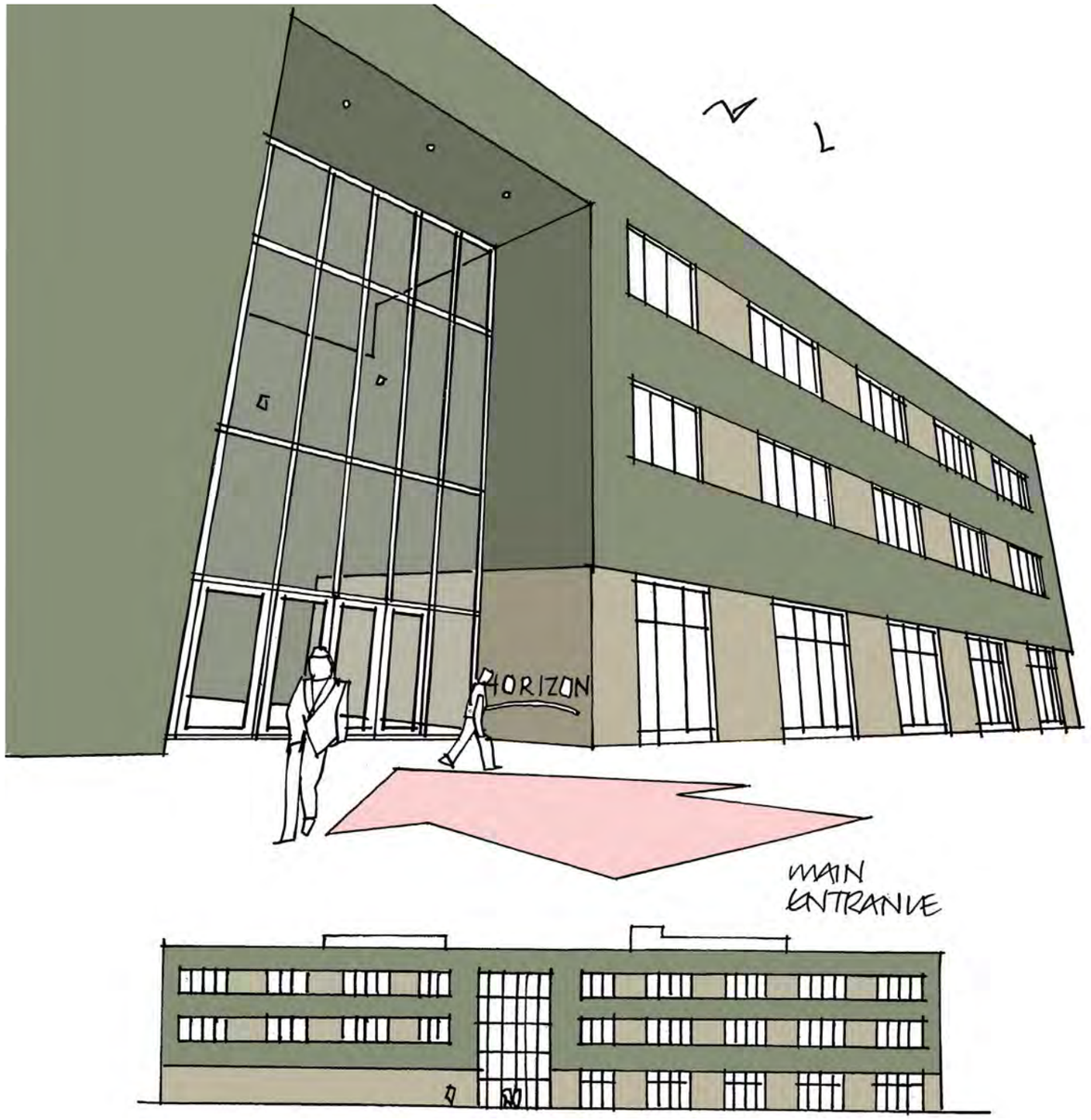


Figure 6-20 Indicative view of external appearance

BUILDING DESIGN

ENVIRONMENTAL DESIGN STRATEGY

6.6.29 There are aspirations for an energy efficient building which is reflected in the indicative environmental approach to it:

- Sustainable Urban Drainage System (SuDS);
- Central heat recovery system;
- Use of local materials;
- Brise soleil;
- Photovoltaics; and,
- Grey water harvesting.

INTERIOR LAYOUT

6.6.30 The building would be designed to locate the office functions on the upper floors with the majority of the 'front-of-house' services being provided at the ground floor level.

6.6.31 The design concept for the building is likely to be based around the provision of a central circulation zone with two primary accommodation wings to the left & right. A double height void could be located over the reception area to create an impressive and light arrival space.

6.6.32 A secondary entrance could then be provided centrally to the back of the building to facilitate access to the canteen for other site staff.

6.6.33 If necessary depending on the building layout, atriums could be included to improve daylight levels. This would also support the achievement of the sustainability aspirations for the building as well as providing a modern and open working environment.

6.6.34 The main entrance to the building could be announced via full height glazing, flanked on both sides with projecting welsh slate walls which could penetrate into the building to create a clear and welcoming environment.

6.6.35 Daylight could be maximised through atrium roof lights, which would help to provide an open, modern look and feel to the work areas.

6.6.36 Office space is likely to be open plan with interspersed meeting rooms to support the use of the space and assist acoustically. A double atrium could maximise daylight into the centre of the office. The base of the atrium could then become a communal hub and collaborative workspace.

Figure 6-21 Ground floor view of atrium

Figure 6-22 First floor view of atrium

EXTERNAL APPEARANCE

6.6.37 The entrance could be announced by projecting stone walls which continue externally to form a stone plinth which incorporates planting and seating to the main elevation of the building. This would support the understanding of the use of the facility as the main management centre for the Power Station and as a building which would be accessed by both staff and visitors. This function dictates a more human scale and the need for tactile materials to be used to generate a welcoming and attractive appearance. The materials illustratively shown and the elevational treatments reflect this.

6.6.38 Vertical louvres could be provided on all four facades for a consistent aesthetic. External plant could also be screened with louvres so as not to distract from the building and maintain a clean and considered appearance.

MATERIAL PALETTE

6.6.39 Materials which are considered to be potentially suitable for the building are: natural stone cladding, curtain walling and large areas of glazing, blue engineering brick and flat panel cladding or rainscreen systems.

6.6.40 The colour palette however could remain consistent with the hues used across the other facilities to provide a coherent and consistent approach to the visual aesthetic of the development.

6.6.41 The elevational treatments are likely to have a more tactile quality and human scale to these used on the larger more industrial buildings in response to the use of the facility. The design could also try to incorporate the idea of the building linking to its surroundings with walls penetrating into the entrance area bringing the outside in, as well as extending across the front of the building to act as a plinth for planting and seating areas.

6.6.42 Brise soleil could be used to assist in controlling the internal environment and also to break down the overall mass of the building. These may incorporate contrast colours to the overall site colour palette to highlight this as a key focal point for staff and visitors alike. The main entrance to the building may be visible from the car park and approach road, giving a high quality first impression on approaching the site.

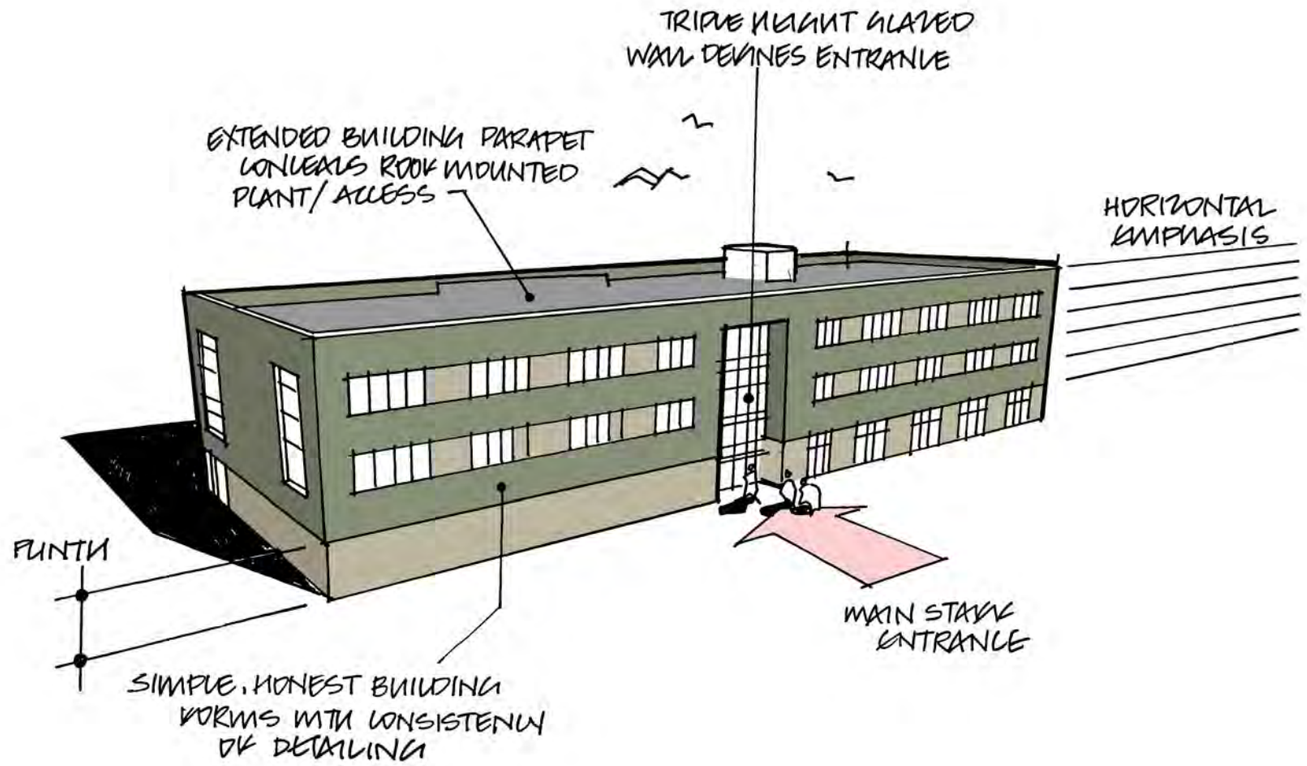


Figure 6-23 Indicative view of external appearance – administrator building

ACCESS

6.6.43 The building would be approached on exiting the main gatehouse via pedestrian walkways to provide a safe pedestrian route to the building.

OUTAGE BUILDING

6.6.44 The outage building is likely to be a two storey building with a rectangular footprint that would be located within the outer security zone of the Power Station and used to support the outage management function.

6.6.45 It would be located near the secondary security access point to reduce congestion at the main access control point. The building would serve both reactor buildings.

6.6.46 The outage building is likely to support 600 workers, albeit only during outage periods.

LANDSCAPE DESIGN

6.6.47 The outage building landscape would be of a similar nature to the Administration building landscape. It would offer an amenity and social space for the workers, while emphasizing the building entrance.

BUILDING DESIGN

INTERIOR LAYOUT

6.6.48 The building concept is to locate administrative functions, the outage store and welfare facilities for a large number of people between two floors with special attention being paid to the building's personnel and materials flows.

6.6.49 All welfare and outage facilities are likely to be located on the ground floor while all the office spaces are located on the first floor. In order to provide an adequate working environment, rooms are likely to be located next to external walls to benefit from natural daylight, while the circulation spaces could be located centrally.

6.6.50 A fully glazed portion of the façade could be used to create a welcoming entrance with has projecting clad walls on each side.

6.6.51 A service yard to support the outage store is likely to be located away from pedestrian thoroughfares.

EXTERNAL APPEARANCE

6.6.52 The entrance could be announced by the introduction of recessed, full height curtain walling, with projected clad walls on both sides. Full height curtain walling could also be used to communal areas such as the canteen to maximise the admission of natural daylight into it.

6.6.53 Overhead sectional doors with vision panels are likely to be needed for the vehicle doors to the outage store area. Louvered screens could screen external plant enclosures.

MATERIAL PALETTE

6.6.54 Materials which are considered to be potentially suitable for the building are: natural stone cladding, curtain walling areas of glazing, blue engineering brick and flat panel cladding or rain screen. The building would be visible from the outage car park and Wales Coast Path and so although supporting a temporary occupation, it would provide on-lookers with a visual opinion of the Power Station from the north of the site.

6.6.55 The elevational treatments could have a more tactile quality and human scale to these used on the larger more industrial buildings in response to the use of the facility.

Figure 6-24 Internal view of outage building

6.7 SITE ENTRANCES AND GATEHOUSES

6.7.1 These buildings would offer the first impressions to all who enter the Power Station Site. They would be utilised by staff, visitors, maintenance and delivery drivers. As such they would, like the office type buildings need to reflect a more human scale and incorporate higher specification products in key areas to provide the desired impression.

6.7.2 The outer fence gatehouses would form the first point of pedestrian access onto the site. Their design needs to be mindful of security and of the vehicle access points which run alongside them. Curtain walling could be used to provide bright, welcoming, reception spaces, teamed with tactile materials as likely to be used on the office type buildings to the entrance areas. The parts of the building's that would not be exposed to pedestrian traffic and human interaction could be simpler in design terms whilst utilising the same colour palette throughout. The concrete structure required in these facilities for operational reasons may be left exposed in its natural state or painted, so as to be reflective of the reactor buildings and the industrial nature of the development. This would be paired with the other materials utilised around the Power Station to provide a consistent site wide palette of materials and colours providing a unified aesthetic.

6.7.3 The parameters set out in section 3 seek to rationalise and consolidate car parking outside of the gatehouses by focusing car parks outside of the boundary fencing at the Power Station entrances for security reasons. The design would ensure that new car parks are incorporated as an integral part of the landscape strategy. The layout, location and treatment of the car parks would assist in minimising the impact of hard surfacing and reduce the scale of hard surfaced space through the introduction of tree and shrub planting and green areas to define car parking bays, aisles and pedestrian routes. Low level planting would be used to delineate pedestrian routes between buildings and site entrances.

OUTER MAIN GATEHOUSE

6.7.4 The outer main gatehouse would be the one building experienced by all people staff and visitors, who enter the site under daily operations with the exception of those serving the site for major maintenance works. It is therefore vital that this building gives a good first impression and is designed to a high standard. Given the level of human interaction with the building it is proposed to treat those areas in a similar way to the administration building and to try to reflect some of the mannerisms utilized in that buildings design here so that the buildings read well alongside each other. Again the higher specification materials have been focused on key elements of the building with the functional and servicing areas having a more simplified palette and functional form. Stone walls could flank and project forward of the main curtain walled entrance to the building on the approach from the car park to announce the entrance to the site. Here contrast bands of colour may be used to further highlight this key facility. The building could be grounded by further stone walling to the base or the building around its perimeter. Above which flat panel cladding and possibly exposed concrete in colours selected from the agreed site colour palette and projecting feature fins could be used to encapsulate the remainder of the building.

6.7.5 Louvered panels are likely to be required to screen plant and these would provide interest and relief to the building.

LANDSCAPE DESIGN

6.7.6 The outer main gatehouse and main car park landscape design would be the object of a particular attention to provide a unique transition between the wider landscape and the power station site. Figure 6-25 shows an illustrative view of the Power station primary entrance and the main car park.

6.7.7 The use of native tree, heather and cloddiau would create continuity with the wider landscape, while the strong print of the grid would be expressed through the use of industrial materials, such as concrete slab paving, would give the visitor a unique arrival experience. Figure 6-26 shows the fine layout and materials palette that could be developed for the main entrance landscape design.

6.7.8 The tree planting would be designed in order to maintain clear sightlines for the CCTV cameras. Single stem specimens with a minimum of 2.5 metres clear-stem would be used, laid in a widely spaced grid.

A clear and legible footpath would be created at the far end of the parking bays, to provide a safe access to the Search Building Main Entrance. This would be separated from the car circulation on both sides by a small clawdd type wall and heather planting.

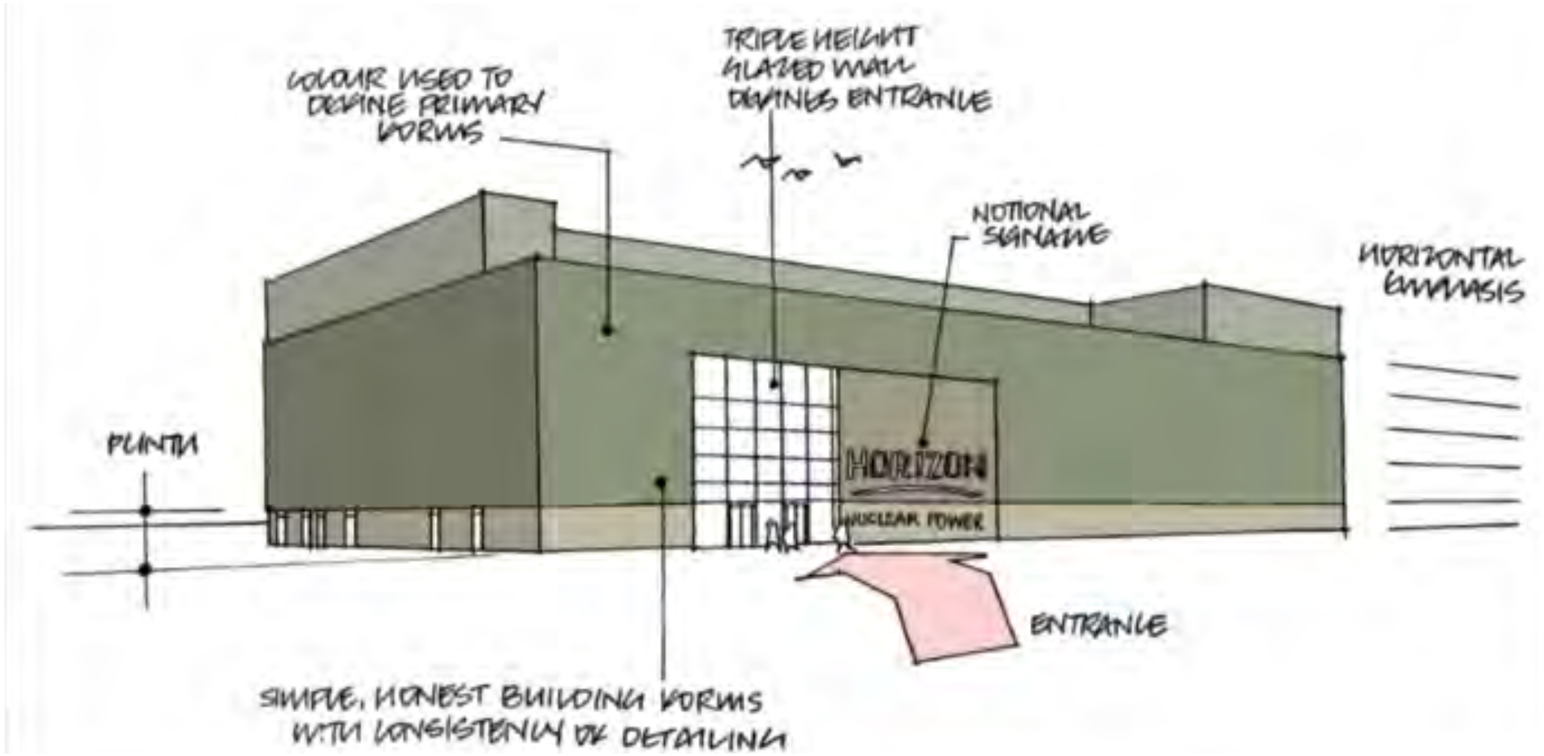


Figure 6-25 Illustrative view of external appearance – outer main gatehouse

Figure 6-26 Illustrative view of Power Station primary entrance

OUTER SECONDARY GATEHOUSE

6.7.9 This building is likely to be single storey that accommodates the secondary access control to the site for use during periods of high level maintenance or outage.

6.7.10 The arrangement of the building would be designed to optimise flow and operational efficiency. The building would also have a very human scale being single storey and small in size. The form of the building would be designed to reflect this and provide simple clean lines and avoid fussy or awkward junctions and details.

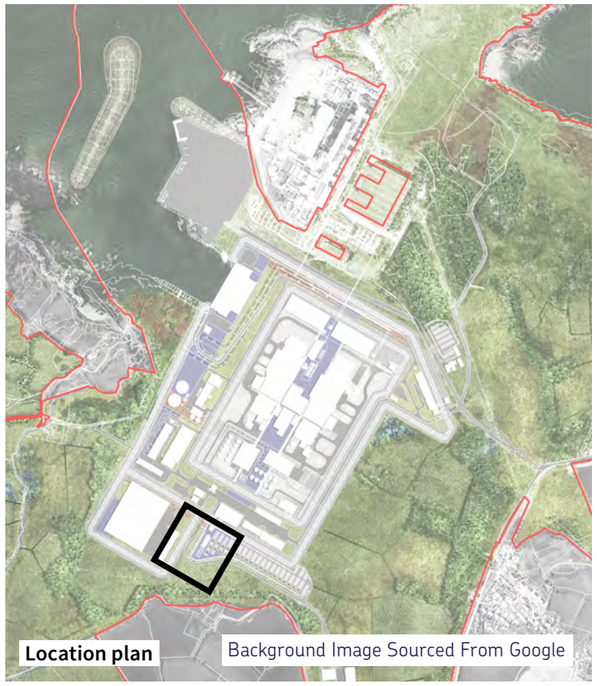
6.7.11 A parapet roof with an integrated overhang to the main entrance could provide shelter as well as an elegant and welcoming feature drawing you into the building and emphasising the entrance. The walls surrounding this set back could be stone and glazing, allowing natural light to penetrate into an open reception area.

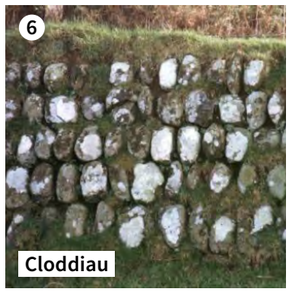
LANDSCAPE DESIGN

6.7.12 The outer secondary gatehouse and secondary car park landscape would be of a similar but simpler design than the main entrance described previously. It would also reflect a transition between the wider landscape and the power station, while providing an arrival experience to the visitors and workers. Figure 6-29 shows an illustrative view of the Power station secondary entrance.

Figure 6-27 Illustrative view of outer secondary gatehouse

Figure 6-28 Illustrative view of Power Station secondary entrance





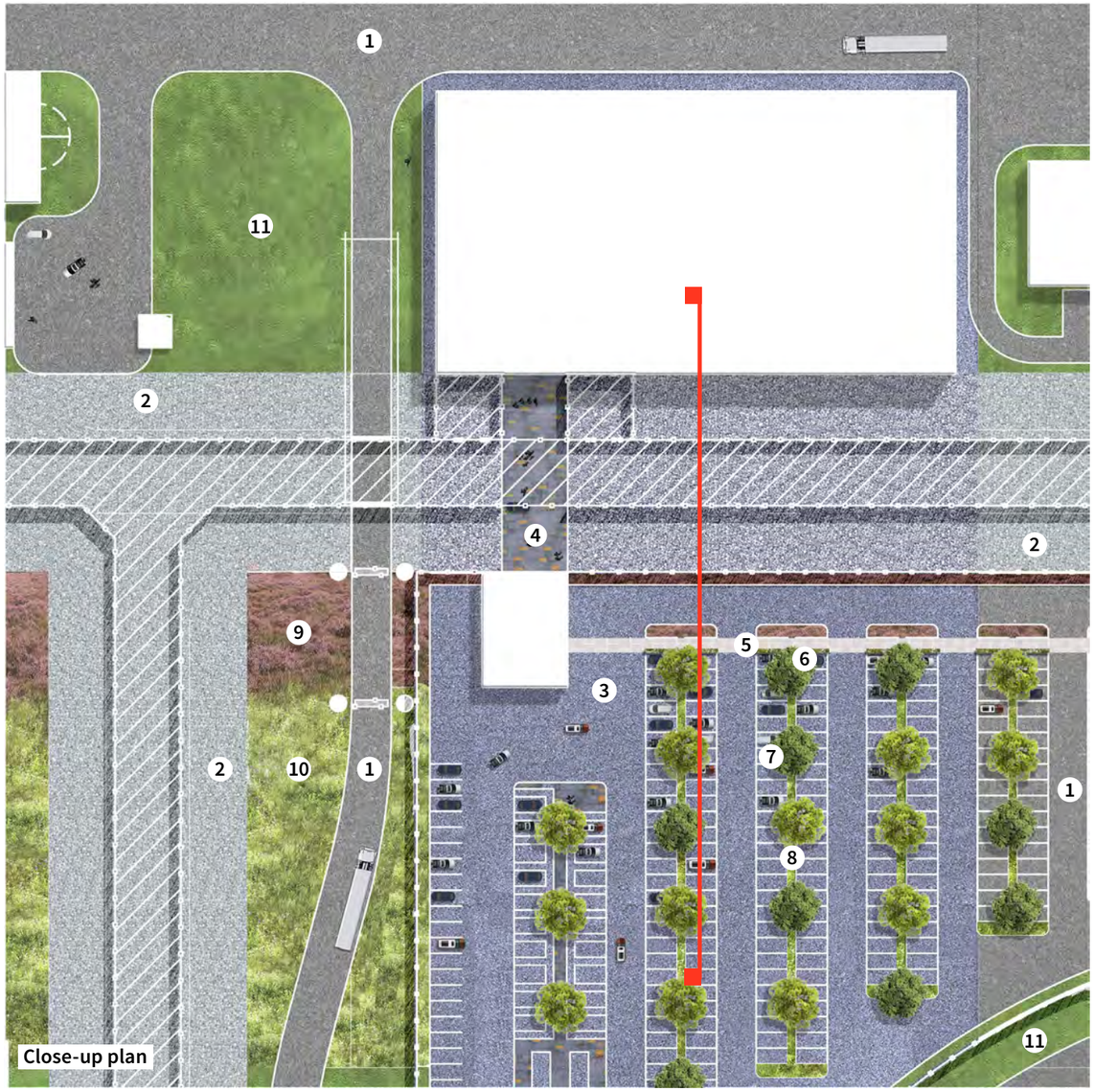


Figure 6-29 Illustrative landscape proposals at the Power Station primary entrance

Figure 6-30 Illustrative landscape proposals at the Power Station primary entrance

6.8 INDUSTRIAL BUILDINGS

6.8.1 A number of facilities would have a more industrial purpose where the function and operational efficiencies of these buildings would be key to the operation of the Power Station. Material selection and massing would therefore be heavily focused on form following function and materials representative of use and longevity. The material palette used on these facilities is therefore likely to be simplified and more industrial in nature, such as profiled composite cladding, blue engineering brickwork and limited glazing to entrances and associated office accommodation. The site colour palette colour be utilised where regulatory requirements do not prohibit this.

6.8.2 The example industrial buildings considered in this section are:

- Garage for mobile emergency cooling related vehicles; and,
- Conventional and hazardous waste building,

GARAGE FOR MOBILE EMERGENCY COOLING RELATED VEHICLES

6.8.3 The garage for mobile emergency cooling related vehicles would be used for the storage and basic servicing of vehicles and equipment on site that would be used during a response to an emergency event.

6.8.4 No permanent staff would be based in these facilities.

6.8.5 As one of the industrial buildings on the site, the function and operational requirements of the building have dictated its form and its external appearance has been kept simple and functional. The building is likely to be single storey with a mono pitch roof or an engineered fabric building.

6.8.6 A combination of vertical and horizontal trapezoidal cladding to break-up the length of the building could provide interest whilst maintaining robustness.

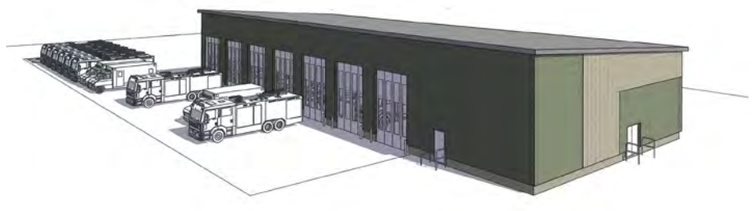


Figure 6-31 Indicative view of garage for mobile emergency cooling related vehicles

CONVENTIONAL AND HAZARDOUS WASTE BUILDING

6.8.7 The conventional and hazardous waste building would be used to support the waste management function at Wylfa Newydd. The facility would receive, scan, sort, separate and store all waste produced, under normal operation, by the Power Station.

6.8.8 The facility would include a hazardous waste storage area which would provide storage for non-radioactive hazardous wastes (batteries, chemicals, etc.) generated and collected during maintenance and cleaning activities. Wastes generated by any major site refurbishments or modification would not be processed in this facility.

6.8.9 Waste contractor vehicles attending the building would be directed straight to the external yard to collect waste and deposit empty containers

6.8.10 The material palette for this industrial building is likely to be minimal and focused upon operational efficiency and robustness. Trapezoidal cladding laid vertical could assist in providing interest and breaking down the length of the building. A blue engineering brick plinth and insulated vehicular doors could complete the materials palette for the elevational treatment of the building which could be supported by aluminium standing seam roof. The colours utilised for the cladding could be selected from the site colour palette and would consider the buildings around it and its position within the overall composition of the site.

6.8.10 The material palette for this industrial building is likely to be minimal and focused upon operational efficiency and robustness. Trapezoidal cladding laid vertical could assist in providing interest and breaking down the length of the building. A blue engineering brick plinth and insulated vehicular doors could complete the materials palette for the elevational treatment of the building which could be supported by aluminium standing seam roof. The colours utilised for the cladding could be selected from the site colour palette and would consider the buildings around it and its position within the overall composition of the site.

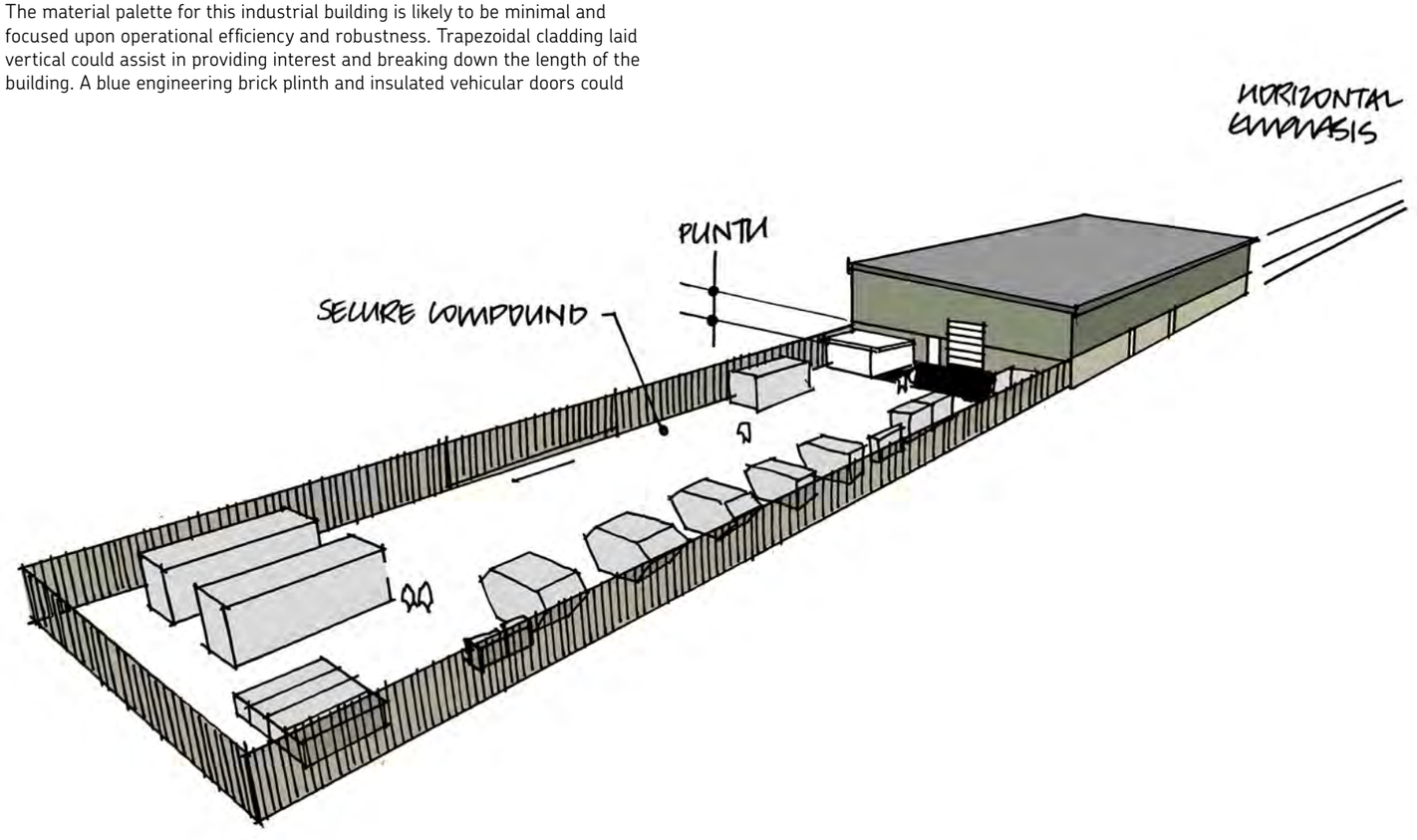


Figure 6-32 Indicative view of conventional and hazardous waste building

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7 ENVIRONMENTAL SUSTAINABILITY

Environmental Sustainability

7.1.1 The overarching approach to sustainable design and construction of the Wylfa Newydd DCO Project is set out in Volume 1 of the DAS and in the Sustainability Statement submitted in support of this application (Application Reference Number: 8.17).

7.1.2 This section of the DAS summarises how the design of the Power Station to date has taken into account sustainability during the design development process. Appendix 1-6 of Volume 3 of the DAS includes a review of relevant sustainable design policies and guidance, and identifies key sustainability themes. This section of the DAS describes how the development has incorporated good practice sustainable design measures in relation to each of these themes and includes recommended next steps to ensure that sustainability remains embedded in the development going forward.

7.1.3 As set out in section 3, design evolution during the pre-application period has contributed to a reduction in the overall footprint of the Power Station compared to the original proposals published at the Stage One Pre-Application Consultation. A number of buildings have also been consolidated. For example, there is now one service building and one radioactive waste building, compared to two of each at the Stage Two Pre-Application Consultation. Reducing the numbers of buildings reduces the overall requirement for construction materials and resources and allows for efficiencies in construction programming.

7.1.4 The MOLF supports the use of sea-based transport for the delivery of bulk materials and certain freight directly to the Power Station, totalling between 60% and 80% of the total construction materials requirements. This prioritisation of sea-based transport is expected to substantially reduce the overall anticipated Heavy Goods Vehicle (HGV) flow along the strategic road network (A55 and A5025 Valley to the Power Station) to the construction compounds within the WNDA.

7.1.5 Parking proposals during both construction and operation at the Power Station would include preferential arrangements for registered car sharers; charging points for electric vehicles; and the provision of cycle parking.

7.1.6 Radioactive wastes and materials would be managed, monitored and disposed of in accordance with Best Available Techniques (BAT). The design of the Power Station incorporates necessary facilities to support this approach.

7.1.7 The Sustainability Statement states that there is potential for the sustainability performance of the Wylfa Newydd DCO Project to be enhanced through future detailed design measures. Sustainability design principles are included in the section 5 of this document accordingly.

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8 ACCESSIBILITY AND MOVEMENT

Accessibility and Movement

8.1 INCLUSIVE ACCESS

8.1.1 It is intended that there should be no discrimination against any person wishing to work on the Wylfa Newydd DCO Project, either on a temporary or a permanent basis.

8.1.2 Horizon intends to accord with the Equality Act 2010, by making reasonable adjustments to the workplace to ensure that a person is not at a substantial disadvantage because of their disability compared to a non-disabled person.

8.1.3 Where it is not considered reasonable or practicable, adjustments would not be made. This may include many of the more industrial and inaccessible areas given the nuclear context of the development.

8.1.4 In accordance with the above legislation, adjustments would be made where it is reasonable to do so. For example, adjustments are likely to be made to office-type facilities and routes to these buildings such as the site entrances. Subject to operational requirements, these adjustments are likely to comply with the recommendations of British Standard (BS) 8300 Design of buildings and their approaches to meet the needs of disabled people. Code of practice.

8.1.5 Reasonable adjustments may include changes to:

- access and security controls at the site entrances/exits;
- signage;
- corridor widths;
- the design of toilets and hygiene provision, including showers; and
- building management, including staff training, to cater for those with disabilities.

8.2 TRANSPORT AND ACCESS

8.2.1 Horizon has taken a holistic approach to considering the transport impacts and opportunities for delivering sustainable transport initiatives at a Project-wide level.

8.2.2 The MOLF supports the use of sea-based transport for the delivery of bulk materials and certain freight directly to the Power Station.

8.2.3 The Logistics Centre at Parc Cybi would provide a further means to manage the onward transport of freight along the A5025 from Valley to the WNDA during construction.

8.2.4 The A5025 Off-line Highways Improvements would improve the highway network between Valley and the Power Station.

8.2.5 The Wylfa Newydd DCO Project incorporates mass transportation proposals for the construction and operational workforces, complemented by construction and operational travel planning that would be overseen by a travel liaison officer.

8.3 ACCESS INTO THE POWER STATION

8.3.1 A new roundabout would be provided on the A5025 to provide access to the Power Station via the Power Station Access Road. This provision reduces the amount of traffic that would have otherwise needed to pass the community of Tregele in order to access the Power Station via the Existing Power Station access road. The proposed access road also reduces any potential combined effects with the decommissioning of the Existing Power Station.

8.3.2 The proposed junction location is also influenced by the existing topography. It would provide an appropriately level site for the junction and would afford suitable visibility on all approaches. The junction was initially proposed to be located approximately 200m further north on the A5025 at the bottom of a 5% gradient. However, because of the risk of collisions between traffic turning out of Wylfa Newydd and traffic on the A5025, the original junction location was discounted on road safety grounds. The current proposal is for a 3-arm at-grade roundabout.

STAFF VEHICULAR ACCESS

8.3.3 Power Station staff would access the facility via the Power Station Access Road and park in the southern car park, which would provide up to 700 car parking spaces. Staff would then proceed on foot through the main gatehouse.

8.3.4 During outage periods additional parking would be available within close proximity to the Power Station, located off the Existing Power Station access road, to accommodate the increased demand. The northern car park would provide 200 permanent car parking spaces and up to 650 temporary car parking spaces on grasscrete or similar surfacing. Temporary parking spaces would only be made available for outage periods and access into the Power Station would be made on foot via the secondary gatehouse.

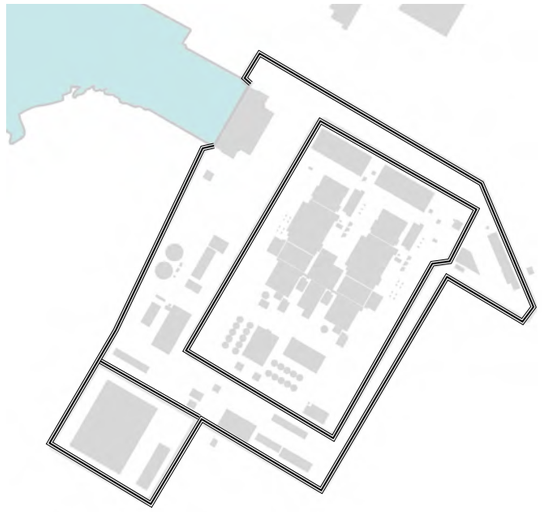
HGV ACCESS AND DELIVERIES

8.3.5 HGVs and vehicles undertaking deliveries to the Power Station would enter along the Power Station Access Road past the main security building. The exception to this would be the delivery of AILs, which would access the Power Station via the MOLF and associated security checkpoints, and directly into the Power Station's internal access road network.

PEDESTRIANS AND CYCLISTS

8.3.6 Pedestrians and cyclists would enter the site through the main gatehouse in the same manner as those staff arriving in a vehicle. Cyclists would be required to dismount, make use of a cycle parking space and then use the pedestrian route.

MAIN SITE SECURITY FENCES



Legend

Security Fence

MAIN SITE PEDESTRIAN CIRCULATION

Legend

Pedestrian
Outage Personnel

MAIN SITE VEHICULAR CIRCULATION

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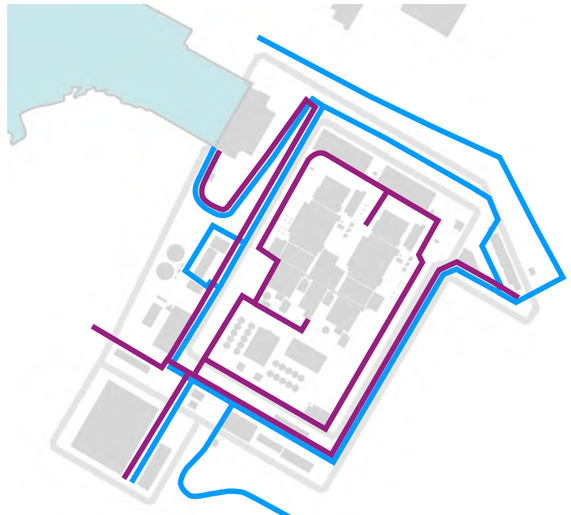
Vehicular
Shuttle

MAIN SITE LOGISTICS AND WASTE CIRCULATION



Legend

Logistic
Waste

Figure 8-1 Main site circulation

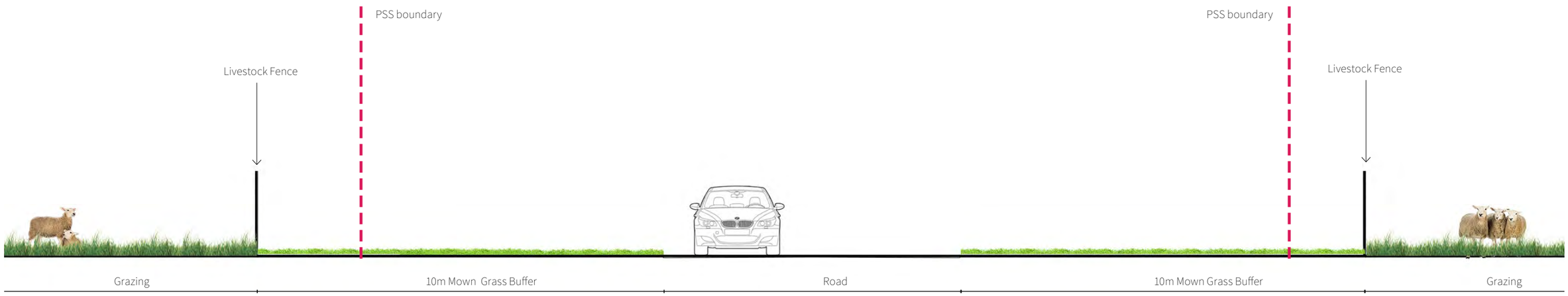


Figure 8-2 Indicative section of the access road

9 POST-OPERATION

Post Operation

INTRODUCTION

9.1.2 The Power Station would be decommissioned following approximately 60 years of operation and the approach would be consulted upon in accordance with the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999, as may be amended. To ensure that the specific environmental conditions following operations are known, the consultation process would begin in the final few years before operations cease. Within this timeframe, decommissioning would be undertaken as early as possible.

9.1.3 This section introduces Horizon's proposed decommissioning approach, which would be subject to ongoing review and refinement, in conjunction with relevant regulators and stakeholders, during the operational lifetime of the Power Station.

DECOMMISSIONING APPROACH

9.1.4 The objective of decommissioning is to convert a nuclear site from its operational state to an end state that is agreed with the relevant authorities and regulators. This is, in simple terms, a progressive process of controlled hazard removal, demolitions and, if considered necessary, land remediation. Once the end state is achieved for a nuclear site or parts of a nuclear site, it is then expected that regulatory controls would be removed to allow the land to be used for new purposes, which can be non-nuclear related.

9.1.5 Before decommissioning starts, Horizon would need to obtain consent from the Office for Nuclear Regulation (ONR) under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999. This would require a period of consultation relating to the submission of a decommissioning proposal and supporting Environmental Statement. Horizon expects that this process would begin in the final few years prior to generation ceasing, so that the specific environmental characteristics of the environmental baseline would be known.

9.1.6 Horizon's proposals for the Power Station have been developed with consideration of the way in which decommissioning would be undertaken, as reflected in the decommissioning principles set out in Section 3.

9.1.7 Horizon aims to complete main decommissioning activities within 20 years following the end of power generation.

MANAGEMENT OF RADIOACTIVE WASTE AND SPENT FUEL

9.1.8 The decommissioning approach assumes that ILR waste and spent fuel would be transferred to the UK Government's planned Geological Disposal Facility (GDF), to accord with relevant current Government guidance. Consequently, storage facilities would be constructed as part of the Power Station and these would remain in-situ and independently operational beyond the completion of the main decommissioning activities, until such time as the waste streams could be safely packaged and transferred to the GDF.

9.1.9 The overall timeframe for spent fuel to remain in the storage facilities would depend on the availability of the GDF and the amount of time needed to allow the spent fuel to have cooled sufficiently to allow disposal. At present, this is conservatively estimated at 140 years after the end of power generation, but may in reality prove to be considerably shorter than this. The certainty around this timeframe would not be possible until UK Government proposals for the GDF become more advanced.

9.1.10 The decommissioning approach assumes that completion of this process would result in complete clearance of radiological material and delicensing of the Power Station Site. The monitoring, remediation (if required), landscape implementation and delicensing is anticipated occur in two distinct phases, the first within 20 years of the end of power generation and the second following despatch of intermediate level radioactive waste and spent fuel to the GDF. The final stage of decommissioning would be the removal of the nuclear licencing requirements, which occurs once the ONR has established that there is no danger to future users of the land.

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REFERENCES

Reference

ID	REFERENCE
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RD2	Design Commission for Wales. Design and Access Statements in Wales 2017 [Online] Available from: https://dcfw.org/design-and-access-statements-in-wales-why-what-and-how/
RD3	IACC and Gwynedd Council, Anglesey and Gwynedd Joint Local Development Plan 2011 – 2026, Written Statement, July 2017. [Online]. [Accessed 2 February 2018]. Available from: http://www.anglesey.gov.uk/Journals/j/v/e/Anglesey-and-Gwynedd-Joint-Local-Development-Plan---Written-Statement.pdf
RD4	IACC, 2014. New Nuclear Build at Wylfa: Supplementary Planning Guidance, Llangefni: IACC. [Online]. [Accessed 2 February 2018]. Available from: http://www.anglesey.gov.uk/Journals/2014/08/11/q/k/h/Wylfa-NNB-SPG-Adopted-July-2014.pdf

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