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# Tees CCPP Project

The Tees Combined Cycle Power Plant Project  
Land at the Wilton International Site, Teesside

## Design and Access Statement



The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms  
and Procedure) Regulations 2009

Regulation 5(2)(q)

**Applicant:** Sembcorp Utilities UK  
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## GLOSSARY

Abbreviation	Description
AOD	above Ordnance Datum
CCS	carbon capture and storage
DAS	Design and Access Statement
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EN-1	The Overarching National Policy Statement for Energy
EN-2	NPS for Fossil Fuel Electricity Generating Infrastructure
EN-4	NPS for Gas Supply Infrastructure and Gas and Oil Pipelines
EN-5	NPS for Electricity Networks Infrastructure
ES	Environmental Statement
ha	Hectares
MW	Megawatts
NPPF	National Planning Policy Framework
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Project
Order	Tees Combined Cycle Power Plant (Generating Station) Order
PA 2008	The Planning Act 2008
PPG	Planning Practice Guidance
RCBC	Redcar and Cleveland Borough Council
SCU	Sembcorp Utilities (UK) Limited
Site	Proposed Development Site
SoS	Secretary of State

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## SUMMARY

1. This Design and Access Statement ('DAS') has been prepared on behalf of Semcorp Utilities (UK) Limited ('SCU'). It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy, under Section 37 of 'The Planning Act 2008' (the 'PA 2008').
2. SCU is seeking a DCO for the construction, operation and maintenance of a new gas-fired electricity generating station with a nominal net electrical output capacity of up to 1,700 megawatts ('MW') at ISO conditions, on the site of the former Teesside Power Station, which forms part of the Wilton International Site, Teesside.
3. A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under Sections 14 and 15(2) of the PA 2008.
4. The DCO, if made by the SoS, would be known as the 'Tees Combined Cycle Power Plant (Generating Station) Order' (the 'Order').
5. The primary purpose of the DAS is to set out how SCU has had regard to design and access considerations in designing the Proposed Development. The document explains how SCU has taken account of the context of the Proposed Development Site (the 'Site'), appraised this and had regard to it in designing the Proposed Development.
6. The immediate context within which much of the Site sits is already very much industrialised in terms of its character and appearance. It is dominated by the large and functional industrial buildings and plant. The closest of which is the Teesside Ensus bioethanol plant, adjacent to the east of the Site. It is also notable that the Site was previously occupied the Teesside Power Station that ceased generation in 2013 and was demolished between 2013 and 2015.
7. The DAS explains where SCU is seeking flexibility in the design of the Proposed Development. In doing so, SCU has defined design parameters upon which to base the Environmental Impact Assessment ('EIA') of the Proposed Development to ensure that its likely significant effects have been robustly assessed. SCU has also included appropriate articles and requirements within the draft DCO submitted with the Application (Application Document Ref. 2.1) to ensure that the detailed design of the Proposed Development is controlled and secured.
8. The design of the Proposed Development is functional, reflecting its purpose to generate electricity and the context within which it would sit. The Proposed Development also incorporates appropriate access arrangements.
9. In summary, it is considered that the Proposed Development represents 'good design' for the purposes of energy infrastructure and policy set out in the relevant National Policy Statements.

# 1 INTRODUCTION

## OVERVIEW

- 1.1 This Design and Access Statement has been prepared on behalf of Sembcorp Utilities (UK) Limited ('SCU' or the 'Applicant'). It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy, under Section 37 of 'The Planning Act 2008' (the 'PA 2008').
- 1.2 SCU is seeking a DCO for the construction, operation and maintenance of a new gas-fired electricity generating station with a nominal net electrical output capacity of up to 1,700 megawatts ('MW') at ISO conditions (the 'Project' or 'Proposed Development'), on the site of the former Teesside Power Station, which forms part of the Wilton International Site, Teesside.
- 1.3 A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under Sections 14 and 15(2) of the PA 2008.
- 1.4 The DCO, if made by the SoS, would be known as the 'Tees Combined Cycle Power Plant (Generating Station) Order' (the 'Order').

## SCU

- 1.5 SCU provides vital utilities and services to major international process industry customers on the Wilton International site on Teesside. Part of Sembcorp Industries, a Singapore-based group providing energy, water and marine services globally, Sembcorp Utilities UK also owns some of the industrial development land on the near 810 hectares (2,000 acre) site which is marketed to energy intensive industries worldwide.
- 1.6 SCU owns the land required for the Proposed Development.

## THE PROJECT SITE

- 1.7 The Project Site (the 'Site') is on the south west side of the Wilton International Site, adjacent to the A1053. The Site lies entirely within the administrative area of Redcar and Cleveland Borough Council (RCBC) which is a unitary authority.
- 1.8 Historically the Site accommodated a 1,875 MW Combined Cycle Gas Turbine power station (the former Teesside Power Station) with the ability to generate steam for utilisation within the wider Wilton International site. The Teesside Power Station ceased generation in 2013 and was demolished between 2013 and 2015.
- 1.9 SCU has identified the Site, based on its historical land use and the availability of natural gas supply and electricity grid connections and utilities as a suitable location for the Project. In summary the benefits of the Site include:
  - brownfield land that has previously been used for power generation;
  - on-site gas connection, supplied from existing National Grid Gas Plc infrastructure;
  - on-site electrical connection, utilising existing National Grid Electricity Transmission infrastructure;
  - existing internal access roads connecting to a robust public road network;

- availability of a cooling water supply using an existing contracted supply (from the Wilton Site mains) and existing permitted discharge consent for effluent to the site drainage system
  - screening and noise attenuation provided by an existing southern noise control wall, approximately 6 m in height; and
  - existing services, including drainage.
- 1.10 A more detailed description of the Site is provided at Chapter 4 'Overview of Environmental and Socioeconomic Baseline' of the Environmental Statement ('ES') Volume I (Application Document Ref. 6.2.4).

## THE PROPOSED DEVELOPMENT

- 1.11 The main components of the Proposed Development are summarised below:
- Work No. 1 – a natural gas fired electricity generating station located on land within the Wilton International site, Teesside, which includes the site of a former CCGT power station, with a nominal net electrical output capacity of up to 1,700 MWe at ISO Conditions; and
  - Work No. 2 – associated development comprising within the meaning of section 115(2) of the 2008 Act in connection with the nationally significant infrastructure project referred to in Work No. 1.
- 1.12 Please refer to Schedule 1 of the Draft DCO (Application Document Ref. 2.1) for more detail.
- 1.13 It is anticipated that subject to the DCO having been made by the SoS (and a final investment decision by SCU), construction work on the Project would commence in around the second half of 2019. The construction of the Project could proceed under one of two scenarios, based on SCU's financial modelling, as follows.
- 'Scenario One': two CCGT 'trains' of up to 850 MW are built in a single phase of construction to give a total capacity of up to 1,700 MW.
  - 'Scenario Two': one CCGT train of up to 850 MW is built and commissioned. Within an estimated five years of its commercial operation the construction of a further CCGT train of up to 850 MWe commences.
- 1.14 The above scenarios have been fully assessed within the ES.
- 1.15 A more detailed description of the Project is provided at Schedule 1 'Authorised Development' of the draft DCO (Application Document Ref. 2.1) and Chapter 5 'Project Description' of the ES Volume I.

## THE PURPOSE AND STRUCTURE OF THIS DOCUMENT

- 1.16 The PA 2008 and related regulations do not require an application for a DCO to be accompanied by a DAS. However, Section 10 'Sustainable development' of the PA 2008 (subsection (3)(b)) states that in setting policy for NSIPs (through National Policy Statements) the SoS must have regard to the desirability of achieving 'good design'.
- 1.17 'The Overarching National Policy Statement for Energy (EN-1)', Part 4 'Assessment Principles' 4.5 'Criteria for good design for energy infrastructure', is clear that applicants should have regard to achieving 'good design' in energy infrastructure projects, and that these should be as attractive,

durable and adaptable as possible.

1.18 The DAS has therefore been prepared to describe the approach that has been taken to the iterative design of the Proposed Development and to demonstrate how regard has been had to the surrounding context and to good design.

1.19 The structure of the DAS is set out in Table 1.1 below:

**Table 1.1 - Design and Access Statement Structure**

Section	Title	Overview
Section 2	Legislative and Policy Context	Provides a summary of relevant policy and guidance relating to design.
Section 3	Site Description, Context and Appraisal	Describes the Site, its immediate context, the surrounding area and appraises this context and the opportunities provided by the Site.
Section 4	Design Flexibility and Information	Explains the design flexibility that is being sought by SCU and sets out the design information being provided with the Application.
Section 5	Design Approach and Evolution	Describes the design process that has been followed, including the broad approach that SCU has taken to the design of the Proposed Development and where the design has evolved.
Section 6	Design Components	Describes the design of the Proposed with reference to its key design components, including use, the amount of development, its layout, scale, appearance and also landscaping.
Section 7	Access Arrangements	Considers access both to and within the Site.
Section 8	Securing Detailed Design	Sets out how the detailed design of the Proposed Development will be in accordance with the design details and parameters upon which the Environmental Impact Assessment of it has been based and secured by DCO requirements, in particular requirement 4.
Section 9	Conclusions	Sets out the conclusions that can be drawn with regard to design and access matters.



## 2 LEGISLATIVE AND POLICY CONTEXT

- 2.1 This section summarises the design related legislative context and policy framework in respect of NSIPs, with particular emphasis on the relevant National Policy Statements. Planning policy more generally is considered within the Planning Statement (Application Document Ref. 5.5).

### LEGISLATIVE CONTEXT

- 2.2 Section 10 'Sustainable development' of the PA 2008 (subsection (3)(b)) states that in setting policy for NSIPs (through National Policy Statements) the SoS must have regard to the desirability of achieving 'good design'. However, the PA 2008 and related regulations do not require applications for NSIPs to be accompanied by a DAS.
- 2.3 The Town and Country Planning (Development Management Procedure) (England) Order 2015 (S.I 2015 No. 595), while applying to applications for planning permission under the Town and Country Planning Act 1990 (the 'TCPA') is of relevance as it sets out the matters to be addressed within a DAS. Article 9 'Design and access statements' of the Order confirms (paragraph 2) that a DAS must:
- explain the design principles and concepts that have been applied to the development;
  - demonstrate the steps taken to appraise the context of the development and how the design of the development takes this context into account;
  - explain the policy adopted as to access, and how policies relating to access in relevant local development documents have been taken into account;
  - state what, if any, consultation has been undertaken on issues relating to access to the development and what account has been taken of the outcome of any such consultation; and
  - explain how any specific issues which might affect access to the development have been addressed.
- 2.4 Article 9 (paragraph 4) confirms that a DAS is not required for applications involving engineering or mining operations.
- 2.5 With regard to Article 9, it is relevant to note that while the Proposed Power Plant involves new buildings and structures, the other works comprised within the Proposed Development (e.g. the electrical, gas, and cooling water connections) for the most part represent engineering works (and are limited in scale on the basis that much of the necessary infrastructure already exists). The main focus of this DAS is therefore upon the Proposed Power Plant and its layout.

### NATIONAL POLICY STATEMENTS

- 2.6 The planning policy framework for examining and determining applications for NSIPs is provided by a number of National Policy Statements ('NPSs'). Section 1 of the PA 2008 confirms that where NPSs are in place, these shall be the primary basis for decisions by the SoS on applications for NSIPs. Policy relating to design contained within the NPSs of relevance to the Proposed Development is set out below.

## OVERARCHING NPS FOR ENERGY (EN-1)

2.7 The Overarching NPS for Energy (EN-1) defines the need for nationally significant energy infrastructure and sets out certain assessment principles and criteria against which applications for such infrastructure should be considered. This includes Section 4.5 'Criteria for good design for energy infrastructure'.

2.8 Paragraph 4.5.1 recognises that the functionality of buildings and infrastructure, including fitness for purpose and sustainability, are as equally important as visual appearance and aesthetic considerations. It goes on to state that applying good design to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates 'good aesthetic' as far as possible. It is acknowledged however:

*"...that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of an area."*

2.9 Paragraph 4.5.2 of EN-1 notes that good design is also a means by which many policy objectives in EN-1 can be met, for example, good design, in terms of siting and use of appropriate technologies can help mitigate adverse impacts such as noise.

2.10 Paragraph 4.5.3 confirms that in assessing applications, the SoS will need to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable and adaptable (including taking account of natural hazards such as flooding) as they can be. In doing so, it goes on to state that the SoS should be satisfied that:

*"..the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located) as far as possible. Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area."*

2.11 Paragraph 4.5.4 stresses the importance of applicants being able to demonstrate in their application documents how the design process was conducted and how the proposed design evolved. However, it is clear that in considering applications the SoS should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements that the design has to satisfy.

## NPS FOR FOSSIL FUEL ELECTRICITY GENERATING INFRASTRUCTURE (EN-2)

2.12 EN-2 provides limited additional guidance on 'good design' for fossil fuel generating stations over and above that provided by EN-1. Paragraph 2.3.15 does, however, state that the principles of good design set out at Section 4.5 of EN-1 should be applied to all energy infrastructure.

2.13 Paragraph 2.3.16 states that applicants should demonstrate good design in respect of landscape and visual amenity and in the design of the development to mitigate impacts such as noise and vibration, transport impacts and air emissions.

### **NPS FOR GAS SUPPLY INFRASTRUCTURE AND GAS AND OIL PIPELINES (EN-4)**

- 2.14 Paragraph 2.3.1 states that Section 4.5 of EN-1 sets out the principles of good design that should be applied to all energy infrastructure.
- 2.15 Paragraph 2.3.2 states that for the reasons given at Section 4.5 of EN-1, applicants should demonstrate good design, in particular, when mitigating the impacts relevant to the infrastructure.

### **NPS FOR ELECTRICITY NETWORKS INFRASTRUCTURE (EN-5)**

- 2.16 Paragraph 2.5.1, as with EN-4, refers to the principles of good design set out at Section 4.5 of EN-1.
- 2.17 Paragraph 2.5.2 states that proposals for electricity networks infrastructure should demonstrate good design in mitigating the potential adverse impacts that can be associated with overhead electric lines, particularly impacts upon biodiversity and geological conservation, landscape and visual, noise and vibration and electro-magnetic fields.

## **NATIONAL PLANNING POLICY FRAMEWORK AND PLANNING PRACTICE GUIDANCE**

- 2.18 The National Planning Policy Framework ('NPPF'), introduced in March 2012, sets out the Government's planning policies for England. It is a material consideration in planning decisions. Although the NPPF does not contain policies in relation to NSIPs, paragraph 3 confirms that the NPPF may be considered by the SoS to be both 'important and relevant' for decision making on NSIPs.
- 2.19 Section 7 of the NPPF 'Requiring good design' sets out policies on design. Paragraph 56 emphasises the importance of good design in the built environment and the role it plays as a key aspect of sustainable development. Much of the guidance is of limited relevance for energy infrastructure, however, the overall aim is to promote developments that function well, create attractive places, optimise the potential of sites, respond to local character and incorporate good architecture and appropriate landscaping.
- 2.20 The Planning Practice Guidance ('PPG'), launched in March 2014, brings together planning practice guidance for England in an online format. It includes a section of design guidance, as with the NPPF, it states that good quality design should be an integral part of sustainable development. In designing new developments it sets out a number of issues that should be considered, including local character and landscape setting.
- 2.21 With regard to local character, the PPG states that the successful integration of new development with its surrounding context is an important design objective. Developers should take into account landform, natural features and heritage resources, while views into and out of large sites should be carefully considered. The importance of high quality landscaping as a means of integrating development within the wide environment is also highlighted.

## **LOCAL PLANNING POLICY**

- 2.22 The most relevant local planning policy relating to design is contained within the Redcar & Cleveland Core Strategy Development Plan Document (adopted July 2007) and the Redcar & Cleveland Development Policies Development Plan Document (adopted July 2007).

- 2.23 Policy CS1 'Securing a Better Quality of Life' of the Core Strategy Development Plan Document states that the principle of sustainable development will underpin the policies and proposals for the use and development of land in the borough.
- 2.24 Policy DP1 'Development Limits' of the Development Policies Development Plan Document states that within development limits, development will generally be acceptable where it accords with site allocations and designations in the Local Development Framework. It is notable, in regards to the Proposed Development, that the Site is identified as falling within the area covered by the South Tees Employment Area under Policy CS4 of the Core Strategy Development Plan Document. Policy CS4 supports the development of energy industries, amongst other things, at the Wilton International Site.
- 2.25 DP3 'Sustainable Design' of the Development Policies Development Plan Document includes a number of relevant criteria, including that proposals will be expected to:
- respect or enhance the character of the site and its surroundings in terms of its proportion, form, massing, density, height, size, scale, materials and detailed design features;
  - include a layout and design that takes into account the potential users of the site and does not cause a significant adverse impact on residential amenity;
  - create a safe and secure environment;
  - respect or enhance the landscape, biodiversity, geological and heritage designations or assets that contribute positively to the site and the surrounding area;
  - incorporate sustainable design and construction techniques;
  - ensure pedestrian, cycling and public transport access is safe, convenient and attractive, linked to existing networks and includes appropriate facilities for cyclists and public transport users;
  - make appropriate access provision for disabled people and those with restricted mobility;
  - fully incorporate, where appropriate, biodiversity and geological interests and landscaping;
  - incorporate infrastructure and services to serve the development including recycling and waste facilities and Sustainable Drainage Systems if appropriate; and
  - provide vehicular access and parking suitable for its use and location.
- 2.26 In addition, the policy states that a Design and Access Statement will be required for all proposals. The level of detail will be dependent on the scale and nature of the development and the sensitivity of its location.
- 2.27 The compliance of the Proposed Development with national and local planning policy is considered in detail at Section 5 of the Planning Statement (Application Document Ref. 5.5).

## 3 SITE DESCRIPTION, CONTEXT AND APPRAISAL

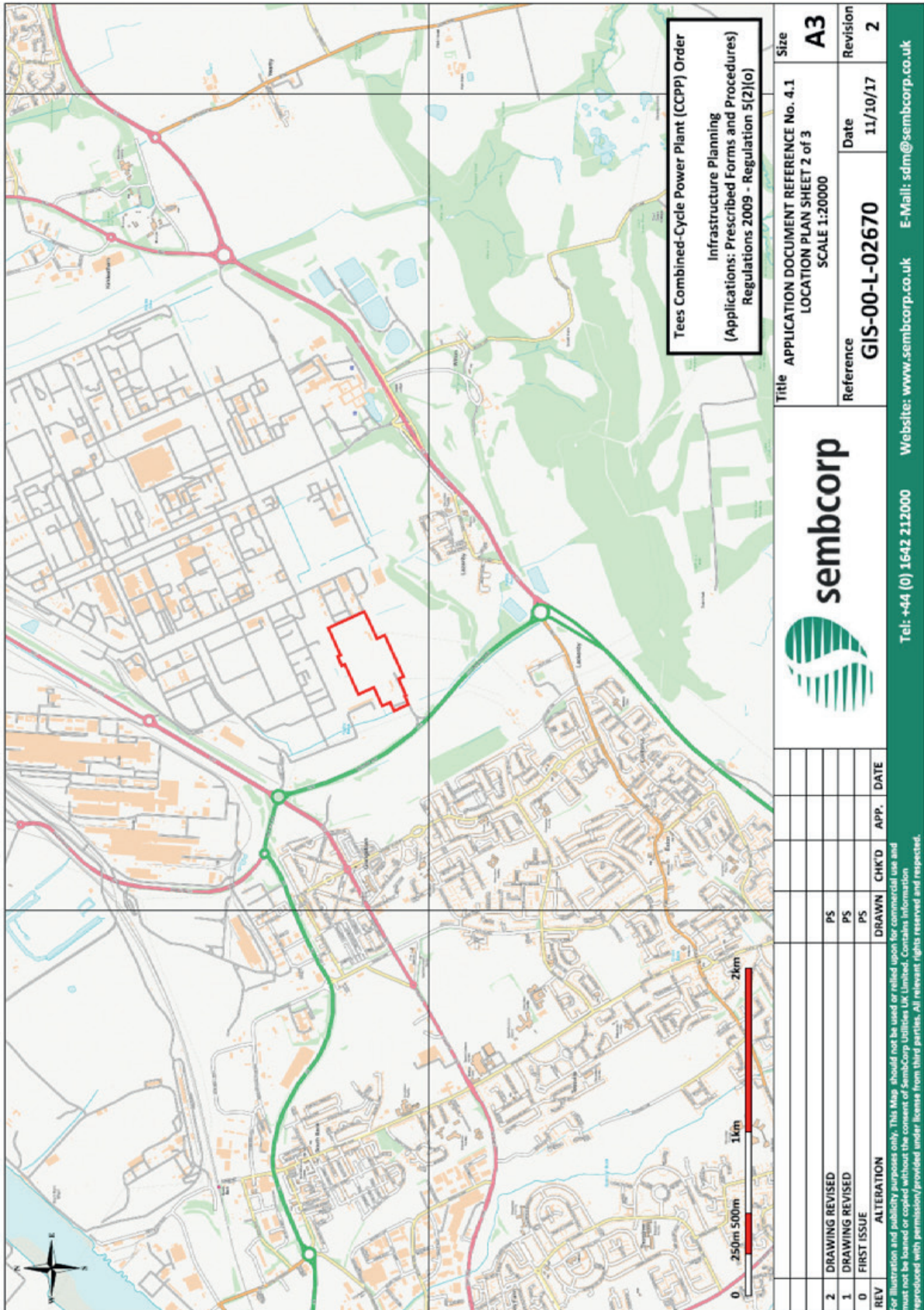
- 3.1 This section describes and appraises the Site's context. This includes a description of its location, the Site itself, the immediate context within which it sits, the surrounding area and how access is achieved. It also explains the planning context for the Site. Finally, it appraises the characteristics of the Site, including the opportunities and constraints it presents for development.

### SITE LOCATION

- 3.2 The Site is on the south west side of the Wilton International Site, adjacent to the A1053. The Wilton International Site is a major industrial complex, measuring approximately 810 hectares ('ha') in area. It comprises predominantly of previously developed land, owing to its industrial status.
- 3.3 The Site lies entirely within the administrative area of Redcar and Cleveland Borough Council (RCBC) which is a unitary authority.
- 3.4 The location of the Site is shown in Figure 3.1 on the following page.

### SITE DESCRIPTION

- 3.5 The Site comprises previously developed land and covers an area of approximately 15 ha. The Site has a history of energy generation. The previous installation (the Teesside Power Station) ceased operations in 2013, and the decommissioning and demolition of all buildings and plant was undertaken between 2013 and 2015.
- 3.6 The site currently comprises open ground, surfaced with a mixture of concrete slab (c.60%, equivalent to the footprint of the previous buildings / structures), gravel (c.35%, equivalent to areas where voids have been backfilled with site won demolition crushed materials, or where gravel existed previously) and soft landscaping (<5%, limited to the site periphery). The Site is situated at an elevation of approximately 16 m above Ordnance Datum (AOD) and is generally flat.
- 3.7 Made ground is known to be present across the application site to depths of up to 2.2 m. Below this layer British Geological Survey mapping indicates that the site is underlain by superficial deposits of poorly sorted till / glacial material across the majority of the Site, and deposits of clay and silt to the north / western areas. These (superficial) deposits are identified as being in the region of 11 m thick. The underlying bedrock is mapped as Redcar Mudstone Formation, listed as being up to c.280 m deep in this area.
- 3.8 The Site is of low ecological sensitivity and all habitats present are highly modified. The Site is not located within any statutory or non-statutory nature conservation designations. There is only one Local Wildlife Site within a 2 km radius of the Site. There are no Local Nature Reserves within 2 km of the Site.
- 3.9 ES Volume 1, Chapter 4 'Overview of the Project's Environmental and Socio-Economic Setting' provides a more detailed description of the Site.

**Figure 3.1 - Site Location**


## IMMEDIATE SITE CONTEXT

3.10 The Site forms part of the wider Wilton International Site and the immediate context is therefore very much industrial in terms of its character and appearance. It is dominated by large and functional industrial buildings and plant. The closest of which is the Teesside Ensus bioethanol plant (Europe's largest wheat bio refinery), adjacent to the east of the Site.

## THE SURROUNDING AREA

3.11 Industrial uses forming part of the Wilton International Site are situated to the north and east of the Site. These include, amongst others:

- SABIC UK Petrochemicals – providing for the manufacture 'building block' chemicals (ethylene and propylene);
- Lotte Chemical UK – providing for the manufacture of Polyethylene Terephthalate (i.e. bottle grade plastic);
- Huntsman Polyurethanes – producing aniline and nitrobenzene at two plants;
- Ensus UK bio-refinery – producing ethanol (or alcohol) from wheat; and
- Suez UK – waste to energy plant which utilises around 450,000 tonnes of household waste a year as a fuel to produce electrical power and steam.

3.12 Agricultural land is situated immediately to the south of the Site, beyond which Lazenby village is situated. The A1053 and mature perimeter planting are situated to the west of the Site, which act as screening between the Wilton International Site and the residential areas of Grangetown and Eston.

3.13 A number of Scheduled Monuments and Listed Buildings are located within 2 kilometres of the Site, including buildings within the Wilton Conservation Area. These include Wilton Castle (Grade II) and the Church of St Cuthbert (Grade II). The Scheduled Monuments include Eston Nab hill fort's palisaded settlement and beacon, and Bowl Barrow.

## ACCESS TO THE SITE

3.14 The Wilton International Site benefits from direct access from the A1053 Greystone Road, which forms part of the strategic trunk road network. The A1053 connects to the A174 to the south and A66 Tees Dock Road to the north. The A174 provides a link to the A19 to the south which in turn links to the A1 (M).

## SITE APPRAISAL

3.15 The Site presents a number of potential opportunities for the Proposed Development:

- the Site and local area has a history of power generation;
- the Site has excellent electrical grid, gas, water and transport links (road);
- the Site comprises of previously developed land, which is considered more attractive to redevelop for large scale power generation than a greenfield site;
- the Site is controlled by SCU;

- the Site is large enough for the Proposed Power Plant and associated infrastructure; and
- the Site and the wider area are of relatively low environmental sensitivity.

3.16 The Site does however present some constraints. The most notable of these is the presence of residential properties in the surrounding area.

3.17 The Site's context, setting and the above opportunities and constraints have influenced the approach taken by SCU to the design of the Proposed Development, as explained in Section 6.

## 4 DESIGN FLEXIBILITY AND INFORMATION

4.1 This section of the DAS explains the flexibility that SCU has sought to incorporate within the design of the Proposed Development. It also explains the purpose and status of the design information that has been submitted as part of the Application.

### DESIGN FLEXIBILITY

4.2 Construction work on the Proposed Development, assuming that a DCO is granted by the SoS, would not commence until a final investment decision has been made by SCU and a contractor appointed. Following the award of the contract, the appointed contractor would carry out a number of detailed studies to inform the technology selection for the Proposed Power Plant and also to optimise its precise layout and design before proceeding with the discharge of the pre-commencement DCO requirements and starting work at the Site.

4.3 In a CCGT plant natural gas fuel is fired in the gas turbine, which is connected to a generator producing electricity. An amount of heat remains in the gas turbine exhaust and this is passed into a HRSG (a 'Heat Recovery Steam Generator' a type of boiler) to make steam to generate additional electricity via a steam turbine. The exhaust steam from the steam turbine is condensed back into water, which is returned to the HRSG to continue the process.

4.4 The Proposed Power Plant would be implemented as two single shaft combined cycles with output of up to 850MW each. Each single shaft unit would have a gas turbine with a gross output of around 580MW and steam turbine with gross output of around 300MW. The gas and steam turbines would drive the same electrical generator.

4.5 It has not been possible for SCU to fix all of the design details of the Proposed Development at this stage and it has therefore sought to incorporate sufficient flexibility within the Proposed Development to allow for the selection of a contractor and preferred technology post DCO grant.

4.6 In order to provide sufficient flexibility and ensure a robust Environmental Impact Assessment ('EIA'), SCU has adopted the 'Rochdale Envelope' approach and, where relevant, assessed maximum design parameters for the Proposed Development. These include appropriate limits of deviation within which the various works (defined by the Works Plans - Application Document Ref. 4.3) can occur.

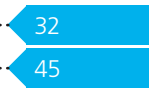
4.7 The location and height of the CCGT plant stacks have been fixed to ensure that the air quality assessment within the EIA is robust and that there is sufficient certainty as to air quality effects even if the final design and sizing of individual buildings may change within the assessed Rochdale Envelope at the detailed design stage.



4.8 The maximum height of the co-located stacks is 75m above existing ground level.

**Table 4.2 - Maximum Dimensions**

Component	Maximum length (m)	Maximum width (w)	Maximum height (m)
Gas turbine building	73 m	30 m	25 m
Heat recovery steam generator building	47 m	30 m	44 m
Stacks	-	10 m Ø	75 m
Cooling towers	150 m x 2	18m	25 m
Control and office building	50 m	25 m	9 m
Workshop	40 m	30 m	12 m



4.9 There will be no new buildings associated with the other components of the Proposed Development.

## DESIGN INFORMATION

4.10 The design information that has been submitted as part of the Application has been based upon the fixed design details, limits of deviation and the maximum design parameters. This information is set out in Table 4.3.

**Table 4.3 - Design Information submitted as part of the DCO Application**

Application Document Ref.	Purpose
Works Plans - Application Document Ref. 4.3	Confirms the extent of the Works Nos. comprised within the Proposed Development, as set out at Schedule 1 of the DCO.
Indicative Generating Station Plans - Application Document Ref. 4.5	Showing the indicative layout and elevations of the Proposed Power Plant.
Indicative Electrical Connection Plan - Application Document Ref. 4.6	Showing the connection point for the existing electrical connection into the Site.
Indicative Demineralised Water Connection Plans - Application Document Ref. 4.7	Showing the route for the demineralised water connection.
Indicative Raw Water Connection Plan - Application Document Ref. 4.8	Showing the route for the raw water connection.
Indicative Gas Supply Pipeline Connection Plan - Application Document Ref. 4.9	Showing the connection point of the existing gas connection into the Site.
Indicative Surface Water Drainage Plan - Application Document Ref. 4.10	Showing the route for the surface water drainage connection.
Indicative Landscaping Plan - Application Document Ref. 4.11	Providing an indication of the landscaping works to be implemented at the Site.
Electricity Grid Connection Statement - Application Document Ref. 5.2	Showing the location of the proposed electricity connection.
Gas Connection Statement - Application Document Ref. 5.3	Showing the location of the proposed electricity connection.

- 4.11 Due to the nature of the Proposed Development and the need to incorporate sufficient flexibility within its design, much of the design information that has been submitted as part of the Application is indicative. However, the information that has been provided would feed into the detailed design of the Proposed Development. The mechanisms by which the detailed design of the Proposed Development would be secured are dealt with at Section 8.

## 5 DESIGN APPROACH AND EVOLUTION

- 5.1 This section sets out the approach that SCU has taken to the design of the Proposed Development and how the design has evolved throughout the pre-application process.

### DESIGN APPROACH

- 5.2 The approach that SCU has taken to the design of the Proposed Development has been informed by the context within which it will sit, in addition to the opportunities and constraints that are presented by the Site.
- 5.3 As described in Section 3, the immediate context within which the Site sits is already very much industrialised in terms of its character and appearance. It is dominated by the large and functional power generation buildings and structures of nearby industrial installations.
- 5.4 Given the Site's context and setting, SCU has adopted a functional approach to the design of the Proposed Development, notably the Proposed Power Plant. The design has also been influenced by technical, engineering, environmental and safety considerations, in addition to the need for the existing power station to be able to operate during the construction phase for the Proposed Development.
- 5.5 Although the new buildings and structures would be functional in appearance, in terms of scale and massing, they would be less prominent than other buildings in the surrounding area. Furthermore, the design and layout of the Proposed Development, including landscape planting, has sought to take advantage of the opportunities presented by the Site to minimise landscape and visual effects.
- 5.6 The approach that has been taken to the design of the Proposed Development is considered appropriate given its context and purpose - to generate and export electricity to the National Grid. It is also important to recognise that this is not a situation where large scale development is being introduced into an area that is devoid of built development and characterised by particularly sensitive landscapes.

### DESIGN EVOLUTION

- 5.7 The design process for the Proposed Development has been an iterative one. The main focus has been upon the Proposed Power Plant in view of the fact that the electrical, gas and cooling water works largely relate to existing infrastructure.
- 5.8 As part of the design process a number of options have been considered for the location of the Proposed Power Plant within the Site. Changes have also resulted to the design and layout of the Proposed Power Plant as a result of engineering design development, environmental considerations and to some extent pre-application consultation. These are outlined below.

## THE PROPOSED POWER PLANT

- 5.9 At the outset a number of options were considered for the layout arrangement of the Proposed Power Plant within the Site.
- 5.10 It was determined that only two units could be built within the Site while setting aside the required land for CCR and, due to the existing access point and National Grid substations, the only viable location for the land to be set aside for CCR is in eastern area of the Site.
- 5.11 The primary consideration was then the orientation of the Proposed Power Plant. Due consideration was given the closest sensitive receptors (including residential properties), comments received through the consultation process in respect of the Proposed Development and historic feedback from the local community in relation to the power station that previously occupied the Site.
- 5.12 The key factors considered in determining the orientation were as follows:
- noise;
  - visual impact; and
  - steam plume.
- 5.13 Three layout option were considered:
- Option 1 – install the CCGT units running west to east with stacks approximately in the middle of the Site;
  - Option 2 – install the CCGT units running north to south with the stacks at the southern part of the Site; and
  - Option 3 – install the CCGT units running south to north with the stacks at the northern part of the Site.
- 5.14 It was considered that the location of the stacks (the tallest structures and the emissions to air point) is best located furthest away from Lazenby to the south-east of the Site. Therefore, Option 3 was selected. This option also facilitates locating the cooling towers on the northern edge of the plot.
- 5.15 Subsequent noise modelling has confirmed this layout also has a lower noise impact compared to installing the units running west to east with stacks approximately in the middle of the Site.

## 6 DESIGN COMPONENTS

- 6.1 This section describes the key design components of the Proposed Development. This includes in relation to use, layout, amount, the scale of the main buildings and structures, appearance and the approach taken to landscaping.

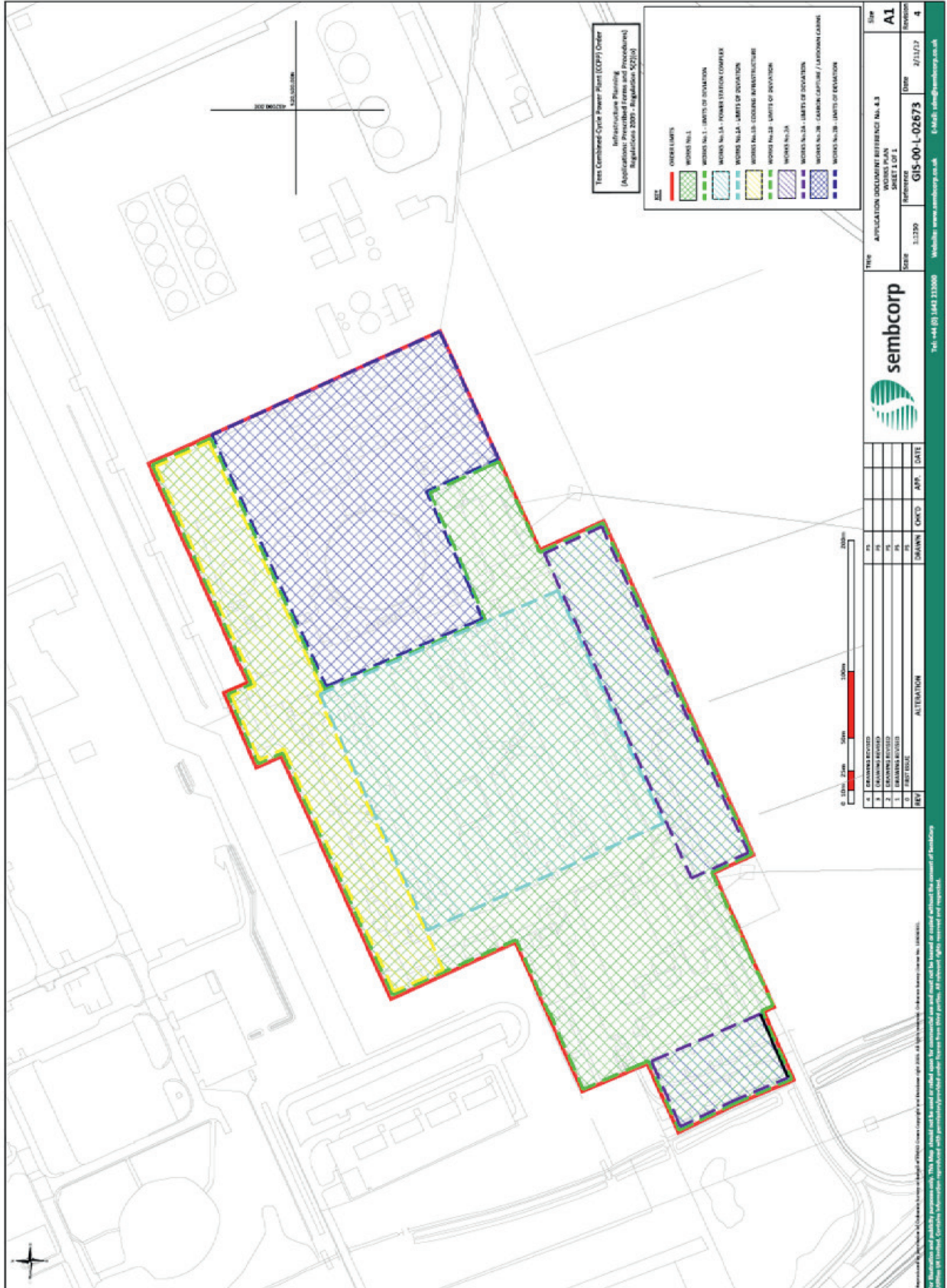
### USE

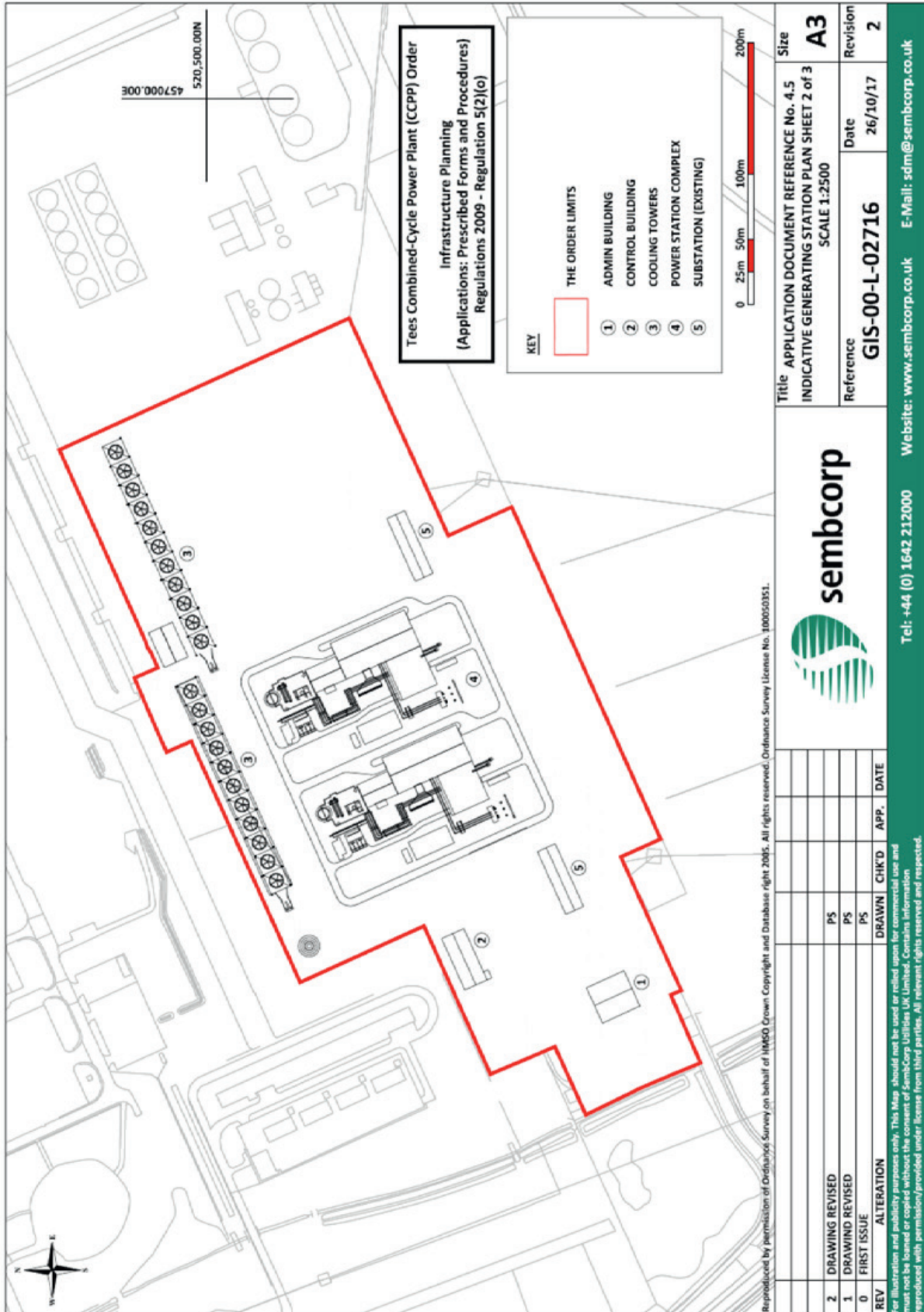
- 6.2 The Site comprises land that is considered suitable for power generation, being previously occupied by a similar power station and located in an industrial area. It should be considered that the immediate context within which much of the Site sits is already very much industrialised in terms of its character and appearance. It is dominated by the large and functional industrial buildings and plant. The closest of which is the Teesside Ensus bioethanol plant, adjacent to the east of the Site.
- 6.3 The Site's historic use as a power station means that it benefits from pre-existing electrical grid, gas, water and transport links (road). This means that the Site is very attractive for use a power station.

### LAYOUT

- 6.4 The main components of the Proposed Power Plant are located centrally within the Site.
- 6.5 The Proposed Power Plant would comprise of four main buildings, including two turbine buildings (each containing a gas and steam turbine driving a common generator) and two HRSG buildings (each with a emissions stack). Each single shaft power train will have a plume abated hybrid cooling tower. In addition, there would be a number of smaller buildings/structures for the station control centre, administration offices, housing switch gear, auxiliary boiler and water treatment plant. There are existing electricity substation located on the Site.
- 6.6 Car parks would be provided to the south and west of the Proposed Power Plant.
- 6.7 The design of the new station allows for the possibility that it may be required to be retro fitted with carbon capture and storage ('CCS') technology at a future date. Land would therefore be retained to the east of the Proposed Power Plant for possible carbon capture plant. The Proposed Development will also be CHP ready.
- 6.8 The proposed layout of the main components of the Proposed Development within the Site is shown in Figure 6.1 and Figure 6.2 on the following pages.

Figure 6.1 - Works Plan



**Figure 6.2 - Proposed Power Plant Layout**


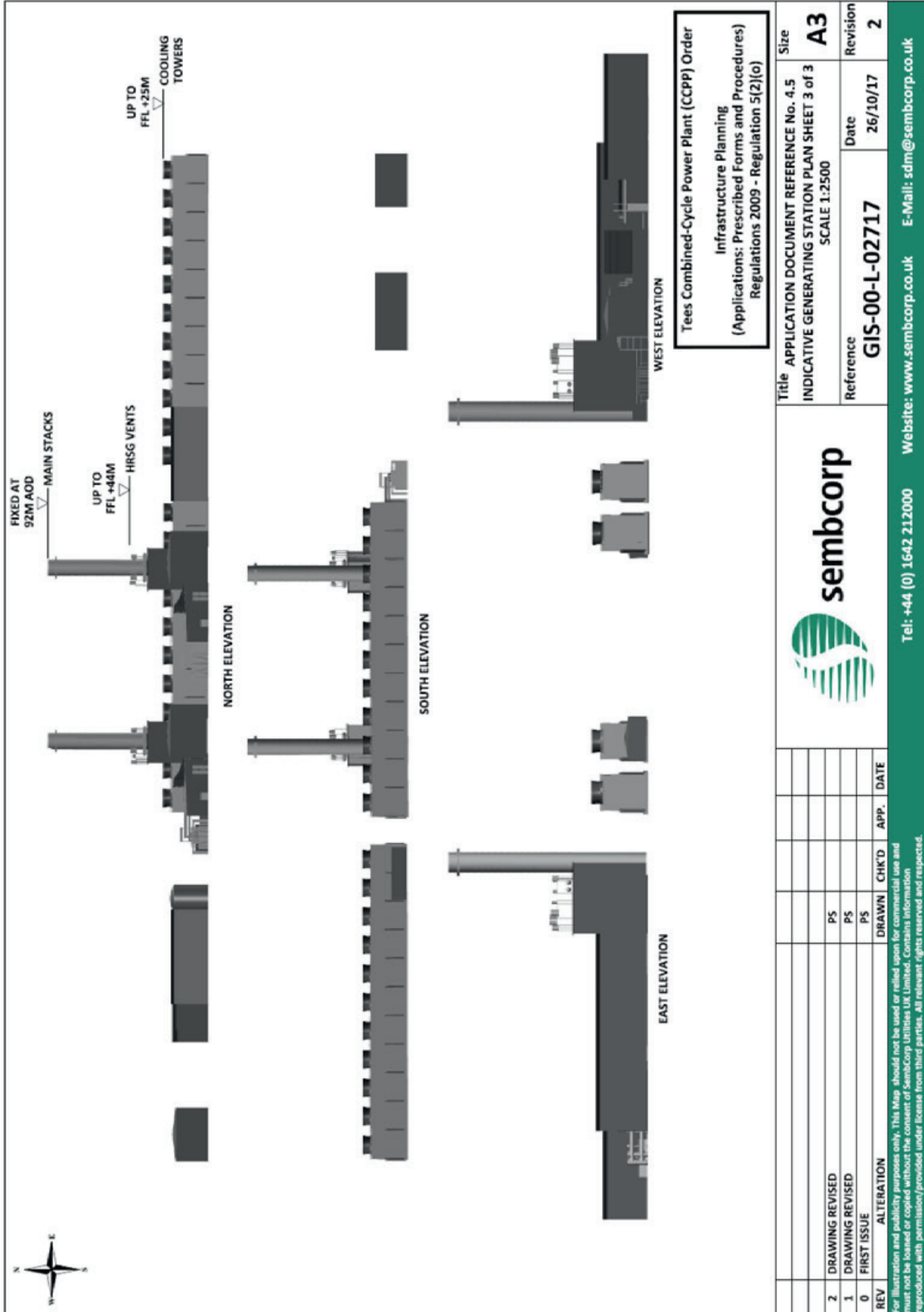
## AMOUNT

- 6.9 The amount of development in terms of the total area of the Site is approximately 15 hectares.
- 6.10 New permanent buildings and structures will be largely confined to the Proposed Power Plant. The amounts for the main buildings and structures and process areas (in terms of footprint) are set out in Tables 4.2. The largest are approximately as follows:
- Gas Turbine Hall – 3,500 sqm;
  - HRSG – 700 sqm; and
  - Cooling Tower Banks – 7'600 sqm.

## SCALE

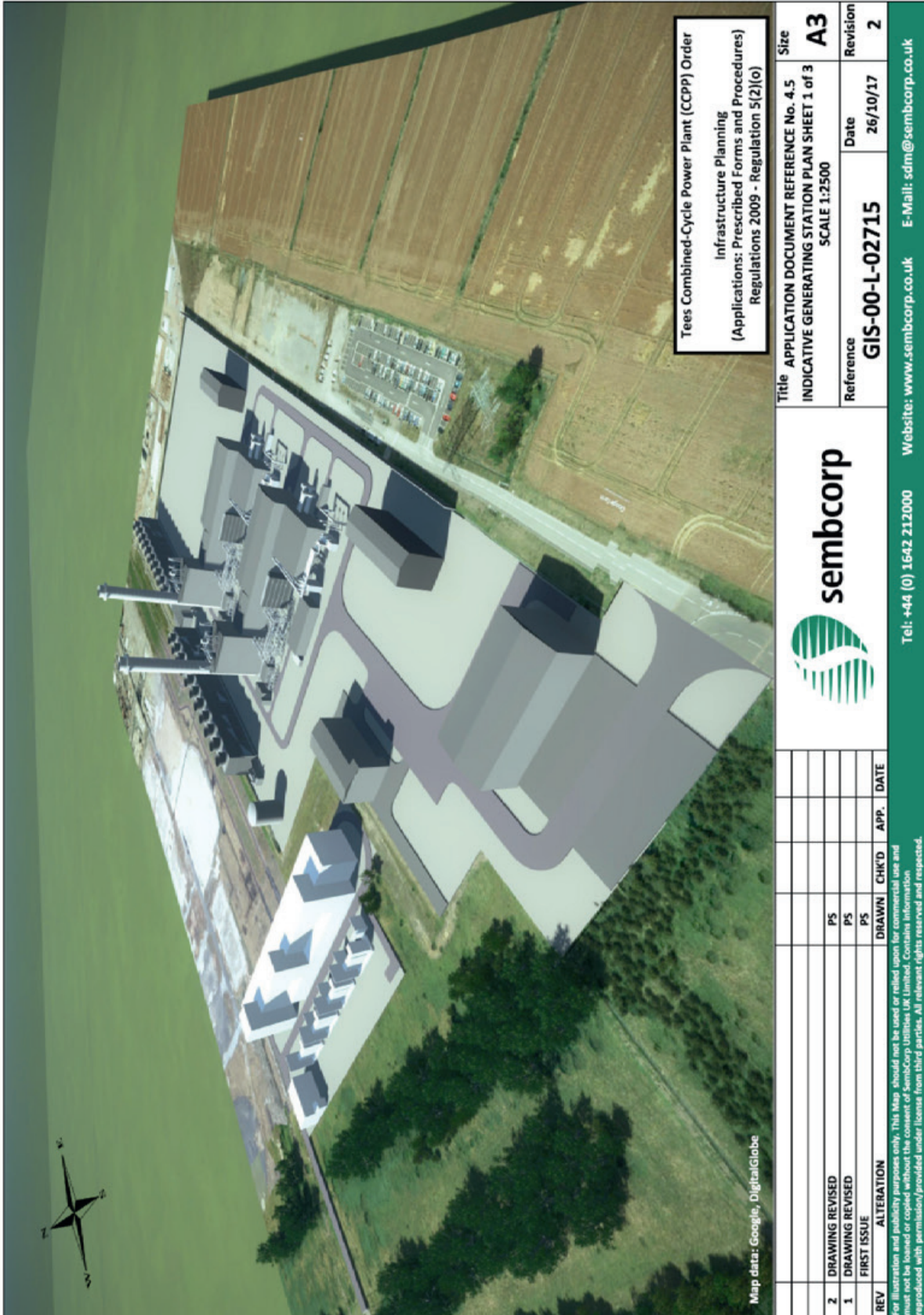
- 6.11 The scale of the Proposed Development relates to the dimensions (length, width and height) of the main buildings and structures that would be constructed at the Site. Almost all the buildings and structures form part of the Proposed Power Plant. The maximum dimensions of these are set out in Tables 4.2.
- 6.12 The tallest buildings and structures comprised within the Proposed Power Plant are the CCGT co-located emissions stacks, the HRSGs building and the cooling tower banks (see Table 4.2 for measurements). The largest buildings/structures in terms of area are those set out above.
- 6.13 The indicative generating station elevations are shown at Figure 6.3 on the following page and provide an indication of the scale and massing of the Proposed Power Plant.



**Figure 6.3 - Proposed Power Plant Elevations**


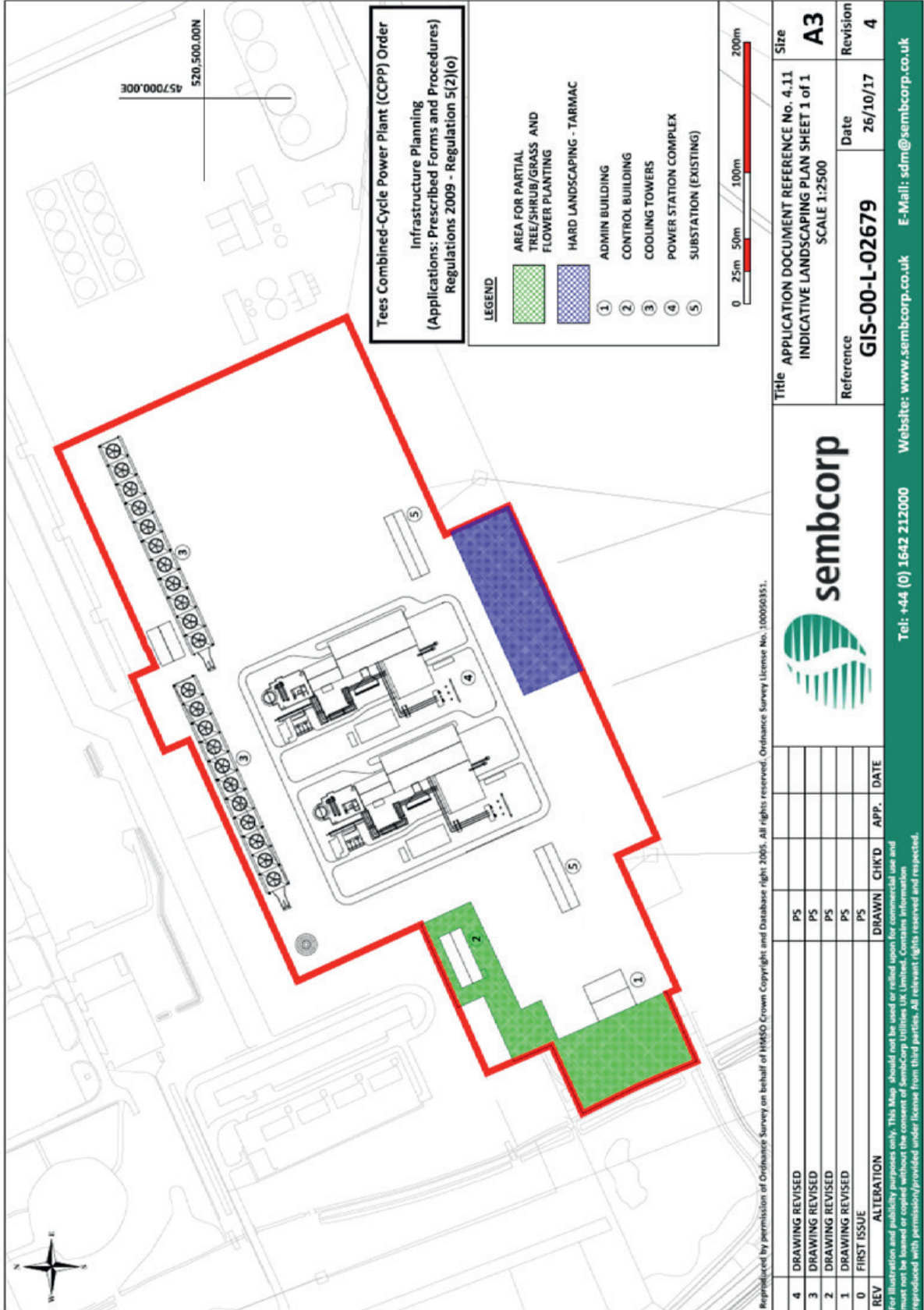
## APPEARANCE

- 6.14 The most visible components of the Proposed Development will be the Proposed Power Plant.
- 6.15 The appearance of the Proposed Power Plant would be consistent with its industrialised context/ setting and has taken design references from other uses in the area. The proposed buildings are industrial, reflecting not only their surroundings but also their purpose, to generate electricity.
- 6.16 The main buildings and structures would be simple and functional in form and detailing, predominantly comprising of steel skeletons covered in appropriate cladding. The latter would be utilised to achieve holistic colour and treatment of the buildings/structures. It is envisaged that the materials for the envelopes of the main buildings/structures would comprise predominantly of metal and concrete cladding. There are a number of possible cladding solutions and a decision on those to employ would be made at the detail design stage.
- 6.17 The elevations at Figures 6.3 along with the 3-D visualisations presented on the following pages at Figure 6.4 provides an indication of how the Proposed Power Plant may appear, including the colouration of the cladding employed.

**Figure 6.4 - 3-D Visualisation**


## LANDSCAPING

- 6.18 The amount of development on the Site, combined with its layout and operational constraints, limits the opportunities for effective soft landscaping. Landscaping within the Site would therefore, for the most part, take the form of concrete hard standing and gravel/crushed stones around the main power plant buildings and structures.
- 6.19 The soft landscaping proposals for the Proposed Development being focused primarily upon reinstating shrubs and planting trees in the western section of the Site (closest to the settlements of Grangetown and Eston). It should also be considered that the existing area of off-site planting to the west of the Site would provide some visual screening of the Proposed Power Plant.
- 6.20 The proposals to reinstate and provide additional planting are illustrated in Figure 6.5 on the following page and set out within the Indicative Landscape Plan that forms part of the Application (Application Document Ref. 4.11).

**Figure 6.5 - Landscaping Proposals**


## 7 ACCESS ARRANGEMENTS

- 7.1 The Site benefits from an existing access off the Wilton International Site internal access road.
- 7.2 Access to the Wilton International Site for all forms of vehicle will be via an existing left in left out junction on the south bound carriageway of A1053; a dual carriageway road to the immediate west of the site. Vehicles wishing to access from the south (travelling on the north bound carriageway of the A1053) are therefore required to make a U-turn at the A1053/ A1085 Westgate Roundabout junction to the north. All vehicles leaving the Wilton International Site must join the south bound carriageway of the A1053 and travel south to the A1053/B1300 Greystone Roundabout.
- 7.3 Car parking facilities will be provided in connection with the vehicular access to the Site. The car park for operational staff and visitors will be provided to the south and west of the Proposed Power Plant.
- 7.4 Where possible, car parking areas, pedestrian routes and buildings within the Site will be designed to provide for inclusive access. This will need to take account of operational and safety considerations given the nature of the use and operations.

## 8 SECURING DETAILED DESIGN

- 8.1 Where flexibility is being sought in the design of a development it is important to ensure that appropriate mechanisms are in place to provide certainty to the SoS, the relevant planning authority and any other relevant bodies, that its detailed design will be in accordance with the fixed design details and maximum design parameters upon which the EIA has been based.
- 8.2 SCU has drafted the DCO for the Proposed Development (Application Document Ref. 2.1) to ensure that it must be carried out in accordance with the Works Plans (Application Document Ref. 4.3), the fixed design details and the maximum design parameters set out in the ES. The DCO therefore includes a number of 'articles' and 'requirements' to secure the detailed design of the Proposed Development. The articles and requirements are summarised in Table 8.1.

**Table 8.1 - DCO Articles and Requirements relating to Detailed Design**

<b>Article 3</b>	<b>Development consent etc. granted by the Order</b>	<b>Requires the Proposed Development to be constructed in accordance with Schedule 1 of the Order.</b>
Requirement 4	Detailed design	Requires that development may not commence until details of the siting, design, external appearance and dimensions of all new or modified buildings and structures which are to be retained following commissioning. Furthermore, that the details approved must be in accordance with the thresholds defined by the requirement.
Requirement 5	External lighting	Requires details of all permanent external lighting (with the exception of aviation warning lighting covered by Requirement 29) to be submitted to the relevant planning authority for approval.
Requirement 6	Fencing and other means of enclosure	Requires that no part of the authorised development may commence until written details of all proposed permanent and temporary fences, walls or other means of enclosure relating to that part have been submitted to and approved by the relevant planning authority.
Requirement 8	Highway accesses	Requires details of any permanent arrangements for vehicular and pedestrian access to and egress from the site to be submitted to the relevant planning authority for approval.
Requirement 12	Landscaping	Requires that no part of the authorised development commence until a written landscaping scheme for that part has been submitted to and approved in writing by the relevant planning authority.
Requirement 16	Surface and foul water drainage - operational	Requires details of all permanent surface and foul water drainage systems to be submitted to the relevant planning authority for approval.
Requirement 17	Aviation safety	Requires that no part of the authorised development comprising the generating station may commence until the undertaker has notified the Ministry of Defence – Defence Geographic Centre and Durham Tees Valley Airport of:  (a) the precise location of the authorised development with grid coordinates;

		<p>(c) the height above ground level in metres of the tallest structure;</p> <p>Furthermore, that the Undertaker must ensure that any stacks are fitted with aviation warning lighting with a minimum intensity of 25 candela omni-directional red light or equivalent infra-red light fitted at the highest practicable point of the structure.</p> <p>(d) the maximum extension height in metres of any construction equipment.</p>
Requirement 21	Combined heat and power	Requires the undertaker to demonstrate to the satisfaction of the relevant planning authority that it has allowed space and routes within the design of the Proposed Development for the later provision of heat pass-outs for off-site users of process or space heating and its later connection to such systems, should they be identified and commercially viable.
Requirement 22	Carbon capture and storage site	Requires the undertaker to not dispose of any interest in the CCR site without the written consent of the Secretary of State.
Requirement 27	Approved details	Requires all details submitted for approval of the relevant planning authority under the requirements to be in accordance with the parameters of the environmental statement and to reflect the principles set out in the documents certified under Article 13.
Article 12	'Certification of plans etc.'	Requires the undertaker to certify certain plans and documents and in effect ensures that the Proposed Development must be carried out in accordance with these documents in line with Requirement 27.

8.3 The above will ensure that the detailed design of the Proposed Development is controlled and secured.



## 9 CONCLUSIONS

- 9.1 This DAS sets out how SCU has had regard to design and access considerations in designing the Proposed Development.
- 9.2 SCU has taken account of the Site's context, appraised this and taken this into account in the design of the Proposed Development.
- 9.3 While flexibility has been sought in the design of the Proposed Development, SCU has defined design parameters upon which to base the EIA to ensure that the likely significant effects of the Proposed Development have been robustly assessed. SCU has also included appropriate articles and requirements to ensure that the detailed design of the Proposed Development is controlled and secured.
- 9.4 The final design of the Proposed Development will need to be functional, reflecting its purpose to generate electricity and the context within which it would sit.
- 9.5 In summary, it is considered that the Proposed Development represents 'good design' for the purposes of energy infrastructure and policy set out in the relevant National Policy Statements.