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INTRODUCTION

Forth Energy is seeking consent under Section 36 of the Electricity Act 1989 to construct and operate a 100 Megawatt (MW) Renewable Energy Plant on a site at the Port of Grangemouth. Forth Energy is a joint venture between Scottish and Southern Energy (SSE) and Forth Ports.

This document presents a Design Concept Statement for the proposals and is submitted in support of the Section 36 application. The document considers the statutory context of the proposals relative to the presentation of design information and looks at how architectural design can be used to enhance and mitigate the visual effects of the Renewable Energy Plant. This document considers the relationship policy and legislative context applicable to the preparation of a Design Statement, particularly given that the proposals are being progressed under the terms of the Electricity Act 1989.

By drawing influence from the site, appropriate context and precedents, and understanding the operational processes of the Renewable Energy Plant, an illustrative design concept can be suggested which then forms the basis for a series of design principles to be followed in any future architectural treatment. This treatment is based on the maximum parameters of anticipated plant size. As a means of testing these principles, an indicative design solution has been developed using them as a guide.

The key design principles which should inform a design approach to the architectural treatment of the proposed development are:

To create an identifiable symbol which will contribute positively to the Grangemouth skyline and the wider Firth of Forth;

Make appropriate use of colour, texture and materials to create strong visual connections between the industrial setting and the proposed Renewable Energy Plant;

Understand the unique qualities of the site on the water's edge, by recognising the visual references and connections provided by Grangemouth's maritime connection and the industrial setting of the port and the opportunities afforded by the open qualities of the Forth setting;

Explore the potential of transparency and light, and the contrast between solid and void to help define how the mass of the Renewable Energy Plant is perceived;

Make use of the capability to have clear visual distinction between the lower linear storage structures and the high level boiler equipment and stack in order to reduce the sense of bulk and increase the drama of the architectural elements which addresses the skyline;

Consider how the Renewable Energy Plant connects with the industrial nature of the port by making strong visual references with the cargo container for the basic building module.

The content of this report is proposed to inform subsequent detailed consideration of the design approach should Scottish Ministers be minded to grant consent for the proposals.



1.0 INTRODUCTION

gordon murray architects

STATUTORY CONTEXT

Applications for consent to construct and operate a thermal electricity generation plant are made to the Scottish Ministers and processed by the Scottish Government's Energy Consents Unit (SGECU) under the terms of the Electricity Act 1989. The Scottish Ministers have the power to grant or refuse consent under Section 36 of the Electricity Act for those seeking to develop and construct, extend and operate electricity generating stations with a capacity greater than 50 MW electrical output located in Scotland.

The Section 36 Application procedures are comprehensive and bring the views of Falkirk Council, local communities and stakeholders, statutory and non-statutory consultees into the overall decision making process.

The Section 36 process also enables applicants to seek a direction from Scottish Ministers that "deemed planning permission" be granted under Section 57(2) of the Town and Country Planning (Scotland) Act 1997. This process runs in tandem with the application for consent under Section 36.

The application of Section 57(2) to the Electricity Act S36 process allows Falkirk Council, as Planning Authority, to suggest conditions to be attached to any consent, which can be discharged by the Planning Authority in relation to the deemed planning permission aspects of the proposal.

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended) apply to Section 36 Applications and require any development that is considered to have the potential for significant effects on the environment to be subject to an Environmental Impact Assessment (EIA), and that an Environmental Statement (ES) should be submitted with the Section 36 Application. The proposals are categorised as a development that requires the preparation of an EIA and as such the Grangemouth Renewable Energy Plant proposals will be assessed from the perspective of a variety of topics. Included within this is the consideration of Landscape and Visual effects of the proposals and in this regard the potential approach to design is a significant element of the proposed mitigation of potential effects.

Forth Energy believes design to be an important factor, and one which needs to be addressed through a series of iterations before the final design is approved. Forth Energy believes that design should be part of the consideration from the early stages of the development of the project, through the consenting process and on to the implementation phase.

The nature of any application under Section 36 of the Electricity Act essentially seeks to establish the acceptance in principle of the approach to the development of the generating capacity proposed. The application is generally, therefore, made at a stage in advance of the preparation of detailed designs for the proposals. Nevertheless, the requirement to assess the environmental effects of the proposals necessitates that the design and layout is advanced to a level of detail that provides sufficient certainty on the proposed approach and associated environmental effects.

On this basis, the proposed approach as presented in this document should be read in tandem with the assessment of the Landscape and Visual Effects of the proposals as contained in Chapter 10 of the Environmental Statement. The assessment in Chapter 10, and the supporting images assess the proposals on the basis of the untreated outline of the proposed buildings and structures, and without the consideration of design mitigation measures to lessen or change the nature of potential effects.

Should Scottish Ministers grant consent for the proposals, it is envisaged Falkirk Council and SGECU would agree a series of appropriately worded conditions to be attached to the consent which, amongst other matters, would require approval of the detailed design of the proposals. This approach will afford Falkirk Council with an appropriate level of control over the final approach to design and materials. It is envisaged that the developers will work up the detailed approach to the design and materials palette in conjunction with Falkirk Council officials.

REQUIREMENT FOR A DESIGN STATEMENT

As an application under the Electricity Act, there is no statutory requirement for a Design Statement to be submitted in support of the proposals. Nevertheless, the applicant recognises the significance of the site location in the context of the urban environment in Grangemouth.

In the context of a similar scaled proposal to be determined under planning procedures, the Planning etc (Scotland) Act 2006 has recently introduced a number of statutory requirements in relation application to submissions⁽¹⁾ to ensure that stakeholders are given an appropriate opportunity to become involved in the development of the proposals.

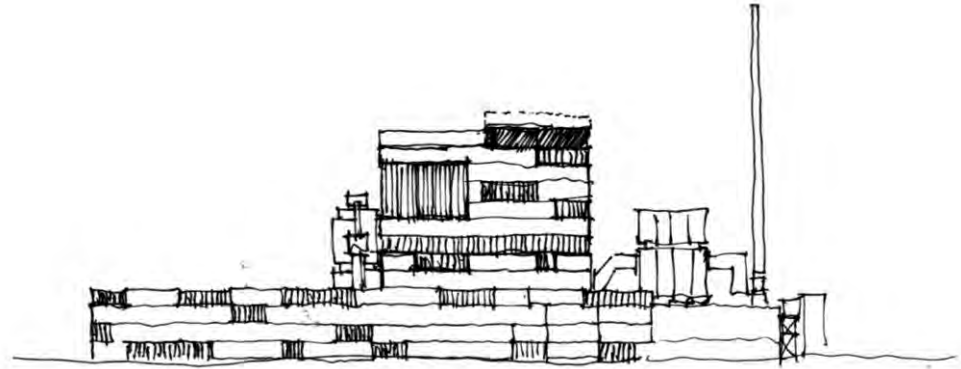
The approach to the development of the proposals has been progressed voluntarily in line with the general principles of the new planning system and the approach that would be adopted for a 'Major Development' under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009, in particular the requirements in terms of Design and Access, and Consultation.

In respect of consultation requirements the applicant has placed significant importance on the approach to involvement of community and other stakeholders in the development of the proposals. A separate Statement of Participation is submitted in support of the Section 36 application which documents the approach and outcomes of the consultation undertaken in association with the development of the proposals.

The regulations require a design statement to be prepared in support of a Major Development, even when such development is applied for 'in principle'. In this case there would be a need for further iterations of the design and the current Section 36 application is a similar case.

The accessibility characteristics of the proposals are considered in the context of the Transport Statement (Volume 4) of the ES. As the detailed design is pursued later, these will be considered further. The inclusive design aspects of the proposals are an important consideration in terms of the future operational characteristics of the proposed Renewable Energy Plant. However, given that the proposals are wholly sited within the Port of Grangemouth's secure port estate there is limited opportunity for public interaction. The developers would be obliged to comply with all relevant legislative requirements in relation to inclusive design and access for plant operatives. This is an area that the applicants consider to be more appropriately addressed in the future, and can be required through a suitably worded condition.

The preparation of this Design Concept Statement is promoted as a tool to assist in communicating the intentions for the proposals and to encourage a greater understanding of the approach to the future development of a detailed design.



⁽¹⁾ The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008, and Circular 4/2009 Development Management Procedures

APPLICABLE POLICY AND GUIDANCE

In considering the approach to the development of the Design Concept Statement there are a number of areas of planning policy and guidance at both the local and national level that are appropriate to consider. This Design Concept Statement has been developed with reference to the requirements and guidance in each case.

The key policies of relevance are summarised as follows:

Structure Plan **Policy ENV.7: Quality of Development** which advocates that priority be attached to the achievement of high standards of design in all development, and that:

"Proposals for development which would have significant visual and physical impact on a site and its surroundings must be accompanied by a "design statement" incorporating the relevant factors outlined in Schedule ENV.7 which sets out how design principles have been addressed and how quality objectives will be achieved."

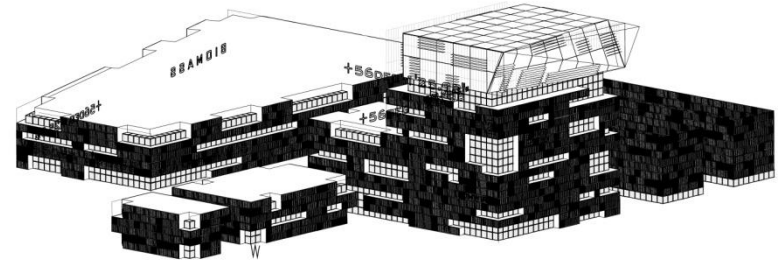
In the Finalised Local plan **Policy EQ1 Sustainable Development Principles**, advocates a high standard of design quality and compliance with the principles of sustainable development. **Policy EQ22 Landscape and Visual Assessment**, encourages the use of design statements in conjunction with landscape and visual impact assessments to consider the setting of an area and the capacity to accommodate development.

A separate Planning Statement has been prepared to provide an assessment of the proposed Renewable Energy Plant against the Development Plan and other material considerations.

Relevant guidance considered in the preparation of this Design Concept Statement is contained within the following documents:

- Scottish Government: Planning Advice Note 68 – Design Statements
- Falkirk Council Supplementary Planning Guidance on Design Statements (2007)

The approach to the preparation has reflected good practice in the preparation of design statements, adapted as appropriate to reflect the specific circumstances associated with the submission of an application under the Electricity Act.



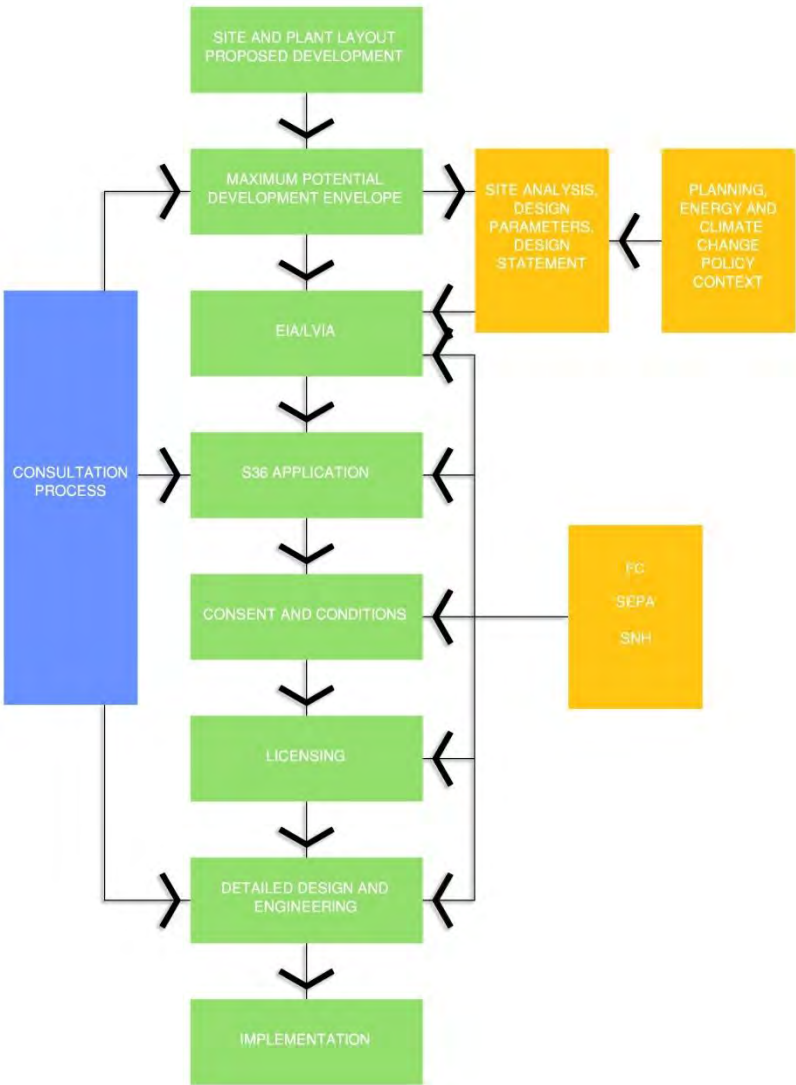
PROPOSED APPROACH

The structure and content of this Design Concept Statement is presented in support of the Section 36 application, to introduce design considerations at this early stage.

The nature and sensitivity of the application site is acknowledged and the approach to the development of the detailed design of the proposals will be a key factor in seeking to integrate the proposals into the surrounding environment successfully.

The remainder of this document provides a description of the development site and surrounding context, and key influences on the design approach. Suggested design principles are presented, supported by illustrations to provide context and examples of a potential approach. This in turn informs the development of an illustrative design concept for the proposed Renewable Energy Plant.

The content of this Design Concept Statement should be read and considered in tandem with the Landscape and Visual Effects Chapter of the Environmental Statement which provides detailed commentary on the potential effects of the proposals from key viewpoints agreed with stakeholders during the ES scoping process. The content of the Design Concept Statement presents the basis of an approach which can be further developed to provide mitigation through design and materials to assist in addressing potential effects.





LOCATION

The proposed site for the Renewable Energy Plant is located at Grangemouth, on the southern bank of the Firth of Forth. The site is adjacent to Carron Dock and the Western Channel. It is located entirely within the operational boundary of the Port of Grangemouth. As such, it sits at a convergence point between the three elements of the port, the refinery, and Grangemouth town. The site enjoys wide vistas north, east and west along the Forth estuary, and is in a prominent location when viewed as part of the overall industrial assembly from the north bank. It is also sufficiently close to the entrance to the Forth and Clyde Canal to be perceived as part of a series of designed canalside objects including the Falkirk Wheel and the Kelpie boatlift, linked by the proposed Helix park.

The site is bounded to the north by the Central Dock Road, to the south by the port container terminal railway spur and an area of scrub grassland, and to the east and west by existing port facilities including storage buildings and areas of hardstanding. The site includes an area extending eastwards along the southern edge of the Western Channel towards 'The Tongue' of Grange Dock. This area is proposed to incorporate the alignment of a conveyor to transfer fuel from the quayside to the proposed Renewable energy Plant.

The closest surface water features are the Carron Dock and the Western Channel, which are adjacent to the northern boundary of the site. The River Carron runs 100 to 150 m parallel to the north of these and the Grange Burn is located 200 m to the south of the site. While the closest shoreline of the Forth Estuary is some 300 m to the north of the site, the River Carron and the docks join the estuary some 2 to 2.4 km to the north east. The nearest residences to the proposed development are located approximately 200 m to the south, sheltered from direct views of the port by tree lines along the boundary of the port and along the Grange Burn. The north side of the River Carron comprises mainly agricultural fields, with some isolated houses and the small community of Skinflats.

3.0 SITE



The area surrounding the development site is flat, with the Forth Estuary to the north. To the south is the town of Grangemouth, which is sandwiched between the industrial complexes on Earls Road to the west of the town (comprising chemical works, timber yards and other industrial users), and the Grangemouth Refinery and petrochemical complexes to the north and east of the town.

To the south, Grangemouth is bordered by the M9 motorway. The site is located in an industrial port, with oil and gas storage located around the Eastern Channel of the port, container storage and handling along the southern shore of the Grange Dock, and a fish meal plant adjacent to the Western Channel. The warehousing and industrial buildings and plant within the docks are 20 m or more in height. Directly across the Forth Estuary, to the north of the port, is the coal-fired Longannet Power Station.



CHARACTER

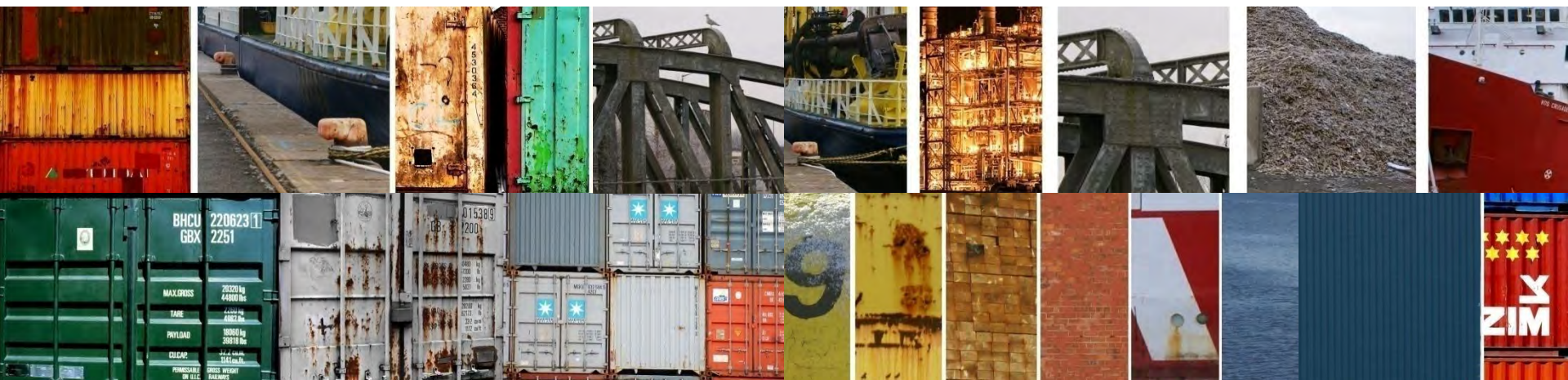
The proposed development site is approximately 10.34 ha. It is generally flat and currently occupied by a cargo container storage yard, areas of scrub and hardstanding. The overall character of the surrounding area and the estuary is industrial due to the working port and the refinery. The most common building types in the immediate area are linear single storey warehouses and two storey office pavilions arranged along the dockside, interspersed with large areas of scrub and hardstanding. However, it is also in relatively close proximity to the residential areas to the south, particularly Grangeburn Road, the scale of the buildings generally being two storey. A large Asda 24 hour supermarket sits southwest of the site. From the car park, the new Renewable Energy Plant will be clearly visible.



KEY ELEMENTS

Within the proposed development site and the immediate surroundings, there are a range of key objects which help give the area it's strong industrial character, add visual interest and provide visual cues for conceptual design development. These include the array of fixed and mobile cranes, the stacked cubic forms of cargo containers within the port and the ships within the docks.

The refinery in the background appears as a forest of aluminum spires, drums and pipework interspersed with extensive steam plumes and bursts of fire, creating a futuristic backdrop to the site.

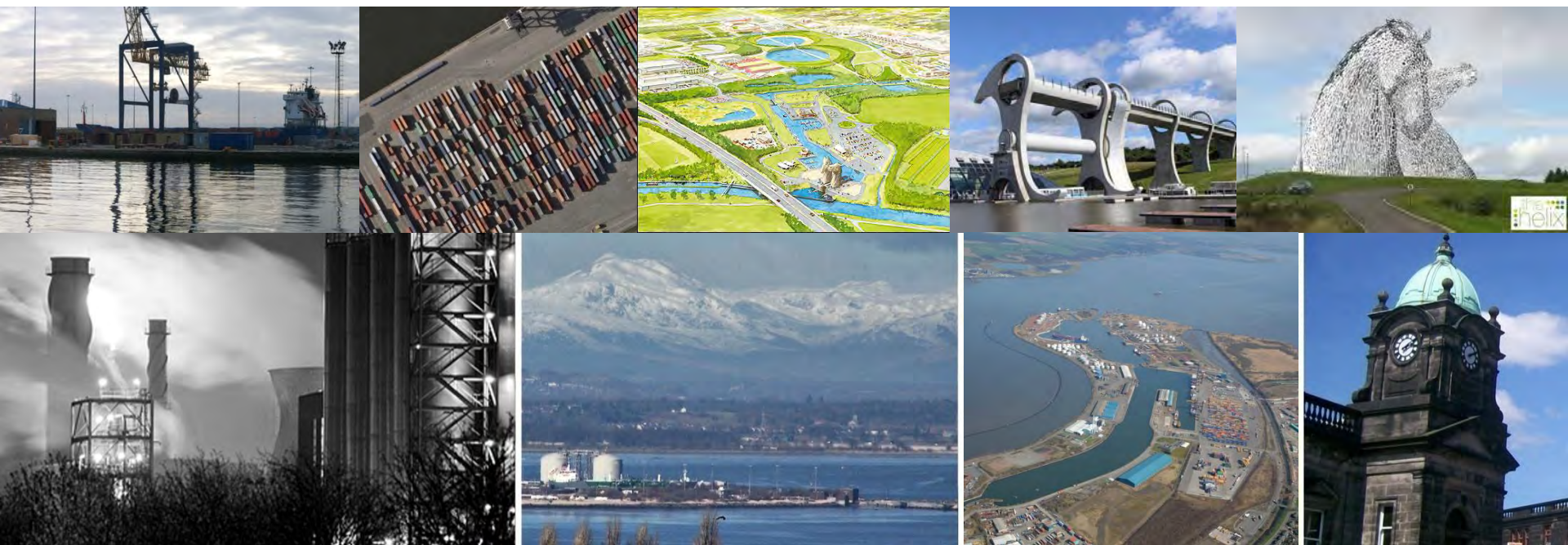


TEXTURE

The range of textures and surfaces visible around the site and in the port area reflect the functionalist, industrial nature of the buildings they clad. Large format aluminium panels, profiled metal sheet and brickwork are the predominant materials. Colours range from mill finish to grey metallic and blue painted profiled sheet. Brickwork is predominantly buff, red and brown.

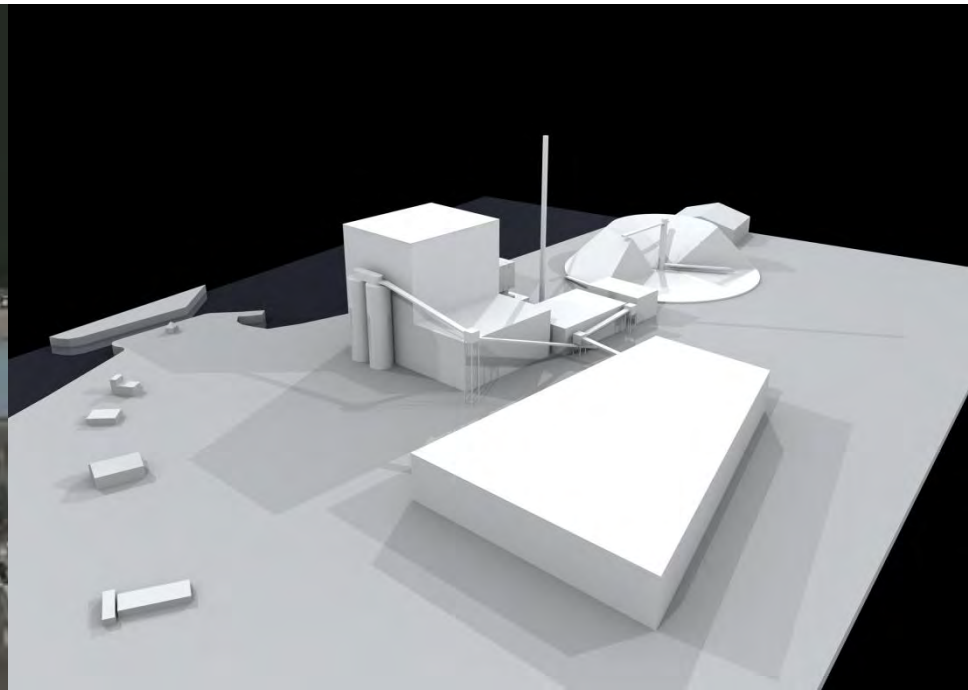
From the brightly coloured and precisely arranged stacks within the container port to the rusting blocks on the proposed Renewable Energy Plant site, the cargo container is a strong visual element.

The surface of the water is the other dominant element in the landscape. This is perceived in two ways –the water surface within the port channel is calm and contained, giving a perfect surface for reflection. Beyond the confines of the port, the Forth Estuary reads as a vast, expansive backdrop to the site.



GRANGEMOUTH: THE TOWN

The character and perception of Grangemouth is inextricably linked with its association with the port and refinery. As the largest container port in Scotland, Grangemouth is a key component of the Scottish economy, while the petrochemical plant is one of the largest in Europe. Historically, Grangemouth, originally known as Sealock due to the close proximity of the Forth and Clyde Canal, has enjoyed a tradition of manufacture and industry, from the ships, pillarboxes and artillery of the Carron Works, the chemical works of the Co-operative Society and Scottish Oils through to the Ineos refinery of the present day.



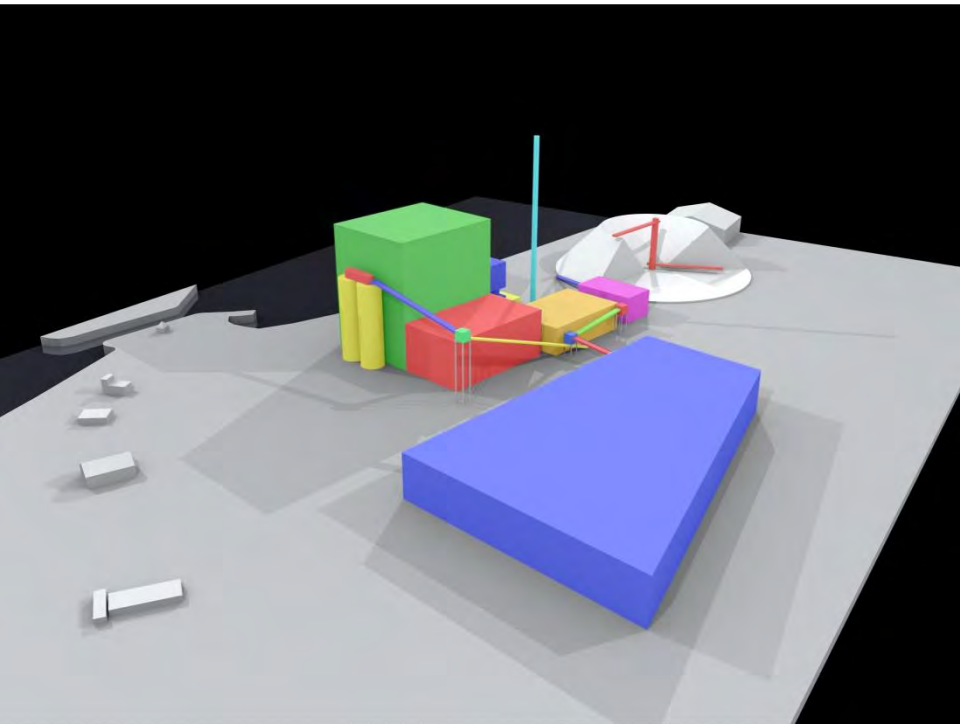
GRANGEMOUTH RENEWABLE ENERGY PLANT

The elements which make up the Renewable Energy Plant are arranged in a group, south of the quayside. The main covered storage area for the mixed fuel is to the south, in long structures commensurate in height with the surrounding waterfront buildings, while the taller elements, boiler house and stack are located to the north. An open storage area is located east of the boiler house, with a large supplementary fuel store to the south.

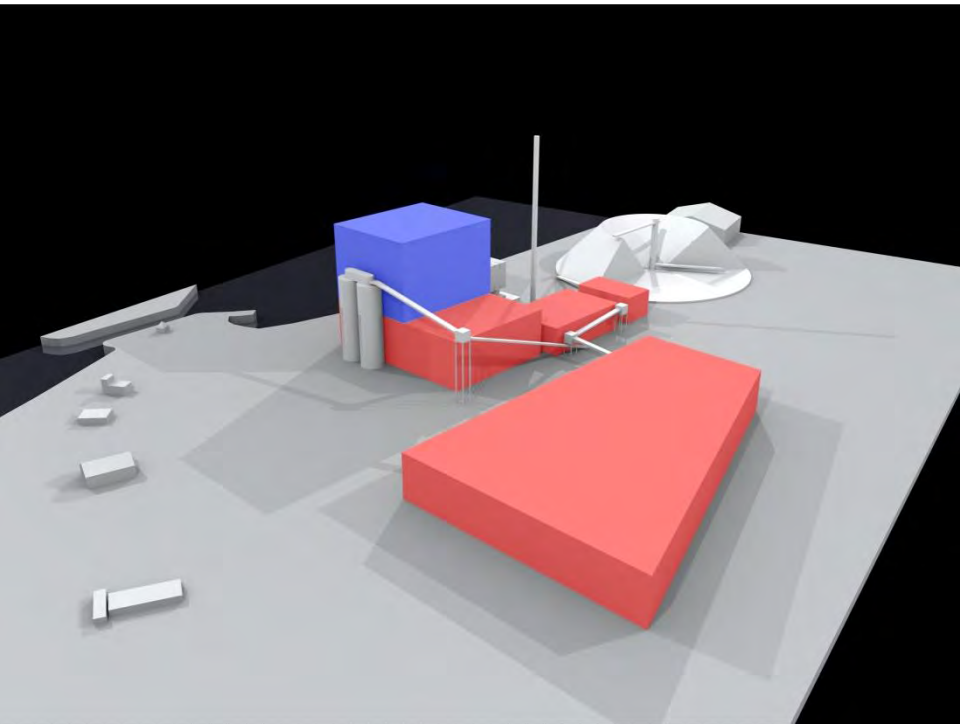
The overall impression is of a series of individual pieces, which will require a unifying structure providing visual consistency for the Renewable Energy Plant.

Significant elements of the renewable energy plant are the boiler house, which has a maximum envelope of 65m high x 50m wide x 60m long and the main stack at 110m high. A smaller auxiliary boiler has a stack 45m high.

4.0 PLANT AND PROCESS



INDIVIDUAL ELEMENTS



HIGH AND LOW LEVEL SEPARATION



fig. 1



fig. 2



fig. 3



fig. 4

COLOUR

Colour can be used for a variety of purposes. Key elements can be highlighted to draw attention away from the general overall mass of the building. Depending on the elements selected, the horizontality or verticality of a building can be exaggerated, for example through use of coloured banding at the parapets of structures to emphasise the horizontal.

Colour can be used to visually fragment an overall form through the use of a strong pattern. On large structures, gradually lightening the colour of the building towards the top is commonly used as a means of allowing the building to blend in to the background. This technique is often only successful under certain lighting conditions.

fig. 1

Corten screening.
Photograph courtesy of Wikimedia Commons

fig. 2

Container port.

fig. 3

Photograph courtesy of Wikimedia Commons

fig. 4

Zorbau, Germany
Photograph courtesy of SITA Deutschland, 2005

5.0 PRECEDENT



fig. 1



fig. 2



fig. 3



fig. 4

TEXTURE

Texture is defined by the materials selected for use. These provide a sense of scale at the medium and close ranges by virtue of the size of module/panel permissible within the properties of the material. The selected materials can create visual, historical and metaphorical links with a site and a function. In the case of the new renewable energy plant, it is appropriate to consider materials and textures commonly found within the port landscape – the plates of a ship's hull, stacked cargo containers, profiled metal sheet. Careful articulation of the building skin can create visual interest at a range of viewing distances – allowing the overall form to be read at long range, the materiality of the skin at medium range, and the tactile qualities and physical profile at close range.

fig. 1
fig. 2
fig. 3
fig. 4

Corten screen
Rustling ships
Derelict factory, New York
Skive CHP Station,
Architect CF Møller, 2006



fig. 1



fig. 2



fig. 3



fig. 4

REFLECTION

The location of the site for the Renewable Energy Plant within a working port and the subsequent close connection to large bodies of water means that reflection can be an important design element. The extent that impact reflection will have on how the Renewable Energy Plant is perceived will vary dramatically with weather and lighting conditions.

Calm, still days with a clear weather can allow objects on the water's edge to be read as floating within space. The massing of structures on the waterfront will appear altered when reflected on the water. In conditions not conducive to strong reflection, the play of light on water from these structures can allow the hard physical edges to become blurred. It is worth noting that in the instance of the Grangemouth Renewable Energy Plant, restricted public access to the water facing elevations does limit the extent to which reflection will be a factor.

fig. 1

fig. 2

fig. 3

fig. 4

Reflected terrace

Csepel Z, Budapest

Photograph courtesy of Alpiq, 2009

Bangladesh National Assembly, Dhaka

Architect Louis Kahn, 1982

Garstad plant

Architect CF Møller, 2004

Photograph courtesy of Ake Eson Lindman



fig. 1



fig. 2



fig. 3



fig. 4

SCULPTURAL FORM

This approach revolves around concealing the processes and elements associated with a building function within an overall form, which is often unrelated to the activities going on within. This form may be angular, curved, highly expressive or monolithic. What is created becomes an immediate and easily identifiable building image. This can have both a negative and positive impact depending on the quality of the design and how it works from a range of views and distances.

fig. 1

Madevej, Denmark
Photograph courtesy of Fris+Møllte A/S, 2004

fig. 2

Avedøre 3, Denmark
Photograph courtesy of Energi E2, 2002

fig. 3

Museum of Graffiti, France
Architect Massimiliano Fuksas, 1993

fig. 4

Guggenheim Bilbao, Bilbao
Architect Gehry Associates, 1997