

## Appendix 04: Outline Design Statement

### A.1 Outline Design Statement

The proposed facility is a large development, and will have a significant impact on the surrounding area. Policy G4 of the Island Plan 2002 suggests that Design Statements are to be submitted for all developments over 100m<sup>2</sup>. The Design Statement provides the following information:

- 1) The Environmental Impact Statement fully documents the purpose of the proposal, and how this is achieved. This section explains the underlying design process.
- 2) The Environmental Impact Statement provides a detailed site appraisal and documents the design of the proposal, in particular the technical description, the landscaping and visual impact sections and the photomontages.
- 3) The Environmental Impact Statement deals with waste management, and the facility is designed to recover energy from the Island's waste. Details of construction materials to be used, water and energy consumption will be submitted as part of the detailed planning proposal. The Environmental Impact Statement provides details of water consumption by the facility, and details how water and effluent discharges will be managed.
- 4) Drawings are submitted as part of the proposal, which indicate the proposed form of the development and its location in respect of the surrounding buildings. The drawings are of sufficient detail to develop the longer distance views of the proposal. More detailed drawings will be provided as part of the detailed planning application. These will be based upon the outline drawings provided in the current outline planning application.
- 5) The Environmental Impact Statement contains a series of photomontages, showing views from strategic locations required by the Planning Department, before and after construction of the facility. In addition, a 360° 3-Dimensional computer model has been generated which will be made available to support the planning application. This shows the proposed facility and its impact on the surrounding area.

### A.2 Outline Design Principles

The proposal is for a facility to dispose of the Island's residual, non-inert solid waste. The plant will be designed by an experienced Energy from Waste supplier developed from standard designs which have been proven for function and build quality in practice. This limits the scope for innovative designs, as it is of the utmost importance that the plant will work with a high reliability and that operational efficiency and / or construction cost efficiencies are not compromised by the design. However, the impact of the facility has and will continue to be a key consideration in the design process

The plant will consist of a number of sections, all of which will have a strong influence on the plant appearance:

- 1) Waste will be delivered by road, which requires significant hard-standing to allow vehicles to deliver waste efficiently and safely, without significant queuing;
- 2) Waste will only be tipped inside to avoid odours and dust nuisance. This requires an enclosed area of sufficient height for waste lorries to tip their loads;
- 3) A waste storage bunker of sufficient capacity to store the Island's waste for a reasonable period. This requires the excavation of a pit for the bunker;

- 4) A boiler house. Energy from waste plants require a reasonably tall boiler structure to ensure that there is sufficient combustion area for the gases to be completely burnt. This is very important for the reliability of the plant and to minimise emissions. The disadvantage is that the boiler house is the tallest part of the structure, and is likely to extend up to 35m above ground. The height has been minimised as far as possible by lowering the boiler into a pit, but there are limits on how much impact this has. The boiler house will also include the boiler itself, where the flue gas is cooled and steam is generated. This structure is relatively large. The boiler house will be totally enclosed both to protect the boiler equipment and to reduce visible impact and noise;
- 5) The flue gas treatment area. The flue gas is treated in a process plant, which includes a bag filter, which is a sizeable unit. In many plants this is located outside. However, to minimise noise, dust and visual impact, it is proposed that this area is also enclosed. This allows a reasonable architectural treatment to mask the process equipment inside, which is a series of vessels, ducts, pipes and fans;
- 6) Ancillary equipment. The plant requires a number of pieces of equipment for it to function, and these will all be located in the building to allow them to be hidden away. There will be a number of silos for storage, which are located outside in areas where they are largely masked by the main building or the landscaping;
- 7) Flue gas ducts and chimney. The Jersey Electricity Company chimney will be used, avoiding the need for another chimney on the Island. Ducts will pass from the energy from waste plant to the Jersey Electricity Company chimney, and it is proposed these are located so that they are mainly hidden by the Jersey Electricity Company building and the landscaping.

The approach taken in relation to design impact is therefore to minimise the overall impact by enclosing equipment within the main structure. The shape of the main structure has been considered in detail, with a variety of potential shapes considered. The approach adopted after consultation was to use curved rooflines and to use the landscaped mounds to diminish the overall impact of the facility. This is discussed in detail in the landscaping section of the Environmental Statement.

The main building will have a steel structure, which will support sheet cladding. The colour of the cladding has been selected with light blue as the predominating colour in the location to minimise the visual impact of the facility.

Materials will be selected during the design phase of the process based upon the following requirements:

- Compliance with the outline planning drawings;
- Design life of the plant, which will be 30 years. Materials will be selected to achieve this life, or to allow easy replacement at minimum whole-life cost;
- Location of the plant on the coast in a marine saline environment. This will impact upon the selection of the concrete, steel paintwork and cladding to be used;
- Environmental considerations such as the noise and thermal insulation requirements for the cladding material;
- Location of windows to provide natural light in working areas;
- Location, type and size of doors to allow easy access for operation and maintenance and safe working practices;
- Areas of hard-standing will be designed to allow controlled drainage;

- Roads will be designed to cater for the waste delivery vehicles identified in the Traffic Assessment. Road layouts are designed to avoid significant queuing, to provide good visibility to avoid accidents and to cater for the waste management operations taking place simultaneously on site;
- Fire risk has been taken into account in the design, and in discussions with the relevant authorities. This will have an impact on the design, as waste storage areas will be designed to enclose any potential fires. Concrete walls will be used where needed to provide fire separation.

### A.3 Design Specification

The main plant will be supplied as a turnkey contract under a single contract. There will be detailed specification which will ensure that the supplier complies with the requirements. A key requirement will be compliance with the planning consent and any conditions.

The specification will ensure that build quality, functionality and impact are all controlled to provide a suitable design. These issues are seen as fundamental to a successful design:

- **Build Quality.** The quality of the equipment to be used, and the construction and installation practices will determine the acceptable life of the plant, the maintenance costs and the safety and operability of the facility. The intention is to provide a facility which will last, at a defined and affordable cost, so that the Island can dispose of its waste in a sustainable manner for the next thirty years.
- **Functionality.** The proposed facility will be based upon developed designs which are operating throughout Europe. Maintaining the functionality of the facility is essential to avoid creating problems with how the plant operates. This may limit some innovative features, if it is foreseen that these could affect the plant operations. The functionality of the plant has been a key concern in the layout of the plant, for example to provide a satisfactory and safe road layout, and to ensure the plant is located sufficiently close to the Jersey Electricity Company chimney.
- **Impact.** It is clear that the proposed facility will have an impact in the proposed location. The Environmental Statement reviews all the potential impacts in depth, and mitigation is provided wherever possible. Minimising the plant impact has important design consequences. For example, to reduce the emissions from the plant to acceptable levels, the plant will be larger than the existing plant as flue gas cleaning equipment is required. A major impact will be the visibility of the plant, and the outline design has concentrated on this aspect, to minimise the impact by rounding the building, together with the use of landscaping.

These issues are highlighted further below. The current proposal is an outline application, and via the detailed plant specification, the preferred bidder's design process, and the detailed planning application, a satisfactory build quality, good functionality and a minimised impact will all be developed.

#### A.3.1 Build Quality

##### A.3.1.1 General Design

All designs shall be carried out according to the current British Standards and Codes of Practice and shall comply with the Building Regulations.

Aspects of items of design or construction not covered in the above documents shall be in accordance with relevant publications from recognised professional organisations.

The civil design work will be controlled throughout the construction phase by the submission of necessary design calculations and drawings to the Project Manager for comment on the following:-

- a) Detailed design of permanent structure of all the buildings including:
  - Detailed analysis of the stability of all superstructures (including but not limited to cladding) subjected to notional and wind load cases
  - Design of foundations to all the new buildings
  - Detailed shop drawings showing all relevant connection details used in prefabrication of the structure, claddings and details for waterproofing of joints in prefabricated construction
  - Detailed calculations showing robustness provision against progressive collapse
  - Detailed design of shear walls and stabilising walls for prefabricated construction, proper detailing of prefabricated components to realise diaphragm action and correct load transfer to the foundation
- b) Detailed design of all internal works, sanitary, drainage, etc.
- c) Detailed design of external works, hardstandings, weighbridge, roads, kerbs, drainage, line marking, fencing and signage
- d) Detailed designs of all temporary works in connection with the construction of all the works

This will ensure that the quality of the design is satisfactory, and in compliance with the planning consent.

### **A.3.1.2 Building Regulation Approval**

Information will be prepared for submission to Building Control; calculations, drawings, details, technical information etc. for the works as will be necessary to comply with all relevant legislation and obtain Building Regulation Approval.

The submission to the Building Authority will strictly comply with relevant Building Regulations so as to facilitate smooth and early approval by the Building Authority.

### **A.3.1.3 Design Reviews**

Regular design reviews will be held with the selected contractor to ensure that the design remains compliant with the original proposal and the planning consent. Where required, detailed information will be supplied to the relevant authority during the construction process.

All civil and structural drawings will be arranged systematically as follows:-

- Index of drawings
- General notes and abbreviations, notations and symbols used, etc.
- Site plans
- Architectural building elevations and sections

- Loading layout plans
- Foundation layout plans (including piles and pile caps where applicable)
- Structural plans, elevations and sections (including columns, walls, beams and slabs)
- Staircases and secondary details
- External works drawings
- Underground services layouts and details
- Architectural details
- Building Services details
- Miscellaneous details

All drawings shall be drawn in a neat, clear and concise manner so that they can be correctly and expeditiously interpreted. The format for the layout of the sketch plans, building plans, engineering plans will comply with the requirements of the Building Authority. All design drawings will be accurate, detailed in S.I. Units, with length in mm and drawn to the agreed scales.

This will allow all aspects of the design to be monitored and checked in the design phase, to enable any issues to be identified and agreed prior to manufacture and installation.

#### **A.3.1.4 Design Calculations**

Quality will be maintained by ensuring design calculations are available for control.

All analysis and design assumptions, design principles, loading conditions, computer programs used, references to Codes of Practice, technical literature, etc. will be clearly stated in the calculations.

All calculations will be carried out in S.I. Units.

All calculations including any amended or additional calculations will be fully checked.

A high standard and completeness of calculations will be required to facilitate checking and submission to the Building Authority for approval.

The following loads and effects are to be considered in the design:-

- Self weight of structure
- Superimposed dead load
- Live load
- Snow load
- Wind load
- Natural geological disturbances
- Earth pressure
- Water pressure
- Effects of shrinkage, creep and temperature
- Forces and effects due to construction methods and sequences
- Differential settlement
- Any other forces and effects arising out of the special nature of the structure.

## A.3.2 Functionality

### A.3.2.1 General

The bulk of the specification will define the functional requirements of the plant, and the required quality of supply. A standard specification will be used for this purpose, developed and used on several UK energy from waste facilities, but adapted to Jersey's special needs.

Good industry practice will be adopted throughout the design to ensure that the delivered plant is built to an acceptable standard. Non-standard techniques or innovations will only be allowed if a high level of confidence is established in their use. The functionality of the facility will be prioritised in the design due to the importance of the plant for Jersey's waste disposal strategy.

The design life of the buildings will be 30 years. All building elements requiring replacement during this period or maintenance (for example, cladding) must be highlighted. All building structural steelwork will be protected taking into account the saline environment.

The various buildings will be designed as a whole to provide a harmonious architectural concept for the complete facility. Cladding types, profiles, roof shapes, glazing etc will be selected to enable replication across the various structures and to facilitate future maintenance.

The design should also incorporate, wherever possible, products and materials derived from, or incorporating a high degree of, waste recycled products.

Cladding generally will be selected to suit a minimum life to first major maintenance of 25 years. Cladding rails, purlins and any other exposed steel within the waste storage building will be arranged to avoid moisture traps and build-up of dust.

### A.3.2.2 Building Design

External walls and roof surfaces will be sheet metal clad. A proprietary safety access system will be provided to facilitate work on the roof.

Cladding will be selected to provide long term protection from the elements in a saline environment. The cladding will also provide sufficient sound insulation to achieve the noise criteria proposed in the Environmental Impact Statement. The design will be such to avoid significant condensation and to prevent significant build up of dust on cable trays, horizontal beams or cladding rails.

The building is required to demonstrate that a low environmental impact can be achieved with the use of well combined active and passive materials and systems of construction, selected such that any enhanced material and technology investment cost is recovered through improved operation and running costs. Consideration is also to be given where reasonable to use of locally sourced materials of construction and those of a high recycled content.

The building will be provided with adequate air ventilation by provision of louvres and/or fans. It shall be assumed that the building entrance doors will normally be closed for design purposes, only opening when required to allow delivery vehicles to pass through..

Roller shutter access doors or similar will be provided into the building. The main doors will be protected with steel bollards, internally and external.

Floor slabs will provide a good durable surface finish capable of withstanding impacts and wear from a front loading machine bucket. The surface shall be finished with a proprietary dust proof floor hardener. Slip resistance will be measured according to BS 8204 and achieve minimum requirements when wet as well as dry.

Wash down hoses will be installed within the building to allow all areas of the floor to be cleaned on a daily basis.

### **A.3.2.3 Building Services**

Building services will be designed to be economical, endeavouring to choose the simplest, best value for money method of achieving the Client's requirements.

Consideration will be given to:

- Running costs and energy efficiency
- Reliable plant and fittings from reputable manufacturers

A pragmatic approach will be taken to sustainable design, which will focus on minimising energy use through a well designed low infiltration building, allowing installed services capacities to be minimised and through sensible controls strategies, with running costs to be kept low.

### **A.3.2.4 Roads and Vehicle Access**

The proposed design has carefully considered traffic flows entering the site, and traffic on site. Space is allocated to allow traffic to queue without blocking access roads. The site will have a one way system to control traffic flows and reduce the risk of accidents.

The detailed road design will be carried out using computer tracking programmes to check turning circles and access.

The energy from waste plant and Bulky Waste Facility will have up to 11 unloading bays in operation at any one time, to avoid queues developing at peak times.

### **A.3.2.5 Access for Process Plant**

The design will allow for all access requirements of the process plant. This will include removable wall panels, floors or doors for the installation of the plant and also for removal of plant for future maintenance works. Due design consideration will be given to infrastructure requirements for the delivery of plant during construction and/or maintenance.

### **A.3.2.6 Future Maintenance**

The design will incorporate reasonable measures for carrying out maintenance of the buildings. Maintenance access will be an important requirement.

All items of building services requiring regular attendance or maintenance shall be positioned to be readily accessible or provided with designated access ways. An appropriate safety system shall be included for safe access onto roofs, to clean gutters, access roof mounted equipment and/or vents and to clean of windows at height.

### **A.3.2.7 Site Fencing and Gates**

A welded wire mesh galvanised and plastic coated steel fence will be provided on the perimeter of the site for security purposes.

### **A.3.3 Impact**

All aspects of the project have been considered in detail in the Environmental Impact Statement. The specification will be used to ensure that the plant is built to ensure that the highlighted impacts are minimised.

#### **A.3.3.1 General**

The specification will state the requirements of the plant design necessary to reduce the impacts of the plant to within those indicated in the Environmental Impact Assessment. Guarantees will be provided, and the plant fully tested to demonstrate that it has been built in compliance with the planning consent.

#### **A.3.3.2 Visual Impact**

The preferred supplier will provide detailed drawings of the proposed plant, based upon the drawings in the outline planning application. The detailed drawings will be submitted as part of the detailed planning application so that the Planning Department can approve the detailed design.

During the design and construction phases, the contractor will be required to comply with the planning consent, and performance will be monitored at the design reviews. This will ensure that the contractor does not depart from the planning drawings.

#### **A.3.3.3 Landscaping**

Landscaping has been designed to diminish the overall visual impact of the plant, and to hide the fuel farm storage tanks which are currently very visible from the East.

The landscaping works will be carried out as a separate contract by TTSD and will be done at an early stage to provide some screening during construction, together with providing longer growing time for the vegetation.

Landscaping is covered in detail in the Environmental Impact Statement.

#### **A.3.3.4 Plant Emissions**

The specification will provide a detailed description of how the plant will be constructed to ensure that emissions are no higher than those modelled.

Once commissioned, the plant will be fully tested to confirm that it achieves the emission guarantees.



### **A.3.3.5 Noise**

The contractor will be bound by the noise limits set by the planning consent. Design reviews will confirm that the equipment to be supplied is suitable, and once operating measurements will be made to ensure that the plant achieves the guaranteed noise levels.

### **A.3.3.6 Potential Adjacent Hazards**

The proposed location is sensitive due to the adjacent fuel farm and gas company, which could potentially create major hazards.

A fire fighting water distribution system around the site inclusive of hose reels, hydrants and extinguishers will be provided to satisfy the Fire Department and the insurers. The system will be in compliance with the planning/waste license terms and conditions. Any above ground water pipes must be in ductile iron with bolted flanged or welded joints. Trace heating and lagging will be provided wherever there is a risk of freezing.

The external works and buildings will be designed to retain all contaminated firewater within the site and allowing no leakage into the ground. The system will include any necessary sluice or similar stop valves within the drainage systems to prevent any contaminated water leaving the site. The shut down system will be manually operated with easy access by operations personnel. Indication will be provided within the gatehouse that the fire alarm system has been activated. The system will be designed to facilitate simple clean down, mop up and cart away of contaminated material.

The site will be designed to provide emergency access, and an alternative emergency route out of the La Collette reclamation area via the site roads.

### **A.3.3.7 Offices and Visitor's Centre**

An office and visitor's centre shall be provided to house facility administration staff, operatives mess facilities and an Education/Visitor centre. This may be a new facility, or may be part of the JEC, linked to the site with a footbridge.

The visitor's centre will be a focal point of the site and a 'demonstration project' for the education of environmental awareness of the waste management and of sustainable building construction. This is seen as an important part of the project due to the need to demonstrate to the general public that the facility is environmentally sustainable, well run and essential to the Island.