

6033 - Steel Museum

Energy

Ace Capital Projects Ltd

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1. Introduction

This section of the report will outline the energy considerations for the steel museum located in port talbot. The information detailed below will outline key factors for the energy and efficiency within the project.

The information below details a list of the regulations that are in place for this construction project in relation to energy:

2. UK Building Regulations

- Ventilation: Approved Document F
- Conservation Of Fuel & Power: Approved Document L
- Infrastructure For Electric Vehicles (Charging): Approved Document S

There is an additional Regulation that will also apply to this construction project as a 'Non – Dwelling' in Wales which is The Building (Amendment) Wales regulations 2022 no 993.

As per the client's brief, this project requires a key focus on sustainability and Innovation as well as making full consideration to the whole environmental impact of the project.

Blueprint will advise on materials, resources, and construction methods to ensure the project meets the client brief as much as possible.

3. Compliance

Blueprint and the clients, ACEP have a duty to comply with relevant building regular building regulations. This document will outline these regulations to be compliant as a minimum standard. Blueprint will also outline accreditations for the client to consider as part of this project.

Full Building Regulations outlined below:

3.1 Ventilation: Approved Document F (Non- Dwellings)- (Welsh Government, 2022)

Approved Document F contains guidance on ventilating structures to ensure that the buildings have adequate indoor air quality for its purpose and to ensure that no issues are raise with condensation build up after handover of the building can be completed. Complying with these regulations ensure that both the building and its occupants are safety constructed and monitored.

- I. Mechanical ventilation needs to be designed and installed correctly, with correct sizing, ensuring equipment is secured and fitted with resilient mounts and installed with the manufacturing instructions and guidelines.
- II. Airflow rates need to be appropriately set; these regulations suggest that CO² monitors are installed in each occupiable room in the described areas of buildings within the document to monitor the indoor air quality.
- III. Natural ventilation must be provided in all habitable rooms
- IV. The ventilation systems to be properly maintained and always monitored to ensure they continue to always work effectively. The follow is classed as regular routine maintenance and should be undertaken:
 - i. Cleaning of filters
 - ii. Inspections of ductwork to ensure no damages
 - iii. Continuous monitor of ventilation rates to ensure efficiency

Any issues or defaults found with systems should be correctly dealt with and responded to in a prompt manner.

3.1.1. Interaction with Other Sections and Parts of the approved documents

Part B & F

This section applies if any part of the ductwork passes through the following:

- a. a fire-resisting wall or floor
- b. a fire compartment
- c. a protected stairway.

Additionally, document B gives guidance on the size of escape windows.

Part J

Guidance with Part J is to ensure that any ventilation fan or open flue appliances do not cause combustion.

Part L

Considerations to energy efficiency when choosing ventilation systems and the control of infiltration.

Part K & M

Ensuring that any controls given to occupants are in reachable distance.

Part O

This part provides guidance on ensuring the building is equipped for 'Purging Ventilation' in cases where the room may be contaminated by indoor pollutants.

3.2. Conservation Of Fuel & Power: Approved Document L (Welsh Government , 2022)

This section focuses on the conservation of fuel and power and can be a significant factor when constructing a building and even more a significant factor when ensuring energy efficiency and sustainability of a new building.

- I. U-Values need to be considered and calculated to as per the method set out in the Building Research Establishment BR 443. This will ensure that heat gains and losses are taken into consideration.
- II. Minimum building services efficiencies and control which applies to new fixed buildings services.
- III. Ensuring all walls are adequately designed and constructed to meet regulations in this document. This includes ensuring that all materials used are suitable for the design, structures are safe and secure with little to no thermal bridging.
- IV. Ductwork must be tested for air leakage following procedures in the Building and Engineering Services Association (BESA).
- V. Information on the following must be provided in the logbook:
 - i. Target Primary Energy Rate
 - ii. Target Emission Rate
 - iii. Building Primary Energy Rate
 - iv. Building Emission Rate

3.2.1. Interaction with Other Sections and Parts of the approved documents

Part C

Guidance on upgrading thermal elements, ensuring they are of acceptable standard.

Part E

Providing guidance on reasonable insulation to limit thermal guidance for example construction junctions should have satisfactory edge sealing.

Part F

This section ensure that guidance is followed for part F and specifying a minimum amount of purpose provided ventilation, air tightness and unwanted heat loss

Part J

This part provides guidance on airtightness and permanent ventilation openings on flue appliances in airtightness buildings.

Part K & M

Ensuring that guidance is followed for controls for fixed buildings services, and automated systems and on-site electricity generation.

Recommended additions:

3.3. Infrastructure For Electric Vehicles (Charging): Approved Document S (Welsh Government , 2021)

As we progress into the future, it would be recommended that ACEP include the use of charging facilities for electric vehicles, it is recommended as this stage since it is yet to be fully enforced in Wales. Charging Facilities are a lot more common at project like this and can be seen to encourage the public to use its facilities.

- I. Ensure the building is equipped with at least one charging point for an electric car and cable routes for at least one in every 5 parking spaces for a car park of more than 10 parking spaces.
- II. Meeting the future standards give in relation to BS7671.
- III. Each charging point should be suitable identified and labelled at standards set out in this document.
- IV. Ensuring that all charging points are checked with routine maintenance

4. Energy Performance certificate – Commercial

Blueprint advise on achieving a rating on the EPC at A+ grade. This can be achieved by being the most energy efficient.

5. Additional Accreditations

These accreditations are suggested to improve the project as a whole. Accreditation such as those detailed below sets the bar for best practices when it comes to the sustainability, building design, construction, and operation.

5.1 BREEAM

The BREEAM assessment evaluates a building's specification, design, construction, and use across the following areas using established performance measures such as:

- Energy and water use
- Internal environment Inc Health & Wellbeing
- Management processes
- Pollution
- Transport
- Materials
- Waste
- Ecology

5.1.1. BREEAM Excellence (70%-84%)

"Excellent" is the second-best BREEAM certification level, requiring a score of between 70% and 84%.

This level uses tried-and-true contemporary technology and concepts to improve sustainability performance, earning it the title of "best practice" from BREEAM.

5.1.2. BREEAM Outstanding (85%)

To receive the most sought-after ranking called "BREEAM Outstanding", a building must receive a score of at least 85%.

Throughout the building's design, procurement, construction, and delivery phases, every step of the process needs to be carefully planned.

6. ETL (Energy Technology List)

This is an approved list of about 14,000 energy-efficient items by the government. By lowering the financial and transactional expenses involved in making an energy-efficient product purchase, the ETL hopes to incentivize businesses in the United Kingdom to invest in high performance energy-efficient equipment.

Accelerated tax benefits, such the Annual Investment Allowance (AIA), can be linked with the ETL. The AIA cap has been increased to £1 million for a two-year period beginning in January 2019, allowing companies to make claims through their AIA for investments in new machinery and plant.

The ETL is recognised in various sustainability assessment processes including BREEAM and SKA rating. Additionally, the Carbon Trust's Low Carbon Workplace certification considers the use of ETL compliant products as part of the qualitative assessment (Department for Business, Energy & Industry Strategy , 2020)
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EFL's Benefits are:

- It helps businesses and organizations make greener energy choices.
- The ETL is free to use and is backed by the UK Government's Department for Energy Security and Net Zero.

7. References

Department for Business, Energy & Industry Strategy , 2020. *The Energy Technology List (ETL)*.

[Online]

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