

Construction Centre of Excellence Feasibility Study



The proposed development is for a new Construction Centre of Excellence located at SA1 Swansea Waterfront, forming an extension to the University of Wales Trinity Saint David campus. The campus currently includes key academic facilities such as the innovation centre (IQ), the library (Y Fforwm), and the recently completed IM building. The proposed new centre will build upon an already established educational and research environment at the waterfront, strengthening the university's role in supporting industry led progress.

The purpose of the development is to create a dedicated hub for advancing construction skills, driving innovation, and supporting the growth of new technologies within the construction sector. The centre will provide a modern space where education, research, and industry enhancement can come together to address current and future challenges facing the built environment.

ACE Capital Projects LTD has a clear vision to deliver a state-of-the-art facility that will act as a focal point for construction industry improvement & promoting the development of innovative solutions. A strong emphasis will be placed on sustainability, innovation, and social value, ensuring the project contributes positively to both the environment and the wider community.

The proposed scheme includes two large workshops designed to provide controlled testing environments. These spaces will enable experimentation and assessment under varying conditions, supporting the advancement of construction methods, materials, and technologies.

Overall, the Construction Centre of Excellence aims to play a key role in shaping the future of the construction industry through education, innovation, and sustainable development. The facility will provide a platform for developing the next generation of construction professionals. (2206144)

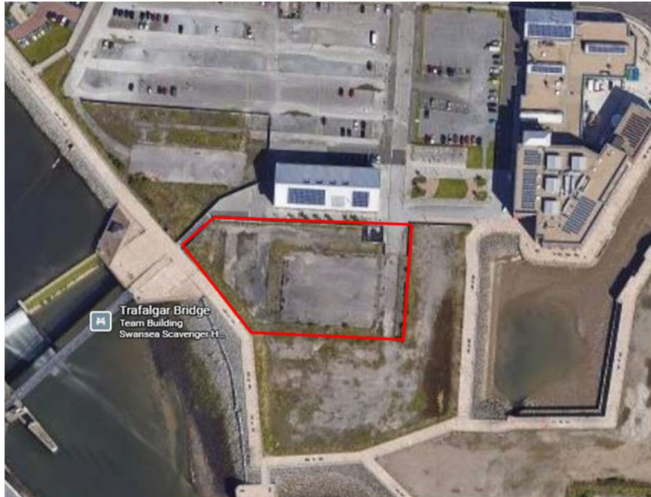
Project Details

Client:	ACE Capital Projects LTD
Value:	£8,436,238
Project Size:	Proposed Site Area = 4145m ² Building Floor Area= 1410m ²
Contract Type:	NEC4 Lump Sum (Option A)
Duration:	22 Months
Planning Start Date =	October 2025
Start On Site =	January 2026
Project Completion =	August 2027
Procurement:	Design & Build
Strategy:	Single Stage Tender



The proposed site comprises an overall area of approximately 4,145m², providing sufficient space to accommodate the client's requirements, including an appropriate provision for parking. The site also offers adequate capacity to support construction phase activities, including site offices, welfare facilities, material storage, and laydown areas.

A further benefit of the location is its potential to facilitate future expansion, with minimal disruption to the university's day to day operations due to its proximity to the existing campus. (2206144)



Capital and Site Costs

The area may involve brownfield remediation and infrastructure upgrades, which can add significantly to upfront costs. Incorporating sustainable construction methods and energy efficient systems may increase initial costs but lower lifecycle expenses and improve environmental credentials.

Operating Costs

Integrating renewable energy systems and efficient building services will reduce long term operating costs and help meet net zero targets. A circular maintenance plan, repairing and reusing materials will also strengthen sustainability outcomes.

Revenue and Demand

Income will come from apprenticeships, short courses and employer funded training. Embedding innovative learning methods such as VR/AR for safety training and digital construction labs, can attract new learners and partnerships. Strong alignment with regional labour market needs in construction, retrofitting and green infrastructure should ensure consistent demand.

(2102939)

The site occupies reclaimed dockland with variable made Ground and soft alluvium over coal measures bedrock.

Groundwater is shallow (1–2 m bgl) and tidally influenced, with moderate sulphate/chloride aggressivity.

Nearby BGS boreholes indicate 2–4 m made ground, 5–10 m soft silty clay, dense sands/gravels between 10–17 m, and bedrock below ~17 m.

High settlement risk renders shallow foundations unsuitable.

Proposed Foundation Solution

Continuous Flight Auger (CFA) or rotary bored piles founded in dense sands/gravels or Coal Measures bedrock.

Pile caps and ground beams supporting a suspended reinforced-concrete ground floor. (2015585)

Element Cost Plan & Outline Cost

The Elemental Cost Plan has been prepared in accordance with NRM 1 at RIBA Stage 2/3. The level of cost certainty is comparable with this stage and will be refined as the design develops.

The Estimated Construction Cost equated to £5,983.15 based on the GIFA of 1,410m² measured in accordance with the RICS Code of Measuring Practice.

Contract Proposal – NEC4 Option A is a lump sum contract where the contractor is paid based on completing activities listed in an Activity Schedule with prices fixed at the outset. Cost risk largely sits with the Contractor with change managed through Compensation Events in line with the NEC early warning and programme procedures. (2114985)

Cost Forecast

The cashflow forecast for this project will help us plan, mitigate and reduce risk.

It will indicate to us and the client when cash will come into and go out of our account, helps avoid running out of funds at critical stages of the project

Helps identify funding gaps early and if a shortfall is predicted you can secure extra funding

Tracks progress by seeing if we are hitting the values of the forecast each month, if not then its telling us that we are not on programme. (2116579)

Funding Opportunities

Whilst funding has been sourced, there is potential funding available from CITB and ECITB training grants, Welsh Government Green Skills Fund and Swansea Bay City Deal or Shared Prosperity programmes. These funds often prioritise innovation and sustainability, so integrating low carbon and digital construction themes will strengthen bids.

Market, Sustainability and Social Value

The centre will deliver local jobs, apprenticeships and community benefits, supporting Swansea's inclusive growth goals and will be a space that stimulates economic regeneration. Commitment to social value, such as working with local contractors and prioritising local supply chains. As well as giving back to the local community such as donations to local charities. Embedding net zero design ensures alignment with Welsh Government sustainability targets.

Innovation

The project can showcase digital construction technologies such as BIM, VR simulation and smart building monitoring systems. These innovations improve teaching quality, reduce risk and position the centre as a regional hub of excellence for modern and future construction methods.

Financial Modelling

A 10 year financial model should include lifecycle costs, energy savings, carbon reduction benefits and risk analysis. Comparing traditional vs sustainable design scenarios will highlight long term cost efficiency and environmental value.

Risk and Mitigation

Major risks include cost inflation, slow learner recruitment or delays in grant funding. Mitigation strategies such as phased construction, partnership with employers and FE / other HE institutions, and robust contingency planning to maintain financial resilience. (2102939)



Project Programme

The proposed Construction Centre of Excellence will be delivered over an estimated **22-month construction programme**, following planning approval in October 2025 and a planned **start on site in January 2026**, with **completion scheduled for August 2027**. The project will be procured using a **Design and Build procurement route with a single stage tender and NEC4 Option A lump sum contract**, allowing the contractor to manage design coordination while maintaining cost certainty through a defined activity schedule.

The construction programme is expected to follow a structured sequence beginning with site mobilisation and enabling works. Initial activities will include site setup, installation of temporary utilities, welfare facilities, and site fencing, followed by site clearance and preparation. Due to the site's reclaimed dockland conditions and variable ground composition, early ground investigation and preparation will be critical prior to foundation works.

Foundation works will consist of **piled foundations using CFA or rotary bored piles**, designed to transfer structural loads through soft made ground and silty clay into the deeper dense sand, gravel, or bedrock layers. Pile caps and ground beams will then be installed to support a suspended reinforced concrete ground floor slab.

Following substructure completion, the **superstructure phase** will commence with erection of the steel portal frame structure. This system enables large open spans suitable for workshop spaces while improving programme efficiency through off-site fabrication. Once the primary structure is complete, roof decking, green roof installation, and the external envelope—including masonry plinths and insulated composite wall panels—will be constructed to achieve early weather tightness.

The next phase will involve internal works, including installation of composite floor systems, internal partitions, mechanical and electrical services, and aluminium curtain wall glazing. These activities will run in coordinated phases to optimise productivity and maintain progress in accordance with the NEC programme requirements.

The final stage of the programme will consist of external works, commissioning, testing of building systems, and completion of landscaping and parking areas. Following practical completion, the building will undergo final inspections, commissioning of systems, and handover to the client, ensuring the facility is fully operational for teaching, research, and industry collaboration. (2320765)

Risks & Opportunities

The proposed Construction Centre of Excellence presents several risks and opportunities that must be considered throughout the feasibility, design and construction stages. One of the primary technical risks relates to the site's ground conditions, as the development is located on reclaimed dockland consisting of variable made ground, soft clay and shallow groundwater influenced by tidal conditions. These factors create potential settlement risks, making shallow foundations unsuitable. To mitigate this, the project proposes the use of piled foundations transferring loads to deeper dense sand or bedrock, ensuring structural stability.

Environmental impacts during construction also present a potential risk due to the site's proximity to the marina. Dust, debris or sediment generated during construction could affect water quality and local aquatic ecosystems if not properly controlled. Mitigation measures such as silt curtains, sediment barriers and dust suppression techniques will be implemented to minimise environmental disturbance. Noise generated by heavy construction activities may also affect nearby university buildings, students and businesses, however this can be managed through controlled working hours, stakeholder communication and the use of well-maintained equipment.

Financial risks may also arise from cost inflation, labour shortages or potential delays in funding. These risks can be managed through contingency allowances, early procurement strategies and ongoing cost monitoring throughout the project lifecycle.

Despite these challenges, the development presents significant opportunities. The centre will support the construction industry by providing education, training and research facilities aligned with industry needs, particularly in areas such as retrofitting, digital construction and sustainable infrastructure. The project also offers opportunities to integrate technologies such as BIM and VR training environments, enhancing teaching capabilities and positioning the facility as a regional hub for modern construction methods. In addition, the development will generate local employment, apprenticeships and economic growth while supporting sustainability objectives. Opportunities may also exist to secure additional funding from organisations such as CITB and Welsh Government programmes that prioritise skills development and low-carbon construction. (2320765)

Traffic Management Plan

The objective of the traffic management plan is to prevent vehicle and pedestrian traffic congestion inside the site boundary and on the public roadways leading into the site. To provide safety measures for various forms of traffic coming to the site and for people who may come into contact with site traffic.

Site traffic inside the boundary will be managed in a way that pedestrians can move around site without being at risk from traffic routes, and vehicles that enter and exit the site will be considered when carrying out the traffic management plan.

Site Traffic outside the boundary will be managed by looking into preferred transfer routes for delivery vehicles and the different delivery restriction times. Surrounding routes to the site will be kept clean and regularly inspected. Drawings will be provided for the during construction site layout plan (2114075)

Environmental Considerations

Ecology and Biodiversity

One of the most significant environmental concerns during construction is the potential impact on aquatic life in the nearby marina. Construction sites often generate dust, debris, and loose sediment, which can easily enter the water if not properly managed. When these materials reach the marina, they can reduce water quality, increase turbidity, and disrupt marine ecosystems. This can harm fish, shellfish, and plant life by limiting sunlight penetration, clogging gills, and altering natural habitats. Given that marina environments often support a variety of species and delicate ecological balances, even small amounts of contamination from construction activities can have wider effects on biodiversity.

To reduce these risks, several mitigation strategies can be implemented throughout the construction process. Silt curtains can be installed in the water to contain suspended debris and prevent sediment from spreading into the wider marina area. Dust suppression techniques, such as water misting and wet cutting of materials, should also be used to minimise airborne particles that could eventually settle in the water. In addition, sediment control measures like drainage filters and barriers can help prevent runoff from entering the marina during rainfall. Storing construction materials and waste as far away from the water as possible further reduces the chance of accidental contamination, helping to protect the surrounding aquatic ecosystem. (2306025)

Environmental Considerations

Noise Pollution

Although the area is only moderately occupied, the presence of heavy construction machinery is likely to create noticeable noise disturbances. Activities such as drilling, piling, and the operation of large vehicles can generate sustained high noise levels that may affect nearby students, local businesses, and residential properties. Prolonged exposure to construction noise can cause disruption to daily routines, reduce concentration for those studying or working nearby, and potentially lead to complaints from the community. In addition, excessive noise can also disturb wildlife in the surrounding area, particularly birds and other species that rely on quieter environments.

To help minimise the impact on the local community, construction work should be carefully scheduled and managed. Providing advance notice of works to residents, businesses, and educational facilities in the area allows people to prepare for potential disruptions. Limiting construction activities to acceptable daytime working hours rather than early mornings, evenings, or weekends can significantly reduce disturbance. Where possible, using quieter machinery, maintaining equipment properly, and positioning particularly noisy operations away from sensitive areas can also help to manage overall noise levels. These measures contribute to maintaining good relations with the community while ensuring the project progresses responsibly. (2306025)

Material Selection

Structural Frame

The proposed structural frame consists of a steel portal frame construction. This has been selected due to its ability to achieve long clear spans with minimal internal columns, ideal for workshops and teaching spaces. Structural steel offers a high strength to weight ratio, reducing the foundation load and off-site fabrication improves build quality and programme certainty.

External Walls

The external envelope consists of a masonry plinth at the lower level with pre-insulated kingspan composite wall panels above. This system allows for early weather tightness while delivering strong thermal performance.

Internal Walls

Internal partitions are formed using lightweight metal stud walls with plasterboard linings. This approach is cost effective, quick to construction and allows flexibility for future amendments of internal spaces.

Roof Structure – Green Roof System

The roof comprises of a composite deck on steel purlins, finished with a waterproof membrane and a modular green roof system on top. This enhances thermal performance, supports sustainable drainage by reducing surface water run off and aligns with the projects sustainability objectives.

Internal Floor Structure

The internal floor uses a composite ribdeck flooring with an in-situ reinforced concrete topping. This provides an efficient structural solution for workshop loading requirements while allowing effective building services coordination.

Glazing

The glazing incorporates aluminium curtain walling and triple glazed window units supplied by a local Swansea based supplier. Triple glazing increases the U-values, reduces heat loss through glazing and increases the natural daylight, which lowers the operational energy demand. (2106960)



Economic Considerations

While initial funding has been secured, the wider strategy remains uncertain and predominantly revenue based. A blended approach to funding introduces coordination and timing risks, possibly leaving the project under-secured. Feasibility is therefore contingent on achieving capital funding certainty aligned with the delivery programme.

An intensive planned preventative maintenance regime is required due to reliance on mechanical, electrical, and specialist systems that are operationally and compliance critical. Failure would compromise safety, statutory compliance, and continuity. Maintenance must therefore be treated as a core feasibility driver.

Maintenance costs are estimated at £115,898 per annum (£82.20/m²/year), exceeding benchmarks and reflecting the building's specialist classification as a technical asset. Although initially reduced by warranties, costs increase to full levels by year six, meaning early affordability may be misleading and long term commitments understated.

Thirty year life cycle costs are estimated at £4.71 million (undiscounted) and £2.98 million (NPV), with maintenance as the dominant component. Feasibility is therefore driven primarily by long term revenue capacity rather than initial capital affordability.

Construction costs are £7.58 million, with professional fees of approximately £0.76 million. A lump sum procurement route may offer cost certainty, but is contingent on resolving site and design risks. Without sufficient pre-construction information, such certainty is unlikely.

Geopolitical instability introduces material price volatility, extended lead times, and supply chain disruption, particularly affecting services and specialist components. As these risks are largely external, feasibility must incorporate uncertainty rather than assume stability.

Demand, while supported by skills shortages and projected sector growth, cannot be assumed. Viability depends on converting demand into sustained enrolment and income. Failure to achieve projected revenue would undermine long term sustainability.

Social and economic benefits, including employment and skills development, are generated. However, these are insufficient to offset capital or life cycle costs. Strategic value is therefore complementary, cannot therefore be a substitute for financial sustainability.

The project is financially viable only where long term income, maintenance liability and capital funding are demonstrably aligned. (2102939)

