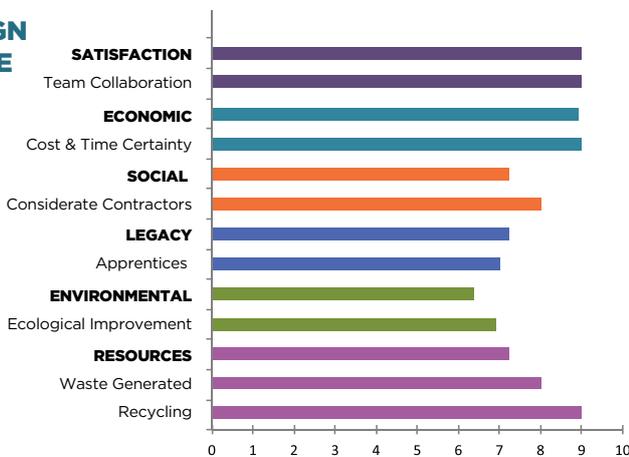




## Pentrehafod Comprehensive School

### DESIGN STAGE



**The refurbishment and remodelling of Pentrehafod Comprehensive School, located in the Hafod area of Swansea is a major project for the City and County of Swansea.**

The redevelopment of the existing school consists of a combination of demolition, refurbishment, new build and external works across the site. The majority of the existing school buildings are currently in very poor condition with the demountable units on site reaching the end of their useful life.

The new proposals will accommodate 1000 pupils aged 11-16, maintaining the current capacity of the school. The scheme addresses maintenance backlog issues, improves the performance of the building fabric and modifies internal layouts to meet current educational space standards. Importantly, it connects two previously separate buildings by introducing a double height central social space for atrium dining and meetings. This new atrium space will also offer the school a remodelled entrance that will become a focal point to welcome staff, pupils and visitors.

Whilst standards have consistently improved over recent years, the fabric of the school buildings is still in need of investment and improvement at a time of ever challenging budget constraints. Morgan Sindall was selected to collaborate with the City and County of Swansea to develop and construct the scheme following a two stage tender process.

### PROJECT DETAILS

**Client:** City & County of Swansea  
**Architect:** Stride Treglown  
**Contractor:** Morgan Sindall  
**Project Value:** £16m  
**Project Size:** GF 5828m<sup>2</sup> of which 1140m<sup>2</sup> is new build; FF 3605m<sup>2</sup> of which 918m<sup>2</sup> is new build. PACE (inc. new changing facilities) = 422m<sup>2</sup> all new build  
**Contract:** NEC Option A - ECI  
**Duration:** 2 year programme starting November 21st 2016 - October 2018  
**Procurement Strategy** - Mini comp under SEWSCAP2 framework



**STRIDE TREGLOWN**

**MORGAN SINDALL**  
CONSTRUCTION INFRASTRUCTURE

### KEY CONTACTS

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## What is an Exemplar project?

An Exemplar is defined as **'something worthy of being copied'**. The Exemplar programme has been developed to help identify the reasons why certain projects are successful in a standardised, quantifiable way and to share with the industry what enabled these successes.

An Exemplar considers all aspects of sustainability, including economic, social and environmental, demonstrating that the

scheme is well rounded and has incorporated best practice and collaboration.

## Case studies are prepared at 3 Key Stages Design Stage; Construction Phase; Post Occupation

This ensures that lessons learnt can be demonstrated throughout the development of the project.

## What Makes this Project Exemplar?

- 1 Live Environment:** The focal point of this project is that it is a redevelopment and extension of the existing facilities instead of building new. This has an implication on costs, circular economy, environmental impact and programme. The question asked is "Is it better to build new, or redevelop what you have?" The greatest challenge to this project is the impact on the school and the ability to physically complete this work in a live environment within the time constraints. Monitoring this at key stages will give an understanding of the real impact on the development and the issues associated with this type of refurbishment being undertaken. The team will measure the impact on the school, industry and other stakeholders.
- 2 Circular Economy:** Meetings with the Enabling Zero Waste team have highlighted the benefits of redevelopment of this school above simply cost. Initially, the team have looked at what can be salvaged from the redevelopment and demolition process as the removal occurs. Then, looking at how the redevelopment can be made better. What steps can we take to ensure that what we replace is better suited to the Circular Economy principals? In fifty years from now, will the next generation struggle to pick apart this building as much as we are now.
- 3 TR&T:** A key focus for us on this project is working with CCoS and Beyond Bricks and Mortar. Targeting stringent recruitment targets; through local bias and supply chain buy in, the contractor and team intend to up-skill the labour force to service this complicated project.
- 4 Collaborative Working:** This is going to be a master class in collaborative working. The correct contract under NEC has been selected and the correct procurement route has been chosen (two stage). The school, LA representatives and partners have been highly visible in the design and procurement process. Regular engagement between partners on the project, with planned meetings supported by action decision logs, has enabled the school to maintain its core business at the start of the project and has fostered excellent working relationships between all parties.

- 5 Environmental Performance:** The simple tool will be to measure the amount of energy consumed to run this school at this point and then what impact the new development has. Will the bills go down? Will there be a positive impact of the new construction techniques on the redeveloped school?
- 6 Pentrehafod Alternative Curriculum Education (PACE)** was established as an educational pilot project to meet the needs of Pentrehafod's most vulnerable, disengaged learners. Its aim to increase access to learning for pupils who are marginalised due to social, emotional or behavioural difficulties, in a safe, structured and predictable environment, linked with the community usage of the building to provide added benefit.

## Notable Achievements

An essential element of this project is the live nature of the project. There are approximately 1000 pupils, 150 staff and multiple visitors within the school on a daily basis. The project is approximately 60% heavy remodelling and refurbishment and 40% demolition and rebuild.

Throughout the planning stage the school has enjoyed a productive dialogue with the LA and professional partners tasked with realising the vision for the refurbished school. This early engagement in the planning phase has been extremely beneficial to both the school and the delivery partners involved and resulted in the following benefits:

- Allowed the school to communicate to planners the changing nature and direction of education in Wales and the educational philosophy promoted in line with WG policy
- The dialogue on curriculum and provision has allowed all parties to gain a clear understanding of the changing demands that will be placed on infrastructure and resources in order to deliver a 21st century curriculum
- The school has been able to communicate the exact type and extent of facilities required, particularly in terms of ICT infrastructure and specialist facilities

- The LA has been able to explain the positive benefits of the project and the constraints involved in the redevelopment of the school. This has secured a greater degree of creative thinking on how best to utilise resources in the future.

This early engagement with the school and all associated parties results in a well thought out and planned project. They are collectively targeting betterment on the original programme, security in budget certainty, and most importantly a high quality finish that affords the pupils a vastly improved learning facility, whilst restricting disruption to the school to an absolute minimum during the process.

Saving unnecessary costs associated with the decanting of pupils and to minimise disruption, the works are to be completed in four phases in a live school environment over a two year period. This creates extensive challenges to the whole project team in managing the interface between school and contractor. It also creates significant challenges for the school in timetabling the curriculum in a reduced area during the two year construction period. Extensive discussions with the school have resulted in a workable solution for all parties which has been fed into the construction programme.

As part of the refurbishment a bespoke PACE facility is to be constructed on site to enhance the educational provision for these vulnerable learners. By bringing these learners back onto site the school has greater control on safeguarding measures and the management of learning.

It is recognised that in order to maximise pupil engagement and achievement an initial investment in an appropriate teaching facility with an effective ICT infrastructure is required which allows pupils to fully access curriculum resources. The new facility needs to;

- Provide a safe predictable environment to re-engage pupils in their learning
- Improve pupils ability to work independently and enable them to make progress in developing their ICT skills across the curriculum
- Increase opportunities for pupils to consolidate and develop their literacy and numeracy skills
- Contribute to increased pupil engagement and motivation
- Preserve learners' sense of community and belonging.

The current PACE outcomes far exceed the historic attainments gained on the EOTAS provision. All pupils have grown in confidence since attending PACE this is due in part to increased opportunities to achieve and succeed.

As pupils no longer associate learning with failure. The environment which the school has created is nurturing, supportive and predictable, allowing pupils to feel safe, comfortable which has a positive impact upon self-esteem. The site itself has further challenges in restricted access as it is surrounded on all sites by primary rail lines and highways.

Formerly a copper works it is considered to be highly contaminated. The existing structures are a form of CLASP modular construction which inherently carries a high risk of Asbestos.

## Improving The Process

The project team are fully engaged with BIM to ensure maximum benefits are gained on this complicated project. The existing building has undergone extensive electronic surveys using the most current technology, inclusive of point clouds internally, externally and even the use of a survey drone to fly over the site and buildings to survey within 10mm accuracy.

From this basis concise modelling has been completed for the existing structures and developed to include proposals for the forthcoming works. This model is being utilised and developed by the whole design team as required by BIM. The information is being used in turn to illustrate issues and proposals to the end user and this is being incorporated into the design.

The contractor will be delivering BIM level 2 & utilising 4D model to map out and manage the logistics; scaffold etc. The model will be used to assist the site management team in their planning of the project, and to present to the end user to highlight safety issues and management requirements.

## Innovation & Continuous Improvement

The two year construction period lends itself to monitoring the performance of the building as it develops. This can also be utilised as an educational resource for the students of the school. Examples include:

- Thermographical survey undertaken before and after
- Water usage before, during and after;
- Gas usage before during and after;
- Electricity usage before during and after;
- Monitor renewables – solar panels;
- Satisfaction surveys within the school – pupil and staff feedback
- Investigating the opportunity to lease lighting as opposed to purchase. Improving circular economy targets, whole life design and improving the end product for the school.

As the school will remain live for the whole period, information will evolve as the phases of work develops. This information will be used as an educational tool for the school, as well as promoting the construction industry and promoting positive aspects of the project.

Morgan Sindall will also monitor using the SEWSCAP KPI's and Project Monitoring processes. Monitoring the project will continue after completion, including consumption of utilities and general performance of the building for twelve months after completion.

## Strategy

Health and safety and the wellbeing of the pupils within the school is of paramount importance, and furthermore teaching and learning cannot be disrupted during the works. To facilitate this, the whole project team, including the school will continue to work collaboratively. Strong lines of communication will ensure all parties are aware of the requirements and constraints going forward. When areas are closed down for works to proceed, the school will make alternative arrangements by working with the site team to ensure that the required provision is in place and disruption is minimised. The site team have worked in live school environments before and are aware of Pentrehafod's limitations from their school timetables and information shared with the team on other critical periods. The general day to day needs of a live working school will be a constant challenge with ongoing pupil movements and catering arrangements, all of which need to be identified and managed throughout the process safely and efficiently. The interface with the public needs to be managed as the school has a busy community swimming pool that is used out of hours, over weekends and holidays. A public sports hall and other sports facilities introduce further consideration when dealing with the local community using the school site.

The above also needs to be considered within the project outcomes to ensure ongoing community access is maintained from design through to implementation. The school requirements, in line with industry specifications, will be incorporated into a clear brief and scope of works which will ultimately provide a product that delivers a high quality learning environment.

## Impact

**A contract requirement is that Morgan Sindall provides a minimum of 800 weeks Targeted Recruitment and Training on this project. This is in conjunction with Beyond Bricks and Mortar, a City and County of Swansea organisation who will collaborate with Morgan Sindall to facilitate training and recruitment, and to monitor the effectiveness of the project delivery of this target.**

In the first month of the contract, placements have already been offered by Morgan Sindall for carpentry apprentices to be trained on this site. One of the apprentices is a former pupil of the school who will achieve an NVQ in carpentry through working in his former school. Further placements are also being organised for a Community Liaison Officer, Gate Person and General Operatives. Project specific employment will be implemented during the scheme as the needs arise to ensure the project maximises its impact on the immediate community and service users.

Morgan Sindall will use STEMNet Status and CITB Construction Skills Status to provide opportunities to the school for further learning opportunities. Other professionals involved in the scheme will also be able to impart knowledge and experience. There will also be a drive to promote the construction industry to the school population by exposing the students to the wide ranging careers and professions within the industry. University of Wales Trinity Saint David, Swansea has been engaged by Morgan Sindall to allow them to use this project as a case study and learning opportunity for the students of the Swansea Campus on the construction related courses.

There will also be opportunities to invest locally within the community and make improvements wherever reasonably practicable.

## Supply Chain Strategy

**Morgan Sindall has an approved subcontractor and supply chain network that has evolved over many years of working very closely with local contractors. Utilising a system of elevating contractors and rewarding them for good performance resulting in preferred subcontractor status. This grants them priority on tenders and works won with other benefits including the full payment of retention early.**

The BREEAM target for this scheme is very good under the Bespoke Scheme. As this is a refurbishment project following achievable BREEAM Excellent is not considered to be achievable, however the target however will be improved on where reasonably practicable.

Morgan Sindall previously used a company called Paint 360 to supply recycled paint to previous education projects. Morgan Sindall has subsequently reengaged with them to supply recycled/reengineered paint for the Pentrehafod project. Paint is collected locally from CCoS Civic Amenity Centres and recycled by Paint 360 to create a finished product to decorate the school. This is a good example of working closely with the Supply Chain for maximum benefit.



## Sustainability

**The project is signed up to Constructing Excellence in Wales' Enabling Zero Waste (EZW) scheme. CEW is working in collaboration with the team as part of EZW to provide a detailed insight into the achievability of zero waste at present, along with identifying any associated barriers to achieving the targets, and disseminating best practice, solutions and opportunities.**

The EZW team is working with Morgan Sindall to investigate and detail the savings and opportunities gained through the refurbishment of the school in comparison to demolition and new build. The project has a Circular Economy focus and will look to identify opportunities to embed these principles. Contact has already been made with Phillips to look into opportunities to lease light fittings and replace the lighting as it reaches end of life in a circular system.

Given the design and nature of the current buildings and the composite materials within them, opportunities for deconstruction, reuse and recycling may be limited. The project is committed to looking at opportunities to ensure that at the end of the building's next life, materials can easily be identified, reused and recycled.

A pre-demolition/ refurbishment survey has been undertaken which has highlighted opportunities for reuse and recycling which will be followed as far as practicable. The project will also look to work with suppliers to introduce packaging and/or product take back schemes. Baseline data will be collated with regard to waste arisings, performance and disposal routes. The exercise will monitor waste from different activities, identifying any problematic waste streams, establishing benchmarks upon which improvements can be made and identifying opportunities for solutions.

Duncan Baker Brown from the University of Brighton has been invited to use Pentrehafod as a case study. An expert in contemporary methods of ecology-friendly building design, architect and academic Baker-Brown's research tests the viability of a number of practices and materials, recognising the potential of discarded "waste" as a valuable resource in the future of building, as well as live projects as valuable teaching aides.

