DUMBARTON ACADEMY

BUILDING INFORMATION:

BREEAM Case Study

- BREEAM rating & score: Targeting – 73.35% (Excellent)
- Basic building cost: £853 / m2
- Building services cost: £410 / m2
- External works cost: £237 / m2
- Gross floor area: 10,331 m2
- Total area of site: 46,770 m2
- Functional areas and their size:
  - Teaching space: 4,972 m2
  - Conference room: 78 m2
  - Drama / Assembly: 761 m2
  - Games hall: 1265 m2
  - Social Space: 475 m2
  - Vocational Space: 192 m2

- Area of circulation: 1,900 m2
- Area of storage: 550 m2
- % Area of grounds to be used by community: 1%
- % Area of buildings to be used by community: 15%
- Predicted electrical consumption: 15kWh/m2 per annum
- Predicted fossil fuel consumption: 34kWh/m2 / annum
- Predicted renewable energy generation
  - Solar thermal (per annum of solar panels): 4.1kWh/m2 / annum
  - Photovoltaics (per annum of solar panels): 4.3kWh/m2/annum
  - Biomass: 45kWh/m2 / annum

- Predicted water use: 5.45m3 /person / year
- % Predicted water use to be provided by rainwater or greywater: 46.2%

Project Description:

The new school was constructed on the same site as the existing school building as a 'tandem-build', meaning that the existing school was still in use while the new school was being constructed. The building itself is a two-story building with a three-story wing to the East of the site, the site itself is fairly level however a small area to the main entrance is within the existing flood-plain where attenuation plans were implemented - this allowed us to create and maintain a very natural feel to the front elevation of the building supplemented by various plants/ vegetation, a music garden area and a 'walk-of-life' route to the main entrance of the school building. There is also a grass pitch and community garden located to the West of the main entrance and to the rear of the building there are various areas of natural interest including a school garden that will encourage a natural habitat - the area is large enough to accommodate a formal school garden area which was encapsulated during the consultation phase with the school and is currently being used by the Science and Home Economics departments to promote learning to the pupils and enhance the school curriculum.

The building itself has a main, central circulation and pupil recreational area spanning the entire width of the school, with three 'fingers' coming off of this central area housing all teaching accommodation, the further West 'finger' is the PE accommodation that is utilised by both the school and the local community out with school hours.

The school is a two-story building with a three-story wing to the East of the school. Photo-voltaic (PV's) panels were installed to the South-facing roof areas of the building in order to promote a method of passive electrical supply – the PV's have now been included within the Science and Technical curriculum where pupils can participate in understanding how the PV's work in a sustainable way.

The building structure is pre-cast, reinforced, insulated concrete panels which assisted in achieving an air tightness rate of **2.26m3/hr/m2**– this was the first building within West Dunbartonshire Council constructed in this way. There is

also a double-height, steel-framed gymnasium that leads out onto the aforementioned pitch areas and to the rear playground area that includes a cross-country running route, external classroom break out areas, sprint track, amphitheatre area and bicycle storage.

The buildings main heating source is underfloor heating which is controlled by a pellet fed biomass system and a solar thermal recovery system.

Internal areas of the building promote both formal and informal teaching practices; formal classroom arrangements, break out areas with the added advantage of having various flexible spaces used by different subjects and teaching methods, and moveable, acoustic dividing walls to allow expansion into associated areas. This has allowed teaching to occur throughout the building and ensure that every space within the building is fully utilised. There are two dining areas within the building; ground floor and first floor, both being available to all pupils.

The building was constructed in two main phases and commencement of construction sequenced from East to West on the site;

- Phase One:
  - Demolition of existing Games Hall to far East of the site,
  - Construction of the main school building,
  - Construction of attenuation works to the South of the site,
  - Construction of full-size 3G all-weather football pitch,

- Phase Two:
  - Demolition of the existing school building,
  - Construction of the extension to the existing 3G all-weather football pitch,
  - Construction of car parking areas,
  - Construction of play areas to the rear of the site,
  - Construction of the new grass pitch.

The Key Innovative and Low Impact Design Features of the Building

- Rainwater recovery,
- Natural lighting maximised,
- Sustainable Urban Drainage system,
- Presence detection lighting system,
- LED lighting,
- Biomass
- Underfloor heating,
- Solar panels,
- Solar Thermal.

Social or Economic Measures Achieved / Piloted

- The project was registered with the Considerate Constructors Scheme and had a BREEAM target to achieve a minimum score of 35 out of 50.
  - The project achieved an average score of 40 out of 50 based on the results of four audits carried out over the duration of the contract.
  - With an average score for each section on site as 8 out of 10 – rated Excellent.
  - The audits assessed performance, culture and overall approaching the following; enhancing appearance, respecting the community, protecting the environment, securing safety and caring for the workforce.
- Facebook page: BAM – Dumbarton Academy,
  : WDC – Dumbarton Academy.
- Local newsletters distributed to the local community and school.
- Meet the buyer event to assist local subcontractors and suppliers.
- Local employment opportunities.
- Education activities in conjunction with the school.

Steps Taken During the Construction Process to Reduce the Environmental Impact

- Implementation of a company Environmental Management Plan.
- Recycling and segregation of construction waste.
- Re-use of aggregates.
- Energy Performance Certificate (EPC) – Employers Requirements document highlighted that a target EPC rating of A+ was required.
- Prevention pollution to the environment – Zero pollution incidents was the achievable target which was met.
- Increasing environmental awareness of all BAM staff and working with subcontractors and suppliers to improve their environmental performance. Training via 'tool box talks' were carried out throughout the duration of the contract where 89 'tool box talks' were carried out.
- Ecology – All mature trees that were to be retained as part of the project were protected. Trees that were required to be moved were programmed out with the breeding and nesting seasons, to remove any threat of impact on wildlife and their habitat. An Ecologist was employed to assist in the implementation of methods of protection of bats that were found on site.
- Key Performance Indicators.
- Tracking and monitoring electricity.
- Fuel and water consumption.
- Implementation of and maintain operating procedures which gave information and guidance on achieving all of the above. Throughout the contract Management Plans and a Site Waste Management Plan were updated where necessary.