



**Marischal College,
Aberdeen City Council headquarters,
Aberdeen, UK**

Background

Aberdeen City Council is a local authority employing over 10,000 people and is the largest employer in the City. Aberdeen is a coastal city in North East Scotland famous for the prevalence of the oil and gas industry. However during the mid-18th to mid-20th centuries, Aberdeen was known for its granite industry and many of the City's buildings incorporated locally quarried grey granite. The City is often nicknamed "The Granite City".

Marischal College is an A-listed building¹ founded in 1593 and is the 2nd largest granite building in the world, surpassed only by El Escorial Palace, outside Madrid. The building was unoccupied and left to deteriorate for 12 years before the Council began the renovation work.

Project Scope

The project involved the renovation of a 16,200m² granite building in the centre of Aberdeen turning it into the Local Authority Head Quarters. The building accommodates 1,300 employees and achieved a BREEAM Excellent standard² which is a worldwide environmental assessment method for best practice in building design, construction and operation.

Aim

To provide suitable, fit-for-purpose accommodation from which to deliver the council's services. In addition to this, Marischal College is an iconic building and its conversion will improve the heritage of the city. The development allowed the Council to create an environmentally sustainable landmark building and show that we are serious about being the energy capital of Europe into the future.

¹ An A-listed building is a building deemed of national or international importance, either because of its architecture, history or if it is a good example of some particular period, style or building type. (Approximately 8% of listed buildings in Scotland are category A).

² BREEAM is the world's foremost environmental assessment method and rating system for buildings. It sets the standard for best practice in sustainable building design, construction and operation. BREEAM Excellent was the highest standard at the time of building Marischal College. However this has now been superseded by BREEAM Outstanding.





Motivating Factor

Aberdeen City Council staff worked in a building (St. Nicholas House) that was constructed in 1966 with a calculated 30-year life span – it is now in its 41st year of use. The Administration agreed that St. Nicholas House did not provide staff with a suitable working environment, nor did it give the opportunity to be energy efficient and utilise renewable energy.

The option of continuing with the previous office accommodation was simply not sustainable. The council would have to undertake significant major capital investment over the next five years to provide suitable office accommodation.

Marischal College provided the best-value option and was not the most expensive of the three proposed options - new green field development, refurbishment of St. Nicholas House or conversion of Marischal College.

Organisation, governance and finance

Project Cost: £65,800,000 (€80,821,800) – well within the original approved budget of £80.4 million.

Source of Funding: The project was funded by the Local Authority but also received some European funding through the Build with CaRe project, Interreg IVB.

Year of building/year of refurbishment: 2008 to 2011

Building owner: Aberdeen City Council

Supervision: Aberdeen City Council/Sir Robert McAlpine

Architect: Holmes Miller, Glasgow

Technical building services: Wallace Whittle, Glasgow



Photograph: Front façade of Marischal College from Schoolhill



Specification

- Retain granite facades and Senate Room
- Remove all other internal fabric
- Excavate ground to create now lower ground level and underpin part of the facade
- Install new steel structure and concrete floors
- Install new roof with part concrete slab for plant areas, part metal structural deck, part timber truss/rafter roof
- Restore/repair/clean granite facade
- Install aluminium double glazed windows
- Construct new zinc faced roof top storey
- Install zinc sheet pitched roof, single ply flat roofs, slated pitched roofs with lead flashing
- Install composite panels roof top plant enclosures with aluminium mesh screening
- Install full building services
- Install raised access floor, suspended ceilings, plasterboard and glass partitions with timber veneer doors
- Install full internal decoration and floor finishes
- Install fitments and furniture
- Lay Caithness and granite slab, concrete block paving, soft landscaping

Technologies Used

Ventilation / Cooling - Water loop heat pumps with heat recovery and free cooling

Heating - Air source heat pumps and biomass boiler. The biomass boiler provides up to 30% of the heating requirement of the building.

Domestic hot water - Re-circulated direct gas fired water heaters

Electric supply - 2.2MVA connection to the public grid.



Photograph: Marischal College Customer Service Centre



Results: successes and lessons learned

Marischal College was officially opened on 21st June 2011. The building has been hailed as a major success. The transformation of the historic building, which has involved 565,000 man-hours of work, has been completed on schedule and under budget. The original budget was set in 2006 at £80.4million but the total capital expenditure was in fact around £65million.

One particular success was integrating the biomass boiler into the building design as the initial plan to install solar panels was prohibited by Historic Scotland³. Forward planning has also ensured that the building was designed in such a way that the boilers can easily connect to the City's combined heat and power network, when the pipes are in place in 2012/13.

Building Energy Results:

Heat energy demand: 270 kWh/(m²a)

Primary energy demand: 982 kWh/(m²a)

Cooling energy demand: 124 kWh/(m²a)

U Values:

Exterior wall: U-Wert: 0.3W/m²K

Windows: U_w-value: 1.8 W/m²K

Roof: U-value: 0.24 W/m²K

Energy Performance Certificate: B+

Carbon Dioxide Emissions (kg per m² of floor area per year): 21

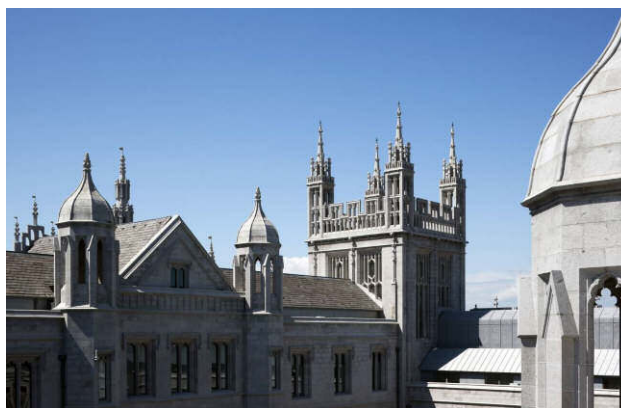
Approximate current energy use per m² of floor area: 58 kWh/m²

Ventilation / Cooling: Water loop heat pumps with heat recovery and free cooling

Heating: Air source heat pumps and biomass boiler

Domestic hot water: Re-circulated direct gas fired water heaters

Electric supply: 2.2MVA connection to the public grid.



Photograph: Marischal College Rooftops

³ Historic Scotland an executive agency of the Scottish Government charged with safeguarding the nation's historic environment.



Transnational Benefits

Both Marischal College and Prittlewell chapel act as flagship historic building refurbishment projects. Through information sharing and networking, primarily at project meetings and via email we learnt from each others experiences. In January 2012, several partners came to Aberdeen for a project meeting and took part in a study tour of Marischal College increasing knowledge exchange between the partnership.

The Marischal College refurbishment project was presented to project partners as well as external organisations throughout the project lifetime. In particular in Gothenburg, Sweden (April 2010) and Hamburg, Germany (November 2011) partners had the chance to discuss the project in more detail and offer expert advice. As a result of a suggestion from the University of East Anglia we looked into a Building Energy Management System that they recommended and would have otherwise not known about.

Publicity & Visitors

Since the building opened in June 2011 it has attracted a lot of publicity and attention and is now a major tourist attraction for the City. The links below show some of the national news articles which were broadcast at the time of opening.

BBC News video - Council moves into Marischal College

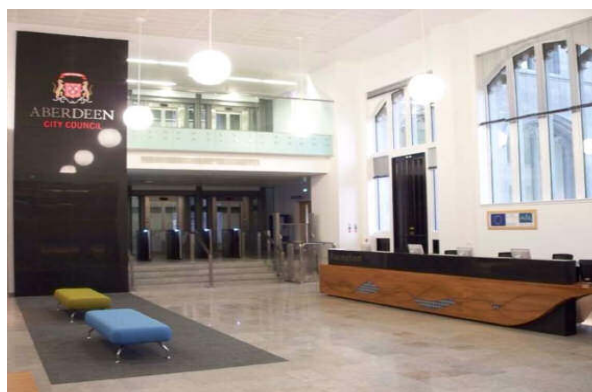
<http://www.bbc.co.uk/news/uk-scotland-13868638>

<http://www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-13855831>

Time lapse video – Marischal College Refurbishment

<http://www.youtube.com/watch?v=59FnU9e-Khg&feature=youtu.be>

Due to the operational nature of the building over 1,000 staff and citizens come through the doors every day. They are greeted by a permanent plaque displaying the BwC and EU logos which is located above the reception desk inside the foyer.



Photograph: Marischal College Reception with BwC permanent plaque



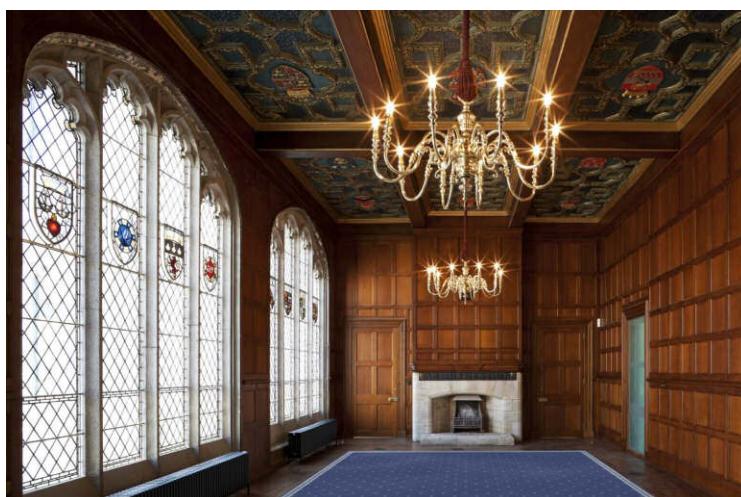
The building has a conference suite on the 4th floor of the building which can hold over 60 people. Several high profile meetings have taken place since the building opened including the LOWCAP cluster project kick off meeting which Build with CaRe is a partner.



Photograph: LOWCAP partners in Marischal College Foyer, Feb 2012

The building also took part in Doors open day for the first time in September 2011. This is a national day where citizens can gain free access to hundreds of buildings across Scotland which are normally closed to the public. Marischal College proved to be a popular attraction attracting over 1,000 visitors, who were given a tour of the building and told of its history and environmental credentials. Marischal College will take part in the campaign again in September 2012.

The ornate, wood-panelled former Senate Room – renamed the Grant Room in memory of former University Court member Sheena Grant – has been retained in its original state and is a popular wedding venue, accommodating up to 60 people.



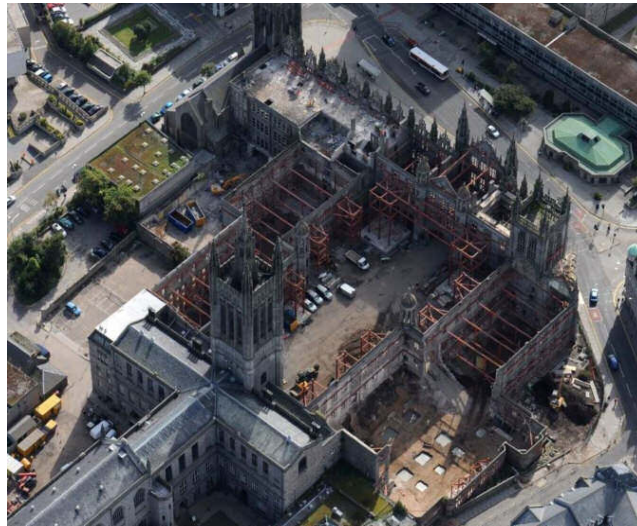
Photograph: The Grant Room, a popular wedding venue



Lessons Learned: Ensure energy efficiency and renewable technologies are considered at the design stage as trying to retrofit technologies can be problematic and costly.

Also ensure any technologies used are correctly specified at the design stage. Again this will avoid problems when in use and will avoid extra maintenance costs.

Another point to note is the importance of training the end users how to operate the building effectively. Particularly if the systems used are newer technologies.



Photograph: Birdseye view of Marischal College

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