



Centre for
Construction Innovation
North West

Sustainable Building Best Practice in the North West



in association with



Sustainable Building Best Practice

in the North West

This brochure and case studies have been produced by the Centre for Construction Innovation (CCI). CCI exemplar projects aim to disseminate innovation and best practice in the construction sector in the North West. Further copies of this brochure are available from CCI's website www.ccinw.com

If you have any questions regarding any of these case studies or would like to enquire about making a project you are involved in an exemplar project please contact:

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Vision for Sustainable Construction

Government and industry share a vision of construction as a competitive sector which plays a central role in delivering sustainability and prosperity across the economy.

The Government has introduced a wide range of measures to promote competitiveness; most recently the Strategy for Sustainable Construction has been developed by Government and the industry to focus on sustainability in construction.

Sustainable Construction

The built environment is one of the largest contributors of carbon emissions. Sustainable construction practices can have a major impact in cutting carbon emissions, as well as contributing to other environmental priorities such as water efficiency, waste reduction and enhancement of natural habitats. Sustainable construction practices also provide opportunities for local employment and skills, economic inclusion, health, education, local community and neighbourhood benefits.

Sustainable construction practices represent financial best value, increasing efficiency in construction, whilst also reducing lifetime costs of building maintenance, energy and occupancy.

The projects detailed in this brochure are developments in the North West that are delivering the principles of sustainability by:

- > Supporting the delivery of a low carbon economy through adaptation and mitigation;
- > Encouraging investment and the retention of investment made in the region;
- > Delivering a high quality sustainable built environment;
- > Bringing maximum social benefits throughout the construction phase and once developments are in use.

CCI hopes you find the following case studies useful and will assist you in taking the sustainability agenda forward.

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Local People, Local Jobs

Blackpool Build Up

Local People, Local Jobs

Organisations Involved:

- > Blackpool Council
- > School of Construction, Blackpool and The Fylde College

Local initiatives, which include socially driven improvements, such as local labour and supply chain, essential skills and apprenticeships, can help local people and businesses from an economic perspective.

Blackpool Build Up is a project aimed at training adults in construction skills and is funded by Blackpool Council and delivered by the School of Construction at Blackpool and The Fylde College, with referrals for training mainly via Jobcentre plus. It provides employer-led construction training and employment opportunities for unemployed local adults.

Blackpool Build Up was designed to appeal to the unemployed and hard to reach. Blackpool has high deprivation, low educational participation and poor achievement rates. It is the twelfth most deprived local authority in the country, with 40 of residents classed as such. Blackpool's pupils are ranked 139 out of 149 authorities for pupils under-achieving at five A–C GCSE grades, including English and Maths.

The organisation supports local employers to create a skilled workforce and helps reduce unemployment in the town by targeting those people who are not in employment, education or training (NEET). To access the project, learners must volunteer, be unemployed or claiming benefits, aged 21 or over and be residents of Blackpool. On completion of training learners undertake an unpaid, three-week, full-time work trial with an employer. The project offers practical, flexible programmes based on local employment needs and is designed to protect trainees' benefits whilst enrolled at the centre. All programmes lead to semi-skilled employment.

The project won a National Training Award in 2009, in the Education and Training category. The outstanding success of the project can be measured by the fact that 398 trainees have gained full-time jobs since its inception in January 2008, against a target of 107. In the same period, 1,390 qualifications have been achieved. This year, 50 of those entering training found a full-time job.

The project has been able to help local businesses by reacting quickly to plug skills gaps - within six weeks of contractors highlighting a lack of roofing skills, training in this area was incorporated into the programme. Another contractor had been using labour from abroad for intricate street masonry work.

Blackpool Build Up designed a programme to provide local labour with the requisite skills, which turned into more full-time jobs for the town. The project also helps contractors satisfy their equality and diversity responsibilities. One profoundly deaf trainee who had difficulty finding employment was placed on a successful work trial through Blackpool Build Up that became a full-time job.

Blackpool Build Up has brought together a unique partnership of the local authority, Jobcentre plus, a large FE college, contractors and many local community groups. It has become a one-stop-shop approach for recruitment, training and community engagement. The project also engages with a wide variety of community-based agencies such as the probation service; careers information partnership CXL; Progress To Work; Shaw Trust and Prolific Offenders. Local contractors have also been quick to support the scheme. Herbert T Forrest, a contractor on a large social housing contract, used Blackpool Build Up to recruit eight local apprentices based on a shopping list of skills, trade area, postcode and apprenticeship funding.

Blackpool Build Up has also worked with Jobcentre plus to target one of the most deprived wards in the country, delivering 27 work trials in a six-week period. On completion these trials resulted in 23 full-time jobs. The project demonstrates that if the local authority, FE college and training provider and Jobcentre plus work together, construction training and employment opportunities can be maximised to the benefit of local employers and the community. Contractors gain by having qualified and trained local labour and the community gains by having skills geared to local employment opportunities.

A photograph of two young men in construction attire standing on a wooden platform. They are wearing white hard hats, high-visibility yellow safety vests over dark jackets, and brown work boots. The background shows a building under construction with large windows and a yellow wall. A yellow banner is overlaid on the image.

Local People, Local Jobs

Young People into Construction, Manchester City Council

Local People, Local Jobs

Organisations Involved:

- > Manchester City Council
- > Connexions
- > Manchester Solutions Group
- > The Manchester College

In July 2008 Manchester City Council (MCC) and Manchester Working Limited, in conjunction with Aspire, Connexions and Training providers, created the 'Young People into Construction' initiative. The programme offers apprenticeships to young Manchester Residents (16-24 year olds), specifically targeting those who are not in education, employment or training (NEET); those that may not have achieved academically; and those from areas of deprivation.

In the first eighteen months, the initiative offered over 60 full time apprentice placements on capital programmes such as Surestart, Building Schools for the Future and Housing Renewal.

The 'Young People into Construction' initiative criterion for recruitment is based on relevant competencies such as communication, team working, motivation, commitment and adaptability. By identifying applicants who possess these skills, the programme minimises barriers to entry for those who can not read or write, therefore creating greater prospects for local people who have lacked opportunities in the past.

The success of this programme depends on the ability to provide ongoing construction placements, which are provided by 13 MCC framework partners. Another key to success is having the ability to manage the placements and be able to move apprentices onto the next project when one comes to an end. In order to achieve this, 'Young People into Construction' created a model known as the 'Aspire Model', where Aspire act as the employment agency which provides a contract of service with apprentices.

The biggest impact this project has had is on the lives of the individuals that it has affected. By targeting deprived areas there are real steps being made to break cycles of deprivation - some of the young people on the programme have come from backgrounds where worklessness has been prevalent in four generations. By leading from the front, MCC has encouraged its main framework partners into an ethos of added value and community benefit, a part of which is to provide training and employment opportunities. This ethos is being filtered down through the supply chain. Prior to this programme being in place, the feedback from some of MCC's framework partners was that, because the capital work load was disjointed, it posed difficulties employing

apprentices on long-term placements. Therefore, MCC looked towards a solution which came in the form of Aspire, a third party not-for-profit organisation, who would carry out health & safety checks and take on all HR functions. This gave them the ability to move apprentices on to other projects should the work come to an end or if they required additional experience for their NVQ's.

Innovation has been shown by senior management within MCC in recognising that a resource is required to manage this project and drive it forward. This initiative has secured funding from MCC's Economic Development Unit for a project manager for three years, as they have seen the benefits it provides in terms of providing employment and increasing skills of local residents. In addition to this, the role of the manager on this project requires some unique competencies and a passion for the job as it can sometimes be emotionally draining. The real difference with this project is that MCC are attempting to break cycles of deprivation and that means some young people show some challenging behaviour – this is where the project manager is required to act as a role model.

Further to the operational partnerships, MCC also have Framework contracting partners including: Manchester Working, Laing O'Rourke, Balfour Beatty, GB Building Solutions, Willmott Dixon Construction, Kinetics, Cruden Group, Bramall Construction, and Parkinson Building Contractors - all these partners have fully embraced the 'Young People into Construction' project on their Manchester sites and are committed to adding value and community benefit with the work that they do. Further to the placements offered they have also organised over 200 community events between them in 2009/10.



Equality and Diversity

Wates Living Space

Equality & Diversity

Organisations Involved:

> Wates Living Space

The areas of equality and diversity have long been recognized as an important area that needs to be addressed in the UK construction industry. In real terms, diversity-based percentiles have remained relatively unchanged, since the early 1990s; consisting of between just 10-12 of women and 2-4 of Black and Minority Ethnic (BMEs).

This low number of women in the UK construction industry lies in stark contrast with the current all-industry employment standard of 46% for women and 8% for BMEs (ConstructionSkills, 2008).

Wates, which has regional offices in Manchester and Warrington, is a 113-year old family business built on people, communities and the environment in which it operates. Wates Living Space, the firm's affordable housing construction arm, is responsible for building or refurbishing around 26,000 homes every year, through more than 50 affordable housing frameworks. Wates is doing its best to reprofile the industry and has a commitment to investing in its people through training and development, and nurtures long-term relationships with its suppliers. The firm believes the construction industry is often widely misrepresented in terms of employment and opportunity and tries to promote the sector and its own business as diverse and inclusive.

The business has created an inclusive and supportive culture that allows staff to fulfil their potential and achieve outstanding performance. Wates has been re-accredited by Investors in People (IIP) to exemplary standards, it has been awarded both the National Council for Work Experience Quality Mark, which recognises employers who have reached the required standard of work experience provision and received accreditation to Committed 2 Equality, a not-for-profit organisation that promotes diversity.

Wates Living Space has built up a strong network of partners in the North West, including the Women and Work Sector Pathways Initiative (facilitated by CCI on behalf of ConstructionSkills) and Women In Construction Action Network to support female workers in the industry, Barnardo's Mentoring Project and The North West Employers Forum for Equality and Diversity.

The firm also partners Business in The Community to help deliver programmes tackling homelessness as well as working with school leavers and people from different religious backgrounds.

The firm engages with its supply chain, local SMEs and social enterprises to promote the industry. Wates commits to service level agreements at the early stages of projects to guarantee local labour, training and community involvement. A resident involvement policy ensures that local people are able to influence decisions that affect them, their homes and their communities by being involved with the design and selection of products.

Wates' own employees have the chance to feedback their views in an annual staff survey. In 2009, the survey found that 93% of staff felt engaged with the business and 100% were committed to ensuring the company's success. The survey also showed four areas that needed improvement, so Wates swiftly set up working groups with staff to come up with solutions for these problems. Proposals were then presented to the management team to help shape regional business objectives and influence changes to training programmes.

Wates also boasts above average industry figures for female employees (twenty four) and BME staff (twelve). 15% of its workforce also enjoys flexible working, including part-time and home working. For those with caring responsibilities, a carers' network has been set up to offer support and advice.

The firm's Building Futures initiative, a two-week scheme aimed at long-term unemployed adults, provides soft skills and practical training as well as an insight into the construction industry. Upon completion, participants are offered job interviews with Wates or members of its supply chain. 65% of people who completed the programme have found full-time jobs and in South Manchester, the firm employed five local residents as apprentices, working on their own estates.



Places for People

Irk Valley Community Primary School

Places for People

Organisations Involved:

- > Morgan Sindall Group plc
- > Manchester City Council
- > Brown & Co (EE) Ltd
- > Murray Building Services Ltd
- > The A A Group Limited
- > Murraywood Construction Ltd
- > P&L Joinery Subcontractors Ltd
- > Parpac Ltd
- > Robinson Design Group
- > Morgan Professional Services (MPS)
- > White Young Green
- > Edmund Shipway

Irk Valley Community Primary School is situated opposite the existing Victorian school in Waterloo Road, Lower Crumpsall, Manchester, adjacent to recreational playing fields and alongside the River Irk. The site is on the flood plain of the river and was formerly used as an engineering works. These works were demolished a number of years ago and the site had become neglected and overgrown.

The new two storey school comprises of a recreation hall with sprung flooring, classrooms, library, computer suite, fully equipped kitchen and dining area, music room and rooms for teachers and staff. Extensive outdoor facilities have also been included; a synthetic sports pitch with changing facilities which will also be utilised by the local community outside normal school hours.

The project team successfully dealt with a number of issues in the design and construction of the school including the regeneration of derelict industrial land, containment of contamination by encapsulation on the site, treatment of Japanese Knotweed, satisfying the requirements of the Environment Agency to enable development on a site with a flood risk, integration of community facilities within a school, enhancing biodiversity, for example, by designing in an ecology/attenuation pond adjacent to the river which provides a learning resource and an extension to the River Irk wildlife corridor. The team's overall approach to 'water management' during construction and in the longer term had to not only satisfy the stringent requirements of the Environment Agency, but also ensure long term sustainability. The approach took account of quantity, quality and amenity issues by adopting a Sustainable Urban Drainage System (SUDS), rainwater harvesting and protection of the River Irk.

An holistic approach to drainage design and water management considered the long term environmental and social factors taking into account the quantity and quality of runoff, the amenity value of surface water in the urban

environment and reduction of the risks conventional drainage systems can cause through flooding and pollution or damage to the environment. A design output was the inclusion of an attenuation pond at the outfall to the River Irk. This pond has been enhanced as an extra outdoor learning resource for the school, becoming part of a wild life sanctuary promoting biodiversity and enabling the children to study different species of plants, animals, birds, fish and reptiles that will naturally inhabit the area. One of the greatest challenges that faced the designers was the requirement for the building to be raised above natural ground level to avoid the risk of flooding. This complicated the means of escape from the building which was resolved by providing a suspended ground floor slab accessed by a complex arrangement of steps and ramps as pedestrian links to the nearest points of safety above the flood plain level. The building was designed with reference to the Green Guide for Specification resulting in over 70% of the materials used to construct the building being 'A' rated and therefore sustainable in terms of the lifecycle of materials in addition to them being readily recycled in the event of demolition.

The school forms part of a framework agreement with Manchester City Council to upgrade and renew a number of primary schools. Partnership working in a framework with Manchester City Council has led to a number of tangible benefits including 2% saving on cost, 5-8 weeks savings on programme, greater inclusion of community and a better safety and environmental performance when benchmarked against national statistics.

Places for People

Liverpool Canal Link and Pier Head Public Realm

Places for People

Organisations Involved:

- > Liverpool City Council
- > British Waterways
- > Balfour Beatty
- > EDAW
- > Arup
- > 2020 Liverpool

The £22m Liverpool Canal Link project restores a navigational connection between the Leeds and Liverpool Canal and the South Docks, which was in-filled in the early 1900s to facilitate the construction of the Three Graces. The new link, which took more than two years to build, reinstates this connection, with the new navigation crossing the front of the three buildings, allowing boaters to journey to the heart of the city.

The project reconfigures the Pier Head to form a world-class space, at the heart of the City's World Heritage site, which is distinctive and vibrant and attracts local and international visitors.

A cultural World Heritage Site is an historic monument, group of buildings or site which is of outstanding universal value to the international community.

The canal scheme was led by British Waterways and the public realm by Liverpool City Council. Funding came from NWDA, Homes and Communities Agency and Merseyside Objective One programme and ERDF. Progress of the works could also be tracked by webcam on the British Waterways' website. This project has transformed Liverpool's Pier Head creating a new events space and sheltered areas where visitors can escape the wind and watch canal boats as well as generous seating facing the river Mersey. The project is helping to reinvigorate Liverpool's docks - a key aim within Liverpool's Strategic Regeneration Framework.

The design with its central lawn and two open basins mirrors the formality and symmetry around the world-renowned Three Grace buildings and retains views of the river from further into the city centre. The scheme also includes a complete replanting of the avenue of maples planted by the Canadian High Commission and dedicated to the Battle of the Atlantic - 95 new semi-mature trees replaced failing specimens. Existing plaques were carefully salvaged and reinstated.

Only an exceptional design proposal was suited to this project, due to the sites cultural, historic and civic significance. Its success lies in the scale of the hard landscaping and its appropriateness to the setting. In addition it helps to anchor the new architecture of the ferry terminal and museum of Liverpool into the

world heritage site and wider waterfront. An environmental assessment of the site, prior to work starting, helped to minimise excavation. The existing dock walls were used in Trafalgar Dock and previously land-locked waterspace was reintroduced in the central docks.

The area was rich in archaeology, recorded diligently and featured on Channel 4's Time Team. Buried features and constraints mapping allowed the anticipation of archaeological surveys and earthwork activities. Laser scanning of old dock and river walls enabled data to be captured quickly, allowing the fast removal of the wall where necessary, optimising plant and labour use.

The designers used seat walls to accommodate level changes, inspired by the geometry of existing historic dock walls. The complexity of the design required extensive, computer-generated 3D models to check the geometry of the canal basins and to cut complex stone shapes with accuracy. This technique reduced waste and was cost effective, as well as showcasing innovative digital craftsmanship. The project underwent rigorous scrutiny by English Heritage and the local planning authority. As part of extensive consultation, the public voted on options for the alignment route for the link and designs for the public space were shared with the Mersey Waterfront Peoples Panel and with local councillors. It has been promoted nationally as an example of best practice in construction and regeneration within a historic environment and has won several awards. Liverpool City Council are organising a conference on regeneration in the historic environment for the 2010 Expo at Shanghai where this project will feature as a case study. Over ten years, through sheer determination and evolved relationships with many project partners and stakeholders, the link has finally become reality.



Places for People

Crosby Lakeside Adventure Centre

Places for People

Organisations Involved:

- > Mansell Construction Services
- > Sefton Metropolitan Borough Council
- > Owen Ellis Partnership
- > AECOM
- > Todd and Ledson
- > Alan Johnston Partnership

Creating new 'places for people' can help tackle issues such as crime, health, and poor educational achievements

Crosby Coastal Park has become one of Merseyside's prime waterfront locations, with the Crosby Lake Adventure Centre (CLAC) standing at its gateway. The area had been in serious decline with poor water quality, dilapidated lakeside buildings and increasing levels of anti-social behaviour. Decline has been reversed through the investment and creation of this outstanding flagship building. Sefton Metropolitan Borough Council set out a vision for the special site based on a new community watersports building that would boost the regional economy through a critical mass of integrated activities.

The design of the Centre had to be innovative; incorporate health, educational, recreational and sporting uses; be financially sustainable and sensitive to the environmental and legal requirements of developing the site. The building sympathizes with its unique environmental setting, using natural building materials. External funders at Mersey Waterfront, ERDF and Sport England helped to drive the vision that would transform the site. Similarly, local residents and wider stakeholders were consulted on what they would like. The building which was delivered on budget and ahead of schedule has been designed to ensure optimum accessibility for disabled users and employees. The CLAC is now the main visitor centre for the Sefton Coastal Park and has been a catalyst for other coastal projects, such as access improvements, garden restoration and the redevelopment of a nearby coastguard station. Within its first four years of operation, CLAC will have played a key role in the 2012 Paralympics; established a development legacy in Sefton's sporting community; maximised the offer to schools and young people across Merseyside and the North West, particularly disabled children; delivered jobs to the local community and economic regeneration to the wider region through increased tourism.

Sustainability has been at the heart of the development, which has been awarded a BREEAM rating of 'Very Good' and an energy performance rating of A. The building design incorporates an innovative green roof utilising locally sourced turf, which complemented the local ecology.

The structure of the building itself is a combination of steel and larch glulam, clad in cedar to blend with the coastal environment.

Crosby Coastal Park is an area of high conservation value, which meant engagement with a number of stakeholders: the Environment Agency and Natural England on sustainability issues; Sport England to ensure a national centre of excellence; ERDF, Mersey Waterfront and the Learning and Skills Council, as well as local residents and lake users on a range of other associated issues. For the management of the construction process, contractors at Mansell Construction Services worked with Step Clever and Build Sefton to source local labour and help train young workers. Mansell achieved practical completion five weeks ahead of schedule and achieved the BREEAM 'Very Good' rating without jeopardising the scheme's budget, despite incorporating some innovative solutions into the build.

> **Dewatering and groundworks** - The site had a high water table with running water and deep excavations requiring dewatering and control of the discharge. Mansell developed an approach moving away from wellpoints to interceptor trenches at strategic points with savings in time and cost.

> **Structural frame** - The design involved both steel and glulam frames and connection details were developed and coordinated to ensure each complemented the other.

Crosby Coastal Park involved both technical and organisational innovations, which have been recognised as exemplars and adopted as company initiatives on subsequent and future high-profile local schemes, including Brockholes Wetland in Preston, NW Fire PFI and Oldham LIFT.

- > Supply Chain development and engagement with SMEs.
- > Working alongside sensitive sites especially SSSIs.
- > Adoption of Considerate Constructors procedures.
- > Community Engagement especially schools.
- > Adoption of sustainable building techniques and materials.

The image shows the interior of a brick building. Two dark, cylindrical columns are in the foreground, framing a view of a large, arched window. The walls are made of red brick, and the floor is paved with light-colored tiles. The lighting is bright, coming from the window, creating a high-contrast scene.

Places for People

The Ancoats Regeneration Programme

Places for People

Organisations Involved:

- > North West Regional Development Agency
- > New East Manchester (NEM)
- > Manchester City Council
- > Homes and Communities Agency
- > Heritage Works
- > English Heritage

The Ancoats Urban Village strategy aims to reverse 50 years of decline in the physical fabric of Ancoats, historically a thriving industrial quarter on the edge of Manchester City Centre, to create a sustainable mixed use extension of the city with a resident population of 3,000 to 5,000 people and a viable economy providing around 3,000 jobs within the 20 hectare site.

Ancoats is located north east of Manchester City Centre, being a 10 minute walk from the retail and commercial core and the two principal rail stations of Piccadilly and Victoria. Ancoats lies at a gateway into the City Centre, at the junction of the A62, Oldham Rd and the inner ring road. The Rochdale Canal runs alongside. In the 1990s the area was considered a 'no go' area for investment due to a perception of: dereliction, a threatening and intimidating place, and a place where vandalism, fly tipping and street crime flourished.

The regeneration project was inherited by the Northwest Regional Development Agency from English Partnerships at the Agency's inception in 1999. The Compulsory Purchase Order (CPO) was made in 2002. The NWDA's investment in the project is to end in 2012.

Ancoats is a three part strategy comprising interlinking elements:

- (i) the implementing of quality design in the built environment via Supplementary Planning Guidance
- (ii) Major investment in the Public Realm, underpinned by a public realm strategy, and
- (iii) An underpinning CPO and Gap Funding for developments

Sustainability has been at the heart of the regeneration of Ancoats, as evidenced by:

- > The re-use of vacant historically significant buildings for new uses in what was the worlds first industrial suburb; a landscape which is now a designated conservation area.
- > Retention of the areas tightly knit street grid pattern which allows for high density development.
- > A mixed use urban village in which employment and living opportunities sit side by side.
- > An area of pedestrian priority facilitated by a stunning new public realm which utilise long life low energy materials and fittings.
- > True engagement of local people and employees through newly established Residents and Business Forums.
- > Use of a pioneering 3D model which covers the urban village and features over 100 buildings, allowing people to virtually fly, walk, drive through and circle the streets and buildings of Ancoats, affording decision makers a unique design tool.
- > Establishing a mechanism to collect ongoing estate charges which will be ring fenced to support future estate management and ensure that the area never again slips back into decline.

In summary, Ancoats in Manchester is an ambitious regeneration programme, where a wealth of public and private investment has helped restore a historic area and its economy to its former glory by creating hi-tech new office space, modern residential accommodation and transforming derelict wasteland into a sustainable environment containing vibrant urban spaces.

Environmental Sustainability

MediaCityUK



Environmental Sustainability

Organisations Involved:

- > Bovis Lend Lease
- > Peel Media

MediaCityUK is a long-term development for the creative and digital industries situated on a vast waterfront site at Salford Quays. MediaCityUK is the largest privately funded development in Europe and is being developed and managed by Peel Media, whose investment in phase one will amount to over £500 million.

The initial aspirations for MediaCityUK have grown from providing an eye-catching car park structure to an Energy Centre which has now become the sustainable beating heart of the development.

The £45M Energy Centre is set to be both energy efficient and environmentally friendly, providing sustainable power, heating and cooling to not only the current development but also for future potential development. It is a scheme that sets the benchmark in sustainable power, heating and cooling for other developments. Media businesses demand a high degree of electrical power resilience, primarily for the support of broadcasting critical activities. The Energy Centre provides the power it requires in the most sustainable way possible.

The original plots allocated for the Energy Centre substations were inadequately sized. The actual size would have compromised adjoining development plots. A solution therefore had to be found on how to accommodate the substations. The Project Team explored alternative locations and the design was significantly modified to accommodate the new Energy Centre substation. The substation takes up approximately 25% of the new space within the multi storey car parks ground floor and Energy Centre level. The remaining free space allowed the introduction of site wide tri-generation plant and centralisation of all of emergency generators from each of the buildings in the development. The rationalisation and consolidation of energy functions realised further financial opportunities including; incorporation of the Gas Governor House and future option to use biofuel, centralising of electrical metering facilities and provision of dedicated incoming communications links for the whole development.

The tri-generation plant and centralisation of the emergency generators were designed to make the MediaCityUK project as sustainable as possible. The system reduces carbon emissions, enhances security of energy supply and provides lower energy costs. The tri-generation plant also generates electrical power, if required, to be exported to the National Electricity Grid. This is, at present, the UK's largest private electrical network. The waste heat from the plant is used to heat the buildings at MediaCityUK in the winter months as well as being used to cool the buildings during the summer months.

Using the tri-generation system enabled the complex and large heating and cooling requirements at MediaCityUK to be dealt with. The system will also reduce the carbon footprint by 36%. Not only is the system tackling global warming issues but the energy savings to the client exceed £400,000 per annum as well as providing lower cost tariffs to the building users. This centralisation has significantly reduced the construction cost of each building as further plant floors or basements were not needed. The associated planning conditions were also negated as building height limitations were then easily met. This also made the construction more sustainable through less use of materials, reduced excavation and cart away of potentially contaminated land. The achievements made on the Energy Centre are now being communicated globally across the development partners businesses.

The image shows the exterior of Saughall All Saints Primary School. It features a red brick building with a modern design, including a curved roofline and large windows. A yellow canopy structure is visible over a colorful play area in the courtyard. The foreground shows a paved area with shadows cast by the building. A purple banner is overlaid on the left side of the image.

Environmental Sustainability

Saughall All Saints Primary School

Environmental Sustainability

Organisations Involved:

- > Lovelock Mitchell Architects
- > Cheshire West and Chester Council
- > Willmott Dixon Construction
- > Rotary North West
- > TACE

Saughall All Saints Primary School is a new 10 class, 310-pupil school formed following the merger of an existing infant and junior school.

The build is a unique design combining a stimulating learning environment with energy efficiency and sustainability, influenced by the surrounding mature trees and pond. A new wildlife and woodland trail, an amphitheatre, a boardwalk and supplementary planting has been added to encourage local wildlife.

The 1,800 sq m building used an exposed 'Glulam' timber structure with classrooms on the outer side of two wings built around a central courtyard. Shared spaces are arranged on the inner side of the wings facing the courtyard.

The project has achieved a BREEAM 'Excellent' rating and incorporates a bio-mass boiler, solar thermal potential for hot water pre-heating and natural ventilation and day-lighting throughout the building.

Light pipes, a type of tube that uses natural light sources to disperse or shift light, have been used throughout to ensure less reliance on electrical lighting.

Intelligent building controls linked to temperature and other environmental sensors activate window controls to ensure the best possible environmental conditionals are maintained in all areas of the school. A building management system links most of the features for optimum performance. The new school will have a huge impact on the local community and its pupils, providing a modern and stimulating learning environment as well as promoting sustainability.

The school will save 12.5 tonnes of carbon each year from just using a bio-mass boiler instead of conventional gas. The design encourages integration as the classrooms, with glazed screens, flow out into a transitional open space and a central courtyard seen from all points within the building.

During the design process there was consultation between school staff and pupils, who were asked to put forward their ideas. Throughout the build, pupils were invited onto site to experience the construction, providing a valuable learning opportunity. The project was widely promoted through Cheshire West and Chester Council, Lovelock Mitchell, Willmott Dixon Construction and other consultants' websites, encouraging a strong sense of partnering and collective responsibility.

Saughall All Saints was the first BREEAM 'Excellent' rated school completed by the design and build team and the techniques developed and knowledge gained during the construction will be taken forward into new projects.

Environmental Sustainability

Liverpool Science Park ic2



Environmental Sustainability

Organisations Involved:

- > Mayfield Construction Company Limited
- > Neptune Developments Ltd
- > Falconer Chester Hall
- > Bingham Davis
- > Tweeds
- > Atlasco Steel & Cladding
- > Genlec Electrical
- > Ambient Energy & Environment
- > Technic Mechanical Services Ltd
- > Davies Partnership

Liverpool Science Park ic2 is located within the Liverpool Metropolitan Cathedral Conservation Area, an area that combines many buildings made with both natural stone materials and curtain walling. The design of ic2 meets both the key objectives of providing a building suitable for a 21st Century Science Park whilst being in keeping with the conservation area design parameters.

Due to the location of the new building there were a number of issues relating to deliveries and public interface during the construction period; as the site was 'shoehorned' between two existing sites with minimal working space. The day to day implications had to be coordinated to ensure the smooth running of the programme was never jeopardised.

The initial brief of the project was to adapt and make safe works previously undertaken by another contractor who, unfortunately, had gone in to receivership shortly after winning the original contract. This left the client with the problem of re-tendering the work and turning around the new procurement process in a quick timeframe to ensure the build programme would not be affected and time constraints could still be met.

Having been successful with the tender, the main focus of Mayfield was to integrate with the retained design team and the client to assess where the true scheme was in relation to the programme. Retaining this basis, the design was further developed and works commenced in good time with the completion date being achieved in line with European funding agreement.

The innovative supply chain approach to the project enabled a specialist team to work with all members of the design team in providing a cost effective design solution to meet and achieve the desired 'Excellent' BREEAM rating. Externally, in order to minimise the scheme's disruption to the existing neighbourhood and environment, the site parking is provided in a purpose built underground car park incorporating a green roof. All of these factors led to it being awarded 'Best Commercial Development of the Year 2009'.

In order to achieve the required rating for the BREEAM assessment a number of renewable energy solutions were assessed and, in conclusion, the use of a ground source heat pump system was adopted for the scheme.

Due to the physical limitations on expenditure and practicalities within the development, any renewable energy achieved would have been considered on a standalone basis. The office development has a total floor area of 3400sqm. Providing a ground source heat pump system utilising bore holes connected to external condensers provides heating and cooling to the site: the calculation of energy production by the renewable energy sources has been calculated as follows:-

- > The total energy produced by the ground source heat pump system would be 198,000Kw hrs per year.
- > As the total predicted energy used would be 765,000Kw hrs it can be seen the ground source heat pump would meet approximately 25% of the energy used.

An ecologist assessment was undertaken and areas identified to ensure that minimal impact to the surrounding area could be achieved. This not only enabled the BREEAM rating of 'Excellent' to be achieved but ensured the Landscape Architect would specify a native planting scheme to ensure the finished design did not impact on the conservation area or the existing wildlife. Some of the items identified will be implemented over the life of the building and as the landscaping matures.



Environmental Sustainability

Sir William Stanier Community School

Environmental Sustainability

Organisations Involved:

- > Willmott Dixon Construction
- > Cheshire East Borough Council
- > Aedas Architects
- > GCM Consulting Engineers Ltd

Sir William Stanier Community School (SWS) started in 2007 after the amalgamation of Coppenhall High School and Victoria Community Technology School.

Previously situated on two sites; Lime Tree (previously Coppenhall) and Meredith (previously Victoria), a brand new £25M 21C School building was constructed on the playing fields of the "Coppenhall" campus. Phase 1 (the main building) was completed in September 2009. Phase 2 Sports and Leisure Centre was a refurbishment after most of the old "Coppenhall" was demolished leaving the Sports and Drama Halls which have been revamped to match the new building style. This was completed in Easter 2010. A sustainable, low carbon approach drove the design of the school from the beginning. A South East orientation gives passive heating in the winter without excessive heat gain in the summer.

A renewable energy strategy was adopted that maximised carbon reduction and also complimented the function of the building. Combined Heat and Power, heat provision through heat recovery techniques, highly efficient lighting, an integrated BMS and super insulated walls were all designed in at a very early stage to compliment an optimal building orientation.

The overall improvement achieved equated to a 35% reduction in Carbon Dioxide emissions when measured against the base performance (2002 Building Regulations energy performance levels). This equates to a building energy usage 54% below the best practice figures of 142 Wh/m²/yr fossil fuels and a CO₂ reduction of 2,385,000 litres. Improvements in other areas were also achieved; rainwater recycling and the incorporation of efficient WC, urinal and washing facilities have resulted in an approximate 70% reduced water usage (based on BREEAM), the equivalent of two Olympic size swimming pools annually.

A target of using 20% recycled materials was met and the utilisation of recycled blocks and demolition materials were key contributors. A sustainable urban drainage system (SUDS) incorporated into the project significantly reduced the

surface water discharge from the site, also assisted by the Natural Sedum Roof which provides an educational opportunity as a science garden. All the above will contribute to achieving a BREEAM rating of Very Good. Material selection was carefully considered to ensure compatibility with the environmental targets and BREEAM strategy. Floor finishes, ceiling tiles, and wall finishes, were selected to ensure a minimum 'A' rated performance when measured against the BRE's Green Guide. Access and registration is controlled by a state of the art biometric system that instantaneously provides accurate pupil accountability and improved security. A Smart Card system has provided keyless access to all teaching, office and administration rooms complimenting and enhancing these improvements.

Engagement with the community commenced at the beginning of the design process. This included displays and talks, a targeted local press campaign and regular open evenings for prospective parents. All of these promoted extensive investment in the future of Crewe and its young people, thereby raising the aspirations and value of the community in general.

Integration of other stakeholders was also vital, The Planning, Highways, and Fire Authorities, Sport England, and Natural England, were all integrated into the design and construct process by Willmott Dixon Construction. Such was the strength of the relationship with the Client, an independent Contract Administrator was not considered necessary on the SWS project.

The new facilities have placed the SWS at the heart of the community. Projects are now co-ordinated from the school, such as the Queens Park Project, which has opened up funding streams to improve young people's facilities in Crewe. The take up in adult learning has increased as has the support provided by SWS to its ten partnered Primary schools.

Environmental Sustainability

Rising Bridge Business and Enterprise Village, Rossendale

Environmental Sustainability

Organisations Involved:

- > Lancashire County Council's Economic Development Department, (Lancashire County Developments Limited LCDL)
- > Northwest Regional Development Agency
- > BREEAM and Sustainability Consultants – Scott Hughes Design
- > Rossendale Borough Council
- > ROK Limited

The Rising Bridge Business and Enterprise Village is located within a semi rural area in Rossendale and comprises 32,000 square feet of high - quality business space, for at least nine small to medium sized businesses in support of the jobs and growth agenda.

Lancashire County Council invested in excess of £6million to build the 'flagship' office development and secured a grant of £820,000 from the NWDA towards site remediation, construction costs and BREEAM requirements. The development, designed in house by Lancashire County Council's Property Group, offers high quality business space of a high environmental standard, demonstrated through achievement of a BREEAM 'Excellent' rating.

To ensure the project achieved the desired high levels of environmental sustainability, the aims and key project drivers were agreed at the outset:

- > Achieve an 'Excellent' BREEAM rating. (A design stage award of 70-75% has been achieved.)
- > Reduce the need for car-parking through improved cycling facilities and a comprehensive travel plan.
- > Reduce waste generated and energy wastage during and following construction through best practice commissioning and site management processes.
- > Maximise the health and well-being of future occupants through careful and considered design. This challenged the notion of industry improvement.

The main challenges related to the site itself. The original ground condition report indicated high concentrations of methane produced by natural peat soils. For this reason private sector developers had been unable to develop the site as expensive remediation works were required to address the geotechnical and topographical ground conditions. The groundwork solution deployed was designed in house by Lancashire County Council's Environment Directorate and included 812 vibro concrete columns to stabilise the site. Additionally, the design's innovative 'colander' drainage system removed the requirement for surface water drains. The design includes provision of a new wildlife corridor between the site and the school field. This functions as an educational resource and transforms what was

previously described as 'ecologically barren' to an area of significant ecological merit. Additionally, LCDL developed a comprehensive educational guide and programme of activities for the duration of the project lifecycle. The measures included to satisfy BREEAM have led to reduced water and energy usage and consequently reduced costs.

In terms of water usage the development is projected to achieve a saving of 76% over the NWDA and BRE benchmark of 5.5 m³ per person, per year. Only 1.32 m³ per person, per year of potable water will be employed on site for non-potable applications, such as WC flushing and irrigation. This high standard has been achieved through the considered design and intelligent technology employed within the development. The landscaping has been designed to require little or no irrigation other than that provided naturally and the development includes the use of dual-flush WCs and low-flow taps and showers. Regarding energy performance, the development has achieved a saving of 33.4% over the standard building, as defined by Building Regulations 2006, Part L2A. This is due to the holistic design approach and to the specification of low-carbon, air-source heat pumps to provide almost 20% of the energy required to service the units.

Minimisation of waste and exploitation of recycled materials was another key consideration of the project. The site required considerable structural remediation producing a large volume of excavation waste, some 3000m³. The creative solution was to utilise around half of this waste to create the school wildlife garden. The other half was recycled for use off-site. It is estimated that via this process the development incorporated some 500 tonnes of waste material, whilst only sending 40 tonnes to landfill. In essence, the development incorporated over 10 times more waste material than was sent to landfill as a result of development. The project demonstrates that through strong partnership working and the use of innovative technology it is possible to achieve a high quality office development which exceeds environmental and sustainability standards.

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