Established in 1974

Case Studies - Combination
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This new-build Tesco Express store, opened in June 2008, was the first Tesco convenience store to be built in their Environmental Format.

Monodraught WINDCATCHER® natural ventilation systems were specified by the Tesco Express design team to counter heat gains by introducing fresh air into the building and expelling stale warm air from the underside of the roof level of the building.

Four GRP 1000 Square WINDCATCHERS were installed in the main sales area of the store and 350 mm Monodraught SUNCATCHER® systems combining natural ventilation and SUNPIPES®, were fitted in the staff toilet facilities. In addition, three 300 Monodraught SUNPIPES were installed in the staff room, store room and bakery preparation area.

This new part refurbishment and part new build centre was opened in June 2010 and the Architects chose Monodraught SOLA-BOOST® solar assisted natural ventilation and SUNPIPE® natural daylight systems to provide ventilation to the internal office spaces and resource rooms.

• **Angiography Suite 3**
• **Client:** NNUH
• **Architect:** LSI Architects
• **Contractor:** Eyre Electrical
Three WINDCATCHER® systems were installed within the canteen and stockroom with a further 42 SUNPIPE® system to back of house areas and 17 SUNCATCHER® systems to internal office areas.

SUNPIPE & SUNCATCHER: Marks and Spencer

Natural Lighting and Ventilation

- Location: Galashiels
- Architect: GVA Grimley

The 9,000 sq ft Galashiels store features 12 SUNPIPE® systems and three GRP 800 Square SUNCATCHERS® among ‘eco-features’ that significantly reduce its carbon footprint and improve its energy efficiency.

M&S claims the store uses up to 25% less energy and emits up to 95% less carbon dioxide than an average Simply Food store.

The Galashiels store has been a test bed for developing new initiatives that have since been rolled out in other Simply Food stores across the UK.
This new extension to the present chemotherapy suite comprises of a ‘link-building’ which joins the existing waiting area and new treatment building, and a new larger treatment space. This treatment area accommodates chemotherapy treatment and clinical cancer trial areas.

The architects approach for the building was to design a bright and spacious environment which is intended to be both uplifting for both staff and patients and the therapeutic value of a link to the outside.

The Chemotherapy unit uses SOLA-BOOST® solar assisted natural ventilation systems to provide energy free and maintenance free ventilation to the office spaces, counselling and PICC rooms. SUNPIPE® natural daylight systems were used to supplement the natural daylight, with the systems dropping through the first floor to provide natural daylight to deep plan and land locked areas on the ground floor.
SUNPIPE & WINDCATCHER:
Trinity & St Nicholas Primary Schools

Natural Lighting and Ventilation

- **Location:** Radstock
- **Consultant:** King Shaw Associates

Trinity School in North Radstock and St Nicholas School in South Radstock are jointly known as the Renaissance Project. They are part of a rationalization programme undertaken by Bath and North East Somerset Council and are bristling with new innovative and sustainable ideas. Tim Goodwin, the Senior Partner of Architects, King Shaw Associates explained, “We take the view that a holistic approach to engineering design results in more complete and fully integrated solutions, which apply to an entire building. We decided to replace many of the conventional skylights originally proposed by using Monodraught SUNPIPES® because of the many advantages that these SUNPIPE systems provide. We considered that WINDCATCHERS were an excellent way to ensure good natural air distribution and to meet the brief of providing a cost effective natural ventilation system within the building envelope budget.”

SUNPIPE, WINDCATCHER & MONOVENT:
Penryn College

Natural Lighting and Ventilation

- **Location:** Cornwall
- **Architect:** Poynton Bradbury Wynter Cole

Cornwall’s BSF Pathfinder project opened a year ahead of any other projects in this funding group – the £20m scheme provides some 8500 square metres of new accommodation for 1150 pupils aged 11-18 and achieved a BREEAM ‘Excellent’ rating. The demand for outstanding environmental performance was achieved with an Architectural design approach with daylighting and natural ventilation and cooling prioritised. A total of 42N° Monodraught WINDCATCHERS®, SUNPIPES®, and MONOVENTS, were used throughout the Project, the largest units being some 3.3 m x 2 m on plan. Some of the smaller units were used on a green roof design.
Twenty Monodraught SUNPIPES® and eight SOLA-BOOST® natural ventilation units with an 8 - zone iNVent natural ventilation control system that monitors and controls the SOLA-BOOST units have been installed. The SOLA-BOOST systems were chosen as part of a thermal model for the building, to work in tandem with the underfloor heating. If sensors detect that temperatures and/or CO₂ levels in the classrooms have exceeded maximum pre-determined settings, the SOLA-BOOST units automatically respond by bringing in fresh, natural air from the outside.

SUNPIPE & SOLA-BOOST: Seaside School

Natural Lighting and Ventilation

- **Location:** Lancing
- **Architect:** R H Partnership

Twenty Monodraught SUNPIPES® and eight SOLA-BOOST® natural ventilation units with an 8 - zone iNVent natural ventilation control system that monitors and controls the SOLA-BOOST units have been installed. The SOLA-BOOST systems were chosen as part of a thermal model for the building, to work in tandem with the underfloor heating. If sensors detect that temperatures and/or CO₂ levels in the classrooms have exceeded maximum pre-determined settings, the SOLA-BOOST units automatically respond by bringing in fresh, natural air from the outside.
Monodraught are pleased to have been part of the re-development at Battersea Dog and Cats home to create a state-of-the-art facility for vulnerable animals in the city of London. A range of our systems were installed in the Tealby building which was opened by Her Majesty the Queen, a patron of the charity last year.

The £4.9m project allowed the charity to have new kennels built, making dogs more comfortable including such measures as; not allowing the dogs to see each other, avoiding intimidation, plus its own outdoor area and underfloor heating.

Monodraught were able to supply SUNPIPE systems to bring natural light into the corridor area. The SUNPIPE natural daylight system directs sunlight into the corridor from roof level. The SUNPIPE collects daylight using a patented Diamond dome, using a silverised PVD coated mirror-finished aluminium tube to transfer light to the kennels, with a ceiling diffuser evenly distributing the light around the kennels.

A WINDCATCHER system was installed in each of the 8 blocks of 7 kennels including Monodraught’s patented “No-Leak guarantee” active Louvre modulating aerofoil louvre technology.

By installing a variety of sustainability measures including Monodraught’s own natural ventilation system, as well as Solar control, high thermal mass, air source heat pumps and a long, photovoltaic canopy the building was granted a top BREEAM accreditation.

There are many benefits to installing a natural ventilation system including the economic benefit of using natural energy thus being sustainable energy in action by using wind pressure and the natural stack effect of thermal buoyancy, natural ventilation does not use any fossil fuelled energy but relies on harnessing wind power and the thermal rise of warm air to be used in a controlled and sophisticated way.

It’s also healthier; natural ventilation brings in a steady supply of fresh air into the building, topping up the oxygen level, whilst at the same time expelling stale air to atmosphere using the natural buoyancy of thermal forces.

WINDCATCHER, SUNPIPE, VENTSAIR & SOLAVENT: Battersea Dogs and Cats Home Tealby

Natural Lighting and Ventilation

- **Sector:** Charity
- **Architect:** Jonathan Clark
- **Consultants:** Mendick Waring
- **Electrical and Mechanical Engineers:** Crestmount UK
- **Construction:** Lakehouse
- **Location:** Battersea, London
- **Product installed (Spring 2015):**
  - 8 N° WINDCATCHER X-AIR 170 systems
  - 4 N° WINDCATCHER X-AIR 140 systems
  - 30 N° SUNPIPE 530 mm systems
  - 1 N° SOLAVENT systems
  - 48 N° 800 x 400 VENTSAIR Wall-mounted systems
  - 8 N° 1120 x 400 VENTSAIR Wall-mounted systems
  - 3 N° 800 x 600 VENTSAIR Wall-mounted Systems
  - 56 N° 480 x 590 external wall louvres
It is most appropriate that Milton Keynes Development Corporation have been one of the first to recognise the advantages of natural ventilation and indeed, natural lighting from SUNPIPES for the benefit of children's health and development. To date 16 schools in the Milton Keynes area have now been completed using these systems. Architects like the clean lines of the Monodraught systems but also recognise they are making a major contribution to reducing energy costs and maintenance costs in their school budget programme.
This was one of the first major Projects for Monodraught WINDCATCHERS® completed more than 10 years ago in January 1998. Building Simulation carried out extensive modelling and top Environmental Consultants, Battle McCarthy undertook the original design concepts.

This was a new £12 million school, at the time the largest Contract being undertaken in Jersey and demonstrates how classrooms both on the top and ground floor can be served by the Monodraught systems ducted down through the first floor classrooms. The project shows that a particularly striking application of natural ventilation systems can be achieved with a totally energy free use of natural ventilation operating under extreme conditions due to the extensive use of full height glazing.

WINDCATCHER:
Haute Vallee School

Natural Lighting and Ventilation

• Location: St Helier, Jersey
• Architect: Architecture PLB, Winchester
Monodraught supports natural ventilation and lighting strategy for Barrow-in-Furness police station

Natural Lighting and Ventilation

- **Sector:** Public Sector
- **Architect:** Unwin Jones Partnership
- **Services Engineer:** QED
- **Contractor:** Thomas Armstrong (Construction) Ltd
- **Location:** Barrow-in-Furness, Cumbria
- **Product installed:**
  - 18 N° 530 SUNPIPE systems and 9 N° 300 SUNPIPE systems
  - 4 N° WINDCATCHER Classic systems

A new state of the art police station was recently opened in Barrow-in-Furness. The new station became operational in October 2015 and was successfully shortlisted as a finalist in the Commercial Build Section of the Northern Design Awards for 2015.

Barrow-in-Furness is a town which has been built on iron and steel production, ship building and maritime industries. The building celebrates both Barrow’s history and its 21st century capabilities with a contemporary design that has clear maritime influences.

Central to the building is an atrium which allows the building to be naturally ventilated and lit. It varies along its length with the wider areas forming informal meeting and seating areas. The three storey atrium helps to create a building that is light, airy, spacious and enjoyable to work in.

The building is north facing and ventilation to the offices and atrium space is provided by Monodraught’s natural ventilation system. There are a series of WINDCATCHERS® at roof level and in addition, there are automatically controlled opening windows. This helps ensure air flow and temperature is controlled throughout the year.

Monodraught supplied 18 N° 530 SUNPIPE® systems and 9 N° 300 SUNPIPE systems to provide a natural lighting solution for the new building, in particular the custody cells. The SUNPIPE natural daylight system directs sunlight into a room from roof level.

Monodraught Sunpipes are:

- **Cost effective** – energy costs can be saved as the need for electric lighting during daytime hours is minimised by as much as 75%.
- **Healthier** – studies have shown that people work better under a natural daylight environment and natural daylight is known to combat the effects of Seasonal Affective Disorder (SAD).
- **Sustainable energy in action** – not only can Sunpipe systems reduce energy usage it also leads to a considerable reduction in CO₂ emissions.

The WINDCATCHER Classic is an energy free natural ventilation system encompassing the benefits of both top-down and passive stack ventilation. The system consists of an external louvre bank protected internally by an anti-bird mesh and internally divided. The simple, but effective design of the system provides fresh air during the daytime as well as night-time cooling.
AA new civic headquarters for Harrogate Borough Council is being built on its Knapping Mount site in Harrogate. The new council offices, which have been designed by Yorkshire based architects Farrell & Clark, aim to enable the council to save in the region of £1 million a year in operating costs. Construction work has already started and the building is planned to be fully operational in the summer of 2017.

An important part of the project is to ensure that it is built to BREEAM Excellent standards. BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building’s environmental performance, ensuring future running costs are greatly reduced.

Monodraught have been specified to provide natural cooling and ventilation to all areas in an open plan office arrangement, whilst a central atrium space will be ventilated by our bespoke ventilation system. Monodraught will be providing 30 N° COOL-PHASE systems and 2 N° WINDCATCHER Classic bespoke circular GRP systems. Monodraught’s COOL-PHASE systems specifically contribute credits towards BREEAM standards for sustainability across a variety of factors, including credits for lifecycle costs, indoor air quality and for the use of low and zero carbon technologies.

COOL-PHASE is a low-energy cooling and ventilation system that creates a thermally comfortable, fresh and healthy indoor environment by monitoring internal air quality and ensuring there is a supply of fresh air. The COOL-PHASE system is energy and carbon saving, it uses an energy efficient variable speed fan with no compressors, pumps or other energy intensive components. A 5A single phase mains supply is all that is required.

Natural ventilation will bring a steady supply of fresh air into the civic headquarters, maintaining CO₂ levels and expelling stale air to the atmosphere using the natural buoyancy of thermal forces.

Monodraught natural ventilation and cooling systems have proved to be consistently effective and reliable over many years. The constant reporting and feedback to Monodraught’s dedicated R&D team enables our products to be improved in their manufacture, aesthetics and performance.

To find out more about our natural cooling and ventilation systems and how they can support your building in qualifying for BREEAM call us on 01494897700.
COOL-PHASE & WINDCATCHER: Alderman Knight School

Natural Cooling and Natural Ventilation

One new COOL-PHASE® unit has been installed in the ICT Room at Alderman Knight School to provide natural cooling within the area. The data below shows the performance achieved from the system as an average.

Internal Temperature Results:

<table>
<thead>
<tr>
<th>Daily Temperatures (°C)</th>
<th>Average</th>
<th>Min Average</th>
<th>Max Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/06/12 - 31/05/13</td>
<td>21.8°C</td>
<td>19.6°C</td>
<td>23.2°C</td>
</tr>
<tr>
<td>31/05/13 - 24/03/14</td>
<td>20.7°C</td>
<td>18.4°C</td>
<td>22.1°C</td>
</tr>
<tr>
<td>24/03/14 - 30/03/15</td>
<td>20.8°C</td>
<td>18.6°C</td>
<td>22.1°C</td>
</tr>
</tbody>
</table>

This data was collected from the unit installed between 7th June 2012 and 30th March 2015. The table shows the overall average daily temperatures for each year.

<table>
<thead>
<tr>
<th>Max Temperatures (%)</th>
<th>&gt;25°C</th>
<th>&gt;28°C</th>
<th>&gt;32°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/06/12 - 31/05/13</td>
<td>7.3%</td>
<td>0.5%</td>
<td>0%</td>
</tr>
<tr>
<td>31/05/13 - 24/03/14</td>
<td>0.4%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>24/03/14 - 30/03/15</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

The table above shows the percentage of time that the internal temperature has spent at over 25°C, 28°C and 32°C during the logged period.

Energy Consumption:

<table>
<thead>
<tr>
<th>Energy Use over the total installed period: 147 weeks (2 Years 10 months)</th>
<th>Total Energy Usage since install (based on £0.11 per KWh)</th>
<th>£48.50 total</th>
<th>33p per week</th>
<th>5p per day</th>
<th>Approx. £17 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Energy Usage since install (based on £0.11 per KWh)</td>
<td>440.9 KWh</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CO₂ Levels:

<table>
<thead>
<tr>
<th>CO₂ Levels</th>
<th>&gt;1000 ppm</th>
<th>&gt;1200 ppm</th>
<th>&gt;1500 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/06/12 - 31/05/13</td>
<td>3%</td>
<td>0.5%</td>
<td>0%</td>
</tr>
<tr>
<td>31/05/13 - 24/03/14</td>
<td>5.1%</td>
<td>0.7%</td>
<td>0%</td>
</tr>
<tr>
<td>24/03/14 - 30/03/15</td>
<td>4.5%</td>
<td>0.6%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Background or atmospheric CO₂ level is approximately 400 parts per million (ppm) and 1500 ppm or above would be considered a high level.

Matt Peplow - Business & Operation Manager at Alderman Knight School said:

“Throughout our school there were very few rooms that suffered with no ventilation. All of our classrooms either have openable north lights or external doors. However we did have an ICT Suite, an Office and a Meeting Room with no external windows so we decided to utilise the Monodraught WINDCATCHER® and COOL-PHASE systems within these spaces. The COOL-PHASE system that we have in the ICT Suite manages the temperature of the room very well and whilst you may lose an element of control that you get with Air-Conditioning, you are reducing the energy consumption that you are using to cool the space. We also had some WINDCATCHER systems installed in the Main Hall which is very useful when the Hall is packed up over a period of time. It makes a big difference in terms of the levels of CO₂ and quality of the air”
Monodraught’s largest COOL-PHASE installation at Lambeth College

Natural Cooling and Ventilation

- **Sector:** Education
- **Location:** Lambeth, London
- **Date:** Summer 2015
- **Consultant:** Atkins
- **Construction:** Graham Construction
- **Mechanical and Electrical Engineers:** JBE
- **Products installed:**
  - 38N° COOL-PHASE® Systems
  - 4N° SOLA-BOOST® X-Air Systems
  - 20N° 800 x 300 VENTSAIR® Systems
  - 8N° 800 x 600 VENTSAIR Systems
  - 1N° iNVent Control System

Monodraught recently completed our largest ever COOL-PHASE installation at Lambeth College in London. 38N° COOL-PHASE systems and 28N° VENTSAIR systems were installed in Classrooms and Teaching Spaces, and 4N° SOLA-BOOST X-Air systems were installed in the Sports Hall.

The £12 million pound Lambeth College development programme was opened by Chukka Umunna last summer, with students starting to use the building in the autumn term. The building works comprised new facilities supporting curriculum areas in sport, travel and tourism, uniformed public services, health and early years as well as provision for adult skills, ESOL, English and Maths and LLDD.

Lambeth College has been investing in sustainable buildings and aiming to reduce carbon emissions since the sixth-form building was constructed back in 2009. Monodraught are pleased to provide solutions which can help meet this criteria.

Andrew McCubbin, Managing Director of Monodraught said “We are delighted to have installed our largest ever Cool-Phase solution at Lambeth College. We continue to see strong growth in our award-winning natural cooling products for the Education Sector.”

COOL-PHASE is a low-energy cooling and ventilation system that creates a thermally comfortable, fresh and healthy indoor environment by monitoring internal air quality and ensuring there is a supply of fresh air. The COOL-PHASE system is energy and carbon saving, it uses an energy efficient variable speed fan with no compressors, pumps or other energy intensive components. A 5A single phase mains supply is all that is required.

SOLA-BOOST X-Air is the latest generation of natural ventilation featuring our patented ActivLouvre modulating aerofoil technology and DC Solar powered fan. Integrating with the WINDCATCHER X-Air system, it will provide additional ventilation on sunny days whilst maintaining zero running costs.

Natural ventilation brings a steady supply of fresh air into the college, topping up the oxygen level, whilst at the same time expelling stale air to the atmosphere using the natural buoyancy of thermal forces. Fan noise, often associated with mechanical systems or air conditioning, is eliminated, to the benefit of the students. Natural ventilation is sustainable energy in action and harnesses wind power and the thermal rise of warm air in a controlled way.

Monodraught natural ventilation systems have proved to be consistently effective and reliable over many years. The constant reporting and feedback to Monodraught’s dedicated R&D team enables our products to be improved in their manufacture, aesthetics and performance.
The University of Cambridge is committed to reducing its environmental impact, with a dedicated Environment and Energy Section within Estate Management leading on carbon reduction and a range of strategic and operational initiatives.

In January 2014, Monodraught were asked to develop a low energy cooling and ventilation strategy for Greenwich House at Cambridge University, as part of a planned building refurbishment into a modern and efficient collaborative office environment.

Monodraught worked closely with David Bedwell and Partners to engineer a scheme which met not only the performance criteria stipulated by the University’s strong sustainability ethos and standards, but also the thermal comfort levels expected by the building occupants.

Human perception of “comfortable” room temperature is subjective. It is based on a number of factors such as; air temperature, radiant temperature, humidity, individual metabolism and clothing. Not everyone will experience “thermal comfort” at 20 °C - 22 °C and therefore occupants prefer to control their own comfort.

COOL-PHASE® uses a thermal energy store utilising a Phase Change Material (PCM) in combination with an intelligently controlled air handling unit to actively ventilate and cool the building. The COOL-PHASE system can radically reduce energy consumption by up to 90%, compared to a conventional cooling system. Unlike conventional cooling approaches, COOL-PHASE uses no refrigerants making it an environmentally sound solution to cooling buildings.

Monodraught installed the COOL-PHASE systems and WINDCATCHER X-Air in a number of open plan office areas, several conference and meeting rooms, training rooms and a café area.

With the system’s ability to record minute by minute data from an integral data logger, plus BACnet connectivity, Monodraught will return to site later in the year to extract this data and provide an audit of performance as part of its post-occupancy analysis service. The reporting system also allows the Estate Management team to track performance on an ongoing basis.

COOL-PHASE is a low energy cooling and ventilation system that creates a comfortable, fresh and healthy indoor environment and also reduces the running costs of buildings. It works upon the principles of adaptive thermal comfort, controlling temperatures within a “thermally comfortable” bandwidth and gives end users more flexibility in controlling their environment.

Initial feedback on the installation has been positive and we look forward to working together with our partners on the project to provide performance data and investigate future opportunities to help reduce energy usage and CO₂ emissions.
Prospects College is a vocational skills training provider based in the South East of England with sites in Southend, Brentwood and Basildon, providing courses for students aged from 14 years upwards.

Architects Ayshford Sansome have been working with Prospects since 2006 and this is the sixth training facility the practice has worked on for the college. The original aspiration for the Centre was to create a sustainable building featuring sustainable technologies, both in its construction and its detailing.

Prospects College also intended to use the building itself and its various services as a practical education resource within which building services students could actively hone their construction skills. To this end it was envisaged that many of the buildings’ services would be exposed and the data provided by monitoring their performance and energy consumption would be displayed within the building and become an integral part of the education process.

Shortly after work started on the new college, changes to the way the funding was provided meant a reduction of one third in the budget for the building. Ayshford Sansome Associate Rob Westbrook: “Obviously, with a significantly reduced budget, we had to look again at everything that was planned for the Centre. Natural ventilation was a key consideration for the sustainability of the building and when the original specification was reviewed Monodraught emerged as the preferred candidate, meeting our brief in terms of cost, sustainability and the potential as an educational source.”

The final design included WINDCATCHER® X-AIR, SOLA-BOOST® variants and the low-energy cooling and ventilation system COOL-PHASE® primarily for the ICT suites due to the expected heat gains. Each of the WINDCATCHERs, SOLA-BOOST and COOL-PHASE units were linked to an iNVent controller.

Data from all the Monodraught systems are recorded every half-hour and can be downloaded to enable the latest energy use figures to be used within teaching sessions. This approach is helping to achieve another Prospects ambition: to provide students with practical on-going educational information.

Key benefits
- BREEAM ‘Very Good’ Certificate achieved
- Budget reductions made a strong case for ventilation & cooling solution
- Installed working systems provide useful training tools
- Low energy, low carbon ventilation & cooling
- No cooling refrigerants
- Low maintenance

Photos are used with the kind permission of Mr Andrew Hatfield.