Monodraught Natural Ventilation
Harnessing the environment for building ventilation
At Monodraught we take great pride in the quality of our engineering. Our Natural Ventilation systems are designed in accordance with our company ethos...

innovation, sustainability, reliability and performance.

Confidence can be taken from the knowledge that our systems are tested extensively in house and by third party academic and research organisations to ensure that our solutions deliver the best possible results for your building.
Natural Ventilation

Why Choose Natural Ventilation?

Healthier
Natural Ventilation brings a steady supply of fresh air into the building, 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 occupants.

Sustainable Energy in Action
By maximising the use of wind pressure and the natural stack effect of thermal buoyancy, Natural Ventilation does not use any fossil fuelled energy. Instead it relies on harnessing wind power and the thermal rise of warm air, using it in a controlled way.

Cost Effective
In today's current climate with energy costs escalating at an unprecedented rate, there is no telling what energy costs will be in 5 or 10 years' time! Once Natural Ventilation is installed, there are...

no running costs ever
...for the life of the building.

More than Just Passive Stack
Early Naturally Ventilated buildings relied purely on a passive stack approach to act like a 'chimney stack'. The limitation of such an arrangement is that to work effectively, the temperature in the passive stack has to be some 10°C above the ambient temperature in the room, which in summer months may lead to overheating.

Monodraught systems overcome this problem by incorporating wind driven air intakes to generate a positive pressure in the room below, and combined with temperature differentials, this assists the passive stack element to exhaust the stale air.

Best in Class
Monodraught Natural Ventilation systems have achieved an enviable reputation although there have been some companies that have attempted to copy the Monodraught systems and indeed, many Engineers and Designers have designed their own bespoke Natural Ventilation systems.

The fact cannot be ignored however that over the last 10 years, Monodraught's systems have proved to be consistently effective and reliable and have performed in accordance with the initial design criteria. It is the constant ‘fine tuning’ and feedback to Monodraught’s dedicated Design Teams which enables our products to be improved in their manufacture, aesthetics, and performance. The ‘acid test’ of the effectiveness of Monodraught’s systems has perhaps been best demonstrated during the hot summer of 2006, where daytime temperatures as high as 36°C were recorded and yet, throughout this unprecedented and extensive ‘hot spell’, schools and offices where WINDCATCHER systems were fitted experienced a high satisfaction rate – with no reports of any failures or overheating. No one knows what future summers hold in store, but if 2006 was anything to go by Monodraught are confident that their systems will continue to provide a completely reliable and effective method of providing energy free Natural Ventilation.

No Leak Guarantee - X-Air Systems
Monoraught’s patented WINDCATCHER X-AIR® Natural Ventilation system is now offered with a...

10 year No Leak Guarantee
This unrivalled level of weather protection for a roof mounted ventilation system guarantees that WINDCATCHER X-AIR units will not leak for ten years from the date of installation/commissioning thanks to three unique layers of ActivLouvre weather protection.

First, Monodraught’s patented modulating louvre technology allows the weather resistance of the external louvre blade to be increased dependent on weather conditions, even when closed at roof level to prevent snow being blown through its open louvre arrangement. Second, the ACTIVLOUVRE uses a weather resistant double-step louvre profile that provides 25% more ventilation than a conventional Classic louvre profile. And third, WINDCATCHER X-AIR units now feature a computer designed, profiled internal rain trap louvre fitted as standard.

WINDCATCHER X-AIR systems carry a 10-year installation guarantee with the systems’ control actuators guaranteed for five years.
**WINDCATCHER Classic**

**What is WINDCATCHER Classic?**

The WINDCATCHER is an energy free Natural Ventilation system encompassing the benefits of both top-down and passive stack ventilation. The system consists of four external louvre banks, to stop the ingress of precipitation, which are protected internally by TriLayer weather protection. The simple, but effective design of the system provides fresh air during the daytime as well as night-time cooling.

Due to the flexibility of the WINDCATCHER, the system can be tailored to suit the needs of almost any area. The systems technological ability has been proven within schools, colleges, healthcare environments, commercial properties, as well as many other areas.

**How Does WINDCATCHER Classic Work?**

The main advantage of the WINDCATCHER Natural Ventilation system over other forms of Natural Ventilation is that it doesn't matter which way the wind blows, the louvres on one side will always encapsulate the prevailing wind and turn that air movement down through 90° due to the internal dividers that split the system into four quadrants.

Stack effect is achieved as a result of the difference between the air temperature inside and outside of a building - and the subsequent imbalance effect on air density and pressure gradient of the internal and external air masses results in the warm air rising up through the quadrants, dispersing to the atmosphere.

**Night Time and Mid-Season Operation**

During mid-seasons, in the evenings, or at weekends, when the building is perhaps unoccupied, the WINDCATCHER system is not dependent on openable windows or vents in the side of the building, which allows the building to fully secure.

With all external windows closed, the Monodraught WINDCATCHER will still continue to operate providing all the benefits of this “free air conditioning”. This is particularly important at night time where the system will cool the room ready for the next day, removing all heat from the fabric of the building. Volume control dampers at the base of the system at ceiling level will precisely control the amount of airflow through the system. If the internal temperature falls below 15°C the dampers will automatically close to prevent over-cooling.

**Summer Operation**

In the summer months, perimeter windows can be utilised to aid cross flow ventilation. With fresh air coming in through the windows on the windward side of the building, stale air will be exhausted through the passive stack element of the WINDCATCHER system. Warm air will naturally rise to ceiling level but at the same time any prevailing wind on the WINDCATCHER system carries a supply of fresh air down into the room below, thereby slightly pressurising the building and increasing the outward flow of stale air.

**Winter Operation**

To minimise ventilation heat loss, control is essential to ensure that the ventilation rate is continuously matched to meet occupant loading and to prevent excessive air change rates during unoccupied periods. Such control can most efficiently be achieved by ensuring that the building structure is airtight and by monitoring and maintaining carbon dioxide concentration in the 1000 ppm to 1500 ppm range. At night time, demand for ventilation is greatly reduced and ventilation heat loss can largely be eliminated. Natural Ventilation may therefore be expected to provide reliable winter ventilation, at the full rate demanded by occupants, without resulting in excessive energy loss.

The system is controlled by manual or fully modulating dampers, linked to temperature and CO₂ sensors which in turn can be linked to a fully automatic control panel, our Monodraught iNVent 2 system.
INVent 2

The INVent 2 system is a bespoke, in-house designed, Natural Ventilation management system for up to 4 zones of Natural Ventilation systems. It utilises our seasonally adjusted proportional control based on temperature and CO₂.

Control

Automatic Control

Provided as standard in the Monodraught package. These panels are controlled by either temperature and CO₂ sensors, depending upon the requirements of each specific application.

Semi-Automatic

Operates in the same fashion as the Automatic Control system, but also allows the end user to control the opening or closing of the dampers using the push button overrides.

Manual Control

Allows the user to operate manual dampers by a lever at ceiling diffuser level.

The BRE established that in its standard format, the style of the WINDCATCHER system has the effect of reducing noise transmission by 15 dB as compared to an open window. However, by incorporating 25 mm of acoustic lining to the air paths, a further 11 dB was achieved. The chart below shows that on larger systems, a greater thickness of insulation foam has the effect of greater attenuation.

Acoustic pods or other forms of attenuation can also be suspended below the Monodraught terminals to achieve an even greater impact on sound insulation.

Additional information available upon request: info@monodraught.com 01494 897700

Sizes

**WINDCATCHER Square System - Dimensions**

<table>
<thead>
<tr>
<th>System Size</th>
<th>Capping Width Dim A</th>
<th>Capping Height Dim B</th>
<th>Louvre Height Dim C</th>
<th>Skirt Height Dim D*</th>
<th>Trunk Length Dim E*</th>
<th>Trunk Width Dim F</th>
<th>Weight</th>
<th>No. of Louvres</th>
<th>Louvre Free Area m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>706</td>
<td>245</td>
<td>460</td>
<td>150</td>
<td>278</td>
<td>600</td>
<td>49</td>
<td>7</td>
<td>0.196</td>
</tr>
<tr>
<td>125</td>
<td>906</td>
<td>271</td>
<td>600</td>
<td>150</td>
<td>278</td>
<td>800</td>
<td>74</td>
<td>9</td>
<td>0.324</td>
</tr>
<tr>
<td>155</td>
<td>1106</td>
<td>298</td>
<td>740</td>
<td>150</td>
<td>278</td>
<td>1000</td>
<td>155</td>
<td>11</td>
<td>0.484</td>
</tr>
<tr>
<td>185</td>
<td>1206</td>
<td>325</td>
<td>880</td>
<td>150</td>
<td>278</td>
<td>1200</td>
<td>157</td>
<td>13</td>
<td>0.531</td>
</tr>
<tr>
<td>225</td>
<td>1506</td>
<td>363</td>
<td>1090</td>
<td>150</td>
<td>278</td>
<td>1500</td>
<td>214</td>
<td>16</td>
<td>0.804</td>
</tr>
</tbody>
</table>

*Dimension may change subject to roof construction, pitch, thickness, installation method and upstand requirements. All ‘Dim’ measurements shown in mm.

Alternative system dimensions available through the contact details shown above.
WINDCATCHER Classic Projects

Royal Chelsea Hospital

London

Monodraught WINDCATCHER Natural Ventilation systems were selected to provide energy-free fresh air throughout the new three storey flagship care home. The fifteen systems were cleverly adapted by Monodraught to complement the architectural style of the new infirmary, which is in context with original Wren and Soane buildings. The units were clad in clay pantiles to ensure a perfect blend with the architectural style. CFD analysis was carried out using Monodraught’s own development team and then verified using external specialists to optimise the architectural cladding.

St Joseph’s College

Ipswich

A state-of-the-art Infants and Junior School characterised by the use of bold organic forms, Natural Light and bright colours designed to inspire its young pupils, provides a clear statement of environmental intent by Naturally Ventilating the 125 square metre hall, a circular library and a series of interlinked shared spaces, by means of a bespoke design WINDCATCHER.

Greg Allen, Facilities Manager at St Joseph’s College says, “The systems have regulated the internal temperatures without any outside assistance.”

Imperial College

London

The Library is on the top floor, with full height glazing and suffered for many years from chronic overheating in the summer months. The WINDCATCHER Natural Ventilation systems were the chosen strategy due to their energy saving features. Another major benefit and consideration for the College was the improved health and comfort aspects of Natural Ventilation systems, which have proved to provide a more calm and stress-free working and studying environment.

Phil Evans, Energy Manager says, “We are all aware how difficult it is to study and work in a stuffy and warm environment and this was one of the key factors in the College’s decision... …after all, what could be more energy efficient than ‘free fresh air’.”

Tranent North Primary School

East Lothian

Monodraught WINDCATCHERS have proven extremely popular in Scotland, being specified and installed now on many schools in the Scottish region. This is all under the direction of Monodraught’s Agents in Scotland, JRF Services of Glenrothes in Fife.

Kentish Town Healthcare

Croydon

Kentish Town Health Centre (KTHC) is a new health building in central London, combining a large GP clinic and a wide range of health facilities. Delivered through the LIFT procurement programme the building was designed to provide a new standard for modern healthcare facilities.

The project was initiated by a project champion with a vision for integrating medicine, health and art within a community building. These views were embraced by the Architects, Allford Hall Monaghan Morris and the partnership with Camden & Islington Community Solutions has set an award winning standard for the future generation of NHS development.

Awards:

- Civic Trust Award 2010
- Building Magazine: Public Building of the Year 2009
- RIBA Stirling Prize Shortlist
- RIBA Award for Architecture 2009
- LIFT Award for best Design for Healthcare Project 2009
What is WINDCATCHER X-AIR?

The Monodraught WINDCATCHER X-AIR is the latest generation of Natural Ventilation that follows in the footsteps of the successful WINDCATCHER Classic systems that have proved to be so popular.

How Does WINDCATCHER X-AIR Work?

The main advantage Monodraught systems have over other forms of Natural Ventilation is that it doesn’t matter which way the wind blows, the louvres on one side will always encapsulate the prevailing wind and turn that air movement down through 90°.

Stack effect is achieved as a result of the difference between the air temperature inside and outside of a building - and the subsequent imbalance effect on air density and pressure gradient of the internal and external air masses, results in the warm air rising up through the quadrants, dispersing to the atmosphere.

Although WINDCATCHER X-AIR operates in the same manner as the classic system, Monodraught’s R&D team have worked to improve the system further by adding some new features:

**Composite Upstand**

Monodraught have developed an insulated upstand arrangement to be used with the WINDCATCHER X-AIR. The upstand is a multi-layer construction allowing for high levels of insulation, and also ensures every system maintains an air tight seal, whilst also minimising install time. The WINDCATCHER X-AIR can be installed onto flat roofs, and roofs with a pitch of up to 35°.

**Swept Divider**

Monodraught WINDCATCHER systems are divided into four separate quadrants, but the WINDCATCHER X-AIR system incorporates swept turning vanes to gently direct air flow while avoiding flow separation and increased frictional losses.

**Aerofoil Louvre**

The ActivLouvre technology is designed to provide ventilation control, but also to be aerodynamically efficient and protect against rain. By reducing losses through the louvred section, the level of ventilation per system is increased, compared with a standard louvre. The aerodynamic profile was developed using computational fluid dynamic (CFD) techniques and wind tunnel tests in association with the University of Reading and University of Nottingham.

**ACTIVLOUVRE Modulating Aerofoil Louvre Technology**

The ActivLouvre technology provides ventilation control at roof level and prevents weather ingress into the WINDCATCHER X-AIR. The system comprises of an external set of static louvres and an internal set of active louvres. The ActivLouvre can be raised and lowered automatically to vary the free area of the opening according to the control strategy. The greatest air flow rates through the louvres are achieved when they are fully open, but the ActivLouvre system is able to modulate their position to increase the resistance of the louvre, or they can be fully shut to prevent the ingress of snow and other precipitation, alleviating the susceptibility of an open louvre system.

**External Air Catchment Fins**

The External Air Catchment Fins are located on each corner of the WINDCATCHER X-AIR and comprise of a tear drop profile light tube and a pressure release fin. At low wind speeds, the fins are used to increase the area across the face of the system. This increases the positive and negative pressure on the windward and leeward faces respectively, and increases the total rate of air flow through the system. When wind speed is high the rubber fins flex, helping to relieve excessive wind loading.

Architectural Solar Powered Lighting System

The Windcatcher X-Air incorporates an architectural lighting system powered by a 10 W photovoltaic panel, mounted within the cap of the system. The solar panel collects solar energy throughout the day charging an internal Lithium ION battery, even during overcast skies. The system automatically illuminates at low light providing soft architectural lighting without the need for user input.

**Note:** Upstand to protrude 150mm above finished roof level
MONODRAUGHT WINDCATCHER X-AIR Projects

Craig Tara - Haven Holiday Park
Ayrshire

Scenario
Monodraught WINDCATCHER X-AIR systems were specified to serve both the Sports Hall and Sports Activity Hall to provide a minimum fresh air requirement of 10 l/s per person with an occupancy level of 100 people. A total of four X-Air 140 systems (two in each area) sharing 1 control panel, covering 4 zones, were used to meet the design criteria following modelling using Navensys.

The WINDCATCHER X-AIR systems were installed in March 2012 and have been monitored by 3 temperature sensors to examine the performance within these areas.

Results
• Room Temperature

The graph below shows the overall average temperature and average daily peak temperature for the areas serviced by the X-Air systems. As you can see the X-Air systems keep the area at a comfortable temperature of approximately 19°C.

- CO₂ Levels

The background or atmospheric CO₂ level is approximately 400 parts per million (ppm), a high level would be considered 1500 ppm or above. The exact CO₂ levels are not recorded at this site; however, results are taken if the levels should exceed 1500 ppm at any time. There have been no recordings of high CO₂ levels showing that at no point have CO₂ levels reached 1500 ppm.

Conclusion
The Monodraught WINDCATCHER X-AIR Natural Ventilation systems have shown that they meet and exceed the design criteria and specification that the client requested. The design was selected to provide a minimum fresh air requirement and ensure that CO₂ levels remain within acceptable boundaries, which the results above have proven is the case. The solution has also been shown to meet the overheating criteria, keeping temperatures within an acceptable level for the vast majority of the time.

Tesco
Cheetham Hill
Tesco, the UK’s leading supermarket chain set itself a target to reduce by 50% the carbon emissions from all its stores by 2020 as compared to a baseline of 2006.

Remarkably they exceeded this ambitious target when they opened their first major new Eco-store at Cheetham Hill, Manchester, reducing the carbon footprint by 70% compared to an equivalent sized store built just over two years ago.

The 52,000 sq. ft. Cheetham Hill store, located in a redevelopment area near Manchester, is built to an environmentally friendly specification by architects Woods Hardwick, the project’s master planners and designers.

The Eco-Store was built by developer Mulberry to Tesco’s specification on the St. James Industrial Estate, and is the largest Eco-Store built to date.

For the Corby store, Monodraught designed a unique terminal, which is now a distinctive feature of new Eco-Stores and an integral part of the corporate image of the buildings.

Summing up, Karl Myhill says: “We were proud to have designed in such sustainable features at the start and worked with Corby Council, which was involved in enhancing the environmental credentials of Tesco’s largest environmental-format store, providing electric car charging points and a number of other initiatives.” He adds that the practice is also proud that the building has achieved a BREEAM ‘Very Good’ rating without having to resort to retro-fit solutions such as photovoltaic cells and wind turbines.

The Corby Eco-Store is expected to become a benchmark for future Tesco Eco-Stores.
SOLA-BOOST Classic

What is SOLA-BOOST Classic?

SOLA-BOOST® is an extension of the proven WINDCATCHER design, providing additional ventilation on sunny days whilst maintaining zero running costs.

Monodraught have improved the potential of WINDCATCHER systems by the addition of a solar driven internal fan that brings in additional fresh air up to 200 l/s. Conversely, the fan operation can be set up to extract stale air; all this without any energy cost.

How Does SOLA-BOOST Classic Work?

SOLA-BOOST is an energy free Natural Ventilation system encompassing the benefits of both top-down and passive stack ventilation, through use of a DC solar powered fan controlled by Monodraughts PowerTrack system. The system consists of an external louvre, protected internally by trilayer weather protection and is internally divided into four quadrants. This simple, but effective design of the system provides fresh air during the daytime as well as providing night time cooling.

A fan served by a central core provides forced intake or extract air (intake as standard), powered by solar panels situated at the system capping. The fan is designed to provide the additional ventilation when it is needed most, during the summer, with zero running cost. In order to maximise the performance of the system, it utilises the PowerTrack control system which maximises the solar energy generated to provide a smooth current to the fan, optimising fan flow.

Weather Conditions

Normal Conditions

Under normal conditions, the WINDCATCHER technology provides Natural Ventilation without any moving parts by encapsulating the prevailing wind, no matter how light, and turning that wind movement down through 90°. Using the compartmentalised vertical vents, fresh air is brought into the room and stale air is expelled using the natural energy of buoyancy and stack effect common to all Natural Ventilation systems.

Sunny Conditions

The high efficiency polycrystalline solar panel activates the fan once the DC electricity generated exceeds a set point. Passing of a second set point for electricity generation will cause the patented PowerTrack system to boost the power transmitted even further, resulting in a 250% increase in the speed of the fan. Maximum efficiency of the system can be achieved by ensuring the solar panel is south facing when the SOLA-BOOST is installed.

Trilayer Weather Protection

Monodraughts Trilayer Weather Protection combines the use of the WINDCATCHER Classics external louvre bank, rain trap louvre and internal fibre mesh to protect against extreme weather conditions, which are all supplied as standard.

The system assists in preventing snow ingress into Monodraught’s SOLA-BOOST systems by averting it before it reaches the trunk of the system and channelling it back down the rain trap louvre. The trilayer weather protection system has been proven to be effective against simulated fine particle blizzard conditions.

PowerTrack

A unique feature of the system is the patented PowerTrack control system. This system works on the basis that the brighter the sun, the greater the speed of the boost fan. The unique switching maximises the solar output to provide a smooth current from the solar panels and optimised fan flow and results in 2.5 times more power from the solar panel that can otherwise be achieved by a direct connection.

Fan

The fan used in the SOLA-BOOST system can be set up to either bring in fresh air from outside or expel the stale air from the room the system is serving. As the fan is powered by a solar panel, it ensures a cost free solution to create a comfortable environment for the user.

Solar Panel

The high efficiency polycrystalline solar panel is optimised for sunny weather, so more power is transmitted on sunny days.
Norwich & Norfolk University Hospital
Norwich
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 Lighting systems to provide Natural Ventilation and Light to the internal office spaces and resource rooms.

Mount Vernon Treatment Centre
Northwood
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 that would be uplifting for both staff and patients and offer a therapeutic value due to the 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 systems were also used, dropping through the first floor to provide Natural Daylight to deep plan and land locked areas on the ground floor.

Seaside School
Lancing
Twenty Monodraught SUNPIPES and eight SOLA-BOOST Natural Ventilation units with an 8-Zone iNVent Natural Ventilation control system have been installed at the Seaside School in Lancing. 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 predetermined settings, the SOLA-BOOST units automatically respond by bringing in fresh, natural air from the outside.

Hazeley School
Milton Keynes
Milton Keynes were one of the first Authorities to implement the use of both SOLA-BOOST and Sunpipes to serve every classroom throughout new school developments. WINDCATCHERS have proved to be successful in eliminating the need for air conditioning in classrooms for many years, the SOLA-BOOST system seemed a natural step for the Architects to further improve and enhance the Natural Ventilation capabilities.

Each classroom, on both the ground and first floors, is served by a separate SOLA-BOOST system and SUNPIPES are similarly used to bring daylight down into the rear of the ground floor classrooms.
What is SOLA-BOOST X-AIR®?

The SOLA-BOOST X-AIR® is the latest generation of Natural Ventilation system featuring the patented ActivLouvre modulating aerofoil louvre technology and DC solar powered fan controlled by Monodraught’s PowerTrack system. Integrated with the existing Monodraught WINDCATCHER X-AIR system, it provides additional ventilation on sunny days whilst maintaining zero running costs.

Monodraught have significantly improved the potential of WINDCATCHER X-AIR systems by the addition of a solar driven internal fan that brings in additional fresh air up to 200 l/s. Conversely, the fan operation can be set up to extract stale air; all this without any energy cost.

How Does SOLA-BOOST X-AIR Work?

The system consists of an external static louvre and internal active louvre arrangement, which varies the opening and free area through the louvre face. The variable louvres can provide maximum ventilation rates when fully open or modulated to increase louvre pressure or closed to prevent the ingress of precipitation.

A fan served by a central core provides intake or extract air (intake as standard), powered by solar panels situated within the system capping. The fan is designed to provide the additional ventilation when it is needed most, during summer, but with zero running cost.

In addition to the ActivLouvre arrangement, the system also incorporates external air catchment fins to provide greater area at the louvre, improving performance in relation to wind speed. Pressure release vanes at the fins provide a means to reduce face pressure under high winds. The system can also be specified to include solar powered architectural lighting.
SOLA-BOOST X-AIR Projects

Ford Runcorn

Runcorn
The Scenario

Monodraught SOLA-BOOST X-AIR 200 systems were specified to serve the Showroom and Service Reception. The systems provide fresh air to the area which maintains thermal comfort and air quality levels throughout the year.

The design team at Monodraught carried out dynamic thermal modelling which predicted that two square SOLA-BOOST X-AIR 200 systems would fully dissipate the heat gains within each specified area of the building where the SOLA-BOOST X-AIR systems were to be installed.

Conclusion

The Monodraught SOLA-BOOST X-AIR systems have shown that they meet the design criteria and specification that the client requested. The design was selected to provide a minimum fresh air requirement and ensure that CO₂ levels remain within acceptable boundaries, which the results above have proven is the case. The solution has also been shown to meet the overheating criteria, keeping temperatures within an acceptable level for the vast majority of the time.

CO₂ Levels

Background or atmospheric CO₂ level is approximately 400 parts per million (ppm) and a high level would be considered 1500 ppm or above. The exact CO₂ levels are not recorded at this site; however results are taken if the levels should exceed 1500 ppm at any time. There have been no recordings of high CO₂ levels at, or above this threshold, showing that at no point have CO₂ levels reached 1500 ppm.

Devon Cliffs – Haven Holiday Park

Exmouth
The Scenario

Two square SOLA-BOOST X-AIR 140 systems with an iNVent control panel were used to meet the design criteria following modelling using Navensys.

Results

Temperature

This graph shows the overall average temperature and average daily peak temperature for the areas serviced by the X-AIR systems. As you can see the X-AIR systems keep the area at a comfortable temperature of approximately 19.5°C.

CO₂ Levels

The background or atmospheric CO₂ level is approximately 400 parts per million (ppm) and a high level would be considered 1500 ppm or above. The exact CO₂ levels are not recorded at this site; however results are taken if the levels should exceed 1500 ppm at any time. There have been no recordings of high CO₂ levels at, or above this threshold, showing that at no point have CO₂ levels reached 1500 ppm.

Conclusion

The Monodraught SOLA-BOOST X-AIR Natural Ventilation systems have shown that they meet the design criteria and specification that the client requested. The design was selected to provide a minimum fresh air requirement and ensure that CO₂ levels remain within acceptable boundaries, which the results above have proven is the case. The solution has also been shown to meet the overheating criteria, keeping temperatures within an acceptable level for the vast majority of the time.
VENTSAIR

What is VENTSAIR?

Roof Mounted

The VENTSAIR Roof Mounted Terminals have a similar appearance to the WINDCATCHER Classic system but have a different internal configuration to allow for dedicated intake or exhaust requirements. The systems are often used in areas of low occupancy including plant or server rooms, as well as areas which employ a cross ventilation strategy.

Acoustic Air Transfer System

The VENTSAIR Acoustic Air Transfer System (ATS) is a patented, internal wall mounted, sound attenuating, air transfer system. It has been designed to promote cross flow Natural Ventilation within rooms to reduce heat build-up and provide fresh air to occupants. The system is also available with Intumescent fire dampers and GR volume control dampers. It has been designed to maximise air flow and minimise sound transfer and to meet both BB93 and BB101 requirements.

Façade

The VENTSAIR® Facade Ventilation System (VAF) is a high specification louvre system designed for use within the commercial industry. The system has been used extensively in education facilities, health facilities as well as retail schemes to provide controlled fresh air during the day and secure night time cooling via cross flow and stack ventilation principles. The system comprises of an external aluminium louvre, a high specification volume control damper and an internal grille. The system can be specified to suit glazed frames or fitted with a flange to suit wall openings.

How Does VENTSAIR Work?

Standard Façade System

The VENTSAIR Natural Ventilation Façade system is designed to suit a variety of different building façade applications to provide controlled fresh air during the day and secure night time cooling via cross flow and stack ventilation. It does this through use of the external weather louvre. This catches any prevailing wind, whilst still ensuring there is no weather ingress. The amount of air that is then let into the room is determined by the motorised volume control dampers, ensuring a suitable level of ventilation is provided to the rooms occupants.

Acoustic Façade System

Facade variants include the VAF150 and VAF275 models. Both of these systems are available for applications with acoustic considerations and are able to provide a deeper louvre profile that is specifically designed to reduce noise entering the room. The system is manufactured from 2 mm aluminium sheet, and comprises of 120 mm depth of acoustic infill material of 45 kg/m² material density that can be powder coated in any BS or RAL colour reference.
Roof Terminal

Although the VENTSAIR Roof Mounted Terminals have a similar appearance to the classic WINDCATCHER systems, their internal construction differs. The main difference being the removal of the internal dividers, it allows the VENTSAIR Roof Mounted Terminal to act simply as an intake or exhaust system.

VENTSAIR systems are mainly used to encourage cross flow ventilation within a room, usually where the aspect is too deep for openable windows or other wall opening to work efficiently. In these cases the VENTSAIR roof mounted terminal would be located at the far end of the room to draw the air through the room and allow the warm stale air to be exhausted via the passive stack method.

Prevailing winds will also create a negative pressure zones encouraging the extraction of stale air to the atmosphere.

Acoustic Air Transfer System

The main purpose of the VENTSAIR Acoustic Air Transfer System is to maximise air flow and minimise sound transfer. It does this by a combination of the components listed below. As you can see from Acoustic Transfer Arrangement construction, the main body of the system consists of a number of different Baffle pods. The different layers of these pods aid in splitting and absorbing both high and low frequency sound waves, and, through the design of their shape, they do this by impeding the transfer of air as little as possible.

Construction

- Acoustic Transfer Arrangement
- Baffle Pods

- Securing Nut
- Drop Rod
- Pod Cover - Top
- Rubber Inner Core
- Perforated Metal - Top
- 5/7 Pods
- Perforated Metal - Bottom
- Outer Core
- Perforated Metal Outer Core Housing
- Acoustic Casing
- Pod Cover - Bottom
- Securing Nut