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As buildings typically consume around 50% of all commercial energy and produce half of global carbon emissions, natural ventilation systems are leading the way in helping reduce both of these figures and provide a more eco-friendly and sustainable future. The natural ventilation strategy is a critical factor in determining the environmental performance of buildings, from energy use to the health, comfort and productivity of occupants.

SE Controls develop tailored natural ventilation strategies using window automation and façade technology to ensure that low energy design and the principles of effective natural ventilation are incorporated into projects from the outset.

Adaptive Natural Ventilation provides a range of advantages, which include:

- Fresh unprocessed air proven to reduce sick building syndrome, induced respiratory and allied health conditions
- Control of CO₂ levels optimises indoor air quality, proven to significantly increase occupant concentration and performance
- Lower running costs through reduced energy consumption maximises the combined benefits of natural ventilation and daylight
- Reduced capital costs
- Lower on-going maintenance costs
- Fewer noise problems from fan coils and other air handling plant.

The environment that we educate and nurture our next generation in is fundamental to the child's performance, productivity and behaviour within the learning environment

What is Natural Ventilation?

Natural ventilation is the introduction and movement of fresh air through buildings without the need for energy-consuming air handling and conditioning plant to drive the flow. As natural ventilation systems require considerably less plant and equipment, they consume less energy, which reduces greenhouse gas emissions, cuts energy costs and helps avoid health problems often associated with air conditioning.

Controlled natural ventilation offers a viable alternative to traditional forms of mechanical ventilation – such as air-conditioning, chillers and fan driven systems, through the intelligent use of natural forces to expel stale air or excessive heat.

Harnessing the freely available elements of wind and thermal buoyancy to move air through a building and create stable temperatures improving thermal comfort, natural ventilation can be used within any building – from schools, offices and residential properties to local healthcare centres, hospital estates and retail sites.

Within buildings using natural ventilation, air movement is enabled by the controlled opening and closing of windows, vents and louvres to not only provide a flow of fresh air, but also ensure that temperatures are maintained within acceptable limits.

Sophisticated sensing systems monitor the temperature and air quality throughout a building as well as external weather conditions; highly refined strategies then respond by modulating specific windows and vent positions proportionally to provide a high degree of environmental control over the interior environment.

In addition to complying with the requirements of Building Regulation Approved Document L to deliver air tightness and thermal efficiency, natural ventilation solutions deliver improved indoor air quality at a fraction of the capital, space and running costs of conventional cooling and ventilation systems.

A well designed and implemented natural ventilation strategy can therefore:

- Use less than half the energy of air conditioned buildings
- Allow for the design of light, airy and spacious buildings
- Lower heating and cooling costs
- Provide a healthy indoor climate
- Increase productivity
- Reduce health issues and absenteeism
- Cut harmful emissions
- Increase available space otherwise used by conventional air conditioning plant & ducts.

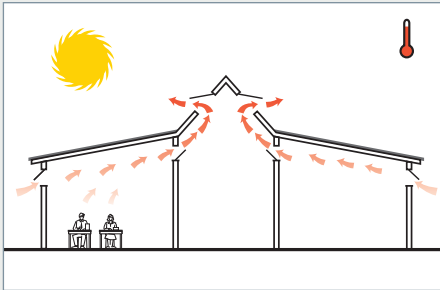
Natural Ventilation Principles

SE Controls, Natural Ventilation strategies are based on six standalone principles, which function differently depending on the building shape, internal heat loads and location of openings. Common ways of capitalising on 'free' air movement is through the stack effect, cross ventilation and passive night time cooling using opening windows to facilitate the natural ventilation.

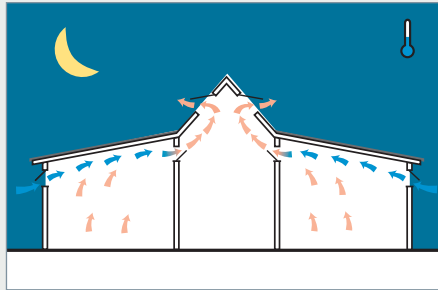


RIGHT: Evelyn Grace Academy
LONDON

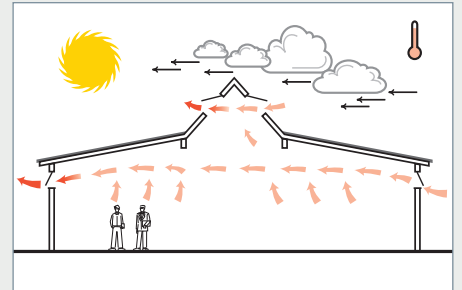
FAR RIGHT: Ordnance Survey
SOUTHAMPTON



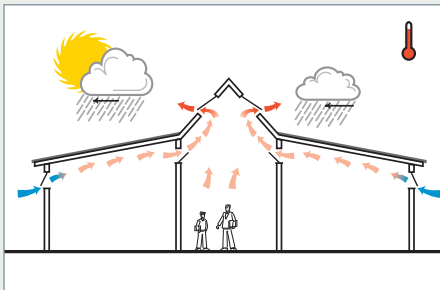
Stack Ventilation



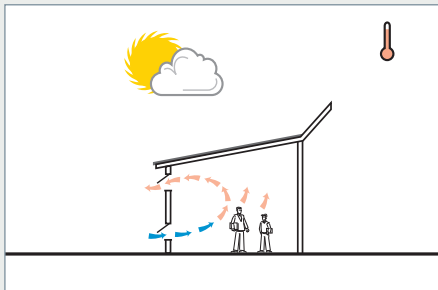
Night or Passive Cooling Ventilation



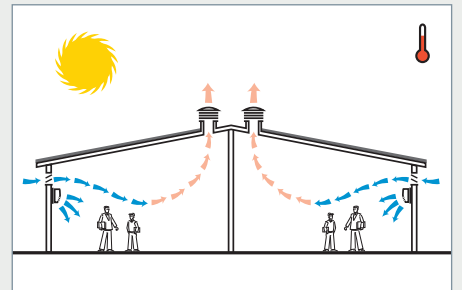
Cross Ventilation



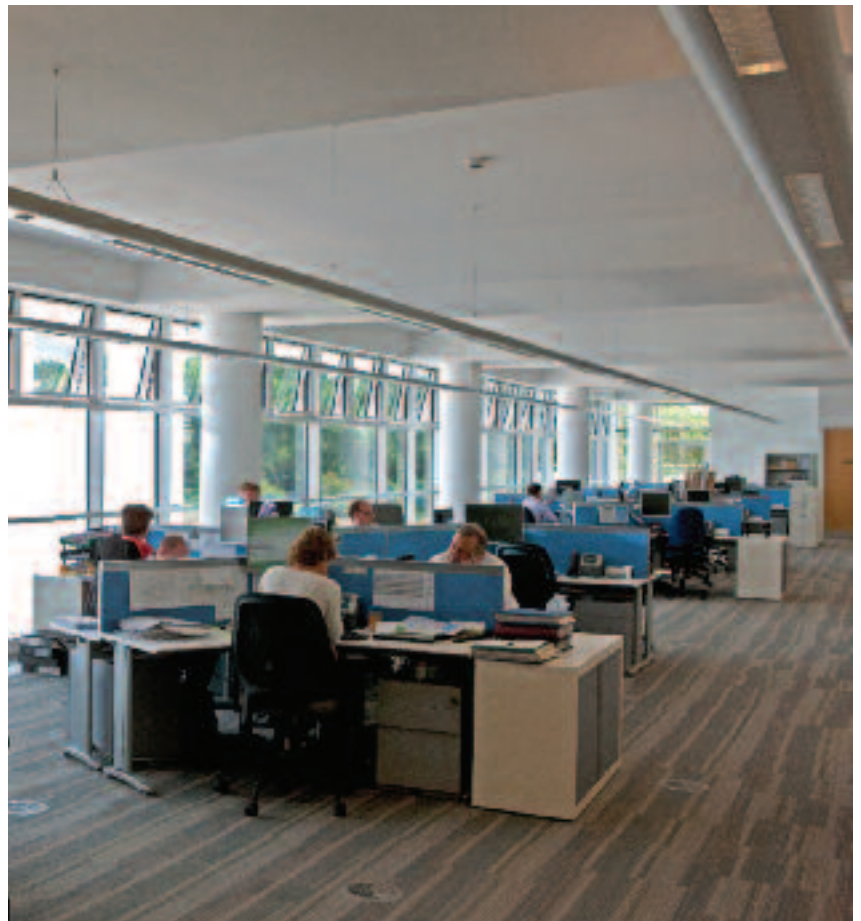
Trickle Ventilation



Single Sided Ventilation



Mixed Mode Ventilation





What SE Controls can do for you

SE Controls provide tailored natural ventilation systems, designed to fit the often differing needs of both client and building requirements. With their fresh approach, combined with an energetic and dynamic feel for design, every bespoke natural ventilation solution delivers impressive and practical end results.

SE Controls' complete turnkey solutions encompass advisory, design and planning services as well as system implementation, installation and project management supported by training and maintenance.

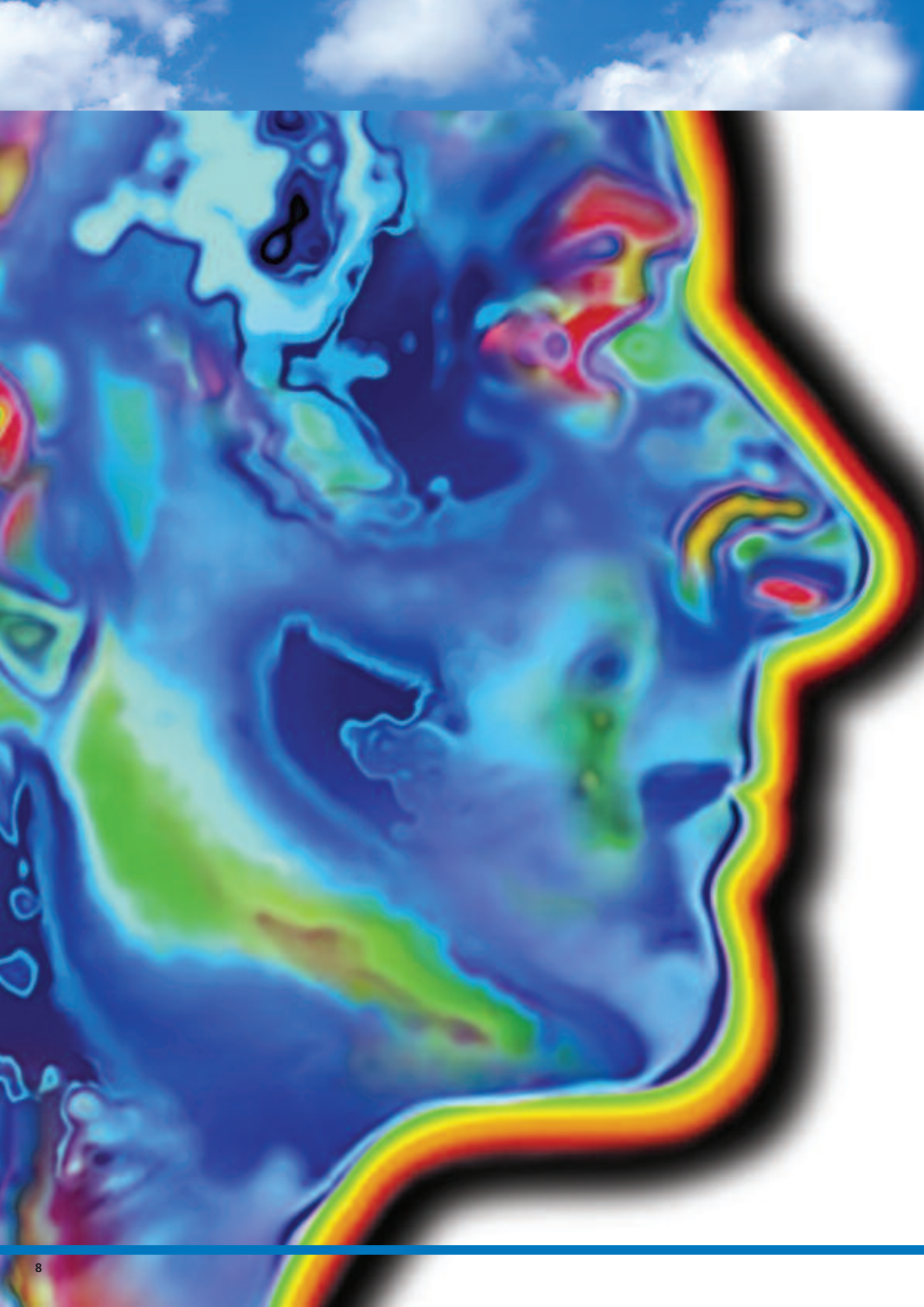
SE Controls' natural ventilation strategies concentrate on the automatic opening and closing of windows, dampers, rooflights, roof terminals and other ventilation devices in a controlled manner.

They can range from a simple open and close switch to a fully integrated energy management system, including elements like CO₂ measurement, internal and external temperature monitoring, weather and rain sensors and interfaces with other building plant and services.

SE Controls' team of highly experienced and professional project managers take the project through every step of the construction process to coordinate the design, specification, installation and commissioning of the natural ventilation solution.

By being actively involved in projects from start to finish and partnering closely with you, they can ensure that all key criteria and specifications are considered and met fully, enabling a highly effective natural ventilation system to be designed and installed.

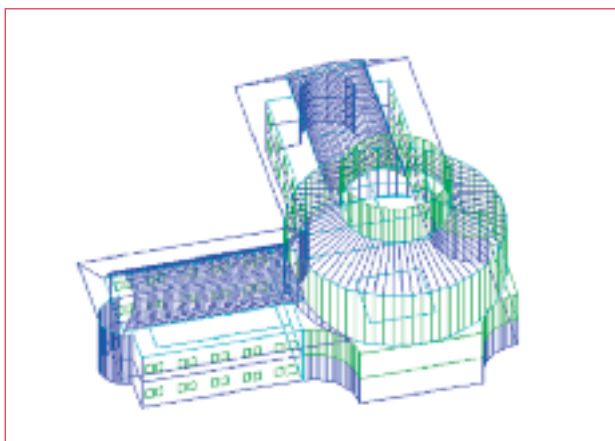




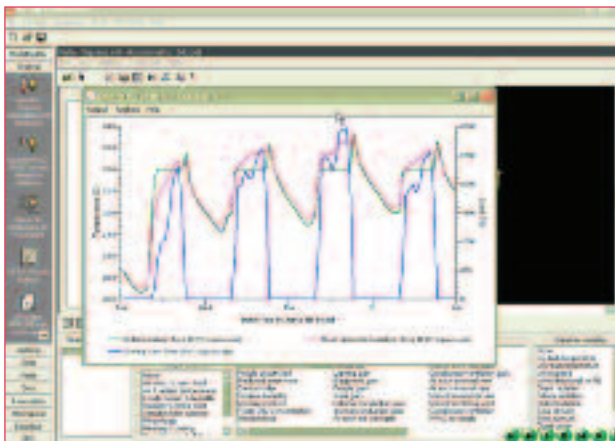
Our Specialist Expertise

SE Controls' team of design engineers is able to offer detailed simulation and analysis of both existing and proposed new buildings to assess the effectiveness of a natural ventilation system prior to it being installed.

Using the latest modelling software for thermal modelling and CFD analysis, we are able to create digital replicas of buildings including vents, sensors and air flows, which can be modelled to optimise aperture sizes and locations within the building envelope to deliver the best results.

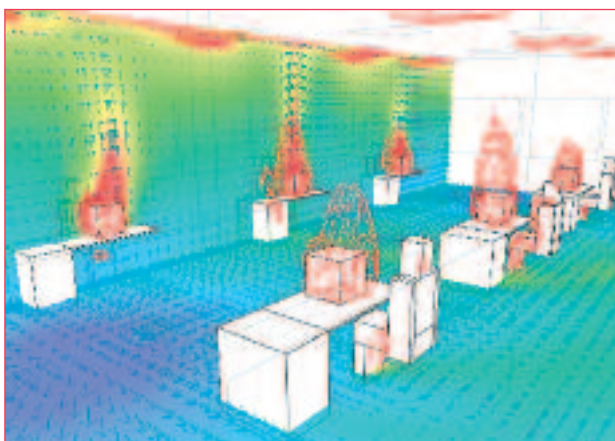


3D modelling and CAD capabilities provide data models for further simulation analysis.



Thermal simulation helps to predict internal temperatures throughout the year – taking into account various heat values such as plant, IT and people.

CFD simulation predicts the air flow in and around a building, enabling the best specification and location of sensors and vents – resulting in optimised design.





Design & Cost Planning

At early design stages SE Controls can assist clients and design teams to specify the most cost efficient and practical natural ventilation solution based on a range of key criteria.

Considerations

- Building location, orientation and depth on plan
- Glazing requirement
- Thermal mass
- Occupancy patterns
- Internal layouts

Solutions

- Single sided
- Cross ventilation
- Stack ventilation
- Night time passive cooling
- Mixed mode ventilation
- Seasonal modes
- Interfaces with 3rd party systems.

Approval and Tendering Process

SE Controls offers coordination with clients, the approving bodies and bidding contractors throughout the tendering process.

- Coordination with approving body
- Production of specification quotations for tendering
- Planning and mid tender meetings.



Stage1 Coordination

During early stages of the project, vital information is required by the contractor to enable AOV openings to be built into the shell and the core of the building along with details on the integration of various system elements within walls, roofs and façades.



Cable Installation

Full wiring schematics are produced for cable installation with all devices located and detailed. This work can then be carried out by SE Controls or by contractors already on site.



Product Installation

At appropriate stages, the associated natural ventilation products are installed and connected. SE Controls' natural ventilation products are certified and compliant to the relevant international standards including CE marking.



Commissioning Handover, Training and Optimisation

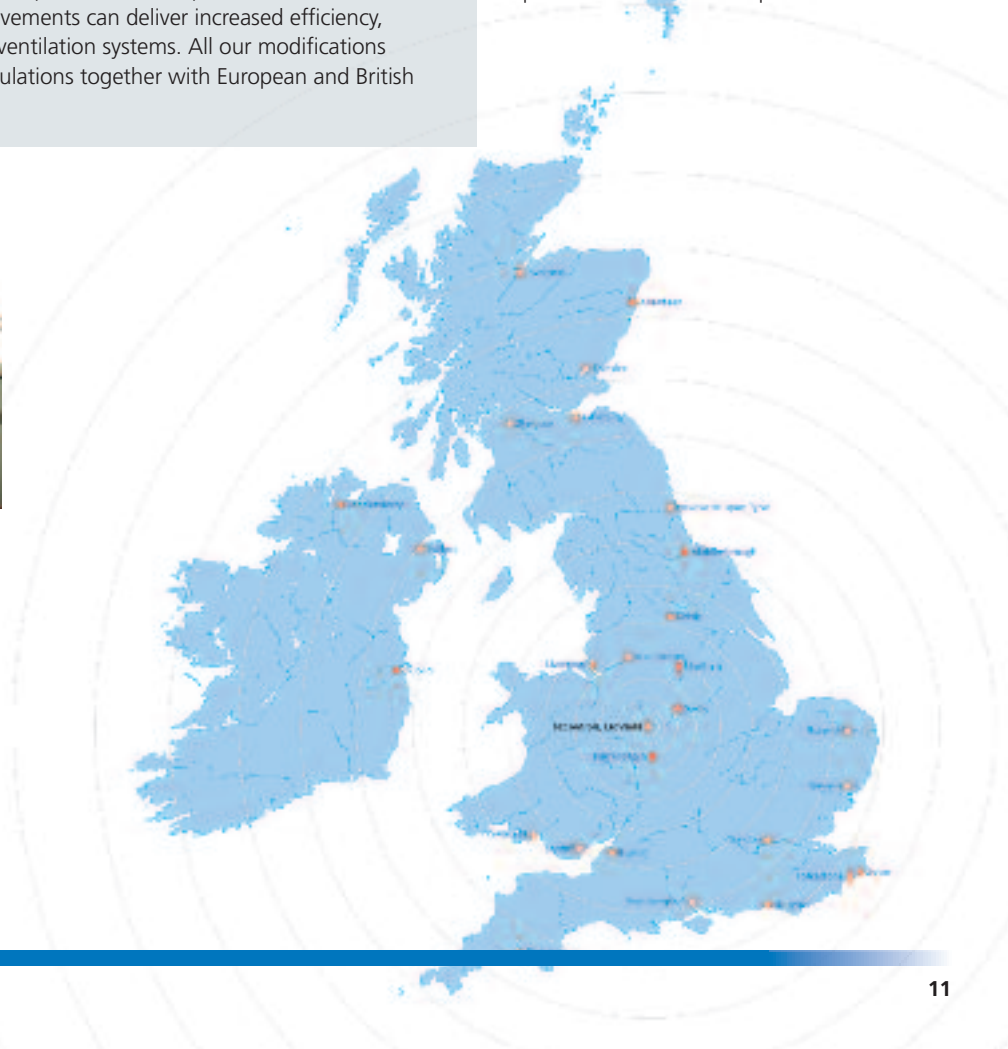
During the final completion stages of the project build phase, SE Controls will commission the natural ventilation system. This will typically involve detailed testing of all system components against the original design specification.

Our trained and experienced commissioning engineers will then hand over the system to the client together with detailed operating and maintenance instructions, supported by training. Following a pre-agreed period of time after occupation, the system can be optimised to suit client requirements.

Maintenance – Nationwide

SE Controls' maintenance team offers problem solving advice and can recommend alternative solutions to existing systems requiring modification or refurbishment, to ensure reliability and peace of mind on single or multiple sites.

Investment in cutting-edge technology allows products to be optimised to maximise the performance of their systems. These improvements can deliver increased efficiency, safety and functionality of our customers' ventilation systems. All our modifications comply with the appropriate Buildings Regulations together with European and British Standards.



Reference Sites



ABOVE: Ordnance Survey
SOUTHAMPTON

RIGHT: London School Economics
LONDON

MIDDLE RIGHT: Evelyn Grace Academy
LONDON

FAR RIGHT: Salford Royal
SALFORD

TOP RIGHT: Tesco Ellesmere
ELLESMERE





Product Groups

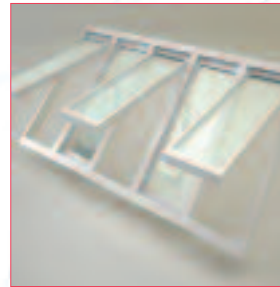
Atria

Central atria are now a common feature in many building designs as they providing natural ventilation and light as well as sense of space within the structure. The principle of stack ventilation is one of the most effective and reliable methods of driving natural ventilation for atria and adjacent spaces.

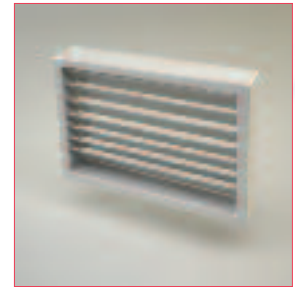
Typically, atria natural ventilation strategies include high and low level automatic opening vents to provide fresh cool air at low level and exhaust stale overheated air at high level.



Top Hung AOV



Sloping Roof Vent



Aluminium Louvre



Glazed Louvre



Chain Actuators



Linear Actuator



CO₂ & Temperature Sensor



External Temperature Sensor



Rain Sensor



Wind Speed & Direction Sensor



Humidity Sensor



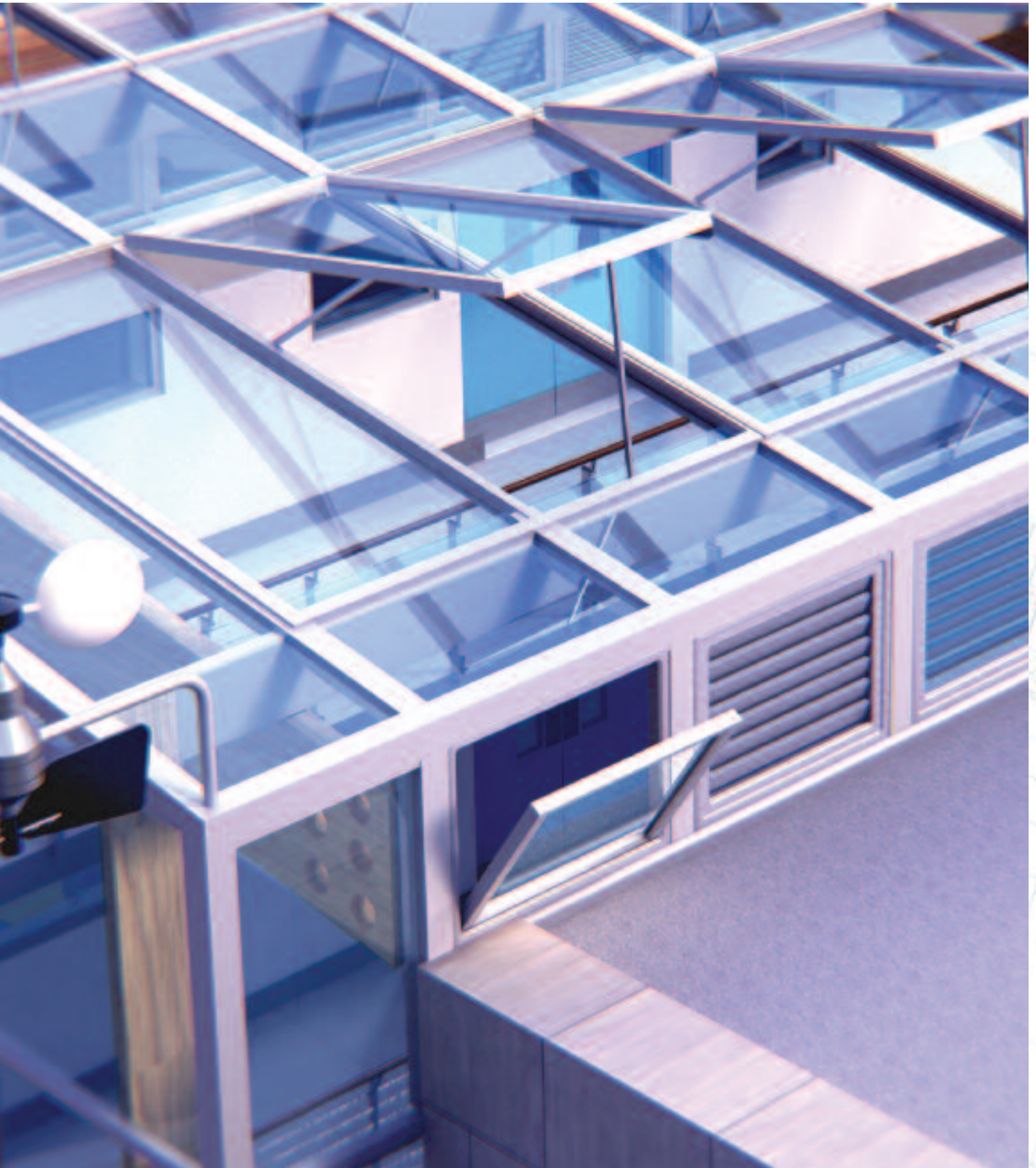
Daylight Sensor



Manual Override Switch/Key Switch



OS2 Controller



Product Groups

External Façade

External façades are used in a natural ventilation strategy to provide openings for either single sided or cross ventilation.

The design process ideally takes account of a building's location and orientation, together with its size, number of occupants and intended use of each room adjacent to the external façade.

Depending on design strategies, AOVs operate based on predefined zone set points for temperature and air quality control.



Top Hung AOV



Parallel Opening AOV



Glazed Louvre



Acoustic AOV Louvre



Chain Actuators



Linear Actuator



CO₂ & Temperature Sensor



External Temperature Sensor



Rain Sensor



Wind Speed & Direction Sensor



Manual Override Switch/Key Switch



Humidity Sensor



NV LogIQ PSU



NV LogIQ Room Controller



OS2 Control Panel



Product Groups

Internal Partition Walls

Natural ventilation strategies can use internal partitions and screens to allow cross ventilation by simultaneously opening AOVs in the external façade, internal glazed screen and within the roof of adjacent atria to draw fresh air into the relevant space and exhaust the hotter stale air.

This design uses natural positive and negative air pressures to create a healthy and productive environment.



Top Hung AOV



Bottom Hung AOV



Glazed Louvre



Acoustic AOV Louvre



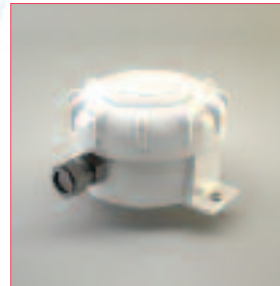
Chain Actuators



Linear Actuator



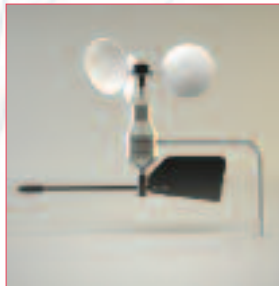
CO₂ & Temperature Sensor



External Temperature Sensor



Rain Sensor



Wind Speed & Direction Sensor



Manual Override Switch/Key Switch



Humidity Sensor



NV LogIQ PSU



NV LogIQ Room Controller



O₂ Controller





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