Learning from Schools

Abbeygate 6th Form College

jestico + whiles

Learning from Schools: Abbeygate 6th Form College
Contents

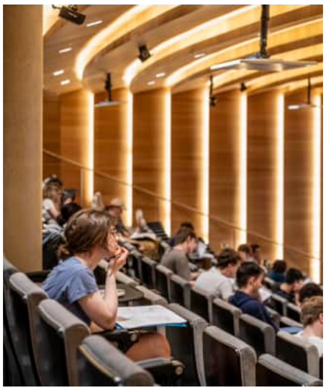
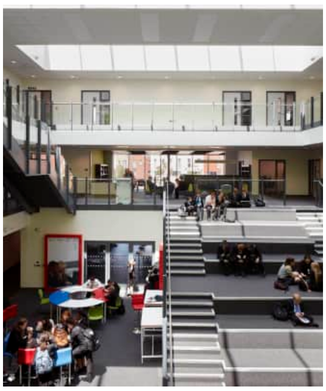
Jestico + Whiles is an award-winning, international architecture and interior design practice based in London.
We work across a wide range of design sectors from hospitality to residential to workplace to science. We have a particular expertise in education design.

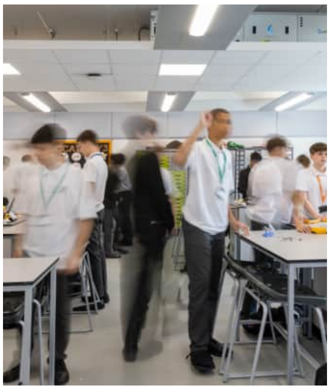
We work with leading education institutions throughout the UK and internationally to create exemplary learning environments for all ages.

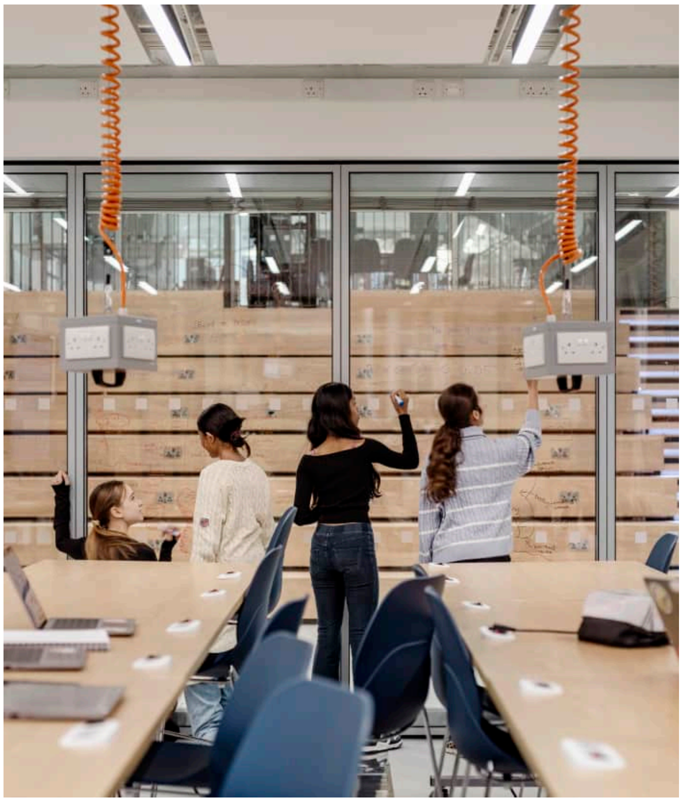
We believe passionately in the power of architecture and quality design to improve human well-being, and educational outcomes for young people.

“ *The whole process working with Jestico + Whiles has felt more like a developing friendship rather than client - architect.*

Steve Leahey
Principal,
Leigh University Technical College

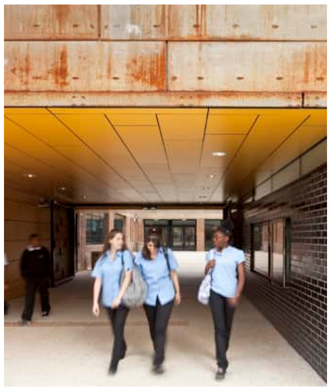








FOR EXCELLENCE



Cardinal Pole Catholic School


Introduction

Executive Summary

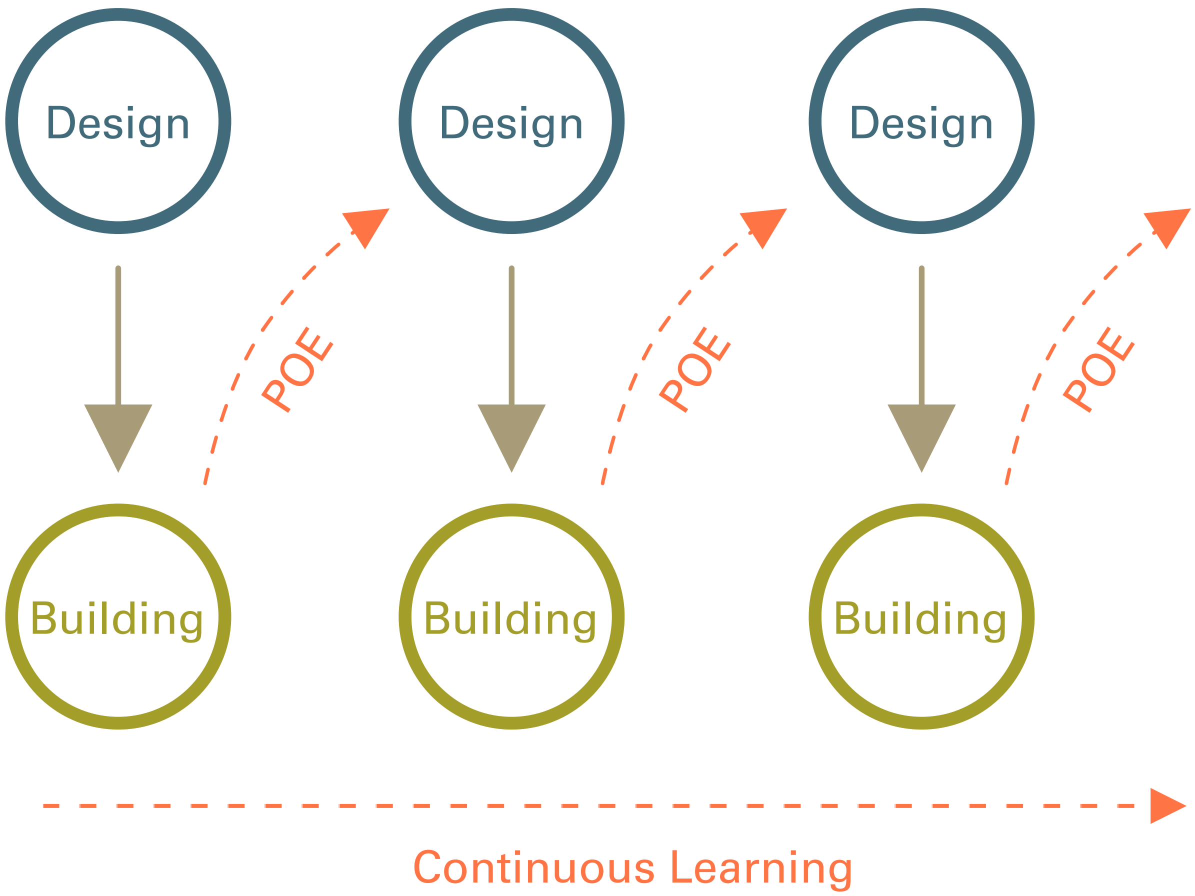
At Jestico + Whiles, we believe passionately in the power of architecture and quality design to improve human wellbeing and enhance educational outcomes for young people. Over the past two decades, we have worked with leading institutions to create exemplary learning environments. However, delivering a building is only part of our responsibility. To truly understand the impact of our work, we must listen to the people who use it every day.

This report presents the findings of our Post Occupancy Evaluation (POE) for Abbeygate Sixth Form College. By combining our Learning From Schools research initiative with our Access to Architecture mentoring programme, we invited the students themselves to become researchers. This dual approach allowed us to capture genuine, user-led insights into the building's performance, from thermal comfort and energy use to spatial functionality and student wellbeing.

While this format yielded invaluable qualitative feedback, coupling the data collection with a scheduled mentoring workshop inherently limited our quantitative environmental readings to a single day. Because our sample window is so narrow, and because we approach this research as architects rather than data scientists, we cannot draw definitive, scientifically exhaustive conclusions. Instead, this study serves to successfully identify emerging trends, daily operational patterns, and areas warranting further investigation across a larger sample size as we continue the programme.

It is also important to view these findings within their regulatory context. Abbeygate was designed under the 2017 ESFA Contractors Framework. With the recent release of the new CF25 (Contractors Framework 2025), it is encouraging to note that several of the friction points and design limitations identified in this document have already been improved upon or eradicated at a policy level (a progression we discuss further in the conclusion).

Ultimately, the findings within this report not only celebrate the successes of the Abbeygate campus but provide transparent, evidence-based lessons that will continue to inform and elevate our future education designs.



Introduction

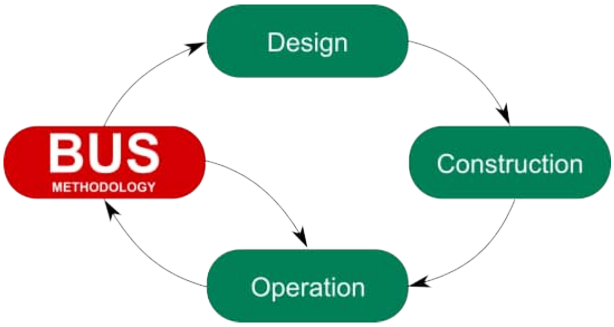
Understanding Building Performance

Building performance encompasses the full range of parameters that determine how effectively a building serves its intended function. Post Occupancy Evaluation (POE) is the systematic process of collecting and analysing both quantitative and qualitative data to assess how a building performs in practice.

As highlighted by the BS 40101:2022 standard, understanding the actual performance of buildings is critically important. It is essential for upgrading the UK building stock, reducing energy demand, improving indoor environments, and ensuring our built environment meets the UK zero carbon emission commitments.

The intended outcome is creating successful designs which will perform better than the last.

Reference documents for designing our POE programme



Building User Survey Methodology

Introduction

Access to Architecture: Empowering Student Voices

To conduct this POE, we integrated our research with Access to Architecture (A2A), our in-house mentoring initiative working with schools we have designed. A2A is designed to broaden access to the architectural profession, creating opportunities for students from diverse backgrounds while fostering ongoing relationships with our schools and their communities.

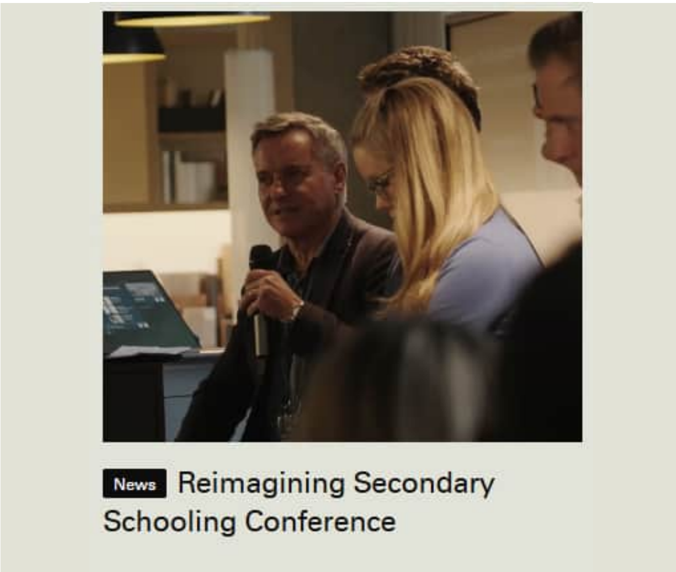
Open to students aged 16 to 18 at schools designed by Jestico + Whiles, the programme takes place over two days.
The first features workshops, talks, and networking at our London studio. The second is spent at the students' own school, where they evaluate the building from an architectural and environmental perspective.

This format delivers a double benefit. It provides hands-on, practical experience for young people interested in a career in the built environment, whilst allowing our in-house sustainability team, plusZero, to collect vital data on the in-use operation of our completed buildings directly from those who know them best.

Introduction
A Legacy in Education Design

We pride ourselves on our reputation as excellent listeners who respond with outstanding design. With over 100 schools completed, we have created quality learning environments for over 180,000 young people and their teachers. This POE represents our continued commitment to the education sector, building upon our wider research initiatives, which include:

- **School Stories:** A project that moves beyond metrics to capture the lived experiences of students and staff within our buildings, using audio and video testimony to record the daily stories playing out in our schools.
- **Designing the Schools of the Future:** A roundtable initiative bringing together influential education leaders, policymakers, and strategists to share perspectives on the future of education design.
- **Reimagining Secondary Schooling:** A collaborative conference where we presented FlexEd Academy, our research project exploring a prototype purpose-built hybrid school.



Introduction

Project Overview: Abbeygate Sixth Form College

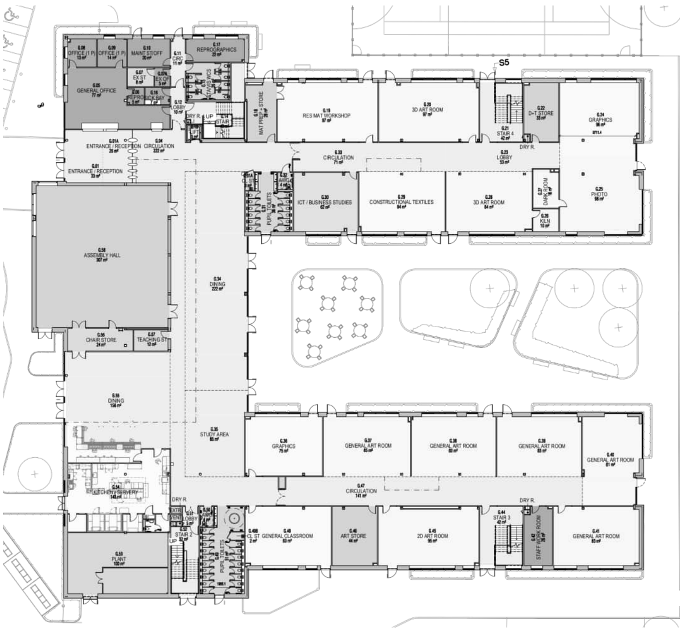
Client: Department for Education
School: Abbeygate 6th Form College
Location: Bury Saint Edmunds, UK
Framework: ESFA Contractors Framework (2017)
Completion: 2020
Contractor: Wates
M&E: MLM
Structures: AKSWard
Landscape Consultant: Ares Landscape Architects
BREEAM Rating: Very good
POE conducted: 2025

Abbeygate Sixth Form College was designed to provide high-quality teaching and learning facilities for up to 1700 young people, with the current occupation at 1200. The college's ethos and identity is embedded in our design of the building. Central voids create unexpected connections between floors and maximise natural light to the variety of informal study spaces.

Arranged as a C-shaped block with 'fingers' of accommodation extending into the site, the building itself acts as an acoustic buffer against the A road that binds the site. The finger-block design, which also facilitated a phased construction programme, creates a semi-enclosed courtyard area for outdoor dining and recreation. The steel-framed structure enables a largely column-free design, allowing for future adaptability and reconfiguration.

> *The building provides staff and students with the specialist facilities that are essential for high quality A-Level teaching. Alongside this, the classrooms are spacious, bright and well-ventilated, facilitating high quality learning. Overall, the College design has helped create a modern, calm and welcoming environment that helps students thrive.*

David Gartland
Principal, Abbeygate, 6th Form College



Ground floor plan

Introduction

Project Overview: Abbeygate Sixth Form College

Methodology

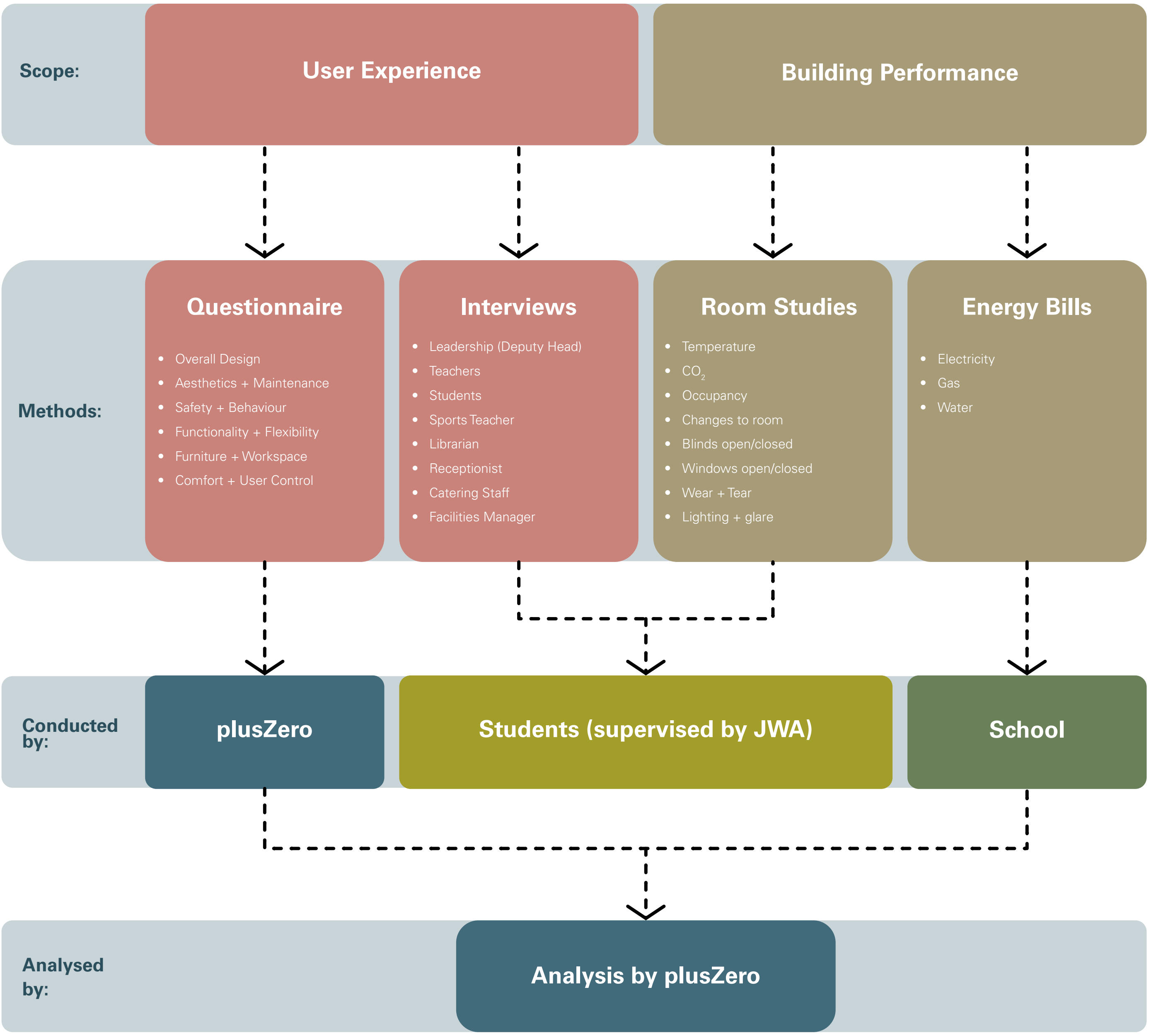
A collaborative approach to data collection

Alongside following the BS 40101:2022 standard, the POE methodology used in this report is rooted in collaboration. By embedding the research within our Access to Architecture (A2A) programme, we empowered Abbeygate Sixth Form students to become co-researchers.

The evaluation was structured across two engaging workshop days. Prior to the first day, our in-house sustainability team, plusZero, identified a baseline selection of rooms for analysis to ensure a representative sample of the building. However, the true value of the exercise was unlocked when the students applied their lived experience of the campus. Using their in-depth knowledge of the school layout and daily routines, the students pinpointed additional spaces for analysis, resulting in a highly targeted and relevant study.

To ensure a robust dataset, a comprehensive questionnaire was distributed to the school community ahead of the site visits. Early engagement with the school leadership facilitated a rapid and high-volume response. During the second workshop day, spent on-site at Abbeygate, the A2A student cohort conducted peer-to-peer interviews, capturing candid insights that adult researchers might have missed.

Whilst vast amounts of data were collected during the exercise, this report focuses on the most significant trends and insights.



Methodology

Measuring both perception and performance

To build a holistic picture of Abbeygate's performance, our methodology combined qualitative user feedback with quantitative environmental data.

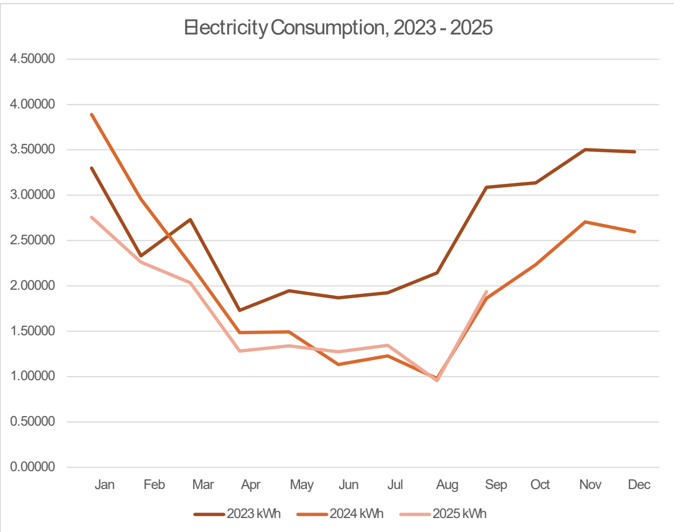
User Experience

Questionnaire

Distributed to students, staff, and teachers. The survey utilised a combination of closed-ended questions based on a Likert scale to generate measurable data, alongside open-ended text boxes to capture nuanced personal experiences.

Interviews

Conducted by a small group of Abbeygate students. The plusZero team provided baseline questions, but the students were encouraged to follow their own lines of enquiry, resulting in highly authentic, peer-led conversations.



Building Performance

Room Data Logging

Students conducted structured observations using worksheets generated by the plusZero team. To track environmental changes throughout the day, the team visited two General Teaching classrooms and two Science classrooms (one north-facing and one south-facing for each) during both morning and afternoon sessions. These rooms were prioritised due to their consistently high occupancy and comparability with standard Department for Education (DfE) design parameters.

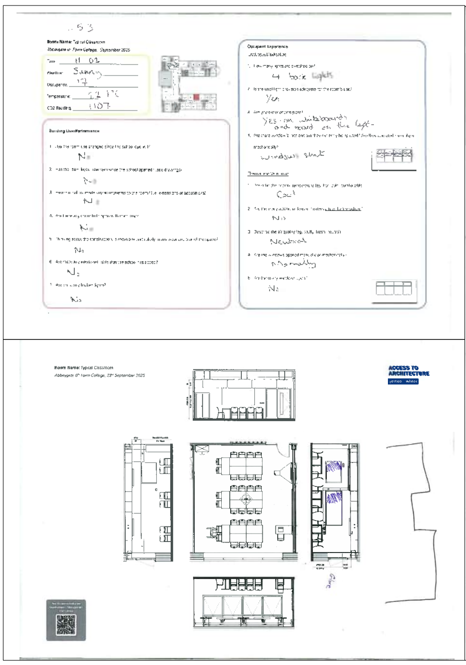
Environmental Monitoring

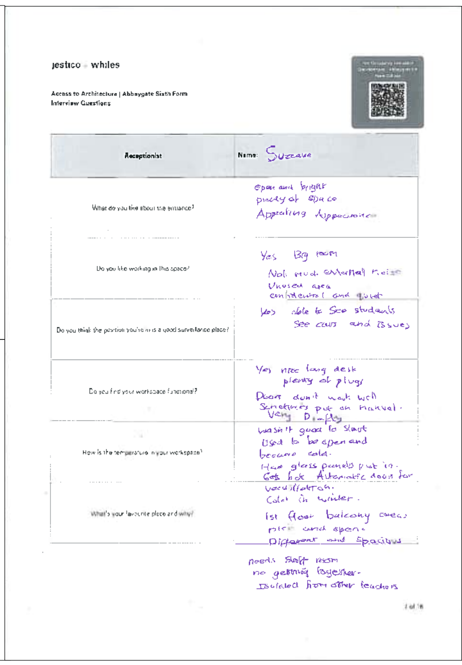
Although the school features integrated CO_2 and temperature sensors, these had not been recently calibrated. To ensure absolute confidence in our readings, the research team used calibrated portable environmental monitors (HT-2000) to measure air quality and thermal comfort.

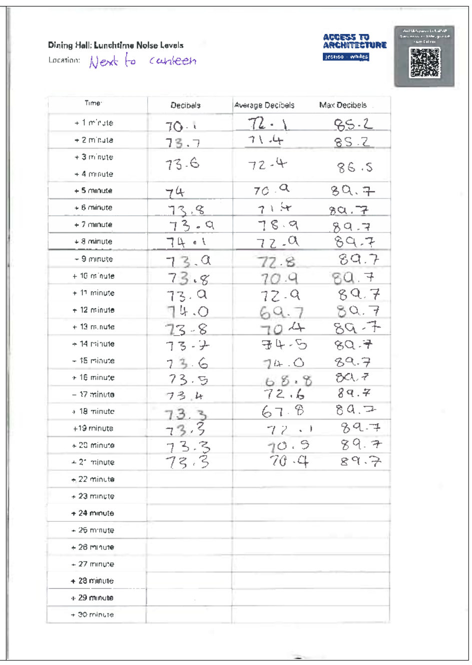
Energy Consumption

The school provided primary utility bills for the previous year, allowing us to benchmark real-world electricity, gas, and water consumption against initial design models.

HT-2000 CO2 Meter







Dining Hall: Lunchtime Noise Levels

Location: Next to canteen

Time	Decibels	Average Decibels	Max Decibels
+ 1 minute	70.1	72.1	85.2
+ 2 minute	73.7	71.4	85.2
+ 3 minute + 4 minute	73.6	72.4	86.5
+ 5 minute	74	70.9	89.7
+ 6 minute	73.8	71.4	89.7
+ 7 minute	73.9	78.9	89.7
+ 8 minute	74.1	72.9	89.7
+ 9 minute	73.9	72.8	89.7
+ 10 minute	73.8	70.9	89.7
+ 11 minute	73.9	72.9	89.7
+ 12 minute	74.0	69.7	89.7
+ 13 minute	73.8	70.4	89.7
+ 14 minute	73.7	74.5	89.7
+ 15 minute	73.6	74.0	89.7
+ 16 minute	73.5	68.8	89.7
+ 17 minute	73.4	72.6	89.7
+ 18 minute	73.3	67.8	89.7
+19 minute	73.3	72.1	89.7
+ 20 minute	73.3	70.5	89.7
+ 21 minute	73.3	70.4	89.7
+ 22 minute			
+ 23 minute			
+ 24 minute			
+ 25 minute			
+ 26 minute			
+ 27 minute			
+ 28 minute			
+ 29 minute			
+ 30 minute			

Methodology

Conducting Research Responsibly

Post Occupancy Evaluation relies on honest, sometimes critical, feedback. To ensure participants felt safe sharing their genuine experiences, we implemented a strict ethical framework focusing on transparency, privacy, and constructive intent.

Transparency and Intent
The POE has a proactive and constructive intent. Participants were clearly informed about the purpose of the study and how their feedback would be used to guide future architectural projects. Our introduction stressed that the focus was on continuous improvement rather than finding fault.

Privacy and Consent
All survey data was collected anonymously, ensuring no subjective feedback could be traced back to an individual. For the documentary film produced alongside the A2A programme, written consent was obtained from all participating students and staff, with clear, pressure-free opt-out options provided for anyone preferring not to be on camera.

Inclusivity and Wellbeing
The survey featured a diverse set of questions covering a full range of assessment points. By combining structured ratings with open-ended text boxes, we ensured respondents had the space to outline their unique perspectives if they felt the standard questions did not capture their specific experience.

Data Usage and Confidentiality
Ensuring data security is a priority. All raw data collected during the POE is stored securely on Jestico + Whiles' internal servers. Access is limited to the plusZero research team, ensuring full compliance with data protection regulations and preserving the confidentiality of the school community.

Methodology
About the authors

Our in-house sustainability team, plusZero, focuses on research, best practice and practice-wide up-skilling. It is made up of architects and interior designers from the various sectors within the practice.

The team champions sustainable design principles and forward-thinking technologies in order to accumulate and grow 'green' knowledge across the office, and thereby to future-proof Jestico +Whiles' design solutions. It aims to share knowledge of current best practice in sustainability by offering support to the project teams in the development of our design solutions through discussions and design reviews.

Adriana Keast
Senior Architect and Sustainability Champion

Adriana primarily works as a Senior Architect, with an additional focus on sustainable design. She leads the plusZero team, supporting project teams, delivering training and conducting POE.

Lucy Marsh
Sustainability Designer

Lucy is currently undertaking an MSc in Environmental Design and Engineering at University College London while working at Jestico + Whiles. She also sits on the plusZero team, and has a particular interest in mitigating operational carbon through passive design strategies.

Adriana.Keast@jesticowhiles.com
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Results: Questionnaire

Identifying successes and friction points

The POE questionnaire received 148 responses within a 48-hour collection period. The demographic breakdown closely mirrored the school population, with students making up 88% of respondents, alongside teachers and support staff. Although the questionnaire was open to parents and guardians, there were no respondents from this category.

The overall sentiment towards the Abbeygate campus is highly favourable. Across all categories, the average satisfaction rating was 3.78 out of 5, indicating a strong positive view of the school environment. Every individual category achieved a positive score (greater than 3), demonstrating that the building is fundamentally succeeding in its core educational and social functions.

The highest-scoring questions related to the physical quality and safety of the environment. Responses indicated that 91% of users feel safe within the building, compared to 39% nationally[1]. Daylight provision was also highly rated, with 90% agreeing the school benefits from sufficient natural light. Furthermore, 90% reported that the building materials and finishes are in good condition, a testament to the durability of the initial specification.

The lowest-scoring category was ‘Comfort and User Control’. While baseline satisfaction with temperatures was generally positive, granular feedback revealed dissatisfaction in specific areas - most notably, overheating in the top-floor Science laboratories and a lack of user control over natural ventilation (discussed in following pages). Similarly, while the architecture itself is well-liked, satisfaction dropped regarding interior furnishings and study space provision. Only 66% were satisfied with the furniture in work areas, and 67% felt there was a sufficient quantity of desk space, indicating that the open-plan social areas are bearing the brunt of intense independent study periods.

Average Satisfaction Rating per category of the questionnaire

Key Learning

The student body comprises both Lower and Upper Sixth students. As the survey was conducted early in the academic year, Lower Sixth respondents had limited experience of the building across different seasons. For future POEs, we recommend filtering respondents to include only those who have experienced at least one full academic year in the space, eliminating the potential for assumptions based on limited exposure.

[1] Department for Education. (2023). National behaviour survey report: findings for 2022 to 2023 academic year (Research Report RR1406). GOV.UK.

Results: Questionnaire

Identifying successes and friction points

70% satisfied with summer internal temperatures

72% satisfied with winter internal temperatures

60% reported the design of the building has a positive impact on their morale and mood.

90% reported there is sufficient amounts of natural daylight in the building.

91% feel safe within the building.

66% are satisfied with the furniture in work areas.

79% satisfied with the overall quality of the school building.

67% are satisfied with the quantity of desk space or work areas

71% reported that there were no places in the building which promote antisocial behaviour.

90% reported that materials used in the building are in good condition.

68% reported that the furniture allows them to use the space effectively

Results: Aesthetics

Colour Strategy

A core element of the architectural identity at Abbeygate is its bold colour strategy, prominently featuring a vibrant yellow.

While the 'Aesthetics' category scored positively in the quantitative questionnaire, the qualitative, open-text feedback revealed a strong subjective divide regarding the colour palette. Several users noted that the yellow was overpowering in certain contexts.

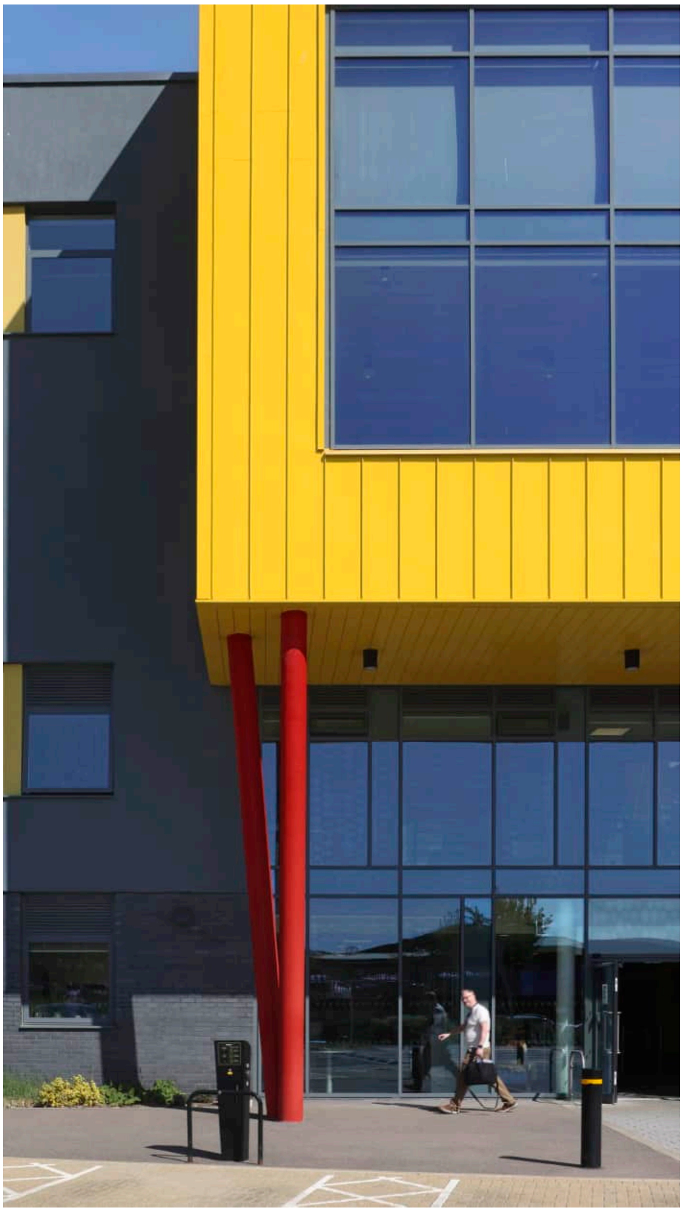
Palette

Brick

Main Facade

Main Facade

Accent colour



> *There is a touch too much yellow.*
>
> **Student**
> Questionnaire comments

> *I'm not fond of the bright yellow colour*
>
> **Student**
> Questionnaire comments

Key Learning

Colour is inherently subjective, but its application in educational spaces must balance the desire for a strong civic or architectural idendity with the need for calm, focused learning environments. In future designs, we will explore confining high-energy, vibrant colours to transient spaces (such as entrances or stairwells) while maintaining a more muted, neutral palettes in extended-stay areas like classrooms and study hubs.

Results: Aesthetics

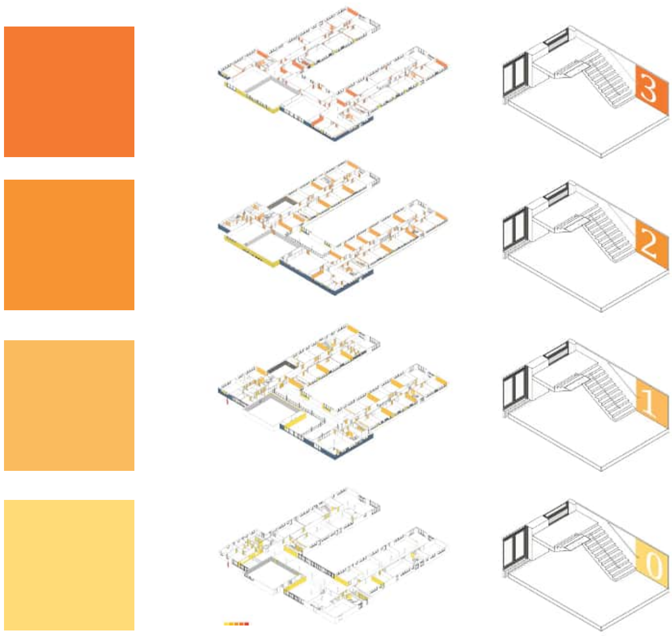
Wayfinding

Clear wayfinding is essential for reducing low-level stress and ensuring a smooth flow of movement between classes.
At Abbeygate, navigation relies heavily on a colour gradient applied across the building's symmetrical floors.

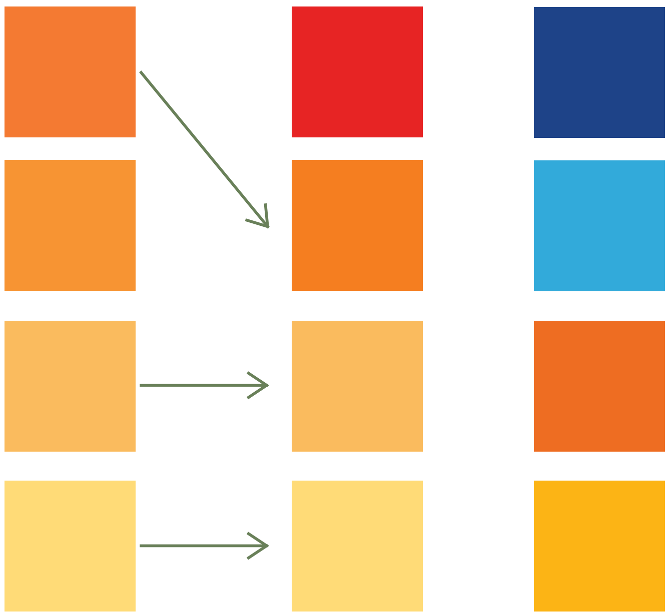
Interestingly, wayfinding scored positively in the general questionnaire, but interviews revealed a different story. The hierarchy of colours is not distinct enough to quickly differentiate between floors. Because the building is highly symmetrical, a student or visitor stepping out of a stairwell can easily become disoriented.

> *It's very easy to navigate as it is symmetrical and follows the same pattern on each floor.*
>
> **Student**
> Questionnaire comments

> *It is only easy to locate your classroom when you know how to get to your classroom and it's not clear what numbers are on each side and sometimes you will need to guess if it's a high number, if it fits the parameter of being on the right side or is it too low to be on the left side of the building.*
>
> **Student**
> Questionnaire comments



Explanatory diagrams to articulate the integration of colour in the wayfinding strategy of Abbeygate 6th Form College at the stage of CEM 6.



Optioneering of alternative wayfinding strategies to increase the hierarchy of colours to improve the ease of distinguishing between levels.

Key Learning

Symmetrical building forms require highly distinct, asymmetrical interior landmarks to aid subconscious navigation. Furthermore, subtle colour gradients - while aesthetically pleasing - are often insufficient for intuitive wayfinding. Introducing darker contrast colours to extend the gradient, or pairing colours with bold, super-graphic numbering systems, would significantly improve legibility.

Oak Academy - one of our most recent schools, uses the third colourway in the image above to distinguish each 'arm' of the building.

Results: Functionality & Flexibility

Social & study spaces

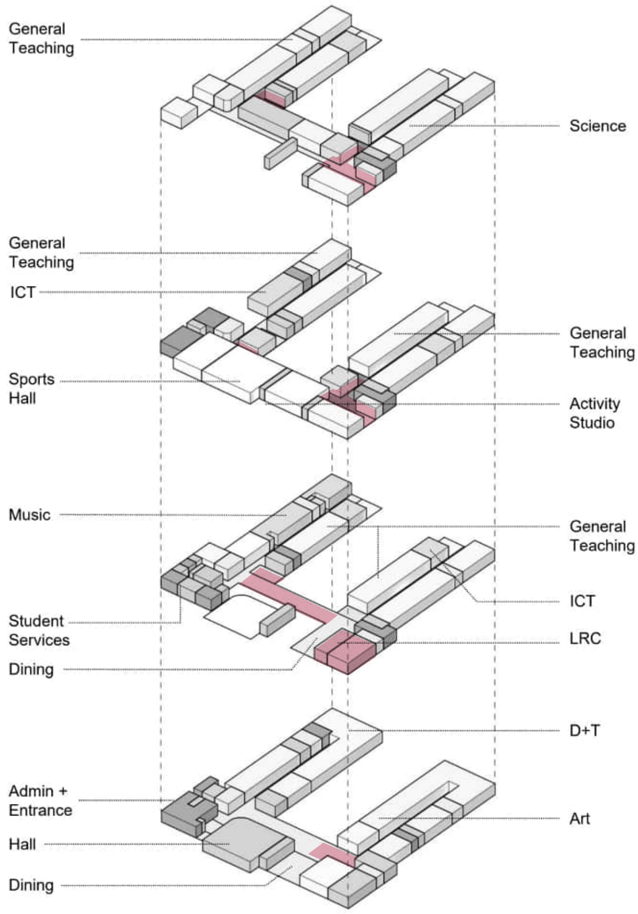
At Abbeygate, the social and study spaces were designed as open-plan communal areas radiating from a central hub on the first floor. The intent was to encourage a collegiate, social atmosphere.

While the spaces successfully act as the social heart of the school, there is a distinct lack of quiet, private study provision. Because the school operates a policy where classrooms are locked when a teacher is not present, immense pressure is placed on these communal areas during free periods. Students and staff reported that the social spaces are often too loud for focused revision, and round tables intended for group work are frequently occupied by a single student spreading out their materials.

To mitigate this, Abbeygate proactively brought in individual exam-style tables in the Learning Resource Centre (LRC) to replace some of the larger round tables, successfully increasing the capacity for independent, focused work.

> *We do have 1200 students in the building, outside the little corner workspaces there's* ***not enough space*** *for students to work… it means* ***staff now give up their lunch time*** *to supervise students in their room because there's nowhere else to work.*
>
> **Teacher,** Interview

> ***All spaces are shared*** *and still close to* ***the noise*** *of the cafeteria. You should offer small cubicle-like rooms for students to book.*
>
> **Teacher,** Interview



Exploded axonometric diagram highlighting the social spaces within the design of Abbeygate 6th Form College at the stage of CEM 6.

The first floor open mezzanine is the hub of the school. It's popularity means it is always loud and bustling.

Key Learning

Open-plan study spaces must offer a clear 'gradient' of zones, ranging from active social hubs to deep-focus, acoustically private study booths. Furthermore, spatial design cannot be divorced from operational policy. If classrooms are locked during free periods, the provision of dedicated, quiet study spaces must be increased to compensate.

Results: Functionality & Flexibility

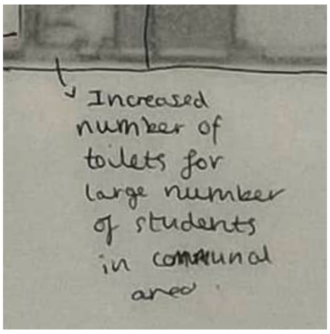
Hygiene facilities and passive supervision

The main toilet blocks at Abbeygate feature an open-plan, non-gender-specific design, feeding directly off main communal circulation routes. The objective of this strategy is to eradicate hidden corners, promote passive supervision, and reduce anti-social behaviour.

Architecturally, the passive supervision strategy is highly successful, a view shared across all schools visited as part of the School Stories project. The layout provides clear sight-lines down corridors and towards stairwells, supported by the strategic distribution of staff spaces. This directly correlates with our survey findings, where 91% of respondents reported feeling safe within the building. However, a small number of students expressed that the open nature of the washrooms felt exposing.

A view into the unisex WCs (open to circulation)

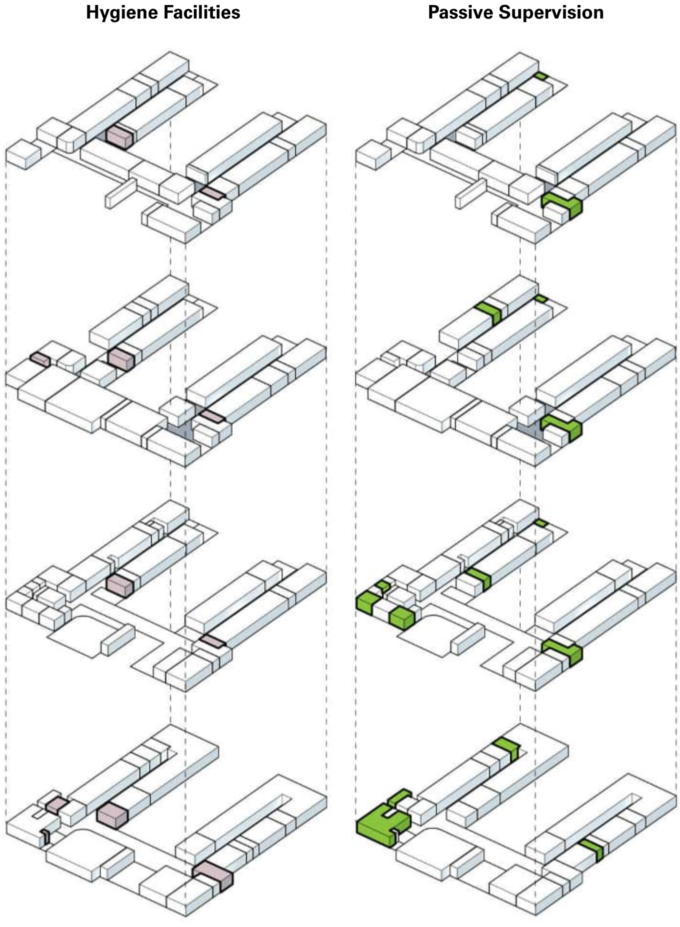
> *Honestly I'd just love it if the bathrooms had doors, it's a little awkward so **I don't find myself using the bathrooms at college**, other than that I LOVE the layout of Abbeygate it's so fresh and modern!!*
>
> **Student**
> Questionnaire comments



Comment on a floor plan during A2A first workshop.

Key Learning

The friction between perceived privacy and actual safety is a common challenge in modern school design. The success of the passive supervision model is undeniable in preventing bullying and anti-social behaviour. Future designs should maintain this open-circulation approach but explore acoustic dampening and staggered modesty screens to enhance the psychological comfort of the students.



Exploded axonometric diagrams highlighting the Toilet Provision and Passive Supervision (staff spaces) within the design of Abbeygate 6th Form College at the stage of CEM 6.

Results: Functionality & Flexibility

External space

The building form is a horseshoe, creating a sheltered external courtyard intended to serve as a primary social and dining over-spill space. As a horseshoe-shaped building, the courtyard provides a useful external shortcut when moving from one side of the building to the opposite one.

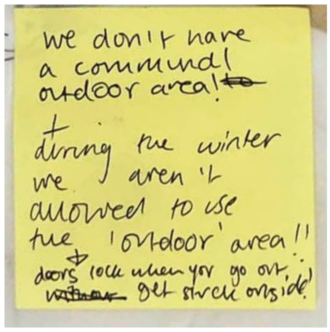
Despite its potential, the courtyard is significantly underutilised. Observation and interviews revealed an operational barrier: the doors leading from the dining area to the courtyard cannot be opened by students from the outside. Fearing they will be locked out, students simply choose to stay inside. We have tried to ascertain where this issue lies, and conclude that it is a tension between the operational strategy and the fire strategy.

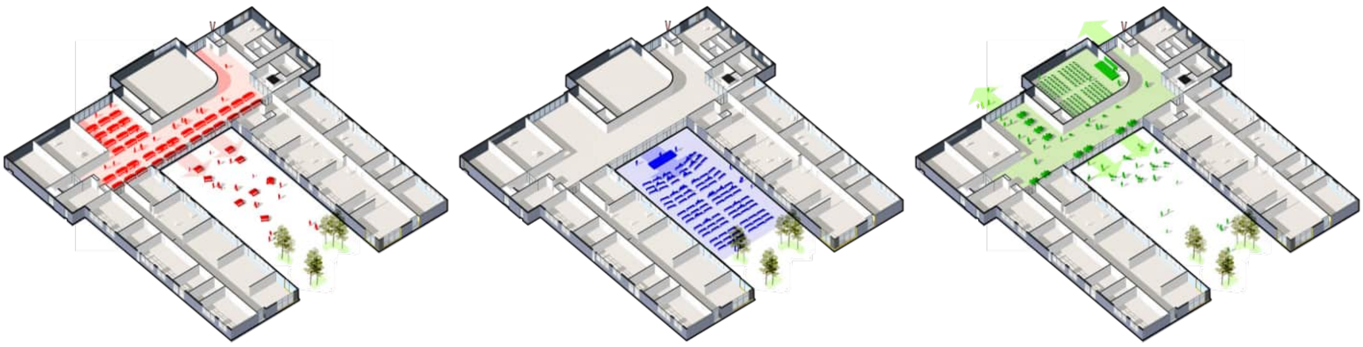
> *I don't think we're utilising or maximising the potential of the outside bit of the building, **nobody uses it.***
>
> **Staff**
> Interview

Key Learning

Ironmongery and access control must align seamlessly with how a space is intended to be used on a daily basis. It is also important to consider the operational strategy - these doors must be unlocked every morning and locked in the evening to be effective. With the facilities team based off-site, it is difficult for this to be followed.

Annotation by an Access to Architecture student to document their experience of their school.





The design stages looked at how the courtyard could be used for various events during and after the school day.

Results: Functionality & Flexibility

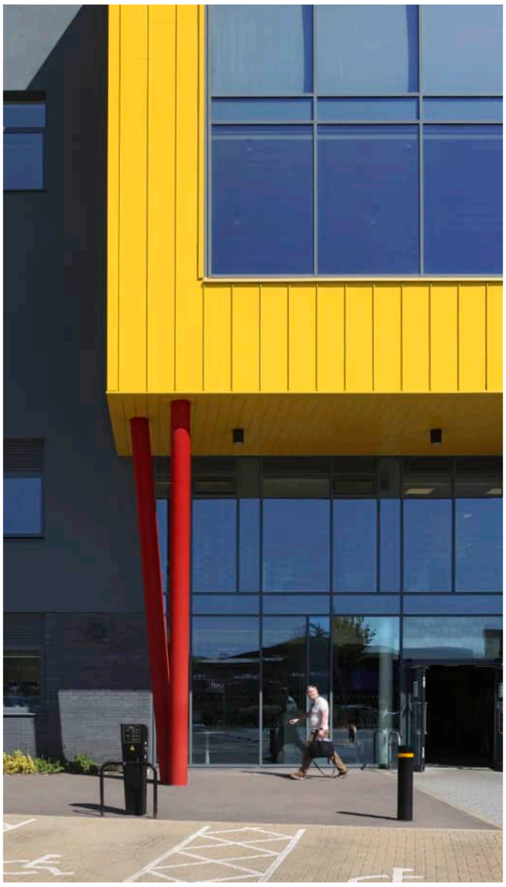
Durability

The interior finishes are performing exceptionally well, with very little evidence of heavy wear and tear across the building. This aligns with our survey data, where 90% of respondents agreed the materials were in good condition. This could indicate that the specified materials are particularly durable. Equally, it could be a reflection of a high level of maintenance and cleaning strategies implemented by the school.

The school's estate team did note that certain external cladding elements are tricky to access and replace, a maintenance consideration for the building's longer-term lifecycle.

Key Learning

The robust interior material specification, a requirement under the DfE Frameworks, is proven successful here. In future POE studies we will capture any materials replaced earlier than expected (according to the material design life) to give us a complete picture of durability.



Palette

Brick

Render

Render

Aluminium

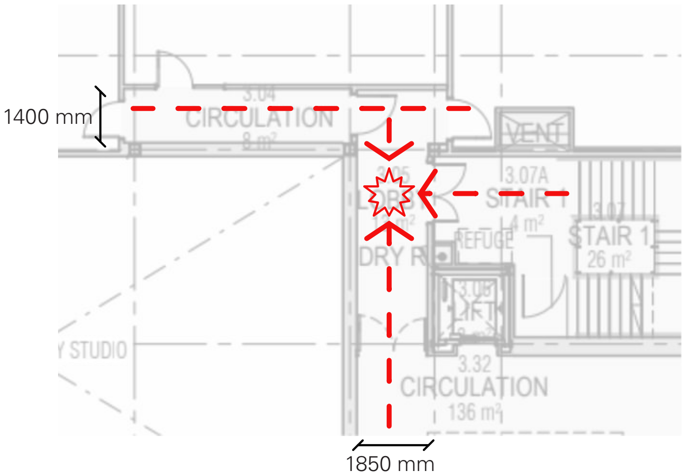
Results: Functionality & Flexibility

Circulation

School corridors experience intense bursts of activity, transitioning from empty to fully occupied within minutes.

Students reported repeated collisions and congestion during lesson changeovers. These 'pinch points' primarily occur where narrow corridors meet the top of the stairs, creating bottlenecks as two-way traffic attempts to navigate the space.

A critical pain point was the vertical circulation and impact of a single-lift provision. The provision, size and reliability of the passenger lift was repeatedly cited as hinderance on day-to-day operations, with school operations requiring daily deliveries and movement of heavy goods to upper floors.



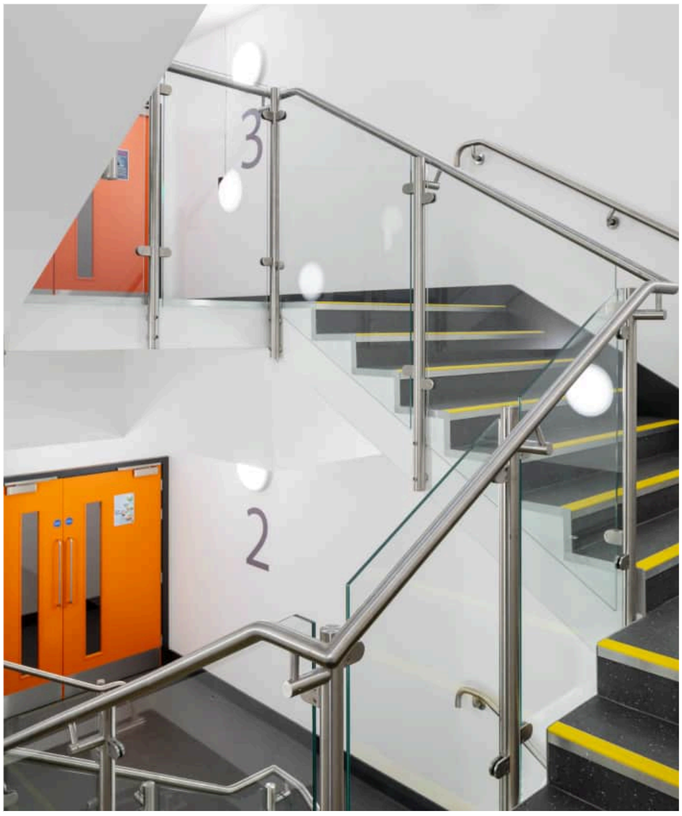
A pinch-point highlighted by the students in the first A2A workshop.

> *It is impossible to move around the corridors before lessons.*
>
> **Student**
> Questionnaire comments

> *There should have been a service lift because when the lift goes out of action, it causes major disruption [...] I've experienced firsthand when the lift is out of order and we've got stuff to move around, it makes your life three times harder.*
>
> **Facilities Manager**
> Interview

Key Learning

An issue rectified in DfE frameworks since 2021, corridors must now be at least 2.4m wide. There is also more than one lift required to align with the latest Building Regulation requirements.



Results: Comfort & Internal Environmental Quality

Furniture

The specification of furniture plays a massive role in how a space is perceived and utilised. While the architecture sets the scene, the furniture dictates the immediate physical comfort of the user.

While general satisfaction with the physical environment is high, specific friction points emerged regarding the furniture. Only 66% of respondents were satisfied with the furniture in work areas. The primary complaints centred on backless benches in the dining and social spaces, as well as unergonomic seating in IT suites.

> *The benches and chairs in the dining and study spaces are uncomfortable. The benches are particularly difficult to use if it is busy.*
>
> **Student**
> Questionnaire comments

> *Computing chairs are uncomfy.*
>
> **Student**
> Questionnaire comments

> *Backs on benches please!!*
>
> **Student**
> Questionnaire comments

> *Desks often using just classroom tables which are not the suitable height for proper work.*
>
> **Student**
> Questionnaire comments

The Science classroom is often used for independent study by students, due to lack of other quiet spaces.

First floor study mezzanine.

Study tables outside of the LRC.

Key Learning

Backless benches are excellent for transient, short-stay dining, but less suitable for spaces that double as extended study areas. Future FF&E specifications should align with intended duration of use, ensuring ergonomic, backed seating is provided wherever independent study is expected.

67% satisfied with the quantity of desk space or work areas.

66% satisfied with the furniture in work areas.

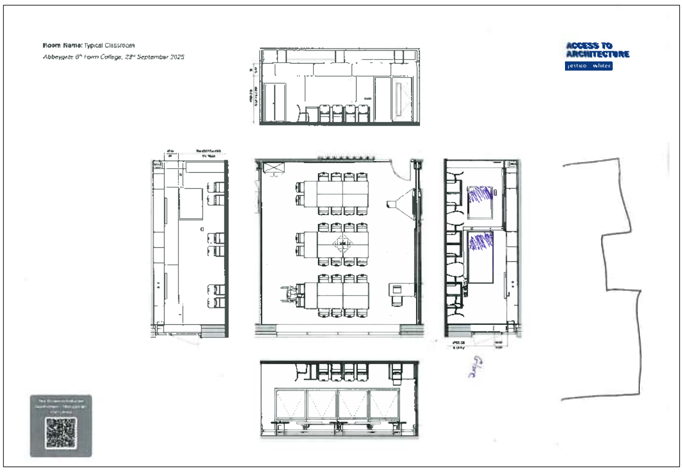
68% reported that the furniture allows them to use the space in the building effectively.

Results: Comfort & Internal Environmental Quality

Visual comfort & Glare

Abbeygate is situated on an elevated, open site with no adjacent buildings. While this provides fantastic views and high levels of natural daylight (with 90% satisfaction reported), the lack of substantial surrounding contextual shading leaves the building vulnerable to solar glare - which we found to be a persistent issue.

It is experienced directly in the south-facing classrooms on the northern wing. It is also experienced in the north-facing classrooms on the southern wing, caused by sunlight reflecting off the light-coloured facade of the opposing wing. Additionally, glare hitting the double-height yellow feature wall in the Dining Space creates visual discomfort. Consequently, blinds are frequently pulled down, negating the benefits of the natural daylight strategy. There are large trees on the southern site boundary which offer relief particularly to the lower levels along the south facade.



Example of a Room Study worksheet where glare was highlighted on a Room Elevation.

Rooms susceptible to glare from direct sunlight

Rooms susceptible to glare reflected from adjacent surfaces

Surfaces causing reflected glare

Rooms susceptible to glare from both direct sunlight and reflected from adjacent surfaces

Proposed First Floor plan annotated to highlight the location of experienced glare during the POE and the potential causes.

Key Learning

On exposed sites, considerations around glare must extend beyond standard window orientation. The reflectivity of opposing facades within courtyard or horseshoe layouts must be carefully evaluated. Exploring darker, matte external finishes on inner-facing elevations could significantly reduce reflective cross-glare.

Results: Comfort & Internal Environmental Quality

Thermal comfort and air quality

Abbeygate was designed to meet the ESFA Construction Framework (2017) thermal comfort requirements, predominantly using mechanical ventilation with the ability to open windows to satisfy individual user comfort. All classroom ventilation units are controlled by a wall-mounted combined CO_2 / temperature monitor.

Thermal comfort was the lowest-scoring category in the survey. While the environmental modelling predicted compliance, our surveys indicate a different story. Our data confirmed high internal temperatures, particularly on the top floor and in the Science classrooms, which frequently pushed beyond comfortable target boundaries. Winter brings the opposite issue, with users reporting cold draughts.

Generally, CO_2 averaged below 1000ppm*, with only ICT and Science classrooms averaging higher (1572ppm and 1290ppm respectively).

To combat the heat, the school independently purchased portable air conditioning units for the exam halls at a significant cost. These units have since been distributed throughout the classrooms to mitigate summer overheating. There is a plan to purchase more, as this will have a lower upfront cost than adapting the building systems.

> *I've logged the temperatures over the course of the day and it can be* ***27-28°C in here when it's like 21-22°C out there****. I have genuinely* ***had to move out of this classroom*** *one time because it's* ***not safe to work*** *in here.*
>
> **Science teacher**
> Interview

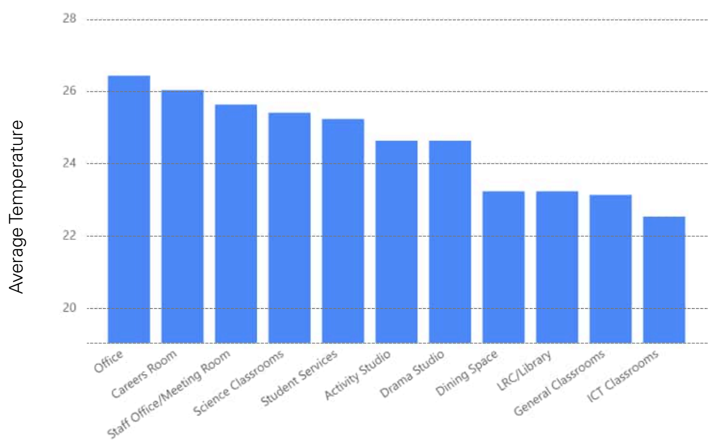
> *In certain classrooms there are* ***issues with the ventilation and heating systems*** *all year round. E.g. in the* ***winter, it is warmer*** *to step into the* ***hallway*** *than it is to* ***stay in your classroom****.*
>
> **Teacher**
> Questionnaire comments

Key Learning

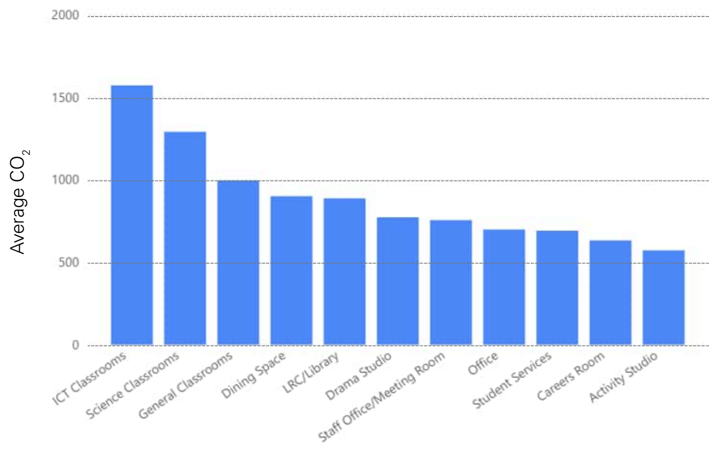
There seems to be a performance gap between regulatory thermal modelling and real-world operation. Relying on manual window operation is unreliable, and in Science labs fixed benches often physically prevent teachers from reaching window handles, even when within Building Regulation distances. Future designs must incorporate more robust, automated purge ventilation and actively challenge baseline DfE ventilation metrics for highly loaded spaces like Science labs.

Pairing data collection with a student workshop inherently limits scientific rigour, and readings are dictated by schedule logistics and live classroom access. The temperature and CO_2 graphs below represent a snapshot - averaging morning and afternoon readings on a single, mild September day - rather than a study across various seasons in the year. These graphs are designed to visually illustrate typical daily fluctuations. For a holistic understanding, they should be read in conjunction with the perceived comfort results from the user questionnaire on the adjacent page.

Internal Temperature



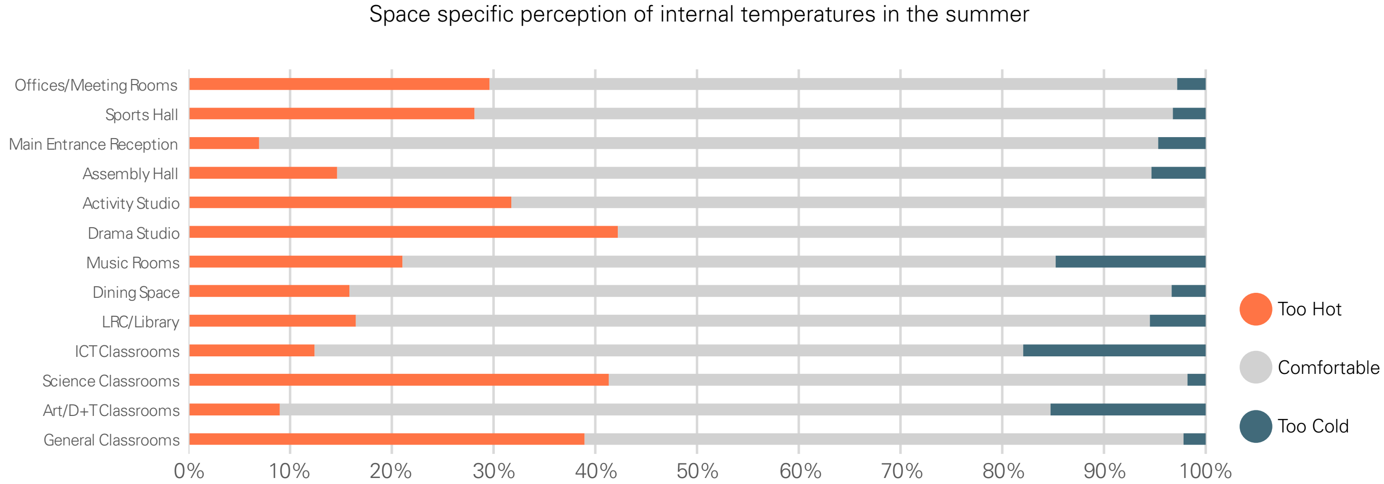
Internal CO_2 (ppm)

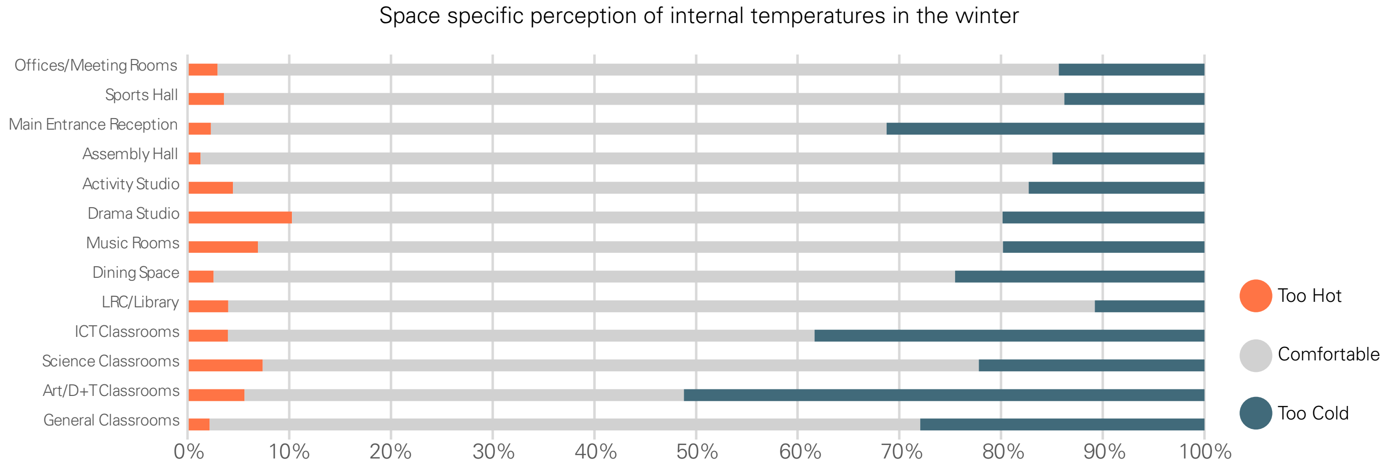


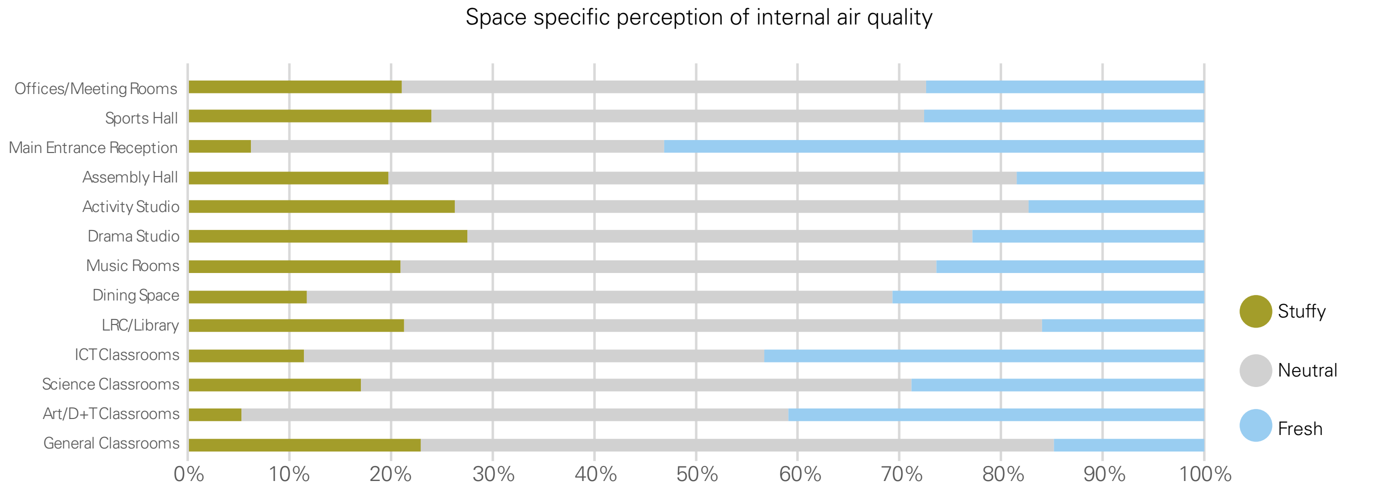
* Parts per million of CO_2. The maximum threshold in a classroom is 1500ppm before students may start to feel drowsy or lose focus.

Results: Comfort & Internal Environmental Quality

Thermal comfort and air quality







Results: Energy Use

Energy Performance

A difficulty in construction is closing the ‘performance gap’ - the disparity between how a building is modelled and how it actually consumes energy in use.

We reviewed the primary utility bills provided by the school (covering electricity, gas, and water across 2023 - 2025) and benchmarked them against our initial design models. The high-level results are positive:

Modelled Primary Energy Use: **81 kWh/m²/a**
Recorded Primary Energy Use: **85 kWh/m²/a**

(Note: Primary Energy Use accounts for the total energy generated to meet the building’s needs, including conversion and transmission losses).

Achieving a recorded energy use within a 5% margin of the modelled target is a major success. It proves that the fabric-first approach and the overarching systems designed by the team are functioning exactly as intended.

While the topline figure is excellent, breaking down the utility data reveals several nuanced operational trends:

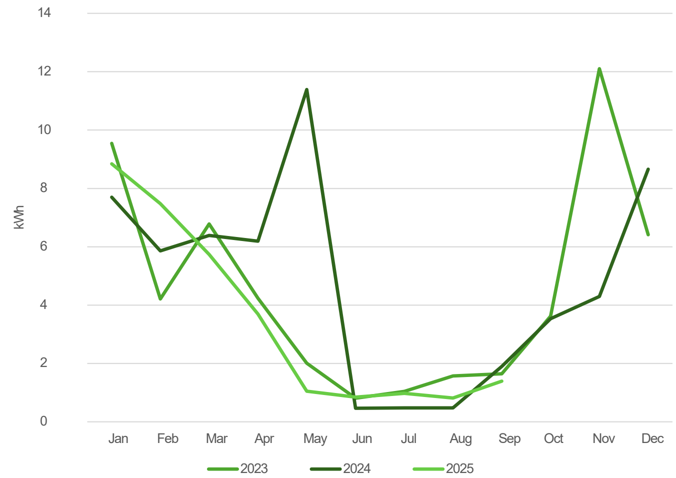
Electricity: Consumption followed a logical, consistent trend across 2023–2025, with an expected dip during the summer months. Notably, when benchmarked against three other Jestico + Whiles schools assessed during our School Stories research, Abbeygate demonstrated a significantly lower electrical energy use, not following the conventional trend.

Gas: General gas consumption followed standard seasonal heating curves. However, there were unexplained outlier spikes in November 2023 and May 2024.

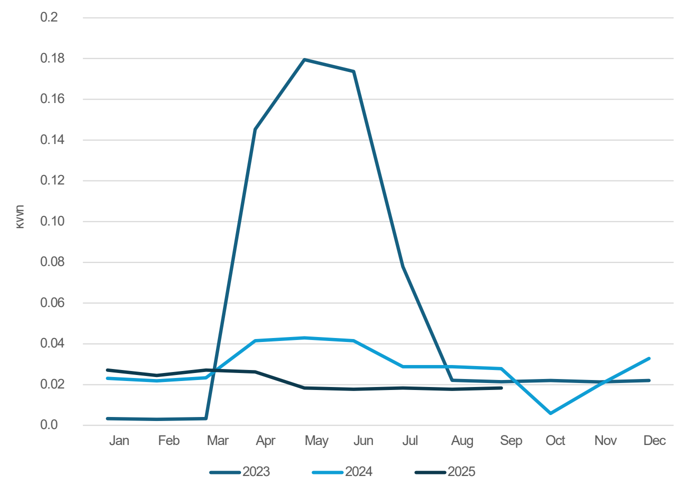
Domestic Hot Water (DHW): DHW consumption in the first year of operation (2023) was dramatically higher than in the subsequent two years. This sharp drop-off suggests there was an initial issue with the system's commissioning or implementation that the facilities team has since rectified.

Electricity Consumption, 2023 -2025

Gas Consumption, 2023 -2025



Water Consumption, 2023 -2025



Key Learning

The gas spikes and initial DHW anomalies highlight the difficulty in diagnosing specific operational inefficiencies using macro-level utility bills.

While the overall building is efficient, to carry out effective analysis, sub-metered data would allow facilities managers (and POE research) to isolate exactly which zone of the building is underpeforming.

It is also worth noting that the building is currently operating at 70% occupancy and results may differ once the building is at full capacity.

Analysis: Thermal Comfort

The 'Goldilocks' effect

The link between student academic performance and thermal comfort is widely, and diversely, studied, concluding a 'Goldilocks' effect. Too cold and intellectual performance drops, mistakes can increase by 44%[1]. Too hot and performance drops; for every degree over 22ºC, student performance can drop by 2%[2]. Whereas students in the just right temperature range, see improved satisfaction in their exam results[3].

Thermal comfort, the intermediate point neither cold nor hot[4], is accepted to vary between people[5]. Understanding someone's thermal comfort range requires a wide range of context about the person and their environment, including personal attributes (age, gender, health, metabolic rate or clothing factor), their thermal context and the present activity.

As thermal comfort is subjective and requires more data about an individual person, to understand how Abbeygate performs we broke down our environmental data across several architectural variables: orientation, room type, time of day, and building height. This analysis can be found across the following pages.

References:

[1] Zehnder (n.d.). Comfort in the classroom: how temperature affects learning | Zehnder Group UK Ltd. [online] www.zehnder.co.uk. Available at: https://www.zehnder.co.uk/en/know-how-centre/detail/comfort-in-the-classroom-how-temperature-affects-learning [Accessed 16 Dec. 2025].

[2] Bryant, C. (2025). The Human Factor: Why Behaviour Change Must Come First in School Decarbonisation.

[3] Romero, P., Víctor Valero-Amaro, Rubio, S. and Miranda, M.T. (2024). Analysis of Thermal Comfort as an Influencing Factor on Academic Performance of University Students. [online] doi:https://doi.org/10.20944/preprints202410.2078.v1.

[4] Hawkes, D., Mcdonald, J. and Steemers, K. (2002). The Selective Environment: An approach to environmentally responsive architecture. London: Spon Press.

[5] Nicol, J.F. and Humphreys, M.A. (2002). Adaptive thermal comfort and sustainable thermal standards for buildings. Energy and Buildings, 34(6), pp.563–572. doi:https://doi.org/10.1016/s0378-7788(02)00006-3.

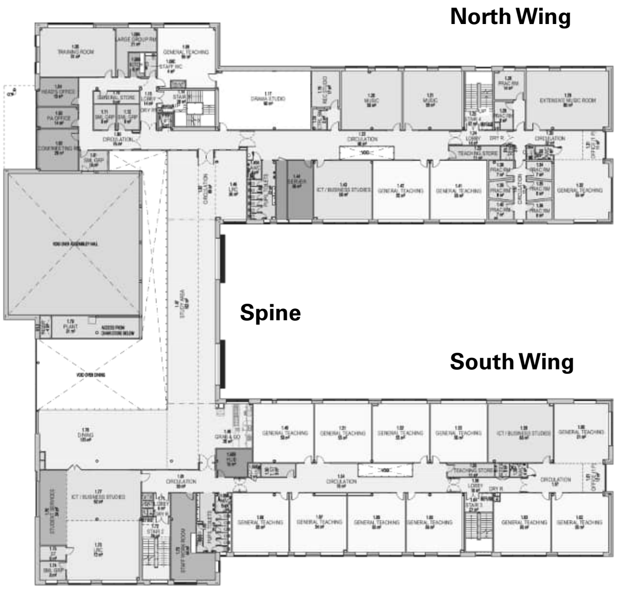
Analysis: Thermal Comfort

Orientation and glazing

We initially hypothesised that south-facing classrooms would record significantly higher internal temperatures than their north-facing counterparts.

What we found, however, was that the data did not identify orientation as the sole causal factor for high internal temperatures, and south-facing general teaching classrooms were not universally hotter than north-facing ones.

Instead, the overriding factor appears to be the overall glazing ratio. To meet baseline Department for Education (DfE) daylighting requirements, the north and south facades feature glazing ratios between 28% and 35%. This is higher than the 15-25% recommended by the LETI Climate Emergency Design Guide for schools.

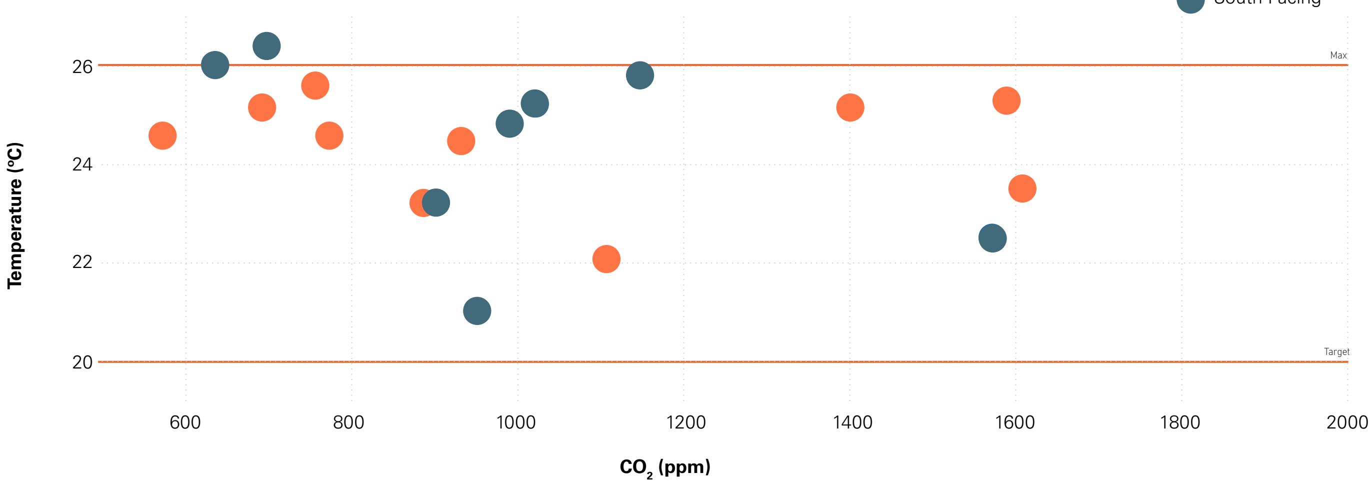


Floor Plan to highlight the spatial distinctions for reference in the text.

	North Wing		South Wing			
	North	**South**	**North**	**South**	**East**	**West**
As Designed	28%	30%	35%	29%	28%	26%
LETI Recommendations	15-25%	15-25%	15-25%	15-25%	15-25%	15-25%

Calculations of the glazing ratios, divided by orientation, with comparisons to the LETI Climate Emergency Design Guide recommendations for Schools.

Room Study Data Collection
23rd September 2025
External Temperature 16°C | Weather: AM Sunny, PM Cloudy



Key Learning

High levels of south-facing glazing can push spaces beyond upper temperature limits, even on mild days. Future designs must rigorously balance DfE daylighting requirements with LETI climate recommendations, utilising enhanced shading strategies rather than relying on occupants to manually open windows once the room feels hot.

Analysis: Thermal Comfort

Room Types and architectural tweaks

While on average temperatures were acceptable, four specific room types recorded temperatures above 25°C on a mild September day:

- **Science classrooms:** four different room data points, both north and south facing. All 4 data points >25°C.
- **Careers Room** (26°C) & **Office** (26.4°C): south facing (conjoined), with large amounts of glazing, east and south facing.
- **Staff Office** (25.6°C): north facing room, data reading taken at the end of a meeting with 4 people in room.

The Careers Room and Office are south and east-facing, featuring large expanses of full-length glazing. Both rooms were completely unoccupied during data collection (evidenced by low CO_2 readings) and had their windows closed, yet still overheated due to solar gain.

Key Learning

Glazing located below the working plane (735mm) contributes nothing to usable desk daylight, yet it significantly increases solar heat gain. The diagrams below show that by eliminating this full-length glazing and raising the sill heights to the standard 1125mm, the east-facing glazing ratio is reduced from 28% to 23%. This simple architectural tweak reduces cooling requirements without compromising the building's external aesthetic or internal daylighting.

East Elevation as designed

East Elevation after reductions to the extent of full height glazing has been made

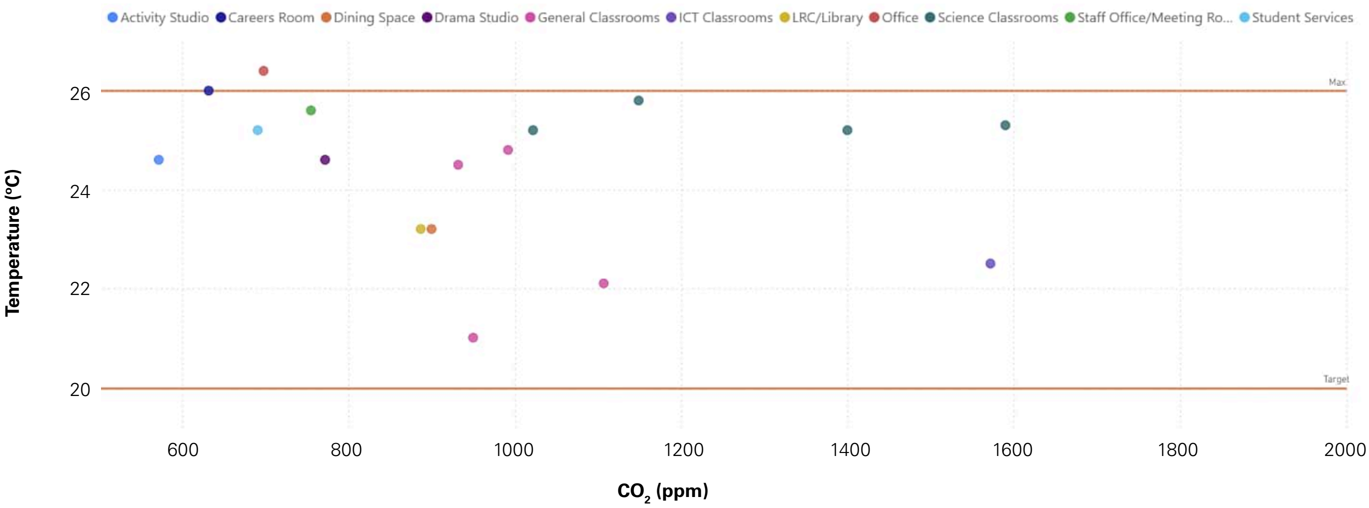
	North Wing		South Wing			
	North	South	North	South	East	West
Delivered scheme	28%	30%	35%	29%	28%	26%
Reduction of full length glazing	28%	29%	33%	29%	23%	26%
LETI recommendations	15-25%	15-25%	15-25%	15-25%	15-25%	15-25%

The diagrams above are an exercise to show the visual impact of reducing full height glazing on east facade and matching the datum of 1125mm to sills of teaching spaces. The table to the left demonstrate the percentage reduction of the glazing by making these changes.

Room Study Data Collection

23rd September 2025

External Temperature 16°C | Weather: AM Sunny, PM Cloudy



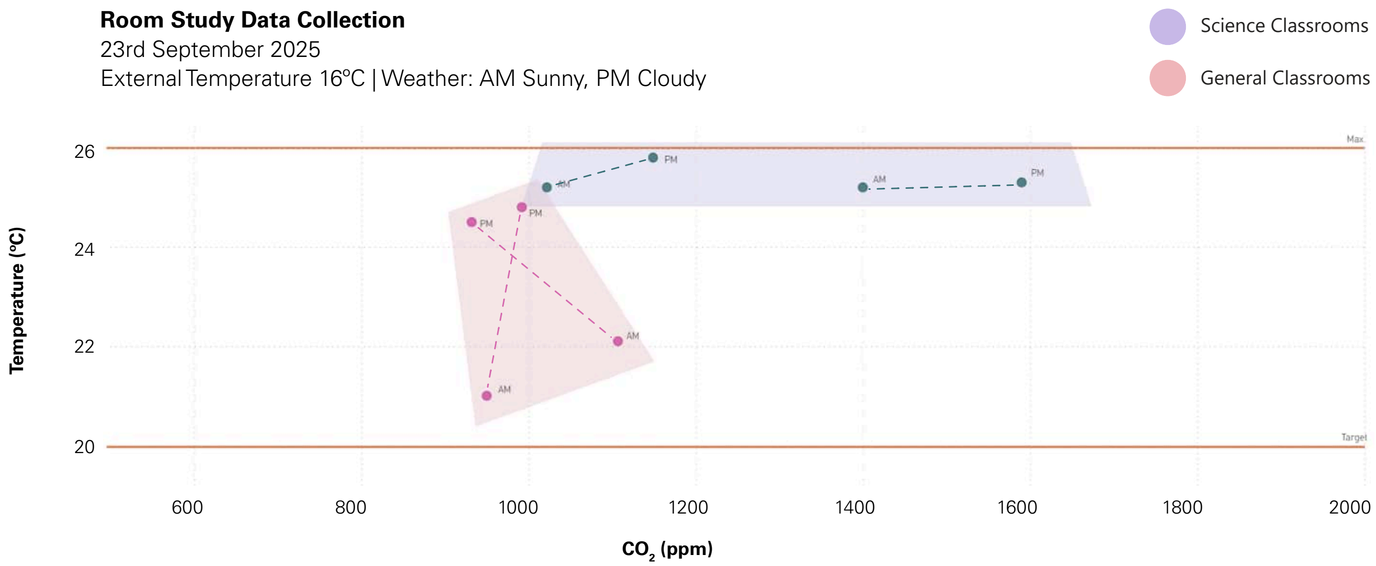
Analysis: Thermal Comfort

Science vs general teaching classrooms

To assess whether the internal environment of classrooms fluctuates throughout the day, we recorded the Indoor Environmental Quality (IEQ) of two General Teaching classrooms and two Science laboratories during both morning and afternoon sessions. The expectation was that classrooms would progressively warm up as the day went on. However, the data revealed that the two room types perform very differently. General Teaching classrooms saw a substantial temperature increase from morning to afternoon, though they never exceeded the peak temperatures of the Science labs.

This significant fluctuation suggests high variability in lesson-to-lesson use, including shifting class sizes and incidental gains, user behaviour, and the manual adjustment of windows or blinds. In contrast, the Science Classrooms were consistently towards the upper temperature limit throughout the entire day, with only a marginal uplift in the afternoon. This suggests that Science Classrooms have a naturally higher base temperature, and while the mechanical ventilation is working well to minimise deviation from this base, further analysis is needed to understand why the starting temperature is so high to begin with. It is highly probable that both explanations are simultaneously true.

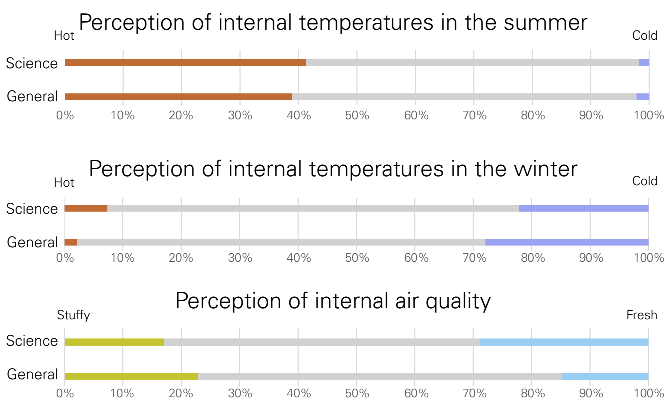
This data correlates perfectly with user perception. Across long-form questionnaire responses and interviews, users consistently described the Science labs as too hot and stuffy, resulting in 'Comfort and User Control' being the lowest-scoring category overall. Teachers reported that north-facing windows are kept shut due to noise and air pollution from the adjacent busy road. Furthermore, the deep fixed benches in the Science labs create a physical barrier, making it difficult for staff to reach and open the windows.



Result of the Room Studies, showcasing the Internal Temperature (°C) and CO_2 levels (ppm) of two General Teaching Classrooms and two Science Labs in the morning and afternoon.

Key Learning

The limitations of only collecting the data on one day mean that although patterns begin to emerge, it is difficult to assess and determine an accurate conclusion. Ideally, evaluations must capture data across summer and winter months at multiple points in a single day. From the data we did collect, we found that the physical ergonomics of window operation must be better addressed, and if an acoustic constraint requires closed windows, automatic purge ventilation should be integrated into the design.



Analysis: Thermal Comfort

Vertical Challenges: Building Height

To assess whether vertical location impacts the internal environment, we investigated whether classrooms on the upper storeys experience different thermal conditions compared to those on lower levels. Reviewing the thermal comfort studies undertaken during the initial design stages revealed a clear link between height within the building and a risk of overheating, rather than it being strictly an issue of orientation. The models consistently indicated that the top floors were the most vulnerable to overheating across all scenarios. In practice, the classrooms located on the top floor of Abbeygate are predominantly Science laboratories and south-facing General Teaching rooms.

This spatial arrangement raises a fundamental diagnostic question: are these rooms overheating simply because of their physical elevation, or due to their programmatic use? Heat naturally rises through the building, and the uppermost south-facing classrooms lack the self-shading benefits enjoyed by rooms on the lower floors. Alternatively, the issue may stem from the specific use profiles of Science Classrooms, which inherently generate higher incidental gains due to specialist equipment and denser practical layouts.

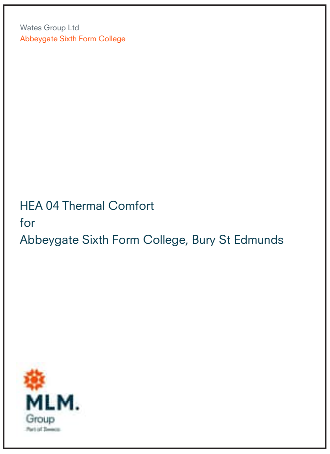
Interestingly, the initial environmental models applied the exact same baseline ventilation rates and fan power to both General Teaching rooms and Specialist Science Labs. It is highly probable that the combination of an elevated location, a lack of contextual shading, and dense equipment loads is compounding the thermal issue.

Abbeygate was designed to mitigate the risk of overheating and achieves the requirements as set out by the BREEAM assessment 2014 HEA 04 criteria. The DfE's Output Specification refers to CIBSE TM52 guidance which establishes the overheating criteria. This allows for teaching spaces to overheat for a certain number of days each year.

Key Learning

The parity in ventilation rates between standard classrooms and specialist laboratories highlights a potential flaw in standard environmental modelling. Future mechanical and environmental engineering strategies must proactively test and apply higher baseline ventilation rates for specialist science spaces, particularly when they are located on upper floors. Overheating Science classrooms were also recorded in other schools visited as part of School Stories. To isolate whether building height or room use is the primary driver of overheating, we will continue to record this on future school POE to help establish any trends.

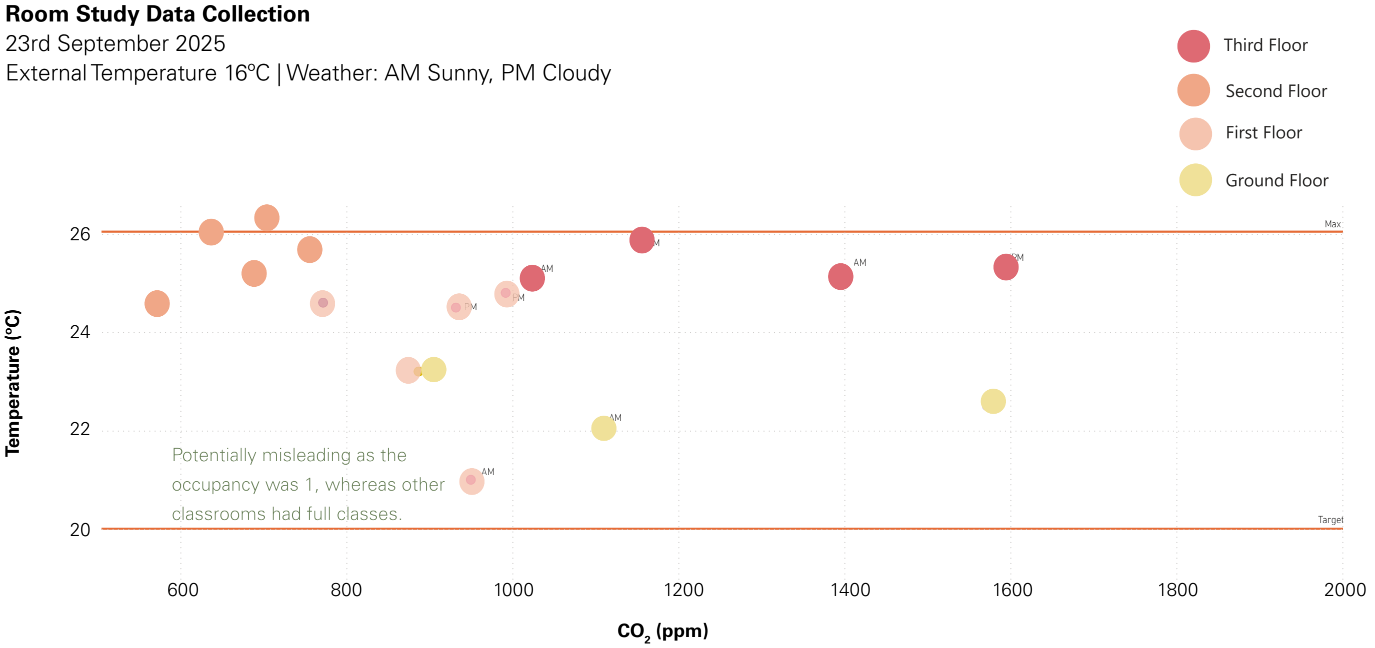
MEP Engineer Thermal Comfort report prepared during design stage, illustrated by the axonometric diagrams on the page opposite.


Wates Group Ltd
Abbeygate Sixth Form College

HEA 04 Thermal Comfort
for
Abbeygate Sixth Form College, Bury St Edmunds

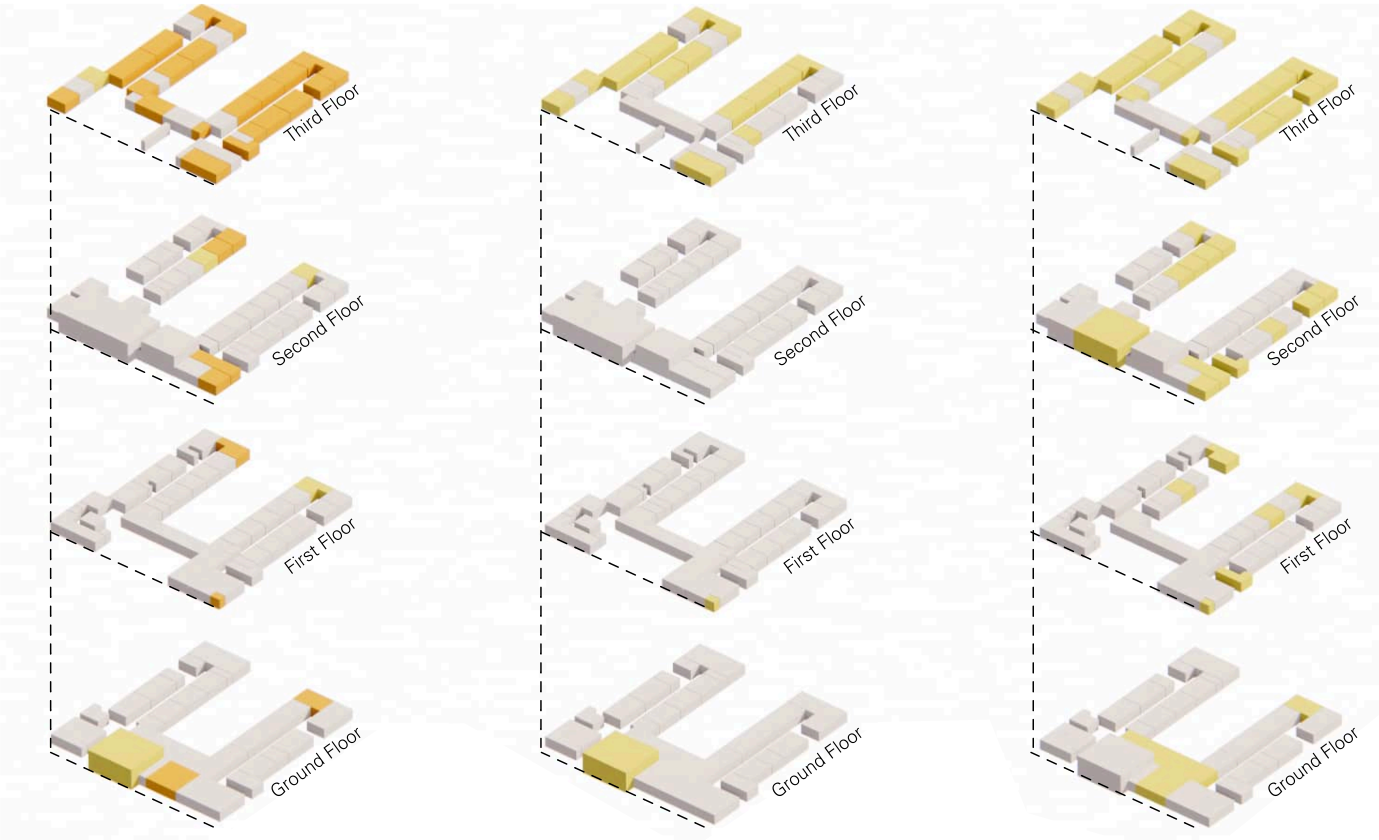
MLM.
Group

Room Study Data Collection
23rd September 2025
External Temperature 16°C | Weather: AM Sunny, PM Cloudy



Analysis: Thermal Comfort

Vertical Challenges: Building Height



Assessed Overheating with current weather without blinds.

Assessed Overheating with current weather with blinds (65% solar reflectance).

Assessed Overheating with future weather (2050) (assuming retrofitted ventilation rates increasing by 50%).

Overheating Criterion 1 or 2 and Pass

Overheating Criterion 1 or 2 and Fail

Analysis: Thermal Comfort

Spatial Volume and Air Quality

We set out to assess the internal environment of the Dining Space during peak lunchtime occupancy. While general user perception of this space was highly positive, with most questionnaire respondents reporting temperatures as comfortable and air quality as fresh to neutral, granular data collection revealed a more complex spatial dynamic.

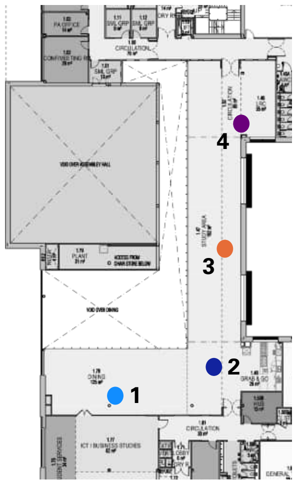
The overall Dining Hall appeared to perform well in both temperature and CO_2 metrics. However, observation confirmed this was largely due to the First Floor Mezzanine being the overwhelmingly preferred location for students. During the lunch break, the mezzanine experienced a highly concentrated, fluctuating occupancy of 150 to 200 students, whereas the main ground floor accommodated just 60.

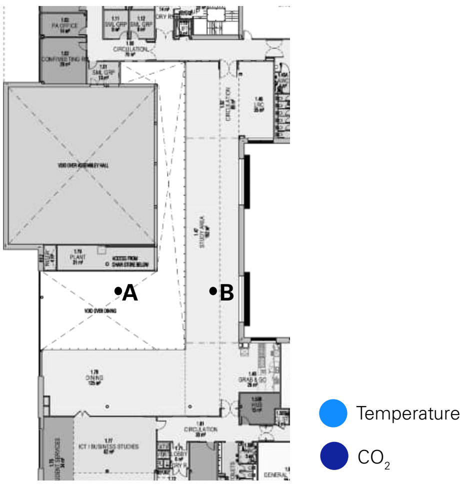
To understand this localised density, we investigated four distinct, heavily populated locations across the mezzanine. Locations 1 and 4 were situated under single-height ceilings, while Locations 2 and 3 benefited from a double-height spatial volume. Across all four locations, the temperature remained remarkably consistent at 25°C.

However, CO_2 concentrations varied significantly depending on the architectural volume above the students. The single-height locations recorded notably higher levels of CO_2 than the double-height locations. We can confidently attribute this disparity to a larger volume of air circulating per cubic metre in the double-height zones, allowing the concentrated carbon dioxide to dilute much more effectively.

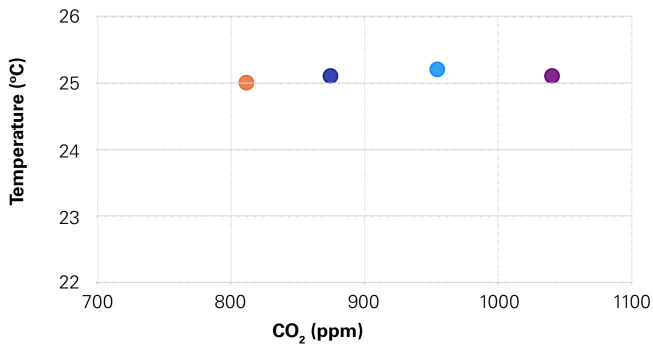
Key Learning

The specification of Furniture, Fixtures and Equipment (FF&E) must respond directly to architectural volume. In future projects, high-density seating arrangements should be prioritised within double-height spaces, while single-height zones should feature sparser furniture layouts to prevent stuffiness and localised CO_2 build-up. Methodologically, this exercise proved that relying on a single central data logger in a large communal space is insufficient. Taking recordings at multiple micro-locations provided a highly accurate view of the environmental reality that would have otherwise been missed.

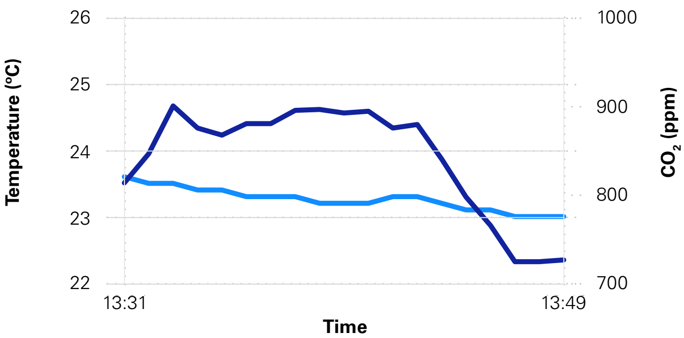




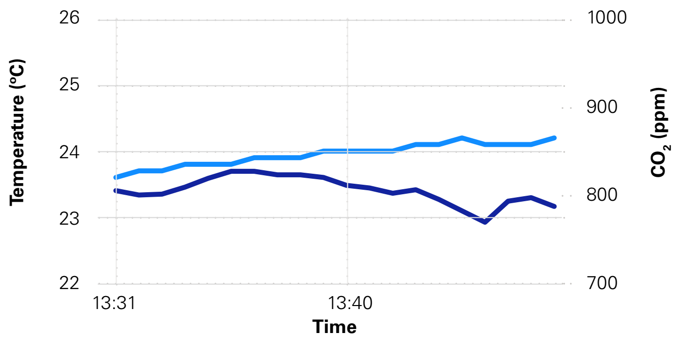
IEQ First Floor Mezzanine



IEQ Location A



IEQ Location B



Lessons Learnt

Architectural

What went well:

- **Passive Supervision**: The open-plan circulation and strategic sightlines are highly successful. With 91% of users feeling safe, this spatial strategy effectively eliminates hidden corners and reduces anti-social behaviour.
- **Energy Performance:** The fabric-first design and overarching systems are performing exceptionally well, with recorded primary energy use (85 kWh/m2/a) tracking within 5% of the ambitious design model.
- **Durability:** The material palette is standing the test of time, with 90% of users agreeing the finishes remain in excellent condition under heavy daily use.

Areas to improve:

- **Wayfinding:** Subtle colour gradients are insufficient for intuitive navigation in symmetrical buildings. A stronger hierarchy of colours, paired with bold super-graphics, is required.
- **Social and Study Spaces:** A more diverse provision of study spaces is needed. The wider questionnaire revealed that only 42% felt that there was sufficient provision for privacy. Open-plan hubs must include a gradient of zones, offering acoustically private booths alongside collaborative tables.
- **Glare Mitigation:** On exposed sites, particularly with horseshoe or courtyard forms, the risk of reflective cross-glare from parallel facades must be actively investigated and mitigated, potentially through darker external cladding choices.
- **Thermal Comfort & Glazing:** High levels of south-facing glazing cause spaces to exceed target temperatures. Relying on occupants to manually open windows is unreliable. Where full-height glazing is not functionally required, sill heights should be raised to 1125mm to reduce solar gain without sacrificing usable daylight.
- **FF&E Density:** Furniture layouts must respond to architectural volume. Seating should be less dense in single-height spaces to prevent CO_2 build-up and stuffiness, reserving high-density layouts for double-height areas.
- **Circulation and Pinch Points**: Narrow corridors meeting the top of stairs create significant bottlenecks during lesson changeovers. Furthermore, reliance on a single passenger lift causes major disruption to daily operations and the movement of goods. Future designs must generously widen corridors at critical junctions and ensure robust vertical circulation provision.

Briefing/Frameworks

What went well:

- **Daylighting:** Baseline DfE daylight requirements have successfully generated bright, welcoming spaces that positively impact student mood and safety.
- **Robustness:** The required interior material specifications have proven highly resilient, reducing the maintenance burden on the school's estate team.

Areas to improve:

- **Balancing Glazing with Climate Targets:** DfE daylighting requirements often push glazing ratios to 30-35%. This conflicts with LETI Climate Emergency recommendations (15-25%) and exacerbates summer overheating. A more nuanced balance is required.
- **Ventilation in Specialist Spaces:** Baseline ventilation rates for specialist Science labs are currently modelled identically to General Teaching classrooms. Given the higher equipment loads and fixed-furniture constraints, framework models must apply higher baseline ventilation rates to laboratories.

The New CF25 Framework

It is highly encouraging to observe that many of the friction points and limitations identified within this POE have already been acknowledged and addressed at Framework level. The evolution through the 2021 Framework to the newly released CF25 demonstrates a positive trajectory for the UK's educational building stock, actively resolving several of our key findings:

Circulation and Accessibility
Since the 2021 Framework, principal circulation corridors have required a minimum width of 2.4m. Under CF25, this can increase up to 3.8m to accommodate a centrally located stack ventilation strategy, which situates classroom doors within recesses so they do not impede the flow of traffic. Furthermore, stairs are now positioned either at the end of a wing or within a specialised circulation link between teaching blocks to streamline movement. The mandate for a stair on any length of corridor exceeding 56m, combined with the elimination of internalised blind corners, significantly reduces the risk of collisions and increases natural daylight into these spaces.
Vertical circulation has also been fundamentally improved. The 2021 Framework requirement for more than one lift has been further reinforced by the latest Building Regulations, ensuring dignified, equal emergency escape for all users.

Thermal Comfort and Glare
To combat the overheating and solar gain issues identified on exposed facades, the new Framework requires the integration of horizontal solar shading. However, as architects, we note that the mere presence of shading is not the full answer; its design must be accurately modelled and tested on an individual site basis to ensure it performs adequately. Alongside this, while glazing percentages are not strictly mandated in the new Framework, there has been a distinct shift towards individual punch-hole windows, naturally bringing down the overall glazing ratio and reducing solar gain. Additionally, the new Framework restricts the use of darker, heat-absorbing materials on horizontal surfaces and incorporates a soft, planted buffer around the perimeter of the building. This mitigates the localised heat island effect, providing a passive safeguard against summer overheating.

Ventilation and Cooling
The CF25 Framework champions a stack ventilation strategy, providing every classroom with an individual stack that ventilates directly out to the roof. This works in tandem with a night purging strategy (first introduced in the 2021 Framework) to cool the building fabric out of hours. The new Framework also mandates more stringent U-values, maintaining a more consistent internal temperature and actively reducing space heating and cooling demand.

Conclusion

The Abbeygate Sixth Form College Post Occupancy Evaluation demonstrates the immense value of revisiting our buildings, listening to their users, and testing our design assumptions against real-world data.

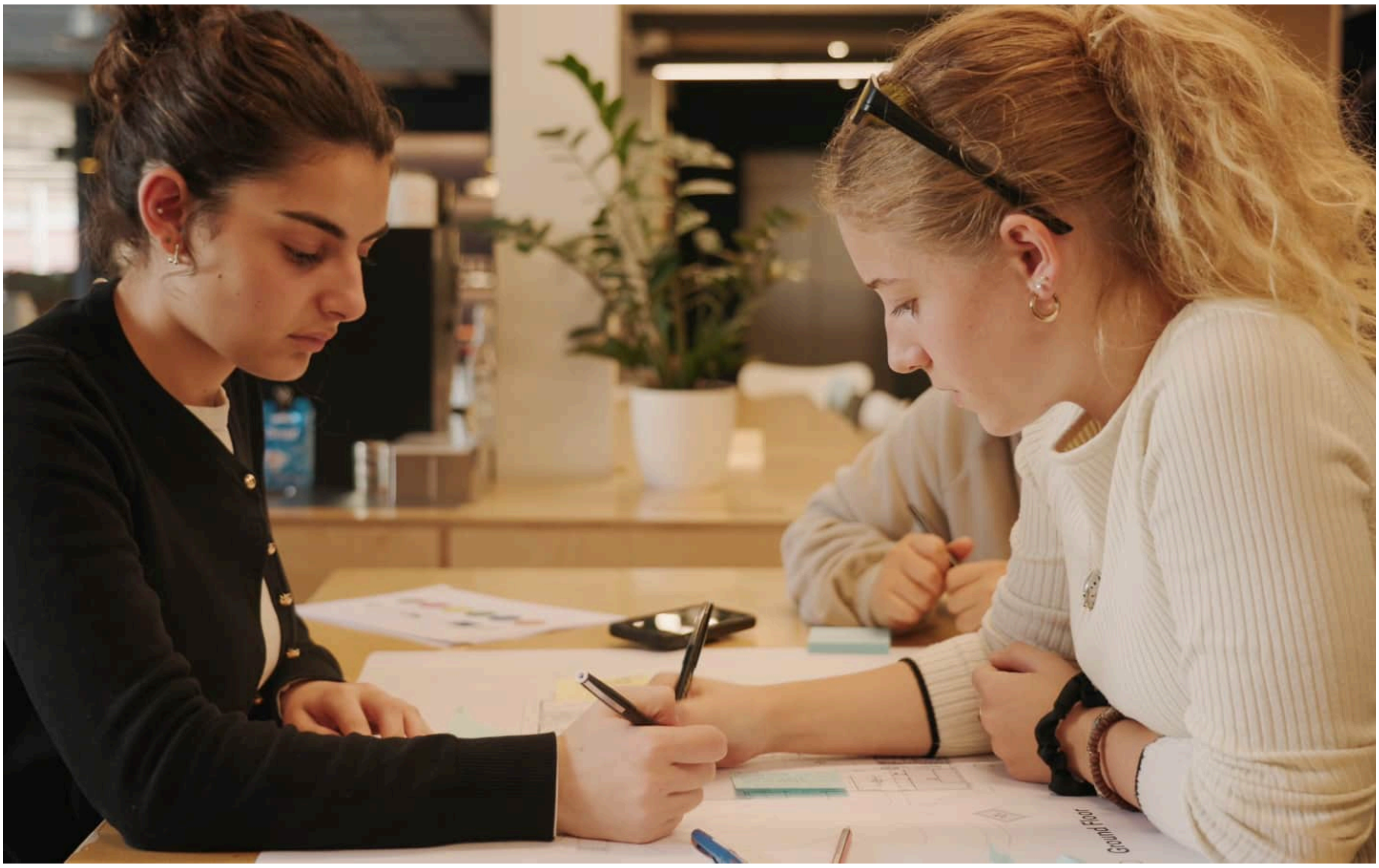
The findings of this report are overwhelmingly positive. Abbeygate is a safe, durable, and highly energy-efficient campus that provides an uplifting environment for 1,200 young people. The successful integration of passive supervision, the clear architectural identity, and the alignment between modelled and recorded energy use are all major successes that we will carry forward into future projects.

However, the true value of this POE lies in identifying the friction points. The anecdotal feedback regarding thermal comfort in specialist science spaces, the demand for acoustically private study zones, and the operational challenges of manual ventilation provide us with clear, actionable insights.

By adapting our approach to glazing ratios, FF&E density, and mechanical ventilation in highly loaded spaces, we can ensure our next generation of schools performs even better.

Finally, by conducting this research through our Access to Architecture programme, we achieved a dual outcome. Not only did we gather authentic, peer-led data to improve our practice, but we also engaged the students with the built environment, hopefully inspiring a few of them to become the architects and engineers of the future.

We'd like to thank the sixth form students who took part in the Access to Architecture programme, and a special thanks to Nadine Payne, Abbeygate's Group Director of Careers, Opportunities and Progression, for the invaluable help in organising the workshops.



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