DKA ARE PASSIVHAUS READY

ENVIRONMENTAL CAPABILITY STATEMENT

May 2021

INTRODUCTION

DKA are committed to developing design solutions to improve the built environment. In partnership with clients, consultants, contractors, local authorities and other participants in the development process, we seek to control the impact of our projects on the natural environment and local communities. We have been delivering highly sustainable buildings for over 25 years, reducing the energy consumptions of our clients' buildings and improving the experience of the building users.

We endeavour to raise the awareness of our clients to the benefits of development with a reduced impact on the environment and to encourage the adoption of the best practice for the design, operation, management and maintenance of buildings. This is never a one-size-fits-all solution and various methods can be employed to maximise the benefit to a particular site or end user. These can include recognised certification schemes, or can be design principles based around Net Zero Carbon and life cycle analysis.

We regularly act as lead consultant, applying our experience to guide both the client team and other consultants. Once a target is set, we seek to explore all options to achieve best value, future flexibility, ease of use, select the right materials and desired level of finish. Our understanding of the design issues, regulations and available environmental technologies means we have produced a consistently high level of sustainable performance for our clients.

Passivhaus is becoming an aspiration for many of our clients, particularly in the public sector for new school projects. The combination of a 'fabric first' approach combined with low energy bills makes this an attractive proposition, and directly helps tackle the UK Governments Carbon Reduction targets and addresses the Climate Emergency declared by many local authorities.

Before embarking on a Passivhaus project you need to understand the methodology, the terminology and the outcomes. This brochure explains these principles along with the skills you require from your professional team. We can help you on your journey.

DKA ARE PASSIVHAUS READY

- ***DELIVERED HIGHLY SUSTAINABLE PROJECTS***
- ***BESPOKE SOLUTIONS FOR EACH PROJECT***
- ***EXPERTS IN THE EDUCATION SECTOR***
- ***LEAD CONSULTANT ROLE***
- ***TRAINED PASSIVHAUS DESIGNER***
- ***INSIGHT INTO TRENDS AND OPPORTUNITIES***

Passivhaus Trust MEMBER
The UK Passive House Organisation

WHAT IS A PASSIVHAUS?

METHODOLOGY

Passivhaus is a voluntary quality assured building performance standard and methodology that provides buildings with a high level of occupant comfort while reducing their energy use and carbon emissions. Passivhaus projects are built with meticulous attention to detail following a rigorous design process according to principles developed by the Passivhaus Institute in Germany, and can be certified through an exacting Quality Assurance process.

Passivhaus is not just a domestic standard, and the UK has seen a rise in the number of commercial buildings and public sector buildings being designed to this method.

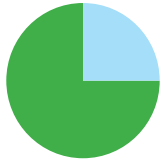
Achieving the Passivhaus Standard in the UK typically involves:

- Accurate design modelling using the Passive House Planning Package (PHPP)
- Very high levels of insulation far in excess of UK Building Regulations
- Extremely high-performance windows with insulated frames
- Building orientation optimised for beneficial solar gain
- An extremely airtight building fabric far in excess of UK Building Regulations
- 'Thermal bridge free' construction focusing on junctions and interfaces
- A mechanical ventilation system with highly efficient heat recovery

BUILDING PERFORMANCE

Passivhaus buildings achieve a 75% reduction in space heating requirements, compared to standard practice for UK new build. The Passivhaus standard therefore gives a robust method to help the industry achieve the 80% carbon reductions that are set as a legislative target for the UK Government. Passivhaus also applies to retrofit projects, achieving similar savings in space heating requirements.

The first houses built to Passivhaus standard were completed in 1991, and since then over 50,000 houses, schools and offices have been constructed to the standard in Europe, USA and many other parts of the world. There has been extensive monitoring of Passivhaus buildings which has demonstrated conclusively that they are performing to standard. This is crucial, given that the discrepancy between design aspiration and as-built performance for many new buildings in the UK can be as much as 50-100%.



75% REDUCTION IN SPACE HEATING

CLIMATE CHANGE ACT 80% CARBON REDUCTION BY 2050

50,000 PASSIVHAUS SCHEMES SINCE 1991

INCREASE POST OCCUPANCY EVALUATION DATA

WHAT IS A PASSIVHAUS?

INTERNAL ENVIRONMENT AND COMFORT

Passivhaus buildings are praised for the high level of comfort they offer throughout the whole year, not only during cold seasons.

Good indoor air quality is an essential requirement, with the ventilation system providing 30m3 of fresh air every hour, for every person in the building.

Not only must the building fabric be draught-free, but the standard requires that the internal surface temperatures vary little from indoor air temperatures, avoiding cold spots even in the face of extreme outdoor temperatures.

In addition, the reduced air leakage, combined with high levels of insulation and efficient glazing have a knock-on effect to the building's acoustic performance, which can exceed the standards required by the Building Regulations.

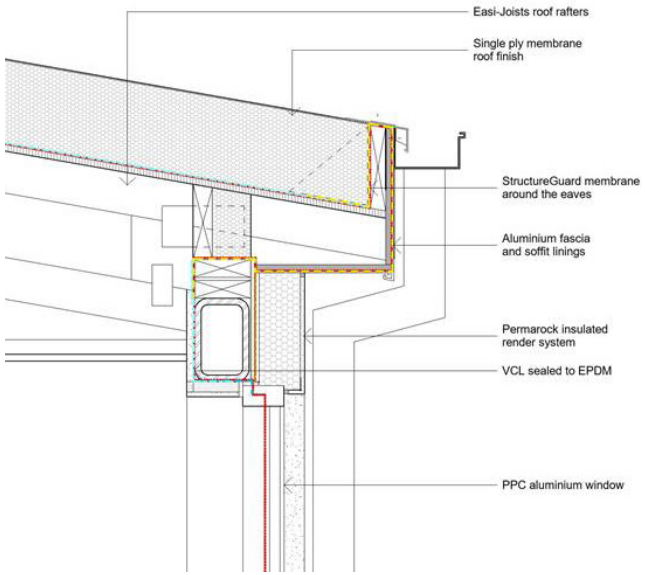
- *INCREASED COMFORT*
- *BETTER INDOOR AIR QUALITY*
- *DRAFTS REDUCED*
- *BETTER ACOUSTIC PERFORMANCE*

CONSTRUCTION

To achieve all these standards, the construction process must be rigorous and with meticulous attention to detail. This relies on close coordination of the junctions between different materials and a clear understanding of the responsibility of different trades.

Materials must also be of high quality, robust and long lasting. This places a large responsibility onto the contractor and their supply chain to supply the correct products and fit them according to the design performance requirements.

The Passivhaus standard advises that the site team in particular are key to this and should ideally have prior knowledge of this method of building.



COST

Like other sustainable methodologies, any cost uplift is minimised if designed from first principles. Passivhaus must be understood and integrated into the design approach from the outset in order to achieve an economic solution.

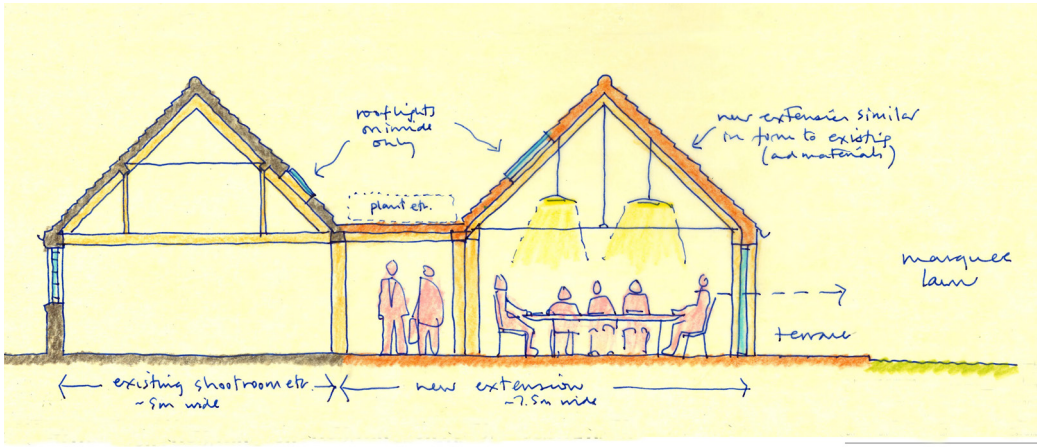
On average, a Passivhaus might cost 5 to 10% more in capital terms. However, these buildings do not require heating and cooling systems on conventional scales, meaning that the operational costs are significantly reduced over the life span of the building – particularly attractive for an owner occupier.

This long-term energy saving makes Passivhaus buildings more cost effective over the long term than a conventional building.

HOW CAN DKA HELP?

We are looking for partners to expand our sustainability experience, particularly local authorities and main contractors looking to develop Passivhaus schemes. What makes DKA suitable?

- Over 25 years experience of delivering highly sustainable projects for public and private sector
- Extensive experience of designing educational environments from nursery to university level, along with a particular expertise in designing for students with Special Educational Needs
- DKA have a Certified Passivhaus Designer and more staff undergoing the training
- DKA are members of the Passivhaus Trust, helping to promote the standard in the UK and with access to the latest technical information and experience
- DKA regularly act as lead consultant, often with a role to coordinate specialist MEP and other engineering elements
- DKA have a number of Certified Autodesk® Professionals and more than ten years' experience collaborating on major projects with BIM requirements for private clients, local authorities and contractors
- Our success lies in the quality of our relationships. We treat our clients, consultants and contractors as partners, and are delighted that over 70% of clients choose to work with us again



Passivhaus Trust MEMBER
The UK Passive House Organisation

KEY PEOPLE

SPECIALIST ROLES

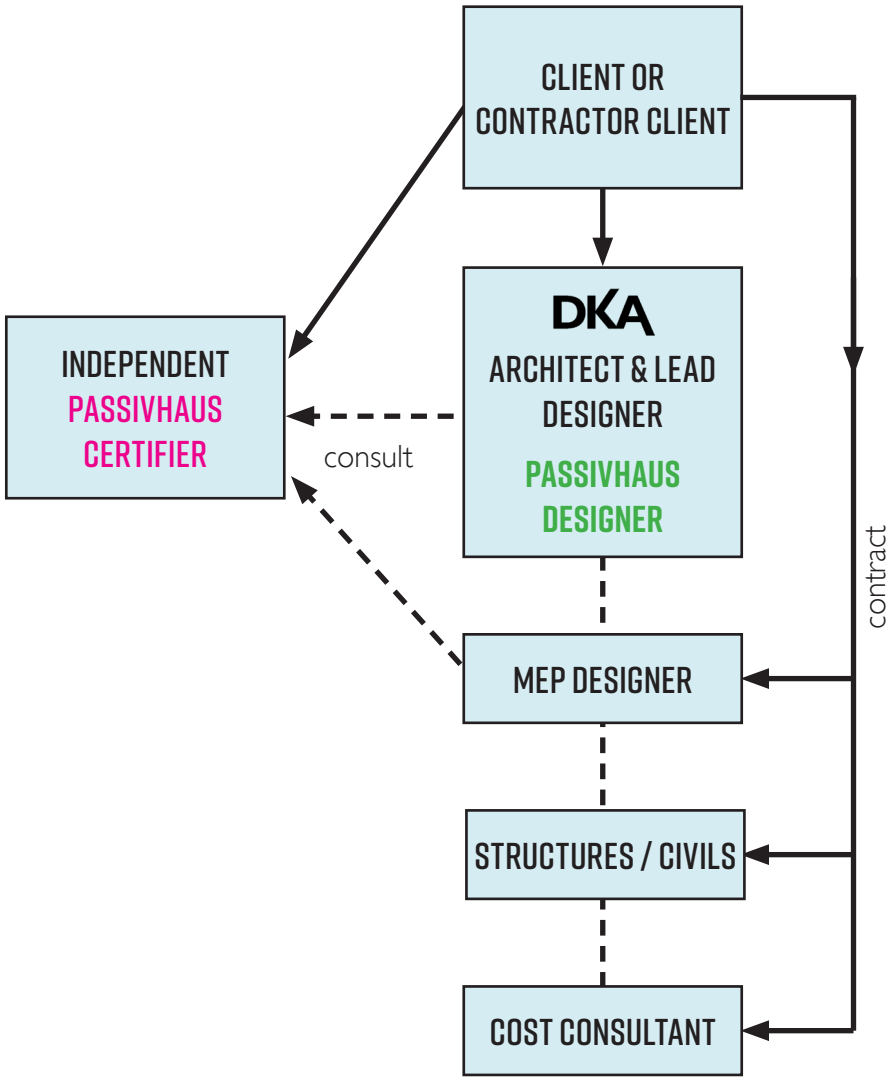
Like other environmental systems, Passivhaus has specific team roles that must be undertaken.

PASSIVHAUS DESIGNER – This is the main consultant within the design team who advises on the design methodology, and coordinates all disciplines, much in the same way as the traditional Lead Designer role. The Passivhaus Designer also inputs data into PHPP, the bespoke calculation software. As this role combines both design and building environment, it is best suited to someone with a broad background combining architectural and engineering training.

In order to become a Passivhaus Designer you must either

- Complete a training course and examination or
- Having been the lead consultant on a completed Passivhaus scheme and submitting a case study

PASSIVHAUS CERTIFIER – These are independent consultants who have the knowledge to validate the designs being prepared. Their impartiality is key to maintaining high quality control. They also help support the Passivhaus Designer towards the goal of achieving compliance. There are only a handful of consultants in the UK who can fulfil this role, and DKA have contacts within the South West region and with researchers in higher education institutions.



KEY PEOPLE

CRIS ALVAREZ

ARCHITECT

BSc (Hons) MArch PgDip
MSc ARB
CERTIFIED PASSIVHAUS DESIGNER

PROFILE

Cris joined DKA's team in 2019 after working for medium and large practices in the UK, in which she gained technical and construction experience across a range of sectors including education and commercial projects.

After gaining qualifications in Spain and then in the UK, Cris followed her interest in sustainable design and emerging technologies to additional postgraduate studies. She achieved an MSc in Architectural Innovation and PgDip in Building Services. In 2017 she also became a Certified Passivhaus Designer by the Passivhaus Institute and a BREEAM Associate in 2020.

During her time at DKA Cris has gained experience on a variety of building types, with an emphasis on the educational and automotive engineering sectors throughout their Technical Design and Construction stages.

Cris' background of architectural and engineering gives her the skills to approach projects from a truly holistic point of view. She enjoys the challenge of matching solutions to the client's aspirations and working hard to deliver a successful sustainable outcome.

ALEX BELL

DIRECTOR

BSc (Hons) MArch ARB RIBA

PROFILE

Alex is a qualified architect with over 15 years' experience in practice. Alex studied at the University of Bath and has worked at small, medium and large sized practices in the south west. He graduated in 2002 as the winner of the Wessex Prize for design and joined DKA. In 2008 Alex gained BRE qualifications in the BREEAM accreditation scheme for environmental design. He became director in July 2017.

Alex takes a methodical approach to design and looks for ways to unlock a client's brief. He enjoys the problem-solving side of designing buildings as well as the technical delivery. In his role as director, Alex continues to have contact with projects and leading design teams across a variety of sectors and contract types. He is capable of managing large design teams, presenting to clients, dealing with contractors and suppliers. He has experience of many Design & Build projects, as well as Traditional JCT, NEC and client side roles throughout the eight RIBA workstages.

Alex has expanded the environmental awareness within the practice and established new procedures for incorporating sustainable design principles.

FABIEN COUPAT

DIRECTOR

BSc (Hons) MArch ARB RIBA

PROFILE

Fabien joined DKA in 2001, after completing his architecture degree at the University of Bath. Since then he has gained experience in a variety of building types, with an emphasis on education and industrial projects, from scheme and detailed design to operations on site. Fabien manages our resourcing needs, is actively involved in maintaining our Quality Management System (QMS), and leads our BIM working group.

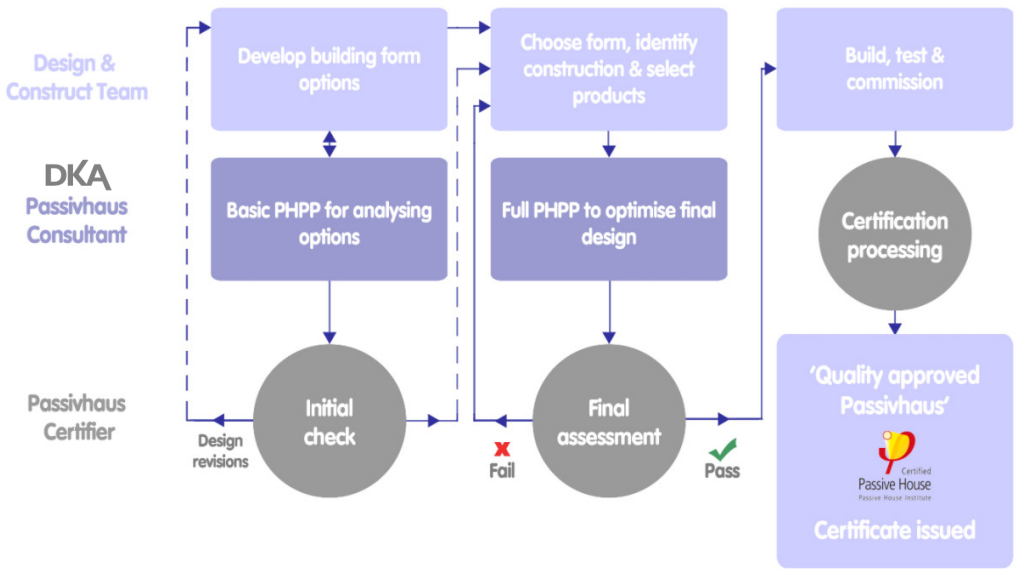
Fabien has strong technical knowledge and understanding that goes beyond his architectural remit. This allows him to engage fully with the Client and design teams, and challenge them where required, resulting in a design which responds to the project brief, and ensures a timely delivery.

In his role as director, Fabien is responsible for education projects and continues to have day-to-day contact with projects he oversees. The education team is currently delivering 3no DfE SEN projects, while Fabien is also involved on two projects which will be carbon neutral in operation.

PASSIVHAUS SERVICES

Our services are rooted in our ability to offer our clients economic, pragmatic design solutions in an open and collaborative way. We can tailor our standard services to a Passivhaus approach, focusing on these elements:

- Fulfil the role of Passivhaus Designer and lead the consultant team
- Selection of the design team and Passivhaus Certifier role
- Helping the client understand the Passivhaus methodology and realistic outcomes
- Selecting economically viable solutions appropriate for the site, building use and end-users
- Provide appropriate materials specifications using resources from Passivhaus approved products
- Undertake the PHPP assessment
- Assist in the selection and interview of main contractors
- Thermal Bridging Analysis
- Undertake Post-occupancy Evaluation



CASE STUDIES OF SUSTAINABLE PROJECTS

MONKTON PARK

Overlooking the River Avon in central Chippenham, Wiltshire Council's Monkton Park provides 6,000 sqm of flexible office space over six storeys, together with public meeting rooms, committee rooms, a council chamber, refectory and undercroft car park.

Highly sustainable using natural ventilation and exposed thermal mass of concrete floors, linked with controlled night time cooling to regulate internal temperatures. Exposed concrete soffits absorb heat given off by equipment and occupants, reducing peak day time temperatures. It was awarded BREEAM 'Excellent' and an exemplar in CABE's (Commission for Architecture and the Built Environment) 'Better Places to Work'.

- BREEAM 'Excellent'
- exposed thermal mass
- natural ventilation & night purging
- day lit atrium
- inspiring interior

ENERGY SKILLS CENTRE

Conceived as a local training base for Nuclear Industries based at Hinkley Point, the Energy Skills Centre for Bridgwater College provides state of the art facilities for the UK energy industry. The building contains a variety of engineering workshops, a welding workshop, science labs and classrooms for the wider college. The large Realistic Working Environment (RWE) with overhead crane allows for nuclear simulation exercises in a controlled environment.

Reaching its target of BREEAM 'Excellent', the centre utilises acoustically attenuated natural stack ventilation, roof mounted photovoltaic cells, solar hot water heating, a 6kW wind turbine, rainwater harvesting and an ecology area.

- educating about energy
- teaching roof
- exposed thermal mass
- natural ventilation
- numerous on-site renewables

HEALTH & FITNESS CENTRE

The Health & Fitness Centre for Bridgwater College provides 28 general classrooms, purpose made teaching spaces for the Health & Beauty and Fitness courses and a café.

Exposed concrete coffers provide thermal mass to regulate the internal temperature of the building and incorporate concealed extract ducts. These connect to chimneys which allowed the deep plan classrooms to benefit from natural ventilation, leading to a sustainable finished building.

- fully naturally ventilated
- exposed thermal mass
- solar shading
- robust interior for long life
- efficient circulation and flexible layout

BRIDGWATER HOSPITAL

When it came to designing a new community hospital for Bridgwater, we had excellent experience of the building type and a thorough understanding of the client requirements having designed three previous community hospitals for NHS Somerset.

The hospital is laid out using standard sized rooms with a structure that has no internal load-bearing walls and minimal internal columns. This ensures maximum flexibility for future layout changes, whether it be 're-badging' rooms for different uses or making more long-term changes by moving internal walls.

- flexible planning grid
- natural light & views
- natural ventilation
- roof PV array
- SUDS & flood defence

CASE STUDIES OF SUSTAINABLE PROJECTS

DEVIZES INTEGRATED CARE CENTRE

Devizes Integrated Care Centre will create a new healthcare facility for NHS Wiltshire. It will provide additional primary care service capacity for the town, urgent care services and modern purpose-built accommodation for the services currently delivered at the Devizes Community Hospital with capacity to enable the provision of a broader range of health and social care services for the area.

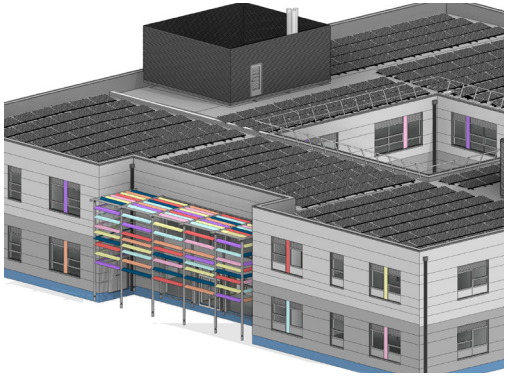
The 1,588sqm, two storey building will be one of the first of this new type of healthcare facility bringing a wide range of services into the community. Filling a role between a GP surgery and a community hospital, the building has no wards but provides a range of outpatient and GP services.

- Net Zero Carbon in operation
- efficient layout
- naturally ventilated consulting rooms
- large roof-mounted PV array
- sustainable drainage solution

PORTON INNOVATION CENTRE

Following the success of the Phase 1 Incubator building at Porton Science Park which opened in September 2018, Wiltshire Council has an aspiration to construct a new 40,000 sq. ft (3,716 sqm) Innovation Centre. The Centre will be a research and innovation facility providing collaborative workspace, flexible office, meeting and laboratory bench space. A programme of business support, training and development will be provided by specialist providers for the Health and Life Sciences sector through the organisation and delivery of a mix of sector-specific conferences, seminars, workshops and one-to-one support.

- BREEAM 'Excellent' target
- Net Zero Carbon in operation
- Modern Method Construction (MMC)
- MVHR system to reduce heating demand
- large roof-mounted PV array
- sustainable drainage solution



ASHTON GATE PRIMARY SCHOOL

Working with Arup structural engineers, DKA converted a former tobacco warehouse in Bristol into a three storey primary school. Although the building is not listed, it is an important landmark in south Bristol and contributes to the local area. We made minimal external changes to preserve the imposing brickwork street frontage whilst making significant internal alterations to create interesting teaching spaces.

A key intervention was the hall space, which had to be carved out of an existing office extension. Through a combined architectural and engineering effort, the design inserted a new hall without the need to remove an existing roof.

- re-use 95% of existing fabric
- natural ventilation
- manual solar controls
- roof PV array
- intelligent LED lighting

CORSHAM DIGITAL MANSION

Digital Mansion Corsham for Wiltshire Council was a complete Grade II refurbishment and extension to provide innovative business start-up space. The scheme re-used 90% of the existing fabric, only demolishing areas that were beyond economic repair or to allow the extension to connection. The extension housed a lift, stair and new efficient plant rooms to allow the existing services to be completely overhauled.

The new facility is fully naturally ventilated, with access to external grounds. A redundant outbuilding was converted for cyclist showers and changing. Being in a town centre location, parking is limited and sustainable transportation methods are encouraged.

- re-use of existing historic fabric
- minimising new build
- naturally ventilated spaces
- new efficient services throughout
- dedicated shower block and cycle storage