

KTP Associate - Passivhoos Design and Construction Manager
Leading the development of a new model of cost effective Passivhaus homes
for social housing providers in Scotland

Passivhoos Knowledge Transfer Partnership

The Passivhoos KTP is a 3-year project, funded by Innovate UK through the Knowledge Transfer Partnership (KTP) scheme. Passivhoos is a range of social housing types that meet the international Passivhaus standards, Housing for Varying Needs and Scottish Government budget benchmarks. It has been developed and will be delivered by John Gilbert Architects, Stewart & Shields contractors and Design Engineering Workshop for Scottish housing providers and is available in a variety of configurations to suit many different sites. This project aims to bring the long-term benefits of Passivhaus construction to Scottish social housing, encourage the take up of genuinely low-energy homes and eliminate fuel poverty. Passivhaus buildings provide a high level of occupant comfort while using very little energy for heating and cooling. Passivhaus homes are built with meticulous attention to detail, rigorous design and construction according to principles developed by the Passivhaus Institute in Germany and can be certified through an exacting quality assurance process.

The aim of this KTP is to develop and refine the Passivhoos model for the Scottish context through the application of rigorous R&D methodology, including modelling and prototyping, development of low skill construction methodology, adaption to Scottish climate, social contexts, and compliance mechanisms, designing out performance gaps in end use. The project will lead the development of a new model of cost effective Passivhaus homes for social housing providers in Scotland.

The Role

Job Title: KTP Associate

Location: The position is FT primarily based at John Gilbert Architects, Glasgow but with periods working at Stewart & Shields offices, Design Engineering Workshop Glasgow and on sites across Scotland.

Reports to: Prof. Tim Sharpe, Director (MEARU)

Responsible to: Prof. Tim Sharpe, Knowledge Base Supervisor

Purpose: To assist in fulfilling the specific requirements of the Knowledge Transfer Partnership between CPA and MEARU

Organisational Chart

See Appendix 1

Dimensions

Funding Provider and Collaborating Companies.

KTP Knowledge Transfer Partnerships funded by Innovate UK

JGA: John Gilbert Architects is a Scottish design studio, passionate about designing places for people and the planet. We deliver beautiful, ecological, low carbon development designed with users, residents and the community, we undertake design work from a strategic level to detailed architecture with creativity, enthusiasm and knowledge. Our work includes Sustainable architecture, Conservation & Retrofit and Masterplanning. We work for public sector, community and commercial clients across Scotland.

S&S: Stewart and Shields is a construction company run by the founder's grandsons Richard and Mark Shields. Their vision is to provide an ever-improving service delivering safe reliable projects on time, to budget and to the quality required. The company provides a full range of building services on projects from small works at £10k up to £5m, covering new-build, refurbishment, conversion and modernisation together with single/multi-trade works.

DEW: Design Engineering Workshop are a structural engineering consultancy who specialise in architecture and design-led projects. Their core business is to provide professional services based on the structural design of buildings. This is often complemented with associated civil engineering design and, although a small and focused practice, our wider network of collaborators allows us to accommodate projects of all complexities and scale.

Principal Accountabilities

The aim of the project is to develop and evolve a series of Passivhaus house types for the Scottish Social housing market, to meet cost and performance targets. There are three key criteria:

Work with the team to evolve a detailed design model for the project (utilising BIM as a common standard), considering information required for design, performance, costing and construction. We envisage this will involve time in JGA design studio, DEW and with Stewart & Shield team developing detailed information models.

Work with the team to refine construction processes, reducing time and cost. This will involve working with prototypes and with on-site staff to develop quicker, more efficient processes.

Meet Passivhaus performance requirements and wider criteria for environmental and in-use performance. Work with the design team to optimise the design for Passivhaus certification and regulatory compliance.

Key stages include:

- Initial project development, review of Passivhaus design and construction processes.
- Review of tools and processes
- Development of a demonstration project
- Supervision and assessment of demonstration project
- Development of standardised design and construction processes
- Project dissemination and publication

This is a new project and the candidate will have a key role in shaping it. There is a generous training budget available to the successful candidate.

Key Challenges

- Enabling research expertise and methods to be applied to real-world environments.
- Developing detailed technical knowledge of Passivhoos to integrate design, engineering and technical knowledge.
- Working across three diverse companies and academia.
- Developing replicable tools and processes and communicating to these to the Company.
- Developing a credible Passivhoos 'offer' and communicate this to a diverse range of personnel including landlords, residents, builders, architects and commercial, business and marketing teams.
- Ensuring effective communication of complex and diverse information to a wide range of designers, stakeholders, suppliers and site team
- Developing the business aspects of Passivhoos delivery including marketing and communication of the ideas
- Identify and develop opportunities for future business streams emerging from the project

Relationships

Internal Contacts:

All MEARU research active staff and support staff where appropriate
JGA and DEW staff
S&S Staff and site teams

External Contacts:

Manufacturer and component supplier chain
Client RSL's staff where appropriate
Occupants
Compliance and certification organisations

Background Qualifications, Experience

We will be looking for someone with degree level qualifications, Masters preferred, in either:

- Architecture/design degree background, with detailed technical and construction knowledge
- Engineer/construction degree background, with experience and knowledge of design processes and architectural practice.
- Experience of housing design and construction in the UK, with knowledge in Passivhaus preferable.
- Experience of Scottish construction industry
- Experience of architecture, housing design, energy and environmental analysis
- Knowledge of low energy design, environmental performance
- Knowledge of BIM software and processes
- Excellent grasp of analytical and numerical skills, ability to understand and process datasets, monitored data
- Ability to interpret complex data sets in a way that is useful and understandable to multiple audiences

- Excellent communication abilities – the ability to present findings verbally, graphically and in written form
- Strong people skills for working with professionals, clients and residents
- Passion for the built environment and design

Person Specification

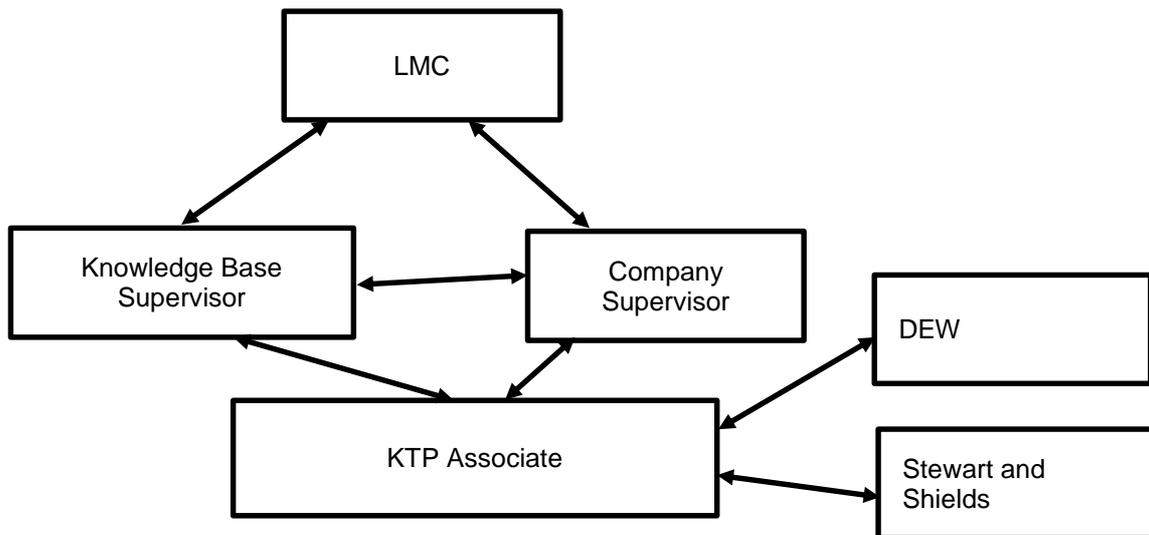
The associate should be able to demonstrate the following attributes and interpersonal skills.

- Self-motivated and ability to use own initiative, but able to work in teams with diverse groups of people
- Ability to work under pressure and to tight deadlines
- Good project management skills and abilities to organise tasks and demands
- Ability to communicate verbally and graphically with a diverse group of audiences
- Professional attitude
- Excellent presentation skills
- Planning
- Co-ordination of resources
- Ability to meet deadlines
- Ambitious
- Entrepreneurial

Terms and Conditions

Contract:	Fixed 36 months
IPR:	The successful candidate will be expected to sign a Non-Disclosure Agreement to protect the IPR of the project partners.
Probationary Period:	6 months
Salary:	circa 35k pa (depending on experience), plus £5k training budget
Hours of Work:	40 hours per week (dependant on task and working location)
Holidays:	21 days + 11 bank holidays
Pension:	Strathclyde Pension Fund / NEST scheme
Notice Period:	3 months

Appendix 1



Appendix 2 – Research Aims

The Scottish Construction industry has a fragmented approach to delivery, architects design mostly in isolation from contractors, cost savings are inevitable at tender stage, contractors propose value engineering late in the project. At the end of the contract the learning from that project is lost and the whole process starts again on a different site with a different team. This approach leads to waste, high costs and poor performance and lack of innovation and ‘tried and tested’ solution predominate and new approaches and improved performance is resisted. This team are looking to radically redefine the design and build process process and offer market leading construction performance at standard build costs.

Passivhaus standard construction is proven, within the UK, to virtually eliminate fuel poverty and dramatically reduce carbon emissions from homes. Our social housing clients are all aiming to eliminate fuel poverty along with meeting their sustainability targets. Our market research indicates a massive competitive advantage to delivering homes which are tried and tested to eliminate fuel poverty.

John Gilbert Architects want to design better buildings, we believe that we can eliminate fuel poverty through design and with an improved design for construction approach we can do this at standard construction costs. If we can do this, we have a unique product that housing providers across Scotland would be interested in. We have evaluated a range of ways of achieving this aim and have settled on designing to the internationally recognised Passivhaus standard. However further innovation is needed to ensure that this approach is fit for purpose in a Scottish context, takes into account lessons learnt from recent Building Performance evaluation projects and take a holistic approach to design that includes compliance, construction, handover, occupancy and maintenance.

Stewart & Shields are contractors who have a long history of building efficient new homes using a range of techniques. The current shortfall is that their construction expertise is often brought in late in the design process and they see things could perform better if they were involved in the design. They aspire to deliver all of their project to Passivhaus standard to offer assured quality to their clients, and this will give them a significant market advantage compared to larger rivals.

We are currently working on 24 houses to Passivhaus standards which we see as first generation Passivhoos units. These use existing components and traditional techniques to achieve compliance with Passivhaus standard but with associated inefficiencies and specific skillset required on site.

John Gilbert Architects have Passivhaus design skills and knowledge, we have skills and knowledge in designing with BIM but lack specific skills and knowledge in efficient timber frame design, integrated BIM and materials. Stewart & Shields have excellent construction skills and connections to manufacturers / suppliers. Their key issues are around lack of BIM (for construction) knowledge and skills in exceptionally high performance construction. Design Engineering Workshop have BIM and engineering skills but lack the specific knowledge on Passivhaus and innovative timber frame technology.

We wish to develop a second generation Passivhoos product which brings costs down by 5% to 8% whilst retaining performance and customisation options. From the strengths and weaknesses of each company, we see three core areas of skills and knowledge that we need to acquire as part of a second generation Passivhoos model:

- Timber Kit design - needs to be bespoke and optimised for Passivhoos. We need specific expertise on high performance, low cost timber construction and to develop a system that is easily built, with less skilled workers on site and an ability to live test construction details, methods of assembly and as-built performance
- Building Information Modelling - We need a sophisticated BIM model of the house types that allows design and manufacture to be more integrated and allow the 'mass customisation' of the Passivhoos model. This includes a BIM model shared by the design and construction teams, which is also connected to the supply chain for components and manufacturers. This process will allow us to identify where improved components can be developed (with supply chain partners) and allow us to eliminate waste in time or materials. We need expertise in developing this model and integration with our processes.
- Design for airtightness - This is a crucial part of Passivhaus and we need expertise in low carbon construction to assist in rethinking the construction process and timber kit design to reduce the skill needed to achieve high airtightness and to consider how to roll-out the specific skills that are still required to a larger workforce. This will apply to all trades on site and to the design / costing team.
- Designing for climate and performance – the project seeks to develop forms of in-depth analysis and evaluation that tests in detail design propositions and seeks out possible unintended consequences, allowing for localized conditions of climate, regulation and social acceptability of new construction forms

Other tangential benefits that will increase the value of the Passivhoos product include; De-risking of the construction, designing out value engineering, zero defects, mandated performance characteristics. All of these add value to the core expertise we need.