Date: 12th May 2021
Time: 10:00-12:00
Venue: Virtual

MINUTES
Construction TSN Meeting Notes

Attendees:

Andrew Arnot	AAr	University of Edinburgh
John Palmer	JP	Passivhaus Trust
Andy Anderson	AAn	APUC
David Charles	DC	University of Strathclyde
Fraser Lovie	FL	University of Aberdeen
Gilbert Valentine	GV	University of Stirling
Jamie Goth	JG	Scottish Futures Trust
John Thorne	JT	Glasgow School of Art
John Keenan	JK	Glasgow College Regional Board
Monika Allison	MW	Glasgow Kelvin College
Roddy Yarr	RY	University of Strathclyde
Scott Bryson	SB	University of Strathclyde
Stewart Miller	SM	University of Glasgow
Jill Burnett	JB	EAUC-Scotland
Scott Thomson	ST	EAUC-Scotland

	SUMMARY OF DISCUSSIONS	ACTIONS
1	**Welcome,** *Scott Bryson, Convenor, University of Strathyclyde*	
2	**Passivhaus and Getting to Net Zero** *John Palmer, Passivhaus Trust* **Presentation slides and recording available here.** Questions from the Group: DC: Student residences also quite naturally have a high form factor don't they so I assume it is not a massive shift from business as normal construction of them to go Passivhaus? Do you think that is part of the reason that they are early adopters? JP: One of the reasons certainly but also the most efficient form factor is cheaper to build. Energy and carbon are attractive qualities but isn't always the main thing, especially if you aren't running the building so speculative developers don't use Passivhaus as often if at all. Currently a lack of	

	evidence to back up the financial gains of Passivhaus so some are worried about spending more on Passivhaus and not getting it back. Social housing and university accommodation both care about these things more than the private sector and want low running costs. Also improves the health and wellbeing of students so really comes down to the long term benefits. RY: Should we not be pursuing well building certification as well as PHT for our new commercial research building? JP: Very compatible with overlap. Passivhaus does operational energy, energy in use of a building and as part of that is does environmental conditions e.g. air quality. It does not do embodied energy, lighting etc. Passivhaus overlaps with some aspects but not all, very complimentary though and both can be done together for best results. GV: Your data suggests that 22C is ideal internal temperature, rather than 19C which historically is a design temp for efficiency? JP: No Passivhaus design temperature is 20C for domestic and non domestic. Conventional buildings tend to be designed to 21C. Lots of temperature evidence comes from studies in the 70's/80's and there are factors like radiant temperature, air flow etc that all affect this. 22C air temperature may not feel like that depending on other factors so Passivhaus also includes a surface temperature measurement so that the surfaces are not significantly colder than the air. If the surface temperatures are more than 17C people do not feel radiant discomfort and this allows Passivhaus to be build to 20C instead of 21C. In addition, any airspeed over 0.1 metres per second result in people turning the temperature up 1C due to the cooling effect. Passivhaus is also designed to avoid this. JG: Are there proprietary energy modelling software offerings that integrate well with Passivhaus House Planning Package? JP: There is a Canadian/US package called Energy B that can be used with Energy Star and PHPP. It is not that easy to integrate though so may not be worth it, not looked into it a huge amount. More broadly there is designPH which can be used to export models into PHPP. Not slick models but some things that can help. AA: A lot of universities here will have complicated buildings with high internal gains from scientific equipment and/or legally required ventilation rates for safety. What design techniques could we use to make the buildings Passivhaus and is it really possible to do or is it too much of a stretch? JP: In general, Passivhaus has grown from a domestic starting point, think like Grand Design style projects. There are currently hospitals being designed as Passivhaus though. You can use elements of Passivhaus like the fabrics but to fully do it you either have to be very clever with the ventilation or relax the criteria and accept the extra losses.	

	Clever ideas are often forgotten though like “Do we need it running all the time”, “could it be sensor activated?” and generally trying to minimize the use. The heat side is far more difficult in specialist buildings. Can be used cleverly to recycle heat, for example Passivhaus has designed supermarkets that run one exhaust heat from freezers. Also looking at pipe diameters, insultation etc can help. Once the system has been optimized fully you need to look at solar gain. Shading and glazing are really important to minimize solar gain. Optimizing glazing often means less which reduces the gain. Both things optimized mean you have a realistic chance of controlling heating. If that still isn’t enough then cooling may need installed but the cooling demand will be low. If the cooling demand is low then you can still get Passivhaus accreditation.	
3	**Net Zero Public Sector Buildings Standard** *Jamie Goth, Scottish Futures Trust* **Presentation slides and recording available here.** If there are any questions then please get in touch with EAUC and we will pass any questions on.	
4	**Roundtable on Net Zero Buildings in the FHE Sector** *Scott Bryson, Convenor, University of Strathclyde* SB: Fraser can you tell us a bit about the work going on in Aberdeen? FL: Yes Aberdeen had a Passivhaus project completed in September 2015. I dealt with the policy side rather than the technical. There are case studies about it so maybe better to talk about what we learned from doing it. No one involved had any experience doing it at that time so it was new to everyone. Lots of issues around “What do we do if it gets really cold, will the building really stay warm?” so we put a failsafe under floor heating in. This was a nursery that was 600 square metres. The underfloor heating was not really required in hindsight but was integrated into the system which meant it ended up coming on at the wrong times and heating the building too much at times. Building has never been cold at all, it has been perfect. Next time we would trust Passivhaus more. Solar thermal was installed on the roof to heat hot water. Not really necessary as not enough demand, should have just put solar PV. Subsequently the Legionella protocols changed and the hot water system had to be adjusted so we are using more water heating than expected at the time the building was made. Building users should probably be given more detail on the building and	

	how it works. Same with maintenance staff who often tried to make it work like a "normal" building which was not how the building was designed. You need specialist staff or training to really know how to work with these buildings. We had BREEAM and Passivhaus, not sure how much BREEAM actually helped. SB: Sounds like there is a bit of caution on the design side with people putting in backups. John do you have experience of that happening? JP: Yes people don't believe it will work so build in other things as backup. Just to clarify, Passivhaus buildings can have heating but the standard requires you to meet the target of 15KwH per metre squared per year to qualify so a small amount of heating can be allowed. DC: Also don't have a Passivhaus project yet but are looking at whether BREEAM is a good standard to adopt. Planning on getting new staff to look more into this. Had several failed attempts at Passivhaus such as the TIC which was altered to not be. Parts of the new innovation zone that are being built are being designed to Passivhaus though which will be the first. Factored in a price uplift of about 10% for the build costs and will expect it to perform better in operational terms. Also working on the place based approach currently at Strathclyde. There is a Place tool but it tends to be aimed more at local authorities. Would be good to see that used more or some training for the sector in how to use it. Estates isn't always involved in the decision making process for new buildings which is at a higher level, usually brought in after the initial decisions was made. Looking at the place based side more though and how the university links with the community. Adaptation is also a focus for the university and local region.	
5	**EAUC-Update** *Jill Burnett, EAUC-Scotland* EAUC are running an Embodied Carbon event on the 13th of May that will be recorded and shared afterwards. Zero Waste Scotland are also running an Energy Benchmarking Initiative and details were sent to key contacts at all institutions. The expression of interest deadline has been extended so if you want to find out more do get in touch with us. (JBurnett@eauc.org.uk)	
6	**Thanks and Close**	

Minutes prepared by Scott Thomson, EAUC-Scotland, May 2021