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Co-creation as the basis for innovation and sustainability in renovation

Lidewij Tummers is a building engineer and with her expertise she contributed to sustainable building construction in building projects realized with the Bauteam model. This approach was chosen due to the power of co-creation in a team with experts. It is a chance to realize innovation and sustainability within a given cost frame. In an interview she talks about her experiences in design, planning and execution in a Bauteam. And she explains why prefab timber has a potential to contribute to school building renovation.



Picture: Lidewij Tummers, Source: Tussen Ruimte

The Bauteam as a chance to realize innovation and sustainability in renovation projects

Sonja Geier: What are your experiences with the Bauteam?

Lidewij Tummers: My experiences with the Bauteam were as a consultant for sustainable buildings. I am a building engineer, specialized in sustainable buildings. I participated in projects on how to realize innovation for sustainable building and construction in the 1990s, when this was not yet common practice. Innovations concerned energy saving measures, integrating renewable energies and the use of wood.

Sonja Geier: Which projects did you do with the Bauteam?

Lidewij Tummers: There were different kinds of buildings that were realized with the Bauteam model. The ones where I was involved, was the Council House of a municipality where the fusion of different villages required a new office building (a so-called «Rathaus»), the other projects were residential, mostly multi-storey buildings, but new buildings and also renovation projects. The renovation projects we did with firms we knew and we had trust in their competences, capacities and continuity, because if you do renovation, you know – it is always a risk: first you have to strip the building and only then you know exactly what is going on.

Sonja Geier: The «Rathaus» – a public client and a new building? What was the reason to choose the Bauteam model?

Lidewij Tummers: There was a national programme stimulating pilots for sustainability building. The Bauteam model was thought to be able to generate innovation, because sustainability really needs that the different components such as structure, engineering and shell work together. The client could decide on the Bauteam because there was no EU tendering obligation at that time. That was very good because the Bauteam offered us the opportunity to perform important studies – comparing different types of heating or comparing wood construction with concrete and so on. For this kind of studies you normally don`t have time. You depend on the competency of the architect and you really have to rely on his or her experiences.

Sonja Geier: So the idea was that there is not only one person designing the building?

Lidewij Tummers: No building is designed by just one person! The idea of co-creation is to work together from zero in order to achieve good integration of all disciplines. But everyone keeps his or her role and responsibility. For example – it was necessary to investigate the building plot and its orientation, to identify

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the relevant framework given by the building regulations. There were some restrictions on the plot and there were specifications concerning the rooms and volume. This information was researched in advance by the architect. The idea was to have a very free and open brainstorming. Like Cornelia Becker[1] described in her interview: optimizing the building in preliminary design phase. And gradually we started to optimize the whole technology concept. Afterwards a specialized project management company coordinated the execution.

Sonja Geier: What is special for the Bauteam in your opinion?

Lidewij Tummers: The idea of the Bauteam is co-creation, but it is not always easy especially for companies. You have to let people look into your backyard. Participants have to be aware of what they can or cannot do, what their processes are, be clear and specific about their costs. For sure not everything is on the table right from the first day. You build up a certain confidence and then you are able to work with that. And that's why it does work. You need an openness towards each other, if you don`t have that you cannot make a good project.

It is a very silly practice in The Netherlands or in other countries to choose a builder with the lowest price, because everybody is getting the wrong incentive. Unite people in a Bauteam with their own expertise – the architect knows a lot about how to integrate functions, use values and so on, different engineers and specialized firms know a lot about energy efficiency, wood construction or sustainability and make them work together to make a good design with cost optimization. The optimization in the team is absolutely one of the big advantages in a Bauteam.

Sonja Geier: What is important from the client's perspective and from the technician's side working in a Bauteam?

Lidewij Tummers: What is important is – that there is a clear representation of the client in the project who is aware of timely decision making. Either it is the client personally or a professional project manager is hired. Most often they have a background like social dynamics; they know exactly how team dynamics and decision making processes work and so on. They are a kind of link between you as a technician and the client and they interpret the question of the client to us and our advice to the client. We develop options A, B and C – and we show the pros and cons and the costs and the managers will help the client to make the decisions. So you as a technician, you also have to think differently. You have to think in terms of options and comparisons and when you are an expert on heating you have to talk to the person who is doing the façade and insulation and work out the design proposal together. The client finally has to decide at the right time.

Sonja Geier: What is an important attitude of a good process manager?

Lidewij Tummers: They have to understand the importance of co-creation. It`s not on competition or on price-optimization but on quality optimization knowing that there is a budget and trying to find an optimal solution. Usually the coordinator acts «on behalf of the client» - that means representing the clients' interests. But they have to be much more capable of steering processes on performance – not steering it on money.

Sonja Geier: Do you think that co-creation could be an approach to integrate users in school renovation?

[1] The interview with Cornelia Becker is available on the Renew School website: www.renew-school.eu/en/the-german-bauteam-cooperative-planning-approaches-for-high-quality-and-low-cost-construction/

Lidewij Tummers: Co-creation in a professional Bauteam is not the same as involving end-users in the design process. If the school acts as client, its position is clear. I don't think it would be useful for school staff to participate in all the design sessions, they are specialised in education not in building. But there needs to be a clear framework beforehand that is made by, or together with, the users of the school. Especially in renovation there are questions like: "are parts of the school in use during building works? What are the problems that the educators encounter now? How would they like them to be improved?" End-users and engineers use different languages, and mediation (translation) is essential. For example, why ask the teachers for ventilation quotes when they just want fresh air? They can, however, give information about how many people use the rooms for how much time, and that is important to calculate the vent-factor. And when teacher are disturbed by the noise form other classrooms, the engineers will need to know about acceptable dB levels in order to design the details. The user-friendliness of the utilities should definitely be design criteria, with a test-round involving end-users during design stage. In that sense maybe it is co-creation.

Sonja Geier: Why is the Bauteam not applied more often – what are barriers in your opinion?

Lidewij Tummers: The big problem I think is that the design phase is not often financed sufficiently and therefore it is difficult to involve all the experts before the feasibility of the building is clear. Even though it can save a lot of money later on!

Sonja Geier: BIM Building Information Modelling is an upcoming technology – The Netherlands are a frontrunner. Do you think the Bauteam approach supports the application of BIM in a project?

Lidewij Tummers: BIM is a fantastic platform for Bauteams. Because you can very quickly explore the options and you can make sure that everybody has the latest information. If you want to involve technical companies in an early stage of the design – this is another very important recognition from the interview from Cornelia Becker- they have to think very in a flexible way.

Sonja Geier: In prefabrication processes – is it really possible to be flexible `till the end?

Lidewij Tummers: There is a limit how far you can act in a flexible way. At a certain point we have to order material and fix the amount of beams and number of screws. But you have to be able to think flexible. And today most companies are not used to that. And I think that a platform like BIM can make it very clear to clients on the one hand who are no experts in construction – so they don`t know the difficulties that can encounter architects. And on the other hand the technicians and companies are supported in the co-creation process. Whether BIM or another standard – but something like that is really helpful.

Sonja Geier: The role of timber construction with high levels of prefabrication could be a chance for building renovation – where is the level of implementation in The Netherlands?

Lidewij Tummers: Certainly there was a lot of promotion of catalogue builders that offer timber prefab constructions. What they offer is a complete design for residential buildings. And what I think is the advantage of prefab timber that you can do fast buildings but also that you can do it «custom-made». And that is the important thing to develop. Yes, you need to be very precise when the production starts. But until that moment you can still decide freely where you put all your windows (within certain margins given by techniques and by regulations.) It is like in glass production: they have standard types of glass but they can change the dimension of a window that you need until the very last moment and compose it into the window frame you want.



Picture: SOLO houses rely on prefab timber to offer 'custom-made' solutions. Source: Tussen Ruimte

Sonja Geier: Do you think that is the potential of timber construction in The Netherlands? Customization approach and doing it with mass production?

Lidewij Tummers: I don`t think that the potential of prefab timber construction is in offering ready-made prefab houses. I think the potential is in offering modules – that is actually my research that I am doing now at Delft University and that deals with the participation of users in the design process. There are a lot of people who want to say something about «can the window be bigger» or «the kitchen smaller»?

This kind of custom-made construction has a big potential. There is an advantage in timber prefab construction if you relate that to in-situ concrete constructions. The users can get a part in this co-creation process, It supports a bottom-up approach instead of the currently applied «Top-down» approach with design exclusively made by an architect. This 'customized mass fabrication approach' absolutely has potential for the timber construction in The Netherlands, offering small changes to adapt window sizes, etc. is interesting for both new built and renovation.

Sonja Geier: Currently it is only applied for residential houses but is it also applicable for other types of buildings. There is a bulk of schools in need for renovation – do you think prefab timber construction would be a solution approach?

Lidewij Tummers: This is the next step. The bulk of the post-war buildings, not only residential building but also schools, need renovation. After 2000, especially ventilation and health became an issue after a report showing very bad conditions in Dutch schools- timber can contribute to healthy environments. Prefab timber has many advantages: it reduces building time, which is important on inner city sites. It can be more easily combined with existing foundations, and future alterations are possible. There are already timber construction companies in The Netherlands who work according to this principle– some are still watching, but others are already trying to get on the train. The IFD program for which I was an evaluator (Industrial, Flexible and Demountable Building, VROM 2002-2010) provided some great incentives for the building sector.

Sonja Geier: Thank you for the interview.

Further information: http://tussen-ruimte.nl/2016_WP/
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