Reflection

Student: Mark Evertzen      Project: Revitalization of the gallery apartment building

To be honest I think it is a bit early for a reflection although the body of the graduation is already completely there, after P4 there is still ±8 weeks before the final presentation.

1.1 the relationship between research and design
I have answered three sub research question, one focused on the embodied energy, on typical characteristics and potentials and one the influence of the user on the operational energy. These three sub-questions all have a different relationship with the design and I will discuss them separately.

1.1.1 Embodied energy
The results of the sub-question based on embodied energy are integrated well in the design. The embodied energy of all material used in the design is considered and the embodied energy is reduced as much as possible, this is the clearest in the transparent part of the façade. The transparent parts of the façade, the glazing turned out to have the highest influence on the embodied energy of the façade. The proposed design contains a lot of ETFE-foil which has a lot lower embodied energy per square meter than glass.

1.1.2 Characteristics and potentials
One of the reasons I started looking at unique characteristics and potentials for the climate design is that the approach to transform big gallery apartments was really similar to that of small row houses while there are completely different characteristics and potentials. One of the main ideas to start looking at unique possibilities was turning the existing blind end facades into Trombe walls, this turns out to be a bad idea as the end façade is directly connected to the construction behind it, this will heat the entire construction unwanted. But the focus on unique characteristics and potentials gave some other interesting results that are integrated in the final design, such as using the height of the building and the solar intensity on the façade to create solar chimneys, using a wing on top of the roof to extract air from the building and create better conditions for wind turbines. This sub-question also pointed the out the big potentials for energy harvesting in the facade on the balcony side (especially the south south east orientation) mostly due the size of the area. All in all, the final design is really focused on the results of this sub-question and this sub-question is embedded in the design really well.

1.1.3 Influence of the user
While in answering the other sub-questions I’ve used analyses, calculations and computer modelling this sub-question was based solely on literature research. The results found are really distinct, the effect of the user on the energy used for heating and warm water is
extraordinary, there is a factor of two to three between the energy usage of different inhabitants of a similar dwelling. In case of gallery apartment buildings, the research shows that energy consumption even goes up after retrofitting the building, so the better insulated buildings have a higher energy consumption. Some adaptations have been found that will lower the operational energy of the building, like constant monitoring the energy use and communicating this to the user or more radical approaches like making the building completely automated. The result of this sub-question are part of the design but are not really integrated in the design. The final design turned out to be more focused on the embodied energy and unique characteristics and measures done considering the influence of the user on the operational energy are more of an extra to the design.

1.2 the relationship between the theme of the graduation lab and the subject/case study chosen by the student within this framework (location/object)
Theme of the graduation lab: Zero energy refurbishment
Theme of the graduation: Zero energy refurbishment of an ERA gallery apartment building

The case study fits well within the studio as it is a zero energy refurbishment within the zero energy refurbishment studio. The case study of a gallery apartment building is relevant as this building typology is build a lot in the Netherlands so the impact could be big. And there is a big opportunity in transforming these buildings taken their unique characteristics and opportunities into account.

1.3 the relationship between the methodical line of approach of the graduation lab and the method chosen by the student in this framework
I am not aware of a general methodical line of approach of the graduation lab, but my sub question on the analyses of the unique characteristics and possibilities is something that is seen a lot in the Zero Energy Refurbishment graduation studio, and I think somewhat standard to the university approach of refurbishment projects. The embodied energy is something considered in a few refurbishment projects but as far as I know of not a standard part of the refurbishment (yet). The effect of the user on the operational energy is something that is as far as I know hardly ever considered in refurbishment projects.

1.4 the relationship between the project and the wider social context
The municipality wants the average ‘energy label’ of all social housing in the Netherlands to be ‘B-label’ by 2020. So in the next few years a lot of refurbishment has to be/will be done. My graduation project shows a way to make gallery apartment buildings ‘zero energy’, a building typology that is often used for social housing. By making the building ‘zero energy’ the unique characteristics and possibilities of this building typology are important as well the quality of life of the inhabitant. If some of the people in charge of the refurbishment of gallery apartment buildings just get a chance to have a look at my project and use some of my findings in their daily practice this could already have an impact on the inhabitants of gallery apartment buildings.