

P4 Reflection

Glass to reinforce concrete heritage buildings

Building Technology Graduation Studio

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Graduation Process

How is your graduation topic positioned in the studio?

The topic is positioned between structural design and heritage conservation, within the Department of Architectural Engineering & Technology. The trajectory of the project has skewed it more toward civil engineering than architecture.

How did the research approach work out (why or why not)? Did it lead to the results you aimed for?

The research approach has generally been literature survey, analytical calculations, then assembly and connection design. I am not sure how this project could have turned out differently or what other direction it could have taken. Maybe my foot should have been harder on the gas, but when is it ever not that way?

If applicable: what is the relationship between the methodical line of approach of the graduation studio (related research program of the department) and your chosen method?

Due to differences in topics, it is difficult to calibrate the project progression with others in the graduating group.

Perhaps going against the methodical approach of formal academic writing, the text of the thesis deliberately experiments with form and does not adhere to traditional, rigid notions of how information should be presented. It is a technical scientific thesis as personal narrative. It insists that a thoughtful exploration of the topic can be augmented by borrowing from lateral formats like journalism or poetry to make a more effective point. The stylistic choices in composition also serve a more utilitarian purpose: by avoiding jargon, complex vocabulary, and unnecessary fluff,¹ the content aims to be accessible and engaging. If the academic gatekeepers bar me from the club, then I will start my own. No cover. Science is for the people.

How are research and design related?

The basis of design comes from a synthesis of previous research and precedence. Several design iterations are formed and as they are changed, the effects are studied. The research is tied to a case study to investigate how assorted variables associated with a given existing condition can affect design, detailing, and installation.

Did you encounter moral/ethical issues or dilemmas during the process? How did you deal with these?

– Intervening in old existing buildings is an ethical question. But to preserve and slow the decay of a place in its current condition is a dated approach. The Charters, Dutch planning policy, and scholars indicate that the sensitive adaptation of an existing industrial building is an acceptable method of conservation that benefits more than a single stakeholder.

– In comparison to art and architecture, it is easy to see structure as a discipline in which there is always an answer that can be explained in numbers. The designer has an ethical responsibility to assume worst case scenarios and err on the side of safety and redundancy.

¹Kornei, Katherine. "Are You Confused by Scientific Jargon? So Are Scientists." *The New York Times*. Accessed 16 May 2021. <https://www.nytimes.com/2021/04/09/science/science-jargon-caves.html>.

- If the proposed site was part of a development that puts a neighborhood at risk of gentrification, or if the project took place at the same site 15 years ago, I would have a moral issue with it. As a student, I would see it as a project about development without displacement, rather than structural design. Professionally, I think of my soul and would perhaps refuse the job on principle.

Societal Impact

To what extent are the results applicable in practice?

The results are not yet applicable in practice, unless they are for some conceptual design. More complete research should contain systematic and repeated experimental testing at a preliminary stage, then at real scale. The results should be studied for trends and unpredictability, and compared to the analytical and numerical models.

To what extent has the projected innovation been achieved?

Examples of glass beams attached to concrete are limited in both research and practice. The innovation of the project is in the reciprocity between glass and concrete, mediated through the connection design.

Does the project contribute to sustainable development?

The project is sustainable in that it promotes the reuse of an existing building and uses material to preserve memory and architectural significance. The project is not sustainable in that the specified glass does not contain a significant portion of reused or recycled material. Additionally, the presence of adhesives and laminated interlayers negatively affects the feasibility of recycling and disassembly at end-of-life.

What is the impact of your project on sustainability (people, planet, profit/prosperity)?

The overall sustainability of the project is directly dependent on the new program of reuse. The proposal is to allow public access to a roof garden, skateboarding activities, and a cafe/bar - all of which contribute to reducing energy bills, promoting biodiversity, increasing the well-being and productivity of people, providing jobs, generating additional revenue, and making the museum below more attractive to visitors.

For public buildings such as the Fenix II, the investment in structural glass reinforcement of the roof is likely to be financially profitable. However, it is fair to consider the inclusion of glass elements as a negative environmental asset. This can be offset by the roof garden and the design of a totally circular bar/restaurant/event space. The projected lifespan of the building can also be a mitigating factor, where continued use and reuse may lessen the environmental impact in life-cycle assessment. Ultimately, the net sustainability (and to what extent it is prioritized) of the project is for the building owner to adjudicate.

What is the socio-cultural and ethical impact?

What is the relation between the project and the wider social context?

The effort associated with retrofitting using structural glass is an exercise in redefining value. It is certainly easier and historically acceptable to use conventional materials, but the danger to both the discipline and the profession is that it fuels the economization of design, where everything *unnecessary* is cut. The project tries to chip away at this architectiarchy. Whether it is ethical to only build things that are easy and cheap is related to a higher philosophical debate on the current role of art in society.

How does the project affect architecture / the built environment?

Though there is something seductive about it, the cult of glass does not always manifest itself in wonder and novelty. The glazed facade that defined 20th century architecture through the glass tower/box can be seen as dated and overused. To convey strength and possibility in a material against expectation is always a journey worth taking.