

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Linfeng Zhou
Student number	6005438

Studio		
Name / Theme	Active Solar Thermal Facades	
Main mentor	Marcel Bilow	FPD
Second mentor	Eric van den Ham	CD
Argumentation of choice of the studio	I would like to apply my knowledge in climate design and façade design to solve real-world challenges and design a marketable product.	

Graduation project	
Title of the graduation project	Engineering an Active Solar Thermal Façade based on Aberson's A-Brick system
Goal	
Location:	Netherlands
The posed problem,	A Dutch façade company, Aberson, came up with an idea of a Active Solar Thermal Facades (ASTFs) which installs water tubes behind their facade products "A-Brick" (a ventilated ceramic facade system), to collect energy from solar radiation and ambient air for heating and cooling demand. The concept needs to be developed further and the performance need to be tested.
research questions and	How can Aberson's A-Brick Façade system be effectively integrated with water tubes and connected to different energy systems to develop a market-available Active Solar Thermal Façade product?
design assignment in which these result.	Producing a scientific research report on the A-Brick ASTF's thermal performance, technical feasibility, integration potential, and manufacturing possibilities. Making a prototype of the

façade product. Providing marketing suggestions for Aberson company.

Process

Method description

This research combines design, simulation, and testing methods to engineer a heat-collecting façade product. It will start with literature research of ASTF and energy systems it connected with. After that, conceptual design of the A-Brick ASTF will be made, and performance of different energy systems will be tested in TRNSYS 18 software. A physical prototype will be built to show the modular assembly possibilities. Finally it will make marketing suggestions for Aberson.

Literature and general practical references

In terms of literature study, I intend to consult with topic of Active solar thermal façade and Solar assisted heat pump systems by both mentor from FPD and CD.

In terms of designing and prototyping, I intend to consult with façade engineering solutions by mentor from FPD.

In terms of energy system design and simulation, I intend to consult with topic of experiment set up, data measurement and analyzing methods with mentor from CD.

Reflection

Through this project, I apply the technical knowledge gained from master track building technology courses in climate design and façade design. The research addresses a real-world design and engineering challenge proposed by Aberson, and involves scientific analysis, prototyping, and practical implementation strategies—reflecting the interdisciplinary and application-oriented nature of both the Building Technology track and the AUBS programme.

The project advances sustainable building by developing an energy-efficient façade system, contributing to climate goals, supporting industry innovation, and filling a scientific gap in solar thermal façade research.