Sodikova S.| Lamptey F.
Angela Mejorin | Eda Özaltay

Performance-Based Facade Design: Frederiksberg Courthouse

Introduction

We took the Frederiksberg Courthouse as our design cue. We tested options with daylight and carbon analyses varying window design, adding and removing louvers and comparing material build-ups. The aim was to create a balanced scheme by using a proper designing as well as material choices, to improve the characteristics.

Fig. No1 Frederiksberg Courthouse

Analysis 1

In the first analysis we decided to follow the material choice that was used in the real life project – brick. The novelty would be the design of the windows that we put. It is a parametric window that can be adjusted. As for the analysis, we made: carbon and also daylight ones.

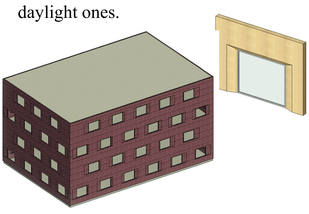

Fig. No2 1) 3D view of the model
2) 3D view of the window

Here are the results of the analysis made:

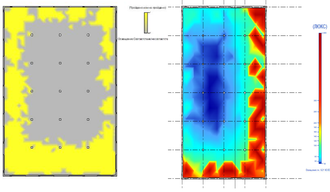

Fig. No3 1) sDA analysis results
2) Illuminance results

Fig. No4 Carbon Analysis result

Analysis 2

For the second approach we aimed at modifying the carbon analysis results. So for that we changed the material from brick, to a wall with ventilated air cavity with a top layer of terracotta.

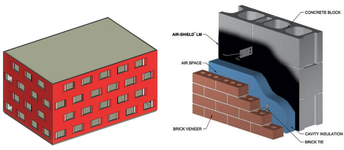

Fig. No4 1)3D view of the model
2) Material with air infiltration

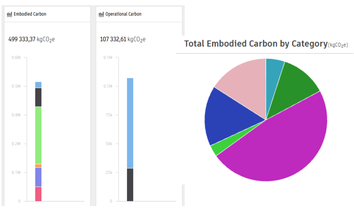

Fig. No5 Carbon Analysis result

Analysis 3

In the last approach we decided to change both material and window type.

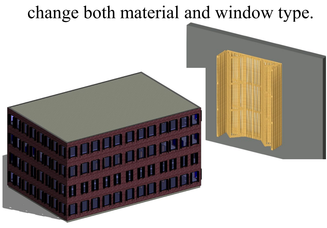

Fig. No6 1) 3D view of the model
2) 3D view of the window

In this case the windows are quite similar to those of the original project, made with louvers. The new material is also a wall with ventilated air cavity but in addition to air it has a layer of Fiberglass Batt. Regarding the windows, we installed louvers that can be regulated in 3 positions.

Fig. No7 Carbon Analysis result

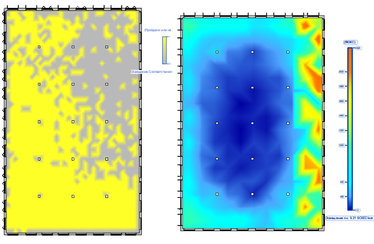

Fig. No8 1) sDA analysis results
2) Illuminance results

Contact:
Sodikova S. | Turin Polytechnic University in Tashkent| sodikovasamira37@gmail.com

Lamptey F. | Central University in Ghana| asarefrancis119@gmail.com