

educational experience

2007-2008, graduation year, master in engineering, architectural design, building technics and engineering

'kiel energy1' development of a software methodology for sustainable design
'kiel energy2' sustainable design of 24 social passive houses in antwerp, belgium
integration of the BIM-principle (building information model)

2006-2007, fourth year, master in engineering, architectural design, building technics and engineering

'quai walk' reconversion of a theatre on the saintelettessquare in brussels, belgium

2005-2006, third year, master in engineering, architectural design, building technics and engineering

'venetian mask' animal shelter in ghent, belgium



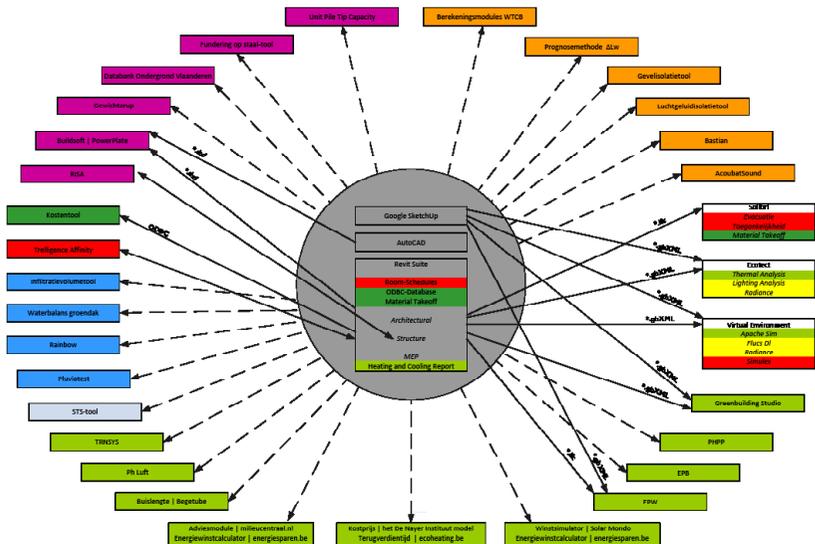
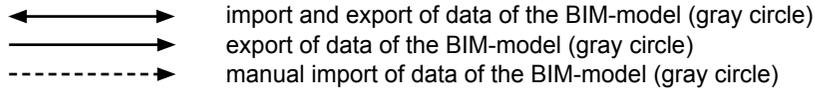
team of supervisors

prof. dr. arch. ronald de meyer
 prof. dr. ir.-arch. arnold janssens
 ir.-arch. ruben verstraeten
 ir.-arch. nathan van den bossche

team of 4 students

assignment

development of a software methodology for sustainable design, with regard to prestations such as energy, daylight, acoustics, accesibility, evacuation, structure, cost, water, garbage, glass, ...
 integration of the BIM-principle (building information model)



This dissertation introduces a scenario for designing and renovating social houses and apartments according to the passive house standards. A wide range of performances concerning sustainability, daylight, acoustics, structure, accessibility, etc. are being discussed. By means of software and tools these building properties are being evaluated throughout the design process. Furthermore, the method is being applied to a concrete architecture assignment presented by the Flemish Society for Social Housing (VMSW). (kiel energy 2)

DESIGN METHODOLOGY FOR LOW ENERGY HOUSES ON THE BASIS OF SOFTWARE & TOOLS				
PRESTATIONS	STANDARDS	TOPICS	SOFTWARE	TOOLS
ENERGY	EPB-standard	K-peil E-peil Positive Solar Gains orientation ZTA glasspanel solar protection thermal inertia	EPB EPM GreenBuilding Studio Ecotect Thermal Analysis Virtual Environment Apache Sim Revit MEP Heating and cooling report EPB EPM TRIMYS	PHPP
		Optimise ventilation space heating passive cooling auxiliary heat source with renewable energy sources	GreenBuilding Studio Ecotect Thermal Analysis Virtual Environment Apache Sim Revit MEP Heating and cooling report EPB TRIMYS	PHPP
		Heat pump		Ecotect het de meyer instuut model Payback on Electricity consumption earth heating, he Quick Scan Dimensioncontrol
		PV-panels		Advies module milieucentraal.nl Calculator of energypro energieprospecten.be Solar Design Pro V6
		Solar collector		Simulator of profit Solar Mondo Calculator of energypro energieprospecten.be SimulatorSoftware Vletoen Energy Software
		Earth to air heat exchanger		PH LIFT
		Heating by air Floor heating Wall heating		Boudekte Begebase
DAYLIGHT	MEM EN 12464 Licht en verlichting; Werkplekverlichting CIBSE: Window Design Applications Manual		Ecotect Lighting Analysis Virtual Environment Flux IM Roofance	
ACOUSTICS	NBN 5101-400-1	barriers of air sound between 2 spaces Facade sound-isolation Isolation of construction	AcoustSound Bastan	barriers of air sound-tail Facade sound-isolation-tail Forecast-method ALU Calculation modules WTE3
DIMENSIONS	Area-standard VMSW		Intelligence Affinity Bastan Room-Schedules	
FIRE EVACUATION	KB 28.04.2003		Virtual Environment Simulac Sofari	
ACCESSIBILITY	Law 17 July 1973 K.B. 9 May 1977 K.B. 7 July 1994 E.B. 4 April 2003		Sofari	
STRUCTURE	EM 1997 Eurocode 7 MEM 6793	Foundation		Dobruut Ondergrond Vismieren Foundation-tool Unit File Tip Capacity
	EM 1998 Eurocode 8 EM 1994 Eurocode 4	Construction	RESA Ballhoft PowerPlate	Gevoelstap
COST	VMSW-casestudie		Revit COBie-stalname Revit Material Takeoff Sofari Material Takeoff	Costool
WATER	VLAREM II	Recovery of rain		PhoVista
		Infiltration and buffering		Rainbow Infiltration-volume-tool Waterbalance model vegetational roof
		Treatment of wastewater		
GARBAGE				
GLASS	MEM 523-802 MEM 823-802-1			STS-tool

sustainable design of 24 social passive houses in antwerp, belgium
master project 2007-2008

team of supervisors

prof. dr. arch. ronald de meyer
ir.-arch. frank van hulle
ir.-arch. Frédéric rasier
ir.-arch. jan-thomas van hoof
ir.-arch. rolf vansteenwegen
ir.-arch. ruben verstraeten
ir.-arch. willem bekens

assignment

analysis existing apartment block
application design methodology 'kiel energy1' for following prestations: energy, daylight, acoustics, accessibility, evacuation.

application passivehouse standard
design and elaboration of architecture

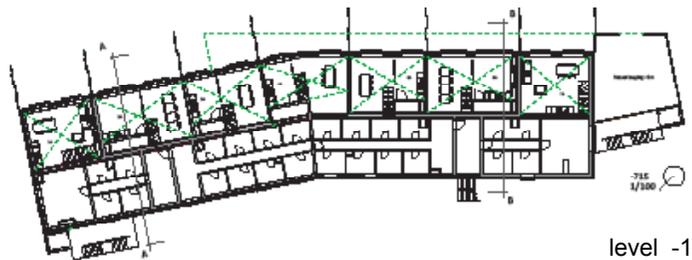
program

24 social apartments
extension of 400 m²

Based on the national XL07 contest, organized by the Flemish Society for Social Housing, the preconditions for the design (annex by the masterproject 'kiel energy1') were set. The existing apartment block had to include 24 units. It had to be thoroughly adjusted to current regulations concerning acoustics, accessibility, water supply and evacuation. The transformation of the old building into a passive and sustainable volume was a major challenge.

An organizational study showed that the existing block was approximately 400m² too small. I decided to expand the existing building with a lightweight construction on the top floor, after several daylight and energy analysis. The volume was placed as a cantilever construction, to generate a positive effect on the cooling and heating loads. The south-west side was extended by an extra volume.

The wooden structure also starts an architectural dialogue with the distortion in the current volume bar. The access to the apartments is provided through passerelles at the northern façade. The existing volume is emphasized by the pale plaster.



level -1



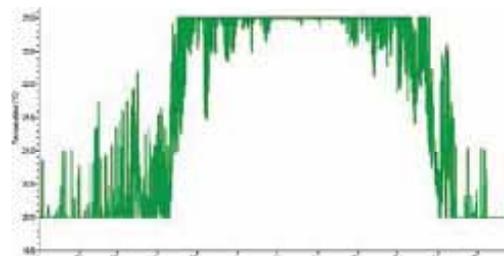
ground floor



level +1



environment



airtemperature during 12 months (20°C-23°C)



view back



view front

reconversion of a theatre on the saintelettesquare in brussels, belgium
2006 - 2007

team of supervisors

prof. dr. ir.-arch. dirk de meyer
arch. hans lust
arch. david schmitz
ir.-arch. marc de kooning

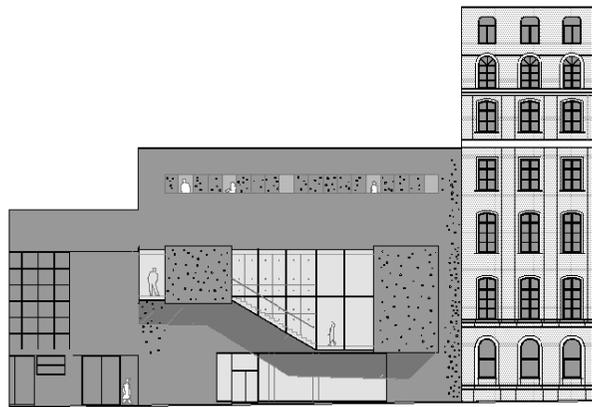
team of 2 students

assignment

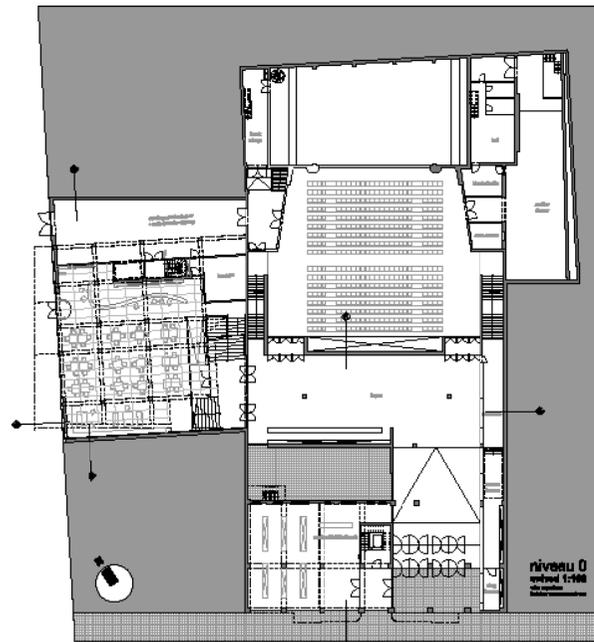
integration of a 2nd theatre hall
reorganisation existing program

program

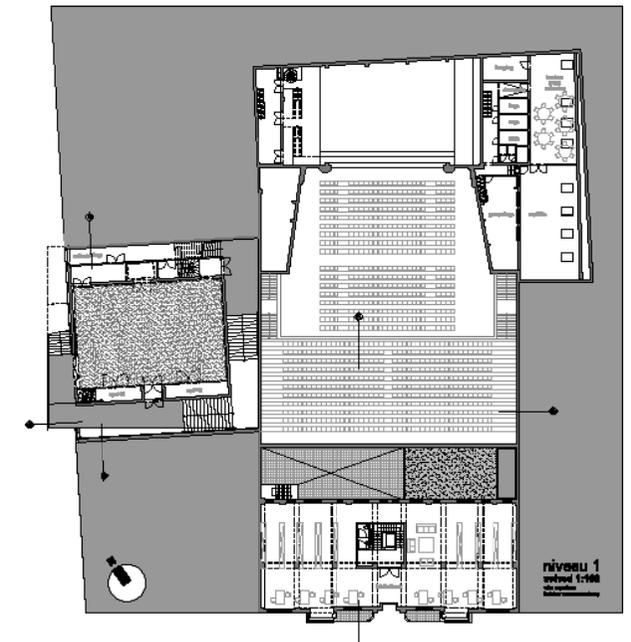
2nd theatre hall with a capacity of 200 persons
lodging artists (level +4 with view on the akenkaai)
bar (level 0 akenkaai)
tickets and inquiry office, vestiaire, foyer (level 0)
library (level 0 en +1 saintelette)
conference rooms and forum (level +2 saintelette)
offices (level +3 en +4 saintelette)
existing theatre hall with a capacity of 700 persons



facade new theatre hall



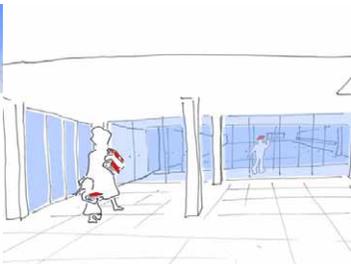
ground floor



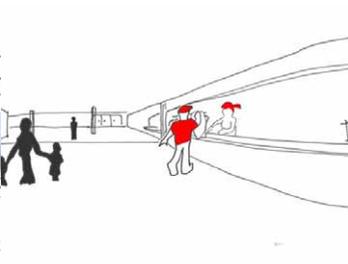
level +1



saintelettesquare, brussels



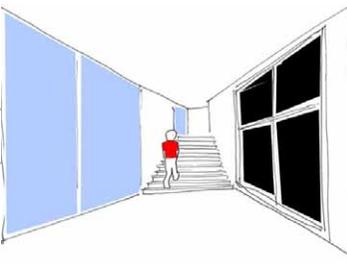
entrance library and theatre



vestiaire



foyer before the performance



walk around the theatre hall



foyer after the performance

animal shelter in ghent, belgium
2005 - 2006

team of supervisors

prof. dr. ir.-arch.dirk de meester
ir.-arch. marc de kooning
arch. godelieve van de ginste
arch. tania vandenbussche

team of 2 students

assignment

design of an animal shelter on a triangular site by the junction of the river Schelde

program

60 dog kennels
20 cat kennels
dropbox dogs and cats
house for caretaker
administration rooms

published in

'koeboekje' - magazine university ghent
department of engineering and architecture

Venice, conceal, hide, a haze of mystery, sinking in time...

Our Flemish soberness brought clarity in the plan, a 'venetian mask'. In one eye dogs can enter the courtyard, overlooking the river Schelde. The other eye contains a public square, accessible by two entrances. The mask itself? A trail of dog kennels, cat boxes in cascade, work spaces and a compact living space.

Venetian carnival in the living and working volume.

A game of steel doors to the public courtyard, a gallery flanked by stately I-beams, a dense pattern of zinc plates under the majestic canopy, a mirror-smooth cast floor, the tension between open and closed wall sections in the volume of work, transparency in the residential volume, a terrace in cedar with a fantastic view. Conclusion ...

Ghent, revealing, presenting, thorough detail, dignified and steadfast in time ...

