PRYDNIPROVSKA STATE ACADEMY
OF CIVIL ENGINEERING AND ARCHITECTURE
UKRAINE

MALACKY – PROJECT PROPOSALS ON IMPROVING THE ENVIRONMENT QUALITY IN BETHANY CENTER

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Master plan

Malacky - the most western town of Slovakia, it is located on the river Morava in the southern part of Zagorskaya lowlands. Malacky town is considered to be the natural center of the Zagorje region. This region has extensive cooperation with the Austrian-Czech border regions. Malacky town is located near the highway connecting the Slovak capital Bratislava with the Czech capital - Prague and the city of Brno in the south of Moravia.

Neighborhood with three European capitals makes the region attractive enough for both living and business development.

The population of Malacky town is 18,000 people, and 62,000 people in the whole region. About 4,000 entrepreneurs plus 680 companies are registered in the District. The unemployment rate is around 18%.

The population of Malacki is predominantly young.

According to the independent analytical agency EAO Empirica Delasasse research supported by the European Union, the Malacky region was rated as the most suitable for investment in Europe.

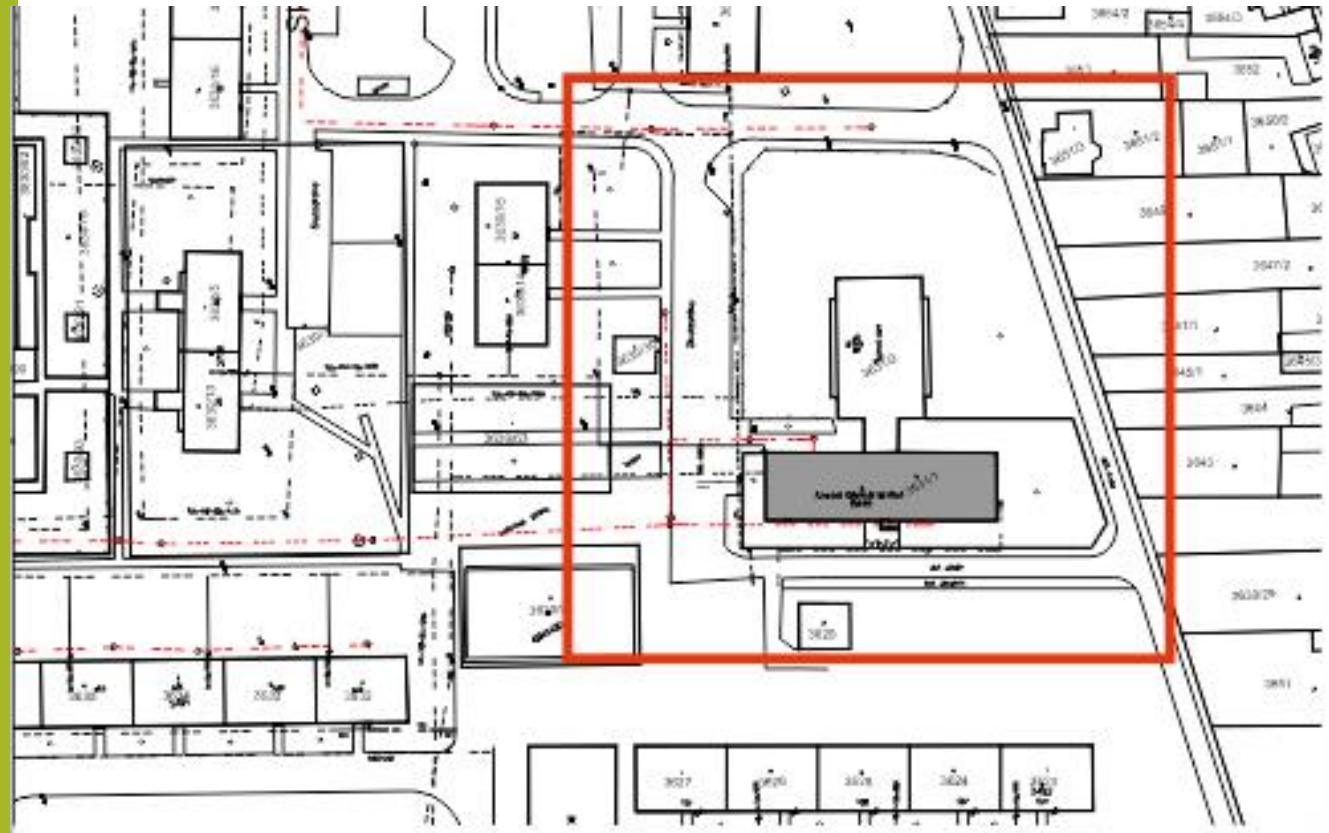
During the research, the development potential of 471 European regions in over 20 years was analyzed. Analysis was based on factors such as infrastructure, skills level and labor costs.

Many international investors such as Pepsi-Cola, IKEA and Volkswagen emphasized Region's benefits and its environs.

Ukrainian experience (mother care centers in Ukraine)

Center for Mothers with Children in Dnipro, Ukraine

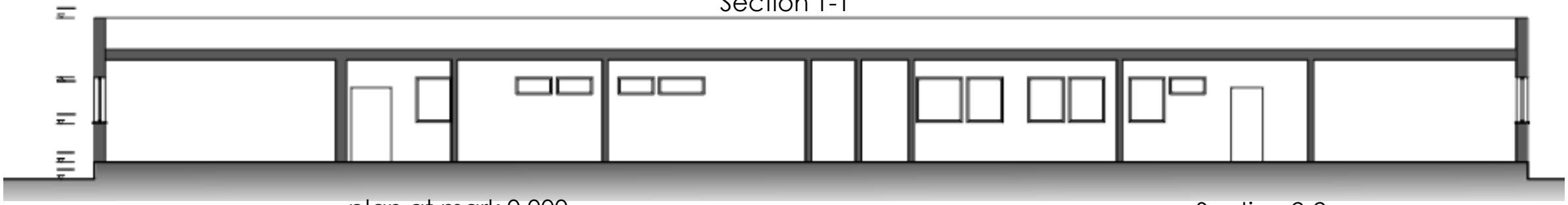
BETANIA CENTER IN MALACKY



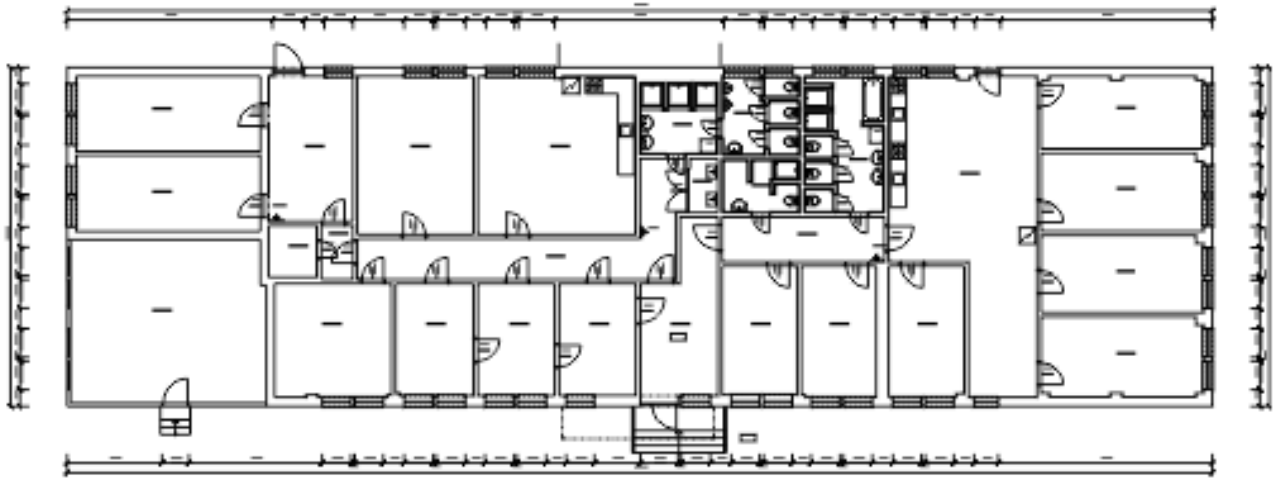
Bethany Center was founded in 2006 in Malacky town (Slovakia). Center - shelter is designed for mothers with children who have nowhere to go or perhaps their lives at home are unbearable. The center opened on October 31, 2006, when the first mothers with children settled here. Each family has own room, separate space, and a shared bathroom, living room and kitchen. The Bethany Center works with labor offices, municipalities and courts, and also helps mothers in courts with such issues as alimony / spousal support etc.

The Bethany Center also has a number of different problems:
- the building is quite old and does not meet modern requirements in the field of energy efficiency;
- there is no medical station to provide qualified medical care in the center ;
- there is no rehabilitation program for the shelter residents;
- there are no children playgrounds and landscaping around the center.

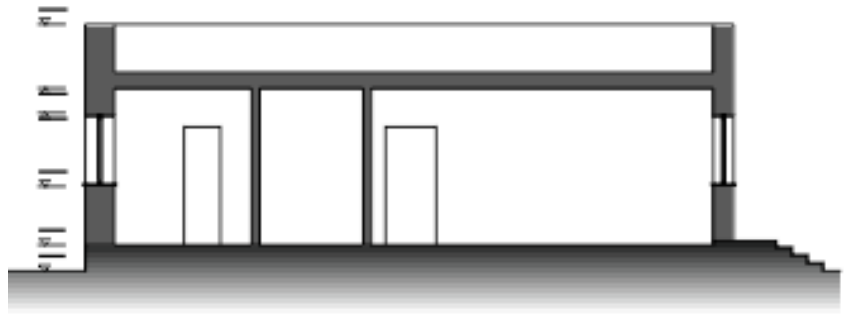
Section 1-1



plan at mark 0.000



Section 2-2

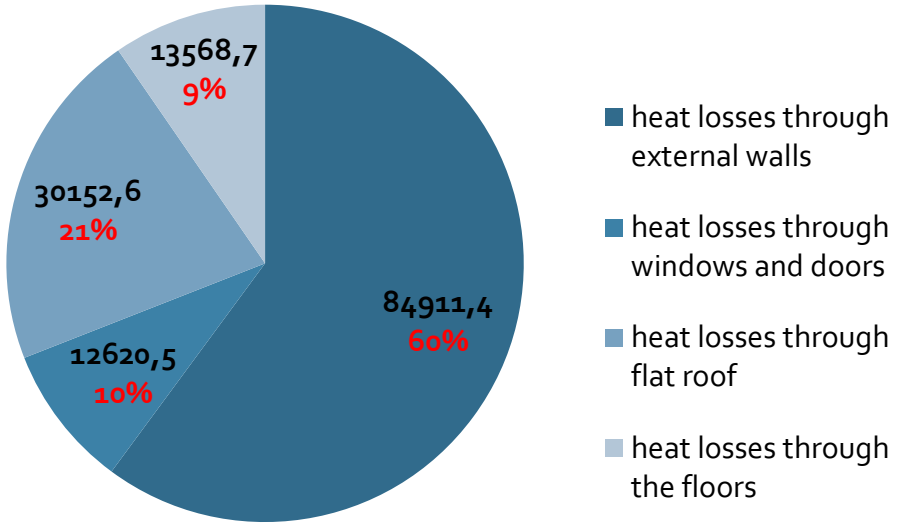


Explication:

101. Entrance hall
102. Office
103. Office
104. Office
105. Corridor
106. Room
107. Room
108. Kitchen
109. Room
110. Room
111.Room
112. Room
113. Room
114. Female bathroom
115. Room for staff
116. Corridor
117. Technical room
118, 119. Male bathroom
120. Corridor
121. Store
122. Corridor + Hall
123. Room
124. Room
125. Room
126. Room
127. Kitchen
128. Boiler + warehouse

Heat losses through Center's building envelope during the heating period

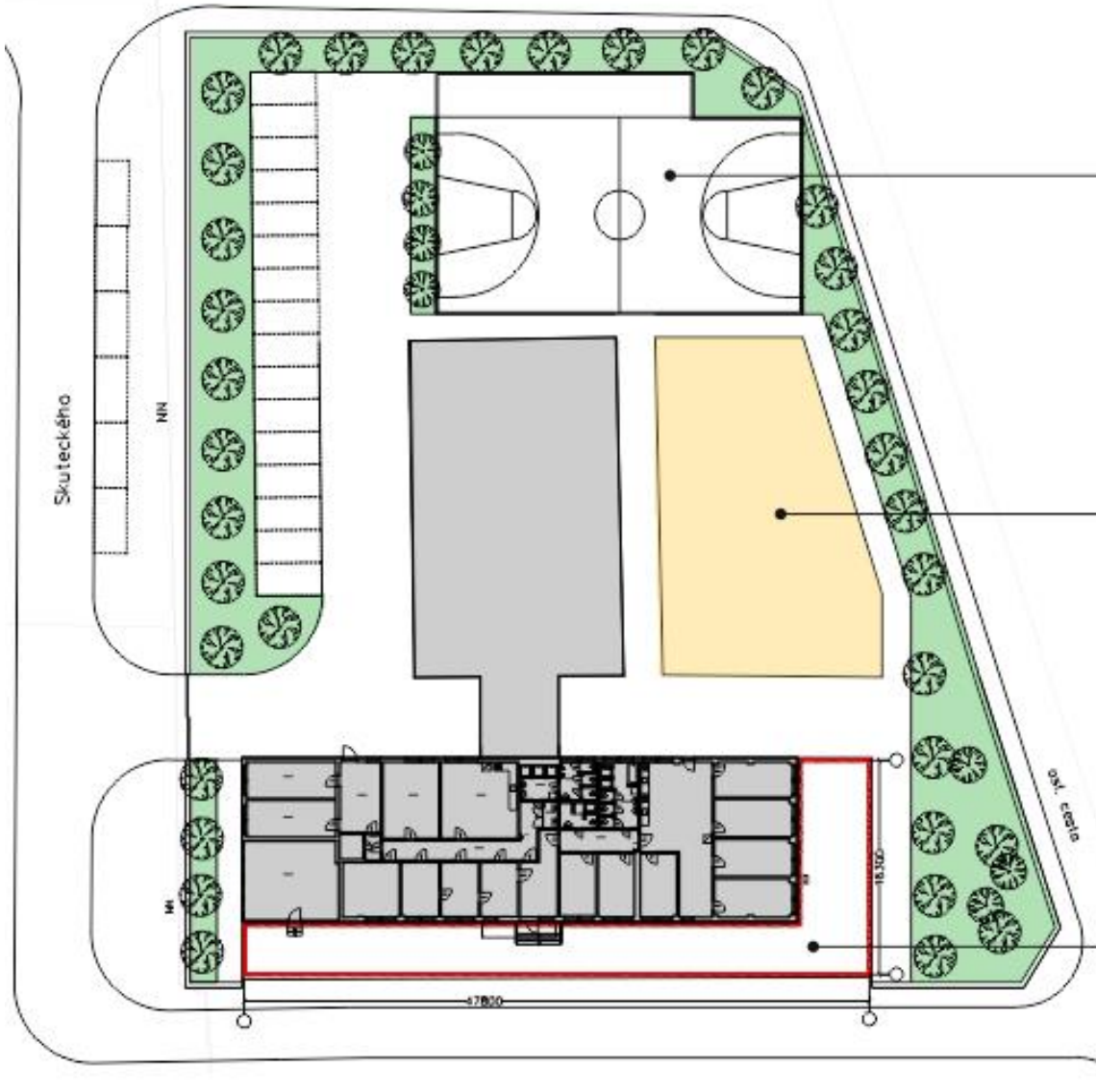
External envelope	Area, m2	The heat transmission coefficient U, W/m²K	Inside temperature t_{in}, °C	Heat losses during the heating period, kW·h							
				October	November	December	January	February	March	April	Total for the period, kW h
Walls	469,3	1,78	21	9260,4	11547	14232	15165	13080	12244	9383	84911,4
Windows	62,08	2	21	1376,4	1716	2115	2254	1944	1820	1394	12620,5
Flat roof	494,4	0,6	21	3288,4	4101	5054	5385	4645	4348	3332	30152,6
The floors	494,4	0,27	21	1479,8	1845	2274	2423	2090	1956	1499	13568,7
Total heat losses during the heating period, kW·h				141253,2							



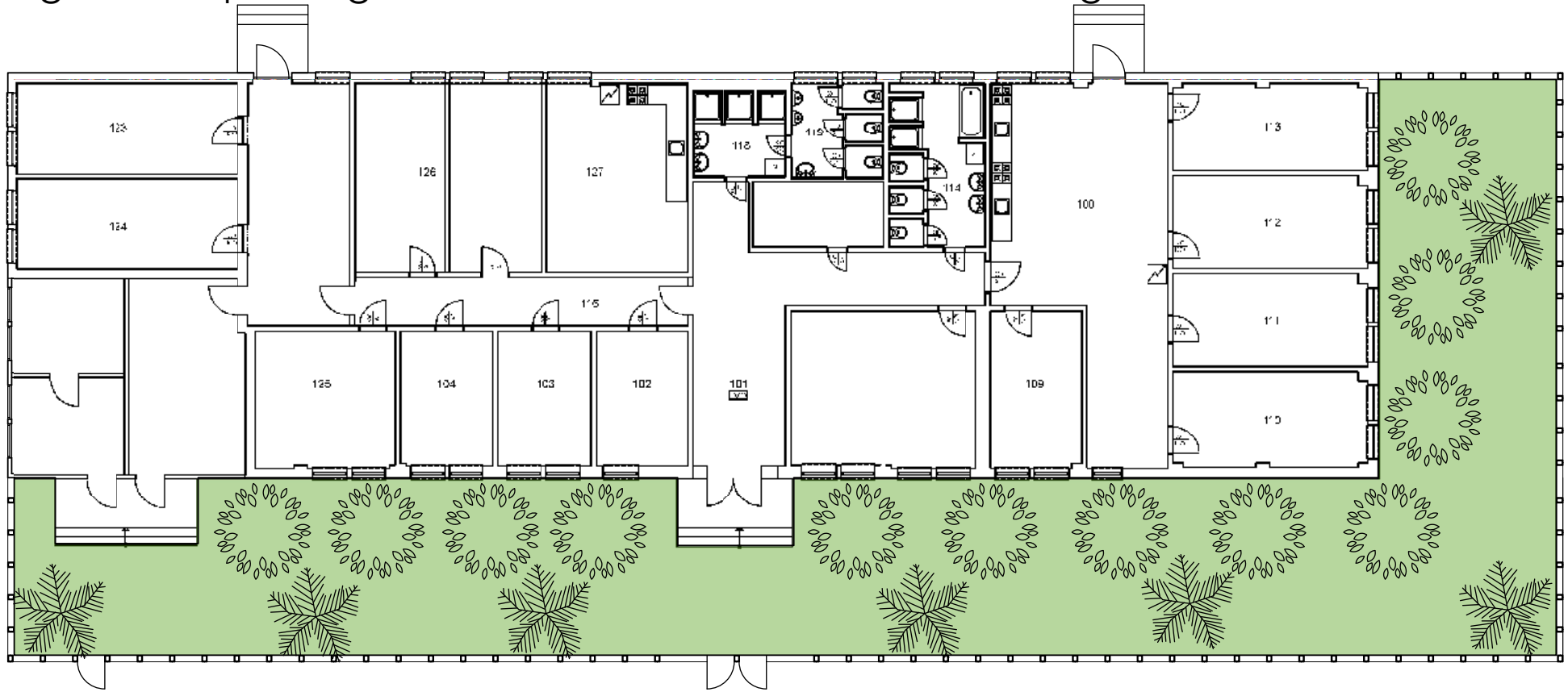
Heat losses through Center's building envelope during the heating period, 141253,2 kW·h, %

Reconstruction proposals:

1. Improvement



2. Redesign and reprofiling of room + extension/extension of the greenhouse



Explication

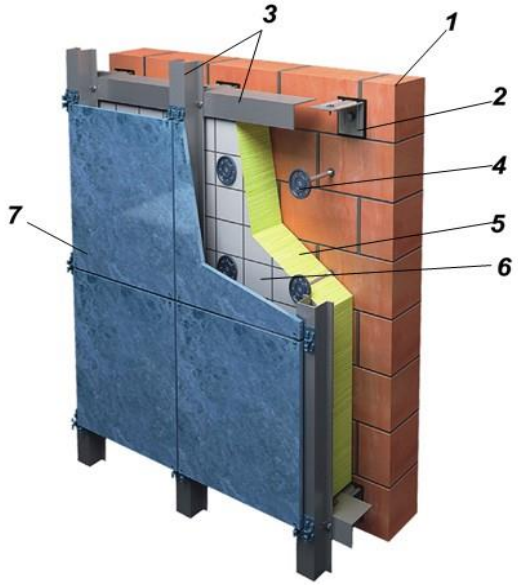
101. Entrance hall
102.Tech Room
103.Shower for men
104. Male bathroom
105. Female bathroom
106. Library
107.Room
108. Kitchen
109.Room
110. Room
111.Room
112. Room
113. Room
114.Room
115.Room
116. Room
117. Psychologist's office
118, 119. Medical service
120.Office
121.Office
122. Room
123. Room
124. Kitchen
125.The entrance hall
126.Corridor

- Insulation of envelope;
- Combined a greenhouse with building;
- Internal redesign and opening medical room;
- Improvement of the surrounding area, creation of recreational zones, playgrounds and landscaping.

3. Insulation

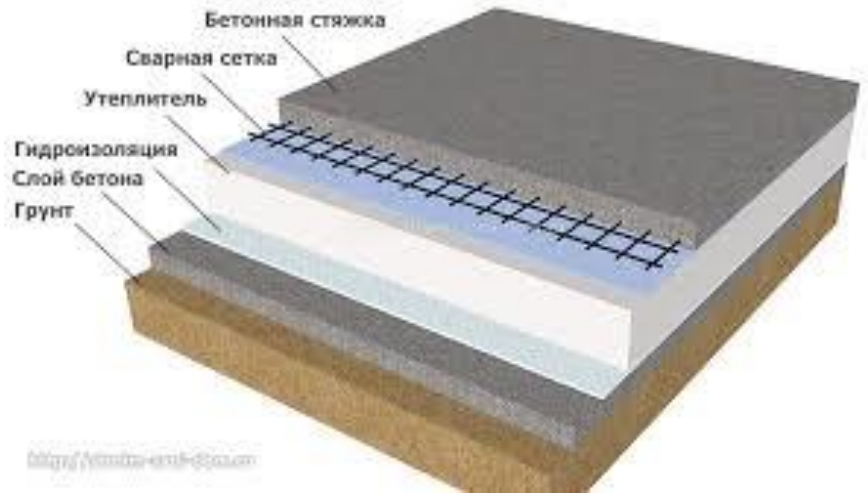
Ways to improve the insulation

Outer wall

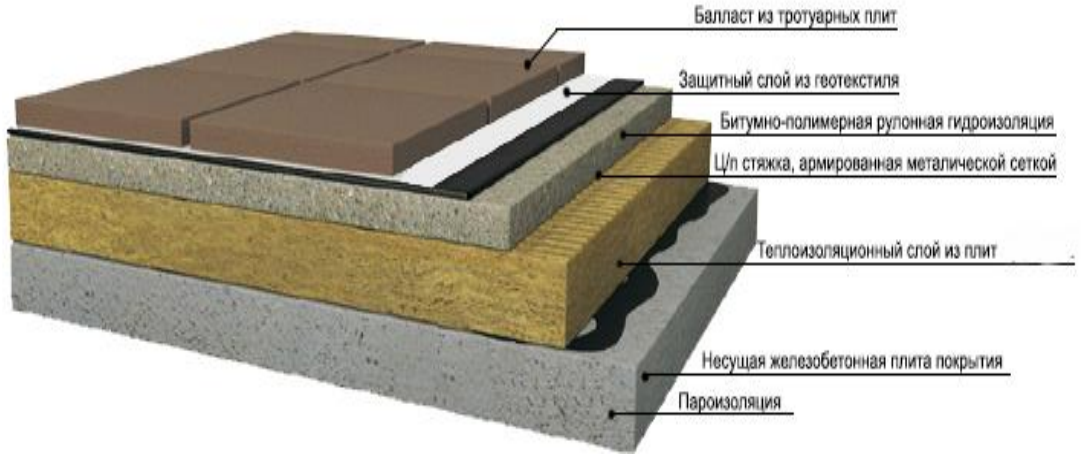


Windows and doors

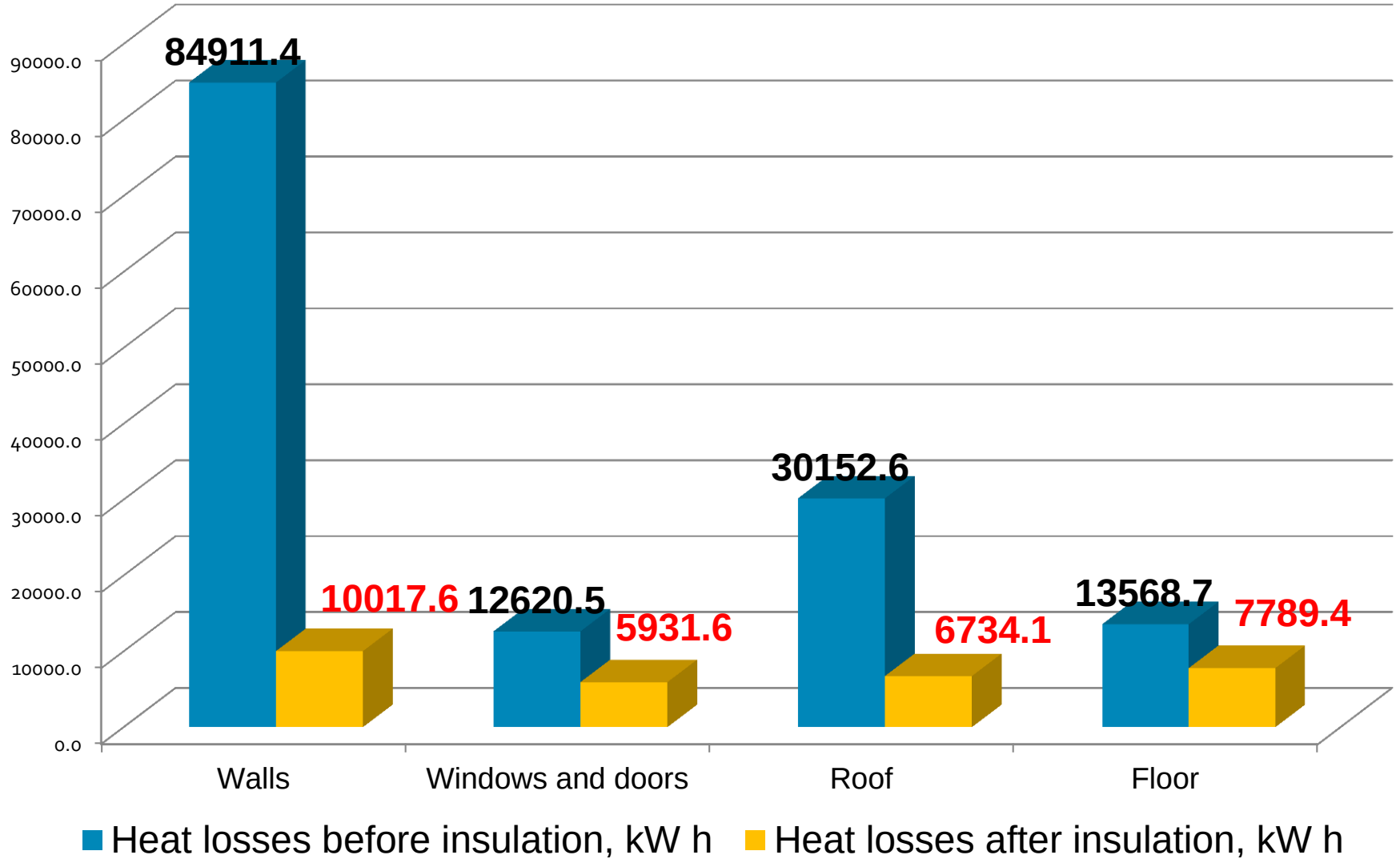
Floors



Roof



3. Heat losses through envelope of the Center **BEFORE** and **AFTER** thermal insulation



Gardening - as an essential tool for improving well-being and life quality.

Worldwide experience. Greenhouses

Montreal farm Lufa Farms on the building roof.

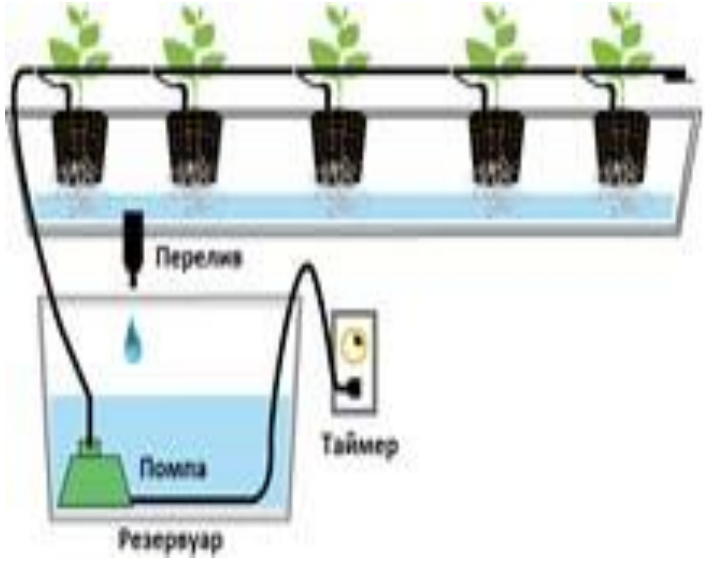
Brooklyn Grange - the biggest roof farm in the world.

Vertical trusses

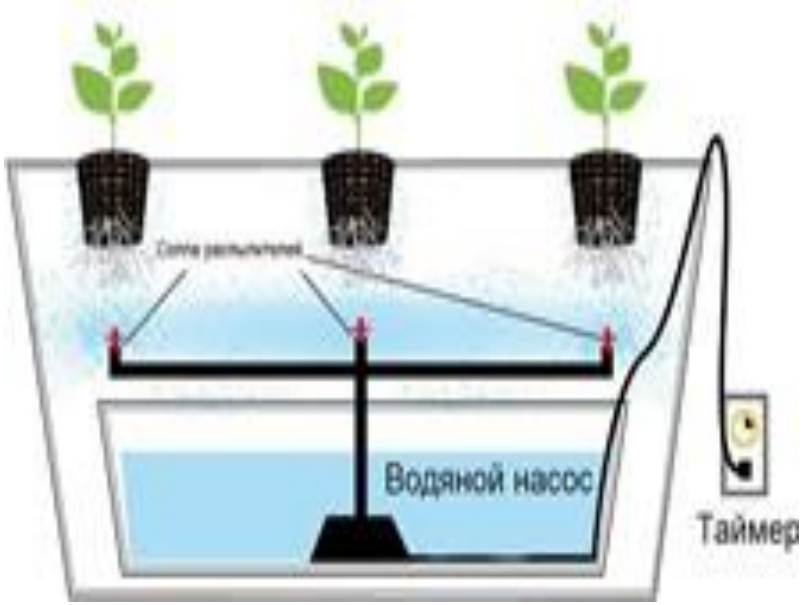
“Zero Carbon Food” Underground greenhouse company

Greenhouses in individual building houses

Ways to grow plants



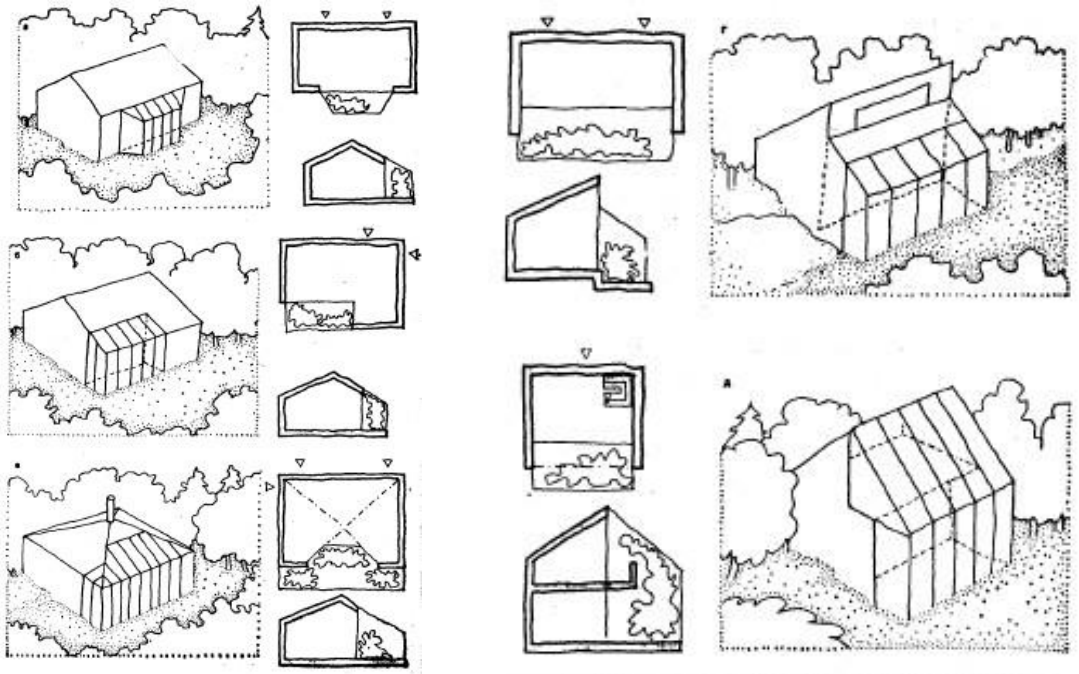
Hydroponics



Airponics

Aquaponics

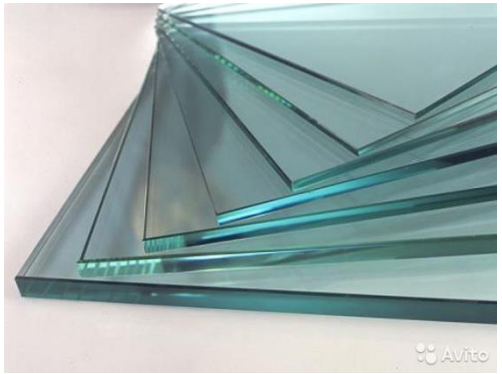
Design features of the greenhouse



Constructive solutions for greenhouses in a small building.

LSTK

Covering:

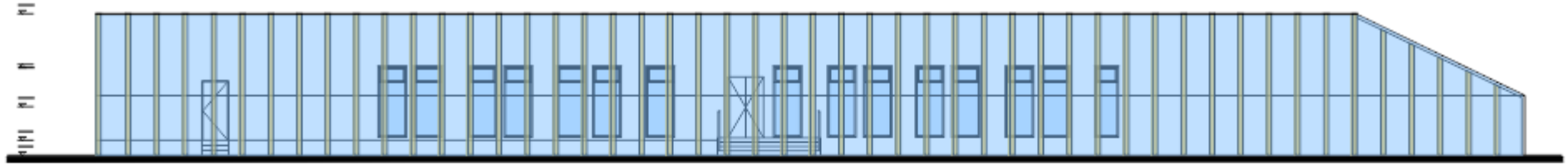


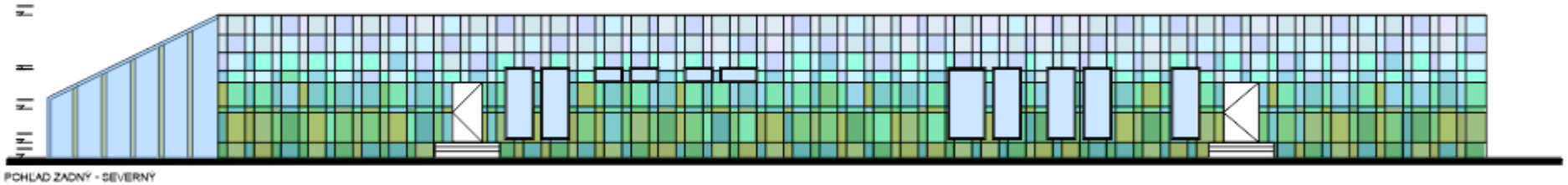
Glass

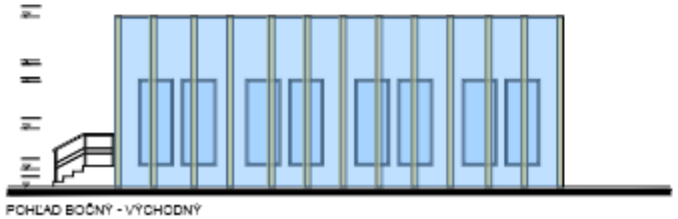
Slick

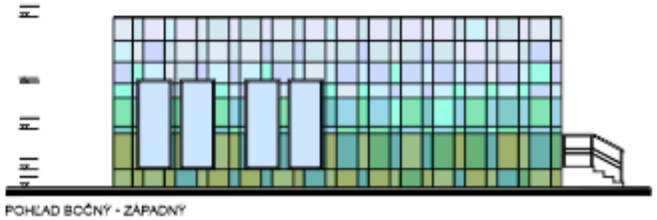
Polycarbonate

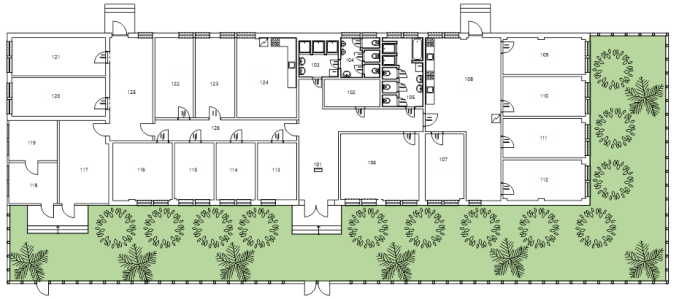
Project proposal (Option 1)

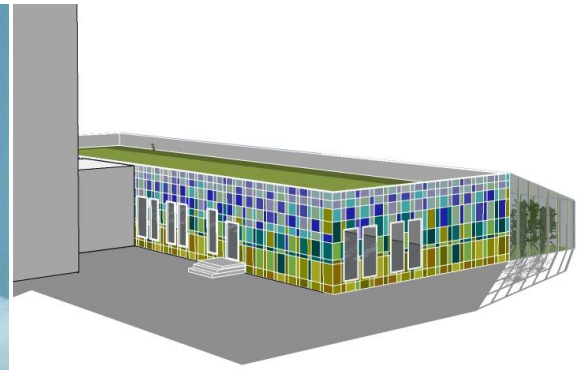


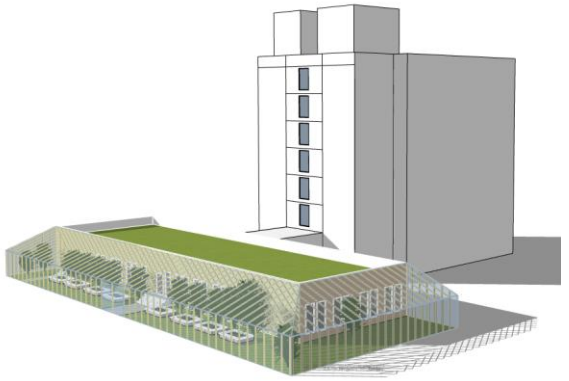


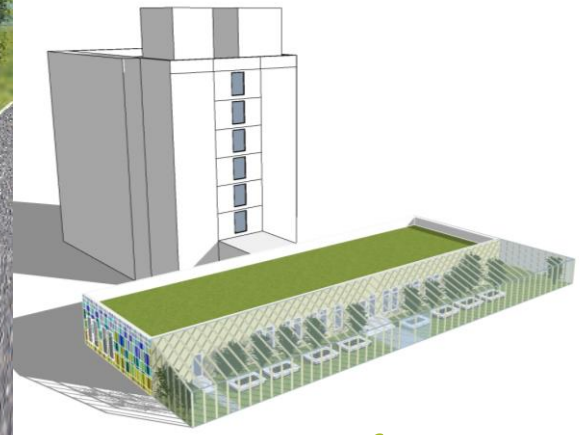




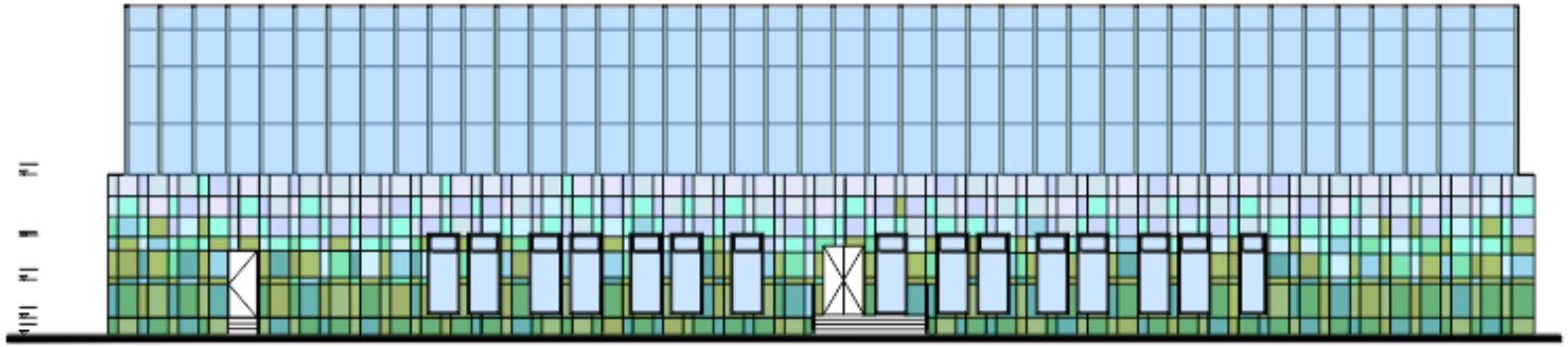




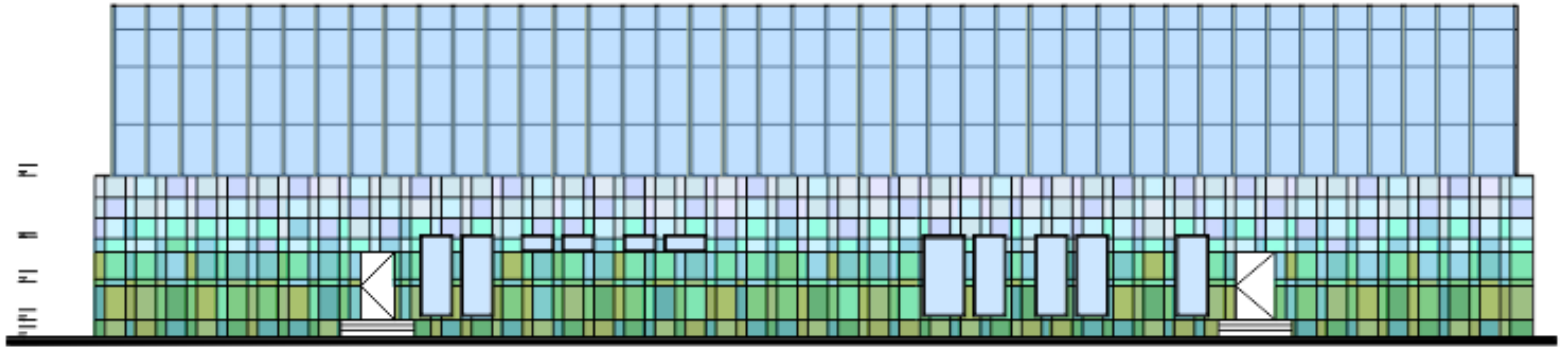




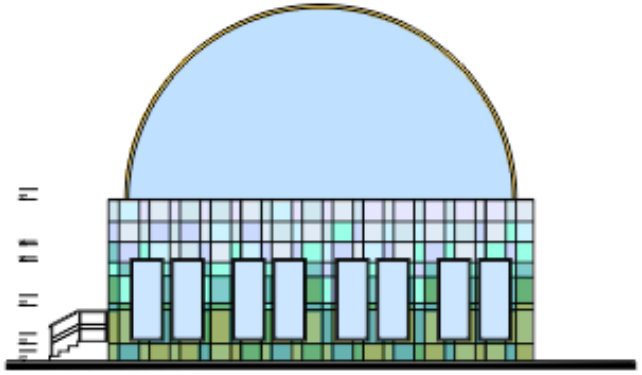
Project proposal (Option 2)



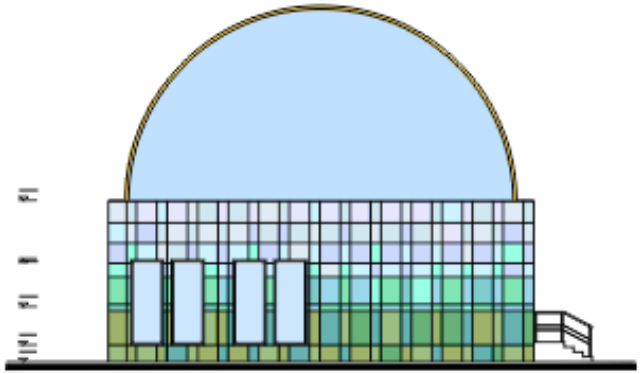
POHĽAD ČELNÝ - JUŽNÝ



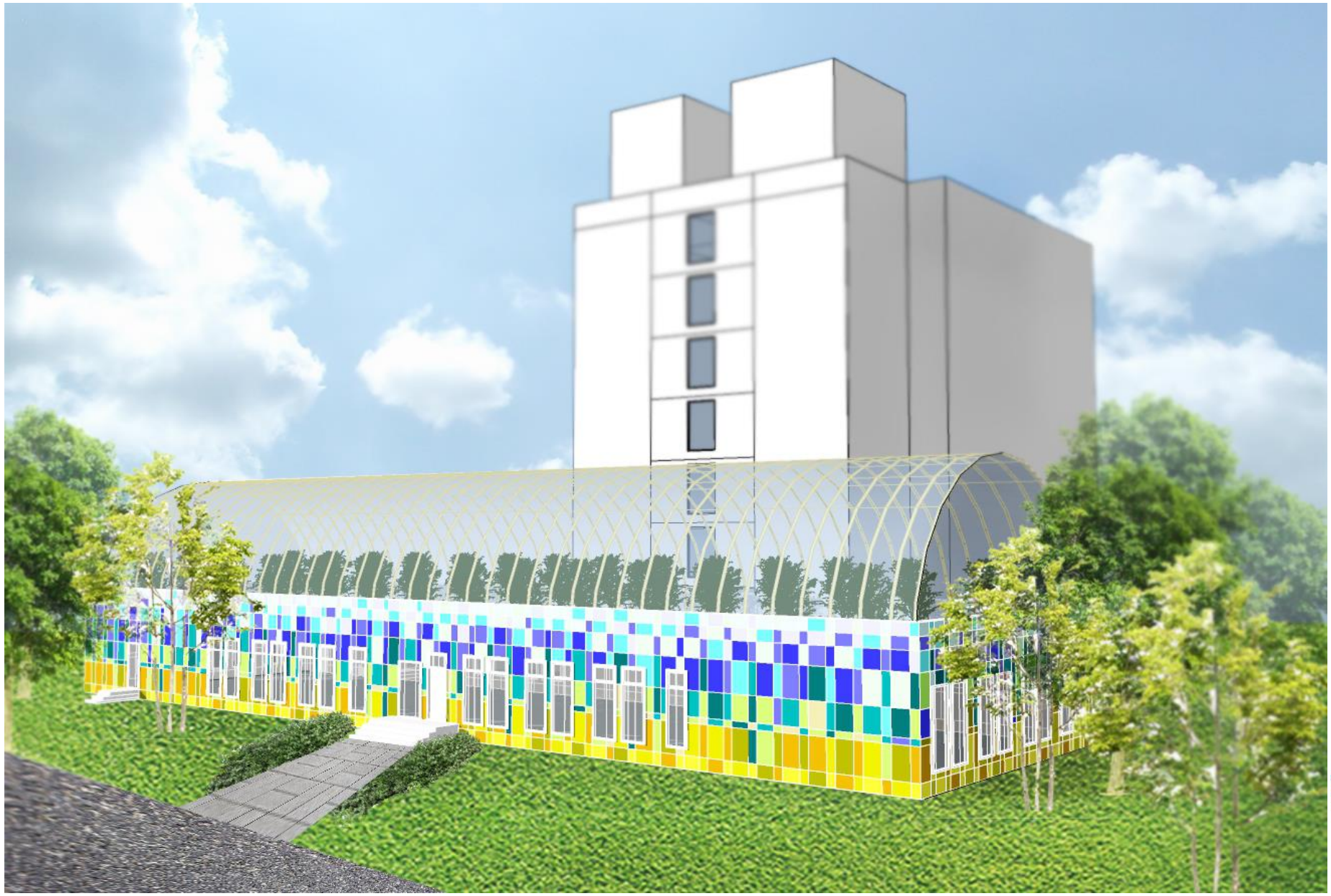
POHĽAD ZADNÝ - SEVERNÝ

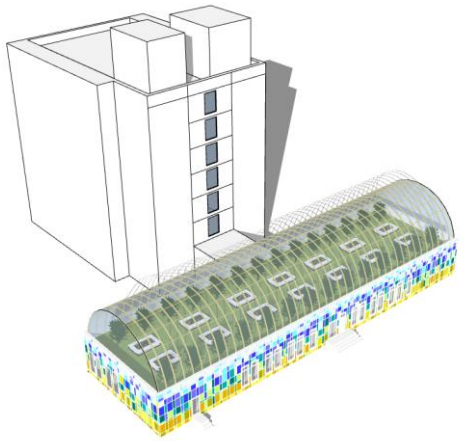


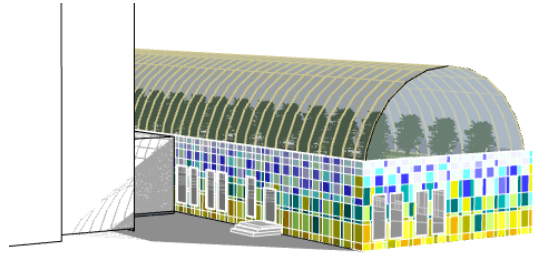
POHĽAD BOČNÝ - VÝCHODNÝ

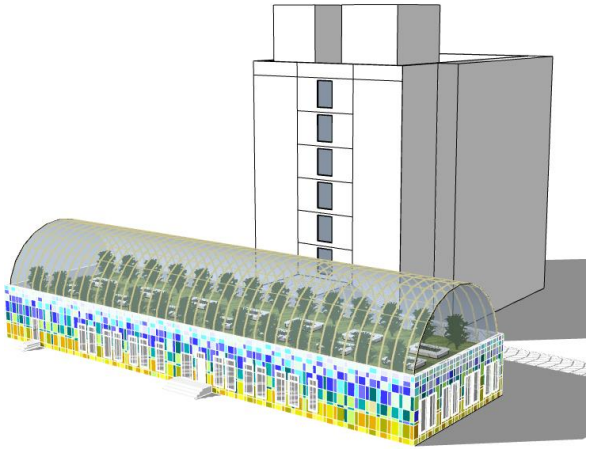


POHĽAD BOČNÝ - ZÁPADNÝ

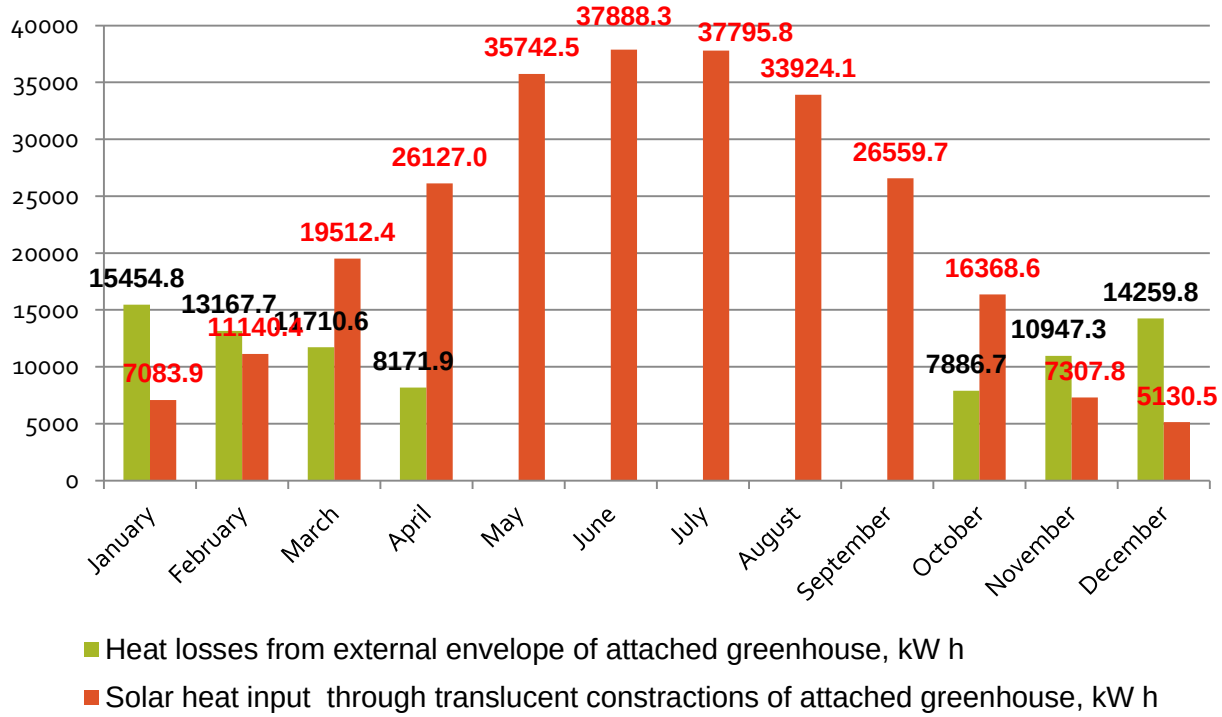




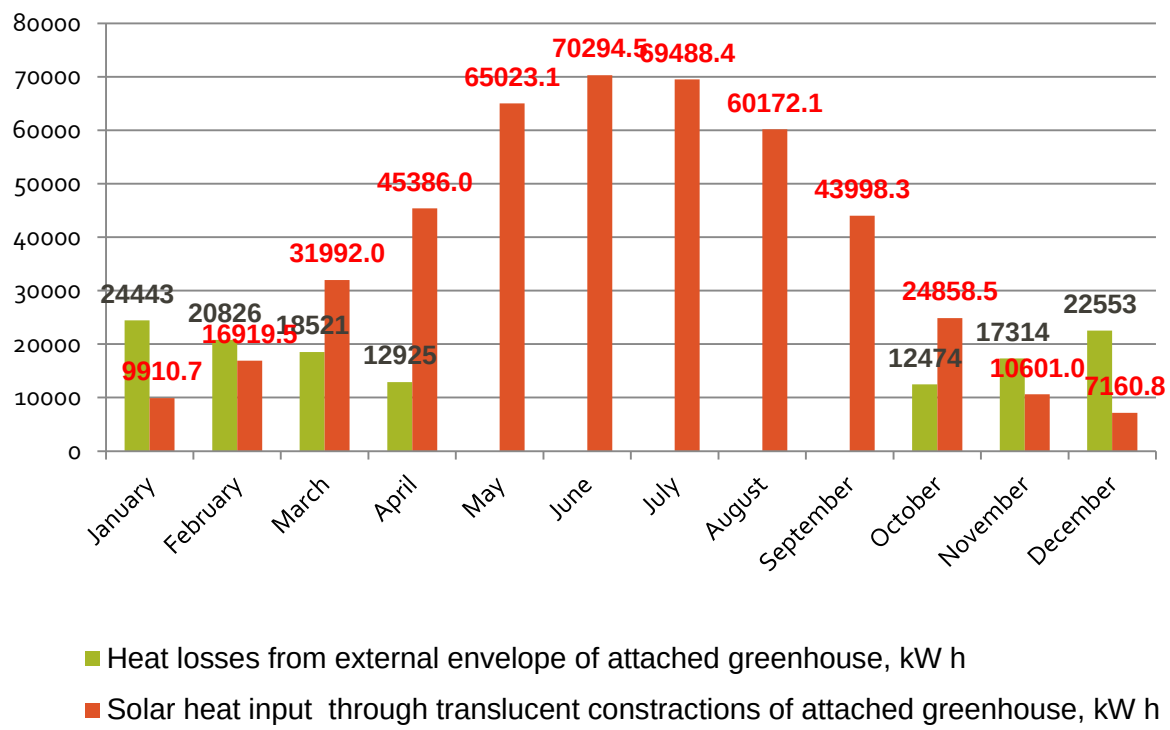




Comparison of heat losses and revenues

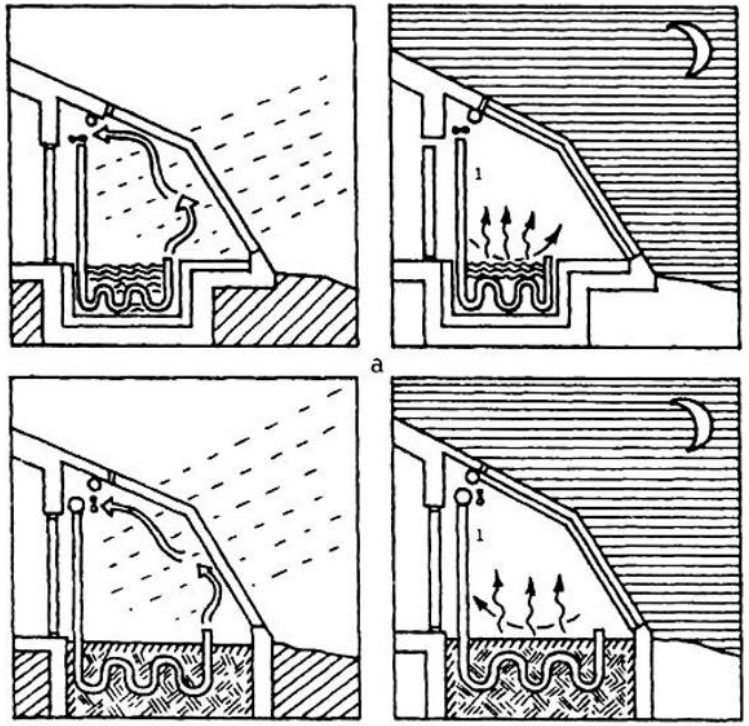


Option 1

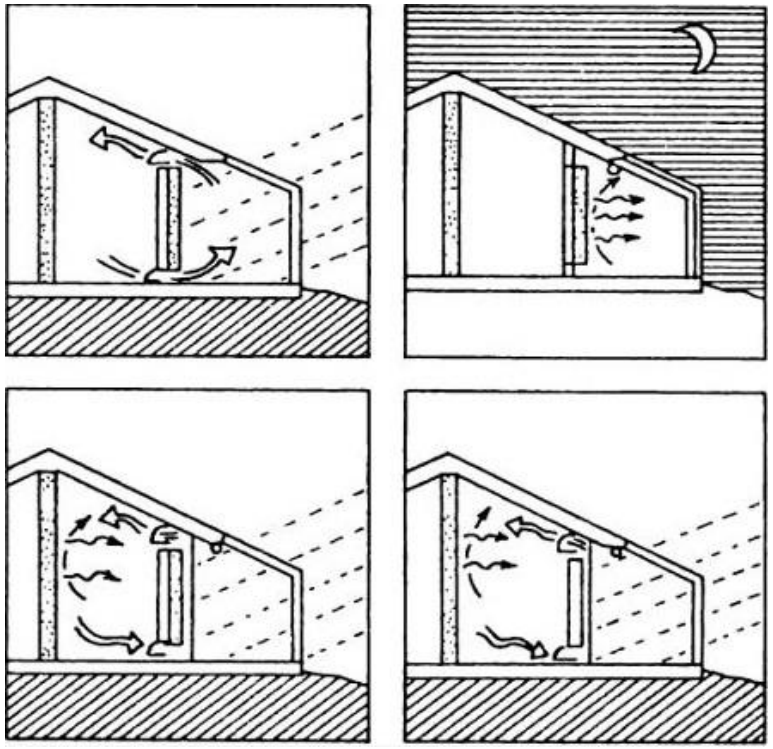


Option 2

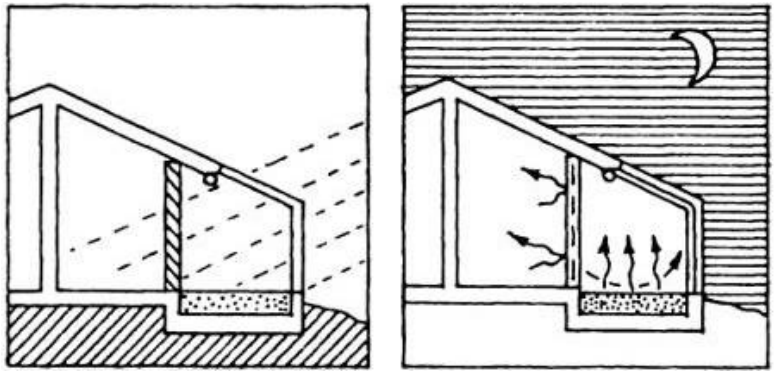
Heat accumulators



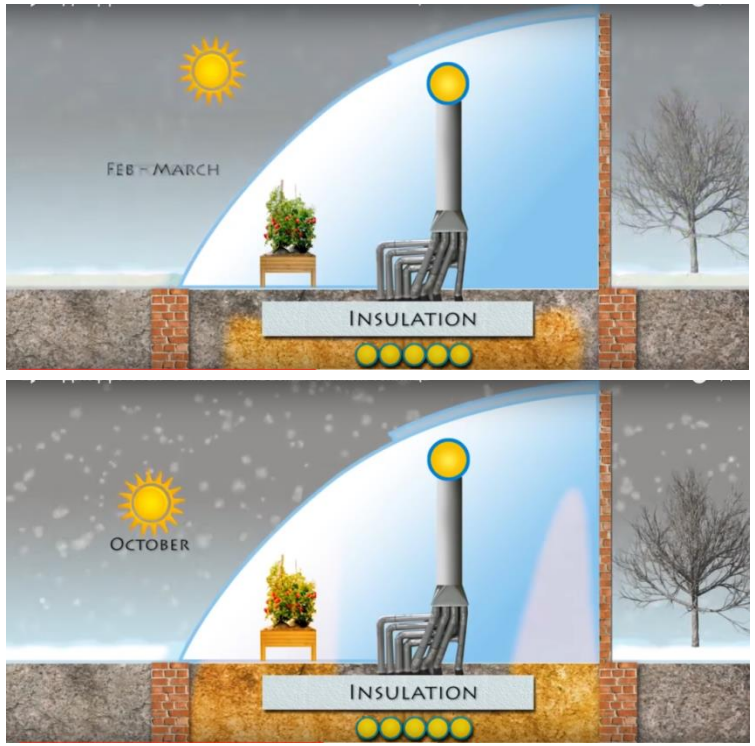
Using soil as
heat accumulator



Stone wall as a heat accumulator

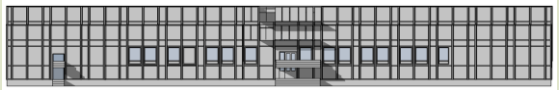
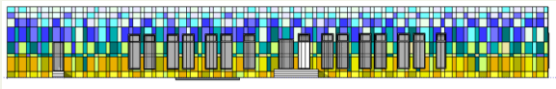
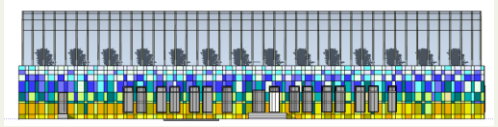


Accumulation of heat stone floor



The principle of the seasonal
heat storage heat

Comparative table

Center - Bethany shelter in the Malatsky town	Activities to improve environment quality	Heat losses of the Center building for the heating period, kW · h	Heat inputs in the building of the Center for the heating period, kW · h
The current state of the building 	-	**141253,2**	**7025,7**
with thermal insulation of external structures 	• Improving the heat-shielding properties of the envelope by insulating the external structures; • Redesign and reprofiling of premises - opening medical room and psychologist's office; • Improvement and landscaping of the territory, creation of playground.	**30472,8**	**7025,7**
with thermal insulation of external structures and greenhouse 	• Improving the heat-shielding properties of the envelope by insulating the external structures; • The construction of a greenhouse adjacent to the south and east facade of the building; • Redesign and reprofiling of premises - opening medical room and psychologist's office; • Improvement and landscaping of the territory, creation of playground.	Center building– **21155,5;** Greenhouse – **81598,9**.	Heating period– **92670,7;** Summertime – **171910,4.**
with thermal insulation of external structures with a built-in greenhouse 	• Improving the heat-shielding properties of the envelope by insulating the external structures; • Construction of the built-up greenhouse; • Redesign and reprofiling of premises - opening medical room and psychologist's office; • Improvement and landscaping of the territory, creation of playground.	Center building – **23739;** Greenhouse – **129057**.	Heating period – **146828,5;** Summertime – **308976,4.**

Conclusions

- The insulation of external structures will improve inner environment and cut costs utility bills.
- Redesign and opening of a medical room could help Bethany residents to check and control their health.
- Adjacent greenhouse can have a lot of advantages:

- Improvement of residents well-being;

- Additional heat source in cold seasons;

- Psychological condition improvement;

- Possibility to have varied healthy food for the residents.

Thanks for attention