

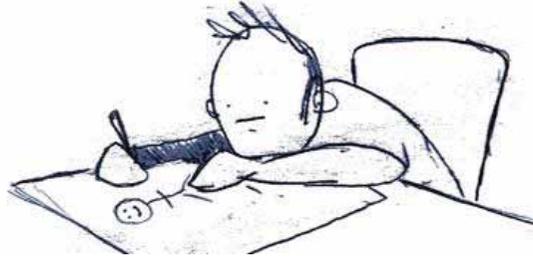
# THE GROWING STEEL HOUSE



FAMILY RULES

growing steel house - family rules

the  
rut.



## The growing steel house

The concept of the house is to address low cost housing that attracts a wide clientele. Architectural design of the project focuses to provide openness of the house and surrounding area. To ensure the variability and flexibility of the concept, the structural design uses prefabricated panels and a steel skeleton. The basic proposal of the house is a starting two floored unit designed for the young generation, with an open concept design allowing for rapid conversion of space.

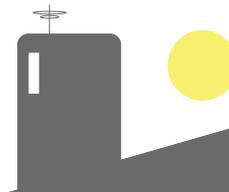
Ground floor contains the entrance, changing room, basic toilet and water tank room. Living room is connected with the dining room and kitchen. The first floor bears a study room, bathroom and bedroom. Optical interconnection of the ground floor and the first floor ensures throughview in the middle of the house.

Windows are oriented to the south in order to produce a dominant impression. However, they also serve the important function of illuminating the interior of the house as well as linking it to the garden outside, thus further enhancing the open concept of the house.

Since the concept is designed for a younger generation if there is an addition to the family, due to the open concept, re-organizing the space can be achieved rapidly and with relative ease.

The studyroom can be converted to another children's room. Further addition/expansion, not necessarily another child but perhaps a car, it is possible to transform the house on a larger scale. For example, on the ground floor there is space to extend and merge the walls with that of the garage, and in the first floor two children rooms with bath room.

The basic building block of the building is a steel skeleton composed of square tube size 120 x 120 mm. Peripheral walls are provided by prefabricated system. Offer of panels starts at the solid panel, the panel with window (smaller and larger format), the panel containing the door, the half panel .... ect. Precast panels have uniform dimensions 2800 x 3750 x 120 mm. Their construction is based on the skeleton formed by U-shaped profiles (90 x 40 mm), the space inside is filled with mineral wool. Sheathing is done with the help of OSB board with a thickness of 15 mm. The interior board has a larger diffusion resistance, avoiding the need to use a vapour barrier, but we have to seal joining of panels and columns. Bars in the interior are made of plasterboard sandwiches with thickness of 150 mm. Construction of the ceiling and also roof provides a cross-oriented steelgirders (profile IPE 270). Distribution of forces from the ceiling is also done by purlins (profile IPE 160) and trapezoidal plates with concrete grout with a thickness of 60 mm. The whole building is carried by strip foundations. Facade is overlayed with Cembrit templates. There is the Solarwall system used for air heating, see solarwall : [www.solarwall.com](http://www.solarwall.com)



growing steel house - family rules

Beginning idea was to propose a house according to the evolving needs of the owner. The house is like a man - living organism which is adapting to. Man is developing and changing his needs during his life. We tried to design a house which would evolve with people. That it would fulfill their needs and requirements. Young couple can find freedom without barriers in it and on the other side people with children certainties and enough space to live. According to this there are no partitions in the first face and this will develop to the last phase where there is much more space but divided in rooms. The last phase ( phase C, fully grown house ) is made by no interference with the living space.

One of the other opportunities which the house gives is close connection of the interior with the nature and surrounding. This is thanks to the south façade which is fully glassed.

One of the main ideas that also influenced the architectural design was the aspiration to make a house that could be built easily a quickly. That is because of the need of young people to move from a flat they are selling. To accomplish this need, there are used just screw connections and the majority of components used in the house is prefab and delivered directly to the construction.

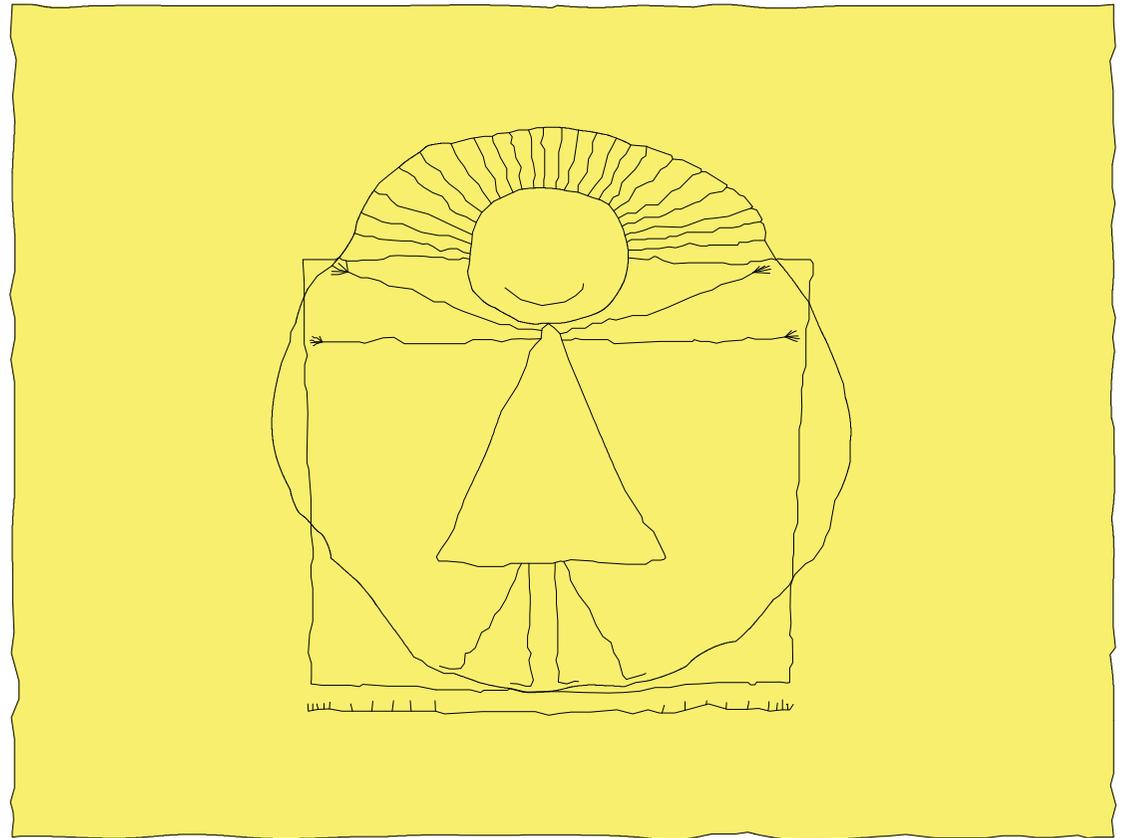
Every owner can design the façade as they wish. This can partly ensure the urban variety, when there are more houses at one area.

The house was also designed as a study of various thicknesses of thermal insulation. Basically there are 80 mm of thermal insulation in prefab panels and then three types of contact insulation system ( 120, 180 and 220 mm ). This was done to see the influence of thermal insulation on energy demandingness of heating. As for the thickness of 220 mm of thermal insulation we got on the standard of passive house. Nowadays this is quite important for the area of the Czech Republic because of the influence on the environment and also because there is a donation programme of the Ministry of the environment. They give extra money to people who build their house in a passive standard.

The fully glassed façade orientated to the South allows us to use the solar gains during the winter time to low down the energy needed for heating. On the other side there are outdoor blinds to reduce the solar gains and energy needed for cooling during the summer time. On the same façade there will be installed the solarwall system which will help to heat up the air coming to the interior during the winter time.

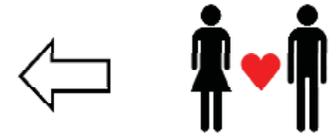


# ARCHITECTURE PART

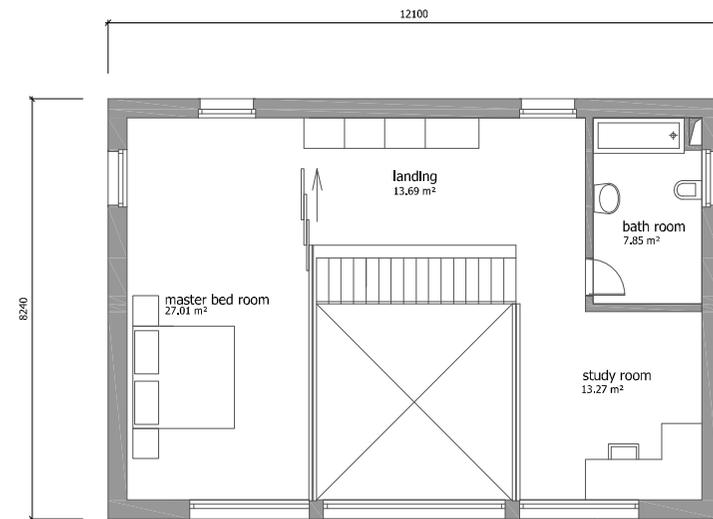


PHASE A

ground floor



first floor



1 : 100

starting unit for young couple

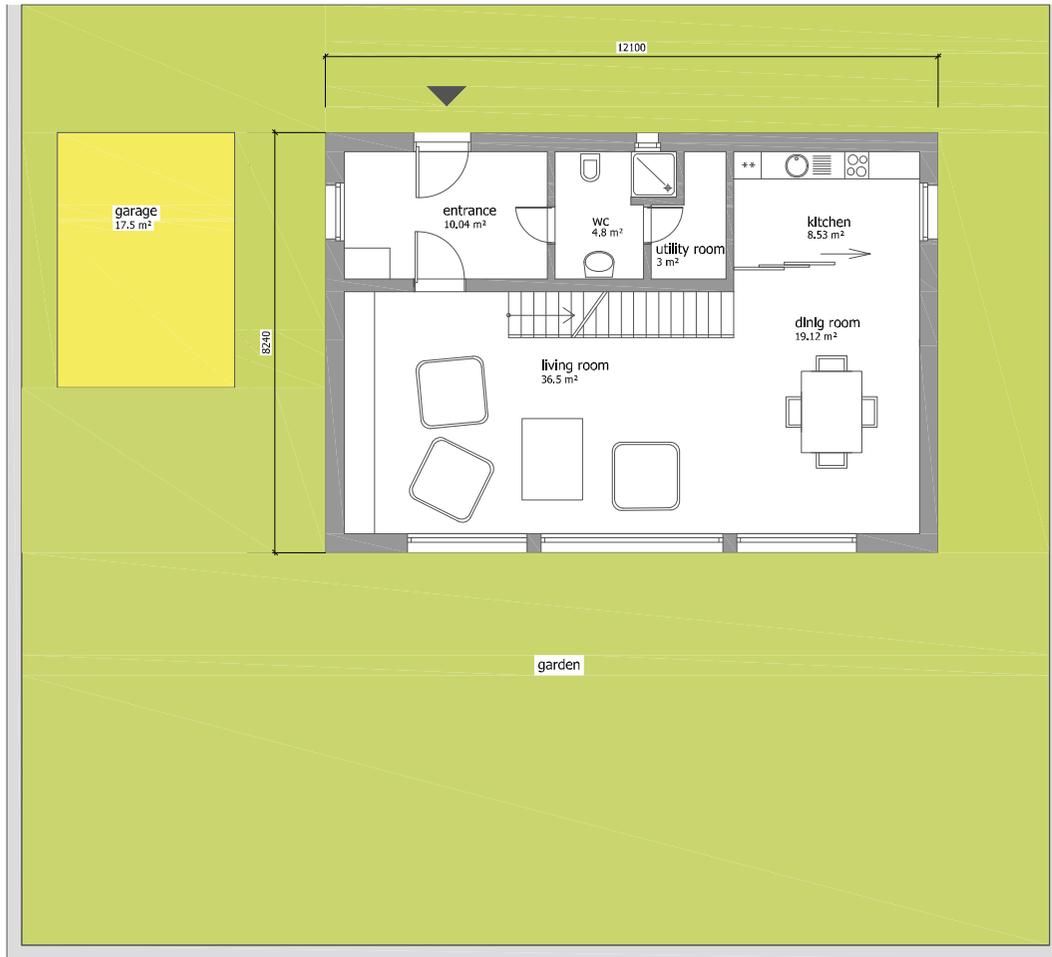
open space / master bed room and bed room

open-ended / master bed room or bed room

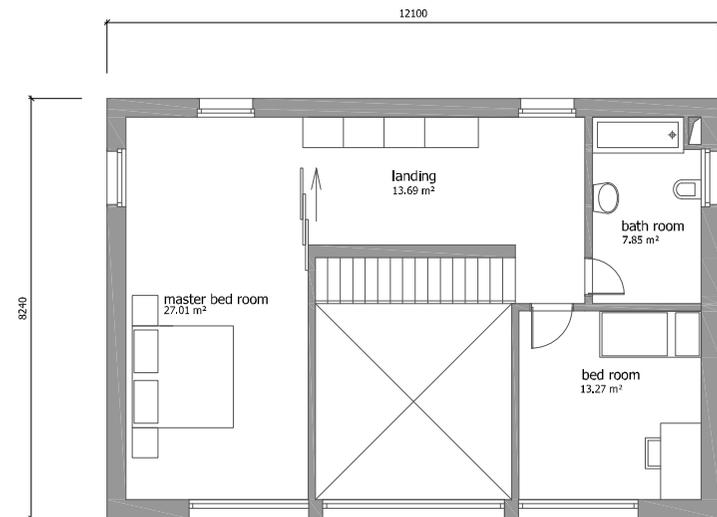
phase A - starting unit - young couple  
growing steel house - family rules

PHASE B

ground floor



first floor



1 : 100

young couple with baby

change in plan arrangement / study room to bed room

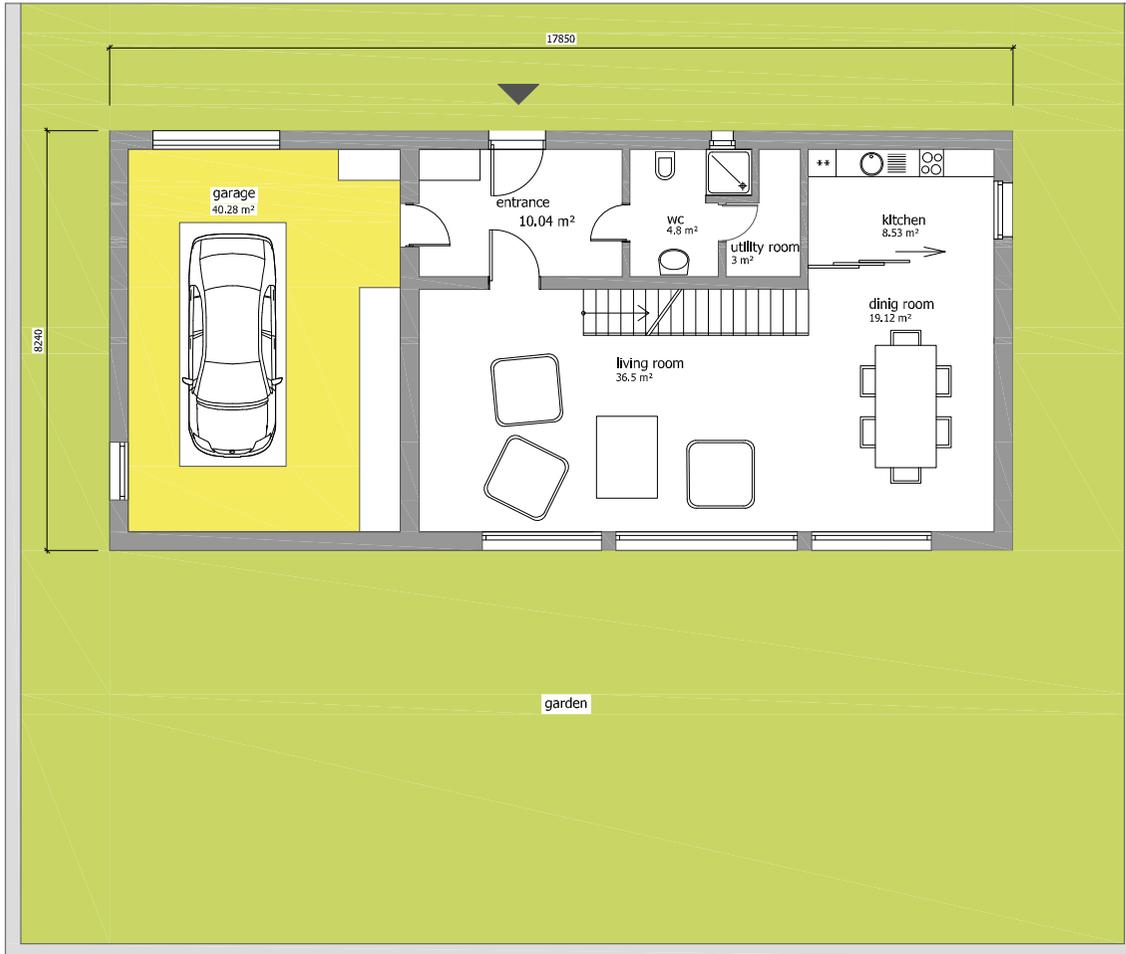
closed space / master bedroom and bed room

open-ended / master bed room or bed room

phase B - young couple with baby  
growing steel house - family rules

PHASE C

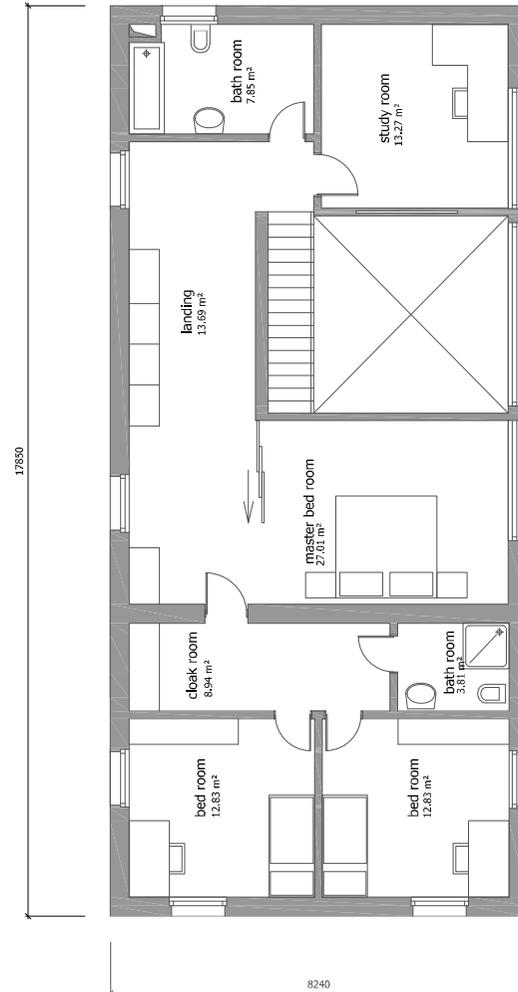
ground floor



- 1 : 100
- couple with 2 children
- expanded by 2 bed rooms and garage
- study room

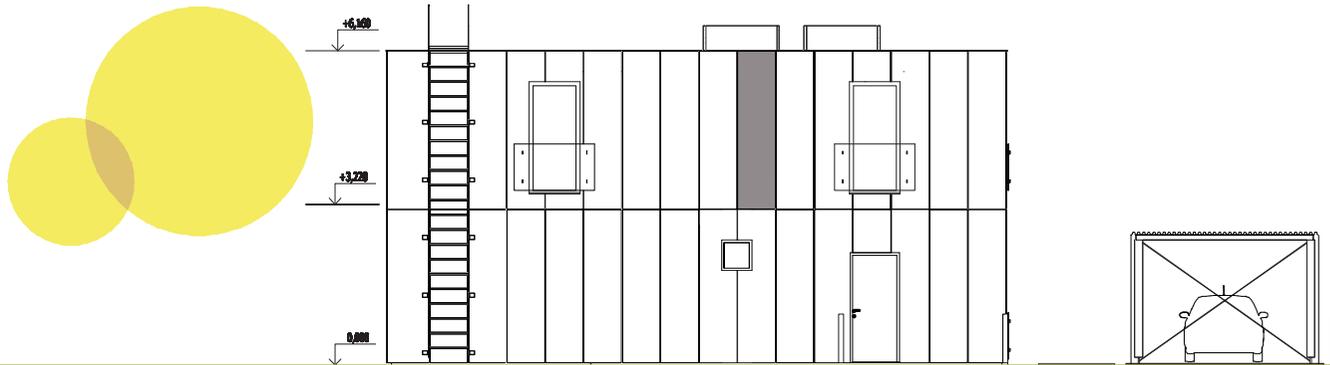


first floor

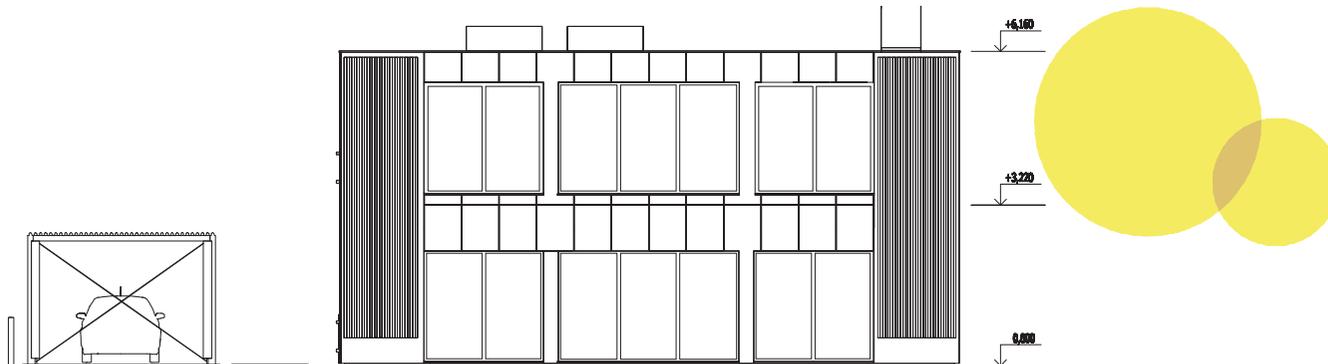


phase C - couple with two children  
growing steel house - family rules

north

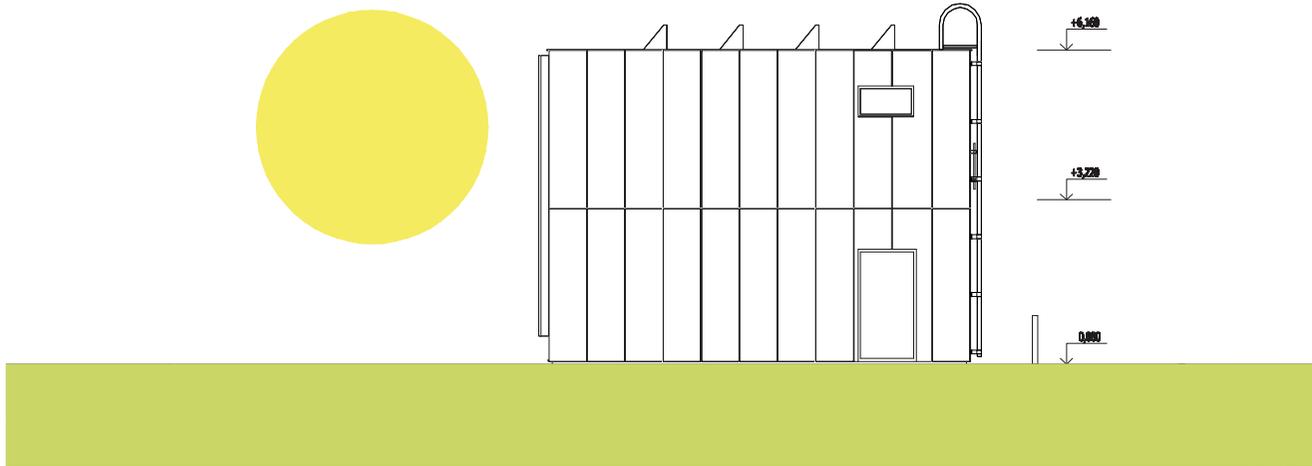


south

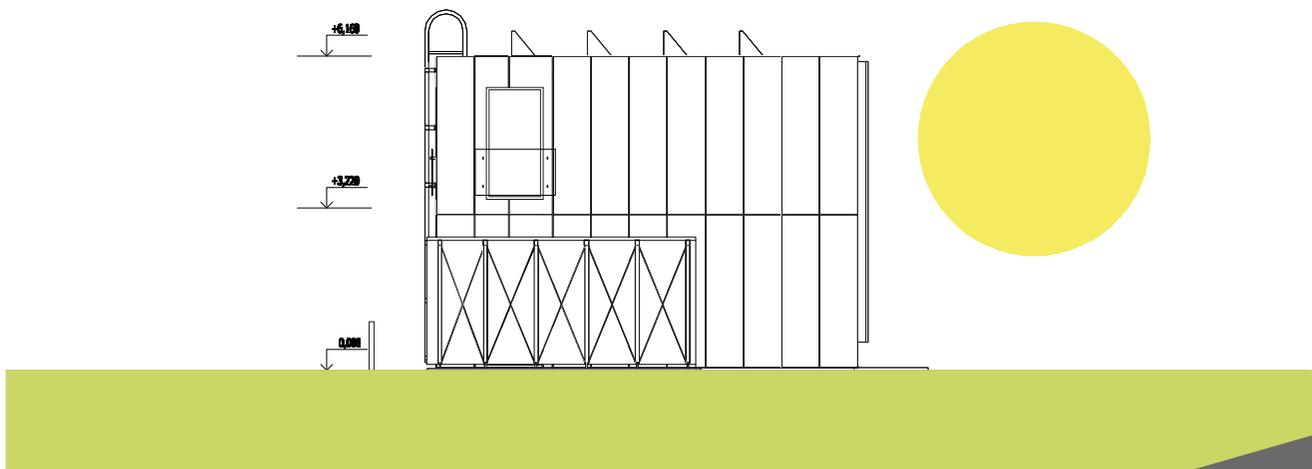


views - 1 : 100  
growing steel house - family rules

east



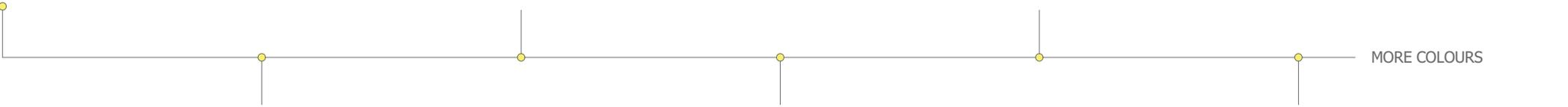
west



views - 1 : 100  
growing steel house - family rules



exterior views  
growing steel house - family rules



MORE COLOURS



combination of colours  
growing steel house - family rules