Isover Student Contest 2011 - Design Report

(Diverse) Tower

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While New York is a diverse and dynamic city, it is dominated by closed mono-functional spaces, lacking intent of diversifying and connecting different elements, which prohibits people from participating in the weave of different worlds that make up the city.

The proposal is a functional solution to bring these diverse elements together. It intends to stand as a model for a more intrinsic way of design, using the elements of the project as natural parts of the definition of space. The morphology of the proposal is not inherent of the design scheme, but a powerful visual demonstrator of how spaces respond to different uses, and how form in this case represents the web of different functions blending together.

The tower is made up a simple organic boundary body, with three internal bodies following the curves of their parent. The intersection of these bodies with the projected floors, and with the possibility of expanding and retracting subsequent apertures, allows for a playful dynamic design to adapt each space to blend, adapt and connect to different uses and adjacent functions.

The floor plans are therefore very diverse, and constantly changing along the formation of the tower. This free forms of the spaces aims to bringing the diversity of the city of New York, into the internal space. Mixing different uses along these three adjacent boundaries in each floor.

The base of the tower is a dense mix of high value activities, connecting to the city space below, forming a vast public space over the former void of the tunnel approach.

The building concept of the tower is based on ISOVER Multi-Comfort-House. It uses all the design elements as a secure base to ensure a energy efficient passive standard. In addition to this, specific intelligent design concepts are stacked on top of this specific solution. Each unit, three on every floor, employs a dynamic natural climate control scheme. The concept is to, during warm periods, take in

the warm air on the north facade and run it through a rain water sprinkler, and then conduce it, descending trough a green gallery, allowing plants and humidity to cool the air down. On the south facade, a gallery heated from the solar radiation, creates a natural flow of air. The habitable units in the center of this system enjoys a natural flow of air. In the case of this scheme not being sufficient, the ISOVER design principles offers a backup system of closed ventilation. The combination of the two systems, or the ability to switch between them ensures a passive, low energy consumption solution for the summer months.

In winter the system is reversed. Using the solar gallery as a heat collector and closing off the northern gallery from the air circuit. The unit is now relying solely on the ISOVER closed ventilation scheme, but the galleries, which are situated on the exterior of the thermal envelope, acts as buffer spaces, reducing considerably the heat losses of the building. Geothermal energy assisted with an efficient heat exchanger ensures a reliable energy source as support to the passive system. All energy needs are estimated to be covered with these three sources; natural airflow, wind power and geothermal energy.

The acoustic comfort is ensured using high quality ISOVER materials and solutions. Absorbent materials are used intelligently throughout the building, and as a basis a lowered acoustic ceiling provides a reliable design standard.

The building is effectively organized into sections of six habitable floors with one service floor. The service floor is dotted with vertical windmills that accumulates all the energy needed to conduce the ISOVER system. Rainwater is collected from open galleries in the facade, on the roof and on the new public space below. Water is used to water gardens along the facade of the tower. Some floors are completely open giving for cultivations, to produce fruits and products daily consumed in offices and other spaces in the tower. The policy is to in every way make the visitor use the resources available all around us, leaving the tower with a less daily impact on the extended environment.

All spaces are generous, and every floor employs the concept of step free floors, where all spaces are designed with a seamless flooring to provide maximum accessibility.

The (diverse) tower is a design experiment to literary project the horizon of the future of the buildings of New York City, harvesting on the very diversity and richness of the city, and bringing them together and transforming cultural intelligence and relations into form.

Calculations:

Heat Losses:

1. Transmission Heat Losses per m^2 and year:	11.60	kWh/(m^2a)
2. Ventilation Heat Losses per m^2 and year:	5.66	kWh/(m^2a)
3. Total Heat Losses per m^2 and year:	17.26	kWh/(m^2a)

Heat Gains:

4. Internal Heat Gains per m^2 and year:	11.34	kWh/(m^2a)
5. Available Solar Heat Gains per m^2 and year:	10.34	kWh/(m^2a)
6. Total Heat Gains (Free Heat) per m^2 and year:	15.75	kWh/(m^2a)

Annual Heat Demand (kWh/m^2):	9081.30	kWh/m^2
Specific Annual Heat Demand (kWh/m^2) :	1.51	kWh/(m^2a)
Specific Annual Heat Hemand < 15 kWh/(m^2a) achieved:	YES