

An aerial architectural rendering of a modern industrial or office complex. The scene features several large buildings with prominent green roofs. A central water feature, possibly a canal or a large fountain, winds through the site. The buildings are surrounded by lush greenery, trees, and parking areas. The overall aesthetic is clean and modern, emphasizing sustainability and green architecture.

Stoica Alexandra, DAS ENGINEERING GRUP
Breeam International Assessor

The reconversion of old furniture factory
Libertatea, Cluj

Once upon a time ... an old piano factory

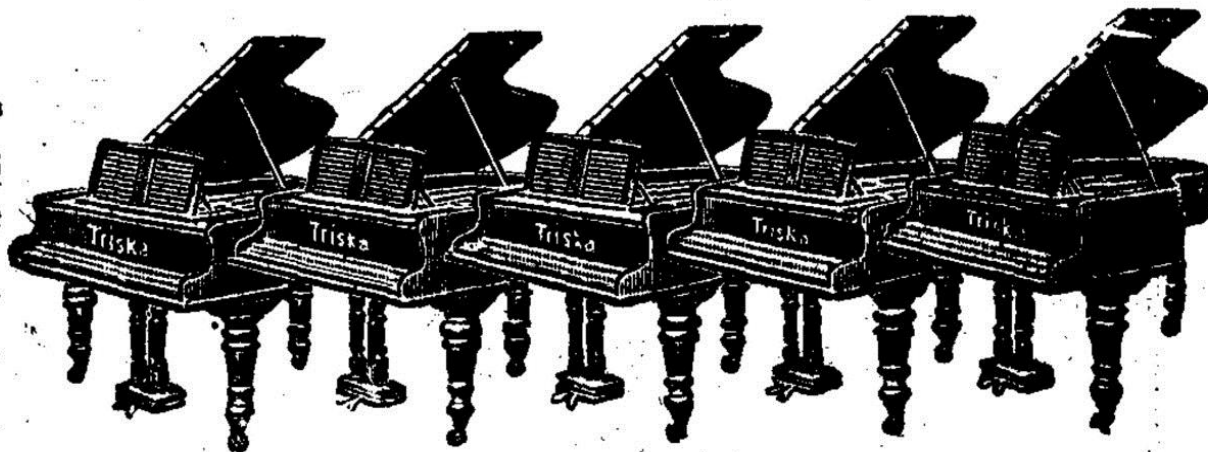
Fabrica Libertatea, de la pianele vieneze la mobila din lemn masiv

Libertatea si-a inceput activitatea in 1870 ca producator de pianele vieneze. Cel care a intemeiat-o a fost mesterul vienez de pianele Franz Triska. In 1949, prin comasarea mai multor unitati producatoare de mobilier ia nastere fabrica Libertatea, cu 4 sectii de productie.

Triska J.

Acoardă, repară și
transportă pianele
conservatorului,
operei și tuturor
institutelor de stat.

Pianele se dau cu
chirie.



Primul și cel mai mare depozit de
pianele din Ardeal.

Cluj, Str. Saguna No. 18.

Au sosit în mare cantitate pianele și pianinele din fabricile „Pörster“ Wirth, Hnffmann și Stingl.

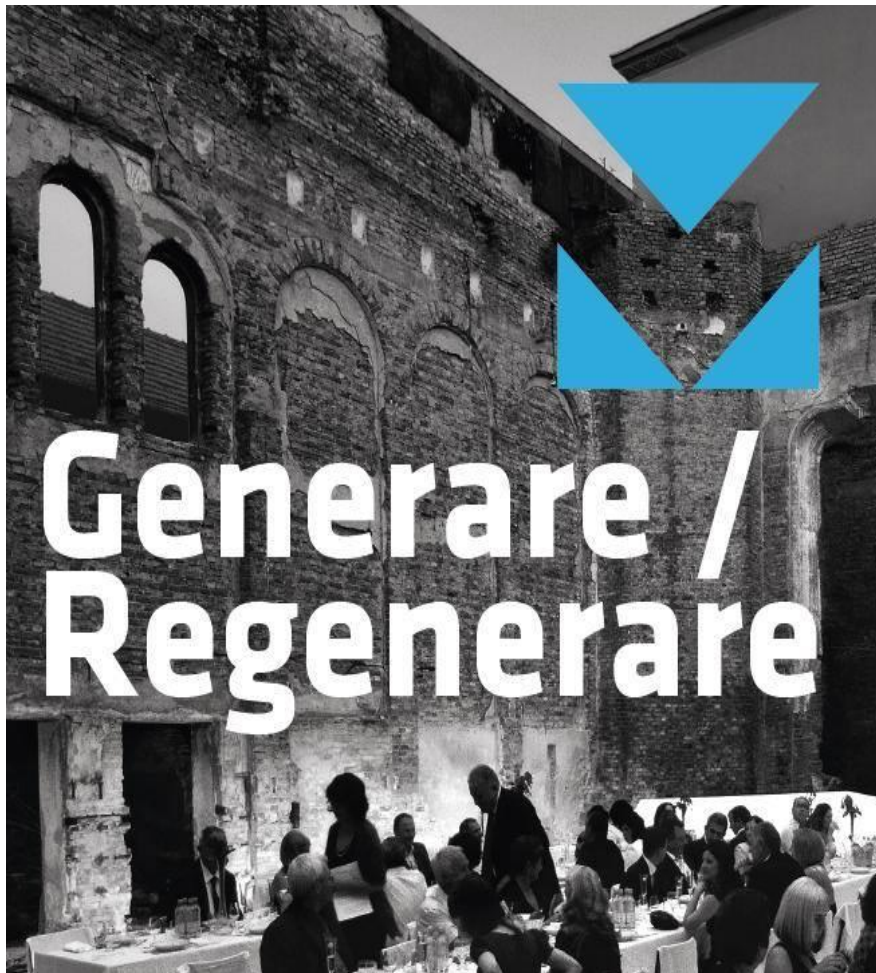
... got ready for a Major REFURBISHMENT operation



The Major Refurbishment was made under 2009 Breeam Europe Commercial - Major Refurbishment Scheme



In order to become an Innovation Park, Spheric Accelerator, IT HUB



So, the transformation begun from
outside in...



So, the transformation begun from
outside in...



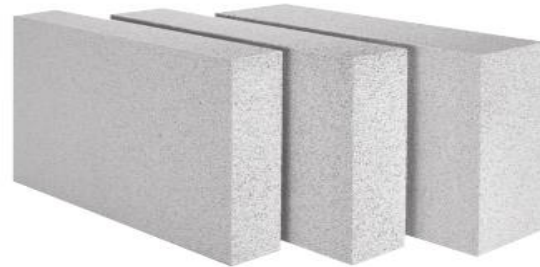
Why Reconversion or Major Refurbishment?

- Important features such as 100 % Reuse of Land, over 90 % Reuse of facade and 35 % Recycled Aggregates are big achievements of the Regeneration Project, fulfilling
- **BREEAM Issues : LE 1 – Reuse of Land; MAT 2 – Reuse of Facade, MAT 3 – Reuse of structure**



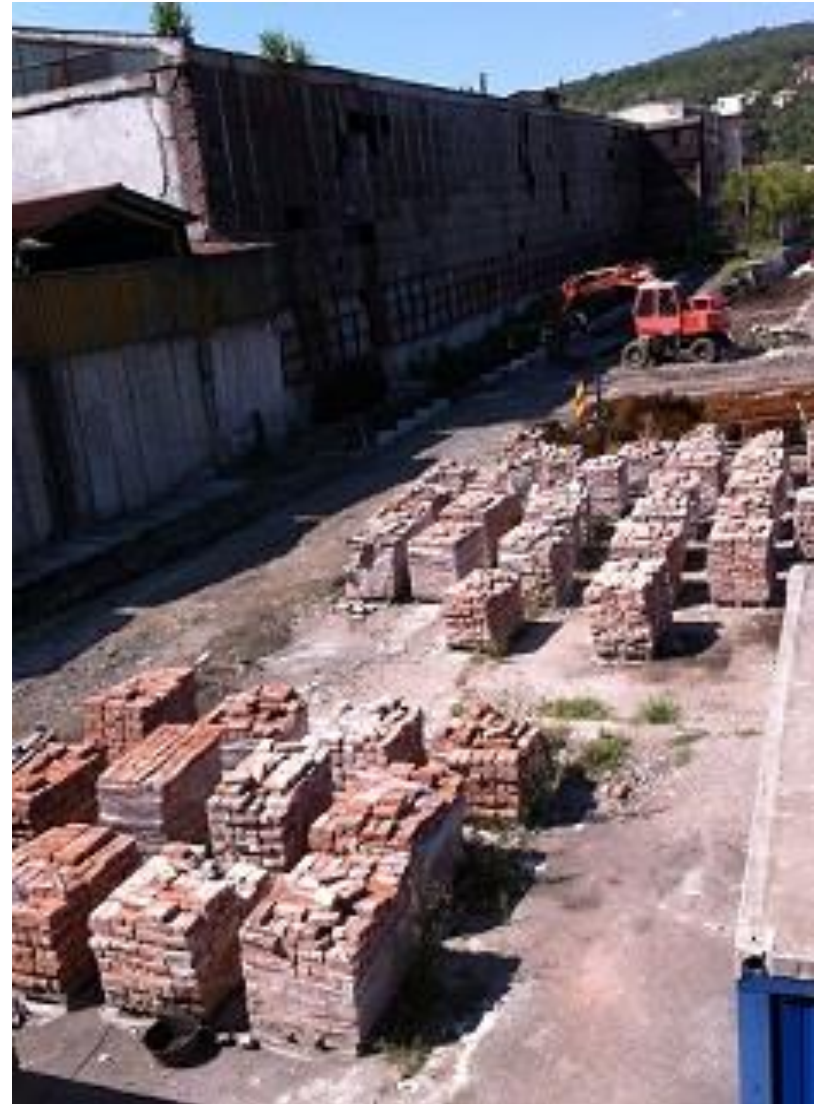
Other important improvements of the old factory – Thermosystem for Heritage Buildings

- A natural & ecological thermosystem **Multipor – brand of Ytong** applied on the internal walls of Heritage Buildings, allowed Liberty to improve its energy efficiency, increasing the score of **issue BREEAM ENE 1 – ENERGY EFFICIENCY** and bringing also supplementary points for **BREEAM MAT 3 Issue - Insulation**



Recycling, Reusing, Reducing Waste

- An important feature of the project was the Recycling, Reusing, Reducing Waste chapter
- Thus, the external concrete platforms of the old factory were removed and use for the sistematization of exterior landscape.
- Also, a great percentage of the facade bricks, wood and recycled agregates were reused on the construction works
- The project considered the following issues regarding WASTE : issue WST 2 - Recycled Aggregates ; WST 3 – Recyclable Waste Storage; Wst 5 – Composting and WST 6 – Floor Finishes.



The project team also considered ...

Transport issue

- Bicycles Parking & facilities – changing rooms, showers, drying rooms – in accordance with **BREEAM TRA 3 - Alternative modes of transportation**
- Also, footpaths and roads inside the site are of proper dimensions and well marked with signs – for pedestrian and cyclists safety, in accordance with **BREEAM TRA 4 – Pedestrian and Cyclist Safety**
- In accordance with issue **TRA 5 – Travel Plan**, a Travel Plan was thought for the entire site



Pollution issues - Oil Separators for Parking Areas

A by pass oil separator with a nominal flow of 100 l/s and a total flow of 400 l/s

Class 2 Oil Separator mounted on site, having an average density of the separate medium : $0,9\text{kg/dm}^3$

**Breem POL 6 –
Minimising Watercourse
Pollution**



Water Systems

Water is an essential resource

Storm waters were captured, purified and reused for irrigation or flushing the toilets.

- There were 2 existing water reservoirs on site : 140 mc and 40 cm for stocking the storm water and use them for irrigation & flushing the toilets, in accordance with **BREEAM WAT 1 – water Consumption & BREEAM WAT 6 – Irrigation Systems**



Sanitary Interior Installation & Water Meters

Cold & hot domestic water are metered separately on each level – through pulsed Water meters linked to the **BMS of the building**
BREEAM WAT 2 – WATER METER



Heating Equipments - Boilers

The boilers used for heating are condensing boilers Hoval Ultragas types 400 D, 500 D and 600 D. (3 boiler's room)
The total heating power – 1370 kW

The NO_x emission according to the manufacturer letter is 32 mg/ kWh ≤ 40 mg/ kWh,
BREEAM Pol 4 – Nox
Emmissions from Heating Source



Cooling Systems - Chiller

The chiller has a cooling power of 759,4 kW

The refrigerant for the packaged unit- chiller is R410 A.

The use of R410A has resulted in units offering better energy and efficiency in full respect for the environment (ODP = 0).

BREEAM POL 1 - Refrigerant GWP - Building Services



HVAC Systems – Heat recovery units & ventiloconvectors

Each level has 4 heat recovery units of 2500 mc/h and 3200 mc/h

Heat Recovery units have CO2 sensors in order to fulfill **BREEAM Hea 8 Indoor Air Quality issue**

Each 40 sqm area has its own ventiloconvector, which can be controlled by a Thermostat according to **BREEAM HEA 11 Thermal Zonning**

The fresh air rates are in accordance with ASHRAE codes of HVAC design; and in accordance with **BREEAM HEA 10 issue – Thermal Confort**



HVAC Systems – Heating & Cooling meters & Thermostats

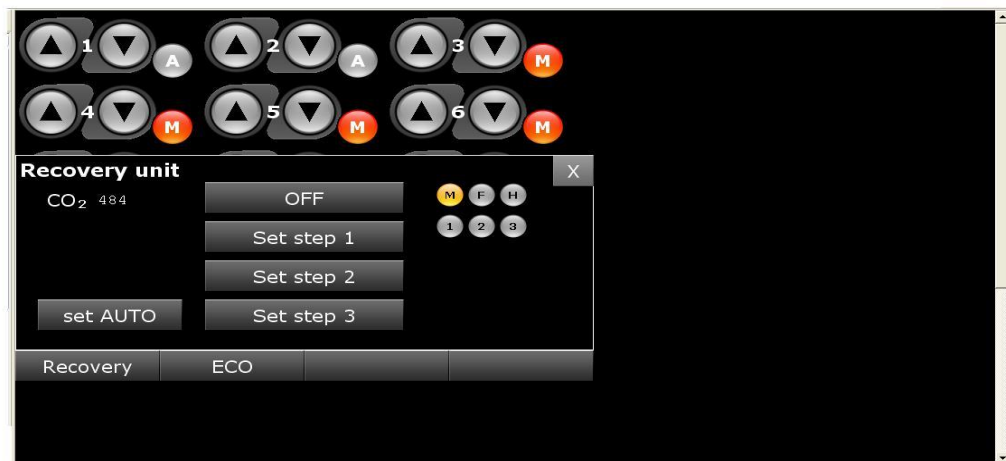
Each area occupied by 4 work stations has its own thermostat which has :

- **Input for automatic change-over cooling/heating**
- **Input for occupancy detector or window contact**
- **Communication cable**

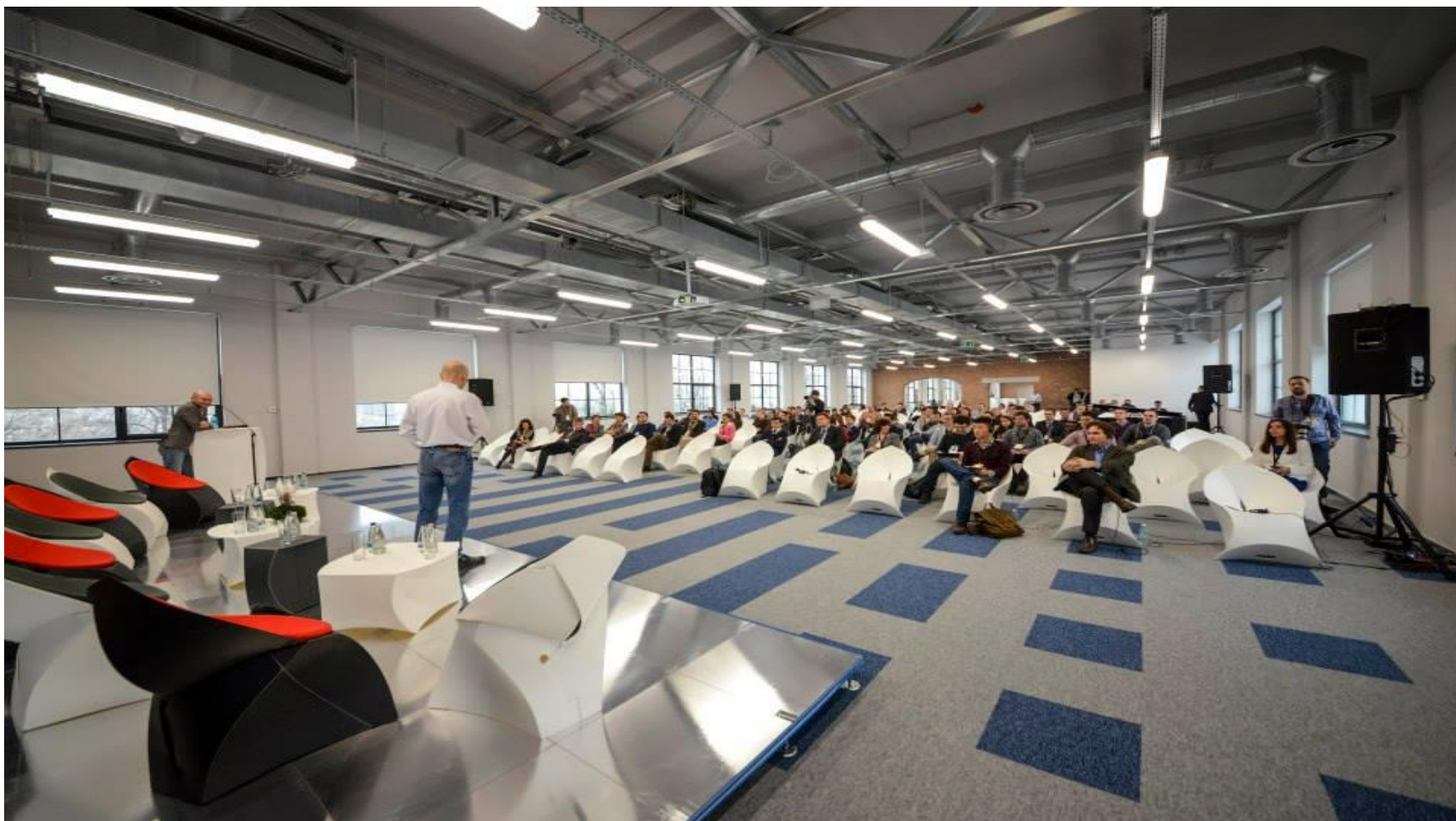


The Heat recovery units have CO2 sensors linked to the BMS of the building

The heating / cooling submeters are pulsed and also linked to the BMS of the bulding.



... At the opening event



Low or Zero Carbon Technologies

- There are 3 areas containing Solar Pannels on the roof of the building
- **In accordance with BREEAM ENE 5 – Low or Zero Carbon Technologies issue**
- They are used mainly for Domestic Hot Water
- They have the following capacity : 3 units of 300 liters , 500 liters and 800 liters



Internal Lighting & Controls

There are LED systems on the entire building, excepting technical spaces where fluorescent lamps are mounted in accordance with **BREEAM HEA 4 Issue – High Frequency Lighting**

The lighting zones are controlled through the BMS of the building - **a DALI SYSTEM**

Each zone of 40 sqm can be monitored and controlled separately, and dimmed in 4 steps

In accordance with **BREEAM HEA 6 Issue –Lighting Zones & Controls**



Internal Lighting & Controls

The screenshot displays a control interface for internal lighting and external lights. The interface is organized into several sections:

- HOME Service** (07.01.2014 11:57:56)
- Global control of all DALI balasts**: A grid of controls for four balasts (B1, B2, B3, B4). Each balast has three buttons: MAX, MIN, and OFF. B2 and B3 have two additional MAX and MIN buttons.
- External lights**: Includes sunrise and sunset times (08:10 and 16:54), a manual control button labeled "manually turn ON", and three BMS (BMS1, BMS2, BMS3) left controls, each with a "manually turn ON" button.

HOME	Service					07.01.2014 11:57:56
B1	Global control of all DALI balasts					
B2	1/B1 MAX	1/B2 MAX	2/B2 MAX	1/B3 MAX	1/B4 MAX	
B3	1/B1 MIN	1/B2 MIN	2/B2 MIN	1/B3 MIN	1/B4 MIN	
B4	1/B1 OFF	1/B2 OFF	2/B2 OFF	1/B3 OFF	1/B4 OFF	
STAIRS	External lights					
RECOVERY	Sunrise	08:10				
	Sunset	16:54				
	Manual	manually turn ON				
	Stairs BMS1 left	manually turn ON				
	Stairs BMS2 left	manually turn ON				
	Stairs BMS3 left	manually turn ON				

External Lighting & Controls

- External lighting systems used on site are LED types (Brika Luminaires)
- The lighting systems are also monitored through BMS of the building
- **The BMS calculates through GPS coordinates the precisely hours of raise and fall of the sun.** Based on these calculations, the exterior lighting shall be switched on or off on the entire site.
- Designed and implemented on site in accordance with **BREEAM ENE 4 issue – External Lighting & HEA5 – Internal & External Lighting Levels**

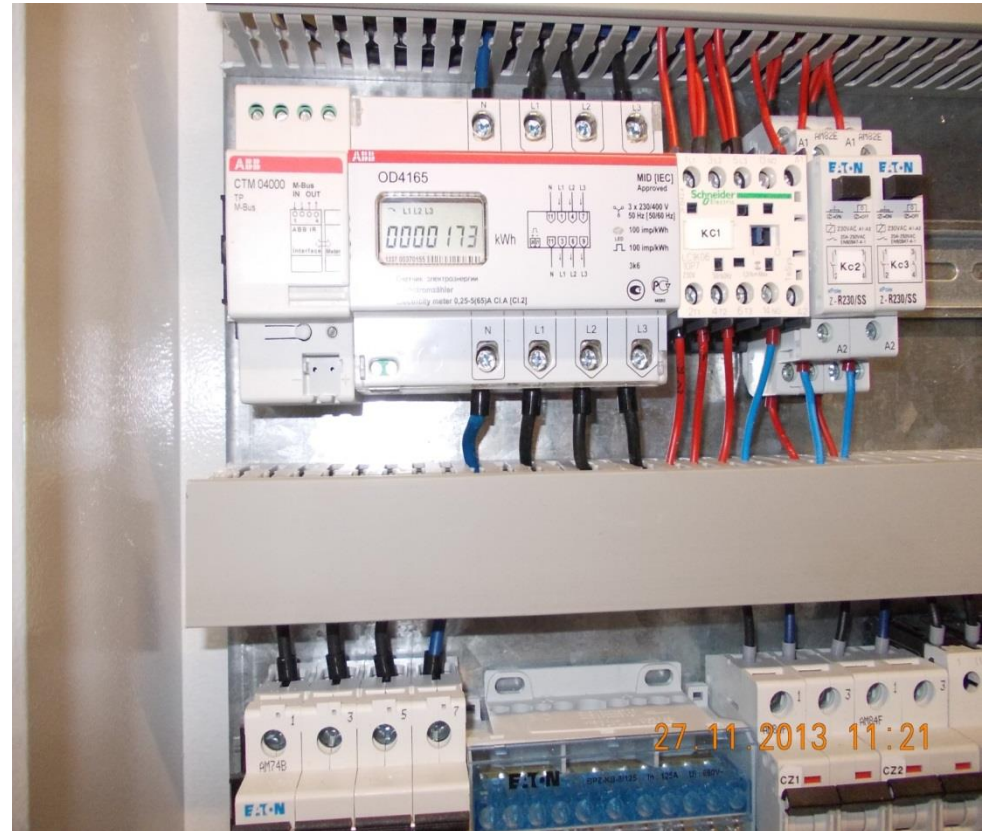


Energy Meters & Controls

There are two distinctive energy metering zones on each level, in order to provide separate meters for future tenants of the buildings

Areas such as : the restaurant on the ground floor, the boiler rooms, the chiller – are metered separately, according to **BREEM ENE 3 – Submetering of High Energy Load and Tenancy Areas**

Main types of controls are through DALI System, but also daily sensors for external lighting and internal levels of dimming



The Human Factor


- An important qualitative factor, with a tremendous add on to the project was „THE HUMAN FACTOR”
- The „**Commissioning**” (BREEAM ISSUE MAN 1) activity of the project was highly considered and improved significantly the quality of the final result
- Also, „**Constructors' Environmental & Social Code of Conduct**” – was an important issue



The Opening Event ...



... not even an old building

A dark, starry night sky with faint clouds. The stars are small, bright points of light scattered across the dark background. The clouds are wispy and light-colored, appearing as soft, ethereal shapes against the dark sky.

No one is too old for fairy tales.

Thank you !