

TCA NEW HEADQUARTERS

Values which will carry TCA into the future

Trustworthiness

Know-how

Competitiveness

Support

Sustainability

Responsibility

High Standards

Collaboration

Guidance



**TURKISH
CONTRACTORS
ASSOCIATION**



Turkish Contractors Association's new, LEED Platinum-certificated headquarters building was planned to set a perfect example of an "integrated design approach". In this sense, all relevant disciplines were coordinated in demonstrating the level reached by the Turkish construction sector, at the same time encouraging the use of local expertise and materials.

In reflecting TCA's commitment to promote "sustainable construction", the building stands out in innovative use of energy efficiency, natural ventilation and air-conditioning applications. In terms of passive heating and cooling techniques, the building embodies some systems to be used for the first time in Turkey. Energy performance has been optimized through installation of a concrete labyrinth as a third basement, getting use of the most significant feature of typical climatic conditions in Ankara; day and night temperature differences.

Through its sustainable design features, the building contains a number of eco-friendly and energy reducing components that control the amount of energy used for heating, cooling, ventilation and lighting. Within this system, such innovative technologies as ground source heating-cooling and night cooling are used.



Although the building possesses a transparent shell, it is surrounded by a second layer of metal mesh, designed through tests of energy modeling. In this regard, solar-sourced excess heating, thus cooling energy needs have been minimized. The central atrium creates a chimney effect, getting use of the principle of hot air rising. Moreover, automatic vent control systems located on the glass roof provide natural ventilation.

Photovoltaic panels and solar panels have been installed on the roof to support the goal of renewable energy. All costs were minimized through adopting such ecological approaches as LED lighting, water saving sanitary ware, rainwater tanks and gray water use. As for landscaping, water efficient endemic plants were preferred in accordance with the holistic design.

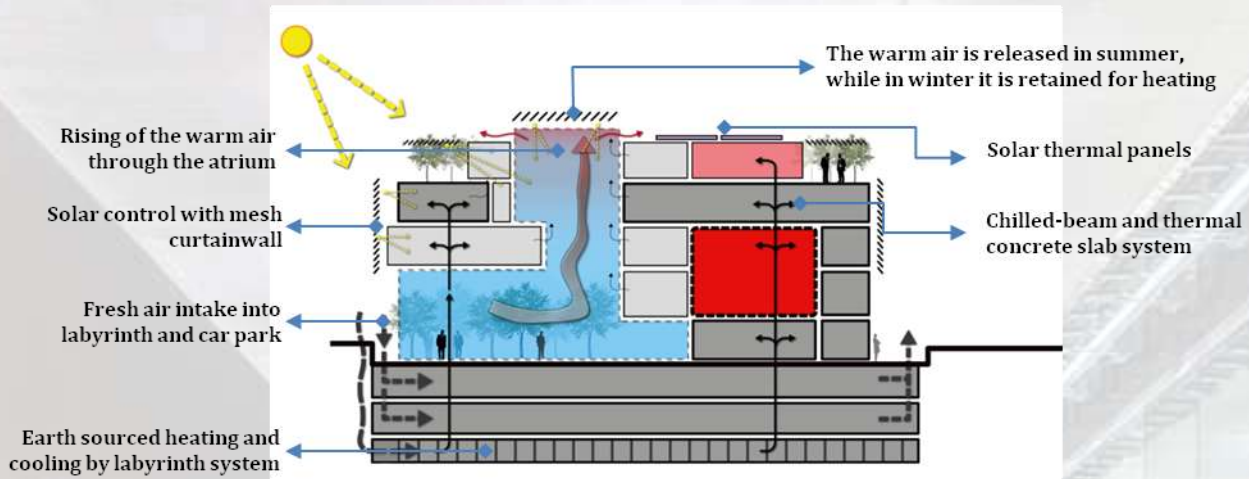
The building is comprised of 4.817 m² office space and 7.138 m² total construction area. In addition to meeting the needs of a typical office building, it was structured to respond to the special needs of an establishment as active as TCA, welcoming a large number of local and international visitors for various events.

The construction of TCA New Headquarters Building began on 14 August 2012 and was completed in October 2013.

TCA Headquarters is located in Doğukent Boulevard, a developing zone in the Çankaya district which commands views of the valley stretching on the east.



Architectural Design Approach



It is the seamless integration of numerous technologies that makes this building innovative: combined together, these design approaches make a high-performance, low-energy building.



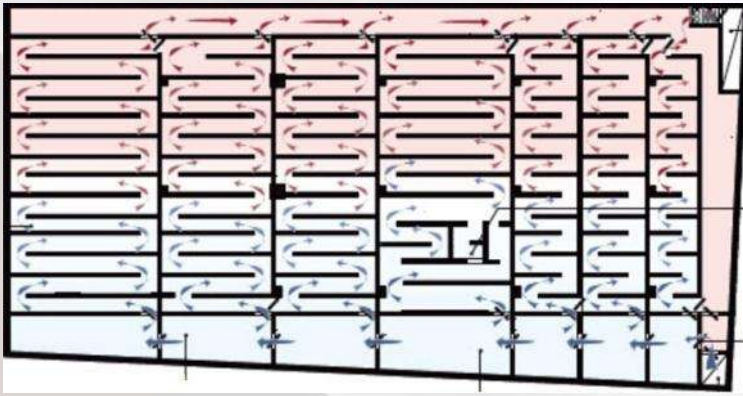
The green design guidelines which have been adopted from the earliest stage of the process of design, meant that the materials and suppliers used were, where possible, from locally generated resources.

The building has been designed to adopt and utilize the local climate conditions and resources to optimise the environmental performance of the building.

A thermal mass storage has been created via an underground labyrinth which is placed at the lowest level of the building and an active integrated thermal slab with chilled beams – it is these chilled beams that allow for precise indoor climate control.

The atrium in the center lets the warm air inside the building rise. The automated ventilation windows above the atrium provides natural ventilation. In the summer the excess heat is released by these windows, while in the winter it is retained to supplement the heating supply.

Labyrinth System



Used for the first time in Turkey, in the summer the labyrinth utilises the naturally available coolth in the night time atmosphere where temperatures fall by 15-20 °C from day to night. Added to this the earth below ground is at a constant average temperature throughout the year.

In Ankara this is around 16 °C, and this source of heat is then used in the winter time to re-heat the incoming air naturally before it rises through the

building. The system will provide savings of between 35-40% in heating and cooling costs.



Thermal Concrete Slab Heating and Cooling System



Secondary ductwork distributes to the individual floors via dedicated ventilation risers. The ductwork on each floor will then be distributed through a central distribution corridor and will interface with the active thermal mass on the office floors coupled with the active chilled beams.

Small bore ductwork cast in concrete slabs provide a surface to absorb internal gains and depending on the season either warm or cool the incoming air into the internal spaces, therefore reducing energy usage at the air handling unit and minimising the chilled beam cooling or heating requirement.

Another important energy efficiency measure in the design of the TCA building is the active thermal floor slabs coupled with the active chilled beam systems.

After the fresh air travels through the labyrinth and naturally tempered, it enters the AHU's.



Chilled-Beam System

Chilled-beams distribute the air coming from the Air Handling Units (AHU) to the rooms and utilize a 4 pipe system to control the thermal comfort conditions. The fact that the distribution of air is carried out only by the pressure from the central system significantly reduces the noise levels in the rooms.



The terminal chilled beam units will provide the final climate control adjustments to ensure thermal comfort within the occupied spaces.

Use of Renewable Energy Resources and Energy Efficiency

The building utilizes innovative passive cooling and heating techniques. Taking advantage of the variations between summer day time and night time temperatures, a thermally massive concrete labyrinth was placed below the lowest level of the car parks to reduce and minimize the cooling energy demands of the building, while also providing a natural source of heating during winter time, gained from annual average ground temperature conditions.

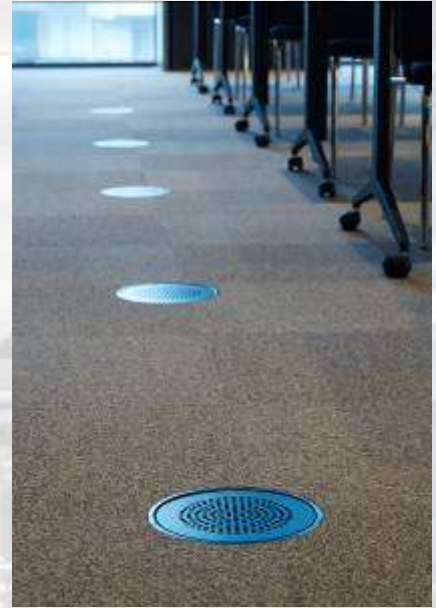


Through its sustainable design features, the building contains a number of environmentally friendly energy reducing components that decreases the amount of energy needed for heating, cooling, ventilation and lighting while providing ideal climatic conditions utilising natural resources. Within this system, such innovative technologies as night time cooling and earth heating-cooling are used.

Its energy efficient lighting automation systems, LED lighting units, effective use of solar and photovoltaic panels placed on the roof are other contributors to the energy performance of a building which demonstrates a highly sensitive approaches to environmental design.

Conference Hall and its ventilation system

The ceiling covering is made of 870 units of walnut veneered timber slats, each of which have been specially computer modelled. Ducts from the hollow walls terminate at vertical displacement ventilation units designed to operate at very low velocity and therefore minimize noise generation. Supplementary floor mounted units provide extra cooling or heating at the centre of the hall.



Mesh Curtainwall

Although the building has a mainly transparent shell, after energy modelling and testing, majority of the surfaces of the building facade are shaded with a second layer of stainless steel metal mesh. The solar heat gain and therefore cooling energy needs have been minimized by means of 3 varying densities of mesh designed to cope with the 3 different solar orientations of the building.



Facts & Figures for TCA Headquarters

16 consulting firms

32 contracting / subcontracting firms

200+ supplier companies

4817 m² enclosed area

7138 m² total construction area

3915 m² useable area

910 m² labyrinth floor

540 m thermal concrete slab system

48 chilled-beam

38 PV solar cell panels

900 m² mesh solar shading

980 m² glass + composite panel

870 m² natural stone wall cladding

2600 end-point building automation

23500 m cabling

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