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## Népliget Center, Hungary

### Case Study 56

The Népliget Center in Budapest, Hungary, is an energy efficient “A” rated office development that has qualified for the European Union’s GreenBuilding Programme.

### Aspects of Sustainability

This project highlights the following:

#### Social Aspects

Human Resources  
Corporate Community Involvement  
Business Ethics  
Health and Safety

#### Environmental Aspects

Energy and Climate  
Materials  
Ecosystems  
Local Impacts

#### Economic Aspects

Project Selection  
Supply Chain  
Value Added



### Project Introduction

The Népliget Center is a modern office development located 4 km southeast of central Budapest in Pest’s district IX. The Center is situated adjacent to the Budapest ring road and the ‘airport corridor’ route, which offers tenants excellent accessibility. Tenants of the high quality office space include Coop Hungary, the MAI Insurance Group and the software developer Hessyn.

Skanska Property Hungary is constructing the US\$ 90 million Népliget Center, which consists of three buildings with a total of 26,600 m<sup>2</sup> of leasable office space, arranged around an enclosed courtyard. Building A was completed in January 2008 and includes 9,200 m<sup>2</sup> of office space. Buildings B and C are scheduled to be completed in the first quarter of 2010. All three buildings have eight storeys of office space and two basement

car-parking levels, and the Center has a combined capacity for around 2,000 office workers and 450 vehicles. The Népliget Center also includes two restaurants, a 24-hour reception, conference facilities and a car wash, and the site surrounding the buildings has been landscaped with trees and grass. Skanska sold the Népliget Center in November 2007 to a real estate investment group, although Skanska will continue to manage the project and all leasing arrangements until the end of 2010.

The Népliget Center has qualified for the European Union’s GreenBuilding Programme, which is a voluntary initiative aimed at improving the energy efficiency of non-residential buildings in Europe. A building must consume at least 25 percent less energy than a country’s national standards demand to qualify. Skanska Property Hungary is a Corporate Partner of the GreenBuilding

Programme. Skanska used an eco-design tool to ensure the Népliget Center was energy efficient and a lifecycle perspective was adopted throughout the design and construction to ensure the efficient use of resources.

## Contributing Toward Sustainable Development

The Népliget Center is an energy efficient office development and is equipped with a solar water heating system. Flexibility has been integrated into the building design to promote a long useful life span and the office spaces encourage healthy working environments. The Center is designed to reduce the urban heat island effect, promote water efficiency and manage stormwater by encouraging site runoff retention and ground infiltration. The site is accessible and well served by public transport and Skanska initiated a free bicycle rental service for tenants. Site contamination was removed prior to construction and Skanska cooperated with the local government and a site neighbour to negotiate a mutually beneficial site boundary arrangement. During construction, high standards of occupational safety were maintained, and local workers and materials were used where possible. Environmental impacts during construction were minimised, waste was sorted and recycled, and environmentally responsible construction materials were sourced for the project.

## Social Aspects

### Occupational health and safety

Until January 2009, there had been only two minor accidents during the construction of the Népliget Center. The Lost Time Accident Rate was 3 per one million hours worked. All project workers and subcontractors underwent occupational health and safety education before being allowed to work on the site. Health and safety issues were discussed in every project meeting and site inspections were conducted on a weekly basis. An external consultant produced a monthly health and safety report to help assess performance and improve safety procedures. Sadly, in March 2009 a subcontractor to a subcontractor of the main contractor fell while fixing a timber strut to a services shaft and died some days later as a result of his injuries. As is normal Skanska practice, the incident was fully investigated by a specialist team and the Skanska AB Global Safety Stand Down

procedure was activated whereby every project, office and depot across the world ceased activities for a management briefing to employees, subcontractors, suppliers and visitors that covered the personal background of the deceased man, the circumstances of the incident, the lessons to be learned and corrective actions to be implemented.

### Healthy office environment

The Népliget Center promotes healthy office environments with good indoor air quality, natural lighting and minimal noise disturbance. All offices in the Népliget Center have operable windows to allow fresh air ventilation. Large windows were integrated into the design to maximise natural light into the building. The Népliget Center is adjacent to one of Budapest's ring roads, which is one of the busiest roads in the city, and the façades were sound proofed to avoid indoor noise and vibration disturbance. The cooling systems are also designed to emit minimal noise and vibrations.



Tenants of the Népliget Center can make use of the central courtyard garden and the building is set in landscaped surroundings.

### **Flexible buildings**

The Népliget buildings are designed to be flexible to promote long useful life spans. The office spaces can easily be customised to accommodate various working environments and several office floor plan layout suggestions are downloadable from the Népliget Center website ([www.nepligetcenter.hu](http://www.nepligetcenter.hu)). The ground floors of all three buildings are designed to be used for either office or retail purposes. The ventilation and cooling systems have uniform sized ducts and can be easily modified to facilitate any future internal remodelling work.

### **Sustainable urban planning and transport**

The Népliget Center is situated in Pest's district IX with good access to amenities and services, such as the Lurdy Ház shopping mall, which is a short walk from the site. The Center has excellent connections to public transport services, which provide easy access to all areas of Budapest and the surrounding region. A subway stop is a five-minute walk from the Népliget Center that provides access to Central Budapest and Budapest Airport. Ring road tram and bus services connect the Népliget Center to the north and west of Budapest. The site is also adjacent to the Volánbusz International and National Bus Station. Skanska initiated a free bicycle rental service for tenants of the Népliget Center. Cycling is a sustainable mode of transport,

which can be used to travel throughout Budapest and can save time by avoiding traffic congestion.

### **Municipality and site neighbour cooperation**

Skanska worked with the neighbouring Volánbusz Bus Company and the Budapest planning authorities to reach an agreement on site boundaries, in accordance with the Budapest local plan. The cooperation allowed the bus company to enlarge the bus parking area at the rear of the Volánbusz bus station, and led to Skanska acquiring more prestigious land adjacent to the ring road.

### **Economic Aspects**

#### **Local employment and construction materials**

There were around 180 workers on site during the peak of construction of phase 1, and around 230 during the peak of phase 2. Approximately 70 percent of the workforce was from the Budapest area. Construction materials that were manufactured in Budapest were purchased where possible, such as all windows and doors used on the project. However, many construction materials originated from other parts of Hungary and abroad.

#### **Efficiency savings for tenants**

The Népliget Center uses over 25 percent less energy than the Hungarian standard for office buildings, which reduces the utility costs for tenants. Efficient cooling systems reduce operating



costs by up to 40 percent compared with conventional systems, and the natural cooling system provides free cooling when operational. The offices also have individual tenant meters to encourage further energy savings.

## Local economic development

District IX is an old industrial area, although modern commercial developments have increasingly been attracted to the district by good accessibility, following the decline of traditional industry. The site was derelict prior to the construction of the Népliget Center, and had previously been used as a warehouse for the former state owned telecommunications company. The Népliget Center has brought businesses and around 2,000 office workers into the area.

## Environmental Aspects

### Bioremediation of contaminated land

Around 2,000 m<sup>2</sup> of the site was contaminated with petroleum hydrocarbons to an average depth of 2.5 m. Around 5,000 m<sup>3</sup> of soil and groundwater was treated on site by filtering material through oil and grease separators, which was chosen as the most effective method of removing the hydrocarbon contamination. Approximately 200 m<sup>3</sup> of concrete containing lead was broken up and properly disposed of off-site. The site was declared free of soil and water



groundwater contamination by the Hungarian Environmental Agency prior to the start of construction.

### Minimising environmental impacts during construction

Skanska selected project partners that were ISO 14001 certified, including the structural and mechanical subcontractors. All project workers and contractors underwent environmental education before working on the site. Skanska project managers conducted weekly environmental site inspections and environmental meetings were held for workers and contractors prior to specific construction activities. Construction equipment was fitted with air cleaners and dust extractors to minimise airborne pollution and trucks were cleaned before leaving the site at a wheel-wash cleaning point, which included an oil-trap to prevent pollution. Site logistics were efficiently planned and coordinated to ensure that materials were easily accessible and that transportation around the site was minimised. Only trucks fulfilling the Euro 4 European emission standards were approved for the project, and efficient electrical fans were used for temporary heating during construction. Site neighbours were informed of any construction activities that could potentially create vibrations or noise disturbance.

### Waste management

All recyclable materials, such as metal, wood, concrete, plastics, paper, and glass, were sorted on-site and recycled off-site. Skanska also worked with project suppliers to minimise the amount of packaging waste by requesting less non-reusable packaging material. Approximately 120,000 tons of excess soil was excavated from the site and reused on highway and landscaping projects in Budapest.

### Environmentally responsible construction materials

Skanska Sweden's list of restricted substances was followed throughout the project and low-VOC substances were used, such as non-toxic paints and natural wood oils. The R 134a cooling systems are chlorine-free and do not contain hydrochlorofluorocarbons (HCFCs). Materials with recycled content included the open grid pervious paving that was manufactured with 100 percent recycled plastic.

### Energy efficiency

The Népliget Center has an annual energy consumption of around 100 kWh/m<sup>2</sup> and is "A" rated according to the European Energy



Performance of Buildings Directive. Skanska used an energy efficiency design tool that sought to build on the experience of other office buildings recently developed by Skanska Commercial Development Europe.

The Népliget Center is better insulated than the Hungarian codes require and is equipped with several energy saving features. Low temperature boilers with an efficiency of 92 percent have been installed in Building A, efficient condensing boilers were installed in Building B and C, and all the mechanical and electrical systems were designed to Level A Hungarian energy standards. Building B has a heat recovery system with a minimum efficiency of 70 percent; whereas buildings B and C have a heat recovery efficiency of 39 percent as exhaust air from the offices is used to heat the basement parking levels. The buildings are equipped with low-pressure drop ventilation systems that are designed to reduce the amount of energy required to circulate the air. The systems consequently use less energy and have fans with a Specific Fan Power factor of 2.5 kW/m<sup>3</sup>/s and have a motor efficiency of around 95 percent. Building Management Systems control all the air-handling units to ensure minimal operation during out of office hours. Natural cooling systems have been installed that operate when the outdoor temperature is under 7 degrees Celsius and there is a need for indoor cooling, such as during the late afternoon or evening. Energy efficient chillers are used to meet the cooling requirements when the conditions do not allow the natural cooling systems to be used. Building Management Systems

control the indoor lighting and efficient T5 illumination was fitted throughout the Center. Exterior sunshades and tinted glazing were fitted on the south facing facades to avoid excessive solar heat gain. Heat and electricity consumption is continually monitored to guide future improvements to the systems.

### **Renewable energy**

Building A is equipped with a solar water heating system, which can produce up to 5 m<sup>3</sup> of domestic hot water per day and meets around 55 percent of the building's annual hot water requirements. The system saves approximately 8,000 kWh per year, or around 1.5 tons of carbon dioxide when compared with the efficient gas hot water boilers that have also been installed in the Népliget Center.

### **Water efficiency**

The Népliget Center consumes approximately 30 percent less water than a conventional Hungarian office development. Water efficient features include dual-flush toilets and low-flow taps.

### **Stormwater management**

A site stormwater management plan has been designed to encourage rainwater runoff retention and infiltration. Runoff from the buildings is directed into retention ponds that allow water to infiltrate the soil and into the ground water system. The areas around the buildings have been grassed, and paths and roads have been partially paved with pervious grass reinforcement grids that allow ground infiltration and prevent runoff.

## Reducing the urban heat island effect

The Népliget Center has been designed to reduce the urban heat island effect by decreasing the extent of paved and dark surfacing. Light surfacing has been used for the roofs and façades, the site is landscaped with vegetation, the car parking has been incorporated underground and the site roads have been partially paved by grass reinforcement grids.

## Learning From Good Practice

An eco-tool was used throughout the planning and construction of the Népliget Center to provide a lifecycle perspective and promote more efficient resource usage.

