



CASE STUDY

Niarchos Foundation Cultural Center



SNFCC with a total extent plot of 210 acres, accommodates National Lyric Scene, National Library, Car Park of 1.000 quartering places, Market Place that constitute link for all operations and a Park of 170 acres, that includes an artificial hill.

DESCRIPTION

It was October 2006 when Stavros Niarchos Foundation announced its intention to assume responsibility to fund the studies and implementation of this massive public project. That included the construction and equipping of new facilities for the National Library of Greece and the Greek National Opera, together with the colossal task of transferring them.

The awarding of the project on September 2012 was the happy ending of long term procedures including legislation issues, planning matters and the final stage for the offers. The architectural design is signed by the internationally renowned architect Renzo Piano, who has also the general responsibility of coordinating a large number of specialized design offices from Greece and abroad, who have worked on the completion of this multi-complex project.

On February 23, the SNFCC held an imposing ceremony to mark its handover to the Greek state, as was the original intention. Now, this multifunctional complex of culture, learning and creativity belongs to Greek society.





The new facilities of the Greek National Opera (left) and the National Library of Greece (right) with the seawater pool.

SCOPE OF WORKS

With view of the coastal front of Athens, 4.5 km south of the city center, on the edge of the Faliraki Delta, the location of SNFCC expresses the name of the surrounding community, "Kallithea", restoring its initial communication with the sea. Stavros Niarchos Park re-connects the neighboring areas with a design that is a continuation of their urban fabric.

Elements of the Greek ecological landscape have been incorporated into its design. Main goal of the project, was being a model of sustainability, emerged in all aspects of its design which also acts in green roof of the building, at the Canal which provides additional flood protection for the whole space, as well as at the photovoltaic roof that produces energy for the needs of two buildings and contributes to low CO2 emissions.

Through environmentally innovative projects and practices, the project has been awarded the LEED Platinum Green Award, the first such distinction in Greece, as well as the first for such a scale project in Europe. The building has been designed and built using strategies that were intended at improving energy efficiency and water efficiency, reducing CO2 emissions, improving the quality of the indoor environment, rationalizing resources and addressing their impacts.

DETAILS OF PROJECT

**Commencement
Construction Date**
December 2011

Contractor
J/V Salini Impregilo-TEPNA

Completion Date
February 2017

Total Value of Donation
630 mill. Euros

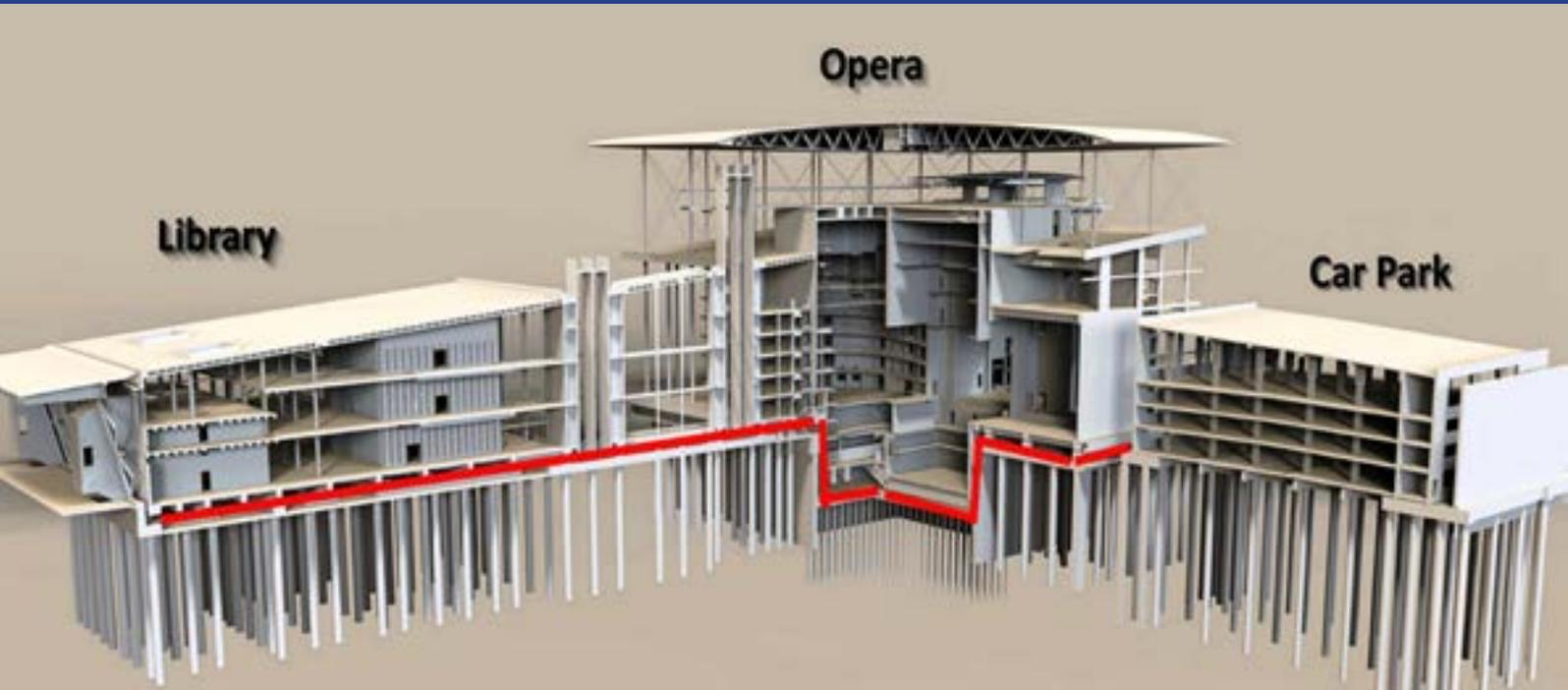
Total Area
210 Acres

Employed On Site
6.000 Employees

Work Placements
2.300 Employments

GDB Contribution Assessment
1,1 bill. Euros

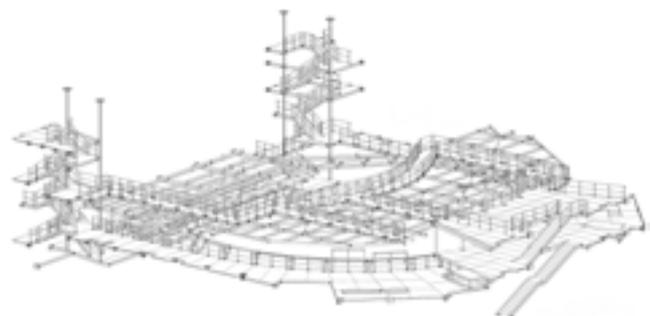
Hosting Capability
32.000 Visitors



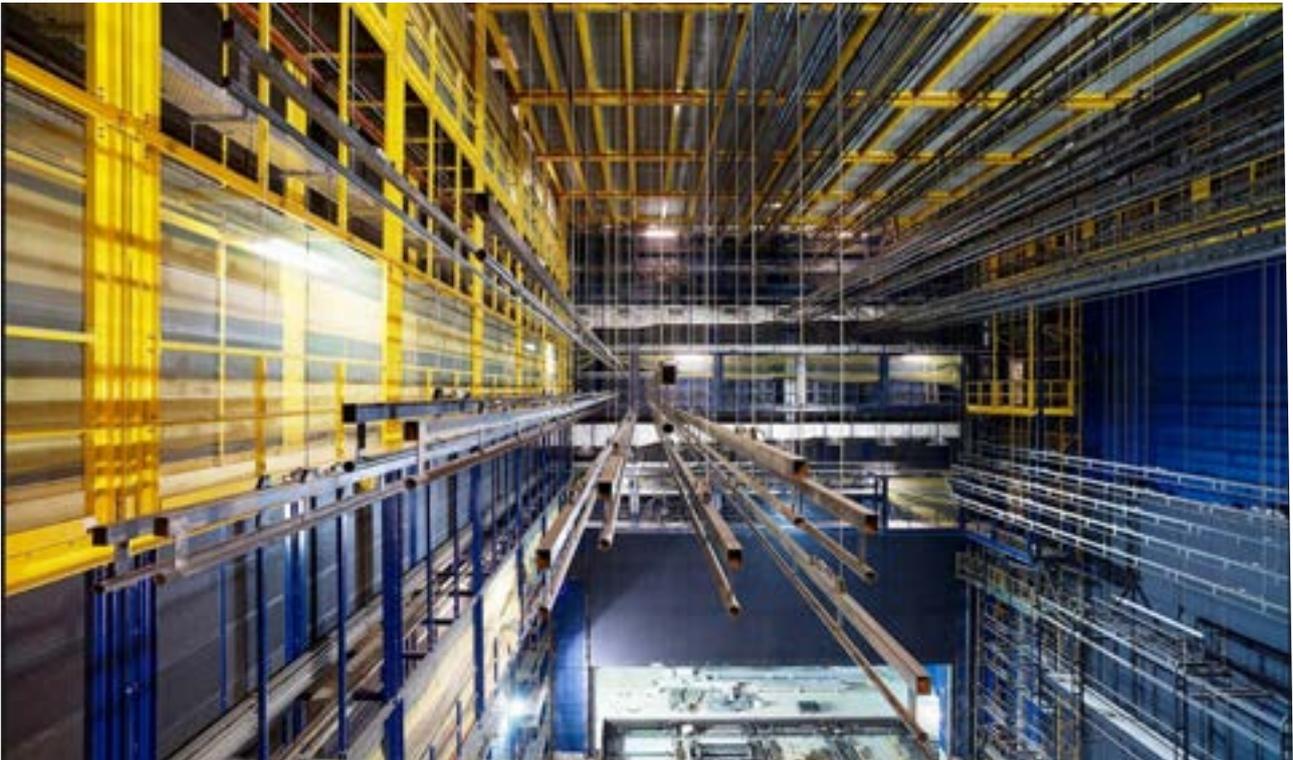
GREEK NATIONAL OPERA



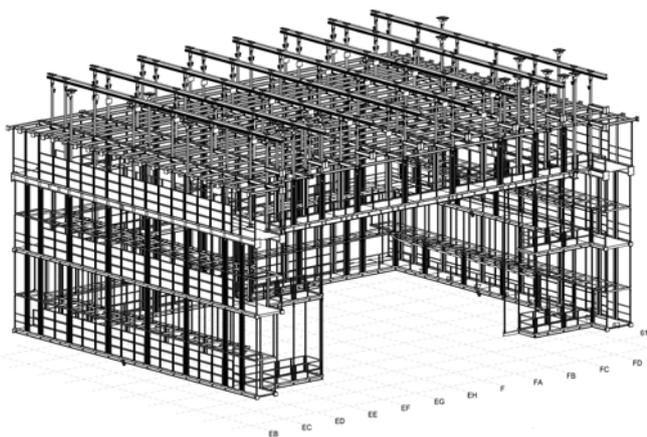
Impressive, modern and highly functional, the new home of the Greek National Opera covers a total area of 28,000 sq/m. Its operations are spread out over six levels and is capable of hosting even the most demanding opera and ballet productions. The Alternative Stage, with 474 seats, is a multipurpose venue that will focus mainly on contemporary and new forms of artistic expression. It will host a pioneering programmed organized into three daily sections: education, society & art.



FLY TOWER



Orchestra scene with a basement span of 43m can accommodate up to 120 musicians, supports Wagner projects. Steel construction of the fly tower which is suspended from the roof has 13m depth. From the impressive roof with «Smile» hanging the Singu work that moves with fans and the time of the show will go up to not disturb the viewers.

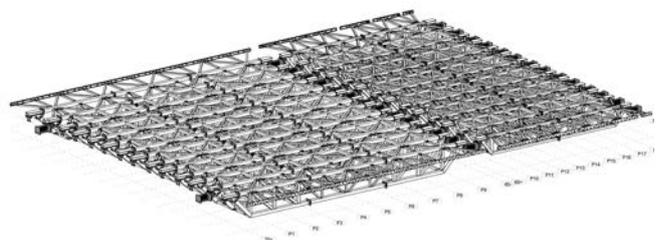


FLY TOWER PROPPING

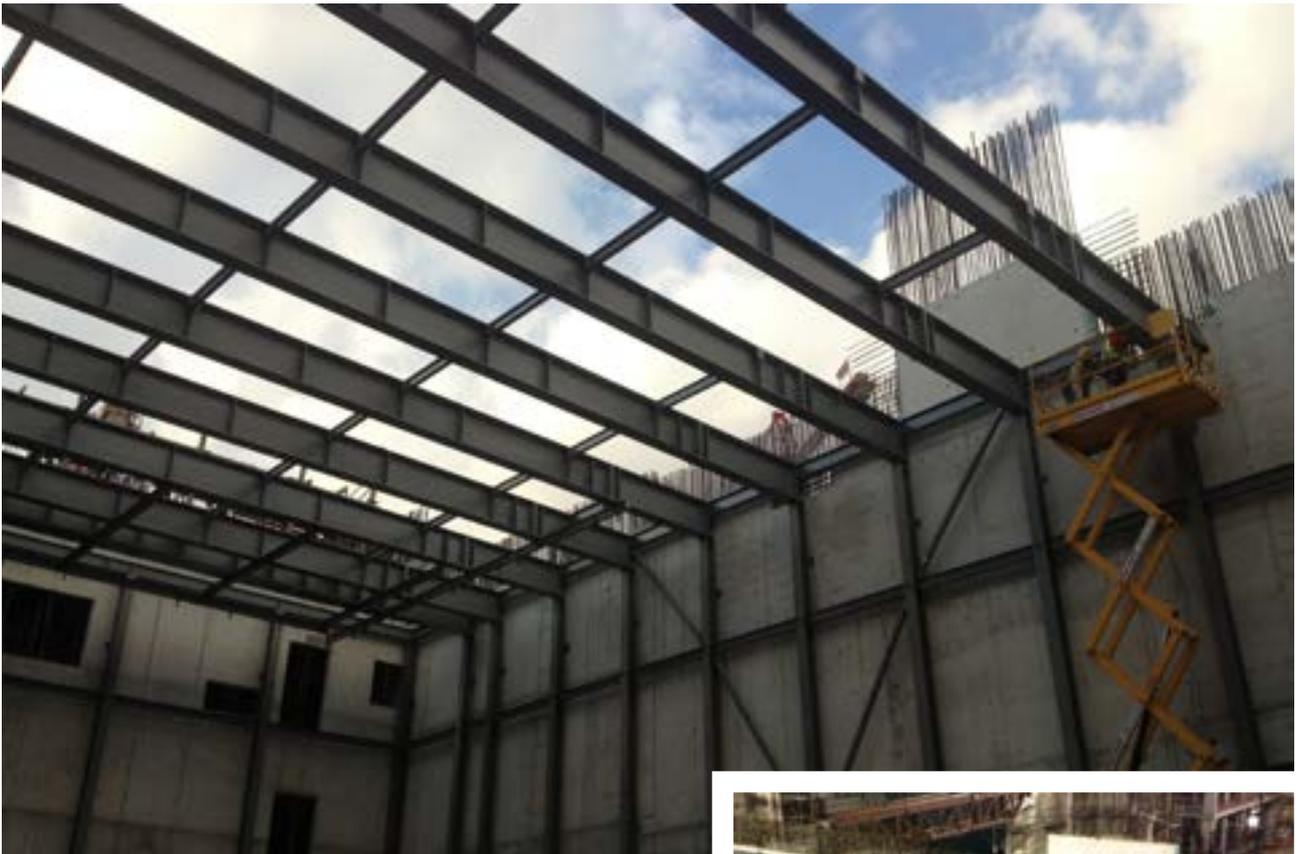


Six meters height concrete walls dominate the reception area, make the impression that you are in the interior of the quarry and preparing the visitor for the lyrical drama that unfolds on the stage. The main space of the lyrical stage is surrounded by a series of suspended lobbies, with entrances leading to the hall offering viewers the chance to enjoy closest the stunning scenery.

- Beam Profiles SHS 300x12mm separately divided with lengths of 22,3m



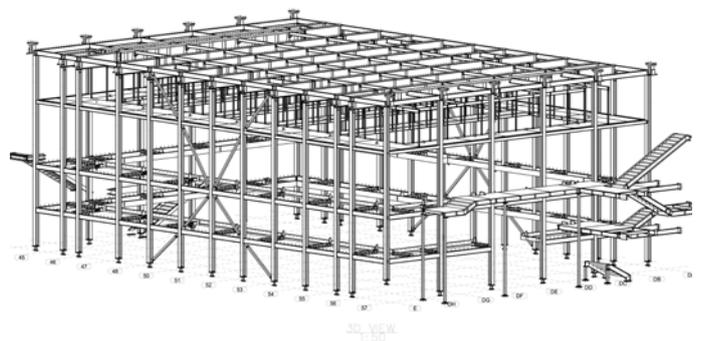
STEEL STRUCTURE OF PERFORMANCE HALL 2



Second theatre stage will be the main reason for the modern creation of education & society with special emphasis on all fields of musical theater. Two balconies feature the alternative lyric stage which is made from cherry wood, with a total capacity of 460 people and the possibility of multiple designs. Ballet, chorus, orchestra, solo, dressing rooms, as well as a recording studio complement the lyric spaces.



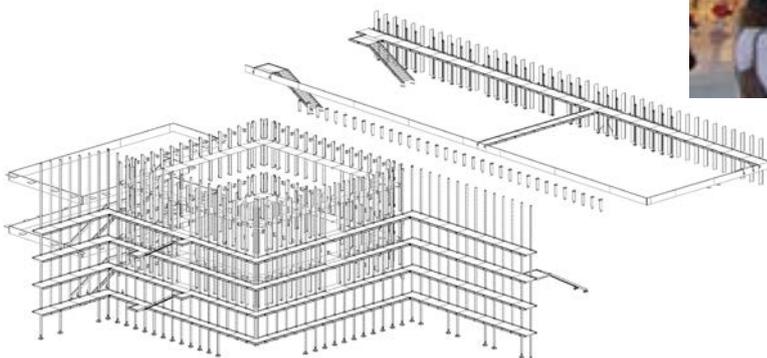
■ Built-Up Welded Beams with a total length of 11m



NATIONAL LIBRARY OF GREECE



The existing services of the National Library of Greece (NLG) will be moved to the new three-level, 23,000 sq/m. premises. The National Research Library will hold more than 4,500 priceless manuscript codices dating from the 9th to the 19th century, along with a large number of important historical documents and archives. The new building has a current capacity of one million books, a figure which could be raised to two million in the future.



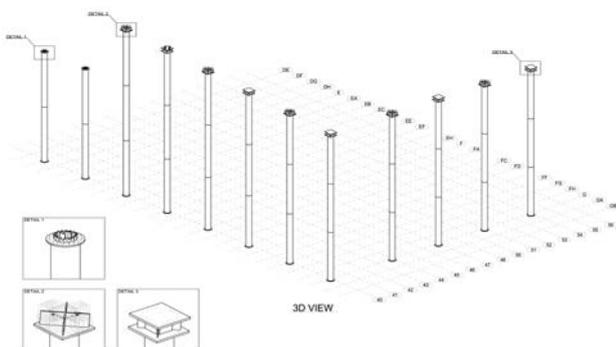
ATRIUM



The main entrance to the Library is a crucial area for first impressions and activities of interest to the local population, as well as visitors to Athens. Access is from the Agora into the atrium, a space that reaches the full height of the building, that unifies the whole building and that allows those entering to appreciate the locations of the different functions.



■ Built-Up Welded Beams with a total length of 27m



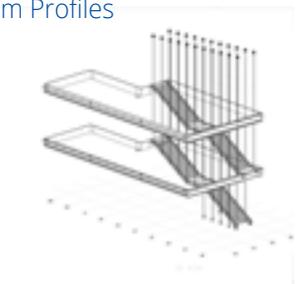
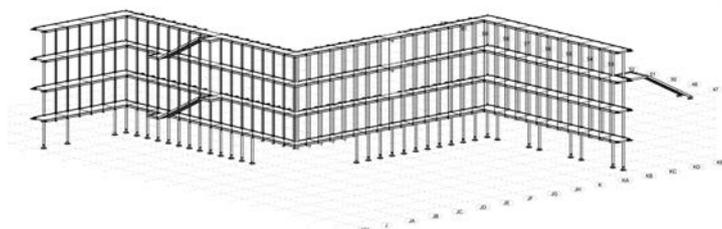
BALCONIES & STAIRCASES



A system of balconies, which resembles linear red lines, is the unifying element of three spaces: Market, Opera and the Library. While at the entrance of the Opera, the balconies are used to link the different levels of seats, the Library connects the different half-timbers building system. In both cases, the balconies are distinguished by the tall glass facades. As they appear from the entrance areas of the Opera and the Library, the balconies rise externally on the western façade of the Agora, emphasizing its depth.



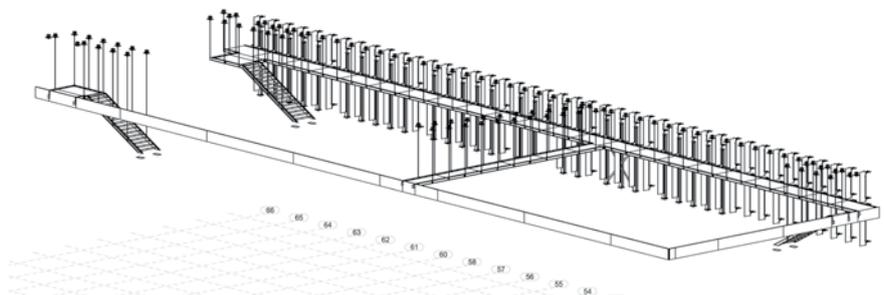
■ FB Beam Profiles



READING ROOM



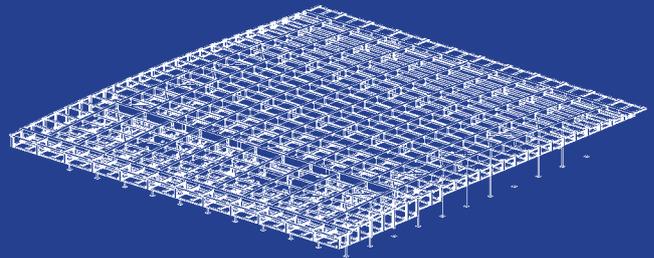
At the top of the Park visitors come across a 900 sqm multifunctional space with a glass shell: the Reading Room. Visitors will arrive at the highest point of the Park to enjoy the view of the nearby sea and visual contact to the city. Beyond the view, however, the Reading Room will offer visitors a quiet place to read and think, or to gather in small groups for seminars, study and various cultural and educational events.



LIGHTHOUSE



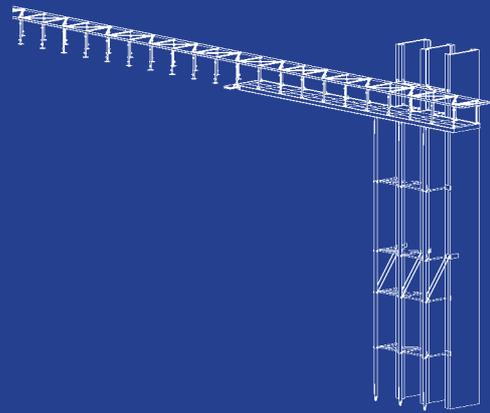
On the 8th floor of the building there is the «Lighthouse», an isolated space for meditation and quiet work, while at the same time transformed into a multipurpose space for events located at the most beautiful point of the complex with panoramic view across the Attica basin. It is easily accessible via two lifts from Agora.



LIGHTHOUSE BRIDGE



Almost... the visitor is flying on the glass bridge. On the 7th floor, above Lyric, under the roof, overlooking 360° degrees, throughout Athens, admires Acropolis and Faliro, sea and the city! View travels to the horizon, and every time the eye changes position, the field of view changes.

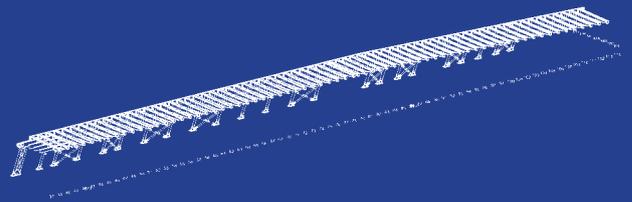


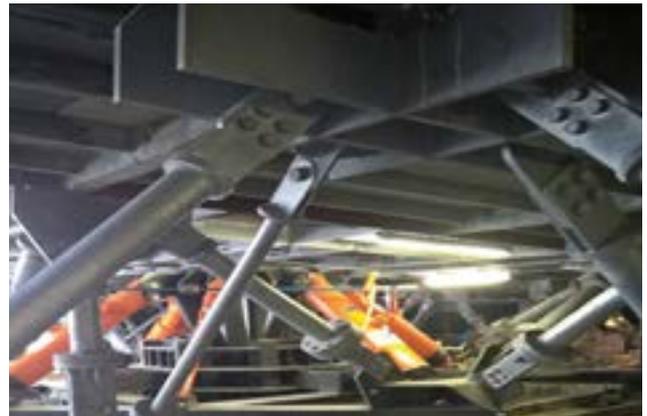


■ Beam Profiles CHS 610x25mm

BUFFER ZONE

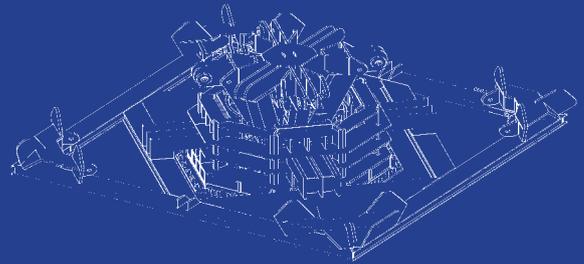
Measures have been taken in the transition area between the hill and the buildings where the Buffer Zone is intercepted so that no vibrations are transmitted because in the event of an earthquake the less compact hill with the oscillations could have adverse effects on the foundations of the buildings. It is a separation zone between the Kallithea Municipal Park and the Niarchos Park, while exhibitions or small concerts can take place in this section.





ROOF SUSPENSION SYSTEM

The roof is designed to receive seismic & wind loads. It is hanging on thirty steel columns which support the roof top linked with suspension units. Each of these suspension units consists of four springs, two dampers and a three-dimensional metal frame carrier



STEEL BUILDINGS

Planning - Study



The study had five main challenges:

- Anti-Seismic construction with insulators
- Ferrocement roof of 10acres,
- Column heights of 40m,
- Glass panels of 25m height and
- Architectural visible concrete.

There were, however, other issues of considerable interest, such as: the steel construction of the stage tower, which is suspended from the ceiling, the triple BufferZone bow with the planted roof, the ceiling-hung library of the National Library and many others.

Engineering Design

Modern Building Information Modeling (BIM), which has been used since the early stages of designing the project, has been extended to the production of construction projects. «Smart» three-dimensional modeling has been implemented, serving the purposes of the final design and construction details of the project. It facilitated, among other things, the effective coordination of the different tasks, the integration of the various elements added by specialized subcontractors and the precise detailed record of the complex engineering systems. The «As Built» designs capture the exact and detailed final image of the project and provide a versatile background for the next stage, which is the management of the facilities, ie the operation and maintenance of the project.



Construction

It focuses on the modules: work quality (labor and materials), environmental protection, respect for the community and new technologies of developmental nature.



Weldings

The production of Built-Up beams was carried out in an automatic SAW machine with two-sided continuous-stitching connections of a suitable thickness.

Quality Control

The whole process of manufacturing and incorporating into the steelworks project has been followed by all appropriate certification and control steps through strict quality assurance protocols both inside and outside of the site.





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