

Software: Scia Engineer

Project History

In 2006, the Stavros Niarchos Foundation (SNF) announced its intention to fund the creation of the Stavros Niarchos Foundation Cultural Centre (SNFCC), a project that includes the construction and complete outfitting of new premises for the National Library of Greece (NLG) and the Greek National Opera (GNO), as well as the development of the 170,000 m² educational and cultural Stavros Niarchos Park. The project has a budget of €566 million.

General Design Team

- Design Architect: RENZO PIANO BUILDING WORKSHOP
- Executive Architect: BETAPLAN
- Landscape Design: DEBORAH NEVINS and Associates, Inc. in collaboration with Helli Pangelou
- Structural Engineer: EXPEDITION in collaboration with OMETE
- MEP Engineer: ARUP in collaboration with LDK
- Theatre Design Consultant: THEATRE PROJECTS CONSULTANTS
- Acoustic Design: ARUP Acoustics
- Library Consultant: AMA Alexi Marmot Associates
- Façade Consultant: FRONT
- Signage Design: C&G PARTNERS
- Food Service Consultant: SefronHornWinch
- Traffic Consultant: DENCO
- Irrigation Design: SOTIRIOS MAVRAGANIS
- Environmental Studies: HPC - PASECO
- Project manager / Cost Consultant: FAITHFUL+GOULD

Contractor

The Joint Venture of Impregilo-Terna has been appointed as the general contractor for the project

Design Verification

Penelis Consulting Engineers is the sole structural and seismic consultant on behalf of the contractor, the Joint Venture of Impregilo-Terna.

Part of the scope was the verification of the main two seismically isolated buildings: the Opera House and the National Library buildings.

The original analysis has been performed using Etabs, while for the verification Scia Engineer and ETools were chosen.

Opera House

It is an R/C structure with seismic isolation in the basement. The building is 100 x 100 m in plan and has the height of 32 m for the R/C part. On top of the building rests a ferrocement canopy which is supported by steel columns, spring dampers and post-tensioned X bracing on the R/C structure below.

Library

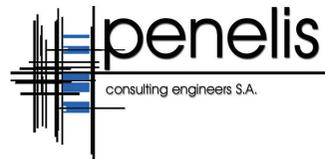
It is an R/C structure with seismic isolation in the basement. The building is 95 x 95 m in plan and has the height of 30 m for the R/C part

The design verification for both buildings consisted of at least the following tasks:

- Selection of inverted pendulum isolators
- Checking the capacity of R/C walls and cores
- Checking the capacity of large beams (200 cm x 200 cm) and waffle slabs with wide spans
- Checking deflections
- Checking temperature effects
- Checking creep effects

All those tasks were executed using Scia Engineer and ETools.

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Penelis Consulting Engineers sa was founded in 2002 and provides the following services:

- Technical advice for the development of buildings
- Technical advice for the restoration-upgrading of existing buildings and monuments
- Structural design of new buildings
- Structural design and assessment of existing buildings and monuments
- Structural design of technical works and bridges
- Supervision of civil engineering works
- Project Management and Construction Management
- Software Development

In 2006 a subsidiary called "3pi- Penelis Software Ltd" was founded in order to separate the software development, with ETools as its main product. The company has projects in Greece, Bulgaria, Romania, Croatia, Serbia and Egypt.

Project information

Owner	Stavros Niarchos Foundation
Architect	Renzo Piano Building Workshop & Betaplan
General Contractor	Joint Venture Impregilo SPA- Terna SA
Engineering Office	Expedition & Omete/ Penelis Consulting Engineers Sa
Location	Athens, Greece
Construction Period	09/2012 to 10/2016

Short description | Stavros Niarchos Cultural Centre

The Stavros Niarchos Foundation Cultural Centre (SNFCC) is a project that includes the construction and complete outfitting of new premises for the National Library of Greece (NLG) and the Greek National Opera (GNO), as well as the development of the 170,000 m² educational and cultural Stavros Niarchos Park. The project has a budget of €566 million.

Penelis Consulting Engineers SA has been appointed by the general contractor, the Joint Venture of Impregilo-Terna, to execute the design structural verification of the two main buildings, the GNO and NLG.

All the structural and seismic analyses and checks have been executed using Scia Engineer and ETools.

