



SIKA AT WORK

THE STAVROS NIARCHOS FOUNDATION CULTURAL CENTER

SIKA SOLUTIONS FROM THE FOUNDATION TO THE ROOF

BUILDING TRUST



THE STAVROS NIARCHOS FOUNDATION CULTURAL CENTER

THE STAVROS NIARCHOS FOUNDATION is one of the world's leading private, international philanthropic organizations, making grants in the areas of arts and culture, education, health and sports, and social welfare. The SNF funds organizations and seeks out projects that exhibit strong leadership and sound management and are expected to achieve a broad, lasting and positive social impact. The foundation actively supports projects that facilitate the formation of public-private partnerships as effective means for serving public welfare.

The Foundation's largest single gift is the Stavros Niarchos Foundation Cultural Center (SNFCC), in Athens. The project's total cost was \$740 million (€630 million). The SNFCC is designed by the renowned architectural firm Renzo Piano Building Workshop, and this project was also designed to include new facilities for the National Library of Greece, and the Greek National Opera, as well as the Stavros Niarchos Park itself, with a total area of 210,000 m².

On February 2017, following handover of the project, the SNF also announced its commitment to continue supporting the SNFCC for the next five years, through grants totaling up to \$53 million (€50 million). The grants are to support the implementation of public programming and help cover part of SNFCC's operational costs.



THE OVERALL PROJECT DESCRIPTION



In 2006, the Stavros Niarchos Foundation (www.SNF.org) announced its plans to fund the development of the Stavros Niarchos Foundation Cultural Center (SNFCC), a project that includes the construction and complete outfitting of new facilities for the National Library of Greece (NLG) and the Greek National Opera (GNO), as well as the creation of the 210,000 m² Stavros Niarchos Park. In February 2008, after a closed international architectural competition, the Stavros Niarchos Foundation's Board of Directors announced its unanimous decision, to choose the Renzo Piano Building Workshop (www.rpbw.com) as the architectural design office.

The project site is located 4.5 km south of the center of Athens, on the edge of Falirio Bay, and the SNFCC is designed as a multifunctional arts, education and entertainment complex. The project's total budget of \$740 million (€630 million) includes two grants of \$6mil (€5mil) each to the National Library of Greece and the Greek National Opera respectively, aiming to support the organizations' transition to their new facilities. The SNFCC is the first private-public partnership of its type in Greece, and one of the most important civic (cultural/educational) projects ever undertaken in the country.

NATIONAL LIBRARY OF GREECE



The new building for the National Library of Greece (NLG) (www.NLG.gr) will modernize the institution founded in 1832, allowing it to strengthen its research role whilst expanding its focus to be an all-inclusive public resource. In its new and enlarged role, the Library will support patrons of all ages and education – from academic researchers to children and young adults destined to become the next generation of users. The nearly 24,000 m² (235,000 sq. ft.) state-of-the-art building combines traditional materials with technological innovation, conservation with information and communication. The flexibility of its design, which was produced in consultation with the prominent specialists from the British Library (www.bl.uk), ensures that the National Library can respond effectively to the ever-changing needs and the challenges of the digital age. A nationwide digitization project has also been started, which will help make heritage materials and information more available to the Greek public and will offer access to the Library's various collections. Connectivity with other libraries both nationally and globally will also allow the Library's users increased access to material abroad that is relevant to Greece or Hellenism. In addition, the new Business Center will provide the public with an active hub for direct access to all of

this knowledge and innovation, including workstations with laptops, and wireless connectivity.

A modern academic research facility within the new National Library will be available as an exemplar for other institutions. This new building will enable all existing research collections, currently located in three separate buildings, to be housed here in a centralized location, with optimized access to the collections for researchers and scholars.

The facilities holdings include over 4,500 manuscript codices from the 9th to the 19th century and a rich variety of important historical documents and archives. Modernized climate control and preservation, plus digitization facilities will ensure that the Library's significant rare manuscript collection is available for future generations of scholars. The National Library of Greece will also have the capacity to function as a venue for exhibitions of its holdings. Selections of the National Library's manuscripts may be exhibited on a rotational basis, affording the public an opportunity to view more of Greece's treasures and cultural heritage.

THE GREEK NATIONAL OPERA



© SNECC / Nikos Karamakidis



In its new home, the Greek National Opera (GNO) (www.nationalopera.gr) will become an exciting destination for music lovers and architectural cognoscenti alike. The new building is designed as a multi-use venue capable of hosting a variety of different performances and events. The new 28,000 m² (301,000 sq. ft.) auditorium is an architectural jewel, designed to enhance the opera experience for the patrons and artistes alike. Its world-class acoustics, enhanced performance capabilities with flexible staging, and its own innate beauty, will position it for immediate entry onto the world opera circuit. It is now ready to play host to the most technically demanding operas, international multimedia art productions, and their formidable vocalists.

The auditorium is on a par with the best European opera houses, and its multiple stage configuration possibilities allows for efficient scene changes and complex productions. The comfort of the 1,400-seat main auditorium will also be equaled for the artistes backstage, and in the dressing rooms and rehearsal spaces; the technical capabilities will also extend to the in-house scenic design and costume shops.

STAVROS NIARCHOS PARK



© SNECC / Yorgis Verolymbos

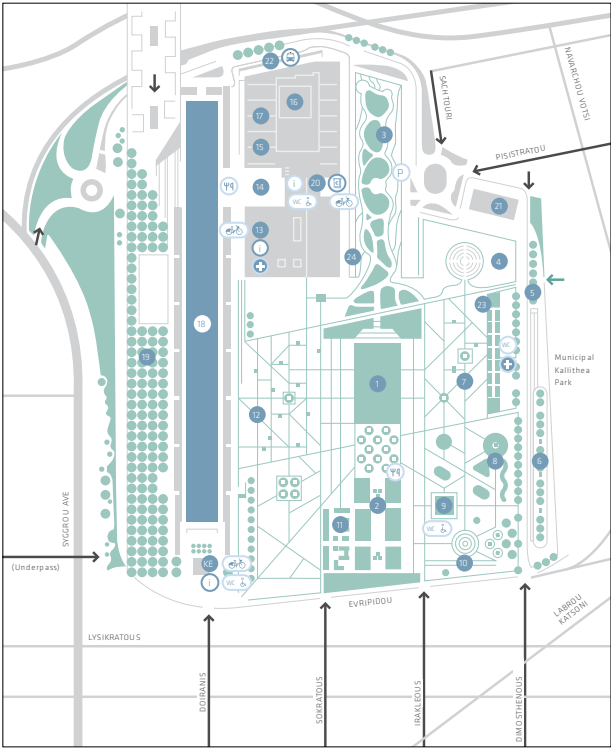
Linked by an ecological concept, its physical topography and function as the gateway in to the new National Library of Greece and the new Greek National Opera House, the Stavros Niarchos Park is a vital green space. It is like a breath of fresh air for Athenians and visitors alike, as an important and valuable addition to the Capital City with the lowest per capita green space in Europe. A respite from the urban environment, the new Park also provides extensive opportunities for learning, for rest and recreation, and for the contemplation of future new experiences.

Greece's strong horticultural tradition is also celebrated in the open, sunlit Mediterranean Garden of the Park. The planting alone makes the park a gardeners destination: with a fabulous mix of evergreen and other endemic plants from the region including boxwood, coronilla, cistus, and lentiscus, salvia, oregano, thyme, lavender, rosemary, roses and euphorbias – All of which combine to add to the sensual pleasure of a visit. Each month brings new colors, and each season introduces a different combination of flowers and/or foliage.

The spectacular features of the Stavros Niarchos Park are not all at ground level. Soaring 14 m above the main building structure there is a photovoltaic canopy that is almost 100 x 100 m. An engineering wonder, supported by only 40 sinewy thin steel columns, the canopy makes a unique and fascinating addition to the city skyline.

At ground level, the tree-lined 'pedestrian only' Esplanade runs parallel to the glass facade of the main building structure. Alongside this is the new Canal, designed as a figurative extension of the adjacent sea and all its history. The Esplanade is also specially designed to accommodate the needs of disabled people, and by day is ideal for running, biking, and many other physical activities. Directly across this central public space or the 'Agora' as it was known in ancient Greek, and on the other side of the canal, wide marble steps provide space for various different forms of entertainment to be performed.

SUSTAINABILITY



Environmental sustainability is one of the core values of the Stavros Niarchos Foundation for Culture. The creation of environmentally friendly and sustainable infrastructure for the new buildings and the Park was an important goal in the design and construction of the SNFCC. The target was therefore always LEED Platinum Certification as a Green Building, the highest distinction for environmental and sustainable buildings. The system certifies that a building is designed and built on the principles of sustainable construction methods, using environmentally innovative practices, aimed at saving energy and water use, the reduction of CO₂ emissions, improvement of the indoor environment, plus rationalizing all of the resource management and addressing their impact. This is the first LEED Platinum Certification to be awarded to a building development in Greece and also the first for such a cultural building in Europe.

- This was achieved through planning and actions on three levels:
- During the design and construction of SNFCC, strict environmental standards have been followed according to the demands of the LEED Specifications.
 - Negative environmental impacts have been minimized through preventive and protective measures, recycling 95% of the building waste and using locally sourced low emission materials.
 - Pollution and environmental disturbances in the area were limited by specific control procedures.

1. Great Lawn
2. Pine Grove
3. Southern Walks
4. Labyrinth
5. Outdoor Gym
6. Running Track
7. Western Walks
8. Playground
9. Park Kiosk
10. Water Jets
11. Sound Garden
12. Mediterranean Garden
13. National Library of Greece
14. Agora
15. Greek National Opera
16. Lighthouse
17. Panoramic Steps
18. Canal
19. Esplanade
20. SNFCC Lobby
21. Outdoor Parking Lot
22. GNO South Wall
23. Vegetable Garden
24. Buffer Zone
25. Visitors Center
26. Food trucks
27. SNFCC Bike Rental
28. Shuttle Bus Stop
29. First Aid
30. ATM

The sustainability of the SNFCC has also been ensured during its operational lifetime:

- Energy efficiency initiatives are installed that contribute to annual energy savings of 7.4GWh, equivalent to ~2,750 tons of CO₂ and a cost saving ~of approximately €0.6 million annually.
- Water management systems are installed to more than cover the irrigation needs of the Park using non-drinking water and also to minimize water consumption overall.

The Stavros Niarchos Park has already improved the local ecosystem & biodiversity with:

- 1,450 trees & 280,000 bushes have created a sustainable ecosystem with a positive effect on local fauna.
- “Green” roofs cover 17,000 m² of the Park’s area.



There are four levels of LEED certification: Platinum certification is the highest distinction received which the SNFCC project achieved and was awarded in November 2016 with a score of 54/69.

LEED SCORECARD (Platinum 54/69)	
Sustainable sites	14 of 14
Water efficiency	5 of 5
Energy & atmosphere	12 of 17
Material & Resources	7 of 13
Indoor environmental quality	11 of 15
Innovation	5 of 5



SIKA'S PARTICIPATION & CONTRIBUTION



A project of this concept and magnitude in any country sets high demands, and is assured of close public and technical scrutiny on almost every level, from the very beginning, through to its final handover and beyond. This complex construction project has therefore required optimum coordination of the project team including the owner, their architects and engineers, main contractor, and the numerous specialist sub-contractors and suppliers of all of the different building systems and materials. Due to the unique and innovative nature of this project there were also many different elements that required laboratory tests and then trials on a pilot scale to be carried out and approved, ahead of the actual works on site.

Sika provided help and assistance in every phase of the project, both by proposing the most appropriate materials and systems based on the specifications, as well as via practical technical evaluations and support on site. This included using Sika's global experience and technical expertise to advise on innovative solutions to save both time and cost, plus to increase durability and thereby the project's service life and sustainability.

Sika therefore provided materials and systems literally from the foundations to the roof, which not only met the project's requirements in terms of technical specifications, but also in terms of sustainability and environmental impact requirements. For example to help to meet all of the specification characteristics as well as having minimal emissions of VOC's based on the methods described and accredited for the Platinum LEED Certification.

The following pages illustrate just some of the key areas of the project and of Sika and Sika systems involvement throughout the design, construction and operation of the new Stavros Niarchos Foundation Cultural Center (SNFCC).

BELOW GROUND WATERPROOFING



In a project of this magnitude, waterproofing below ground to protect the structural foundations and create a water resistant structure is always of the utmost importance. The Sika Watertight Concrete System was used for the below ground structures, which comprises of waterproof concrete prepared using special Sika water resisting admixtures, in combination with Sika engineered jointing systems, including Sika® Waterbars, plus additional Sika waterstops, such as SikaSwell®-A water swelling profiles. In addition, a built-up Sikaplan® WP-1100 15HL sheet waterproofing system, incorporating geotextiles and an integral drainage layer was used for the deep basement area.

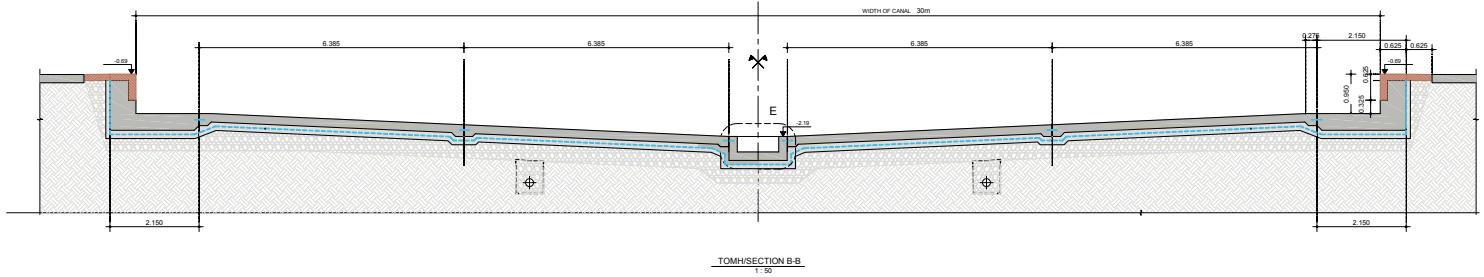
At the diaphragm walls below the new Greek Opera building, special SikaFuko® VT-1 injection hoses were installed to allow for easy reinjection and sealing in the event of any future ground movement.

CANAL WATERPROOFING



The beautiful new Canal that forms an important feature of the park, day and night, was built to run parallel to the Esplanade. This contains ~15,000 m³ of water and so absolute watertightness was required for this new body of water at the heart of the project. The whole of the canal structure was waterproofed using a reinforced, built-up Sika sheet membrane system, inside the new structure.

This Sika system also enabled the engineers to ensure fully watertight connections, joints and terminations, by connecting it directly to the retaining concrete structures using Sika® Waterbars and Sika engineered waterstops. Sikaplan® membrane was selected in order to ensure the complete watertightness of the canal construction.



STRUCTURAL AND ARCHITECTURAL CONCRETE



aesthetic demands for the final surfaces and their visual appearance. The fair-faced concrete surfaces had to be smooth, without any visible defects, and of uniform color. Fair-faced concrete was extensively used for the new Library and Opera buildings as part of their visual design and aesthetics.

In order to evaluate all of these different concrete mixes, as well as their influencing factors such as their placing, curing and demoulding, many full scale mock-ups were made. The final concrete mix designs for the fair-faced concrete were based on the latest Self Compacting Concrete, which was all produced using Sika® ViscoCrete® Ultra-600 superplasticizers in combination with Sika® Stabilizer®-4R viscosity modifiers for the thinner elements.

Approximately 150,000 m³ of 10 different classes of structural and architectural concrete with many different technical characteristics were required. The technical performance and placing requirements of all of these different concrete mixes had to be met, but naturally, the architectural concretes (especially the fair-faced areas), equally had to meet the additional

Sika admixtures were incorporated in all of the concrete mixes, for cost and resource saving in the least demanding, through to ensuring all of the most stringent high performance and aesthetic demands were fully complied with. Sika® Separol® W-320 and Antisol® systems were also used extensively for demoulding and controlled water evaporation from the concrete surfaces during curing.

SEISMIC ISOLATION SYSTEMS



The new Opera and Library buildings are built on specially designed seismic isolation systems, which are placed between the vertical bearing elements and the building foundations. These seismic isolators form an alternative and practical method for the seismic reinforcement of structures, as they can significantly reduce the stress that the structure would be subjected to in the event of earthquake. For these seismic isolators installation, a special 1-component, fiber reinforced, cementitious grout from the SikaGrout®-312 RFA range was selected. Prior to the final selection of this product, extensive tests were performed in the laboratory and onsite. When the installation was done on site, this was all performed before dawn, as this phase of the construction had to take place during the summer months with increased ambient temperatures.



OPERA & CAFÉ CANOPY USING THE FERROCEMENT METHOD



The new Greek National Opera building is covered by a huge canopy (100 x 100 m) that was envisioned by the architect to hover above it like a cloud, being both part of it and separate at the same time. This fabulous feature is one of the most important elements of the project design, both architecturally and structurally.

This canopy had to be lightweight and compact, with a perfectly smooth and continuous surface, which led to the selection of an unusual material for the canopy, of ferrocement. Ferrocement is a thin, composite material that can be easily formed and molded for lightweight structures, though not normally on this size, or for such structural applications. It is far better known where Stavros Niarchos was also a household name, in shipping and specifically of course for shipbuilding. This is therefore the first time worldwide that it has been used for building work on this scale, and in particular for a structural element!

Ferrocement construction is widely used around the world for lower cost structures and generally consists of a cement mortar and laminated layers of metallic mesh. However the

SNFCC canopy is a far more complex structure and consists of two high quality ferrocement surfaces – the bottom and the top layers, connected to each other. The canopy's maximum thickness in the center is 4.5 cm falling to a thinner section of 30 cm around the perimeter, which also includes the rain water drainage channel (part of the water recycling system). The whole canopy is supported by tubular metal columns from the Opera building's reinforced concrete structure.

Prior to full scale construction of the canopy, a mockup of 5 x 5 m had to be constructed and approved and this mockup was actually itself a prerequisite for the final approval of the main contractor.

For this high quality of ferrocement construction the design and performance of the cement mortar was of critical importance and therefore Sika engineers and concrete technicians provided assistance from the very beginning, through to its successful completion on site. This included detailed raw materials analysis, mix design and testing in the laboratory and then on site.



For its completion, 530 man-hours of Sika Hellas' engineers and technicians were required, along with 341 on-site man-hours of Sika Hellas' engineers.

The high performance mortar was injected into the moulds, where it achieved full penetration across the whole of the mesh surfaces. This superfluid Ferrocement mortar developed with Sika had a compressive strength of 100Mpa and its composition consisted of:

- Cement type – I 52.5
- Graded quartz sand
- Silica fume – SikaFume® HR-E

High range water reducer/superplasticizer – Sika® ViscoCrete® Ferro-1000, (which was specially developed / tailor made) in Sika Greece's' Concrete Laboratory for this project).



ROOF WATERPROOFING



ROOF WATERPROOFING

The roof waterproofing of all of the different building structures that together form the new SNFCC had to meet high specifications for performance, durability and sustainability.



For all of the flat roofs on this project, the most appropriate system was selected from the fully comprehensive Sika range of roof deck waterproofing systems. For the single-ply membrane roof build-ups this was the Sarnafil® TG 66-20, multi-layer, anti-root, synthetic roof water-proofing sheet based on premium-quality flexible polyolefins (FPO), reinforced with an inlay of non-woven glass fabric and according to EN 13956.



Light house is the building on which the hill ends.

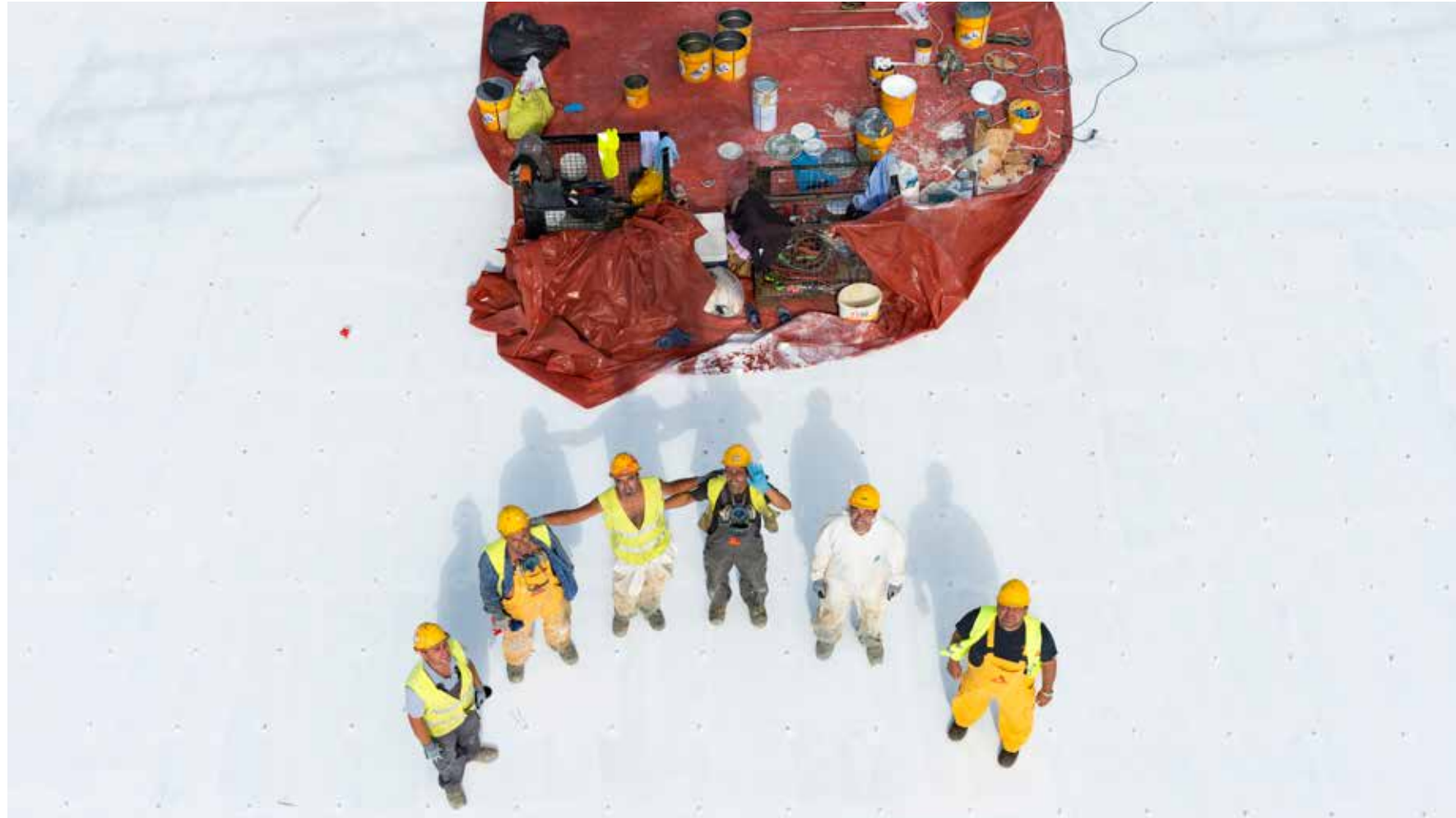
The new Stavros Niarchos Foundation Cultural Center has the largest 'Green Roof' in Greece, both in terms of the total surface area, and also in the volume of substrate that has been

created. The largest individual green roof is the 10,000 m² roof of the main Car Park.

FERROCEMENT CANOPY WATERPROOFING



FERROCEMENT CANOPY WATERPROOFING



The canopy itself is a project that was pioneering and unique. The selected waterproofing system was the liquid applied, polyurea resin based membrane system Sikalastic®-8800, which was spray applied onto the primed surface using two-component, hot spray equipment. Overall a protective, polyurethane resin based, highly UV and weathering resistant, top coating of SikaCor® EG-5 was then applied. The total Ferrocement canopy surface of 10,000 m² was waterproofed in this way.

Finally the waterproofed surface of the Ferrocement Canopy was covered with photovoltaic panels, which contribute very positively to the sustainability of the project, and significantly reducing its CO₂ footprint.



CAR PARK FLOORING SYSTEMS



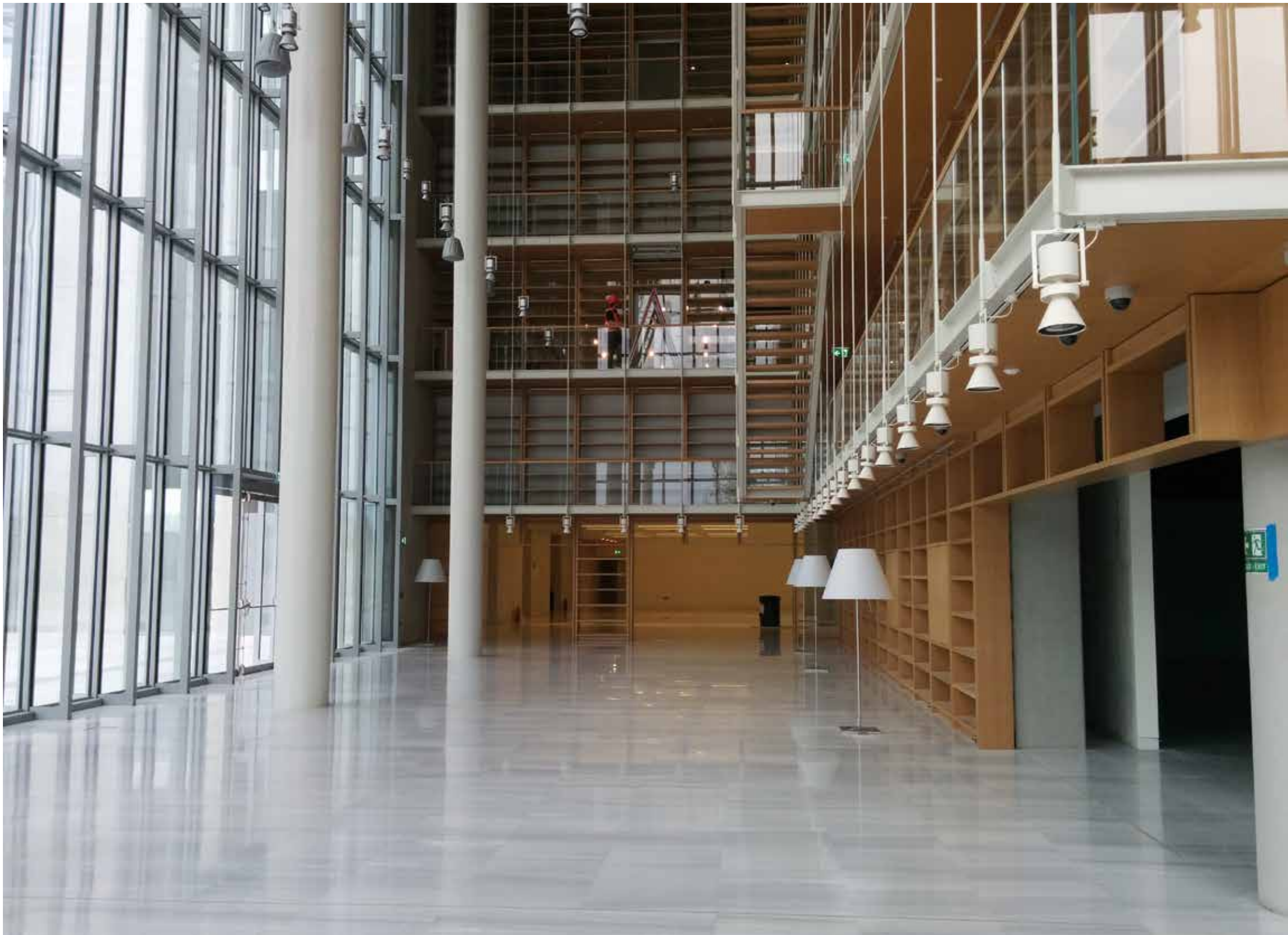
The extensive multi-story and mostly underground facilities for visitors parking total ~40,000 m² of dedicated parking spaces. The concrete deck surfaces needed to be protected from abrasion and wear, particularly on the ramps and turning areas. According to the specific requirements of each area polyurethane (~22,000 m²) and epoxy (~18,000 m²) deck coating system from Sika found to be ideal and so these were applied throughout the facility. A special Sika polyurethane resin based system was applied next to and below the Opera building. Sikafloor® MultiFlex PB-21 UV is a highly aesthetic, anti-slip, crack bridging flooring system that features high resistance against abrasion and is also a low noise system (minimizing noise produced by tyre friction and movement). This was particularly important during performances, when noise transmission had to be kept to the absolute minimum.

All of the selected Sikafloor® MultiDur ES-14 deck coating systems carry a LEED Attestation regarding their VOC content, tested in accordance with the accepted US Council methods.

During construction and finishing of the extensive concrete floor slabs, Sika QuartzTop Dryshake, mineral surface hardener, was broadcast directly into the surface, to increase the finished surface hardness and reduce cement laitance, whilst also assisting the concrete finishing, improving curing and increasing the future dusting resistance.

On the parking area under the Opera, the uniform color, epoxy roller coating system Sikafloor® MultiDur ES-14 was applied, which is suitable for application on medium to heavy duty substrates. All Sikafloor® systems carry a LEED Attestation regarding their VOC content, according to the accepted US Council methods.

ELASTIC SEALING & BONDING / ANCHORING



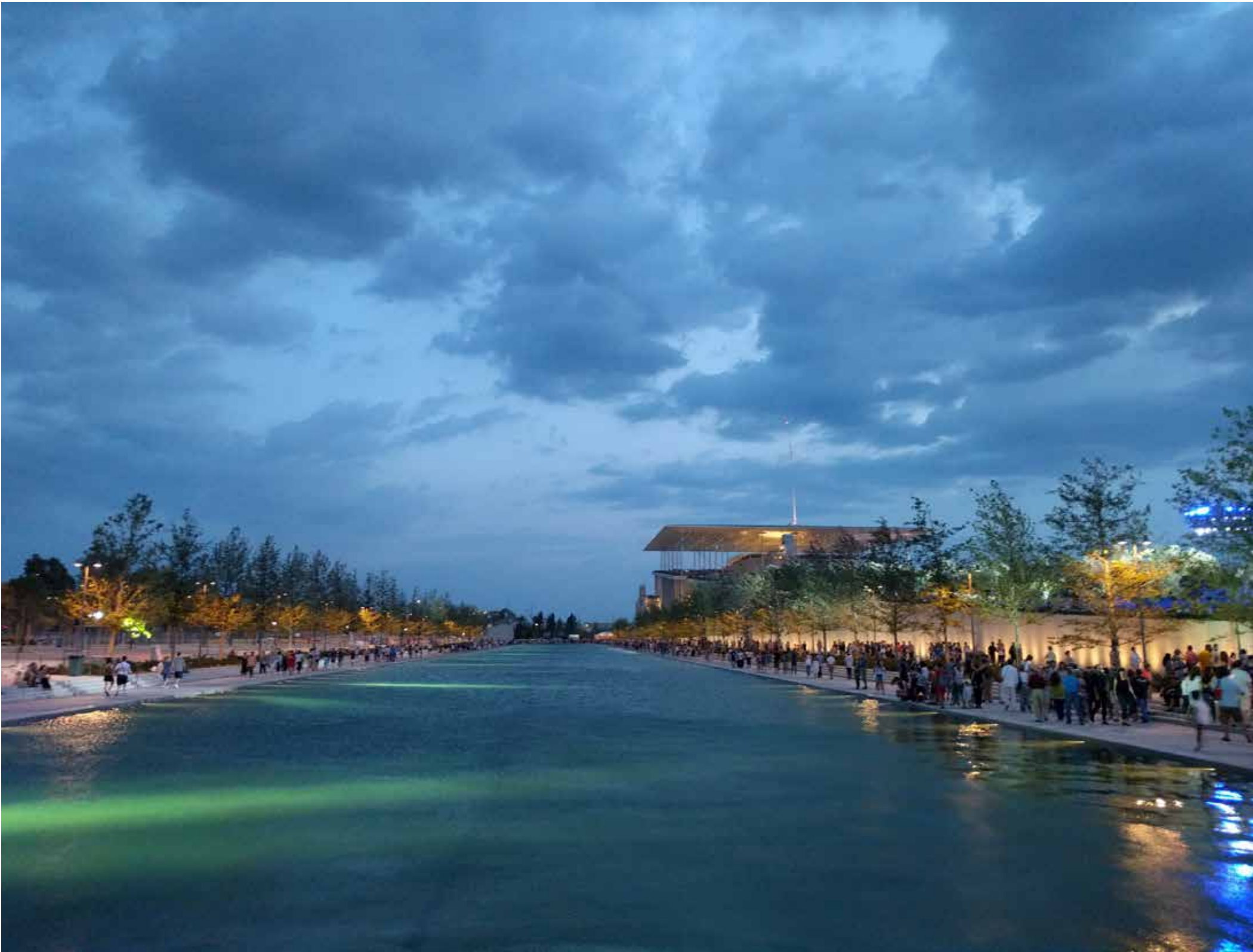
The use of highly aesthetic wood flooring was a must for the Opera building and this was installed using the elastic, 1-component, polyurethane resin adhesives from the SikaBond®-54/-52 Parquet range. These innovative materials ensure minimum delay in application, optimum bond to the different substrates and result in a finished wood floor with minimal footfall impact noise transmission. The wood floor systems selected included various natural parquet and engineered wood solutions according to the demands of each area, including coving and adjacent vertical surfaces.

All of the concrete floor joints, as well as all of the building facade joints in concrete substrates were sealed and made watertight using 1-component Sikaflex® WS-355 polyurethane resin based sealants. Sealing of the natural stone (white marble) floor and wall tiles was performed using a special 1-component silicone resin based Sikasil® WS-355 sealant, which is approved for contact with natural stone (does not stain).



Structural fixing and anchoring of the special 15 cm thick architectural wall in front of the new Opera building, was undertaken using resin anchoring techniques with the special epoxy resin based Sika AnchorFix®-3+.

SIKA PRODUCT SALES AND VOLUMES IN THE SNFCC PROJECT



CONCRETE PRODUCTION

- 540 t superplasticizers Sika® ViscoCrete® series
- 29 t superplasticizer Sika® ViscoCrete® Ferro-1000
- 61 t waterproofing admixture Sika®-1+
- 123 t silica fume SikaFume®
- 10,5 t stabilizer Sika® Stabilizer
- 130 t retarder Sika® Plastiment
- 29 t evaporation control membrane Sika® Antisol®
- 2,7 t curing membrane Sika® Antisol®
- 5 t demoulding agent Sika® Separol®

WATERPROOFING

- 200 m of injection hoses SikaFuko® VT-1
- 4.2 km sea-water swellable profiles SikaSwell® A-2010M
- 2.6 km swellable profiles SikaSwell® A-2010 / A-2005
- 750 cartridges of swellable sealant SikaSwell® S-2
- 4.7 km Sika® Waterbars
- 2.75 t cementitious waterproofing mortar SikaTop® Seal 107
- 4,100 m² PVC waterproofing membrane Sikaplan®
- 15,400 m² PVC waterproofing membrane Sikaplan® WP (Blue-UV stabilized)
- 480 m² drainage membrane Sika® Drain-S
- 20,100 m² geotextile S-Felt A 300 F
- 13,700 m² geotextile S-Felt GK 400
- 24 t sprayed LAM membrane Sikalastic®-8800

ROOF WATERPROOFING

- 2,900 m² bituminous roofing felt Sika® Bituseal
- 1,800 m² FPO membrane Sarnafil® 2 mm
- 36,520 m² FPO membrane Sarnafil® TG 66-20
- 680 m² PVC membrane Sikaplan® 1.5 mm
- 500 kg sprayed LAM membrane Sikalastic®-612
- 320 m² adhered FPO membrane Sarnafil® 1.2 mm

REPAIR MORTARS / ANCHORING / GROUTING

- 2 t cementitious repair mortar Sika MonoTop®-627
- 2 t cementitious repair mortar Sika MonoTop® Dynamic
- 2 t cementitious repair mortar Sika MonoTop®-621 Evolution
- 1.8 t Sikadur® Epoxy Mortar
- 112 t cementitious grouts SikaGrout®
- 5,784 kg epoxy chemical anchors Sika AnchorFix®-3+
- 4.65 t Protective coating – SikaCor® EG-5

ELASTIC SEALING & BONDING

- 5,680 sausages of elastic polyurethane based sealants for facade joints Sikaflex® AT Facade / Construction+ / SikaHyflex®-250 Facade
- 146 l epoxy primers Sika® Primer-3
- 6,800 sausages of elastic polyurethane based sealants for floor joints Sikaflex® Pro-3
- 417 cartridges of special silicone for natural stone Sikasil®
- 1.62 t cementitious tile grout SikaCeram® CleanGrout
- 3.7 km joint backer rod Sika® Backing Rod
- 2,315 cartridges of multipurpose sealant & adhesive Sikaflex®-11 FC+
- 4,800 sausages of engineered silicone Sikasil® WS
- 1,300 cartridges of fire rated sealant EverBuild Fire Sealant-300
- 5.0 t of elastic wood floor adhesive SikaBond®-54 Parquet
- 950 sausages of elastic wood floor adhesive SikaBond®-52 Parquet

INDUSTRIAL FLOORING

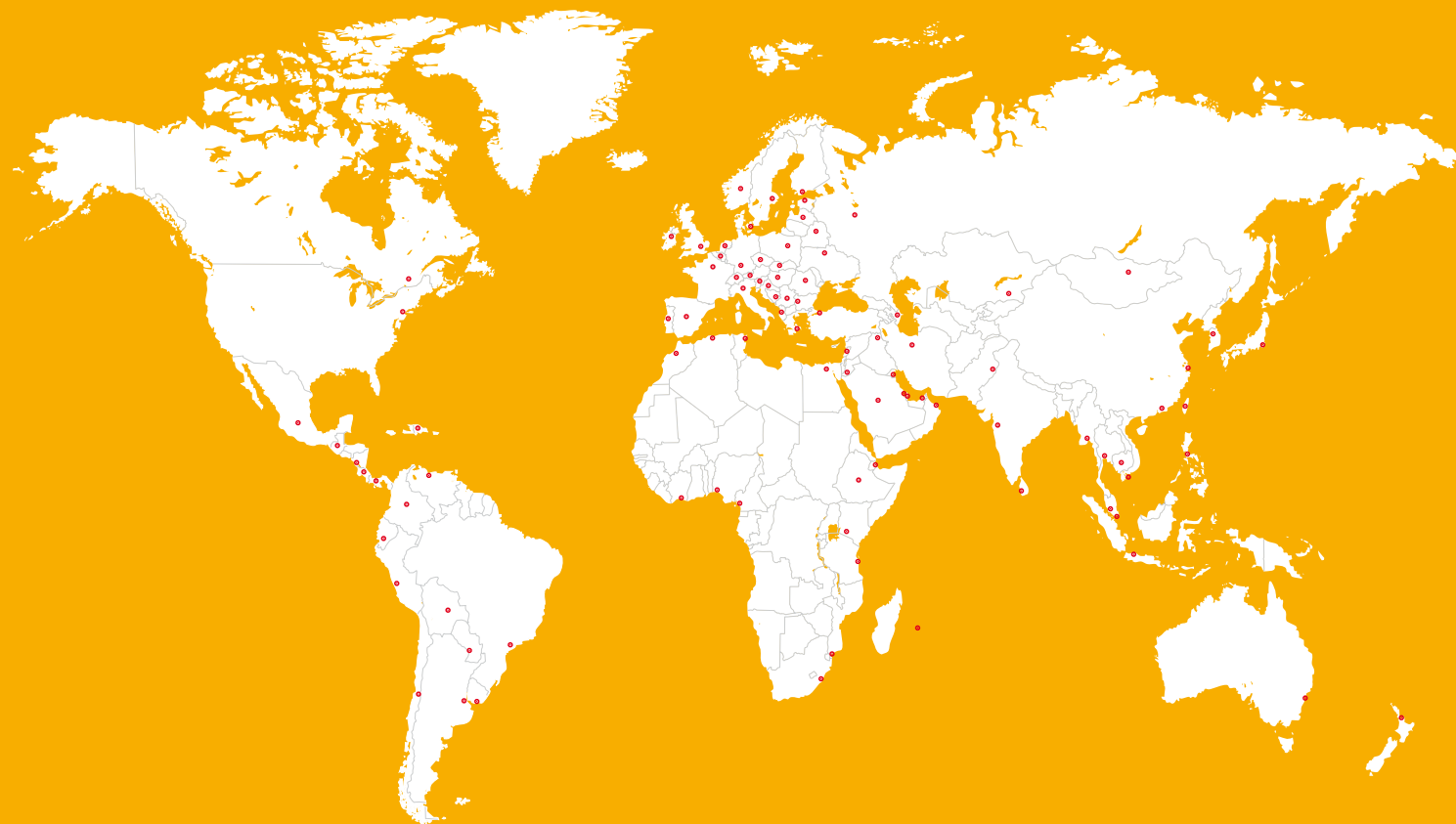
- 200 t Dryshake hardener – Sika QuartzTop – Chapdur® Premix
- 4 t epoxy primer – Sikafloor®-156
- 7 t epoxy primer – Sikafloor®-161
- 33 t polyurethane deck coating Sikafloor®-375
- 17 t polyurethane top coat Sikafloor®-359 N
- 9 t epoxy deck coating Sikafloor®-264

PROJECT PARTICIPANTS



Architectural design /
Project architect:
RENZO PIANO BUILDING WORKSHOP
Associate architect: BETAPLAN
Main contractor: Salini Impregilo-Tepna
Surrounding area study:
DEBORAH NEVINS and Associates, Inc.
Associate of surrounding area study:
H. PANGALOU AND ASSOCIATES
Structural design: EXPEDITION
Associate for structural design: OMETE
Environmental study: HPC - PASECO
Project management /
Sustainable planning & cost consul-
ants: FAITHFUL+GOULD

GLOBAL BUT LOCAL PARTNERSHIP



WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



SIKA SERVICES AG
Tueffenwies 16
CH-8048 Zurich
Switzerland

Contact
Phone: +41 58 436 40 40
www.sika.com

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