

# THE MASTERWORKS OF STRUCTURAL ENGINEERING



[www.MidasUser.com](http://www.MidasUser.com)

MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea  
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# THE MASTERWORKS OF STRUCTURAL ENGINEERING

MIDAS IT always strives for constant growth and progress with midas users who have made us a trusted leader in technology.

This project application book was published by MIDAS IT, but what MIDAS IT did was just collecting the masterworks of midas users. This book is dedicated to the midas users without whom it would not exist.

MIDAS IT will keep providing the world with utilitarian values that support human pursuit of happiness with our creative technology.

## MIDAS Power Users

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ENGINEERING

CCCC Highway Consultants Co., Ltd.

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Thornton Tomasetti

TRACTEBEL

TU Delft

TYLIN  
INTERNATIONAL

UPTEU  
ADVANCED CONSULTING  
ENGINEERING

WRINER GROUP

wsp

Yoshin  
ENGINEERING CORPORATION

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80	San Lorenzo	112	Maeshiba School Gymnasium
82	Villa Reale	113	Kusanagi Gymnasium / Konohana Arena
84	Saint Irene Basilica	114	Daejeon World Cup Stadium
86	Wachirathammawart Temple	115	Jeonju World Cup Stadium
88	Phatum Mahajaede	116	Seoul World Cup Stadium
90	Oita Prefectural Art Museum	117	Tank with Slashing
91	Liyang Museum	118	Precast Concrete Hybrid Tower
92	Beijing Olympic Stadium	120	Gas Pipeline with Venturi Support Tower
94	Mari time Museum	121	Raw Meal
96	West International Expo Center	122	Clinker Storage
98	Ordos Museum	123	CF Silo

# Burj khalifa

Dubai, UAE



Owner	Emaar Properties
General Contractor	Samsung C&T
Architect	Skidmore, Owings & Merrill
Engineering Consultant	MIDAS IT / Skidmore, Owings & Merrill / Arcadis
Construction Period	2004 - 2010
Type of Project	Mixed-use Building
Size of Structure	829m Height (164-story)



midas **Gen**

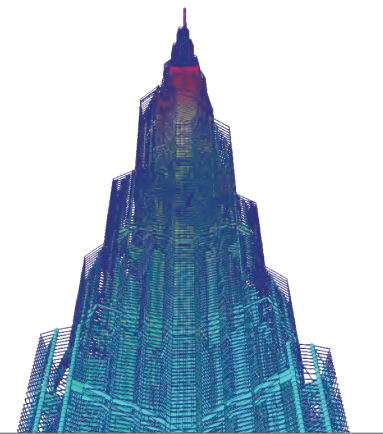
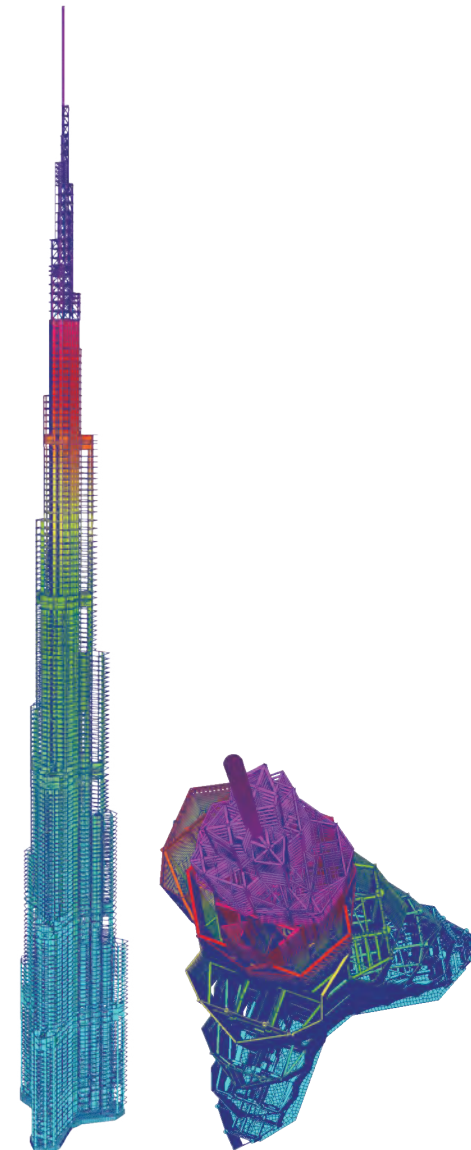
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear static analysis with plate and wall elements

## Description on this project

The Burj Khalifa is a mega-tall skyscraper in Dubai, United Arab Emirates. With a total height of 829.8m, the primary structure is reinforced concrete. It is designed to be the centerpiece of large-scale, mixed-use development. The design is derived from the Islamic architecture of the region, such as in the Great Mosque of Samarra. The Y-shaped tripartite floor geometry is designed to optimize residential and hotel space. A buttressed central core and wings are used to support the height of the building. Although this design was derived from Tower Palace III, the Burj Khalifa's central core houses all vertical transportation with the exception of egress stairs within each of the wings. The structure also features a cladding system which is designed to withstand Dubai's hot summer temperatures.



## MIDAS IT

Address	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea		
Introduction	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.		
Website	<a href="http://www.midasuser.com">www.midasuser.com</a>	Email	<a href="mailto:info@midasit.com">info@midasit.com</a>

# Libeskind and Hadid Tower

Milan, Italy



Owner	CityLife
General Contractor	CMB
Architect	Zaha Hadid and Daniel Libeskind
Engineering Consultant	Redesco Progetti
Construction Period	2014 - 2017
Type of Project	Mixed-use Building
Size of Structure	<ul style="list-style-type: none"><li>• Hadid Tower 170m Height (44-story)</li><li>• Libeskind Tower 175m Height (28-story)</li></ul>



## Main features used in this application

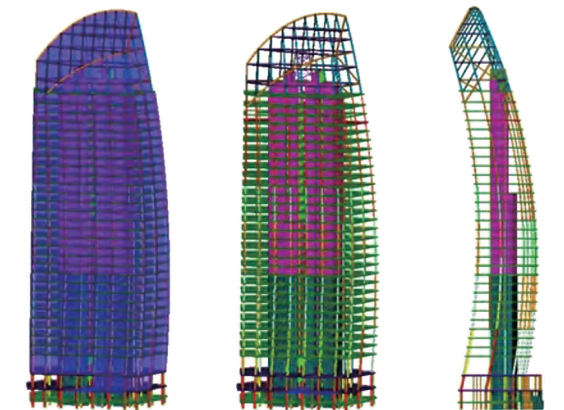


- Construction stage analysis with creep and shrinkage
- Finite element model for slabs and walls

## Description on this project

**Hadid Tower** The project is located at the intersection of several important urban axes. The sinuous profile of the rooflines repeats over the entire complex. The tower is conceived as a stack of equivalent, economically efficient floors slabs that incrementally twist about a vertical axis.

**Libeskind Tower** The curved tower's facade is made of sustainable, state of the art glass, that will reflect the public space below and vistas around. Libeskind tower is personally crafted and conceived to provide a sculpted and highly visible skyline on the site.



## Redesco Progetti

**Address** via Gioberti 5, 20123 Milan, Italy

**Introduction** Redesco is a specialized structural engineering consultancy, whose first core was established in 1975. Merging broad vision with focused specialization, they simply design and enable outstanding structures. Also, they focus on structures, from conceptual design to site supervision.

**Website** [www.redesco.it](http://www.redesco.it)

**Email** [redesco@redesco.it](mailto:redesco@redesco.it)

# Gate to the East

Suzhou, China



<b>Owner</b>	Suzhou Chinaing Real Estate
<b>General Contractor</b>	Shanghai Construction Group
<b>Architect</b>	RMJM
<b>Engineering Consultant</b>	East China Architectural Design & Research Institute
<b>Construction Period</b>	2004 - 2016
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	302m Height (71-story)



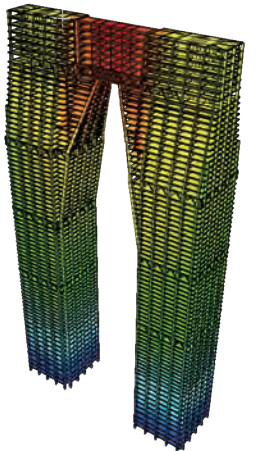
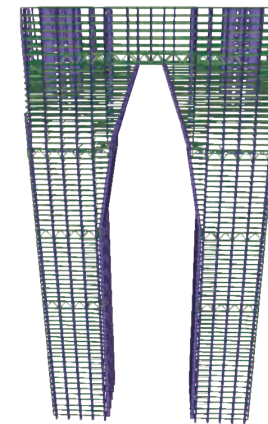
## Main features used in this application



- Linear static analysis with P-delta effects
- Construction stage analysis with creep and shrinkage
- RC building design

## Description on this project

The design for the Gate of the Orient is inspired by the combined Chinese traditions and western influences of the projects two lead designers. The result is a mix of westernized pure form and Chinese subtlety. The Gate of the Orient has drawn inspiration from the historic and cultural references of the traditional famous gardens of Suzhou and stands almost 300m high and sits directly above a major underground rail interchange, which is fully integrated into the building.



## East China Architectural Design & Research Institute

<b>Address</b>	Block B 14/F, Huafu Building, 76 Shishan Road, Suzhou New Area 215011, China		
<b>Introduction</b>	ECADI is one of China's most influential architectural design institutions. Over the years, ECADI has designed projects for provinces and cities nationwide, and dozens of countries and regions as well. They have completed over 10,000 design and consulting projects, and cultivated many outstanding experts and talents including academicians and national design masters.		
<b>Website</b>	<a href="http://www.ecadi.com">www.ecadi.com</a>	<b>Email</b>	<a href="mailto:suzhou@ecadi.com">suzhou@ecadi.com</a>

# City Center and Hard Rock Hotel

Saint Juliens, Malta



Owner	Seabank Group
Architect	MYGG Architecture
Engineering Consultant	F&M Ingegneria / Arup
Construction Period	Under Construction
Type of Project	Mixed-use Building
Size of Structure	68,400m <sup>2</sup>



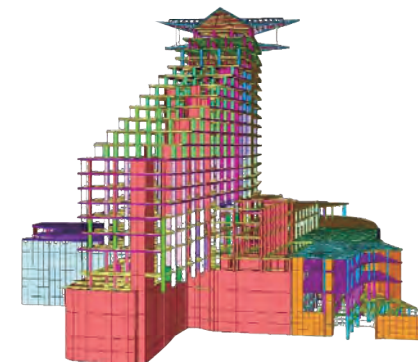
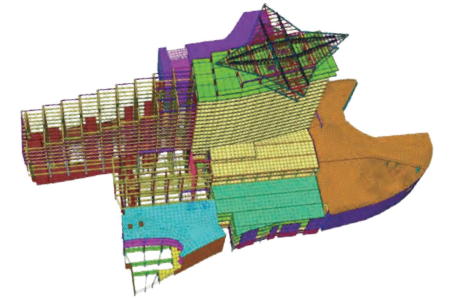
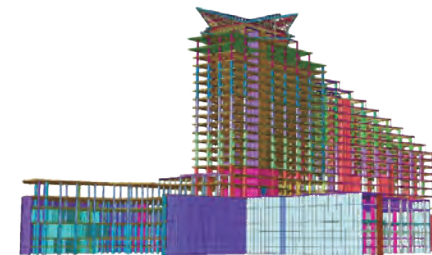
## Main features used in this application



- DFX import for irregular model generation
- Construction stage analysis
- Linear time history analysis for walk vibration

## Description on this project

The City Centre complex includes 3 main facilities: two residential towers, one of where located in the east side (Tower A), and the other in the north (Tower B), and an hotel (Hard Rock Hotel) that are connected together by a podium with a shopping mall and a multi-level parking. The building consists of 4 main facilities with foundation at 0.5m, the podium consists of 6 floors and reaches 22.25m. At this level, the two towers and the hotel erect separately. Both towers have a circular footprint of 1,200m<sup>2</sup> and reach 162.85m height (35 floors), while the hotel building has a rectangular plan 24 x 150m and it reaches 94.40m height (19 floors).



## F&M Ingegneria

Address	Via Belvedere 8/10 30035 Mirano, Italy		
Introduction	F&M Ingegneria is a leading Italian multidisciplinary practice of designers, engineers and specialist consultant with over 35 years of experience. The firm provides a wide range of design services in infrastructural, building, environment and project management. They work across all sectors from education and residential to transport, from arts to health and sports facilities.		
Website	www.fm-ingegneria.com	Email	fm@fm-ingegneria.com

# Dongdaemun Design Plaza (DDP)

Seoul, Korea



Owner	Seoul Metropolitan Government
Architect	Zaha Hadid Architects
Engineering Consultant	SAMOO Architects & Engineers / Arup / POSTECH
Construction Period	2007 - 2014
Type of Project	Complex Mall
Size of Structure	85,000m <sup>2</sup>



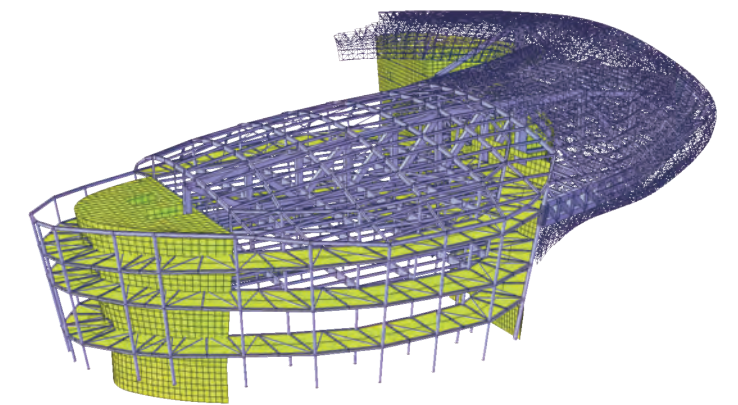
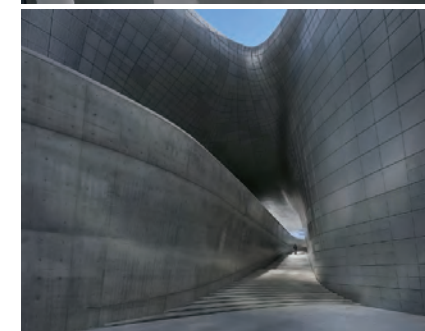
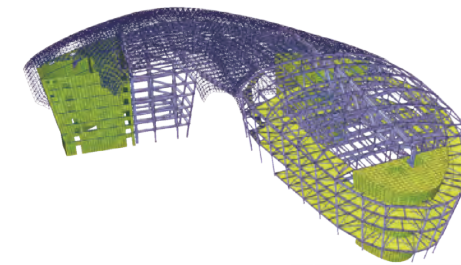
## Main features used in this application



- Fibre reinforced concrete analysis
- Linear dynamic analysis with response spectrum

## Description on this project

The DDP has been designed as a cultural hub at the center of Dongdaemun, a historic district of Seoul that is now renowned for 24-hour shopping and cafes. DDP is a place for people of all ages as a catalyst for the instigation and exchange of ideas and for new technologies and media to be explored. The variety of public spaces within DDP includes art/exhibition halls, conference hall, design museum/exhibition hall/pathway and ect. Like this, DDP is enable to present the widest diversity of exhibitions and events that feed the cultural vitality of the city.



## SAMOO Architects & Engineers

Address	295, Olympic-ro, Songpa-gu, Seoul, 05510, Korea
Introduction	SAMOO Architects & Engineers is a global architecture company which provides a total solution covering from architectural, urban, interior, sustainable design to engineering. Since 1976, SAMOO has completed about 8,000 projects. The more than 100 award winning records explains SAMOO's design competence which has been refined throughout the last 40 years.
Website	<a href="http://www.samoo.com">www.samoo.com</a>

# Dubai Pearl Project

Dubai, UAE



Owner	MGM Mirage
General Contractor	Al Habtoor Leighton Group
Architect	Schweger Associated Architects
Engineering Consultant	e-Construct
Construction Period	Under Construction
Type of Project	Mixed-use Building
Size of Structure	300m Height (73-story)



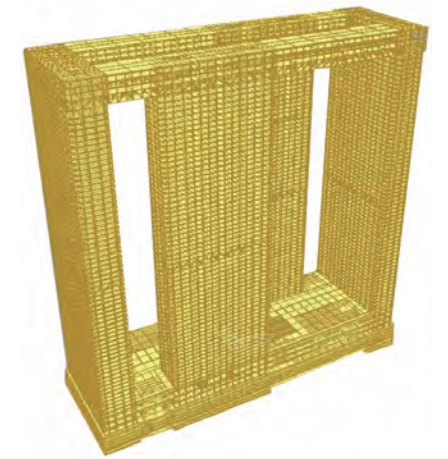
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- RC building design as per ACI318

## Description on this project

The building is a world class, mixed-use, 6,700km<sup>2</sup> (22million ft<sup>2</sup>) integrated development by Pearl Dubai FZ LLC. The development will ultimately provide a home for approximately 29,000 people. Dubai Pearl's initial handover is scheduled to commence in 2018.



## e-Construct

**Address** Suite 203, Building 4 Dubai Internet City P.O. Box 500288 Dubai, UAE

**Introduction** e-Construct is an engineering firm that is focused on providing cost effective engineering solutions to design bridges, high-rise buildings, precast concrete engineering and post-tensioning design.

**Website** [www.econstruct.ae](http://www.econstruct.ae)

**Email** [info@econstruct.ae](mailto:info@econstruct.ae)

# Shanghai Center Building

Shanghai, China



<b>Owner</b>	JOINT VENTURE ASTALDI - FCC
<b>General Contractor</b>	Shanghai Central Building Construction and Development
<b>Architect</b>	Gensler / Tongji Architectural Design Group
<b>Engineering Consultant</b>	Thornton Tomasetti
<b>Construction Period</b>	2008 - 2015
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	632m Height (124-story)



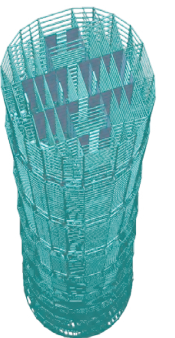
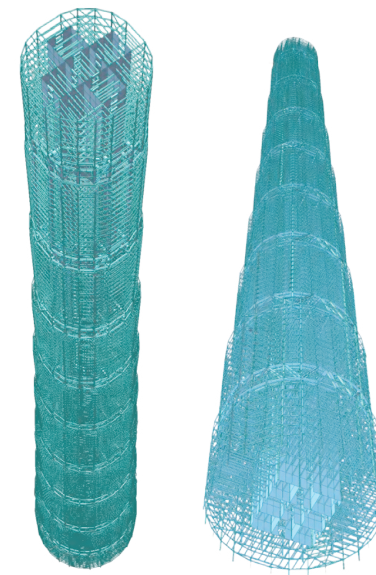
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear dynamic analysis with response spectrum
- Equivalent wind load simulation

## Description on this project

At 632m, Shanghai Tower became China's tallest building and the second tallest building in the world in 2015. The mixed-use development comprises 380,000m<sup>2</sup> and includes Class A office space, retail, a luxury hotel, 2,200-seat arena, and connections to the Shanghai Metro and three floors of below-grade parking. It also features the world's highest non-enclosed observation deck. The tower features a twisting triangular form with a façade that curves 120 degrees from its base. Its structural system consists of a 90-by-90-foot concrete core connected to a system of outriggers and super columns supported on 1,079 concrete and steel bore piles driven deep into ground. The outrigger trusses and super columns derive stiffness from the concrete inner building, comprising an effective system for resisting wind and seismic loads for supertall buildings.



## Thornton Tomasetti

<b>Address</b>	398 Han Kou Road Room 1601, Shanghai 200001, China
<b>Introduction</b>	Thornton Tomasetti is an American 1,200+ person structural engineering consulting firm headquartered in New York City. The company has expertise in structural engineering, façade engineering, forensics, renewal, construction engineering, property loss consulting, sustainability, applied science, protective design and transportation.
<b>Website</b>	<a href="http://www.thorntontomasetti.com">www.thorntontomasetti.com</a>

# Hanoi Landmark Tower

Hanoi, Vietnam



Owner	AON BGN
General Contractor	Kyungnam Enterprise
Architect	Heerim Architects & Planners
Engineering Consultant	Dong Yang Structural Engineers / MIDAS IT
Construction Period	2008 - 2012
Type of Project	Mixed-use Building
Size of Structure	349m Height (72-story)



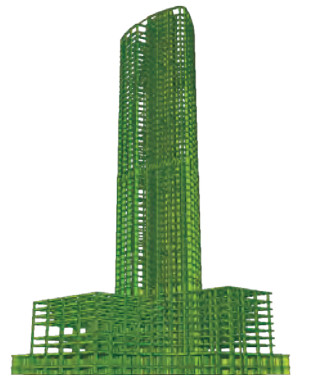
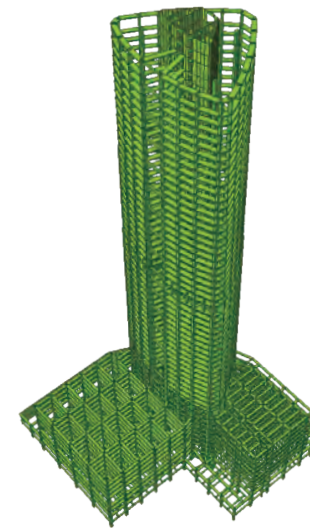
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- RC building design

## Description on this project

Upon completion in 2012, it was the tallest building in Vietnam and was a redefining moment for the city of Hanoi, which at the time had very few tall buildings. The 72 story building is comprised of offices and is the tallest in a three building complex featuring two 49 story residential towers with curved facades to maximize views. In order to construct the complex in the soft soils of Hanoi, 980 piles with diameters of up to two across are drilled deep underground in a process which took longer than one full year during the construction phase. The reinforced concrete frame of the 72 story tower utilizes post-tensioning which allowed the structure to rise as quickly as of one floor every five days, a rate which is faster than what would have occurred with conventional construction techniques.



## Dong Yang Structural Engineers

Address	7 Beopwon-ro 11-gil Tower C Suite 1101, Songpa-gu, Seoul 05836, Korea		
Introduction	Dongyang is a Korean engineering firm with technical know-how in structural design, maintenance inspections, management, and BIM. Over the past 30-plus years, Dongyang has participated in and collaborated on a wide variety of projects, focusing primarily on high-rise building projects, optimizing systems in consideration of economic feasibility and constructability.		
Website	www.dysec.co.kr	Email	dy@dysec.co.kr

# Guangzhou Twin Tower

Guangzhou, China



<b>Owner</b>	Guangzhou Plan Government
<b>General Contractor</b>	Guangzhou Municipal Construction Group / China State Construction Engineering
<b>Architect</b>	Wilkinson Eyre Architects
<b>Engineering Consultant</b>	Arup / South China Design Institute
<b>Construction Period</b>	2006 - 2010
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	438m Height (103-story)



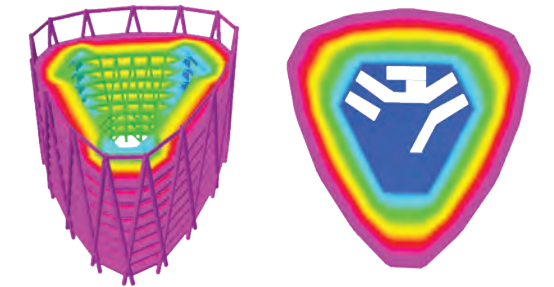
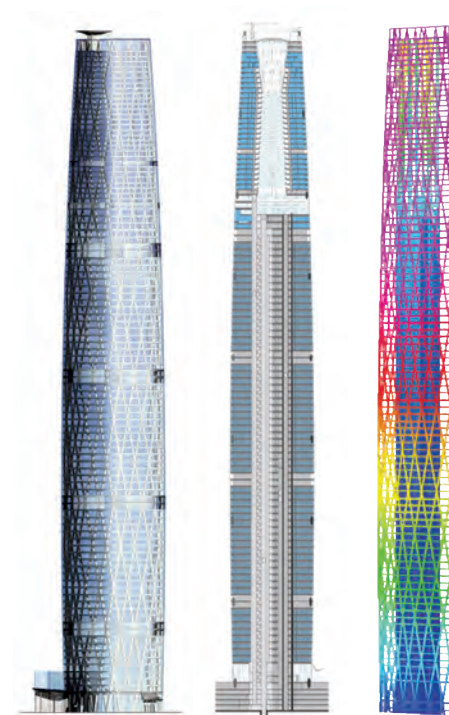
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear dynamic analysis with response spectrum

## Description on this project

It is a tower which defines the emerging international strength of China's third largest city and serves as a landmark for Guangzhou Zhujiang New Town's main axis, which links the commercial district in the north with the Pearl River to the south. Its elegant simplicity belies the complex geometry of form and structure which makes it possible. Each of the three façades of the curved triangular plan is also curved in section with a radius of 5.1km set out asymmetrically with the widest point at a third of the height, tapering to its narrowest point at the top. There is no spire, and the three curved façades continue up beyond the highest floor and, in some views, seems to disappear to infinity. The inside of this atrium, with its crystalline geometry, sparkles with abundant daylight.



## Arup

<b>Address</b>	Room 1301, Tower A Center Plaza 161 Linhexi Road Tianhe District, Guangzhou 510620, China		
<b>Introduction</b>	Arup is a multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 14,000 staffs based in 92 offices across 42 countries, and has participated in projects in over 160 countries.		
<b>Website</b>	www.Arup.com	<b>Email</b>	guangzhou@Arup.com

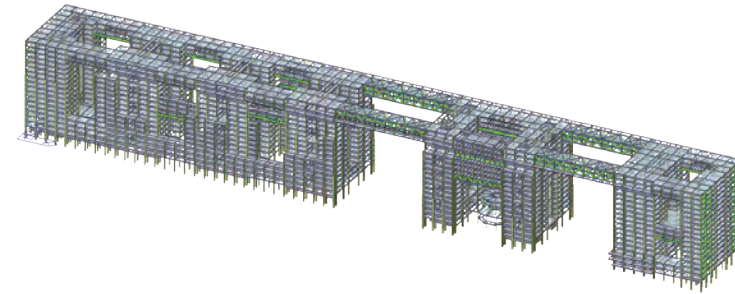
# Zhongguang Guanggu Star - Zhongjian Courtyard

midas Gen



## Wuhan, China

<b>General Contractor</b>	Central-Southern China Engineering Consulting and Design Group
<b>Engineering Consultant</b>	CITIC
<b>Construction Period</b>	In Design Phase
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	87m Height (21-story)



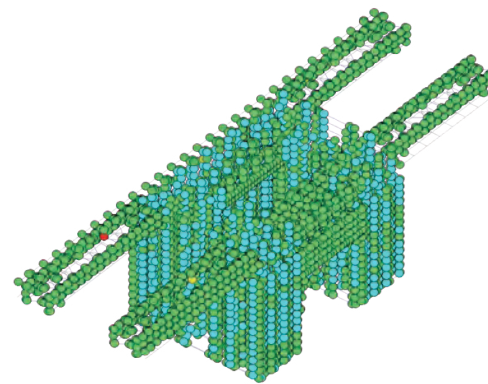
### Main features used in this application



- Nonlinear dynamic analysis with plastic hinges
- Steel frame design

### Description on this project

Zhongguang Guanggu Star is located in the East Lake High-tech Zone. It includes Administrative service center, Wuhan Science and Technology Exhibition Center and the Provincial Science and Technology Museum. It was built in the area of 67,000m<sup>2</sup>.



### CITIC

<b>Address</b>	Capital Mansion, 6 Xinyuannanlu, Chaoyang District, Beijing 100004, China		
<b>Introduction</b>	Founded in 1952, CITIC is one of the large state-owned design agencies in China. Also, the firm has certified one of the top engineering company in China with qualified certificates. With those qualification, they can operate design projects of commercial inside and outside the ministry.		
<b>Website</b>	www.citic.com	<b>Email</b>	contact@citic.com

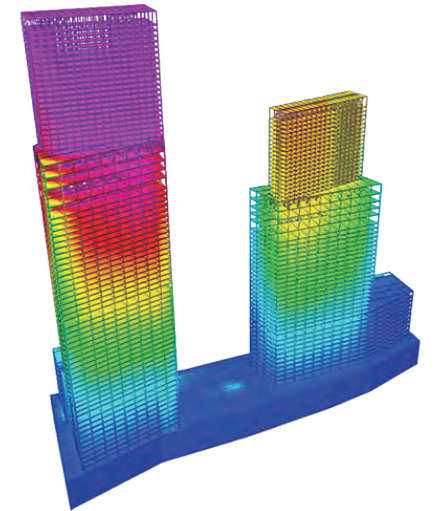
# Taipei Twin Tower

midas Gen



## Taipei, Taiwan

<b>Owner</b>	Taipei City Council
<b>General Contractor</b>	Joint Development Projects
<b>Engineering Consultant</b>	Evergreen Consulting Engineering
<b>Architect</b>	Fumihiko Maki
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	332m Height (76-story)



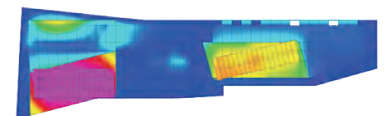
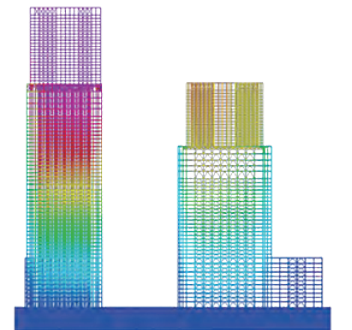
### Main features used in this application



- Construction stage analysis
- Steel frame design as per TWN-LSD

### Description on this project

Taipei Twin Tower is a supertall skyscraper development in Taipei, Taiwan. It includes two skyscrapers (C1 and D1). When completed, it will be the 2<sup>nd</sup> tallest building in Taipei. The basement of C1 will be the terminus for the Taoyuan International Airport Access MRT System.



### Evergreen Consulting Engineering

<b>Address</b>	10F, 63 Anhe Rd. Sec. 2, Taipei 106, Taiwan		
<b>Introduction</b>	Evergreen Consulting Engineering mainly provides structural engineering services. Evergreen is ranked No. 10 in a list of 'top structural engineers - design' by CTBUH, since they designed Taipei 101 and T&C Tower 85 in Kaohsiung listed in the world's tallest 100 buildings.		
<b>Website</b>	www.egc.com.tw	<b>Email</b>	egc@egc.com.tw

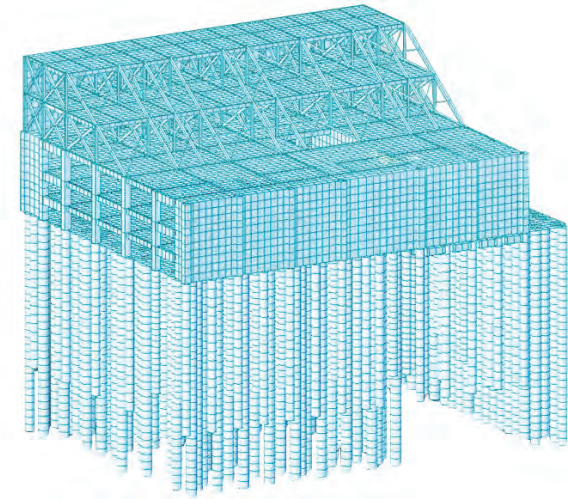
# World Trade Center

midas Gen



## Bucharest, Romania

**Engineering Consultant** STRUCON PROJECT  
**Construction Period** Completed in 2013  
**Type of Project** Mixed-use Building  
**Size of Structure** 64m Height



### Main features used in this application



- Dynamic analysis
- Soil structure interaction analysis

### Description on this project

World Trade Center Constanta is located in Bucharest city of Romania. Located in the heart of Constanta, in downtown area, with access to Traian street and it is very close to the tourist part of the city, the Tomis Harbor, the beach and the promenade area.

#### STRUCON PROJECT

**Address** B-dul. Corneliu Coposu no. 3 bl. 101, sc. 4, level 7, 030167, Romania

**Introduction** S.C STRUCON PROIECT is a structural engineering company. They design to Euro, British, US and SNIP codes of practice and adopt these codes to suit local conditions and practice in other countries from Middle East and Asia.

**Website** [www.struconproiect.ro](http://www.struconproiect.ro) **Email** [marketing@strucon.ro](mailto:marketing@strucon.ro)



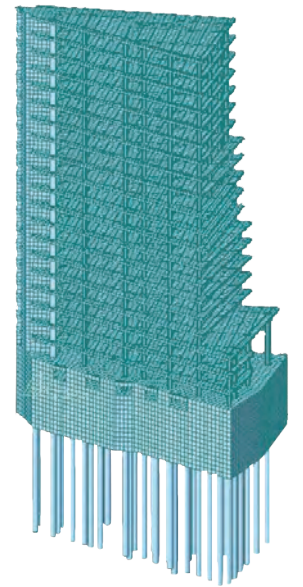
# Borak Zahir Tower

midas Gen



## Dhaka, Bangladesh

**Engineering Consultant** STRUCON PROJECT  
**Construction Period** Completed in 2013  
**Type of Project** Mixed-use Building  
**Size of Structure** 64m Height (18-story)



### Main features used in this application



- Linear static analysis with finite elements
- Soil structure interaction analysis
- Linear dynamic analysis with response spectrum

### Description on this project

It is a commercial skyscraper complex in Dhaka, Bangladesh that is one of the tallest completed buildings in the country. The tower is located at Pantha Path in Dhaka. The construction was completed and the towers were inaugurated in 2013.

#### STRUCON PROJECT

**Address** B-dul. Corneliu Coposu no. 3 bl. 101, sc. 4, level 7, 030167, Romania

**Introduction** S.C STRUCON PROIECT is a structural engineering company. They design to Euro, British, US and SNIP codes of practice and adopt these codes to suit local conditions and practice in other countries from Middle East and Asia.

**Website** [www.struconproiect.ro](http://www.struconproiect.ro) **Email** [marketing@strucon.ro](mailto:marketing@strucon.ro)



# Sai World City

midas Gen



## Panvel, India

<b>Owner</b>	Paradise Lifespaces
<b>General Contractor</b>	Bhavika Enterprises
<b>Architect</b>	Dimensions
<b>Engineering Consultant</b>	Structural Concept
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	120m Height



### Main features used in this application



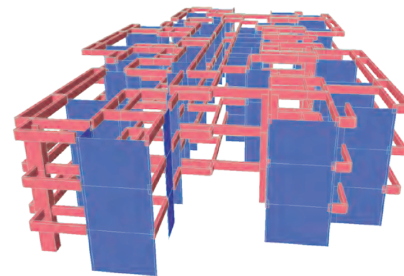
- Frame + shear wall system building
- RC design as per IS 456 & 1893

### Description on this project

The structure known as Sai World City is spread across 43 acres with 13 towers of 40 story each. The structural system is a combination of shear walls and columns. The slab cycle achieved is of 7 days.

### Structural Concept

<b>Address</b>	803, Maithali's Signet, Sector 30A, Vashi, Navi Mumbai, Maharashtra, 400705, India		
<b>Introduction</b>	Structural Concept Designs was established in 2001 at Navi Mumbai. The firm provides a full range of structural engineering services from concept to construction. Also, the firm helps in creating high performance and durable concrete aids in and economical structures.		
<b>Website</b>	<a href="http://www.structuralconcept.com">www.structuralconcept.com</a>	<b>Email</b>	<a href="mailto:strconcept@gmail.com">strconcept@gmail.com</a>



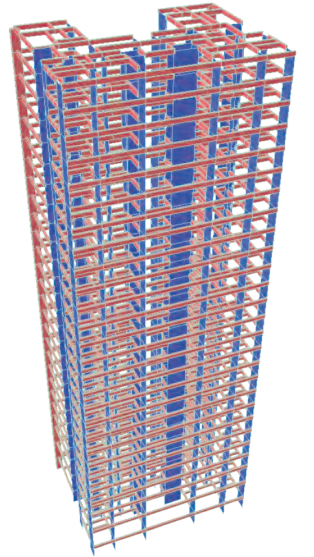
# Sky Lounge

midas Gen



## Kalyan, India

<b>General Contractor</b>	K. K. Enterprises
<b>Architect</b>	A Cube Architects
<b>Engineering Consultant</b>	Structural Concept
<b>Construction Period</b>	2013 - 2015
<b>Type of project</b>	Mixed-use Building
<b>Size of Structure</b>	75m Height (22-story)



### Main features used in this application



- RC building design as per IS 456 & 1893

### Description on this project

The structure known as sky lounge is mixed-used building. Ground and first floor are for commercial use, second to fourth floors for parking and fifth to 22<sup>nd</sup> floors for residential use. The USP of the project is the wave form elevational treatment and the lounge on the terrace floor.

### Structural Concept

<b>Address</b>	803, Maithali's Signet, Sector 30A, Vashi, Navi Mumbai, Maharashtra, 400705, India		
<b>Introduction</b>	Structural Concept Designs was established in 2001 at Navi Mumbai. The firm provides a full range of structural engineering services from concept to construction. Also, the firm helps in creating high performance and durable concrete aids in and economical structures.		
<b>Website</b>	<a href="http://www.structuralconcept.com">www.structuralconcept.com</a>	<b>Email</b>	<a href="mailto:strconcept@gmail.com">strconcept@gmail.com</a>



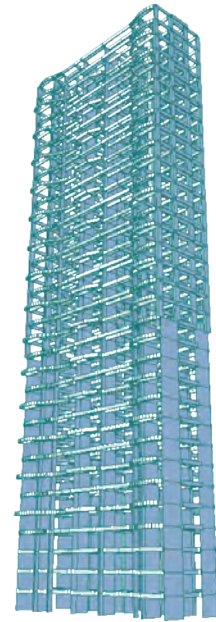
# Atlantis

midas Gen



## Ghansoli, India

<b>Engineering Consultant</b>	B & M Buildcon
<b>General Contractor</b>	N. P. Enterprises
<b>Architect</b>	Dimensions
<b>Engineering Consultant</b>	Structural Concept
<b>Construction Period</b>	2014 - 2016
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	110m Height (32-story)



### Main features used in this application



- RC design as per IS 456 & 1893
- Combination of shear walls and columns as structural system

### Description on this project

The project is a mixed-use structure for commercial and residential composed of 3 towers. Ground floor is for commercial and parking, first and second floors are for parking, third floor is for podium garden and recreational spaces and fourth to 32<sup>nd</sup> floors are for residential use.

### Structural Concept

<b>Address</b>	803, Maithali's Signet, Sector 30A, Vashi, Navi Mumbai, Maharashtra, 400705, India		
<b>Introduction</b>	Structural Concept Designs was established in 2001 at Navi Mumbai. The firm provides a full range of structural engineering services from concept to construction. Also, the firm helps in creating high performance and durable concrete aids in and economical structures.		
<b>Website</b>	www.structuralconcept.com	<b>Email</b>	strconcept@gmail.com



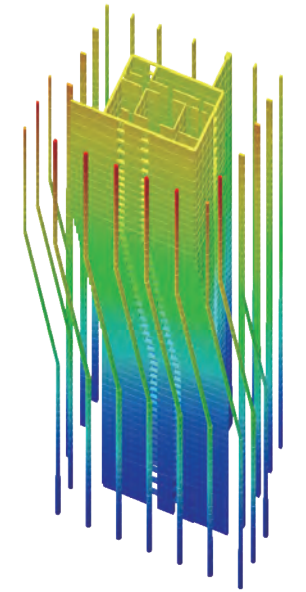
# Songdo the # Central Park 2

midas Gen



## Incheon, Korea

<b>Owner</b>	New Songdo International City Development (Gale International and POSCO E&C)
<b>General Contractor</b>	POSCO E&C
<b>Architect</b>	Dongill Arch / HOK
<b>Engineering Consultant</b>	MIDAS IT
<b>Construction Period</b>	2007 - 2011
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	175m Height (47-story)



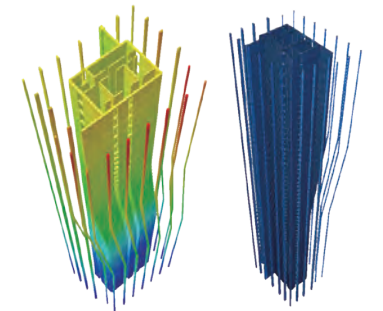
### Main features used in this application



- Construction stage analysis
- Linear dynamic analysis with response spectrum

### Description on this project

The # Central Park II is a collection of 632 luxury residential units with retail on the first three levels. Overlooking Songdo Central Park, these premium residences are part of Songdo IBD's planned 22,500 housing units.



### MIDAS IT

<b>Address</b>	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea		
<b>Introduction</b>	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.		
<b>Website</b>	www.midasuser.com	<b>Email</b>	info@midasit.com



# Rolex Tower

midas Gen



## Dubai, UAE

<b>Owner</b>	Ahmed Seddiqi & Sons
<b>General Contractor</b>	Dubai Contracting Company
<b>Architect</b>	Skidmore, Owings & Merrill
<b>Engineering Consultant</b>	e-Construct / Skidmore, Owings & Merrill
<b>Construction Period</b>	2007 - 2010
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	247m Height (60-story)



### Main features used in this application



- Construction stage analysis for column shortening
- RC building design as per ACI318

### Description on this project

Rolex Tower is a prominent high-rise building designed with a quiet urbanity in response to the street's exuberance, the project sets a standard for new high rise buildings in Dubai after its construction. The tower is divided into office and residential stories.



### e-Construct

**Address** Suite 203, Building 4 Dubai Internet City P.O. Box 500288 Dubai, UAE

**Introduction** e-Construct is an engineering firm that is focused on providing cost effective engineering solutions to design bridges, high-rise building, precast concrete engineering and post-tensioning design.

**Website** [www.econstruct.ae](http://www.econstruct.ae) **Email** [info@econstruct.ae](mailto:info@econstruct.ae)

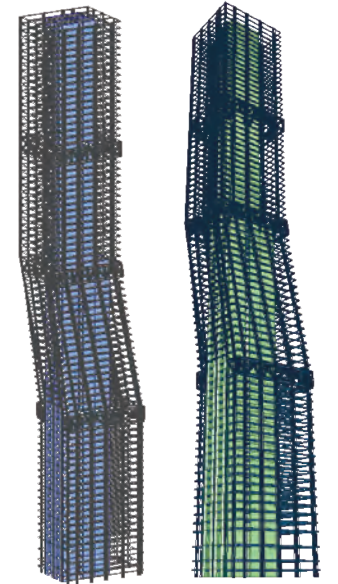
# Signature Tower

midas Gen



## Dubai, UAE

<b>Owner</b>	Dubai Properties
<b>Architect</b>	Zaha Hadid Architects
<b>Engineering Consultant</b>	Meinhardt Engineering / e-Construct / MIDAS IT
<b>Construction Period</b>	Stale Proposal
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	357m Height (78-story)



### Main features used in this application



- Construction stage analysis for column shortening
- RC building design as per ACI318

### Description on this project

Signature tower is composed of three towers, mixed-use complex in Dubai, UAE. It's designed by Zaha Hadid Architects. With the 3 buildings, the project would include a new building, the Dubai Financial Market, a large podium containing retail space and a pedestrian bridge crossing the creek extension.

### e-Construct

**Address** Suite 203, Building 4 Dubai Internet City P.O. Box 500288 Dubai, UAE

**Introduction** e-Construct is an engineering firm that is focused on providing cost effective engineering solutions to design bridges, high-rise building, precast concrete engineering and post-tensioning design.

**Website** [www.econstruct.ae](http://www.econstruct.ae) **Email** [info@econstruct.ae](mailto:info@econstruct.ae)



# Yeouido S-Trenue

midas Gen



Seoul, Korea

<b>Owner</b>	SK Networks
<b>General Contractor</b>	SK E&C
<b>Architect</b>	Mass Studies
<b>Engineering Consultant</b>	Junwoo Structure
<b>Construction Period</b>	2006 - 2009
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	154m Height (36-story)

## Main features used in this application



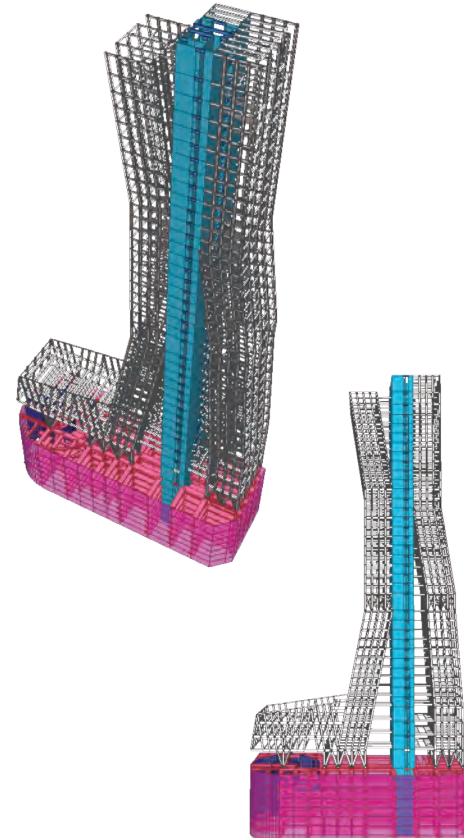
- Construction stage analysis with creep and shrinkage
- Composite action for SRC columns
- Wall elements for core walls

## Description on this project

located in Yeouido, the building maximizes its allowable height, giving the tower a challenging slenderness ration of 1:8. The core tower is of reinforced concrete construction whilst the two side towers are steel. With the core tower at the center, the slimmer steel construction towers lean at varying angles but maintain structural soundness.

### Junwoo Structure

<b>Address</b>	2F Bokrim Building, Dogok 1dong 543-4 Gangnam-Gu, Seoul, Korea
<b>Introduction</b>	Junwoo Structure was found in 1987 and specialized in high-rise building and large scales building. It has more than 800 experiences in the field of structural design as well as ones of abroad projects.
<b>Email</b>	bsjeon@jnp21.com



# Songdo Centroad

midas Gen



Incheon, Korea

<b>General Contractor</b>	POSCO E&C
<b>Architect</b>	Gansam / Heerim Architects & Planners
<b>Engineering Consultant</b>	MIDAS IT / POSCO E&C
<b>Construction Period</b>	2008 - 2011
<b>Type of Project</b>	Mixed-use Building
<b>Size of Structure</b>	190m Height (45-story)

## Main features used in this application



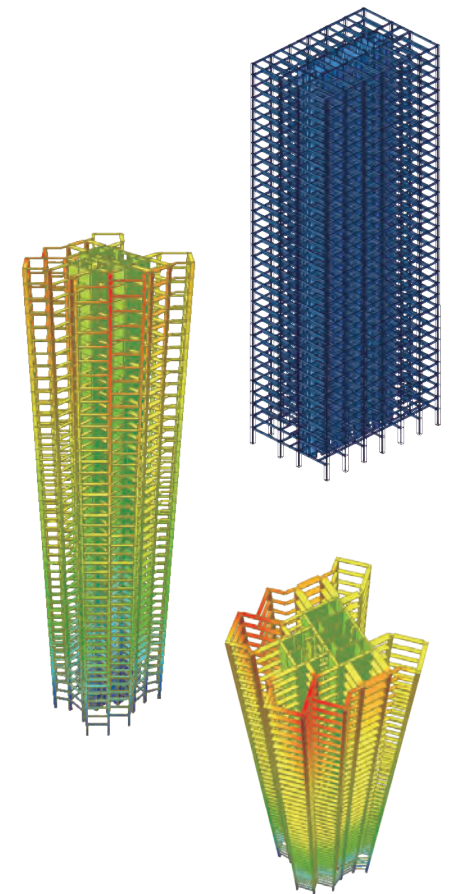
- Construction stage analysis with creep and shrinkage
- RC building design as per KCI-USD

## Description on this project

Songdo Centroad is composed of 3 buildings. Building A (45 floors) and B (34 floors) are office buildings and building C (33 floors) is a residential building. The buildings were completed in 2011 with a total floor area of 201,952m<sup>2</sup>. Total construction cost was 370 billion won.

### MIDAS IT

<b>Address</b>	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea
<b>Introduction</b>	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.
<b>Website</b>	www.midasuser.com
<b>Email</b>	info@midasit.com



# Unicredit Tower

Milan, Italy



Owner	INES ITALIA SGR SPA
General Contractor	COLOMBO COSTRUZIONI S.P.A.
Architect	Pelli Clarke Pelli Architects
Engineering Consultant	MSC Associati
Construction Period	2008 - 2012
Type of Project	Office Building
Size of Structure	230m Height (37-story)



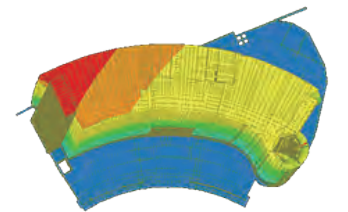
## Main features used in this application



- Construction stage analysis
- Finite element model for slabs and walls
- Linear dynamic analysis with response spectrum

## Description on this project

The Unicredit headquarter is a complex of three towers, comprising the largest components of Porta Nuova Garibaldi, a seven-hectare, mixed-use development north of Milan's city center. Also, they redevelop the abandoned railyards adjacent to Stazione Garibaldi, forming a new gateway to the city. Spiraling upward, the asymmetrical main tower culminates in a sculptural, stainless steel spire. Like the two smaller towers, the building is clad in reflective glass. Their narrow, curved forms enclose Piazza Gae Aulenti, a new public space. Facing the piazza, the facades incorporate sunshades, emphasizing the buildings' fluid shape.



## MSC Associati

Address	via cialdini 37 ang. via montanari 20161 Milano, Italy		
Introduction	MSC Associati was established in 1961 and is configured as a design and consulting company which is active in the fields of architecture, urban planning and civil engineering. The company employs staffs of about 30 technicians who can operate in a wide range of activities. MSC Associati can provide modular services according to the client's needs, from specialized consulting to the engineering.		
Website	www.mscassociati.it	Email	milano@mscassociati.it

# Moscow City Palace Tower

Moscow, Russia



<b>Owner</b>	City-Palace LLC / ZAO Snegiri Development / Transneft
<b>General Contractor</b>	Renaissance Construction Company
<b>Architect</b>	GCorproject / RMJM
<b>Engineering Consultant</b>	GK-Techstroy
<b>Construction Period</b>	2008 - 2015
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	245m Height (58-story)



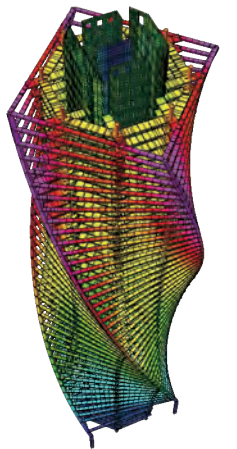
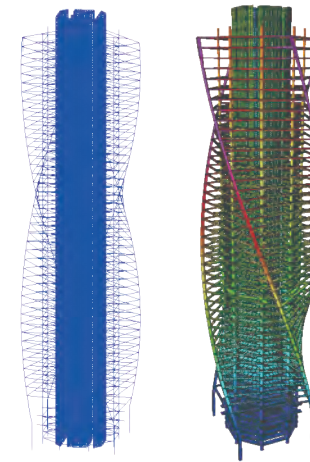
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear dynamic analysis with response spectrum

## Description on this project

The tower has become Moscow City's new architectural landmark. Inspired by the images of St. Basil's Cathedral and Tatlin's tower, the evolutionary spiral building structure represents the idea of progress and future. The project got short-listed in MIPIM 2016, where the world's best real estate projects are selected. The building combines state-of-the-art engineering technologies and features of Russian architectural style. Each of the 54 floors is constantly twisted by 3° whilst being arranged around the central core of the building lets the skyscraper experience an elegant rotation in a clockwise direction from the base to the top by more than 150°.



## GK-Techstroy

**Address** ul. Petrovka, d. 15/13, building 5, 107031 Moscow, Russia

**Introduction** The company was founded in 2000. They engage in a full range of design projects of constructive part of production, residential and public buildings, including the unique objects.

**Website** [www.gktechstroy.ru](http://www.gktechstroy.ru)

**Email** [Gkinfo@gktechstroy.ru](mailto:Gkinfo@gktechstroy.ru)

# Ping An International Finance Center Tower

Shenzhen, China



Owner	Ping An Life Insurance Company of China
General Contractor	China Construction First Group Construction & Development
Architect	Kohn Pedersen Fox Associates
Engineering Consultant	CCDI / Thornton Tomasetti
Construction Period	2010 - 2017
Type of Project	Office Building
Size of Structure	599m Height (115-story)



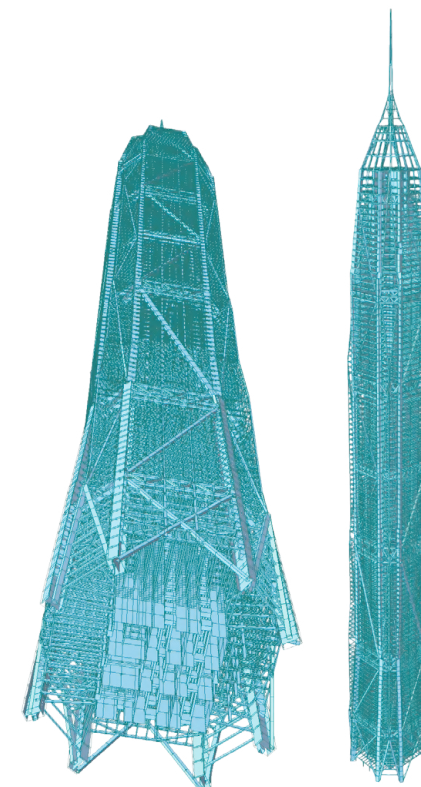
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear dynamic analysis with response spectrum

## Description on this project

Ping An International Finance Center Tower will become the second tallest building in China, at 599m. This building is a 115 story office tower consisting of offices, support facilities, a conference center, retail and parking. The selected structural system consists of a composite concrete core with steel outriggers connecting to eight super-columns. The exterior frame is composed of seven double layer belt trusses located at the mechanical and refugee floors. The exterior belt trusses are interconnected with a super diagonal at each exterior face of the building. The project also includes a steel-framed 11-story podium with high-end shopping arcades, restaurants and roof-top cafes.



## CCDI

**Address** CCDI GROUP Building, No.1758, Siping Road, Shanghai, 200433, China

**Introduction** Founded in 1994, CCDI is a large global architecture and engineering consulting firm that provides integrated professional services for urban construction and development. Its business units cover broad industry sectors with diverse specialized expertise. CCDI operates cross-regionally with main offices in Shanghai, Beijing, Shenzhen, Chengdu, Sydney, New York, Qingdao and Suzhou.

**Website** [en.ccdi.com.cn](http://en.ccdi.com.cn)

# Bewtech Office Building

Bangkok, Thailand



Owner: Bewtech  
Engineering Consultant: Umbau  
Construction Period: Completed in 2014  
Type of Project: Office Building  
Size of Structure: 3-story



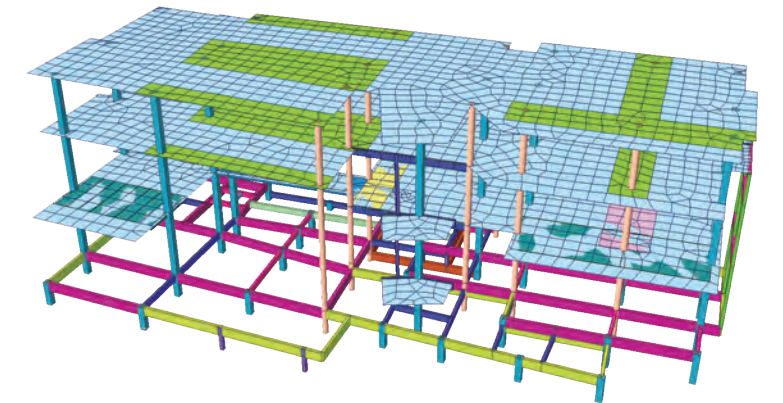
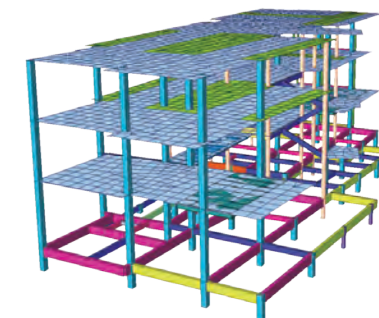
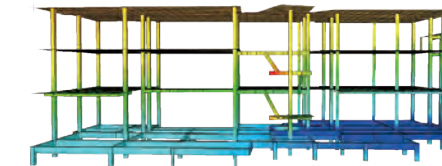
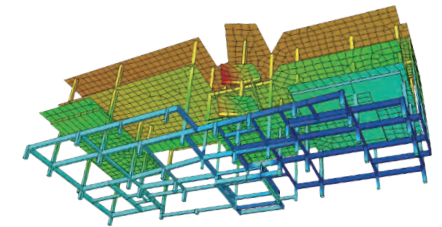
## Main features used in this application



- Concrete design as per ACI318
- Linear static analysis with finite elements

## Description on this project

This building is composed of 3 stories. Regarding of structure, meshed plate elements were used with auto-mesh generation feature in order to simulate irregular shape of slab. Also, void entrance with piloti and glass façade provides open and bright space from a design point. With the excellence of the design of the building from its irregular shape, this building is also actively showed in local broadcast shootings.



## Umbau

**Address** 3/49 Prachaniwet Building 1, floor, Nimitmai Nua, Chatuchak, Bangkok 10900, Thailand

**Introduction** Umbau is an architectural design services provider for structural engineering design, electrical system, air conditioning and construction management. Design services of all types of construction such as residential buildings, special-purpose plant buildings and advertising signposts for building structure design.

**Website** [www.umbau.com](http://www.umbau.com)

**Email** [webmaster@umbau.com](mailto:webmaster@umbau.com)

# Shibata City Hall

midas Gen



## Shibata, Japan

<b>General Contractor</b>	Taisei Shibata Ito Joint Venture
<b>Architect</b>	aat+makoto yokomizo architects, Inc.
<b>Engineering Consultant</b>	Arup
<b>Construction Period</b>	2014 - 2016
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	34m Height (8-story)

### Main features used in this application



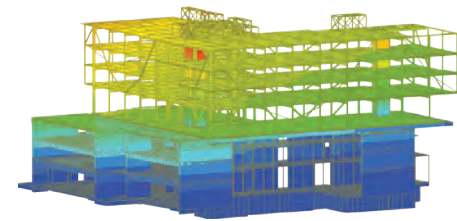
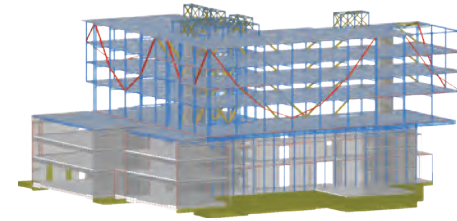
- Steel structure (upper structure) + reinforced concrete
- Construction partially striking post tension (lower structure) + base isolation structure (3rd wall head)
- Basic structure: piled raft (deep soil improvement + prepared concrete pile)

### Description on this project

The new city hall project of Shibata, Niigata has 400 years of history as a castle town. This project is expected to become activation of a central city area, and a starting point on which a tourist takes a walk. The building consists of three layers. The high part is a work room which appears like white clouds. The medium-rise part is a parliamentary function. The low layer part has a citizen service function. There is a half-outdoor open space called "FUDANOTSUJI" in the first floor.

#### Arup

<b>Address</b>	3F, Tobu Fuji Building, 24-4 Sakuragaoka-cho, Shibuya-Ku, Tokyo 150-0031, Japan
<b>Introduction</b>	Arup is a multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 14,000 staffs based in 92 offices across 42 countries, and has participated in projects in over 160 countries.
<b>Website</b>	www.Arup.com
<b>Email</b>	tokyo@Arup.com



# Xiamen International Center

midas Gen



## Xiamen, China

<b>Owner</b>	Winland Group
<b>General Contractor</b>	China Construction Six Engineering Division (CSCEC 6 <sup>th</sup> Bureau)
<b>Architect</b>	Gensler
<b>Engineering Consultant</b>	ISA Architecture
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	344m Height (72-story)

### Main features used in this application



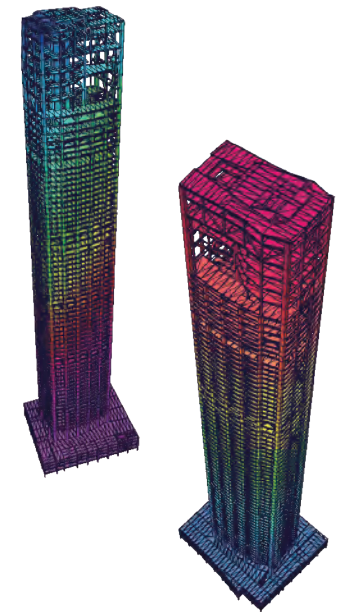
- Construction stage analysis
- Linear static analysis with finite elements

### Description on this project

The building is located on the western side of Xiamen Island in the Siming District. For the majority of its height, the building is curved outward on its northwest and southeast elevations. As it reaches its pinnacle, an aperture disrupts the outwardly curved façade, which then curves inward along the building's final stories. This interplay between convex and concave forms imparts a sense of dynamism and tension. The gap in the building runs through the northwest and southeast elevations, where a traversable ledge extends beyond the exterior wall for unparalleled views of the strait and mainland China.

#### ISA Architecture

<b>Address</b>	No.258 Shimen Road(No.2), 200041, Shanghai, China
<b>Introduction</b>	ISA Architecture was founded in 1953. It is a leading international architectural, construction design, urban planning and engineering institute. ISA is also committed to green building and sustainable urban development. They handle with international and local long-term integration of architectural harmony with the environment.
<b>Website</b>	www.isaarchitecture.com
<b>Email</b>	isa@isaarchitecture.com



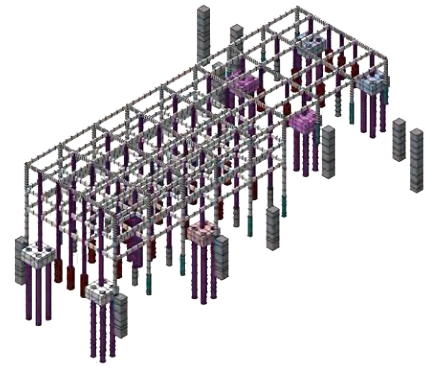
# Park Place Office Tower

midas Gen



Yueyang, China

<b>Owner</b>	Shanghai Cross Ocean Property & Development
<b>General Contractor</b>	Shanghai Cross Ocean Property & Development
<b>Engineering Consultant</b>	CCTEG Chongqing Engineering
<b>Construction Period</b>	Completed in 2008
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	198m Height (43-story)



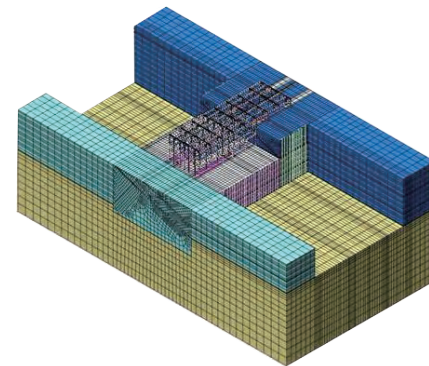
## Main features used in this application



- Construction stage
- Implanted truss
- Nonlinear analysis

## Description on this project

Park Place Office Tower covers an area of about 21,000m<sup>2</sup>, from a 43-story Grade A office building, 5-story international brand and high-end leisure, the theme of shopping and shopping malls and 24-story super five-star boutique hotel composition, is expected to be completed in 2010 as a whole, 1 Division to provide 60 sets of Hitachi Electric (Fu) ladder. After the completion of the Shanghai area is another landmark and premier high-grade office buildings.



## CCTEG Chongqing Engineering

<b>Address</b>	District Daping (Majiabao) two Yangtze River Road 179, Chongqing city, Yuzhong 400016, China		
<b>Introduction</b>	CCTEG Chongqing Engineering Co., Ltd. was established in 1953. Coal Design Institute in the industry has been formed in the engineering survey, design, supervision and construction general contracting as the main body, leading to the construction, municipal, industrial and environmental protection in the industry pattern, the remarkable results were achieved in all fields.		
<b>Website</b>	www.cqmsy.com	<b>Email</b>	cqmsy@cqmsy.com



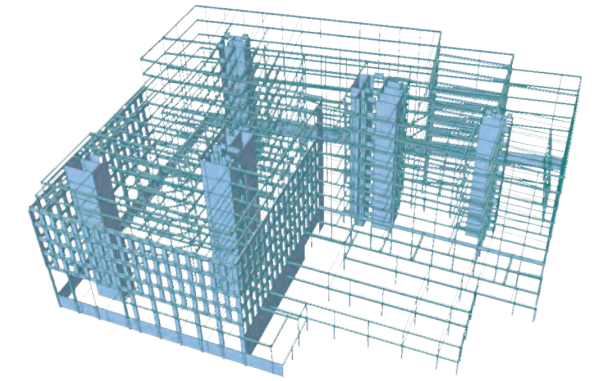
# NCC Office Building

midas Gen



Stockholm, Sweden

<b>Owner</b>	NCC
<b>General Contractor</b>	NCC
<b>Architect</b>	White
<b>Engineering Consultant</b>	NCC
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	38,000m <sup>2</sup>



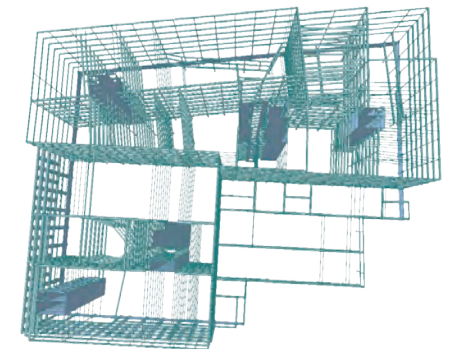
## Main features used in this application



- Linear static and nonlinear dynamic analyses
- Construction stage analyses
- Dimensioning steel and concrete structures

## Description on this project

The NCC Buildings are three connected office buildings with commercial premises at the ground floor as well as public premises and services for the users of the offices.



## NCC

<b>Address</b>	Vallgatan 3, 170 80 Solna, Sweden		
<b>Introduction</b>	NCC is one of the leading construction and property development companies in the Nordic Region. With the Nordic region as its home market, NCC is active throughout the value chain - developing and building residential and commercial properties, and constructing industrial facilities and public buildings, roads, civil engineering structures and other types of infrastructure.		
<b>Website</b>	www.ncc.se	<b>Email</b>	info@ncc.se



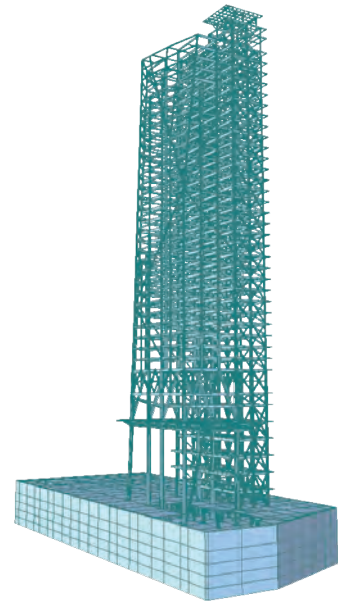
# POSCO E&C Tower

midas Gen



Incheon, Korea

<b>Owner</b>	POSCO E&C
<b>General Contractor</b>	POSCO E&C
<b>Engineering Consultant</b>	MIDAS IT
<b>Construction Period</b>	2007 - 2010
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	185m Height (39-story)



## Main features used in this application



- Construction stage analysis
- Linear dynamic analysis with response spectrum
- Steel frame design as per KSSC-LSD

## Description on this project

POSCO E&C Tower is a twin-tower building with a floor space of 148,790m<sup>2</sup>, each with five basement floors and 39 aboveground floors. The class A office space can accommodate 3,200 workers and features 1,124 parking spaces.

### MIDAS IT

<b>Address</b>	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea		
<b>Introduction</b>	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.		
<b>Website</b>	www.midasuser.com	<b>Email</b>	info@midasit.com



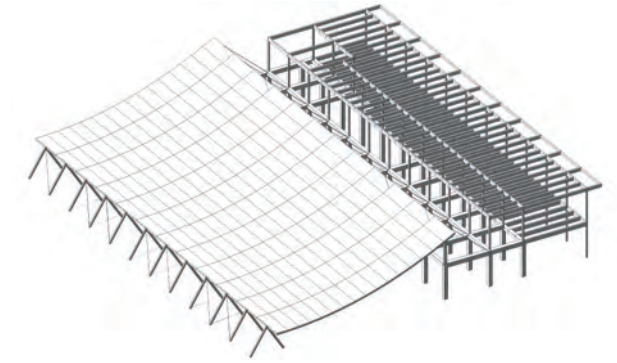
# Nagoya-C-Office Building

midas Gen



Nagoya, Japan

<b>Engineering Consultant</b>	Shuji Tada Structural Consultant
<b>Construction Period</b>	Completed in 2003
<b>Type of Project</b>	Office Building
<b>Size of Structure</b>	2-story



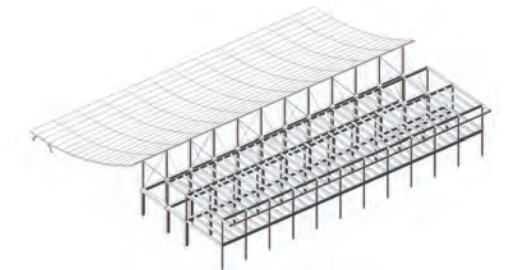
## Main features used in this application



- Finite elements for meshed slabs and roofs
- Linear dynamic analysis with response spectrum

## Description on this project

A relatively large roof at the upper part of the office which is integrated with the exhibition space is formed in a one-way hanging shape. A laminated material of 120mm × 150mm, which is discretized, is laid on one side and arranged in a direction orthogonal to the wood fiber. It is characterized by introducing prestress.



### Shuji Tada Structural Consultant

<b>Address</b>	4-7-4, Wakabayashi, Setagaya, Tokyo, 154-0023, Japan		
<b>Introduction</b>	Shuji Tada Structural Consultant is specialized in structural engineering design. Also, they provide structural system which is focused on material features such as steel, wood, RC and so on.		
<b>Website</b>	info47728.wixsite.com/shujitada	<b>Email</b>	info@shutada.com



# The # Adelis Building

midas Gen



## Busan, Korea

<b>General Contractor</b>	POSCO E&C
<b>Engineering Consultant</b>	MIDAS IT / ROSENWASSER / GROSSMAN Consulting Engineers
<b>Construction Period</b>	2003 - 2006
<b>Type of Project</b>	Residential Building
<b>Size of Structure</b>	164m Height (47-story)

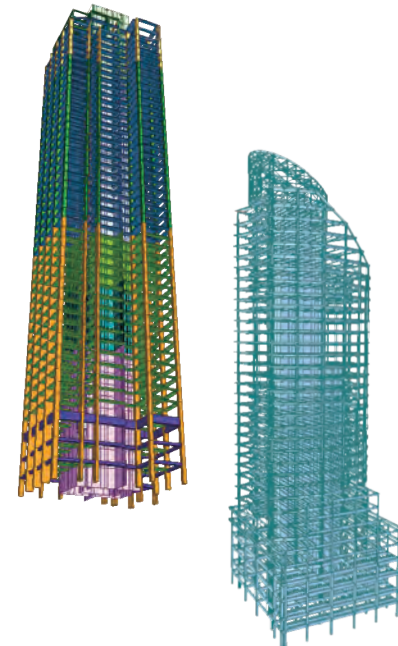
### Main features used in this application



- RC Design as per AIK
- Foundation design

### Description on this project

The # Haeundae Adelis comprises of three RC skyscrapers designed with new high strength concrete. Housing an indoor golf club, swimming pool, fitness center, and business facilities, it is also ideally located such that 90% of the residents have an ocean view of the pacific.



### MIDAS IT

<b>Address</b>	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea		
<b>Introduction</b>	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.		
<b>Website</b>	www.midasuser.com	<b>Email</b>	info@midasit.com

# The President Bangwa Building

midas Gen



## Bangkok, Thailand

<b>Owner</b>	Pattana Land Development
<b>Engineering Consultant</b>	Umbau
<b>Construction Period</b>	2013 - 2017
<b>Type of Project</b>	Residential Building
<b>Size of Structure</b>	113m Height (35-story)

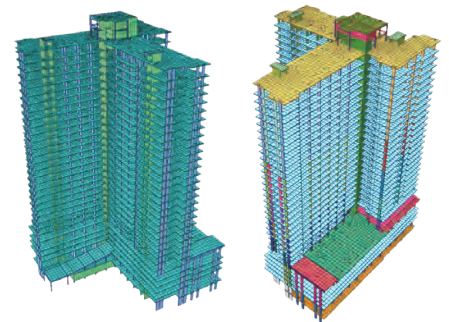
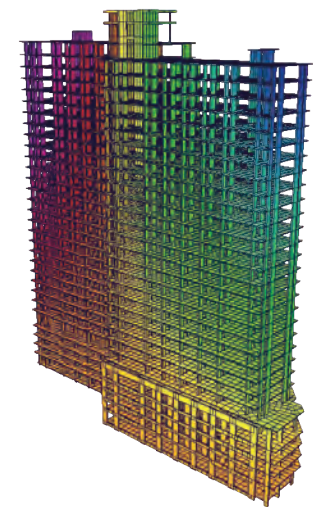
### Main features used in this application



- Linear static analysis with finite elements for mat foundation
- Response spectrum analysis
- Static wind load as per ASCE7

### Description on this project

The President Bangwa is a condominium project, developed by Pattana Land Development, located at Bangkok. Construction of The President Bangwa was completed in 2017. The condominium comprises of 3 buildings, having 30 floors and 35 floors respectively.



### Umbau

<b>Address</b>	3/49 Prachaniwet Building 1, 5 <sup>th</sup> floor, Nimitmai Nua, Chatuchak, Bangkok 10900, Thailand		
<b>Introduction</b>	Umbau is an architectural design services provider for structural engineering design, electrical system, air conditioning and construction management. Design services of all types of construction such as residential buildings, special-purpose plant buildings and advertising signposts for building structure design.		
<b>Website</b>	www.umbau.com	<b>Email</b>	webmaster@umbau.com

# Centric Sathorn - Saint. Louis

midas Gen



## Bangkok, Thailand

<b>Owner</b>	SC ASSET Public
<b>Engineering Consultant</b>	Umbau
<b>Construction Period</b>	2012 - 2014
<b>Type of Project</b>	Residential Building
<b>Size of Structure</b>	28-story

### Main features used in this application



- Steel frame design as per AISC
- Linear static and P-delta analysis
- Eigenvalue and response spectrum analysis

### Description on this project

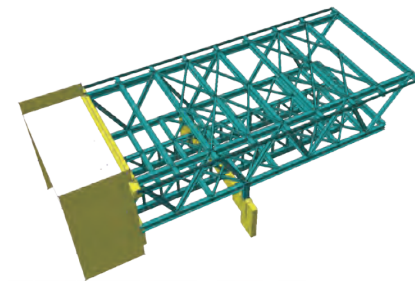
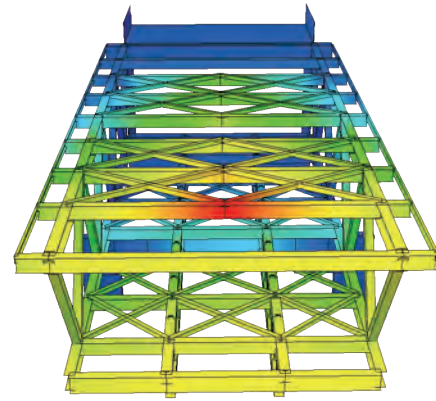
Saint Louis is a condominium project, developed by SC Asset, located at Soi Saint Louise 3, Yannawa, Sathon, Bangkok 10500. Construction of Centric Sathorn-Saint. Louis was completed in 2013. The condominium comprises of 2 buildings, having 28 floors and includes 344 units.

### Umbau

**Address** 3/49 Prachaniwet Building 1, 5<sup>th</sup> floor, Nimitmai Nua, Chatuchak, Bangkok 10900, Thailand

**Introduction** Umbau is an architectural design services provider for structural engineering design, electrical system, air conditioning and construction management. Design services of all types of construction such as residential buildings, special-purpose plant buildings and advertising signposts for building structure design.

**Website** [www.umbau.com](http://www.umbau.com) **Email** [webmaster@umbau.com](mailto:webmaster@umbau.com)



# Miramón Hotel

midas Gen



## San Sebastian, Spain

<b>Owner</b>	Cliving 15, S.L.
<b>General Contractor</b>	Construcciones Imaz
<b>Engineering Consultant</b>	LKS Ingenieria
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Residential Building
<b>Size of Structure</b>	30m Height

### Main features used in this application



- Linear static analysis with finite elements
- Surface spring support
- Meshed slab and wall design as per Eurocode2

### Description on this project

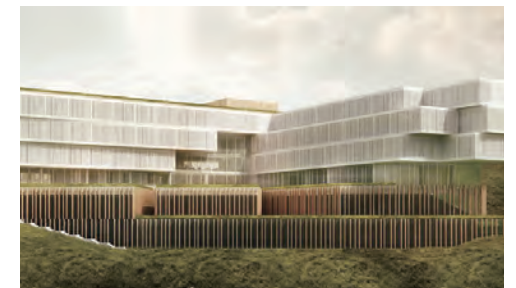
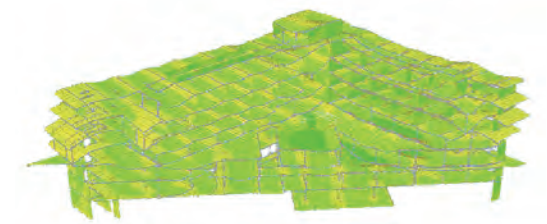
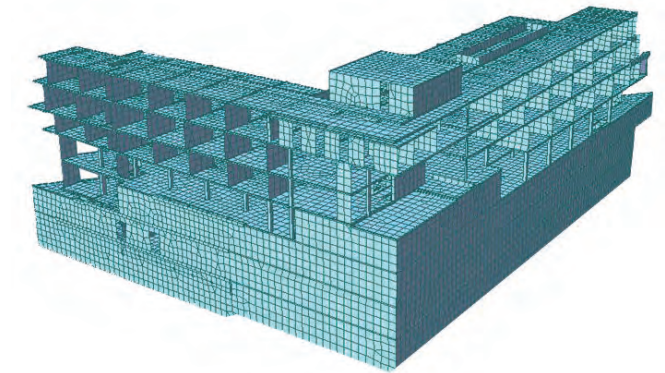
This building is composed of columns, walls and slabs of reinforced concrete. For special elements, steel profiles are used. There are large spans and overhangs.

### LKS Ingenieria

**Address** Parque Tecnológico de Bizkaia, Laida Bidea, 207C Planta -1, 48160 DERIO Bizkaia, Spain

**Introduction** LKS' architecture team is made up of professionals from different specialties that have a global approach to the creative process, combining complementary visions and developing a creative, sustainable and responsible architecture.

**Website** [www.lks.es](http://www.lks.es) **Email** [bilbao@lksgroup.com](mailto:bilbao@lksgroup.com)



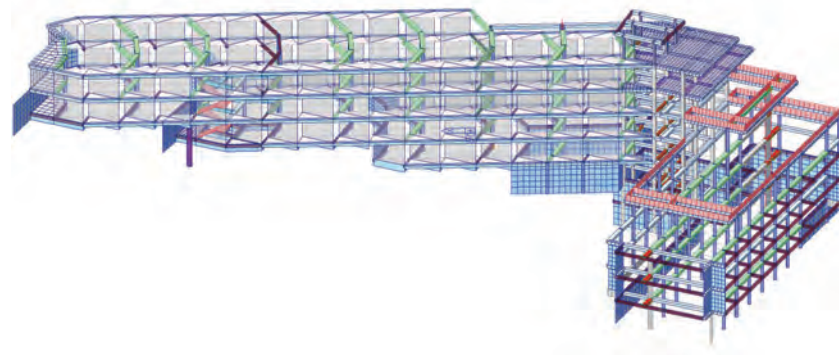
# Residential Building

midas Gen



Caceres, Spain

**Architect** ACID Consultantoria  
**Engineering Consultant** iConcrete / ZENET  
**Type of Project** Residential Building  
**Size of Structure** 4-story



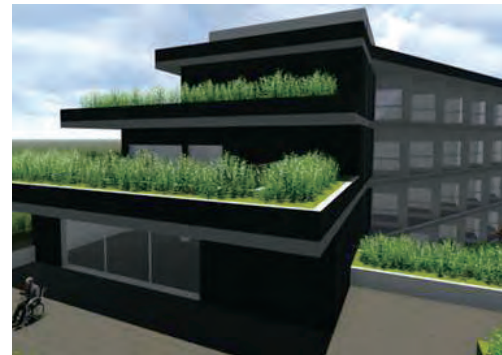
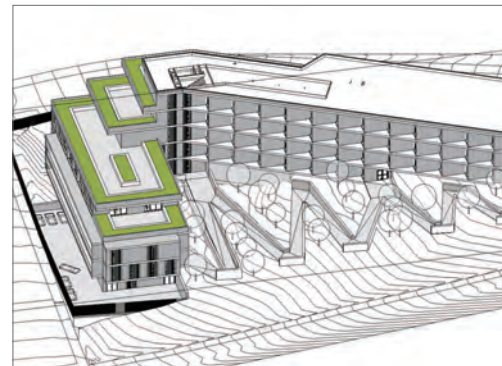
## Main features used in this application



- Linear static and RS analysis
- RC building design as per Eurocode2

## Description on this project

The 4 floors residential building is composed of precast concrete members. In order to simulate the underground walls, meshed plate elements were used with soil spring.



## iConcrete / ZENET

**Address** C / Islas Cies 73, Bajo Local D 28035, Madrid, Spain

**Introduction** iConcrete is an engineering company created in 2012 to develop solutions that industrialize the construction with prefabricated concrete. The experience of iConcrete professionals is more than 15 years in the field of engineering, prefabrication, building and civil works.

**Website** [www.iconcrete.com](http://www.iconcrete.com)

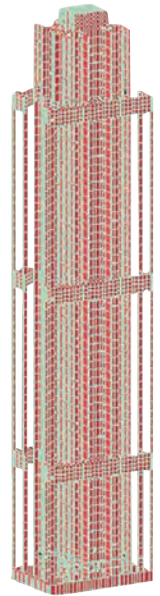
# Millennium Tower

midas Gen



Dubai, UAE

**Owner** Bright Start Holdings  
**General Contractor** Dubai Contracting Company  
**Architect** ATKINS  
**Engineering Consultant** e-Construct  
**Construction Period** 2004 - 2006  
**Type of Project** Residential Building  
**Size of Structure** 285m Height (60-story)



## Main features used in this application



- Construction stage analysis for column shortening
- RC building design as per ACI318

## Description on this project

Millennium Tower, formerly known as Bright Start Tower, is a residential building. It consists of basement + transfer + 55 typical-story + 3 service + roof and even 27m steel feature. All horizontal elements are in precast concrete including balconies. During the construction, floor to floor cycle has reached 3 days.

## e-Construct

**Address** Suite 203, Building 4 Dubai Internet City P.O. Box 500288 Dubai, UAE

**Introduction** e-Construct is an engineering firm that is focused on providing cost effective engineering solutions to design bridges, high-rise building, precast concrete engineering and post-tensioning design.

**Website** [www.econstruct.ae](http://www.econstruct.ae)

**Email** [info@econstruct.ae](mailto:info@econstruct.ae)



# DaeGu SuSung SK Leaders View

midas Gen



Daegu, Korea

Owner	Guyan D&C
General Contractor	SK E&C
Engineering Consultant	MIDAS IT / Arup
Construction Period	2007 - 2010
Type of Project	Residential Building
Size of Structure	225m Height (57-story)



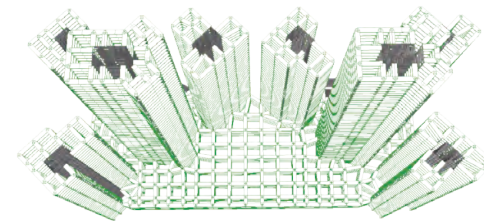
## Main features used in this application



- Construction stage analysis with creep and shrinkage
- RC building design as per KCI-USD

## Description on this project

It is a high-rise complex which is located in Suseong-gu, Daegu, Republic of Korea. It is one of the tallest building in Daegu and it is made up of 7 buildings (788 generations) with 225m height.



## MIDAS IT

Address	MIDAS IT Tower, 17, Pangyo-ro 228 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13487, Korea
Introduction	MIDAS IT specializes in engineering consultancy, web business and CAE software development. MIDAS IT provides world class consultancy services in the fields of civil, structural, geotechnical and mechanical engineering.
Website	www.midasuser.com
Email	info@midasit.com

# Shimouma Apartment

midas Gen



Tokyo, Japan

General Contractor	Daiwa House Industry
Architect	KUS (Aya Utsumi, Eijiro Kosugi)
Engineering Consultant	TEAM SAKURA
Construction Period	2003 - 2013
Type of Project	Residential Building
Size of Structure	15.52m Height (5-story)



## Main features used in this application



- Finite elements for meshed slabs and walls
- Linear dynamic analysis with response spectrum

## Description on this project

It's a wood architecture in the city. The pillars of the glulam and the flat slab cover the vertical power. Also, the wood brace which covers the outer circumference burdens the horizontal load and wraps the living space softly. A common staircase of a single straw carving and a carved stone characterize this apartment house, the stairs are a place to see the city and feel the seasonal change.

## TEAM SAKURA

Address	Yoyogi Palace 501, 2-21-10 Yoyogi, Shibuya-ku, Tokyo 151-0053, Japan		
Introduction	In the TEAM SAKURA, they are designing comfortable wooden buildings, the structural design and fire protection design of wooden buildings requiring advanced technology, technology and research and development concerning structure and fire protection.		
Website	www.teamsakura.jp	Email	info@teamsakura.jp

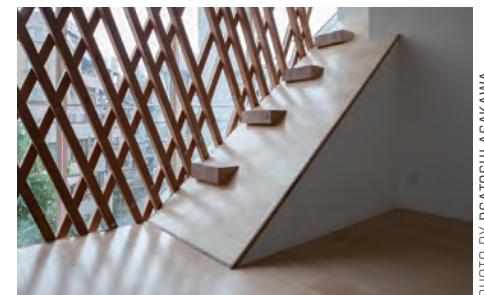


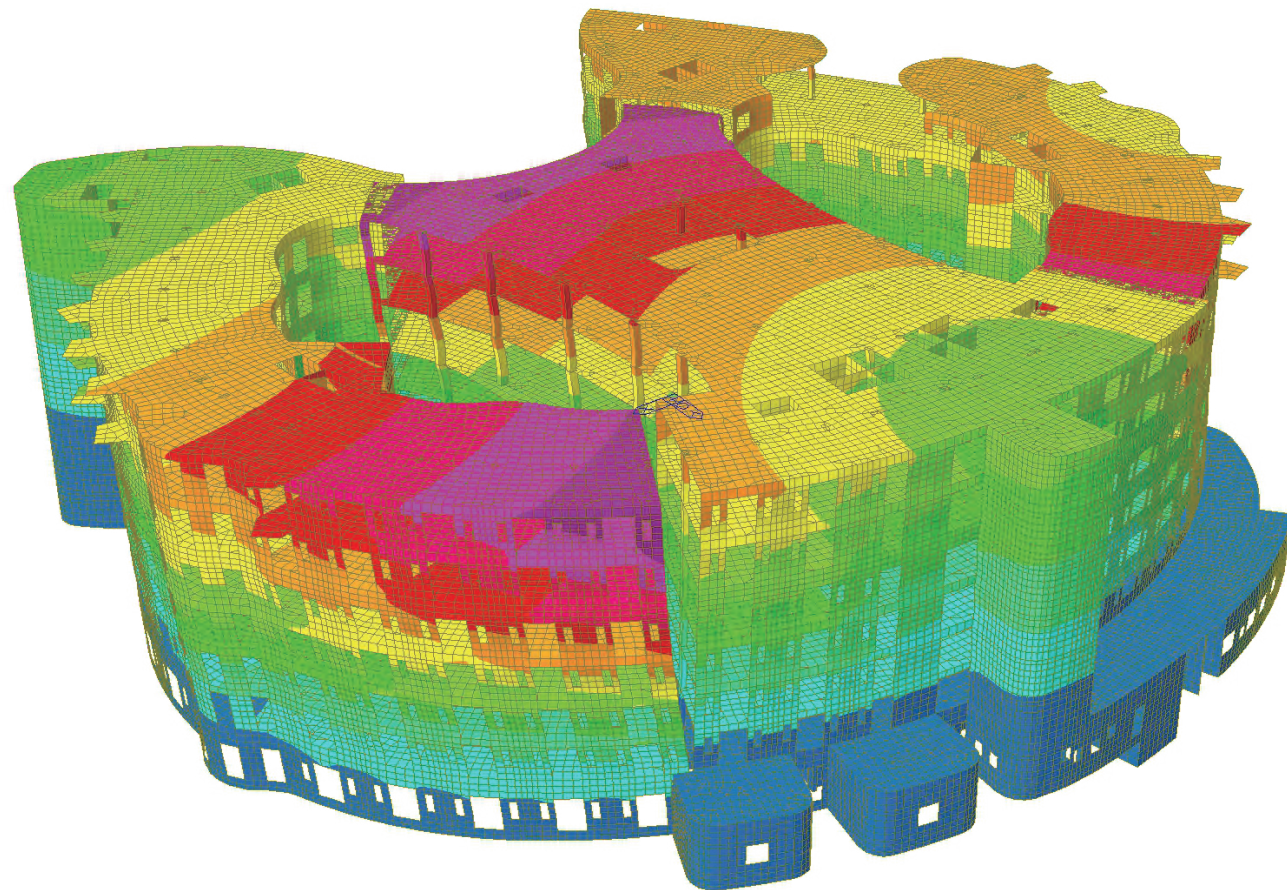
PHOTO BY RSATOSHI ASAKAWA

# Hospital in Montecchio Maggiore

Montecchio, Italy



**Engineering Consultant** Ramboll, Eng. Steve Alemanno, Riccardo Bertolo and Alberto Ferrari  
**Construction Period** Under Construction  
**Type of Project** Hospital Building  
**Size of Structure** 26m Height (7-story)



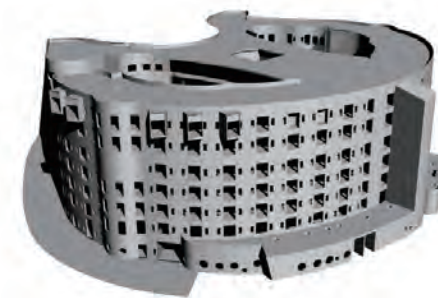
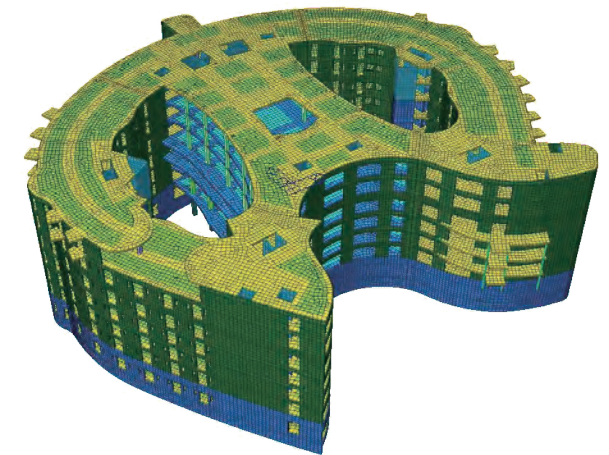
## Main features used in this application



- Linear dynamic analysis with response spectrum
- Meshed slab and wall design as per Eurocode2

## Description on this project

The irregular shape building for hospital is located in Montecchio, Italy. It has 7 floors with basement space. FEM was used for the irregular slabs by midas Gen.



## Ramboll

**Address** Via Mentore Maggini, 50, 00143 Rome, Italy

**Introduction** Ramboll is a leading engineering, design and consultancy company founded in Denmark in 1945. They employ 13,000 experts and have a strong presence in many countries. Ramboll works across the market: buildings, transport, planning & urban design, water, environment & health, energy, oil & gas and management consulting.

**Website** [www.ramboll.com](http://www.ramboll.com)

**Email** [info@ramboll.com](mailto:info@ramboll.com)

# Taoyuan International Airport MRT Station

Taoyuan, Taiwan



Owner	Bureau of High Speed Rail / MOTC
General Contractor	Bureau of High Speed Rail / MOTC
Engineering Consultant	CECI Consulting Engineering
Construction Period	Completed in 2014
Type of Project	Metro Station



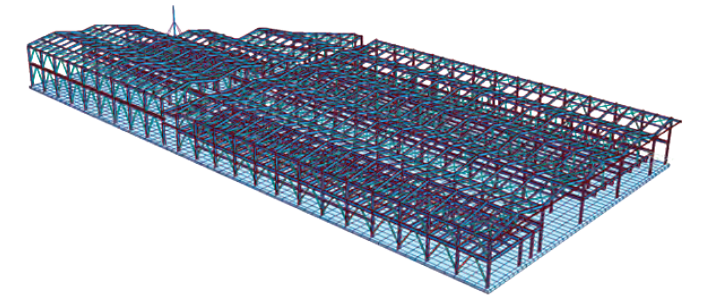
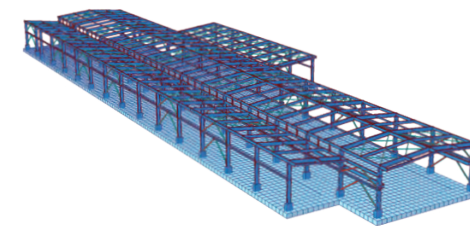
## Main features used in this application



- Linear static and dynamic response analysis
- Surface spring supports for mat foundation

## Description on this project

The project is a five-story parking facility in Taoyuan MRT airport line. It also provides Taizhou MRT airport train maintenance service. It is located in Taoyuan City Park North Road, Taiwan high-iron Taoyuan station. The main purpose of the building is to provide the airport train scheduling and maintenance services, etc., with a total area of about 19 hectares. The factory contains A17 terminal and Taoyuan MRT headquarters including five maintenance factories, electric car cleaning facility, sewage treatment facility and Taoyuan Jiejie control center.



## CECI Consulting Engineering

<b>Address</b>	No. 323 Yangguang St., Neihu District, Taipei City 11491, Taiwan		
<b>Introduction</b>	CECI was established in 1969 and has been awarded ISO certification for planning, design, construction supervision, construction management, information technology and system engineering as well as numerous other accreditations. With its sense of entrepreneurship, CECI has participated in the nation's most important projects and be a part to transform Taiwan.		
<b>Website</b>	<a href="http://www.ceci.com.tw">www.ceci.com.tw</a>	<b>Email</b>	<a href="mailto:ob@ceci.com.tw">ob@ceci.com.tw</a>

# Yothinurana School

Bangkok, Thailand



**Owner** Office of The Basic Educational Commission  
**General Contractor** Mr. Chay Sangsawai, NL Development  
**Engineering Consultant** Index International Group  
**Construction Period** 2011 - 2014  
**Type of Project** Educational Building  
**Size of Structure** 68.15m Height (13-story)



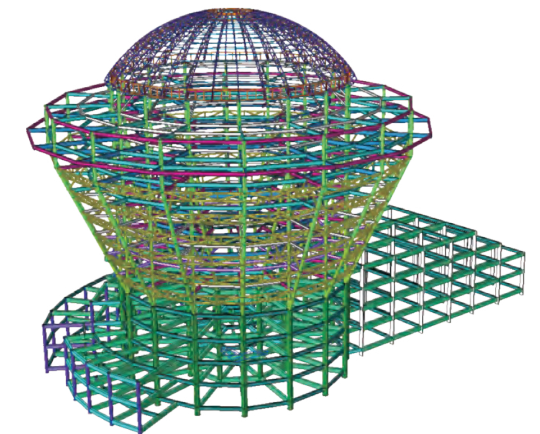
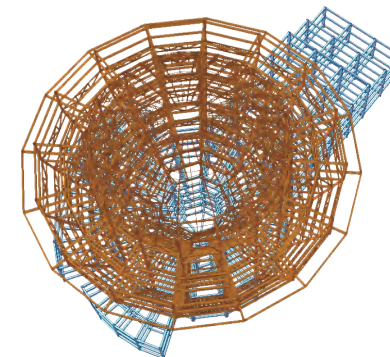
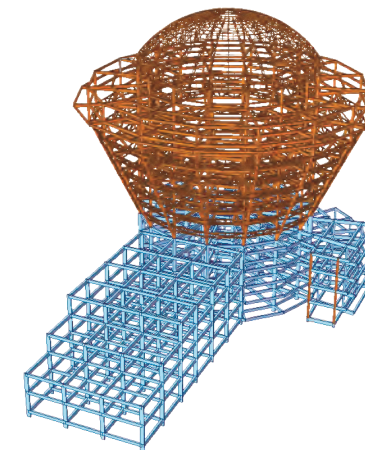
## Main features used in this application



- Linear static analysis
- Construction stage analysis

## Description on this project

Yothinurana school is a publicly funded secondary school with nearly 4,000 students in Bangkok, Thailand under the jurisdiction of the General Educational Department of Ministry of Educational. It has 2 parts, Ground floor to 5<sup>th</sup> floor is reinforce concrete and 6<sup>th</sup> floor to 13<sup>th</sup> floor is steel structure. The building area is 29,400m<sup>2</sup> with 68.15m height.



## Index International Group

**Address** 1/814 Soi 60 (km.26) Phaholyothin Rd. Khukot, Lamlukka, Pathumthani, 12130, Thailand

**Introduction** Index International Group was established in 1983 and is specialized fields such as city and district planning, architectural design, engineering design involving structural, mechanical, transportation, sanitary and geotechnical engineering. The construction management and supervision including buildings, factories, roads, bridges, dams, airports etc., and the project study for investment are offered as well.

**Website** [www.index.co.th](http://www.index.co.th)

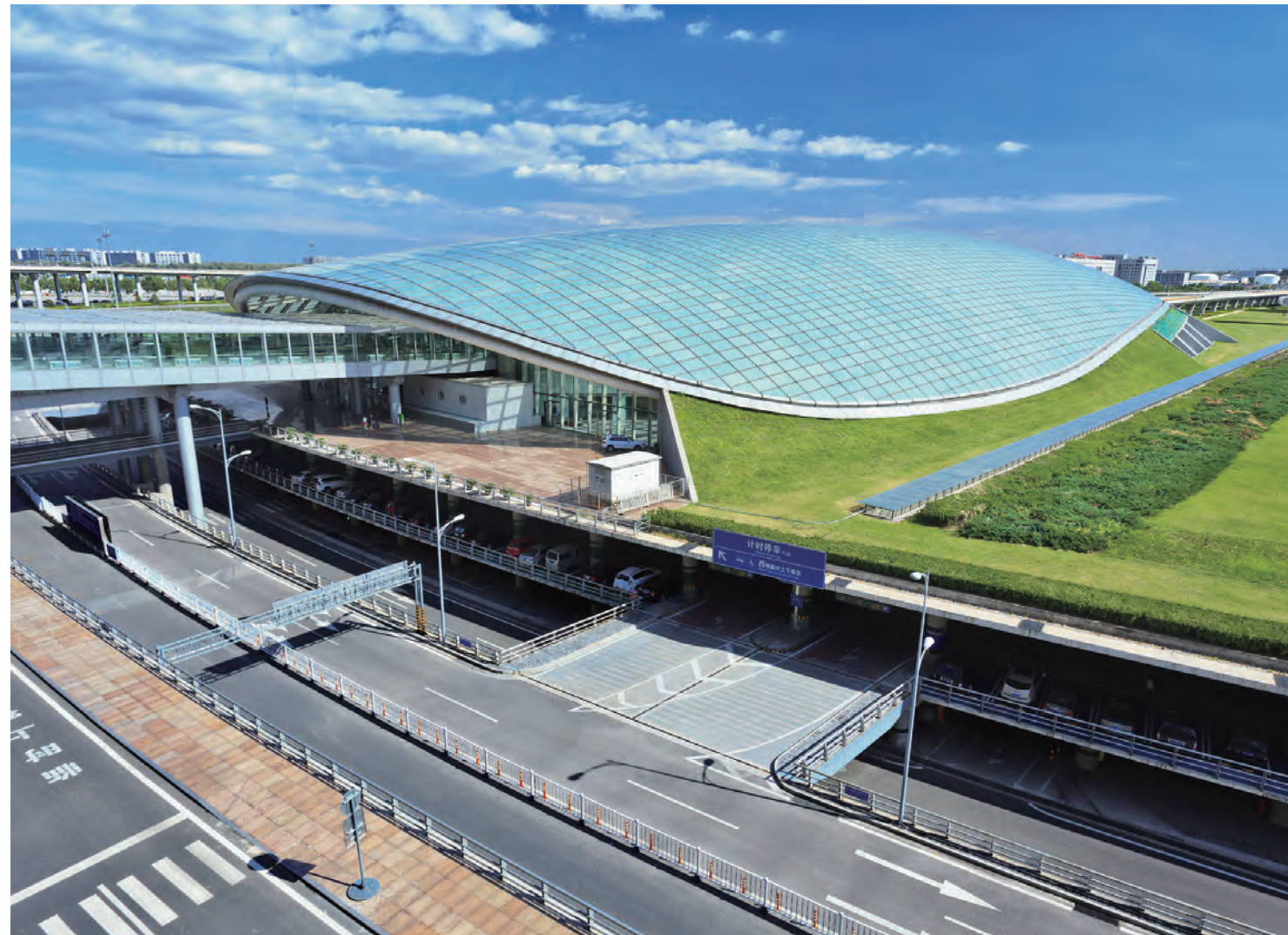
**Email** [admin@index.co.th](mailto:admin@index.co.th)

# Terminal 3 at Beijing Capital International Airport

Beijing, China



Owner	Beijing Capital International Airport Company
General Contractor	Beijing Urban Construction Group (BUCG)
Architect	Foster and Partners
Engineering Consultant	Arup
Construction Period	2004 - 2008
Type of Project	Airport Terminal
Size of Structure	930,000m <sup>2</sup>



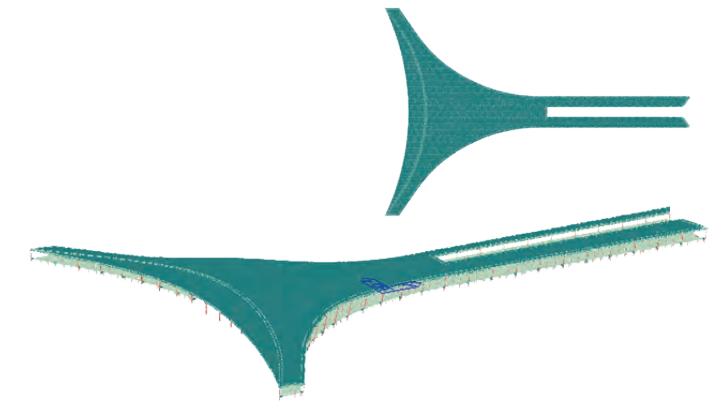
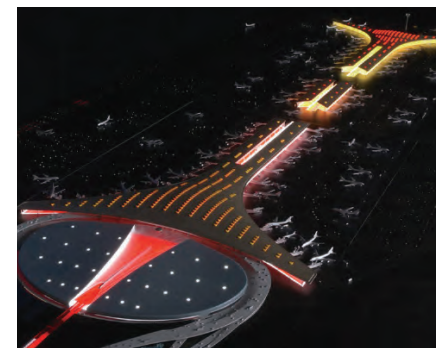
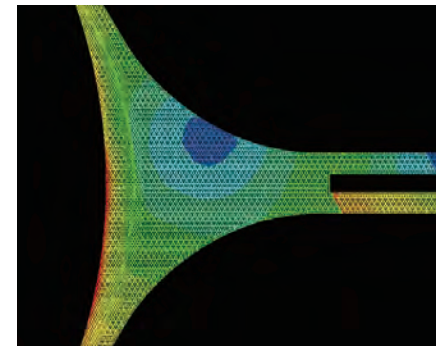
## Main features used in this application



- Linear static analysis with finite elements
- Node local axis for reaction in local direction
- Beam end release for pinned connection

## Description on this project

Completed as the gateway to the city for the twenty-ninth Olympiad in 2008, Beijing's international terminal is the world's largest and most advanced airport building not only technologically but also in terms of passenger experience, operational efficiency and sustainability. Designed to be welcoming and uplifting, it is also a symbol of place and its soaring aerodynamic roof and dragon-like form celebrating the thrill and poetry of flight and evoking traditional Chinese colors and symbols.



## Arup

**Address** Room 3008, 30/F, Jing Guang Centre, Hu Jia Lou, Chaoyang District, Beijing 100020, China

**Introduction** Arup is a multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 14,000 staffs based in 92 offices across 42 countries, and has participated in projects in over 160 countries.

**Website** [www.Arup.com](http://www.Arup.com)

**Email** [beijing@Arup.com](mailto:beijing@Arup.com)

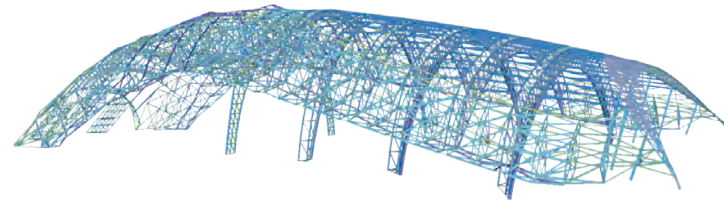
# Incheon International Airport Transportation Center

midas Gen



Incheon, Korea

<b>Owner</b>	Government of Korea
<b>General Contractor</b>	Hyundai / Samsung and Daewoo E&C
<b>Architect</b>	Terry Farrell & Partners / DMJM / SAMOO Architects & Engineers
<b>Engineering Consultant</b>	YOOSHIN Architects & Engineers
<b>Construction Period</b>	Completed in 2002
<b>Type of Project</b>	Airport Terminal
<b>Size of Structure</b>	6-story



## Main features used in this application



- Linear static analysis with finite elements
- Steel frame design as per KSSC-LSD

## Description on this project

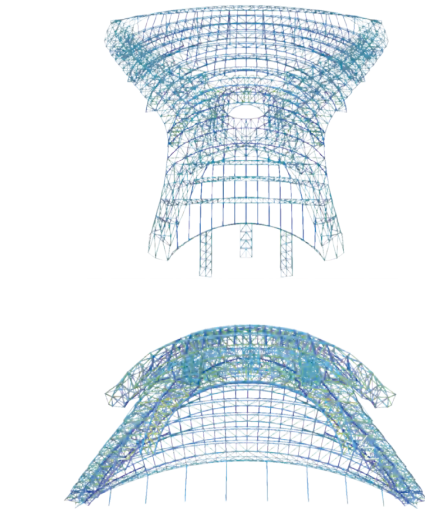
Incheon International Airport Transportation Center is an icon of dynamism, embracing culture and flight and invoking the future. The structural form and composition symbolize flight and dynamism. The steel truss structure rises from the ground and vaults over the hall. The long graceful curves of the skeletal roof express the fluid form of a plane in take-off. Resting on top is the futuristic pod-like flight control center. With its glass belly, it acts as an aero foil for the natural ventilation of the interior hall.

## YOOSHIN Architects & Engineers

**Address** Seungjin B/D, 48 Pyeongchondaero 227 beongil, Dongangu, Anyangsi, Gyeonggi-do 14072, Korea

**Introduction** YOOSHIN AE is an architectural practice established in 1978. They have plodded away for over 35 years in the field of architectural design and construction management / supervision, and produced notable projects such as Daejeon World Cup Stadium, Jincheon National Athlete Training Centre, Gwangyang Harbor Facilities, Incheon Children's Science Museum and etc for private, commercial and public sector clients.

**Website** [www.yooshinae.com](http://www.yooshinae.com) **Email** [webmaster@yooshinae.com](mailto:webmaster@yooshinae.com)



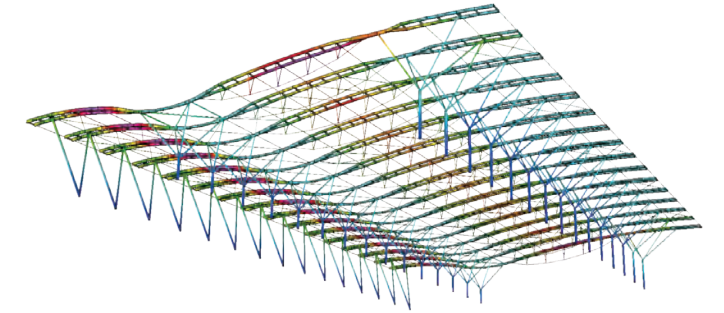
# Yulin Yuyang Airport Phase II expansion project terminal

midas Gen



Yuyang, China

<b>Owner</b>	Western Airport Group
<b>General Contractor</b>	Northwest Airport Group Construction Company
<b>Engineering Consultant</b>	JINGGONG Group
<b>Construction Period</b>	2015 - 2017
<b>Type of Project</b>	Airport Terminal
<b>Size of Structure</b>	28m Height



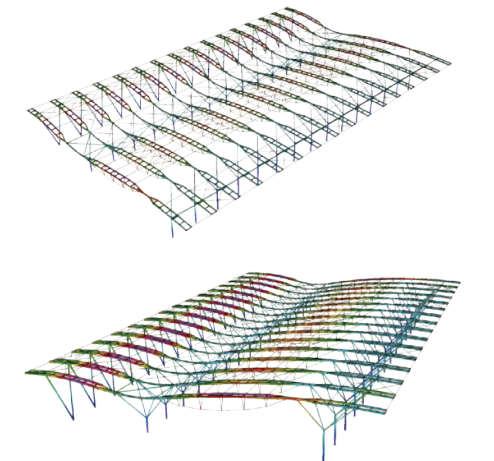
## Main features used in this application



- Construction stage analysis with prestressed tendon
- Linear dynamic analysis with response spectrum

## Description on this project

The project has 42,500m<sup>2</sup> area, located in Yulin City. The main body is a concrete frame structure and the roof is large span steel structure. Roof is a string arch structure made with two box-shaped steel beams, high-strength steel wire string, pole for the triangle and round steel pipe.



## JINGGONG Group

**Address** Jinggong Plaza, No.112 Jinkeqiao Road, Keqiao, Shaoxing City, Zhejiang Province, China

**Introduction** The company was found in 1968. It is located in Shaoxing now and has built up its predominant industries and grown into a large-sized hi-tech global-market-oriented enterprise. They focus on its dominant industries of steel structure building and equipment manufacture.

**Website** [www.jinggonggroup.com](http://www.jinggonggroup.com) **Email** [info@jinggonggroup.com](mailto:info@jinggonggroup.com)

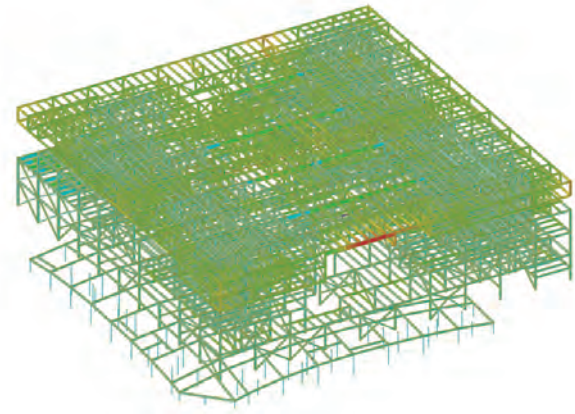
# Tianjin Cultural Center Library

midas Gen



Tianjin, China

<b>General Contractor</b>	Tianjin City Real Estate Development Group
<b>Architect</b>	Riken Yamamoto & Field Shop
<b>Engineering Consultant</b>	Structural Design Office Plus One Co., Ltd.
<b>Construction Period</b>	Completed in 2011
<b>Type of Project</b>	Library
<b>Size of Structure</b>	30m Height (5-story)



## Main features used in this application



- Steel frame design as per Chinese standard
- Truss elements

## Description on this project

In order to realize the concept of "stacking while shifting", the wall girder is assembled in a parallel cross shape of 20.4m in length and width. It is a frame in which it is shifted by half span. In addition, earthquake resistant cores are connected to each other with a wall girder and the entire frame is used as a super ramen frame.

## Structural Design Office Plus One Co., Ltd.

<b>Address</b>	Yoshino Building 3F, 8-13 Yanban-cho, Chiyoda-ku, Tokyo 102-0081, Japan		
<b>Introduction</b>	The firm was established in 1988. Through the structural design, they work hard to achieve their purpose while working with clients, architects, facility designers and constructors as much as possible.		
<b>Website</b>	sp-plusone.co.jp	<b>Email</b>	info@sp-plusone.co.jp



PHOTO BY "山本理雄設計工場 / Riken Yamamoto & Field Shop"

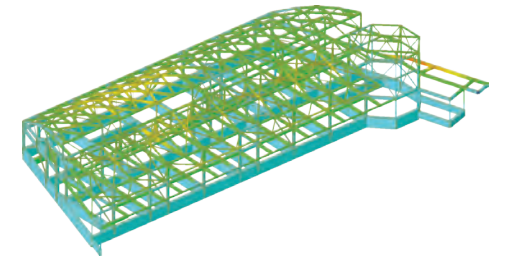
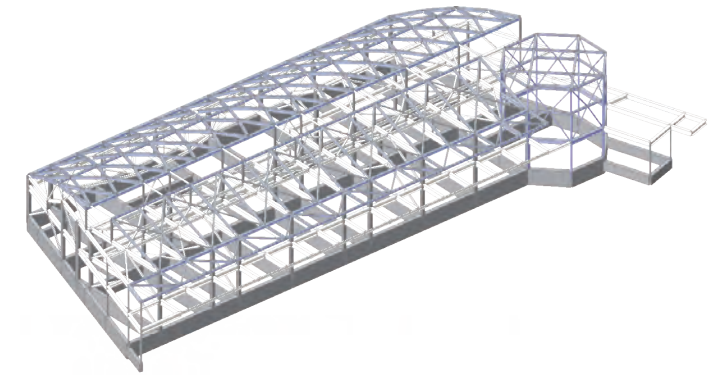
# Kobato Kindergarten

midas Gen



Tokyo, Japan

<b>Architect</b>	Osamu Watanabe Architects
<b>Engineering Consultant</b>	Rhythm Design Mov Co., Ltd.
<b>Construction Period</b>	Completed in 2014
<b>Type of Project</b>	Educational Building
<b>Size of Structure</b>	2-story



## Main features used in this application



- Steel building design as per Japanese standard
- Linear dynamic analysis with response spectrum

## Description on this project

It is a 2-story building on the ground, but it is a three-layer structure with a large colonnade space with a roof hut to secure daylighting and ceiling height. The roof structure is a vault-like diagonal lattice beam with a span of 13.5m and it is a space blown by about 30m out of the total length of about 50m.

## Rhythm Design Mov Co., Ltd.

<b>Address</b>	1-2-21, Kamimaezu, Naka-ku Nagoya-shi, Aichi, 460-0013, Japan		
<b>Introduction</b>	Rhythm Design Mov Co., Ltd. is a structural design office. They provide an appropriate engineering service for architecture and environment. Also, they have established two offices in Tokyo and Nagoya to get the real information.		
<b>Website</b>	www.rd2002.com	<b>Email</b>	info@rd2002.com



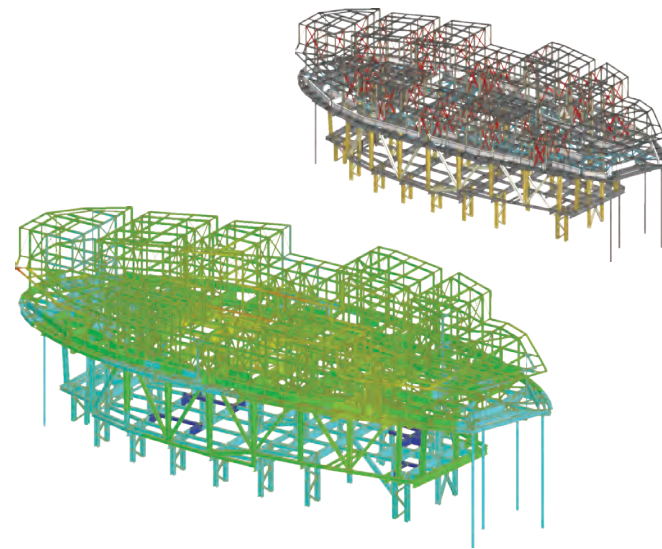
# Noyori Conference Hall

midas Gen



Nagoya, Japan

**Architect** Iida Archship Studio  
**Engineering Consultant** Structural Design Office Plus One Co., Ltd  
**Construction Period** Completed in 2004  
**Type of Project** Educational Building  
**Size of Structure** 18.7m Height (5-story)



## Main features used in this application



- Steel building design as per Japanese standard
- Linear dynamic analysis with response spectrum

## Description on this project

It is surrounded by glass. There are halls on the 1<sup>st</sup> and 2<sup>nd</sup> floors, the 3<sup>rd</sup> and 4<sup>th</sup> floor are a complex steel frame framed with the residence building. By adopting two PC steel rods with tension applied to the mullion of a glass curtain wall with a height of approximately 10m and a truss made of square steel slanted material, it's possible to make a glass screen with high transparency.



PHOTO BY DAICHI ANO

## Structural Design Office Plus One Co., Ltd.

**Address** Yoshino Building 3F, 8-13 Yanban-cho, Chiyoda-ku, Tokyo 102-0081, Japan  
**Introduction** The firm was established in 1988. Through the structural design, they work hard to achieve their purpose while working with clients, architects, facility designers and constructors as much as possible.  
**Website** [sp-plusone.co.jp](http://sp-plusone.co.jp) **Email** [info@sp-plusone.co.jp](mailto:info@sp-plusone.co.jp)

# Marine Academy

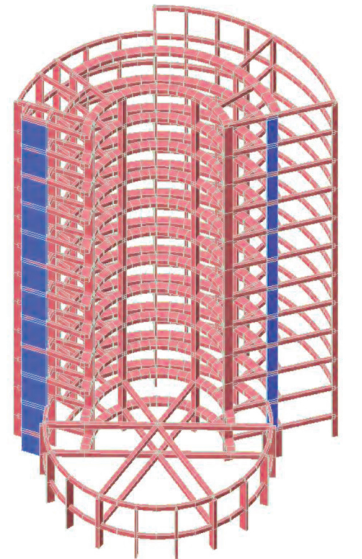
midas Gen



Panvel, India

**Owner** B. P. Marine Institute  
**General Contractor** Accurate Enterprises  
**Architect** Dimensions  
**Engineering Consultant** Structural Concept  
**Construction Period** 2006 - 2008  
**Type of Project** Educational Building  
**Size of Structure**

- Hostel Building (12-story)
- Academic Building (5-story)
- Recreation Building (4-story)



## Main features used in this application



- RC building design as per IS 456 & 1893

## Description on this project

The structure is designed resembling the units of a ship as it is a marine institute. The columns are designed as sloping members, as the floor plate increases, which gives clear floor plates on all the floors.

## Structural Concept

**Address** 803, Maithali's Signet, Sector 30A, Vashi, Navi Mumbai, Maharashtra, 400705, India  
**Introduction** Structural Concept Designs was established in 2001 at Navi Mumbai. The firm provides a full range of structural engineering services from concept to construction. Also, the firm helps in creating high performance and durable concrete aids in and economical structures.  
**Website** [www.structuralconcept.com](http://www.structuralconcept.com) **Email** [strconcept@gmail.com](mailto:strconcept@gmail.com)



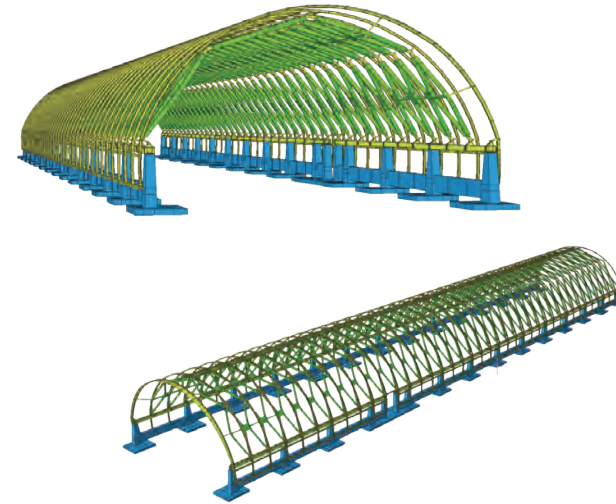
# Brillia Running Stadium

midas Gen



## Tokyo, Japan

<b>Owner</b>	Taiyo-Kogyo Corporation / Tokyo Tatemono Co., Ltd.
<b>Architect</b>	E.P.A
<b>Engineering Consultant</b>	KAP
<b>Construction Period</b>	Completed in 2016
<b>Type of Project</b>	Sports Dome
<b>Size of Structure</b>	8.5m Height



### Main features used in this application



- Linear static analysis with beam elements
- Buckling analysis

### Description on this project

It is a sports facility athletes for Paralympics. Under the large-scale roof composed of wood and ETFE, there are 60m athletic track, research facility, conference room and shower room. In order to reinforce the arch frame in both horizontal and vertical direction, laminated wood members are arranged at the bottom.

### KAP

<b>Address</b>	Chiyoda Fujimi Sky Mansion 1F, 2-4-9 Fujimi, Chiyoda-ku, Tokyo 102-0071, Japan
<b>Introduction</b>	KAP is a structural design group for various materials, scales and purposes. They can handle many structure type such as wood, RC, steel, PCa/pc and seismic. Also, they support diverse scales projects from a house to a large-scale government office and civil engineering structures.
<b>Website</b>	<a href="http://kapstructure.wixsite.com/engineers">kapstructure.wixsite.com/engineers</a>



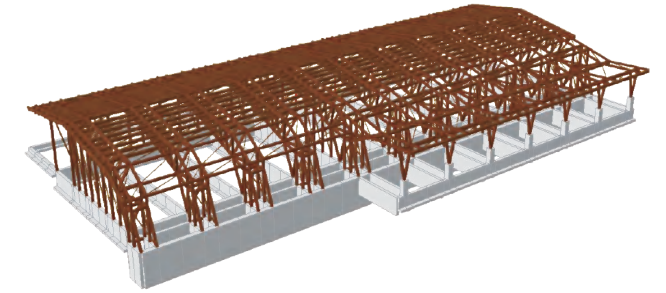
# Naruto Kindergarten

midas Gen



## Sammu, Japan

<b>Owner</b>	Sammu City Council
<b>Architect</b>	NISSOKEN Architects and Engineers
<b>Engineering Consultant</b>	KAP
<b>Construction Period</b>	2010 - 2013
<b>Type of Project</b>	Educational Building
<b>Size of Structure</b>	7.5m Height



### Main features used in this application



- Linear static analysis with truss elements
- Linear dynamic analysis with response spectrum

### Description on this project

Based on the concept of "wooden framework with market distribution material utilizing local Sanbu cedar", it is composed as a group construction which combines four types of rail constructions making maximum use of small diam Sanbu cedar. The cross section of the member is based on a four-sided material. The structure is composed of columns, beams and folded plate structure for the roof.

### KAP

<b>Address</b>	Chiyoda Fujimi Sky Mansion 1F, 2-4-9 Fujimi, Chiyoda-ku, Tokyo 102-0071, Japan
<b>Introduction</b>	KAP is a structural design group for various materials, scales and purposes. They can handle many structure type such as wood, RC, steel, PCa/pc and seismic. Also, they support diverse scales projects from a house to a large-scale government office and civil engineering structures.
<b>Website</b>	<a href="http://kapstructure.wixsite.com/engineers">kapstructure.wixsite.com/engineers</a>



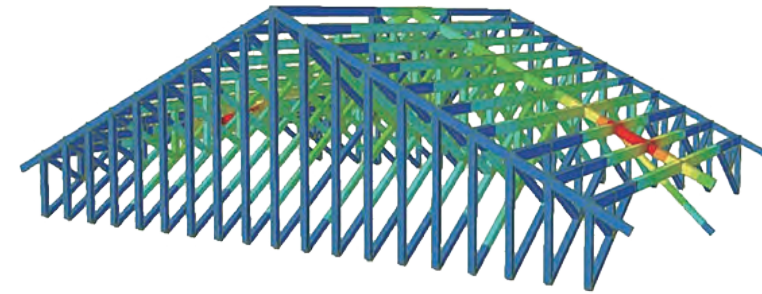
# Higashidori Kindergarten

midas Gen



## Higashidori, Japan

<b>Owner</b>	Higashidori Village
<b>Architect</b>	KEIKAKU-KOBO
<b>Engineering Consultant</b>	KAP
<b>Construction Period</b>	Completed in 2012
<b>Type of Project</b>	Educational Building
<b>Size of Structure</b>	11m Height (2-story)



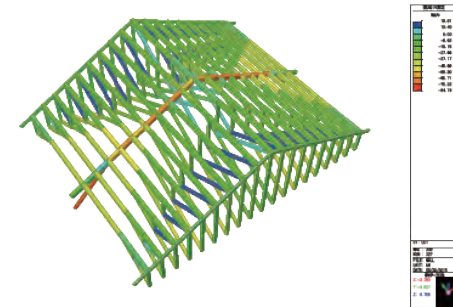
### Main features used in this application



- Linear static analysis for RC & wood structure

### Description on this project

The building is partly two stories, with a staff room, entrance, lobby, multi-purpose hall and cooking room on the first floor and child rearing support room on the second floor. For fire protection, the basic is RC construction but the roof of the multi-purpose hall and the child rearing support room are wooden. For building management of multipurpose hall roof, it was built with local red pine.



### KAP

<b>Address</b>	Chiyoda Fujimi Sky Mansion 1F, 2-4-9 Fujimi, Chiyoda-ku, Tokyo 102-0071, Japan
<b>Introduction</b>	KAP is a structural design group for various materials, scales and purposes. They can handle many structure type such as wood, RC, steel, PCa/pc and seismic. Also, they support diverse scales projects from a house to a large-scale government office and civil engineering structures.
<b>Website</b>	<a href="http://kapstructure.wixsite.com/engineers">kapstructure.wixsite.com/engineers</a>

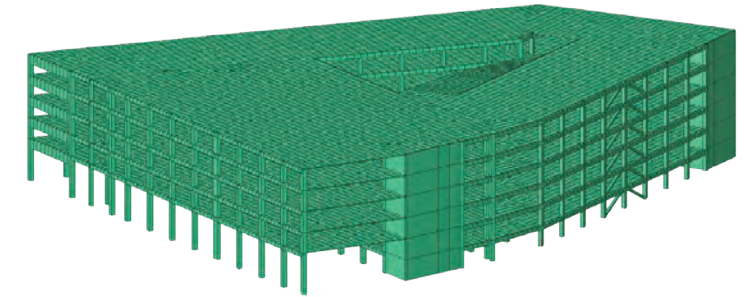
# Car Parking Lot

midas Gen



## Karlstad, Sweden

<b>Owner</b>	Löfbergs Fastigheter
<b>Architect</b>	PROJEKTENGAGEMANG
<b>Engineering Consultant</b>	PROJEKTENGAGEMANG
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Car-park Building
<b>Size of Structure</b>	6-story



### Main features used in this application



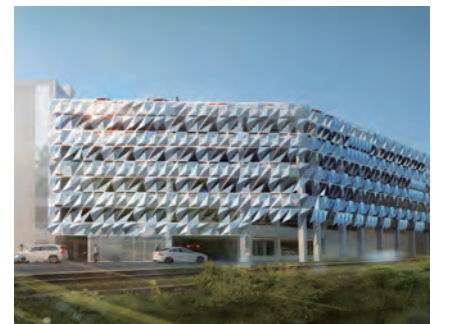
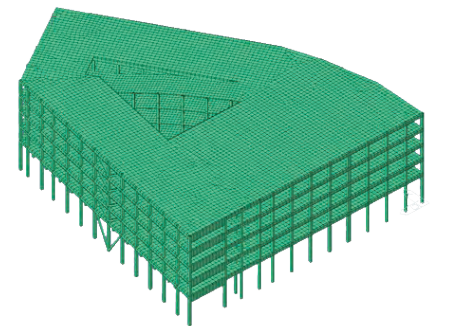
- Finite element model for meshed slab members
- RC building design as per Eurocode2

### Description on this project

The design of the parking lot creates opportunities for alternative uses of the building in the future. The construction is based on a concrete prefabricated concrete frame and is dimensioned so that the possibility of building an additional roof-covered floor can be found. Parts of the roof can be used as green space, while the rest of the roof is still available for cars and car parking.

### PROJEKTENGAGEMANG

<b>Address</b>	Arstaangsvagen 11, 100 74 Stockholm, 47146, Sweden
<b>Introduction</b>	Projektengagemang was founded in 2006. Per Goranson joins the company, and the building of the group starts. The firm now has over 600 employees in over 30 locations. They create extra value through the provision of qualified consultancy services and solutions within architecture, construction, infrastructure, industry and project management.
<b>Website</b>	<a href="http://www.projektengagemang.se">www.projektengagemang.se</a>



# St. Peter's Square

Vatican, Italy



Owner	Vatican City State
General Contractor	Italiana Costruzioni spa - F.lli Navarra
Engineering Consultant	Studio Croci & Associati
Construction Period	1655 - 1667
Restoration Period	2009 - 2014
Type of Project	Monuments



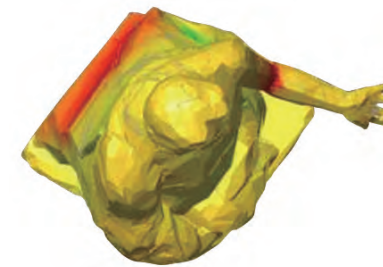
## Main features used in this application



- Plastic analysis with finite elements

## Description on this project

In the spring of 2009, the largest restoration ever undertaken of the colonnades is built in the 17<sup>th</sup> century by Bernini, occupied more than 100 conservators, scientists and engineers using the most modern techniques. They are thus able to bring to their former glory 88 pillars, 284 columns and 140 statues of saints surrounding the square, which forms part of the border between the Vatican and the Italian states. The Studio Croci & Associati in Rome is commissions to design an intervention that provides for the complete demolition of the floor in question and the subsequent reconstruction of the same by means of prefabricated slabs prestressed concrete.



## Studio Croci & Associati

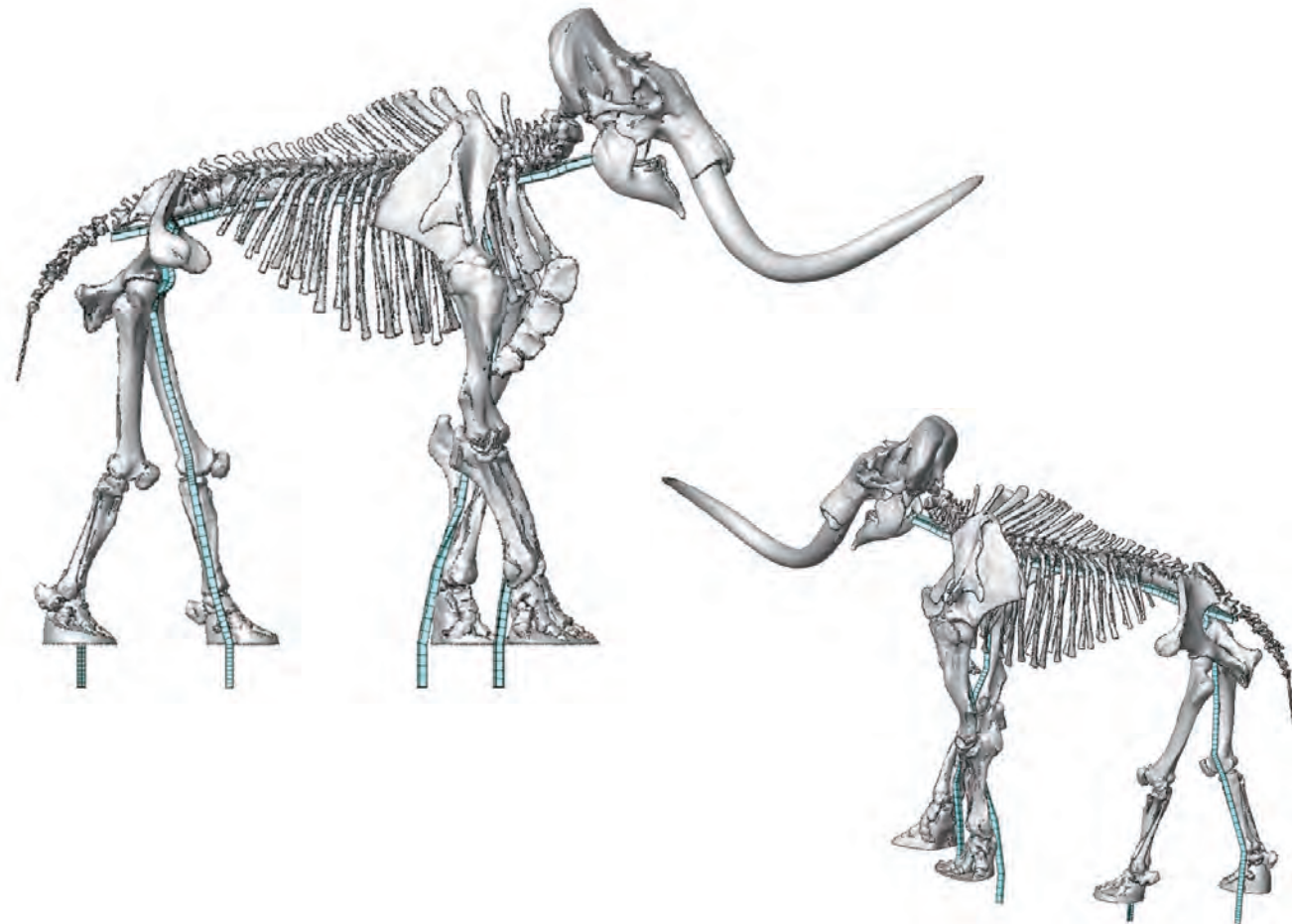
Address	Viale Marco polo, 37 00154 Rome, Italy		
Introduction	The company was founded in 1985 by the activity of Prof. Giorgio Croci, and specializes itself in design and tests for civil engineering and for the architecture, with particular attention to structural and architectural design, to the diagnostics, to the consolidation and restoration of monumental structures, to the seismic protection, to the survey.		
Website	<a href="http://www.spc-engineering.it">www.spc-engineering.it</a>	Email	<a href="mailto:mail@spc-engineering.it">mail@spc-engineering.it</a>

# Process to Knowledge base Modeling FEM

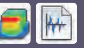
L'Aquila, Italy



**Owner** Ministry of Cultural Heritage and Tourism  
**General Contractor** Regional Directorate for Cultural and Landscape Heritage for Abruzzo IT  
**Engineering Consultant** Expin  
**Construction Period** Conducted in 1954  
**Size of Structure** 3.5m Height



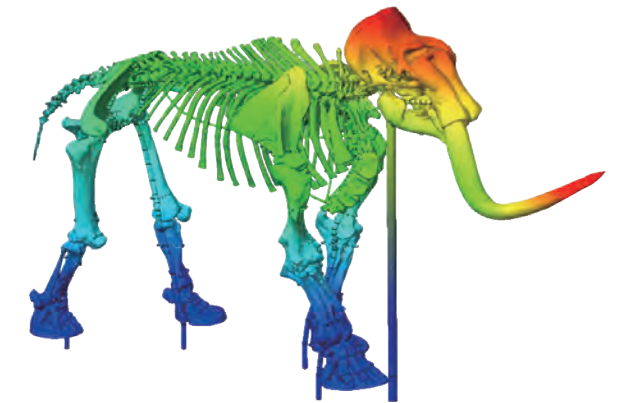
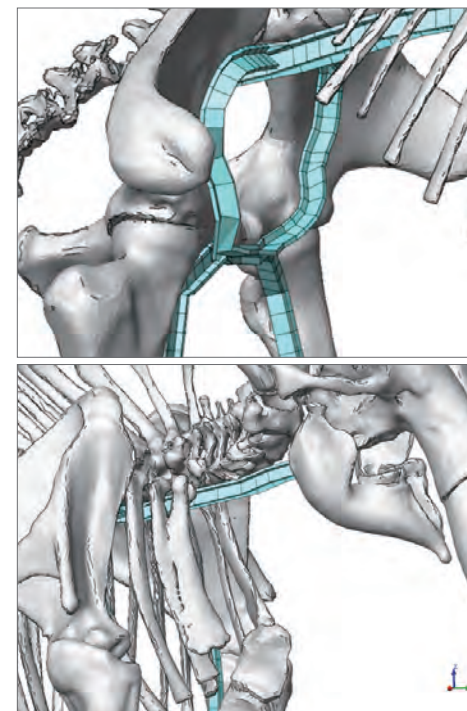
## Main features used in this application



- 3D 5million elements solid model
- Dynamic behavior of the mammoth in the Spanish fortress

## Description on this project

The study of the metallic supporting frame of the mammoth is particularly for its structural stability. It's located in a seismic prone area and has survived from the very strong L'Aquila earthquake in 2009.



## Expin

**Address** Via Panà, 56/ter, 35027 Noventa Padovana, PD, Italy

**Introduction** Expin is a company born in 2010 as a spin-off of the University of Padova. The company works in the field of development, application and management of structural diagnostics systems, structural health monitoring and implementation of advanced structural models for civil engineering (relevant and strategic buildings, infrastructures, housing and industries) and restoration (cultural and architectural heritage).

**Website** [www.expin.it](http://www.expin.it)

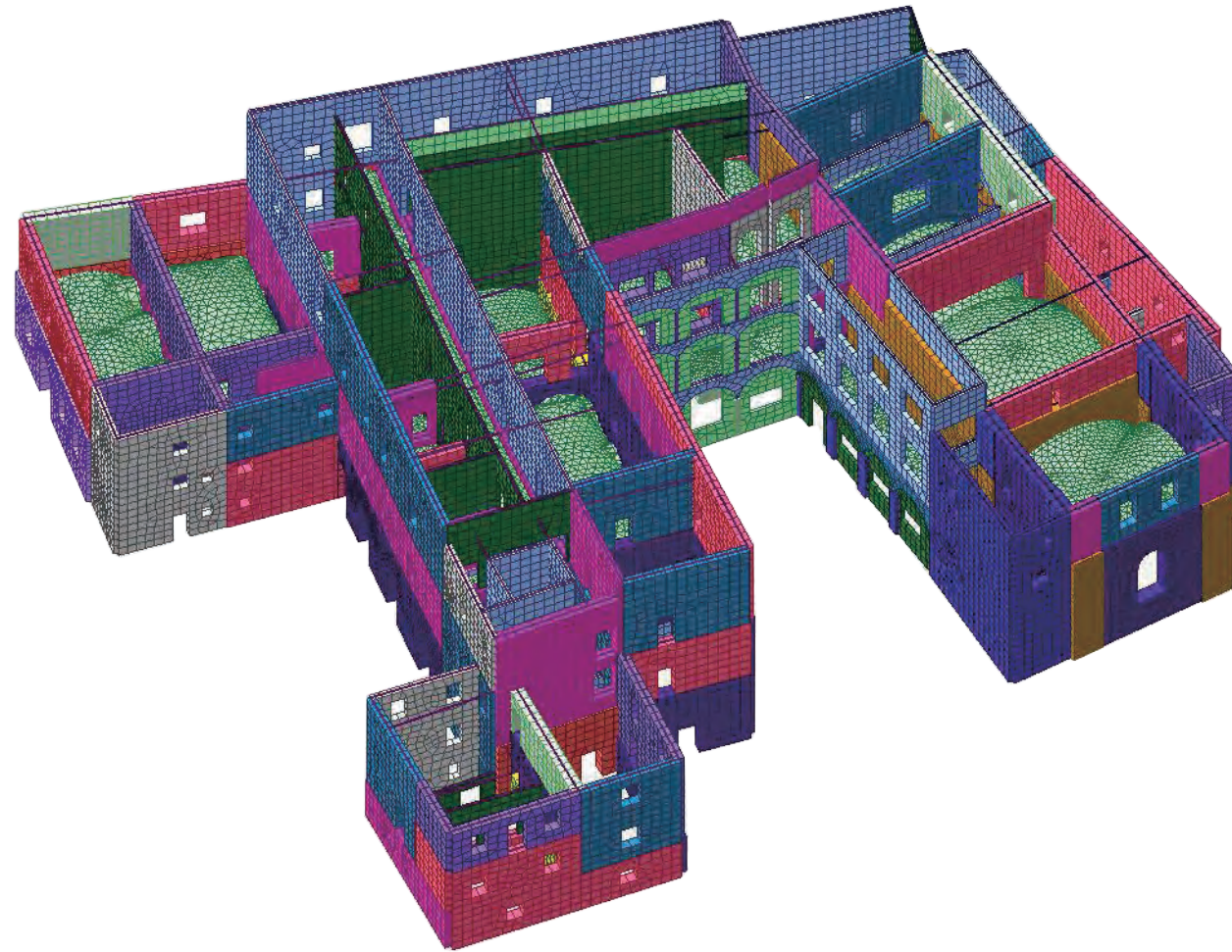
**Email** [info@expin.it](mailto:info@expin.it)

# San Lorenzo

Arezzo, Italy



Engineering Consultant: Microm Ingegneria  
Construction Period: Evaluation of Existing Building  
Type of Project: Religion Building  
Size of Structure: 13m Height (3-story)



## Main features used in this application

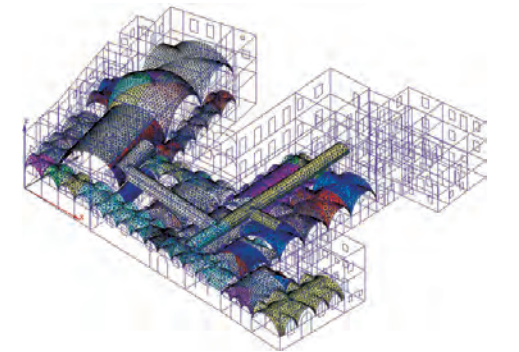


- Plastic analysis with masonry material properties
- Finite element model for seismic safety verification of masonry building

## Description on this project

The building, for its historical and constructional characteristic, is monumental and cultural interest type. Overall, it has a 1,600m<sup>2</sup> plant area, spreads over three levels above ground and has a total of about 13m height. The total volume is approximately 20,000m<sup>3</sup>. The purpose of the investigation was to:

- Determine the natural frequency of vibration of the construction site.
- Determine the natural frequency of vibration of the building in its main direction.
- Check the phenomenon of double resonance of the brick-resistance structure.
- Compare the results between obtained from vibration frequency and those from the FEM model and give an assessment of the mechanical model validation.



## Microm Ingegneria

**Address** Via E. Francini, 3, 52037 Sansepolcro, Italy

**Introduction** Microm Ingegneria uses BIM software for architectural and structural design of constructive organisms. The firm specializes in BIM or Building Information Modeling which is an innovative technology that represents a new way of working where, through the use of common standards and product-oriented representations, a 3D visualization of the building is presented.

**Email** michele.romolini@micromingegneria.com

# Villa Reale

Monza, Italy



<b>Owner</b>	Comune di Monza and the Lombardy Region
<b>General Contractor</b>	Restauro Nuova Villa Reale Monza
<b>Engineering Consultant</b>	Studio Croci & Associati
<b>Construction Period</b>	Completed in 1780
<b>Restoration Period</b>	2012 - 2014
<b>Type of Project</b>	Monuments / Historical Building



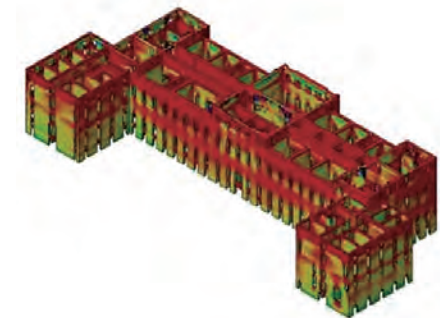
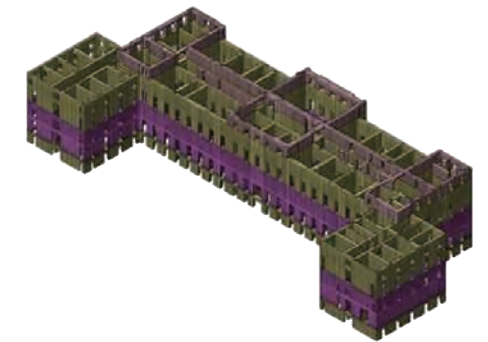
## Main features used in this application



- Plastic analysis with total strain crack model

## Description on this project

Empress Maria Theresa of Austria commissioned the construction of the estate between 1777 and 1780. Design and execution of necessary structural works have granted a significant seismic improvement of the whole building, thanks to the special strengthening of the walls implemented and to the consolidation/stiffening of slabs. All original surfaces have been respected, all wooden slabs have been maintained. Almost one hundred workers and restorers have been involved in the restoration of the central body of more than 10,000m<sup>2</sup>, with over 40 rooms, 2,000m<sup>2</sup> of parquet, 3,000m<sup>2</sup> of roofs and 800m<sup>2</sup> of stone surfaces.



## Studio Croci & Associati

<b>Address</b>	Viale Marco polo, 37 00154 Rome, Italy		
<b>Introduction</b>	The company was founded in 1985 by the activity of Prof. Giorgio Croci, and specializes itself in design and tests for civil engineering and for the architecture, with particular attention to structural and architectural design, to the diagnostics, to the consolidation and restoration of monumental structures, to the seismic protection, to the survey.		
<b>Website</b>	<a href="http://www.spc-engineering.it">www.spc-engineering.it</a>	<b>Email</b>	<a href="mailto:mail@spc-engineering.it">mail@spc-engineering.it</a>

# Saint Irene Basilica

Istanbul, Turkey



Owner	Turkish Ministry for Cultural Heritage and Activities
Engineering Consultant	Studio Croci & Associati
Construction Period	4 <sup>th</sup> - 8 <sup>th</sup> Century
Type of Project	Monuments / Religion Building



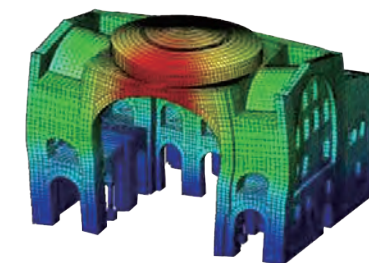
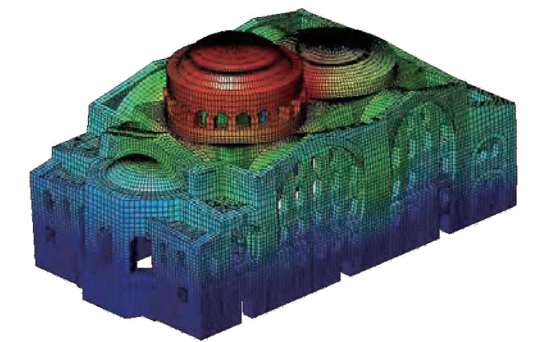
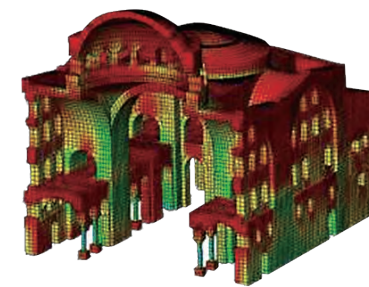
## Main features used in this application



- Masonry analysis
- Cracked analysis with total strain crack model

## Description on this project

Located in the outer courtyard of Topkapi Palace, Hagia Irene has the typical form of a Roman basilica, consisting of a nave and two aisles, which are divided by three pairs of piers. This helps to support the galleries above the narthex. Semicircular arches are also attached to the capitals which also helps to provide support to the galleries above. The basilica is approximately 100m long and the dome itself is 15m wide and 35m high and has twenty windows. Design and seismic retrofitting, reliefs, non-destructive investigations, shaking table tests of a physical model in a scale of 1:10.



## Studio Croci & Associati

Address	Viale Marco polo, 37 00154 Rome, Italy		
Introduction	The company was founded in 1985 by the activity of Prof. Giorgio Croci, and specializes itself in design and tests for civil engineering and for the architecture, with particular attention to structural and architectural design, to the diagnostics, to the consolidation and restoration of monumental structures, to the seismic protection, to the survey.		
Website	<a href="http://www.spc-engineering.it">www.spc-engineering.it</a>	Email	<a href="mailto:mail@spc-engineering.it">mail@spc-engineering.it</a>

# Wachirathammawart Temple

Bangkok, Thailand



Owner	Wachirathammawart Temple
General Contractor	Pra Pinai
Engineering Consultant	Wiraj Engineer Design
Construction Period	Under Construction
Type of Project	Religion Building
Size of Structure	75m Height



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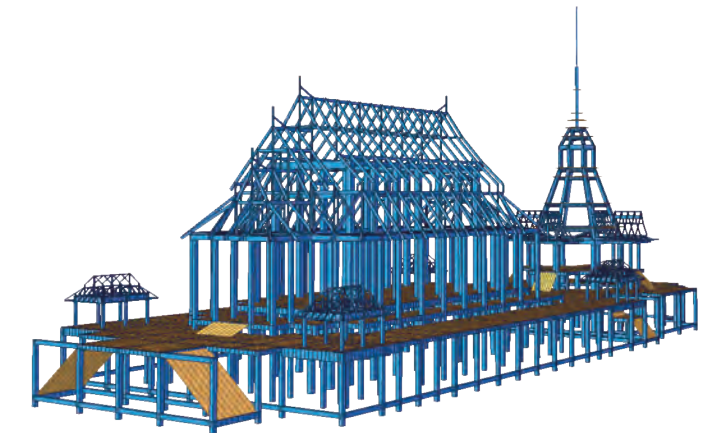
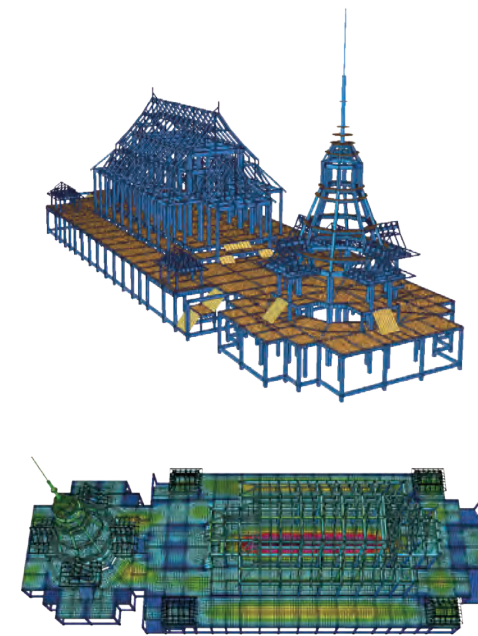
## Main features used in this application



- Construction stage analysis
- Static wind and seismic load as per ASCE7

## Description on this project

This building has been planned for the 200<sup>th</sup> anniversary of king Mongkut. It is a multi-purpose building for Buddhism. All parts of the building are designed with reinforce concrete members. Its area is 12,000m<sup>2</sup> with 75m of height.



## Wiraj Engineer Design

**Address** 49/558 Sammakorn Nimid-Mai Samwatawonok, 10510 Bangkok, Thailand

**Introduction** Wiraj Engineer Design Company Limited designs details in architect, engineering and consultants in factory, plant, residence, building, special building and infrastructure. Highly experienced team members who just love to design are working for the clients.

**Email** [engineerkuru@gmail.com](mailto:engineerkuru@gmail.com)

# Phathum Mahajaede

Nakhon Phathom, Thailand



Owner	Watprathom Potiyan Kamphaene Saen / Nakhon Pathom Thailand
Engineering Consultant	Diseno Company Limited
Construction Period	Under Construction
Type of Project	Religion Monument
Size of Structure	60.5m Height



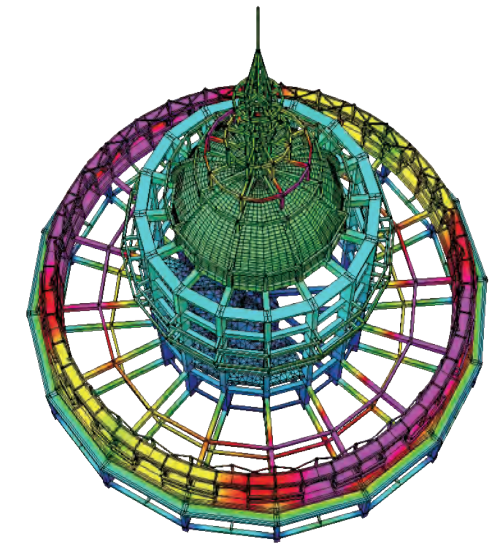
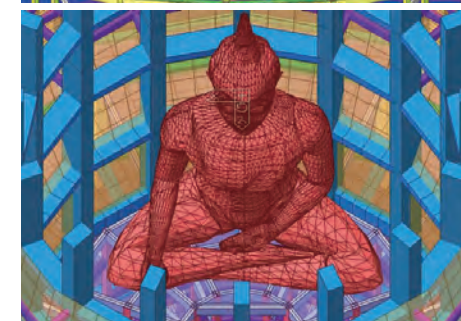
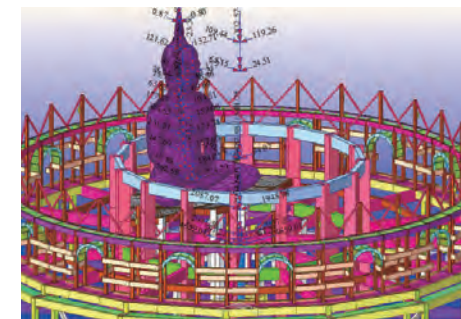
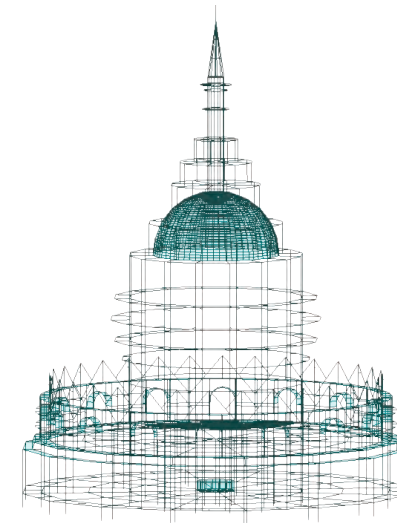
## Main features used in this application



- Linear static analysis with finite elements
- Response spectrum analysis
- RC building design as per ACI318

## Description on this project

The temple building has a 14m height Buddha inside. Ground floor to 2<sup>nd</sup> floor is reinforce concrete structure. The building area is 3,735m<sup>2</sup> with 60.5m height.



## Diseno Company Limited

Address	26 Soi Lad Phrao-Wanghin 55, Ladphrao-Wanghin Road, Ladphrao, Ladphrao, Bangkok 10230, Thailand
Introduction	Diseno Company Limited designs details in architect, engineering and consultants in factory, plant, residence, building, special building and infrastructure. Highly experienced team members who just love to design are working for the clients.
Email	disenothailand@gmail.com

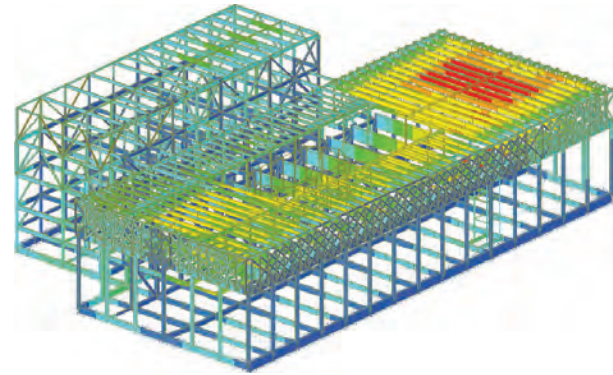
# Oita Prefectural Art Museum

midas Gen



## Oita, Japan

<b>Owner</b>	Oita Prefecture
<b>General Contractor</b>	Kajima Corporation / Umabayashi Corporation
<b>Architect</b>	Shigeru Ban Architects
<b>Engineering Consultant</b>	Arup
<b>Construction Period</b>	2013 - 2015
<b>Type of Project</b>	Museum Building
<b>Size of Structure</b>	25m Height (4-story)



### Main features used in this application



- Steel & RC building design as per Japanese standard
- Linear time-history dynamic analysis

### Description on this project

This museum is an open and flexible space, and at the same time, it incorporates a design based on the bamboo work traditionally inherited in Oita. On the first floor, there is a vast pillar space which opens to the front and an exhibition space surrounded by timber grid walls is arranged on the third floor. In order to realize the large space on the first floor, a large span steel truss and hanging floors are placed. In the design of timber grid walls, earthquake-resistant brace is adopted by laminated wood as fire resistant covering of steel columns, and planned to make the most of wooden materials.

#### Arup

<b>Address</b>	3F, Tobu Fuji Building, 24-4 Sakuragaoka-cho, Shibuya-Ku, Tokyo 150-0031, Japan		
<b>Introduction</b>	Arup is a multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 14,000 staffs based in 92 offices across 42 countries, and has participated in projects in over 160 countries.		
<b>Website</b>	www.Arup.com	<b>Email</b>	tokyo@Arup.com

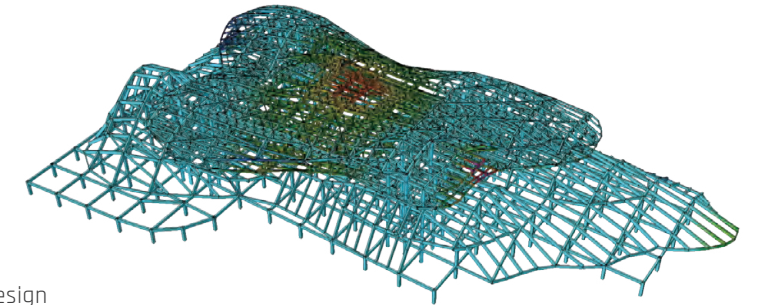
# Liyang Museum

midas Gen



## Liyang, China

<b>Owner</b>	Liyang City Government
<b>Engineering Consultant</b>	Nanjing Yangtze River Urban Architectural Design
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Museum
<b>Size of Structure</b>	18,318m <sup>2</sup>



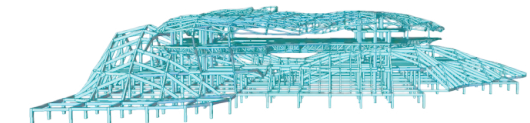
### Main features used in this application



- Construction stage analysis with creep and shrinkage
- Linear dynamic analysis with response spectrum

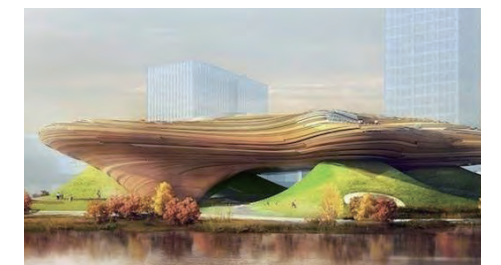
### Description on this project

Liyang City Museum & Planning Exhibition Hall created the general architectural form of the box set to avant-garde natural Jiaoqiang Qin as the title, the depth of mining urban landscape characteristics, multi-dimensional vector angle into the historical connotation, so floating in the city over the architectural expression of the melody surrounds the state and feelings in the air.



#### Nanjing Yangtze River Urban Architectural Design

<b>Address</b>	No.328, Hongwu Road, Baixia District, Nanjing 210000, China		
<b>Introduction</b>	Nanjing Yangtze River Urban Architectural Design is a "national high-tech enterprise". The company features mainly urban planning and design, office buildings, commercial buildings, research and education construction and residential design.		
<b>Website</b>	www.nanjing-design.cn	<b>Email</b>	office@nanjing-design.com

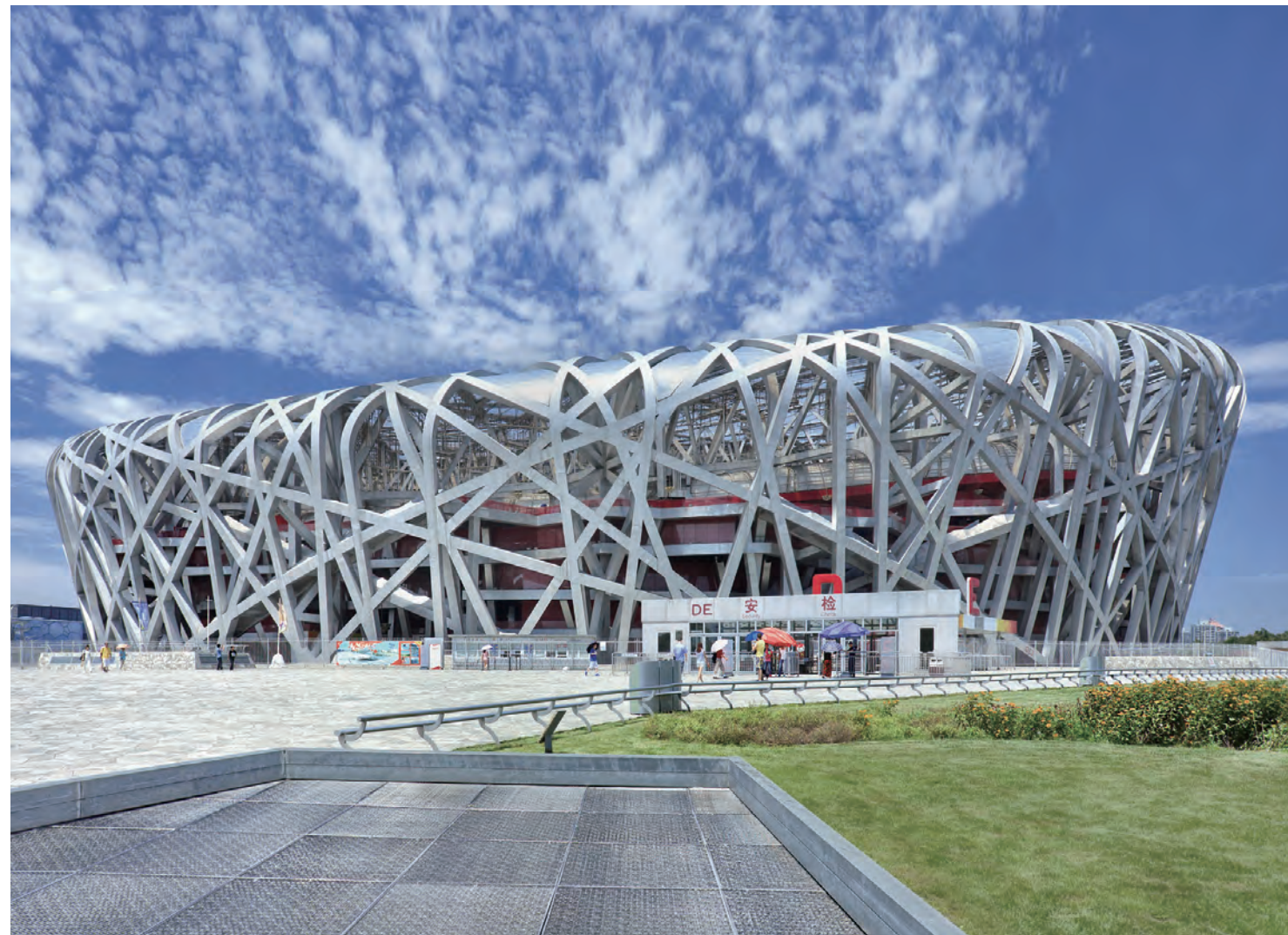


# Beijing Olympic Stadium

Beijing, China



Owner	National Stadium Co., Ltd.
General Contractor	CITIC International Contracting
Architect	Herzog & de Meuron Architekten AG
Engineering Consultant	Arup
Construction Period	2003 - 2008
Type of Project	Stadium
Size of Structure	69m Height (7-story)



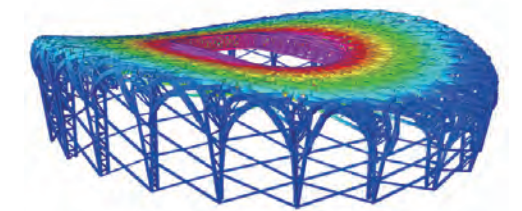
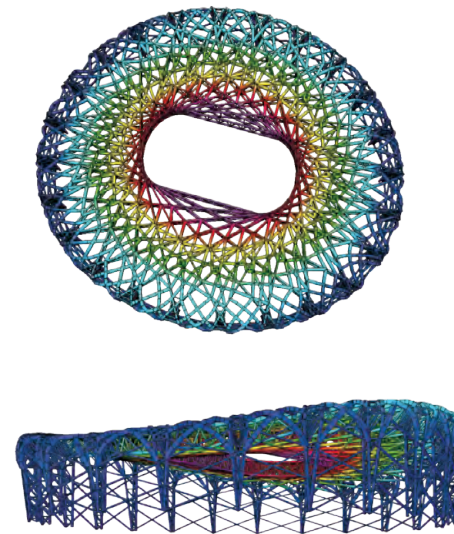
## Main features used in this application



- Linear static analysis with truss elements
- Linear dynamic analysis with response spectrum

## Description on this project

Beijing Olympic Stadium is the 2008 Olympic Games' most striking structure, recognized all over the world. The building's dynamic form and vast scale create a new icon for China and the city of Beijing. The circular shape of the stadium represents 'heaven', while the adjacent square form of the National Aquatics Center (Water Cube), also design-engineered by Arup, is a reflection of the Chinese symbol for Earth. The structural form of the stadium is popularly described as a 'bird's nest', with its pattern inspired by Chinese-style 'crazed pottery'. Seemingly random, the pattern abides by complex rules for which advanced geometry was defined. To ensure a compact and optimum design, the seating bowl was established first, with the outer façade wrapping around it. The design ensures that all spectators are as close as possible to the action and have clear sight lines. As Beijing is located in one of the world's most active seismic zones, Arup uses advanced seismic analysis to test the stadium under various earthquake conditions and ensure that the structure can withstand major shocks.



## Arup

**Address** Room 1301, Tower A Center Plaza 161 Linhexi Road Tianhe District, Guangzhou 510620, China

**Introduction** Arup is a multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 14,000 staffs based in 92 offices across 42 countries, and has participated in projects in over 160 countries.

**Website** [www.Arup.com](http://www.Arup.com)

**Email** [guangzhou@Arup.com](mailto:guangzhou@Arup.com)

# Mari time Museum

Lingang, China



<b>Owner</b>	Shanghai Harbour City Investment
<b>General Contractor</b>	The Shanghai Lingang New City Development
<b>Architect</b>	GMP Hamburg German / Gerkan Marg & Partner
<b>Engineering Consultant</b>	Werner Sobek
<b>Construction Period</b>	2005 - 2009
<b>Type of Project</b>	Museum Building
<b>Size of Structure</b>	46,400m <sup>2</sup>



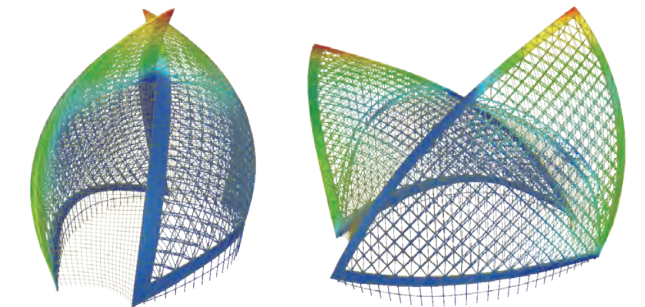
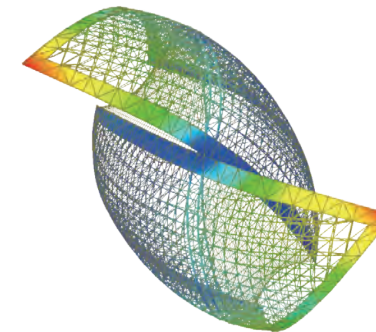
## Main features used in this application



- Linear static analysis with steel truss elements
- Steel frame design

## Description on this project

The main component of the new Maritime Museum in Lingang is composed of a large-hall encompassing a volume of some 63,000m<sup>3</sup> and is formed by two dual-curved shell-shaped surfaces and two cable-net facades spanned between them. Designed as a two-layer steel-grid shell the framework is supported at a total of four pivoted points. The two entwined shells face in opposite directions and touch at just a single point at a height of 40m. The overall height to the extended 'wing tips' is approximately 58m. Each of the respective opaque roof areas with aluminum panel cladding incorporates a highly transparent, dual-curved, pre-stressed cable-net facade with a width of up to 24m and a surface area of 1,000m<sup>2</sup>.



## Werner Sobek

<b>Address</b>	Albstraße 14, 70597 Stuttgart, Germany		
<b>Introduction</b>	Werner Sobek stands throughout the world for engineering, design, and sustainability. The work of them is defined by premium design on the basis of high-class engineering combined with sophisticated green technologies. They work on all types of buildings and materials. Special emphasis lies on lightweight structural design, transparent facade systems, and sustainable building concepts.		
<b>Website</b>	www.wernersobek.de	<b>Email</b>	stuttgart@wernersobek.com

# West International Expo Center

Chengdu, China



General Contractor	China Construction Second Engineering Bureau Limited
Engineering Consultant	China Construction Bureau Installation Engineering
Construction Period	2014 - 2017
Type of Project	Exhibition Building
Size of Structure	530,000m <sup>2</sup>



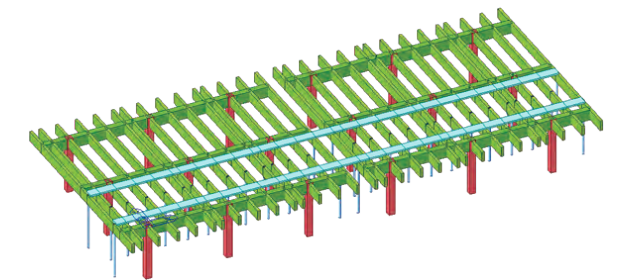
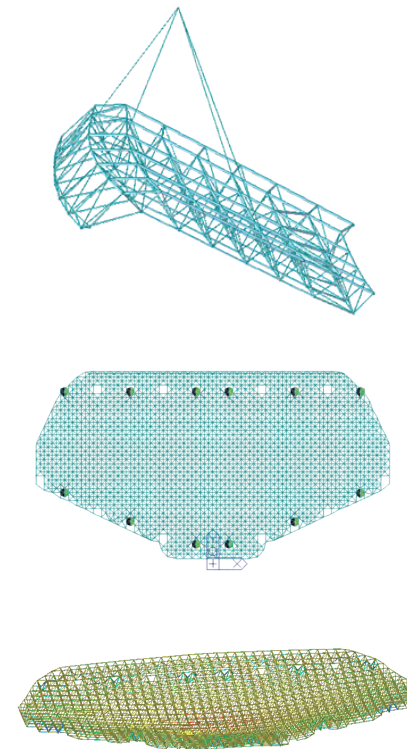
## Main features used in this application



- Construction stage analysis
- Linear static analysis with finite elements

## Description on this project

There are 6 exhibition halls, including 5 exhibition halls (A, B, C, E and F) and a multi-purpose hall (Hall D), as well as entrance hall and traffic corridor outside the exhibition hall (traffic hall). The main structure of the project is the distribution of the theme structure of the venues, the roof structure and traffic hall of the venues. The tender scope is A, B, C, D Hall and the traffic hall. The total steel quantity is about 50,000 tons. The main structure is grid, spindle truss, plane truss and steel column steel beam. The main connection form is high strength bolt node, bolt ball node and sliding bearing.



## China Construction Bureau Installation Engineering

Address	Beijing Fengtai District Auto Museum East Road on the 6 <sup>th</sup> floor, Block E, 7-8 layer, China		
Introduction	The company was founded in 1952. After the restructuring in December 2007, the name was changed "built two innings to install engineering". The company provides services in general contracts and construction of mechanical, electrical and structure engineering including municipal public works.		
Website	www.ccec2baz.com.cn	Email	azgs_bgs@126.com

# Ordos Museum

Ordos, China



Owner	Ordos Municipal Government
Architect	MAD Architects
Engineering Consultant	China Institute of Building Standard Design & Research
Construction Period	2005 - 2011
Type of Project	Museum Building
Size of Structure	40m Height



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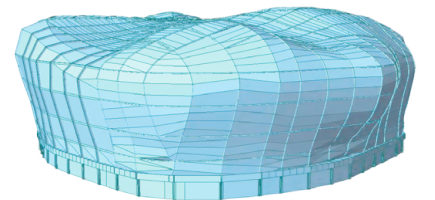
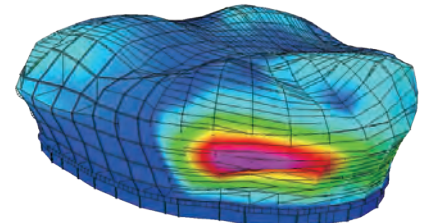
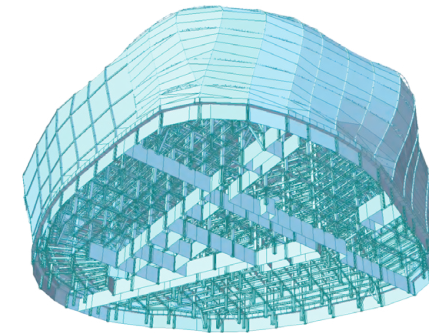
## Main features used in this application



- Linear static analysis with finite elements
- Irregular geometry generation & auto-mesh with midas FX+

## Description on this project

The museum's construction was started in 2008 and completed in 2011. The building is wrapped in polished metal louvers to reflect and dissolve the planned surroundings while filtering solar gain and introducing natural ventilation. The interior is divided into several exhibition halls opening onto a shared public space that runs through the building. The extensive roof glazing introduces cascading into this environment, which is then channeled through the building by the luminescent walls.



## China Institute of Building Standard Design & Research

Address	No. 2, Interwest Building, 9 Shou Ti South Road Haidian District Beijing, 11, 100048, China
Introduction	The firm was founded in 1956. It was formerly known as the Ministry of Construction directly under the institutions - Building Standards Design Institute but was transformed into a central science and technology enterprises. Now, it's under the China Construction Technology Group.
Website	<a href="http://www.cbs.com.cn">www.cbs.com.cn</a>

# China Aviation International Aviation City Exhibition Center

Xi'an, China



Owner	Xi'an China Aviation Culture Tourism Industry
General Contractor	China Aviation Construction Group
Engineering Consultant	JINGGONG Group
Construction Period	2015 - 2016
Type of Project	Exhibition Hall
Size of Structure	26m Height



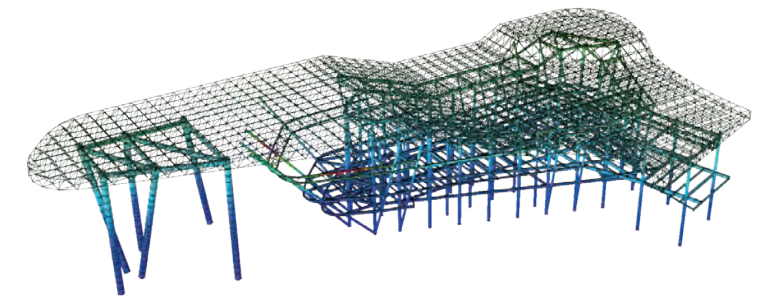
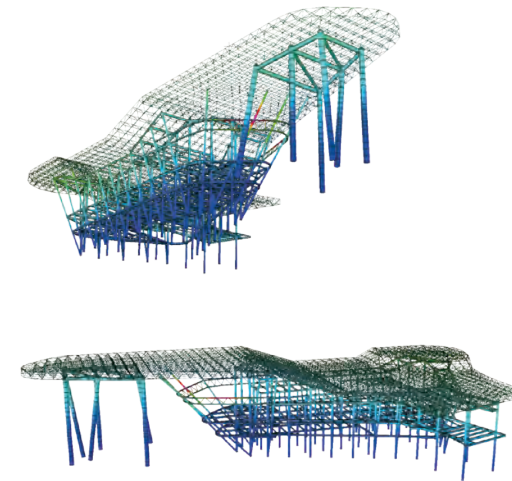
## Main features used in this application



- Plastic analysis
- Buckling analysis with finite elements

## Description on this project

The project is located in Yingbin North Road, Yanliang District, Xi'an, with a total construction area of about 11,300m<sup>2</sup>, the building height of 20.3m (the high point of 26.1m). According to the building function, it is divided into two areas of south and north by the middle hall. The north building is for the show area, flight show field and a helipad on the roof and the south building is for the management, reception and business district.



## JINGGONG Group

Address	Jinggong Plaza, No.112 Jinkeqiao Road, Keqiao, Shaoxing City, Zhejiang Province, China		
Introduction	The company was found in 1968. It is located in Shaoxing Now and has built up its predominant industries and grown into a large-sized hi-tech global-market-oriented enterprise. They focus on its three dominant industries of steel structure building, equipment manufacture.		
Website	<a href="http://www.jinggonggroup.com">www.jinggonggroup.com</a>	Email	<a href="mailto:info@jinggonggroup.com">info@jinggonggroup.com</a>

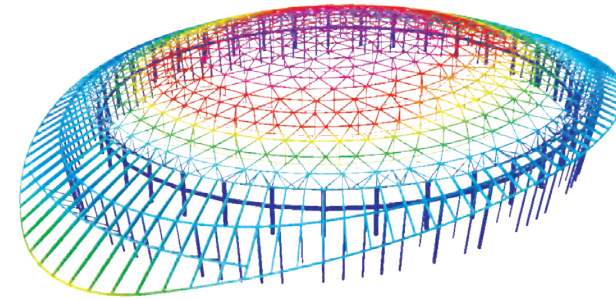
# Beijing University of Technology Gymnasium

midas Gen



## Beijing, China

<b>Owner</b>	Beijing University of Technology
<b>General Contractor</b>	Architecture Design & Research Institute of south China University of Technology
<b>Architect</b>	Beijing construction industry group Co., Ltd.
<b>Engineering Consultant</b>	Architectural Design & Research Institute of south China University of Technology
<b>Construction Period</b>	2005 -2007
<b>Type of Project</b>	Gymnasium
<b>Size of Structure</b>	34,838m <sup>2</sup>



### Main features used in this application



- Optimization design of steel structure
- Construction stage analysis

### Description on this project

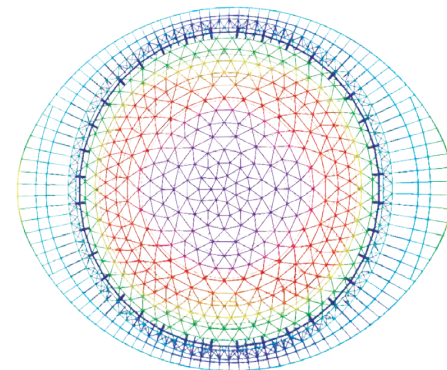
It is an indoor arena located on the campus of the Beijing University of Technology in the Chaoyang District in Beijing, China. The gymnasium hosted the 2008 Summer Olympics badminton and rhythmic gymnastics events. A seating capacity of the gymnasium is 7,500 and has a floor space of 24,000m<sup>2</sup>. After the Olympic Games, it has served as a training facility for Chinese badminton teams and also as a sports and recreational activities center for students and local communities. The gymnasium was completed in September, 2007.

### Architectural Design & Research Institute of south China University of Technology

**Address** Wanshan Road 381, Guangzhou City, Tianhe District, China

**Introduction** The School of Architecture, with more than 80 years of history, is one of the earliest schools established at South China University of Technology (SCUT). SCUT used to be named Xiang Qin University, founded in 1932, with the Technology Institute of National Sun Yet-sen University merged into the school in 1938.

**Website** [www.scutad.com.cn](http://www.scutad.com.cn) **Email** [hgsjyzp@126.com](mailto:hgsjyzp@126.com)



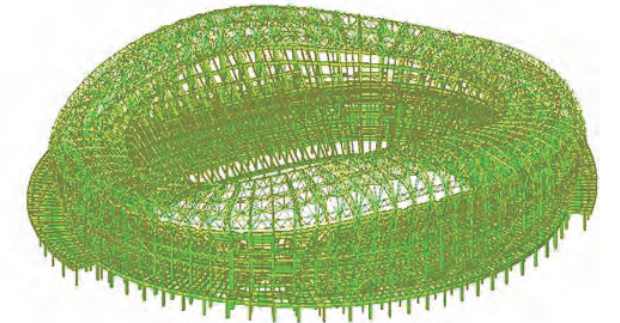
# Dalian Stadium

midas Gen



## Dalian, China

<b>Owner</b>	Dalian Sports Center Development and Construction Investment
<b>General Contractor</b>	China Three Metallurgical Group
<b>Engineering Consultant</b>	Harbin Institute of Technology Architectural Design and Research Institute
<b>Construction Period</b>	2007 - 2011
<b>Type of Project</b>	Stadium
<b>Size of Structure</b>	38,500m <sup>2</sup>



### Main features used in this application



- Construction stage analysis
- Linear static analysis with finite elements

### Description on this project

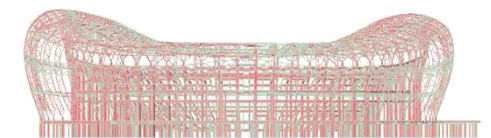
The stadium is the largest independent building in Dalian Sports Center and opened in 2013. The main roof of the stadium is a steel structure and adopts the annular spatial structure system formed by 68 cantilever trusses and 6 annular trusses. The unfolded area of the membrane structure is 60,000m<sup>2</sup>.

### Harbin Institute of Technology Architectural Design and Research Institute

**Address** 92 West Dazhi Street, Nan Gang District, Harbin, China

**Introduction** HITAD covers the whole process of engineering project construction business areas including architectural and urban design, planning and design, environment and landscape design, engineering survey, engineering supervision, engineering consulting and contracting and other fields.

**Website** [en.hit.edu.cn](http://en.hit.edu.cn) **Email** [jennyzhai@hit.edu.cn](mailto:jennyzhai@hit.edu.cn)



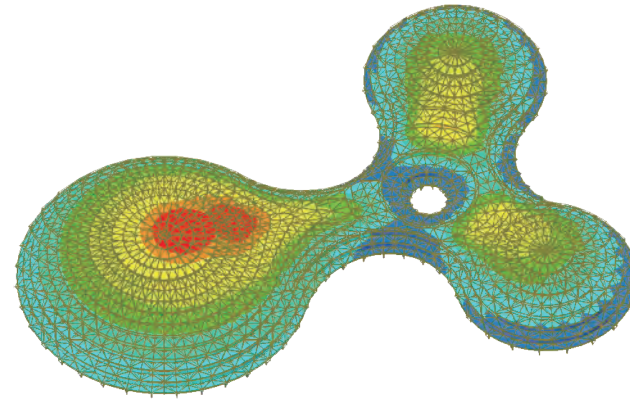
# Foshan Lingnan Pearl Gymnasium

midas Gen



## Guangdong, China

<b>General Contractor</b>	Guangzhou 3rd Construction & Engineering
<b>Architect</b>	Environment Design Institute / Architectural Design & Research Institute of Guangdong
<b>Engineering Consultant</b>	Guangzhou City Planning Kance Design & Research Institute
<b>Construction Period</b>	Completed in 2006
<b>Type of Project</b>	Sport Stadium
<b>Size of Structure</b>	35m Height (4-story)



### Main features used in this application



- Linear static analysis with finite elements
- Auto-mesh generation

### Description on this project

The project is designed to complete the pursuit of rational mechanics, and change the rotation of the dome. The arched body methods used for this project is to correct for the level of ring assembly body by complying with the new computer technology. In addition, it is configured to support the level of central and lateral pillars of the oblique stroke. The dome satisfies the stability under seismic, wind pressure and partial loads.

#### Guangzhou City Planning Kance Design & Research Institute

<b>Address</b>	3 Jianshe 2 <sup>nd</sup> Rd, HuanShi DongLu YanXian, Yuexiu Qu, Guangzhou Shi, Guangdong Sheng 510000, China		
<b>Introduction</b>	GZPI founded in 1953, is the largest and most professional, comprehensive company of the country's leading planning and design of high-tech units. They have committed the government, society and the public to provide the whole process of construction technology services.		
<b>Website</b>	www.gzpi.com.cn	<b>Email</b>	huangfuxiang@gzpi.com.cn

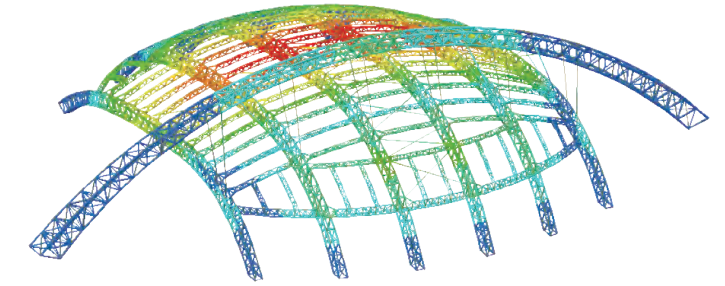
# Yantai University Gymnasium

midas Gen



## Yantai, China

<b>General Contractor</b>	Zhejiang Southeast space Frame
<b>Engineering Consultant</b>	China Metallurgical Engineering Technology
<b>Construction Period</b>	Completed in 2006
<b>Type of Project</b>	Gymnasium
<b>Size of Structure</b>	51,980m <sup>2</sup> / 8,728 Seats



### Main features used in this application



- Reinforced concrete frame and steel arch members
- Linear dynamic analysis with response spectrum

### Description on this project

The project is a multi-functional gymnasium project and massive concrete structure with super arch foot platform. To obtain satisfactory results, it carried out that the preparation of the application of computer software, an in-depth detailed analysis for the technical characteristics and in accordance with the specific conditions of the construction site formulate practical concrete implementation plan. Also, a large arch foot platform was performed in order to handle technology difficulties of mass concrete construction.

#### China Metallurgical Engineering Technology

<b>Address</b>	No.33, Xidu Cheng Road, Daidain District, Beijing 100088, China
<b>Introduction</b>	The firm was established in 1955. It is engaged in construction technology research, promotion and application of large-scale technology enterprises, under the China Metallurgical Industry Group Co.
<b>Email</b>	iysiy@263.net

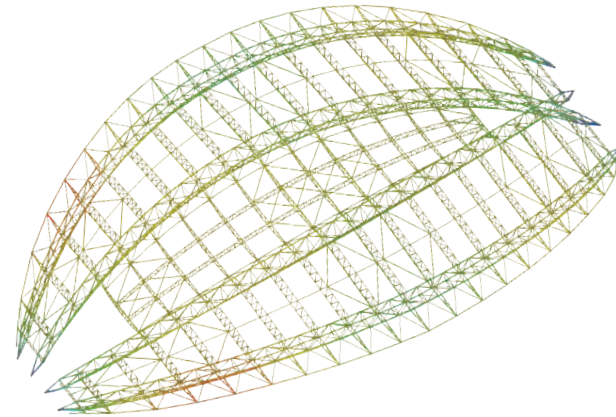
# Mianyang Jiuzhou Stadium

midas Gen



Sichuan, China

<b>Owner</b>	Mianyang City Sports Bureau
<b>Architect</b>	Beijing Institute of Architectural Design
<b>Engineering Consultant</b>	Beijing Institute of Architectural Design
<b>Construction Period</b>	2003 - 2004
<b>Type of Project</b>	Sport Stadium
<b>Size of Structure</b>	161,877m <sup>2</sup>



## Main features used in this application



- Linear static analysis
- Linear dynamic analysis with response spectrum
- Buckling analysis

## Description on this project

Jiuzhou Stadium is a first-class and modern landmark. It applied steel structure construction technology, with a strong ductility, attenuation of seismic waves, which effectively absorb seismic capacity, which ensuring construction almost not affected by the earthquake. In 2008, it became the temporary housing for survivors in the aftermath of the Sichuan earthquake.

## Beijing Institute of Architectural Design

<b>Address</b>	No 62.Nan Li Shi Lu Xicheng District, Beijing 100045, China		
<b>Introduction</b>	BIAD is a large-scale state-owned architectural design and consulting institute established in 1949. It has 13 domestic branches and 14 wholly-owned or holding companies, 9 joint-stock companies nationwide.		
<b>Website</b>	www.biad.com.cn	<b>Email</b>	marketing@biad.com.cn



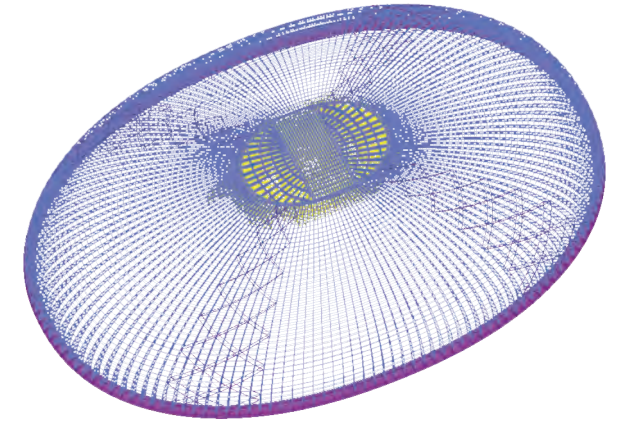
# Grand National Theater

midas Gen



Beijing, China

<b>General Contractor</b>	Hong Kong Construction
<b>Architect</b>	Paul Andreu, Architecte Paris
<b>Engineering Consultant</b>	Setec TPI
<b>Construction Period</b>	1999 - 2008
<b>Type of Project</b>	Opera House
<b>Size of Structure</b>	46m Height



## Main features used in this application



- Linear static analysis with finite elements
- Linear dynamic analysis with response spectrum

## Description on this project

The project is located in the heart of Beijing. It is a building with a total area of 149,500m<sup>2</sup> which curved volume emerges like an island in the middle of a lake. The hull covered with titanium is a super-ellipsoid of 213m of long axis, 144m of small axis and 46m of Height. A curved canopy 100m wide at the base cuts the hull in half.

## Setec TPI

<b>Address</b>	42-52 Quai de la Rapée, 75012 Paris, France		
<b>Introduction</b>	Setec is a subsidiary of the Setec group, which specializes in infrastructures, industrial buildings and civil engineering works. They focus on the responsibility and motivation of teams through the direct relationship of specialist engineers with its customers.		
<b>Website</b>	www.tpi.setec.fr	<b>Email</b>	tpi@tpi.setec.fr



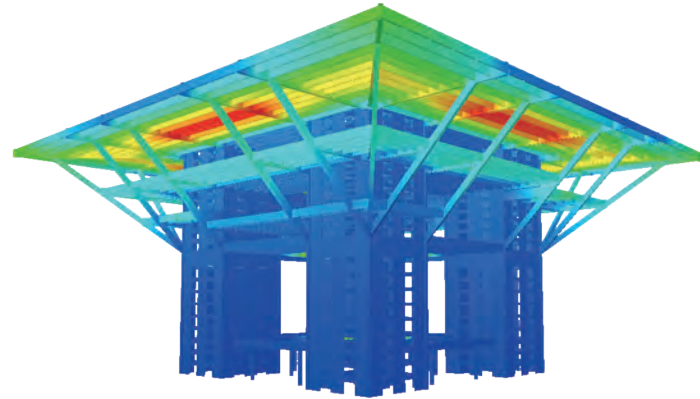
# China Pavilion Oriental Crown in Shanghai Expo

midas Gen



Shanghai, China

<b>Owner</b>	Bureau of Shanghai World Expo Coordination
<b>General Contractor</b>	Shanghai Mechanized Construction Cooperation
<b>Architect</b>	South China University of Technology
<b>Engineering Consultant</b>	South China University of Technology
<b>Construction Period</b>	2007 - 2010
<b>Type of Project</b>	Exhibition Hall
<b>Size of Structure</b>	70m Height



## Main features used in this application



- Linear static analysis with finite elements
- Linear dynamic analysis with response spectrum

## Description on this project

The China Pavilion is the flagship of the Shanghai Expo pavilions. With 70m tall, it is three times the height of other countries' pavilions and is designed as a permanent structure for Shanghai. The form of the building is based on the traditional Chinese dougong or wooden crossbeam but on a massive scale.



## South China University of Technology

<b>Address</b>	Room 1224, Building 1, Wushan Campus 381 Wushan Road, Tianhe District, Guangzhou 510641, China		
<b>Introduction</b>	SCUT is widely recognized as one of the most creative and influential universities in China. Their reputation comes from the University's historical commitment to innovative courses, cross-disciplinary teaching and research, and flexible and high responses to society needs.		
<b>Website</b>	en.scut.edu.cn	<b>Email</b>	scuta10@scut.edu.cn

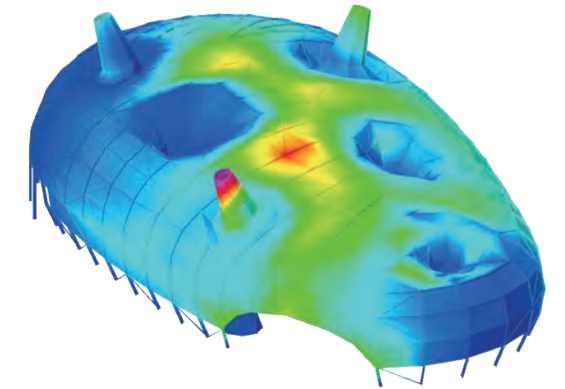
# Japan Pavilion in Shanghai Expo

midas Gen



Shanghai, China

<b>General Contractor</b>	Takenaka Corporation
<b>Engineering Consultant</b>	Takenaka Corporation
<b>Construction Period</b>	2007 - 2010
<b>Type of Project</b>	Exhibition Hall
<b>Size of Structure</b>	24m Height (3-story)



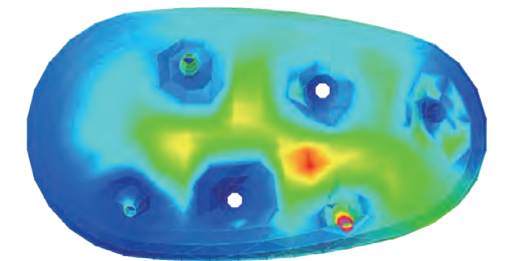
## Main features used in this application



- Irregular geometry generation & auto-mesh with midas FX+
- Linear static analysis with finite elements
- Linear dynamic analysis with response spectrum

## Description on this project

The huge 'breathing organism' pavilion situates on a 6,000m<sup>2</sup> plot. With the 24m height, it is also one of the largest pavilions at Shanghai Expo 2010. The pavilion is divided into past, present and future exhibitions.



## Takenaka Corporation

<b>Address</b>	1-13, 4-chome, Hammachi, Chuo-ku, Osaka 541-0053, Japan
<b>Introduction</b>	With 20 overseas offices, Takenaka offers comprehensive services worldwide across the entire spectrum of space creation from site location and planning to design and construction as well as post-completion services such as building maintenance.
<b>Website</b>	www.takenaka.co.jp



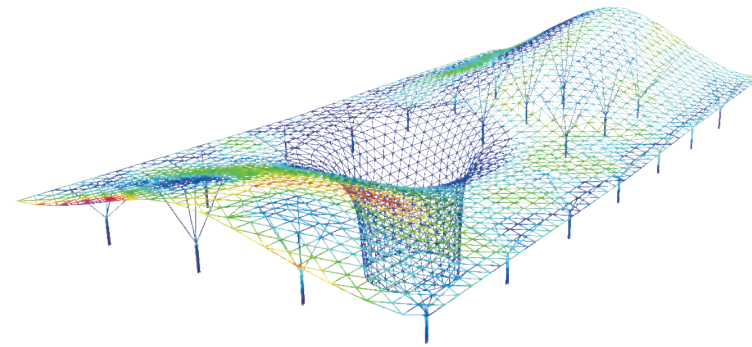
# Sunshine Vale of the Axis (Expo Axis)

midas Gen



Shanghai, China

<b>Owner</b>	Shanghai World EXPO Land Holding
<b>General Contractor</b>	Ministry of Foreign Trade and Economic
<b>Architect</b>	SBA / Hong Li, Bianca Nitsch
<b>Engineering Consultant</b>	Knippers Helbig
<b>Construction Period</b>	2006 - 2010
<b>Type of Project</b>	Exhibition Structure
<b>Size of Structure</b>	45m Height



## Main features used in this application



- Irregular geometry generation & auto-mesh with midas FX+
- Linear static analysis with finite elements
- Linear dynamic analysis with response spectrum

## Description on this project

The landmark of the Expo Shanghai 2010 is at the central boulevard. It forms the central entrance area and provides 350,000m<sup>2</sup> effective area for numerous facilities for the exposition. It has a height of 35m and a free projection of 70m. These are called sun valleys direct natural light into the basements. The Expo boulevard is one of five buildings, which remain after the world exposition to form the center of a new urban district of Shanghai in the long run.

## Knippers Helbig

<b>Address</b>	75 Broad Street, New York, NY 10004, USA		
<b>Introduction</b>	Knippers Helbig Advanced Engineering is a nationally and internationally consulting engineering practice with a multidisciplinary team of civil and structural engineers, architects and facade engineers. The company offers a comprehensive range of services for structural engineering, facade design and geometric consulting for architecturally challenging building and bridge projects.		
<b>Website</b>	www.knippershelbig.com	<b>Email</b>	newyork@knippershelbig.com



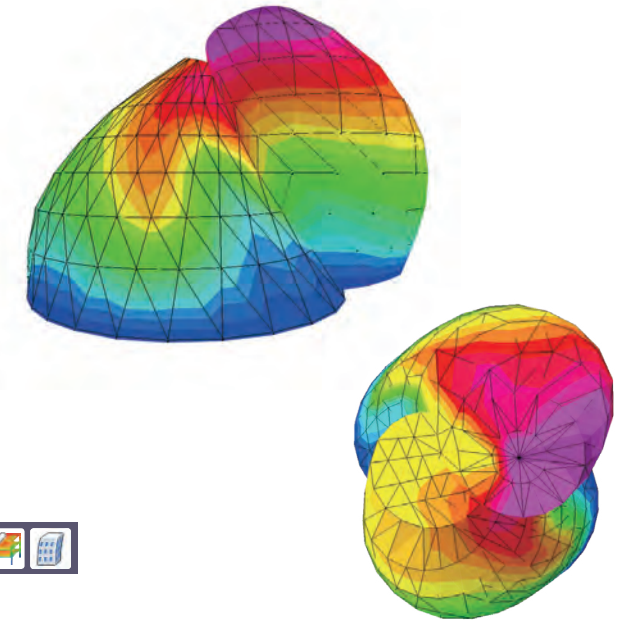
# Israel Pavilion in Shanghai Expo

midas Gen



Shanghai, China

<b>Owner</b>	Israel Ministry of Foreign Affairs
<b>Engineering Consultant</b>	YARON-SHIMONI-SHACHAM
<b>Construction Period</b>	Completed in 2010
<b>Type of Project</b>	Exhibition Hall
<b>Size of Structure</b>	24m Height



## Main features used in this application



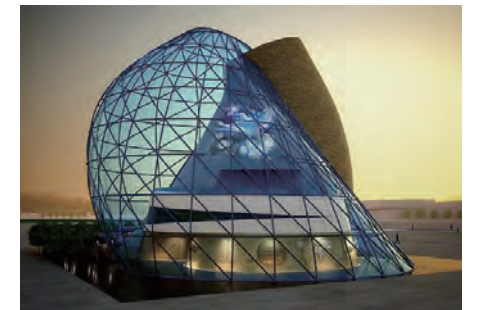
- Irregular geometry generation & auto-mesh with midas FX+
- Linear static analysis with finite elements
- Linear dynamic analysis with response spectrum

## Description on this project

The pavilion consists of three areas - Whispering Garden, Hall of Light and Hall of Innovations. The Whispering Garden is a green orchard that greets visitors as they enter the building. The Hall of Light includes a 15m high screen. It displays films highlighting the country's innovations and technological achievements.

## YARON-SHIMONI-SHACHAM

<b>Address</b>	38 Hamasger Street P.O.Box 57047 Tel Aviv 61570, Israel		
<b>Introduction</b>	YSS offers extensive experience in a very broad range of civil engineering projects. They are noted for their work in bridges, marine structures, reinforced concrete structures, prestressed concrete and steel structures.		
<b>Website</b>	www.yss.co.il	<b>Email</b>	office@yss.co.il



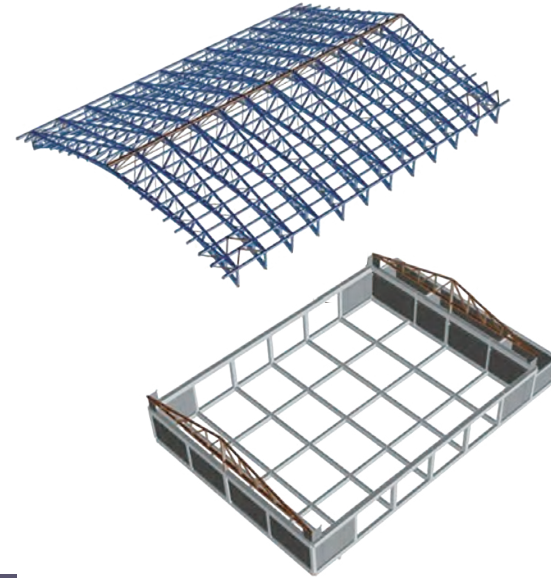
# Maeshiba School Gymnasium

midas Gen



Toyohashi, Japan

**Architect** Ozaki Architects  
**Engineering Consultant** Rhythm Design Mov Co., Ltd.  
**Construction Period** Completed in 2015  
**Type of Project** Gymnasium  
**Size of Structure** 2-story



## Main features used in this application



- Linear static analysis with truss elements
- Linear dynamic analysis with response spectrum

## Description on this project

The size of the space is 36m x 27m and the short side direction is a three-dimensional gradient three-dimensional truss with beams and a lower chord arches. By forming the keel through the rod material in the center, the force flows in the long side direction. It has a hybrid wooden roof with strong tensile member as steel.

## Rhythm Design Mov Co., Ltd.

**Address** 1-2-21, Kamimaezu, Naka-ku Nagoya-shi, Aichi, 460-0013, Japan  
**Introduction** Rhythm Design Mov Co., Ltd. is a structural design office. They provide an appropriate engineering service for architecture and environment. Also, they have established two offices in Tokyo and Nagoya to get the real information.  
**Website** [www.rd2002.com](http://www.rd2002.com) **Email** [info@rd2002.com](mailto:info@rd2002.com)



PHOTO BY YASUO HAGIWARA

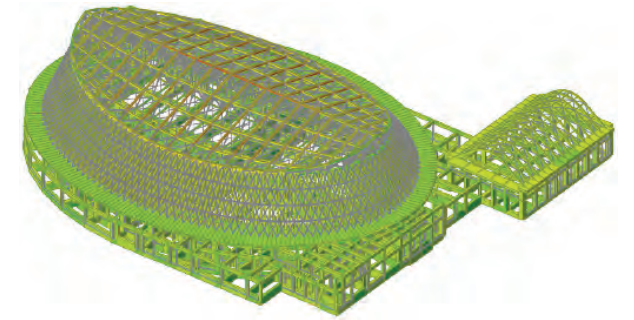
# Kusanagi Gymnasium / Konohana Arena

midas Gen



Shizuoka, Japan

**Owner** Shizuoka Prefecture  
**Architect** Naito Architect & Associates  
**Engineering Consultant** KAP  
**Construction Period** 2013 - 2014  
**Type of Project** Gymnasium  
**Size of Structure** 2-story



## Main features used in this application



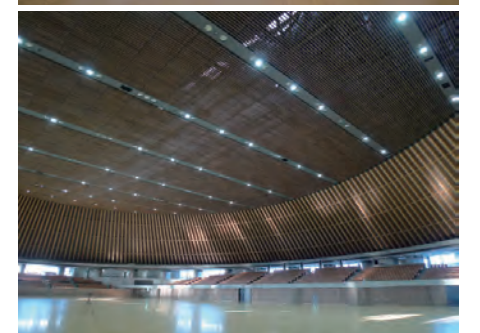
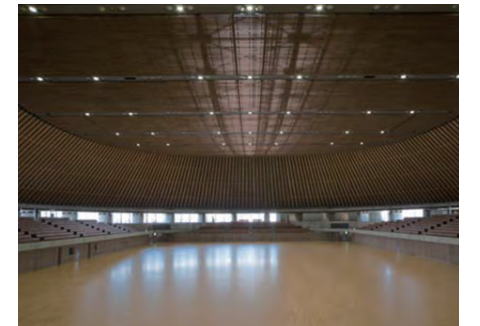
- Steel & RC & timber building design as per Japanese standard
- Boundary nonlinear dynamic analysis with seismic isolation element

## Description on this project

It is an integrated athletic park with a series of competition facilities such as an indoor playground, baseball field and space for athletics. The roof is floated in the air by the seismic isolation and the outer circumference is solidified with a strong prestressed concrete ring and the high quality Tenryu Sugi laminated wood. The strong earthquake-resistant brace is placed on the outer shell and the soft space is closed with a large roof of the steel keel.

## KAP

**Address** Chiyoda Fujimi Sky Mansion 1F, 2-4-9 Fujimi, Chiyoda-ku, Tokyo 102-0071, Japan  
**Introduction** KAP is a structural design group for various materials, scales and purposes. They can handle many structure type such as wood, RC, steel, PCa/pc and seismic. Also, they support diverse scales projects from a house to a large-scale government office and civil engineering structures.  
**Website** [kapstructure.wixsite.com/engineers](http://kapstructure.wixsite.com/engineers)



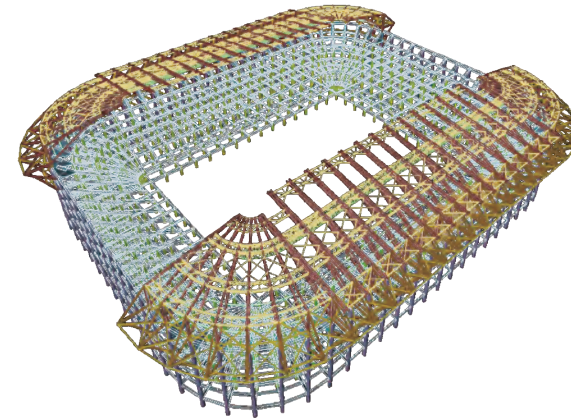
# Daejeon World Cup Stadium

midas Gen



Daejeon, Korea

<b>Owner</b>	Daejeon City
<b>General Contractor</b>	Hyundai Development and 52 other firms
<b>Engineering Consultant</b>	YOOSHIN Architects & Engineers
<b>Construction Period</b>	1998 - 2001
<b>Type of Project</b>	Sport Stadium
<b>Size of Structure</b>	6-story



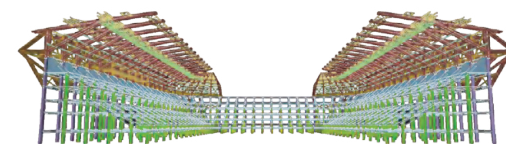
## Main features used in this application



- Steel truss cantilever elements
- Prestress analysis
- RC frame design as per KCI-USD

## Description on this project

It is a soccer-specific stadium located in Daejeon, Korea. It has 40,407 seats and is equipped with the facilities for usage in a variety of sporting and any kind of large scale of events. Also, it's the venue where Korea and Italy played the 2002 FIFA World Cup finals. In 2016, it was named to the K-League Green Stadium.



## YOOSHIN Architects & Engineers

<b>Address</b>	Seungjin B/D, 48 Pyeongchondaero 227 beongil, Dongangu, Anyangsi, Gyeonggi-do 14072, Korea		
<b>Introduction</b>	YOOSHIN AE is an architectural practice established in 1978. They have plodded away for over 35 years in the field of architectural design and construction management & supervision, and produced notable projects with commercial and public sector clients.		
<b>Website</b>	www.yooshinae.com	<b>Email</b>	webmaster@yooshinae.com



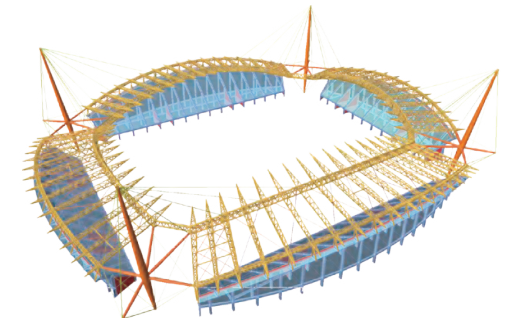
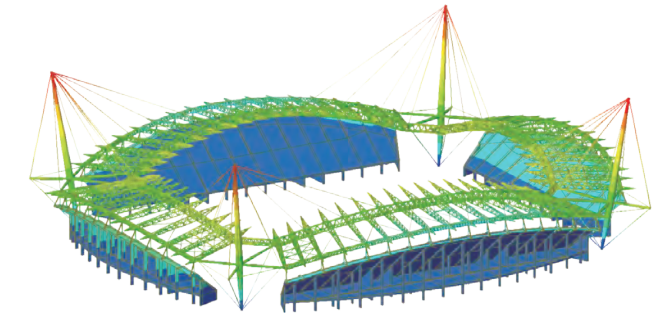
# Jeonju World Cup Stadium

midas Gen



Jeonju, Korea

<b>Owner</b>	Jeonju City
<b>General Contractor</b>	SUNGWON Corporation and 2 other firms
<b>Architect</b>	POS A.C
<b>Engineering Consultant</b>	C-S Structural Engineering
<b>Construction Period</b>	1999 - 2001
<b>Type of Project</b>	Sport Stadium
<b>Size of Structure</b>	7-story



## Main features used in this application



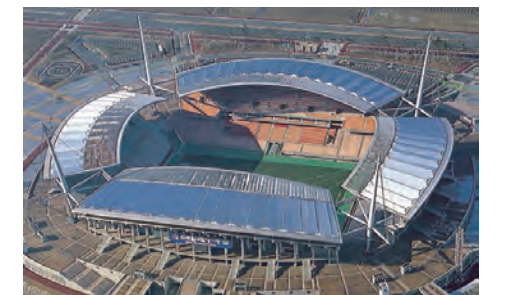
- Tension-only truss elements
- Prestress analysis
- Steel frame design as per KSSC-LSD

## Description on this project

The unique shape comes from a Korean traditional fan known as Hapjukseon in Korea. This fan represents the beauty of traditional Korean designs. The design of the stadium gives visitors a dramatic feeling as the rows of the stadium seems to blend effortlessly into field.

## C-S Structural Engineering

<b>Address</b>	B-#505 Woolmilil \$146-8, Sangdaewon, Jungwon, Seongnam, Gyeonggi 13204, Korea		
<b>Introduction</b>	C-S Structural Engineering is one of the leading architectural engineering consultants in Korea that provides complete systems to comply with local building codes and safety legislation. Their professional architectural engineering consultants have an experience of more than 2 decades.		
<b>Website</b>	www.csse.kr	<b>Email</b>	cs@csse.kr



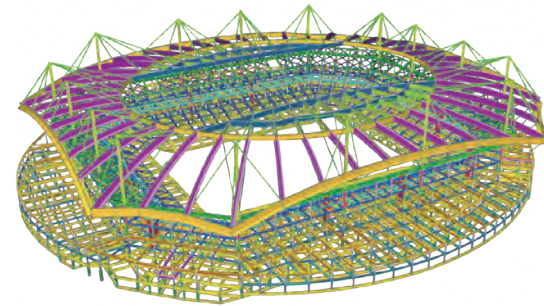
# Seoul World Cup Stadium

midas Gen



Seoul, Korea

<b>Owner</b>	Seoul Metropolitan Facilities Management Corporation
<b>General Contractor</b>	Samsung Engineering
<b>Architect</b>	Choon-soo Ryu, Beyond ce Group
<b>Engineering Consultant</b>	Samsung Engineering and 5 other firms
<b>Construction Period</b>	1998 - 2001
<b>Type of Project</b>	Sport Stadium
<b>Size of Structure</b>	50m Height (7-story)



## Main features used in this application



- Tension-only truss elements
- Prestress analysis
- Steel frame design as per KSSC-LSD

## Description on this project

The stadium, also known as Sangam Stadium, is located in Seoul, Korea. It was built for the 2002 FIFA World Cup and opened in 2001. It is currently the second largest stadium in Korea after Seoul Olympic Stadium. It's designed to represent the image of a traditional Korean kite.

## Samsung Engineering

<b>Address</b>	Samsung GEC, 26, Sangil-ro 6-gil, Gangdong-gu, Seoul 05288, Korea
<b>Introduction</b>	Founded in 1970, Samsung Engineering has grown from a modest engineering firm to a globally recognized name in the EPC market. It has a broadened range of engineering services: Hydrocarbon facilities, power plants, waste treatment plants and industrial production facilities.
<b>Website</b>	<a href="http://www.samsungengineering.com">www.samsungengineering.com</a>



# Tank with Sloshing

midas Gen



Bergamo, Italy

<b>Owner</b>	Siad S.p.A.
<b>General Contractor</b>	Siad S.p.A.
<b>Engineering Consultant</b>	E.T.S. S.p.A. Engineering and Technical Services
<b>Construction Period</b>	Completed in 2013
<b>Type of Project</b>	Steel Industry Plant
<b>Size of Structure</b>	28,000 Liters

## Main features used in this application



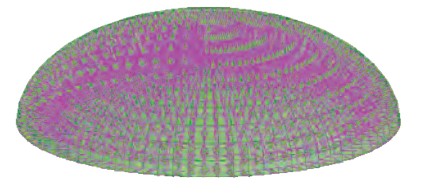
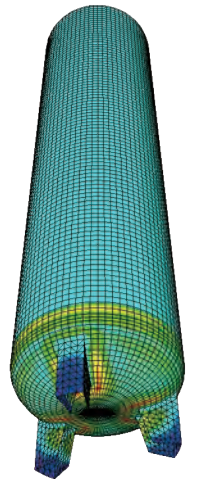
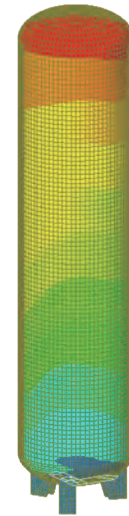
- The tank is modeled with triangular and quadrangular mesh. The loads that have been implemented are structural, non structural, thermal, wind, snow and earthquake. A dynamic modal analysis with response spectrum has been performed.

## Description on this project

The steel cryogenic tank contains oxygen and is about 12m tall including legs. It has an external diameter of 2.47m. The installation's site is a low seismicity area in northern Italy near to the hinterland of Milan.

## E.T.S. S.p.A. Engineering and Technical Services

<b>Address</b>	Via A. Mazzi, 32 - 24018 Villa d'Alme (Bergamo), Italy		
<b>Introduction</b>	Over 25 years, the firm has provided design and site management service with competence and professionalism in every areas of engineering both civil engineering and plants design. They are specialized in Innovative building and construction design in civil, industrial, plants and hospital area as well as main road, highway rails, and tram-line design.		
<b>Website</b>	<a href="http://www.etseng.it">www.etseng.it</a>	<b>Email</b>	<a href="mailto:info@etseng.it">info@etseng.it</a>



# Precast Concrete Hybrid Tower

Palencia, Spain



Owner	Enerpal
General Contractor	Max Bogl
Engineering Consultant	iConcrete / ZENET
Type of Project	Wind Power Plant
Size of Structure	213m Height



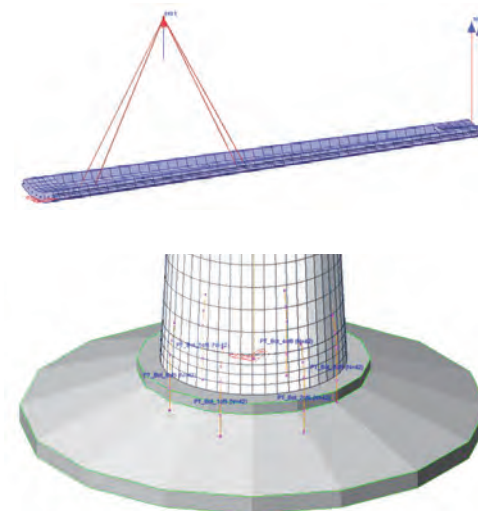
## Main features used in this application



- Linear dynamic analysis with response spectrum
- General section designer

## Description on this project

The wind power plant is built by using precast method. The concrete strength is checked by vibration dynamic analysis in midas Gen. The height is 213m and it is located in Palencia. The large wind power towers measuring up to over 100m in height are crucial significant for efficient wind exploitation and electric power generation. The towers of these dimensions are virtually impossible to realize efficiently with conventional construction methods.



## iConcrete / ZENET

**Address** C / Islas Cíes 73, Bajo Local D 28035, Madrid, Spain

**Introduction** iConcrete is an engineering company created in 2012 to develop solutions that industrialize the construction with prefabricated concrete. The experience of iConcrete professionals is more than 15 years in the field of engineering, prefabrication, building and civil works.

**Website** [www.iconcrete.com](http://www.iconcrete.com)

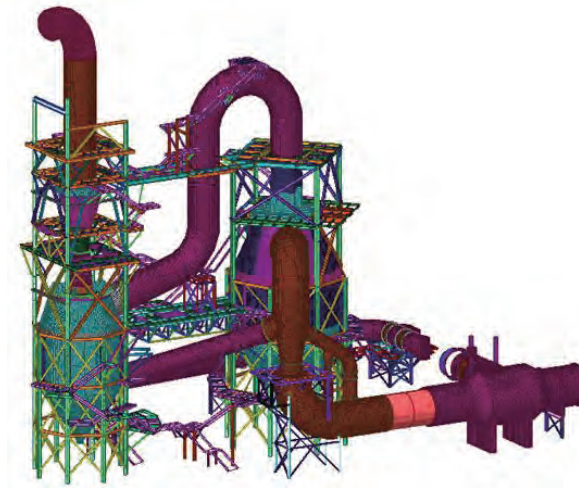
# Gas Pipeline with Venturi Support Tower

midas Gen



Genoa, Italy

Engineering Consultant: DAC Ingegneria  
Type of Project: Steel Industry Plant



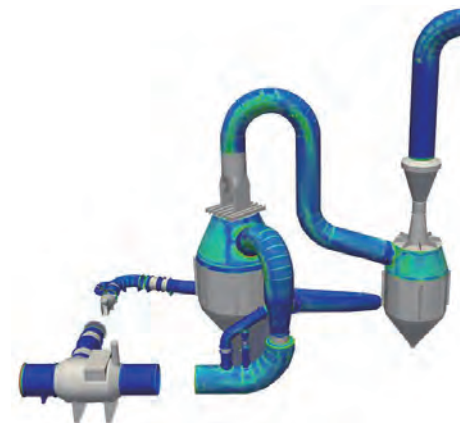
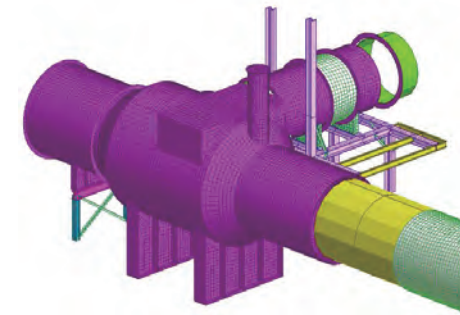
## Main features used in this application



- Static and dynamic analysis with finite elements
- Mesh generation using midas FX+

## Description on this project

In this project, stress analysis of the gas purification line with integrated static and dynamic calculation of the new metallic structures of the existing venturi support towers are performed.



## OAC Ingegneria

Address: Via Sottoripa, 1A / 121, Genoa, 16124, Italy

Introduction: OAC Engineering was born as a choice of integration of the professional experiences of the owners with the aim of dealing with multidisciplinary problems that arise in the complex reality of the design of the plants and the territorial infrastructures.

Website: [www.oacingegneria.com](http://www.oacingegneria.com) Email: [info@oacingegneria.com](mailto:info@oacingegneria.com)

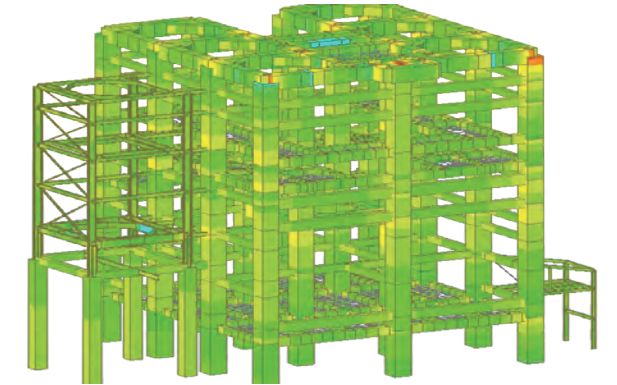
# Raw Meal

midas Gen



Indarung, Indonesia

Owner: PT Semen Indonesia  
General Contractor: PT. PP  
Engineering Consultant: Partono Fondas Engineering Consultant  
Construction Period: 2014 - 2016  
Type of Project: Power Plant  
Size of Structure: 55m Height



## Main features used in this application



- Steel code checking as per BS 5950
- Concrete code design & checking as per BS 8110

## Description on this project

PT. Semen Indonesia intends to build the new cement plant in Indarung VI project. This raw meal building is intended to assume the mechanical equipment to process raw material with producing rate of 8,000 ton/day.

## Partono Fondas Engineering Consultant

Address: Pusat Niaga Roxy Mas Blok C4 No.16 Jl. KH Hasyim Ashari No.125, Jakarta Pusat 10150, Indonesia

Introduction: PT. Partono Fondas is one of the most well-known civil engineering consultant in Indonesia, specialized in industrial building and bridge structure design. They have handled many large scaled national projects, ranging from industrial infrastructures to long-spanned cable bridges.

Website: [www.partonofondas.com](http://www.partonofondas.com) Email: [office@partonofondas.com](mailto:office@partonofondas.com)



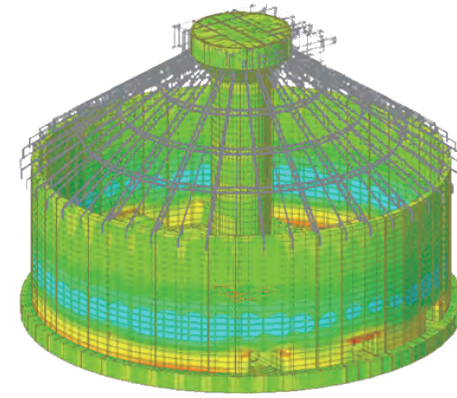
# Clinker Storage

midas Gen



## Indarung, Indonesia

<b>Owner</b>	Semen Indonesia
<b>General Contractor</b>	PT. PP
<b>Engineering Consultant</b>	Partono Fondas Engineering Consultant
<b>Construction Period</b>	2014 - 2016
<b>Type of Project</b>	Power Plant
<b>Size of Structure</b>	60m Inner diameter, 21m Height



### Main features used in this application



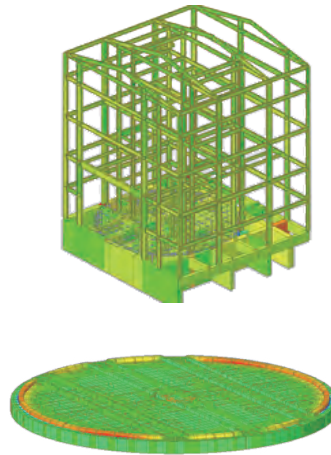
- Surface spring supports for mat foundation
- Unit length force result in plate element

### Description on this project

PT. Semen Indonesia intends to build the new cement plant in Indarung VI Project. This silo storage is intended to collect and store semi raw material with producing capacity rate of 8,000 ton/day.

### Partono Fondas Engineering Consultant

<b>Address</b>	Pusat Niaga Roxy Mas Blok C4 No.16 Jl. KH Hasyim Ashari No.125, Jakarta Pusat 10150, Indonesia		
<b>Introduction</b>	PT. Partono Fondas is one of the most well-known civil engineering consultant in Indonesia, specialized in industrial building and bridge structure design. They have handled many large scaled national projects, ranging from industrial infrastructures to long-spanned cable bridges.		
<b>Website</b>	www.partonofondas.com	<b>Email</b>	office@partonofondas.com



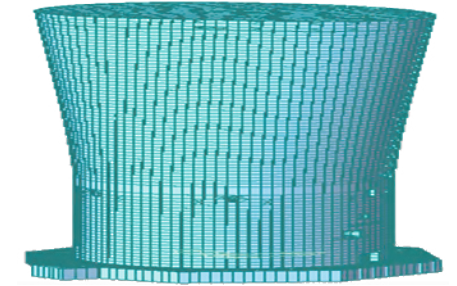
# CF Silo

midas Gen



## Padang, Indonesia

<b>Owner</b>	Semen Indonesia
<b>General Contractor</b>	Waskita Karya
<b>Engineering Consultant</b>	Partono Fondas Engineering Consultant
<b>Construction Period</b>	2014 - 2016
<b>Type of Project</b>	Power Plant
<b>Size of Structure</b>	28m Inner diameter, 80m Height



### Main features used in this application



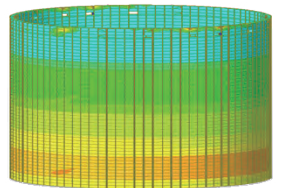
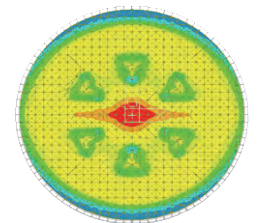
- Linear dynamic analysis with response spectrum
- Surface spring supports for mat foundation
- Unit length force result in plate element

### Description on this project

PT. Semen Indonesia intends to build the new cement plant in Indarung VI Project. Functioned to collect and store plenty of raw materials, this slender structure is built in the highest earthquake prone zone in Indonesia to accommodate the cement producing capacity rate of 8,000 ton/day.

### Partono Fondas Engineering Consultant

<b>Address</b>	Pusat Niaga Roxy Mas Blok C4 No.16 Jl. KH Hasyim Ashari No.125, Jakarta Pusat 10150, Indonesia		
<b>Introduction</b>	PT. Partono Fondas is one of the most well-known civil engineering consultant in Indonesia, specialized in industrial building and bridge structure design. They have handled many large scaled national projects, ranging from industrial infrastructures to long-spanned cable bridges.		
<b>Website</b>	www.partonofondas.com	<b>Email</b>	office@partonofondas.com



**MIDAS**