

# THE MASTERWORKS OF GEOTECHNICAL 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  
Copyright © Since 1989 MIDAS Information Technology Co., Ltd. All rights reserved.



# THE MASTERWORKS OF GEOTECHNICAL 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

AECOM

AFCONS

ARCADIS

ARUP

BIAD

BURO HAPPOLD  
ENGINEERING

CCCC Highway Consultants Co., Ltd.

COI

ch2m

DAELIM

e.construct

GARVER

ORGCE

HDR

HNTB

iConcrete

ILF  
CONSULTING  
ENGINEERS

JACOBS

Knippers Helbig

LANGAN

LKS

Lombardi

Louis Berger

Michael Baker  
INTERNATIONAL

MORGAN  
SINDALL

MOTT  
MACDONALD

NCC

PRF

posco  
E&C

RAMBOLL

EPF  
ENGINEERING PVT LTD

SAMSUNG  
SAMSUNG ENGINEERING

Structural Design Group

SKANSKA

SHP

SNC-LAWALIN

Thornton Tomasetti

TRACTEBEL

TU Delft

TYLIN  
INTERNATIONAL

UPTEU

WRINER GROUP

wsp

Yoshin

---

06	Bosphorus Third Bridge
08	Buhang Dam
09	Hangzhou a Block of Commercial - Financial Space Foundation Pit Works
10	Busan Subway Line 3 Tunnel
11	Posiva's Onkalo
12	ARC: Trans-Hudson Express Dyer Avenue Fan Plant
13	Trans - Hudson Express
14	Interchange near the Sokol Subway
16	Cityringen Copenhagen Metro
18	King's Cross Station
20	Jeddah Tower
21	Odeon Tower
22	Hangzhou Yintai City Foundation Pit
23	Dubai Tower in Qatar
24	Canton Tower Foundation Ditch
26	Foundation of Sugar Silo
27	Isothermal Tank - Liquefied Hydrocarbon Storage
28	Hefei Metro Line 4
29	Pentominium Residential Development

# Bosphorus Third Bridge

Istanbul, Turkey



Owner	Republic of Turkey
General Contractor	Hyundai E&C / SK E&C
Engineering Consultant	Lombardi
Construction Period	2013 - 2015
Type of Project	Bridge Foundation
Size of Structure	1.4km Main Span, 2.2km Total Length



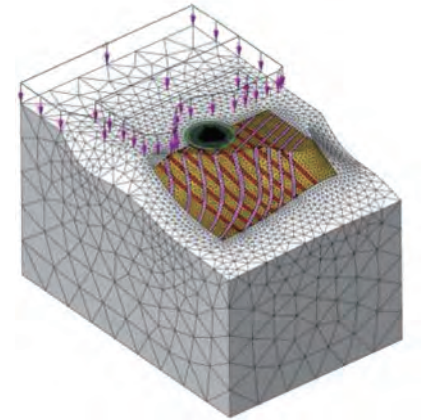
## Main features used in this application



- Anchor block and ground approach of the cable stayed bridge
- Interface elements between shaft and soil

## Description on this project

The Bosphorus Third Bridge is a part of the 260km long Northern Marmara Motorway. The bridge, which is 2.2km long with a main span of 1.4km, links Europe to Asia, north of Istanbul. With its width of 59m, this is the first bridge of the world that accommodates an 8-lane highway and a 2-lane railway at the same level.



## Lombardi

**Address** Via Giotto 36IT - 20145 Milano, Italy

**Introduction** In 1955, Dr. Giovanni Lombardi founded his consulting company for engineering services, cornerstone of the Lombardi Group. Today, the company cares for the life cycle of transport infrastructures and hydraulic works from the initial design phases to their operation.

**Website** [www.lombardi.ch](http://www.lombardi.ch)

**Email** [milano@lombardi.group](mailto:milano@lombardi.group)

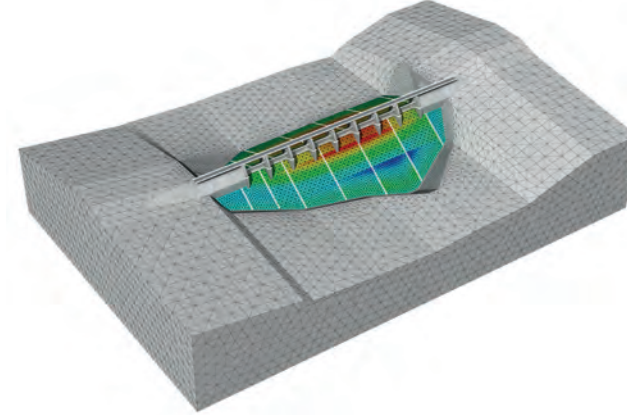
# Buhang Dam

GTS NX



Gimcheon, Korea

**Owner** Korea Water Resources Corporation  
**Engineering Consultant** GS E&C  
**Construction Period** 2006 - 2014  
**Type of Project** Concrete / Flood - Control Dam  
**Size of Structure** 472m Length, 75m Height



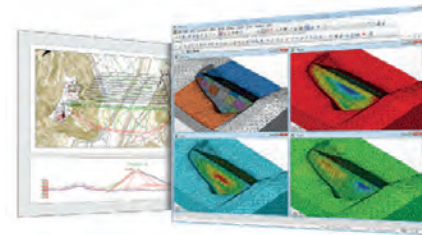
## Main features used in this application



- Evaluate the deformation and member force of cut - off wall due to water pressure
- Deformation and stress distribution with constitutive models

## Description on this project

Buhang Dam is located in Gimcheon City, Gyeongsangbukdo, South Korea. After typhoon Rusa passed, a dam was deemed to be necessary to prevent flood damage. It is expected to contribute to the development of local communities through the supply of river maintenance water for dams and minimization of flood damage in the Gamcheon coastal area around Gimcheon City. It will also supply drinking water and agricultural water in Gwangcheon and Gumi.



## GS E&C

**Address** GRAN SEOUL, 33 Jong-ro, Jongno-gu, Seoul, Korea  
**Introduction** GS E&C has established its status as a top - ranking company domestically since its foundation in 1969 by achieving tremendous growth in the fields of architecture, civil engineering, housing, plant, environment and power plant.  
**Website** www.gsenc.com

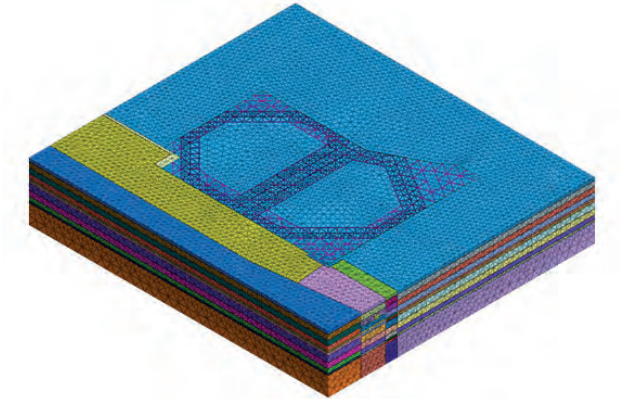
# Hangzhou a Block of Commercial - Financial Space Foundation Pit Works

GTS NX



Hangzhou, China

**Engineering Consultant** Hangzhou Survey and Design Institute  
**Type of Project** Foundation  
**Size of Structure** 20m Height, 26,000m<sup>2</sup> Area



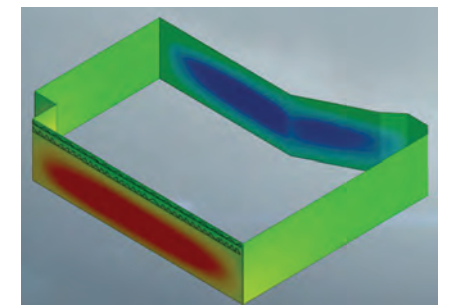
## Main features used in this application



- 3D FEM analysis of the impact of excavation on the subway station and tunnel

## Description on this project

The excavation area is about 26,000m<sup>2</sup> and a depth of 20.2m. The pile is constructed by using the bored piles. The excavation pit is surrounded by a building complex and the Metro Line 2 Qingchun Road Station. Analysis was required to verify the excavation will not affect adjacent structures.



## Hangzhou Survey and Design Institute

**Address** China's Hangzhou City, Zhejiang Province, Wulin Gate Village on the 13<sup>th</sup>, China  
**Introduction** Hangzhou Survey and Design Institute was built in 1984. Class A "Engineering Survey Certificate" and Class A "mapping qualification certificate" were issued by Ministry of Construction and State Bureau of Surveying and Mapping respectively. Hangzhou Survey and Design Institute actively participate in urban construction, subway, a large number of high-rise buildings and geotechnical engineering design.  
**Website** www.hkance.com **Email** Hkance@mail.hz.zj.cn

# Busan Subway Line 3 Tunnel

GTS NX



## Busan, Korea

<b>Owner</b>	Busan Metro
<b>Engineering Consultant</b>	ORUM
<b>Construction Period</b>	Completed in 2005
<b>Type of Project</b>	Subway Tunnel
<b>Size of Structure</b>	18.1km Total Length

### Main features used in this application



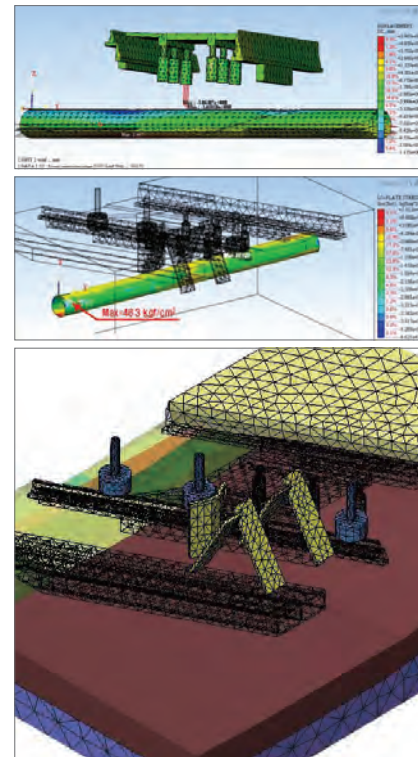
- Performing construction stage analysis to check the settlement while checking the initial support capacity for the fan plant structure

### Description on this project

Two types of analysis were performed based on different 3D model files. The full underground structure was modeled to monitor the initial support capacity including rock bolts and shotcrete, at structural level. A construction sequences analysis of the fan plant was ran to obtain the general stability and settlements of the soil layers, at geotechnical level.

#### ORUM

<b>Address</b>	201, 8 <sup>th</sup> Orum Building, Geoje1-dong, 1493-6 beon-gi, Yonje-gu, Busan, Korea
<b>Introduction</b>	Orum creates economical and stable structures finding the most proper methods with fluent experiences in the field. The firm is specialized in Civil analysis and drawing, geotechnical investigation, and instrumentation.
<b>Website</b>	<a href="http://www.orumeng.com">www.orumeng.com</a>



# Posiva's Onkalo

GTS NX



## Eurajoki, Finland

<b>General Contractor</b>	Kalliorakennus Oy, SK-Kaivin Oy and Destia Oy
<b>Engineering Consultant</b>	Posiva
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Nuclear Waste Disposal Facility
<b>Size of Structure</b>	455m Depth

### Main features used in this application



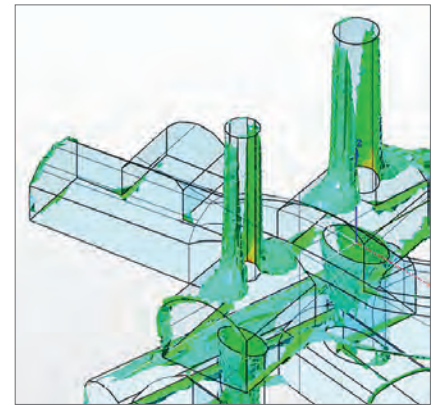
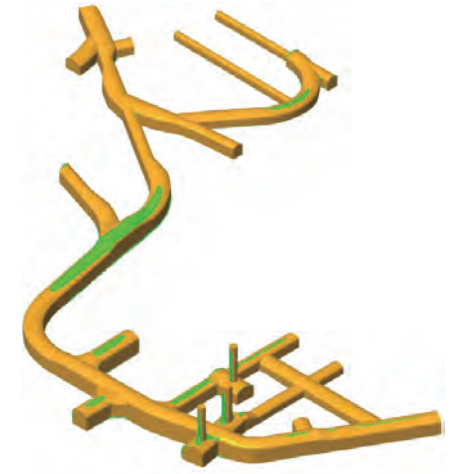
- Stability of hard rock excavations in depth up to 500m and to optimize rock support system
- Impact of vibration due to blasting and groundwater level on underground cavern

### Description on this project

The Onkalo Spent Nuclear Fuel Repository is a deep tunnel system for the final disposal of spent nuclear fuel. It is first of such repository in the world. It is currently under construction at the Olkiluoto Nuclear Power Plant in the municipality of Eurajoki, on the west coast of Finland, by the company Posiva. It is based on the KBS - 3 method of nuclear waste burial developed in Sweden by Svensk Kärnbränslehantering AB (SKB).

#### Posiva

<b>Address</b>	Posiva Oy, Olkiluoto, FI - 27160 Eurajoki, Finland
<b>Introduction</b>	Posiva aims for safe, on-time and economically feasible final disposal of spent nuclear fuel, working according to the demands of the company's owners and other stakeholders. Posiva commits to the continuous improvement of the safety and quality of its operations, as well as to the fulfilment of the requirements of the society in full compliance with laws and regulations. The management of operational safety is carried out in a holistic and systematic manner.
<b>Website</b>	<a href="http://www.posiva.fi">www.posiva.fi</a>





# Interchange near the Sokol Subway

Moscow, Russia



<b>Owner</b>	Government of Moscow
<b>General Contractor</b>	NPO 'Cosmos'
<b>Engineering Consultant</b>	Podzemproekt
<b>Construction Period</b>	2007 - 2015
<b>Type of Project</b>	Underground Tunnel
<b>Size of Structure</b>	<ul style="list-style-type: none"> <li>• Reconstruction of the Leningrad Tunnel (660m Length, 12 - 14m Depth)</li> <li>• Construction of Volokolamsk Tunnel (1.73km Length, 20m Depth)</li> <li>• Construction of Overpasses (390m Length)</li> <li>• Construction Halabyan-Baltic Tunnel (1.94km Length, 22.5m Depth)</li> </ul>



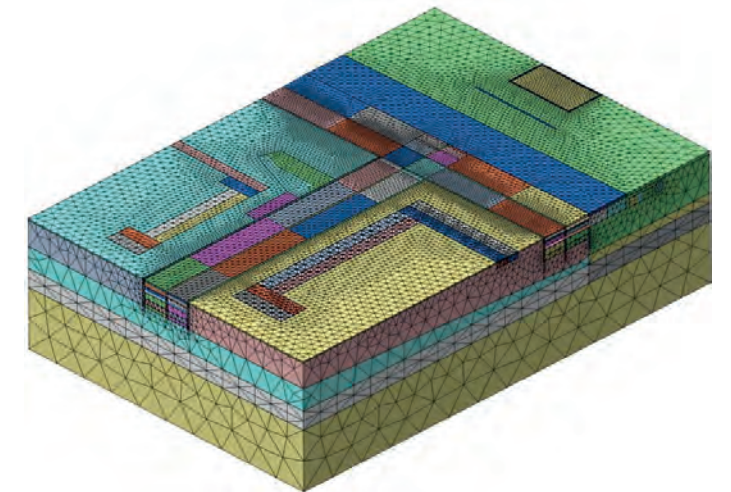
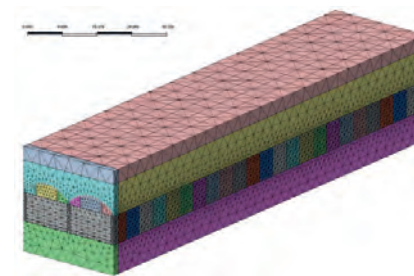
## Main features used in this application



- Construction stage analysis
- Tunneling effects on adjacent structures

## Description on this project

The construction is complicated by the fact that 20m deep tunnels performed open way in water - saturated sands and tested at an average distance of 10m from residential buildings. In this excavation, Halabyan - Baltic tunnel under two tunnels under the existing subway and the Leningrad highway tunnel runs closed method without stopping subway and vehicle traffic.



## Podzemproekt

<b>Address</b>	125040, 3rd Yamskogo Polya Str., 2, Moscow, Russia		
<b>Introduction</b>	Podzemproekt organization was founded in 2005. The main activity is the design calculation of building structures, foundations, basements and underground structures, as well as research in the field of construction theory, soil mechanics and rock mechanics of underground structures.		
<b>Website</b>	<a href="http://www.podzemproekt.ru">www.podzemproekt.ru</a>	<b>Email</b>	<a href="mailto:mail@podzemproekt.ru">mail@podzemproekt.ru</a>

# Cityringen Copenhagen Metro

Copenhagen, Denmark



<b>Owner</b>	Metroselskabet
<b>General Contractor</b>	CMT COPENHAGEN METRO TEAM, Tecnimont Civil Construction, salini impregilo, SELI
<b>Engineering Consultant</b>	Lombardi
<b>Construction Period</b>	2011 - 2017
<b>Type of Project</b>	Building Risk Assessment for Subway Station and underpass of historical buildings
<b>Size of the Structure</b>	15.5km long twin single - track metro tunnels, 17 underground stations



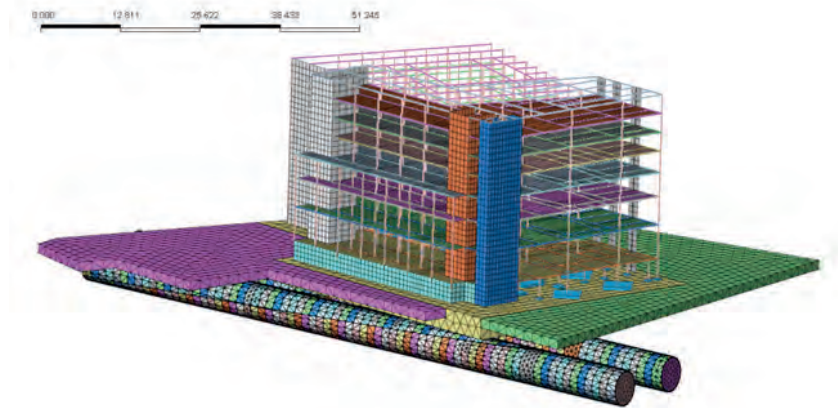
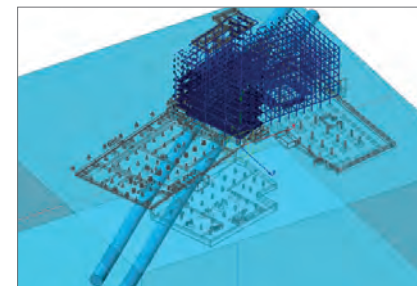
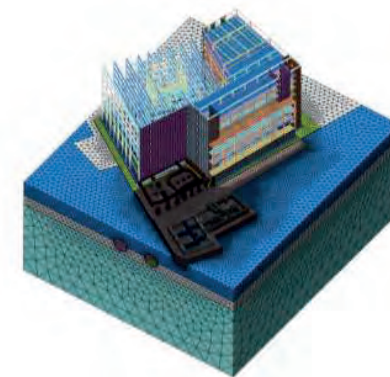
## Main features used in this application



- Interaction between MIDAS family programs (Gen & GTS)
- Construction stage analysis for TBM

## Description on this project

The Cityringen is a city circle metro - line, approximately 15.5km long and will serve major areas of the city of Copenhagen including the Danish Parliament, the Central Station, the City Hall, existing major S - train and metro stations and national monuments. The line will have driverless communication - based train control system, with stewards on board. A round trip is expected to take 23 minutes. The headway interval is expected to be 200 seconds, with 28 trains of 3 carriages running at 90km/h.



## Lombardi

**Address** Via Giotto 36IT - 20145 Milano, Italy

**Introduction** In 1955 Dr. Giovanni Lombardi founded his consulting company for engineering services, cornerstone of the Lombardi Group. Today, the company cares for the life cycle of transport infrastructures and hydraulic works from the initial design phases to their operation.

**Website** [www.lombardi.ch](http://www.lombardi.ch)

**Email** [milano@lombardi.group](mailto:milano@lombardi.group)

# King's Cross Station

London, UK



Owner	Network Rail
Architect	John McAslan + Partners
Engineering Consultant	Arup / Morgan Sindall
Construction Period	2008 - 2013
Type of Project	Railroad Station



## Main features used in this application



- The section of the existing tunnel where the shaft intersects is strengthened with block work
- The cylindrical section of the shaft is built with segmental lining
- The tapered section of the shaft is built in 1m deep stages and lined with sprayed concrete

## Description on this project

The redevelopment of King's Cross station in the city of London is turning a historic rail terminus into a dynamic transport hub. Arup's work as a lead consultant on King's Cross station embraced transport planning, multi-disciplinary engineering services, security, IT, lighting design, acoustics, visualization, and pedestrian modeling.



## Arup

**Address** 13 Fitzroy Street, London W1T 4BQ, UK

**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** [london@arup.com](mailto:london@arup.com)

# Jeddah Tower

GTS NX



## Jeddah, Saudi Arabia

<b>Owner</b>	Jeddah Economic Company / Kingdom Real Estate Development
<b>General Contractor</b>	Saudi Bin Laden Group
<b>Architect</b>	Adrian Smith + Gordon Gill Architecture
<b>Engineering Consultant</b>	LANGAN International / Thornton Tomasetti
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Pile Foundation
<b>Size of the Structure</b>	1,008m Height

### Main features used in this application



- Piled - raft foundation for high-rise building

### Description on this project

Rising 1,000m (3,280 feet) into the Arabian sky, the tower will eclipse the reigning tallest building by 173m (568 feet). The first phase of the Kingdom City comprises the tower, a 65,000-square-m retail mall, and a 3,000+ car underground garage. LANGAN's role has included the development and oversight of the site subsurface investigation, final design of the piles in collaboration with the design team, storm water management, integration of the circulation, volume demands of the tower and retail building into the traffic master plan for Jeddah's Kingdom City.

### LANGAN International

<b>Address</b>	300 Kimball Drive, 4 <sup>th</sup> Floor Parsippany, New Jersey 07054-2172, USA		
<b>Introduction</b>	Founded as a geotechnical specialty firm in 1970, LANGAN quickly became involved in many large, complex projects located throughout the eastern part of the USA. As their growth continued, they leveraged our highly technical base to expand into the civil engineering and environmental disciplines. LANGAN International was formed to support global clients and partner with the world's elite design and construction teams around the world.		
<b>Website</b>	www.LANGAN.com	<b>Email</b>	info@LANGAN.com

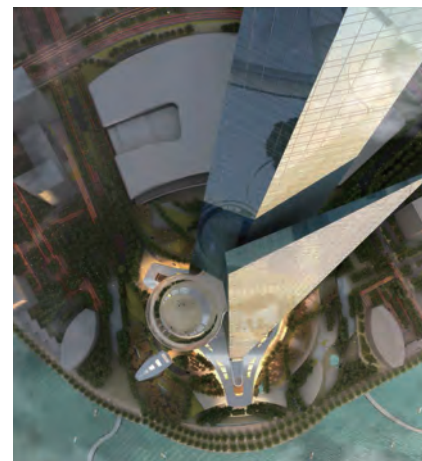
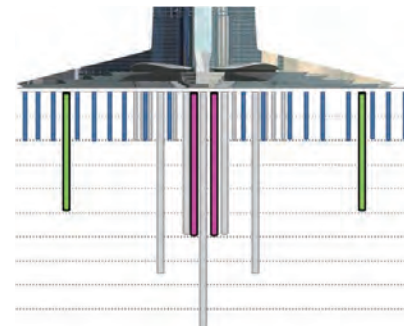
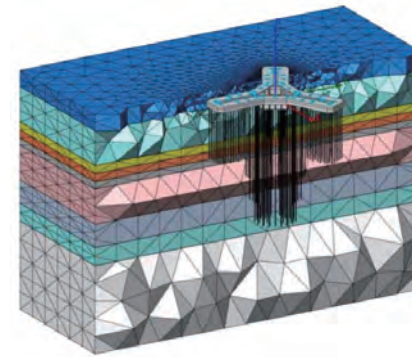


PHOTO BY Adrian Smith + Gordon Gill Architecture

# Odeon Tower

GTS NX



## Monaco, Monaco

<b>Owner</b>	Group Marzocco
<b>General Contractor</b>	Vinci Construction France
<b>Architect</b>	Alexandre Giraldi
<b>Engineering Consultant</b>	Coyne et Bellier
<b>Construction Period</b>	2010 - 2015
<b>Type of Project</b>	Office Building Foundation
<b>Size of Structure</b>	170m Height (49-story)

### Main features used in this application



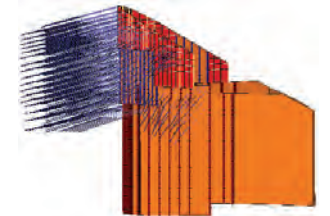
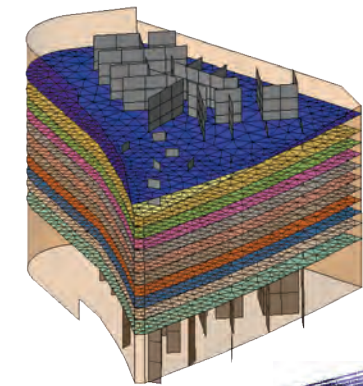
- Assessment of ground movements especially at adjacent building foundations
- Deep excavation in a sloping site and retaining system (especially arching effects on the uphill side)

### Description on this project

The Odeon Tower is a double - skyscraper in the Principality of Monaco. It was the first high-rise in the city to be built since the 1980s. But high-rise constructions had been abandoned due to aesthetic concerns and criticism of over-development. 3D model of excavation and construction sequence was necessary to ensure adjacent school buildings will not be affected.

### Coyne et Bellier

<b>Address</b>	Le Delage, 5, rue du 19 mars 1962, 92622 Gennevilliers CEDEX, France
<b>Introduction</b>	Coyne et Bellier is a global consulting and engineering firm based out of Gennevilliers, France. They specialize in infrastructure projects such as dams, nuclear and hydroelectric power plants, roads, tunnels and other below - surface facilities. The company also carries out environmental and social impact assessment. They operate out of 43 offices in Asia, Europe, the Americas, and Africa. The company was created by André Coyne and is a subsidiary of Tractebel.
<b>Website</b>	www.tractebel-engie.com



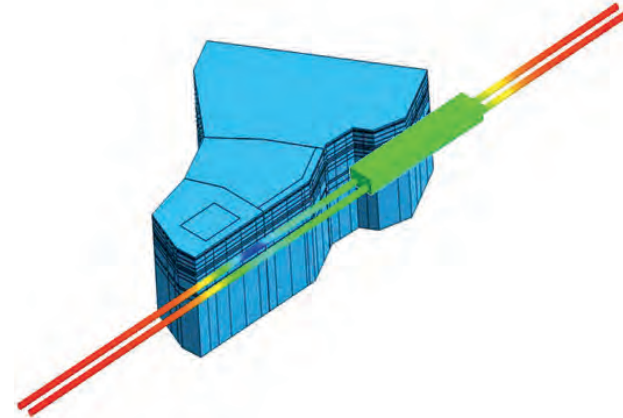
# Hangzhou Yintai City Foundation Pit

GTS NX



## Hangzhou, China

<b>Owner</b>	Intime Group
<b>Engineering Consultant</b>	East China Investigation and Design Institute
<b>Construction Period</b>	2013 - 2015
<b>Type of Project</b>	Foundation Pit
<b>Size of Structure</b>	400m Length, 1.3km Total Length



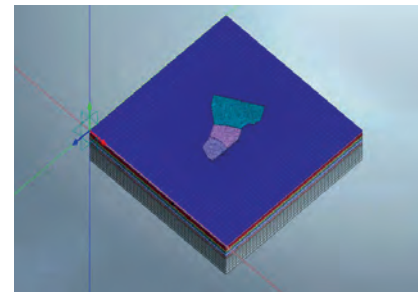
### Main features used in this application



- The basic excavation depth of the project is 15.6m – 17.4m and the local pit depth is 23.7m. The commercial part is close to the Hangzhou subway station and shield tunnel (two adjacent to the subway station, two other near the shield tunnel), the envelope from the subway station and tunnel is 12m – 15.2m.

### Description on this project

This project is located in Hangzhou Linping District. The foundation pit will use bored piles and will have irregular triangular shapes. The Foundation Pit was to be excavated by stages and most additionally consider 5 basements that will be used for commercial retail.



### East China Investigation and Design Institute

<b>Address</b>	Zhejiang Hangzhou Higher Education Road 201, China		
<b>Introduction</b>	East China Investigation and Design Institute was established in 1954 which is the national institute of large-scale comprehensive survey and design units. In September 2008, it has been awarded a total of 21 sets of engineering design, including electricity, highway, waterway, municipal, water conservancy and marine industry.		
<b>Website</b>	www.ecidi.com	<b>Email</b>	hwyw@ecidi.com

# Dubai Tower in Qatar

GTS NX



## Doha, Qatar

<b>Owner</b>	Sama Dubai (Dubai International Properties)
<b>General Contractor</b>	Al Habtoor - Al Jaber Joint Venture
<b>Architect</b>	RMJM
<b>Engineering Consultant</b>	Arcadis
<b>Type of Project</b>	Mixed-use Building Foundation
<b>Size of Structure</b>	439m Height (88-story)



### Main features used in this application



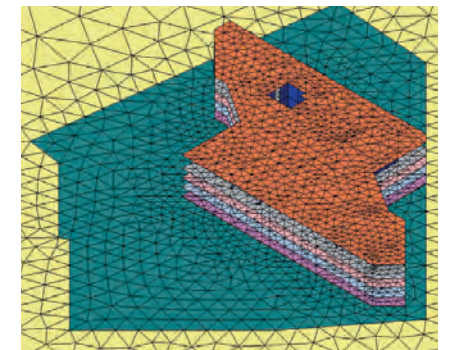
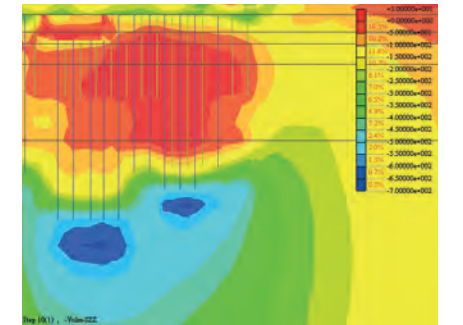
- Piled-raft foundation for high-rise building
- Analysis results for design (Settlements, raft forces and bending moments, pile forces and bending moments)

### Description on this project

The proposed development for the Dubai Tower project comprises the construction of an approximately 80 floor high-rise tower with a mezzanine, ground floor and five basement levels. It will be the tallest structure in Qatar when it is complete. The tower was founded on soft sand and required the design of a piled raft in a 3D finite element model to fully understand the behavior.

### Arcadis

<b>Address</b>	Arcadis House, 34 York Way, London N1 9AB, UK		
<b>Introduction</b>	Arcadis is an integrated engineering and environmental consultancy. Supported by a strong engineering, planning and transport capability, Arcadis has a long history of providing simple, straightforward and cost - effective advice to governmental, commercial and industrial clients in the UK and around the world.		
<b>Website</b>	www.arcadis.com	<b>Email</b>	UKenquiries@arcadis.com



# Canton Tower Foundation Ditch

Guangzhou, China



<b>Owner</b>	Guangzhou New TV Tower
<b>General Contractor</b>	Guangzhou Municipal Construction Group JV / Shanghai Construction Group
<b>Architect</b>	Guangzhou Design Institute
<b>Engineering Consultant</b>	Arup
<b>Construction Period</b>	2005 - 2010
<b>Type of Project</b>	Observation & Television Transmission Tower
<b>Size of Structure</b>	600m Height



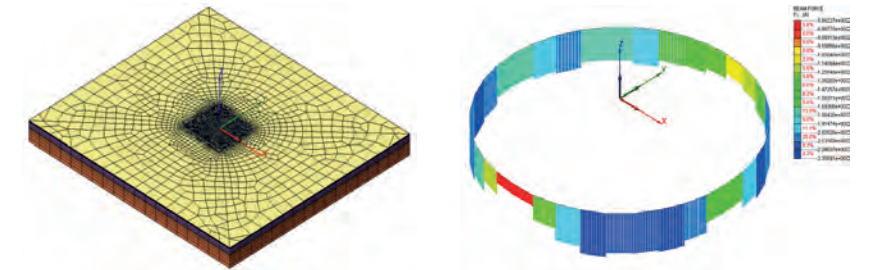
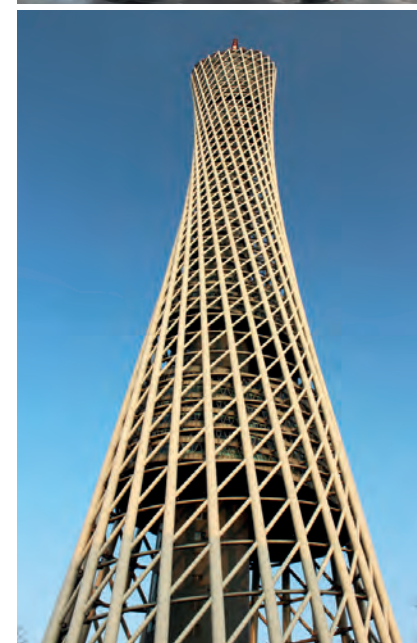
## Main features used in this application



- Foundation pit excavation stability analysis

## Description on this project

Canton Tower is constructed as a composite tube-in-tube design, featuring a reinforced concrete core containing all the tower's services and vertical transportation which set inside an outer structure made up of a steel lattice. The two structural components then support series of smaller structures suspended within the tower at different elevations. The slenderness of the tower's design makes it especially vulnerable to sway in the wind, and requires the inclusion of a tuned mass damper system. A 3D FEM model with dynamic loads and construction stages was used to verify the foundation's stability during construction and operational use.



## 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>	<a href="http://www.arup.com">www.arup.com</a>	<b>Email</b>	<a href="mailto:guangzhou@arup.com">guangzhou@arup.com</a>

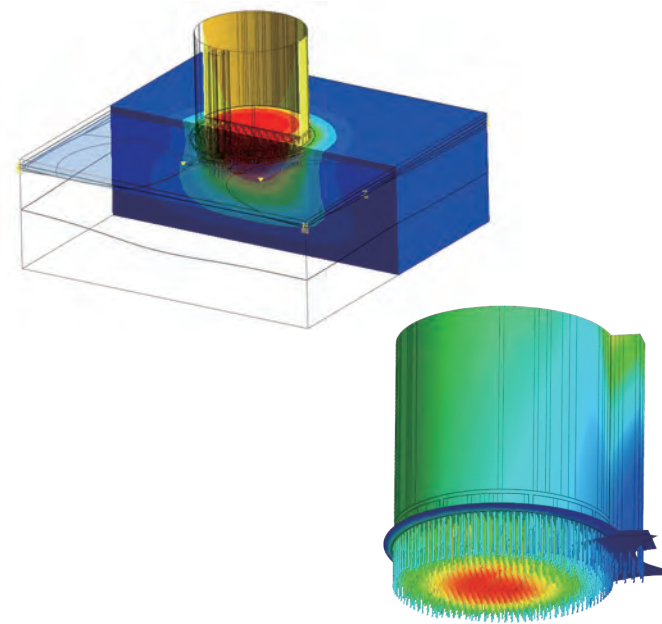
# Foundation of Sugar Silo

GTS NX



Gostyn, Poland

Engineering Consultant GT Projekt  
 Construction Period 2012 - 2013  
 Type of Project Silos Foundation  
 Size of Structure 50m Diameter, 70m Height, 80,000 tons Capacity



## Main features used in this application



- Linear static analysis with construction stages
- Hardening soil material and soil - pile interface elements

## Description on this project

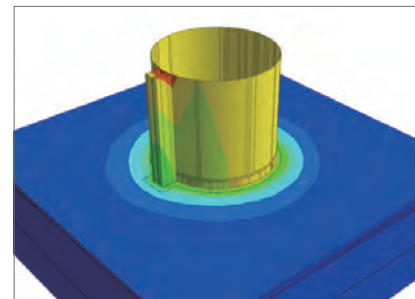
Special solution was needed for the largest sugar silo in Poland because it would sit on soft soil. It was determined that more than 1,000 displacement piles were needed for the foundation following the design with advanced analysis.

## GT Projekt

**Address** Parkowa 4, Swadzim 62-080 Tarnowo Podgórne, Poland

**Introduction** GT Projekt is a consulting company operating since 1999, involved in many international projects. Main fields of activity are: civil and structural engineering, geotechnics, engineering geology and chemistry. GT Projekt is experienced in design, field investigation and laboratory test.

**Website** [www.gtprojekt.pl](http://www.gtprojekt.pl) **Email** [info@gtprojekt.pl](mailto:info@gtprojekt.pl)



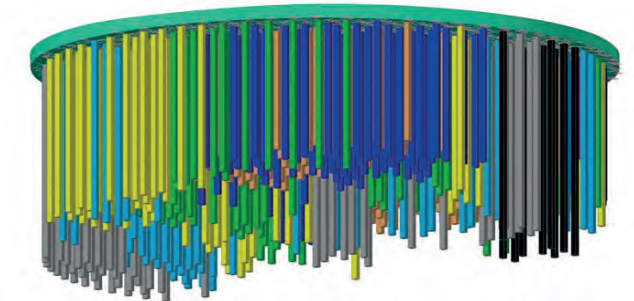
# Isothermal Tank - Liquefied Hydrocarbon Storage

GTS NX



Leningrad, Russia

Owner NIPi gaspererobotka  
 Engineering Consultant GEOTECH  
 Construction Period Completed in 2012  
 Type of Project Building Foundation  
 Size of Structure 20,000m<sup>3</sup>



## Main features used in this application



- Nonlinear analysis with pile elements

## Description on this project

Three - dimensional simulation of pile-raft foundation with elastic - plastic deformation of the ground model was considered. The number of foundation's final design used 497 piles, which were modeled with special pile elements in midas GTS NX.

## GEOTECH

**Address** 350005, Pokrishkina str., 4/8, Krasnodar, Russia

**Introduction** GEOTECH includes many highly qualified specialists able to solve the most complicated architectural, structural and geotechnical tasks. The Company is divided into departments with narrow specializations. This is their major advantage because every single task solves by the professional team of architects, structural and geotechnical engineers.

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



# Hefei Metro Line 4

GTS NX



## Anhui, China

<b>Owner</b>	Hefei Urban Mass Transit
<b>Engineering Consultant</b>	Traffic Planning and Design Institute of Anhui Province
<b>Construction Period</b>	Completed in 2015
<b>Type of Project</b>	Subway Tunnel
<b>Size of Structure</b>	68.2 × 17.2m (The Foundation pit)



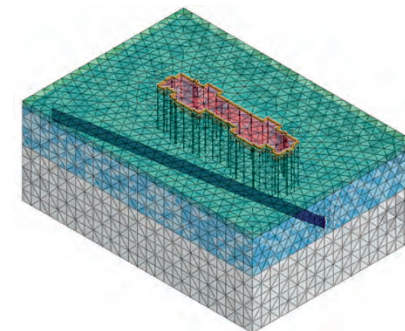
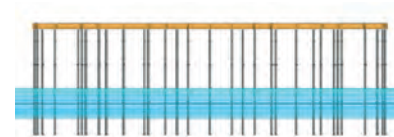
### Main features used in this application



- Impact of shield construction on buildings

### Description on this project

Hefei subway tunnel would be excavated next to a high-rise building with a 21m long pipe pile foundation. The building's foundation runs parallel to the tunnel excavation for an extended segment of the new project. Therefore, 3D FEM model was required to verify differential settlement on the existing structure.



### Traffic Planning and Design Institute of Anhui Province

<b>Address</b>	No.180, Xiangzhuang Road, High-tech Zone, Hefei, Anhui Province, China
<b>Introduction</b>	The company was founded in 1960. At present, the company and its subsidiaries have engineering grade A, engineering survey comprehensive grade A, road industry design class A, water transportation industry design grade A, municipal industry professional grade A and construction industry class A.
<b>Website</b>	www.acdi.ah.cn

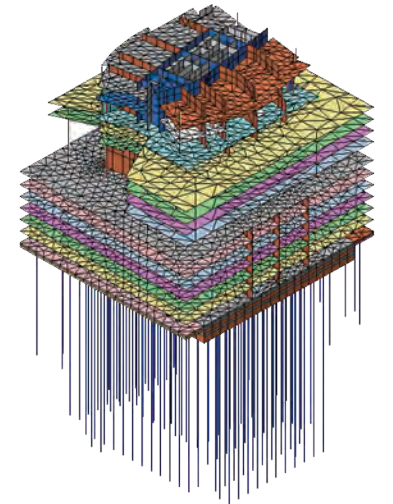
# Pentominium Residential Development

GTS NX



## Dubai, UAE

<b>Owner</b>	Trident International Holdings
<b>General Contractor</b>	Arabian Construction Company - Hitachi Plant Technologies
<b>Engineering Consultant</b>	Arcadis
<b>Construction Period</b>	Under Construction
<b>Type of Project</b>	Residential Building Foundation
<b>Size of Structure</b>	516m Height (122-story)



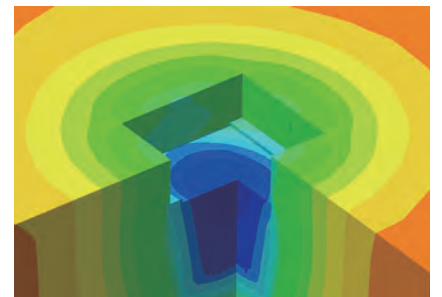
### Main features used in this application



- Piled - raft foundation for high - rise building
- Analysis results for design  
(Settlements, raft forces and bending moments, pile forces and bending moments)

### Description on this project

The Pentominium Residential Development is located on the west side of the creek in Dubai. The development comprises the construction of an approximately 120 story high-rise tower inter-linked by low level podium structure housing up to 7 basement levels. The Pentominium Tower will be founded on a piled raft and required a 3D finite element model to fully understand the behavior of the foundation interaction with surrounding soil.



### Arcadis

<b>Address</b>	Arcadis House, 34 York Way, London N1 9AB, UK		
<b>Introduction</b>	Arcadis is an integrated engineering and environmental consultancy. Supported by a strong engineering, planning and transport capability, Arcadis has a long history of providing simple, straightforward and cost - effective advice to governmental, commercial and industrial clients in the UK and around the world.		
<b>Website</b>	www.arcadis.com	<b>Email</b>	UKenquiries@arcadis.com

**MIDAS**