



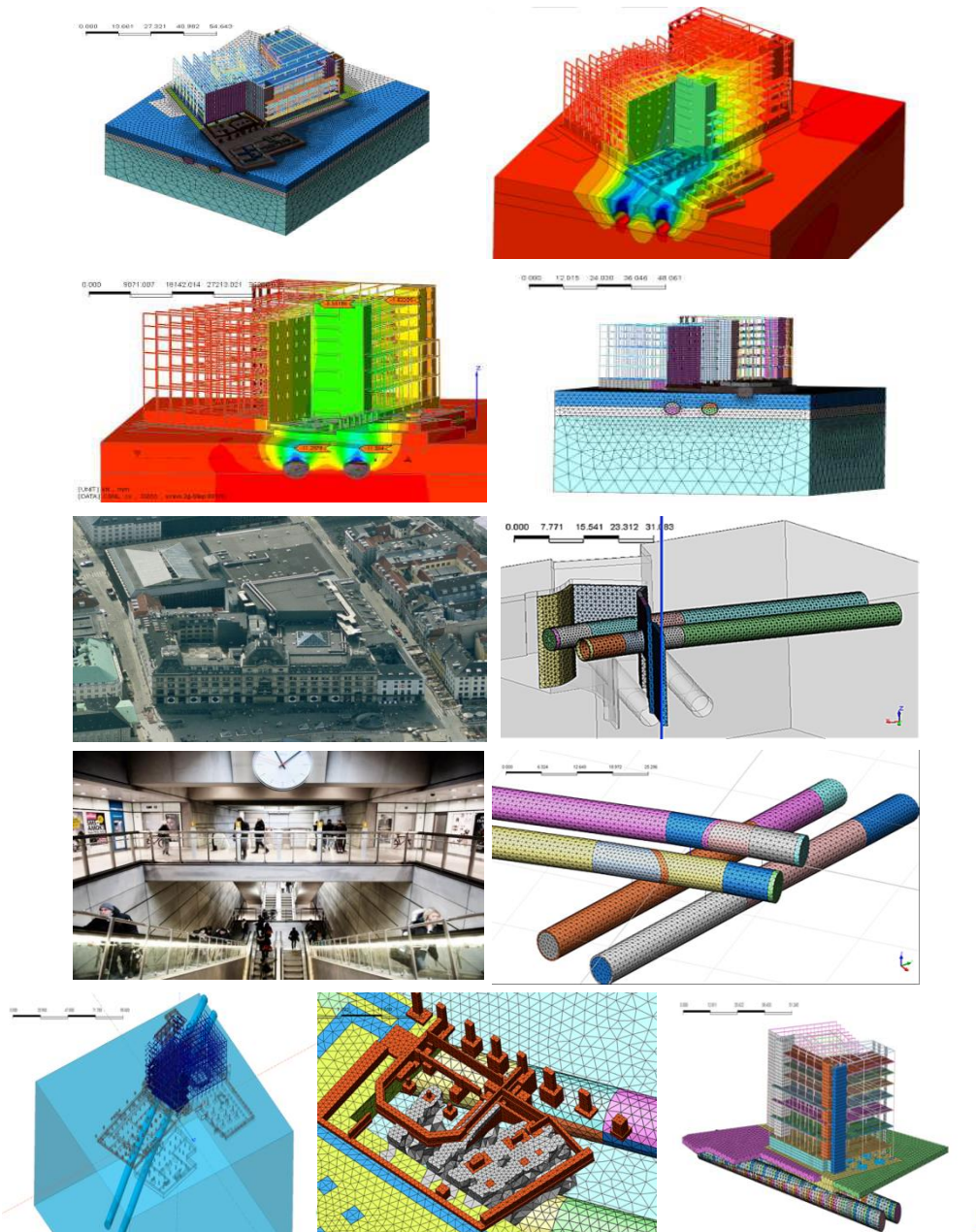
Geotechnical Project Application

(Projects performed by European GTS NX users)



Integrated Solver Optimized for the next generation 64-bit platform
Finite Element Solutions for Geotechnical Engineering

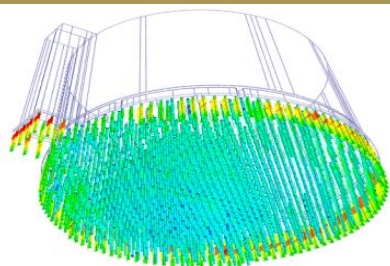
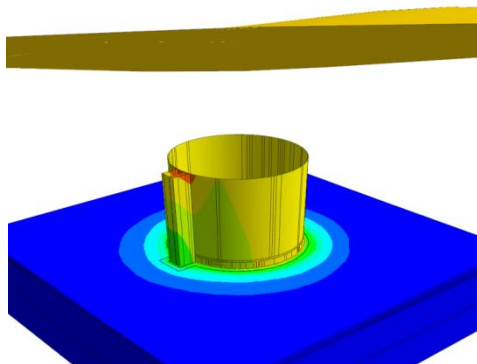
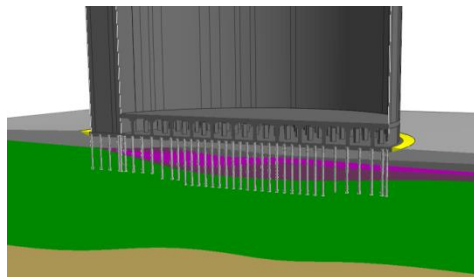
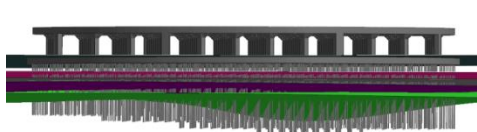




- **Owner:** Metroselskabet
- **Engineering Consultant:** Lombardi
- **Construction Period:** 2011 - 2017
- **Project Type:** Subway Station
- **Size of the Structure:** 15.5 km long twin single - track metro tunnels
- **Main features in modelling:**
 - Interaction between MIDAS family programs (Gen & GTS)
 - Construction stage analysis for TBM
- **Description on this project:** The Cityringen is a city circle metro - line, approximately 15.5 km 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 sec., with 28 trains of 3 carriages running at 90 km/h.



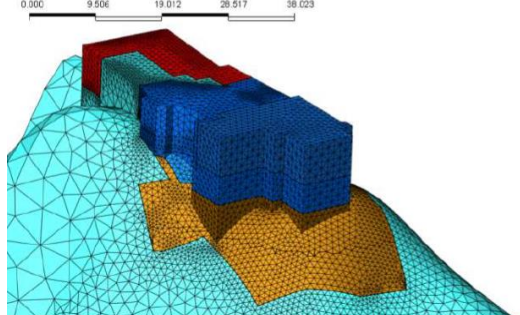
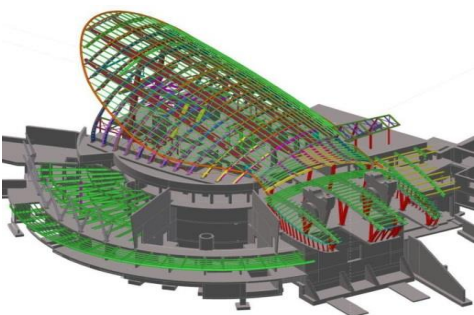
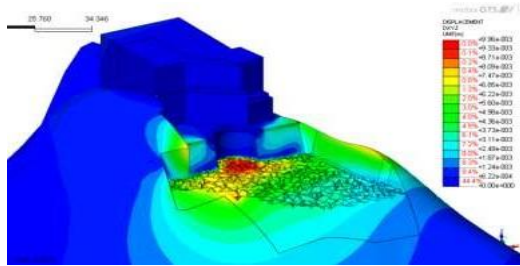
- **Address:** Via Giotto 36IT - 20145 Milano, Italy
- **Phone:** 390258303324
- **FAX:** 390258303190
- **Website:** www.lombardi.ch
- **Email:** milano@lombardi.group
- **Introduction:** In 1955 Dr Giovanni Lombardi founded his consulting company for engineering services, cornerstone of the Lombardi Group. Today, the company cares for the life cycle of transport infrastructures and hydraulic works from the initial design phases to their operation.



- **Engineering Consultant:** GT Projekt
- **Construction Period:** 2012 - 2013
- **Project type:** Silos Foundation
- **Size of the Structure:** 50m Diameter, 70m Height, 80,000 tons Capacity
- **Main features in modelling:**
 - Linear static analysis with construction stages
 - Hardening soil material and soil - pile interface elements
- **Description on this project:** Special solutions is having to be applied to found on soft soil the largest sugar silo in Poland. More than 1'000 displacements have been carried out following the design with advanced computation analyses.

GT PROJEKT

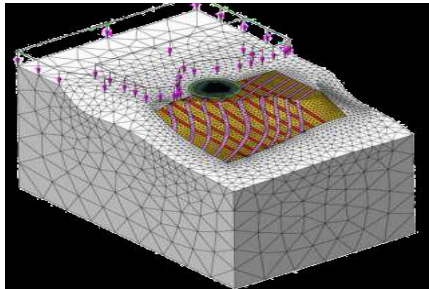
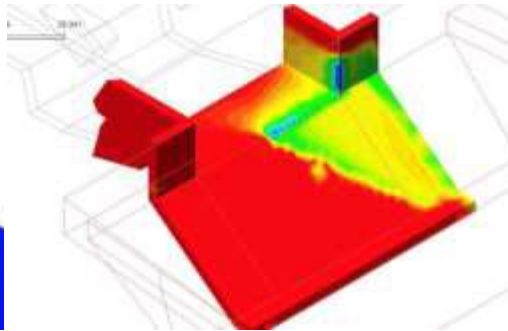
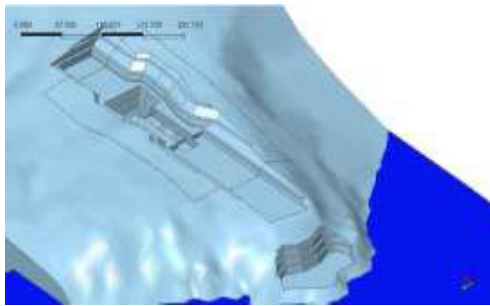
- **Address:** Parkowa 4, Swadzim 62-080 Tarnowo Podgórne, Poland
- **Phone:** 48616252222
- **FAX:** 48616252225
- **Website:** www.gtprojekt.pl
- **Email:** info@gtprojekt.pl
- **Introduction:** GT Projekt is a consulting company operating since 1999, involved in many international projects. Main fields of activity are: civil and structural engineering, geotechnics, engineering geology and chemistry. GT Project is experienced in designing, field investigation and laboratory test.



- **Owner:** Funivie Monte Bianco AG
- **General Contractor:** Cogeis
- **Architecture:** Studio Progetti
- **Design:** Dimensione Ingegnerie
- **Engineering Consultant:** Holzner & Bertagnolli Engineering
- **Construction Period:** 2010 - 2015
- **Project Type:** Aerial Lift
- **Main features in modelling:**
 - Rock excavation stability on top of the mountain
 - Tensile variations of the existing tie rods cableway
- **Description on this project:** The cable car in the valley of the Aosta Valley, at the entrance to the Mont Blanc tunnel, leads from Courmayeur to 1,200m above sea level. Up to the middle station Mont Frety, it's at 2,300 m above sea level. And then to the Helbronner peak, the peak is at 3,500 m above sea level. The panorama cabins can accommodate up to 80 people. The new valley station is being built in Pontal d'Entrevies and becomes an aesthetic view, but very well integrated into the overall picture. The middle station will be built near the existing station, and there will be several conference rooms next to a restaurant. At 3,500m above sea level near the Helbronner peak, the new mountain station is created, with a spectacular view of the Mont Blanc massif.

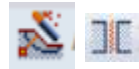
Holzner & Bertagnolli Engineering

- **Address:** Freibadstraße 30 81543 München, Germany
- **Phone:** 4908955292477
- **Website:** www.h-b.it
- **Email:** info@h-b.engineering
- **Introduction:** The Holzner & Bertagnolli Engineering GmbH is an on structural engineering and geotechnical engineering firm specialized. It has focused on the development of the structural design of industrial, civil and service buildings, in the geotechnical and when Seilbahnbau specialized. Hb engineering has taken over the planning for a variety of projects in South Tyrol, but also in other regions of Northern Italy and Germany.



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- **Owner:** Republic of Turkey
- **General Contractor:** Hyundai E&C / SK E&C
- **Engineering Consultant:** Lombardi
- **Construction Period:** 2013 - 2015
- **Size of the Structure:** 1.4km Main Span, 2.2km Total Length
- **Main features in modelling:**
 - Anchor block and ground approach of the cable stayed bridge
 - Interface elements between shaft and soil
- **Description on this project:** The Third Bosphorus Bridge is part of the 260 km long North ern Marmara Motorway. The bridge, which is 2.2 km long with a main span of 1.4 km, links Europe to Asia, north of Istanbul. With its width of 59 m, this is the first bridge of the world that accommodates an 8 - lane highway and a 2 - lane railway at the same level.



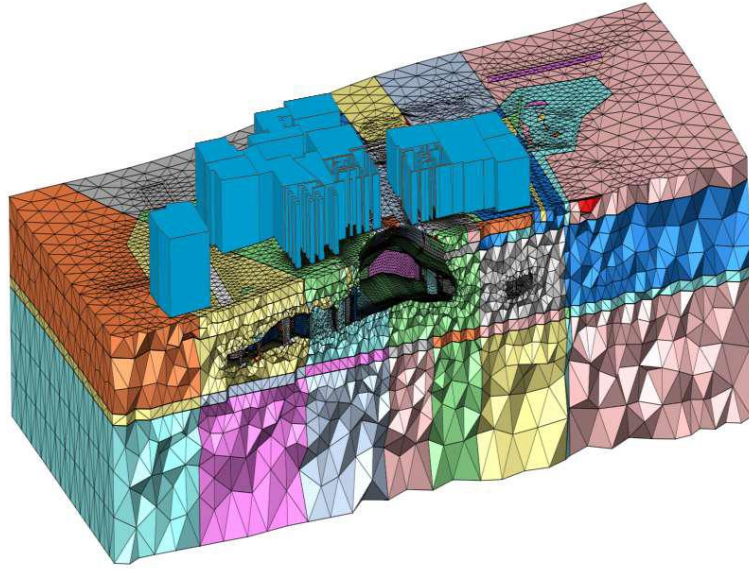
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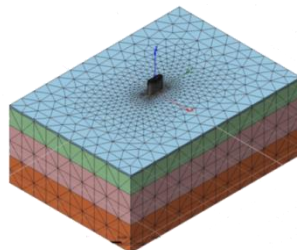
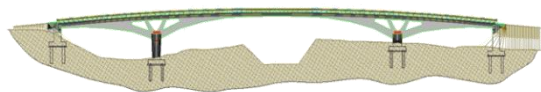
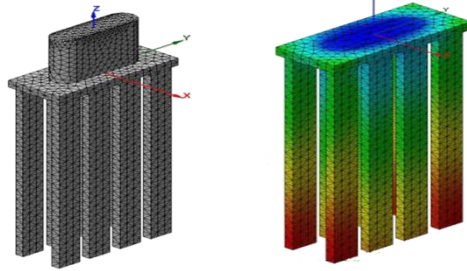
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- **Engineering Consultant:** Paolo greco
- **Main features in modelling:**
 - Sinkhole of ground surface
 - Simulation of the load bearing capacity
- **Description on this project:**

paologreco

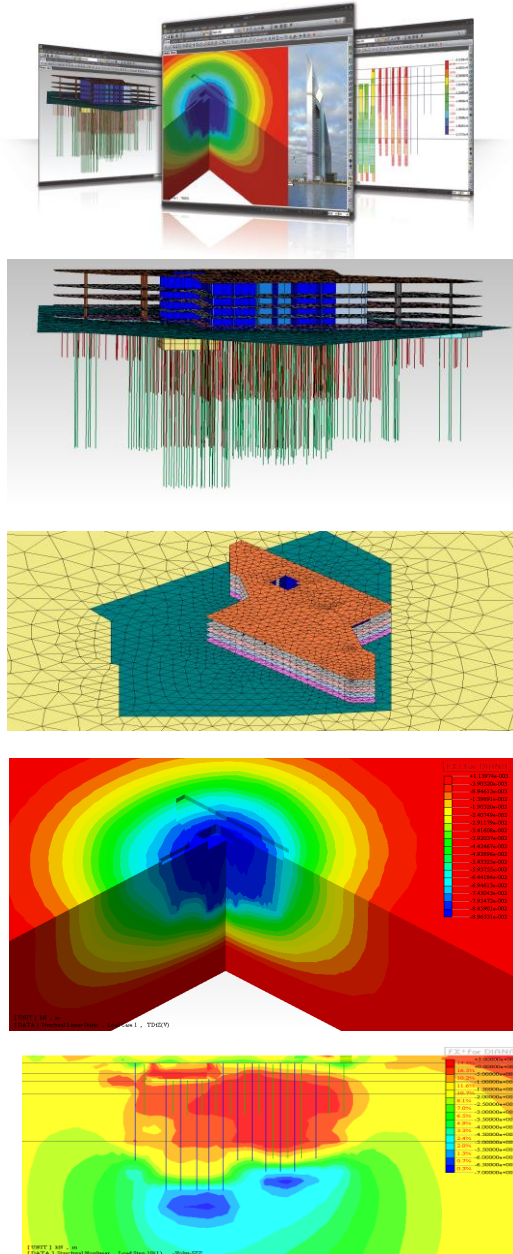
- **Address:** Via Della Liberta' 152 Lecce, Lecce, 73100 Italy
- **Phone:**
- **FAX:**
- **Website:** linkedin.com/in/paolo - greco - 8603674
- **Email:**
- **Introduction:** EnSea, a Start Up company that believes in a green renewable engine for a sustainable world growth, in challenging the status quo and the strategic contribution of wave energy for a progressive reduction of the traditional fuels dependence. EnSea develops Wave Energy Converters patents that drastically increase energy conversion over existing technologies. EnSea Team has a strong expertise in maritime works and research, mechanical engineering and electromechanical design.



- **Engineering Consultant:** ULMA Construction
- **Size of the Structure:** 180m Total Length
- **Main features in modelling:**
 - Construction stage analysis
 - Stability analysis for the pier foundation of bridge
- **Description on this project:** After pier construction, the bridge is completed in three stages. The 70m long stretch between the abutment and the pier is built with horizontal beam - based formwork and full shoring. After concrete hardening and falsework removal, the same material is used in a symmetrical manner between the abutment and the pier on the other side of the bridge. A high capacity shoring tower on a temporary footing supports the central part of the bridge (40m). The distance between bearings is spanned with high load capacity trusses carrying the formwork. The specific curvature and the inclined geometry are formed with spindles adjustable into any direction on the shoring. This ensures that a perfect adjustment without using wood templates, which brought high cost savings.



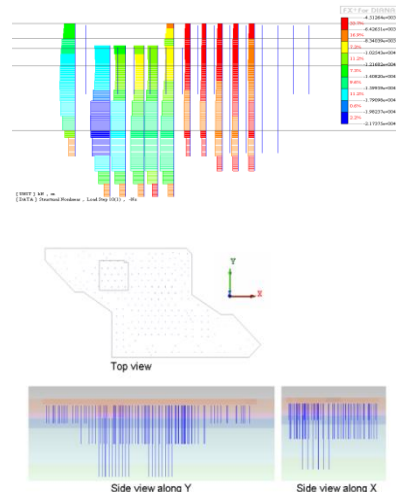
- **Address:** Via Di Pacciano, 52 00065 Fiano Romano (Roma), Italy
- **Phone:** 39 (045) 723 79 20
- **FAX:** 39 (045) 723 79 96
- **Website:** www.ulmaconstruction.it
- **Introduction:** ULMA offers complete formwork, climbing, shoring and scaffolding solutions - for sale and rental - in residential and non - residential construction, civil engineering and restoration. More than 50 years in business have enabled them to accumulate knowledge and experience.

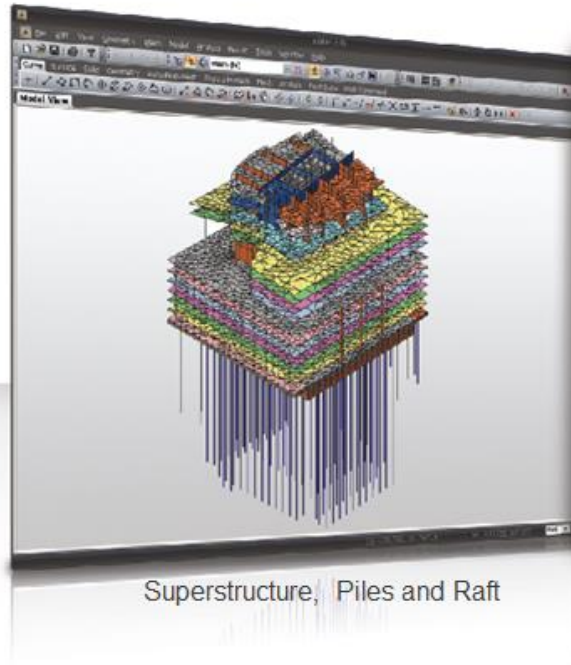


- **Owner:** Sama Dubai (Dubai International Properties)
- **General Contractor:** Al Habtoor - Al Jaber Joint Venture
- **Architecture:** RMJM
- **Engineering Consultant:** Hyder Consulting
- **Project Type:** Mixed-Use Building
- **Size of the Structure:** 439m Height (88-Story)
- **Main features in modelling:**
 - 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 eighty floors high rise tower with mezzanine, ground floor and five basement levels and will be the tallest structure in Qatar when it is complete. The tower is founded on a piled raft. In order to fully understand the behavior of the foundation, a 3D finite element model is required.



- **Address:** Manning House 22 Carlisle Place, London SW1P 1JA, UK
- **Phone:** 02030149000
- **FAX:** 02078288428
- **Website:** www.arcadis.com
- **Introduction:** As an integrated engineering and environmental consultancy, Hyder knows that sustainability matters to our clients and their stakeholders. Supported by a strong engineering, planning and transport capability, Hyder 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.

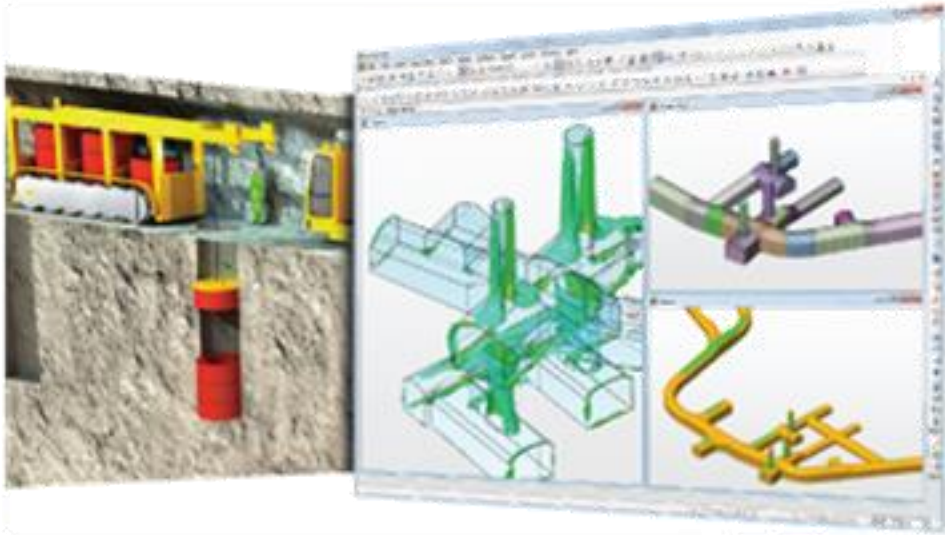




- **Owner:** Trident International Holdings
- **General Contractor:** Arabian Construction Company - Hitachi Plant Technologies
- **Engineering Consultant:** Hyder Consulting
- **Construction Period:** Under Construction
- **Project Type:** Residential Building
- **Size of the Structure:** 516m Height (122-Story)
- **Main features in modelling:**
 - 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 stories high - rise tower interlinked by low level podium structure housing up to 7 basement levels. The Pentominium Tower will be founded on a piled raft and to fully understand the behavior of the foundation, a 3D finite element model is required.



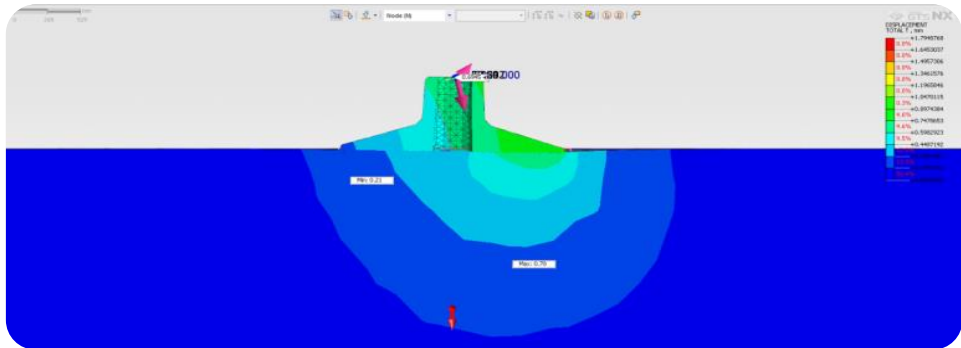
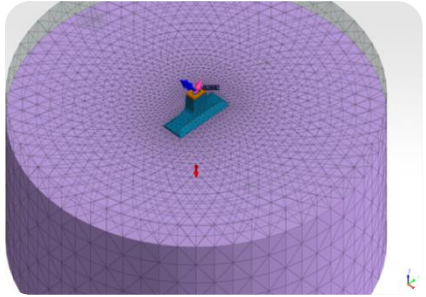
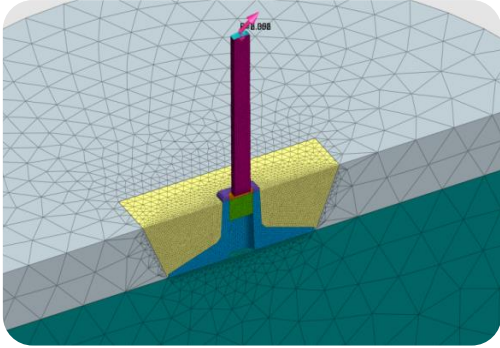
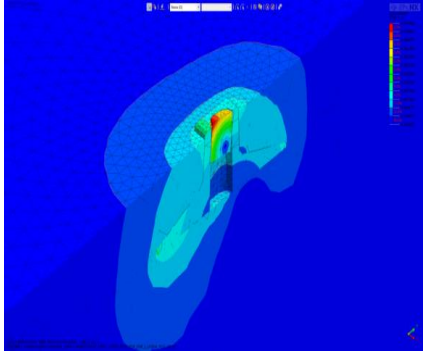
- **Address** Arcadis House, 34 York Way, London N1 9AB, United Kingdom
- **Phone:** 4402078122000
- **Website:** www.arcadis.com
- **Email:** UKenquiries@arcadis.com
- **Introduction:** As an integrated engineering and environmental consultancy, Hyder knows that sustainability matters to our clients and their stakeholders. Supported by a strong engineering, planning and transport capability, Hyder 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.



- **General Contractor:** Kalliorakennus Oy, SK - Kaivin Oy and Destia Oy
- **Engineering Consultant:** Posiva
- **Project Type:** Nuclear Waste Disposal Facility
- **Construction Period:** 2004 - Under Construction
- **Size of the Structure:** 455m Depth
- **Main features in modelling:**
 - Stability of hard rock excavations in depth up to 500 m 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 geological repository for the final disposal of spent nuclear fuel, the first 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).



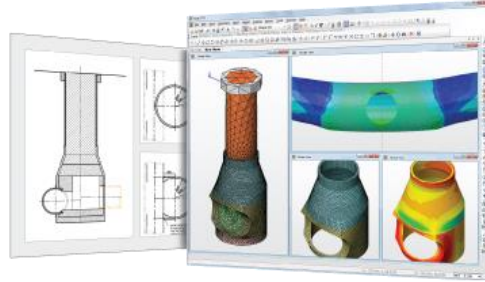
- **Address:** Posiva Oy, Olkiluoto, FI - 27160 Eurajoki, Finland
- **Phone:** 3582837231
- **FAX:** 358283723709
- **Website:** www.posiva.fi
- **Introduction:** Posiva was founded in 1995 by Teollisuuden Voima and Fortum two Finnish nuclear plant operators, for researching and creating a method of final disposal of spent nuclear fuel from their plants. For this purpose, Posiva is currently constructing the Onkalo spent nuclear fuel repository, the world's first deep geological repository, at the Olkiluoto Nuclear Power Plant site.



- **Engineering Consultant:** iKoncrete / ZENET



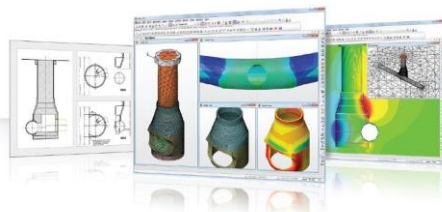
- **Address:** C / Islas Cíes 73, Bajo Local D 28035, Madrid, Spain
- **Phone:** 910068091
- **Website:** www.ikoncrete.com
- **Introduction:** iKoncrete is an engineering company created in 2012 to develop solutions that industrialize the construction with prefabricated concrete. The experience of iKoncrete professionals is more than 15 years in the field of engineering, prefabrication, building and civil works.



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- **Engineering Consultant:** Arup/Morgan Sindall
- **Project Type:** Railroad Station
- **Construction Period:** 2008 - 2013
- **Main features in modelling:**
 - 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 1 m deep stages and lined with sprayed concrete.
- **Description on this project:** The sympathetic redevelopment of King's Cross station in the city of London is turning an unloved, historical rail terminal into a dynamic transport hub and a destination in its own right. Arup's work on King's Cross station embraced transport planning, multi-disciplinary engineering services, security, IT, lighting design, acoustics, visualization and pedestrian modelling, as well as being the lead consultant.

- **Address:** 13 Fitzroy St, London W1T 4BQ, United Kingdom
- **Phone:** +44 (0) 20 7636 1531
- **Website:** www.arup.com/
- **Email:** london@arup.com

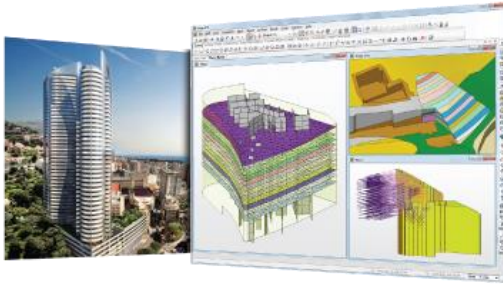
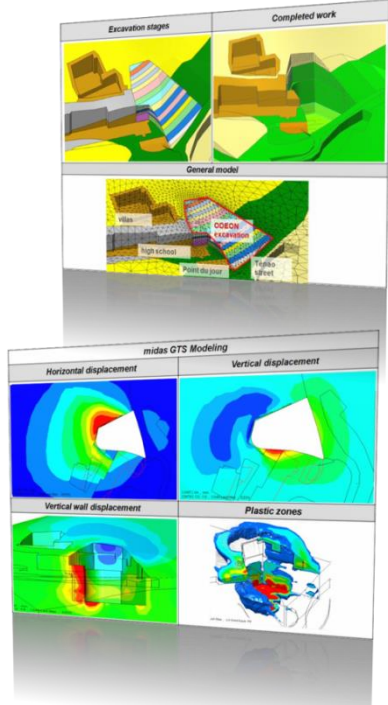
• **Introduction:** Arup brings together professionals from diverse disciplines and with complementary skills, on a uniquely global scale. The depth of expertise and sheer numbers of specialists allow Arup to take on complex, strategic projects that no other firm could deliver. We bring a longer term view than many others.

- **Address:** Corporation Street, Rugby, Warwickshire, CV21 2DW United Kingdom
- **Phone:** +44 01788 534 500
- **FAX:** +44 01788 534 579

- **Website:** www.morgansindall.com
- **Email:** info@morgansindall.com
- **Introduction:** Morgan Sindall is the construction and infrastructure division of Morgan Sindall Group plc, a leading UK construction and regeneration group. They deliver public and private sector projects of all sizes. They also collaborate with our sister companies within Morgan Sindall Group to maximize our offering to customers.

ARUP

**MORGAN
SINDALL
GROUP**



- **Owner:** Group Marzocco
- **General Contractor:** Vinci Construction France
- **Architect:** Alexandre Giraldi
- **Engineering Consultant:** Coyne et Bellier (Tractebel engineering)
- **Project Type:** Office Building
- **Construction Period:** 2010 - 2015
- **Size of the Structure:** 170m Height (49-Story)
- **Main features in modelling:**
 - 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 - state to be built since the 1980s. But high constructions had been abandoned due to aesthetic concerns and criticism of overdevelopment. So, At 170m high, Tour Odeon on its completion was the second tallest building on Europe's Mediterranean coast, after Gran Hotel Bali (186m) in Benidorm, Spain. Had Tour Odeon been built in neighboring France, it would have been among that country's 10 highest buildings.



- **Address:** Le Delage, 5, rue du 19 mars 1962, 92622 Gennevilliers CEDEX, France
- **Phone:** 33141850369
- **Website:** [www.tractebel - engie.com](http://www.tractebel-engie.com)
- **Introduction:** 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.