

OFFSHORE PLATFORMS AND MARINE FACILITIES



INFRASTRUCTURAL WORKS - RAILWAYS AND METRO FACILITIES



CAPABILITY AND EXPERIENCE

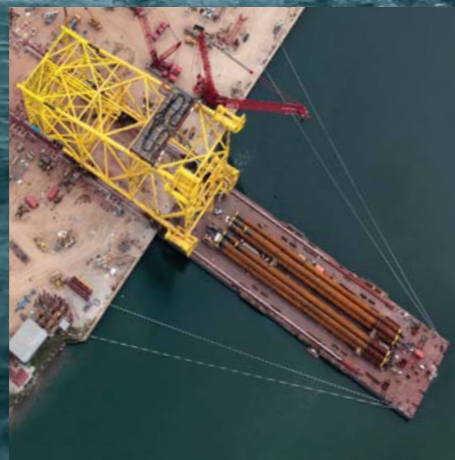
More than
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with supply
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Services:

Tecon is a leading Italian Engineering Consulting Company in the field of structural offshore/marine engineering providing comprehensive design, project management, construction and installation supervision services for offshore and marine structures.

We assist our Clients during all the design process starting from the early feasibility phase up to Detailed Engineering.

More than 1000 projects have been developed with supply of the following Services:

- Structural Design and multidisciplinary Projects of Offshore Platforms
- Structural Design and multidisciplinary Projects of Oil and Gas Marine Terminals
- Structural Design of Offshore Modules with Stiffened Walls
- Structural Design of Ports and Jetties
- Marine Terminal Inspection and Revamping Engineering
- Naval Analysis of ships, barges and other floating bodies to study their sea-keeping characteristics and dynamic responses for free and moored vessels.
- Consultancy services for fabrication, handling, transportation and installation of heavy onshore and offshore structures.
- Technical specifications for Design, materials, fabrication, transportation and installation and operating manuals.
- Assistance to Clients for Design approval by Classification Authorities such as Det Norske Veritas, Lloyd's Register of Shipping, Bureau Veritas, American Bureau of Shipping, Registro Italiano Navale.
- Detailed Design of Special Equipment for the Offshore/Sealine Installation Industry

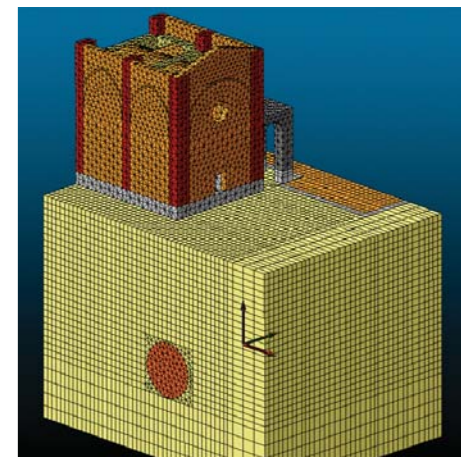
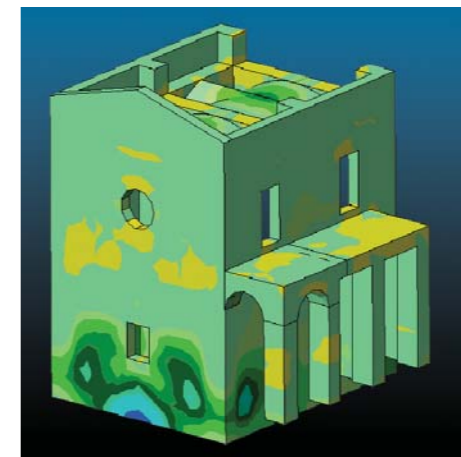




CAPABILITY AND EXPERIENCE

Tecon has developed many detailed projects for Milan Metro and Rome lines.

- Structural Linear and Non-linear Seismic Analysis
- Steel Structure Stochastic Fatigue Analysis
- Piping Stress Analysis
- Metro and Railway Underground Stations
- Deep Reinforced Concrete Wells under Heavy Water Neap Pressure
- Technical specifications for Design, materials, fabrication, construction manuals.
- Assistance to Clients for Design approval by Classification and Statutory Authorities
- Geotechnical Design of Anchored Sheet Piles and Diaphragms
- Analysis and Assessment of settlement acceptability criteria for Buildings and Churches
- Design of special Steel Strut Systems for Heavy Diaphragm Walls
- Ground consolidation Design





Our
experience
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OFFSHORE PLATFORMS

Our experience in this field derives from more than 30 years activity in the sector involving all stages from feasibility phases for final Owners/Companies up to final detailing for Construction/Installation Contractors.

Offshore Industry requires the most cost effective solution based on both material weight saving and the best configurations compatible with the available installation means on the global market

Continuous and intense activity of Tecon in this field give us a wide knowledge of the Installation Vessels/Cranes over the world enabling the search of the most economical solution from the installation point of view.

Key features of Tecon's activity:

- Preparation of Basis of Design
- Design with International Codes as required by Clients (European, American, Indian, Japanese)
- Integrated Structural/Multidisciplinary Projects
- Specification for site Surveys and Geotechnical Investigations
- Geotechnical Reports

- Pile Design and Driveability
- Jacket/Pile Design in Liquefaction Conditions
- Platform/Jacket structures Design for the In Service Conditions
- Integrated Models Deck/Jacket/Foundations
- Jacket Seismic Design for different Return Periods
- Jacket Node Fatigue Design including Transportation effects
- Jacket Transportation and Installation Check including Barge Stiffness
- Jacket Lifting/Free Floating/Up-Ending
- Jacket Sleeves detailed FEM Analysis
- Jacket Installation Sequences
- Deck In Service Analysis
- Deck Transportation/Installation Analysis
- Sea Fastening Design
- Transportation Barge Check and Strengthening Design
- Dynamic Analysis of floating Crane Vessel during Lifting
- Platform Deck Mating Analysis
- Economical Studies for Platform Feasibility
- Jacket/Deck Detailing
- Assistance during Jacket/Deck Construction
- Roll Up Operation Design, Checks and Assistance
- Load-out Operation Design, Check and Assistance
- Existing Platform Survey and Structural Assessment
- Existing Platform Modification and Upgrading
- Design of Special Equipment
- Assistance to Client During Certification Process





**Customized
design
of piled
foundation
to suit site
geotechnics
and
installation
contractor
equipment.**



MARINE TERMINALS AND JETTIES

Our wide experience in different marine fields, also dating from more than 30 years allows us to deliver tailored, integrated and cost effective solutions to our customers.

Design of jetty structures with integrated loading berths in open ocean conditions is a cost effective means of providing ship-loading facilities for dedicated ports.

Coastal geology and dredging conditions, possible mooring solutions at the berth, and the berth response to various oceanographic conditions are investigated in detail to define the jetty position and orientation.

Key features of Tecon's activity:

- Preparation of Basis of Design
- Site selection
- Marine and Structural Design of Jetties and Wharves
- Integrated Structural/Multidisciplinary Projects
- Isolated sea island Berths
- Jacket Structures in poor ground conditions

- Modular construction
- Constructability assessments
- Geotechnical and Pile Design
- Design of optimal Berth Location and Orientation to minimize downtime
- Berthing and Fendering systems
- Vessel Mooring Analysis
- Mooring system Design and Assessment
- Vessel Motion Response Analysis
- Evaluation of the consequences of Line Failure
- Prediction and monitoring of Vessel, Gangway and Manifold movements
- Mooring procedures and safety studies
- Materials handling
- Selection of the most suitable Configuration and Materials
- Minimizing over-water work by providing innovative prefabrication techniques
- Identifying cost effective and schedule saving procurement options
- Considering cost effective fendering and berthing solutions
- Specifying an appropriate combination of material solutions, coating and active corrosion protection systems to maximize Design life
- Determination of limiting conditions for berth occupation and operation
- Existing jetty and terminal Condition surveys
- Revamping of Existing Jetties and Terminals
- Assistance to Client During Certification Process





BRESCIA METRO PROJECT

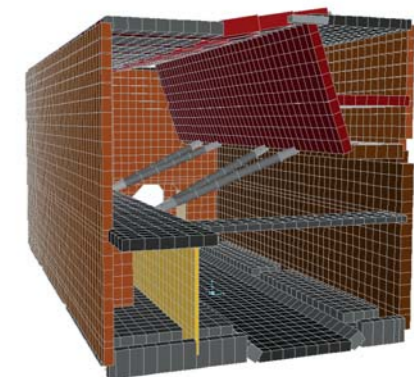
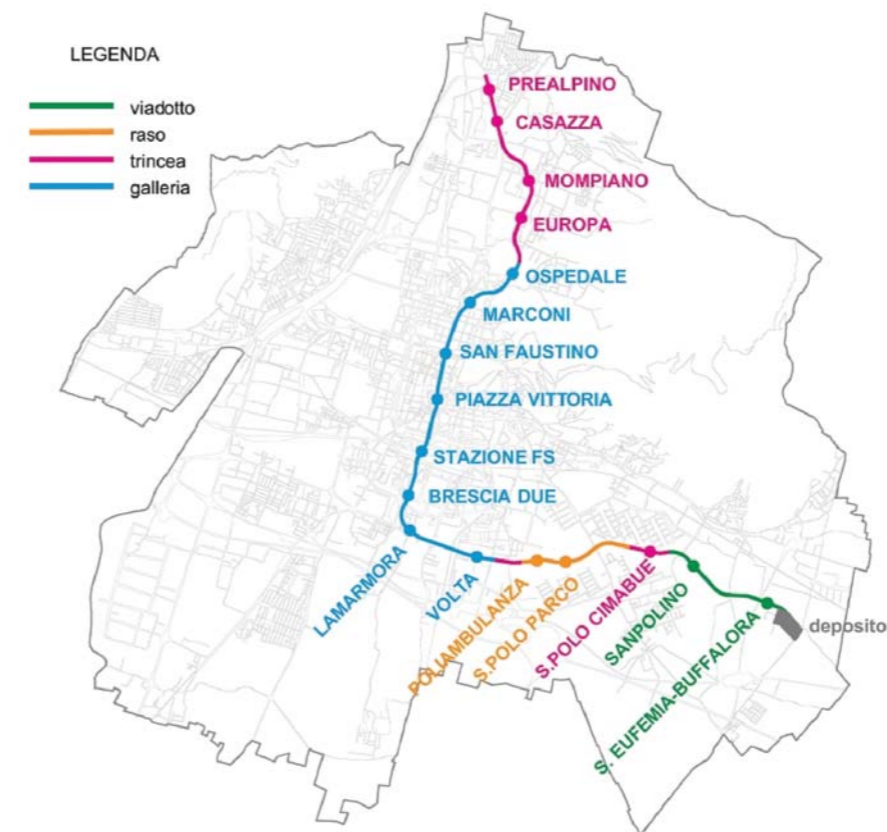
For METRO-BRESCIA Tecon has developed the detailed project of four stations (Volta, Lamarmora, Brescia 2, and Vittoria) and the two departure and arrival wells for TBM.

SERVICES:

- Detailed Design of all the earth retaining structures made up by anchored slurry walls and micropiles
- Detailed Design of the anchoring and strut systems
- Detailed Design of all the station and well reinforced concrete structures
- Detailed Design of all the temporary steel bridges and decks
- Bar bending sheets
- Assistance to Contractor during execution
- Assistance to Contractors and Owner during commissioning
- Three dimensional FEM Analysis of several Brescia buildings and Churches subject to TBM settlement fields
- Assessment of settlement acceptability criteria for Buildings and Churches

Owner: BRESCIA CITY

Client: METROBRESCIA-ANSALDO-ASTALDI-NESCO





MILAN METRO PROJECT

In the last decade city of Milan has expanded its metro lines and built new ones.

MAIN PROJECTS:

- Line 1 "Prolungamento Molino Dorino - Rho Fiera
- Line 2 "Prolungamento : Famagosta - Assago - Milanofiori forum
- Line 3 "Prolungamento verso Comasina -Affori Centro e Affori Nord
- Line 5 "Costruzione Stazioni: Bignami, Zara, Deposito
- Line Nord "Collegamento FNM – Saronno - Malpensa.

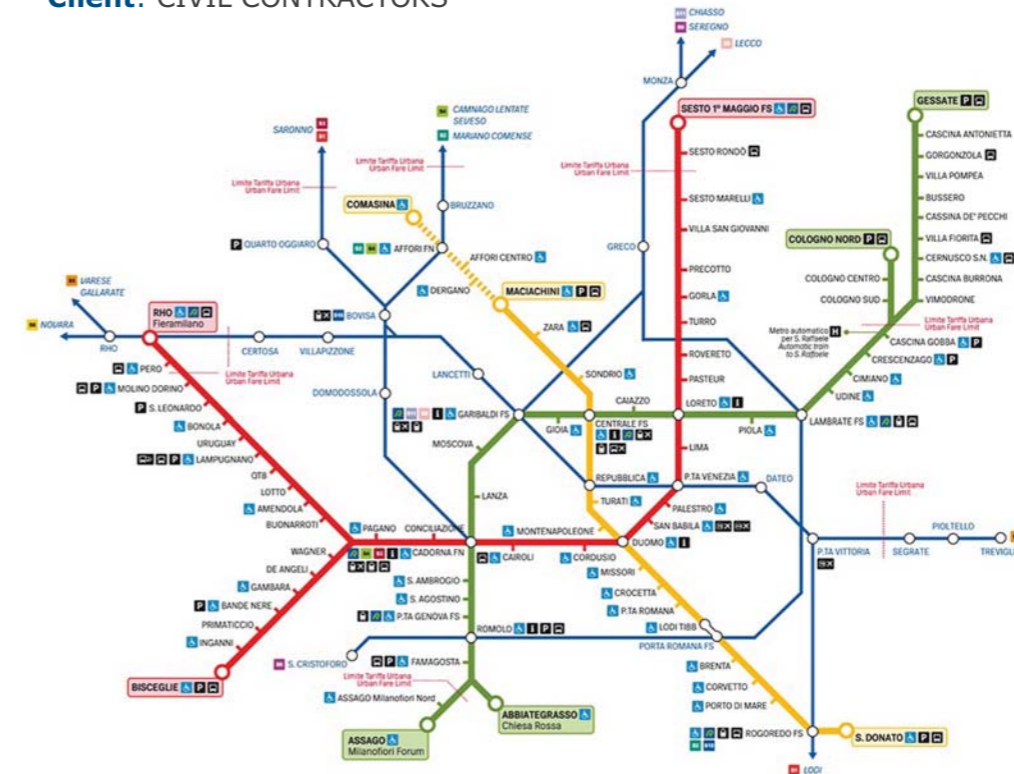
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- Detailed Design of the anchoring and strut systems
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- Detailed Design of all the temporary steel bridges and decks
- Bar bending sheets
- Assistance to Contractors during execution
- Assistance to Contractors and Owner during commissioning



Owner: METROPOLITANA MILANESE, MILAN CITY, FNM

Client: CIVIL CONTRACTORS



OTHER PROJECTS:

- ROME - METRO B1
- BOLOGNA - HIGH SPEED MAIN STATION





SOFTWARE AND NUMERICAL MODELLING

**Tecon
Engineering
activities
involve a
wide use
of the most
advanced
computer
techniques.**

Our policy is to adopt the most up to date computer techniques in terms of both hardware and software and to maximise the staff productivity by in house tailor made procedures.

MARINE/OFFSHORE STRUCTURES

- SACS System by Engineering Dynamic (Bentley) for structural Analysis (for offshore structures)
- MOSES by Ultramarine for naval Analysis and dynamic simulation
- LPILE by Ensoft (Lymon C. Reese) for laterally loaded piles
- APILE by Ensoft (Lymon C. Reese) for axially loaded piles
- RFWAVE by Delft Hydraulics for wave description with stream function
- OPTIMOOR by Tension Technology International, Inc. for Mooring Analysis
- TEKLA steel structure drafting Design program

GEOTECHNICAL AND SOIL/STRUCTURE INTERACTION PROGRAMS

- MIDAS GTS FEM geotechnical/structural Analysis program
- LPILE by Ensoft (Lymon C. Reese) for laterally loaded piles
- APILE by Ensoft (Lymon C. Reese) for axially loaded piles
- PARATIE by Ceas for foundation diaphragms
- GRLWEAP Wave Equation Analysis Program

OFFSHORE PIPELINES AND PIPING

- TCS/LAY for non linear laying Analysis
- CAESAR II piping stress Analysis

GENERAL PURPOSE STRUCTURAL/CIVIL AND FEM PROGRAMS

- SAP2000 general purpose program for structural Analysis
- MIDAS GEN general purpose program for structural staged Analysis
- MIDAS FEA non linear structural Analysis program
- DIANA FEM structural program for special materials (masonry, composites, rock, etc)

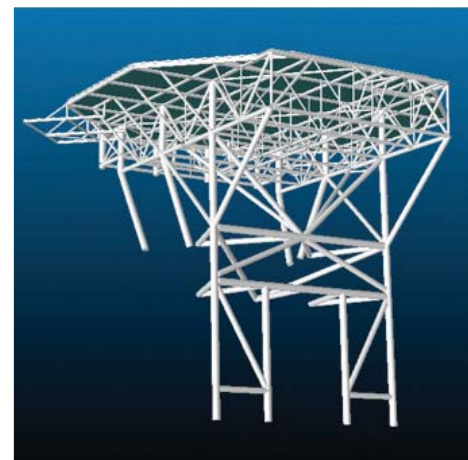
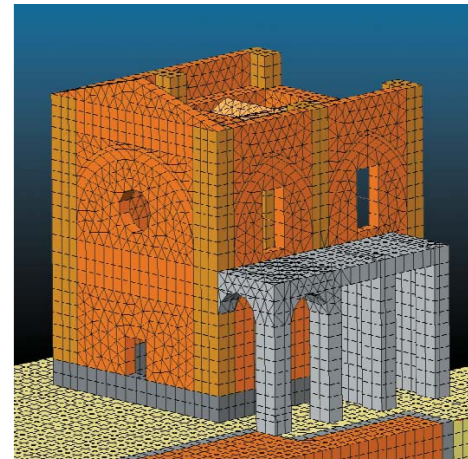
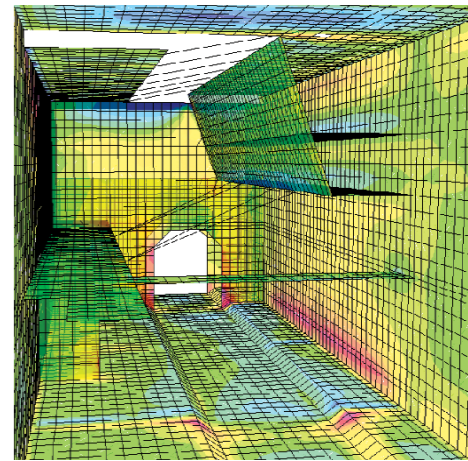
HARDWARE

In order to ensure the maximum reliability and security of all design data, Tecon avails itself of the most advanced hardware and always keeps it up to date.

All Tecon central Information System and distributed Hardware are based on HP products.

Tecon central Information System is organised on three levels:

- **Servers:** three BL460c Blade Servers – one DL360 managing the blades and one DL380 Linux Server.
- **Data Storage:** SAN, Storage Area Network (HP Enterprise Virtual Array 4400) – 12 N. FC Disks.
- **Data Security:** guaranteed by a HP Library. HP Storage Works MSL 2024 Tape Libraries, autoloader.



OFFSHORE STRUCTURES-BASIC & DETAIL DESIGN

BELAYIM Field - 40 m water depth (1982)

Owner/Client: PETROBEL

Services: Four platforms for a total weight of 2500 t excluding piles - Structural detail design of platforms including decks, jackets and piles.

VEGA A Platform (1986)

Owner/Client: SELM/TECNIMONT

Services: Well-head and Separation Modules weighing 1100t and 1300t - Structural basic and de-tail design.

EDOP Field (1989)

Owner/Client: MOBIL

Services: Switchgear and Workshop Module - Basic and detail structural and architectural design.

EDOP & UBIT Fields 50 m water depth (1991)

Owner/Client: MOBIL

Services: Underwater manifold & line crossing structures Basic and detail structural design of two manifold supporting frames and several crossings

CLAYMORE Field 110 m water depth (1992)

Owner/Client: CIO

Services: Jacket weight 4200t Piles weight 1800t - Complete structural design for bid of jacket and piles

DARIA B Platform 56 m water depth (1993)

Owner/Client: AGIP/ROSETTI

Services: Platform weight 1000t Piles weight 500t - Complete structural design from the bid stage to the issue of all A.F.C. drawings

BONACCIA Field 86 m water depth (1994)

Owner/Client: SAIPEM

Services: Platform weight 1900t Piles weight 1000t - Basic structural design of deck, jacket and piles.

CABINDA Field 70 m water depth (1995)

Owner/Client: C.G.O.Co - CHEVRON

Services: Underwater guide frame structure 400t - Basic and detail structural design of the un-derwater structure and levelling system

IVANA A Platform (1996)

Owner/Client: INAGIP/ROSETTI

Services: Complete structural design of jacket, deck and living quarter from the bid stage to the issue of A.F.C. dwgs (43 m water depth)

DABHOL Power Project (1997)

Owner/Client: SAIPEM

Services: Detail design of 20" sealine connecting the SBM PLEM to the Onshore Plant

BARBARA NW Platform (1997)

Owner/Client: AGIP

Services: Basic and detail structural design of jacket and deck including issue of tender specifica-tions. (70 m water depth)

ESSAR OIL REFINERY Project (1997)

Owner/Client: SASP

Services: Detail design of two 48" sealines for Essar Oil Refinery of the 48" sealine for crude oil and the 48" sealine for water outfall

ODIDI (1998)

Owner/Client: SHELL NIGERIA/ABB-SOIMI

Services: Basic and detail structural design of the Combined Utilities Module for the Odidi Field

KOMBI LIKALALA Project (1998)

Owner/Client: ELF CONGO/ROS-BOS Consortium

Services: Basic and detail structural design of two drilling decks for platforms offshore Congo

DARFEEL Project (1998)

Owner/Client: AGIP

Services: Detail structural design of the electrical & instrumental module structure

CLARA COMPLEX Project (1999)

Owner/Client: AGIP/SASP

Services: Basic and detail structural design of three drilling and gas production platforms for the Adriatic sea, in water depths ranging from 73 to 77 m

IVANA B, D and E Platforms (1999)

Owner/Client: INAGIP

Services: Complete structural design of two tripod and one monopod satellite platforms including jackets, decks, living quarters and helidecks as applicable, from the bid stage to the is-sue of A.F.C. dwgs. (41 m water depth)



Module Production Facilities –SHELL Nigeria (1999)

Owner/Client: ABB-SOIMI

Services: Basic and detail design of the structures housing the complete oil production plant. The structures are installed on a floating concrete caisson operating in the Niger river delta

SOROOSH Field Development Project – NIOC Iran (1999)

Owner/Client: EDISON

Services: Structural design for bid of one production & utility platform, one drilling platform and one living quarter platform, in 45 m water depth

MWAFI & FOUKANDA Platforms (2000)

Owner/Client: AGIP CONGO/SASP

Services: Basic and detail structural design including all A.F.C. drawings, developed together with SASP, of the platforms. Tecon was responsible to perform the complete design of the decks and for the foundation design and all naval and installation analyses (100 - 105 m water depth). Due to the very poor top soil characteristics, the foundation was based on pre-installed piles driven through a purpose designed guide frame

TEMSAH NW Platform (2000)

Owner/Client: PETROBEL/SASP

Services: Basic and detail structural design, developed together with SASP, of the platform jacket in 85 m water depth. Tecon was responsible to perform the foundation design and all naval and installation analyses. All A.F.C. structural drawings were also developed by Tecon

ROSETTA Phase 2 (2000)

Owner/Client: EDISON

Services: Feasibility study and conceptual design of one minimum facilities wellhead platform in 63 m water depth.

BD1 Platform Deck (2001)

Owner/Client: TOTAL-FINA-ELF/ROSBOS

Services: Basic and detailed structural design of the 8 leg drilling and production deck for BD1 platform, Total Fina Elf C137 B development project, in Libya

OKONO/OKPOHO Field (2001)

Owner/Client: NPDC - AGIP NIGERIA/SEI

Services: Basic and detail structural design of the Okpoho wellhead platform in 100 m water depth

MARICA Platform (2002)

Owner/Client: INAGIP/ROSETTI

Services: Conceptual, basic and detail structural design of one four legged platform including jacket, deck, well head module. (69 m water depth)

SABRATHA Platform (2002)

Owner/Client: AGIP LIBYA/SEI

Services: Detail structural design of all risers, j-tubes and caissons of the Sabratha jacket to be installed offshore Libya in 188 m water depth

PFD Platform (2002)

Owner/Client: PETROBEL/SEI

Services: Detail structural design of the tripod platform for the Port Fouad field including the sub-structure, wellhead module and deck.

RPP Platform (2002)

Owner/Client: PETROBEL/SEI

Services: Detail structural design of the jacket of one four legged platform for the Port Fouad field.

RED SEA Platforms (2002)

Owner/Client: ENI AGIP

Services: Basic and detail structural design of the 113M18A monopod and of the MWP5 tripod including substructures and decks. (Water depths from 24 to 37 m)

TEA Platform (2002)

Owner/Client: AGIP/TECNOMARE

Services: Detail structural design of the jacket of one four legged platform, in 41.5 m water depth, including the wellhead module.

IVANA K Platform (2002)

Owner/Client: INAGIP

Services: Conceptual and basic structural design of one four legged compression platform including jacket and deck. (43 m water depth)

Temsah 4, Barboni 1, Baltim North Project (2003)

Owner/Client: ENI AGIP

Services: Conceptual structural design of the Temsah 4, Barboni 1 and Baltim North platforms to be installed in the Mediterranean Sea offshore Egypt in water depths ranging from 75 to 91 m. The foundation of all jackets is based on the same concept of pre-installed piles and guide frame already adopted for the Foukanda, Mwafi and Okpoho platforms

KASHAGAN POWER GENERATION Barge (2004)

Owner/Client: ABB - RR Consortium

Services: Detailed structural design of the barge hull and superstructures housing four Rolls-Royce power generation units and relevant switchgear and control building, for the Ka-shagan field development, Experimental Programme Project, Block D, barge 8.



IVANA K and IVANA C Platforms (2004)

Owner/Client: INAGIP/NAVALMARE

Services: Detail structural design of the compression platform Ivana K and monopod platform Ivana C for Inagip offshore Croatia 43 m water depth

EAP Project Platforms (2004)

Owner/Client: EXXON-MOBIL/SEI

Services: Detail structural design of three riser platforms as part of the East Area development project offshore Nigeria in water depths ranging from 25 to 40 m

WEST ESPOIR Platform (2005)

Owner/Client: CNR INTERNATIONAL/SEI

Services: Detail structural design of the three leg jacket and deck for the West Espoir field off-shore Ivory Coast, in 120 m water depth

VALDEMAR AB Platform Deck (2005)

Owner/Client: MAERSK OIL/ROSETTI

Services: Detailed structural design of the 5 level topsides for Valdemar AB for the Danish sector of the North Sea.

HALFDAN CA and BC Platform (2006)

Owner/Client: MAERSK OIL/ROSETTI

Services: Detailed structural design of the HBC Topside (3000t lifting weight) and HCA Deck (600t lifting weight) for the Danish sector of the North Sea.

AKCO Kashagan Project LERs (2007)

Owner/Client: AKCO/JV SKEMA TOZZI

Services: Detail design of LERs, each made by two modules weighing about 800 t each

Izabela Field Development in North Adriatic Sea (2007)

Owner/Client: EDINA

Services: Feed Design of two Platform and interconnecting sealines to be installed in North Adriatic Sea in about 40m water depth. The scope of work included the preparation of the ITT for EPC contracts

IKALOU Development Project (2007)

Owner/Client: SEI

Services: Detailed structural design of two drilling and production platforms to be installed in West Africa, offshore Congo, in 80m water depth

HALFDAN BB Platform (2007)

Owner/Client: MAERSK OIL/SEI

Services: Detailed structural design of the HBB Deck (600t lifting weight) for the Danish sector of the North Sea

Annamaria A & B Platforms (2007-2008)

Owner/Client: AGIP-INAGIP/SEI

Services: Detail structural design of Annamaria A and B Platforms to be installed in Adriatic Sea in 70m water depth. The Jacket and deck lifting weights are 1100t and 1500t respectively

Offshore Wind Power Generation (2007-2008)

Owner/Client: CESI RICERCA

Services: Feasibility study and basic design of floating base structures of various types for deep-water offshore wind power generation units analysing different types of foundations.

AKCO Kashagan Project Buildings (2008-2010)

Owner/Client: AKCO/JV SKEMA TOZZI

Services: Detail design of 18 buildings, weighing from 400 to 1200 t each. The service include the engineering for load-out and transportation and the supervision of all load-outs.

AKCO Kashagan Project Infill Decks (2009)

Owner/Client: AKCO/TECNOMARE

Services: Detail design of two infill decks, each weighing about 500 t.

LIBONDO Platform (2008-2009)

Owner/Client: TOTAL/ROSETTI MARINO

Services: Detailed structural design of the Libondo platform deck, jacket and foundations to be in-stalled offshore Congo in 113.6 m water depth

NAQ-PII Platform (2010)

Owner/Client: AQP/ROSETTI MARINO

Services: Basic and detail design of a platform to be installed in Egypt, Mediterranean sea at Abu Qir Filed in 35m water depth.

WEST FRANKLIN – ELGIN B Deck (2012 - in progress)

Owner/Client: TOTAL UK/ROSETTI MARINO

Services: Detail design of two decks to be fabricated in Ravenna and installed in North Sea. The expected deck weigh is 4000t and 3500t.

CMMP Platform (2012 - in progress)

Owner/Client: SOUTH OIL COMPNAY / SAIPEM

Services: Detail structural design of a platform to be installed in Arabic Gulf in 27m water depth. The deck weighing 9000t will be installed by floatover.

COSTA CONCORDIA Wreck Removal Project (2012 – in progress)

Owner/Client: TITAN MICOPERI JV

Services: Concept studies and detail design of holdback system and supporting platforms re-required for removing the Costa Concordia wreck.



MARLIN Platform (2012 – in progress)

Owner/Client: FOXTROT/ROSETTI MARINO

Services: Detail structural design of jacket and deck of Marlin platform to be installed offshore Ivory Coast in 120m water depth.

OFFSHORE STRUCTURES- FABRICATION ENGINEERING

CONSORZIO ITALOFFSHORE - Punta Cugno Yard (Sicily)

From 1985 to 1995 Tecon was permanently involved in the fabrication engineering and technical assistance to special operations such as heavy lifts, roll-ups and load-outs.

VEGA Jacket, M.S.F and Piles (1985)

Owner/Client: SELM/C.I.O. (CONSORZIO ITALOFFSHORE)

Services: Management of the fabrication engineering including shop drawings, logistics of prefabricated components, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 12000 t jacket and other components. (120 m water depth)

TIFFANY Jacket, M.S.F and Piles (1991-1992)

Owner/Client: AGIP U.K./C.I.O. (CONSORZIO ITALOFFSHORE)

Services: Management of the fabrication engineering including shop drawings, logistics of prefabricated components, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 17000 t jacket, 2200 t MSF and 7800 t piles. (126 m water depth)

JUDY Jacket and Piles (1995)

Owner/Client: PHILLIPS/C.I.O. (CONSORZIO ITALOFFSHORE)

Services: Management of the fabrication engineering including shop drawings, logistics of prefabricated components, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 8000 t jacket. (75 m water depth)

INTERMARE SARDA - Arbatax Yard (Sardinia)

From 1982 to 1995 Tecon was permanently involved in the fabrication engineering and technical assistance to special operations such as heavy lifts, roll-ups and load-outs.

BARBARA C, D, E Jackets and Piles (1985)

Owner/Client: AGIP/Intermare Sarda

Services: Management of the fabrication engineering including shop drawings, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 1600 t each jackets. (70 m water depth)

LUNA B Jacket and Piles (1990)

Owner/Client: AGIP/Intermare Sarda

Services: Management of the fabrication engineering including shop drawings, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 5000 t jacket. (125 m water depth)

ASPF3 Jacket and Piles (1995)

Owner/Client: ELF Tunisia/Intermare Sarda

Services: Management of the fabrication engineering including shop drawings, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 1300 t jacket. (67 m water depth)

In 2003 Saipem Intermare Sarda were awarded the fabrication contract for the Sabratha jacket and piles and Tecon was involved as follows:

SABRATHA Jacket and Piles (2003)

Owner/Client: AGIP Libya/Intermare Sarda

Services: Preparation of shop drawings and M.T.O.s for all structural material requisitions, engineering and supervision in the yard of all major roll-ups for the 23000 t jacket. (188 m water depth)

ROSETTI - Piomboni Yard (Ravenna)

Since the beginning of its activities up to present Tecon is involved in the fabrication and temporary works engineering and technical assistance to special operations such as heavy lifts, roll-ups and load-outs.

BD1 Jacket and Piles (2002)

Owner/Client: Total Fina Elf/Rosetti Marino

Services: Management of the fabrication engineering including logistics of prefabricated components, engineering and supervision in the yard of all major lifts, roll-ups and load-outs for the 6000 t jacket. (87 m water depth)

LIBONDO Deck (2008-2009)

Owner/Client: Total/Rosetti Marino

Services: Follow-up in the fabrication yard of the structural design, definition of the erection sequence and engineering and supervision of all major lifts.

JASMINE, JRP and JRQ Jacket (2010)

Owner/Client: Conoco Phillips/Rosetti Marino

Services: Fabrication engineering of 3 jackets for North Sea weighing 5500t, 6000t and 4000t. The activities include the definition of the erection sequence and engineering and supervision of all roll-ups, main lifts and load-outs.



OFFSHORE STRUCTURES - INSTALLATION ENGINEERING

WIN Platform - 65 m water depth (1984)

Owner/Client: ONGC India/MICOPERI

Services: Complete installation engineering including launching and up-ending simulations

ASPF 2 Platform - 70 m water depth (1984)

Owner/Client: SEREPT/SNAMPROGETTI

Services: Transportation and launching analyses of the 1800t jacket

C40 Module - Weight 6000t (1989)

Owner/Client: BP Norway/MICOPERI

Services: Transportation engineering and sea fastening design

MOKOKO ABANA Field (1990)

Owner/Client: PECTEN Cameroon/SAIPEM

Services: Installation engineering for three jackets and decks and for all sea lines and risers

SAFANIYA GOSP 4 Complex (1992)

Owner/Client: ARAMCO/SAIPEM

Services: Complete design of the installation aids for all jackets, decks, modules and bridges

NORTHERN ADRIATIC Field (1995)

Owner/Client: AGIP

Services: Study of the installation of mono-tower platforms using a crane barge or a jack-up drilling rig

SARAWAK M1PQ-A and M3PQ-A (1995)

Owner/Client: SHELL/SAIPEM

Services: Transportation engineering and sea fastening design for all structures: jackets (max. weight 10000 t), living quarters, bridges and flares

Installation by MATING (1996)

Owner/Client: SAIPEM

Services: Conceptual and feasibility study of the installation by Mating of large topside structures

DECK INSTALLATION by The Float-Over / Mating System (1996-2003)

Client: SAIPEM

Services: Tecon has developed on behalf of Saipem a number of dynamic naval analyses for actual installations (Helang, Cakerawala, Sakhalin) and for a patented active system of load transfer. The PA-B and Lun-A Sakhalin topsides weighed up to 30000t, were transported on T-shaped barges built on purpose and were installed on concrete bases with large cylindrical columns, which proximity to the barge hull required the development of special elements to be introduced in the Moses software.

AL SHAHEEN Project (1998)

Owner/Client: MAERSK/SAIPEM

Services: Engineering of transportation, sea-fastening, docking and upending of the BA and CA jackets

HELANG Field Project (2000)

Owner/Client: NIPPON OIL/SAIPEM MALAYSIA

Services: Engineering of launching and upending of the jacket and mating of the deck

SANHA Condensate Project (2001)

Owner/Client: CHEVRON/SAIPEM USA

Services: Engineering of launching and upending of three jackets with definition of additional buoyancy tanks and of jacket modifications

CAKERAWALA Field Project (2001)

Owner/Client: CARIGALI TRITON/SAIPEM MALAYSIA

Services: Handling and installation engineering for a number of risers and spool pieces of the 18" and 6" sealines linking three platforms and one FSO

CASPIAN SEA BLUE STREAM Project (2002)

Owner/Client: SAIPEM

Services: Transportation engineering and sea fastening design for a number of transportations in the Mediterranean and Black Seas of pipe joints and sealine installation equipment

ACG Full Field Development (AZERBAIJAN) (2002)

Owner/Client: ACG/SAIPEM

Services: Check of the limiting weight for the DP jacket due to transportation stability and barge strength. Study of the deck installation by mating. Transportation engineering for the template and piles

PECIKO Phase 3 Project (2002)

Owner/Client: GUNANUSA/SAIPEM INDONESIA

Services: Basic engineering of the jacket upending and establishment of criteria for the final analyses to be performed by the jacket designer



CLARA EAST & NORTH Project (2002)

Owner/Client: AGIP/ROSETTI

Services: Detail engineering for transportation and installation of two helideck modules, including the preparation of installation manuals and the assistance to the operations

CALPURNIA Project (2002)

Owner/Client: AGIP/COSMI

Services: Detail engineering for transportation and installation of one living quarter module, including the preparation of installation manuals and the assistance to the operation

ACG Full Field Development (AZERBAIJAN) (2002)

Owner/Client: ACG/SAIPEM

Services: Detail structural design of all reinforcements of the STB1 barge, required by the load-out and transportation loads generated by the jackets and decks relevant to phase 1 and phase 2 of the full field development

LIKALALA Project (2003)

Owner/Client: ELF Congo/ABB

Services: Detail engineering for transportation and installation of one 50 m long flare boom, including the preparation of installation manuals and the assistance to the operation

YACHENG Field Project (2003)

Owner/Client: SAIPEM MALAYSIA

Services: Engineering of free floating and upending of the jackets with definition of additional buoyancy tanks and relevant design

PS1K Platform (2003)

Owner/Client: SAIPEM

Services: Dynamic naval and structural analyses of the docking operation of PS-1K jacket, in a water depth of 33.26 m, over the pre-installed docking pile

MARICA Project (2003)

Owner/Client: INAGIP/MICOPERI

Services: Engineering for the installation of the jacket and deck of the Marica platform and for the installation of the sealine from Barbara T2 to Marica

SAKHALIN Project (2003)

Owner/Client: SAIPEM

Services: Study and development of all naval analyses for the transportation and float over installation of the Sakhalin PA-B and LUN-A topsides. The two units, weighing up to almost 30000 t, will be transported on purpose built T-shaped barges. The simulation results were checked against the findings of physical model tests

TEMSAH – NW2 Platform (2005)

Owner/Client: ENI Petrobel/SAIPEM

Services: Time domain dynamic simulation of the 2000t deck lifting and installation. The simulation was performed for the three body system (HLV S3000, transport barge and deck) in different seastates and different position with scope of identifying the limiting installation conditions. The platform was installed in Mediterranean Sea, offshore Egypt

WEST ESPOIR Platform (2005)

Owner/Client: CNR (CANADIAN NATURAL RESOURCES)/SAIPEM

Services: Time domain dynamic simulation of the 1500t three-leg jacket lifting and installation. The jacket was successfully installed in West Africa, offshore Ivory Coast

HEAVY LIFTS by SAIPEM S3000 (2005-2006)

Client: SAIPEM

Services: Tecon was asked by Saipem to study the dynamics of a number of heavy lifts using multi-body simulations that included the S3000, the transportation barge and the deck or jacket being lifted and in case of jackets being lowered into the water. Such simulations were performed for the Temsah NW2, West Esprit, Awa Palouko platforms and resulted in precisely defining the operational limits for the vessel as a function of full environmental data (direction, height and period of waves, direction and speed of wind and current).

AKOGEP PHASE 2 AMP1-AMP2 Bridge (2006)

Owner/Client: AKOGEP/SAIPEM

Services: Time domain dynamic simulation of the 750t, 100m long bridge lifting from the transportation barge and installation between the Amenam AMP1 and AMP2 platforms. The jacket was successfully installed in West Africa, offshore Ivory Coast

M30 Laying Barge (2006-2009)

Owner/Client: MICOPERI

Services: Basic and detail design of the fire line and laying ramp modifications to increase the barge laying capabilities. Basic and detail design of the new stinger. Basic and detail design of the gantry crane reinforcements for the new 1250 t capacity hook.

S3000 VESSEL (2005)

Owner/Client: SAIPEM

Services: Dynamic analysis of the installation of various topsides performed by dynamic positioning vessel S3000 including the multibody simulation of the behaviour in time domain of the crane vessel transportation barge and lifted structure.



STINGER for Laying Pipes (2007)

Owner/Client: SAIPEM

Services: Feasibility study and basic design of an articulated stinger for laying pipes with broad spectrum of sizes weights and water depth conditions.

KASHAGAN Experimental Program (2006-2010)

Owner/Client: AKCO/SAIPEM

Services: Development of all naval analyses to ascertain the static and dynamic stability and the dynamic loads on transported items for all equipment and material transportations in the Caspian Sea on standard and purpose built barges

KASHAGAN Experimental Program (2009-2011)

Owner/Client: EXXONMOBIL / SAIPEM

Services: Complete engineering services for relocation of the RIG 401 and RIG 402 from D-Island to DC05 Island and Bautino Base. The activities include the structural check of the module and the design of required reinforcement, the study of load-out, transportation and offloading operation and the direction of the main operations.

SPECIAL SERVICES

VENICE FLOOD PREVENTION Scheme (1987 - in progress)

Owner/Client: Magistrato alle Acque di Venezia/Technital

Services: Management of the engineering team in charge of the development of the design of the flap gates and related equipment and plants. The activities included studies and re-search projects performed by international hydraulic and structural laboratories and led to the design, construction, installation and test campaigns of the full scale prototype MOSE.

TIFFANY Jacket, M.S.F and Piles (1991-1992)

Owner/Client: AGIP U.K./C.I.O. (CONSORZIO ITALOFFSHORE)

Services: Management of all engineering activities related to the EPIC contract for the 27000 tons platform including detail design, fabrication engineering, material management, transportation and installation engineering.

STOREBÆLT Suspension Bridge (1995-1996)

Owner/Client: Danish Authorities/COINFRA

Services: Management of the engineering team co-ordinating the development of the procedures and the design of all temporary structures, equipment and tools necessary to erect the nearly 2700 m long suspension bridge over the Storebælt Eastern channel in Denmark.

MARINE TERMINALS AND SPECIAL PROJECTS

Ras el Mungar Oil Terminal (1992)

Owner/Client: Saipem

Services: Feasibility Study and Basic Design of a 300 m Jetty, loading facilities, dolphins

North Adriatic LNG Terminal (2001)

Owner/Client: Technimont / Sofregaz

Services: Design for Bid of the Modules Housing the Re-gasification Plant

IDKU - Egypt LNG Project-Marine Terminal (2002)

Owner/Client: British Gas and Bechtel/Technimont

Services: FEED design of a Marine Terminal for loading LNG gas carriers.

KASHAGAN Saipem Fabrication Yard (2003)

Owner/Client: Saipem

Services: Detailed Design of the quay structures for the fabrication yard

MOSE – Venice Flood Prevention System (2004-2009)

Owner/Client: Magistrato alle Acque di Venezia/Technital

Services: Detailed Design of Flap Gates

BRINDISI LNG Project - Marine Terminal (2005-2006)

Owner/Client: BRINDISI LNG/ATI Technimont GLF

Services: Detailed Design of a marine terminal for unloading LNG gas carriers

Panigaglia LNG Terminal (2005)

Owner/Client: GNL ITALIA/ SEI (SAIPEM)

Services: Basic Design to increase capacity Gas Carriers from 70.000 m³ to 140.000 m³.

NEW CALEDONIA-DONIAMBO LNG Marine Terminal (2005)

Owner/Client: SOGREAH

Services: Feasibility design of a marine terminal for 30.000 to 80.000 LNG carriers

TOTAL-SOUTH PARS LNG Project Marine Terminal (2005)

Owner/Client: SOGREAH/TECHNIP/TOTAL

Services: Feed design of a marine terminal for 60.000 to 250.000 LNG carriers



INDUSTRIAL STRUCTURES BASIC & DETAIL DESIGN

NIGERIA - OK-LNG Project – Marine Terminal (2006)

Owner/Client: TECHNIP ROME/SNAMPROGETTI

Services: Bid design of the Topsides and Piling alternative of the Approach Trestle

JAMNAGAR Marine Terminal Increase Capacity Project (2006-2008)

Owner/Client: Reliance Port & Terminal LTD/BECHTEL FRANCE

Services: Multi-discipline detailed engineering of marine terminal upgrade to increase the crude processing capacity from 33 MMTPA to 64.6 MMTPA

PORTO MARGHERA Canale Sud- New Terminal 33/34 Bis (2007-2008)

Owner/Client: POLIMERI EUROPA

Services: Multi-discipline Feed design of the new terminal quay for petrochemical products.

CONGO DEVELOPMENT PROGRAM – M'BOUNDI (2008-2009)

Owner/Client: ENI CONGO/S.E.S. (Saipem Energy Services)

Services: Multi-discipline Feed design of the new terminal LPG Island and W.I. Jetty.

DUNKERQUE LNG Project - Marine Terminal (2008)

Owner/Client: Dunkerque LNG-EDF-CIT/SOGREAH-SOFREGAZ

Services: Feed structural design of a marine terminal for 70.000 to 250.000 LNG carriers

GIOIA TAURO LNG - Marine Terminal (Phase 1) (2008-2009)

Owner/Client: LNG MED GAS (Sorgenia – Iride)

Services: Pre-Feed structural design of a marine terminal for 70.000 to 250.000 LNG carriers

KASHAGAN – Rosetti Fabrication Yard (2009)

Owner/Client: ROSETTI MARINO

Services: Detailed Design of the quay structures site preparation for the fabrication yard

API TERMINAL FALCONARA (2009)

Owner/Client: API Refinery

Services: Basic and detailed engineering of revamping of the near shore terminal facilities and loading/unloading platforms.

JAMNAGAR Berth A1 Project (2009-2010)

Owner/Client: Reliance Port & Terminal LTD India

Services: Multi-discipline detailed engineering of the new Berth Platform A1

Telecommunication towers height 20 to 40 m (1991)

Owner/Client: ERICSSON

Services: Complete structural design of several telecommunication towers

Stockertown cement plant (USA) (1992)

Owner/Client: ITALCEMENTI

Services: Structural design of a 70 m high preheater tower for the kiln n. 3 revamping.

Montalto di Castro Racks (Italy) (1993)

Owner/Client: ITIN

Services: Structural design of pipe racks for the Montalto di Castro power plant.

Telecommunication towers height 20 to 40 m (1997)

Owner/Client: ICOMA

Services: Complete structural verification of several telecommunication towers

GPDF Plant in Algeria (2001)

Owner/Client: ABB

Services: Structural design of steel buildings, equipment and tanks foundations

OK1 Plant in Algeria (2003)

Owner/Client: ABB

Services: Structural design of steel buildings, equipment and tanks foundations

Bir Berkine Plant in Algeria (2004)

Owner/Client: ABB

Services: Structural design of steel buildings, equipment and tanks foundations



METRO AND RAILWAYS

Upgrading of the Milan Rogoredo Station (2000)

Owner/Client: RFI/TORNO

Services: Underground tunnels made by the jacked-digged-out pipe technique.

Rome Underground Line B1 (2000)

Owner/Client: COMUNE DI ROMA/ROCKSOIL

Services: Detailed design of four deep access wells and two metro stations.

Rome Connection Road under Monte Mario (2000)

Owner/Client: ROCKSOIL / ASTALDI

Services: Detailed design of one multiple access well for tunnel excavation.

Milan Underground Line 1 up to Rho Exhibition Terminal (2002)

Owner/Client: METROPOLITANA MILANESE

Services: Basic design of the Rho station, of the artificial tunnels, of four ventilation wells and of the safety exits

Milan Underground Line 4 (2002)

Owner/Client: METROPOLITANA MILANESE

Services: Feasibility design of seven open trench stations

Milan Underground Line 3 –Comasina Unit (2002)

Owner/Client: METROPOLITANA MILANESE

Services: Basic design of the station and of all open trench structures of the lengthening up to Comasina

Milan Underground Line 3 – Dergano Station (2001)

Owner/Client: TORNO / CMC

Services: Detailed and construction design of the station and of all open trench structures

Milan - Rho Exhibition Terminal Underground Station (2004)

Owner/Client: METROPOLITANA MILANESE

Services: Basic design of the underground station structures and budget estimate of the works

Underground Line 1 up to Rho Exhibition Terminal (2004-2006)

Owner/Client: METROPOLITANA MILANESE /TORNO - MAIRE Engineering

Services: Detail construction design of the Rho and Pero stations and of the artificial tunnels and deep wells

Brescia - Underground Line (2005-2009)

Owner/Client: METROBRESCHIA-ANSALDO-ASTALDI-NESCO

Services: Detail construction design of five deep stations and two in-out wells for TBM machine

Milano-Genoa High Speed Railway Project (2004)

Owner/Client: MAIRE Engineering

Services: Advanced basic design of a 10 kilometre long artificial tunnel

COLL. FERROVIARIO SARONNO-MALPENSA (2005)

Owner/Client: TORNO / ROMAGNOLI

Services: Detail construction design of several wells and of all open trench structures

MILANO – Underground Line 2- Famagosta Milanofiori (2005-2008)

Owner/Client: METROPOLITANA MILANESE/SALINI LOCATELLI

Services: Detailed design of two open trench stations, several wells and artificial galleries

Underground Line 3 – Extensions “Lotto” 2 and 3” (2005-2008)

Owner/Client: METROPOLITANA MILANESE/TORNO INT. S.p.A./IMPRESA

Services: Detailed design of two open trench stations, several wells and artificial galleries

Penetrazione urbana S.S. n° 415 Pallese Lotto 4 (2006)

Owner/Client: METROPOLITANA MILANESE.

Services: Underground tunnel made by the jacked-digged-out pipe technique

BOLOGNA – High Speed Railway Underground Main Station (2005-2009)

Owner/Client: ITALFERR/STONE/ ASTALDI

Services: Detailed design of the station concrete-and steel structures

Tunneling by TBM under Brescia Town (2005)

Owner/Client: METROBRESCHIA-ANSALDO-ASTALDI-NESCO

Services: Building response to tunnelling with TBM effects – FEM analyses of concrete and masonry historical buildings

MILANO-Underground Linea 5 Garibaldi F.S. Bignami (2007-2009)

Owner/Client: METROPOLITANA MILANESE /ASTALDI/TORNO/ROCKSOIL

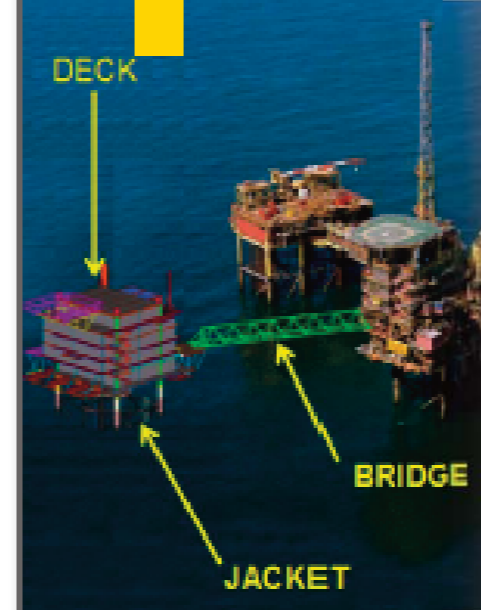
Services: Detailed and construction design of three concrete stations.



Clients:

ABB PS • AGIP • API • ASTALDI
BAYARDS ITALIA • BASIS
ENGINEERING • BECHTEL
CONSORZIO VENEZIA NUOVA
EDINA • EDISON • E&M SERVICES
ERSAI • FORES ENGINEERING
GRANDI LAVORI FINCOSIT
INTERMARE SARDA • MAIRE
ENGINEERING • METROPOLITANA
MILANESE • MICOPERI
POLIMERI EUROPA • RELIANCE
PORTS & TERMINALS • ROCKSOIL
ROSETTI MARINO • SAIPEM
SALINI LOCATELLI • SAIPEM
ENERGY SERVICES • SKEMA TOZZI
SYNDIAL • SNAMPROGETTI
SOGREAH • SOFREGAZ • TECHINT
TECHNIP ITALIA • TECHNITAL
TECNIMONT • TECNOMARE
TORNO INTERNAZIONALE

CLIPPER PLATFORM



Owner	SHEL
Client	Rose
Country	Norfolk
Period	2012
Value of Works	000.
TECON SOW	Detail
BASIS SOW	Detail

WORK DESCRIPTION

- The Clipper PH platform is situated on the Norfolk coast. The accommodation for people and all relevant facilities are provided on the existing PT Platform.

TECON/BASIS SERVICES

- Detailed design of the Topsides structures
- Detailed design of the Foundation structures

