



TECHNITAL

# URBAN PLANNING, BUILDINGS AND ARCHITECTURE

COMPANY PROFILE AND  
STATEMENT OF CAPABILITIES 2023



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# 1 Company Profile

## About TECHNITAL

### Description

TECHNITAL is a private joint stock company established more than 50 years ago (in 1964) and is one of the oldest engineering consultancy companies in Italy. Thanks to its high level of expertise, its dynamic nature and versatility, management autonomy and efficiency and its sophisticated hardware equipment and software libraries, the Company has been awarded large scale international and national projects by major public and private entities and by international funding organizations.

TECHNITAL's headquarters are situated in Verona, Italy. The organization abroad includes 15 between branches and subsidiaries in Algeria, Armenia, Bosnia & Herzegovina, Croatia, Djibouti, Georgia, Iraq, Kenya, Kosovo, Qatar, Tanzania, Trinidad & Tobago, Tunisia, Uruguay and Zambia and a number of local offices which is continuously changing according to the on-going international projects (at the moment there are 4 local site offices).

### Services

TECHNITAL is a dynamic company whose sectors of activity cover transport infrastructure (roads and motorways, railways, inland waterways, urban transport, ports and airports), hydraulics (water treatment and desalination plants, dams, aqueducts, sewerage systems, waste water treatment), maritime and coastal engineering, environment, energy (incineration and waste to energy plants, hydroelectric plants, solar plants, biogas plants), waste treatment (recycling plants, dump sites), buildings, architecture and urban planning.

The company covers the full range of services, from planning and feasibility studies through to detailed design, works supervision and technical assistance:

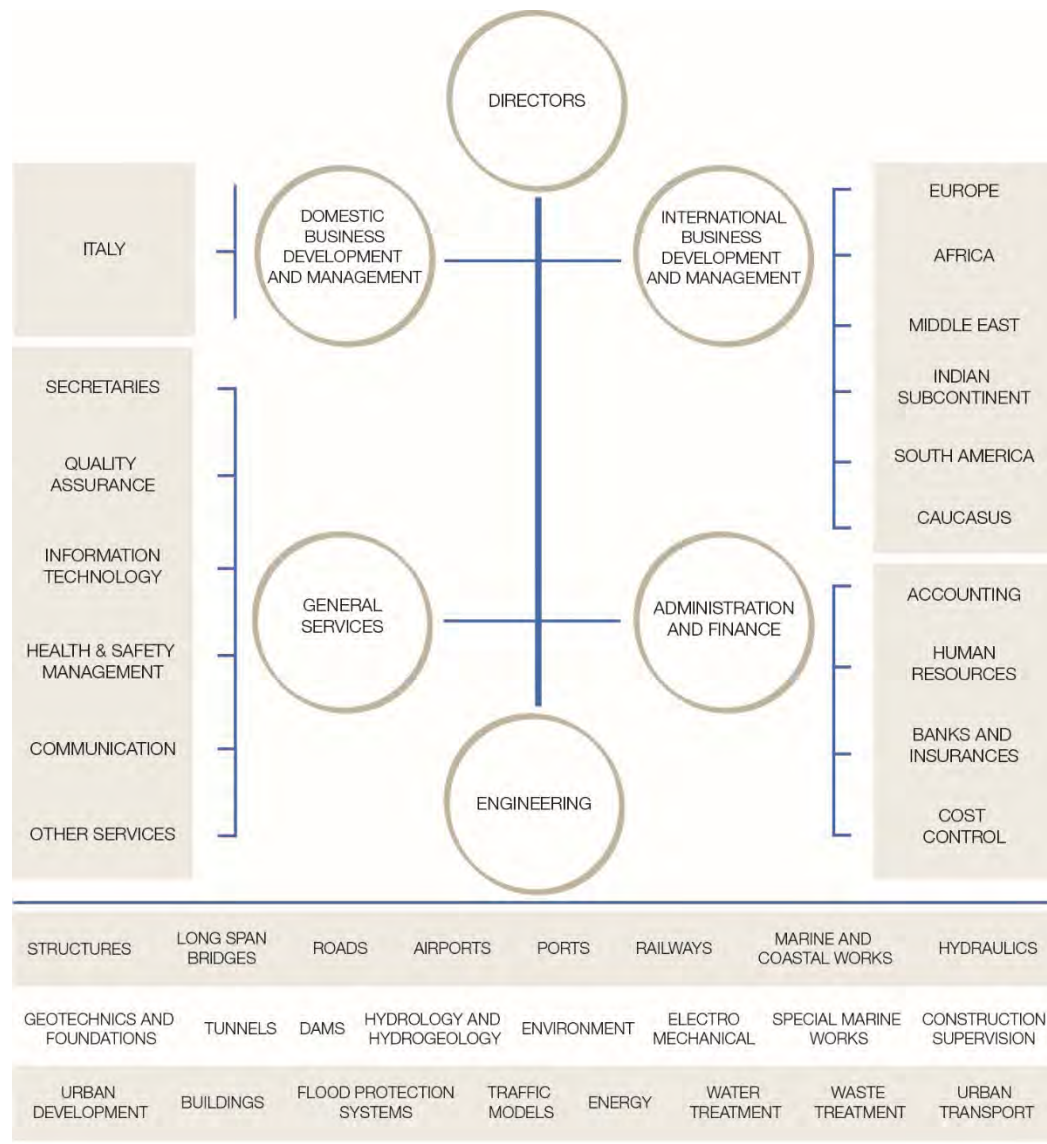
- } project management
- } planning and economic-financial evaluation of investments
- } feasibility studies and technical-economic evaluations
- } all levels of design
- } environmental impact assessment and studies
- } traffic studies
- } procurement and assistance with tenders
- } construction supervision, quality assurance, testing and commissioning
- } co-ordination and supervision of research and laboratory tests
- } development of hydrodynamic and hydrogeological analysis and simulations
- } development and application of analysis methods and computer modelling.

TECHNITAL has worked in several countries world-wide: Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Bahamas, Benin, Bolivia, Bosnia & Herzegovina, Brazil, Bulgaria, Burkina Faso, Burundi, Cayman Islands, Colombia, Croatia, Cuba, Cyprus, Czech Republic, Democratic Republic of the Congo, Djibouti, Dominican Republic, Egypt, Ethiopia, Georgia, Germany, Ghana, Greece, Guatemala, Hungary, India, Iraq, Italy, Jordan, Kenya, Kosovo, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Monaco, Montenegro, Mozambique, Nicaragua, Niger, Norway, Panama, Peru, Poland, Qatar, Republic of Haiti, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Slovenia, Somalia, Spain, Sudan, Syria, Tanzania, Togo, Trinidad & Tobago, Turkey, Uganda, Ukraine, U.A.E., United Kingdom, U.S.A., Uruguay, Venezuela, Yemen, Zambia.



### Organization and staffing

TECHNITAL's multidisciplinary staff is organized according to the following chart:



TECHNITAL's multidisciplinary staff includes about 250 professional employees covering the various aspects of the engineering services: Transport, Hydraulics, Geotechnical, Marine & Coastal, Environmental Studies & Territorial Analysis, Structures, Electronic Data Processing & Systems Analysis, Quantity Surveying & Cost Estimation, Electromechanics, BIM/CAD/CAE, Works Supervision, etc.

Whenever required for the solution of specific problems, the home group is integrated by external consultants and specialists, both Italian and foreign. Seeking assistance and advice from colleagues, scientists, and academics throughout the world is part of TECHNITAL's policy of aiming for excellence.

Given the firm's considerable international experience, TECHNITAL's staff are perfectly at ease working in the main international languages (English, French, Spanish) and using international engineering codes (BS, ASTM, AASHTO, ASME, API and the like) and contract conditions (FIDIC and others).



### *Quality control*

TECHNITAL's activity is ISO 9001:2015 Quality System Management certified. The company is also certified ISO 14001: 2015 Environmental Quality Management, ISO 45001:2018 Occupational Health and Safety Management System and SA 8000:2014 Social Accountability Management System.

TECHNITAL has developed a company policy regarding quality control which is constantly being updated and applied, taking into account the costs to be sustained to achieve the objectives of quality and maximum benefit for both the Company and the Client. Thanks to its Quality Control System, TECHNITAL is capable of guaranteeing the quality of its services and of ensuring the Client that these services satisfy the required quality standards.

### *Code of Ethics*

Ethical and responsible decision making is very important for the company in terms of risk management and in order to keep actions within the ethical and legal boundaries.

For that reason, the company is adopting a Code of Ethics (available from the web site of the company) and conduct for its Executives and Directors and for all the Employees able to fulfil requirements for responsible decision taking. Such code aims at reducing the possibility of stepping outside behavioral limits set by the company.

The Code of Ethics the company is adopting also meets the Organization, Management and Control Model pursuant to Italian Legislative Decree n. 231/2001.



### *Sectors of Specialization*

TECHNITAL provides high-quality consultancy services in different areas of specialization: Roads and Motorways, Railways and Urban Transport, Airports, Ports and Waterways, Marine and Coastal Engineering, Environmental Engineering, Urban Planning, Buildings and Architecture, Hydraulic Engineering, Water Treatment, Waste Treatment, Energy.

In each of these sectors, TECHNITAL provides innovative project solutions to Government Agencies, International Financial Institutions and Private Sector Organizations.

Services provided by TECHNITAL include master plans, feasibility studies, techno-economical evaluations, traffic studies, mathematical and physical modeling, all phases of design from concept to detailed design, environmental impact studies and monitoring plans, tender document preparation and assistance in the procurement of works, construction supervision.





## 2 Our Experience

### Experience in Urban Planning, Buildings and Architecture

TECHNITAL has a wide experience in all engineering consultancy services related to urban planning, buildings and architecture, and has carried out in this field highly significant projects at international scale.

Thanks to the Company's resources, in terms of staff and equipment, TECHNITAL is able to intervene successfully in areas where the entity and complexity of the project require integrated engineering services at a high level of specialization.

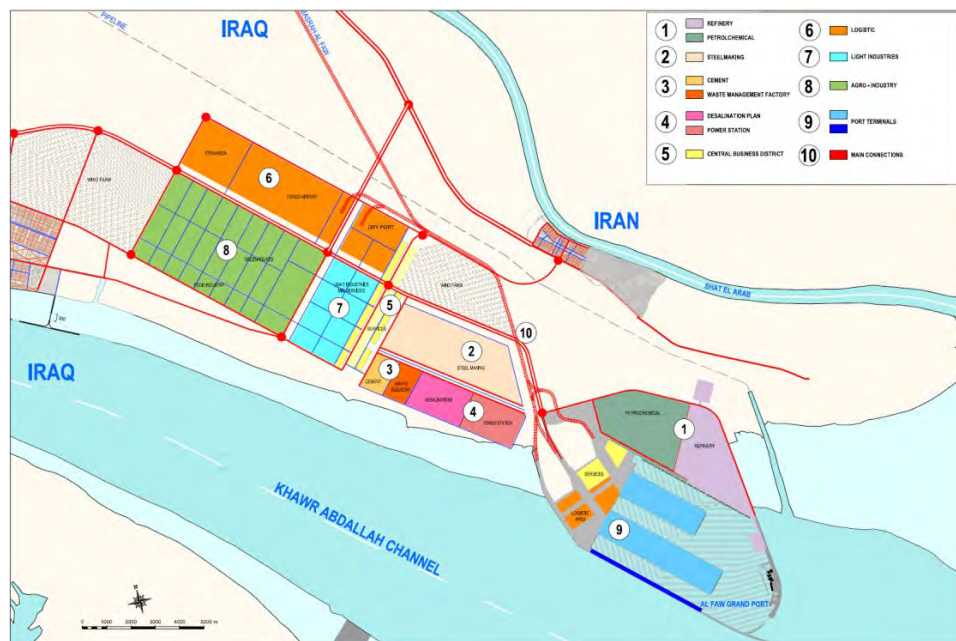
TECHNITAL provides integrated tailor-made engineering services ranging from technical-economic feasibility studies, master planning, concept/preliminary and detailed/final design, preparation of technical specifications and tender documents, up to construction management and works supervision.

The company's expertise includes the management of the entire design process with the BIM (Building Information Modelling) system which ensures, using a comprehensive 3-D model-based process: highest quality of product, information flow control across all design phases, effective coordination with detection of clashes and interferences (as it typically occurs in buildings between civil works and MEP systems), improved planning of construction works through realistic simulations, precise monitoring of the activities' progress, accurate maintenance planning and management.

A fully implemented BIM is achieved through specific software tools such as Revit and Civil 3D for model building, Naviswork and ProjectWise for process coordination and management.

#### Urban and Industrial development and planning

**Al Faw Peninsula Industrial and Urban planning in Iraq:** master plan covering the industrial and urban development of an area of 2,500 Ha hosting about 350,000 people. It includes the highway connection between the Um Qasr and New Al Faw port with tunnel under passing Khor Al Zubair.





**Master Plan of Al Maqil Waterfront in Iraq:** The company has recently completed the Master Plan for the Al Maqil port area, along the waterfront of the Shatt-al-Arab, aimed at integrating this area in the urban system of Basra, enriching the city with new residential, commercial, cultural, service and leisure functions which will increase the quality of life and work activities of its inhabitants.

The study area extends along the Shat El Arab river, for a length of ~ 2,900 meters, and an average depth of 250 meters. The total surface is about 80 hectares.



In the context of the contract **Engineering, procurement, construction management and supervision of Batumi coastal protection in Georgia**, TECHNITAL has carried out the embellishment of the coastline, designing the waterfront with beach renourishment and revetment consolidation, the architectural set up of hard and soft landscaping plus the rearrangement of water outfalls from the town.





**Infrastructure Development for Phase 1 Konza Techno City in Kenya:** design and contract administration/works supervision for a new urban development over a 5,000-acre land (for about 28'000 inhabitants), located approximately 60 Km south of Nairobi.

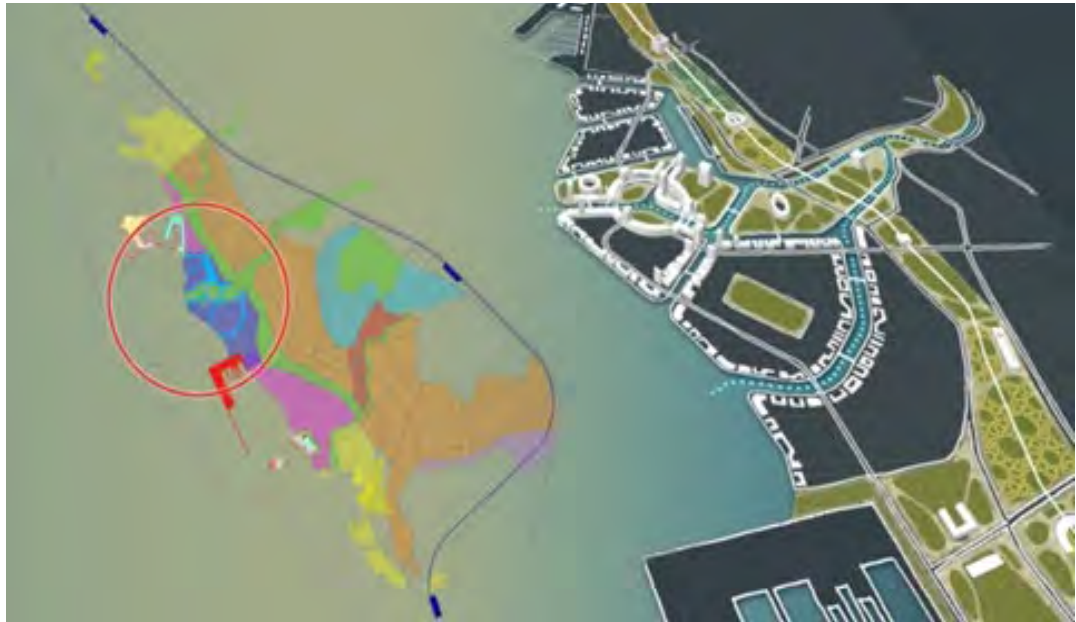


The following infrastructure are part of the scope of the design: 40km of landscaped streets complete with drainage facilities and subsurface utilities (water distribution, sewage collection, drainage network, Reuse water network, Under pressure solid waste network); Parks and open spaces; Water treatment plant and storage reservoir and related infrastructure; Wastewater Reclamation Facility and related infrastructures; Electrical distribution system including approximately 40Km of electric power lines, substations, transformers and other appurtenances; Transit Hub building; Police and Fire Station building; Solid Waste Handling Facility; Entrance and Security Features.



**Development of the Coastal Region Area of The Province of Azir in the Kingdom of Saudi Arabia.** The province of Azir has access to the sea for a limited portion of the coast with no facilities. The rationale beyond the project was to select and develop a specific cluster not oil dependent as the rest of the national economy.





The urban planning has considered the development of a city of 500,000 inhabitants taking into account the presence of the 6 basic maritime activities directly related, the number of supporting services connected to them and to all actions needed to develop urban settlements and residences (e.g. hospitals, recreational and sports areas, university and technical schools, libraries, museums, restaurants, etc.). The total area involved is about 12.500 ha with an investment of approx. 22 billion USD to be financed by the State and private entrepreneurs.





### **Buildings and Architecture**

Buildings are often included as extremely specialized structures within larger infrastructure projects. Few examples taken from TECHNITAL's long track record are mentioned in the following.



**Welcome Centre Building for Konza Techno City, Kenya:** Concept/Preliminary, Detailed Design, Final Design, Works' Supervision.

### **Airport development and extension works:**

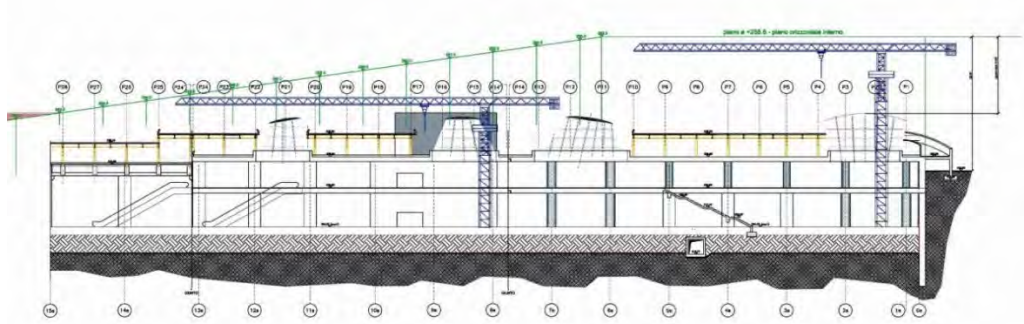
**Bucharest Otopeni Airport in Romania:** preliminary, final and detailed design of Departure Terminal (expansion to 39,000 m<sup>2</sup>) and Finger (expansion to 25,000 m<sup>2</sup>), restructuring of Arrival Terminal.

The new arrival/departure terminal building of Otopeni was awarded the European Award for Steel Structures assigned by ECCS (European Convention for Constructional Steelworks).





**Milan Malpensa Airport in Italy:** detailed design of the new railway station at Terminal 2.



**Expansion of the passenger terminal of Djibouti Airport in Djibouti:** preliminary and detailed design, construction supervision.



### Ports development

**Redevelopment of the historical waterfront of the city of Trapani in Sicily:** cruise terminal, fish market, promenade and waterfront park. TECHNITAL carried out the masterplan, preliminary design, and environmental studies.





### *Railways and metro development*

New railway stations of Riyadh, Hofuf and Dammam in Saudi Arabia, which is a part of the railway line between Riyadh and Dammam. For the same line the Company has also worked for the Railways Maintenance facilities in Dammam.



Another important project belonging to this group is **New Trenitalia Current Maintenance Centre** in “Torino Smistamento” of Turin in Italy, a maintenance center of 49,000 m<sup>2</sup> for current operations and for internal/external clearing of trains.

### *Bus Station and Parking development*

Multi-storey car park “Former Gasometer” of Verona in Italy, detailed design and works supervision for around 480 car stalls and 20 bus stalls, and design of **five underground car parks** in Verona - Italy, as part of the scheme for the phased closing of the historic centre to traffic.



### *Hospital & Healthcare facilities development*

New Hospital “San Cataldo” in the city of Taranto in Italy: detailed design and works supervision of the hospital for 715 beds.





**New Hospital of Balbalà in Djibouti:** detailed design and construction supervision of the new Hospital for about 150 beds and serving one third of the population of the country.



*Universities and colleges*

**Dukhan Community College (Qatar):** concept, preliminary and detailed design.





**Institutional palaces and public facilities**

**Extension to the Presidential Palace in Djibouti:** detailed design and works supervision, including all architectural aspects, MEP systems and safety/security equipment.



**Post-earthquake reconstruction of damaged houses, buildings and infrastructures**

TECHNITAL carried out the design for the reconstruction after natural earthquakes for:

- } *Friuli-Venzia-Giulia Region after the 1976 earthquake*
- } *Campania Region after the 1980 earthquake*

Both projects included the detailed survey of the existing building patrimony, an analysis of functional and structural damage and geological investigations followed by the planning of the required interventions and the Detailed Design of the works, preserving as much as possible of the pre-earthquake building features. In both cases the Company was also responsible for the Construction Supervision.

The services provided by TECHNITAL in the field of urban planning, buildings and architecture include:

1. Consulting
  - } Master-planning
  - } Technical-economic feasibility studies
  - } Financial analyses
  - } Socio-economic analyses
  - } Transport system planning



2. Design
  - } All phases of design from concept/preliminary up to detailed design for all kinds of buildings and covering all different aspects (architecture, structures, MEP, special plants, etc.)
  - } Technical specifications, contracts, construction planning, cost estimates
  - } Environmental impact studies
  - } Tender documents preparation and procurement
3. Supervision
  - } Construction management and supervision
  - } Technical assistance during tender phase
  - } Works supervision
  - } Coordination and supervision of research and laboratory tests
  - } Environmental monitoring

The following table and related projects sheets give full details of the main projects performed in this field.



TABLE A – COMPANY'S EXPERIENCE (For titles in **bold** type see project sheets in Appendix A)

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
URBAN/INDUSTRIAL PLANNING						
Widening of San Leone marina in Agrigento (Sicily) – Italy	Municipality of Agrigento	10/2022	ongoing	Final and Detailed design	403,785	19,050,000
Redevelopment of Trapani's historical waterfront: cruise terminal, fish market, promenade and waterfront park (Sicily) – Italy	Western Sicily Sea Port System Authority	02/2022	ongoing	Master Plan, Preliminary design, Environmental studies	420,130	60,000,000
Design and Works' Supervision of the Infrastructure Development for Phase 1 Konza Techno City - Kenya	KoTDA (Konza Technopolis Development Authority	08/2018	ongoing	Concept, Preliminary and Detailed Design, Contract Administration, Works Supervision	10,576,360	367,000,000
Batumi Coastal Protection – Georgia	Municipal Development Fund of Georgia	10/2014	02/2022	EPCM, Works Supervision	1,880,779	18,250,000
Master Plan of Al Maqil Waterfront – Iraq	Iraqi Ministry of Transportation	12/2019	07/2020	Master Plan, Preliminary Design, FEED	1,370,000	n.a.
Al Faw Peninsula Industrial and Urban planning – Iraq	Ministry of Transport	11/2016	06/2019	Master Plan, Technical Studies, Tender Documents	10,200,000	n.a.
Development of the Coastal Region Area of The Province of Azir – Kingdom of Saudi Arabia	Saudi Maritime Centre Company Limited	10/2013	05/2015	Master Plan, Macro-Economic Analysis, Economic and Financial Analysis	941,600	19,302,800,000
Tourist development of the Fazenda Caeira - Island of Tinharé, Salvador - Brazil	European Union: ECIP 2 Programme	02/1995	06/1996	Feasibility Study; Preliminary Design; Environmental Study	54,000	5,784,300
Jeddah Tourist City - Saudi Arabia	S.C.R.C. Saudi Company for Recreation Centre	01/1988	12/1991	Detailed Design; Works Supervision	624,700	12,911,400



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Engineering services for the development of Costa Smeralda - Sardinia Region - Italy	Servizi Immobiliari Costa Smeralda S.r.l. and Costa Smeralda Hotels S.p.A.	1975	1989	General Master Plan; Preliminary and Detailed Design	532,700	17,000,000
New Al-Fateh University Complex in Sebha, Libya	Ministry of Education - Libya	1980	1985	Feasibility Study Preliminary and Detailed Design	8,263,300	578,431,700
BUILDINGS and ARCHITECTURE						
New Hospital San Cataldo in the city of Taranto – Italy	Puglia Region	11/2017	Ongoing	Detailed Design Works Supervision	4,521,940	161,770,258
Expansion and requalification of the Departure Terminal of “Valerio Catullo” Airport - Italy	Aeroporto Valerio Catullo di Verona Villafranca S.p.A.	01/2017	Ongoing	Detailed Design Works Supervision	2,424,611	52,000,000
Design and works supervision for the phase 1B expansion of the passenger terminal of “Orio al Serio” Airport (Bergamo) – Italy	SACBO S.p.A.	11/2016	Ongoing	Preliminary and Detailed Design Works Supervision	817,685	25,735,000
Design of a new cruise terminal in Bari Port– Italy	Authority of the port system of the Southern Adriatic Sea	04/2020	09/2022	Final and Detailed Design	380,090	9,390,048
Engineering Design Services related to Welcome Center Facility for Phase 1 Konza Techno City – Kenya	KoTDA (Konza Technopolis Development Authority)	08/2018	07/2021	Concept / Preliminary, Detailed Design	458,000	9,000,000
Engineering Design Services related to Public Safety Centre (Police & Fire Station Building) for Phase 1 Konza Techno City – Kenya	KoTDA (Konza Technopolis Development Authority)	08/2018	07/2021	Concept / Preliminary, Detailed Design	457,000	7,500,000
Engineering design services for entrance and security features for Phase 1 Konza Techno City – Kenya	KoTDA (Konza Technopolis Development Authority)	08/2018	07/2021	Concept / Preliminary, Detailed Design	327,000	1,200,000



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
New Apostolic Nunciature in Lilongue – Malawi	Apostolic Nunciature of Zambia and Malawi	09/2020	04/2021	Concept, Preliminary and Final Architectural Design	Pro-bono (estimated in 200,000)	3,500,000
Expansion of the South Pier passenger terminal and renovation of the existing terminal of the "Marco Polo" Airport in Venice – Italy	SAVE S.p.A.	05/2018	11/2020	Works Supervision	793,043	18,577,918
Multifunctional sport pitch for education and development in Mthunzi - Zambia	Koinonia Amani	09/2020	10/2020	Concept, Preliminary and Final Architectural Design	Pro-bono	60,000.00
New block for Cicetekelo School – Zambia	Association Pope John 23rd	02/2020	06/2020	Concept, Preliminary and Final Architectural Design	Pro-bono	120,000
Construction supervision for the expansion of the terminal (lot 4A) of Orio al Serio airport - Italy	SACBO S.p.A.	01/2019	05/2020	Works Supervision	555,024	17,736,223
Masterplan for the upgrade of the family-home for street-children in Mthunzi - Zambia	Koinonia Amani	11/2018	07/2019	Concept, Preliminary and Final Architectural Design, Works Supervision	Pro-bono	120,000
Consultancy Services for Feasibility Study for Herat International Airport - Afghanistan	Afghanistan Civil Aviation Authority (ACAA)	05/2018	02/2019	Feasibility Study	746,992	73,200,000
Design and Construction supervision for the expansion of the northern aircraft apron of Orio al Serio airport – Italy	S.A.C.B.O. S.p.A.	05/2017	01/2019	Detailed and Final Design; Works Supervision	530,000	15,575,000
Detailed Design of the New Trenitalia Current Maintenance Centre "Torino Smistamento" in Turin – Italy	Vianini Lavori S.p.A. (Contractor) for Italferr S.p.A. on behalf of Trenitalia S.p.A.	09/2014	04/2017	Detailed Design	1,170,000	124,895,000
<b>Expansion of the passenger terminal of Djibouti Airport, detailed design – Djibouti</b>	Ministry of Transports - Djibouti	10/2015	02/2016	Preliminary and Detailed Design	450,000	11,500,000



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Expansion of the passenger terminal of Djibouti Airport, concept and preliminary design - Djibouti	Ministry of Transports - Djibouti	03/2015	05/2015	Concept and Preliminary Design	30,000	11,500,000
<b>Extension of the New Presidential Palace - Djibouti</b>	Government of Djibouti	01/2010	12/2015	Detailed Design; Works Supervision	1,870,000	<i>Confidential</i>
<b>Rehabilitation and extension of the new Hospital of Balbalà - Djibouti</b>	Ministry of Health - Djibouti	06/2010	05/2015	Detailed Design and Works Supervision	562,000	7,850,000
<b>Community College in Dukhan (Tender N°: GT 07101200) – Qatar</b>	Qatar Petroleum	03/2008	04/2015	Concept, Preliminary and Detailed Design, Tender Documents	1,918,200	100,000,000
<b>Design of the Presidential Palace garden – Djibouti</b>	Government of Djibouti	01/2014	07/2014	Concept and Detailed Design	33,500	2,085,000
<b>“Former Gasometer” Multi-storey Car Park in Verona- Italy</b>	Municipality of Verona	07/2012	09/2014	Detailed Design; Works Supervision	600,000	14.301.863
<b>Malpensa T2 Link-Up - New Railway Station at Terminal 2 (Lot 1) and Railway Link T1-T2 (Lot 2) - Malpensa Airport – Italy</b>	S.E.A. S.p.A.	04/2012	09/2012	Final Design	336,364	92,442,700
Construction supervision of the works for a cement plant in Ali Sabieh – Djibouti	Ministry of Trade and Industry	10/2010	11/2011	Works Supervision	229,000	33,360,000
<b>3rd phase of development interventions (buildings and air/land-side pavements) of the Otopeni international airport of Bucharest – Romania</b>	ROMAIRPORT S.r.l.	06/2008	12/2011	Preliminary, Final and Detailed Design	945,000	93,460,000



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
New international airport of Djibouti – Republic Djibouti	Ministry of Equipment & Transport	12/2010	05/2011	Pre-Feasibility Study	Project carried out pro bono, estimated cost of services € 220,000	Confidential
<b>Airport railway Stations and railway link between Bari Palese Airport and Bari Town Center - Italy</b>	DEC - Degennaro Costruzioni, in association with IPA Precast	09/2008	05/2009	Detailed Design	700,000	52,212,000
<b>Control Tower of the Otopeni international airport of Bucharest (2nd phase of development) - Romania</b>	Romairport S.r.l.	04/2004	07/2004	Preliminary and Final Design	16,000	2,000,000
<b>Supervision of the Works for Border Crossing Orasje - Bosnia &amp; Herzegovina</b>	Ministry of Civil Affairs and Communications	11/2002	06/2004	Works Supervision	175,300	3,100,000
Passenger Terminal of Bergamo - Orio al Serio - Italy	S.A.C.B.O. S.p.A.	11/2003	12/2003	Preliminary Design	17,000	10,000,000
Supply of design for Karakaj Border Crossing Point - Bosnia & Herzegovina	Ministry of Civil Affairs and Communications	02/2003	12/2003	Detailed Design, Technical Assistance	188,500	3,200,000
Passengers Terminal building of international airport of Bari Palese - Italy	S.E.A. S.p.A.	10/2000	02/2003	Preliminary, Final and Detailed Design	107,900	2,300,000
<b>Design of the Border Crossings Kamensko and Gorica - Bosnia &amp; Herzegovina</b>	Ministry of Civil Affairs and Communications	08/2002	12/2002	Preliminary and Detailed Design	148,100	6,500,000
<b>2nd phase of development interventions (buildings and air-side pavements) of Bucharest Otopeni Airport – Romania</b>	S.E.A. S.p.A.	12/1999	05/2002	Preliminary and Final Design	77,480	80,000,000
<b>Master plan, new runway, aircraft apron, and control tower of Ezeiza international airport, Buenos Aires – Argentina</b>	Aeropuertos Argentinos 2000 S.A.	10/2000	10/2001	Master Plan	674,300	1,480,400,000



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
<b>Rehabilitation of the Police Academy in Tirana – Albania</b>	Ministry of Public Order of Albania – EU Phare	09/2000	06/2001	Detailed Design, Tender Documents	95,000	1,200,000
New passenger terminal building, BHS system, access roads / parkings & sewerage system for international airport of Bari Palese – Italy	Italairport S.p.A.	08/1997	06/1998	Detailed Design	258,200	13,200,000
<b>Master Plan of Carrasco international airport of Montevideo – Uruguay</b>	P.N.U.D. (Programa de las Naciones Unidas para el Desarrollo)  D.G.I.A. (Direccion General de Infraestructura Aeronautica)	03/1997	09/1997	Master Plan; Preliminary Design	356,000	152,000,000
<b>Rehabilitation of the existing hospital of Como – Italy</b>	S. Anna hospital firm	01/1993	12/1996	Basic and Final Design	457,897	8,205,210
<b>New Hospital, Psychiatric Unit and Rest Home for the Elderly – Pesaro – Italy</b>	Municipality of Pesaro	1991	1996	Feasibility Study; Preliminary and Final Design	3,000,000	50,000,000
<b>Reconstruction and antiseismic restructuring of housing, buildings and infrastructures damaged by the 1980 earthquake in Campania - Italy</b>	Municipalities of the Campania Region	01/1983	12/1995	Feasibility Study; Concept, Preliminary and Detailed Design; Works Supervision	5,880,200	43,382,400
<b>New buildings for infectious diseases in Cesena, Forlì and Parma – Italy</b>	Ministry of Health	1992	1995	Preliminary and Final Design	360,000	6,000,000
Passengers Terminal, Control Tower, aircraft Apron and Access roads of Alma-Ata international airport – Kazakhstan	Italstrade S.p.A.	07/1992	09/1992	Preliminary Design	135,200	83,000,000
<b>Main railway stations of Dammam, Hofuf and Riyadh for the new direct line - Saudi Arabia</b>	S.R.O. - Saudi Railway Organization - Dammam	01/1983	12/1992	Feasibility Study; Preliminary and Detailed Designs; Works Supervision; Technical Assistance	3,150,400	34,654,300



PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
<b>Railway maintenance facilities in Dammam and Riyadh for the new direct line Dammam-Hofuf-Riyadh - Saudi Arabia</b>	S.R.O. - Saudi Railway Organization - Dammam	01/1983	12/1992	Feasibility Study, Preliminary and Detailed Designs; Works Supervision, and Technical Assistance	826,300	24,046,200
Restructuring of Hotel de Bains - Lido di Venezia - Italy	Ciga Hotels S.p.A.	01/1990	12/1991	Preliminary Design	134,300	4,131,600
Restructuring of Hotel Principe di Savoia and Hotel Palace – Milan - Italy	Ciga Hotels S.p.A.	01/1988	12/1991	Detailed Design	461,300	8,728,100
<b>University of Padua - Biology department – Padua - Italy</b>	University of Padua	01/1984	12/1991	Preliminary and Detailed Design, Works Supervision	973,500	20,658,300
<b>Design of five underground car parks in Verona - Italy</b>	Residence Bussolengo S.p.A. for the Municipality of Verona	01/1989	12/1990	Preliminary Design	129,100	15,493,700
<b>Reconstruction and antiseismic restructuring of housing, buildings and infrastructures damaged by the 1976 earthquake in Friuli - Italy</b>	Ministry of Public Works - Friuli Region	01/1977	12/1989	Preliminary and Detailed Design, Works Supervision	2,223,300	16,526,600
New hospital for the Dakar university – Senegal	African Development Bank	1987	1987	Feasibility Study; Master Plan	60,000	1,000,000
<b>New maternity building – Cotonou – Benin</b>	European Development Bank	1983	1983	Final Design; Tender Documents	90,000	800,000



## Appendix A – Company's Experience



## Urban Planning



# REDEVELOPMENT OF TRAPANI'S HISTORICAL WATERFRONT: CRUISE TERMINAL, FISH MARKET, PROMENADE AND WATERFRONT PARK

Location:	Trapani, Sicily
Client:	Western Sicily Sea Port System Authority
Services:	Master Plan, Preliminary Design, Environmental studies
Period:	02/2022 – ongoing
Construction cost:	€ 60,000,000

## Project Description:

The project aims at the redevelopment of the historical port waterfront and at triggering processes of urban transformation and regeneration. This involves the coastline as well as the entire urban network of places that relate to the sea and port areas. The 5 main works are: the historic waterfront with the new passenger terminal, the market and recreational marina, the fishing dock and urban square, the waterfront park, the dredging needed for the cruise terminal.



The project site is a narrow and long stretch of lagoon coast dotted with islands and islets of small dimensions, connected by shallow waters, rocks and strips of land. An extraordinary set of focal points that emerge on the horizontal landscape of the salt pans, the internal water mirrors, the quays, the sea. The project needs to fit a multifaceted context and to deal with current port activities.

## Technical data:

- 1 km long interface between the city and the sea: maritime, architectural, hydraulic works and landscaping;
- a 300 m long new Pier and 200.000 m<sup>3</sup> dredging works for the new cruise terminal;
- a 1.000 m<sup>2</sup> passenger terminal (new building and promenade);
- floating piers and boating workshops;
- urban squares (around 15.000 m<sup>2</sup>), new parking lots, pedestrian paths, new market buildings and restaurants.





# DESIGN AND WORKS' SUPERVISION OF THE INFRASTRUCTURES RELATED TO THE PHASE 1 OF KONZA TECHNO CITY

Location:	Machakos County - Kenya
Client:	KoTDA (Konza Technopolis Development Authority)
Services:	Concept, Preliminary and Detailed Design; Contract Administration, Works Supervision
Period:	08/2018 - ongoing
Construction cost:	about Euro 367,000,000

## Project Description:

The Konza Technology City (KTC) is a project of the Government of Kenya (GoK), implemented through the Konza Technopolis Development Authority (KoTDA), under the Ministry of Information and Communication Technology (MOICT).

Konza City will be constructed over a 5000 acre land, located approximately 60km south of Nairobi Center. The city plot boundaries are the A109 Highway (Mombasa Road) to the east, and Konza-Katmani Road to the west.

The city is designed to allow phased development, and Phase 1 includes various types of land uses and infrastructures that would support future phases of development.

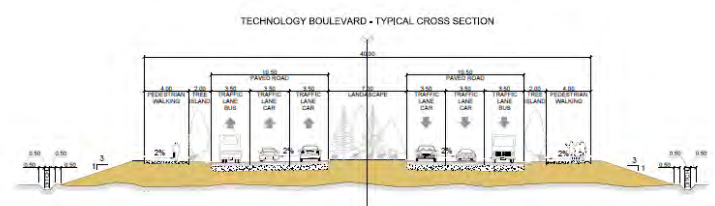


The project concerns the development of a new smart technology city of about 28'000 inhabitants including:

- 40km of landscaped streets complete with drainage facilities and subsurface utilities (water distribution, sewage collection, drainage network, reuse water network, under pressure solid waste network)
- Parks and open spaces
- Water treatment plant and storage reservoir and related infrastructure
- Wastewater Reclamation Facility and related infrastructures
- Electrical distribution system including approximately 40Km of electric power lines, substations, transformers and other appurtenances
- Transit Hub building
- Police and Fire Station building
- Solid Waste Handling Facility
- Entrance and Security Features

The road hierarchy and classification within the Project area comprises the following:

- Arterial: Technology Boulevard (total length approximately 1'000m)
- Collector: Auto Boulevard & University Boulevard (total length approximately 5'500m)
- Public Transit Corridor: Green Boulevard, 60meter parkscape (total length approximately 3'000m)
- District Distributor (total length approximately 3'000m)
- Local Distributor (total length approximately 2'500m)
- Local (total length approximately 20'000m)
- Service Roads (total length approximately 5'000m).





# ENGINEERING, PROCUREMENT, CONSTRUCTION MANAGEMENT AND SUPERVISION OF BATUMI COASTAL PROTECTION

Location:	Georgia
Client:	Municipal Development Fund of Georgia
Services:	Review of feasibility studies and cost benefit analysis; Detailed design, Tender documents Work Supervision
Period:	11/2014 – 02/2022
Construction cost:	€ 18,250,000

### Project Description:

Batumi is the capital of the Autonomous Republic of Adjara (Georgia) and one of the major cities on the Georgian Black Sea coast. For centuries, the Chorokhi River (just south of Batumi) transported sediment (both sand and pebbles) towards the coast. Due to this, a delta was created. The City of Batumi is situated on the delta of the Chorokhi River. For decades now, part of the coast where Batumi is located is eroding. The erosion is caused by: autonomous development, sediment mining from the Chorokhi River mouth, construction of power dams along the Chorokhi River and underwater landslides in submarine canyons close to the coastline.

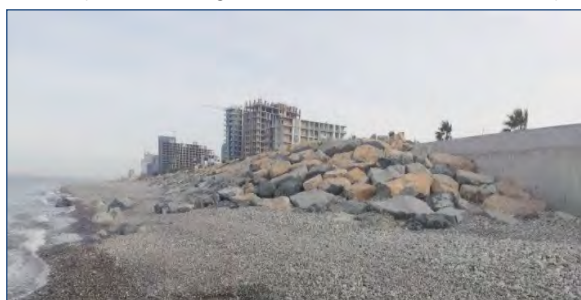


An adequate solution accounting for these very complex physical and land-use settings was needed to solve the erosion problems of the coast.

TECHNICAL was appointed by Municipal Fund Development of Batumi (Georgia) to carry out the design of Batumi coastal protection system and execute services for construction supervision during implementation of the project. The project was financed by the Asian Development Bank. According to the Terms of Reference of the project, the stretch of coast to be protected, composed of sand and gravel, extended for about 7.5 km.

The design process was articulated in the following phases:

- Review of the existing design
- Definition of the baseline situation, including:
  - metocean and coastal conditions (winds, waves, water levels, currents, sediment transport patterns, coastal evolution trends), supported by modelling studies;
  - geological, geotechnical and seismic features of the project area. In particular the canyon stability conditions were analysed, supported by modelling analysis.
- Development of design alternatives and cost benefit analysis



of the selected alternative: during this stage, a number of alternative design options were studied and tested by means of numerical models, including also the original groynes solutions at the base of the Contract. The solution deemed the most appropriate was the recirculation of sediment from the areas in accretion to the areas undergoing erosion. A suitable dredging system was studied, capable of working in very shallow areas. This sediment recirculation was complemented with a revetment along the stretch under erosion and beach enlargement along the same section.

- Sizing of the marine structures and execution of structural and hydraulic calculations of the same
- Development of the dredging system
- Preparation of Technical Specifications, BoQ and Cost Estimate
- Preparation of the Initial Environmental Examination
- Preparation of Tender documents



The design was completed at the end of 2016 but at mid-2017 it had to be reviewed due to the new unexpected local conditions caused by violent sea storms.

New stability and hydraulic calculations, BoQ and all documents were prepared for the new revetment that was built in stones of 3-7t category (instead of 1-3t as previously foreseen).



The Construction Supervision process started at the beginning of 2018 and the Works have been completed in January 2021.

The final arrangement included the embellishment of the coast line, the construction of new waterfront with beach renourishment and revetment consolidation, the architectural set up of hard and soft landscaping plus the rearrangement of water outfalls from the town.



# MASTER PLAN OF AL MAQIL WATERFRONT

Location:	Basra, Iraq
Client:	Ministry of Transport of Iraq
Services:	Master Plan, Preliminary Design, FEED
Period:	12/2019 – 07/2020
Construction cost:	n.a.

## Project Description:

The Master Plan for the Al Maqil port area, along the water front of the Shat el Arab, aimed at integrating this area in the urban system of Basra, enriching the city with new residential, commercial, cultural, service and leisure functions which will increase the quality of life and work activities of its inhabitants.

The study area extends along the Shat El Arab river, for a length of ~ 2,900 meters, and an average depth of 250 meters. The total surface is about 80 hectares.



The Master Plan of the whole area will be integrated with preliminary design of some – functional, necessary and prior – components: the design of the upgrading of Dinar street, the underpass under the public square in front of GCPI offices etc.

The Master Plan is organized in three steps:

1. Development of an idea and proposal on how to use the port area for the use of the city, but self-sustainable from an economic point
2. Definition of the interactions of the port area, with the city:
  - amendments of Dinar street (backbone of the project area and hinge between the urban fabric and the planned area), for a safety access to the new planned area;
  - Implement public and private parking areas;
  - Implement green areas and leisure facilities
  - plan for buildings, shops restaurants, hotels and real estate development.

3. Development of a preliminary design of some necessary and prior infrastructures: dinar street, underpass under GCPI square; touristic terminal and waterway station, etc,

The work is based on a multi criteria approach, shaped on the sustainability:

- Urban sustainability
- Economic sustainability

## - Environmental sustainability

The Masterplan defines the general structure of the functions and their spatial distribution – the so called “zoning”. The interventions that will take place over the years, shall respect the master plan prescriptions (the framework of the function) in a unitary, homogeneous and balanced order. The zoning of the functions is invariant, even if a wide elasticity in building typologies and about the organization of infrastructures and services are allowed. In the study area, 4 invariant main functions have been identified:

1. Operational port
2. New Residential areas and commercial services
3. Improvement and integration of the existing urban areas
4. Public services area



The project is composed by a set of variables factors. The configuration of these factors (listed below) make the alternative scenarios.

1. Height of the building
2. Dinar street improvement
3. Dimensions and characteristics of infrastructure in the public area
4. Number of natural climate mitigation systems
5. Public buildings surrounding the 1 km shadow promenade

The preferred scenario is furthermore composed by:

- an existing shopping and congress center to be renovated;
- a cultural / school / gyms center, serving the city (for about 15,000 sqm)
- the system of towers (height ~ 60 m) and the low buildings that make up the new urban system continuation of the urban system through buildings of varying heights;
- the existing port to be expanded and improved by new equipment.





# AL FAW PENINSULA INDUSTRIAL AND URBAN PLANNING

Location:	Iraq
Client:	Ministry of Transport
Services:	Planning, Design, technical studies, tender documents preparation, site investigations technical specifications
Period:	11/2016 – 06/2019
Construction cost:	Confidential

## Project Description:

The project consists of the preparation of the Master Plan of a wide Industrial Area and the related new City, on the North of the Al Faw Grand Port, in the mouth of the Tigris-Euphrates river.

The project has been structured in the following steps:

- Identification of the type of industries willing to develop their activities in the area in relation to the country need, relocation of existing industries and possible new international companies. An ad hoc macro-economic study has been performed;
- Identification of location and dimensions a of the areas where each type of industry can be located (zoning) and Sizing of each industry;
- Identification of the requirements of each type of industry, in terms of connections with port, roads and railways, in terms of services, and main supplies (power, water, sewerage water and solid waste, communications);
- Preparation of the Master Plan documentation (planning) as a tool;
- Evaluation of the impacts (social, economic and environmental).

Beside the Master Plan of the Industrial Area, an important related task is the study of the development of the urbanization process (moreover initiated by the construction of the port).

The Urban Development Study has been structured in the following steps:

- Identification of the magnitude of urban development and the type of urban functions to be forecast, taking

into account the particular genesis of the new urban pole, gravitating around a big multipurpose port and the induced wide industrial area;

- Identification of location and dimensions of the areas where each type urban functions can be located (zoning) ;
- Identification of the needs and requirements of each type zone/function/activity, in terms of connections with port, roads and railways, in terms of services, and main supplies (power, water, sewerage water and solid waste, communications);
- Preparation of the study documentation (zoning, phasing, implementing urban standards).

The project includes also:

- Preliminary and FEED design of the Industrial area main roads;
- Preliminary and FEED design of the road connection between the new Al Faw port, the new industrial area, the new town and the existing Um Qasr Port. This connection includes a TUNNEL under the Al Khawr Abd Allah channel.

Some key figures of the project:

- 12.000 ha of industrial area;
- 70 km of new highway;
- About 300 km of new industrial roads;
- 400.000 inhabitants (new Al Faw city)



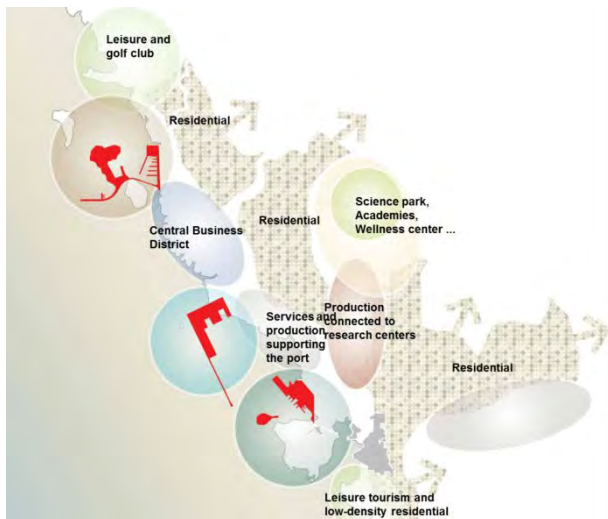


# DEVELOPMENT OF THE COSTAL REGION AREA OF THE PROVINCE OF AZIR

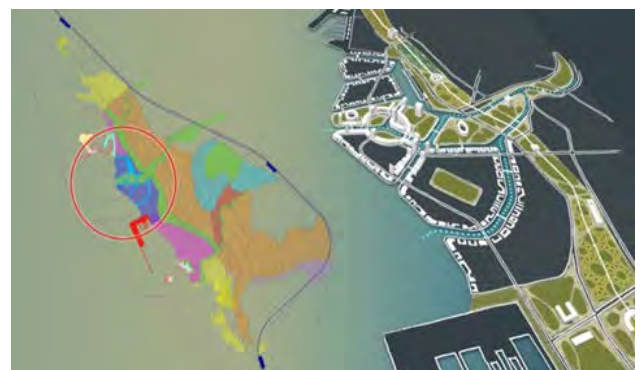
Location:	Azir, Kingdom of Saudi Arabia
Client:	Saudi Maritime Centre Company Limited
Services:	Analysis of the potential economic development activities, location of the activities and analysis of the related urban development, development of analysis for all the sectors involved (including shipyards, fishing, biomedicine and cosmetics, transports, drinkable water supply, waste water treatment, solid waste treatment, power supply, etc.), analysis of the cost of the investments, macro-economic impact assessment of the project, economic and financial analysis of the investments.
Period:	10/2013 – 05/2015
Construction cost:	about USD 22 billion

## Project Description:

The province of Azir has access to the sea for a limited portion of the coast with no facilities. The rationale beyond the project was to select and develop a specific cluster not oil dependent as the rest of the national economy.



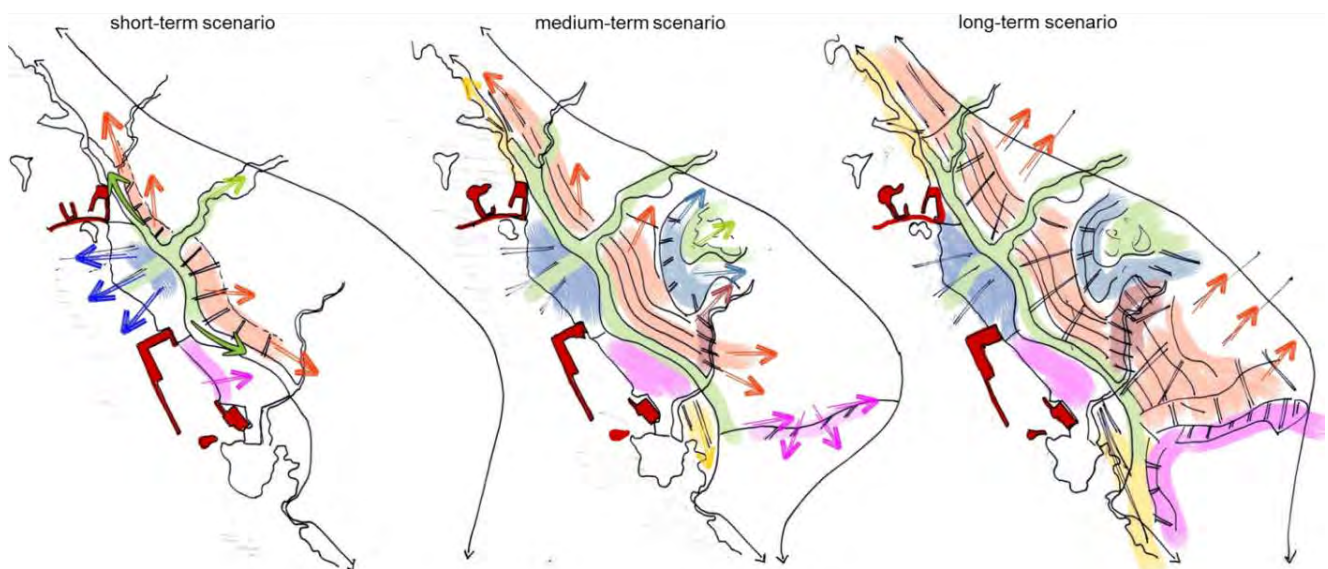
The coastal area belonging to Azir, although not very large, lies before one of the busiest corridors worldwide (i.e. about 7.000 ships/year cross the Suez Canal) and the portion of land facing the Red Sea has a naturalistic importance (i.e. a tropical environment with marine life, coral reefs and mangroves).



The presence of the maritime corridor calls for several services such as supplies, maintenance, safety through the use of modern shipyards and related facilities. Furthermore, the proximity to the sea guarantees the development of fishing activities and associated processing industries.

Moreover, an attractive environment might ensure tourism development with the possibility to create a base for cruises both to discover the landscape and to visit the historical heritage inland.

In addition to that, the opportunity to create a Navy Base for the national Navy was also included in the project.





The urban planning has considered the development of a city of 500,000 inhabitants taking into account the presence of the 6 basic maritime activities directly related, the number of supporting services connected to them and to all actions needed to develop urban settlements and residences (e.g. hospitals, recreational and sports areas, university and technical schools, libraries, museums, restaurants, etc)

The total area involved is about 12.500 ha with an investment of approx. 22 billion USD to be financed by the State and private entrepreneurs.





# TOURIST DEVELOPMENT OF FAZENDA CAEIRA

Location:	State of Bahia – Brazil
Client:	European Commission ECIP 2 programme
Services:	Feasibility study for tourist development, and Preliminary Design of the basic structures. Environmental Impact Assessment Study
Period:	02/1995 - 06/1996
Construction cost:	€ 5,784,300

## Project Description:

*Fazenda Caeira*, a private property of some 1000 ha. on the island of Tinharé, in the State of Bahia, currently offers accommodation for up to 50 people. The present project entrusted to TECHNITAL consists of the planning and the preliminary design of the tourist infrastructures needed to develop some 250 ha. of the property .

Given the considerable natural beauty and environmental importance of the location particular attention has been paid to

landscaping and environmental protection measures as one of the main objectives of the project is that of safeguarding and valorising the natural environment.

The structures foreseen include private residences and a fully serviced hotel (capacity 250) with sports and leisure facilities, access and internal roads and parking facilities.

The project also envisages the improvement of the island accesses (it is currently reached by air from São Paulo and Rio, by ferry from Valença and by boat from Salvador).





# JEDDAH TOURIST CITY

Location:	Saudi Arabia
Client:	S.C.R.C. (Saudi Company for Recreation Center)
Services:	Feasibility study, Preliminary and Final design, tender documents
Period:	01/1988 – 12/1991
Construction cost:	€ 12,911,400

## Project Description:

The tourist complex, located near Jeddah on the Red Sea, occupies an area of 600 ha.



- recreation park
- open-air theatre
- 5.4 km Formula 1 racing track in accordance with international standards.

The complex includes:

- Marina for 700 boats
- 500 dwellings of various types for a total of 210.000 m<sup>3</sup>
- service buildings for a total of 40.000 m<sup>3</sup>
- a 12 km internal road network



- a primary water supply system of 25 km and desalination plant
- sewerage and drainage system of 18 km and related treatment plant
- primary and secondary electric system and power station for the production of 24 megaWatts of electricity



# ENGINEERING SERVICES FOR THE DEVELOPMENT OF COSTA SMERALDA

Location:	Sardinia, Italy
Client:	Servizi Immobiliari Costa Smeralda S.r.l. and Costa Smeralda Hotels S.p.a.
Services:	Feasibility study, basic, preliminary, final design and detail design, works supervision
Period:	01/1975 – 12/1989
Construction cost:	€ 17,000,000

## Project Description:

Costa Smeralda is one of the most valuable and exclusive resort areas in the Mediterranean coast, extending from the Golfo degli Aranci in the south to the gulf of Arzachena in the north.



Within the Costa Smeralda development plan, TECHNITAL was awarded the following projects:

- Study of the infrastructures for the General Master Plan;
- Preliminary and final design of a residential complex in Porto Cervo of approx. 90.000 sq.m., in collaboration with Arch. Vietti and Piacentini;
- Detail design of infrastructures for the extension of Hotel Pitrizza and for urbanisation of Liscia di Vacca, Marina di Porto Cervo, Porto Cervo Villaggio, Cala Romantica e Golf 1 (heating, air-conditioning, public lighting, telephone, water distribution and sewerage systems);



- Detail design of extension of Porto Cervo sewage treatment plant;

- Detail design of 10 km of urban roads

- Works supervision for the construction of the Marina, Porto Cervo Yacht Club and urbanisation infrastructures.





# NEW AL-FATEH UNIVERSITY COMPLEX

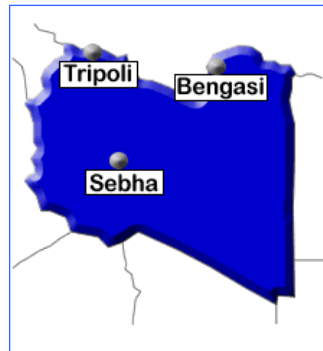
Location:	Sebha, Libya
Client:	Sebha University - Ministry of Education
Services:	Feasibility study, basic, preliminary and final design
Period:	01/1980 – 12/1985
Construction cost:	€ 578,431,700

## Project Description:

Sebha is situated 900 km. from the coast, in a very large oasis in the centre of Libyan desert. The new University of Sebha, which is about to be constructed in the eastern suburbs of the town, on an area of 290 ha, will comprise 6 faculties and accommodate 12,000 students, 7,000 of whom are expected to reside in the university campus.

The new University of Sebha foresees the long-term realization of the following six faculties: Education, Engineering, Medicine, Agriculture, Philosophy, and Languages.

The project will represent one of the biggest and most complex single interventions in the whole Mediterranean area, with an overall cost, for just the first phase of realisation, of nearly 600 million euros.



This first phase included: central building and service buildings for the whole future University and the entire Faculty of Education for a total of 322.000 m<sup>2</sup> or 600.000 m<sup>3</sup>.



The following buildings and facilities are included in the **Main Complex**:

- The Library, Research and Computer Centre, a 7-level building with the capacity for 1 million books and 2,200 seats for consultation;
- The Sport Centre which will include a stadium with 15,000 seats and a polysport facility with swimming pools, air-conditioned indoor gyms;
- The Catering Centre which will include a 500 m<sup>2</sup> laundry room, a 30,000 m<sup>2</sup> warehouse, an ongoing kitchen for the production of 6,000 meals per day which can be expanded to 12,000, and a restaurant with 1,000 seats.
- The Plant Area where the following plants are located: a heating plant with the heating capacity of 9.1 million KCal/h and an air-conditioning plant with the cooling capacity of 9 million Frig/h;
- A Service Tunnel, an underground service passage for the entire area which will be built on a total of 3,700 meters.



The **Faculty of Education** includes the following buildings:

- The Didactic Buildings, a series of buildings totalling 75,000 m<sup>2</sup> overall.
- The Student Residences, designed for 2,000 beds.
- The Staff Residences and Services, which foresees the completion of 276 apartments and one and two-family houses;



A network of roads and parking lots 12,000 meters long with 4,000 parking spaces



## Buildings and Architecture



# NEW HOSPITAL “SAN CATALDO” IN TARANTO

Location:	Taranto - Italy
Client:	Regione Puglia – Azienda sanitaria locale
Services:	Detailed design, works supervision
Period:	11/2017 - ongoing
Construction cost:	Euro 161,770,000

## Project Description:

The new hospital is located in Taranto, along the new road linking the town to San Giorgio Jonico, and it is designed to accommodate 715 beds.

The intervention covers an area of 226,297 m<sup>2</sup> with a volume of 491,777 m<sup>3</sup> and a covered area of 42,870 m<sup>2</sup>. A large area of 81,065 m<sup>2</sup> is devoted to public park.

The hospital complex will take advantage of a parking area of 1116 stalls for the visitors and 1170 parking stalls to be used by operators.

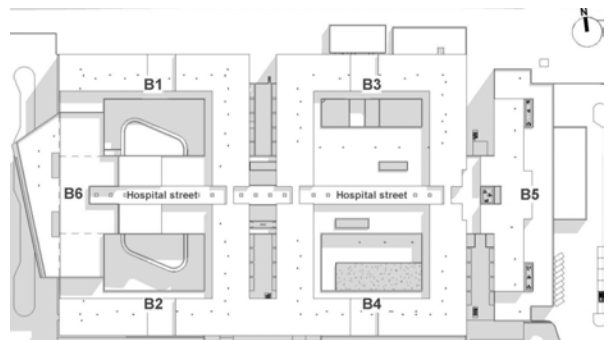
The hospital building is erected on one foundation slab 310 x 240 m and is composed of the following blocks:

- A central axis “Hospital street”: 3-storey building, 210 m long
- 4 blocks “C” shaped, located along both sides, 4-storey each
- On the western side, a protruding block covering the main entrance like a canopy
- On the eastern side, a 4-storey rectangular block, including an elevated service area for emergency vehicles.

Special care has been paid to the architectural concept. The main entrance is covered by the elevated block accommodating the management offices, which protrudes towards the parking area and is supported by 6 columns intended as a modern interpretation of the ancient Doric columns located in the historical centre of Taranto.

Compact and symmetrical architectural forms have been used, along with ceramic, local stone, plaster and steel as materials for the facades.

The detailed design also includes internal roads, landscaping and utilities diversion.





# EXPANSION AND REQUALIFICATION OF THE DEPARTURE TERMINAL OF “VALERIO CATULLO” AIRPORT

Location:	Verona, Italy
Client:	Aeroporto Valerio Catullo di Verona Villafranca S. p. A
Services:	Detailed Design, Works Supervision
Period:	01/2017 – ongoing
Construction cost:	Euro 52,000,000

## Project Description:

The project concerns the expansion and refurbishment of the Departures Terminal of the Valerio Catullo Airport in Verona, according to the Master Plan approved by ENAC (Civil Aviation Authority), which foresees by 2025 an increase of the passenger movements per year from the current 3 million to about 5 million.



The passenger terminal is located NE / SW parallel to the runway and consists of two main volumes (total surface of 25,000 sq.m.), separated from each other, respectively for the arrivals and the departures. The facade has an overall length of 400 meters, whereas the width of the building is about 40 meters only.

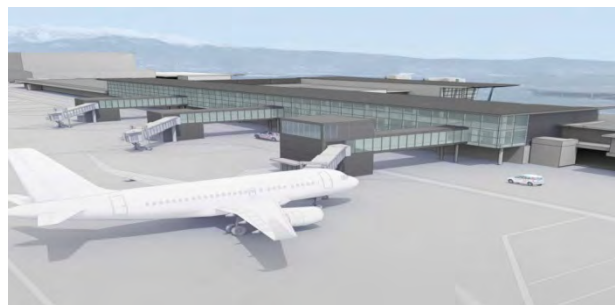


The departures terminal has an area of approximately 18,800 square meters distributed over three levels. The limited width of the building (40 m) implies a "horizontal" development of the airport functions, as highlighted by the very long (400 m) landside facade. Other critical issues that determine the limited competitiveness of the Verona terminal are the lack of boarding gates served by loading bridges and the absence of a direct connection with the arrivals terminal.



The expansion and refurbishment project aims at solving all these

critical issues, as well as to enhance the operational subsystems of the airport, in order to ensure adequate service levels to passengers as requested by the expected traffic growth. Moreover, the project is an opportunity to improve the range of services (including retail) offered to passengers both land and air side, as well as to bring the Passenger Terminal back to a unique architectural image through new distinctive elements to effectively combine the new buildings with the existing one.



The project comprises the expansion of the passenger terminals through new buildings adjacent and in elevation with respect to the existing building, and the architectural upgrading of the existing spaces through the redistribution of some functional areas and, at the same time, the structural consolidation of part of the existing terminal.



The project includes expansion of the departures terminal for approximately 10,000 sq.m., and upgrading for 12,300 sq.m. In addition, 3 new loading bridges and access roads for connection to the land side road network are designed.



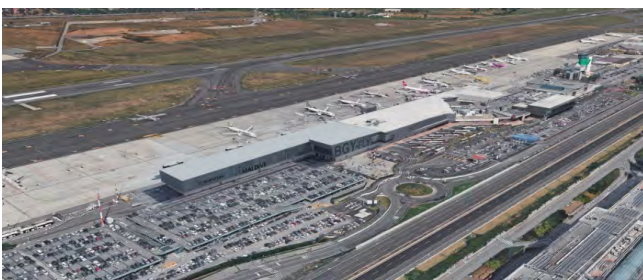


# DESIGN AND WORKS SUPERVISION FOR THE PHASE 1B EXPANSION OF THE PASSENGER TERMINAL OF “BERGAMO ORIO AL SERIO” AIRPORT

Location:	Bergamo, Italy
Client:	SACBO S.p.A.
Services:	Preliminary and Detailed Design, Works Supervision
Period:	11/2016 – 03/2017 (Preliminary Design); 2017 – 05/2019 (Detailed Design); ongoing Works Supervision
Construction cost:	Euro 25,735,000

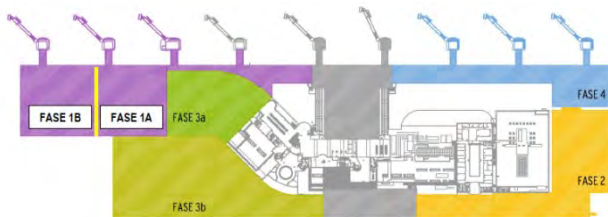
## Project Description:

The project is part of the updated 2016-2030 airport development plan set out for Bergamo-Orio al Serio International Airport.



The Phase 1B terminal expansion regards the construction of two new buildings located west of the existing passenger terminal, that are functionally a unique volume divided in two levels:

- Ground floor level: expansion of Schengen arrivals halls and baggage claim area
- First floor level: 3 new boarding towers equipped with loading bridges for Schengen flights (6 gates) to replace the existing 5 boarding gates located in Lot 1A which will be destined solely to extra Schengen passengers.



Fasi di ampliamento del terminal passeggeri individuate dal progetto preliminare approvato da Enac

Among the basic design parameters provided by the Client are: max. 18 aircraft landings per hour, design aircraft Boeing 737-800 (189 passengers), max. passenger traffic 13,750,000 (2030 forecast).



The design criteria take into account the need to provide an adequate level of service for the airport transit passengers, related to Schengen/Extra-Schengen classification. The LOS are calculated according to IATA - Airport Development Reference Manual (ADRM) -10<sup>th</sup> edition.



The 1<sup>st</sup> building is square-shaped with 2420 m<sup>2</sup> footprint, whereas the 2<sup>nd</sup> building is rectangular with 2510 m<sup>2</sup> footprint and extending westbound over a 100 m length. Air-side façade is in continuity with the existing one, whereas a discontinuity in land-side façade is introduced to preserve the existing car park.

The overall surface of the extension is about 8800 m<sup>2</sup> (4000 m<sup>2</sup> at ground floor and 4400 m<sup>2</sup> at first floor).

The two new buildings create a unique volume with the same height of the adjacent existing building (Lot 1A) constructed in 2015, with which the architectural and interior design is harmonized.



The structural system is a steel frame with columns at a fairly regular pattern (14 m – 20 m spacing) and beams made by lattice girders due to the long span. Intermediate floor and rooftop are made by prefabricated p.r.c. box elements. The design includes also a mezzanine between first floor and the roof, to accommodate the equipment for mechanical systems.

MEP design includes air conditioning, plumbing, firefighting, electrical and special systems. The related layout has been designed taking into account the existing systems of Lot 1A and the need of connection with external electrical power supply network.



# DESIGN OF A NEW CRUISE TERMINAL IN BARI PORT

Location:	Italy
Client:	Bari Port Authority
Services:	Final and Detailed Design
Period:	05/2020 – 09/2022
Construction cost:	€ 9,390,000

## Project Description:

The new terminal is a large multi-functional building for port and passenger services.



The building is distributed on two levels plus a roof sheltered terrace, with a total height of 11m. The functional macro-areas are divided in: passenger areas, boarding and disembarking areas, service areas, multipurpose areas.



The whole terminal is distributed on a rectangular building 33 m wide and 68 m long, which extends with the external terraces up to a length of 106 m. The structure is made of a reinforced concrete and it is founded on piles.

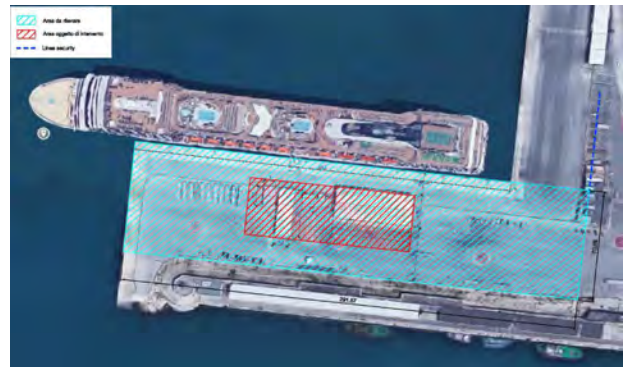


The use of the design solution for the exploitation of hydrothermal energy from marine sources in a sea city like Bari, arises from the availability of a quenchless resource immediately close to the

intervention area and from the opportunity to implement renewable sources.



This design solution also complies with the guidelines of the national energy policy and community, which aims to rationalize the energy system, focusing on the thermal sector and on reducing heating and cooling consumption and emissions drastically.





# ENGINEERING DESIGN SERVICES FOR WELCOME CENTRE BUILDING FOR PHASE 1 KONZA TECHNO CITY

Location:	Kenya
Client:	DELMA UK (ICM Group); final Client: KoTDA (Konza Technopolis Development Authority)
Services:	Concept/Preliminary, Detailed and Final Design (approved for construction)
Period:	08/2018 – 07/2021
Construction cost:	€ 9,000,000

## Project Description:

The Konza Technology City (KTC) is a project of the Government of Kenya (GoK), implemented through EPCF (Engineering, Procurement, Construction and Finance) by the Konza Technopolis Development Authority (KoTDA), under the Ministry of Information and Communication Technology (MOICT). Konza City will be constructed over a 5000-acre land, located approximately 60 Km south of Nairobi Center. The city is designed to allow phased development, and Phase 1 includes various types of land uses and infrastructures that would support future phases of development. The project, implemented through EPCF (FIDIC Silver Book), concerns the development of a new smart technology city of about 28'000 inhabitants.

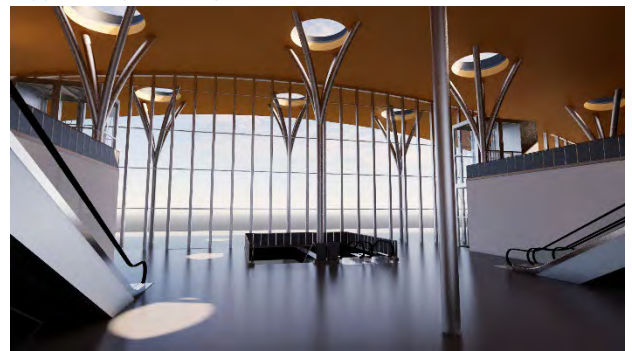


The Welcome Center is the primary “gateway” into Konza Technopolis for residents, workers and visitors arriving by car, train, bus and matatu minivans. As such, it is designed to convey a clear sense of place and identity, to provide clear sense of orientation and seamless wayfinding, to create a grand sense of space, with welcoming architecture that is monumental and iconic as a City landmark and to promote a model of sustainability (social, economic, environmental).



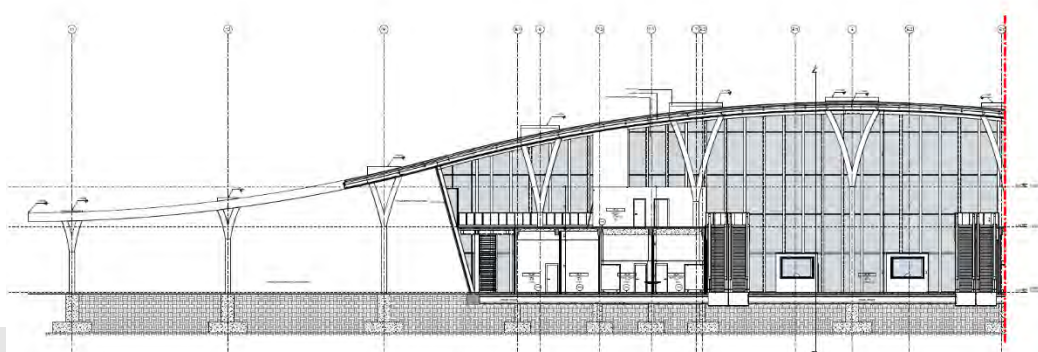
The Welcome Center serves as pedestrian gateway both into and from the City, it helps to create the first and final memories that visitors enjoy and provides amenities for those who travel.

The Welcome Center creates a first impression of the City and offers a view of the Green Transit Corridor over the Grand Plaza. It is a dominant presence with its single sweeping roof. In fact, the building looks like a large, glazed volume with a curved roof supported by tree-shaped columns.



Part of the roof extends outwards on the façade and seems to be a suspended construction in a forest. Tree-like columns represent a gesture to the natural environment for which Konza will be known as a steward of, and they evoke the tree logo used for the branding of the City. These elements characterize the architecture of the building.

The solution considers a number of key design aspects, such as the use of natural light to improve the passenger experience. Also, open and flexible spaces ensure fluid and spacious environments that facilitate passenger orientation and the views of the surrounding.





# ENGINEERING DESIGN SERVICES FOR PUBLIC SAFETY CENTRE BUILDING FOR PHASE 1 KONZA TECHNO CITY

Location:	Kenya
Client:	DELMA UK (ICM Group); final Client: KoTDA (Konza Technopolis Development Authority)
Services:	Concept/Preliminary, Detailed and Final Design (approved for construction)
Period:	08/2018 – 07/2021
Construction cost:	€ 7,500,000

## Project Description:

The Konza Technology City (KTC) is a project of the Government of Kenya (GoK), implemented through EPCF (Engineering, Procurement, Construction and Finance) by the Konza Technopolis Development Authority (KoTDA), under the Ministry of Information and Communication Technology (MOICT). Konza City will be constructed over a 5000-acre land, located approximately 60 Km south of Nairobi Center. The city is designed to allow phased development, and Phase 1 includes various types of land uses and infrastructures that would support future phases of development. The project, implemented through EPCF (FIDIC Silver Book), concerns the development of a new smart technology city of about 28'000 inhabitants.



The new Public Safety Center at Konza Technopolis is a major building intended for several public functions: Police Department, Fire Department, Traffic Control, Emergency Management, Living Quarters.

The compound is in a unique environment, within the savannah context, and consists of three buildings (*office building, fire/emergency building, living quarters building*) having different height and number of storeys, but strictly interconnected with security-controlled pedestrian and vehicular flows, for a total floor area of 15,900 m<sup>2</sup> (out of which 7,400 m<sup>2</sup> for living quarters). Specific features include the following:

- Security: fences, flows and accesses are designed to achieve a high level of security
- External areas are dedicated to different functions such as gardens, training, fitness
- Energy saving: MEP equipment with high efficiency and low consumption by integrating energy demand from alternative sources such as photovoltaic systems
- Combination of both passive and active air circulation and conditioning techniques (HVAC systems) for better performance and comfort
- Building Management System (BMS): centralized supervision and diagnostic of MEP and security systems with optimization of energy consumption and safety
- Rainwater recovery system to minimize water consumption
- Compliance with environmental sustainability and energy efficiency topics promoted by certification protocols such as LEED.





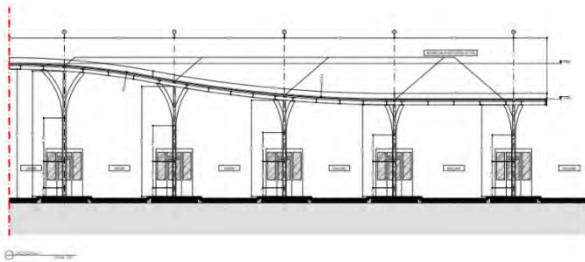
# ENGINEERING DESIGN SERVICES FOR ENTRANCE AND SECURITY FEATURES FOR PHASE 1 KONZA TECHNO CITY

Location:	Kenya
Client:	DELMA UK (ICM Group); final Client: KoTDA (Konza Technopolis Development Authority)
Services:	Concept/Preliminary, Detailed and Final Design (approved for construction)
Period:	08/2018 – 07/2021
Construction cost:	€ 1,200,000

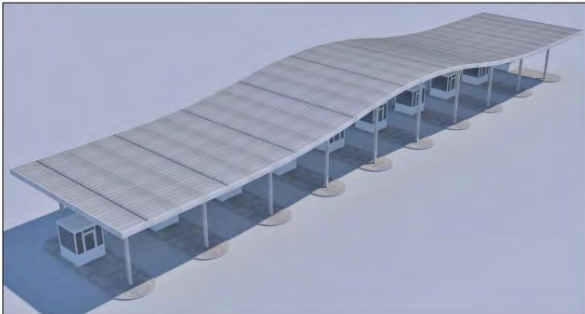
## Project Description:

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The project, implemented through EPCF (FIDIC Silver Book), concerns the development of a new smart technology city of about 28'000 inhabitants.



The engineering services include the design of the entrance and security feature which is an integral aspect of the Perimeter Security and serves as a gateway both into and from the City. Some key functions of the Security Portal include the use of a variety of perimeter security technologies to ensure the safety and wellbeing of Konza visitors, residents and properties.



The structure is composed of a curved canopy, supported by tree-shaped columns, which develops on the East-West direction, increasing in height from the sides to the center.

Tree-like columns represent a gesture to the natural environment for which Konza will be known as a steward of, and they evoke the tree logo used for the branding of the City.

The same elements characterize the architecture of the iconic pedestrian gateway to the city: the Welcome Center.

The Security Features is composed of 10 road lanes with control booths; there are also preferential lanes for buses, taxis and motorcycles. Traffic island are paved with concrete and standard precast curbs.





# EXPANSION OF THE PASSENGER TERMINAL OF DJIBOUTI AIRPORT

Location:	Djibouti
Client:	Ministry of Equipment & Transport - Republic of Djibouti
Services:	Concept, Preliminary and Detailed Design
Period:	03/2015 – 02/2016
Construction cost:	Euro 11,500,000

## Project Description:

The objective of the extension of the existing Terminal is to achieve an adequate level of service for 0.5 million pax/year and a new and modern architectural image for the period of time necessary for the construction of the new Djibouti civil Airport.

Design targets are, consequently, minimized impact to the adjacent buildings and aircraft apron, and speed of execution of works. Based on various design targets and constraints, a Level of Service B-IATA has been considered for the Air Terminal expansion.

Scope of work of the services carried out by TECHNITAL includes:

- Concept functional layout of the Terminal expansion (4 alternative options) with concept architectural design of the new façade (3 alternative options) and interiors. Selection of the preferred option to be further studied at preliminary and detailed design level
- Architectural and civil design of the Passenger Terminal expansion (new 2-storey building, with an additional surface of 2.100 m<sup>2</sup>)
- Modernization of the interiors of the existing passenger terminal (5.200 m<sup>2</sup>)
- MEP design (potable water, firefighting, electrical, etc.)
- Architectural/Structural design of the new landside façade
- Reorganization and upgrade of the landside access roads and parking





# EXTENSION OF THE PRESIDENTIAL PALACE

Location:	Djibouti
Client:	Government of Djibouti
Services:	Detailed design and works supervision
Period:	01/2010 – 12/2015
Contract value:	€ 1,870,000

## Project Description:



TECHNITAL started the final design of the Presidential Palace of Djibouti after an evaluation mission, carried out by an architect in 2009, regarding works and tender procedures.

The scope of the services carried out comprised the following activities:

Architecture and civil engineering: waterproofing, metal structure, external paving, paintworks, etc.

Mechanical systems: acoustic and thermal studies for the external walls and windows, plumbing, sanitary and drainage networks

Electrical systems: smoke detection systems, electrical network, lifts, lighting, etc.

All these activities as well as the revision of the structural project were not included in the framework of the initial agreement and were not part of the tasks to be realized by the Contractor.



In fact, the initial framework of the contract ("Design and Build" – conception and construction comparable to the FIDIC Yellow Book) did not appear to be very suitable for a good advancement of works.

For this reason, the Government of Djibouti agreed to revise the project framework and decided to award TECHNITAL the development of the missing activities as well as the construction supervision.



Regarding the construction supervision, TECHNITAL mobilized the following staff:

- 1 architect
- 1 structural engineer
- 1 quantity surveyor
- 3 construction site inspectors,

others as required by specific needs (an electrical engineer and a geologist will realize some visits within the site in order to evaluate the good advancement of works).







# REHABILITATION AND EXTENSION OF THE NEW HOSPITAL OF BALBALA

Location:	Djibouti
Client:	Ministry of Health Financing; Italian Ministry of Foreign Affairs (Directorate General for Cooperation and Development)
Services:	Detailed design and works supervision
Period:	06/2010 – 05/2015
Construction cost:	€ 7,850,000

## Project Description:

The new hospital of Balbala is located in the heavily populated urban settlement of Balbala, on the South-West of Djibouti capital city, which hosts more than 200.000 inhabitants, one-third of the whole population of the Republic of Djibouti.

The Hospital of Balbala was built in 1985 with the funds of the Italian Ministry of Foreign Affairs – Directorate General for Cooperation for Development and, since 1994, it is a Djiboutian-owned structure. The hospital developed more and more becoming an important chirurgic centre in the whole region.



*Project site*

The project for the rehabilitation and extension of the Hospital of Balbala focuses on three main objectives:

- Preparation of the studies, technical plans, reports, and all necessary documentation for the rehabilitation, construction, management and supply of the new hospital;
- Assist the Ministry of Health of the Republic of Djibouti in organizing, managing and controlling the various activities; managing all administrative aspects; coordinating and controlling the different activities regarding the construction and the management of the hospital;
- Provide the Ministry of Health of the Republic of Djibouti with the qualified technical assistance necessary to perform the following services: management of the construction site; work supervision; supply supervision and related training activities; redaction of a user manual for the various technical installations.



*Entrance of the Hospital of Balbala*

The project for the extension of the hospital foresees the construction of two new buildings for a total of 150 new beds (70 beds in Building A and 80 beds in Building B). The works for the new building will concern a surface of approx. 6900 m<sup>2</sup> while the rehabilitation works will cover an area of 2080 m<sup>2</sup>.

The duration of project is expected to be 870 days (intended as field presence).



*Satellite view of the project site*



# ENGINEERING CONSULTANCY SERVICES FOR COMMUNITY COLLEGE IN DUKHAN

Location:	Dukhan, Qatar
Client:	Qatar Petroleum
Services:	Concept, preliminary and detailed design, tender documents
Period:	03/2008 – 04/2015
Construction cost:	€ 100,000,000

## Project Description:

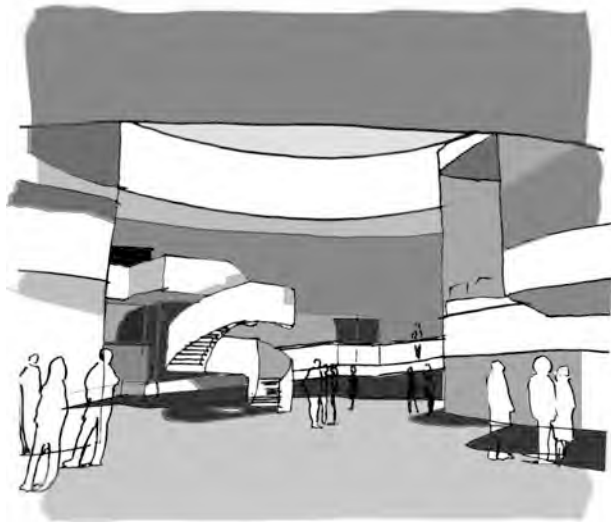
The objective of the project is to provide a new modern school campus (International quality with IGCSE requirements) for Qatar Petroleum in Dukhan.

Technital is developing the design for the DCC and all its components based on the information provided, study their relationship and implications, rationalize the spatial requirements in order to fully satisfy the intended usage of the school campus.

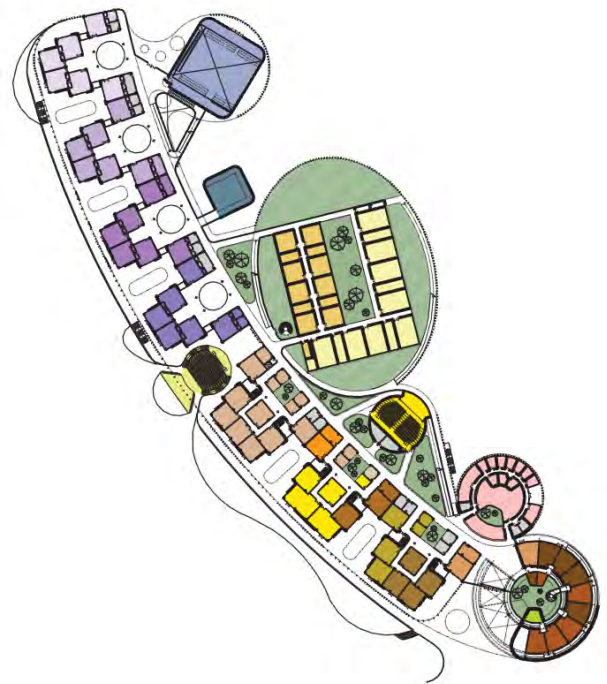
Technital is performing all architectural, civil, structural, interior design, internal and external signage, landscaping, irrigation, building services, electrical, telecom, IT / ELV System, life safety and loss prevention design work as part of the SERVICES.

The purpose built DCC will be a result of several design activities applying the most up to date knowledge and technologies with a unique artistic input.

Technital is producing a comprehensive design package for inclusion by QP into a construction tender package. The package is including a construction contract scope of work to completely identify the scope of the construction contract, allowing QP appointed construction contractor to build the fully functional DCC without any need to perform additional design work, except for shop drawings, temporary works.

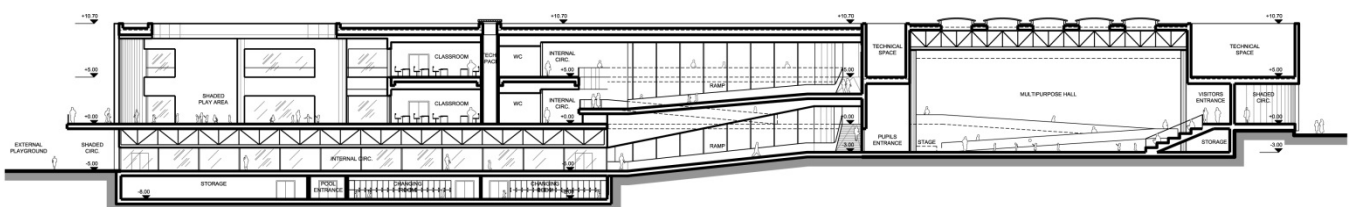


The solution under development has a spectacular curved facade facing the sea with a sinuously curved facade facing the road integrating administration blocks, cafeteria and staff facilities, as a contrast are the angular halls with the potential to have independent entrance. It also features circular theatre, library and art block and a dramatic amphitheatre doubling up as access to the playing fields.



The Dukhan Community College has been designed starting from a concept of a full accessibility, as the building itself is not expected to be used only for educational purposes, but also for the activities involving the Dukhan Township.

As key principle it was assumed a design which wouldn't have excluded anybody from the events and the activities that have to take place in the premises of the school.





## Inclusive design principles

'Inclusive' design, with attractive, accessible school buildings, can empower children and young people with SEN (special educational needs) and disabilities. Designing for disabled people and children with special educational needs sets out 'inclusive design principles' which in this case underpin the project.

Inclusive school design goes beyond a one-size-fits-all model, considering all users and removing barriers that might deny anyone – children, staff or visitors – access to services.

An accessible environment has been designed for the Dukhan Community College: children with SEN and disabilities will take part in school activities alongside their peers. The layout is simple and clear and circulation routes are easily accessible.





# DESIGN OF THE PRESIDENTIAL PALACE GARDEN – DJIBOUTI

Location:	Djibouti
Client:	Government of Djibouti
Services:	Concept and detailed design
Period:	01-05/2014
Construction cost:	2,085,000

## Project Description:

Technital Djibouti SARL has been appointed for the concept and detail design of the park of the presidential palace of Djibouti, since during the design of the Presidential Palace, Technital has demonstrated to be able to meet the taste of the Client.

The design of the park of the Presidential Palace in Djibouti originates from an exclusive study carried out on the basis of the specific needs to decorate the site pertaining to the most representative building of the Country. The park has been designed as a formal Italian garden with geometric hedges, accurate choice of colours and proportions and broad prospects.

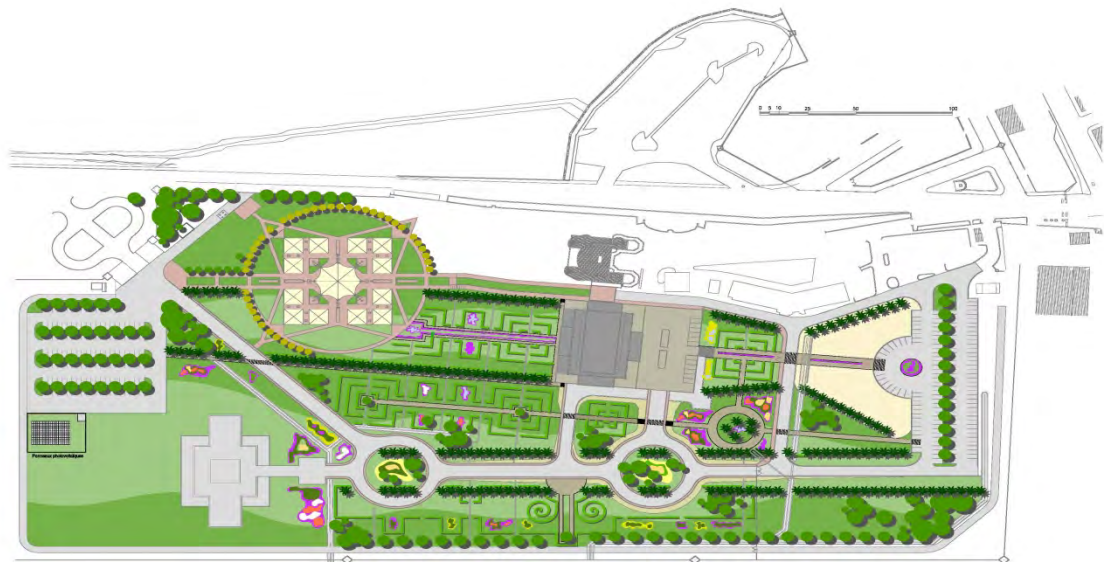
The project occupy an area of land of approximately 30,000 square meters, in addition to the adjacent heliport and guest parking areas.

The park has been organized so as to transfer a strong and pleasant impact to its audience, giving the viewer an immediate intuition of its operation, geometries and paths. The colours are soft and lacking contrast, with the simple and elegant style that characterizes the park of the Presidential Palace.

The arid climate of Djibouti has been a strong obstacle for the design of the park, overcome by appropriate species selection and an equally careful design of the irrigation system. In fact, the choice of plant species (like palms) has followed criteria linked to the shape and colours, as well as to their environmental adaptability

In addition to the landscape design, the project includes the design of the lighting and the irrigation systems. A solar panel system has been designed in order to make the park energy independent, contributing to its sustainability. The irrigation system includes both the drip and the sprinkler irrigation, providing an adequate water supply by limiting water waste.

The lighting system enhances the scenic character of the park also during night time.





# "EX GASOMETRO" UNDERGROUND MULTI STOREY CAR PAR

Location:	Verona, Italy
Client:	Parcheggio Ponte Aleardi S.r.l.
Services:	Detailed Design, Works Supervision
Period:	09/2012 - 12/2014
Construction cost:	Euro14,301,863

## Project Description:

The activities carried out by TECHNITAL S.p.A were the detailed design and work supervision of a multi-storey automated underground car park called "Centro" near the historic center of Verona. The parking has a maximum capacity of 487 stalls, of which 48 are on the surface for tourist coaches, 217 on the first basement floor and 222 on the second basement for cars.

The project includes the construction of a building above-ground floor destined which was to be devoted to the services necessary for public parking, such as ticketing and bar/restaurant, and, also, to accommodate commercial spaces.

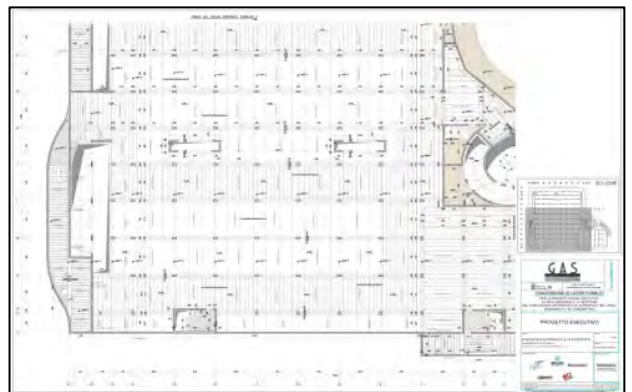


The main objective of the project was the requalification of a polluted site of the city (Ex-Gasometro), in order to change its identity through new function and newfound relationship with the natural and architectural elements that surround it, such as: the Monumental Cemetery, the Aleardi Bridge on the Adige River and the historical center of the city.

The parking is equipped with an adequate ventilation system and the various floors are naturally lit, through ventilation cavities. The routes of the internal road system avoid intersections as much as possible and are equipped with signs with clear and clearly visible indications. The stalls are of minimum dimensions 2.50x5.00 m and 90 ° oriented with respect to the manoeuvring lanes. The car



park is equipped with a system to detect and indicate the status of the single parking space (free or occupied) to the incoming customers,



The new annexed commercial building acts as visual curtain for the street of access to the monumental cemetery so as to become an element of separation from the rear parking area. The building will host different functions which are individuated by the arrangements of volumes. Finally, the new arrangement of Via Campo Marzo where the accesses to the parking are located, is completed, by an underpass on the bicycle path served also by a system of escalators and elevators to be used by all pedestrians accessing/egressing the city center even if they didn't park.

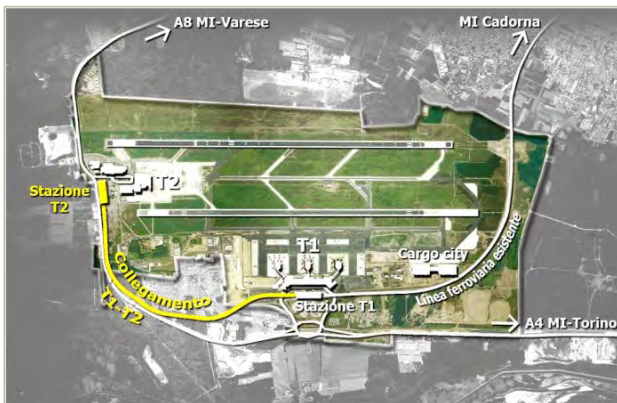




# MALPENSA AIRPORT - T2 LINK-UP NEW RAILWAY STATION AT TERMINAL 2 (Lot 1) AND RAILWAY LINK T1-T2 (Lot 2)

Location:	Milan, Italy
Client:	SEA S. p. A. (Lot 1) - Nord Ing S.r.l. (FERROVIENORD Group) (Lot 2)
Services:	Final Design
Period:	04/2012 – 09/2012
Construction cost:	Lot 1: € 49,020,000 - Lot 2: 43,422,700

## Project Description:



The Lot 1 project regards the new underground railway station at Terminal 2 of Milan Malpensa Airport, with a 2-level car park located above the station, connected by a pedestrian link to the passenger Terminal 2.

The station is the terminus of the new railway link between Terminal 1 and Terminal 2 (Lot 2) and it is designed (both structures and services) to be transformed in a crossing station to allow for future link with regional network.

The station comprises four levels: platform level for 4 rail tracks, under which tunnels for technical and emergency services are located; concourse level dedicated to passenger services and power substations. These underground levels are made of partially prefabricated concrete structures (both cast-in-situ and prefabricated).

In addition there are two levels above ground, which are destined to car park for passengers, constructed with steel structures.

Due to vicinity of buildings, existing roads and utilities, excavation works are carried out by large use of diaphragm walls.

Large steel structured light cannons lead natural light to concourse and platform level.

The Lot 1 includes a new pedestrian link to the air terminal with a shelter made of complex steelwork with glass cover.

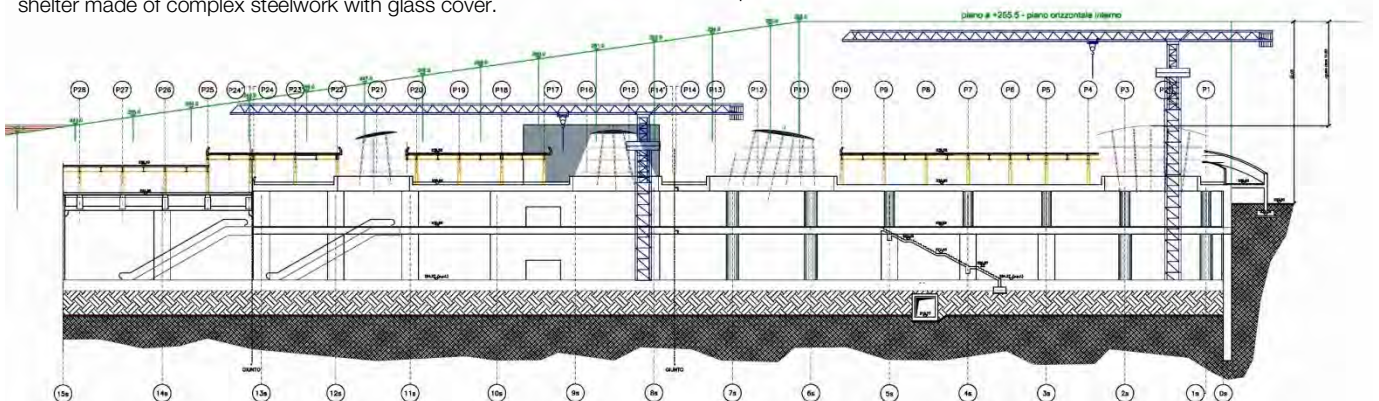


Mechanical electrical and plumbing services are included in the design:

- mechanical and ventilation systems
- water supply and fire-fighting installations
- special electrical systems
- lighting and motive power systems for line and stations
- earthing system
- cableways for the system installations
- fire detection system.



The Lot 2 project regards the double-track railway link T1-T2 of a total length of 3.15 km which develops entirely below the ground level. It includes No. 5 cut-and-cover tunnels for a total covered length of 998 m. The tunnel construction method is different based on the surface constraints: either top-down method with r.c. pile walls or prefabricated or cast in place structures within open excavation.





# 3<sup>RD</sup> PHASE OF DEVELOPMENT INTERVENTIONS OF THE BUCHAREST-OTOPENI INTERNATIONAL AIRPORT

Location:	Bucharest, Romania
Client:	ROMAIRPORT S.r.l.
Services:	Preliminary, Final and Detailed Design
Period:	06/2008 - 12/2011
Construction cost:	€ 93.460.000

## Project Description:

Romania's entry into the Schengen area changes radically the nature of the passengers' flows. This change impacts greatly on the Otopeni Airport, structured in 3 Terminals (Departure Terminal, Arrival Terminal and Finger). The whole system of 3 Buildings is also extended to accommodate passenger traffic of 6 million passengers / year in service category B (IATA classification). This involves the tripling of the Finger (from 8.000 m<sup>2</sup> to 25.000 m<sup>2</sup>), the doubling the Departure Terminal (from 19.500 m<sup>2</sup> to 39.000 m<sup>2</sup>) and the restructuring of the Arrivals Terminal, to extend the baggage arrival areas into the areas left free because of the restructuring of the entire system.

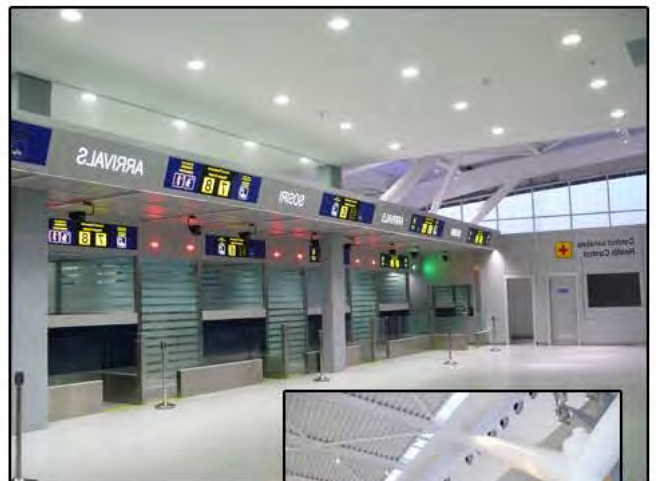
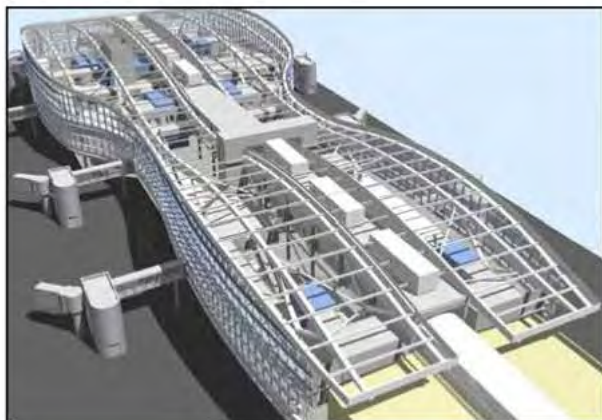
- 1) *New extension of the Finger Building (17.000 m<sup>2</sup>) and modifications of the existing Finger.*
  - Architectural design: conceptual layout, preliminary, final and working design.
  - Structural design: preliminary and final design.
  - Plant design: advanced preliminary design.
- 2) *Enlargement of the Departures Terminal (19.500 m<sup>2</sup>) and modifications of the existing Departure Terminal.*
  - Architectural design: conceptual layout, preliminary and final design.
  - Structural design: preliminary and final design.
  - Plant design: advanced preliminary design.
- 3) *Renewal and modification of the existing Arrival Terminal*
  - Architectural design: conceptual layout, preliminary and final design.



- 4) *New passenger parking*
  - Infrastructural design: conceptual layout and preliminary design.
- 5) *Other specialist airport conceptual design*
  - Calculation and verification of the dimension of passenger terminal areas.
  - Study of the Main Apron operations during the new Finger construction.
  - Feasibility study of enlargement on the north side of Main Apron.
  - Study of a new layout for the Apron N.2 with locations for B747 self -manoeuvring.













# RAILWAY LINK FROM BARI TOWN CENTER TO BARI AIRPORT

Location:	Bari, Italy
Client:	DEC - Degennaro Costruzioni, in association with IPA Precast
Services:	Detailed Design
Period:	09/2008 – 05/2009
Construction cost:	€ 52,212,000

## Project Description:

The new railway link is intended to connect the Bari-Palese Airport



to the Bari Town Center, through a new by-pass along the existing Bari-Barletta railway line, to directly connect Bari central station and the passenger terminal (Fermata Aerostazione).

The new rail section, which has a total length of 7,700 m, is double rail track and runs parallel to the flight runway. For environmental reasons and to reduce the impact on the functionality of the airport, the new line is mainly below ground level, partially in tunnel and partially in cutting, and very little on embankment, with maximum design speed of 120 km / h and a minimum of 50 Km / h.

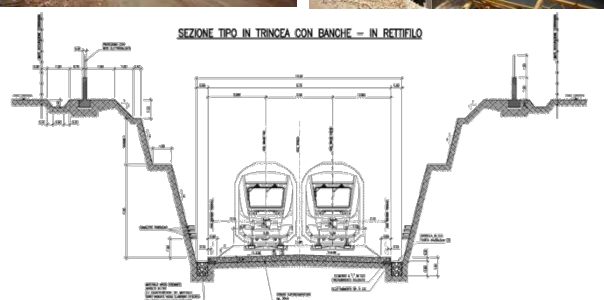
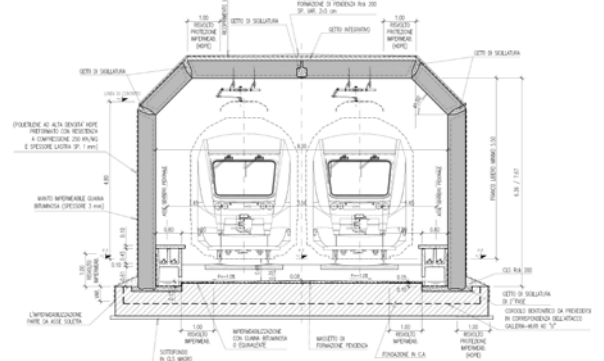
The railway underpasses some existing areas of the military airport (runway and taxiway) and other military installation (Guardia di Finanza), developing or in artificial tunnel or within a "U". structure

A 400 m long section, corresponding to the more populated areas, will have rail mounted on concrete prefabricated slab and anti-noise and anti-vibration carpet. To improve structural performance are provided 7 typical sections galleries, with size of 9.00 m \* 6:36 m.

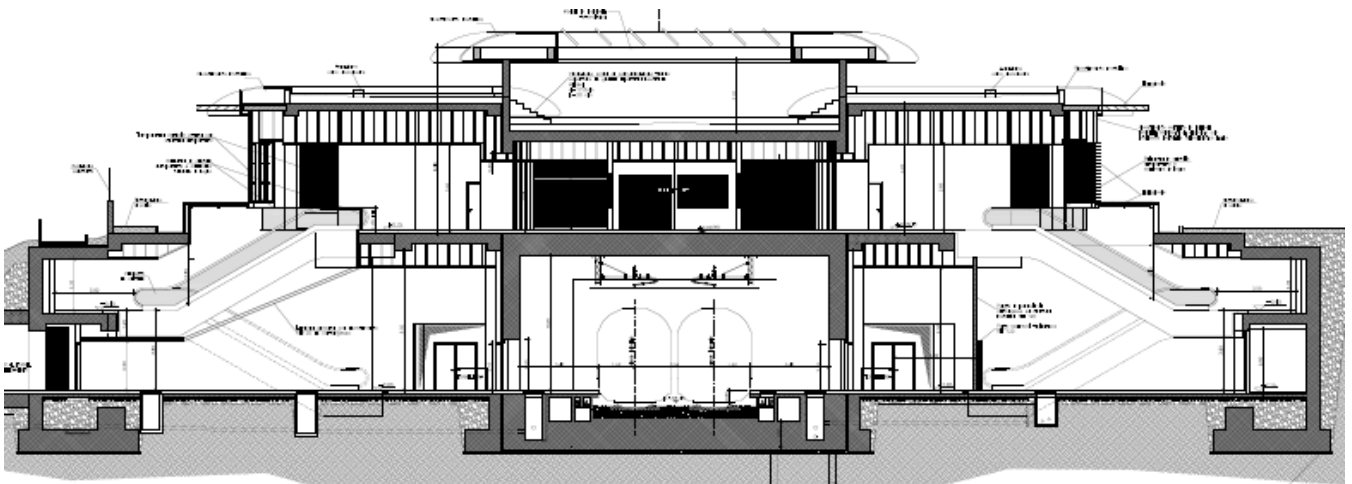
The double track tunnel will be realised through a prefabricated structure, as per the typical cross section shown, with the aim to save both construction time and cost, and providing surfaces more resistant to the corrosion.

Railway equipment includes electric traction works (3,000 V), whereas signalling equipment was not included in the design & construction contract.

The drainage system was designed, on the basis of a hydrological study, with the aim of avoiding rain water remaining at track level, taking into account the local piezometric level and soil permeability. Works include continuous dispersion trenches on both sides of the open air railway sections as well as treatment tanks for the only water coming from station road side paved areas, and from the first line section 500 m long due to groundwater high level.



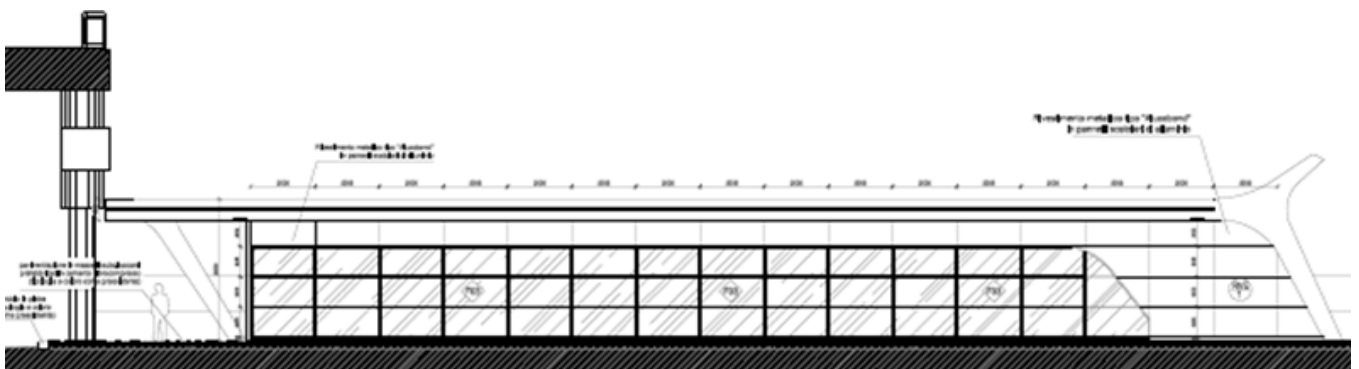




The project includes the detailed design of 2 new Stations named "Aerostazione" and "Europath", both inground and above with pedestrian access, equipped with technological systems, fire detection, health and safety systems and elevators.

The "Aerostazione" Station is about 240 m from the Airport, which is connected by an underground pedestrian tunnel to avoid road crossings. The tunnel is equipped with escalators and moving walkways. The tunnel emerges at the surface in the new building next to the air transit terminal building

Careful studies allowed to never interrupt the airport vehicular traffic during the construction.





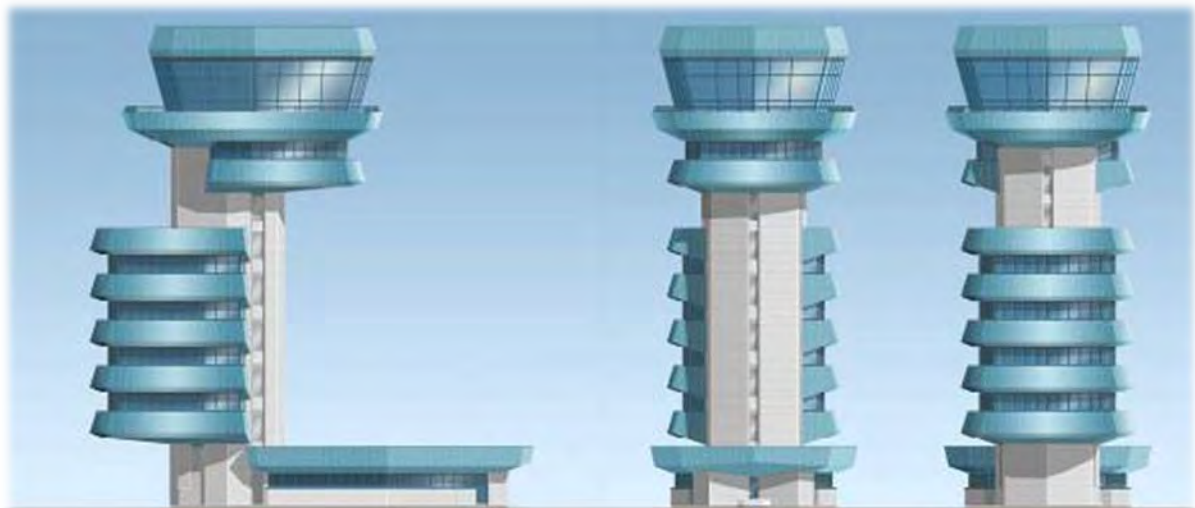
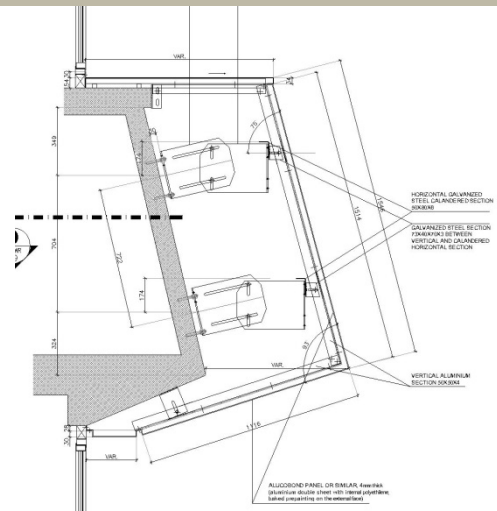
# CONTROL TOWER RENEWAL OF THE OTOPENI INTERNATIONAL AIRPORT OF BUCHAREST (2<sup>ND</sup> PHASE OF DEVELOPMENT AND MODERNIZATION)

Location:	Bucharest, Romania
Client:	Romairport S.r.l.
Services:	Preliminary and Final Design
Period:	04/2004 – 07/2004
Construction cost:	Euro 2,000,000

## Project Description:

Preliminary and final designs of the internal and external refurbishment of the existing control tower of Bucarest-Otopeni international airport.

The tower of 10 levels is about 43 m high from the ground.





# SUPERVISION OF THE WORKS FOR THE BORDER CROSSING ORASJE

Location:	BOSNIA & HERZEGOVINA
Client:	Ministry of Civil Affairs and Communications
Services:	Works Supervision
Period:	11/2002 – 06/2004
Construction cost:	€ 3,100,000

## Project Description:

This Border Crossing is part of the Regional Trade and Transportation Facilitation Program in Southeast Europe, with the aim of strengthening and modernizing the Customs Administrations and Agencies for border control. Orasje Border Crossing is located on the border with the Republic of Croatia in the north-east region.

The overall objective of the Project is to ensure smooth and efficient legal movement of goods and passengers between Bosnia and Herzegovina and the Republic of Croatia.



The specific activities performed by the Consultant consists in providing professional supervision in compliance with the relevant laws and standards in force in Bosnia and Herzegovina, international standards, the design and the particular requirements of the Client.

The Consultant's services included:

- Control of the respect and fulfilment of the contractual obligations by the Works Contractor
- Financial Control
- Control of the respect of the time-frame by the Works Contractor
- Control of the safety measures on the job.

The Consultant had the obligation to ensure an external control on the laboratory, equipment and installations, which had been provided on the site.



The Head of the Supervision was also responsible for providing the Client with a Monthly Report, including the following:

- Statement of progress of the works
- Program of the Works planned
- Comparison between contractual works time-frame and the real progress of the works
- In case of delay, justification and the measures to undertake
- A chart about the Works time-frame
- A statement indicating the contractual expenses related to the Works



The Supervision Team consisted of six experts involved for 14 months maximum.



# DESIGN OF THE BORDER CROSSINGS KAMENSKO AND GORICA

Location:	BOSNIA & HERZEGOVINA
Client:	Ministry of Civil Affairs and Communications
Services:	Preliminary and Detailed Design
Period:	08/2002 – 12/2002
Construction cost:	€ 6,500,000

## Project Description:

The Border Crossings Project is part of the Regional Trade and Transportation Facilitation Program in Southeast Europe, with the aim of strengthening and modernizing the Customs Administrations and Agencies for border control. These Border Crossings are located on the border with the Republic of Croatia in the south-west region.



The overall objective of the Project is to ensure smooth and efficient legal movement of goods and passengers between Bosnia and Herzegovina and the Republic of Croatia.

The specific activities performed by the Consultant consist in developing the Preliminary and Detailed Design, including Technical Specifications and Bill of Quantities.

The Design of the Border Crossing comprised the following features:

1. Urban Planning, Architectural and Traffic Designs;
2. Facilities Design:
  - o Canopy over the space of primary control
  - o Control cabins
  - o Administrative buildings Testing hall
  - o Building for secondary controls of the buses and cars
  - o Truck weighing equipment
  - o Building for border inspections and secondary customs procedures
  - o Commercial offices
  - o Energy block



### 3. Installations Designs and utility connections:

- o water supply system, firefighting hydrants
- o sewerage system
- o air conditioning
- o surface water drainage system
- o electricity supply, signalisation, street lights and lightning protection
- o HVAC installations
- o phone lines/computer net/fire alarm net/security installations/loudspeaker system.

### 4. Technical specifications;

### 5. Bills of prices and quantities.

The Consultant also designed proper fencing to isolate the compound from the neighbouring area, and prevent illegal and uncontrolled trespassing. The landscaping has been foreseen as plane surfacing, finished with topsoil and grass turf strips.



# 2<sup>nd</sup> PHASE OF DEVELOPMENT INTERVENTIONS (BUILDINGS AND AIR-SIDE PAVEMENTS) OF BUCHAREST OTOPENI AIRPORT

Location:	Bucharest, Romania
Client:	SEA S. p. A.
Services:	Preliminary and Final design
Period:	12/1999 – 05/2002
Construction cost:	Euro 80,000,000

## Project Description:

Preliminary design of the following modifications of existing buildings:

- ✈ Renewal and modification of the existing Terminal building for the conversion into an Arrival terminal (19.200 m<sup>2</sup>).
- ✈ Renewal and modification of the existing A-B4 Building (connection between Arrival and Departure Terminals) for the conversion into Commercial Area and Offices (7.500 m<sup>2</sup>).
- ✈ Renewal and modification of the existing C Building (connection between Arrivals and Cerimonial Padillion) for the conversion into Offices area (5.100 m<sup>2</sup>).
- ✈ Renewal of the central heating plant building (1.750 m<sup>2</sup>).

Preliminary design of the following new buildings:

- ✈ New multistorey car parking (3 levels - 17.700 m<sup>2</sup>).
- ✈ Baggage handling building adjacent to the Departure Terminal (470 m<sup>2</sup>).
- ✈ Ground support equipment recovery Hangar with annexed Apron Control Tower (5.750 m<sup>2</sup>).
- ✈ 2 water treatment stations (300 m<sup>2</sup> tot.).

Preliminary design of the following infrastructures:

- ✈ New rapid exit taxiway for runway 08R, new partial parallel taxiway N.1, and rehabilitation of existing taxiway Delta (98.000 m<sup>2</sup>).
- ✈ Rehabilitation of internal service road D10 and Taxiway November.

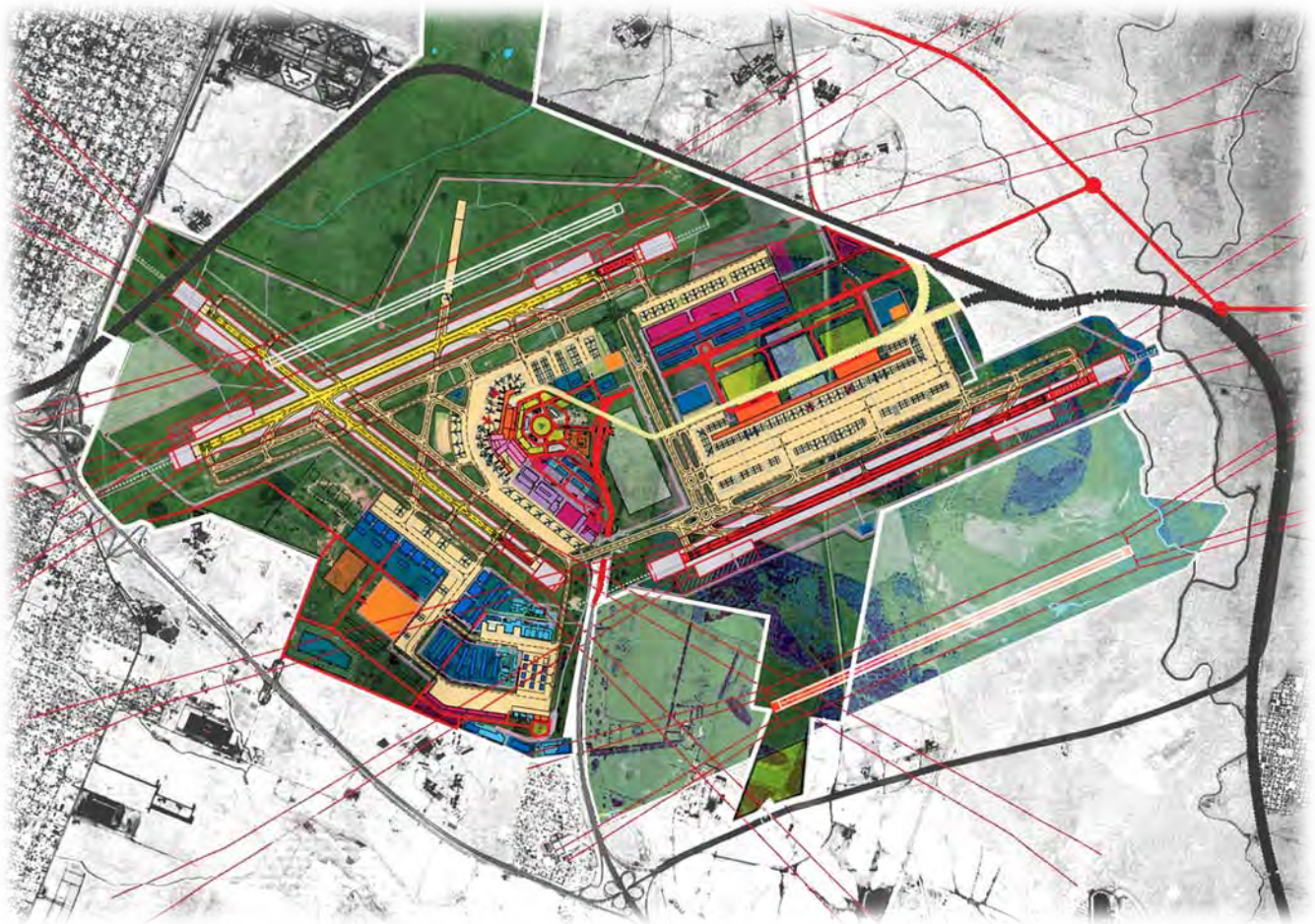




# MASTER PLAN, NEW RUNWAY, AIRCRAFT APRON, AND CONTROL TOWER OF EZEIZA INTERNATIONAL AIRPORT

Location:	Buenos Aires , Argentina
Client:	Consortium Aeropuertos Argentina 2000
Services:	Master Plan
Period:	10/2000 -10/2001
Construction cost:	€ 1,480,400,000

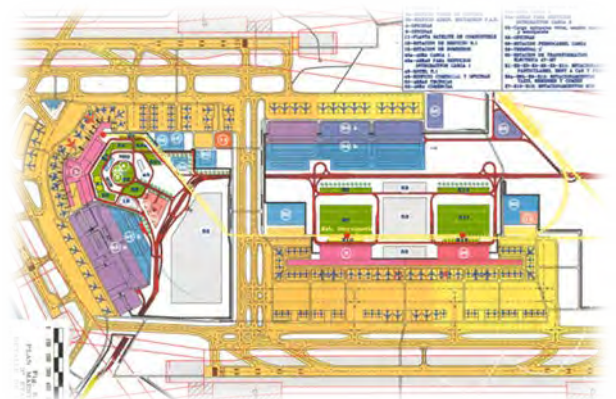
## Project Description:



The present airport system of Buenos Aires – which serves an inhabited area of over 13 million people – consists of the airport of Aeroparque, where national and middle distance flights are based, and the international airport of Ezeiza which serves the long-distance intercontinental traffic.

Since the former has reached its maximum capacity (with 7.1 million pax/year) and cannot be enlarged owing to its inner city location, the need has arisen to plan the development of Ezeiza airport which is located some 32 km south-west of the capital.

Traffic studies and analyses were carried out to quantify the future traffic demand for three time horizons (2005, 2015 and 2028), considering various alternative scenarios of moving traffic from Aeroparque to Ezeiza.







The passenger traffic at Ezeiza is expected to increase from the present 6.2 million/year to 22 million in 2015 and over 38 million in 2028, with an increase in annual plane movements from the present 64,500 to some 240,000 in 2015 and almost 370,000 in 2028.

In particular, the study defined the urgent short-term works needed to modify the existing terminal, examined the possible alternatives for the location of a third runway, and selected the layout for the new passenger and cargo terminals, as well as the new control tower and the extension of the fuel depot.

The preliminary design considered all the operative areas of the airport, both "land-side" and "air-side", developing the organization of the individual functional blocks (arrivals and departures concourse, cargo storage areas, parking facilities, etc.) and of the service areas assigned to the utility plants, especially the electrical, air-conditioning and fuelling installations (apron side).

In particular, the plants foreseen in the design include:

- Visual aids;
- Apron lighting;
- Fuel supply (H.R.S.);
- Electric power supply at 400 Hz;
- Air-conditioning system;
- Compressed air system for aeroplane starting;
- Potable water supply;
- Sewerage system

The first phase included the analysis of the existing plants in

each sector and the identification of the best solution for the airport of Buenos Aires. The second phase concerned the preparation of the preliminary designs of each network, including technical reports and drawings.

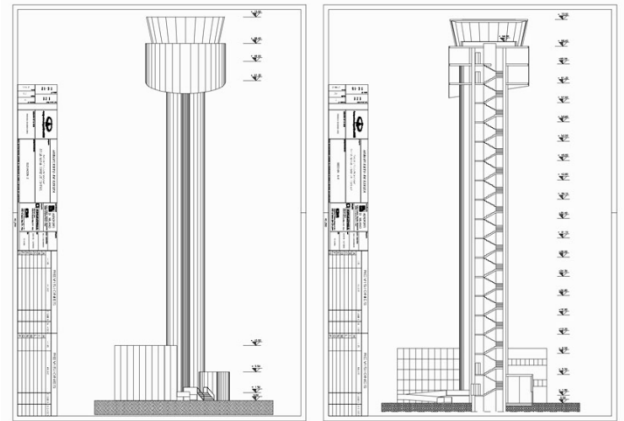
With regards airport accessibility, the consulting services included:

- a study of the present and foreseen future traffic and service level of the existing road infrastructures,
- a comparative evaluation of the various alternative ways of connecting the airport to the city of Buenos Aires by mass transport systems (metro extension, branch lines from two different existing adjacent railway lines, new fast dedicated automated people-mover, etc), and preliminary indications as to the most suitable solutions

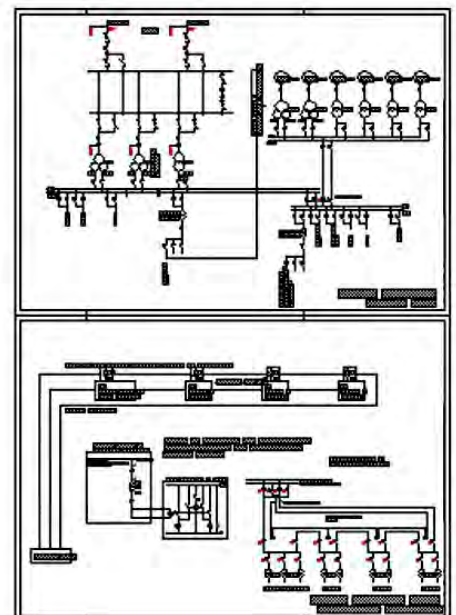
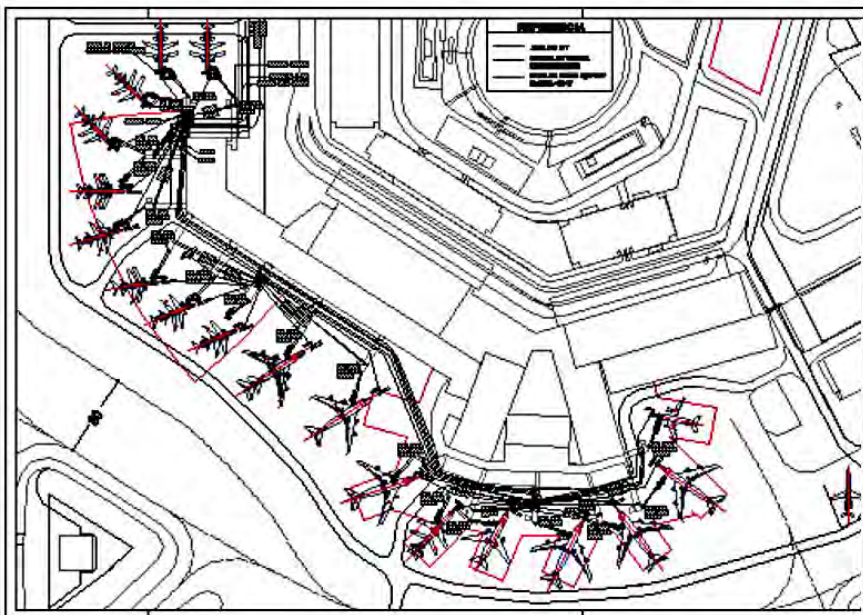
### Control Tower

The works foreseen in the Master Plan include, besides the extension of the present terminal and apron, and the construction of a new runway and subsequently a whole new terminal, also the construction of a new control tower.

The new Control Tower, which is 74 m high, includes a technical-administrative block of about 1000 m<sup>2</sup> at the base of the tower.



The construction of the new runway involves significant environmental and physical constraints related to the presence of the *Rio Matanza*. The study therefore also included an in-depth examination of the hydraulic and hydrological aspects of the project area.





- Definition of the best position of the runway from the topographic, geotechnical, hydraulic and operating points of view;
- Preparation of the technical specifications necessary for the execution of a geological-geotechnical campaign;
- Preliminary studies to define the horizontal layout of the new runway (length, geometry of the taxiway alongside and of the exit routes, geometry of the ends of the runway);

- Definition of the longitudinal profile and the typical cross sections;
- Identification of the audio-visual aids;
- Identification of the reclamation and hydraulic works relating to water courses in the area of the new runway;
- Definition of the storm water drainage network;
- Drawing up of an Investment plan





# REHABILITATION OF THE POLICE ACADEMY

Location:	Tirana, Albania
Client:	Directorate for Logistics and Technics – Ministry of Public Order - Albania
Services:	Detailed design, tender documents
Period:	09/2000 - 06/2001
Construction cost:	€ 1,200,000

## Project Description:

In 1998 the Ministry of Public Order approved a programme (financed by the European Commission – OBNOVA Programme) for the reform and qualification of the Albanian Police, which included a program for the improvement of the living and teaching conditions through the rehabilitation of the Police Academy in Tirana in the period 1998-2001. The existing accommodation and teaching facilities are considered very poor. The specific objective of this project is to provide the Ministry of Public Order / the Albanian Police Service with a modest, well equipped and furnished professional training environment.

The Academy is situated about 3 km south of Tirana, in the area called Sauk, on a total surface of 170 000 m<sup>2</sup>. Although on hilly terrain, the location and area are suitable to fulfil the specific goals of this institution. There are 15 buildings on it, some built in the period 1939-41, whilst others are of a more recent date. The overall location is considered unique and functional.

TECHNITAL carried out technical assistance including evaluations, construction design, cost estimates, list of priorities for both for reconstruction works and procurement of equipment and complete tender dossier for the rehabilitation works, and specifically:

- assessment of the existing infrastructure and constructions in the compound of the Tirana Police Academy and the available documents on the Albanian Police Training System;
- verification of the most urgent training and facility needs;
- assessment and verification of the existing infrastructure needs.

The project products included:

- an Inception Report in which all the works needed for a complete renovation are described together with a list of estimated costs for the works, including a proposal for a combined list of priorities for reconstruction works and procurement of equipment in accordance with the present budget;
- drawings, Technical Specifications, Bill of Quantities regarding all the works related to the total rehabilitation of the Police Academy.

- the complete and final Tender dossier (according to Phare regulations) regarding those works that can be realised with the present available budgets for the rehabilitation of the Police Academy, including: Demolitions and removals on the existing buildings and their structures, Earthworks and general excavation, Concrete and reinforced concrete works, Masonry works, Roof and waterproofing works, Plastering and wall tiles works, Laying, tiling and flooring works, Doors, windows and fence works, Painting works, various works, Hydro-sanitary works, Electrical works.



In particular the services therefore included

- 1) the execution of assessments and verifications regarding:
  - existing infrastructure and constructions and the available documents;
  - the most urgent training and facility needs;
  - existing infrastructure needs
- 2) the production of the following documents:
  - Inception Report;
  - Drawings, Technical Specifications, and Bill of Quantities for the rehabilitation works;.

Tender dossier for the demolition, excavation, building and ancillary works.





# MASTER PLAN OF CARRASCO INTERNATIONAL AIRPORT

Location:	Montevideo, Uruguay
Client:	P.N.U.D. (Programa de las Naciones Unidas para el Desarrollo) & D.G.I.A. (Direccion General de Infraestructura)
Services:	Master Plan and Preliminary Design
Period:	03/1997– 09/1997
Construction cost:	€ 152,000,000



The International Airport of Carrasco is the main airport of Uruguay, connected to 21 cities in 11 different foreign countries. It was constructed in 1947 and has been constantly improved over the succeeding years.

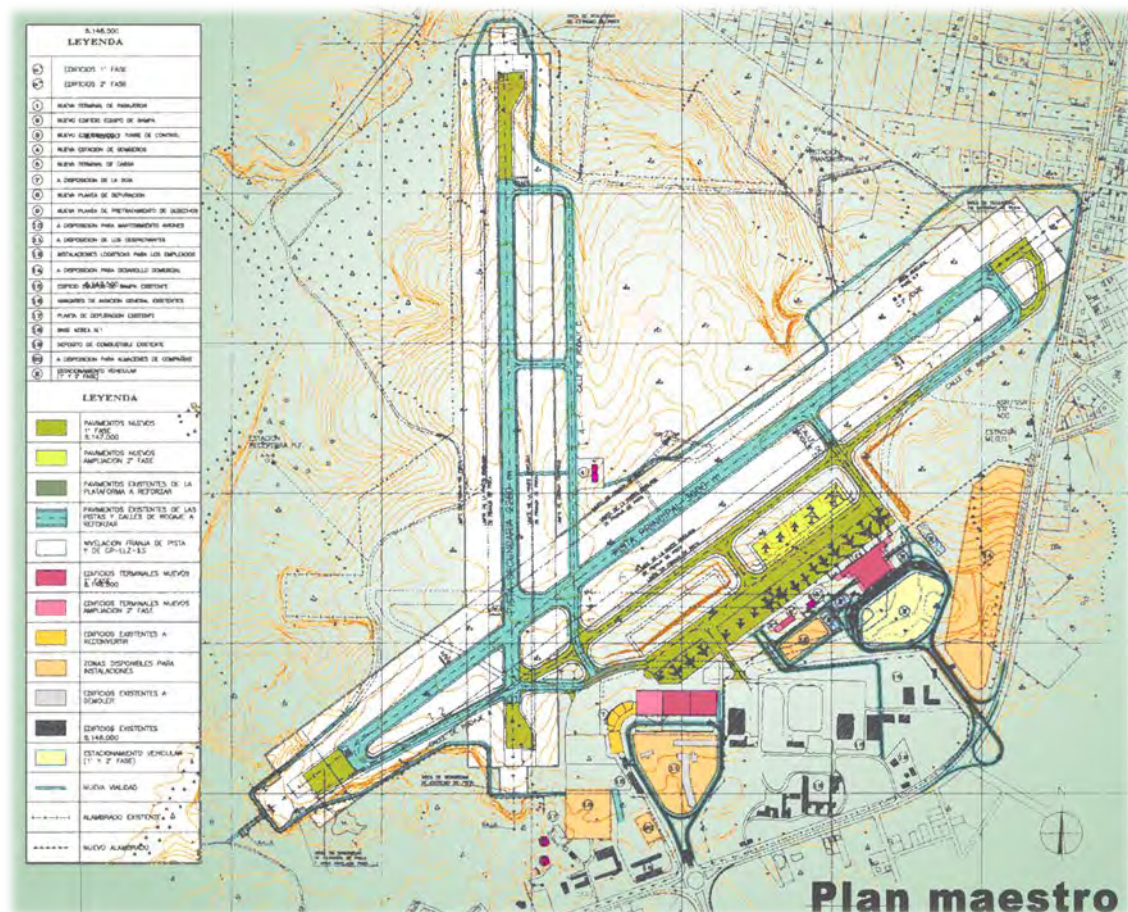
In 1994 the operational capacity of the airport was barely sufficient to cope with the existing traffic flows, and totally inadequate to meet the future traffic and operational demand.

In 1995-96 the consortium SEA-Technital was commissioned by UNDP and from D.G.I.A. to develop the Master Plan and the Preliminary Design of the air-side facilities (runways, taxiways, apron, radio/visual aids and flood-lighting).

In 1997-98 the consortium SEA-Technital was commissioned to develop the new General Airport Master Plan, in order to prepare the necessary documentation for the international tender for the election of a private dealer for the management of Carrasco Airport.

6 different alternative of master plan have been studied and compared to identify the best alternative. Among the various parameters of comparison, the most important were the functional and the economic.

For the 2 main alternatives have also developed the layouts of Passengers and Cargo Terminals.

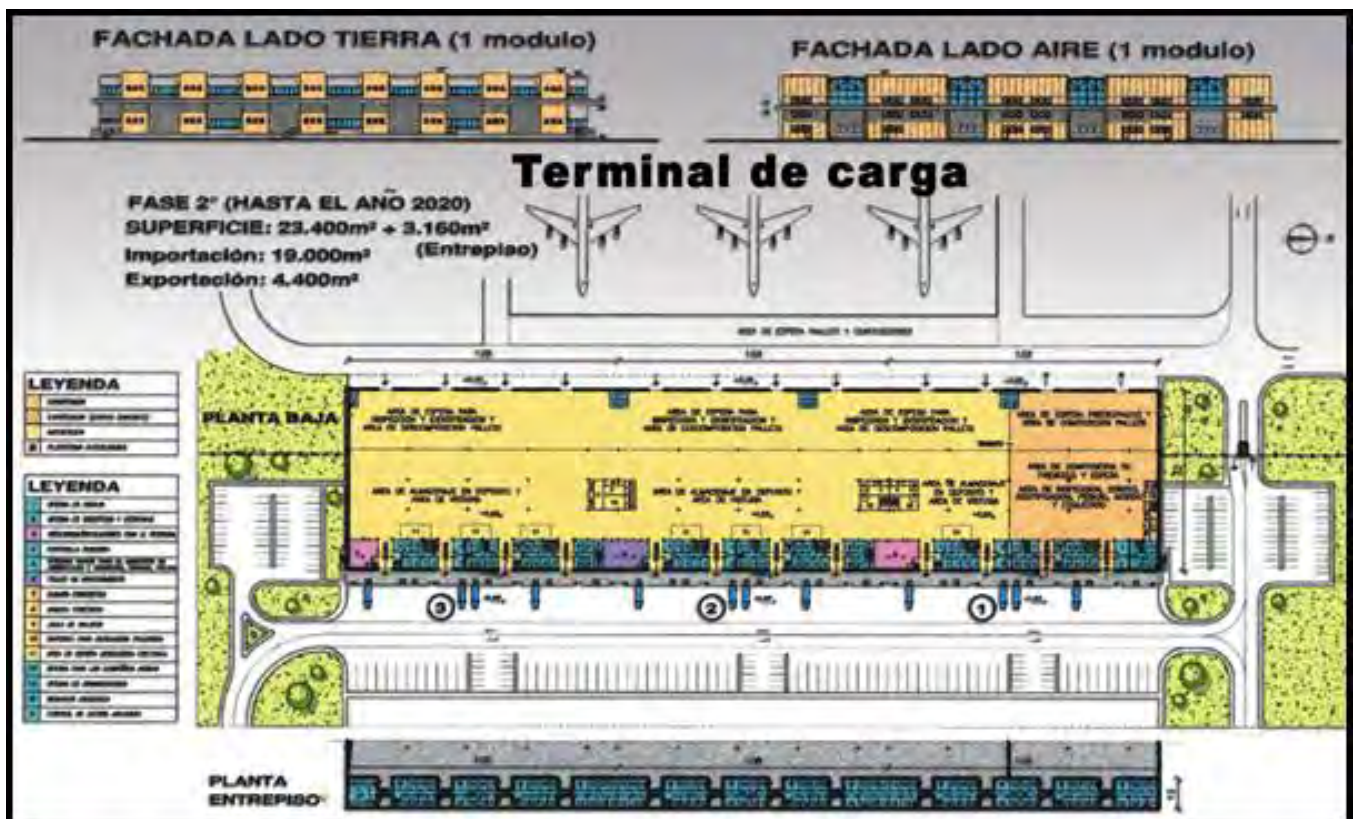




The Master Plan study includes the following activities:

- The Preliminary Design includes:

- 





# REHABILITATION OF THE EXISTING HOSPITAL OF COMO - ITALY

Location:	Como, Italy
Client:	S. Anna Hospital Firm
Services:	Basic and Final Design
Period:	1993 - 1996
Construction cost:	8,000,000 Euro

## Project Description:

The designs concerned the following:

- building
- civil works
- plumbing system
- oxygen system
- air conditioning system
- fire-fighting system
- electrical system





# NEW HOSPITAL, PSYCHIATRIC UNIT AND REST HOME FOR THE ELDERLY

Location:	Pesaro, Italy
Client:	Pesaro Municipality
Services:	Feasibility study, Preliminary and Final Design
Period:	1991 - 1996
Construction cost:	Euro 50,000,000

## Project Description:

The designs concerned the following:

- building
- civil works
- plumbing system
- oxygen system
- air conditioning system
- fire fighting system
- electrical system





# RECONSTRUCTION AND ASEISMIC RESTRUCTURING OF HOUSING, BUILDINGS AND INFRASTRUCTURES IN VARIOUS MUNICIPALITIES DAMAGED BY THE 1980 EARTHQUAKE IN THE CAMPANIA REGION

Location:	Campania Region, Italy
Client:	Municipalities of Castel Nuovo di Conza, Petina, Contursi Terme - Financing by Ministero per gli Interventi Straordinari nel Mezzogiorno.
Services:	Feasibility Study; Preliminary, Final and Detail design, Works supervision
Period:	01/1983 – 12/1995
Construction cost:	€ 43,382,400

## Project Description:

The damage caused by the earthquake of 23/11/1980 to the urban structures of Castel Nuovo di Conza, Petina and Contursi Terme was catastrophic and made it necessary to totally demolish about 60% of the building patrimony.



The general reconstruction project awarded to Technital concern the following sectors: urban planning, architecture, structures, technical plants and utility lines, hydraulics, geology and investigations.



In a first phase of the project all properties and land uses have been identified and all legally required documentation has been prepared. Topographical surveys and detailed cross sections were carried out in the entire study area, as well as surveys of all buildings requiring reconstruction or repair works. Geological surveys and geognostic investigations were also carried out.

In the second phase preliminary and final design of reconstruction or restructuring works was carried out.



Technital also carried out the supervision of the works which were completed in 1993.



# NEW BUILDINGS FOR INFECTIOUS DISEASES

Location:	Cesena, Forlì and Parma - Italy
Client:	Ministry of Health
Services:	Preliminary and Final Design
Period:	1992 - 1995
Construction cost:	€ 6,000,000

## Project Description:

The designs concerned the following:

- civil works
- plumbing system
- air conditioning system
- electrical system





# MAIN RAILWAY STATIONS OF RIYADH, HOFUF AND DAMMAM FOR THE NEW DIRECT LINE

Location:	Saudi Arabia
Client:	S.R.O. - Saudi Railway Organization
Services:	Preliminary, final and construction design, works supervision
Period:	1983 - 1992
Construction cost:	€ 34,654,300

## Project Description:

In the context of the new direct railway line between the capital city of Riyadh and Dammam, already under contract to Technital, in 1982 S.R.O. commissioned Technital with the task of designing the three railway stations of Riyadh, Hofuf, and Dammam. The works on the three stations, directed by Technital, were contracted in 1983 and completed in 1992.



From a technical point of view, the station of Riyadh is decidedly the most important. The complex of railway facilities extends throughout a vast area involving a 4 km. stretch of the railway line from Hofuf. At the beginning of this last 4 km. stretch from Hofuf, a marshalling yard was foreseen to the left of the main line, in order to permit stop and the composition of freight trains which, according to the original scheme, were to reach Dammam by way of the line for Al Kharj and Haradh leaving the new line principally to passenger trains. The station plan has a total of 10 tracks.

The layout of the infrastructures was studied in order to give maximum importance to the station building while permitting optimization of the available space, connections with city access roads to the station, and the location of the parking lot and pedestrian transit. The parking areas include spaces for passenger use, a taxi zone, a bus zone, and a special parking area for representative vehicles.

The station building is composed of a part which includes the external front portico and a central core which occupies the basement where the passenger facilities are located. Two wings are connected to the central core, one for offices, and the other for police and representative services. The vertical support structure has a series of arches placed length-wise on a reticular structure. All of the building materials were prepared on site in reinforced concrete. The building is partly covered in coloured marble.



Other prefabricated building elements were also utilized like, for instance, the frame which completes the entire front of the building and the "brise soleil" screen grids which in some cases close the top part of the arches.



The plant facilities are located in a particular area which is divided into two parts; an underground part which includes the thermoelectric steam power plant, the air-conditioning unit, and the water supply tanks; and one part on the surface which includes an electricity and water substation and a tank.

The project had furthermore foreseen all of the plants for the distribution of electricity and water, the sewerage and drainage systems, the tank and the distribution network for G.P.L. liquid gas, the heating plant and air-conditioning.

Furthermore, provisions were made for a system of clocks, a closed circuit television system, a speaker system and last of all, an information system with train arrivals and departures.



# RAILWAY MAINTENANCE FACILITIES IN DAMMAM AND RIYADH FOR THE NEW DIRECT LINE DAMMAM-HOFUF-RIYADH

Location:	Saudi Arabia
Client:	S.R.O. - Saudi Railway Organization
Services:	Preliminary, final and construction design, works supervision
Period:	01/1983 – 12/1992
Construction cost:	€ 24,046,200

## Project Description:

In the context of the new direct railway line between the capital city of Riyadh and Dammam, already under contract to Technital, S.R.O. commissioned Technital in 1982 with the task of designing and supervising the works pertaining to the three maintenance facilities.

The *Workshop for routine maintenance and minor repairs on passenger cars in Dammam* is a complex covering approximately 500 m<sup>2</sup>, complete with all of the necessary equipment and facilities for the various operations.

The *Workshop for the routine maintenance of rolling stock in Riyadh* covers approximately 2,000 m<sup>2</sup> was also fully equipped with the necessary installations.

The *Workshop for major repairs in Dammam* is without doubt the most important installation, for the maintenance of the diesel-electric locomotives of the entire Saudi railway fleet. The two main areas of the workshop, occupying respectively 12,400 and 8,100 m<sup>2</sup>, are built in modular 24 m x 12 m units. The total workshop facilities include 12 operative departments and a warehouse with the capacity to accommodate 20 locomotives at one time. The foreseen work cycle includes dismantling of the body from the bogie, separation of the various components and transfer to the specific type of operations and, upon completion, convergence to re-assembly. All of the operations for restoration to the original characteristics of the various components can be done in the workshop.



The project envisaged the following equipment: 23 wagon traversers, 2 pillar cranes, 2 travelling cranes, 1 frame crane, and one monorail crane. The equipment is completed by a 150 t traverser and a vast palleting system through fork trucks and adequate capacity trailers. Furthermore, the project included all of the operative machinery for which the techno-operative specifics were defined by making recourse to all of the most modern solutions offered by the international market and washing and automatic functioning systems which eliminate the direct presence of operative personnel in the work area.



The workshop is also equipped with all of the systems necessary for the various procedures: electricity, water, compressed air, oxygen, acetylene and steam. Two complete sewerage systems were also foreseen in the workshop, one for raw sewage and the other for industrial waste water deriving from the various operations. The project foresaw a sprinkler system with relative alarm devices, a system for measuring temperature with a central unit and peripheral units dislocated in the various departments, a telephone system, a complete forced ventilation system, and a removal system for dust and smoke in the departments where the most pollutant operations are carried out.

The following installations were planned to be separate from the workshop: a lubricating device, a gasoline supply station, a compensation tank for water with a piezometric distribution tower and pumping station; a tub for oil separation from waters discharged from the workshop, two electric substations for feeding; a steam production plant with distribution to the various washing sites inside the workshop; an oxygen and acetylene distribution plant; a plant for the production of compressed air; a fleet of vehicles complete with frame crane for the movement of wheel sets.

Lastly, the project included the arrangement of the entire external area destined to the complex of installations with access and service roads, a track system to facilitate access to the various areas, a draining area for rain water, a sewage system, a water supply system, electricity and lighting, a telephone system and fencing to limit and protect the area pertaining to the entire installation



# BIOLOGY DEPARTMENT - UNIVERSITY OF PADUA

Location:	Padua, Italy
Client:	University of Padua
Services:	Preliminary, final design and works supervision
Period:	01/1984 – 12/1991
Construction cost:	€ 20,658,000

## Project Description:

The project awarded to TECHNITAL included the Preliminary design, Final design and Works supervision of a building for scientific research and didactic purposes in the field of biochemistry and biology:

- volume of the research building (45,000 m<sup>3</sup>)
- volume of the didactic building (55,000 m<sup>3</sup>).

TECHNITAL was also entrusted with the design and works supervision of the technological installations and scientific equipment of the University complex.

The project was carried out in association with S.T.E.R. Consulting professional Engineering of Vicenza.





# PROJECT FOR THE REALIZATION OF FIVE UNDERGROUND CARPARKS IN VERONA

Location:	Verona , Italy
Client:	Residence Bussolengo 2 s.r.l. on behalf of the Verona municipality
Services:	Feasibility Study and Preliminary design
Period:	01/1989 – 12/1990
Construction cost:	€ 15,493,700

## Project Description:

Within the context of the program to progressively increase pedestrian areas in the Historic Centre, the Municipality of Verona called for bids to develop and manage car-parks in order to satisfy visitor and resident parking demand. The position of the main access roads to the Historical District permitted identification of the most suitable locations for the car-parks, compatible with environmental restraints and the city road system, namely: Piazzale Cadorna, the Borgo Trento Hospital, Piazza Isolo, the Arsenal at Castelvecchio and between the Garibaldi Bridge and Via Mameli.

The carpark at the **Borgo Trento Hospital** was located in the area between Via Camillo de Lellis and Lungadige Attiraglio and covers an area of 11,667 m<sup>2</sup>. The circular, helicoidal-type, structure has 6 floors above ground and 2 underground floors. The above ground part can hold 371 parking spaces with 128 private garages in the underground section for a total parking capacity of 499 cars. Given the rather visible position of the area from both the Adige River side and the hills, a vegetal cover was chosen, kept green by means an automatic irrigation system.

The carpark of **Piazza Isolo** blends with the town-planning/architectural development plan for the area which was elaborated by Architect Paolo Portoghesi on behalf of the Municipality of Verona. The carpark occupies a total surface of 15,219 m<sup>2</sup>. on two underground floors and holds 518 parking spaces, 266 temporary, and 230 private garages. One of the main problems to resolve was placement of the aeration ducts which had to be integrated with the surface system included in Portoghesi's project.

The carpark in the **Arsenal** zone at Castelvecchio covers a 10,308 m<sup>2</sup> area adjacent to the right bank of the Adige River and consists of a three-story structure, entirely underground, enabling it to provide 444 parking spaces, 252 temporary and 192 private. The underground building was made completely water-tight in order to avoid any type of interference with the underground watertable which is approximately 7 meters higher than the floor level of the lowest storey during the Adige River's highest flood.

The carpark at the **Garibaldi Bridge - Via Mameli** covers 10,046 m<sup>2</sup> and is a two-story underground structure which can hold 390 parking spaces, 195 temporary and 194 private garages. The structure was studied for optimal placement within a particular urban context which features historic walls and the extremely rich vegetation of the Lombroso Park.

Each car-park has two or three floors. The total area occupied by the 5 car-park buildings is 55,000 m<sup>2</sup> with a total capacity of 2,142 between temporary spaces and private garages.

The necessary complementary works were planned for all of the carparks with access ramps, barrier-free stairs and elevators, and aeration ducts. All of the garages were equipped with the following technological equipment: electrical systems, audio systems for messages via loudspeaker, closed circuit television for monitoring and centralized surveillance, fire detection systems to sensor and signal fires and for the automatic control of the compartmenting of the parking areas through fire stop doors, sprinkler systems, fire-fighting system for early intervention in extinguishing small fires, sanitary-hygienic facilities, financial and administrative management installations for each carpark.

Furthermore, a centralized planning and management system for carpark capacity was also foreseen whereby users are directed toward available parking areas through telephonic data transmission and signal boards with variable messages. This led to the elaboration of a circulation plan through which the best routes for user access to the parking facility were identified. Lastly, a plan was elaborated to verify the financial income deriving from the investment through parking fees and the sale of private garages.

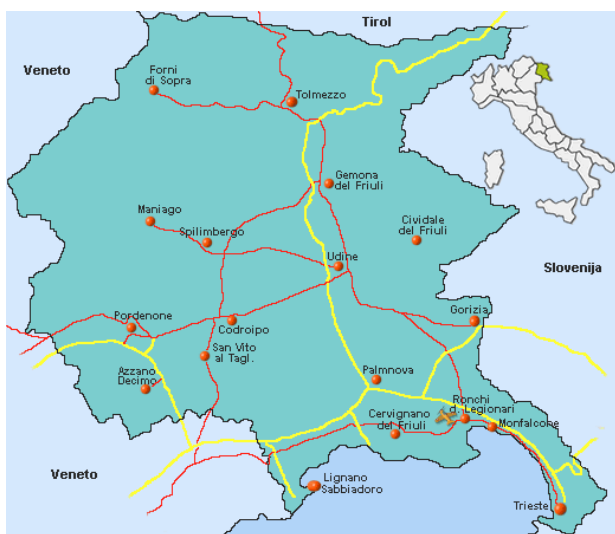




# RECONSTRUCTION AND ASEISMIC RESTRUCTURING OF HOUSING, BUILDINGS AND INFRASTRUCTURES IN VARIOUS MUNICIPALITIES DAMAGED BY THE 1976 EARTHQUAKE IN FRIULI

Location:	Friuli - Venezia-Giulia Region , Italy
Client:	Friuli - Venezia-Giulia Region - various municipalities
Services:	Feasibility Study; Preliminary, Final and Detail design, Works Supervision
Period:	01/1977 – 12/1989
Construction cost:	€ 16,256,600

## Project Description:



The damage caused by the earthquake of 1976 was catastrophic and made it necessary to totally demolish about 80% of the building patrimony.



Technital was charged with the reconstruction and restructuring of 800 buildings of which 100 of historic, cultural, environmental or ethnic value, as well as the design and construction of the municipal water supply and sewerage networks of Tramonti di Sopra.





# NEW MATERNITY BUILDING

Location:	Cotonou, Benin
Client:	European Development Bank
Services:	Final Design and Tender Documents
Period:	1983
Construction cost:	€ 800,000

## Project Description:







TECHNITAL S.p.A.  
Via Carlo Cattaneo, 20 - 37121 Verona - Italy  
Tel.: +39 045-8053611 - Fax: +39 045-8011558  
[tender.office@technital.it](mailto:tender.office@technital.it)

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