



TECHNITAL

AIRPORTS

COMPANY PROFILE AND
STATEMENT OF CAPABILITIES 2023

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AIRPORTS

AIRPORT TERMINALS

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.

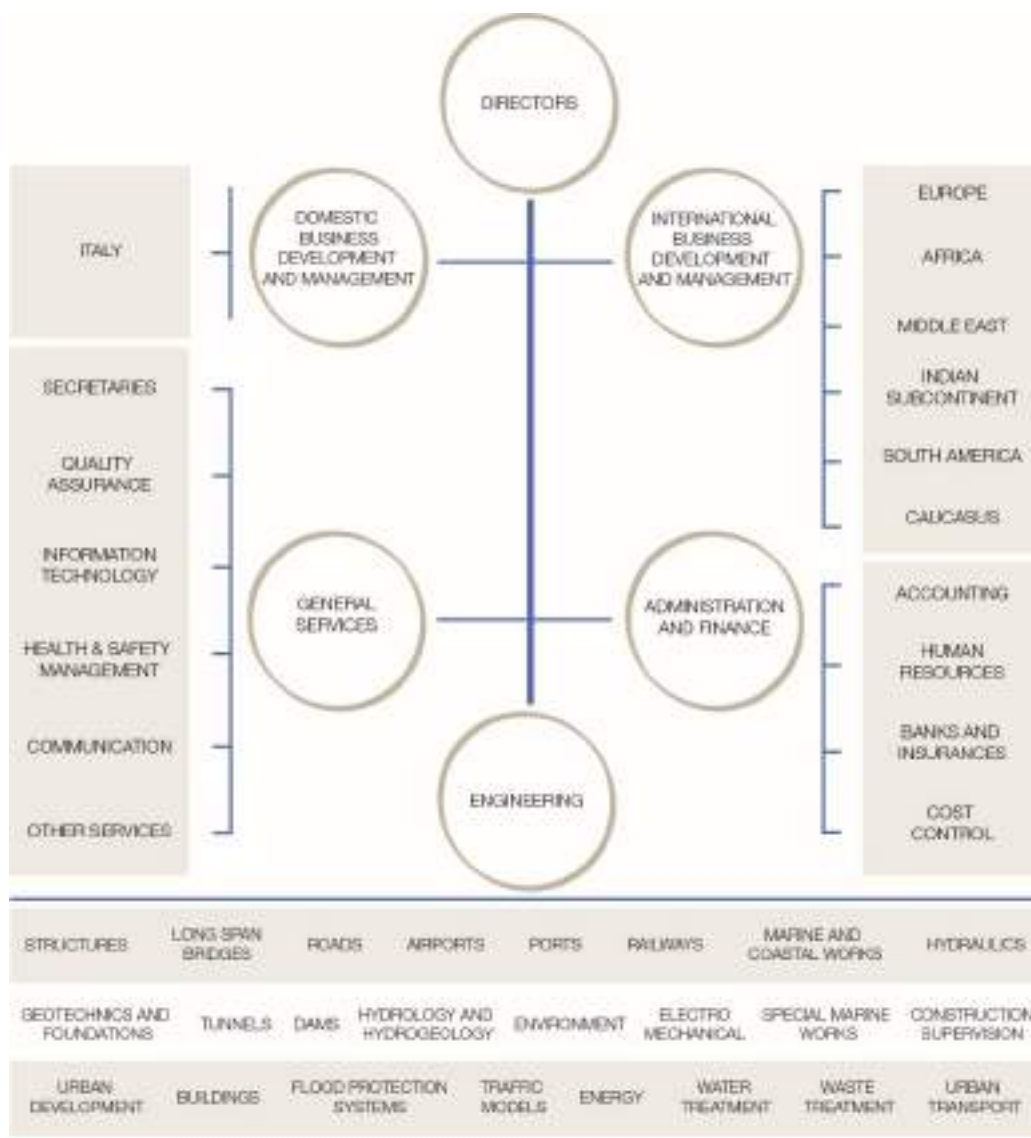
The company covers the full range of services, from planning and feasibility studies through to detailed design, works supervision and technical assistance:

- } 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 fulfill 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 Airports

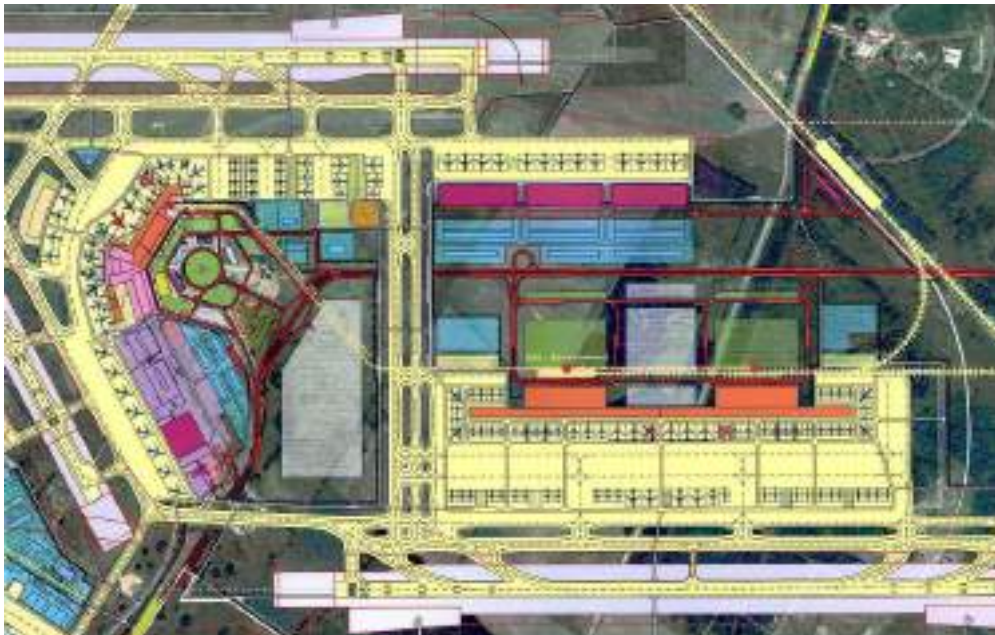
TECHNITAL has a vast international experience in all engineering consultancy services related to air transport providing state-of-the-art solutions for civil and military airports and air transport in general which dates back to the 1970s.

Airport engineering is a multi-disciplinary sector which incorporates many aspects such as traffic, logistics, environment, architecture, structures, operations, geotechnical and pavement engineering, drainage, and special systems (aeronautical navigation and surveillance, aircraft ground handling, processing of passengers and their baggage).

TECHNITAL provides integrated tailor-made engineering services for land-side and air-side facilities, ranging from technical-economic feasibility studies, infrastructures planning, concept/preliminary and detailed/final design, preparation of technical specifications and tender documents, up to construction management and works supervision. TECHNITAL's expertise covers a full range of engineering and architectural consultancy services including electrical and mechanical systems.

Airport master planning is a fundamental tool in determining future requirements for airports, and provides the comprehensive vision for short, medium and long-term infrastructures development. TECHNITAL has developed master plans in several Countries: Argentina (16 airports), Uruguay (Montevideo), Bosnia Herzegovina (Sarajevo), Peru (Lima), Armenia (Yerevan), Italy (Malpensa, Linate, Agrigento, Salerno, Alghero), Djibouti, Russia (Raduzhny) and the study of the Master Plans for the Romanian Airports under the European Union's Phare Programme.

In this field, TECHNITAL has carried out among other the **study of integrated airport system in Buenos Aires and the Master Plan of its 2 airports, Ezeiza and Aeroparque**, in Argentina.



Master Plan of Ezeiza International Airport (Buenos Aires) – Terminal Areas

Also in Argentina, TECHNITAL has developed the **Master Plans of Cordoba and of 13 minor Argentinian airports**: Bariloche, Comodoro Rivadavia, Iguazu, Mar del Plata, Mendoza, Paraná, Rio Cuarto, Villa Reynolds, General Pico, Reconquista, Formosa, Catamarca, Rio Grande. In Uruguay, for the **Montevideo Carrasco International Airport**, TECHNITAL

performed a comparative study for 6 alternative Master Plans including passengers and cargo new terminals.



Iguazu Master Plan



Mar del Plata Master Plan



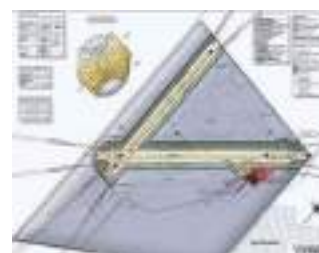
Catamarca Master Plan



Rio Grande Master Plan



Reconquista Master Plan



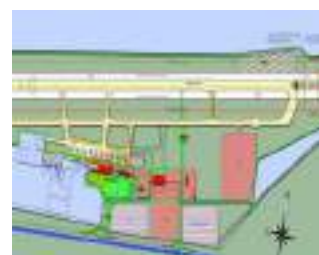
Rio Cuarto Master Plan



Mendoza Master Plan



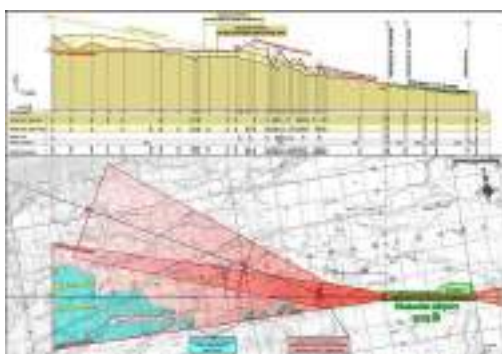
Bariloche Master Plan



Comodoro Master Plan

Master Plans of 13 Argentinian Airports

The planning phase may involve specific studies on the optimal airport positioning which take into account the possible alternatives in terms of catchment areas, earthworks, terrestrial links, airspace, obstacles, ranges, runway orientation, costs, future development, constraints, etc. Such studies were performed, for example, for the airports of **Djibouti** and **Agrigento** (Italy).



Approach and take-off orographic obstacles

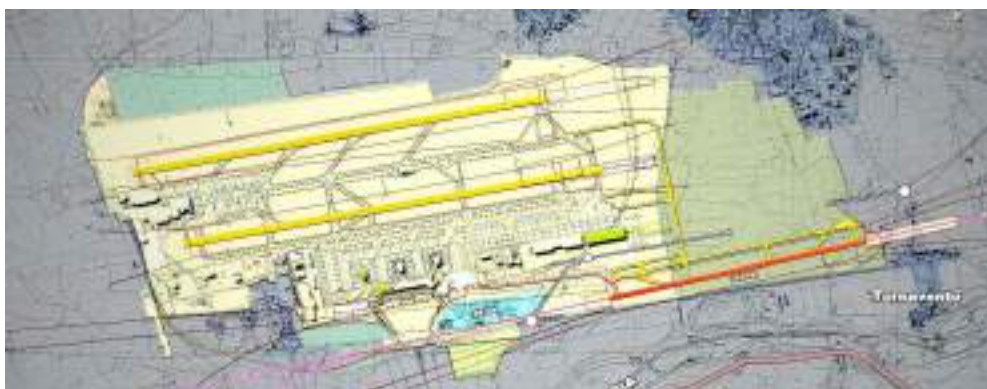


Djibouti New Airport aerial view



Airspace – Interfered airspace take-off and aborted approach

In the case of the 3rd runway of the **Milan Malpensa Airport** (Italy), the main objective was to reduce the noise impact on surrounding communities. Various hypotheses, parallel and transverse runway, adopting various criteria, were studied and compared to select the best option.

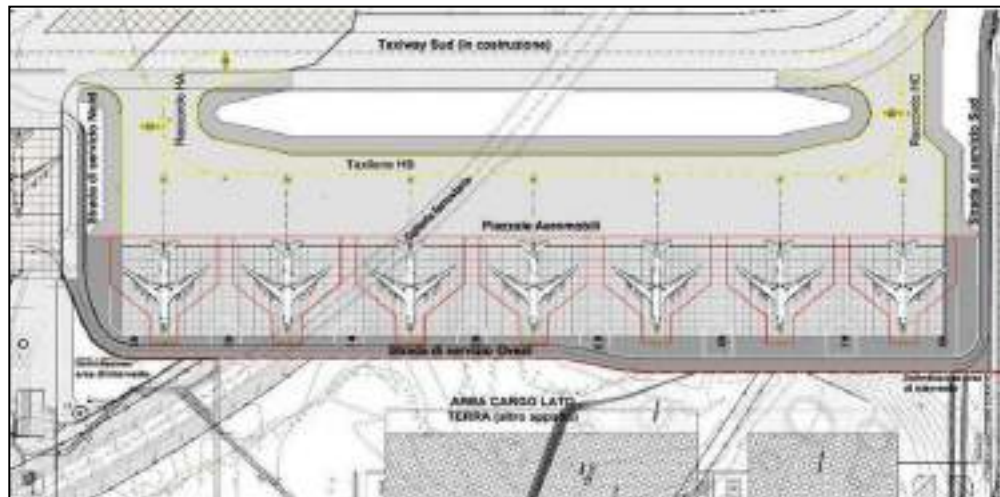


Alternative selected for the 3rd runway for the Milan Malpensa International Airport (Italy)

Airside engineering regards flight infrastructure (either new runways, taxiways and aprons or rehabilitation/improvement of existing facilities) and airfield special systems (airfield ground lighting and navigational aids etc.). TECHNITAL provides complete civil engineering services for airside infrastructure from concept design up to tender support and works supervision. Since airside infrastructure often has to be built whilst the airport is still operational, special attention is paid to ensure that all deadlines and targets are met.

TECHNITAL has carried out airside infrastructure projects in many countries, among other Argentina, Uruguay (Montevideo), Italy (Verona, Malpensa, Vicenza, Agrigento, Foggia), Madagascar (Nosy Be), Romania (Bucharest), Bosnia and Herzegovina (Sarajevo), Afghanistan (Herat).

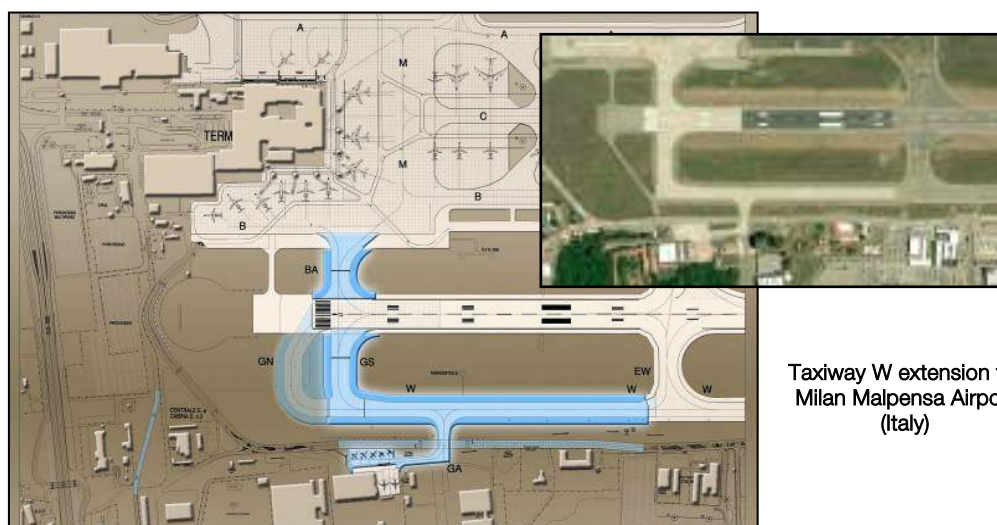
Among major projects are **Montevideo Airport** (preliminary to detailed design for the upgrade of runways, apron, drainages and visual aids), **Milan Malpensa Airport** (final and detailed design of the new cargo apron, including 142,100 m² concrete and bituminous paving and A.G.L. systems; final and detailed design of 70,240 m² taxiway W extension, new taxiways GS and BA, including visual aids and drainage system, General Aviation apron, and service roads), **Verona Airport** (design and works supervision of taxiways and other airside facilities).



New cargo apron of Milan Malpensa Airport



Works supervision of airside infrastructure at Verona Airport



Taxiway W extension for
Milan Malpensa Airport
(Italy)

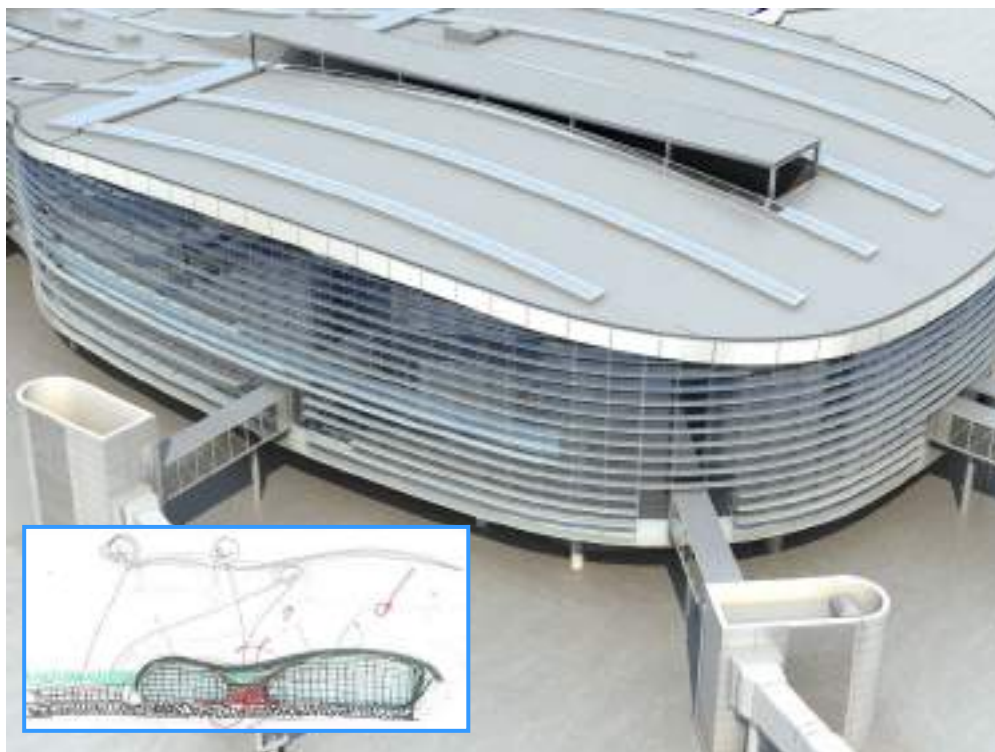
With regard to integrated design of airport buildings, especially, but not limited to, passenger's terminals, TECHNITAL's experience covers all levels of planning and design of civil works and MEP systems: from concept/preliminary design (terminal sizing and layout, aircraft apron layout, with or without boarding bridge) through to final and detailed design. Consultancy services have been provided in several countries among which: Romania (Bucharest), Armenia (Yerevan), Italy (Malpensa, Bergamo, Verona, Bari, Foggia, Bergamo), Albania (Tirana), Uruguay (Montevideo), Argentina (Buenos-Aires), Bosnia and Herzegovina (Sarajevo).

Among the most relevant assignments, TECHNITAL has carried out the design of Phase 3 rehabilitation and extension works for **Bucharest Otopeni Airport in Romania**. The project includes various terminal buildings, the control tower, a multi-level parking, baggage handling buildings, hangars, apron, taxiway, technical systems. The whole system of 3 Buildings (Departure Terminal, Arrival Terminal and Finger) is extended as a consequence of Romania's entry in Schengen area and to accommodate annual passenger traffic of 6 million in service category B (IATA classification). This involves (pictured below): 1) extension of the Finger Building (from 8,000 m² to 25,000 m²) and modification of the existing Fingers; 2) doubling of the Departure Terminal (from 19,500 m² to 39,000 m²); 3) restructuring of the Arrivals Terminal; 4) a new passenger parking.



3rd Phase of rehabilitation and extension works for Bucharest Otopeni Airport – Romania

The new arrival/departure terminal building of Otopeni was awarded in 2011 the European Award for Steel Structures assigned by ECCS (European Convention for Constructional Steelworks).



New Finger of Bucharest Otopeni Airport – Romania

TECHNITAL has designed many other airport buildings, among which the expansion of the terminals at Bergamo Orio al Serio (Italy), Verona Catullo (Italy), Montevideo (Uruguay) and Djibouti.



Concept design of expansion of Passengers Terminal of Bergamo Orio al Serio Airport – Italy

Services provided for airport buildings include tender support, technical assistance and works supervision.



Construction supervision of terminal buildings at Marco Polo Airport in Venice – Italy

TECHNITAL has also carried out several projects related to land-side roads and parking, among other: multi-level car parking and at-grade car parking at the Bucharest Otopeni Airport (Romania), at-grade car parking lot of the Milan Malpensa Airport (Italy), access roads and car-parks of the Bari Palese Airport (Italy) and of the Milan Linate Airport (Italy).



Multi-level car parking of Bucarest Otopeni Airport



At-grade car parking of Milano Malpensa Airport

TECHNITAL has also gained a long experience in military bases design.

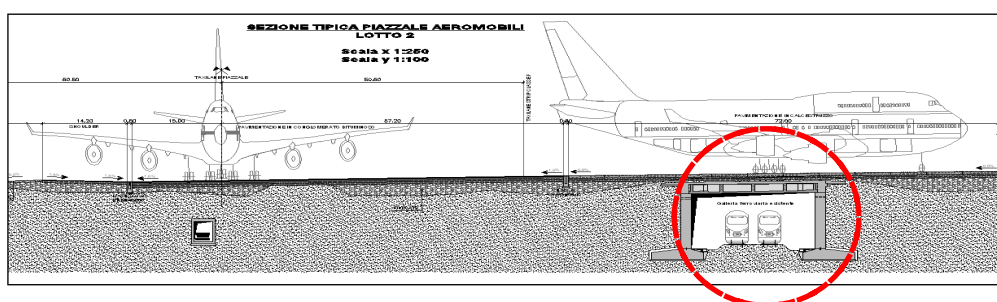
In Italy: Aviano (Aircraft Aprons, Runway, Taxiways, Electronic laboratory with EMP protection), Cameri (Engine workshop, semi-hardened SPBF - Squadron Pilot Briefing Facility), Cervia (AMX aircraft Maintenance hangar and workshop, semi-hardened SPBF), Crotone (NATO air base – redeployment 401 tactical fighter wing), Ghedi (Electronic laboratory with EMP protection, Ammunition igloo depot, refuelling and recovery Shelters MEF - Mine Enemies Fall), Gioia del Colle (shelters MEF), Istrana (Maintenance hangar and workshop), Montichiari (Ammunition igloo depot), Piacenza (Air base adjustment for the Tornado aircraft, Special aeronautic materials hardened Storage, semi-hardened SPBF, Electronic laboratory with EMP protection), Poggio Ballone (semi-hardened SPBF), Poggio Renatico (semi-hardened SPBF), Rimini (Shelters MEF), Thiene (New Visual Aids and new Flight facilities), Treviso (AMX aircraft Maintenance hangar and workshop, Housing building), Villafranca (Shelters MEF, semi-hardened SPBF).

Abroad: Ali al Salem air base - Kuwait (hardened aircraft shelters), Poland (16 hardened aircraft shelters to accommodate 3rd generation NATO aircrafts), Russia (russian aircraft shelters upgrade to meet Nato 3rd generation aircraft shelters), Al-Udeid air base - Qatar.



3rd generation NATO hardened aircraft shelters

With regard to railway/mass transit systems serving airports, TECHNITAL has carried out among other two projects for the Milan Malpensa Airport (new railway station in front of terminal T2, and railway link between terminals T1 and T2, and underground railway tunnel under the cargo apron), and for the Bari Palese Airport (2 railway-stations, 1 transit building and railway link) in Italy.



Underground railway tunnel of Milano Malpensa Airport (Italy)

Other significant projects in the airport sector include:

- ✧ Trieste Airport – Air-side pavements, access roads and parking, control tower and operational services building, water supply, sewage, visual aids, lighting – Italy
- ✧ Ancona Airport - Air-side pavements, access roads and parking, water supply, and sewage system – Italy
- ✧ Bergamo Airport - Air-side pavements and visual aids, water supply, drainage, sewage system, fire and rescue building and first aid and Fire Brigade building – Italy
- ✧ Khartoum Airport – All airport infrastructures – Sudan
- ✧ Taranto Manduria Airport – Passengers and Cargo Terminals and runway enlargement – Italy
- ✧ Herat Airport – Feasibility Study for the upgrade to ICAO standards - Afghanistan
- ✧ New Logar Airport – Feasibility Study - Afghanistan
- ✧ New Nangharar Airport – Feasibility Study - Afghanistan
- ✧ Pisa Airport – Apron and access roads – Italy
- ✧ Rimini Airport – Apron, access roads, lighting, water supply, sewage system – Italy
- ✧ Barcelona Milazzo Airport – Feasibility Study for a Class A airport – Spain
- ✧ Verona Villafranca Airport – Air-side pavements, new passenger terminal, fire and rescue building, water supply, sewage system, visual aids, lighting, access roads and parking - Italy
- ✧ Vicenza Airport – Master plan in order to open to civil air traffic (3 alternatives) – Italy

Services provided by TECHNITAL include:

1. Consulting
 - } Technical-economic feasibility studies
 - } Time and cost analyses
 - } Socio-economic analyses
 - } Transportation system planning
2. Design
 - } Preliminary and final design of infrastructures for both land-side and air-side, including primarily civil and military airports
 - } Preliminary and final architectural design
 - } Preliminary and final design of electrical and mechanical installations
 - } Technical specifications, contracts, construction planning, cost estimates
 - } Tender documents preparation
3. Supervision
 - } Construction management and supervision
 - } Technical assistance during tender phase
 - } Works supervision

The following table and related project 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			
AIRPORTS						
Consultancy Services for Feasibility Study for Nangahrar International Airport - Afghanistan	Afghanistan Civil Aviation Authority (ACAA)	11/2019	08/2021	Feasibility Study, Preliminary Design	781,000	180,000,000
Consultancy Services for Feasibility Study for Logar International Airport - Afghanistan	Afghanistan Civil Aviation Authority (ACAA)	05/2019	08/2021	Feasibility Study, Preliminary Design	804,197	195,000,000
Requalification of the Taxiway “Tango” and Other Air-Side Facilities at “Valerio Catullo” Airport – Italy	Aeroporto Valerio Catullo di Verona Villafranca S. p. A	06/2015	06/2019	Preliminary and Detailed Design, Supervision of Construction Works of taxiway and other airside facilities	682,031	14,155,000
Consultancy Services for Feasibility Study for Herat International Airport - Afghanistan	Afghanistan Civil Aviation Authority (ACAA)	05/2018	02/2019	Feasibility Study	746,992	39,000,000
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
New international airport of Djibouti – Republic Djibouti	Ministry of Equipment & Transport	12/2010	05/2011	Pre-Feasibility Study of new airport	Pro bono, estimated cost of services € 220,000	Confidential
International Airport of Milan Malpensa - New Cargo Apron	S.E.A. S.p.A.	01/2008	04/2010	Final and Detailed Design	255,000	21,700,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Airport railway Stations and railway link between Bari Palese Airport and Bari Town Center - Italy	DEC - Degennaro Costruzioni, in association with IPA Precast	09/2008	06/2009	Detailed Design	700,000	52,212,000
Development Plan and Design of the General Aviation Area of Milan-Linate Airport - Italy	ATA – Ali Trasporti Aerei S.p.A.	08/2007	04/2009	Development Plan, Preliminary and Final Design	275,000	30,139,000
Hydrologic, Geotechnical and Hydraulic Studies and Campaign for Pontecagnano Airport – Italy	Aeroporto di Salerno S.p.A.	07/2007	08/2008	Hydrologic, geotechnical and hydraulic studies	90,000	4,290,000
New underground Railway Tunnel for the new cargo city of Milan Malpensa Airport – Italy	S.E.A. S.p.A.	06/2006	01/2008	Detailed Design	145,380	12,900,000
Taxiway W extension for Milan Malpensa international airport - Italy	S.E.A. S.p.A.	01/2005	12/2007	Final and Detailed Design	236,110	11,490,000
Development of Zwartkops International Airport (Yerevan): Technical Assistance - Armenia	Armenia International Airports – CJSC - EBRD	07/2006	06/2007	Technical Assistance	80,000	n.a.
Master Plan of Pontecagnano Airport – Italy	Giorgiofossa S.A.S.	10/2006	02/2007	Master Plan, Economic and Financial Plan	59,400	28,020,000
New Military Al-Udaid Airbase - Qatar	Rizzani De Eccher SpA	11/2003	04/2006	Master Plan, Preliminary, Final and Detailed Design	972,800	Confidential
Technical Assistance for New Airport of Agrigento Valle dei Templi - Italy	Aeroporto Agrigento Valle dei Templi S.p.A	01/2005	11/2005	Technical Assistance, Preliminary Design	n.a.	n.a.

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Airside Infrastructures of New Airport of Agrigento Valle dei Templi - Italy	Aeroporto Agrigento Valle dei Templi S.p.A.	09/2003	09/2004	Final Design	231,000	63,000,000
New Airport of Agrigento Valle dei Templi, serving Southern-central Sicily - Italy	Aeroporto Agrigento Valle dei Templi S.p.A.	11/2002	03/2003	Master Plan, Pre-Feasibility Study, Preliminary Design	100,000	110,000,000
Master Plan of Alghero Fertilia Airport - Italy	S.E.A. S.p.A.	06/2002	08/2002	Master Plan	60,000	n.a.
Development study of international airport of Milan Malpensa - Italy	S.E.A. S.p.A.	04/2002	07/2002	Technical Feasibility Study	49,000	n.a.
International airport of Nosy Be – Madagascar	Viaggi del Ventaglio S.p.A.	04/2002	06/2002	Feasibility Study	8,500	3,000,000
Aeronautical servitudes on neighbouring towns at Milan Linate Airport - Italy	S.E.A. S.p.A.	05/2002	05/2002	Identification of aeronautical servitudes	n.a.	n.a.
Master Plan, Runway Visual Aids, Aircraft Apron, Passenger Terminal (building and area) of Carrasco international Airport of Montevideo - Uruguay	D.G.I.A. (Direccion General de Infraestructura Aeronautica)	09/2001	02/2002	Master Plan, Preliminary Design Detailed Design	1,050,000	77,800,000
Master plan, new runway, aircraft apron, and control tower of Ezeiza international airport, Buenos Aires – Argentina	Aeropuertos Argentinos 2000 S.A.	10/2000	10/2001	Master Plan, Preliminary Design	674,300	1,480,400,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Master Plans of 8 airports: Paraná, Rio Cuarto, Villa Reynolds, General Pico, Reconquista, Formosa, Catamarca, Rio Grande – Argentina	Aeropuertos Argentinos 2000 S.A.	11/1999	02/2000	Master Plan, Environment Studies	220,000	152,870,000
Master plan for the international airport of Cordoba, new Terminal of Cordoba and expansion of Terminals of 2 Buenos Aires Airports - Argentina	Aeropuertos Argentinos 2000 S.A.	08/1999	08/2000	Master plan, Environment Studies	75,000	390,000,000
Master Plans of 5 airports: Bariloche, Comodoro Rivadavia, Iguazu, Mar del Plata, Mendoza – Argentina	Aeropuertos Argentinos 2000 S.A.	07/1999	02/2000	Master plan, Environment Studies	140,000	321,130,000
Jorge Chavez international airport in Lima – Perú	S.E.A. S.p.A.	07/1999	09/1999	Master Plan, Traffic Forecasts, Environmental Study, Business Plan	n.a.	744,300,000
Renewal of G. Lisa airport in Foggia for year 2000 jubilee – Italy	S.E.A. S.p.A.	12/1998	08/1999	Final Design	70,700	3,664,000
International airport of Sarajevo – Bosnia & Herzegovina	S.E.A. S.p.A.	07/1998	12/1998	Master Plan Preliminary Design	31,000	21,400,000
Master Plan and Passengers Terminals of Ezeiza International airport in Buenos Aires – Argentina	S.E.A. S.p.A.	07/1998	11/1998	Master Plan, Preliminary Design	93,000	53,300,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Master Plan of Carrasco international airport of Montevideo – Uruguay	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
17 airports master plan and design of a civil aviation. technical assistance and training programme - Romania	Romanian Ministry of Transport - Bucharest	09/1996	05/1997	Feasibility Study, Concept and Preliminary Design. Economic and Financial Analysis, Technical Assistance	414,000	n.a.
Airside Facilities and Visual Aids of Carrasco international airport – Uruguay	P.N.U.D. (Programa de las Naciones Unidas para el Desarrollo) D.G.I.A. (Direccion General de Infraestructura Aeronautica)	06/1995	09/1996	Master Plan, Feasibility Study and Detailed Design	800,000	48,000,000
Bridges and Subways at Milan Malpensa Airport - Italy	Italaairport S.p.A.	10/1991	12/1991	Detailed Design	37,700	n.a.
Sewer and Drainage System of the Milan Malpensa Airport - Italy	Italaairport S.p.A.	06/1990	10/1991	Detailed Design	18,500	n.a.
Airbases of Ghedi and Montichiari: various air/land side infrastructures - Italy	Cogei S.p.A.	09/1990	04/1991	Detailed Design	78,700	6,300,000
Adaptation of the military airport for a new civil airport at Vicenza Airbase - Italy	Italaairport S.p.A. (Final Design) Aeroporti Vicentini S.p.A. (Construction Supervision)	05/1990	12/1990	Final Design and Works Supervision	62,000	n.a.

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Sewer-Water Systems of Milan Malpensa Airport - Italy	Italairport S.p.A.	03/1989	10/1990	Detailed Design	5,200	n.a.
Air-side Pavements of Ushuaia airport - Argentina	Italairport S.p.A.	01/1989	12/1989	Air-side Pavements Design	n.a.	n.a.
Airbase of Piacenza: airbase adaptation to tornado aircraft - Italy	ISE Costruzioni S.p.A.	10/1988	10/1989	Detailed Design	62,000	n.a.
AIRPORT TERMINALS						
Expansion and requalification of the Departure Terminal of "Valerio Catullo" Airport - Italy	Aeroporto Valerio Catullo di Verona Villafranca S.p.A.	01/2017	Ongoing	Final and 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, Final and Detailed Design, Works Supervision	817,685	25,735,000
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.	04/2018	11/2020	Works Supervision	793,025	18,577,918
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, MEP testing and commissioning	555,024	17,736,223
Expansion of the passenger terminal of Djibouti Airport, detailed design - Djibouti	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
Malpensa T2 Link-Up - New Railway Station at Terminal 2 (Lot 1) and Railway Link T1-T2 (Lot 2) - Malpensa Airport	S.E.A. S.p.A.	04/2012	07/2013	Final Design	336,300	92,442,700
3 rd phase of development interventions (buildings and air/land-side pavements) of the Otopeni international airport of Bucharest - Romania	ROMAIRPORT S.r.l.	06/2008	12/2011	Preliminary, Final and Detailed Design	945,000	93,460,000
Hardened armoured decompression Chambers to baggages and goods control for Milan Malpensa Airport - Italy	S.E.A. S.p.A.	11/2003	11/2006	Feasibility Study Preliminary Design, Final and Detailed Design	30,500	338,400
New parking and service road for Milan Malpensa International Airport - Italy	S.E.A. S.p.A.	11/2004	05/2005	Preliminary, Final and Detailed Design	95,000	4,150,000
16 Hardened Shelters for third generation aircraft for NATO Military Airbase of Poznam - Poland	C.C.A. Cimolai S.p.A.	09/2004	03/2005	Final and Detailed Design	45,000	22,000,000
Control Tower of the Otopeni international airport of Bucharest (2 nd phase of development) - Romania	Romairport S.r.l.	04/2004	07/2004	Preliminary and Final Design	16,000	2,000,000
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

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
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
2 nd phase of development interventions (buildings and air-side pavements) of Bucharest Otopeni Airport – Romania	S.E.A. S.p.A.	12/1999	05/2002	Preliminary and Final Design	77,480	80,000,000
Passengers Terminal of Zwartnoots International Airport (Yerevan) – Armenia	Aeropuertos Argentinos 2000 S.A. / Armenia International Airports – CJSC	12/2000	02/2001	Concept Design	n.a.	25,700,000
Airbase of Istrana: Aircraft Recovery and Maintenance Hangar - Italy	Aeronautica Militare - 1° Reparto operativo infrastrutture Milano	06/2000	09/2000	Detailed Design	39,200	2,000,000
Terminal area Master Plan and Passengers Terminal of Aeroparque international airport of Buenos Aires – Argentina	S.E.A. S.p.A.	11/1998	03/1999	Master Plan layout, Feasibility Study	n.a.	22,300,000 (civil works only)
New passenger terminal building, BHS system, access roads / parkings & sewerage system for international airport of Bari Palese – Italy	Italaairport S.p.A.	08/1997	06/1998	Detailed Design	258,200	13,200,000
1 st phase of development interventions (buildings and air-side pavements) of Bucharest Otopeni Airport – Romania	S.E.A. S.p.A.	09/1994	02/1997	Preliminary and Final Design	311,000	147,700,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Structural and Civil Shop Drawings for New Terminal Building of International Airport of Milan Malpensa – Italy	S.E.A. S.p.A.	11/1995	12/1996	Detailed Design	51,600	2,500,000
Airbases of Piacenza and Ghedi: Electronic Laboratory with EMP protection - Italy	Ministero della Difesa – Direzione Demanio della 1a Regione Aerea	04/1991	12/1996	Technical Assistance to Works Supervision	88,800	n.a.
New passenger terminal building, and access roads for the international airport of Bari Palese – Italy	S.E.A. S.p.A.	10/1996	11/1996	Preliminary Design	6,200	n.a.
Passengers Terminal of Tirana Rinas international airport – Albania	S.E.A. S.p.A.	05/1996	07/1996	Preliminary and Detailed Design	20,700	2,000,000
Railway station at Terminal 1 in Milan Malpensa Airport - Italy	S.E.A. S.p.A.	12/1994	12/1995	Design Verification	8,200	n.a.
Master Plan, Buisness Plan and Passenger Terminal of Raduzhnyj airport - Russia	Saltra S.A. Financing Agency: Raduzhny OIL Company	11/1993	05/1994	Feasibility Study, Business Plan, Master Plan, Preliminary Design	12,900	59,600,000
New Passenger Terminal at Milan Malpensa Airport - Italy	Italaairport S.p.A.	10/1992	11/1992	Detailed Design	21,400	n.a.
Buildings architectural surveys at Milan Malpensa Airport - Italy	Italaairport S.p.A.	09/1992	10/1992	Airport buildings relief	7,000	n.a.
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

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
New U.S.A.F. Airbase of Crotona: Aircraft Maintenance Facilities - Italy	Airsystem S.r.l.	07/1990	09/1992	Preliminary Design	312,000	n.a.
Airbase of Cervia: Aircraft maintenance Hangar - Italy	A.I.A. Costruzioni S.p.A.	10/1991	01/1992	Detailed Design	60,000	n.a.
Airbase of Villafranca: semi-hardened S.P.B.F. (Squadron Pilot Briefing Facility) - Italy	Cormio Engineering S.r.l.	05/1991	09/1992	Detailed Design	15,500	n.a.
Airbase of Piacenza: Mess Hall - Italy	Costruzioni Perregrini S.r.l.	09/1990	01/1992	Detailed Design	12,000	n.a.
Airbase of Piacenza: semi-hardened S.P.B.F. (Squadron Pilot Briefing Facility) - Italy	L.I.E.S. S.r.l. and S.E.C. S.r.l.	03/1991	09/1991	Detailed Design	77,500	n.a.
Airbase of Rivolto: semi-hardened S.P.B.F. (Squadron Pilot Briefing Facility) - Italy	Impresa Presotto S.p.A.	02/1991	09/1991	Detailed Design	16,500	n.a.
Airbase of Aviano: 2 Runways and 3 Aircraft Apron - Italy	Travanut Strade S.p.A.	10/1990	09/1991	Assistance during Construction	18,600	n.a.
Airbase of Ghedi: Ammunition Igloo Depot - Italy	Gelfi Costruzioni S.p.A.	02/1991	05/1991	Detailed Design	25,800	n.a.
Airbase of Cervia: semi-hardened S.P.B.F. (Squadron Pilot Briefing Facility) - Italy	A.I.A. Costruzioni S.p.A.	10/1990	01/1991	Detailed Design	16,500	n.a.
Cargo Terminal of the Milan Malpensa Airport - Italy	Italaairport S.p.A.	10/1990	12/1990	Detailed Design	35,600	n.a.
Airbase of Ghedi: ASM, MEF programs physical protection works -Italy	Ministero della Difesa - Direzione del Genio - 5qa divisione	05/1989	11/1990	Preliminary and Detailed Design, Tender Documents	182,600	n.a.

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Kuwait Airbase: Master Plan and Hardened aircraft Shelters - Kuwait	Italairport S.p.A.	11/1989	09/1990	Master Plan, Preliminary Design	41,800	n.a.
Passenger Terminal of Airport of S. Martin - Antilles	Italairport S.p.A.	12/1989	08/1990	Preliminary and Final Design	15,000	n.a.
Railway station at Terminal 1 and building expansions in Milano Malpensa Airport - Italy	Italairport S.p.A.	07/1989	07/1990	Detailed Design	53,700	n.a.
Airbase of Poggio Ballone: hardened operative building with E.M.P. protection - Italy	Italairport S.p.A. and Airsystem S.r.l.	06/1989	01/1990	Preliminary and Detailed Design	28,400	n.a.
Airbase of Aviano: Electronic Laboratory with EMP protection - Italy	Italairport S.p.A.	07/1988	12/1989	Preliminary and Detailed Design	55,500	n.a.
Passenger Terminal of Trento airport - Italy	Italairport S.p.A.	01/1989	12/1989	Detailed Design	n.a.	n.a.
Airbase of Piacenza: Electronic Laboratory with EMP protection - Italy	Italairport S.p.A.	10/1988	10/1989	Detailed Design	8,200	n.a.
Airbase of Ramstein: 12 Aircraft Shelters - Germany	Costruzioni Cimolai Armando S.r.l.	02/1989	09/1989	Detailed Design	20,700	n.a.
Airbases of Ghedi and Gioia del Colle: n.2 Electronic Laboratory with EMP protection - Italy	Italairport S.p.A.	11/1988	09/1989	Technical Assistance, Detailed Design	4,100	n.a.
Airbase of St. Mawgan: 9 Aircraft Shelters - U.K.	Costruzioni Cimolai Armando S.r.l.	10/1988	07/1989	Detailed Design	38,700	n.a.
Airbase of Cameri: Engine Workshop - Italy	Ministry of Defence - Direzione Demanio della 1a Regione Aerea	11/1988	02/1989	Design Review	16,500	n.a.

Appendix A – Company's Experience

Airports

FEASIBILITY STUDY FOR LOGAR INTERNATIONAL AIRPORT

Location:	Logar Province, Afghanistan
Client:	Afghanistan Civil Aviation Authority (ACAA)
Services:	Feasibility Study of air-side and land-side infrastructures, Preliminary Design
Period:	05/2019 – 08/2021
Construction cost:	Euro 195,000,000

Project Description:

The main objective of the study is to develop a greenfield international airport to fulfil the future traffic demand of the capital city Kabul as well as the central zone of the country, provided that the capacity of the existing Hamid Karzai airport cannot be expanded due to its location within the urban area of Kabul.

The new airport site has been studied as indicated by the Client (ACAA) within an available land area of approx. 30 Km² in the Logar Province, about 38 Km south of Kabul capital, and 3 km far to the east of Kabul-Gardez Highway.



The Feasibility Study includes the following tasks:

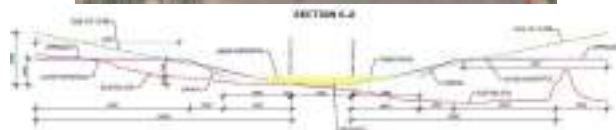
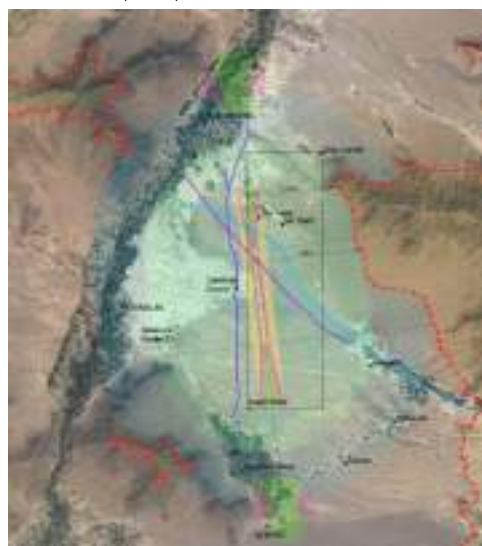
- Airport site selection. 6 alternative options have been studied as to runway location and orientation, taking into account all relevant factors (orography, wind, geology, hydrology, impacts on built-up areas, etc.)
- Airport lay-out study, preliminary/conceptual design for the new airport, including air-side infrastructures (runway, taxiway, aprons, traffic control tower) and land-side infrastructures (passenger and cargo terminals, access roads and parking)
- Social Study, including interviews to local communities and social mitigation measures
- Economic Study, including traffic projections over a period of 30 years from 2035 (operating phase year 1) to 2064 (operating phase year 30), assessment of economic and financial viability
- Environmental Study, including assessment of environmentally sensitive issues and proposed mitigation measures
- Topographic survey over the selected airport site
- Geotechnical and Hydrological study, including field and laboratory investigations to assess soil properties and groundwater levels
- Construction cost estimates



The selected option for the runway allows to minimize the impacts and is consistent with ICAO standards concerning obstacle limitation surfaces. The designed airport (reference code 4E) allows to manage a passenger traffic of 4 million pax/year and includes the following main works:

- Runway 3,500 m x 45 m (+ 7.5 m paved shoulders), R.E.S.A. 240 x 150 m
- Taxiway 3,500 m x 44 m, and connections with runway and apron

- Passenger Apron (255,000 m²): 10 stands class C (push back procedure), 6 stands class D/E in mixed configuration (12 stands C) (self-maneuvring)
- Cargo Apron (81,100 m²): 3 stands class D/E (self-maneuvring)
- General Aviation Apron (13,920 m²): 4 stands class B (self-maneuvring)
- Control Tower (30 m high)
- Passenger Terminal (21,400 m²) including departures hall, arrivals hall, facilities, safety and security controls, commercial areas
- Cargo Terminal (6,300 m²)
- General Aviation Terminal (200 m²)
- Customs office (1,000 m²)
- Fire Station (1,500 m²)
- Aircraft maintenance Hangar (8,000 m²)
- Service vehicle hangar (1,200 m²)
- NavAids (VOR/DME, ALS, SALS, ILS, PAPI, aerodrome beacon)
- Power supply – water supply – drainage system
- Terminal parking (98,800 m²): short-term car parking 950 lots, long-term parking 2500 lots, taxi lanes, bus station 20 parking lots, parking areas reserved to military authority and police, parking area reserved to airport staff
- Cargo parking (4,400 m²)
- Perimeter road and fencing
- Access road (9 Km)



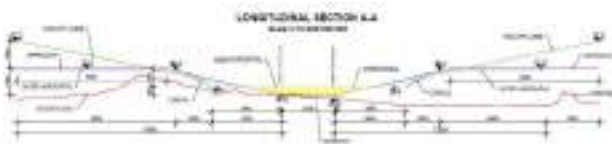
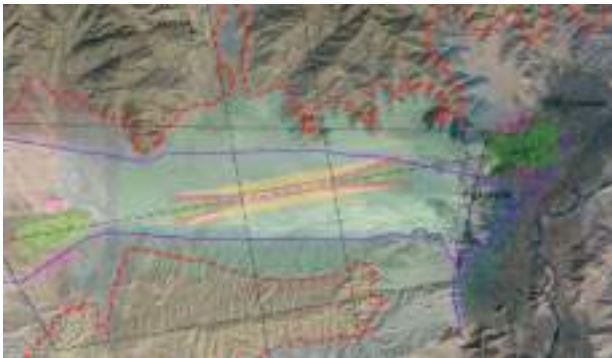
FEASIBILITY STUDY FOR NANGARHAR INTERNATIONAL AIRPORT

Location:	Nangarhar Province, Afghanistan
Client:	Afghanistan Civil Aviation Authority (ACAA)
Services:	Feasibility Study of airside and land-side infrastructures, Preliminary Design
Period:	11/2019 – 08/2021
Construction cost:	Euro 180,000,000

Project Description:

The main objective of the study is to develop a greenfield international airport in accordance with ICAO standards to fulfil the future traffic demand of the Eastern zone of the country, and to contribute to the economic growth of that region.

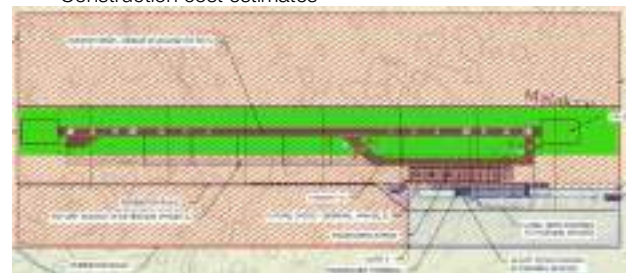
The existing airport in Jalalabad, capital city of the Nangarhar province, is only used for military purposes, and this zone of the country is currently making use of Hamid Karzai International Airport in Kabul which is about 200 Km away. Two alternative locations close to Jalalabad have been studied for the site of the new civil airport: Dasht-e-Gambiri in Kama (Khiwa) district (30 Km North of the city) and Enzari desert (Daag) in Roundaat district (25 Km East of the city).



The Feasibility Study includes the following tasks:

- Airport site selection. For both the alternative locations, 4-5 different options as to runway location and orientation have been compared, taking into account all relevant factors (orography, wind, geology, hydrology, impacts on built-up areas, ground accessibility, etc.). Based on a multi-criteria approach, Khiwa has been selected as the most suitable site.
- Airport lay-out study, preliminary/conceptual design for the new airport, including air-side infrastructures (runway, taxiway, aprons, traffic control tower) and land-side infrastructures (passenger terminal, access roads and parking)
- Social Study, including interviews to local communities and social mitigation measures
- Economic Study, including traffic projections over a period of 30 years from 2030 (operating phase year 1) to 2059 (operating phase year 30), assessment of economic and financial viability
- Environmental Study, including assessment of environmentally sensitive issues and proposed mitigation measures
- Topographic survey over the selected airport site

- Geotechnical and Hydrological study, including field and laboratory investigations to assess soil properties and groundwater levels
- Construction cost estimates



The selected option (08/26 oriented) for the runway allows to minimize the impacts and is consistent with ICAO standards concerning obstacle limitation surfaces. The designed airport (reference code 4E) allows to manage a passenger traffic of 500,000 pax/year and includes the following main works:

- Taxiway 1,050 m x 44 m, and connections with runway and apron
- Passenger Apron (112,500 m²): 6 stands class C (2 push back procedure, 4 self-manoeuvring), 3 stands class D/E or 6 stands class C in mixed configuration (push back procedure)
- Control Tower (30 m high)
- Passenger Terminal (4,580 m²) including departures hall, check-in desks and queue area (traditional, self-service and baggage drop), security check (X-ray control), departure lounges and gates, arrivals hall, baggage claim area, arrival customs, facilities
- Fire Station (450 m²)
- Aircraft maintenance Hangar (8,000 m²)
- Service vehicle hangar (1,200 m²)
- Nav aids (VOR/DME, ALS, SALS, ILS, PAPI, aerodrome beacon)
- Power supply – water supply – drainage system
- Terminal parking: short-term car parking (6000 m², 65 lots), long-term parking (25700 m², 775 lots), taxi and bus stop in front of the Terminal
- Perimeter road and fencing
- Access road (5.4 Km)



REQUALIFICATION OF THE TAXIWAY “TANGO” AND OTHER AIRSIDE FACILITIES AT “VALERIO CATULLO” AIRPORT

Location:	Verona, Italy
Client:	Aeroporto Valerio Catullo di Verona Villafranca S. p. A
Services:	Preliminary and Final Design, Works Supervision of taxiways and other airside facilities
Period:	06/2015 – 10/2017 (Design); 09/2018 – 05/2019 (Construction Supervision)
Construction cost:	Euro 14,155,000

Project Description:

The Verona Airport is strategically located in North-eastern Italy and serves an area with a social and economic development among Europe's highest. It is also significant for the tourist industry, accommodating domestic as well as international tourism drawn in by various cultural prospects. During the year 2012 Verona airport handled 3.2 million passengers (around 40000 flights), confirming its international position.



The taxiway “Tango” has a length of 2500 m and is located N-W parallel to the runway (04/32) at 190 m spacing, on the opposite side with respect to the Passenger Terminal. It has a paved width of 22 m (18 m + 2 paved shoulders of 2 m each) and can handle up to ICAO class ‘C’ aircraft, as well as class ‘D’ aircraft with outer main gear wheel span up to 9 m such as B757.

The taxiway is provided with several orthogonal connectors; the taxiway connectors ‘B’ and ‘F’ located at the two ends are operational for civil aircraft.

The taxiway pavement is of composite type, consisting of:

- concrete slabs on the taxiway connectors ‘B’ and ‘F’ with presence of asphalt in the subgrade
- rigid pavement (concrete slabs) overlaid by bitumen concrete along most of the taxiway length.

The pavement of the taxiway is deteriorated due to time and traffic, showing a high level of distress with intensive surface cracking. Analysis carried out by the Airport Authority have shown a residual service life of 2 years hence urgent rehabilitation works are needed. The project's objectives are:

- pavement requalification for taxiway “Tango” and connectors B and F to the following standards:
 - service life beyond 2030, in compliance with the Airport Development Plan
 - traffic foreseen in 2030: 5.6 million passengers, 42000 flights/year
 - traffic on the taxiway at least 60% of the take-off manoeuvres, out of which 90% in class C
 - visual aids suitable for Cat. IIIB, LVTO
- new Turn Pad at the runway end for class ‘F’ aircraft
- rectification of taxiway alignment deficiencies
- requalification and expansion of RESA (runway end safety area) including aeronautical ground lighting, to comply with international standards

- completion of pavement of connectors ‘Nora’ and ‘Nally’ linking the taxiway ‘Tango’ to the existing Air Force apron located N-W of the taxiway.

A major design constraint is the need to minimize the operational impact of the works i.e. the interference of the construction worksite with the flying activities, as today 20% of the take-off manoeuvres are being performed taxiing through “Tango”.

The selected approach for the rehabilitation of taxiway and connectors consists in the full reconstruction over a 18 m width through the following steps:

- removal of upper bitumen concrete layer and of concrete slabs
- placement of a 26 cm sub-base layer of cement-bound granular material produced through re-use of the removed and milled structural concrete with possible addition of aggregates
- placement of high performance bitumen concrete up to design level (12 cm base course, 7 cm intermediate course, 5 cm wearing course).



The pavement requalification through in-situ recycling to the highest possible rate of the materials coming from demolitions and/or subgrade layers is of paramount importance in the design. Such environmental and energy-saving goal is achieved through a detailed investigation programme including field and laboratory tests. The recycled materials are suitably processed and mixed depending on the layer and the structural requirement they must comply with. Possible additional supply of aggregates is based upon the correction of the grain size distribution curve.



FEASIBILITY STUDY FOR HERAT INTERNATIONAL AIRPORT

Location:	Herat, Afghanistan
Client:	Afghanistan Civil Aviation Authority (ACAA)
Services:	Feasibility Study of air-side and land-side infrastructures
Period:	05/2018 – 02/2019
Construction cost:	Euro 29-37,000,000 for 1 st Phase, Euro 31-39,000,000 for 2 nd Phase (depending on design option)

Project Description:

The Herat Airport is located in the Western region of Afghanistan, approximately 10 km south of Herat, the country's third largest city.

Currently, the airport manages about 350,000 passengers per year, and the airport management and the maintenance of the airfield are performed by the NATO forces under Italian Command.

The project's objective is to upgrade the infrastructures so as to raise the airport from a regional to a fully-fledged international airport, compliant with International Civil Aviation Organisation (ICAO) standards, and capable of handling the estimated future traffic in excess of 1,000,000 passengers per year.

The Feasibility Study includes the following tasks:

- Airport lay-out study, preliminary/conceptual design and comparison of alternative options for the airport upgrade, including air-side infrastructures (runway, taxiway, aprons, traffic control tower) and land-side infrastructures (passenger and cargo terminals, access roads and parking)
- Social Study, including interviews to local communities and social mitigation measures
- Economic Study, including traffic projections over the next 20 year period (up to year 2040), assessment of economic and financial viability
- Environmental Study, including assessment of environmentally sensitive issues and proposed mitigation measures
- Geotechnical and Hydrological study, including field and laboratory investigations to assess soil properties and groundwater levels
- Construction cost estimates

The Consultant has studied 4 alternative options for the airport upgrade, considering two phases of development. The main works envisaged are the following:

1st Phase – urgent works to comply with ICAO standards (reference code assumed 4E) and manage a passenger traffic of 1 million pax/year

- Construction of a new runway 3,150 m (or 3,390 m) x 45 m x 60 m clearway + R.E.S.A. 240 x 150 m. The runway can be constructed without interfering with air traffic
- Construction of new connections with runway, taxiway, apron



- Refurbishment of existing civil apron, enlargement and repaving, for commercial and cargo aircraft (12 stands class C or 6 stands class D/E in mixed configuration)
- Construction of a new fire station
- Nav aids (VOR/DME, ALS, SALS, ILS)
- Modernization and rationalization of the existing terminal building, including 600 sqm expansion
- Power supply (20 KV electric substation) – Electric generator – electric UPS, water supply, drainage system
- Construction of a new Control Tower, and repaving of existing runway 3,000 m x 45 m to be reused as taxiway (related works to be carried out by NATO)



2nd Phase – airport expansion in the north-east area and strengthening of air side and land side infrastructures with an increase in air traffic to over 1.5 million pax/year (from 20 to 30 aircraft movements/day).

- Construction of a new taxiway for ICAO class E aircraft
- Construction of a new terminal of about 18,050 sqm including departures hall, arrivals hall, facilities, safety and security controls, commercial areas
- Power supply – water supply – drainage system
- New apron with 14 stands in class C or 5 stands in class D/E in mixed configuration
- New car park for about 800 car stands
- New road connection to highway A1
- Re-use of the 1st Phase taxiway and apron for cargo traffic
- Conversion of the 1st Phase terminal into office building



DESIGN AND CONSTRUCTION SUPERVISION FOR THE EXPANSION OF THE NORTHERN AIRCRAFT APRON OF ORIO AL SERIO AIRPORT

Location:	Bergamo, Italy
Client:	SACBO S.p.A.
Services:	Final and Detailed Design, Works Supervision
Period:	05/2017 – 10/2017 (Design); 05/2018 – 01/2019 (Construction Supervision)
Construction cost:	Euro 15,575,000

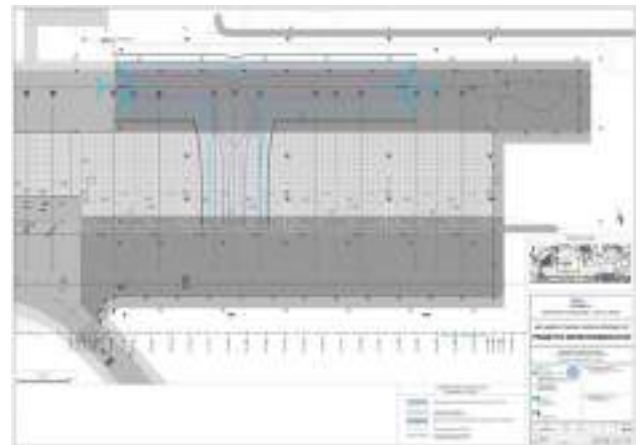
Project Description:

The Project constitutes the final/detailed stage of development of the design performed in compliance with the Airport Development Plan, particularly with works included in the Four-Year Plan 2016-2019.

Main objective of the North Apron expansion is the realization of 8 parking stands for class C (according to ICAO standards) aircraft, which can be used as 4 stands in class D/E in mixed configuration. In addition, the project includes the realization in the north-east area of a dedicated lay-by for engine tests that will be used by self-maneuvering aircraft up to class C (according to ICAO standards), and by D/E aircraft in push-back operation.

The designed works will increase the capacity of the North Apron which currently includes 6 parking stands for class C aircraft, that can be used as 3 stands in class D/E in mixed configuration. The design was performed adopting cutting-edge technologies and systems and aiming at the optimization of the available areas. Particular attention has been paid to:

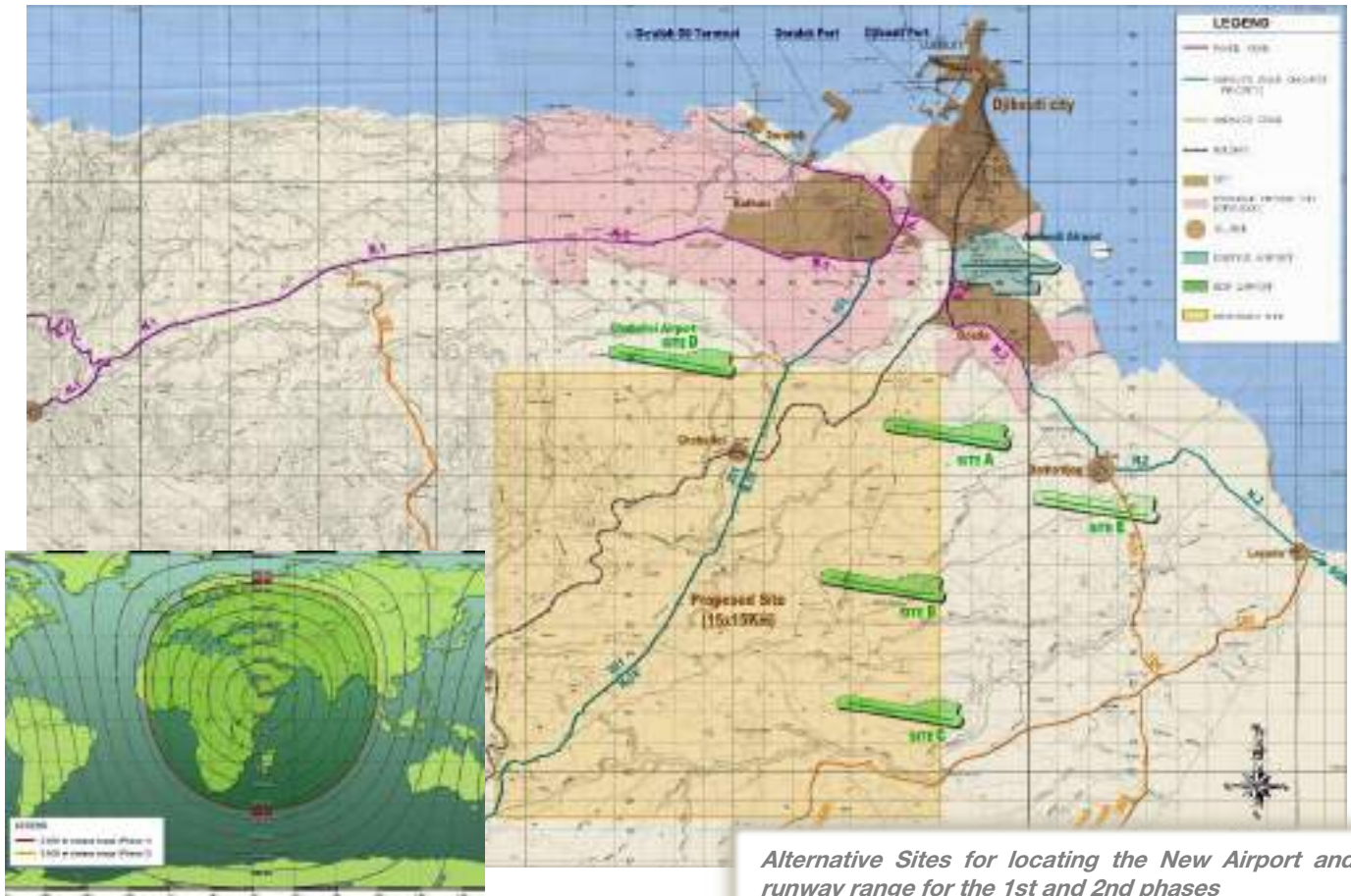
- Harmonize the designed infrastructures with the existing ones
- Optimize the construction sequence in order to minimize duration and interference with airport operations
- Ensure safety of the worksite and of third parties at all construction phases
- Introduce innovative technologies for materials and systems



NEW INTERNATIONAL AIRPORT OF DJIBOUTI

Location:	Djibouti - Republic of Djibouti
Client:	Ministry of Equipment & Transport - Republic of Djibouti
Services:	Pre-feasibility Study and new airport Master Plan
Period:	12/2010 - 05/2011
Construction cost:	Confidential

Project Description:



Alternative Sites for locating the New Airport and runway range for the 1st and 2nd phases

The implementation of a new International Airport is of strategic importance for Djibouti, in view of the opportunity to play a major role as *hub* for the air-sea transit and regional platform for redistribution of freight across the East African sub-region. The Client indicated a large area of land made available for the new airport, consisting in a 225 Km² area south-west of Djibouti City, and provided the reference traffic scenario for the design of 2 million passengers/year.



Apron and Terminal Areas Layout (Phase 2)

The Study involved the following activities:

- Identification of alternative sites for the new airport, comparative evaluation with regard to different aspects (geology, topography, aeronautical procedures and obstacles, accessibility, environmental constraints, construction cost, etc.) and selection of the most suitable site;
- Based on the analysis of the traffic data at the existing airport, estimation of the reference traffic scenario for dimensioning the airport in the first operation period (Phase 1), as appropriate for a prudent schedule of the investments;
- Design of the airport layout with regard to the short-term (Phase 1), and subsequent development of facilities to meet the long-term traffic demand (Phase 2). Runway orientation was defined based on the available wind records in such a way to obtain an adequate usability factor and at the same time minimizing the orographic obstacles.

The proposed airport includes the following facilities:

- Runway L=2,800 m in Phase 1, with an operational capacity adequate to serve a range of 6.000 Km (3,250 NM) which allows non-stop direct flights to the main

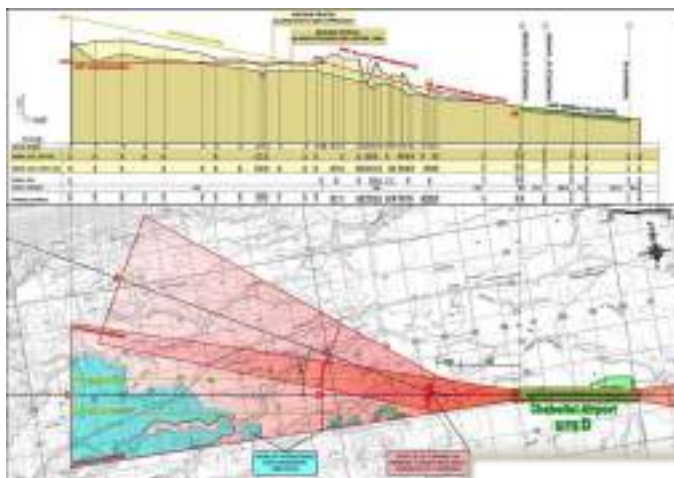
African and European Capitals (ICAO Code: 4E). In Phase 2 the runway length is increased to 3,600 m as adequate to serve the maximum ranges allowed by modern aeronautics industry (ICAO Code: 4F);

- Navigation aids: VOR-DME, ILS, approach lighting system (full length);
- Parallel Taxiway, with end links and rapid exits;

- Aircraft Apron, Heliport, service roads;
- Control Tower, Fire Fighting, Meteorological Service, Ground Support Equipment;
- Passenger Terminal, Cargo Terminal, State Ceremonial & VIP Terminal, Parking areas;
- Environmental Services, Fuel Storage.



Airspace – Interfered airspace take-off and aborted approach



Approach and take-off orographic obstacles and New Airport aerial view

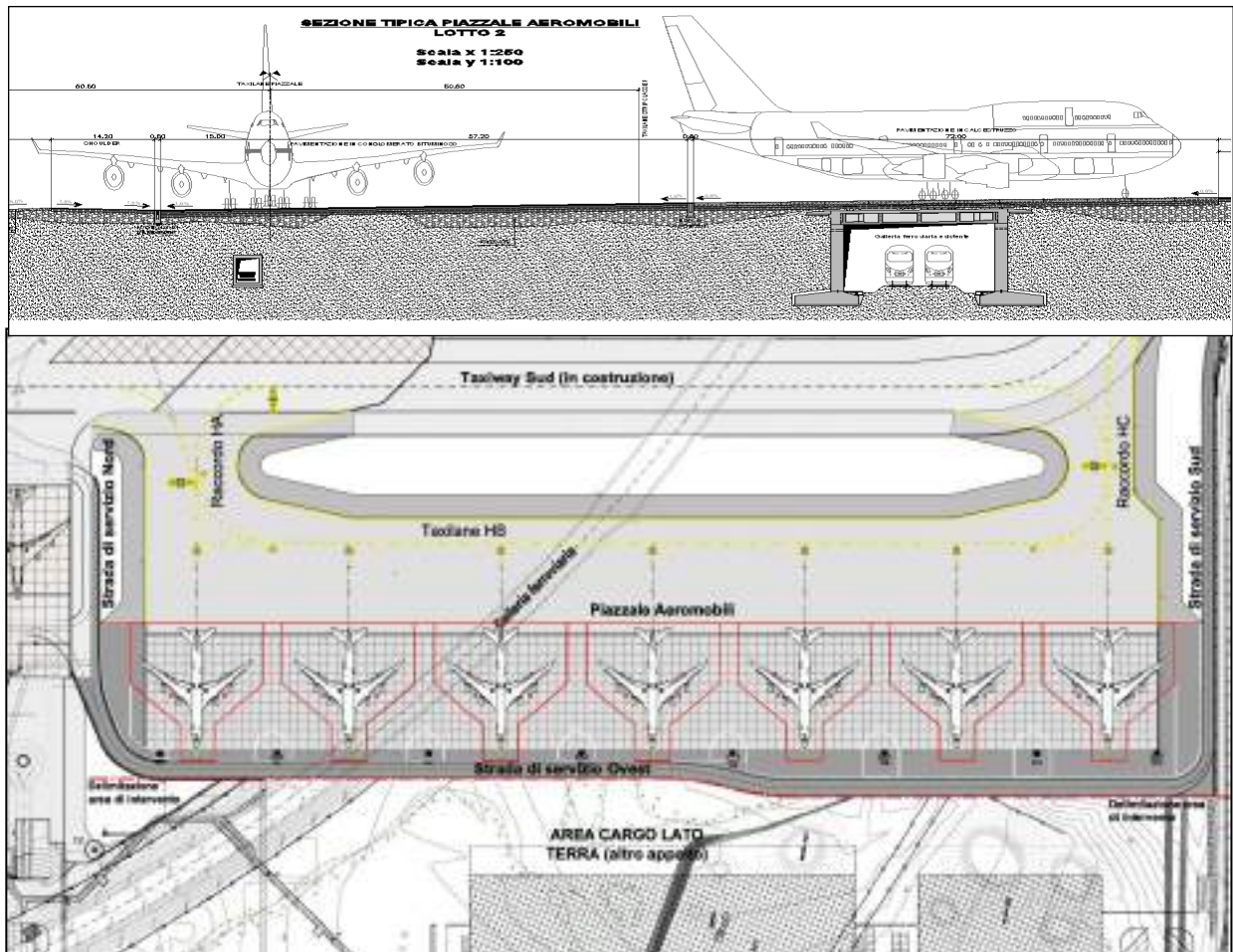
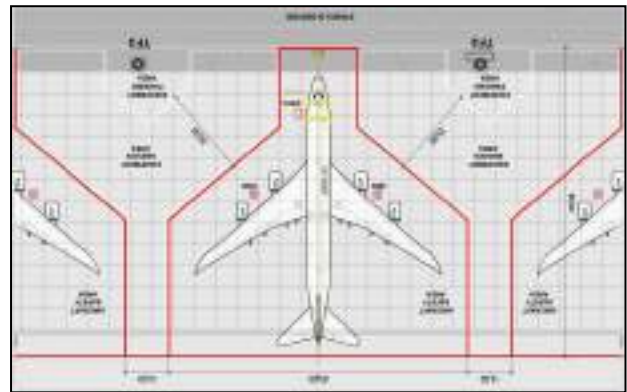
MALPENSA INTERNATIONAL AIRPORT: NEW CARGO APRON

Location:	Milan, Italy
Client:	S.E.A. S.p.A.
Services:	Final and detailed design of the new cargo apron of the new Cargo City of Milan Malpensa Airport.
Period:	01/2008 - 04/2010
Construction cost:	Euro 21,700,000

Project Description:

The works designed consisted of:

- Airport paving in concrete and bituminous conglomerate (142.100m²);
- Drainage system and primary treatment system for surface runoff;
- Airport service road;
- Civil works for the H.R.S. plant (Hydrant Refuelling System);
- A.G.L. systems (Aeronautical Ground Lighting)
- Apron Markings and Signs.





RAILWAY LINK FROM BARI TOWN CENTER TO BARI AIRPORT

Location:	Bari, Italy
Client:	DEC - Degennaro Costruzioni, in association with IPA Precast
Services:	Detailed Design of the new railway link between the Bari Palese Airport and Bari Town Center integrated to the railway line Bari-Barletta (Ferrovia Bari Nord) from the km 6+050 to the km 14+865. Detailed design of 2 airport railway Stations, 1 Transit building and an underground pedestrian passageway.
Period:	09/2008 – 06/2009
Construction cost:	Euro 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.

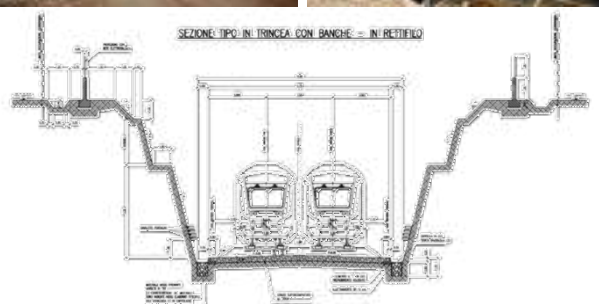
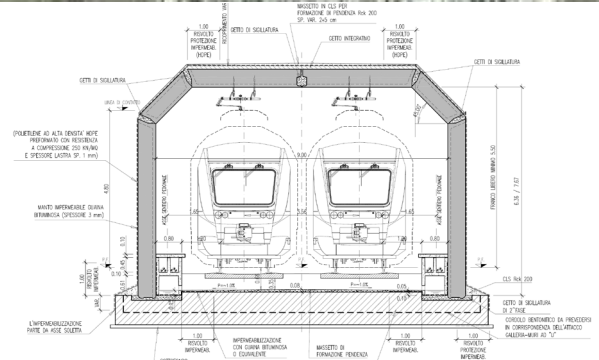
The railway underpasses some existing areas of the military airport (runway and taxiway) and other military installation (Guardia di Finanza), developing in or artificial tunnel or within a "U". structure

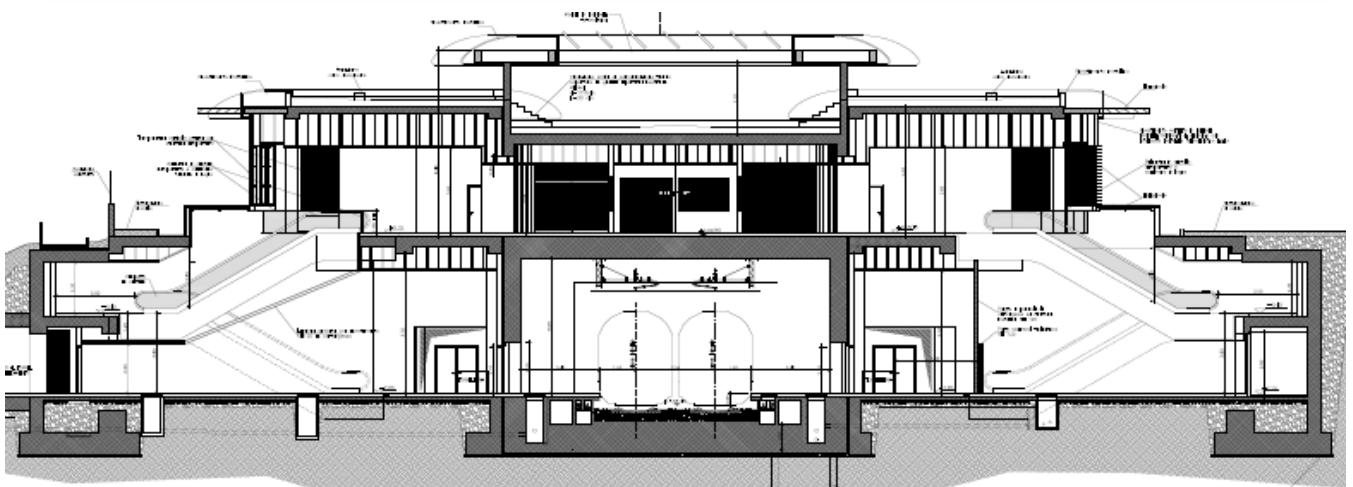
A 400 m long section, corresponding to the more populated areas, will have rail mounted on concrete prefabricated slab and anti-noise and anti-vibration carpet. To improve structural performance are provided 7 typical sections galleries, with size of 9.00 m * 6.36 m.

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.

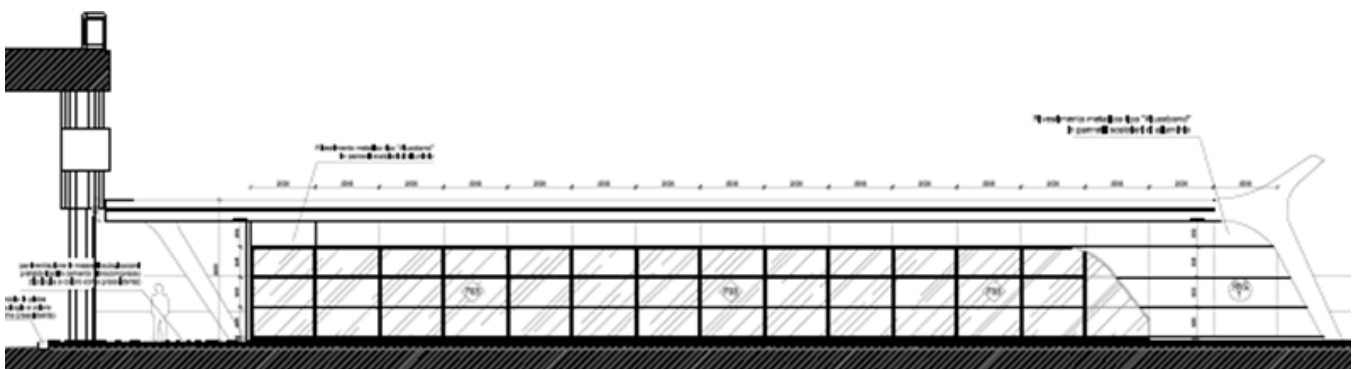




The project includes the detailed design of 2 new Stations named "*Aerostazione*" and "*Europath*", both inground and above with pedestrian access, equipped with technological systems, fire detection, health and safety systems and elevators.

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.



DEVELOPMENT PLAN AND DESIGN OF THE GENERAL AVIATION AREA OF MILAN LINATE AIRPORT

Location:	Milan, Italy
Client:	ATA S.p.A.
Services:	Airport Development Plan (2 phases) of the General Aviation Area and preliminary and final design of a part of the 1 st phase works. Technical specifications for soil tests and for topographic surveys.
Period:	08/2007 – 04/2009
Construction cost:	Euro 30,139,000 (1 st phase)

Project Description:

Airport Development Plan:

The study of a new Airport Development Plan of the General Aviation area was necessary for the increased traffic, to increase the aircraft indoor spaces and to improve the service quality.

The interventions of the first phase include:

- The creation of a new hangar (m. 180 x 45)
- The renovation and expansion of the passenger terminal
- The construction of a new fuel depot and a washing plant for aircraft
- A series of small measures for the most urgent needs
- The reconfiguration of parking spaces, including a new multilevel parking building, and improved access
- The improvement of security.

The interventions of the second phase include:

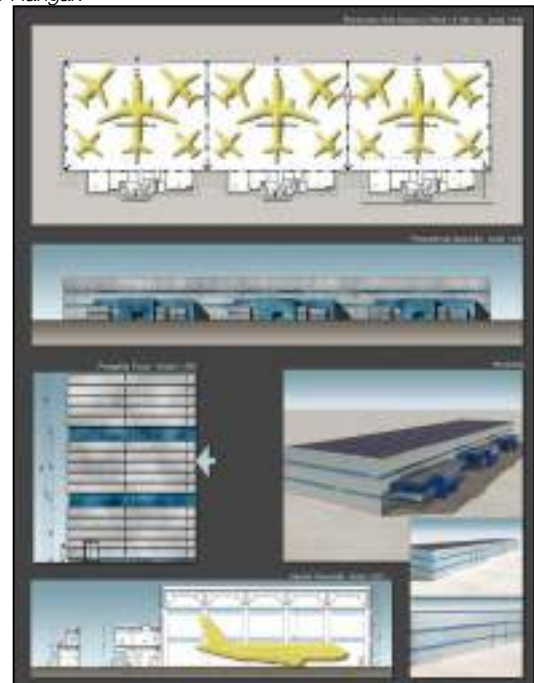
- The expansion of the apron (60,000 m²)
- The construction of new hangars
- A new area for service and storage yard ramp
- The improvement of the rainwater treatment plant.

The new triple hangar (180mx45m) is sized for B737-500 and A319 and is equipped with appendices for technical spaces, offices and reception areas.

The hangar is also equipped with self-sufficient energy thanks to a photovoltaic system installed on the roof.

The construction of new hangar increases by 40% the areas available to General Aviation.

New Hangar:



HYDROLOGIC, GEOTECHNICAL AND HYDRAULIC STUDIES AND CAMPAIGN FOR PONTECAGNANO AIRPORT

Location:	Pontecagnano (Salerno), Italy
Client:	Aeroporto di Salerno S.p.A.
Services:	Hydrologic, Geotechnical and Hydraulic Studies and Campaign for Hydraulic Safety and for embankment for Runway extension
Period:	07/2007 - 08/2008
Construction cost:	Euro 4,290,000

Project Description:

Adjustment and extension works were foreseen within the Pontecagnano Airport with the aim to adjust the existing runway and infrastructures for a more extensive and intense air traffic included the possibility to open the airport to planes of class C that is B737-700/800 or A320/321. An extensive study has been carried out by Technital in 2006 in order to define a development plan for the whole airport including an economic and financial plan. After that, an hydrologic and hydraulic study has been performed together with a general plan defining the works to be executed to guarantee the hydraulic safety of the area. In fact the airport area was surrounded by two hydraulic channels which drained the water coming from rain and irrigation of the areas within and nearby the airport.

In particular, the extension of the existing runway was foreseen through the execution of an earth embankment using the local clayey soil stabilized with lime. In order to realize the earth embankment the two existing channels had to be deviated.

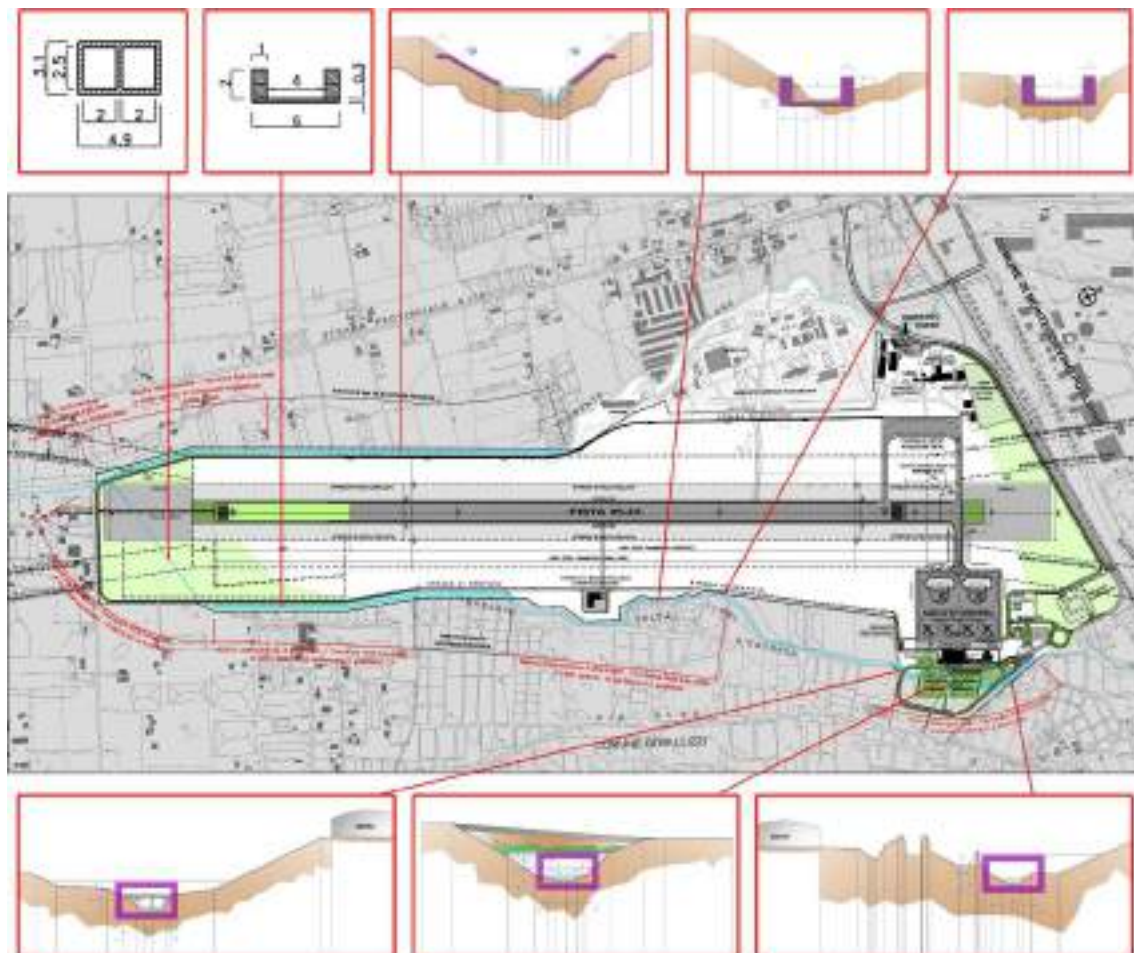
Therefore, beyond the complete hydrologic and hydraulic study, a geotechnical campaign was carried out.

The aim was to define the characteristics of the existing runway to be improved, the characteristics of the foundation soil beneath the new runway extension and the physical and mechanical characteristics of the stabilized local material to be used for the execution of the runway extension with an earth embankment

Within the scope of work, in-depth hydrological, hydraulic and hydro-geological studies were carried out with the purpose to define the better way to deviate the existing channels allowing the runway extension.

Detailed field and geognostic surveys were carried out; a geotechnical campaign was accomplished to define the characteristic of the foundation soil beneath the new runway and the existing runway pavement.

In order to allow the execution of the new runway with an earth embankment using the local soil, which was a clayey soil, detailed laboratory tests were performed to define the optimal lime percentage to guarantee the adequate geotechnical characteristics for the new runway, that is resistance and stiffness. The geotechnical designs of the existing runway adjustment and that of the new embankment together with the hydraulic design of channels deviation were carried out.



NEW UNDERGROUND RAILWAY TUNNEL FOR THE NEW CARGO CITY OF MILAN MALPENSA AIRPORT

Location:	Milan, Italy
Client:	S.E.A. S.p.A.
Services:	Detailed design of the new underground railway tunnel and technological passageway for the new Cargo City of Milan Malpensa Airport
Period:	06/2006 – 01/2008
Construction cost:	Euro 12,900,000

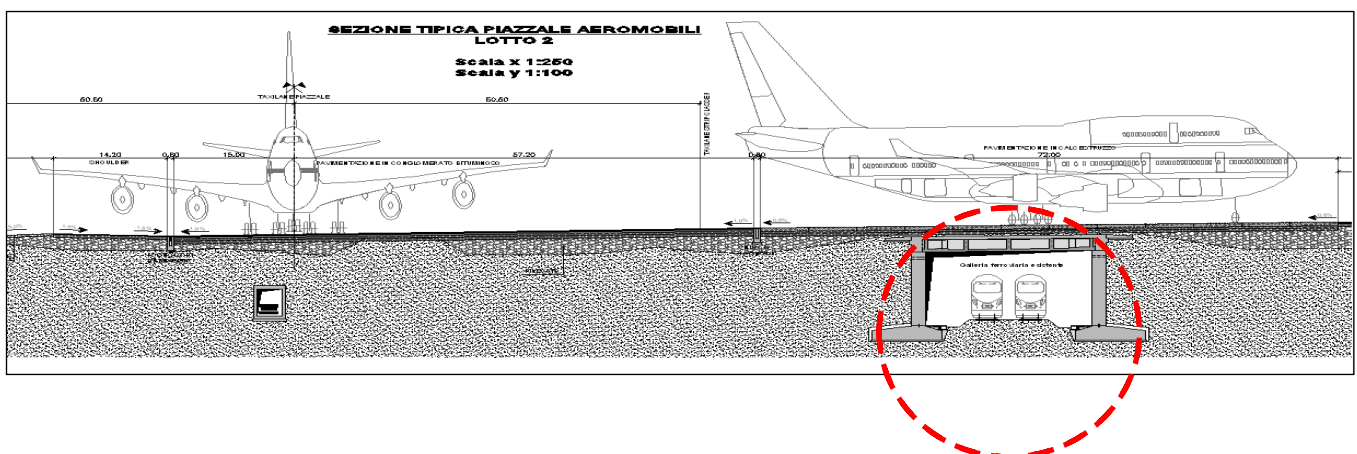
Project Description:

The project works regards a new underground railway tunnel for the new Cargo City at Malpensa Airport in Milan (Italy).

The whole tunnel has a length of 626 m, is totally curve with a radius of 1,200 m and has a double-track railway line. The first section 141m long falls in the "land side" of the airport and is designed for "road load; the subsequent section 485m long falls into the "air side" and are designed for "cargo aircraft loads". The tunnel roof has a box section, with internal width of 15.60 m and a minimum height of 6.1m above the rail. The width is greater than the minimum required for the double track in order to allow for the execution of the excavations and foundations, without interfering with the rail traffic.

The designed works consist of:

- Detailed design (structures and finishing) of a new underground railway tunnel of the new cargo city.
- Detailed design of Technological passageway of technical networks, water, sewer, and fire protection to interface with the existing tunnels and other pre-existing works.
- Earthing Network.
- Geotechnical investigations needed for the design and geotechnical Report.
- Health and safety, worksite coordination plan at design stage.
- Maintenance Plan of the works.



TAXIWAY W EXTENSION FOR MALPENSA INTERNATIONAL AIRPORT

Location:	Milan, Italy
Client:	S.E.A. S.p.A.
Services:	Final and Detailed Designs of taxiways, apron and roads Pavements, Drainage system and Visual Aids system
Period:	01/2005 – 12/2007
Construction cost:	Euro 11,490,000

Project Description:

The main purpose of the project is to connect the threshold 17R of the runway P2 with aircraft aprons of Terminal 1 (extending Taxiway W) and Terminal 2 (Remaking Taxiway BA). The intervention is designed for F-class aircraft and is compatible with the future construction of a Holding bay.

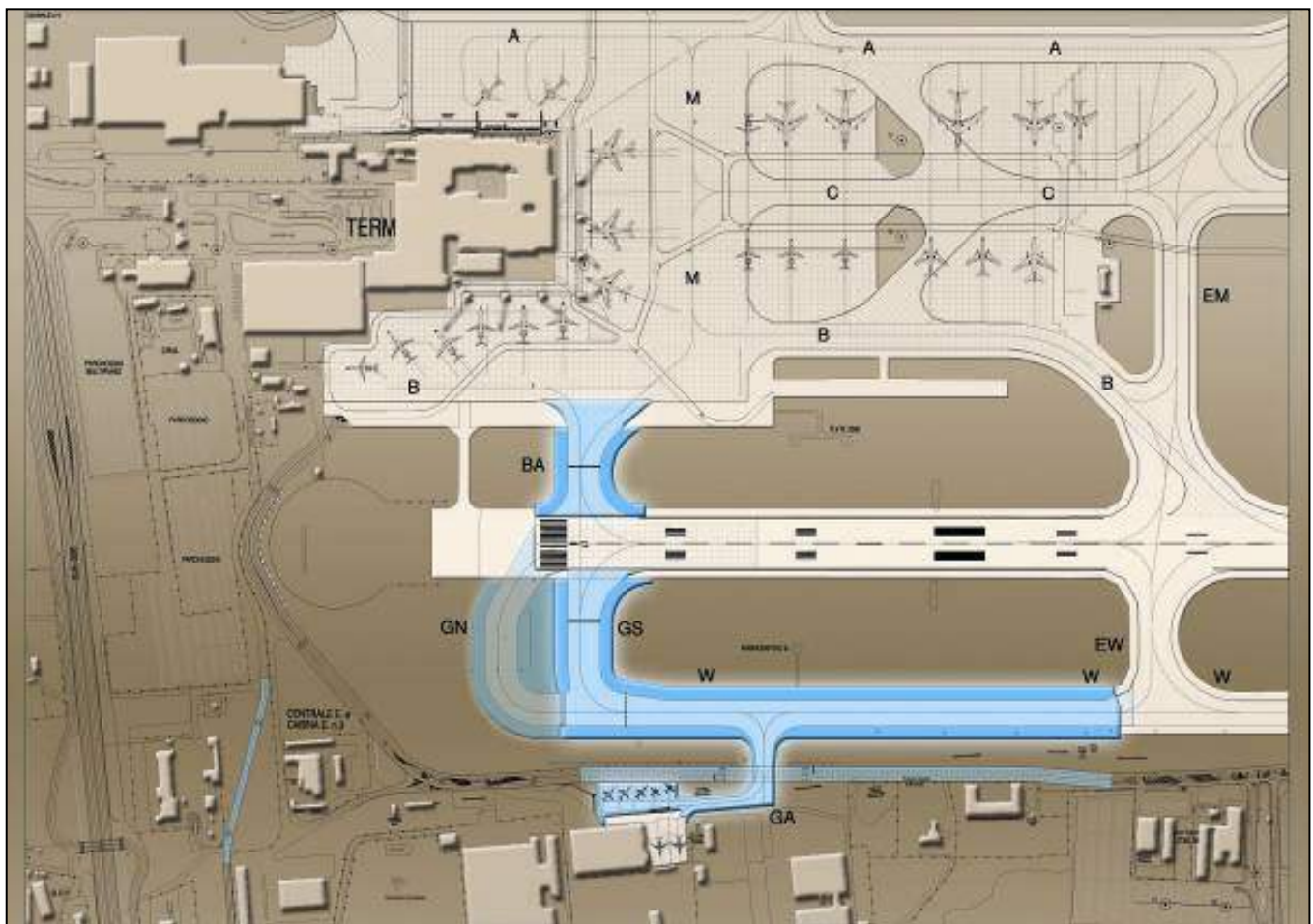
Other complementary additional works were made for: rehabilitation of General Aviation taxiway and apron, moving the existing ecological Island (storm water treatment), changing service roads and fences path, insert wind barriers, expanding the electrical cabinet for the new Visual Aids systems, etc.

The project includes the final and detailed design of:

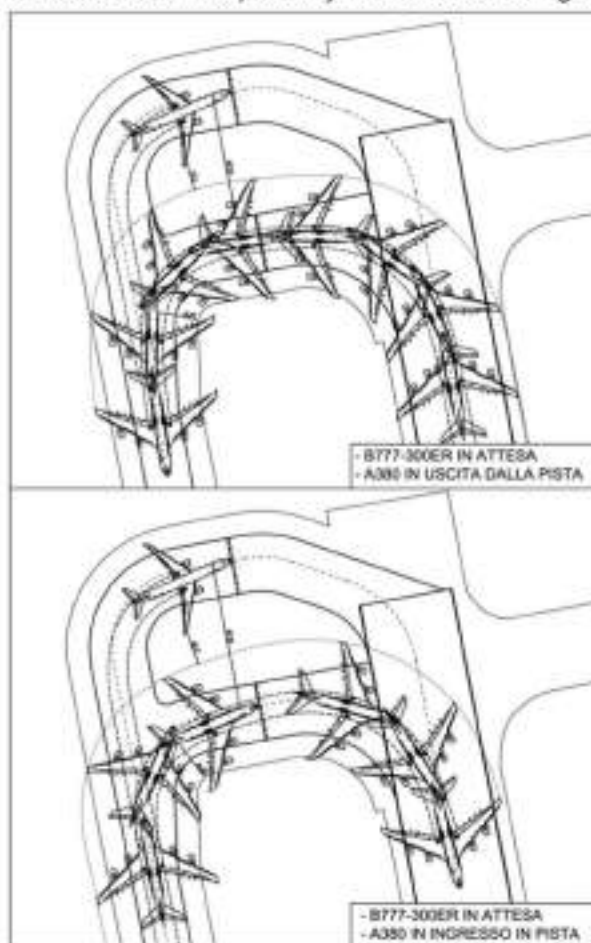
- Airport Pavements (total 70,240 m²) of taxiway W, GS, BA and GA and rehabilitation of General Aviation apron.

- Visual Aids systems with new distribution technologies and with monitoring and telecontrol system.
- Bypass of airport service road in airside and landside area.
- Drainage and storm water treatment systems, with dispersion system of water from Casenuove and Passengers Terminal 2.

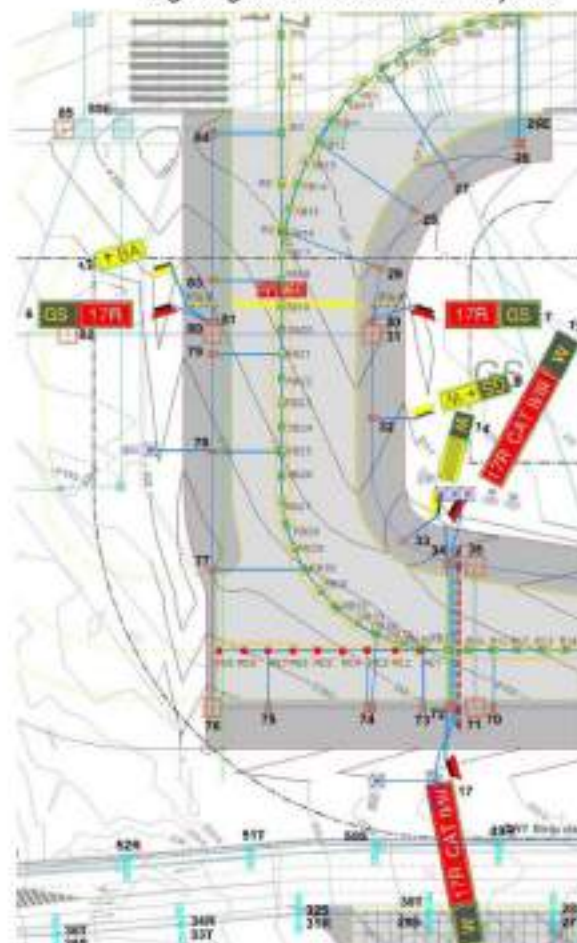
The design included also an accurate study to cancel the interferences of construction works with airport operations, identifying the best construction phases, limiting the construction vehicles heights under the runway transition plans, decalando the threshold 17R of 550 m in some construction phase, etc.



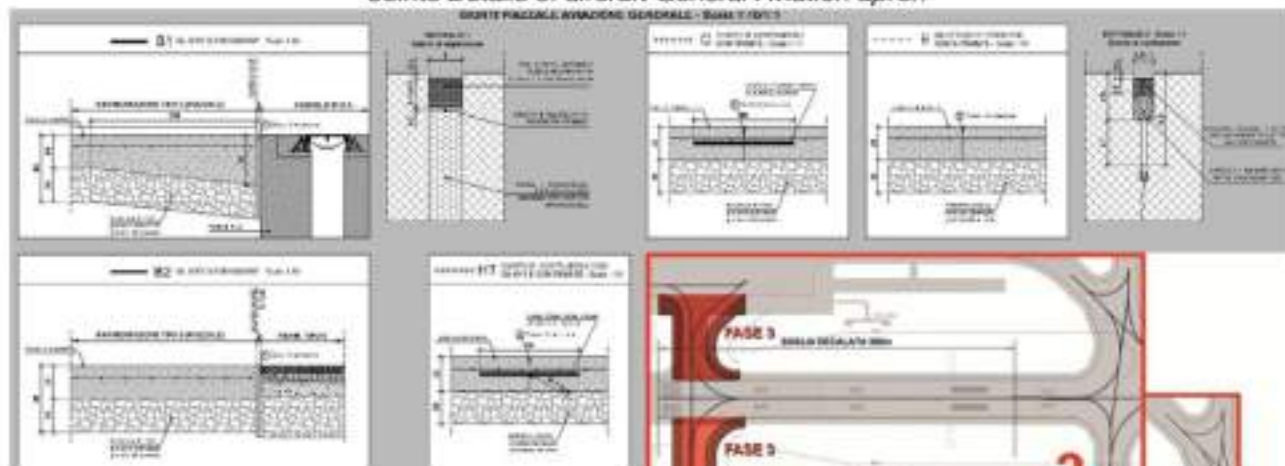
Verifications of compatibility with future Holding Bay



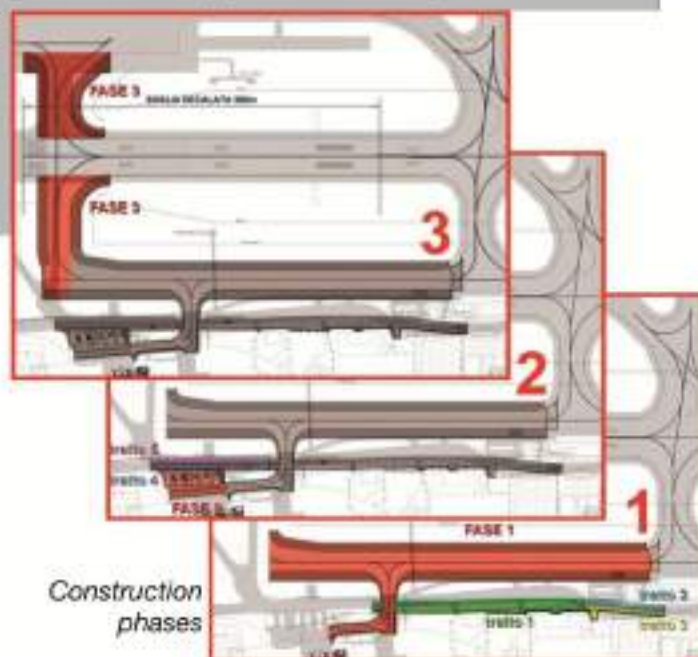
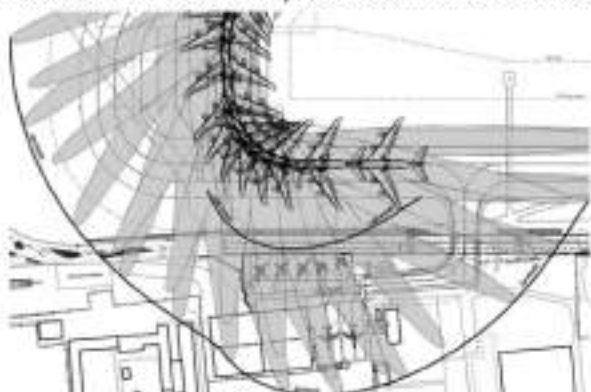
Lighting Visual Aids of Taxiway GS



Details of aircraft General Aviation apron



Detection of area to be protected from aircraft Jet



Construction phases

DEVELOPMENT OF ZWARTNOTS INTERNATIONAL AIRPORT: TECHNICAL ASSISTANCE

Location:	Yerevan, Armenia
Client:	European Bank for Reconstruction and Development (EBRD)
Services:	Lenders' supervisor engineering services: project supervision, monitoring of activities performed and certification of disbursement
Period:	07/2006 - 06/2007
Construction cost:	N.A.

Project Description:

The EBRD (European Bank for Reconstruction and Development) together with DEG (Deutsche Investitions- und Entwicklungsgesellschaft) have been requested to provide a loan to the AIA (Armenia International Airports) to co-finance construction of a new passenger terminal and purchase relevant terminal equipment in accordance with investments agreed in the Master Plan.

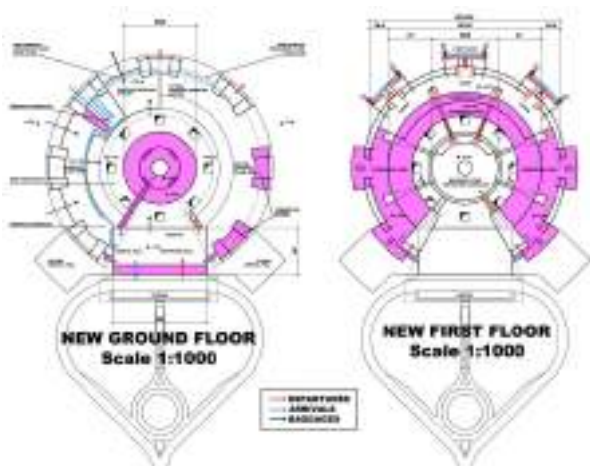


Project, and compile all relevant information as part of the monitoring of the overall Project implementation;

- Review the contractors' Work Programme, Payment Certificates, tests results and other relevant Project Documentation, and conduct a comparison of these with the actual works carried out on the Project site, with particular focus on potential cost overruns and/or time delays;
- Monitor the contract administration to ensure that the works are carried out in accordance with the agreed contract terms;
- Certify disbursement requests presented by the Company to the Lenders, in order to confirm that proceeds will be used towards payment of actual works completed or due within the next 60 days;
- Assess all proposed material changes and deviations to the Project and its consequences for the overall implementation of the Project, as applicable; and
- Confirm achievement of relevant milestones in Project implementation, such as completion of physical works for passenger terminal, and certify to the Senior Lenders that Terminal Operational Readiness has been achieved. The Terminal Operational Readiness includes confirmation that the new passenger terminal has been put into full operational use.

The Lenders' Supervisor paid special attention and report on:

- Risks
- Critical Issues
- Progress Control
- Cost Control



- Review all tender documentation, not signed at the time this Agreement it executed.
- Review of Progress Reports, Implementation Schedules, and any other documentation available prepared by the Company's Engineers during the implementation of the

AIRPORT DEVELOPMENT PLAN, ECONOMIC AND FINANCIAL PLAN OF PONTECAGNANO AIRPORT

Location:	Pontecagnano (Salerno), Italy
Client:	Giorgiofossa SAS
Services:	Airport development plan (in 2 phases), economic and financial plan
Period:	10/2006 – 02/2007
Construction cost:	Euro 28,020,000 (first phase Euro 17,200,000 + second phase Euro 10,800,000)

Project Description:



1ST Phase design

This study is a companion document to the Request for Grant of the airport, already presented by airport management company to the Civil Aviation Authority (ENAC) and constitutes an advance summary of the future Airport Master Plan.

The study contains:

- revision of traffic forecast;
- punctual description of the existing situation of airport and of work in progress;
- development plan for the whole airport with the intervention plan and the resulting investment plan (at present, 1st phase, 2nd phase);
- economic and financial plan carried out in accordance with the circular no. 12479 AC of Civil Aviation Authority (ENAC).

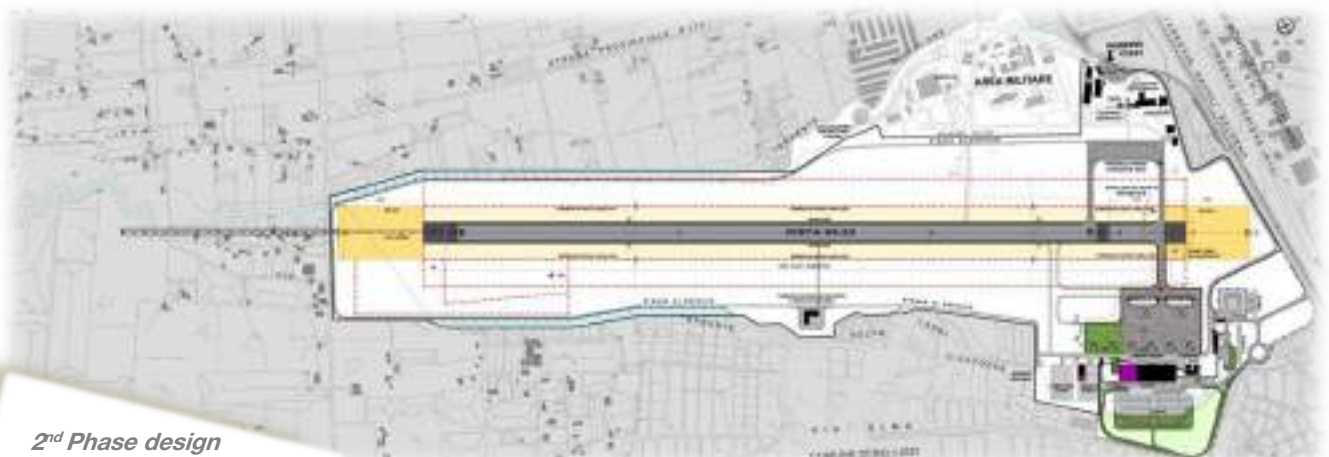
In the two phases of the **Airport Development Plan** were also identified the types of aircraft that could be work in the future, the possible load penalties, and the operating radius.

The study is completed by the **Intervention Plan** and the **Investment Plan**, that includes technical-descriptive report, bill of quantities, sizing calculations, planimetric and detailed drawings.

The intervention and investment plans are the foundation for the **Economic and Financial Plans** in the first 10-15 years of the airport operating, which is the most critical period for the effective upgrade of the initiative. The definition of costs and revenues has been designed in close collaboration with the management company.

Summarizing, the actions planned in the various phases are:

- 1st Phase A: extension of the runway up to 2020m and reinforcement of the runway existing part, of the taxiway and of the East aircraft apron.
- 1st Phase B: Supplying the terminal Area with some support buildings (multi-purpose building, ground support equipment building and rescue and firefighters station extension) and the related access roads and parking area.
- 2nd Phase: expansion of access roads, parking area and of support terminal buildings to adapt to traffic expected from 2018 to 2027.



2nd Phase design

INFRASTRUCTURE AND EXTERNAL SUPPORT SYSTEMS DEVELOPMENT OF AL-UDAID AIR BASE

Location:	Al-Udaid, Qatar
Client:	Rizzani De Eccher
Services:	Master Plan, Preliminary, Final and Detailed design of infrastructures and external support systems provided for the 2nd phase of development of the airbase: grading and landscaping of airport area, roads and parking and external plant networks
Period:	11/2003 – 04/2006
Construction cost:	Confidential

Project Description:

The Project includes the General Master Plan and Detailed Design of Supporting Infrastructure and Utilities of the Qatar Air Force Base of Al Udaid.



In particular, the Project includes:

1. Road Network and Paved Areas

- Design of approx 25 km of single and double carriageway distribution network including junctions, roundabouts and tie-ins;
- Design of road networks within development areas, including parking areas, facility accesses, bus-stops and sidewalks;
- Design of road corridor stormwater drainage;
- Design of traffic signs and road markings;
- Design of combined utilities plans indicating existing and proposed services and proposed diversions and service ducts;
- Design of ducting for street lighting network.

2. Sewerage Network

- Design of approximately 18km of building connections, collector mains, gravity outfalls and pumping mains serving various area of the base;
- Design of four sewage pumping stations and flow balancing facility;
- Design of Septic/Conservancy tanks (if gravity connection to network not viable);

3. Water Distribution Networks

- Evaluation of supply with regards acceptable flow rate, residual pressure and reliable duration;
- Computer modelling to define extensions or reinforcing requirements to the feeder ring main;

- Extensions and reinforcing of existing ring mains;
- Evaluation of ground / elevated storage needs and mechanical plant requirement, to supply domestic and fire flow demands;
- Design of fire mains and domestic networks up To and including supply point at each facility.

4. High, Medium and Low Voltage Electrical Network

- Establish primary sources of power to the site and location of primary supply points within the site;
- Evaluate existing sub-station infrastructure and assessment of their suitability;
- Location and design of sub-stations, including detailed electrical arrangements; and architectural and structural design of housings;
- Detailed design of HV and MV and LV cable network;
- Provision of all detailed drawings, plans, layouts, standard details, supporting calculations, specifications and schedules of quantities as required for the completion of construction works.

5. Street and General Area Lighting

- Design of Street and General Area Lighting including road lighting, general area lighting, parking areas.

6. Site Communications

- Design of a Site Communications Ductbank System to connect the various areas of the base.

7. Surface Water Drainage and Site Grading

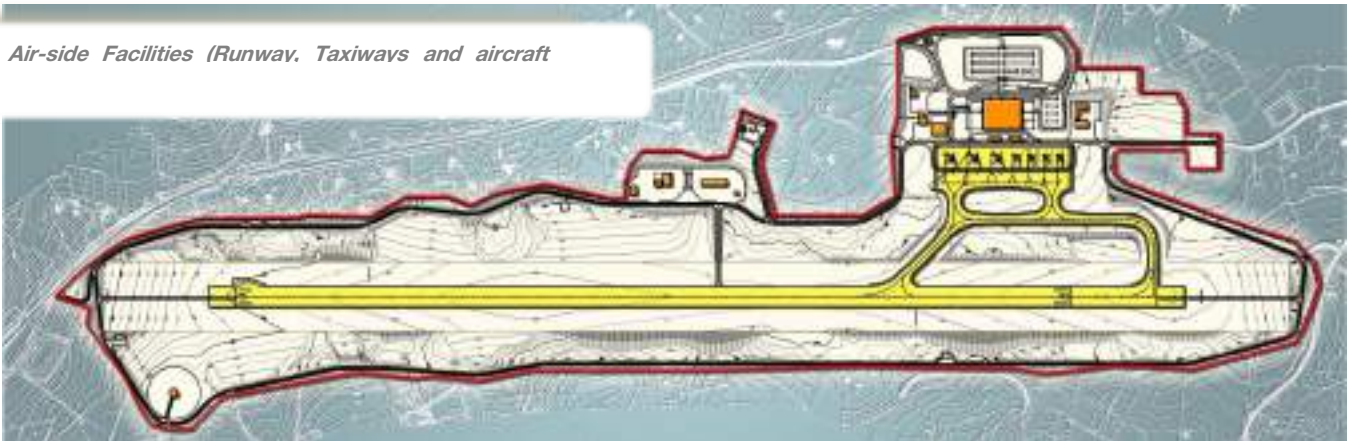
- Areas within and adjacent to the various development areas are to be graded to ensure that existing and proposed facilities and works are adequately protected from surface storm water run-off, resulting from a 1 in 10 year storm event. Grading of the above mentioned sites has been designed to take cognizance of watersheds, storm flow paths and localised depression areas such that run-off is conveyed safely away from development facilities.

AIRSIDE INFRASTRUCTURES OF NEW AGRIGENTO VALLE DEI TEMPLI AIRPORT

Location:	Agrigento, Italy
Client:	Aeroporto Agrigento Valle dei Templi S.p.A.
Services:	Final Design of airside infrastructures of the 1 st phase of development: Flight and auxiliary infrastructures and installations (including Visual Aids and apron lighting) topographic and geotechnical surveys and expropriations
Period:	09/2003 – 09/2004
Construction cost:	Euro 63,000,000

Project Description:

Air-side Facilities (Runway, Taxiways and aircraft



The project for the realization of a new civil airport to serve southern-central Sicily – the "Valle dei Templi" Airport at Agrigento - includes the preliminary studies and detailed design in relation to the following works:

- Flight infrastructures: runway, taxiways and apron, complete with horizontal daytime signalworks and luminous visual aids for navigation;
- Passenger and cargo terminal buildings: passenger terminal, control tower, fire station, fuel depot, cargo terminal, equipment store, maintenance workshops, etc., complete with all technological plant systems (hydro-sanitary, electrical, air-conditioning, fire-fighting, telephone, etc.);
- Auxiliary infrastructures: internal road network and parking areas, access roads and fencing, complete with lighting and green areas;
- Installations: electricity, water supply, sewerage, drainage and water treatment.

The contract also foresees the provision of the following consulting services:

- geological study, with all the necessary site investigations,

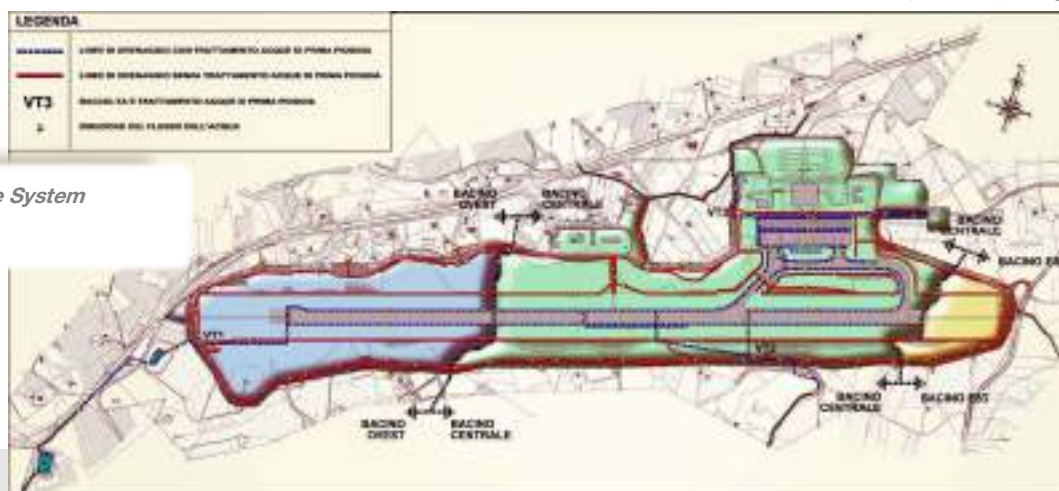
- topographic surveys
- expropriation procedures
- environmental impact assessment.

The contract was awarded to the Temporary Association of ADR Engineering S.p.A., Bonifica S.p.A., Technital S.p.A. and Studio Prof. Ing. A. Bevilacqua.

In particular Technital S.p.A. has developed (€ 30.000.000 of construction cost):

- Land planning, topographic and geological survey, fence.
- Air side facilities (Runway, Apron, Taxiway).
- Air side service roads.
- Air side Drainage system.
- Air side electrical installations including visual aids and apron flood-lighting

In 2005 Technital also provided the same airport management company (Agrigento Valle dei Templi S.p.A) with technical assistance to verify the consistency of the final design with the Decree DPR 554/99 and with the preliminary design.



Drainage System

NEW AIRPORT OF AGRIGENTO VALLE DEI TEMPLI, SERVING SOUTHERN-CENTRAL SICILY

Location:	Agrigento, Italy
Client:	Aeroporto Agrigento Valle dei Templi S.p.A.
Services:	Master Plan in 3 phases (including site selection), Pre-feasibility study of Environmental impact, Preliminary Design (runway, obstacles, airspace, terminal area, etc.) and geological and hydrological study
Period:	11/2002 – 03/2003
Construction cost:	Euro 110,000,000 (Euro 55,000,000 without expropriation)

Project Description:

The study starts from the multi-functional analysis of various alternative positioning of the airport, then develops the master plan of the alternative chosen in 3 phases and details the master plan interventions at the level of preliminary design.

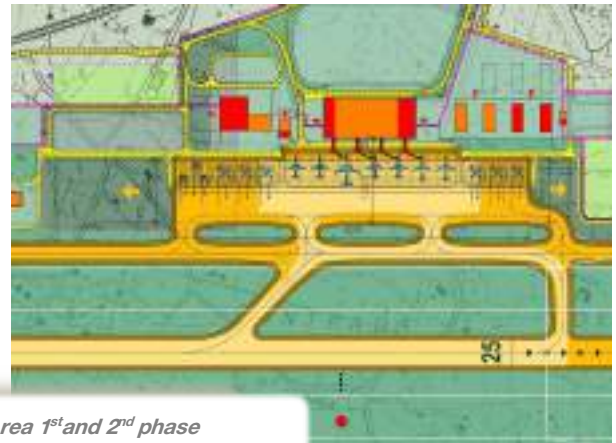
In particular the study consists of:

- Airport site evaluation and selection. Traffic forecasts. Development of aeronautical studies on Runway Length Requirement, Navigational Aids Requirements, SID and STAR procedures, control of obstacles, airspace analysis
- Development of the airport layout plan including landside and airside facilities
- Development of the airport Master Plan on a 20 years period phasing (3 phases)
- Estimate of costs
- Environmental study

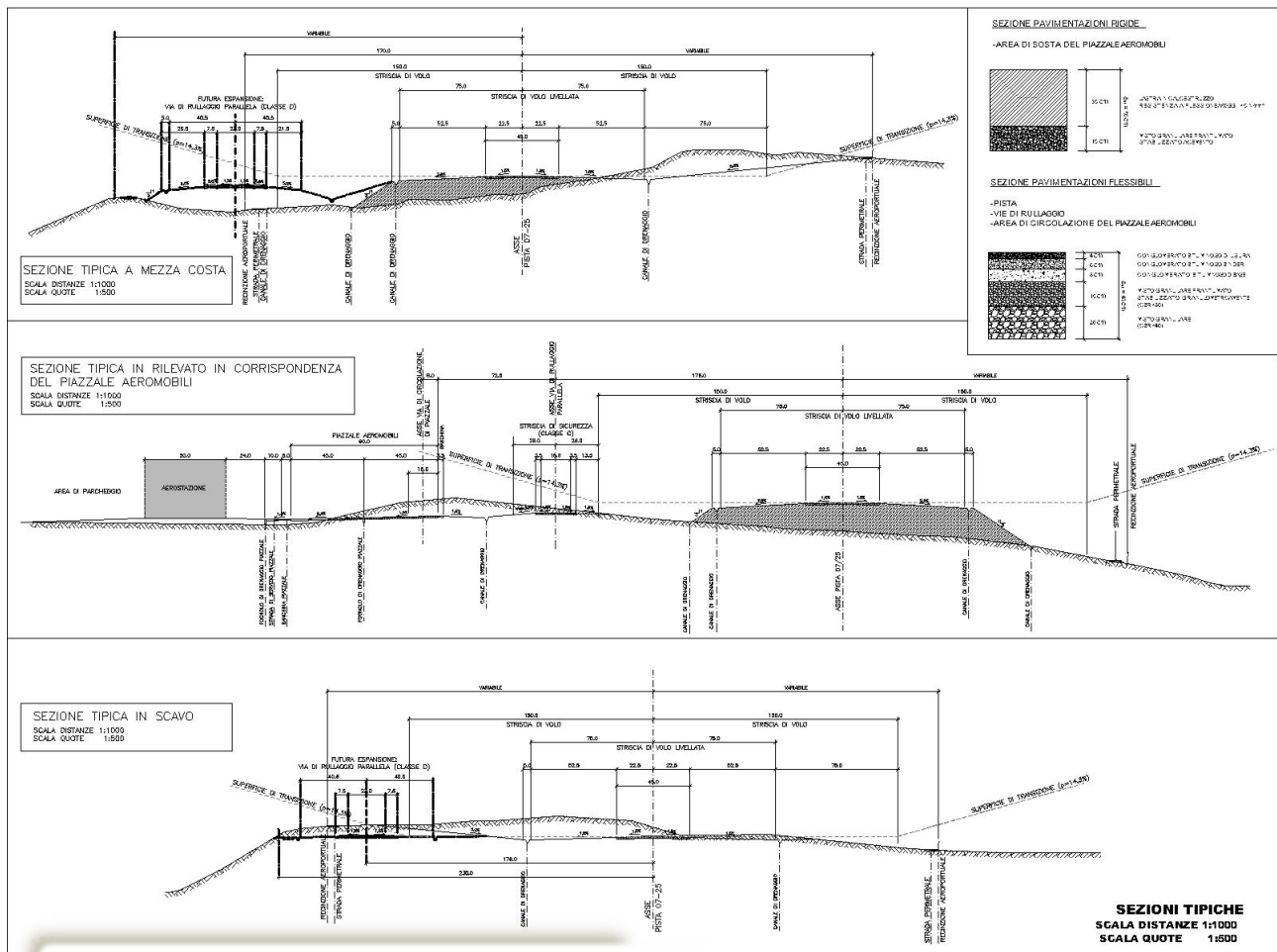


Catchment areas with times accessibility of Sicilian airport and of the new airport





Master Plan - Terminal Area 1st and 2nd phase



Typical sections of runway, taxiways and aircraft

DEVELOPMENT STUDY OF THE INTERNATIONAL AIRPORT OF MALPENSA

Location:	Milan, Italy
Client:	S.E.A. S.p.A.
Services:	Development of a comparative technical proposal on the future expansion of the airport (traffic analysis, 3 rd runway and apron hypothesis).
Period:	04/2002 – 07/2002
Construction cost:	N.A.

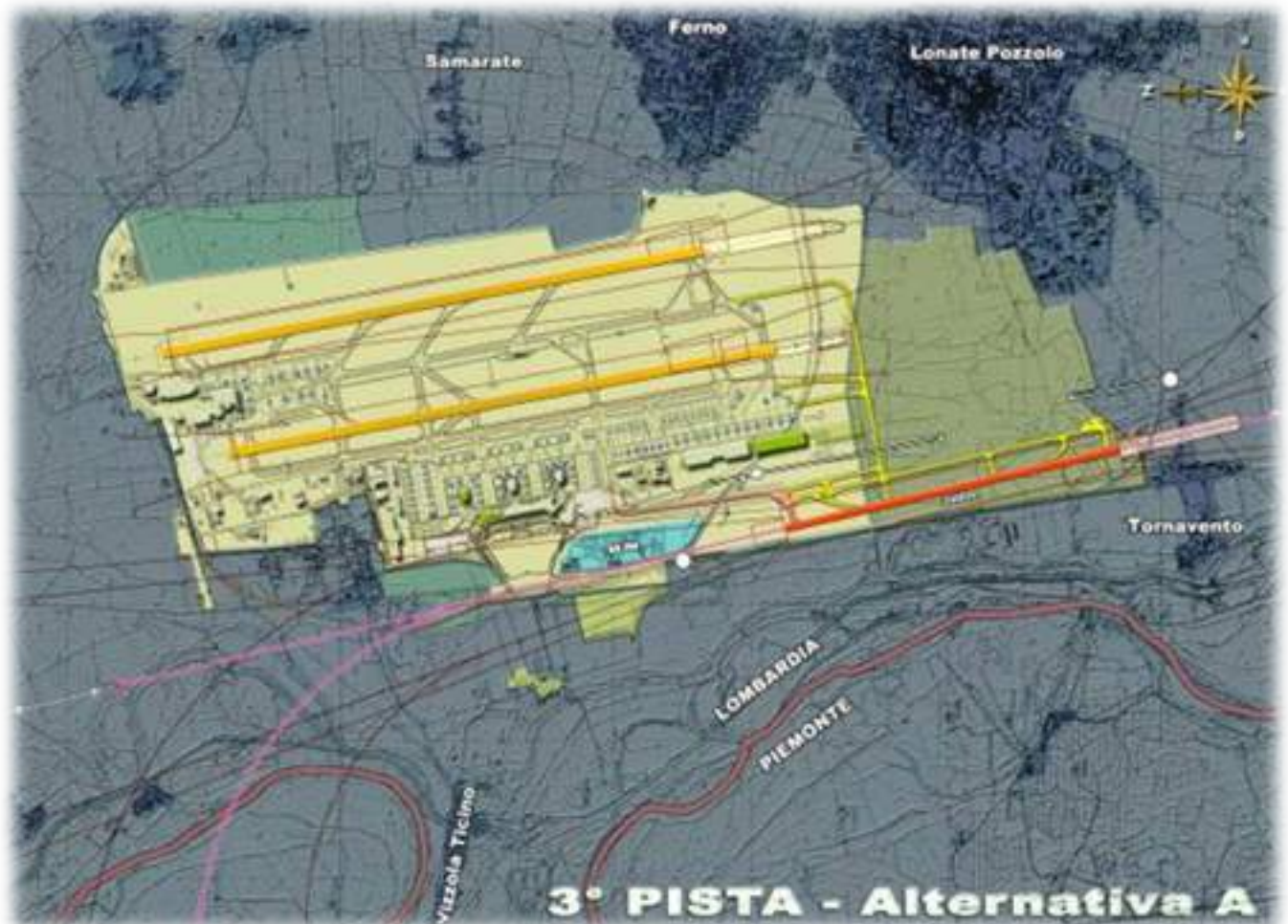
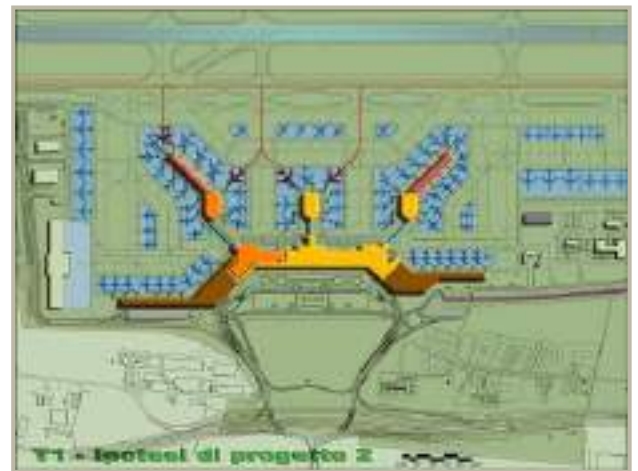
Project Description:

The technical proposal concerned the following:

- Review of the actual facilities of the airport and peak hour passenger and traffic analysis
- Aeronautical studies regarding the siting and characteristics of a new third runway (comparative analysis of several options)
- Proposals of future development of the terminal area and aprons layout (comparative analysis of several options)

The study was developed in cooperation with SEA S.p.A. technical staff.

The positioning of the third runway identified in this study was, in fact, adopted by the master plan of the airport (third runway currently under construction).



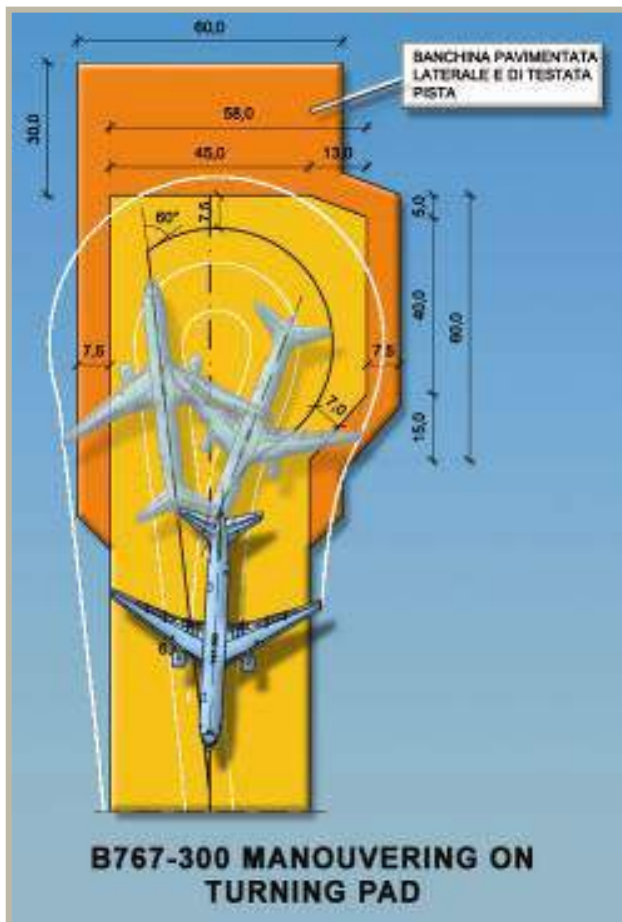
INTERNATIONAL AIRPORT OF NOSY BE

Location:	Nosy Be, Madagascar
Client:	Viaggi del Ventaglio S.p.A.
Services:	Feasibility study of the rehabilitation and reinforcement of the runway, apron and taxiway for the 767-300 aircraft with Europe destinations
Period:	04/2002 – 06/2002
Construction cost:	Euro 3,000,000

Project Description:

Feasibility study of the rehabilitation and reinforcement of the runway, apron and taxiway system in order to make possible operations of a B767-300 aircraft directly from Europe for touristic purposes.

The study was developed in cooperation with Lauda Air.



MASTER PLAN, RUNWAY VISUAL AIDS, AIRCRAFT APRON, PASSENGER TERMINAL (BUILDING AND AREA) OF CARRASCO INTERNATIONAL AIRPORT

Location:	Montevideo, Uruguay
Client:	D.G.I.A. (Direccion General de Infraestructura Aeronautica)
Services:	Revision of the Master Plan of 1997. Preliminary Design of Terminal Area and Passengers Terminal. Detailed Design of approach lighting system and Aircraft Apron, including plant systems. Revision of detailed design no more compatible with new layout
Period:	09/2001 – 02/2002
Construction cost:	Euro 77,800,000

Project Description:

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 (pavements, radio/visual aids and flood-lighting).

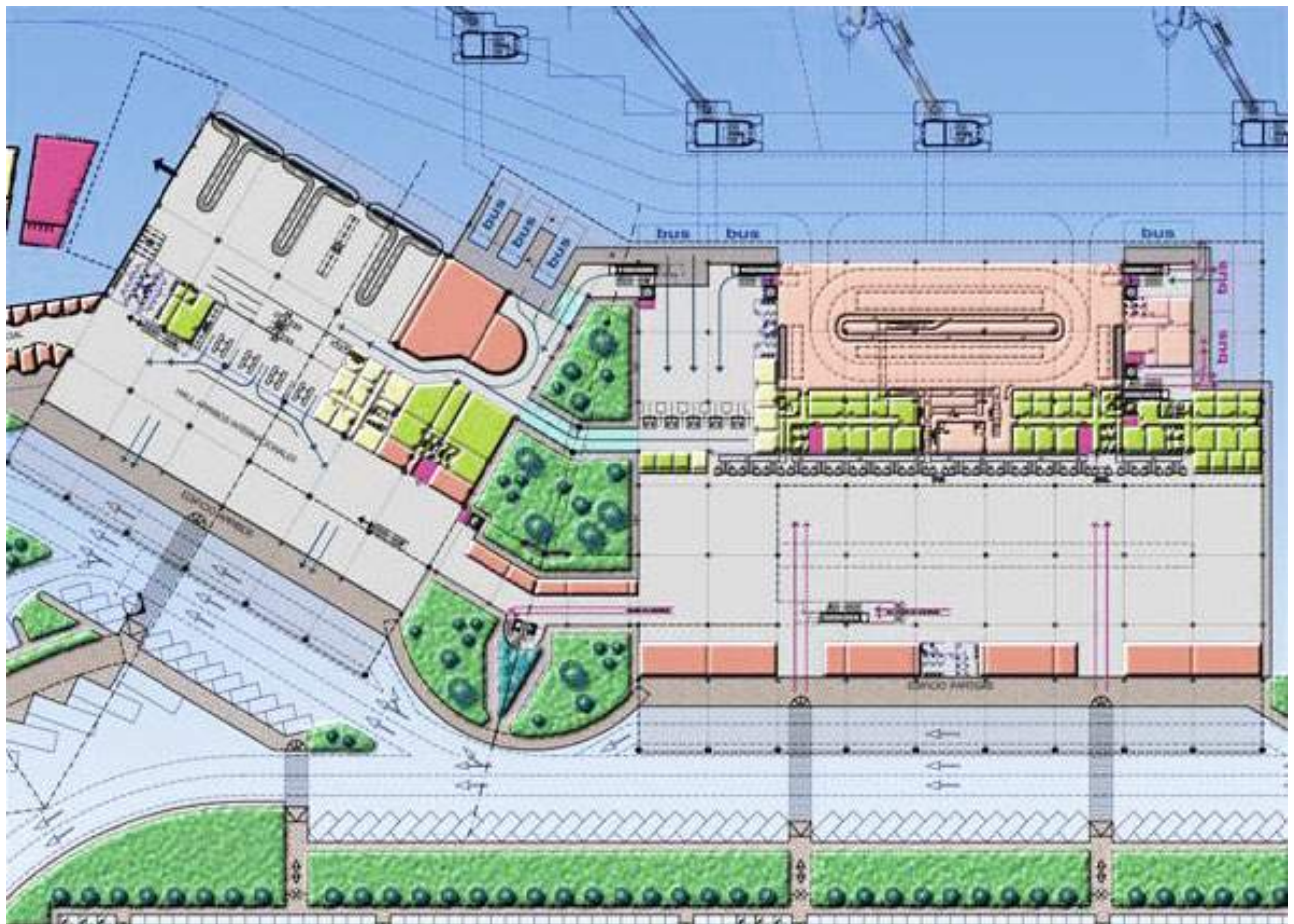
In 1997-98 the consortium SEA-Technital was commissioned to develop the new General Airport Master Plan, in order to prepare the necessary documentation for the international tender for the election of a private dealer for the management of Carrasco Airport.

Finally in 2001, having the Uruguayan government decided to maintain the Airport in public management, the consortium SEA-TECHNITAL was again asked to review the Master Plan of 1997-98 as a function of different investment capacity and the exchange of ideas on development scenario: in summary was required that the terminal area would remain in its current position and that planning was limited to the time horizon of 10 years.

In particular, the study has developed:

- Definition of planning criteria in the short and medium term.
- New traffic forecasts and sizing of the terminal area.
- Revision of the Airport Master Plan developed by TCH in 1997 according to the new development scenario.
- Investment plan and Time schedule of works.
- Preliminary Design of a new passenger terminal (1.600.000 pax/year, 19.000 m²), access roads and parkings (35.600 m² of paved area).
- Revision of the Detailed Design, developed by TCH in 1996, to attend to the new airport Master Plan.
- Detailed design of a new approach lighting system for runway 24 with a MALS R system.
- Detailed Design of Aircraft Apron, including plan systems.

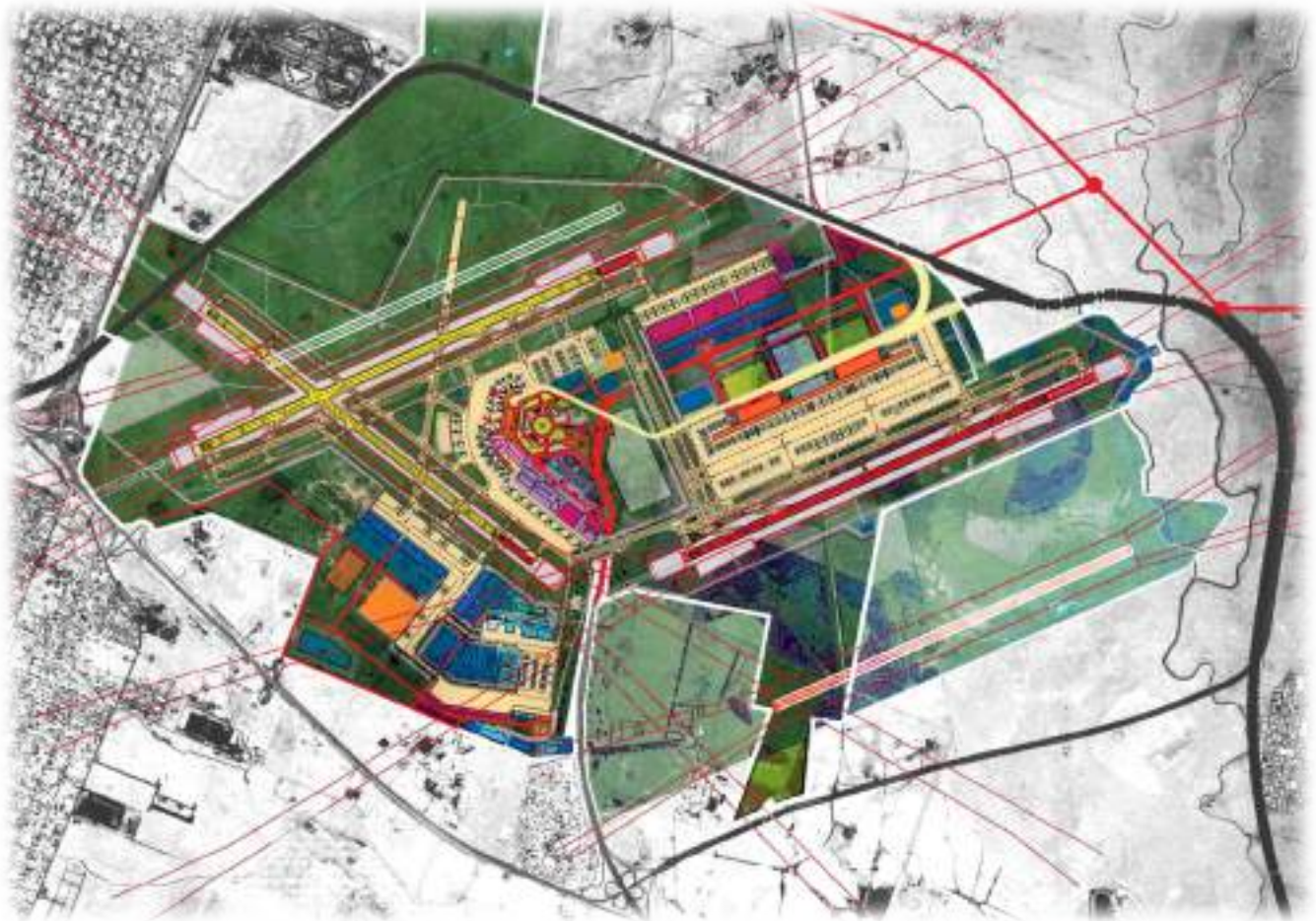




MASTER PLAN, NEW RUNWAY, AIRCRAFT APRON, AND CONTROL TOWER OF EZEIZA INTERNATIONAL AIRPORT

Location:	Buenos Aires , Argentina
Client:	Consortium Aeropuertos Argentina 2000
Services:	Master Plan (38 mil pax/years), Preliminary Design of new 3 rd runway and taxiways, new control tower (70m high) and new fixed aircraft ground servicing facilities
Period:	10/2000 -10/2001
Construction cost:	Euro 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.

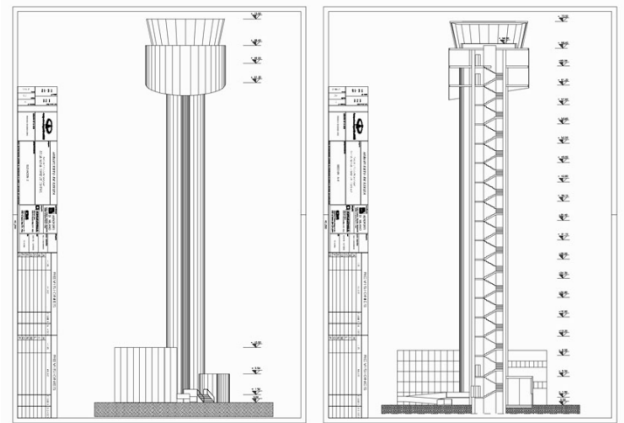
With regards airport accessibility, the consulting services included:

- 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

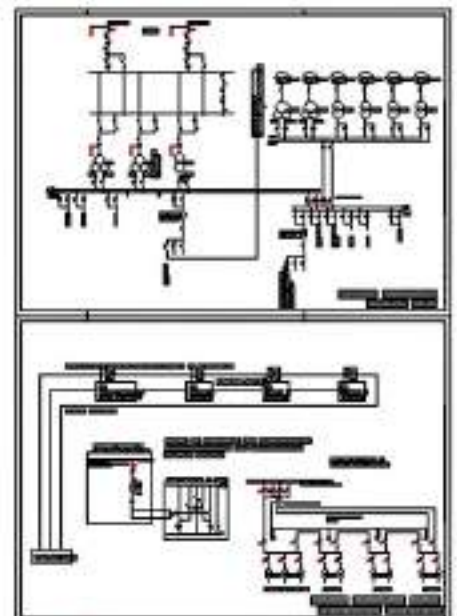
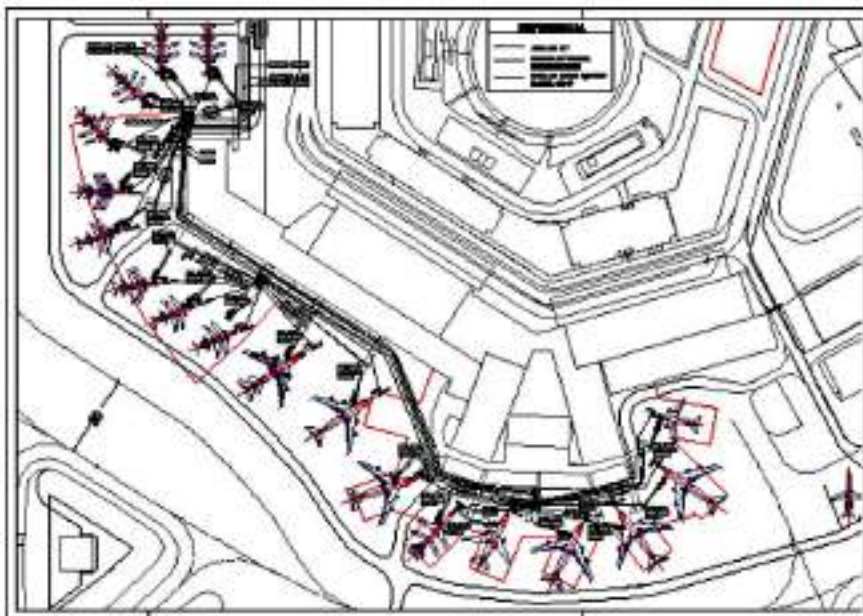
Control Tower

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 m² at the base of the tower.

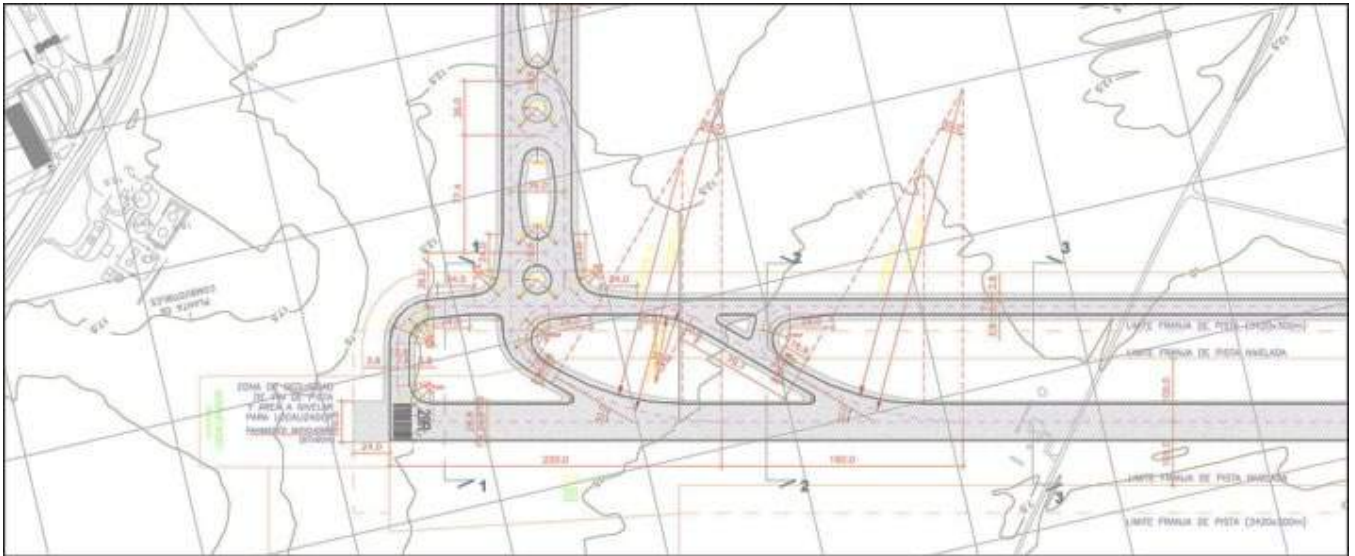


The construction of the new runway involves significant environmental and physical constraints related to the presence of the *Rio Matanza*. The study therefore also included an in-depth examination of the hydraulic and hydrological aspects of the project area.



With regard to the new runway parallel to the existing runway 11-29, the activities included:

- 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);
- 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



MASTER PLAN OF 8 AIRPORTS: PARANÀ, RIO CUARTO, VILLA REYNOLDS, GENERAL PICO, RECONQUISTA, FORMOSA, CATAMARCA, RIO GRANDE

Location:	Argentina
Client:	Aeropuertos Argentina 2000 SA
Services:	For each airport: Evaluation of the current state of infrastructures, Definition of urgent operations and commissioning in accordance with ICAO, Defining interventions of the first and second phase, Identification of alternatives or possible development, Quality control and environmental impact, Cost evaluation and investment plan, Final Master Plan
Period:	11/1999 – 02/2000
Construction cost:	Euro 152,870,000

Project Description:

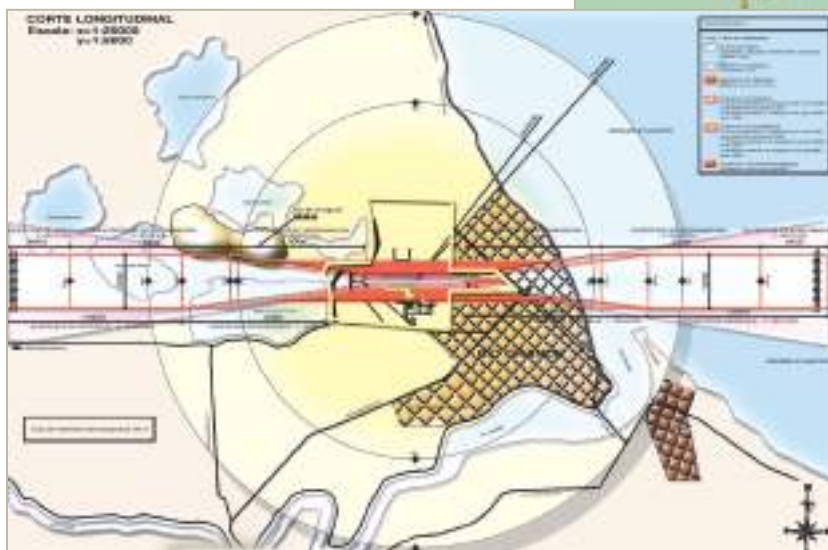
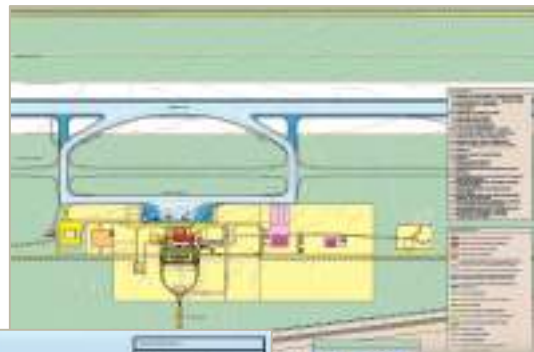
Since 1998 Technital-EBM has become advisor to the consortium Aeropuertos Argentina 2000, Concessionaire managing 33 Argentina's Airports, previously military managing.

During the 3 years of design consulting are executed Master Plans (up to 28 years), Three-year Development Plans, Cost Evaluation and Investment Plans of the 16 most important airports of the Country, of which the most important are those of the capital Buenos Aires (Ezeiza and Aeroparque) and those of other major cities (Cordoba, Mendoza ,

Mar del Plata, etc..)

The 2nd step of study regarded the Master Plans of 8 Airport with annual passenger traffic ranging from 300.000 to 1.000.000 pax/year:

- o Catamarca
- o Formosa
- o General Pico
- o Paraná
- o Reconquista
- o Rio Cuarto
- o Rio Grande
- o Villa Reynolds

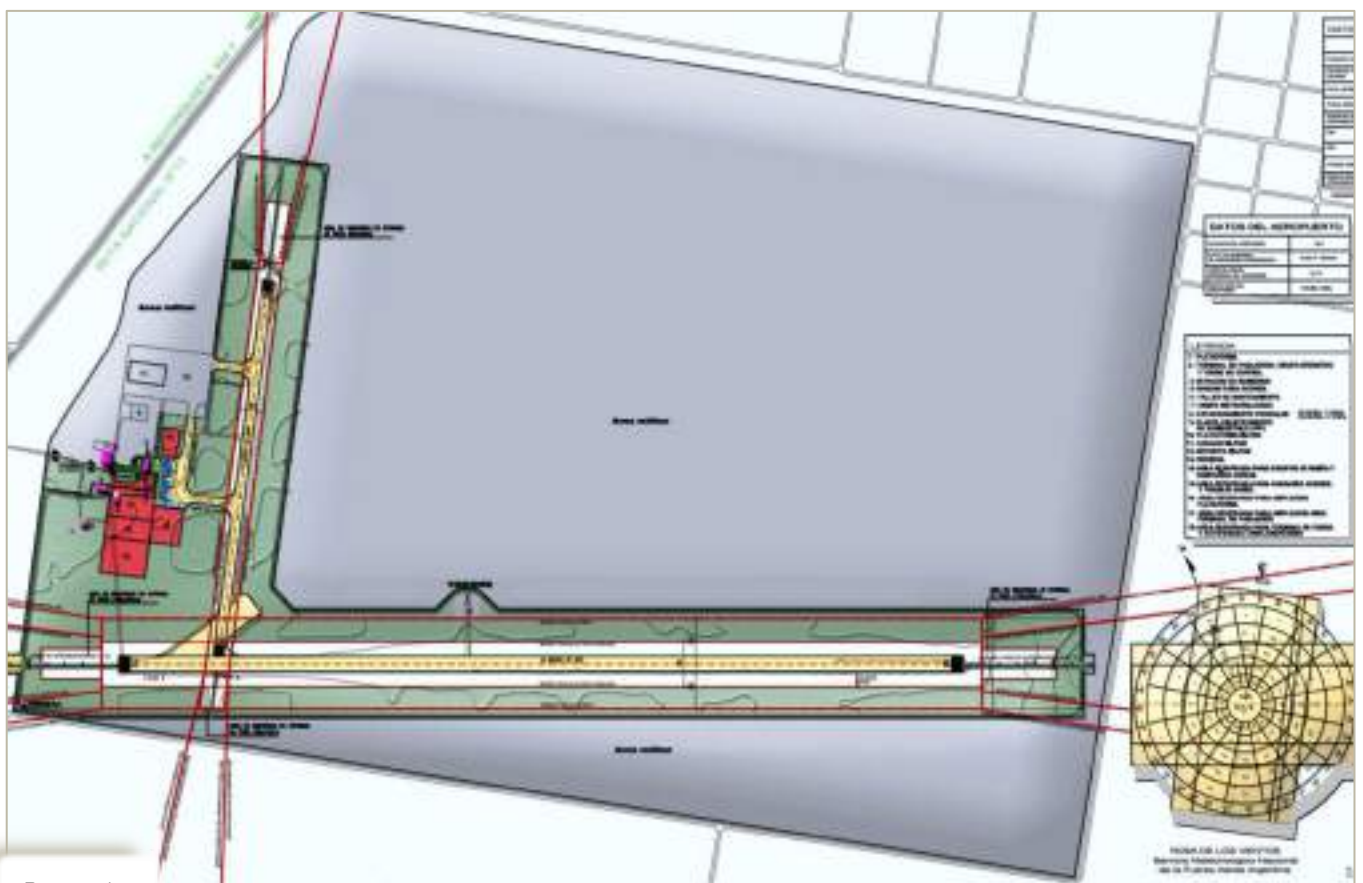
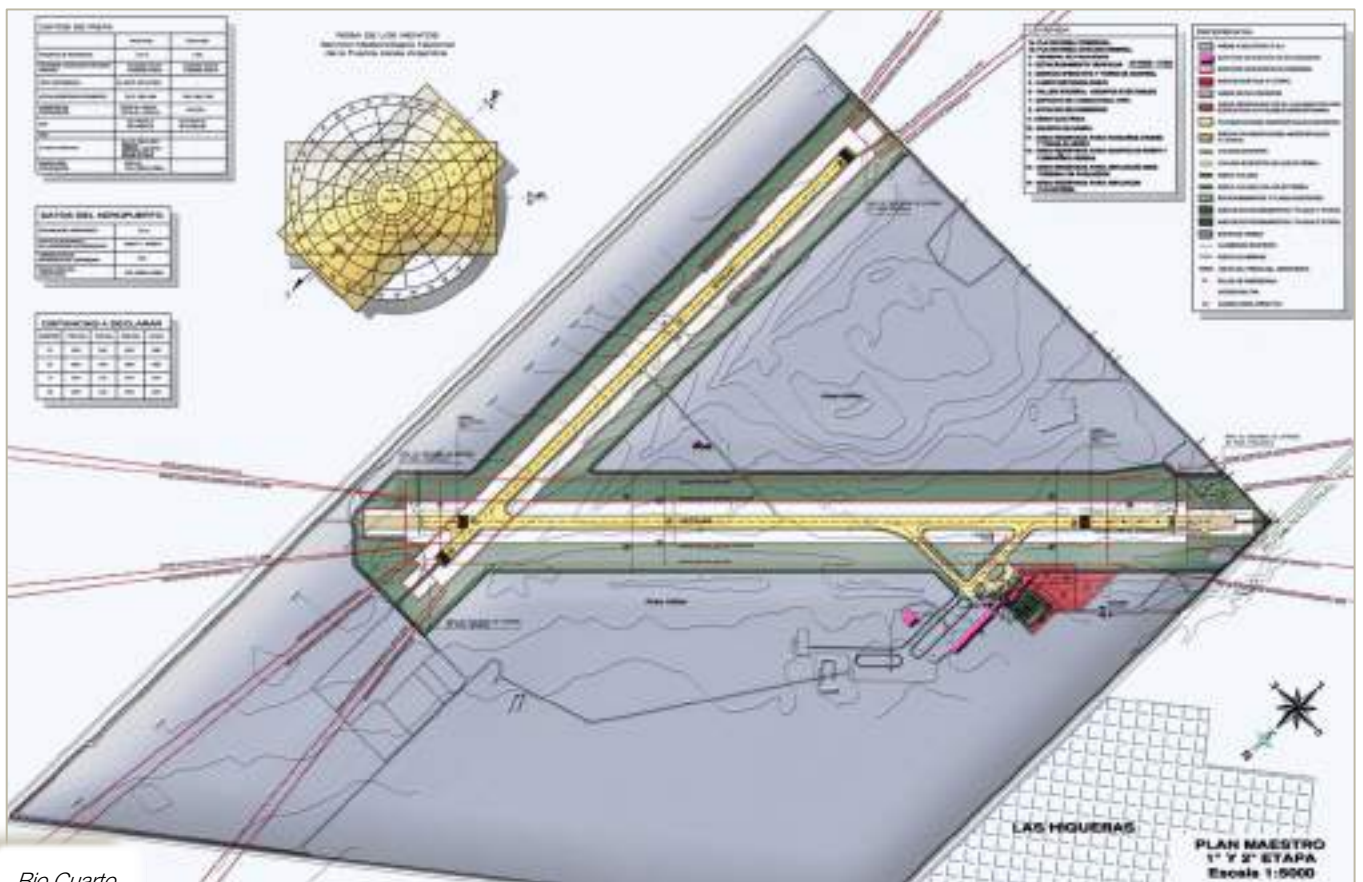


Rio Grande

Catamarca

Paraná

o



MASTER PLAN FOR THE INTERNATIONAL AIRPORT OF CORDOBA, NEW TERMINAL OF CORDOBA AND EXPANSION OF TERMINALS OF 2 BUENOS AIRES AIRPORTS - ARGENTINA

Location:	Cordoba and Bueno Aires, Argentina
Client:	Aeropuertos Argentina 2000 S.A.
Services:	For the Master Plan: Evaluation of the current state of infrastructures, Definition of urgent operations and commissioning in accordance with ICAO, Defining interventions of the first and second phase, Identification of alternatives or possible development, Quality control and environmental impact, Cost evaluation and investment plan, Final Master Plan
Period:	08/1999 – 08/2000
Construction cost:	Euro 390,000,000 (USD 350,000,000)

Project Description:

Since 1998 Technital-EBM has become advisor to the consortium Aeropuertos Argentina 2000, Concessionaire managing 33 Argentina's Airports, previously military managing.

During the 3 years of design consulting are executed Master Plans (up to 28 years), Three-year Development Plans, Cost Evaluation and Investment Plans of the 16 most important airports of the Country, of which the most important are those of the capital Buenos Aires (Ezeiza and Aeroparque) and those of other major cities (Cordoba, Mendoza , Mar del Plata, etc..)

The 3rd step of study regarded:

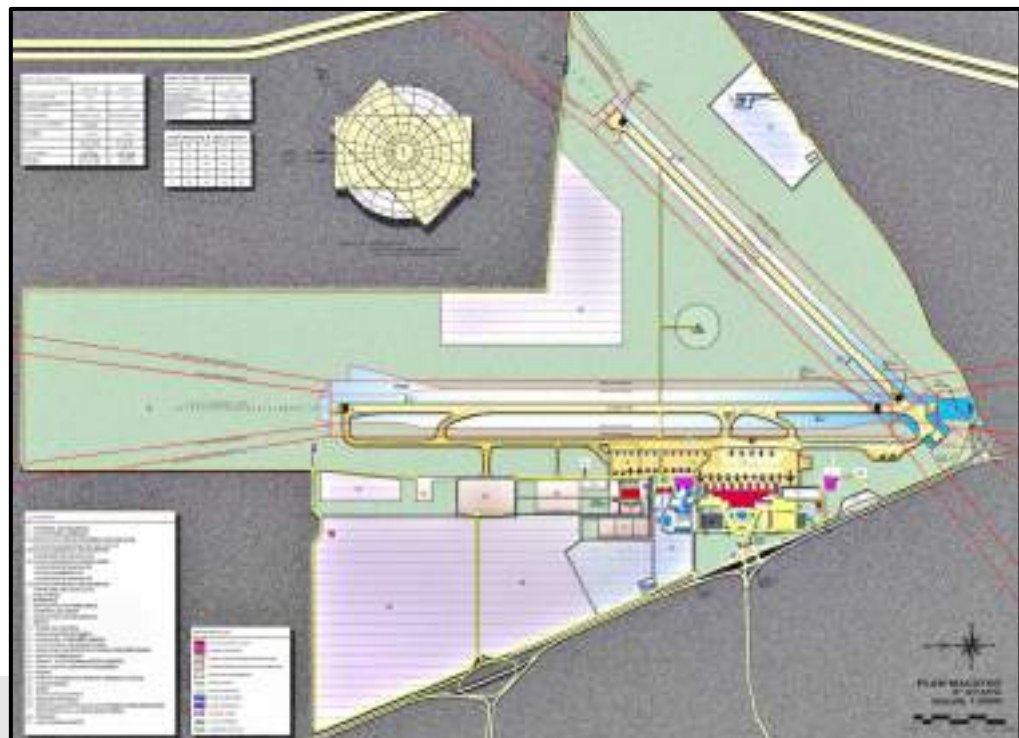
- Cordoba Airport: Master Plan from 4.5 to 6.0 million pax/year
- Cordoba Airport: Conceptual Designs of the new Cordoba Passengers Terminal (\$ 130.000.000)
- Buenos Aires Ezeiza Airport: Conceptual Designs of the expansion of Passengers Terminal (\$ 120.000.000) and renewal of the existing Terminals up to a capacity of 12 million pax/year
- Buenos Aires Aeroparque Airport: Conceptual Designs of the Terminal Area and of the restructuring and expansion of Passengers Terminal (\$ 100.000.000)

developed Conceptual Designs of the most urgent and important interventions, that served as the basis for local designers to develop the Detailed Design.

The studies was developed in cooperation with S.E.A. S.p.A.



In addition to the Master Plans and Investment Plans are also



MASTER PLAN OF 5 AIRPORTS: BARILOCHE, COMODORO RIVADAVIA, IGUU, MAR DEL PLATA, MENDOZA

Location:	Argentina
Client:	Aeropuertos Argentina 2000 SA
Services:	For each airport: Evaluation of the current state of infrastructures, Definition of urgent operations and commissioning in accordance with ICAO, Defining interventions of the first and second phase, Identification of alternatives or possible development, Quality control and environmental impact, Cost evaluation and investment plan, Final Master Plan
Period:	07/1999 – 02/2000
Construction cost:	Euro 321,130,000

Project Description:

Since 1998 Technital-EBM has become advisor to the consortium Aeropuertos Argentina 2000, Concessionaire managing 33 Argentina's Airports, previously military managing.

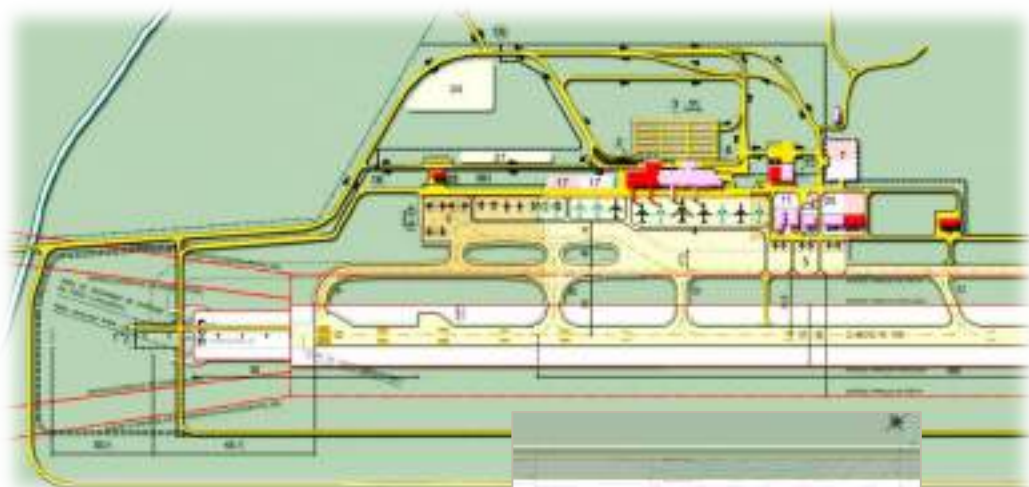
During the 3 years of design consulting are executed Master Plans (up to 28 years), Three-year Development Plans, Cost Evaluation and Investment Plans of the 16 most important airports of the Country, of which the most important are those of the capital Buenos Aires (Ezeiza and Aeroparque) and those of other major cities (Cordoba, Mendoza, Mar del Plata, etc..)

The 1st step of study regarded the Master Plans of 5 Airport with annual passenger traffic ranging from 1.500.000 to 2.000.000

pax/year:

- o Bariloche
- o Mendoza
- o Iguazù
- o Mar del Plata
- o Comodoro Rivadavia

Bariloche



Iguazù



Comodoro Rivadavia





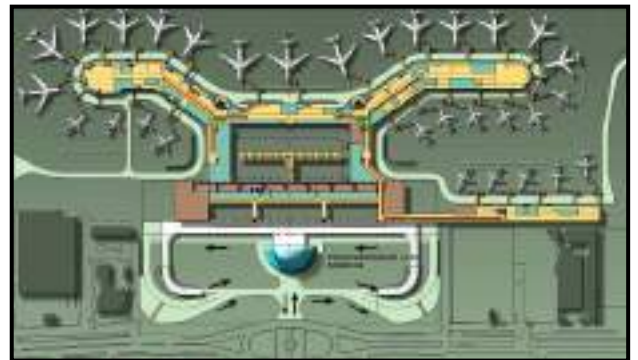
JORGE CHAVEZ INTERNATIONAL AIRPORT IN LIMA

Location:	Lima, Peru
Client:	S.E.A. S.p.A..
Services:	Master Plan, traffic forecasts, environmental study, business plan and conceptual layout design of the passenger terminal.
Period:	07/1999 – 09/1999
Construction cost:	Euro 744,300,000

Project Description:

The objectives of the studies was an international BOT tender for the development of a new airport in Lima. Studies were 80% completed when S.E.A. S.p.A. withdrew from the tender.

The master plan included forecasts up to 2029.



RENEWAL OF G. LISA AIRPORT IN FOGGIA FOR YEAR 2000 JUBILEE

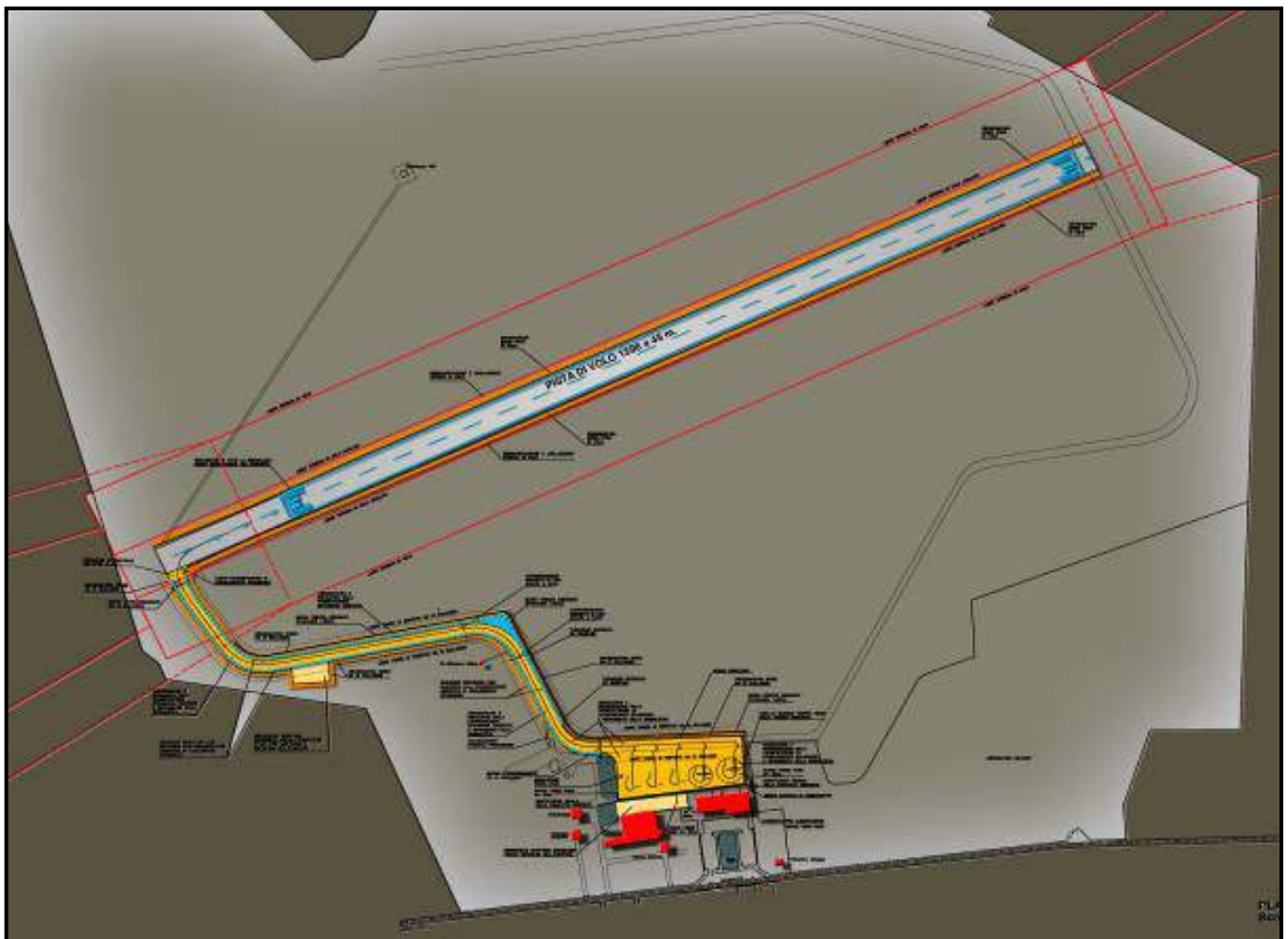
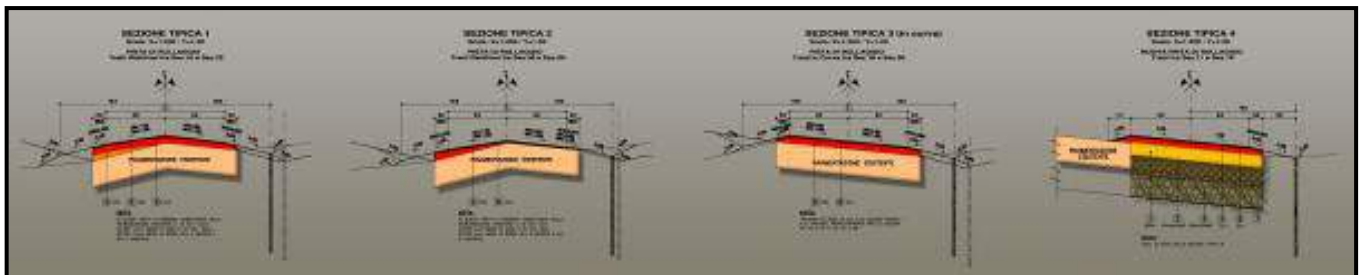
Location:	Foggia, Italy
Client:	S.E.A. S.p.A.
Services:	Final design of the Refurbishing of: Runway, Taxiway and Apron. - Hangars and Logistic Buildings. - Passenger Terminal
Period:	12/1998 – 08/1999
Construction cost:	Euro 3,644,000

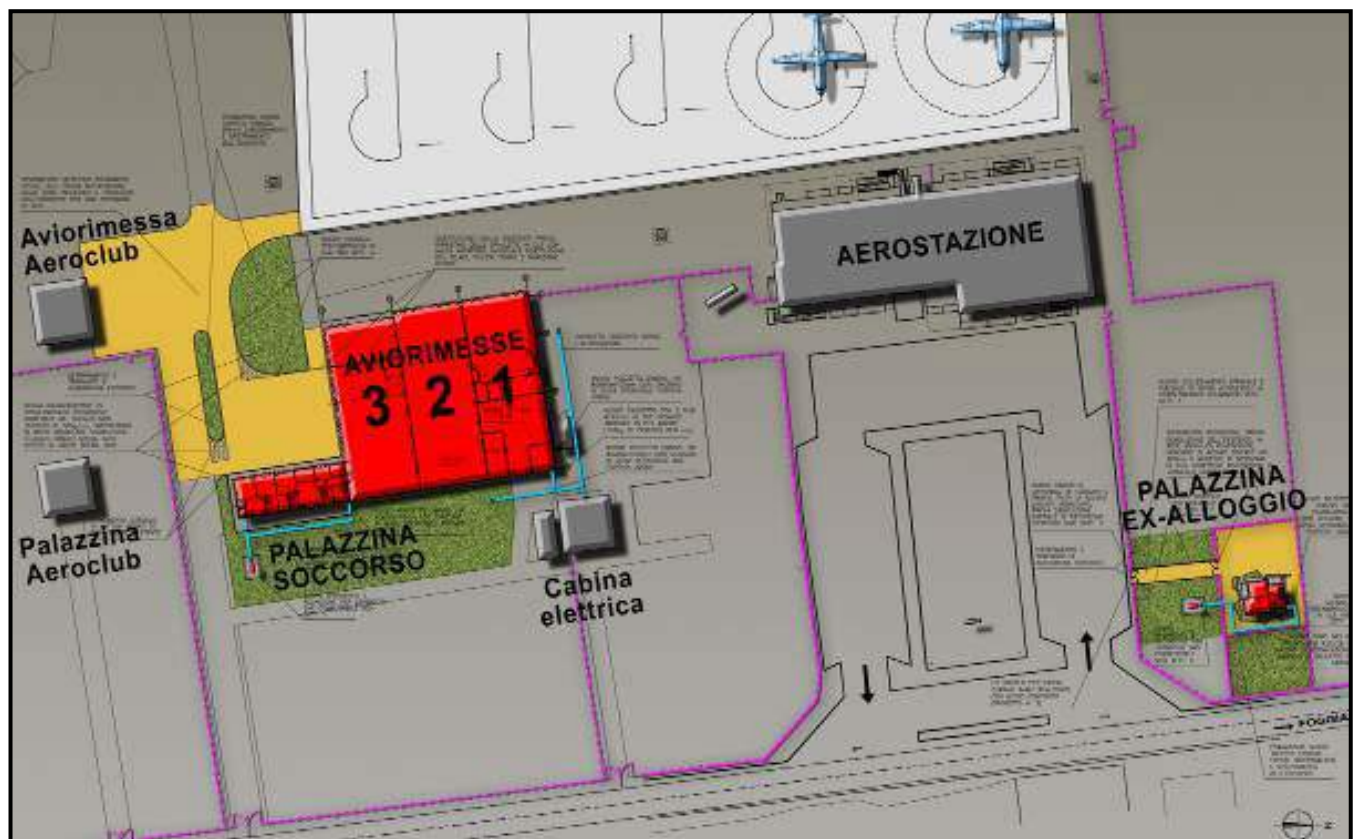
Project Description:

Final design of the following:

- project 1: refurbishing of the runway, taxiway and apron
- project 2: refurbishing of hangars and logistic buildings
- project 3: refurbishing of the passenger terminal

The works were completed in year 2001.





INTERNATIONAL AIRPORT OF SARAJEVO

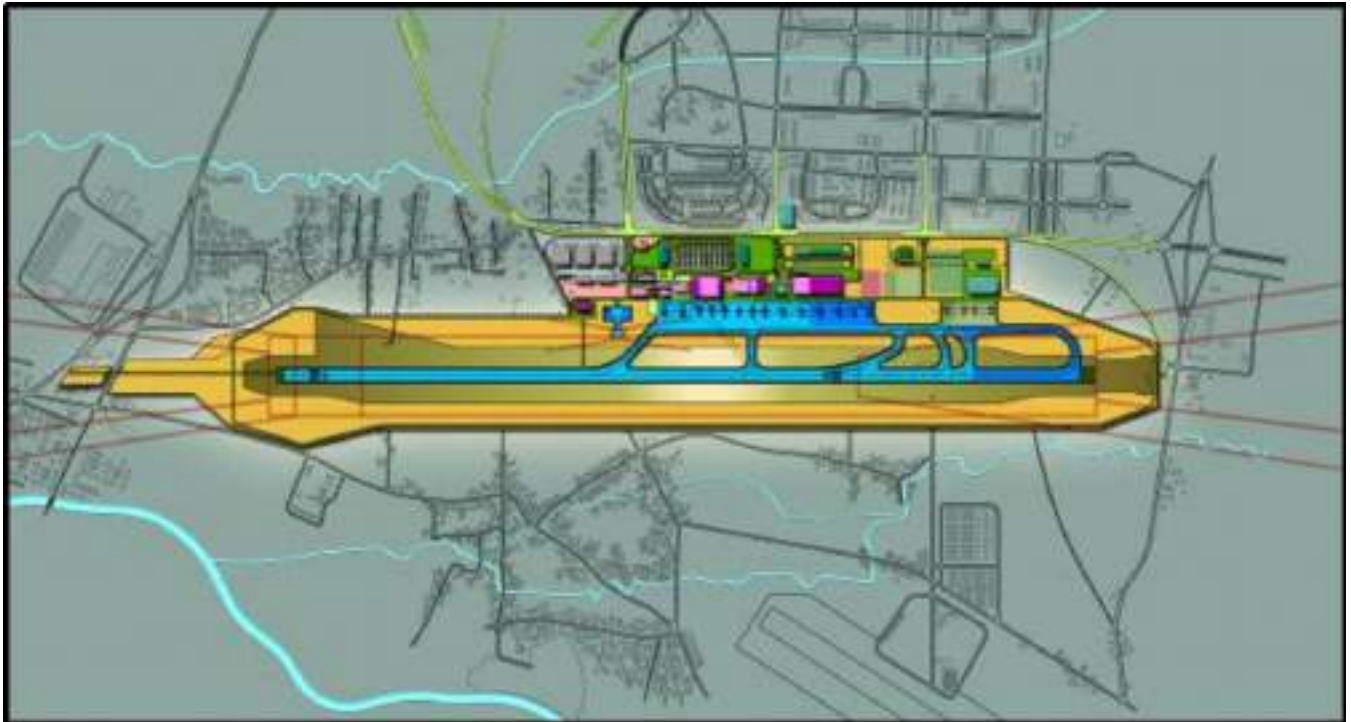
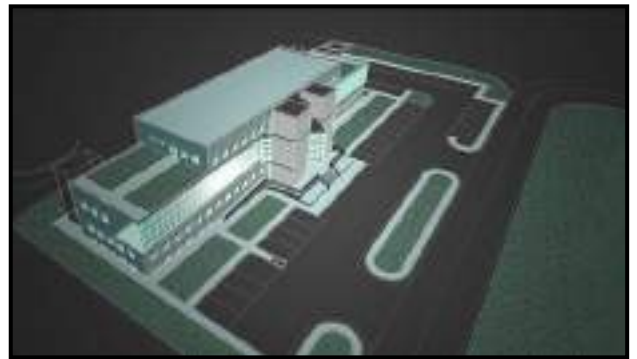
Location:	Sarajevo, Bosnia Herzegovina
Client:	SEA S.p.A.
Services:	Master Plan up to year 2020 and Preliminary Design of the 1 st phase planned interventions
Period:	07/1998 – 12/1998
Construction cost:	Euro 21,400,000

Project Description:

The Master Plan studies were developed in cooperation with SEA S.p.A.

The preliminary design of the first phase planned interventions of the following:

- New Buildings: Cargo Terminal, Maintenance Workshop, Electrical Power Station, Firefighting Building, Ground Support Equipment Recovery Hangar, Administrative Building.
- Expansion of the apron.
- New taxiways
- Internal service roads



MASTER PLAN AND PASSENGERS TERMINALS OF EZEIZA INTERNATIONAL AIRPORT IN BUENOS AIRES

Location:	Buenos Aires, Argentina
Client:	SEA S.p.A.
Services:	Master Plan layouts (6 alternatives), Layout and Preliminary Design (civil works) of passengers terminals: 1 expansion building and renovation of existing 2 buildings (12 million pax/year)
Period:	07/1998 - 11/1998
Construction cost:	Euro 53,300,000

Project Description:

The works for the expansion of the Terminal Building were completed in June 2000. The following studies were developed in cooperation with S.E.A. S.p.A.:

- airport master plan for the development of a new airport layout plan (6 alternatives)
- expansion to bring the capacity of the Terminal Building up to 12 million passengers / year
- refurbishing of the existing 2 terminal buildings



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. (Dirección General de Infraestructura)
Services:	Master Plan and Preliminary Design of the internal roads and the main terminal area buildings, including Passenger Terminal, Cargo Terminal and Firefighting Station
Period:	03/1997– 09/1997
Construction cost:	Euro 152,000,000

Project Description:



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.



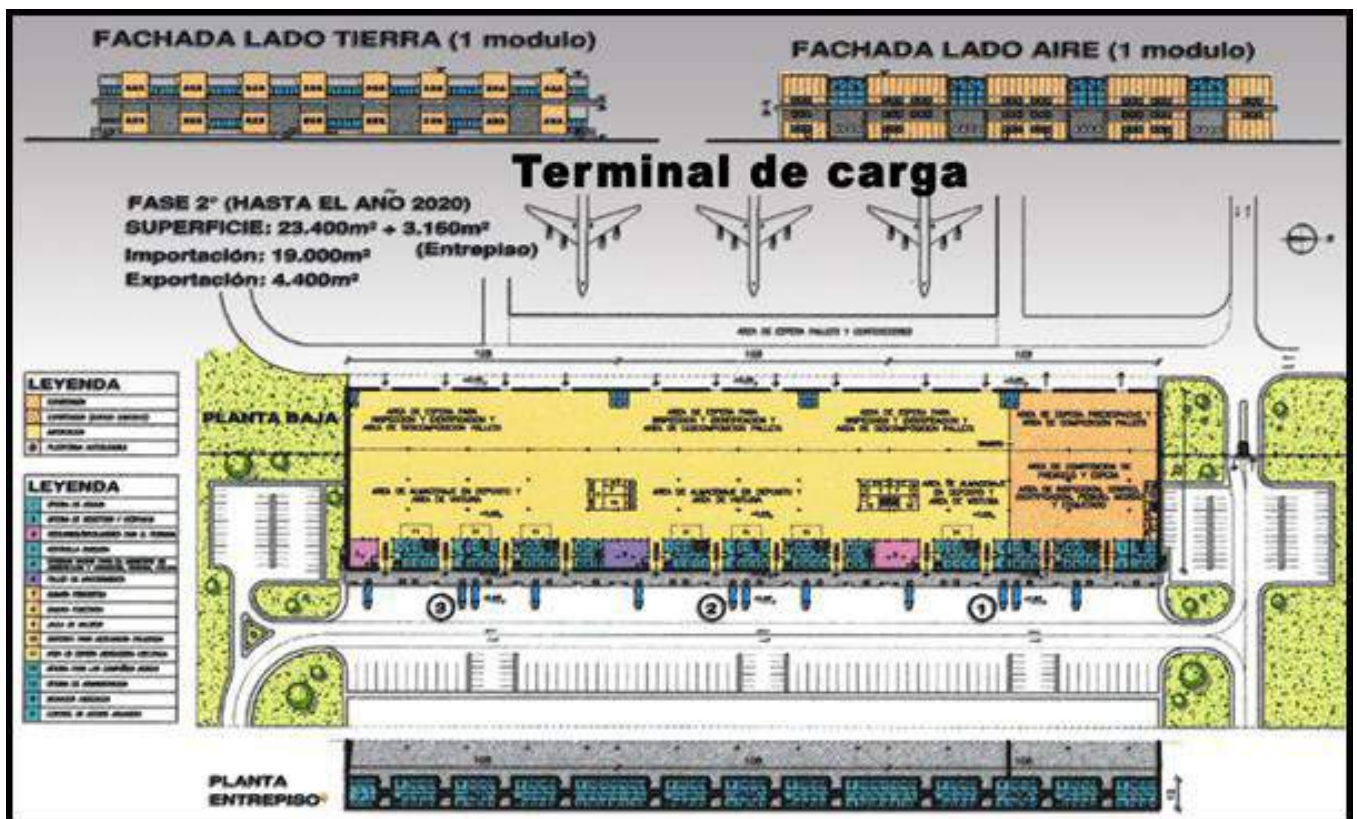
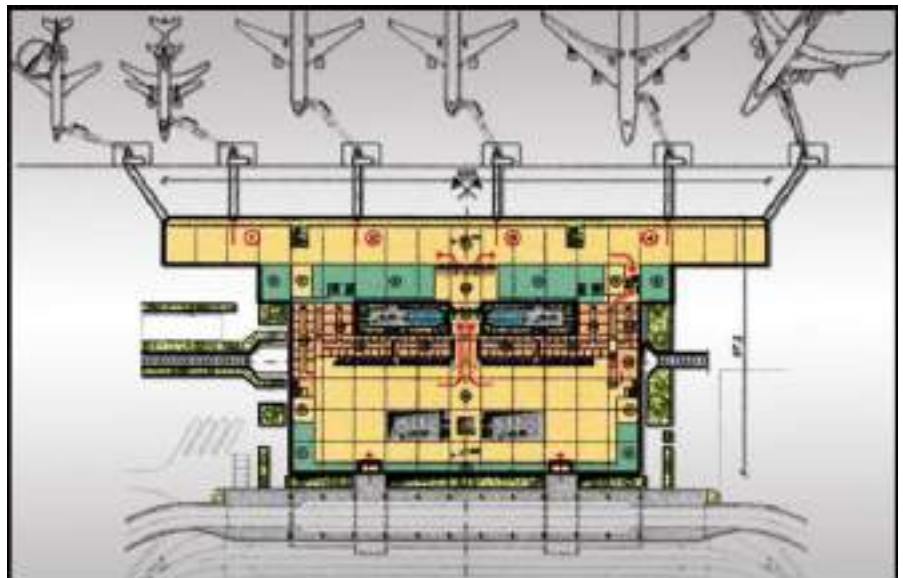
The Master Plan, comprehensive of the aeronautical infrastructures designed in 1995-96, involved the definition the future development of the airport in relation to the passenger and cargo terminals, access routes and parking areas for buses and cars.

The Master Plan study includes the following activities:

- Traffic forecast updating
- definition of two alternative master plan solutions
- cost estimates for both solutions
- selection of the design solution
- general technical specifications for civil, electrical and mechanical works
- investment programme.

The Preliminary Design includes:

- Internal roads
- Passenger Terminal
- Cargo Terminal
- Firefighting Station
- Other minor buildings in the terminal area.



17 AIRPORTS MASTER PLAN AND DESIGN OF A CIVIL AVIATION. TECHNICAL ASSISTANCE AND TRAINING PROGRAMME

Location:	17 national airports throughout the country, Romania
Client:	Romanian Ministry of Transport - Bucharest
Services:	Feasibility Study, Concept and Preliminary Design. Economic and financial analysis of the current operation of the 17 Romanian airports, financial plan and technical assistance and training programme.
Period:	09/1996 – 05/1997
Construction cost:	n.a.

Project Description:

Technical evaluations, economic and financial analyses, financial plan, technical assistance and training programme in the context of the E.U. sponsored project for the upgrading and restructuring of the Romanian airports. Technital, together with SEA - *Servizio Esercizi Aeronautici* of Milan, has been charged with the study of the current operation of the 17 Romanian airports.

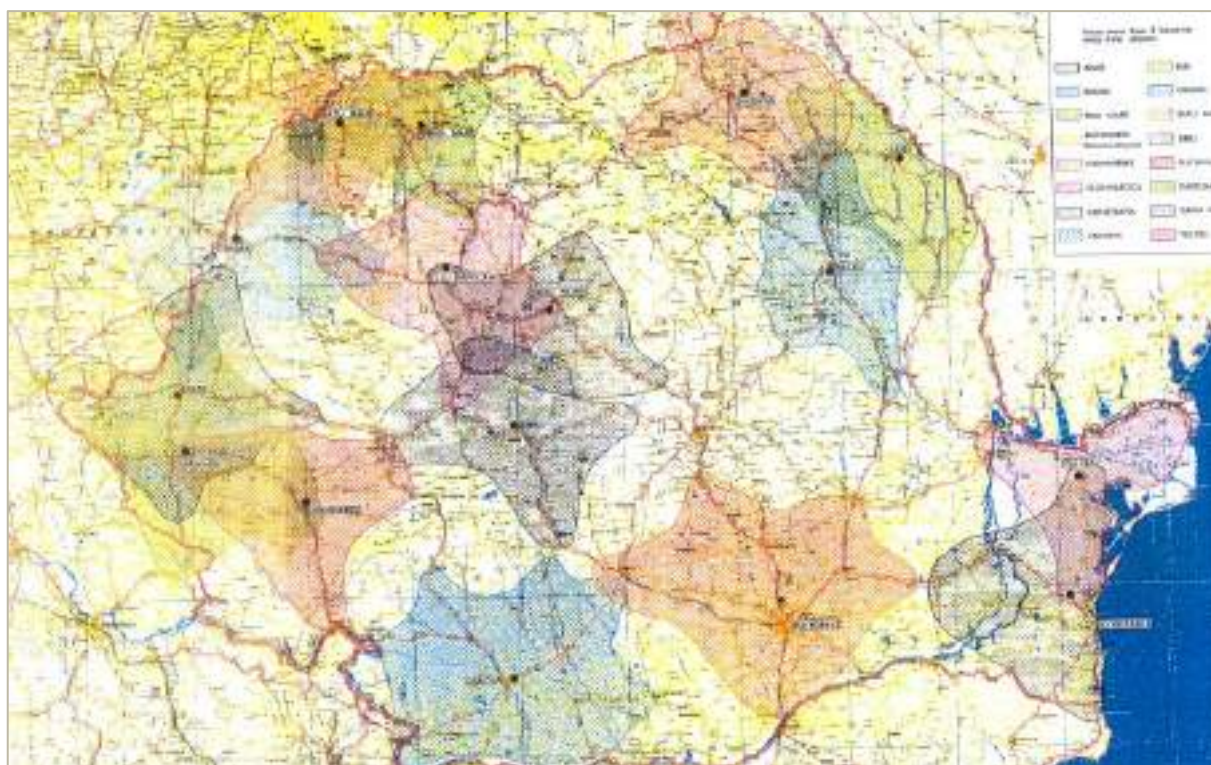


The project aims to help the Romanian Ministry of Transport make fundamental decisions on airport policy within a land-use



planning approach by:

- analysing and demonstrating the economic and financial viability of the seventeen Romanian airports as autonomous enterprises, distinguishing between those airports which should be upgraded and those which should be closed or converted for other purposes;
- making clear recommendations for the future development of the most viable Romanian airports, and in particular providing:
 - technical recommendations and plans for infrastructure development
 - financial plans for investment
 - technical assistance and training programme.



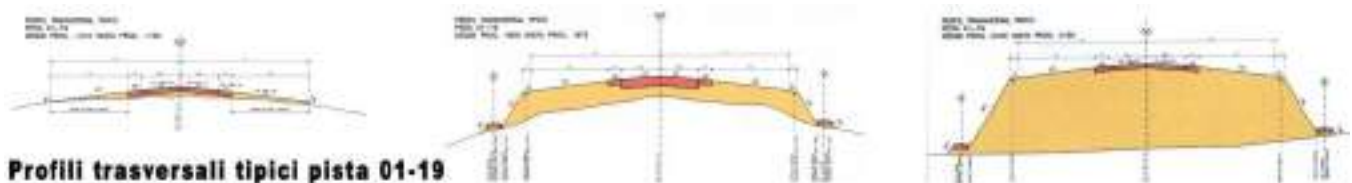
AIRSIDE FACILITIES AND VISUAL AIDS OF CARRASCO INTERNATIONAL AIRPORT

Location:	Montevideo, Uruguay
Client:	P.N.U.D. (Programa de las Naciones Unidas para el Desarrollo) & D.G.I.A. (Dirección General de Infraestructura)
Services:	Master Plan of airside facilities, Feasibility study and Detailed Design of expansion and reinforcement of air-side pavements (runway, apron and taxiway system), drainage, visual/radio aids and apron flood-lighting
Period:	06/1995 - 09/1996
Construction cost:	Euro 48,000,000

Project Description:

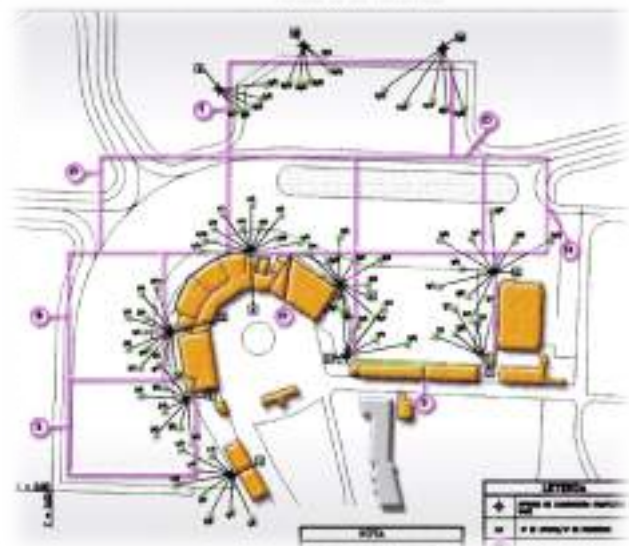
The International Airport of Carrasco is the main airport of Uruguay, connected to 21 cities in 11 different foreign countries. It was constructed in 1947 and has been constantly improved over the succeeding years: its aeronautical structure is at present constituted by three runways, the largest of which is 2.740 m long and 48 m wide. Today the operational capacity of the airport is barely sufficient to cope with the existing traffic flows, inadequate therefore for the future traffic and operational demand.

Following an evaluation study conducted by the Administration, it has been decided to provide for a short term programme of rehabilitation and improvement of the aeronautical part of the AIC, with particular regard to **pavements, drainage and visual aids**. The Administration, with the support of the UNDP, launched an international Tender for engineering services in relation to the performance of a feasibility study and the detailed design of the needed interventions. TECHNITAL, in association with SEA, was selected for the execution of the Project and a Contract was signed on 23/5/1995.

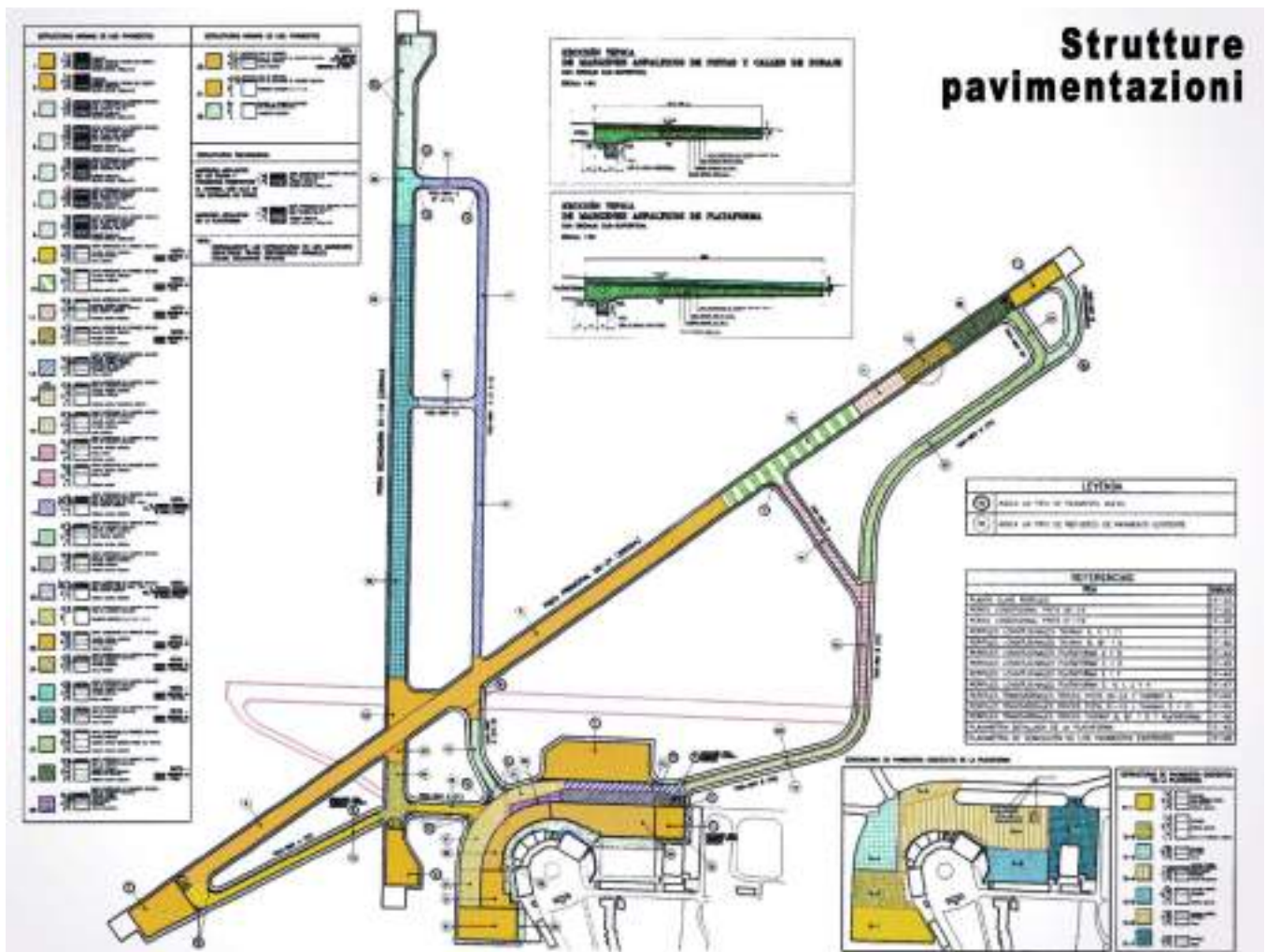


The Project included the following activities:

- study of the present transportation system;
- analysis and evaluation of traffic demand for alternative development scenarios;
- definition of AIC development strategies and Master Plan;
- outline of alternative technical solutions for the reinforcement and rehabilitation of pavements and drainage and modernisation of visual aids;
- technical evaluation of possible alternative solutions;
- economic and financial analysis;
- environmental impact assessment;
- selection of best alternative;
- final design of interventions;
- preparation of Tender documents for international bid.



Strutture mentazioni



Airport Terminals

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:	Final Design, 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 m²), separated from each other, respectively for the Arrivals and the Departures. The facade has an overall length of 400 m, whereas the width of the building is about 40 m only.



The Departures Terminal has an area of approximately 18,800 m² 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/MEP 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 by approximately 11,530 m², and upgrading by 12,300 m². 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:	Concept, Preliminary and Detailed Design, Works Supervision
Period:	11/2016 - ongoing
Construction cost:	Euro 25,735,000

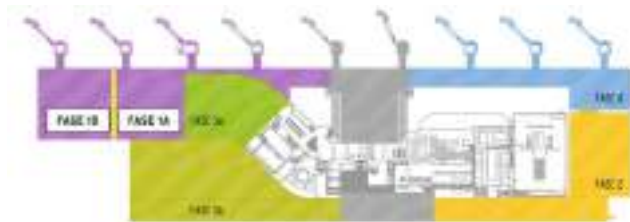
Project Description:

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 Eiras

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) -10th edition.



The 1st building is square-shaped with 2420 m² footprint, whereas the 2nd building is rectangular with 2510 m² 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 m² (4000 m² at ground floor and 4400 m² 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.

EXPANSION OF THE SOUTH PIER PASSENGER TERMINAL AND RENOVATION OF THE EXISTING TERMINAL OF THE "MARCO POLO" AIRPORT IN VENICE.

Location:	Venice, Italy
Client:	SAVE S.p.A.
Services:	Works Supervision
Period:	04/2018 – 11/2020
Construction cost:	Euro 18,577,918

Project Description:

The consulting services regard construction supervision, worksite management, quantity surveying and coordination of safety during construction for the extension of the Passenger Terminal - South Pier and renovation of the existing terminal at the "Marco Polo" Airport in Venice.

The South Pier project is intended to increase, starting from year 2020, the level of service of the areas dedicated to non-Schengen passengers through expansion works south of the existing terminal.

The supervised works include:

- Expansion of the Extra-Schengen arrival hall and related passenger passport control, at ground floor
- Expansion of the departure hall for Extra-Schengen passengers at 1st floor
- Expansion of the passenger arrivals corridor at the mezzanine floor
- New equipment rooms at the 2nd floor
- New boarding bridge to serve the new tower
- Two new boarding bridges to serve the existing tower south of the terminal
- Creation of a dedicated access gate for cargo
- New compartment for utilities located in the basement of the new building, connected with the utility tunnel already built within Lot 1
- New parking area and related facilities, and upgrade of airside service roads including parking spaces for shuttle bus

Besides an increase of passenger terminal's surface area by approximately 3,000 m², the project includes seismic strengthening of the existing terminal and requalification of the adjacent areas.



The new building is constructed with mixed steel-concrete circular columns and steel lattice girders as horizontal beams. The rooftop is made of major and secondary steel elements and horizontal self-supporting wooden panels. The part of the roof on the airside facade has an articulated and three-dimensional shape to recreate the typical Venetian form so called "a gaggiandre". The new boarding bridges have a steel structure whereas the connected new tower is constructed with reinforced concrete walls.

The assignment includes the conception and management of strategic plans for the coordination of works with the aim of minimizing interference with airport operations, particularly with regard to foundation works and seismic improvement works, involving the adoption of technical solutions in compliance with safety and security standards. The launching of the 5 new boarding bridges was carried out by night with a detailed check of all work phases in close liaison with the relevant airport operators.

The assignment also includes review of the detailed design, as well as inspections and checks at the prefabrication factory.



EXPANSION OF THE PASSENGER TERMINAL OF DJIBOUTI AIRPORT

Location:	Djibouti - Republic of 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

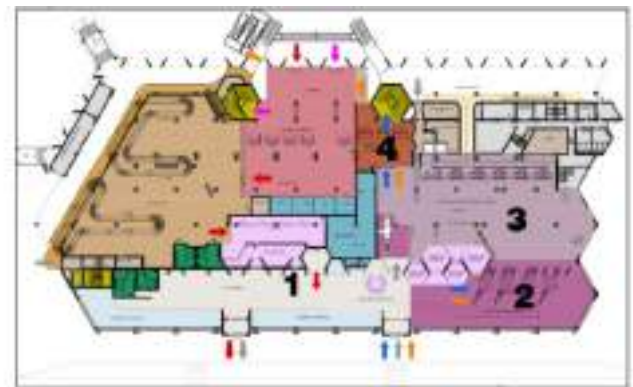
Project Description:

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 m²)
- Modernization of the interiors of the existing passenger terminal (5.200 m²)
- 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



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 of the new underground railway station and railway link between Terminals 1 and 2 (Lot 2). Final design of civil works, mechanical, electrical and plumbing services for the station, geological and geotechnical studies, utility diversions, site layout planning, preparation of tender documents.
Period:	04/2012 – 07/2013 (Lot 1) – 07/2015 Lot 2
Construction cost:	Lot 1: Euro 49,020,000 - Lot 2:Euro 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.

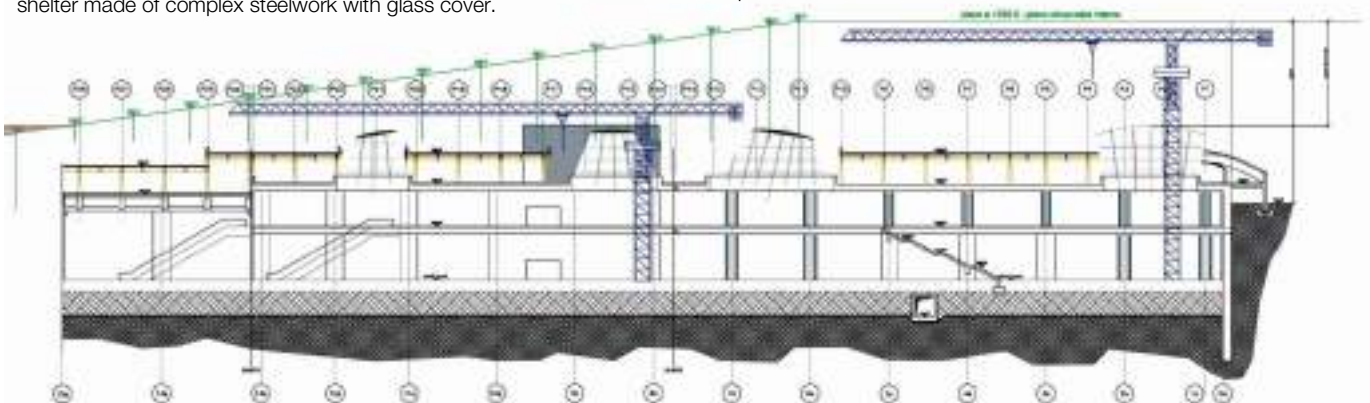


Mechanical electrical and plumbing services are included in the design:

- 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.



3RD PHASE OF DEVELOPMENT INTERVENTIONS OF THE BUCHAREST-OTOPENI INTERNATIONAL AIRPORT

Location:	Bucharest, Romania
Client:	ROMAIRPORT S.r.l.
Services:	Preliminary, Final and Detailed Design of interventions of the 3 rd phase of airport development: 2 new Terminals, 1 Terminal renewal, Aprons, at-level Parking
Period:	06/2008 - 12/2011
Construction cost:	Euro 93.460.000

Project Description:

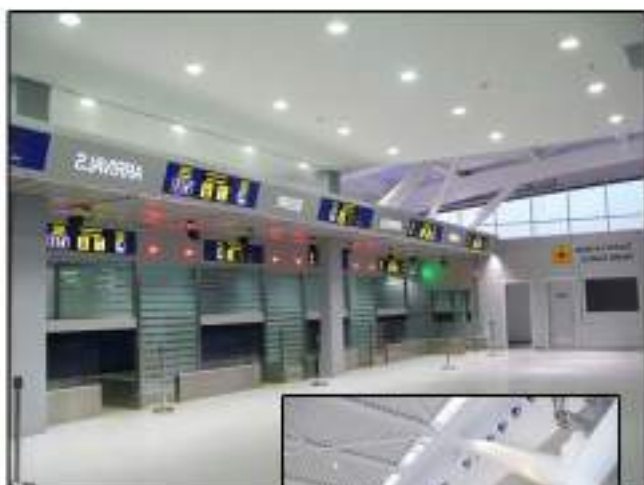
Romania's entry into the Schengen area changes radically the nature of the passengers' flows. This change impacts greatly on the Otopeni Airport, structured in 3 Terminals (Departure Terminal, Arrival Terminal and Finger). The whole system of 3 Buildings is also extended to accommodate passenger traffic of 6 million passengers / year in service category B (IATA classification). This involves the tripling of the Finger (from 8.000 m² to 25.000 m²), the doubling the Departure Terminal (from 19.500 m² to 39.000 m²) 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 m²) 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 m²) 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.







NEW PARKING AND SERVICE ROAD FOR MALPENSA INTERNATIONAL AIRPORT

Location:	Milan, Italy
Client:	S.E.A. S.p.A.
Services:	Preliminary, Final and Detailed Designs and Health and safety, worksite coordination plan of the new at-grade parking (1,700 cars) in front of the Terminal 1 and new service road underpass
Period:	11/2004 – 05/2005
Construction cost:	Euro 4,150,000

Project Description:

Preliminary, final and detailed design of a new at level parking with a capacity of 1,700 cars and of the modification of the adjacent roads. The parking, reserved for passengers and visitors, is in front of the passengers terminal 1 and of the rail station.

The construction of the new parking involves a change of the road system in front of the rail station, with the shift of the road and the creation of access roads to the parking.

A green works plan of the parking was also developed: each round is characterized by a different green theme (rocks, water, roses, etc.) to help the user orientation.

As it is expected that in the future this road will be buried (to eliminate interferences between pedestrian crossing and road traffic) we have also developed the preliminary design of the future underpass to avoid the incompatibility of implementation.

During the preliminary analysis, were proposed 4 alternative layouts and was also studied a solution of a multi-storey underground parking building.

The high visibility of the new parking, located at the center of the terminal area, has prompted the search for solutions to high-landscaped, with excellent finish and high accuracy of realization level.

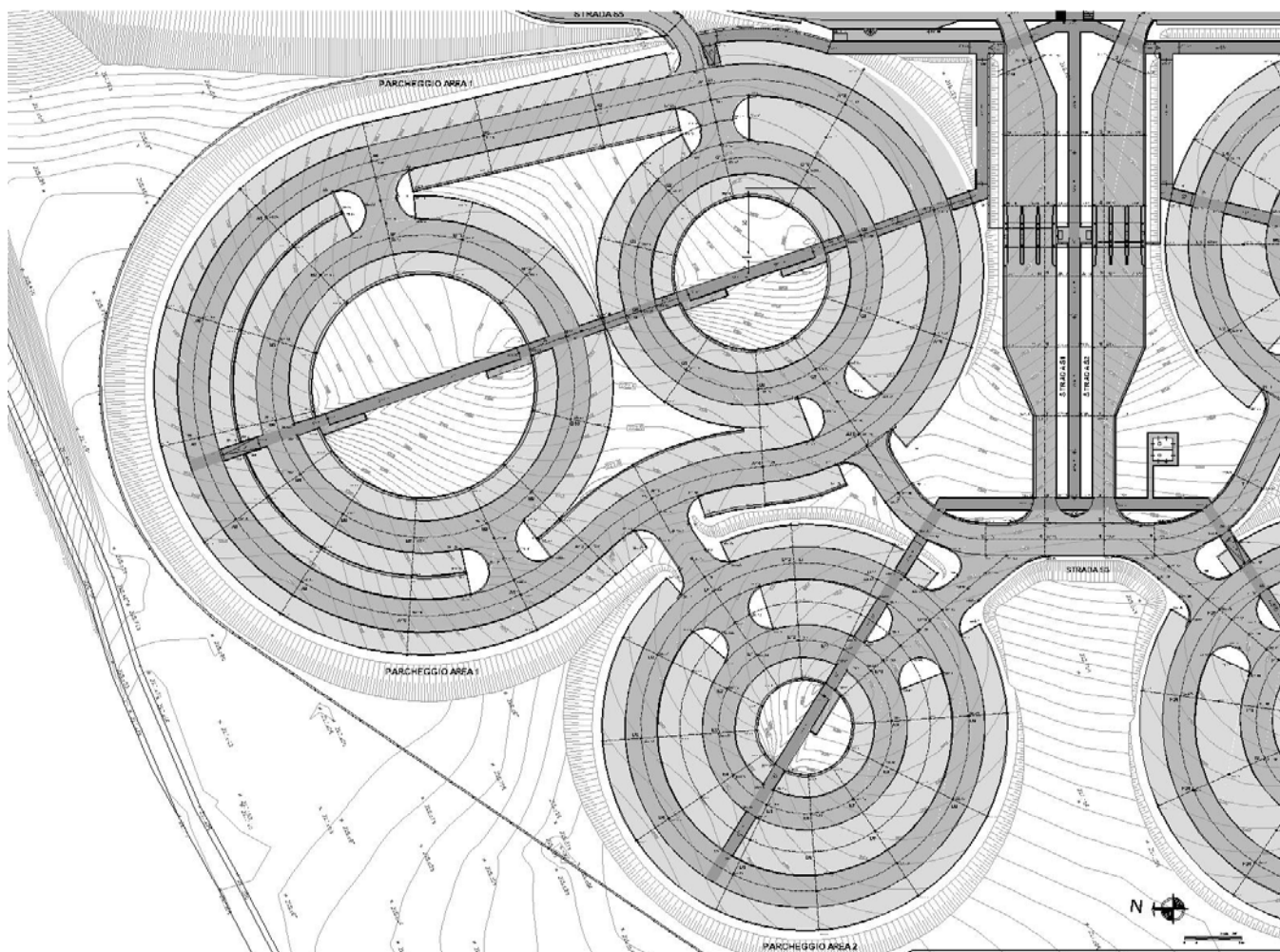
Therefore it was chosen the layout (with rounds) that allowed to leave more green areas and to adapt to natural gradients of the ground, in the form of large amphitheatre, in order to reduce the impact on the landscape and the earth movements. This layout has also shorter pedestrian paths.

4 types of pavements have been used:

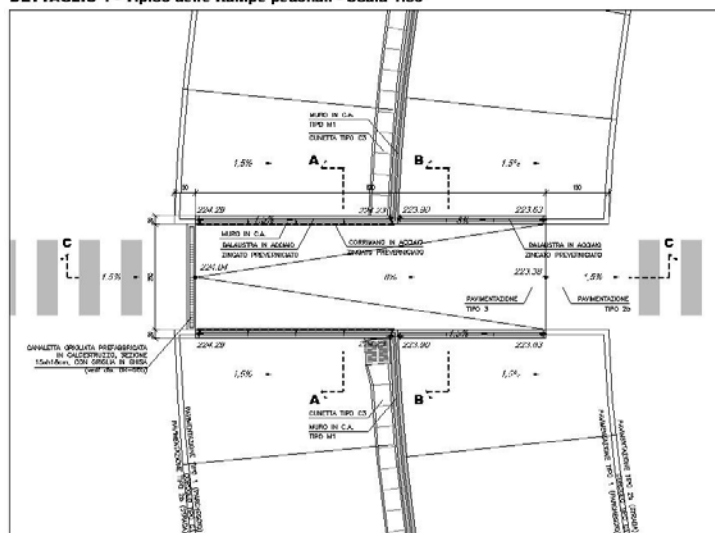
- For internal parking service roads: bituminous pavements type 1.
- For translated external road: bituminous pavements type 2.
- For cars places: interlocking double-layer tiles.
- For walkways: porous bituminous pavement coated with antislip modified synthetic resins.

In the works designed are included fences, railings, drainage system, irrigation system, firefighting network, green works, road signs, lighting system, supervision system, power station and predispositions for management equipment.

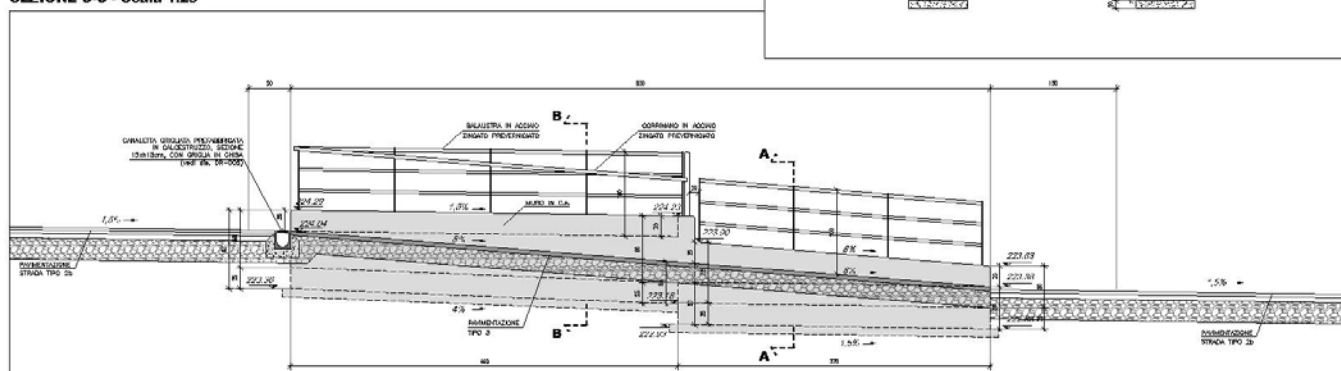




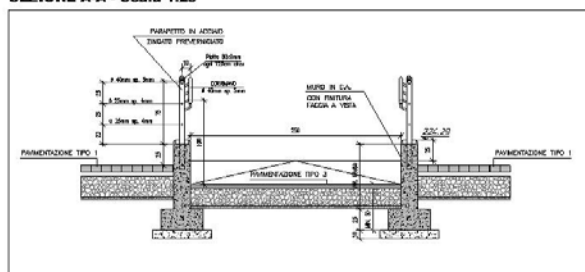
DETTAGLIO 1 - Tipico delle Rampe pedonali - Scala 1:50



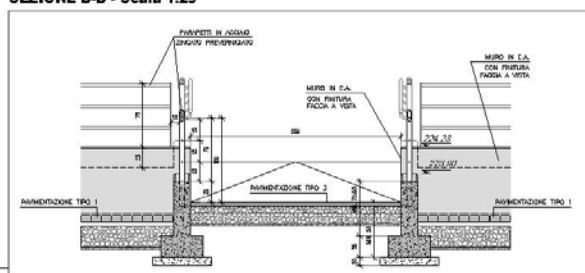
SEZIONE C-C - Scala 1:25



SEZIONE A-A - Scala 1:25



SEZIONE B-B - Scala 1:25



16 HARDENED SHELTERS FOR 3rd GENERATION AIRCRAFT FOR NATO MILITARY BASE OF POZNAN

Location:	Poznan, Poland
Client:	C.C.A. Cimolai S.p.A.
Services:	Final and Detailed Designs
Period:	09/2004 – 03/2005
Construction cost:	Euro 22,000,000

Project Description:

Final and detailed design of the reinforced concrete structure of 16 hardened shelters for 3rd generation aircraft for NATO military base in Poland.

The NATO third generation aircraft shelters have been designed to resist the effects of impacts and dynamical loads caused by high energy explosions, and have been subject to full scale tests through the years to verify their ability to resist to this type of loads.

The structure of the shelters is a cylindrical reinforced concrete vault with corrugated steel arched panels at the intrados acting as casting forms as well as structural reinforcement.

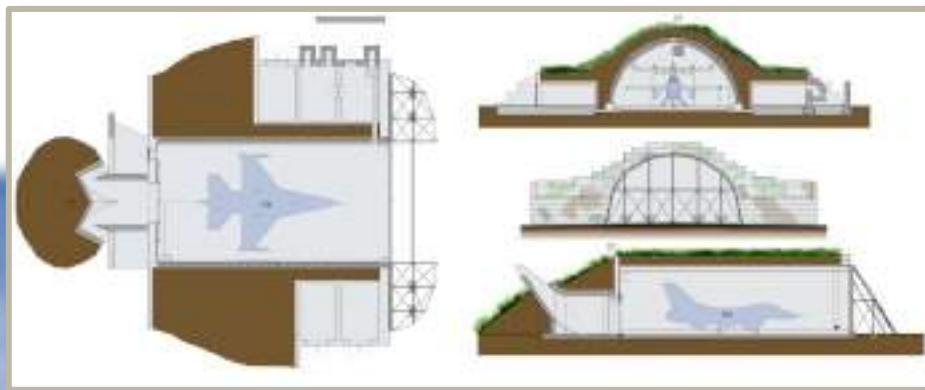
In order to reduce total construction time, casting of concrete on the previously assembled steel panels vault will proceed symmetrically along the arch at a rate of 1 m of per hour, thus being completed in less than 20 hours. In this conditions, lacking the time for hardening of concrete, the vault formed by the

corrugated steel panels will be subject to the pressure of freshly mixed concrete along its entire span. Since the steel panels vault is not capable of supporting by its self the weight of the freshly mixed concrete, a secondary support structure was needed.

The structure of the shelter is closed on the rear side by a 60 cm thick wall with a reinforced concrete jet blast deflector.

The front of the shelter structure is completely open; a separate structural concrete steel sliding door is provided for closing the shelter.

Foundation of the concrete vault is a 2.0 m wide foundation beam, connected with 9 reinforced concrete tension ties provided to resist to the horizontal thrust of the arch.



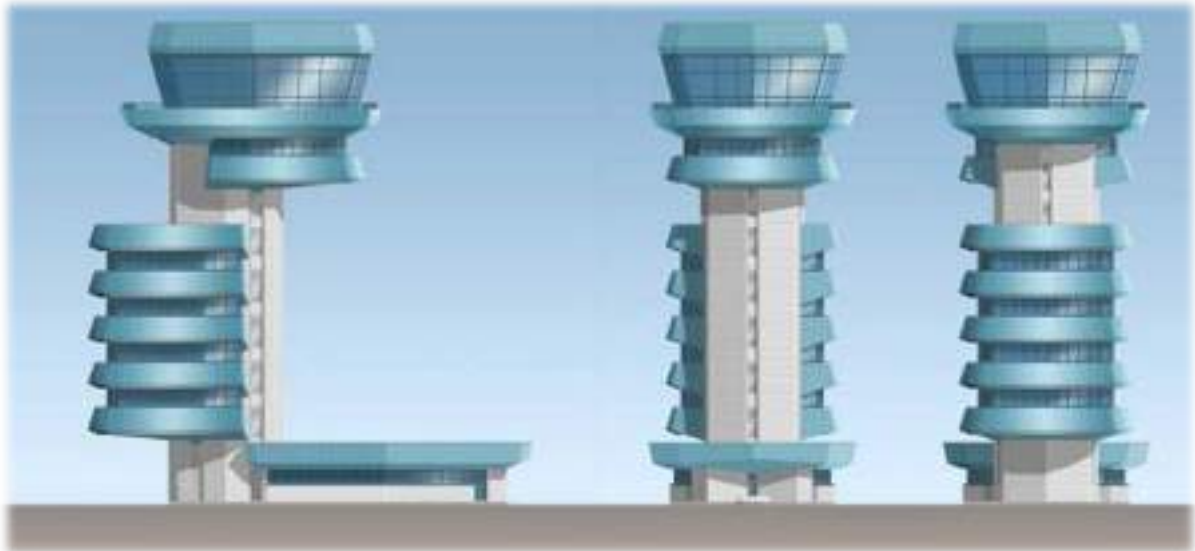
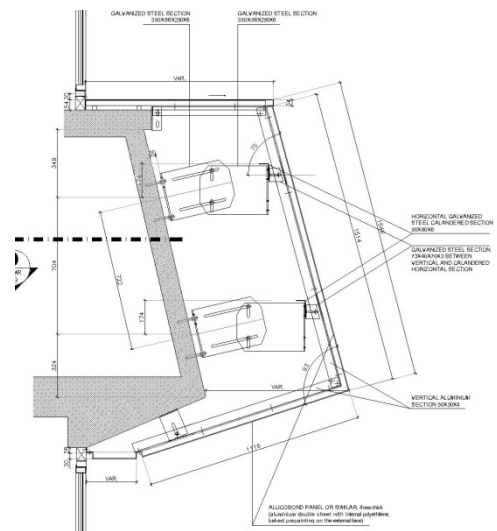
CONTROL TOWER RENEWAL OF THE OTOPENI INTERNATIONAL AIRPORT OF BUCHAREST (2ND PHASE OF DEVELOPMENT AND MODERNIZATION)

Location:	Bucharest, Romania
Client:	Romairport S.r.l.
Services:	Preliminary and Final Designs of the Control Tower renewal
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.



PASSENGER TERMINAL OF BERGAMO ORIO AL SERIO AIRPORT

Location:	Bergamo, Italy
Client:	S.A.C.B.O. S.p.A.
Services:	Preliminary Design of the air-side extension of the Passengers Terminal and of the new air-side roads
Period:	11/2003 – 12/2003
Construction cost:	Euro 10,000,000

Project Description:

Preliminary Design of the air-side extension of the Passengers Terminal Building and of the new air-side roads.



PASSENGERS TERMINAL BUILDING OF BARI PALESE INTERNATIONAL AIRPORT

Location:	Bari, Italy
Client:	S.E.A. S.p.A.
Services:	Preliminary, Final and Detailed Designs of extension (1,150 m ²) of Departure Terminal and of the Rehabilitation and Renovation of existing Terminal (3,500 m ²).
Period:	10/2000 – 02/2003
Construction cost:	Euro 2,300,000

Project Description:

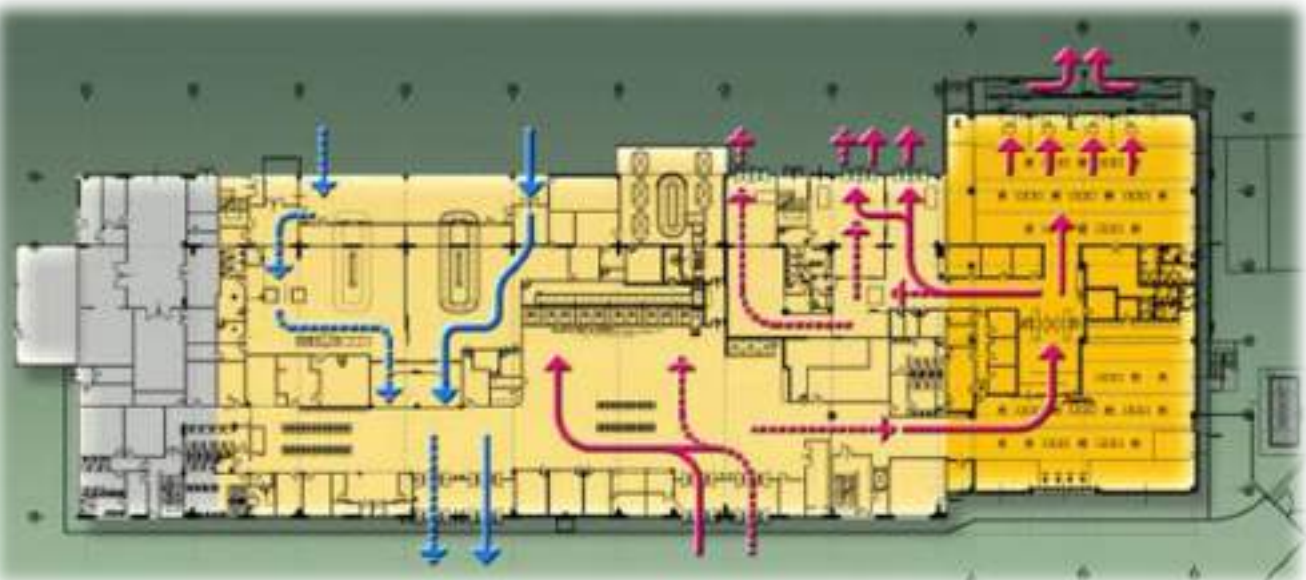
The objective of the extension of the existing Terminal was to achieve an adequate level of service in the period of time necessary for the construction of the new Terminal. The design had to be developed in short time, and the cost had to be strictly limited. The Terminal instead of a Departure Terminal.

It was designed the civil and structural works, special furnishings, mechanical, electrical and special installations, baggage handling system and external works (landside viability and airside apron).

The original design, prepared up by TCH in the period 2000-2001 according the initial requests of Airport Management Company (SEAP), provided that the building expansion would host the arriving passengers flow.

During the construction, following the tragic events of 11 September 2001, which induce airports to increase the dimensions of the areas devoted to security, SEAP requested a variant study which change completely the function of use of the original project (departures instead of arrivals) and upgrading of the existing building.

The variant studies led to the complete re-design, totally different from and more complex than the original project.



2nd 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 of all civil works of the modifications of existing buildings, new buildings and as well as of the air-side infrastructures provided for the 2 nd phase of airport development.
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 m²).
- ✦ 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 m²).
- ✦ Renewal and modification of the existing C Building (connection between Arrivals and Cerimonial Padillion) for the conversion into Offices area (5.100 m²).
- ✦ Renewal of the central heating plant building (1.750 m²).

Preliminary design of the following new buildings:

- ✦ New multistorey car parking (3 levels - 17.700 m²).
- ✦ Baggage handling building adjacent to the Departure Terminal (470 m²).
- ✦ Ground support equipment recovery Hangar with annexed Apron Control Tower (5.750 m²).
- ✦ 2 water treatment stations (300 m² 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 m²).
- ✦ Rehabilitation of internal service road D10 and Taxiway November.

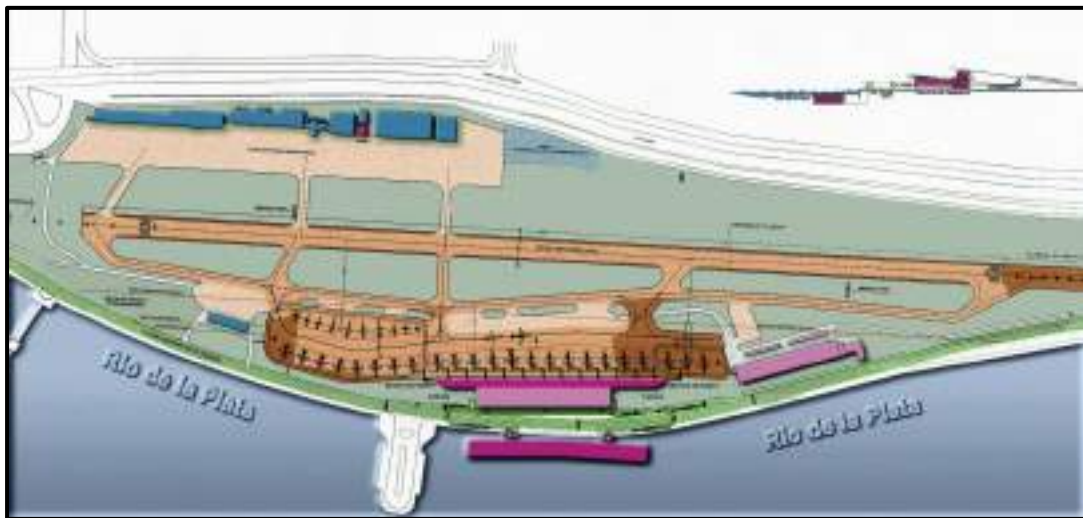


TERMINAL AREA MASTER PLAN AND PASSENGERS TERMINAL OF AEROPARQUE INTERNATIONAL AIRPORT

Location:	Buenos Aires, Argentina
Client:	S.E.A. S.p.A.
Services:	Master Plan layout of terminal area (3 alternatives) and Feasibility Study of renovation and expansion of passengers terminal (8 million pax/year)
Period:	11/1998 – 03/1999
Construction cost:	Euro 22,300,000 (only civil works)

Project Description:

The construction was terminated in September 2001. The studies were developed in cooperation with S.E.A. S.p.A.



NEW PASSENGER TERMINAL BUILDING, BHS SYSTEM, ACCESS ROADS / PARKINGS & SEWERAGE SYSTEM FOR INTERNATIONAL AIRPORT OF BARI PALESE

Location:	Bari, Italy
Client:	ITL Itlairport S.p.A. in liquidazione
Services:	Detailed design of the new Passengers Terminal (28.000 m ²): civil works, Baggage Handling System (BHS), relevant access roads, parking and sewerage system and Design Management
Period:	08/1997 – 06/1998
Construction cost:	Euro 13,200,000

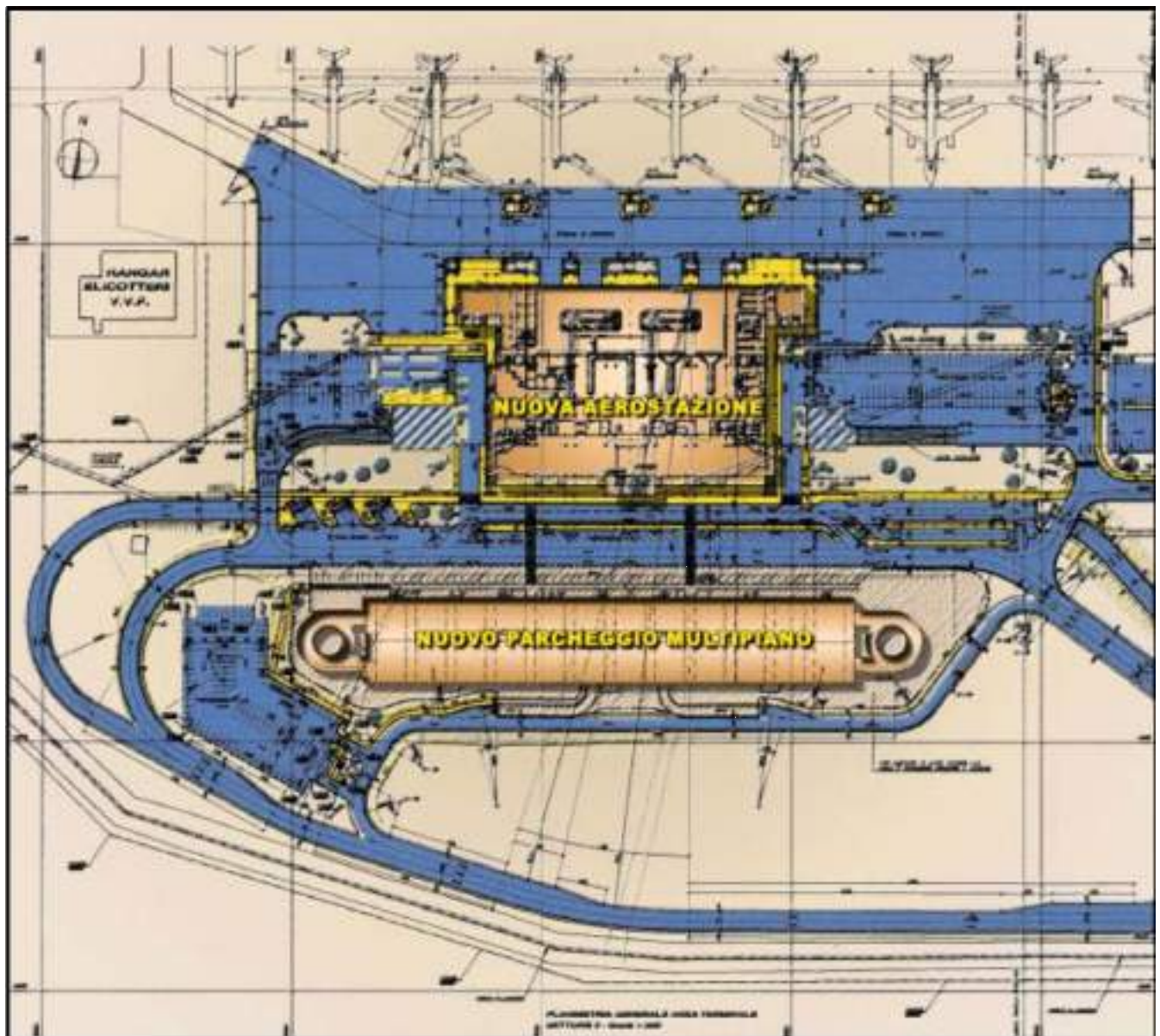
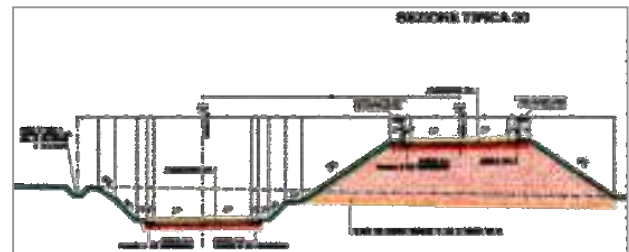
Project Description:

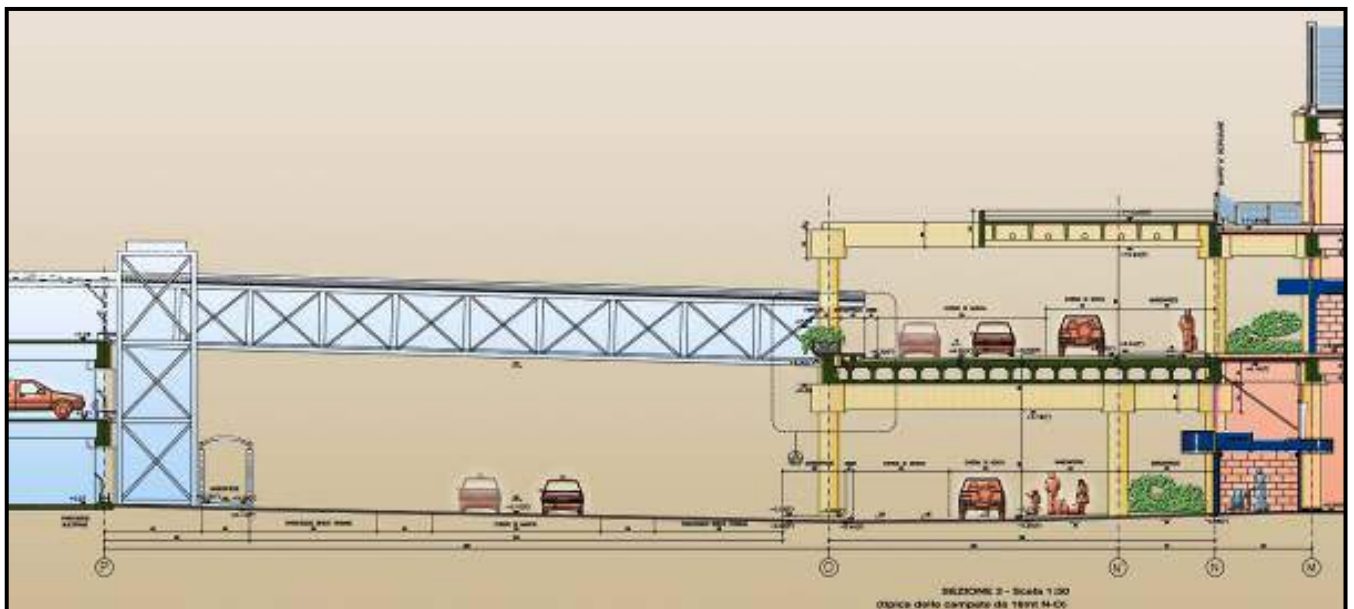
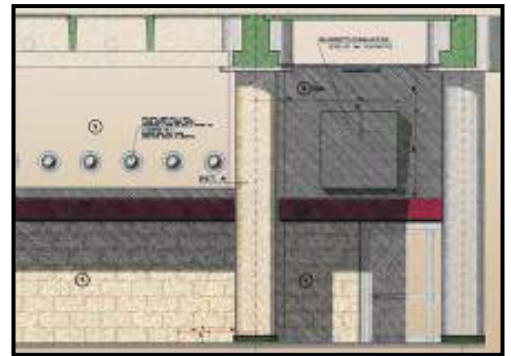
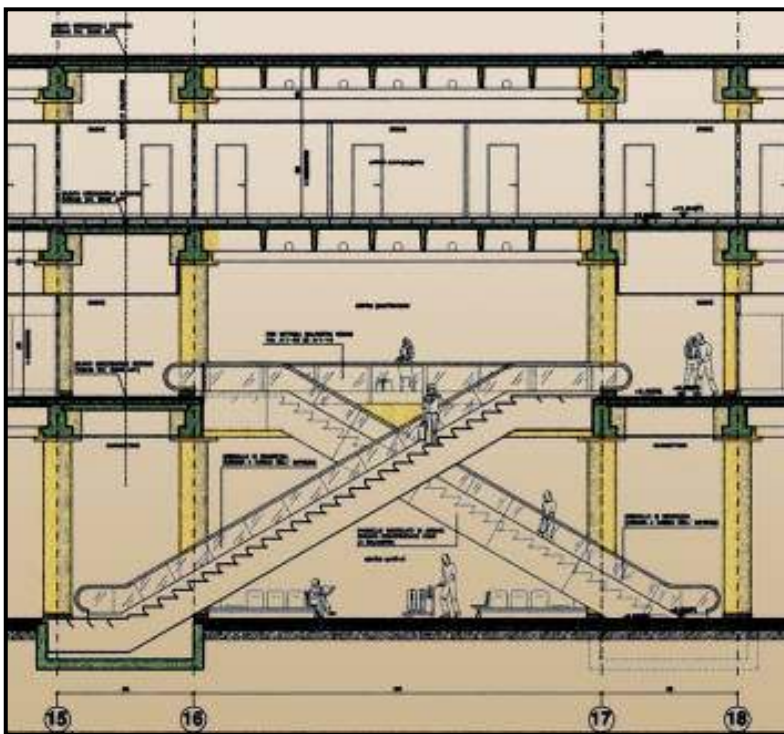
The scope of the project is to improve the capacity of the Airport with the construction of a new Passenger Terminal Building for 3 million passengers per year, forecast in 2015.

In particular:

- Construct a new Passenger Terminal Building of 35.000m² fully equipped and furnished.
- Construct new access roads and parking areas for 3.000 cars.









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