



STT *SpA*
ingegneria

COMPREHENSIVE
ENGINEERING
FOR A SUSTAINABLE FUTURE



LOTTI INGEGNERIA IS A MEMBER OF OICE,
A MEMBER ASSOCIATION OF FIDIC

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yesterday

A group of imaginative and enterprising professionals coming from different sectors, joined in partnership to develop **project engineering** in Italy and the world.

today

An international company with over **50 years** of experience and a background of **1,000 projects** completed in **4 continents**.

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about us

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sectors

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atlas of projects

LOTTI INGEGNERIA REFLECTS THE IMPRINTING AND VALUES INTRODUCED BY THE FOUNDER OF THE COMPANY, ENGINEER **CARLO LOTTI**, AND A UNIQUE CAPACITY TO ADOPT A MULTIDISCIPLINARY AND INTEGRATED APPROACH MAKING IT AN **IDEAL PARTNER** WORLDWIDE.

1950

Strength of will



1960

The firm goes abroad

Aiming toward the future

Founded in 1957 as a firm for hydraulic engineering, LOTTI Ingegneria successfully overcame its first great challenges in Southern Italy after the end of the war, executing important public works in the water and roads sectors, which are still strategic for the Group today. The opening to foreign market was not long in coming. Often working jointly with major Italian construction firms, the company was constantly interacting both with the contractors on the one hand and foreign institutions on the other.

Steps forward towards cooperation and sustainability

Starting from the 1980s, we started up numerous assignments throughout the world for development cooperation. This experience was consolidated and became the capacity to tackle any major project on the basis of environmental and social responsibility.

The path of continuity

Under the guidance of Engineer Patrizia Lotti, we are a group of approximately 200 professionals with a highly integrated range of multidisciplinary skills, prepared to achieve our goals and joined together with a commitment to go beyond expectations. "Each person's experience is everyone's wealth" is the underlying incentive constantly fostering sharing and discussion, with the integration of specializations, the tendency towards improvement and ongoing development.

Experience is our guide

Thanks to our background, we believe that know-how and great skill in design can be brought to fruition only on the basis of experience. We have put this principle into action and managed major, highly complex projects in Italy and at the international level. Among the largest projects, we contributed to the design of the **Milan-Bologna High Speed Railway line** and the supervision of the works for the Venice Lagoon defence system (**MOSE**)*.

* Built by the Ministry of Infrastructures and Transport – Triveneto Inter-Regional Office for Public Works, through the Venezia Nuova Consortium.

1970

Italy grows



1980

Collaboration for integration

We do our utmost

Doing well and better

We are working all over the world, taking part in the creation of better living conditions through large-scale projects.

In our history, the future is always present, because we are a tight-knit group of designers with a focus on the needs of the customer who commissions the works and of those who are responsible for their execution, and able to guarantee a flexible, dynamic approach throughout the stages of a project.

We adapt to a very wide range of cultures, clients, countries and regulations, and implement sustainable planning, promoting the involvement of the local population and taking care for the places and people on which the projects have an impact.

In Italy and in the world, we deal with highly complex situations and handle the specific challenges of each project by finding the most innovative and effective solutions. With project engineering, we help satisfy today's needs without compromising the potentials of future generations.

We give more

Each major project is the result of top quality international experience and know-how "made in Italy" developed at the highest levels.

Our leadership involves extra know-how providing the best integration of skills with a global vision of the project. We bring together the potentials of synergy and partnership, fostering the cooperation and development of human potentials, joining new technologies with consolidated experience. We undertake each assignment, from the concept stage, then to the design up to the supervision of the works during construction and their commissioning, with special care to structural efficiency, functionality, sustainability and aesthetic impact.



1990

High speed

2000

A new millennium, new challenges



Intervention for protecting Venice from high tides (MOSE) built by the Ministry of Infrastructures and Transport – Triveneto Inter-Regional Office for Public Works, through Consorzio Venezia Nuova.

Dedicated to excellence

Mission: about our goals

For us, every project involves the achievement of the maximum result possible both in terms of the combination of technical services and of the best social, environmental and economic results for the sites and communities affected.

Resources. Quality of life. Environment

These are key points where we focus our attention for implementing each assignment.

In particular, our efforts aim to: In particolare, le nostre opere concorrono a:

- contributing to access to water, the efficiency of watersheds and of urban and regional networks, the protection of the environment and health
- enhancing the possibility of mobility for development and well-being
- responding to the increase of critical climatic and environmental issues by providing the populations with a greater capacity of resilience.

Respect and responsibility

Each assignment involves the respect for and responsibility to customers, to the people related to them and the places hosting the projects. We approach each contract with a view to accessibility, since we consider this to be a primary driving force for development and the only way to unblock the economic and social potential of countries and populations.

Destination safety

Not only the water supply sector, but also the transport infrastructure sector contributes to improving living conditions in the world. We are heavily committed to guaranteeing road safety, bringing our knowledge and a sensitive, careful approach to the problem, especially where road mortality rate is still a highly critical factor, as it occurs in developing areas.

2010

One step ahead



Raising expectations

As dedicated, integrated and independent engineering firm, we provide a range of services to bring to the world our approach to the project. We pursue the goals in a way that includes a strong focus on the participatory and approval aspects that run parallel to the actual design process, thus creating “consensus engineering”, which is one of our strong points.

Thanks to our specific abilities, from the planning to the management stage, we are able to follow each project step by step, with an open and multidisciplinary approach. Together, we make all our experience available in order to achieve the expected results and, possibly, to exceed the expectations, always moving one step ahead.

Identifying



- Master planning
- General economic analysis and planning

Planning



- Feasibility studies
- Investment plans

Designing



- Preliminary design
- Detailed design
- Executive design
- Impact and environmental studies
- Tender documents

Execution

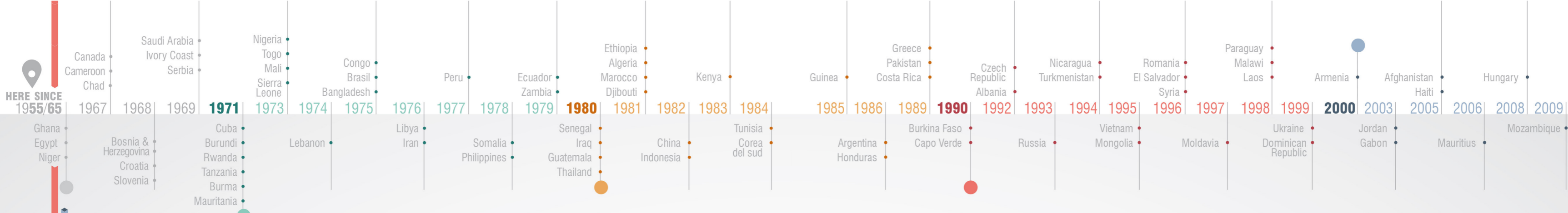


- Works supervision
- Consultancy services during execution of works
- Technical assistance

Managing



- Technical training
- Training courses
- Concessions
- BOT
- Project management



About the projects

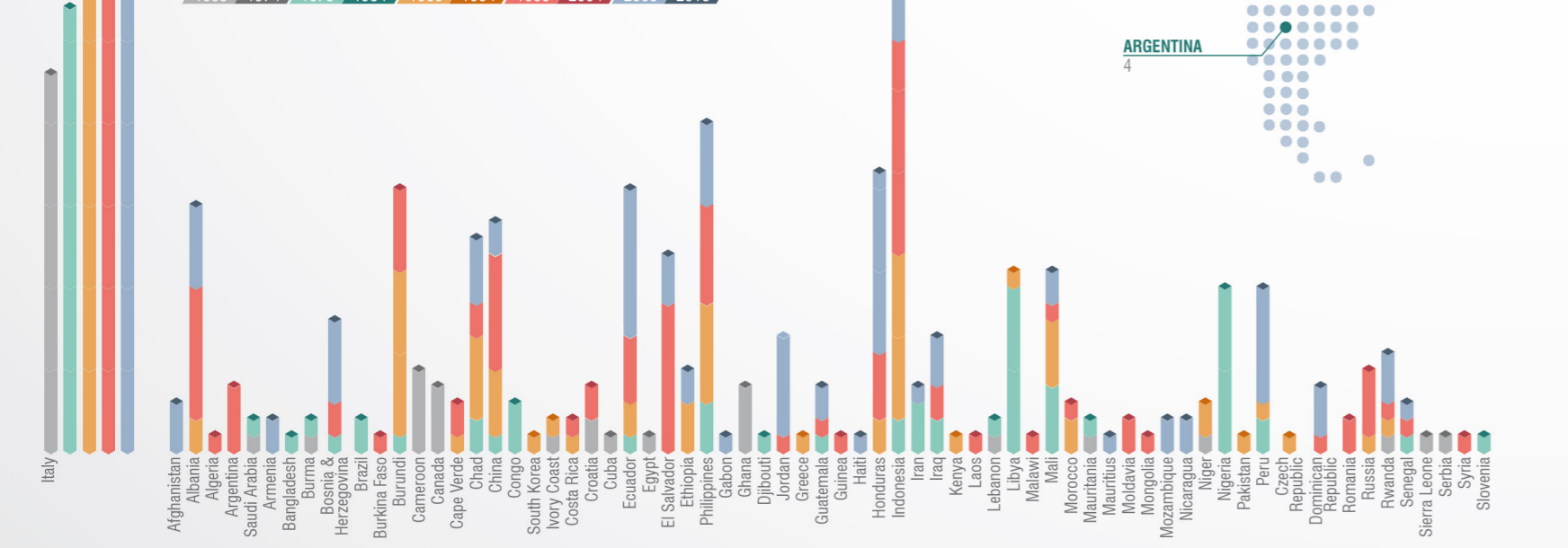
The map shows the number of projects conducted in the countries.

COUNTRY
n. projects



The histogram shows the last **50 years of business** divided into **5 decades**, highlighted by different colours and ranging over the **69 countries** where projects were located.

1965 1974 1975 1984 1985 1994 1995 2004 2005 2015



over **1000**
PROJECTS
in **50** years

with branches and offices located throughout the world, we are in over **15** countries.

Thanks to our considerable experience in the integration of skills, we are able to manage major coordination operations, always with total compliance with customer requirements and in the time agreed. In Italy, as in the rest of the world, our projects, the result of the most advanced know-how, can speak for themselves.

Water resources

IN THE FIELD OF WATER RESOURCES, LOTTI INGEGNERIA PAYS THE UTMOST ATTENTION TO THE BALANCE OF LOCAL RESOURCES, THE ENVIRONMENTAL VULNERABILITY OF THE SOIL AND GROUNDWATER. SPECIALIZED KNOW-HOW AND ADVANCED TECHNOLOGIES CREATE SOLUTIONS ENABLING THE CONTRIBUTION TO THE PROTECTION OF ECOSYSTEMS AND PEOPLE.



OUR PROJECTS INVEST IN THE ENTIRE WATER SUPPLY CYCLE:

study of rainfall, hydrogeological studies, water supply, irrigation and hydroelectric use, surveys of existing networks, watershed management plans, sewerage collection and treatment.

WE DEVELOP ALL THE PHASES OF PROJECTS:

from planning, also at the regional scale, to the detailed issues connected with the management of plants.

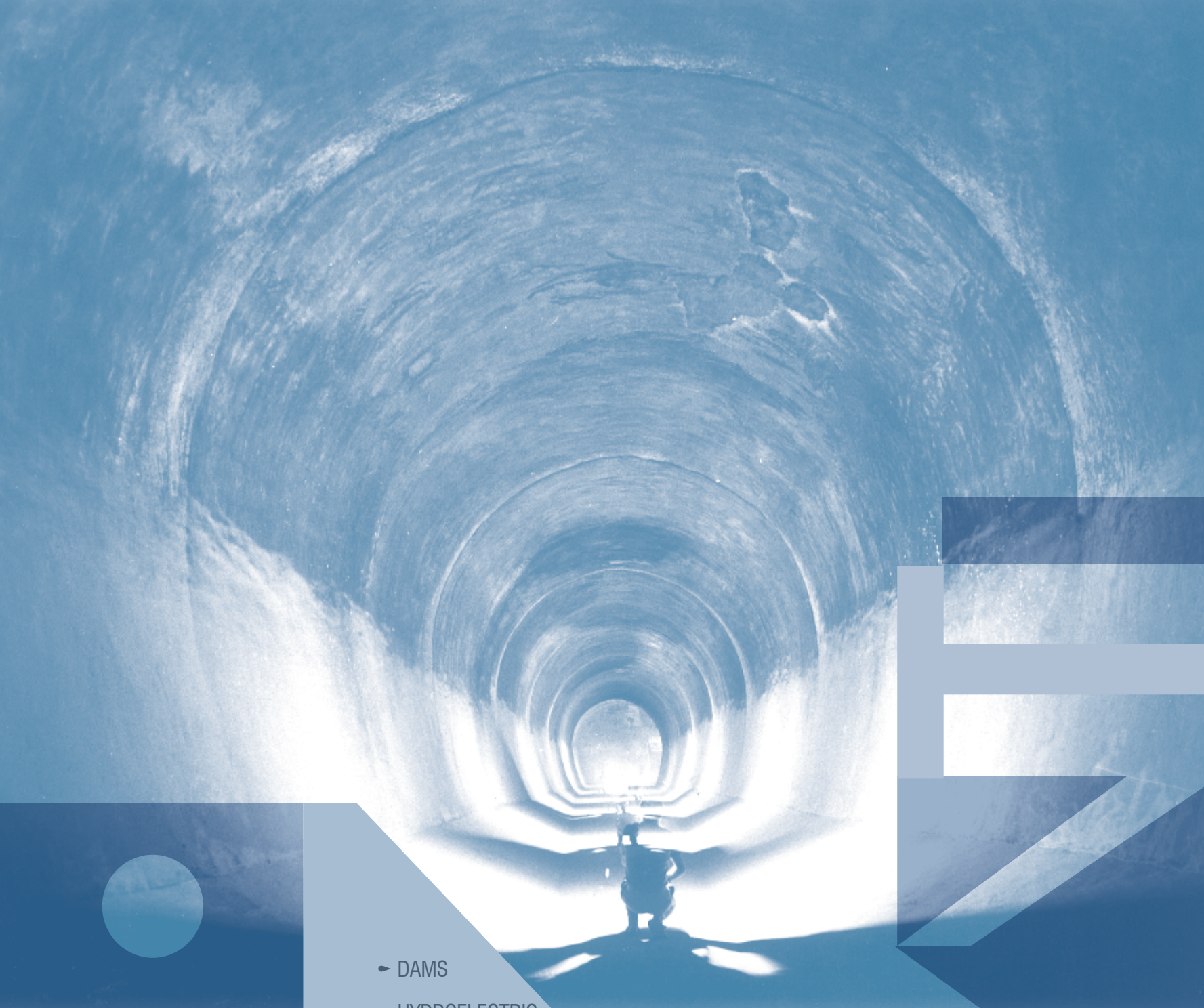
WE WORK FOR THE ACCESSIBILITY OF WATER RESOURCES,

the efficiency of watersheds and of the major urban and regional distribution and drainage networks; for the conservation of the environment and protection of health, for the development of rural areas, for the safeguard of the economy.

WE CONDUCT TRAINING

ACTIVITY in the context of cooperation for development, targeted to the local populations, the technical personnel of the management agencies and the local authorities.





- DAMS
- HYDROELECTRIC PLANTS
- IRRIGATION
- TREATMENT
- LEAK DETECTION
- HYDROGEOLOGY
- RECLAMATION
- SANITATION
- WATER SUPPLY SYSTEMS
- WATERSHED MANAGEMENT PLANS



Transport



IN THE TRANSPORT SECTOR
THE GROUP ADOPTS
A MULTIDISCIPLINARY APPROACH
TO DEVELOP STRATEGIES AND
DESIGN SOLUTIONS FOR
SAFE AND SUSTAINABLE MOBILITY.

THOUSANDS OF KILOMETRES OF
INFRASTRUCTURES SHOW TO THE
WORLD AN EXPERIENCE ACCRUED
IN THE FIELD BY PLANNING,
DESIGNING AND CONDUCTING
WORKS SUPERVISION FOR
INFRASTRUCTURES OF MAJOR
IMPORTANCE.



**OUR PROJECTS CONCERN
THE CONSTRUCTION OF
ALL TYPES OF ROADS AND
RAILWAYS:** ranging from the
development of minor roads
in developing countries up to
major high speed railway lines
in developed countries. Besides
design and supervision, our
services also include national and
regional transport plans.

**WE DESIGN NEW
SOLUTIONS** to sustain
accessibility and mobility. We use
the most innovative technologies
available on the market, working
throughout the world to improve
road safety and extend the
duration of their useful life.

**WE PROVIDE THE HIGHEST
LEVEL OF PROFESSIONAL
EXCELLENCE** to achieve the
strategic goals of the customer
and the community affected.

**WE GUARANTEE
EXPERIENCE IN THE
SECTOR OF MARITIME
AND PORT WORKS** that have
become particularly significant for
today's development of domestic
and global economy.





- ▶ ROADS
- ▶ HIGHWAYS
- ▶ MOTORWAYS
- ▶ RAILWAYS AND HIGH SPEED RAILWAYS
- ▶ SUBWAYS AND TRAMWAYS
- ▶ WATERWAYS
- ▶ PORTS

Structures and geotechnics

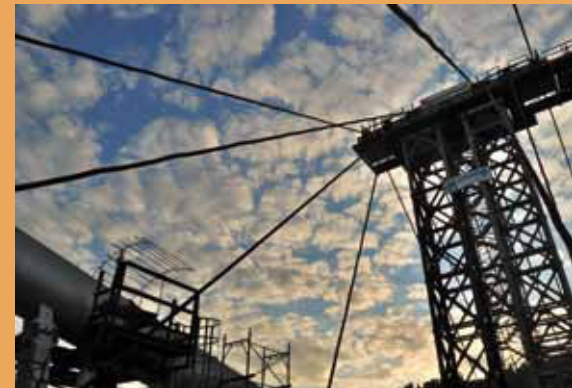
THE STRUCTURAL AND GEOTECHNICAL SECTORS ARE VITAL COMPONENTS OF THE MULTIDISCIPLINARY APPROACH COMBINED WITH DESIGN. CONSIDERING THEIR ECONOMIC IMPORTANCE, THERE IS A SPECIAL FOCUS ON **STRUCTURES AND UNDERGROUND WORKS** TO ENSURE THAT THEIR DESIGN IS COMBINED WITH THE OTHER DISCIPLINES, GUARANTEEING MAXIMUM LEVELS OF QUALITY AND EFFICIENCY.

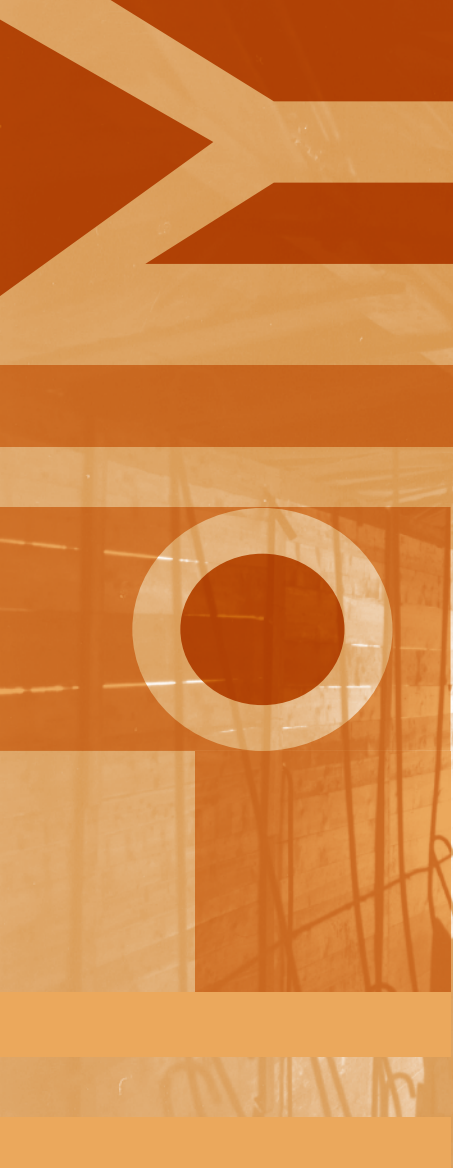


WE ALWAYS OPERATE WITH A VIEW TO STRUCTURAL EFFICIENCY, functionality, sustainability and the aesthetic aspect, whether for viaducts, natural and artificial tunnels or for railway stations, civil plants, new buildings or the consolidation of existing ones.

WE UNDERTAKE THE REFURBISHING of existing buildings with a sensitive, careful approach to their monumental character.

WE ARE COMMITTED TO UNDERTAKING MEASURES TO IMPROVE STRUCTURAL STABILITY thus extending the useful life of structures and their functionality.

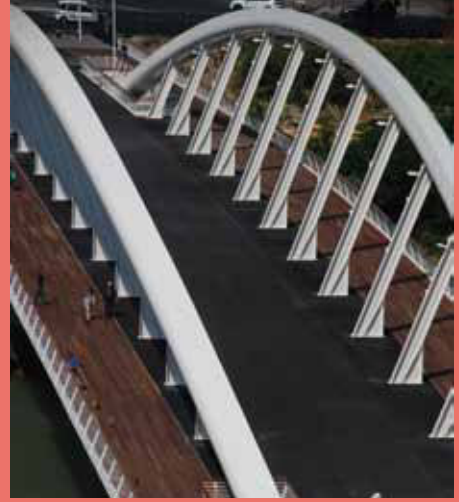




- ▶ BRIDGES AND VIADUCTS
- ▶ TUNNELS AND UNDERGROUND WORKS
- ▶ STATIONS
- ▶ CIVIL CONSTRUCTIONS
- ▶ NEW BUILDINGS
- ▶ CONSERVATION AND REQUALIFICATION OF BUILDINGS
- ▶ DAMS

Integrated engineering

IN THE ARCHITECTURAL SECTOR, THE COMPANY OPERATES IN LARGE PROJECTS AND IN MAJOR URBAN DEVELOPMENTS. FOR EVERY CIVIL STRUCTURE A MAXIMUM PERFORMANCE LEVELS IN TERMS OF DESIGN, ACCESSIBILITY AND FUNCTIONALITY IS RESEARCHED AND THE DEVELOPMENT OF SPACES IS DESIGNED TO INTERACT WITH PEOPLE.



WE PURSUE MAXIMUM CUSTOMER SATISFACTION while respecting the environment affected; the design of any space is thus preceded by the understanding of the surrounding context.

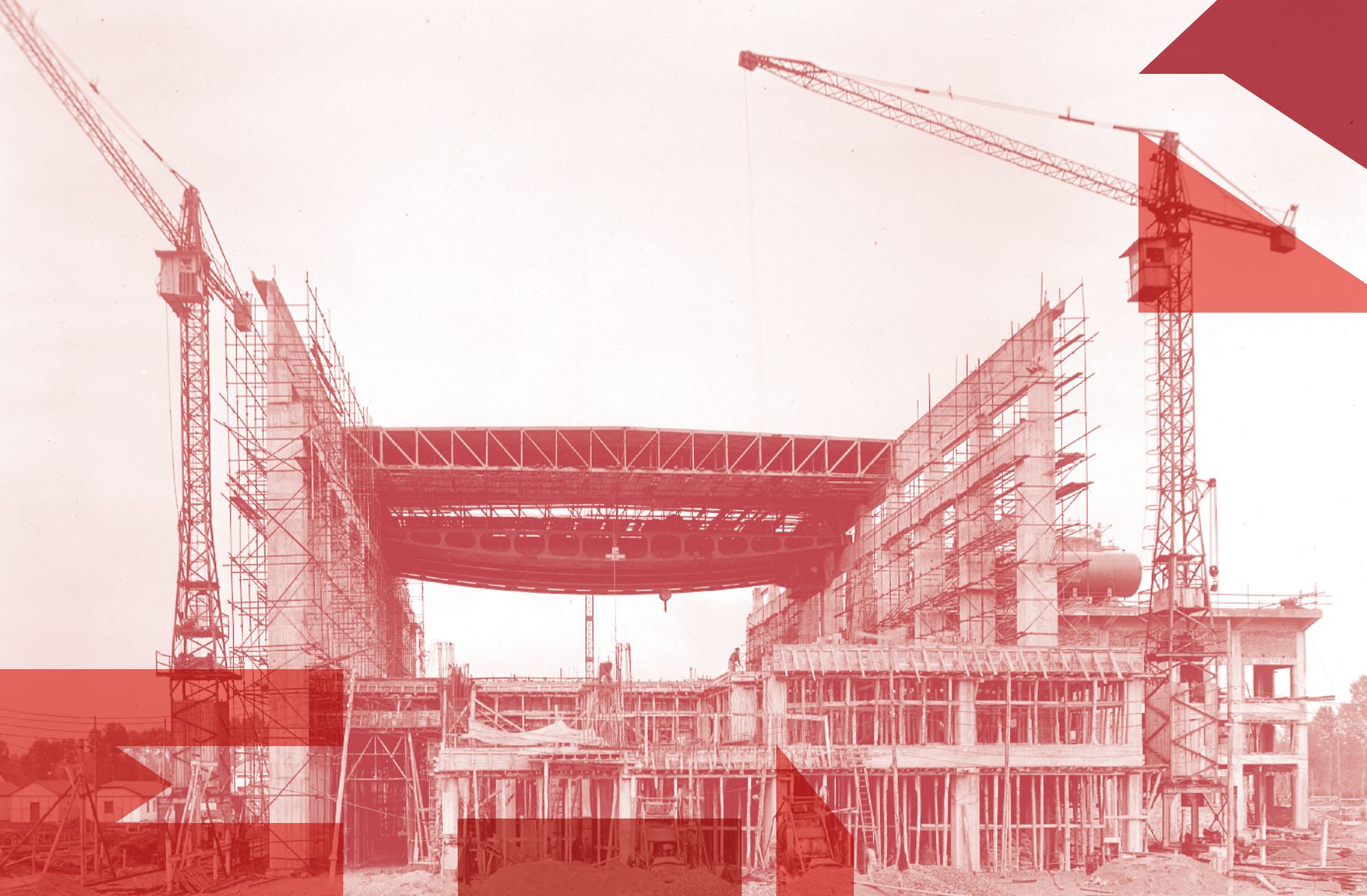
WE ENSURE THAT EVERY BUILDING HAS AN APPEARANCE COHERENT WITH ITS FUNCTION, so that it will create a specific atmosphere and communicate culture, modernity, efficiency and sociality.

WE APPLY A SPECIFIC VISION AND KNOW-HOW in the phases of restoration and refurbishing of historic buildings.

WE COLLABORATE WITH EMERGING AND WORLD-FAMOUS ARCHITECTS to design buildings with high quality aesthetic, functional, structural and sustainable features.

WE INTEGRATE ENGINEERING WORKS with the vision of our architects.





- ▶ URBAN SPACES
- ▶ WATERFRONTS
- ▶ HISTORIC AND ARTISTIC BUILDINGS
- ▶ MULTI-FUNCTIONAL SPACES
- ▶ BUILDINGS
- ▶ CIVIL STRUCTURES
- ▶ HEALTH STRUCTURES



WORLD ENGINEERING

Europe



Asia



America



Africa





Africa

THE LAND OF BLUE GOLD

- Programmes for access to drinking water and sanitary services in Chad
- Support programmes to local communities for drinking water and sanitary services in Mali
- Sewerage system in the Plaines Wilhems district
- Rehabilitation of RN1 Road
- Rehabilitation of the Great East Road
- Construction of 2 bridges and rehabilitation of the Biyi Eba-Meyo Kyé Road
- Water supply for the Maputo Metropolitan Area
- Urban water supply on the island of Pemba
- Upgrading of the Mwanza road and water network
- Tunis Outer By-Pass



PROGRAMMES FOR ACCESS TO DRINKING WATER AND SANITARY SERVICES

Country: Ciad

Client:

7th EDF: Ministère du Plan et de la Coopération

8th EDF: Ministère du Plan et de l'Aménagement du territoire

10th EDF: Ministère du Plan, de l'Economie et de la Coopération Internationale Ordonnateur National du FED, cellule ACTION FED

Services provided: evaluation of water resources, socio-economic studies, final design, preparation of tender documents, works supervision

Periods of execution:

7th EDF: 1994 – 1998

8th EDF: 1999 – 2005

10th EDF: 2011 – 2016

Values of the works:

7th EDF: € 6,174,185

8th EDF: € 18,375,000

10th EDF: € 67,000,000

In the past two decades, the European Commission, through the EDF (European Development Fund), has funded various important projects in Chad concerning the development of groundwater resources.

For over twenty years, LOTTI Ingegneria has successfully implemented these projects, which have always had the aim of eliminating as much as possible the diseases due to the use of dirty water, still the primary cause of death among the rural populations and above all for infants, and to improve the living conditions of the population in rural and semi-urban areas. The socio-economic studies and the campaign to enhance awareness in the beneficiary villages to promote the use of the water from the wells and the maintenance of the wells, are very important, fundamental for the success of this type of intervention.



▲ Involvement of the population in the villages.

THE TOTAL FIGURES OF THE PROJECT:

- 2,500,000 people provided with clean water
- 3,000 wells with hand pumps
- 200 wells to supply distribution systems
- 20 lined wells
- 250 existing wells refurbished
- 105 water distribution systems powered with a photovoltaic system
- 173 water distribution systems powered with a thermal system
- 5 water distribution systems refurbished
- 11 piezometers
- 45 hydraulic production units
- 400 latrines

▼ Water gushes fresh and clean from the well just completed.



SUPPORT PROGRAMMES TO LOCAL COMMUNITIES FOR DRINKING WATER AND SANITARY SERVICES



Country: Mali
Client: Ordonnateur National du FED
Funding agency: 10th European Development Fund (EDF)
Services provided: technical assistance, hydrogeological and geophysical studies, socio-economic studies, development of orthophoto plans, detailed design and tender documents, works supervision
Period of execution: 2013 – 2017
Value of the works: € 23.1 millions

The purpose is to contribute to the reduction of poverty and improvement of the health conditions of the populations in numerous rural and semi-urban areas in the regions of Koulikoro, Sikasso, Ségou and Tombouctou. The project is the continuation of a previous contract successfully completed by LOTTI Ingegneria between 2007 and 2010, which was to be continued to reinforce the results. The aims are the supply of drinking water for approximately 485,000 people by constructing 110 wells, 70 distribution systems and 2,000 sanitary structures. User associations are also being set up for the management, and 130 orthophoto plans are being created for the mapping of the territory.



SEWERAGE SYSTEM IN THE PLAINES WILHEMS DISTRICT

Country: Mauritius
Client: Wastewater Management Authority
Funding agency: EIB – European Investment Bank, Local government, Exim Bank of China and African Development Bank (AfDB)
Services provided: detailed design, works supervision
Period of execution: 2006 – 2017
Value of the works: € 130 millions

The aim of the project is to set up a sewerage collection system and a treatment plant, necessary since the area only has individual sinkholes. The intervention, made complex due to technical problems such as the extensive excavations in the rock and the presence of existing utilities, involves an urban area with heavy traffic. The careful organization of the construction sites was therefore essential, and this was supported by a traffic management expert operating in close coordination with the authorities, in order to minimize interference for the access to properties. The new network consists of approximately 235 km of sewerage pipelines, connections for approximately 30,000 buildings as well as the replacement of a total of 110 km old drinking water pipelines.





REHABILITATION OF RN1 ROAD

Country: Senegal

Client: Ministère de l'Economie et des Finances, Direction de la Dette et de l'Investissement, l'Ordonnateur National Délégué du FED

Funding agency: EDF European Development Fund

Period of execution: 2007 – 2011

Value of the works: € 68 millions

The reinforcement of the RN1 between Tambacounda and Mbirkelane, with a total length of 237 km, is a fundamental step in the plan for the development of trade within the eastern regions of Senegal and, at a larger scale, between Senegal and Mali. The project aims, in the short term, to create the basis for a permanent all-weather link to Bamako (Mali) through Kidira. In the medium term the rehabilitated road will also serve the future alternative link from Dakar to Bamako through Kedougou. The works involved the rehabilitation of the existing roadway, the improvement of the drainage system and the laying of an asphalt concrete wearing course.



REHABILITATION OF THE GREAT EAST ROAD

Country: Zambia

Client: Ministry of Finance The National Authorising Officer of the EDF

Funding agency: EDF European Development Fund

Services provided: Works Supervision

Period of execution: 2013 – 2016

Value of the works: € 43.5 millions



The Great East Road is the only fast, all-weather, road crossing the Luangwa River and connecting the capital Lusaka to the eastern provinces of Zambia. At the regional scale it represents the major link with Malawi and the ports of Nacala and Quelimane in northern Mozambique. LOTTI Ingegneria is undertaking the works supervision of the lot going from the city of Sinda to the village of Mtenguleni for a length of 95 km on mainly flat terrain at an altitude of 900 m. The works include widening of the road to 9.8 m cross section and up to 16.2 m in agglomerations, the laying of an asphalt concrete wearing course on the two traffic lanes and of a sealed coating on the two shoulders, the improvement of drainage structures and the realisation of bus bays, new intersections and other works for enhancing road safety. The project involves complementary activities for social purposes.

CONSTRUCTION OF 2 BRIDGES AND REHABILITATION OF THE BIYI EBA-MEYO KYÉ ROAD

The aim of the project was to improve mobility in the “three borders area” between Gabon, Cameroon and Equatorial Guinea. This involved the construction of the following:

- **a bridge on the River Ntem at Eboro** to join the Gabon and the Cameroon sides; approximately 180 m long, with spans of up to 50 m, connected by two access ramps totalling 1.5 km;
- **a bridge built entirely in Cameroon** on the same river, approximately 145 m long with spans up to 55 m.

In Gabon, the Biyi Eba'a-Meyo Kyé road linking northern Gabon with Equatorial Guinea was also renovated, bringing the carriageway to a width of 7 m over a length of about 20 km.



Country: Gabon

Client: Ministère du Plan et de
la Programmation du Développement

Funding agency: European Commission

Services provided: works supervision

Period of execution: 2003 – 2005

Value of the works: € 20,250,000



WATER SUPPLY FOR THE MAPUTO METROPOLITAN AREA

In the metropolitan area, with a population of nearly 2 million, only 40% of population has access to drinking water with acceptable quality. The purpose of the project was to draw up a 25-year development plan for the water supply system in accordance with urban development. This plan is accompanied by the development of the infrastructure, supporting the public bodies responsible with a view to improve management and planning; moreover it will show the order of priorities for future works. One of the greatest challenges has been the limited availability of fresh water and the identification of the sources of water supply. The assignment also includes the organization of training seminars.

Country: Mozambique
Client: FIPAG-Fundo de Investimento e Património do Abastecimento de Água
Funding agency: EIB - European Investment Bank
Services provided: master plan
Period of execution: 2009 – 2011
Value of the works: € 320,058,100



URBAN WATER SUPPLY ON THE ISLAND OF PEMBA

Country: Tanzania
Client: Zanzibar Water Authority
Funding agency: AfDB African Development Bank
Services provided: final design, works supervision
Period of execution: 2011 – 2015
Value of the works: € 9 millions

The project concerns the water supply system in three urban areas: Chake Chake, Wete and Mkoani. The abundance of rain and the considerable permeability of the soil ensures the availability of water sources, but due the small size of the island, approximately 1,000 km², a careful study of the hydrogeological conditions is required in order to avoid the contamination of groundwater with seawater. The project included 29 wells, 6 tanks and 2 pumping stations, with the laying of approximately 85 km of pipes, both new and for replacement.



UPGRADING OF THE MWANZA ROAD AND WATER NETWORK

Country: Tanzania

Client: Permanent Secretary Ministry of Works, Mwanza Urban Water and Sewerage Authority (MWAUWASA)

Funding agency: European Commission /EDF European Development Fund, KfW (Kreditanstalt fuer Wiederaufbau)

Services provided: detailed planning, works supervision

Period of execution: 2001 – 2010

Value of the works:
€ 76.5 millions

Thanks to its location on the shores of Lake Victoria near various natural parks, Mwanza, with a population of over 500,000, has considerable opportunities for economic development. Over the years, there has been an imbalance between the expansion of the town and its infrastructure. The aim of the project was to upgrade the services to the size of the city. The road network has been implemented with 50 km of paved roads in the urban and non-urban networks. For the water supply emergency, the capacity of the intake plant on the lake has been doubled, with a new treatment plant, the extension of the drinking water distribution network for another 80 km, the expansion of the sewerage network including pumping stations and a new

sewerage treatment plant. Careful planning of the construction works was necessary to harmonize and integrate them on the two service networks, seeking to reduce to a minimum the subsequent refurbishing or interventions.

The execution of the works was affected by the high population density and the rocky character of the land.

All this involved the adoption of special logistic measures, with a specific organization of the construction sites and safety measures. The limited size of the road network also involved the execution of works in locations with difficult access to machinery. There were also activities for enhancing the operational and management capacities of the aqueduct administration.

TUNIS OUTER BY-PASS

Country: Tunisia

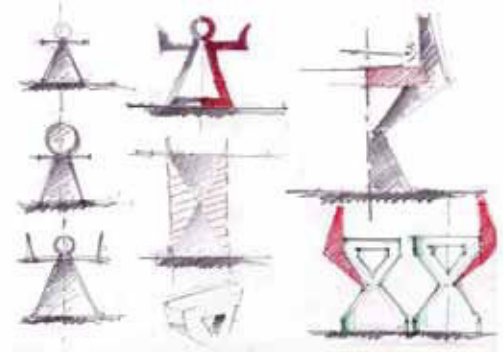
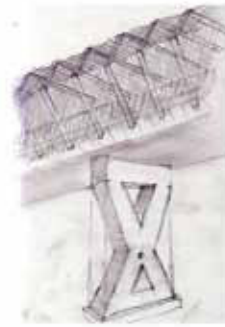
Client: EIB European Investment Bank

Beneficiary: Ministry of Public Works of the Republic of Tunisia

Services provided: feasibility study, preliminary design, detailed design, tender documents

Period of execution: 2011 – 2015

Value of the works: € 300 millions



The purpose of the by-pass is to create a belt at motorway standard around the urban area of the capital and to interconnect other motorways and main radial highways all around Tunis central area. With a length of approximately 80 km, it will serve the major settlements of the suburbs, as well as favouring access to the new or planned outlying development centres. The road, with 2-lane divided carriageways extendible to 3-lane, is designed to prevent medium-long distance traffic from causing congestion in the Tunis city centre. Other purposes are to provide the necessary connections for development, to reduce transport costs, travel time and the number of accidents and to support the development of key sectors of the economy.

The zone crossed by the motorway corridor has a very large number of constraints which were duly identified and analyzed in the initial stages of the study (urban zones and others for planned development, land use and agriculture, irrigation, property values, geology and hydrography, archaeology and others).

The identification of the possible options of the corridor was developed by a particularly detailed Multi-Criteria Analysis, created also thanks to an extensive use of GIS (Geographic Information System) to quantify many geospatial parameters regarding the current situation.

There was also a considerable emphasis from the very beginning on the road safety and aesthetic aspects.





Asia

A CONTINENT ON THE MOVE

- Rehabilitation of the Maidan Shar-Bamyan Road
- Kabul Ring Road
- Rehabilitation and improvement of the M6 Vanadzor-Alaverdi Road
- Dalian Aqueduct
- Conservation and restoration of the cultural heritage in Sichuan
- Umiray-Angat Inter-Basin Hydraulic Tunnel
- Master Plan of the Jordan Road Network
- Amman Ring Road
- Training project of the Iraqi Ministry of Water Resources
- Water Treatment Plants of the cities of Dahuk, Erbil and Sulaymaniyah

REHABILITATION OF THE MAIDAN SHAR-BAMYAN ROAD

Country: Afghanistan – Maidan Shar-Bamyan
Client: Ministry of Public Works – Afghanistan
Funding agency: Ministry of Foreign Affairs DGCS – General Directorate for Development Cooperation
Services provided: feasibility study, detailed design, works supervision
Collaborazione con: BCL Associates Ltd
Period of execution: 2005 – 2015
Value of the works: € 83,481,000



The road, 136 km long, connects Kabul to the township of Bamyan, and is the initial section of the shortest route connecting the capital to Herat, replacing an existing road over 230 km long. This will allow for a reduction in travel time of approximately 5 hours.

The road goes through very rough mountainous terrain with geological and technical obstacles and altitudes exceeding 2,500 m. The road is designed for speeds between 80 and 100 km/h, with a maximum slope of 8% and a single carriageway with two 3.5 m wide lanes.

The works were conducted in difficult conditions due to the morphology of the area, characterized by narrow valleys bordered by steep cliffs, as well as by the bad weather conditions and the problematic safety situation.

KABUL RING ROAD

Country: Afghanistan – Kabul

Client: Ministry of Public Works – Afghanistan

Funding agency: IDA International Development Association

Services provided: feasibility study, preliminary design, environmental impact study, works supervision

Period of execution: 2007 – 2008

Value of the works: € 167 millions



The project concerns the study of a ring road around the city of Kabul, with a length of approximately 90 km.

The new link crosses the peripheral and farming areas on the outskirts of the city aiming to guarantee the rapid connection among the major roads and motorways, avoiding the transit of heavy traffic through the city centre which is almost permanently congested due to considerably increasing traffic, and an inadequate road network in poor condition.

The absence of an overall city plan has made the study of this project particularly complex due to the heavy impact on the of residential developments in the newly urbanized areas and on the industrial, logistic and commercial facilities that have grown up in an uncoordinated manner along the major roads.

REHABILITATION AND IMPROVEMENT OF THE M6 VANADZOR-ALAVERDI ROAD

Country: Armenia

Client and funding agency: EIB
European Investment Bank

Beneficiary: Ministry of Transport and Communications

Services provided: feasibility study, executive design, tender documents

Period of execution: 2014 – 2015

Value of the works: € 85 millions

The existing 2-lane paved road follows the valley of the Debed River. The total length of the road is 92 km. The alignment is bordered by the river and the railway on either sides and is dangerous and inadequate for the volume of traffic.

The existing 13 bridges and 3 tunnels show evident signs of deterioration and thus require repairs and/or rebuilding.

Armenia is a land-locked country, and the access to the Black Sea through Georgia is one of the main routes for trade. The Government is therefore assigning priority to the rehabilitation of the transport infrastructure including this project in order to promote economic development through better mobility.



DALIAN AQUEDUCT

Country: China

Client: ADB Asian Development Bank

Services provided: revision of the executive design, assistance to the works supervision, training of personnel

Period of execution: 1995 – 2002

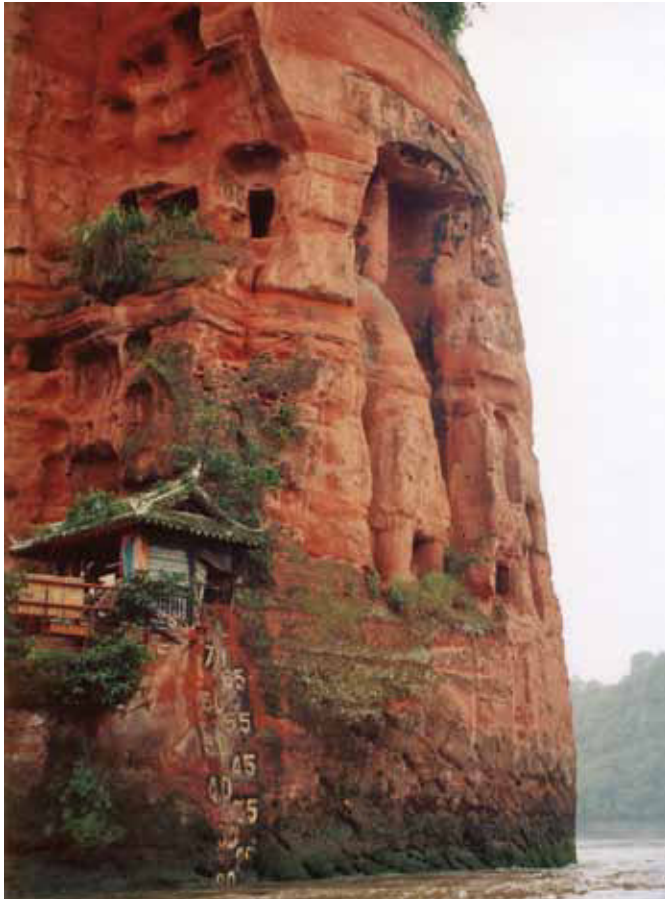
Value of the works: € 319 millions

The aim was to eliminate the lack of drinking water in the city with a population of approximately 5 million, located in one of China's largest industrial areas.

With the project, part of the water in the Biliuhe reservoir, about 150 km away, previously used for irrigation only, was piped to the city.

The works included two aqueducts totalling 150 km length, 2 water treatment plants with an overall capacity of 330,000 m³/day and the extension of the distribution network with approximately 200 km of pipes and 6 tanks. Despite the technical problems, mainly of a geological nature, the aqueduct has ensured sufficient water to the city since January 2002.

CONSERVATION AND RESTORATION OF THE CULTURAL HERITAGE IN SICHUAN



Country: China
Client: World Bank
Services provided: strategic master plan for the conservation, restoration and sustainable development of the cultural heritage
Period of execution: 1998 – 1999



Sichuan is one of the most important provinces in China, and has an abundance of very valuable cultural resources, most of which date back to very ancient times. The aim of the project was to draw up a long term development programme. A number of key policies were identified to develop an action programme for immediate measures and to define a general plan for the conservation and the restoration of the cultural heritage. The most important operation involved the town of Lishan where there is a gigantic statue of Buddha, 71 metres high, carved out of the rock on a cliff overlooking the point where three rivers meet; in 1996 it was included in the list of **UNESCO world cultural heritage sites**.

Country: Philippines
Client: UNOPS - WAASE Division
Funding agency: ADB Asian Development Bank
Services provided: feasibility study, preliminary design, environmental impact study, final design
Period of execution: 1991 – 1994
Value of the works: € 76.4 millions

UMIRAY-ANGAT INTER-BASIN HYDRAULIC TUNNEL



The purpose of the project was to supply drinking water to the coastal towns, where the water supply systems, fed by wells near the sea, were affected by saline infiltration in groundwater.

A 13 km long tunnel and a treatment plant having a capacity of 500,000 m³/day were thus planned to provide the population with drinking water derived from the Umiray River.

The design encountered various geological and logistical difficulties, since the pipeline crosses a protected area; the absence of roads required the transport of equipment and material via helicopter. At the time of its completion, the tunnel was the longest structure of its kind drilled starting from one end only.

MASTER PLAN OF THE JORDAN ROAD NETWORK

Country: Amman – Jordan
Client: EIB European Investment Bank
Services provided: road network master plan
Period of execution: 2009 – 2011

The overall aim of the plan was to ensure the better management of the road infrastructure sector in order to promote economic growth. The study consisted of two phases: a) the diagnosis of the road network and the identification of a development strategy applicable to the road sector and b) the preparation of the a general investment plan. The main problems of the road network observed were poor maintenance of the pavements and inadequate safety of the roads and crossings of populated areas, which are a major obstacle to economic development. Many and varied topics were covered in the study and went far beyond a normal 20-year investment plan. A combined visual and automatized survey system (VIZIROAD) was used to enable the collection of the surface condition data, as well as the complete geometric characteristics and the type of road structure and environment; in addition,

road photos were taken automatically at 50 m intervals. Parallel surveying, with pavement pits and measurement of the roughness and deflexion, enabled the study team to obtain a complete picture of the situation of the approximately 7,400 km of road network. The VIZIROAD device, consisting of a PC with two parallel keyboards was used (with each key for a theme or event), a GPS unit connected with a digital camera (applied to the pick-up front glass) and to the traction system for the automatic measurement of the distance travelled. The amount and the accuracy of the data collected make it an advanced tool for drawing up a wide-ranging master plan. A 20-year plan was subdivided into four 5-year periods, with a detailed programme for the first 5-year period. Besides this, a formal training was conducted for Ministry technical staff with a specific course with the aim to enable them to manage the execution and monitoring of the plan.

- ♥ Road along the Dead Sea.
- ♥ The VIZIROAD device.
- ♥ View of the road for Wadi Rum..
- ♥ The King's Highway at Wadi Mujib.



AMMAN RING ROAD

Country: Amman – Jordan
Client: EIB European Investment Bank
Beneficiary: Jordanian Ministry of Public Works and Housing
Services provided: preliminary design, final design – SIA
Period of execution: 2006 – 2009
Value of the works: € 650 millions

The project aims to reduce the traffic transiting through the city centre, diverting most of it to the approximately 80 km long ring road with a 4-lane divided (extendable to a 6-lane) roadway and with motorway characteristics. The traffic study, conducted with a simulation model, proved to be especially challenging. The site has a geomorphological profile leading to complex choices in order to take measures with as little impact as possible on the environment. The hydrological characteristics are irregular since the climate changes throughout the route from Mediterranean to desert type; this led the designers to find targeted and innovative solutions. Given the rough topography, numerous viaducts and tunnels were needed. The impact of the works was reduced by the screening of the structures, and their integration in the surrounding environment, also improving the especially high landscape quality in the stretch bordering the valley of the Jordan River.



TRAINING PROJECT OF THE IRAQI MINISTRY OF WATER RESOURCES

Country: Iraq, Italy
Client: Ministry of Foreign Affairs
Period of execution: 2007 – 2008



The economic and social development of Iraq has been influenced by the rational use of the water resources of the rivers in the Tigris and Euphrates basins. The project is part of a set of initiatives aimed at improving the technical training of technicians of the Ministry of Water Resources (MWR), in particular on know-how about technological innovation, not adequately adopted in the country due to the events connected with war and political situation. The training programme involved three successive courses, each lasting six weeks. The subjects studied included: water resource management, GIS and hydraulic models, the safety of dams, environmental impact, quality of the water, efficiency of plants.

WATER TREATMENT PLANTS OF THE CITIES OF DAHUK, ERBIL AND SULAYMANIYAH

The aim of the project was to draw up a detailed plan regarding the rehabilitation of the water treatment plants of the main cities of Kurdistan, serving approximately 1.5 million people. There had been no maintenance and repairs at the plants for over ten years, and although they were adequate in terms of size, they did not guarantee the production capacity required. The necessary rehabilitation measures were undertaken with the preparation of specific techniques and their design definition. The training resources and plans for improving the technical and operational skills were also identified.



- Clariflocculation plant.
- Campaign for the measurement of water quality with portable equipment and kits.



Country: Iraq

Client and funding agency: UNOPS – WAASE Division

Services provided: final design, personnel training

Period of execution: 2002 – 2003

Value of the works: € 19 millions



Europe

WE FACE MAJOR CHALLENGES

- Ferrara Waterway
- Extension of Rome Underground Railway Line B
- Measures for protecting Venice and its lagoon: the MOSE system
- Recovery of the former Burrese Hospital Building
- Final treatment plant of the organic fraction of solid urban waste
- Ponte della Musica on the River Tiber in Rome
- Milan-Bologna high-speed railway line
- Salerno-Reggio Calabria Motorway
- Pan-European Corridor Vc
- Improvement measures for the Puglia Aqueduct (AQP)
- Rehabilitation of the Tirana aqueduct and sewerage systems



FERRARA WATERWAY

Country: Italy

Client: Ferrara provincial administration

Services provided: preliminary and final design

Period of execution: 2001 – 2011

Value of the works: € 75 millions

The project involved the measures for the refurbishing and development of the canal crossing the Ferrara plain in order to convert the surrounding area into a genuine resource. The main goals were to convert the waterway into a navigable canal compatible with the environment, so that it can be used by the local people and tourists, in order to develop business involving the transportation of goods and passengers, with the resulting reduction of the volume of road traffic. LOTTI Ingegneria developed the design of the most challenging sector 19 km long going through the Ferrara area, involving considerable interference factors such as the crossing of the chemical industrial complex. The project also included the construction of over 4 km of new cycling paths.

EXTENSION OF ROME UNDERGROUND RAILWAY LINE B



Country: Italy

Client: Municipality of Rome, Department VII Mobility Policies

Services provided: preliminary and definitive design for a design & build contracting

Period of execution: 2004 – 2008

Value of the works: € 400 millions



The aim of the project was to extend the urban transport system to the expanding peripheral areas beyond Rome's Ring Road. The extension of Line B, serving some 300,000 passengers per day, was also an occasion for the improvement of the eastern district of Rome, including important infrastructure measures and the construction of three new stations. While the stations have common architectural features and a similar organizational and functional layout on three levels, each one has its own specific urban identity, with the simplicity of the San Basilio station, the plasticity of Torraccia and the complexity of Casal Monastero.

MEASURES FOR PROTECTING VENICE AND ITS LAGOON: THE MOSE SYSTEM

Country: Italy

Client: Consorzio Venezia Nuova – Concessionaire of the Ministry of Infrastructure and Transport – Triveneto Public Works Department

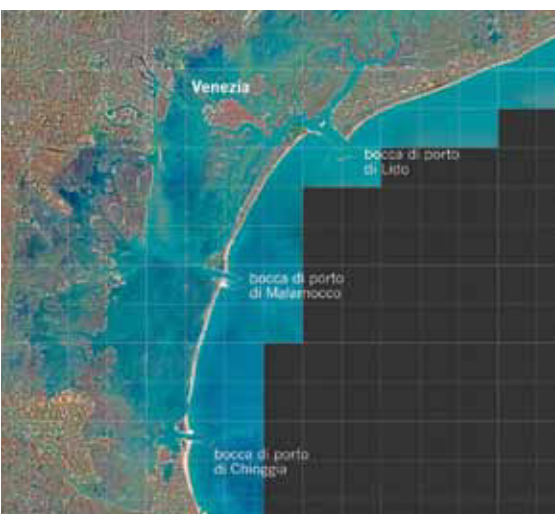
Services provided: works supervision

Period of execution: 2004 – 2018

The MOSE system for protecting Venice and its lagoon from high tides is the latest and most important part of a wide-ranging plan for measures implemented under special legislation for Venice, affecting the entire Venice Lagoon, and combining the defence from high tides with other environmental measures. The project is being undertaken on behalf of the Ministry of infrastructure and Transport – Inter-Regional Department for Public Works of Veneto – Trentino Alto Adige – Friuli Venezia Giulia through the concessionaire Consorzio Venezia Nuova. The MOSE system is designed to protect Venice and the its lagoon from tides of up to 3 m. This figure takes into account possible eustasy phenomena over the next 100 years. The system basically consists of 4 sets of moveable gates installed on the seabed of the 3 port inlets, designed to temporarily protect the lagoon, for the duration of the high tide, from the incoming tide flows. Each gate is 20 m wide, with a length varying from 18.5 to 29.5 m depending on the depth of the seabed, and over 3.50 m high.

The structure is made of metallic carpentry, while the structures to support and house the gates consist of reinforced concrete caissons cast in special construction sites and then transported by flotation to the point of the inlet for installation and then sunk. Together with the gates, these structures characterize the MOSE system both for the complexity associated with the size of each element (on average 60 x 45 x 15 m) and for the major implications related to the launching, transport, alignment and sinking of the elements, ensuring the watertight sealing between the various elements, the continuity of the plant modules and the accessibility of the service tunnels connecting both shores of the inlets. Three navigable channels allow for the transit of emergency vessels and boats also when the gates are in operation. An artificial island divides the inlet of the Lido Port, allowing for the construction of two shorter gate sets. Together with this project, complex works have been undertaken in the lagoon aiming at environmental and morphological protection.

- ▼ Malamocco inlet: temporary area for the precasting of the “housing” elements of the gates.
- ▼ Lido Treporti inlet. Gates in operation.
- ▼ Venice Lagoon: location of the inlets where the MOSE mobile gates are installed.
- ▼ Chioggia inlet: construction works under way.



The MOSE System is undertaken on behalf of the Ministry of infrastructure and Transport – Inter-Regional Department for Public Works of Veneto – Trentino Alto Adige - Friuli Venezia Giulia.



RECOVERY OF THE FORMER BURRESI HOSPITAL BUILDING

Country: Italy

Client: Municipality of Poggibonsi

Services provided: definitive design, executive design, works supervision, safety coordination for the design and execution phase of the works

Period of design: 2006 – 2007

Value of the works: € 7 millions

Period works supervision: 2009 – 2013

The aim of the refurbishing and improvement works was to convert the hospital into a multi-functional building, ensuring the compatibility and balance between the intention to preserve the monumental character of the building and the new requirements of functionality and consolidation.

The new types of use (library, offices and others)

distributed in larger rooms compared to the previous setting inside the hospital, have not adversely affected its architectural features.

The structural measures have guaranteed the recovery of the original spaces and volumes, the restoration of missing original architectural elements and the elimination of accretions.



FINAL TREATMENT PLANT OF THE ORGANIC FRACTION OF URBAN SOLID WASTE

Country: Italy

Client: Municipality of Salerno

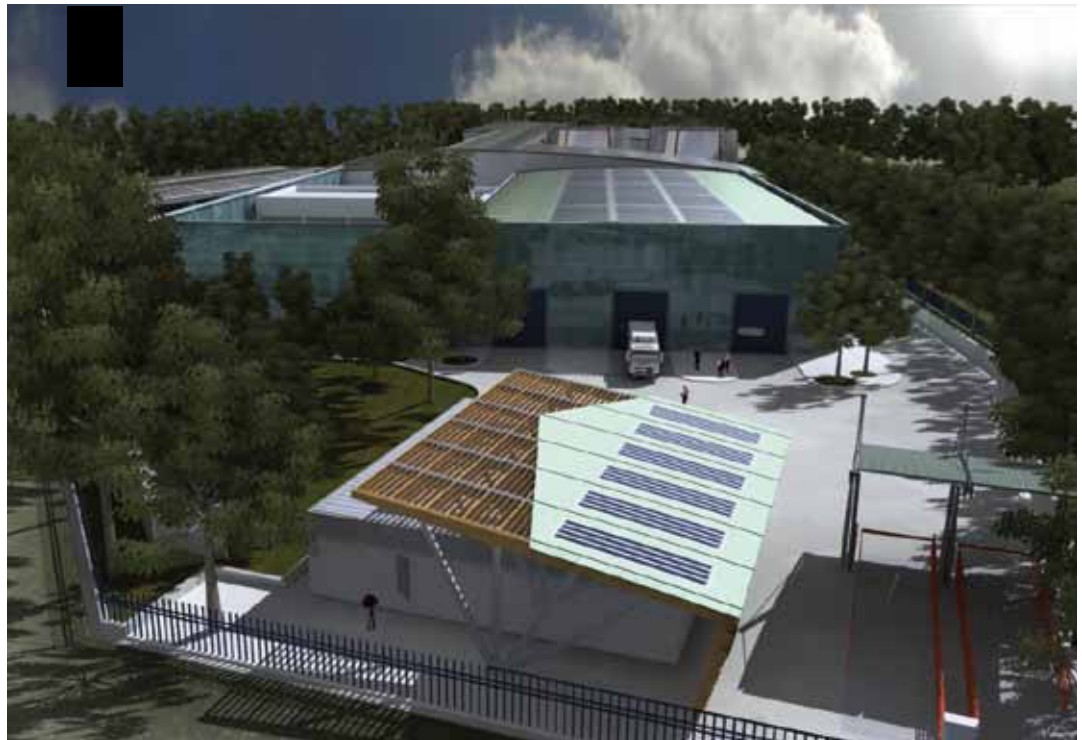
Services provided: definitive and executive design, works supervision and safety coordination in the design and execution stage

Period of execution: 2007 – 2011

Value of the works: € 21 millions

The organic fraction of urban solid waste project started with the aim of utilizing waste as an energy source. The complex was designed to host the composting process cycle, and consisted of a series of industrial buildings characterized by environmentally compatible solutions aimed at reducing odorous emissions, and characterized by

lamella wood roofs and fixtures in semi-opaque polycarbonates with bright colours. The plant was built for a treatment capacity of 40,000 t/year, and can produce 3,000,000 kWh/year from the use of biogas in co-generation, and a similar amount of kWh from photovoltaic panels installed on the available roof areas.





PONTE DELLA MUSICA ON THE RIVER TIBER IN ROME

Country: Italy

Client: Buro Happold Ltd, London
(Preliminary and Definitive Design)

Municipality of Rome
(Works Supervision)

Services provided: preliminary and
final design, works supervision, safety
coordination during execution

Period of execution: 2003 – 2011

Value of the works: € 10 millions

The “Ponte della Musica” bridge, nearly 190 m long, connects the “Tridente Flaminio” district to the Foro Italico neighbourhood, joining two areas of expansion of the city centre with their significant architectural elements.

Among the various forms sought for the supporting structure; the arch represents not only most appropriate one, but also the one that can reach the long span required.

The structural and architectural study proceeded together, in order to obtain a structure where each architectural element is strictly functional, and each structural element has been given an architectural expression.





MILAN-BOLOGNA HIGH SPEED RAILWAY LINE

Country: Italy
Client: Snamprogetti S.p.A. – Milan
Services provided: detailed design
Period of execution: 1992 – 2001
Value of the works: € 450 millions



The aims of the project were not only to speed up travel times but also to free the existing rail line of long distance traffic, thus improving the standard of service for local traffic. The main technical problems faced involved the innovative character of the works to be designed.

Many of the innovative and specific techniques were applied, for the first time, by the large group of engineers; this required an “industrial” type of production in a context that is traditionally “crafts” oriented. Furthermore, the local authorities were strongly opposed to the previous design criteria, so that together with the execution of the detailed design, it was necessary to study an acceptable alternative “corridor”.



SALERNO-REGGIO CALABRIA MOTORWAY



Country: Italy
Client: DG58/ DG07/DG10 ANAS S.p.A. Central Headquarters
 DG24 Impregilo S.p.A., Condotte S.p.A.,
 Salerno-Reggio Calabria S.C.p.A.
 DG87 Reggio Calabria-Scilla S.C.p.A.
 DG48 Impresa Pizzarotti & C. S.p.A. Rome Branch
Funding agency: ANAS S.p.A. General Headquarters
Services provided: DG58 final design; DG07 final and detailed design; DG24 final and detailed design, technical assistance in construction; DG87 final design changes, detailed design, technical assistance in construction; DG10 detailed design; DG48 final design
Period of execution: 1998 – 2013
Value of the works: € 2,700 millions

The motorway is the main connecting road between the far southern Tyrrhenian coastal areas of Italy to the European motorway network, and includes a large number of structures, including the highest arch bridge in the world with thrust retained by the abutments, the Sfalassà. The purpose of the works was to modernize the roadway by functional reinforcement and upgrading the alignment to current standards. The measures for enhancing driving comfort and visibility led to the improvement of safety conditions and to the increase of average driving speeds, while guaranteeing road use during the construction phase. The works took place over some 100 km of motorway which included 20 km of bridges and viaducts and 40 km of tunnels.

PAN-EUROPEAN CORRIDOR Vc

- The Neretva Gorges between Sarajevo and Mostar.
- Location of the works.



Country: Bosnia & Herzegovina
Clienti: EC, MoCT, RS Roads, JP Direkcija cesta FBiH
Funding agency: EBRD, EC, GoBH
Services provided: preliminary design, final design, environmental impact study, detailed design, works supervision
Period of execution: 2004 – 2013
Value of the works: € 1,500 millions



The Vc corridor is part of the Pan-European corridor connecting Italy and the Ukraine. It crosses Bosnia from the north of the country down to the Adriatic coast. This involved the design of approximately 120 km of motorway, with two lanes plus emergency lane in each direction, thus providing better mobility conditions.

On the various stretches difficult natural conditions are found: the over 50 bridges and viaducts, together with nearly 20 km of tunnels, thus formed the main components of the design. Some stretches go through natural reserves or areas of historical and landscape importance, and the impact of the motorway was minimized in the areas of greatest interest. The existing road network is almost totally preserved, guaranteeing an optimum interaction of the new motorway with local traffic. There were also hydraulic difficulties involved, and a special focus was made on the study of solutions to ensure the continuity of the existing waterways and avoid possible flooding. Besides the improvement of road transport, the project included the design for rebuilding two stretches of railway, Samac – Doboj totalling 63 km and Sarajevo – Bradina totalling 41 km, including the improvement of the alignment to allow for the increase of the speed to 160 km/h.



IMPROVEMENT MEASURES FOR THE PUGLIA AQUEDUCT (AQP)

The aqueduct provides for the management of the integrated water cycle for the Puglia region and for some towns located in other regions. The project involved a wide-ranging set of activities regarding field surveys and works, engineering studies and the conducting of repairs and refurbishing in 95 towns served by the AQP for a population totalling 700,000. The data, collected using appropriate topographical instruments and historical analysis, are stored in the SIT (Sistema Informativo Territoriale – Territorial Information System) database. The data were then used to create a mathematical model of the networks, subdivided into several stages, for each municipality. The modelling was then used to define the structural interventions and the breakdown into districts to be applied for each network. Leak detection and repair activities were also undertaken. Between 2007 and 2010, a project was brought to execution for the recovery of 21 million cubic metres, monitoring 7,000 of the 12,000 km of the AQP network.

Country: Italy
Client: Acquedotto Pugliese S.p.A.
Services provided: hydraulic network engineering, network mapping, leak detection
Period of execution: 2012 – 2015
Value of the works: € 26 millions

REHABILITATION OF THE TIRANA AQUEDUCT AND SEWERAGE SYSTEMS

Country: Albania
Client: Ministry of Public Works and Transport
Funding agency: Cooperazione Italiana, Ministry of Foreign Affairs
Services provided: works supervision
Period of execution: 2006 – 2012
Value of the works: € 5 millions

The rehabilitation was undertaken on the water and sewerage network of the city of Tirana, with a population of 650,000, of which a considerable portion had no connection to the sewerage system. The existing systems were in poor condition and thus required suitable modernization, and above all expansion to the areas not covered by the service. The project involved the improvement of the water supply system at the springs and a water treatment plant downstream from the Bovilla Reservoir.

The system was improved by refurbishing the 4 pumping stations as well as by the replacement of pipes in poor condition on some stretches of the water supply and sewerage systems. The sewerage system improvement plan involved a mixed system extending for approximately 530 km.

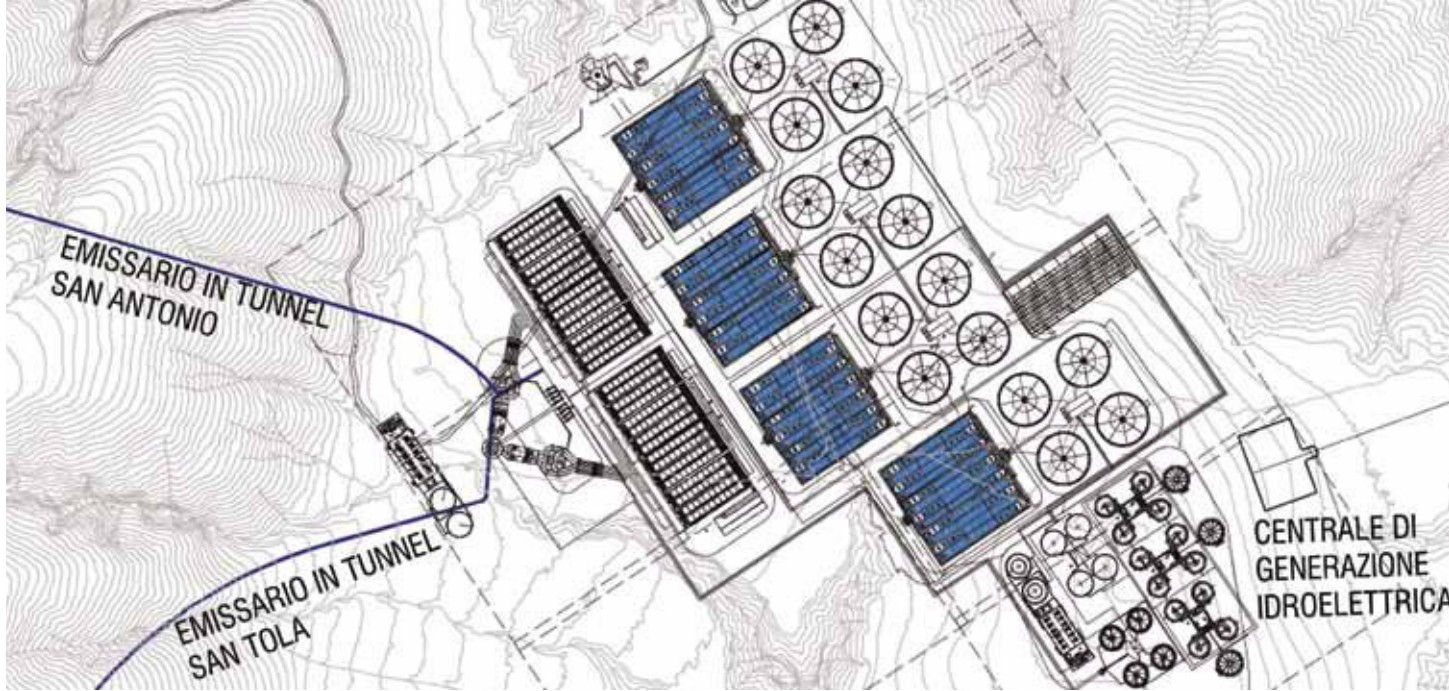




America

THE FOCUS OF OUR ACTION

- Works for the collection and treatment of wastewater in Quito and the surrounding rural areas
- Urban development of marginal areas of Guayaquil
- Aqueduct and sewer programme for rural development
- Hydraulic modelling and monitoring of drinking water supply systems in Quito
- San Salvador rainwater sewer system
- Apopa-Sitio del Niño Road
- Concepcion Dam
- Advanced Paediatric Hospital in Tegucigalpa
- Drinking water supply and sewerage system for the city of San Pedro Sula
- Rio Chillón waters offtake works
- Río Ozama Aqueduct



WORKS FOR THE COLLECTION AND TREATMENT OF WASTEWATER IN QUITO AND THE SURROUNDING RURAL AREAS

Country: Ecuador

Client: Empresa Pública Metropolitana de Agua Potable y Saneamiento (EPMAPS)

Funding agency: BID – Banco Interamericano de Desarrollo

Services provided: feasibility study and alternatives study, preliminary design, detailed design, supervision of designworks

Period of execution: 2012 – 2015

In order to reduce pollution levels in the streams and to keep open stretches of streams that have not yet been channelled, LOTTI Ingegneria has designed **two wastewater treatment plants** for the southern area of Quito, with one plant located near Quitumbe and another in the Beguine area, serving a population of approximately 250,000. In addition, the company had the task of supervising the design of the following large-scale, complex works:

Two sewer outlet tunnels: the Tola Vindobona tunnel, over 30 km long, crossing a wide area of the city, and 4 adjacent rural areas, and the San Antonio-Vindobona tunnel, 2.5 km long, for collection of wastewater in the northern part of Quito.

A wastewater treatment plant (PTAR) located in the northern sector with an average flow treatment capacity of 7.5 m³/s, corresponding to a population of 3,700,000.

A hydroelectric power station with a power of 22 MW through a turbine fed by treated water exploiting the drop of 360 m between the PTAR and the outlet point in the Rio Guayllabamba.

The specific objectives of the supervision activity are aimed at continuous control of the design activities through the verification of their compliance with international standards, to identify the critical matters that could arise during the execution of the works and to suggest the corrective actions to be undertaken.

URBAN DEVELOPMENT OF MARGINAL AREAS IN GUAYAQUIL

Country: Ecuador

Client: Unione Europea

Services provided: technical assistance

Period of execution: 2002 – 2006

Value of the works: € 5 millions

In early 2000, 70% of the population of the Bastion Popular neighbourhood did not have running water, sewers or paved roads and public schools. The aim of the project was to enhance the capacity of the social service networks and infrastructure in the barrio, in order to contribute to the improvement of the living conditions of the population, respecting its ethnic and social context.

The interesting approach was to cover both the engineering and social aspect at the same time and with coordination, ensuring that both aspects are genuinely and effectively complementary. There was rehabilitation of roads, of the drinking water system, of the rainwater channels and the sewerage network, as well as of some public facilities.



AQUEDUCT AND SEWER PROGRAMME FOR RURAL DEVELOPMENT



Country: Guatemala

Client: Inter-American Development Bank

Services provided: feasibility study, detailed design, technical assistance

Period of execution: 2009 – 2010

The water supply and sanitary sector in the country was characterized by poor coverage, the low quality of the service and deterioration due to lack of maintenance. All this was partly due to the lack of policies in the sector, solutions for regulation and control and in effective centralized systems for monitoring and managing the system.

The project included the development of a proposal to implement a managing body, including a preliminary evaluation, the definition of an outline for execution, and the development of an operational regulation.

Activities included the drafting of feasibility studies and detailed designs for a sample of projects for supplying drinking water and sewers in rural and urban areas and in various cities.

HYDRAULIC MODELLING AND MONITORING OF DRINKING WATER SUPPLY SYSTEMS IN QUITO

Country: Ecuador

Client: Empresa Pública Metropolitana
de Agua Potable y Saneamiento
(EPMAPS)

Funding agency: Inter-American
Development Bank

Services provided: hydraulic modelling,
design of telemetry and remote control

Period of execution: 2007 – 2010

The aim of the assignment was the evaluation, modelling and design of the hydraulic functions in aqueducts in order to improve the management and monitoring of the systems. As a result it will be possible to implement the actions for the administrative aspect and the infrastructure of the water supply system, in order to optimize the integral management and to contribute to the programme for the reduction of free water consumption.

The automation of the processes was deemed essential, considering that correct monitoring is an indispensable aspect of the systems, and LOTTI Ingeniería has developed the design of the telemetry and remote control of the system with the use of SCADA method.





SAN SALVADOR RAINWATER SEWER SYSTEM

Country: El Salvador
Client: Fondo Salvadoreño para Estudios de Preinversión (FOSEP)
Funding agency: Inter-American Development Bank
Services provided: feasibility study, detailed design
Period of execution: 2000 – 2002
Value of the works: € 61 millions

San Salvador city, with a population of 1,200,000, has had a very high construction growth rate that has reduced the infiltration of rainwater in the soil, thus increasing surface drainage, so that even ordinary rainfall determine heavy surface flows that flood the lower flat zones of the city with a negative impact on the local economy.

The project has involved the ascertainment of the conditions of the rainwater sewer and drainage systems in four critical zones. A GIS model was set up using all the information collected enabling the creation of an efficient management tool. A package of priority measures was then defined in order to start up their detailed design.

APOPA-SITIO DEL NIÑO ROAD

Country: El Salvador
Client: Siman S.A. de C.V
Funding agency: Inter-American Development Bank
Services provided: detailed design
Period of execution: 2002
Value of the works: € 25 millions



The aim of the project was the reconstruction and updating to the current traffic flows on the Apopa-Sitio del Niño road near the city of San Salvador. The reconstruction involved the widening to 4-lane of the previous 2-lane road, with a new horizontal and vertical alignment. The road runs for a total length of 16 km and involved various appurtenances. The execution design was drawn up for the contractor by the “fast track” method, directly during the construction stage.

CONCEPCION DAM

Country: Honduras

Client: SANAA

Tegucigalpa / Astaldi – Roma

Services provided: detailed design,
works supervision

Period of execution:

1988 – 1992

Value of the works:

€ 44,415,000

The Concepción Dam was built to supply drinking water to the capital, creating a reservoir with a usable capacity of 33 million m³. The dam was one of the first in the world built with the RCC (Rolled and Compacted Concrete) method, allowing for lower costs and faster construction, and the concrete was laid with ordinary earth moving equipment, thus saving on labour, with subsequent compacting with vibratory rollers.

The design was awarded the Ingersoll-Rand Italia prize in 1991 (reserved to the best work designed and built abroad by Italian firms), since it had the great merit of solving the dramatic water emergency situation in a record time.

ADVANCED PAEDIATRIC HOSPITAL IN TEGUCIGALPA



Country: Honduras

Client: GHELLA S.p.A.

Committente: Fundación Maria di Tegucigalpa

Services provided: design and works supervision

Period of execution: 2000 – 2003

Value of the works: € 22 millions

Built using the “fast track” method, the hospital was designed with an extendable and flexible layout, with a specific architectural design coherent with the local area and its morphology. This involved a compromise between the simplicity of local customs and a technologically and scientifically advanced health facility construction model. The functions are organized in 2 macro-areas: **diagnosis and care**, located in three connected buildings organized on 4 levels housing the various healthcare services, and **hospitalization** located on a single level on the ground floor, with rooms facing onto the edge of the courtyards, thus suited to the local climate and the habits of the population, used to an open-air life.

DRINKING WATER SUPPLY AND SEWERAGE SYSTEM FOR THE CITY OF SAN PEDRO SULA

In its role as Technical Consultant for “Aguas de San Pedro, S.A. de C.V.” (the concessionaire company of the aqueduct and sewerage system of the city of San Pedro Sula up to 2031), LOTTI completed various assignments for the improvement of the drinking water supply system and the wastewater collection and treatment system, thus enabling the service to be provided in an efficient manner while guaranteeing high standard health and environmental conditions for the city’s population. A **general plan of the drinking water system** up to the year 2031 was developed, in order to enable ASP to have a technical and economic planning instrument for the entire period of management of the system.

The plan presented an investment proposal aimed at guaranteeing the growth of the system within the pre-planned levels of service, optimizing the functioning of the existing system and ensuring that the construction of the new works is in compliance with the principles of technical functionality with the minimum cost of investment and operation. The technical measures connected with the drinking water supply investment plan for the period 2011 – 2015 were then conducted on the basis of the detailed design for: 180 km of pipelines, 27 km of sewerage lines, 5 pumping stations, 6 tanks, 20 wells and the expansion of a treatment plant. At the same time, a **general plan for the sewerage line and the treatment of wastewater** was developed to provide for the total collection and partial treatment within the 2031 time frame, also including the collection and treatment of industrial wastewater.

For the works included in the general plan a preliminary design was conducted. This involved 3 treatment plants for an overall average capacity of 2,100 l/s (for a total population of approximately 1 million) and utilizing UASB technology with energy recovery from the biogas produced, works for containment and protection from flooding, 300 km of sewers, 4 new pumping stations and 3 rehabilitated pumping stations.

Country: Honduras

Client: Aguas de San Pedro, S.A. de C.V

Services provided: general plan for the drinking water supply and wastewater collection and treatment system, detailed design of the drinking water supply system, preliminary design of the wastewater collection and treatment system

Period of execution:

2002 • 2004 general plan for the drinking water supply system

2002 • 2003 (update 2011 – 2014) general plan of the wastewater collection and treatment system

2013 • 2014 technical measures for the plan for the development of the drinking water supply system

2014 wastewater collection and treatment system

Partial amount of the works: € 480 millions



RIO CHILLON WATERS OFFTAKE WORKS



Country: Peru
Client: Consorcio Agua Azul
Services provided: detailed design
Period of execution: 1999 – 2003
Value of the works: € 50 millions

In order to supply drinking water to the city of Lima, the **surface water** was exploited by the design of a offtake dam, an intake unit with sand separator with a maximum entering flow of 5 m³/s, a main feed pipeline, balance and regulation as well as primary sedimentation tanks (200,000 m³) and a water treatment plant (2.5 m³/s).

The exploitation of groundwater involved the design of 28 wells drilled in the river aquifer. The water pumped from these wells was then to be distributed through pipelines extending for a total length of 56 km and with 6 new tanks having a total capacity of 9,000 m³. The project also includes a SCADA telemetry and remote control system for all the components.



RIO OZAMA AQUEDUCT

Country: Dominican Republic
Client: Impregilo S.p.A.
Funding agency: Consorcio Acueducto Oriental
Services provided: detailed design, technical assistance
Period of execution: 1999 – 2003
Value of the works: € 105 millions

The purpose of the Acueducto Oriental in Santo Domingo is to supply drinking water to the eastern zone of the capital, serving a population of 500,000. After an initial in-depth study of the objectives of the project and the subsequent development of alternative solutions, the detailed design was then developed at the construction site during the start-up phase of the works. Assistance was also provided to the contractor during the construction of the works by the preparation of the detailed construction drawings and with assistance during the discussion and approval of the design. The project included the movable type diversion dam on the Rio Ozama, with three 9 m wide spans, intake works, pumping stations, a water treatment plant and the main distribution network.



Clients

In Italy and abroad, we work on behalf of the main protagonists of engineering and development.



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