

Italian engineering in the world: Artelia Italia redesigns the Benghazi Business District in Libya

Seven futuristic buildings designed together with Studio Boeri Architetti, intended to become an icon of the Libyan rebirth and a model of sustainability throughout the Mediterranean area

A lot of six hectares (the equivalent of nine football stadiums), a built-up area of about 130,000 square metres (about seven times the coliseum), seven buildings, for an investment of 600 million dollars: these are the numbers of the impressive **Benghazi Business District project that Artelia Italia was awarded by the Libyan National Oil Corporation (NOC)**, winning a tender procedure that involved the world's most important engineering companies.

The project calls for the construction of seven main buildings, divided into an organic executive complex that revolves around the building intended for the headquarters of the National Oil Corporation, the so-called "Diamond": a tower of 30,000 square metres in the shape of diamond. But the new large multi-purpose district will also see the birth of the new headquarters of the Central Bank of Libya, the Ministry of Oil and Gas, the offices of the Brega company and international oil companies, a convention centre, a 250-room hotel, a health centre, a mall, as well as a large covered square with restaurants, cafés and shops, car parks and outdoor spaces.

*"NOC's choice to award this important engineering and project management task to Artelia Italia is not only a source of great pride for our company and for the whole Artelia group, but also represents an extraordinary confirmation of the excellence, creativity and innovation of Italian engineering in the world", says **Gabriele Scicolone, CEO of Artelia Italia**. "For us this contract marks a return to Libya, a country we have been active in since 2009 through a branch established by the then Intertecno, which merged into Artelia Italia in 2017".*

Resource conservation, energy efficiency, selection of materials, low-consumption lighting, a quality indoor environment and use of systems that facilitate the management of buildings are all part of the design strategy to create high-performance buildings. Engineering details completely integrate with the architecture, taking on an aesthetic strength and contributing to a whole that blends beauty with innovation. Artelia Italia's proposal was successful because of a design concept with great architectural impact - thanks to the solutions proposed by **Studio Boeri Architetti** - and advanced engineering, carefully studied to meet the most modern operational requirements, but also thanks to an offer of project management that meets the needs of an international player like NOC.

As noted by **Alberto Romeo, Managing Director Artelia Italia** and former CEO of Intertecno, who has followed the whole offer process, from the presentation to the signing of the contract, *"The project is intended to become an icon of the process of rebirth of the city of Benghazi and of all of Libya after years of great difficulty, and a model of reference in the entire Mediterranean area for its specific attention to energy and environmental sustainability. We are very satisfied with this outstanding result. Artelia Italia will play a key role as NOC's lead consultant, providing integrated engineering services that will combine design activities and management services throughout the entire duration of the project".*

Construction will start in 2019, but the task awarded to Artelia Italia - which will also manage all the project and construction management services - calls for the immediate preparation of the integrated multidisciplinary project (architecture, engineering, sustainability), followed by the phase of managing procedures for selecting companies, calls for tenders and works supervision. The project team will involve many different disciplines to guarantee compliance with the highest international standards.

*"The construction of a multi-purpose district around the new headquarters of the Libyan oil company is a tangible sign of a rebirth that until a few months ago seemed unthinkable" - **says the architect Stefano Boeri**- "and is an expression of hope for a future of exchanges between Italy and Libya that are not only commercial, but also of projects and ideas".*

*"NOC's new facilities in Benghazi will be a signal of our ambition for all Libya; and a signal to the world of our industry's successful future. We are very pleased to be re-starting this historically important project for all Libyans." **says Mustafa Sanalla CEO of NOC.***

ABOUT ARTELIA

Artelia is an international, multidisciplinary consultancy, engineering and project management group specialising in the sectors of building construction, infrastructure, water and the environment. With 4900 employees and turnover of €520m (Cumulative 2016 turnover of Artelia and Auxitec), Artelia is one of France's leading groups in the sector. Internationally, the group has offices in more than 35 countries in Europe, Africa, the Middle East, Asia and South America. Artelia is 97% owned by its managers and employees. It offers services to customers both private (industrial groups, developers, investors, building contractors, banks, insurance companies, etc.) and public (institutions and local, public and supranational entities). It is structured to conduct efficient project management with solutions that are always well designed and technically advanced, with an approach that is both multidisciplinary and global yet at the same time tailored to the local needs.

Artelia Italia, established in 2001, it has earned a leadership position in Italy in Building and Multi-Site Project Management and Engineering. In 2015 Artelia Italia consolidated its position through the acquisition of Intertecno, one of the most important Italian engineering companies in the construction sector. Thanks to this initiative it now ranks among the top Italian engineering companies, with an annual turnover of around 30 million euros and a total staff of more than 250 people working in its Rome and Milan offices.

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A SHINING DIAMOND FOR LYBIA – PROJECT TECHNICAL DETAILS

MASTERPLAN

The distribution of buildings within the masterplan revolves around the central element of the headquarters of the NOC. The sequence and the volumetric articulation of the buildings, in fact, is designed in such a way as to make clear the exceptionality and the uniqueness of the "diamond" building.

The arrangement of the buildings is ordered around a longitudinal axis that is parallel to the coastline, covering the entire area from northwest to southeast. This axis defines a regular portion of the lot toward east where, from north to south, the building of the NOC HQ, the plate offices of Braga marketing company and the international oil companies and the hotel are arranged.

Symmetrically the main axis cuts out a lot of irregular portion facing the sea towards west where from the north are located: the park that hosts the conference center, the local office of the ministry of oil and gas, the building of Central Bank of Libya and the clinic to serve the entire compound.

Situated at the origin of the longitudinal axis, as mentioned, the HQ of NOC is separated from the rest of the buildings by a large water square that reaffirms the exceptional character and allows a distanced view.

NATIONAL OIL COMPANY HEADQUARTERS

The building, designed to evoke in the forms and in the treatment of the facade a large and shiny diamond is essentially constituted by a vertical blade of 85 m width and 100 m height. The section, variable in the vertical development of the structure, defines a projecting tip of about 15 m at the 14th floor.

The building entrance is located at -1 level and reached via a sloping path that cuts through the square in front of the water. The triple-height entrance hall occupies the central part of the grounds between the two main vertical distribution nucleuses of the building.

The need to obtain an iridescent and shimmering effect encouraged the team to imagine a particular treatment of glass surfaces. The building envelope has been envisioned as a double skin with a natural convection ventilation system can contribute significantly to the maintenance of the levels of environmental comfort inside.

The design of the facade and the golden hue of chromatic treatment can be obtained by incorporating in the stratification of the glasses a wire mesh stretched with a treatment of screen printing digital with the result of obtaining a double articulated design in shades of gold and at the same time ensure an internal treatment that is neutral and respectful of the work environments of the building.

BRAGA MARKETING COMPANY AND INTERNATIONAL OIL COMPANY BUILDING

The building was conceived as a large plate suspended by a few major support to the soil in which are embedded entrances, vertical links, commercial activities and services intended for the covered plaza defined by the presence of the structure. The articulation of the buildings defines four great courts whose hexagonal paving takes the classic iconographic themes of Arab and Mediterranean culture.

The proposed distribution scheme provides for the localization of collective and representative functions at the ends of the building [to the NOC and the hotel] and the division of the intermediate parts of the plants in separate nucleuses of operational offices that will, according to needs of the client be merged. Contributes to the great flexibility of use of the spaces of the building also the availability of numerous attacks on the ground that I can operate from separate entrances.

The glare protection and mitigation of the effects of direct radiation is ensured with the adoption of a shield made of panels of ultra high performance concrete. Within the plot some of the hexagons defined by the components of the cement panels can be in-filled with the insertion of glass panels in coloured paste.

HOTEL

The hotel designed for the complex has a volumetric articulation that provides a base on two levels topped by a slimmer body of building to house the rooms. Covering this body, a penthouse on two levels allows the realization of the most prestigious suites. The treatment of the facade of the building to house the hotel can be briefly divided into three types .

The first, which is reserved to the first level of the base, is basically a glass curtain wall with mullions and transoms made of aluminium alloy. This solution allows to optimize the natural lighting of the environments placed in the lowest part of the building and to compensate for the presence of the cantilever, more or less accentuated along the perimeter, of the second level of the base.

The second is the one adopted for the basement floor immediately above. The effect of the wall mass with triangular openings is designed in this stage, assuming the use of portions of prefabricated facade panels with lightweight concrete and with layers of insulation inserted in the workshop. Once placed in the operating parts of the facade are subject to the final painting and finishing process with a process of spray finishing.

The last type of facade is that which distinguishes the main body of the rooms, in this case cells facade preliminarily implemented could easily ensure the system of glazed openings and translucent infill, projecting with respect to the main body characterize the volumetric treatment of this building part.

CONFERENCE CENTER

The conference center has been designed with a large open space system able to connect the closed 'boxes' halls of congresses and meetings. The project has pursued the idea of allowing maximum freedom of movement and use of spaces of connection between the parties. For these reasons, the building is suspended from the ground and able to ensure the continuity of the open space of the surrounding park.

The main circular building, contains all the halls, services, technical rooms contained in the program. In the spaces of the foyer, areas for commercial hospitality and support activities can be arranged including through temporary installations.

On the roof of the building the project foresees the localization of elipad facility.

MINISTRY OF OIL AND GAS BUILDING

The Ministry of oil and gas building is divided into two-storey tall bodies joined at the base by a common lobby, which houses the functions of the front desk and a small meeting center. To these covered surfaces adds a terrace between the two bodies that can be used for events and for the reception of the most prestigious guests.

The distribution of the functional program inside the towers has been suggested reserving the upper floors for the location of the offices of the leadership and meeting rooms, imagining a use of the lower floors for more operative spaces.

The facade of the building, built in curtain wall is designed with a metal shield that also in this case, mitigates the effects of direct solar radiation and reproduces the local iconographic tradition.

CENTRAL BANK OF LIBYA BUILDING

Along the longitudinal axis, the portion of the lot facing towards the sea and in sequence after the building of the Ministry, the project involves the location of the headquarters of the Central Bank of Libya, a base on two levels in dark stone surmounted by three transparent towers aligned on the front of the pedestrian path.

The building tries to represent through the facade treatments, especially of the base, the nature of the institution that houses it. The introverted treatment and wall mass of the base, in fact, is opposed to the transparency and luminosity of the facades of the towers that stick out and look out towards the sea.

In the basement of the building has been foreseen the location of sensitive areas that require the greatest degree of safety. On the ground floor the entrance hall has been designed to ensure a double access from the street to the pedestrian space pertaining to external facing the driveway perimeter.

On the upper floors, the hypothesized distribution function provides for the establishment of working spaces differentiated between them. In the logic of distribution adopted for all the buildings sector the higher floors were devoted to the management possibilities, including the possibility of providing these services for offices.

HEALTH CENTER

The clinic project was developed with the aim to ensure the highest possible availability of flexible spaces. The basement was planned to locate all diagnostic tasks that require special protection measures as well as technical rooms and direct access from the basement parking of vehicles belonging.

The floors have been designed assuming the use of the ground floor and first acceptance as healthcare support [observation and emergency treatment] and the two upper floors for the location of doctors of different specialties. Regarding the facade, also the clinic has been designed adopting the maximum possible degree of industrialization of the production process of the elements that constitute the parts.

For the tight envelope has been provided the use of pre-assembled fully glazed facade cells, and placed on the height of the interstorey. To complete the facade, in a synergistic way with respect to the use of high performance glazing, the improvement of the control of solar radiation will be secured by metal shields that constitute at the same time the second skin and a decorative texture for the building. The metal panels, forged on a design that reinterprets the local iconographic tradition, will be supported by a steel frame anchored to the facade.

SUSTAINABILITY

It is believed that the NOC project could represent a very good opportunity to apply the LEED ND rating system to the whole area. The benefits that are expected to be obtained by pursuing LEED ND certification include:

- Creation of a unique landmark: not a single project has been certified yet with LEED ND in the whole Mediterranean area. It will become a symbol and an example to imitate.
- Added value to the project and to the surrounding areas. Further development of the harbour area will benefit from this certification, as it could be extended to other projects. It may attract other investors and contribute to the development of the whole city.
- Enhancement of comfort and livability to all outdoor areas. People will appreciate their stay both in the buildings and outdoors.