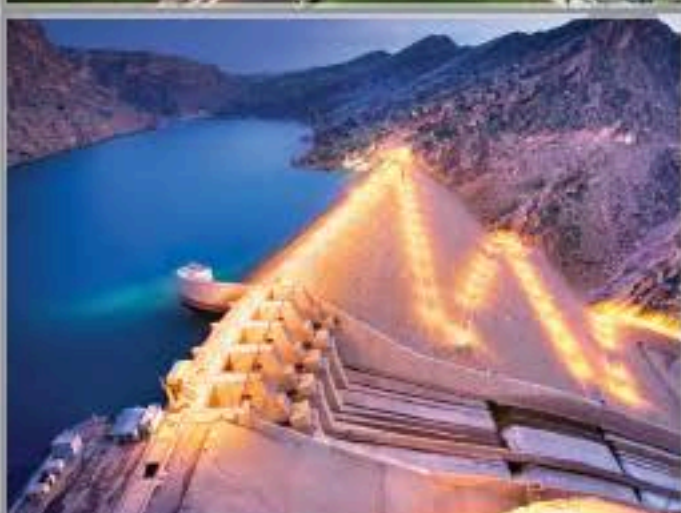
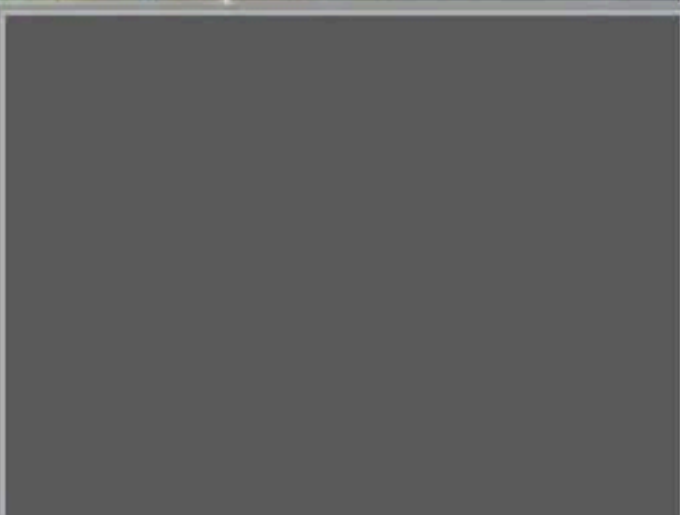
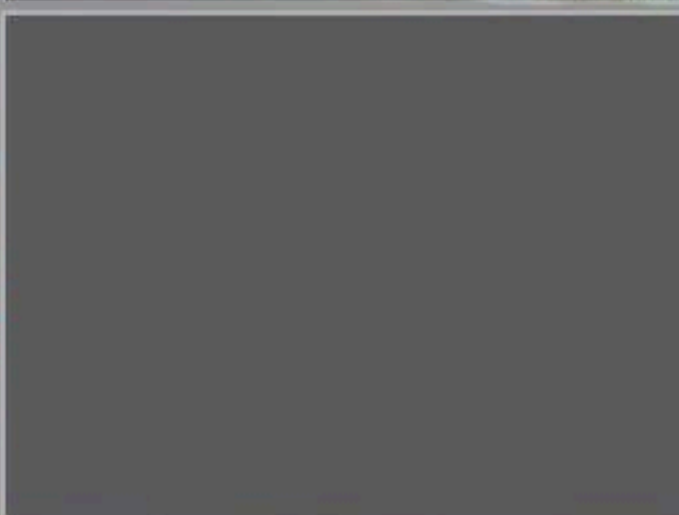
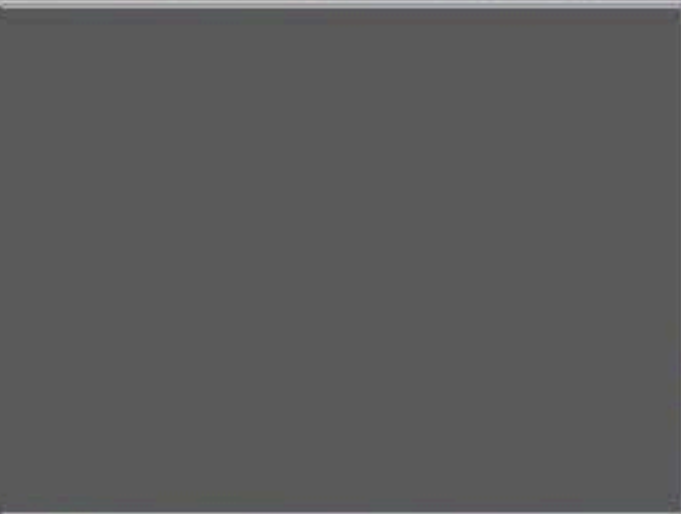




**PERLITE
BORGEH**
construction consortium



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Rank No.1 in Building & Construction

Rank No.1 in Utilities & Equipment

Rank No.1 in Water Resources

Rank No.1 in Roads & Transportation

After several decades of activity and successful execution of prominent projects in various fields, in 2022, Perlite (founded in 1982) and Borgeh (founded in 1974) companies combined their facilities, experiences, and capacities to form the **Perlite Borgeh Construction Consortium**.

This consortium prides itself on achieving completion of multitude of projects during the last four decades, including construction of the following:

- ◇ **Public / Official / Commercial Buildings**
- ◇ **Hotels**
- ◇ **Residential Complexes**
- ◇ **Educational Buildings**
- ◇ **Tunnels**
- ◇ **Highways**
- ◇ **Dams**
- ◇ **Powerhouse**
- ◇ **Docks and Jetties**
- ◇ **Oil and Gas Refineries**
- ◇ **Offshore Structures**

The successful execution of all contracts and assigned projects over more than four decades of continuous activity by two companies demonstrates that the Perlite Borgeh Consortium now has the capability to undertake challenging and innovative projects such as manufacturing and erection of all pre-cast pipe racks for Bandar Abbas refinery, construction of Assaluyeh jetty in the form of pre-cast caissons which were placed deep in the seawater, construction of mega projects like Iran Mall and the National Library of Iran and construction of two underground traffic tunnels in Tehran.

Perlite Borgeh Consortium through its team of talented and experienced workforce is committed to use state-of-the-art and the highest standard of workmanship and quality in every project.

MESSAGE OF THE MANAGING DIRECTORS



Alireza Nasser Moadeli



Manouchehr Malekiani

As the managing directors of **Perlite Borgeh Consortium**, we proudly announce that during the past 4 decades, Perlite Borgeh Companies have served the country and the engineering community by completing numerous infrastructure projects throughout our beloved country. None of these could be achieved without the following policies and principles which we all adhered to:

Maximum reliance on our local facilities and resources, believing in innovations and creativity of our engineers and experts, promoting new ideas such as use of precast concrete segments as formwork, taking advantage of equipment and machinery developed by the talented and skilled local engineers, paying special attention to the quality and lifelong durability of the projects, practicing cost and time saving policies, and ultimately boosting the localization of technology.

Reliance on human resources capacity, talent and innovation, benefits from local young human resources, and inspired by our experienced staff and predecessors led us to achieve the completion

of large and complex projects.

Perusing the best solutions for complex projects by conceptualizing the process and adjusting the work to local culture. This resulted in successful completion of the projects.

We all believe in a team work that combines sympathy, sincerity, enthusiasm, as well as compassion for each and every team member. We all try to motivate each other and believe in being devoted to the tasks assigned to us.

We all trust in God and consider Him in our daily work and exercise the above notions to the best of our abilities. We all rely on assistance from our fellow team members and colleagues at Perlite Borgeh Consortium, and believe that none of the achievements such as completion of huge infrastructure projects could be done if it was not for such a good collaboration amongst us all.

For the future we all hope for much greater success to be realized by Perlite Borgeh Construction Consortium through continuous efforts of our valued colleagues.





Public / Official / Commercial Buildings

- IRAN MALL SHOPPING CENTER
- IRAN MALL PARKING
- NATIONAL LIBRARY OF THE ISLAMIC REPUBLIC OF IRAN
- IRAN CHAMBER OF COMMERCE (NEW OFFICIAL BUILDING)
- NATIONAL DEVELOPMENT FUND OF IRAN
- PARLIAMENT MEMBERS' OFFICES BUILDING
- TOHEED TUNNEL CONTROL BUILDING
- PRINTING FACTORY OF THE BANK-E-MELLI OF IRAN

IRAN MALL SHOPPING CENTER

This project is located in Tehran District 22 at the end of West Hemmat Highway on its southern part. It was completed in 2016. The land area is about 33 hectares on which one of the largest shopping complexes in the Middle East is new built.



Northwest View



General View From Top



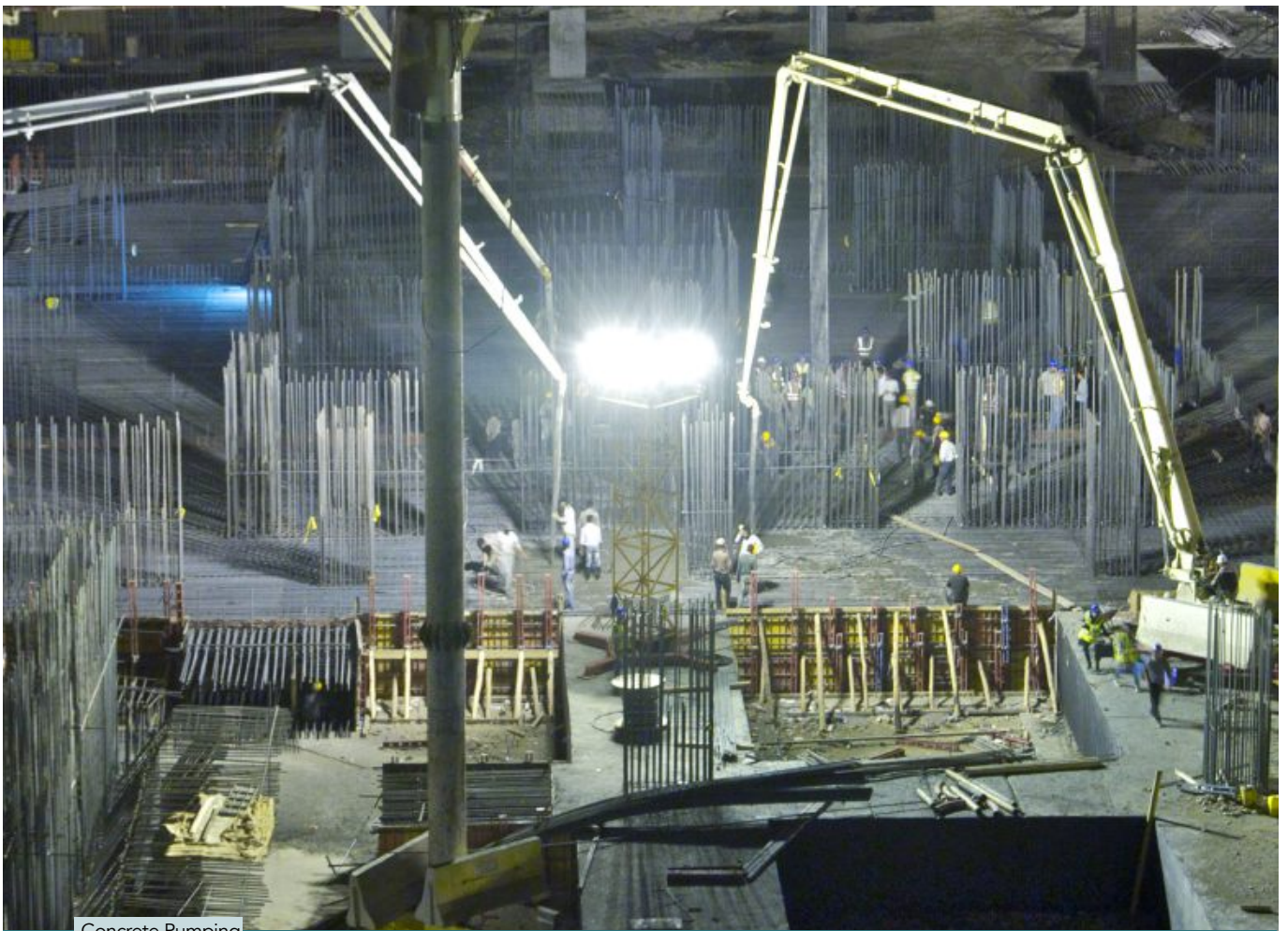
IRAN MALL SHOPPING CENTER

The total **area under construction is 1,000,000 sqm** which will accommodate cultural, sports, and business areas. In addition to the above, the entire project is annexed to **a hotel with 190,000 sqm** per floor. In order to build ceilings separating different levels, a prefabricated unit was installed on the site in order to produce hollow-core concrete pieces. This prefabricating unit had 10 production lines with a total capacity of 52,000sqm of hollow-core pieces every month.





Foundation Construction



Concrete Pumping

IRAN MALL SHOPPING CENTER

Hollow-core Manufacturing plant

This plant was built and started production in Tehran District 22 by the side of Iran Mall Shopping Center with 10 separate production lines, each 150 m long.

The objective was to produce precast hollow-core pieces for the ceilings in this spacious 1,000,000 sq m building.

Total number of equipment pieces of this plant were about 190 all of which are manufactured in Perlite Borgeh's Design and Manufacture Department.



General View Of Hollow Core Workshop



Produced Hollow Cores



Hollow Core Production Line

REBAR CUTTING AND BENDING

Perlite Borgeh's Rebar Cutting and Bending Section works with a capacity of 200 tons of different shapes rebar and networks per day with precise dimensions and angles as required in the shop drawings. This work is done by using full automatic CNC equipment to expedite project's operations.



IRAN MALL PARKING

THE CAR PARKING BUILDING

The car parking building of Iran Mall has a unique structure of **24.000 square meters** in six floor, located under the fountain at the entrance of the Mall. It is built by using the modern method of construction building the whole structure by using pre-fabricated concrete segments.

This is done by producing pre-cast components outside of the project site in a pre-fabrication unit, and transporting them to the place for installation. Several benefits were achieved, such as increased construction speed, higher quality of work, façade aesthetic, etc. In this project 2576 pre-cast components and 23000 interior decorative parts are used.

The following are a few advantages of pre-cast **concrete parts:**

- 1-Structure remains unaffected by weather changes
- 2- Improved efficiency of activities by eliminating traffic and personnel movements.
- 3- Increasing the speed of project implementation.
- 4- Minimizing accident and increasing safety by manufacturing the pre-cast parts in the factory as compared to in-situ concreting.
- 5- Reducing risks and waste of material and construction time.
- 6- Making efficient use of machinery and equipment in a controlled factory environment and thus maintaining high quality of products
- 7- Possibility of easy monitoring.
- 8- Possibility of parallel activities with pre-cast parts in comparison with Hierarchical activities with in-situ construction.





Installation of 18m beam using two cranes

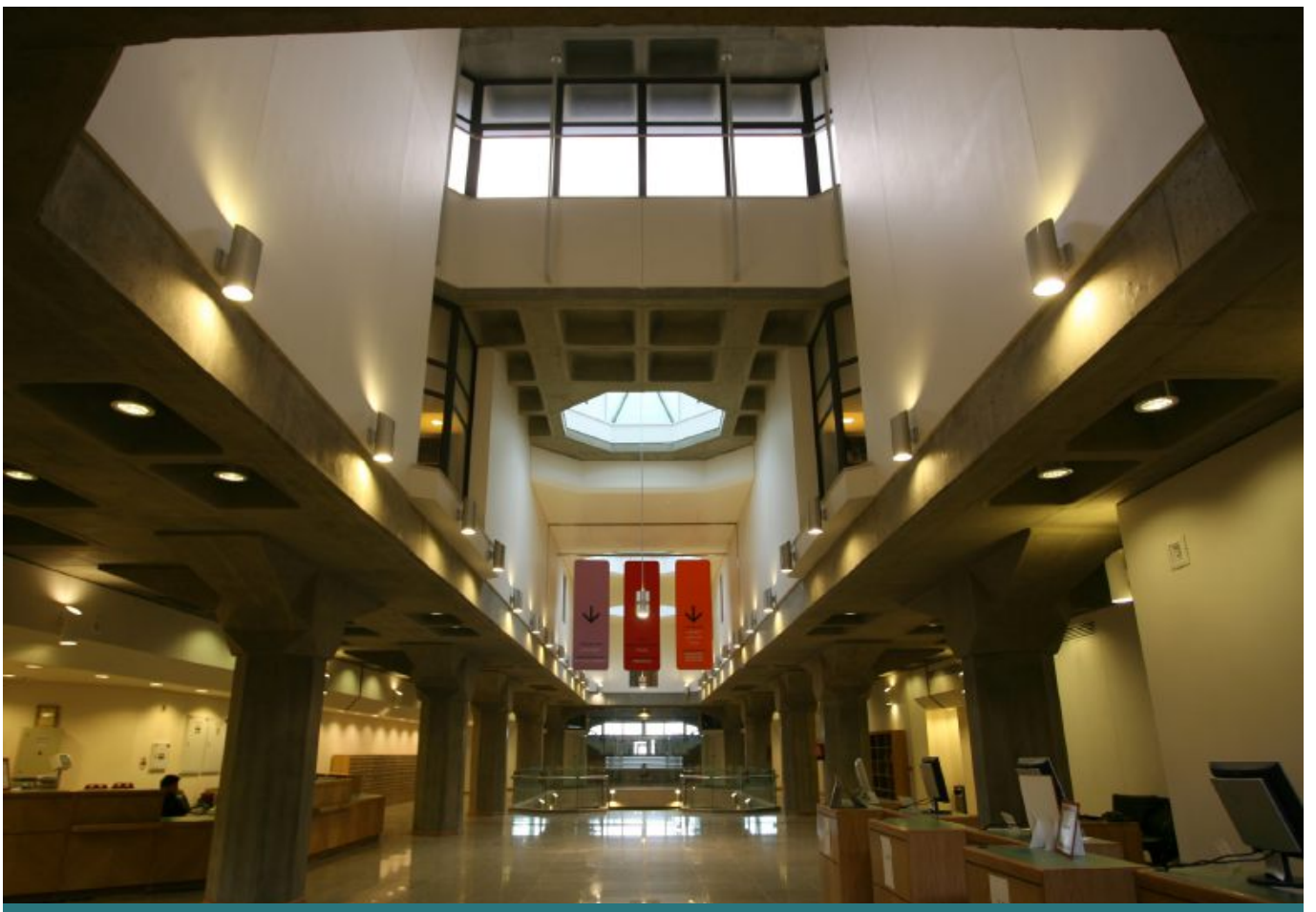


NATIONAL LIBRARY OF THE ISLAMIC REPUBLIC OF IRAN

The new building of the National Library of Iran has been located in Tehran. The building, with a concrete structure, is situated on a land area of approximately 62,000 square meters and has a **total floor area of 100,000 square meters**, in nine floors, and it was extensively designed horizontally instead of vertically inspired by traditional Iranian architecture. The building is designed with a 500-year operating lifetime.

The project's construction was completed in 54 months by Iran Borgeh Company without any delays. The project design was carried out by Pir-Raz consulting engineers, and the project client was the Ministry of Housing and Urban Development of Iran.





NATIONAL LIBRARY OF THE ISLAMIC REPUBLIC OF IRAN

Using modular design principles and innovative construction methods and durable materials such as fireproof bricks in the building's facade, upgradable stone false floors, a fully automated and mechanized book transportation system, natural lighting in all public spaces in a way that optimally utilizes natural daylight throughout the day without the need for artificial lighting and electricity consumption, the implementation of the latest fire suppression technology specific to book repositories, and the use of over 100,000 square meters of various natural stones in the building, along with a smart building management system, are some of the project's features.





IRAN CHAMBER OF COMMERCE (NEW OFFICIAL BUILDING)

The construction project of the new building for the Chamber of Commerce, Industries, Mines, and Agriculture of Iran (ICC) in Tehran is a part of the development plan for the Iran Chamber of Commerce.

The total area of this project is approximately 100,000 square meters. In this phase, the office building has been constructed, with a total floor area of 13,000 square meters and consisting of twelve floors. All construction operations, mechanical installations, electrical installations, and interior architectural work of the main building, as well as the construction of the central power plant, were carried out by the Iran Borgeh Company.

The project was delivered without delay and ahead of the agreed-upon deadline. The project design was performed by consulting engineers from Bavand, and the project's client was the Chamber of Commerce of Iran.

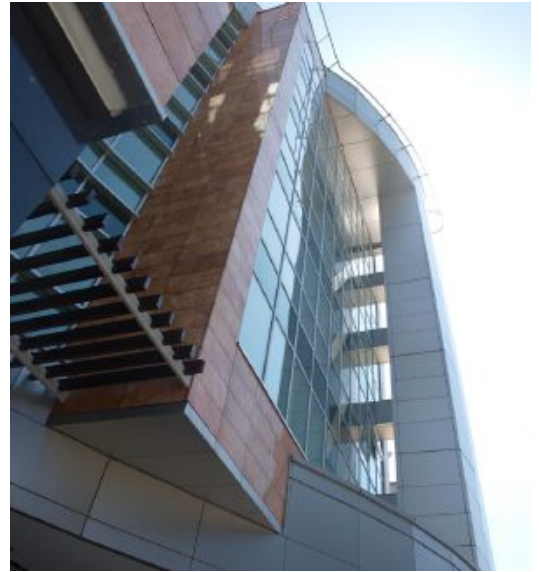




NATIONAL DEVELOPMENT FUND OF IRAN

The project of the National Development Fund of Iran building is located in Tehran, with a total floor area of 8,000 square meters and consisting of ten floors, has been completed in 2018.

All construction operations, mechanical installations, electrical installations, interior architectural work, and soil stabilization by nailing were carried out by Iran Borgeh Company. The project was delivered without delay and ahead of the agreed-upon deadline. The project design was performed by consulting engineers from Arta Bin, and the client for the project was the Retirement Fund of the National Iranian Oil Company(NIOC).





PARLIAMENT MEMBERS' OFFICES BUILDING

The Parliament Members' Offices Building project, with a total floor area of 20,000 square meters over 9 floors and a landscaping area of 5,000 square meters, has been executed in Tehran.

The structure of this building was originally designed in the 1960s with old structural calculations. After the project contract was awarded, due to the contractor's proposal and the client's approval, load testing and technical inspections has been done by contractor, and the structural reinforcement design was prepared and executed by the contractor.

This project was completed concurrently as a design and build project by Iran Borgeh Company in 37 months without any delays and was delivered. The client of the project was the Iranian Parliament.





TOHEED TUNNEL CONTROL BUILDING

This building is located halfway along and outside the Tunnel for the purpose of controlling both main and auxiliary tunnel utilities. The attractive architecture of this building is the same as the tunnel, with its entrance similar to that of the twin tunnel portal. The main systems controlled

from this building are:

HVAC: fresh air supply, exhaust air, jet-fan/axial fan controls and remote control unit.

Lighting: tunnel threshold, transient zone, interior zone and exit zone lightings, power distribution and fire alarm systems.

Intelligent control system: CCTV cameras, CO and NO₂ sensor/detectors, interior temperature measuring and wind anemometer.

Signals and Signs: power supply and distribution, emergency power supply, tunnel central traffic control, fire-fighting and emergency services center outside the tunnel.



Axial Fans For Fresh Air In Sacardo



Cofrance Room Of Control Building

PRINTING FACTORY OF THE BANK-E-MELLI OF IRAN

The project of the Printing Factory of the Bank-e-Melli of Iran, an industrial building for the use of the Bank-e-Melli of Iran printing facility, with a total floor area of 28,000 square meters, has been constructed in Tehran.

The scope of work included all construction operations, mechanical installations, electrical installations of the building, and its landscaping. The project was designed by the Bank-e-Melli of Iran Building Department, and the client for the project was the Bank-e-Melli of Iran.







Hotels

- PARS INTERNATIONAL FIVE-STAR HOTEL (ELGOLI), TABRIZ

PARS INTERNATIONAL FIVE-STAR HOTEL (ELGOLI), TABRIZ

The 5-star Pars Tabriz Hotel project, with a capacity of **200 rooms**, is located in the city of Tabriz, the capital of East Azerbaijan province, Iran. The hotel building, with a concrete structure, designed in 17 floors and has a total floor area of approximately **30,000 square meters**, designed with eye-catching architecture.

The concrete structure of the project was a candidate for the Iranian Best Concrete Building of the Year award in 1996. All construction operations, mechanical installations, electrical installations, architectural work for the hotel, and its landscaping on an area of about 60,000 square meters were carried out by Iran Borgeh Company.

The project was delivered without delay. The project design was performed by consulting engineers Grouh-e-Chahar , and the client for the project was the Investment Company of the Iran Social Security Organization.





PARS INTERNATIONAL FIVE-STAR HOTEL (ELGOLI), TABRIZ









Residential Buildings

- YASAMAN RESIDENTIAL COMPLEX
- DEZASHIB RESIDENTIAL COMPLEX

YASAMAN RESIDENTIAL COMPLEX

This project is a residential complex commissioned by a private sector client, with a total floor area of 13,000 square meters designed in fifteen floors in Tehran.

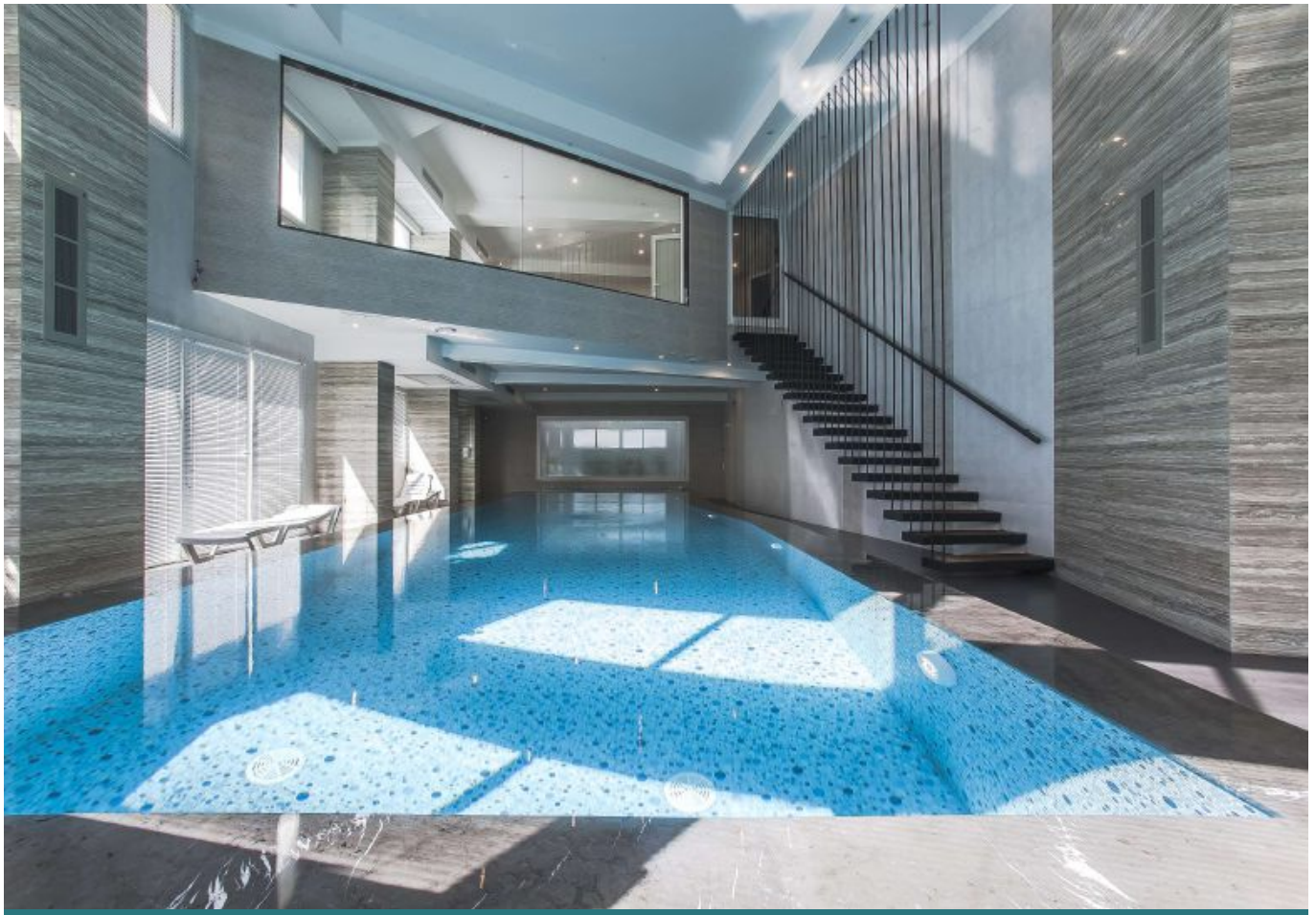
It features modern architecture and unique design. This project has a complex and distinctive architectural design, with each floor having a special and different plan compared to the others. It incorporates all sustainable design criteria, energy saving considerations, and environmental factors. All construction operations, mechanical installations, electrical installations, and interior architectural work were carried out by Iran Borgeh Company, and this project also was delivered without delay in the year 2020.

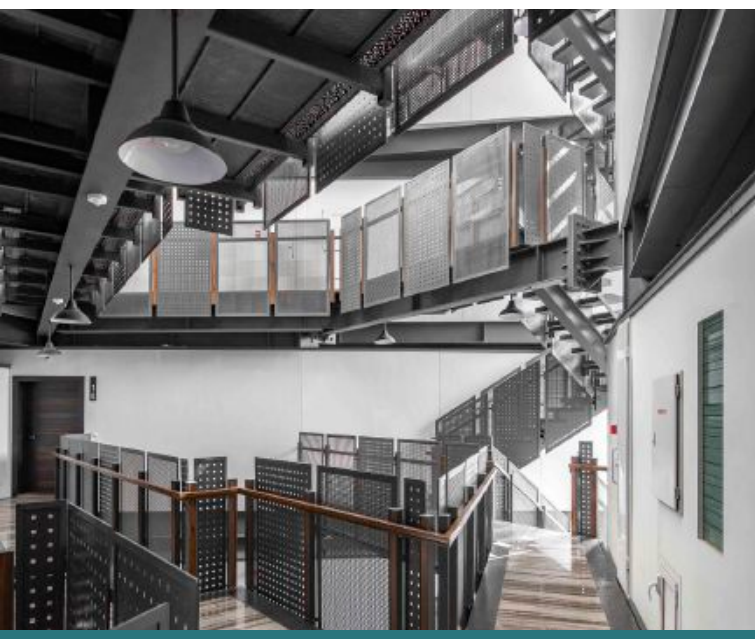
The project was designed by consulting engineers Safamanesh and colleagues, with the private sector as the client.





YASAMAN RESIDENTIAL COMPLEX





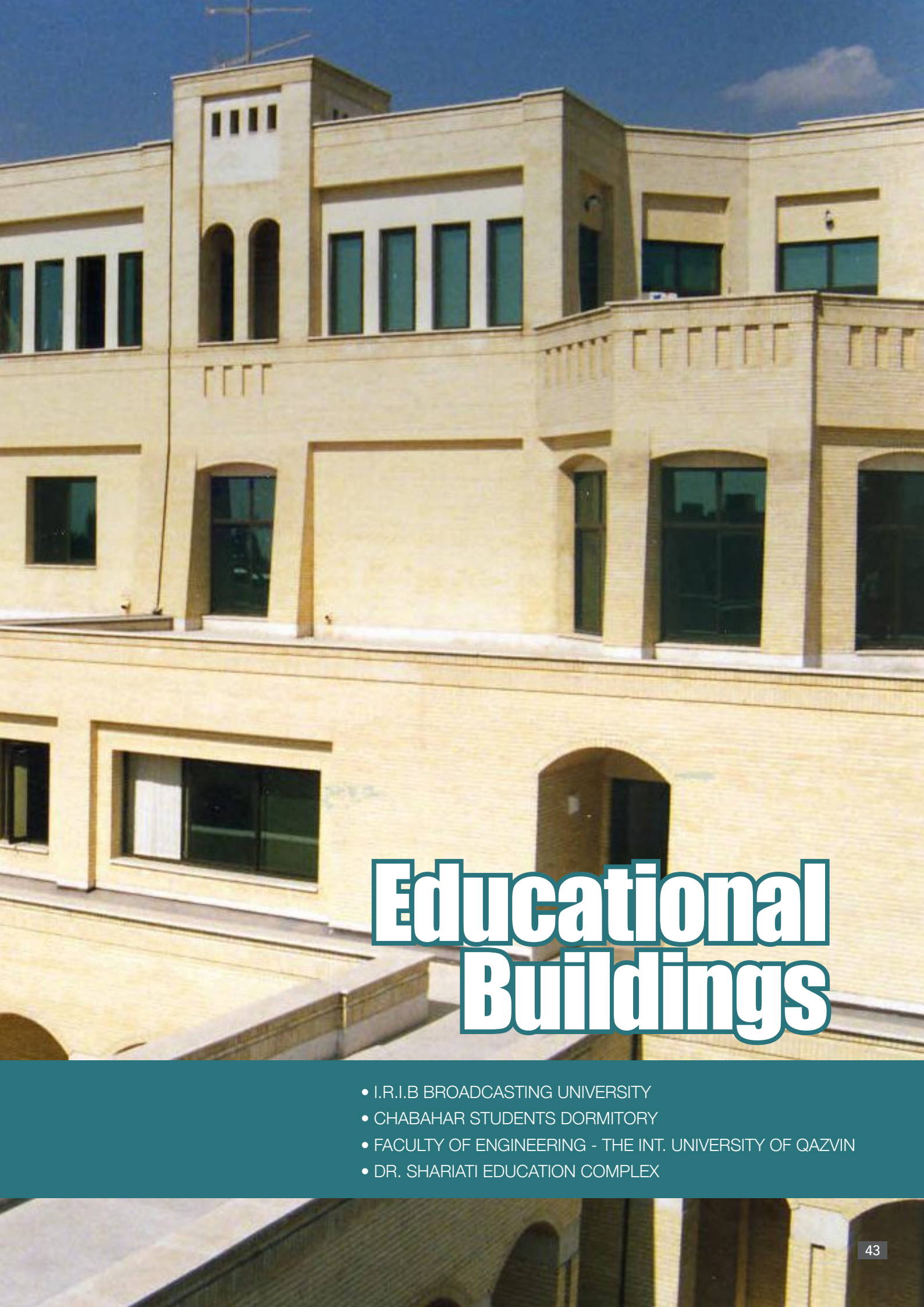
DEZASHIB RESIDENTIAL COMPLEX

The residential project, Dezashib Complex is located in Tehran, with a floor area of 11,000 square meters and spanning thirteen floors, was constructed with a steel frame. All construction operations, mechanical installations, and electrical installations of the building were carried out by Iran Borgeh Company, and the project was delivered without delay as per the contract. The project design was performed by Sath-o-Sanat consulting engineers, and the client for the project was the Investment Company of the Iran Social Security Organization.









Educational Buildings

- I.R.I.B BROADCASTING UNIVERSITY
- CHABAHAR STUDENTS DORMITORY
- FACULTY OF ENGINEERING - THE INT. UNIVERSITY OF QAZVIN
- DR. SHARIATI EDUCATION COMPLEX

I.R. OF IRAN BROADCASTING UNIVERSITY

The project of the University of Islamic Republic of Iran Broadcasting Company, commissioned by the Islamic Republic of Iran Broadcasting (IRIB), has been constructed in Tehran. The building, with a concrete structure, is situated on a land area of approximately 65,000 square meters and has a total floor area of **25,000 square meters**, designed in four floors. It was designed and built with inspiration from traditional Iranian architecture as a low-rise building.

The use of traditional Iranian architectural materials, especially domestic Iranian bricks, is a feature of this project. During the project's construction, unforeseen soil conditions, including soft and loose layers under the foundation, were encountered. The client instructed the contractor to stabilize and consolidate the soil bed, which was accomplished by the construction of over 240 in-situ concrete piles with an average depth of 24 meters. This soil bed consolidation was carried out concurrently with the overall project construction.

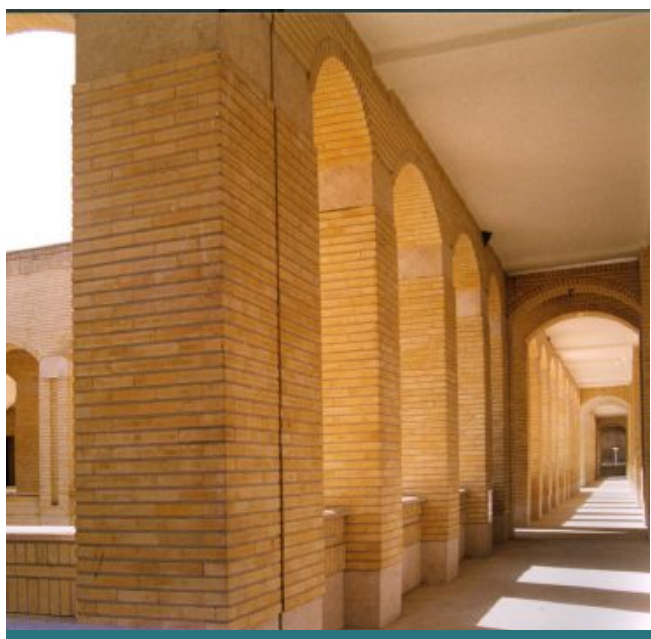




I.R. OF IRAN BROADCASTING UNIVERSITY

All construction operations, mechanical installations, electrical installations, and interior architectural work were carried out by Iran Borgeh Company. The company's performance on this project was officially received recommendation by the Iran Organization for Management and Planning. The project design was performed by Sinam consulting engineers, and the client for the project was the Islamic Republic of Iran Broadcasting (IRIB).





CHABAHAR STUDENTS DORMITORY

This project has been built in Chahbahar Free Trade Zone District on an 80,000 m² piece of land. The Dormitory consists of two building complexes, each having a central core and four branches in three floors. Building area of each complex is 15,000 m², totaling **30,000 m²**. The buildings have concrete structures and ceilings have stringer joists. All other facilities including exterior decoration, finishing, air conditioning (split

units), computer networking, library and cafeteria are considered for each building. Landscaping of the entire area of Dormitories, earthworks, water distribution network, water storage tank and related equipment, waste water treatment system and electric post were also within the scope of Perlite Borgeh Consortiun.



Views From Students Dormitory



Dormitory Entrance



Dormitory View From Top



Dormitory Backyard



Dormitory Corridors

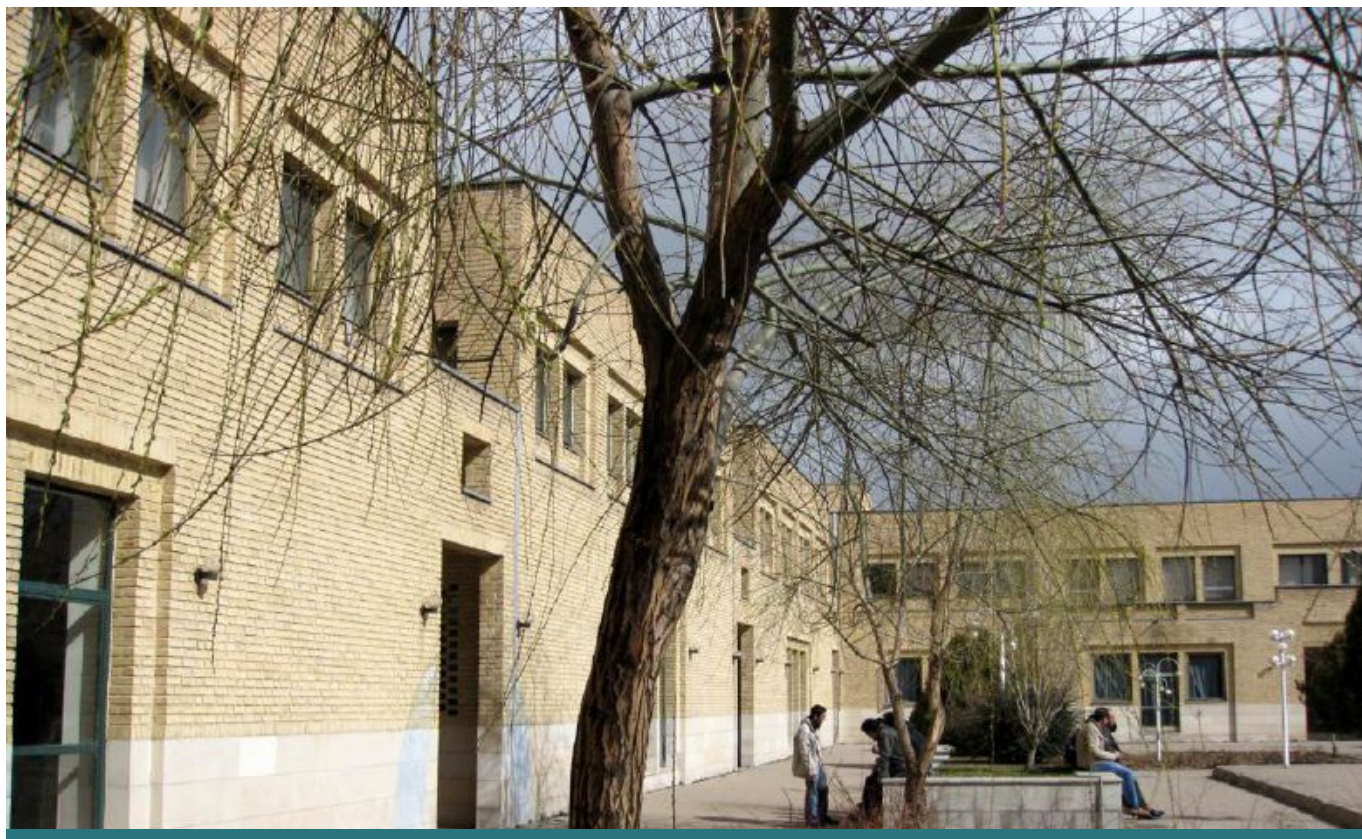
THE FACULTY OF ENGINEERING AT THE INTERNATIONAL UNIVERSITY OF QAZVIN

The project of the Faculty of Engineering at the International University of Qazvin has been constructed in the city of Qazvin, covering an area of **23,000 square meters** with an 11,000 square meter landscaping area.

Simultaneously with the subject of this contract, the construction operations of the access road, bridge, water resources, and landscaping have also been entrusted to Iran Borgeh Company and executed.

The project design was carried out by Bavand consulting engineers, and the project's client was the International University of Qazvin.





DR. SHARIATI EDUCATION COMPLEX

The Dr. Shariati Education Complex, an educational building covering an area of 37,000 square meters and a landscaping area of **20,000 square meters**, has been constructed in Tehran.

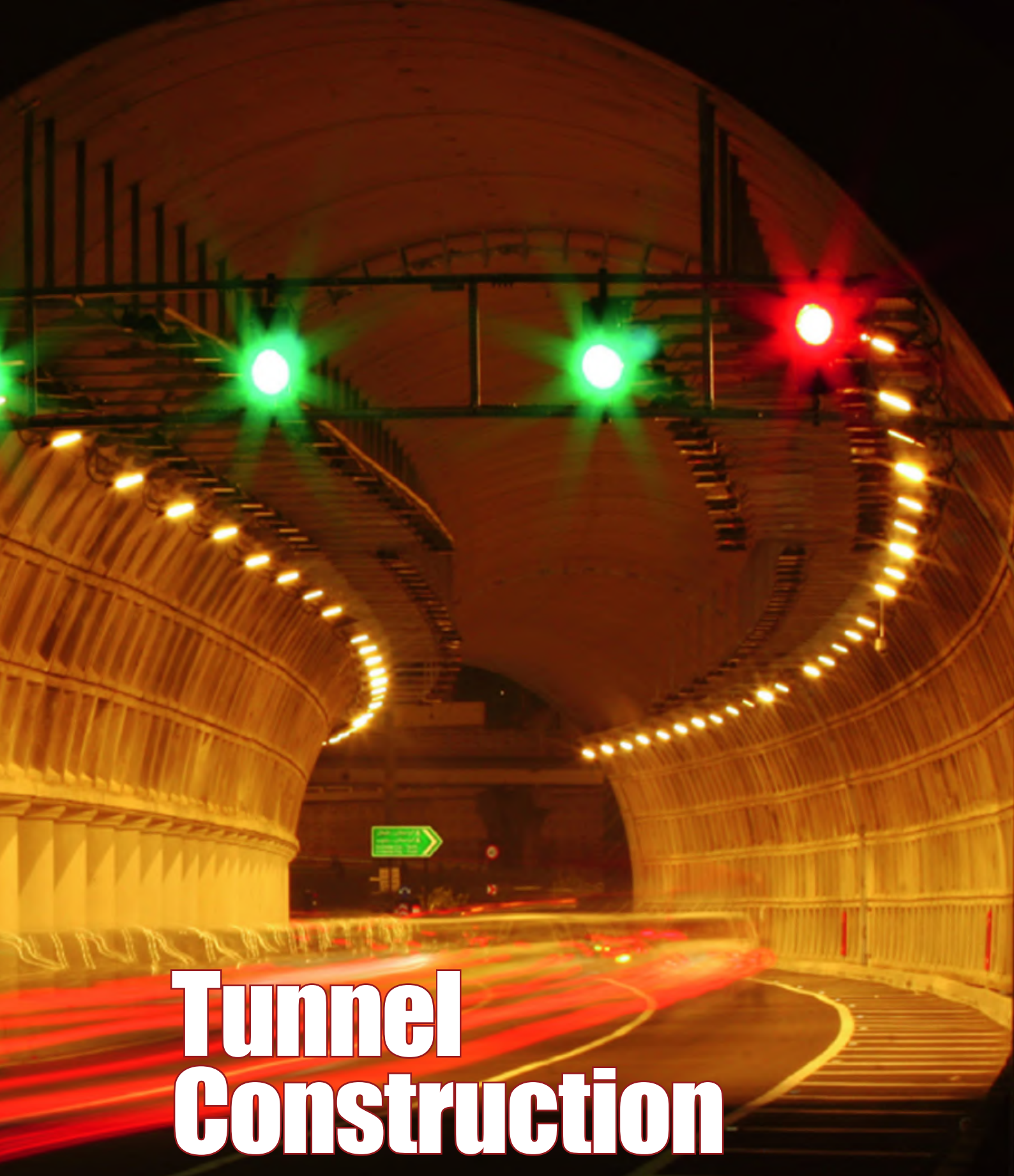
The scope of work included all construction operations, mechanical installations, electrical installations of the building, and its landscaping.

The project was designed by Stand consulting engineers and the client for the project was the Organization for Renovation, Development, and Equipping of Schools of the Ministry of Education in Iran.









Tunnel Construction

- TOHEED TUNNEL PROJECT
- RESSALAT TUNNELS PROJECT
- ABA SALEH ALMAHDI TUNNEL PROJECT

TOHEED TUNNEL

Toheed Tunnel is located under Chamran-Navab Highway between Fatemi St. north of Toheed Sq. and south of Azarbaijan intersection. The length of tunnel is 2,136m each side with an overall 867 m length of ramps and a total cross section of about 300 m². The effective width of each portal is 12.5 m with three traffic lanes on each side and a pedestrian walkway for maintenance personnel. These twin tunnels are separated by a series of pillars with diameters of 1.5m placed at 4m intervals.

The filtered air is circulated and monitored through a central control unit located in a five story building. The highest point in the Tunnel is 8.5m above the ground and effective traffic width is 11m.

Overburden thickness over the tunnel varies from 6m at the entrance portals to 23m at the point directly under Metro Station No.2 at the Azarbaijan Street intersection. This Project was completed in 30 months. Precast concrete waffles are used for interior finishing.



A view From Inside The Tunnel



پایداری روی اصول درست و منطقی ضامن موفقیت در کارهاست

آلودگی هوا - تهران
از آلودگی هوا دوری کنید
از آلودگی هوا دوری کنید
از آلودگی هوا دوری کنید

Tunnel South Portal

TOHEED TUNNEL



Formwork For Toheed Tunnel Lining



Mucking By Conveyor Belt In The Middle Gallery



Toheed Tunnel Under Construction



Toheed Tunnel Under Construction

RESSALAT TWIN TUNNELS

Ressalat Tunnel is located along the highway of the same name.

It is one of the longest East-West main arteries of the Tehran highway network.

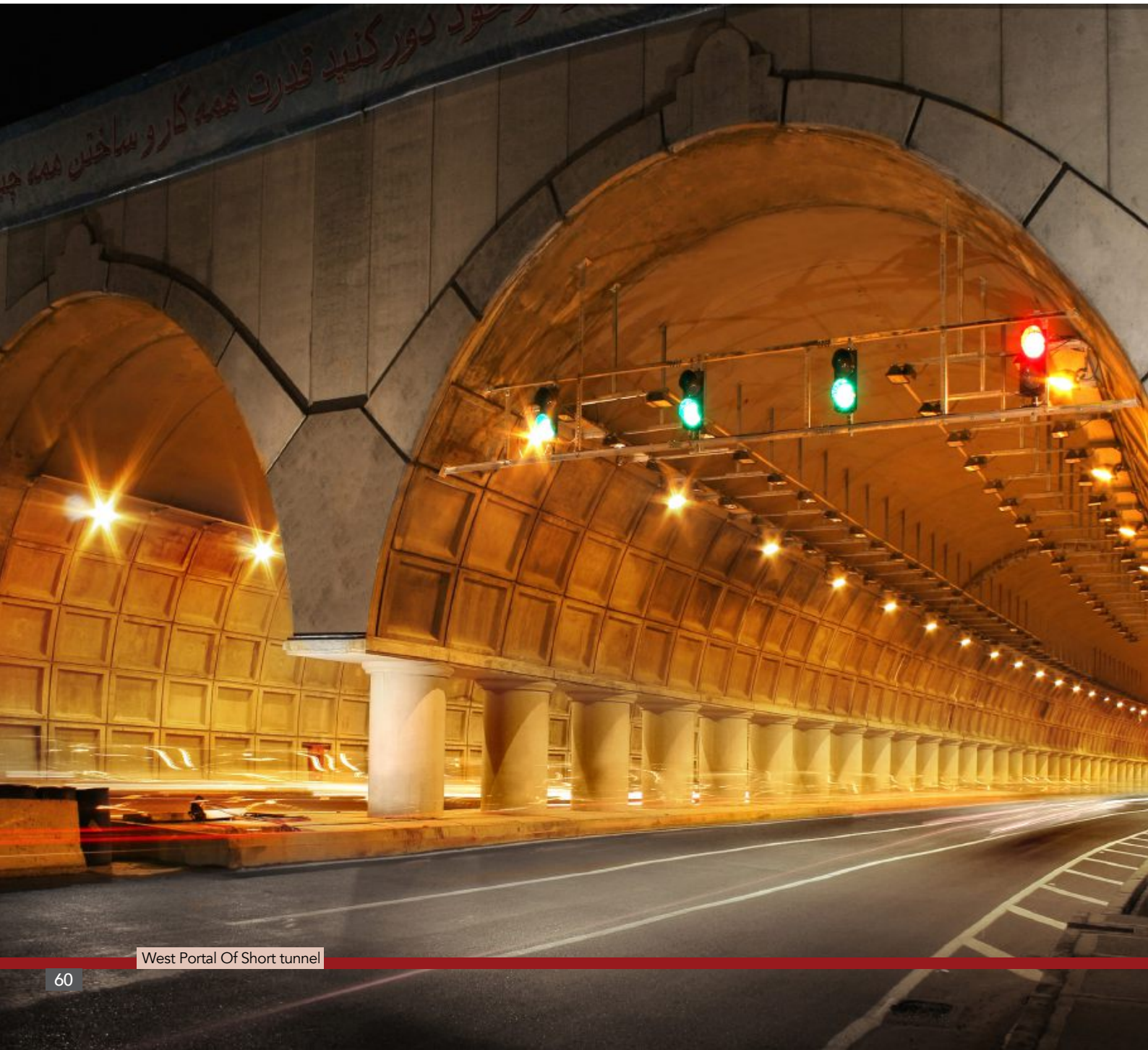
This project includes two parallel tunnels each consisting of one long section and one short section with a combined length of 1150m.

The excavation diameter of each tunnel is 16.5m and the finished diameter is 13.5m.

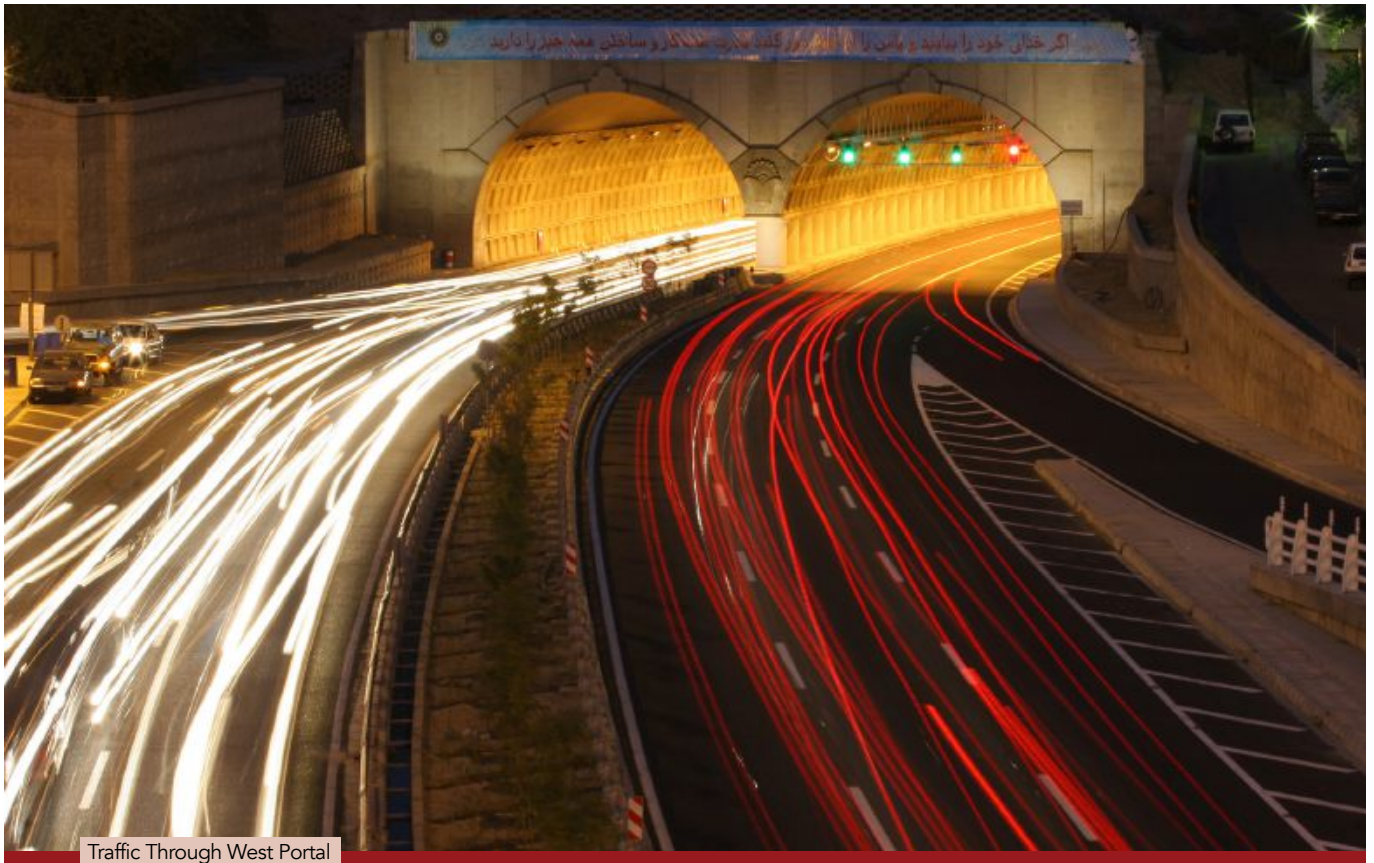
Tunnel portals are 16.7m wide separated 4m from each other.

During construction, the excavation was designed for a single portal with an effective width of 37m.

The tunnels run beneath one of Tehran's residential and business areas and streets with heavy traffic. The excavation of such a large cavity in Tehran's soft soil for the first time with minimal impact on the structures above was an engineering feat.



West Portal Of Short tunnel



Traffic Through West Portal

Since aesthetics was one of the important attributes of the tunnels, pre-cast concrete segments (waffles) were specially designed to be used as a permanent part of the concrete structure

supporting the tunnel walls. Replicas of ancient Iranian symbolic images are used at the tunnel portals for adornment.



Construction Works In The Long Tunnel

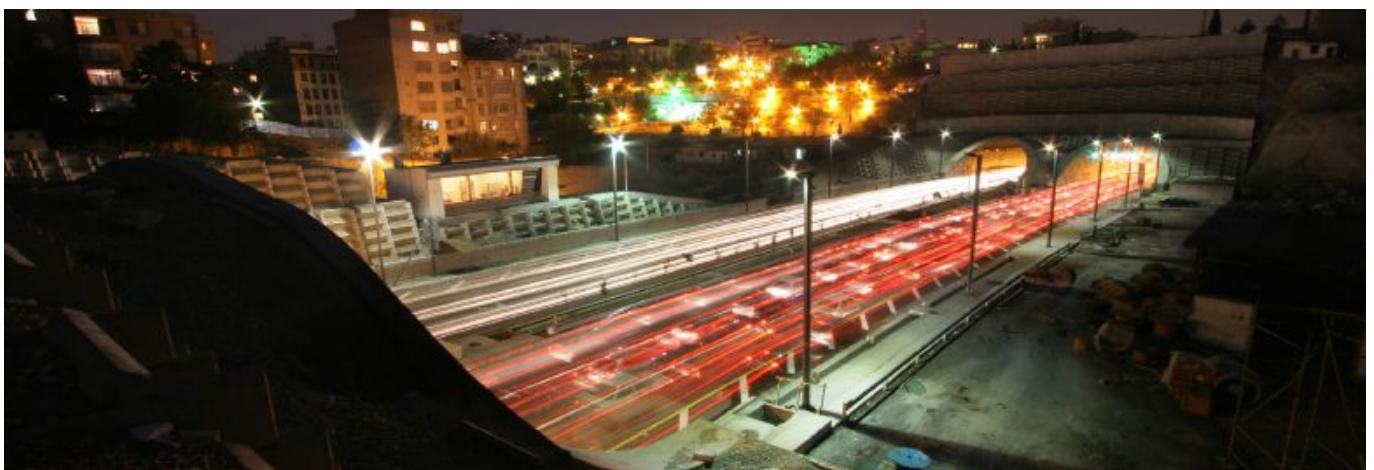
RESSALAT TWIN TUNNELS

An innovative procedure was adopted to run the tunnel underneath Vali-Asr busy street. Another challenge was the delicate support of a main gas pipeline in Africa Square, with

an operating pressure of 250 psi, and construction of two bridges in Africa Square. A culvert bridge was also considered in Nezami Valley using traditional Persian architecture.

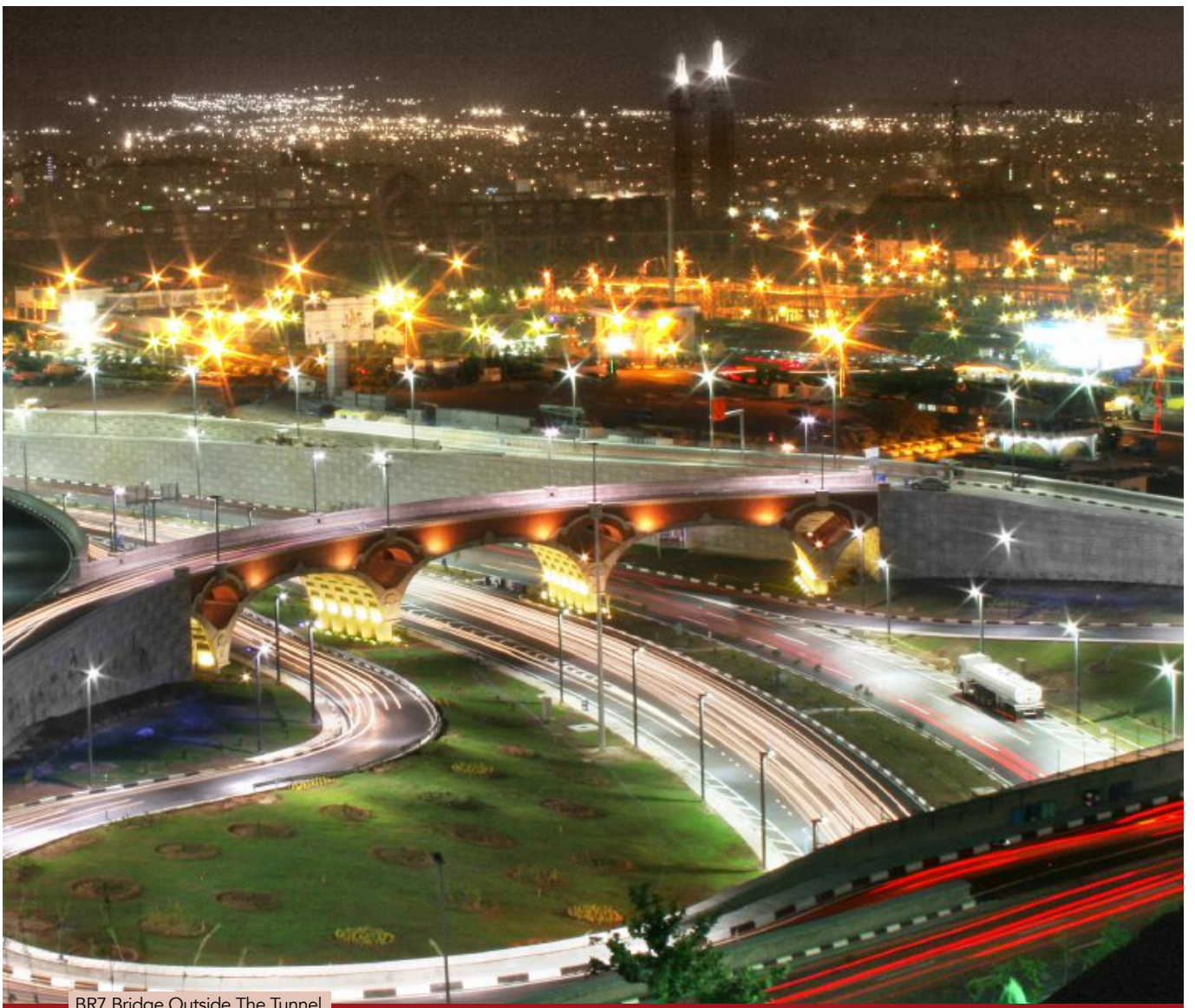


Long Tunnel portal





Long Tunnel Illumination System



BR7 Bridge Outside The Tunnel

EGHLID TUNNEL (TIMARGUN)

Located in central Iran, this tunnel starts from 12km south of the city of Eghlid and runs towards the city of Yassuj.

The total length of the tunnel is 4,200m.

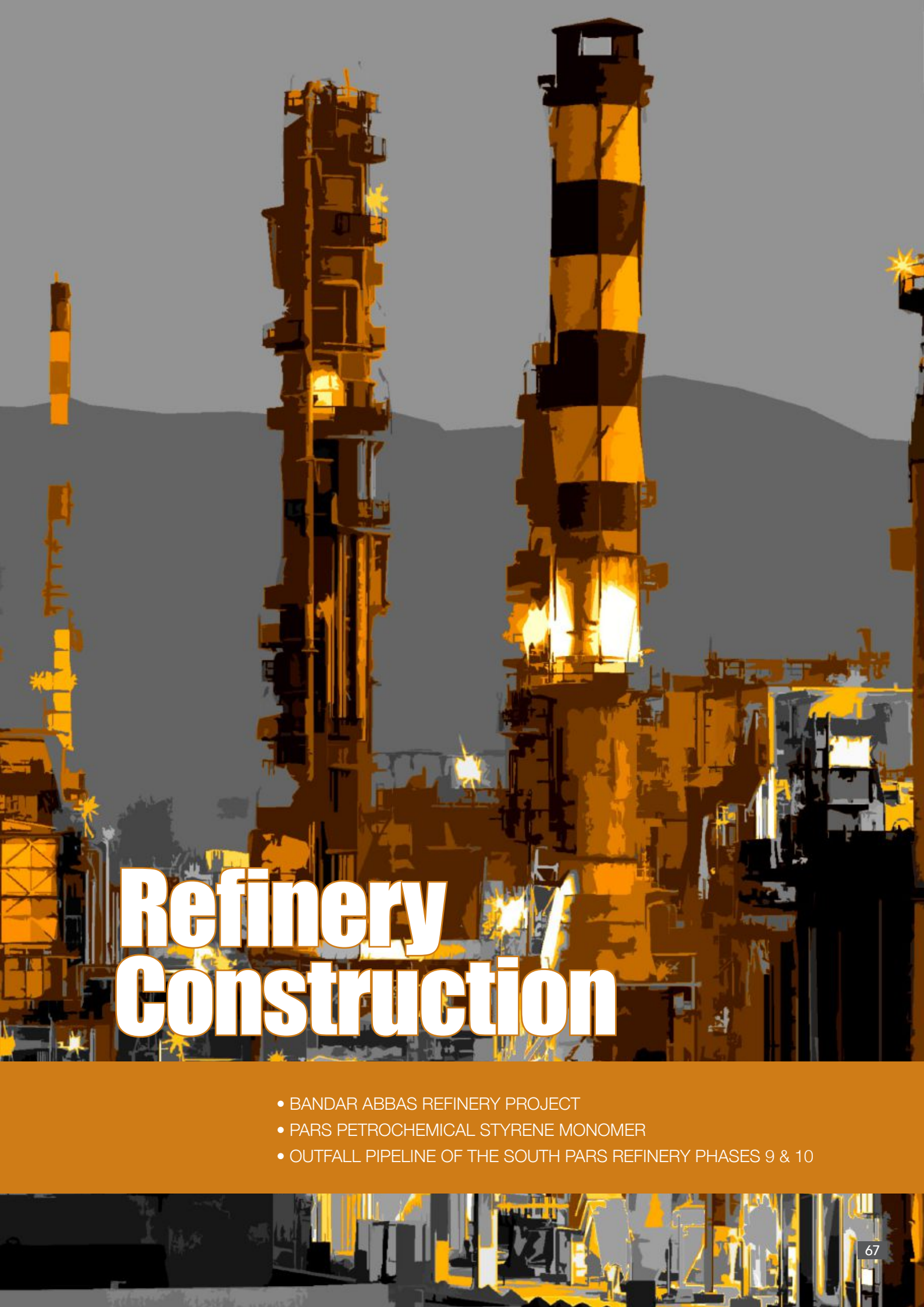
Construction of Eghlid tunnel was vital to alleviate the danger to the traveling public and to shorten the distance between Eghlid and Yassuj by 13km. The Eghlid tunnel is currently the longest transportation tunnel in Iran. The overall length is 2,600 m with a width of 10m. It is a two-way route having a carriage width of 8m and a clear height of 6.5m.





Tunnel Before Finishing





Refinery Construction

- BANDAR ABBAS REFINERY PROJECT
- PARS PETROCHEMICAL STYRENE MONOMER
- OUTFALL PIPELINE OF THE SOUTH PARS REFINERY PHASES 9 & 10

BANDAR ABBAS REFINERY

Given the multitude of oil products produced at the Bandar Abbas facility, it ranks among the first of its kind worldwide. This refinery refines more than **232,000 barrels of crude oil per day**. Despite numerous earth quakes registered since the startup of the refinery, no damage has been reported.

Both Snamprogetti of Italy and Chiyoda of Japan have hailed this project as one of the most valuable projects achieved in the field of engineering. Construction of the Bandar Abbas Refinery serves as proof of the talent, innovation, and competence of Perlite Borgeh Consortiun engineers.



Bandar Abbas Refinery



A View Of Refinery At Night

BANDAR ABBAS REFINERY

Perlite Borgeh Consortiun has put in place a new approach to use pre-cast concrete segments for the construction of the pipe racks. this had the positive effect to produce and install more than 2,700 segments of concrete beams and 1,300 segments of concrete columns in a period of 13 months.

This was the first time that an Iranian company has used pre-cast pipe rack segments and a record was set by accomplishing the job in 13 months.



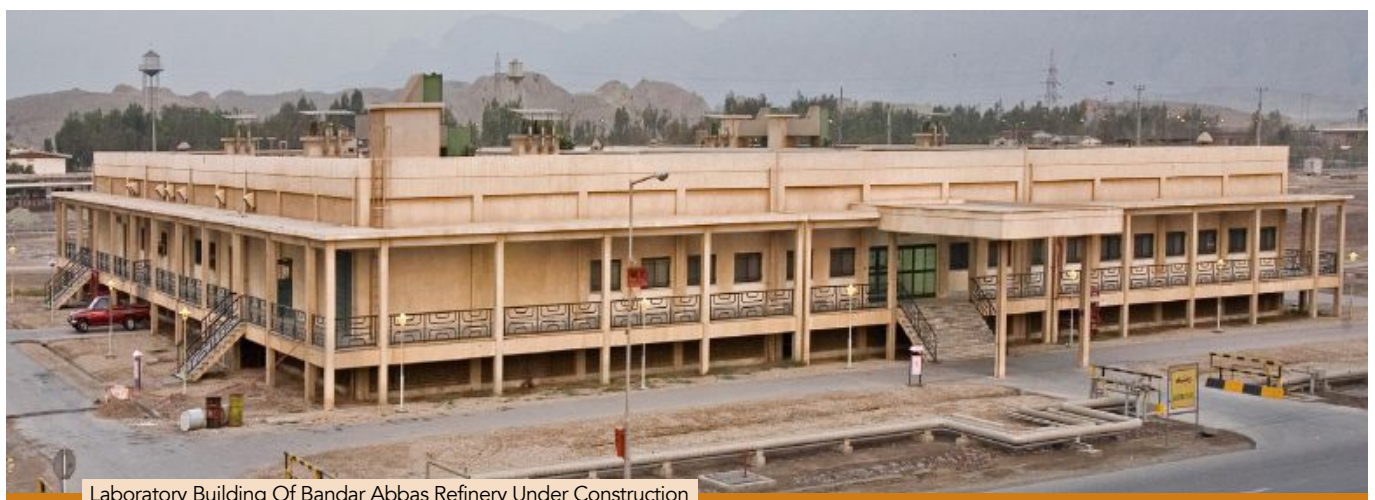
General View Of Refinery

Phase I of the project commenced in 1990 with earthworks, construction of channels, and installation of fencing and guard rail.

Phase II of the project which has been contracted to **Perlite Borgeh** included civil works, public buildings, concrete structures, access roads, bridge construction, local fencing, concrete foundations, production and installation of pipe racks, concrete placement, and construction of a sewage treatment plant.



High Elevation Pipe Racks



Laboratory Building Of Bandar Abbas Refinery Under Construction

BANDAR ABBAS REFINERY

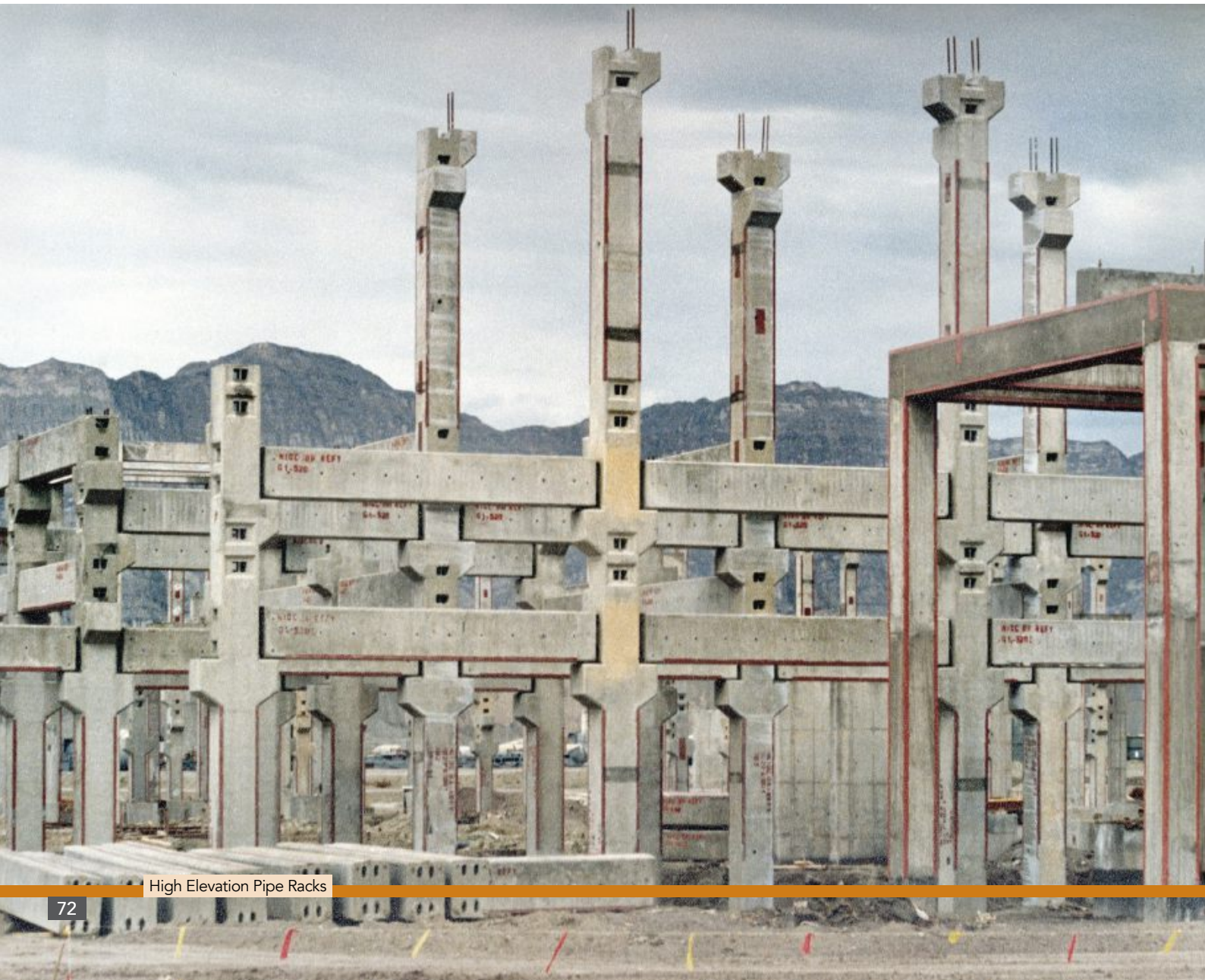
Pipe Racks

As the region of Bandar Abbas refinery has an extremely moist and corrosive climate, the original designs planned an in situ concreting method. The foundations, columns, and parts of the beam structure were planned to be on site concreting with some beams being pre-cast concrete. In addition, since the Bandar Abbas region is located in the seismic Zone 4, it was necessary to use more rebars in the reinforced concrete of those elements. The density of the rebars within a restricted area made pouring of concrete a bit difficult.

In order to overcome such difficulties, Perlite Borgeh Consortiun's specialists and experienced team made a comprehensive study and found a solution of using pre-cast technology.

Perlite Borgeh Consortiun undertook the design and construction of a pre-cast facility for the manufacture of high quality, precision columns and beams. Perlite Borgeh also developed a variety of concrete mixes that could stand up to the extreme humidity of the region.

International Consultant Engineers



High Elevation Pipe Racks



Pipe Racks Connection

(Chiyuda and Snamprojeti) initially expressed their reservations to precast pipe racks but they finally accepted it as a valuable method after explanation and technical review. They even suggested that the method be used in other similar projects worldwide.

At present, after two decades of the refinery operation, despite some earthquakes, no structural defects has been reported.



High Elevation Pipe Racks

PARS PETROCHEMICAL STYRENE MONOMER

This project is located 4 km west of Assaluyeh, adjacent to the petrochemical complex. The Styrene Monomer Unit is one of the production units of the Pars Petrochemical Complex in Assaluyeh.

The project included the civil works of the process units, storage tanks, industrial building, electrical works, cathodic protection, and underground piping work.



Styrene Monomer Plant



Styrene Monomer Plant



Embedded Cooling Water Network



A View Of STRO 2 Unit

OUTFALL PIPELINE OF THE SOUTH PARS REFINERY PHASES 9 & 10

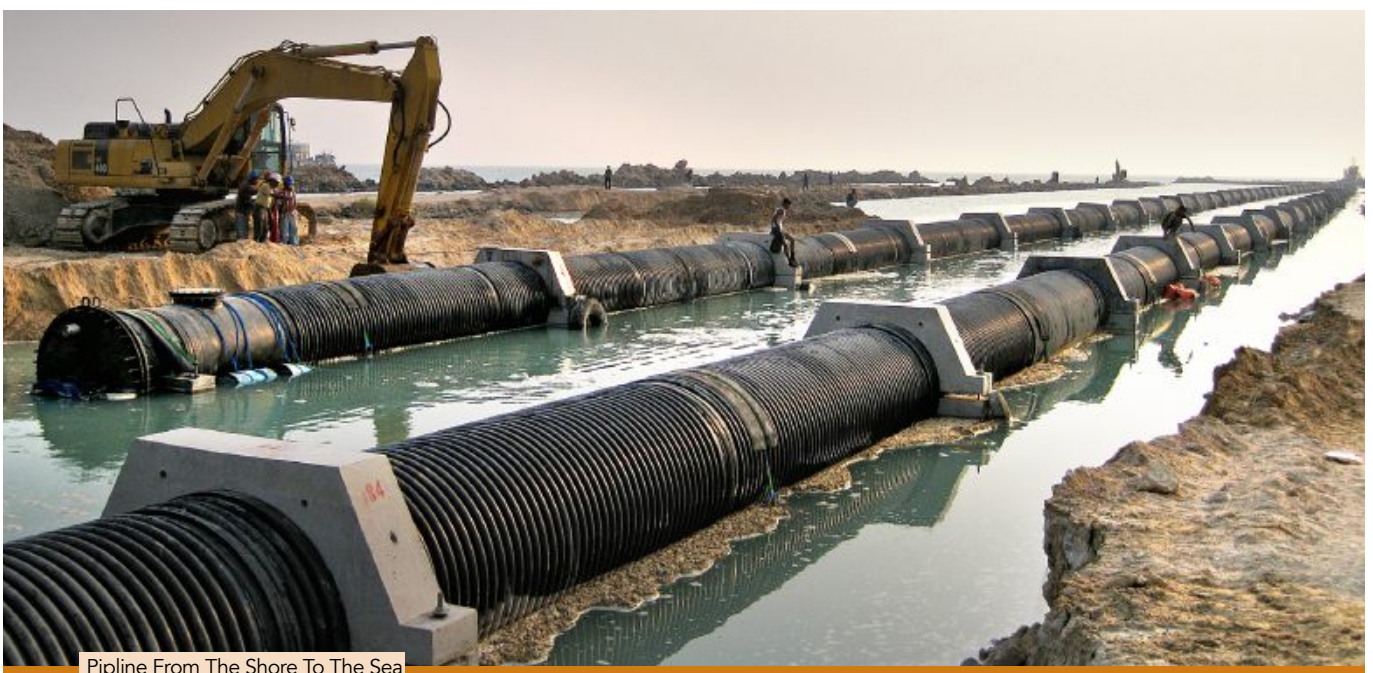
Waste water of the refinery Phases 9 & 10 of South Pars Gas Fields with a flow rate of $3 \text{ m}^3/\text{s}$ is discharged to the deep sea water (10m depth) according to the environmental rules and regulations via outfall underground pipeline.

About 5 km of the pipeline is located onshore and 1km is the offshore part which is placed on the sea bed. They are double-layered HDPE pipes with KRAH German Specifications.

These pipes were joined together by electro-fusion and extrusion welding.



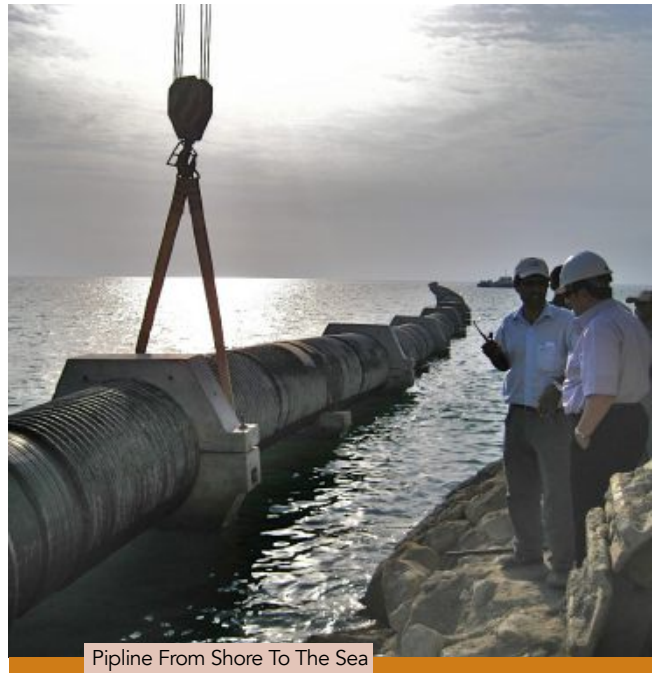
48" Polyethylene Pipeline Ready To Be Submerged



Pipeline From The Shore To The Sea



Polyethylene Pipeline Connection



Pipeline From Shore To The Sea

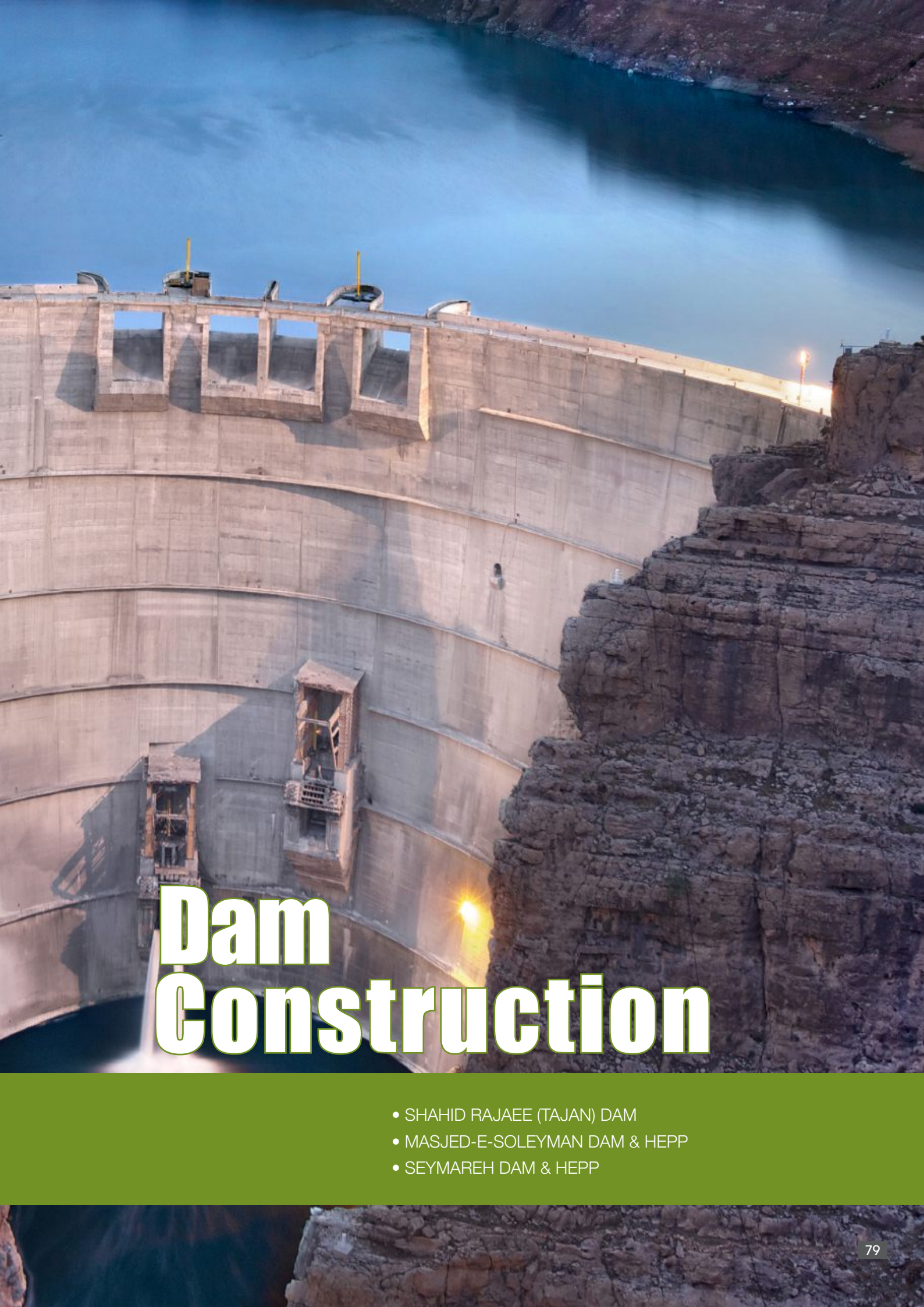


Pipeline From Shore To The Sea



Polyethylene Pipeline Being Submerged





Dam Construction

- SHAHID RAJAEI (TAJAN) DAM
- MASJED-E-SOLEYMAN DAM & HEPP
- SEYMAREH DAM & HEPP

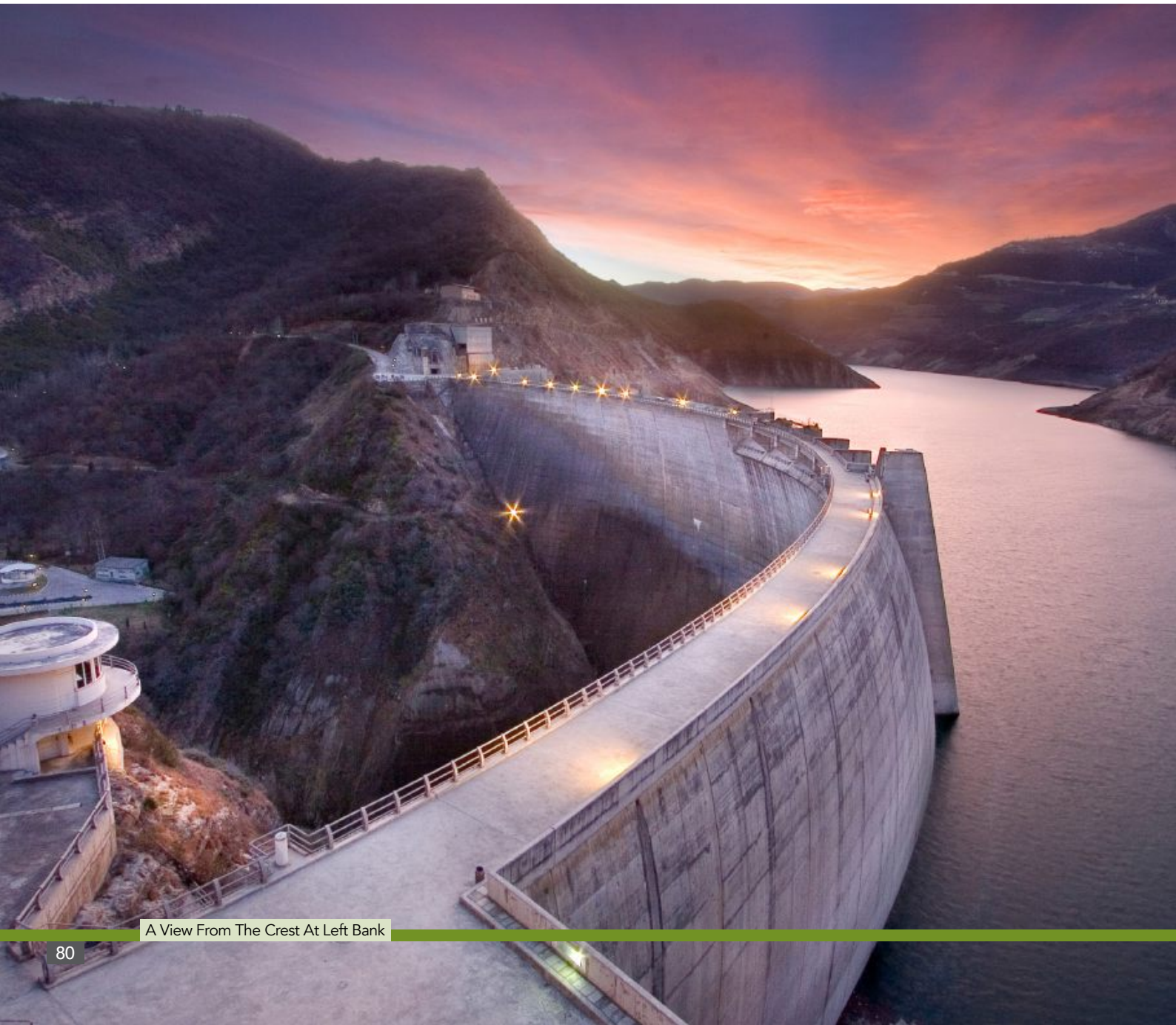
SHAHID RAJAEI (TAJAN) DAM

Shahid Rajaei is a double curvature concrete arch dam which has been constructed on the Tajan River, 40km south of Sari in Mazandaran Province.

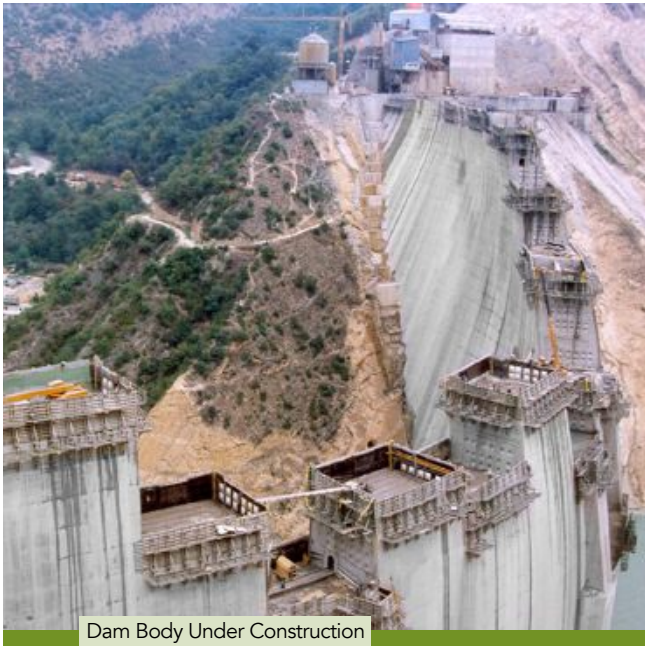
The **height** of the dam is **137m** and the **length** of the crest is **427m**, with a **thickness** of **27m** at the foundation level, and 7m at the crest.

The volume of concrete for the dam body and the hydraulic structures is $730,000\text{m}^3$. The volume of excavated rock for the foundation and abutments is $450,000\text{m}^3$. The grout curtain for the abutments is approximately $90,000\text{m}^2$. It presents more than 105,000m of drilling, and more than 8,000 tons of cement grout. The discharge rate of the 77m free spillway is $1,000\text{ m}^3/\text{s}$.

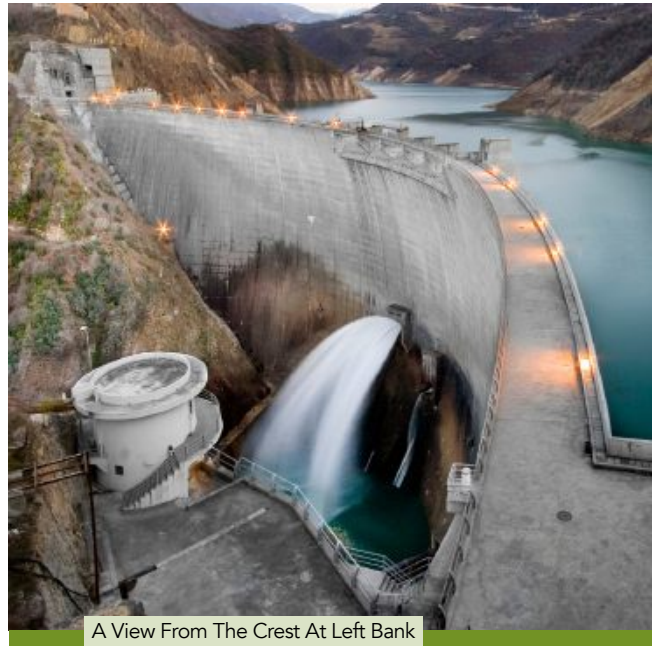
The powerhouse consists of three generating units with a total installed capacity of 13.5MW.



A View From The Crest At Left Bank



Dam Body Under Construction



A View From The Crest At Left Bank



An Upstream View Of The Dam At Night

SHAHID RAJAE (TAJAN) DAM



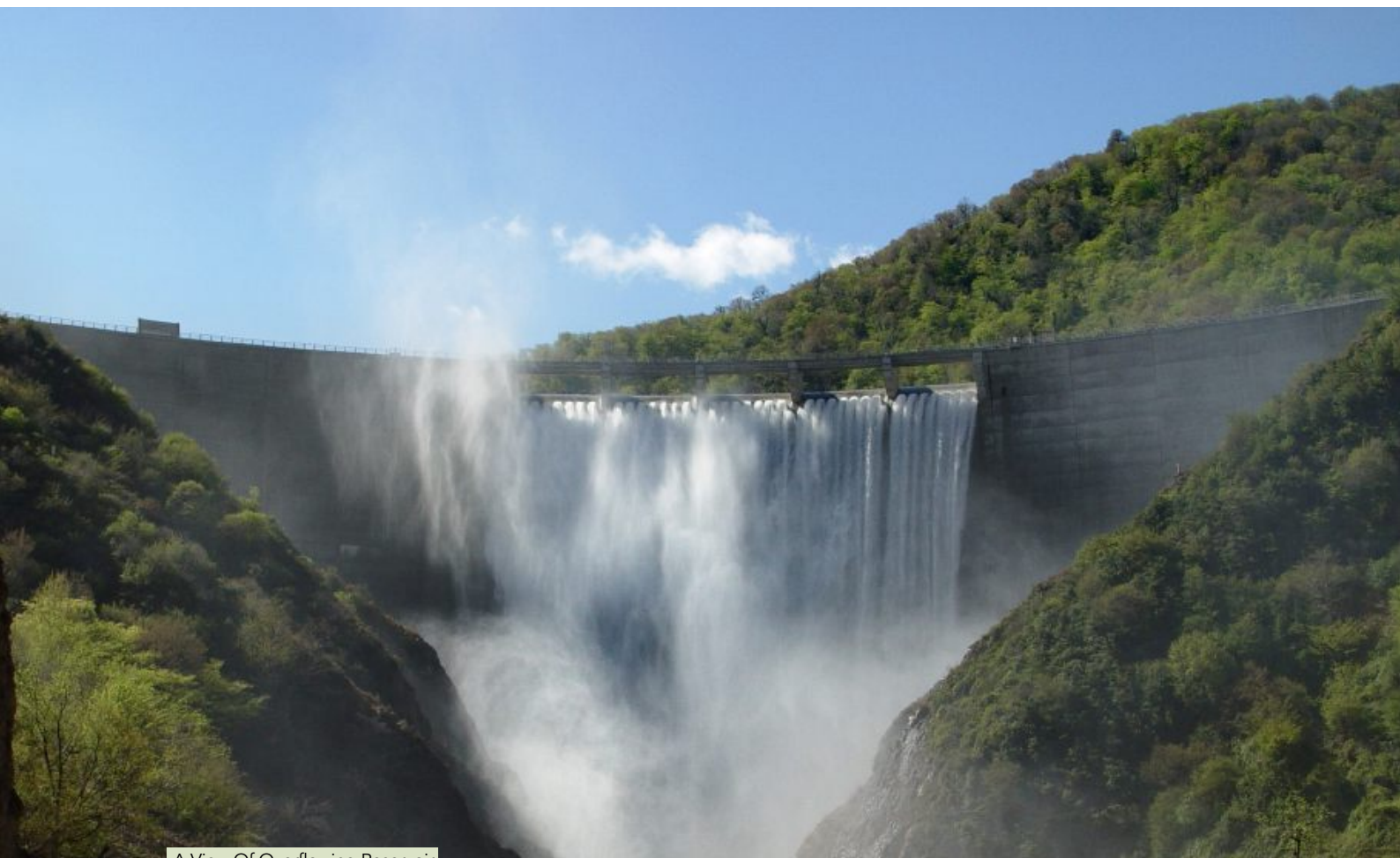
Overflow Spillway



Upstream Reservoir



Reservoir Overflowing Through Spillway



A View Of Overflowing Reservoir

MASJED-E-SOLEYMAN DAM & HEPP

The Masjed-e-Soleyman Dam is located 160km from Ahwaz, and 25km from the city of Masjed-e Soleyman. It is located 23.5km downstream of the Karoun First Dam. It is the highest rock fill dam in Iran.

The main purpose of this dam is electrical power generation with an installed capacity of **2,000MW** and a yearly production of 3,700GWH.

Reservoir capacity : With a surface catchment area of 27,548km² and a yearly mean river flow rate of 362 m³/s, the reservoir can store more than **228 million m³ of water** .

The dam is of rock fill type with an impervious clay core. It is **164m high** from the foundation and has a crest length of 480m. The total volume of the dam body is **13,000,000 m³** and the total volume of the clay core is **1,819,700m³**.



Dam Body, Spillway And Downstream Access Road



Power House



Chute Spillway

MASJED-E-SOLEYMAN DAM & HEPP

The project also includes the construction of concrete structures such as the spillway, powerhouse and concrete lined tunnels. The U/S cofferdam is 80m high and has a volume of 1,800,000 m³.

The spillway is a chute type equipped with 5 gates. There is also a stilling basin, an underground powerhouse and transmission chamber.

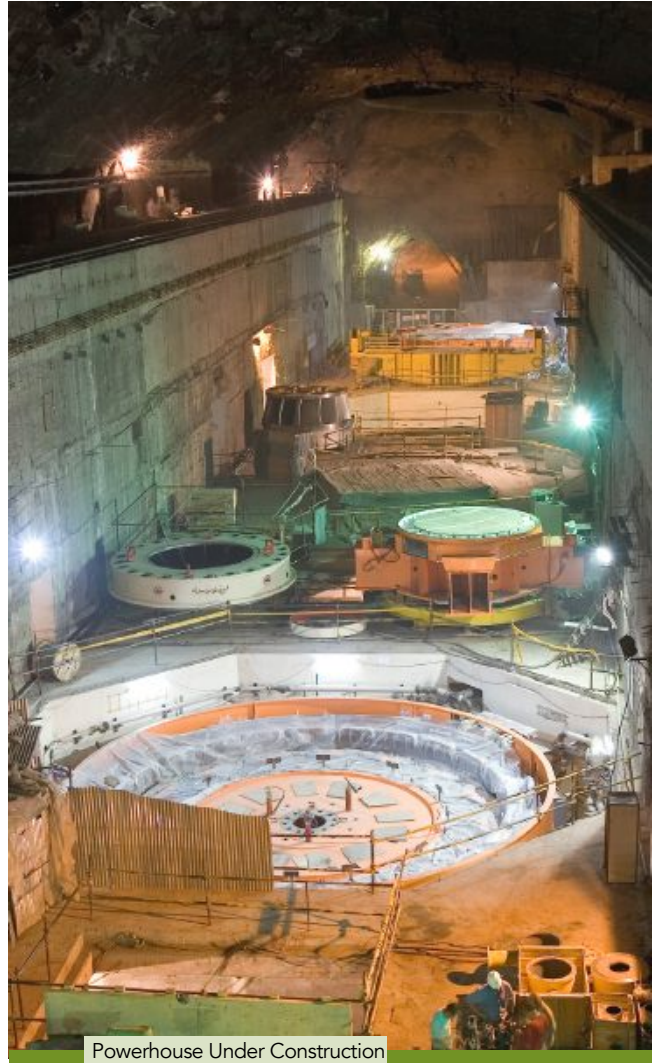
The scope of work for Perlite Borgeh Consortiun was construction of the cofferdam, earth fill work of the main dam body, excavation of the powerhouse cavern, construction of the spillway, excavation of tailrace tunnels and diversion tunnels, and the access tunnel to the powerhouse cavern.



Chute Spillway Top View



Power House Cavern Under Construction



Powerhouse Under Construction



Spillway Gates



Spillway Upstream Side

SEYMAREH DAM & HYDROELECTRIC POWER PLANT

The Seymareh Dam site is located 106km southeast of the city of Ilam. The mean annual discharge rate of the Seymareh River is $109.5 \text{ m}^3/\text{s}$.

Seymareh River is 417km long and has a general slope of 3%. Seymareh Dam is one of the largest dams in Iran.



Crest Of Dam



Upstream View Of Dam



Downstream View Of Dam And Spillway

SEYMAREH DAM & HYDROELECTRIC POWER PLANT

The Seymareh Dam is a concrete double-curvature arch dam with a **height** of **180m**. The **thickness** of the structure is **25 m** at the foundation level and 6m at the crest elevation. The **length** of the dam is **220m** at the crest elevation.



Power Intake



Upstream View Of Dam



Bottom Spillway At Work

SEYMAREH DAM & HYDROELECTRIC POWER PLANT



Drilling And Grouting Gallery



Lining Of Power Tunnel

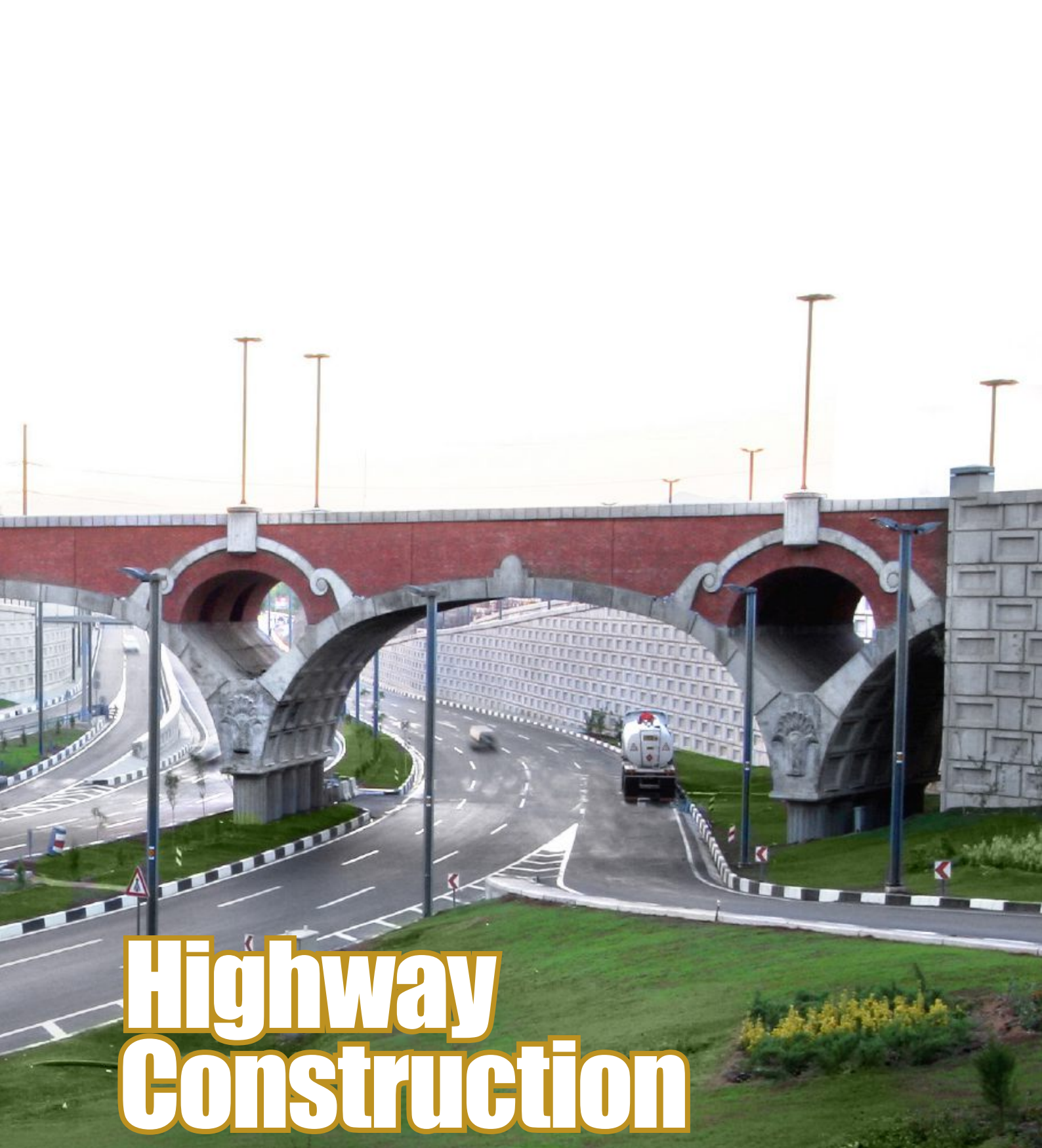


Lining Of Power Tunnel

The dam consists of 13 blocks.
The total volume of **concrete** is **350,000 m³**,
rock excavation **500,000 m³** and there are
8 grouting galleries with a total length of
4,600m and 750m for the access galleries.
The project also included upstream and
downstream coffer-dams, chute spillway and
gated spillway.







Highway Construction

- AFRICA HIGHWAY BRIDGE
- MAIN ROAD OF CHABAHAR, NIK-SHAHR, IRAN SHAHR SECTIONS 6 & 5
- CHABAHAR DISTRICT

AFRICA HIGHWAY BRIDGE

This bridge is located in the right-hand side of Resalat Tunnel portal and it connects the one-way traffic from Argentina Square to Africa Highway. The bridge passes over the exits from Resalat highway to Argentina Square at one side and from Africa Highway to Resalat East at the other side.

This bridge consists of three interconnected spans with 26.5 m long each and two cantilever type spans at both ends 6.13m long. It has two 3.5 m traffic lanes and two 1.5 m pedestrian walkways. In plan view, Africa Highway Bridge is an arc with 76 m radius with a combination of arcs in the forefront. Finishing of columns, column heads and column drop panels are done based on Iranian traditional architecture. Bricks and precast concrete pieces are used beautifully for finishing the bridge face symbolizing rich Iranian cultural heritage. Both industrial and traditional techniques are adopted in harmony in design and construction of the bridge.



Bridge View At Night



Bridge View From East



Bridge View From West

MAIN ROAD OF CHABAHAR, NIK-SHAHR, IRAN SHAHR SECTIONS 5&6

This stretch of the highway (Sections 5 and 6) is 48.5km long and is located on the main axis route connecting together Chabahar, Nik-Shahr, Iran-Shahr.

Connection of Chabahar economic zone to other similar zones in Iran serves as the main connection between the countries surrounding the Persian Gulf and the Oman Sea; namely Pakistan and India in the southeast, the countries of the former Soviet Union in Central Asia, and Afghanistan in the northeast.

The length of the existing road was shortened about 60km. The overall length of this route is 48.5km with an average width of 11m. The paved surface of the road is 7.30m wide with 1.85m wide shoulders on each side. There are a total of 164 culverts and bridges along this route with span sizes ranging from 2m to 20m.

In view of the high quality work demanded by the Client and the technical specification of the project, it has been decided to use pre-cast pieces for most of these structures.



Excavation Of High Trenches



Tunnel Under Construction



A View Of Bridge

MAIN ROAD OF CHABAHAR, NIK-SHAHR, IRAN SHAHR SECTIONS 5&6

The project also included the construction of three tunnels with a total length of 1,024m. As part of the site installation, a pre-cast concrete yard was constructed close to the job site in order to furnish the project with high quality pre-cast concrete pieces. The manufactured pre-cast concrete sections done on site include beams in lengths of 2, 4, 6, 10, and 20 m, parapet walls, ribbed flat slabs, and diaphragm walls.



Construction Of Bridge With 20 m Pre-Cast Beams



Bridge At Km 129+325



A View From Chabahar Main Road And Tunnel

CHABAHAR DISTRICT

Perlite Company, started its activities in 1984 in the Chabahar and Konarak district. These projects included construction of main roads, port landscaping, boulevards, building boulevards, building construction in the Chahbahar Free Trade Zone, renovation of Konarak Air and Naval Bases.



An Intersection At Chabahar District Entrance



Square At Entrance Of Konarak Marine Base In Chabahar



Bridge Along 45 m Boulevard



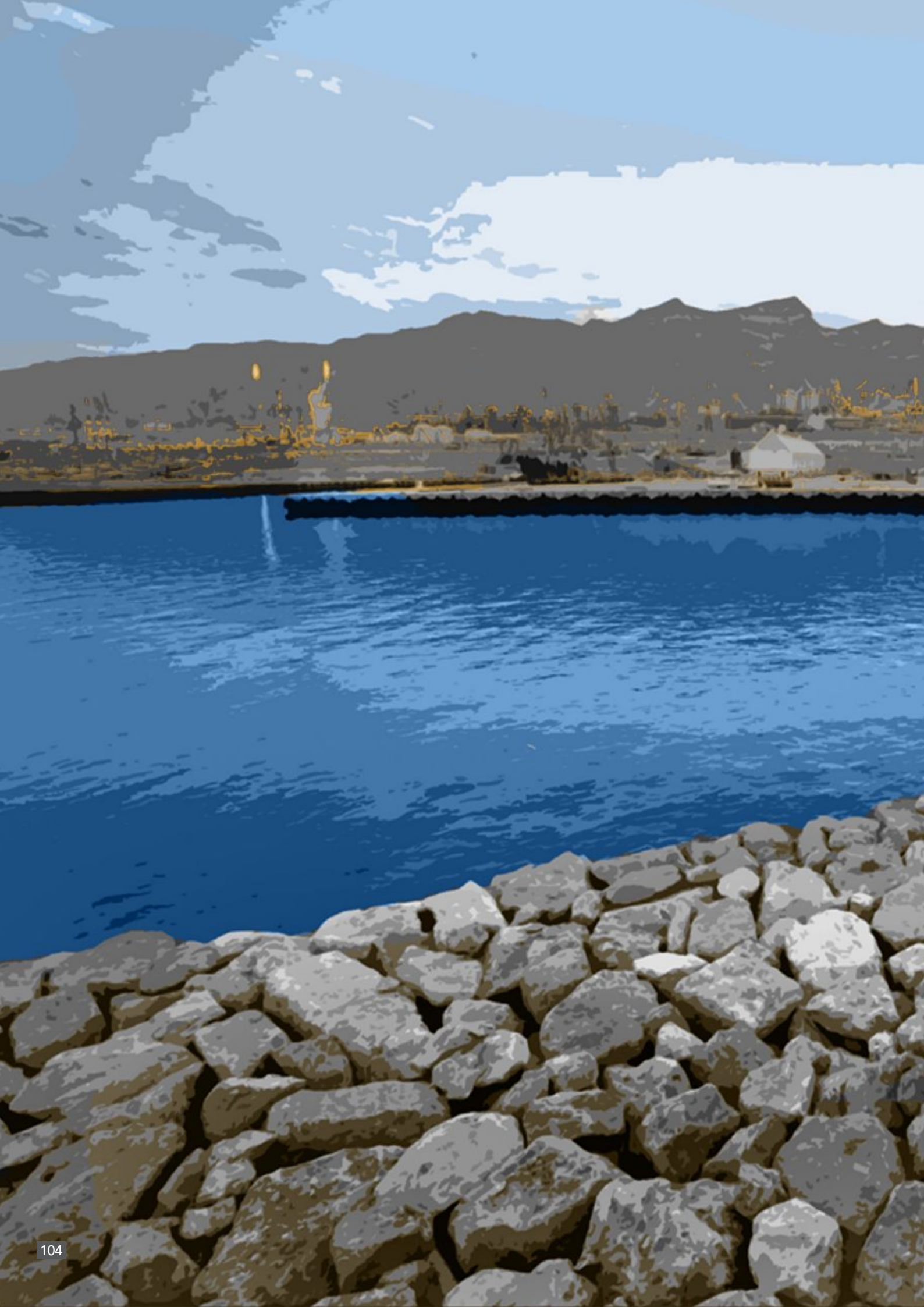
Construction Of Concrete Curbs By Guamako Curbing Machine

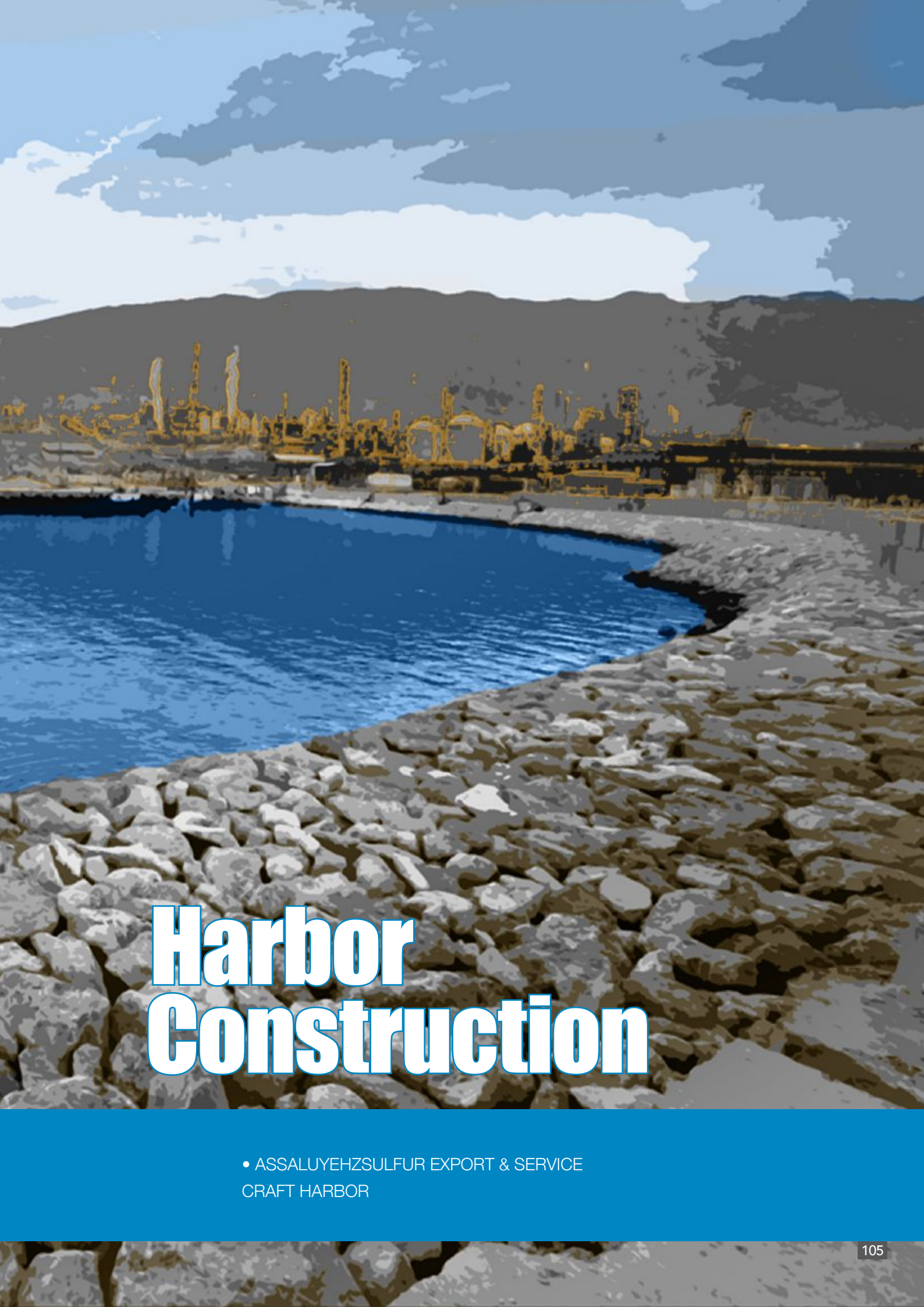


Tis Boulevard



A View Of Tis Boulevard In Chabahar



A wide-angle photograph of a harbor construction site. In the foreground, a large, curved breakwater made of grey stone blocks separates the calm blue water of the harbor from the sea. In the background, an industrial facility with several tall, yellow cranes and buildings is visible along the shoreline. Beyond the industrial area, a range of dark, rugged mountains stretches across the horizon under a blue sky with scattered white clouds.

Harbor Construction

- ASSALUYEHZSULFUR EXPORT & SERVICE
CRAFT HARBOR

ASSALUYEH SULFUR EXPORT & SERVICE CRAFT HARBOR

This was the first time that Iranian engineers have designed and constructed a dock in Iran. The dock is in the form of a caisson jetty and has been constructed in the Persian Gulf with a depth of more than 11.5m.

This jetty, which is 440m long, was built in 10 months. It is considered as a vital component for the development of the expanding oil and gas industry in this region. The jetty is for services such as berthing of ships and barges with 25,000 tons capacity, and for unloading millions of tons of cargo, equipment, and heavy parts for the South Pars projects.



Gantry Crane To Install Caisson Blocks



A View Of Assaluyeh Harbor



Completed Harbor Under Operation

ASSALUYEH SULFUR EXPORT & SERVICE CRAFT HARBOR



A View Of Assaluyeh Caisson Harbor

In order to install precast caissons in the sea from the land, Perlite Borgeh designed and manufactured a special gantry crane with 1250 ton-meters capacity to lift and move large caissons in place. All stages of design, manufacture, assembling and operation were done by Perlite Borgeh experts. The

accuracy of this machine is remarkable.

The project also included the construction of the main breakwater for the harbor including a core, a toe, a filter, and installation of 16,044 pieces of tetra-pod and antifer. All work related to the design, manufacturing, fabrication, and operation was carried out by Perlite Borgeh experts.

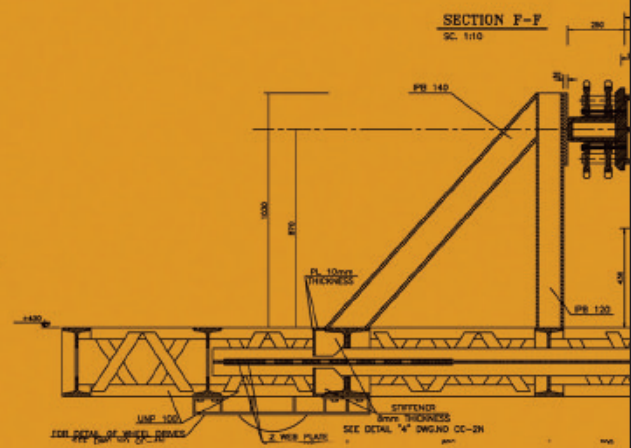
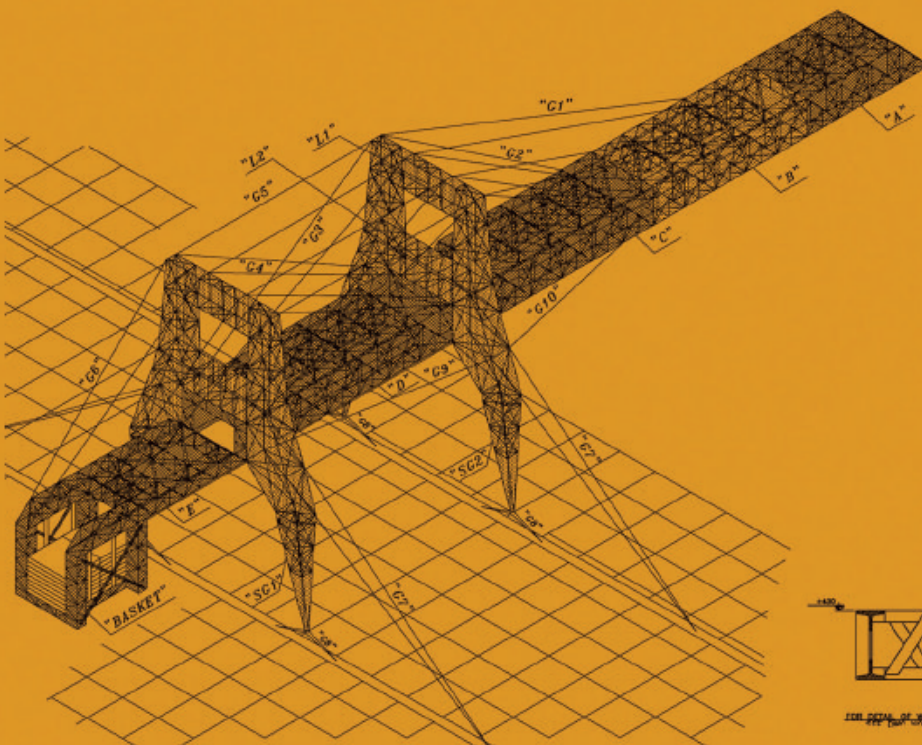
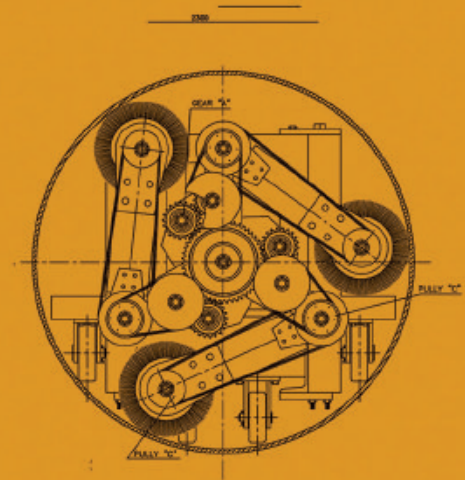
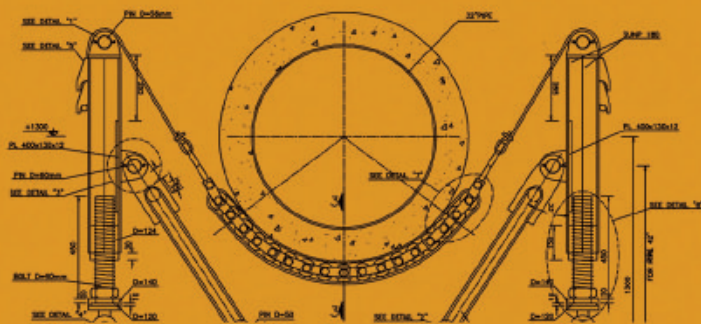
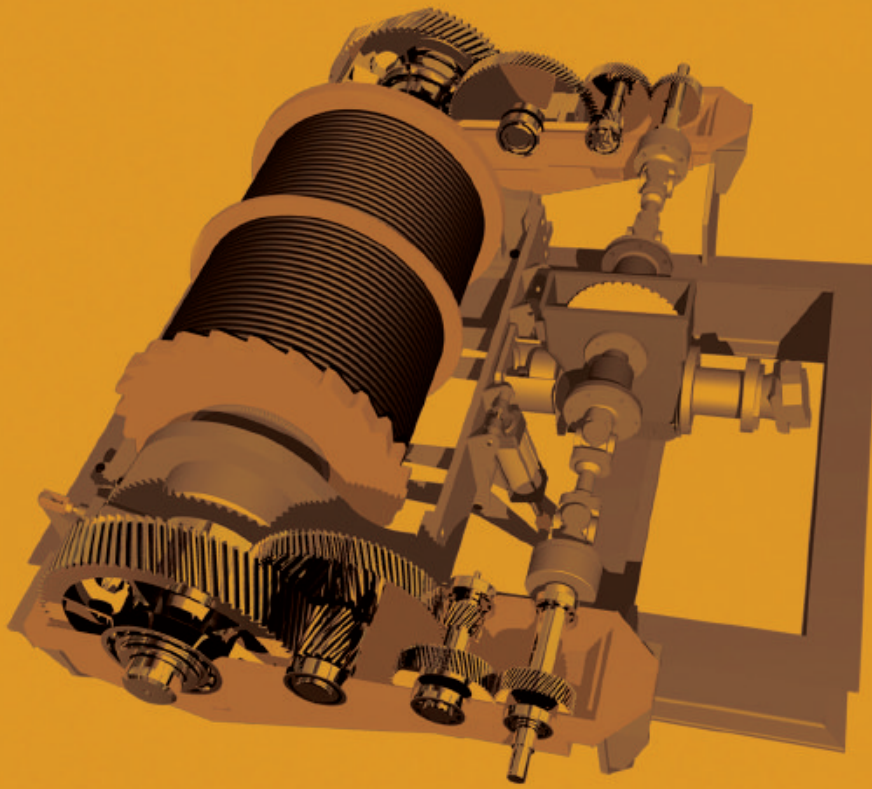


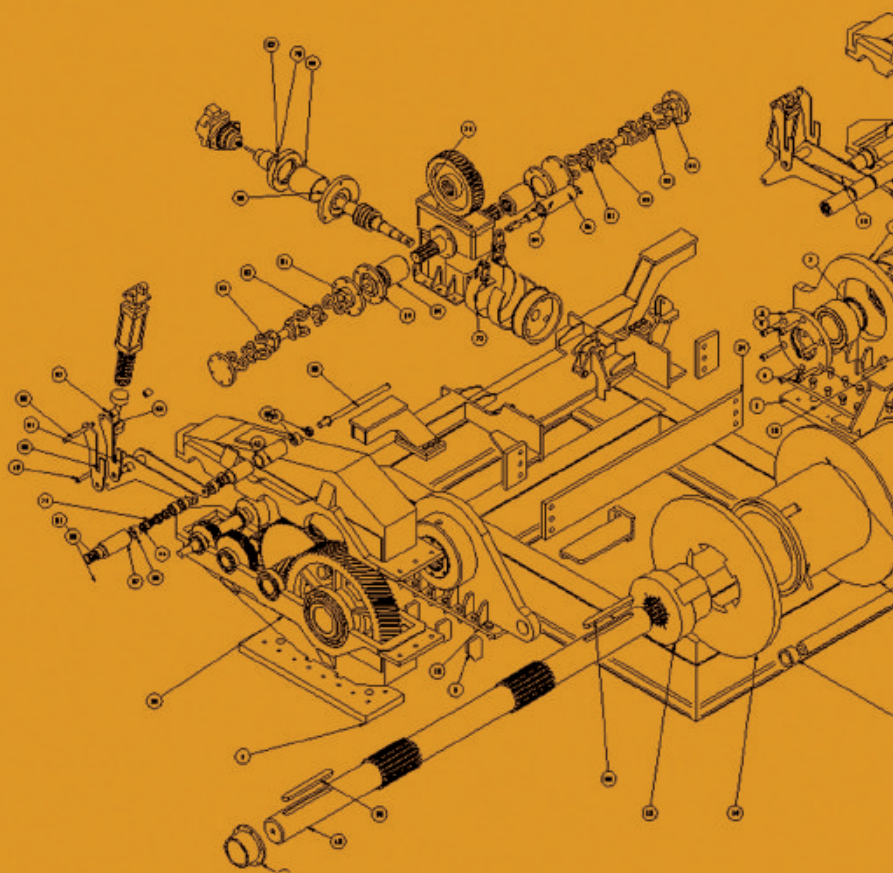
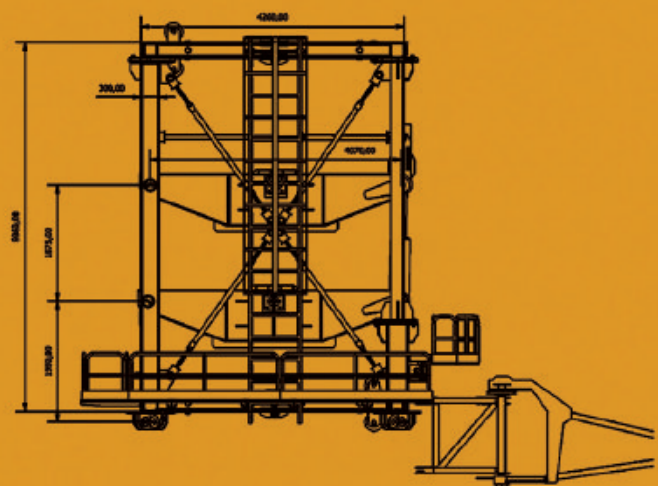
A view Of The Break Water



Harbor Ready For Operation







Manufacture of Machinery



DESIGN AND MANUFACTURE OF EQUIPMENT & MACHINERY

Concerning the projects in Iran, the procurement of specialized machinery and equipment from abroad demands a substantial amount of foreign currency which involves a lengthy importation procedure. During the last decades, in order to provide the required machinery and equipment, **Perlite Borgeh** mobilized a team of local engineers who undertook the design and manufacturing of machinery and equipment that were scarce in the domestic market. You find below some of the designed and manufactured machinery realized by **Perlite Borgeh**.

CHAIN ELEVATOR

A chain-bucket system has been manufactured to lift materials from shafts. This system is made with 36 m and 42 m and was used at Toheed Tunnel Project for the first time. The electro-motor, gearbox

and chain-wheels transmit the power. Hardox 450 type plates are used in buckets to protect them against erosion. Rate of material transport with this system is 36 cu m per hour.



Chain Bucket Elevator

TOWER CONVEYOR BELT

The main purpose of manufacturing this tower conveyor belt was to facilitate both the transportation and the pouring concrete at the work front.

This system is composed of two conveyor belts joined together and hangs to a tower crane with a cable. The concrete is placed on the tower conveyor belt through a feeder,

and the conveyor belt is able to transport it to different heights by using the height of the tower. A telescopic system with two winches is used to keep the conveyor belt in hanging position. Each winch holds one of the belts. This machine can be called a “top belt” system for its systematic transporting operation.



Concreting Seymareh Dam Blocks using Topbelt

DESIGN AND MANUFACTURE OF EQUIPMENT & MACHINERY

EXTERNAL CONCRETE COATING MACHINE

This machine has been designed and manufactured to apply a concrete coating to the external surface of steel pipes of 8" to 64" diameter. In this system the pipe to be coated is fixed at both ends with two steel cones which are mounted on a chassis. The pipe is then rotated and laterally moved in front of a mortar spraying device. By using a continuous and controlled spray, a layer

of mortar is applied to the external surface of the pipe. In order to prevent shrinkage cracks affecting the sprayed mortar, the coating layer is provided with the reinforcement. The used type of mesh or bar reinforcement depends on the diameter of the pipe and the thickness of the coating layer.



Concrete Coating Machine Spindle



Concrete Coating Machine

DESIGN AND MANUFACTURE OF INTERNAL CEMENT LINING MACHINE

This machine has been designed and manufactured for cement lining of the inner wall of the steel pipes. With a protection layer of 12 or 17 mm on the inner wall of the pipe, the internal surfaces of the pipe is protected against deteriorating agents and corrosive water such as sea water. This machine was

used at the Bandar Abbas refinery to provide adequate protection for the underground seawater transport piping system up to a maximum diameter of 56 inches. This internal cementing machine is significant and valuable for its proved quality function and meets the international standards.



Cement Lining Machine



Cement Lining Machine



Cement Lining Machine

DESIGN AND MANUFACTURE OF EQUIPMENT & MACHINERY

CRANE FOR INSTALLATION OF CAISSON BLOCKS

A 1,250 ton meter crane was used to install caisson segments on the offshore of Assaluyeh Jetty in Bushehr Province.

Length: 50 m, height: 17.5 m, width: 15.5 m, boom: 26.5 m Spacing between the rails: 13.4 m

Type of crane: Gantry Crane

Loading capacity: 1,250 ton meter

Weight: 300 tons

Winch lifting capacity: 5 tons

Winch electromotor lifting power: 90 KW

It is equipped with an electromagnetic system, disc brake, hydraulic wheel, CCTV of inside and outside water, and electronic and illumination systems.



Gantry Crane Under Construction



Gantry Crane To Install Caisson Blocks

MANITOWAC CRANE 4100 W

Renovation and overhaul of this crane are hundred percent completed. The following items are manufactured:

- 12m boom pieces 3
- 6m pieces 2
- 3m pieces 1
- 15m GIB piece 1
- boom stopper 2
- 10 ton balancing weights 2
- Operator cabin
- A-frame renovation



Discarded Body of Equipment



Revamped Maniowac Crane 4100 W

BOGIE FOR LIEBHERR 630 EC-H40 TOWER CRANE

This system is designed and manufactured to move the above-mentioned tower crane on rails. The electrical mover provides necessary moment by six gearboxes.

Number of wheels on the bogie is 16 to reduce pressure on rails.

A generator supplies required electricity for the system. Speed of the system is 12 m per minute. Movement of the system is controlled either from the operator's control room or the one on the bogie. 150 ton concrete weights are used for balancing.



Liebherr Tower Crane on Bogie

DESIGN AND MANUFACTURE OF EQUIPMENT & MACHINERY

FORMWORK FOR LINING THE ROOF OF TOHEED TUNNEL

Each formwork consists of 4 modules of 1.5 meters. After assembly they provide formwork for concreting 7 meters of tunnel in one stage of operation. The weight of a formwork is 43 tons. Two modules of the formwork move forward and the other two move in reverse, in order to close the frontal face of the section being concreted. One of the advantages of these formworks is that no rail is required to be installed on the tunnel bottom; since installation of rails is rather difficult to implement inside the tunnel.



BRUSH MACHINE

This machine has been designed and manufactured by Perlite Borgeh to remove the rust and to clean the inner wall of the steel pipes of 40" to 68" which are to be lined later with a coating of cement by the cement lining machine. The machine was designed and manufactured to remove rust from the internal wall. This machine replaced previously manual rust removal practice by sand blasting which was slower and less safe or hygienic. Rust is removed by three brushes that have rotational and longitudinal movements inside the pipes of various diameters. The centrifugal force that results from fast rotation of arms causes effective contacts of brushes with the internal surface of the pipes. The dust material is automatically transported out of the pipe resulting in a highly efficient dust removal operation.



CERTIFICATES, AWARDS, TABLETS OF COMMENDATION

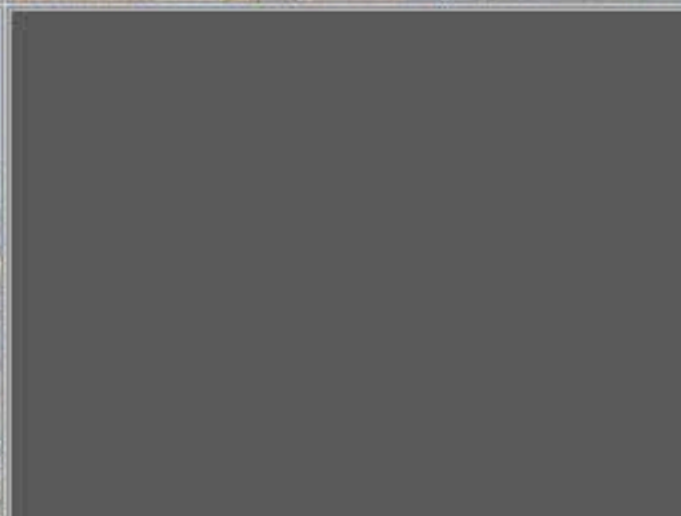
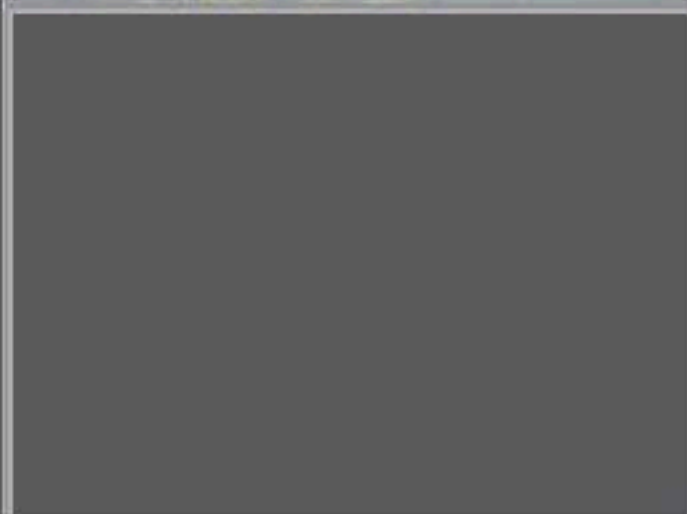
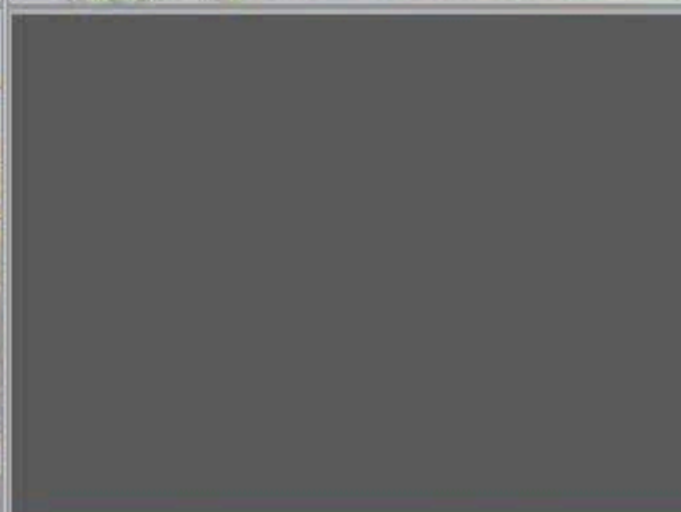
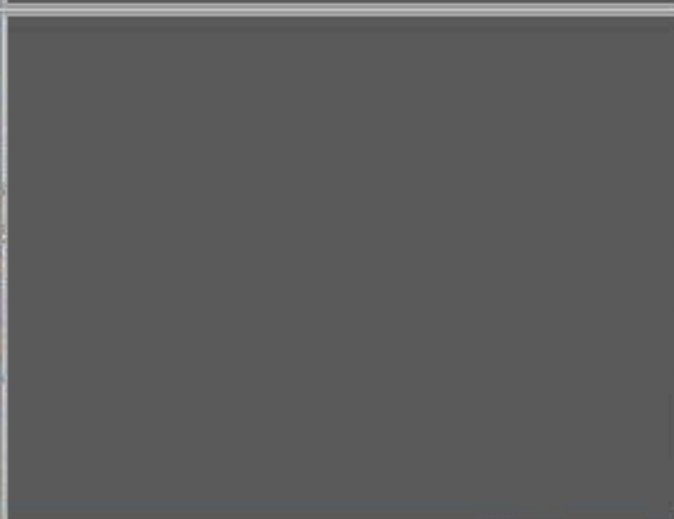




Perlite Borgeh Construction Consortium Main Office



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BORGEH**
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