



**Investigation,
Assessment,
Rehabilitation Design
and Site Supervision
Capability Statement**



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Assessment,
Rehabilitation Design
and Site Supervision**

Capability Statement

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1. Summary

Alrabiah Consulting Engineers (ARE) was established in 1988 as a professional engineering firm in Dammam, Saudi Arabia. The company operates as a 100% Saudi consulting firm.

Alrabiah Consulting Engineers has shown steady growth through careful marketing and selective tendering of projects best suited to the range of services offered. "ARE" is able to offer Clients the full range of services and fields of expertise in general engineering works. These services range from the early planning and conceptual development through detailed design and analysis, preparation of contractual documents, appraisal of costs, to construction supervision and quality assurance.

Drawing on our substantial experience spanning a range of building, marine, airport, civil engineering projects and bridge structures and implementing this in the development of project specifications, combined with supervision of site activities, we aim to deliver the highest standards of service in the fields of civil and electro-mechanical engineering to a wide and varied client base here in Saudi Arabia.

Besides the above main services, the Company has forayed into specialized fields such as Value Engineering, Project Cost Analysis, Contract Administration, Arbitration, Claims Preparation and Risk Assessment & Analysis.

ARE is a leader in the field of structural investigation and rehabilitation, the core business on which the Company in Saudi Arabia was originally founded. We aim to provide our clients with a service of real value, providing solutions that will provide our clients very significant cost savings, especially in the longer term.

ARE is also successful in Project Management having undertaken many assignments including new build and complicated rehabilitation projects. ARE's list of completed projects includes clients in the Private, Semi-government and Government sectors covering structures for Domestic, Commercial, Education, Retail, Defence, Leisure, Industrial/Petrochemical, Health and Transportation.

2. Alrabiah's General Capabilities

“ARE” has developed a wealth of experience and expertise throughout a range of engineering fields. For any given project, a suitable team of specialists can be assembled to ensure the necessary experience and particular expertise is available for the collection, analysis and presentation of relevant data. “ARE” offers comprehensive services in a wide range of engineering activities including:

- Detailed Design of Buildings & Infrastructure
- Structural Assessment and Rehabilitation
- Project Management and Supervision
- Design Review and Service Life Study
- Traffic and Transportation Studies
- Risk/HAZOP/RAM/BRA, etc. Studies

“ARE”'s head office and regional offices employ specialist engineers covering most engineering disciplines.

“ARE” is a leader in the field of structural investigation and rehabilitation. It aims to provide its clients with a service of real value, and providing solutions that will help its clients gain very significant cost savings, especially in the longer term.

3. Investigation, Assessment and Rehabilitation Design and Site Supervision Capability

3.1 Design Review and Service Life Study

Arabiah Consulting Engineers (ARE) can appraise the durability of structures while they are still on the drawing board. The cost of significant improvement at this stage will often be very modest compared to the resulting savings in later maintenance costs.

The classic elements in the design of durable concrete or steel include sound materials, adequate protective measures against aggressive environment and sound structural design practice. Theoretical models based on these elements allow predictions to be made for the degradation of the different elements of the structure and a desired design lifetime may be achieved by adjusting the relevant parameters accordingly.

Construction in hot climates presents particular difficulties, and a well-considered design may be ruined by construction errors or inadequate workmanship on the construction site. It is possible to reduce the risk of mishaps and to improve the workmanship by ensuring that the works are properly planned, monitored, and documented as part of a proper Quality Assurance Program.

ARE offers its assistance in reviewing the Quality Control Program and monitoring the subsequent QC activities during construction.

ARE also provides specialist advice on specific problems within Civil, Electrical or Mechanical works.

3.2 Investigation & Assessment of Structures and M&E installations

ARE provides professional services for inspecting, testing and damage assessment for all types of structures, including pavements.

These services include visual survey, check of structural geometry, half-cell potential measurements, sampling & chemical analyses, thin-section microscopy, structural design & fatigue analyses, etc. The review together with the inspection and testing will establish an overview of the structure's initial quality and its present general condition. It will also

provide detailed knowledge about the nature and severity of any observed deterioration processes, facilitating a forecast of their future development.

For larger groups of structures, computer based maintenance management systems may be introduced to facilitate systematic record keeping and consistent budget updating for regular maintenance.

ARE is in a position to perform these services efficiently and to a high professional standard. In-house expertise in materials testing, advanced computer modelling, structural analysis, and tailored maintenance management systems are combined to provide comprehensive, flexible solutions to complex problems.

3.3 Rehabilitation Design

For the design of rehabilitation schemes, ARE combines its local know-how with latest developments in Europe, USA and the Middle East where rehabilitation schemes have been designed to restore the capacity and preserve the function of damaged structures and electro-mechanical installations for their desired service life.

Each scheme is designed on the basis of a thorough assessment and diagnosis in order to achieve a predictable and acceptable performance. Depending on the circumstances, the rehabilitation may include.

- replacing damaged components,
- strengthening or supplementing structural systems,
- repairing deteriorated areas,
- Preventive maintenance.

The flexible combination of replacing, strengthening, and repairing allows a solution to be formulated for each problem according to the needs. This is made possible by the multi-disciplinary skills and resources in ARE, covering material technology, durability design and advanced design facilities.

ARE provides the client with comprehensive rehabilitation tender documents comprising scope of work, BoQ, drawings and specifications for materials & execution.

3.4 Typical Stages in Investigation

3.4.1 Phase 1 - Visual Inspection & Testing

Task 1 - Document Review

Prior to undertaking the site works described below, the Consultant would carry out a desk study of all available records relating to the structure. In addition to reviewing these, the

Consultant would interview maintenance personnel to obtain a more detailed account of previous incidents and actions taken.

Task 2 - Visual Inspection

A visual inspection and hammer tapping to record the extent of deterioration in the different parts of the areas under consideration would be carried out by the Consultant. The inspection would include the following:

- accessible/exposed areas of slab soffits;
- accessible/exposed areas of retaining walls.
- accessible/exposed areas of ground slab;

The inspections would record briefly the following;

- overall general condition of the structure,
- areas of visible damage, abuse or extensive corrosion,
- areas of delamination (by hammer tapping),
- condition/cover of the reinforcement at cut-out areas

Task 3 - Site Sampling and Laboratory Testing

The tentative site sampling and testing is listed below:

- cover meter survey at selected areas,
- rebound hammer tests at designated locations,
- Half Cell Potentials Mapping (HCP) in sample areas,
- extraction of dust samples for chemical analysis,
- extraction of concrete cores for laboratory tests (strength and chemical testing),

Laboratory testing of dust samples & cores would be used to determine the following;

- chloride contents,
- sulphate contents,
- carbonation/pH (on site),
- compressive strength.

Excavations of suitable size will be undertaken to check the condition of the foundation / footing.

Geotechnical

Bore holes would be sunk at discrete locations, and Standard Penetration Tests and material sampling for laboratory testing would be performed with a view to know the soil properties.

Task 4 - Final Investigation Report

The information obtained from the investigation and testing listed in the above tasks, would be used to assess the condition of the structure and the most appropriate remedial works techniques. These investigation findings, conclusions, assessment and the general recommendations based on the above will be presented in documents

3.4.2 Phase 2 - Detailed Design and Tender Package

The Consultant will produce fully co-ordinated rehabilitation details for the said structures, conceptual rehabilitation plans, fully dimensioned rehabilitation details and sequencing arrangements for rehabilitation works to enable a suitably experienced contractor to undertake the work.

The Consultant will provide Specifications, Scope of Work and Bills of Quantities, along with Rehabilitation Drawings, of sufficient detail to allow the appointed suitably qualified contractor to carry out the structural remedial works.

3.4.3 Phase 3 - Tender Assessment

The Consultant shall review and analyse the bids received from the Client, and shall submit a Technical Evaluation Analysis to the Client accordingly. The Consultant will be obliged to review maximum four numbers of bidders.

3.4.4 Phase 4 - Site Supervision

Construction Management and Site Supervision are regarded essential elements for the execution of a successful and durable rehabilitation project. Experience has shown on many occasions that high quality construction documents are not enough to ensure proper execution of the project at site. Accordingly, if requested by the Client, the Consultant could provide a team of professionally qualified staff experienced in the rehabilitation works to oversee and manage the project in conjunction with the Clients appointed "in house" management personnel.

ARE provides full service for Site Supervision to follow the day-to-day site activities through experienced engineers, quantity surveyors and inspectors. The actual size, qualifications and experience of the supervision team would be agreed with the Client when the full scope of the site work has been properly established.

4. Projects Selected References



ALRABIAH PROJECT EXPERIENCE:

<i>Project Name</i>	<i>Contract No. 02H-T14, Infrastructure Protection Consultation Studies in RIC</i>
<i>Client</i>	<i>RC – Jubail & Yanbu</i>
<i>Location</i>	<i>Ras Al Khair- KSA</i>
<i>Year</i>	<i>2022 – On going</i>
<i>Project Value</i>	<i>SR . 6,000,000</i>

The Royal Commission for Jubail & Yanbu, Royal Commission in Jubail appointed “ARE” to carry out engineering and consultancy services for the corrosion management of all RC structures, systems and facilities in Ras Al Khair. This work included the evaluation of structures, testing and the preparation of complete tender packages for bidding purposes, as well as consultancy services for specialised studies and designs related to corrosion studies



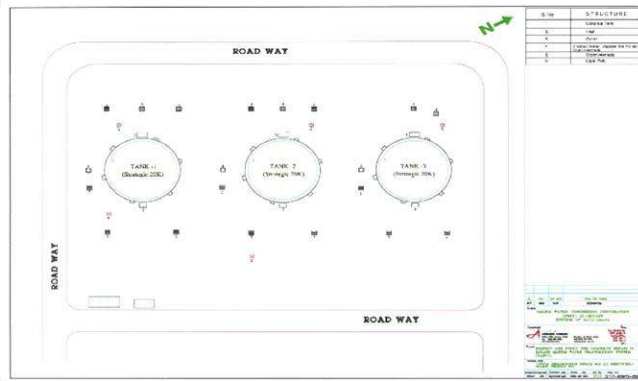
ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Rehabilitation of Pipe Bridge in Arab Tank, Yanbu</i>
<i>Client</i>	<i>Assystem Radicon (c/o Royal Commission)</i>
<i>Location</i>	<i>Yanbu - KSA</i>
<i>Year</i>	<i>2021 - On going</i>
<i>Project Value</i>	<i>SR . 486,400</i>

The Royal Commission for Jubail & Yanbu, Royal Commission in Jubail appointed "ARE" to carry out engineering and consultancy services for the corrosion management of all RC structures, systems and facilities in Ras Al Khair. This work included the evaluation of structures, testing and the preparation of complete tender packages for bidding purposes, as well as consultancy services for specialised studies and designs related to corrosion studies

ALRABIAH PROJECT EXPERIENCE:



Project Name	Preparation of technical studies and repair specifications for the Riyadh - Qassim water transmission system and its accessories
Client	SWCC
Location	Riyadh - KSA
Year	2021 - On going
Project Value	SR . 3,622,500

SWCC, appointed "ARE" to prepare technical studies and repair specifications of the structures. Scope includes: concrete tanks for Riyadh Water System (used for Operational / storage / fire system); Drain Valve Chambers, etc. "ARE" has to prepare documentation which incl. Scope of Works; Tender Drawings; Bills of Quantities; Performance Specification for the monitoring scheme; and Specification for any addition rehabilitation or remedial works.



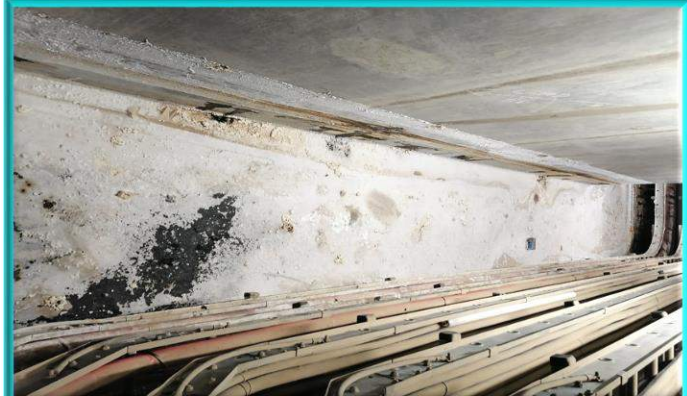
ALRABIAH PROJECT EXPERIENCE:



Project Name	<i>Preparing technical studies and repair specifications for drinking water tanks and their accessories in the mixing stations of East Coast cities</i>
Client	SWCC
Location	Eastern Province - KSA
Year	2021 – On going
Project Value	SR . 1,132,750

SWCC appointed “ARE” to prepare technical studies and repair specifications of the structures which includes Foundations (ring beams) of Portable Water Tanks, Inspection Chambers, Security fence and Land Survey. The main coastal cities covered during project are: Safwa, Sihat, RasTannurah, Qatif, Dammam, Dhahran, and Khobar.

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Inspection and study of the concrete repair in cable trench - AK3</i>
<i>Client</i>	<i>SWCC - Al Khobar</i>
<i>Location</i>	<i>Al Khobar - KSA</i>
<i>Year</i>	<i>2021 - On going</i>
<i>Project Value</i>	<i>SR . 299,000</i>

Alrabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the Inspection and study of the concrete repair in cable trench - AK3 in Al Khobar - KSA. SOW incl.:

- 1. Inspection of the entire cable trench as shown in the drawings for the entire third stage.*
- 2. Submit a detailed report on the current concrete situation, accompanied by pictures and drawings, and an indication of the extent of deterioration in affected areas.*
- 3. Submission of a technical report on how to repair after studying the current situation, and developing technical plans for the method of removing deteriorated concrete surface and replace it with new one.*
- 4. Submit scope of work, accompanied by a bill of quantities, in order to be tendered.*
- 5. Provides cost estimate for repair works based on the approved scope of work and the bill of quantities.*

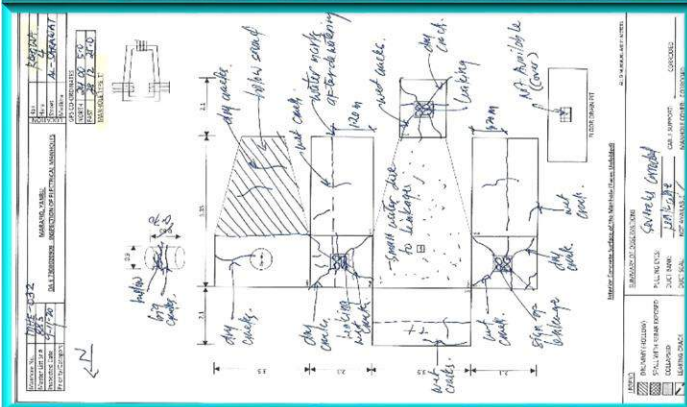
ALRABIAH PROJECT EXPERIENCE:



Project Name	Inspection of Electrical Manholes in MYAS
Client	Marafiq – Yanbu
Location	Yanbu - KSA
Year	2020 – On- Going
Project Value	SR . 2.3 Million

“ARE” was appointed Marafiq, Yanbu to inspect about 3,000 electrical manholes in MYAS, Yanbu.

The work involved visual inspection, assess the existing condition based on the guidelines agreed with Marafiq and prepare inspection reports for each manhole.





ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Infrastructure Protection Studies in Industrial and Community Area</i>
<i>Client</i>	<i>Royal Commission – Jubail</i>
<i>Location</i>	<i>Jubail - KSA</i>
<i>Year</i>	<i>2018 (On Going)</i>
<i>Project Value</i>	<i>SR . 14 Million (approx.)</i>

The Royal Commission for Jubail & Yanbu, Royal Commission in Jubail appointed “ARE” to carry out engineering and consultancy services for the corrosion management of all Royal Commission Jubail Al-Sinaiyah structures, systems and facilities.

This work included the evaluation of structures, testing and the preparation of complete tender packages for bidding purposes, as well as consultancy services for specialised studies and designs.



ALRABIAH PROJECT EXPERIENCE:



Project Name	<i>Condition Assessment of Strategic Water Reservoirs in Makkah</i>
Client	<i>SWCC - Riyadh</i>
Location	<i>Makkah - KSA</i>
Year	<i>2018</i>
Project Value	<i>SR . 2,150,000</i>

SWCC-Riyadh, appointed "ARE", for the assessment of the Million and Jurrannah reservoirs in Makkah region. The scope included investigation and assessment of the concrete structural elements, cable stayed roof and earthen dams.

The work involved carrying analyses and simulation to examine if the detected seepage (if any) is within safe ranges and in controlled pattern, evaluation of the existing piezometers data. Also includes evaluation of the safety of reservoirs slopes and base from different aspects. Works involved visual inspection, sampling and testing, and assessment & recommendations.

Based on the assessment, ARE shall produce a Remedial Works Package to be carried out by a specialist Contractor (s) including; Scope of Works; Tender Drawings; BOQ; Performance Specs. for the monitoring scheme; and Specification for any addition rehabilitation or remedial works.



ALRABIAH PROJECT EXPERIENCE:



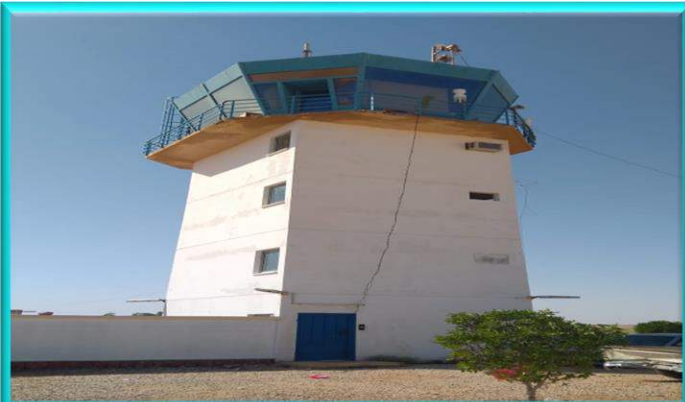
Project Name	<i>Engineering Study for Weigh Bridge Conc. Foundation</i>
Client	<i>LUBEREF - Yanbu</i>
Location	<i>Yanbu - KSA</i>
Year	<i>2018</i>
Project Value	<i>SR . 99,000</i>

LUBEREF, Yanbu appointed "ARE" to carry out an investigation, detailed design check, assessment and recommendations, related to Engineering Study for Weigh Bridge Concrete Foundation located on the Eastern Coast of KSA.

ARE's scope of services included a comprehensive condition survey, site sampling and laboratory testing, as well as the detailed rehabilitation design and the preparation of all tender documents, to restore the foundation under operation.



ALRABIAH PROJECT EXPERIENCE:



Project Name	Consultancy Services for Concrete Condition Survey of Structures
Client	Saudi Development & Reconstruction Program for Yemen
Location	Ghaydah - Yemen
Year	2018
Project Value	SR . 285,000

The Saudi Development & Reconstruction Program for Yemen appointed ARE to carry out investigation/assessment to determine the immediate requirements with the goal of operating this airport at the soonest possible time, taking into consideration the safety, security and functionality of the airport.

The Al-Ghayda Airport in Yemen was constructed in two phases (1984 & 2000 -2001). Assessment for the Terminal Building and all associated buildings and airport infrastructure were carried out to ascertain their integrity including all related services associated within the buildings such as the architectural, civil, mechanical, electrical and telecom requirements. ARE also prepared Remedial Works Package including; Scope of Works; Tender Drawings; Bills of Quantities; and Specifications.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Detail Design & Ten. Docs., for Main & Secondary Dolphins in SAMREF</i>
<i>Client</i>	<i>SAMREF - Yanbu</i>
<i>Location</i>	<i>Yanbu - KSA</i>
<i>Year</i>	<i>2017</i>
<i>Project Value</i>	<i>SR . 449,000</i>

SAMREF, Yanbu appointed "ARE" to carry out an investigation related to the deterioration of selected fenders of the Suez Berths and Short Haul Berths in Yanbu. Apart from a condition survey, ARE's scope of work included condition assessment, recommendations of appropriate remedial works, and prepare tender documents for suitable repair/replacement works.



ALRABIAH PROJECT EXPERIENCE:

<i>Project Name</i>	<i>Seawater Pump House - Study for Assessment of Steel Structure of Building # 10 SWPH - Yanbu</i>
<i>Client</i>	<i>MARAFIQ - Yanbu</i>
<i>Location</i>	<i>Yanbu - KSA</i>
<i>Year</i>	<i>2017</i>
<i>Project Value</i>	<i>SR . 780,000</i>

“ARE” was appointed by Marafiq, Yanbu to investigate the existing PEB in SWPH, Yanbu. The elements inspected were steel columns, beams supporting crane rails, etc.

The work involved visual inspection, structural design check of the beams supporting the rails, and dimensional survey. Calculations were carried out to assess the adequacy of the structure according to the international standards. The scope was mainly to check the original design and advice what structural strengthening measures are needed for the crane load to be increased from existing 35T to 40T. The scope also included preparation of tender documents for the necessary strengthening of the structure.



ALRABIAH PROJECT EXPERIENCE:

<i>Project Name</i>	<i>Study & Prep. of Ten Docs for Civil Works Rehab in Shoaibah Plant</i>
<i>Client</i>	<i>SWCC - Riyadh</i>
<i>Location</i>	<i>Shoaibah - KSA</i>
<i>Year</i>	<i>2017</i>
<i>Project Value</i>	<i>SR . 654,000</i>

“ARE” were appointed for the investigation and assessment of certain concrete structures at the Shoaibah Desalination Plant (Phase 1) including the Turbine Area, Boiler Area, Jetty Area, cable ducts, and other structures.

In addition to the above ARE have been requested to prepare the Detailed Design and Tender Package for the rehabilitation works.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Strategic Reservoirs in Jeddah, Condition Assessment</i>
<i>Client</i>	<i>SWCC - Riyadh</i>
<i>Location</i>	<i>Jeddah - KSA</i>
<i>Year</i>	<i>2017</i>
<i>Project Value</i>	<i>SR . 649,000</i>

SWCC-Riyadh, appointed "ARE" to carry out condition assessment of four strategic water tanks under construction in Jeddah. Works involved visual inspection, sampling and testing, and assessment & recommendations



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Consultancy Services for Concrete Condition Survey of Structures in Jubail</i>
<i>Client</i>	<i>MARAFIQ</i>
<i>Location</i>	<i>Al Jubail- KSA</i>
<i>Year</i>	<i>2015 - Ongoing</i>
<i>Project Value</i>	<i>SR . 5,850,000</i>

The Marafiq, Jubail appointed "ARE" to carry out engineering and consultancy services for the concrete condition survey of civil structures for potable water, waste water and sea water facilities in Jubail. This work included the evaluation of structures, testing and the preparation of complete tender packages for bidding purposes, as well as consultancy services for specialised studies and designs.

The structures assessed during the study were waste water pumping stations, SWTP, IWTP, Pumping stations, Sea water channels, Sea water Return channel, etc.



ALRABIAH PROJECT EXPERIENCE:

<i>Project Name</i>	<i>Structural Design Check of a PEB</i>
<i>Client</i>	<i>eTEC Arabia</i>
<i>Location</i>	<i>Al Khobar- KSA</i>
<i>Year</i>	<i>2015</i>
<i>Project Value</i>	<i>SR . 345,000</i>

“ARE” was appointed eTEC Arabia Co. Ltd. to investigate the newly constructed PEB in Hadeed, Jubail. The elements inspected were steel columns, beams supporting crane rails, etc..

The work involved visual inspection, structural design check of the beams supporting the rails, and dimensional survey. Calculations were carried out to assess the adequacy of the structure according to the international standards. The scope was mainly to check the original design and advise of any deficiencies in the design.

ALRABIAH PROJECT EXPERIENCE:



Project Name	<i>Struct. Assessment of Direct Reduction (A, B & C) Structure - HADEED Plant</i>
Client	SABIC-Jubail
Location	Jubail- KSA
Year	2015
Project Value	SR . 3,215,000

“ARE” was appointed SABIC, Jubail to investigate the existing Direct Reduction Structures (A, B & C) in Hadeed Jubail. The elements inspected were columns, beams supporting crane rails, rail and exposed foundations.

The work involved visual inspection, dynamic assessment of the beams supporting the rails, and static alignment survey. Calculations were also carried out to assess the adequacy of the structure according to the DIN standards. During this calculations, installation of additional supports/loads on some structural elements of the structures were considered. Following the investigation we prepared a report giving recommendations on how to prolong the life of the structure. The scope also included preparation of tender documents for the strengthening/rehabilitation/restoration of the structure for smooth operations.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Structural Assessment of Mooring Dolphins in SAMREF's Oil Port</i>
<i>Client</i>	<i>Saudi Aramco Mobil Refinery Co. Ltd. (SAMREF)</i>
<i>Location</i>	<i>Yanbu- KSA</i>
<i>Year</i>	<i>2014</i>
<i>Project Value</i>	<i>SR 492,000</i>

Arabiah Consulting Engineers, (ARE) were appointed by the Saudi ARAMCO Mobil Refinery Co. Ltd. (SAMREF) for the provision of professional services for the structural assessment of mooring dolphins of the Suez Berths (E & W), Short Hall Berth in SAMREF's oil port, with-in the King Fahd Industrial Port (KFIP) - Yanbu.

Work involved visual inspection and NDT testing of selected piles, inspection of pile caps of breasting and mooring dolphins and fenders. Both above as well as underwater inspection and NDT testing of piles were undertaken to evaluate the existing condition of these structures. The pile wall thickness was measured both above and under water with the help of ANSI Level II non-destructive ultrasonic thickness testing instrument in accordance with ASME V, Article 23 SE 797 and SE 114, in the area between the high tide and low tide water line, where the corrosion was noted to be the most severe. Tests were also done on the piles in undamaged areas.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Condition Assessment of Old Scrap Steel Structure in Hadeed Plant</i>
<i>Client</i>	<i>SABIC-Jubail</i>
<i>Location</i>	<i>Jubail- KSA</i>
<i>Year</i>	<i>2014</i>
<i>Project Value</i>	<i>SR . 615,000</i>

Arabiah Consulting Engineers "ARE" were appointed by SABIC, Jubail to investigate the existing condition of the Old Scrap Steel Structure in Hadeed Plant. The structural steel elements of the scrap structure, including columns, beams supporting crane rails, rail and exposed concrete foundations were inspected.

The work involved; visual inspection, dynamic assessment of the beams supporting the rails, and static alignment survey. Calculations were also carried out to assess the adequacy of the structure according to the DIN standards. Following the investigation a report was prepared giving recommendations on how to prolong the life of the structure.

The scope also included preparation of tender documents for the rehabilitation/restoration of the structure for smooth operations.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Consultancy Services for Corrosion Control</i>
<i>Client</i>	<i>Royal Commission for Jubail & Yanbu- Directorate General for Yanbu Project</i>
<i>Location</i>	<i>Yanbu- KSA</i>
<i>Year</i>	<i>2012-Ongoing</i>
<i>Project Value</i>	<i>SR 10,330,000</i>

The Royal Commission for Jubail & Yanbu, Royal Commission in Yanbu appointed Alrabiah Consulting Engineers "ARE" to carry out engineering and consultancy services for the corrosion management of all Royal Commission Yanbu Al-Sinaiyah structures, systems and facilities.

This contract spans over three years and includes various tasks, which will be issued by the Royal Commission from time to time, on as and when required basis. These tasks may include the evaluation of general condition of various structures, including buildings, culverts, manholes, etc., their testing and the preparation of complete tender packages for bidding purposes, as well as consultancy services for specialized studies and designs. Some tasks have already be completed, others are in process, and more to come in future.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Structural Evaluation of 395 Villas in SABIC Mega Housing Project, Jubail, KSA</i>
<i>Client</i>	<i>Beijing Construction Engineering Group</i>
<i>Location</i>	<i>Jubail- KSA</i>
<i>Year</i>	<i>2013</i>
<i>Project Value</i>	<i>SR 2,376,600</i>

Alrabiah Consulting Engineers, "ARE" were invited by the Beijing Construction Engineering Group to perform the investigation, assessment and diagnosis for three hundred ninety five (395) villas, which were still under construction in Jubail. Beijing Construction Engineering Group was working as contractor for construction of residential villas for SABIC mega housing project, in Jubail. SABIC noticed some defects in the construction of these villas, and hence asked to contractor to hire the services of a third party to undertake an independent investigation of the villas, under construction.

The work involved visual inspection, document review, and identification of locations for Ultrasonic Pulse Velocity measurements, estimation of core compressive strength, perform structural analysis, and thereafter carryout assessment and recommendations for restoration works. "ARE" after investigation prepared the recommendation report for rehabilitation works.



ALRABIAH PROJECT EXPERIENCE:



Project Name	Investigation of Three Saudi Post Buildings, KSA
Client	Saudi Post, Riyadh
Location	Riyadh, Al-Rass & Hafr Albatin, KSA
Year	2013
Project Value	SR 1,700,000

Arabiah Consulting Engineers, "ARE" were appointed by the Saudi Post to undertake the investigation, assessment and diagnosis for three Saudi post office branches (Riyadh, Hafr Al Batin and Al Rass). This project was divided into three phases, viz., preliminary investigation, detailed investigation and preparation of tender documents. The work involved visual inspection, document review, extensive sampling and testing, assessment and recommendations for restoration works. After the approval of detailed investigation reports, "ARE" prepared the tender documents for rehabilitation works. The project was executed by a team of 14 engineers including Project Manager and engineers from all disciplines viz. civil, architectural, landscaping, plumbing, sanitary, HVAC, FFS, FAS, electrical, etc. Site data was collected and photographs were taken. Field data collected from the site was analyzed in the office and corresponding reports were prepared by each discipline engineer independently.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Study & Rehabilitation Design of Some Concrete Structures at SWCC Shuqaiq Plant, KSA</i>
<i>Client</i>	<i>Saline Water Conversion Corporation – (SWCC)</i>
<i>Location</i>	<i>Shuqaiq- KSA</i>
<i>Year</i>	<i>2012</i>
<i>Project Value</i>	<i>SR 982,048</i>

Arabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the provision of professional services related to the investigation and remedial works design for the some concrete structures in SWCC Shuqaiq Power & Desalination Plants.

The SWCC Shuqaiq plant is located along the Red Sea coast in Assir region and is more than 25 years old. Some of the concrete structures in this plant were noted to show outward signs of ongoing deterioration. The Client is concerned about the safety of these structures, and has invited Consultants to conduct a professional durability engineering study in order to investigate the condition of the selected structures, recommend appropriate remedial works, and provide the associated tender documents for a contractor to carry out the remedial works.

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>"B" TYPE OFFICE BUILDINGS ASSESSMENT</i>
<i>Client</i>	<i>Saudi ARAMCO</i>
<i>Location</i>	<i>Dhahran- KSA</i>
<i>Year</i>	<i>2012</i>
<i>Project Value</i>	<i>SR 1,065,799</i>

Saudi Aramco hired the professional services of Alrabiah Consulting Engineers to conduct kingdom-wide assessment study of "B" Type Office Buildings. This study comprised assessment of twenty one (21) buildings located in different areas of Saudi Aramco facilities, viz., Dhahran, Ras Tanurah, Abqaiq, Safaniyah, Tanajib, Berri and Jeddah.

This study focused on the evaluation of the general condition of the structural elements of the buildings, as well as the assessment of the status of the other associated services, like; Electrical, HVAC, Fire Protection, Plumbing & Utilities and Telecommunication systems of these buildings.

At 50% submittal stage, the assessment report for three buildings was submitted, while at 90% submittal stage, the assessment report of the remaining eighteen (18) buildings was submitted;

At 100% submittal stage, a combined observation, assessment & recommendation report of all the buildings was submitted.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Yanbu and Al-Muajjiz Terminal Upgrade Study</i>
<i>Client</i>	<i>Saudi ARAMCO</i>
<i>Location</i>	<i>Dhahran- KSA</i>
<i>Year</i>	<i>2011</i>
<i>Project Value</i>	<i>SR 991,627</i>

Arabiah Consulting Engineers (ARE) were appointed by the Saudi Aramco to undertake a technical study to up-grade their existing marine terminals (Yanbu Crude Oil Terminal and Al-Muajjiz Terminal) in the Western Region of the Kingdom of Saudi Arabia.

This Project was undertaken with the co-operation of our associate COWI of Denmark with offices in other parts of the world.

The upgrade study covered two berths #63 and #64 in Yanbu Crude Oil Terminal (YCOT) and the two berths #101 and #103 in Al-Muajjiz Terminal (AMT).

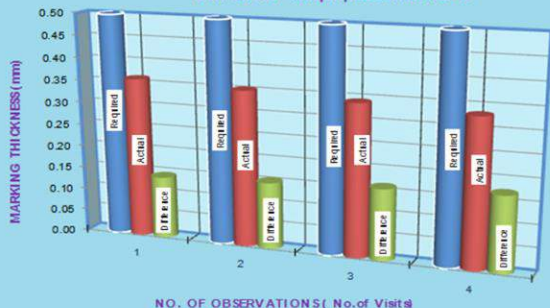
The primary objective of this study was to evaluate and determine the required structural modifications to the existing berths so as to expand their operational range to obtain a higher utilization of these berths and upgrading them to accommodate a wider range of modern vessels.

ARE also provided material take-off and rough order of magnitude (ROM) cost estimate for the proposed structural modifications.

ALRABIAH PROJECT EXPERIENCE:



COMPARISON OF PAVEMENT MARKING THICKNESS
9th Street- Abqaiq-Location ID-B



Project Name	Pavement Marking Failure Study
Client	Saudi ARAMCO
Location	Dhahran- KSA
Year	2010
Project Value	SR 375,000

Saudi Aramco was frequently experiencing the premature failure of the pavement markings at most of the roads, where the applied marking paint disappeared in much less time than its expected service life, thus causing loss of expenditures to the company. This frequent failure of the pavement marking within a very short time has raised the Saudi Aramco's concern. Consequently, they hired the professional services of Alrabiah Consulting Engineers (ARE) for undertaking a field study to find out the causes of the premature failure of the pavement markings, and based on the study findings; recommend appropriate remedial actions to extend their service life.

During this study, the field data was collected during and after the application of the pavement marking. This data was analyzed to find out the root causes of the pavement marking failure and appropriate recommendations were developed for pavement marking applications and replacement strategy. Subsequently, a QA/QC procedure was developed to assist the Client during inspections of pavement marking.



ALRABIAH PROJECT EXPERIENCE:

Ministry of Water & Electricity
Reinforced Concrete Repair and Arresting of Water Leakage in Riyadh Emergency Reservoirs
-Compartment R2C6
Vol. 3 of 4: Data Report, Concrete Sampling & Laboratory Testing



Photo No. 1: Extraction of Core from Column Footing is in Progress



Photo No. 2: A Close View of Extraction of Core from Column Footing.



Photo No. 3: A View of the Column after Core Extraction.



Photo No. 4: A Close View of the Core Hole in the Column.

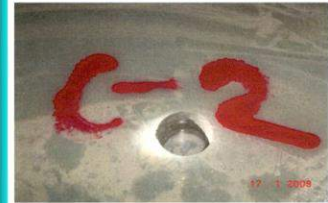


Photo No. 5: A View of a Core Hole at the Floor Slab



Photo No. 6: A Close View of the Core Hole in the Floor Slab.



<i>Project Name</i>	<i>Investigation of High Point Reservoirs in Riyadh</i>
<i>Client</i>	<i>SWCC</i>
<i>Location</i>	<i>Riyadh - KSA</i>
<i>Year</i>	<i>2008</i>
<i>Project Value</i>	<i>SR 3,686,000</i>

Arabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the Investigation of High Point Reservoirs in Riyadh

The extent of deterioration of the reinforced concrete elements was investigated and remedial measures recommended to the Client. Detailed repair drawings and tender documents were also prepared.

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Investigation of Selected Concrete Structures in Shoaibah & Al-Khobar Power and Desalination Plants, KSA</i>
<i>Client</i>	<i>Saline Water Conversion Corporation – (SWCC)</i>
<i>Location</i>	<i>Shoaibah & Al-Khobar, KSA</i>
<i>Year</i>	<i>2006</i>
<i>Project Value</i>	<i>SR 1.9 Million</i>

Arabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), , for the provision of professional services related to the investigation and remedial works design for the additional concrete structures in both SWCC Alkhobar (Phase II) and Shoaibah (Phase 1) Power & Desalination Plants.

The Shoaibah Power and Desalination Plant - Phase 1 is located in the Western Province of Saudi Arabia on the shores of the Red Sea. The Al-Khobar Power and Desalination Plant - Phase 2 is located in the Eastern Province of Saudi Arabia on the shores of the Arabian Gulf. The Plants were constructed about 30 years ago and are in operation since then. The Plants produce potable water and electric power, which are then transmitted to various cities. The Client is concerned about the general condition of these structures exhibiting signs of deterioration, and would like to maintain the structural integrity of the different structural elements.

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Condition Assessment of Villas in Al-Nakheel Housing Compound in KFUPM</i>
<i>Client</i>	<i>King Fahd University of Petroleum & Minerals- (KFUPM)</i>
<i>Location</i>	<i>Dhahran- KSA</i>
<i>Year</i>	<i>2004</i>
<i>Project Value</i>	<i>SR 98,000</i>

Arabiah Consulting Engineers, (ARE) were appointed by King Fahd University of Petroleum & Minerals, Dhaharn for the investigation and assessment of all the reinforced concrete buildings of the housing compound.

Al-Nakheel Compound is located within the King Fahd University Campus at Dhahran. The construction of these villas was stopped midway around 20 years back and since then they were exposed to an extreme environment. The Client was concerned that the long term exposure of these villas to the environment must have caused some deterioration in the reinforced concrete elements. ARE were thus requested to assess the structural condition of the villas and determine the remedial works required prior to starting the finishing works.

The extent of deterioration of the reinforced concrete elements was investigated and remedial measures recommended to the Client. Detailed repair drawings and tender documents were also prepared.

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Evaluation of the Structural Condition of the TCC Exchange in Dammam</i>
<i>Client</i>	<i>Saudi Telecom Company (STC)</i>
<i>Location</i>	<i>Dammam- KSA</i>
<i>Year</i>	<i>2002</i>
<i>Project Value</i>	<i>SR 1.2 Million</i>

Alrabiah Consulting Engineers, (ARE) were appointed by the Saudi Telecom Company (STC), to conduct an investigation for their TCC Exchange located in Dammam to appraise the structural condition of the building.

The building was an above-ground five-storey reinforced concrete construction arranged on a rectangular grid pattern of columns, beams and solid / waffle slab construction. The structure was exhibiting signs of structural distress and concrete deterioration. Some elements in the building raised concerns regarding their structural integrity and a number of parapets were actually endangering the public safety.

During this study, in addition to visual inspection, sampling & testing and structural analysis, a dimensional survey of the building was also conducted to ascertain the compliance of the information on the design drawings with that of the existing condition.

ALRABIAH PROJECT EXPERIENCE:



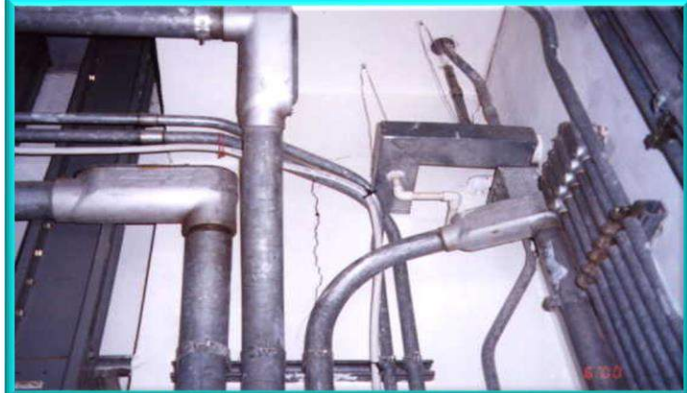
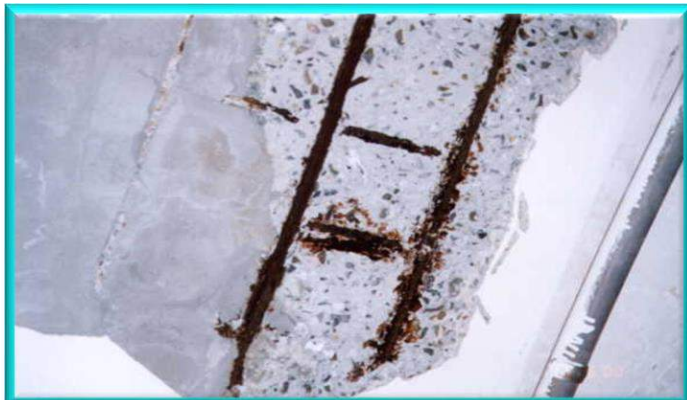
<i>Project Name</i>	<i>Rehabilitation of Reinforced Concrete Structures in Jubail Plant (Phases 1 & 2) and Housing Compound, KSA</i>
<i>Client</i>	<i>Saline Water Conversion Corporation – (SWCC)</i>
<i>Location</i>	<i>Jubail- KSA</i>
<i>Year</i>	<i>2002</i>
<i>Project Value</i>	<i>SR 1.5 Million</i>

Alrabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the provision of professional services related to the investigation and remedial works design for the selected concrete structures in SWCC Jubail Desalination Plant (Phases 1 and 2) and Housing Compound.

The Phase 1 Desalination and Power Plant has a capacity of 30 million gallons per day of water and 300 MW of power. The Phase 1 structures were constructed by different engineering companies, Construction of the Phase I was completed in 1980. In view of the poor condition of various structures, the Client has invited Consultants to conduct a professional durability engineering study in order to investigate the condition of the selected structures, recommend appropriate remedial works, and provide the associated tender documents for a contractor to carry out the remedial works.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Condition Assessment of Existing Structures, GOSI Buildings in Jeddah and Dammam, KSA</i>
<i>Client</i>	<i>General Organization for Social Insurance (GOSI)</i>
<i>Location</i>	<i>Jeddah & Dammam, KSA</i>
<i>Year</i>	<i>2000</i>
<i>Project Value</i>	<i>SR 500,000</i>

Arabiah Consulting Engineers, (ARE) were appointed by the General Organization for Social Insurance (GOSI) for provision of professional services for the investigation and appraisal of the damages in GOSI's office buildings in Jeddah and Dammam. The structures were exhibiting signs of structural distress and concrete deterioration.

The study included the detailed investigation for locations and elements predefined by the Client in addition to a condition survey proposed by ARE for the different accessible areas of the building in order to record briefly the general condition of the remaining parts of the building with a concentration on the predefined damaged areas.

ARE carried out the investigation of both buildings in order to evaluate the condition of the selected structures, recommend appropriate remedial works, and provide the associated tender documents.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Investigation and Rehabilitation of King Fahd Naval Base- Jeddah & King Abdul Aziz Naval Base Jubail</i>
<i>Client</i>	<i>Royal Saudi Naval Forces, RSNF</i>
<i>Location</i>	<i>Jeddah & Jubail-KSA</i>
<i>Year</i>	<i>1999-2001</i>
<i>Project Value</i>	<i>SR 6 Million</i>

The Royal Saudi Navy appointed Alrabiah Consulting Engineers "ARE" to carry out the investigation, assessment, recommendations, and detailed design check, under water survey, structural analysis, rehabilitation design, and tender documents for the restoration of the Ship Repair Facilities (SRF) at King Fahd Naval Base in Jeddah and King Abdul Aziz Naval Base in Jubail.

The Scope of Works involved visual inspection above and under water, site sampling & testing, assessment of & recommendations for the rehabilitation works. Apart from concrete elements (piles, pile caps, beams, pre-stressed deck slabs, etc.), all utilities and M & E installations were included in the scope, as was the structural analysis of the piers and wharves, the design check for the Synchro Ship Lift.

The job involved experts from our Associate Company, COWI (Denmark) and Synchro Lift (USA).

ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>National Hospital – Rehabilitation Work Site Supervision</i>
<i>Client</i>	<i>General Organization for Social Insurance (GOSI)</i>
<i>Location</i>	<i>Riyadh, KSA</i>
<i>Year</i>	<i>2002</i>

Alrabiah Consulting Engineers, (ARE) were appointed by the General Organization for Social Insurance (GOSI) for Supervising the temporary remedial works at National Hospital, Riyadh – KSA.

Scope of temporary remedial work includes, Jacketing of selected columns, First floor Slab Soffit, Cantilever Slab at roof, repair of 2nd cantilever slab, parapet and other Masonry walls. While supervising the remedial works, ARE to ensure the structural stability and integrity of the elements etc.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Upgrading Sewage System in Jubail Commercial Port "Study, Design & Supervision"</i>
<i>Client</i>	<i>Saudi Ports Authority</i>
<i>Location</i>	<i>Jubail</i>
<i>Year</i>	<i>2007</i>
<i>Project Value</i>	<i>SR 1,877,000</i>

Alrabiah Consulting Engineers Co. were appointed to carry out the study, design and supervision of a comprehensive Sewage system in the Jubail Commercial Port.

The works involved investigation of the existing facilities, and preparation of design for up gradation and renovation of the existing sewage system, including preparation of tender documents, supervision of the execution of the up gradation works by the Contractor, as well as the supervision during the maintenance period.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Supervision for Rehabilitation of Selected Concrete Structures in Shoaibah & Al-Khobar Power and Desalination Plants, KSA</i>
<i>Client</i>	<i>Saline Water Conversion Corporation – (SWCC)</i>
<i>Location</i>	<i>Shoaibah & Al-Khobar, KSA</i>
<i>Year</i>	<i>2010</i>
<i>Project Value</i>	<i>SR 6,320,000</i>

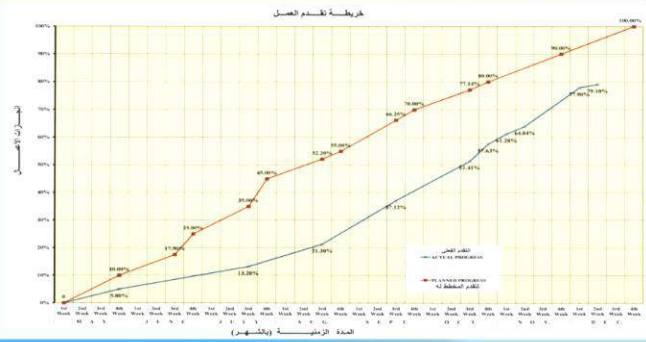
“ARE” were appointed for the site supervision for the rehabilitation of selected reinforced concrete structures in the Plant and selected buildings of the housing compound.

The works mainly involve supervising whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc.

ALRABIAH PROJECT EXPERIENCE:



Project Name	Saudi Post Buildings Site Supervision for Rehabilitation Work
Client	Saudi Post
Location	Dammam & Jeddah
Year	2012
Project Value	SR 1,620,000



“ARE” were appointed for the site supervision for the rehabilitation of Saudi Post H.O. buildings. The Consultant works mainly involve supervising whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc. The rehabilitation works were for both civil and mechanical utilities.





ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Site Supervision Rehabilitation of High point Reservoirs</i>
<i>Client</i>	SWCC
<i>Location</i>	Riyadh - KSA
<i>Year</i>	2017
<i>Project Value</i>	SR 4,240,000

“ARE” were appointed for the supervision of the rehabilitation works of the reinforced concrete elements within the 2 high point reservoirs (R2C2 & R2C3 in 2010) and (R1C4, R1C5, R2C6, R2C6 in 2017) of size 725m x 325m and 7.5m depth, used for storing potable water prior to its transmission to Riyadh city.

The Consultant works mainly involve supervising whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Site Supervision for Rehabilitation of Selected Concrete Structures at SWCC Shuqaiq Plant, KSA</i>
<i>Client</i>	<i>Saline Water Conversion Corporation – (SWCC)</i>
<i>Location</i>	<i>Shuqaiq- KSA</i>
<i>Year</i>	<i>2014 -2019</i>
<i>Project Value</i>	<i>SR 1,680,000</i>

“ARE” was invited to provide site supervision services for the supervision of the rehabilitation works of selected concrete structures in the SWCC Shuqaiq Power & Desalination Plant.

The works mainly involve checking whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc. The structures rehabilitated were the intakes, pump houses, power houses, perimeter fencing, etc.



ALRABIAH PROJECT EXPERIENCE:



<i>Project Name</i>	<i>Site Supervision for Rehabilitation of the Million Reservoir in Makkah,</i>
<i>Client</i>	<i>SWCC – Al Riyadh</i>
<i>Location</i>	<i>Al Riyadh- KSA</i>
<i>Year</i>	<i>2021 – On going</i>
<i>Project Value</i>	<i>SR . 3,898,960</i>

Alrabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the Site Supervision for Rehabilitation of the Million Reservoir in Makkah.

The works mainly involve supervising whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc.



ALRABIAH PROJECT EXPERIENCE:

<i>Project Name</i>	<i>Site Supervision for Rehabilitation of Selected Concrete Structures in Shoaibah Plant</i>
<i>Client</i>	<i>SWCC – Al Riyadh</i>
<i>Location</i>	<i>Al Riyadh- KSA</i>
<i>Year</i>	<i>2021 – On going</i>
<i>Project Value</i>	<i>SR . 2,080,000</i>

Arabiah Consulting Engineers, (ARE) were appointed by the Saline Water Conversion Corporation (SWCC), for the Site Supervision for Rehabilitation of Selected Concrete Structures in Shoaibah Plant, Site Supervision in Riyadh – KSA.

The works mainly involve supervising whether the execution on site is undertaken as per the project contract documents. The activities include preparation of monthly reports, conduct regular meetings, inspection of all activities on site, approval of materials, etc.