

**Engineering,
Design**



**Environmental
Services**



What's in a name

EDESSA stands for Engineering, Design and Environmental Services S.A.L. EDESSA also stands for quality, commitment and client satisfaction. EDESSA is a professional full-service, multi-disciplinary engineering firm providing specialized engineering and integrated environmental consulting services. EDESSA was setup in the year 2000 by taking over the activities of Dames & Moore, one of the largest US engineering firms, in Lebanon. Although the firm, as such, was setup in the year 2000, the EDESSA team has been operating for several decades throughout the United States of America, Europe, Africa and the Middle East.

What's in a logo

The EDESSA logo incorporates the engineering symbol for precision and accuracy, symbolizing our work spirit and philosophy.

The colors of the logo combine the colors of the environment. The lower quarter in blue represents the color of the marine environment and the groundwater we work to preserve. The upper quarter in green represents the color of the environment we strive at protecting.

The overlays of the engineering emblem represent the ground, symbol of our earth sciences expertise, and the air, symbol of the environmental services we provide.



Services

Our fields of activities encompass the areas of planning, engineering, earth sciences, environmental management, design and regulatory assistance and construction services. The firm's projects comprise a high degree of diversity including industrial facilities, commercial and residential buildings, infrastructures, disposal sites and natural resource developments. Our clients include businesses and industries in the private sector, public utilities companies, architects, engineers, contractors, financial institutions and governmental agencies.

Specialized Engineering and Integrated Environmental Services



Our main areas of expertise have traditionally been in the civil engineering and the earth sciences fields and have developed to include the following general services:

Engineering	Earth Sciences	Environment
<ul style="list-style-type: none">▪ Civil Engineering Design▪ Structural Engineering▪ Hydraulic Engineering▪ Earthworks Engineering▪ Roadway Engineering▪ Construction Management▪ Construction Quality Assurance▪ Contracting Services	<ul style="list-style-type: none">▪ Geotechnical Engineering▪ Marine Studies▪ Geology▪ Hydrogeology▪ Geophysical Surveys▪ Soil-Structure Interaction▪ Seismic Evaluation▪ Laboratory Testing	<ul style="list-style-type: none">▪ Environmental Impact Assessments▪ Waste Management▪ Pollution Control Engineering▪ Landfill Design and Supervision▪ Site Investigations▪ Remediation▪ Environmental Management System▪ Due Diligence Assessment

EDESSA has developed very strong ties with a number of specialized consulting and engineering firms overseas. A number of association agreements have been setup with such international firms in order to combine the resources and expertise of EDESSA with such partnering firms for specific projects in Lebanon, the Middle East, North Africa and Europe.

Engineering Design

- Civil engineering
- Structural engineering
- Hydraulic engineering
- Earthworks engineering
- Specifications development
- Computer aided drafting
- Shop drawings preparation
- Value engineering
- Bid package preparation
- Quality assurance plan
- Topographic survey

Concrete Works

- Structural design
- Structural evaluation and investigations
- Structural strengthening
- Concrete design and specifications
- Concrete pumping
- In-situ and destructive testing
- Quality control testing
- Concrete aggregates testing
- Chemical testing of concrete water
- Steel reinforcement testing
- Concrete admixtures

Roadway Design/Assessment

- Damage assessment of bridges, roadways, retaining walls, culverts, surface water channels
- Detailed investigations
- Upgrade of existing structures
- Surface water management
- Design and project specifications
- Traffic studies
- Environmental impact assessment (EIA)
- Air pollution evaluation

Engineering Design

Complete design services are provided relying on state-of-the-art design software and methodologies. EDESSA has in-house capabilities for all aspects of civil, environmental, hydraulic and structural engineering designs associated with various types of structures and projects. From calculation software to graphical presentations and FIDIC specifications, we are able to produce all required

design documents, calculation notes and drawings backing up our submittals. We maintain a technical library of suppliers, products, specifications and data sheets in order to include in our designs, whenever possible, products available on the local market, avoiding future requests for change orders from contractors.



Concrete Works

Various concrete services are provided for a wide range of projects including buildings, infrastructures and special facilities. Our services encompass design of new facilities, assessment of existing ones and upgrade and retrofitting of unsound structures. Our ACI certified engineers use proven design and

investigation techniques, field and laboratory testing methods and a variety of computer modeling techniques. We also get involved in design mixes and concrete pumping as well as the assessment of steel, water, aggregates and advise on the use of additives and admixtures.

Roadway Design/Assessment

EDESSA has been involved in a number of damage assessment and upgrade to both roadways and roadway structures ranging from bridges, retaining walls, pavements, culverts and surface water

channels. Our role has either been initiated by the investigation of a failure or a damage or has been requested for the design and construction supervision of new structures. On new projects, we prepare the design and project specifications based on the results of sound geotechnical investigations. Our designs and specifications are thorough and complete but also take into consideration available material, cost effectiveness and environmental impacts.



Construction Management

We use modern management techniques to follow-up construction projects. Our services can be offered as a total package or individually to supplement an owner's resources. We can assist in projects of all sizes at all points in the process. However, the earlier we are brought into a project, the greater the opportunity for us to help our clients. Our multi-disciplinary skills enable us to anticipate problems, develop alternatives and assist our clients in achieving solutions. We suggest easier ways to perform a task or propose solutions that prevent delays. We schedule to save time, expedite the information and approval flow and inspect to prevent expensive rework.



Construction Supervision

Whether we have been involved in the consultancy and design stages of a project or not, EDESSA engineers are often called upon to play a supervision role during the construction of a project or the operation stages of a facility. Our role is to ensure that the work is conducted

technically in accordance with the project specifications and requirements. We also get involved in rapidly finding solutions to problems arising during construction and helping the contractor, the client or the owner's representative to improve the site activities.



Contracting Services

The involvement of EDESSA in contracting services has started in the form of construction supervision. It has evolved to include design-construct services for special projects and currently encompasses a wide variety of contracting services. As EDESSA's philosophy is structured around client service, our involvement often extend beyond consulting and design works to manage and take the lead role in

construction projects. The type of contracting services is not limited to specialty civil works, it has included traditional building construction, renovation, structural and architectural works. We also manage projects including various subcontracting activities in various and diversified fields and sectors.

Construction Management

- Design coordination and management
- Project planning
- Construction supervision
- Project management
- Construction quality assurance
- Contract administration
- Schedule and cost control
- Value engineering

Construction Supervision

- Supervision and management on behalf of the owner
- Supervision and management of subcontracted activities
- Civil works supervision
- Earthworks supervision
- Topographic surveys
- Environmental works supervision

Contracting Services

- Design-construction
- Civil works construction
- Structural works
- Renovation works
- Architectural works
- Subcontract management

Geotechnical Engineering

- Site investigations
- Soil and rock engineering
- Foundation engineering
- Ground improvement
- Slope stabilizations
- Retaining walls
- Containment structures
- Soil-structure interaction
- Earthquake loading assessment
- Soil liquefaction analysis
- Numerical modeling
- Field testing and instrumentation

Marine Services

- Offshore geotechnical investigations
- Geophysical and oceanographic surveys
- Marine facility design
- Ports, harbors and marinas
- Shore protection and breakwater
- Environmental studies
- Dredging studies
- Environmental impact assessment (EIA)
- Tide measurements
- Current measurements
- Diving surveys
- Sediment and sand search surveys
- Cooling water intake structure
- Thermal discharge analysis
- Oil spill contingency plans
- Deep sea wastewater disposal
- Mooring stations

Geotechnical Engineering

Complete geotechnical services are provided for a wide range of projects including marine structures, buildings, infrastructures, resource development projects and special facilities. Our engineers use proven investigation techniques, field and laboratory testing methods and a variety of computer modeling techniques. Knowledge of local geological and geotechnical conditions and extensive experience accumulated through our numerous projects are an invaluable resource available to our clients. We scope our investigations to meet the exact needs of our clients. We have no vested interest in using any particular equipment. We therefore select the most cost-effective and technically suitable method and equipment for every project.



Marine Services

EDESSA's staff has been involved in some of the most challenging coastal and off-shore engineering projects in Lebanon. Whether the project includes the construction of a breakwater, a sea defense structure, a marina, a reclamation project, a harbor or a coastal industrial facility, our staff has provided numerous types of services to find the optimal solutions for the project siting. Our marine service capabilities are not limited to offshore geotechnical engineering; but include geophysical, design and environmental work as well.

Geotechnical investigations typically include boreholes, Cone Penetration Tests (CPTs) and vibrocores. Geophysical surveys typically include bathymetric surveys, seismic reflection and refraction surveys, as well as tide and current measurements. Another aspect of our marine experience includes environmental impact assessments of new facilities, effluent discharges or dredging works.

Finally, marine design services encompass all types of design aspects from liquefaction of hydraulic fills to design of structures and harbors.



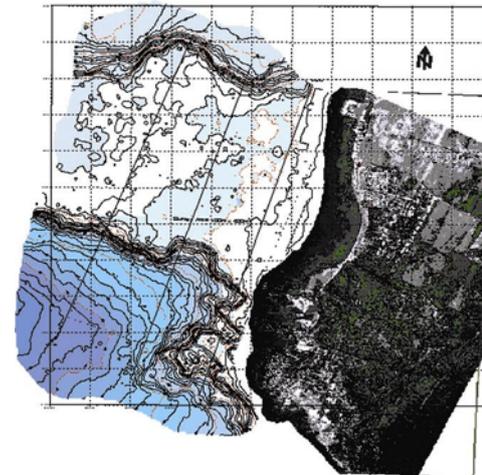


Material Testing

- Quality controlled sampling
- Field and laboratory analysis
- Quality system and procedures
- Geotechnical testing
- Concrete testing
- Asphalt testing
- Geosynthetics testing
- Special material testing
- Environmental testing
- Agreements with US and European laboratories
- State-of-the-art equipment

Geosciences

- Site investigations
- Geological mapping
- Geological structural analyses
- Geophysical surveys
- Groundwater impact assessments (GWIA)
- Numerical modeling



Material Testing

Our laboratory is equipped to handle a wide range of analyses ranging from geotechnical to concrete testing, as well as special construction and environmental testing. Our services start in the field with sampling procedures in-line with international standards. A portion of the testing we conduct consists of field testing. These range from simple field characterization to complex nondestructive sampling using ultrasonic,

electromagnetic or nuclear methods. Required tests are conducted in accordance with ASTM, BS, AFNOR, DIN, ISO or other internationally recognized standards. Our analytical capabilities are also strengthened by a number of subcontractors' agreements with specialized laboratories in Lebanon, Europe and the United States of America.

Geosciences

Multidisciplinary capabilities in such fields as geology, hydrology, hydrogeology, engineering seismology and geophysics make EDESSA a leading choice when it comes to projects involving geosciences. Geologic investigations carried out by EDESSA staff include geological mapping and structural analysis for site characterization. EDESSA staff has been involved in numerous hydrological/

hydrogeological investigations. The study of surface water and groundwater resources is an important aspect of all such investigations. Traditional services such as groundwater well location, development, testing, and rehabilitation are also conducted. Another aspect of our capabilities is in the field of applied geophysical studies on terrestrial and marine environments.

Water Resource Engineering

EDESSA's water resource services range from planning, consulting, engineering, design, environmental and construction related services. We serve public and private utility companies as well as government agencies, land developers, industry and the agricultural sectors. We have conducted a number of watershed, surface water and groundwater studies and have addressed issues related to storm water management and groundwater quality.

Groundwater resources evaluation and usage also constitute a major aspect of our water resource projects. From studies on the hydrogeological potential/ safe yield of a certain area to the preparation of the specifications for well drilling and installation and the proper development of such wells, our team of experts can assist clients in properly tapping groundwater resources.

Water Resources

- Water resources planning
- Water supply development
- Storm water management
- Surface water and groundwater evaluation
- Water quality evaluation
- Water conveyance structures
- Storage projects (dams, reservoirs)
- Groundwater contamination remediation
- River and basin studies (canals, water intake and outfall structures)
- Pumping test design and analysis
- Irrigation and drainage systems

Environmental Management

- Strategic advice
- Environmental studies
- ISO 14001 management systems
- Environmental impact assessments (EIA)
- Regulatory compliance audits
- Due diligence for property transfer
- Remedial design and action
- Product life-cycle analyses
- Program and policy implementation
- Strategic communication support
- Emergency response
- Environmental, health and safety
- Pollution control engineering
- Emission and effluent control
- Value engineering

Pollution Control

- Effluent characterization
- Emission testing and inventory
- Impact assessment
- Pollution prevention and minimization
- Accidental release prevention
- Process engineering
- Water treatment
- Industrial wastewater treatment
- Municipal wastewater treatment
- Leachate treatment plants
- Air emission abatement
- Pollution control equipment design and specification
- Construction and operation oversight
- Permitting assistance
- Process and Instrumentation Diagrams (PIDs)

Environmental Management

EDESSA routinely assists clients with regulatory compliance and environmental management. We consult with top management on strategic planning for environmental policies and programs as well as project developers and plant managers on site-specific environmental needs. EDESSA helps clients develop and implement strategies for addressing regulatory needs, business

opportunities and community concerns as well as ISO 14001 certification as desired. A key element in EDESSA's approach to environmental management is the use of environmental audits and EIAs used to identify areas with environmental impairment and to assess regulatory compliance needs.



Pollution Control Engineering

The company's experience encompasses all aspects of pollution control engineering for waste management, wastewater management and air emissions. These range from process engineering, emission minimization and recycling to the design and implementation of protection/remediation programs for air, soil, surface water and groundwater resources. EDESSA offers its pollution control engineering services to a wide range of industries, municipalities and waste management contractors. Our capabilities are

strengthened by the various association agreements we have with specialized international consulting firms. Our projects often start with the evaluation of flows and loads and field and laboratory investigations. All process designs are computer-based. Process flowsheets are initially developed and then translated into outline Process and Instrumentation and Diagrams (PIDs). The PIDs are then developed into detailed drawings for all process units, piping and controls.



Waste Management

EDESSA provides integrated waste management, engineering, design, environmental and regulatory support services for the proper management of waste. Whether the need is developing a new waste management facility or bringing an older facility into compliance, there is no substitute to the creative solutions that result from expert engineering, design and construction support services. Waste management projects include all aspects of the sector from waste characterization and quantification to sorting, recycling, reuse studies as well as full-scale treatment using various methods such as composting, bioremediation, physical and chemical treatment of special wastes.



Landfill Engineering

Design of new landfills typically starts with the evaluation of the site and its assessment from a geological and hydrogeological point of view. Environmental impact assessments are then typically conducted. The design of a new facility typically includes extensive earthworks aspects. The lining system is adopted based on the results of the EIA and the GWIA, the type of waste deposited and the availability of mineral or

geosynthetic lining materials. Specifications are developed for all components of the lining and the leachate collection systems. Operation plans are often prepared along with environmental monitoring plans. The management and treatment of leachate and gas are typically addressed in the operation plan of the site.



Dump Site Remediation

Waste is unfortunately not always disposed of in engineered landfills. The staff of EDESSA has been involved in the assessment and remediation evaluation of numerous such dumps. Typical activities related to existing dump sites include the improvement of the prevailing situation until the site can be closed. The next stage is to conduct a historical assessment of the facility in order to know how long the site has been in use and what

type of waste is likely to be found in it. Field investigations are typically started following the initial stage. Proper closure of the site is usually the next priority. Remedial investigations and recommendations are then proposed for such sites based on the master plan of the area, the site constraints and the financial budgets available.

Waste Management

- Waste characterization
- Municipal, industrial, commercial and medical waste management
- Waste minimization
- Recycling and reuse potential
- Composting and bioremediation
- Physical and chemical treatment
- Market assessment and study
- Toxicity assessment

Landfill Engineering

- Site selection
- Earthworks design
- Lining system design
- Surface water management
- Capping design
- Operation plans
- Environmental monitoring plans
- Leachate management
- Landfill gas management
- Construction supervision
- Operation supervision
- Environmental management

Dump Site Remediation

- Emergency management
- Historical assessments
- Field investigations
- Landfill gas surveys
- Leachate and surface water analysis
- Proper site closure
- Remedial investigation
- Confinement and isolation
- Gas extraction and flaring
- Leachate extraction/recirculation
- Full scale excavation, sorting and bioremediation

Quality Statement

Our aim is to be responsive to our clients' needs and deliver the product agreed upon at the proposal stage making sure it is always in-line with the clients' expectations. In order to ensure such responsiveness, we always focus on improving our communications with the clients and delivering a product on time and on budget.

We go beyond meeting the clients' expectations. We strive at exceeding them and ensuring that our clients is getting value for the money spent.

Our technical competence allows us to establish long-term relationships with clients, which we consider to be a key indicator of our success.

Our objective is to deliver the highest level of quality on every project deliverable.

We specialize in value-added services that enhance our clients' business, environmental regulatory compliance and technological decisions as well as the public acceptability of those decisions. We design creative engineering solutions and deliver results. Our engineers are problem solvers. Developing creative practical solutions is our specialty.

We have the expertise to take projects from earliest conceptual stages through design to construction management and supervision. Our emphasis on value-added services contributes to the success of our projects and the repeat business from our clients.

We build long-term relationships with our clients and serve their needs on large and small-scale projects.

The company's commitment to client service begins with its employees who have a wealth of knowledge, experience, capabilities and project management expertise. We see creative solutions where others see problems.

Our style of client service goes beyond completing a project on time and within budget, to making sure that every aspect of the project is taken care of in the best way possible. We explore alternative approaches and work hard at providing the most appropriate, cost-effective engineering solutions.

The success of every project assignment depends on the skills of our staff members. Our personnel are dedicated to their profession and their work. They are of course chosen for their technical abilities but also for their client interaction, communication skills and for their abilities to deliver a quality project on time and within budget. The mission of our staff is to make sure every project is completed to the satisfaction of the client, in compliance with technical requirements and in accordance with EDESSA's high standards of quality. We work closely with our clients' staff maintaining continuous communication throughout all phases of the project. We keep the clients informed about the status of the projects and any developing issues.

As every project is different, EDESSA is continually seeking new ways to serve our clients project needs. Sometimes this involves developing new strategies for unique projects. Other times it is mobilizing a team of international experts, or even placing our professionals in our clients' office to work with their in-house personnel as an extension to the clients' staff. These are just some of the ways we are prepared to provide the services needed by our clients when and where needed.

This brochure provides an overview of EDESSA's many services. We would welcome the opportunity to submit a more tailored presentation of our capabilities based on your particular project needs. Of course the best way to find how we can assist your organization is to talk to one of our consultants.



EDESSA ■ 145, Habib Bacha El Saad Street – Lyan Building ■ Ashrafieh, Beirut 2064 2506 ■ Lebanon ■
Phone: (+961 1) 615 140/2 ■ Fax: (+961 1) 611 047 ■ e-mail:beirut@edessagroup.com ■ www.edessagroup.com ■