

Offshore Geotechnical Engineer

ROLE OVERVIEW

You will be responsible for the study and the review of the natural environment before a construction project takes place.

You will provide your expert engineering advice and recommendations for near-shore and offshore construction projects. As an offshore geotechnical engineer, you will require specific knowledge related to seabed composition and soil conditions. Unusual and unique soil conditions create challenges to offshore activities, increasing costs because of site investigations and assessments. For the same reasons, modifications in design during construction are either unfeasible or extremely expensive. This limited margin of error also applies to environmental risks as operations and offshore structures are exposed to a wider range of geohazards. Additionally, environmental, and financial costs in case of failure are also exponentially higher than onshore activities.

You will likely work as a member of a multidisciplinary team, providing support in operations related to soil and rock behaviour from an engineering perspective. Within the team, you will likely be supported by intermediate and junior engineers, as well as by CAD technicians. At the senior level, you will participate in technical reviews, inspections, safety reviews, and other studies related to the design and construction of facilities.

You will also be required to work under unique conditions, with openness to spend time at sea on offshore structures. Before any development of offshore or nearshore structures begins, you will have to perform geotechnical studies of the area in question. Depending on company policy or level of seniority, your authority in geotechnical engineering will also be required to determine and obtain necessary compliance permits.

STRATA LEVEL: 3B – Engineer, Technical Specialist

Also Known as:

- Geological Engineer
- Geological Technology Engineering Specialist
- Geological Technology Engineering Consultant
- Geological Technology Engineer

Education and Experience:

- Degree in geotechnical engineering, geological engineering, geo-environmental engineering, or a related field.
- Master's degree or doctorate in related engineering discipline may be required.
- Certification by a provincial association of engineering may be required.

Associated NOC(s):

- **2144** – Geological Engineers



TECHNICAL



Engineering Design

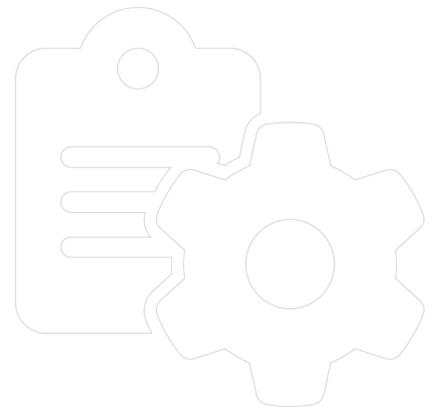
Responsible for the technical aspects of the planning and design of engineering project(s) to ensure the project is constructed in a safe, efficient, and effective manner.

- Create technical design and technical drawings using specialized CAD software to evaluate site characterization and develop advanced ground models.
- Proposes technical design or process changes to improve efficiency, quality, or performance of structures, systems, or facilities.
- Creates sketches, notes, documentation, and design documents to prepare proposals, preliminary, and final design drawings for acceptance by the client and approval by regulatory authorities.
- Prepares complete technical drawings with sufficient details and specifications to ensure the effective and safe construction of structures, systems, and facilities.
- Considers information from multidisciplinary assessments to design offshore foundations for the safe construction of offshore structures.

Engineering Review and Analysis

Reviews and analyzes relevant information pertaining to technical designs and complex systems to develop appropriate solutions.

- Reviews the designs of junior engineers and technical staff for the purposes of communicating findings, issues, and suggesting alternatives.
- Applies quality control techniques throughout the design and construction to ensure the safe construction of structures, systems, and facilities for the purposes of achieving regulatory compliance.
- Recommends appropriate technical designs or process changes to improve efficiency, quality, or performance.
- Evaluates the precision and accuracy of equipment, facilities, structures, and systems to formulate a corrective action plan.
- Carries out a regular review of data and sampling to identify changes in soil behaviour for the safe continuation of operations.



Feasibility Analysis

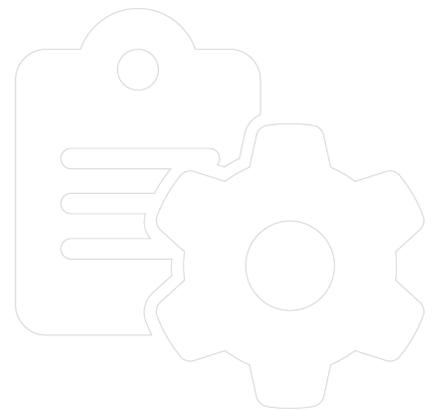
Produces a feasibility analysis of the practicality of a proposed project[s] including the economic viability, associated costs and benefits, and technical and time constraints of the project to ensure projects are completed on time and on budget.

- Carries out a scientific literature review to identify existing relevant information for the identification and evaluation of risks.
- Uses geotechnical surveys such as sampling, drilling and in situ testing to provide detailed accounts of the seabed stratigraphy and soil engineering properties for future development.
- Analyzes the efficiency of existing infrastructure and processes to determine where improvements could be implemented.
- Analyzes relevant regulations, legislations, and standards to ensure the project complies with laws, regulations, and standards.
- Reviews the criteria for a project and identifies appropriate information sources according to the purpose and types of survey work.
- Collects, interprets, and uses geospatial terrain data from existing sources to assist in the preparation of preliminary cost estimates.

Site Survey

Conducts surveys to avoid or reduce unexpected seabed or ground conditions during offshore or nearshore construction projects.

- Collect and analyze geotechnical data to ensure projects are not exposed to substantial and unnecessary risk.
- Identify geologic zones to map the economic potential of subsurface resources.
- Calculate the water saturation and other properties of subsurface sediments, rocks, and structures using electrical properties to create geophysical profiles.
- Utilizes Global Positioning Surveys and Geographic Information Systems for survey work to collect terrestrial survey data.



Data Analysis

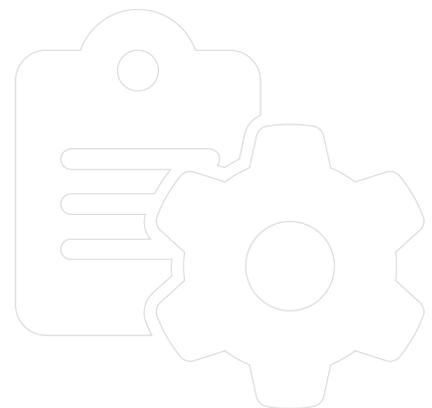
Applies recognized statistical tools and techniques to interpret and analyze data for the purposes of uncovering trends, patterns, and opportunities to enable strategic decision-making.

- Ensures appropriate tests on collected samples are properly conducted to allow for an accurate analysis.
- Uses appropriate methodologies to study collected data and provide interpretations of the result.
- Analyzes test results to make appropriate process adjustments.
- Applies qualitative and quantitative data analysis techniques and methods to determine environmental impacts of geotechnical engineering initiatives, plans and activities.
- Employs standardized techniques to plan, organize, prepare, and modify graphics to meet industry standards.
- Applies knowledge of Global Navigation Satellite System to improve the coordination and the collection of survey data.

Quality Assurance and Control

Follows appropriate processes, as directed by organizational best practices, to ensure quality is maintained throughout the collection, analysis, and management of data.

- Supervises laboratory testing to ensure accurate geotechnical analysis and reporting of soil and rock samples follow accuracy requirements.
- Monitors the execution of project activities to assess the performance of team members and project quality.
- Assesses quality control and calibration data to maintain operational standards.
- Applies statistical techniques and calculations to monitor and track acceptability of quality control results.
- Ensures that the quality of data collected to obtain compliance permits is accurate to prevent damage to the environment and human life.
- Analyze data to ensure conformance with precision and accuracy requirements.



Project Planning and Integration

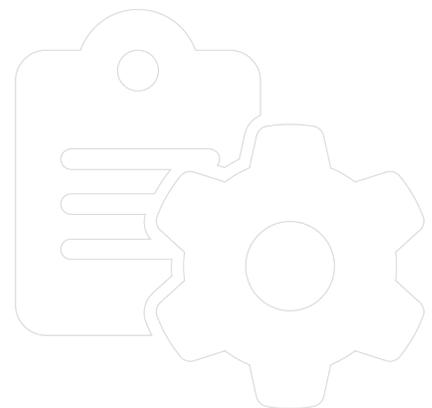
Develops a comprehensive project management plan to define how the project is executed, monitored, and controlled, integrating any subsidiary plans to perform the necessary actions and processes required to complete the project.

- Defines the project scope in accordance with organizational expectations to establish clear project deliverables and goals.
- Develops a work breakdown structure to provide the project team and relevant stakeholders with a detailed overview of deliverables.
- Defines the scope, strategy, and objectives for the technical aspects of projects and programs to establish parameters and deliverables.
- Leads the development of a project schedule to establish clear and accountable timelines to complete project phases.

Project Team Management

Coordinates a team of professionals to effectively and efficiently produce the required output to ensure project(s) are completed on time and within budget.

- Assigns daily and weekly duties to team and members to ensure supervised employees achieve deliverables and tasks are completed as required.
- Tracks team member performance and provides feedback in a constructive manner to ensure the growth of staff.
- Monitors and controls the allocation of resources and reassigns staff as needed to support project deliverables.
- Provides direction and supervision to engineers, technicians, and technologists in the design and development process to ensure clear and effective channels of communication across all departments.



PERSONAL AND PROFESSIONAL



Communication

Positively directs outcomes by delivering communication that results in a better understanding of goals and objectives and that capture interest, and gain support for immediate action.

- Prepares comprehensive reports that clearly identify project objectives, scope, research findings, alternatives, and recommendations to create a defensible impact statement.
- Leads presentations to technical and non-technical colleagues and clients to convey project plan and progress.
- Provides clear instructions, information, and duties to ensure supervised employees clearly understand their position.
- Integrates the contribution of multiple disciplines into an integrated and cohesive narrative that stakeholders can readily and easily understand.

Mentorship

Mentors junior staff by advising, supervising, and challenging them to facilitate the development and application of new knowledge in their role for the purposes of the delivery of sustainable environmental practices and professional growth.

- Engages with junior staff members to mentor and support growth to professional development.
- Shares knowledge with junior technical staff on institutional and organizational goals and values to promote a strong team environment.
- Provides constructive feedback for junior technical staff in meeting objectives to support professional development.
- Identifies training or developmental needs both for individuals and the organization and establishes new methods or programs to meet the need.



Problem Solving

Identifies problems and uses logic, judgement, and evidence to evaluate alternative scenarios and recommend solutions to achieve the desired goal.

- Builds networks of influence across stakeholders and internal staff to understand organizational dynamics to successfully respond to issues and concerns.
- Analyzes project metrics to understand trends and potential areas of concern to take appropriate actions where required.
- Uses appropriate management principles, processes, and tools to solve problems.
- Analyzes operational data to evaluate operations, understand trends, and potential areas of concern to take appropriate action where required.

Leadership

Promotes and leads cooperation among supervised personnel to achieve a collective outcome.

- Allocates duties and informs the crew of expected standards of work and behaviour to meet a standard result.
- Shares relevant and useful knowledge, experience, or expertise to aid crew to accomplish their objective more efficiently or effectively.
- Encourages team members to assist one another by contributing their knowledge, expertise, or efforts to achieve objectives.
- Provides junior members of the crew with training and developmental objectives to improve operational capabilities and current levels of competence.



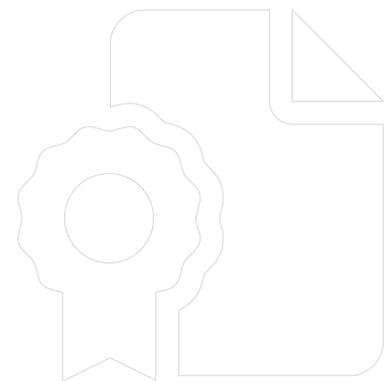
LEGAL, REGULATORY, AND POLICY



Regulatory Compliance

Adheres to specific regulations, codes, and legislation within a defined jurisdiction to ensure the health and safety of others.

- Possess up-to-date knowledge of federal, state, and local environmental regulations to ensure specific codes and technical standards are followed.
- Complies with specific industry regulations within a defined jurisdiction to maintain a safe work environment.
- Notifies necessary parties of containment or quality issues to ensure appropriate measures are taken.
- Clearly communicates the regulatory compliance requirements to ensure employees have the requisite information to perform duties safely and effectively.
- Demonstrate knowledge of regulations, codes, standards, and safety, including local engineering procedures and practices to ensure the safe operation of facilities and systems.



ENVIRONMENTAL



Environmental Evaluation

Studies environmental aspects of an area to understand the potential effects of proposed development activities on the surrounding natural and human environments.

- Performs geotechnical studies, field tests, and analysis to provide expert engineering advice and recommendations for construction projects.
- Uses precaution when analyzing specific project objectives and goals to ensure the lowest environmental impact possible.
- Researches the environmental effect of geotechnical activities on aquatic environments to determine the impacts of departmental initiatives, plans and activities.
- Weighs the impacts of engineered designs on life, health, property, economic interests, and the environment to ensure products or systems are in the best interest of public life.

Marine Pollution Prevention

Follows requirements to ensure projects and operations are conducted at the highest standard possible for the prevention of marine pollution.

- Takes appropriate precautions to prevent pollution of the marine environment.
- Applies procedures for monitoring offshore operations to comply with legislative requirements to ensure a positive environmental reputation.
- Takes into consideration seabed quality to safely develop offshore structures to withstand the weight of the structure in any meteorological scenario.
- Carries out exhaustive research to implement best techniques for the prevention of submarine pipelines from breaking or sliding.

