

# MD AFROJ ALAM

PMP®, CEng, PEng

## Senior Manager-Tunnel/Geotech/Infrastructure



### Contact

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Location: Riyadh

### Qualifications

- **M.Tech** Geotechnical Engineering), Indian Institute of Technology (IIT) Kharagpur, India
- **B.Tech'** Civil from Aligarh Muslim University (AMU) Aligarh-India

### Core Skills

- Strategic Project Leadership
- Design Governance
- Tunnel system oversight
- Ground Engineering solution
- Site investigation & GIR
- Team and Resource Management
- Risk, interface and dependency control
- Contractor and stack holder alignment
- QA, QC, Regulatory Compliance
- Cost, value and change management
- People driving management

### Technical Skills:

#### - Advanced

- RS2 (Phase2)
- Swedge
- Unwedge Slide2DSlope/W
- RocLab
- RocSupport
- LPile, AllPile
- GINT

#### - Intermediate

- BIM
- Aconex
- GeoStudio Suite
- MathCAD
- PLAXIS 2D/3D

#### - Working Knowledge

- SeisImage
- NOVA Point
- PIKWIN
- COM624
- GGU Settle

### Professional Overview

PMP-certified Civil & Geotechnical Engineering leader with **20 years** of global experience shaping and delivering complex underground infrastructure project such as Rail, Metro, Tunnel (TBM/NATM), Airport, Highway, Marine Giga/Mega development programs across Saudi Arabia, UAE, Kuwait, India, South Korea, Vietnam, Finland, Sweden, and Bangladesh.

Adept at steering geotechnical and tunnel design strategy, governing multidisciplinary engineering interfaces, and guiding project teams through high-value design, construction, and delivery phases. Known for elevating design governance, strengthening technical decision-making, and orchestrating cross-functional collaboration to achieve safe, compliant, and cost-optimized outcomes. Combines deep technical capability in ground engineering, tunnel with a leadership philosophy centered on vision, clarity, and organizational alignment.

Recognized for mitigating geotechnical risks, improving engineering efficiency, driving team for technical due diligence and enabling project success across EPC/PMC environments.

### Professional Skills

| Area                          | Expertise/Exposure   |
|-------------------------------|--|
| <b>Design Management</b>      | <ul style="list-style-type: none"><li>• Strategic design leadership, for entire design process including conceptual, preliminary, and detailed design phases, technical guidance and feedback to clients</li><li>• Comprehensive reviews of tunnel designs challenging geological occurrence and excavation strategies, Numerical Modelling, ground freezing, TBM thrust forces</li><li>• Assess Risk Management, identify potential risks during tunnel design and construction phases, including ground stability, water ingress, emergency response strategies for face instability and recommendation of different monitoring system.</li><li>• Engage with regulatory authorities to obtain permits and approvals while integrating the latest technical advancements into design solutions.</li><li>• Monitor design Progress, design decisions, change orders, approvals, and compliance reports for auditability and transparency.</li></ul> |
| <b>Project Management</b>     | <ul style="list-style-type: none"><li>• <b>Project Planning &amp; Team Leadership:</b> Oversee project setup, ensuring seamless integration of Ground Engineering with site operations, design, and technical deliverables.</li><li>• <b>Construction Methodology:</b> Assess the integration of tunnel technology in the design process, reviewing technical aspects such as machine type, cutterhead design, segment lining, mucking systems, and TBM ovalization etc.</li><li>• <b>Construction Oversight:</b> Expertise in project supervision, risk management, quality control, and execution, standardized operating procedures for efficient project execution.</li><li>• Champion on strong safety culture, competency development across organization within support function.</li><li>• Establish and operationalize the capability for Tunnelling, process optimization and digitalization initiative.</li></ul>                         |
| <b>Leadership Management</b>  | <ul style="list-style-type: none"><li>• Provide Strategic and operational Leadership for all ground engineering services activities.</li><li>• Lead mentoring and training programs, fostering continuous improvement in sustainable engineering practices.</li><li>• Support BD team for tunnel and Geotech business strategies &amp; business, integrating sustainability, Prebid and contract negotiation</li><li>• Managing own divisional Budget, performance KPI, Oversee software licensing,</li><li>• Conduct training sessions on tunnelling technologies, develop culture of collaboration, accountability, and continuous improvement strategy</li></ul>  |
| <b>Stakeholder Management</b> | <ul style="list-style-type: none"><li>• <b>Client &amp; Vendor Management:</b> Lead techno-commercial discussions, manage client relationships, vendor empanelment, cost variations, and Bill of Quantities (BOQ).</li><li>• <b>Stakeholder Collaboration:</b> Collaborate with internal stakeholders including design, procurement, contracts, and construction management teams to align project execution with design to ensure compliance and high-level execution.</li></ul>  |

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### Certification & Membership

- PMP® – Project Management Institute
- Chartered Engineer (CEng), Institution of Engineers
- Professional Engineer (PE), Engineering Council of India
- Life Member – Indian Geotechnical Society
- Life Member – ISRM (Tunnelling & Rock Mechanics)
- Member – International Tunnelling Association
- Life Member – Consulting Engineers Association of India

### Achievements/Publication:

- Selected for DGM – Geotech, DMRC (Govt. of India), 2021
- Invited Speaker – “Tunnel Construction in India,” Grand Hyatt Mumbai
- Selected for SMEC Young Dynamic Engineer Program, 2018

### Professional Trainings/ Workshops

- Rocscience (2D–3D Slope Analysis)
- MDP for Engineering Leadership
- Advanced Geotechnical Workshops
- PMP training by Red Sea Global
- Effective Communication Management
- Quality Management Training

### Language Known:

- English,
- Arabic,
- Hindi,
- Urdu,
- Persian
- Finnish

### Career Conspectus

#### **Senior Manager – Infrastructure / Geotech / Tunnel RED SEA GLOBAL (RSG), Riyadh, Saudi Arabia Mar 2023 – Present**

##### Key Responsibilities

- Provide technical authority for geotechnical, tunnelling, deep foundation, and underground works across AMAALA, Red Sea, Desert Rock, and GIGA-scale assets.
- Lead end-to-end design governance, multidisciplinary integration, and civil–geotechnical strategy, ensuring optimized, compliant, and coordinated design outcomes.
- Evaluate advanced digital tools, modelling platforms, and innovative construction technologies to enhance ground engineering performance.
- Conduct high-level technical due diligence for new packages, design validations, GIR reviews, and optimization of foundation, piling, and grading solutions.
- Direct constructability reviews, risk assessments, and method-statement approvals, ensuring execution plans align with performance, safety, and cost objectives.
- Mentor engineering teams, conduct capability-building workshops, and establish a knowledge ecosystem for continuous improvement in tunnelling and ground engineering.
- Represent the organization in industry forums, technical committees, and partner engagements to strengthen RSG’s geotechnical & tunnelling leadership presence.
- Strengthen stakeholder collaboration with design, procurement, contracts, environment, and construction teams to resolve technical issues and maintain engineering coherence

##### Key Achievements

- Delivered multiple infrastructure packages with zero design rework and sustained technical compliance.
- Achieved 12–15% cost savings by optimizing piling, ground improvement, and terrain modeling solutions.
- Reduced Tunnel design conflicts by 30% through structured oversight and multidisciplinary governance.
- Optimized ground improvement and rock-anchor design strategies, achieving 25–30% cost savings.
- Strengthened internal capability through structured training programs and design-review frameworks.

#### **Senior Engineering Manager / Project Manager LARSEN & TOUBRO (L&T ECC), India May 2021 – Mar 2023**

##### Key Responsibilities

- Served as the tunnelling technical lead for TBM/NATM projects (Pakaldul 10 km, NEOM MRT 3A 31 km), guiding end-to-end design, modelling, and execution strategies.
- Evaluated and finalized TBM specifications, cutterhead design, ground conditioning methods, and stabilization requirements under complex geological profiles.
- Directed geotechnical risk modelling, EGO mitigation, segmental lining reviews, and compliance checks across all engineering deliverables.
- Conducted constructability assessments, method-statement validation, and execution-stage risk predictions to safeguard schedule and quality.
- Led TBM procurement strategy, portal excavation stabilization, launching-shaft engineering, and multidisciplinary interface coordination.
- Provided capability development to engineering teams through technical sessions and establish the operationalize capacity for tunnelling.
- Supported tendering teams with technical inputs, risk evaluation, and value-engineering options for major tunnel bids.
- Fostered inclusive leadership across multinational field teams, demonstrating clarity and calmness during ground-related uncertainties.

##### Key Achievements

- Improved TBM performance by 18% through refined specification and cutterhead strategies.
- Prevented excavation delays through early detection of high-risk geological zones and proactive mitigation.

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- Achieved 100% technical compliance across all client engineering submissions.
- Strengthened tunnelling design governance through structured modelling and technical review processes.

### Senior Associate – Rail, Metro & Tunnel

SMEC (Surbana Jurong Group), India & Bangladesh

Apr 2017 – Mar 2021

#### Key Responsibilities

- Led geotechnical and tunnelling design for Chennai Metro UG stations and Mumbai Metro elevated corridors, ensuring design alignment with system-wide requirements.
- Conducted advanced FEM modelling, settlement simulations, liquefaction evaluations, and slope-stability analysis using PLAXIS and geotechnical suites.
- Prepared GIRs, optimized ground improvement systems, and designed deep foundations, D-walls, secant piles, and raft systems.
- Drove design reviews, interdisciplinary coordination, and stakeholder approvals across DPR and DDC packages.
- Delivered constructability assessments and technical recommendations during bid and execution planning.
- Provided internal training on FEM modelling, geotechnical interpretation, and design governance practices.
- Supported business development teams with technical inputs and feasibility-stage risk insights.
- Maintained strong collaboration with architects, structures, MEP, and systems teams to ensure seamless integration.

#### Key Achievements

- Delivered design packages with zero NCRs from client reviewers.
- Enhanced settlement prediction accuracy by refining geo-material models and calibration methods.
- Ensured timely delivery of DPR/DDC packages, strengthening client confidence.

### Senior Design Engineer – Geotechnical

RAMBOLL (REC), Finland, Sweden, Denmark, Estonia, France

Oct 2015 – Apr 2017

#### Key Responsibilities

- Led geotechnical design for Helsinki Airport development and Stockholm motorway tunnels, ensuring Eurocode-aligned deliverables.
- Conducted deep excavation modelling, sheet-pile and secant-pile design, FEM analysis, and ground-behaviour assessments.
- Coordinated with civil, structural, and architectural teams to harmonize geotechnical solutions and design interfaces.
- Provided value-engineering suggestions and constructability insights for cost-efficient implementation.
- Shared technical knowledge through internal review sessions and cross-discipline engagement.

#### Key Achievements

- Delivered airport geotechnical packages ahead of schedule, strengthening Ramboll's client reputation.
- Reduced risk-class deviations through rigorous design checks and optimized modelling approaches. Expertise in developing and implementing shoring systems to ensure the stability and safety of excavations throughout the project lifecycle.
- Design of Retaining and Sheet Pile Walls using advanced analytical programs, including D-Sheet, to optimize design efficiency and structural performance.
- Plaxis 2D Analysis for Excavation Support under complex loading conditions, evaluating wall deflection and ground movement around excavations.
- Geotechnical Design Development for Foundations systems, ensuring stability, load-bearing capacity, and compliance with project specifications and site conditions.

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### Senior Geotechnical Expert

PETROFAC ENGINEERING, Sharjah, UAE

Apr 2014 – Sep 2015

#### Key Responsibilities

- Designed foundations and ground systems for refinery structures, storage tanks, and heavy-equipment zones.
- Led GI plans, vendor evaluations, BOQs, specifications, and construction-supervision guidance.
- Recommended PVD, vibro-compaction, and soil-stabilization solutions for complex refinery soils.
- Provided technical training on refinery geotechnics and ground-improvement technologies.
- Collaborated with process, structural, and procurement teams to ensure fully integrated solutions.
- Identifying and mitigating geotechnical risks related to soil, settlement, and groundwater.

#### Key Achievements

- Delivered optimized ground-improvement systems resulting in major cost efficiencies.
- Supported construction teams through targeted technical interventions and risk mitigation.

### Project Engineer

SK ENGINEERING & CONSTRUCTION (SK E&C), South Korea

Aug 2010 – Apr 2014

#### Key Responsibilities

- Supervised TBM tunnelling operations for high-speed rail corridors, ensuring safe and efficient operations.
- Monitored segment installation, annulus grouting, TBM performance, and geotechnical responses.
- Provided design feedback, technical progress reporting, and alignment corrections during tunnelling.
- Coordinated with OEM specialists and field teams to address machine-performance challenges.
- Supported site teams in resolving ground-behavior issues and optimizing work cycles.
- Lead and coordinate multi-disciplinary teams, including TBM operators, segment installation crews, and geotechnical specialists, to ensure seamless operations.
- Oversee tunneling activities to maintain the designed alignment, strict tolerances, and gradient, ensuring compatibility with high-speed rail operational standards.
- Reviewing and verifying soil investigation reports and providing foundation recommendations.

### Geotechnical Engineer

GULF CONSULT, Saudi Arabia

Jun 2007 – Jul 2010

#### Key Responsibilities

- Executed GI, borehole logging, CPT/SPT campaigns, lab testing, GIR preparation, and foundation recommendations.
- Performed bearing-capacity calculations, settlement modelling, slope stability assessments, and dewatering design.
- Interfaced with design teams for Riyadh Metro, Aramco, and water-transmission projects, ensuring alignment with ground conditions.
- Conducted construction-stage geotechnical checks and provided on-site technical support.
- Supported feasibility studies with soil-profile interpretations and risk screenings.
- Evaluate seismic and dynamic effects on metro structures.
- Ensure adherence to Saudi Building Code, ASTM, AASHTO, and project-specific guidelines.
- Address desert-specific issues like collapsible soils, expansive clays, and high evaporation.

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## Project Portfolio

| Sector        | Projects   |
|---------------|--|
| Red Se Global | <ul style="list-style-type: none"><li>• Laheq Island, Ridge residency, Rock Desert – AMAALA</li><li>• Laheq Mudra Crossing Bridge (3.8 km length)</li><li>• Mountain Golf and ocean Golf Residence- Saudi Arabia</li></ul>   |
| Rail & Metro  | <ul style="list-style-type: none"><li>• Chennai Metro, Mumbai Metro-<b>India</b></li><li>• Riyadh Metro-<b>Saudi Arabia</b></li><li>• Etihad Rail -<b>UAE</b></li><li>• Honam High-Speed Rail- <b>South Korea</b></li><li>• Dedicated Rail freight Corridor, Package CTP-11, CTP-14, CPT 3R- <b>India</b></li></ul>  |
| Tunnels       | <ul style="list-style-type: none"><li>• Pakaldul Head Race Tunnels (HRT) Tunnel; J&amp;K-India</li><li>• Lower Kopili Hydroelectric Project (120MW)</li><li>• Gandhi Sagar Pumped Storage Project</li><li>• Chenani-Nashri Tunnel Tunnel (9.2km NATM); <b>J&amp;K-India</b></li><li>• Neom MTR-3A (Tunnel)- (30km NATM/D&amp;B) <b>Saudi Arabia</b></li><li>• Salang Tunnel- (2.6km) – <b>Afghanistan</b></li><li>• Etihad Rail- HJR Tunnel, (3.2km NATM)- <b>UAE</b></li><li>• Zojila Tunnel- (14km NATM)- <b>J&amp;K India</b></li><li>• Mumbai Coastal Road Tunnel-(2.07km twin TBM)- <b>Mumbai</b></li></ul> |
| Airport       | <ul style="list-style-type: none"><li>• Helsinki Airport – <b>Finland</b></li><li>• Kabalega International Airport, <b>Uganda</b></li><li>• Noida International Airport-India</li></ul>  |