

# Syed Waheed Hamdani

## Engineering Geologist | Geotechnical Engineer

✉ waheedxyed@gmail.com

☎ +966-553842503

📍 Tabuk, Saudi Arabia

🇵🇰 Pakistani

📄 Transferable Iqama | Saudi Driving License

🛡 Neom Approved Geotechnical Engineer

📄 Registered with SEC - 1177998



### Profile

Geotechnical and tunneling professional with over 11 years of experience delivering large-scale infrastructure and underground construction projects. Extensive expertise in ground investigation, rock mechanics, slope stability, and tunnel excavation using TBM and Drill-and-Blast methods. Proven contribution to complex, multi-billion-dollar developments including NEOM, supporting both surface and underground works through detailed geological mapping, real-time ground assessment, and optimized support solutions. Strong ability to integrate geotechnical data with construction activities, mitigate subsurface risks, and enhance safety and performance in challenging ground conditions. Experienced in working closely with clients, consultants, and contractors to deliver technically sound and efficient project outcomes.

### Education

2018 – 2020	<b>MS Geology</b> University of Azad Jamu and Kashmir CGPA 3.47/4
2011 – 2015	<b>BS Geology</b> University of Azad Jamu and Kashmir CGPA 3.31/4

### Core Competencies

- Ground Investigation & Subsurface Characterization
- Tunnel Construction (TBM & Drill-and-Blast)
- Rock Mechanics & Rock Mass Classification (RMR, Q, SMR)
- Geological Mapping & Tunnel Face Assessment
- Foundation Engineering & Ground Improvement
- In-situ Testing & Geotechnical Instrumentation
- Tunnel Support Systems & Excavation Control
- Grouting & Seepage Mitigation
- Slope Stability & Geotechnical Analysis
- Risk Assessment & Hazard Mitigation
- Technical Reporting & Stakeholder Coordination

### Projects

2024/12 – present	<b>Trojena Dam</b> <b>Project Type:</b> Mega Dam & Mountain Infrastructure Development <b>Estimated Project Value:</b> ~\$5–10+ Billion <ul style="list-style-type: none"><li>• Scope includes <b>Roller Compacted Concrete (RCC) Dam, Rockfill Dam, Bow Structure, Roads &amp; Tunnels</b>, and <b>Enchanted Forest development</b></li><li>• Client: <b>NEOM</b></li><li>• Consultant: <b>Bechtel</b></li><li>• Contractor &amp; Designer: <b>Webuild S.p.A</b></li></ul>
2023/09 – 2024/12	<b>NEOM Spine Infrastructure – Running Tunnels (Mountain Section) Lot 4 and 5, Tabuk, Saudi Arabia</b> <b>Location:</b> Tabuk, Saudi Arabia <b>Project Type:</b> Mega Rail & Tunnel Infrastructure <b>Estimated Project Value:</b> Part of NEOM Spine (~\$20–50+ Billion program) <ul style="list-style-type: none"><li>• Construction of <b>28 km MRT &amp; FRT tunnels (Mountain Section)</b></li><li>• Client: <b>NEOM</b></li><li>• Consultant: <b>Bechtel</b></li><li>• Designer: <b>ACOM</b></li><li>• Contractor: <b>Samsung C&amp;T (SHAJV)</b></li></ul>
2022/11 – 2024/02	<b>NEOM Spine Earthwork – Coastal Desert West Region</b> <b>Project Type:</b> Large-Scale Earthworks & Infrastructure Preparation <b>Estimated Project Value:</b> Part of NEOM Spine (~\$20–50+ Billion program) <ul style="list-style-type: none"><li>• Major <b>earthworks &amp; site development</b> for Spine corridor</li><li>• Employer / Client: <b>NEOM</b></li><li>• Consultant: <b>Bechtel</b></li><li>• Designer: <b>Khatib &amp; Alami</b></li><li>• Contractor: <b>MASCO</b></li></ul>
2021/04 – 2022/09	<b>Jagran Hydropower Project Phase-II</b> <b>Location:</b> Neelum Valley, AJK <b>Project Type:</b> Hydropower / Tunnel Engineering <b>Estimated Project Value:</b> ~\$90–120 Million <ul style="list-style-type: none"><li>• <b>48 MW Hydropower Project</b></li><li>• Client: <b>Power &amp; Development Authority, AJK</b></li><li>• Consultant: <b>JHC</b></li><li>• Contractor: <b>FWO (Frontier Works Organization)</b></li></ul>

2016/01 – 2021/02

### Neelum Jhelum Hydropower Project

**Location:** Muzaffarabad, AJK

**Project Type:** Mega Hydropower & Underground Tunneling

**Total Project Value:** ~\$4.5–5 Billion

**Capacity:** 969 MW

- **28.5 km underground tunnel system**
- Employer: WAPDA
- Consultant: JV (MWH, NORPLAN, NESPAK, ACE, NDC)
- Contractor: CGGC (China Gezhouba Group Company)

## Professional Experience

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2024/12 – present  
Trojena Dam- NEOM,  
Saudi Arabia

### Engineering Geologist

*Webuild S.P.A KSA*

#### Dam Construction

- Conducted sketch and Ortho slope & foundation mapping and stability analysis to ensure safety of slopes & foundation.
- Supervised in-situ testing, including Standard Penetration Tests (SPT), Cone Penetration Tests (CPT), and Load Bearing Tests to assess soil and rock properties.
- Performed permeability testing and groundwater flow evaluations, optimizing dam foundation designs for stability and longevity.
- Collaborated with design teams to incorporate geological insights into planning and execution phases.

#### Tunnel Construction

- Performed geological mapping during tunnel excavation to identify rock mass classifications, discontinuities, and structural challenges.
- Assessed ground conditions to mitigate risks such as instability and water ingress, ensuring excavation safety.
- Coordinated with design teams to optimize tunnel alignment and excavation methods.

#### Ground Investigation & Foundation Works

- Supervise borehole drilling, soil & rock logging, sampling, and in-situ testing for dam foundations, slopes, tunnels, and associated infrastructure.
- Review and verify micropiling investigation data, foundation levels, and ground improvement requirements.
- Coordinate and monitor geophysical ground investigations, including seismic-based studies, to correlate subsurface profiles with borehole data.
- Cross-check ground investigation reports submitted by subcontractors to ensure compliance with project specifications and international standards.

#### Supervision & Coordination

- Supervise GI subcontractors performing drilling, testing, and geophysical surveys on site.
- Act as a technical focal point between client (NEOM), consultant (Bechtel), and contractor for ground investigation-related matters.
- Provide technical input for foundation design optimization and construction sequencing.

#### Reporting & Communication

- Prepare and review geological, geotechnical, and ground investigation reports, including factual and interpretative reports.
- Maintain accurate GI databases and ensure data integrity in AGS and project-specific formats.

2024/02 – 2024/12  
MRT-The Line-Neom  
City, Tabuk-KSA

### Geotechnical | Construction Engineer

*Samsung C&T-Saudi Arabia*

#### Technical Coordination & Planning

- Acted as a technical liaison between design, geotechnical, and construction teams, resolving ground-related issues during daily Site Review Group (SRG) meetings.
- Reviewed ground conditions against design assumptions and communicated geotechnical risks, constraints, and mitigation measures to stakeholders.
- Prepared and reviewed technical submissions, method statements, and reports, ensuring compliance with project specifications, contract requirements, and quality standards.

#### Construction Supervision

- Supervised drilling and blasting operations, ensuring compliance with approved method statements, safety requirements, and environmental controls.
- Oversaw the installation of tunnel support systems including rock bolts, shotcrete, steel ribs, and CT bolts, verifying support types against ground conditions.
- Coordinated with construction teams to adjust excavation and support measures in response to changing geological and geotechnical conditions.

#### Geotechnical & Ground Investigation

- Conducted detailed geological mapping during tunnel excavation to document lithology, structural features, discontinuities, and potential geological hazards.
- Supervised soil and rock investigation works, including borehole drilling, sampling, and logging for tunnel alignments, portals, and associated structures.
- Witnessed and supervised in-situ soil testing, including SPT and CPT, ensuring correct procedures, test frequency, and data accuracy.
- Supported and supervised supplementary ground investigations to address unforeseen ground conditions encountered during construction.

#### Technical Coordination & Data Management

- Processed and structured geotechnical data (SPT, CPT, laboratory results, borehole logs) for input into advanced data management systems.
- Managed the transfer, validation, and storage of field testing, monitoring, and ground investigation data on centralized project servers for client and contractor access.
- Cross-checked ground investigation and laboratory reports submitted by subcontractors, ensuring consistency, completeness, and technical accuracy.
- Contributed to the preparation of Hazard Identification Plans (HIP), ground risk assessments, and other critical geotechnical documentation.

#### Safety & Compliance

- Ensured full compliance with geotechnical, HSE, and legislative standards during confined-space operations, drilling, blasting, and underground works.
- Managed work permits, risk assessments, and safety protocols for ground investigation activities and tunnel support installations.
- Monitored subcontractor compliance with approved safety and quality procedures, raising non-conformances where required.

2023/11 – 2024/02  
NEOM Spine Earthwork  
– Coastal Desert West  
Region

### **Geotechnical Engineer**

*MASCO (Mahammad Ali Alswailem Group)*

#### **Field Investigations and Geological Mapping:**

- Conducted comprehensive field investigations, including geological mapping and soil sampling, to assess slope conditions and inform stabilization strategies.
- Led geological mapping of open-cut slopes at Spine Earthwork Neom Lot 10.1, employing detailed analysis to accurately classify rock types and identify potential risks.

#### **Slope Stability Analysis and Design:**

- Applied Rock Mass Rating (RMR), Slope Mass Rating (SMR), and kinematic analysis techniques to evaluate slope stability and geological formations, optimizing design solutions.
- Finalized slope support designs for rock and soil slopes, ensuring resilience against excavation stresses and structural integrity.

#### **Risk Assessment and Mitigation:**

- Conducted risk assessments considering environmental conditions, meteorological factors, and potential hazards to enhance worker safety and project resilience.
- Implemented monitoring programs to assess and mitigate slope instability issues during project execution, ensuring proactive risk management.

#### **Slope Stabilization and Technical Documentation:**

- Supervised measurements and installation of open-cut support systems, including rock bolts, anchors, soil nail walls, sprayed concrete, and fiber-reinforced shotcrete, ensuring structural stability.
- Contributed to the design and implementation of slope stabilization measures, integrating findings into comprehensive strategies to mitigate geological risks.
- Prepared detailed reports on slope stability, delivering clear and concise technical documentation to clients, stakeholders, and regulatory authorities to facilitate informed decision-making.

#### **Software Skills and Analysis:**

- Utilized Rock science Dips, MS Word, and MS Excel for calculating SMR factors, conducting kinematic analyses, and performing geotechnical analyses to optimize slope designs and construction methodologies.

2021/04 – 2022/09  
Jagran Hydropower  
Project Phase-II, Neelum  
Valley, Pakistan

### **Geotechnical Engineer**

*FWO*

- Inspected reinforcement installations across powerhouse and tunnel sections, ensuring compliance with updated shop drawings.
- Supervised **ground stabilization activities**, including consolidation grouting and anchor installation.
- Conducted excavation and slope stability assessments, applying **RMR and SMR techniques**.
- Ensured adherence to safety protocols and prepared detailed progress reports for stakeholders.

2016/01 – 2021/02  
Neelum Jhelum  
Hydropower  
Project, Muzaffarabad,  
Pakistan

### **Engineering Geologist**

*(ACE) Associate Consultant Engineering*

#### **Ground & Geotechnical Investigation**

- Conducted and interpreted ground and geotechnical investigations, including correlation of borehole data, probe drilling results, and geological logs, to predict ground behavior ahead of the TBM face.
- Reviewed borehole logs, core recovery, and geotechnical investigation data to validate baseline ground models and identify discrepancies during construction.

#### **Face Mapping, Probe Drilling & Geological Logging**

- Performed detailed face mapping, probe drilling interpretation, and geological logging to identify weak zones, fault intersections, shear zones, and potential water ingress areas.
- Assessed ground conditions ahead of excavation to support proactive risk mitigation measures.

#### **Grouting & Ground Improvement**

- Supervised pre-excavation, contact, and consolidation grouting operations to control seepage, improve ground conditions, and stabilize weak or fractured zones.
- Monitored grout pressures, volumes, and ground response to assess treatment effectiveness.

#### **Rock Mechanics & Stability Assessment**

- Conducted rock mass classification using RMR, Q-System, and SMR, determining tunnel support requirements and reinforcement measures.
- Identified squeezing ground, fault gouge zones, and unstable rock masses, providing technical recommendations to mitigate associated risks.

#### **Risk Mitigation & Construction Support**

- Provided real-time geological and geotechnical recommendations to mitigate construction risks such as squeezing ground, face instability, excessive deformation, and high groundwater inflows.
- Supported decision-making related to excavation sequencing and ground treatment strategies.

#### **Geotechnical Reporting & Documentation**

- Produced detailed geotechnical and geological reports, including longitudinal sections, cross-sections, and geological profiles, for design validation and construction reference.
- Maintained accurate records of ground conditions, investigation data, and construction observations in accordance with project documentation standards.

## Skills

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MS Word

MS PowerPoint

Adobe Photoshop

CorelDraw

Arc GIS

Petrel

TechLog

MS Excel

gINT

AutoCad

Outlook

Dip Software

Un-Wedge

Slide 2

Swedge

AGIS soft Metashape

## Languages

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• English

• Urdu