

# Daira Sabz

Consulting and Engineering Group

## Geotechnical Services and Laboratory

At Daira Sabz Consulting and Engineering Group, we provide specialized Geotechnical Services and advanced Geotechnical Laboratory Testing to support the mining, construction, and environmental sectors. With operations in Germany and Afghanistan, and international project experience, we adhere to global best practices including ISO 9001:2015, ISO 14001:2015, DIN EN standards, and relevant Afghan national regulations.

Our services combine in-depth engineering knowledge, precise field data, and state-of-the-art laboratory analysis to ensure safety, resilience, and compliance in diverse infrastructure projects.





## Site Investigation and Soil Analysis

- Borehole drilling, sampling, and geophysical logging
- Standard Penetration Test (SPT), Cone Penetration Test (CPT)
- Laboratory classification, compaction, permeability, and strength testing
- Subsurface profiling and stratigraphy



## Slope Stability and Landslide Risk Assessment

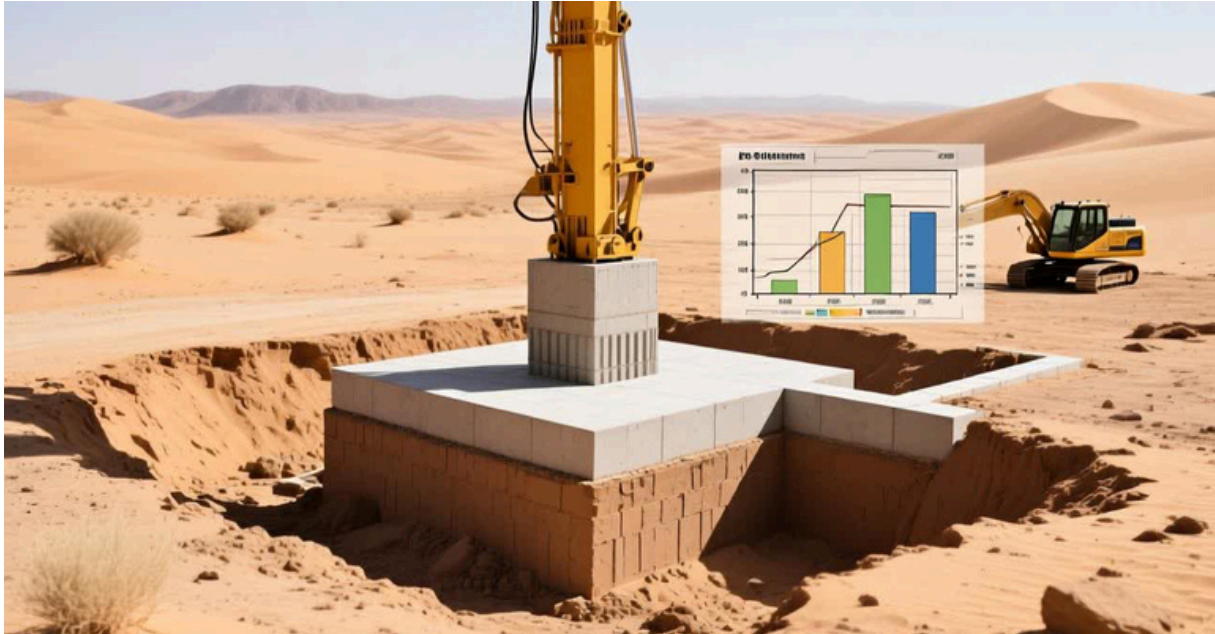
- Stability design for embankments, slopes, and open-pit mines
- Seepage and reinforcement analysis using PLAXIS, Slide, and Geo5
- Real-time slope monitoring systems





# Foundation Design and Settlement Analysis

- Shallow and deep foundation design (pads, rafts, piles)
- Bearing capacity estimation
- Soil-structure interaction modeling
- Load-settlement prediction and foundation optimization



# Earth Retention Systems & Ground Improvement

- Design of retaining walls, anchored walls, and mechanically stabilized earth structures
- Ground improvement (grouting, stone columns, deep soil mixing)
- Drainage and dewatering design



# Hydrogeological and Environmental Geotechnics

- Groundwater impact modeling using MODFLOW and SEEP/W
- Contaminant transport modeling and mitigation
- Dewatering system design
- Environmental risk assessments and landfill siting studies



## Geotechnical Laboratory Services

**Our laboratory is fully equipped to deliver high-quality testing for soil, rock, water, and construction materials. We support project lifecycle phases from feasibility to monitoring and commissioning.**

### Soil & Rock Testing

- Soil Classification: Atterberg limits, particle size distribution, Proctor, CBR
- Strength Testing: Direct shear, unconfined compressive strength, triaxial tests
- Consolidation Tests: Oedometer, swell potential
- Rock Mechanics: Uniaxial/triaxial compressive strength, RQD, point load index

### Material Testing

- Concrete compressive strength
- Asphalt and aggregate grading
- Cement fineness, setting time, soundness
- Plate load and pile load tests



# Water Quality Testing

- pH, turbidity, conductivity, dissolved oxygen
- Heavy metal analysis, nitrate/phosphate levels
- Groundwater suitability for construction and irrigation



## Software Tools Used

No	Application Area	Software
1	Site & Soil Analysis	gINT, GEO5
2	Slope Stability	PLAXIS 2D/3D, Slide
3	Foundation Design	PLAXIS, GEO5
4	Groundwater Modeling	MODFLOW, SEEP/W
5	Reporting & Documentation	AutoCAD, MS Project, QGIS

# Geotechnical Laboratory Services

- **ISO-Certified Lab and Engineering Services**
- **Cross-border Experience:** Deep knowledge of local terrain in Central Asia and regulatory systems in the EU
- **Advanced Instrumentation:** Calibrated lab and field equipment
- **Sustainability Focus:** Integration of eco-efficient and low-impact construction techniques
- **Multidisciplinary Team:** Geotechnical engineers, hydrologists, geologists, and environmental consultants



**Daira Sabz**  
**Consulting and Engineering Group**  
Your Strategic Partner for  
Development and Sustainability