



AARON L. LEOPOLD, P.E.
Senior Engineer



Professional Experience

Joined DBA 2022

Total years of experience: 8

Senior Geotechnical Engineer, Shannon & Wilson, Denver, Colorado (2014-2022)

Undergraduate and Graduate Research Assistant, Dept. of Civil and Environ. Eng., University of Illinois (2012-2014)

Education

M.S., Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, 2014

B.S., Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, 2013

Professional Licensure and Certifications

Licensed Professional Engineer in Colorado

Fields of Expertise

Geotechnical exploration, design, construction, and instrumentation of deep foundations; Extensive construction experience of drilled shafts of varying techniques throughout the western US; Design, construction, instrumentation, and testing of ground anchors; Numerical modeling of anchored drilled shaft systems for landslide stabilization; Design and construction of support of excavation (SOE) systems

Major Projects

NDDOT Horseshoe Bend Landslide Stabilization – North Dakota (2019-2022) – Geotechnical explorations, instrumentation, and design to stabilize a 60-ft deep landslide. Design with FLAC2D consisted of 6-foot diameter drilled shafts connected with a cap beam and 6-strand ground anchors. Construction observation occurred over 8 months and included two sacrificial ground anchor tests, CSL tests, TIP tests, and temporary and permanent SAAs.

Traer Water Tank Replacement – Colorado (2020-2021) – Explorations, instrumentation, design, and construction oversight for drilled shafts to support a water tank on top of collapsible soils. Soil-structure interaction was analyzed and designed with FLAC3D. Drilled shafts of various diameters and spacing were analyzed to optimize the project cost.

NDDOT Long X Bridge Replacement – North Dakota (2019-2020) – Geotechnical exploration, instrumentation, and design for bridge foundations to withstand landslide movement up to 65 feet deep. Construction observation consisted of the first drilled shaft installed with 8-foot-diameter oscillated permanent casing and two 10-strand sacrificial ground anchors with downhole DynaForce sensors.

Ralston Reservoir Monitoring – Colorado (2015-2022) – Instrumentation monitoring for ongoing slope instability. Instrumentation readings were increased during reconstruction of the spillway with large live loads on the slope.

CDOT Retaining Wall Asset Management Program – Colorado (2015-2022) – Asset Management of over 3,000 retaining walls in Colorado. Included prioritizing repairs by risk and determining life cycle analysis based on deterioration rates of wall types, facing, and repairs.

MDT MT-80 Arrow Creek Landslide Stabilizations – Montana (2020-2021) – Landslide reconnaissance, geotechnical explorations, instrumentation, and preliminary analyses for stabilizing three landslides within the highway corridor. LiDAR data was also processed within GIS ArcPro to better delineate subtle landslide extents.

Mountain View Corridor Design-Build – Utah (2019) – Settlement and global stability analyses for over 40 retaining walls and large embankments. Proposed retaining walls and abutments required phased construction and geogrid to meet project factors of safety and differential settlement criteria.

ND-73 Landslide Stabilization – North Dakota (2018) – Construction oversight of over 150 drilled shafts to stabilize a landslide. Drilled shafts were constructed with open hole, temporary casing, telescoping casing, and with slurry methods.

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MDT D1 Slope Stability Repairs Phase II – Montana (2017) – Construction oversight of multiple soil nail walls to stabilize shallow landslides. The project sites had challenging access and an accelerated schedule prior to winter.

Lodge Grass Retaining Wall Repair – Montana (2017) – Exploration, instrumentation, design, and construction oversight of an A-frame micropile system to stabilize a landslide impacting an existing retaining wall.

McClure Pass Landslide – Colorado (2015-2016) – Design of slope stabilization utilizing Slope/W, CT-Shoring, and FLAC 2D for an anchored soldier pile system. FLAC2D was ultimately used for the design.

State Highway 13 Landslide Stabilization – Colorado (2015) – Inclinator measurements, design, and construction observation for an emergency landslide repair. The repair consisted of drilled shafts supporting an MSE wall to reclaim the original roadway grade.

Fairbanks Memorial Hospital Expansion and Ground Improvement – Alaska (2015) – Construction oversight of 150 augercast piles, compaction grouting, and vibro aggregate piers. Site observations also consisted of vibration monitoring and downhole shear wave velocity testing to confirm adequate subsurface densification.

Taum-Sauk Monopole Foundations – Missouri (2015) – Construction observation of drilled shafts in remote areas for new electric lines. Multiple drilling techniques were utilized to advance through extremely strong shallow bedrock.

C-470 Design-Build Project – Colorado (2015-2018) – Geotechnical explorations, design, and construction observation of a highway widening consisting of 50 retaining walls, 5 bridge widenings, and 2 new bridges. Drilled shaft foundations for bridges consisted of difficult access and nightwork to diminish impact to the existing highway.

Burlington Northern Santa Fe Railway Front Range Improvements – Colorado (2014-2015) – Construction observation of over 300 drilled shafts installed as part of Colorado's lightrail expansion on behalf of the BNSF Railroad. Drilled shafts were installed with permanent casing, temporary casing, and polymer slurry methods.

Professional Memberships

American Society of Civil Engineers Colorado

Treasurer, Vice President, President, and Past-President of ASCE Denver Branch (2017 – Present)

Colorado Section Geo-Institute Chair (2021 – Present)

Colorado Transportation Symposium Steering Committee (2019 – Present)

Colorado Section Secretary (2021 – Present)

Association of Drilled Shaft Contractors Rocky Mountain Chapter (2022 - Present)

Colorado Association of Geotechnical Engineers Member (2015 – Present)

Selected Publications and Presentations

Leopold, A.L., Schwagler, C., (2021). "Geotechnical Considerations for the Long-X Bridge," Presentation, North Dakota Department of Transportation Construction Conference, Virtual, April 7, 2021.

Vessely, M.J., Leopold, A.L., Walters, B.E., and Collins, M.P., (2018). "Discussion of Comparison of Three Retaining Wall Condition Assessment Rating Systems," American Society of Civil Engineers Journal of Infrastructure Systems.

Gainse, M.A., Leopold, A.L., Strom, O.L., Fischer, G.R., (2016). "Condition Assessment and Repair of the Stanley Canyon Tunnel," Proceedings, 2016 Biennial Rocky Mountain Geo-Conference, Denver, CO, Nov 4, 2016.

Jafari, N.H., Stark, T.D., Leopold, A.L., Merry, S.M., (2015). "Three-dimensional levee and floodwall underseepage," Canadian Geotechnical Journal.

Stark, T.D., Jafari, N.H., Leopold, A.L., and Brandon, T.L., (2014). "Soil compressibility in transient unsaturated seepage analyses," Canadian Geotechnical Journal.