Ryan Peterson

ITASCA Consulting Group, Inc.
An Itasca International Company

Senior Geotechnical Engineer

Expertise
Soil and Rock Mass Characterization, Rock Mechanics, Vibration Assessment and Monitoring, Data Integration and Visualization, Structural and Geotechnical Instrumentation, Occupied Underground Space Design, Trenchless Underground Utilities Design, Underground Utilities Rehabilitation, Deep Hard-Rock Cavern Design, Core Logging, In-Situ Soil Modulus Measurements

Education
B.S. (Geological Engineering), 2001
University of Minnesota, Minneapolis, Minnesota

Registration
Registered Professional Engineer, Minnesota

Professional Affiliations
Member and Past President — Minnesota Geotechnical Society
Member — American Society of Civil Engineers

Professional Experience

Itasca Consulting Group, Inc., Minneapolis, Minnesota
2015 – Present — *Senior Geotechnical Engineer*
2012 – 2015 — *Geotechnical Engineer*

2001 – 2012 — *CNA Consulting Engineers, Minneapolis, Minnesota*
Project Engineer and Project Manager

Minnesota Air National Guard, Saint Paul, Minnesota
2002 – 2004 — *Civil Engineering Assistant*
1996 – 2002 — *Communication Plans and Implementation Specialist*

Project Experience

Site Investigation and Mine Design for a Large Underground Cu-Ni-PG Mine — Geotechnical Engineer for this conceptual and pre-feasibility design project. Duties as part of this multi-year project included core logging, training client staff on geotechnical core logging procedures, geotechnical analysis, ATV logging and interpretation, crown pillar characterization, development of calibrated stochastic DFN models, rock mass strength estimates, development of rock mass domains, assessment of rock mass variability, evaluation of ground support requirements as a function of standoff distance and depth, and development of a 3D geotechnical model.

Construction Impacts from Vibratory Compaction — Project Engineer for a Minnesota Department of Transportation research project to assess existing practices for precondition surveys and vibration monitoring for construction projects. The work included researching MnDOT's practices and customs, the standards and policies of DOT, synthesis of literature and polling information, and development of a model policy.

CCLRT Civil West Vibration Monitoring — Project Manager. Responsible for vibration monitoring of 15 simultaneous locations, preparing vibration estimate calculations, preparing the contractor's vibration control

plan, and daily reporting of vibration measurements for the Central Corridor Light Rail Transit Civil West project on the University of Minnesota east bank camps in Minneapolis, Minnesota.

MN – 310 Repairs at West River Road — Project Engineer. Duties included geotechnical site investigation and preparation of the geotechnical baseline and specifications for this project to repair a sanitary interceptor's failed-concrete tunnel liner in Minneapolis, Minnesota.

CCLRT UM Test Hit Vibration Monitoring — Project Manager. Responsible for summarizing background vibrations and test hit vibrations of construction equipment at thirteen different outdoor locations on the east bank campus of the University of Minnesota in Minneapolis, Minnesota.

CCLRT UM ATI Vibration Monitoring — Project Manager. Responsible for vibration monitoring up to 7 simultaneous locations, preparing vibration estimate calculations, and daily reporting of vibration measurements for the Central Corridor Light Rail Transit University of Minnesota Advanced Traffic Improvements project on the University of Minnesota east bank campus in Minneapolis, Minnesota.

MN – 320 Repairs at I394 — Project Engineer. Duties included geotechnical site investigation and preparation of the geotechnical baseline and specifications for this project to repair a sanitary interceptor's failed-concrete tunnel liner under Interstate 394 in Minneapolis, Minnesota.

MN – 300 Tunnel Protection — Project Engineer. Duties included geotechnical site investigation, design, and preparation of the project manual for this project to protect a sanitary interceptor's exposed-concrete tunnel liner at the base of Bridal Veil Falls in Minneapolis, Minnesota.

CCLRT 4th Street Advanced Utility Construction — Project Engineer. Responsible for precondition surveys, noise monitoring, noise calculations, and submittal preparation for this eight-block project in the downtown area of St. Paul, MN.

LUX & Majorana Experiment Designs for Sanford Laboratory at Homestake — Project Engineer. Responsible for conceptual design and construction documents for these two experiments at Sanford Laboratory. The LUX experiment, a xenon-based detector sensitive to WIMPs (dark matter) will be sited on the 4850 Level in the Davis chamber. Majorana, a neutrinoless double beta decay experiment, will be located near the Davis chamber on the 4850 Level. Both experiments require rock excavation, clean spaces rated from Class 100 to Class 100,000 transition spaces, mechanical/electrical systems, and fire and life safety provisions. All facilities are designed using the provisions of the prevailing building codes.

South St. Paul Force Main — Project Engineer. Duties included geotechnical site investigation and plan and specification preparation for a force main crossing the Mississippi River and under a levee in South St. Paul, MN.

Victoria Tunnel — Project Engineer. Duties included logging soil borings, estimating boulder and cobble quantities, geotechnical baseline preparation, and construction document preparation. This project included the installation of over 7,400 feet of a 72-in diameter sanitary tunnel constructed at depths of over 100 ft in soil in Carver County, MN.

MN / DOT Crosstown Commons Reconstruction — Project Engineer. Duties include vibration and sound monitoring and reporting of pile driving activities for 22 bridges, 9 retaining walls, and dozens of temporary sheet pile and lag wall retaining walls as well as preparation of a summary report of the project's vibration data.

St. Anthony Park Storm Tunnel Repairs Phases I, II, & III — Project Manager. Duties included tunnel condition evaluation, project manual preparation, cost estimating, and project management during design and construction. The project consisted of 3.6 miles of 6-foot to 13-foot diameter tunnels located in the St. Peter Sandstone in St. Paul, MN

MSP 4-22 Tunnel — Quality Control Manager. Duties included the management and administration of the contractor's Quality Control Program for a 1,593-foot long cut and cover roadway tunnel under an existing runway. Construction of the cut and cover tunnel included excavation of over 300,000 cubic yards of soil, line drilling 30, 000 lineal feet of bedrock, excavation of 24,500 cubic yards of bedrock, 1,593 lineal feel of cast-in-place tunnel, 569 lineal feet of cast-in-place boat section, two M/E buildings, over 200,000 cubic yards of backfill, 16,000 square yards of airfield pavement, and all associated mechanical and electrical utilities, including jet fans and lighting at the Minneapolis/St. Paul International Airport in Minnesota.

Minneapolis Tunnel Management Plan — Geotechnical Engineer. Duties included conducting field observations and data management for the evaluation of 16 miles of storm water tunnels constructed 100 feet below the ground surface in St. Peter sandstone in Minneapolis, MN.

South Washington County Tunnels — Geotechnical Engineer. Duties included logging soil borings, logging rock coring and field inspection for one mile of a 54-in diameter sewer tunnel in Washington County, MN.

T.H. 61 Glen Road — Project Engineer. Duties included soil testing, instrument installation, instrument monitoring, GIS data dictionary development and GIS mapping of all soil tests using the Trimble ProXR GRS unit. This was a value-engineering project requiring retaining wall foundation improvement. Foundation soils were soft and variable, including fine-grained layers. Original design included extensive deep-soil mixing. Under a value-engineering agreement, a portion of the foundations were improved by replacing loose granular soils with select granular borrow. The agreement made the contractor responsible for quality control during compaction and quality assurance afterwards. In the past, the soil compaction would have been specified and controlled using soil density. Development of practical methods for measuring or monitoring in place soil modulus (including the Humboldt GeoGauge, small-scale plate load test, and the dynamic cone penetrometer) allowed an alternative approach. Approximately 402 GeoGauge, 44 plate load, and 15 pressure-meter tests were conducted.

RiverCentre Connection Project — Geotechnical Engineer. Duties included site investigation and geologic mapping for this pedestrian tunnel and skyway in St. Paul.

U.S. Silica South Ottawa Mine Development Tunnel — Geotechnical Engineer. Duties included plan and specification preparation, geotechnical evaluation and design of a 3300-foot long, 18-foot diameter tunnel located in the St. Peter sandstone and Shakopee dolomite formations underneath the Illinois River. The tunnel located in Ottawa, Illinois and owned by U.S. Silica Company, will provide utility and mine development access between the company's plant and pit, located on opposite sides of the river.

MSP LRT Station and Tunnels — Geotechnical Engineer. Duties included construction observations, geotechnical instrumentation installation and monitoring of a 60-foot wide, 38-foot tall and 530-foot long mined cavern, located beneath the Minneapolis/St. Paul International Airport. Lining systems include reinforced shotcrete, cast-in-place concrete and precast concrete. Rock support systems include pre-stressed, cement grouted rockbolts, un-tensioned resin-grouted rockbolts and un-tensioned cement-grouted rockbolts. Geotechnical instrumentation included 6 inclinometers, 6

down-hole extensometers, 5 up-hole extensometers, 6 horizontal extensometers, level surveys of surface settlement points and measurements using a tape extensometer.

St. Peter – Rondo Storm Tunnel Repairs Phases I, II, & III — Project Engineer. Duties included tunnel condition evaluation, project manual preparation, cost estimating, and project management during construction. The project consisted of 4.3 miles of 7.5- to 12-foot diameter tunnels located in the St. Peter Sandstone under the central business district and I-94 in St. Paul, MN.

T.H. 169 Underground Mines Study — Geotechnical Engineer. Duties included gathering historical information, GIS data dictionary development, GIS mapping of surface features relevant to underground mine workings using a Trimnle ProXR GPS unit, core logging and a survey of reconnaissance geophysics testing locations. The study was sponsored by MN/DOT to determine subsurface conditions under several miles of busy divided highway.

RiverCentre Connection Project — Geotechnical Engineer. Duties included site investigation and geologic mapping for this pedestrian tunnel and skyway in St. Paul.

Gitchi Gami Trail — Geotechnical Engineer. Duties included rock wedge stability analysis. A portion of the Gitchi Gami Trail near Split Rock State Park passes between the Lake Superior cliff and T.H. 61. In a critical section about 200 ft long, the cliff is between 8 ft and 50 ft from the crest of the 40-foot high cliff. The first phase assessment required site reconnaissance, including joint mapping, erosion rate, and cliff geometry. After a bridge was chosen to span the critical section, the second phase addressed stability of the bridge foundation based on rock wedge stability analysis.

Minneapolis/St. Paul Airport — 17-35, Y-3, and W-Y tunnels — Geotechnical Engineer. Duties included construction observations and soil testing for these three road tunnels at the Minneapolis/ St. Paul International Airport.

Runway 17-35 Trunk Highway 5 Tunnel — Geotechnical Engineer. Duties included instrumentation programming, installation and maintenance, settlement monitoring, and compensation-grout monitoring of two ten-foot diameter, 400-foot long storm water tunnels under a six lane divided highway in Richfield, MN.

Empire Tunnels — Geotechnical Engineer. Duties included logging soil borings, field inspections, and preparing plans and specifications of ten tunnels (54 in – 78 in) over two miles in length, and two drop-shaft structures up to 100-feet deep for a 12-mile wastewater effluent line to the Mississippi River in St. Paul, MN.

Flood Mitigation Area 19 — Project Engineer. Duties included review of construction submittals including equipment, materials, methods, and shop drawings; field observations and geotechnical instrumentation monitoring including vibration and sound monitoring, settlement monitoring, and inclinometer monitoring for a 4000-foot long, 66-in diameter storm water tunnel through soft ground in Minneapolis, MN.

St. Paul Tunnel and Bluff Inspection — Geotechnical Engineer. Duties included rock joint mapping, geotechnical evaluation of rock bluff and field observations for the reconstruction of four storm tunnel outlets along the Mississippi River in St. Paul, MN.