VAUGHN RUPNOW, PE

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Education

B.S. CIVIL ENGINEERING **2003**
Iowa State University *Ames, Iowa*

Employment

ALLENDER BUTZKE ENGINEERS **MARCH, 2004 TO PRESENT**
Urbandale, Iowa

Staff/Project Engineer (March, 2004 to present)

- Prepared boring logs using United Soil Classification System (USCS)
- Prepared geotechnical reports for residential, commercial, and industrial construction as well as for sewers, lagoons, bridges, and water towers
- Performed slope stability and settlement analyses and pavement designs
- Consulted with contractors on-site to alleviate geotechnical project concerns

Drilling coordinator (October, 2008 to present)

- Prepared geotechnical exploration proposals
- Scheduled two teams of drillers and coordinated utility location arrangements

Certifications and Organizations

- Licensed Professional Engineer (PE) – Iowa #19259
- American Society of Civil Engineers (ASCE) Associate Member

Computer Skills

- Microsoft Office, GeoSystems, AutoCAD, StedWin, WinPas

Projects

- Project Experience Summary is attached

COMMERCIAL OR INDUSTRIAL CONSTRUCTION

I have been a member of the project team on over 150 commercial or industrial type construction projects, including warehouses, strip malls, churches, communications towers, and wind turbines. Projects were typically small or simple in scope and included recommendations for site grading, spread foundation design, lateral earth pressure parameters, and pavement design.

The Wellmark Headquarters and Parking Ramp is currently under construction in downtown Des Moines, Iowa. The project site is located at the terminal moraine of the Wisconsinan glacier, adjacent to the floodplain of the Raccoon River, and the soil profile generally is comprised of 5 to 15 feet of glacial or alluvial silts or clays over loose to medium dense sand. Bedrock was encountered in the borings near depths of approximately 40 to 45 feet. Berkel & Company Contractors installed auger pressure grouted (APG) displacement piles to support the four-story headquarters building and 11-level parking garage. Frequent observations were conducted during excavation of the lower level parking areas to delineate basements and cisterns associated with previous construction and verify that they were completely removed from building footprints prior to foundation construction.

BRIDGES AND CULVERTS

I have authored over 95 geotechnical exploration reports for construction of bridges or culverts. In general, exploration reports included boring logs with soil classifications consistent with the Iowa Department of Transportation *DRIVEN PILE FOUNDATION SOILS INFORMATION CHART* as well as abutment slope stability analyses. Spread foundation design parameters were provided when adequate bedrock materials were present within reasonable depths.

RESIDENTIAL OR COMMERCIAL DEVELOPMENTS

I have been a member of the project team on over 65 geotechnical explorations for residential or commercial developments. Explorations included analysis and recommendations for excavation stability/dewatering for cut-and-fill construction and installation of utilities. Stability analyses were also performed as necessary for large slopes or retaining walls. Recommendations for subgrade preparation and pavement design were also commonly included in project scopes.

The Village of Ponderosa is a mixed use commercial/residential development in a trendy area of West Des Moines, Iowa referred to as West Glen that was developed on a site formerly occupied by a nine-hole public golf course. The project required draining a large pond and reshaping three new ponds in its location. A causeway was constructed, dividing one large pond into halves. Much of the soil profile was alluvial or loess derived silts or clays of very high moisture content (25% to 40%) and low unconfined compressive strength (750 to 1500 psf), and the upper 3 to 7 feet of soil also had expansive potential. Street subgrades were stabilized using flyash or quicklime, and building pads were over-excavated to depths of 2 to 3 feet to remediate expansive soils. Lightly loaded structures were supported on conventional spread foundations designed for low bearing capacities, while moderately loaded structures utilized GeoPiers™ or crushed rock backfill procedures to support spread foundations. Several heavy buildings were constructed on auger cast pile deep foundations extending into very stiff glacial till.

PUBLIC OR GOVERNMENT BUILDINGS

I have provided geotechnical engineering services on over 60 public or government construction projects, including public safety buildings, schools, and university projects. The buildings were typically one or two-story structures with light to moderate structural loads.

Timberline Elementary School was constructed for the Johnston Community School District in Johnston, Iowa. The site was formerly occupied by mature timber, and the soil profile consisted of glacial clays overlying loess and clay shale bedrock. Earthwork required deep cuts through an existing hill slope, intercepting the surface of the bedrock. Full-time on-site consultation was provided during the first week of earthwork to assist the grading contractor in delineating areas of expansive soil types. Deep fill sections were required to achieve desired finish floor elevations across the building pad, and the site was vacated over the winter to allow the fill induced settlement to occur without impacting construction. The presence of highly expansive clay shale bedrock required special construction techniques for many frost-depth foundations.

RESIDENTIAL CONSTRUCTION

I have been a member of the project team on over 50 residential construction projects, ranging from single-family homes to multi-story apartments and condominiums. Projects typically required design of spread foundations.

East Village Square Apartments is a four-story apartment building in downtown Des Moines, Iowa. The site is blocks away from the Des Moines River, and the soil profile consisted of 5 to 10 feet of urbanite (rubble fill) overlying alluvial sand. Bedrock was encountered in project borings near depths of 40 to 45 feet. The presence of existing fill required consideration of over-excavation, deep foundations, or ground improvement to support building loads. Several meetings were held with the owner's representative and the project team before deciding that GeoPiers™ would make the most economical foundation alternative.

WATER OR WASTEWATER TREATMENT PLANTS AND SEWERS

I have been involved with preparing geotechnical reports for over 35 water/wastewater treatment facilities or sewers. Typical scopes on these projects included foundation design and cut-and-fill recommendations such as backfill compaction requirements and excavation stability.

Rock Creek Sewer is a several mile long sanitary trunk sewer constructed around the southwest and west sides of Ankeny, Iowa. Sewer excavations encountered very hard clay shale or sandstone, and horizontal boring techniques were required at several crossings. Slope stability analyses were performed where the centerline of the proposed sewer was in a ditch section adjacent to a slope with a history of movements.

PAVEMENTS

I have authored over 20 geotechnical reports for the design of pavements or analysis of poor pavement performance.

Morrill Road at Iowa State University in Ames, Iowa was planned for reconstruction in 2009. Project plans called for the removal and replacement of the approximately 1500 feet stretch of road. Parking areas were proposed to be porous pavement types. Recommendations were provided for subgrade preparation, fill compaction, and stormwater infiltration in accordance with the *Iowa Stormwater Management Manual* for areas of pervious pavement.

SPECIAL EXPLORATIONS

I have provided geotechnical engineering experience on several "special" explorations, most of which were analysis of landslides, but also included several small lakes with overflow structures or earthen dams.

The Wilson Residence Landslide occurred following a weekend of heavy precipitation in Des Moines, Iowa during the early summer of 2008. At the time of an initial site visit, the main scarp was approximately 6 to 7 feet in height and was located between 10 to 15 feet from the home's foundation wall. Borings were conducted immediately, and it was recommended that the slope be temporarily stabilized using the quicklime method patented by Dr. Richard Handy until a feasible long term solution could be selected. This temporary solution was still effective during the summer of 2009, when plans were made to construct a series of retaining walls along the slope.