



GILMORE & ASSOCIATES, INC.

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BRIDLE PATH APARTMENTS SINKHOLE REMEDIATION

Hanover Township, PA

The Bridle Path Apartment Complex experienced substantial sinkhole activity in February of 2008, after a water service ruptured under one of the buildings and allowed water to seep into the surrounding carbonate geology. The resulting sinkhole, shown at left, was the main cavity, which exposes utility lines and displaced nearby residents.

A geological/geotechnical study of the site was conducted to evaluate the underlying site soils and geology, 10 test borings were advanced, and geophysical tests were taken to evaluate the sinkhole and surrounding areas in order to provide the best remediation solution available. To prevent further damage and provide support to adjacent buildings, the sinkholes were filled in with a flowable fill concrete mix and soil. Temporary supports were installed to alleviate as much weight on the building foundations as possible.

After the geological/geotechnical study was completed, N.D. Remy Associates was able to design a foundation system using a system of micropiles, concrete collars and grade beams to evenly distribute building loads through the existing foundations down to a competent load-bearing rock structure. A compaction grouting program was also implemented to reduce the risk of future cavities forming.



Services Provided by G&A

- Test Borings
- Geophysical Testing (MASW, Resistivity Testing, etc.)
- Compaction Grouting
- Micropile/Foundation Support
- Onsite Technical Services

Client Information
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Once an overall foundation and compaction grouting plan was selected, Nicholson Construction Company was hired to design and install the micropiles and compaction grout.

Micropile depths varied widely as new carbonate cavities were encountered, and a primary compaction grouting plan was designed to fill any suspected cavities to prevent future sinkhole activity. During the course of the compaction grouting procedure it was determined that alterations to the original compaction grouting plan were needed, and through the use of our on-site technical services and documentation, G&A was able to readily develop secondary and tertiary compaction grouting plans which minimized costs and installation downtime. G&A also observed the application of a pile-load test to ensure that the installed micropiles would support their designed allowable load, and conducted post-construction geophysical testing to ensure that any observed cavities had been filled and that the micropile had been installed to an adequate depth.

Project Team:

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TWINING ROAD COMMUNICATIONS TOWER Upper Dublin Township, PA

Gilmore & Associates, Inc. (G&A) was engaged by City Switch, LLC to provide the Grading and E&S Plans for a communications tower development at a steeply-sloping site located along Twining Road in Upper Dublin Township, Montgomery County, PA.

In order to level the site, a retaining wall was required. G&A was engaged to design the retaining wall. The wall was designed using the Recon Retaining Wall System. Design considerations included global embankment stability, and tower foundation loads adjacent to the retaining wall.

G&A worked closely with the owner and the Structural Engineer during the design process. Once the plans were approved and the contractor selected, G&A provided construction observation and testing services for the retaining wall and communication tower foundation.

Services Provided by G&A

- Grading Plan and Erosion and Sediment Control Plan
- Retaining Wall Design
- Construction Observation Services

Client Information
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COBHAM SENSOR SYSTEMS

Lansdale, PA

Cobham Sensor Systems was in need of asphalt repair and asphalt overlay for the existing parking and drive lanes at their facility in Montgomery Township, Montgomery County, PA.

Cobham Sensor Systems engaged Gilmore & Associates, Inc. (G&A) to evaluate the existing pavement and subgrade conditions and to prepare plans, specifications, and details for the asphalt repair. G&A investigated the existing asphalt pavements at the site through an asphalt coring program, which allowed G&A to evaluate the existing pavement makeup and thickness, and to observe and evaluate the underlying subgrade soil.

Based on the information gathered during the pavement investigation, G&A prepared bid documents and construction cost estimates for budgeting purposes. After the contractor was selected, G&A provided construction observation and testing services for the Client, which included verification of field quantities, and assessment of the contractor's conformance with the bid documents.

Services Provided by G&A

- Pavement Study
- Bid Package Preparation
- Contract Administration
- Construction Observation and Testing Services

Client Information
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MODERN CONCRETE KARST STUDY

Gilmore & Associates, Inc. (G&A) was contracted to conduct a geotechnical investigation for the proposed 80,000 square foot steel-framed building. The site was located within karst (carbonate) geology, which is prone to cavity (sinkhole) development. The test borings conducted by G&A revealed soft subsurface soils in some areas of the site. Based on the preliminary structural information, G&A estimated that supporting the building loads on conventional shallow-based footings over these soft soils could induce up to two inches of total settlement, and differential settlement between columns of over 1 inch. G&A considered various options for controlling total and differential settlement, while considering project costs. G&A recommended a ground improvement program be conducted to control total and differential settlement.

GeoConstructors, Inc. submitted a proposal to conduct Rapid Impact Compaction (RIC) along the foundation lines to receive the highest column loads. G&A reviewed GeoConstructors' submittals, conducted technical oversight of the RIC procedures, and conducted supplemental geotechnical borings following the RIC program to confirm that the performance specifications were achieved.



Services Provided by G&A

- Geotechnical Investigation
- Construction Observation & Testing
- Technical Review & Oversight of Ground Improvement Program

Client Information
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ARCADIA STREAMBANK STABILIZATION Cheltenham Township, PA

Gilmore & Associates, Inc. (G&A) was engaged by Arcadia University to address continuing erosion of a stream bank of a headwater of the Tacony Creek, which was beginning to undermine the parking area for an existing, adjacent apartment building.

Drawing on its extensive experience in the design of retaining walls and embankments, G&A advised Arcadia University that a modular block retaining wall system would provide a cost-effective solution to stabilize the stream bank, and protect the parking area above from further damage. G&A recommended this system based on unique site features such as stream path, water depth and existing grades.



After the project team decided to proceed with a modular block retaining wall system, G&A conducted a topographic survey of the site to obtain information necessary for design, then prepared design drawings and construction specifications, including temporary stream diversion drawings, for the Pennsylvania Department of Environmental Protection, the Montgomery County Conservation District, and Cheltenham Township for review and permitting. After the design was approved, G&A provided onsite quality assurance services during construction.

G&A's depth and range of expertise allowed Arcadia University to rely on a single engineering consultant for this project, resulting in a streamlined design and construction process.

Services Provided by G&A

- Survey
- Civil Engineering
- Retaining Wall Design
- Temporary Stream Diversion Design
- Permitting
- Construction Observation

Client Information

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