



GEOTECHNICAL  
CONSULTANTS INC.

## Making Space for One Million More People

When MORPC revealed the May 2016 update to its *insight2050* report, growth trends indicated that the seven-county Central Ohio region could add upwards of one million more people by 2050.

Many of these individuals will live and work in buildings constructed on redeveloped sites and infill properties. Redevelopment reduces land consumption and increases the efficiency of infrastructure. But there are geotechnical and environmental challenges that developers, contractors and architects must consider when sites transition from one- or two-story structures to buildings with as many as 25 stories.

### Unsuitable Soils

By far the most prevalent legacy issue on redevelopment sites is the presence of unsuitable soils. These can include cinders, local trash dumps, building rubble and contaminated soils. These materials are typically loose and were dumped with no regard to compaction.

An initial boring program coupled with the project parameters in terms of size, height and type of proposed structure, will guide the foundation considerations. Based on findings, methods to improve the ground to make it suitable for foundations will be considered.



### The Jackson

*GCI recommended caissons, or drilled shafts, to bypass poor soil conditions and create an effective deep foundation solution.*



### The Joseph

*Auger cast piles were selected for their high load capacity and relative ease of installation on this urban redevelopment site with existing adjacent buildings.*

Where the depth of poor soils or the weight of structures are very large, deep foundations must be used to bypass poor soil conditions.

Up to depths of 20-30' of unsuitable soils can be remedied with ground improvement options such as rammed aggregate pier systems particularly where soils are above the groundwater table. On some sites, drilled shafts (caissons) can be an effective deep foundation solution.

Currently, auger cast piles are a preferred deep foundation system in central Ohio due to their high capacity, ease of installation and because they are not impacted by groundwater.

### Zero Lot Lines

Structures constructed right up to one or more property lines are common in urban areas, to take advantage of every buildable foot of real estate. When excavating and building adjacent to zero lot line structures, consideration must be given to temporary support structures

such as retaining walls, to protect the integrity of the neighboring structures, utilities and roadways where significant excavations are planned for the project.

### Buried structures and prior uses

For urban redevelopment projects, an environmental assessment should nearly always be done early in the planning stage. During the Phase I Environmental Assessment, a review of Sanborn Maps can help uncover the history of former buildings, streets and site usage.

Sanborn Maps were originally created for assessing fire insurance liability in U.S. towns and cities starting in 1867. The maps help identify old foundations, buried structures, and prior uses with high likelihood for the presence of contaminants in the subsurface, such as older dry cleaners, gas stations and manufacturing plants.

### Contaminants

Whether a building is being demolished or renovated for new uses, a complete inventory and mitigation plan is required for all hazardous materials such as asbestos, lead paint, mercury switches, light bulbs, lead-containing components, batteries, refrigerants, coolants and old electronic equipment.

### Risk mitigation approach minimizes costs and delays

A thorough assessment of potential site and building issues in the earliest planning stages will help minimize costly surprises, avoid financing and construction delays, and allow developers to build the cost of any necessary remedial actions into the project budget.



#### 250 High

*The auger cast pile foundation bypassed rubble fill and old basements and allowed the building to be constructed over an active, deep 60" storm sewer. Zero lot line on all sides and the adjacent existing COTA garage were also construction considerations.*



#### Rogue Fitness

*GeoPiers® (a type of rammed aggregate piers) support the foundations of this manufacturing facility constructed on a brownfield site, following mitigation for prior contaminants and buried structures.*

For additional information about site redevelopment considerations, call 614.895.1400 or email:

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#### Grant Park

*Shallow grade beams and columns resolved the poor soil conditions yet were sufficient for the weight of low-rise structures.*





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## GCI Downtown Columbus Redevelopment Projects

The GCI projects identified on this map are buildings that have recently undergone or are in planning for significant renovation and sites that are being or have been redeveloped from one- or two-story buildings to mid-rise and high-rise structures.

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