

Subsurface Constructors

Ground Improvement

St. Louis Ice Center & Blues Practice Facility

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Ground improvement to mitigate potential for liquefaction at major new ice rink facility

Subsurface Constructors recently completed the vibro stone columns and vibrocompaction [ground improvement](#) for the new St. Louis Ice Center project located in Maryland Heights, Missouri. This exciting project will consist of the construction of an approximately 300,000 square foot ice center with three indoor ice rinks with viewing areas, changing rooms and office space. A fourth rink is planned for the future. This site is located in the Missouri River floodplain and protected by area levees. The soils at the site generally consist of an upper layer of soft to medium stiff clay and silt at depths ranging from 4 to 12 feet. This layer is underlain by loose to medium dense silty sand and sand that increase in density with depth, becoming mostly dense to very dense by 50 feet depth.

Due to the relative proximity of the site to the New Madrid fault and its location in a floodplain, liquefaction was a concern. Additionally, the footings for the structures required a bearing pressure of 5,000 pounds per square foot (psf) that could only be achieved with some type of ground improvement. Subsurface Constructors worked with the project geotechnical consultants and general contractor to design a plan consisting of [vibro stone columns](#) (a.k.a. aggregate piers) and vibrocompaction to provide the required bearing pressure and to mitigate the potential for liquefaction to depths of 40 to 45 feet below grade.

Subsurface installed approximately 825 stone columns under all of the continuous and spread footings on this site using a wet top-feed method. In doing so, they were able to change the Seismic Site Class from an F to a D by densifying the loose to medium dense sands and provide the required 5,000psf for a post-treatment bearing pressure.

Project details:

Services Provided: Ground improvement, stone columns

Location: St. Louis, Missouri