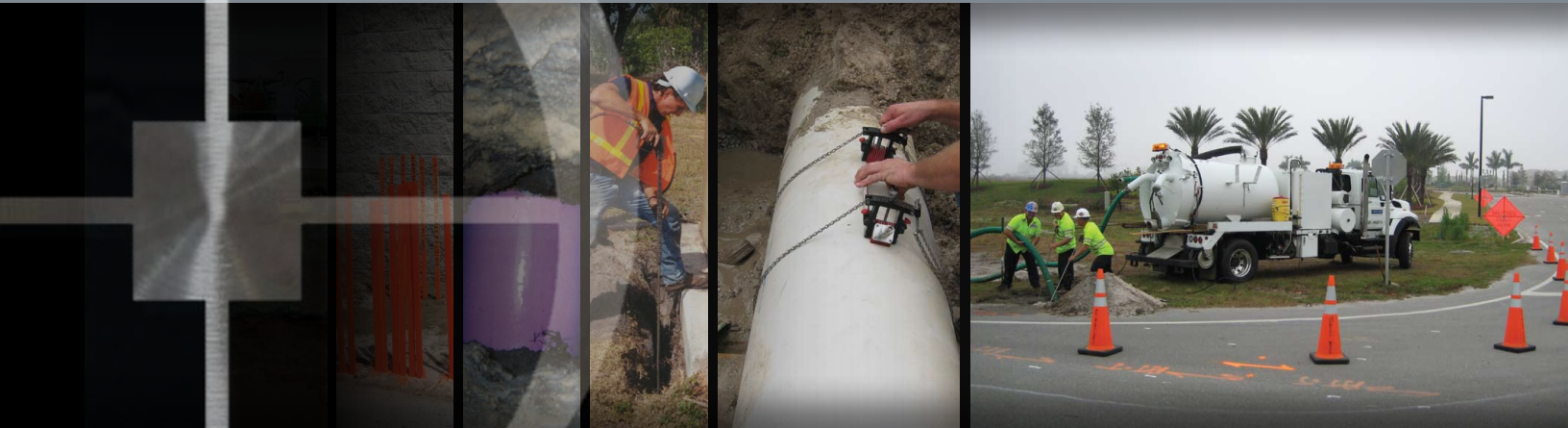


Subsurface Utility Engineering

Subsurface Utility Engineering (SUE) is a non-intrusive and harmless way to excavate, identify, locate and map underground utility lines under asphalt or natural ground. Any underground utility, from a large diameter water or sewer line to small diameter fiber optic conduit, can be uncovered using the SUE process. Once uncovered, the size and composition of the utility pipe is recorded-12" ductile iron, 8" PVC, etc. A digital photograph is then taken and the center of the pipe is marked with a wooden stake. The stake is labeled with length of lath and the size, pipe material for client and field use in location. Traditional survey methods are then used to locate x, y and z coordinates of the utility. Survey technicians can put this information into CAD programs for engineering design use or into a geographic information systems for a variety of mapping applications. After the dig is completed the pothole or trench is backfilled and the soil is hydro compacted back to its original condition. Using a combination of pressurized water and high vacuum suction, the soil, rocks and underground roots covering a particular utility line are broken up and efficiently removed to reveal the utility lines. These lines are typically buried anywhere from one foot deep to eight feet below the earth's surface.



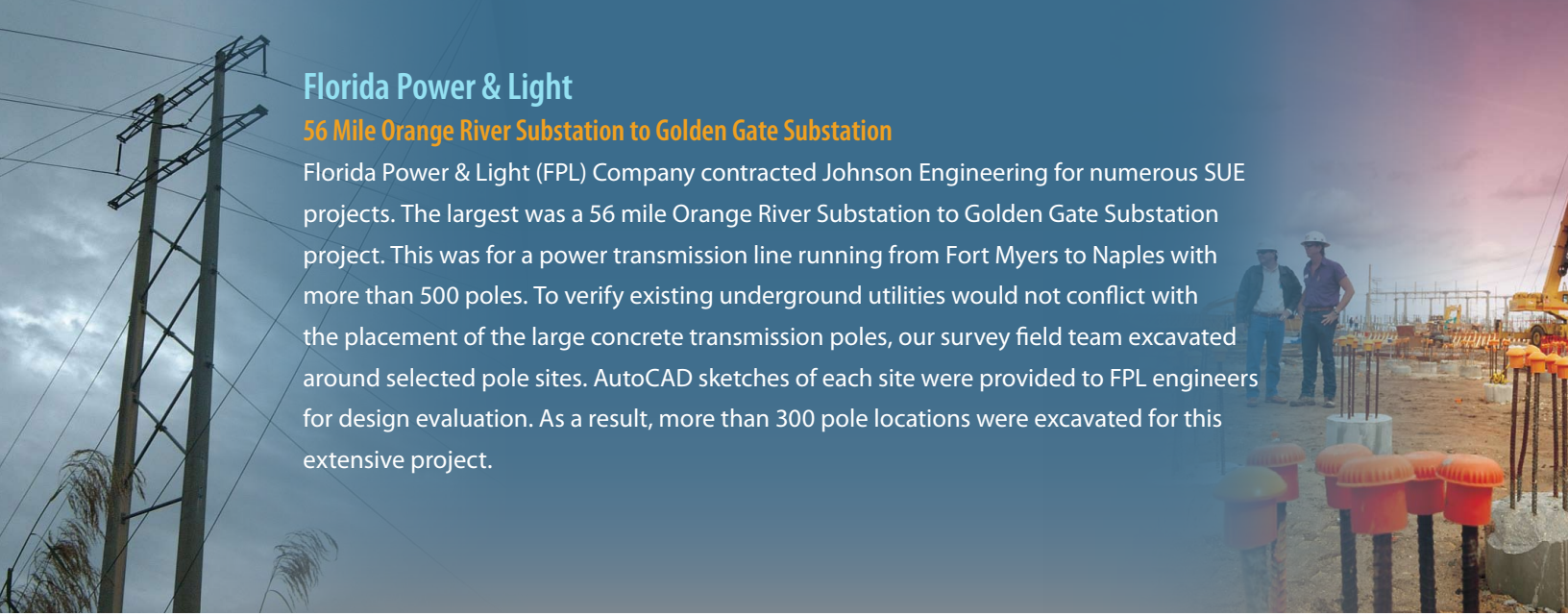
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Subsurface Utility Engineering (SUE)



Florida Power & Light

56 Mile Orange River Substation to Golden Gate Substation

Florida Power & Light (FPL) Company contracted Johnson Engineering for numerous SUE projects. The largest was a 56 mile Orange River Substation to Golden Gate Substation project. This was for a power transmission line running from Fort Myers to Naples with more than 500 poles. To verify existing underground utilities would not conflict with the placement of the large concrete transmission poles, our survey field team excavated around selected pole sites. AutoCAD sketches of each site were provided to FPL engineers for design evaluation. As a result, more than 300 pole locations were excavated for this extensive project.



HealthPark Florida West

Bass Road & Summerlin Road

When a new three-story wing was to be built on Lee Memorial's HealthPark campus, Johnson Engineering was hired to map the numerous underground utilities since as-builts and drawings were nonexistent for the proposed site. The job proved to be a challenge due to the concentration of utilities in a small area. To avoid conflicts with the new construction, our survey field team utilized our SUE to excavate and map the underground utilities.

Marco Island

2.5 miles of North Collier Boulevard

Johnson Engineering provided SUE services for Tindale-Oliver & Associates for the widening of 2.5 miles of North Collier Boulevard, which is the main artery on Marco Island. A trench was excavated from the edge of the pavement to the right of way every 100 feet throughout this 2.5 mile job to verify all underground utilities were located. We mapped these utilities using AutoCAD for planning and design purposes.



Montgomery Watson

Cape Coral reverse osmosis plant expansion projects

In 1999, Johnson Engineering teamed with Montgomery Watson utility engineers to provide surveying and SUE services for the City of Cape Coral's massive utility expansion program. The SUE services included locating underground utilities at waste water treatment and reverse osmosis plants, along road right of ways, and under the pavement of major roads and intersections.

Bonita Springs Utilities

Johnson Engineering began providing a variety of SUE services to Bonita Springs Utilities (BSU) in 2001. This included the excavation and location of a water line beneath 17 feet of compacted fill in the I-75 median. The majority of SUE work performed for BSU is for utility relocation due to road widening projects. The accuracy of the utility maps allows the engineers to design and build with little or no conflicts to existing utilities, saving time and money.

