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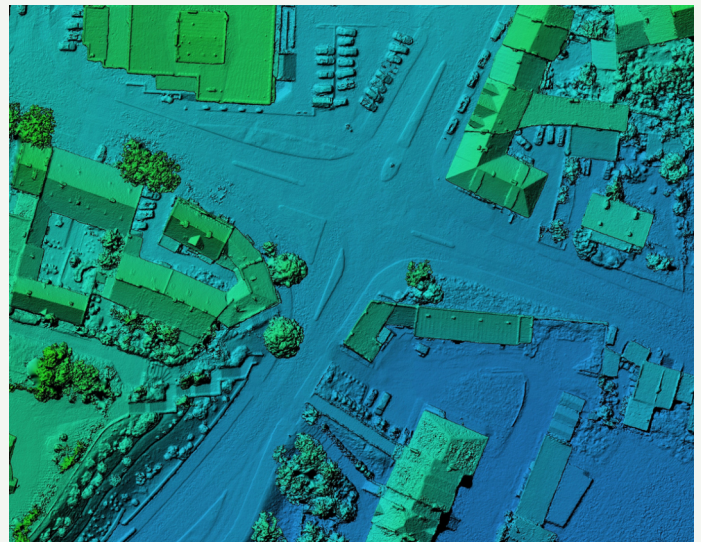
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JUNE 2023

Understanding GIS and Its Essential Role in Civil Engineering

A geographic information system, or GIS, is a system that organizes, analyzes, and maps location-based data in separate layers, allowing the data to be viewed in a geographical context with various other information. GIS data comes from a near-limitless variety of primary and secondary sources including GPS, land surveys, lidar, digitized maps, worksheets, and historical records, just to name a few, and can be used to inform strategic decisions in virtually any industry or sector. GIS is essentially a living digital document, and collected data can be added, tracked, and updated indefinitely and as needed.

GIS is an absolutely vital tool in civil engineering and its uses and benefits are almost countless. For example, when it comes to site planning and development, geographic data overlaid with various images and other information enable civil engineers and their clients to visualize a project more clearly and allow for a better design. Examining hydraulic and hydrologic modeling in combination with other aggregated data like terrain analyses and flood maps is invaluable for the planning, improvement, and maintenance of stormwater management systems. Surveyors can use GIS to quickly and easily identify environmentally-sensitive areas and garner information about zoning, boundaries, permit status, and many other critical aspects of a project.



Finelli Consulting Engineers not only employs GIS in our day-to-day civil engineering activities, but we also implement and maintain GIS systems for municipalities and other clients. In fact, our founder and president Michael Finelli was instrumental in developing the first GIS system for an individual municipality in Warren County, New Jersey. FCE also provides GIS data analysis and can assist clients with any other GIS needs. For more information, please contact us at (908) 835-9500 or fce@finellicon.com.

New York City's Central Park Considered a Marvel of Civil Engineering



During the first half of the 19th century, there was little open space where New York City's booming population could go to escape the chaos. In 1853, after the city's elite began campaigning for a large park open to all city residents, the state legislature set aside a 778-acre site situated between Fifth and Eighth Avenues and 59th and 106th Streets (the park would be extended north to 110th Street in 1860). A design competition was held in 1857 by the new Central Park Commission and won by landscape architects Frederick Law Olmsted and Calvert Vaux for their Greensward Plan. The project began later that year, and construction would not be an easy task.

The rocky land had been almost entirely denuded of trees during the Revolutionary War by British soldiers who used them for ships and fuel, and swampland covered much of the southern area. Dynamite hadn't yet been invented, so laborers had to use gunpowder to remove rock outcrops of Manhattan schist. Dense vegetation was cleared and a drainage tile system was installed to drain swampy areas and direct stormwater runoff. Around 18,500 cubic yards of topsoil were carted in from New Jersey and Long Island to fill in the swamps and sustain more than 4 million new trees, shrubs, and other plantings.

The Drives, a winding network of roads, arches, and bridges flanked by footpaths, were graded and built to accommodate pedestrians and horse-drawn carriages. A 20-acre manmade body of water known as the Lake was opened to the public in late 1858, and an estimated 8,000 residents turned out on Christmas Day to ice skate. The Ramble, a 36-acre wooded area between 74th and 79th Streets with winding paths, rustic bridges, and a meandering stream, was completed in June 1859. Four transverse roadways, sunken eight feet below grade to minimize visual impact, were built to allow city traffic to cut across the park.

Construction of various other ponds, fountains, meadows, terraces, bridges, sculptures, walls, and buildings including Belvedere Castle and a sheepfold that would later become Tavern on the Green, continued until 1876 when the park was declared to be officially completed. In all, more than 20,000 workers helped build Central Park, handling and moving an estimated 10 million cartloads of material. The project was remarkably safe for the era, with only five lives lost during construction,

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REALTOR®

C: 908-447-1534

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