Engineering and Land Surveying, P.C.

GEOTECHNICAL ENGINEERING

Stability Solutions.

GEOTECHNICAL ENGINEERING

At KC Engineering and Land Surveying, P.C. (KC), our interdisciplinary team ensures responsible solutions tailored to planning challenges and specific clients' needs.

KC's geotechnical engineering group has the combined expertise and experience to accommodate clients' diverse geotechnical engineering needs.

Our expertise includes evaluating project sites, coordinating surface and subsurface geotechnical investigations, analyzing laboratory test results, evaluating critical design parameters, recommending optimum foundation design based on client requirements, seismic site evaluation and liquefaction potential, and alternate foundation design and ground improvements.

KC focuses on the preparation and documentation of geotechnical work that, depending on the needs of the project, may include creating geotechnical work plans and various reports, such as Geotechnical Baseline Reports and Foundation Design Reports.

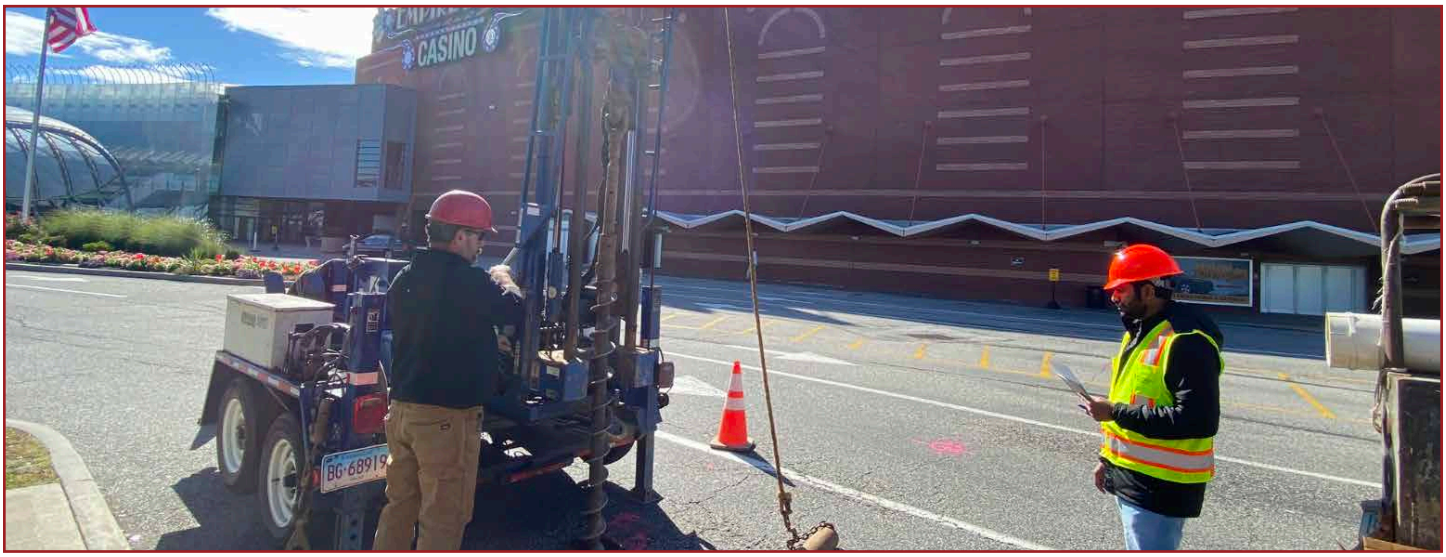
KC's engineers hold QC in the utmost regard and have extensive experience in providing stable foundation solutions for various structures, including bridges; highways; buildings; waterfront structures; retaining, mechanically stabilized earth (MSE), and modular walls; and underpinning of existing structures.

KC's geotechnical and structural engineers provide effective foundation designs ranging from conventional spread footings to pile foundations and drilled shafts. Additionally, we can provide innovative solutions using helical piles, soil nails, and soil anchors based on project requirements. We have the knowledge to implement the appropriate design, analysis, and installation solutions that lead to a reliable finished product while considering client needs as well as each project's unique site conditions, schedule, and cost.

Services

- Bearing Capacity Evaluation for Shallow Foundations
- Design & Analysis of Deep Foundations
- Soil Structure Interaction Analysis with FEM
- Geotechnical Baseline & Foundation Design Reports
- Global Stability Analysis of Embankments & Excavations
- Ground Improvements & Subgrade Stabilization
- Concrete Retaining, T-Wall, MSE, & Modular Walls
- Drilled Shaft Foundation Design for Noise Walls, Light Towers, & OHSS
- Seismic Site Classification & Liquefaction Analysis
- Settlement Analysis, Surcharge Loading Evaluation, & Wick Drain Solutions
- Geotechnical Investigations & Boring Inspections
- Geophysical Evaluation of Subsurface Rock Profile & Karst Investigations
- Structural Analysis of Foundation Members & Foundation Inspections
- Support of Excavation with Sheet Piles, Soldier Piles, & Soil Anchors
- Underpinning Design & Evaluation of Existing Foundation Structures
- Value Engineering & Alternate Foundation Design
- Waterfront Structures, Cofferdams, Bulkhead, & Seepage Analysis
- WEAP, PDA, & CAPWAP Analysis for Pile Foundations

NYSDOT Design-Build Contract D900056: I-81 Viaduct - Phase 1, Contract 2, Syracuse, NY | The scope of work includes I-81 improvements, including removal / replacement of multiple bridges and interchange improvements and reconstruction. KC is the Lead Designer and Quality Manager and is providing complete geotechnical, structural, utility, drainage, stormwater, and highway design. KC's geotechnical scope of work includes geotechnical investigation with standard penetration testing (SPT) and cone penetration testing (CPT) borings; overseeing geophysical surveys for evaluation of possible Karst formations; performing design and analysis of pile foundations for replacement bridges, tieback anchors, retaining walls with heights up to 40 feet, and drilled shaft foundations for noise walls, sign structures, and Geosynthetic Reinforced Soil (GRS) walls; performing slope stability analyses and shop drawing and constructability reviews; preparing geotechnical reports; evaluating the suitability of subsurface soils for infiltration basins; and coordinating design changes.

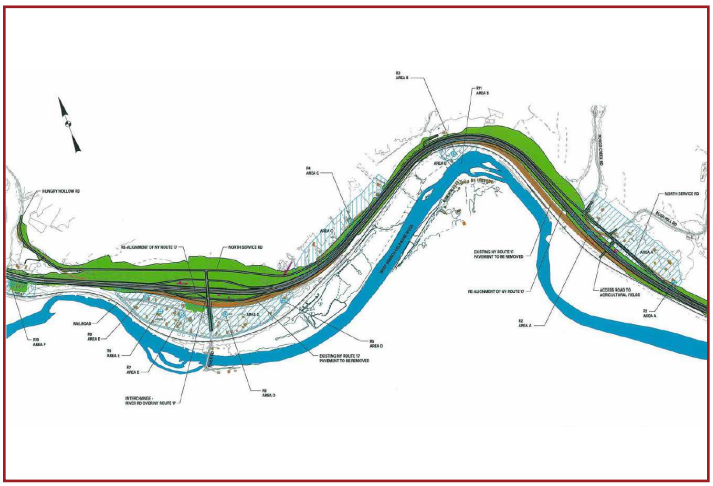


Design-Build Contract YON-103219: Empire City Casino Valet Entrance Bridge Replacement, Phase 1, Yonkers, NY | The project scope included the rehabilitation of the existing valet entrance bridge at the Empire City Casino and Raceway. KC's scope of work included development and implementation of a geotechnical investigation program, including soil borings, test pits, and pavement coring. KC coordinated and supervised borings, pavement and concrete cores, and test pits; arranged for laboratory testing of soil samples; prepared a geotechnical investigation report; analyzed existing foundation capacity based on structural loading requirements and developed recommendations for stabilization of foundations; performed stability analyses of the abutment wall and wing wall in regard to sliding and overturning, traffic surcharge loading, hydrostatic loading considerations, and recommendations for groundwater control measures; and reviewed subgrade soil and pavement structures based on cores collected during field investigation, identified possible reasons for observed pavement defects, and developed recommendations for pavement stabilization.

KC provides comprehensive Geotechnical Engineering services on projects key to the region's infrastructure.

Champlain Hudson Power Express (CHPE), Various Locations, NY | The CHPE is an innovative renewable power transmission project for the delivery of low-cost renewable energy to New York State, which includes the installation of approximately 339 miles of underground and underwater transmission line from the United States-Canada border to Astoria, Queens, NY. At the Astoria Converter Station complex, KC is preparing the geotechnical design, including review of soil boring logs, classification of soils based on the United Soil Classification System, development of design soil parameters and wall sizing, sliding and overturning stability analyses, and bearing capacity analysis; preparing structural design (reinforcement design) of retaining walls; drafting plans, profiles, and sections for retaining walls; and performing buried pipe analysis to determine the adequacy of soil cover. KC is also designing and analyzing a permanent sheet pile wall to protect a sloping access roadway. The sheet pile wall is being designed for sudden draw down conditions to account for groundwater fluctuations due to tidal waves.

NYSDOT Design-Build Contract D900043: Kew Gardens Interchange Improvements, New York, NY | This design-build project included six full bridge replacements consisting of the demolition of the existing structures and complete construction of the replacement bridges. In addition, the construction of five new bridges and alignment modifications provided operational improvements to the Grand Central Parkway (GCP), Jackie Robinson Parkway (JRP), and Union Turnpike (UT) in the Kew Gardens Interchange. KC provided geotechnical, structural, utility, and drainage design; risk management; and quality management services. KC's geotechnical scope of work included assessing boring logs; evaluating subsurface soil conditions and calculating soil parameters; analyzing soil structure using PLAXIS 2D; reviewing loading information for a proposed culvert under a 15-foot embankment; investigating an existing culvert's structural capacity; coordinating with the contractor to devise various construction plans; and preparing expanded polystyrene (EPS) material specifications, accounting for density and limiting strain values.



NYSDOT Contract D038220: Route 17 / I-86 Upgrades, Hale Eddy to Hancock Village, Delaware County, NY | The project scope includes Route 17 / I-86 upgrades to interstate standards. KC's geotechnical scope of work includes geotechnical investigation, reviewing proposed highway alignments and subsurface soil conditions based on available borings, developing boring location plans for proposed bridge structures and retaining walls, developing foundation design for the proposed bridge structures, evaluating suitable retaining wall types based on soil conditions and field constraints, performing pavement structure evaluation, providing recommendations for subgrade improvement, and supervising a geotechnical drilling and soil testing subcontractor.

NYSDOT Contract D038186: Retaining Wall Inspections and Corrective Maintenance, New York, NY | The project scope included the enhanced hands-on and visual inspection of priority walls on all NYSDOT-owned retaining walls along arterial highways / locations and in-depth inspection of walls with defects. KC's geotechnical group provided retaining wall inspection and reporting, final design work for new retaining walls, and project management services. KC inspected retaining walls for defects such as cracks, spalling, and efflorescence; documented and photographed the project; developed geotechnical solutions; and prepared field notes detailing the defects.

NYSDOT Contract D037949-04: Route 94 and 17A Pavement and Improvements, Orange County, NY | The project scope included the preliminary design services required for the improvement of 21 locations along the Route 94 and 94 / 17A corridor. The scope of work included milling and overlay; sidewalk, intersection, and traffic signal improvements; embankment stabilization; culvert replacement; pavement settlement repairs; sight distance improvements; and miscellaneous drainage improvements. KC provided geotechnical engineering, including scoping analysis, and developed scoping alternatives, design alternatives, and the draft and final Design Approval Documents (DADs) for embankment stabilization at Route 94 and provided environmental services for all sites. Additionally, KC evaluated the alternatives with NYSDOT's Preliminary Cost Estimating Tool (PCET).

NYSDOT Design-Build Contract D900034: Region 8 Bridge Replacement, Ulster County, NY | The scope of this design-build project included the replacement of two bridges: BIN 1040750 NYS Route 209 (3-span continuous steel girder bridge with a total span of 402 feet) over Rochester Creek and BIN 1019700 NYS Route 28 (7-span continuous steel girder bridge with a total span of 994 feet) over Esopus Creek. KC's geotechnical scope of work included geotechnical investigation, conducting soil borings to depths exceeding 100 feet, and laboratory testing of soil samples; evaluation of design soil parameters and subsurface soil conditions based on borings; review of maximum loading conditions; selection of the foundation type; design and analysis of steel pipe piles extending to more than 100 feet; and L-pile analysis to determine maximum lateral deflections, pile group analysis to determine group efficiency, and settlement analysis for the embankment area. Piles were designed for severe erosion conditions with meandering river flow around the pier foundations. A modified pile foundation design was developed using closed end pipe piles to increase the individual geotechnical pile capacity and to minimize the concrete quantity, which resulted in reduced cost and an expedited construction schedule. Additionally, the scope of work included preparation of working drawings with material notes and specifications, recommendations for pile installation, and testing and inspection requirements.

NYSTA Contract D214890-03: Interchange 25 / 25A Gantry and OHSS Design, Schenectady, NY | KC provided geotechnical investigation, design, and analysis for various OHSS and gantry structures. The project scope included the preliminary and final design for the installation of tolling gantries in Albany, Schenectady, and Harrison, NY. KC provided the structural and geotechnical design for gantries and sign structures, inspection of soil boring operations, evaluation of design soil parameters for the proposed foundations, preparation of the geotechnical engineering report, settlement analysis, design of drilled shaft foundations for the sign structures and gantry structures based on the structural loading requirements and subsurface soil conditions, and development of the construction drawings for the drilled shafts, reinforcement details, material specifications, and installation notes.

Franny Reese Park Modular Retaining Wall, Wappingers Falls, NY | The project scope included the development of a new park on two former residential parcels in the Village of Wappingers Falls, which required the installation of 20-foot-high retaining walls along a steep slope. KC provided coordination of the subsurface geotechnical investigation program; evaluation of design soil parameters; review of site topography; review of the modular block retaining wall design submittal; evaluation of the allowable bearing capacity of sub-grade soils; recommendations for ground stabilization; recommendations for improvement of existing unstable soils; recommendation of material specifications for backfill and geotextile reinforcement; and verification of sliding, overturning, and global stability analysis.

Engineering and Land Surveying, P.C.

Diversified. Multidisciplined.

KC Engineering and Land Surveying, P.C. (KC) is a diversified, multidisciplined consulting engineering firm. Since 1983, KC has provided our public and private sector clients with a comprehensive range of professional services using only the latest technical equipment. The corporate headquarters of the firm is located in New York City, with branch offices in Newburgh and Albany, NY. KC has extensive experience with government agencies, municipalities, and private clients; a diverse, professional staff; and an impeccable record of services rendered.

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