

GEOTECHNICAL PROJECT EXPERIENCE – City of Chicago

Wang has completed numerous major geotechnical projects throughout the Chicago Area for Various Agencies with the City of Chicago. Some of the typical projects we have recently completed or are currently working on in the Chicago Area:

City of Chicago Department of Aviation O'Hare Modernization Program - Runway 9c-27c Completion Phase

Wang Engineering, Inc. performed the geotechnical investigations and engineering analyses for the O'Hare Modernization Program (OMP) Completion Phase for the new Runway 9C-27C and associated taxiways at O'Hare International Airport. Runway 9C-27C will be 11,245 feet long, 200 feet wide, meeting the FAA's Airplane Design Group VI. This Runway will be capable of accommodating Category II/III operations. The project also includes the design and construction of storm sewer systems. Up to 12-foot diameter pipes and various sizes of junction chambers and manholes are involved.

Wang has prepared interim subsurface investigation reports. In the reports, Wang described the subsurface and groundwater conditions encountered, estimated the stability and deformability of existing ground, and estimated the potential geotechnical complexity of the site. Due to site conditions, Wang has proposed a revised investigation program to determine the extent and depth of the unsuitable soils.

In addition, Wang recommended ground improvements methods and geotechnical parameters for the final design and construction. .

O'Hare Modernization Program Runway 10C-28C And Associated Taxiways East, West And Center Packages

Wang Engineering, Inc. is performing Geotechnical Engineering Analyses and Phase III Construction Monitoring for the O'Hare Modernization Program (OMP) Runway 10C-28C and Associated Taxiways – East And West Packages at O'Hare International Airport. Runway 10C-28C will be a 200-foot wide, Group VI capable runway, built to accommodate newest, larger aircrafts.

Construction staging provided for the completion of the east and west ends and center of Runway 10C-28C. Once cargo facilities for United Airlines and FedEx will be relocated southwest of their current locations, the OMP will complete construction on the middle section and connect both ends of the runway.

During the design phase of the project, Wang provided field inspection of numerous test pits and performed Piezocone Penetrometer Testing (CPT) to determine the extent of unsuitable non-engineered fill material present at the West End of the Runway. It was determined this unsuitable material was predominantly 10 to 15 feet thick. Based upon the findings, Wang provided evaluations for several ground improvement treatments including removal and replacement of the existing fill, dynamic compaction for fill densification and ground reinforcement by stone columns.

During the construction phase of the project, Wang provided recommendations for the removal and replacement of unsuitable material, evaluation of monitoring data for Taxiway QQ settlement, settlement analyses and evaluation of ground improvement techniques for the United Cargo Apron and for other unanticipated geotechnical issues encountered.

Chicago Transit Authority Block 37 Station Tunnel Connection Airport Express Rail Service

Wang Engineering, Inc. performed the subsurface investigations, laboratory testing, and geotechnical data compilation to support the design and construction of the Airport Express Tunnel planned for Block 37 site bounded by Dearborn, Washington State, and Randolph streets, in Chicago, Illinois. The proposed new CTA tunnel crosses the site diagonally from northwest to south west.

The subsurface investigations consisted of three structure borings and two cone piezometric and cone penetration testing with seismic wave velocity and electrical conductivity measurements at each end of the tunnel within the Block 37. In addition, downhole vane shear testing was performed on the soft to medium clay layer that extended to greater depth than initially anticipated and underlay the entire site. One full depth boring was sampled using the Osterberg piston sampler.

Selected undisturbed samples obtained from this boring were shipped to Northwestern University for specialized testing including consolidated drained triaxial test with K_0 measurement. Wang performed additional testing on undisturbed samples including moisture contents, Atterberg limits, particle size, unconfined compressive strength, one dimensional consolidations and triaxial unconsolidated-undrained and consolidated- undrained with pore pressure measurements.

Wang prepared the field investigation program and schedule and coordinated all the field activities. In addition, Wang secured all the necessary permits and clearances from the Chicago Board of Underground. Wang also provided field engineers to observe and monitor the drilling, sampling, and the in situ testing, to log the borings, and collect soil samples for further investigation and laboratory testing. All work was performed during non-peak, overnight hours and under very adverse weather conditions. The report included the results of subsurface investigations and laboratory testing.