

# CASE HISTORY

## ECP STEEL PIERS™ ECP TORQUE ANCHORS™

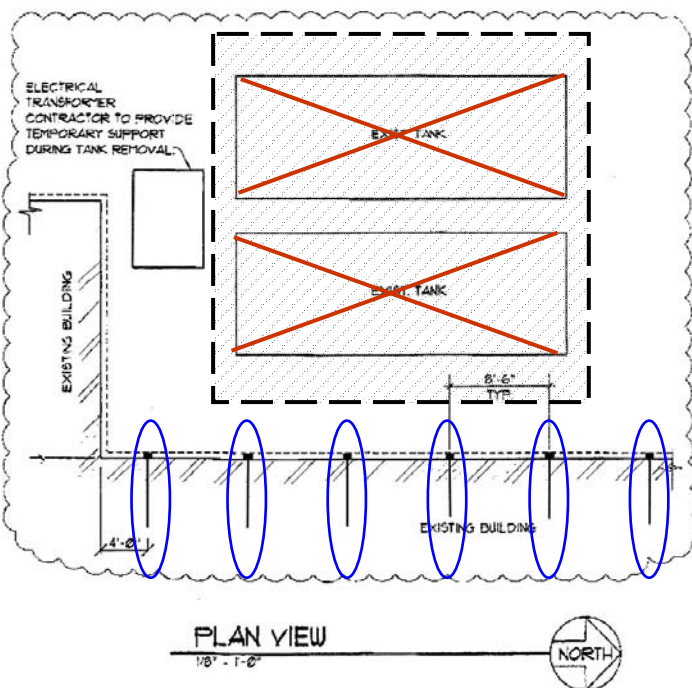


### Removal of Fuel Tanks near an Existing Structure Brooklyn Center, MN

Earth Contact Products' Steel Piers™ with integral Torque Anchor™ tiebacks were selected to support this existing municipal bus facility while nearby fuel tanks were removed. The engineer determined that a loss of soil support from under the building's footings was possible and he wanted to provide supplemental lateral and vertical support during excavation operations.

ECP Model 350 Steel Piers™ were recommended for the vertical supplemental support along with Torque Anchor™ tieback anchors to lateral stabilization of the footing.

The plan below shows the engineer's sketch of the two storage tanks and the proximity to the existing structure. One can easily see from this scale drawing that soil could drift from under the footing of the building during the excavation and removal of the tanks. The engineer called for ECP Steel Piers™ with tiebacks to be installed at locations circled at the bottom of the plan.

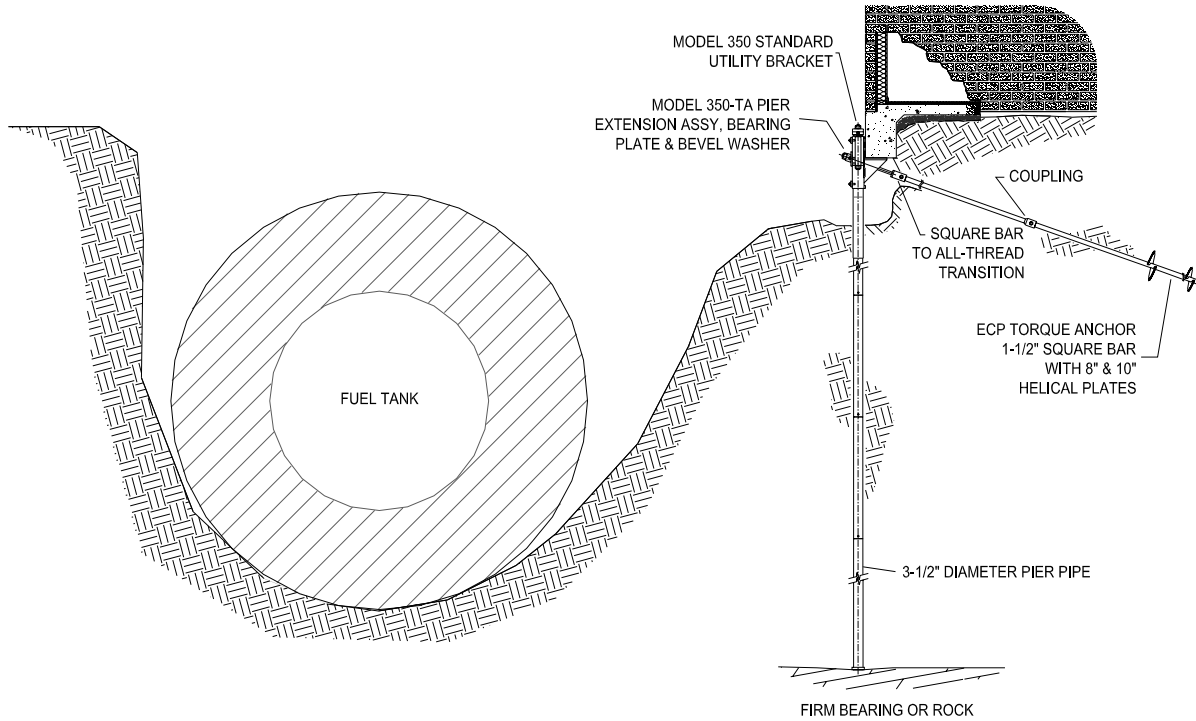


Each pier was advanced through the soil until the pier encountered firm load bearing. Once firm bearing was reached, each ECP Steel Pier™ was field load tested to a proof load or test force averaging 33,467 pounds. This method of individually testing each pier after reaching end resistance provided verification that the bearing stratum was suitable for support of the perimeter beam. The test results confirmed, on average, a factor of safety of 1.5 between the field load test and the steel pier working loads.

During installation of the ECP Steel Piers™ end bearing was encountered at a shallower depth than anticipated. The engineer decided to reduce the design loading of the steel piers by increasing the number of pier placements to nine thus reducing the working loads on each pier. These additional pier placements did not require tiebacks because the original tieback design loading was achieved with six Torque Anchors™.



## ELEVATION VIEW OF THE CONSTRUCTION SITE



The elevation sketch above shows that basic configuration of the project. One can see the engineer's concern for loss of soil support from under the structure during tank removal. The graph below left represents the factor of safety demonstrated by the field load testing during the ECP Steel Pier™ installation process. Each pier was tested to a load approximately one and one-half times the working load. The right graph presents the Torque Anchor™ tieback installation data showing the installed tieback length along with the relationship between installation torsion and ultimate tieback capacity.

