CASE HISTORY

ECP TORQUE ANCHORS™
CONCRETE SLAB REPAIR

Emergency Battery Packs Cause Slab to Settle

A major internet entertainment provider called McDowell NW Pile King, Inc. for help with slab settlement in their emergency battery room. The engineer attributed the distress to the racks of wet cell batteries causing extremely heavy floor loads on the slab.

After investigating the advantages and disadvantages of several underpinning systems, Pile King proposed to the owner to install ECP Torque Anchors™ as the best solution to provide supplemental support to the affected area. However, this solution was not without challenges. The battery room was located on the lower level of the building; the room had low overhead clearance and was located some 300 feet from the nearest entrance. In addition, the work had to be completed rapidly because once the back-up power system was disabled; the company would be at the mercy of the power company. They would not be able to operate their business during power surges, brown outs or a power outage.

Construction noise or vibration was not permitted because normal business activities could not be disturbed during repair operations. The key to landing this project was a plan to use a Brokk 90 Mobile Drill machine. It was small enough to gain access the work area. The machine operated on electric power; so when it was running, there was no motor noise, fumes or vibration to disturb the building's occupants. By using the Brokk machine, the project was able to be completed in only 1-1/2 days instead of the original plan of working from 6:00 to 11:30 in the evening for more than a week.

Photographs: At the top is a view showing the tight area of work in the emergency battery room. Access holes for the helical piles have been drilled in the floor. Unfortunately, obstructions required relocating several placements. At left is a view of the Brokk 90 Mobile Driller. The machine was fitted with an Eskridge 4K5 hydraulic gear motor that provided up to 4,500 foot-pounds of torque for the rotary installation of the piles.

The helical screw pile configuration used on this project consisted of a lead section of 2-7/8" diameter tubing that had one 10 inch diameter and one 12 inch diameter helical plate welded onto the shaft. Once a lead section was installed into the soil, extensions were added to drive the Torque Anchor™ down to the target bearing stratum of soil.

Project Summary	
Project:	Supplemental Support for Emergency Batteries Seattle, Washington
Installing Contractor:	McDowell Pile King, Inc. Kent, Washington
Product Installed:	TAF-288-60 10-12 ECP Torque Anchor™
Number of Placements:	7
Average Depth:	15-1/2 ft
Average Install Torque:	3,450 ft-lb
Average Ultimate Capacity:	30,000 lb
Average Working Load:	15,000 lb
Factor of Safety:	2.0 : 1

The project was not without unforeseen problems, however. At one end of the battery room the piles continually hit an obstruction during installation. Given the limited space, the only option was to move the piles slightly to clear the obstruction. In one of the corners, the obstruction was so large that a pile was successfully installed only after three attempts failed when the pile shaft struck the obstruction.

Photographs: Above right shows the maneuverability of the Brokk machine. Here the workers are guiding it through the office space on its way to the emergency battery room on the lower level. Below are two views of the job site. The emergency battery packs occupy the area where the floor has been drilled. ECP Helical Torque Anchors™ were installed under each battery array, which provided additional working load support of 15,000 pounds per pile placement.