



## Heavy Emergency Battery Packs Cause Settlement - Supplemental Support with Helical Torque Anchors™ Seattle, Washington



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

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.

This solution was not without challenges. The battery room was located on the lower level of the building with low overhead clearance. The battery room was located 300 feet from the nearest entrance. Another consideration was that 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 construction operations could not disturb normal business activities. 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:



Top photo is a view showing the tight area of work in the emergency battery room. Access holes for the helical piles have

already been drilled through the floor slab. Unfortunately, obstructions were encountered requiring relocation of several placements.

Above is a view of the Brokk 90 Mobile Driller. The machine was fitted with an Eskridge 4K5 hydraulic 4,500 foot-pound gear motor that provided shaft torsion for the pile installations.

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

The project was not without unforeseen problems, however. At one end of the

battery room the piles continually hit obstructions 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 workers guiding the Brokk machine through office space on its way to the emergency battery room on the lower level.

Below are 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 providing additional support of 15,000 pounds per pile placement.



**Earth Contact Products, LLC**

ECP Helical Torque Anchors  
*"Designed and Engineered to Perform"*