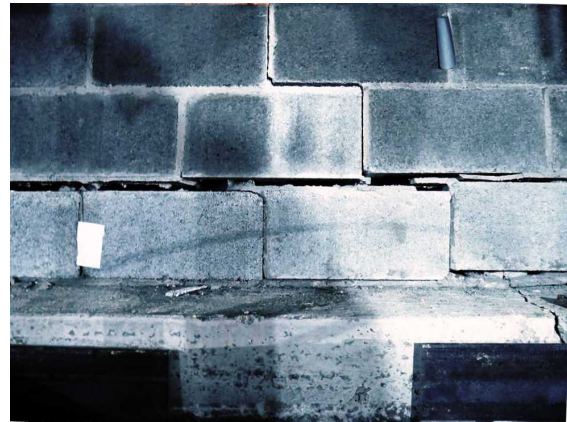




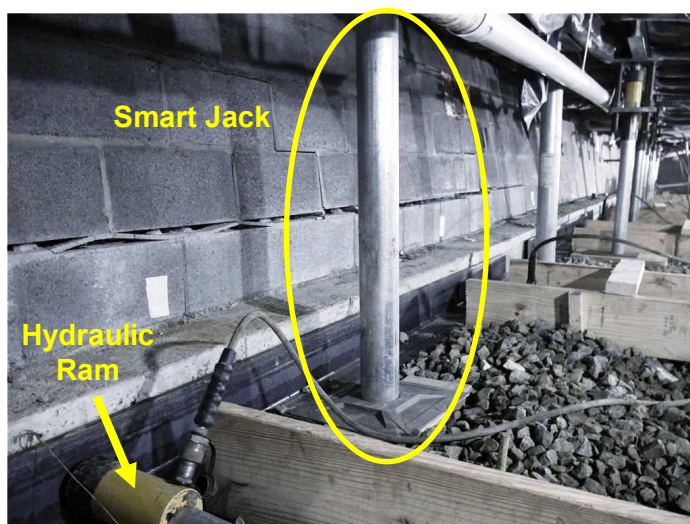
Foundation Settlement and Lateral Movement Rebuilt and Supported by ECP Steel Piers™ West Virginia

The homeowner noticed cracks in the drywall and serious door and window misalignments inside the house. This one year old home showed serious signs of foundation movement. Near the concrete spread footing on the rear exterior of the house there was serious masonry cracking and misalignments. One day when the homeowner was mowing, he noticed the entire back wall had become concaved, and the front wall had bulged forward toward the front porch.

The homeowner called Foundation Systems of West Virginia to assess and correct the foundation movements.



Inside the crawl space revealed substantial cracks spanning the length of the entire back wall and a spread footing with numerous fractures. The front wall had shown a substantial crack on the right side. It appeared that the porch which was built later and is not connected to the home's foundation. The porch had provided lateral support against movement and generally held the front wall in place. The rear wall had moved 2-1/2 inches inward at the footing. The front wall had rotated 1-1/2 inches outward toward the porch. These movements at the front and back walls and footings also caused slight distress to the left exterior wall. Along with observed wall movements, the concrete spread footings had settled from one to two inches within the crawl space. Extreme high humidity and groundwater was present in the crawl space.



Normally one would expect to raise the house off of the foundation and completely remove and replace the failed concrete footings at the perimeter. Usually a house moving company is hired to lift and support the structure while the spread footings are replaced. This is an extremely expensive and time consuming process. Foundation Systems of West Virginia found an innovative way to make repairs that were faster and economical.

The first order of business was to move the displaced and rotated concrete spread footings to the original location. The structural load was removed from the footing by using smart jacks to temporarily support the house. Once the concrete footings were no longer supporting the total weight of the house, hydraulic rams were evenly spaced in the crawl space. These hydraulic rams

applied horizontal force against the damaged concrete footings on the front and back walls. The slow and gentle horizontal hydraulic force caused the concrete footings to move back to their original locations thus straightening the walls.

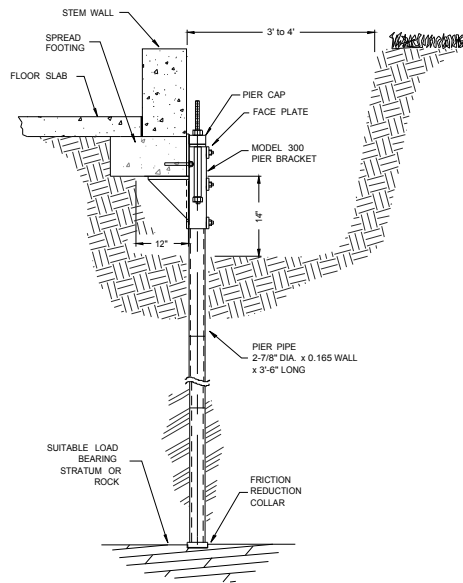
The next step was to construct four concrete crosstie beams that interlocked with the perimeter footings to provide strength and stability. Once this was accomplished, the footing settlement had to be corrected and additional vertical support added to recover lost elevations.

Thirty **ECP Steel Piers™** with standard underpinning were installed on the perimeter. These steel piers were driven to a verified load bearing stratum deep below the unstable soil below the existing concrete footings.

For long term success and stability of the restoration, ground water was diverted from the crawl space and Foundations Systems of WV installed a Clean Space Vapor Barrier System to keep the crawl space dry.



The photo above shows the completed crawl space repairs with the moisture control products in place that will keep the crawl space clean and dry.



The photo and sketch above show typical installation and components of the ECP PPB-300 Steel Pier™



At left is a view of the exterior of the structure after foundation repair and restoration by Foundation Systems of WV. The footing is completely level and the stem wall is plumb.



ECP Steel Piers™
Earth Contact Products, LLC.

"Designed and Engineered to Perform"