

CASE STUDY

Vulcraft NSP

Brigham City, Utah

OVERVIEW

For over 50 years, Nucor has been a leader in the steel industry, utilizing innovative technology that makes them the most sustainable steel manufacturer globally. As we continue down this path of continual improvement, we will achieve even cleaner steel products.

Nucor started their journey in sustainability through the utilization of the electric arc furnace (EAF), which melts recycled scrap to produce high quality steel. EAFs are energy efficient, utilizing electricity instead of natural gas and coal, traditionally used in blast furnace steel making.

As Nucor strives to provide better products to our customers, innovation is at the forefront of everything we do. Minimizing waste and energy use, recycling all materials, and being part of a circular economy is an important part of who we are. Nucor products are made with an average of 97% recycled content, with some products containing almost 100% recycled content.

POWERFUL PRODUCTS

In this vein of constant innovation and improvement, Nucor has developed a new solar foundation pile, the Nucor Solar Pile (NSP). The Nucor Solar Pile utilizes flat-rolled steel from the Nucor Gallatin facility, located in Ghent, KY. The engineering team from Nucor Skyline, a leader in foundation piles, provided engineering and design expertise for this new pile, creating a unique shape that outperforms traditional wide flange beams, as well as the original C-shaped foundation piles. This new pile has the potential to reduce weight by 30%, through utilizing higher strength steel and an innovative design. The Nucor Solar Pile has



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a unique cold-rolled shape, which allows for lighter weight steel while maintaining the load strength for the system. Not only does the pile have a unique shape that helps to strengthen this cold-rolled pile, but it also has a unique chemistry developed by Nucor, ASTM A653 Grade 80 Modified, which achieves a tensile strength of 90,000KSI minimum.

This pile was developed specifically for use as a solar pile. The NSP was designed and tested to maximize strength to weight ratios and has strengthening stiffeners in strategic locations to assist in the ease of installation. The unique geometry, along with modified high-strength grade of steel gives the characteristics needed for strength, deflection, driving, and connection requirements. The NSP can be used for both fix-tilt and single axis tracker systems, depending on your design and soil type. Nucor Skyline can assist in determining the best solutions for your solar field.

Extensive lab testing has been done across the country and backed by a Black & Veatch bankability study available on the Nucor

Skyline website. Nucor Skyline has also done test pile drives across the United States in Kentucky, Nevada, and Utah with great success.

The first project with the NSP is a single axis tracker with 1,092 energy generating panels, located at the Nucor Vulcraft Group facility in Brigham City, UT. This project is now complete and ready to supply up to 0.4 MW of solar power behind the meter. The new array adds to two existing fix-tilt arrays and the combined capacity will supply a third of the power requirements of the facility. Over 210 NSPs were used for the array system, and another 21 auxiliary piles were used for the support structures.

The three arrays consist of two fixed tilt and one single axis tracker. The single axis tracker moves with the help of a pneumatic system with air bladders and tracks the sun as it moves from east to west. The NSP piles were driven to an embedment depth of 4.5 feet with no trouble.

PROJECT PARTNERS

Owner: Nucor Vulcraft – Brigham City, UT

Solar System Equipment Supplier:
Sunfolding – San Francisco, CA

PRODUCT

Proprietary beams (Nucor Solar Piles):
231 piles for three arrays) supplied by
Nucor Steel Gallatin, Ghent, KY

PROJECT TIMELINE

April 2021 to January 2022