

Nucor JFE Sheet Facility

Silao, Mexico

HISTORY

The automotive industry in Mexico is growing at a rapid pace. The production of automobiles in Mexico is expected to increase from 3.4 million to 5.3 million by the year 2020. Five hundred miles south of the United States border, in the Silao region of Mexico, there are many different automobile manufacturers, including General Motors, Volkswagen, BMW, Toyota, Honda, and Mazda. To be able to tap into this growing market, a new joint venture was formed between Nucor and JFE Steel.

Nucor is the largest steel manufacturer in the United States and is primarily located in the United States and Canada. They produce carbon and alloy steel, which is made into bars, beams, sheet and plate; steel piling; steel joists and joist girders; steel deck; fabricated concrete reinforcing steel; cold finished steel; steel fasteners; metal building systems; steel grating; and wire and wire mesh.

JFE Steel Corporation is one of the world's leading integrated steel producers, operating several steel mills in Japan, as well as technical research centers dedicated to the development and application of the most advanced steelmaking technologies in the world.

This 50-50 joint venture will build and operate a plant in central Mexico to supply that country's automotive market.

PROBLEM

Continental Construction Company, Inc. from Memphis, Tennessee, was contracted to drive the piles for the deep foundation of this new facility. Nucor approached Continental back in 2017 for the initial stage of this project, a test-pile program. Then, in December of that same year, the production piles began to be



put into the ground. The design capacity of the piles was 135 tons in compression and 60 tons in tension, using HP 14x73 piles with a 70 feet embedment depth. This was one of the first jobs in this region to use steel piles instead of concrete.

The production pile project required mobilization of two crawler cranes and six pile hammers from the United States, and three crawler cranes from Mexico. Even with a site as large as the Nucor-JFE site, having five driving rigs at a time created the need for increased coordination, not only from a safety perspective, but also from a production standpoint.

SOLUTION

It was imperative to keep all the driving rigs adequately spaced, allowing each rig to drive as many piles as possible, each day, without encroaching on the other rigs, or running out

of room to continue driving piles. The optimal rig spacing and sequencing required daily planning and also relied on each rig driving a certain number of piles each day. To mitigate downtime, the job had a dedicated stand-by hammer and a fully stocked conex box of spare parts for the multiple hammers onsite.

The task of record keeping on such a project was huge, with 25,000 cubic yards of soil excavated, 8,000 uplift dowels installed, and 3,800 piles driven. It was a daily process of collecting, checking, and distributing quality control documents to the appropriate parties. Blow count sheets were reviewed daily by field supervisors, project managers, and geotechnical engineers for completeness and data analysis to keep the project moving forward. With this daily review, low capacity piles were identified and fixed immediately, giving Nucor-JFE the ability to release the

CASE STUDY

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concrete contractor immediately behind the piling contractor to speed up the project.

The initial order of HP 14x73, fulfilled by Skyline Comercial de Mexico, was for 1,008 pieces. The remaining 2,800 H-piles were supplied directly by Nucor to Continental.

The driving of the 3,800 piles took six months and reached almost 51 miles in length. By providing the manpower and equipment to operate five driving rigs, Continental was able

to beat the local four-month rainy season. With only two days lost to weather during that time, driving the H-piles for this foundation was a success. Focusing the initial efforts on high value areas enabled Nucor-JFE to get a head start on the areas with critical equipment and logistics hubs to continue the work on the project.

The plant is expected to open in the second half of 2019 and have the capacity to produce 400,000 tons of galvanized sheet steel per year.

PROJECT PARTNERS

Owner

Nucor-JFE Steel – Silao, MX

General Contractors

Continental Construction Company, Inc.
– Memphis, TN

PRODUCT

H-Piles: HP 14x73 (3,800 pieces)

PROJECT TIME FRAME

December 2017 through June 2018