

STOCK HOUSE HISTORY (1863–1997)

The Stock House is one of six related facilities built between 1860 and 1863 by the Bethlehem Rolling Mill and Iron Company. Robert Sayre, General Superintendent and Chief Engineer of the Lehigh Valley Railroad founded the Bethlehem Rolling Mill and Iron Company in 1858. He had moved the railroad's headquarters to its primary repair shop earlier that same year. The repair shop, around which grew the iron-making and rail-production plant, stood on the southern bank of the Lehigh River at a location that is now part of the City of Bethlehem, Pennsylvania.

Bethlehem was an ideal place to both locate the railroad headquarters and establish an iron plant. The new headquarters was situated at a junction where the Lehigh Valley Railroad connected to the North Pennsylvania Railroad and the Central Railroad of New Jersey, both of which had routes to Philadelphia and New York City where links exited to continuing rail networks.

With respect to iron production, all essential ingredients were at hand: abundant river water; iron ore deposits in the nearby Soucon Valley; limestone was quarried near the site; and a source of coal was only a few miles away. Products made by the iron works could be distributed by the Lehigh Valley Railroad and connecting railroad lines that passed through the site.

The iron furnace, rolling mill, and forge was established by Sayre as an offshoot of the railroad company. In the 1850s, only European plants produced high-quality wrought iron rails. These rails were available to U.S. companies, but supplies and costs were unpredictable. Sayre's ambition was to manufacture rails for his own railroad equal to the best rails made in Europe, and to sell surplus production to other American companies. In 1860 Sayre convinced John Fritz to leave his job as superintendent of the Cambria Iron Company in Johnstown, Pennsylvania and join his new venture as general manager and superintendent of the Bethlehem Rolling Mill and Iron Company.

Fritz's first undertaking for Sayre was the design of the Bethlehem plant and supervision of its construction. Plant operation began in 1863, the same year Sayre reorganized the manufacturing company and renamed it the Bethlehem Iron Company. The plant designed by Fritz comprised two blast furnaces; a stock house at the foot of the furnaces with wings off the north wall that encompassed the bases of the furnaces to form stock floors; an engine house immediately west of the stock house that enclosed machinery for steam generation, blowing, and pumping; puddling furnaces (where pig iron was melted and stirred to become wrought iron for rails) and rolling mills organized under a single roof; and a foundry.

The four plant buildings – stock house, engine house, mill building, and foundry – were of similar construction. All were built with rubble stone (quartzite sandstone) quarried across the Lehigh River in the South Mountain district of the City of Bethlehem. Openings in the masonry

walls were infilled with wooden doors and/or wood-and-glass windows. Floors were concrete. Roof trusses were iron and incorporated an innovative Fritz design: hollow struts formed by connecting semicircular (“half-moon”) sections. The trusses supported hemlock decking. The decking supported locally quarried slate roofing. Ground-level rail tracks ran along and through the buildings carrying cars used to transport raw materials, pig iron produced by the blast furnaces, and products produced by the mill and foundry.

As originally constructed, the Stock House was 47-ft.-6-ins. wide and approximately 260 feet long. Its tall, arched, 8-ft.-2-in.-wide wall openings supplied natural light to the interior through windows that nearly reached the floor. At the base of selected wall openings a combination of double-doors below and windows above facilitated the easy flow of materials and products.

The Stock House was designed to be a storage shed for iron ore, limestone, and coal – the raw materials for iron-making. Plant employees transported these materials into the Stock House interior by rail cars where the materials were unloaded and stockpiled until transported to the tops of the blast furnace stacks.

Getting the materials to the tops of the furnaces -- the furnace to the west was 63-feet-tall and the furnace to the east was 70-feet-tall -- entailed a combination of machine-powered lifting and back-breaking labor. Men shoveled stockpiled material into wheelbarrows, pushed the wheelbarrows into elevator cages that used hydraulic power to carry the loaded wheelbarrows to platforms at the tops of the furnaces. Workmen stationed at the tops of the stacks removed the wheelbarrows from the elevator cages, pushed them to the edges of the opening of the stacks, and manually dumped the material into the blazing furnaces.

Early plant expansion

The Bethlehem Iron Company enjoyed commercial success during its start-up years, however transportation and metallurgy were rapidly changing as steel technology replaced wrought iron technology. To keep pace, Fritz designed a new facility for steel-making and rail rolling in 1870 that was construction and ready for operation in 1873. The large and impressive new facility -- the Bessemer Plant and Rail Rolling Mill – occupied land immediately south of the 1863 puddling and rolling mill.

To support production within the Bessemer Plant and Rail Rolling Mill a third blast furnace was added to blast furnace row in 1874. By 1877 a fourth and fifth furnace had been built to align with the other three.

The Stock House was expanded eastward to front and supply the new furnaces. Now nearly 750 feet long, the Stock House addition, like the original building, had two north bays that formed stock floors at the bases of the fourth and fifth furnaces (there was no stock floor for the third furnace, a Spiegel furnace).

As part of the 1870s expansion, a new, much larger engine house was built immediately south of the Stock House addition making the 1863 engine house obsolete. The Bessemer Plant and Rail Rolling Mill, new engine house, and the addition to the Stock House followed the basic construction of the earlier buildings; however, machinery, engines, and roof trusses for the new facilities were made on site in the machine shop and foundry of the Bethlehem Iron Company.

The output from these new facilities established the Bethlehem Iron Company's stature as a manufacturing powerhouse of national significance. When Charles Schwab became the company president in 1904 he renamed it the Bethlehem Steel Company and initiated a robust upgrading and expansion of the company for the new century.

20th century technology and the near demise of the Stock House

With Schwab at the company helm, the five blast furnaces comprising blast furnace row were rebuilt and modernized for increased production. The system supplying raw materials to the furnaces was upgraded too.

The Stock House's storage capacity was inadequate and the supply system it supported too slow to match the production capabilities of the 20th century furnaces. Schwab, therefore, hired the Chicago-based team of Frank Kryder Hoover and Arthur J. Mason to design a mechanical method for the high-volume delivering ore, limestone, and fuel to the blast furnaces. Hoover and Mason's plan called for storage pits at the eastern end of the site and an elevated rail line -- the Hoover-Mason Trestle -- that used railroad cars to carry material stockpiled in the pits to stock bins at the base of the furnaces where a skip hoist system transported the raw materials to the tops of the stacks.

The Stock House stood in the way of the trestle so most of the building was demolished. When the trestle was completed in 1907, only the western-most 190 feet (all part of the 1863 original Stock House) remained standing of what had been a 750-ft.-long structure. The Hoover-Mason Trestle stopped just a few feet short of the Stock House's new east wall.

No longer needed as part of the supply chain for the blast furnaces, the Stock House was repurposed to serve as a warehouse for company products including crucible steel and tool steel, and to store equipment used in the making of crucible steel.

As the company continued to expand, a new building were grafted to the remaining Stock House's west wall (the Store House, which straddled the site of the former 1863 engine house) and north wall (the Hammer Shop). Rail lines, steam pipes, and electrical utilities passed through the Stock House and connected to other facilities in the plant.

In 1909, the windows and doors of the truncated Stock House were replaced. During this renovation, masons raised the window sills by several feet.

In 1916, the north side of the Stock House roof was reshaped to allow an extension of the Hoover-Mason Trestle along the entire length of the building. The alternation entailed slicing sections out of the building's two gables, dismantling slate shingles and wood decking, the disassembly of the north side of the roof trusses, reconfiguration of the trusses to make space to allow passage of the trestle tracks and cars, and reinstallation of roof decking and slate. Columns and beams supporting the elevated rail straddled the Stock House with one line of columns at the building interior and the other line immediately outside.

In 1936, another 31 feet at the eastern end of the Stock House was demolished to make room for an extension to the western-most furnace on blast furnace row (Furnace A). The length of the Stock House changed over time from 260 feet in 1863; to 750 feet in 1877; to 190 feet in 1907; to 159 feet in 1936. Concrete block was used to close the eastern end of the building after the 1936 demolition.

In the 1950s, masons built concrete partition walls in the Stock House; and a crane assembly supported by 8-in. x 8-in. "H"-shaped steel columns was added along the length of the interior. Access to the crane was provided by a metal stair and mezzanine installed at the east end.

The Bethlehem Steel Corporation in decline

Between 1960 and 1995 the Stock House witnessed the steady, irreversible closing of plant facilities that together now occupied 1,800 acres within the City of Bethlehem. The Bethlehem Steel Corporation shut down the blast furnace adjacent to the Stock House in 1960. The other four furnaces were shut down one-by-one over the next several decades. Starting in the 1970s, the Stock House was used to store parts and equipment for the blast furnaces that remained in operation. During this period, the Stock House's slate roof was replaced with corrugated steel. In the 1990s, the two buildings attached to the remaining 11 bays of the Stock House -- the Store House and Hammer Shop -- were demolished.

The last operating blast furnace went cold on November 18, 1995. By then, the Stock House was suffering from years of differed maintenance. In 1997, the company closed the combination mill and sold BethForge and CENTEC, the last remaining operations of the Bethlehem plant. All other facilities in the plant were mothballed, transforming the 1,800-acre site into the largest brown field in America.