NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

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United States Department of the Interior National Park Service
NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORM

RECEIVED 2280
OCT 10 1997
NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

1. Name of Property: LA BELLE IRON WORKS

historic name: La Belle Iron Works
other name/site number: La Belle Cut Nail Works

2. Location

street & number: 31st and Wood Streets not for publication: N/A
city/town: Wheeling vicinity: N/A
state: WV county: Ohio code: 069 zip code: 26003

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this x nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property x meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant x nationally x statewide ___ locally.

William C. Forman — 10/1/97
Signature of Certifying Official — Date

State or Federal agency and bureau — Date

In my opinion, the property ___ meets ___ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official — Date

State or Federal agency and bureau — Date

4. National Park Service Certification

I, hereby certify that this property is:

	Signature of Keeper	Date of Action
✓ entered in the National Register ___ See continuation sheet.	for Beth K. Savage	11/24/97
___ determined eligible for the National Register ___ See continuation sheet.		
___ determined not eligible for the National Register		
___ removed from the National Register		
___ other (explain): _____		

5. Classification

Ownership of Property:
(Check as many boxes as apply)

- [x] private
- [ ] public-local
- [ ] public-State
- [ ] public-Federal

Category of Property:
(Check only one box)

- [ ] building(s)
- [x] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property:
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
4	0	buildings
		sites
		structures
		objects
4	0	Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)
N/A

Number of contributing resources previously listed in the National Register: 0

6. Function or Use

Historic Functions (Enter categories from instructions)	**Current Functions** (Enter categories from Instructions)
Industry: Manufacturing Facility	Industry:Manufacturing facility

7. Description

Architectural Classification:

INDUSTRIAL ITALIANATE

Materials

Foundation	Sandstone
Walls	Brick, Corrugated Metal
Roof	Corrugated Metal
Other	

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "X" in one or more boxes for the criteria qualifying the property for National Register listing.)

x **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

__ **B** Property is associated with the lives of persons significant in our past.

__ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, ore represents a significant and distinguishable entity whose components lack individual distinction.

__ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "X" in all the boxes that apply.)

Property is:
__ **A** owned by a religious institution or used for religious purposes.

__ **B** removed from its original location.

__ **C** a birthplace or grave.

__ **D** a cemetery.

__ **E** a reconstructed building, object, or structure.

__ **F** a commemorative property.

__ **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)
Industry

Period of Significance
1852-1922

La Belle Iron Works
Name of Property

Ohio County, WV
County and State

Significant Dates
1852, 1886,

Significant Person
(Complete if Criterion B is marked above)
N/A

Cultural Affiliation
N/A

Architect/Builder
N/A

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

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9. Major Bibliographical References

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Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):
__ preliminary determination of individual listing (36 CFR 67) has been requested.
__ previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey # _____
_x_ recorded by Historic American Engineering Record # **WV-47**

Primary location of additional data:
_x_ State historic preservation office
__ Other state agency
__ Federal agency
__ Local government
__ University
__ Other

Name of Repository: _____
_____

La Belle Iron Works
Name of Property

Ohio County, WV
County and State

10. Geographical Data

Acreage of Property: 4.59 acres

UTM References

Zone	Easting	Northing	
17	523700	4433160	Wheeling Quad Map

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

Name/Title: Katherine M. Jourdan, and Laura Pfeifer

Organization: WV State Historic Preservation Office Date: 1992/July 1997

Street & Number: 1900 Kanawha Blvd, East Telephone: 304/558-0220

City or Town: Charleston State: WV Zip: 25305

Property Owner

Name: Wheeling-LaBelle Nail Company
Contact: Stephen F. Beecroft

Street & Number: P.O. Box 6667 Telephone: 304/232-1355

City: Wheeling State: WV Zip: 26003-0911

The La Belle Iron Works began operations in 1852 on a site south of the city of Wheeling. The industrial site grew from the original two brick buildings to cover almost six acres by 1902. Today the plant is smaller in size with the original buildings now incorporated under one roof as well as the early equipment used for the production of cut nails.

The La Belle Iron Works is located in Center Wheeling on what was part of Joseph Caldwell's farm. The land is flat and is five blocks from the Ohio River, bounded roughly by Wood Street to the west, Alley G on the east, and lying between 30th Street to the north and 32nd Street to the south. To the north is the elevated exit ramp for I-470, and to the east is Route 2, both of which took a section of the property in 1979.

When Bailey, Woodward and Company was formed in 1852 they purchased four acres choosing a site with easy access to the Ohio River and the new B&O Railroad. From this piece of property they set aside two acres for workers housing. Some of this construction is still in evidence along McColloch and 31st Streets but has been heavily altered and is not being addressed in this nomination (see lots noted B.W. & Co. on Figure 1). On the other two acres they erected two brick buildings to house the machinery.

The building to the west (A in Figure 2) of the complex was constructed to house the blacksmith shop, machine shop, and nail machines (Contributing). The latter eventually held 40 nail machines and was fondly called the dog house, a name still in use today. This rectangular red brick building is one story in height, with segmental arch windows and corbelled brick surrounds. The style would be called an industrial Italianate. Brick pilasters divide the three bays with corbelling above each section. The center door on the south end had a round arch with a fanlight transom, but this has been covered with a metal shed overhang. The east and west windows on this structure have been bricked in, probably when the building was surrounded by new additions. Single doors open into each section of the building. The gable metal roof is still in place.

The second original brick building (B in Figure 2) was the Annealing house (contributing) which is where the nails were heated in one of the two furnaces and subsequently cooled to prevent brittleness and increase strength. Today it is used as an office by the plant superintendent and his staff. This structure is also a rectangular red brick, one-and-a half story, gable metal roof building with two segmental window bays on each floor of the south facade, and several single door openings on the west side. The east side is divided by pilasters into six bays with three window openings, and one wooden door set high in the north corner wall. The southeast corner of the building is angled.

To the north of the annealing house is a c. 1930's one-story flat roof addition connecting the present office to the compressor room. The connecting addition has three segmental arch openings, and above each bay

is a recessed cross design in the brick. The Compressor Room (contributing) is also one and a half stories in height, rectangular, with a gabled rolled asphalt roof. The building extends out to the east with an uncoursed sandstone foundation. It has three segmental arch openings on the east side, and one on the south facade next to a round arch doorway which has been bricked in above the double doors. One window on each facade has been altered to hold a ventilation fan. On the 1902 Sanborn Map (C in Figure 2) this building was the engine room and the cooper shop. It was probably constructed just after the annealing house and once had four steam boilers powered by coal. The map also shows the extensive railroad spur system with the B&O Railroad to facilitate loading.

The land between 31st Street and 32nd Street was acquired from Sobieski Brady in 1868 (Figure 3), as well as a lot to the west side of the blacksmith shop. By 1874 the main plant had been expanded to include 58 nail machines, 13 puddling furnaces, and one heat furnace but the main section of the plant was a separate frame building. The south end of the property saw the construction of a warehouse, coopers shop, and stock shed.

In 1894-95, and again in 1897, the tin plate mill was added to the site (D in Figure 2) with eight hot mills, 4 stands for cold mill, and six tinning stacks. This necessitated the removal of the existing frame building which covered the center operation of the plant. The 1902 Sanborn Map shows that iron construction was chosen for the new center building (E in Figure 2) with a brick south facade. The center part of this facade was later removed to extend the building out to the south. Part of the brick facade is visible on the southeast corner with stepped segmental arch openings, one of which has been changed to a doorway with a shed overhang. The three original brick buildings are still separate structures at this time although the north wall of the blacksmith/machine shop and the north and west walls of the engine room butt against the new building. By 1902 the two companies, La Belle Iron Company and American Tin Plate, occupied almost the entire site and shared some common machinery. The American Tin Plate Company was out of production and the north section of the building was removed by 1922.

After 1902 the buildings were combined under a single roof, although the truss systems date to different periods achieving the configuration visible today. A brick facade was attached next to the blacksmith shop with a similar style of segmental arch openings, corbelling above, and dividing pilasters (Contributing). This had been an open area between the buildings for a railroad spur. A second metal addition was placed on the west side of the plant soon after 1902 to house the new Mesta carousel pickler. The metal center section of the building has an iron truss and framing system for the corrugated roof and side walls. This allowed a larger expanse for production and the ribbon of windows as skylights. The gable corrugated metal roof was extended

with 12/3 light awning windows running almost the entire length of the building. The west side of the plant has two tiers of 9/9 double-hung ribbon windows running the length of the structure, and one tier on the north side, as well as an extended gable for ventilation with 12/9 awning windows. These side wall windows have been covered as well as those for ventilation with corrugated metal siding. On the center of the west facade is a large loading bay and a single entrance. The north facade of the building is irregular and had corrugated metal siding. A large painted sign decorates the west and north walls of the building reading in black letters on a white background "La Belle Cut Nail Plant, The Largest in the World, Wheeling Corrugating Company, A Division of Wheeling Pittsburgh Steel Corporation." Incorporated in the sign is the traditional logo of La Belle, a red fleur-de-lis.

By the time of La Belle's centennial in 1952, some of the buildings had been vacated and were in poor repair. Within a decade the site lost the structures located between 31st and 32nd Streets. This included the warehouse, coopers shed, stock shed, and a circa 1890's two-story brick office next to the warehouse. The hospital/first aid and clock office which was located at the entrance to the plant at 31st and Wood Streets has also been removed.

The cut nail machinery still in use by La Belle dates to 1852 and the 1860's. The parts necessary for repairs are either taken from other machines, or are hand made in the blacksmiths shop or by a foundry. Currently La Belle operates more than half the machines on the site and produces several tons of cut nails a year. The majority of their output is masonry nails which are shipped to different parts of the world.

La Belle originally powered its nail machines with steam power provided by a vein of soft coal mined from the hillside above the plant. The steam drove a flywheel system located below the floor which connected by way of belts to the individual machines. This system later converted to a large electric motor and finally in 1971 to individual electric motors on each machine. The flywheel is still present near the center section of nail machines.

A turn of the century piece of equipment is present in the building although it has been recently replaced by new environmentally concerned technology. The Mesta Carousel Pickler (Figure 5) is located at the northeast corner of the blacksmith shop building in the later west metal addition. The machine was made by the Mesta Machine Company about 1902. The purpose of the pickler is to clean the steel and coat it with lime which acts as a lubricant during the shearing process. The carousel pickler was used full time up until the fall of 1990 when the process began to be transferred to a new machine method that took full control in March of 1991. The new method uses shot blast to clean the steel instead

of sulfuric acid which was evironmentally hazardous. The management of La Belle intends to keep the Mesta carousel pickler for historical purposes to interpret early twentieth century changes in the nail industry.

The machinery at La Belle along with the different processes were documented by a HABS/HAER team during the summer of 1990. The drawings are provided in Figures 4-8 for a greater understanding of the mechanical process. Photographs of the production methods were also taken for documentation and are available at the Library of Congress.

The buildings and nail machines of the La Belle Cut Nail Plant present an excellent picture of nineteenth century technology still present and viable in the late twentieth century. The plant well represents Wheeling's industrial past being the lone remaining such enterprise within a city where the nail industry once dominated the market. Today La Belle is considered the largest cut nail plant in the world, and only one of two cut nail companies still in existence in the United States.

The La Belle Iron Works in Wheeling, West Virginia, is being nominated under Criterion A, for Industry. La Belle is significant because it represents a period in history when manufacturers in the Wheeling area dominated the national nail industry. La Belle has survived the demise of cut nail factories due to wise fiscal investment and management techniques. The period of significance for this nomination extends from the founding of the La Belle plant in 1852, until the reduction of the site in 1922. After the "great nail strike" of 1886, the wire nail dominated the nail market and the manufacture of cut nails declined. The three original 1852 brick Italianate structures that comprised part of the operations are still a integral part of the plant. The iron truss building constructed in the mid-1890's highlights the change in construction techniques that allowed large open expanses for factory floors. Nails continue to be made at La Belle Iron Works today in much the same way as when the plant opened in 1852, and the plant supplies a large share of the cut nail market in the United States. This plant is the largest cut nail plant in the world, and the only survivor from the period of Wheeling's dominance of the cut nail market.

Nails were originally wrought by hand and began as thin rods. After a point had been formed on one end of a rod, the pointed end was cut from the rod and the nail was headed by hand. This process was labor intensive and expensive. In 1775 Jeremiah Wilkinson invented a method for cutting thin strips from a metal plate instead of striking them from rods. Although Wilkinson used this process for making tacks instead of nails, it was quickly applied to the nail industry. However, this invention did not dramatically increase production, since nails were still headed by hand until the advent of the automatic heading machines in the 1830's.

The process for making cut nails began with pig iron, which was turned into wrought iron by puddling. Puddling involved heating and stirring pig iron in a furnace. The stirring removed carbon from the iron through oxidation and converted it into wrought iron. The wrought iron was then rolled into muck bar, which in turn was made into nail plate. Scale on the nail plate was removed by pickling it in sulfuric acid, rinsing it in water, and coating it with lime slurry. The coating helped lubricate the plate during the cutting process. The iron was sheared into strips, whose width determined the size of the nail. Nail machines struck a tapered nail from the end of the strip and formed a head on the wide end of the shank. The machines were driven by belts connected to a line shaft system, which was powered by a steam engine. "Feeders" were responsible for heating the metal, putting it into a machine, and manually flipping the strip after each nail was cut. "Nailers" were responsible for sharpening the cutting blades and regrinding the dies that headed the nails. The skill involved in being a nailer was closely guarded. No-one outside the industry was to be taught the skill, and if a nailer had two sons, only one of them could learn the

trade. In the early 1870's when bricklayers were earning $3.66 a day, carpenters $2.25, and common laborers $1.25, nailers in Wheeling, West Virginia, were earning $12 to $20 a day, depending on the size of nails being cut. Wages in Wheeling were one third higher than those of eastern nail factories.

Today, steel has replaced iron as a raw material, and the nails are no longer pickled with sulfuric acid, since that process can be replaced by a less expensive method that does not pose a threat to the environment. Instead, cold rolled steel is fed into a machine that cleans the metal by shot blast, coats it with lime, and shears it into thin strips. The nail cutting machines still in use date back to the 1860's. Parts for this equipment are no longer being manufactured, so La Belle has a full time blacksmith who can make the necessary repairs. Automatic feeders rotate the strip after each nail is cut. Modern employees, still called feeders, are responsible for putting nail plate into four machines. After steam was no longer used, the equipment was powered by electric engines before each machine was given an electric motor in 1971. Nailers still take care of the machines as they did when the plant opened. After the nails have been cut and headed, they are heated at 1800^0 F and quenched with water to make them harder. Then they are tempered in a drawing tube, which heats the nails between 400^0 and 800^0 F. The temperature is adjusted so that the nails will bend without breaking. Automatic packers make the finished product ready for shipping.

Industries were attracted to Wheeling for several reasons. Natural resources like coal and iron were available. In the 1840's coal was cheaper in Wheeling than any other western city. The land was poor for agriculture, and capital, although not plentiful, was accessible. Wheeling was also a link in the country's vast transportation network. The Ohio River gave access to southern and western markets, and to northern markets through the Ohio canal system, it was also navigable during the dry season. In 1818 Wheeling became the western terminus for the National Road on the Ohio River and was later connected to the B&O Railroad in 1853. These advantages led to the founding of the first iron mill in Wheeling, Top Mill, in the 1830's by Peter Schoenberger and David Agnew of Pittsburgh. The factory produced sheet iron, iron bar, and nails. The second mill, and the first to limit production to nails, was the Virginia Mill, which began operating in 1848. During the time nail plants in the Wheeling area were being constructed, many companies were created. Investors would form a company and construct a mill. They then sold the factory at a profit to local businessmen and set up a competing firm.

Bailey, Woodward and Company was established in 1851 by seven men who left the Belmont Mill, a local nail factory founded in 1849, and fifteen other partners. Unlike the founders of other firms, these men were mechanics or craftsmen, rather than business men, who were familiar

with the manufacturing process. Each member of the board supervised a section of the plant. In order to have a stable company, they agreed that when a stockholder wanted to sell out he first had to offer his stock to the current partners, beginning with the man who owned the least shares and working upward. If no-one wanted it, the stock was purchased by the company and divided among the interest holders. This arrangement was so durable that in 1874 half of the 22 founders were still with the company, but no new partners had been taken into the corporation. When La Belle became part of Wheeling Steel in 1920, the partnership still consisted of original founders or their descendants.

In order to establish their business, Bailey, Woodward and Company purchased four acres of land for $4000: two acres for company houses and two for a nail plant. The company began production with two brick buildings to house the nailing machines and the annealing process. A separate brick building was soon constructed to hold the steam boilers used to power the nail machines. These facades are an industrial Italianate style with segmental arch window openings and corbelled brick surrounds, supported by masonry bearing walls. These types of walls which needed to be quite thick to support the weight of a roof, did not allow a wide area without some type of wall or pier for support. Masonry construction was probably used because the nail making process required heavy equipment and generated a great deal of heat, and the thick brick walls would provide protection against fire. These early narrow buildings are still quite visible on the perimeter of the complex. The early buildings can be easily compared to the later large center metal truss system constructed in the mid-1890's.

La Belle Iron Works opened operations with 25 nail machines, eight boiling furnaces, two heating furnaces, a muck mill, and a skelp mill. The factory also incorporated the rotary squeezer and bullhead rollers. These last two machines allowed the plate to be made with the grain running the length of the nails, making them less apt to snap. This helped cut competition from wrought nails, which were still being used in the nineteenth century. Although it incorporated no major innovations when it began operating in 1852, La Belle quickly became one of the leading manufacturers in the Wheeling district. When La Belle started running a blast furnace in 1855, it became the first mill in Wheeling to produce its own pig iron. Blast furnaces allowed companies to produce their own pig iron instead of purchasing it, thus reducing the cost of the finished product.

During the panic of 1857, all of the area plants except La Belle either reorganized or went bankrupt. La Belle's unusual conservative spending policy allowed them to weather this tough financial period with enough capital to purchase the Jefferson Works in Steubenville, Ohio, in 1859 for $75,000. This added 184 acres of coal land and 40 nail machines, plus rolling and puddling mills, to Bailey, Woodward and

Company, making them the largest producer of nails in the Wheeling area. They continued to expand by constructing blast furnaces at the Steubenville plant in 1862 and 1864. Only two companies in the Wheeling district, La Belle and Belmont, had blast furnaces in 1865, but the remaining mills began constructing furnaces in the early 1870's. By 1874 the La Belle and Jefferson plants employed 900 people, and operated 167 nail machines, two blast furnaces, and 21 puddling furnaces, along with various rolling and keg mills. In 1875 Bailey, Woodward and Company had been incorporated as the La Belle Iron Company and had become the largest nail producing firm in the United States.

La Belle developed a cost accounting system prior to 1866 that had a tremendous impact on Wheeling nail companies. By breaking down the costs that went into producing each keg of nails into different headings, La Belle could see where costs were increasing or decreasing. Based on this method, improvements could be proposed and accurately evaluated. Other Wheeling nail companies adopted La Belle's system in the early 1870's, after new managers with experience in banking and business took over the plants, and the companies started making their own iron. Since the new managers had little technical knowledge of the nail making process, they had to find methods for managing materials, conveying decisions, and gathering information throughout the plants. To do this they were able to use La Belle's cost accounting system to track expenses for each step of the manufacturing procedure and predict the impact minor changes would have. Wheeling firms assumed that if they made nails at the lowest price possible, they would insure themselves a portion of the market. When other companies chose to offset declines in the industry by keeping prices artificially high, Wheeling manufacturers used accounting to decrease internal costs. This kept their prices low, allowing them to outsell their competition at a profit, and causing eastern companies to either lose their share of the market or meet Wheeling prices at a loss. Unfortunately, the cost management system ultimately failed by not being able to evaluate any product other than the cut nail and by not encouraging technological experimentation. In the publication Rise and Decline of the American Cut Nail Industry, Amos Loveday said, "Overstatement of the importance of the cost control system would be difficult. It touched every area of operations and was a significant factor in almost every decision made by the [Wheeling] firms. Neither the emphasis on cost control nor the cost accounting system that evolved at Wheeling can be found in other segments of the industry during the 1870's." (p. 84) The cost accounting system started at La Belle allowed Wheeling companies to dominate the national nail market.

Around 1885 La Belle converted to steel by building its own steel plant in Steubenville. The change was made in part to reduce internal costs. A good puddler who could turn two and one half to three tons of pig iron into wrought iron in a nine hour shift was easily outdistanced by a Bessemer converter, which made fifteen to twenty tons of steel in

twenty minutes. Once the new system was in place, the plants fired the puddlers, who convinced the nailers to strike. Surprisingly that same year the Wheeling district produced one third of all nails made in the United States. The "Great Nail Strike" from May 1885 to June 1886 helped the new wire nail impinge on the cut nail market. Unions were trying to prevent the use of cut nails in order to strengthen the strike, the supply had been exhausted early in 1886, and the demand could not be met by eastern factories. Wire nails also gained wide acceptance during the strike because consumers discovered that they were easy to use, and companies found them inexpensive to make. The manufacture of cut nails declined sharply after 1886.

Since the conversion to wire nail production was too expensive, the Wheeling mills tried to stay in business by making other products. The La Belle Iron Company ran a tin mill from 1894 to 1898, along with their nail factories. The expansion for the addition of the tin mill caused a frame structure which covered the central operations to be removed in favor of a new iron truss building. It is interesting to note that iron is listed as the building material on the Sanborn Maps and not steel, even though La Belle's Steubenville plant was producing steel by the mid-1880's. The use of a metal truss and wall system allowed greater use of the now expansive factory floor, and the lighter framing allowed ribbon windows to run the length of the building. In 1898 the tin plant was purchased by the American Tin Plate Company, who continued to share factory space and services with La Belle. By 1922 the tin company was gone and the portion of the factory which had been used for production was removed. La Belle was the only functioning nail plant left in Wheeling by 1914. La Belle and two local steel mills, the Whitaker Glessner Corporation and the Wheeling Steel and Iron Corporation, became Wheeling Steel Corporation in 1920. Later Wheeling Steel and the Pittsburgh Steel Corporation came together in 1967 to form the Wheeling Pittsburgh Steel Corporation which owned the plant until 1997.

La Belle continues to produce several tons of nails each year and supplies a large share of the cut nail market in the United States. La Belle's competition comes from firms in South Korea and from the Tremont Nail Company in Wareham, Massachusetts, the only other operating cut nail plant in the United States. Tremont Nail Company was started in 1819 through a cooperative effort among several local nail firms. Tremont never reached the capacity of La Belle, and it did not have the far reaching impact on the national nail market as did La Belle and other Wheeling nail plants. The cost accounting system developed at La Belle allowed Wheeling firms to control national nail prices during the 1870's and early 1880's. La Belle was recognized by 1875 as the largest nail producing company in the United States.

The architecture of Tremont and La Belle reflects regional influences as well as a progression of construction as the factory sites developed. The earliest existing building at Tremont is the main factory dating to 1848, with three other nineteenth century edifices supplying additional services scattered on the site. The exteriors of eight of the nine buildings on the complex are sheathed in wood shingles and have double-hung sash window openings, including two workers cottages. The wood shingle is a popular exterior material in Massachusetts, especially near Cape Cod. While most of the buildings are in original condition some modifications have been made as the function of the buildings changed, namely the facades of the store house, cooper shed and office.

The architecture of La Belle is typical of the Midwest with the brick and metal construction being found in other iron/steel or foundry operations in the Ohio River Valley. La Belle was limited in its development being land locked by workers cottages, a steep hillside to the east, and railroad sidings on the west. (Land has since been lost to State Route 2 and Interstate 470.) Hence the buildings at La Belle are close together with the three original 1850's brick buildings forming the nucleus and the iron framed center section of the 1890's factory floor spanning the gulf in between. One must realize that La Belle expanded and diversified beyond Tremont, needing additional floor space for more nail machines and furnaces while also sharing operations with the tin plate mill. It was because of this diversification that La Belle managed to stay in business while other Wheeling nail plants failed.

The configuration of the present buildings has remained basically the same since the tin plate mill was removed in 1922. The plant is currently about the same size as it was at the end of the nail strike in 1886. Although most of the nails made in Wheeling are for fastening wood to masonry, La Belle's nails have been used on a restoration project at Monticello and in the construction of the "Lady Washington," a reproduction of an eighteenth century brig.

La Belle survives as the largest cut nail plant in the world and the only example of the Wheeling mills, which as a unit had a profound impact on the national cut nail industry. The plant highly represents the struggle to compete in the difficult market of the nineteenth century, and to hold on after the new method of wire nail production affected the cut nail position. The architecture of the complex dates to the mid and late nineteenth century with the brick and iron construction typical of other Ohio River Valley mills.

Archives, La Belle Iron Works, a Division of Wheeling-Pittsburgh Steel Corporation. Wheeling, West Virginia.

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"The La Belle and Jefferson Iron Works." THE WHEELING INTELLIGENCER. 18 February 1874, p. 3.

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Plummer, Robert L. SIXTY-FIVE YEARS OF IRON AND STEEL IN WHEELING. Wheeling, West Virginia: 1925.

Property Survey Map. Wheeling Steel Corporation. Drawing Number RE11-57, tube 31, 1939, latest revision 1981.

Scott, Henry Dickerson. IRON AND STEEL IN WHEELING. Toledo, Ohio: Caslon Company, 1929.

Verbal Boundary Description:

All that parcel or piece of land situated in the city of Wheeling, Ohio County, West Virginia, more particularly bounded and described as follows: beginning in the west line of Alley G at an iron bar one inch in diameter, set in a concrete base, 408.3 feet (measured along the line of said alley) southwardly from an iron bar one inch in diameter, set in a concrete base at a point where the south line of 29th Street intersects the west line of Alley G; thence from the first mentioned iron bar in a westerly direction 50.6 feet to a point being indicated by an iron bar one inch in diameter, set in a concrete base; thence by an angle of $90^{0}17'$ to the right in a westerly direction to a point in the east wall of the tin pot, as indicated by an iron pin embedded in the brick wall; thence at right angles in a southerly direction with said east wall of the tin pot and the southerly prolongation of the same 32.2 feet to a point, indicated by an iron bar one inch in diameter, set in a concrete base; thence at right angles in a westerly direction 19.4 feet to a point in the east brick wall of the old tin house, indicated by an iron pin embedded in the brick wall; thence in a southerly direction with the said east wall of the old tin-house 10.8 feet to a corner of the tin-house; thence at right angles in a westerly direction with the south wall of the tin-house 44.7 feet to an angle formed by the intersection of the south and east walls thereof; thence at right angles in a southerly direction with said east wall 9.45 feet to a corner in the tin-house; thence at right angles in a westerly direction with the south wall of said tin-house 41.5 feet to an angle formed by the intersection of the last mentioned south wall and the east wall of the old sorting room; thence in a southerly direction with the said east wall of the old sorting room 20.47 feet to the southeast corner of the old sorting room; thence at right angles in a westerly direction with the south wall of the old sorting room and the westerly prolongation of the same across the railway track 42.9 feet to a point in the east brick wall of the warehouse, which is indicated by an iron pin embedded in the wall; thence at right angles in a southerly direction with the said east brick wall of the warehouse 6.2 feet to a corner of the warehouse; thence in a southerly direction with the east wall of the warehouse 42.88 feet to a corner of the warehouse; thence in a westerly direction with the south wall of the warehouse 42 feet to a point in the east line of Wood Street at the southwest corner of the warehouse; thence following the east line of Wood Street in a southerly direction approximately 325 feet to a point; thence in an easterly direction approximately 312 feet to the southeast corner of the intersection of 31st Street with Alley G; thence in a northwardly direction 310 feet to the place of beginning.

Boundary Justification
As described in Deed book 658, page 383, County Clerk's Office, Wheeling, West Virginia. Area described encompasses area of original plant.

La Belle Iron Works
31st and Wood Streets
Wheeling, WV
Ohio County

Photographer: Katherine Jourdan

Date: October and November 1991

Negatives: WV SHPO, Charleston, WV

PHOTO 1 of 10: Looking southeast at the northwest corner and west side of plant.

PHOTO 2 of 10: Looking north at the south facade.

PHOTO 3 of 10: Looking north east at the southwest corner of the building.

PHOTO 4 of 10: Looking northwest at the southeast corner of the annealing house.

PHOTO 5 of 10: Looking southeast at the west side of plant.

PHOTO 6 of 10: Looking southeast at north facade.

PHOTO 7 of 10: Looking west at east facade.

PHOTO 8 of 10: Interior view of plant looking north.

PHOTO 9 of 10: Interior view - nail machines.

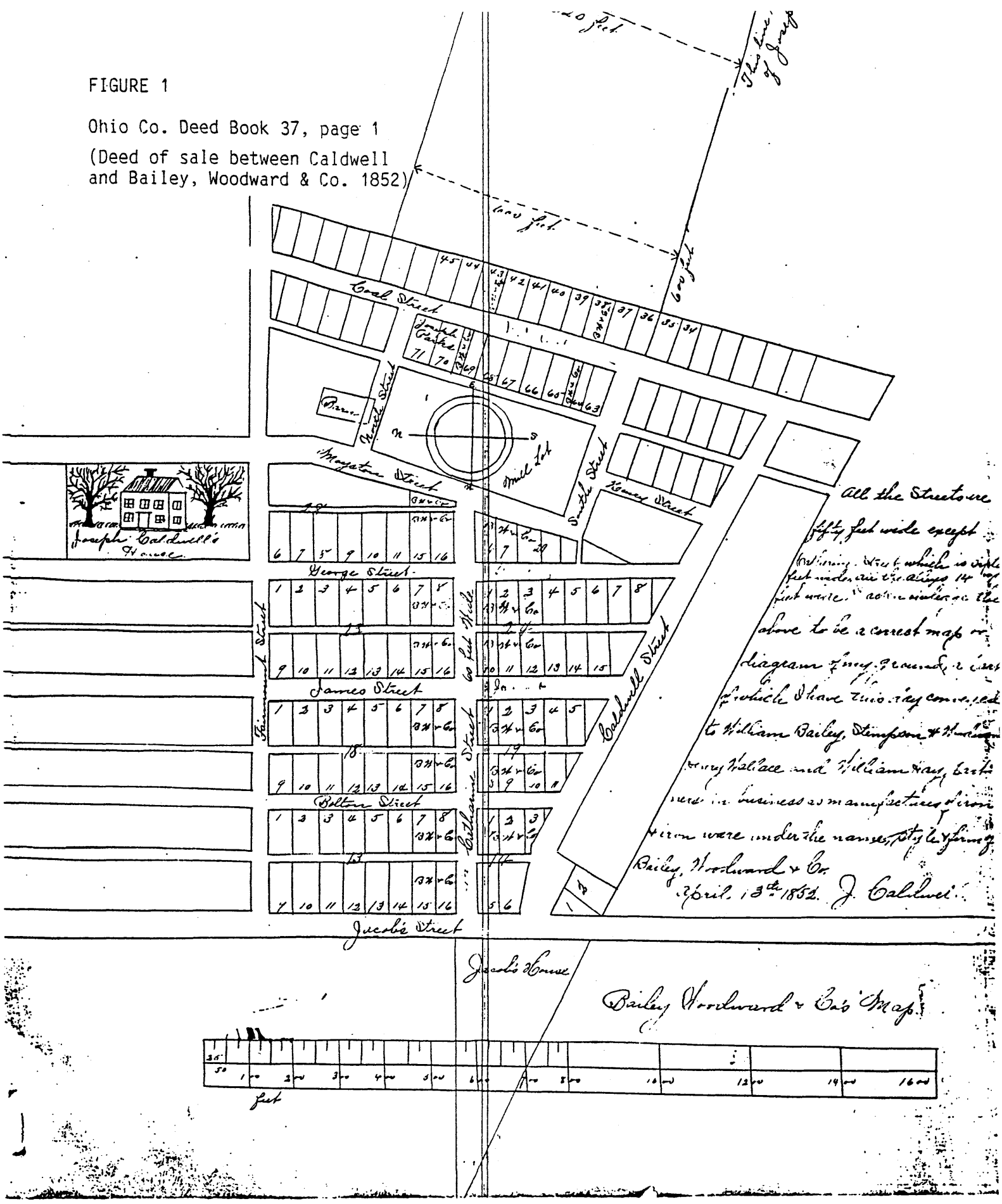
PHOTO 10 of 10: Interior view - flywheel.

*** A site visit in July 1997 has confirmed that the photographs taken in 1991 are still current and up to date. No physical changes have taken place to the buildings since that time, and the machinery is intact.

FIGURE 1

Ohio Co. Deed Book 37, page 1

(Deed of sale between Caldwell and Bailey, Woodward & Co. 1852)



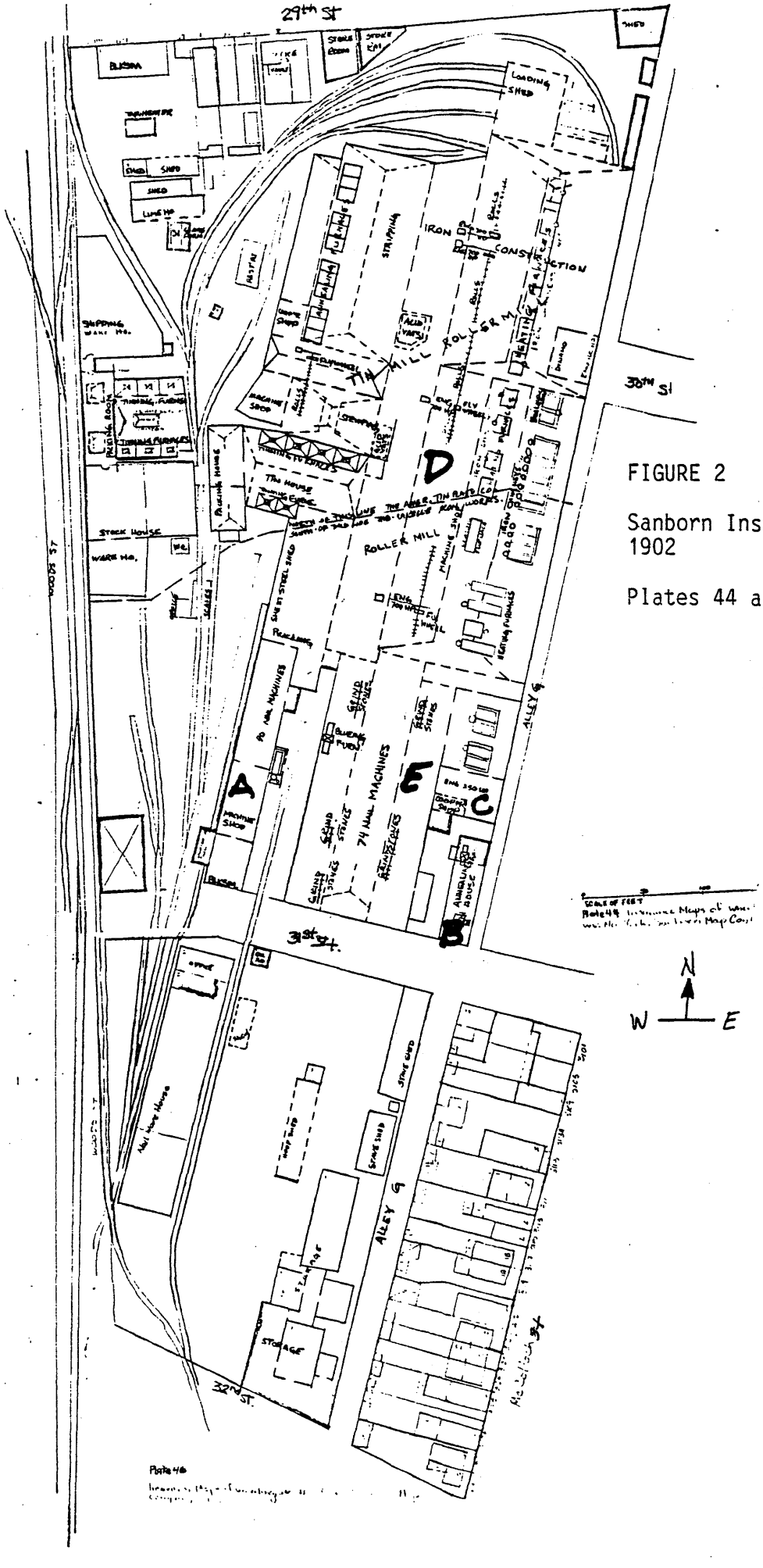


FIGURE 2

Sanborn Insurance Map
1902

Plates 44 and 46

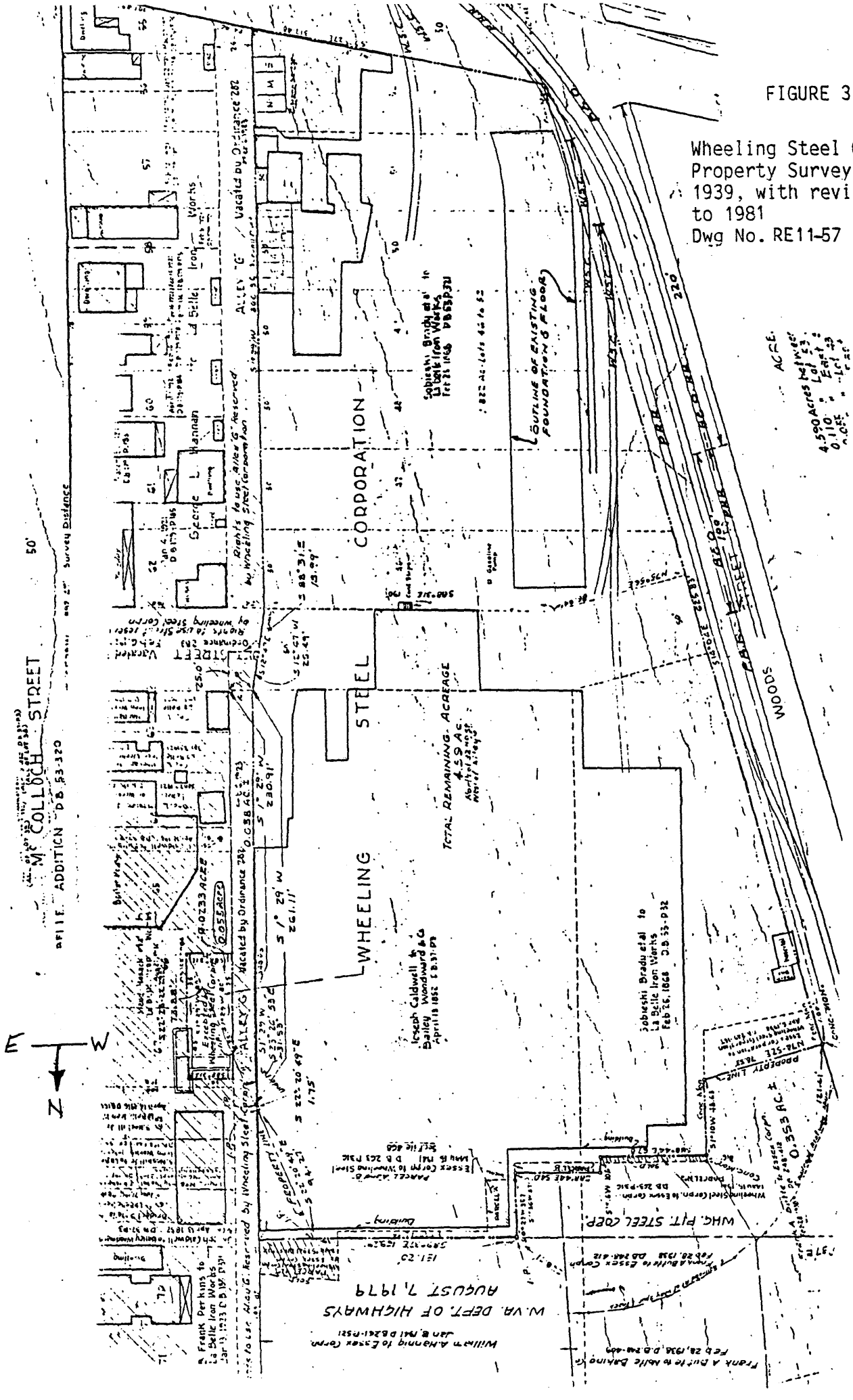


FIGURE 3

Wheeling Steel Corp.
Property Survey Map
1939, with revisions up to 1981
Dwg No. RE11-57 Tube 31

LA BELLE IRON WORKS

ESTABLISHED IN 1852

DURING THE NINETEENTH CENTURY, WHEELING, WEST VIRGINIA (VIRGINIA) WAS A GATEWAY TO THE WEST. WHEELING WAS NOT ONLY A HUB OF TRANSPORTATION WHERE THE OHIO RIVER, THE NATIONAL ROAD AND THE BALTIMORE AND OHIO RAILROAD MEET, BUT THE CITY ALSO HAD AN ABUNDANCE OF RAW MATERIALS, ESPECIALLY COAL. WHEELING WAS THEREFORE AN ATTRACTIVE SITE FOR THE ESTABLISHMENT OF IRONWORKS. THE FIRST IRONWORKS WERE LOCATED IN WHEELING DURING THE 1830s, AFTER WHICH THE CITY QUICKLY BECAME A CENTER FOR THE MANUFACTURE OF IRON PRODUCTS, ESPECIALLY CUT NAILS. IN THE 1880s WHEELING BECAME KNOWN AS "NAIL CITY".

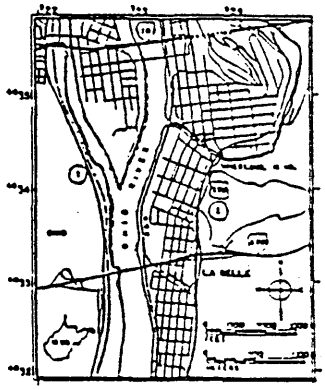
THE LA BELLE IRON WORKS—WHICH BEGAN OPERATIONS IN 1852—WAS A PARTNERSHIP AMONG FOUNDING MEMBERS AND WORKMEN FROM WHEELING MILLS ESTABLISHED IN THE 1830s AND 1840s. PIG IRON WAS PUDDLED INTO WROUGHT IRON, ROLLED INTO PLATE, AND CUT INTO NAILS.

THE AMERICAN CIVIL WAR WAS A BOOM PERIOD FOR LA BELLE; PROFITS FROM THE WARTIME ECONOMY ALLOWED THE COMPANY TO EXPAND ITS WHEELING AND STEUBENVILLE, OHIO OPERATIONS. THE INTRODUCTION OF THE BESSEMER STEEL-MAKING PROCESS NOT ONLY REPLACED WROUGHT IRON WITH STEEL, BUT ALSO PRECIPITATED THE GREAT NAIL STRIKE OF 1884-85. THIS STRIKE LED DIRECTLY TO THE DECLINE OF THE CUT NAIL INDUSTRY BY ALLOWING THE WIRE NAIL TO DOMINATE THE MARKET. BY 1912, ONLY LA BELLE CONTINUED TO MANUFACTURE CUT NAILS IN WHEELING, AND SURVIVED ONLY BECAUSE OF CAREFUL MANAGEMENT AND A HISTORY OF DIVERSIFICATION. IN ADDITION TO CUT NAILS, LA BELLE OVER THE YEARS HAD PRODUCED TIN PLATE AND OTHER FINISHED IRON AND STEEL PRODUCTS.

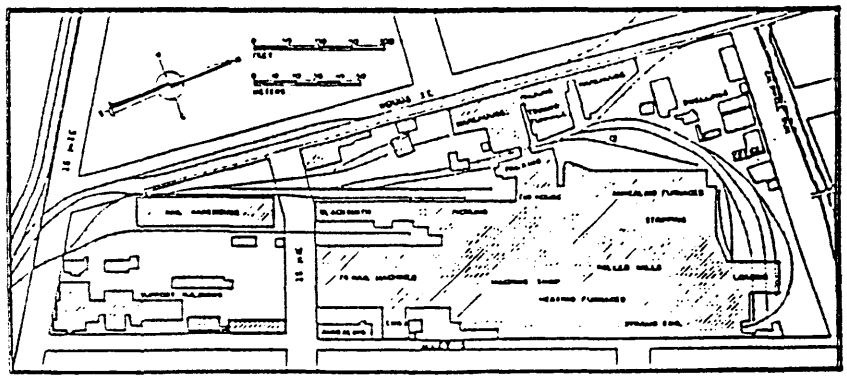
IN 1920, THREE REMAINING INDEPENDENT WHEELING IRON AND STEEL WORKS, WHITAKER-GLESSNER, WHEELING IRON AND STEEL, AND LA BELLE MERGED TO FORM WHEELING STEEL CORPORATION. TODAY LA BELLE IS A SUBSIDIARY OF WHEELING CORRUGATING COMPANY (PART OF WHEELING-PITTSBURGH STEEL CORPORATION), OF THE TWO REMAINING CUT NAIL FACTORIES IN THE UNITED STATES, LA BELLE IS THE LARGER.

THE LA BELLE IRON WORKS RECORDING PROJECT WAS UNDERTAKEN DURING THE SUMMER OF 1990 BY THE HISTORIC AMERICAN BUILDINGS SURVEY/HISTORIC AMERICAN ENGINEERING RECORD (HABS/HAER) DIVISION OF THE NATIONAL PARK SERVICE, AND WAS COSPONSORED BY THE WEST VIRGINIA UNIVERSITY INSTITUTE FOR THE HISTORY OF TECHNOLOGY AND INDUSTRIAL ARCHAEOLOGY AND THE VICTORIAN WHEELING LANDMARK FOUNDATION. PRINCIPALS INVOLVED WERE ROBERT J. KAPSCH, CHIEF, HABS/HAER; PAUL D. DOLINSKY, CHIEF OF HABS AND PROJECT LEADER; JOSEPH D. BALACHOWSKI, HABS ARCHITECT; CATHERINE C. LAVOIE, HABS HISTORIAN.

THE DOCUMENTATION WAS PRODUCED BY PROFESSOR JOHN P. WHITE, SUPERVISORY ARCHITECT, TEXAS TECH UNIVERSITY; ARCHITECTURAL TECHNICIAN MARK A. RADVEN, TEXAS TECH UNIVERSITY; HISTORIAN LEE R. MADDEX, WEST VIRGINIA UNIVERSITY; AND WASHINGTON OFFICE INTERNS CHRISTOPHER HOXIE AND ANTHONY WHITE.



LOCATION MAP

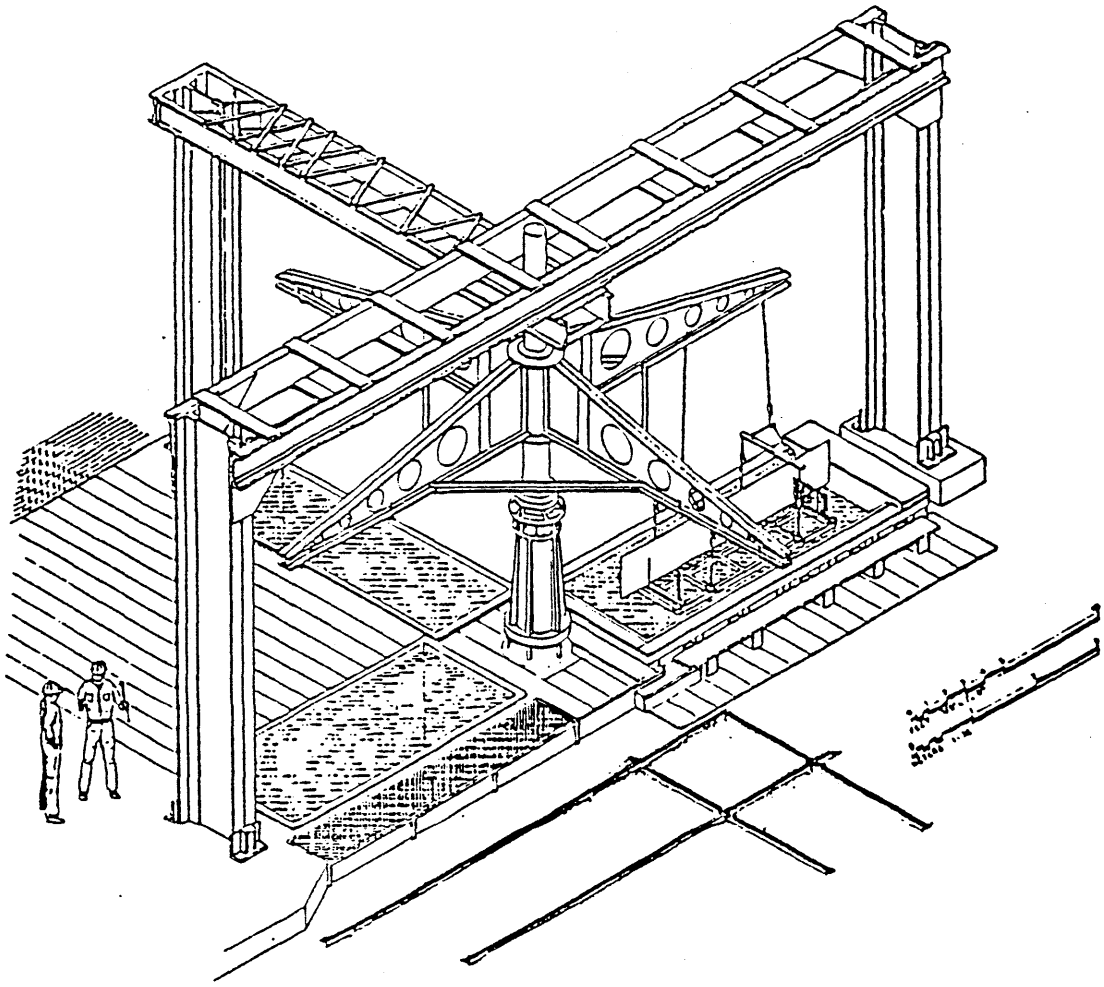


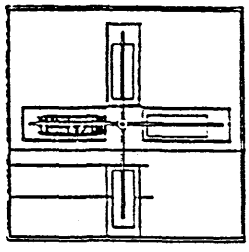
SITE PLAN OF LA BELLE IRON WORKS/AMERICAN TIN PLATE CO. COMPLEX IN 1902

HISTORIC WHEELING PROJECT, 1990	LA BELLE IRON WORKS (LA BELLE CUT NAILS)		
	30TH AND WOOD STREETS WHEELING OHIO COUNTY WEST VIRGINIA		WV47

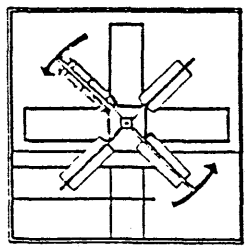
FIGURE 5
HAER Drawings WV47
2 of 5

1: PICKLING PROCESS

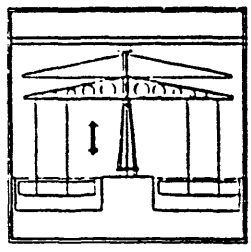




A: LOADING AND IMMERSION



B: ROTATION



C: IMMERSION

HIGH CARBON HOT-ROLLED STEEL IN SHEETS MEASURING 24" X 135" ARE HAND-LOADED ONTO VERTICAL RACKS OR "CRADLES". THE CRADLES ARE WHEELED TO THE PICKLING LINE AND ARE ATTACHED WITH CHAINS TO ONE OF THE FOUR ARMS OF THE CAROUSEL PICKLER (MESTA MACHINE COMPANY, CA. 1902). THE CAROUSEL RAISES AND LOWERS THE CRADLES BY COMPRESSED AIR INTO THE VARIOUS BATHS. THE SHEET STEEL IS FIRST PICKLED BY IMMERSION IN A 8% SOLUTION OF SULFURIC ACID (H_2SO_4) AT 175° F. (79.4° C.). THIS REMOVES OXIDATION AND MILL SCALE FROM THE STEEL. THE CAROUSEL IS ROTATED AGAIN AND THE SHEET STEEL IS RINSED WITH CLEAN WATER. THE CAROUSEL IS THEN ROTATED A THIRD TIME AND THE STEEL IS IMMERSED IN A LIME SLURRY AT 165° F. TO 175° F. (73.9° C. TO 79.4° C.). THE RACK IS THEN LIFTED FROM THE LIME SLURRY AND THE STEEL IS BLOWN WITH AIR TO DRY THE SURFACE. THIS PROCESS IS REPEATED TWO OR THREE TIMES UNTIL THE STEEL IS SUFFICIENTLY COATED WITH LIME, WHICH ACTS AS A LUBRICANT WHEN THE METAL IS SHEARED. DUE TO THE COST AND THREAT TO THE ENVIRONMENT OF THE SULFURIC ACID, THE PICKLING PROCESS WAS DISCONTINUED DURING THE SUMMER OF 1990. COLD-ROLLED STEEL THAT CAN BE CLEANED BY SHOT BLAST IS NOW BEING USED.

MARK A. RADVEN, JOSEPH D. SALACHOWSKI, 1990

HISTORIC WHEELING PROJECT, 1990

LA BELLE IRON WORKS (LA BELLE CUT NAILS)

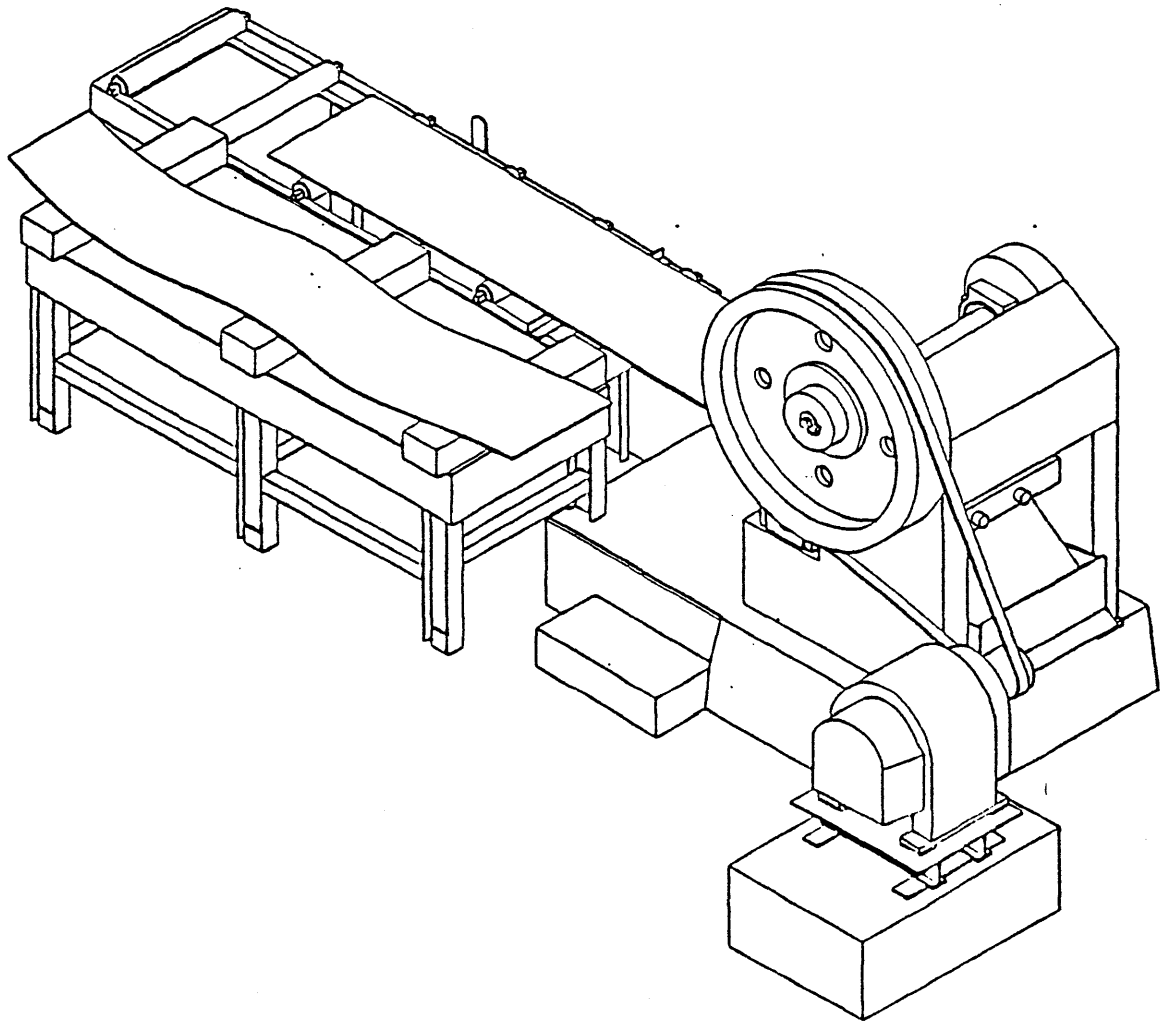
16TH AND WOOD STREETS, WHEELING, OHIO COUNTY, WEST VIRGINIA

WV47

HISTORIC AMERICAN ENGINEERING RECORD

1 - 5

2: SHEARING



THIS PROCESS INVOLVES CUTTING OR "SHEARING" THE PICKLED SHEET STEEL INTO BLANKS CALLED "NAIL PLATE." THE SHEET STEEL IS TRANSPORTED FROM THE PICKLING LINE BY A RADIO CONTROLLED FLOOR CRANE. THE SHEET IS MANUALLY FED OVER A ROLLER CONVEYOR THROUGH THE SHEARING MACHINE; ONLY 15 SECONDS ARE REQUIRED TO COMPLETELY CUT ONE 24" x 135" (61 m x 3.43 m) SHEET INTO NAIL PLATE. THE NAIL PLATE IS THEN MANUALLY WHEELED IN BUGGIES TO THE NAIL CUTTING MACHINES.

THE WIDTH OF THE NAIL PLATE INTO WHICH THE SHEET STEEL IS SHEARED IS DETERMINED BY THE SIZE OF THE NAILS REQUIRED. FOR EXAMPLE, NAIL PLATE FOR A 3p NAIL IS 1-1/4" (3.18 cm) WIDE, AND AN 8p NAIL REQUIRES 2-17/32" (6.43 cm) NAIL PLATE. THE WIDTH OF THE NAIL PLATE INCLUDES MATERIAL FOR HEADING THE NAIL.

MARK A. RADVEN, ROBERT S. COLOSIMO 1979

HISTORIC WHEELING PROJECT, 1979

LA BELLE IRON WORKS (LA BELLE CUT NAILS)

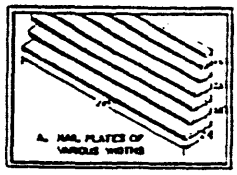
(14th TO 32nd WOOD STREETS) WHEELING (OHIO COUNTY) WEST VIRGINIA

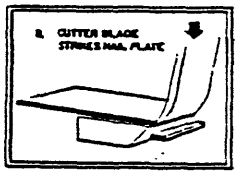
SHEET 3 - 5

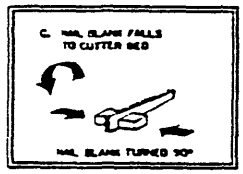
HISTORIC AMERICAN ENGINEERING RECORD WV-47

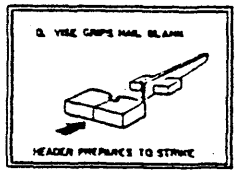
FIGURE 7
HAER Drawings WV 47
4 of 5

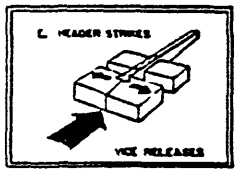
3: NAIL CUTTING

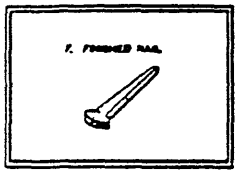


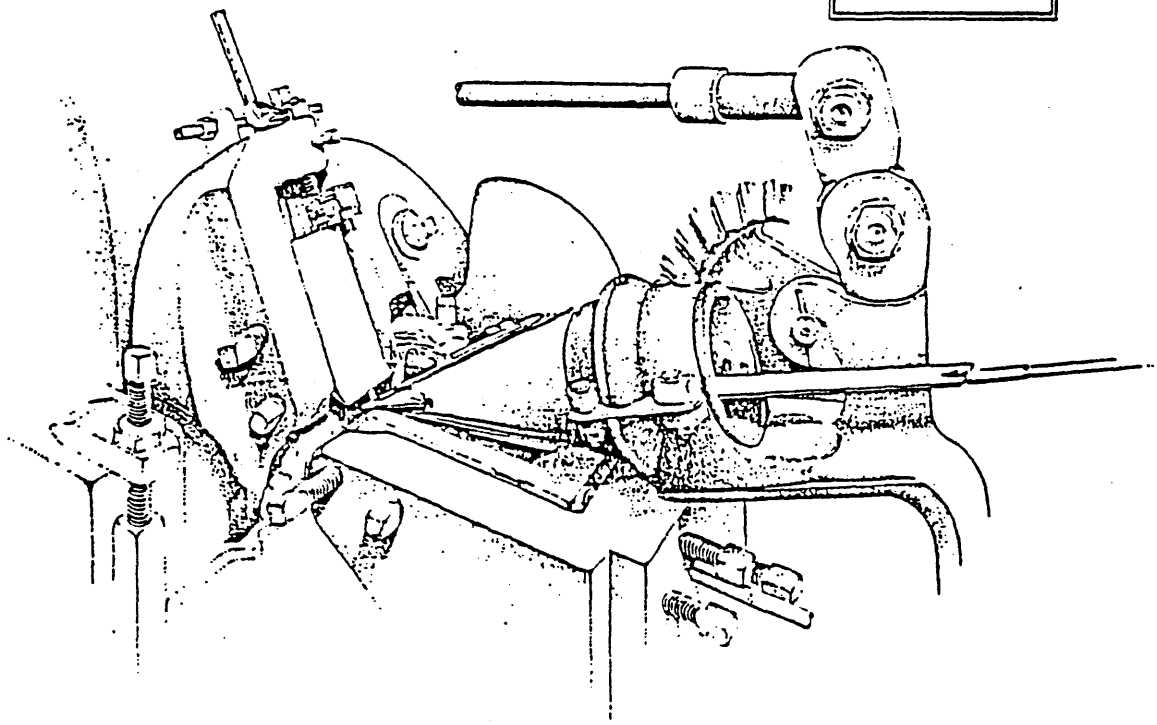












THE OPERATOR OR "FEEDER" LOADS A PIECE OF NAIL PLATE IN THE NIPPER OF THE FEEDER ROD BY PRYING IT OPEN WITH A PRY BAR. THE LOADED FEEDER ROD IS THEN OFFERED INTO THE BARREL OF THE MACHINE. SINCE THE BARREL IS CONSTANTLY ROTATING, TIMING IS IMPORTANT IN THE INSERTION OF THE ROD. ONCE THE FEEDER ROD IS PROPERLY INSERTED, THE NAIL IS SHEARED FROM THE PLATE. ALL THE MACHINES, EXCEPT THOSE FOR CUTTING THE LARGER SIZE NAILS, HAVE AUTOMATIC FEEDING DEVICES WHICH ADVANCE THE NAIL PLATE INTO THE MACHINE AS IT IS CUT. ALONG WITH THE AUTOMATIC FEEDER IS THE ROTATING BARREL WHICH FLIP FLOPS THE NAIL PLATE, THUS CUTTING A TAPERED NAIL. THE HEAD OF THE NAIL IS FORMED BY THE COMBINATION OF A MOVING DIE AND A STATIONARY DIE, WHICH HOLDS THE NAIL WHILE THE HEADER HEADS IT. WHEN THE NAIL PLATE IS COMPLETELY SHEARED, THE FEEDER PRIES OPEN THE NIPPER, REMOVES THE SCRAP AND INSERTS A NEW PIECE OF NAIL PLATE. THE CUT NAILS THEN DROP FROM THE BOTTOM OF THE MACHINE INTO BINS. THIS PROCESS IS REPEATED AT EACH MACHINE AT THE RATE OF SIX RODS A MINUTE, WITH EACH FEEDER OPERATING FOUR MACHINES AT ONCE.

HISTORIC WHEELING PROJECT, 1990

LA BELLE IRON WORKS (LA BELLE CUT NAILS)

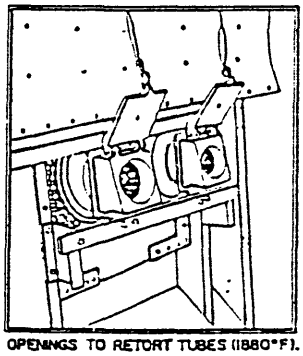
20TH AND WOOD STREETS — WHEELING — OHIO COUNTY — WEST VIRGINIA

SHEET 4 OF 5

WV 47

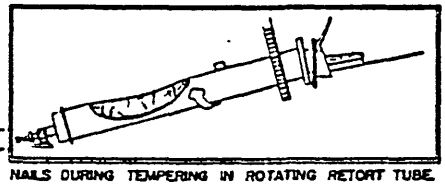
FIGURE 8
HAER Drawings WV 47
5 of 5

4: ANNEALING

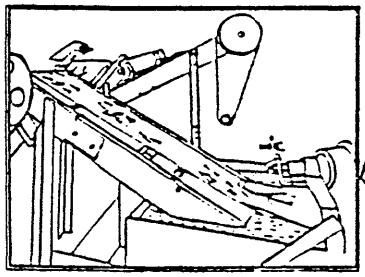


OPENINGS TO RETORT TUBES (1880°F).

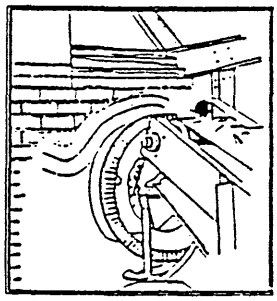
CUT NAILS ARE SHOVELED BY HAND INTO RETORT TUBES.



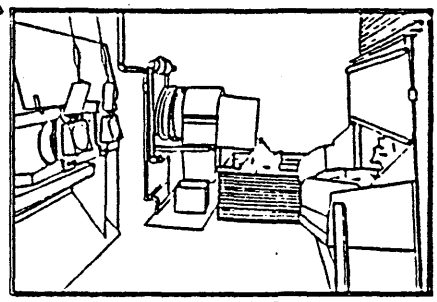
NAILS DURING TEMPERING IN ROTATING RETORT TUBE.



NAILS DROP FROM RETORT TUBE INTO QUENCHING BATH, THEN TRAVEL BY CONVEYOR BELT TOWARD DRAW BACK TUBE.



OPENING TO DRAW BACK TUBE (400°F - 800°F).



NAILS DROP FROM DRAW BACK TUBE.

AFTER THE NAILS HAVE BEEN CUT, THEY ARE READY FOR HARDENING (ALSO CALLED ANNEALING OR TEMPERING), IN ORDER TO INCREASE THEIR RESISTANCE TO BREAKAGE. THE TEMPERING PROCESS REQUIRES THE NAILS TO BE HEATED TO 1,800°F (982.2°C) AND THEN QUENCHED. THE NAILS ARE THEN REHEATED OR "DRAWN" IN A DRAW BACK TUBE AT TEMPERATURES VARYING BETWEEN 400°F AND 800°F (204.4°C - 426.7°C). INDUSTRIAL TEMPERATURE CONTROLS HAVE BEEN INSTALLED ON THE FURNACE BOTH FOR IMPROVED QUALITY CONTROL AND FOR SAFETY REASONS. NAILS ARE RANDOMLY TESTED FOR HARDNESS BY A HAND-OPERATED TORSIONAL DEVICE DESIGNED TO BEND AND BREAK THE NAIL. IF THE NAIL BREAKS TOO EASILY DUE TO BRITTLENESS, THE TEMPERATURE IN THE DRAW BACK TUBE IS RAISED. IF THE NAIL BENDS WITHOUT BREAKING, THE TEMPERATURE IN THE DRAW BACK TUBE IS LOWERED. THE NAILS ARE NOW READY FOR PACKING AND SHIPPING.

DRAWN BY JUDITH COLLINS, 1992

HISTORIC WHEELING PROJECT, 1990

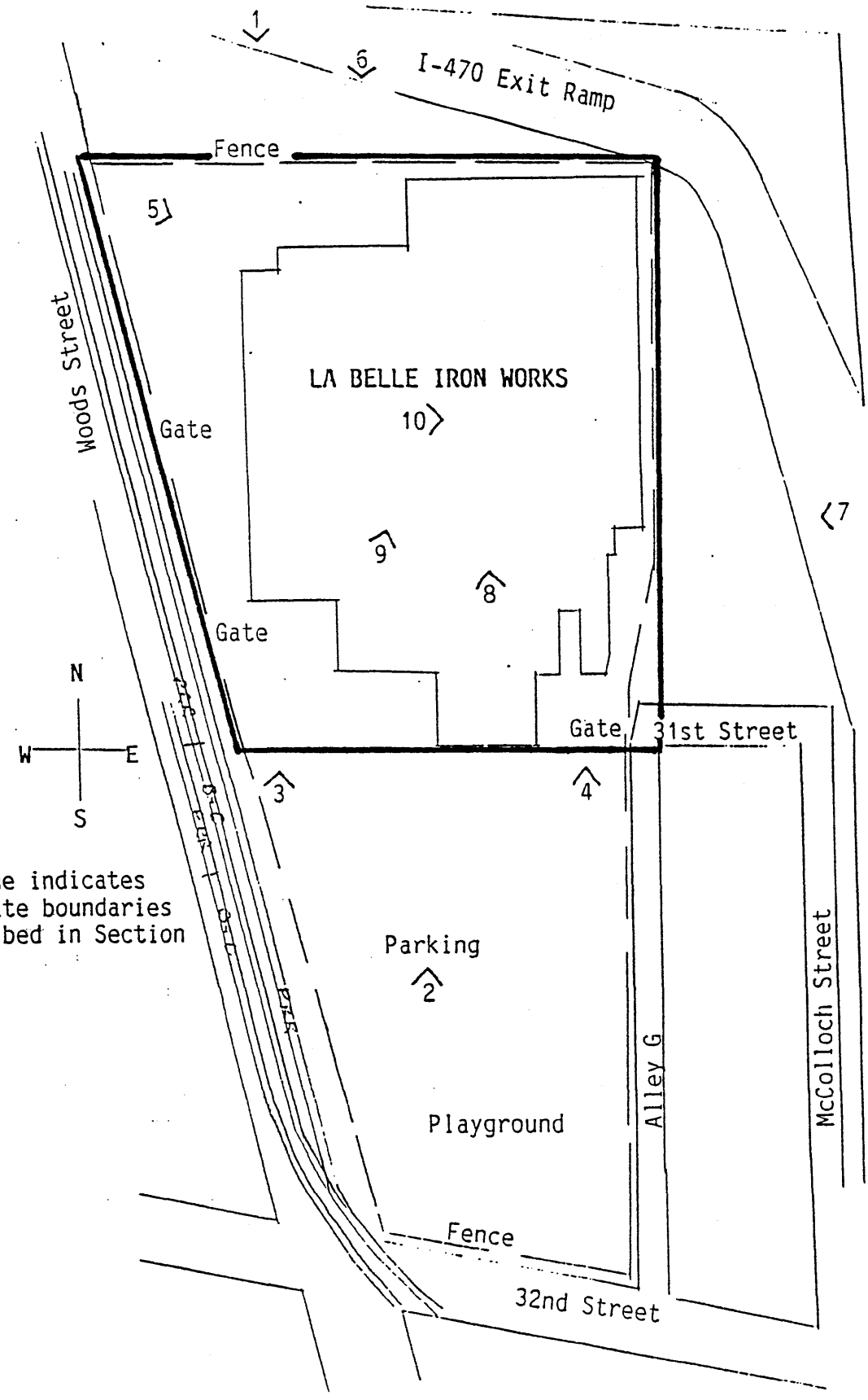
LA BELLE IRON WORKS (LA BELLE CUT NAILS)

10TH AND WOOD STREETS WHEELING OHIO COUNTY WEST VIRGINIA

SHEET 5 OF 5

HISTORIC AMERICAN ENGINEERING RECORD WV-47

SKETCH/PHOTO MAP



Heavy line indicates approximate boundaries as described in Section 10.