

COMPLEX #6  
THE WILMINGTON MALLEABLE IRON CO.

Statement of Significance

Significant as an example of the development of southern Wilmington as a manufacturing area during the late nineteenth and early twentieth centuries, the Wilmington Malleable Iron Co. buildings are eligible for listing on the National Register of Historic Places under Criterion A, buildings associated with events contributing to broad patterns of history. Currently composed of three buildings constructed in 1904 standing on the northeast corner of New Castle and New York avenues in Wilmington's Waterfront Analysis Area (see Figure 15, p. 78), the Wilmington Malleable Iron buildings help illustrate the expansion and movement of older Wilmington industries to open, previously undeveloped sites on the south side of the Christina River. As the density and size of manufacturing concerns increased within Wilmington's industrial riverfront areas during the late 1800s, city boosters urged industrialists to develop land in south Wilmington in order to maintain the city's economic health. The Wilmington Malleable Iron Co. buildings most immediately reflect the resulting growth of manufacturing concerns in southern Wilmington during the early twentieth century. Acquired by the Eastern Malleable Iron Company in 1912, the former Wilmington Malleable buildings became part of a national corporation, thus participating in the late nineteenth and early twentieth century movement toward large corporate firms and monopolies operating in national and international markets.

Wilmington's Waterfront Analysis Area lies within the Urban Geographic Zone (Zone V; see Figure 4, p. 9), an area bounded by the City of Wilmington's corporate limits as defined by the Delaware Comprehensive Historic Preservation Plan. Although situated within the Urban Zone, the Waterfront Analysis Area actually forms part of the Coastal Geographic Zone (Zone IV). Composed of land surrounding major and minor streams flowing into the Delaware River and Bay, the Coastal Zone in Wilmington once sustained a rich and diverse ecological habitat. Turtles, muskrat, wood ducks, great blue herons, ospreys, turkey vultures and bald eagles as well as many types of fish thrived in the coastal marshes and waterways. A wide variety of vegetation existed including arrowarum, spatterdock, water-willow, smartweed, and red and white oak. Some of these species of flora and fauna may survive in less-developed sections of eastern and southern Wilmington. Soils throughout the Coastal Zone range from moderately well-drained and medium-textured loam to tidal marsh lands. Much of Wilmington's colonial riverfront areas have experienced landfilling and other development activities obscuring most of city's early shoreline. Roughly describing land surrounding the Christina and Brandywine rivers in Wilmington, the Waterfront Analysis Area comprises a discrete geographical area defined by the City of Wilmington's

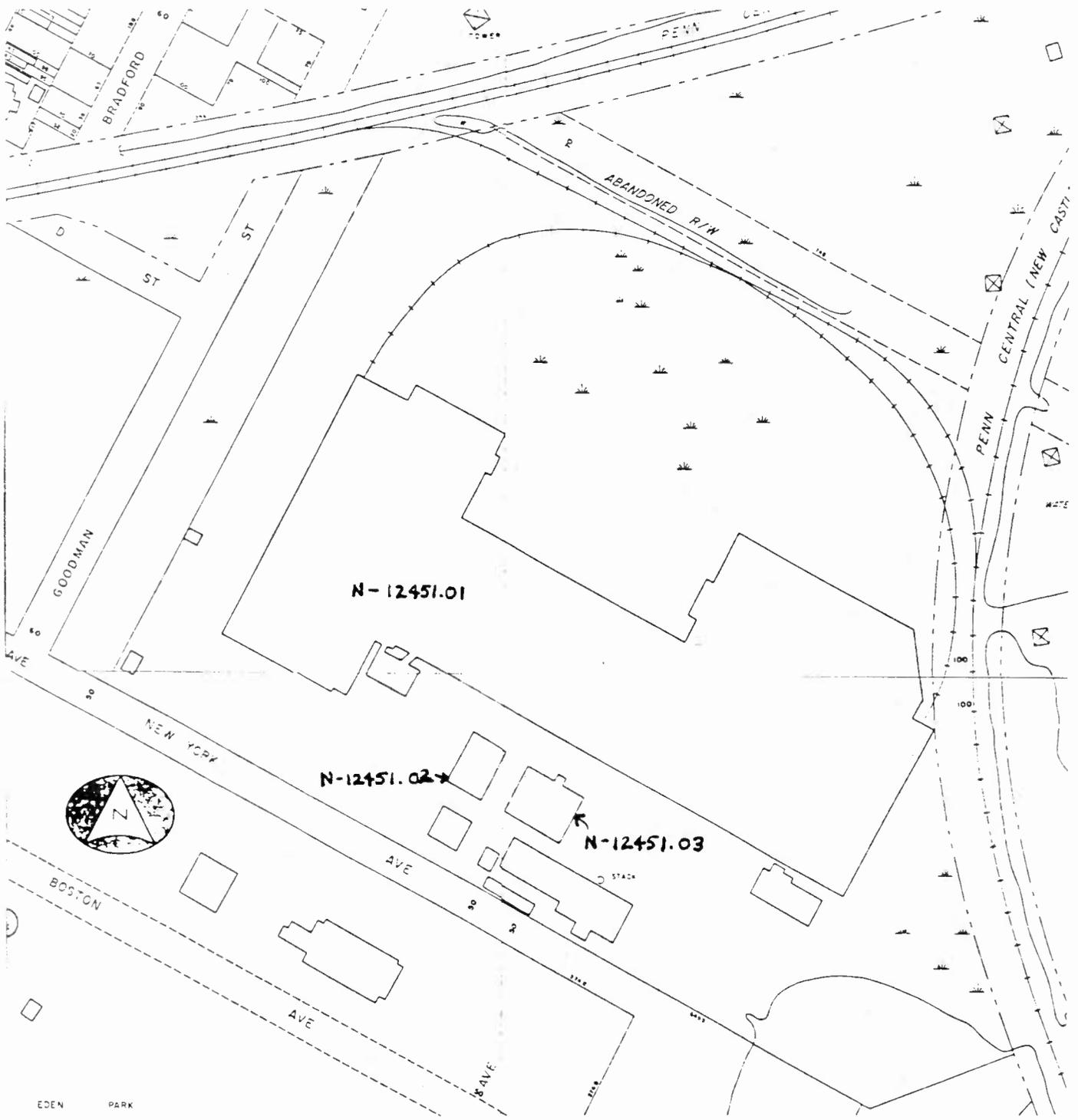


Figure 15: Site Plan of Complex #6  
The Wilmington Malleable Iron Co.

Office of Planning.<sup>52</sup>

The Wilmington Malleable Iron Co.'s buildings relate to the historic theme 6E in the Delaware Comprehensive Historic Preservation Plan (Manufacturing, 1880-1940 +/-: Urbanization and Early Suburbanization). Manufacturing describes enterprises typically housed in plants, factories or mills using power driven machinery and/or handling equipment in the mechanical or chemical transformation of inorganic or organic materials into new products.<sup>53</sup> Characterized by continued industrial expansion and growth, the first few decades of the period of Urbanization and Early Suburbanization (1880-1940 +/-) witnessed a diversity of manufacturing establishments throughout the city. Although iron-shipbuilding, railcar factories, and metal processing firms, including machine and tool manufacturers, dominated manufacturing in the Waterfront Analysis Area, large portions of the Area in south Wilmington remained relatively undeveloped until the early 1880s. The construction of railroad freight spurs through south Wilmington in the 1890s, combined with periodic dredging of the Christina River and the building of the Port of Wilmington harbor facilities in the 1920s, encouraged construction and expansion throughout south Wilmington during the period of Urbanization and Early Suburbanization (1880-1940 +/-).

Prior to the 1870s industrial development south of the Christina River entailed three carriage factories at the foot of the Market Street Bridge and the Diamond State Iron Company's operation near the Fourth Street Bridge. Beginning in the 1880s the city Board of Trade began attempts to attract new industry to Wilmington through public works improvements while Joshua Heald, a local land agent, advertized land in south Wilmington free from taxation for ten years if used for establishing industry. In 1886 the Delaware Chemical Corporation constructed an ammonia and ice manufacturing facility in south Wilmington. The Christiana Window Glass Co. began operations near the Fourth Street Bridge in 1887. Some Wilmington businesses expanded or moved to new facilities south of the Christina. The Lobdell Car Wheel Company, formerly located on the north shore of the Christina, moved to larger facilities nearer the Delaware River in south Wilmington in 1882. The Charles Warner Co. began a large coal and gravel yard on the Christina's south shore directly opposite of their packet wharf on the north side. Other manufacturers locating in the southern part of the Waterfront Area during this period include the Johnson Forge Co., the Steelton Manufacturing Company, the Marine Construction Co., Thomas Drein, a manufacturer of lifeboats, and numerous lumber and coal yards. The Wilmington Malleable Iron Company established their plant in south Wilmington amidst this milieu of manufacturing growth.

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<sup>52</sup> Ames, et al., pp. 31-36.

<sup>53</sup> Ibid., pp. 26, 36-37.

The Wilmington Malleable Iron Co. traces its founding to the firm of Rile & Stock who began manufacturing malleable iron in the Waterfront Analysis Area during 1873. In July of 1878 Richard P. Pim acquired the former Rile & Stock ironworks at the southeast corner of Taylor and Locust streets bounded by Ninth Street, the Brandywine River and the Philadelphia, Wilmington and Baltimore Railroad. The Hilles & Jones company (see Complex #13) later acquired this property and erected the buildings that currently occupy the block. Pim employed 25 men and five children in the production of a variety of special-ordered malleable iron castings. Similar to puddling, malleable iron production utilized an air furnace to super-heat iron to high temperatures in order to make exceedingly strong castings. Especially suitable for railroad and other transportation related uses, malleable castings were less costly and time consuming to manufacture than wrought iron items. Regular cast-iron products were too brittle for the wide array of applications that malleable iron proved suitable. After annealing malleable castings could withstand great pressure, resisted corrosion, and could be shaped, bent, cut and drilled. Utilizing the "direct cupola process of Mr. J. Elton Bolt," Pim shortened production of castings from between seven to ten days to between two to four days.<sup>54</sup>

Pim incorporated the firm as the Wilmington Malleable Iron Co. in 1881 and served as its president until 1887. Wilmington Malleable continued to manufacture a wide array of railroad and transportation related castings at the Taylor Street site under the leadership of Joseph H. Bailey until 1901 when Harris Whittemore succeeded him. An expanded product line requiring larger castings, including parts for ships and automobiles, spurred Wilmington Malleable to purchase property in southern Wilmington where they erected the present buildings in 1904.

The long portion of the Tee-shaped building (N-12451.01), labeled No. 1 in a 1914 insurance map, served as the foundry building and possessed five iron chimneys for venting forge fire fumes on both its north and south elevations. Building No. 2, the portion of the building capping the Tee (also N-12451.01), functioned as the annealing building. The northeast corner of the annealing building contained a cupola furnace and a pickeling room. The offices of the current owners, Forbes Steel & Wire Corp., incorporate the former cupola and pickeling rooms. A trimming room occupied the space joining the annealing and foundry buildings. Building No. 4 (N-12451.02), the western of two buildings south of the main, Tee-shaped annealing and foundry building operated as the pattern house where casting molds were stored. The Pattern Shop (building No. 3;

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<sup>54</sup> Richards, p. 95; U. S. Census, Manufacturing Schedules, 1880. Microfilm on file at EMHL; Jack Weeks, The Story of the Eastern Malleable Iron Company (Naugatuck, Conn.: The Eastern Malleable Iron Company, 1952).

N-12451.03), where castings patterns were made, contained a machine shop and a carpenter shop. Five other buildings described in the insurance map, including a small office building, no longer stand. At the time of its construction the Wilmington Malleable foundry building in south Wilmington stood as the largest industrial building in the state of Delaware.

In 1912 the Eastern Malleable Iron Company purchased Wilmington Malleable. Through its association with the Eastern Malleable Iron Company, the former Wilmington Malleable buildings participated in the early twentieth century trend towards large corporations and monopolies serving national markets. Other examples of Waterfront Analysis Area industries becoming part of national corporations include Harlan & Hollingsworth (see Complex #7), bought by the United States Shipbuilding Co. in 1902 and then the Bethlehem Steel Corp. in 1904, and Jackson & Sharp, a railcar manufacturer purchased by the American Car and Foundry Co. in 1901. The Pullman Palace Car Company (see Complex #5) acquired another Wilmington railcar manufacturer, Bowers, Dure & Co., in 1886 and completely rebuilt its plant in the early twentieth century.

The Eastern Malleable Iron Co. began in Connecticut in 1858 under the ownership of Bronson Tuttle and John Howard Whittemore. After the depression of 1873 the company experienced tremendous growth, incorporating first as the Naugatuck Malleable Iron Co. and then as Eastern Malleable. By World War I Eastern Malleable owned four foundries outright and had acquired substantial interests in nine other foundries. Such geographically diverse cities as Bridgeport, Connecticut, Chicago, Cincinnati, Cleveland, Denver, Milwaukee, and Troy, New York, contained Eastern Malleable associated plants. Competition from former employees who started independent firms cut into profits during the First World War and, combined with the Great Depression of 1929, forced Eastern to consolidate operations. By 1936 only the Wilmington and Naugatuck plants remained under Eastern Malleable ownership. By the outbreak of the Second World War, Eastern Malleable had acquired the Eberhard Manufacturing Co. in Cleveland. During the war the Cleveland factory manufactured vehicle parts while Wilmington undertook large castings and the Naugatuck plant manufactured smaller castings for the military effort.

By the early 1950s Eastern Malleable owned five factories; the former Wilmington Malleable plant ranked as the second largest of Eastern's factories. Wilmington's main production emphasis remained large castings, especially parts for railroad related equipment and trucks. The Wilmington plant employed 540 men and women in the manufacture of "pearlitic" and "Eastern-Z-Metal" malleable castings as well as steel castings. During this period Eastern Malleable attempted to expand its market by promoting "conversions," a process where products formerly made by welding or forging would be cast with malleable iron. Possibly as a result over 100,000 patterns for castings from 330 active customers

cluttered the pattern storage building.

A history of Eastern Malleable written in the early 1950s described a production process similar to that used by Pim. An air furnace, fired with pulverized coal, melts steel, malleable iron scrap and pig iron until it reaches 2,900 degrees Fahrenheit. Poured into sand molds and allowed to cool, the brittle castings then bake for four to seven days at 1250 to 1800 degrees Fahrenheit in annealing ovens whereby they become malleable. A "wheelabrator" bombards the malleable castings with tiny shot cleaning the surfaces of any inconsistencies. Heavy presses straighten any deformed castings before receiving final processing such as threading, drilling or punching. In 1972 the former Wilmington Malleable buildings were acquired by the present owners who manufacture wire rope, mesh fencing material and other steel and wire products continuing the building's nearly ninety year association with metal processing.

Related to the historic theme Manufacturing during the period of Urbanization and Early Suburbanization (1880-1940 +/-) the Wilmington Malleable Iron Co. documents the evolution of manufacturing concerns in south Wilmington during the late nineteenth and early twentieth centuries. Formerly located in another portion of the Waterfront Analysis Area, the Wilmington Malleable Iron Co. constructed the present complex in 1904 as a result of its success as a manufacturing concern and subsequent requirements for larger facilities. The buildings' association with the Eastern Malleable Iron Company beginning in 1912, also helps illustrate the rise of big business throughout the United States in the late nineteenth and early twentieth century. As such the Wilmington Malleable Iron Co. buildings are eligible for inclusion on the National Register of Historic Places under Criterion A, buildings associated with events contributing to broad patterns of history.

## Architectural Description

Situated on the northeast corner of New York Avenue and Goodman Street in southern Wilmington, the former Wilmington Malleable Iron Co. (Complex #6; Figure 15, p. 78) consists of a large T-shaped, two story factory building with roof monitors and one-story additions to the northeast and southwest (N-12451.01). Two small brick buildings stand south of the factory (N-12451.02 & N-12451.03).

The large T-shaped building (N-12451.01) contains thirteen large monitors atop the Tee's long body extending parallel to New York Avenue (see Plate 8, p. 84). Perpendicular to New York Avenue, the Tee's top possesses seven similarly massed monitors. Constructed of five-to-one common bond brick and painted white along portions of its western and southern elevations, corrugated fiberglass or tin sheathing covers most of the building's window and door openings.

Shallowly-sloped gable-roofed monitors cap the western elevation containing thirty-nine bays on the first and second storys. Triple rowlock segmental arch lintels and stone sills surround fiberglass-covered windows on the second story and concrete block-filled windows on the first story. Large black letters contrast with the painted white brick between the second and first story levels declaring that the "FORBES STEEL & WIRE CORP" currently occupies the former Wilmington Malleable property. Three one-story attached sheds protrude from the southern half of the elevation. A small, one-story unattached concrete block shed of recent construction west of the western elevation serves as an HVAC cooling tower. A cylindrical tower marked "hydrochloric acid" stands south of the southern attached concrete block shed. A concrete loading dock stretches below the first six southern bays of the west elevation. A concrete wall extending north from the northwest corner of the elevation once served as a loading dock for freight cars that sat on rails immediately to the west.

Nineteen bays treated comparably to the western elevation's bays penetrate the south elevation of the Tee-top (see Plate 9, p. 85). Unsheathed windows reveal twelve light industrial sash with six light hoppers per bay. A tin-corrugate shed roof overhangs twelve window bays on the first story. Lintel and sill adornment and concrete block infilling copies the western elevation treatment. One concrete blocked former loading bay opening in the third bay from the east sports a quadruple rowlock segmental arch lintel. Two other loading bays symmetrically spaced in the center and west ends of the elevation contain sliding doors. Second story windows above the center loading bay are elongated to the level of first story lintels. A faint white-painted diamond with the number "2" inside matches the site numbering contained in a 1970s Franklin Insurance Co. map. A concrete block loading dock extends underneath the western thirteen bays of the south elevation.



Plate 8: West elevation of the Wilmington Malleable  
foundry (N-12451.01) looking east  
(Photograph by D. Gula)

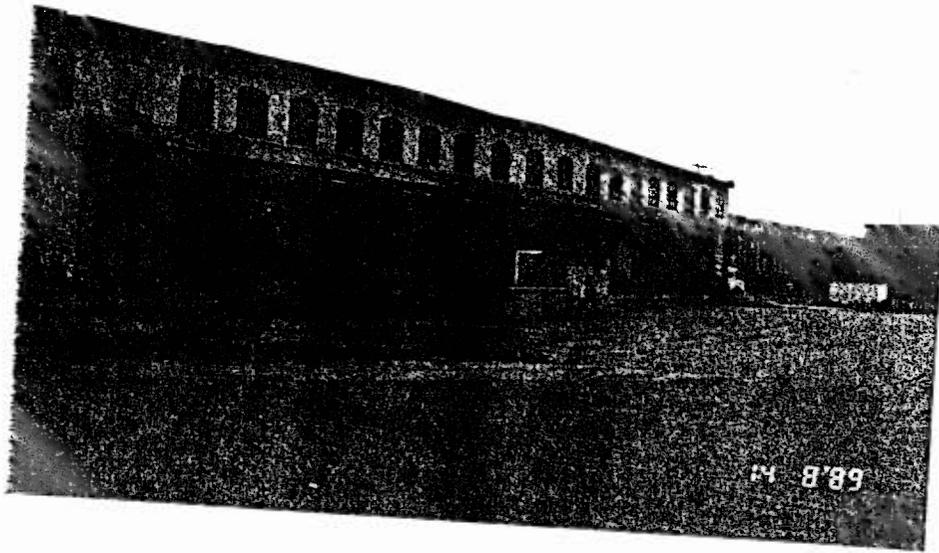


Plate 9: South elevation of the Wilmington Malleable  
foundry (N-12451.01) looking east  
(Photograph by D. Gula)

A rectangular one-story brick locker building exhibiting seven-to-one common bond comprises the southwest addition to the main Tee-shaped building. Eight industrial sash windows and one door pierce the south elevation while four industrial windows and one door penetrate the east elevation. The locker building possesses a shallowly-sloped gable roof that veils much of the southwest portion of the factory.

Many of the thirteen monitors along the south elevation of the elongated Tee-body display uncovered clerestories composed of three pairs of four-light hoppers per frame. Uncovered second story windows present similar treatment. Concrete block fills most first story windows while the majority of second story and monitor windows remain sheathed under corrugate fiberglass. A total of 78 openings extend along the south elevation.

Periodic quadruple rowlock semi-circular arched openings along the first story level exhibiting brick fill and stucco probably indicate the location of original furnace exhaust stacks. The sole surviving brick stack rises from the eleventh bay from the east. The stack joins the factory through a corbeled, barrel-vault connected to a quadruple rowlock semi-circular arch lintel. The north elevation also contains similar periodic semi-circular arches denoting earlier furnace stack placement.

A faint, painted-white diamond with the number "1" painted below the twenty-fourth bay from the west conforms with the Franklin Insurance map's designation of the Forbes Steel Company building. A concrete block and brick raised ramp further east of the diamond "1" connects to another concrete ramp on the north elevation of the building south of the factory. Four new loading docks stand where six bays once stood penetrated the south elevation. A shed roof overhangs the loading dock. Two more loading bays shielded by a shed roof sheathed with corrugated metal penetrate the south elevation below the fifth monitor from the east. One loading bay currently resides under a quadruple rowlock semi-circular arch lintel, the former location of a furnace stack.

The east elevation of the building contains eighteen bays filled with concrete block along the first story and fiberglass sheets on the second story. A modern, one-story concrete block warehouse connects to the factory along its northeast. This warehouse extends seven bays along the foundry's north elevation and was built in 1972 according to office workers at Forbes Steel & Wire. The north elevation of the foundry exhibits the same fiberglass and concrete block bay treatment found on the rest of the building. Two steel-framed shed-roofed car ports protect ten vehicles.

Forbes Steel & Wire's offices occupy the one-story building along the northeast end of the Tee-top. A sawtooth monitor skylight covered with tar paper once illuminated the office's interior space. Small one-over-one aluminum sash windows sit in the south

and north end of the elevation. Triple rowlock segmental arch lintels and stone sills remain the standard decorative embellishment. A steel door with a concrete block surrounds possesses a small wooden pent roof with asphalt shingles.

A two-story, metal-sided, shed-roofed wing extends north off the north elevation of the Tee-top. Another wing west of the shed-roofed wing, composed of brick and two stories high, possesses a concrete foundation and supports a fiberglass sheathed tower. Three additional small one-story sheds constructed of concrete block adjoin the wing to the west. A fourth one-story concrete block shed connects to the northwest corner of the factory's Tee-top.

A building south of the factory possesses a painted white diamond with the number "4" inside on its southern elevation. This number corresponds with a 1970s Franklin Insurance Co. map describing the property. The building (N-12451.02) currently stands one story with basement constructed of five-to-one common bond brick with a terra cotta coping and flat roof (see Plate 10, p. 88). A concrete ramp and pad connects a wooden sliding loading door to the factory to the north. Basement windows penetrating the concrete foundation contain eight-light wireglass windows. Thin two-over-two wireglass sash with segmental arch lintels sit in each window bay above stone sills along the north elevation. Three hinge pintles border window bays as well.

Nine bays wide, the east elevation exhibits four windows flanking a central wooden door with a three-step concrete stoop. Window treatment consists of four-light casements topping pairs of eight-light wireglass hoppers in each bay. The one bay along the southern elevation contains a wooden door. The west elevation mirrors the east although upper windows are boarded. In addition the central door possesses wooden steps instead of concrete. A modern brick-enclosed shed-roofed bulkhead entrance to the basement leads into the "Painting and Plumbing" shop according to a painted sign on the door. Small louvered grills underneath most windows ventilate the building's interior.

A two-story with basement brick building (N-12451.03; see Plate 11, p. 89) stands a short distance south of the factory and east of the Building 4 (N-12451.02). Five-to-one common bond brick walls capped by a terra cotta coping supports the flat roof. A ramp connects the building's north elevation loading bay with the factory. An electrical lift carries equipment and supplies to the second story level on the exterior of the north elevation. Corrugated tin encloses the lift. A steel frame buttresses concrete block infill surrounding a wood door with a five-step concrete threshold in the fourth bay from the west. A pair of wooden doors in the third and fourth bays from the east are not original. A bulkhead entrance to the basement penetrating the concrete foundation in the west end of the north elevation reveals

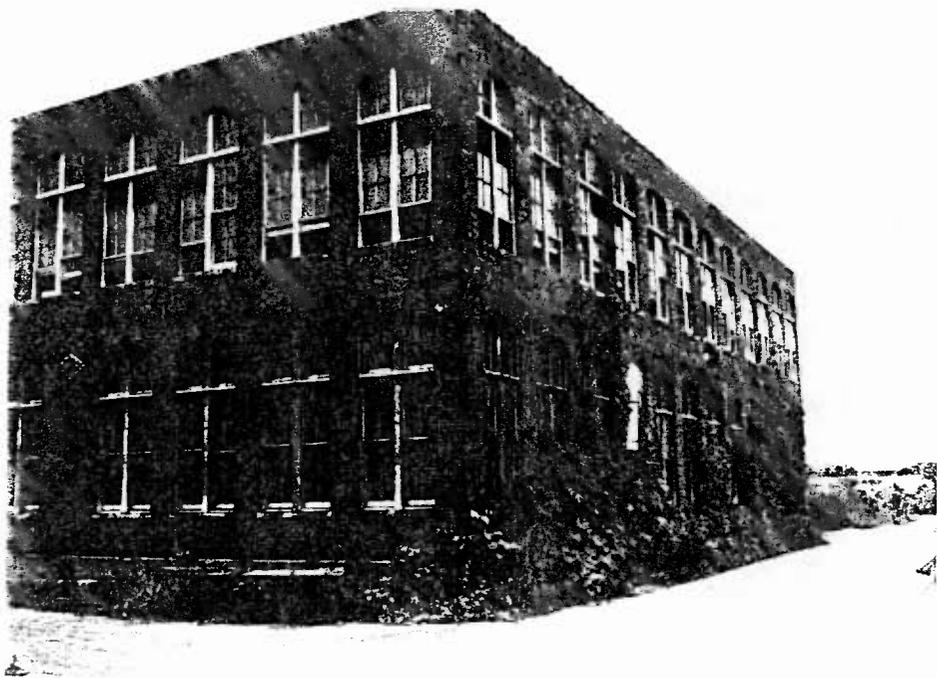


Plate 10: West and south elevations of the Wilmington  
Malleable pattern house (N-12451.02) looking east  
(Photograph by D. Gula)

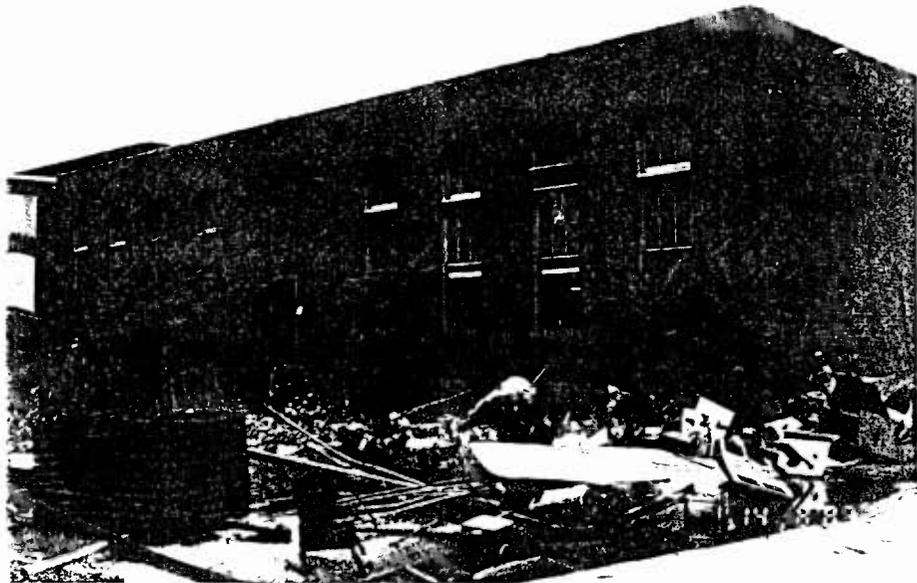


Plate 11: West elevation of the Wilmington Malleable  
pattern shop (N-12451.03) looking east  
(Photograph by D. Gula)

a flooded basement. Another bulkhead entrance rests on the north end of the east elevation.

Ten windows puncture the eastern elevation. Four-light casements top pairs of eight-light wireglass hoppers per bay. Each bay possesses a triple rowlock segmental arch lintel and a stone sill. The southern elevation's twelve bays display similar treatment. However, doors in the fourth bays from the east and west contain concrete block. Concrete steps rise to the doors. Four basement windows hold eight light hoppers. The west elevation displays only nine bays. An original entrance in the north end has been filled with concrete block. A white-painted diamond surrounds the number "3" between the first and second story matching building numbers described on a 1970s Franklin Insurance Co. map.