National Park Service
U. S. Department of the Interior

Dayton Aviation Heritage National Historical Park
Dayton, Ohio



The Wright Company Factory Historic Structure Report

September 4, 2023

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The Wright Company Factory Historic Structure Report

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NPS PMIS # 152252

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Administrative Summary and Data

RESOURCE INFORMATION

The Wright Company factory is a historic structure located within the boundaries of the Dayton Aviation National Historical Park, located in Dayton, Ohio. Currently, the site is closed due to unsafe conditions.

Building Name:	The Wright Company Factory, Buildings 1 and 2
Owner:	City of Dayton, Ohio
Location:	54 and 102 Coleman Avenue, Dayton, Ohio 45417
General Description:	Single-story, high bay, daylight factories constructed in multiple phases with brick masonry bearing walls and steel truss roof structures that support wood roof decks. Infill structures (interconnects) are present between the primary buildings. Attached, non-contributing structures are present on the north side of Building 1 and the south side of Interconnect 2-3.

Current Dimensions:

Building 1
177’-2.75” (east-west) by 60’-10.5” (north-south)
Approx. 11,100 square feet

Interconnect 1-2
210’-5.25” (east-west) by 20’-1.75” (north-south)
Approx. 3,555 square feet

Building 2
202’-2.25” (east-west) by 62’-0.25” (north-south)
Approx. 11,310 square feet

Interconnect 2-3
207-8.75” (east-west) by 20’-11.25” (north-south)
Approx. 5,740 square feet

Building 17
150’-10.75” (east-west) by 83’-0.25” (north-south)
Approx. 9,975 square feet

PROJECT PURPOSE AND NEED

Site Overview

The Wright Company factory site is located at 54 and 102 Coleman Avenue in Dayton, Ohio, on an asymmetrical lot bordered on the north by West Third Street, the east by South Ardmore Avenue, and the south by abandoned rail lines.

Building 1 was constructed by the Wright Company in 1910 as the site of Wilbur and Orville Wright’s first purpose-built airplane manufacturing facility. In 1911, Building 2 was constructed, also by the Wright Company. Over the subsequent decades, the buildings changed ownership several times and underwent multiple phases of expansion, eventually developing into a 54-acre complex for automotive and other heavy industrial fabrication. Industrial use of the site ceased in 2008, and the majority of the structures were demolished in 2014, leaving only the interconnected Buildings 1 through 5 and 17 still remaining.

The City of Dayton purchased the site and remaining buildings in 2018 with a future plan for redevelopment. In 2019, Buildings 1 through 5 and 17 were listed in the National Register of Historic Places.

Project Purpose

Congress established the Dayton Aviation Heritage National Historical Park on October 16, 1992 (PL 102-419):

> The purposes of this Act [this subchapter] are—
>
> (1) to establish a unit of the National Park System in Dayton, Ohio, consisting of certain lands and structures associated with Wilbur and Orville Wright and the early development of aviation; and
>
> (2) to create partnerships among Federal, State, and local governments and the private sector to preserve, enhance, and interpret for present and future generations the historic and cultural structures, districts, and artifacts in Dayton and the Miami Valley in the State of Ohio, which are associated with the Wright brothers, the invention and development of aviation, or the life and works of Paul Laurence Dunbar, and which, as a whole, represent a nationally significant resource.

The legislation also directs NPS to evaluate other resources for potential inclusion, specifically including the Wright Company factory. As such, this project supports park purposes as defined in the park's enabling legislation. Dayton Aviation Heritage NHP includes multiple, non-contiguous sites in and near the city of Dayton associated with Wilbur and Orville Wright and their contributions to aviation heritage and sites associated with Paul Laurence Dunbar, the noted African American author and poet.

The National Park Service (NPS) is currently working with the City of Dayton regarding options for the rehabilitation Buildings 1 and 2 for interpretation, administration, and operational uses. In 2009, the boundaries of Dayton Aviation Heritage NHP were expanded to include the Wright Company factory buildings and adjacent parcels.

Project Scope and Methodology

In 2020, NPS engaged a consultant team to prepare a historic structure report (HSR) in two parts for Buildings 1 and 2 of the Wright Company factory. The purpose of the HSR is to compile the findings of historical research regarding the development and changes over time of the site, identify the primary interpretive themes, establish historic preservation objectives, document the existing conditions of the physical structures, and prepare alternatives for the reuse of the site by NPS. This HSR will act as a foundation for future decision making regarding rehabilitation and interpretation of the site. The HSR was prepared in compliance with *Preservation Brief 43* "The Preparation and Use of Historic Structure Reports."

FIRE ON MARCH 27, 2023

Th early morning hours of March 27, 2023, the Wright Company factory was severely damaged by fire, resulting in significant loss of historic fabric. At the time of this report, the full extent of the damage and the cause of the fire have not yet been determined, but the damage is anticipated to impact the ultimate treatment for the buildings and site. The City of Dayton is currently performing a post-fire assessment of the structures, and a report of findings is anticipated in the spring of 2024.

PRE-FIRE SUMMARY OF FINDINGS AND PREFERRED TREATMENT

At the time of the fire, this HSR was in progress and approaching the 95% draft; the scope of the project was modified in response to the fire. The preferred treatments determined through the workshop and discussions with the park and stakeholders were retained but summarized, and preparation of a formal cost opinion was eliminated.

This HSR is one document within the Dayton Aviation Heritage NHP planning portfolio, a collection of documents that guides decision making for the historic resources within the park. Given the damage caused by the fire and the unknown future for the Wright Company factory, this HSR was completed to present the historical research and investigation into the existing conditions that were performed for the report and to present documentation on the potential treatments that were considered for future rehabilitation of the site.

Prior to the fire, the HSR team determined that a high level of historic fabric dating to the period of significance remained extant and Buildings 1 and 2 were suitable for rehabilitation for a variety of potential uses. The preferred treatments considered by NPS centered around rehabilitating Buildings 1 and 2 for mixed use as interpretive space and as administrative and maintenance support space for park operations, along with recommendations for site and landscape features, accessible entry and pathways to and through the interior, envelope repairs, structural stabilization, and introduction of new building systems (HVAC, electrical, plumbing, and fire suppression). The ultimate goals of the preferred treatment were to protect and restore the extant historic fabric and to return the buildings to a condition suitable for continued use and enjoyment.

Project Team

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Part 1: Developmental History

Introduction

This HSR was prepared in anticipation of NPS's acquisition of Buildings 1, 2, and 17 and the immediately adjacent land from the City of Dayton. The factory and adjacent land are part of the Dayton Aviation Heritage NHP. The parcels surrounding the proposed NPS property is planned for development by the City of Dayton, in partnership with private developers. A new library was recently constructed southwest of the remaining factory buildings. Buildings 3 to 5, which are currently attached to Buildings 1, 2, and 17 are included in the National Register nomination for the site but are not part of the scope of this report. Buildings 3, 4, and 5 will be rehabilitated for reuse by City of Dayton or their development partners.

NOTES ON TERMINOLOGY AND DATE STYLE CONVENTIONS

Flyer, Aeroplane, Plane, and Airplane

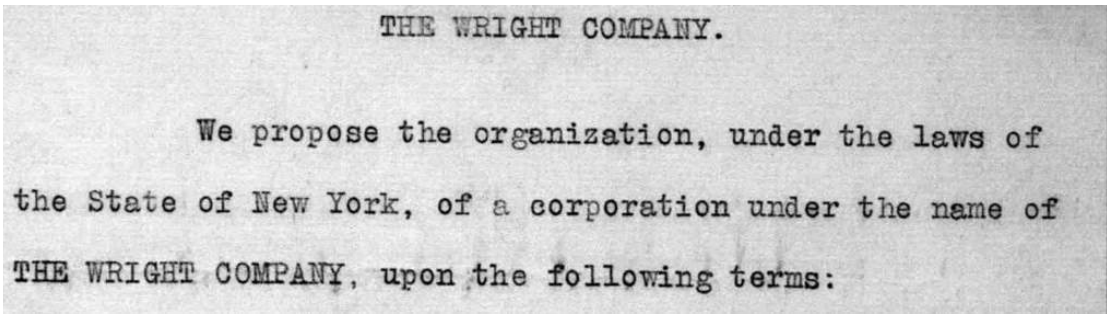
The terminology used to describe powered, manned flying machines was not well defined in early aviation, employing flyer, aeroplane, plane, and airplane at various times and often interchangeably. The Wright Company initially advertised their machines as "Wright Flyers" and later described them as "Aeroplanes". Throughout this report, the historical terminology and spelling has been used when referring to specific historical events or where used in direct quotations. In modern usage, the HSR defaults to plane or airplane.

Aeroboat, Flying Boat, Seaplanes, Aeroyacht, Flying Yacht, and Float Plane

Early aviation engineers also recognized the value of creating planes that could take off and "land" on water. Like with airplanes, the names of these water-landing machines were not well defined. Generally, a "flying boat" refers to a plane that lands and takes off on the water via the body of the plane, where the plane body is also the hull. A "float plane" referred to a plane that takes off and lands on pontoons. However, there were variations of this usage, including flying boats that had pontoons for stabilization. An "Aeroboat" is a general name for any plane that lands on water. The "Aeroyachts" and "flying yachts" were typically larger versions of these crafts that were designed to carry passengers. The term "seaplane" was historically used to describe a plane that uses the body for flotation, but in modern usage typically refers to a float plane.

The Company Name

The name of the Wright brothers' company has appeared in print, both historically and recently, under multiple configurations: The Wright Co., Wright Company, etc. In the 1909 articles of incorporation, the company name is written as "THE WRIGHT COMPANY" in full capital letters per the convention commonly used for such documents at the time (Figure 1-1). The inclusion of the leading article "THE" is noteworthy in the formal company name. The name appears in the same usage on the company letterhead, brochures, and


THE WRIGHT COMPANY.

We propose the organization, under the laws of the State of New York, of a corporation under the name of THE WRIGHT COMPANY, upon the following terms:

Figure 1-1 The introduction to the 1909 Articles of Incorporation of the Wright Company (Source: Library of Congress).



Figure 1-2 Company Name from advertisement in the November 1910 issue of *Aeronautics* magazine.

advertisements. While the font and branding used by the company changed over time, the name was consistent: always with the leading article “The” and always with “Company” spelled out (Figure 1-2).

Per the Chicago Manual of Style: “A *the* preceding a name, even when part of the official title, is lower case in running text.”[1] Therefore, this HSR follows this standard. However, capitalizing the leading article may more clearly represent the full incorporated name of the company. This should be considered as interpretive materials are developed for the factory site.

A Note on Dates

The dates as presented in this HSR are drawn from the information available at the time of writing. In a many cases, the dates are supported by direct historical documentation, but in some cases, the dates proposed are the project team’s best determination based on factors such as physical evidence, circumstantial documentation, research by others, professional experience, or those dates adopted by general consensus. Further research, investigation, and analysis may refine or refute the dates proposed herein.

No notation.	Direct attribution of the date or date range given is supported by historical documentation or physical evidence; ex: 1910 or 1919 –1923.
Circa (c.).	Attribution to within one or two years of the date or date range given is supported by historical documentation or physical evidence, but the precise dates are not known; ex. c. 1955 or c. 1933 – c. 1935.
Dash (–).	Indicates that the range given is inclusive of the years between the start and end dates, such as an ongoing event or period of ownership, ex: 1923–1963.
Slash (/).	Indicates that two or more specific dates are referenced without being inclusive of the years between; ex: c.1940/c.1952 or 1940/1988.
Decade Span.	Indicates a 10-year span, but the date or date range given is approximate and may be refuted by further study; ex: 1920s or 1960s – 1970s.

1 *The Chicago Manual of Style, 16th Edition* (Chicago: University of Chicago Press, 2010), 416.

Historical Background

INTRODUCTION

The globally renowned Wright brothers have had much written about their lives and their world-changing inventions for powered manned flight and aviation. Appropriately, these have generally focused on the invention of a practical airplane and the brothers themselves as historical figures, often with only a minor mention of the company that they founded and the pivotal role this company played in establishing the field of aviation design and manufacturing. Two books have focused specifically on the Wright Company: *The Wright Company: from Invention to Industry* by NPS historian Edward J. Roach and *The Dayton Flight Factory: The Wright Brothers & the Birth of Aviation* by Timothy R. Gaffney. These books have served as valuable resources for the history of the Wright Company and the context around the construction of the Wright Company factory.

Since this report focuses on the factory buildings, with particular emphasis on Buildings 1 and 2, the additional research performed for the HSR has been focused on refining the understanding of the initial construction and later developments of the buildings. In many cases, information gleaned from available sources may be unclear, not well documented, or circumstantial. The HSR team has endeavored to develop as detailed a chronology of the site's changes over time as possible, particularly the Wright Company's time as the direct occupant of the buildings, from which few original documents pertinent to the structures are known to have survived.

SITE HISTORY

Pre-European Contact Cultures

Paleo-Indian and Archaic Traditions (10,000 BP – 1,000 BP)

The Miami Valley encompasses lands surrounding the Great Miami River and related smaller waterways which flow through southwest Ohio, including the lands which now form the greater metropolitan area of Dayton, Ohio. Formed by the recession of the Wisconsin glacier approximately 12,000 years ago, the first human inhabitants of the valley were likely nomadic communities of Paleo-Indians. Artifacts from their travels have been found throughout the Miami Valley, including Montgomery County and around modern-day Dayton. As the climate warmed c. 8,000 BP, the Archaic Tradition period saw inhabitants adopt new ways of living in the Miami Valley, settling in semi-permanent communities in and around the Dayton area.[2]

Woodland and Late Woodland Traditions (1,000 BP – 400)

With the development of the Woodland Tradition, the pre-contact peoples of the Miami Valley formed permanent settlements and began construction of designed and planned works such as conical burial mounds and other geometric formations of earthwork and stone. Many of these works are extant today, such as the Miamisburg Burial Mound, located southwest of modern Dayton – one of the two largest extant mounds in North America.[3] The earliest of these works are believed to have been constructed by the Adena Culture (1,000 BP – 100) and later mounds built by the Hopewell Culture (200 BP – 400), who may have also reused Adena Culture mounds. Burial goods found within these mounds during archeological excavations include a wide range of pottery, tools, trophies and effigies, and food. Both Adena and Hopewell Cultures were also known to have established a wide network for trading of raw materials and goods.[4]

Fort Ancient Culture (1000 – 1780)

Starting in about 1000, the Fort Ancient Culture established the first subsistence farming in the area to support permanent settlements of typically 200 to 600 people. The Fort Ancient Culture were also mound builders and are believed to be associated with the Serpent Mound near Peebles, Ohio, located southeast of Dayton, although archeological studies suggest that the Adena Culture may also have associations with the site. Settlement sites from the Fort Ancient Culture have been identified in and around Dayton; in the 1970s, the SunWatch Indian Village was reconstructed as a Fort Ancient Culture village for educational and interpretive purposes.[5] The SunWatch Indian Village was designated a National Historical Landmark (Reference Number 75001500) in 1990.

Other Native American cultures were present in the Miami Valley starting around 1700, including the Miami and Shawnee. Although they may not have settled in the immediate lands around Dayton, they appeared to use the area as hunting grounds.[6]

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2 Ann Honious, *What Dreams We Have: The Wright Brothers and Their Hometown of Dayton, Ohio*. (Fort Washington, PA: Eastern National, 2003). Available online at https://www.nps.gov/parkhistory/online_books/daav/index.htm. Accessed March 25, 2023; Martha A. Potter, *Ohio's Prehistoric Peoples* (Columbus: Ohio Historical Society, 1968), 9-14.

3 Honious, W*hat Dreams We Have,* and Robert Silverberg, *The Mound Builders* (Athens: Ohio University Press, 1970), 10-13.

4 Honious, *What Dreams We Have*, and Silverberg, *The Mound Builders*, 176-201.

5 Honious, *What Dreams We Have*; and Silverberg, *The Mound Builders*, 231-232.

6 Honious, *What Dreams We Have*.

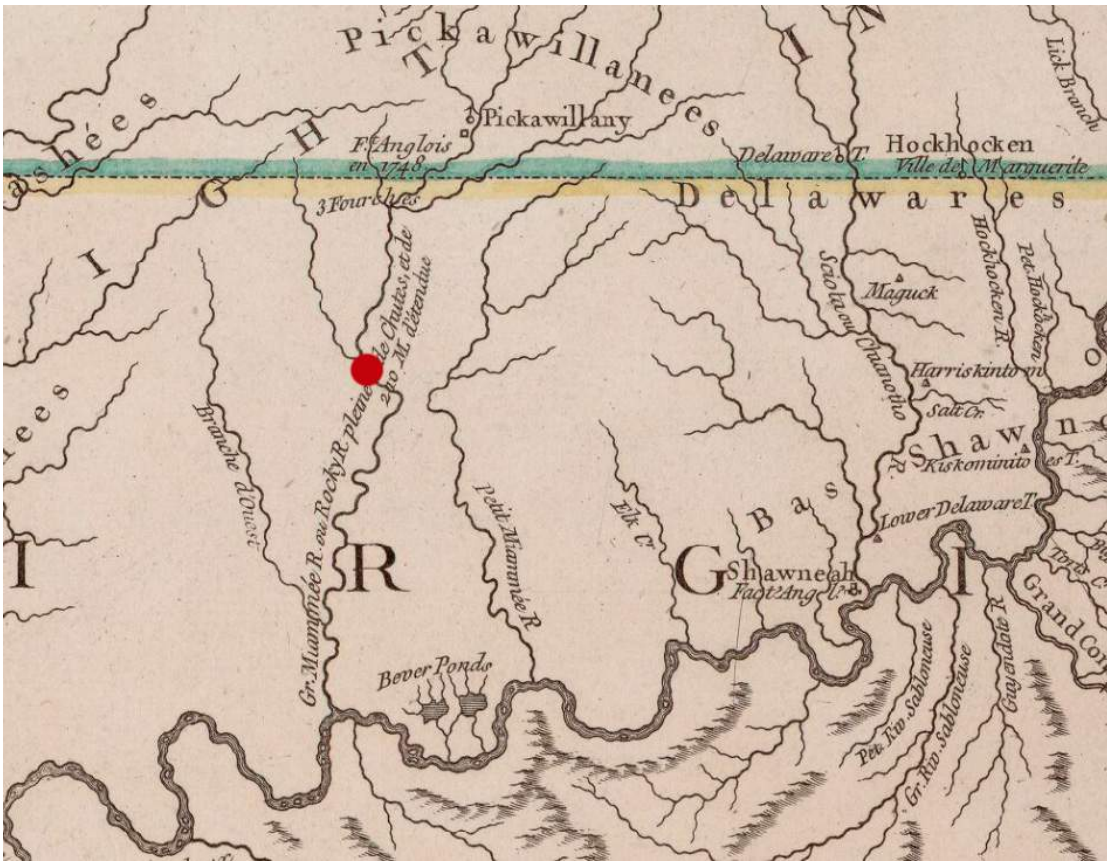


Figure 1-3 Excerpt from Robert de Vaugondy's 1755 map of the Ohio River, with the approximate location of Dayton marked in red and Pickawillany (Twigtwee Town) to the north along the Miammée (Miami) River. (Source: Bibliothèque nationale de France)

European Settlement in the Miami Valley

Early European Contact (c. 1700 – 1779)

French and British traders and explorers were among the first Europeans to travel into and document the Miami Valley starting in the first half of the eighteenth century. Early explorers to the area included Christopher Gist who was sent to survey the region by the Ohio Company in 1750-51; Gist may have passed through the Dayton area when he traveled north along the "Big Miamee River" from a trading post west of modern-day Cincinnati to a settlement of the Twigtwee (or Miami) nation near modern-day Pickawillany, Ohio, about 33 miles north of Dayton, which formed the northern terminus of his travels. Gist described the Miami River valley as "fine, rich level Land, well timbered" and "well watered with a great Number of little Streams or Rivulets and full of beautiful natural Meadows," concluding "…it wants Nothing but Cultivation to make it a most delightfull Country."[7]

According to his journals, Gist arrived in Twigtwee Town on Sunday, February 17, 1751, and was greeted kindly by the people and their leader, who he described as a king but did not name. Gist described the town as one of the larger Native American communities in the

7 William McCullough Darlington, *Christopher Gist's Journals: With Historical, Geographical and Ethnological Notes and Biographies of His Contemporaries* (Pittsburgh, PA: J. R. Weldin & Company, 1893), 47.

area, with about 400 resident families and growing in population daily. Gist's journals recount a stay in the village of 12 days, during which a group described as being from the Cutaway and Shanaw (Shawnee) tribes, as well as "four French Indians" arrived and were assumed to be there for warlike purposes, causing some trepidation for the village and Gist and his companions, who were English. After some back and forth, peace was made between the groups, at least temporarily. On Sunday, March 3, Gist's group parted Twigtwee Town to continue their journey, still with some worry about violence from the French-allied nations in the area.[8] Interestingly, on his journey back south along the Big Miamee, Gist described being presented with a mammoth tooth "of better than four Pounds Weight," a remnant of the Paleo-Indian and Archaic eras that first brought people to the Miami River Valley.[9]

Of the area in the immediate vicinity of Dayton, Gist's journals document little information, suggesting that the largest settlements were not located along this leg of the Miami River. Likewise, the 1755 map made by Didier Robert de Vaugondy shows no settlements or points of interest along the "Gr[ande] Miammée R[ivière]" between the junction with the Ohio River and Pickawillany village (Figure 1-3).[10]

European Settlement

France and Great Britain fought to control the region for the early half of the 18th century, with tensions finally erupting into the French and Indian War in 1754. With British victory in 1763, the French were pushed from the Ohio River Valley. For a short time, the resident Native Americans were protected from the influx of European settlers by a royal proclamation prohibiting settlement, but with the Treaty of Fort Stanwix in 1768, the territories were opened to European settlement. Conflicts between European settlers and Native Americans were common, particularly with the Shawnee, who had already been forcibly displaced by Europeans multiple times. Such conflicts escalated after the American Revolutionary War. Violent military actions undertaken by the new United States of America, along with a systemic program of duplicitous land purchases and treaties executed under duress and false pretense (including the 1795 Treaty of Greenville, in which the Native American nations ceded much of Ohio to the United States), ultimately resulted in Native Americans being forcibly removed from the Miami River Valley in favor of Europeans.[11] The first permanent American settlers moved into the Dayton area shortly after.

In 1787, John Cleve Symmes petitioned the United States Congress to purchase 311,682 acres of land, a transaction that was called the Miami Purchase and included the land between the Little and Great Miami Rivers. Symmes resold lots of 160 acres to potential settlers. He proved to a poor businessman, failing to make his required payments of one dollar per acre to the government, failing to collect on debts from resold lots, selling lots outside his land grant, and failing to track lot sales and boundaries. Many purchasers sued Symmes, and he died in poverty in 1814.[12]

Of the Symmes land grant, the tracts of land that are now Dayton were sold to four individuals in 1795: General Arthur St. Clair, Colonel Israel Ludlow, General James Wilkinson, and Jonathan Dayton. This sale, known as the Dayton Purchase, led to the establishment of

8 Darlington, *Christopher Gist's Journals*, 48-57.
9 Darlington, *Christopher Gist's Journals*, 57-58.
10 Didier Robert de Vaugondy, *Partie de l'Amérique septentrionale qui comprend le cours de l'Ohio, la Nlle Angleterre, la Nlle York, le New Jersey, la Pensylvanie, le Maryland, la Virginie, la Caroline* (1755). Bibliothèque nationale de France, département Cartes et plans, GE DD-2987 (8717). Accessed January 14, 2023. http://catalogue.bnf.fr/ark:/12148/cb406059215.
11 Honious, *What Dreams We Have*; R. Douglas Hurt, T*he Ohio Frontier: Crucible of the Old Northwest, 1720–1830* (Bloomington, In: Indiana University Press, 1998), 140-148; and Augustus Waldo Drury, *History of the City of Dayton and Montgomery County, Ohio, Volume 1* (Chicago, IL: S. J. Clarke Publishing Company, 1909), 41-42.
12 Hurt, T*he Ohio Frontier*, 160-168.

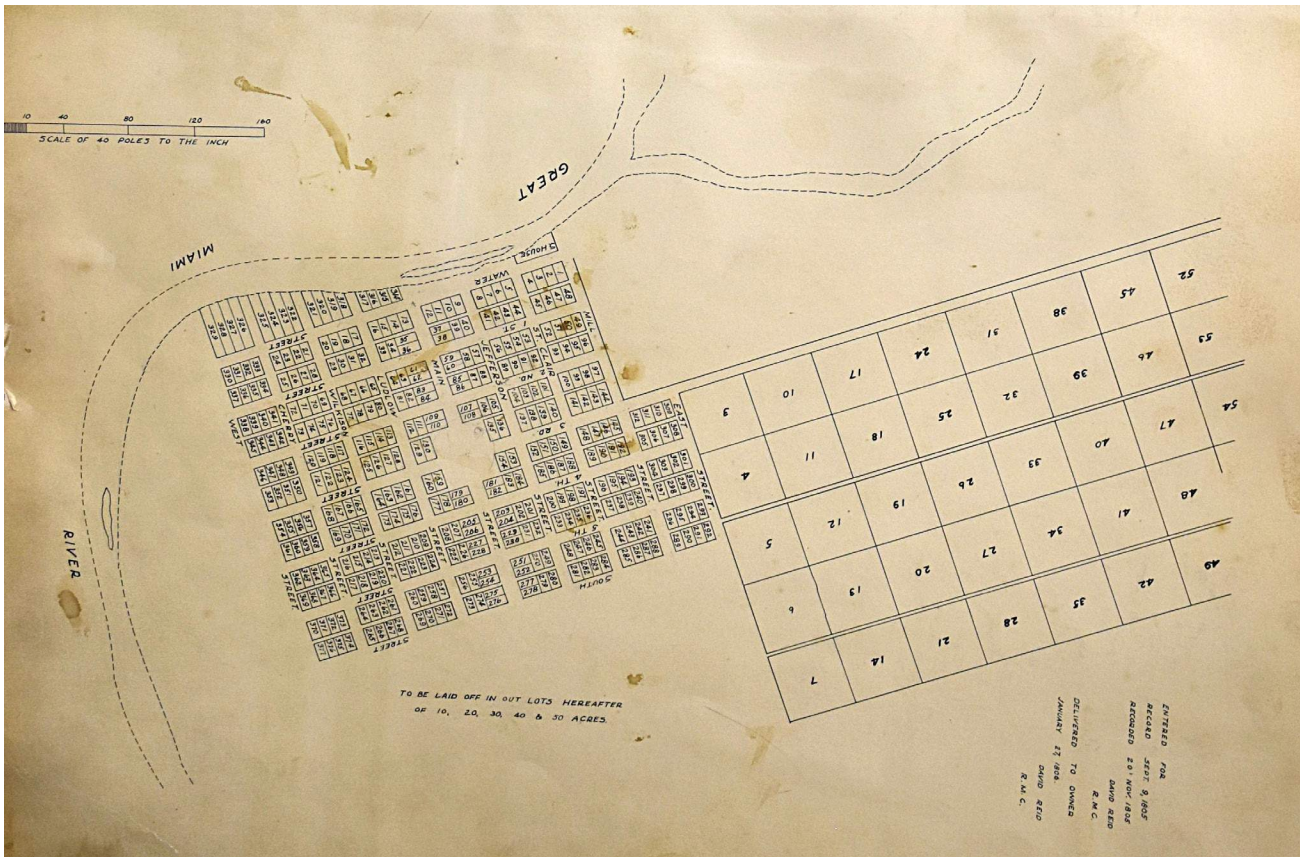


Figure 1-4 Cooper's 1805 plat map of Dayton. (Source: Montgomery County Auditor's Office)

the township of Dayton. Colonel Ludlow had the land platted, and nineteen settlers traveled to the new settlement.[13] In 1798, tax rolls for the city noted 138 taxpayers (all men), with assessments ranging from 37 and a half cents to 5 dollars and 40 cents,[14] although other sources state that only 22 taxpayers were present that year.[15]

DAYTON BEFORE THE WRIGHT COMPANY FACTORY

Dayton's growth continued into the nineteenth century, growing from approximately 383 in 1810 to 80,000 residents in 1896.[16] The earliest settlers of Dayton established their township on the south side of the river in what is now downtown Dayton. In 1803, Ohio became a state. In 1805, Daniel Cooper formalized the first plat map of the town, showing the extent of settlement and the first planned township expansion to the east (Figure 1-4); this tilted grid system, still place today, oriented the east-west streets to roughly align with the Great Miami River and established Main Street as the primary north-south corridor and Third Street as the primary east-west corridor.[17]

13 Honious, *What Dreams We Have*.
14 Drury, *History of the City of Dayton and Montgomery County, Ohio*, 81-84.
15 Robert Wilbur Steele, *Early Dayton: With Important Facts and Incidents from the Founding of the City of Dayton, Ohio, to the Hundredth Anniversary, 1796-1896* (Dayton, OH: W. J. Shuey, 1896),14.
16 Steele, *Early Dayton*, 233-237.
17 Daniel C. Cooper, [Plat map of Dayton, Ohio], 1905. Montgomery County Auditor's Office. Accessed January 14, 2023. http://gis.mcohio.org/web_docs/PDF_NRecPlat/vol-001/001-001.pdf.

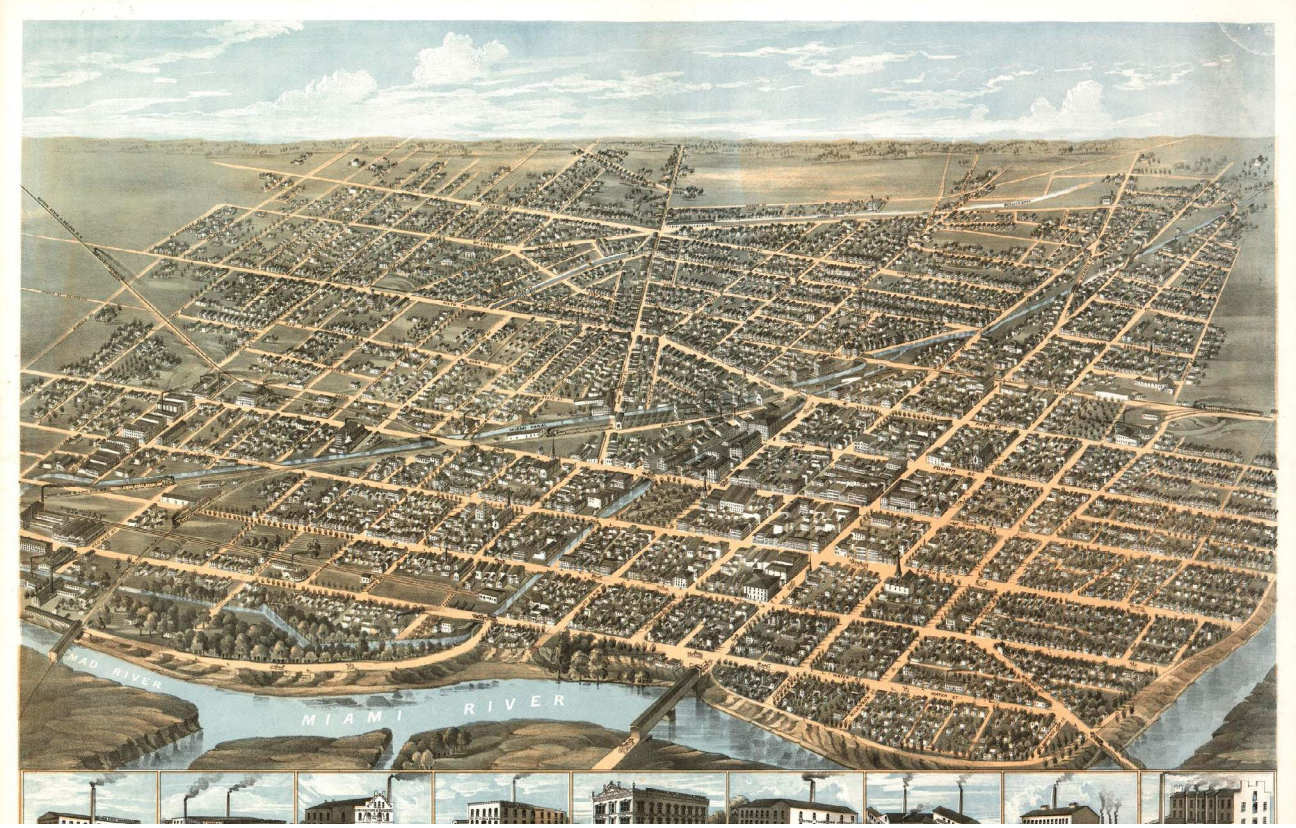


Figure 1-5 Albert Ruger's 1870 bird's-eye illustration of the City of Dayton, looking south. The future site of the Wright Company factory is to the right, out of frame. Montgomery County Courthouse can be seen in the foreground, slightly right of center, at the lower right corner of Main and Third Streets. (Source: Library of Congress)

The construction of the Miami-Erie Canal in 1829 - 1845 connected Dayton along what became a major shipping route between Cincinnati to the south and Lake Erie to the north. Business from the canal brought prosperity to Dayton. Bridges were constructed to span the canal and rivers, and the streets were paved in this era.[18] The Third Street Bridge, constructed in 1838, facilitated expansion of the township to the west bank of the Great Miami River. Industry boomed in Dayton with factories manufacturing goods of all kinds, from tools, to guns, to hats.[19] By 1851 and 1852, railroads had extended to Dayton, further opening the township to trade and industrial opportunities,[20] and nine railroad lines would eventually pass through Dayton.

Outside the central business district, development of the lands west of the river remained slow until the construction of the Third Street Bridge and the extension of Third Street into the Dayton and Western Turnpike.[21] The area had a spattering of residential developments but was primarily rural. The area was annexed by Dayton in 1868. By the 1870s, growth in West Dayton was steadily increasing due to the introduction of the first horse-drawn street railway in the city – the "City Railway" which circulated from the east end of Third Street, running approximately 3.75 miles along the Dayton and Western Turnpike (now West Third

18 Drury, *History of the City of Dayton and Montgomery County, Ohio*, 135-137 and 138-139.
19 Drury, *History of the City of Dayton and Montgomery County, Ohio*, 150-153.
20 Drury, *History of the City of Dayton and Montgomery County, Ohio,* 155-159; and Steele, *Early Dayton*, 236
21 Drury, *History of the City of Dayton and Montgomery County, Ohio*, 235-237.

Street). Transportation further improved in the 1880s and 1890s with the introduction of the electric streetcar, running along this same corridor (Figure 1-5). With the improvement of easy transportation to and from West Dayton, industry began to spring up in formerly rural lots, as manufacturing facilities began to relocate to the outskirts of the city.[22] By the time the Wright brothers were looking for a site for their planned factory, Dayton was in a period of economic prosperity, pushing both residential and industrial development into West Dayton.

INVENTION, DEVELOPMENT, AND DEMONSTRATION (1903-1909)

After the first manned, powered, heavier-than-air flight by the Wright brothers on December 17, 1903, in Kitty Hawk, North Carolina, the efforts to produce viable aircraft for production started in earnest. Just nine days after their historic flight, the Wright brothers received a letter from Augustus Herring, an early pioneer of American aviation, suggesting that they form a company in which the Wrights brothers would have two-thirds share and Herring a one-third share. The Wright brothers had met Herring the year before, when Herring accompanied Octave Chanute to Kitty Hawk where Chanute and the Wright brothers were testing their kites. Chanute and Wilbur Wright had enjoyed a years-long correspondence on the subject of manned flight, but the Wright brothers were leery of Herring's presence at the trials. The Wright brothers did not reply directly to Herring, but Wilbur wrote to Chanute regarding Herring's "effrontery" and "rascality."

Herring had an on-going interest in manned flight and worked alternately for Chanute and Samuel Langley on different flying projects. As early as 1896, Herring and Chanute had filed a joint patent application for an flying machine that was subsequently denied.[23] Despite the Wrights' rejection, they had not heard the last of Herring, who would reappear as a competitor periodically over the next decade.

The Wright brothers dedicated their time and energy to refining and developing their flyer into a more reliable machine. Their initial United States patent application from 1903 was denied. In response, they retained Harry Toulmin as their patent attorney, who assisted them in obtaining patents in France in 1904 and in the United States and Germany in 1906.[24] Although the Wright brothers did try to sell their airplane during this time, they were hampered by their reluctance to demonstrate the machine, fearing industrial espionage. Only after the patents were granted did they start to demonstrate their flyers in Europe and the United States.

The Wright brothers and their competitors, most notably the Aeriel Experiment Association (AEA), spent the next few years testing, demonstrating, and refining their flying machines. The field was crowded with enthusiasts developing their own aircraft. Early aviators, including the Wright brothers, were constantly setting new records for speed and length of flights to demonstrate the superiority of their designs. In addition to development and experimentation, the Wright brothers moved forward with their plans for larger-scale production and by 1908 were producing planes in Germany, England, and France. They formed Flugmaschine Wright GmbH in Germany and La Compagnie Générale de Navigation Aérienne in France to

22 Steele, *Early Dayton*, 228 and 236; and Nathalie Wright, "Ohio Modern: Preserving Our Recent Past, Dayton and Surrounding Area Survey Report," Ohio Historic Preservation Office of the Ohio Historical Society, 25. Accessed February 22, 2023. https://www.ohiohistory.org/preserving-ohio/survey-inventory/ohio-modern-preserving-our-recent-past/#:~:text=Since%201974%2C%20more%20than%2097%2C000,of%20architectural%20or%20 historical%20significance.

23 Richard Stimson, "Herring No Friend of the Wrights", Accessed April 27, 2022, https://wrightstories.com/articles/wright-contemporaries/

24 Timothy Gaffney, *The Dayton Flight Factory: the Wright Brothers and the Birth of Aviation* (Charleston, SC: The History Press, 2014), 79.

produce Wright planes, while the Short Brothers were contracted to produce Wright planes in Great Britain.[25]

Interest in airplanes extended beyond flight enthusiasts, and practical applications for flying machines were being explored by the United States military. In early 1908, the Army Signal Corps issued a request for bids for airplanes. Three bids were ultimately accepted: the Wright brothers, as expected, but also bids from Herring and J. F. Scott of Chicago. On February 28, 1908, the Wright brothers signed the contract and were able to deliver a plane to Fort Myer, Virginia, for testing on August 15, 1908, less than six months later.[26] Despite also being awarded contracts, neither Scott nor Herring were able to successfully delivery an airplane, leaving only the Wright brothers with a working model - one based on the 1905 Flyer, but with a larger engine and room for both pilot and passenger. The Wright plane was tested with encouraging results in the first few weeks of September, staying aloft for as long as an hour and two minutes.

Tragically, during a training flight on September 17, 1908, Orville Wright and Lt. Thomas Selfridge crashed, likely due to a mechanical failure, killing Selfridge and injuring Orville. Selfridge was a member and the secretary of the AEA at the time, and the accident increased tension between members of the AEA and the Wright brothers. Alexander Graham Bell, an AEA founder, and other members of the AEA were accused of taking measurements of the Wright flyer while attending Selfridge's funeral.[27]

The plane flown by Orville and Selfridge was totaled in the crash. The military extended the contract, allowing the plane to be rebuilt and retested (Figure 1-6). Despite the earlier crash, the new airplane, the 1909 Wright Military Flyer, was eventually accepted by the Signal Corps on August 2, 1909. The successful delivery of the "military flyer," along with other demonstration flights, provided "proof of concept" sufficient to convince financiers to back the Wright brothers in the formation of the Wright Company on November 22, 1909.

Earlier that same year, Curtiss and Herring had launched the Herring-Curtiss Company,[28] thereby beating the Wright brothers by several months in the formation of an airplane manufacturing company. However, Herring's partnership with Curtiss was short lived, as Herring had falsely claimed to have a patent that preceded the one held by the Wright brothers, likely a reference to his rejected 1896 patent application with Chanute.[29] The company began production of airplanes under this claim, resulting in the Wright brothers filing a patent infringement lawsuit in the summer of 1909. Herring's relationship with Curtiss ended when he was unable to produce his patent to counter the lawsuit. By 1910, the Herring-Curtiss Company had filed bankruptcy and Curtiss re-established it as the Curtiss Aeroplane Company.

Despite these legal issues, Herring convinced W. Starling Burgess, another American aviation pioneer and yacht designer, to partner with him to form the Herring-Burgess Company later in 1909. That partnership was also brief, after which Burgess partnered with Greely S. Curtis, an engineer with a deep interest in aeronautics, and Frank H. Russell to form the Burgess Company and Curtis, Inc. The Burgess Company and Curtis was licensed by the Wright Company to produce Wright planes but developed their own modifications, in violation of their

25 Edward Roach, *The Wright Company: From Innovation to Industry* (Athens, OH: Ohio University Press, 2014), 6

26 David McCullough, *The Wright Brothers* (New York: Simon & Schuster, Inc, 2015), 191.

27 Tom Crouch, *The Bishop's Boys: A Life of Wilbur and Orville Wright* (New York, W. W. Norton & Company, 1989), 380.

28 Crouch, *The Bishop's Boys*, 401

29 Herring's papers, located in the Cornell University Library, Division of Rare and Manuscript Collections, contain correspondence with the US Patent office from 1909 to 1913. His patent application was rejected, despite his efforts to resubmit.



Figure 1-6 A record-setting flight by Orville Wright and Lieutenant Frank Lahm of the United States Signal Corps on July 27, 1909, in Fort Myer, Virginia. The Wright Military Flyer (pictured) traveled fifty miles at forty miles per hour. (Source: Library of Congress)

licensing agreement, using Wright engines, which were manufactured at the Wright Company factory in Dayton, for both Wright Flyers and Burgess-designed planes.

THE WRIGHT COMPANY FACTORY (1909–1916)

Establishing the Company (1909)

Already celebrities, the brothers were mobbed by a crowd of 10,000 onlookers upon on their return to Dayton on May 13, 1909. They were further feted by the people of Dayton. The city hosted an extravagant, two-day homecoming party on June 17 and 18, 1909, during which the bothers were paraded along an elaborately decorated North Main Street (Figure 1-7), with a rigorous agenda of receptions, speeches, awards, medals, fireworks, and much hand shaking. Always wary of the limelight, the brothers attended but privately had little patience for the festivities. Immediately after the party, they departed for Fort Myer, Virginia, to conduct more demonstration flights, including the record-setting flight on July 27, 1909, when the Wright Military Flyer was aloft for fifty miles and flew at over forty miles per hour with Orville piloting and Lieutenant Frank Lahm of the United States Signal Corps as a passenger.[30]

The Wright brothers were the darlings of Dayton and never seriously considered locating their new factory anywhere but their hometown. However, unlike their rivals Curtiss and Burgess,

30 Gaffney, *The Dayton Flight Factory,* 89-91.



Figure 1-7 The parade route along North Main Street for the 1909 homecoming celebration in Dayton, Ohio Source: Wright State University Special Collections and Archives)

they did not already have manufacturing facilities for the construction of their new airplanes and began to scout favorable sites for the new factory.

Following the success of the "military flyer," they also attracted an impressive list of investors which demonstrated the eager interest in American aeronautics, including Cornelius Vanderbilt III, Robert Collier, De Lancey Nicoll, August Belmont, Jr., and Andrew Freedman. For the new undertaking, dubbed the Wright Company, Wilbur Wright was appointed president and Orville Wright and Andrew Freedman were appointed co-vice presidents. They were joined on the board by Theodore Shonts, Allan Plant, Allan Ryan, Edward Berwind, Howard Gould, Vanderbilt, Belmont, and Russell Alger. Alpheus Barnes served as the secretary and treasurer. Barnes also ran the New York office of the Wright Company.[31]

Until the new factory was ready, the company produced planes in space rented from the Speedwell Motor Car Company in Dayton.[32] The engines were produced at the former cycle shop, and an office for the manager, Frank Russell, was secured in the back of a plumbing shop nearby.

31 Roach, *The Wright Company*, 21-22.
32 Gaffney, *The Dayton Flight Factory,* 99.

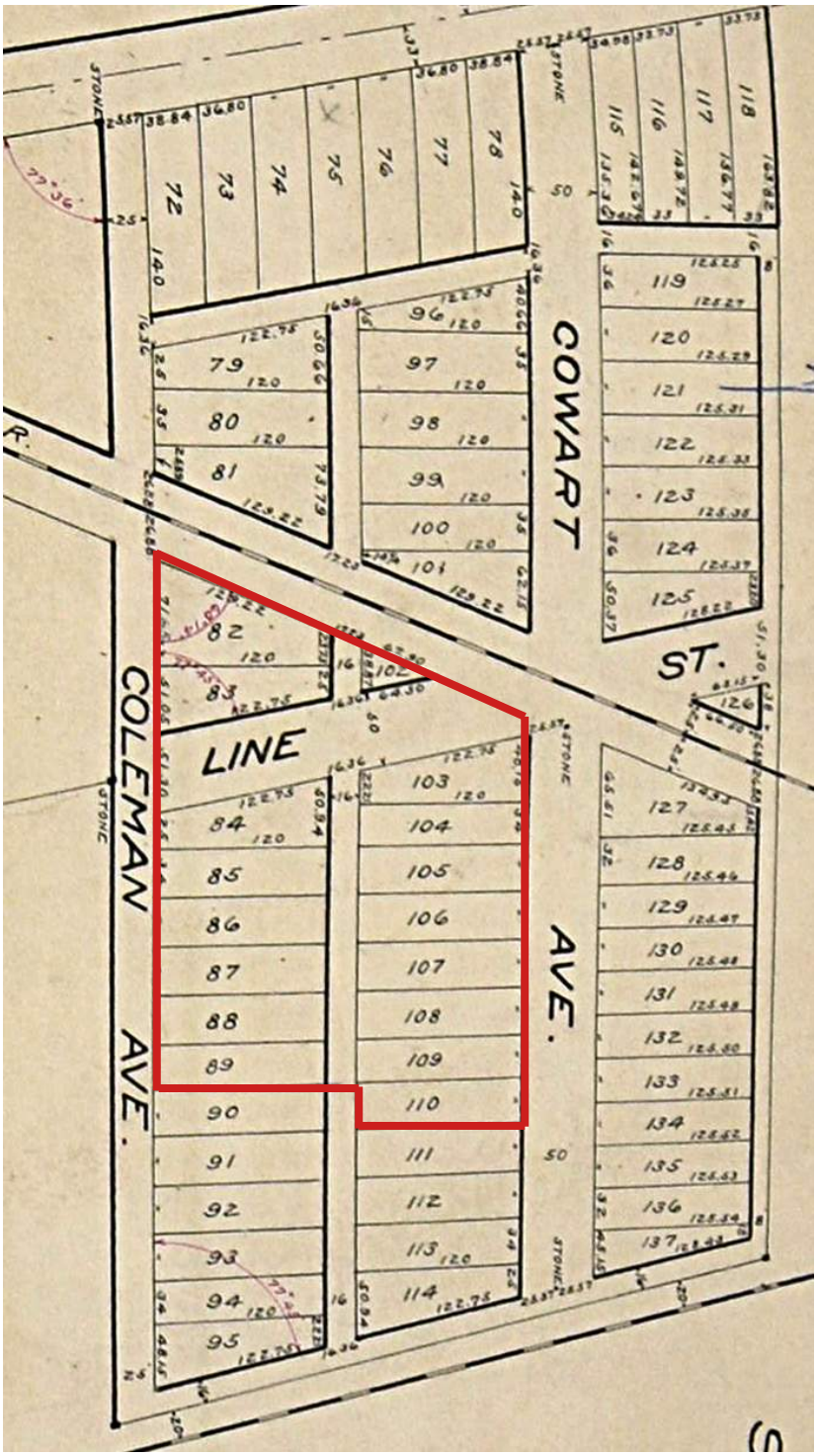


Figure 1-8 1896 Plat of Geo. L. Clemmer's Heirs Subdivision. The subdivision included this area and another area further west. The red line represents the boundaries of the factory site per the 1919 Sanborn Map. Note that this image is slightly warped from the camera lens. (Source: Montgomery County Plat Book E)



Figure 1-9 Rendering of Building 1, presumably by William Earl Russ, c. 1910 (Source: Wright State University Special Collections and Archives)

Building the Factory (1910–1911)

The Site

The newly incorporated Wright Company purchased several parcels of land from Lewis Clemmer and his aunt Sarah Clemmer Bish in August 1910.[33] The property was platted in 1896 by eight descendants of George Clemmer, including Lewis and Sarah.[34] The Clemmer family were early settlers and farmers in the Dayton area.[35] Lewis Clemmer had turned from farming to running a grocery store. Similarly, Sarah Clemmer's husband Noah Tyler Bish was a grocer.[36] The property acquired by the Wright Company was located along the Dayton-Soldiers Home Railway that ran from downtown Dayton to the Soldiers Home about four miles to the west of downtown and about one and a half miles west of the former Wright Cycle shop. The City of Dayton worked quickly with the Wright Company to de-map the alleys and Line Street running through these lots (Figure 1-8).

The factory site was relatively isolated from urban development and was located amid actively cultivated cornfields and neighboring residential streets. The fertile loam topsoil of this area had been farmed since the early 19th century to produce abundant crops of peas, beans, and corn. Gravel deposits, left by ancient glaciers beneath the topsoil, was often used to build roads in Dayton as the city expanded its system of wide, straight streets laid out in a grid pattern that followed the river.[37] The land around the factory remained under cultivation throughout the Wright Company use of the buildings, as evidenced by the presence of cornfields in the 1911 and 1918 historical photographs. Construction of the Wright Company factory occurred along the existing Cincinnati, Hamilton and Dayton Railway line, which facilitated transport of equipment and materials for construction of the buildings and later transport of manufactured planes.[38]

The parcels purchased by the Wright Company were bounded by transportation corridors on the north, south, and west of the site. The line for the Cincinnati, Hamilton & Dayton Railroad, chartered on March 2,1846, (later the Baltimore and Ohio Railroad, popularly called the B&O)

33 Roach, *The Wright Company*, 39.
34 Montgomery County Plat Book E, 21-22.
35 Drury, *History of the City of Dayton and Montgomery County*, 992-993.
36 Drury, *History of the City of Dayton and Montgomery County,* 372-373.
37 Gaffney, *The Dayton Flight Factory*, 21.
38 Ibid, 99.



Figure 1-10 Site after completion of Buildings 1 and 2 in 1911. Surrounding cornfield is visible and some neighborhood structures. The access road appears to have small scale rail tracks or distinct treads created by carriages and wagons, either used to bring in or take out construction materials or soil. (Source: Library of Congress)



Figure 1-11 Building 1 under construction 1910. Note the skylight at the center. Building 2 and subsequent buildings had a similar form to Building 1 but without the skylight.(Source: Wright State University Special Collections and Archives)

formed the northern boundary, while the Dayton-Soldiers Home Railway Company Red Line, an electric streetcar line constructed in 1890, formed the southern boundary. Abbey Avenue formed the western boundary, and Cowart Avenue the east. The primary site access was from West Third Street along Coleman Avenue as shown in the 1896 plat map. Coleman Avenue passed the west and principal facades of the two Wright Company factory buildings. This road survives today as Inland Avenue.

The parcels north of the B&O Railroad line and west of Cowart Avenue contained residences, a coal yard associated with a spur of the railroad line, storage structures, and small business establishments.

Constructing a Daylight Factory

With the site secured and financial backing in place, the Wright Company retained a young local architect with industrial experience, William Earl Russ, to design the new factory. The John Rouzer Company,a prominent contractor in the area, was engaged to manage the construction of the new Wright Company buildings; interestingly, Wilbur and Orville's older brother Lorin worked as a bookkeeper for Rouzer.[39]

Building 1 as conceived for the factory (Figure 1-9) was an early and simple example of the "daylight factory" typology - industrial structures designed to make best advantage of natural



Figure 1-12 Propeller and Rib Department on north side of Building 1, 1911. (Source: Wright State University Special Collections and Archives)

39 "Lorin Wright", National Park Service Website, Accessed 5-4-2022, https://www.nps.gov/people/lorin-wright.htm

lighting through large windows, skylights, and building orientation.[40] The repetitious window bays, expressed structure, and modest ornament at the Wright Company factory (Figure 1-10 and Figure 1-11) are all typical of daylight factories of this era, if executed on a significantly smaller scale than other contemporary buildings such as Albert Kahn's 1910 Highland Park plant for Ford Motors in Michigan. Building 1 and the first power plant that ran the shaft-and-belt power system for the machines were constructed in 1910. The construction of Building 2 followed shortly after in 1911. A larger coal-power plant was located to the east of the building in the late 1920s.

No signage indicating the Wright Company name was mounted or painted on the buildings, nor was the function of the buildings explicitly visible in the historical photographs. Lacking signage promoting the Wright Company, Buildings 1 and 2 had only modest architectural expressions to hint at their purpose as a fabrication plant. Oversized sliding doors and the open interior spaces (Figure 1-12) facilitated the construction of early airplanes, but these features were common to industrial buildings of varying uses. Architecturally, the buildings apparently received little fanfare, described as "businesslike and commonplace" by the press.[41]

In 1911, a series of photographs, now housed in the Special Collections and Archives of the Wright State University Libraries, were taken of Building 1 to market the Wright Company's new factory, showing the various department and stages of aircraft manufacturing. Since the photos were taken for publicity purposes, some of the settings and workers appear to be staged and therefore may not accurately

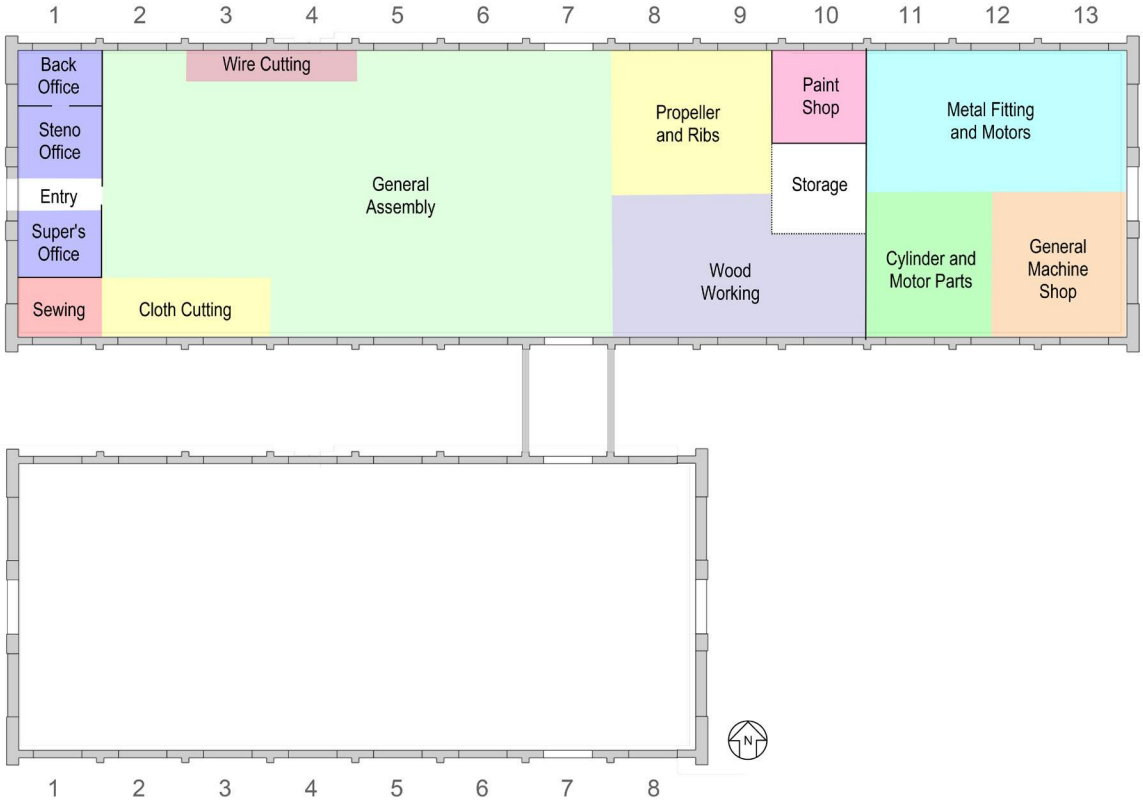


Figure 1-13 Diagram of historical use of Building 1, based on the 1911 publicity photographs in the Wright State University archive. (Source: RRJ)

40 Case, Willard L. *The Factory Buildings*. 439-442.
41 Edward Roach, *The Wright Company*, 41.

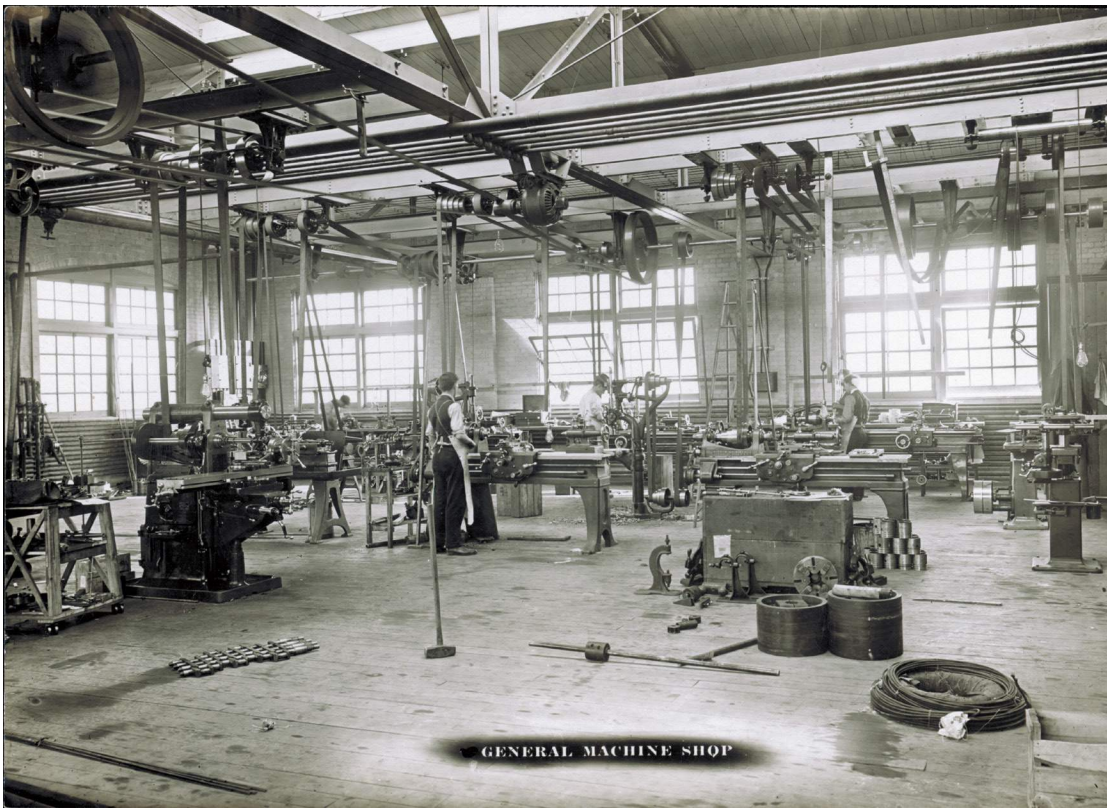


Figure 1-14 General Machine Shop at southeast corner of Building 1, 1911. (Source: Wright State University Special Collections and Archives)

show how the factory truly functioned. However, the photographs do provide valuable context for the earliest days of the Wright airplane fabrication, sequencing of departments, working environment, and the equipment, tools, and materials used (Figure 1-14). Figure 1-13 is a diagram of the approximate locations of the factory departments based on these photographs; comparable photographic documentation for Building 2 has not been found.

Exterior photographs in the collection of the Library of Congress were taken at approximately the same time. Additional photographs were also taken at slightly later, but undetermined, dates in the factory showing specific airplanes under production. Only a few photographs dating between 1911 and 1923 have been found. The historical photographs are included in Appendix A.

Building 1

The first Wright Company factory building, referred to as Building 1, is a long, linear structure with concrete foundations, mass brick exterior walls, steel roof trusses, and a wood roof deck. The steel roof trusses created an open interior space uninterrupted by columns or structural bearing walls.

As originally constructed in 1910, Building 1 was a stand-alone structure, approximately 232 feet long and divided into 13 equal bays in the east-west direction by masonry piers that support the roof trusses. The north and south walls feature large wood-framed windows in each structural bay to take advantage of the natural light. Double sliding doors were located on the north and south walls in bay seven. A north-facing gabled skylight with three ventilation monitors was installed over bays three to 12, counting from the west face. In the north-south direction, the building measured approximately 62 feet wide. The west wall served as the primary facade. The facade and rear wall featured slightly battered walls and an arched parapet, which became a characteristic feature of later Buildings 2 through 5. The center

double door was flanked by brick piers and large multi-lite windows, dividing the west facade into three bays. As noted in the National Register nomination, "These characteristic features, typical of late nineteenth and early twentieth century industrial buildings in America, provided the architectural vocabulary for the additions that were subsequently made to the building."[42]

The double door of the main entry opened into an office space with wood paneled walls and ceilings. The superintendent's office was to the south and the stenographers or office assistants were to the north, with a smaller office against the north wall. Wood rails separated the offices from the main entry circulation. There may have been a mezzanine level above the offices, but it is unclear from the photographs. Passing east through the front offices, paneled wood doors with glass windows opened out to the general assembly floor. The back office also had a private door that opened to the wire cutting area.

On the general assembly floor, the space was not subdivided between functions until bays 10 and 11 from the west, where a partition wall was present. The interior was open to accommodate assembly of both airplane components and entire airplanes (Figure 1-15 and Figure 1-16). The skylight and large windows provided abundant interior light, but small incandescent fixtures were also suspended over the space. The brick masonry and steel trusses were exposed. The brick walls appear to have been left unpainted, but the underside of the roof deck was painted a light color to maximize light reflectance. Steam radiator pipes ran along the interior face of the walls around the entire building. Long bench tables lined the north and south walls to provide work areas for detailed tasks. The southwest corner was dedicated to handling the fabric that covered the wings and bodies of the planes. The west half of the interior was a wood working shop where the wood frame components were constructed. The flooring was concrete slab with inset wood sleepers, likely preparation for wood flooring, such as was present in other areas of Building 1.



Figure 1-15 Model B Flyer being assembled in the general assembly area in Building 1, 1911. (Source: Wright State University Special Collections and Archives)

42 Beverly Shaw, "Wright Company Factory," National Register of Historic Places Nomination (US Department of the Interior, National Park Service, 2019), 6.

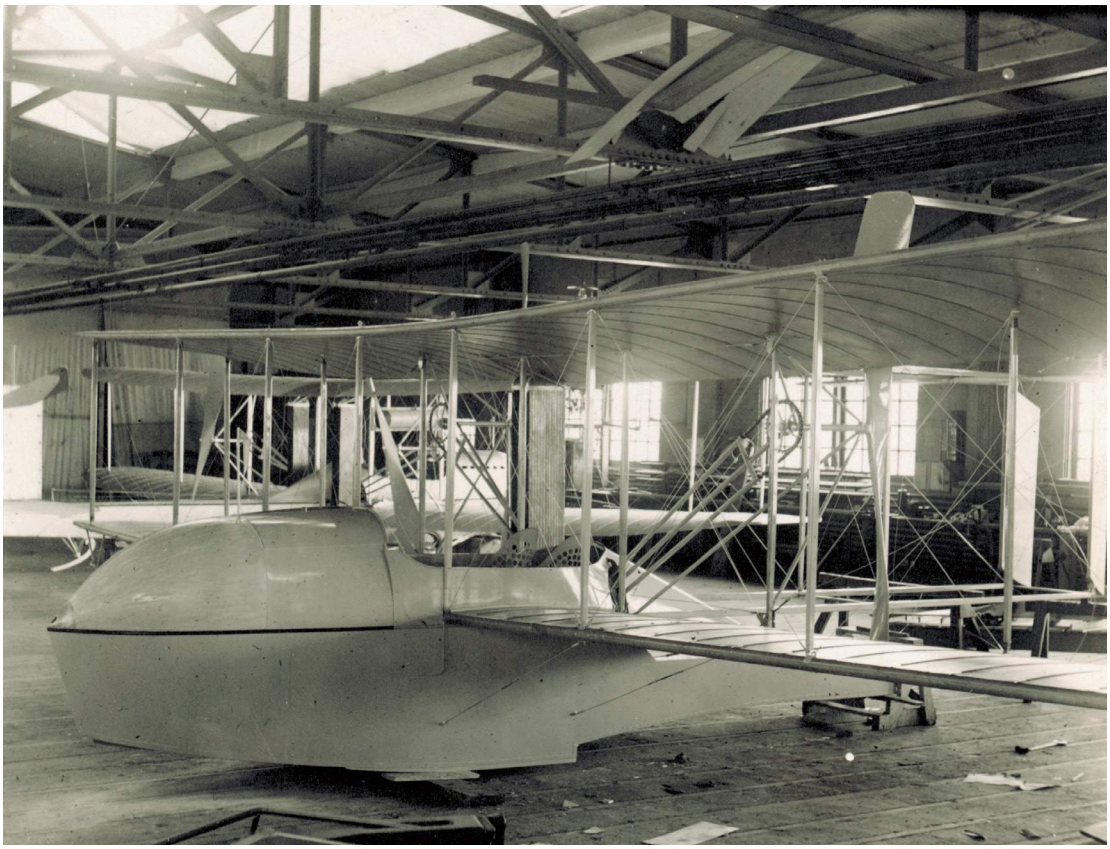


Figure 1-16 Model F Flyer being assembled in Building 1, 1913. (Source: Wright State University Special Collections and Archives)

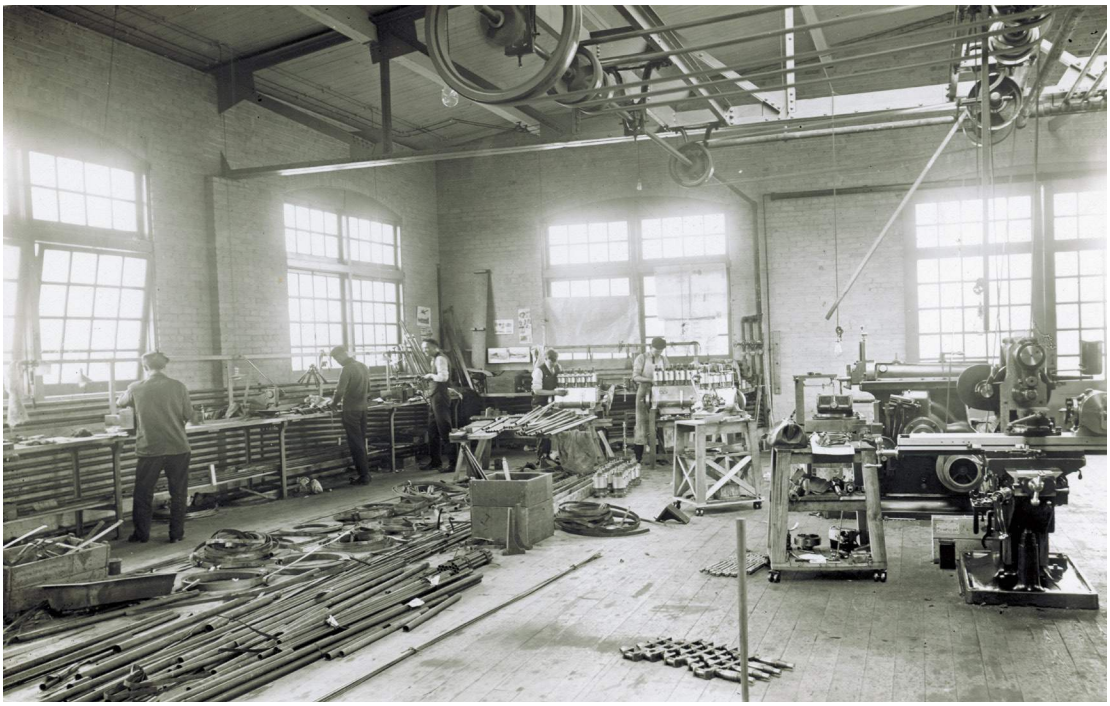


Figure 1-17 Workers assembling 4-40 motors, 1911 (Source: Wright State University Special Collections and Archives)

Between bays eight and nine, a full-height interior partition wall was present. This wall was wood framed and covered with corrugated metal panels. To pass into the machine shop at the east end of the building, one first entered a wire mesh storage enclosure and then passed through a door in the partition wall. The paint shop was located north of the open storage within its own enclosed space.

The eastern three bays were dedicated to the machinery needed to assemble the motors and for general tooling needs (Figure 1-17). Belt-driven equipment was located throughout the space. The flooring was wood planks. Tables were placed against the north and south walls. At the east facade, a large double sliding door was present.

Conspicuously missing from these photographs is any evidence suggesting where or if employee facilities, such as lavatories, changing rooms, or cloakrooms, were originally present in Building 1.

Building 2

The second Wright Company factory building was constructed almost immediately after Building 1 and was sited approximately 20 feet to the south, leaving a narrow open space between the buildings for natural light and ventilation. As originally constructed, Building 2 was also a stand-alone structure, approximately 142 feet long by 62 feet wide and divided into eight equal bays in the east-west direction. The design of Building 2 follows that of Building 1, with nearly identical windows on the north and south facades and matching structural dimensions. The west facade of Building 2 was aligned with that of Building 1 and featured the same arched parapet profile and battered walls. The west entry was a large double sliding door. A small wood-framed connecting link to Building 1 was constructed at bay seven on the north wall; this link is shown on the 1919 Sanborn map. Building 2 did not have a skylight. Reportedly, Orville was unimpressed with Building 2.[43]

Photographic documentation of Building 2 is not as readily available as Building 1. Building 2 was used for the manufacturing of engines, but there is inadequate documentation of the individual functions and workspaces within the structure during the Wright Company time.

Wright Flyer Manufacturing (1910–1916)

The Wright Company needed skilled labor for the manufacturing of airplanes, and placed the factory under Frank Russell's general management. Russell had experience managing a factory but did not have experience manufacturing planes. It fell to Russell to engage and train new laborers and to manage the manufacturing floor. Assembling an airplane was a slow process; the factory completed only six airplanes between January and July 1911, and in the following years never reached anything near the full production capacity of "50 machines per year." By 1916, the factory had fewer than 20 full-time workers, down from the initial number of almost 60 in 1911.[44] During the six years under direct operation by the Wright Company, Orville estimated that the factory produced only about 120 planes, 21 of which were used by their own exhibition department.[45] Tension between the Wright brothers and Russell mounted from the start; Russell wanted to increase production and make other improvements to the business, but the brothers were slow to adopt change. The Wright brothers in turn were displeased with Russell's management. Personality conflicts and unclear expectations may have contributed to the souring of relations on both sides. By 1912, Russell tendered his resignation, moving on to the Burgess Company and Curtis. Over time, the Wright Factory would slowly incorporate many of Russell's ideas but without a capable manager to oversee the factory.[46]

43 Roach, *The Wright Company*, 56.
44 Roach, *The Wright Company*, 25-27 and 43; and Gaffney, *The Dayton Flight Factory,* 98-99.
45 Roach, *The Wright Company*, 57 and 93; and Gaffney, *The Dayton Flight Factory,* 101.
46 Roach, *The Wright Company*, 130-139; and Gaffney, *The Dayton Flight Factory,* 101-103.

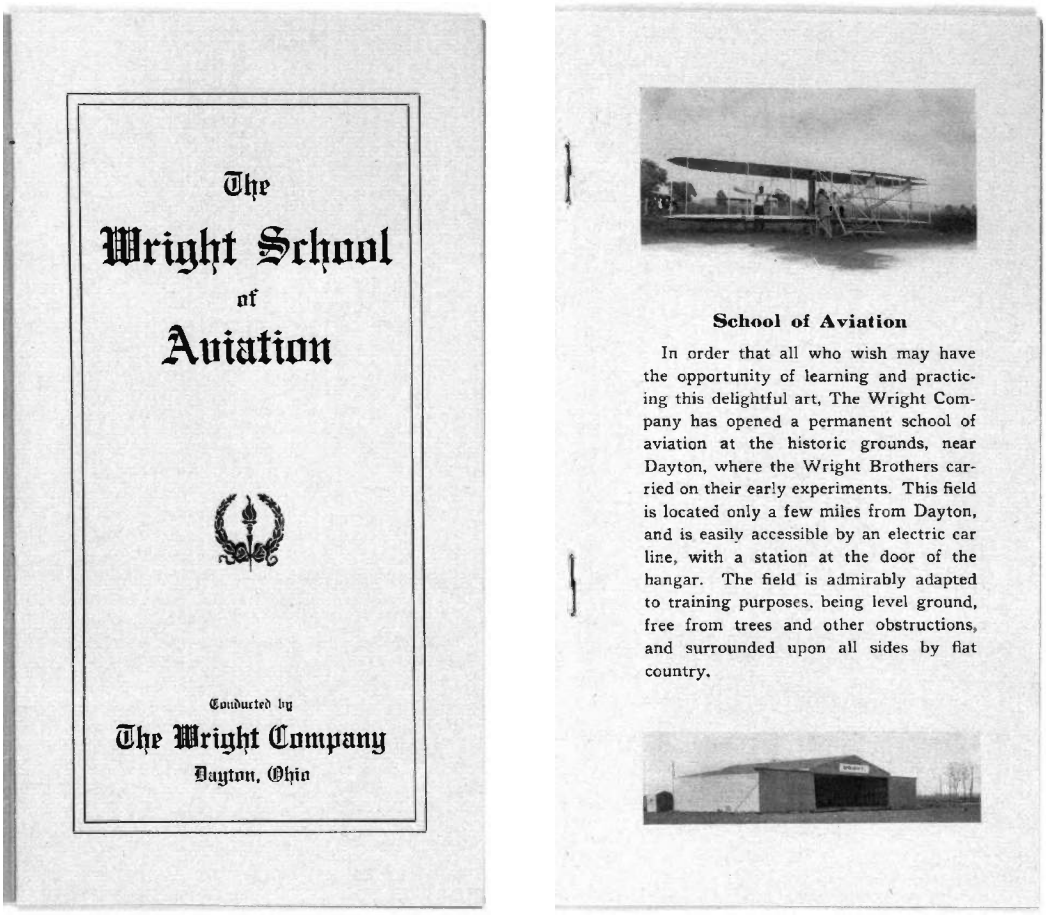


Figure 1-18 Pages from brochure for The Wright School of Aviation, c. 1912 (Source: Library of Congress)

While never a prolific manufacturer, the Wright Company influenced the development of the aviation industry in multiple ways, playing a key role in training early pilots, workers, and engineers; promoting airplanes as a viable mode of transportation; and developing airplane and airplane engine design. The patent battle with Curtiss and its resolution also shaped the way aviation patents were managed, changing the landscape of airplane manufacturing during the critical years of World War I (WWI).

The Launch of Commercial Airplane Manufacturing

The year 1909 was the launch point of the airplane manufacturing industry in the United States. Although several individuals and groups, including the Wright brothers, had produced and sold planes prior to 1909, in this year, three, influential companies were formed with the specific purpose of airplane manufacturing: the Herring-Curtiss Company (1909 - 1910), the Herring-Burgess Company (1909 - 1910), and the Wright Company (1909 - 1916).

The first two decades of aviation manufacturing were periods of major technological innovation and advancement, establishing aviation as a significant industry. Following these first three companies, numerous manufacturers both domestic and abroad were formed, merged, split, re-formed, and folded during these early years. For the purposes of the HSR, this discussion focuses on the Wright Company, their licensed manufacturers, and direct competitors. However, there were many other companies and aviators in this crowded field.

As the first purpose-built factory building for airplane manufacturing and one of the first three airplane manufacturing companies in the United States, the Wright Company played a foundational role in early aviation production. The Wright brothers were in fierce

competition with Curtiss and many other companies both in the United States and especially Europe, where airplane manufacturing was thriving. Thirteen different models of planes were produced at the Dayton factory during the core years of the Wright brothers' direct involvement (1910 - 1916). These planes were powered by four different types of Wright engines, showing the rapidity of advancements in design and technology within a span of about six years.

- Model B (1910-1914)
- Model R (1910)
- Model EX (1911-1912), exhibition version of the Model E
- Model C (1912-1913)
- Model D (1912)
- Model CH (1913)
- Model E (1913)
- Model F (1913)
- Model G (1913-1914)
- Model H (1914-1915)
- Model HS (1914-1915) Model H with shorter wing span
- Model K (1915)
- Model L (1916)

However, production at the Wright Company never reached the efficiency of the Curtiss and Burgess Companies, and as more airplane manufacturing companies came into being, the Wright Company saw itself occupying a smaller and smaller role in a booming aeronautics field.

The Wright School of Aviation

One of the key roles of the Wright Company was pilot training, which began the year before founding the Wright Company. Training pilots was seen as a critical part of selling airplanes, but the training did not start in the air. At the factory, an airplane propped up on blocks was used for training on the airplane control system,[47] establishing the first, albeit crude, flight simulator. This system of pre-flight training became standard procedure around the world and continues to this day. The Wright brothers found success with their flight schools, setting up a temporary school in Montgomery, Alabama. Later, a permanent pilot school was established at nearby Huffman Field, with satellite schools also in Long Island, New York, and Augusta, Georgia.[48] Although the flight school was expensive, with tuition of about $250.00 (about $7,500.00 in current currency), “within five years, some 116 military and civilian men and three women received instruction form the Wright School of Aviation,”[49] including Lieutenant Frank Lahm, who became the first certified pilot for the army.[50]

Training the Second Generation of Airplane Pioneers

Although each stayed with the Wright Company only a short time, Frank Russell and Grover Loening, an early aeronautical engineer, were educated and trained by the Wright Company. Both men went on to have long and influential careers in the aviation industry. See the section "Key people Associated with The Wright Company Factory" on page 1-38 for further information.

47 H. H. Arnold,*Global Mission.*(New York: Harber & Brothers, 1949), 17-18 as quoted in Beverly Shaw, “Wright Company Factory”,17.

48 The Wright School of Aviation Brochure, c. 1912, Library of Congress; and Roach, *The Wright Company*, 91.

49 Howard R. Dufour and Peter J. Nutt, *Charles E. Taylor: 1868-1956 The Wright Brothers Mechancian* (Dayton, OH: Wright State University Library, 2008)*, 54.*

50 Roach, *The Wright Company*, 43 and 91.

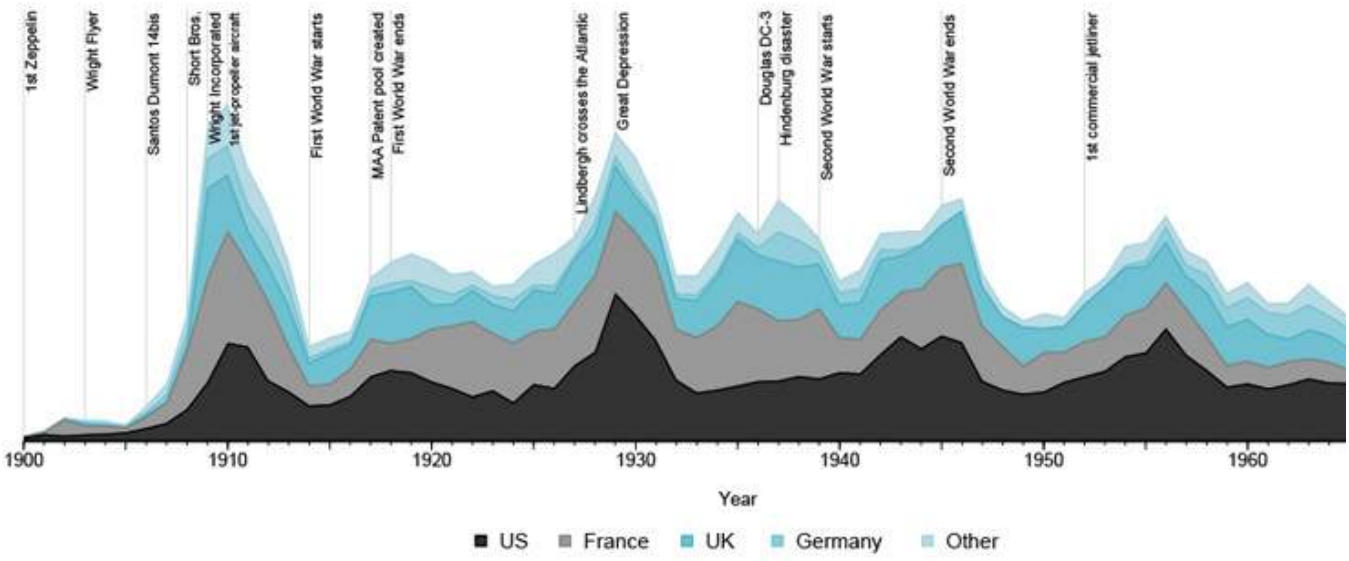


Figure 1-19 Aviation Patent Filings 1900-1970. (Source: World Intellectual Property Report 2015 - Breakthrough Innovation and Economic Growth, Geneva, WIPO.)

The Wright Company Exhibition Pilots

Roy Knabenshue, an American aviator with experience with dirigible (or airship) exhibitions, was recruited by the Wright brothers in 1910 to head the Wright Exhibition Department. The exhibition department was, in some ways, the natural extension of the demonstration flights performed by the Wright brothers in the years preceding the formation of the Wright Company, and was seen as a key marketing tool for Wright flyers. Knabenshue's team of exhibition pilots was a collective of mechanics, race car drivers, aviators, and vaudeville performers - pilots often willing to perform stunts and push the capabilities of the flying machines, much to the displeasure of the Wright brothers. Being an exhibition pilot was a dangerous undertaking, and many pilots lost their lives.[51]

The exhibition department proved one of the major revenue streams for the Wright Company in 1911. The company made money directly from the exhibitions in two ways. First, the company paid their pilots flat rates but kept the prize money. In addition, Wright Company negotiated with the Aero Club of America to only sanction exhibitions when the promoters had obtained a license from the Wright Company and paid a licensing fee, usually 10 percent of ticket sales. However, circumstances often required Wright Exhibition pilots to compete against other pilots flying planes which the Wright brothers claimed infringed on their patents, a constant source of frustration for the brothers.[52] During the two short years the exhibition department was live, it was popular with attendees, consistently drawing sizable crowds, but failed to spark demand for Wright flyers. In fact, during this time the Wright Company was its own largest customer, selling the exhibition department 21 planes.[53] The company shuttered the department in November 1911, but flying exhibitions, the precursor to the modern airshow, remained a popular form of entertainment and were continued by other companies.

51 Gaffney, *The Dayton Flight Factory,* 117-120; and Roach, *The Wright Company*, 173-176.
52 Lawrence Goldstone, *Birdmen: The Wright Brothers, Glenn Curtiss, and the Battle to Control the Skies* (New York: Ballantine Books, 2015),193.
53 Roach, *The Wright Company*, 81; and Gaffney, *The Dayton Flight Factory,* 117.

The Airplane Patent Battle

The foundations of the “Patent Battle” were laid years before the first lawsuit filings, even before the Wright Brothers entered the race for powered, manned flight. Other inventors, many more formally educated, better financed, and better known were working towards the same objective, and the Wright brothers, as outsiders in the manned flight race, upset those with more money, power, and influence. This would play out most notably in the Wright brothers' battles with Glenn Curtiss, with whom the fight was as much personal as legal.

The initial 1909 lawsuit against Curtiss for infringement of the 1906 Wright patent, was brought for the use of ailerons (a hinged section of the wing used for lateral control) in Curtiss's planes. The initial complaint would expand to a total of 10 lawsuits by 1914, when the courts ruled in favor of the Wright brothers on all cases. However, these verdicts did not stop the patent battle, and, indeed, the battle with Curtiss was expensive, time consuming, unpopular with shareholders, unfavorable in public opinion, and served to stifle innovation within the Wright Company. Curtiss continued to attempt to discredit the Wright brothers and their patents. The fight between the Wright Company and Curtiss created a litigious atmosphere in the aviation industry as a whole, with many lawsuits springing up among the growing number of airplane manufacturers (Figure 1-19). The legal wrangling of the American aviation industry hampered technical advancement, putting the United States far behind the Europeans in innovation and manufacturing of aircraft.

With the United States on the cusp of entering WWI, the government intervened. In 1915, the National Advisory Committee for Aeronautics (NACA) was organized to advise the President and Executive Branch on aeronautics. The establishment of NACA was an effort to coordinate the disparate development of American aviation, which was rapidly falling behind their European counterparts. Under this charge, NACA was soon asked to study the problem of aviation litigation. As a solution, the Manufacturers Aircraft Association, Inc. (MAA), a New York-based trade association, was founded in 1917, essentially consolidating aviation patents and requiring airplane manufacturers to pay a cross-licensing fee but making the technology more widely available:

> In effect, the cross-licensing agreement of 1917 established that the American aviation industry would operate without major patents. Small royalties would be paid for certain contributions within the Manufacturers Aircraft Association, but in general the ideas and techniques of aircraft manufacturers were to be shared openly among the members.[54]

However, the initiative was too late to have much impact on WWI, and European designed planes dominated the war effort. During WWI, the former Wright Company factory buildings, now owned by the Dayton-Wright Company, manufactured a version of the British De Havilland-4, instead of a Wright or any other domestic designs.[55] The MAA dominated the aviation industry for five decades until it was disbanded in 1977.[56]

54 “War Business: A Laboratory and Licensing; Committees and Engines, 1915-1918 SP-4103 Model Research - Volume 1,” Accessed May 16, 2022, https://history.nasa.gov/SP-4103/ch2.htm

55 Crouch, *The Bishop’s Boys*, 470.

56 The Manufacturers Aircraft Association records, 1843-1979, (University of Wyoming. American Heritage Center) Accessed March 24, 2022, https://archiveswest.orbiscascade.org/ark:80444/xv779710#overview

Orville Wright's Exit and Merger with Glenn L. Martin (1915–1916)

After Wilbur's death in 1912, Orville held his investment in the Wright Company until 1915, when he sold his interest to investors. The deal included a salary of $25,000 (about $750,000 today) for Orville to serve as the chief consulting engineer for a year.[57] In the search for new company leadership, the new owners, which included William Bryce and Frank Manville, decided to merge with the Glenn L. Martin Company in 1916.[58] Soon after the merger, all manufacturing shifted to New Jersey, where the Glenn Martin Company already had manufacturing facilities. After only a year in partnership, Martin left to form a second Glenn L. Martin Company. Manufacturing at the Dayton factory was phased out and finally closed in February 1917. A month later, the Dayton factory was sold to the Darling Motor Company.[59] The Darling Motor Company went into bankruptcy shortly thereafter, and it is unclear how or if they used the Wright Company factory buildings.

An Industry in Flux (1912-1917)

During this time, other airplane manufacturers were also undergoing changes similar to the Wright Company, resulting in a complex mesh of company mergers and restructuring. In 1912, two key companies entered the aircraft manufacturing arena: the Alco Hydro-Aeroplane Company, founded by brothers Allan and Malcolm Loughead (Lockheed), and the Glenn L. Martin Company. To better distinguish from the Curtiss Aeroplane Company, the Burgess and Curtis, Inc., changed its name to the Burgess Company in 1914.

Also in 1916, Curtiss combined his Curtiss Aeroplane Company and Curtiss Motor Company to form the Curtiss Aeroplane and Motor Company. Later that same year, the Burgess Company was sold to John N. Willys, who in turn sold the Burgess Company to Curtiss Aeroplane and Motor Company, thereby making the Burgess Company a subsidiary to Curtiss. That same year, the Loughead brothers reorganized their company as the Loughead Aircraft Manufacturing Company. William Boeing formed Pacific Aero Products Company in 1916, but changed the name to Boeing Airplane Company in 1917. The successor firms of some of these companies are still in the aviation business today, including the Lockheed Martin Corporation, the Boeing Company, and the Curtiss-Wright Corporation.

For more information on the timeline of the Wright competitors and affiliated companies see "Chronology of Associated Airplane Manufacturers" on page 1-53.

The Wright Company beyond Dayton (1916-Present)

The descendant companies, Wright-Martin and Wright Aeronautical, would continue beyond Dayton but maintained no association with the original Wright Company factory buildings. Despite their fierce previous competition and legal opposition, the successor firms of the Wright and Curtiss companies merged in 1929 to form the Curtiss-Wright Corporation.[60] The corporation's website states that 12 firms merged, but only 11 are listed in the December 1929 article in *Aviation*:[61]

- Curtiss Aeroplane & Motor Company, Inc.
- Curtiss Airports Corporation
- Curtiss Flying Service, Inc.
- Curtiss Aeroplane Export Corporation
- Curtiss-Caproni Corporation

57 Couch, *The Bishop's Boys*, 466; and Roach, *The Wright Company*, 169.
58 *Innovation With Purpose: Lockheed Martin's First 100 Years* (Bethesda, MD: Lockheed Martin Corporation, 20130,) 23-25.
59 Roach, *The Wright Company*, 177.
60 "Over 90 Years of Growth", Curtiss-Wright Corporation Website, Accessed May 11, 2022. https://curtisswright.com/company/history/default.aspx
61 Talbot O. Freeman. "What price Merger?" *Aviation*, December 7,1929, 1105.

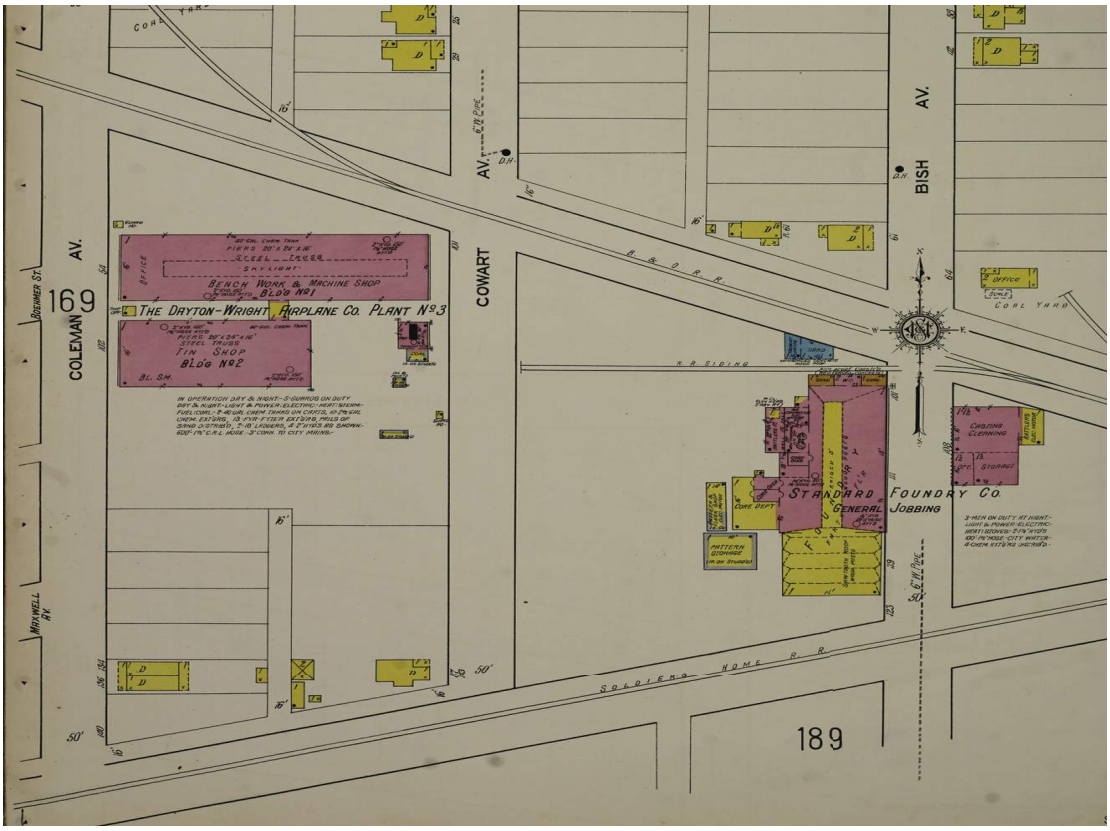


Figure 1-20 Site as depicted in the 1919 Sanborn Map. “Plant No. 3” refers to the Dayton-Wright designation of this site, not be confused with the buildings numbers within the site. (Source: Library of Congress)

- Curtiss-Robertson Airplane Mfg. Co.
- Wright Aeronautical Corporation
- Keystone Aircraft Corpora/ion
- Moth Aircraft Corporation
- New York and Suburban Air Lines, Inc.
- New York Air Terminals, Inc.

Missing from this list is the Loening Aeronautical Engineering Corporation, which had merged with the Curtiss Company the year before. Although not legally tied to the Wright Company, it was associated through its founder Grover Loening, who was the former manager of the Wright Company. Since Burgess had also merged with Curtiss back in 1916, within 20 years, the three pioneering companies founded in 1909 had all merged into a single entity.

THE DAYTON AVIATION/DAYTON-WRIGHT COMPANY (1917–1923)

The Dayton Aviation/Dayton-Wright Company, the second to occupy the factory buildings, had no direct lineage to the Wright Company except for the name. Dayton industrialists Edward Deeds and Charles Kettering started the Dayton Aviation Company in 1917 and shortly after reorganized as the Dayton-Wright Company, when Orville joined the board as a director and consultant.[62] Orville did not play an active role in running the Dayton-Wright Company. On March 22, 1917, they acquired the Wright Company factory buildings from the bankrupt Darling Motor Company for $50,000 (about $1.1 million in today's currency)

62 Edward Roach, *The Wright Company*, 177.

to use as the third of three facilities in the Dayton area for manufacturing airplanes.[63] The former Wright Company factory, now referred to as Dayton-Wright Plant 3, was used for parts manufacturing, while airplane assembly occurred in Dayton-Wright Plant 1 in Moraine, Ohio. The company manufactured planes as part of WWI efforts, primarily a version of the British De Havilland–4 fighters.

While at Dayton-Wright, Orville contributed to the design of an unmanned mini-plane, the 1918 Liberty Eagle, a precursor to the guided missile.[64] He also contributed to the design of the 1919 OW.1 Aerial Coupe,[65] a large cabin bi-plane with seating for four. Only one Aerial Coupe was ever built as it never found a market. The Aerial Coupe, as Orville's last contribution to aviation design, marked the end of the Wright aviation innovation.

The Factory Site

The 1919 Sanborn Map shows the “Dayton-Wright Airplane Co. Plant No. 3.” The main plant was situated between Coleman Avenue to the west and Cowart Avenue to the east. Two major structures associated with the plant are shown on the map and labeled “Bench Work & Machine Shop” and “Tin Shop;” these are Buildings 1 and 2, respectively. Seven separate parcels were identified south of the site boundary. A few smaller, residential structures were still present on the parcels south of the factory buildings, along the Soldier's Home Railroad line (Figure 1-20).

Even at this time, Buildings 1 and 2 continued to be surrounded by cornfields as documented in a 1918 historical photographs (Figure 1-10 and Figure 1-21).

The exterior of the Wright Company buildings remained largely unchanged from 1911 to 1918. A few small structures were introduced, including what appear to be guard shacks and a separate paint shop or paint storage structure. The interior of Building 1 was adapted to the specific manufacturing needs but remained largely open with few interior partitions (Figure 1-22). The machines were run by an overhead crankshaft and belt system, similar to the one used by the Wright Company. It is not clear if the new company adapted the system already in place or if a new machinery system was installed.

In 1919, Dayton-Wright was acquired by General Motors, who operated the company as a subsidiary of General Motors.[66] Airplane production continued at the plant through 1922, before transitioning entirely to automotive production in 1923. Following this, General Motors sold the airplane design rights to Consolidated Airplane Company.[67]

GENERAL MOTORS - INLAND MANUFACTURING DIVISION, FISHER GUIDE DIVISION, AUTOMOTIVE COMPONENTS GROUP, AND DELPHI AUTOMOTIVE (1923–2008)

Inland Manufacturing was the only division of General Motors that was developed internally within the company, rather than formed as part of an acquisition.[68] Dedicated to the development of new products, Inland's early innovations included the design of warped wood and rubber steering wheels. A key area of Inland’s product development was in the production of rubber parts. By 1941, they had shifted to wartime manufacturing of “tanks tracks, gun

63 *The Dayton Herald,* January 1, 2018, 3.
64 “Wright Airplanes,” Accessed March 17, 2022, https://www.wright-brothers.org/Information_Desk/Just_the_Facts/Airplanes/Wright_Airplanes.htm
65 “Wright Airplanes.”
66 Beverly Shaw, “Wright Company Factory,” 21.
67 Lisa Rickey, “Spotlight on the Dayton-Wright Airplane Company”, May 30, 2014, Accessed May 19, 2022, https://www.libraries.wright.edu/community/outofthebox/2014/05/30/spotlight-on-the-dayton-wright-airplane-company/
68 All other divisions in General Motors were created through acquisitions of other companies, similar to the acquisition of the Dayton-Wright Company.



Figure 1-21 Site as it appeared in 1918 after completion of Buildings 1 and 2. Cornfields remain on the site, surrounding the buildings. Note the British flag at the left and French flag at the right. (Source: Wright State University Special Collections and Archives)



Figure 1-22 Workers at machines run by shaft and belts in Building 1, c. 1918 (Source: Wright State University Special Collections and Archives)



Figure 1-23 The site in 1924, shortly after the construction of Buildings 3 and 4. (Source: *Inlander*)

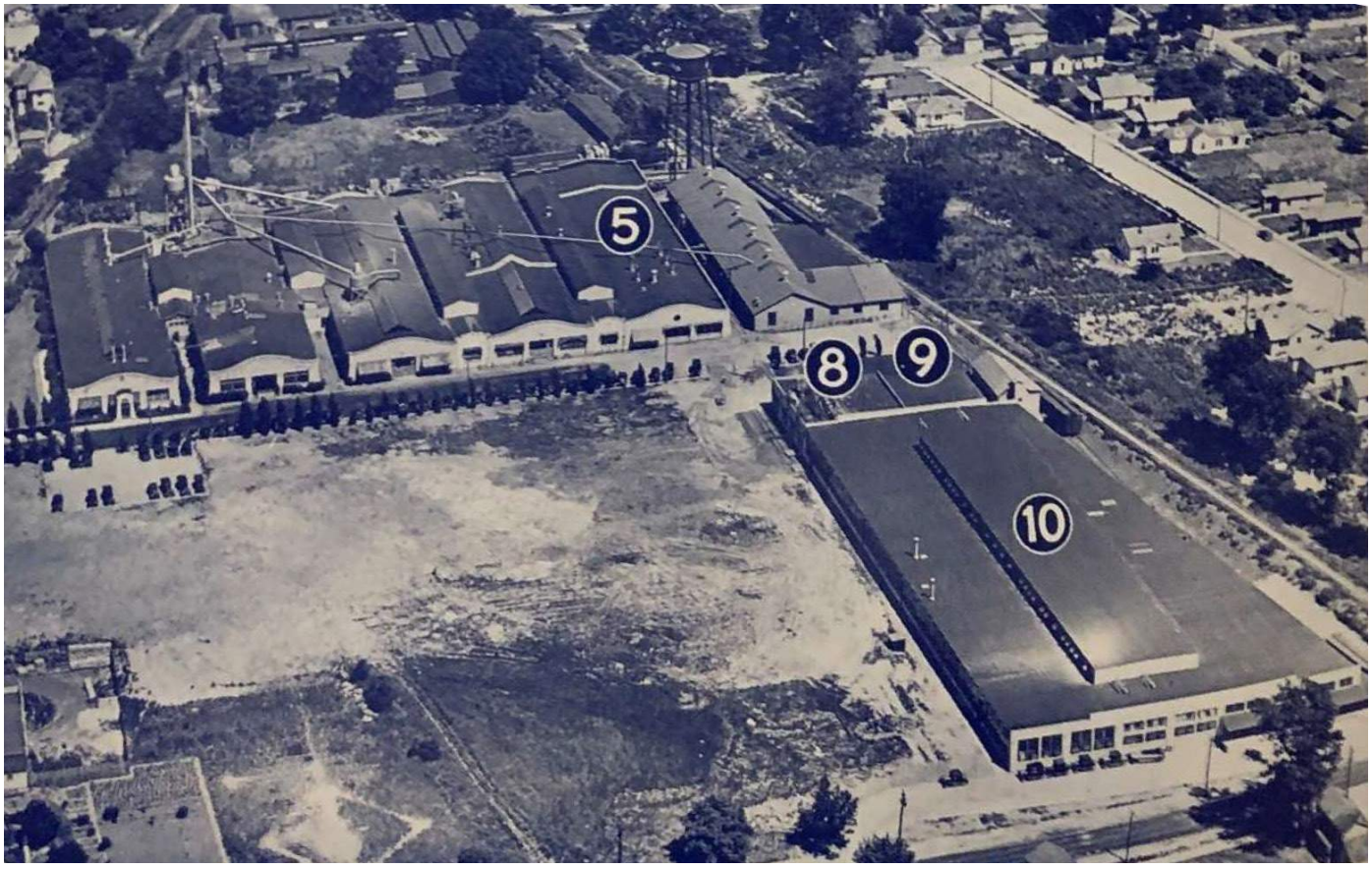


Figure 1-24 The site in 1926, shortly after the construction of Building 5 and Interconnects 3-4 and 4-5. (Source: *Inlander*)

sights, shoulder rests, and helmet liners."[69] Inland shifted back to commercial production after the war and created a wide variety of automotive parts and other consumer products. The factory reached peak production in the early 1970s, then started to decline as cheaper parts were imported from abroad. In efforts to consolidate costs, General Motors went through a series of restructuring efforts. First, Inland merged with Fisher Guide Division in 1989. Two years later, it was merged with all component divisions of GM into the Automotive Components Group, which was later spun off as a separate company, Delphi Automotive, in 1995. Delphi operated the site through the mid 2000s before filing for bankruptcy in 2008, which resulted in the factory being closed.[70]

The Site and Buildings

In 1923, Buildings 3 and 4 were constructed to the south of Building 2 (Figure 1-23). The design, materials, and massing were similar to the original structures. The new buildings were linked by small walkway structures running north and south between the buildings. Starting in 1925, the open areas between the buildings were slowly infilled with larger interconnect structures. In 1926, Building 5 was added to the south of Building 4 (Figure 1-24). Building 5 deviated from the design of the other four buildings in that the west facade was not symmetrically arranged. Over several construction campaigns in the late 1920s, a large power plant was added to the east end of Building 1, eventually expanding to encompass the east end of Building 2. The construction of the enlarged boiler building included removal of the eastern bays of Building 1.

By 1934, Building 6 was constructed as a stand-alone structure south of Building 5, as depicted in contemporary plans for the site's storm and sanitary sewers. In 1935, Building 17 was constructed on the north side of Building 1 (Figure 1-25). The plan of the building is angled along the northern wall to align with the B&O Railroad. In 1936, the complex expanded to the west of Coleman Avenue. A 1945 aerial photograph depicts the site as

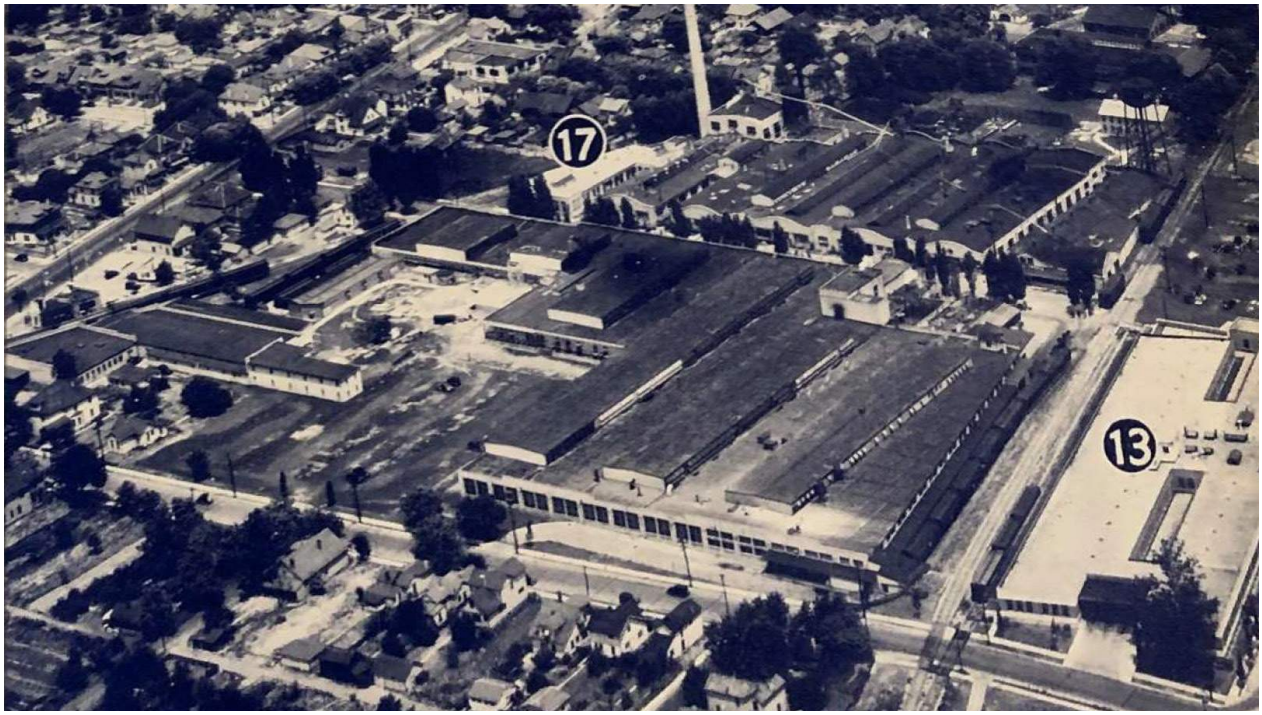


Figure 1-25 The site in 1935, shortly after the construction of Building 17. (Source: *Inlander*)

69 Beverly Shaw, "Wright Company Factory," 24.
70 Beverly Shaw, "Wright Company Factory," 25.



Figure 1-26 In the 1940s, Inland Manufacturing ran a series of advertisements in *Fortune* magazine which included an illustration of the Dayton factory. The two smokestacks just below logo show the location of the Wright Company factory buildings (see Figure 1-27). Note also how the "Inland" logo has adopted the outline of the Building 1 west facade. (Source: *Fortune*, Vol. XXI, no. 3. (March 1940): 35)

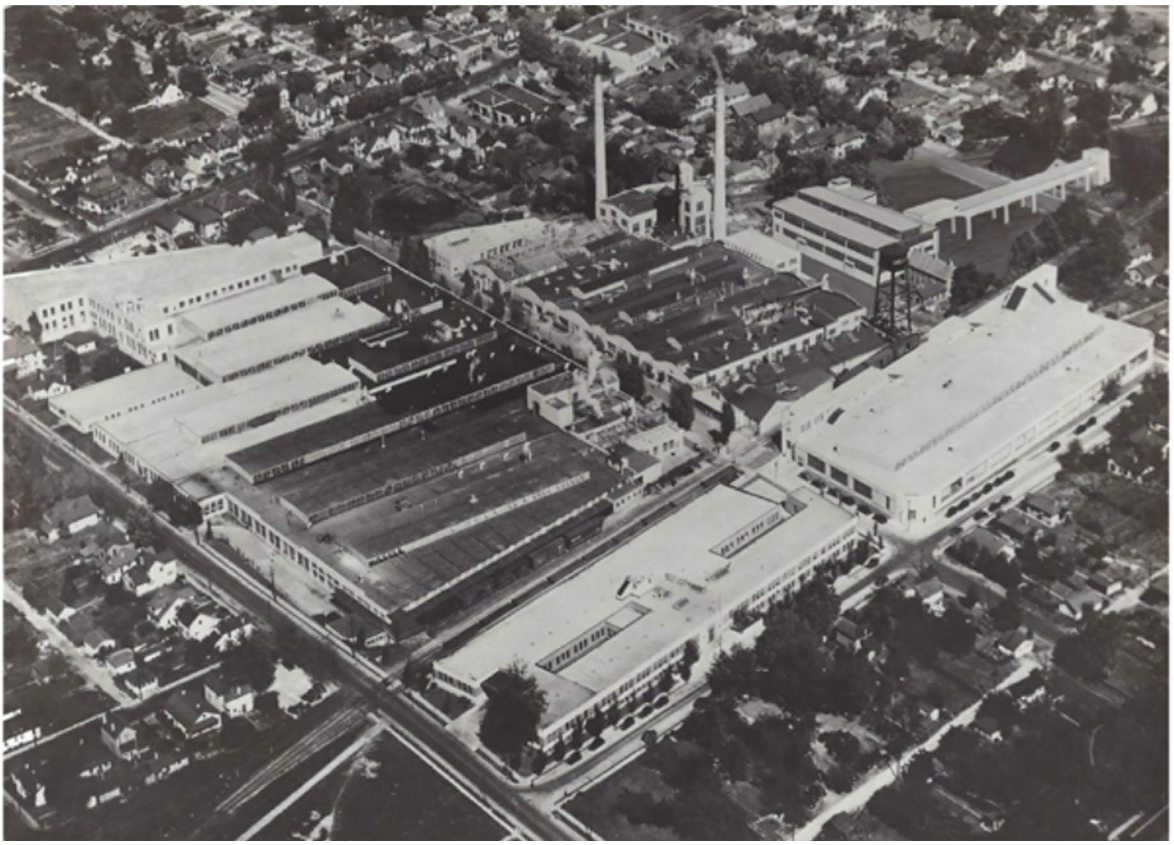


Figure 1-27 Inland Manufacturing Division General Motors Corporation, 1945 aerial photograph (Source: Wright State University Special Collections and Archives)

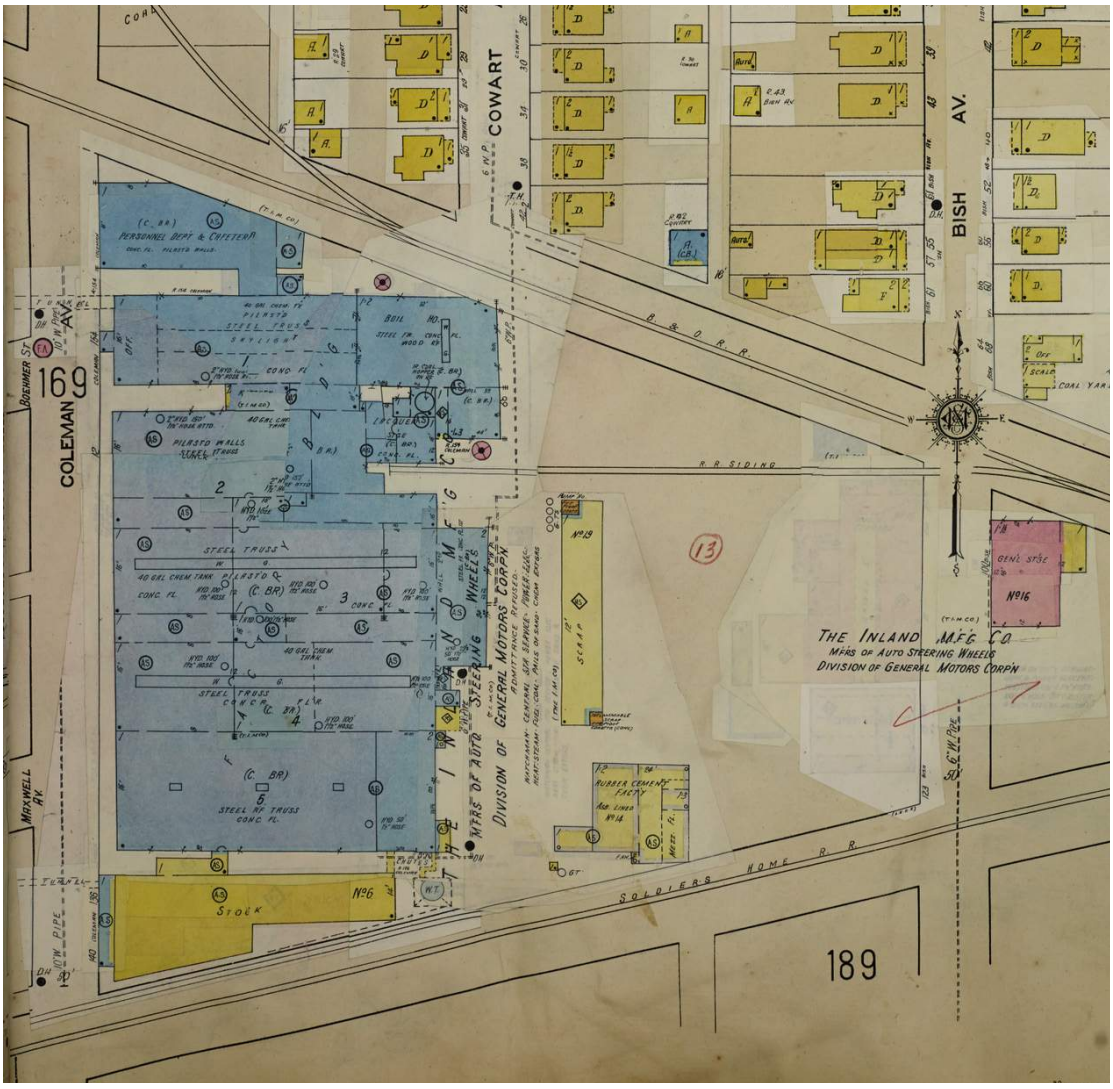


Figure 1-28 Site as depicted in the 1955 Sanborn Map. (Source: Library of Congress)

nearly completely developed with buildings on either side of Coleman Avenue and south of the Soldiers Home Railroad line (Figure 1-27). Trees were planted along the western margin of Coleman Avenue. Parking was not yet present on the parcels north of Building 17.

The property later appears on a 1955 Sanborn Fire Insurance Map (Figure 1-28). By this time, the entire area (including the parcels east of Coleman Avenue, west of South Ardmore, south of the B&O Railroad, and north of Soldiers Home Railroad) was identified as owned by the Inland Manufacturing Company, as well as a large parcel to the west of Abbey Avenue situated along Maywood Avenue.[71] Access to the plant was controlled. Buildings 1, 2, 3, 4, 5, and 17 were depicted as nearly a solid interconnected mass, with only partial open areas between Buildings 1, 2, and 17. Building 17 was noted as the "Personnel Dep't & Cafeteria;" Buildings 1 through 5 were noted to have concrete floors and steel trusses. The boiler room (power plant), shown east of Buildings 1 and 2, was also indicated as having a concrete floor. The addition to the east of Building 2 was identified as "Lacquer Stge [Storage]."

71 1955 Sanborn Fire Insurance Map, Vol. 2, Plate 170 and Vol. 5, Plates 512 and 516.

Two circular structures were shown at the southeast and northwest corners of the boiler room; these circular structures were the tall smokestacks visible in the early aerial photographs. Building 6 was identified as the “Stock” building. East of Building 6 was a water tower. There was also a detached, narrow building running north-south east of Buildings 3 and 4 identified as “Scrap.” The Scrap building included a pump house on the north end and storage for inflammable scrap on the south.

By 1955, the Standard Foundry Company building to the east of the factory buildings was no longer extant and the site had not been redeveloped; the foundry’s storage building was still standing and marked as Building 16 for general storage use. The B&O Railroad spur had been extended to the east end of Building 2. A separate B&O Railroad spur was shown terminating at the coal yard that covers the three parcels north of Building 17; today, this area is the south half of the east parking lot. To the north of the coal yard facing West Third Street was as a filling station; today, this area is the north half of the east parking lot.

A site plan dated November 1973 depicted the construction of additional buildings from immediately east of Buildings 1-5 to South Ardmore. Parking had still not yet been developed on the parcels north of the B&O Railroad line.

DECONSTRUCTION AND RE-PURPOSING (2008–2022)

The Wright Company factory buildings have been unoccupied since General Motors/Delphi ceased operations at the site in 2008. The historic buildings that survived the 2014 site demolition have remained largely intact but have deteriorated because of vandalism, theft of metals (mostly copper wiring), and water infiltration.

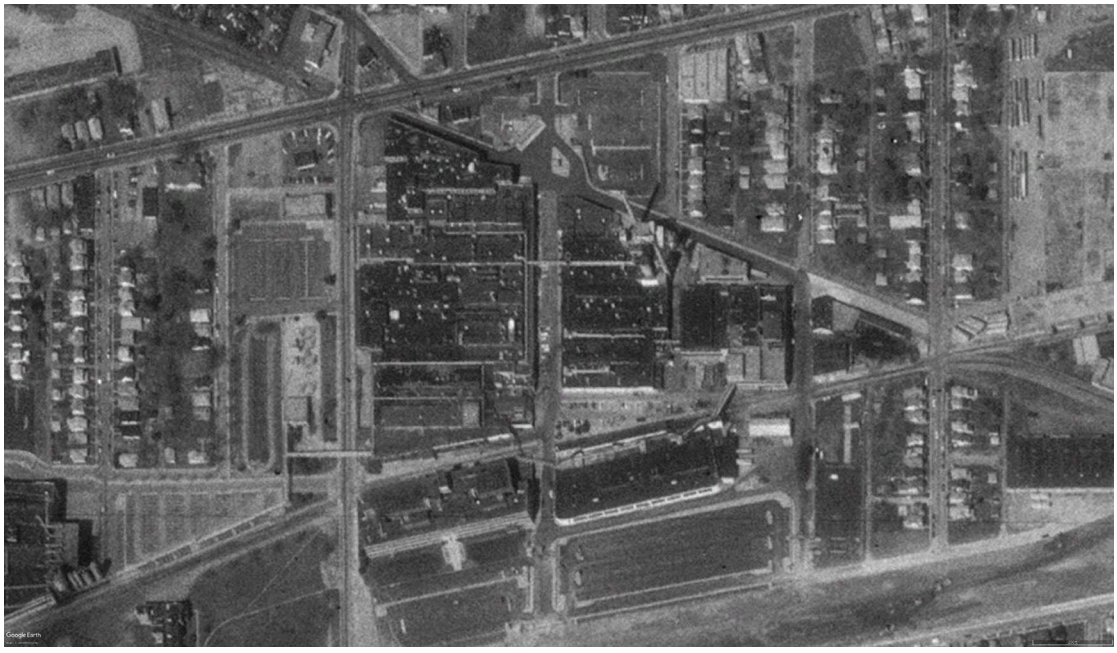


Figure 1-29 The 1994 aerial photograph available through Google Earth depicted the site and its vicinity, including the parking lots north of Building 17. Also shown is the initial construction of US Route 35 to the south of the industrial complex. (Source: Google Earth)

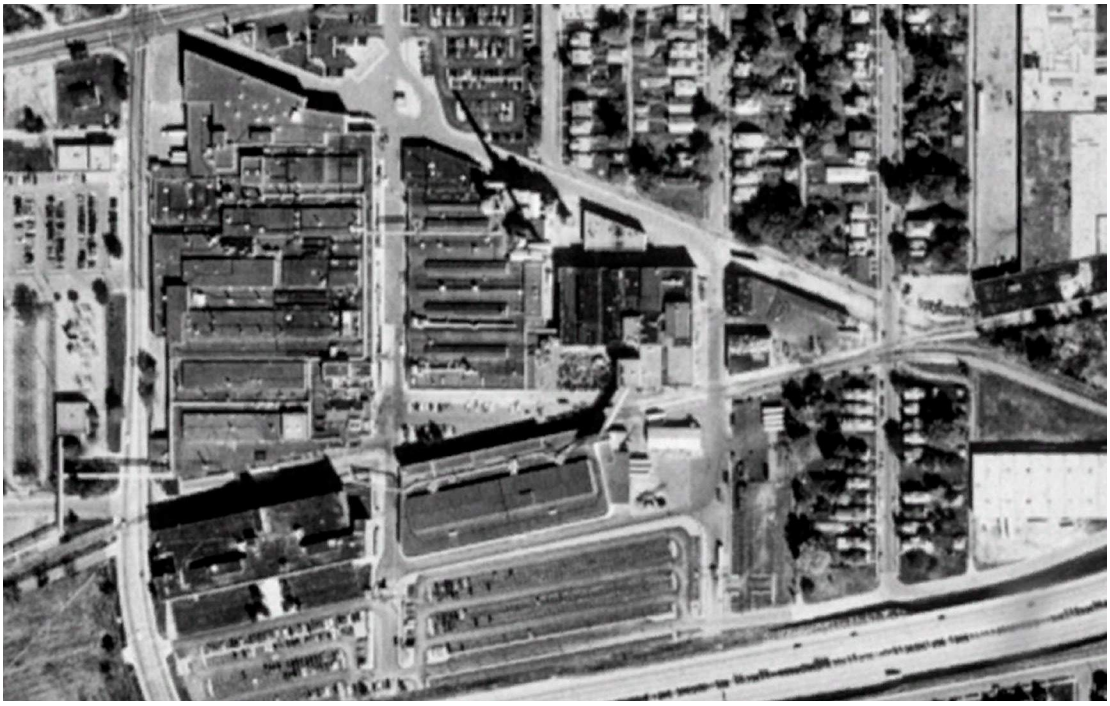


Figure 1-30 The 2000 aerial photograph available through Google Earth also indicated the congestion of the property and the surrounding parcels. By this time, construction of US Route 35 appears complete. (Source: Google Earth)



Figure 1-31 The 2012 aerial photograph available through Google Earth depicted the site after the factory closed but prior to demolition of many of the General Motors facilities. (Source: Google Earth)



Figure 1-32 The 2013 aerial photograph captured the site during demolition of Buildings 11 and 11A. (Source: Google Earth)



Figure 1-33 The 2015 aerial photograph available through Google Earth showed the site following demolition of all General Motors plant buildings in 2013 and 2014, with the only Buildings 1-5 and 17 remaining (Google Earth). This aerial photograph also documented the loss of the east end of Building 1 where the power plant formerly stood.

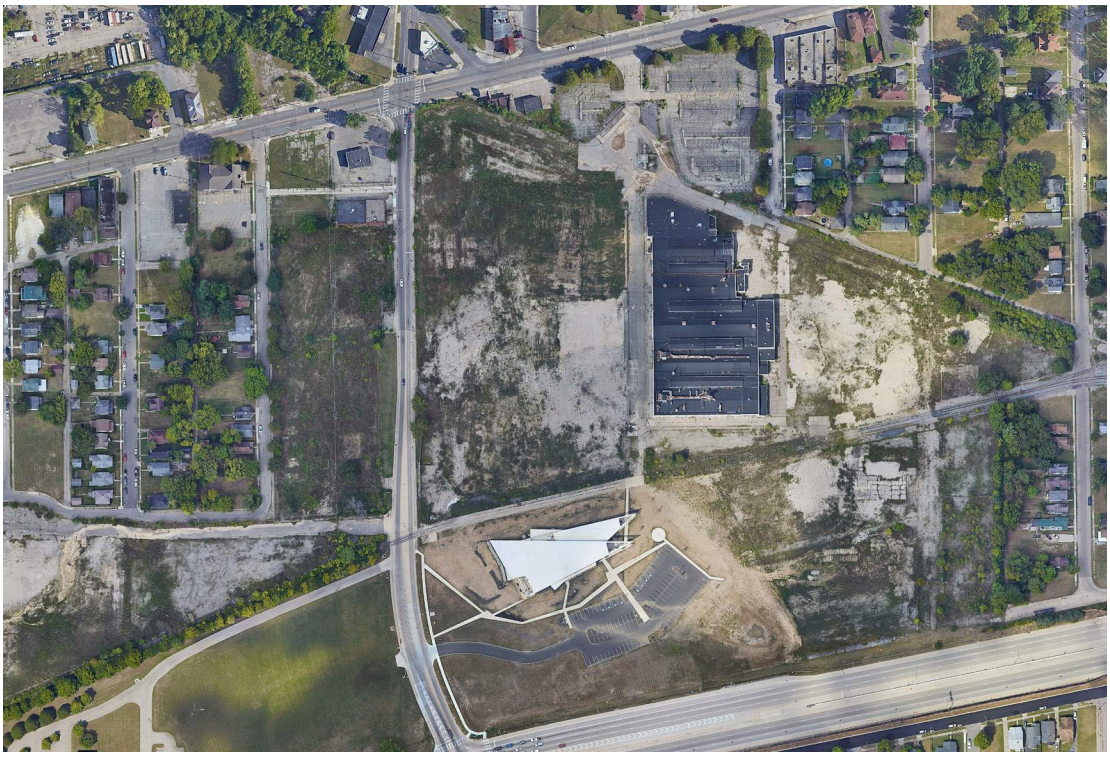


Figure 1-34 The 2022 aerial photograph depicts the complete demolition of the site except for Buildings 1,2,3,4,5, and 17 and the new library structure. (Source: Google Earth)

The Site and Buildings

Sometime in the late 1970s, the parcels to the north and northwest of Building 17 were acquired by General Motors, and by 1979 the small residential and commercial structures on these lots had been razed and the parcels redeveloped into surface parking lots.[72] The 1981 Sanborn Fire Insurance map showed the parcels as "Parking."[73] The 1985 Sanborn map also indicated that Coleman Avenue (by then referred to as Chester Avenue) continued to bisect the main plant site with the massive Buildings 11 and 11A on the west and Buildings 1 to 6 and 17 on the east. The B&O Railroad spurs were no longer depicted.

The 1985 Sanborn Fire Insurance map also indicated that by the mid-1980s, the complex had grown to include the main plant, consisting of a large cluster of buildings east of Abbey Avenue, as well as significant construction west of Abbey Avenue. The portion of the complex located along Cowart Avenue and Bish Avenue had also been incorporated into the General Motors facility. From the 1990s into the 2020s, changes to the site are visible through a series of aerial photographs available through Google Earth (Figure 1-29 through Figure 1-34). The aerial photographs show the plant under its final years of active operation, through closure of the facility, and then into the decommissioning and demolition of the structures surrounding the historic buildings in 2013 and 2014.

72 Plant Engineering. "City Water Layout, Inland Division, General Motors Corporation." Dayton, OH: May 1979.

KEY PEOPLE ASSOCIATED WITH THE WRIGHT COMPANY FACTORY

Wilbur Wright (1867–1912)

The elder of two flying Wright brothers, Wilbur (Figure 1-35) served as the president of the Wright Company from its inception in 1909 until his death in 1912. As the president, he lead the efforts to defend their patents, most notably in a protracted and contentious series of patent infringement lawsuits against Curtiss.



Figure 1-35 Wilbur Wright 1909 (Source: Wright State University Special Collections and Archives)

Orville Wright (1871–1948)

Orville (Figure 1-36) served as co-vice-president of the Wright Company, taking over as president after Wilbur's death in 1912. After selling his shares in the Wright Company in 1915, he would continue to be involved in the aviation industry minimally first as a director and advisor to the Dayton-Wright Company and later by serving an a variety of aviation boards, most notably the National Advisory Committee for Aeronautics (NACA). Appointed by President Wilson in 1920, he would serve longer that anyone else in the history of the NACA.[74] He set up a laboratory in June 1916 at 15 North Broadway Street to pursue research.[75] He experimented with ideas for further airplane development for the Dayton-Wright Company, but later pursued a wide variety of ideas.[76] While he defended he and his brother's accomplishments, he was not outgoing and tended to shun public attention. However, due to his fame, the spotlight could not be completely avoided. As Tom Crouch, American Aeronautics historian, stated, "He was, quite literally, a legend in his own time—an exemplar and an inspiration for future generations of Americans."[77]



Figure 1-36 Orville Wright 1909 (Source: Wright State University Special Collections and Archives)

Charles (Charlie) Edward Taylor (1868–1956)

Charles Taylor's (Figure 1-37) first introduction to the Wright family was in 1894 when Bishop Milton Wright, the father of the Wright brothers, visited Taylor's soon-to-be in-laws, the Webbert Family, in Kearney, Nebraska. In one of those "fascinating coincidences of life,"[78] none knew at the time how Taylor's career would later interweave with Bishop Wright's soon-to-be famous sons.

Taylor and his young family arrived in Dayton in 1896. He worked at the Stoddard Manufacturing Company from 1896 to 1898. Departing Stoddard, he and a partner started a mechanist (or mechanic) company. Taylor's company used Wright bicycle parts; he and the Wright brothers developed a business acquaintanceship, and the Wright brothers referred work to him.[79] After selling his mechanist business 18 months later, he continued on under the new owner for a while, then moved to the Dayton Electric Company, before eventually joining the Wright Cycle Company in June 1901.

In late 1902, the Wright brothers tasked him with building a powerful, lightweight engine for their flyer, a task that would later earn him the title of the "World's First Aviation Mechanic."[80] Taylor would go on to refine and build many other airplane engines with the Wright brothers and was also instrumental in packing, shipping, assembling, and maintaining the early planes.

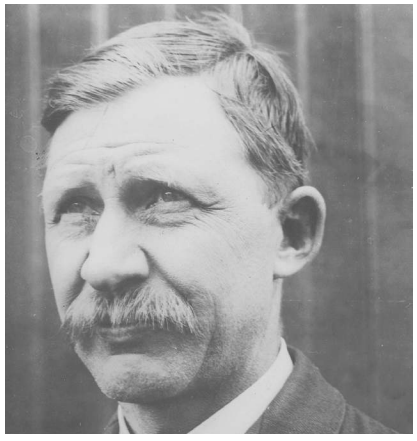


Figure 1-37 Charles Taylor (Source: National Air and Space Museum)

74 Crouch, *The Bishop's Boys,* 473.
75 Crouch, *The Bishop's Boys,* 468.
76 Crouch, *The Bishop's Boys,* 469.
77 Crouch, *The Bishop's Boys,* 472.
78 Dufour and Unit, *Charles E. Taylor*, 3.
79 Dufour and Unit, *Charles E. Taylor*, 12.
80 US Air Services August 1940 as quoted in Dufour and Unitt, *Charles E. Taylor*, 2.



Figure 1-38 Frank Henry Russell (Source: Who's Who in American Aeronautics, 1922, 90)

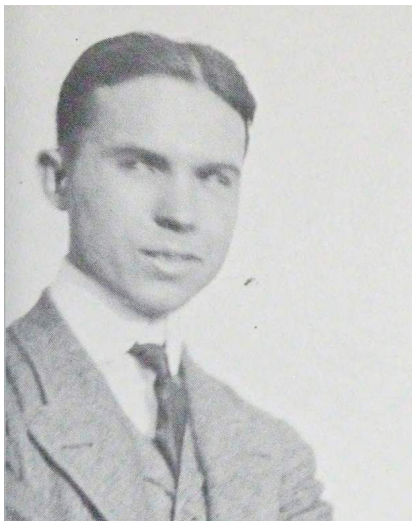


Figure 1-39 Grover Cleveland Loening in 1913 (Source: Loening, *Takeoff Into Greatness*, 52)

Taylor worked for the Wright Company from the opening until 1923, except for a short period in 1911, when he served as the mechanic for Cal Rodgers during his first transcontinental flight attempt. After leaving the Wright Company, he moved to California and worked several different mechanic positions, including at North American Aviation, Inc., in Inglewood and O-Keefe & Merritt Company in Los Angeles.[81]

In the 1930s, Taylor assisted Orville and Henry Ford in relocating the Wright Cycle shop to Greenfield Village in Dearborn, Michigan.[82] He spent several very happy months tracking down the equipment from the Wright Cycle Company shop and helping set it up in the shop in Dearborn in 1937 to 1941. He also made a half size working replica of the engine for the 1903 flyer to be displayed in the shop.[83]

Frank Henry Russell (1878–1947)

A board member of the Wright Company, Russell A. Alger, recommended his nephew Frank Russell (Figure 1-38) for the position of factory manager of the Wright Company. A Yale graduate, Frank came to the Wright Company with manufacturing managerial experience but no experience directly related to airplane or engine manufacturing. He did not get along well with the Wright brothers and his time with the company was fraught with tension on both sides.[84] He left the company after only a year, but the experience would launch him into a 22 year career in aviation manufacturing.

After leaving the Wright Company, Russell joined the Burgess Company and Curtis, where he held a seat on the board of directors. He would continue with the Burgess Company after it was purchased by Curtiss and Company. When the Wright and Curtiss companies combined in 1929, Russell was a member of the board for the conglomerate. He resigned from the company in 1931 but stayed active in retirement by working for the Budd Company, a major manufacturer of automotive components.[85] Russell also served as secretary and later the president of MAA, which oversaw the consolidation and licensing of airplane patents. Through his career, he was credited for contributing to considerable advancements in the development of airplane design and manufacturing, most notably for military aircraft.

Grover Cleveland Loening (1888–1976)

As an engineering student interested in aeronautics, Grover Loening (Figure 1-39) wrote to Wilbur Wright for career advice and met with him on a few occasions.[86] Loening received three degrees from Columbia University: a bachelor's in 1909, the first ever master's degree in aeronautics in 1910, and a civil engineering degree in 1911.[87] After graduating, he joined the Queen Aeroplane Company, a small airplane manufacturer in New York. Loening had a great interest in seaplanes, and his unofficial "flying boat" made its first flight in June 1912, a month before Glenn Curtiss flew his flying boat, the Curtiss Model

81 Dufour and Unitt, *Charles E. Taylor*, 148.
82 Dufour and Unitt, *Charles E. Taylor,* 100.
83 Dufour and Unitt, *Charles E. Taylor,* 97.
84 Roach, *The Wright Company*, 130.
85 Frank Russell Papers, 1901-1947, Overview of Collection, Archives West Orbis Cascade Alliance
86 Grover Loening, *Takeoff to Greatness: How American Aviation Grew So Big So Fast* (New York: G. P. Putnam's Sons, 1968), 62-63.
87 "Grover C. Loening Dies at 87; A Pioneer Airplane Designer" *New York Times*, March 1,1976, 20.

E.[88] Loening joined the Wright Company in July 1913 at the age of 24, and although he did not have an official title, he was referred to as the company's manager in the press and in his own books.

In addition to assisting Orville in the operation of the plant and developing designs, he worked to strengthen the company's marketing efforts, traveled to aviation events, and made efforts to improve and expand the company. In his 1968 book *Takeoff into Greatness*, a history of the aviation industry in America, Loening described being caught in the middle of tensions between Alpheus Barnes and Orville Wright, regarding his role in the factory operations.

With the start of WWI in 1914, he left the Wright Company to become the Chief Aeronautical Engineer of the United States Army's Aviation Section in San Diego. In 1917, he founded Loening Aeronautical Engineering Corporation to produce planes for the Navy and Army. He would design many patented improvements to airplanes and continued his interest in seaplanes, designing the Loening S-1 Flying Yacht in 1921. His company merged with Curtiss Wright in 1928.[89]

Loening continued a distinguished career as a aviation consulting engineer, working with Curtiss-Wright, Grumman Aviation, Fairchild Aircraft, and many others. He served as a director of the Pan American Airways and won numerous awards for his work in aviation.[90] He authored several books on aviation including: *Monoplanes and Biplanes* which was his masters thesis (1910), *Military Aeroplanes* (1915), *Our Wings Grow Faster* (1935), *Takeoff to Greatness: How American Aviation Grew So Big So Fast* (1968), *The Conquering Wing* (1970), and *Amphibian: The Story of the Loening Biplane* (1973).

William Earl Russ (1878–1950)

Educated at Columbia University, William Earl Russ was still a young architect when he was engaged by the Wright Company to design Buildings 1 and 2 for their new factory. He had already established himself as an industrial architect, having designed several notable factories and warehouses, including the Orr Felt Blanket Company factory, the Piqua Hosiery Company factory north of Dayton, and a building for the National Cash Register Company in Dayton.[91] He would later design the S. Zollinger Company Building (1923, National Register 15000903) in Piqua, Ohio.

His work was not limited to industrial buildings. Russ, along with Albert Pretzinger, won the 1907 design competition for the commission for the Memorial Hall (NR 88001062) in Dayton (Figure 1-40). The building was completed and dedicated in January 1910.

Russ moved to Indianapolis in 1913 and later formed a partnership with Merritt Harrison in 1923.[92] He designed many prominent buildings in Indianapolis including the Columbia Club, Piccadilly Apartments, Lockefield Gardens, Sunnyside Tuberculosis Sanitarium, and Hotel Harrison.

88 "Loening, Grover", National Aviation Hall of Fame website, Accessed January 14, 2022, https://www.nationalaviation.org/our-enshrinees/loening-grover/

89 "Loening, Grover", National Aviation Hall of Fame website, Accessed January 14, 2022, https://www.nationalaviation.org/our-enshrinees/loening-grover/

90 Grover Loening, *Amphibian: the Story of the Loening Biplane (Greenwich, CT: New York Graphic Society Ltd, 1973),* the Author inside dust cover.

91 Samiran Chanchani, "S. Zollinger Company Building" National Register of Historic Places Nomination (US Department of the Interior, National Park Service, 2015), 8.

92 "Russ and Harrison" Encyclopedia of Indianapolis Website, Accessed January 13, 2022, https://indyencyclopedia.org/russ-and-harrison/

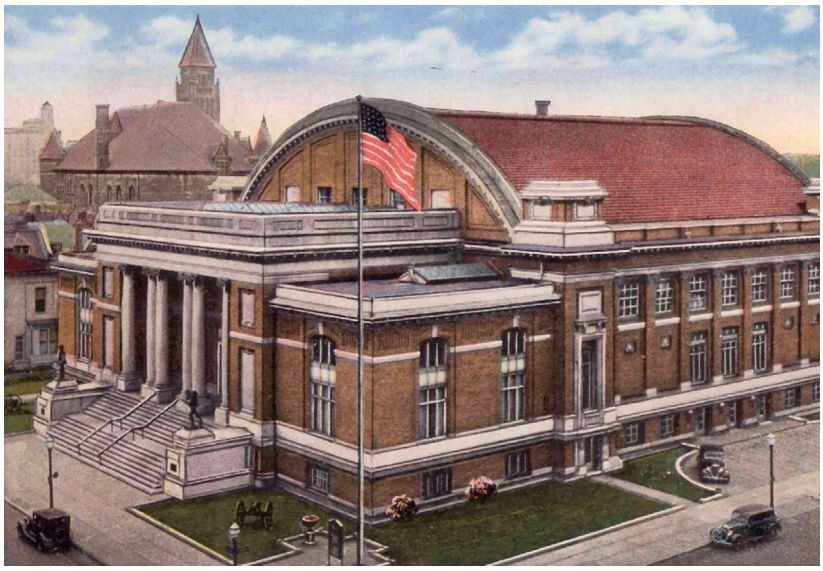


Figure 1-40 Memorial Hall colorized photograph, c. 1907. Designed by Russ and Pretzinger shortly before designing the Wright Company factory buildings.

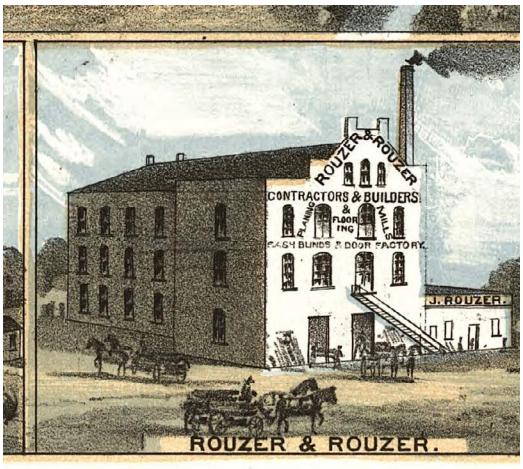


Figure 1-41 Rouzer and Rouzer advertisement on 1890 Dayton Map produced by Nordyke & Personett Art's and printed by Merchants Lithographing Co. Chicago (Source: Library of Congress)

John Rouzer Company - Contractor

John Rouzer (1822–1893) incorporated the John Rouzer Company in February 1890. He started his career as a carpenter from 1844 to 1854. In 1861, he "put into operation the first iron frame molding machine in the United States."[93] He was involved in the construction of many prominent buildings, including the Turner Opera House, Columbus Courthouse, Columbus Board of Trade Building, Dayton Courthouse, and the Teutonia Insurance Company offices.

Upon his death in 1893, his wife, Martha Jane Rouzer (1836–1911),[94] took over the John Rouzer Company, serving as the president. Under her leadership, the Wright Company factory was built by a woman-owned construction company, which was unusual for the time. Her specific level of involvement in the construction of the Wright Company factory is not known, but she capably managed the company during her tenure as president. Martha was known for her "excellent judgment, exhibiting strong business ability and executive tact."[95] Their grandson, John Rouzer Flotron (1871–1930), took over the Rouzers' extensive mill operations after his grandfather passed away and presumably continued the construction company after his grandmother's passing in 1911. However, he did not continue his career in construction, and by 1917, had become an insurance agent for the Union Central Life Insurance Company.[96]

The Rouzer Company, in addition to serving as the general contractor, may have also produced the trusses in their iron mill and may have produced the windows and doors. The 1870 panoramic map of Dayton shows a sketch of the Rouzer Company buildings, with building signage reading "sash blinds and door factory" (Figure 1-41).

93 *Centennial Portrait and Biographical Record of the City of Dayton and of Montgomery County*, Accessed January 13, 20222, https:/www.daytonhistory books online/page/page/1612901.htm, 470.

94 Woodland Cemetery - Burial Records, accessed on May http://www.interment.net/data/us/oh/montgomery/woodland/records-ros-ryo.htm

95 *Centennial Portrait and Biographical Record*, 470.

96 "1920- John Rouzer Flotron, Sr.," The Grand Lodge of Ohio Free and Accepted Masons website, Accessed May 5, 2022, https://www.freemason.com/pgm/1920-john-rouzer-flotron-sr/

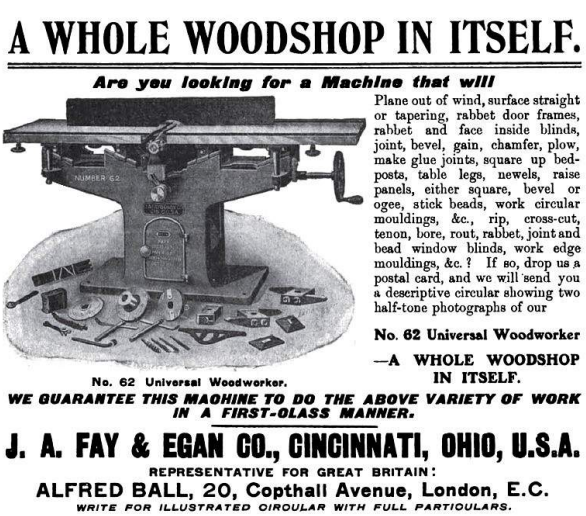


Figure 1-42 Advertisement for J. A. Fay & Egan Company c. 1909. (Source: Vintage Machinery website)

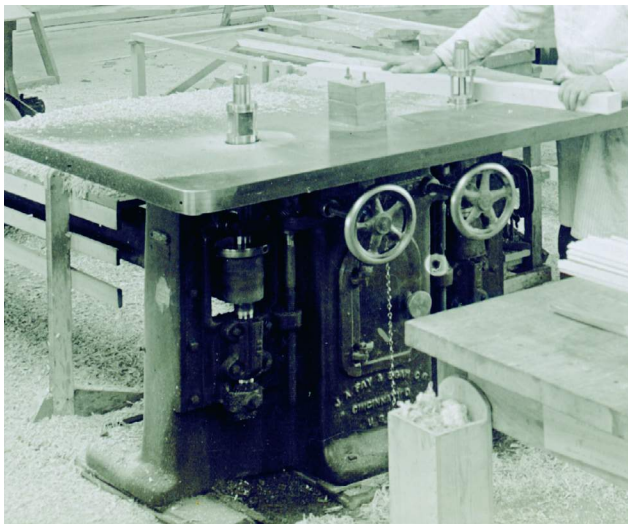


Figure 1-43 J. A. Fay and Egan Company table saw in the Wright Company factory, 1910. (Source: Wright State University Special Collections and Archives)

MACHINERY

J. A. Fay and Egan Company - Industrial Wood Working Machinery

The early history of this company is not clear as there were multiple, smaller machine manufacturing companies that were related by merger or restructuring. Circa 1850, the J. A. Fay and Company factory was opened in Cincinnati, Ohio. In 1893, the firm merged with their competitor the Egan Company, but each company continued to make machines under their individual names until around 1900. They had a near monopoly on industrial wood working machine manufacturing at the time.[97]

The company supplied wood working equipment to factories around the country and for transportation-related industries including automotive and railroad car manufacturers. *The Vintage Machinery* website is a trove of information about the J. A. Fay and Egan Company equipment, including historical catalogs, historical advertisements (Figure 1-42), general company information and even classifieds of historic machines.

J. A. Fay and Egan Company supplied much of machinery pictured in the 1911 promotional photographs of the Wright Company Building 1 (Figure 1-43).

97 "J. A. Fay & Egan Co. " Last Modified October 14 2021, Accessed January 13, 2022, vintagemachinery.org/mfgindex/detail.aspx?id=304&tab=0

Chronology

Below is a chronological summary of the major events and the changes over time for the building and site. The chronology is not all inclusive but attempts to capture significant moments in the historical record and significant changes to the Wright Company factory. A series of diagrams depicting the changes in the building massing are found immediately after this table in the “Chronology of Building Additions”. Additional information on the history of the company changes can be found in the table “Chronology of Associated Airplane Manufacturers.”

CHRONOLOGY OF BUILDINGS AND RELATED EVENTS

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS

RELATED EVENTS	DATE	BUILDING AND SITE CHANGES
First powered flight	**December 17, 1903**	
Development of the first practical airplane	**1903-1905**	
French Patent issued	**1904**	
US Patent 821,393 issued	**May 22, 1906**	
German Patent issued	**July 1906**	
Orville Wright and Charles Taylor build a plane to fulfill contract with the Signal Corps plane while Wilbur is in Europe	**1908**	
La Compagnie Générale de Navigation Aérienne formed to make Wright planes in France	**November 30, 1908**	
United States Army Signal Corps purchases first “heavier than air flying machine” from Wright brothers, their first sale to the United States Government	**February 28,1908**	
First military plane is shipped to Fort Myer, Virginia	**August 15, 1908**	
Orville Wright and Lt. Thomas Selfridge crash at Fort Myer, killing Selfridge	**September 17, 1908**	
Short Brothers contracted to make Wright planes in Great Britain	**February 1909**	
Herring and Curtiss start Herring-Curtiss Company in Hammondsport, New York.	**1909**	
Flugmaschine Wright-GmbH formed to make Wright Planes in Germany	**June 1909**	
United States Government accepts delivery of its first airplane, the 1909 Signal Corps “Military Flyer”	**August 2, 1909**	

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS		
RELATED EVENTS	**DATE**	**BUILDING AND SITE CHANGES**
The Wright Company incorporated in New York, and the Wright Company assumes ownership of Wright Patents.	**November 22, 1909**	
Herring and Burgess start the Herring-Burgess Company	**1909**	
Wright Company rents space from Speedwell Motor Car Company to start commercial airplane production in Dayton.	**January to September 1910**	
Production of Wright B Flyer begins in Dayton. Burgess manufacturing license granted. Former Wright Cycle shop converted to engine production.	**1910**	
	August 1910	The Wright Company purchases lots from Lewis Clemmer and Sarah Clemmer Bish. City of Dayton vacates public alleys and street on site to accommodate the new factory.
	August to November 1910	Construction of Building 1 and power plant. A detached coal-powered power plant is constructed to the southeast of Building 1.
	November 6, 1910	Russell moves his office and starts transition of operations from the Speedwell building to the Wright Company building.
	1911	Construction of Building 2.
Wilbur Wright dies.	**May 30, 1912**	
Flood in Dayton damages the Wright home and former cycle shop.	**March 1913**	
Start of WWI. Patent infringement case verdict is delivered.	**1914**	
Orville sells the Wright Company to a group of New York investors and remains on salary as a consultant.	**October 15, 1915**	
Orville opens his experimental laboratory at 15 North Broadway. Charles Taylor joins him.	**1916**	
Wright and Glenn L. Martin Companies merge to create Wright-Martin Company.	**1916**	Manufacturing in Dayton is phased out.

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS

RELATED EVENTS	DATE	BUILDING AND SITE CHANGES
Glenn L. Martin leaves Wright-Martin Company and starts a second Glenn L. Martin Company.	**1917**	
	February 1917	Wright-Martin Company closes the Dayton factory, but continues to manufacture planes at their other factory sites.
	March 1917	Wright-Martin sells the Dayton factory to Darling Motor Company.
Deeds and Kettering form Dayton Airplane Company, which is renamed Dayton-Wright when Orville comes on as advisor.	**1917**	
	Early 1918	Dayton-Wright Company buys the former Wright Company factory buildings from the bankrupt Darling Motor Company. The site becomes known as Dayton-Wright Plant 3.
	1918-1919	Building interiors are remodeled to meet current production needs. Five small structures are added around site and fencing added to guard wartime production.
First Sanborn Fire Insurance Map of the factory site.	**1919**	
General Motors buys Dayton-Wright and renames the company Wright Aeronautical Company.	**September 1919**	
General Motors exits the aviation industry.	**December 1922**	
	1923	Airplane-related manufacturing ceases at the Wright Company factory site and shifts to automotive manufacturing. General Motors launches massive building campaign to greatly increase size of factory. Construction of Buildings 3, 4, and 6, along with other structures on the campus. Coal shed for the power plant is expanded.
Dayton-Wright Company design rights sold to Consolidated Airplane.	**1923**	

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS		
RELATED EVENTS	**DATE**	**BUILDING AND SITE CHANGES**
	1925 - 1926	Construction of the first power plant at the east end of Building 1, contained within the original envelope of Building 1. Major addition to the east end of Building 2. Construction of eastern portion of Interconnects 1-2 and 2-3. Construction of Interconnect 3-4. Construction of Interconnect 4-5. Construction of Building 5. Construction of a water tower behind Building 6. Expansion of other buildings on the campus continues.
	1927	Eastern three bays of Building 1 are removed and replaced with a two-story power plant with a tall smokestack. Alterations to the east end of Building 2 utility vaults.
	c. 1930	Addition to the power plant on the east end of Building 1. Alterations to the east end of Building 2. Addition to the east end of Building 3.
	1934	Current vestibule is added to Building 1 west entry. Utility tunnels constructed between Buildings 1 and 11. Construction of the west portion of Interconnect 2-3.
	1935	Construction of Building 17. Alterations to the east ends of Building 2.
	1936	Major expansion of the power plant on the east end of Building 1. Alterations to the east end of Building 2.

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS		
RELATED EVENTS	**DATE**	**BUILDING AND SITE CHANGES**
Earliest aerial photograph in *The Inlander* company newsletter.	**1937**	Addition to east end of Building 3. Two-story addition to the east end of Building 5 and Interconnect 4-5. Addition to the east end of Building 17.
	1941	Designs for an addition to Interconnect 1-2 to infill the remaining open space between Buildings 1 and 2. Not constructed until after 1945.
	1943	Designs for an addition to Interconnect 1-17 to infill the remaining open space between Buildings 1 and 17. Building 1 north wall windows infilled with glass blocks.
	1945	Factory campus is highly developed based on an aerial photograph.
	by 1949	Addition to the west end of Interconnect 1-2 infills remaining open space between Buildings 1 and 2.
1955 Sanborn Fire Insurance map shows the factory complex (with some outdated information).	**1955**	Building 1 is now used for payroll and Building 2 is used for engineering garage. Third-story addition to the power plant at the east end of Building 1.
	by 1960	Addition to the west end of Interconnect 1-17 infills remaining open space between Buildings 1 and 17. Small additions to the east ends of Buildings 4 and 5.
	by 1968	Expansion of the Building 1 power plant with a new smokestack.
	by 1980	Building 6 has been removed and replaced with surface parking. The residential and commercial lots north and northwest of Building 17 have been redeveloped as surface parking. The guard shack at the Third Avenue entrance has been constructed. A second major expansion of the Building 1 power plant. Addition to the east end of Building 17. Alterations to the east end of Building 2.

TABLE 1-1 CHRONOLOGY OF BUILDINGS AND RELATED EVENTS		
RELATED EVENTS	**DATE**	**BUILDING AND SITE CHANGES**
	by 1980 (cont'd.)	The B&O Railroad lines have been removed, but a street following the angled line of the tracks remains.
Establishment of Dayton Aviation Heritage National Historical Park	**October 16, 1992**	
	by 1994	Alternations to the Building 1 power plant. The water tower has been removed.
	by 2004	Between 2000 and 2004, the smokestacks for the Building 1 power plant are removed.
General Motors ceases operations at the site.	**2008**	
Dayton Aviation Heritage National Historical Park is expanded to include the Wright Company factory.	**March 30, 2009**	
	c. 2013	Demolition of all General Motors buildings on site except Buildings 1 through 5 and 17. The power plant at the east end of Building 1 is also demolished.
Home Avenue Redevelopment, LLC, purchases a 54-acre portion of the former General Motors campus, which includes the Wright Company factory and adjacent parcels.	**December 2012**	Brownfield remediation is performed at the site, partially funded by a grant from the Clean Ohio Fund.
City of Dayton purchases the property from Home Avenue Redevelopment.	**2018**	
The Wright Company factory Buildings 1-5 and 17 are listed on National Register of Historic Places.	**September 9, 2019**	
Preparation of the historic structures report.	**2021-2023**	
	March 26, 2023	Fire significantly damages the complex, with Buildings 1 through 5 and 17 receiving varying levels of damage.

CHRONOLOGY OF BUILDING ALTERATIONS

The following figures show the progressive additions and alterations to the Wright Company factory buildings from 1910, when the Wright Company completed Building 1, through the development of the site in the mid-twentieth century, until 2014 when the surrounding General Motors buildings were demolished. These diagrams were compiled from a collection of available site maps, historical and modern aerial images, and available building plans for the site.

The massing diagrams focus on the development and changes over time for Buildings 1-5 and 17, as these are the buildings that remain on the site today. Starting in the 1920s during the automotive manufacturing era, the factory campus was heavily developed, and other buildings enveloped the original Wright Company factory structures on all sides. For clarity, the development of the surrounding parcels is not shown in the diagrams. Features in yellow represent a change over the previous diagram.

Refer to Appendix C - Site Chronology Diagrams for larger images and additional information.

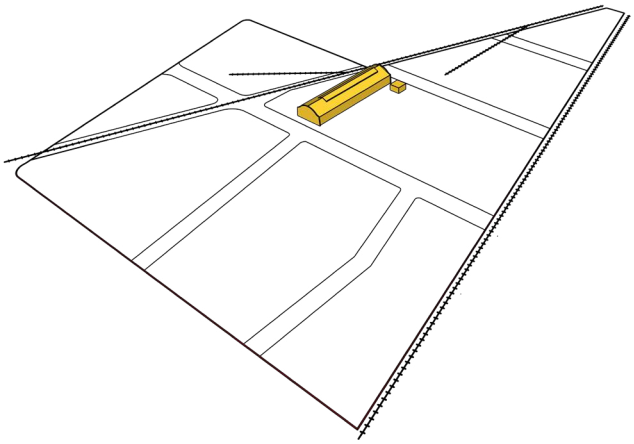


Figure 1-45 Building Massing Diagram 1910

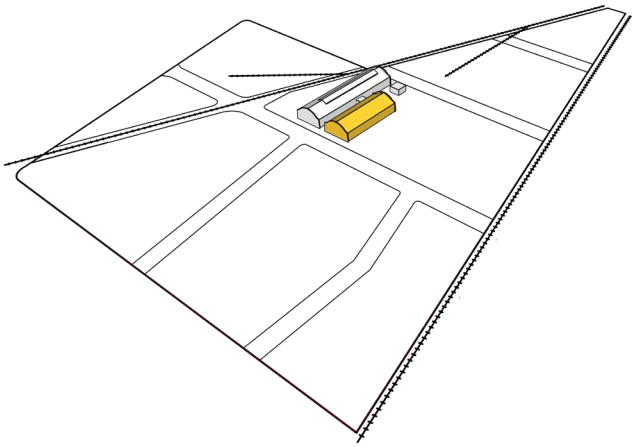


Figure 1-46 Building Massing Diagram 1911

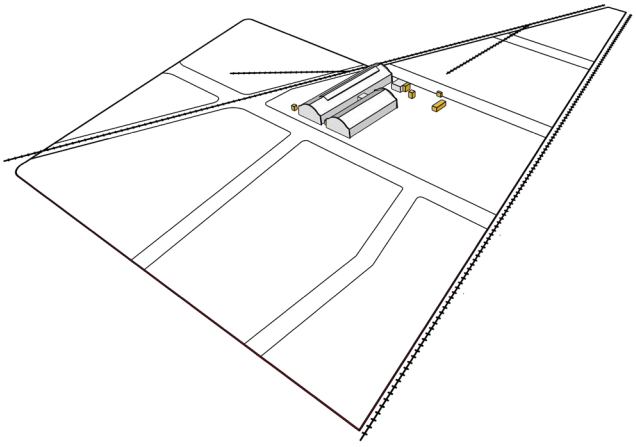


Figure 1-47 Building Massing Diagram 1919

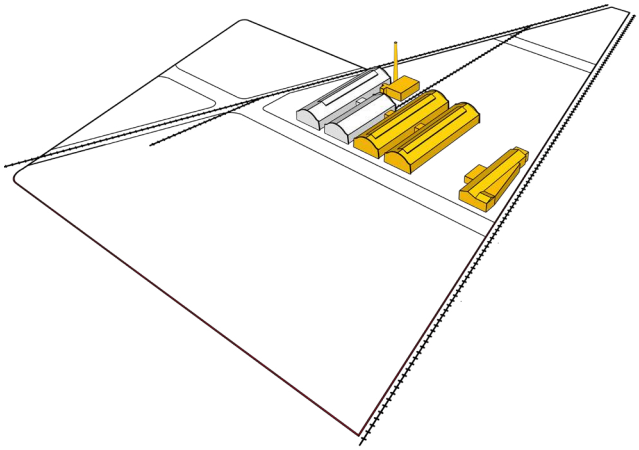


Figure 1-48 Building Massing Diagram 1923

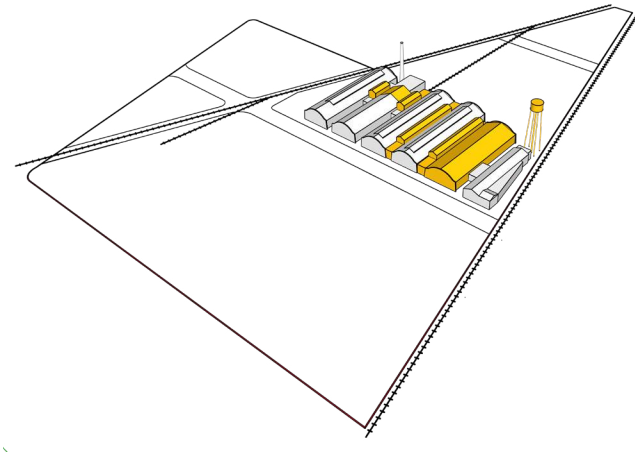


Figure 1-49 Building Massing Diagram 1925

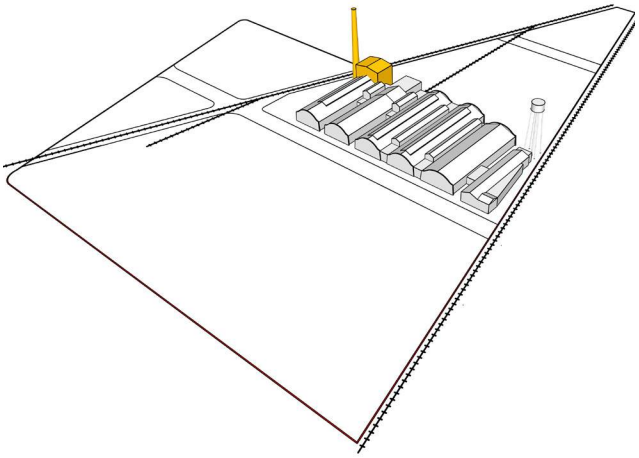


Figure 1-50 Building Diagram 1927

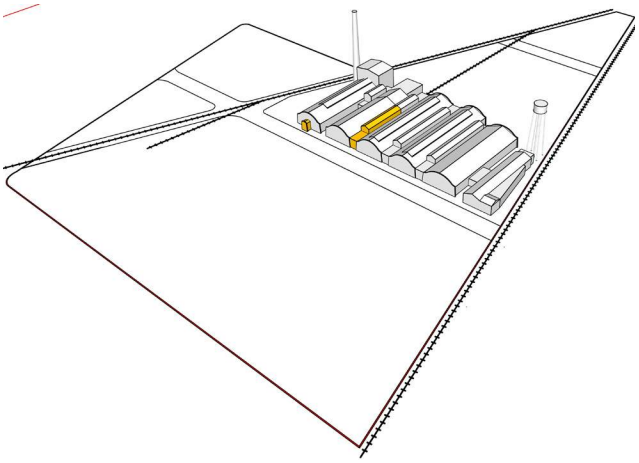


Figure 1-51 Building Massing Diagram 1934

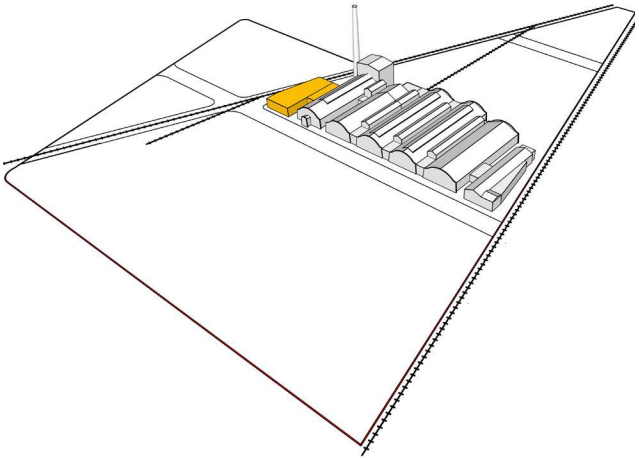


Figure 1-52 Building Massing Diagram 1935

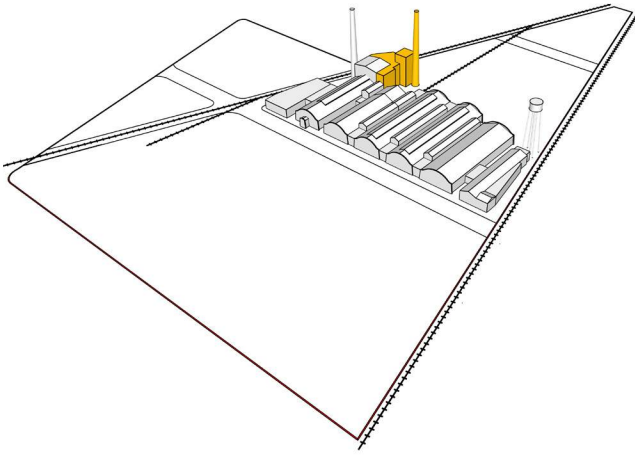


Figure 1-53 Building Massing Diagram 1936

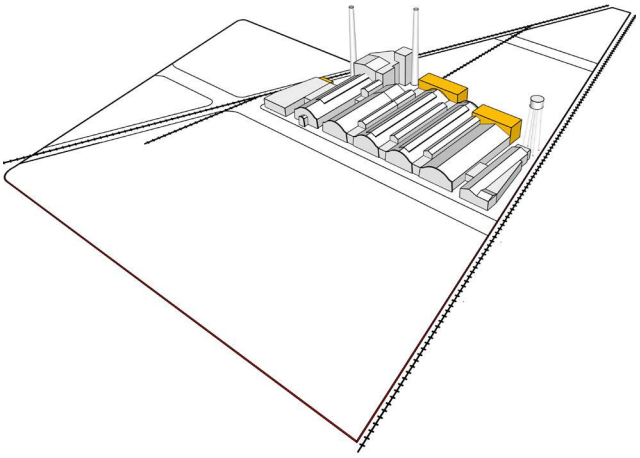


Figure 1-54 Building Massing Diagram 1937

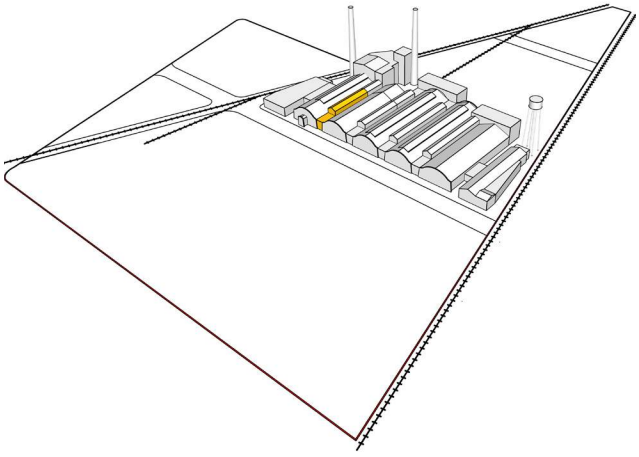


Figure 1-55 Building Massing Diagram by 1949

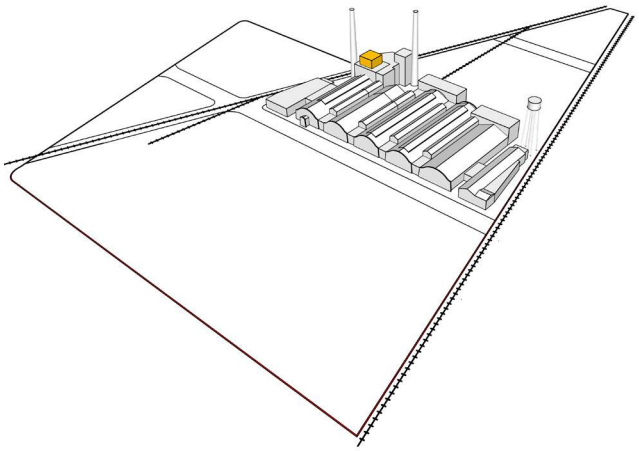


Figure 1-56 Building Massing Diagram by 1955

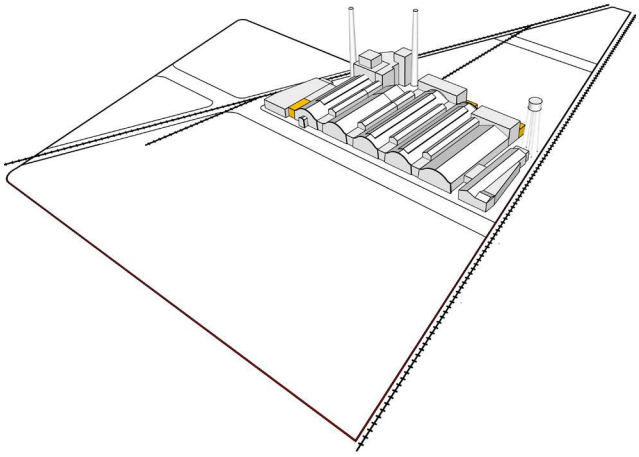


Figure 1-57 Building Massing Diagram by 1960

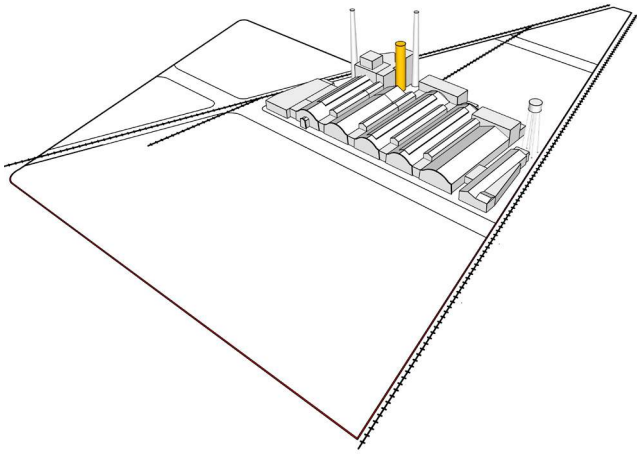


Figure 1-58 Building Massing Diagram by 1968

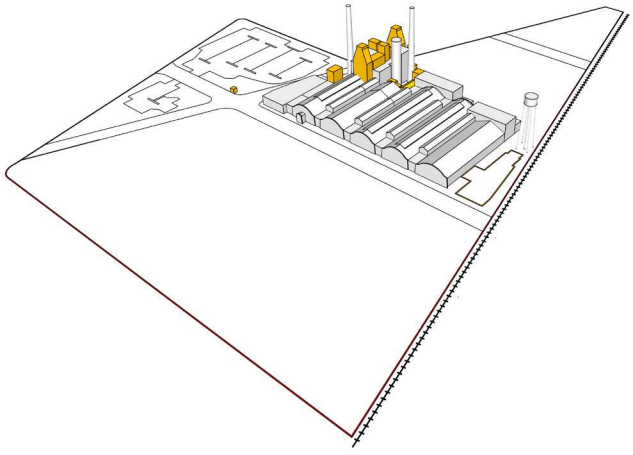


Figure 1-59 Building Massing Diagram by 1980

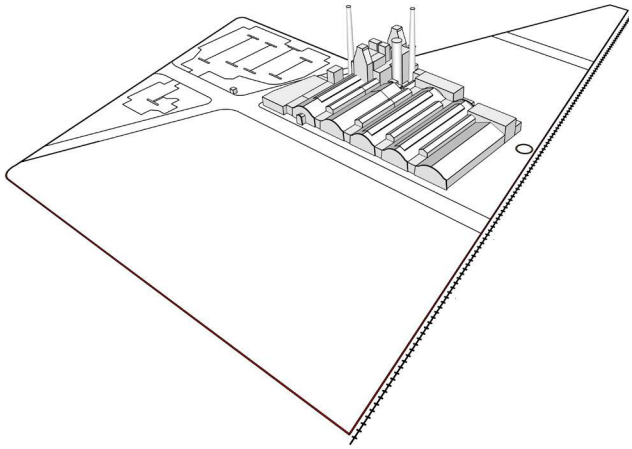


Figure 1-60 Building Massing Diagram by 1994

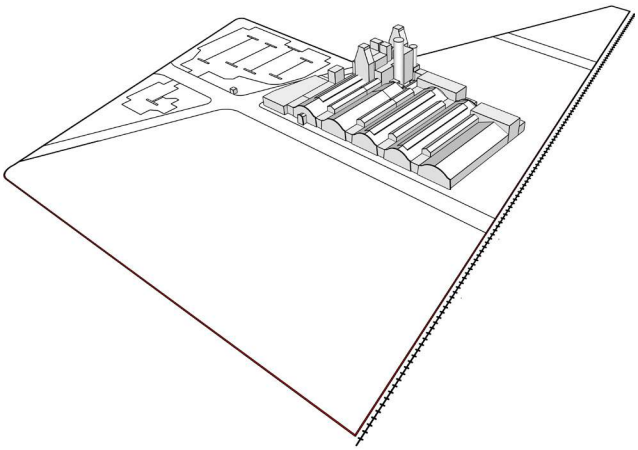


Figure 1-61 Building Massing Diagram 2004

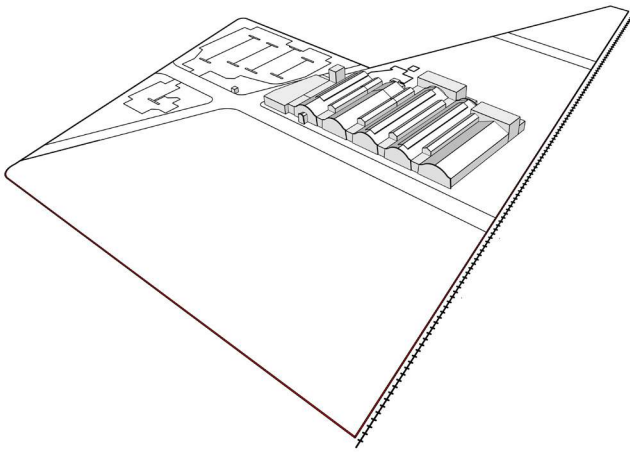


Figure 1-62 Building Massing Diagram 2014

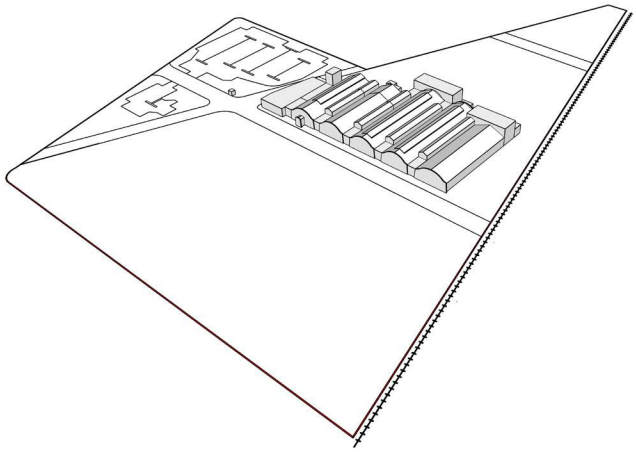


Figure 1-63 Building Massing Diagram 2022

CHRONOLOGY OF ASSOCIATED AIRPLANE MANUFACTURERS

As is often the case with new industries, the first years can be volatile, with many companies and individuals vying for position and control of new opportunities. The early aviation industry was a crowded field, with dozens of players, at home and abroad, beyond those discussed here. For some context of this volatility, the list below is limited to individuals and companies that have a direct connection to the Wright Company or the factory buildings; this truncated chronology is in no way intended to diminish the significant contributions and accomplishments of the many other innovators that molded the modern aviation industry into what it is today.

TABLE 1-2 CHRONOLOGY OF ASSOCIATED AIRPLANE MANUFACTURERS

	World Events	Curtiss	Burgess	Wright	Martin	Dayton
1906				Wright U.S. Patent granted.		
1907		Aerial Experiment Association (AEA) founded by Bell, Curtiss, Selfridge and others.				
1908		AEA disbands and Curtiss gets patents.				
1909	Start of airplane manufacturing in US.	March - Glenn Curtiss and Augustus Moore Herring found Herring-Curtiss Company.	W. Starling Burgess and Augustus Moore Herring found Herring-Burgess Company.	November - The Wright Company founded.		
1910		Herring-Curtiss Company bankruptcy. Curtiss buys assets and starts Curtiss Aeroplane Company.	Herring leaves and Greely Curtis and Frank Russell join Burgess and reorganize as Burgess Company and Curtis, Inc. Company builds Wright Flyers under license from the Wright Company.			
1912				Wilbur dies and Orville becomes president of the Wright Company.	Glenn L. Martin Company founded.	

	TABLE 1-2 CHRONOLOGY OF ASSOCIATED AIRPLANE MANUFACTURERS					
	World Events	**Curtiss**	**Burgess**	**Wright**	**Martin**	**Dayton**
1914	Start of WWI.		Burgess Company and Curtis, Inc., renamed Burgess Company.	Wright win patent lawsuit against Curtiss Aeroplane Company.		
1915				Orville buys shares from original investors and sells company.		
1916	Airplane companies reposition with ramp-up of airplane production for war.	Curtiss Aeroplane Company merges with Curtiss Motor Company to form Curtiss Aeroplane and Motor Company Burgess sells to John N. Willys, who sells to Curtiss, Burgess Company becomes subsidiary of Curtiss Aeroplane and Motor Company.		The Wright Company merges with Glenn L. Martin Company to form Wright-Martin Company.		
1917	Manufacturers Aircraft Association (MAA) establish by U.S. Government to promote war production on consolidate airplane patent licensing.				Glenn L. Martin leaves Wright-Martin and starts second Glenn L. Martin Company.	Deeds and Kettering found Dayton Airplane Company, renamed Dayton-Wright when Orville is brought on as advisor.
1918	End of WW1.					
1919				Wright-Martin Company renamed Wright Aeronautical.		Dayton-Wright Company purchased by General Motors, Dayton-Wright becomes subsidiary of General Motors.
1921		Herring sues Curtiss in 1921.				

	TABLE 1-2 CHRONOLOGY OF ASSOCIATED AIRPLANE MANUFACTURERS					
	World Events	**Curtiss**	**Burgess**	**Wright**	**Martin**	**Dayton**
1923				Wright Aeronautical purchases Lawrance Aero Engine Company.		General Motors disbands Dayton-Wright subsidiary and gets out of airplane manufacturing. Design rights are sold to Consolidated Airplane.
1926		Herring estate wins lawsuit against Curtiss.				
1929	Great Depression Starts.	12 Curtiss and Wright Companies and Affiliates are combined to form Curtiss-Wright Company				
1961					Glenn L. Martin Company merges with American Marietta Corporation to form Martin-Marietta Corporation.	
1995					Martin Marietta Corporation merges with Lockheed Corporation to form Lockheed Martin.	
Present		Curtiss-Wright Company survives to the present day as the Curtiss-Wright Corporation, a manufacturer of industrial and military components, including for the aviation industry.			Lockheed Martin is still in business as an aircraft manufacturer.	

Historical Significance

NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY CRITERIA

The criteria of the National Register of Historic Places provide the basis under which a structure, site, building, district, or object can be considered significant for listing in the National Register. A potential resource needs to meet only one of the four criteria to achieve significance. The criteria include resources that:

(A) are associated with events that have made a significant contribution to the broad patterns of history; or

(B) are associated with the lives of persons significant in our past; or

(C) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) have yielded or may likely yield information important in prehistory or history.

LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES

The Wright Company factory is listed in the National Register of Historic Places as locally significant under Criteria A for industry; however, given the importance of the site and its association with both the Wright brothers and the history of aviation, a strong case can be made for national significance under this criteria.

The nomination includes Buildings 1 and 2, which were built by the Wright Company, as well as four additions: Buildings 3 to 5, which are of similar construction to the Buildings 1 and 2, and Building 17, which was constructed last. It also includes several interconnects between these buildings. Please refer to the building chronology for additional details on the history of the factory's alterations and additions.

Within the overall significance of the site's role as a manufacturing facility, there were two types of manufacturing: aviation and automotive. The aviation manufacturing can be further divided into 1) airplane manufacturing and innovation under the Wright Company and 2) airplane parts manufacturing under the Dayton Aviation and Dayton-Wright Aviation Company.

PERIOD OF SIGNIFICANCE (1910-1916)

> Period of significance is the length of time when a property was associated with important events, activities, or persons, or attained the characteristics which qualify it for National Register listing. Period of significance usually begins with the date when significant activities or events began giving the property its historic significance; this is often a date of construction.[98]

The Wright Company factory buildings have three layers of historical significance from three contributing historic periods. The first significance is from 1910 to 1916, the time when the Wright Company constructed and operated the factory. The second period is from 1917 to 1922 when airplane parts manufacturing continued at the factory under successor firms. The third period of significance is from 1923 to 1955 when the factory was used for automotive parts manufacturing by General Motors and its subsidiaries. In 1955, the Buildings 1 through 5 and 17 were re-purposed for administrative uses, and manufacturing ceased in these specific buildings.

98 How to Complete the National Register Registration Form, 42.

While the national register nomination makes no distinction in the significance of the different contributing periods, the research and analysis performed for this HSR indicate that the most important period of significance is the Wright Company period from 1910 to 1916. The Wright Company, as one of the three original airplane manufacturers in the United States and the first purpose-built airplane factory, should be considered for national significance. The training of pilots, mechanics, and workers at the site during this time may well be as significant as the manufacturing of the planes themselves.

During the second contributing period of airplane manufacturing from 1917 to 1922, the factory was used to make airplane parts and had only a small role in aviation innovation. In particular, it played a role in the manufacture of plane components for WWI. Although the Wright name was attached to the Dayton-Wright Company, Orville had very little involvement in the company and it was not under his direct management. Very few changes where made to the buildings during the first two periods of significance.

During the final contributing period of significance (1923 to 1955), the factory was used for the production of automotive parts. Extensive additions to and alterations of the buildings were completed to accommodate the expanded production. The manufacturing facility grew significantly, engulfing Buildings 1 and 2 into a vast plant. Multiple alterations and additions were introduced, and the original buildings lost some of their integrity related to the earlier periods.

Significance as Related to Dayton Aviation Heritage National Historical Park

The purpose of the Dayton Aviation Heritage National Historical Park is:

> The National Park Service and its partners at Dayton Aviation Heritage National Historical Park interpret the lives and creations of Wilbur and Orville Wright and Paul Laurence Dunbar and preserve sites in the Dayton region associated with them as well as the early development of aviation.[99]

Therefore, the period of significance most closely associated with the park purpose is the initial period of significance from 1910 to 1916, when the buildings were constructed and under direct use by the Wright Company.

TABLE 1-3 SUMMARY OF SIGNIFICANCE (1910-1955)

Criterion	Significance	Company Name(s)	Level	Period
A	Early aviation manufacturing and innovation, role in establishing aviation industry	The Wright Company	Potentially national, but currently listed as local	1910-1916
A	Aircraft and aircraft parts production (WWI production)	Dayton Aviation, Dayton-Wright Co.	Local	1917-1922
A	Automotive parts manufacturing	General Motors, Inland Division	Local	1923-1955

99 Foundation Document Dayton Aviation Heritage National Historical Park. 5

Evaluation of Integrity

Historic integrity is the ability of a property to convey its historic significance. Integrity involves seven aspects: location, design, setting, materials, workmanship, feeling and association.[100] These aspects closely relate to the resource's significance and should be primarily intact for designation. Depending on the significance criterion, some aspects of integrity are more critical to conveying the building's historic significance.

A property that is significant for architectural merit must retain the historic elements that characterize the type, period, or method of construction that the property represents. Retention of design, workmanship, and materials is usually more important than location, setting, feeling, and association when determining integrity. Location and setting are important for properties whose design is a reflection of their immediate environment.

For this evaluation, only Buildings 1 and 2 were considered and were evaluated under each aspect of integrity as low, medium, or high. Please note that the integrity assessment reflects conditions prior to the March 2023 fire.

Location

Location is the place where the historic property was constructed or the place where the historic event occurred.

The Wright Company factory remains in the same location that it was originally constructed. The proximity to the associated historic sites is strong. Therefore, the Wright Company factory has high integrity of location.

Design

Design is the combination of elements that create the form, plan, space, structure, and style of a property.

The Wright Company factory buildings have been modified many times. The west (front) facades of both buildings are largely intact. The construction of Building 17 obscured the north side of Building 1. Interconnect 1-2 obscured the south side of Building 1 and the north wall of Building 2, while Interconnect 2-3 obscured what remains of the south wall of Building 2. The easternmost three bays of Building 1 were demolished in 1926. The east wall and part of the south wall of Building 2 have likewise been demolished over a series of alterations. The skylight of Building 1 has been removed and the opening covered. The taller interconnect structures alter the overall massing of original building roofs, thereby altering the visual form of the buildings. The Wright Company factory has low integrity of design in its current state, but enough historic fabric and historical documentation exists to return the buildings to a medium to high level of integrity of design.

Setting

Setting is the physical environment of a historic property, constituting topographic features, vegetation, man-made features, and relationships between buildings or open space.

The setting of the Wright Company factory has changed substantially, starting as a lightly developed, primarily rural area before transitioning through a time of heavy industrial development. The site is currently undergoing additional changes, with the removal of the surrounding factory buildings and plans for urban redevelopment of the surrounding parcels. The Factory has medium integrity of setting.

100 Shrimpton 1994.

Materials

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

Most of the exterior walls, the steel trusses, and the roof deck remain intact. The majority of the original windows are gone, with a few exceptions. The skylight of Building 1 is gone. The original east walls of both buildings were removed, along with a portion of the south wall of Building 2. The original wood flooring seen in the earliest historical photographs was replaced with concrete slabs. Extensive non-historic materials have been added to both buildings including new east walls, many interior partitions, and suspended ceilings. The Wright Company factory has medium integrity of materials.

Workmanship

Workmanship is the physical evidence of the crafts of a particular culture, people, or artisan during any given period in history or pre-history.

Similar to the design and materials, the workmanship of the Wright Company factory has suffered from multiple alterations. The original walls, roof trusses, and remaining windows are all obscured by non-historic modifications. Most of the windows are missing, as are some of the exterior walls. The Wright Company factory has a medium level of integrity of workmanship.

Feeling

Feeling is a property's expression of the aesthetic or historical sense of a particular period of time.

The feeling of the Wright Company factory has changed dramatically over the years, and very little of the original feeling of the factory and its site remains. Removal of non-historic interior partitions, finishes, and ceilings will restore much of the interior feeling. Restoration of the windows and skylights is key to the restoration of the feeling of the structure as a daylight factory. In its current form, the Wright Company factory has a low level of integrity of feeling.

Association

Association is the direct link between an important historic event or person and a historic property.

The Wright Company factory, as it currently stands, reflects its association with the automotive industry more than its association with the aviation industry. Buildings 3 through 5 and 17 obscure the Wright Company era structures. As such, it has low integrity of association to its primary significance. Rehabilitation of the buildings can improve the site to better reflect its most significant association: the Wright Company and aviation manufacturing.

Summary

Overall the Wright Company factory currently has low to medium integrity. Extensive alterations to the buildings and the site have negatively impacted the integrity of the factory buildings. However, enough historical materials, workmanship, and design remain to rehabilitate the structure and increase their historic integrity.

Physical Description

HISTORICAL AND PHYSICAL CONTEXT

The Wright Company factory is one of several historical sites associated with the Wright brothers and the invention of aviation. As such, the Wright Company factory tells one part of the greater story of American aviation innovation. Far from Dayton are two key sites associated with the Wright brothers. First is the Wright Brothers National Memorial at Kitty Hawk, North Carolina, that commemorates development of the Wright Glider and most significantly, the first flight. Second is the collection of Wright buildings at Greenfield Village in Michigan. The three structures moved from Dayton to Greenfield are the Wright Cycle Shop, the Wright family home, and their garden shed.

SITE AND CONTEXT DESCRIPTION

Site Context for Dayton Aviation Heritage National Historical Park and the National Aviation Heritage Area

The Wright Company factory falls within the Dayton Aviation Heritage NHP, a unit of the National Park System. The park is composed of six discontiguous properties in the greater Dayton, Ohio, area (Figure 1-62) and protects and interprets resources related to inventors Wilbur and Orville Wright, writer Paul Laurence Dunbar, and sites in Dayton associated with the early development of aviation. The six properties include 1) the Wright Cycle Company and Visitor Center at South Williams and West Third Streets; 2) Paul Laurence Dunbar House State Memorial at 219 North Paul Laurence Dunbar Street; 3) the Wright Company factory, the focus of this study, along West Third Street; 4) Wright Brothers Aviation Center at Carillon Historical Park; 5) Hawthorn Hill, a family home at Park and Harman Avenues; and 6) Huffman Prairie Flying Field on Marl Road. Together the land associated with these properties totals 111 acres. President George H. W. Bush signed into law H.R. 2321, the Dayton Aviation Heritage Preservation Act, establishing the National Historical Park on October 16, 1992. The park falls within a larger eight-county National Aviation Heritage Area that honors the region's leadership in the nation's aviation history and provides opportunities to experience several significant sites of importance within the region.[101] Congress authorized establishment of the National Aviation Heritage Area in 2004.

The Wright Company Factory

The Wright Company factory opened in west Dayton in 1910 as the first factory in the United States designed especially for building airplanes. The two original buildings dating from 1910 and 1911 present on the site are the focus of this HSR, along with original circulation and access features. As noted in the NPS Foundation Document for the park, "The factory within its original setting is significant for its role in the early development of the American aviation industry from 1910 to1923 which made Dayton an important center for the development of early commercial and military aircraft. Although other individuals were building airplanes, the Wright Company factory was the first industrial building designed specifically for their manufacture."[102] The factory buildings and site are accessed from West Third Street, west of the Wright Company Cycle Complex and the West Third Street Historic District.

The Wright Company Factory Site Overview

The Wright Company factory is located at 54 and 102 Coleman Avenue and accessed from West Third Street as noted above. The two buildings established by Orville and Wilbur Wrights to support factory needs, Building 1 (1910) and Building 2 (1911), were built by to manufacture airplanes based on the designs of aircraft involved in early flight. At the time this HSR was being prepared, Buildings 1 and 2 were in the process of being transferred

101 National Park Service, Dayton Aviation National Historical Park Foundation Document, 2017, 3.
102 Beverly Shaw, "Wright Company Factory," 8.

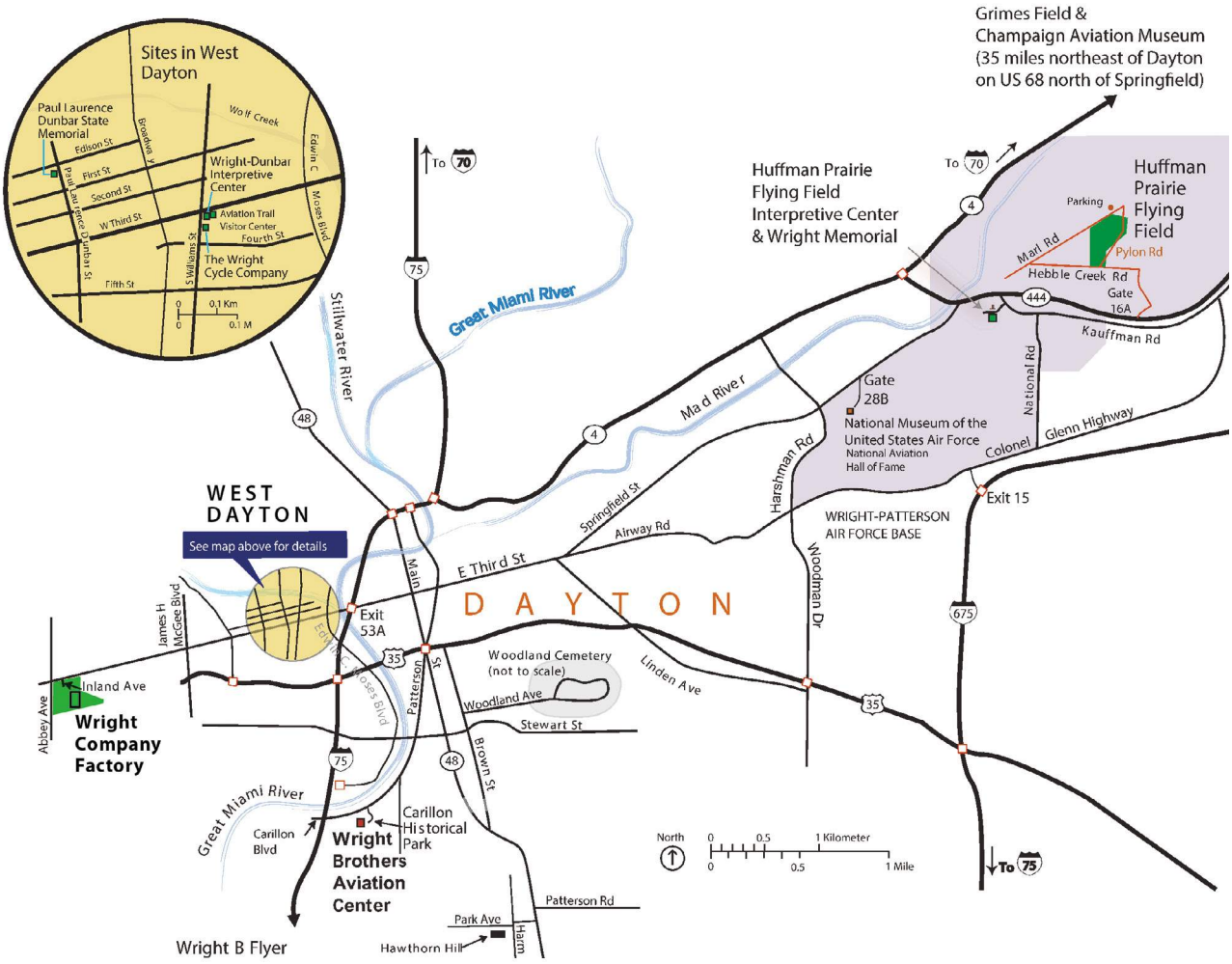


Figure 1-64 Dayton Aviation Heritage National Historical Park, the Wright Company factory location is the green highlighted area at the lower left (southwest). (Source: NPS, modified by LSHLA)

to federal government ownership for inclusion within the Dayton Aviation Heritage National Historical Park.[103]

The Wright Company factory sits within a somewhat triangular-shaped lot, 19.717 acres in size, bounded to the west by Abbey Avenue, to the north by West Third Street, to the east by Cowart Avenue and South Ardmore Avenue, and to the south by a former CSX rail line (Figure 1-63 and Figure 1-64). In addition to Buildings 1 and 2, the lot includes Building 17 to the north and Buildings 3, 4, 5 to the south (Figure 1-65 and Figure 1-66), as well as Inland Avenue, an access road that extends north/south from West Third Street and the alignment of a historic rail line that served factory needs There are also parking areas that survive from subsequent General Motors use of the property.

Buildings 1 and 2 fall within one of two parcels associated with the larger lot that are being acquired by the federal government. The parcel containing Buildings 1 and 2 is 2.28 acres in size. It also includes Building 17, attached to Building 1 to the north, a portion of the historic rail line, and a parking area. The second parcel is a parking area that measures 0.57 acres in

103 The parcel containing Buildings 1 and 2 encompasses an area 2.28-acres in size, while the parking area parcel is 0.57-acres in size.

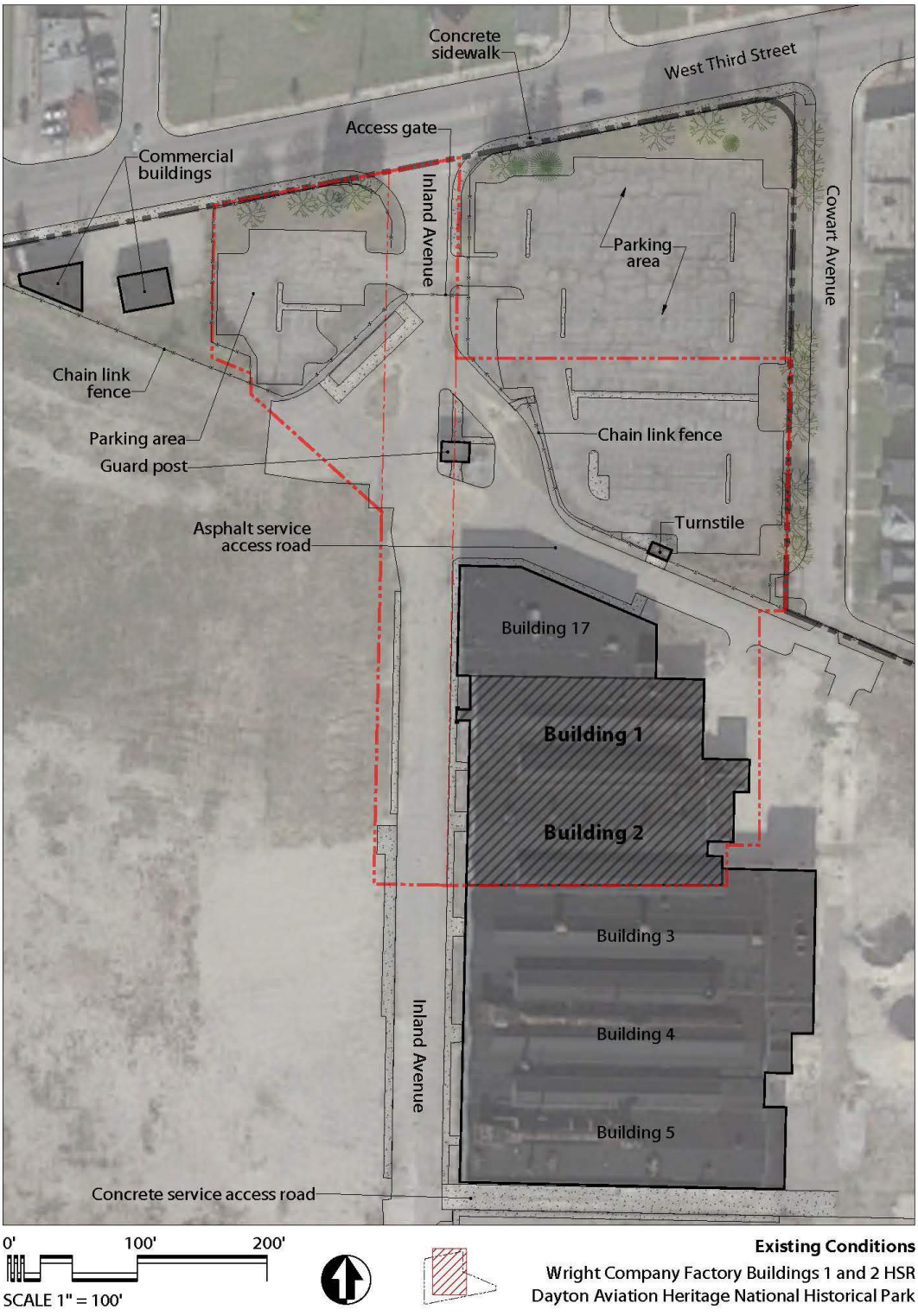


Figure 1-67 2022 Existing Conditions Map. The dashed red lines indicate the proposed NPS area for acquisition. (Source: RRJ)

size, located to the northwest of the second parcel. The two parcels are separated by a road right-of-way that provides access to the property from West Third Street to the north.

The Wright brothers operated the factory within Buildings 1 and 2 together until Wilbur's death in 1912. Orville continued to oversee production in the factory until 1915, when he sold his stake in the company. During World War I (WWI), the buildings were used by the Dayton-Wright Company. After the war, the company was acquired by General Motors and became the site of the corporation's Inland Manufacturing Division. General Motors constructed a complex of factory buildings around the original Wright structures that covered a sizable percentage of the 19.717-acre parcel that is the focus of this study by 1945. During the 2010s, the majority of the buildings were demolished, leaving only Buildings 1 through 5 and 17 on the property. The Wright Company factory property, including Buildings 1 and 2 and other surviving historic site features, are significant in American history for their role in furthering aviation. The property was listed in the National Register of Historic Places in 2019. The nomination indicates the property to be significant under Criterion A in the area of Industry, with a period of significance that extends between 1910 and 1955. As the five primary buildings that survive on the property are all connected via a series of passageways, the nomination lists the entire complex as a single building that contributes to the significance of the property. Several landscape features appear to also survive from the period of significance with sufficient integrity to convey their historic associations and contribute to the significance of the historic property. These include Inland Avenue, historic rail line alignments, patterns of spatial organization associated with the perimeter roads and rail line, and views.

The features associated with the two parcels in the process of being acquired by the federal government, as well as those located within the larger 19.717-acre parcel are discussed below in terms of their physical composition, arrangement on the site, date of origin, and potential to contribute to the National Register listed property.



Figure 1-68 View across the relatively level terrain of the Wright Company factory property, 2021. (Source: LSHLA)



Figure 1-69 View of the principal facades of the building complex from the Abbey Avenue. From left to right, pictured are Building 17, and Buildings 1 through 5. (Source: LSHLA)



Figure 1-70 View east toward The Wright Company factory Buildings 1 and 2 (middle, right), edged by Building 17 (left), 2021. (Source: LSHLA)

THE WRIGHT COMPANY FACTORY SITE DESCRIPTION

The 19.717-acre site (See Figure 1-67, designation “A”) associated with the Wright Company factory (B) site is generally oriented to the cardinal directions, with the principal facades of the connected building complex facing west toward Abbey Avenue. The buildings are accessed from West Third Street to the north via Inland Avenue (C). The alignments of two rail lines, no longer in use, cut across the cardinal arrangement of the site features each at a different angle. The former B&O rail line to the north (D) is oriented northwest/southeast, while the former Soldier’s Home/CSX rail line to the south (E) is oriented southwest/northeast.

The majority of the property is enclosed by chain-link and barbwire fencing (F), including to the north along West Third Street, to the east along Cowart Avenue, along the northern boundary between Cowart Avenue and South Ardmore Avenue, and to the west along Abbey Avenue. This fencing limits access into the property.

Where Inland Avenue enters the property along West Third Street, there is a concrete sidewalk that continues into the parcel from the public road corridor. The sidewalk and

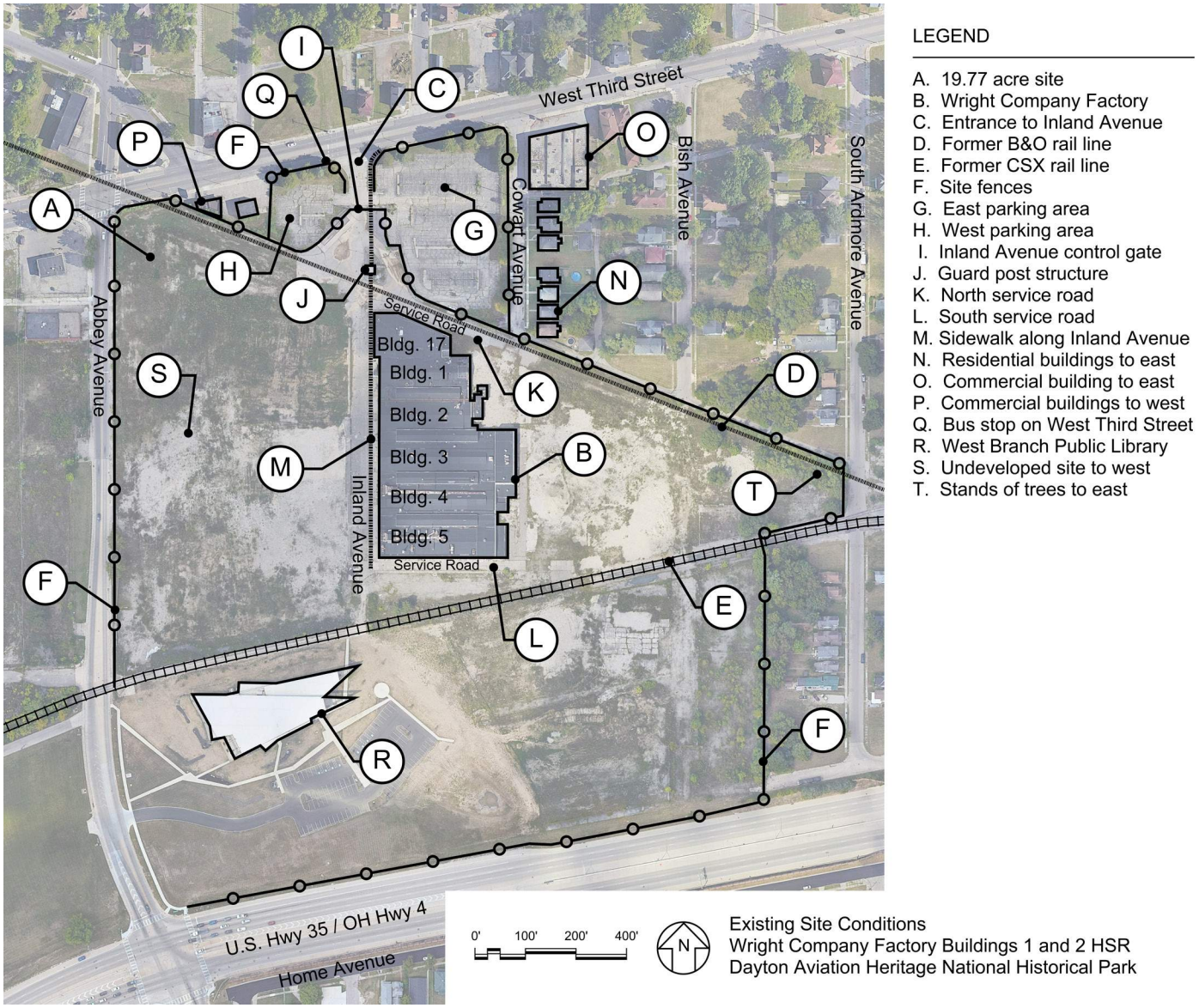


Figure 1-71 Site features in 2022 at the Wright Company factory. (Source: RRJ)

Inland Avenue lead to two parking areas, one to the east (G) and the other to the west (H). These are located to the north of a gate controlling access to the property and survive from the General Motors period of ownership.The gate is a large steel structure that opens by sliding along a track. Beyond the gate is a guard post (J) east of the road. Beyond the guard post, Inland Avenue intersects a service road (K). Both this service road and the north wall of Building 17 align with the path of the former B&O rail line. The road provides service access to the rear of the building complex and to additional parking to the east of the factory buildings.

Continuing south beyond the former B&O rail line, Inland Avenue passes the principal facades of Buildings 17, 1, 2, 3, 4, and 5 (B) before intersecting a second service road (L), leading along the southern edge of Building 5 and providing access to the rear of the building

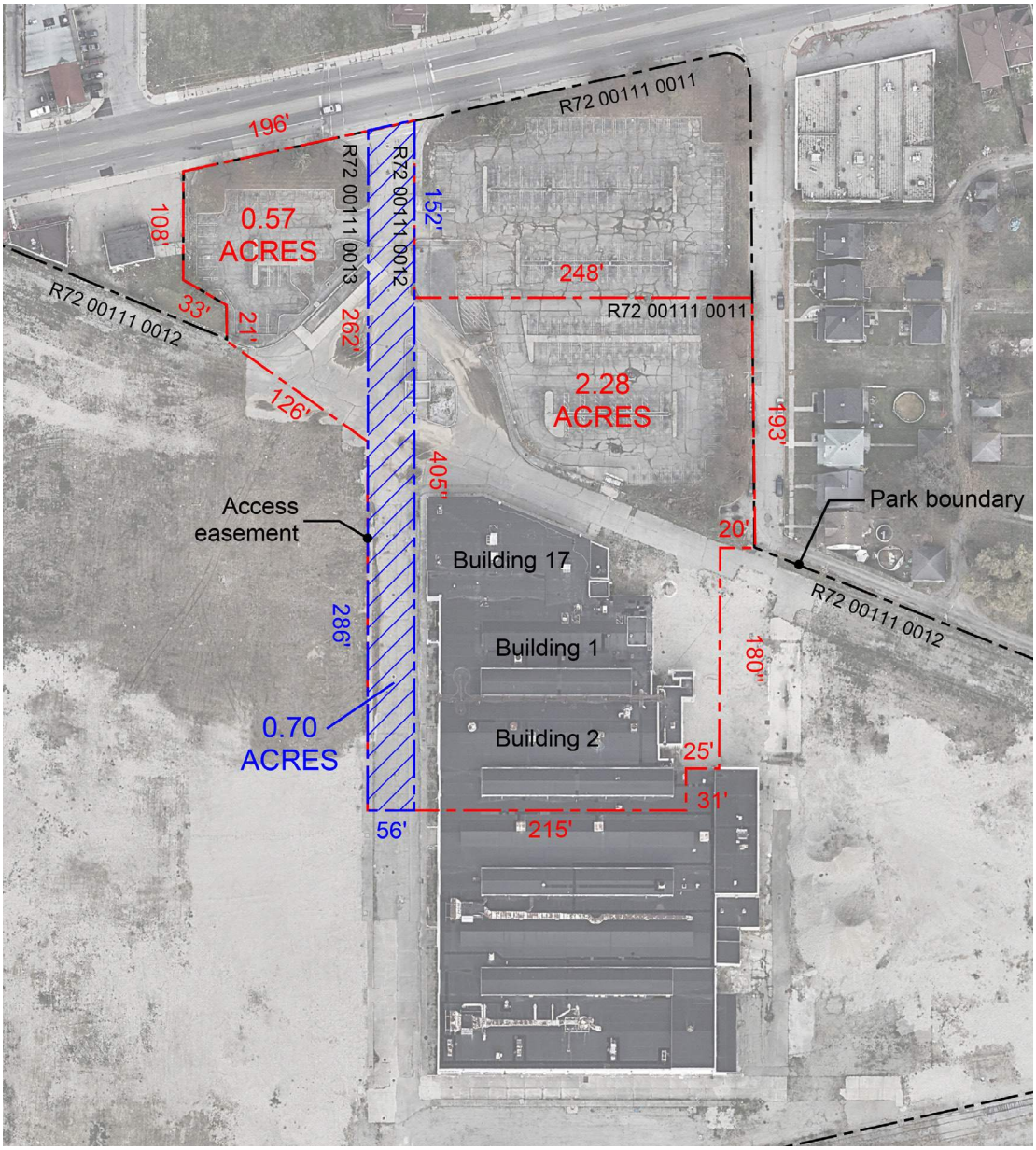


Figure 1-72 The boundaries of the 3.55 acres comprising the Wright Company factory property proposed for acquisition by NPS. Parcel information from the Montgomery County Auditor's Office (https://www.mcohio.org/gis/), annotations by RRJ.

complex. South of the southern service road (L), the land rises slightly to a berm along which is sited the tracks of a former Soldier's Home/CSX rail line (E).

Remnants of the factory roadways and site circulation still exist along Inland Avenue. A concrete curb and side walk (M) edges Inland Avenue to the west and connects with the sidewalks along West Third Street to the north; at the south, the sidewalk ends at Building 5. Concrete curbing edges the road to the east. Curb cuts mark where there are entrances into several of the buildings via garage doors.

The parcel is edged to the east by Cowart Avenue, a residential street that dead-ends at the Wright Company factory property. Seven residential structures (N) edge Cowart Avenue to the east; these structures face the former General Motors parking areas. There is also a commercial building (O) at the intersection of Cowart Avenue and West Third Street. Commercial buildings (P) are also present to the west near the intersection of Abbey Avenue and West Third Street. There is a bus stop (Q) located just outside the property west of the intersection of West Third Street and Inland Avenue.

The parcel extends southeast beyond Cowart Avenue to South Ardmore Avenue. It passes Bish Avenue a residential street arising from West Third Street on the north that dead-ends at the parcel on the south. To the south of the property is the West Branch Public Library (R), constructed circa 2021.

Abbey Avenue marks the western property boundary. Between the fencing along Abbey Avenue and Inland Avenue, the grounds are open and not currently developed (S). The ground plane contains rubble associated with the demolition of former General Motors plant buildings. The landscape to the east of the buildings is similar, although there are also stands of trees (T) along the property margins. Present throughout the site are abandoned utility structures, ranging from fire hydrants to manholes.

Only a small portion of this site is proposed for acquisition by NPS (Figure 1-68), totaling about 3.55 acres.

CURRENT BUILDING DESCRIPTIONS

Building 1

Building 1 was impacted by the 2013 - 2014 demolition activities at the site. The three easternmost bays were converted into a power plant starting in 1926 and modified over multiple later dates. When the power plant was removed, any extant structure from the original construction was lost, permanently shortening the building by approximately 55 feet. The existing east wall is an infill wall that dates to after the period of significance and is non-contributing. The majority of the north wall is extant but is currently concealed by Building 17, constructed in 1935. The window openings and various component parts of the original wood-framed windows are still present behind the interior finishes of Buildings 1 and 2. Two bays are exposed past the east end of Building 17 (original bays 9 and 10, propeller fabrication and paint shop). The removal of Building 17 will not negatively impact the stability or condition of the north wall. The south wall is entirely enclosed by Interconnect 1-2, but the window rough openings and various component parts of the original wood-framed windows are still present behind the interior finishes. At bays 9 and 10, the window openings were altered to install larger steel windows at an undetermined date. The west facade maintains integrity of the original design with the arched parapet and window locations (Figure 1-69); the existing vestibule over the main entrance was added after the period of significance and is non-contributing. The interior of Building 1 has been altered. None of the existing partition walls, finishes, or building systems date to the period of significance.

Despite these alterations, Building 1 possesses sufficient integrity to continue to convey its original construction and historic associations, and it contributes to the significance of the property.



Figure 1-73 Building 1, west facade in October 2021. (Source: RRJ)

Building 2

Building 2 (Figure 1-70) was expanded in 1925 with an addition to the east, and a second addition was built in 1929. These additions are still in place. The existing footprint of Building 2 is approximately 58 feet longer than as originally constructed. The original east wall and the immediately adjoining portions of the north and south walls of the original construction for Building 2 are no longer extant. The majority of the north and south walls appears to still be in place behind the interior finishes, along with components of the original windows.

The interior of Building 2 has also been altered. None of the existing partition walls, finishes, or building systems date to the period of significance. However, the corridor that currently connects Buildings 1 and 2 is located in the same bay as the original connecting link, providing circulation between the buildings that echoes that of the Wright Company era.

Despite these alterations, Building 2 possesses sufficient integrity to continue to convey its original construction and historic associations, and it contributes to the significance of the property.

Interconnect 1-2

Interconnect 1-2 (Figure 1-71) was constructed in the space between Buildings 1 and 2 c. 1925, along with other additions to the facility by the Inland Company. The exact sequencing of the c. 1925 additions is undetermined. The interconnect replaced a much smaller passageway from 1911 that was originally constructed between the two buildings. The expanded interconnect was approximately 65 feet long in the east-west direction and spanned from bay 5 to 10 from the west facade of Building 1. Interconnect 1-2 underwent an expansion to the east in c. 1949, fully infilling the former open space between the buildings.



Figure 1-74 Building 2, west facade in October 2021. (Source: RRJ)



Figure 1-75 Interconnect 1-2, west facade in October 2021. (Source: RRJ)



Figure 1-76 Interconnect 2-3, west facade in October 2021. (Source: RRJ)

The west facade of Interconnect 1-2 is recessed from the front facades of adjacent Buildings 1 and 2 and has a stepped parapet. This parapet configuration was repeated at Interconnect 2-3 and the front vestibule added to Building 1.

Interconnect 1-2 is supported by the exterior masonry walls of Buildings 1 and 2. The roof structure is steel trusses and a wood roof deck with a monitor roof extending from bay 3 to bay 9. The monitor windows are a steel-framed window wall that provides daylight into the space below. The existing interior partitions and finishes appear to have undergone multiple alterations over time. Interconnect 1-2 postdates the Wright Company period of significance.

Interconnect 2-3

Interconnect 2-3 (Figure 1-72) was constructed in the space between Buildings 2 and 3 c. 1925, along with other additions to the facility by the Inland Company. The interconnect replaced a smaller, original passageway between the buildings and was approximately 100 feet long in the east-west direction starting at bay 5 from the west facade of Building 2. Interconnect 2-3 underwent an expansion in 1934 that extended Interconnect 2-3 to the west face of Building 2, fully infilling the former open space between the buildings. The west facade has a stepped parapet; this form was repeated in later interconnect structures.

Interconnect 2-3 is supported on the north side by the exterior masonry wall of Building 2 and on the south side by steel columns and is open to Building 3. The roof structure is substantially similar to Interconnect 1-2, with a wood roof deck and monitor roof extending from bay 3 to bay 11. The monitor windows are a The clerestory is a steel-framed window wall that provide daylight into the open space below to the west and a mechanical mezzanine to the east. The existing interior partitions and finishes appear to have undergone multiple alterations over time. Interconnect 2-3 postdates the Wright Company period of significance.

Building 3

Building 3 (Figure 1-73) was constructed south of Building 2 c.1923, following the establishment of the Inland Company and the transition of the facility from aviation to automotive manufacturing use. Building 3 was constructed to replicate the design and massing of Buildings 1 and 2. An addition was constructed on the east end of Building 3 in 1937. Building 3 postdates the Wright Company period of significance.

Interconnect 3-4

Interconnect 3-4 (Figure 1-73) was constructed in the space between Buildings 3 and 4 c. 1925, during a period of expansion to the facility when Building 5 and Interconnect 4-5 were added, along with alternations to the east end of Building 2 and expansion of Interconnects 1-2 and 2-3. Interconnect 3-4 replaced a smaller, single bay passage between the two buildings. The interconnect appeared to have been constructed in a single phase, extending approximately 230 feet east-west and approximately 20 feet north-south. The partial second story is original to the c. 1925 construction.

Interconnect 3-4 is supported by the exterior masonry walls of Buildings 3 and 4. The west wall is recessed from the facades of the adjacent buildings and features a decorative stepped gable, similar in style to the other interconnect structures. The clerestory is a steel-framed window wall that overlooks the open space below. Interconnect 3-4 postdates the Wright Company period of significance.

Building 4

Building 4 (Figure 1-73) was constructed at approximately the same time as Building 3, along with the interconnect between the structures. The design and massing of Building 4 continued the design and massing established by the preceding structures. Small additions to the east end of Building 4 were added c. 1960. Building 4 postdates the Wright Company period of significance.



Figure 1-77 Buildings 3, 4, and 5, west facade in October 2021. (Source: RRJ)

Interconnect 4-5

Interconnect 4-5 (Figure 1-73) was constructed in the space between Buildings 4 and 5 c. 1925, concurrent with the construction of Building 5, as they appear on the same set of construction drawings. The interconnect appeared to have been constructed in a single phase, extending approximately 230 feet east-west and approximately 20 feet north-south. The partial second story is original to the c. 1925 construction.

Interconnect 4-5 is supported on the north side by the exterior masonry wall of Building 4. Unlike other the interconnects, the structure of Interconnect 4-5 was integral with the structure of Building 5, and the interior space was not divided by a bearing wall, essentially making this structure the north bay of Building 5 but designed to look like an interconnect structure to mimic the rhythm of the rest of the buildings.

Again, the west wall is recessed from the facades of the adjacent buildings and features the same decorative stepped gable. The clerestory is a steel-framed window wall that overlooks the open space below. Interconnect 4-5 postdates the Wright Company period of significance.

Building 5

Building 5 (Figure 1-73) was added south of Building 4 in 1925. It also followed a design scheme similar to the other four buildings, with the exception of the entrance being located in the north bay. As such, the west facade was not symmetrical like the other buildings. The building also featured a simple roof line with no skylight. Building 5 postdates the Wright Company period of significance.



Figure 1-78 Building 17, partial north wall and west facade in October 2021. (Source: RRJ)

Building 17

Building 17 (Figure 1-74) was constructed in 1935 to the north of Building 1. It had a low-slope roof and was built of reinforced concrete and steel framing with mass masonry walls. The irregular, polygon shape of the building followed the angled alignment of the adjacent rail line corridor. The west facade was seven bays wide, with either a window or door opening in each bay. The windows were elongated, rectangular windows that have since been infilled with brick. The north wall was 13 bays long with the bays demarcated by brick piers; the window openings on the north wall have also been infilled with brick. A connecting hallway provided access into Building 1 from Building 17 from the rear east bays. By the 1960s, the open space between Buildings 1 and 17 was infilled. Building 17 postdates the Wright Company period of significance.

Character-Defining Features

A character-defining feature is an aspect of a building's design, construction, or detail that is representative of function, type, or architectural style. Character-defining elements include the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment. Generally, character-defining features date to a property's period of significance. For a historic resource to retain significance, its character-defining features must be retained to the greatest extent possible. An understanding of a building's character-defining features is a crucial step in developing a rehabilitation plan that incorporates an appropriate level of restoration, rehabilitation, maintenance, and protection. Landscapes also contain character-defining features that can be articulated in terms of function, type, or design style.

It is most typical to list only extant character-defining features. However, as a result of future possible future removal of non-contributing elements, additions, and buildings, notably Building 17, non-extant features may potentially be returned. In particular, missing windows and skylights may be reestablished. Additionally, future interpretative plans may involve some consideration for non-extant interior character-defining features. In order anticipate future facility improvement projects, non-extant character-defining features are added with notations.

SITE AND CONTEXT

As indicated in documents, maps, drawings, and photographs, the Wright Company factory Property had been developed to include Buildings 1 and 2, rail lines, perimeter and internal road corridors by 1919. The features that survive with integrity from the primary Wright period of significance of 1910-1916. See also Figure 1-82, the contributing features map.

Contributing features include:

- Buildings 1 and 2 of the Wright Company factory and small (non-extant) interconnect (1910-1911).
- West Third Street and its intersection with the site entrance road (1910).
- Entrance/access road known during the period of significance as Coleman Avenue and Chester Avenue, and later as Inland Avenue (1910).
- B&O Railroad line alignment depicted on Sanborn Maps and in later drawings as CH&D and CSX runs through the site from northeast to southwest (early 1850s). The alignment and some evidence of the rails survive.
- Former CSX rail line depicted on the 1919 Sanborn map as Soldiers Home Railroad forms the southern boundary of the site (c. 1890).
- Pattern of spatial organization associated with the perimeter roads surrounding the site, including West Third Street, Abbey Avenue, Cowart Avenue, and South Ardmore present before 1910.
- Viewshed from West Third Street to the north wall of the factory buildings (1910-1911).

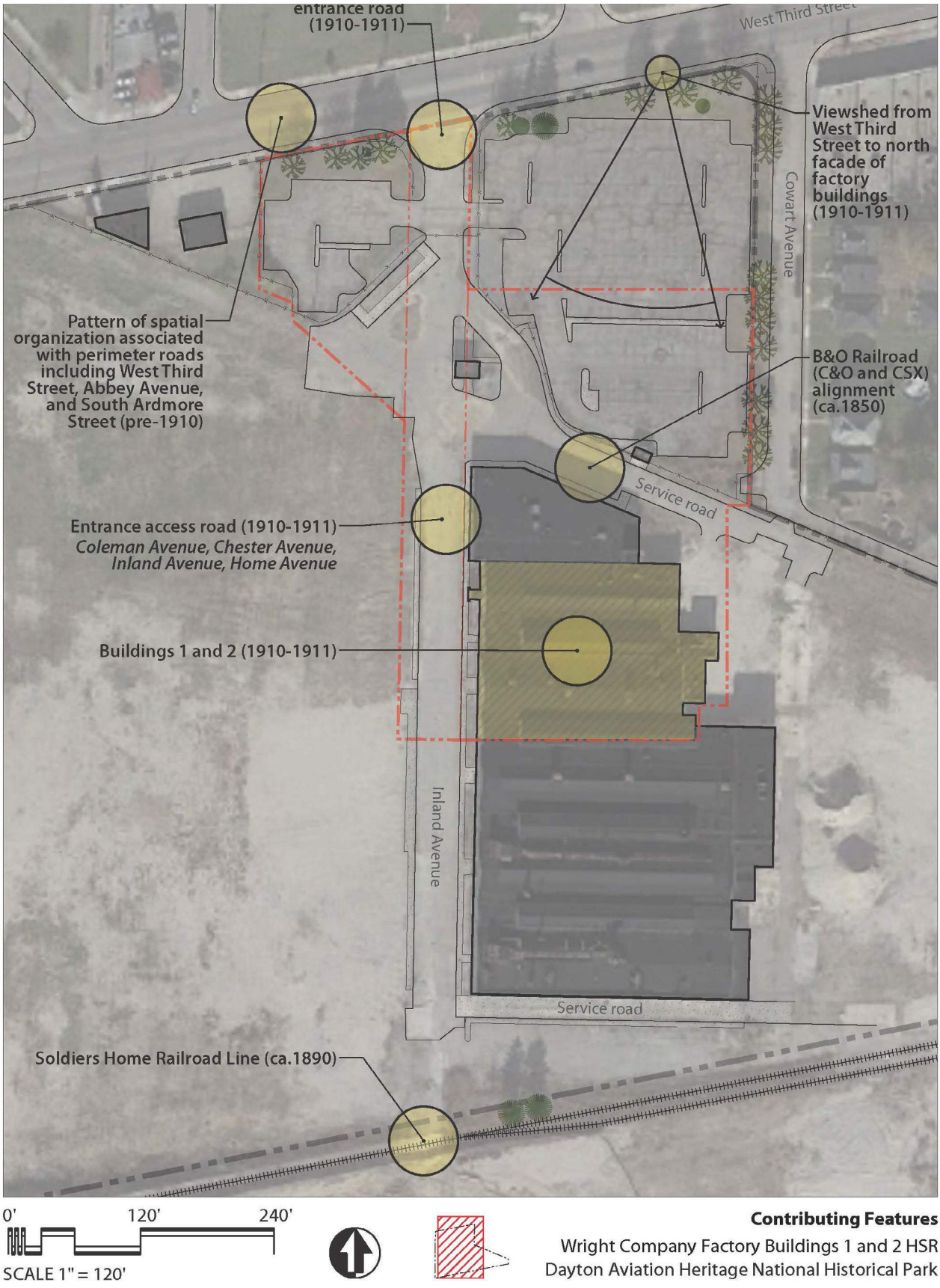


Figure 1-79 Site Plan with landscape contributing features. (Source: LSHLA)

BUILDING 1

Exterior

- Long narrow rectangular building (partially extant)
- West end wall with arched parapet and tapered (battered) sides
- Arched parapets and tapered (battered) outer edges of east and west walls (east non-extant)
- Large opening flanked by large windows at center of east and west end walls (east non-extant)
- Connecting passageway with Building 2 (non-extant)
- Regularly spaced window openings with concrete brick sills.
- Wood doors, transom, and sidelights at center of west wall, flanked by large windows (openings extant, doors and windows non-extant)
- Double sliding doors at north and east exterior walls (openings extant, doors non-extant)
- Large wood framed windows in segmental arch openings centered in each bay on north and south walls (only a few windows extant, but most openings extant)
    - Each masonry opening has a fixed wood arch, two 8-light transoms and two 16-light pivot windows
- Skylight facing north (Roof framing for skylight extant, skylight non-extant)
- Brick pilasters on north and south walls
- Concrete brick exterior walls

Interior

- Offices on either side of west entrance (non-extant)
    - Wood walls and ceilings
    - Wood railings and raised wood platform floors one step up on either side of the central walkway
- Open space divided by partitions in a few areas (non-extant)
    - Wood stud and corrugated sheet metal partitions
    - Exposed steel trusses with wood purlins and wood deck
- Exposed riveted steel trusses with wood purlins and exposed wood roof deck
    - Pulleys and drive shafts attached to underside of trusses (non-extant)
- Exposed concrete brick walls
- Brick and concrete pilasters
- Concrete floors with wood slats and wood plank floor (non-extant)
- Exposed tube radiant heating at perimeter (non-extant)
- Quantity and quality of natural light from large windows and skylight (non-extant)
- Bare bulb lights (some with metal reflector) (non-extant)

BUILDING 2

Exterior

- Long narrow rectangular building
- Arched parapets and tapered (battered) outer edges of east and west walls (east non-extant)
- Large opening with pair of large sliding doors at center of east and west walls (east wall non-extant, doors in west wall non-extant)
- Regularly spaced window openings with concrete brick sills.
- Large wood framed windows in segmental arch openings centered in each bay on north and south walls (only a few windows extant, but most openings extant)
    - Each masonry opening has a fixed wood arch, two 8-light transoms and two 16-light pivot windows
- Brick pilasters on north and south walls
- Concrete brick exterior walls

Interior

Some character defining features at the interior of Building 2 are assumed based on the documentation available for Building 1. Further research may be able to confirm interior features of Building 2.

- Exposed riveted steel trusses with wood purlins and exposed wood roof deck
  - Pulleys and drive shafts attached to underside of trusses (non-extant)
- Exposed concrete brick walls
- Brick and Concrete pilasters
- Wood plank floor
- Exposed tube radiant heating at perimeter (non-extant)
- Quantity and quality of natural light from large windows
- Bare bulb lights (some with metal reflector) (non-extant)

Part 2: Treatment and Use Recommendations

Condition Assessment

ASSESSMENT METHODOLOGY

In the execution of this scope, the project team performed the following:

- Reviewed documentation on the Wright Company factory provided by NPS and from other sources, as well as available documentation from local, regional, and national archival collections that was readily available online.
- Performed a physical investigation of Buildings 1, 2, 17, and their interconnects from the interior and exterior to observe and document the conditions of the structure, architecture, finishes, building systems, and other components.
- Field verified select dimensions and measurements to confirm conditions as documented by others.
- Performed a site survey to document architectural and utility features on the site.
- Reviewed available documentation regarding site environmental contamination (“brownfield”) conditions and site mediation activities performed to date by state and local agencies.

DEFINITIONS

The following terms define subjective ratings used in this part to apply a sliding scale of condition rating, deficiency of the component and priority of the repair, as developed from Sections 7.2 and 7.4 of the “Field Operations Manual, Volume 1”, United States National Park Service, Washington, D.C., 1985.

Condition Rating

Good	The element is intact, structurally sound, and performing its intended purpose. There are few or no cosmetic imperfections, and the elements need no repair and only minor or routine maintenance.
Fair	There are early signs of wear, failure, or deterioration, though the element is generally structurally sound and performing its intended purpose. There is failure of a sub-component of the element. Up to 25 % of the element or replacement of a sub-component is required.
Poor	The element is no longer performing its intended purpose. The element is missing. Deterioration or damage affects more than 25% of the element and cannot be adjusted or rebuilt. The element shows signs of imminent failure or breakdown. The element requires major repair or replacement.
Failed	The element is no longer performing its intended purpose and has deteriorated to a point where it presents a life-safety hazard or is contributing to damage to other elements.

Repair Timeline

Immediate	There is advanced deterioration which has resulted in the failure of the building element or will result in the failure of the building element if not corrected within two years; and/or there is accelerated deterioration of adjacent or related building materials as a result of the element's deficiency; and/or there is a threat to the health and/or safety of the user; and/or there is failure to meet a legislative requirement.
Short-Term	There is deterioration which, if not corrected within two to five years, will result in the failure of the building element, and/or; a threat to the health and/or safety of the user may occur within two to five years if the deterioration is not corrected, and/or; there is deterioration of adjacent or related building materials and/or systems as a result of the element's deficiency.
Long-Term	Standard preventative maintenance practices and building conservation methods have not been followed, and/or; there is a reduced life expectancy of affected or related building materials and/or systems, and/or; there is a condition with long-term impact beyond five years.

CONDITIONS CATEGORIZED BY BUILDING FEATURE GROUP

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
SITE AND LANDSCAPE					
Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Timeline
G	BUILDING SITE WORK				
G20	SITE IMPROVEMENTS				
	G2059	OTHER LANDSCAPE FEATURES			
		G205901	Landform and Topography	N/A	N/A
		G205902	Views and Viewsheds	N/A	N/A
	G2040	SITE DEVELOPMENT			
		G204001	General Site Circulation	N/A	N/A
		G204002	Inland Avenue	Poor	Short-Term
	G2020	PARKING LOTS			
		G202001	North Parking Lot	Poor	Short-Term
		G202002	Northwest Parking Lot	Poor	Short-Term
	G2010	ROADWAYS			
		G103001	Service Access Roads	Poor	Short-Term
		G103002	North Rail Line	Poor	N/A
		G103003	South Rail Line	Poor	N/A
	G2049	MISCELLANEOUS STRUCTURES			
		G204901	Guard Post	Fair	Long-Term
	G2055	PLANTING			
		G205501	Vegetation	N/A	N/A
	G2041	FENCES AND GATES			
		G204101	Chainlink and Barbwire Fencing	Fair	Long-Term
		G204102	Gate Along Inland Avenue	Fair	Long-Term
		G204103	Turnstile at North Parking Area	Fair	Long-Term
	G2044	SIGNAGE			
		G204401	Miscellaneous Signage	N/A	N/A
	G2059	OTHER LANDSCAPE FEATURES			
		G205901	Utility Features	N/A	N/A

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
ENCLOSURE					
Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Timeline
B	SHELL				
B20	EXTERIOR ENCLOSURE				
B2010		EXTERIOR WALL CONSTRUCTION			
		B201001	Brick Exterior Walls, Building 1	Fair to Failed	Immediate
		B201002	Brick Exterior Walls, Interconnect 1-2	Fair	Short-Term
		B201003	Brick Exterior Walls, Building 2	Fair to Poor	Immediate
		B201004	Brick Exterior Walls, Interconnect 2-3	Fair	Immediate
		B201005	Brick Exterior Walls, Building 17	Fair to Poor	Immediate
B2020		EXTERIOR WINDOWS			
		B202001	Skylight, Building 1	N/A	N/A
		B202002	Windows, Building 1	Poor to Failed	Immediate
		B202003	Windows, Interconnect 1-2	Fair	Immediate
		B202004	Windows, Building 2	Poor to Failed	Immediate
		B202005	Windows, Interconnect 2-3	Fair	Immediate
		B202006	Windows, Building 17	N/A	N/A
B2030		EXTERIOR DOORS			
		B203001	Exterior Doors, Building 1	Poor	Immediate
		B203002	Exterior Doors, Interconnect 1-2	Poor	Immediate
		B203003	Exterior Doors, Building 2	Poor	Immediate
		B203004	Exterior Doors, Interconnect 2-3	Poor	Immediate
		B203005	Exterior Doors, Building 17	Poor	Immediate
		B203006	West Vestibule, Building 1	Poor	Immediate
		B203007	Exterior Overhead Door, Building 2	Poor	Short-Term
B30	ROOFING				
B3010		ROOF COVERINGS			
		B301001	Roofing System, Building 1	Failed	Immediate
		B301002	Roofing System, Interconnect 1-2	Failed	Immediate
		B301003	Roofing System, Building 2	Failed	Immediate
		B301004	Roofing System, Interconnect 2-3	Failed	Immediate
		B301005	Roofing System, Building 17	Failed	Immediate

G	**BUILDING SITEWORK**				
G20	**SITE IMPROVEMENTS**				
	G2049	**MISCELLANEOUS STRUCTURES**			
		G204901	Mechanical Vaults, Building 2	Failed	Immediate
G90	**OTHER SITE CONSTRUCTION**				
	G9011	**SERVICE TUNNELS**			
		G901101	Service Tunnels	Failed	Immediate

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
STRUCTURE					
Category	**Topic**	**Code**	**Subtopic**	**Assessment**	
				Condition Rating	**Repair Timeline**
B	**SHELL**				
B10	**SUPERSTRUCTURE**				
	B1010	**FLOOR CONSTRUCTION**			
		B101001	Concrete Slab-on-Grade	Good	Long-Term
	B1015	**STAIR CONSTRUCTION**			
		B101501	Roof Access Points	Fair to Failed	Immediate
	B1020	**ROOF CONSTRUCTION**			
		B102001	Steel Trusses, Building 1	Good	Long-Term
		B102002	Steel Trusses, Interconnect 1-2	Good	Long-Term
		B102003	Steel Trusses, Building 2	Good	Long-Term
		B102004	Steel Trusses, Interconnect 2-3	Good	Long-Term
		B102005	Roof Framing, Building 17	Fair to Poor	Immediate
		B102006	Wood Plank Roof Decking	Good to Failed	Immediate
		B102007	Wood Beams and Purlins	Good	Long-Term

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
INTERIORS					
Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Timeline
C	INTERIORS				
C10	INTERIOR CONSTRUCTION				
C3020	FLOOR FINISHES				
		C302001	Floor Finishes	Fair to Failed	Immediate
C1010	PARTITIONS				
		C101001	Partition Walls and Finishes	Fair to Failed	Immediate
C3030	CEILING FINISHES				
		C303001	Ceiling Finishes	Failed	Immediate

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
MECHANICAL SYSTEMS					
Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Timeline
D	SERVICES				
D10	FIRE PROTECTION				
D1020	FIRE MAIN SUPPLY				
		D102001	Fire Main Supply – Interior Risers	Poor	Immediate
D1010	FIRE MAIN SUPPLY ISOLATION AND INDICATION				
		D101001	Fire Main Supply – Post Indicator Valves	Poor	Immediate
D1030	FIRE SPRINKLERS				
		D103001	Fire Sprinkler System – Sprinkler Piping & Heads	Poor	Immediate
D20	PLUMBING				
D2010	WATER SERVICE				
		D201001	Water Service Piping	Poor	Immediate
D2020	SANITARY SERVICE				
		D202001	Sanitary Service Piping	Poor	Immediate
D2030	STORM SERVICE				
		D203001	Storm Piping	Good	Immediate
D2040	GAS SERVICE				
		D204001	Gas Piping	Poor	Immediate
D2050	WATER HEATING EQUIPMENT				
		D205001	Water Heating Equipment	Poor	Immediate

D2060		**INTERIOR WATER PIPING AND PLUMBING FIXTURES**			
		D206001	Interior Water Piping and Plumbing Fixtures	Poor	Immediate
D30	**HVAC**				
D3040		**DISTRIBUTION SYSTEMS**			
		D304001	HVAC Systems (equipment, ductwork & controls)	Poor	Immediate

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
ELECTRICAL SYSTEMS					
Category	**Topic**	**Code**	**Subtopic**	**Assessment**	
				Condition Rating	**Repair Timeline**
G	**SITE UTILITIES**				
G40	**ELECTRICAL**				
G4010		**SITE ELECTRICAL UTILITIES**			
		G401001	Site Electrical Service to Building	Poor	Immediate
		G401002	Site Communications (Telephone) Service to Building	N/A	Immediate
D	**SERVICES**				
D40	**ELECTRICAL**				
D4010		**ELECTRICAL POWER DISTRIBUTION**			
		D401001	Electrical Panels	Poor	Immediate
		D401002	Grounding	Poor	Immediate
		D401003	Branch Circuits	Poor	Immediate
D4020		**POWER DISTRIBUTION AND CONTROL DEVICES**			
		D402001	Receptacles and Switches	Poor to Failed	Immediate
D4030		**LIGHTING**			
		D403001	Lighting Fixture Types	Poor to Failed	Immediate
		D403002	Exit Lighting and Emergency Lighting	N/A	Immediate
D4040		**COMMUNICATIONS AND SECURITY**			
		D404001	Fiber Optic Service	N/A	Immediate
D4050		**FIRE ALARM SYSTEMS**			
		D405001	Fire Alarm System	N/A	Immediate
D4060		**SECURITY AND DETECTION SYSTEMS**			
		D406001	Intrusion Alarm Systems	N/A	Immediate
D4070		**LIGHTNING HAZARD REDUCTION**			
		D407001	Lightning Protection System	N/A	Immediate

CONDITIONS CATEGORIZED BY REPAIR PRIORITIES

SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES					
IMMEDIATE PRIORITIES					
Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Timeline
G	SITE UTILITIES				
G20	SITE IMPROVEMENTS				
		MISCELLANEOUS STRUCTURES			
		G204901	Mechanical Vaults, Building 2	Failed	Immediate
G40	ELECTRICAL				
G4010		SITE ELECTRICAL UTILITIES			
		G401001	Site Electrical Service to Building	Poor	Immediate
		G401002	Site Communications (Telephone) Service to Building	N/A	Immediate
G90	OTHER SITE CONSTRUCTION				
		SERVICE TUNNELS			
		G901101	Service Tunnels	Failed	Immediate
B	SHELL				
B10	SUPERSTRUCTURE				
B1015		STAIR CONSTRUCTION			
		B101501	Roof Access Points	Fair to Failed	Immediate
B1020		ROOF CONSTRUCTION			
		B102005	Roof Framing, Building 17	Fair to Poor	Immediate
		B102006	Wood Plank Roof Decking	Good to Failed	Immediate
B20	EXTERIOR ENCLOSURE				
B2010		EXTERIOR WALL CONSTRUCTION			
		B201001	Brick Exterior Walls, Building 1	Fair to Failed	Immediate
		B201003	Brick Exterior Walls, Building 2	Fair to Poor	Immediate
		B201004	Brick Exterior Walls, Interconnect 2-3	Fair	Immediate
		B201005	Brick Exterior Walls, Building 17	Fair to Poor	Immediate
B2020		EXTERIOR WINDOWS			
		B202002	Windows, Building 1	Poor to Failed	Immediate
		B202003	Windows, Interconnect 1-2	Fair	Immediate
		B202004	Windows, Building 2	Poor to Failed	Immediate
		B202005	Windows, Interconnect 2-3	Fair	Immediate
B2030		EXTERIOR DOORS			
		B203001	Exterior Doors, Building 1	Poor	Immediate

		B203002	Exterior Doors, Interconnect 1-2	Poor	Immediate
		B203003	Exterior Doors, Building 2	Poor	Immediate
		B203004	Exterior Doors, Interconnect 2-3	Poor	Immediate
		B203005	Exterior Doors, Building 17	Poor	Immediate
		B203006	West Vestibule, Building 1	Poor	Immediate
B30	**ROOFING**				
	B3010	**ROOF COVERINGS**			
		B301001	Roofing System, Building 1	Failed	Immediate
		B301002	Roofing System, Interconnect 1-2	Failed	Immediate
		B301003	Roofing System, Building 2	Failed	Immediate
		B301004	Roofing System, Interconnect 2-3	Failed	Immediate
		B301005	Roofing System, Building 17	Failed	Immediate
C	**INTERIORS**				
C10	**INTERIOR CONSTRUCTION**				
	C3020	**FLOOR FINISHES**			
		C302001	Floor Finishes	Fair to Failed	Immediate
	C1010	**PARTITIONS**			
		C101001	Partition Walls and Finishes	Fair to Failed	Immediate
	C3030	**CEILING FINISHES**			
		C303001	Ceiling Finishes	Failed	Immediate
D	**SERVICES**				
D10	**FIRE PROTECTION**				
	D1020	**FIRE MAIN SUPPLY**			
		D102001	Fire Main Supply – Interior Risers	Poor	Immediate
	D1010	**FIRE MAIN SUPPLY ISOLATION AND INDICATION**			
		D101001	Fire Main Supply – Post Indicator Valves	Poor	Immediate
	D1030	**FIRE SPRINKLERS**			
		D103001	Fire Sprinkler System – Sprinkler Piping & Heads	Poor	Immediate
D20	**PLUMBING**				
	D2010	**WATER SERVICE**			
		D201001	Water Service Piping	Poor	Immediate
	D2020	**SANITARY SERVICE**			
		D202001	Sanitary Service Piping	Poor	Immediate
	D2040	**GAS SERVICE**			
		D204001	Gas Piping	Poor	Immediate
	D2050	**WATER HEATING EQUIPMENT**			
		D205001	Water Heating Equipment	Poor	Immediate
	D2060	**INTERIOR WATER PIPING AND PLUMBING FIXTURES**			
		D206001	Interior Water Piping and Plumbing Fixtures	Poor	Immediate

D30	**HVAC**				
D3040		**DISTRIBUTION SYSTEMS**			
		D304001	HVAC Systems (equipment, ductwork & controls)	Poor	Immediate
D40	**ELECTRICAL**				
D4010		**ELECTRICAL POWER DISTRIBUTION**			
		D401001	Electrical Panels	Poor	Immediate
		D401002	Grounding	Poor	Immediate
		D401003	Branch Circuits	Poor	Immediate
D4020		**POWER DISTRIBUTION AND CONTROL DEVICES**			
		D402001	Receptacles and Switches	Poor to Failed	Immediate
D4030		**LIGHTING**			
		D403001	Lighting Fixture Types	Poor to Failed	Immediate
		D403002	Exit Lighting and Emergency Lighting	N/A	Immediate
		D403003	Exit Lighting and Emergency Lighting		
D4040		**COMMUNICATIONS AND SECURITY**			
		D404001	Fiber Optic Service	N/A	Immediate
D4050		**FIRE ALARM SYSTEMS**			
		D405001	Fire Alarm System	N/A	Immediate
D4060		**SECURITY AND DETECTION SYSTEMS**			
		D406001	Intrusion Alarm Systems	N/A	Immediate
D4070		**LIGHTNING HAZARD REDUCTION**			
		D407001	Lightning Protection System	N/A	Immediate

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES

SHORT-TERM PRIORITIES

Category	Topic	Code	Subtopic	Assessment	
				Condition Rating	Repair Priority
G	**BUILDING SITE WORK**				
G20	**SITE IMPROVEMENTS**				
G2040		**SITE DEVELOPMENT**			
		G204002	Inland Avenue	Poor	Short-Term
G2020		**PARKING LOTS**			
		G202001	North Parking Lot	Poor	Short-Term
		G202002	Northwest Parking Lot	Poor	Short-Term
G2010		**ROADWAYS**			
		G103001	Service Access Roads	Poor	Short-Term

B	**SHELL**				
B20	**EXTERIOR ENCLOSURE**				
		B201002	Brick Exterior Walls, Interconnect 1-2	Fair	Short-Term
	B2030	**EXTERIOR DOORS**			
		B203007	Exterior Overhead Door, Building 2	Poor	Short-Term

SUMMARY OF CONDITION RATING & REPAIR PRIORITIES					
LONG-TERM PRIORITIES					
Category	**Topic**	**Code**	**Subtopic**	**Assessment**	
				Condition Rating	**Repair Priority**
G	**BUILDING SITE WORK**				
G20	**SITE IMPROVEMENTS**				
	G2049	**MISCELLANEOUS STRUCTURES**			
		G204901	Guard Post	Fair	Long-Term
	G2041	**FENCES AND GATES**			
		G204101	Chainlink and Barbwire Fencing	Fair	Long-Term
		G204102	Gate Along Inland Avenue	Fair	Long-Term
		G204103	Turnstile at North Parking Area	Fair	Long-Term
B	**SHELL**				
B10	**SUPERSTRUCTURE**				
	B1010	**FLOOR CONSTRUCTION**			
		B101001	Concrete Slab-on-Grade	Good	Long-Term
	B1020	**ROOF CONSTRUCTION**			
		B102001	Steel Trusses, Building 1	Good	Long-Term
		B102002	Steel Trusses, Interconnect 1-2	Good	Long-Term
		B102003	Steel Trusses, Building 2	Good	Long-Term
		B102004	Steel Trusses, Interconnect 2-3	Good	Long-Term
		B102007	Wood Beams and Purlins	Good	Long-Term
D	**SERVICES**				
D10	**FIRE PROTECTION**				
	D2030	**STORM SERVICE**			
		D203001	Storm Piping	Good	Long-Term

LANDSCAPE ASSESSMENT

G	**BUILDING SITE WORK**		
G20	**SITE PREPARATION**		
	G2059	**OTHER LANDSCAPE FEATURES**	
		G205901	Landform and Topography
		Condition Rating:	N/A
		Repair Timeline:	N/A
Date:	Post-2014	**Contributing:**	Non-Contributing

Description

Level Terrain

The majority of the parcel is relatively level (Figure 2-1), with a constructed stormwater containment system forming a depression near Abbey Road, and a berm forming the bed of the former CSX Rail line along the southern margin of the property. The ground west of Inland Avenue rises a few feet due to the presence of rubble and debris (Figure 2-2). There are also piles of debris behind the buildings (Figure 2-3).

Treatment Recommendations

Removal of piled soil and rubble should occur as part of site development related to opening the property to the public.



Figure 2-1 View across the relatively level terrain of the Wright Company factory property in October 2021. (Source: LSHLA)



Figure 2-2 Rubble west of the Wright Company factory buildings has elevated the ground plane across Inland Avenue from the complex. (Source: LSHLA)



Figure 2-3 View of the terrain behind the buildings, with debris piles in the viewshed. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2059	**OTHER LANDSCAPE FEATURES**	
		G205902	Views and Viewsheds
		Condition Rating:	N/A
		Repair Timeline:	N/A

Date: c. 1910, Post-2014 **Contributing:** Contributing and Non-Contributing

Description

Expansive Views
Expansive views are afforded across much of the property due to the level terrain and lack of built features and woody vegetation (refer to Figure 2-1 and Figure 2-3). These expansive, open views appear to have characterized the property during the Wright Company period, but later became increasingly obscured as the site was developed to accommodate the Inland Manufacturing Division of General Motors. By 1945, the formerly open property had been completely developed with buildings. The open character was restored with the demolition of all but the six surviving buildings in the 2010s. The expansive views are character-defining for the historic property. Visible to the northeast is a cellular communications tower that interferes with these views.

Views to Buildings 1 and 2
From the perimeter of the property, an unobstructed view of the Wright Company factory complex is afforded from Abbey Avenue near West Third Street (Figure 2-4). Views to the complex are limited from West Third Street and the West Branch Public Library property



Figure 2-4 Views of the complex are afforded across the undeveloped area from Abbey Avenue near its intersection with West Third Street. (Source: LSHLA)



Figure 2-5 View north toward the residential neighborhood along Cowart Avenue. (Source: LSHLA)



Figure 2-6 View south along Inland Avenue toward the West Branch Public Library. (Source: LSHLA)



Figure 2-7 View northeast along Inland Avenue. (Source: LSHLA)

to the south. These views are likely similar to those present historically. Like the expansive views across the property, these views were restored in the 2010s through demolition of the General Motors factory buildings and are character-defining for the historic property.

View to the Cowart Street Neighborhood. Views are afforded to the adjacent residential streetscape along Cowart Avenue from the area north of the building complex (Figure 2-5). This view is afforded from one of the parcels being acquired by the federal government. The 1919 Sanborn map indicates that these parcels had been platted by the time the Wright Company factory was in operation, but no residences had yet been built. Several dwellings, however, existed on the property north of Buildings 1 and 2 that are no longer extant where a parking area currently sits. The view to the Cowart Street neighborhood is not consistent with historic conditions and is not character-defining for the historic property.

View to the West Branch Public Library. The newly-constructed West Branch Public Library is also visible from the property, particularly from Inland Avenue (Figure 2-6). This view is a contemporary condition that is not character-defining for the historic property (Figure 2-7).

Treatment Recommendations

To preserve the remaining historic views of the building, development of the northwest corner of the property should not obstruct the view to the west facades.

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2040	**SITE DEVELOPMENT**	
		G204001	General Site Circulation
		Condition Rating:	N/A
		Repair Timeline:	N/A

Date: Multiple **Contributing:** Contributing and Non-Contributing

Description

As noted, the property is edged by public streets to the west (Abbey Avenue) and north (West Third Street), as well as east (Cowart Avenue and South Ardmore Avenue). South Ardmore Avenue was originally known as Putterbaugh Avenue based on review of the 1919 Sanborn map. Although these streets lie outside of the project area, they remain in the same locations as streets present during the Wright Company factory period and are important structuring and character-defining elements of the property.

Also located outside the project area is the alignment of the former CSX rail line that forms the southern boundary of the property. The rail line survives from the period of significance and is character-defining for the property.

Located within the larger property that forms the setting for the Wright Company factory, parcels being acquired by the federal government include portions of Inland Avenue, two service drives, two parking areas, and sidewalks.

Treatment Recommendations

Alteration or upgrades of the existing site circulation should be coordinated with the greater campus development plan, with the introduction of compatible accessibility improvements a primary goal.

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2040	**SITE DEVELOPMENT**	
		G204002	Inland Avenue
		Condition Rating:	Poor
		Repair Timeline:	Short-Term
Date:	Post-2014	**Contributing:**	Non-Contributing

Description

Extending into the property from West Third Street is Inland Avenue. The road occurs within a 50-foot right-of-way. Formerly known as Chester and Coleman roads, Inland Avenue measures approximately 22 feet in width and carries two travel lanes associated with two-way traffic use. The road is paved with asphalt. The road widens at the south end. A concrete sidewalk and curb edge the road to the west, while a concrete curb edges the road to the east. Curb cuts occur in the curbing to the east of the road to mark building entrances with garage doors. The road provides access to the former rail line alignment, now used as a road, north of the building complex, via broad curved intersections. The road is cracked and broken in several places and thus is assessed as in fair condition. As indicated in a 1919 Sanborn Map, Inland Avenue (labeled as Coleman Avenue) follows the historic alignment. It is believed to have been used to convey manufacturing materials to the factory by horse and wagon. It is an important historic feature that survives from the period of significance and contributes to the National Register significance of the property.

Treatment Recommendations

The existing paving should be removed and replaced as needed to provide new parking areas, queuing and gathering areas, and pedestrian circulation.



Figure 2-8 View east across the parking area west of Inland Avenue. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2020	**PARKING LOTS**	
		G202001	North Parking Lot
		G202002	Northwest Parking Lot
		Condition Rating:	Poor
		Repair Timeline:	Short-Term
Date:	1970s	**Contributing:**	Non-Contributing

Description

Parking areas edge Inland Avenue to the east and west near its intersection with West Third Street. The parking area to the west of Inland Avenue (Figure 2-8) is smaller than the parking area east of Inland Avenue (Figure 2-9). Both feature striped asphalt parking spaces arranged into bays edged by concrete curbing. Overhead lighting is set within concrete footers between the bays. Drop inlets covered with steel grates capture stormwater at intervals within the parking areas (Figure 2-10). Both parking areas are in deteriorated condition, with plants growing through cracks in the paving, broken concrete curbing, and missing overhead light fixtures (Figure 2-11). These facilities supported employee parking needs associated with the General Motors factory. They occupy the sites of former residences and rail line spurs leading to coal yards. The parking areas postdate the period of significance and are non-contributing.

Treatment Recommendations

The existing paving should be removed and replaced as needed to provide new parking areas, queuing and gathering areas, and pedestrian circulation.



Figure 2-9 View east across the north parking area east of Inland Avenue. (Source: LSHLA)



Figure 2-10 Catch basin in the pavement at northwest parking lot, looking west. (Source: LSHLA)



Figure 2-11 Catch basin in the pavement at northwest parking lot, looking west. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2010	**ROADWAYS**	
		G103001	Service Access Roads
		Condition Rating:	Poor
		Repair Timeline:	Short-Term
Date:	Undetermined	**Contributing:**	Contributing and Non-Contributing

Description

Paved service access roads extend north and south of the building complex to allow vehicles to reach the rear of the buildings. The service road to the north of the building complex is asphalt. It turns to follow the rear sides of the building after passing Building 17 (Figure 2-12). The road follows the alignment of a former rail line. As such, it is an important historic route of transportation that is character-defining and contributes to the significance of the property.

The road to the south of the building complex is paved with concrete. A concrete curb edges the building. A concrete curb and sidewalk edge the road to the south (Figure 2-13). The date of origin of the southern service road is not currently known. It falls outside of the property being acquired by the federal government. The road appears to postdate the period of significance and is thus assessed to be non-contributing.

Treatment Recommendations

The existing paving should be removed and replaced as needed to provide new parking areas, queuing and gathering areas, and pedestrian circulation.



Figure 2-12 View east along the service access road south of the building complex. (Source: LSHLA)



Figure 2-13 View west along the service access road north of the building complex. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2010	**ROADWAYS**	
		G103002	North Rail Line
		Condition Rating:	Poor
		Repair Timeline:	N/A
Date:	Before 1919	**Contributing:**	Contributing

Description

Evidence of a former rail line that extended north of the building complex survives on the property as of 2023, but is no longer in service for rail use. Rather, the route now serves as a road and is used for parking within the property (Figure 2-14 and Figure 2-15). The rail line is marked as the B&O Railroad line on a 1919 Sanborn map. The presence and location of this rail line was likely a key factor in the Wright brothers choosing this location to build their factory. The rail line served an important purpose in allowing for the transport of manufactured airplanes and related materials to their destination. The alignment and some evidence of the rails survive. The angled form of the north facade of Building 17 conforms to the alignment of the rail line, suggesting that the line remained in use even after Orville Wright sold the property. The rail line is an important historic feature with associations to the Wright Company factory that contributes to the National Register significance of the property.

Treatment Recommendations

Although the rail line is no longer in use, the alignment and any surviving original fabric should be incorporated into future site plans as a way to interpret the historic rail line.



Figure 2-14 View west along the former rail line alignment, with metal rails visible in the pavement. (Source: LSHLA)



Figure 2-15 View west along the former alignment as it passes the building complex (right). (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2010	**ROADWAYS**	
		G103003	South Rail Line
		Condition Rating:	Poor
		Repair Timeline:	N/A
Date:	Before 1919	**Contributing:**	Contributing

Description

Marking the southern boundary of the property is an abandoned CSX rail line set atop a berm. The rail line is obscured by vegetation growth south of the building complex, but open and visible to its southwest (Figure 2-16 and Figure 2-17). This rail line appears on a 1919 Sanborn map as the Soldiers Home Railroad. This route originated as an electric rail line ca. 1890. Located a longer distance to the south of Buildings 1 and 2, this rail line may have been less important to the Wright Company factory operations than the B&O Railroad line. Although no longer in use, the alignment, associated grading, and some rails survive from the period of significance. Despite the fact that the rail line falls outside of the project area, it is an important historic feature with associations to the Wright Company factory that contributes to the National Register significance of the property.

Treatment Recommendations

The abandoned rail line should be considered in site plans for future access and interpretation of the property



Figure 2-16 View east along the CSX rail line south of the property. (Source: LSHLA)



Figure 2-17 View west across the CSX rail line with the West Branch Library beyond. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2049	**MISCELLANEOUS STRUCTURES**	
		G204901	Guard Post
		Condition Rating:	Fair
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Located beyond the steel gate that separates the parking area from the rest of the site is a guard post that closely edges Inland Avenue to the west (Figure 2-18). The building measures approximately 9 feet square. A flat roof forms a box over top of the building, while also covering a concrete pad to the east of the structure. The overhang is supported by steel posts. The box is edged by welded steel panels. The lower half of the building is painted brick masonry set on a concrete foundation. The upper half is a composed of a single large window on the north façade and several lower windows and a door in the west façade. Windows are also in the south and east sides. A bank of clerestory windows is below the roof box. A flagpole is outside the guard post. The guard post postdates the period of significance and is non-contributing.

Treatment Recommendations

The guard post structure post-dates the period of significance and should be considered for removal.



Figure 2-18 View south toward the guard post. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2055	**PLANTING**	
		G205501	Vegetation
		Condition Rating:	N/A
		Repair Timeline:	N/A

Date: N/A

Contributing: Contributing and Non-Contributing



Figure 2-19 Linden trees along the property boundary at West Third Street. (Source: LSHLA)

Description

Trees

Street trees edge West Third Street inside the property fencing (Figure 2-19), as well as Cowart Street outside of the fencing. The trees are little leaf lindens (Tilia cordata). There are several pine trees located along the northern edge of the parking area east of Inland Avenue. An evergreen tree is located east of Building 5. Other trees are located in the eastern corner of the property near South Ardmore Avenue. These trees postdate the period of significance and are non-contributing.

Turf Grass

Turf grass is found in association with the parking area margins. The turf is associated with the parking area development, postdates the period of significance, and is non-contributing.

Meadow

Much of the open landscape is covered with herbaceous grasses and forbs that have grown up through the rubble where factory buildings stood until 2013. When Buildings 1 and 2 were constructed in the 1910s, the site was a cornfield based on photographs from the period. The open character of the meadow recalls the cornfield and is character-defining, although not contributing.

Treatment Recommendations

The existing plantings and vegetation can be protected in place and incorporated into the site rehabilitation plan as needed, but do not hold any historic significance and could also be replaced.

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2041	**FENCES AND GATES**	
		G204101	Chainlink and Barbwire Fencing
		Condition Rating:	Fair
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The fencing that limits visitor access to the 19.717-acre property is standard chain-link fencing supported by steel posts. The posts flare at the top. Barbwire is strung along the top of the fencing (Figure 2-20). Some sections of the fencing are bent, broken, or rusty. The fencing is in fair condition overall. The fencing postdates the period of significance and is non-contributing. .

Smaller chain link gates are set within the fencing at Cowart Avenue and Bish Avenue.

Treatment Recommendations

The chain-link fences post-date the period of significance and should be considered for removal.



Figure 2-20 View south toward fencing along West Third Street. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2041	**FENCES AND GATES**	
		G204102	Gate Along Inland Avenue
		Condition Rating:	Fair
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

A steel gate spans Inland Avenue to control access to the property. The gate is constructed of three double steel posts supporting a steel beam, from which a sliding gate is supported (Figure 2-21). The gate postdates the period of significance and is non-contributing.

Treatment Recommendations

The vehicle gate post-dates the period of significance and should be considered for removal.



Figure 2-21 The steel gate spanning Inland Avenue at the Third Street entrance. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2041	**FENCES AND GATES**	
		G204103	Turnstile at North Parking Area
		Condition Rating:	Fair
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

A covered structure composed of steel posts supporting a flat roof protects a metal turnstile set within the chain-link and barbwire fencing south of the eastern parking area (Figure 2-22). The turnstile allowed pedestrians to enter the factory area of the property during the General Motors period of ownership. The turnstile postdates the period of significance and is non-contributing.

Treatment Recommendations

The turnstile structure post-dates the period of significance and should be considered for removal.



Figure 2-22 The turnstile connecting the parking area east of Inland Avenue with the interior of the property. (Source: LSHLA)

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2044	**SIGNAGE**	
		G204401	Miscellaneous Signage
		Condition Rating:	N/A
		Repair Timeline:	N/A
Date:	Undetermined	**Contributing:**	Non-Contributing



Figure 2-23 The sign near the Inland Avenue entrance along West Third Street indicating the property as the future site of a National Park Service property. (Source: LSHLA)



Figure 2-24 Abandoned “Safety First” sign mounted to the north side of Building 17. (Source: RRJ)

Description

Road Signs

Standard Yield, Stop, One Way, and Do Not Enter traffic control signs are present in association with the parking areas and at the guard post. These signs postdate the period of significance and are non-contributing.

Interpretive Signs

An empty sign frame is located outside of the entrance into Building 1 that likely held an interpretive panel in the past. It postdates the period of significance and is non-contributing

Temporary Signage

Vinyl signs attached to the fence near the West Third Street entrance provide information about the future use of the property as part of the Dayton Aviation Heritage National Historical Park (Figure 2-23). The signage postdates the period of significance and is non-contributing

Abandoned Building Signage

Exterior-mounted signs associated with General Motor’s use of the buildings are still in place. These signs include cautions regarding restricted access and safety (Figure 2-24). These signs postdate the period of significance and are non-contributing.

Treatment Recommendations

All current signage post-dates the period of significance and should be considered for removal where deteriorated. Permanent park signage can be installed as part of site rehabilitation.

G	**BUILDING SITE WORK**		
G20	**SITE IMPROVEMENTS**		
	G2059	**OTHER LANDSCAPE FEATURES**	
		G205901	Utility Features
		Condition Rating:	N/A
		Repair Timeline:	N/A
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

In close proximity of the buildings are several manholes and other utility features. The property also includes fire hydrants in several locations. An older model fire hydrant or woodcock is located along Abbey Avenue (Figure 2-25).

Treatment Recommendations

Abandoned site utilities can be considered for removal.



Figure 2-25 View south toward the older model fire hydrant along Abbey Avenue. (Source: LSHLA)

EXTERIOR CONDITION ASSESSMENT

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2010	**EXTERIOR WALL CONSTRUCTION**	
		B201001	Brick Exterior Walls, Building 1
		Condition Rating:	Fair to Failed
		Repair Timeline:	Immediate
Date:	1910	**Contributing:**	Contributing



Figure 2-26 West facade of Building 1, showing infill of windows and later entry vestibule. (Source: RRJ)

Description

The exterior walls of the structure are triple-wythe brick masonry. The north, south and west sides are part of the original building construction dating to 1910 (Figure 2-26). The west side has undergone some alterations but retains its original form and massing. The original window openings have been partially infilled with brick at an undetermined date. The vestibule at the main entry on the west side is a later alteration and is non-contributing. The existing east side appears to be an infill wall of similar but not identical brick; this wall likely dates to c. 1928 or c. 1929 when the power plant alterations were made to the east end of Building 1 (Figure 2-27). In its original state, Building 1 stood free-standing. A small area of the north wall of Building 1 is still visible at the exterior (Figure 2-28), and portions of the Building 1 exterior walls at north and south are visible from within interior of the neighboring buildings (Figure 2-29). When the power plant was demolished in 2014, the easternmost three bays of Building 1 were also removed, permanently shortening the structure by approximately 55 feet.

The bricks appear to be manufactured from a gray cementitious binder, rather than fired clay, with rounded and semi-angular sand aggregate (Figure 2-30). Units are set in cementitious mortar. Further petrographic analysis is recommended to confirm the composition of the bricks and mortar for future repairs. Brick units measure approximately 8-3/8 inches long by 2-1/2 inches tall by 3-1/2 inches deep with mortar joints measuring between 1/4 and 3/8 inch. Head joints were typically flush with the face of the brick, but bed joint were slightly recessed, emphasizing the horizontal joints. The exterior face of the brick has multiple coats of white paint. Where the paint had debonded, it had removed the surface skin of the brick.

The exterior walls are in typically in fair condition, but the wall at the east side is in poor condition (Figure 2-31 and Figure 2-32). The east wall and the east portion of the north wall exhibits step cracking. The east ends of the north and south walls appear rough with various protruding wythes following the demolition of the power plant. The east wall also contains multiple open penetrations to the interior, allowing for intrusion of water and wildlife. North, south, and west walls are in need of localized brick replacement and repointing (Figure 2-33 and Figure 2-34).

At the interior, brick or concrete pilasters are typically present at truss bearing locations where the steel roof trusses are embedded in the brick masonry walls. Multiple brick pilasters exhibited cracking and displacement at the truss embedment or bearing.

At the interior, much of the brick is covered by later, non-contributing wall finishes. The original window openings with arched brick lintels appear to mostly be intact. The north and south walls side door openings have been altered.

Treatment Recommendations

- Perform a petrographic analysis on the existing mortar to determine an appropriate repointing mix.
- Perform a petrographic analysis on the historic concrete bricks to determine an appropriate mix for producing replacements.
- Repoint the exterior brick mortar joints and replace areas of deteriorated, damaged, or missing bricks.
- Repair cracks in the brick walls as required.
- Remove the existing distressed east wall and install a new exterior wall tied into the existing brick walls at the north and south.
- Clean and recoat the steel lintels and add flashing over the windows at the west wall.
- Remove the metal flashing and repair the masonry parapet coping.



Figure 2-27 East side of Building 1, showing distressed brick masonry wall. (Source: RRJ)



Figure 2-28 North side of Building 1 showing two original windows. (Source: RRJ)



Figure 2-29 South wall of Building 1 from the interior, showing original window opening. (Source: RRJ)



Figure 2-30 Cementitious brick with debonded painted surface. (Source: RRJ)



Figure 2-31 Distressed east side of Building 1. (Source: RRJ)



Figure 2-32 Deterioration of bricks at east parapet of Building 1. (Source: RRJ)



Figure 2-33 West side of Building 1, showing area of brick deterioration. (Source: RRJ)

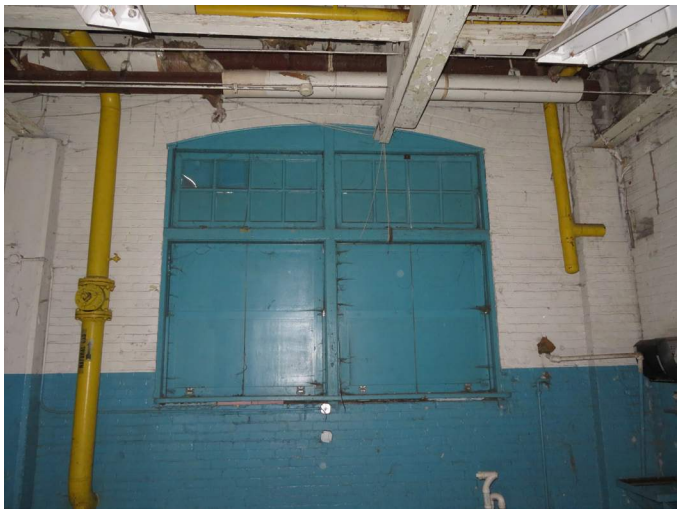


Figure 2-34 Interior of Building 1 window, adjacent to the brick distress at the east wall. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2010	**EXTERIOR WALL CONSTRUCTION**	
		B201002	Brick Exterior Walls, Interconnect 1-2
		Condition Rating:	Fair
		Repair Timeline:	Short-Term
Date:	1925, c. 1949	**Contributing:**	Non-Contributing

Description

Interconnect 1-2 infills the space between Buildings 1 and 2 that was originally open except for a single-bay transfer between the structures (Figure 2-35). Interconnect 1-2 was constructed in several phases after the period of significance associated with the Wright brothers and the aviation manufacturing use of the facility. The east and west walls of the structure are three-wythe brick masonry. The south wall of Building 1 and the north wall of Building 2 serve as the north and south walls of Interconnect 1-2, respectively. The west facade of Interconnect 1-2 has been altered to remove an oversized door or large window; the rough opening for the existing man-door has been covered with plywood. The east side exhibits damaged and unpatched walls where later additions were removed, likely during the 2013-2014 site cleanup (Figure 2-36).



Figure 2-35 West facade of Interconnect 1-2, showing distress to the brick at the embedded lintel. (Source: RRJ)

The east and west exterior walls are in typically in fair condition, The west facade exhibits isolated conditions requiring repair, including linear and step cracking and mortar loss, debonded and failing paint, and corrosion of an embedded steel lintel. At the east side, areas of erosion of the brick masonry and mortar loss are present. The brick used at Interconnect 1-2 appears to be a gray, cementitious brick, similar but not identical to the bricks used at Buildings 1 and 2.



Figure 2-36 East side of Interconnect 1-2, showing stairs to roof and distress to brick masonry. (Source: RRJ)

Treatment Recommendations

- Repoint the exterior brick mortar joints and replace areas of deteriorated, damaged, or missing bricks.
- Repair cracks in the brick walls as required.
- Remove the existing distressed walls and vaults at the east end of the building and patch the brick masonry as required.
- Clean and recoat the steel lintels and add flashing over the window openings at the west wall.
- Remove the metal flashing and repair the masonry parapet coping.

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2010	**EXTERIOR WALL CONSTRUCTION**	
		B201003	Brick Exterior Walls, Building 2
		Condition Rating:	Fair to Poor
		Repair Timeline:	Immediate
Date:	1911, 1925	**Contributing:**	Contributing and Non-Contributing



Figure 2-37 West facade of Building 2. (Source: RRJ)

Description

Similar to Building 1, the exterior walls of Building 2 are triple-wythe brick masonry. The north, south, and west sides are part of the original building construction. The original east side of Building 2 was removed c. 1925 when Building 2 underwent a major alteration and the facility transitioned from aviation to automotive manufacturing. In its existing form, Building 2 is approximately two bays longer than the original 1911 footprint.

The west facade of Building 2 has undergone some alterations but retains its original form and massing (Figure 2-37). The central door is now an overhead door rather than sliding doors as seen in the 1911 photographs, and the side windows have been infilled with brick. Multiple semi-attached utility structures are present at the east end of Building 2 (Figure 2-38). These structures are in poor to failed condition and were damaged by the 2013 - 2014 demolition. Because the utility structures were constructed after the period of significance associated with the Wright brothers and the aviation manufacturing use of the facility, they are non-contributing and should be removed.

The north and south walls of Building 2 are now entirely enclosed by Interconnect 1-2 and Interconnect 2-3 (Figure 2-39). At the interior, much of the brick is covered by later, non-contributing wall finishes. The original window openings with arched brick lintels appear to mostly be intact. The north and south walls side door openings have been altered.

The exterior walls are typically in fair condition. The west wall exhibits failed paint and brick deterioration at grade (Figure 2-40). The east wall exhibits efflorescence, staining, and evidence of past repairs. Multiple layers of paint were observed at the exterior walls within Building 2; similar to Building 1, where the exterior paint has debonded, it has removed the surface skin of the cementitious brick.

Brick pilasters are present at the building interior, two wythes deep and three bricks wide, where steel roof trusses bear upon the masonry walls. Multiple brick pilasters exhibited cracking, step cracking, bulging, or displacement at the location of truss embedment or bearing (Figure 2-41).

Treatment Recommendations

- Repoint the exterior brick mortar joints and replace areas of deteriorated, damaged, or missing bricks.
- Remove areas of failed exterior coating, and analyze the brick to determine if recoating is recommended.
- Repair cracks in the brick walls as required.
- Remove the existing distressed walls and vaults at the east end of the building and patch the brick masonry as required.
- Clean and recoat the steel lintels and add flashing over the openings at the west wall.
- Remove the metal flashing and repair the masonry parapet coping.



Figure 2-38 East side of Building 2, showing distressed utility structures. (Source: RRJ)

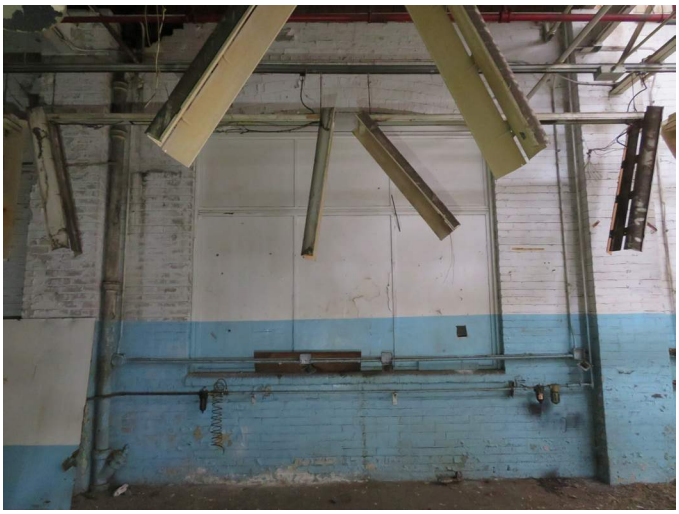


Figure 2-39 South wall of Building 2 as visible from the interior with original window opening. (Source: RRJ)



Figure 2-40 Deterioration of brick and mortar joints at grade at west facade. (Source: RRJ)

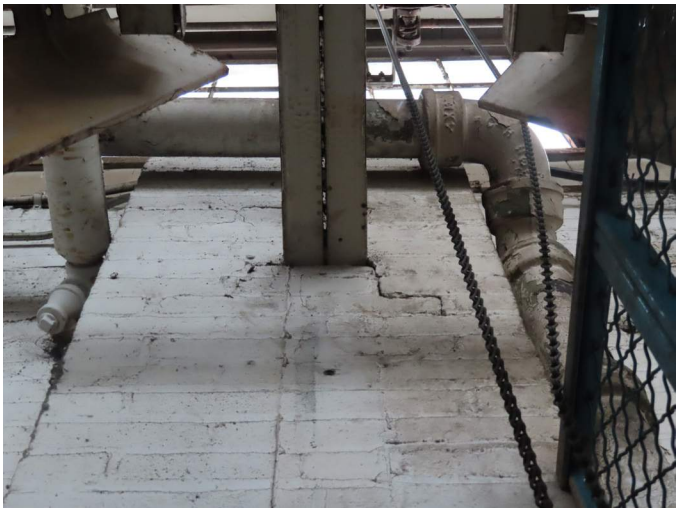


Figure 2-41 Distress to brick at roof truss embed location at brick pier in Building 2. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2010	**EXTERIOR WALL CONSTRUCTION**	
		B201004	Brick Exterior Walls, Interconnect 2-3
		Condition Rating:	Fair
		Repair Timeline:	Immediate
Date:	1923, 1925, 1934	**Contributing:**	Non-Contributing

Description

Interconnect 2-3 is situated between Buildings 2 and 3. The eastern half of Interconnect 2-3 appears to have been constructed concurrently with Building 3 in 1923 when the facility transitioned from aviation to automotive manufacturing, while the western half was infilled years later in two phases, c. 1925 and c. 1934. Interconnect 2-3 was constructed after the period of significance associated with the Wright brothers and the aviation manufacturing use of the facility.

The east and west walls of the structure are three-wythe brick masonry. The south wall of Building 2 serves as the north wall of Interconnect 2-3. The interconnect does not have a dedicated south or east wall and is open to the interior of Building 3. The west facade of Interconnect 2-3 has been altered to infill doors or windows with brick (Figure 2-42).



Figure 2-42 West facade of Interconnect 2-3, showing infilled doors or windows.(Source: RRJ)

The west exterior wall is in typically in fair condition and exhibits isolated conditions requiring repair, including brick cracking and mortar loss, debonded and failing paint, and corrosion of an embedded steel lintel. The brick used at Interconnect 2-3 appears to be a gray, cementitious brick at the west facade, similar but not identical to the bricks used at Buildings 1 and 2 and Interconnect 1-2. At the east side, the brick appears to be buff, fired clay brick (Figure 2-43).



Figure 2-43 East side of Interconnect 2-3 and Building 3. (Source: RRJ)

Treatment Recommendations

- Repoint the exterior brick mortar joints and replace areas of deteriorated, damaged, or missing bricks.
- Remove areas of failed exterior coating, and analyze the brick to determine if recoating is recommended.
- Repair cracks in the brick walls as required.
- Remove the existing distressed walls and
- Clean and recoat the steel lintels and add flashing over the openings at the west wall.
- Remove the metal flashing and repair the masonry parapet coping.

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2010	**EXTERIOR WALL CONSTRUCTION**	
		B201004	Brick Exterior Walls, Building 17
		Condition Rating:	Fair to Poor
		Repair Timeline:	Immediate
Date:	1935, 1937, 1960s	**Contributing:**	Non-Contributing

Description

Building 17 was constructed in 1935, expanded in 1937, and altered in the 1960s (Figure 2-44). This structure dates to after the period of significance associated with the Wright brothers and the aviation manufacturing use of the facility. The building was constructed as an addition to Building 1. The north side of Building 1 serves as the south wall for Building 17, however, the two buildings are mostly structurally separate.

The exterior walls of Building 17 are multi-wythe brick masonry. The exterior walls are typically in fair to poor condition, exhibiting widespread areas of brick deterioration, brick cracking, mortar deterioration, as well as evidence of significant water intrusion through the brick masonry parapets. At the west and north sides, the openings for tall, narrow windows have been infilled with brick. Embedded steel lintels exhibit step-cracking in the adjacent brick related to expansive forces from steel corrosion (sometimes called “rust jacking”). The east wall of Building 17 has several smaller utility additions and a short tower structure (Figure 2-45). These structures are in poor condition and should be removed.

The bricks appear to be gray, cementitious units, similar but not identical in color or size to those at Buildings 1 and 2. Mortar joints appear to be uniformly tooled at head joints and bed joints are tooled to a slightly rake or concave profile.

Treatment Recommendations

Building 17 post-dates the period of significance and should be considered for removal.



Figure 2-44 West facade of Building 17. (Source: RRJ)



Figure 2-45 East side of Building 17, showing distressed utility structures. (Source: RRJ)

B	**SHELL**		
B30	**ROOFING**		
	B3010	**ROOF COVERINGS**	
		B301001	Roofing System, Building 1
		B301002	Roofing System, Interconnect 1-2
		B301003	Roofing System, Building 2
		B301004	Roofing System, Interconnect 2-3
		B301005	Roofing System, Building 17
		Condition Rating:	Failed
		Repair Timeline:	Immediate
Date:	2000s	**Contributing:**	Non-Contributing



Figure 2-46 EPDM roofing at Building 1, looking west from the east end of the roof with Interconnect 1-2 clerestory at left. (Source: RRJ)

Description

The existing roofing system over all buildings is a black EPDM single-ply membrane over a single layer of polyisocyanurate insulation (Figure 2-46 through Figure 2-48). The roof structure over Buildings 1 and 2 slopes from the center point (ridge) to internal drains located at the edge of Building 17 and at the interconnects (Figure 2-49).

The roofing system has failed in place and is no longer providing weather protection to the building. Numerous locations of open seams and punctures in the membrane were observed (Figure 2-50). The insulation is wet, and water damage to the roof sheathing board is occurring in multiple areas. Wide-spread debonding of the EPDM membrane has also occurred, which makes the membrane vulnerable to tear-off during high wind events.

At Buildings 1 and 2 and the interconnects, a few locations of holes through the roofing and deck to the interior were observed, which represent a life-safety hazard; park staff should

take safety precautions when accessing these roofs. At Building 17, numerous locations of holes were observed through the roof structure that allow significant water intrusion into the building interior, causing damage to Building 17 and the north side of Building 1 (Figure 2-51). The roof of Building 17 is unsafe, especially the transition at the north wall of Building 1. The roof of Building 17 should not be accessed.

Treatment Recommendations

The existing roofing should be removed to the roof deck and replaced at all locations.



Figure 2-47 Building 1 roof, looking northwest over Building 17. (Source: RRJ)



Figure 2-48 Building 2 roof, looking east with Interconnect 1-2 at left. (Source: RRJ)



Figure 2-49 Internal drain at Building 1 against the north wall of Interconnect 1-2. (Source: RRJ)



Figure 2-50 Hole through the roof and decking of Building 1. (Source: RRJ)



Figure 2-51 Roof of Building 17, multiple areas of roof structure failure are visible. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202001	Skylight, Building 1
		Condition Rating:	N/A
		Repair Timeline:	N/A

Date: 1910 (Demolished) **Contributing:** Contributing

Description

Building 1 was originally constructed with a gabled skylight that ran the majority of the length of the building from east to west, starting to the west of the front offices and terminating one bay shy of the east side (Figure 2-52). Building 2 was not originally constructed with a skylight. The skylight was glazed on the north slope and had three ventilation monitors, and the south slope was roofed. This was a traditional practice for skylights to maximize the available light and minimize solar heating and glare at the interior. The gable ends were clad with flat-seam sheet metal. At an undetermined date, the skylight was removed, potentially during the addition of the power plant in the late 1920s which also demolished the east end of the skylight. The original skylight framing is still present, and a new skylight could be installed in the original location (Figure 2-53).

Treatment Recommendations

The skylight for Building 1 is a non-extant character defining feature and should be considered for restoration. A new skylight system of compatible design can be installed.



Figure 2-52 1910 photograph of Building 1 under construction showing the skylight. (Source: Wright State University Archive.)



Figure 2-53 Building 1 skylight from roof of Interconnect 1-2, looking northwest. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2030	**EXTERIOR DOORS**	
		B203006	West Vestibule, Building 1
		Condition Rating:	Poor
		Repair Timeline:	Immediate

Date: 1934 **Contributing:** Non-Contributing

Description

A projecting vestibule was constructed at the main entry on the west facade of Building 1 in 1934 (Figure 2-54). The vestibule is multi-wythe brick construction with a battered profile to match the profile of the interconnects between Buildings 1 and 2. The north and south sides have tall window openings with modern vinyl window units with interior false muntins. The west wall door opening has been infilled with an aluminum storefront system of undetermined date. The roofing is an asphaltic built-up roof over wood plank deck with galvanized steel gutters and downspouts; the gutter at the north eave is missing. The coping flashing at the parapet is also galvanized steel.

The vestibule is in poor condition. The exterior bricks are painted and exhibit step cracking, erosion, spalling, and mortar loss (Figure 2-55). The roofing system has failed, exposing the wood plank deck and allowing water intrusion into the vestibule interior.

Treatment Recommendations

The vestibule post-dates the period of significance and can be considered for removal.



Figure 2-54 West entry vestibule at Building 1. (Source: RRJ)



Figure 2-55 North side of vestibule showing modern window unit and distress to the bricks. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2030	**EXTERIOR DOORS**	
		B203001	Exterior Doors, Building 1
		B203002	Exterior Doors, Interconnect 1-2
		B203003	Exterior Doors, Building 2
		B203004	Exterior Doors, Interconnect 2-3
		B203005	Exterior Doors, Building 17
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing**:	Non-Contributing

Description

The exterior doors at all buildings are of various materials, styles, and appear to have been installed at multiple, undetermined dates. None of the extant exterior doors appear to date to the period of significance associated with the Wright Company or the aviation manufacturing use of the facility.

Several doors are missing, and the rough openings are infilled with plywood (Figure 2-56 and Figure 2-61. The doors are generally in poor condition. Hollow metal doors are corroded with loss of section at the sill (Figure 2-57 through Figure 2-60). Door hardware in many locations is not functional, and most doors have been locked or mechanically secured in place from the interior.

Treatment Recommendations

No historic doors are extant, and all the existing doors are in poor condition. All doors should be removed and replaced. At the west facades, doors of a design compatible with the early photographs should be installed.



Figure 2-56 Infilled door opening at west facade of Interconnect 1-2. (Source: RRJ)



Figure 2-57 Exterior hollow metal door with wire glass panel at east side of Interconnect 1-2. (Source: RRJ)



Figure 2-58 Exterior hollow metal door at east side of Building 2. (Source: RRJ)



Figure 2-59 Exterior hollow metal door at east side of Building 2. (Source: RRJ)



Figure 2-60 Exterior door at east side of Building 2 in a modified rough opening. (Source: RRJ)



Figure 2-61 Infilled door opening at west facade of Building 17. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2030	**EXTERIOR DOORS**	
		B203007	Exterior Overhead Door, Building 2
		Condition Rating:	Poor
		Repair Timeline:	Short-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The west facade of Building 2 currently has a multi-panel overhead door that was installed at an undetermined date but is not original to the building (Figure 2-62). In c. 1911 photographs of Building 2, this door was originally a double sliding door. The rough opening appears to be the same dimensions as seen in the c. 1911 photographs.

The overhead door is in poor condition. At the time of the October 2021 physical investigation, the door had recently been reinstalled to close this opening which was previously open to the elements (Figure 2-63).

Treatment Recommendations

An overhead door is unlikely to be required as part of the rehabilitation program. The existing door should be removed and the door opening infilled with a wall system to recreate the appearance of the 1911 sliding doors. The side doors should be reinstalled to match the appearance of the historic doors.



Figure 2-62 Overhead door at west facade of Building 2, from exterior. (Source: RRJ)



Figure 2-63 Overhead door at west facade of Building 2, from interior. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202002	Windows, Building 1
		Condition Rating:	Poor to Failed
		Repair Timeline:	Immediate
Date:	1910, 1920s, 1943, and Undetermined	**Contributing:**	Contributing and Non-Contributing

Description

The original 1910 windows were wood units. The windows were approximately 10-feet wide by 8-feet tall with a infill panel at the segmental arch lintel and were regularly spaced centered at each structural bay between brick piers. At the west facade, the window lintels were flat. The windows were divided into four sashes: two 16-lite lower sashes and two 8-light transom sashes above a dividing rail. The sashes were tilt-in units operated by handle at the lower sash and pull chain at the transom sash. Glazing was single pane vision glass.

Many of the exterior windows at Building 1 are partially concealed behind later interior finishes. Remnants of the original 1910 windows appear to be extant in the majority of the window openings at Building 1 (Figure 2-64 and Figure 2-65), but it is currently undetermined if any locations of a complete original window still exist. Profiles of the window frames and muntins appear to match those visible in the 1910 historic photographs. In multiple locations, the transom sashes and frames are still in place, with the lower sashes having been replaced or infilled with placed at later dates.

Along the north wall, the original wood frame appears to still be in place, but the sashes were replaced with glass block set in wood filler strips in 1943 at all windows that shared a common wall with Building 17 (Figure 2-66).



Figure 2-64 Mostly intact 1910 window at north side of Building 1, with later exterior security wire. (Source: RRJ)



Figure 2-65 Intact transom at window on south side, visible from Interconnect 1-2. (Source: RRJ)

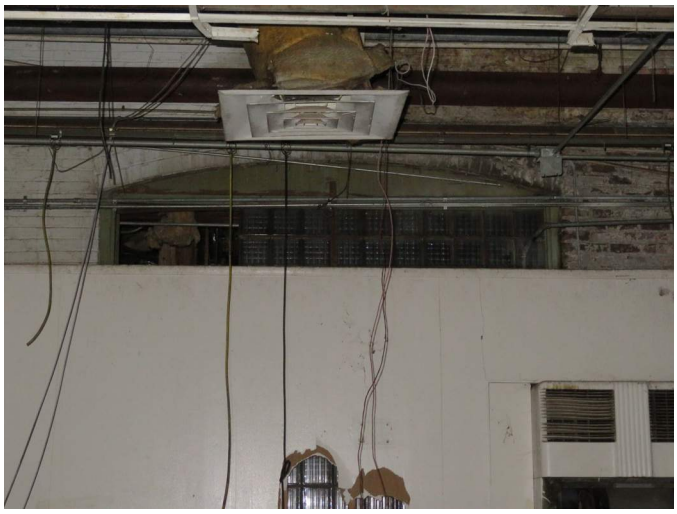


Figure 2-66 North wall window partially visible with glass blocks at Building 17. (Source: RRJ)



Figure 2-67 West facade windows from interior, showing modern replacement units. (Source: RRJ)



Figure 2-68 North wall window showing two shades of green. (Source: RRJ)

At the easternmost bays of Building 1, the south windows were replaced with larger steel windows, likely in the late-1920s with the expansion of Interconnect 1-2 and the construction of the power plant at the east end of Building 1.

At the west facade, the north window has been infilled with brick and the south window has been replaced with a modern white vinyl unit with internal false muntins and has been covered with plywood on the interior (Figure 2-67).

The windows had multiple layers of failed paint. At the remaining exterior units on the north side, multiple coats of white were observed over what appeared to be traces of a faded green directly applied to the wood (Figure 2-68). At the interior, the windows were painted multiple colors, with layers of white, teal blue, and yellow appearing to be later paint applications as they extended onto later partition walls. At the north wall windows, the two paint layers immediately adjacent to the wood were similar shades of green; these two green paint layers are similar to the paint layers in the clerestory of Interconnect 1-2, suggesting these colors date to at least the 1920s. Further analysis of painted finishes is recommended to determine if any remnants of the original paint colors still exist.

The existing window components were in fair to failed condition. A full assessment of all existing windows was not possible due to the presence of interior finishes concealing many units. Sufficient historic fabric and photographic documentation exist to fabricate replacement windows to match the original 1910 windows.

Treatment Recommendations

No historic windows are fully extant but sufficient material remains of the 1910-11 windows to fabricate reproduction units. Likely all of the existing windows at the main floor will need to be replaced with modern units.

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202003	Windows, Interconnect 1-2
		Condition Rating:	Fair
		Repair Timeline:	Immediate

Date: 1925, 1940s **Contributing:** Non-Contributing

Description

The clerestory windows at Interconnect 1-2 are steel multi-lite units with tilt-in ventilators (Figure 2-69). The windows are single-pane and interior glazed. There are two eras of steel windows present. The eastern half of the clerestory was constructed in 1925; these windows appear to be Fenestra steel windows, given the characteristic overlapping muntin joint (Figure 2-70). The interconnect was expanded in 1941, and the western half of the clerestory was constructed in the 1940s.

The windows are generally in fair condition, with minor corrosion to steel surfaces and isolated areas of damage to the framing members. Glazing putty has failed. Many of the ventilators are partially operable, and the operator mechanism is still in place but needs repair (Figure 2-71). The exterior frames appear to have been painted silver. The interior frames appear to have remnants of at least two layers of green paint. Further finishes analysis is needed to determine if the original colors can be identified.

Treatment Recommendations

The clerestory windows appeared to be suitable for restoration. The existing lights can be removed, cleaned and reinstalled, or replaced in the restored sashes. Sashes and frames should be cleaned, repaired, and repainted. For security purposes, consider securing the ventilators in a fixed position.



Figure 2-69 North side of the clerestory windows of Interconnect 1-2, looking west. (Source: RRJ)



Figure 2-71 Rack and pinion-style ventilator operator mechanism at 1940s window. (Source: RRJ)



Figure 2-70 Overlapping muntin at 1925 windows, characteristic of Fenestra brand windows. (Source: RRJ)

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202004	Windows, Building 2
		Condition Rating:	Poor to Failed
		Repair Timeline:	Immediate
Date:	1911	**Contributing:**	Contributing



Figure 2-72 South wall window infilled with masonite panels, visible from Interconnect 2-3. (Source: RRJ)



Figure 2-73 North wall window viewed from Building 2 interior, the lintel is just visible above the interior finishes. (Source: RRJ)

Description

The original windows at Building 2 were substantially similar to those at Building 1.The exterior windows at Building 2 are partially or entirely concealed behind later interior finishes (Figure 2-72 and Figure 2-73). It is currently undetermined if any locations of a complete original window still exist. Where visible from Interconnect 2-3, the windows at the south side appeared to have had the sashes removed and were infilled with masonite panels.

Treatment Recommendations

No historic windows are fully extant but sufficient material remains of the 1910-11 windows to fabricate reproduction units. Likely all of the existing windows at the main floor will need to be replaced with modern units.

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202005	Windows, Interconnect 2-3
		Condition Rating:	Fair
		Repair Timeline:	Immediate

Date: 1924, 1935 **Contributing:** Non-Contributing

Description

The clerestory windows at Interconnect 2-3 are steel multi-lite units with tilt-in ventilators (Figure 2-74). The windows are single-pane and interior glazed. There are two eras of steel windows present. The eastern half of the clerestory was constructed in 1925; these windows appear to be Fenestra steel windows, given the characteristic overlapping muntin joint. The western half of the clerestory was constructed in 1934.

The windows are generally in fair condition, which minor corrosion to steel surfaces and isolated areas of damage to the framing members. Glazing putty has failed. Many of the ventilators are partially operable but in need of repair. The gang ventilator operator is labeled “The T. J. Callahan Co. Sash Operators / Dayton O / Patented Pending / 780A2” (Figure 2-75). The T. J. Callahan Co. company name came into use in 1920; its successor company Dayton Metal Products is still in operation. Both the 1925 and 1934 windows appear to be Fenestra brand. The exterior frames were painted silver. The interior frames appear to have remnants of at least two layers of green paint. Further finishes analysis is needed to determine if the original colors can be identified.

At the east end of the shared wall with Building 1, the Building 1 windows have been altered into large multi-lite steel windows. These windows are generally in fair condition but have broken and missing glazing.



Figure 2-74 Clerestory windows at south side, showing ventilator. (Source: RRJ)



Figure 2-75 T. J. Callahan Co. ventilator operator with pull chain. (Source: RRJ)

Treatment Recommendations

The clerestory windows appeared to be suitable for restoration. The existing lights can be removed, cleaned and reinstalled, or replaced in the restored sashes. Sashes and frames should be cleaned, repaired, and repainted. For security purposes, consider securing the ventilators in a fixed position.

B	**SHELL**		
B20	**EXTERIOR ENCLOSURE**		
	B2020	**EXTERIOR WINDOWS**	
		B202006	Windows, Building 17
		Condition Rating:	N/A
		Repair Timeline:	N/A
Date:	1935	**Contributing:**	Non-Contributing

Description

No windows for Building 17 are extant. All window openings have been infilled with brick (Figure 2-76 and Figure 2-77).

Treatment Recommendations

Building 17 post-dates the period of significance and should be considered for removal.



Figure 2-76 West facade of Building 17, showing infilled window openings. (Source: RRJ)



Figure 2-77 North side of Building 17, showing approximate extents of infilled window openings in red. (Source: RRJ)

G	**BUILDING SITEWORK**		
G20	**SITE IMPROVEMENTS**		
	G2049	**MISCELLANEOUS STRUCTURES**	
		G204901	Mechanical Vaults, Building 2
		Condition Rating:	Failed
		Repair Timeline:	Immediate

Date: Undetermined **Contributing:** Non-Contributing

Description

Several semi-attached utility vaults are present at the east side of Building 2 (Figure 2-78). The utility vaults are multi-wythe brick construction. The east side of Building 2 has undergone multiple campaigns of alteration and expansion; the construction dates for the vaults are undetermined but likely date to after 1923 and later. The vaults were damaged by the 2013-2014 demolition and are heavily deteriorated (Figure 2-79).

Treatment Recommendations

The utility vaults post-date the period of significance and should be considered for removal.



Figure 2-78 Electrical vault at east end of Building 2. (Source: RRJ)



Figure 2-79 Deterioration of damaged wall of utility vault at east end of Building 2. (Source: RRJ)

G	**BUILDING SITEWORK**		
G90	**OTHER SITE CONSTRUCTION**		
	G9011	**SERVICE TUNNELS**	
		G901101	Service Tunnels
		Condition Rating:	Failed
		Repair Timeline:	Immediate

Date: Undetermined / Before c. 1960 **Contributing:** Non-Contributing

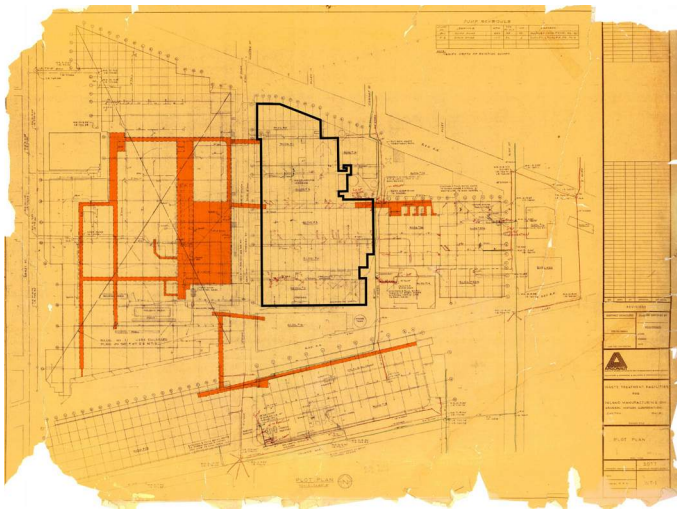


Figure 2-80 Inland Manufacturing site plan c. 1970, with site tunnels and basement levels highlighted. The current footprint of the Wright Company factory building is indicated in black. (Source: 1970 drawings)



Figure 2-81 Tunnel at west end of Interconnect 2-3, showing access ladder and flooding. (Source: RRJ)

Description

Three service tunnels are present that partially extend under the footprint of the Wright Company factory. The tunnel at Building 1 can be accessed via an exterior stair on the west facade of Building 1. The tunnels at Interconnect 2-3 can be accessed from interior entries.

The construction date for these tunnels is currently undetermined. Building 1's tunnel appears on a 1920s Inland Manufacturing site plan. The extent of the tunnel system is clearly marked on a storm sewer plan prepared for Inland Manufacturing sometime between 1964 and 1973 (Figure 2-80). At one time, an extensive network of tunnels and basement levels extended under Building 11 (now demolished) to the west and Building 20 (now demolished) to the east. It is currently unclear if the tunnels under Buildings 11 and 20 were infilled or removed as part of the demolition or if they are still in place. At the time of the physical investigation in October 2021, the tunnels were flooded and unable to be assessed (Figure 2-81 and Figure 1-149).

Based on the findings of the Phase II Environmental Assessment, the flood water is likely contaminated with a variety of environmental toxins, including TCE, VOCs, and heavy metals. Biological contaminants are also likely present.

Treatment Recommendations

When the flood water can be removed and the vaults safely accessed, the vaults should be surveyed to determine the remaining extents of tunnels. If they will not be incorporated into the rehabilitation, the vaults and tunnels should be backfilled. Additional treatment of the tunnel system to mitigate vapor migration may also be required.

STRUCTURAL ASSESSMENT

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1010	**FLOOR CONSTRUCTION**	
		B101001	Concrete Slab-on-Grade
		Condition Rating:	Good
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Not Assessed

Description

A concrete slab-on-grade is present at all five buildings. The flooring elevation at Building 2 is slightly higher than Building 1; a ramp is located within the footprint of Interconnect 1-2 at approximately the midpoint of the buildings.

The existing slab-on-grade in Building 1 does not appear to be the original floor construction. In the historic photograph taken while Building 1 was under construction, the flooring appeared to be unfinished dirt (Figure 2-82). Photographs taken later in 1910 show wood plank flooring in the front offices and in the machine shop located in the eastern half of Building 1. In the General Assembly area, the flooring appears to be an unfinished concrete or mud slab with embedded wood sleepers, potentially to receive future wood flooring; this area is now a solid concrete slab without sleepers. Wood sleepers embedded in the slab are present in the easternmost room of Building 1 under the existing composite wood panel flooring, but they appear to be different from those shown in the historic photographs (Figure 2-83). A core made through the slab in this room indicated that the slab at this location is approximately six inches thick and set directly on soil without a gravel drainage bed. No steel reinforcing was observed in the core (Figure 2-84).



Figure 2-82 Excerpt from 1910 photograph of Building 1 General Assembly room floor, showing wood sleepers in concrete or mud slab. (Source: Wright State University Archive)



Figure 2-83 Existing wood sleepers under composite wood flooring panels in the east room of Building 1. (Source: RRJ)

The existing slab-on-grade in Building 2 does not appear to be the original floor construction. It was unclear whether the existing slabs in the other buildings were original construction or later alterations.

The concrete slabs-on-grade generally appeared to be structurally sound and in serviceable condition, suitable for supporting standard loads for office and assembly occupancies (Figure 2-86). Minor cracks and surface scaling were observed throughout the buildings. Isolated trip hazards were observed in the form of uneven floor levels. In the westernmost room of Building 2, small service pits and a trench drain are present in the slab and will need to be removed (Figure 2-85).

Treatment Recommendations

While the existing slabs are generally appear serviceable, removal and replacement will likely be required. There is no sub-slab vapor retarder, which may limit floor finishes that can be installed. Additionally, with the site soil contamination and soil gas issues, a sub-slab vapor mitigation system may be required and a vapor impermeable membrane may be recommended under the new slab. The high water table in the area may also warrant installing a continuous sub-slab waterproofing membrane instead of a standard vapor retarder.



Figure 2-84 Core through concrete slab in Building 1, showing soil directly below slab.



Figure 2-85 Concrete slab with trench drain and small service pits in Building 2. (Source: RRJ)



Figure 2-86 Concrete slab in Building 17 partly obscured by debris. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1015	**STAIR CONSTRUCTION**	
		B101501	Roof Access Points
		Condition Rating:	Fair to Failed
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Not Assessed

Description

The roof is accessed from the exterior at the east wall of Building 2 via a set of steel stairs (Figure 2-87). The stairs have failed in place; there are loose railing components and a missing tread. The roof edge at the top of the stairs is not secured against falls. Other points of access to the roof at the east side of the complex have been removed, and wire mesh has been installed around the remaining stair in an attempt to secure the roof against trespassers.

Access to the interconnect roofs is provided by steel ladders (Figure 2-88). The ladders were generally in fair condition with minor surface corrosion.

Treatment Recommendations

The existing roof stairs and ladders should be removed and replaced with modern, code compliant roof access systems. Roof access paths should be secured against trespassers.



Figure 2-87 Roof stairs at Building 2 with missing tread and loose railing components. (Source: RRJ)



Figure 2-88 Ladder to roof of Interconnect 1-2. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102001	Steel Trusses, Building 1
		Condition Rating:	Good
		Repair Timeline:	Long-Term
Date:	1910, 1923	**Contributing:**	Contributing and Non-Contributing

Description

Ten steel trusses are present within Building 1, comprising its roof-supporting structure (Figure 2-89 and Figure 2-90). These trusses are part of the original building construction. As originally constructed, the building was 13 bays long and likely contained 12 steel trusses. The two eastern-most of the trusses were likely removed c. 1926 when the east end of Building 1 was altered into the power plant. The power plant was demolished in 2013-2014. Multiple trusses at the west end of Building 1 were concealed by interior finishes and could not be fully assessed.

Each truss spans approximately 60 feet in the north-south direction and has the form of a modified Pratt truss, containing eight symmetrical and diagonally-braced panels. All truss members consist of double-angle sections. Vertical members connect panel points at top and bottom chords. Vertical members at either end of the truss are typically embedded within brick masonry walls. The bottom chord is constructed of two sections which meet at a splice connection at the truss centerline. The truss top chord is constructed of two members which slope upwards from each bearing end at an angle of about seven degrees to meet at the truss centerline. The truss measures approximately four tall at the ends, and eight feet and four inches tall at centerline. Members are connected at all panel points with gusset plates and riveted connections.



Figure 2-89 South portion of truss at east end of Building 1, showing Pratt truss configuration. (Source: RRJ)



Figure 2-90 Overview of trusses within Building 1, looking west. (Source: RRJ)

The trusses in Building 1 are spaced approximately 17'-6" on center. Timber rafters span the distance between trusses to panel points along the truss top chord, with the exception of panel points at the ends. Longitudinal cross-bracing using metal tie rods is present within at least one bay of Building 1. These ties connect the center top panel point of one truss to the center bottom panel point of its neighbor, and the same in reverse. Horizontal lateral braces consisting of angle sections are located at the bottom and top panel points at the truss centerline in every bay (Figure 2-91). Both types of lateral bracing are visible in the 1910 photographs.

At Building 1, a short vertical member extends from the top chord at the truss centerline (Figure 2-92). This vertical member provided support for the skylight ridge beam. Although the roof of Building 1 maintains the shape of the original skylight, the skylight framing appears to have been replaced with wood decking at an undetermined date.

The Building 1 trusses were generally observed to be in good condition. Minor web crimping was observed in one vertical member within the third truss from the west (Figure 2-93). Rivets were generally in good condition without distress or corrosion. At the northeast building corner, an exposed vertical member, which was originally embedded within the exterior masonry wall, was observed to be unpainted. Isolated instances of water infiltration and moisture staining were observed at trusses, especially along the south wall where the roofing of Building 17 has failed. Masonry cracking at the embedded truss bearing ends may indicate that the embedded steel is corroding.

It is unclear from the 1910 photographs if the trusses were painted; they do not appear to have been painted white like the underside of the roof deck. Currently, there are multiple failed paint layers of varying colors, including green, beige, and white, with green appearing to be the paint layer closest to the steel surface. Finishes analysis is recommended to determine if the original colors can be determined.

Treatment Recommendations

- Inspect each truss member for evidence of crimping or buckling and perform repairs as required.
- Expose bearing ends of each truss, clean the steel, and apply a corrosion-resistant coating before reinstalling the masonry.
- Remove existing paint and repaint trusses.



Figure 2-91 Centerline of Pratt truss. (Source: RRJ)



Figure 2-92 Vertical member off truss top chord supporting skylight ridge beam. (Source: RRJ)



Figure 2-93 Crimped web member observed within the third truss from west in Building 1. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102002	Steel Trusses, Interconnect 1-2
		Condition Rating:	Good
		Repair Timeline:	Long-Term
Date:	1925, c. 1949	**Contributing:**	Non-Contributing

Description

Seven steel trusses are present within Interconnect 1-2, comprising its roof-supporting structure. Multiple trusses within Interconnect 1-2 are concealed from view at one side by interior finishes and could not be fully assessed.

Each truss spans approximately 21 feet in the north-south direction and is a combined triangular Fink truss atop a parallel-chord, cross-braced truss (Figure 2-94 and Figure 2-95). It is likely that the upper Fink truss functions to resist gravity loads from the roof, and that the lower portion of the truss serves as lateral bracing. As in Building 1, members are connected at all panel points with gusset plates containing rivet connections.

The triangular Fink truss is symmetrical and contains four diagonal members and one central vertical member composed of single angle sections. The Fink truss is 55 inches tall at its apex. The top chord consists of double-angle members sloped at approximately 17 degrees. The bottom chord, which doubles as the top chord of the parallel-chord truss, consists of a double-angle section

The parallel-chord truss contains four single-angle diagonal members connected to a central hexagonal gusset plate, which is also connected to a continuous vertical single-angle member spanning the top and bottom chords. The vertical members at either side and the bottom chord of the parallel-chord truss are likewise constructed of double-angle sections.

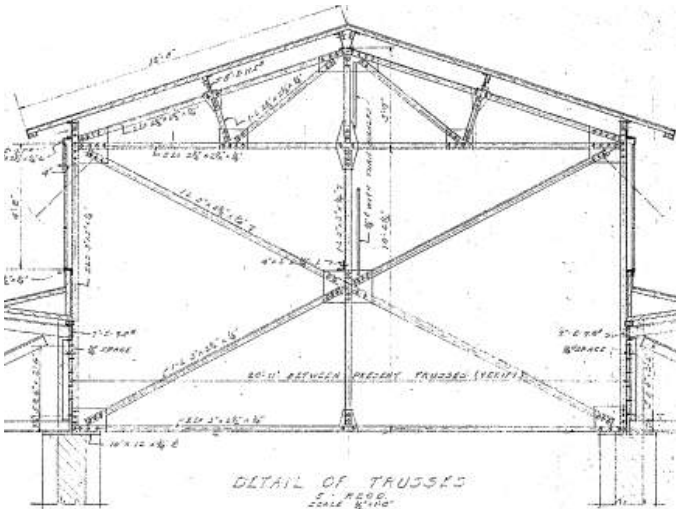


Figure 2-94 Interconnect truss elevation from 1941 construction drawings; the expansion of Interconnect 1-2 to the west was not constructed until sometime between 1955 and 1968. (Source: 1941 drawings)



Figure 2-95 Overview of typical 1923 truss and wooden rafters at the east end of Interconnect 1-2. (Source: RRJ)

Vertical members at either end of the truss are typically embedded within brick masonry walls and measure ten and a half feet tall; these members may be mechanically attached to the end members of the trusses at Buildings 1 and 2.

The trusses in Interconnect 1-2 are spaced approximately 17'-6" on center and align with the trusses at Buildings 1 and 2 on either side. Wood rafters span longitudinally between trusses at the east portion of the building, and steel channel rafters span longitudinally on the west end of the building; the change in rafter member likely corresponds with the expansion of Interconnect 1-2 (Figure 2-96).

Longitudinal cross-bracing using metal tie rods is present within at least two bays of Interconnect 1-2. These ties connect the center top panel point of one truss to the center bottom panel point of its neighbor, and the same in reverse. Horizontal lateral bracing consisting of angle sections are located at the bottom and top panel points at the truss centerline in every bay.

Interconnect 1-2 trusses were generally observed to be in good condition. Rivets were generally in good condition without distress or corrosion. Masonry cracking at the embedded truss bearing ends may indicate that the embedded steel is corroding (Figure 2-97). Currently, there are multiple failed paint layers on the steel. The paint appears to primarily be shades of white. Finishes analysis is recommended to determine if the original colors can be determined.

Treatment Recommendations

- Inspect each truss member for evidence of crimping or buckling and perform repairs as required.
- Expose bearing ends of each truss, clean the steel, and apply a corrosion-resistant coating before reinstalling the masonry.
- Remove existing paint and repaint trusses.



Figure 2-96 Overview of typical 1960s truss and steel channel rafters at the west end of Interconnect 1-2. (Source: RRJ)



Figure 2-97 Step cracking observed at a masonry pier within Interconnect 1-2 at the embedded end of a truss bottom chord. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102003	Steel Trusses, Building 2
		Condition Rating:	Good
		Repair Timeline:	Long-Term

Date:	1911, 1925	**Contributing:**	Contributing and Non-Contributing

Description

Nine steel trusses are present within Building 2, comprising its roof-supporting structure. The seven western-most trusses are part of the original building's structure, which contained eight bays in total; the two westernmost trusses likely date to the 1925 facility expansion. Several trusses near the center of Building 2 are concealed from view by interior finishes and could not be fully assessed.

The trusses at Building 2 are substantially similar to those at Building 1: eight-panel Pratt trusses spanning approximately 60 feet in the north-south direction, spaced approximately 17'-6" on center, with similar cross and longitudinal bracing (Figure 2-98). Minor variations to the bracing was observed at the east end of the building at the later trusses. Vertical members at either end of the truss are typically embedded within brick masonry walls. Unlike Building 1, the trusses at Building 2 do not feature an additional vertical member at the truss centerline because Building 2 was not originally constructed with a skylight.

The Building 2 trusses were generally observed to be in good condition. Moisture staining was observed in multiple locations, and active water infiltration was observed at two distinct locations which can promote corrosion of the steel. Masonry cracking at the embedded truss bearing ends may indicate that the embedded steel is corroding (Figure 2-99).

Localized areas of bolted rather than riveted connections were observed on the two easternmost trusses; these areas may represent previous repairs or alterations to the original trusses. Because the eastern expansion of Building 2 and the construction of the power plant at Building 1 occurred within a narrow time frame, it is possible that the two eastern trusses



Figure 2-98 Overview of steel truss at west end of Building 2. (Source: RRJ)



Figure 2-99 Water intrusion through failed roofing at bearing end of truss and moisture staining atop white-painted truss members. (Source: RRJ)

of Building 2 may have come from Building 1 and the bolts represent modifications dating to that relocation; further investigation and analysis would be needed to determine if this is a possibility (Figure 2-100).

Multiple failed paint layers are present on the steel. The paint appears to primarily be shades of green and white (Figure 2-101). Finishes analysis is recommended to determine if the original colors can be determined.

Treatment Recommendations

- Inspect each truss member for evidence of crimping or buckling and perform repairs as required.
- Expose bearing ends of each truss, clean the steel, and apply a corrosion-resistant coating before reinstalling the masonry.
- Remove existing paint and repaint trusses.



Figure 2-100 Bolted and riveted connections at second-most truss from east end of Building 2. (Source: RRJ)



Figure 2-101 Green and white paint on steel. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102004	Steel Trusses, Interconnect 2-3
		Condition Rating:	Good
		Repair Timeline:	Long-Term
Date:	1923, 1925, 1934	**Contributing:**	Non-Contributing



Figure 2-102 Overview of typical steel truss at Interconnect 2-3. (Source: RRJ)



Figure 2-103 Missing diagonal truss member and cross bracing at mezzanine structure. (Source: RRJ)

Description

Ten steel trusses are present within Interconnect 2-3, comprising its roof-supporting structure. Several trusses are partially concealed from view by interior finishes and the mezzanine structure and could not be fully assessed.

The trusses at Interconnect 2-3 are substantially similar to those at Interconnect 1-2: triangular Fink trusses atop parallel-chord, cross-braced trusses spanning approximately 21 feet in the north-south direction, spaced approximately 17’-6” on center, with similar cross and longitudinal bracing (Figure 2-102). Vertical members at either end of the truss are typically embedded within brick masonry walls. One truss location intersects the mezzanine construction; at this location one diagonal truss member is missing, and the cross-bracing is disrupted (Figure 2-103).

Interconnect 1-2 trusses were generally observed to be in good condition, with localized areas of surface corrosion. Rivets were generally in good condition without distress or corrosion. Kinked and loose cross-bracing was observed at one location. Masonry cracking at the embedded truss bearing ends may indicate that the embedded steel is corroding. Currently, there are multiple failed paint layers on the steel. The paint appears to primarily be shades of green and white. Finishes analysis is recommended to determine if the original colors can be determined.

Treatment Recommendations

- Inspect each truss member for evidence of crimping or buckling and perform repairs as required.
- Repair the truss with the missing bracing member.
- Expose bearing ends of each truss, clean the steel, and apply a corrosion-resistant coating before reinstalling the masonry.
- Remove existing paint and repaint trusses.

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102005	Roof Framing, Building 17
		Condition Rating:	Fair to Poor
		Repair Timeline:	Immediate

Date: 1935 **Contributing:** Non-Contributing

Description

Building 17 shares a common wall with the north wall of Building 1. Much of the roof structure at Building 17 was concealed by interior finishes and could not be fully assessed.

The roof structure of Building 17 is combination of parallel-chord steel trusses, steel beams, and reinforced concrete beams. Some roof structure members appear to bear on the Building 1 masonry wall while others are independently supported, but Building 17 can likely be removed without significant damage to Building 1 (Figure 2-104 and Figure 2-105). Significant water intrusion through the failed roofing of Building 17 has caused corrosion and damage to the steel trusses.

Treatment Recommendations

Building 17 post-dates the period of significance and should be considered for removal. Perform masonry repairs to infill affected areas where structural members were embedded at the north wall of Building 1.



Figure 2-104 Steel roof truss at Building 17 independently supported by a steel column. (Source: RRJ)



Figure 2-105 Concrete beam at Building 17 bearing on the Building 1 north exterior wall. (Source: RRJ)

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102006	Wood Plank Roof Decking
		Condition Rating:	Good to Failed
		Repair Timeline:	Immediate

Date: Multiple **Contributing:** Contributing and Non-Contributing



Figure 2-106 Replacement wood planks, showing tongue-and-groove ends at the transition between Building 1 and Interconnect 1-2. (Source: RRJ)



Figure 2-107 Failure of the wood planks at an area of sustained water intrusion at the transition between Buildings 1 and 17; yellow roof insulation is visible. This condition is hazardous. (Source: RRJ)

Description

At Buildings 1 and 2 and Interconnects 1-2 and 2-3, the roof decking is 1x6 tongue-and-groove wood planks (Figure 2-106). The planks span in the north-south direction and are supported by timber and steel purlins. In some locations, the decking was concealed by ceiling finishes and could not be fully assessed.

Much of the wood plank decking appears to be original to the construction of each building. The 1910 photographs show wood plank decking at Building 1 that is consistent with the decking still in place. The underside of the roof deck appears to have been painted white for light reflection in these photos, which is consistent with the failed paint layers at Building 1.

The condition of the wood planks is highly variable, primarily influenced by water intrusion through failed roofing systems. At most areas, the planks appeared to be in good condition without deterioration or water staining; these planks are likely suitable to remain in place. Localized areas of plank replacement were observed. Other areas of water staining, deterioration of the wood

planks, and complete failure of the wood planks were also observed and will require replacement (Figure 2-107). Due to the condition of the decking, care should be taken when accessing the roof, particularly to avoid the transition between Buildings 1 and 17 where there is significant water intrusion and deterioration of the roof deck.

Treatment Recommendations

- During roofing replacement, remove all deteriorated and damaged decked and replace to match existing tongue-and-groove boards.

B	**SHELL**		
B10	**SUPERSTRUCTURE**		
	B1020	**ROOF CONSTRUCTION**	
		B102007	Wood Beams and Purlins
		Condition Rating:	Good
		Repair Timeline:	Long-Term

Date: Multiple **Contributing:** Contributing and Non-Contributing

Description

At Buildings 1 and 2 and Interconnect 1-2 and 2-3, timber members serve as ridge beams and purlins for the roof structure. These members run longitudinally in the east-west direction and support the wood plank roof decking. The wood members are spliced at truss locations. Some locations were concealed by interior finishes and not able to be fully assessed.

The beams and purlins were generally in good condition without observable distress or deterioration. One location of rotation at a splice end was observed in Building 1; this condition can likely be stabilized in place (Figure 2-108). Checking (non-continuous cracks in the wood that do not extend through the full thickness of the member) was observed in multiple locations. The presence of checks is timber members is normal and not necessarily indicative of distress or failure; these members are likely suitable to remain in place (Figure 2-109). Further structural analysis of specific members is recommended to determine if repairs or stabilization are required.

Treatment Recommendations

- Inspect each timber purlin and perform isolated repairs as required.



Figure 2-108 Timber purlin splice connection at truss in Building 1. (Source: RRJ)



Figure 2-109 Checks on underside of timber purlin in Interconnect 2-3. (Source: RRJ)

INTERIOR ASSESSMENT

C	**INTERIORS**		
C10	**INTERIOR CONSTRUCTION**		
	C3020	**FLOOR FINISHES**	
		C302001	Floor Finishes
		Condition Rating:	Fair to Failed
		Repair Timeline:	Immediate

Date: Undetermined **Contributing:** Non-Contributing

Description

Very few floor finishes remain in place. No extant floor finishes appear to date to within the period of significance associated with the aviation manufacturing use of the facility. Terrazzo is present at the Building 1 main entry (Figure 2-110 and Figure 2-111). Other areas of Building 1 and Interconnect 1-2 may have previously had adhered vinyl or composite tile, based on traces of glue on the slab. The eastern room of Building 1 has composite wood panel flooring that is deteriorated (Figure 2-112). Much of Building 2 and Interconnect 2-3 appeared to have been exposed concrete slab-on-grade without applied floor finishes. The rear offices in Interconnect 2-3 may have been carpeted. The front entry of Building 17 still retained some of the flooring and wall tile.



Figure 2-110 Terrazzo at main entry of Building 1. (Source: RRJ)

Treatment Recommendations

The existing floor finishes post-date the period of significance and can be removed. New flooring appropriate for the use of individual spaces should be installed; where Building 1 is used as interpretive space, wood plank flooring to match the historic photographs should be installed.



Figure 2-111 Detail photograph of terrazzo. (Source: RRJ)



Figure 2-112 Deteriorated wood panel flooring at the rear of Building 1. (Source: RRJ)

C	**INTERIORS**		
C10	**INTERIOR CONSTRUCTION**		
	C1010	**PARTITIONS**	
		C101001	Partition Walls and Finishes
		Condition Rating:	Fair to Failed
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The existing partition walls and wall finishes in all buildings are not original and do not appear to date to within the period of significance associated with the aviation manufacturing use of the facility. The 1910 photographs of Building 1 show wood-framed partition walls covered with wood or corrugated metal panels; these partitions are no longer extant. The existing partition walls are a variety of construction types and include:

- Wood-framed partition walls with plaster on wire lath.
- Wood-framed partition walls with plywood boards (Figure 2-113).
- Wood-framed partition walls with pre-fabricated gypsum board (drywall) (Figure 2-114)
- Metal stud partition walls with pre-fabricated gypsum board (drywall) (Figure 2-116).
- Wood-framed partition walls with composite wood-fiber panels (masonite) (Figure 2-117).
- Wood-framed panelized partition walls with glazing, masonite, or bead-board infill panels (Figure 2-118).
- Drywall applied over wood-framed panelized partition walls.
- Gypsum block (Figure 2-119).

Interior partition walls were generally in fair to poor condition with significant areas of failed partition walls due to damage and water intrusion (Figure 2-120). Generally, the existing partitions and wall finishes are not suitable for reuse and should be removed entirely. Drywall finishes were subject to biological growth due to exposure to moisture. Masonite and wood panels also exhibited moisture-related and mechanical damage. Metal-framed walls exhibited significant corrosion of the stud track and lower portion of the studs.



Figure 2-113 Front office of Building 1, with wood stud partition walls and wood panel finishes. (Source: RRJ)



Figure 2-114 Typical room in Building 1 with drywall over wood stud partition walls. (Source: RRJ)

Treatment Recommendations

The interior partitions and wall finishes post-date the period of significance and should be considered for removal.



Figure 2-115 Front room of Building 1 showing evidence of partition walls on the slab. (Source: RRJ)



Figure 2-116 Front offices of Building 2, showing drywall on metal stud partition walls. (Source: RRJ)



Figure 2-117 Panelized partition walls in Building 2 with masonite infill panels. (Source: RRJ)



Figure 2-118 Panelized partition walls in Interconnect 1-2 with masonite and glass infill panels. (Source: RRJ)



Figure 2-119 US Gypsum Company “Pyrobar” gypsum block wall in Building 1. (Source: RRJ)



Figure 2-120 Severe water damage to drywall and wood stud partition walls in Building 17. (Source: RRJ)

C	**INTERIORS**		
C10	**INTERIOR CONSTRUCTION**		
	C3030	**CEILING FINISHES**	
		C303001	Ceiling Finishes
		Condition Rating:	Failed
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Very few ceiling finishes remain in place. No extant ceiling finishes appear to date to within the period of significance associated with the aviation manufacturing use of the facility.

The front office of Building 1 has a hard plaster ceiling with textured finish. All other rooms in Building 1 with extant ceiling finishes are suspended acoustical ceilings with integrated light fixtures and ventilation registers.

The suspended ceilings had failed in all locations (Figure 2-121 and Figure 2-122). They have been damaged by previous demolition activities, vandalism, and water intrusion and should be removed entirely.

Treatment Recommendations

The ceiling finishes post-date the period of significance and should be considered for removal.



Figure 2-121 Failed suspended ceiling in Building 1. (Source: RRJ)



Figure 2-122 Failed suspended ceiling in Building 17. (Source: RRJ)

MECHANICAL AND PLUMBING ASSESSMENT

D	**SERVICES**		
D10	**FIRE PROTECTION**		
	D1020	**FIRE MAIN SUPPLY**	
		D102001	Fire Main Supply – Interior Risers
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing



Figure 2-123 Fire Riser #1 in Building 1. (Source: Alvine)



Figure 2-124 Fire Riser #2 in Building 2. (Source: Alvine)

Description

There are two fire risers that serve Building #1 and #2. These risers are 8” in size and appear to be constructed of ductile iron. The riser sizes are quite large and it is assumed that this size may have been this large to accommodate the demand of the building or perhaps there might have been an issue with city pressure when the fire services were first installed to serve the manufacturing plant buildings. The fire suppression systems would have had to have been designed and installed to provide coverage based on the area and density required for the type of occupancy the building would have been used for at the time they were installed (reference Figure 2-123 and Figure 2-124).

The fire lines appear to be in reasonable good condition although the condition of the piping below the floor is unknown. There are no signs of external corrosion to the piping although the integrity of the interior of the piping is unknown. Internal corrosion would be the biggest concern as any corrosion caused by air pockets can lead to the possibility of pinhole leaks in the piping.

The documentation found on site was produced when the buildings were owned and operated by Delphi Chassis Systems based on the information provided in the titles blocks on the documentation. It is unknown how long the fire protection systems were in place prior to the documents being produced although the documents are dated 1996. It is likely the drawings or plans were produced to document and record what areas of the buildings the lines served when the buildings were owned and operated by Delphi Chassis Systems.

Treatment Recommendations

The existing fire main supply is likely non-functioning and should be removed and replaced with a new system.

D	**SERVICES**		
D10	**FIRE PROTECTION**		
	D1010	**FIRE MAIN SUPPLY ISOLATION AND INDICATION**	
		D101001	Fire Main Supply – Post Indicator Valves
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Water for fire protection for the buildings on the Wright Company factory site, is believed to originate from West Third Street to the north of the site. Drawings documenting where the water on the site served the various buildings used for fire protection, indicate that there were multiple city mains entering the property from the north from West Third Street and from the west from Abbey Avenue.

The city water line used for fire water at Buildings 1 and 2 originates from a city water main which is believed to extend south from Cowart Avenue located north of the site with the main located east of the buildings (Figure 2-125). This city water main routes to an underground pit (Pit #4) which would have been located east of the Building 1 and east of the demolished boiler plant. Documentation states that service valves are located in this pit which allow for water main isolation.

The water main exits the pit and continues to run south where it offsets to the west. Once it offsets west, it branches to the east end of Building 1 and the east end of Building 2. At Building 1, there is a post indicator valve (PIV #1) located outside the east end of the building. A post Indicator Valve (PIV) is a valve used to control the water supply to the fire sprinkler system. The PIV has a display that shows whether water line is open or closed when the valve is located below the ground. From the PIV location, fire water then enters the building below the floor where it routes to riser labeled as Riser #1 (Figure 2-126).

The water main branch that serves Building 2, routes to post indicator valve, PIV #2 (Figure 2-127). Immediately upstream of PIV #2, the water main tees off and then routes south



Figure 2-125 Water main for fire service from Cowart Ave to the north of the site. (Source: Alvine)



Figure 2-126 Existing PIV #1 located at east side of Building 1 (Source: Alvine)

to PIV #3 (Figure 2-128) located near the east end of Building #2. The water mains from each post indicator valves PIV #2 and #3 then route inside Building #2 to Risers #2 and #3. Riser #2 is located within the Building 2 perimeter while riser #3 is located just south of the connecting link south of Building 2.

It appears that all riser sizes are 8" based on the alarm valve sizes therefore it is assumed that the city mains serving the risers are at a minimum 8" in size. The piping from risers #1 and #2 then extends out to serve the fire protection sprinkler systems for each of the two buildings this HSR addresses.

Treatment Recommendations

The existing fire main supply is likely non-functioning and should be removed and replaced with a new system. Abandoned equipment should be removed from the site.



Figure 2-127 Existing PIV #2 located at east side of Building #2. PIV #3 is located next to PIV #2 (just out of the picture). (Source: Alvine)



Figure 2-128 Existing PIV #3 which serves Building #2. Note PIV #2 to the right in the figure. (Source: Alvine)

D	**SERVICES**		
D10	**FIRE PROTECTION**		
	D1030	**FIRE SPRINKLERS**	
		D103001	Fire Sprinkler System – Sprinkler Piping & Heads
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

All spaces within Buildings #1 and #2 are served by wet sprinkler systems with the main piping connected to each of the two fire risers. Fire protection sprinkler piping is identified with red paint on the pipe where the piping is installed exposed in the building spaces. Where it is concealed above ceilings, it was left unpainted. Where the piping was left unpainted, the piping appears rusty indicating the piping is not galvanized piping. The piping shows signs of corrosion on the exterior of the pipe which may be caused by high humidity conditions which may have occurred for the years the buildings were not occupied (reference Figure 2-129 and Figure 2-130).

There is at least one location within the building within the connecting link between Building #1 and #2 where there is a break in one section of vertical fire sprinkler piping. The break appears to have been caused by corrosion based on inspection of the piping at the break location.

Treatment Recommendations

Based on the condition of the fire sprinkler piping, the piping appears to be in poor to fair condition at best throughout the two buildings and would be recommended to be removed and replaced as part of any future renovation or building rehabilitation project.



Figure 2-129 Existing fire sprinkler piping where piping. Note the rusty conditions of the piping indicating it has existed in an unconditioned environment. (Source: Alvine)



Figure 2-130 Typical existing fire sprinkler piping exposed (red piping in figure). (Source: Alvine)

D	**SERVICES**		
D20	**PLUMBING**		
	D2010	**WATER SERVICE**	
		D201001	Water Service Piping
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

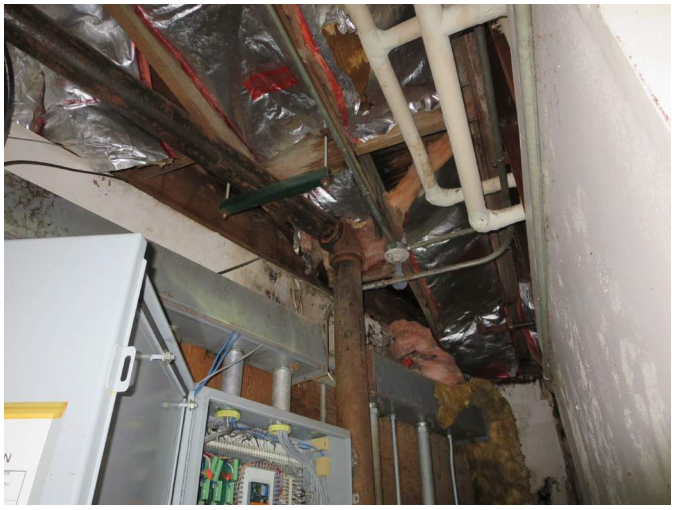


Figure 2-131 Existing water service offsetting up high through the space of Building 17. (Source: Alvine)

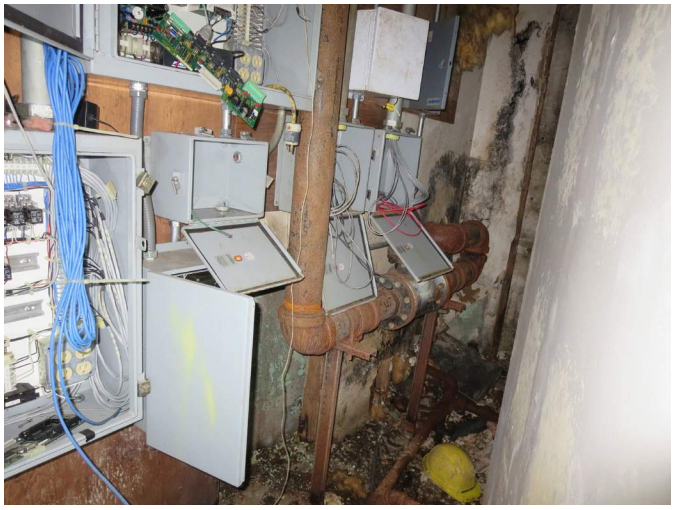


Figure 2-132 Existing water service entering in at the north side of the room in Building 17. (Source: Alvine)

Description

Potable water for the building interior plumbing system appears to enter at a perimeter room located at the north end of Building 17 at approximately the middle of the north wall exposure. It is assumed that this water line serves all of the remaining buildings on the site as no other water entrance was found. In the room where water enters the building, there is what is believed to be a water meter present. This location also has a lot of electrical panels and electrical cabinets in it which would not be typical of a water entrance room although since no other entrance location was found (Figure 2-131 and Figure 2-132). There were some utility tunnels under portions of the building where possible utility rooms may exist but these were full of water so access to the tunnels was not possible to explore if any other water entrance locations existed at some lower level.

The size of the water pipe appears to be 4” and the piping material is assumed to be galvanized piping with threaded fittings. It is assumed that this water piping would have not likely been original to the building as Building 17 was added some time after Buildings 1 and 2 were first constructed. While not original, it appears to be in excess of 40-50 years old based on its condition and material used.

Based on the fact that the piping originates in Building 17, it would not be original to Buildings 1 and 2 as Building 17 was added after the first two buildings were constructed. With the water lines assumed in the range of 40-50 years old, this piping has reached the end of its useful life and would be recommended to be removed and replaced with newer material such as copper piping to ensure its reliability and longevity for any future renovation or building rehabilitation projects.

Treatment Recommendations

Since Building 17 is slated to be demolished, the piping service entrance would be removed with it therefore Buildings 1 and 2 will require a new service be brought into one of the remaining buildings. The new piping can be sized and routed throughout Buildings 1 and 2 to meet with any new floor plan layout and plumbing fixture demand. Any new potable water system would require a new service entrance to be provided.

D	**SERVICES**		
D20	**PLUMBING**		
	D2020	**SANITARY SERVICE**	
		D202001	Sanitary Service Piping
		Condition Rating:	Poor
		Repair Timeline:	Immediate

Date: Undetermined **Contributing:** Non-Contributing

Description

The sanitary and vent piping inside the building is comprised of hub and spigot cast iron piping. This piping is assumed to be in excess of 40-50 years old (Figure 2-133 through Figure 2-136).

Similar to the water supply piping, the existing sanitary sewer system would be deemed quite old and is assumed to have reached the end of its useful life. As a large quantity of the sanitary sewer piping routes below the floors or behind walls, this makes any visual verification of its condition nearly impossible. Cameras can be inserted down into the piping where exposed to give a visual inspection of the interior of the piping below the floors but using a camera inserted in the interior of the piping, one cannot determine the condition of the exterior of the piping.

The diameter of the sanitary sewers is unknown as only a small amount of piping is visible from above the floors. It is assumed that restroom groups are served by a minimum of 4" sanitary sewers to accommodate the water closets. It is also unknown where the sanitary and industrial waste sewers route within the building footprint without building plans indicating where certain processes or where restrooms with fixtures would have been located.

At the exterior of the building, there are multiple manholes indicting that might suggest that multiple sanitary sewer lines exit the building at varying locations around the remaining buildings on the site. These manholes are located on the west, south and east sides of the buildings. Some of the manhole covers are labeled as "industrial waste", while others have no labeling at all (Figure 2-137 and Figure 2-138). It is assumed that since the building was a manufacturing plant for automobile parts in its later years after production of aircraft ceased, industrial waste water collected due to manufacturing processes would have required separate sewers to handle harmful by-products from various manufacturing processes that may have been undertaken in the buildings at one time. It is unclear where the industrial waste lines route once outside the buildings but it is assumed that they may have routed to some sort of collection location where treatment of the waste was done before the waste was discharged into the municipal sewer system.

As much of the plumbing fixtures have since been removed inside the buildings, it is unknown where or how the sanitary piping routes under the floors other than a general area. It is also unknown how many of the sanitary sewer lines that exit the building are still connected to sanitary sewer mains located outside the buildings with the demolition of the other automobile manufacturing buildings on the site. Locating all of the site utilities will be important to fully understand what sanitary sewers exiting the buildings may have been used and where they route for potable water waste or industrial waste.

Treatment Recommendations

Based on the sanitary sewer age of piping and unknown routing within the building, any existing piping would require verification via a pipe camera of its condition before connecting to it to determine its viability it would be recommended to abandon the existing sewer lines that exist below the floor of the building and provide new under any future renovation and building rehabilitation work.



Figure 2-133 Sanitary piping in one of the Building 2 restrooms with hub & spigot fittings. (Source: Alvine)



Figure 2-134 Sanitary piping in one of the Building 2 restrooms with hub & spigot fittings. (Source: Alvine)



Figure 2-135 Sanitary piping at abandoned Building 2 second level restrooms with hub & spigot fittings. (Source: Alvine)



Figure 2-136 Sanitary piping at abandoned Building 2 second level restrooms with hub & spigot fittings. (Source: Alvine)



Figure 2-137 Exterior manhole cover for waste labeled “Industrial Waste”. (Source: Alvine)



Figure 2-138 Exterior manhole cover for waste labeled “Industrial Waste”. (Source: Alvine)

D	**SERVICES**		
D20	**PLUMBING**		
	D2030	**STORM SERVICE**	
		D203001	Storm Piping
		Condition Rating:	Good
		Repair Timeline:	Long-Term
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Storm drainage for Buildings 1 and 2 are served by roof drains and an interior piped drainage system. The roof drainage for the north side of Building 1 also serves the south end of Building 17. With Building 17 to be demolished, the roof drainage for the north side of Building 1 should not be affected as it appears the drains are located south of the building's common wall.

The south side of Building 1 is served by roof drains and interior storm piping with the drains located at the low point at the west side of Interconnect 1-2 between Building 1 and Building 2. This condition is mirrored at the south side of the connecting link where Building 2 starts.

The size of the storm drain lines are unknown as is the storm drains at the roof as access to the roof and visual inspection of much of the storm piping above ceilings was not possible during the site walk-through. Verification of the drain sizes will need to be made at a later time to determine if they are sized adequately for rainfall in this part of the country.

The storm drainage system for Buildings 1 and 2 and the connecting links between these buildings is assumed to have been in place for over 30-years. Storm systems for buildings are generally designed to last the life of the building as removing and replacing these systems can be costly and impractical. Although the piping material is not entirely known, it is likely cast iron which has a projected life span of 50-100 years. The size of the piping currently in place is unknown as it was not accessible during the site investigation.

While the sizing and condition of the piping appears adequate to relieve the roof of rain water, there are signs of some minor ponding on the roof around the locations of the roof drains based on a visual observation of the roof using Google Earth software. This minor ponding of water on the roof can be caused by improper sloping of the roof, inadequately sized roof drains and drain piping, or rainfall rates that exceed what the roof drainage system was sized for. While the conditions do not appear to be serious based on the visual observations, an overall evaluation of the roof drainage system would be recommended for the existing sizing and design to ensure that the storm system is sized appropriately for these buildings. This evaluation can be made at a later date.

As mentioned previously, there are tunnels located under portions of the remaining buildings on the site. It is unknown if the interior tunnels are connected to an exterior stairwell which leads from grade level downward assumed to a tunnel at the west side of Building 1. The low-point of this stairwell was full of water which indicates that any drainage system which would carry storm water away from this stairwell was either plugged or not working (Figure 1-207). This stairwell and tunnel system would need to have the water pumped out before anyone could access the tunnels for further exploration and verification on the site.



Figure 2-139 Existing exterior stairwell located at the west side of Building 1 where storm water has collected. (Source: Alvine)

D	**SERVICES**		
D20	**PLUMBING**		
	D2040	**GAS SERVICE**	
		D204001	Gas Piping
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The building was served by a natural gas service which entered the building from the north wall near the east end of Building 1 (Figure 2-140). The gas piping at the building entrance is welded black steel piping with welded fittings while once inside, the piping employs threaded fittings. The age of the piping is unknown but it is assumed to be at least 30-40 years old. It is in reasonable good shape and is painted yellow where it routes in the building.

The gas service outside the building at its entrance location, offsets down below the ground where it is believed to route from an old above ground gas piping meter and valve location located east of Building 17 and north of Building 1 (Figure 2-141 and Figure 2-142). The gas meter at this location has been removed and much of the piping at and near the meter location has been abandoned in place and is very poor condition.

The line size of the gas main entering Building 1 is 4” based on visual observation. This piping offsets up in the room and then continues to various locations within the room. At one location within the building is a pressure regulator which suggests the gas pressure of the main would have been something higher than the equipment pressure required (Figure 2-143). There is no equipment currently connected to the gas piping within the building where the gas piping originates.

Treatment Recommendations

As much of the gas piping in Building 1 has been abandoned and is no longer in service, it is recommended that it be removed. Since the service on the site has had it meter removed and the piping outside has also been abandoned, it will also need to be removed on site and a new service extended to the remaining building if natural gas is used as a fuel source for any new building equipment.



Figure 2-140 Existing gas service entry location at north wall of Building 1. (Source: Alvine)



Figure 2-141 Existing gas piping which offset down to below ground at the north side of Building 1. (Source: Alvine)



Figure 2-142 Existing gas service utility valve and old meter location located outside north of Building 1 and east of Building 17. (Source: Alvine)



Figure 2-143 Existing gas piping with gas pressure regulator (round device in figure) up high in space of room in Building 1. (Source: Alvine)

D	**SERVICES**		
D20	**PLUMBING**		
	D2050	**WATER HEATING EQUIPMENT**	
		D205001	Water Heating Equipment
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

In a room located in the connecting link between Building 1 and #2, was an old abandoned, 20-30-gallon, electric water heater (Figure 2-144). In another location at one of the old restrooms located in Building 2, was a small 2 to 3 gallon electric water heater (Figure 2-145). It appears that hot water for restrooms or other processes, was produced locally near the spaces needing hot water and that no central potable hot water system was used. It is assumed that hot water was not used originally at Buildings 1 and 2 as these two buildings would have been used primarily for aircraft production and no potable hot water was present.

No other water heating equipment was found during the site investigation. Based on the manufacturers label on the water heaters, the water heaters found would not have been original to the buildings and were assumed to have been added to accommodate the restrooms or other building functions when the buildings were used for automobile parts manufacturing sometime after the buildings ceased to be used for airplane production.

Treatment Recommendations

The existing water heating equipment are non-functioning and should be removed.



Figure 2-144 Existing electric water heater located in corner of room of Building 2. (Source: Alvine)



Figure 2-145 Existing electric water heater located on floor of one of the restrooms in Building 2. (Source: Alvine)

D	**SERVICES**		
D20	**PLUMBING**		
	D2060	**INTERIOR WATER PIPING AND PLUMBING FIXTURES**	
		D206001	Interior Water Piping and Plumbing Fixtures
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Much of the interior water piping in Buildings 1 and 2 has been disconnected and abandoned in place. It is unclear if any of the old abandoned piping is still connected above ceilings or in walls so trying to reuse any of it would require extensive exploratory work to determine its viability to be reused for any new functions. As much of the piping is galvanized metal piping and is assumed to have been in place for over 40 years, it is assumed to have outlived its useful life. Replacing the piping with modern materials such as copper pipe is recommended

Plumbing fixtures observed in Buildings 1 and 2 were quite old and in very poor condition. There were a few locations where water closets and urinals while still in place and intact, were not functional. Lavatories have been removed in counters and on walls or have bene broken by transients that have vandalized the buildings. All of the fixtures observed in the buildings have had their water supply piping, faucets and flush valves removed so the fixtures are not operational (Figure 2-146 through Figure 2-150).

There was one utility sink in one of the large rooms located in Building 2 which might possibly be able to be salvaged but this fixture is missing its faucet (Figure 2-151).

Treatment Recommendations

The existing plumbing fixtures and associated piping are non-functioning and should be removed.

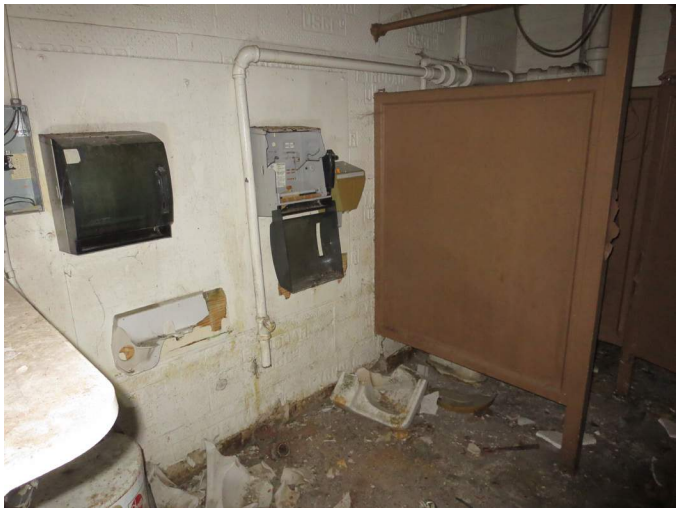


Figure 2-146 Existing plumbing fixtures broken and lying on the floor in Building 2. (Source: Alvine)



Figure 2-147 Existing wall urinals abandoned in place with missing flush valves. Adjacent counters with missing their lavatories. (Source: Alvine)



Figure 2-148 Existing bathroom counters with missing lavatories and faucets in Building 2. (Source: Alvine)



Figure 2-149 Existing restroom water closet with missing water supply and flush valve in Building 2. (Source: Alvine)



Figure 2-150 Missing restroom plumbing fixtures in Building 2. (Source: Alvine)



Figure 2-151 Existing utility sink missing water supply piping and faucet in Building 2. (Source: Alvine)

D	SERVICES		
D30	HVAC		
	D3040	DISTRIBUTION SYSTEMS	
		D304001	HVAC Systems (equipment, ductwork & controls)
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	Contributing:	Non-Contributing

Description

There are multiple packaged rooftop units currently located on the roof of Building 17 (Figure 2-152 and Figure 2-153). These units and their associated duct distributions systems below the roof in the spaces below are quite old and are in a non-operational condition at this time. These units and their associated duct systems will be demolished when Building 17 is removed.

On the roof of Buildings 1 and 2, are located several roof air handling units and ventilation hoods. The units and hoods appear to be of the same vintage equipment as those systems abandoned within the building. These pieces of equipment appear to be non-operational and have been abandoned in place for a number of years. Similar to the equipment and systems inside the building, these pieces of equipment on the roof are recommended to be removed as they are not original to the buildings and have no historical value (Figure 2-154 through Figure 2-156).



Figure 2-152 Existing roof equipment on roof of Building 17 looking east). (Source: NPS)

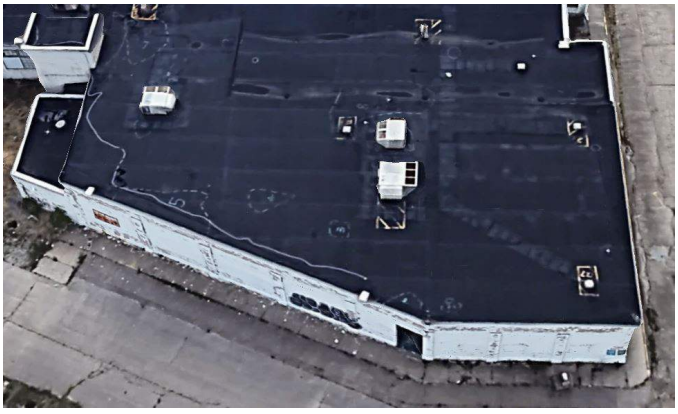


Figure 2-153 Existing roof equipment on roof of Building 17 looking south). (Source: NPS)

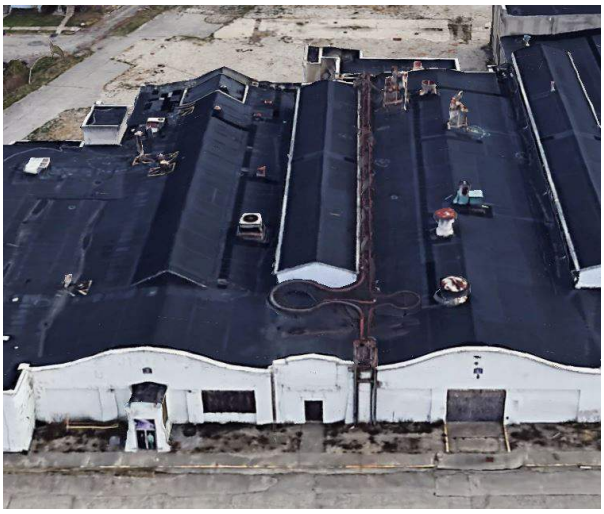


Figure 2-154 Existing roof equipment on roof of Buildings 1 and 2 with looking east. (Source: NPS)

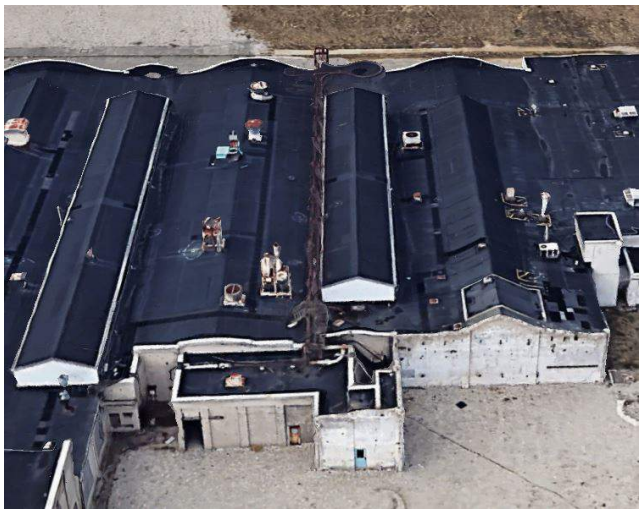


Figure 2-155 Existing roof equipment on roof of Buildings 1 and 2 looking west. (Source: NPS)



Figure 2-156 Existing HVAC unit on the roof of Building 2 (figure taken through a window looking north at Interconnect 2-3). (Source: Alvine)

Within Buildings 1 and 2 much of the heating, ventilating and air conditioning systems are in very poor condition with the majority of the equipment having been abandoned in place in a non-operational condition. Much of the system ductwork has been abandoned in place with much of it in a state of disrepair. The HVAC units serving the space have been damaged with many parts scavenged or stolen by transients that have occupied the buildings over the years.

The equipment abandoned in place within Buildings 1 and 2 ranges from packaged self-contained air conditioning units and small packaged air handling units. This equipment appears to be in excess of 30-40 years old and his assumed to have exceeded any useful lifespan. This equipment cannot be salvaged for re-use as parts to repair any of the equipment are likely no longer available.

Flexible ductwork is present where it was connected to the rigid ductwork mains and where ceiling diffusers reside. Where ceilings are damaged or have been removed, there is flexible ductwork which was left hanging unattached to diffusers or dangling from the open ceilings above. For a typical representation of the condition of the ductwork at many of the interior rooms (Figure 2-163 through Figure 2-170).

Treatment Recommendations

It is recommended that any abandoned equipment and ductwork be removed and replaced with newer modern equipment that would be more efficient to operate and selected for modern and updated use (Figure 2-157 through Figure 2-162).



Figure 2-157 Existing HVAC equipment and ductwork in Building 1. (Source: Alvine)

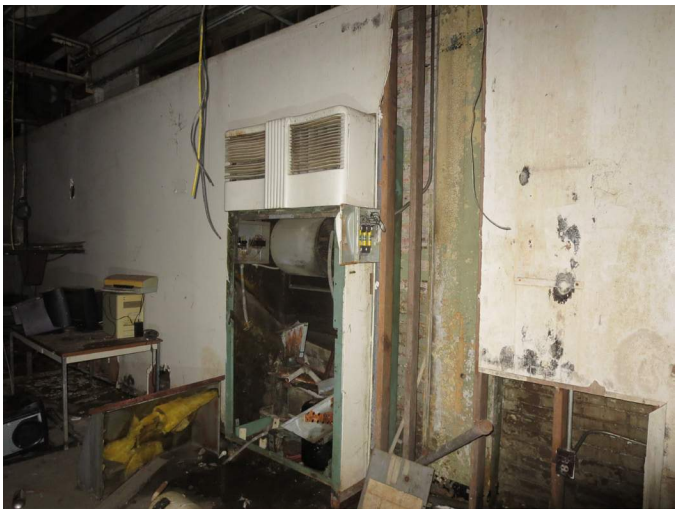


Figure 2-158 Existing HVAC equipment and ductwork in Building 1. (Source: Alvine)



Figure 2-159 Existing HVAC equipment and ductwork in Interconnect 2-3. (Source: Alvine)



Figure 2-160 Existing HVAC equipment and ductwork in Interconnect 2-3. (Source: Alvine)



Figure 2-161 Existing packaged HVAC unit ductwork in Interconnect 1-2. (Source: Alvine)



Figure 2-162 Existing HVAC equipment and ductwork in Interconnect 2-3. (Source: Alvine)



Figure 2-163 Existing HVAC flexible ductwork in Building 1. (Source: Alvine)

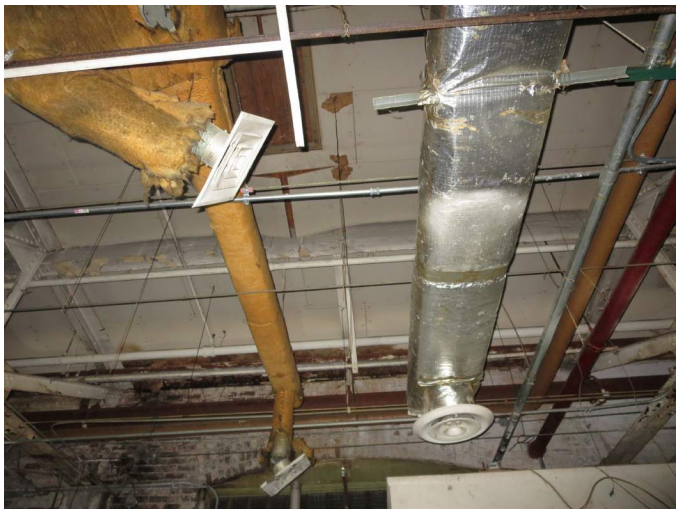


Figure 2-164 Existing HVAC ductwork in Building 1. (Source: Alvine)



Figure 2-165 Existing HVAC flexible ductwork and insulated rigid ductwork in Building 1. (Source: Alvine)



Figure 2-166 Existing HVAC flexible ductwork and insulated rigid ductwork in Building 1. (Source: Alvine)



Figure 2-167 Existing HVAC flexible ductwork and ceiling diffusers in Building 1. (Source: Alvine)



Figure 2-168 Existing HVAC flexible ductwork and ceiling diffuser in Building 1. (Source: Alvine)



Figure 2-169 Existing HVAC ductwork and ceiling diffuser in Building 1. (Source: Alvine)



Figure 2-170 Existing HVAC ductwork in Building 2. (Source: Alvine)

There are tunnels present in Interconnect 2-3 which appear to extend into Building 2 (Figure 2-171 and Figure 2-172). It is assumed that the tunnels were installed when the buildings were constructed to allow steam and condensate piping to be installed in the tunnels which then offset vertically out of the tunnels to wall mounted steam radiators consisting of multiple horizontal pipes stacked over each other. These stacked pipes were located below the perimeter wall windows (Figure 2-173 through Figure 2-175). A historical site plat produced in 1919 indicated that a small boiler plant was located to the east of Building 2 which housed a coal-fired boiler used to produce steam (Figure 2-176). It is assumed the steam was piped below the boiler room by means of underground tunnels which were connected at each building for routing the steam and condensate piping to the radiators.

Access down into the tunnels from within the buildings was not possible due to excessive water in the tunnel system to verify the extent of the tunnel system but it believed the tunnels continue around the perimeter of Buildings 1 and 2 as historical photographs indicated old radiators were present in Buildings 1 and 2 when these two buildings were used by the Wright brothers to construct airplanes.



Figure 2-171 Existing access to perimeter tunnel from Interconnect 2-3. Note the tunnel is full of water. (Source: RRJ)



Figure 2-172 Existing water in tunnel access at Interconnect 2-3. (Source: RRJ)



Figure 2-173 Historical photograph depicting steam radiators below windows at perimeter walls. (Source: Wright State University)

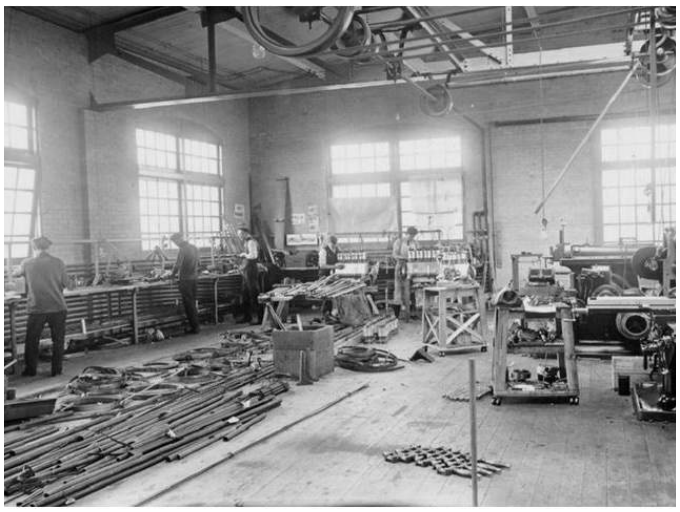


Figure 2-174 Historical photograph depicting steam radiators below windows at perimeter walls. (Source: Wright State University)



Figure 2-175 Historical photograph depicting steam radiators at perimeter walls below windows. (Source: Wright State University)

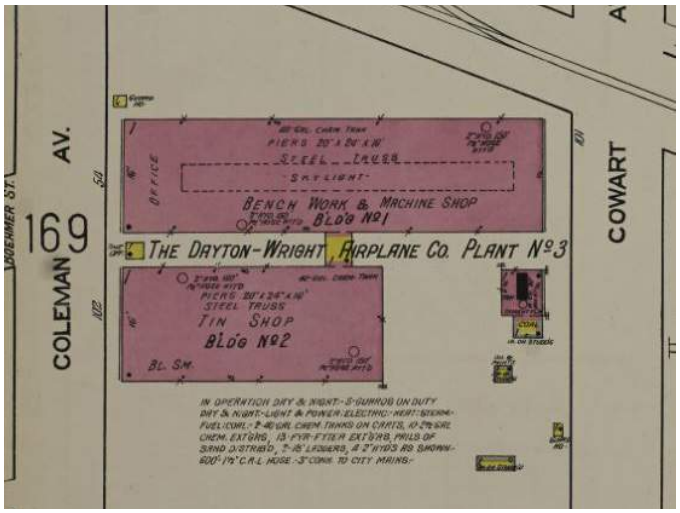


Figure 2-176 1919 Historical site plat indicating small boiler plant located east (right in Figure) of Building 2. (Source: 1919 Sanborn)

ELECTRICAL ASSESSMENT

G	**SITE UTILITIES**		
G40	**ELECTRICAL**		
	G4010	**SITE ELECTRICAL UTILITIES**	
		G401001	Site Electrical Service to Building
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

AES Ohio is the electric utility company serving Dayton, Ohio, formerly known as Dayton Power and Light (DP&L). AES Ohio is a regulated utility company that provides electric service to over 527,000 customers in west central Ohio.

The AES Ohio overhead primary electrical line serving the Wright Company factory Building 1, 2, 3, 4, 5, and 17 is located along West Third Street. On the south side of West Third Street, near the northwest end of the parking lot, there is a utility company power pole with a pole-mounted transformer. The pole-mounted transformer has an output of 240/120-volt, single-phase, three-wire (Figure 2-179).

Utility company, 240/120-volt, single-phase, three-wire, secondary electrical overhead power is routed overhead to another pole and down to a 400-amp meter socket (Figure 2-180).

On each side of the meter socket, there is a 200-amp, fusible, NEMA 3R, safety switch disconnect. One, 200-amp safety switch serves power to Building 1, #2, and #17 (Figure 2-181). The other 200-amp safety switch serves Building #4 and #5. Also connected to one of the 200-amp safety switches is a 30-amp, fused safety switch that provides power to a ground fault circuit interrupter (GFCI) receptacle in a weatherproof enclosure.

The 400-amp meter socket, two, 200-amp safety switches, 30-amp safety switch, and GFCI receptacle are all mounted on a sheet of plywood located on the north side of the parking lot,



Figure 2-177 Building 17 Abandoned Transformer Vault. (Source: Alvine)



Figure 2-178 Building 2 Abandoned Transformer Vault. (Source: Alvine)



Figure 2-179 Utility Company Pole-Mounted Transformer. (Source: Alvine)



Figure 2-180 Outdoor 400-Amp, 240/120-Volt, Single-Phase Electrical Service Entrance. (Source: Alvine)



Figure 2-181 Building 2 Electrical Service 200-Amp Disconnect Switch. (Source: Alvine)

alongside of the chain link fence. Refer to electrical sketch sheets, Existing Power Distribution Diagram ES-1 and Existing Electrical Service Entrance Diagram ES-2, in the appendix.

In the past, there was an active transformer vault located on the east side of Building 2 that held oil-filled transformers that provided secondary electrical power for Building 1 and #2 (Figure 2-178). Currently, the transformers have been removed. The existing medium-voltage insulators still remain. In the room next to the transformer vault, there is abandoned main electrical service switchgear.

On the northeast side of Building 17, there is a small transformer vault that held oil-filled transformers that provided secondary power for Building 17 (Figure 2-177). Currently, the transformers have been removed. Some of the secondary abandoned electrical equipment remains in a partially demolished room.

From each of the two, 200-amp safety switches next to the 400-amp meter socket, a 240/120-volt, single-phase, three-wire feeder cable is routed up the pole and overhead via three wooden power poles, to a pole-mounted, 200-amp, NEMA 3R, fusible, safety switch disconnect. One of these 200-amp safety switches is located on the west side of Building 2 to serve Building 1, 2, and 17. The other 200-amp safety switch is located on the west side of Building 4 to serve Building 4 and 5.

The 200-amp safety switch outside of Building 2 is currently in the “off” position with an electrical feeder connection to Building 2. The feeder termination point inside the building could not be located. There are no current active electrical panels in Building 1 and 2 to support a connection to the electrical service.

The 200-amp safety switch outside of Building 4 is currently in the “on” position with an electrical connection to a 200-amp, 240/120-volt, single-phase panel inside Building 4.

Treatment Recommendations

Abandoned electrical equipment and power lines should be identified and removed. The existing service to the building is sufficient for a minimal amount of lighting and other small loads. A new electrical supply will be required for the rehabilitation.

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4010	**ELECTRICAL POWER DISTRIBUTION**	
		D401001	Electrical Panels
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Existing electrical panels in all Buildings are in poor condition. The panels in Buildings 1 and 2 appear to have been stripped and are abandoned (Figure 2-182 through Figure 2-184). An active panel is present in Building 5 (Figure 2-185).

Treatment Recommendations

The existing electrical distribution system is not suitable for reuse and should be replaced.



Figure 2-182 Building 2 Abandoned and Stripped Switchboard. (Source: Alvine)



Figure 2-183 Abandoned and Stripped Panelboard. (Source: Alvine)



Figure 2-184 Abandoned Panelboard with Older-Style Conductors. (Source: Alvine)



Figure 2-185 Building 5 Active Load Center. (Source: Alvine)

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4010	**ELECTRICAL POWER DISTRIBUTION**	
		D401002	Grounding
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

Grounding Electrode System

Out of the bottom of the utility company 400-amp meter socket, there is a bare #6 AWG copper ground wire routed over to each of the two 200-amp, safety switch, main electrical disconnects. Out of the bottom of each of the two 200-amp safety switch main electrical disconnects, a bare #6 AWG copper ground wire is routed down to a driven ground rod.

At each of the wooden power poles, that the overhead secondary electrical are attached to, a #6 AWG bare copper wire is connected to the secondary electrical neutral wires and then is routed down the poles to a driven ground rod.

At the outside of the building on the west side of Building 2, the 200-amp safety switch building disconnect has a bare #6 AWG copper ground wire routed down to a driven ground rod.

At the outside of the building on the west side of Building 4, the 200-amp safety switch building disconnect has a bare #6 AWG copper ground wire routed down to a driven ground rod.

Equipment Grounding System

There is no functional equipment grounding system inside of Building 1, 2, and 17. Most of the feeder and branch circuit conductors, along with the equipment grounding conductors, have been stripped out of buildings.

Treatment Recommendations

The existing electrical distribution system is not suitable for reuse and should be replaced.

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4010	**ELECTRICAL POWER DISTRIBUTION**	
		D401003	Branch Circuits
		Condition Rating:	Poor
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

There are no functional branch circuits inside of Building 1, 2, and 17. Most of the branch circuit wiring has been stripped out the buildings. The wiring that does still remain is unusable. When the buildings were used as an airplane factory, the branch circuits would have been mainly for lighting circuits and woodworking machinery. There were few hand tools that required electricity at that time.

The use of conductors in conduit for branch circuits started to be used by at least by 1900. The most common early-use conduit was solid drawn, black-enameled; commonly called “black pipe.” Black pipe was used up until the early 1930s. There is black pipe currently present in Building 1 and #2. The age of this conduit is not known, but most likely installed after the buildings were used as an airplane factory.

Early branch circuits did not have an equipment grounding conductor installed with the phase and neutral conductors. Instead, the black pipe itself was used as a grounding pathway.

The conductor type commonly used in present day construction has insulation type THHN/ THWN, which has a thermoplastic insulation with a nylon sheath and comes in many colors.

The early conductor insulation type used was rubber and cloth. The cloth insulation usually consisted of multiple layers of cellulose-based fabric or yarn and was impregnated with a waterproof or fireproof compound and was black in color.

There are several locations in Building 1 and 2 where this cloth-covered conductor is currently present (Figure 2-186). It is not known the age of the cloth-covered conductors, but was probably installed after the period of significance associated with aviation manufacturing use of the facility.

Treatment Recommendations

The existing electrical distribution system is not suitable for reuse and should be replaced.



Figure 2-186 Branch circuit with black iron conduits, Black iron box, and older-style conductors. (Source: Alvine)

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4020	**POWER DISTRIBUTION AND CONTROL DEVICES**	
		D402001	Receptacles and Switches
		Condition Rating:	Varies
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The existing receptacles and switches appear to date well after the period of significance associated with aviation manufacturing use of the facility (Figure 2-187). The majority of receptacles and switches are consistent with late-twentieth century standard equipment. Few older receptacles and switches are still extant, and those that are present appear to have been abandoned in place.

Treatment Recommendations

The existing electrical control devices are not suitable for reuse and should be replaced.



Figure 2-187 Older-Style Rotary Switch. (Source: Alvine)

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4030	**LIGHTING**	
		D403001	Lighting Fixture Types
		Condition Rating:	Poor to Failed
		Repair Timeline:	Immediate
Date:	Undetermined	**Contributing:**	Non-Contributing

Description

The buildings were originally supplied with electrical power. In the historic 1910 photographs of Building 1, bare incandescent bulb fixtures or fixtures with small reflectors were suspended over work areas. (Figure 2-188)



Figure 2-188 Historical photograph of Building 1, showing original light fixtures. (Source: Wright State University)

The existing light fixtures appear to date well after the period of significance associated with aviation manufacturing use of the facility. The majority of light fixtures are consistent with late-twentieth century equipment and include fluorescent lighting and ballasts, incandescent utility lights, and wall-mounted security flood lights (Figure 2-189 and Figure 2-190). None of the existing light fixtures are functional or suitable for reuse. The only interior light source is a except a single utility light located in Building 2 that is served by temporary power from Building 4.

Treatment Recommendations

The existing lighting systems and fixtures are not suitable for reuse and should be replaced.



Figure 2-189 Abandoned Fluorescent Lighting Fixture with Lamps Removed with Ballast Remaining. (Source: Alvine)



Figure 2-190 Abandoned Fluorescent Lighting Fixture with lamps, Ballasts, and Wiring Removed. (Source: Alvine)

G	**SITE UTILITIES**		
G40	**COMMUNICATIONS**		
	G4010	**SITE COMMUNICATIONS UTILITIES**	
		G401002	Site Communications (Telephone) Service to Building
		Condition Rating:	N/A
		Repair Timeline:	Immediate
Date:	N/A	**Contributing:**	N/A

Description

Currently, there are no communication utilities routed to the Wright Company factory.

Treatment Recommendations

Communication utilities should be provided as part of any future rehabilitation of the buildings.

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4030	**LIGHTING**	
		D403002	Exit Lighting and Emergency Lighting
		Condition Rating:	N/A
		Deficiency Rating:	N/A
		Repair Timeline:	Immediate
Date:	N/A	**Contributing:**	N/A

Description

The buildings do not currently have exit lighting or emergency lighting.

Treatment Recommendations

Emergency lighting should be provided. The existing electrical service is suitable for a minimal amount of emergency egress lighting.

D	**SERVICES**		
D40	**ELECTRICAL**		
	D4040	**COMMUNICATIONS AND SECURITY**	
		D404001	Fiber Optic Service
		Condition Rating:	N/A
		Deficiency Rating:	N/A
		Repair Timeline:	Immediate
Date:	N/A	**Contributing:**	N/A

Description

The buildings do not currently have a fiber optic service.

Treatment Recommendations

Fiber optic service should be provided as part of any future rehabilitation of the buildings.

D	SERVICES		
D40	ELECTRICAL		
	D4050	FIRE ALARM SYSTEMS	
		D405001	Fire Alarm System
		Condition Rating:	N/A
		Repair Timeline:	Immediate
Date:	Undetermined	Contributing:	Non-Contributing

Description

The buildings do not currently have a functional fire alarm system. When the buildings were last occupied, there was a functional fire alarm system that monitored the fire sprinkler mains, had manual pull stations by the exterior doors, smoke detectors in the office areas in Building 1, and smoke detectors in the transformer vault and electrical switchboard room in Building 2.

Treatment Recommendations

A fire alarm system capable of off-site signaling should be installed. For future rehabilitation, a full alarm and suppression system should be provided.

D	SERVICES		
D40	ELECTRICAL		
	D4060	SECURITY AND DETECTION SYSTEMS	
		D406001	Intrusion Alarm Systems
		Condition Rating:	N/A
		Repair Timeline:	Immediate
Date:	Undetermined	Contributing:	Non-Contributing

Description

The buildings do not currently have an intrusion alarm system.

Treatment Recommendations

An intrusion alarm system capable of off-site signaling should be installed. For future rehabilitation, a full intruder alarm system should be provided.

D	SERVICES		
D40	ELECTRICAL		
	D4070	LIGHTNING HAZARD REDUCTION	
		D407001	Lightning Protection System
		Condition Rating:	N/A
		Repair Timeline:	Immediate
Date:	Undetermined	Contributing:	Non-Contributing

Description

The buildings do not currently have a lightning protection system.

Treatment Recommendations

A lightning protection system should be provided as part of the roofing replacement.

Requirements for Treatment

LAWS, REGULATIONS, AND FUNCTIONAL REQUIREMENTS

Key laws, regulations, and functional requirements that apply to the recommended work include the following:

- National Park Service Cultural Resources Management Guideline (Director's Order 28), which requires planning for the protection of cultural resources on park property.
- Section 106 of the National Historic Preservation Act, which mandates that federal agencies, including the National Park Service, take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment.

Treatment of the building and site are also to be guided by the following, listed as of the date of preparation of this report and subject to future amendment, revision, and adoption of updated editions:

- *Secretary of Interior's Standards for the Treatment of Historic Properties*
- National Park Service Management Policies, 2006 Edition
- National Park Service Guiding Principles of Sustainable Design
- Architectural Barriers Act Accessibility Standards (ABAAS)
- Current State and Local Building Codes:
  - Ohio Building Code, 2017 Edition
  - Ohio Plumbing Code, 2017 Edition
  - Ohio Mechanical Code, 2017 Edition
  - Ohio Fire Code, 2017 Edition
  - International Energy Conservation Code, 2017 Edition
  - International Fuel Gas Code, 2015 Edition
  - National Electric Code (NFPA 70), 2017 Edition
  - National Fire Alarm Code (NFPA 72), 2016 Edition
  - Standard for the Installation of Sprinkler Systems (NFPA 13), 2016 Edition
  - City of Dayton Revised Code of General Ordinances

The State of Ohio has not adopted the International Existing Building Code (IEBC); instead Chapter 34 of the Ohio Building Code includes provisions for existing buildings, including Historic Buildings (Section 3409), with references to allowances for historic structures included within the IECC. With historic structures, attempts to achieve strict conformance with model building code standards that are intended for new construction can lead to damage or destruction of historic fabric and negative impacts to the character or integrity of the building. The Ohio Building Code allows flexibility in the repair and alteration of historic structures where such changes do not "constitute a distinct life safety hazard" as determined by the building official. This language aligns with the provisions in IEBC Section 507, Historic Buildings. This flexibility provides opportunities for compliance alternatives that protect the fabric and character of historic buildings where strict compliance with the model code would be detrimental to the building.

The NPS is self-regulating in terms of enacting and enforcing building code standards. The Wright Company factory is therefore not legally subject to local or state building code requirements. When undertaking repairs to buildings and structures, NPS endeavors to have the work comply with model building code standards.

NPS currently recognizes the following as the model building codes for design and construction projects:

- International Building Code (IBC), 2021 Edition
- International Energy Conservation Code (IECC), 2021 Edition
- International Existing Building Code (IEBC), 2021 Edition
- NFPA 101 Life Safety Code (where IBC is silent)

Where conflicts exist between the 2021 ICC Codes and the currently adopted Ohio Building Codes, compliance with the more stringent of the two, as determined by a licensed design professional or code official, should be followed.

Additionally, the NPS Authority Having Jurisdicion (AHJ) for Interior Regions 3, 4, and 5will have input on determining code related treatments, including the Regional Chief of Design and Construction and Regional Structural Fire Manager / Fire Control Officer.

Preservation Objectives

The recommendations presented within this report have been developed in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. These standards define four treatment approaches that may be applied to historic properties with guidelines for the application of each approach:

Preservation	The act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.
Rehabilitation	The act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.
Restoration	The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.
Reconstruction	The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Of the four treatment approaches, *Rehabilitation*, which involves making possible a compatible use through repair, alterations, or additions, is the most appropriate for the Wright Company factory. This approach will permit the removal of non-contributing additions and alterations, any repairs that are necessary to stabilize the historic structure, and the renovations that will be required to meet the programmatic, interpretive, and management

needs of NPS and DAAV. Aspects of *Restoration* or *Reconstruction* may be incorporated in a limited manner to support interpretation and visitor experience.

TREATMENT OPTIONS

For each category, recommendations have been prepared. For some systems alternatives have been explored and will be presented below.

Component	Integrity	Contributing	Treatment Options
Exterior	Moderate	Contributing & Non-Contributing	Rehabilitation
Structure	High	Contributing	Rehabilitation
Interior	Low	Non-Contributing	Rehabilitation
Landscape	Low	Contributing & Non-Contributing	Rehabilitation
Building Systems	Low	Non-Contributing	Rehabilitation

Code Analysis

The following specific building code and life safety deficiencies based on the 2021 IBC and NFPA 101 have been identified.

OCCUPANCY

Multiple occupancy classifications are proposed for the rehabilitation of the Wright Company factory, potentially to include (as defined by the 2021 IBC, Chapter 3):

- Assembly Group A-1, Theaters.
- Assembly Group A-3, Museums.
- Business Group B. Office.
- Storage Group S-1, Moderate Hazard.

Each occupancy classification has specific requirements for life-safety considerations such as fire protection and emergency egress that are also factored based on the occupancy load. Efficiencies may be also available by taking advantage of code-permitted exceptions for small assembly spaces with occupant loads below 50 persons, which can be considered as Business Group B under certain circumstances.

Fire separation between occupancies is generally required. For occupancies with the potential for odors, fumes, or that include the storage of limited hazardous materials such as the proposed maintenance area, mechanical isolation and specialty ventilation will also be required.

ACCESSIBILITY

The site and existing buildings are well suited for compliance with ABAAS standards. The relatively level site provides few challenges to providing accessible paths to the building from parking areas and for general circulation within the site. The original industrial use of the building provided level interior walking surfaces, unrestricted interior circulation, and wide exterior doors. The lack of historic interior partition walls or finishes provides great flexibility in fully adapting the reuse of the buildings to modern code requirements.

MECHANICAL AND PLUMBING

The buildings do not currently have functional mechanical or plumbing systems. Sizing and separation of ventilation and plumbing systems will be factored based on occupancy classifications, occupant density, and the character and square footage of spaces served, as governed by the 2021 IBC, 2021 International Plumbing Code (IPC), and the 2021 International Mechanical Code (IMC).

ELECTRICAL AND LIGHTING

The buildings do not currently have functional electrical or lighting systems. Emergency egress lighting is not present. Electrical loads will generally depend on occupancy classifications and space usage, with considerations for specific needs or specialty uses, particularly for interpretive areas, as governed by the 2021 IBC and NFPA 101.

ENERGY CONSERVATION

During the period of significance associated with the Wright Company, the buildings were not insulated; the brick walls were exposed on the interior, and no insulation was included within the roofing system. Prescriptive and performance-based building envelope insulation values are provided by the 2021 IECC, with specific allowances and exemptions for historic properties provided by Section 501.5, Historic Buildings

The Fire on March 26, 2023

At about 2:30 A.M. on Sunday, March 26, 2023, the Dayton Fire Department was called to respond to a structure fire at the Wright Company factory complex. Upon arrival of emergency response units, the fire was “fully involved,” meaning the structures were engulfed and flames had breached the roof and wall openings. A fire of this intensity presents high risk to emergency personnel due to the intensity of the heat, severe smoke development, and the risk for structural collapse. Water spray was directed through openings in the roof in an attempt to control the fire, but firefighters did not enter the buildings. The complex continued to burn into Monday, March 28, and firefighters were monitoring hot spots for several more days (Figure 1-191).



Figure 2-191 Dayton Fire Department battling active flames on Sunday, March 26, 2023. (Source: NPS)

At the time of this report, a formal investigation of the fire causation and an estimate of damage has not yet been completed. Based on photographs of the structures made available by various news sources during the event and aerial drone photography taken by NPS, the damage to the historic buildings appeared to be extensive, with Building 1 being the most affected by the fire (Figure 1-192 through Figure 1-194).

- Building 17: The roof structure appeared to have been partially damaged, with an undetermined extent of damage to the interiors and brick masonry walls.
- Building 1: The roof structure had entirely collapsed. The interior finishes and partitions walls were likely completely destroyed, and the brick masonry exterior walls were heavily damaged and in some locations destroyed. Interconnect 1-2: The roof structure had almost completely collapsed and the mezzanine structure was heavily damaged.

- Building 2: Approximately 60 percent of the roof structure had collapsed towards the east side of the building; the remaining roof structure is likely heavily damaged and may not be salvageable. The interiors and remnants of the original exterior walls appeared to have been heavily damaged and in some locations, destroyed. Interconnect 2-3: The roof structure included the mezzanine had almost completely collapsed.
- Building 3: Approximately 80 percent of the roof structure had collapsed; the remaining roof structure is likely heavily damaged and may not be salvageable. The interiors appeared to have been heavily damaged and in most locations, destroyed.
- Interconnect 3-4: The roof structure had entirely collapsed.
- Building 4: Approximately 40 percent of the roof structure was damaged or partially collapsed, with an undetermined extent of damage to the remaining structure.
- Interconnect 4-5: Damage to the structure was of an undetermined extent.
- Building 5: Damage to the structure was of an undetermined extent.

Following the Fire

The City of Dayton has engaged an engineer to assess the building; the post-fire assessment report identifying the full extent of the damage to the complex is expected in the spring of 2024. NPS consulted with the historic structure report project team regarding the impact of the fire on the report and the treatment recommendations being developed. It was decided to finalize the report as documentation of the existing conditions prior to the fire and as a record of the discussions and research into options for future rehabilitation of the site.



Figure 2-192 Aerial photograph of damage taken on Sunday, March 26, 2023. (Source: NPS)



Figure 2-193 Photograph of Building 1 and Interconnect 1-2, looking southeast from the west entry. (Copyright Jim Noelker/Dayton Daily News)



Figure 2-194 Photograph of Building 3 showing the roof structure collapse, looking east from the west end of the building. (Copyright Jim Noelker/Dayton Daily News)

Ultimate Treatment and Use

ULTIMATE TREATMENT AND USE

Following a participatory workshop which included NPS staff, the project consultant team, park partners, and other stakeholders, the following preferred treatments were distilled from discussions spurred by the options presented (and documented below under “Other Treatment Options Considered”).

Both the site and buildings of the Wright Company factory campus offer a high level of flexibility for programming, circulation, and interpretation. The treatments specific the Buildings 1 and 2 will be impacted by the development of the surrounding parcels which will remain under private ownership. Given the unknown timeline for the broader campus redevelopment, the preferred treatment recommendations focused on options to address programmatic and interpretive needs specific to the parcels planned for acquisition by NPS but with flexibility for integration into future redevelopment plans for the rest of the site. Preference was also given to treatment options which reduced the need for new construction and prioritized maintaining programmatic needs, for both administration and visitor purposes, within the footprint of the existing buildings, while restoring as much as possible the historic site character and preserving existing viewsheds to the historic building.

The preferred use of Buildings 1 and 2 was determined to be a blended program of park administration, park maintenance, interpretation support, resource management, and interpretive display.

Due to the March 2023 fire, development of the preferred treatment was paused and a preparation of a formal cost estimate was removed from the project scope. Based on the preliminary work towards a probable construction cost, the preferred treatment options were likely to range between $29,300,000 and $33,700,000, assuming median square foot costs for government Class B office space and semi-finished maintenance space and inclusive of parking, sidewalks, drive lanes, and other surface paving with limited landscaping restoration. Estimated structural repairs, roofing replacement, and restoration of exterior walls, doors, and windows are included. Standard government markups and historic preservation factors have been applied. Costs for Furniture, Fixtures, and Equipment (FF&E) are excluded, as are costs for brown field mitigation and monitoring, as recommended in the environmental assessment report.

Landscape and Site (Figure 1-195)

The relatively level topography of the site lends itself well to accessible development. The preferred site treatment incorporates aspects of both Options #1 and #2 (see “Other Treatment Options Considered” below). Features such as changes in the paving or landscape treatment can be integrated into the site plan along with signage and interpretive nodes to communicate to visitors regarding historic features that are no longer extant, such as the CSX rail line and the original footprint of the east end of Building 1. The site plan accommodates dedicated visitor parking, a bus loading/unloading zone with potential areas for orientation and interpretation, and staff parking. Visitor parking can also be configured to accommodate several spaces for oversized vehicles and RV parking. Integration with regional public transportation and maintaining the primary site entry at West Third Street respects the multi-modal history and orientation of the site with the early twentieth century development of West Dayton.

Visitors will primarily approach the site from West Third Street, on the north side of the property. Since this approach aligns with the historic entry to the site, parking and other visual obstructions should be located several feet away from the north wall to maintain the view of the historic building. From the public parking lot, visitors will proceed south along a pedestrian walk that follows Inland Avenue toward the new public entry at the west



Figure 2-195 Preferred landscape treatment. (Source: LSHLA and RRJ)

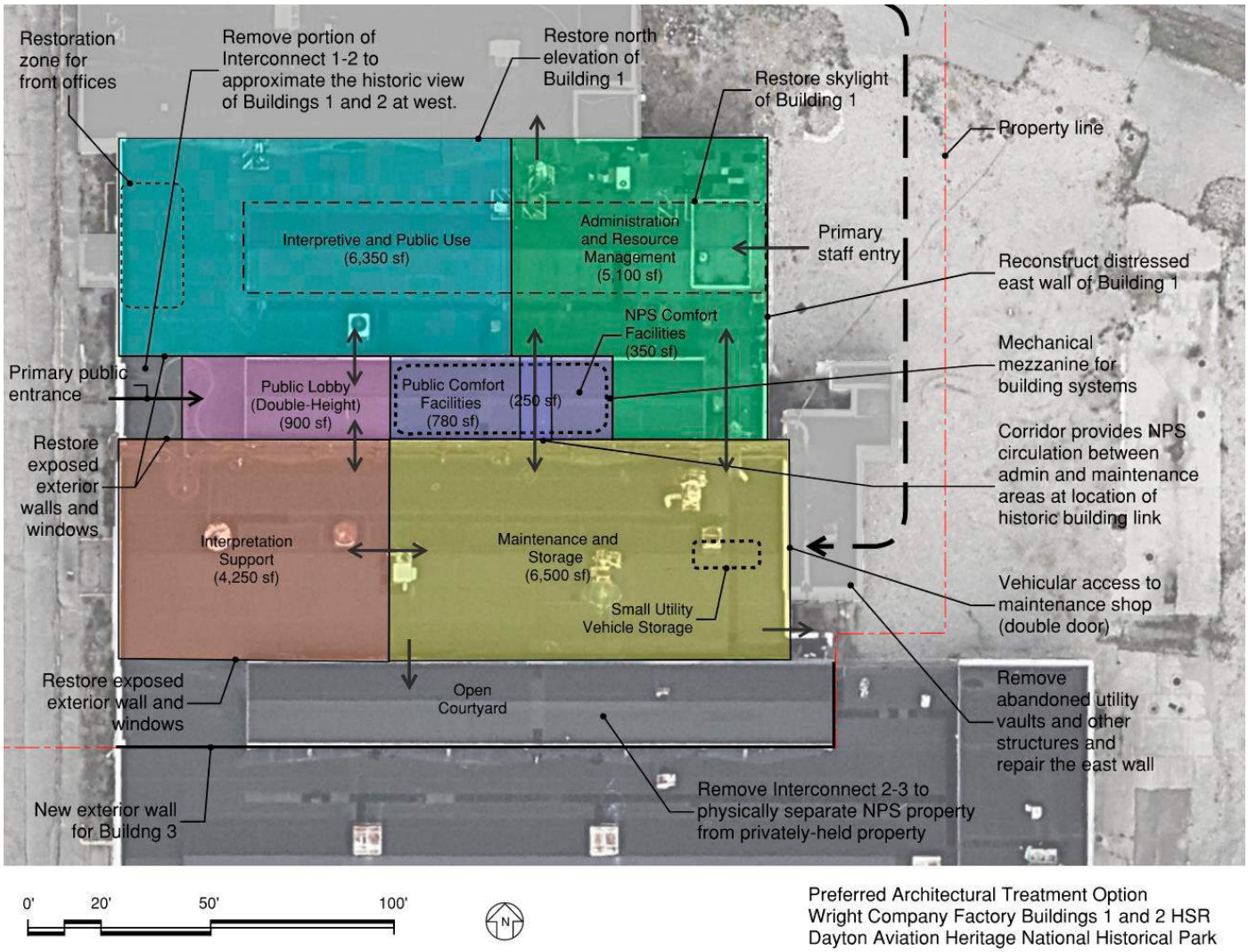


Figure 2-196 Preferred architectural treatment. (Source: RRJ)

facade of Interconnect 1-2. Since visitors approach from the side of Building 1, compatible signage and wayfinding will be in place to direct them to the west side. As visitors progress towards the entrance, multiple opportunities for interpretive nodes where stories related to the establishment, operation, and use of the factory complex by the Wright brothers and the Wright Company factory can be told to enhance understanding and appreciation of the site - both during the Wright brothers period of significance and its later transformation into a major industrial complex under subsequent ownership. Opportunities also exist to provide visitors with educational information about brownfield redevelopment and environmental stewardship.

Architecture (Figure 1-196)

The preferred architectural and structural treatments were selected to protect the character defining features and historical significance of the property and to maximize the property's use to meet the park's needs. The treatment complies with the Secretary of the Interior's Standards for Rehabilitation and encourages sensitive and compatible alterations to the historic fabric.

Non-contributing structures will be removed, including Building 17, the Building 1 vestibule, and the abandoned utility vaults on the east ends of Buildings 1 and 2. Interconnect 2-3 will also be removed to provide a physical separation between the historic buildings being acquired by the National Park Service and those buildings that will remain under private ownership.

Programming for Building 1 will focus on visitor experience and interpretive space on the west side of the building. The interpretive concept for Building 1 is to restore the front offices as they appeared in the 1911 photographs, while the rest of the space will be programmed to retain the unobstructed floor plan and abundance of natural light that are character defining features of the historic factory. Within this floor plan is generous room for museum exhibits, public assembly space, and other interpretive programming.

A new partition aligned with the original location of the corrugated steel partition wall visible in the historic photographs of Building 1 will serve as the occupancy separation between the Group A museum and interpretation space and the Group B offices and administration space on the east side of Building 1. The primary staff entrance will be at the east wall of Building 1.

Interconnect 1-2 will remain in place with alterations; the west facade will be recessed to restore some of the original sense of Buildings 1 and 2 being independent structures. The interconnect will serve as the primary public entrance and will contain space for public restrooms that are separated and secured from facilities servicing the NPS offices. The interconnect mezzanine provides space for centralized building mechanical systems.

Programming for Building 2 is primary Group S, focused on workshops and maintenance space, with generous square footage for interpretation support. A maintenance space with room to store small utility vehicles will be accessed via oversized doors on the east wall. Circulation between Buildings 1 and 2 is maintained along the historic alignment via a corridor that passes through the interconnect at the location of the original link shown in the 1919 Sanborn map. This allows full separation of visitor circulation, staff circulation, and maintenance vehicle circulation.

To accomplish this treatment, alterations of the buildings as they currently exist will be required:

- After the demolition of Building 17, the north wall of Building 1 will require repairs.
- The east wall of Building 1 is distressed and requires removal and reconstruction. Because this is not the original east wall of Building 1, the replacement wall can take design inspiration from the 1910 east wall, or be of a modern but compatible design.
- The skylight for Building 1 will be restored. As a modern replacement, a high-performing skylight assembly can be installed with a design that is sympathetic to the original skylight visible in the historic photographs.
- The west facade and west structural bays of Interconnect 1-2 will be removed to recess the west face from the facades of Building 1 and 2. As a new wall that will serve as the primarily public entry point, the design may draw inspiration from the existing interconnect parapet profile or incorporate more modern systems and envelope materials.
- The west facades of Buildings 1 and 2 will be restored to the 1910-11 appearance. New windows and doors of a compatible design will be installed. For Building 2, the oversized central door may instead be a fixed storefront system with a design sympathetic to the original sliding doors.
- The east wall of Building 2 will require repairs after removal of the abandoned utility vaults. Since this is not the original east end wall, again the rehabilitation of this wall to

accommodate the maintenance shop can draw inspiration from the historic appearance or be reinterpreted with a modern appearance.
- The south wall of Building 2 will require repairs, and a new wall will need to be constructed at the eastern bays where no wall currently exists to enclose Building 2.
- Building 3 was never constructed as a stand-alone structure and has no north exterior wall. After the removal of Interconnect 2-3, a new exterior wall will be required along the north of Building 3. Since Building 3 will remain under private ownership, plans for the alteration of this building should made in consultation and partnership with the City of Dayton or the current owner at the time of the alteration.
- All windows and exterior doors will require replacement. Replacement windows and doors should match the historic units in appearance, but as modern replacement units, considerations for energy efficiency can be made, including thermally broken frames, double glazing, and additional security measures as required.

MEP/FP

All buildings will require new mechanical systems. The open footprint of Buildings 1 and 2 allows for a variety of opportunities for programming and conditioning the interior spaces. The preferred treatment for HVAC purposes was to centralize mechanical, data, and utility spaces as much as possible, particularly taking advantage of the mezzanine space in Interconnect 1-2 for interior equipment, such as air handlers, where possible. Based on the anticipated occupancy groups, which require ventilation separation between Buildings 1 and 2, Building 1 will be served by a larger, centralized, high-efficiency mechanical unit, and Building 2 may be divided into zones served by high-efficiency smaller units. Where exterior equipment is required, ground-level equipment should be used and rooftop equipment should be minimized. Exterior equipment will be placed at the east side of the building, and options for visual screening and protection against vandalism or theft will be incorporated.

Because much of Building 1 will retain its internal historic character, exposed mechanical systems are appropriate to consider. Exposed building systems such as ductwork and piping can be designed to be sympathetic to the historic building. A hot water radiator heating system will be designed to reflect the system of steam radiator pipes visible in the historic photographs. Overhead ductwork, fire suppression, electrical lines, and other utilities will be integrated into the roof truss space to maintain the historic clearance.

- All new site utilities and interior plumbing will be required for water supply, sanitary sewer services, and storm water sewer services. Site utility improvements will need to be coordinated with the City of Dayton and other stakeholders involved in the campus redevelopment plans.
- All new site utilities and interior wiring will be required for electrical service. Electrical service to Buildings 1 and 2 should be independent from the other structures and should be relocated underground. Site utility improvements will need to be coordinated with the City of Dayton and other stakeholders involved in the campus redevelopment plans.
- Lighting fixtures and other electrical loads should be selected for appropriateness of the space and energy efficiency.
- A new fire suppression system will be provided at all buildings. Preference is for a wet-pipe system. At this time, a fire pump is not anticipated to be required; however, coordination is needed with the planned site utility improvements.
- Telecommunications service will need to be provided to the site. Again, coordination with the broader campus redevelopment will be required.

SITE ENVIRONMENTAL CONSIDERATIONS

Regardless of the preferred treatments selected, considerations and planning to address the site contamination will be required. Vanasse Hangen Brustlin, Inc., (VHB) performed a Phase II Environmental Site Assessment (ESA) and a hazardous building material (HBM) survey in 2022 and issued a report of findings on October 18, 2022. The scope of the ESA and HBM was threefold:

- Assess the potential for a previously undocumented release of volatile organic chemicals (VOCs), particularly trichloroethene (TCE).
- Assess the hazard potential for occupants of Buildings 1 and 2 due to VOCs in the sub-slab soil gas.
- Identify the presence and location of HBMs inside the buildings.

History of Contamination Issues

Since at least 2003, elevated levels of TCE, tetrachloroethene(PCE), chloroform, other industrial solvents, and petroleum related VOCs have been known to be present at the groundwater and soil gas at the site. Heavy metals have also been detected in the site soil, including arsenic, lead, and cadmium. These contaminants were the result of historical manufacturing processes.

In 2007, Delphi/DHP Holdings, in partnership with the City of Dayton, entered into an investigation and remediation process for site contaminants under the Ohio Voluntary Action Program (VAP). Per the Ohio Environmental Protection Agency (Ohio EPA) website, a VAP program provides the following:

> ...a way to investigate possible environmental contamination, clean it up if necessary and receive a promise from the State of Ohio that no more cleanup is needed... When cleanup requirements are met, the director of Ohio EPA issues a covenant not to sue. This covenant protects the property owner or operator and future owners from being legally responsible to the State of Ohio for further investigation and cleanup.[104]

Delphi/DHP Holdings and the City of Dayton undertook sampling, monitoring, and mitigation measures under the VAP to address the identified issues, which included material removal, soil treatment, and installation of Sub-Slab Depressurization System (SSDS) systems at private structures north of the former plant which are affected by the contaminated plume of ground water and soil gas. Removal of asbestos-containing materials (ACM), primarily floor tiles, insulation and plaster, was performed in 2013 and 2014. After completing these activities, Delphi/DHP Holdings and the City of Dayton were granted a Covenant Not to Sue by the Ohio EPA on October 5, 2017.[105] Future uses of the site were limited by this covenant:

> i) limit the Property to commercial use, industrial use or combination of these uses; ii) prohibit the extraction and use of ground water for purposes other than monitoring or remediation; and iii) limit occupancy of any building on the eastern portion of the property until a remedy addressing vapor intrusion is

104 Ohio EPA, “Voluntary Action Program.” https://epa.ohio.gov/divisions-and-offices/environmental-response-revitalization/derr-programs/voluntary-action-program.

105 Ohio EPA, “Issuance of Covenant Not To Sue for the Dayton Aviation Heritage Redevelopment Project Property (16NFA647).” https://epa.ohio.gov/static/Portals/32/pdf/delphi%20ave%20CNS.pdf.

in place and maintained as an engineering control or a demonstration made that applicable vapor intrusion standards are met.

2022 ESA and HBM Study

In 2022, a sampling and testing program was conducted by VHB on the 3.5-acre parcel identified for potential acquisition by NPS. VHB's study sampling building materials, soil, and soil gas. Based on the results of the testing, VHB concluded:

- VOCs including TCE are present in the soil below the slab-on-grade inside Buildings 1 and 2 at levels that exceed recommended thresholds, which represents an unacceptable VOC exposure risk for both visitors and staff.
- VOC concentrations were highest in center and east ends of Buildings 1 and 2, likely related to a prior release of TCE and other VOCs inside the structures.
- Petroleum-related VOCs were detected in high quantities along the west side of the buildings, likely related to a former underground storage tank, which also has the potential to create an unacceptable VOC exposure risk.
- The HBM survey identified building materials containing both asbestos-containing materials (ACM) and lead-based paint (LBP) inside both buildings. Building 17 was also suspected to have similar HBMs.

VHB's recommendations to address these contamination issues included a combination of mitigation specific to the HBMs identified at the building interiors, an on-site SSDS to manage soil gas and vapor migration concerns, and continued monitoring of the soil gas and other environmental contaminants. Longterm maintenance of the offsite SVE systems will also be required and the responsibility for these systems should be part of the parcel acquisition negotiation with the City of Dayton. Additionally, the ESA and HBM studies may not have captured all possible conditions requiring abatement or treatment, and additional testing may be needed based on rehabilitation plans.

Other Treatment Options Considered

SITE TREATMENT ALTERNATES

Treatment options for the Wright Company factory site were developed within the approximately 3.55-acre parcel within the park boundary established on the plat for acquisition (Figure 2-197) developed by the National Park Service. The red boundary line defines the study area for the project and the limits of development. A portion of the area indicated within the park boundary, south of West Third Street and east of Inland Avenue, is designated for commercial development through agreements with the City of Dayton. Inland Avenue will remain a public road corridor. Although it is not part of the park, the National Park Service will retain rights of access from West Third Street to Building 2 and areas suitable for visitor parking.

The 3.55-acre parcel addressed herein is anticipated to accommodate park functions and needs, including visitor and park service/maintenance access, vehicular and pedestrian circulation systems, parking, interpretation of the site, and its relationship to Dayton Aviation Heritage National Historical Park and the eight-county National Aviation Heritage Area.

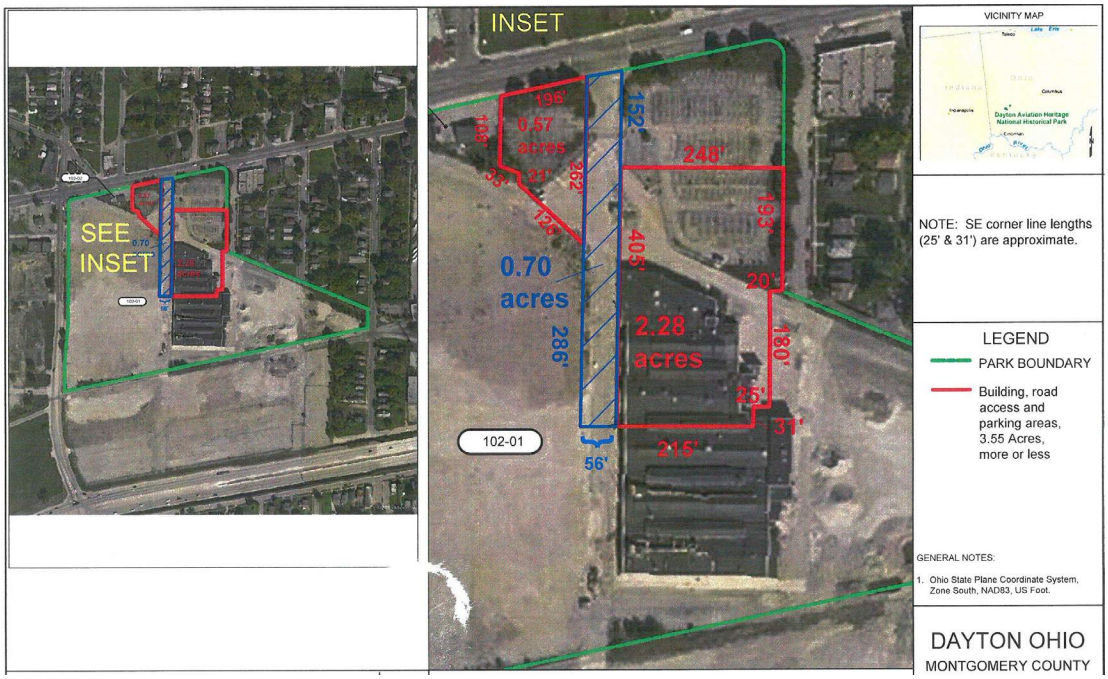


Figure 2-197 The proposed plat for acquisition associated with the Wright Company factory site. (Source: NPS)

Treatment is a preservation strategy for long-term management of a historic property, intended to direct physical work on the landscape so that the distinguishing characteristics and features that contribute to the significance of the property are preserved. The pages that follow outline a treatment plan and conceptual design options for the 3.55-acre parcel prepared in support of the Historic Structures Report to provide the National Park Service with an overall vision for the cultural landscape of the Wright Company factory and address management and interpretation of the property's historic associations, while also addressing the need for site developments that accommodate the programmatic elements listed above. The treatment plan and conceptual design options have been developed based on the assumption that both natural and cultural resources merit careful stewardship and conservation strategies.

The conceptual design options are designed to respond to the specific management issues, concerns, and objectives conveyed to the HSR team in the project statement of work and by park and regional National Park Service personnel during a start-up meeting conducted on behalf of this project. Based upon the park's need to meet current and projected future interpretive, functional, and management goals, rehabilitation is recommended as the most appropriate overarching treatment approach for the Wright Company factory site. Because rehabilitation is defined as the act or process of making possible a compatible use for a property, this approach allows for protection of the site's historic character and resources while carefully addressing the need for development of interpretive opportunities and circulation routes, parking for both National Park Service and visitors, additional buildings associated with maintenance for the park, ecological maintenance and restoration, and the improvement of visitor amenities.

The conceptual design options have been developed following the Secretary of the Interior's Standards for Rehabilitation. The standards, composed of ten principles, are intended to help preserve the distinctive character of a site while allowing for necessary additions and changes to meet new needs.

Two conceptual design options are provided herein for consideration for the site by the National Park Service. Both options identify a means for visitors to enter the property, circulate through the site, and gain an understanding of its historical events and associations through the provision of interpretive information. Both options carefully address these needs in such a way as to limit the impacts on significant cultural and or natural resources. There are several commonalities between the options as discussed below. The principal difference is the way in which a historic rail line alignment is used to structure new development and interpretation. Each of the options is discussed in more detail below and illustrated in Figure 2-198 and Figure 2-199.

Treatment Actions Common to Both Concept Options

- The historic entrance from West Third Street is retained and used tas the main entrance to the property
- Inland Avenue remains a key route of circulation and continues to edge the principal facades of Buildings 1, 2, 3, 4, and 5.
- Building 17 is removed.
- The historic alignment of the former CXS (B&O) railroad line through the site is interpreted.
- National Park Service maintenance and staff parking needs are accommodated through programming within the footprint of the existing structures and a designated parking area.
- Visitor parking is accommodated in a space that is separate from the NPS staff parking area
- Provision is made for a bus drop-off area, a turn-around, and parking.
- Provision is made for ABAAS/ADA compliant circulation, including accessible parking and an accessible route connecting parking with accessible entrances into Buildings 1 and 2.
- Provision is made for a small group gathering area that will accommodate tour groups and provide general amenities such as benches and wayside exhibits.
- Provision is made for vegetative screening buffers designed to diminish impacts of contemporary features on historic areas, views, and interpreted locations.

Concept Option 1 (Figure 2-198)

This option would provide vehicular access from West Third Street onto Inland Avenue. The road would remain in its current alignment, extending the length of the existing building complex (Buildings 1-5). Inland Avenue would provide access to a visitor parking area east and a bus drop-off and parking area west. A paved service road would extend east from Inland Avenue along the south boundary of the commercial parcel, providing access to the NPS staff parking and maintenance areas. A two-bay storage building, and a light industrial shop would be added along the service road to meet National Park Service programming needs for maintenance. The service road would follow a portion of the former alignment of the CSX/B&O railroad line.

To facilitate access, the proposed visitor parking area and walk system are designed to be large enough to accommodate visitors comfortably. Due to the relatively level topography, all pedestrian walkways, gathering areas, parking areas, and building entrances are anticipated to be fully accessible with a minimum of grading. All pedestrian walkways, parking areas, gathering areas, and entrances to Building 1 and 2 will meet ABAAS/ADA guidelines for accessibility. The location of visitor parking east of Inland Avenue allows for access to the buildings without crossing the access road. Bus drop-off and parking is located west of Inland Avenue, providing a gathering and orientation space for tour and school groups. Crosswalks signal the passage of visitors from the gathering area across Inland Avenue to the entrances into Buildings 1 and 2.

An accessible sidewalk extends south from West Third Street along the western edge of Inland Avenue. The sidewalk would connect to the city bus stop nearby and the sidewalk along West Third Street. Wayside exhibits sited along the walks and in gathering areas would provide interpretation on a variety of topics.

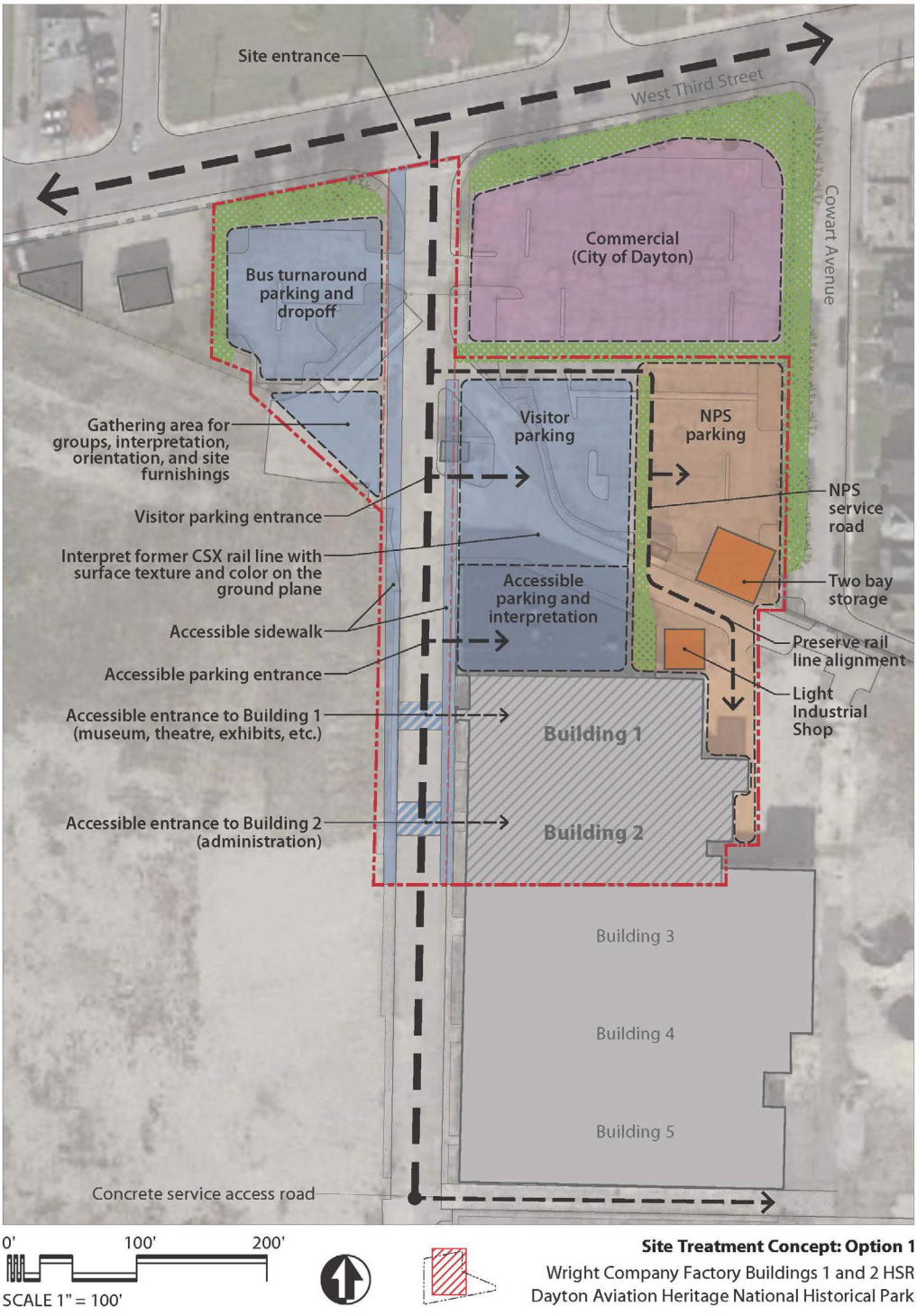


Figure 2-198 Site treatment, Concept 1. (Source: LSHLA)

Concept Option 2 (Figure 2-199)

This option provides many of the same amenities and program needs as described in Option 1. The major difference within this option is the interpretive feature linking visitor amenities located east and west of Inland Avenue. The interpretive feature is the former alignment of the CSX/B&O railroad line. A crosswalk follows the angled alignment of the rail line and interpretive information is provided in association with the route. The route would be designed with special paving materials, textures, and colors. Associated with this option is a designated interpretive circulation system connecting gathering areas, walkways, and spaces at the entrances of Building 1 and Building 2. This concept option provides an alternative footprint and layout for the two NPS maintenance buildings. This alternative may serve to provide more parking and ease of access to the north and east portion of Building 1 and the east portion of Building 2.

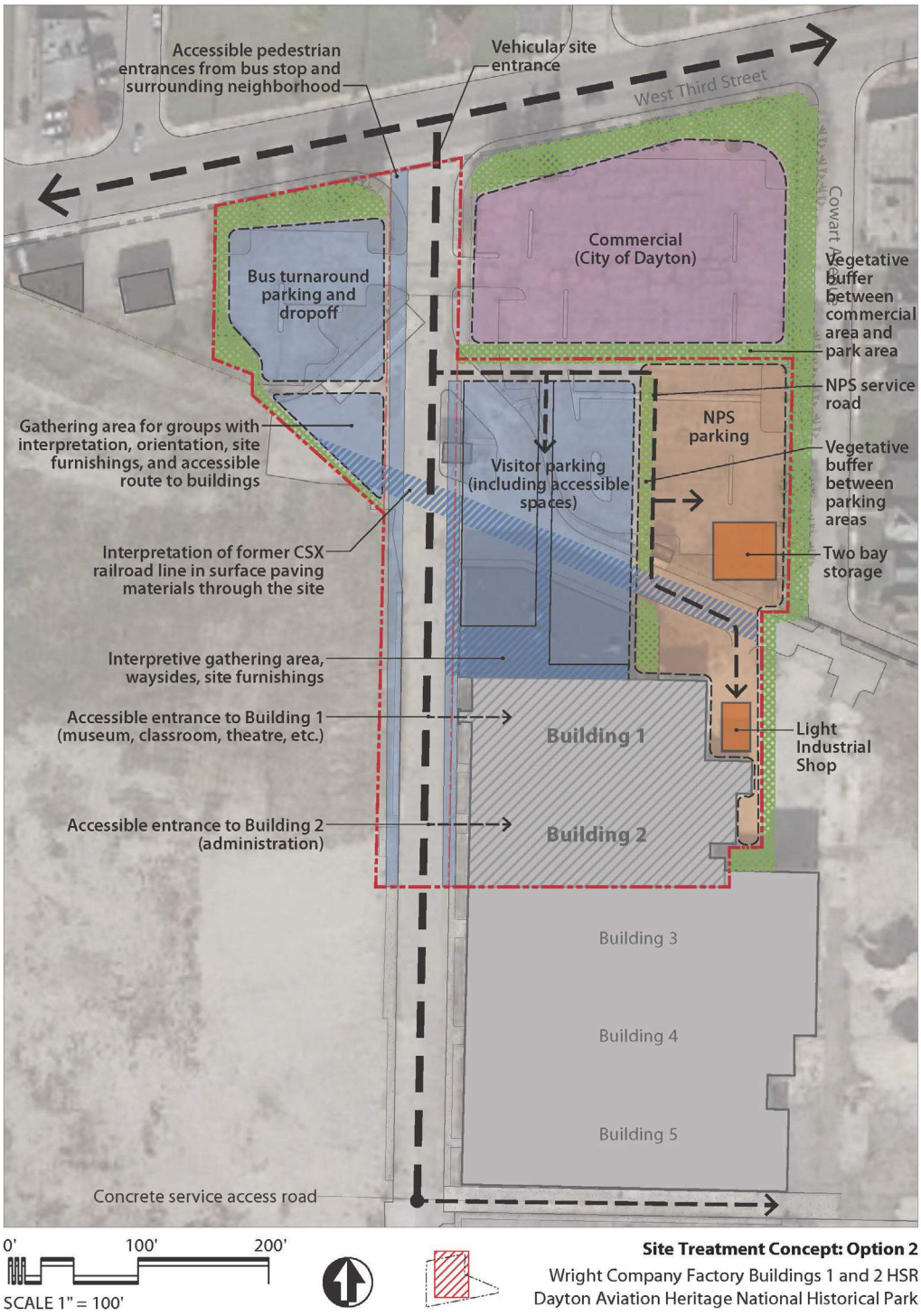


Figure 2-199 Site treatment, Concept 2. (Source: LSHLA)

ARCHITECTURAL ALTERNATES

Design Concept Overview

The architectural treatment alternates presented here were developed to provide conceptual guidance to the NPS in the rehabilitation of the Wright Company factory Buildings 1 and 2. The treatment alternates were prepared to protect the character defining features and historical significance of the property and to maximize the property's use to meet the park's management needs, interpretation goals, and for the public's enjoyment. The treatment alternates have been developed following the Secretary of the Interior's Standards for Rehabilitation.

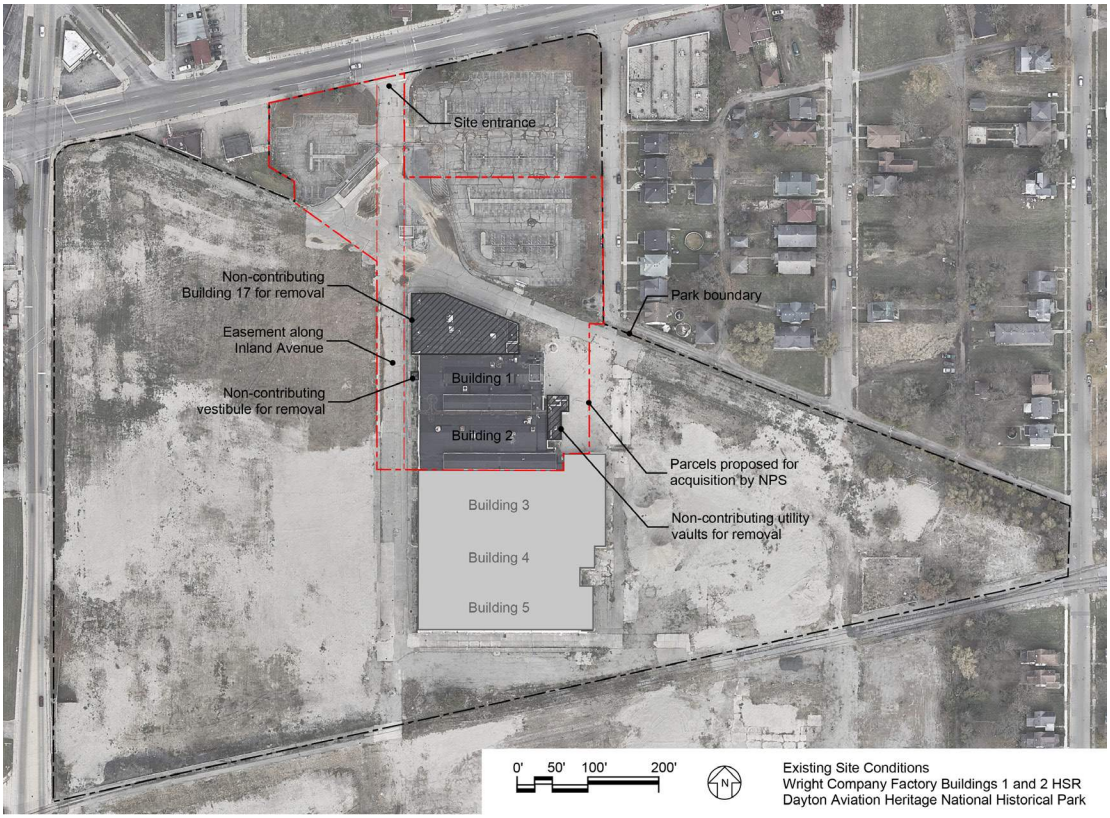


Figure 2-200 Existing site conditions influencing architectural treatment options. (Source: RRJ)

Specific considerations for program and space needs were also communicated to the project team. An early treatment discussion was held on February 16, 2022, where the project team and representatives of NPS discussed conceptual rehabilitation approaches and prepared a preliminary list of programmatic and interpretive goals. Following this discussion, the park held an internal interpretive planning charette on February 24, 2022.

As an outcome of the charette, the park established the following conceptual programmatic needs and space allocation:

PROPOSED CONCEPTUAL BUILDING PROGRAM			
Function	**Area (SF)**	**Occupancy**	**Comments**
Maintenance – 4,850 SF			
Office	1,050	7	
Office Support	200	7	Break room/Kitchenette
Restroom (2)	200	7	
Light Industrial Shop	1,000		Small wood shop; Tool storage; Wash station
Storage	2,400		Bobcat Toolkat (small utility vehicle and equipment storage; Flammable cabinet; General park storage; Wash station
Administration – 2,150 SF			
Office Area	1,050	7	
Conference/Training room	750	20-25	
Office support	150	7-10	Break room/Kitchenette; Administration storage; Supplies
Restroom (2)	200	7-10	
Interpretation Support – 2,800 SF			
Office Area	1,400	12	
Office Support	200	10-15	
Storage	1,000		
Restrooms (2)	200	10-15	
Resource Management – 1,700 SF			
Office Area	300	2	
Office Support	200	10-15	Administration storage; Supplies
Library	500		
Workstation	700	2	Collections/Storage/exhibit development
Restrooms (1)	100	2	
Staff Parking – 9,600 SF			
Maintenance Parking	3,200	10	
Additional Staff Parking	6,400	20	
Interpretive Display			
Exhibit Floor	TBD	TBD	

Assumptions and Treatment Actions Common to All Options

- The boundaries proposed for acquisition by NPS will be the final boundaries of the parcels available for rehabilitation. This includes assuming that the easement along Inland/Cowart Avenue requires unrestricted public access.
- The City of Dayton has immediate plans to establish community green space at the site. These plans will require communication and coordination with the city and other stakeholders and will influence the ultimate site treatment for the Wright Company factory.
- Long-term plans for the overall campus are likely to include major redevelopment into a commercial and entertainment district by private parties or through public-private partnership agreements that will require coordination with NPS use and needs.
- Building 17 will be removed in its entirety to restore the north side of Building 1.
- While Buildings 3, 4, and 5 are within the park boundaries, they are not within the boundaries proposed for acquisition by the National Park Service. Buildings 3, 4, and 5 will remain in place and under separate ownership.
- The environmental site contaminants are assumed to have been remediated to a sufficient level to allow for commercial development. There are likely to be additional site remediation actions required, but these are assumed to not be of a character that would prevent the planned rehabilitation and reuse of Buildings 1 and 2.
- Building 1 is preferred for interpretive and public use, while Building 2 is preferred for administrative and operational uses.

Treatment Option 1: Existing Footprint

Treatment Option 1 assumes the least alteration to the existing footprint of Buildings 1 and 2 and takes advantage of the additional floor area provided by the non-contributing interconnect structures.

The majority of Building 1 is reserved for exhibit and interpretive space. The west entry would serve as the primary entry for the public, guiding visitors through a recreation of the historic front offices before stepping into the open and light-filled factory floor. The uninterrupted interior space provides maximum flexibility for exhibit design, including large artifacts such as reproduction Wright airplanes in various states of assembly. A secondary public entry space at Interconnect 1-2 can permit opportunity for school groups to gather or to provide a controlled entry point for after hours or private events if community use such as classrooms or maker spaces might be incorporated into Building 1. No new construction is proposed at the east end of Building 1, but interpretation of the historic footprint can be incorporated through site or landscape features.

Building 2 is dedicated to park operations and provides ample square footage for the desired functions. The interior spaces can be organized to take maximum advantage of shared needs between office and workshop spaces. The maintenance area is located to the east end of Building 2 to allow direct vehicular access to a drive-in bay for vehicle maintenance. There are multiple potential access points for circulation between the buildings. The exterior walls of Buildings 1 and 2 can be interpretively restored in select areas.

To physically separate NPS property from the privately-held Buildings 3, 4, and 5, a new interior partition wall will be constructed along the column line between Interconnect 2-3 and Building 3. This partition wall will provide security and fire separation purposes.

A generous mechanical space is located at the east end of Interconnect 1-2. Centralizing ventilation and other building systems distribution is the most efficient approach to servicing a building of this size; smaller HVAC units can be located within the operational areas for zoning control.

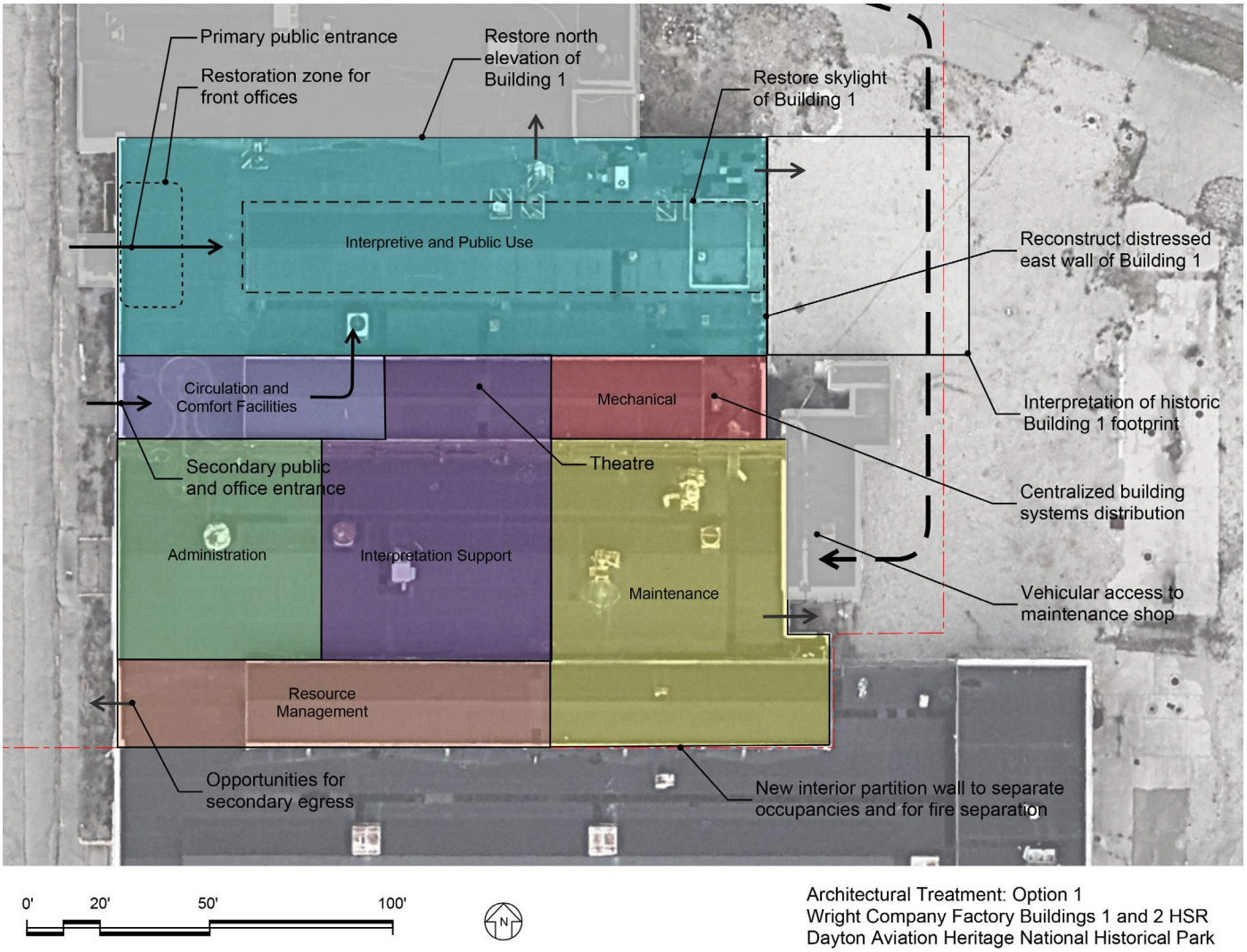


Figure 2-201 Treatment Option 1. (Source: RRJ)

Treatment Option 2: Visual Separation

Treatment Option 2 incorporates strategic removal of the non-contributing interconnects to create a visual effect of Buildings 1 and 2 as being stand-alone structures without losing all of the additional square footage provided by the interconnects. One advantage of this option is that viewing the building from the northwest restores a sense of the view shed shown in the early photographs, before the construction of Buildings 3, 4, and 5. One disadvantage is that this option returns the building to the c.1923 footprint, just after the period of significance associated with airplane manufacturing. Consideration is needed if this is an appropriate approach under the proposed period of significance limited to the Wright Company.

Building 1 is used primarily for exhibit and interpretive space, with the option to reconstruct the missing east end of Building 1 to provide additional space for either interpretive, community, or operational use. Economies of space planning can be explored to potentially condense all operational uses into Building 2.

If Building 1 is extended to its historic footprint, the boundaries of the new construction area will fall outside the boundaries of the parcels currently under consideration for acquisition. Adjusting the purchase boundary will need to be explored prior to moving forward with this treatment.

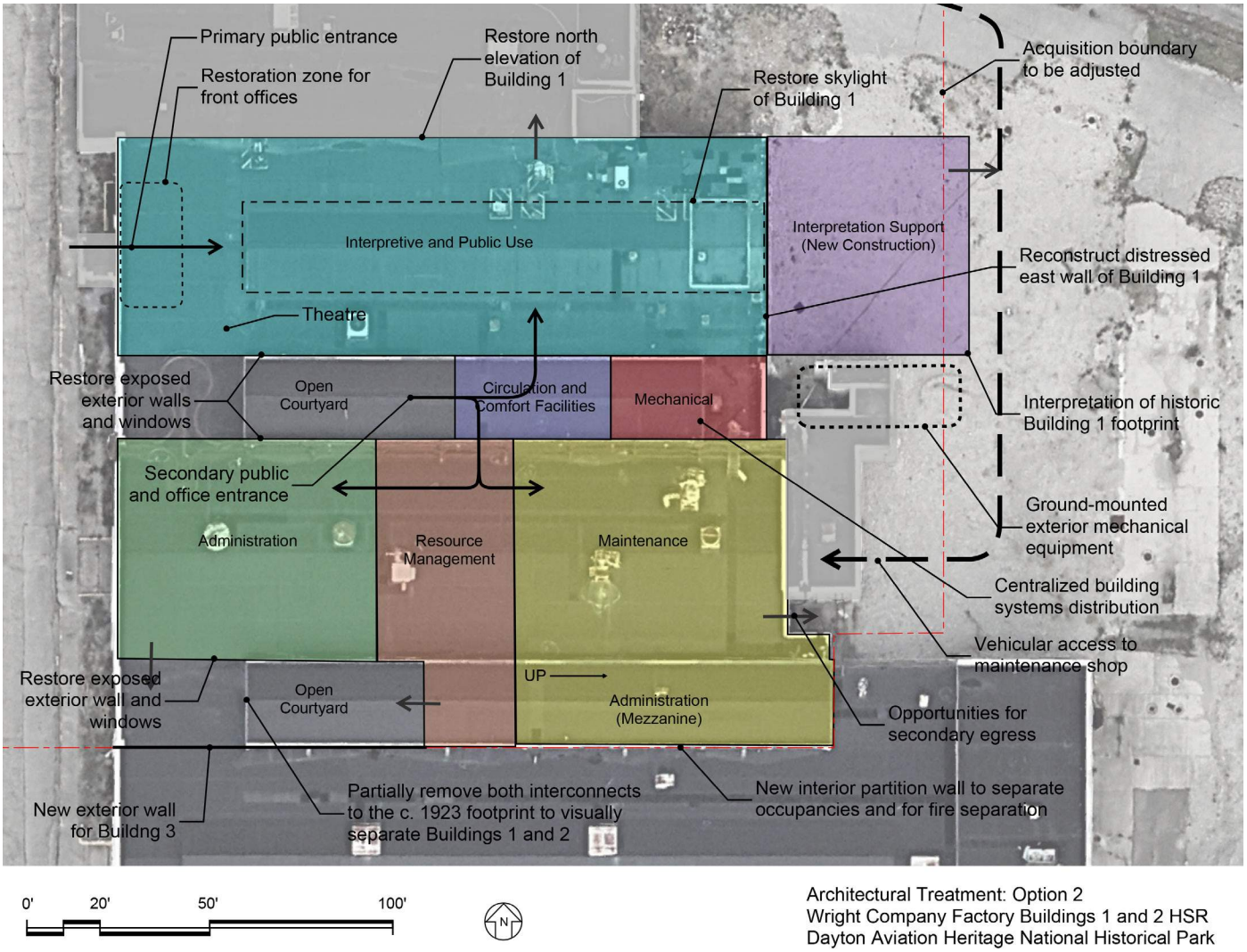


Figure 2-202 Treatment Option 2. (Source: RRJ)

Treatment Option 3: Physical Separation

Treatment Option 3 involves the demolition of both existing interconnect structures to return Buildings 1 and 2 to their historic footprints. Option 3A incorporates new construction at the east end of Building 1 to restore the bays demolished in 2013-2014 but retains the non-contributing bays at the east end of Building 2 for an advantageous increase in available square footage. Option 3B removes the non-contributing bays at the east end of Building 2 to restore the historic footprint to both structures.

A smaller interconnect structure will be built between Buildings 1 and 2, more aligned with the smaller footprint of the historic link. The new interconnect is proposed to provide secondary public entry points and to house the public lavatories. A smaller interior mechanical space pushes equipment to the exterior to serve the majority of the building, with smaller units strategically located to provide zoning and localized controls.

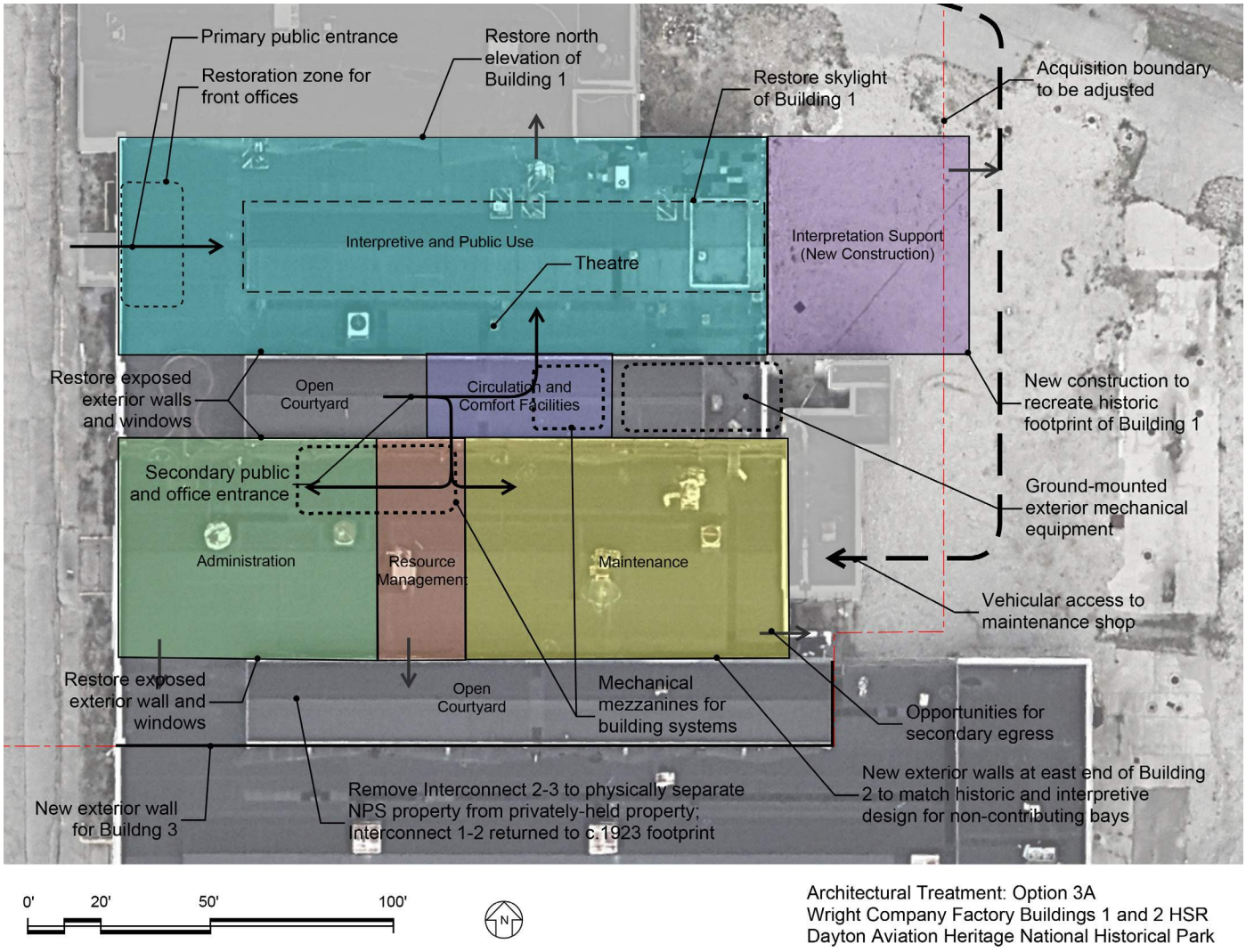


Figure 2-203 Treatment Option 3A. (Source: RRJ)

The advantage of Option 3 is that it returns Buildings 1 and 2 to a closer representation of the historic form and appearance. However, Buildings 1 and 2 were never stand-alone structures after Buildings 3, 4, and 5 were constructed, and this option would need to be clearly interpreted to visitors to understand the development of the campus and the changes over time specifically to Buildings 1 and 2.

Another consideration is that removing Interconnect 2-3 impacts privately-held Building 3, which never had a north exterior wall. A new exterior wall will need to be constructed to enclose Building 3. Structural analysis of Building 3 should also be performed to determine if the building relies on Interconnect 2-3 for structural stability.

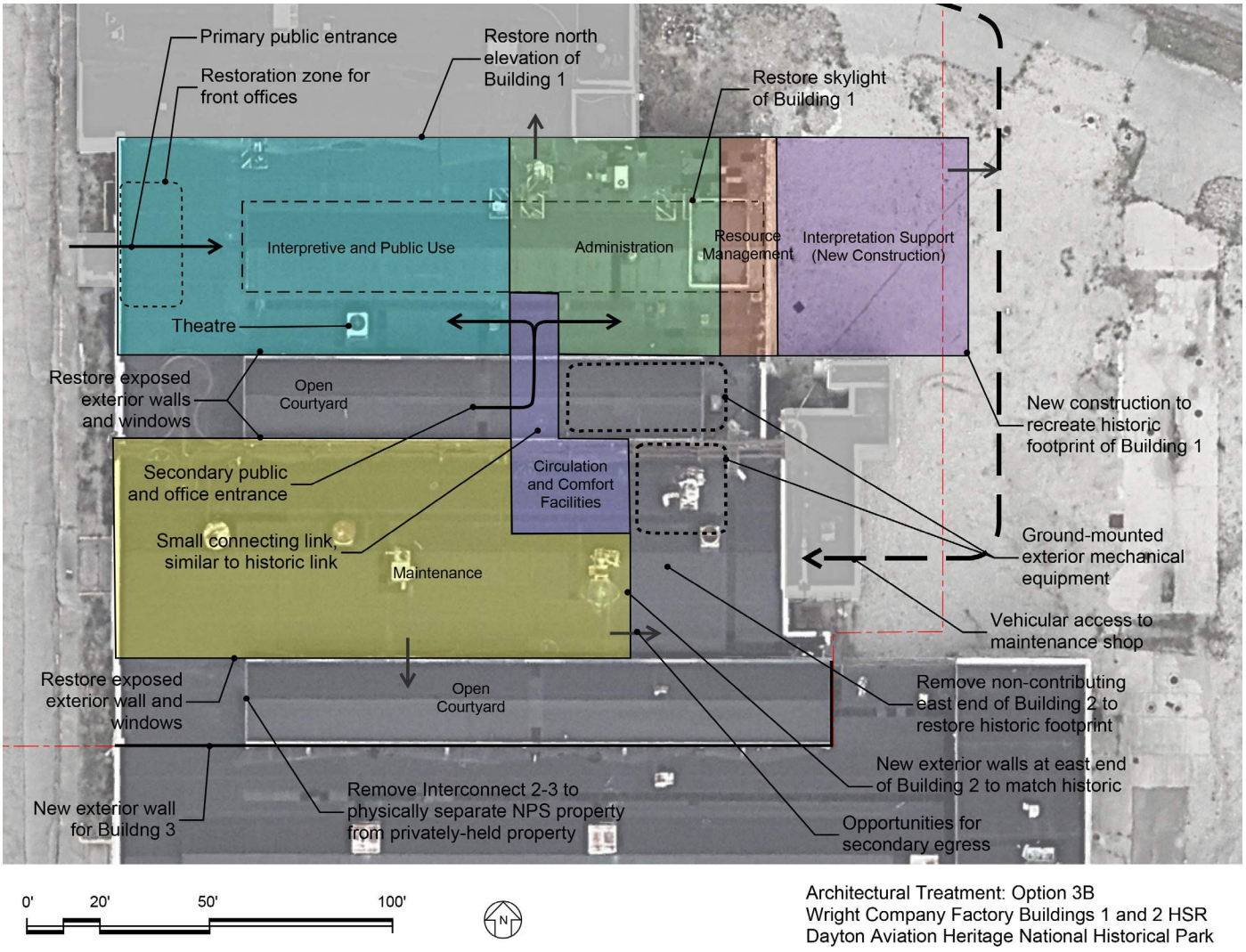


Figure 2-204 Treatment Option 3B. (Source: RRJ)

FIRE PROTECTION AND FIRE SAFETY ALTERNATES

Fire Safety should be considered an immediate need for Buildings 1 and 2. The need to incorporate an efficient, cost-effective fire protection and life safety system that is effective in detecting, extinguishing, or controlling a fire event will result in improving overall building safety. Today, the most common fire safety objectives include safeguarding human life, while protection of property, capital, and environment reservation come in second to saving lives.

Six strategies of Fire Protection within a building include the following:

Prevention	The first strategy in fire protection is to prevent a fire completely. This includes risk education, control and waste management, and cleaning practices. Prevention can include lightning protection systems, maintaining a clean environment and keeping flammable materials away from heat sources
Reduction	If fire is not prevented, the next step is to reduce the protection for rapid-fire growth. The severity of a fire can be reduced through design, selection and handling of materials and products which can exposure to fires. This can be done with the use of fire-retardant materials, restrict flammable materials used in furnishings, use interior room finishes that prevent the spread of flames and smoke and managing combustible materials on the premises.
Detection	Early detection of a fire allows for early intervention. The quicker a detector senses smoke and initiates an alarm, the more likely lives and property can be saved.
Suppression	Fire sprinklers aid in the reduction of death and damage during a fire. The National Fire Protection Association (NFPA) states that if sprinklers are present, the probability of death in a fire is reduced by two thirds.
Confinement	Confine the fire in the room of origin through correct compartmentalization and other passive fire protection means. Statistically, the greatest number of fatalities occurs when a fire extends beyond the room of origin. Incorporating fire barriers, fire rated doors and windows, utilizing appropriate fire stops at penetrations to fire barriers such as conduits, ducts, pipes, or structural elements. Providing heating, ventilation and air conditioning (HVAC) systems that draw hot air and smoke out of the building might also be employed.
Move	The last step is to move occupants to safe locations. This involves providing protection of the means of egress, making sure the appropriate number of exits for occupants are present and are correctly spaced and sized, providing appropriate exit lighting, making sure that the correct use of fire barriers is used, and ensuring the structural integrity of the escape routes is provided.

It is important that each and every public building employ a strategy similar to that outlined to protect the public and maintain the integrity of the environment for which the public occupies.

General Use Fire Protection System

The fire system will need to meet the requirements of the 2017 Ohio Fire Code, the current editions of NFPA, and any other local code amendments in force.

It is recommended that a wet-type fire suppression system be provided for the Wright Company factory buildings which is similar in nature to the system utilized previously. Depending on space finishes, sprinkler piping and head types can be provided to fit the aesthetic needs of the spaces, whether exposed of concealed above ceilings. Additional fire extinguishers should be located throughout the property especially where sensitive materials will be displayed or stored.

Any new sprinkler system will be required to have a new fire riser entrance location provided where appropriate valves for draining, isolating and testing can be performed on the system. Other devices for monitoring such as gauges, water flow switches, motor gongs and a connection to the fire department connection will also be required. The fire protection system will be required to have all of the aforementioned items provided as required per NFPA.

Sensitive Use Fire Protection System

Where sensitive materials may be displayed and the concern for the integrity of the materials or interior finishes is present, employing a pre-action, water-based fire sprinkler system, a gaseous or clean agent system, or a water mist system can be utilized.

Pre-Action Systems

Pre-Action Systems require that two distinct actions occur before water is discharged at the fire. First, a heat, smoke or flame detector must sense a fire. If heat or smoke is present, the detector sends a signal to the fire alarm panel which then sends a signal to a motorize valve to open and release the water upstream of the valve essentially filling the sprinkler piping. With the piping filled, a secondary heat detection action needs to occur with the sprinkler head fusible link melting due to heat where water is then discharged from the sprinkler head onto the fire.

Gaseous Systems

Gaseous Systems extinguish a fire by deleting the oxygen or through the disruption of the chemical chain reaction of combustion. These are often referred to as “clean agent systems” because they leave no residue and do not cause damage to items within the activation space. These types of systems can be employed as “total flooding” or “local application” depending on the area to be served.

Water Mist Systems

Water Mist Systems are another type of water-based fire suppression system. As the name suggests, water mist systems utilize water discharged from a head or heads to extinguish the fire. While similar to a wet-sprinkler system, a water mist system emits its suppressing agent in fine droplets. The fine droplets contribute to a more rapid extinguishment of the fire thus reducing water damage and provide easier clean-up.

PLUMBING SYSTEM ALTERNATES

Sanitary, potable water and gas utilities will need to be restored to Buildings 1 and 2. While these utilities were present to the buildings previously, they no longer function. In the case of potable water, this utility will be removed when Building 17 is removed. The existing gas utility is no longer connected to the building while the condition of the sanitary

sewer is unknown. As these utilities are important components in the revitalization of the buildings, they will need to be upgraded or replaced with new services to return the building's functionality. This will be critical to allow the building to serve as a landmark into the future.

Sanitary Utility

A new 4" minimum sanitary sewer is recommended to serve Buildings 1 and 2. The new service will be needed to serve any building plumbing fixtures once a determination of where the probable plumbing needs will be placed in the building. The sewer must be sized to meet the sanitary and vent requirements of the 2017 Ohio Plumbing Code with adopted amendments from the 2015 International Plumbing Code (IPC).

The exit location of the new sanitary sewer will require an evaluation of where the most viable location for connection of an exterior sanitary sewer exists.

It appears that the existing building tunnel system currently does not have any type of sanitary drainage as indicated by the flooded condition at the time of the site visit. As it is suspected that the exterior stairwell located at the west side of Building 1 may be connected to the tunnel system, any storm water from the stairwell may infiltrate the tunnel system via the exterior door of the stairwell. Any storm waste that collects in the west stairwell will need to be collected and pumped to a storm sewer or discharged above grade as any water collected by a drain at the stairwell is prohibited from being discharged to the sanitary sewer per the Ohio Plumbing Code. Further investigation will be needed to determine where the water in tunnel system originated from and whether the tunnel or stairwell, currently have drains in them. This was not possible at the time of the site visit walk-thru due to the standing water in both locations.

Water Utility

It is recommended that a new water service sized to adequately serve the needs of potable water be provided for Buildings 1 and 2 to serve plumbing fixtures, for drinking or culinary purposes or for processing of food. The water demand for restroom fixtures, kitchen needs, housekeeping, etc., will need to be determined based on the required demand calculated using the 2017 Ohio Plumbing Code and adopted amendments from the 2015 International Plumbing Code (IPC).

The use of low-flow plumbing fixtures and touchless faucets and water flush valves are recommended minimize water flow and to conserve water usage.

The water entrance location will need to be determined once a proposed building floor plan is provided. Code required backflow prevention devices will need to be included with any new water service meeting the 2017 Ohio Plumbing Code and adopted amendments from the 2015 International Plumbing Code (IPC).

Water Heating

The water heating demand for any plumbing fixtures or processes requiring potable hot water should be calculated to determine an appropriately sized water heater(s). Whether the water heater is served with natural gas or electricity, or from a solar energy system, a determination as to the viability of each energy source will need to be taken into consideration. Natural gas-fired water heaters and electric water heaters are more common for commercial facilities.

Another consideration is whether the building's water heater will be of a demand-type (instantaneous) or if a storage-type will be needed. Instantaneous water heaters provide hot water only when it is needed and are generally tank-less in design therefore they do not incur storage heat losses however, instantaneous water heaters are generally more expensive than storage-type water heaters and can only handle relatively low water flows. Gas and

electric storage-type water heaters on the other hand are less costly than instantaneous water heaters and can handle more flow. Gas-fired storage-type water heaters can handle higher flows than comparatively sized electric water heaters. Storage-type water heaters do have one drawback, however, in that they cannot provide 100% of their storage capacity as the storage capacity is reduced by as much as 30%, making only 70% usable. Instantaneous water heaters have no tanks so there is no tank heat loss which allows 100% of the water to be heated and used albeit at a lower water flow.

High thermal efficiency can be provided for the water heater regardless of type with efficiencies up to 90% when sealed combustion and condensing water heaters are utilized. Hi-efficient models are available in tank-less and storage-type water heaters.

Building physical constraints and exterior building aesthetics would need to be considered if a solar water heating system is desired. The building's configuration may not be conducive for placing solar panels on the roof simply due to the the peaked roof areas at Interconnect structures. Locating roof solar panels at the barrel-vaulted sloped roofs of Buildings 1 and 2 may not be desirable simply due to aesthetics. A solar water heating system would require that a space for housing a collection tank with internal heat exchanger along with circulating pumps between the solar panels and collection tank. These components would be required to be located in mechanical space along with other mechanical components associated with heating, ventilating and air conditioning (HVAC) system thus increasing the overall mechanical system footprint. Based on the increased space the additional components require, it is recommended that smaller electric water heaters or gas water heaters be provided, possibly in multiple locations, to reducing the space impact.

If the water heating demands are limited to just a couple of fixtures such as lavatories associated with restrooms, then small electric instantaneous water heaters can be utilized. If the hot water demand was higher such has having a small kitchen with sinks and restroom lavatories, an electric or gas-fired storage-type water heater would be recommended.

Legionella and Mixing Valve

Potable hot water provided for the buildings will be required to be stored at a temperature to protect against the formation of Legionella. Hot water temperatures from 85 deg F to 110 deg F are the prime temperatures where Legionella multiplies, or grows very well, on a biofilm which is the slimy surface of the inside of water pipes. Water, moving quickly enough, will make it hard for this biofilm to grow. Hot water temperatures at 131 deg F and above will start to kill off Legionella bacteria. The higher the water temperature, the faster you kill the bacteria. A minimum temperature of 140 deg F for stored hot water is recommended for this purpose. With water stored at this temperature, a master mixing valve would be required to reduce the storage temperature to a delivery temperature of 120 deg F to mitigate any scalding potential.

Gas Utility

The natural gas utility is recommended to be restored to serve the building. Natural gas would be used for building heating and for heating potable hot water. Natural gas is available to the site so an extension can be provided from the gas company to the building. The location of the gas utility meter and building entrance will need to be determined once the building's interior floor plan has been established.

Other alternative energy sources may be considered for heating the building including geothermal and electric heat if the use of gas is not desired.

Providing an all-electric building where electricity is used for power, lighting, and building heating would require a much larger electrical service costing more for the utility to the building when compared to a building served by natural gas for heating and electricity for power and lights. This would need to be considered when comparing the two utilities.

HEATING, VENTILATING, AND AIR CONDITIONING ALTERNATES

There are many important factors to consider when making the choice for the heating, ventilating and air conditioning (HVAC) system for any new building or for a renovation project. The goal of the HVAC system is to create and maintain a comfortable environment within a building. This includes both temperature and humidity. Of all of the decisions made by owners, architects, engineers, and contractors during the design and construction phases of a project, the selection of the HVAC system tends to be a decision that is often revisited throughout the life of the building. Several factors are involved when making the selection of the appropriate HVAC system for a given building. These can include:

- Preference of the building owner
- Available construction budget
- Size and shape of the building
- The function of the building
- Architectural limitations
- Life-cycle cost
- Ease of operation and maintenance
- Time available for construction

The building owner may have a preference to the type of system that they prefer based on their experiences. His preferences may be based on maintenance costs, system reliability and the ability of the HVAC system to provide an environment to support the propose use of the building which are all important.

Available construction budget has an impact on the type of HVAC system to be used as the system has to meet the requirements of the building with the available money for the project. Often times some other requirements are sacrificed because the stated requirements do not match the available budget to meet those requirements.

Building configuration as it relates to size and shape can quickly narrow down the available HVAC system choices. Some types of systems may not fit the building configuration thus allowing them to be disregarded.

The function of the building and its interior spaces may require specific zoning and environmental characteristics that some HVAC systems may be not be able to provide thus eliminating them from consideration.

Architectural limitations and constraints often times can be particularly challenging for a central air-handling system which may result in the system to be configured in such a way to make the end result inefficient or result in a system not operating as it was intended therefore causing problems for the end-user.

Decisions made solely, or primarily, on installed (first) cost often ignore such factors as energy use, maintenance requirements, or expected life. Life-cycle cost includes the total cost of owning and operating the HVAC system over a given period of years. This includes installed cost, energy cost, maintenance cost, replacement cost, and any other known and expected costs. As could be expected, some HVAC systems use more energy than others. Many state and local building codes include requirements for energy efficiency. Some requirements relate to the efficiency of various components, such as packaged DX rooftop units or water chillers, and some requirements relate to the design and control of the entire system. Some of these requirements even prohibit the use of certain types of HVAC systems for certain applications.

Operation and maintenance of the HVAC system may also dictate the system chosen of the building. If the building will not have someone onsite to operate or maintain the HVAC system, this will impact the system choice. Most types of HVAC systems have to rely on a

level of automatic control if no one will be on site to operate the systems. This often is related to the size and capacity of the systems and based on the building type, the type of code requirements may cause the selection of a system that is comprised of smaller pieces of equipment rather than a few large pieces of equipment.

The timeframe and schedule for which the project has to be completed and when the HVAC equipment must be installed and be ready for start-up can influence the selection of the HVAC system. Some types of HVAC equipment are made-to-order and have long lead times for manufacturing. For this reason, equipment that is in stock may be selected for a fast-track project. Packaged equipment with factory-installed controls is often selected because it can typically be installed and commissioned very quickly. Complexity of the equipment can also influence the time-frame in which to order and manufacturer equipment for various systems.

HVAC System Types

The types of HVAC systems that could potentially serve Buildings 1 and 2 could be one or more of many types. Building configuration and proposed usage, climate conditions, and owner's preference can be considered the criteria for choosing the HVAC system for a particular project. Some criteria can be considered such as climate change (e.g., temperature, humidity, and space pressure), building capacity, spatial requirements, cost such as capital cost, operating cost, and maintenance cost, life cycle analysis, and reliability and flexibility.

However, the selection of a system has some constraints that must be determined. These constraints include the available capacity according to standards, building configuration, available space, construction budget, the available utility source, heating and cooling building loads, occupancy of the building, and building use.

The 2016 ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) Systems and Applications Handbook has been used to develop a list of decentralized and centralized HVAC systems along with their advantageous and disadvantageous to provide a basis of the types of systems that may be appropriate to serve Buildings 1 and 2. The possible systems and a rating table are included indicating how the types of systems address specific criteria related to temperature and humidity, capacity, redundancy, facility management, space requirements, first cost, operating cost, maintenance cost, system reliability, system flexibility, level of control, noise and vibration isolation, and constructability. The ratings are based on high, medium and low on the ability of the decentralized and centralized systems to address each category (appendix M-1).

A brief description of the types of systems available are as follows:

All-Air Systems

The thermal energy transfer medium through the building delivery systems is air. All-air systems can be sub-classified as single zone and multizone, with airflow for each zone as constant air volume and variable air volume, and with terminal reheat.

Single Zone

A single zone system consists of an air handling unit, a heat source and cooling source, distribution ductwork, and appropriate delivery devices. The air handling units can be wholly integrated where heat and cooling sources are available or separate where heat and cooling source are detached. The integrated package is most-commonly a rooftop unit and connected to ductwork to deliver the conditioned air into several spaces with the same thermal zone. The main advantage of single zone systems is simplicity in design and maintenance and low first cost compared to other systems. However, its main disadvantage is its inability to serve multiple, independent thermal zones.

In a single zone all-air HVAC system, one control device such as thermostat located in the zone controls the operation of the system. Control may be either modulating or on–off to meet the required thermal load of the single zone. This can be achieved by adjusting the output of heating and cooling source within the packaged unit.

Few commercial buildings can be a single thermal zone, therefore multiple units may be required to provide ample zoning. Movements of occupants affect the thermal load of the building, which results in dividing the building into several single zones to provide the required environmental condition. Many sizeable single-story buildings can be effectively conditioned by a series of single zone systems. An example of this is where large office buildings are sometimes conditioned by a series of separate single zone systems.

Multi-Zone

In a multi-zone all-air system, individual supply air ducts are provided for each zone in a building. Cold air and hot (or return) air are mixed at the air handling unit to achieve the thermal requirement of each zone. A particular zone has its conditioned air that cannot be mixed with that of other zones, and all multiple zones with different thermal requirement demand separate supply ducts. Multi-zone all-air system consists of an air handling unit with parallel flow paths through cooling coils and heating coils and internal mixing dampers. The advantage of the multi-zone system is to adequately condition several zones without energy waste associated with a terminal reheat system. However, leakage between the decks of air handler may reduce energy efficiency. The main disadvantage is the need for multiple supply air ducts to serve multiple zones.

Terminal Reheat A terminal reheat all-air system is a multiple zone system, which considers an adaptation of single zone system. This can be performed by adding heating equipment, such as hot water coil or electric coil, to the downstream side of the supply air ductwork from air handling units near each zone. Each zone is controlled by a thermostat to adjust the heat output of heating equipment to meet the thermal condition. The supply air from air handling units is cooled to the lowest cooling point, and the terminal reheat adds the required heating load. The advantage of terminal reheat is flexible and can be installed or removed to accommodate changes in zones, which provides better control of the thermal conditions in multiple zones. However, the design of terminal reheat is not energy-efficient because a significant amount of energy may be required to cool the air to meet the cooling requirements of some zones while other zones need the air at a higher temperature. Zones needing heat then have to use reheat to boost the temperature to meet their zone requirement. Therefore, energy codes and standards regulate the use of reheat systems.

Variable Air Volume Some spaces require different quantities of supply air due to the changes in thermal loads. Therefore, a variable-air-volume (VAV) all-air system is the suitable solution for achieving thermal comfort. The previous four types of all-air systems are constant volume systems. The VAV system consists of a central air handling unit which provides supply air to VAV terminal control boxes that are located in each zone to adjust the supply air volume. The temperature of supply air of each zone is controlled by manipulating the supply air flow rate at each box. The main disadvantage is that the controlled airflow rate can negatively impact other adjacent zones with different or similar airflow rate and temperature if these zones are provided with their own box. Part-load conditions in buildings which require lower air-flow rate result in a reduction of fan power therefore realizing energy savings. However, by reducing the airflow, you also reduce the ventilation air flow rate, which can be problematic to the HVAC system and affect the indoor air quality of the building.

All-Water Systems

In an all-water system, heated and cooled water is distributed from a central system to the conditioned spaces. This type of system is relatively small compared to other types because the use of pipes as distribution containers and the water has higher heat capacity and density than air, which requires the lower volume to transfer heat. All-water heating-only systems include several delivery devices such as floor radiators, baseboard radiators, unit heaters, and convectors. However, all-water cooling-only systems are unusual such as valance units mounted in the ceiling. The primary type of this system used in buildings today could be a fan-coil unit system.

Fan-Coil Units

Fan-coil units are considerably small units that use heating and cooling coils, circulation fans, and a proper control system. The unit can be vertically or horizontally installed. The fan-coil unit can be placed above ceiling or in the finished room exposed to occupants, so it has to be provided with appropriate finishes and styling. For central systems, the fan-coil units are connected to hydronic systems with boilers producing heating hot water and to water chillers which produce cooling water that is then distributed via pumps to the fan coil units serving the conditioned spaces. The desired temperature of a zone is detected by a thermostat which controls the water flow to the fan-coil units. In some systems, the occupants may have the ability to adjust fan coil unit air discharge by adjusting supply air louvers to achieve the desired temperature. The main disadvantage of fan-coils is ventilation air cannot be provided building wise through the fan coil units therefore some other means of providing outside air to the building is needed such as a dedicated outside air system (DOAS). Another disadvantage is the noise level fan coil unit can create, especially in critical locations in a building such as conference rooms.

Air-Water Systems

Air-water systems are introduced as a hybrid system to combine both advantages of all-air and all-water systems. The volume of the combined system is reduced, and the outdoor ventilation is produced to properly condition the desired zone. The water medium is responsible for carrying the thermal load in a building by 80–90% through heating and cooling water, while air medium conditions the remainder. There are two main types: fan-coil units and induction units.

Fan-Coil Units

Fan-coil units for air-water systems are similar to that of all-water systems except that the supply air and the conditioned water are provided to the desired zone from a central air handling unit or DOAS unit and central water systems (e.g., boilers or chillers). The ventilation air can be separately delivered into the space or connected to the fan-coil units return air inlet. The major types of fan-coil systems, are 2 pipes or 4-pipes systems.

Water-Source Heat Pumps

Water-source heat pumps are used to provide considerable energy savings for large buildings under the extreme cold weather. A building of various zones can be conditioned by several individual heat pumps since each heat pump can be controlled according to the zone control. A centralized water circulation loop can be used as a heat source and heat sink for heat pumps. Therefore, heat pumps can act as the primary source of heating and cooling. The main disadvantage is the lack of air ventilation similar to the all-water systems as in fan-coil units where some type of central air handling unit or DOAS unit would be needed to condition outside air for ventilation. For a heating process, the boiler or solar collectors will be used to supply heat to the water circulation, while a cooling tower or fluid cooler is used to reject heat collected from the heat pumps to the atmosphere. This system does not use water chillers or any other supplementary cooling systems as the heat pumps have small refrigeration circuits built-in where the water loop is used for heat rejection of the compressors. If a building requires a heating process for some zones and cooling process for other zones at the same time, the heat pump will redistribute heat from one part of the system to another with no need for a boiler to heat or chiller or cooling tower to cool for this operation.

Packaged Rooftop Units

A packaged rooftop unit consists of a vapor compression refrigeration cycle; heat source such as heat pump, electric resistance or gas-fired heating; an air handler with dampers, filter, and fan; and control devices. This system may be connected to ductwork and serve a large-size single zone. They provide conditioned air to designated areas via building air ducts. They are engineered to be more weatherproof and robust to help them withstand sun, rain, snow, wind, etc. Because rooftop units are completely self-contained, they are generally not connected to external chillers or boilers for heating and cooling functions.

With the right additions (humidistat), a rooftop system can also offer humidity control, and the systems also naturally add more ventilation options, helping to meet outside air ventilation requirements. Rooftop units are equipped with a wide variety of additional controls for more precise temperature control and reduced energy use. Couple this with the fact that they're available in excellent SEER and AFUE ratings and you're looking at an all-in-one that can help keep costs down.

Rooftop units, if of considerable capacities, can add weight to the roof which may require that additional structural framing be added to support them.

Geothermal System

Geothermal systems may be considered an alternative to more conventional gas or electric system but geothermal systems historically have had much higher first costs associated with them as these systems involve the initial investment of installing heat transfer wells below grade outside the building to dissipate building heat in the summer and capture heat from the ground in the winter.

A geothermal system hydronic loop utilizes indoor pumps in the summer time between the water loop and heat pumps scattered throughout the building serving the individual zones. The same pumps would circulate water back and forth between the geothermal well field and the building to capture heat from the ground in the winter or dissipate the heat in the water loop in the summer. While having a higher first cost, the long-term operational costs for geothermal system would be lower as the ground is used as the heat source in the winter therefore no other building heating utility is generally needed to provide heat nor is any additional water-cooling equipment needed such as a chiller to reduce the temperature in the loop in the summer. This reduces the operational costs. Electricity would still be needed to operate building circulating pumps.

A geothermal system would require that a thermal conductivity test be performed to establish the earth's conductive properties at the building's location. This test is used to determine the baseline for heat transfer within the ground at the site in determining the number of geothermal wells required to serve the buildings heat and cooling load. Generally, the test location becomes permanent and can be used in any well field array if the project eventually utilizes a geothermal system.

As this site is considered a brownfield site with much of the soil being contaminated over the years due to the automobile factory processes that took place, special consideration as to clean-up of the site to prepare the site for a geothermal well field will need to be implemented if not already done. Excavation of contaminated site, any tank removal, capping of the site with a geotextile material, site injections at the site to breakdown contaminates and turn them into less harmful or toxic substances, bioremediation by using naturally-occurring or adapted microbes to consume organic contaminants, phytoremediation which use plant roof systems to release substances which help to neutralize or increase microbial degradation of contaminants, and lead and asbestos abatement are methods for cleanup of the site for reuse.

VRF/VRV Systems

There are other alternatives such as variable flow refrigeration (VRF) and variable refrigerant volume (VRV) systems. VRF and VRV systems are basically the same type of systems but with different terminology based on the system manufacturer. Both use refrigerant for cooling in the system. Variable refrigerant flow (VRF) is an air-condition system configuration where there is one outdoor condensing unit and multiple indoor units. The term variable refrigerant flow refers to the ability of the system to control the amount of refrigerant flowing to the multiple evaporators (indoor units), enabling the use of many evaporators of differing capacities and configurations connected to a single condensing unit. The arrangement provides an individualized comfort control, and simultaneous heating and cooling in different zones. With a higher efficiency and increased controllability, the VRF system can help achieve a sustainable design. Unfortunately, the design of VRF systems is more complicated and requires additional work compared to designing a conventional direct expansion (DX) system.

Advantages of a VRF system include low initial cost, less noise and ease of installation. They are energy efficient. Since they use individual evaporator units, ductwork is not needed. Since these systems utilize inverter compressors, the can provide adequate heating in most climate zones even with the temperature is near 0 degrees Fahrenheit.

Disadvantages include there is limitation on the distance between the indoor and outdoor unit which typically limits the length of the refrigerant piping lengths to 100 to 150 feet. There is also maintenance required within the space with respect to filter changeout and cleaning. The evaporators also have limited throw which can lead to hot/cold spots. System controls are also proprietary, locking users into the technology and requiring the installed manufacturer to repair. VRF/VRV systems also increase coordination demands during design and in the field to navigate pipe routing. Additionally, exposure to refrigerant can be a health and safety risk. Leaks can occur over time and must be monitored and repaired.

These simple systems were designed mainly for small to medium commercial applications where the installation of ductwork was either too expensive, or aesthetically unacceptable. The small-bore refrigerant piping, which connects the indoor and outdoor units requires much lower space and is easier to install than the metal ducting. Each indoor unit has its own set of refrigerant pipe work connecting it to the outdoor unit. VRF systems are engineered systems and use complex refrigerant and oil control circuitry. They are best suited for mid and high-rise multi-family developments, assisted living facilities, hotels, and mid and mid-rise buildings.

ELECTRICAL ALTERNATES

Electrical Site Utilities

The existing AES Ohio Electrical Utility Company's pole-mounted transformer with a 240/120-volt, single-phase, 3-wire output and overhead wiring over to the existing 400-amp meter socket is adequate for the current, very-limited usage of Buildings 1, 2, 4, 5, and 17.

The existing electrical site utility's power would be adequate to use as available electrical power during construction.

Currently, the existing AES Ohio Electric Utility Company's 400-amp meter meters electric power usage for Buildings 1, 2, 4, 5, and 17. In the future, Buildings 1, 2, and 17 will be a National Park System property and Buildings 4 and 5 will be under a different ownership. Therefore, an agreement between the National Park System and the other building owners must be worked out for sharing of the electrical utility billing.

If the shared electrical utility billing is not desired, then the existing AES Ohio 400-amp metering would need to be removed and a 200-amp meter would need to be installed to serve Buildings 1, 2, and 17; and another 200-amp meter will need to be installed to serve Buildings 4 and 5 for construction power.

When Buildings 1 and 2 are renovated for other usage, then the existing AES Ohio pole-mounted transformer, 240/120-volt, single-phase, 400-amp metering and overhead wiring to the buildings would not be adequate or desirable. The existing electrical utility service should be removed and an AES Ohio pad-mounted transformer installed which has a 208/120-volt, 3-phase, 4-wire output and underground secondary electrical wiring to the buildings. The actual location of the new pad-mounted transformer needs to be coordinated with site development plans and AES Ohio utility company.

Communications Site Utilities

Currently, there are no communications utilities routed to the buildings. When Buildings 1 and 2 are renovated for other usage, communications utilities need to be provided to the buildings. The new communications utilities should be routed underground on the site. The communication utilities should be routed to new main distribution frame (MDF) communications room that meets the current ANSI/TIA requirements and National Park Service requirements.

The routing of the new underground communications utility needs to be coordinated with site development plans and the local communications utility company. The location of the new MDF room needs to be considered with interior building development plans.

Electrical Power Distribution

Electric Panels

The existing electric panels are not functional or able to be reused. Many of the panels have had the copper components removed for salvage or vandalized by copper theft. The associated electrical panel feeder conductors have been removed for the same reasons.

It is not thought that any of the current panels date back to when the buildings were used as an airplane factory. The existing panels and associated feeder conduits should be removed. In the future, when the buildings are renovated for other usage, then a new power distribution system will need to be provided with new panels and feeders.

The new panels should meet National Park System requirements, such as panelboard construction, have copper lugs, copper bus bars, copper ground bar, and have adequate amps interrupting current AIC rating.

Grounding

Currently, the existing grounding electrode system consists of ground wires connected to ground rods near the 400-amp, 240/120-volt, one-phase electrical service outside metering location and at the two, 200-amp outside building disconnect switches located at Buildings 2 and 4.

In the future, when Buildings 1 and 2 are renovated for other usage, then a new grounding electrode system will be provided which complies with National Electrical Code (NEC), Article 250, Grounding and Bonding. The NEC, Article 250, will require grounding electrical connection to the following items where present at the building: metal, underground water pipe; metal, in-ground support structures; concrete-encased electrode; ground ring; rod and pipe electrodes; other listed electrodes; and plate electrodes. On new electrical feeders and branch circuits, a separate green insulated equipment grounding wire routed along with the phase conductors will be provided.

Branch Circuits

There currently are not any functional, useable branch circuits in Buildings 1, 2, and 17. Most of the existing copper branch circuit conductors have been removed for salvage or removed by copper theft.

In the future, when Buildings 1 and 2 are renovated for other usage, the existing remaining branch circuit conductors and conduits shall be removed. New branch circuits will be provided to serve new lighting, new receptacles, new HVAC equipment, and owner equipment. New branch circuit conductors shall be copper, #12 AWG, minimum size, with a green insulated ground wire and installed in a minimum of 3/4-inch conduit. Wiring methods like the use of aluminum conductors and metal clad MC cable will not be used.

Receptacles and Switches

There currently are not any usable receptacles and switches in Buildings 1, 2, and 17. The associated branch circuit conductors have been removed for salvage or copper theft.

In the future, when Buildings 1 and 2 are renovated for other usage, the existing remaining receptacles and switches shall be removed. New receptacles and switches shall be provided to serve the new floor plan and building use. New receptacles and switches shall be specification-grade, 20-amp rated, standard color(s) as selected. Ground-fault circuit interrupter GFCI receptacles shall be provided where required by the NEC.

Lighting

Lighting Fixture Types

There currently are not any functional, useable lighting fixtures in Buildings 1, 2, and 17. The lighting fixtures that were used when the buildings were last used as a manufacturing plant have either been removed or stripped of internal wiring and lamps.

These remaining lighting fixtures should be removed. Any remaining fluorescent lamps and ballasts should be disposed of properly.

Historic photographs of the time period when the buildings were used to manufacture airplanes indicated that large wattage incandescent bare lamps were used for general lighting. There are no lamps or lamp holders of this type remaining in the buildings.

Exit Lighting and Emergency Lighting

There are currently not any functional, useable exit lights or emergency lights in Buildings 1, 2, and 17. The few exit lights or emergency lights that still remain have been stripped of their internal components and batteries.

When Buildings 1 and 2 are renovated for other usage, then exit lighting and emergency egress lighting need to be provided that meet local Codes and is appropriate for building occupancy and use. The exit lighting and emergency egress lighting need to have a backup power source which can be either individual batteries, a central battery inverter system or an emergency generator system.

Fiber Optic Service

There is no fiber optic service to the buildings. When Buildings 1 and 2 are renovated for other usage, fiber optic utilities need to be provided to the buildings. The new fiber optic utilities should be routed underground on the site. The fiber optic utilities should be routed to new main distribution frame (MDF) communications room that meets the current ANSI/TIA requirements and National Park System requirements.

The routing of the new underground fiber optic utility needs to be coordinated with site development plans and the local fiber optic utility company. The location of the new MDF room needs to be coordinated with interior building development plans.

Fire Alarm System

Currently, Buildings 1, 2, and 17 do not have a functional fire alarm system.

When the buildings were last occupied, there was a functional fire alarm system that monitored the fire sprinkler mains, had manual pull stations by the exterior doors, smoke

detectors in the office areas in Building 1, and smoke detectors in the transformer vault and electrical switchboard room in Building 2. The information about the location of past fire alarm devices was taken from June 14, 1996, Fire Signaling Drawings. When the buildings were used to manufacture airplanes, the buildings would not have had a fire alarm system.

When Buildings 1 and 2 are renovated for other usage, a new fire alarm system would need to be installed that meets local codes, National Park System standards, and is appropriate for building occupancy and use.

Intrusion and Alarm System

Currently, Buildings 1, 2, and 17 do not have an intrusion alarm system.

Buildings 1, 2, and 17 should have a basic intrusion alarm system installed now to detect people breaking into the building to prevent future theft and vandalism. When Buildings 1 and 2 are renovated for other usage, then a more sophisticated intrusion alarm system should be provided.

Lightning Protection System

Currently, Buildings 1, 2, and 17 do not have a lightning protection system.

A lightning protection risk assessment study should be performed to determine the lightning risks to the buildings to determine if adding a lightning protection system is beneficial.

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University of Wyoming, American Heritage Center, The Manufacturers Aircraft Association Records 1843-1979.

Appendix A - Historical Photographs

The following pages show the historical photographs of the Wright Company factory. They are organized by exterior, then interior and further arranged in approximate chronological order.

Some of the photographs were found in multiple places within the archives. The highest quality version of each photograph has been included here and the additional archive locations are noted.

Exterior Photographs



Figure A-1 Architect's Rendering of the Wright Company Building 1 circa 1910.
Source: Wright State University Special Collections and Archives, File ms398_01_18



Figure A-2 Building 1 and power plant looking northwest, circa 1910
Source: National Cash Register Archive at Dayton History

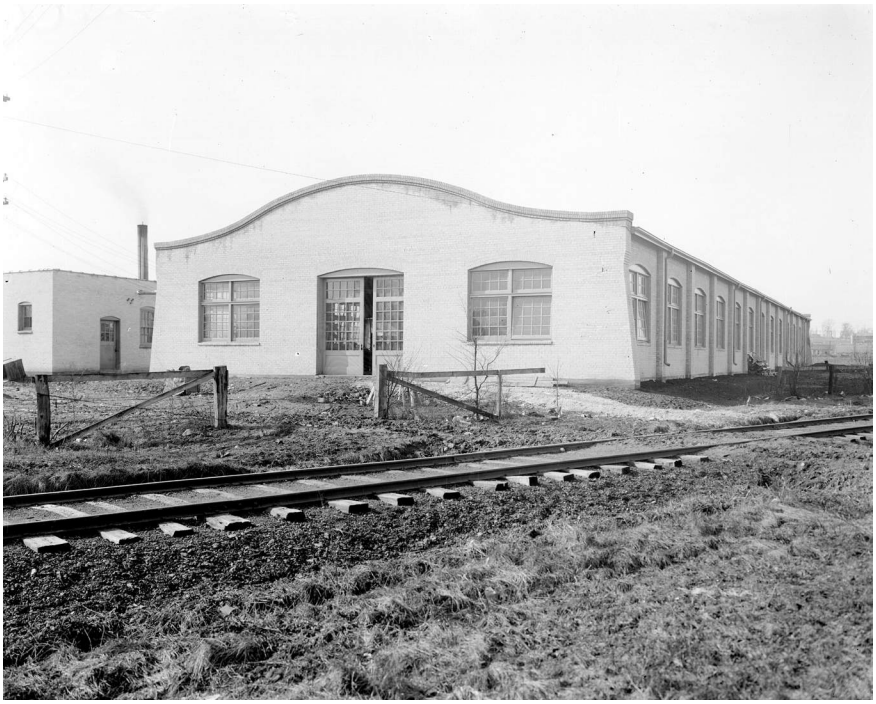


Figure A-4 Building 1 looking west, circa 1910.
Source: National Cash Register Archive at Dayton History



Figure A-3 Exterior looking north towards Building 2 with Building 1 in background circa 1911. Source: Library of Congress, File master-pnp-ppprs-00600-00686a (Similar to Figure A-71, but from a slightly different angle. They were likely taken at the same time.)



Figure A-5 Exterior looking northeast circa 1911.
Source: Library of Congress, File master-pnp-ppprs-00600-00687a (Similar to Figure A-70)



Figure A-6 Exterior looking northeast circa 1911.
Source: Library of Congress, File master-pnp-ppprs-00700-00712a
(Same image as Wright State University Special Collections and Archives, File ms21-3-20)



Figure A-7 Exterior looking southeast circa 1911.
Source: Library of Congress, File master-pnp-ppprs-00600-00689a

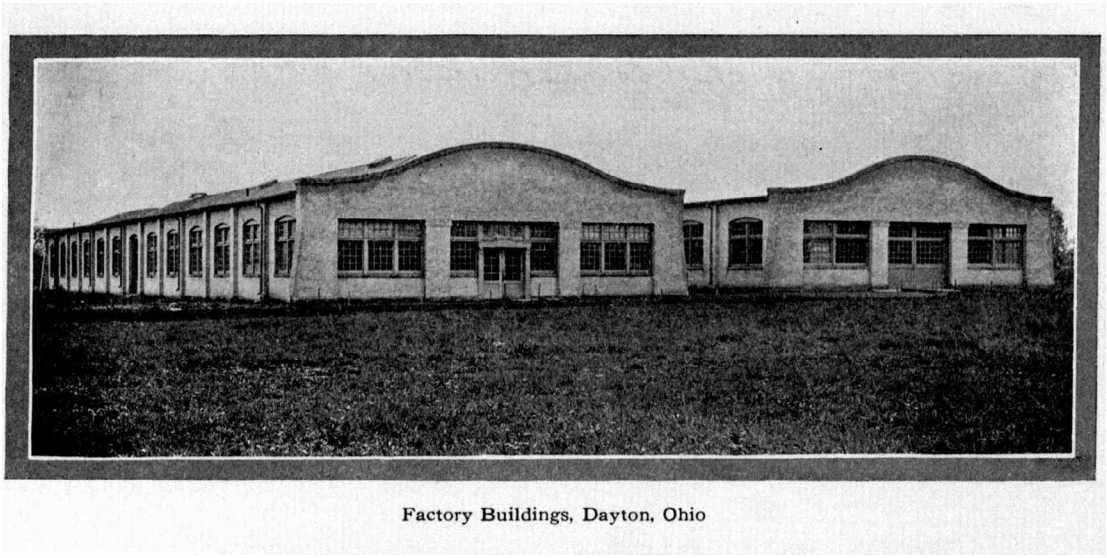


Figure A-8 Exterior looking southeast. Date: Unknown.
Source: Library of Congress, File master-mss-mwright-04-04180-0041



Figure A-9 Exterior looking east circa 1917.
Source: Wright State University Special Collections and Archives, File ms152_159_ presentation
(Same as Wright State University Special Collection and Archives, File ms21-3-20)



Figure A-10 Exterior looking Southeast, dated April 1918.
Source: Wright State University Special Collections and Archives, ms152_015_presentation

Interior Photographs



Figure A-11 Interior of Building 1 during construction circa 1910.
Source: Wright State University Special Collections and Archives, File ms21-3-21



Figure A-12 Interior of Building 1 office south of entrance circa 1911.
Source: Wright State University Archives file ms21-3-1



Figure A-13 Interior of Building 1 office north of entrance.
Source: Wright State University Special Collections and Archives, File ms21-3-2



Figure A-14 Sewing Department at southwest corner of building 1 circa 1911.
Source: Wright State University Special Collections and Archives, File ms21-3-11
(same as Wright State University Special Collections and Archives, File ms21-3-10)

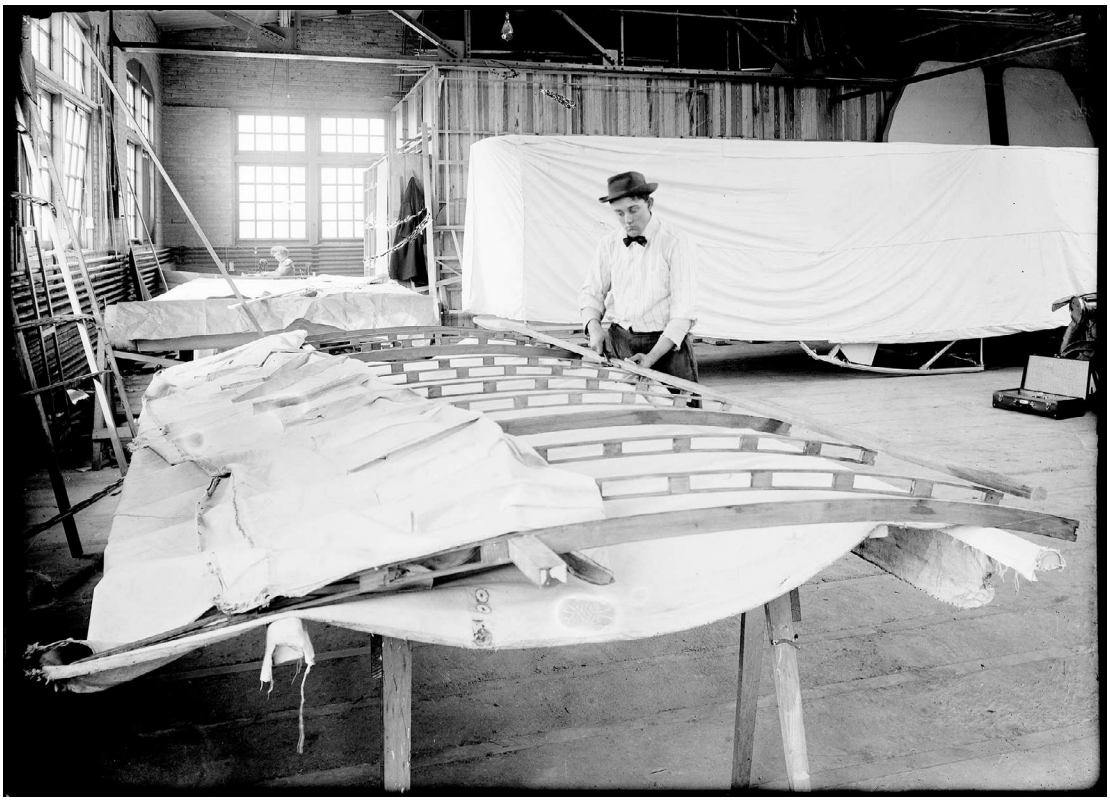


Figure A-15 Interior of Building 1, looking west to southwest corner, circa 1911
Source: Wright State University Special Collections and Archives, File ms398_01_04



Figure A-16 Interior of Building 1, from Sewing to Cloth Cutting and General Assembly beyond, looking east circa 1911
Source: Wright State University Special Collections and Archives, File ms398_01_19



Figure A-17 Interior of Building 1, General Assembly looking southwest, circa 1911
Source: Wright State University Special Collections and Archives, File ms21-3-18



Figure A-18 Interior of Building 1, General Assembly looking northeast, circa 1911
Source: Wright State University Special Collections and Archives, File ms21-3-3

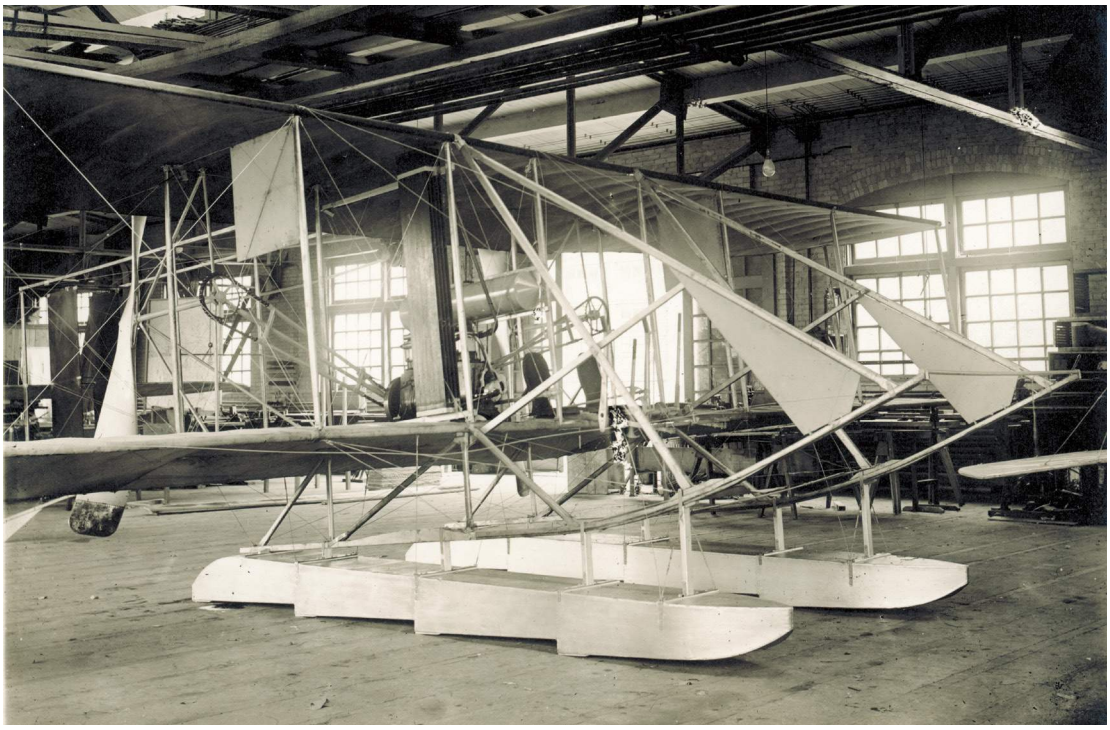


Figure A-19 Model B Flyer with pontoon in assembly area, 1913
Source: Wright State University Special Collections and Archives, File ms20_02_02

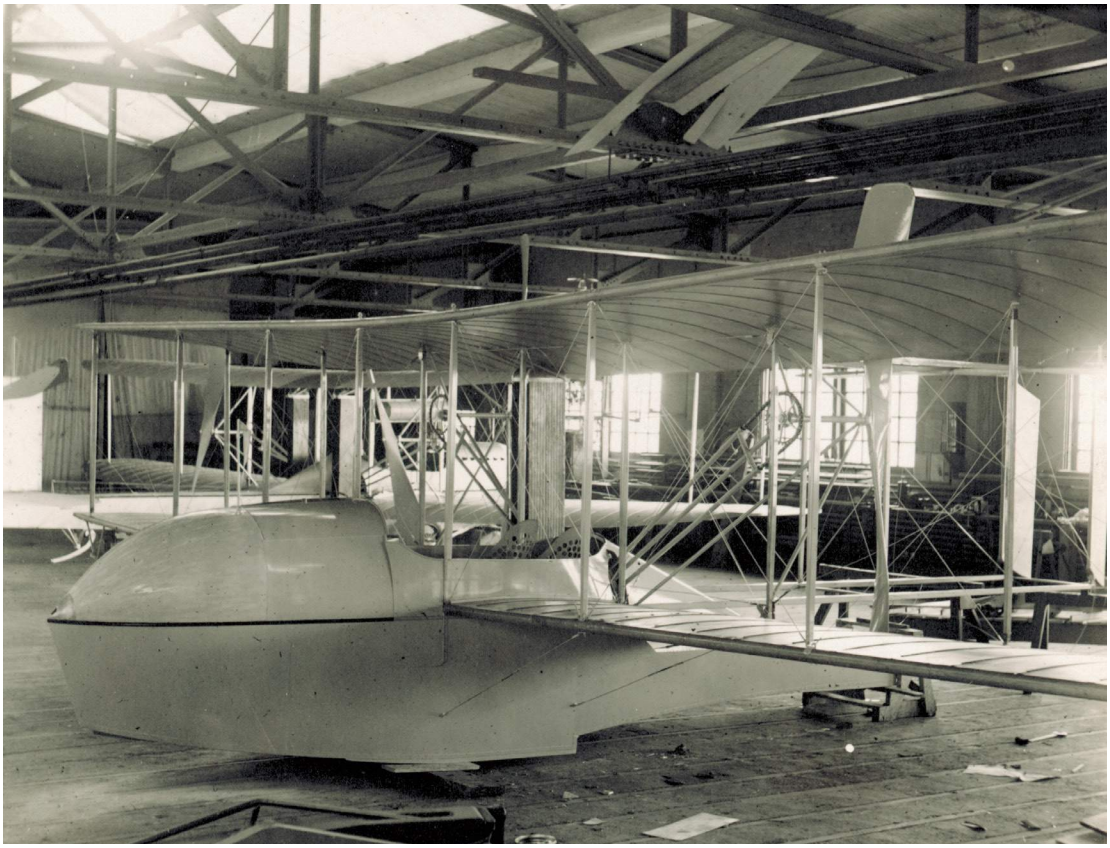


Figure A-20 Partially assembled plane in assembly area, circa 1913-1914
Source: Wright State University Special Collections and Archives, File ms20_02_22



Figure A-21 General Assembly area looking east, circa 1911
Source: Wright State University Special Collections and Archives, File ms398_01_15



Figure A-22 Interior view of work on wing, location unknown, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_13



Figure A-23 Interior location unknown, possibly part of Assembly area, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_4

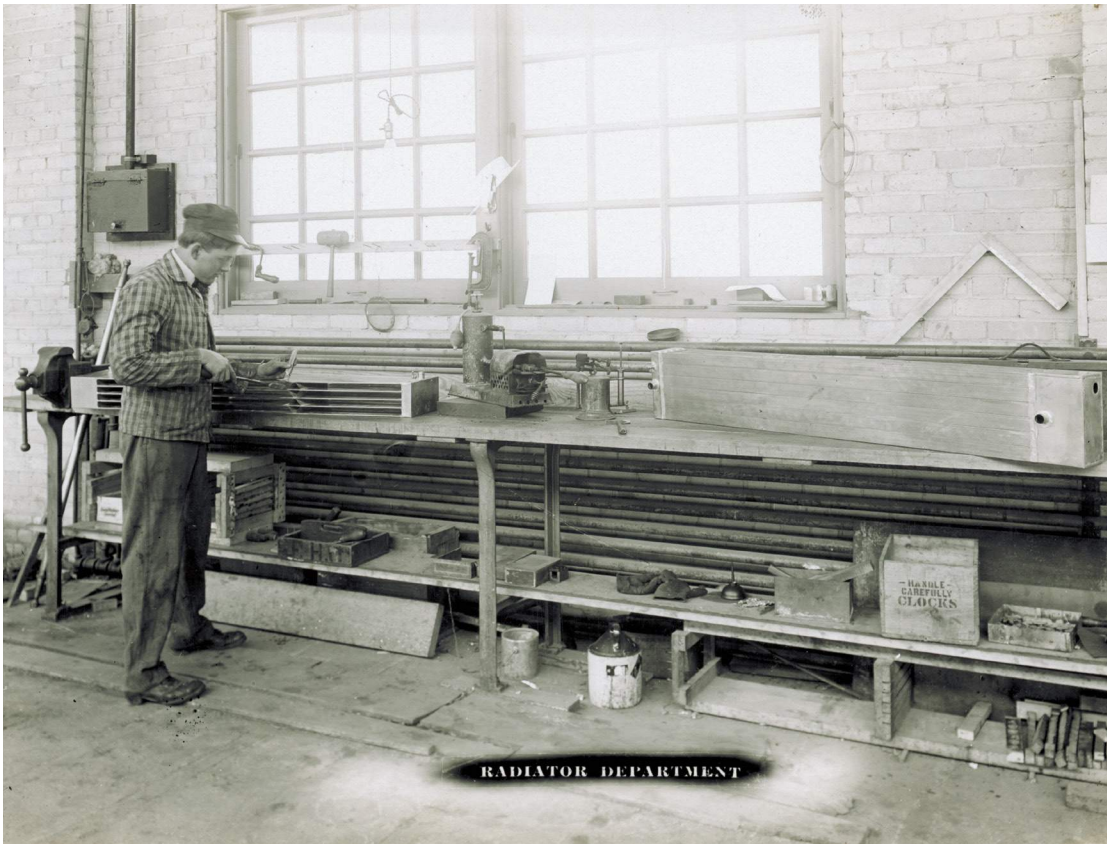


Figure A-24 Interior location unknown, circa 1911.
Source: Wright State University Special Collections and Archives, File ms21_03_8

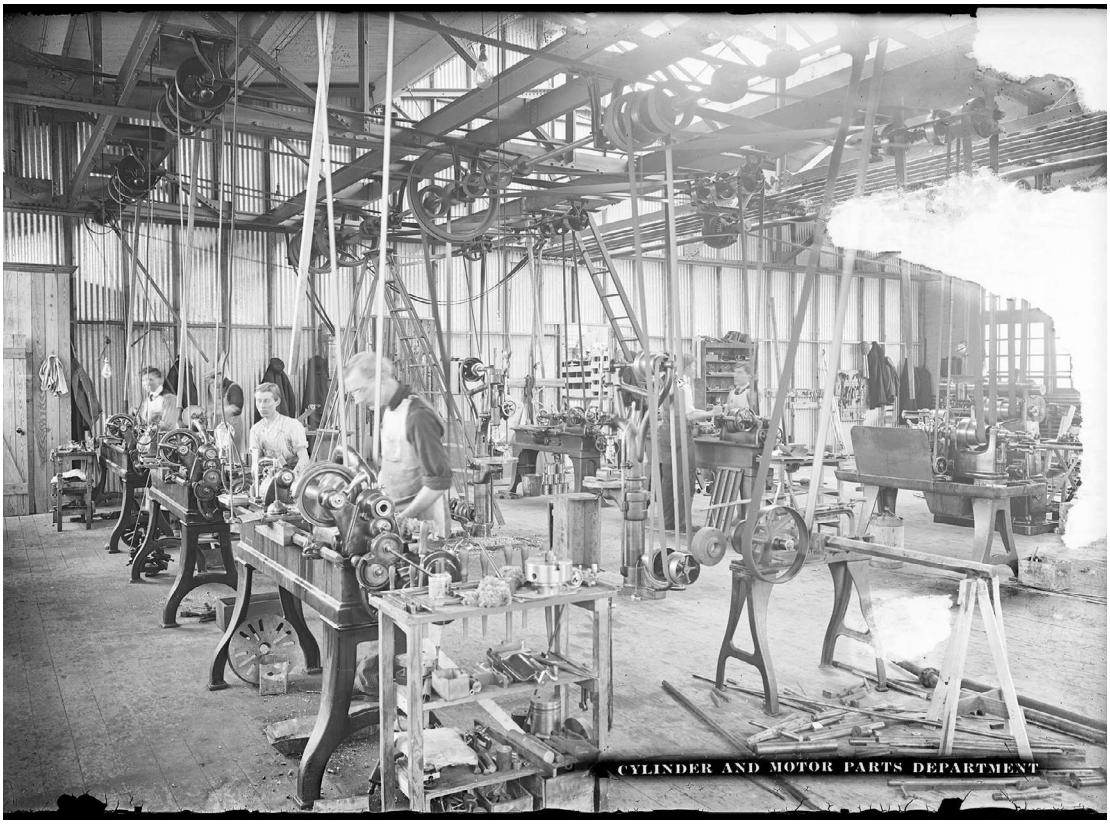


Figure A-25 Interior of Building 1, Cylinder and Motor Parts Department circa 1911
Source: Wright State University Special Collections and Archives, File ms398_01_07



Figure A-26 Worker at machine, exact location unknown, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_16



Figure A-27 Interior of Building 1, Southeast corner, General Machine Shop, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_05

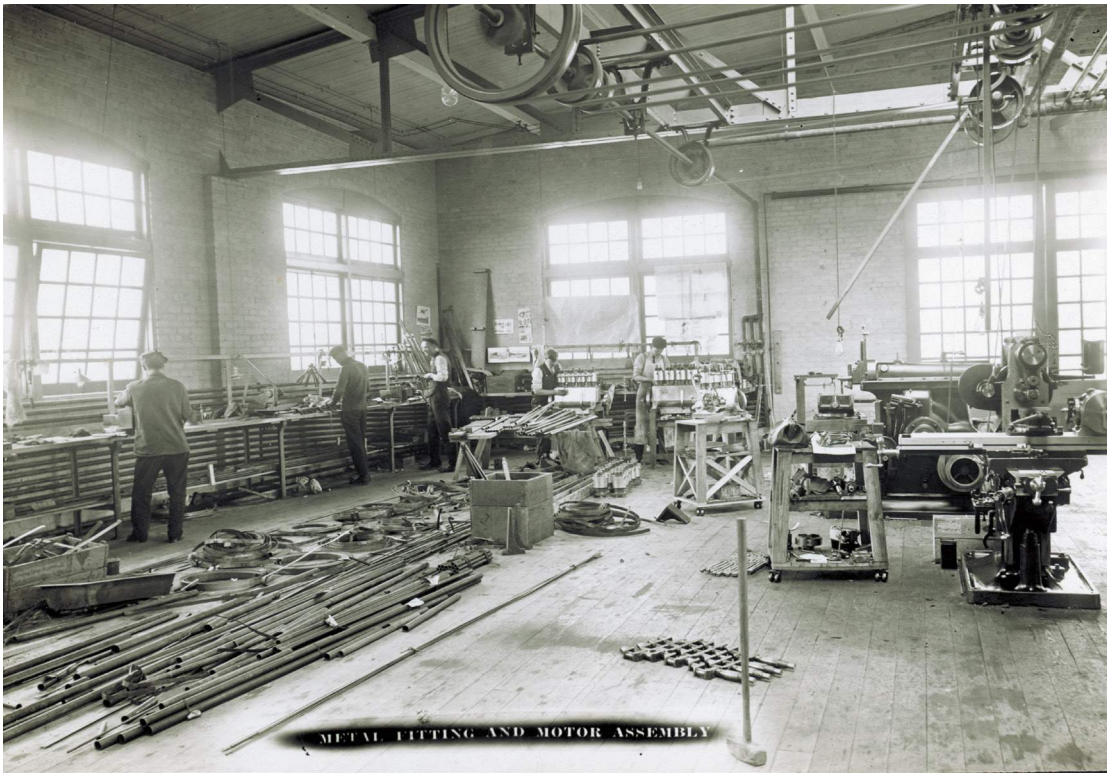


Figure A-28 Interior of Building 1, northeast corner, Metal Cutting and Motor Assembly, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_06



Figure A-29 Charles Taylor at workbench, location unknown, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_17

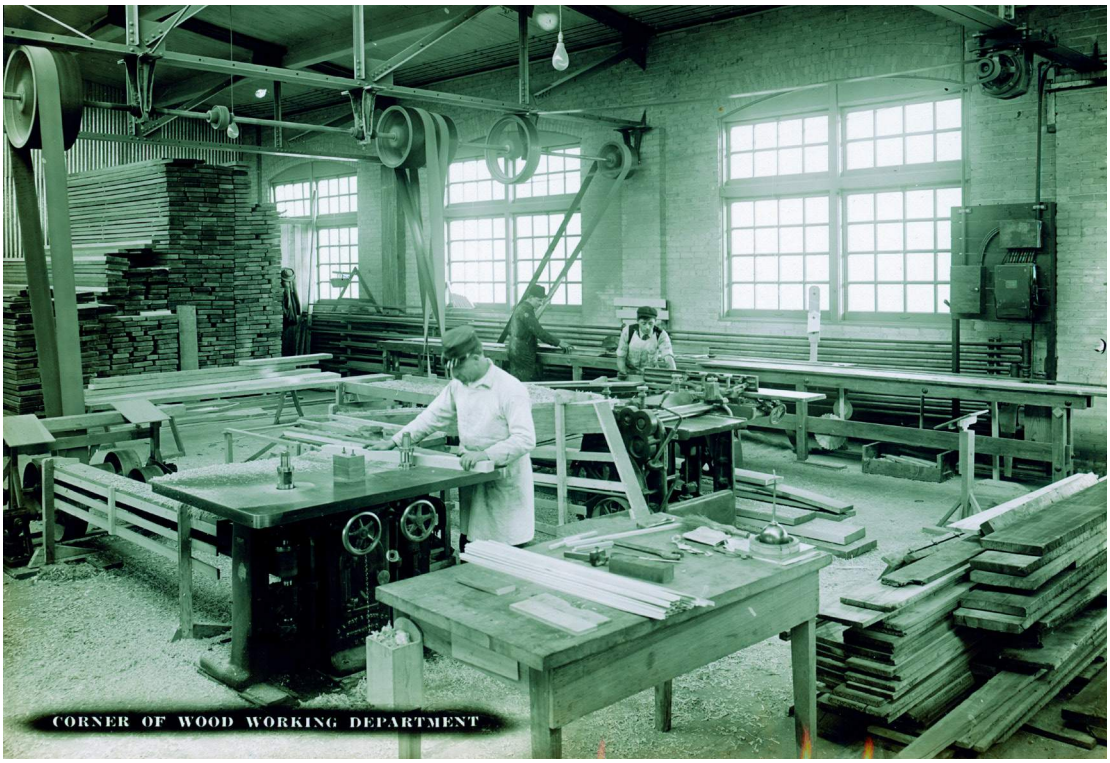


Figure A-30 Corner of Wood Working Department, Interior of Building 1, south wall in bays 8 to 10, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_07



Figure A-31 Interior of Building 1 along north wall bays 8 and 9, Propeller and Rib Department, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_09



Figure A-32 Mr. Steinway and Harry Howard in Corner of Paint Shop, Interior of Building 1, bay 10 circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_12



Figure A-33 Interior of Building 2, Paint Shop, circa 1911
Source: Wright State University Special Collections and Arcthives, File ms21_03_15



Figure A-34 Worker assembling airplane frame, location unknown, circa 1911
Source: Wright State University Special Collections and Archives, File ms21_03_13

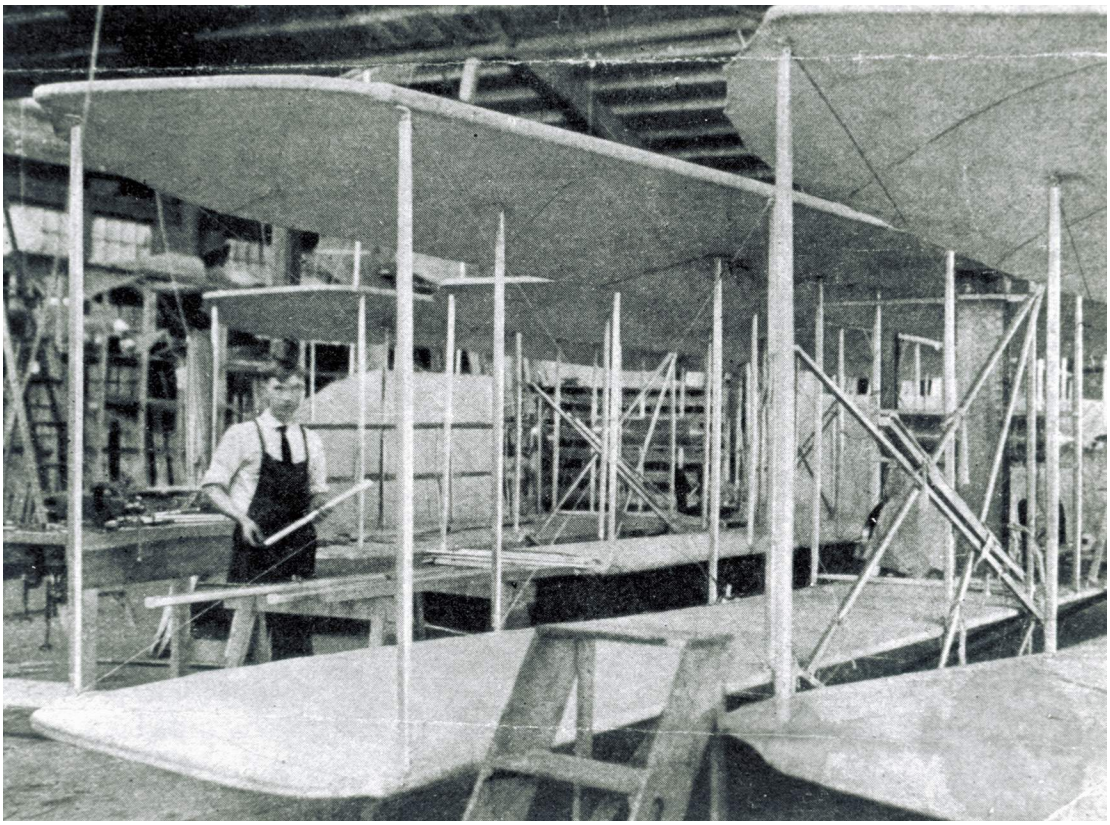


Figure A-35 Wing Assembly, location unknown, possibly Building 2, date unknown.
Source: Wright State University Special Collections and Archives, File ms21_03_22



Figure A-36 Dayton-Wright Workers, location unknown, circa 1918
Source: Wright State University Special Collections and Archives, File ms152_160_ presentation



Figure A-37 Building 1, circa 1918
Source: Wright State University Special Collections and Archives, File ms152_161_presentation
Same as Wright State University Special Collections and Archives, File ms152_162_presentation

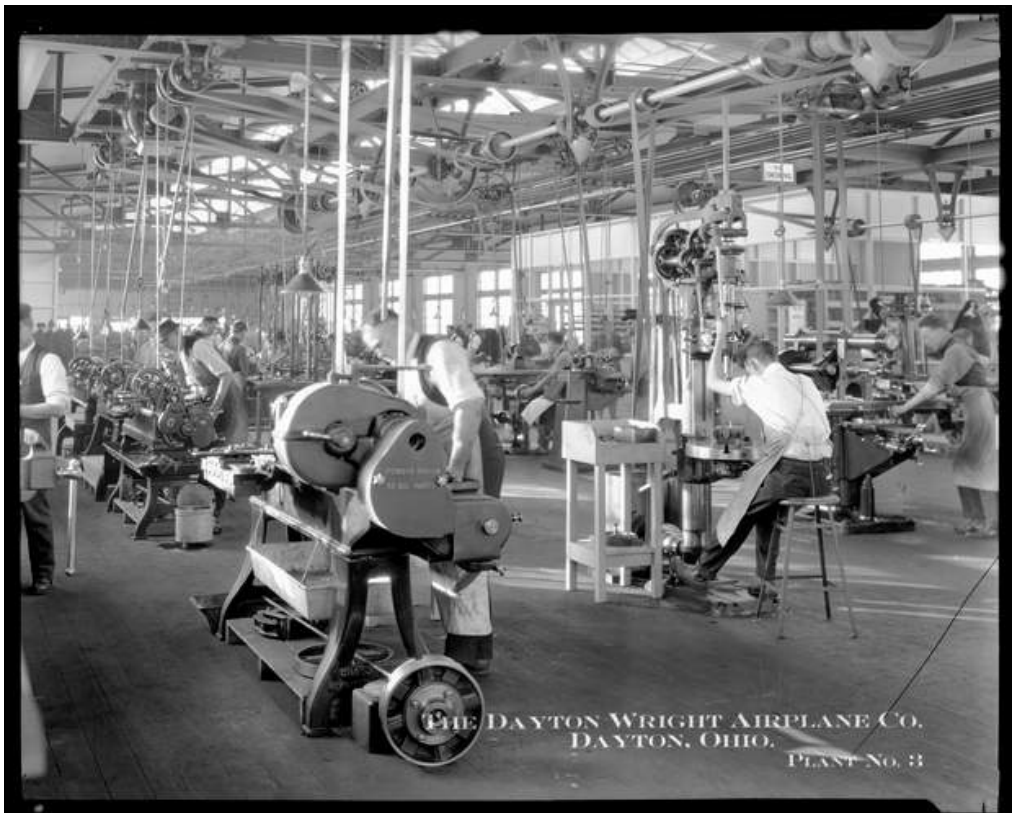


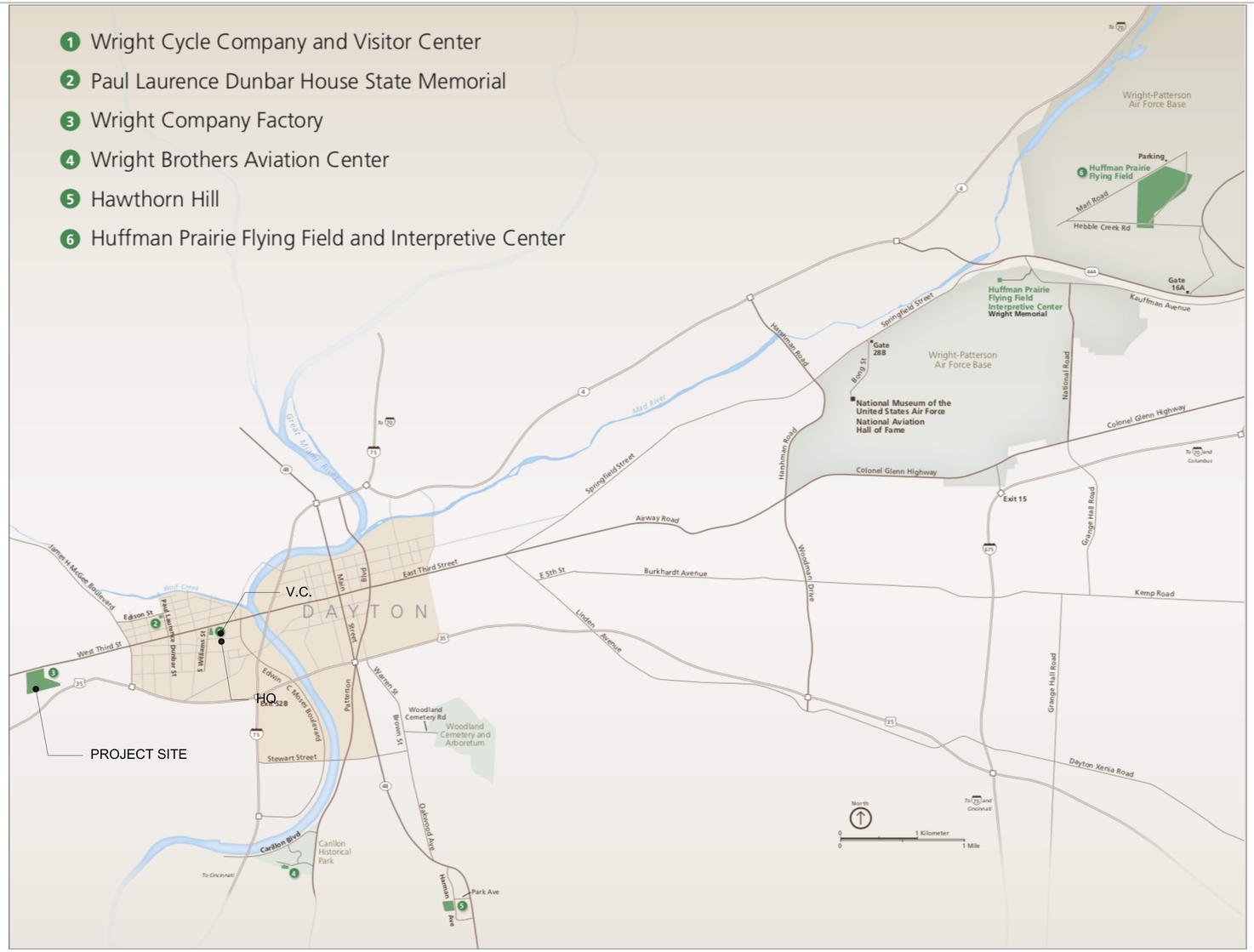
Figure A-38 Interior of Building 1 looking east circa 1918
Source: Wright State University Special Collections and Archives, File ms152_161_presentation

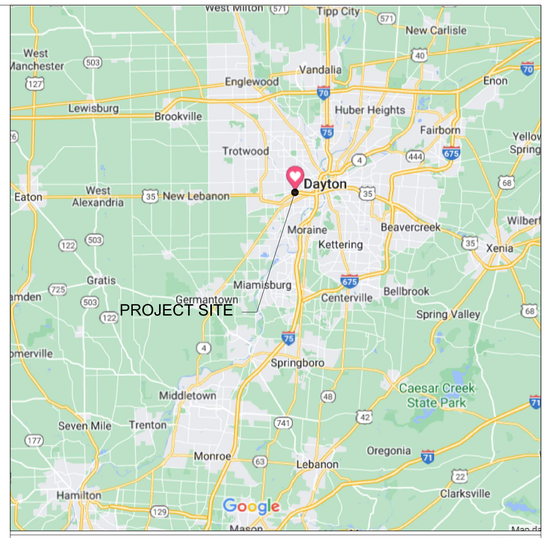


Figure A-39 Interior of Building 1, possibly looking west circa 1918
Source: Wright State University Special Collections and Archives, File ms152_161_presentation

Appendix B - Existing Condition Drawings

1. Wright Cycle Company and Visitor Center
2. Paul Laurence Dunbar House State Memorial
3. Wright Company Factory
4. Wright Brothers Aviation Center
5. Hawthorn Hill
6. Huffman Prairie Flying Field and Interpretive Center





0 5 0
SCALE OF MILES

DAYTON, OHIO

LEGEND

V.C. VISITOR CENTER

HQ. PARK HEADQUARTERS

SCALE OF MILES
1 0.5 0 0.25 0.5 1

SCALE OF KILOMETERS
1 0.5 0 0.5 1

LIST OF DRAWINGS:

G0.0	COVER
G0.1	SCHEMATIC SITE PLAN
A1.1	LEVEL 1 PLAN
A1.2	ROOF PLAN
A2.0	BUILDING ELEVATIONS
A3.0	BUILDINGS 1 AND 2 ELEVATIONS, C. 1911

WRIGHT COMPANY FACTORY BUILDINGS 1 AND 2
DAYTON AVIATION NATIONAL HISTORICAL PARK

A/E FIRM	Mark	Sheet	REVISION	Date	Initial
ARCHITECT:	x	x	x	xx.xx.xx	XXX
RATHS, RATHS & JOHNSON, INC.					
500 Joliet Road, Suite 200 Willowbrook, Illinois 60527–5618					

QUALITY DESIGN CERTIFICATION

☐ Prepared in Accordance with Design Development (Title I) _____
OR
☐ Variance from Design Development (Title I) Approved by Superintendent on _____
OR
☐ Construction Drawing Not Preceded by Design Development (Title I)

Project Manager _____ Date _____

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
DENVER SERVICE CENTER

TITLE OF DRAWING
EXISTING CONDITION DRAWINGS

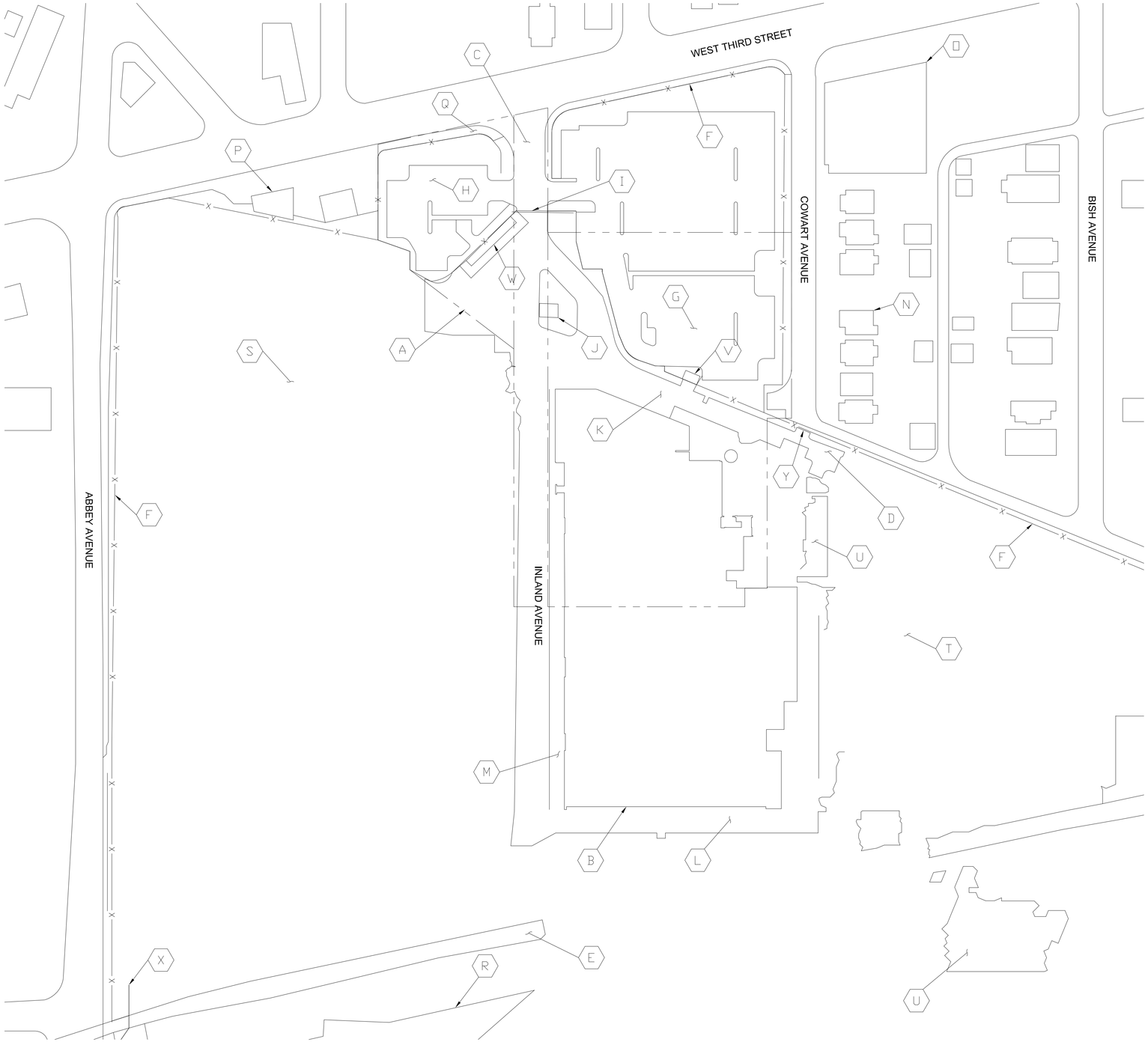
LOCATION WITHIN PARK
WRIGHT COMPANY FACTORY
NAME OF PARK

REGION | COUNTY: MONTGOMERY | STATE: OHIO

DRAWING NO. .

PMIS NO. 15 22 52

SHEET 1 OF 6



1 G.01 SCHEMATIC SITE PLAN

SCALE: 1/64" = 1'-0"

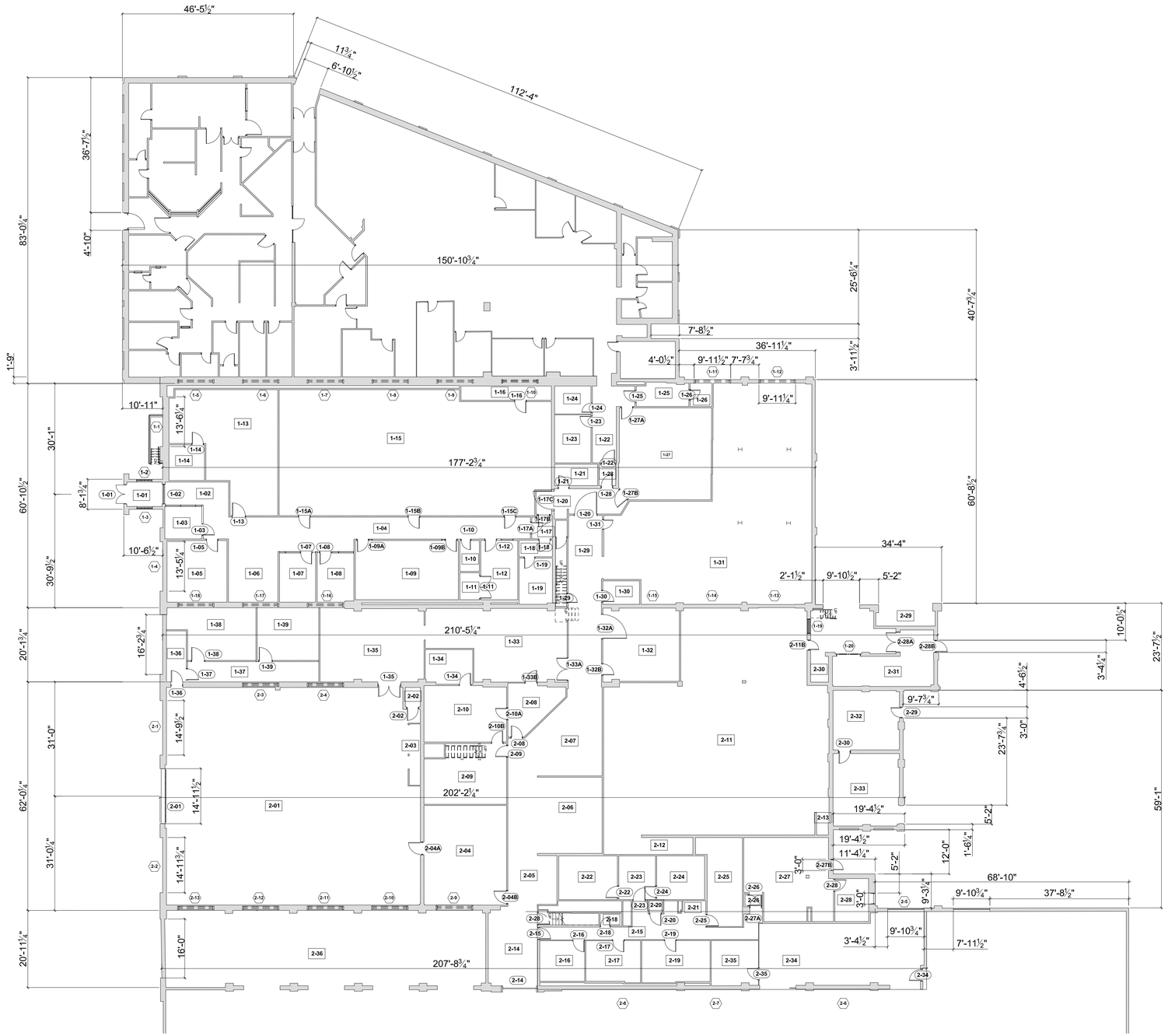
0 32' 64' 128'

SITE PLAN LEGEND

ID	DESCRIPTION
A	APPROXIMATE BOUNDARIES OF 3.55 ACRE PARCELS PROPOSED FOR ACQUISITION BY NPS AND ACCESS EASEMENT ALONG INLAND AVENUE.
B	WRIGHT COMPANY FACTORY, BUILDINGS 1, 2, 3, 4, 5, AND 17
C	ENTRANCE TO SITE FROM WEST THIRD STREET
D	ALIGNMENT OF NON-EXTANT B&O RAILROAD LINE
E	ALIGNMENT OF ABANDONED CSX RAILROAD LINE
F	CHAINLINK AND BARBED WIRE SITE FENCES
G	EAST PARKING AREA
H	WEST PARKING AREA
I	CONTROL GATE ON INLAND AVENUE
J	GUARD POST STRUCTURE
K	NORTH SERVICE ROAD
L	SOUTH SERVICE ROAD
M	PEDESTRIAN SIDEWALK ALONG EAST SIDE OF INLAND AVENUE
N	RESIDENTIAL NEIGHBORHOOD TO THE EAST
O	COMMERCIAL BUILDING TO THE EAST
P	COMMERCIAL BUILDINGS TO THE WEST
Q	BUS STOP ON WEST THIRD STREET AT INLAND AVENUE
R	WEST BRANCH PUBLIC LIBRARY, CONSTRUCTED 2022
S	UNDEVELOPED SITE TO THE WEST
T	UNDEVELOPED SITE TO THE EAST
U	REMNANTS OF DETERIORATED AND ABANDONED SITE FEATURES, SUCH AS PAVING, FOUNDATION, UTILITY PADS, ETC, SHOWN SCHEMATICALLY
V	EAST PARKING TURNSTILE
W	TRUCK SCALE
X	CONTROL GATE ON ABBEY AVENUE
Y	CONTROL GATE AT COWART AVENUE

A/E FIRM PRIME/ARCH: RATHS, RATHS & JOHNSON, INC. 500 Joliet Road, Suite 200 Willowbrook, Illinois 60527-5618	DESIGNED: N/A CADD: LMB/GAF TECH. REVIEW: LMB DATE: 07/14/2023	SUB SHEET NO. G.01	TITLE OF SHEET SCHEMATIC SITE PLAN DAYTON AVIATION NATIONAL HISTORICAL PARK	DRAWING NO. . . PMIS/PKG NO. 152252 SHEET 2 OF 7

Last Saved: Lmblank (July 16, 2023) | AutoCAD LT 2019 | C:\Users\lmblank\OneDrive - Raths, Raths & Johnson, Inc\Desktop\WRIGHTFACTORY\Revit_Export_To_CADA10 SITE PLAN.dwg



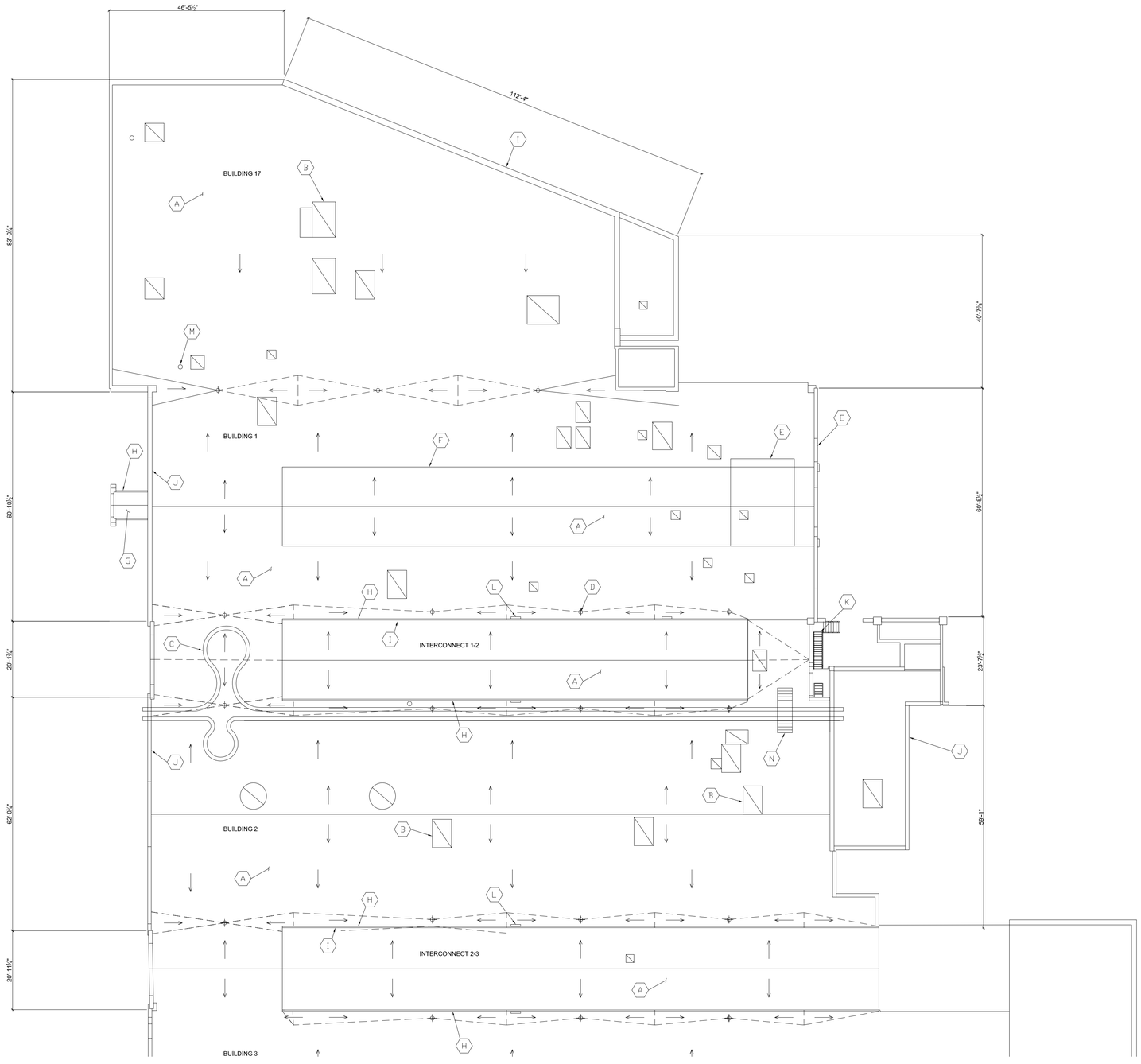
1 A1.2 FIRST FLOOR PLAN

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

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1 A1.1 ROOF PLAN
SCALE: 1/16" = 1'-0"

0 8' 16' 32'

ROOF PLAN LEGEND	
ID	DESCRIPTION
A	ROOFING MEMBRANE: SINGLE PLY EPDM MEMBRANE WITH 1-INCH POLYISOCYANURATE INSULATION BOARD OVER WOOD PLANK ROOF SHEATHING
B	ABANDONED ROOFTOP UNITS, EQUIPMENT, AND EQUIPMENT CURBS/SUPPORTS, SHOWN SCHEMATICALLY
C	ABANDONED ROOFTOP EQUIPMENT PIPING
D	ROOF DRAIN WITH INSULATION CRICKETS
E	REMNANTS OF POWER PLANT STRUCTURE
F	BUILDING 1 SKYLIGHT STRUCTURE
G	BUILT-UP ROOFING MEMBRANE AT VESTIBULE
H	PREFINISHED METAL BOX GUTTERS WITH PREFINISHED METAL DOWNSPOUTS
I	PREFINISHED ROOF EDGE METAL
J	PREFINISHED METAL COPING AT PARAPET
K	EXTERIOR METAL STAIR ACCESS TO ROOF
L	METAL ACCESS LADDER
M	PIPE PENETRATION
N	WOOD STAIRS AND LANDING
O	DETERIORATED PARAPET AT EAST SIDE OF BUILDING 1
←	ROOF SLOPE

A/E FIRM	DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
PRIME/ARCH: RATHS, RATHS & JOHNSON, INC. 500 Joliet Road, Suite 200 Willowbrook, Illinois 60527-5618	N/A	A1.3	ROOF PLAN	. .
	CADD: LMB/GAF			PMIS/PKG NO. 152252
	TECH. REVIEW: LMB			SHEET 4 OF 6
	DATE: 07/14/2023		DAYTON AVIATION NATIONAL HISTORICAL PARK	

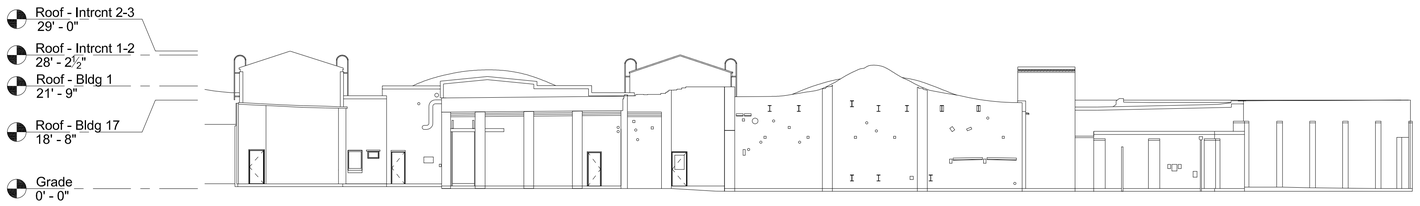
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1 A2.0 NORTH ELEVATION

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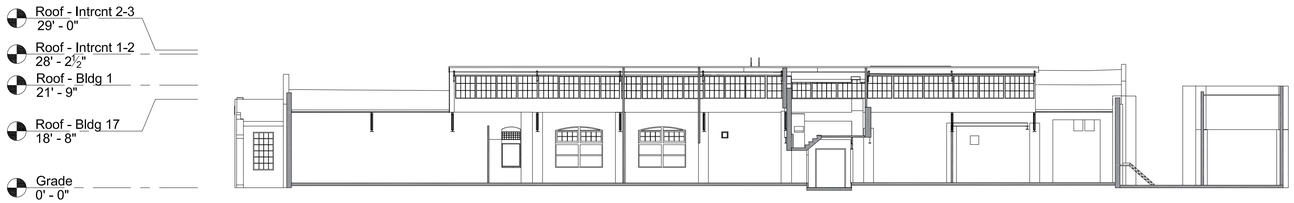
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2 A2.0 EAST ELEVATION

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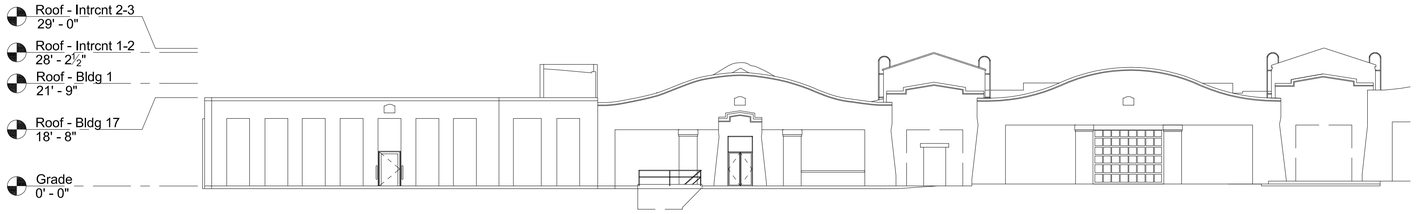
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3 A2.0 SOUTH ELEVATION

SCALE: 1/16" = 1'-0"

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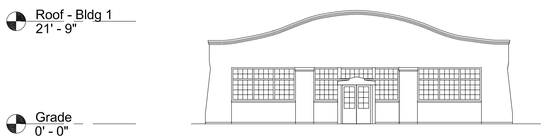
4 A2.0 WEST ELEVATION

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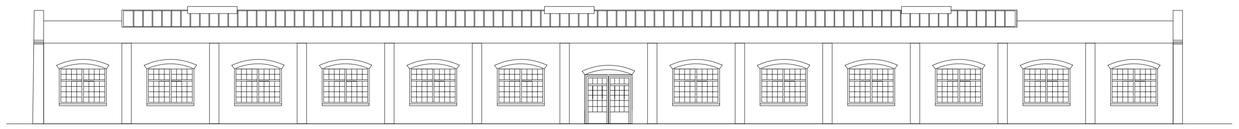
0 8' 16' 32'

A/E FIRM PRIME/ARCH: RATHS, RATHS & JOHNSON, INC. 500 Joliet Road, Suite 200 Willowbrook, Illinois 60527-5618	DESIGNED: N/A CADD: LMB/GAF TECH. REVIEW: LMB DATE: 07/14/2023	SUB SHEET NO. A2.0	TITLE OF SHEET BUILDING ELEVATIONS DAYTON AVIATION NATIONAL HISTORICAL PARK	DRAWING NO. . . PMIS/PKG NO. 152252 SHEET 5 OF 6

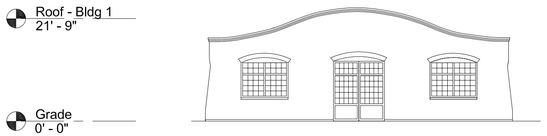
Last Saved: Lmblank (July 16, 2023) | AutoCAD LT 2019 | C:\Users\lmblank\OneDrive - Raths, Raths & Johnson, Inc\Desktop\WRIGHTFACTORY\Revit_Export_To_CADA\15 NORTH ELEV.dwg



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



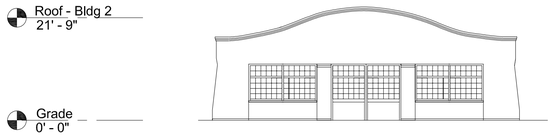
SOUTH ELEVATION

1
A3.0

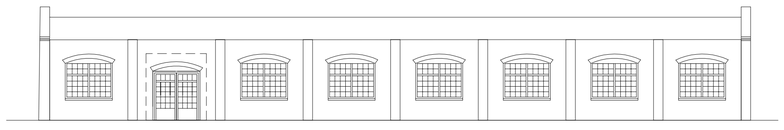
BUILDING 1 - 1911 ELEVATIONS

SCALE: 1/16" = 1'-0"

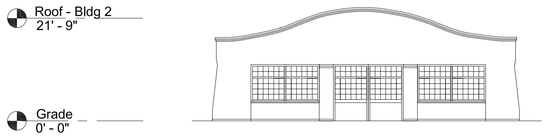
0 8' 16' 32'



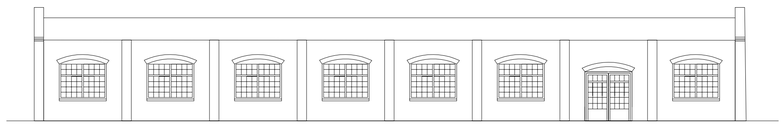
WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



SOUTH ELEVATION

2
A3.0

BUILDING 2 - 1911 ELEVATIONS

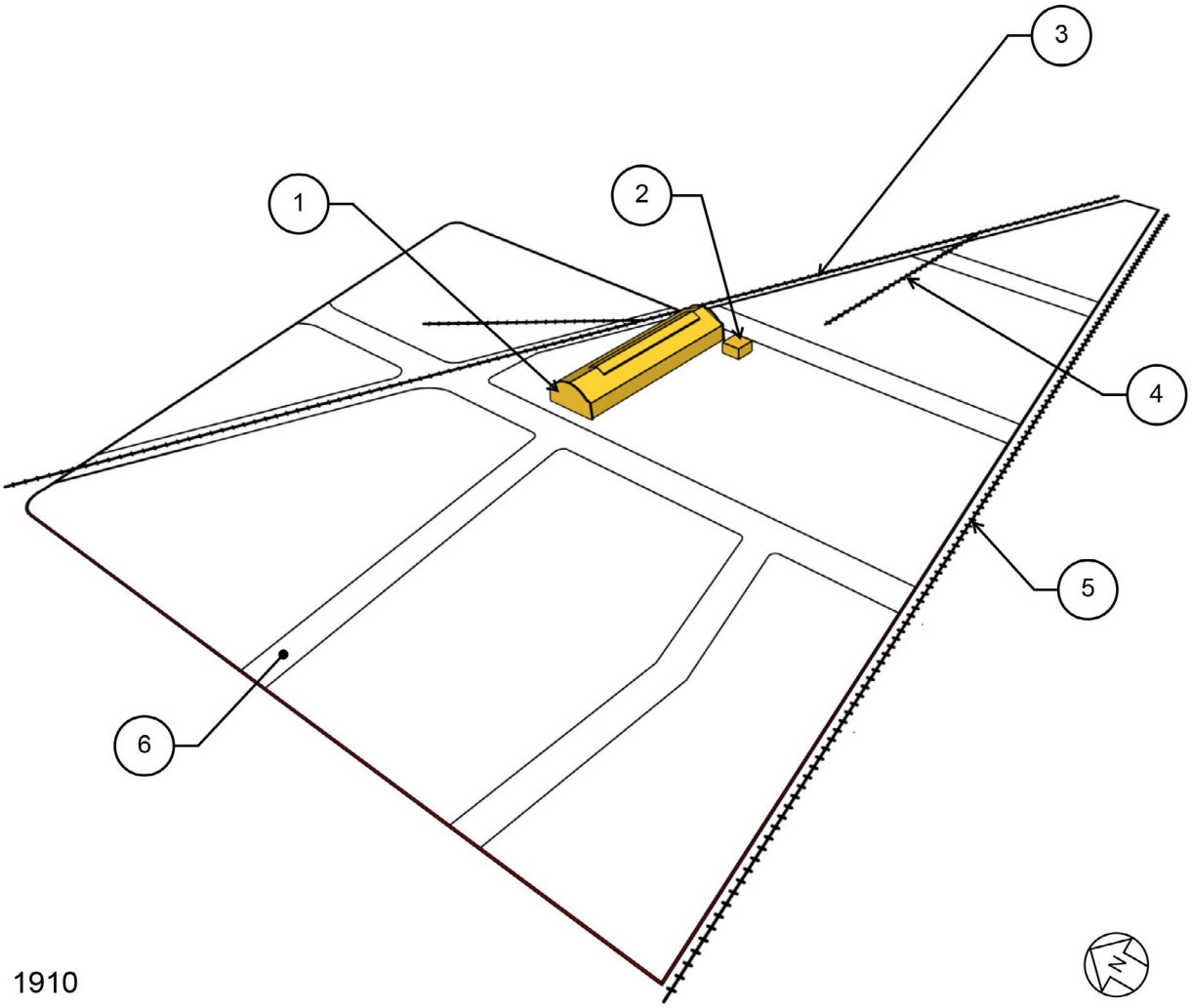
SCALE: 1/16" = 1'-0"

0 8' 16' 32'

A/E FIRM PRIME/ARCH: RATHS, RATHS & JOHNSON, INC. 500 Joliet Road, Suite 200 Willowbrook, Illinois 60527-5618	DESIGNED: N/A CADD: LMB/GAF TECH. REVIEW: LMB DATE: 07/14/2023	SUB SHEET NO. A3.0	TITLE OF SHEET BUILDINGS 1 AND 2 C. 1911 DAYTON AVIATION NATIONAL HISTORICAL PARK	DRAWING NO. . . PMIS/PKG NO. 152252 SHEET 6 OF 6

Last Saved: Lmblank (July 16, 2023) | AutoCAD LT 2019 | C:\Users\lmblank\OneDrive - Raths, Raths & Johnson, Inc\Desktop\WRIGHTFACTORY\Revit_Export_To_CADA\19 BLDG1 ORG.dwg

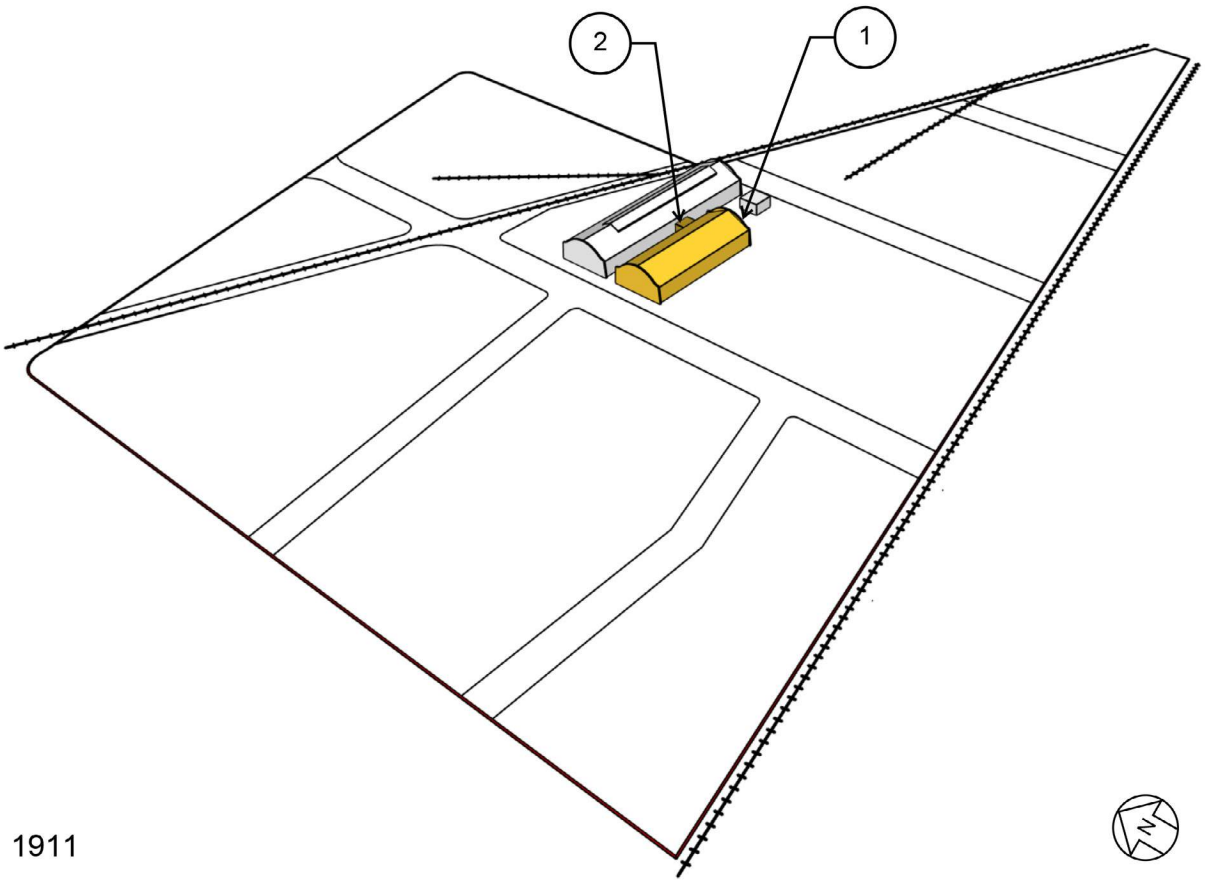
Appendix C - Site Chronology Diagrams



1910

Legend

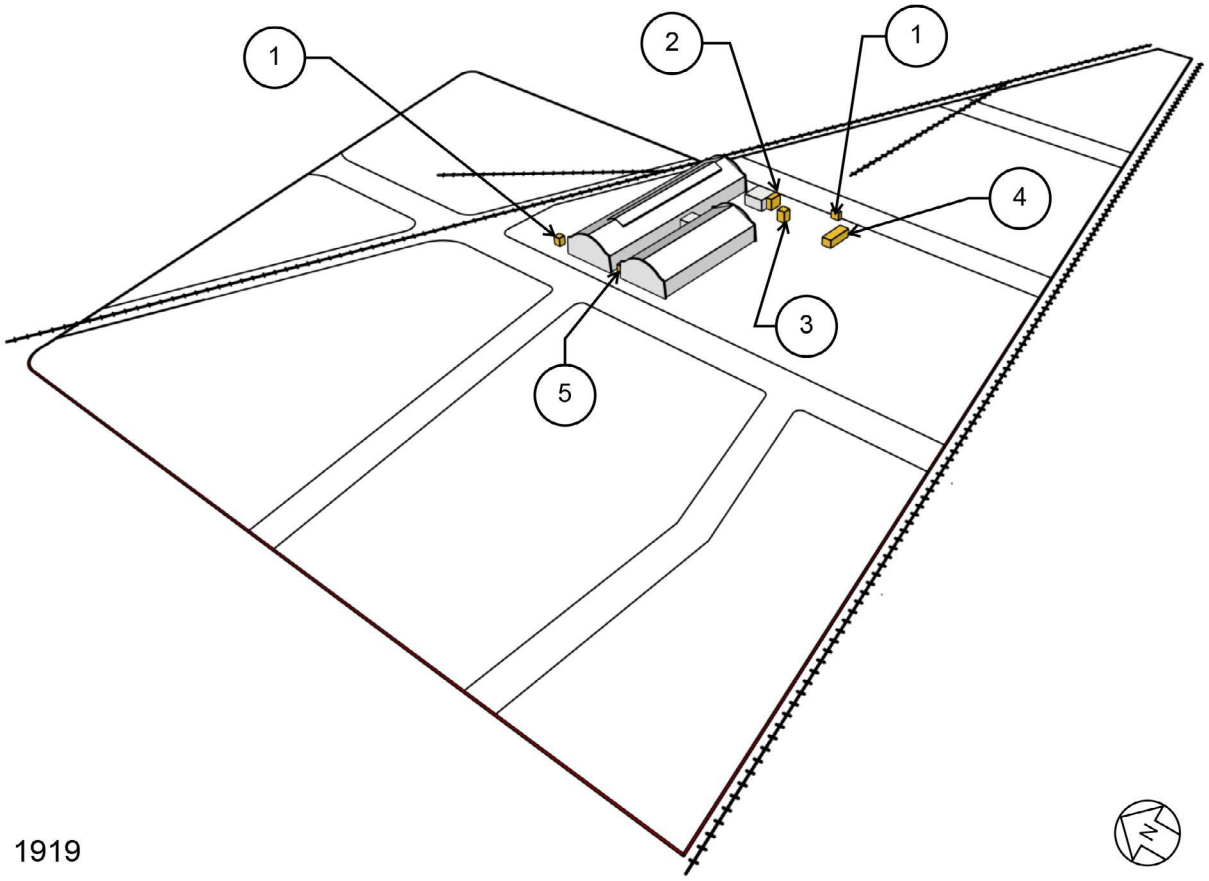
1. Building 1 (*Source: 1910 photograph*)
2. Powerplant for Building 1 (*Source: 1910 photograph*)
3. B&O Railroad line (*Source: 1896 Clemmer's Heirs plat, 1919 Sanborn map*)
4. Rail line spurs for factory (*Source: 1919 Sanborn map)*
5. Soldier's Home Railroad line (Source: 1919 Sanborn map)
6. Roads platted and mapped but possibly not paved



1911

Legend

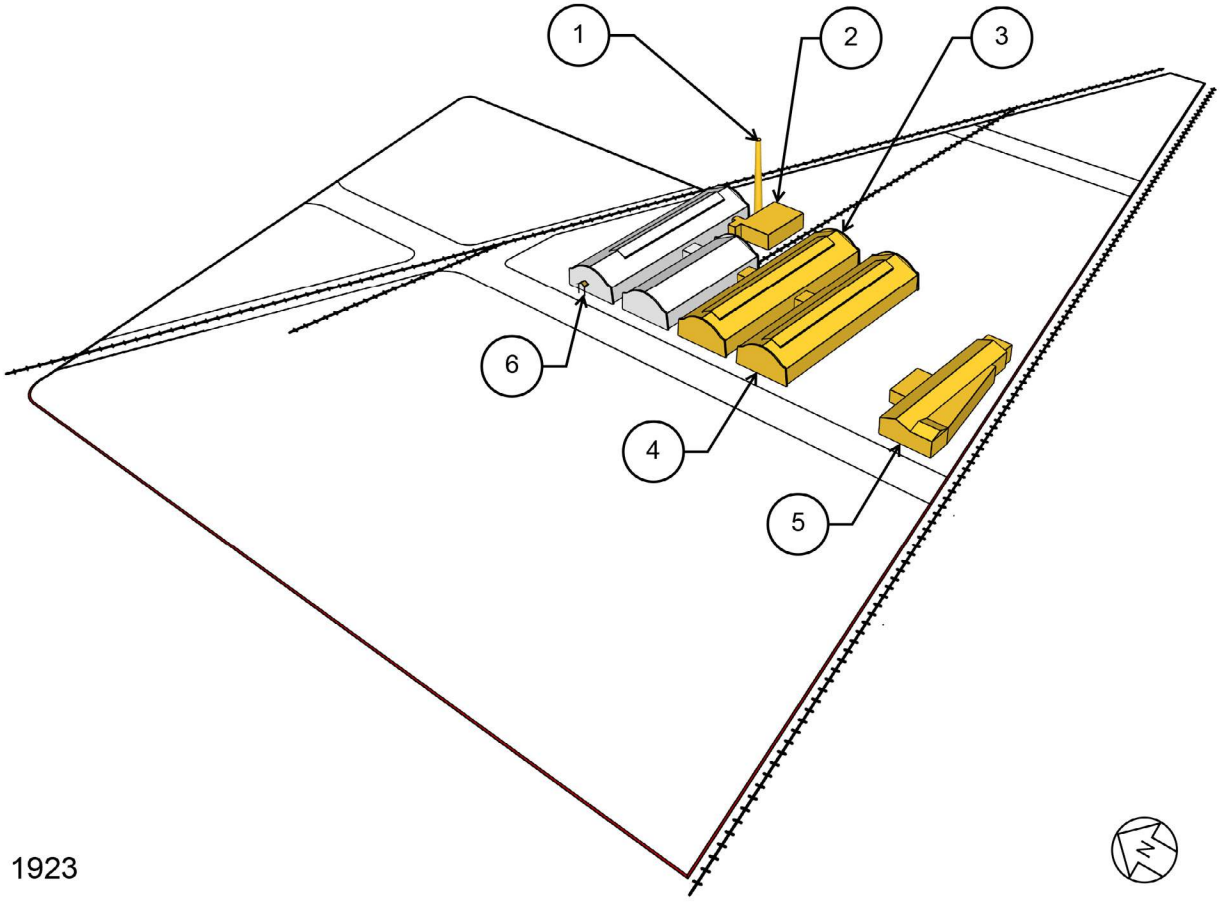
1. Building 2 (*Source: Wright State University photographs, 1919 Sanborn*)
2. Link between Buildings 1 and 2 (*Source: 1919 Sanborn*)



1919

Legend

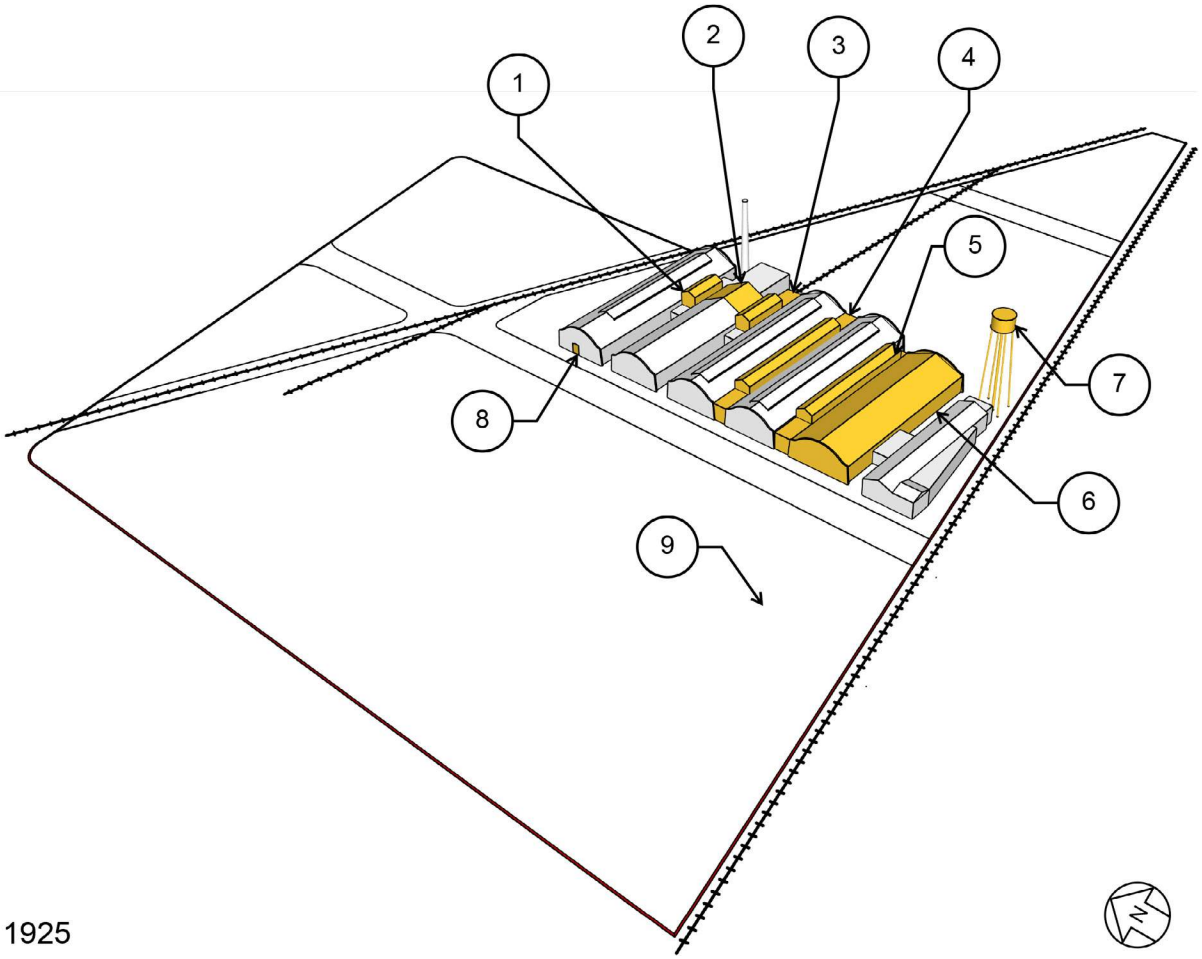
1. Guard posts (*Source: 1919 Sanborn, 1918 photographs*)
2. Coal storage (*Source: 1919 Sanborn*)
3. Oil and paint storage (*Source: 1919 Sanborn*)
4. Unidentified building (*Source: 1919 Sanborn*)
5. Time office (*Source: 1919 Sanborn, 1918 photographs*)



1923

Legend

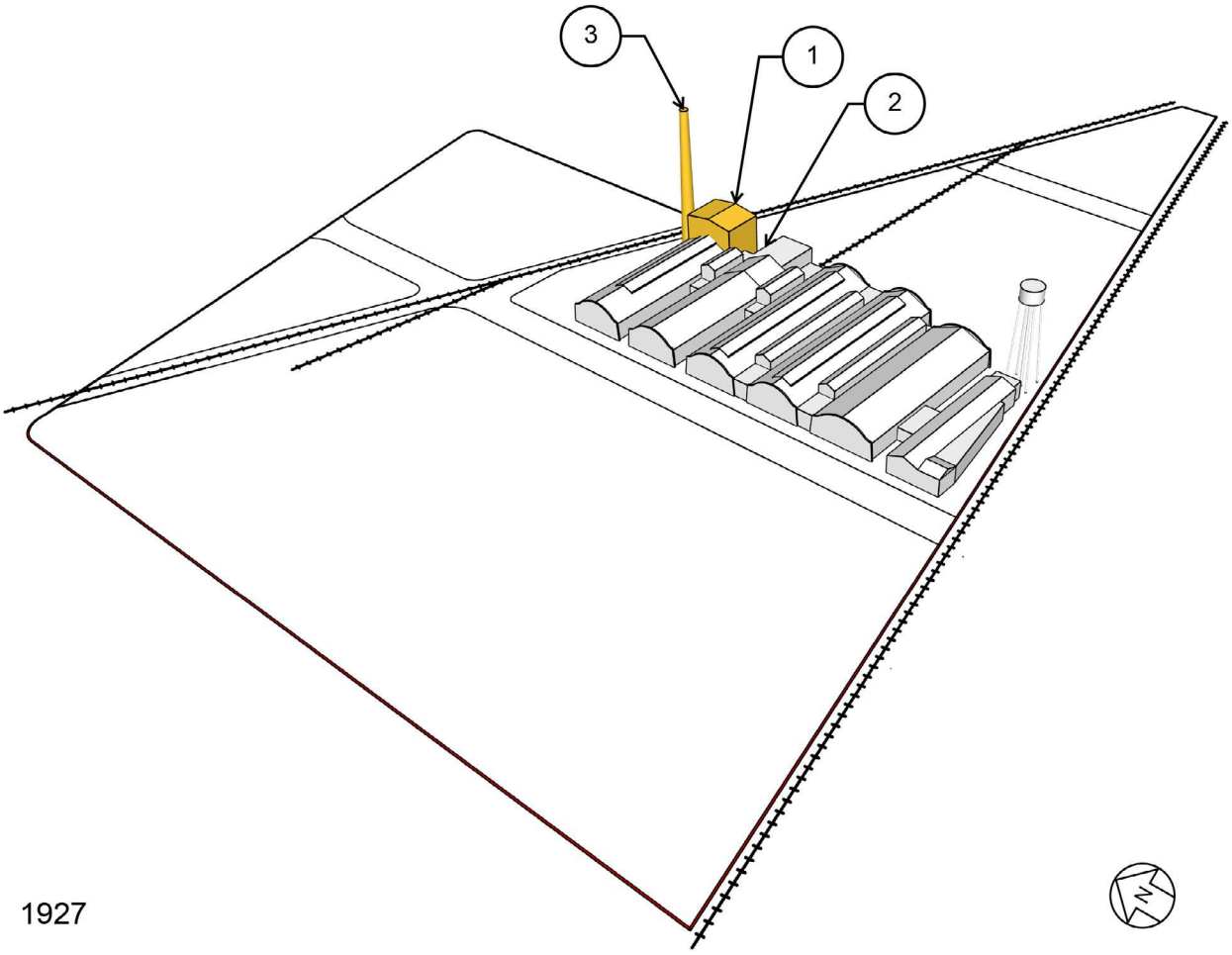
1. Smokestack for power plant (*Source: 1924 Inlander*)
2. Power plant expansion (*Source: 1927-28 drawings*)
3. Building 3 and link structure (*Source: 1924 Inlander, 1925 drawings*)
4. Building 4 and link structure (*Source: 1924 Inlander, 1925 drawings*)
5. Building 6 and link structure (*Source: 1924 Inlander*)
6. Small canopy or open-air vestibule at Building 1 entry (*Source: 1924 Inlander*)



1925

Legend

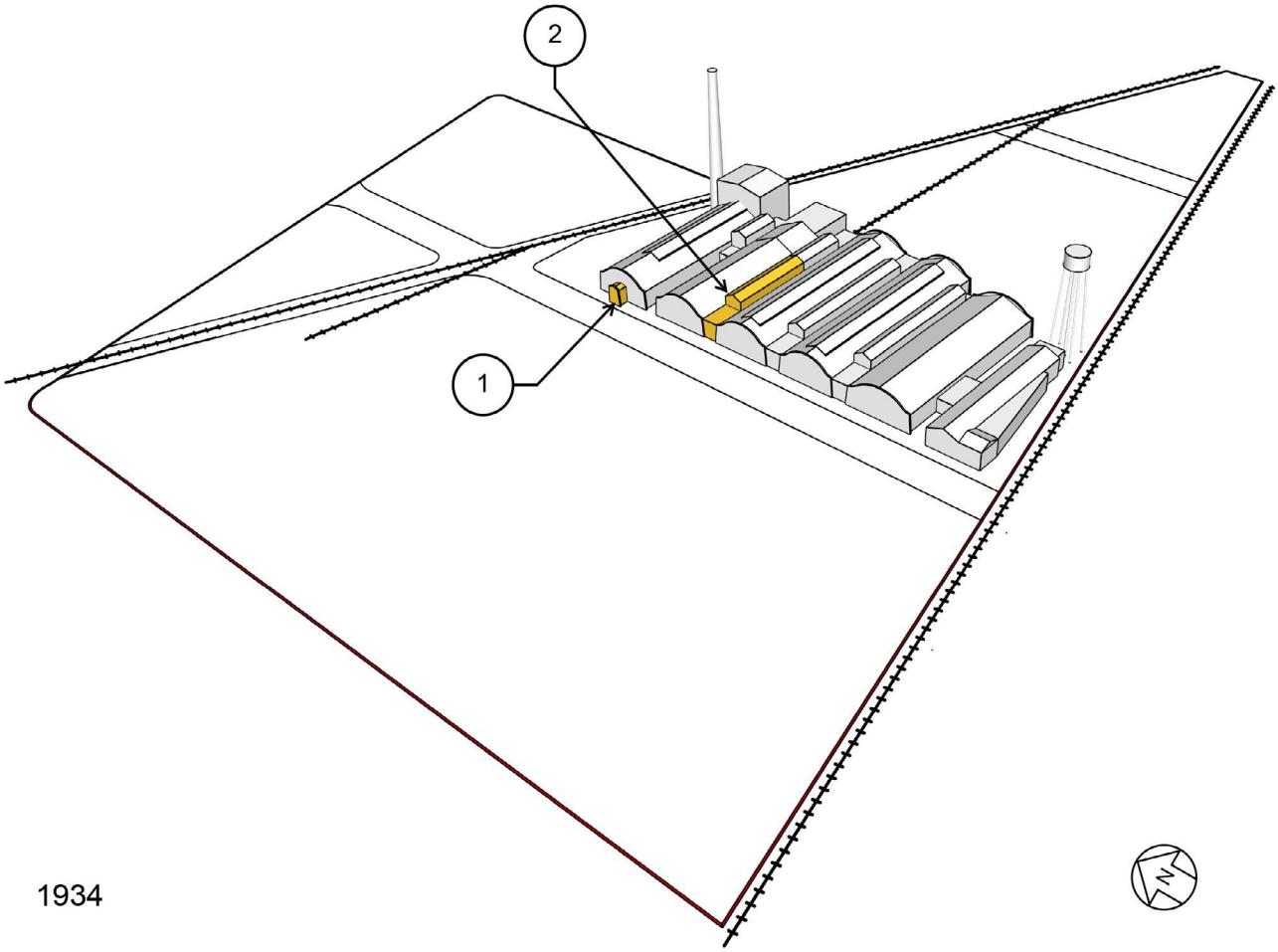
1. Construction of Interconnect 1-2 (*Source: 1926 site plan, 1941 drawings*)
2. Expansion of Building 2 to the east (*Source: 1927-28 drawings*)
3. Construction of Interconnect 2-3 (*Source: 1925 drawings, 1926 Inlander*)
4. Construction of Interconnect 3-4 (*Source: 1925 drawings, 1926 Inlander*)
5. Construction of Interconnect 4-5 (*Source: 1926 and 1934 drawings, 1926 Inlander*)
6. Construction of Building 5 (*Source: 1926 and 1934 drawings, 1926 Inlander*)
7. Water tower located behind Building 6 (*Source: 1926 Inlander*)
8. Door surround or small vestibule on Building 1 entry (*Source: 1926 Inlander*)
9. Development of parcels west of Inland Avenue begins (not shown for clarity)



1927

Legend

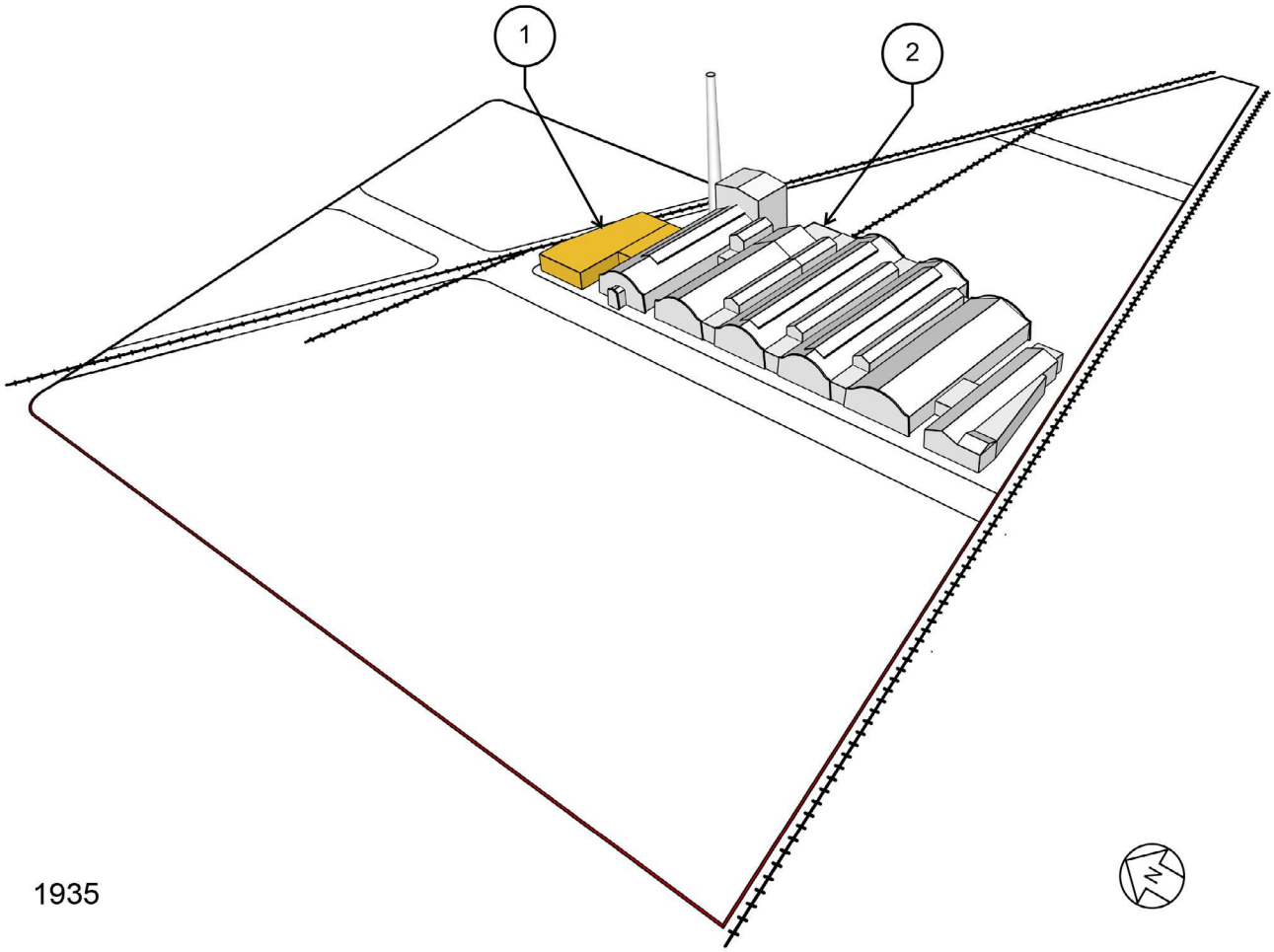
1. Major expansion of the Building 1 power plant (*Source: 1926 Inlander, 1927-28 drawings*)
2. Smaller smokestack removed (*Source: 1927-28 drawings, 1935 Inlander*)
3. Taller smokestack added to Building 1 power plant (*Source: 1927-28 drawings*)



1934

Legend

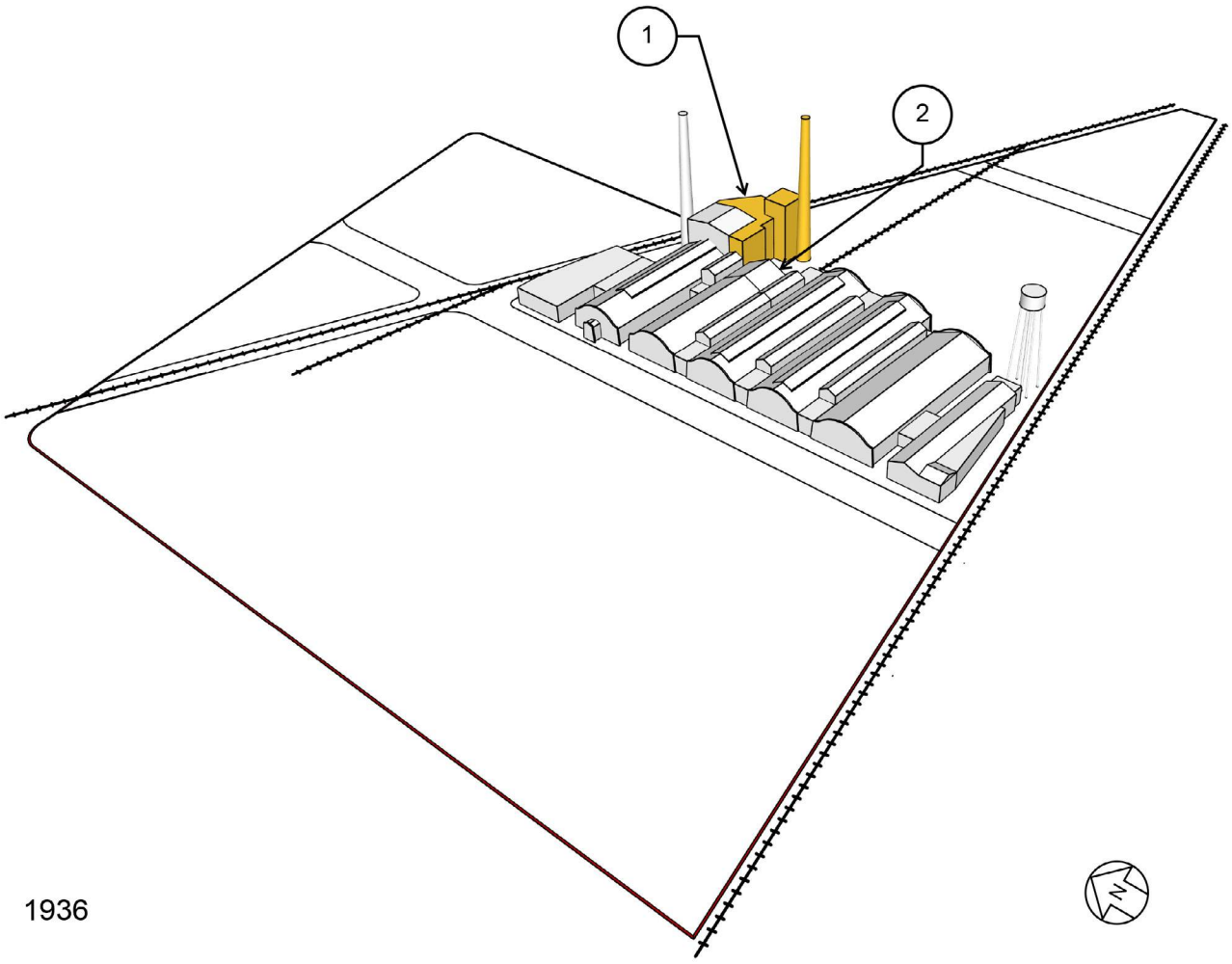
1. New vestibule added to Building 1 (*Source: 1935 drawings*)
2. Expansion of Interconnect 2-3 (*Source: 1935 Inlander*)



1935

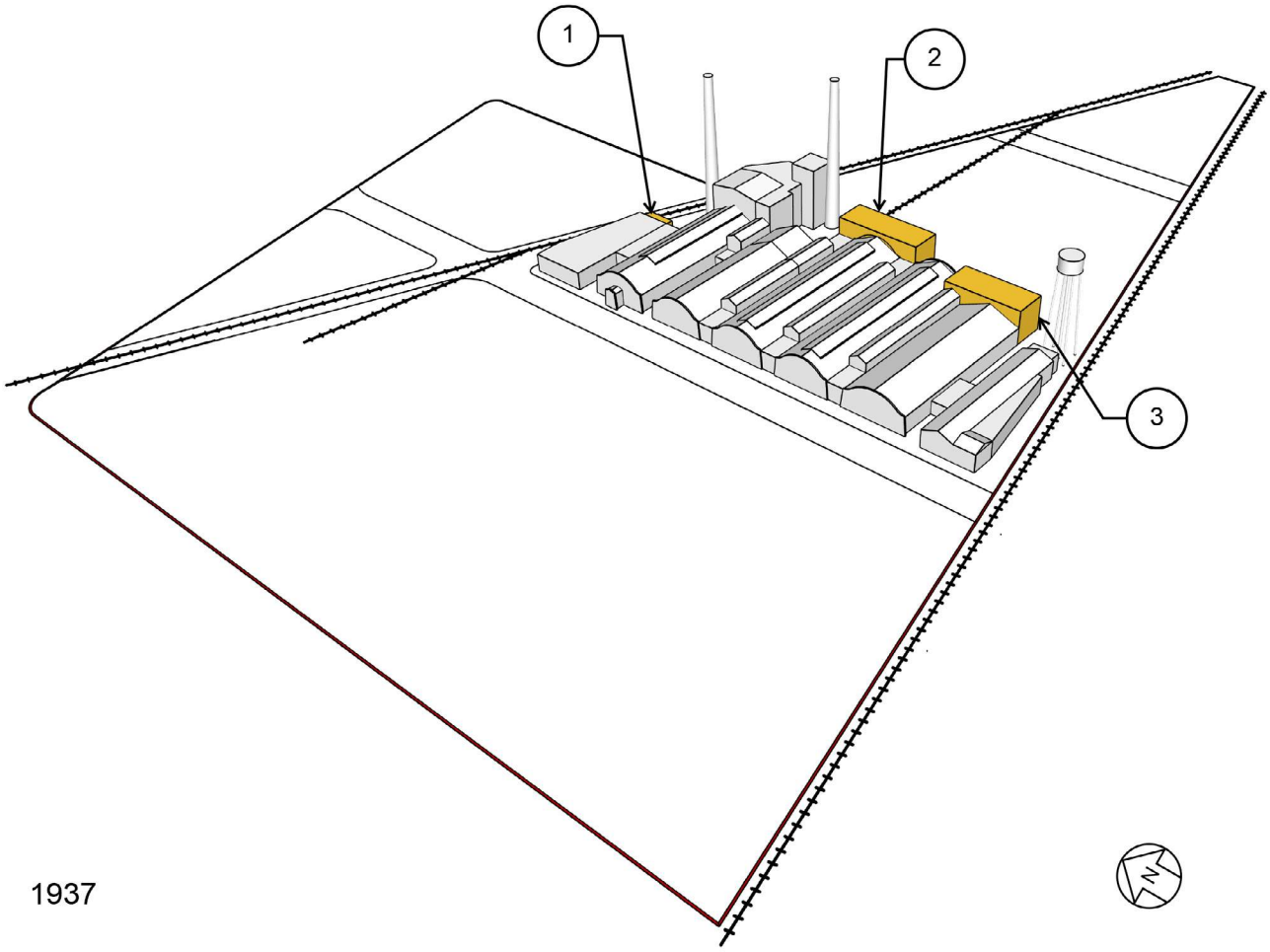
Legend

1. Construction of Building 17 (Source: 1935 Inlander, 1937 drawings)
2. Alterations to the east end of Building 2 (Source: 1935 drawings)



Legend

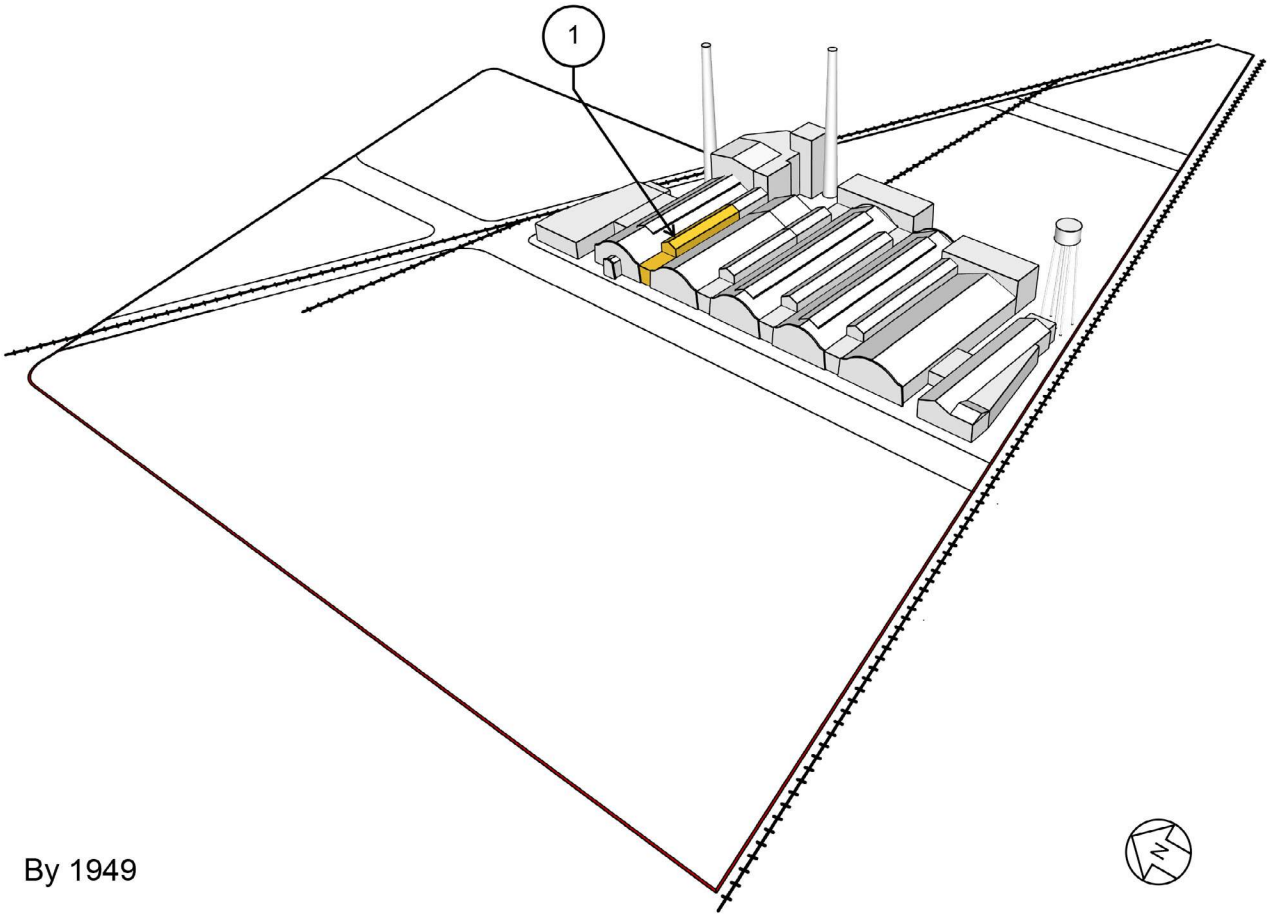
1. Alterations and major expansion of the Building power plant (*Source: 1935-36 drawings, 1945 Inlander*)
2. Alterations to the east end of Building 2 (*Source: 1935-35 drawings*)



1937

Legend

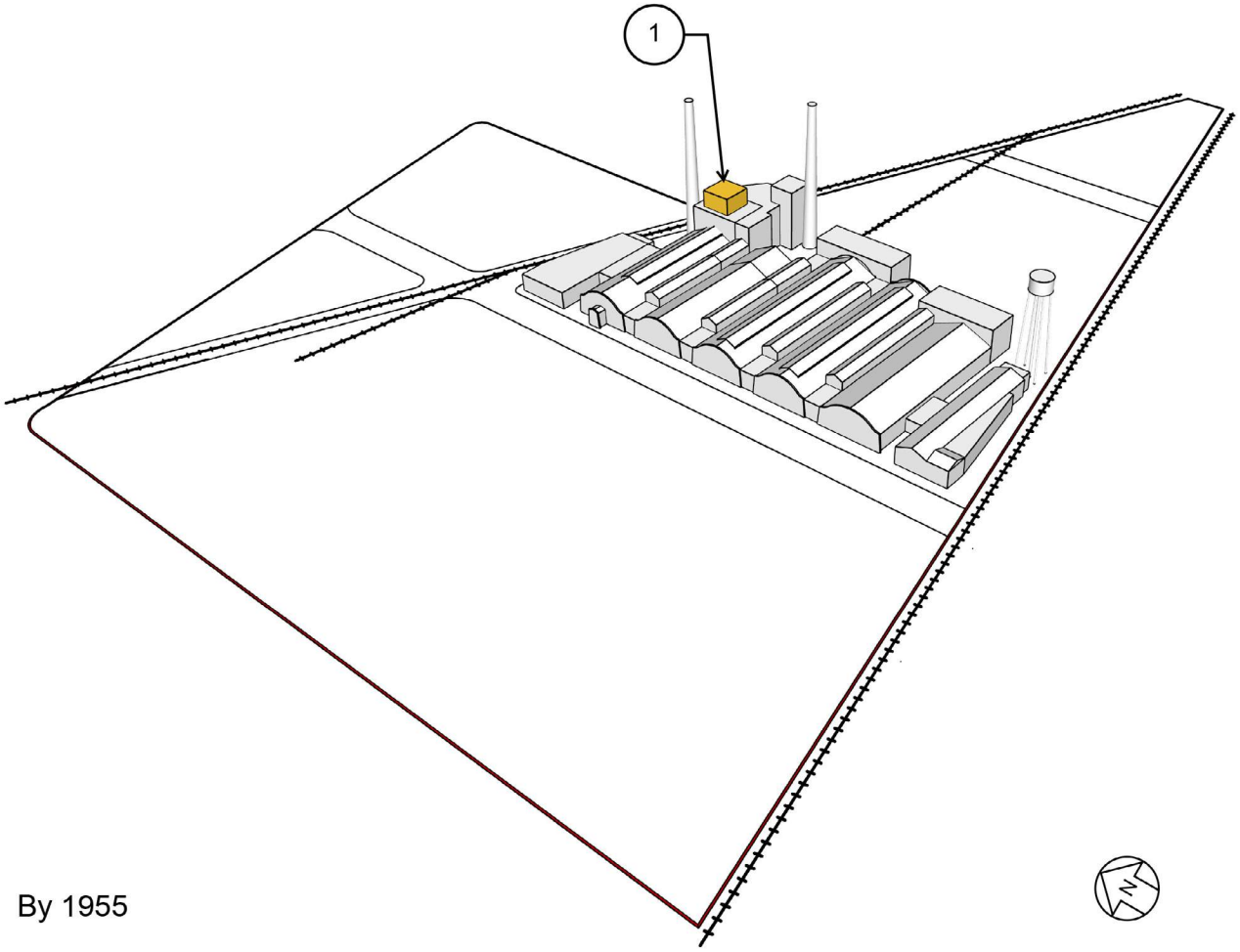
1. Addition to the east of Building 17 (*Source: 1936 drawings, 1938 Montgomery County aerial*)
2. Addition to the east of Building 3 (*Source: 1937 drawings, 1938 Montgomery County aerial*)
3. Addition to the east of Building 5 (*Source: 1936 drawings, 1938 Montgomery County aerial*)



By 1949

Legend

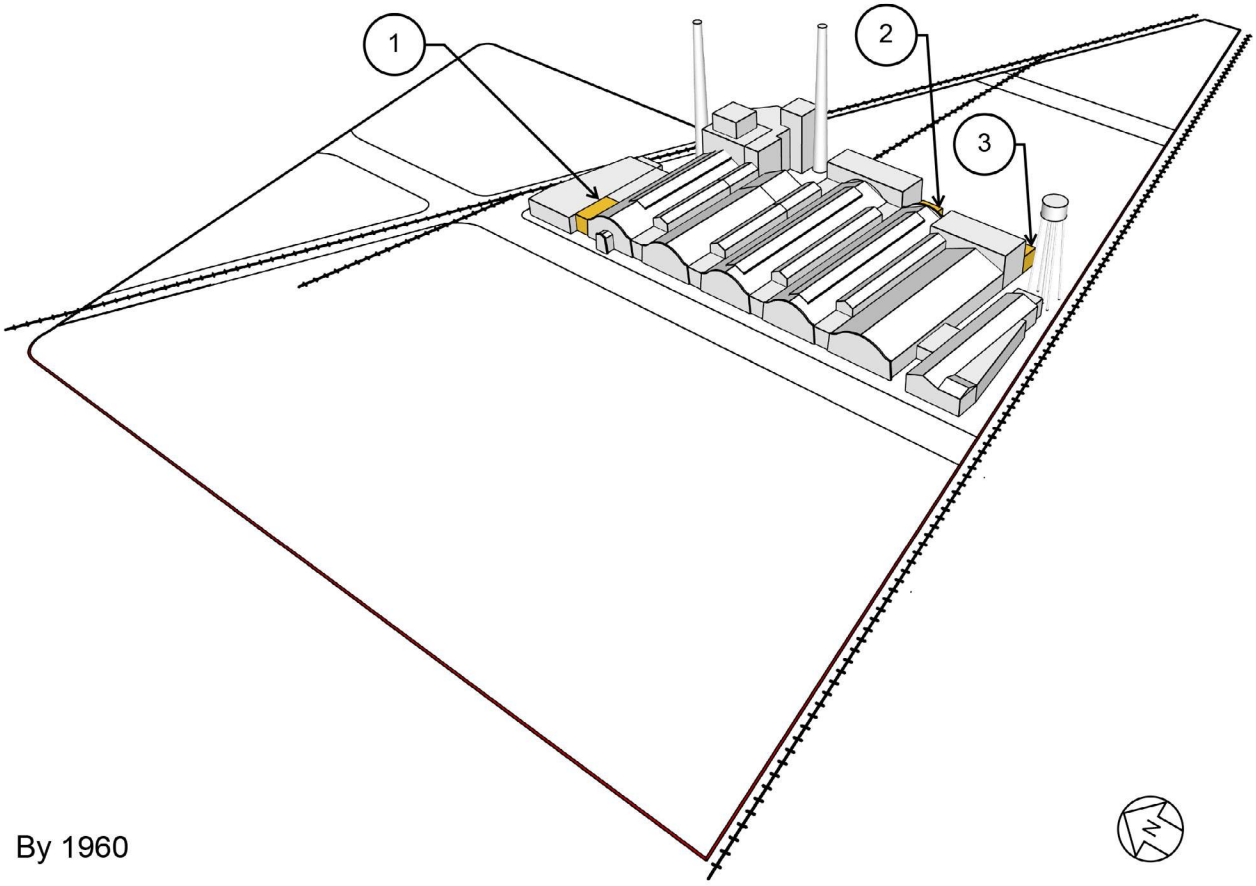
1. Expansion of Interconnect 1-2 (*Source: 1945 Inlander, 1949 Montgomery County aerial*)



By 1955

Legend

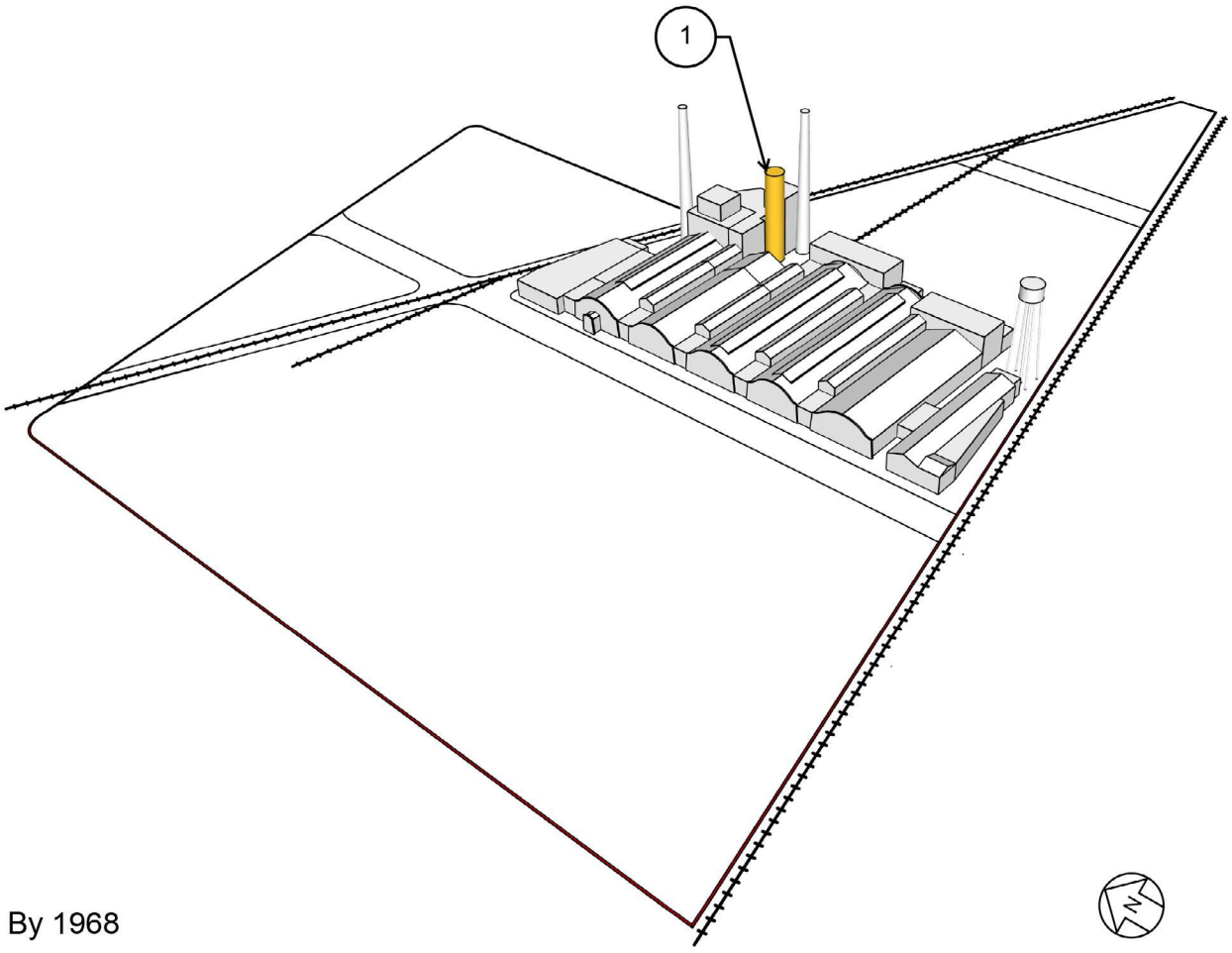
1. Expansion of Building 1 power plant (*Source: 1949 Montgomery County aerial, 1955 drawings*)



By 1960

Legend

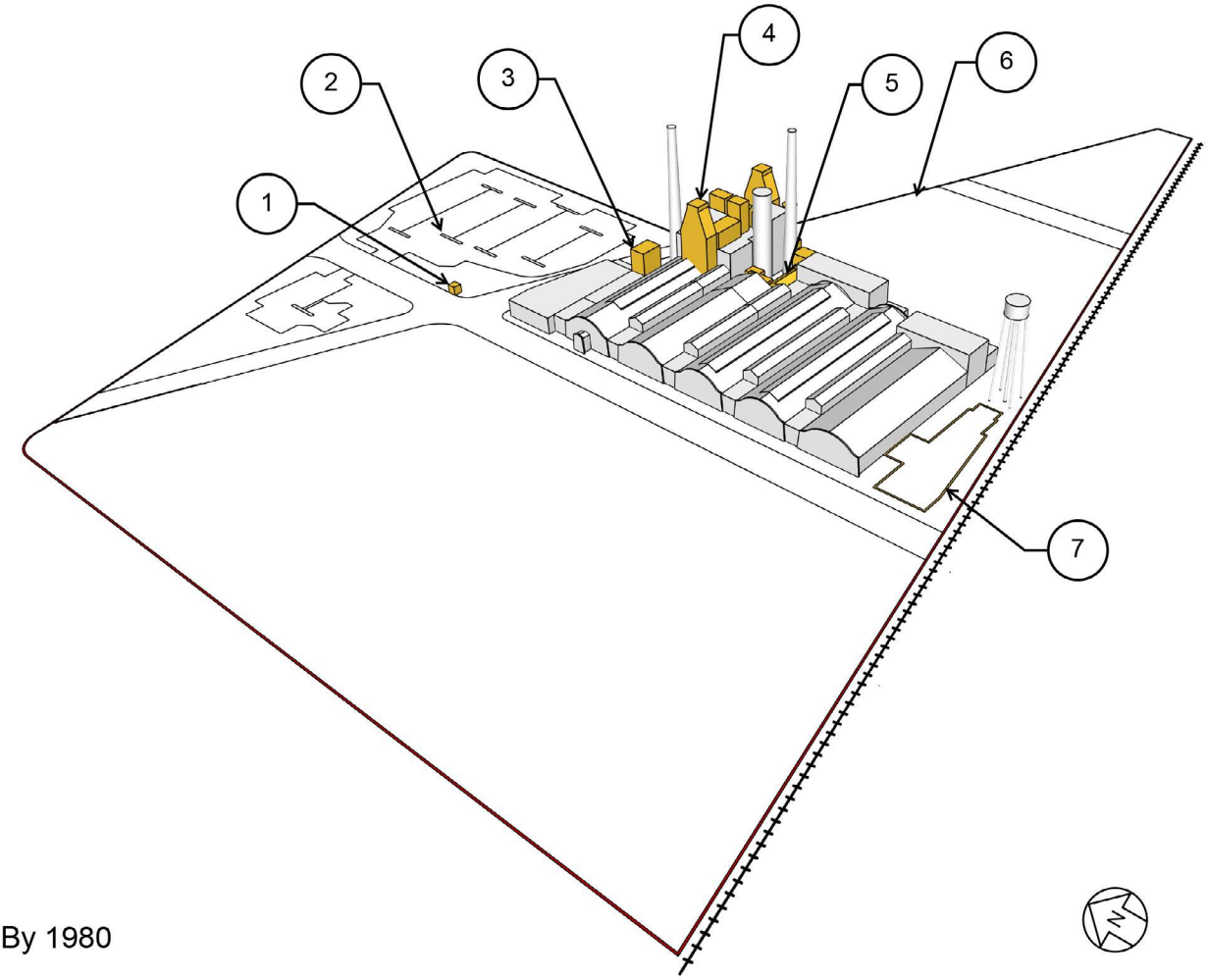
1. Expansion of Interconnect 17-1 (*Source: 1943 drawings, 1964 drawings*)
2. Addition to the east of Building 4 (*Source: 1964 drawings*)
3. Addition to the east of Building 5 (*Source: 1964 drawings*)



By 1968

Legend

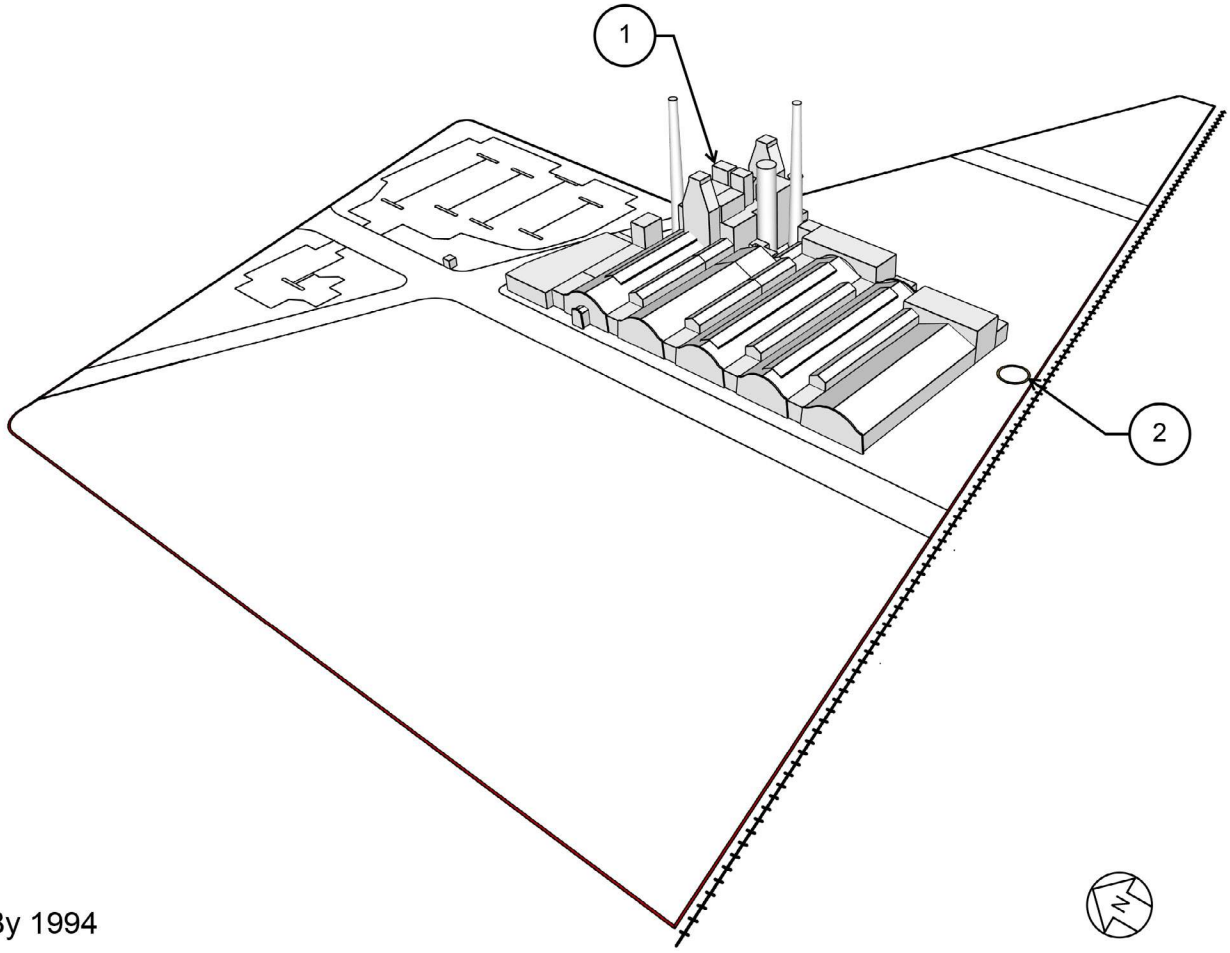
1. New smokestack for Building 1 power plant (*Source: 1968 drawings, 1968 Montgomery County aerial)*



By 1980

Legend

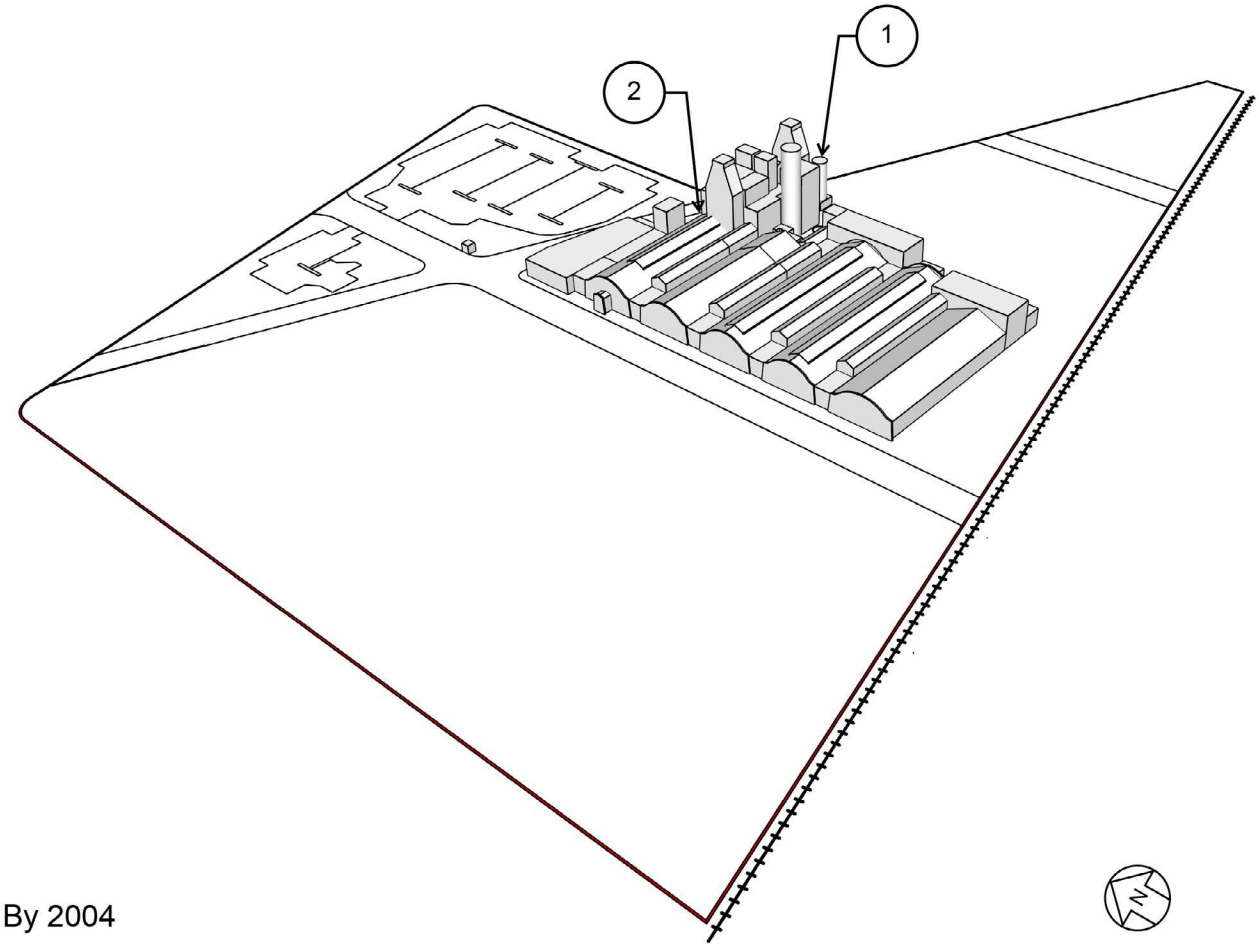
1. Guard post building (*Source: 1979 drawings, 1980 Montgomery County aerial*)
2. East and west parking areas developed (*Source: 1980 Montgomery County aerial*)
3. Addition on the east of Building 17 (*Source: 1980 Montgomery County aerial*)
4. Expansion of Building 1 power plant (*Source: 1980 Montgomery County aerial, 1994 Google Earth aerial*)
5. Alterations on the east of Building 2 (*Source: 1980 drawings*)
6. Partial removal of B&O Railroad lines (*Source: 1980 Montgomery County aerial*)
7. Removal of Building 6 (*Source: 1980 Montgomery County aerial*)



By 1994

Legend

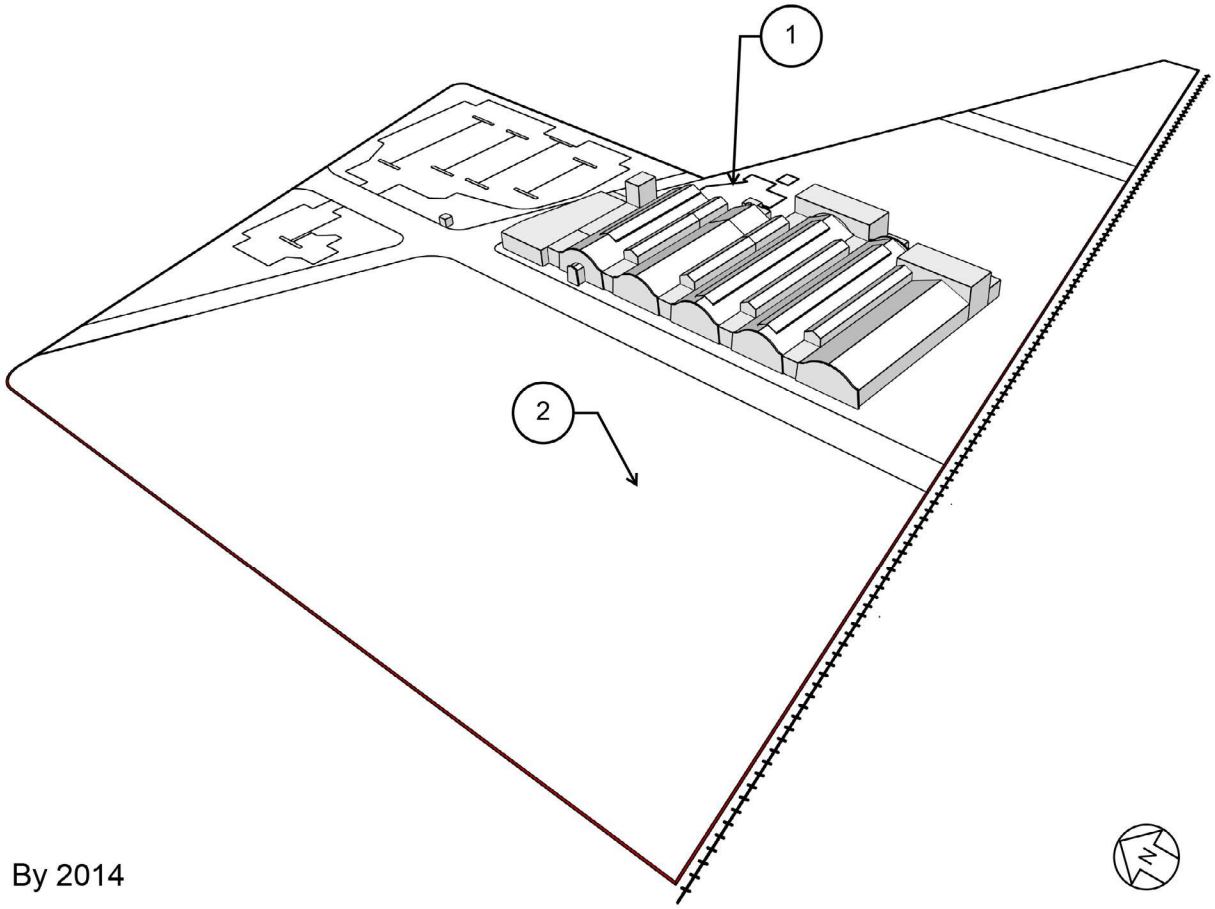
1. Alterations to the Building 1 power plant (*Source: 1994-95 Google Earth aerials*)
2. Removal of water tower (*Source: 1994 Google Earth aerial*)



By 2004

Legend

1. Partial removal of east smokestack (*Source: 2004 Google Earth aerial*)
2. Removal of north smokestack (*Source: 2004 Google Earth aerial*)



By 2014

Legend

1. Removal of the Building 1 power plant (*Source: 2000-14 Google Earth aerials*)
2. Removal of other structures on the parcels to the east and west (not shown)