

CHAPTER THREE: DESIGN, CONSTRUCTION, AND EARLY OPERATIONS

Once the Ford Motor Company decided to build a new plant in San Francisco Bay area as part of its expanded system of branch assembly plants described in the previous chapter, several other contexts converged to yield the plant as it exists today. There was the effort on the part the City of Richmond, California, to develop its industrial infrastructure and more particularly the effort by Fred Parr to lure the Ford Motor Company to Richmond as part of that development plant. Once Ford decided to build at Richmond, two other streams of development converged along Richmond's waterfront: the experience of Ford's engineers in laying out automobile assembly lines and the masterful expertise of Albert Kahn and his architectural firm in designing factory buildings to house automobile assembly lines. This chapter describes those contexts and then provides a brief overview of the first decade of the Richmond plants operation. The chapter also features a description of the building as it was built and as it stands today. The physical description focuses in particular on stages in the process of assembling automobiles at Richmond, linking the present empty building to historic photographs drawings depicting features of those stages of production.

A. Industrial Development in Richmond

Richmond, California, is located in Contra Costa County, on the east side of San Francisco Bay. In the nineteenth century, San Francisco developed on the peninsula that forms the south end of the Golden Gate, the entrance into the Bay. Cities like Oakland, Berkeley, and Alameda grew up on the east side of the Bay, becoming especially prominent with the completion of the transcontinental railroad in 1869. They are in Alameda County. Contra Costa County is located north of Alameda County and south of the arm of the Bay that is the mouth of the San Joaquin River. Prior to 1900, most of Contra Costa County was agricultural or undeveloped land. Much of the area that would become Richmond was farmland that had been Mexican land-grants prior to 1848. There were a few small landings along the shoreline where farmers could ship their produce and where miners or merchants heading into the gold country could procure provisions. One of the most important of these was Ellis Landing, located at the north end of what is now Richmond's Harbor Channel.¹

In 1895, A.S. Macdonald acquired much of the Mexican land grant that is now Richmond. He began negotiating with the Santa Fe Railroad to establish a railroad and ferry terminal at Point Richmond to provide a railroad link to San Francisco, arguing that it was closer than the terminals at Oakland or Alameda. The Santa Fe's new facility went into service in July

¹David L. Felton, "The Industrial Heritage of the Richmond Inner Harbor Area: An Initial Inventory of Cultural Resources," unpublished cultural resources report dated 6 November 1979 and prepared for the Richmond Inner Harbor Port Redevelopment Project, City of Richmond, pp. 4-8; Shirley Ann Wilson Moore, *To Place Our Deeds: The African American Community in Richmond, California, 1910-1963* (Berkeley and Los Angeles: University of California Press, 2000), 8.

1900, spurring commercial growth near Point Richmond. Macdonald, however, intended the commercial center for the town he was developing to be few miles inland. He platted commercial lots along his city's main east-west thoroughfare, named Macdonald Avenue, and platted residential lots around the core. Macdonald and other developers offered businesses and workers incentives like housing and transportation to locate near the area he intended to be the city's center. The City of Richmond incorporated in 1905. Municipal government was first located at Point Richmond, but it moved to new quarters in downtown Richmond in 1917.²

At about the same, developers began to more intensively develop harbor improvements for Richmond. In 1905, H.C. Cutting purchased 400 acres of marshy land around the old Ellis Landing. He then formed the Point Richmond Canal and Land Company to cut a channel through the swamp toward the northwest, using material excavated from the channel to begin filling swamp. That dredge cut has been improved over the years and is now known as the Santa Fe Channel. In 1910, the City of Richmond began working to help improve the harbor, securing the assistance of the federal Rivers and Harbors Committee to study the harbor while at the same time contracting with a San Francisco engineering firm to do so. Both studies were completed in 1912, and both recommended similar improvements, which formed the basis for the Inner Harbor as it exists today. There were to be three components that required dredging: 1) an entrance channel extending from deep water in the San Francisco Bay eastward along the south side of the Richmond peninsula to the north side of Brooks Island, 2) a rectangular basin running along the Richmond waterfront from Brooks Island to Point Isabel, and 3) a 600-foot-wide channel extending from the entrance channel, adjacent to Brooks Island and Point Portrero, roughly northward to the vicinity of Ellis Landing. The latter channel is now called Ellis Channel or the Harbor Channel.³

Congress did not authorize federal construction of the improvements until 1917. During the intervening five years, the municipal government and other local parties began paying for dredging to improve the Harbor Channel and for construction of bulkheads along the channel behind which to place the dredged fill. Federal dredging and filling lasted from 1917 to 1933, with new fill expanding the areas of improved ground on both sides of the channel during that period. By the early 1930s, there were several manufacturing and transportation facilities along the Inner Harbor, including two municipal shipping terminals (one equipped for handling sugar and one for handling general cargo), a few private docks, the Filice and Perrelli cannery, and the Ford Motor Company's Richmond assembly plant. The latter two facilities began operating in the early 1930s. They were in part the fruits of Fred Parr's efforts to promote the development of new land, created by dredge fill, for industrial development along the Inner Harbor's waterfront.⁴

²Felton, "The Industrial Heritage of the Richmond Inner Harbor Area," 11-12; Moore, *To Place Our Deeds*, 8-9.

³Felton, "The Industrial Heritage of the Richmond Inner Harbor Area," 12-14.

⁴Felton, "The Industrial Heritage of the Richmond Inner Harbor Area," 14-37; Marjorie Dobkin, "Filice and Perrelli Canning Company, Inc., Richmond, California: Historic Resource Evaluation Report," unpublished cultural resources report dated August 1998 and prepared for

Fred Parr was born in 1885 on a ranch near Visalia, California. His father died when he was still a teen, so before he had completed high school his mother sent him to business school in San Francisco. After completing a course in business administration, he went to work as a bookkeeper in the San Francisco business, E.J. Dodge Company, of which former California governor J.N. Gillett was president. Noticing that most steam schooners delivering lumber to San Francisco from the Pacific Northwest returned empty, Parr started a business predicated on the improved rates he could obtain for cargo shipped on the schooners' return trips. He built his business during World War I into the Parr-McCormick Steamship Line, of which the E.J. Dodge Company was a major investor. At the same time, Parr got involved in developments on Oakland's inner harbor, working with the Corps of Engineers to accomplish some dredging for a deep-water channel, building a terminal to provide Oakland with steamship service, and participating in the political moves that led to the Port of Oakland and its governing commission being independent of the Oakland City Council.⁵

Seeing what an effective operator Parr was, the Richmond Chamber of Commerce asked him to speak in Richmond about that city's potential for expanded harbor facilities. In response to his remarks, Richmond's mayor asked Parr to manage and operate the city's municipal docks, which were small and received little business. Parr proposed instead that he head the implementation of a comprehensive plan to expand Richmond's harbor facilities. Among the features of Parr's plan were his commitment to acquire 100 acres on the Richmond harbor, to coordinate efforts by the City to get the Corps of Engineers, finally, to dredge the channel to the Richmond harbor and make it suitable for ocean vessels, to fill waterfront areas and make them suitable for industrial development, to expand railroads, streets, and utilities into the harbor area, to lobby the legislature to allow cities to make lease agreements with fifty-year terms, and to bring industries of national scope to Richmond. In implementing the plan, he formed the Parr-Richmond Terminal Company, which built a large terminal facility in cooperation with the City of Richmond.⁶

Parr secured the first of the promised national developments in 1926, when he read a notice in a newspaper that Ford was looking for a site on which to build a new assembly plant in the Bay Area. He first contacted Charles Bulwinkel, Ford's assistant manager in San Francisco to learn the company's site requirements, which were:

1. approximately 50 acres of land
2. entire lot in one parcel with no intervening streets
3. location on the waterfront with service by deep-water channel
4. service by both the Southern Pacific and the Santa Fe railroads

the STG Group, Santa Rosa, CA, pp. 7-9.

⁵"The Reminiscences of Mr. Fred D. Parr," Oral History conducted by Owen Bombard and dated 14 June 1952, HFM Acc. No. 65, 1-28.

⁶"The Reminiscences of Fred D. Parr," 28-32.

5. streets, sewers, a public utilities serving entire lot

Ford wanted to have all of those improvements made to the site without cost to the company. Parr and Richmond mayor W.W. Scott travelled to Detroit to meet with company officials to assure them that the proposed site in Richmond would meet Ford's specifications. Parr had paid \$90,000 for the land, which included about 50 acres of dry land plus some property extending into the bay and channel. After convincing the Ford officials of the suitability of the site he proposed a sale agreement. He asked for Ford to pay \$2,500 as a down payment. He would then make all the improvements necessary at no cost to Ford. When the Ford company was satisfied that the site was ready, it would pay Parr the balance of what he had paid. He asked that Ford pay interest on the balance until the transaction was completed, but he was informed by company officials that Henry Ford never paid interest. According to Parr's account, he tried to secure some other means of payment from the company for the time during which he was carrying the price of the land, but Ford would not compromise. Wanting to secure the deal, Parr agreed to Ford's terms.⁷

Even though Parr had sold land on the east side of the Ellis Channel to Ford in 1926, that company had not yet built its new plant in 1929, when Parr sold another parcel of reclaimed land to the Filice and Perrelli Canning Company. Gennaro Filice and John Perrelli had emigrated to California from Italy in 1908. They and members of their families worked in canneries near San Jose and Gilroy until 1914, when they formed their own business to grow and can tomatoes. The next year, they leased a small cannery at Gilroy, and they incorporated the Filice and Perrelli Canning Company in 1918. They leased another cannery in San Jose in the 1920s. Toward the end of the decade, they bought land in Oakland on which to build their own facility, but then Fred Parr contacted them, offering to trade land in Richmond for the Oakland property. Filice and Perrelli made the swap early in 1929 and began building their new fruit cannery. It was ready to begin canning that year's crop. Filice and Perrelli canned cherries, peaches, apricots, plums, and figs, as well as fruit cocktail, a product developed by the University of California in the 1930s. Filice and Perrelli operated the cannery until they sold it to California Canners and Growers (Cal-Can), a growers cooperative. Cal-Can closed the cannery about 1970 and sold the building to the City of Richmond, which used it for offices and warehousing.⁸

B. Design & Construction of Richmond Plant

The Ford Motor Company's 1930 plans for expanding its system of branch assembly

⁷"How Ford Came to Richmond," *Richmond United* (special issue of the Richmond Chamber of Commerce's monthly) 4 (August 1930): 3; "The Reminiscences of Fred D. Parr," 32-41; M. Wiesmyer, "Branch Operations - Richmond," preliminary draft report dated 26 April 1956, HFM Acc. No. 106, microfiche. The latter document includes several descriptions of the land owned by Ford at the Richmond plant, and they vary from 47.84 to 50.76 acres for the area of dry land and from 58.57 to 73.71 acres for the total area, including water, within the property boundaries.

⁸Felton, "The Industrial Heritage of the Richmond Inner Harbor Area, 33-37; Dobkin, "Filice and Perrelli Canning Company," 3-13.

plants around North America and the elsewhere in the world would cost an estimated \$60,000,000. The plan included the construction of a new facility on the waterfront of San Francisco Bay. A tide water location would allow delivery of parts to the assembly plant and the delivery of finished autos to Pacific Coast ports, Hawaii, and foreign countries by ocean-going ship. As describe above, the Ford Motor Company signed an agreement with Fred Parr in 1926 to purchase 72 acres on Richmond's Inner Harbor, giving the company access to shipment both by rail (the Southern Pacific and the Santa Fe) and by water. Ford did not begin construction, however, until 1930. The new plant would be capable of producing up to 400 cars per eight-hour shift, twice what Ford's existing San Francisco plant could assemble in a full day. To maintain that full production at the Richmond plant, though, an additional shift was necessary in the body shop. Employment at full production would be 2,600.⁹

The Ford awarded the contract to build the new Richmond plant in July 1930. Clinton Construction Company of San Francisco was the successful bidder for the \$3,500,000 contract. According to B.R. Brown, who had charge of awarding contracts, the Ford Motor Company usually tried to rely on local contractors. He also recalled that Ford did not always award contracts to the low bidder. Brown was confident enough in his ability to estimate costs that if he received a bid that was too low, he would award the contract to another bidder whose bid was more in line with his estimates. The Ford Motor Company always insisted on including a clause in the construction contract that assured the construction project would be an open shop, i.e., that the contractor would not discriminate between union and non-union workers.¹⁰ City officials, delegates from neighboring cities, and many of Richmond's citizens celebrated the beginning of construction on July 30.

Albert Kahn Associates of Detroit designed the shell of the building, but Ford's Power and Construction Department designed the layout of the automobile assembly equipment for the plant. Power & Construction and Kahn will be described in turn.

⁹"Ford Acquires Land on Coast," *Automobile Topics* 84 (18 December 1926): 522; "Ford to Rebuild on Coast," *Automobile Topics* 96 (18 January 1930): 1015; "Ford Is Completing Third Coast Plant," *Automobile Topics* 103 (8 August 1931): 12; "History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No. 429, box 2, Richmond, CA, folder. The acreage cited in the paragraph is from the earliest of the above-cited notes in *Automobile Topics* and almost certainly refers to the total area, including water, acquired by Ford.

¹⁰"Ford Lets Plant Contract," *Automobile Topics* 98 (2 August 1930): 1031; "Local Contract Announcement Is Made," *Richmond United* 4 (August 1930): 3; "Celebration Marks Opening of Work on Big Plant," *Richmond United* 4 (August 1930): 5; "The Reminiscences of Clarence Bulwinkel," 26; "The Reminiscences of B.R. Brown," 24-25.

In "The Reminiscences of B.R. Brown," (p. 8), Brown lists to cost of the Richmond branch plant as \$1,845,284, which is probably just the building itself, while Clinton Construction's total \$3,500,000 contract probably included site work, such as the dock.

1. Ford's Department of Power & Construction

Although Albert Kahn has garnered much deserved attention for his designs of Ford Motor Company and other factory buildings, it is important to recognize that he designed envelopes around an assembly layout that took precedence over the building, and the layout was designed by Ford officials who were in charge of factory layout. These various tasks--plant layout, architectural design, as well as site selection and construction supervision--were the responsibility of an organization called Power & Construction. In the 1920s and the period during which the Richmond plant was designed and built, B.R. Brown was its head. Brown recalled:

I always conferred with them [the Manufacturing Department] before we began the plant plans. I insisted that the Layout Department give me a layout so the column spacings would be correct and so there would be no interference with the assembly lines, drying ovens and other installations. In other words, we built the buildings around their layouts rather building the buildings and then putting the equipment in. We did that because I remember in one plant we built before I had seen the layout, we had trouble fitting the paint ovens into the plant.¹¹

Like so many of Ford's top officials at the time, Brown was not college educated. In fact, he did not even finish high school. Born in 1880 at Battle Creek, Michigan, he went to school there through the eleventh grade, after which he went to work in a local bicycle shop. Thereafter, he held a variety of jobs with employers who familiarized him with aspects of the construction business, including a plumber, a manufacturer of plumbing fixtures, a manufacturer of closet combinations, a lumber company, an electrical contractor, and a general contractor. In 1912, he took a job as clerk of the works for the W.E. Wood Company, which had a contract to build an addition to the Ford Motor Company's Highland Park plant. Among his duties was the accounting of all materials and labor used on the project. At the end of the project, Ford officials were so impressed that his figures on the \$1,500,000 contract coincided exactly with theirs that they offered him the job supervising the Ford Motor Company's construction program. Initially his work was limited to maintenance and expansion of Ford's existing Highland Park plant, but by 1922, when Ford embarked on a major expansion program, he had charge of the company's site selection, the preparation of plans and specifications, and awarding of construction contracts. During more than 21 years of service with Ford, he was responsible for the construction of nearly 13,000,000 square feet of space in the U.S. and abroad at a cost of about \$65,000,000. The 519,000 square feet of assembly plant at Richmond costing \$1,845,000 was a fraction of his aggregate accomplishment.¹²

¹¹"The Reminiscences of B.R. Brown," 27.

¹²"The Reminiscences of B.R. Brown," 1-2, 8.

During the period when the Richmond branch was designed, the Ford organization in charge of designing the physical layout within plants or within departments was called the Factory Layout Department, of which M.L. Wiesmyer was a prominent designer. Born in 1899 at Whitmore Lake, Michigan, Wiesmyer grew up working for his father, a carpenter and contractor who built houses in the vicinities of Detroit and Ann Arbor. In 1918, shortly after graduating high school, Wiesmyer took a job as a machine hand at the Ford Motor Company's Highland Park plant. The following year, the Factory Layout Department selected Wiesmyer to work on plant design. Despite his lack of drafting experience, he was selected to make small templates representing pieces of equipment and then try various arrangements of the equipment on floor plans in a effort to find an efficient layout. Initially, Wiesmyer worked on reconfiguring existing departments at various Ford plants around Detroit (but not the branches) either to make more room or because the department was moving to a new location. In preparation for a particular redesign job he would visit the department in question and interview the foreman. He would also investigate the possibility of installing conveyors or other labor-saving equipment. When he first started in factory layout, configuring equipment with an eye to efficient connection to overhead line shafts was still an important parameter shaping design. Wiesmyer was transferred to the Upholstery Department in 1921.¹³

In 1922, about the time that the Factory Layout Department took charge of designing the layouts of branch assembly plants, Max Wiesmyer was transferred back to Factory Layout. At the same time, the Ford Motor Company embarked on a major expansion of its branch assembly system, and corporate officials decided the company would switch from building multi-story assembly plants to single-story structures. This was intended to make the assembly lines more efficient and also to facilitate alterations to the process necessitated by car-model changes. Whenever possible, plants were also to be built along navigable waterways. Wiesmyer and the Factory Layout Department developed several standard features for the new plants, eventually built in places like Chicago, Louisville, Chester, Edgewater, Charlotte, Dallas, and Memphis. Ford management gave the department a production target (e.g. 300 cars per day), and then they allocated 700 square feet of floor space per car per day. They also set 300 feet as the standard width of a new Ford branch assembly plant. Various volumes of production were therefore accommodated by varying the length of the design for a particular branch. Once the size and layout of the branch plant had been determined, the Layout Department passed the design on to the Power and Construction Department, headed by B.R. Brown. Power and Construction in turn passed the design project to the Albert Kahn firm, who designed the structure that would serve as the envelope for the plant layout. Actual construction of the building and installation of the assembly-line equipment was under the authority of the Power and Construction Department. Throughout the process of site selection, layout, and construction, Charles Sorensen played a prominent supervisory role.¹⁴

¹³"The Reminiscences of Mr. M.L. Wiesmyer," Oral History conducted by Owen Bombard and dated 18 March 1953, HFM Acc. No. 65, 1-5, 8-13, 18-20.

¹⁴"The Reminiscences of M.L. Wiesmyer," 28, 31-39; "The Reminiscences of B.R. Brown," 25-27.

The Richmond plant differed from the typical Ford plants of the 1920s. It was a two-story structure rather than one-story, and it had about 1,000 square feet per car per day rather than 700. In these aspects, Richmond was like the Buffalo and Seattle branch plants, designed and built at the same time (1930-1931). Each of the plants had its body department on the second floor. The Buffalo, Richmond, and Seattle group was the last major expansion built under B.R. Brown's supervision before he left the company in 1933. During construction of the Richmond plant, Brown made numerous trips to the Bay Area to check on construction. As was typical, Wiesmyer was responsible for the layout of the Richmond plant.¹⁵

In his oral history, Wiesmyer tells an interesting story that reflects Sorensen's unquestioned authority within the Ford organization and in particular in the process of plant design. Wiesmyer, Brown, and others had been working on the layout of the Richmond design for some time, experimenting with various configurations that would address the site variables presented by waterfront, railroad track locations, etc. They were anxious to get Sorensen's approval of their proposed design before he left for a vacation in Florida. At a meeting in his office, they presented several design options, none of which he liked, so he sketched the configuration he wanted. Wiesmyer, who had been studying the problem for some time, interjected, "Mr. Sorensen, I think...." Sorensen cut Wiesmyer off, saying, "Well, who in the hell ever told you were supposed to think." Sorensen then left for his vacation, and Brown sent a re-oriented plant design, based on Sorensen's sketch, to Kahn's architects so they could design a building. When Sorensen returned from two weeks' vacation, however, he called for Wiesmyer and said, "You know, the more I get to thinking about the Richmond plant, the more I think maybe we ought to turn that building around and set it the other way." Contemplating the matter, Sorensen had come to realize that Wiesmyer and the others had recommended a configuration more appropriate to the site, so the Ford staff had to send a new layout to Kahn Associates and have the architects begin their design anew.¹⁶

2. Albert Kahn

Kahn designed most of Ford's buildings during the first half of the twentieth century, including the expansion of the Highland Park plant, the River Rouge plant, and most of the branch assembly plants throughout the U.S. and abroad. There was a brief period in the 1910s when the Ford Motor Company hired John Graham, a Seattle architect, brought him to Detroit, and installed him in an architecture department at Highland Park to design several branch plants, including Seattle, Cambridge, Houston, Dallas, Columbus, Cincinnati, Atlanta, and Pittsburgh. Kahn was responsible for nearly all of the 1920s generation of branch assembly plants, including

¹⁵"The Reminiscences of M.L. Wiesmyer," 54, 56-57; "The Reminiscences of B.R. Brown, 8-9; "The Reminiscences of Clarence Bulwinkel," 26; "The Reminiscences of Fred Parr," 43.

¹⁶"The Reminiscences of M.L. Wiesmyer," 54-56.

Richmond.¹⁷

Born in Germany in 1869, Albert Kahn was the oldest of eight children in the family of Rosalie and Joseph Kahn, an itinerant rabbi. By the time Albert Kahn was old enough for school, his family had moved to Luxembourg, where they lived until 1880, when they emigrated to the United States. The Kahns settled in Detroit. Rather than attend school, young Albert took a variety of jobs to help support the family. But he also had a knack for drawing, so his parents encouraged him by buying him drawing materials and helping him find a job doing menial work, without pay, in a Detroit architectural office. That led at the age of 15 to drawing lessons and another non-paying job with the firm Mason & Rice. This time he was actually able to put his drawing skills to work. Kahn's skill at rendering and working drawings helped him garner paid responsibilities with the firm, and in 1888, at the age of 19, he was put in charge of designing and supervising construction for the firm's residential work. Two years later, the *American Architect and Building News* awarded him a travelling scholarship, which afforded him the opportunity to travel to Europe for a year of visiting architectural landmarks and meeting architects. When Kahn returned to Detroit in late 1891, Mason & Rice appointed him chief designer. He remained with the firm until 1896, during which time he became enamored of the work of McKim, Meade and White. In 1896, Kahn and two Cornell graduates left Mason & Rice to form their own firm: Nettleton, Kahn and Trowbridge.¹⁸

As Grant Hildebrand observes in his biography of Albert Kahn, nothing in Kahn's early career suggested that he would eventually design buildings that were to become some of the icons of the Modern Era. Kahn's early, non-industrial work was conventionally derivative of historical European styles.¹⁹

In 1897, Alexander Trowbridge left the year-old firm to become the head of the Department of Architecture at Cornell University. Kahn and George Nettleton continued their firm until 1900, when Nettleton died. That same year, Kahn designed his first industrial building for Joseph Boyer, a manufacturer of pneumatic hammers. With Nettleton and Trowbridge gone, Kahn remained the sole principle in the firm. To supplement his own skills, Kahn hired Ernest Wilby as chief designer in 1902 and made him an associate, and Kahn began to collaborate with his brother, Julius, a civil engineer who had graduated from the University of Michigan. The two brothers designed a new Engineering Building for the University of Michigan at Ann Arbor in 1902. In its construction, they used reinforced concrete, a new building material they were both interested in exploring. Julius also established the Trussed Concrete Steel Company in Detroit to produce steel reinforcing bars according to his own design. A third important event of

¹⁷"The Reminiscences of B.R. Brown," 12.

¹⁸Grant Hildebrand, *Designing for Industry: The Architecture of Albert Kahn* (Cambridge, MA: The MIT Press, 1974), 5-18; Federico Bucci, *Albert Kahn: Architect of Ford* (New York: Princeton Architectural Press, 2002), 27-28.

¹⁹Hildebrand, *Designing for Industry*, 21.

1902 occurred with Joseph Boyer introduced Kahn to Henry Joy, soon to head the Packard Motor Car Company. When Joy assumed Packard's presidency in 1903, he appointed Kahn its architect. Through Joy, Kahn's firm received several non-industrial commissions, but the most important work stemming from the connection with Joy was the design of factory buildings for the expanding Packard company.²⁰

During the years 1903-1905, the Kahn firm designed nine factory buildings for Packard, all of conventional mill construction. In 1905, though, Albert and Julius Kahn made an important breakthrough when they designed Packard Plant Building No. 10 of reinforced concrete. The new structural system allowed them to provide spacing between columns that was somewhat greater than in conventional mill construction. More significantly, the reinforced-concrete frame embedded in the perimeter walls left more space in the envelope for windows, enhancing the day-lighting of the interior work spaces. The structure was also fireproof. Although comparable to the pioneering work being done in reinforced-concrete industrial design by Ernest Ransome in California and the New York area, the Kahn design was a great improvement over the conventional industrial buildings being used by the automobile industry elsewhere in Detroit. Another feature of the Kahn design was perhaps equally important in attracting future clients in the automobile industry: Building No. 10 was asymmetrical, as Kahn set aside normal aesthetic considerations of the period and rather let the functional requirements of the plant dictate its overall form and shape. In this regard, Kahn exhibited a willingness to explore new areas in architectural design that did not appeal to his peers in the architectural profession.²¹

Kahn's next set of industrial buildings was in Buffalo for George N. Pierce, maker of the Pierce Arrow car. Designed in 1906, the complex is important because it foreshadowed buildings that would become the norm in the auto industry a decade later. The Pierce buildings were one-story, very wide, and employed a saw-tooth roof to allow skylights to illuminate all of the broad interior space.²²

By the time the Ford Motor Company announced its intention in 1908 to build the Highland Park plant to manufacture the Model T, Albert Kahn's reputation was known to Ford officials because of the Packard plant, only a few miles from the Highland Park site. Some time after the company decided to build the plant, it selected Kahn as its architect, beginning a long relationship between Kahn and Henry Ford. Although there must have been many fascinating facets to their relationship, two stand out. First, both men had risen to prominence in their respective fields without much formal education. Ford is known to have disliked the pretenses he believed some education people exhibited, but that would have been absent in Kahn, who

²⁰Hildebrand, *Designing for Industry*, 25-28; Bucci, *Albert Kahn*, 29-31. On Boyer, see David A. Simmons, "'The Continuous Clatter': Practical Field Riveting," *IA: The Journal of the Society for Industrial Archeology* 23 (1997, no. 2): 5-20.

²¹Hildebrand, *Designing for Industry*, 28-34; Bucci, *Albert Kahn*, 31-35.

²²Hildebrand, *Designing for Industry*, 34-43; Bucci, *Albert Kahn* 35-36.

shared the feeling. In fact, during the 1920s and until 1935, Kahn did not hire a single person with an architectural degree, believing such a person's desire for self-expression was not compatible with the cooperative team he had assembled in his office. Second, Ford was a notorious anti-semitic, even going to far as to publish anti-Jewish diatribes in his weekly newspaper, the *Dearborn Independent*, which he bought in 1918. Yet despite the fact that Kahn was a Jew, neither man terminated the relationship. One thing that certainly must have enamored Ford of Kahn was Kahn's oft-repeated adage: "Architecture is 90% business and 10% art."²³

The Highland Park plant was very similar to Kahn's Packard plant and not much like the Pierce plant in Buffalo. The original building was of reinforced concrete, four stories tall, 860 feet long, and 75 feet wide, with a row of columns extending along the building's central axis. Later additions, such as power plant, offices, machine shop, and another multi-story factory building made the Highland Park complex immense. Edward Gray, a Ford engineer, contributed much to the design of the additions. Two features were fundamental to the design of Highland Park: efficient flow of materials was paramount to the configuration of buildings and spaces, and effective daylighting increased workers' productivity within the buildings.²⁴

While Kahn and his office worked on Highland Park, they also continued to work on expanding the Packard plant and designed industrial buildings for other firms, like Dodge Brothers, Hudson, and Continental in the auto industry and B.F. Goodrich Rubber Company and Joseph Mack Printing in other sectors. In 1910, Kahn's brother Louis joined the firm. By 1918, 80 people worked in the office. Wilby remained with the Kahn firm until 1922.²⁵

The River Rouge plant, which marked a new turn in the operations of the Ford Motor Company, also marked a turn in the kinds of factories Kahn designed. Prior to the Rouge plant, most of Kahn's factory buildings had been multi-storied reinforced-concrete structures; after Rouge, most were single-storied steel-frame structures. Kahn was already experienced with steel frames. He had used the system in 1904 when designing a single-story building with sawtooth roof for the Burroughs Adding Machine Company in Detroit, and he used a steel frame for machine shop at Highland Park and for Packard's forge shop. But none of those buildings came close to the scale of the plant Kahn designed for Ford at the Rouge site in 1918. The first use of the original Rouge building was not to assemble automobiles but rather submarine chasers. Henry Ford had convinced the government that he could mass-produce submarine chasers, called Eagle boats, using the same principles he used to make the Model T. The government agreed to

²³Kahn quoted in Bucci, *Albert Kahn*, 37; see also, Hildebrand, *Designing for Industry*, 43-44, 127; Nevins and Hill, *Ford: Decline and Rebirth*, 124-129, 311- 322; David L. Lewis, "Ford and Kahn," *Michigan History* (September/October 1980): 26-27. Lewis (p. 17) describes Ford asking Kahn to design Highland Park in 1907, but Lewis offers no citations for his version of the initial meeting between Ford and Kahn.

²⁴Hildebrand, *Designing for Industry*, 44-54; Bucci, *Albert Kahn*, 38-44.

²⁵Hildebrand, *Designing for Industry*, 54-61.

finance construction of the building in early 1918, and Kahn proceeded to design a building 1,700 feet long and 255 feet wide. The building was ready for operations in May 1918, and Ford launched its first Eagle boat in July. After the war, the company converted the building, designated "B" Building in the River Rouge complex, for use in assembling Model T cars and Fordson tractors. Kahn also designed the other buildings at the Rouge plant, which grew in the ensuing years to the gigantic proportions described in a previous section of this report.²⁶

In addition to the Rouge plant, Kahn designed 35 of the branch assembly plants that were part of the Ford expansion of the 1920s. And Ford was not Kahn's only client. He designed major projects for Studebaker, Fisher Body, Chrysler, Chalmers Motor Company, Plymouth, and the Glenn L. Martin Company. The latter client was his first in the aircraft industry. Throughout this period Kahn continued to design non-industrial buildings as well, notably the General Motors Building and the Fisher Building in Detroit and the William L. Clements Memorial Library at the University of Michigan. Kahn's non-industrial buildings are beautiful structures and impeccably detailed, but they also demonstrate that as a commercial architect he remained entirely conventional and derivative. By 1929, the Kahn firm had designed more than fifty major factories and had grown to more than 400 employees, who were designing more than \$1,000,000 worth of construction each week. This was the Kahn firm as it stood when called upon by Ford to design the branch assembly plant in Richmond, California.²⁷

With the onset of the Great Depression, sales of automobiles dropped, and auto companies and other industrial firms curtailed their plans for expansion of plant and capacity. Correspondingly, Kahn's roster of domestic commissions languished, and his firm would have suffered were it not for a new venture he began in 1929. The Soviet Union, through its international commerce arm the Amtorg Trading Corporation, commissioned him to design a giant tractor factory at Chelyabinsk. Kahn was initially reluctant because the United States had still not recognized the Soviet government, many of Kahn's American clients were strongly anti-communist, and the Nazis and anti-semites in the U.S. often accused Jews of being communist sympathizers, a label that thereby might affix to him. He concluded, however, that the Russian people had long suffered under the czars and were as entitled to benefits deriving from good factory design as anyone. He could contribute in that regard. During the next three years, Kahn and his firm designed several other huge industrial plants inside the Soviet Union, at least one of which was in conjunction with the Ford Motor Company, which was also in a contractual relationship with Amtorg. Ford agreed to supply the Soviets with plans, specifications, management systems, and technical assistance for the construction at Niznij Novgorod of an automotive plant based on the River Rouge model. Kahn designed the complex. Kahn and his staff not only designed industrial buildings for the Soviets; they also established a branch office in Moscow to help train Russian architects and engineers in the principles of factory design on the Ford/Kahn model. Not surprisingly, Kahn did have to defend himself against accusations in

²⁶Hildebrand, *Designing for Industry*, 72-123; Bucci, *Albert Kahn*, 48-57.

²⁷Hildebrand, *Designing for Industry*, 100, 124-126, 133-149; Bucci, *Albert Kahn*, 62-64.

the U.S. that he was supporting the communists, accusations which subsided after his contract with the Soviets ended in 1932.²⁸

As the need for new construction re-emerged in the mid-1930s, Kahn again began to secure domestic industrial projects, including the Lady Esther cosmetics factory in Illinois, giant new plants for Chevrolet, Chrysler, Dodge, and DeSoto in Michigan, and several more airplane factories for such clients as United Aircraft Corporation and Glenn L. Martin again. With war on the horizon in the late 1930s and with Congress and the U.S. military taking steps to mobilize American industry for the production of aircraft, Kahn secured more airplane factory commissions in the early 1940s, including Wright Aeronautical Corporation in Ohio, Consolidated Aircraft Corporation in New Orleans, Curtiss Wright Corporation in Kentucky and New York, and Ford's Willow Run plant in Michigan. Kahn also designed the giant Chrysler Tank Arsenal in Detroit and a torpedo plant for the Navy and American Can Company. Albert Kahn died in 1945 after becoming the most prolific and influential architect of industrial structures in the first half of the twentieth century. His firm, Albert Kahn Associated, Inc., exists to this day.²⁹

C. The Building, Then and Now

The Ford Motor Company assembly plant at Richmond is 1,050 feet long from north to south and 320 feet wide from east to west. The main body of the building is 950 feet by 320, and there is a craneway, 100 feet wide, that extends along the south end, giving the building its total length of 1,050 feet. The craneway is built over the water and actually extends an additional 80 feet to the east as well, so that the south end of the building measures 400 feet. A boiler room (80 ft. by 55 ft.) is located at the inside corner of the "L" formed by the main body of the building and the craneway. There is a dock structure 40 feet wide running along the entire south end the building (the craneway), and the dock, is also built over water. These are the original dimensions of the building.³⁰

The building has a slab-on-grade, a steel frame with the columns sitting on spot footings

²⁸Hildebrand, *Designing for Industry*, 128-130; Bucci, *Albert Kahn*, 88-94.

²⁹Hildebrand, *Designing for Industry*, 166, 180, 197-205; Bucci, *Albert Kahn*, 77-87, 101-114. For a recent assessment of Kahn's place in the history of modernism and American architecture, see Brian Carter, ed., *Albert Kahn: Inspiration for the Modern* (Ann Arbor: University of Michigan Museum of Art, 2001). For an excellent collection of photos of Kahn's buildings, see W. Hawkins Ferry, *The Legacy of Albert Kahn* (Detroit: Wayne State University Press, 1987). The book features a concluding essay by Walter B. Sanders, "Albert Kahn Associates, 1942-1970," that reviews major projects by the Kahn firm after his death.

³⁰Albert Kahn, Inc., Architects, Assembly Building of Ford Motor Company, Richmond, California, Job No. 1562, "Plot Plan," Sheet 1, dated 22 May 1930.

atop pilings, and curtain walls of brick, industrial garage doors, and industrial window sash. The west half of the main body of the building is two stories, and the east half is one story. Sawtooth roof trusses create skylights over the second floor of the west half and the first floor of the east half. The craneway is two stories throughout. Most of the interior of the building is open factory space, but the northwest corner of the building has partitions that divide areas into showroom and office spaces. There is a free-standing oil house just northeast of the boiler room.³¹

Historically, two sets of railroad spurs served the plant, both entering the Ford property at the northeast corner. One set of two spurs curved toward the plant and approached the northeast corner of the building from the north. One spur actually entered the building at that corner at a grade several feet below the first floor, and the other spur ran along outside of the east side. Both of these spurs extended the full length of the main body of the building. Although there is evidence of the interior set of tracks, most of the area along that spur has been filled and the floor there is now at the level of the first floor. The other set of spurs ran along the east side of the property and curved toward the southeast corner of the plant, approaching it from the east. One spur entered and extended the length of the crane way and two others ran the length of the dock. Another pair of spurs in this set ran along the north side of the oil house.³²

The general flow of materials to and through the plant was as follows. Ford delivered auto parts to the craneway of the Richmond plant either by ship or by rail. A conveyor, located at the center of the south end of the second floor, transported unpainted body parts from the craneway through a slot in the concrete floor to the second floor for storage, painting, and partial assembly.³³ Conveyors, probably added later in the 1930s, delivered other body parts, like roof

³¹Albert Kahn, Inc., Architects, Assembly Building of Ford Motor Company, Richmond, California, Job No. 1562, "Sections and Details," Sheet 6, dated 22 May 1930.

³²Albert Kahn, Inc., Architects, Assembly Building of Ford Motor Company, Richmond, California, Job No. 1562, "Plot Plan," Sheet 1, and "First Floor Plan," Sheet 3, both dated 22 May 1930.

³³The earliest known drawing of the layout of equipment on the second floor of the Richmond plant is "Assembly Building - Richmond - Second Floor Layout," drawing dated 1 May 1939 and included in M. Wiesmyer, "Branch Operations - Richmond." Although, there may have been some modifications to the layout, so that the configuration in 1939 was different from 1931, when Ford was still producing the Model A, the general scheme and location of equipment as described here matches the evidence in photographs produced in 1931 at the Richmond plant as assembly equipment was being installed in the plant, construction of which was just completed. See, for example, photo no. 2011 (folder 1) dated 23 May 1931 and showing the first coat of plaster complete on the body prime ovens, located along the west side of the second floor; photo no 2026 (folder 2) dated 14 June 1931 and showing the trim and finish trim conveyors with Cooper-Hewitts (task-lighting fixtures) installed down the center of the second floor; photo no. 2050 (folder 4) dated 25 July 1931 and showing the body stock conveyor from the southeast corner of the second floor; photo no. 2052 (folder 4) dated 25 July 1931 and showing the closed

panels of car bodies, from the delivery dock along the east side of the plant to the second floor.³⁴ An incline conveyor delivered partially assembled bodies to the central area of the first floor for further treatment before delivery to the final assembly line.³⁵ Materials for assembly of seat cushions and service stock parts were also delivered to the second floor, either by means of the conveyors or by two freight elevators, one located at the southeast corner of the second floor and one located along the east wall of the second floor near the north end. Both elevator shafts are still in place. Service stock storage was located at the northeast corner of the second floor. The seat cushion assembly area was located just south of the second-floor offices and the service stock storage area.³⁶

The final assembly line was located along the west wall of the first floor, with vehicles in the process of assembly moving from south to north.³⁷ Tributary sub-assembly lines moved from east to west toward the final assembly line. The frame conveyor was located at the south end of the first floor, moving from east to west and with the steering gear assemblies being

body construction conveyor from the south end of the second floor; all photos HFM Acc. No. 696, box 8.

³⁴Photo without number (folder 8) dated June 1937 and showing conveyor for delivering body stock from unloading dock to second floor; photo without number (folder 8) dated July 1937 and showing conveyor for mixed delivering body stock from unloading dock to second floor; photo without number (folder 8) dated 1937 and showing conveyor delivering body roof panels to roof panel storage at south end of second floor; all photos HFM Acc. No. 696, box 8. The opening in the east wall for this conveyor appears in the 1939 drawing for the second-floor layout, but it does not appear on the original Kahn drawings. It is therefore likely this conveyor was added sometime in the 1930s after Ford ceased producing the Model A.

³⁵Photo no. 2039 (folder 3) dated 28 June 1931 and showing construction of the incline conveyor for bringing bodies from the second floor to the first; photo no. 2040 (folder 3) dated 12 July 1931 and showing incline conveyor from first floor to balcony; photo no. 2057 (folder 4) dated 25 July 1931 and showing table for loading bodies onto incline conveyor; all photos HFM Acc. No. 696, box 8.

³⁶Photo no. 2055 (folder 4) dated 25 July 1931 and showing the cushion assembly area at the north end of the second floor, HFM Acc. No. 696, box 8.

³⁷The earliest known drawing of the layout of equipment on the first floor of the Richmond plant is "Assembly Building - Richmond - First Floor Layout," drawing dated 1 May 1939 and included in M. Wiesmyer, "Branch Operations - Richmond." As with the second floor, there is a nice match between this 1939 drawing and the 1931 photos of assembly equipment as it was being installed at the Richmond plant. See, for example, photo no. 2013 (folder 1) dated 29 May 1931 and showing the escalator and the final assembly line under construction; photo no. 2041 (folder 3) dated 12 July 1931 and showing the escalator and final assembly line; photo no. 2068 (folder 5) dated 25 July 1931 and showing the south end of the chassis assembly line; all photos HFM Acc. No. 696, box 8.

installed just before the frames were placed on the final assembly conveyor. Conveyors for axle assemblies led from north to south toward the frame conveyor.³⁸ The motor line was just north of the frame conveyor, again moving from east to west, where completed motors could be installed on frames as they moved north along the final assembly line. North of the motor line were an area for tire storage (east), a wheel oven for baking freshly painted wheels (west), and a mounting line, along which tires were mounted on wheels before the wheels were conveyed to the final assembly line to be mounted on the chassis as they moved north.³⁹ North of the mounting line were the radiator storage racks. The next area to the north was quite large, and it featured ovens and lines along which fenders, hoods, trim, etc. were treated before being assembled as bodies and then conveyed to the chassis assembly line.⁴⁰ Body hoists along the final assembly line hoisted completed bodies down upon the completed chassis as they moved north along final assembly.⁴¹ Completed cars and trucks rolled off the north end of assembly line, located about 300 feet south of the northwest corner of the building.⁴²

There were several openings in the east wall of the second floor through which conveyors

³⁸Photo no. 2030 (folder 2), no date, showing axle conveyors and Model A and Model AA frame conveyors, HFM Acc. No. 696, box 8.

³⁹Photo no. 2045 (folder 3) dated 12 July 1931 and showing wheel delivery conveyor; photo without number (folder 8) dated June 1937 and showing conveyor, adjacent to tire storage, for delivering body stock from unloading dock to second floor; photo without number (folder 8) dated July 1937 and showing conveyor, adjacent to tire storage and wheel storage, for delivering body panels from unloading dock to second floor; all photos HFM Acc. No. 696, box 8.

⁴⁰Photo no. 2002 (folder 1) dated 15 May 1931 and showing the unloading end of the enamel oven under construction; photo no. 2005 (folder 1) dated 15 May 1931 and showing the loading end of the enamel ovens under construction; photo no. 2019 (folder 2) dated 8 June 1931 and showing the south end of an enamel oven and the ventilation system for the commercial body spray booth; photo no. 2022 (folder 2) dated 8 June 1931 and showing the south end of the assembly line and the overhead supporting steel for hicycle tools; photo no. 2049 (folder 4) dated 25 July 1931 and showing the sand line and solvent booth; photo no. 2058 (folder 4) dated 25 July 1931 and showing the unloading end of the enamel oven; photo no. 2061 (folder 4) dated 25 July 1931 and showing fender conveyor and the washing machine and burn-off oven; photo no. 2062 (folder 4) dated 25 July 1931 and showing hood and enamel storage area and deliver conveyors adjacent to north end of final assembly line; all photos HFM Acc. No. 696, box 8.

⁴¹Photo no. 2065 (folder 5) dated 25 July 1931 and showing commercial body conveyors and hoists; photo no. 3018 (folder 7) dated June 1937 and showing the final assembly line near the north end; all photos HFM Acc. No. 696, box 8.

⁴²Photo no. 2062 (folder 4) dated 25 July 1931 and showing hood and enamel storage area and deliver conveyors adjacent to north end of final assembly line; photo without number (folder 7) dated ca. 1933 and showing a truck moving along the escalator at the north end of the final assembly line; all photos HFM Acc. No. 696, box 8.

delivered body parts to the second floor and carried assembled bodies and delivered them to subsequent conveyors for body assembly on the first floor. The original drawings for the building show only two openings for conveyors to the second floor: the one through the floor at the south end of the building, mentioned in a previous paragraph, and one midway along the east wall of the second floor. This is undoubtedly the opening at the head end of the incline conveyor shown in photo no. 2057.⁴³ There are at least two other openings through the east wall that match the appearance of that in the 1937 photo of the conveyor delivering roof panels to the roof panel storage area (the corners of the openings are cropped).⁴⁴ The current developer of the Richmond plant is changing the spacial relationship between the second floor and the first by cutting a polygonal opening in the east wall at each first-floor skylight bay. The shape of these openings parallels the slope of the north-facing skylight windows, but it does not stem from the shapes of the openings for the conveyors that were part of the production process.

Although most of the interior of the Richmond plant is open space, there are several enclosed, partitioned areas. General offices for the plant were located on the second floor at the northwest corner. They included individual offices for managers, small meeting rooms, cashier's office, and rest rooms. These offices are the only rooms finished in wood. With small exceptions, the configuration of the offices is that shown on the Kahn drawings of the plant. There are four sets of coat rooms and toilet rooms for production workers located along the east wall of the second floor. These sets of rooms are located in enclosed mezzanines that are two steps down from the second floor and extend into the sawtooth roof skylights over the east side of the first floor. A pair of staircases, each with midway landing, one stair on the north and one on the south, descended from each coat room/toilet mezzanine. These stairs have been altered over the years by completely removing one of the pair in some cases and also by altering the direction of the stairs extending from the landings to the first floor, undoubtedly to accommodate alterations to the assembly equipment on the first floor. Production workers used to enter the plant near the northeast corner, just west of the railroad spur. The employee entry area has been altered over the years. Just west of the employee entrance, however, is a set of rooms that appears to be configured much as in 1931. They include a factory service office, a first aid room, operating room, rest rooms, and a dressing room. The showroom area on the first floor beneath the general offices has been changed considerably since the plant was used to assemble autos. The main feature that is partially intact is the formal plant entrance and the relatively grand stairway to the second-floor offices.⁴⁵

⁴³Photo no. 2057 (folder 4) dated 25 July 1931 and showing table for loading bodies onto incline conveyor, HFM Acc. No. 696, box 8.

⁴⁴Photo without number (folder 8) dated 1937 and showing conveyor delivering body roof panels to roof panel storage at south end of second floor, HFM Acc. No. 696, box 8.

⁴⁵Albert Kahn, Inc., Architects, Assembly Building of Ford Motor Company, Richmond, California, Job No. 1562, "First Floor Plan," Sheet 2, and "Second Floor & Roof Plans," Sheet 4, both dated 22 May 1930.

The exterior of the plant has sustained little change over the years. The brick and glass exterior is industrial in character throughout, with limited and modest ornamentation at the corners of the building, in the minimal application of dentils along the roof-line, and in the gable ends of the craneway. The exception to the industrial character is at the northwest corner, where the showrooms (first floor) and general offices (second floor) were located. The fact that these spaces were more open to the public (at least the public who had business at the plant) is reflected in the window configuration and the roof. Whereas windows throughout the factory are industrial sash, the windows at the northwest corner are double-hung with transoms, presenting a more commercial appearance. A truncated hipped roof of glazed clay tile projects above the offices, delineating the non-industrial area of the building by again presenting a more commercial appearance, and the dentils in the cornice beneath the eaves of the tile roof are somewhat more elaborate than the dentils elsewhere. Except for modifications to some of the doors, the exterior is largely intact.⁴⁶

D. Operation during the 1930s

Ford's three new assembly plants on the Pacific Coast opened in the early 1930s. The Long Beach plant was the first to open in 1930. The Richmond plant opened on August 1st, 1931, and the Seattle plant commenced operations in early 1932. Because of the onset of the Great Depression, demand for autos was down, and the Richmond plant employed only 1,000 at the outset. Yet despite the Depression, Ford maintained its record of expansion around the world. The year 1931 saw the opening of four other assembly plants in addition to the one at Richmond. Plants went into service at Buffalo, New York; Cologne, Germany; and Madras, India, and the new facility at Dagenham, near London, England, became the second-largest automobile manufacturing plant in the world after Ford's River Rouge plant. At about the time the Richmond plant began operating, Ford also inaugurated the manufacture of body parts, pressed sheet steel parts, at its Long Beach Plant. The new department at Long Beach supplied hoods, fenders, and other body parts to the Ford assembly plants at Long Beach, Richmond, Portland, and Seattle.⁴⁷

Getting the Richmond plant ready to operate entailed completing the building and installing the assembly-line and ancillary equipment necessary for the assembly of parts made elsewhere into finished autos. Ford moved very little of that equipment from the San Francisco plant. By mid-July, equipment was installed and the plant, under the management of Charles A. Bulwinkel, began assembling Model A and Model AA cars.⁴⁸

⁴⁶Albert Kahn, Inc., Architects, Assembly Building of Ford Motor Company, Richmond, California, Job No. 1562, "Elevations," Sheet 5, dated 22 May 1930.

⁴⁷"Ford Is Completing Third Coast Plant," *Automobile Topics* 103 (8 August 1931): 12; "Making Pressed Steel Parts at Long Beach," *Ford News* 11 (September 1931): 4; "1931: a Year of Progress in the Ford World," *Ford News* 12 (January 1932): 10.

⁴⁸"Plant Questionnaire" dated 10 February 1932, in chapter on Richmond in M. Wiesmyer, "Branch Operations," unpublished preliminary report dated 26 April 1956, HFM Acc. No. 106; "History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No. 429,

The Richmond plant was originally organized into several departments, each headed by a superintendent. They were the Sales Department, Accounting Department, Production Department, Inspection Department, Stock Department, and Receiving Department. The Production Department was sub-divided into several of its own departments, each headed by a foreman. Those departments were the assembly line, body production, body trim, body paint, enameling, and the stock department. Shift foremen supervised the workers and reported to their respective department foremen.⁴⁹

The Ford Motor Company and local organizations sponsored a variety of events to celebrate the Richmond plant's opening on August 1st. The night before, the Richmond Chamber of Commerce held a banquet featuring a speech by California's Governor. The day of the opening, caravans of Ford cars carrying dealers and enthusiasts said to represent more than 250 cities in northern and central California converged on Richmond. The Ford Motor Company hosted a luncheon for more about 1,000 of California's business people and then dedicated the plant with speeches, after which the first automobile rolled off the assembly line. Following the official ceremony, the company opened the plant to visitors, giving tours throughout the day to about 20,000 people. The operating plant remained open to tours for a week, and as many as 100,000 people observed the assembly line in operation during the festivities.⁵⁰

The Ford Motor Company's first ship to deliver parts to Richmond, under the command of Captain O.L. St. Marie, arrived later in August carrying engines, axles, and frames. It had already stopped at the Long Beach plant. After Richmond, it was bound for the Ford plant at Portland before returning to the Atlantic Coast. The parts had not travelled all the way to Richmond by water, however. Ford had sent them by rail to Chester, Pennsylvania, where they were loaded on the ship.⁵¹

The Richmond Branch supplied autos to Ford dealerships in its territory, which included Hawaii. Depending on demand in other regions and the output of the assembly plants serving those regions, the Richmond Branch also supplied cars to the Seattle, Portland, Salt Lake City, and Long Beach territories.⁵² The Richmond plant also housed a Stock Department, which stored a stock of Ford parts to supply dealerships throughout the Pacific Coast region.⁵³

box 2, Richmond, CA, folder; "The Reminiscences of Mr. Clarence Bulwinkel," 27.

⁴⁹"The Reminiscences of Mr. Clarence Bulwinkel," 28.

⁵⁰"New Plant Opens on San Francisco Bay," *Ford News* 11 (September 1931): 4; "The Reminiscences of Mr. Clarence Bulwinkel," 27-28.

⁵¹"Ford Boat Delivers Parts," *Automobile Topics* 103 (29 August 1931): 224.

⁵²"History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No. 429, box 2, Richmond, CA, folder.

⁵³"History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No.

The Richmond and other Pacific Coast plants had opened during an inauspicious time, though, because of the lagging demand for autos. Several Ford assembly plants around the country closed temporarily at the end of 1931, not opening until late in the spring of 1932. Ford's problems were compounded by stiff competition from Chevrolet and the newcomer in the economy-car market, Plymouth. After a peak in car sales in 1929, when the economy was still robust, the market slumped through the early 1930s. The three economy makes--Ford, Chevrolet, and Plymouth--sold a combined 2,174,000 autos in 1929, with Ford accounting for more than 60% of those sales. Even though the three automakers' combined sales slumped to 1,737,000 in 1930, Ford retained its 60% share. In 1931 and 1932, though, even as overall sales continue to decline each year, Ford's share of that total fell to 44% and 35% respectively. In 1932, Ford sold only 258,000 autos. During those years, Chevrolet's sales declined, but not as precipitously as Ford's, and Plymouth's sales actually grew. One reason for the slip in Ford sales was the difficulty the company had changing the Rouge plant over to the V-8 engine.⁵⁴

The Ford Motor Company introduced its new V-8 engine to great fanfare in 1932. Conscious of the pioneering role the Model T had played 25 years earlier, *Ford News* claimed that its V-8 was pioneering into the next stage of the automobile age:

The Model T blazed the way for the motor industry. It was almost entirely utilitarian in character. It pioneered in an era when the public was not conscious of its need for motor cars. The V-8 pioneers in an era when that conscious need is universal.

Personal transportation should never be a luxury. It and the latest of its refinements are the rightful heritage of every man, woman, and child in America. Modern civilization has given it to them. This heritage is the wholly reasonable and logical outgrowth of higher standards of living.⁵⁵

The change was very disruptive of Ford sales, however. Just as the switch from the Model T to the Model A disrupted production schedules, leading to a sharp drop in sales in 1927, the switch to the V-8 led to cuts in 1932 Ford sales to a number less than half of 1931 sales. Conversion to the V-8 was delayed because of mechanical problems with the new engine block that Ford engineers discovered at the River Rouge plant.⁵⁶

The Ford Motor Company began manufacturing Mercuries at the Richmond plant in

429, box 2, Richmond, CA, folder.

⁵⁴"Ford Branch Assembly Is Getting Under Way," *Automobile Topics* 106 (21 May 1932): 139; "Ford Branch Production Continues to Increase," *Automobile Topics* 106 (4 June 1932): 236; "Mr. Ford Doesn't Care," *Fortune* 8 (December 1933): 66.

⁵⁵"A New Car: The Ford V-8," *Ford News* 12 (April 1932): 3.

⁵⁶"Mr. Ford Doesn't Care," *Fortune* 8 (December 1933): 66-67; "The Reminiscences of Mr. Clarence Bulwinkel," 28-29.

1938. The Richmond Branch supplied Mercuries to all the Ford territories on the Pacific Coast and to the Hawaiian Islands.⁵⁷

The Ford Motor Company assembled its ceremonial twenty-seven-millionth car at the Richmond Branch on 15 February 1939. It was the first time the company had designated one of its assembly plants outside of Detroit or Dearborn for the honor of producing a "millionth" Ford.⁵⁸

Throughout the 1930s and into the 1940s, the Richmond Branch remained fully integrated into the Ford Motor Company's continent-wide and world-wide system of production. Thus, managers of the Richmond Branch had to obtain authority from Dearborn to conduct extraordinary activities, whether large or small. A relatively large project for which Richmond sought approval in the summer of 1940 concerned repairs to the rock rip-rap along the water's edge of the Ford property, necessitated by recent storm damage. Manager W.A. Abbott sent photographs of the damage to the Branch Operations Superintendent's Office in Dearborn, described the remedy he proposed, and asked for comments on his proposal and for the authority to solicit bids from contractors to make the specified repairs. Dearborn authorized the repairs and instructed Abbott in the specifications he should issue to bidders. Upon receipt of bids, Abbott forwarded them to Dearborn, along with his recommendation of which contractor's bid to select. Dearborn approved the recommendation, pending the contractor's certification that it was properly insured against liability and workers compensation.⁵⁹

Likewise, Abbott needed Dearborn's approval for something as significant as raising employees' pay. In 1940, for example, Abbott wanted raise the pay for several salaried superintendents, foremen, and clerks. Some of the individuals had recently been transferred to new, more responsible positions, but they had not yet received raises commensurate with their new posts. Others had taken on challenging new tasks in their existing positions, and Abbott wanted to give them raises to reward the quality of work they were doing. Abbott did not, however, have the authority to grant raises without approval from Dearborn, so he wrote to the Payroll Office there explaining his reasons for wanting to issue the raises.⁶⁰

⁵⁷"History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No. 429, box 2, Richmond, CA, folder.

⁵⁸"27-Millionth Ford Made At Richmond," 15 February 1939 newspaper clipping in HFM Acc. No. 99, box , Richmond, CA, Branch Clippings folder; "History of Richmond Branch," unpublished report dated 18 March 1941, HFM Acc. No. 429, box 2, Richmond, CA, folder.

⁵⁹W.A. Abbott to Superintendent's Office, Dearborn, undated memorandum; Abbott to Power & Construction, Dearborn, memoranda dated 21 June & 11 July 1940; H.B. Hanson to Abbott, telegram dated 2 July 1940; all in HFM Acc. No. 371, box 16, folder 1.

⁶⁰Abbott to Payroll Office, Dearborn, memorandum dated 14 June 1940, HFM Acc. No. 371, box 16, folder 1.

Ford's central Branch Operations Office in Dearborn also maintained control of seemingly more minor matters. Thus, when Branch Operations decided to make a system-wide change, each branch, including Richmond, was expected to implement it unless some local condition suggested an exception be made, in which case the local branch needed to request such an exception. Letters from the 1940s in the Records of the Ford Motor Company at the Henry Ford Museum indicate the extent to which Dearborn supervised small details at the branch operations. For example, the Dearborn Superintendent's Office sent a letter to all branch plants in 1940 describing the kinds of oxygen tanks and breathing apparatus they were expected to have in their first aid departments. The plant physician at the Richmond plant, however, recommended against the purchase, because the City of Richmond had such emergency equipment available within five minutes of a call. Richmond branch superintendent W.A. Abbott therefore requested that Richmond be exempted from the required purchase, stating that he would buy the equipment, though, if the Dearborn office required it nevertheless. In another instance, Richmond's general foreman Charles Johnson wished to remove a spray booth and oven that was intended for use on small parts. His crews had begun painting small booths in other departments, so he wished to remove the booth and oven in question to make space available for other purposes. He needed to seek authority from Dearborn to do so.⁶¹ This experience of working as a component in a much larger system perhaps helped prepare Ford's Richmond managers for their participation in the World War II production.

E. Production for the Civilian Market in the Early 1940s

Henry Ford had an extensive empire of auto plants throughout Europe at the end of the 1930s. Dearborn managed all of them through Dagenham, England, except the plants in Germany and France, which were autonomous from Dagenham but still managed by Dearborn. While Adolf Hitler and the Nazis were appalling much of the world for their treatment of Jews and for an imposing military escalation, Henry Ford showed little concern. In 1938, Ford was even willing to become the first American to receive an award, the Grand Cross of the Supreme Order of the German Eagle, from Hitler's government.⁶² Ford also tried to remain neutral in Asia, even as Japan invaded and occupied countries like China and Korea. The company produced and shipped several thousand military trucks to Japan from the Richmond dock in 1937.⁶³ Although Ford wanted to remain neutral as hostilities loomed, nationalistic forces soon

⁶¹Charles Johnson to Superintendent's Office, Dearborn, memorandum dated 11 July 1940, and W.A. Abbott to Medical Department, Dearborn, memorandum dated 22 July 1940, both in HFM Acc. No. 371, box 16, folder 1.

⁶²*Labor Herald* (11 August 1938): 3. A headline, "Fordism Is Fascism...This Proves It!", appears over a photograph of Ford, on his 75th birthday, receiving the award from Karl Kapp, German consul in Cleveland.

⁶³"Hitler Decorated Ford: His Workers Apply for Relief," *Labor Herald* (11 August 1938): 1. The article is primarily about how production at Ford plants was so low that Ford workers had to apply for relief much of the year, but the article also points out that Ford produced military

wrested control of Ford production in Germany away from Dearborn and placed it in support of the building Nazi war machine. As the Nazis swept through most of western Europe, Ford plants in Hungary, France, Denmark, and the Netherlands also came under German control. Until the attack on Pearl Harbor and formal declarations of war in December 1941 made Germany and Japan enemies of the United States, Ford managers in Dearborn maintained limited communications with the German managers and even continued shipping some auto parts to Ford plants in occupied countries. Meanwhile, Ford's plant at Dagenham turned its production to the defense of England.⁶⁴

In 1940, while Europe and Asia had gone to war and the United States still struggled with economic depression, the Richmond Branch produced about 100 cars each day. As in previous years, the plant turned out many but not all of the models Ford offered. As mentioned earlier, Richmond was now a Mercury assembly plant, so five models of Mercuries including sedans, coupes, and convertibles comprised about one-quarter of Richmond's output. About half of the Mercuries Richmond produced were Town Sedans. All the Mercuries had 95-hp engines. Richmond produced Fords in seven body types, including sedans, coupes, convertibles, and station wagons. Most were equipped with 85-hp engines, but some had either 60-hp or 95-hp engines. The plant produced no trucks during the first seven months of the year. Then in August, while much of the plant was converting for production of the new 1941 model cars, Richmond produced 200 light trucks of the 1941 model, including pick-ups, panel delivery trucks, and commercial cab-over-engine truck chassis that others bought to finish as dump-trucks and delivery trucks. About half of the trucks had 85-hp engines and the rest had 95-hp engines. In September, the plant turned out 1,130 light trucks as well as nearly 800 1941-model cars. Even with the possibility of war looming for the U.S., and with Ford and other automakers beginning to increase military production, Ford's 1941 models featured a variety of changes. Wheelbases and overall lengths were longer, the cars were wider, and the greater size led to changes in exterior and interior styling. With more of the nation's workers returning to work because of huge increases in production of military ordnance, sales of Ford's 1941 models were among the best ever.⁶⁵

When Ford rolled out its new 1942 models, however, a different set of parameters shaped

trucks the previous year for Japan in its invasion of China. The author has not verified this production for the Japanese military in Ford sources. That Ford's Richmond plant produced trucks for the Japanese government is corroborated, however, in "Parley Ends Ford Strike," *Richmond Independent* (24 April 1937): 3.

⁶⁴Nevins and Hill, *Ford: Decline & Rebirth*, 273-281.

⁶⁵Monthly Report of Total Assemblies, Form 6116, Richmond Branch, for the months January through September 1940, HFM Acc. No. 468, box 9; "It's a Big, New Car: 1941 Ford," *Ford News* 20 (October 1940): 219-227; "Progress in the Ford World," *Ford News* 22 (January 1942): 24.

the design. The federal government had started to divert certain strategic metals to the production of military weapons, ammunition, and equipment, leaving less for the automobile industry. Ford responded by nearly eliminating the use of aluminum in its 1942 cars and trucks and reducing dramatically the amounts of nickel, magnesium, and tungsten. This led to visual changes, like the elimination of nickel and chrome finishes on wheel rings, headlights, hood ornaments, and other decorative features, and it led to heavier cars. Those changes in design became moot in January 1942, however, when Donald Nelson and the War Production Board issued a decree that after the end of the month no materials would be authorized for use in manufacturing new passenger cars and trucks for civilian use.⁶⁶

America's auto industry was one of the nation's largest, and with the termination of civilian car production the industry could turn its entire attention and energy to the production of ordnance for the military. The converted auto industry therefore achieved a remarkable record during the years 1942-1945. Of the United States' total output for the military during the war, American auto makers produced more than 20%, including more than 50% of the aircraft engines, 33% of the machine guns, 80% of the tanks and tank parts, 50% of the diesel engines, and 100% of the trucks. The U.S. built more B-24 bombers during the war than any other airplane, and the auto industry built most of those B-24s.⁶⁷ The next chapter describes the role of Ford's Richmond assembly plant in helping to accomplish that tremendous output.

⁶⁶"Savings in Defense Metals," *Ford News* 21 (October 1941): 259, 270; "Mercury 8 for 1942," *Ford News* 21 (October 1941): 260-261; "The Beautiful New Ford for 1942," *Ford News* 21 (October 1941): 262-263; "1942 Ford Trucks," *Ford News* 21 (October 1941): 266-267; "Progress in the Ford World," *Ford News* 22 (January 1942): 25; Nevins Hill, *Ford: Decline and Rebirth*, 198-199.

⁶⁷Donald Nelson, *Arsenal of Democracy: the Story of American War Production* (New York: Harcourt, Brace and Company, 1946), 212-224.