THE LOWER PENINSULA OF MICHIGAN

An Inventory of Historic Engineering and Industrial Sites

Historic American Engineering Record

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An Inventory of Historic Engineering and Industrial Sites

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Historic American Engineering Record
Office of Archeology and Historic Preservation
National Park Service
U.S. Department of the Interior
1976

Office of Archeology and Historic Preservation
Jerry L. Rogers, Acting Director

Historic American Engineering Record
Douglas L. Griffin, Chief

Cover: Ford Motor Company - Glass Plant 1924

Photo Courtesy of Albert Kahn Associates,
Architects and Engineers, Detroit, Michigan

Sponsored by:

The Michigan History Division,
Michigan Department of State
Lansing, Michigan 48918

Wayne State University
Detroit, Michigan 48202

The Michigan Society of
Professional Engineers
Lansing, Michigan 48902

The Historic American
Engineering Record,
National Park Service
Washington, D.C. 20240

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INTRODUCTION

Origins of the Michigan Inventory

The Historic American Engineering Record (HAER) is a program of the Office of Archeology and Historic Preservation, National Park Service and is responsible for documenting and thus preserving America's engineering and industrial heritage. As part of its program, HAER prepares inventories or lists of significant engineering and industrial sites in all parts of the country. It was decided to inventory the Lower Peninsula of Michigan during the summers of 1975-1976 and then conduct a separate inventory of the Upper Peninsula at a later time. It has been an ambitious undertaking because of the immense size of the area surveyed (sixty-eight counties in the Lower Peninsula) and the rich industrial history of the state. There were few systematic surveys on which to draw. HAER previously gathered information on only a handful of sites, while the existing county and local surveys concentrated on structures of architectural, rather than engineering or industrial, interest.

Format of the Inventory

With few exceptions, the Inventory is limited to sites which predate 1925. Even with this limitation, 678 engineering and industrial sites are recorded. Each inventory card includes a brief history of the site, a physical description, the precise location of the site, a sketch-map, several photographs, and a list of historical source materials. The complete cards are deposited with HAER in Washington and with the Michigan History Division in Lansing. Space limitations have made it necessary to delete some of the less important sites from this volume and to abridge the descriptions of about one-quarter of the sites. For two common structures, bridges and railroad stations, the less important examples are simply listed.

The sites are arranged according to the HAER Industrial Classification System and then listed alphabetically by the name of the site. Categories which include a large number of sites, such as "Bridges and Trestles", are further subdivided. In the left-hand corner of each entry, the reader will find the site name, the date of the structure now standing, its street address or location, and the city or town. The right-hand corner contains the name of the United States Geological Survey map on which the site is located and beneath it the Universal

Transverse Mercator (UTM) grid reference. This fifteen-digit reference is a precise locating mechanism consisting of three elements: the zone number, the east-west measurement, and the north-south measurement. Below the UTM reference is the county in which the site is located. At the end of each entry are the important sources of information for the site and an indication if the site is listed on the National Register of Historic Places (NR). Indices were also prepared listing county, city or town, and site names to further assist the reader.

Acknowledgements

The Michigan Inventory was a cooperative venture supported by several institutions. The encouragement and advice of T. Allan Comp, HAER Senior Historian, was indispensable. The Inventory received vital financial support and cooperation from the Michigan History Division of the Michigan Department of State, particularly from Kathryn Eckert, Michael Washo, and Amy Hecker. Much of the impetus for this project came from the Michigan Society of Professional Engineers, a major financial contributor for two years. The M.S.P.E.'s Executive Director, Scott R. Kingan, and Presidents William J. Bier and Clair H. Aiken have enthusiastically supported this effort. The Michigan Section of the American Society of Civil Engineers also financially supported the Inventory.

Wayne State University played a vital role in this endeavor. Yates Hafner and Martin M. Herman, Deans of Monteith College, agreed to donate secretarial services to the project, while Kay A. Hartley and Linda G. Henson adeptly handled the financial administration of the Inventory. Dean Stanley K. Stynes and Associate Dean James M. Paulson of the College of Engineering generously donated office space, while Nancy D. Cunningham of the University's Office of Grants and Contracts coordinated the project funding. Dean Lawrence von Tersch of the College of Engineering, Michigan State University, arranged to allow several of his students to work on the project.

Scores of Michiganders supplied information on individual sites. Their assistance was invaluable, but they are far too numerous to acknowledge here. However, there are several individuals who provided information on dozens of sites. They include Charles Hunt and Richard Rogness of the Consumers Power Company, Richard Sylvain of the Detroit Edison Company, Edward M. Cummings of the Chessie System, Robert Dedow of the Penn Central Railroad, Bernard Gulowski of the Argonaut Division of the General Motors Corporation, and John Hornbach, Grand Rapids City Engineer.

This volume is really the work of two teams of individuals which shared the tasks of field work, research, and writing in the summers of 1975 and 1976. Many of the inventory cards were completed by student assistants, including Donald Harning, Gary Horwitch, Karen McKinley, Kevin Tolliver, and Wallace Szumny. Diane Abbott typed and edited all of the inventory cards, as well as this volume. The successful completion of the Michigan Inventory is due in large part to her diligence, patience, and good humor.

The success of this work is largely the result of the assistance I have received from these institutions and individuals. Its omissions and shortcomings are my own responsibility.

Charles K. Hyde

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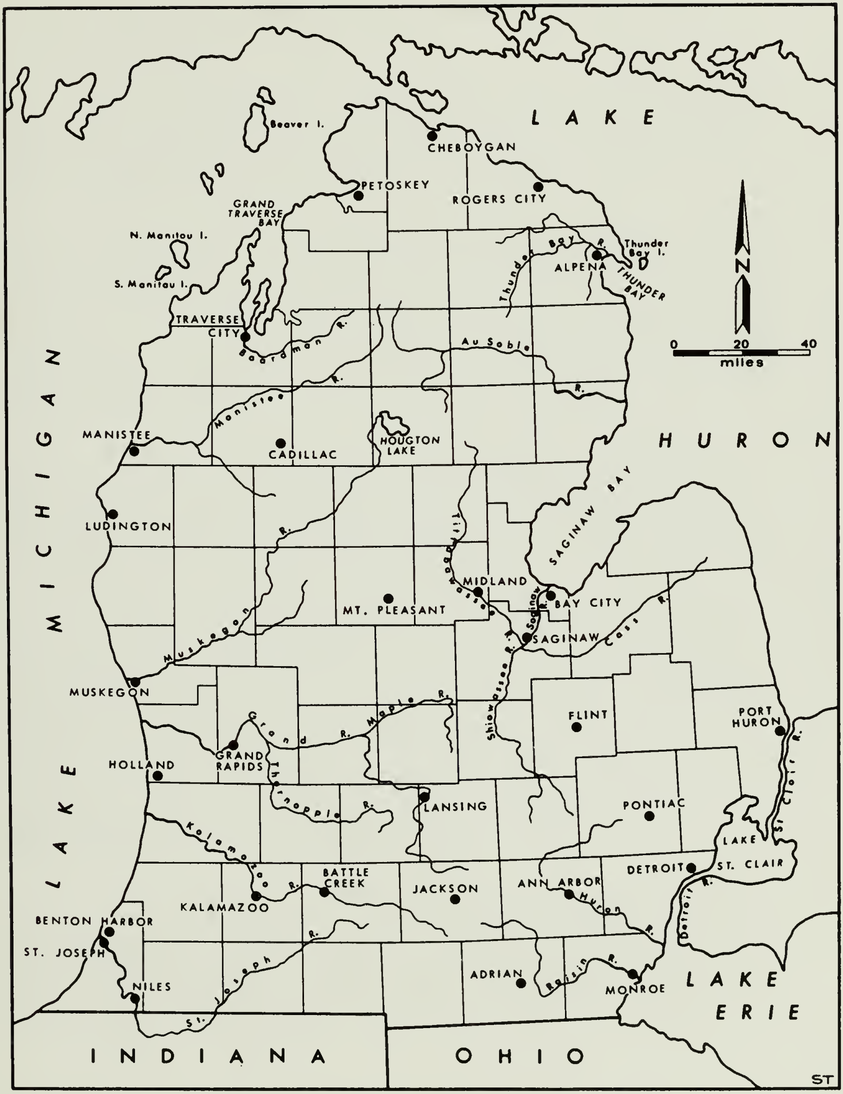
LAKE
HURON
SAGINAW BAY
LAKE MICHIGAN
LAKE ERIE
LAKE ST. CLAIR
INDIANA
OHIO
GRAND TRAVERSE BAY
N
0 20 40
miles
EMMET
CHEBOYGAN
PRESQUE ISLE
CHARLEVOIX
ANTRIM
OTSEGO
MONTMORENCY
ALPENA
LEELANAU
BENZIE
GRAND TRAVERSE
KALKASKA
CRAWFORD
OSCODA
ALCONA
MANISTEE
WEXFORD
MISSAUKEE
ROSCOMMON
OGEMAW
IOSCO
ARENAC
MASON
LAKE
OSCEOLA
CLARE
GLADWIN
HURON
OCEANA
NEWAGO
MECOSTA
ISABELLA
MIDLAND
BAY
TUSCOLA
SANILAC
SAGINAW
MONTCALM
GRATIOT
MUSKEGON
LAPEER
GENESEE
ST. CLAIR
KENT
OTTAWA
IONIA
CLINTON
SHIAWASSEE
ALLEGAN
BARRY
EATON
INGHAM
LIVINGSTON
OAKLAND
MACOMB
VAN BUREN
KALAMAZOO
CALHOUN
JACKSON
WASHTENAW
WAYNE
BERRIEN
CASS
ST. JOSEPH
BRANCH
HILLSDALE
LENAWEE
MONROE
ST


LAKE
HURON
LAKE MICHIGAN
LAKE ERIE
INDIANA
OHIO
Beaver I.
CHEBOYGAN
PETOSKEY
ROGERS CITY
GRAND TRAVERSE BAY
N. Manitou I.
S. Manitou I.
Thunder Bay I.
Thunder Bay R.
ALPENA
THUNDER BAY
N
0
20
40
miles
TRAVERSE CITY
Boardman R.
Au Sable R.
Manistee R.
MANISTEE
CADILLAC
HOUGTON LAKE
SAGINAW BAY
LUDINGTON
Tittabawassee
MIDLAND
BAY CITY
MT. PLEASANT
Saginaw R.
SAGINAW
Cass R.
Muskegon R.
Shiowassee R.
MUSKEGON
Maple R.
Grand R.
FLINT
PORT HURON
HOLLAND
GRAND RAPIDS
Thornapple R.
LANSING
PONTIAC
St. Clair R.
LAKE ST. CLAIR
Kalamazoo R.
BATTLE CREEK
DETROIT
KALAMAZOO
JACKSON
ANN ARBOR
Huron R.
Detroit R.
BENTON HARBOR
ST. JOSEPH
St. Joseph R.
ADRIAN
Raisin R.
MONROE
NILES
ST

INTRODUCTION TO EXTRACTIVE AND BULK PRODUCTS INDUSTRIES

This category of sites includes all mining operations, agriculture, kiln-fired products, the chemical industry, food processing, primary metal industries, textiles, lumber, paper, and wood products. While the Inventory includes sites from all of these industries, the majority relate to food processing and wood products.

Today Michigan is one of the most heavily industrialized states in the nation, but for most of the nineteenth century, the overwhelming majority of her population worked in agriculture, lumbering, fishing, or in industries which processed the products of her farms and forests. As late as 1880, over half the population lived on farms and three-quarters lived in towns of less than 4,000 people. Rapid industrialization and urbanization did not begin until the 1890's and the most spectacular industrial growth, particularly in Detroit, occurred in the period 1900-1929.

The earliest "industrial" buildings in this inventory are water-powered flour and grist mills, many dating from the 1840's and 1850's. Only a few of these, such as the Atlas Mill (1836), Waterloo Mill (1838), Bellevue Mill (1852), Flowerfield Mill (1855), New Troy Mills (1867), and the Fleming Creek Mill (1873) still have significant machinery and power transmission systems intact.

Food processing has not been limited to small rural flour mills. The ready-to-eat cereal industry was established in Battle Creek through the pioneering efforts of C.W. Post and W.K. Kellogg around 1895. They built large manufacturing complexes in Battle Creek and many of the original structures still stand. Michigan also made a significant, but abortive, entry into the beet sugar industry after the passage of the Dingley Tariff (1897) which protected domestic sugar producers. There were twenty-four substantial beet processing plants constructed in 1898-1906, mainly in Bay City, Saginaw, and in the "Thumb" area. Most of these failed within a few years and were subsequently demolished. The survivors include mills at Alma, Caro, Carrollton, Crosswell, Salzburg, and Sebewaing.

Lumbering was the most important economic activity in the northern Lower Peninsula in the second half of the nineteenth century. The exploitation of Michigan's forests (principally white pine) for sale in national markets began in the Saginaw River Valley, where seventy-two sawmills were at work by 1860. The industry spread northward into the Muskegon, Manistee, Au Sable, and other river valleys in the 1870's and 1880's. The lumber industry reached its peak around 1890, when there were nearly two thousand sawmills producing about 4.3 billion board-feet annually. Michigan was still the nation's leading lumber producer in 1900, but then the industry quickly disappeared because short-sighted lumbermen had rapidly exhausted the state's forests. There are virtually no physical remains of this great lumbering era because most of the sawmills were built of wood and were either demolished or lost by fire.

The lumbering industry played a significant role in the economic development of much of the state. The early growth of several cities, including Saginaw, Bay City, Midland, Grand Rapids, Muskegon, Manistee, and Traverse City, was the direct result of lumbering. It spawned other industrial development as well. The availability of mountains of cheap scrap wood for fuel encouraged the development of salt brine evaporation plants. In 1880, Michigan produced 2.5 million barrels of salt, over 40% of the national output. The construction of railroads into northern Michigan after 1860 was intimately connected with logging and the decline of the industry in the early twentieth century encouraged the railroads to develop the tourist potential of the region.

This inventory includes many indirect reminders of this logging era. Some of the sawmill operators turned to papermaking and a few of their plants, such as those of the French Paper Company, the Kalamazoo Paper Company, and the Fletcher Paper Company have survived. The City of Muskegon subsidized the construction of the Amazon Hosiery Mill (1895) to provide jobs for unemployed lumbermill workers.

The manufacture of furniture is another industry with roots in the lumbering era. In Grand Rapids, furniture making expanded rapidly beginning in the 1870's and by 1905, when there were thirty-eight firms in the city employing over 6,600 workers, the Bureau of the Census called the city "the recognized center of the furniture industry in the United States". Grand Rapids had seventy firms with over 12,000 employees during the late 1920's, the industry's peak years. From the early 1930's onward, the industry declined rapidly as the result of both the Depression and the movement of plants into the South. Several powerful reminders of this great industry have survived, including the Klingman Building (1895), the Waters Building (1899), and the Keeler Building (1912), all constructed as furniture exhibition centers, and the manufacturing complexes of the Grand Rapids Chair Company (1873) and the Berkey and Gay Furniture Company (1893).

Michigan never developed a significant cotton or wool textile industry, but the hamlet of Belding in Ionia County became a major silk cloth center in the late nineteenth century. The Belding brothers erected the Richardson Mill there in 1886, followed by additional mills in 1889, 1901, and 1907. The silk industry collapsed in the 1930's, but these attractive brick factory buildings remain.

The Inventory includes several significant examples of mining and other extractive industries. There are limekilns extant at Bellevue (1835,1875) and at Bay Port (1888), as well as the immense quarry of the Michigan Limestone and Chemical Company (1911) at Rogers City. There are also gypsum mines at Alabaster (1862) and in Grand Rapids (1907), and major cement plants in Marlborough (1902) and Alpena (1908).

ALABASTER MINE (1907)
1200 Judd St., S.W.
Grand Rapids

Grand Rapids West
16.605130.4754960
Kent

Gypsum deposits were first discovered in the Grand Rapids area in 1827 by an Indian trapper and the first mines were opened in 1841 by Warren Granger and Daniel Bell. The Alabaster Mine, however, was not opened until 1907, but remained in operation until 1943. This mine eventually included approximately six miles of underground tunnels, 85 feet below the surface, extending over 20 acres. There were only two vertical shafts extending from the surface to the tunnels. The main shaft, roughly 20 feet square, was used to move men, equipment, and gypsum, while a smaller shaft, five feet square, provided ventilation. The tunnels are between eight and twelve feet high and 20 to 30 feet wide. The tunnels are used today for "natural" storage, partly because they retain a year-round constant temperature of 50° F. They are reached with a modern freight elevator running through the main vertical shaft. [Lydens, Z.Z., editor, <u>The Story of Grand Rapids</u> (Grand Rapids: Kregel, 1966), p. 261]

ALABASTER QUARRY (1862-1929)
US-23
Alabaster

Alabaster
17.295600.4895920
Iosco

William S. Patrick discovered gypsum deposits outcropping on the surface of this site in 1861 and mining operations were begun the following year by B.F. Smith, who had purchased Patrick's claim. The present owner, the United States Gypsum Company, took over the operation in 1902. The huge open quarry, covering several hundred acres, is simply an expansion of the original quarry. There are a few surface buildings on the site. The oldest is a two-story rectangular brick structure, approximately 40 feet wide and 200 feet long, built around 1900. The most impressive structure on this site is an aerial tramway which enables large bulk carriers to load about 6,000 feet offshore, where Lake Huron water depths are adequate. This tramway, completed in 1929, is 6,700 feet long and consists of eight steel towers, each 85 feet high and 750 feet apart, a shore bin, and a marine bin at the lake end with a holding capacity of 8,000 tons. The stone is transported in 72 buckets, each with a capacity of 50.2 cubic feet or 2.3 tons of stone. The steel cables supporting the buckets are one and three-quarters inches in diameter on the loaded side and one and one-eighth inches in diameter on the empty side. The traction cable pulling the buckets is three-fourths inch in diameter

and is driven by a 60 H.P. motor. The buckets are spaced 202 feet apart and the line travels at 350 feet per minute, giving the system a capacity of 240 tons per hour.
[MHD, Site Files; NR]

ALMA SUGAR COMPANY (1899)
150 Court St.
Alma

Alma
16.690020.4805017
Gratiot

The Alma Sugar Company was established in 1899 and this plant was built by the Kilby Manufacturing Company with H.N. Kilby serving as the construction engineer. It had an initial daily beet slicing capacity of 600 tons. Many of the original structures, such as a five-story brick building measuring 90 feet by 300 feet, have been demolished. The remaining buildings include a two-story brick office building, 30 feet by 55 feet, with a gabled roof; a rectangular one-story brick warehouse with a flat roof, 75 feet wide and 200 feet long; a two-story brick building, 25 feet wide and 180 feet long, with a gabled roof; and three smaller single-story brick buildings.
[Tucker, Willard, <u>Gratiot County, Michigan</u> (Saginaw, 1913), pp. 692-695; Gutleben, Dan, <u>The Sugar Tramp</u> (San Francisco, 1954), p. 28]

AMAZON HOSIERY MILL (1895,1899)
530-550 W. Western Ave.
Muskegon

Lake Harbor
16.558280.4786300
Muskegon

The Amazon Hosiery Company was originally organized in 1876 in Valparaiso, Indiana and was operating a plant in Michigan City, Indiana beginning in 1884. The Muskegon Chamber of Commerce, facing an economic depression because of Muskegon's declining lumber industry, offered George Powell, the president of the company, a free building site and a bonus of $5,000 if he would build a knitting mill in Muskegon. He agreed to come to Muskegon in 1895 and promised to employ 500-600 workers. By 1899, the Amazon Hosiery Company employed over 650, absorbing most of the unemployed from the lumber industry. The original mill, still extant, is an L-shaped one-story brick building, with wings 270 and 110 feet long, both 70 feet wide, and a two-story brick tower with a hipped roof located at the junction of the wings. A considerably larger addition, erected in 1899 (also extant) is a four-story U-shaped brick building. The main portion is 240 feet long and 70 feet wide, while the two wings are each 200 feet long and 70 feet wide. It features two square towers, one five stories high, and the other, which holds a clock, is six stories high. Both towers contain water tanks used for the mill's fire protection. ["The Romance of Muskegon," (Muskegon: Muskegon Chronicle, 1937), p. 146; Muskegon Chronicle, January 14, 1956, p. 7]

AMENT [NORVELL] MILL (c.1840)
305 Mill Rd.
Norvell Township

Manchester
16.732060.46700075
Jackson

The water power of the Raisin River was first harnessed at Norvell when the Fitzgerald Sawmill was erected in 1839 on the south side of the river and a dam was constructed. The present gristmill, located on the north bank of the river, was probably built in 1840 or 1841. It has had numerous owners, including William B. Reynolds, who was operating the mill in 1881. It remained in operation until 1960, when virtually all of the machinery and equipment was removed and scrapped. This mill was among the largest on the Raisin River because the head developed at Norvell (nine and one-half feet) was unusually large on this river. During the period roughly 1880-1920, this mill boasted three vertical turbines, the largest of which reputedly developed 100 horsepower. A generator was installed here at the turn of the century to provide this small remote hamlet with electric power, making Norvell one of the earliest rural communities in Michigan to electrify. The surviving building is a rectangular structure, 25 feet wide, 60 feet long, and three and one-half stories high, with a gabled roof and wide overhanging eaves supported by wooden brackets. It is supported by a massive hand-hewn timber frame and rests on a stone foundation.
[History of Jackson County (Chicago, 1881), p. 991]

ATLAS MILL (1836)
Historical Crossroads Village
Flint

Flint North
17.284390.4774200
Genesee

The Atlas Mill is the oldest surviving mill in Michigan. It was in use until 1942 and was badly deteriorating when it was moved in 1975 to the Historical Crossroads Village in Flint. The Genesee County Parks and Recreation Commission intends to restore the mill to working order. It ia a rectangular three and one-half story timber-framed structure, 45 feet long and 30 feet wide. Most of the shafting and gearing, which seems to date from the late nineteenth century, is extant.
[MHD, Site Files]

AVON HILLS MILL (c.1900)
Avon Rd. and Larchville
Rochester

Utica
17.326180.4725700
Oakland

Originally built as a gristmill, the mill now only stands as a landmark. The mill is a wooden-framed three and one-half story building with dimensions of 33 feet by 66 feet. Adjacent to the mill is a seven foot diameter silo standing three and one-half stories high. A gabled roof is topped by two metal air intake receptacles standing another five feet high. The mill is no longer used today but is the property of Avon Hills Condominiums of Rochester, Michigan.

BARNEY [HOMER] MILL (1887,1913)
305 Leigh St.
Homer

Homer
16.681065.4668010
Calhoun

Milton Barney, one of Homer's earliest settlers, erected this mill in 1887, replacing an earlier mill located on the same site. Two Leffel turbines, still extant, were part of the original installation. The bearings and line shafts are still in place, but the rest of the machinery has been removed. The present building is made up of three sections built in 1887 and two additions on the rear of the original mill. The original mill has a two-story portion, 20 feet by 40 feet, a three-story portion, 40 feet by 20 feet, and a four-story portion, 40 feet by 50 feet, all resting on a rough rubble foundation and featuring massive hand-hewn oak framing, tongue and groove siding, and flat roofs. The addition, 40 feet by 30 feet, is of similar construction, but has gabled roofs. The dam, on the South Branch of the Kalamazoo River, along with the raceway gates, both of concrete construction, were built in 1913. The dam originally had four gates, 20 feet wide and four feet high, and were raised by a manually operated rack and pinion mechanism. Only two gates remain. The six raceway gates, five feet wide and three feet high, raised by a similar mechanism, are extant.
[Gardner, Washington, History of Calhoun County (Chicago: Lewis, 1913), pp. 188-190]

BAY PORT QUARRIES: LIMEKILN (c.1888)
West of Pobanz Rd., south of Bernie Rd.
Bay Port

Bay Port East
17.313195.4856390
Huron

This kiln was erected around 1888 by the Bay Port Quarries, owned by the

Saginaw, Tuscola, and Huron Railroad Company. W.H. Wallace was the superintendent of the quarry in 1899 and he established the Wallace Stone Company in 1900, when he probably took over the operation from the railroad. Limestone was produced in this kiln until about 1908. The structure is a truncated pyramid, 15 feet square at the base and approximately 12 feet square at the top, and stands approximately 30 feet high. It has three openings arched in brick. There are wooden supports tied together with steel rods extending around the kiln's exterior at the top. The steel rods are still evident where there were four additional sets of these timber supports extending almost to ground level. They were probably removed to prevent people from climbing to the top of the furnace. [Eckstein, Norman and Hey, Chet, Huron County Centennial History, 1859-1959 (n.p., 1959), p. 71]

BEDFORD [PAYETTE] MILL (1855)
220 Main St.
Bedford

Bedford
16.645310.6952200
Calhoun

This mill was built on the Walbascon Creek in 1855 by H.M. Marvin. It was owned by the firm of Kane & Meachem in 1866-1876 and ground about 20,000 bushels of grain in 1876. It has changed hands several times during its life, but was owned for roughly fifty years by the Payette family, from the late 1880's until the 1930's. It was converted into a restaurant in 1950 and is now serving as an antique shop and private residence. This two-story structure has hand-hewn oak framing, tongue and groove siding, and a gabled roof, and is 40 feet long and 30 feet wide. An extension to the original building, 20 feet by 30 feet, with a pitched roof, was probably built in 1918, when the mill was modified considerably. At that time, a turbine was installed, probably replacing an earlier water wheel, and the raceway and adjacent dam were rebuilt in concrete. The turbine, raceway, and dam are extant, but none of the other milling equipment has survived.
[History of Calhoun County (Philadelphia: Everts & Co., 1877), pp. 194-195; MHD, Site Files]

Bay Port Quarries: Limekiln (c.1888), Bay Port

BELDING BROTHERS NUMBER 1 [RED] MILL (1889)
Riverside St. at Ashfield St.
Belding

Belding
16.644680.4772990
Ionia

The Belding Brothers (Alva, Hiram, Milo, and David) were successfully operating silk mills in Rockville, Connecticut, Northampton, Massachusetts, Montreal, and in Petaluma, California when they decided to build a mill in Belding, where Alva and Hiram had spent part of their childhood. This village, originally called Patterson's Mills, had changed its name to Belding in 1871. The first mill they built in Belding was the Number 1 or "Red" Mill. It is an L-shaped structure, with one wing 275 feet long, the other wing 120 feet long, and both wings 50 feet wide. It is three stories high, of red brick construction, featuring decorative courses of white brick which arch the windows. It features two five-story red brick towers, each 15 feet square, with hipped roofs. It was used exclusively for the manufacture of silk thread. Raw silk was spun into thread in the spinning room on the first floor, winding was done on the second floor, and the third floor was devoted to spooling. At its peak, about 75 men and 225 women worked here. It operated continuously until 1934, when it fell victim to the Depression. It was dismantled in 1936, the machinery and equipment were sold, and the building was later acquired by the Gibson Refrigerator Company, today part of a large conglomerate.
[Belding Banner-News, August 29, 1957, pp. 3-4]

BELDING BROTHERS NUMBER 2 [WHITE] MILL (1901)
East High St.
Belding

Belding
16.644580.4773065
Ionia

The White Mill was the second silk mill constructed by the Belding Brothers in this small village renamed in their honor in 1871. It is an L-shaped building, with one wing 375 feet long, the other wing 120 feet long, and both wings 50 feet wide. It is four stories high, of white brick construction, with decorative courses of red brick which arch the windows. It features three brick towers, one of five stories and two which are four stories high. This mill was used exclusively for the manufacture of silk cloth until it was closed and dismantled in 1935-1936. The White Mill was equipped with the Sturtevant system of heating and featured the automatic regulation of temperature and humidity.
[Belding Banner-News, August 29, 1957, pp. 3-4]

BELDING BROTHERS NUMBER 3 [ELECTRIC] MILL (1907)
East Main St.
Belding

Belding
16.644235.4773085
Ionia

This was the third mill erected by the Belding Brothers in Belding and was called the "Electric Mill" because it was equipped exclusively with electrically-driven machinery. It was used exclusively for the manufacture of silk cloth. After the completion of this mill, Belding Brothers employed about 1,400 workers in Belding alone and their three mills consumed 10,000 pounds of raw silk weekly. The Electric Mill is a three-story red brick structure with brick arched windows, 350 feet long and 50 feet wide. It features an ornate five-story brick clock tower, as well as a four-story square brick tower with a flat roof. [Belding Banner-News, August 29, 1957, p. 3]

BELLEVUE [GOTHIC] MILL (1852)
Riverside St.
Bellevue

Bellevue
16.663140.4700990
Eaton

This gristmill was built on Battle Creek in 1852 by Manlius Mann. Reputedly the water power of Battle Creek River was only valuable at Bellevue, and that the gristmill there proved very beneficial to the early settlers of the area, some of whom hauled their grain a distance of twenty miles. Horatio Hall was the actual builder who "certainly showed his skill as a carpenter in constructing it. A History of Eaton County cited the mill as 'one of the most substantial frame structures to be found in the state.'" A Smith Roller Process was installed in 1888. In 1928 the Gothic Mill was acquired by A.G. Butler who added turbines (280 H.P.) and established the trade name of Bellevue Bird Flower. It closed down in 1958. The mill is three and one-half stories high. Built on a rubble foundation, the south and east sides have tongue and groove siding, while the north side has vertical board and batten siding. Shingles cover the west side; sheet metal roofing covers the gabled roof. Inside, massive 12 by 12 walnut timbers support the upper stories. The pulleys, drive shafts, and chutes by which the mill operated are still in place. A one-story fake front office adjoins it on the west side. The Parks Commission plans to restore it as a functioning mill.
[Barber, Edward W., "Beginnings in Eaton County: Its Earliest Settlements and Settlers," Michigan Pioneer Collections, Vol. 29 (1901), p. 345; Bellevue Gazette, July 10, 1958, p. 3; NR]

BERKEY AND GAY FURNITURE COMPANY (1893)
920-964 Monroe St., N.W.
Grand Rapids

Grand Rapids West
16.608340.4759120
Kent

William Berkey and George Gay, both experienced furniture manufacturers, formed the Berkey and Gay Furniture Company in 1873. The oldest segment of this plant was built for the Oriel Furniture Company in 1893 and was subsequently taken over by Berkey and Gay. This plant became the largest furniture factory in Grand Rapids. It is a sprawling complex of five-story rectangular brick buildings, all interconnected. There are two open interior courtyards, not visible from the street. Fronting on Monroe Street, the complex is 460 feet long and 200 feet wide. There are six sections which are 200 feet long and 50 feet wide, plus a section fronting on Mason Street which is 80 feet wide and 270 feet in length. [Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), p. 314]

CARO SUGAR COMPANY (1899)
725 S. Almar St.
Caro

Caro
17.306260.4817140
Tuscola

The Caro Sugar Company was established in November 1898 by a group of Caro area farmers and businessmen. The production of beet sugar in this area had been promoted by Richard Hoodless, an area man who had previously toured several German beet sugar mills. The plant was constructed by the A. Wernicke Maschinenbau Aktiengesellschafft of Hale, Germany at a cost of $400,000 and was to have an initial slicing capacity of 600 tons of sugar beets per day. The plant, however, failed to process anywhere near its supposed capacity, and after considerable litigation, the original builders were paid only $125,000 for their work. The plant was then rebuilt in 1900-1901 by the Oxnard Construction Company. It was taken over by the American Sugar Refining Company in 1901 and its capacity doubled to 1200 tons. The Michigan Sugar Company, the current owners, then acquired the plant in 1906. The surviving buildings include a complex of interconnected three and four-story buildings with overall dimensions of 330 feet by 260 feet, all of brick construction, and a separate two-story rectangular brick building, 50 feet wide and 330 feet long. [Gutleben, Dan, The Sugar Tramp (San Francisco, 1954), pp. 91-108]

CHARLES SUPE GRAIN ELEVATOR (1871)
1022 N. Adams St.
Bay City

Bay City
17.267000.4831760
Bay

Charles Supe came to Bay City in 1868 and constructed this grain elevator in 1871. It later served as a steam-powered gristmill, and is now used as a beer warehouse. Painted on one wall is the sign, "Bromfield & Colvin, Grain Buying Department" and "Grinding Dept.". It is a two and one-half story rectangular brick building, 40 feet wide and 99 feet long, with a gabled roof.
[History of Bay County, Michigan (Chicago: Page, 1883), pp. 120,210]

COMFORT BRICK AND TILE COMPANY (c.1940)
On Rogers Hwy., north of Centennial Rd.
Tecumseh

Blissfield
17.257070.4651095
Lenawee

The Comfort Brick and Tile Company has operated on this site since it was founded in 1859 by Elwood Comfort. It has remained in the hands of the Comfort family throughout its history. The extant structures include five brick drying kilns, each a round brick structure 30 feet in diameter and 15 feet high, with supporting iron bands running around their outside circumference. They were built around 1940 by Ralph A. Comfort.

DETROIT PRODUCE TERMINAL, BUILDING A (1929)
7210 Fort St. at Green St.
Detroit

Detroit
17.325790.4685220
Wayne

Built by the Wabash, Pere Marquette and Pennsylvania Railroads, the Detroit Produce Terminal was constructed to give Detroit an efficient method of produce distribution. It took only 150 days to build the entire terminal. Building A, the main building, is a two-story reinforced concrete structure with dimensions of 1,040 feet by 70 feet. The first floor is a flat slab type while the second floor and roofs are of the beam and girder design. The top floor is composed of offices and auction floors while the bottom floors are for display purposes. The bottom floor has 14 foot by 8 foot doors that open straight up and 7 foot loading platforms. It is still being used for a produce terminal.
["Railroads Build Modern Produce Terminal at Detroit," Railroad Age, December 28, 1929, pp. 1463-1468]

DETROIT PRODUCE TERMINAL, BUILDING B (1929)
7210 Fort St. at Green St.
Detroit

Detroit
17.325790.4685220
Wayne

Building B, the secondary building of the Detroit Produce Company, is a two-story concrete structure with dimensions of 633 feet by 70 feet. The first floor is of the flat slab type while the second floor and roofs are of the beam and girder design. The top floor is composed of offices and a cafeteria and the bottom floor is for sales purposes. The bottom floor has 14 by 8 foot doors that open straight up and 7 foot loading platforms on each side of the building. The building cost approximately $1,000,000. It is still being used today.
["Railroads Build Modern Produce Terminal at Detroit," Railroad Age, December 28, 1929, pp. 1463-1468]

DETROIT PRODUCE TERMINAL, BANANA BLDG. (1929)
7210 Fort St. at Green St.
Detroit

Detroit
17.325790.4685220
Wayne

The Banana Building, part of the Detroit Produce Terminal and an extension of Building B, is a one-story reinforced concrete structure, 70 feet wide and 378 feet long. The building is used for the ripening of bananas. Part of the building is also used for the distribution of tomatoes. Seven foot loading platforms are provided on each side of the building and the structure has 14 by 8 foot doors that open straight up. The building cost approximately $1,000,000. It is still being used today.
["Railroads Build Modern Produce Terminal at Detroit," Railroad Age, December 28, 1929, pp. 1463-1468]

DETROIT SALT MINE (1906)
12841 Sanders
Detroit

Dearborn
17.322820.4683510
Wayne

The Detroit Salt Mine, one of four operated by the International Salt Company, is the only salt mine in Michigan. The first shaft was started in 1906 and by 1910, after encountering much difficulty with hydrogen sulfide gas and water under high pressure, was completed to a depth of 1,160 feet. The second shaft, 16 feet in diameter, was built in 1922-1924. The shaft was divided in half to accomodate two counterbalanced skip hoists powered by two 550 H.P. electric motors. To reduce the torrent of water entering the first shaft it was rebuilt in 1926-1927. It became a concrete monolith 150 square feet in cross-section pierced by two vertical tubes 42 inches in diameter. Cast iron pipe lines the inside of the tubes to a depth of 600 feet. The mine uses the room and pillar system, where salt forms the roof, roof-supporting pillars, and floor. The load-bearing strength of salt eliminates the need for wood, concrete, or steel tunnel supports and braces. The mine uses modern mining techniques (explosives) and equipment. It is virtually an underground city.

DUNDEE GRISTMILL (1866,1910,1935) — Dundee
Lloyd Rd., on Raisin River — 17.278055.4648020
Dundee — Monroe

This site originally contained a sawmill erected in 1828. The oldest extant building is a gristmill erected in 1866 by Alfred Wilkerson, who owned the mill until 1880. It was then operated by R.B. Davis until 1910, when it was sold to the Dundee Hydraulic Power Company and converted into a hydroelectric generating plant. Henry Ford purchased the site in 1931, restored the old mill building in 1935, and added a single-story stone building to the original mill. This was Henry Ford's earliest "rural factory" and it produced copper tips for welding machines until 1954, when it was sold to the Wolverine Manufacturing Company. They operated the mill until 1970, when they sold it to the Village of Dundee, the present owners. The old mill is a three-story rectangular frame structure, 30 feet wide and 50 feet long, with a gabled roof. It has a frame of 10 inch square hand-hewn oak timbers. The first dam across the Raisin River was built in 1827 of brush and dirt and there were several log dams built here before the present concrete dam was constructed in 1910.
[Monroe Evening News, December 31, 1970, p. 9]

DYER KILN (c.1875) — Bellevue
Sand Rd., south of M-78 — 16.660950.4700160
Bellevue — Eaton

This limekiln was constructed around 1875 by Thomas Roberts. It was one of three perpetual limekilns which existed in Eaton County in the late nineteenth century. The kiln or furnace is 20 feet square at the base, about 12 feet square at its top, and stands approximately 15 feet high. It is of rough stone construction, utilizing large stones for the base and much smaller ones for the stack. The four openings into the furnace

(one on each side) are crude brick arches using little mortar. These openings were used to feed limestone and probably charcoal into the furnace. There is in addition, a crude stone building, 20 feet square, adjoining the furnace. It was probably used for the storage of charcoal, although it no longer has a roof. It operated until 1899 and produced lime for the mortar used for the construction of the State Capitol Building in Lansing, completed in 1878.
[MHD, Site Files]

EGEY-SAMU BARN (1924)
6948 Ritchie Rd.
Gagetown

Gagetown
17.321330.4837520
Tuscola

This is a rare example of a large-scale octagonal barn in Michigan. Constructed in 1924, this building is approximately 100 feet in diameter, and rests on a poured concrete foundation. The lower roof level includes eight windowed dormers, there is a clerestory with sixteen windows, and the barn is then topped off with an octagonal cupola, also with a window in each side. This massive timber-framed building features an interior arena, 60 feet in diameter, which is totally unobstructed by columns. The extensive windows provide sufficient natural light to the interior to enable the farmer to almost entirely avoid artificial lighting.
[Hartman, p. 30]

FLEMING CREEK [PARKER] MILL (1873,1887)
Geddes Rd., east of Dixboro Rd.
Ann Arbor

Ann Arbor East
17.280000.4683440
Washtenaw

This site originally contained a sawmill built in 1822 or 1823 by Robert Fleming. The property was acquired by William Parker in 1862 and in 1873 he built the gristmill which is still standing, using the old raceways from the sawmill. The 1873 building, with the original stones, turbine, and gearing is extant. Also located on the same site is a water-powered cider mill erected in 1887. Both buildings are wood-framed rectangular structures resting on cut fieldstone foundations, and both have vertical board and batten siding and gabled roofs. The Washtenaw County Historical Society intends to fully restore the gristmill, including the machinery, penstocks, raceways, and timber dam, to once again grind flour there.

Egey-Samu Barn (1924), Gagetown

FLETCHER PAPER COMPANY MILL (1898)
318 W. Fletcher St.
Alpena

Alpena
17.308425.4993080
Alpena

George Fletcher established a sawmill on this site in 1857 and in 1886, he and his sons, Allan and Frank, organized the Alpena Sulphite Fibre Company and constructed a sulphite plant. Michigan's timber resources were quickly exhausted in the late nineteenth century and Fletcher was forced to discontinue the sawmill in 1898. The firm was reorganized at that time as the Fletcher Paper Company, which constructed the surviving papermill. The sulphite mill was subsequently demolished in 1938. The papermill is a two-story L-shaped building, with each wing approximately 50 feet by 150 feet. One wing has a gabled roof and the

other a flat roof. There is also a two-story rectangular brick building, 40 feet by 60 feet, with a gabled roof and small brick arched windows, which probably served as a warehouse. It has a smaller one-story brick wing, 20 feet wide and 30 feet long.
["Welcome to Fletcher Paper Company," Fletcher Paper Company Brochure; Powers, Perry F., History of Northern Michigan and Its People (Chicago, 1912), p. 473]

FLOWERFIELD MILLS (1855)
Factory St.
Flowerfield

Schoolcraft
16.611000.4657780
St. Joseph

The present mill replaced an earlier (1831) mill which burned in 1851. The mill was rebuilt by Lewis and Joseph Tubbs and had three runs of stone powered by a waterwheel. The Flowerfield Mills is a three and one-half story building supported by massive (15 inch square) hand-hewn, wood-pegged oak beams resting on a rough rubble foundation. It has a gabled roof and tongue and groove siding. The building contains equipment for three distinct milling processes. One of the three original 48 inch diameter stones remains for producing stone-ground flour. There are also six rolling machines, produced by Sprout Waldrin, "mill builders", which were added in 1913 to produce refined white flour. Finally, there is a "hammer mill" to produce feed grains. It includes a cob crusher and husking machine. This mill was originally powered by a waterwheel which was replaced in 1913 by twin turbines connected to two line shafts, all still extant. A 25 KW generator and electric motor to power the mill were installed in 1955, but never used. The mill ceased operating in 1943.
[History of St. Joseph County (Philadelphia: Everts & Co., 1877), p. 196]

FOX AND BEERS MILL (1830)
XY Ave., west of US Rte. 131
Schoolcraft

Schoolcraft
16.610230.4660400
Kalamazoo

Settlers first arrived in the Schoolcraft area in 1827 and this mill was erected in 1830 by John Vickers. The original waterwheel was replaced by a wood-geared turbine around 1900. This turbine, along with a small concrete dam constructed about the same time, are still extant. This mill stopped working in 1947 and the building now serves as the club

house for the Old Mill Golf Course. The original hand-hewn oak framing is still in place, supporting this three-story structure which features a combination of gabled and pitched roofs and a two-story wooden porch extending around three sides of the building. The original exterior of the building had tongue and groove siding, now covered by aluminum siding.
[Dunbar, Willis F., Kalamazoo and How It Grew (Kalamazoo: Western Michigan University Press, 1969), pp. 30-31; Fisher, David and Little, Frank, Compendium of History and Biography of Kalamazoo County (Chicago: Bowen & Co., 1906), pp. 37-39]

FRENCH PAPER COMPANY (1891-1921)
100 French St.
Niles

Niles West
16.561460.4629680
Berrien

J.W. French came to Niles in 1871 after the City of Niles offered him a free building site on the St. Joseph River. He established the Michigan Wood Pulp Paper Company and began producing paperboard from the silver poplars available locally. When the supply of these trees became exhausted around 1895, he began to produce paper, and the company has specialized in high quality papers since then. The oldest surviving buildings (1891, 1895, 1899, and 1906) in this complex are simple one and two-story rectangular brick structures which are largely obscured by modern additions. This factory complex also includes a powerhouse erected in 1921 (see other entry), a steam plant (c. 1920), and an office building (c. 1921).
[French Paper Company: First Century, 1871-1971 (French Paper Company, 1971), pp. 19-20]

GERMAN-AMERICAN SUGAR COMPANY
2600 S. Euclid Ave.
Bay City

Bay City
17.264375.4828590
Bay

The German-American Farmers Cooperative Beet Sugar Company was founded in 1901, when Michigan's beet sugar industry was rapidly developing. In the years 1898-1906, twenty-four beet sugar plants were opened in the state, mostly in the Bay City-Saginaw region and in Michigan's "Thumb". This plant was erected by the American Copper, Brass, and Iron Works of Chicago, with Otto Meinhausen as the construction engineer, and it opened in 1902 with a capacity of 400 tons of beets sliced per day. The plant's capacity was enlarged to 1500 tons in 1910 and now has a capacity of

about 4,000 tons. The plant originally used the Steffen Process, but this was dropped in the 1920's. The firm changed its name to the Columbia Sugar Company in 1917, due to considerable anti-German sentiment. It went into receivership in 1930, when it was taken over by Robert Coryell, who then reorganized it as the Monitor Sugar Company in 1932. The surviving buildings include the original two and three-story brick processing plant built in 1901, but includes additions probably made in 1910, a limekiln erected in 1911, and a two-story warehouse built in 1921.
[Butterfield, George E., Bay County Past and Present (Bay City, 1957), p. 94; McGinnis, R.A., Beet-Sugar Technology (Fort Collins, Colorado, 1971), p. 738; West Bay City Tribune, October 23, 1901, p. 1]

GRAND RAPIDS CHAIR COMPANY (1872-1873)
1661 Monroe St., N.W.
Grand Rapids

Grand Rapids West
16.608320.4760770
Kent

In 1872, Henry Fralick, C.C. Comstock, and F.W. Worden established the Grand Rapids Chair Company with a capital of $300,000 and immediately began construction of their manufacturing complex. This five-story brick factory, featuring brick arched windows and flat roofs, consists of two wings arranged to form a cross. The wing running north to south is 60 feet wide and 540 feet long, while the east-west wing, also 60 feet wide, is 374 feet long.
[Baxter, Albert, History of Grand Rapids (New York: Munsell, 1891), pp. 477-478; Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), p. 315]

GREAT NORTHERN PORTLAND CEMENT
COMPANY WAREHOUSE (1902)
James Rd.
Marlborough

Baldwin
16.593020.4856080
Lake

The Great Northern Portland Cement Company was incorporated in New Jersey in 1901 and began constructing a plant just south of Baldwin to produce cement using the "wet process" developed by Professor Roola Carpenter of Cornell University. Production costs soon proved to be prohibitive and the firm went into receivership in 1906. Almost the entire plant, which had included seven kilns, fourteen grinding mills, and an immense powerhouse, were dynamited for salvage purposes. The warehouse is the only surviving building. It is a one and two-story concrete building reinforced with steel rods, 80 feet wide and 210 feet long. The framing and even the portion of the roof that remains were constructed of reinforced concrete.
[NR]

Fleming Creek Mill (1873,1887), Ann Arbor

HALL BROTHERS MANUFACTURING COMPANY (1890)
Riverside Ave., south of York St.
Belding

Belding
16.644785.4772930
Ionia

The Hall Brothers Manufacturing Company was organized in 1890 by Brinton F. Hall and three of his brothers. This mill building was originally used for the manufacture of sewing and card tables, stove boards, and side boards. In 1895, the firm merged with the Belding Manufacturing Company, which made refrigerators, to form the Belding-Hall Manufacturing Company. By the early 1920's, the firm was producing 65,000 refrigerators per year, had an annual payroll of $130,000, and was the largest single employer of heads of households in Belding, with about 300 men on their payroll. The firm went bankrupt in the early 1930's and was taken over by the Gibson Refrigerator Company. The surviving building is a three-story yellow brick rectangular structure, approximately 450 feet long and 40 feet wide, featuring two four-story square towers. The hipped roof of the west tower has been removed and replaced by a flat roof.
[Belding Banner-News, August 29, 1957, p. 3]

HOLDEN KILN
Southwest of Bellevue City Limits
Bellevue

Bellevue
16.661220.4699140
Eaton

The Holden Kiln, constructed in 1835, was the first limekiln built in Michigan. It produced some of the lime used in the mortar for the State Capitol Building, constructed in 1878. It is an extremely crude stone furnace, built into the side of a hill. It has a roughly round configuration and is approximately 20 feet in diameter and 15 feet high. There are four openings into the furnace, all arched in stone.
[MHD, Site Files]

HOMER GRIST AND FLOURING MILL
Washington Rd., over Fish Creek
Hubbardston

Hubbardston
16.675550.4772945
Ionia

This flour mill, erected by Patrick and Sabin in 1857, originally had three run of stone and was powered by a waterwheel. It was producing about 100 barrels of flour per day during the late 1860's. The mill changed over to the roller process and turbines were installed around 1910. Virtually all of this installation is intact, although it is now

run by electric power. The main portion of the mill is a five-story building with a massive hand-hewn timber frame, resting on a stone and concrete foundation. Its gabled roof is now covered by corrugated tin, while the tongue and groove siding is probably original. Attached to the southeast corner of the main mill building is a smaller building, 20 feet wide and 40 feet long, three stories high, and architecturally the same as the main building.
[Schenck, John, History of Ionia and Montcalm Counties (Philadelphia: Lippincott, 1881), pp. 273-274]

HOUPPERT [LAWTON] WINERY (1918,1940)
Nursery St. at Penn Central RR
Lawton

Marcellus
16.595750.4669055
Van Buren

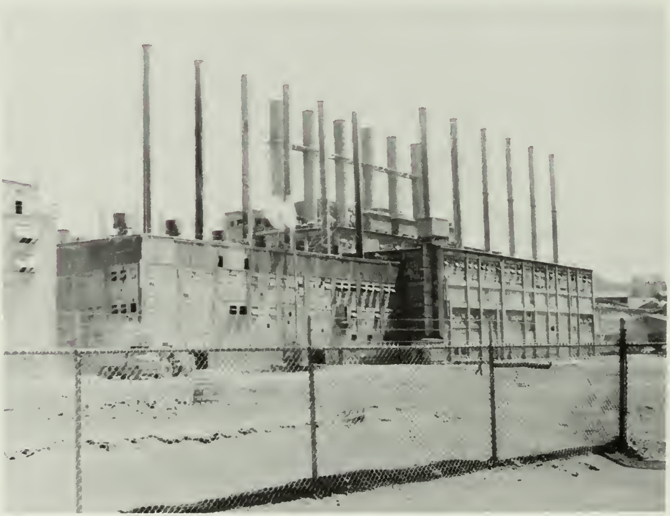
This fieldstone structure was erected in 1918 as a winery by William C. Houppert of Lawton. The building burned in 1940 and was rebuilt in the same year. The present rounded roof is supported by steel "Rain-bo" roof trusses, installed in 1940 to replace the earlier wooden trusses. This rectangular building is 100 feet wide and 200 feet long and features stone arched doors and cut stone lintels and sills on the windows.

HURON PORTLAND CEMENT COMPANY (1908)
Ford Ave., east of Alpena
Alpena

Alpena
17.310530.4993320
Alpena

The Huron Portland Cement Company was established in 1907 by Captain John B. Ford, E.L. Ford, Harry J. Paxton, and Stanford L. Crapo, with a capital stock of $1.2 million. Construction began almost immediately, with the Bonnot Company of Canton, Ohio building six kilns. The company merged with the National Gypsum Company in 1959. This plant has undergone a massive expansion since its early years. The capacity of the plant has grown from about 2,000 barrels per year in 1908 to about 2.35 million tons in 1976. The complex includes approximately 200 separate buildings and structures, with 35 of these predating 1925. Extant structures erected in 1908 include the Number 1 Kiln Room, Powerhouse, Gypsum Drying and Storage Building, (water) Softening Plant, and the Old Stone Drying Building. Other significant buildings include the Office Building (1917), Raw Grind Building (1922), and Number 2 Kiln Room (1923). The Powerhouse originally contained three 800 horsepower Corliss engines, no longer extant, which utilized the vast amounts of waste heat produced in the kilns to produce all the electricity needed in the plant. The

Powerhouse still contains a variety of steam turbines driving generators of mixed vintage. These include the Number 3 generator, an Allis-Chalmers 5,000 KW unit built in 1919; Number 4 generator, an Allis-Chalmers 10,000 KW unit built in 1920; Number 5 generator, an Allis-Chalmers 10,000 KW unit built in 1927; and generators built in 1948 and 1957. There are also three Ingersoll-Rand air compressors (c. 1920) driven by Worthington steam engines of similar vintage.
[Stark, George, The Huron Heritage (Detroit, 1957), pp. 13-17, 35; Alpena News, January 16, 1907, p. 1]



Huron Portland Cement Company (1908), Alpena

KEELER BUILDING (1912-1914)
60 North Division
Grand Rapids

Grand Rapids West
16.608680.4757610
Kent

This building was erected in 1912-1914 by the Keeler family, successful brass manufacturers in Grand Rapids, to be used as a showroom for the world famous furniture manufacturers of the city. Designed by the architectural firm of Osgood & Osgood, this reinforced concrete building with concrete slab floors was the first of its type in the city. It was designed to support a dead weight of 225 pounds per square foot and a live weight of 450 pounds. This seven-story building is 126 feet wide, 198 feet long, and has 154,000 square feet of floor space.
[Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), p. 218]

KELLOGG COMPANY HORSE BARNS:
BUILDINGS NUMBER 29 AND 29A (1916,1920)
235 Porter St.
Battle Creek

Battle Creek
16.652320.4686510
Calhoun

W.K. Kellogg was forty-eight years old when he first began to produce ready-to-eat cereals in his Porter Street plant. He had worked most of his adult life as business manager and bookkeeper in the Battle Creek Sanitarium, where his brother, Dr. John Harvey Kellogg, was Superintendent and Chief Surgeon. During his years at the "San" (1879-1906), W.K. Kellogg and his brother discovered the "tempering of grains", necessary to produce flaked cereals. He established the Battle Creek Toasted Corn Flake Company in 1906 and purchased the machinery and formula of the Korn Krisp Company, as well as the Bartlett Avenue plant of the Hygienic Food Company. His Bartlett Avenue plant burned in 1907 and he then relocated in a new plant on Porter Street in 1908. A major fire in 1924 destroyed most of the original buildings and most of the few remaining have been altered beyond recognition. The Horse Barns are the oldest remaining structures on this site. Both are two-story frame structures. The barn dating from 1916 is 50 feet square, has a gabled roof, and sheet metal siding, probably not original. The newer structure measures 50 feet by 80 feet, has a flat roof, and shingle siding, probably installed in the 1930's. Both buildings are now used for storage.
[Battle Creek Enquirer-News, July 20, 1975, pp. E-1, E-9]

KELLOGG MAINTENANCE SHOPS:
BUILDINGS NUMBER 24 AND 25 (1918,1923)
235 Porter St.
Battle Creek

Battle Creek
16.652150.4686395
Calhoun

These two buildings, located at the rear of the Kellogg Company's immense Porter Street complex, have always been described in the Company site plans as "machine building and repair shops", and this was probably their function during the early years of the Kellogg Company. They now stand vacant and are occasionally used for storage. The northernmost of the two structures, which are about three feet apart, is a wooden-framed, one-story building, with an arched roof supported by wooden Pratt "Rainbo" trusses. It is 125 feet long and 40 feet wide. The second building, also wood-framed and one-story high, has a gabled roof and measures 100 feet long and 40 feet wide.

KING [LEONIDAS] MILL (1873,1900,1907)
880 King Rd., on Nottawa Creek
Leonidas

Leonidas
16.633700.4652975
St. Joseph

This gristmill was erected in 1873 by Charles and William Switzer. The name of the mill is derived from the fact that the King family owned and operated it continuously from 1888 until 1948. The original installation included grindstones driven by a waterwheel. The mill changed over to the roller process in 1900, when a 73 H.P. Leffel turbine was installed. A smaller (41 H.P.) turbine was installed in 1907. Both turbines are still in place and the smaller one is used to generate electricity. The mill is a four-story structure supported by a massive frame of 12 inch square hand-hewn timbers, with a gambrel roof, and is 30 feet wide and 60 feet long. The mill ceased operating in 1966 and now serves as a combination residence-gift shop. The original timber dam was washed out by a flood in 1907 and replaced by the present concrete dam, forty feet long and eight feet high.

KLINGMAN BUILDING (1895)
82 Ionia Ave., N.W.
Grand Rapids

Grand Rapids West
16.608610.4757600
Kent

Philip Klingman of Portsmouth, Ohio and Dudley Waters, a Grand Rapids banker, erected this building in 1895 to serve as a showroom for the furniture manufacturers of Grand Rapids. It is a four-story brick

building, approximately 100 feet wide and 150 feet long, with brick-arched doors and windows on the center portions of the south and west facades.
[Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), p. 218]

KOLB BREWERY (1890)
304 State St.
Bay City

Bay City
17.266425.4832400
Bay

This building was constructed in 1890 by George and Frederick Kolb at a cost of $50,000. It served as their brewery until Prohibition. They made "near beer" here in 1921-1925 and then produced various fruit sodas. It is a single-story rectangular brick building, 150 feet long and 60 feet wide, with a small wing (35 feet by 20 feet) extending from the southeast corner.
[Baker, C., Vanished Industries of Bay County (Bay City, 1975), I, pp. 94-96]

LIMBERT [BAKER] FURNITURE COMPANY (1904,1910)
147 Columbia Ave.
Holland

Holland
16.574075.4737075
Ottawa

Charles P. Limbert, a Grand Rapids resident, commuted to Holland via the electric interurban line during the construction of this factory. Frank Duke & Sons, contractors from Holland, erected the building, which contained about 90,000 square feet of floor space. A three-story addition was constructed in 1910 to the west of the original building. The Limbert Furniture Company failed in the late 1930's, a victim of the Depression. The buildings were used by the Northern Wood Products Company from 1940 until the late 1940's, then purchased in 1950 by the Baker Furniture Company, which has used them since for its upholstery operation. The westernmost portion of the extant buildings, extending from the water tower to Columbia Avenue, is an L-shaped building. One wing is 70 feet long, the other is 150 feet long, and both are 40 feet wide. This is the addition built in 1910. Proceeding east from the water tower, the remainder of the complex, built in 1904, consists of a three-story rectangular brick building, 70 feet wide and 220 feet long; a single-story rectangular brick structure, 70 feet wide and 135 feet long; and an L-shaped wood-framed building, each wing 220 feet long and 70 feet wide. This last portion, originally used for storing lumber, now serves as the Baker Furniture Museum.

Keeler Building (1912,1914), Grand Rapids

LINDEN MILL (1850) | Linden
Tickner St. | 17.272645.4743870
Linden | Genesee

The Linden Mill replaced an earlier (1837) mill lost to fire. It was an active mill until 1956 and has now been converted into municipal offices. A concrete dam constructed in 1967 replaced an earlier dam. It is a timber-framed building, 30 feet by 60 feet, two and one-half stories high, with clapboard siding, and a gabled roof. None of the original machinery and equipment is extant.
[MHD, Site Files; NR]

LOGGING EQUIPMENT (c.1900) | Grayling
Hartwick Pines State Park | 16.685170.4956860
Grayling Township | Crawford

This collection of logging equipment dates from Michigan's great logging era, c.1870-c.1900. It includes a logging wheel manufactured by Silas C. Overpack of Manistee, Michigan. These wheels, which won awards at the Chicago World's Fair in 1893, were developed by Overpack to enable Michigan's timbermen to move heavy logs with horses over rough logging roads. He manufactured these wheels in diameters of 9, 9 and one-half, and 10 feet, with the average set weighing approximately one ton. Also included in this collection is a sleigh used to move logs in the winter; a cast iron snow roller, 7 feet in diameter and 10 feet long, used to pack down snow on the logging roads; and a sprinkler sled, 5 feet wide and 12 feet long, used to ice the roads to facilitate the use of sleds. This equipment is located at a reconstructed lumber camp at the Hartwick Pines State Park.
[Overpack, Roy M., "The Michigan Logging Wheels," Michigan History (1951), pp. 222-225]

LUTCHKA BARN (1853) | Manchester
3427 Jacob Rd. | 16.738050.4675020
Sharon Township | Washtenaw

The Lutchka Barn is a rectangular fieldstone building, 30 feet wide and 40 feet long, with a gabled roof, brick-arched doors on the gable ends, and brick corners. This horse barn is a rare example of masonry barn construction in Michigan.
[Hartman, p. 22]

MANISTEE IRONWORKS (1907,1925)
254 River St.
Manistee

Bar Lake
16.554060.4899080
Manistee

The Manistee Ironworks was established in Manistee in 1875 and was a major producer of pumps and evaporation pans for salt and sugar plants. This plant has had major fires in 1905 and 1925, destroying most of the older buildings on the site. Two structures built in 1907 remain, a rectangular two-story brick building, 20 feet wide and 50 feet long, with a gabled roof, and the main foundry building, a rectangular brick structure, 120 feet wide and 270 feet long. It is two and one-half stories high and features a gabled roof with monitor, supported by a steel Fink truss. There is in addition a one-story rectangular brick building with a flat roof, 70 feet by 200 feet, built around 1925.

E.G. MANN AND SONS FEED MILL (1833,1896,1926)
201 E. Main St.
Manchester

Manchester
16.744065.4670040
Washtenaw

The gristmill originally built on this site in 1833 utilized a waterwheel and three run of stone. In 1896, a 100 H.P. Leffel turbine was installed in the mill, the roller process was introduced, and a new concrete dam, with a 12 foot head, along with concrete raceways, were constructed. The turbine, dam, and raceways are extant and still in use. The present building, however, dates from 1926.
[Jackson Citizen Patriot, September 15, 1974, pp. 29-31]

MEMMER BARN (c.1850)
Corner of Wolf Lake Rd. and old Michigan Ave.
Grass Lake

Manchester
16.729028.4680080
Jackson

This horse barn is a rectangular brick structure, 25 feet wide and 40 feet long, with a gabled roof and brick-arched doorways in the gable ends. Brick barn construction is virtually unknown in Michigan, particularly because of the state's rich timber resources.
[Hartman, p. 22]

MICHIGAN LIMESTONE AND CHEMICAL COMPANY:
CALCITE QUARRY (1911, c.1940)
Calcite Rd.
Rogers City

Rogers City
17.282000.5032000
Presque Isle

The limestone deposits at this site were thoroughly investigated in 1908-1909 by the geologist Henry H. Hindshaw. With the commercial value of the deposits firmly established, the Michigan Limestone and Chemical Company was formed in 1910 and they began operations here in 1912. The firm was purchased by Carl D. Bradley and the United States Steel Corporation in 1920 and has been solely owned by U.S. Steel since 1928. There is nothing remaining on this site predating the late 1930's with the exception of a Vulcan Steam Shovel with a three-fourths yard scoop. The steam shovel bears the inscription, "First Shovel at Calcite, Year 1911". The most impressive structure at this site is the screen house (c. 1940), an immense steel-framed brick building approximately ten stories high, measuring roughly 150 feet by 200 feet.

MONARCH PAPER MILL (1874)
Intersection of Cork St. and Portage Creek
Kalamazoo

Kalamazoo
16.617535.4679300
Kalamazoo

This is a mill complex of six interconnected buildings, all in brick with brick-arched windows, ranging from three to five stories high, mainly because the site is on the side of a steep hill. A combination of flat and slightly pitched roofs are present. There is a small rolling dam at the rear of the plant, with a rack and pinion lifting mechanism to control the flow of water from the Monarch Millpond. This mill complex was built by the Kalamazoo Paper Company in 1874 to replace an earlier (1866) wooden mill located on the same site and destroyed by fire in 1872. This is reputed to be the oldest paper mill in the Kalamazoo Valley still extant. The rebuilt mill was operated by the Monarch Paper Company until 1922, when it merged with the King Paper Company and the Berdeen Paper Company to form the Allied Paper Company, now a subsidiary of Smith Corona Marchant Company.
[Dunbar, Willis F., Kalamazoo and How It Grew (Kalamazoo: Western Michigan University Press, 1969), pp. 90-91, 100, 134, 175]

MORTON SALT COMPANY (1925, c.1940)
Ramsdell St.
Manistee

Manistee
16.555015.4898080
Manistee

This salt evaporation plant was constructed in 1925 after a major fire had destroyed all the buildings on this site. The surviving buildings include the Pan House, a five-story rectangular brick structure, approximately 75 feet by 50 feet; a single-story brick building, 75 feet wide and approximately 200 feet long, used for bagging, storage, and shipping; and a newer Pan House (c. 1940), a five-story brick building, approximately 50 feet by 75 feet.

NANKIN MILLS (c.1844)
33175 Ann Arbor Trail
Westland

Inkster
17.304830.4691000
Wayne

Built in 1844 as a gristmill, it was purchased in 1918 by Henry Ford. It was to be the first of his local village industries. Ford turned it into a hydroelectric plant that could generate from 30 to 50 horsepower. The mill was used for an engraving and die making factory. The mill is five stories high, three above ground and two below, and has dimensions of 30 feet by 40 feet. It has a gabled roof. Various additions have been built over the years, but basically the mill exists as it did during the late 1880's. The mill is presently being used as a nature center.
[Lewis, p. 36]

NEW TROY MILLS (1867,1891)
Avery Rd. at Galien River
New Troy

Three Oaks
16.534985.4635685
Berrien

This site formerly contained a sawmill erected in 1836. In 1867, Thomas and Ambrose Morley erected the present gristmill, located on the Galien River, and the mill remained in the Morley family until 1973. It was originally equipped with a horizontal turbine which drove several sets of stones, but these were removed in 1891 when the mill was converted to the roller process. The original dam was removed in the early 1920's when the mill was converted to electricity. The surviving building is a three-story timber-framed structure, with a gabled roof, 30 feet wide and 60 feet long. It has a sheet metal exterior. Virtually the entire

1867 gearing and belt system is intact as well as four sets of double rollers installed in 1891. The mill is still in active operation. [MHD, Site Files; Community Enterprise, Bridgman, Michigan, July 7, 1966, p. 6]

ORTONVILLE MILL (1852)
366 Mill St.
Ortonville

Ortonville
17.300090.4747100
Oakland

Built by Amos Orton in 1852 as a sawmill, the Ortonville Mill was erected for the purpose of attracting people to the community which is now called Ortonville. In 1889 the mill was converted to the roller process. In the 1920's the mill generated electric power for the community. The mill is a two and one-half story Greek Revival building with hand-hewn timber frame and unpaved basement. It now measures 36 feet by 108 feet although it was originally only 48 feet long. The larger room at the west end was added at a later date. Most of the original windows are sliding sash, 9 over 6. A roofed loading dock lines the mill side of the building. The mill is presently being used as a gathering place and a museum for residents of the village.
[History of Oakland County, Michigan (New York: Beers, 1872), p. 29; NR]

PARSHALLBURG MILL (1855-1856)
Niver Rd. and Ditch Rd.
Chesaning Township

Chesaning
16.736250.4780500
Saginaw

This mill was built by Israel Parshall in 1855-1856 and remained in the Parshall family until 1943. It ceased operations in the early 1960's and is now vacant. It rests on a rough-rubble foundation and is 30 feet wide and 115 feet long. There are two distinct segments, one of two stories and one of three stories.
[MHD, Site Files]

PETER VAN EVERY GRISTMILL (1837)
7450 Franklin Rd.
Bloomfield Township

Pontiac South
17.310655.4711010
Oakland

Built by Colonel Peter Van Every of Detroit in 1837, this gristmill was the first flour mill in Oakland County. The millwright was William A. Pratt. The milling equipment is gone and the cider press now at the

mill is believed to have been taken from another mill located downstream. The original mill is three stories high with dimensions of 60 feet by 90 feet. A one-story addition, 42 feet by 20 feet, has been added. Both buildings are made completely of wood and have gabled roofs. The building is now used as the ever popular Franklin Cider Mill.
[Portrait and Biographical Album of Oakland County, Michigan (Chicago: Chapman Bros., 1891), pp. 619-620; MHD, Site Files]

PEWABIC POTTERY COMPANY (1907)
10125 E. Jefferson Ave.
Detroit

Belle Isle
17.336815.4691610
Wayne

The Pewabic Pottery Works was designed and built by William B. Stratton and Frank D. Baldwin who formed the first firm in Michigan manned solely by architects trained in American schools. The first level of this two-story building is timber and brick while the oversail second level is half-timbered stucco. Brickwork is common bond and the windows are rectangular. The building has a medium hip roof with two chimneys. The eaves project over the walls and are framed with metal trim. Steel columns and beams support the structure at the rear machinery room and the roof is supported by steel Pratt trusses. The building is 45 feet wide, 100 feet long on one side, 90 feet long on the other. Power is transmitted to the mixing-pumping-filtering machinery by a series of belts, drive wheels, and bevelled pinion gears. The building is still used for pottery classes and a museum.
[Ferry, p. 282; MHD, Site Files; NR]

PEWABIC POTTERY EQUIPMENT ROOM (1912)
10125 E. Jefferson Ave.
Detroit

Belle Isle
17.336815.4691610
Wayne

The Pewabic Pottery had a rear addition built in 1912 to house the clay mixing and filtering equipment. The equipment was driven by a series of belts, suspended from the ceiling, and bevelled pinion gears which were all powered by a single 10 horsepower electric motor. The columns of the first floor were steel which supported the concrete and tile second floor. The roof was supported by wooden beams and columns with wooden pin joints.
[MHD, Site Files]

PEWABIC POTTERY KILN (1907) | Belle Isle
10125 E. Jefferson Ave. | 17.336815.4691610
Detroit | Wayne

The Pewabic Pottery Company used a revolutionary new, high-heat, oil-burning, kiln developed by Horace James Caulkins. He discovered much about gas fixtures and heat reactions while inventing a kiln to produce dental enamel. Miss Mary Chase Perry experimented with many clays and glazes in her ceramics that won her national acclaim. The Pewabic Pottery Company provided tiles for some of Detroit's outstanding buildings, including the Institute of Arts, the Public Library, St. Paul's Cathedral, and the Union Trust Building.
[Ferry, p. 262; MHD, Site Files; NR]

PORT HURON SALT COMPANY (1913-1931) | Port Huron
601 Busha Hwy. (M-29) | 17.380640.4752870
Marysville | St. Clair

This salt evaporation plant was originally constructed by the Port Huron Salt Company at the beginning of the twentieth century and was acquired by the Morton Salt Company in 1929. A major fire in 1944 destroyed the oldest buildings on the site. The remaining structures include the Powerhouse (1913), a two-story brick building, 260 feet long and 62 feet wide; the Maintenance Shops (1918), 114 feet long and 82 feet wide, also a two-story brick building; the Pan House (1914, 1918), a rectangular brick building 55 feet wide, 200 feet long, and 67 feet high, containing the original salt evaporation pans manufactured by the Manistee Ironworks of Manistee, Michigan (see other entry); the Grainers (1921-1933), three interconnected one-story brick buildings 156 feet wide with a combined length of 282 feet; and the Number 3 Warehouse (1916), 100 feet wide, 240 feet long, with a gabled roof.
[Jenks, William Lee, St. Clair County, Michigan (New York, 1912), I, pp. 374-375; The Morton Salt Tapestry, 1848-1973 (Morton Salt Company, 1973), p. 15]

POST CEREAL MANUFACTURING COMPLEX (1903-1917) | Battle Creek
E. Michigan Ave., near Porter St. | 16.651550.4685740
Battle Creek | Calhoun

This complex of buildings is the oldest extant portion of the Post Cereal complex of some thirty buildings. Beginning on the easternmost edge of this complex, and proceeding west, the first building is the Warehouse (1905), a two-story brick building, 150 feet by 50 feet. Next is the Powerhouse (1917), a three-story, steel-framed, brick structure which replaced an earlier powerhouse (1900) at the same location. It is approximately 50 feet square. The next structure, erected in 1907, is simply called Building Number 16 and has always been a general cereal manufacturing plant. It is 60 feet by 50 feet, three stories high, brick with brick arched windows. The fourth building (Number 17), is a five-story, steel-framed brick structure, 60 feet square, erected in 1917 and used for general cereal production. The fifth building (Number 18), erected in 1909, is five stories high, brick with brick arched windows, 60 feet square, and was also used for general cereal manufacture. All five of these buildings are flat-roofed.

POST BARN: BUILDING NUMBER 1 (c.1895)
275 Cliff St.
Battle Creek

Battle Creek
16.651620.4685650
Calhoun

It was in this building, originally a barn on what was the Beardslee Farm, that Charles W. Post began the manufacture of Postum Cereal (originally called "Monk's Brew"), the first of several ready-to-eat cereals which Post developed. He was the first "cereal millionaire" which Battle Creek produced. A plaque on the building reads, in part, "His equipment consisted of a coffee grinder, a gasoline stove, and $11.95 worth of grain". This simple wood-framed building rests on a cut stone foundation, has wooden clapboard siding, and a gabled roof, and measures around 50 feet by 40 feet. It is presently used as a medical facility for Post employees.
[Inside Battle Creek, Battle Creek Board of Education, Brochure No. 6, no date, p. 5]

POST OFFICE BUILDING NUMBER 7 (c.1895,1916,1920)
275 Cliff St.
Battle Creek

Battle Creek
16.651620.4685650
Calhoun

The southern half of this structure was the first office building C.W. Post built for his rapidly expanding business empire based on his innovations in the production and sale of ready-to-eat cereals, most notably Postum (1895), Grape Nuts (1897), and Post Toasties (1906). C.W. Post probably had his office in this building until 1904, when he erected the nearby office building known as the Clubhouse. This building, enlarged

in 1916 and 1920, has been in continuous use as an office building since its construction. It is a two-story, wood-framed structure with a mansard roof. The earliest portion of this building was approximately 100 feet long and 50 feet wide and was doubled in size by the additions made in 1916 and 1920. It rests on a stone and concrete foundation.
[Inside Battle Creek, Battle Creek Board of Education, Brochure No. 6, no date, pp. 5-6]

POST OFFICE BUILDING NUMBER 14:
CLUBHOUSE (1904,1908,1911,1937)
275 Cliff St.
Battle Creek

Battle Creek
16.651620.4685650
Calhoun

This handsome two-story brick and stucco building, with a gabled slate roof, approximately 75 feet by 40 feet, was C.W. Post's second office building on the grounds of his Battle Creek plant, standing in sharp contrast with the simpler wooden building erected around 1895, where his first office was located. It was in his private office on the second floor of this building that Post assembled his famous "brain trust" to manage his immense corporate empire. The enlarged building, roughly double its original size, was turned over to the Post employees for use as a clubhouse in 1924. C.W. Post's private office has been preserved and this building houses much of his art collection, still serves as a clubhouse for employees, and is used as a conference center by the Post Division of General Foods.
[Inside Battle Creek, Battle Creek Board of Education, Brochure No. 6, no date, pp. 5-6]

POST STORES BUILDING NUMBER 23 (1907)
275 Cliff St.
Battle Creek

Battle Creek
16.651620.4685650
Calhoun

This is an L-shaped wood-framed structure with a gambrel roof. The main portion is 100 feet by 30 feet, while the wing making up the L is 25 feet wide and 50 feet long. This barn-like structure was probably used as a barn for storage, rather than for cereal production, when initially constructed. Charles W. Post (1854-1914), after introducing Postum in 1895 and Grape Nuts in 1897, developed his third major ready-to-eat cereal, Elija's Manna (Post Toasties) in 1906. This building was part of a major expansion of his Battle Creek plant that took place at that time. It is presently used for storage.
[Inside Battle Creek, Battle Creek Board of Education, Brochure No. 6, no date, pp. 5-6]

RICHARDSON SILK MILL (1886,1905)
101 N. Front St.
Belding

Belding
16.643700.4773020
Ionia

Alva and Hiram Belding came to Patterson's Mills (renamed Belding in 1871) in 1858, but they returned to Massachusetts to join their brother Milo, who was engaged in silk manufacturing. Along with a fourth brother, David, they established a silk factory in Rockville, Connecticut in 1866 and built additional factories in Northampton, Massachusetts (1876), Montreal, and in Petaluma, California. Belding Brothers decided to establish a mill in Belding in 1886, but did not want their firm's name to be associated with the venture because they feared it might fail. Accordingly, they convinced a friend, George Richardson, to invest money in the venture and to give it his name. The mill that was built, which manufactured spool silk and thread, bore the name "Richardson". The surviving building has two distinct portions. The oldest (1886) is a rectangular four-story white brick building with four decorative courses of red brick which arch the windows. It is 50 feet wide and 250 feet long, and features two five-story brick towers, each 15 feet square. Adjoining this portion is an addition constructed in 1905. It is also a four-story rectangular structure, of white brick construction, but with no decorative red brick courses. It is 100 feet long and 50 feet wide.
[Belding Banner-News, August 29, 1957, pp. 3-4]

SANILAC SUGAR REFINING COMPANY (1902)
159 S. Howard St.
Croswell

Croswell
17.368820.4791460
Sanilac

The Sanilac Sugar Refining Company was organized by Charles Bemick of Detroit in 1901. This plant was constructed in 1902 by the Oxnard Construction Company with A.P. Cooper and S.W. Sinsheimer serving as construction engineers. The plant initially had a capacity of 600 tons of sugar beets sliced per day, and cost $600,000. The first campaign (1902) produced 5 million pounds of refined sugar, but the firm suffered losses of over $100,000 in 1902-1903. The plant was taken over by the Michigan Sugar Company in 1906 and is one of the firm's producing plants today. The main plant, all of brick construction, includes a two and three-story segment, 90 feet wide and 270 feet long, connected to a single-story segment 60 feet wide and 400 feet long, with a flat roof. In addition, there is a two-story brick warehouse, 48 feet wide and 200 feet long, and a one-story brick storage building, 40 feet by 90 feet.
[Dumond, Neva, Thumb Diggings (Lexington, MI, 1962), pp. 54-57; Gutleben, Dan, The Sugar Tramp (San Francisco, 1954), pp. 147-168]

Richardson Silk Mill (1886,1905), Belding

SCOTTS MILLING COMPANY (c.1880)
QR Ave., east of 36th St.
Scotts

Leonidas
16.630325.4671950
Kalamazoo

The Scotts Milling Company building is a typical example of late nineteenth century gristmills in operation in small rural communities in Michigan. It is a two-story rectangular structure, 100 feet long and 50 feet wide, resting on a rough rubble foundation. The main roof is gabled, while a pitched roof covers an addition located to the rear of the main structure.

SEBEWAING SUGAR COMPANY (1902)
501 Pine St. (M-25)
Sebewaing

Sebewaing
17.302870.4845840
Huron

The Sebewaing Sugar Refining Company was founded in 1901 by John Liken of Sebewaing and Ben Boutwell, a Bay City sugar magnate, with a capital stock of $300,000. The plant was constructed by the American Construction and Supply Company, with J.S. Eckert serving as construction engineer, and had an initial slicing capacity of 600 tons of sugar beets per day. The first campaign (1902) yielded 9.1 million pounds of granulated sugar and 505,000 pounds of yellow sugar from 48,270 tons of sugar beets. The plant's most successful campaign occurred in 1950, when it processed 213,000 tons of sugar beets. The Michigan Sugar Company acquired the plant in 1906 and it remains in production. The buildings surviving from 1902 include a three and four-story rectangular brick structure resting on a cut stone foundation, 160 feet wide and 270 feet long, connected to a similar two-story building, 210 feet in length, and a single-story segment 100 feet long. There is in addition a one-story brick storage building, 45 feet by 120 feet and a brick office building, 20 feet wide and 45 feet long, with a gabled roof. The complex also includes a two-story warehouse (c. 1920), approximately 75 feet wide and 250 feet in length.
[Gutleben, Dan, The Sugar Tramp (San Francisco, 1954), pp. 177-186]

STROH BREWERY COMPANY COMPLEX (1912,1955)
909 E. Elizabeth St.
Detroit

Detroit
17.331840.4689470
Wayne

The Stroh's Brewery Complex consists of approximately 26 buildings. These are the office building, the stockhouse, the eight-story brew house, and the ice cream building as well as a number of other miscellaneous structures. All of the buildings are constructed of red brick with white concrete trimming. The office building and the brew house were both built in 1912 and are the only original structures in the complex. The brew house contains nineteen 250 barrel capacity copper brew kettles and the interior walls are finished in pewabic tiling. The walls of the ice cream building are constructed of eight foot thick brick which tapers off upward. The stockhouse was built in 1955. The complex is situated on the corner of Gratiot Avenue near Downtown Detroit, forming a triangular island with the Chrysler Freeway. It produces a capacity of 6,000,000 barrels of beer annually as well as malt extracts, soft drinks, and ice cream.

SUMNER GRISTMILL (1880)
Mill St.
Sumner

Sumner
16.676880.4796850
Gratiot

This mill was constructed by Willaby B. Lathrop in 1880 and was operated by him until 1904, when Arthur Fowler purchased the property. Fowler installed a feed mill and began using the roller process. The mill consists of a two-story segment, 25 feet by 30 feet, with a gabled roof, and a three-story segment, 20 feet by 40 feet, with a gambrel roof. Both segments rest on stone foundations. The mill building is badly deteriorated, but contains grinders, sifters, a stone mill, and a centrifugal waterwheel, all dating from the late nineteenth century.
[Tucker, Willard, Gratiot County, Michigan (Saginaw, 1913), pp. 527, 1188; Portrait and Biographical Album of Gratiot County (Chicago: Chapman Bros., 1884), pp. 572-575]

SWINDELL BUILDINGS (1902,1914)
425-429 N. Church St.
Kalamazoo

Kalamazoo
16.616530.4683300
Kalamazoo

The oldest of these two adjoining four-story brick buildings was erected in 1902 by Charles H. Swindell of Kalamazoo, wholesaler of produce, poultry, and dairy products and his brother Joseph of Plymouth, Indiana, president of the Swindell Brothers Cold Storage Company. The 1902 building is flat-roofed and features small brick-arched windows. In 1914, Charles Swindell and G.K. Taylor formed the Swindell-Taylor Company and erected the second building, immediately south of the first. Approximately 150 feet long and 75 feet wide, it features four large loading bays which facilitate the movement of produce by truck. None of the original refrigeration equipment is extant.
[Kalamazoo City Directory, 1902-1919]

VALLEY SUGAR COMPANY (1901)
341 Sugar St.
Carrollton

Saginaw
17.262620.4815418
Saginaw

The Valley Sugar Company was established in 1901 and began operating this beet sugar processing plant in 1902. After successful campaigns in 1902 and 1903, the plant was closed until 1906, when it was taken over by the newly-formed Michigan Sugar Company, which was operating five additional sugar plants in Michigan. This plant was built by the Kilby Manufacturing

Company, with J.A. Shepard serving as the construction engineer. It initially had a capacity of 600 tons (sugar beets sliced per day). The surviving buildings dating from 1901 include a one-story rectangular brick building, approximately 70 feet wide and 200 feet long; a similar two-story building of the same dimensions; and the main processing building, a four-story brick structure, 70 feet wide and approximately 300 feet in length.
[Mills, James C., History of Saginaw County (Saginaw, 1918), p. 479; The Sugar Tramp (Bay City, 1920), pp. 44, 188-194]

WALKER'S GRISTMILL (1869)
8507 Parshallville Rd.
Parshallville

Hartland
17.272200.4730060
Livingston

This attractive gristmill was constructed in 1869. It was purchased by Tom Walker and John Browing in 1878 for $10,000 and remained in the Walker family until 1969, when it ceased operating. It is now occupied by several gift shops. It is a four-story frame building, 30 feet wide and 50 feet long, with board and batten siding and a gambrel roof.
[MHD, Site Files]

WALLACE MILLS (1887)
3475 Bluff Rd.
Port Austin Township

Port Austin East
17.348440.4879150
Huron

Robert Wallace was a partner in the Lake Huron Stone Company, one of the major producers of grindstones in Grindstone City. This gristmill was constructed here in 1887 to serve the community, which had a population of about 1,500 at the time. This is one of the few native stone buildings constructed in this district, which was a major center for quarries and grindstone production. The mill building is 30 feet wide, 40 feet long, three stories high, and has a flat roof. None of the milling machinery remains and the building has been converted into apartments.
[Portrait and Biographical Album of Huron County, Michigan (Chicago, 1884), p. 187; MHD, Site Files; NR]

WATERLOO MILL (1838, c.1890)
15675 Gorton Rd.
Waterloo

Stockbridge
16.735095.4692077
Jackson

Patrick Hubbard built this gristmill, the first in Waterloo, in 1838 and it has operated continuously until 1952. The rectangular frame building is 30 feet wide, 40 feet long, with a gabled roof. The extant machinery and equipment includes a turbine (c. 1890), one of the original millstones, and several late nineteenth century milling machines.
[History of Jackson County, Michigan (Chicago, 1881), pp. 1132-1133]

WATERS BUILDING (1899)
Ottawa Ave., Pearl St. to Lyon St.
Grand Rapids

Grand Rapids West
16.608410.4757780
Kent

The Waters Building was one of several major furniture exhibition centers in Grand Rapids where buyers would come from all over the United States to view and purchase the high quality products of the Grand Rapids furniture industry. The Waters Building was constructed by Philip Klingman, a major furniture dealer, and Dudley Waters, a powerful Grand Rapids banker. It is a six-story steel-framed brick structure, approximately 350 feet long and 200 feet wide.
[Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), p. 218]

WILLIAM HAYDEN MILLING COMPANY (1898,1935)
703 Chicago Blvd. (M-50)
Tecumseh

Tecumseh North
17.257000.4654230
Lenawee

William Hayden settled in Tecumseh in 1858 and purchased the Globe Flour Mill, originally built in 1833 by the firm of Wing, Evans, and Brown. This mill was destroyed by fire in 1898 and was rebuilt by Levi Hayden, the son of the previous owner. In 1935 Henry Ford purchased the old mill, restored it and built an additional building on this site, and used the buildings for a soybean cleaning plant. The oldest portion is a two-story rectangular frame building resting on a rough-cut stone foundation, with a gambrel roof, and is 30 feet wide and 175 feet long. The 1935 building is a rectangular two-story structure, 30 feet wide and 70 feet long, with a flat roof. An overshot steel waterwheel, 8 feet wide and 20 feet in diameter, is extant. It bears the nameplate, "Fitz Waterwheel

Co., Hanover, PA", and probably was installed in 1935. These buildings now serve as a community center for the City of Tecumseh.
[Bonner, Richard, Memoirs of Lenawee County, Vol. II (Madison, Wisconsin, 1909), pp. 208-209; Lewis, David, "Tour of Henry Ford's Village Industries," Old Mill News, October, 1975, p. 16]

WOLCOTT'S MILL (c.1838)
8572 Silver Lake Rd.
Argentine

Linden
17.267400.4741400
Genesee

James H. Murray, one of the first settlers in Argentine in 1836, built a large frame gristmill with two run of stone in about 1838. His flour was brought to Detroit by wagon over the White Lake Road. The extant rectangular frame building, 30 feet wide and 50 feet long, with a gambrel roof, appears to be the original structure. After a major flood in 1929, the building's stone foundation was replaced with concrete. The twin Leffel turbines which operate the mill were installed in 1937.
[Fenton Courier, September 13, 1935; MHD, Site Files]

INTRODUCTION TO MANUFACTURING INDUSTRIES

This section includes all manufacturing not covered in the "Bulk Product Industry" category and the sites identified reflect Michigan's mixed industrial history. Included are facilities used to manufacture adding machines, aircraft, buggies, farm implements, lathes, leather goods, pianos, railroad cranes, rulers, ships, stoves, wagons, and window shades. Logically enough, the largest number of sites are automobile manufacturing and assembly plants.

A great deal of attention is concentrated on the automobile industry because Michigan has been the center of the industry since the early twentieth century and because it has dominated the state's economic and urban development since 1900. Motor vehicle production was only about 65,000 units nationally in 1908, but then increased dramatically to 1.6 million in 1916 and then continued to expand to a pre-Depression peak of 5.3 million units in 1929. Along with this expansion of output, there was an increased concentration of production in Michigan. In 1916 about one-quarter of all American automobiles were made in Michigan and by the 1930's, the state accounted for over 60% of all employment in the industry. This concentration has been reversed in the postwar era, leaving the state with chronic unemployment since the mid-1950's.

The automobile industry also determined the pace, timing, and character of much of the state's urban growth. Detroit was already a manufacturing center (stoves, railroad cars, and bicycles) in 1900 with a population of nearly 300,000, but remarkable growth in the following decades led to a population of nearly 1.6 million by 1930. Flint, more closely tied to the automobile than Detroit, grew from 13,000 in 1900 to 156,000 by 1930.

The industry has been significant in terms of industrial engineering and in the design of industrial buildings. Henry Ford developed and perfected the moving assembly line at his Highland Park Plant after 1910 and the other automakers quickly followed suit. Ford, with Albert Kahn as his chief architect, was instrumental in several innovations in factory design, particularly the use of reinforced concrete in the 1910's and the movement towards single-story steel-frame buildings in the 1920's. These developments are discussed in more detail in the Building Technology section of this volume.

No attempt to summarize the history of the automobile industry or explain why it blossomed in Michigan will be encountered here. There are, however, a few observations which may help the reader place these individual sites in better perspective. Detroit and Flint were major manufacturing centers for buggies, carriages, and wagons before the coming of the automobile and many of the important early pioneers in the industry, such as Billy Durant, Dallas Dort, and the Fisher Brothers, originally produced horse-drawn vehicles.

The automobile industry began with hundreds of small producers located all over the United States. The Ford Motor Company was founded in 1903, introduced the Model T in 1908, and moved into the Highland Park Plant in 1910, but Ford dominated the industry only for the period from about 1915 until the mid-1920's. Ford remained essentially a Detroit-based operation during these years. The General Motors Corporation founded by Billy Durant in 1908 became the dominant firm in the industry in the mid-1920's, largely because of the success of Chevrolet. General Motors is not as closely associated with Detroit as the other automakers. While Cadillac production was concentrated in Detroit, Chevrolets and Buicks were made in Flint, Oldsmobiles in Lansing, and Oaklands (later Pontiacs) in Pontiac. The Chrysler Corporation did not start until 1925, but its major predecessor companies had earlier roots in Detroit.

ALTER MOTOR CAR COMPANY (1914)
Farmer St.
Plymouth

Northville
17.296960.4694510
Wayne

The Alter Motor Car Company was established in the hamlet of Plymouth in 1914 by F.M. Woodward and Guy Hamilton with $5,000 in capital raised from village residents. It produced several models, the most popular a roadster (1916) with a 108 inch wheelbase, 27 horsepower motor, and a price tag of $685. The owners considered expanding the plant in 1916, but were unsuccessful in attracting additional capital. It was dissolved in January 1917 and placed in the hands of receivers. In three years, this firm had produced about 1,000 cars. The surviving building consists of a one-story rectangular frame segment, 40 feet wide and 200 feet long and an adjoining two-story segment, 60 feet wide and 192 feet long.
[Hudson, Sam, The Story of Plymouth, Michigan: A Midwest Microcosm (Plymouth, 1976), pp. 73, 91-94]

AMERICAN LOGGING TOOL CORPORATION (1906)
302 N. Main St.
Evart

Evart
16.639085.4862050
Osceola

Maglorie Belanger came to Evart in 1875, when this was a major logging and sawmill center on the Muskegon River. He began making logging tools in his forge and then joined the Champion Tool and Handle Company (established in the 1880's) in 1893. Along with the Evart Tool Company, Champion Tool became a major producer of logging tools in the late 1890's. In 1905, all the major logging tool producers in the United States formed the American Logging Tool Corporation, but the firm was disbanded in 1911 for violating the Sherman Anti-Trust Act. It was permitted to operate as a single firm in 1912, with the provision that it could operate only one plant. The firm decided to concentrate all its production at this site, the previous location of the Champion Tool and Handle Company. The surviving buildings date from 1906 because the entire plant was lost by fire in that year. The main manufacturing building is 60 feet wide and 250 feet long. The westerly segment (60 feet by 50 feet) is brick, with a gabled roof, while the remainder of the building is a wood-framed structure with a flat roof and a monitor 20 feet wide, all supported by wood trussing.
[Hesselink, Alice, "The Story of the Logging Tool Industry of Evart, Michigan," unpublished paper, Central Michigan University, 1968, passim]

BARLEY MANUFACTURING COMPANY PLANT (c.1920)
1811 Factory St.
Kalamazoo

Kalamazoo
16.619155.4689350
Kalamazoo

The Barley Manufacturing Company built this factory complex in the early 1920's and the Roamer automobile was assembled here until 1927, when assembly operations were transferred to Canada. It was originally a U-shaped, three-story brick building containing 350,000 square feet of floor space, fronting on Factory and Reed Streets. The portion fronting on Reed Street was destroyed in a recent fire, while two sections of the original structure, each 50 feet wide and 150 feet long, are extant. [Lewis, p. 36]

BLOOD BROTHERS AUTOMOBILE AND MACHINE COMPANY (1912)
635 W. Ransom St.
Kalamazoo

Kalamazoo
16.616040.4683425
Kalamazoo

Charles C. and Maurice E. Blood were bicycle manufacturers in Kalamazoo from 1891 on. They organized the Blood Brothers Automobile and Machine Company in 1904 and made the Cornelian car in this building in 1912-1913. They moved their automobile assembly operations to Allegan, Michigan in 1913 and soon stopped production of cars altogether. This U-shaped brick structure, using Flemish bond, is two stories high at both ends, and one story high in the middle section and has a three-story hexagonal tower on the northwest corner. All the windows are arched in brick. This building has had numerous occupants and is now used by a building company for storage and offices.
[Dunbar, Willis F., Kalamazoo and How It Grew (Kalamazoo: Western Michigan University Press, 1969), p. 122; Lewis, p. 36]

BURROUGHS ADDING MACHINE COMPANY (1904)
1 Burroughs Place
Detroit

Detroit
17.328880.4692100
Wayne

Joseph Boyer transplanted the Burroughs Adding Machine Company to Detroit from St. Louis is 1902. The lack of trade union activity played a very important role in his decision. He hired Albert Kahn in 1904 to design a new factory for him at its present site on Second Avenue. The following year Burroughs became incorporated. The building was constructed of reinforced concrete and brick, with a sawtooth roof for natural lighting, and

stood at various heights. The plans included the broadening of the roads and the landscaping of the surrounding grounds. An effort was also made at enhancing the aesthetic quality of the two-story office portion of the building. A five-story concrete structure with open courts was added between 1912 and 1919. In 1973 the building was completely torn apart, with the exception of the original framework, and a totally new structure was put up around the initial framework. Outside of the original framework and the original board room, nothing is left of the original building.
[Burton, Vol. 1, pp. 557-562; Legacy, p. 13; Ferry, p. 179; Titus, p. 276]

BURTT BROTHERS MANUFACTURING COMPANY (c.1900)
130 N. Edwards St.
Kalamazoo

Kalamazoo
16.617040.4683080
Kalamazoo

This two-story rectangular brick building was erected around 1900 and was originally occupied by the Newton Buggy Company. The Burtt Brothers Manufacturing Company assembled the Cannon automobile in this building in 1903-1906. Production took place on both floors and a freight elevator, still extant, was used to move parts and sub-assemblies between the two floors. The first floor has been altered, with a new brick facing and wood panels placed over the original brick facade.
[Lewis, p. 36]

BUSH AND LANE PIANO COMPANY (1905,1924)
573 Columbia Ave.
Holland

Holland
16.574070.4736020
Ottawa

In 1905, the Bush and Lane Piano Company of Chicago moved into Holland and erected a new plant with 135,000 feet of floor space. The company was capitalized at $500,000 and employed about sixty workers initially. The general contractor for the building was Frank Duke and Son, while the masonry was done by Burt Hebbing, Holland's leading bricklayer. The plant was powered by an Allis-Chalmers Corliss engine until 1959, when it was retired and moved to its present location, adjacent to the Baker Furniture Museum. Bush and Lane was a very successful firm and increased its floor space by building a large three-story addition in 1924. The firm went bankrupt during the Depression and the building was vacant in 1929-1933. The Baker Furniture Company, which had three small furniture factories in Allegan, moved into the plant in 1934 and still occupies the buildings at the present time. The building erected in 1905 is a two-story white brick structure, with flat roofs. It is L-shaped, with one wing 300 feet long, the other 240 feet long, and both wings 50 feet wide. The 1924 addition is three stories high, 300 feet long, 50 feet wide, and has a flat roof. It is a steel-framed building with red brick walls.

CADILLAC MOTOR CAR COMPANY (1905)
450 Amsterdam
Detroit

Detroit
17.329055.4692225
Wayne

The Cadillac Automobile Company was founded in 1902 by Henry Leland and a group of Detroit financiers. The firm then merged with the Leland and Faulconer Manufacturing Company in 1905 to form the Cadillac Motor Car Company. It was at the time of this merger that the firm needed to expand its plant to take advantage of a booming market and it turned to a reinforced concrete design as a solution. The building was designed by George D. Mason, while the Trussed Concrete Steel Company of Detroit prepared the reinforced concrete designs and the Concrete Steel and Tile Construction Company of Detroit served as the general contractor. Construction took only 67 days and the building was completely shortly after the Packard Motor Car Company Building Number 10 was finished. It is a three-story structure with a basement, 90 feet wide and 300 feet long, providing 94,500 square feet of floor space. The concrete columns, each reinforced with four Kahn bars, one at each corner, are 18 inches square in the basement and two inches smaller on each succeeding floor. The spans between columns vary from 13 to 24 feet. The floors consist of five inch concrete joists spaced 17 inches apart, each joist containing a Kahn trussed bar with shear members 7 inches apart. There are hollow terra cotta building tiles between the joists, and a two inch layer of cement grout over the joists and tiles. The floors vary in depth from 8 to 14 inches and are designed for live loads of 200 pounds per square foot on the first floor and 150 pounds on the remaining floors. The exterior walls facing the street are brick, while the remaining walls are reinforced concrete.
[Burton, Vol. 1, pp. 572-573; Ferry, pp. 181-182; Engineering Record, Vol. 54, No. 20, November 17, 1906, pp. 544-545]

MANUFACTURING INDUSTRIES

CADILLAC MOTOR CAR COMPANY (1921)
2860 Clark St.
Detroit

Detroit
17.326740.4680050
Wayne

Over the years much of Cadillac's production had become scattered all over the city. At one point Cadillac decided to establish its operations at one location, and chose the site on Clark Street which had originally been picked by H.M. Leland. Cadillac gave up its eastside plant on Trombley Avenue, and sold the factory at Cass and Amsterdam to Fisher Body. The design and construction of the buildings was assumed by the Du Pont Engineering Company of Delaware. With Cadillac's stress on product excellence rather than mass production, it was thought that the long, one-story factory would take up too much space. It was decided to build a number of buildings, keeping the details of the structures fairly constant -- a standard width between wings, a standard height for most of the buildings, and a standard height of 14 feet between floor and ceiling. The buildings were to be heated by using steam circulating throughout the plant. When talking about the Cadillac site, a number of buildings are included. The original factory buildings still remaining consist of the Heat Treatment Plant, the Manufacturing Building, the Assembly Building, the Storage Building, and the loading docks. On the northwest corner of Clark Street stood the Heat Treatment Plant. This building is a one-story structure, built of reinforced concrete, and measuring 499 feet long and 78 feet wide. It has red brick facing, walls of glass on the sides, and a butterfly monitor extending the full length of the building. The foundry was closed on July 23, 1963 and is currently being utilized for the complete production of the Cadillac Eldorado and the Seville. Next to the Heat Treatment Plant is the largest of the original buildings, the Manufacturing Building. This structure's dimensions are 792 feet long and 616 feet wide, and is divided into six rectangular open courts with each wing of the building being 66 feet wide. The lighting and the ventilation for this building came from these open courts which are generally 66 feet wide. The courts were covered with glass roofs at the first floor level. The building is four stories high, built of reinforced concrete of flat slab construction and red brick facing. It also has a flat roof and steel window sash covering a large area of space. Today, engine assembly, gear and axle, and the press plant are located in this building. Across Clark Street, on the northeast side stands the Assembly Building. This was the second largest of the original factory buildings. Its overall dimensions are 815 feet long and 362 feet wide. It is a U-shaped structure with two long parallel wings, one measuring 66 feet wide and the other 80 feet wide, each wing separated by an open court that is 66 feet wide. The extended portion of the outer wings are 150 feet long.

It is built of reinforced concrete and features four stories, red-faced brick, a flat roof, and steel window sashes. A fifth floor of steel was later added. It was the site of the final assembly of the Cadillac. It is currently being used for sub-assembly operations and engineering offices. Adjoining the Assembly Building was the Storage Building which was used for storing up to 1,000 automobiles and service stock. It is a four-story building of reinforced concrete with dimensions of 490 feet in length and 145 feet in width. It also has red brick facing and a flat roof. The area between the Assembly and Storage Buildings has since been filled in. Next to the Storage Building stands the loading docks on the tracks of the New York Central Railroad. The building is shaped like a right triangle and measures 442 feet long and 216 feet wide. The loading dock had a glass roof over it with a butterfly monitor so that automobiles could be loaded in any type of weather. It also had a crane for loading automobiles into the railroad cars.
[Burton, Vol. 1, p. 573; Ferry, p. 337; Hendry, Maurice D., Cadillac, The Complete Seventy-Five Year History (New Jersey: Princeton Publishing Company, 1973), p. 116; Cadillac Clearing House, January 1, 1920]

CHALMERS MOTOR COMPANY:
CHRYSLER JEFFERSON ASSEMBLY PLANT (1907,1916)
12200 E. Jefferson Ave.
Detroit

Belle Isle
17.338340.4692640
Wayne

Roy Chapin brought Hugh Chalmers, a salesman for National Cash Register Company, into the Thomas Motor Company of Buffalo. In 1908 the name of the firm was changed to Chalmers-Detroit when Chrysler bought E.R. Thomas' stock. The Chalmers Motor Company thereupon followed the Chalmers-Detroit Company in 1911. Their factory was leased to the Maxwell Motor Company for five years in 1917. Because of financial difficulties, Walter Chrysler stepped in, at first to reorganize the company, but later purchasing the Maxwell-Chalmers companies in 1923. Designed by Albert Kahn, the Chalmers Motor Company consisted of three parallel wings that resemble the Packard Number 10 Building expanded. These wings were linked together by intersecting passageways designed to form both open and closed courts. Each wing is 400 feet long and 60 feet wide, and four stories high. It is built of reinforced concrete and has a flat roof. The intersecting wing is approximately 180 feet long and 60 feet wide. Another parallel wing was added in 1916. It is also 400 feet long and 60 feet wide, and connects the other building by a wing that is 50 feet by 60 feet. Many

different model cars were built at the Chalmers plant. In 1924 the first model of the Chrysler was made here. The first DeSoto was turned out from here in 1928, as well as the first Saxons.
[Ferry, p. 338; Legacy, p. 12; Rae, John B., American Automobile Manufacturers, The First Forty Years (Philadelphia: Chilton Company, 1959), pp. 55-56, 96-97, 114, 143-144, 162-163; "Chalmers Factory Grows With Chalmers Sales," Automobile Topics, XLII, (June 3, 1916), p. 347]

CHEVROLET MOTOR COMPANY (1911-1912)
1145 W. Grand Blvd.
Detroit

Detroit
17.327000.4688800
Wayne

Louis Chevrolet, a Swiss racing driver and engineer, experimented with four and six cylinder automobiles in a small shop on Grand River Avenue in Detroit in 1911, financed by Billy Durant of General Motors. Durant wanted to produce a car which could compete with Ford's Model T and Chevrolet delivered several prototypes to Durant in the Fall of 1911. Durant organized the Chevrolet Motor Company in November 1911, with William Little as general manager, to produce a six cylinder model known as the "Classic Six" or "Model C". Durant took over this plant on West Grand Blvd. and produced about 3,000 cars there in 1912. Louis Chevrolet had left the enterprise to return to racing and Durant merged the company with the Little Motor Car Company and the Mason Motor Car Company of Flint (see other entry). The production of Chevrolets was moved to Flint in August 1913. This plant was used to produce Sterling automobiles in 1913-1918, and then was occupied by the Automatic Products Company, makers of screw machines, until 1968. This three-story rectangular brick building, 100 feet wide and 330 feet long, is now vacant.
[Pound, Arthur, The Turning Wheel (New York, 1934), pp. 145-148; Detroit News, November 3, 1961, p. 12]

CLARK-CARTER AUTOMOBILE COMPANY (1909)
520 N. Mechanic St.
Jackson

Jackson North
16.713940.4680875
Jackson

This building was used briefly, in 1909-1912, by the Cutting Motor Company to manufacture the Cutting car. There was a brief period in Jackson's history when about a dozen different automobile companies were operating there, but most were short-lived and Jackson never became a center for automobile production. This is a three-story red brick L-shaped structure, with one wing 60 feet wide and 320 feet long and a smaller wing measuring 60 feet wide and 80 feet long.
[Lewis, p. 36]

COLLINS WAGON WORKS BUILDING (1895,1899)
2301 E. Michigan Ave.
Jackson

Jackson North
16.716500.4680940
Jackson

This large factory complex, originally the home of a wagon works, was purchased by the Jackson Automobile Company in 1903 and was used by that company to produce the Jackson car in 1903-1923. It is a three-story brick structure with brick-arched windows and flat roofs. There are four sections, each 240 feet long and 60 feet wide, which form an immense square enclosing a large open court in the center of the complex. There is, in addition, a five-story square tower, built in 1899, on the northwest corner of the complex.
[Lewis, p. 36]

CONTINENTAL MOTOR MANUFACTURING COMPANY (1912)
12801 E. Jefferson Ave.
Detroit

Belle Isle
17.399020.4692585
Wayne

Opposite the Hudson Motor Car Company on Algonquin Street stood the Continental Motor Manufacturing Company. This firm manufactured automobile engines. This business proved to be so promising that the parent company, located in Muskegon, decided to build a plant in Detroit, which was the hub of the automotive industry in 1912. Continental became one of the largest independent suppliers of engines to the automotive factories. Most of the buildings have already been razed, so that only two buildings are left. One building still standing was the Machine Shop. The Machine Shop was designed by Albert Kahn and Ernest Wilby. It is a one-story building constructed of structural steel and brick. The steel channels used to support the counter shafting are set out in such a manner that they make a part of the roof framing itself. It has a sawtooth roof running the full width of the building, and monitors. In order to provide maximum lighting, steel sash was used. An addition to the building was made later. This expanded building was built of reinforced concrete and brick, with multiple levels and many monitors. The Powerhouse, near the Machine Shop, is about two stories high, built of structural steel and brick on a reinforced concrete base. Its dimensions are 110 feet long and 90 feet wide. It had wide walls of frosted glass on the east and west sides of the building, and also has a flat roof. There were seven coal-fired boilers installed between 1911 and 1920. Kaiser Frazer Corporation leased the buildings in the 1950's, and replaced the seven coal-fired boilers for three of the more economical

and more efficient oil-fired boilers. A fourth boiler was added later. Electric power was produced here at one time too. The most prominent characteristic that identifies this site as the Continental Motor Company plant is the large smokestack with its name still inscribed on it. The buildings stand vacant today.
[Legacy, p. 13; Baird, D.G., "Coal to Oil Changeover Pays Off in Eighteen Months," Mill and Factory, L, (March 1952), pp. 128-129; Frohne, H.W., "Factory and Warehouse," The American Architect, CI, (June 19, 1912), pp. 278-279, 281; Rae, John B., American Automobile Manufacturers (Philadelphia: Chilton Company, 1959), p. 130; Pamphlet of the Continental Motor Company, circa 1927, n.p.]

DEFOE BOAT AND MOTOR WORKS (1920)	Bay City
Adams St.	17.266985.4831900
Bay City	Bay

The Defoe Boat and Motor Works was organized by Harry J. Defoe in 1905. It operated on the east bank of the Saginaw River at the present site of Wononah Park in 1905-1910, then moved to the west bank, where the firm remained until 1918, when it moved to its current location on Adams Street on the east bank. During World War II, the Defoe yards developed the "Roll-Over" technique for large ship construction. The ship was initially built upside down, then rolled over on two eccentric wheels, each 50 feet in diameter and weighing 40 tons. A 1700 ton vessel could be righted in three minutes and the remaining assembly work completed. The "Roll-Over" technique enabled all welding to be done in the "tip-down" position, which was not only faster, but could be carried out by relatively unskilled labor, and thus represented a considerable savings in labor costs. There are no buildings or equipment in this site surviving from the original yards of 1918. The oldest building, constructed around 1920, is a wood-framed rectangular structure, 60 feet wide and 200 feet long, with a round roof supported by a steel "Rain-bo" truss. The walls are sheathed with corrugated iron, added in more recent years. There are no other buildings in this complex predating the late 1930's.
[Butterfield, George E., Bay County, Past and Present (Bay City, 1914), pp. 100-103]

DETROIT FREE PRESS BUILDING (1911-1913)
131 W. Lafayette Blvd.
Detroit

Detroit
17.331200.4688390
Wayne

Albert Kahn designed this ten-story flat-roofed former Detroit Free Press Building. Kahn was accustomed to working with concrete structures. However, building over eight stories with concrete was impractical and uneconomical. This building was his first design using steel-frame construction. The structure is 120 feet long and 95 feet wide. It has a white terra-cotta facing while the brickwork is common bond. The windows are rectangular with basket-handled arches on the top floor. The building was later called the Transportation Building for many years but has been recently renamed the Canadian National and Grand Trunk Building.
[Ferry, p. 187; Legacy, p. 14]

DETROIT FREE PRESS BUILDING (1923)
321 W. Lafayette Blvd.
Detroit

Detroit
17.331000.4688270
Wayne

Albert Kahn designed this flat-roofed building as the new headquarters for the Detroit Free Press. The building has a thirteen-story central tower with two six-story wings. The steel-framed structure is faced with limestone. It is 200 feet long, 125 feet wide, and has rectangular windows with basket-handled arches on the top floor. The rear and light courts of the building are faced with common bond brick.
[Ferry, p. 333]

DETROIT NEWS BUILDING (1917)
615 Lafayette Blvd. at Second Ave.
Detroit

Detroit
17.330745.4688165
Wayne

The Detroit News Building, designed by Albert Kahn and Ernest Wilby in 1915, is a massive modern structure that still suggests a sense of the old world. Kahn used as his model for this building a department store in Berlin. This style of architecture exemplified his later efforts at commercial buildings and represents the architect's idea of efficient use of space for production. The site was the home of Zachariah Chandler, a prominent Michigan politician. Ground was broken in November 1915 and was not completed until October 1917. The building is three stories high, constructed of reinforced concrete, and has a flat roof. Its dimensions

are 325 feet long by 165 feet wide. Spacious windows on the first floor trimmed by very large arches, massive corner pylons, and extensive decorations are among the building's other features. It still serves as the main offices of the Detroit News.
[Burton, Vol. 1, pp. 817-819; Ferry, pp. 332-333; Legacy, p. 14; Titus, p. 270]

DODGE BROTHERS COMPANY (1914,1917)
79000 Joseph Campau
Hamtramck

Highland Park
17.331560.4694360
Wayne

Almost from the beginning, the Dodge Brothers Company built automotive engines and parts for the Ford Motor Company. But as early as 1910, the Dodge brothers were planning to manufacture a car of their own. In that year they purchased the present site of the Dodge Assembly Plant in Hamtramck. After their break with Ford, the Dodge brothers produced the first car, which rolled off the assembly line on November 14, 1914. Commissioned by the Dodge brothers, Albert Kahn began to design the factory buildings for them. The striking similarities between the Dodge factory and that of Highland Park are readily apparent, especially the arrangement of the administration building, the powerhouse, and the assembly building with its six-story wing on the south side. The main assembly building is approximately 1,100 feet long and 60 feet wide. It is four stories high, constructed of reinforced concrete, has a flat roof, and has two closed courts at the north end. Its fenestra windows give the building an appearance of an unbroken wall of glass. On the south side, the building is six stories high, constructed of reinforced concrete, and has a flat roof. In front of this building stands the four-story office building. It measures 400 feet long by 80 feet wide, has a flat roof, and is constructed of brick. The office building was completed in October 1915. Connecting the administration building is the present powerhouse which dates back to 1920. Another building was added in 1917 to assist the war effort during World War I. Its purpose was to build a certain recoil apparatus for the 155 mm Howitzers. The building was constructed of reinforced concrete and steel with brick facing. Its dimensions were 310 feet long by 125 feet wide. It is eight stories high facing Joseph Campau but only five stories in the back. On July 30, 1928, the Chrysler Corporation acquired the Dodge Brothers Company, and therefore was known as the "Dodge Division". The main offices for the

Dodge Division were removed to Chrysler's World Headquarters in Highland Park in 1972. Today the offices are being used for the Hamtramck plant.
[Legacy, p. 13; Chambers, Dave, "Dodge Brothers First Fifty Years," Antique Automobiles, XXVIII, (Nov.-Dec. 1964), pp. 4-34; Hildebrand, Grant, Designing for Industry, The Architecture of Albert Kahn (Cambridge: MIT Press, 1974), p. 59; "Building a Name," Dodge Brothers International Review, I, (August 1917), p. 6; "A Mechanical Triumph," Dodge Brothers, November 7, 1921, pp. 3, 7; "Dodge Headquarters Move Marks End of an Era," PR Sheet, Dodge Division, December 1971]

DURANT-DORT CARRIAGE COMPANY (1895)
315 W. Water St.
Flint

Flint North
17.280295.4766020
Genesee

This building was originally used as an office building and display area by the Durant-Dort Carriage Company, an important forerunner of the automobile industry in Flint. The two partners in this firm, J. Dallas Dort and William Crapo Durant, were important early pioneers in the automobile industry. After achieving considerable success in carriage manufacturing, they entered the automobile industry by purchasing controlling interest in the Buick Automobile Company in 1904. This firm was the cornerstone of Durant's General Motors Corporation. This rectangular brick building, 60 feet long and 40 feet wide, was originally a two-story structure, but a third-story with a flat roof was added in 1906 after a major fire. It is virtually the only surviving structure from the early carriage industry of Flint.
[MHD, Site Files]

DURANT MOTOR COMPANY (1920)
401 N. Verlinden Ave.
Lansing

Lansing South
16.698230.4734100
Ingham

William Durant opened this large manufacturing complex in 1920 and produced the Durant automobile here in 1921-1932. It is an excellent example of the construction of long, narrow assembly plants in reinforced concrete. This complex consists of a main wing, 820 feet long and 100 feet wide, fronting on Verlinden Avenue, and running north to south, plus four connecting wings, running on an east-west alignment. Their dimensions are 80 by 460 feet, 80 by 460 feet, 100 by 200 feet, and 100 by 440 feet. This two-story building encloses 351,310 square feet.

EAGLE TANNING WORKS (1912)
Lake St.
Whitehall

Montague
16.552045.4605030
Muskegon

The Eagle Tanning Works (Whitehall Tannery), established in 1866 in Whitehall to exploit the hemlock bark readily available in the vicinity, is the oldest industry in Muskegon County. The works have had numerous owners during their long history, including the Eagle Ottawa Leather Company of Chicago, which operated the tannery in 1916-1944. The oldest surviving buildings date from 1912. The main building consists of two sections, both brick with brick-arched windows and flat roofs. The northern portion is four stories high, 250 feet long, 60 feet wide, and includes a 15 foot square, seven-story tower holding water tanks for fire protection. The southern portion is three stories high, 300 feet long, and 150 feet wide. In addition, there is a two-story brick storage building, 30 feet wide and 100 feet long, with a gabled roof, located to the west of the main buildings.
[Muskegon Chronicle, July 27, 1957, p. 4; Muskegon Chronicle, June 18, 1966, p. 9]

EPHRAIM SHAY MACHINE SHOP (1889)
Judd St.
Harbor Springs

Petoskey
16.657083.5032055
Emmet

Ephraim Shay, the inventor of the Shay logging locomotive, patented in 1881, came to Harbor Springs in 1888 and built this machine shop. This inventive genius used this shop to manufacture three locomotives, a one cylinder automobile, a steel-hulled steamboat, as well as numerous tools and machines. The shop is a simple rectangular brick building, 30 feet wide and 100 feet long, with a hipped roof. It is now used as a garage by the City of Harbor Springs.
[NR]

FISHER BODY FLEETWOOD ASSEMBLY PLANT (1917-1922)
Fort St. at W. End Ave.
Detroit

Detroit
17.325160.4684860
Wayne

This plant was constructed in 1916-1917 under a government contract to produce the Italian Caproni Bomber, the J-1 training aircraft, and the British DeHaviland fighter. It was an aircraft assembly plant until December 1918 and then was purchased from the government by Fisher Body

in 1919. They built Ford, Dodge, and Chrysler-Maxwell bodies here from 1919 until 1926, when Fisher Body became a subsidiary of General Motors Corporation. The plant made LaSalle bodies in 1926-1940. Fisher Body had purchased the Fleetwood Custom Body Company of Fleetwood, Pennsylvania and concentrated production here from 1931 on. The plant has been used primarily for Cadillac body production since then, except in 1942-1945, when it produced tank and aircraft parts. Today it produces over 200,000 Cadillac bodies annually. The earliest structures of this complex include Buildings #1 (1917), #2 and #3 (1918), and #4 (1919), all single-story steel-framed buildings designed by the Detroit architectural firm of Smith, Hinchman & Grylls. All four of these buildings front on West End Avenue and have aluminum siding exteriors added in 1974. Building #6 (1922) is a six-story reinforced concrete structure, 100 feet wide and 979 feet long, designed by Albert Kahn.
[Fisher Body Division, General Motors Corporation, Facilities Planning Department, "Fisher Body Fleetwood Assembly Plant," October 28, 1974]

FISHER BODY PLANT NUMBER 21 (1919)	Detroit
Hastings at Piquette Ave.	17.330200.4692600
Detroit	Wayne

Fred J. and Charles T. Fisher, two of six brothers, came to Detroit in 1901 and began working for the C.R. Wilson Body Company, the largest producer of automotive bodies. They established the Fisher Body Company in 1908 and received their first major order (150 bodies) from the Cadillac Motor Car Company (see other entries) in 1910. During the period from 1908 until the late 1920's, most of the Fisher Body production was concentrated in Detroit in an area east of Woodward Avenue and south of Grand Boulevard. By 1926, they owned or leased 40 buildings in this area with a combined floorspace of over 3.7 million square feet. There has been a major decentralization of production since then, and Fisher Body today uses less than one million square feet of factory floorspace in this area. The earliest buildings have been demolished in the past two decades. The oldest remaining structure, Building #21, was constructed as a Body Assembly Plant and produced Buick and Cadillac bodies until 1925, when Buick production was moved to Flint. It made Cadillac bodies until 1929 and then was used as an engineering design facility in 1930-1956. Since then, it has been used to assemble Cadillac limosine bodies. It is a six-story reinforced concrete building, 200 feet wide and 581 feet long, and has a total floorspace of 536,000 square feet.
[Fisher Body Division, General Motors Corporation, Facilities Planning Department, "Fisher Body Detroit Central Plants," October 30, 1974]

FLINT MOTOR COMPANY (1923) Flint South
4300 S. Saginaw St. 17.281700.4762390
Flint Genesee

William C. Durant announced in the summer of 1922 that he had organized the Flint Motor Company (a subsidiary of Durant Motors) with a capitalization of $5 million and intended to erect a major factory complex on a 100 acre site in Flint to manufacture the Flint Six automobile. Thousands of Flint residents gathered to celebrate the groundbreaking. Durant sold this plant to General Motors for about $4 million in July 1926. It has since served as Flint Fisher Body Plant Number 1, building bodies for the Buick assembly complex located on the north side of Flint. The original plant consists of two three-story reinforced concrete segments, with a total floor space of 1,157,000 square feet. Each section is E-shaped, with a main wing 920 feet long and 80 feet wide and three rear wings 400 feet long and 80 feet in width. Both buildings front on Saginaw Street, but their original configuration is obscured because this complex has been enlarged by several dozen additions since 1923.
[Gustin, Larry, Billy Durant (Grand Rapids, 1973), pp. 231, 235]

FORD ENGINEERING LABORATORY (1924) Dearborn
Oakwood Ave. 17.315610.4685745
Dearborn Wayne

With the expansion of Ford activities, Henry Ford foresaw the need for a large building to conduct research and experimentation. He engaged Albert Kahn to design the Engineering Laboratories Building in Dearborn near the Rouge Complex. The building, patterned in the classical architectural style, is a one-story structure, measuring 200 feet by 800 feet, and built of reinforced concrete. Construction on the building began on March 16, 1923. The interior of the building was given special attention. Spacing between columns was 40 feet to allow considerable room for experimental work of all kinds, and all conduits for lighting and heating were concealed in the beams and in the columns. Placed at the Engineering Lab in 1924 were the Johanson gauges. These gauges are still used for industrial measurement exact to a millionth of an inch. The Engineering Lab also housed the Dearborn Independent newspaper and the radio equipment used by Ford for his distant operations in the Upper Peninsula. Today the building is used as the Engine and Electrical Engineering Laboratory.
[Legacy, p. 23; Nevins, Expansion, pp. 250-251; Nelson, George, Industrial Architecture of Albert Kahn Inc. (New York: Architectural Book Publishing Company, Inc., 1939), p. 154]

FORD HIGHLAND PARK PLANT (1909-1914)
15050 Woodward Ave.
Highland Park

Highland Park
17.327730.4697240
Wayne

The Ford Highland Park Plant was the home of the Model T, the most popular car of its day. Its importance in automobile history lies in Ford's introduction at Highland Park of the moving assembly line which revolutionized automobile manufacturing. This enabled workers to turn out not just a few hundred cars, but many thousands of automobiles in one day. To this plant Ford added numerous overhead conveyors for transferring heavy machinery and automobile parts -- something he did not have on Piquette Street. Besides these two new elements to automobile production, Ford brought to Highland Park many of the operational methods employed on Piquette Street, such as the efficient, strategic placement of machines, parts, and operations around the factory in order to insure a smooth progression of the whole assembly line process. Ford acquired 60 acres of land in Highland Park for the purpose of locating all phases of the manufacturing process in one place. The "Crystal Palace", as the Highland Park Plant was called, was designed by Albert Kahn, assisted by Edward Gray, Ford's construction engineer. Construction on the original buildings began in 1909, and the work was not completed until the summer of 1914. In the meantime, the transfer of various departments from Piquette Street was completed on New Year's Day, 1910. The main factory building, facing Woodward Avenue, was a four-story flat-roofed structure with a length of 865 feet and 75 feet in breadth. The materials used included reinforced concrete, steel, and walls of glass to make use of natural sunlight. Kahn put to use for the first time industrial steel sashes combined with concrete between the layers of windows. The architect also added decorations to the corners of the building in order to relieve the monotony of the design -- something which will not be found in his later works. Behind this main factory building and parallel to it stood a one-story structure 840 feet long by 140 feet in breadth with a sawtooth roof. This was the machine shop. It was constructed of structural steel with concrete foundations. Between these two buildings was esconced a large craneway 860 feet by 57 feet with a glass roof over it. An intersecting craneway also converged into the machine shop. Thus these two buildings joined together by the craneway formed the largest single factory in Michigan up to that time. The buildings in front of the factory comprised the Administration Building, the powerhouse with its five smokstacks, and the Lincoln Sales and Service Building. To the rear of the machine shop and along Manchester Avenue stand several six-story structures built around 1915-1916. Although most of the original factory building, Administration Building, and the powerhouse were

torn down in 1959, a portion of the factory building and the Lincoln Sales and Service Building still stand. The buildings on Manchester Avenue still stand and are used by Ford as a trim shop and for paint and chemical products.
[Legacy, p. 12; Ferry, pp. 182-183; Nevins, The Times, pp. 451-457; Detroit News, February 15, 1957, n.p.; Detroit News, April 16, 1959, n.p.; NR]

FORD HIGHLAND PARK:
SALES AND SERVICE BUILDING (1920)
15050 Woodward Ave.
Highland Park

Highland Park
17.327300.4697140
Wayne

This four-story structure was erected by the Ford Motor Company as a service building and the Michigan sales branch office. It was designed by Albert Kahn and was completed in 1920. The structure is a reinforced concrete frame building with a flat concrete roof. It has wooden sash windows and red brick facing on the north and south ends of the building. The edifice measures 200 feet long and 62 feet wide. The first floor of the building was used as a showroom, stock salesroom, and for sales offices. The second floor was used for sales and executive offices. The third floor was also used for offices, while the fourth floor was employed for the storage of automobiles. Directly behind this building is a one-story garage measuring 200 feet long and 44 feet wide. During the late 1940's and 1950's the Ford Tractor Division was located here. The building stands vacant today.
[Detroit Free Press, June 5, 1919, p. 10; Detroit Journal, June 4, 1919; NR]

FORD MOTOR COMPANY PIQUETTE PLANT (1904)
411 Piquette St. at Beaubien
Detroit

Detroit
17.329920.4692570
Wayne

The phenomenal success of Ford sales in 1904 and 1905, only one year after incorporation, enabled Ford to plow back the profits into a new plant at Piquette and Beaubien Avenues. Their accomplishment allowed Ford and his colleagues to realize their dream of not only creating an immense corporation able to compete with the other large automobile manufacturers, but also to surpass them by offering to the general public an inexpensive, efficient means of transportation. On April 1, 1904 approval was given for the construction of the Piquette Street factory, at a cost of $76,500. The architectural firm engaged for the project was Field, Hinchman & Smith. Construction began in May of a three-story, flat-roofed structure measuring 402 feet by 56 feet. The outside wall surfaces were reduced to tapered pillars supported by heavy timbers. Interior beams and girders were supported by wood, iron or steel columns. Prudent precautions were taken against fire. Automatic sprinkler systems were provided and each floor was divided into four sections by fire walls. A powerhouse, a paint shop, and a testing area stood next to the factory. The site was also easily connected to several railroad lines. A number of different model cars were manufactured on Piquette Street including the famous Model T which first appeared in October 1908. The Model T proved so popular that in 1909 Ford announced to the world that this would be the only model he would build. The huge demand for Ford automobiles forced Ford to seek even larger spaces. His eye was turned to Highland Park. In the summer of 1911 the buildings here were sold to the Studebaker Corporation and became Studebaker Plant Number 10. The 3M Company used the buildings from 1938 through the 1960's. Today the factories belong to the Detroit Overall Manufacturing Company and the Cadillac Overall Supply Company. [Ferry, p. 179; Nevins, The Times, pp. 261-262, 265-266, 452]

FORD MOTOR COMPANY: BUILDING B (1917)	Dearborn
Ford River Rouge Complex	17.321850.4685900
Dearborn	Wayne

One of the earliest factory buildings constructed at the vast Ford Rouge Complex was Building B. The Rouge Complex in Dearborn, Michigan forms the hub for the production of Ford automobiles in the United States. Building B was the site of the first productive activity at the Rouge, but not for automobiles at first. During World War I, Henry Ford was contracted to manufacture Eagle boats for the Navy. He sought to apply the mass production techniques used at the Ford Highland Park Plant to produce these boats, and to design a new, distinctive building, in contrast to previous patterns, to manufacture them. From his experience at the Piquette Street Plant and the Highland Park Plant, Ford acknowledged the many disadvantages of multi-storied factories. Ford employed Albert Kahn, an architect in Detroit, to design for him a one-story structure. Kahn designed for him a building 1,700 feet long, 350 feet wide, and 100 feet high with a steel frame and massive walls of glass. This style of industrial architecture, one-story buildings with steel frames and walls of glass, became the standard design for automobile plants. After the war, the foundations of the building were reinforced and two stories were added to either side of the central part of the building. By August 1919

Building B was converted to automobile parts manufacturing for shipment to Highland Park. The following year witnessed the production of the Fordson tractor in Building B, taking up a large part of the first floor. But it was not until the transfer of the assembly line from Highland Park in September 1927 that Ford achieved his vision of a comprehensive site where all manufacturing processes took place. No longer would parts have to be shipped from plants all over the city. Today, automobiles are still being assembled there, now called the Dearborn Assembly Plant.
[Legacy, p. 23; Nevins, Expansion, pp. 209-210, 212, 293]

FORD RIVER ROUGE PRESS SHOP (1938)
Ford River Rouge Complex
Dearborn

Dearborn
17.321340.4685800
Wayne

The Press Shop at the River Rouge Complex was an L-shaped building devoted to molding a major portion of the exterior body parts needed for automobile assembly. The building was designed by Albert Kahn and represented Ford's idea of planning factory buildings around machinery locations. The main part of the structure extended 1,600 feet long by 392 feet wide, and the shorter section measured 664 feet long by 240 feet wide. The Press Shop was made of steel and reinforced concrete construction. In order to support all of the enormously heavy machinery and the massive loads within the building, use was made of H beam pilings which were driven 90-110 feet down to bedrock. The members of the building constructed of reinforced concrete included all abutments and building and machine foundations, all of which lie on top of the H beams. About 47,000 tons of steel were used in the piles and the superstructure. Although the building gives the appearance of being a 4-tiered structure, in actual fact there were only two floors: the main floor with all the presses used for production, and an above-ground basement where the cast steel bases for the huge presses are housed. The most unusual feature of the Press Shop is the ease with which these presses, often weighing over 350 tons, can be moved around to new locations and made to set into the bases fixed in the floor below. The three 90 ton overhead craneways are used for this purpose. Throughout the building are a number of smaller presses that stamp out various other body parts. The Press Shop has been connected with the Rolling Mills, the Spring and Upset Shop, the Sleeve and Axle Building, and the Open Hearth Mill to constitute the present Dearborn Stamping Plant.
[Legacy, p. 25; Deckard, H.C., "Ford Opens Two New Shops," American Machinist, LXXXIII, (February 22, 1939), pp. 69-71; "Portfolio of Industrial Buildings, Albert Kahn, Inc.," Architectural Forum, LXIX, (August 1938), p. 132; "Ford Rouge Guide," (Ford Motor Company Vertical Guide, Wayne State University Library, n.d.), p. 59]

FORD MOTOR COMPANY GLASS PLANT (1925)
Ford River Rouge Complex
Dearborn

Dearborn
17.321670.4685920
Wayne

Henry Ford commissioned Albert Kahn to design the Glass Plant at the River Rouge Complex in 1922. The source of glass for Ford automobiles prior to the Rouge plant had been Highland Park and a glass plant in Glassmere, Pennsylvania. The original bed of Rouge Creek once flowed through the present site of the Glass Plant. The building was constructed of steel with extensive walls of glass, and measured 760 feet long by 240 feet wide. It also featured butterfly roofs and clerestory monitors. There are four furnaces, each making glass for a specific purpose, as well as four smokestacks detached from the building. Completed in 1925, a major addition dates from 1935.
[Legacy, p. 23; Nevins, Decline, pp. 26, 60; "Architectural Plans for the Glass Plant," Albert Kahn Associates]

FORD MOTOR COMPANY TIRE PLANT (1938)
Ford River Rouge Complex
Dearborn

Dearborn
17.321870.4685500
Wayne

The Ford Tire Plant at the River Rouge Complex illustrates Albert Kahn's style of industrial architecture, with its prominent glass exteriors, unadorned walls, and the simple form of factory design. The building is flat-roofed, measures 802 feet long by 242 feet wide, and is constructed of steel. Several monitors provide natural lighting from above. Ford's attention to details regarding the direction of the manufacturing process is recognized in his use of special glass in the skylights and windows to filter out certain acid rays which affect rubber. The Tire Plant was completed on January 30, 1938. The most significant aspect of the Tire Plant is the almost complete automation of the whole manufacturing process. Prior to the construction of the Tire Plant, Ford bought his tires from the major tire manufacturers. But labor problems in the rubber industry during the 1930's persuaded Ford of the necessity for producing his own tires. A standard practice of Ford, so as to keep a constant check on costs and to stimulate new manufacturing processes, was to manufacture part of his needs. Ford acquired a rubber plantation in South America as a source for rubber. At one point 5,000 tires were produced in one day. During the early 1940's, Ford sold part of the tire manufacturing equipment to Russia in order to make room in the plant for

war production. The building is presently being used as the Dearborn Assembly Plant Stock Storage Warehouse.
[Legacy, p. 24; Nevins, Decline, pp. 60, 219; "Portfolio of Industrial Buildings, Albert Kahn, Inc.," Architectural Forum, LXIX, (August 1938), p. 124; Detroit Free Press, August 6, 1936; Detroit News, May 27, 1938; "Architectural Plans for the Tire Plant," Albert Kahn Associates]

FULLER BUGGY COMPANY (1909, c.1925)
225 N. Horton St.
Jackson

Jackson North
16.716480.4681320
Jackson

There are two distinct buildings on this site, both closely associated with the early automobile industry. The smaller building, constructed in 1909, is a one-story brick structure, 110 feet by 85 feet, with a gabled roof. It was occupied by the Fuller Buggy Company in 1909-1911, when the Fuller car was made here. Benjamin Briscoe, one of Michigan's early automobile manufacturers, formed the Briscoe Motor Company in 1913 and manufactured the Briscoe car in this building in 1914-1921. Several other automobiles were made here, including the Hollier car in 1915-1921 and the Earl car in 1921-1923. The second building on this site is a one-story brick structure, approximately 250 feet square, with a sawtooth roof, built around 1925. Both buildings have been continuously occupied by firms producing either automobiles or automobile parts.
[Lewis, p. 36; Rae, John B., American Automobile Manufacturers (New York: Chilton Company, 1959), p. 96]

GALE MANUFACTURING COMPANY (1888)
N. Albion St.
Albion

Homer
16.684060.4679025
Calhoun

Horatio, Augustus, and O.C. Gale established the Gale Manufacturing Company in 1861 to manufacture farm implements. From 1863 until 1888, they operated in a complex which is no longer extant, located near the Albion business district. The firm became known for their high quality farm implements and by 1876, output had reached 7,000 plows and 1,200 rakes. They constructed a new manufacturing complex on North Albion Street in 1888, but most of those buildings are no longer extant. All that remains is the office building, a rectangular two-story brick building, 40 feet long and 30 feet wide, resting on a stone foundation.
[History of Calhoun County (Philadelphia: Everts & Company, 1877), p. 106; Krenerick, Miriam, Albion's Milestones and Memories (Albion, 1932), p. 70]

GENERAL MOTORS PROVING GROUND (1924)
General Motors Rd.
Milford

Kent Lake
17.280160.4716160
Oakland

The General Technical Committee of General Motors Corporation was established in September 1923 by Alfred Sloan to establish a unified engineering policy for the Corporation. It included Sloan, the Chief Engineers of the Car and Truck Divisions, and several other Corporation executives. This committee decided to construct a private facility to conduct experimental road testing under controlled conditions. They purchased a tract of land of approximately 1,000 acres near Milford, located centrally to serve the six Car and Truck Divisions in Detroit, Pontiac, Flint, and Lansing. The initial facility opened in 1924 consisted of seven miles of test track, including a concrete straightaway 20 feet wide and over one mile long, a high speed gravel segment, a concrete hill segment with a grade of 11%, and a gravel hill segment with a 7% grade. The size and configuration of the original test tracks is largely untouched, although these tracks have been resurfaced numerous times. A steel-framed garage, 60 feet wide and 200 feet long, with glass walls and a mansard roof, was the first building erected there. Similar garages were built on either side of the first garage in 1926 and 1928, and the three garages were enlarged and combined into one large building in the 1940's. This complex has grown considerably since its foundation. Nineteen miles of new test tracks were built in 1924-1942 and an additional 145,000 square feet of test facilities and living quarters were constructed. By 1974, this facility included 79 miles of test tracks, over one million square feet of floor space, and employed 1,254 personnel. [Twenty Years of Getting the Facts," (n.p., 1944), pp. 2-15; Grindings From the Grounds, Fiftieth Anniversary Issue, Number 833 (September 5, 1974)]

GLAZIER STOVE COMPANY (1894,1905)
Main St.
Chelsea

Stockbridge
16.745085.4689050
Washtenaw

Frank Glazier established the Glazier Stove Company in Chelsea in 1891 and this firm specialized in the manufacture of oil burning stoves. His original factory was destroyed by fire in 1894 and he rebuilt on the present site. The Glazier Stove Company and its large factory complex dominated the economy of Chelsea during the first four decades of this century. The surviving structures include the landmark "Tower Building", a three-story pentagonal brick building with an attractive

five-story octagonal brick clock tower on the southwest corner. There are two one-story brick buildings, one 400 feet long and 105 feet wide, the other measuring 100 by 60 feet, as well as two three-story brick structures, 80 by 100 feet and 80 by 150 feet. All of these buildings have flat roofs. Finally, there is an employees' recreation center, constructed in 1905, commonly called the Welfare Building. This ornate two-story brick structure, 50 feet wide and 100 feet long, was originally equipped with a swimming pool and steam baths, no longer extant.
[Chelsea, 125th Anniversary, 1834-1959, pp. 25-29]

HANDLEY MOTORS COMPANY (1921)
2016 N. Pitcher St.
Kalamazoo

Kalamazoo
16.617150.4685200
Kalamazoo

The Handley Motors Company erected this building in 1920-1921 and used it to build the Handley and Handley-Knight automobiles in 1921-1923. It is approximately 100 feet wide and 400 feet long. The southernmost portion, about 50 feet long, is of brick construction, while the remainder is steel-framed, enabling the extensive use of windows on the walls. The building is owned by the Checker Motors Corporation and is used for office space and storage.
[Lewis, p. 36; Kalamazoo Gazette, January 7, 1920, p. 1]

HARTSHORN CURTAIN ROLLER COMPANY (1903)
1050 W. Western Ave.
Muskegon

Lake Harbor
16.556800.4784550
Muskegon

This shade manufactory is an early example of the use of reinforced concrete in factory construction. Mr. Hartshorn reportedly consulted Mortimer Coole, Dean of the University of Michigan College of Engineering, before proceeding to build this structure. It is a one and one-half story rectangular building, 300 feet long and 60 feet wide, with gabled roofs.
[Muskegon Chronicle, February 16, 1957, p. 3]

Glazier Stove Company (1894,1905), Chelsea

IMPERIAL WHEEL COMPANY PLANT (1899)
512 N. Wisner St.
Jackson

Jackson North
16.712060.4680980
Jackson

William Durant and J. Dallas Dort organized the Imperial Wheel Company in 1899 and erected this building as a wheel factory. They were producing over one million wheels by 1903. Both men became early leaders in the automobile industry. Durant used this building to produce Buicks in 1905-1907, immediately before he opened his new Buick plant in Flint. The Marion-Handley car was also manufactured in this building in 1916-1919. It is a two-story brick structure, with a large rectangular section, 375 feet long and 60 feet wide, with a gabled roof, and a smaller attached office building, 75 feet long and 20 feet wide, with a steeply-pitched roof.
[Charles DeLand, History of Jackson County (Chicago: Bowen, 1903), pp. 585-586]

INDUSTRIAL WORKS:
INDUSTRIAL BROWNHOIST (c.1890-1920)
135 Washington Ave.
Bay City

Bay City
17.266500.4830255
Bay

The Industrial Works was founded in 1873, with George Kimball serving as its first president. They began manufacturing general machinery, but in 1879 made their first railroad steam shovels, and by the early 1880's the firm was specializing in heavy duty railroad wrecking cranes. Virtually all of the manufacturing complex in Bay City was completed by 1920, when the firm was reputed to own 59 buildings with a total floor space of 440,000 square feet. The Industrial Works merged with the Brown Hoisting Machinery Company of Cleveland in 1927, forming the Industrial Brownhoist Corporation. The complex includes five major buildings and numerous smaller ones. The two oldest buildings, both dating from the early 1890's, are brick-walled structures with massive timber framing and timber roof trusses. One is approximately 75 feet by 300 feet and the other approximately 200 feet square. The foundry (c. 1910) is a steel-framed building, 100 feet by 300 feet, with a gabled roof providing two levels of monitor windows. The Machine Shop (1918) is a steel-framed building, 200 feet by 600 feet, utilizing extensive expanses of glass both in the walls and in roof monitors and skylights. The Steel Fabrication Shops consist of two adjoining

buildings running parallel to each other and running perpendicular to a third building. All three are of similar design and dimensions, each approximately 150 feet by 50 feet, of steel-framed construction, with single-monitor roofs.
[Butterfield, George, Bay County, Past and Present (Bay City, 1918), p. 146; Butterfield, George E., Bay County, Past and Present (Bay City, 1957), p. 81; Gansser, Augustus H., History of Bay County, Michigan (Chicago, 1905), p. 226]

JUDGE WISNER CARRIAGE BARN (c.1880)
Crossroads Village
Flint

Flint North
17.284390.4774200
Genesee

The first automobile made in Flint was assembled in this barn by Judge Charles H. Wisner in 1900. It was originally located behind Judge Wisner's home at 516 East Court Street, but was moved to its present location in 1975. Wisner's first automobile, called a "buzz wagon" by skeptics in this city known for its carriage industry, appeared in Flint's Labor Day Parade in 1900. Wisner unsuccessfully tried to interest William Durant, the eventual founder of General Motors, in his vehicle. The building is a simple wood-framed structure, 20 feet square, with a hipped roof topped by a square cupola.
[Gustin, Larry, Billy Durant (Grand Rapids, 1973), p. 51; Lethbridge, Alice, Halfway to Yesterday (n.p., 1974), p. 213]

LAMBERT BUILDING (1899)
500 S. Kalamazoo Ave.
Marshall

Marshall
16.667775.4681125
Calhoun

William and Egbert Page began manufacturing buggies in Marshall in 1869. They incorporated in 1890, then reincorporated in 1893, with a capital of $50,000. This successful manufacturing firm erected this three-story brick building, 60 feet wide and 400 feet long, in 1899. With its brick-arched windows, flat roof, and strictly functional lines, it is an example of typical factory construction of the late nineteenth century. It is now occupied by a firm which manufactures automatic doors.
[Gardner, Washington, History of Calhoun County, Michigan (New York: Lewis, 1913), p. 252]

LANE MOTOR TRUCK COMPANY (1918)
1802 Reed St.
Kalamazoo

Kalamazoo
16.618935.4680935
Kalamazoo

This structure was first used to manufacture the Lane truck in 1918-1919. The Kalamazoo Motors Corporation purchased this building in 1920 and assembled the popular Kalamazoo truck here during the early 1920's. It is a one-story rectangular brick structure, 60 feet wide and 300 feet long, with a flat roof. Approximately three-quarters of the roof area is supported by brick columns two feet in width, spaced five feet apart, permitting the extensive use of windows on the walls.
[Lewis, p. 36]

LINCOLN MOTOR CAR COMPANY (1917)
6200 Warren Ave.
Detroit

Dearborn
17.324485.4690200
Wayne

Henry Leland and his son left Cadillac Motor Car Company over a dispute with Billy Durant concerning the production of Liberty engines for the war effort. He went on to form the Lincoln Motor Car Company on August 29, 1917 for the purpose of manufacturing Liberty engines. The first Lincoln plant was located on Holden Avenue, but this plant proved too small for large quantity production. Ground was broken for the Warren Avenue Plant on September 21, 1917. Construction of the main buildings was completed by Christmas of that year. This included the long L-shaped structure, now designated as "B" and "C" Buildings, the office building, "D" Building, and the powerhouse. Due to shortages of steel and masonry during World War I, the old mill style of construction with brick walls and wooden sashes was utilized. George D. Mason was the architect for these buildings. The main buildings, "B" and "C", measure 45 feet by 200 feet and 840 feet by 70 feet respectively. They are both four stories high, have flat roofs, and are faced with cream colored brick. They were built of reinforced concrete and include many windows for natural lighting. The third and fourth floors of the "C" Building are wooden. The building designated as "D" measures 1,275 feet long and 68 feet wide. It was constructed of reinforced concrete, has cream colored brick facing, and uses many windows for lighting. The first floor was constructed in 1918 and the upper three floors were added in 1926. The roof of this building is flat. Unfortunately for Leland, his venture proved unsuccessful and the Lincoln Motor Car Company was purchased by Henry Ford in 1922. Another addition was made in 1923 of a one-story structure of steel and brick. Ford had Albert Kahn design this building

for him because the upper three floors of "C" Building were wooden and could not hold much machinery. The building stands 1,552 feet long and 250 feet wide. Atop this building were two butterfly monitors extending the full length of the building. But this has been modified over the years. The Lincoln Zephyr, the Mercury, and the Lincoln Continental were all produced at this plant. In 1952 the assembly operations for the Lincoln and Mercury were moved to a new site in Wayne, Michigan, and the plant on Warren and Livernois was purchased by the Detroit Edison Company as a service center in 1955.
[Ferry, p. 337; Nevins, Expansion, pp. 174-175; "How an Ideal of Service Became the Lincoln Motor Company," Ford News, September 15, 1923, p. 1; A Pledge Made Good (Detroit: Press of Lincoln Motor Car Company, 1919)]

LUFKIN RULE COMPANY (1892, c.1910)
1730-2000 Hess St.
Saginaw

Saginaw
17.261840.4809200
Saginaw

The Lufkin Rule Company, manufacturers of steel and wooden rules, gauges, and scientific instruments, was founded in Cleveland in 1883 by Fred Buck. The company moved to Saginaw in 1892, when the lumbering industry of Michigan was in decline, and it quickly became one of the largest employers in the city. By 1912, the firm employed over 400 workers. After several prolonged labor disputes in the 1940's and early 1950's, the firm moved its operations out of Saginaw. The oldest portion of the complex, built in 1892, consists of two and three-story interconnected brick buildings approximately 400 feet in length fronting on Hess Street, with a major wing extending approximately 300 feet to the south. Also fronting on Hess Street is a two-story brick building, 400 feet long and 200 feet wide, with a sawtooth roof supporting glass panels, probably built around 1910.
[Gardner, H.W., Greater Saginaw (Saginaw, 1912), p. 45; Mills, James C., History of Saginaw County (Saginaw, 1918), pp. 490, 498; Saginaw Directory, 1891-1892, p. 501]

MASON MOTOR CAR COMPANY:
CHEVROLET MOTOR CAR COMPANY (1916,1919,1926)
300 Chevrolet Ave.
Flint

Flint North
17.279198.4765350
Genesee

This manufacturing complex centered around the intersection of Chevrolet Avenue and the Flint River has a long and complex history. It was first

occupied in the early 1880's by the Flint Wagon Works. In 1903, William C. Durant took over the Flint Wagon Works properties, originally to aid in the production of Buicks. In 1911, he established the Chevrolet Motor Car Company, initially centered in Detroit, and the Mason Motor Car Company, which was to produce engines for Chevrolet in the Flint Wagon Works buildings. Chevrolet moved to Flint in 1913 and Mason Motors became a division of Chevrolet Motors. The oldest extant building in this complex is the Mason Engine Plant (1916) on the east side of Chevrolet Avenue, just south of the Flint River. Later additions to this complex include the Assembly Plant (1919) located north of the Mason Motor Car Company building across the Flint River; the Powerhouse (1919); Old Fisher Body Plant Number 2 (1926); a new engine plant (1926); and several additional buildings. This complex is significant in that it was the second Chevrolet manufacturing and assembly complex and was the basis for Chevrolet's rapid growth during the 1910's. The total production of this automobile plant had increased from about 3,000 units in 1912 to nearly 150,000 units by 1919. This was also the scene of the critical sit-down strikes of 1936-1937 which brought about the unionization of this major industry.
[Gustin, Lawrence, Billy Durant: Creator of General Motors (Grand Rapids: Eerdmans, 1973), pp. 34-38, 60-63, 146-158; The Chevrolet Story (Chevrolet Division, General Motors, 1970), pp. 5-13]

OAKLAND MOTOR CAR DIVISION (1919-1925)
Baldwin Ave. at Howard St.
Pontiac

Pontiac North
17.311610.4723840
Oakland

The Oakland Motor Car Company was established in 1907 by Edward M. Murphy, a Pontiac buggy manufacturer. He introduced the Model K Oakland in 1908 and sales of this expensive four cylinder car grew rapidly. William C. Durant became interested in the company and in 1909 bought controlling interest and brought the Oakland Motor Car Company into General Motors. Production of the Oakland climbed from 491 in 1909 to nearly 30,000 in 1918, necessitating a major plant expansion the following year. The oldest buildings on this site are several dating from that expansion. Earlier buildings were all razed in 1934. This is now a minor part of the Pontiac Motor Division's operations. In fact, this site began to lose its importance as early as 1927, when an immense new plant to build the Pontiac car (introduced in 1926) was opened on a 246 acre site on the northern edge of the city. The Oakland automobile was discontinued in 1932. The surviving buildings on the Oakland Motor Car site include Building Number 125 (Plant 4), a brick wood-framed single-

story building, of irregular shape, with about 250,000 square feet of floor space. This building is totally obscured by more recent additions. Building Number 115 (1921) is a four-story reinforced concrete structure, 138 feet wide and 148 feet long. Building Number 127 (1925) is a three-story rectangular reinforced concrete building, 64 feet wide and 340 feet long, originally used as a heat treatment plant.
[Detroit Engineer, January 1976, pp. 6-8]

OLDSMOBILE BUILDING NUMBER 16 (1912,1945)
300 feet south of Division St.
Lansing

Lansing South
16.699560.4732500
Ingham

This building was constructed in 1912 by W.E. Wood, a Detroit contractor, and was originally used for the assembly and testing of Oldsmobiles. It was used for storage in 1949-1960, was then used to assembly the F-85 automobile and has recently been used for the assembly of the Oldsmobile Toronado. It is a two-story rectangular brick building, with an interior frame of wooden timbers, and a flat roof. It is 74 feet wide and 756 feet long, and is divided into three equal sections. Steel structural channels were added in 1945 as floor reinforcement.

PACKARD SALESROOM (1915)
8500 Woodward Ave.
Detroit

Highland Park
17.328940.4693560
Wayne

Built by Albert Kahn, the Packard Salesroom illustrates the use of architectural features in the framework of the building. Classical columns are utilized for structural support of the building. Very large windows give a light, spacious quality inside. The building is two stories high with dimensions of 120 feet by 70 feet. The flat roof is bordered by a concrete cornice across the top. There was also very ornate ironwork around the doors and windows. A service area was located behind the showroom. The building is currently being used as a McDonald's hamburger restaurant.
[Legacy, p. 20; Detroit Free Press, April 6, 1974, p. C-2; Progressive Architect, IV (August 1974), p. 32]

PACKARD MOTOR CAR COMPANY:
BUILDING NUMBER 5 (1910)
1580 E. Grand Blvd.
Detroit

Highland Park
17.332800.4693680
Wayne

After Building Number 10 was constructed in 1905, Henry Joy had Albert Kahn replace the mill construction buildings with reinforced concrete ones. Building Number 5 was put up in 1910. Kahn placed the building in the middle of a quadrangle with windows on all eight sides. Number 5 is seven stories high, constructed of reinforced concrete and brick facing, and measures 200 feet long by 153 feet wide. It has a flat roof and steel sash windows. The building is now being used by a number of small businesses. The Packard complex was the home of the Packard Motor Car Company until 1956 when it was merged with the Studebaker Corporation.
[Ferry, p. 180; "Packard Cars Made and Being Made," Motor Age, V, (April 15, 1904), p. 12]

PACKARD MOTOR CAR COMPANY:
BUILDING NUMBER 10 (1905)
1580 E. Grand Blvd.
Detroit

Highland Park
17.332800.4693680
Wayne

After experimenting with reinforced concrete in the Palms Apartment Building in 1903 (see other entry), Albert Kahn then designed this automobile factory constructed in 1905. It was the first reinforced concrete factory building in Detroit. The Trussed Concrete Steel Company of Detroit prepared the structural design for the building and it was erected by the Concrete Steel and Tile Construction Company, also of Detroit. Construction was completed in two and one-half months, a remarkable achievement in itself. It was originally a two-story building, 60 feet wide and 457 feet long, with an ell measuring 60 feet by 240 feet. The design utilized a single row of reinforced concrete interior columns, each 18 inches by 16 inches, set 32 feet apart. This arrangement left a clear floor space of 32 feet by 60 feet between columns, a major advantage from the viewpoint of the automobile manufacturer. The longitudinal girder between the columns is 22 inches wide, 36 inches deep, and reinforced with two one inch by three inch steel bars and three one and one-fourth inch by three and three-fourths inch steel bars. The traverse floor girders, placed at intervals of 16 feet, were 30 feet long, 18 inches wide, and 30 inches deep, and were reinforced in the same manner as the longitudinal girder.
[Ferry, p. 180; Engineering Record, Vol. 54, No. 20, November 17, 1906, p. 545; Parker, John, "A History of the Packard Motor Car Company from 1899 to 1929" (Master's Thesis, Wayne State University, 1949), pp. 35-36]

Packard Motor Car Company: Building Number 10 (1905), Detroit

PLYMOUTH MOTOR CORPORATION (1928)
6334 Lynch Rd. at Mt. Elliot Ave.
Detroit

Highland Park
17.332520.4696130
Wayne

In 1928 Walter Chrysler established the Plymouth Motor Corporation to manufacture the low priced Chrysler Plymouth automobile, to be introduced at a time when Ford was changing over from production of the Model T to the Model A. Albert Kahn was commissioned to build the vast assembly building at Mt. Elliot and Lynch Road. A Dodge plant, already located there, served as the nucleus for the new Plymouth factory. Ground was broken on October 10, 1928, and laborers spent six months to erect the largest assembly plant at that time. The factory was opened in January 1929, producing 1,000 cars per day. The Dodge factory was 1,952 feet long and 250 feet wide. Kahn increased the size of the building to a length of 2,490 feet and a width of 375 feet. An extended portion was 200 feet in width. The factory is a one-story structure, steel-framed with a sawtooth roof, and various kinds of monitors for natural lighting. At the end of World War II, the Plymouth Detroit Assembly Plant performed an important role in the development of the A Bomb. The engineers of Chrysler constructed a nickel-plated steel process for use in a diffusion tank that separated isotope U-235, an important element for the A Bomb, from the ordinary isotope U-238. The plant is still being used today for assembly operations.
[Ferry, p. 338; Titus, pp. 278-279; Blonston, Gary, Plymouth, Its First Forty Years, Chrysler Plymouth Division, Public Relations Department, June 11, 1968, pp. 21, 35; Rae, John B., American Automobile Manufacturers, The First Forty Years (Philadelphia: Chilton Company, 1959), pp. 199-200; "Eighty Days From Factory Foundation to Finished Cars," Machinery (New York, May 1929), XXXV, pp. 648-652]

RAINIER MOTOR CAR COMPANY (1906,1935)
1305 N. Washington St.
Saginaw

Saginaw
17.263290.4814560
Saginaw

J.T. Rainier moved to Saginaw from New York City in 1906 and briefly produced the heavy, expensive Rainier automobile here in 1906-1907. The plant was then taken over by the Peninsular Motor Company, which produced the Marquette automobile there until 1912, when the plant closed. General Motors then purchased the facility and used it during World War I to produce trench mortar shells. The plant was retooled and produced the Chevrolet "Baby Grand" engine, a four cylinder valve-in-head engine until 1922, when the plant was again shut down. It was

reopened in 1928 to serve as a pilot plant for the new Chevrolet six cylinder engine. It then served as unit of the Chevrolet foundry in 1935-1945 and has served as a parts manufacturing operation since then, specializing in water pumps. The two-story brick building is a rectangular building with the southwest corner truncated to give the structure five sides. Overall, it is 240 feet wide and 560 feet long and features a massive glassed sawtooth roof covering about two-thirds of the building.
[Polk, R.L., _Saginaw Directory, 1908_, p. 723; _Detroit Free Press_, March 12, 1965, p. 6-D]

REO MOTOR CAR COMPANY PLANT (1905-1926)
2100 S. Washington St.
Lansing

Lansing South
16.700700.4732150
Ingham

Ransom E. Olds was one of the most important American pioneers in the automobile industry. He first produced automobiles in 1897 with the formation of the Olds Motor Company in Lansing. He moved his manufacturing operations to Detroit in 1899, then sold the Olds Motor Company (and the name "Oldsmobile") in 1904 and returned to Lansing. On September 27, 1904, he formed the Reo Motor Car Company in Lansing and opened up the first building in this complex in 1905. He produced the "Reo" (formed from his initials) in this plant in 1905-1936. This was also the home of an extensive production of Reo trucks. In 1957, the firm was purchased by the White Motor Corporation, which then purchased the Diamond T Company, a Chicago truck manufacturer. The two firms were then merged in 1967 to form Diamond Reo Trucks, Inc. This complex of about fifty buildings with a combined floor space of slightly over two million square feet is located on a compact site containing 38.7 acres. Virtually all of the buildings were constructed between 1905 and 1926. The most historic buildings still standing are Building Number 1 and an adjoining office structure, both erected in 1905; Building Number 4 (1908); Buildings Numbers 6 and 7 (1914); and the Clubhouse (1917). All of these structures with the exception of Building Number 1 front on Washington Street.
[Darling, Birt, _City on the Forest: The Story of Lansing_ (New York, 1950), pp. 163-164]

ROUND OAK STOVE COMPANY (1900)
Becson St.
Dowagiac

Cassopolis
16.573087.4647070
Cass

The Round Oak Stove Company developed the first stove large enough to take whole oak logs, along with an underdraft system in 1867. The company expanded greatly during the 1890's and this building was erected at the beginning of this century. It is a three-story, brick structure, 80 feet wide and 200 feet long, with brick-arched windows and a flat roof. The brick walls are two feet thick, the floor joists are two inches by fourteen inches, and the columns supporting the floors are fourteen inch square oak timbers.
[MHD, Site Files]

SANIWAX BUILDINGS:
BARTLETT LABEL COMPANY (1897,1923)
436 N. Park St.
Kalamazoo

Kalamazoo
16.616480.4683250
Kalamazoo

There are two distinct, but interconnected structures in this complex. The first, a one-story brick building (140 feet by 32 feet) fronting on North Park Street, was constructed shortly after the Bartlett Label Company was founded in 1897 by Russell E. Bartlett. The Saniwax Paper Company, founded in 1923, then occupied the building. The adjacent four-story brick building, 266 feet long and 98 feet wide, is composed of two sections of different age. The western one-third of the building was constructed by the Kalamazoo Loose Leaf Binder Company in the late 1890's, while the remaining two-thirds was built in 1923. The Saniwax Company, now a division of a plastics firm, was one of the earliest producers of waxed paper products in the Midwest.
[Kalamazoo Gazette, November 17, 1925]

STORY AND CLARK PIANO COMPANY (1903)
Washington St. at First St.
Grand Haven

Muskegon
16.562052.4768015
Ottawa

The Story and Clark Piano Company manufacturing complex consists of two large L-shaped brick buildings, both three stories high. The main wings of both buildings are 50 feet wide and 300 feet long, while the smaller wings are 100 feet long and 50 feet wide. The two buildings are adjacent to each other, with both fronting on First Street. They are separated only by Columbia Avenue. A smaller one-story section, 75 feet long and 50 feet wide, is attached to the northern end of the northernmost building.

UNION STEEL PRODUCTS COMPANY (1907,1915)
S. Berrien St.
Albion

Homer
16.685060.4679057
Calhoun

The Union Steel Products Company was organized in Battle Creek in 1903, moved to Jackson in 1904, and then to Albion in 1905. The firm moved into this manufacturing complex in 1907. They manufactured a variety of metal products including refrigerator and oven shelves, screening, fanguards, and bakery equipment, employing about 450 workers during the late 1920's. The extant buildings include three typical two-story brick factory buildings erected in 1907 and a two-story reinforced concrete building added in 1915.
[Krenerick, Miriam, Albion's Milestones and Memories (Albion, 1932), pp. 72-73]

WALCOTT LATHE COMPANY (c.1910)
420 Ingham St.
Jackson

Jackson North
16.713575.4680770
Jackson

The Walcott Lathe Company clearly designed this building to maximize the amount of natural light available for its workers, presumably because of the precision work they were performing. It is a steel-framed red brick building, 120 feet square, featuring a two-tier skylight 120 feet in length, extensive use of windows on the ground floor, and the use of a sawtooth roof over roughly half of the floor space. Both the east and west facades give this building the appearance of a greenhouse.

WILLOW RUN BOMBER PLANT (1942)
Willow Run
Ypsilanti

Ypsilanti East
17.289500.4679440
Washtenaw

The Willow Run Bomber Plant was built by the War Department in 1941-1942 for the Ford Motor Company to assemble the B-24 Liberator Bomber. It was designed by Albert Kahn and the firm of Hubbell, Roth, and Clark of Detroit. This was the largest war plant in the world, cost $65 million and had a peak employment of 42,000 in June 1943. Total output during the war was 8,685 B-24's. The Kaiser-Frazer Company leased this facility from the War Department in 1946-1953 and produced automobiles there. On August 12, 1953 a disastrous fire destroyed the massive General Motors Hydramatic plant in nearby Livonia. General Motors quickly made a lease agreement with Kaiser-Frazer and began "Operation Hydramatic" to convert

the Willow Run Plant into a major transmission plant. After heroic efforts, the first Hydramatic transmissions were produced at Willow Run on November 4th. This immense single-story steel-framed building is 3,150 feet long, and varies in width from 700 feet to 1,300 feet. It represents a major departure from Albert Kahn's practice of maximizing natural lighting through extensive use of glass as evidenced in his work at Ford's River Rouge Complex in the previous two decades. It has a solid roof and small exterior windows, so that it could be easily blacked out to prevent detection by enemy bombers. Other security features include two completely independent water systems, internal steam and electrical systems buried in concrete tunnels, and a system of pedestrian overpasses which served as security checkpoints for employees.
[Legacy, pp. 25-26; Wilson, Marion F., The Story of Willow Run (Ann Arbor: University of Michigan, 1956), pp. 20, 51, 66, 70]

INTRODUCTION TO UTILITIES

This category includes structures and systems used to produce, store, or distribute water, sewage, steam, gas, and electricity. There are examples of small town waterworks at Manistee (1881), Charlotte (1886), Harbor Springs (1890), Paw Paw (1898), and Mt. Pleasant (1907), as well as larger municipal plants in Grand Rapids (1912) and Detroit (1924, 1931). The magnificent water towers at Ypsilanti (1889) and Kalamazoo (1895) can be found in the Specialized Structures section of this volume. There are also several municipal steam heating plants. Gas manufacturing and holding facilities were common in Michigan in the early twentieth century, but virtually all of the plants have since been scrapped.

More than three-quarters of the sites in this section are from the electric utility industry. Michigan was a leading state in the development of electricity and her engineers can be credited with several important innovations, particularly in long-distance high-voltage transmission. Thomas Edison built one of the earliest generating plants (not extant) in Detroit in 1886. Dozens of plants utilizing water power and fossil fuels were built in the 1890's and early 1900's by private concerns and municipalities. There are twenty-two sites from the period 1895-1910 and an additional sixteen built in 1911-1920.

Since the early 1920's the production of electricity in Michigan has been dominated by the Detroit Edison Company in the metropolitan Detroit area and the Consumers Power Company serving virtually all of the rest of the Lower Peninsula. Detroit Edison concentrated its production in massive fossil fuel plants such as those at Connors Creek (1914) and Delray (1926), while Consumers Power relied more heavily on the power provided by Michigan's rivers.

The hydroelectric plants in this section range in size from the 55 KW powerhouse (1914) designed by Thomas Edison for Henry Ford's Fairlane estate to the 30,000 KW Hardy Plant (1931) on the Muskegon River. Many municipally-owned companies and private concerns harnessed water power to make electricity, but it was the Consumers Power Company and its predecessors, led by J.B. and W.A. Foote, that developed Michigan's hydroelectric potential on a large scale. One difficulty they faced was the long distance between the state's best generating sites, on the Au Sable, Muskegon, and Manistee rivers, and the potential users of electricity, heavily concentrated in southern Michigan.

W.A. Foote built three dams (Trowbridge, Pine Creek, and Plainwell) on the Kalamazoo River in 1898-1900 and transmitted power to Kalamazoo over a twenty-four mile line at the unprecedented pressure of 22,000 volts. The company then set new precedents for long distance transmission with a 72,000 volt line ninety miles long from their Rogers Dam (1906) to Grand Rapids, a 110,000 volt line from Croton Dam (1908), and a 140,000 volt line one hundred and twenty-five miles long from Cooke Dam (1911) to Bay City. The ten hydroelectric plants built by Consumers Power in the period 1906-1925 accounted for about half of the company's generating capacity in the early 1920's.

With Michigan's hydroelectric potential exploited, both Detroit Edison and Consumers Power expanded output in the 1940's and 1950's by constructing massive fossil fuel plants. Since the early 1960's both utilities have emphasized nuclear power as the long-range solution to escalating electricity consumption. One notable exception is the monumental Consumers Power Company Ludington Pumped Storage Plant, a 1,872 MW facility completed in 1974.

ADA HYDROELECTRIC PLANT (1926)
Thornapple River Drive
Ada

Lowell
16.623650.4756140
Kent

The Ada Hydroelectric Plant was constructed in 1926 by the Michigan Water Power Company, then sold to Consumers Power Company in 1934. It was in turn acquired by Thornapple Associates in 1969. The dam creates a pond of approximately 280 acres and a nominal head of 22 feet. It is an earth-embankment dam, with a concrete spillway and four steel tainter (radial) gates, each 20 feet wide, controlling the flow of water. The generator house is a steel-framed rectangular brick structure, 20 feet by 40 feet, and contains two S. Morgan Smith vertical discharge turbines driving a pair of Westinghouse 1,000 KW generators, all original equipment.

ALCONA HYDROELECTRIC PLANT (1923)
On Au Sable River
Bamfield

Not Mapped

Alcona

The Alcona Dam was begun in 1916, but was not completed until 1923, largely because Consumers Power Company faced severe financial problems which continued through the 1921 recession. There were construction difficulties as well, because the foundation had to rest on sand which was underlaid with a ten foot layer of quicksand. The foundation difficulties were solved by building the powerhouse and spillway as a single unit, with the spillway (six 78 inch Tefft spillway tubes) underneath the building. The structure was placed on a monolithic slab of heavily reinforced concrete, which in turn rested on wooden piles driven to a depth of 70 feet below the slab. Approximately 100,000 linear feet of pilings were driven. The original installation, still extant, included two vertical turbines manufactured by Wellman, Seaver, and Morgan and two General Electric generators, each producing 4,000 KW, 5,000 volts, and operating at 90 R.P.M. The dam develops a head of 41 feet and the spillway tubes can discharge 8,400 cubic feet per second. The powerhouse itself is a brick structure, 75 feet square.
[Bush, pp. 198-199, 222, 496]

ALTON STREET TREATMENT PLANT (1947)
Alton St. and King St.
East Lansing

East Lansing
16.706975.4735100
Ingham

The entire East Lansing system consisted of three water treatment plants (Alton, Audubon, and Orchard Streets) tied into a one million gallon covered ground reservoir (on Hagerdorn St., 800 block), a 250,000 gallon elevated tank (at Alton St. Plant), and a 200,000 gallon elevated tank (at Longfellow and Prescott St.) which fed the distribution system. The treatment plants were fed by ten wells 400 feet deep. The Alton Street Treatment Plant, an automatic softening and iron removal plant, operated with three zeolite tanks on the same principles and utilizing similar equipment as the Orchard Street Water Treatment Plant (1934). This plant can treat one and one-half million gallons per day during its continuous 24-hour operation. The one-story common bond brick building is 40 feet long, 30 feet wide, has a flat roof and rectangular windows. The equipment is scheduled to be removed by the end of 1975 and the plant converted to a community arts and crafts center.

AUDUBON STREET TREATMENT PLANT (1939-1940)
800 Audubon St.
East Lansing

East Lansing
16.704780.4735020
Ingham

This automatic softening and iron removal plant operated with four zeolite tanks on the same principles and utilizing the same equipment as the Orchard Street Water Treatment Plant (1934). The architecturally unique feature of these two plants was desiging the exterior to blend in with the surrounding neighborhood. Instead of being the usual eyesore, these plants were built to resemble brick colonial houses with maintained residential landscaping. This one-story common bond brick building is 35 feet long, 20 feet wide, has a gabled roof and rectangular windows. The plant had a capacity of treating one million gallons per day during its round-the-clock operation. The sodium chloride solution used for regenerating the zeolite tanks were stored in covered ground reservoirs outside each plant. A brine recovery system was used on these plants, allowing the brine to be used for portions of two regenerating cycles instead of just one, having a marked effect on the economical use of salt (sodium chloride).

BAY CITY STEAM PLANT (1893,1908)
Water St., south of 10th St.
Bay City

Bay City
17.266600.4830435
Bay

The Bay City Steam Plant was constructed in 1893 by the Bay City Electric and Traction Company and was subsequently enlarged in 1908. It operated as a generating plant until 1913, was placed on standby in 1913-1920, and was then retired in 1924, when all remaining equipment was scrapped. The buildings are now serving as a substation. The oldest segment of this structure is a rectangular brick building, 66 feet wide and 88 feet long, resting on a cut stone foundation, with a gabled slate roof. The 1908 addition is 14 feet wide, 87 feet long, with a flat roof.

BEAVERTON HYDROELECTRIC PLANT (1919)
Across Tobacco River
Beaverton

Gladwin
16.702170.4861750
Gladwin

This hydroelectric plant includes two distinct powerhouses. The one at the eastern end of the dam is a rectangular brick building 15 feet wide and 30 feet long and originally housed a 270 KW, 2,300 volt generator. The larger powerhouse (30 feet by 35 feet), originally equipped with a 700 KW generator, is about 20 feet upstream and has a separate tailrace. Both generators were driven by Leffel vertical turbines. The concrete dam, developing a head of 20 feet, is approximately 100 feet long and has seven spillway openings. Beginning at the eastern end of the dam and proceeding westerly, the first spillway has a steel tainter gate, 20 feet wide; the next three openings are 15 feet wide and equipped with wooden stoplogs inserted into grooves in the concrete walls; the fifth and sixth spillways contain steel tainter gates, each 12 feet wide; and the last opening, also 12 feet wide, is equipped with stop-logs.

BELLE ISLE WATER INTAKE SYSTEM (1902-1905)
Detroit River near Belle Isle
Detroit

Belle Isle
17.337900.4690600
Wayne

The Belle Isle Water Intake System was constructed in the years 1902-1905 with Uriah Gould serving as chief engineer of the project. It consisted of a shore tunnel, a river tunnel, and an intake crib. The system's purpose was to draw in raw water from the Detroit River, transport it to shore by way of a river tunnel, where the water would continue through

a shore tunnel to pumps at Waterworks Park, to the settling basin, and then through the pumps to be distributed throughout the city. The intake structure is 800 feet above Belle Isle's head and consists of a circular house above water. It is constructed of gray Canyon-Berea sandstone walls, surmounted by a conical roof. The house has a 37 foot inside diameter and is about 39 feet high. The house rests on and provides access to the intake crib which extends 32 feet below the water. The crib is constructed of three rings of concrete brick, over three rings of ordinary brick, over 28 feet of wood. The crib has eight sides with an open center well constructed of concrete and measuring 67 feet 11 inches by 52 feet 8 inches. The river tunnel has a ten foot diameter and is lined with four rings of vitrified brick and has a length of 3,149 and one-half feet. On shore the river tunnel connects with a ten foot diameter shore tunnel, 1,032 feet long, and goes to the Waterworks Park pumps through to the settling basins and then through the pumps to be distributed throughout the city. The pumps drew their supply from the settling basins until typhoid deaths caused the construction of a filtration plant. New low-lift pumps raised the capacity of the system, originally designed for a maximum of 150 million gallons per day, to bloom to 400 mgd. The pumps delivered water into three pressure areas through twelve mains varying in size from 42 inches to 60 inches. The maximum consumption of the system was 390 million gallons per day in 1927. Increases likely to average 20 million gallons per day for subsequent years and the inability to service neighborhoods in Detroit's southwest area prompted the construction of a replacement system in the years 1928-1931.
[Detroit Department of Water Supply, A Descriptive Survey, May 1923; Hubbell, George, "How They Built the Water Tunnel," Detroit Engineer, July 1976, p. 22; Annual Reports of the Detroit Board of Water Commissioners, Vol. 53-56, 1902-1906]

BELLE ISLE WATER INTAKE SYSTEM (1929) — Belle Isle
Belle Isle and Waterworks Park — 17.338190.4690320
Detroit — Wayne

The Belle Isle Water Intake System consists of an intake lagoon at Belle Isle, an intake structure at Belle Isle, an emergency intake, a river connecting tunnel between the old and present intakes, a river tunnel to Waterworks Park, a land tunnel through the park to Jefferson Avenue where it connects with the tunnel with water enroute to the Springwells Pumping and Filtration Plants and the Northeast Station, a screen chamber at Waterworks Park, and a short tunnel from the chamber to the intake

system's lagoon. The intake structure was designed for a maximum capacity of 940 million gallons per day (mgd) of which 346 mgd would go to Springwells, 217 mgd to the Northeast Station, and 370 mgd to Waterworks Park. The quantity to Waterworks Park is intended for emergency use should the supply through the old intake system be cut off. The lagoon consists of a 34 acre surface area of fill; it is 2,700 feet in length, 22 feet deep, with a maximum width of 480 feet and opens to the east. The lagoon is protected by rock dikes (100,000 cubic yards). The intake structure is 68 feet by 145 feet, semicircular at the ends, and constructed of limestone. The structure is 25 feet above water and 32 feet in depth below the water where it has 20 openings to admit water. The building's foundation is of two rings of steel sheet piling. The tunnel connected to the emergency intake, the old intake, and then to the screen chamber is 10 feet in diameter and has a length of more than 1,000 feet. The river connecting tunnel from the present intake to the shore shaft is 970 feet long with an 11 foot diameter. The tunnel connecting the shore shaft and the screen chamber is 625 feet long with a diameter of 15 and one-half feet. The emergency intake is a double-barreled conduit, each barrel being 10 feet by 13 feet inside. It is 250 feet in length and has a maximum width of 103 feet and provides eight entrance openings. The connection to the intake structure is controlled by six large valves so designed to open and supply water to the intake system if the intake structure is obstructed. The screen chamber on shore is a brick circular structure with an outside diameter of 74 feet, and inside diameter of 64 feet, and a depth of 46 feet to the bottom of the foundation slab. It has 10 traveling water screens around a 14 foot diameter well (six Link-Belt Clean-Water screens at installation time). Water is admitted to the chamber through a cylindrical chamber. The total cost of the contracts awarded was $3.5 million. George Fenkell was chief engineer of the project, F. Stephenson was assistant chief engineer, and E.A. Prokop was the designing engineer in charge of the river tunnel.
[Detroit Department of Water Supply, Additional Supply: Intake System and Land Tunnels, 1931; Detroit Department of Water Supply, A Descriptive Survey, October 1928; "Ten Traveling Screens in a Circular Installation in Detroit," American City, Vol. 46, May 1932]

BERRIEN SPRINGS HYDROELECTRIC PLANT (1908)
On St. Joseph River
Berrien Springs

Berrien Springs
16.555680.4643590
Berrien

Construction of the Berrien Springs Hydroelectric Plant and Dam was begun in April 1907 and completed in October 1908. The original installation consisted of four Leffel-Samson horizonal, center-discharge turbines, developing a total of 11,700 H.P., which drove four Westinghouse generators, each producing 1,800 KW, 150 R.P.M., 2,300 volts, and four Westinghouse 26 DC exciters. The entire original installation is extant. Beginning on the west bank of the St. Joseph River, the surviving works include an earth wing dam, 150 feet long; a concrete wastewater spillway, 50 feet long and 30 feet high; a two-story brick powerhouse, 30 feet wide and 75 feet long, resting on a concrete foundation; a concrete waste spillway, with a rolling configuration, 75 feet long; six steel radial gates, each 15 feet long; and an earth wing dam, approximately 150 feet long.

BOARDMAN HYDROELECTRIC PLANT (c.1920)
On Boardman River, at Cass Ave.
Garfield Township

Kingsley
16.609034.4950015
Grand Traverse

The Boardman River Electric Light and Power Company was incorporated in 1893 with a capital of $100,000 and began construction of a hydroelectric plant to provide Traverse City with street lighting in April 1894. The dam and hydroelectric plant, the first of several on this site, was completed in November 1894. The present dam was built around 1920 by the Michigan Public Service Company, was acquired by Consumers Power Company in 1950, and then went out of service in September 1969 and was subsequently sold to Grand Traverse County. The facility consists of a concrete bridge-dam structure, 15 feet wide and 200 feet long, with two Stoney spillway gates and a rectangular brick powerhouse, 18 feet by 60 feet, resting on a concrete foundation. The dam developed a head of 41 feet. The generating equipment consisted of two Leffel vertical turbines and two 550 KW generators, operating at 225 R.P.M., 2,100 volts.
[Bush, p. 361; Smith, Mrs. George and Sprague, Elvin, History of Grand Traverse and Leelenau Counties (Chicago, 1903), p. 298]

BOARD OF WATER AND LIGHT:
OTTAWA STREET STATION (1938-1950)
200 E. Ottawa St.
Lansing

Lansing South
16.700600.4734170
Ingham

The Michigan Power Company built a steam and electrical generating plant on this site in 1908 and it was purchased by the City of Lansing in 1919 when the company went into bankruptcy. This plant was demolished in 1937 and the present plant erected. It houses 81,500 KW of generating equipment and can produce 200,000 pounds of steam heat per hour. It supplies the steam heating needs for most of downtown Lansing. This massive steel-framed brick building is about 300 feet by 150 feet and is approximately 250 feet high.
[Board of Water and Light, Water and Power (Lansing, 1966), pp. 12-16]

BROWN'S BRIDGE DAM HYDROELECTRIC PLANT (1922)
On Boardman River, north of River Rd.
Union Township

Kingsley
16.618025.4944020
Grand Traverse

This hydroelectric plant was completed in 1922 by the Traverse City Light and Power Company. It consists of an earth embankment dam approximately 800 yards long, producing a head of about 30 feet. The rectangular brick powerhouse, 20 feet by 25 feet, contains the two original generators, each approximately 200 KW capacity. The powerhouse rests on the concrete spillway, which has two steel tainter gates, each 12 feet wide.
[Grand Traverse Bicentennial Board, "The Boardman River Historical Trail"]

BUCHANAN HYDROELECTRIC PLANT (1902,1908,1920)
Across St. Joseph River
Buchanan

Niles West
16.553880.4631980
Berrien

A timber dam was originally constructed on this site in 1893. This dam was little used and in 1901, Charles A. Chapin, owner of the South Bend Electric Company, purchased the site to develop its hydroelectric potential. In 1902, ten 68 inch vertical Samson turbines driving a 1,500 KW General Electric generator were installed, along with a 40 inch vertical Samson turbine driving a 60 KW General Electric exciter. These units were all controlled by Type B Lombard Governors. Four of the 68 inch vertical turbines are still in place, but are badly worn. The remaining six were replaced in 1919-1920 with six vertical direct connected units consisting of Leffel "45" Type Z wheels and Electric Machinery Company generators rated at 480 KVA, 3 phase; 60 cycle; 2,300 volts; 109 R.P.M., still extant. Each unit has a Woodward Type H.R. Governor. The original dam washed out in 1908 and was replaced by the existing concrete dam, which is approximately 200 feet long and creates a hydraulic head of ten feet. The surviving generating equipment is housed in the 1902 building, a brick structure consisting of two distinct sections, one 20 feet wide and 30 feet long, while the other is 50 feet long and 20 feet wide. Both sections have gabled roofs.

CALKINS BRIDGE DAM AND
GENERATING PLANT (1930-1936,1945)
Allegan Dam Rd.
Allegan

Allegan
16.585095.4712065
Allegan

The Calkins Bridge Dam and Generating Station was constructed in 1936 for the Consumers Power Company and is still in active use. The General contractors were the Hay-Weaver Company and the consulting engineers were the firm of Ayres, Lewis, Norris and May. The Kalamazoo River has a hydraulic head of sixteen feet at this site. The brick powerhouse, 210 feet long and 60 feet wide, houses the original installation of three Leffel vertical turbines and three turbo-generators with a total capacity of 2,550 KW. It rests on the northern end of the dam, all of concrete construction. The remainder of the dam is 150 feet long, with six steel radial gates (tainter gates), each 25 feet wide and 20 feet high. Originally built for the City of Allegan, Consumers Power Company took it over in 1968.

CASCADE HYDROELECTRIC PLANT (1926)
On Thornapple River
Cascade

Lowell
16.622710.4751665
Kent

The Cascade Hydroelectric Plant was constructed by the Michigan Water Power Company in 1926 and was purchased by Consumers Power Company in 1934. It was retired from service in October 1971. The original installation, no longer extant, consisted of two S. Morgan Smith vertical turbines driving two Westinghouse 1,280 KW generators.

CERESCO POWER STATION (1904)
161 S. Main St.
Ceresco

Ceresco
16.659930.4681330
Calhoun

The Ceresco Mill and Hydraulic Company owned this site when the company was taken over in 1904 by W.A. Foote, a pioneer in electrical generation in Michigan and one of the founders of the Consumers Power Company. He converted this site into a hydroelectric plant in 1904 and electricity was generated here until 1953. There is a concrete dam across the Kalamazoo River, 200 feet long, with the flow of water controlled by eight vertical lift gates, each 25 feet wide. The powerhouse is a one-story rectangular brick building, 30 feet wide and approximately 75 feet long, resting on a concrete foundation. About one-third of the original powerhouse is covered by a wood facade added by the present owners of the building. None of the original turbines or generators are extant. [Bush, p. 73; Detroit Free Press, May 25, 1974, n.p.]

CHARLOTTE WATERWORKS (1886)
S. Cochran Ave., at Bennett Park
Charlotte

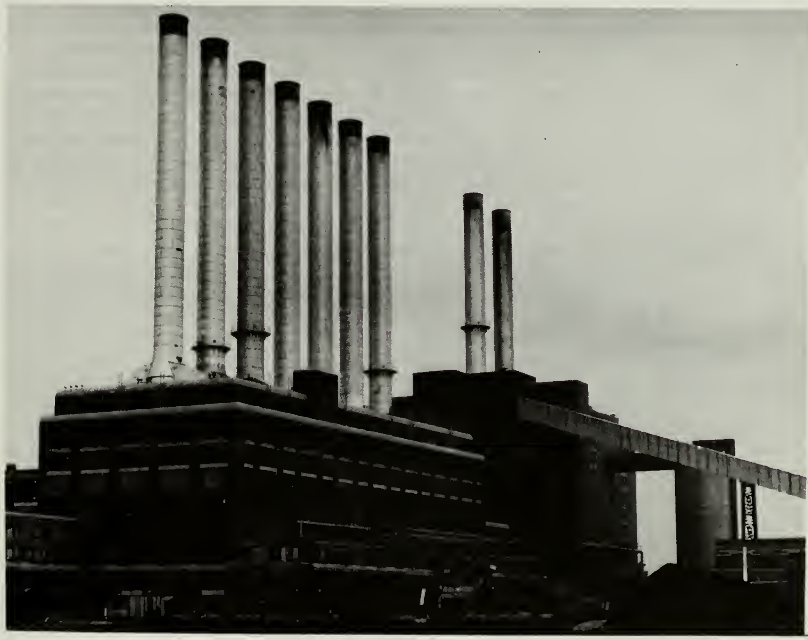
Charlotte
16.697750.4712325
Eaton

The Charlotte Waterworks Building was constructed in 1886 and housed a steam driven pump, no longer extant, which pumped water from the nearby Battle Creek River. It is a single-story rectangular brick structure, 40 feet wide and 100 feet long, with brick-arched doors and windows and a roof which is pitched slightly to the rear. The octagonal brick chimney was originally about 75 feet high, but the top 30 feet have been removed. The National Tube Works Company of Chicago erected the building at a cost of $30,000, while the contract for the pumping engine and boilers was executed by L.M. Walker of Port Huron for $5,000. [Engineering News, Vol. XV (1886), p. 173]

CONNORS CREEK GENERATING STATION (1914)
200 Lycaste St.
Detroit

Belle Isle
17.338570.4691260
Wayne

This is one of several large-scale fossil fuel plants constructed in the Detroit area by Detroit Edison in the early years of this century. The massive brick boiler house is 120 feet wide, 571 feet long, and 98 feet high, with a gabled roof supported by steel Pratt trusses. There are nine distinct smokestacks, named the Seven Sisters and Two Brothers by local residents, each 227 feet high and 13 and one-half feet in diameter at the base. The equipment in place includes two 30 MW turbines, three 60 MK turbines, and a single 150 MW unit. The powerhouse and equipment cost slightly over $25 million.



Connors Creek Generating Station (1914), Detroit

CONNORS CREEK STORMWATER
PUMPING AND SEWAGE STATION (1928-1930)
12244 E. Jefferson Ave.
Detroit

Belle Isle
17.338520.4692400
Wayne

The Connors Creek Stormwater Pumping and Sewage Station is Detroit's oldest stormwater facility. It was erected during the years 1928-1930. Its main purpose is to relieve a southeastern neighborhood of Detroit of flood conditions whenever the Detroit River rises. Stormwater is pumped to the station by means of two 14 foot sewers and then settles in the discharge tunnel. In addition, dry-weather flow is absorbed and diverted to the intercepting sewers beneath Jefferson Avenue by means of the backwater gates. There they are discharged into the Detroit River at a point far below the city, thus no pollution occurs in the bathing beaches of the river. These same gates by means of a one-way hinge opening absorb stormwater from the river during emergencies but do not allow it to surge backwards onto the low lying land again. The stormwater station is made up of three main structures along with concrete compartments below grade. Each of the three structures have steel frames, steel columns supporting the roofs, and red brick construction with limestone trim. The pumping station is circular with a 112 foot diameter and a height of 66 feet (not including a suction well that extends 50 feet below the ground). The main switch house is approximately 43 feet by 78 feet, the backwaters gate station is about 42 feet by 128 feet, and both structures are one-story buildings. The backwaters gate station has nine concrete compartments underneath it at a maximum of 25 feet. Upon completion of the station there were eight pump motors, each with 2,300 HP and 4,600 volts, and having a capacity of 500 cubic feet per second. Priming of the motors is effected by six motor-driven pumps. The station has a 20 ton revolving crane for handling the motors. The backwater station has a 10 ton revolving crane, also to handle the massive gates. The nine channels are all separated by heavy piers. Each channel has an automatic timber backwater gate which covers an opening 10 feet by 10 feet. The gates are constructed of selected creosoted yellow pine timbers 8 inches by 8 inches, laid horizonally and fastened together by four one and one-quarter inch bronze binding rods supplied with self-adjusting nuts to permit wood expansion and contraction. Provisions were made at the time of construction for four additional pump motors, and they have since been added. Each are 500 HP motors with 4,600 volts. They are housed in an auxiliary building 30 feet by 68 feet. Ayres, Lewis, Norris & May of Ann Arbor, Michigan were the consulting engineers and Perry Fellows was the city engineer at the time of construction.
[Engineering News-Record, Vol. 102, May 23, 1929, pp. 832-833; Vol. 104, May 29, 1930, pp. 884-886; Vol. 107, July 30, 1931, pp. 182-184]

COOKE HYDROELECTRIC PLANT (1911)
On Au Sable River
Oscoda Township

Tawas City
17.295050.4927035
Iosco

This was the first of six hydroelectric plants constructed on the Au Sable River by the Consumers Power Company in 1911-1923. It was named after Andrew Cooke of the Harris Trust Company, one of the men instrumental in arranging financing for the project. The original installation, still extant, consisted of three horizonal Allis-Chalmers turbines and three General Electric generators, each operating at 180 R.P.M., 2,500 volts, producing 4,000 KW. The power produced at Cooke was transmitted to Bay City, Saginaw, and Flint, initially over a line 125 miles long, which was later extended to 235 miles long. In early 1912, transmission began at the then unprecedented level of 140,000 volts. Several innovations in tower design and insulators were made at this time by J.B. Foote of Consumers Power Company. These included the use of tapered steel towers and cap and pin insulators, which became standard for most of the electrical industry. The dam is an earth-filled type with a concrete core wall and it creates a head of 41 feet. The powerhouse is a rectangular brick building, 40 feet by 120 feet, with a gabled roof. The concrete spillway contains three tainter gates which can discharge 15,800 cubic feet per second.
[Bush, pp. 158-161, 476; Engineering News, Vol. 67, May 16, 1912, p. 912]

CROTON HYDROELECTRIC PLANT (1908,1915)
On Muskegon River
Croton

Sand Lake
16.608010.4810000
Newaygo

The Croton Dam, begun in 1906 and completed in July 1908, was the scene of major breakthroughs in hydroelectric development and high voltage transmission of electric power. This was a large hydroelectric project for the time, developing 15,000 horsepower with a head of 40 feet. Power was transmitted to Grand Rapids at the unprecedented pressure of 110,000 volts, necessitating several innovations in transmission equipment. The wooden poles with pin insulators used on the 70,000 volt Rogers line (see other entry) were inadequate, so J.B. Foote, the chief engineer for Consumers Power Company, developed a three-legged steel "windmill" tower and used the Hewlick-Buck porcelain bell insulators recently developed by General Electric in Schenectady, New York. The conductor used on this line consisted of six strands of Number 10 medium hard-drawn copper wire. The innovations achieved at Croton attracted engineers from all over the United States and from Europe, Russia, and even India. It

became so famous that a "Song of Croton Dam" (sung to the tune of "Marching Through Georgia") was composed in its honor. The dam, which is 670 feet long, included a 238 foot concrete spillway with eight steel tainter gates, each 25 feet wide, and a beartrap gate 38 feet wide. The brick powerhouse, resting on concrete foundations, consists of a segment 50 feet wide and 100 feet long perpendicular to a segment 40 feet wide and 80 feet long. Both segments have gabled roofs. The original generators, two Westinghouse 4,500 KW units are extant, along with two Allis-Chalmers generators, each producing 1,260 KW, 7,500 volts, operating at 150 R.P.M., installed in 1915. Originally, Croton had two octuple turbine units, i.e., each consisting of four pairs of 45 inch Leffel wheels mounted in open pits. These are no longer extant. However, the Allis-Chalmers vertical turbines installed in 1915 are still in place, along with a pair of Allis-Chalmers horizonal turbines of later vintage.
[Bush, pp. 89-93, 464-465]

Croton Hydroelectric Plant (1908,1915), Croton

DELRAY COAL TIPPER HOUSE (1926)
6603 W. Jefferson Ave.
Detroit

Detroit
17.326970.4684600
Wayne

This structure is two stories high with dimensions of 196 feet by 55 feet, and is of brick construction with a roof consisting of 9 steel trusses covered by a wood gabled roof. The building could handle a maximum of fifteen 120 ton coal cars per hour. The equipment used in the building was furnished by the Welman-Seaver-Morgan Company, and the total cost of the project was $411,720.

DELRAY POWERHOUSE NUMBER 3 (1929)
6603 W. Jefferson Ave.
Detroit

Detroit
17.326970.4684500
Wayne

This structure consists of a large boiler house, 100 feet tall with six smokestacks 227 feet high with a diameter of 13 feet 6 inches. The building is of brick construction with a steel trussed gabled roof. The boiler house has 5 low pressure and 7 high pressure boilers. This 380 MW plant was built at a cost of nearly $18 million.

DETROIT AND NORTHERN RAILROAD:
FARMINGTON POWERHOUSE (1900)
31505 Grand River Ave.
Farmington

Redford
17.306140.4702920
Oakland

Built by the Detroit and Northern Railroad Company, later the Detroit United Railroad Company, this electrical generating plant is three stories high with dimensions of 264 feet by 120 feet. The building is of brick construction with decorative arched windows. A massive towering smokestack is still standing at the rear of the building. It was utilized by a wine distributor from 1930 until 1971, and now stands vacant.
[MHD, Site Files]

DETROIT WASTEWATER TREATMENT PLANT (1935-1940)
9300 W. Jefferson Ave.
Detroit

Dearborn
17.324640.4683300
Wayne

The Detroit Wastewater Treatment Plant was constructed in 1935-1940 with the purpose of drawing in the sewage of Detroit and seven adjacent communities, treating it, and sending the treated water to the Detroit River. The plant project cost $27 million and was basically funded through the P.W.A. (Public Works Administration). L.G. Lenhardt was the Commissioner of Public Works at the time of construction and J.S. Stringham was the City Engineer. In 1940 the facilities rested on 96 acres but now, through expansion, the facilities occupy 129 acres. The plant receives sewage through the two sewage interceptors and the main pump lifts the sewage up 30 feet to effect the flow of gravity throughout the rest of the sewage's journey. The sewage goes through the bar screens where the coarse material is removed and then to the grit chambers where the heavy material is made to drop out. The sewage then goes to the sedimentation tanks where organic matter settles to the bottom and any material left floating is skimmed off. The wastewater now goes through the sludge digester where naturally occurring bacteria is allowed to consume most of the remaining organic material. The wastewater is then treated with chlorine and returned to the river. Meanwhile the sludge is filtered and burned and used as land fill. The main pump station is a circular building with a radius of 56 feet, a height of 50 feet with a sump pit that extends 68 feet below grade. The rack and grit building is 218 feet long, 55 feet wide, and 37 feet high. The main powerhouse is 125 feet long, 58 feet wide, and 30 feet high while the administration building is 82 feet long, about 45 feet wide, and 27 and one-half feet high. The garage and chlorination house, which adjoins the administration building at opposite sides, are each 62 feet long and 30 feet high, while the garage is 48 feet wide and the chlorination building 39 feet wide. Each of these structures is constructed of red brick. The structure housing the eight sedimentation tanks is 1,014 feet long by 310 feet wide by 21 feet deep and is constructed of stone. The sludge digester is a circular structure with a 105 foot diameter, standing 18 feet high above grade, and extending 30 feet below grade. In 1957 a $33 million program was launched to expand and improve the treatment facilities and add newer and better equipment. The original equipment still in use are six main pumps with a combined capacity of 1,300 million gallons per day (mgd), eight mechanically cleaned bar racks, eight grit chambers comprised of V-shaped buckets on chains, each 150 feet long, 15 feet deep, and 16 feet wide, and eight rectangular sedimentation tanks 270 feet long by 120 feet wide with that width divided

into seven 16 foot compartments. The sedimentation tanks use eight vacuum filters, each 11 and one-half feet in diameter and 14 feet long. In 1940 peak capacity was 715 mgd but today's capacity is upwards of 1,300 mgd.
[Detroit Metropolitan Water Department, Clean Water: A New Day for Southeast Michigan, December 1973; Engineering News-Record, Vol. 117, September 3, 1936, p. 330; Vol. 124, June 13, 1949, p. 7]

EDENVILLE HYDROELECTRIC PLANT (1925)
Across the Tittabawassee River
Edenville

Edenville
16.711000.4354360
Gladwin

The dam at Edenville develops the highest head (45 feet) of the four dams constructed by the Wolverine Power Company on the Tittabawassee River in 1925. The output of these dams (Edenville, Sanford, Secord Lake, and Smallwood) has been sold to Consumers Power Company since 1925. The brick powerhouse is 40 feet long, 25 feet wide, and rests on a concrete foundation. It contains the original installation, consisting of two General Electric generators, each rated at 2,400 KW, 2,300 volts, operating at 138 R.P.M. The adjoining concrete spillway consists of three steel radial gates, each 24 feet wide.
[Bush, p. 222]

ELM STREET POWER STATION (1912,1920,1937)
179 Elm St.
Battle Creek

Battle Creek
16.650700.4686370
Calhoun

This generating station has undergone several major changes since it was originally constructed to provide Battle Creek with electric power in 1912. The original powerhouse was 119 feet wide, 161.5 feet long, and 45 feet high, of steel and brick construction. Major alterations took place in 1920, producing a building which was 66.5 feet wide, 159.5 feet long, and 67.5 feet high. This building remains, along with a boiler house, 70 feet wide, 50 feet long, and approximately 120 feet high, which was added in 1937. The two original smokestacks were removed in 1937 and replaced by a new stack, approximately 250 feet high, which is still in place. None of the original equipment remains. However, the Number 4 turbo-generator, installed in 1924, is still in place. It is a 20,000 KW Westinghouse 1,800 R.P.M. turbo-generator, 25,000 kv-a, 5,000 volts, 60 cycles. A 1937 "topping turbine" (10,000 KW General Electric, 3,600 R.P.M.), installed to permit the installation of boilers with operating pressures higher than the capacity of the 1924 turbines, remains in place.

EPHRAIM SHAY WATERWORKS BUILDING (1890)
E. Bay St.
Harbor Springs

Petoskey
16.657083.5032055
Emmet

Ephraim Shay built a waterworks system with a capacity of 100,000 gallons per day to serve the population of Harbor Springs and Harbor Point in 1890, shortly after he had moved to Harbor Springs. This building housed the steam engine and pumps. In 1894 he developed a reservoir system and then sold the waterworks to the city a few years later. The waterworks building is a simple rectangular brick structure, 40 feet wide and 50 feet long, with a partially hipped roof.
[NR]

FAIRLANE POWERHOUSE (1914)
Fairlane
Dearborn

Dearborn
17.316060.4686750
Wayne

This powerhouse was designed by Thomas Edison to serve the Fairlane estate of Henry Ford. There are two vertical turbines built by the James Leffel Company of Springfield, Ohio resting in a concrete wheelpit. The Wheel Room, located directly above the wheelpit, contains two manually-operated gates controlling the flow of water in and out of the wheelpit; two three and one-half ton grey iron flywheels, one attached to each of the two turbine shafts; and a system of shafts, pulleys, and belts linking the turbine shafts with the speed governors located in the Generating Room on the level above. The Generating Room contains the following equipment: two D.C. Generators, 55 KW capacity, 110 S.R.P.M., 250 volts, 220 Amps Per Term (inal?), both built by the Electric Machinery Company of Minneapolis; both generators are tied to flyball governors manufactured by the Lombard Governor Company of Ashland, MA; a third generator, 35 KW, 285 S.R.P.M., 250 volts, 140 Amps Per Term (inal?), driven by a single-piston Armington-Sims steam engine; and a marble control panel containing manually-operated breaker switches for approximately 24 distinct circuits. The Boiler Room contains two 60 HP "Perfection Smokeless" boilers manufactured by the Titusville Iron Company of Titusville, PA. These boilers were hand-charged with coke and were in continuous use from 1914 until 1950, when they were converted to burn oil. They went out of service in 1957 when a new oil furnace was installed in the same boiler room.
[Johnson, William J., "Feasibility Plan for the Adaptive Reuse of Fairlane," pp. 8-9, 98-101]

FIVE CHANNELS HYDROELECTRIC PLANT (1912)
On Au Sable River
Oscoda Township

Tawas City
17.287000.4925067
losco

This was the second dam built on the Au Sable River by the Consumers Power Company in 1911-1923. Grant Cochran was the construction supervisor for this dam as well as for the Cooke and Loud dams (see other entries). Cochran built three dams in four years by "leap-frogging" men and equipment from one dam to the next. Five Channels is an earth embankment dam utilizing a reinforced concrete core wall. The original installation, still extant, included two Allis-Chalmers horizonal turbines and two General Electric generators, each producing 3,000 KW and operating at 150 R.P.M. The rectangular brick powerhouse is 40 feet wide, 140 feet long, with a gabled roof, and rests on a concrete foundation. The concrete spillway contains three tainter gates, which can discharge approximately 15,000 cubic feet per second.
[Bush, pp. 158-159]

FOOTE HYDROELECTRIC PLANT (1918)
On Au Sable River
Oscoda Township

East Tawas
17.305084.4922095
losco

The Foote Dam is an earth embankment dam with a reinforced concrete core wall creating a head of 39 feet. The original installation, still extant, included three Allis-Chalmers vertical turbines and three General Electric generators, each producing 3,000 KW, 5,000 volts, operating at 90 R.P.M. The powerhouse is a rectangular brick building resting on a concrete foundation, 40 feet wide and 120 feet long, with a flat roof. The concrete spillway contains three tainter gates and can discharge 15,800 cubic feet per second. This dam was named after J.B. Foote, the founding engineer of the Consumers Power Company.
[Bush, p. 159]

FORD DAM AND POWERHOUSE (1932)
Across the Huron River
Ypsilanti Township

Ypsilanti East
17.288850.4675600
Washtenaw

Henry Ford constructed this dam and generating plant in 1932 as part of his program to develop "rural industry" in Michigan. The brick, steel-framed powerhouse is 45 feet sqauare and 90 feet high, resting on a concrete foundation. The two original Westinghouse turbo-generators, one of 1,800 KW capacity, the other 1,600 KW, are extant, but not in use. Plans are underway, however, to restore them to working order and to once again generate power from this plant. Adjacent to the powerhouse is a combination bridge-dam structure, of concrete construction, 200 feet long and approximately 50 feet high.

Five Channels Hydroelectric Plant (1912), Oscoda Township

FOUR MILE HYDROELECTRIC PLANT (1909, c.1940)
Across Thunder Bay River, end of Four Mile Rd.
Maple Ridge Township

Lake Winyah
17.303100.4996160
Alpena

The Alpena Electric Light Company, organized in 1882, constructed this dam and powerhouse in 1909. The powerhouse is a rectangular brick building, 40 feet wide and approximately 80 feet long, with a flat roof. It contains the original installation, which includes three horizonal turbines driving three General Electric generators, each producing 600 KW, 6,600 volts, at 257 R.P.M. The dam, which produces a head of 52 feet, is concrete, approximately 400 feet in length, and is topped off with flashboards. There are no separate spillway gates. The dam was constructed around 1940.
[Powers, Perry F., History of Northern Michigan and Its People (Chicago, 1912), p. 472]

FRENCH PAPER COMPANY:
DAM AND POWERHOUSE (1915,1921)
100 French St.
Niles

Niles West
16.561580.4629600
Berrien

J.W. French came to Niles in 1871 after the city of Niles offered him a free building site on the St. Joseph River. He established the Michigan Wood Pulp Paper Company and began producing paperboard from the silver poplars available locally. When the supply of these trees became exhausted around 1895, he began to produce paper, and the French Paper Company has specialized in high quality papers since then. There have been several dams on this site, but the present dam was constructed in 1915 after a major flood washed out the then-existing dam. The concrete dam is 320 feet long, 12 feet high, has a "rolling" configuration, and is slightly bowed in the upstream direction. The powerhouse (1921) is a rectangular steel-framed brick building resting on a concrete foundation, approximately 70 feet long and 40 feet wide. It still houses the original 1915 installation, which included three Allis-Chalmers generators, each 500 KVA, 480 volts, 180 R.P.M.
[French Paper Company: First Century, 1871-1971 (French Paper Company: Niles, Michigan, 1971), p. 20]

GRAND RAPIDS WATER FILTRATION PLANT (1912,1923)
1430 Monroe St., N.E.
Grand Rapids

Grand Rapids West
16.608440.4760250
Kent

The City of Grand Rapids created a $400,000 bond issue in 1910 to finance the construction of a new water filtration plant for the city. This plant was built under the supervision of George W. Fuller, Supervisory Engineer, and R.E. Harrison, Resident Engineer. The contractors included J.P. Rusche, A.H. Prance, the Fort Wayne Electric Works, and the Roberts Filter Manufacturing Company. The capacity of the plant was doubled in 1924 with an addition which is identical to the 1912 plant. R.E. Harrison was the Supervisory Engineer for the addition and J.P. DeKorne was the Resident Engineer. The General Contractor was the Owens-Ames-Kimball Company. This plant filtered water from the Grand River initially and from Lake Michigan after 1940. It remained in constant service until 1963, when a new filtration plant was opened on the lake. It remains a standby facility and is occasionally used during periods of peak demands, particularly during the summer. Grand Rapids was the first city in the United States to fluoridate its water supply and it was from this plant that sodium flouride was introduced into the water supply in January 1945. The plant, with total capacity of 40 million gallons per day, includes 8 centrifugal pumps to bring in the river water, the filtration beds, outside settling tanks, and two 50,000 gallon tanks for storing water used to backwash the system. This facility, enclosed in a two-story brick building with tile roofs, is essentially unaltered since its construction.
[Lydens, Z.Z., editor, The Story of Grand Rapids (Grand Rapids: Kregel, 1966), pp. 171-172, 400]

HARBOR STREET DIESEL
GENERATING PLANT (1896,1931)
Harbor St. at Sherman Ave.
Grand Haven

Muskegon
16.562025.4767045
Ottawa

The City of Grand Haven established a Board of Light and Power in 1896 to provide the city with electricity. A steam plant was erected in that year at a cost of $9,985, including all equipment. H.H. Humphrey was the consulting engineer and the building contractor was VanDongen and Groenevelt. Although none of the original equipment remains, this building is extant. It is a 70 foot square two-story brick building with a steel frame and a flat roof with a skylight. In 1931, the adjoining diesel plant was constructed and equipped at a cost of $217,000.

The building is rectangular, 150 feet long and 75 feet wide, two stories high, and has a flat roof. It is a steel-framed brick building resting on a concrete foundation. None of the original equipment is extant. There are, however, six Nordberg Diesel Generators, built between 1937 and 1948, still in place. They vary greatly in size, but are otherwise virtually identical.
[Annual Statement of the Board of Public Works, Municipal Power and Light System, Grand Haven, MI, 1937, pp. 2-6]

HARDY [OXBOW] HYDROELECTRIC PLANT (1931) | Sand Lake
On Muskegon River | 16.609078.4815060
Oxbow | Newaygo

The Hardy Dam was begun in 1929 and completed in 1931 at a cost of $5.3 million, the largest hydroelectric project built by Consumers Power Company prior to their recently completed Ludington Pumped Storage Facility. At the time of construction, the dam, which creates a head of 100 feet, was the highest earth-filled dam in the world constructed with hydraulic fill methods. The original installation, still extant, included three I.P. Morris vertical turbines and three General Electric generators, each producing 10,000 KW, 7,500 volts, operating at 163.6 R.P.M. The brick powerhouse is 50 feet wide, 130 feet long, and has a hipped roof. There is an undersluice spillway which can discharge 26,000 cubic feet per second, plus an emergency spillway at the northern end of the dam with a capacity of 40,000 cubic feet per second. The water is brought into the turbines through three round steel penstocks 14 feet in diameter and approximately 300 feet long.
[Bush, pp. 429-430, 502]

HIGHLAND PARK WATERWORKS (1921) | Highland Park
13512 Dequindre Ave. | 17.329050.4697230
Highland Park | Wayne

The water purification plant in Highland Park consists of a 48 million gallon concrete storage reservoir, a 2.75 million gallon covered coagulation basin, a filtration plant, and an electrically-operated pumping station. The coagulation basin is 114 feet by 324 feet by 13 feet and is covered with a concrete groined roof. The filtration plant consists of twelve filters and a head house over a 4 million gallon filtered water reservoir. The head house is built of red brick and is three stories high including the basement. The reservoir is below grade 24

inches and is 121 feet by 415 feet by 13 feet and is constructed of concrete masonry. The pumping station is a larger red brick building with six pumping units, four of which were used in an older station. L.C. Whitsit was the city engineer at the time of construction.
["Water Purification Plant at Highland Park, Michigan," Engineering News-Record, May 5, 1921, pp. 772-775]

Hardy [Oxbow] Hydroelectric Plant (1931), Oxbow

HODENPYL [COUNTY LINE]
HYDROELECTRIC PLANT (1925)
On Manistee River
Springfield Township

Copemish
16.594005.4912065
Wexford

This is an earth embankment dam with a reinforced concrete core wall and creates a head of 67.5 feet. The original installation, still extant, consisted of two Allis-Chalmers vertical turbines and two Allis-Chalmers generators, each producing 9,000 KW, 7,500 volts, operating at 120 R.P.M. The spillway, which runs under the powerhouse, consists of six Tefft spillway tubes, which can discharge a total of 11,000 cubic feet per second. The concrete powerhouse is 140 feet long, 120 feet wide, and approximately 140 feet high. The Consumers Power Company first used pilot exciters here to provide a separate source of excitation to the main exciter.
[Bush, pp. 499-500]

JACKSON STEAM PLANT (1905,1907,1930)
N. Mechanic St. at W. Trail
Jackson

Jackson North
16.713940.4680800
Jackson

The Jackson Steam Plant was originally (1905) equipped with four 500 HP Altas boilers operating at 160 pounds PSI, and a single 1,500 KW General Electric vertical turbo-generator, 2,300 volts, 60 cycles, operating at 1,800 R.P.M. Tbe building was enlarged in 1907 and 1930 and there were numerous changes in equipment between 1905 and 1927, when the plant was taken out of regular service. It has not generated electricity since 1927 and is used as a warehouse by the Consumers Power Company. None of the boilers or generators are extant. The building is a two-story steel-framed brick structure with brick-arched windows and a flat roof. It is L-shaped, with one wing 190 feet long and 100 feet wide, while the other wing is 50 feet square.
[Jackson Steam Plant, a report prepared in the late 1940's by engineers at Consumers Power Company]

JUNCTION [TIPPY] HYDROELECTRIC PLANT (1918)
On Manistee River
Dickson Township

Copemish
16.584073.4901000
Manistee

This was originally the Junction Dam, but was renamed the Charles W. Tippy Dam in honor of the General Manager of Consumers Power Company

during the period 1915-1933. It is an earth embankment dam with a reinforced concrete core wall and develops a head of 56 feet. The rectangular brick powerhouse, 40 feet by 150 feet, rests on a concrete foundation. The concrete spillway contains four steel tainter gates and has a discharge capacity of 24,000 cubic feet per second. The original installation, still extant, consisted of three Wellman-Morgan vertical turbines and three Westinghouse generators, each producing 6,700 KW, 7,500 volts, operating at 109 R.P.M.
[Bush, p. 160]

Junction [Tippy] Hydroelectric Plant (1918), Dickson Township

KALAMAZOO GENERATING PLANT (1913,1939)
740 S. Mills St.
Kalamazoo

Kalamazoo
16.618125.4683190
Kalamazoo

Kalamazoo began operating a municipal electrical power system in 1894 when it purchased the Kalamazoo Electric Company for $12,000. The northern section of the existing building was erected in 1914 and originally contained two General Electric 600 KW turbines. The southern portion of the present structure, facing Mills Street, is 85 feet long, 35 feet wide, and 55 feet high, of steel and brick construction. This addition was built in 1939 at a cost of $78,000 to house a new Allis-Chalmers turbine (capacity of 2,000 KW) and Springfield boiler (3,500 H.P., 400 P.S.I.). None of this equipment has remained intact. The plant supplied electric power for the city's lights, for the municipal water system, and for most of Kalamazoo's residents until it was sold to Consumers Power Company in 1955 and shut down.
[Dunbar, Willis F., Kalamazoo and How It Grew (Kalamazoo: Western Michigan University, 1959), pp. 114-115; Kalamazoo Gazette, November 1, 1939, p. 12 and May 7, 1956, p. 11]

KALAMAZOO GENERATING STATION (1911)
E. Michigan Ave.
Kalamazoo

Kalamazoo
16.617810.4683400
Kalamazoo

The Kalamazoo Generating Station was constructed in 1911 to provide electrical power for Kalamazoo and the surrounding area. The original equipment included three 350 H.P., 210 lb. pressure Wickes vertical water tube boilers and a single 3,000 KW, 1,800 R.P.M. steam turbo-generator producing 3,750 kv-a, 5,000 volts, 60 cycles, made by the General Electric Company. This plant stopped producing electricity in 1927, when it was converted into a heating plant to provide steam for downtown Kalamazoo. This plant, constructed of reinforced concrete, brick, and steel, consists of four distinct parts: the main building, housing the steam plant, is 144 feet long and 103 feet wide, and is the NE portion of the complex; the NW portion (52 feet by 92 feet) housed the boiler room; the SW portion (144 feet by 52 feet) contained the turbine room; and the SE portion (52 feet square) housed the offices. Included on the site is a four ton overhead crane used to move coal from a pit 100 feet wide and 500 feet long, which runs the length of the plant and abuts the northern facade of the buildings. The crane is supported by a combination of reinforced concrete and steel piers.

LABARGE HYDROELECTRIC PLANT (1922)
On Thornapple River
Caledonia Township

Lowell
16.623440.4740750
Kent

This hydroelectric plant was built by the Michigan Water Power Company in 1922. It consists of a rectangular wood-framed powerhouse, 25 feet wide and 40 feet long, with a gabled roof, and originally housed a 400 KW and a 300 KW generator (no longer extant). The dam, which develops a head of 17.5 feet, consists of a concrete wasteway segment 120 feet in length, and two steel tainter spill gates, each 20 feet wide and supported by concrete piers.

LOUD HYDROELECTRIC PLANT (1913)
On Au Sable River
Huron Township

Tawas City
17.283050.4926077
Iosco

This was the third hydroelectric project completed on the Au Sable River by the Consumers Power Company. Grant Cochran was the construction supervisor. It was named after Edward Loud, a lumberman who had owned most of the lands on the Au Sable River from Mio to Oscoda prior to selling them to the Consumers Power Company in 1909. This is an earth embankment dam utilizing a reinforced concrete core wall and it creates a head of 27 feet. The original installation, still extant, includes two Allis-Chalmers horizonal turbines and two General Electric generators, each producing 2,000 KW, 2,500 volts, operating at 120 R.P.M. The powerhouse is a flat-roofed, rectangular brick building, 40 feet wide and 120 feet long, resting on a concrete foundation. The concrete spillway consists of three tainter gates and can discharge 16,650 cubic feet per second.
[Bush, pp. 125-137, 158-159, 173]

MANISTEE WATERWORKS (1881)
538-540 First St.
Manistee

Manistee
16.553045.4899030
Manistee

This waterworks building bears the sign, "Manistee Waterworks, Holly System". It was sold to the Manistee County Historical Society in 1954. It is a rectangular brick building, 40 feet wide and 80 feet long, with brick-arched windows and a gabled roof. The western end of the building, which contained the pumping machinery, has a basement extending approximately 30 feet below ground level. None of the original machinery and equipment survives except for the main valve.
[MHD, Site Files]

MARSHALL ELECTRIC LIGHT COMPANY (1911)
906 S. Marshall Ave.
Marshall

Marshall
16.668650.4680675
Calhoun

This electric generating plant was built by the City of Marshall to supply power to 150 arc street lights of 200 candle power each, as well as to serve the general demand for electricity in the community. It was constructed at a cost of $50,000. The original installation included four turbines producing a total of 664 H.P. and two generators, a General Electric 250 KW and a Fort Wayne 187 KW, both producing 2,300 volts, 60 cycles. This equipment, along with the brick powerhouse, concrete dam, and concrete raceways, is extant. The powerhouse, 30 feet wide and 85 feet long, consists of three sections of one, two, and three stories in height, all with flat roofs.
[Gardner, Washington, History of Calhoun County (New York: Lewis, 1913), pp. 252, 257-258]

MIO HYDROELECTRIC PLANT (1916)
On Au Sable River
Mio

Not Mapped

Oscoda

Mio Dam is an earth embankment dam with a reinforced concrete core wall creating a head of 29 feet. The original installation, still extant, consisted of two Allis-Chalmers vertical turbines and two Allis-Chalmers generators, each producing 2,500 KW, 2,500 volts, and operating at 80 R.P.M. The construction of Mio posed several serious problems for its builders. Its isolated location away from railroad lines made it necessary to haul cement and machinery fifteen miles by wagon from Cummins, with some pieces of machinery weighing thirty tons. Because of the narrow space they had to work with, it was decided to use the "conduit spillway" patented by W.W. Tefft. This spillway was built under the powerhouse and consisted of two steel tubes, each sixty inches in diameter, controlled by valves from within the powerhouse. There is in addition a small concrete spillway with a single tainter gate located next to the powerhouse, a rectangular brick building, 30 feet by 75 feet.
[Bush, pp. 174-175, 496]

MORROW POWER PLANT (1937,1939,1941,1948)
South of M-86
Comstock

Galesburg
16.631045.4692060
Kalamazoo

The Morrow Power Plant, erected in 1937, was named in honor of Bryce E. Morrow (1873-1936), an electrical engineer who began his carrer in Thomas Edison's workshop and spent much of his career with the Consumers Power Company. This massive steel-framed brick structure, approximately 100 feet wide and 200 feet long, is three times the size of the original structure, with major additions made in 1939, 1941, and 1948. The original boiler and turbo-generator are no longer extant. The oldest surviving equipment is the Number 2 turbo-generator, a General Electric 40,000 KWH unit which operates at 3,600 R.P.M., and the Number 2 boiler, which originally burned coal to produce 825 lbs. P.S.I. of steam at 900 degrees. Both units were installed in 1939. The original equipment for crushing coal and conveying it to the plant remains, along with a 100 foot dam erected in 1941 to increase the supply of water for cooling available to the plant. Today, the Morrow plant is used strictly as a peaking plant by Consumers Power Company.
[Bush, pp. 477, 525]

MT. PLEASANT DAM (1907)
Across Chippewa River, south of Broadway
Mt. Pleasant

Mt. Pleasant
16.678840.4829675
Isabella

This dam was constructed as part of a new municipal water supply system for Mt. Pleasant which included a pumping facility (see other entry). Three concrete segments were built between several islands on the Chippewa River. These are all 20 feet wide, approximately 20 feet high, and consist of concrete piers and abutments forming a gate 20 feet wide equipped with wooden stoplogs. The westernmost segment is 100 feet long and is V-shaped, while the remaining two segments are both 40 feet long.
[Fancher, Issac, Past and Present of Isabella County (Indianapolis, 1911), p. 376]

MT. PLEASANT WATERWORKS (1907)
Broadway
Mt. Pleasant

Mt. Pleasant
16.679110.4830110
Isabella

The City of Mt. Pleasant built this waterworks after her citizens had experienced continuous problems with both the quantity and quality of

water drawn from wells. A bond issue of $20,000 was approved in March 1907 to construct a dam across the Chippewa River (see other entry) and a pumping facility. The waterworks building, 30 feet wide and 75 feet long, is a brick structure resting on a concrete foundation, with a gabled roof. It was originally equipped with a Dean water pump which ran continuously to maintain pressure in the system. The pump is not extant.
[Fancher, Issac, Past and Present of Isabella County (Indianapolis, 1911), p. 376]

NEWAYGO PORTLAND CEMENT COMPANY
POWERHOUSE (1900)
West of Mason Rd.
Newaygo

Fremont
16.597017.4808025
Newaygo

The Newaygo Portland Cement Company, with Daniel McCool as President, built a dam and powerhouse in 1900 to utilize the hydroelectric potential of the Muskegon River. The firm sold the installation to the Consumers Power Company in the 1920's and moved out of Newaygo entirely in the late 1920's. The original generators, no longer extant, were powered by a rope transmission system from the turbines, which still rest in their housings. The dam is no longer extant and the powerhouse serves as a museum for the Newaygo County Historical Society. It is a rectangular brick building, 30 feet wide and 100 feet long, with a gabled roof, resting on a concrete foundation.

NILES CITY POWER PLANT (1895,1928)
Pucker St. at Dowagiac Creek
Niles

Cassopolis
16.562097.4634080
Berrien

On August 14, 1895 the newly-formed Niles Board of Public Works took over the Niles Electric Company hydroelectric plant located on Dowagiac Creek north of Niles. The dam and generating station located at this site, powered by horizonal water wheels, supplied Niles with electricity until they were replaced in 1928 by the present dam and powerhouse. The only part of the 1895 installation still extant are portions of the exit race-wyas leading from the old powerhouse. The 1928 powerhouse, 10 feet by 15 feet, is a brick structure resting on a concrete foundation. The adjoining spillway dam is 60 feet long and is equipped with six radial (tainter) gates.
[Stevens, Howard G., Niles Board of Public Works, Seventy-Fifth Anniversary Report (Niles, 1970)]

NINTH AVENUE HYDROELECTRIC PLANT (1910,1922) | Alpena
On Thunder Bay River | 17.308150.4993640
Alpena | Alpena

The Alpena Power Company was organized in 1882 by several prominent lumbermill operators in Alpena. This was the first dam the company constructed. It replaced the Richardson Dam, a logging dam located slightly upstream from this site. The brick powerhouse, approximately 30 feet by 75 feet, was constructed in 1910 and housed three horizonal Leffel turbines driving three Westinghouse generators. The concrete spillway was built in 1922 and includes seven steel radial gates.
[Law, John W. and Deloris A., Home Was Alpena (Alpena, 1975), p. 86; Alpena News, July 22, 1964, p. 19]

NORTH LANSING DAM (1935) | Lansing South
South of Grand River Ave. | 16.700500.4735280
Lansing | Ingham

There has been a dam across the Grand River at this site since 1843, when John Burchard, one of Lansing's first residents, built one there. The Board of Water and Light purchased this site in 1934 and erected a new concrete dam and a small 200 KW hydroelectric station. The dam was built primarily to supply the Ottawa Street Steam Station with condensing water. The dam, approximately 200 feet long, has a four foot moveable crest which permits the regulation of the height of the Grand River.
[Board of Water and Light, Water and Power (Lansing, 1966), pp. 29-30]

NORWAY POINT HYDROELECTRIC PLANT (1924) | Lake Winyah
Across Thunder Bay River | 17.301820.4997160
Alpena | Alpena

This hydroelectric plant became the chief source of power for the Alpena Power Company when it opened in 1924. The dam develops a head of approximately 40 feet and the two generators produced a total of 4,000 KW. The original generators are extant and are housed in a rectangular brick powerhouse and adjacent to it is a concrete spillway with three steel radial gates, each 30 feet wide, and a wasteway, approximately 150 feet long, consisting of timber stop logs supported by concrete piers.
[Law, John W. and Deloris A., Home Was Alpena (Alpena, 1975), p. 86; Alpena News, November 28, 1924, p. 1 and July 22, 1964, p. 18]

OAKWOOD PUMPING STATION (1923-1924)
12330 Sanders St.
Detroit

Dearborn
17.323290.4683320
Wayne

The Oakwood Pumping Station is a small structure which houses eight pumps. Four of these pumps were originally installed in 1929, one was installed in 1935, one in 1938, and two in 1949. These pumps pump approximately 500 cubic feet of water per second. The main function of this station is to pump water to the homes in the surrounding area. The station has been renovated several times. Also, located in back of the station are two reservoirs which store a large quantity of water. This station was designed by the Detroit Public Works (D.P.W.) and John Reid was the civil engineer at the time of construction.

ORCHARD STREET TREATMENT PLANT (1934)
300 block of Orchard St.
East Lansing

East Lansing
16.706835.4734455
Ingham

East Lansing formerly used a well water system which was objectionable because of its hardness and iron content. So in 1934 this automatic softening and iron removal plant was built at a cost of $21,000. It is a common bond brick one-story building 40 feet long, 30 feet wide, has a gabled roof and rectangular windows. The general design was by Claude E. Erickson of Lansing and the equipment was provided by the Permutit Company of New York City. The plant had a one million gallon per day capacity. It is believed that this was the most completely automatically operated municipal water treatment plant in the United States at that time. The pumping was done at a constant rate and the operation was controlled by an electrical sequence-time-switch which was tied into a motor operated multiport valve on each tank, keeping the plant in operation 24 hours a day. The plant operated with five water-softening iron-removal green-sand zeolite tanks, each seven feet in diameter and 11 feet high, and two iron-removing manganese zeolite tanks.
[Kenny, Tim, "'Pump House Gang' Formed," Lansing State Journal, July 7, 1975; The Permutit Company, "Automatic Softening and Iron Removal Plant at East Lansing, Michigan," reprinted in Water Works and Sewerage, May 1936]

PAW PAW WATERWORKS (1898,1899)
706 S. Kalamazoo St.
Paw Paw

Marcellus
16.591750.4673067
Van Buren

The Paw Paw Waterworks Building was constructed in 1898 by J.W. Pearl and George A. Mills, contractors. It housed a steam-driven pump used to raise water into the adjacent water tower, still extant, which was erected in 1899. The pumphouse is a one-story brick building, 30 feet by 40 feet, with a hipped roof and brick-arched windows, and has a small attached addition (10 feet by 8 feet) of later vintage. The square smoke-stack located at the rear was part of the original installation, as was the water tower.
[MHD, Site Files]

PENINSULAR PAPER COMPANY DAM (1920)
1125 N. Huron St.
Ypsilanti

Denton
17.283565.4681310
Washtenaw

The Peninsular Paper Company, incorporated in 1867, has continuously operated paper mills on this site, utilizing the Huron River for power. There have been numerous dams here. The present dam was built in 1920 after a disastrous flood in 1918 destroyed an earlier dam which was only two years old. It is approximately 200 feet long and 10 feet high, of concrete construction. The powerhouse, located at the northern end of the dam, is a two-story brick structure, 50 feet square, resting on a concrete foundation.
[Beakes, Samuel, Past and Present of Washtenaw County (Chicago: Clarke, 1906), pp. 736-737; Colburn, Harvey, The Story of Ypsilanti (Ypsilanti, 1923), p. 307]

PINE CREEK [OTSEGO] DAM (c.1900)
Kalamazoo River, off River Rd.
Otsego

Otsego
16.602970.4701980
Allegan

W.A. Foote, a pioneer in the production and transmission of electric power in Michigan, constructed three dams on the Kalamazoo River between Plainwell and Allegan in 1898-1900. The river falls a total of 100 feet over a distance of ten miles, making this area one of the few good hydro-electric sites in southern Michigan close to population centers, particularly Kalamazoo. The Pine Creek Dam, later known as the Otsego Dam, was constructed two miles downstream from Otsego. Of the original

hydroelectric installation, only the dam survives and is now used for flood control only. It is a concrete structure, 120 feet long, with five radial gates (tainter gates) 20 feet wide and 15 feet high, with a steel ribbed frame.
[Bush, pp. 74-75]

PLAINWELL DAM (c.1900)
On Kalamazoo River, east of Otsego
Plainwell

Otsego
16.609560.4701040
Allegan

W.A. Foote, a pioneer in the production and transmission of electric power in Michigan, constructed three dams on the Kalamazoo River between Plainwell and Allegan in 1898-1900. The Kalamazoo River falls a total of 100 feet over a distance of about ten miles, making this area one of the few good hydroelectric sites in southern Michigan. The Plainwell Dam, located between Plainwell and Otsego, was the westernmost of the four dams that Foote constructed. Only the dam survives at this site and it is used only for flood control. It consists of two sections, separated from each other by an island. The southern portion, originally containing the powerhouse and turbo-generators, is of concrete construction, 75 feet long and 30 feet wide. There are three concrete circular bases, 7 feet in diameter, which originally supported the three generators. The eastern portion of the dam is of concrete and steel construction, has a spillway 300 feet long, with ten bays which originally contained vertical lift waste gates, each 25 feet wide. The gates are no longer extant.
[Bush, pp. 75-76]

PONTIAC STEAM PLANT (1911)
Rapid St.
Pontiac

Pontiac North
17.312420.4721680
Oakland

This plant was originally designed as a combination generating-heating plant, but produced electricity only until 1915. The original installation included four 350 H.P. 165 lbs. pressure Wickes vertical tube boilers, two Allis-Chalmers steam engines linked to two 600 kv-a Allis-Chalmers 2,400 volt, 3 phase, 60 cycle generators, and a single Erie steam engine connected to a 100 kv-a Allis-Chalmers 2,400 volt, 3 phase, 60 cycle generator. The plant was owned by Consumers Power Company throughout its life, but was leased to Detroit Edison Company in 1914-1918. It ceased operation in 1931 and was retired in 1933. Only the building remains, a steel-framed brick and concrete rectangular building, 110 feet wide, 240 feet long, and approximately 60 feet high.

RILEY GENERATING PLANT (1922) | Union City
St. Joseph River, east of Riley Rd. | 16.648062.4655087
Sherwood Township | Branch

This municipally-owned power plant was constructed in 1922 by the Benjamin Douglas Company, contractors. The firm of Holland, Ackerman, and Holland served as consulting engineers for the project. The installation includes a concrete dam, 125 feet long, with the flow of water controlled by five steel radial or "tainter" gates, each 24 feet long. The steel-framed brick powerhouse resting on a concrete foundation is 20 feet wide and 70 feet long and contains the two original Westinghouse generators driven by two Leffel turbines. This facility has been automated and still provides power to Union City.

ROGERS HYDROELECTRIC PLANT (1906,1922) | Big Rapids
On Muskegon River | 16.622079.4829085
Big Rapids | Mecosta

The Rogers Dam, completed in 1906, is an earth embankment dam with a reinforced concrete core wall, 635 feet long, creating a head of 40 feet. Power was transmitted from this plant over a line 89.5 miles to Grand Rapids and Muskegon. The original plant produced electricity at 7,200 volts, which was then stepped up to 72,000 volts, the highest voltage in use in the world at the time. The original transmission line utilized simple wooden poles with pin insulators. The original equipment and powerhouse were destroyed by fire in 1922. The new installation (1922), still extant, includes four Allis-Chalmers vertical turbines and four Allis-Chalmers generators, each producing 1,500 KW, 7,500 volts, operating at 150 R.P.M. The concrete spillway has six steel tainter gates which can discharge 22,650 cubic feet per second. The brick powerhouse, 50 feet by 75 feet, rests on a concrete foundation.
[Bush, pp. 88, 160, 502]

SABIN HYDROELECTRIC PLANT (c.1920) | Kingsley
On Boardman River | 16.609015.4951027
Garfield Township | Grand Traverse

Sabin Dam was first built in 1906, enlarged in 1913, and was then washed out in a flood in 1918. It was rebuilt around 1920 by the Michigan Public Service Company. Consumers Power Company acquired the facility in 1950 and operated it until September 1969, when it was permanently retired

and sold to Grand Traverse County. It consists of a rectangular brick powerhouse, 20 feet by 60 feet, resting on a concrete foundation, and a concrete dam producing a head of 19 feet. The dam is 110 feet long and included a spillway with a single steel tainter gate, 18 feet wide and three wooden lift gates, each ten feet wide. The original installation, still extant, includes two vertical Leffel turbines and two General Electric generators, of 400 KW and 500 KW capacity.
[Bush, p. 361; Grand Traverse Bicentennial Board, "The Boardman River Historical Trail"]

SANFORD HYDROELECTRIC PLANT (1925)
320 S. Center St.
Sanford

Sanford
16.711140.4839100
Midland

The Wolverine Power Company constructed a series of dams on the Tittabawassee River at Sanford, Secord Lake, Smallwood, and Edenville in 1925, but the company immediately began to sell the entire output of these plants to the Consumers Power Company and has continued this arrangement to the present day. The Sanford Plant consists of an earth embankment dam, with a concrete spillway containing six steel tainter gates, each 24 feet wide, and a rectangular brick powerhouse, 25 feet by 75 feet, resting on a concrete foundation. The original installation, still extant, included three Allis-Chalmers turbines, rated at 1,800 B.H.P., operating at 225 R.P.M., driving three Allis-Chalmers generators, each producing 1,375 KW, 2,300 volts, and 30 cycles.
[Bush, p. 222]

SECORD LAKE HYDROELECTRIC PLANT (1925,1946)
Across the Tittabawassee River
Secord

Secord Lake
16.713000.4879670
Gladwin

The Secord Lake Hydroelectric Plant consists of an earth embankment dam, a rectangular brick powerhouse (15 feet by 30 feet), resting on a concrete foundation, and a concrete spillway with two steel tainter gates, each 20 feet wide. The original generator was lost to fire in 1946 and was replaced with a 1,500 KW, 1,200 volt unit operating at 200 R.P.M., built by the Electric Machinery Manufacturing Company of Minneapolis.
[Bush, p. 222]

SMALLWOOD HYDROELECTRIC PLANT (1925)
Across the Tittabawassee River
Hay Township

Wooden Shoe Village
16.713770.4870660
Gladwin

This is one of four hydroelectric plants built by the Wolverine Power Company in 1925 on the Tittabawassee River. The other plants were at Sanford, Edenville, and Secord Lake (see other entries). The earth embankment dam here produces a head of 28 feet. The brick powerhouse is 25 feet square, rests on a concrete foundation, and contains the original installation, a single Allis-Chalmers turbine rated at 1,800 H.P. driving an Allis-Chalmers generator rated at 1,375 KW, 2,300 volts, at 275 R.P.M. The adjoining concrete spillway has two steel tainter gates, each 24 feet wide.

SMITHVILLE DAM AND POWER STATION (1920,1944)
Across Grand River, west of Smithville Rd.
Hamlin Township

Springport
16.694070.4707025
Eaton

This site originally contained a sawmill which operated during the last three decades of the nineteenth century. It was first used as a hydroelectric plant by the City of Eaton Rapids around 1900. The wooden powerhouse burned in 1920 and was replaced with a brick building. However, the three Leffel turbines, producing 700 H.P. altogether, are extant. Miller Dairy Farms, the present owners, acquired the property in 1936 and added two 500 H.P. diesel engines to supplement the available water power. The dam which is now standing was built in 1944 and raised in 1950 to increase the head from nine to twelve feet. The brick powerhouse was also enlarged in 1950. The concrete dam, approximately 100 feet long, has a single vertical lift waste gate at each end. The 1920 powerhouse is a one-story structure, 30 feet square, with a flat roof. The 1950 powerhouse, also a one-story building, is 40 feet wide and 120 feet long.

SPRINGWELLS PUMPING STATION (1925-1931)
8300 W. Warren Ave.
Dearborn

Dearborn
17.322890.4690340
Wayne

The Springwells Pumping Station consists of five main buildings. They are the Office and Laboratory Building, the Pumping Plant, the Filter and Chemical Building and Machine Shop, the Garage, and the Warehouse. The Office and Laboratory Building is located to the east of the project.

It is usually referred to as the Main Station. This station contains the main offices and the general laboratory as well as the mechanical testing lab and chlorination room. The entire building is approximately 72 feet 4 inches by 107 feet 8 inches by 25 feet. The Pumping Station contains both the high lift and the low lift. The room containing the two is 100 feet by 386 feet. The high lift has 16 pumps which pump water to various reservoirs and booster stations. The low lift is an "open concrete caisson" which is 90.3 feet in outside diameter. The caisson is 73 feet deep and the walls are 8 feet thick. It contains only eight pumps and two standby pumps with a total capacity of 435 million gallons per day. The Filter Building has 108 filter beds. Sixty-eight of the filter beds are contained in the original building and the other 40 filter beds are located in an annex built in the 1960's. The dimensions of the original building are 523 feet by 226 feet. The roof consists of a steel Pratt truss. The Springwells Pumping Station Project was built in 1925-1931 and was the second major pumping station, the first in the city being Waterworks Park (see other entry). The entire project cost approximately $30 million to build. The chief engineer was George H. Fenkell. F.H. Stephenson served as the assistant chief engineer and J.C. Thornton was the architect.
[City of Detroit, Board of Water Commissioners, "The 100th Annual Report of the Department of Water Supply"; Thornton, J.C., "Detroit Plant of Unique Design," Water Works Engineering Magazine, Vol. 84, No. 8, pp. 495-496, 535]

STRONACH DAM (1912) | Wellston
On Pine River | 16.588017.4895094
Norman Township | Manistee

This dam was constructed by the Manistee County Electric Company, organized in 1908 by Clyde Holmes, a Grand Rapids lawyer. It began operating in October 1912, supplying power to Manistee utilizing a 44,000 volt line. The service was extended to Cadillac in 1915, when the Consumers Power Company purchased the plant. The plant originally had two 400 KW generators and the dam produced a head of 13 feet. The powerhouse and generators are gone and the dam primarily serves to prevent silting in the Tippy Pond, a short distance downstream. The concrete foundation for the powerhouse, measuring 27 feet by 40 feet, is still visible. The concrete dam is 75 feet long and consists of three bays, each 25 feet wide, separated by concrete piers. Each bay was originally equipped with two sets of flashboards.
[Bush, pp. 191, 484, 502]

STURGIS GENERATING STATION (1911)
Across St. Joseph River
Nottawa Township

Three Rivers East
16.621125.4647350
St. Joseph

The Sturgis Generating Station, completed in 1911, was built by the City of Sturgis as a municipally-owned power plant. The concrete dam, 300 feet long and 15 feet high, has 30 vertical lift waste gates, each ten feet wide. On the south end of the dam, there is a three-story brick powerhouse, 75 feet by 50 feet, resting on a concrete foundation. It houses the original generating equipment, two Allis-Chalmers turbo-generators, each producing 500 KW and operating at 150 R.P.M.

TROWBRIDGE DAM (1899)
West of 26th St.
Trowbridge

Gobles
16.598090.4703087
Allegan

This was Michigan's first large hydroelectric facility, planned by W.A. Foote, a pioneer in the production and transmission of electric power in Michigan, and constructed by William G. Fargo of Jackson. It was an earth embankment dam and originally included three wooden radial or tainter gates. Steel tainter gates were installed in 1908 and are extant. The site originally contained a wooden powerhouse resting on a stone foundation. After a fire in 1911, it was replaced by a brick powerhouse, which was recently demolished. The original installation featured four pair of Leffel turbines connected in tandem to a single shaft. The generator was a General Electric 60 cycle, 3 phase, 2,500 volt, 1,500 KW unit. When this plant was placed into service on September 20, 1899, the voltage was stepped up to 22,000 volts before transmission to Kalamazoo over a 24 mile long line carried on windmill towers. Both the distance of the transmission and the high voltage level utilized were unprecedented. By 1903, the line voltage from Trowbridge had been raised to 40,000. Dr. Charles P. Steinmetz, the "wizard of General Electric", spent considerable time conducting electrical experiments at Trowbridge in 1901. [Bush, pp. 74-79; Luther, E. Hardy, "Trowbridge, Scene of Pioneering," Consumer Power News, XXII, (November 1957), p. 10]

WASHINGTON AVENUE STEAM PLANT (1905)
S. Washington Ave.
Saginaw

Saginaw
17.261190.4811300
Saginaw

The Washington Avenue Steam Plant was opened in 1905, but remained in active service only until 1913, when it was placed on standby. In 1924 all equipment and machinery was sold for scrap and the building was used for storage and as a repair shop. Only the engine room is extant, a rectangular brick building, 68 feet wide, 87 feet long, and 56 feet high, with a flat roof. It is currently owned by the City of Saginaw.

WATERWORKS PARK (1910-1931)
10100 E. Jefferson Ave.
Detroit

Belle Isle
17.337000.4690310
Wayne

Waterworks Park consists of six major buildings: the Main Office, the Filtration Building, the High Lift Building, the Low Lift Building, the Auxiliary Low Lift Building, and the Screenhouse. The High Lift Building was built in 1910-1913. It is a very large building because the machinery needed to run the pumps are three to four stories high. Today there are eleven pumps although originally there were sixteen. One of the features in the interior of the building is a brass balcony which runs all around the floor. The walls are brick and the roof is supported by a Howe truss. There are also winding staircases and balconies at the windows which are made of brass as are all the fixtures. There is no original equipment left except for eight venture meters which tell the rate of the outgoing water. The Filtration Building was constructed in 1921-1923. All the filtration works are located in one building. This building is 480 feet wide by 810 feet long, three stories high, and located at the center of the north end of the park. There are 80 filter beds occupying a space of 480 feet by 270 feet. South of the filter beds are the coagulation basins and overhead chemicals are stored here. The filter beds have 1,080 square feet of effective sand area and are divided into five double rows each containing eight beds with pipe galleries between each two rows. The filters are covered by a steel truss roof having continuously raised monitors over the operating galleries thus giving plenty of light and ventilation. The Low Lift Building was built in 1924. It is a brick structure that is 65 feet by 75 feet in plan. A balcony made of brass encircles the interior of the building at entrance level and the pump floor is 20 feet below ground level. There are five original pumps with a capacity of 465 million gallons per day. There is also a separate room containing seven, electrically operated, revolving screens, each 6 feet wide by 25 feet high. These screens intercept all coarse floating material only for Waterworks Park. The Auxiliary Low Lift Building was built in 1930. It contains two huge below grade pumps as well as other equipment. The Screenhouse was built in 1931. It handles water headed for the Springwells Plant and the Northeast Plant. There are again approximately seven traveling water screens, three of which are original. This

structure features two winding staircases which extend to the ceiling as well as a revolving crane. The complete park occupies a rectangular space 810 feet by 937 feet or slightly over 17 acres. The total cost of the filtration plant, excluding the pumping station, was about $4,480,000. The engineer for the project was George Fenkell. Frank H. Stephenson served as assistant engineer and Theodore Leisen was the architect.
[Engineering News-Record, Vol. 84, June 17, 1920, pp. 1194-1196 and Vol. 90, May 17, 1923, pp. 860-865]

WEBBER HYDROELECTRIC PLANT (1906)
On Grand River, southeast of Lyons
Lyons Township

Portland
16.671050.4757410
Ionia

The Commonwealth Power Company, a forerunner of the Consumers Power Company, purchased the land and rights to erect a dam here from H.R. Wager of Ionia in April 1906. The dam and generating station, named after a Portland banker who conducted some of the real estate transactions, went into service on March 12, 1907. It is an earth embankment dam with a concrete core wall, and is 28 feet high, giving the generating station an effective head of 26 feet. The 40,000 volt transmission line from Webber Dam to Lansing featured three-legged steel towers utilizing pin-type insulators. This was the first use of steel transmission towers in Michigan. The original equipment still extant includes a Leffel turbine which drives a General Electric generator rated at 2,300 KW, 7,200 volts, and operates at 164 R.P.M. Additional equipment, all installed in 1949, includes two Leffel turbines driving two EMC generators rated at 1,000 KW each, 2,500 volts, and operating at 200 R.P.M. The powerhouse is a T-Shaped brick building resting on a concrete foundation, with gabled roofs. One segment is approximately 20 feet wide and 60 feet long, while the other section is 30 feet wide and 40 feet long. Proceeding from the powerhouse to the north shore of the Grand River, there is a concrete spillway, approximately 60 feet long, and five steel radial or tainter gates, each 20 feet wide, resting in a concrete framework.
[Bush, p. 465]

AMERICAN FARM WINDMILLS (c.1880,1895)
4634 S. Luce Ave.
Fremont

Fremont
16.587068.4813087
Newaygo

The American Farm Windmill was crucial to the survival of farmers in the Midwest and Plains states and is an often-forgotten part of American technological history. Here at the Windmill Gardens Museum Village in Fremont, there is a collection of more than a dozen farm windmills of various sizes and styles. Among the more significant is the Waupum Tail-less Windmill (1895) manufactured by the Althouse Wheeler Company of Waupum, Wisconsin. It was called the "cyclone proof windmill" because during high winds which would destroy the standard windmill, vanes could be manually opened to prevent it from turning. If high winds developed unexpectedly, centrifical force would force the vane open. At this same site, there is also a direct stroke windmill with a tail manufactured by the Union Steel Screen Company of Albion, Michigan (see other entry) in the early 1880's.

BUSH AND LANE PIANO COMPANY:
CORLISS ENGINE (1904)
E. 7th St.
Holland

Holland
16.574075.4737075
Ottawa

This Corliss Engine was exhibited at the St. Louis World's Fair in 1904 by the E.P. Allis Company. The Bush and Lane Piano Company, in need of a power plant for their new factory in Holland, purchased this engine at the Fair. The engine transmitted power to the machinery in the piano factory through a one and one-eighth inch diameter cable which was 2,250 feet long. The engine was retired in 1959 and moved to its present location, next to the Baker Furniture Museum.

CEDAR STREET STATION PUMPING ENGINE (1917)
112 S. Cedar St.
Lansing

Lansing South
16.700800.4733900
Ingham

This steam pumping engine was built in 1917 by the Worthington Pump and Machinery Corporation at their Snow-Holly Works in Buffalo, New York. This 10 million gallon per day engine has a total weight of 125 tons and was built at a cost of $25,000. It has a low pressure cylinder which has a 44 inch bore, 36 inch stroke. It was designed to carry 70 pounds

of steam pressure and to operate at 41 R.P.M. This engine features a flywheel which has a diameter of thirteen feet and weighs 23,000 pounds. It is still operable, although it serves only as an emergency backup unit.
[Board of Water and Light, Water and Power (Lansing, 1966), p. 18]

ENSLEY WINDMILL TOWER (1866)
4634 S. Luce Ave.
Fremont

Fremont
16.587068.4813087
Newaygo

This windmill tower (1866) was constructed by Benjamin Ensley to pump water for his farm. It was built of white pine, is 43 feet high, 12 feet square at the base, and then tapers to about 4 feet square at the top, and weighs approximately 13 tons. It originally had a water tank on the top floor and had a wooden direct stroke vane. The tower was moved in 1966 from its original location to the Windmill Gardens Museum Village in Fremont.
[West State Chronicle, December 23, 1966, p. 5]

Ensley Windmill Tower (1866), Fremont

INTRODUCTION TO TRANSPORTATION

The transportation category includes all structures and equipment associated with canals and inland navigation, marine transportation, railroads, roads, and air travel. This section is comprised mainly of sites relating to marine navigation and railroads, historically the principal means of transportation in the state and the most significant to its economic development. Several important related sites, such as the Grand Trunk Western Railroad St. Clair River Tunnel (1891), the Michigan Central Railroad Detroit River Tunnel (1909), and the Detroit-Windsor Vehicular Tunnel (1930) appear in the Specialized Structures section of this volume.

Water-borne transportation on the Great Lakes and on the inland rivers of Michigan preceded the development of railroads by well over a century and continues to be significant today. Michigan's central position in the Great Lakes encouraged much of the state's earliest settlement and economic development. There was early recognition of the commercial and military significance of the narrow waterways connecting the lakes, especially the Detroit and St. Clair Rivers linking Lakes Huron and Erie, and the Straits of Mackinac between Lakes Huron and Michigan. The first settlers to arrive in many of the coastal areas came to build and operate lighthouses constructed to aid this traffic. Seven lighthouses constructed before 1860 and an additional eighteen built before 1892 are recorded here.

The rivers of Michigan were the cheapest mode of transport before the coming of the railroad and several major rivers remained important avenues of trade until the late nineteenth century. This was particularly true of the St. Joseph, Kalamazoo, Raisin, and Huron Rivers. The Grand River was navigable as far inland as Grand Rapids until the 1930's and the Saginaw River remains a vital artery of commerce to this day. The dozens of moveable bridges recorded in this inventory and listed in a separate category later in the volume attest to the significance of the river traffic.

It was the railroad, however, that opened Michigan to settlement and development in the early nineteenth century. In 1830, there were only about 30,000 residents in the state, with 2,000 of these concentrated in Detroit and most of the remainder scattered in the three southernmost tiers of counties. The state legislature passed an ambitious Internal Improvements Act in 1837 committing the state to construct a system of three railroads and two canals. The routes were surveyed and construction started on the railroad lines, which were to run east to west through the three southern tiers of counties. The southernmost line extended from Monroe to Hillsdale by 1843, while the "central" line, beginning in Detroit, reached Kalamazoo by 1846. A small canal segment between Mt. Clemens and Rochester was also completed. The state abandoned this program in 1846 after expending $4.5 million in cash and giving away about 300,000 acres of public lands. The railroad lines were sold to private concerns for a total of $2.5 million. This costly venture did little to encourage state intervention in transportation, but it at least established the nucleus for the state's railroad network.

The southernmost line, which became the Michigan Southern Railroad, extended to Coldwater in 1850 and then southward to South Bend, Indiana, in 1851, reaching Chicago in 1852. The line passing through the second tier of counties became the Michigan Central Railroad, destined to become the most important line in the state. It extended from Kalamazoo to Niles in 1849 and reached Chicago in 1852. The Michigan Central gained an important connection with Eastern markets when the Great Western Railway completed its line across Canada (Niagara Falls to Windsor, Ontario) in 1854. The third line to span the Lower Peninsula was the Detroit and Milwaukee Railroad, running from Detroit northward to Pontiac, then west to Grand Rapids, terminating in Grand Haven on Lake Michigan. The Detroit to Pontiac segment opened in 1843, but the 165 mile line from Pontiac to Grand Haven was laboriously built over the period 1852-1858. On the eve of the Civil War, Michigan had three major east-west lines and a total of 800 miles of railroads. In the three decades since 1830, the state's population leaped from 30,000 to about 750,000 and was heavily concentrated along the major rail lines.

The construction of additional railroad mileage after the Civil War was both extensive and chaotic. Numerous lines were built into northern Michigan, often in the hopes of capturing the lumber traffic. New lines reached the Straits of Mackinac from Saginaw in 1881 and from Grand Rapids a year later. There were over 8,000 miles of lines by 1900, serving virtually every village in the Lower Peninsula. At the same time that there was a proliferation of hundreds of new railroad companies, there were also several significant consolidations. The Michigan Central Railroad built or purchased dozens of feeder lines and then became part of the Vanderbilts' railroad empire in the mid-1870's. To counter this development, the Grand Trunk Railroad of Canada created a new trunkline in 1879 extending from Chicago through Michigan to Port Huron, where cars could be ferried across the St. Clair River to Sarnia and then continue on the Grand Trunk's lines to the eastern United States. Finally, a giant new network was created in 1900 when the Flint and Pere Marquette Railroad merged with several other lines to form the Pere Marquette Railroad.

The railroad was the premier inland transportation system in Michigan in the nineteenth century, for both passengers and freight. Railroad stations were focal points of economic and social life in that era and they are well represented in this inventory. About two dozen attractive stations of brick or stone construction survive in the larger cities. These are second-generation passenger stations built in the last quarter of the nineteenth century, replacing earlier wooden structures. In the larger cities, separate freighthouses were usually constructed close to the passenger depots. It is more difficult to generalize about the small town stations. There are over a dozen examples of brick or stone structures, usually with separate freight sheds, but in northern Michigan the wooden combination passenger-freight depot predominates.

One interesting chapter in Michigan's transportation history was the development of the electric interurban lines. The first line was completed in 1890 between Ann Arbor and Ypsilanti, permitting, among other things, faster movement between the all-male University of Michigan and the all-female Michigan State Normal School in Ypsilanti. The success of that first line set off a boom in interurban construction and by 1918 there were eighteen companies operating more than 1,700 miles of lines in southern Michigan, representing an investment of $140 million. Detroit was the hub of the system, with lines reaching Toledo, Port Huron, Bay City, Kalamazoo, Grand Rapids, and Muskegon. They remained successful until the early 1920's, when they quickly fell victim to the competition of the private automobile. Virtually the entire interurban system was dismantled between 1924 and 1932.

Railroads and waterways still carry a significant share of the state's freight traffic, particularly in bulk commodities, but the automobile and the truck have dominated the transportation system since the mid-1920's. Not surprisingly, the same workers who "put the nation on wheels" enthusiastically purchased automobiles for their own use and pressured state and local governments to upgrade highways. The urban development of the state in this century was closely geared to the automobile. To this day, public mass transportation is used by only a small number of Michigan's residents.

RAILROAD ABBREVIATIONS

AA RW	Ann Arbor Railway
C & O RR	Chesapeake and Ohio Railroad
C, D & C GJ RR	Chicago, Detroit, and Canada Grand Junction Railroad
C & NM RR	Chicago and North Michigan Railroad
C & WM RR	Chicago and West Michigan Railroad
C, S & M RR	Cincinnati, Saginaw, and Mackinac Railroad
D, L & N RR	Detroit, Lansing, and Northern Railroad
D, L & NM RR	Detroit, Lansing, and Northern Michigan Railroad
D & M RR	Detroit and Mackinac Railroad
D & MW RR	Detroit and Milwaukee Railroad
D, T & I RR	Detroit, Toledo, and Ironton Railroad
D & TSL RR	Detroit and Toledo Shore Line Railroad
DU RW	Detroit United Railway
F & PM RR	Flint and Pere Marquette Railroad
GR, GH & M RW	Grand Rapids, Grand Haven, and Muskegon Railway
GR & I LINE	Grand Rapids and Indiana Line
GTW RR	Grand Trunk Western Railroad
LM RW	Lansing Manufacturers Railway
MC RR	Michigan Central Railroad

RAILROAD ABBREVIATIONS

MS RR	Michigan Southern Railroad
PM RR	Pere Marquette Railroad
NYC RR	New York Central Railroad
N & W RR	Norfolk and Western Railroad
T, AA & NM RR	Toledo, Ann Arbor, and Northern Michigan Railroad

BATTLE CREEK TRACTION COMPANY:
PARMA SUBSTATION (1903)
102 Church St.
Parma

Springport
16.697095.4688040
Jackson

The Battle Creek Traction Company erected this structure in 1903 to serve as a combination passenger station, freight station, and electrical substation for its line extending from Jackson to Battle Creek. There were five such stations on the line, in Jackson, Parma, Albion, Marshall, and Battle Creek. Each station had three 225 KW, 40,000 volt-375 volt step-down transformers to convert AC into DC for use on this electric interurban line, which utilized a third rail system. None of the original equipment is extant and the station, considerably modernized, now serves as a county library. It is a rectangular brick structure, 25 feet wide and 75 feet long, with a hipped roof and wide overhanging eaves supported by wooden brackets.
[Street Railway Journal, January 2, 1904, pp. 11-13]

BIG SABLE POINT LIGHTHOUSE (1867,1905)
On Big Sable Point
Hamlin Township

Manistee
16.538015.4878015
Mason

The lighthouse at Big Sable was erected in 1867 at a cost of $50,000. It opened on November 1 of that year and was equipped with a third order lens made in Paris. The cylindrical tower, 100 feet high and 15 feet in diameter at the base, is of brick construction. It was covered with a steel casing in 1905 to prevent deterioration from the elements. The adjoining lightkeeper's house is a two-story rectangular frame building, 24 feet wide and 66 feet long, with a gabled roof. The lighthouse is located in Ludington State Park and is leased from the Coast Guard by the Michigan Department of Natural Resources.
[MHD, Site Files; USCG, Light List, p. 151; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 185]

BLACK LAKE LIGHTHOUSE (1870,1907)
Point Macatawa
Holland

Holland
16.565040.4735065
Ottawa

This lighthouse stands at the entrance to Lake Macatawa, also commonly called Black Lake. It was constructed in 1870, but was altered in 1907 when most of the original shingle siding was covered with cast iron

plating. The lower portion is a rectangular building, 24 feet wide, 35 feet long, and approximately 30 feet high, with two gabled roofs extending the width of the building. The western (seaward) roof is topped off by a 12 foot square tower, ten feet high, on which the beacon, enclosed in an octagonal glass and cast iron house, rests. The overall height of this lighthouse is 45 feet.
[MHD, Site Files; USCG, Light List, p. 155]

Big Sable Point Lighthouse (1867,1905), Hamlin Township

CHARLEVOIX SOUTH PIERHEAD LIGHTHOUSE (c.1920)
Outer end of South Pierhead
Charlevoix

Charlevoix
16.636000.5019075
Charlevoix

This light is supported by a steel skeletal tower, 40 feet high and 12 feet square at the base. The top 10 feet of the tower, where the light is housed, is enclosed by a simple sheet metal shed, while the rest of the tower is exposed to the elements. The Coast Guard has maintained a light at this location since 1858, but the extant structure is of more recent vintage, probably dating from the 1920's.
[USCG, Light List, p. 147]

CHEBOYGAN CRIB LIGHTHOUSE (1884,1910)
On west side of Cheboygan River
Cheboygan

Cheboygan
16.698000.5059052
Cheboygan

The Cheboygan Crib Lighthouse was constructed in 1884 and substantially rebuilt in 1910. It is a brick octagonal tower, 35 feet high, resting on a concrete crib.
[USCG, Light List, p. 92]

CHEBOYGAN DAM AND LOCK (1927,1951)
Across Cheboygan River
Cheboygan

Cheboygan
16.696050.5056068
Cheboygan

The Straits of Mackinac offered a precarious passage for small boats attempting to travel between Lake Huron and Lake Michigan. The Cheboygan Slack Water Navigation Company was established to develop an inland water passage consisting of the Cheboygan River, Mullett Lake, Indian River, Burt Lake, the Crooked River, and Crooked Lake, to Little Traverse Bay. This company built a dam and lock on the Cheboygan River in 1869 to maintain the water levels in this inland route. In 1876-1879, the entire route was dredged to a minimum depth of five feet. The present dam on this site was built in 1922 and replaced an old timber crib dam at the same location. The concrete apron of this dam rests on part of the old timber cribwork. The boat lock dates from 1927, but the lock gates were completely rebuilt in 1951. This complex was purchased by Consumers Power Company in 1950 and then sold in 1967 to the Michigan Department of Natural Resources. The concrete dam is 100 feet long, 43 feet wide, with a

concrete apron, and six vertical lift gates. The dam is curved convex to the upstream side. The boat lock is 147 feet long overall, 94 feet long between the gates, 18 feet wide, and 24 feet deep. The timber lock gates are operated by a horizonal shaft from an air-driven piston.
[Ayres, Lewis, Norris & May, Consulting Engineers, Report on Cheboygan Dam and Lock (August 1965), pp. 11-14; Powers, Perry, History of Northern Michigan and Its People (Chicago, 1912), pp. 450-454]

CHEBOYGAN RIVER RANGE FRONT LIGHTHOUSE (1880)
North bank of Cheboygan River
Cheboygan

Cheboygan
16.697015.5058040
Cheboygan

This lighthouse was constructed in 1880 at the entrance to the Cheboygan River from Lake Huron. It consists of a two-story frame building, 20 feet wide and 25 feet long, resting on a stone foundation, with a gabled roof. The tower housing the light, built into the south facade of the house, is six feet square and 45 feet high.
[USCG, Light List, p. 92]

C, D & C GJ RR: PORT HURON STATION (1858)
Between Forest St. and Gratiot St.
Port Huron

Port Huron
17.383780.4761430
St. Clair

The first railroad connection between Detroit and Port Huron was completed in November 1859 by the Chicago, Detroit and Canada Grand Junction Railroad Company. It was from this station that twelve year old Thomas Edison departed to sell newspapers and confections on the Port Huron to Detroit run. He worked as a newsboy on this run for three years and made sufficient earnings to support himself and to purchase materials and supplies for his early experiments. This simple one-story rectangular brick building with a stucco facing is 30 feet wide, 66 feet long, with a gabled roof and overhanging eaves supported by wooden braces. It was used as an office building by the Peerless Cement Company since about 1915, but was saved when the rest of the cement complex was demolished in the early 1970's.
[Dunbar, pp. 96-97; MHD, Site Files; Port Huron Times-Herald, February 24, 1955]

Cheboygan River Range Front Lighthouse (1880), Cheboygan

C & NM RR: PETOSKEY STATION (1892)
W. Lake St.
Petoskey

Petoskey
16.659048.5026055
Emmet

The Chicago and North Michigan Railroad Company was organized in 1890 to extend the Chicago and West Michigan Railway line from Traverse City to Bay View, a distance of 78.5 miles. The two companies were in fact indistinguishable, sharing the same directors and stockholders. This branch line reached Petoskey in January 1892. The railroad hired the Cadillac firm of Mosser and Wilson to build a passenger depot on a spacious piece of land on Little Traverse Bay and the new station was completed in August 1892. The station was owned by the Pere Marquette Railway Company in 1899-1947 and then by the Chesapeake and Ohio Railway Company. Passenger service was discontinued in the late 1950's and the station is now owned by the local historical society, which uses it as a museum. It is a rectangular brick structure, 81 feet long and 60 feet wide overall, with a second story 39 feet square surmounted by a conical tower.
[Ivey, p. 245; NR]

C, S & M RR: FLUSHING STATION (1889)
431 W. Main St.
Flushing

Flushing
17.266970.4771520
Genesee

The Cincinnati, Saginaw, and Mackinac Railroad was one of numerous short lines built in Michigan to serve as feeders for the main lines of the larger railroads. This line was fifty-four miles long, linking Saginaw with the Grand Trunk Western's main line at Durand. It opened in 1890 and was immediately purchased by the Grand Trunk. This attractive depot is a rectangular wood-framed building, 73 feet long and 24 feet wide, resting on a stone foundation, with a hipped roof. It is adjacent to the Chicago, Saginaw, and Mackinac Railroad Freighthouse constructed in the same year (see other entry). It is now used as a restaurant.
[MHD, Site Files; GTR, "Statement", p. 2; Dunbar, p. 148; Flushing Observer, February 16, 1972, p. 1]

C & NM RR: Petoskey Station (1892), Petoskey

CLINTON-KALAMAZOO CANAL (1842)
Hale Rd., south of Utica
Avon Township

Utica
17.326960.4727390
Oakland

In 1837 the Michigan Legislature passed an Internal Improvements Bill which provided for the construction of three railroads and two canals with public funds. One canal was to connect Lake St. Clair and Lake Michigan by linking the Clinton and Kalamazoo Rivers. The only portion of this canal that was constructed was a sixteen mile segment between Mt. Clemens and Utica. Three different contractors began work on this segment in July 1838, but after continuous construction difficulties and financial problems, work was suspended in 1842. The state had spent

about $125,000 on the project, but only two barges used the canal. Since it was abandoned, flooding and erosion have filled in most of the original cuts, and nothing remains of the original wooden locks. Near Utica, foundation piers for an aqueduct are still visible.
[NR]

DAVISON LIMITED EXPRESSWAY (1942) | Highland Park
Davison St. to the Lodge Freeway | 17.327730.4696550
Detroit | Wayne

The Davison Limited Expressway was the first expressway built in Detroit. Its purpose was to relieve some of the traffic-congested streets due to the large number of Ford factory workers in the Detroit-Highland Park area. Construction of the expressway began in 1941 and it was opened to traffic in 1942. The expressway begins at Gallagher and Davison and extends some 8,000 feet eastward to the Lodge Freeway. It primarily consists of two 33 foot, unreinforced concrete pavements, 10 feet thick, depressed some 12 to 17 feet to an almost local terrain. The median strip is 6 feet wide. The construction cost of this road, including overhead, was $2,130,000. The only major renovating changes made were repavement and the construction of an interchange with the Chrysler Freeway in 1969. Respectively, the Bridge Engineer and Chief Bridge Designer for Wayne County, Michigan were Harry A. Shuptrine and Julian C. Meade.
[Civil Engineering, Vol. 12 (December 1942), pp. 673-676]

DETROIT CITY AIRPORT (1929-1930) | Highland Park
11499 Conner Ave. | 17.335360.4696540
Detroit | Wayne

The Detroit City Airport, originally called the Detroit Municipal Airport, was erected in 1929-1930. The cost of the airport was $2.4 million which was raised through a bond issue. The airport is peculiar in that it has an L-shaped field, the area of which is 270 acres. It has four 100 foot wide runways which are from 1,000 to 5,000 feet long and aggregate a total of two and one-half miles. The runways give takeoffs in six different directions. The paving on the runways include seven inches of concrete, seven inches of asphaltic concrete, and sheet asphalt on water-bound macadam. The main municipal hangar is 1,014 feet long. It is 250 feet wide for 114 feet at one end, 204 feet wide for 786 feet, and 127 and one-half feet wide for the 114 feet north bay. The structure is two

stories high and sits on a 40 foot concrete pile foundation. It is constructed of yellow brick with concrete trim and is reinforced with steel beams. The roof is supported by steel, upside-down Baltimore (Petit) trusses and is covered with over a one-half inch insulation of asbestos felt laid on pre-cast concrete tile. On the field end of the building a glass enclosed tower extends upward about 20 feet. It was originally used as the operator's office. The airport keeps its fuel underground in eight fuel pits. In 1966 the old terminal was replaced by a new $2 million terminal. The old terminal is now used as an airline's office. In 1970 a new watch tower was dedicated. It was designed under the supervision of P.A. Fellows, City Engineer.
[Engineering News-Record, Vol. 105, September 11, 1930, p. 433 and Vol. 106, June 18, 1931, pp. 1006-1008; "Detroit's New Close-In Terminal," Detroit News, June 28, 1966; Eastside Newspaper, June 23, 1970; "Detroit City Airport Scrapbook"]

D, L & N RR: LAKE ODESSA STATION (c.1890) — Ionia
Between 4th Ave. and 5th Ave. — 16.652025.4738030
Lake Odessa — Ionia

In 1888, the Detroit, Lansing, and Northern Railroad completed a line between Grand Ledge, near Lansing, and Grand Rapids, passing through Lake Odessa. This line became part of the Pere Marquette Railroad system in 1900. The Lake Odessa Station is a one-story rectangular frame structure, 25 feet wide and 60 feet long, with a hipped roof and wide overhanging eaves supported by wooden brackets. It features a two-story domed tower and board-and-batten siding.
[MHD, Site Files; Ivey, pp. 257-258]

D, L & N RR: SARANAC STATION (c.1890) — Ionia
Depot St. — 16.646045.4754065
Saranac — Ionia

In 1871, the Detroit, Lansing, and Lake Michigan Railroad completed a line between Lansing and Howard City, passing through Saranac. The line was taken over in 1876 by the Detroit, Lansing, and Northern Railroad Company, which in turn became part of the Pere Marquette Railroad system in 1900. The Saranac Station, constructed around 1890, is a one-story rectangular frame structure, 60 feet long and 20 feet wide, with a gabled roof and a single conical roof at the south end. The wide overhanging eaves are supported by wooden brackets.
[MHD, Site Files; Ivey, pp. 252-254]

D, L & N RR: Lake Odessa Station (c.1890), Lake Odessa

D & M RR: ALPENA STATION (1911)
10th Ave. at Saginaw St.
Alpena

Alpena
17.307410.4993130
Alpena

The Detroit, Bay City, and Alpena Railroad reached Alpena in 1886 and merged with the Alpena and Northern Railway Company in 1895 to form the Detroit and Mackinac Railway. This passenger station replaced an earlier one located on West Fletcher Street. To facilitate construction, the City of Alpena gave the Detroit and Mackinac Railway the right to take the 10th Avenue right-of-way for its tracks, thus eliminating that street from the city's street system. It is a brick building resting on a cut

stone foundation, with hipped roofs. It consists of a passenger waiting area 40 feet wide and 120 feet long and a separate baggage building, 20 feet wide and 30 feet long. The two segments are connected by a covered walkway. It is now used as an ice manufacturing plant.
[Law, John W. and Deloris A., Home Was Alpena (Alpena, 1975), pp. 67-68]

D & M RR: EAST TAWAS ROUNDHOUSE (1895)
US-31, between Oak St. and Pine St.
East Tawas

Tawas City
17.300033.4905045
Iosco

The Detroit, Bay City, and Alpena Railroad built a major line extending from Bay City to Alpena in 1886, skirting the coast of Lake Huron. The company merged with the Alpena and Northern Railway Company in 1895 to form the Detroit and Mackinac Railroad and located its main offices and repair facilities in East Tawas. The brick roundhouse contains 16 stalls, each 60 feet deep, and has an outside circumference of 320 feet. The adjacent rectangular brick building housing the carshops is 50 feet wide and 250 feet long, with a flat roof. There were about 125 workers employed in the carshops alone in 1912.
[Powers, Perry F., A History of Northern Michigan and Its People, I, (Chicago, 1912), p. 520]

D & MW RR: GRAND HAVEN STATION (1870)
1 N. Harbor St.
Grand Haven

Muskegon
16.562065.4768035
Ottawa

The Detroit and Milwaukee Railroad, the second major line to span the Lower Peninsula of Michigan, reached Grand Haven in 1858. The company initially constructed a wooden station on the east side of the Grand River, so that passengers had to be ferried across the Grand River into the city. In 1868 the City of Grand Haven offered the railroad a subsidy of $52,000 to relocate their line and move their station into the city proper. The railroad accepted the offer and constructed the present station in the middle of the city's business district. It opened in 1870. It is a one-story white brick rectangular building, 130 feet long and 35 feet wide, with a hipped roof and wide overhanging eaves supported by wooden brackets. Both the doors and windows are arched in brick, while the later have stone sills.
[Dunbar, pp. 77-78; Lilly, Leo, Historic Grand Haven and Ottawa County (Grand Haven: the author, 1931), pp. 338-340]

D, T & I RR: CATENARY ARCHES (1926-1927)
Southfield Rd. and Allen Rd.
Allen Park

Dearborn
17.317500.4680935
Wayne

These reinforced concrete Catenary Arches were constructed in 1926-1927 to electrify the railroad line from the Ford Motor Company River Rouge Complex to 35 miles south of here along the Detroit, Toledo, and Ironton Railroad line. The arches were spaced at 200-foot intervals. They have not been used for nearly 50 years but remain in good condition along the Detroit, Toledo, and Ironton Railroad Company's Dearborn branch between Oakwood Blvd., Allen Park and Pennsylvania Road, Taylor.

F & PM RR: SAGINAW STATION (1887)
Potter St.
Saginaw

Saginaw
17.262670.4813740
Saginaw

This sprawling passenger station was built in 1887 for the Flint and Pere Marquette Railroad. It is a two-story rectangular red brick building, 40 feet wide and 270 feet long, with hipped roofs, a four-story square tower, and a ten foot wide overhang supported by cast iron brackets extending around the entire building.

FORT GRATIOT LIGHTHOUSE (1829,1861,1875)
Garfield St. and Omar St.
Port Huron

Lakeport
17.384070.4762300
St. Clair

The Fort Gratiot Lighthouse is the oldest surviving lighthouse in Michigan. It was completed in December 1829 and was built by Lucius Lyon at a cost of $4,445. The height of the tower was increased by 20 feet in 1861 to its present height of 86 feet. It is 25 feet in diameter at the base, with five foot thick walls. The adjacent two-story brick lightkeeper's house was erected in 1874-1875 to house two families. [USCG, Light List, p. 82; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), pp. 182-183; Jenks, William, History of St. Clair County (New York: Lewis, 1912), I, p. 419]

Fort Gratiot Lighthouse (1829,1861,1875), Port Huron

FRANKFORT NORTH BREAKWATER LIGHTHOUSE (1873,1932)
On outer end of North Breakwater
Frankfort

Frankfort
16.559033.4942000
Benzie

The original lighthouse (1873) was a brick structure which was subsequently covered with steel plates in 1932 to protect it from the elements. The tower is 50 feet high and 15 feet square at the base, but tapers to approximately 12 feet square at the top.
[USCG, Light List, p. 150]

GRAND HAVEN SOUTH PIERHEAD INNER LIGHTHOUSE (1905)
200 feet from the end of South Pierhead
Grand Haven

Lake Harbor
16.560680.4767150
Ottawa

The present lighthouse tower was erected in 1905, although a navigation beacon has been continuously maintained at this site since 1839. This round tower, 51 feet high, has a diameter of 12 feet at the base and then gradually tapers to a diameter of 10 feet at the top. The tower has a riveted cast iron plate exterior, rests on an octagonal concrete foundation, and is topped with a beacon enclosed in a round glass and cast iron house.
[USCG, Light List, p. 154; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 185]

GRAND HAVEN SOUTH PIERHEAD LIGHTHOUSE (1871)
At the end of South Pierhead
Grand Haven

Lake Harbor
16.560750.4767200
Ottawa

This lighthouse was erected in 1871, had a fixed white light, and was originally located on the south pier, at or near the shore. In 1883, it was moved to the end of the pier, where it still stands. The lighthouse building is 25 feet high, 24 feet wide, and 45 feet long, a wood-framed structure which is covered by corrugated galvinized iron sheets and has a gabled roof. The building rests on a concrete foundation which has five sides, two forming a point on the seaward side, the remaining three forming the other sides of a rectangle. The foundation is 28 feet wide and 75 feet long from the "point".
[Lilly, Leo, Historic Grand Haven and Ottawa County (Grand Haven: the author, 1933), p. 363; History of the Great Lakes (Chicago: Beers, 1899), p. 371]

GR, GH & M RW: COOPERSVILLE STATION (1902)
363 W. Main St.
Coopersville

Ravenna
16.586065.4767120
Ottawa

The Grand Rapids, Grand Haven, and Muskegon Railway was incorporated in 1899 and began service on its main line running between Grand Rapids and Muskegon in February 1902. It was one of the first electric interurban lines in the United States to utilize a third rail system. The line was taken over by the United Light and Railway Company in 1912. It fell into receivership in 1926 and ceased operating in 1928. Like the other interurban lines in Michigan and elsewhere, it was no longer profitable after the private automobile gained mass acceptance. The station served as a combination passenger depot-electrical substation. The tower in this depot housed transformers which converted AC into DC for use on the line. It is a rectangular brick structure, 50 feet long and 35 feet wide, with a hipped tile roof. The two-story brick tower which housed the transformers is 25 feet long and 8 feet wide. This depot is identical to another surviving station, also built in 1902 by the Grand Rapids, Grand Haven, and Muskegon Railway, located in Walker, northwest of Grand Rapids. [Electric Railway Journal, XXXIX (1912); XL (1912); LXV (1925); LXXI (1928); NR]

GR, GH & M RW: WALKER STATION (1902)
4011 Remembrance Rd.
Walker City

Ravenna
16.600040.4761062
Kent

The Grand Rapids, Grand Haven, and Muskegon Railway opened an electric interurban line between Grand Rapids and Muskegon in February 1902. This line was taken over by the United Light and Railway Company in 1912 and was a successful line until the mid-1920's, when the private automobile began to reduce ridership. The line fell into receivership in July 1926, and ceased all service in 1928. This station served as both a passenger depot and an electrical substation where AC was converted into DC for use on the line, which utilized a third rail system. The Walker Station is virtually identical to the surviving Grand Rapids, Grand Haven, and Muskegon Railway station at Coopersville. It is a single-story rectangular brick building with a hipped roof, and measures 35 feet wide and 50 feet long. The adjoining two-story brick tower, which housed the transformers, is 8 feet wide, 20 feet long, and has a hipped roof. The original tile roof has been replaced with asbestos shingles, and a cinder block garage and small wooden shed are recent additions. [MHD, Site Files; Electric Railway Journal, XXXIX (1912); XL (1912); LXV (1925); LXXI (1928)]

GR & I LINE: KALAMAZOO STATION (1872)
403 E. Michigan Ave.
Kalamazoo

Kalamazoo
16.617185.4683045
Kalamazoo

This station was built after the Grand Rapids and Indiana Line, extending from Fort Wayne, Indiana to Petoskey, Michigan reached Kalamazoo in 1870. It consists of two distinct parts, a passenger station fronting on Michigan Avenue and an adjoining freight station facing South Pitcher Street. The passenger station is a two-story rectangular brick building, approximately 50 feet by 70 feet, topped with a gabled roof. A slightly pitched roof extends from three sides of the building between the first and second stories to form a porch. The freight station, also of brick construction, is one-story in height, with a gabled roof, and is approximately 30 feet wide and 150 feet long. The station is now serving as one of Kalamazoo's more popular restaurants.
[MHD, Site Files; Fisher, David and Little, Frank, Compendium of History and Biography of Kalamazoo County (Chicago: Bowen & Co., 1906), pp. 58-60]

GTW RR: BATTLE CREEK FREIGHTHOUSE (1906,1948)
Capital Ave., north of Liberty St.
Battle Creek

Battle Creek
16.649455.4686400
Calhoun

A wooden Grand Trunk Railway passenger station located on this site was demolished in 1906 after a new passenger depot, still in existence, was opened on East Dickman Street. The freight office building is a rectangular brick structure, 40 feet by 30 feet, two stories high, with brick-arched windows and a flat roof, fronting on Capital Avenue. The original freight shed constructed in 1906 was wooden and was destroyed by fire in 1948. It was then replaced by the present shed, a steel-framed, one and one-half story brick and glass structure with a slightly pitched roof, 40 feet wide and 100 feet long.

GTW RR: BATTLE CREEK STATION (1905)
25 E. Dickman St.
Battle Creek

Battle Creek
16.650460.4685820
Calhoun

This passenger depot replaced an earlier wooden depot located on Capital Avenue about one-fourth of a mile west of this site. The main portion is 141 feet long and 67 feet wide, three stories high, with walls of stone on the first floor and of brick for the remainder of the building. The main roof is gabled and three sides of the main building have widely projecting eaves to provide passengers with protection from the elements.

Two square bell towers adorn the western facade. The main lobby is 100 feet long and 60 feet wide. The roof is supported by massive wooden arches. Extending from the eastern facade of the main building is a 225 foot long platform, originally protected only by a gabled, slate roof supported by wooden posts. Most of this platform was enclosed with brick during the 1950's to provide office space. At the end of the platform is a 25 foot square stone building with a hipped roof, part of the original 1905 structure.

GTW RR: Battle Creek Station (1905), Battle Creek

GTW RR: CHARLOTTE STATION (1885)
130 McClure St.
Charlotte

Charlotte
16.697600.4715010
Eaton

The first railroad to reach Charlotte was the Peninsular Railway Company, which completed a line between Lansing and Battle Creek in 1869. This line was purchased by Sir Henry Tyler of the Grand Trunk Railroad in 1878 as part of his plan to control a line between Port Huron and Chicago and challenge the Vanderbilt monopoly on through traffic between Detroit and Chicago. The Charlotte Station, constructed in 1885, is a rectangular red brick building, 23 feet wide and 71 feet long, featuring a single bay window, and a gabled roof with overhanging eaves supported by wooden brackets. The original slate roof has been replaced with asphalt shingles. [GTR, "Statement"; Dunbar, p. 145]

GTW RR: DURAND STATION (1905)
200 Railroad St.
Durand

Durand
17.256530.4754820
Shiawassee

At the beginning of the twentieth century, Durand was one of the busiest railroad towns in Michigan, with most of its population of nearly 3,000 working for the Grand Trunk Railroad. It was located at the juncture point for the Grand Trunk Western's two major lines, as well as the Ann Arbor Railway Company's main line. It was also a major locomotive repair center for the Grand Trunk Railway, which built its largest roundhouse between Toronto and Chicago there. Thirty-five passenger trains and over one hundred freight trains passed through Durand every day in 1904. This passenger station was built in 1905 to replace a similar station lost by fire earlier in the year. Located at the junction of the Grand Trunk and Ann Arbor Railway lines, it served both lines. This two and one-half story brick building rests on a finished ashlar foundation four feet high and is 49 feet wide and 244 feet long. The northwest end of the building has two rounded bays topped by conical roofs and three sides of the building have an overhanging roof supported by metal brackets forming a covered waiting area approximately eight feet deep. The building originally had a tile roof and four dormers, but they were removed in 1965 and an asphalt roof now covers the station.
[GTR, "Statement"; NR]

GTW RR: Durand Station (1905), Durand

GTW RR: DURAND TURNTABLE (1916)
End of Brookfield St.
Durand

Durand
17.255540.4755320
Shiawassee

This center-mounted turntable was built in 1916 to service the immense Durand Roundhouse, no longer extant, of the Grand Trunk Railroad. The nameplate on the turntable reads, "American Bridge Company of New York, No. 825, Ambridge Plant". The turntable is 15 feet 2 inches wide and 86 feet 6 inches long, and turns in a concrete-lined pit which is five feet deep. It consists of two through plate girders, 9 feet 6 inches high in the center, tapering to 4 feet 6 inches in height at both ends. [GTR, "Statement"]

GTW RR: JACKSON ROUNDHOUSE (c.1900)
N. Jackson Ave., north of W. Trail St.
Jackson

Jackson North
16.713820.4680940
Jackson

This roundhouse was built by the Grand Trunk Western Railroad at the terminus of their line between Pontiac and Jackson. It was a relatively minor repair facility compared to the immense roundhouses at Durand and Battle Creek. This brick building has an inside circumference of 130 feet, an outside circumference of 250 feet, and contains nine bays, each 25 feet deep. It extends for only 90 degrees, so is barely recognizable as a "round" house. The building has a flat roof and nine sets of wooden double doors. It is now occupied by a construction company, which has built a cinder block addition which covers four of the bays.
[Jackson Citizen-Patriot, September 19, 1937, p. 11]

GTW RR: KALAMAZOO STATION (1907)
427 E. Michigan Ave.
Kalamazoo

Kalamazoo
16.617240.4683165
Kalamazoo

The Kalamazoo and White Pigeon Railroad was completed to Kalamazoo in 1867. This line was taken over by the Lake Shore and Michigan Southern Line in 1871, and in turn it was purchased by the Grand Trunk Railroad Company, the present owner, in 1879. This station, constructed in 1907, originally served as a passenger and freight station, although it is now used only as a freight station. It consists of a rectangular, two-story, flat-roofed, brick (English bond) office building, approximately 50 feet by 70 feet and a one and one-half story, rectangular wooden shed, approximately 50 feet by 250 feet, with a slightly pitched roof, designed for freight storage. The building is still used as a freight office by the Grand Trunk Western Railroad Company.
[Fisher, David and Little, Frank, Compendium of History and Biography of Kalamazoo County (Chicago: Bowen & Co., 1906), pp. 58-60]

GTW RR: LANSING STATION (1902)
1203 S. Washington Ave.
Lansing

Lansing South
16.700500.4732350
Ingham

The Lansing Station of the Grand Trunk Western Railroad was constructed in 1902 and remained in service until 1971. The building has served as a restaurant since 1972. It is a square brick building, 33 feet wide and 107 feet long, rests on a finished ashlar foundation, and has a tiled

gabled roof with overhanging eaves supported by wooden brackets. The building features a two-story brick tower, ten feet square and a bay window topped by a conical roof. At the eastern end of the station, there is a covered waiting platform, 30 feet square, with a hipped roof supported by wooden columns. It was designed by the architectural firm of Spier and Rohns of Detroit.
[GTR, "Statement"; Dunbar, p. 209]

GTW RR: Lansing Station (1902), Lansing

GTW RR: LOCOMOTIVE NUMBER 6325 (1942)
E. Dickman St. at E. Elm St.
Battle Creek

Battle Creek
16.650600.4685720
Calhoun

This 4-8-16 steam locomotive was in service on the Grand Trunk Western Railroad in 1942-1958 and was one of the last steam locomotives used by that company. It was donated to the City of Battle Creek by the Grand Trunk Western Railroad and was put in its present location in 1960, after repair and restoration.

GTW RR: OWOSSO STATION (c.1900)
524 S. Washington Ave.
Owosso

Corunna
16.730065.4763072
Shiawassee

This is a good example of the substantial brick depots erected by Michigan's railroads to serve medium-sized towns. This one-story brick building rests on a finished ashlar foundation four feet high and features brick-arched doors and windows, and hipped slate roofs with slightly overhanging eaves. It is 110 feet long and ranges between 40 and 60 feet wide.

GTW RR: PONTIAC STATION (1908)
110 W. Huron St.
Pontiac

Pontiac North
17.311650.4723050
Oakland

This passenger station is a rectangular brick building, resting on a stone foundation, and is 27 feet wide and 88 feet long. It features a hipped roof with eaves that overhang by four feet, a bay window, and a covered passenger entrance which has been closed in with cinder blocks to provide additional office space for the Grand Trunk Western Railroad.

GTW RR: PORT HURON CAR SHOPS (1915-1916)
2801 Minnie St.
Port Huron

Port Huron
17.381000.4757650
St. Clair

The Grand Trunk Western Railroad complex of car shops in Port Huron was originally located on the west bank of the St. Clair River near the present site of the Bluewater Bridge. These shops were totally destroyed by a fire in November 1913. The Grand Trunk rebuilt these facilities in 1915-1916 on land donated by the citizens of Port Huron after a public

appeal raised $110,000 for that purpose. This complex includes some twenty buildings, virtually all single-story brick structures. The major buildings are the Small Passenger Car Shop (138 feet by 315 feet); Large Passenger Car Shop (138 feet by 306 feet); the Main Freight Car Shop (363 feet by 1,100 feet); the Blacksmith and Machine Shop (152 feet by 302 feet); the Woodmill (91 feet by 211 feet); the Powerhouse (57 feet by 111 feet); and the Office Building (62 feet by 220 feet). With the reconstruction of these car repair facilities, Port Huron has served as the Grand Trunk Western's principal repair center within Michigan for nearly a century.
[GTR, "Statement"; Port Huron Herald-Times, July 23, 1938, n.p.]

GTW RR: STATIONARY STORAGE BUILDING (1925) | Battle Creek
GT Rd., south of Verona Rd. | 16.652800.4687665
Battle Creek | Calhoun

This building was part of a major service complex built by the Grand Trunk Western Railroad in 1925. This complex included a massive roundhouse and turntable near Verona Road in the northern outskirts of Battle Creek. This building was used to store "stationary supplies," virtually anything other than rolling stock. It was abandoned around 1960, but is now scheduled to be rehabilitated. The building is of brick and concrete construction, and has two distinct parts. The northern portion is two stories high, 50 feet wide and 60 feet long, and has a flat roof, while the southern portion is one-story high, with a gabled roof, and measures 60 feet wide and 120 feet long.

GTW RR: VERONA ROAD ROUNDHOUSE (1925) | Battle Creek
GT Rd., south of Verona Rd. | 16.652920.4687765
Battle Creek | Calhoun

The Verona Road Roundhouse served as a major locomotive repair facility for the Grand Trunk Western Railroad during the period 1925-c.1955. The roundhouse has an inside circumference of 540 feet and an outside circumference of 1,700 feet. It contained 45 stalls, each 120 feet deep. The outside circumference and the end of this building are of brick and concrete construction. The roof and the 45 sets of wooden doors are supported by massive oak framing. The building is subdivided into three sections of 15 bays each by brick walls. The roof is built on two levels, with both roofs slightly pitched. There are two sets of windows on the inside circumference, one set directly above the bay doors, and the other set bridging the gap of nearly three feet between the lower level roof on the inside circumference and the higher level roof on the outside circumference. The tin stack ventilators are still in place.

GTW RR: Verona Road Roundhouse (1925), Battle Creek

GROSSE ILE LIGHTHOUSE (1906)
On Lighthouse Point
Grosse Ile Township

Wyandotte
17.323230.4670440
Wayne

When originally constructed in 1894, this lighthouse stood on three wooden legs or stilts. The surviving structure was built in 1906. Resting on a concrete foundation, it is an octagonal wooden structure, 40 feet high, 12 feet in diameter at the base and then tapered to a diameter of 7 feet at the top. The interior, which consists mainly of a circular staircase leading to the light (no longer extant) is well protected by a roof of thin copper sheets.

HARBOR BEACH LIGHTHOUSE (1885)
On north side of Breakwater Entrance
Harbor Beach

Harbor Beach
17.368900.4855800
Huron

This lighthouse was erected when the U.S. Army Corps of Engineers created a harbor of refuge at Harbor Beach (Sand Beach) in 1885. It is a white conical tower, 54 feet high, 20 feet in diameter at the base, and approximately 15 feet in diameter at the top. It is equipped with a fourth order lens made in France at the time of its construction.
[USCG, Light List, p. 83; Bicentennial Committee, Harbor Beach Women's Club, Harbor Beach: Yesterday and Today (Harbor Beach, 1976), pp. 29-30; Portrait and Biographical Album of Huron County, Michigan (Chicago, 1884), p. 479]

THE HURON (1921,1949)
Pine Grove Park
Port Huron

Port Huron
17.383680.4760440
St. Clair

This lightship was commissioned in 1921 and originally served to relieve several permanent lightships in service in northern Lake Michigan. It was permanently assigned to the Corsica shoals, six miles north of Port Huron, in 1935 and remained in service there until 1970. It was the only lightship in use on the Great Lakes after 1940. She was built by the Consolidated Shipbuilding Company of Morris Heights, New York. She is 97 feet long, with a beam of 24 feet and a displacement of 340 tons. Her original steam boilers were replaced with diesel engines in 1949. The Coast Guard presented the *Huron* to the City of Port Huron in 1971 and she now rests in Pine Grove Park in that city.
[MHD, Site Files; Castagnera, J.O., "A Brief History of the Huron Lightship" (Fall 1970), XXVI, pp. 185-187]

S.S. KEEWATIN (1907)
Foot of Hamilton St.
Douglas

Fennville
16.565025.4743095
Allegan

This passenger cruise ship was constructed in 1907 by the Fairfield Company in Govan, Scotland. When transferred to the Great Lakes, it had to be cut in half and later reassembled in order to enable it to pass through the Welland Canal. The *Keewatin*, owned by the Canadian Pacific Railroad, served as a cruise ship in 1908-1965, mainly operating between Georgian Bay and Lake Superior. It had a capacity of 288 passengers and carried considerable volumes of grain as well. It is 350 feet long, with a beam of 43.8 feet, and a gross tonnage of 3,856 tons. It was driven by a coal-fired quadruple expansion steam engine developing 3,300 horsepower. The present wheelhouse was added in 1940 and the three original wooden masts were replaced by two steel masts in 1950. Since 1967, when it was moved to Douglas, the *Keewatin* has served as a floating museum. It is the oldest surviving Great Lakes steamer.
[MHD, Site Files]

LANSING UNION STATION (1910)
637 E. Michigan Ave.
Lansing

Lansing South
16.701130.4734050
Ingham

Lansing's Union Station was constructed in 1910 for joint use by the Pere Marquette Railroad and the Michigan Central Railroad. The Pere Marquette leased space from the Michigan Central, but did not own a share of the property or bear any of the costs of construction. There are two buildings, both of brick construction with finished ashlar foundations approximately three feet high, hipped roofs, and wide overhanging eaves supported by wooden brackets. The larger of the two, the passenger waiting area, is 40 feet wide and 140 feet long, and features two bay windows topped by conical roofs. The original tile roof has been replaced with shingles. The smaller building, 40 feet wide and 90 feet long, served as a baggage room and was originally linked to the passenger waiting room by a covered walkway, no longer extant. This structure still has its original tile roof, however.

LAWRENCE & CHAPIN BUILDING (1872) — Kalamazoo
205 N. Rose St. — 16.616365.4683030
Kalamazoo — Kalamazoo

This building has had numerous occupants since it was erected in 1872. It was an integral part of Michigan's system of electric interurban lines which developed in the early twentieth century. The second interurban line in Michigan was constructed in 1900 between Kalamazoo and Battle Creek by the Michigan Traction Company. The Michigan Railway Company, a successor company, used this building as its Kalamazoo terminal in 1915-1927. The trains stopped in the area adjacent and to the north of the building, now used as a parking lot. It is a three-story, rectangular brick structure, approximately 70 feet wide and 300 feet long, featuring decorative concrete arches over the windows on the front facade and a mansard roof. It is now used as a furniture showroom.
[Dunbar, Willis F., Kalamazoo and How It Grew (Kalamazoo: Western Michigan University Press, 1969), pp. 139-140, 160]

LITTLE SABLE POINT LIGHTHOUSE (1874) — Hart
On Little Sable Point — 16.535016.4833000
Golden Township — Oceana

This lighthouse was completed in 1874 at a cost of $35,000 and was equipped with a third order light. The brick cylindrical tower rests on a concrete foundation, stands 100 feet high and is 14 feet in diameter at the base. The lightkeeper's house is no longer extant.
[MHD, Site Files; USCG, Light List, p. 152]

LUDINGTON NORTH BREAKWATER LIGHTHOUSE (1870,1924) — Ludington
On outer end of North Breakwater — 16.542062.4866065
Ludington — Mason

The North Breakwater Light at Ludington was built in 1870 and sheathed in steel plates in 1924. The tower is 15 feet square at the base and then tapers to about 8 feet square at the top. The tower is 40 feet high and rests on a massive concrete crib approximately 16 feet wide, 25 feet long, and rising 15 feet above the water level.
[USCG, Light List, p. 151]

Little Sable Point Lighthouse (1874), Golden Township

MACKINAC POINT LIGHTHOUSE (1892)
Michilimackinac State Park
Mackinac City

St. Ignace
16.676440.5072700
Cheboygan

The passage through the Straits of Mackinac had been marked by a lighthouse at McGulpin's Point since 1856, but that light could not be seen from all points in the straits. A fog signal was built at Mackinac Point in 1890 and the present lighthouse was completed in October 1892. Its light was visible for sixteen miles and it remained in active service until 1958. The round light tower is a brick structure resting on a cut stone foundation nearly six feet high, has a diameter of ten feet, and stands 40 feet high. The adjoining brick lightkeeper's house is a two-story brick building, also resting on a cut stone foundation, approximately 25 feet by 50 feet, with a combination of flat, gabled, and hipped roofs. It now serves as a maritime museum.
[NR]

MANISTEE NORTH PIERHEAD LIGHTHOUSE (1875,1927)
On outer end of North Pier
Manistee

Bar Lake
16.552030.4899085
Manistee

This cylindrical lighthouse was constructed of brick in 1875 and later sheathed with steel plates in 1927. The tower is 55 feet high and ten feet in diameter at the base.
[USCG, Light List, p. 150]

MC RR: ALBION STATION (1897)
Michigan Ave., between Cass and Superior
Albion

Homer
16.685015.4679045
Calhoun

The Albion Station of the Michigan Central Railroad was constructed in 1897 to replace an earlier wooden depot. It is a rectangular red brick structure, 35 feet wide and 110 feet long, with a bay window, stone lintels and sills on the windows, and a gabled roof with wide overhanging eaves supported by wooden brackets. At the eastern end of the building, there is a covered passenger platform, 20 feet by 24 feet, protected by a pitched roof supported by four wooden columns.

Mackinac Point Lighthouse (1892), Mackinac City

MC RR: ANN ARBOR STATION (1886)
401 Depot St.
Ann Arbor

Ann Arbor East
17.273900.4685090
Washtenaw

The Michigan Central Railroad, the state's first major line, reached Ann Arbor in 1839. This station, built in 1886, was designed by Frederick Spier, a German-born architect who emigrated to the United States in 1873. He was a partner in the Detroit architectural firm of Spier and Rohn, which designed several major passenger stations in Michigan in the late 1880's. This depot, constructed of rock-faced masonry in the Romanesque style, consists of three buildings linked by two covered walkways, each 20 feet wide and 60 feet long, with cast iron columns supporting the roofs. The main building, which served as the ticket office and waiting area, is 40 feet wide and 100 feet long, with a high-gabled hipped roof pierced by two swept dormer windows. It has been converted into a restaurant and cocktail lounge. The building located to the west of the main building is 30 feet by 50 feet and originally served as a baggage room. It is now used as an Amtrak station. The third structure, located east of the main building, measures 20 feet by 40 feet. It originally served as a Railway Express office and is now used for storage. [Ann Arbor Courier (1/20/86; 10/27/86; 11/21/86; 1/5/87; 4/27/87); Michigan History Magazine, Vol. 33 (1949), pp. 325-326; Marquis, Albert, The Book of Detroiters (Chicago, 1914); NR]

MC RR: BATTLE CREEK FREIGHTHOUSE (1903)
46 N. Monroe St.
Battle Creek

Battle Creek
16.650035.4686650
Calhoun

The Michigan Central Railroad, which had served Battle Creek since 1846, built this freight depot in 1903 and it remained in continuous service until 1962, when it was sold to the present owner by the New York Central System. It consists of a two-story, brick office structure, 50 feet wide and 100 feet long, fronting on Monroe Street, featuring brick-arched windows and a flat roof and a one-story brick storage building, 50 feet wide and 200 feet long. This storage building has a gabled roof with a four foot overhang. This overhang is completely enclosed on the northern side of the building, providing a protected loading dock which abuts the tracks.

MC RR: Ann Arbor Station (1886), Ann Arbor

MC RR: BATTLE CREEK STATION (1888)
West of Jackson St.
Battle Creek

Battle Creek
16.649835.4686840
Calhoun

The Michigan Central Railroad, one of the state's earliest and most succesful lines, was extended from Marshall to Battle Creek in 1845. This rectangular brick passenger station consists of a main waiting room, 35 feet wide and 120 feet long, and a separate brick baggage room, 35 feet wide and 54 feet long, connected by a covered walkway 22 feet wide and 40 feet long. The structure has hipped roofs, with widely projecting eaves supported by cast iron brackets, and features a high brick tower above the south entrance.
[NR]

MC RR: Battle Creek Station (1888), Battle Creek

MC RR: BATTLE CREEK TURNTABLE (1919)
Elm St., north of Michigan Ave.
Battle Creek

Battle Creek
16.650550.4686280
Calhoun

This turntable was part of a car repair facility established by the Michigan Central Railroad in Battle Creek in 1919. It is a center-mounted turntable, 85 feet long, 17.5 feet wide, resting on steel beams, each 85 feet long and 7 feet high. The deck is supported by oak beams, 8 inches by 8 inches by 10 feet long, these crossmembers running the length of the deck. In addition, there are sixteen 2 inches by 4 inches by 20 feet crossmembers, one foot apart, which support the outside portion of the deck, which does not have to bear the weight of a locomotive.

The turntable rests in a concrete-lined pit, seven feet deep, and revolves on a single track running around the circumference of the pit. The original installation included an electric motor, no longer extant. The nameplate reads "George P. Nichols & Broth, Designers and Builders, Chicago".
[Battle Creek Enquirer-News, July 20, 1975, p. E-2]

MC RR: DETROIT STATION (1913)
2405 W. Vernor Hwy.
Detroit

Detroit
17.328800.4688160
Wayne

The Michigan Central Railroad Station in Detroit is primarily neo-classic in design and consists of two sections: a two-story entrance hall and a sixteen-story office building. The former is the more elaborate, with three large round-arched windows with two Doric columns on either side, two pilasters at each end of the section, and three pedimented gables above each of the windows. The interior of the structure, which is of limestone with a steel framework, includes a waiting room that is 97 feet by 230 feet, and a grand concourse with heavy marble columns and a domed ceiling five stories above. The station was designed by the well-known architects Warren and Wetmore in collaboration with Reed and Stem. Warren and Wetmore are known for the vaulted concourse in New York City's Grand Central Station. The station was opened on December 26, 1913, eight days ahead of schedule because of a fire in the old depot at Third and Jefferson. It was a well-appointed facility with both public and private washing rooms, a barber shop, a newsstand, and a drug store. With the demolition of the Union Depot in 1974, the Michigan Central station is Detroit's last railroad terminal. The Michigan Central is now part of the Penn Central System.
[Ferry; Meeks, Carroll, The Railroad Station (New Haven, 1956); Woodford, Frank B. and Arthur M., All Our Yesterdays (Wayne State University Press, 1969); NR]

MC RR: DOWAGIAC STATION (1898)
W. Railroad Drive
Dowagiac

Cassopolis
16.573045.4647085
Cass

This passenger station replaced an earlier wooden depot constructed shortly after the Michigan Central Railroad reached Dowagiac in 1848. It is a red brick building resting on a finished ashlar foundation and features stone arch doorways and hipped roofs with overhanging eaves supported by wooden brackets. The eastern portion of this building, the main passenger waiting area, is 90 feet long and 50 feet wide. The western portion, used as a freight office, is 25 feet long and 35 feet wide, also with a hipped roof. The two sections are connected by a covered walkway, 60 feet long and 20 feet wide, with a roof supported by cast iron posts.

MC RR: JACKSON LOCOMOTIVE SHOPS (1901,1903,1920)
Page Ave. and Elm St.
Jackson

Jackson South
16.716200.4679530
Jackson

The Michigan Central Railroad moved its locomotive shops from Marshall to Jackson in 1871. This immense complex includes a Blacksmith Shop (1901), Powerhouse (1903), and numerous minor buildings, but the major shops were contained in a sprawling T-shaped building. The main wing is a three-story steel-framed brick building, 50 feet wide and 400 feet long, which housed the locomotive erection shop. It has a gabled roof topped by a skylight running the length of the building. The pipe fitters shop occupied a wing which was 70 feet wide and 100 feet in length, while a second wing, 200 feet long and 80 feet wide, contained the foundry, wheel shop, and brass pattern shops. The two wings are both steel-framed brick structures with gabled roofs.
[Jackson Citizen-Patriot, September 19, 1937, p. 11]

MC RR: JACKSON ROUNDHOUSE (1911,1941)
Page Ave. and Elm St.
Jackson

Jackson South
16.715960.4679450
Jackson

The Jackson Roundhouse was one of the Michigan Central Railroad's major repair facilities at the turn of the century (the other was in Niles). It originally contained forty bays, each 100 feet deep, and was nearly a full circle of 360 degrees, with an outside diameter of approximately 1,200 feet. Only ten bays, roughly 90 degrees of a full circle, are extant. The surviving brick structure has an inside circumference of 150 feet and an outside circumference of 300 feet. The building features a roof pitched slightly to the rear, ten sets of double wooden doors, a massive timber frame, and seven of the ten original tin stack ventilators. There is a square brick building, 100 by 80 feet, constructed in 1941, attached to the rear of the original structure.
[Jackson Citizen-Patriot, September 19, 1937, p. 11]

MC RR: JACKSON STATION (1874)
501 E. Michigan Ave.
Jackson

Jackson South
16.714530.4680350
Jackson

The Michigan Central Railroad, the state's first major line, reached Jackson from Detroit in 1842. This station, constructed in 1874, replaced an earlier wooden depot, located about 300 feet east of the present structure. There are two separate buildings originally linked by a covered walkway. The passenger waiting area and ticket office is a one-story brick structure with two-story sections at each end, with a combination of gabled and hipped roofs. Overall, it is 60 feet wide and 350 feet long. It features a platform covered by a slightly pitched roof 25 feet wide and 300 feet long, supported by cast iron columns. A second building, which housed the baggage room and Railway Express Office, is a one-story L-shaped brick structure with two separate hipped roofs. One section is 40 feet wide and 90 feet long, while the other section is 40 feet by 60 feet.

MC RR: JACKSON TURNTABLE (1911)
Page Ave. and Elm St.
Jackson

Jackson South
16.715960.4679450
Jackson

This is a center-mounted turntable set in a concrete-lined pit, 100 feet in diameter and five feet deep. The turntable is 15 feet wide, 100 feet long, and consists of two steel beams, four feet high in the center tapering to three feet in height at the ends. The track rests on 15 inch square oak crossmembers. It is powered by an electric motor (not original) mounted at one end and turns on a single track mounted on wooden ties.
[_Jackson Citizen-Patriot_, September 19, 1937, p. 11]

MC RR: KALAMAZOO ROUNDHOUSE (c.1920)
S. Mills St.
Kalamazoo

Kalamazoo
16.618210.4683180
Kalamazoo

This roundhouse was constructed by the Michigan Central Railroad in the early 1920's and served as part of a major locomotive repair complex (the Botsford Yards) in Kalamazoo until the early 1950's. Originally, the roundhouse was a full 180 degrees in circumference, but only 90 degrees remain, the rest having been torn down to provide parking area for employees. What remains is a wood-framed, brick structure with

square windows and roof which is slightly pitched to the rear of the structure. It has ten bays with wooden doors and each bay is equipped with a tin stack ventilator to exhaust the gases produced by the coal-fired steam locomotives which originally used this facility. This structure has an inside circumference of 150 feet, an outside circumference of 300 feet, and each bay is 75 feet deep.
[Kalamazoo Gazette, November 18, 1925, p. 15]

MC RR: Jackson Station (1874), Jackson

MC RR: KALAMAZOO STATION (1887)
459 N. Burdick St.
Kalamazoo

Kalamazoo
16.616720.4683340
Kalamazoo

The Kalamazoo Station of the Michigan Central Railroad was built in 1887 and was designed by Cyrus W.L. Eidlitz, the architect responsible for the Dearborn Station in Chicago (1886). At the time of its construction Kalamazoo was served by five railroads and had more than 100 passenger and freight trains passing through each day. The station itself was built in a Richardsonian Romanesque style and extends for approximately 200 feet consisting of a central, hipped-roof mass flanked by smaller asymmetrical wings, also hipped-roof. The structure has a conical tower, rock-faced masonry arches, and broad planed roofs. It is built of red brick. Original dark oak benches, wall mouldings, and ceilings characterize the station's interior. The ticket office and waiting room function in their original capacity as Kalamazoo is served by some forty Amtrak trains per week (the stop is on the Chicago-Detroit line). [MHD, Site Files; Schuyler, Montgomery, "Cyrus W.L. Eidlitz," Architectural Record, Vol. V (1896), pp. 411-435; NR]

MC RR: KALAMAZOO TURNTABLE (1912)
S. Mills St.
Kalamazoo

Kalamazoo
16.618245.4683180
Kalamazoo

The plate on this turntable reads, "American Bridge Company of New York, 1912, No. 663, Toledo Plant". The turntable consists of two massive steel girders, each 75 feet long and 5 feet in height, with connecting crossmembers forming the bed for the tracks. The turntable rests in a concrete-lined pit 75 feet in diameter and four feet deep. It turns on a single rail which runs around the circumference of the pit. The turntable was moved by a large electric motor connected to a driving wheel (flanged) at one end of the turntable. The other end of the turntable has a pair of 12 inch diameter unflanged wheels which turn freely on the track.

MC RR: LAWTON STATION (c.1880)
N. Main St.
Lawton

Marcellus
16.595000.4669025
Van Buren

The Michigan Central Railroad reached Lawton when it was extended from Kalamazoo to New Buffalo in 1848-1849. The original wooden depot

constructed by the Michigan Central is no longer extant. This handsome stone depot was erected in the 1880's. It measures 60 feet long and 35 feet wide and features a gabled main roof and a small conical roof. Several of the windows are arched with cut stone, while others are framed by horizonal stone lintels and sills.
[Dunbar, pp. 53-54, 62, 188-190]

MC RR: Kalamazoo Station (1887), Kalamazoo

MC RR: NILES LOCOMOTIVE SHOPS (1919)
2101 Terminal Rd.
Niles

Cassopolis
16.564055.4633095
Berrien

The Niles Locomotive Shops, built in 1919 by the Dominion Construction Company of Toronto, are located immediately behind the Michigan Central

Railroad Roundhouse dating from 1903. These locomotive shops were used to rebuild and recondition steam and later, diesel locomotives. It is a sprawling complex of three distinct, but interconnected buildings, all flat-roofed brick structures with steel frames and massive steel Pratt truss roof trussing, designed primarily to carry the weight of heavy-duty overhead cranes. The machine shop is a two-story rectangular building, 50 feet long and 40 feet wide. There is a long and narrow (200 feet by 30 feet) one-story section which leads into the main building, two and one-half stories high, 50 feet wide, and 150 feet long.

MC RR: NILES ROUNDHOUSE (1903)
2200 Terminal Rd.
Howard Township

Cassopolis
16.564055.4633095
Berrien

The Niles Roundhouse was one of three major locomotive repair facilities used by the Michigan Central Railroad during the first three decades of this century. The other two were in Detroit and Jackson. It has an outside circumference of 400 feet, an inside circumference of 300 feet, and a radius of 100 feet. It is a brick and concrete structure with a total of twenty-four bays. The roof, pitched slightly to the rear, is supported by concrete pillars. The building is approximately 20 feet high in the front and 14 feet high in the rear. The tin stack exhausts remain in place. Two-thirds of the building is vacant while the remainder is used for storage.

MC RR: NILES STATION (1891)
598 Dey St.
Niles

Niles West
16.562080.4631780
Berrien

The Michigan Central Railroad reached Niles in 1849 and initially constructed a wood-framed passenger depot. The surviving depot was built in 1891. It is a sprawling finished ashlar structure, two stories high, featuring a combination of hipped and conical roofs, wide overhanging eaves supported by cast iron brackets, and a clock tower. It consists of three sections and measures 200 feet long overall. The western portion is 65 feet long and 54 feet wide, the center portion is 30 feet by 80 feet, while the eastern portion is 25 feet by 35 feet. The western and center portions are connected by a hallway 10 feet wide and 30 feet long, while the center and eastern portions are linked by a covered walkway 50 feet long.
[Dunbar, pp. 62, 209]

MC RR: NILES TURNTABLE (1918)
2200 Terminal Rd.
Howard Township

Cassopolis
16.564055.4633095
Berrien

Niles served as a major locomotive repair center for the Michigan Central Railroad from the turn of the century until the late 1930's. The nameplate on this turntable reads, "The Nichols Engineering Company, Designers and Builders, Chicago. American Bridge Company of New York, 1918. No. 1029, Ambridge Plant". It is a center-mounted turntable, 100 feet long and 24 feet wide, consisting of two massive steel I-beams, eight feet in height in the center and tapering off to four feet high at the ends. The turntable rests in a concrete-lined pit, 100 feet in diameter and nine feet deep. The flanged wheels at each end of the turntable rest on a single rail set on a concrete footing which is three feet wide and two feet deep.

MC RR: WEST DETROIT ROUNDHOUSE (1912)
John Kronk St.
Detroit

Detroit
17.325540.4687460
Wayne

The Michigan Central Railroad West Detroit Roundhouse is a brick structure with a concrete pit and concrete foundation. It is a one-story building with a depth of 100 feet, an internal circumference of 270 feet, and an external circumference of 667 feet. Only eleven stalls of forty are still in use. Since construction almost one-third of the building has been razed. The George Fuller Company of New Jersey constructed the roundhouse and George Webb of the Michigan Central Railroad served as chief engineer.

MC RR: YPSILANTI STATION (c.1880)
N. River St.
Ypsilanti

Ypsilanti East
17.284755.4680230
Washtenaw

The Michigan Central Railroad, the first major line built in the state, reached Ypsilanti in 1838. This passenger depot was built around 1880, replacing an earlier wooden depot lost by fire. It consists of two rectangular red brick buildings with hipped roofs, connected by a 40 foot covered walkway supported by wooden posts. The larger building, which served as the ticket office and waiting room, is 24 feet wide and 100 feet long, while the smaller structure, used for baggage, measures 30 feet by 20 feet.
[Dunbar, pp. 43, 208]

MS RR: ADRIAN ROUNDHOUSE (c.1900)
930 Michigan St.
Adrian

Adrian
16.746935.4642020
Lenawee

The Michigan Southern Railroad reached Adrian in 1840, after her citizens paid the railroad a "bonus" of $40,000 to induce it to build there. Part of the agreement made at that time was that the Michigan Southern promised to maintain its general offices, as well as a major repair facility in Adrian. There has been a major roundhouse in Adrian since the 1850's, although the surviving structure is only part of a facility that was built around 1900. It is a brick building, 75 feet deep, with an outside circumference of 140 feet and an inside circumference of 100 feet, with a flat roof pitched slightly to the inside. Few signs of the building's original function remain. The doors to the seven bays are covered with sheet metal, the stack ventilators are no longer evident, and there is no evidence of the turntable.

MICHIGAN TRACTION COMPANY OFFICE BUILDING (c.1910)
26945 W. Michigan Ave.
Albion

Marshall
16.684320.4680240
Calhoun

The Michigan Traction Company was one of the pioneer electric interurban lines in Michigan in the early twentieth century. In 1903, they opened a 44 mile long line linking Jackson and Battle Creek passing through Albion. The line became part of the Michigan Electric Railway system in 1906 and Albion became a major car repair center until the line stopped operating in 1928. This office building is the only reminder left of the once sprawling repair facilities. It is a single-story rectangular wood-framed structure, 15 feet wide and 60 feet long, with a gabled roof. [MHD, Site Files; Dunbar, pp. 235, 241; Krenerick, Miriam, <u>Albion's Milestones and Memories</u> (Albion, 1932), p. 63]

MUSKEGON SOUTH BREAKWATER LIGHTHOUSE (1929)
End of South Breakwater
Muskegon

Lake Harbor
16.553110.4787050
Muskegon

The Muskegon South Breakwater Lighthouse was erected in 1929 when the breakwater was first built by the United States Army Corps of Engineers. It stands 53 feet high overall. The lighthouse consists of a rectangular

base, 10 feet wide, 20 feet long, and 15 feet high from which the sharply tapered square tower extends. This tower, with a riveted cast iron plate exterior, is 10 feet square at its base, but only 3 and one-half square at the top.
[USCG, Light List, p. 152]

MUSKEGON SOUTH PIERHEAD LIGHTHOUSE (1903)
End of South Pierhead
Muskegon

Lake Harbor
16.553475.4785925
Muskegon

A series of beacons, originally mounted on wooden and later, iron towers, have been located at this site since 1852. The present tower was built in 1903 by the Lakeside Bridge and Steel Company of Milwaukee, Wisconsin. This round structure is 48 feet high and tapers from a diameter of 10 feet at the base to a diameter of about 7 feet at the top. It has a riveted cast iron plate exterior and the beacon is enclosed in an octagonal glass and cast iron housing.
[USCG, Light List, p. 152; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 185]

MUSKEGON UNION STATION (1895)
586 W. Western Ave.
Muskegon

Lake Harbor
16.558125.4786360
Muskegon

The first railroad to serve Muskegon was the Michigan Lake Shore Railroad Company, which completed a line between Allegan and Muskegon in 1871. A second line, the Muskegon, Grand Rapids, and Indiana Railroad, reached Muskegon in 1886 and used a temporary passenger depot until the two lines decided to build a single passenger depot. The general contract to build the station, at a cost of $18,000, was awarded to John L. Connell of Muskegon in May 1893, but the Panic of 1893 halted construction until August 1894. The contract was then transferred to another builder and the station was opened a year later, on September 22, 1895. It is a rectangular building, 100 feet by 45 feet, with brick walls, cut stone arches over the doors and one window, and a hipped roof. It features a stone and brick tower, 25 feet square and 50 feet high, along with a smaller round stone tower, 10 feet in diameter and 30 feet high.
[Dunbar, p. 149; Ivey, pp. 235-241; Muskegon Chronicle, November 28, 1953, p. 3; "The Romance of Muskegon," (Muskegon: Muskegon Chronicle, 1939), p. 119; NR]

Muskegon Union Station (1895), Muskegon

OLD MISSION POINT LIGHTHOUSE (1870)
Old Mission Peninsula
Peninsula Township

Elk Rapids
16.619095.4982095
Grand Traverse

The Mission Point Lighthouse was constructed in 1870 to guide ships into Traverse Bay. The square tower housing the light, approximately 30 feet high, projects from the roof of the lightkeeper's house, a rectangular frame structure 20 feet wide and 30 feet long, with a gabled roof. It is now owned by Peninsula Township, and is used as a residence by some of the township's employees.
[MHD, Site Files]

OLD PRESQUE ISLE LIGHTHOUSE (1840)
Presque Isle Harbor
Presque Isle Township

Presque Isle
17.305810.5023720
Presque Isle

One of the oldest lighthouses on the Great Lakes, the Old Presque Isle Lighthouse is a 30 foot circular tower with a diameter of 18 feet at the base and 9 feet at the top with 3 foot thick walls tapering to 20 inches; the bottom two-thirds is of stone, the top one-third of brick. "Soapstone" deck, 4 inches thick with leaded joints. Circular dressed stone stairway to lantern house which was originally wrought iron octagon with a copper dome. Presque Isle Harbor is known as a "safe haven", and was used frequently by early shipping trade that sailed along the coast. In 1838, Congress approved $5,000 for construction of the lighthouse; the site chosen was on a rise east of the bay so that the light could function as both coast and harbor light. It was built by Jeremiah Moors. In 1871 a new lighthouse at another location was built, and the lamp and lamphouse from the old tower were removed. Sold by the government in 1897, the lighthouse was renovated and a surplus lamp and lamphouse installed in 1961.
[Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 183; Lagerberg, Matt, "The Old Presque Isle Lighthouse," Michigan History, XXXIV, 1950, pp. 245-248; Wallin, Helen, "Old Presque Isle Lighthouse Memorialized," Michigan Heritage, VI, 1965, pp. 177-182; NR]

PM RR: GRAND HAVEN STATION (c.1927)
Madison St., west of 4th St.
Grand Haven

Muskegon
16.563000.4768025
Ottawa

The Michigan Lake Shore Railroad reached Grand Haven in 1871, when the company completed a line running from New Buffalo to Montague. In 1878, this line was taken over by the Chicago and West Michigan Railroad Company, which in turn became part of the Pere Marquette Railroad in 1900. The Chicago and West Michigan Railroad maintained a depot on this site, nicknamed the "Holland Depot" because the line ran from there to Holland. The present depot, which closely resembles a Pere Marquette depot built in Holland in 1927, was probably built at the same time. It is a one-story rectangular building, 200 feet long and 30 feet wide, built of white brick, with hipped tile roofs. It is currently used as a gift shop.
[Dunbar, p. 149; Lilly, Leo, Historic Grand Haven and Ottawa County (Grand Haven: the author, 1931), p. 383; History of Ottawa County, Michigan (Chicago: Page, 1882), p. 37]

Old Presque Isle Lighthouse (1840), Presque Isle Township

PM RR: HOLLAND STATION (1927)
250 E. 7th St.
Holland

Holland
16.574075.4737075
Ottawa

The Pere Marquette Railroad, which took over the Chicago and West Michigan Railroad in 1900, constructed this passenger station in 1927. It is still used as a freight office by the Chesapeake and Ohio Railroad. It consists of two sections, both white brick with hipped roofs. The portion which housed the waiting room and ticket facilities is 25 feet wide and 120 feet long, while the section which held the baggage area is 25 feet wide and 66 feet long.

PM RR: PORT HURON ROUNDHOUSE (1912)
15th St.
Port Huron

Port Huron
17.382530.4757100
St. Clair

The Port Huron Roundhouse of the Pere Marquette Railroad, built in 1912, has a reinforced concrete frame, a rare structural form for roundhouses. It covers only 90 degrees of a full circle and contained only ten stalls. The building has an inside circumference of 150 feet, an outside circumference of 350 feet, and is 90 feet deep. This building has been long abandoned, and only the skeletal frame remains extant.

PM RR: PORT HURON TURNTABLE (1912)
15th St.
Port Huron

Port Huron
17.382530.4757100
St. Clair

This turntable was constructed in 1912 by the King Bridge Company of Cleveland for the Pere Marquette Railroad's Port Huron Roundhouse. It is 75 feet long, 12 feet wide, and consists of two deck plate girders, each six feet high at the center and tapering to three feet in height at the ends. This center-mounted turntable rests in a concrete-lined pit approximately five feet deep.

PM RR: SAGINAW ROUNDHOUSE (1920)
N. 8th St.
Saginaw

Saginaw
17.263810.4813760
Saginaw

The Pere Marquette Railroad Saginaw Roundhouse (1920) has exterior walls of brick and massive oak timbers support the roof. It contains twenty stalls, has an inside circumference of 300 feet, an outside circumference of approximately 1,200 feet, and is 110 feet deep. The adjoining steel-framed brick machine shop is approximately 150 feet by 200 feet. The roundhouse was originally equipped with smoke ventilators for steam locomotives, but these are no longer extant. This repair facility is still in active use by the Chesapeake and Ohio Railroad.

PM RR: SAGINAW TURNTABLE (1920)
N. 8th St.
Saginaw

Saginaw
17.263810.4813760
Saginaw

This turntable was built by the Pere Marquette Railroad in 1920 for their Saginaw Roundhouse completed at the same time. It consists of two parallel through plate girders, 100 feet long, six feet high at the center, and tapering to four feet in height at the ends. The turntable is 12 feet wide, center-mounted, and revolves in a concrete-lined pit five feet deep.

PM RR: ST. JOSEPH STATION (1914)
410 Vine St.
St. Joseph

Benton Harbor
16.542620.4661810
Berrien

The first rail line to service St. Joseph was the Chicago and West Michigan Railroad, which completed a 28 mile line between St. Joseph and New Buffalo in 1870. This line was taken over by the Pere Marquette Railroad in 1900. There has been a passenger depot at this location since at least 1892, although the present structure dates from 1914. It is a simple one-story brick and stucco rectangular building, 100 feet long and 30 feet wide, with hipped roofs. There is also a covered passenger waiting platform, adjoining the depot and adjacent to the tracks, measuring 200 feet long and 12 feet wide, supported by cast iron columns, and featuring a hipped roof.
[Franklin, Ellis, History of Berrien and Van Buren Counties (Philadelphia: Ensign, 1880), p. 55; Berrien County Directory (Detroit: Polk, 1892), p. 126]

PM RR: TRAVERSE CITY STATION (1926)
Railroad St.
Traverse City

Traverse City
16.608070.4957051
Grand Traverse

The Pere Marquette Railroad Traverse City Station (1926) consists of two adjacent one-story rectangular brick buildings, both with tiled hipped roofs. The passenger station (30 feet by 100 feet) and baggage station (25 feet by 75 feet) are connected by a covered walkway 15 feet wide and approximately 250 feet long, supported by steel columns. There is also a covered passenger platform at the eastern end of the baggage station, measuring 20 feet by 25 feet, and two similar platforms at both ends of the main passenger station.

PM RR: WYOMING YARD ROUNDHOUSE (1911)
South of Market St. and I-196
Wyoming

Grand Rapids West
16.605790.4755270
Kent

The Wyoming Yard Roundhouse, erected by the Pere Marquette Railroad in 1911, originally approximated a complete circle, with only a single track leading to the turntable left uncovered. It contained 43 stalls, each 100 feet deep. The roundhouse had a diameter of 400 feet, an outside circumference of 1,250 feet and an inside circumference of 625 feet. It still serves as a locomotive repair facility, but only the northern half is extant. The southern half, containing 21 stalls, was deteriorating badly and was demolished in the mid-1960's. The outside walls are of brick construction, while the roof and the wooden doors leading into each stall are supported by massive oak timbers.

PM RR: WYOMING YARD SHOPS (1924)
South of Market St. and I-196
Wyoming

Grand Rapids West
16.605620.4755240
Kent

This is a rectangular brick structure resting on a concrete foundation with a massive steel I-beam frame to support heavy-duty overhead cranes used to move heavy locomotive parts and subassemblies. Overall, it is approximately 400 feet long and 225 feet wide.

POINT AUX BARQUES LIGHTHOUSE (1857,1908)
Lighthouse Rd.
Huron Township

Huron City
17.356300.4875780
Huron

The Point Aux Barques Lighthouse was originally constructed in 1847, but extensively rebuilt in 1854-1857 by Alanson Sweet, Luzene Ransom, and Morgan Shinn, who received contracts to work on several lighthouses in Michigan at the same time. The white conical tower is of brick construction, with stucco facing, and is 89 feet high, with a base approximately 18 feet in diameter. The adjacent one and one-half story brick lightkeeper's house was constructed in 1908. It measures 15 feet by 20 feet and has a gabled roof. This is one of the two oldest lighthouses in Michigan and is still in service, although it is completely automated. [USCG, Light List, p. 83; MHD, Site Files; NR]

POINT BETSIE LIGHTHOUSE (1856)
On Point Betsie Point
Frankfort

Frankfort
16.559000.4948070
Benzie

Construction on this lighthouse was begun in 1852 and completed in 1856 at a cost of $3,000. The lighthouse keeper and his family were the first residents of Frankfort. The conical brick tower holding the light is 52 feet high and approximately 12 feet in diameter at the base. The adjoining frame lightkeeper's house is a rectangular building, 30 feet wide and 70 feet long, with a mansard roof.
[USCG, Light List, p. 150; Powers, Perry, A History of Northern Michigan and Its People (Chicago, 1912), p. 358]

PORT AUSTIN REEF LIGHTHOUSE (1878,1902)
East end of Port Austin Reef
Port Austin

Port Austin East
17.340290.4879480
Huron

The Port Austin Reef Lighthouse was constructed in 1878 at the tip of Michigan's "Thumb" to guide vessels into Saginaw Bay. It rests on an octagonal concrete crib, 80 feet in diameter and 30 feet high, which rests on a solid rock foundation which is six feet underwater. The tower itself is of brick construction, ten feet square and 50 feet high, topped off with a round cast iron tower about six feet in diameter and 15 feet high which contains the light.
[USCG, Light List, p. 83; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 184; Portrait and Biographical Album of Huron County, Michigan (Chicago, 1884), p. 448]

PORT SANILAC LIGHTHOUSE (1886)
Lake St.
Port Sanilac

Port Sanilac
17.375340.4809380
Sanilac

The Port Sanilac Lighthouse (1886) is a white brick octagonal tower 60 feet high, with a base 12 feet in diameter, resting on a cut stone foundation. The adjacent two-story brick lightkeeper's house is 30 feet wide, 40 feet long, rests on a cut stone foundation, and has a gabled roof.
[USCG, Light List, p. 82]

Port Sanilac Lighthouse (1886), Port Sanilac

PRESQUE ISLE LIGHTHOUSE (1870)
North end of Presque Isle
Presque Isle Township

Presque Isle
17.304760.5025360
Presque Isle

This lighthouse was constructed in 1870 to replace the older Presque Isle Lighthouse (1840) located in Presque Isle Harbor (see other entry). It is a conical brick tower, 105 feet high, 15 feet in diameter at the base, and approximately 10 feet in diameter at the top. The tower is connected to the lightkeeper's house, a rectangular brick building, 20 feet by 25 feet, with a gabled roof. The lighthouse is located in a public park maintained by Presque Isle Township.
[USCG, _Light List_, p. 90]

THE _REISS_ (1917)
Foot of Hamilton St.
Douglas

Fennville
16.565025.4743095
Allegan

The steam tugboat _Reiss_, formerly the _Gilmore_, is one of the last surviving steam tugboats on the Great Lakes. It is moored next to the _Keewatin_ in Douglas Harbor and is in the process of restoration.
[MHD, Site Files]

SAND [HARBOR] BEACH HARBOR OF REFUGE (1873-1894)
In Harbor Beach Harbor
Harbor Beach

Harbor Beach
17.368345.4856560
Huron

Ships passing through Lake Huron from the St. Clair River into Saginaw Bay had to traverse the dangerous Point Aux Barques without any harbor of refuge from the often violent storms of Lake Huron. A United States Army Corps of Engineers Survey of 1873 selected Sand Beach, now Harbor Beach, as the site for the construction of a harbor of refuge. The project was begun immediately, with a contract initially awarded to the firm of Date, Stead & Company, a local contractor. The firm proceeded to build heavy timber cribs on land, tow them into the harbor, and sink them by filling them with stones, thus building a breakwall. This work was hampered by poor weather and proceeded very slowly. The Army Corps took over the task around 1876 and had the main breakwater sufficiently completed by 1880 for boats to begin to use the harbor. By 1882, about 1,000 ships were using the harbor for refuge. The bulk of this work was completed under the direction of engineer Charles P. Gilbert, at a cost of about $1.2 million. A lighthouse (see other entry) was erected on the south end of the main breakwall in 1885. The initial construction was not completed until 1894 and there were additional modifications made in 1917 and 1927. The configuration of this harbor today is as follows: the North Breakwall, 1,200 feet long; the North Opening, 300 feet in length; the Main Breakwall, 4,716 feet long; the Main Opening or Channel, 600 feet wide; and the South Breakwall, 1,956 feet long. The original cribs, still extant, extend seven feet above the mean water. [Harbor Beach Women's Club, Harbor Beach, Yesterday and Today (Harbor Beach, 1976), pp. 23-27]

ST. JAMES LIGHTHOUSE (1856,1870)
Northeast end of Beaver Island
Beaver Island

Beaver Island
16.616000.5066033
Charlevoix

This lighthouse was first erected in 1856, but a new tower was added in 1870, with an iron stairway leading to its light. The white cylindrical light tower is 40 feet high, 16 feet in diameter at the base, and tapers to about 10 feet in diameter at the top. The adjoining lightkeeper's house (1856) is a two-story brick building with a gabled roof, measuring approximately 30 feet by 60 feet.
[USCG, Light List, p. 146; MHD, Site Files]

ST. JOSEPH NORTH PIER INNER LIGHTHOUSE (1908)
North Pier
St. Joseph

Benton Harbor
16.541890.4662580
Berrien

There has been a light located on this site since 1898, but a permanent lighthouse was not built until 1908. This lighthouse, which has an overall height of 53 feet, consists of a lower portion, 25 feet square and 20 feet high, resting on a concrete foundation, and a narrow octagonal upper portion, approximately 10 feet wide, with the light itself resting in a round housing at the top. The entire structure has an exterior of riveted cast iron plates.
[USCG, Light List, p. 156]

Presque Isle Lighthouse (1870), Presque Isle Township

ST. JOSEPH NORTH PIERHEAD LIGHTHOUSE (1907)
North Pier
St. Joseph

Benton Harbor
16.541790.4662610
Berrien

There has been a functioning light on this site since 1846, although the present tower dates from 1907. This round tower stands 30 feet high, rests on a concrete foundation, and has an exterior of riveted cast iron plates. The beacon is enclosed in an octagonal glass and cast iron housing. [USCG, Light List, p. 156]

SHAY LOGGING LOCOMOTIVE (c.1900)
Cass St.
Cadillac

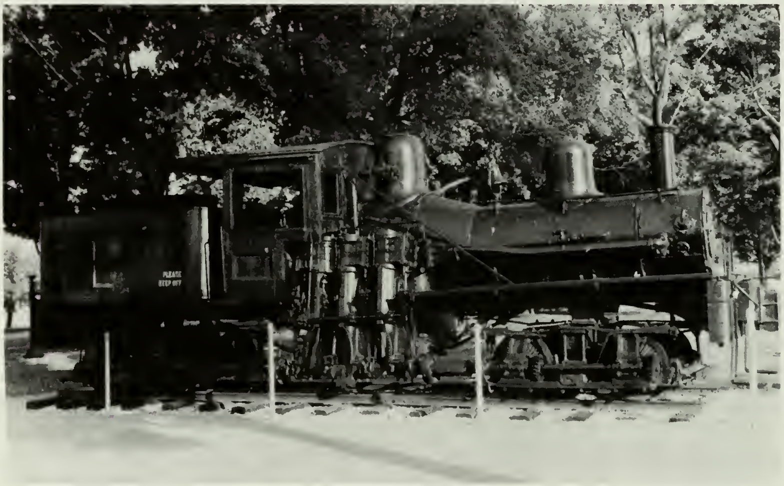
Cadillac South
16.627080.4900060
Wexford

Ephraim Shay began experimenting with logging tramways in the late 1870's in Cadillac. He decided to develop a locomotive which could effectively pull heavy loads on primitive wooden tracks. Standard railroad locomotives would not work because their inflexible driving wheels prevented the effective application of power to the tracks and because they tore up the primitive track. The locomotive that Shay patented in 1881 utilized vertical pistons driving a crankshaft which turned a pinion shaft, all located on the right-hand side of the locomotive. The pinion shaft was broken into sections linked by sleeve couplings with long bearings and universal joints, giving flexibility to the power transmission system. Bevel gears on the faces of the wheels meshed with similar gears mounted on the pinion shaft. The Shay locomotive was manufactured by the Lima Locomotive and Machine Company from 1881 until 1945. This three cylinder model was probably built around 1900.
[Koch, Michael, The Shay Locomotive: Titan of the Timbers (Denver, 1971), pp. 22-25, 35-37]

SOUTH HAVEN SOUTH PIERHEAD LIGHTHOUSE (1913)
South Pier
South Haven

South Haven
16.559250.4694150
Van Buren

The first permanent light on the south pier at South Haven was erected in 1872, but was gradually moved seaward as the pier was extended. The light was moved 120 feet in 1888 and another 249 feet in 1901 to its present location. The present tower, built in 1913, is a round, slightly tapered cast iron tower, 35 feet in height. The light rests in a smaller octagonal cast iron housing encircled by a decorative wrought iron railing. [USCG, Light List, p. 156; MHD, Site Files; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 185]



Shay Logging Locomotive (c.1900), Cadillac

SOUTH LYON UNION STATION (1909)
McHattie Park
South Lyon

South Lyon
17.281910.4703630
Oakland

The combination passenger-freight station was jointly owned and operated by the Grand Trunk Western Railroad and the Pere Marquette Railroad. It is a wood-framed rectangular building 50 feet long and 20 feet wide, with a hipped roof and overhanging eaves. The conical roof covering the passenger waiting room closely resembles a witch's hat. The station was moved approximately one mile from its original location in April 1976 in order to enable the South Lyon Historical Society to preserve it for posterity.

SOUTH MANITOU ISLAND LIGHTHOUSE (1858,1871)
Southeast tip of South Manitou Island
South Manitou Island

North Manitou
16.571043.4984000
Leelanau

A brick lighthouse was first constructed on the south end of South Manitou Island in 1840 to guide ships through one of the routes leading to the Straits of Mackinac. The lightkeeper's dwelling, still extant, was built in 1858 and the present light tower was added in 1871. This facility was closed by the Coast Guard in 1958 and is now part of the Sleeping Bear Dunes National Lakeshore. The lightkeeper's house is a rectangular two-story brick building, 20 feet wide and 25 feet long, with a gabled roof. It is connected to the light tower by a one-story rectangular brick passageway, about 10 feet wide and 35 feet long. The brick light tower is 100 feet high, 15 feet in diameter at the base, and approximately 10 feet in diameter at the top. The original light is not extant.
[Vent, Myron H., South Manitou Island: From Pioneer Settlement to National Park (Springfield, VA, 1973), pp. 46-47]

STURGEON POINT LIGHTHOUSE (1869)
End of Point Rd.
Haynes Township

Harrisville
17.320000.4953033
Alcona

The Sturgeon Point Lighthouse was constructed in 1869 on land donated by Perley Silverthorn, who became the first keeper of the light. The original light, visible for 16 miles, was replaced by a new acetylene lamp in 1912. The conical brick light tower is 70 feet high, 15 feet in diameter at the base, and about ten feet in diameter at the top. The adjoining lightkeeper's house is a rectangular brick building, 20 feet by 25 feet, with a gabled roof. This facility is no longer in service and has been boarded up.
[USCG, Light List; MHD, Site Files]

TAWAS POINT LIGHTHOUSE (1876)
On Tawas Point
East Tawas

East Tawas
17.304045.4902075
Iosco

The Tawas Point Lighthouse was originally built in 1853 and then reconstructed in 1876. It consists of a brick conical tower, 70 feet in height, 15 feet in diameter at the base and tapering to a diameter of about 8 feet at the top. There is an attached rectangular brick house with a gabled roof, 20 feet wide and 30 feet long. It remains an active lighthouse.
[USCG, Light List, p. 87; Holland, Francis, America's Lighthouses (Brattleboro: Stephen Greene Press, 1972), p. 184]

THUNDER BAY ISLAND LIGHTHOUSE (1857,1868)
Northeast end of shoal
Thunder Bay Island

Thunder Bay Island
17.327150.4989210
Alpena

A lighthouse was first established on Thunder Bay Island in 1832, although the present light was constructed in 1857. The conical tower housing the light is 65 feet high, 25 feet in diameter at the base, and tapers to a diameter of approximately 10 feet at the top. The adjoining lightkeeper's house, rebuilt in 1868, is a two-story rectangular brick building, 30 feet wide and 50 feet long, with a gabled roof. This lighthouse remains in active service and is normally manned.
[USCG, Light List, p. 90; Michigan Historical and Pioneer Records, Vol. 6, p. 170]

T, AA & NM RR: ANN ARBOR STATION (1889)
416 S. Ashley St.
Ann Arbor

Ann Arbor West
17.273200.4684515
Washtenaw

The Michigan Central Railroad had served Ann Arbor since 1839, but many of the city's residents tried for many years to get a second line built into Ann Arbor to undercut the Central's monopolistic position. Under the direction of Colonel James Ashley, the Ann Arbor Railway opened a line between Ann Arbor and Toledo in 1878. This passenger station, constructed in 1889, is located on South Ashley Street, renamed in honor of Colonel Ashley. This station served large numbers of passengers traveling to popular summer resorts at Whitmore Lake, Zukey Lake, and points north. It is a rectangular wood-framed structure, 30 feet wide and 130 feet long, featuring a hipped roof with wide overhanging eaves supported by wooden brackets. It has not served passengers since 1950 and is now occupied by a restaurant and several gift shops. [Dunbar, p. 162-163; Westside Neighborhood Press, Ann Arbor, September 1975, p. 3]

Thunder Bay Island Lighthouse (1857,1868), Thunder Bay Island

T, AA & NM RR: CADILLAC STATION (c.1890)
127 W. Cass St.
Cadillac

Cadillac South
16.627075.4900050
Wexford

The Toledo, Ann Arbor, and Northern Michigan Railroad was extended from Mt. Pleasant to Cadillac in 1887, after Cadillac's citizens had paid the

line a bounty of $35,000. This passenger station was erected shortly thereafter. It consists of separate passenger and baggage buildings linked by a covered walkway. The passenger waiting area is a rectangular two-story brick building with a gabled roof, 27 feet wide and 90 feet long. The baggage building is a one-story structure with a hipped roof, 27 feet wide and 35 feet long. Wide overhanging eaves supported by steel brackets extend completely around the station, forming a covered waiting area for passengers. The covered walkway linking the two buildings was originally open, but has been enclosed with cinder block walls.
[Wheeler, John, History of Wexford County, Michigan (Chicago, 1903), p. 263]

T, AA & NM RR: HOWELL STATION (1886)
126 Wetmore St.
Howell

Howell
17.259700.4721360
Livingston

The citizens of Ann Arbor, long unhappy with the rates charged by the Michigan Central Railroad, voted $100,000 in bonds in 1869 to encourage the construction of a competitive line linking Ann Arbor with Toledo. After numerous delays, including the bankruptcy of the Toledo and Ann Arbor Railroad Company in 1873, the line was opened in 1879. It was gradually extended north from Ann Arbor and was built through Howell in 1885 after her citizens gave the Toledo, Ann Arbor, and Northern Michigan Railroad a bonus of $20,000. The Howell Station was constructed the following year. It is a rectangular brick building, 22 feet wide and 50 feet long, with a gabled roof and wide overhanging eaves supported by wooden brackets. It now serves as an historical museum for the Livingston County Historical Society.
[Dunbar, pp. 164-166; Michigan Railroad Commission, Aids, Gifts, Grants, and Donations to Railroads (Lansing: Michigan Railroad Commission, 1919); NR]

TROWBRIDGE STREET (1906)
Between Clancy St. and Lafayette St.
Grand Rapids

Grand Rapids West
16.609060.4758550
Kent

This surviving segment of Trowbridge Street is an excellent example of a cobblestone street, a common type of pavement in the early twentieth century. This segment, built in 1906, is 30 feet wide and 280 feet long.

It consists of cobblestones, between 5 and 8 inches in height, set in a 4 inch base of gravel. To facilitate drainage, the crown of this street is approximately 7 inches above the street elevation at the gutters. A similar segment of cobblestone street (built in 1913) has also survived on nearby North Avenue.
[Grand Rapids Board of Public Works, "Plan for the Improvement of Trowbridge Street, February 24, 1906"]

WHITE LAKE LIGHTHOUSE (1844) | Montague
South bank of White Lake Channel | 16.546070.4802037
Fruitland Township | Muskegon

The White Lake Lighthouse, erected in 1844, is one of the oldest lighthouses extant in Michigan. It is an excellent example of a "true" lighthouse, i.e., it is a residence with an attached tower containing the navigation beacon. The house is a rectangular brick structure, 20 feet wide and 55 feet long, resting on a finished ashlar foundation, and featuring a gabled roof with overhanging eaves. The brick tower containing the light is attached to the northwest corner of the house. It is octagonal, 10 feet in diameter, and approximately 35 feet high.
[MHD, Site Files]

ADDITIONAL RAILROAD STATIONS

AA RW: MT. PLEASANT STATION (c.1890) Broadway Mt. Pleasant	Mt. Pleasant 16.679100.4830110 Isabella
C, S & M RR: BAY CITY STATION (c.1890) 101 S. Williams St. Bay City	Bay City 17.265770.4831490 Bay
C, S & M RR: FLUSHING FREIGHTHOUSE (1889) Next to 431 W. Main St. Flushing	Flushing 17.266970.4771520 Genesee
DU RW: JACKSON CAR BARN (c.1910) 500 E. Pearl St. Jackson	Jackson South 16.714450.4680450 Jackson
F & PM RR: MIDLAND FREIGHTHOUSE (1899) Ann St. Midland	Midland South 16.722120.4832410 Midland
F & PM RR: SAGINAW FREIGHTHOUSE (c.1890) 621 Potter St. Saginaw	Saginaw 17.262820.4813680 Saginaw
GR & I LINE: KALKASKA STATION (1911) Cedar St. Kalkaska	Kalkaska 16.644027.4954045 Kalkaska
GTW RR: CAPAC STATION (1914) W. Railroad St. Capac	Capac 17.342720.4763530 St. Clair

GTW RR: COOPERSVILLE STATION (c.1890)
Eastonville St.
Coopersville

Ravenna
16.586093.4767110
Ottawa

GTW RR: DAVISON STATION (1900)
Historic Crossroads Village
Flint

Flint North
17.284390.4774200
Genesee

GTW RR: FLINT STATION (1903)
115 E. 14th St.
Flint

Flint North
17.281730.4764560
Genesee

GTW RR: JACKSON FREIGHTHOUSE (1880)
N. Jackson Ave.
Jackson

Jackson North
16.713775.4681040
Jackson

GTW RR: LANSING FREIGHTHOUSE (1912)
1203 S. Washington Ave.
Lansing

Lansing South
16.700460.4734000
Ingham

GTW RR: LAPEER STATION (1900)
73 Howard St.
Lapeer

Lapeer
17.312180.4768680
Lapeer

GTW RR: OTTERBURN STATION (1904)
Torrey Rd.
Flint

Flint South
17.277530.4762390
Genesee

GTW RR: OWOSSO FREIGHTHOUSE (c.1900)
524 S. Washington Ave.
Owosso

Corunna
16.730065.4763072
Shiawassee

GTW RR: PORT HURON FREIGHTHOUSE (1924)
2001 24th St.
Port Huron

Port Huron
17.381490.4757470
St. Clair

GTW RR: ST. JOHNS STATION (c.1900) Railroad St. St. Johns	St. Johns North 16.699110.4764040 Clinton
MC RR: BAY CITY STATION (c.1900) 701 First St. Bay City	Bay City 17.267390.4831600 Bay
MC RR: CHARLOTTE STATION (1902) 350 N. Cochran Ave. Charlotte	Charlotte 16.697600.4715010 Eaton
MC RR: CHELSEA STATION (c.1890) Jackson St., east of Main St. Chelsea	Stockbridge 16.745085.4689050 Washtenaw
MC RR: DEXTER STATION (c.1900) Broad St. Dexter	Dexter 17.462430.4691400 Washtenaw
MC RR: GROSSE ILE STATION (1904) 810 E. River Drive Grosse Ile Township	Wyandotte 17.322970.4665770 Wayne
MC RR: LANSING FREIGHTHOUSE (c.1900) 703 E. Michigan Ave. Lansing	Lansing South 16.701210.4733995 Ingham
MC RR: LAPEER STATION (c.1900) 145 E. Nepessing St. Lapeer	Lapeer 17.312170.4769510 Lapeer
MC RR: MIDLAND STATION (c.1900) 715 Townsend St. Midland	Midland South 16.722900.4832690 Midland

MC RR: WEST BAY CITY STATION (c.1900) South End of State St. West Bay City	Bay City 17.266500.4832160 Bay
MC RR: YPSILANTI FREIGHTHOUSE (c.1900) N. River St. Ypsilanti	Ypsilanti East 17.284660.4680200 Washtenaw
MS RR: COLDWATER STATION (c.1890) 200 S. Monroe St. Coldwater	Coldwater West 16.645480.4644270 Branch
PM RR: BAD AXE STATION (c.1900) 6440 Huron Ave. Bad Axe	Bad Axe East 17.339860.4851580 Huron
PM RR: BAY CITY STATION (1905) 919 Boutell Place Bay City	Bay City 17.267080.4831360 Bay
PM RR: EVART STATION (c.1900) S. Main St. Evart	Evart 16.639075.4861093 Osceola
PM RR: GRAND BLANC STATION (c.1900) 320 Grand Blanc Rd. Grand Blanc	Flint South 17.285040.4755670 Genesee
PM RR: HARBOR BEACH STATION (c.1900) 56 Buell St. Harbor Beach	Harbor Beach 17.367280.4856030 Huron
PM RR: HOLLAND FREIGHTHOUSE (1873) E. 7th St., west of Lincoln St. Holland	Holland 16.574075.4737075 Ottawa

PM RR: MIDLAND STATION (1906) Ann St. Midland	Midland South 16.722120.4832410 Midland
PM RR: MONROE STATION (c.1890) W. Front St. Monroe	Monroe 17.299950.4643270 Monroe
PM RR: PORT HURON FREIGHTHOUSE (1915) Court St. Port Huron	Port Huron 17.384080.4758345 St. Clair
PM RR: PORT HURON STATION (1913) 210 Court St. Port Huron	Port Huron 17.384120.4758500 St. Clair
PM RR: REED CITY FREIGHTHOUSE (c.1900) 124 E. Upton Ave. Reed City	Reed City 16.619083.4859000 Osceola
PM RR: ST. LOUIS STATION (c.1900) Crawford St. St. Louis	Alma 16.693083.4808042 Gratiot

INTRODUCTION TO BRIDGES AND TRESTLES

The design of safe, yet inexpensive, bridges is a major contribution of Michigan's engineers to the state's development. This section contains over two hundred bridges of widely varying age, size, and design. There is a recognizable evolution in bridge design since the mid-nineteenth century, an engineering response to changing costs of construction materials and increasing load requirements. There are no clearcut watersheds, when one bridge design suddenly disappears and is replaced by another, but the sites in this section suggest a fairly rapid evolutionary process.

Among the oldest examples in this section are four covered wooden Howe truss bridges -- White's, Ada, Fallasburg, and Langley -- built between 1867 and 1887. The first three are single-spans of less than 125 feet, while the Langley Bridge (1887) is a three-span structure 282 feet long. This design was adequate for light wagon traffic, could be built by local carpenters, and utilized inexpensive raw materials usually available locally. Contrary to several myths, they were covered simply to prevent the timbers from rotting.

The wooden truss bridge had serious drawbacks in some applications. It was inadequate for the increasingly heavy loads of the railroads and it was highly susceptible to sparks from locomotives. The stone arch bridge was one solution, but construction was very difficult for long spans and was costly in any case. There are six stone arch bridges identified below, built between 1867 and 1897, with four of these on railroad lines.

The iron or steel truss was easily the most popular design during the years roughly 1880 until the late 1920's. Truss bridges were fireproof, utilized materials which were becoming relatively less costly over time, and could be designed to carry heavy loads, particularly when steel replaced iron after about 1890. There are eighty trusses listed here, ranging in age from the Button Road Bridge (1881) to the Mio Road Bridge (1928). They vary in size from single-spans of less than fifty feet to the five-span, 580 foot North Park Street Bridge (1904) in Grand Rapids. The approaches, piers, and abutments for these bridges were usually built by local contractors, while the superstructures were designed and fabricated by specialized firms which shipped the structural members from their plants and then assembled the trusses at the site. Nineteen firms concentrated in Ohio, Indiana, and Illinois built forty-five of these bridges. The companies best represented are the Joliet Bridge and Iron Company of Joliet, Illinois, with six bridges, and the Massillon Bridge Company of Massillon, Ohio, with five.

Beginning in the 1890's railroads utilized the steel girder bridge extensively, particularly where they could use individual spans of less than seventy-five feet. There are forty bridges of this type built between 1891 and 1928 listed below. The overwhelming majority of these were built for railroads in 1900-1915 by either the Detroit Bridge Company or the American Bridge Company of New York. The most impressive example of this design is the Ann Arbor Railway's Huron River Bridge (1906), an eleven-span structure with an overall length of 714 feet.

The next major design innovation was the use of the reinforced concrete arch after about 1900, at approximately the same time that Albert Kahn and others were beginning to use concrete in buildings (see the Building Technology section). Reinforced concrete was a strong, yet inexpensive, building material. There are thirty bridges of this type listed below and virtually all of them were built for vehicular traffic. The five-span Bridge Street Bridge (1904) in Grand Rapids is the oldest surviving example, while the most impressive is the magnificent Belle Isle Bridge (1923), with nineteen spans and an overall length of 2,356 feet.

One of the problems engineers faced was how to bridge the state's waterways without obstructing navigation. The solution was the moveable bridge and this inventory contains thirty-four examples built between 1886 and 1944. They were built for both railroad and vehicular traffic and more than half of them are concentrated on the Saginaw, Grand, and Rouge Rivers. There are two basic moveable bridge designs. The swing bridge, with one span that can be swiveled ninety degress, was ideal for wide rivers and was the common design used in the nineteenth century. There are eighteen truss swing bridges in this section. However, where waterways are narrow and the entire width is needed for navigation, engineers were forced to build bascule (draw) bridges, which lift the roadbeds vertically to permit the passage of ships. A series of bascule bridges were constructed on the Rouge River in the early 1920's, when it was made navigable to serve the Ford Motor Company Rouge Complex.

Several of Michigan's widest waterways are also vital passages for the freighters that ply the Great Lakes and bridging them was especially challenging. Three impressive structures have resulted: the Ambassador Bridge (1929) across the Detroit River, a suspension bridge with a main span of 1,850 feet; the Bluewater Bridge (1938) across the St. Clair River, with a cantilever span of 871 feet; and the Mackinac Straits Bridge (1958), a suspension bridge with a main span of 3,800 feet and an overall length of over three miles.

AA RW: HURON RIVER BRIDGE (1906)
Over the Huron River
Ann Arbor

Ann Arbor East
17.273650.4685410
Washtenaw

The Ann Arbor Railway's Huron River Bridge, erected in 1906, consists of eleven spans, ten of which are deck-plate girder spans, while one is a through-plate girder span. It is 14 feet wide and 714 feet long, carrying a single track over Main Street, the Penn Central (formerly Michigan Central) Railroad right-of-way, and the Huron River. Proceeding from west to east, there is an 82 foot span over Main Street, then two approach spans of 34 feet and 24 feet, then a 110 foot through-plate girder span over the Penn Central Railroad. The next five spans are all 70 feet long and rest on concrete piers, as do the remaining two spans, each 57 feet long. These last seven spans cross the Huron River.

AA RW: HURON STREET BRIDGE (1903)
Ann Arbor Railway over W. Huron St.
Ann Arbor

Ann Arbor West
17.273060.4684520
Washtenaw

This is one of several bridges erected in Ann Arbor by the Ann Arbor Railway in 1903 to eliminate grade crossings. It is a steel through-plate girder bridge, 79 feet long and 8 feet wide. There are three spans, with the longest, 50 feet in length, spanning West Huron Street. Virtually identical bridges are located approximately 100 yards north and south of this structure, over Liberty Street and Miller Street.

D & M RR: KAWKAWLIN RIVER BRIDGE (1898)
Detroit & Mackinac RR, over Kawkawlin River
Kawkawlin

Kawkawlin
17.266610.4837190
Bay

This bridge consists of four spans, each 40 feet long, resting on concrete piers and abutments. The northernmost and southernmost spans are deck girders, while the two middle spans are through-plate girders. It was constructed in 1898 by the Detroit Bridge and Iron Works.

D, T & I RR: FLAT ROCK BRIDGE-DAM STRUCTURE (1928)
Crosses Huron River
Flat Rock

Flat Rock
17.310160.4663200
Wayne

This combined structure which serves as a railroad-highway bridge and dam was constructed of reinforced concrete in 1928. The bridge carries the double track main line of the Detroit, Toledo, and Ironton Railroad Company and vehicle industrial traffic. The dam formerly served a Ford Motor Company power plant but now supports the Flat Rock city water reservoir. The height of the concrete spillway is ten feet. The concrete bridge is 535 feet long, 45 feet wide, and has 18 spans. The roadway runs along the west side of the bridge while the two railroad tracks run along the east side.

GTW RR: BATTLE CREEK RIVER BRIDGE (1903)
East of Washington St., over Battle Creek River
Battle Creek

Battle Creek
16.649125.4686950
Calhoun

This simple steel beam railroad bridge, constructed in 1903 by the King Bridge Company of Cleveland, Ohio, carries the Grand Trunk Western Railroad's main line in Michigan (Chicago to Port Huron) into downtown Battle Creek. There are four spans, each 32 feet long, resting on three stone and concrete piers. Each span consists of four steel I-beams, each 4 feet 6 inches high, supporting 8 inch steel I-beams which serve as crossmembers to support the roadbed. The overall dimensions of the bridge are 132 feet by 24 feet.

GTW RR: GRAND RIVER BRIDGE (1906)
Over Grand River, south of Ann St.
Grand Rapids

Grand Rapids West
16.608170.4760640
Kent

This simple steel I-beam bridge is 12 feet wide, approximately 675 feet long, and rests on concrete piers and abutments. It consists of nine spans. The five center spans are eight foot steel I-beams, while the four remaining spans, two at each end of the bridge, are five foot I-beams. The deck rests on 4 by 8 inch oak crossmembers.

GTW RR: KALAMAZOO RIVER BRIDGE (1903)
Over Kalamazoo River, north of Michigan Ave.
Kalamazoo

Kalamazoo
16.617665.4683390
Kalamazoo

This is a simple steel beam railroad bridge over the Kalamazoo River. This bridge is approximately 300 feet long and rests on three stone piers. It consists of two massive steel beams, four feet in height. The rails rest on 8 inch steel crossmembers.

GTW RR: MONROE STREET BRIDGES (1906)
Over Monroe St., N.E., south of Sweet St.
Grand Rapids

Grand Rapids West
16.608395.4760510
Kent

There are two similar bridges which provide the Grand Trunk Western Railroad with alternative approaches to their Grand River Bridge (see other entry). Each bridge consists of three spans, offset to Monroe Street, resting on concrete abutments and supported by two piers, each consisting of three steel I-beams. Each has two 20 foot approach spans, both three foot steel I-beams, and a through-plate girder span, 40 feet long. One is 15 feet wide and the other is 24 feet wide.

LM RW: GRAND RIVER BRIDGE (1919)
Across Grand River, north of Shiawassee St.
Lansing

Lansing South
16.700650.4734575
Ingham

This is a three-span through-plate girder bridge, 12 feet wide, 231 feet long, resting on concrete piers and abutments. The steel girders, each five feet high, make up the three spans, each 77 feet long. The line which this bridge carried no longer exists.
[Penn Central List, p. 17]

MC RR: CASS RIVER BRIDGE (1903)
Over Cass River
Vassar

Vassar
17.291220.4805220
Tuscola

The Cass River Bridge (1903) is a two-span deck girder bridge, 150 feet long, 12 feet wide, resting on a concrete pier and cut stone abutments. The four parallel girders are six feet in height and support eight inch steel I-beam crossmembers.
[Penn Central List, p. 16]

MC RR: COLUMBIAVILLE BRIDGE (1903)
Across Flint River
Columbiaville

Columbiaville
17.303970.4781030
Lapeer

This is a two-span deck plate girder bridge, 15 feet wide and 121 feet long, resting on a concrete pier and concrete abutments. The main beams are five feet deep and the roadbed rests in eight inch steel I-beam crossmembers.
[Penn Central List, p. 16]

MC RR: HURON RIVER BRIDGES (1900-1901)
Across the Huron River
Ann Arbor, Delhi

Ann Arbor West
17.265000.4689730
Washtenaw

This is a series of bridges constructed by the Michigan Central Railroad to carry its line over the Huron River west of Ann Arbor. There are eight bridges between the intersection of U.S Route 23 across the Huron River in the western part of Ann Arbor and a point approximately four miles west of the Ann Arbor city limits. They were all built in 1900-1901, seven by the Detroit Bridge and Ironworks Company and one by the American Bridge Company of New York. They are all steel I-beam bridges with main beams ranging from five to eight feet high, with six inch steel I-beams as crossmembers. They range in width from 24 to 28 feet and from 100 to 185 feet in length. They rest on either concrete or concrete and stone abutments and most of the piers are concrete. They replaced a series of earlier bridges, probably dating from the 1870's, which were apparently judged unsafe and replaced at the same time. The few stone piers which remain were probably from these earlier bridges.

MC RR: KAWKAWLIN RIVER BRIDGE (1891)
Penn Central Railroad, over Kawkawlin River
Kawkawlin

Kawkawlin
17.262590.4837460
Bay

This is a two-span deck girder bridge, 104 feet long and 15 feet wide. The deck girders, each 51 feet and five and one-half feet in height, rest on cut stone abutments and a single cut stone pier. This bridge was built by the Detroit Bridge and Iron Company.
[Penn Central List, p. 18]

MC RR: MUSKEGON RIVER BRIDGE (1898)
Penn Central Railroad, over Muskegon River
Big Rapids

Big Rapids
16.621086.4842070
Mecosta

This is a three-span steel deck girder bridge, resting on cut stone piers and abutments. It was constructed in 1898. It has three equal spans, each 10 feet wide and 105 feet long, giving the bridge a total length of 315 feet.
[Penn Central List, p. 34]

MC RR: RICE CREEK BRIDGE (1895)
Penn Central Railroad, over Rice Creek
Marshall

Marshall
16.668240.4681050
Calhoun

This bridge, which carried the Michigan Central Railroad over Rice Creek, is 120 feet long and 15 feet wide. It is a simple steel girder structure, single-span, consisting of five foot high steel girders, with six inch steel I-beams serving as crossmembers.
[Penn Central List, p. 22]

MC RR: ST. JOSEPH RIVER BRIDGE (1919)
Over St. Joseph River, 300 feet west of M-86
Three Rivers

Three Rivers West
16.613350.4644090
St. Joseph

A four-span steel I-beam bridge, 230 feet long and 16 feet wide, erected in 1919 by the American Bridge Company of New York. The massive four foot steel I-beams rest on cut stone abutments. The center pier is stone, while the other two piers are concrete. The roadbed rests on ten inch square oak crossmembers.

NYC RR: RAISIN RIVER BRIDGE (1912)
Across Raisin River, west of Winchester St.
Monroe

Monroe
17.302300.4642720
Monroe

This is a three-span steel through-plate girder bridge, 15 feet wide, 330 feet long, resting on finished ashlar piers and abutments. It was built in 1912 by the Pennsylvania Steel Company of Steelton, Pennsylvania.

PM RR: KALAMAZOO RIVER BRIDGE (1907)
Over Kalamazoo River, south of 57th St.
New Richmond

Fennville
16.573025.4742025
Allegan

Constructed in 1907 by the American Bridge Company of New York for the Pere Marquette Railroad, this bridge is 435 feet long and eight feet wide. It consists of six spans, deck girder, resting on concrete piers. The spans on either end of the bridge consist of two steel I-beams 3.5 feet high, while the remaining four spans have I-beams which are four feet high. The crossmembers supporting the deck are 4 by 6 inch oak timbers.

PM RR: THORNAPPLE RIVER BRIDGE (1907)
Over Thornapple River, east of Thornapple Drive
Ada

Lowell
16.623525.4756375
Kent

This is a three-span, steel girder railroad bridge, 12 feet wide and 220 feet long, resting on concrete abutments and two concrete piers. The main span, approximately 170 feet long, consists of two five foot I-beams, while the two approach spans consist of two two foot I-beams. It was erected in 1907 by the American Bridge Company of New York.

RUDDIMAN CREEK PEDESTRIAN BRIDGE (1911)
Over Ruddiman Creek, north of Lake Shore Drive
Muskegon

Lake Harbor
16.557050.4785000
Muskegon

In 1911, the City of Muskegon was installing a new 24 inch water main which crossed the Ruddiman Creek just south of the stone arch bridge which carries Lake Shore Drive over the creek. Since several pedestrians had been injured while crossing the Lake Shore Drive Bridge, the city decided to build a pedestrian bridge which would also serve to support the water main. It was built by the Markle Cement Company at a cost of $2,755. This reinforced concrete bridge is eight feet wide and 53 feet long. It covers and supports the water main with eight steel rods which are anchored to the side of the bridge.
[Muskegon News-Chronicle, September 8, 1911, p. 10]

ADDITIONAL GIRDER BRIDGES

D & M RR: THUNDER BAY RIVER BRIDGE (1910) Detroit & Mackinac RR, over Thunder Bay River Alpena	Alpena 17.308090.4993795 Alpena
"FEDERAL AID BRIDGE" (1922) US-12, over St. Joseph River Mottville	Vandalia 16.603045.4628005 St. Joseph
FISH LAKE ROAD BRIDGE (1900) Over Penn Central Railroad Kendall	Gobles 16.598050.4689060 Van Buren
KING HIGHWAY BRIDGE (1930) King Hwy., over Kalamazoo River Kalamazoo	Kalamazoo 16.619330.4682210 Kalamazoo
MC RR: BAGLEY STREET BRIDGE (1911) 14th St., over Penn Central Railroad Detroit	Detroit 17.329040.4687920 Wayne
MC RR: FIFTEENTH STREET BRIDGE (1911) 15th St., over Penn Central Railroad Detroit	Detroit 17.329040.4687920 Wayne
MC RR: FOURTEENTH STREET BRIDGE (1911) 14th St., over Penn Central Railroad Detroit	Detroit 17.329120.4687860 Wayne
MC RR: INDIAN RIVER BRIDGE (1903) Penn Central Railroad, over Indian River Indian River	Wolverine 16.686087.5031043 Cheboygan

MC RR: MARQUETTE STREET BRIDGE (1926) Penn Central Railroad, over Marquette St. Bay City	Bay City 17.266540.4832250 Bay
MC RR: MILWAUKEE STREET BRIDGE (1912) Penn Central Railroad, over Milwaukee St. Detroit	Detroit 17.330140.4693000 Wayne
MC RR: PORTER STREET BRIDGE (1915) Porter St., over Penn Central Railroad Detroit	Detroit 17.329320.4687740 Wayne
MC RR: TERMINAL STREET BRIDGE (1910) Vernor Hwy., near Bagley St. Detroit	Detroit 17.328670.4688000 Wayne
NYC RR: BAD RIVER BRIDGE (1927) Penn Central Railroad, over Bad River St. Charles	St. Charles 16.732075.4797950 Saginaw
PM RR: BLACK RIVER CANAL BRIDGE (c.1920) Over Black River Canal, west of Pine Grove Ave. Port Huron	Lakeport 17.381930.4763540 St. Clair
RED ARROW HIGHWAY BRIDGE (1928) Red Arrow Hwy., over Penn Central Railroad New Buffalo	New Buffalo East 16.523670.4628325 Berrien
STATE REWARD BRIDGE (1928) M-45, over Grand River Allendale	Grandville 16.591055.4758030 Ottawa
SUPERIOR STREET BRIDGE (1908) Superior St., over Kalamazoo River Albion	Homer 16.685043.4679025 Calhoun

BELLE ISLE BRIDGE (1923)
E. Grand Blvd. to Belle Isle
Detroit

Belle Isle
17.335370.4689490
Wayne

The Belle Isle Bridge linking Detroit with one of its major recreational areas is an interesting example of changing engineering design in response to economic pressures. The Detroit City Council appointed a commission in 1916 to make recommendations on the construction of a new Belle Isle Bridge. This commission issued its report in November 1917 recommending a steel and concrete cantilever design which they estimated could be built for about $3 million. The City Council accepted this design in 1918 and the citizens of Detroit approved a $3 million bond issue. The project was delayed, however, and when bids were finally submitted in November 1920, the projected costs had risen to $5 million, so the City Council was forced to reject all bids. In January 1921, Daniel B. Luton proposed an open-spandrel concrete arch design which he estimated would cost only $2.5 million. They accepted this new design and work was commenced in August 1921 and completed in October 1923. The bridge is 2,356 feet long, 85 feet wide, and consists of nineteen concrete arch spans resting on foundation pillars. Soil conditions in the riverbed necessitated the use of 6,366 piles extending some 46 feet below the riverbed, roughly 75 feet below the water surface.
[Engineering News-Record, Vol. 86, No. 11, March 17, 1921, pp. 452-455]

BRIDGE STREET BRIDGE (1904)
Bridge St., over Grand River
Grand Rapids

Grand Rapids West
16.608085.4758170
Kent

This is a reinforced concrete arch bridge, earth-filled, 66 feet wide and 411 feet long. There are five spans of unequal length. The center span is 87 feet long, the two spans abutting the center span are 83 feet long, while the two spans abutting the river banks are 79 feet in length. This bridge was erected in 1904 under the direction of L.W. Anderson, City Engineer for Grand Rapids. It was built by Joseph P. Rusche for $87,400.
[MSIAS; Engineering News, Vol. 52, December 1, 1904, p. 489]

CASS AVENUE BRIDGE (1897)
Cass Ave., over Kalamazoo River
Albion

Homer
16.685043.4679025
Calhoun

This was the only bridge in Albion to survive the disastrous flood of 1908 which resulted from the destruction of the dams upstream at Homer. It is a stone-arch bridge, 30 feet wide and 145 feet long, with three arches of equal length.
[MSIAS]

FULTON STREET BRIDGE (1927)
Fulton St. (M-45), over Grand River
Grand Rapids

Grand Rapids West
16.607990.4757380
Kent

This structure, which carries Fulton Street over the Grand River, is an open-spandrel concrete arch bridge, 58 feet wide and 535 feet long. It consists of five spans of equal length. It was erected in 1927 under the supervision of Charles W. Darline, City Engineer for Grand Rapids, by the Stein Construction Company of Milwaukee for $324,000. It was designed by the Westcott Engineering Company of Chicago.
[MSIAS]

KALAMAZOO STREET BRIDGE (1926)
Kalamazoo St., over Grand River
Lansing

Lansing South
16.700780.4733530
Ingham

The Kalamazoo Street Bridge is an open-spandrel concrete arch bridge, 53 feet wide and 519 feet in length. The three main spans, each approximately 100 feet long, carry the bridge over the Grand River, while six shorter spans comprise the approaches. This structure was built in 1926 by the Koss Construction Company of Des Moines, Iowa under the supervision of the City Engineer, Otto E. Eckert.
[MSIAS]

LAKE SHORE DRIVE BRIDGE (c.1890)
Lake Shore Drive, over Ruddiman Creek
Muskegon

Lake Harbor
16.557050.4785000
Muskegon

This massive stone-arch bridge is 50 feet long, 45 feet wide, 25 feet high, with four wing walls, each 21 feet long, 3 feet thick, and ranging

from 25 feet high where they abut up against the arch to 18 feet high at the ends. The single arch through which the Ruddiman Creek flows is 20 feet wide, 14 feet high, and 45 feet long. The masonry making up the arch is cut, coursed ashlar, while the rest of the bridge is made up of rough, uncoursed stones.
[Muskegon News-Chronicle, September 8, 1911, p. 10]

Kalamazoo Street Bridge (1926), Lansing

LEONARD STREET BRIDGE (1912)
Leonard St., over Grand River
Grand Rapids

Grand Rapids West
16.608200.4759760
Kent

This is a seven-span earth-filled concrete arch bridge, 44 feet wide and 614 feet long. It was erected in 1912 by the Hackendorn Contracting

Company of Indianapolis under the supervision of L.O. Cutcheon, Grand Rapids City Engineer. Daniel B. Luten was the consulting engineer. It was constructed at a cost of $78,940.
[MSIAS]

LOGAN STREET BRIDGE (1928)
Logan St., over Grand River and GTW RR
Lansing

Lansing South
16.699200.4732360
Ingham

The Logan Street Bridge is an open-spandrel reinforced concrete arch bridge, 38 feet wide and 912 feet long. There are seven major arch spans, which carry the roadway over the Grand River and the Grand Trunk Western Railroad tracks and account for approximately 700 feet of the bridge's total length. The approaches to the main spans consist of an additional sixteen reinforced concrete girder spans.
[MSIAS]

MAIN STREET BRIDGE (1919)
Main St. (US-12), over St. Joseph River
Niles

Niles West
16.561445.4630950
Berrien

This four-span concrete arch bridge, constructed in 1919, is 338 feet long and 30 feet wide. It was designed by Charles W. Cole, engineer, and built by the Kuehn-Jordan Company.
[MSIAS]

MARSHALL AVENUE BRIDGE (c.1900)
S. Marshall Ave., over Rice Creek
Marshall

Marshall
16.668650.4681310
Calhoun

The Marshall Avenue Bridge, measuring 25 feet wide and 150 feet long, consists of three stone arches, each 20 feet high and 25 feet wide. The southernmost arch is blocked by the river embankment and the two open arches seem more than adequate to handle the flow of Rice Creek. The bridge is situated slightly west of the site of an old water-powered mill and the three arches may have been needed originally to handle the larger flow from the mill races.

MC RR: ISLAND LAKE ROAD BRIDGE (1890)
Michigan Central RR, over Island Lake Rd.
Dexter

Dexter
17.261730.4691310
Washtenaw

This stone-arch bridge was built by the Michigan Central Railroad in 1890 to eliminate a grade crossing which had been the scene of several major accidents. It was built by a contractor named Griffon, who used stones excavated from the bed of nearby Mill Creek. A stone inside the arch reads, "H.B. Ledyard, Pres. - L.D. Hawks, Engineer". The bridge is 36 feet long, 30 feet wide, and 18 feet high. The single arch, which is skewed, is 20 feet wide and approximately 18 feet high at its center.

MC RR: MILL CREEK BRIDGE (1890)
Michigan Central RR, over Mill Creek
Dexter

Dexter
17.461920.4691390
Washtenaw

This stone-arch bridge was built in 1890 by the Michigan Central Railroad and is near the Island Lake Road stone-arch bridge built in the same year (see other entry). It is 50 feet long, 35 feet high, and 24 feet wide. The single-arch is 28 feet high in the center. The arch has been reinforced with horizonal steel rods supported by vertical I-beams encased in two horizonal reinforced concrete girders located on the top of the bridge and running parallel to the tracks.
[Penn Central <u>List</u>, p. 19]

MC RR: WATTLES ROAD [DIXON'S] BRIDGE (1891)
Over Wattles Rd.
Emmett Township

Ceresco
16.655300.4683490
Calhoun

This massive stone-arch bridge was built around 1890 to carry the Michigan Central Railroad over Wattles Road. Overall, the bridge is 40 feet long, 20 feet high, and 60 feet wide. There are two arches -- the main arch is 10 feet wide and 12 feet high, while a second arch, possibly built for use by pedestrians, is 7 feet wide and 10 feet high.
[Penn Central <u>List</u>, p. 19]

MICHIGAN RAILWAY ENGINEERING COMPANY:
GRAND RIVER BRIDGE (1915)
West of Huron St., over Grand River
Grand Rapids

Grand Rapids West
16.608050.4757850
Kent

An electric interurban line linking Grand Rapids and Kalamazoo was constructed in 1912-1915 by the Michigan Railway Engineering Company (later called the Michigan Railway Company). This bridge was erected in 1915 to carry their line across the Grand River. It is a four-span earth-filled reinforced concrete arch bridge, 27 feet wide and 486 feet long. It is used today for pedestrian traffic between several parking lots and the Grand Rapids Civic Center.
[Grand Rapids Public Library, Citizens History of Grand Rapids, p. 156]

Michigan Railway Engineering Co.: Grand River Bridge (1915), Grand Rapids

MS RR: RAISIN RIVER BRIDGE (1867)
Across Raisin River, north of Beecher Rd.
Adrian

Adrian
16.745100.4641530
Lenawee

This stone-arch bridge was erected in 1867 by the Michigan Southern Railroad to carry its line over the Raisin River. It is 75 feet long, 30 feet high, 25 feet wide, and has two identical arches, each approximately 18 feet high in the center and 22 feet wide at the water level. Each arch has been given additional support by five horizontal steel rods which are connected to two sets of five vertical timbers, each eight inches square, which are in turn connected by steel rods which run just below the deck of the bridge.

MS RR: Raisin River Bridge (1867), Adrian

PEARL STREET BRIDGE (1922)
Pearl St., over Grand River
Grand Rapids

Grand Rapids West
16.608050.4757740
Kent

The Pearl Street Bridge is an open-spandrel concrete arch structure, of five spans, 72 feet wide and 485 feet long. It was designed by the Westcott Engineering Company of Chicago and was built by the Koss Construction Company of Des Moines, Iowa for $207,000.
[MSIAS]

Pearl Street Bridge (1922), Grand Rapids

SHIAWASSEE STREET BRIDGE (1923)
Over Grand River and Penn Central Railroad
Lansing

Lansing South
16.700650.4634340
Ingham

The Shiawassee Street Bridge is an earth-filled concrete arch bridge, 54 feet wide and 536 feet long. It crosses the Grand River and a New York Central Railroad line, now abandoned, and has a total of nine spans. Proceeding west to east, there are three main spans, each 92 feet long, over the Grand River, then two smaller spans, approximately 60 feet in length, all concrete. There is an 80 foot steel girder span over the railroad right-of-way, then three additional reinforced concrete spans. It was built by the Koss Construction Company of Des Moines, Iowa under the supervisions of two different City Engineers, Wesley Bintz and Otto Eckert.
[MSIAS]

ADDITIONAL ARCHED BRIDGES

EASTERN MICHIGAN AVENUE BRIDGE (1912) Eastern Michigan Ave., over Huron River Ypsilanti	Ypsilanti East 17.284500.4679630 Washtenaw
EMMETT STREET BRIDGE (1919) E. Emmett St., over Battle Creek River Battle Creek	Battle Creek 16.652220.4687900 Calhoun
FACTORY STREET BRIDGE (1909) Factory St., over Huron River Ypsilanti	Ypsilanti East 17.284800.4678900 Washtenaw
GULL ROAD BRIDGE (1911) Gull Rd., over Kalamazoo River Kalamazoo	Kalamazoo 16.617700.4683740 Kalamazoo
HURON PORTLAND CEMENT BRIDGE (1908) Detroit and Mackinac RR, over Ford Rd. Alpena	Alpena 17.310690.4993800 Alpena
LEFORGE STREET BRIDGE (1920) LeForge St., over Huron River Ypsilanti	Denton 17.483710.4681280 Washtenaw
MAIN STREET BRIDGE (1918) S. Main St. (M-86), over St. Joseph River Three Rivers	Three Rivers West 16.613410.4644150 St. Joseph
MEMORIAL BRIDGE (1927) E. Michigan Ave., over Kalamazoo River Kalamazoo	Kalamazoo 16.617715.4683270 Kalamazoo

MERIDIAN ROAD BRIDGE (c.1920) Meridian Rd., over Teed Drain Sanford	Sanford 16.710350.4838710 Midland
MERRICK STREET BRIDGE (1926) Merrick St., over Raisin River Adrian	Adrian 16.744985.4642080 Lenawee
MONROE STREET BRIDGE (1927) Monroe St. (M-125), over Raisin River Monroe	Monroe 17.301240.4643160 Monroe
PERE MARQUETTE ROAD [NORTH] BRIDGE (c.1920) Pere Marquette Rd., over Pere Marquette River Ludington	Ludington 16.546080.4864035 Mason
PERE MARQUETTE ROAD [SOUTH] BRIDGE (c.1920) Pere Marquette Rd., over Pere Marquette River Ludington	Ludington 16.546080.4863083 Mason
SAGINAW STREET BRIDGE (1923) Saginaw St. (M-52), over Bad River St. Charles	St. Charles 16.731760.4797700 Saginaw
SOUTH MILLS STREET BRIDGE (1912) S. Mills St., over Kalamazoo River Kalamazoo	Kalamazoo 16.618165.4681000 Kalamazoo
STATE REWARD BRIDGE (1924) Mosel Ave., over Kalamazoo River Parchment	Kalamazoo 16.617600.4685835 Kalamazoo
STATE REWARD BRIDGE NUMBER 53 (1920) Twelve Mile Rd., over Kalamazoo River Ceresco	Ceresco 16.659930.4681330 Calhoun

BRIDGES AND TRESTLES: ARCHED

STURGEON RIVER STREET BRIDGE (1924) Sturgeon River St., over Indian River Indian River	Wolverine 16.686087.5031043 Cheboygan
TELEGRAPH ROAD BRIDGE (1925) Telegraph Rd. (US-24), over Raisin River Monroe	Monroe 17.299780.4643870 Monroe
WEST CROSS STREET BRIDGE (1910) W. Cross St., over Huron River Ypsilanti	Ypsilanti East 17.284500.4680160 Washtenaw
WEST MITCHELL STREET BRIDGE (1930) W. Mitchell St. (US-31), over Bear River Petoskey	Petoskey 16.659080.5026033 Emmet

ADA [BRADFORD] COVERED BRIDGE (c.1867) — Lowell
Over Thornapple River — 16.623525.4756375
Ada — Kent

In 1867, Ada Township was authorized by the State Legislature to borrow up to $3,000 for the construction or repair of bridges. The bridge was probably constructed in 1867 by William Holmes, a local carpenter-bridge contractor. The original wooden piles were replaced with concrete ones in 1913, while the roof and sides were replaced in 1941 when the county decided to preserve the bridge. The lattice work was probably originally tied together with wooden pegs, which were later replaced with iron bolts. It is a single-span Howe truss, 125 feet long, 14 feet wide, and 15 feet high, resting on concrete abutments. It has been closed to vehicular traffic since 1930 and now serves as a pedestrian route to a public park. [Nellist, Darwin, "The Covered Bridge at Ada," Kent County Road Commission Report, March 18, 1957; NR]

AA RW: RAISIN RIVER BRIDGE (1922) — Dundee
Across Raisin River, east of Dundee — 17.280055.4647080
Dundee — Monroe

This bridge, which is 12 feet wide and 250 feet long, consists of four spans. There is a steel girder span, 30 feet long, then a steel Warren truss with a length of 120 feet, followed by two 50 foot steel girder spans, with all spans resting on concrete piers and abutments. The bridge was built in 1922 by the American Bridge Company.

BRIDGE STREET BRIDGE (1890) — Portland
Bridge St., over Grand River — 16.671225.4748225
Portland — Ionia

This bridge consists of two steel and wrought iron Pratt trusses resting on concrete abutments and a single concrete pier. It is 205 feet long and 24 feet wide. It was erected in 1890 by the Croton Bridge and Manufacturing Company of Croton, New York.
[MSIAS]

CHARLOTTE HIGHWAY BRIDGE (1886)
Charlotte Hwy., over Grand River
Danby Township

Portland
16.672100.4742190
Ionia

The Charlotte Highway Bridge is a single-span all-steel double-intersection Pratt truss, 177 feet long, 19 feet wide, resting on finished ashlar abutments. It was erected in 1886 by the Buckeye Bridge Works of Cleveland, Ohio. H.P. Hepburn was the Engineer and Contractor. [MSIAS]

C & WM RR: MUSKEGON RIVER BRIDGE (1888,1907)
Chesapeake and Ohio RR, over Muskegon River
Newaygo

Fremont
16.597017.4808025
Newaygo

The Grand Rapids, Newaygo, and Lake Shore Railroad reached Newaygo in 1872, but did not bridge the Muskegon River until 1875. This line merged with the Chicago and West Michigan Railroad in 1881 and the original wooden trestle was replaced with a steel bridge in 1888. The southernmost span was removed in 1907 and replaced with a through-plate girder span built by the American Bridge Company of New York. Overall, the bridge consists of seven spans, all resting on concrete piers and abutments, and is 515 feet long. Proceeding from south to north, there is a single through-plate girder span 35 feet long; three steel deck girder spans, each 60 feet long; two riveted steel Warren deck truss spans, each 100 feet long; and a steel deck girder span 100 feet long.

D, L & NM RR: GRAND RIVER BRIDGE (1904)
One mile west of M-100, over Grand River
Grand Ledge

Portland
16.684305.4736175
Eaton

This is a five-span bridge, 10 feet wide and 466 feet long, resting on stone piers and abutments. It consists of two short steel girder approach spans, one 55 feet long and the other 51 feet in length and three steel deck Pratt truss spans, each 120 feet in length and 20 feet high. The deck truss spans are supported by four steel towers, each 20 feet high, which in turn rest on finished ashlar piers. The roadbed is approximately 50 feet above the water surface.

C & WM RR: Muskegon River Bridge (1888,1907), Newaygo

D & TSL RR: RAISIN RIVER BRIDGE (c.1910)
Across Raisin River, east of Winchester St.
Monroe

Monroe
17.302580.4642560
Monroe

This railroad bridge, which is 24 feet wide and measures 420 feet long, consists of a single steel through-plate girder span, 50 feet long, and three steel through Warren truss spans, two of 120 feet and one which is 130 feet long. All four spans rest on concrete piers and abutments.

FALLASBURG COVERED BRIDGE (1871)
Covered Bridge Rd., across Flat River
Vergennes Township

Lowell
16.636500.4759650
Kent

This is the fifth bridge at this site. The previous four (1839, 1844, 1849, and 1860) were all destroyed by ice jams which swept away their center piers. This single-span bridge was erected in 1871 by Jared Bresee of Ada at a cost of $1,500. It is a Howe truss, 100 feet long, 14 feet wide, and 12 feet high, with a gabled roof. It is built of white pine, with 10 inch by 4 inch floor beams and 4 inch by 6 inch stringers. The concrete abutments were added in 1905 and in 1945, the original wooden pegs which tied together the lattice work were replaced by steel rods.
[MHD, Site Files; NR]

FIFTH STREET BRIDGE (1891)
N. 5th St., over Penn Central Railroad
Niles

Niles West
16.562000.4631700
Berrien

When erected in 1891, this bridge carried North Fifth Street over the Michigan Central Railroad lines just west of the Michigan Central Railroad passenger depot. It is 178 feet long and 23 feet wide, consisting of three spans resting on cut stone abutments and supported by steel I-beams. The two approach spans, each 24 feet long, are simple steel girder spans, while the main span, 130 feet long, is an all-steel Pratt truss.
[MSIAS]

FIFTY-SEVENTH STREET BRIDGE (1890)
57th St., over Kalamazoo River
New Richmond

Fennville
16.573025.4742025
Allegan

The Fifty-Seventh Street Bridge is an excellent example of late nineteenth-century steel bridge construction. It is 429 feet long and 12 feet wide, and consists of four spans, each a Warren truss of steel and wrought iron.
[MSIAS]

FORT STREET BRIDGE (1906)
Fort St., over Cass River
Bridgeport

Bridgeport
17.266420.4804400
Saginaw

This bridge consists of two Pratt trusses resting on concrete abutments. It is 15 feet wide, 260 feet long, and was built by the Joliet Bridge and Iron Company of Joliet, Illinois. It is now used for pedestrian traffic only. An earlier bridge at this location probably gave Bridgeport its name.
[MSIAS]

GALESBURG BRIDGE (1903)
Over Kalamazoo River
Galesburg

Galesburg
16.630140.4681170
Kalamazoo

This bridge, erected by the Illinois Bridge Company of Chicago, Illinois in 1903, is 210 feet long and 20 feet wide, with an asphalt road surface. It consists of two steel Pratt trusses, each 105 feet long, with cast iron vertical compression members, wrought iron diagonal tension members, and a wrought iron railing. This bridge has been closed to traffic for about ten years.

GR & I LINE: GRAND RIVER BRIDGE (1892)
Over Grand River, south of Pearl St.
Grand Rapids

Grand Rapids West
16.608030.4757530
Kent

The Grand Rapids and Indiana Line erected this bridge in 1892 to replace an earlier structure destroyed by a flood. It is 24 feet wide and 575 feet long, and rests on finished ashlar piers and abutments. It consists of five spans. The westernmost span is a simple steel I-beam span, 125 feet in length. The remaining four spans are steel Pratt trusses. The easternmost span is 120 feet long, while the remaining three spans are all 110 feet in length.

JACKSON STREET BRIDGE (1881,1895)
Jackson St., over Grand River
Lowell

Lowell
16.636150.4754025
Kent

The Jackson Street Bridge consists of three steel and wrought iron Pratt trusses, resting on concrete piers and abutments, and is 17 feet wide and

291 feet long. The north span was erected in 1881 by the King Iron Bridge Company of Cleveland, Ohio, while the middle and south spans were built in 1895 by the Wrought Iron Bridge Company of Canton, Ohio.
[MSIAS]

LANGLEY COVERED BRIDGE (1887) | Three Rivers East
Covered Bridge Rd., over St. Joseph River | 16.621940.4647000
Nottawa Township | St. Joseph

This is the longest surviving covered bridge in Michigan. It was constructed of white pine by Pierce Bodner of Parkville in 1887. It is 20 feet wide and 282 feet long and consists of three identical Howe trusses utilizing six inch square white pine timbers for trussing. The bridge had to be raised eight feet in 1910 when the Sturgis Dam was built a mile downstream, creating Sturgis Lake. It underwent extensive repairs in 1950-1951, when four steel I-beams, each 40 feet long and three feet high, were inserted under the bridge for support. They rest on concrete piers.
[MHD, Site Files]

MC RR: CHESAPEAKE AND OHIO RAILROAD BRIDGE (1891) | Dearborn
Southern Rd. at Miller St. | 17.321960.4687070
Detroit | Wayne

The Detroit Chesapeake and Ohio Bridge is a steel subdivided Warren truss bridge which carries the Chesapeake and Ohio Railroad tracks over the Penn Central Railroad tracks. It has an overall length of 233 feet and is a three-span bridge with two piers of reinforced steel and concrete. It was built in 1891 and designed by Charles Jaeger.
[Penn Central List, p. 1]

MC RR: ROUGE RIVER BRIDGE (1898) | Rockford
Across Rouge River | 16.617030.4776300
Rockford | Kent

This bridge, built by the Detroit Bridge and Iron Company, is a single-span steel through Pratt truss, 134 feet long, resting on cut stone abutments. Both the line and the Rouge River are curved at this site and the designers compensated by offsetting the end posts approximately 10 feet.
[Penn Central List, p. 33]

D, L & NM RR: Grand River Bridge (1904), Grand Ledge

MC RR: ST. JOSEPH RIVER BRIDGE (1900)
Over St. Joseph River and Front St.
Niles

Niles West
16.561480.4635550
Berrien

This bridge was built in 1900 by the Detroit Bridge and Iron Works to carry the Michigan Central Railroad over Front Street and the St. Joseph River. It is 43 feet wide and 475 feet long, and consists of two distinct portions. The eastern section, over Front Street, is a single-span, simple beam bridge, consisting of three parallel steel I-beams, each 75 feet long and three feet high. The western portion, over the St. Joseph River, is a three-span Baltimore deck truss bridge resting on concrete piers.
[MSIAS]

NYC RR: RAISIN RIVER BRIDGE (1907)
Penn Central Railroad, across Raisin River
Blissfield

Blissfield
17.260065.4635060
Lenawee

This is a single-span steel Baltimore through truss bridge, 18 feet wide and 150 feet long, resting on finished ashlar abutments. It was erected in 1907 by the American Bridge Company of New York.

NYC RR: RAISIN RIVER BRIDGE (1910)
Across Raisin River, east of Winchester St.
Monroe

Monroe
17.302550.4642600
Monroe

This bridge consists of three pin-connected steel Baltimore through truss spans, resting on concrete piers and abutments. It is 15 feet wide and 353 feet long. Each span is of equal length.
[Penn Central List, p. 17]

NORTH PARK STREET BRIDGE (1904)
N. Park St., over Grand River
Grand Rapids

Cedar Springs S.W.
16.609080.4764000
Kent

The North Park Street Bridge is 21 feet wide and 580 feet long and consists of five steel Pratt trusses, each 116 feet long, resting on concrete piers and abutments. It was erected by the New Jersey Bridge Company of Manasquan, New Jersey at a cost of $31,306. It was designed by L.W. Anderson.
[MSIAS]

PM RR: GRAND RIVER BRIDGE (1899)
Over Grand River, north of Grand River Ave.
Portland

Portland
16.671375.4748590
Ionia

The concrete pier and abutments on which this bridge rests were built in 1880 for an earlier bridge, but the extant bridge was built in 1899 by the Detroit Bridge and Iron Company. It consists of two steel Pratt trusses, each 15 feet wide and 165 feet long. The rails rest on eight inch square oak crossmembers.

PM RR: GRAND RIVER BRIDGE (1904)
Over Grand River, west of S. Jackson St.
Lowell

Lowell
16.635900.4754025
Kent

This two-span bridge consists of two steel Pratt trusses, each 15 feet wide and 165 feet long, resting on concrete abutments and a single concrete pier. It was erected by the American Bridge Company of New York in 1904.

PM RR: RAISIN RIVER BRIDGE (1896,1911)
Across Raisin River, west of Roessler St.
Monroe

Monroe
17.299980.4643420
Monroe

This bridge consists of two steel Warren trusses resting on a single concrete pier and finished ashlar abutments. It is 30 feet wide and 330 feet long. The substructure dates from 1896, while the superstructure was erected in 1911.

PORTLAND AND DANBY BRIDGE (1907)
Kent St., over Grand River
South Portlandville

Portland
16.670550.4746725
Ionia

The Portland and Danby Bridge is an all-steel single-span bridge, 224 feet long and 18 feet wide, resting on concrete abutments. The contractors were Wynthrop and McCormley. This is the longest single-span truss bridge in Michigan. It is a through Parker or curved Chord truss. [MSIAS]

RIVER STREET BRIDGE (1924)
River St., over Grand River
Lansing

Lansing South
16.700860.4732950
Ingham

The River Street Bridge consists of two steel Parker trusses resting on concrete abutments and a single concrete pier. It is 224 feet in length and 35 feet wide, including two five foot sidewalks. It was erected in 1924 by the Wisconsin Bridge and Iron Company of North Milwaukee, Wisconsin.

SCOTTSDALE ROAD [US-31] BRIDGE (1896,1928)
Scottsdale Rd., over St. Joseph River
Benton Township

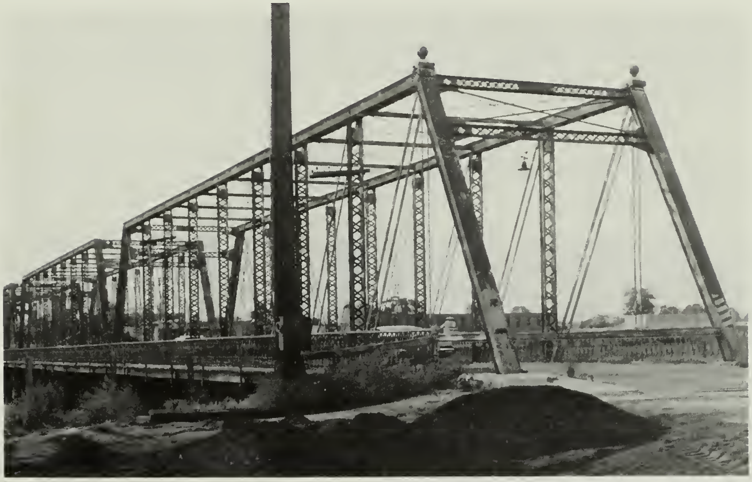
Benton Harbor
16.546460.4655616
Berrien

This bridge, measuring 350 feet long and 30 feet wide, consists of four distinct spans, all resting on concrete piers and abutments. The two southernmost portions, built in 1896, are steel Pratt through trusses. The largest of the two is approximately 175 feet long, the smallest about 75 feet in length. The remaining two spans of the bridge, originally trusses, were replaced in 1928 by reinforced concrete girders. [MSIAS]

SIXTH STREET BRIDGE (1886)
6th St., over Grand River
Grand Rapids

Grand Rapids West
16.608130.4758870
Kent

In 1884 the Grand Rapids Common Council appropriated $6,000 towards the construction of a new bridge across the Grand River at Sixth Street. This bridge, linking the industrial west side of the city with the major commercial and residential districts, was begun in 1885 and completed the following year. The piers and abutments were constructed at a cost of $11,084.95. The superstructure, erected by the Massillon Bridge Company of Massillon, Ohio, cost $21,281 and was put in place in 1886. The bridge originally consisted of four steel and wrought iron Pratt trusses, each 151 feet 9 and one-half inches long and 20 feet 6 inches wide, resting on stone piers. The westernmost span was shortened to one-third of its original length when the Grand River was constricted in 1921 by the construction of a concrete retaining wall on its west bank. This is the oldest surviving bridge across the Grand River at Grand Rapids and is the oldest surviving truss bridge of its size in Michigan. [MSIAS; Baxter, Albert, History of the City of Grand Rapids, p. 547; An Historic Tour of Kent County, (Grand Rapids, 1975), p. 52; NR]



Sixth Street Bridge (1886), Grand Rapids

SMITH'S CROSSING ROAD BRIDGE (1907)
Smith's Crossing Rd., over Tittabawassee River
Mapleton

Midland South
16.727190.4827130
Midland

The Smith's Crossing Road Bridge was built in 1907 by the Joliet Bridge and Iron Company of Joilet, Illinois under the supervision of J.C. Reifenberg, Engineer. It consists of two through Pratt truss spans, each 15 feet wide and 150 feet long, resting on a concrete pier and concrete abutments.

SMITHVILLE ROAD BRIDGE (1897)
Smithville Rd., across Grand River
Hamlin Township

Springport
16.694070.4707025
Eaton

The Smithville Road Bridge consists of two steel and wrought iron Warren trusses resting on concrete abutments and a single concrete pier. It is 15 feet wide and 160 feet long and was built by the R.D. Wheaton Bridge Company of Chicago in 1897.

State Street Bridge (1910), Saginaw Township

STATE STREET BRIDGE (1910)
State St., over Tittabawassee River
Saginaw Township

St. Charles
16.738020.4808310
Saginaw

The State Street Bridge, built in 1910 by the Saginaw Bridge Company of Saginaw, consists of two through Pratt truss spans, each 150 feet long and 18 feet wide, resting on concrete abutments and a single concrete pier.

T, AA & NM RR: MANISTEE RIVER BRIDGE (1902)
Ann Arbor Railway, across Manistee River
Mesick

Mesick
16.600095.4918000
Wexford

This bridge was constructed for the Toledo, Ann Arbor, and Northern Michigan Railroad in 1902. It is a three-span bridge 10 feet wide and 237 feet long, resting on concrete piers and abutments. The two approach spans, each 60 feet long, are deck plate girders seven feet high, while the main span, 116 feet long, is a riveted Warren deck truss of steel.
[Wheeler, John, History of Wexford County, Michigan (Chicago, 1903), pp. 263-265]

WASHINGTON ROAD BRIDGE (1906)
Washington Rd., over Fish Creek
Hubbardston

Hubbardston
16.675560.4773000
Ionia

The Washington Road Bridge was erected by the Joilet Bridge and Iron Company of Joliet, Illinois in 1906, under the supervision of S. Page Borden. It is a single-span steel and wrought iron through Camelback truss, 100 feet long and 20 feet wide, and rests on concrete abutments.
[MSIAS]

Washington Road Bridge (1906), Hubbardston

WHITE'S COVERED BRIDGE (c.1867)
Over Flat River, southwest of Smyrna
Keene Township

Smyrna
16.638710.4763615
Ionia

This covered bridge was constructed by Jared N. Bresee and J.N. Walker around 1867 for approximately $2,000. It is a single-span Howe truss, 119 feet long and 18 feet wide, with a gabled roof, and it rests on finished ashlar abutments. It is one of only four covered bridges extant in Michigan.
[MSIAS; NR]

White's Covered Bridge (c.1867), Keene Township

ADDITIONAL TRUSSED BRIDGES

ANGEDEVINE ROAD BRIDGE (1912) Angedevine Rd., over St. Joseph River Centreville	Three Rivers East 16.623650.4644779 St. Joseph
APPLEGATE ROAD BRIDGE (1910) Applegate Rd., over Black River Applegate	Applegate 17.366340.4801350 Sanilac
BAMFIELD ROAD BRIDGE (1910,1947) Bamfield Rd., over Au Sable River Curtis Township	Not Mapped Alcona
BLACK RIVER BRIDGE (c.1890) Paw Paw Drive, over Black River Holland	Holland 16.577090.4738080 Ottawa
BUNDY ROAD BRIDGE (1906) Bundy Rd., over Paw Paw River Hagar Township	Coloma 16.554340.4671750 Berrien
BURT ROAD BRIDGE (1885) Burt Rd., over Flint River Morseville	Birch Run South 17.267080.4790860 Saginaw
BUTTON ROAD BRIDGE (1881) Button Rd., over Flat River Smyrna	Smyrna 16.642150.4768600 Ionia
CENTRAL STREET BRIDGE (1899) Central St., across Huron River Dexter	Dexter 17.262780.4691460 Washtenaw

CHESSMAN ROAD BRIDGE (1886) Chessman Rd., over Pine River St. Louis	Alma 16.639005.4807087 Gratiot
COMFORT ROAD BRIDGE (c.1890) Comfort Rd., over Raisin River Tecumseh	Blissfield 17.257020.4653040 Lenawee
COSTER ROAD BRIDGE (1896) Coster Rd., over Manistee River Springfield Township	Fife Lake 16.637000.4931075 Kalkaska
CROTON ROAD BRIDGE (1925) Croton Rd., over Chesapeake and Ohio RR Newaygo	Fremont 16.597017.4808025 Newaygo
CURRIE PARKWAY BRIDGE (c.1890) Currie Parkway, over Tittabawassee River Midland	Sanford 16.721660.4832755 Midland
DAVIS BRIDGE (1904) Holtom Rd., over St. Joseph River Three Rivers	Three Rivers East 16.618560.4646680 St. Joseph
EAST DELHI ROAD BRIDGE (c.1890) E. Delhi Rd., over Huron River Delhi	Ann Arbor West 17.268555.4690440 Washtenaw
ELM VALLEY ROAD BRIDGE (c.1910) Elm Valley Rd., over Galien River Three Oaks	New Buffalo East 16.528610.4630520 Berrien
F DRIVE BRIDGE (c.1890) F Drive, over Kalamazoo River Emmett Township	Ceresco 16.655300.4683490 Calhoun

FREELAND ROAD BRIDGE (c.1900) Freeland Rd., over Tittabawassee River Freeland	Midland South 16.732320.4822900 Saginaw
GEDDES ROAD BRIDGE (1893,1914) Geddes Rd., over Huron River Ann Arbor	Ann Arbor East 17.277160.4683715 Washtenaw
GLENGARY BRIDGE (1905) Eugene St., over Manistee River Glengary	Mesick 16.601093.4919025 Wexford
INGELLS ROAD BRIDGE (1894) Ingells Rd., over Flat River Smyrna	Smyrna 16.642400.4767950 Ionia
KING ROAD BRIDGE (1897) King Rd., over Nottawa Creek Leonidas	Leonidas 16.633700.4652975 St. Joseph
LAPEER STREET BRIDGE (1906) Lapeer St., over Flint River Columbiaville	Columbiaville 17.304220.4781140 Lapeer
LINCOLN AVENUE BRIDGE (1900) Lincoln Ave., over Cheboygan River Cheboygan	Cheboygan 16.696033.5056025 Cheboygan
MAPLE ROAD BRIDGE (c.1890) Maple Rd., over Huron River Delhi	Ann Arbor West 17.271060.4688500 Washtenaw
MIO ROAD BRIDGE (1928) Mio Rd. (M-33), over Au Sable River Mio	Not Mapped Oscoda

BRIDGES AND TRESTLES: TRUSSED

NICKEL PLATE ROAD BRIDGE (1898) Nickel Plate Rd., over Maple River Lyons Township	Hubbardston 16.674180.4766430 Ionia
NINTH STREET BRIDGE (c.1900) 9th St., over Gun Creek Gun Plain	Otsego 16.612820.4703150 Allegan
NIVER ROAD BRIDGE (1889) Niver Rd., across Shiawassee River Chesaning Township	Chesaning 16.736250.4780500 Saginaw
NOTTAWA ROAD BRIDGE (1900) Nottawa Rd., over St. Joseph River Mendon	Leonidas 16.627400.4651100 St. Joseph
OLD BLACK BRIDGE (1907) Dehmel Rd., over Cass River Frankenmuth	Birch Run North 17.276435.4800730 Saginaw
133RD STREET BRIDGE (c.1890) 133rd St., over Rabbit River Manlius	Fennville 16.576055.4741050 Allegan
PM RR: CEDAR CREEK BRIDGE (1924) Chesapeake and Ohio RR, over Cedar Creek North Muskegon	Twin Lake 16.561090.4790023 Muskegon
PM RR: MUSKEGON RIVER BRIDGE (c.1910) Chesapeake and Ohio RR, over Muskegon River Evart	Evart 16.640020.4862010 Osceola
PM RR: TITTABAWASSEE RIVER BRIDGE (1912) Chesapeake and Ohio RR, over Tittabawassee River Sanford	Sanford 16.710520.4838825 Midland

RILEY ROAD BRIDGE (1897) Riley Rd., over St. Joseph River Sherwood Township	Union City 16.648062.4655087 Branch
SAGINAW ROAD BRIDGE (1920,1932) Saginaw Rd., over Tittabawassee River Sanford	Sanford 16.710520.4838825 Midland
SECOND STREET BRIDGE (c.1890) 2nd St., over Gun Creek Gun Plain	Wayland 16.615105.4724010 Allegan
SEVENTH STREET BRIDGE (1903) 7th St., over Gun Creek Gun Plain	Kalamazoo N.E. 16.614080.4703540 Allegan
SIXTY-FOURTH STREET BRIDGE (1901) 64th St., over Paw Paw River Hartford	Hartford 16.567800.4675225 Van Buren
STANCER ROAD BRIDGE (c.1900) Stancer Rd., over Coldwater Creek Union	Union City 16.656070.4654050 Branch
STATE STREET BRIDGE (c.1890) State St., over Grand River Leslie	Leslie 16.711630.4697460 Jackson
STOUDT ROAD BRIDGE (1905) Stoudt Rd., over Fish Creek Matherton	Hubbardston 16.675700.4770320 Ionia
STUDLEY BRIDGE (1910) Arney Rd., over St. Joseph River Sherwood Township	Union City 16.645072.4652035 Branch

BRIDGES AND TRESTLES: TRUSSED

VISTULA ROAD BRIDGE (1909) Vistula Rd., over White Pigeon Creek Mottville	Constantine 16.606370.4625500 St. Joseph
WEST KNIGHT STREET BRIDGE (1893) W. Knight St., over Spring Brook Eaton Rapids	Eaton Rapids 16.692420.4709160 Eaton
WILLIAMS BRIDGE (1890) 26th St., over Kalamazoo River Trowbridge	Gobles 16.598070.4703085 Allegan

CENTER STREET BRIDGE (1908)	Adrian
Center St., over Penn Central RR and Michigan St.	16.746470.4642010
Adrian	Lenawee

The Center Street Bridge is an eight-span timber trestle, 36 feet wide and 138 feet long, resting on cut stone abutments and rough-cut treated oak beams. The roadbed rests on 15 horizontal main beams, each 6 by 12 inch oak timbers.
[MSIAS]

D, T & I RR: WOLF CREEK TRESTLE (1928)	Adrian
Over Wolf Creek, north of Bent Oak St.	16.746060.4643900
Adrian	Lenawee

The Wolf Creek Trestle carries the Tecumseh Branch of the Detroit, Toledo, and Ironton Railroad over Wolf Creek. It is 8 feet wide, 520 feet long, and rises 30 feet above the low water level of the creek. There are six parallel main beams, each 6 by 15 inch oak, supported by 41 cross beams, each 15 inches square, which rest in turn on rough-cut treated oak logs. The trestle is given additional rigidity by a series of pin-connected cross supports.

GTW RR: DUTCH CREEK TRESTLE (c.1900)	Bay City
Grand Trunk Western RR, over Dutch Creek	17.264820.4826780
Bay City	Bay

This is an eighteen-span timber trestle (c.1900), 12 feet wide and 170 feet long. It consists of piers constructed of twelve inch diameter treated oak timbers, with six timbers supporting a 12 inch by 14 inch oak beam on which the eight main beams, each 6 inches by 16 inches, rest. The main beams in turn support the eight inch square oak crossmembers on which the roadbed rests.

GTW RR: SOUTH CHANNEL TRESTLE (c.1910)	Muskegon
Over South Channel of Grand River, east of US-31	16.563025.4768080
Grand Haven	Ottawa

This trestle, which carries the Grand Trunk Western Railroad across the South Channel of the Grand River north of Grand Haven, is 8 feet wide and 270 feet long. The rails rest on 5 by 6 inch oak crossmembers, supported by two parallel beams, each 8 inches by 16 inches, which in turn rest on rough-cut treated oak piles one foot in diameter.

LM RW: GRAND RIVER TRESTLE (1918,1933)
Over Grand River, northwest of N. Logan St.
Lansing

Lansing North
16.698770.4736640
Ingham

This trestle carrying the Lansing Manufacturers Railway across the Grand River is 12 feet wide and 270 feet long, and consists of two parallel steel I-beams, each two feet high, resting on piers consisting of seven treated oak logs, each approximately five inches in diameter. The steel I-beams, which replaced two massive oak timbers, were installed in 1933 when the trestle was rebuilt.
[Penn Central List, p. 34]

MC RR: BEAVER CREEK TRESTLE (1899)
Penn Central RR, across Beaver Creek
St. Charles

St. Charles
16.731750.4799020
Saginaw

This is a nine-span timber trestle, 12 feet wide and 132 feet long. The piles are rough-cut treated oak logs approximately six inches in diameter.
[Penn Central List, p. 16]

MC RR: DUTCH CREEK TRESTLE (1890,1917)
Penn Central RR, over Dutch Creek
Bay City

Bay City
17.263960.4826650
Bay

The Michigan Central Railroad Dutch Creek Trestle is 151 feet long, 12 feet wide, and consists of ten spans. Beginning at the southern riverbank, there are six spans of steel I-beams, each 12 feet long, resting on rough-cut treated oak timbers. The main span, 38 feet in length and resting on concrete piers, was built in 1890 by the Detroit Bridge and Iron Company. There are then three additional 12 foot I-beam spans resting on oak timbers. These shorter spans were all built in 1917.
[Penn Central List, p. 18]

MC RR: HERSEY RIVER TRESTLE (c.1900)
Penn Central RR, over Hersey River
Reed City

Reed City
16.619075.4859050
Osceola

This trestle is 12 feet wide, 150 feet long, and has concrete abutments. It has twelve sets of five rough-cut treated oak timber supports. The two main beams, also of treated oak, are 15 inches square.

MC RR: ST. JOSEPH RIVER TRESTLE (1928)
West of Bond St., south of Main St.
Niles

Niles West
16.561495.4629510
Berrien

This trestle carries the Penn Central Railroad across the St. Joseph River at Niles. It is 348 feet long and 10 feet wide, and consists of two parallel steel I-beams, two feet high, supported by 15 inch square oak crossmembers which in turn rest on round oak piers.
[Penn Central List, p. 36]

MOORE STREET BRIDGE (1917)
Moore St., over Penn Central RR
Three Rivers

Three Rivers West
16.612960.4644440
St. Joseph

The Moore Street Bridge is 214 feet long, 28 feet wide, and rests on cut stone abutments. It is supported by five piers consisting of 15 inch square treated oak timbers, which support four parallel horizontal beams (also treated oak) 12 inch square. The crossmembers supporting the deck are 2 inch by 8 inch oak timbers.
[Penn Central List, p. 24]

PM RR: CEDAR CREEK TRESTLE (1912)
Chesapeake and Ohio RR, over Cedar Creek
North Muskegon

Twin Lake
16.561087.4790040
Muskegon

This trestle was erected in 1912 to replace an earlier bridge washed out in a flood. It is 150 feet long and 10 feet wide and consists of two parallel 15 inch square oak beams which rest on 2 inch by 6 inch crossmembers which in turn rest on 6 inch diameter oak piers.
[Muskegon Times, May 24, 1912, p. 1]

PM RR: RABBIT RIVER TRESTLE (1916)
Over Little Rabbit River, west of M-40
Hamilton

Fennville
16.581080.4739010
Allegan

This trestle was constructed in 1916 to carry the Pere Marquette Railroad over the Little Rabbit River. It is 12 feet wide, approximately 300 feet long, and approximately 60 feet high. The tracks rest on 8 inch square treated oak timber crossmembers, which in turn rest on two parallel 15 inch square oak beams, supported by treated oak logs, approximately 6 inches in diameter and 60 to 70 feet in length. The trestle is stabilized through a complex system of cross supports, all tied to the main logs with iron pins.

PM RR: Rabbit River Trestle (1916), Hamilton

BELINDA STREET BRIDGE (1892)
Belinda St., over Saginaw River
Bay City

Essexville
17.268040.4832700
Bay

This swing bridge is 35 feet wide and 628 feet long and consists of three major spans, all Pratt trusses, and three short approach spans, all deck girder spans. All piers and abutments are cut stone. There are two short approach spans, 20 feet and 45 feet long, on the eastern bank of the river. Proceeding westerly, there is a main span 141 feet long, the swing span of 263 feet in length, another main truss span 141 feet long, and then a deck girder span 18 feet long on the west bank. This bridge is scheduled for demolition in late July 1976 when it will be replaced by a new four lane bridge slightly downstream.

BRIDGE STREET BRIDGE (1924)
Bridge St., over Belle River
Marine City

Marine City
17.377430.4729880
St. Clair

This is a single-span, steel swing bridge, 150 feet long and 36 feet wide, resting on concrete abutments and a single concrete pier. This manually-operated bridge is scheduled for replacement in 1977.

C & O RR: BLACK RIVER DRAWBRIDGE (1930)
Over Black River, at St. Clair River
Port Huron

Port Huron
17.384170.4758650
St. Clair

This rolling lift bascule bridge was constructed in 1930 by the American Bridge Company for the Chesapeake and Ohio Railroad. It consists of a bascule span, 173 feet long and 18 feet wide, and a through-plate girder span 61 feet in length, both resting on concrete piers and abutments.

D & M RR: SAGINAW RIVER BRIDGE (1892)
Detroit and Mackinac RR, over Saginaw River
Essexville

Essexville
17.269440.4832640
Bay

The Detroit and Mackinac Railroad was the last major line built in Northern Michigan, although the line never actually reached either Detroit or Mackinac City. It began as a series of lumbering railroads around Alpena which were consolidated in 1883 as the Detroit, Bay City, and Alpena Railroad. This line went into receivership and was reorganized in 1895 as the Detroit and Mackinac Railroad Company and by September 1896 its line extended from Bay City to Cheboygan. This swing bridge across the Saginaw River, built in 1892, is approximately 740 feet long, 15 feet wide, and rests on cut stone piers and abutments. It is a five-span bridge, with all spans subdivided Pratt trusses of steel. Proceeding from south to north, the bridge consists of a single through truss span, 120 feet long, a swing span approximately 260 feet long, and then three through truss spans, each 120 feet in length. [Dunbar, pp. 176-177]

DIX AVENUE BASCULE BRIDGE (1926)
Dix Ave., across Rouge River
Dearborn

Dearborn
17.322690.4684735
Wayne

The substructure of this bridge was built by the Missouri Valley Bridge and Iron Company and the superstructure was built by the Wisconsin Bridge and Iron Company. This structure is identical to the Fort Street Bascule Bridge. Each abutment has a motor and pinion gears below the roadway and a two-story control tower. The abutments are 100 feet long, 100 feet wide, and have common bond stone masonry. The two steel spans are each 70 feet long, 65 feet wide with a steel grating roadway 50 feet wide. When lowered these two steel spans form an arched Pratt truss. This bridge allows Great Lakes ore boats loaded with coal, iron, and limestone to supply steel mills and foundries at the Ford Motor Company's River Rouge Complex, the largest industrial complex in the world. This complex represents every step of Ford manufacturing from the production of steel and raw materials to the assembly of cars.

FORT STREET BASCULE BRIDGE (1922)
Fort St., at Rouge River
Detroit

Dearborn
17.323350.4684140
Wayne

The Chicago Bascule Bridge Company built this bascule bridge over the Rouge River to allow barge traffic to flow upriver to the Ford Motor Company River Rouge Complex. The east and west abutments are identical. Each consists of a 50 foot long ramp, with the roadbed supported between common bond stone walls, leading up to the 80 foot long and 95 foot wide concrete abutment which houses the motor, pinion gear and rack below and a two-story control tower on top. Each abutment controls a steel span 65 feet long and 65 feet wide which has an iron grille deck and a 50 foot wide roadway with two sets of trolley tracks along the center.

GTW RR: BLACK RIVER DRAWBRIDGE (1929)
North of Water St., over Black River
Port Huron

Port Huron
17.382400.4759900
St. Clair

This rolling lift bascule bridge was built in 1929 by the Wisconsin Bridge and Iron Company for the Grand Trunk Western Railroad. It consists of two deck girder approach spans, with the draw span in the middle. The southernmost span is 80 feet long, the draw span is approximately 150 feet in length, and the northernmost span is 100 feet long. All spans rest on concrete piers and abutments. The draw span features massive concrete counterweights.

GTW RR: GRAND RIVER BRIDGE (c.1910)
Over Grand River, east of US-31
Grand Haven

Muskegon
16.563060.4769025
Ottawa

This steel swing bridge carries the Grand Trunk Western Railroad line across the Grand River just north of Grand Haven. The swing span is approximately 150 feet long and 14 feet wide and consists of two steel Warren trusses. The two approach spans, each approximately 150 feet long, consist of two parallel steel I-beams resting on concrete piers and abutments.

GTW RR: SPRING LAKE BRIDGE (c.1910)
Over Spring Lake outlet, north of M-104
Spring Lake

Muskegon
16.564005.4769045
Ottawa

The Spring Lake Bridge consists of a single steel deck plate girder swing span, approximately 125 feet long and 8 feet wide, and two approach trestles, each approximately 50 feet in length, resting on rough-cut treated oak piles one foot in diameter.

GROSSE ILE PARKWAY BRIDGE (1930)
Grosse Ile Parkway, over Trenton Channel
Grosse Ile

Wyandotte
17.320280.4666000
Wayne

The substructure and concrete deck of this structure was built by the A.J. Dupuis Company of Detroit. The west causeway consists of steel girders spanning eight concrete piers and a stone retaining wall and is 770 feet long and 25 feet wide. The east causeway, 190 feet long and 25 feet wide, consists of steel girders spanning two concrete piers and a stone retaining wall. The main span consists of a steel and cast iron swing bridge which is a Pratt truss 325 feet long and 25 feet wide. The bridge carries a two-lane asphalt roadway 15 feet wide.

GROSSE ILE TOLL BRIDGE (1912-1913) — Wyandotte
Bridge Rd., over Trenton Channel — 17.321410.4671080
Grosse Ile — Wayne

This bridge consists of five spans, all of which are steel Warren trusses with verticals. The center or swing bridge is 295 feet long and 25 feet wide. It is flanked on each side by two more steel spans, each 175 feet long and 25 feet wide resting on steel-lined concrete piers at each end of each span. The east earth causeway is 1,080 feet long and 30 feet wide while the west earth causeway is 350 feet long and 30 feet wide. The two-lane asphalt roadway is 20 feet wide. The structural work was done by Whitehead and Kales Company of River Rouge, Michigan.

HURON AVENUE DRAWBRIDGE (1914) — Port Huron
Huron Ave. (M-25), over Black River — 17.383870.4758870
Port Huron — St. Clair

The Huron Avenue Drawbridge, built in 1914, is 140 feet long and approximately 60 feet wide, with a 48 foot roadway and two sidewalks, each six feet wide. The two lift spans are each 45 feet long.
[MSIAS]

JEFFERSON AVENUE BASCULE BRIDGE (1922) — Dearborn
Jefferson Ave., across Rouge River — 17.324475.4682940
River Rouge — Wayne

The substructure of this drawbridge-type structure was built by the Missouri Valley Bridge and Iron Company while the superstructure was built by the Stroebel Steel Construction Company. A 45 foot long concrete-lined ramp leads up to the east abutment while a similar 90 foot ramp leads up to the west abutment. Each abutment is 65 feet long, 90 feet wide, has the motor and pinion gears below the roadway, a two-story control tower, and a common bond stone masonry. The two steel spans are 65 feet wide, 80 feet long with a steel grating roadway 40 feet wide.

When lowered these two spans form a Pratt truss with curved upper chord members. This bridge is built on the site of an old wooden bascule bridge, built in 1882, which had twin drawbridges raised by ropes and winches. The original bridge is no longer standing. The bridge allows Great Lakes ore boats to supply steel and auto plants at Ford's River Rouge Complex.

JOHNSON STREET BRIDGE (1912) Saginaw
Johnson St., over Saginaw River 17.262000.4813240
Saginaw Saginaw

The Johnson Street Bridge was constructed in 1912 at a cost of $85,000. It is 48 feet wide, 648 feet long, and consists of five deck girder spans and one Scherzer lift span, all resting on concrete piers and abutments. From east to west, there is a deck girder span 116 feet long; the lift span, which is 130 feet long; and four additional deck girder spans of 112, 100, 96, and 84 feet in length.
[Mills, James C., <u>History of Saginaw County</u> (Saginaw, 1918), p. 246]

MC RR: GRAND RIVER BRIDGE (1914) Grand Rapids West
Over Grand River, south of Wealthy St. 16.607140.4756270
Grand Rapids Kent

This swing bridge was erected to carry the Michigan Central Railroad over Market Street and the Grand River. The builder was the Toledo Bridge and Crane Company of Toledo, Ohio. It is a simple steel girder bridge, 12 feet wide and approximately 680 feet long. It consists of two parallel steel girders, eight feet high, with six inch steel I-beams as crossmembers supporting the roadbed. There are four spans resting on concrete piers and abutments. Proceeding from east to west, the first span (crossing Market Street and extending over the Grand River) is 200 feet long, the next span is 100 feet long, the swing span in 200 feet long, and finally, the westernmost span is 180 feet in length. The swing span is no longer moveable and the line itself has been abandoned for at least a decade.

MC RR: ROUGE RIVER BASCULE BRIDGE (1920) Dearborn
Over Rouge River, between I-75 and Jefferson Ave. 17.323900.4683160
River Rouge Wayne

The Wisconsin Bridge and Iron Company built this steel bridge which carries two sets of tracks across the Rouge River between Detroit and River Rouge. The east abutment is concrete, 25 feet long and 30 feet wide, leading to a girder span 50 feet long and 30 feet wide which supports a half A-frame with two concrete slab counterweights. The concrete west abutment is 50 feet long and 30 feet wide. The main span, which is a steel and cast iron Warren truss with verticals and a wooden deck, is 135 feet long and 30 feet wide.

MC RR: Rouge River Bascule Bridge (1920), River Rouge

MC RR: SAGINAW RIVER BRIDGE (1914)
Penn Central RR, over Saginaw River
Saginaw

Saginaw
17.261680.4812200
Saginaw

The Michigan Central Railroad Saginaw River Bridge (1914) is 551 feet long, 12 feet wide, and consists of seven spans, all resting on concrete piers and abutments. Proceeding from east to west, it consists of three deck girder spans, of 30, 36, and 30 feet in length; a through truss (Baltimore truss) swing span, 226 feet long; a fixed Baltimore through truss, 138 feet long; and two deck girder spans, 40 and 47 feet long. [Penn Central List, p. 17]

MC RR: Saginaw River Bridge (1914), Saginaw

MC RR: SAGINAW RIVER BRIDGE (1905,1925)
Penn Central RR, over Saginaw River
Bay City

Bay City
17.266800.4831880
Bay

The Saginaw River Bridge of the Michigan Central Railroad replaced an earlier swing bridge that had been built in 1873. In April 1905, two sets of pile frames were constructed parallel to the old bridge, one upstream and one downstream from it. The old bridge was lifted off its piers and placed on the downstream piles, where it was later dismantled, while the new bridge, which had been resting on the upstream set of piles, was placed on the old piers. This operation was accomplished in only six hours using barge-mounted cranes. The new bridge is a four-span bridge, 12 feet wide and 660 feet long, resting on concrete piers and abutments. The easternmost span is a through girder, 12 feet in height and 123 feet long, fabricated in 1925 by the Bethlehem Steel Company of Bethlehem, Pennsylvania. Proceeding to the west, the next span is the swing span, a through truss 245 feet long, built in 1905. There are then two through truss spans, each 146 feet long, both built in 1905. All of the truss spans are Warren trusses.
[Penn Central List, p. 25; Gansser, Augustus H., History of Bay County, Michigan (Chicago, 1905), p. 235]

MORRISON CHANNEL BRIDGE (1911)
Wayne St., over Morrison Channel
St. Joseph

Benton Harbor
16.543400.4661900
Berrien

This swing bridge over the Morrison Channel replaced an earlier wooden bridge erected on the same site. This bridge connects the "twin cities" of St. Joseph and Benton Harbor, passing over a man-made channel cut to facilitate the passage of Great Lakes shipping into Benton Harbor. It is a single-span, continuous steel Warren truss bridge, 176 feet long and 31 feet wide. Originally moved by an electric motor, this bridge no longer moves and is scheduled to be demolished when a new bridge approximately 300 feet to the west is completed.
[MSIAS]

NYC RR: GRAND RIVER BRIDGE (c.1900)
Over Grand River
Wyoming

Grand Rapids West
16.604220.4754465
Kent

This swing bridge across the Grand River was constructed around 1900 by the New York Central Railroad. The bridge has a north-south alignment,

with the swing span at the south end. At the north end of the bridge, there is an approach trestle, 12 feet wide, and approximately 400 feet long, which carries the single track over wetlands. It consists of two steel beams, two feet in height, supported by rough-cut treated log piers, and has a maximum height of eight feet. Proceeding south from the trestle, there are three steel Pratt truss spans, 12 feet wide and 100 feet long, resting on stone piers and abutments. The swing span, 138 feet long, rests on a round finished ashlar pier. The bridge is no longer moveable and this line is no longer used by the Penn Central Railroad.
[Penn Central List, p. 13]

Morrison Channel Bridge (1911), St. Joseph

N & W RR: ROUGE RIVER BASCULE BRIDGE (1921)
Over Rouge River, between I-75 and Fort St.
Detroit

Dearborn
17.323560.4683670
Wayne

The American Bridge Company built this steel bascule bridge which is now used by the Norfolk and Western Railroad Company, and the Detroit, Toledo, and Ironton Railroad. The bridge is 30 feet wide and carries two sets of railroad tracks, on a wooden deck across steel stringers, across the Rouge River. The main span is a 150 foot long steel Warren truss with verticals. The east abutment consists of a 50 foot long steel girder spanning the water between a concrete retaining wall and a concrete pier. The west abutment is a 70 foot girder spanning the water between a concrete retaining wall and a concrete pier and supports a truss which has the rack and counterweight. The counterweight truss is an A-frame type. There is also a control house on top of this truss. This bridge allows barge traffic to flow upriver to the Ford Motor Company River Rouge Complex.

PM RR: CHARLEVOIX RIVER BRIDGE (1904)
Chesapeake and Ohio RR, over Charlevoix River
Charlevoix

Bayshore
16.637055.5019030
Charlevoix

This swing bridge over the Charlevoix River was built by the American Bridge Company of New York for the Pere Marquette Railroad in 1904. The main span is a steel Warren truss, 234 feet long and 15 feet wide. It is powered by an electric motor, 10 H.P., 220 volts, 60 cycles, operating at 1,200 R.P.M., and geared down through seven sets of gears to turn the main wheel (23 feet in diameter) 0.357 revolutions per minute. The southern approach to the swing span is a timber trestle 425 feet long and 10 feet wide. The swing span is identical to the one built for the same railroad in St. Joseph (see other entry).

PM RR: GRAND RIVER BRIDGE (1901,1902,1908,1922)
Over Grand River, north of Wealthy St.
Grand Rapids

Grand Rapids West
16.607630.4756810
Kent

This four-span swing bridge is 30 feet wide and 655 feet long, consisting of steel Pratt trusses resting on concrete piers and abutments. The two westerly spans are 151.5 feet long. The westernmost span was constructed in 1922 at the Gary, Indiana plant of the American Bridge Company, while the adjoining span was built in 1901 by the Detroit Bridge and Iron Company. The easternmost span, 120 feet long, was fabricated at the Toledo, Ohio plant of the American Bridge Company in 1908. The swing span, 231 feet long, was built at the Detroit plant of the American Bridge Company in 1902. Although this span is no longer moveable, the original gearing is still in place.

N & W RR: Rouge River Bascule Bridge (1921), Detroit

PM RR: MANISTEE RIVER BRIDGE (1937)
Chesapeake and Ohio RR, over Manistee River
Manistee

Bar Lake
16.554045.4899094
Manistee

This swing bridge consists of two steel deck girder approach spans of 25 feet and 60 feet, and a steel through-plate girder swing span 250 feet long, all resting on concrete piers and abutments. The swing span is asymmetrical, with the segment extending north from the center pier approximately 100 feet long, while the southern segment is about 150 feet long.

PM RR: SAGINAW RIVER BRIDGE (1944)
Chesapeake and Ohio RR, over Saginaw River
Saginaw

Saginaw
17.262220.4814000
Saginaw

This bascule bridge was constructed in 1944 by the American Bridge Company. It is approximately 700 feet long, with a bascule span 24 feet wide and the remaining spans 15 feet wide, all resting on concrete piers and abutments. The bascule span, located at the eastern end of the bridge, is a through truss span 160 feet long. Proceeding to the west, there are three through truss spans, all 120 feet long, and two steel deck girder spans, each 60 feet long. All the through truss spans are steel Warren trusses, with verticals.

PM RR: ST. JOSEPH RIVER BRIDGE (1904,1941)
Over St. Joseph River, west of US BR-94
St. Joseph

Benton Harbor
16.542750.4662155
Berrien

This swing bridge over the St. Joseph River was built by the American Bridge Company of New York for the Pere Marquette Railroad in 1904. The main span, a steel Warren truss, is 234 feet long and 15 feet wide. It is powered by an electric motor, 10 H.P., 220 volts, 60 cycles, 1,200 R.P.M. The motor is geared down through seven sets of gears, so that it turns the main wheel (23 feet in diameter) 0.357 revolutions per minute. The pier and protective pilings over which the swing span rests when in the open position is 280 feet long and 34 feet wide. The northern approach span, a steel deck girder span, is 130 feet long. There are two southern approach spans, both steel deck girder, 85 feet long and 95 feet long. The 95 foot approach span was installed in 1941, replacing the original steel truss span.

PM RR: St. Joseph River Bridge (1904,1941), St. Joseph

PM RR: WHITE RIVER BRIDGE (1894,1904)
Across White River, east of US BR-31
Whitehall

Montague
16.552055.4806075
Muskegon

This railroad bridge across the White River consists of two distinct portions. The southern portion consists of three steel girder spans, each 50 feet long and 8 feet wide, resting on concrete piers. It was built in 1894 by the Detroit Bridge and Ironworks of Detroit, Michigan. The northern section is a single swing span, 80 feet long and 8 feet wide, consisting of two bowed steel girders, eight feet high in the middle and six feet high at the ends. Although this section is no longer moveable, it was apparently originally operated manually. This portion was constructed by the American Bridge Company of New York in 1904.

SHORT-CUT CANAL BASCULE BRIDGE (1923)
Over Rouge River, at south end of Zug Island
River Rouge

Detroit
17.325525.4682600
Wayne

This highly unusual railroad bascule bridge is operated by a motor driven counterweight housed below grade in the concrete north abutment which is 35 feet long, 15 feet wide, and has a two-story control tower. The main span, which is a steel Warren truss with verticals and carries one track across the wooden deck, is 135 feet long and 15 feet wide spanning between a concrete retaining wall and two concrete piers. The bridge was upgraded in 1957 to accomodate heavier hot-bottle railroad cars. The bridge originally belonged to the Detroit, Toledo, and Ironton Railroad Company.

SIXTH STREET BRIDGE (1886)
6th St., across Saginaw River
Saginaw

Saginaw
17.263190.4815235
Saginaw

The Sixth Street Bridge was constructed by the Smith Bridge Company of Toledo, Ohio in 1886 and originally carried Genesee Avenue across the Saginaw River further upstream in downtown Saginaw. It was moved to its present site in 1904 when a new bridge was erected for Genesee Avenue. It is 30 feet wide, 555 feet long, and rests on cut stone piers and abutments. There are four distinct sections of this bridge. There are two approach trestles extending from both the north and south banks of the river, a single fixed Pratt truss span, and the swing span, also a Pratt truss. Proceeding from south to north, the approach trestle is 120 feet long, the fixed truss span is 150 feet long, the swing span is 185 feet in length, and the other approach trestle is 100 feet long.
[Mills, James C., History of Saginaw County (Saginaw, 1918), p. 243]

THIRD STREET BRIDGE (1889)
3rd St., over Saginaw River
Bay City

Bay City
17.266600.4831460
Bay

The Third Street Bridge (1889) is a five-span swing bridge, 39 feet wide and 811 feet long, resting on concrete piers and abutments. It was built by the Milwaukee Bridge and Iron Works for the Bay County Bridge Commission under the direction of H.E. Brawner, Engineer. The swing span is the center span, and is 233 feet long and pivots on a pier that is 45 feet in diameter. The other four spans, all Pratt trusses, are each 140 feet long. The Third Street Bridge served as a major artery across the Saginaw River until the swing span collapsed on June 17, 1976. [Bay City Times, June 18, 1976, p. 1]

Sixth Street Bridge (1886), Saginaw

WEST MAIN STREET BRIDGE (1909)
W. Main St., over St. Joseph River
Benton Harbor

Benton Harbor
16.543695.4662130
Berrien

This steel bascule bridge was constructed in 1909 at a cost of $60,000 to replace a wooden bridge which was rotting and in danger of collapse.

The costs of construction were shared by the two cities joined by the bridge, St. Joseph and Benton Harbor. It has three spans and is 306 feet long and 31 feet wide. This bridge has not been moveable for about fifteen years and is due to be demolished when a new bridge, now under construction, is completed.
[Reber, L. Benjamin, History of St. Joseph (St. Joseph: Morse, n.d.), pp. 133-136]

ZUG ISLAND BASCULE BRIDGE NUMBER 1 (1914)
Over Rouge River, at north end of Zug Island
River Rouge

Detroit
17.326160.4683800
Wayne

This single-track railroad bridge was built by the Scherzer Rolling Lift Bridge Company of Chicago. William Scherzer, Civil Engineer, patented this style of bridge in 1883. The bridge spans the Rouge River between Zug Island and Detroit. The north abutment, 20 feet long and 20 feet wide, consists of steel girders spanning between a concrete retaining wall and a composite steel and concrete pier. The south abutment, which contains the rack and concrete counterweight, is 40 feet long and 20 feet wide. The main span is 210 feet long and 20 feet wide. The steel bridge, which has a wooden deck, is a Warren truss with verticals.

ZUG ISLAND BASCULE BRIDGE NUMBER 2 (1914)
Over Rouge River, at north end of Zug Island
River Rouge

Detroit
17.326085.4633840
Wayne

This single-track railroad bridge was built by the Pennsylvania Steel Company in 1914. The bridge spans the Rouge River between Zug Island and Detroit. Today it is being used as a motor vehicle bridge as well as a railroad bridge. The north abutment, 25 feet long and 20 feet wide, consists of steel girders spanning between a concrete retaining wall and a composite steel and concrete pier. The south abutment, which contains the rack and concrete counterweight, is 35 feet long and 20 feet wide. The main span is 135 feet long and 20 feet wide. The steel bridge, which has a steel grating deck, is a Warren truss with verticals. A catwalk runs along the side of the bridge. This bridge is identical to Zug Island Bascule Bridge Number 1 which was designed by William Scherzer, Civil Engineer.

ZUG ISLAND SWING BRIDGE (1929)
Over Rouge River, near Jefferson-White intersection
River Rouge

Detroit
17.325355.4683880
Wayne

This single-track railroad bridge, also used by motor vehicles, spans the Rouge River between Zug Island and Detroit. The abutments consist of steel girders spanning concrete piers and steel sheet pile retaining walls. The north abutment is 35 feet long and 15 feet wide. The steel and cast iron main span, which is a Warren truss with verticals, is 15 feet wide, 230 feet long with 125 feet north of the pivot spanning the channel while the remaining 105 feet spans the southern portion from the off-centered pivot. The bridge originally belonged to the Detroit, Toledo, and Ironton Railroad Company.

Zug Island Swing Bridge (1929), River Rouge

AMBASSADOR BRIDGE (1929)
Across Detroit River to Windsor, Ontario
Detroit

Detroit
17.329050.4686270
Wayne

The Ambassador Bridge linking Detroit and Windsor, Canada was begun in May 1927 and completed in November 1929 at a cost of $22.5 million. The general contractor was the McClintic-Marshall Company of Pittsburgh and their chief engineer, Jonathan Jones, designed the bridge and supervised its erection. When completed, it was the longest suspension bridge in the world, extending a total of 9,602 feet with approaches. The two steel towers are 363 feet high and the main span is 1,850 feet long and 55 feet wide. The original design called for cables consisting of 37 strands of 206 wires, Number 6, heat-treated and galvanized. The bridge was well under construction when it was discovered that there was considerable breaking of the cable wires in the Mount Hope suspension bridge in Rhode Island, where the McClintic-Marshall Company was also using heat-treated wires. Work on the Ambassador Bridge was suspended on March 5, 1929 and it was decided to replace all of the heat-treated wire with cold-drawn wire. This was a major endeavor, since the main cables were already in place and much of the center span had already been completed, including the stiffening trusses. The main span was dismantled by lowering the stiffening trusses, floor beams, and suspended steel onto barges in the river. The new cables were then erected, and finally, the suspended span steel was then replaced. Between September 6 and September 27, 1929 about 4,000 tons of structural steel was erected. In spite of these modifications, the bridge was opened to traffic nine months ahead of its scheduled opening date of August 1930.
[Engineering News-Record, Vol. 102, April 14, 1929, pp. 564, 567; Vol. 103, November 14, 1929, pp. 766-767]

BLUEWATER BRIDGE (1938)
Across St. Clair River to Sarnia, Ontario
Port Huron

Port Huron
17.384000.4761460
St. Clair

The Bluewater Bridge linking Port Huron, Michigan and Sarnia, Ontario was completed in 1938 at a cost of $4 million, financed jointly by the State of Michigan and the Province of Ontario. This steel cantilever bridge has a main span of 871 feet, anchor arms 326 feet long, and approaches consisting of deck girder spans and two deck truss spans adjoining the anchor arms on both the American and Canadian sides. The American approach spans are 2,283 feet in length, while the Canadian approach is 2,657 feet long, giving the bridge an overall length of

6,463 feet. It is 38 feet wide, providing a roadway of 32 feet and two sidewalks. Each of the two main piers consists of two caissons 26 feet in diameter, with eight foot dredging wells. These were sunk to rock 95 feet below water level. The main span of the bridge provides clearance of 150 feet above the heavily-traveled St. Clair River. It was designed by the firm of Modjeski and Masters and their Canadian associates, the firm of Monsarrat and Pratley. The American Bridge Company fabricated and erected the main span, the Wisconsin Bridge and Iron Company erected the American approaches, and the superstructure for the Canadian approach span was built by the Sarnia Bridge Company. [Engineering News-Record, Vol. 121 (1938), pp. 234-236]

Bluewater Bridge (1938), Port Huron

MACKINAC STRAITS BRIDGE (1958)
Across Straits of Mackinac
Mackinac City

St. Ignace
16.676510.5076000
Emmet

The Straits of Mackinac have long served as a major Great Lakes shipping passage, but the five mile wide passage has also kept the two peninsulas of Michigan separated. As early as 1920, it was proposed that a tunnel be constructed to cross the Straits. Plans to construct a bridge were drawn up in 1934 and 1935, but languished during the Depression and World War II. The Michigan State Legislature then created the Mackinac Bridge Authority in 1950 and the Authority hired a team of consulting engineers to "determine whether a bridge can be safely and feasibly constructed across the Straits of Mackinac". The consultants, O.H. Ammann, D.B. Steinman, and G.B. Woodruff, recommended construction of the bridge in their report issued in 1951. The Authority retained D.B. Steinman to design the bridge and unsuccessfully attempted to sell $99.8 million in bonds in April 1953. The bonds were finally sold in December, but one construction season was thus lost. The substructure contract was awarded to Merritt-Chapman and Scott Corporation of New York City for $25,735,000 and the steel superstructure contract of $44.5 million went to the American Bridge Division of the United States Steel Corporation. During construction, which began in the summer of 1954, Grover C. Denny served as project manager for substructure construction and C.E. Haltenhoff was project engineer. J.W. Kinney served as the resident engineer for Steinman, who also retained G.B. Woodruff as a special consulting engineer for the project. The overall dimensions of this suspension bridge are impressive: a center span of 3,800 feet; two side spans of 1,800 feet; two backstay spans of 472 feet, giving the bridge a length of 8,614 feet between anchorages, the longest in the world; the two main towers are 552 feet above the water level, each contains 6,250 tons of structural steel, and they rest on massive concrete piers founded on bedrock 200 feet below the water level; the rest of the bridge consists of 28 truss spans resting on concrete piers and varying from 160 feet to 560 feet in length; overall, the bridge is 17,918 feet long, providing a roadway of 48 feet wide, and a minimum clearance above the water of 148 feet. The two cables supporting the main span are each 25.25 inches in diameter and consist of 37 strands of 348 galvanized wires. The cable sag of 350 feet or about one-eleventh of the length of the center span, gives the bridge a graceful appearance. This engineering monument was opened to traffic on November 1, 1957 and all work was completed by September 1958.
[Engineering News-Record, Vol. 154, January 27, 1955, pp. 35-39, 42-44; Vol. 160, February 6, 1958, pp. 36-40]

This section contains sites which illustrate the evolution of building design, with emphasis on innovations in building frameworks. A great deal of attention is given to industrial buildings where the interplay between architectural form and industrial function is direct and intimate. Many important examples of building technology have already been listed in previous sections of this book, particularly in those treating the bulk product and manufacturing industries.

The first "factories" in Michigan were the timber-framed flour and grist mills listed in the first section of this book. They were relatively small buildings, although often three or four stories high. Except for their stone foundations, they were constructed entirely of wood, with a frame of massive hand-hewn timbers (usually oak) as large as eighteen inches square, linked with wooden pegs. This design was attractive in rural areas in the nineteenth century because it could be built at low cost by a skilled carpenter utilizing local labor and readily-accessible raw materials. The chief drawback of the timber-framed mill was its susceptibility to fire, a disaster that struck hundreds of mills in Michigan in the past two centuries. As the state's forests became depleted at the end of the nineteenth century, the huge timbers required for this design became increasingly more costly.

At about that time, mill owners turned to masonry (usually brick) construction. Typically, the exterior brick walls bore the entire weight of the roof. The floors, usually wooden, were supported by horizontal timber beams resting on masonry. Vertical columns of either wood or cast iron completed the framework. This design had several advantages over timber-framed buildings. It was less vulnerable to fire, especially after sprinkler systems were introduced; floors could bear heavier loads and yet utilize smaller columns; and it was less costly, particularly for larger industrial buildings in urban areas in the late nineteenth century. There are over fifty examples of large-scale brick-walled buildings in this inventory. The West Cellblock of the Michigan State Prison (1842) is the oldest, but most of the buildings that have survived were constructed between 1885 and 1910. Large-scale construction in stone was rare in Michigan. Two interesting exceptions are the massive Phelps Sanitarium (1900) in Battle Creek and the Houppert Winery (1918). The brick-walled building was still far from ideal from the viewpoint of the factory owner. It was not entirely fireproof and the floorspace was still obstructed by numerous columns usually placed only ten or twelve feet apart.

Michigan was the birthplace of a significant innovation in building design -- the use of reinforced concrete in factory construction. Two Detroit architects, Albert Kahn and George Mason, experimented with reinforced concrete in the Palms Apartment Building (1902), the University of Michigan Engineering Building (1902), and in an office building erected for the Burroughs Adding Machine Company in 1904. Kahn then designed the first reinforced concrete factory building in Detroit, the Packard Motor Car Company Building Number 10 (1905). He used the same material for a Cadillac plant built in the same year, for a complex designed for the Chalmers Motor Car Company (1908), and for the Ford Motor Company Highland Park Plant (1910). All of these examples of the early use of reinforced concrete are still extant. Reinforced concrete was ideally suited to the needs of the early automakers, who wanted three or four-story factory buildings which had large unobstructed floorspace and were strong, fireproof, and inexpensive. From 1905 until the early 1920's virtually all of the major automobile factories built in Detroit were reinforced concrete structures designed by Kahn or Mason. Outside of Detroit, automakers adopted a wide variety of styles for their plants, with brick-walled buildings the most common.

Detroit's burgeoning automobile industry, with Kahn as its chief architect, continued to make significant innovations in industrial architecture. From his experience at the Highland Park Plant, Henry Ford concluded that single-story factories would improve efficiency for most manufacturing and assembly operations. His River Rouge Complex, designed by Kahn, embodied Ford's thinking on a massive scale. The first major structure erected there was Building B (1917), a single-story steel-framed building one-half mile long. There were over a dozen major buildings of similar design built at this site between 1921 and 1939, making the Ford Motor Company River Rouge Plant the largest industrial complex in the world. The other automakers followed Ford's lead, as did most other manufacturers, and this design has dominated industrial architecture to the present day. The general unsuitability of single-story factories in urban areas, with their high real estate values, is not unrelated to the decay of Detroit and other industrial cities in recent decades.

BATTLE CREEK SANITARIUM HOSPITAL (1903,1928)
74 N. Washington Ave.
Battle Creek

Battle Creek
16.649240.4687500
Calhoun

The Seventh Day Adventists established a boarding house in Battle Creek in 1866. Dr. John Harvey Kellogg became Superintendent of this facility, the Health Reform Institute (later, the Battle Creek Sanitarium) in 1876 and remained in this position until 1943. He and his brother established the Battle Creek Toasted Corn Flake Company, the forerunner of the W.K. Kellogg Company, in 1906. The present buildings are on the site of the original Battle Creek Sanitarium Hospital, a wooden structure which burned to the ground in 1902. The hospital built in 1903, fronting on North Washington Avenue, is a five-story brick building, with a flat roof, approximately 450 feet long and 75 feet wide, with six Doric columns over the main entrance and four similar columns at both ends of the building. A thirteen-story steel-framed brick tower was constructed in 1928 to the southeast of the 1903 structure. It has twenty Doric columns on its southwest facade. In 1942, both buildings were sold to the U.S. Army, which converted them into the Percy Jones Hospital for Amputees for the duration of the war. This complex now serves as the Battle Creek Federal Center.
[Battle Creek Enquirer-News, July 20, 1975, pp. F-1, F-4]

CHAMBER OF COMMERCE BUILDING (1895)
46 State St.
Detroit

Detroit
17.331185.4688560
Wayne

This thirteen-story flat-roofed skyscraper was designed by Frederick H. Spier and William C. Rohns. This building and the original Union Trust Building, which is no longer standing, were the first buildings in Detroit to use an all-steel skeleton frame which supported the entire structure. The style is Italian Renaissance with round arched windows on the third and tenth floors with the rest of the windows being rectangular. The building is 100 feet long, 85 feet wide, and U-shaped above the third floor to admit light. The first two floors are faced with stone, the next two floors are faced with rusticated stone veneer, and the remainder of the structure is covered with common bond brick. The building has been renamed the Detroit Savings Bank.
[Ferry, pp. 136-137]

DAVID WHITNEY BUILDING (1915)
1553 Woodward Ave.
Detroit

Detroit
17.331060.4688880
Wayne

This eighteen-story steel-framed structure was designed by Daniel H. Burnham of Chicago. It was intended for doctors and dentists with the corridors facing an inside court, thus permitting an outside exposure for all the offices. The building is 125 feet long, 90 feet wide at the front, 120 feet wide at the back, and has a flat roof. The windows are rectangular. There are cast iron spandrels on the third, fourth, seventeenth, and eighteenth floors. The rest of the structure is sheathed with white brick laid in common bond pattern. The lobby is covered by a glass and beam dome at the fifth floor level.
[Ferry, p. 188]

DETROIT CORNICE AND SLATE COMPANY BUILDING (1897)
733 St. Antoine St.
Detroit

Detroit
17.331880.4688720
Wayne

Designed by architect Harry J. Rill, the Detroit Cornice and Slate Company Building is a three-story structure of brick with a front facade of hammered and pressed galvanized steel that was painted to resemble stone. Most of the numerous friezes and tampanums were hammered by hand; the facade was fabricated inside the shop during construction. Evolving from the cast iron tradition, the use of a galvanized steel facade was particularly advantageous in Detroit where, as Hawkins Ferry writes, "the dearth of stone quarries and skilled stone workers had always been a problem, the economic advantage of substituting iron for cut stone was particularly welcome". The building was used by the Detroit Cornice and Slate Company until 1972 at which time the firm moved to the suburbs. The new owners hope to use the third floor as an apartment and art studio while the first and second floors will be used for office space.
[Ferry, p. 189; "Sheet Metal Fronts for Buildings," Carpentry and Building, XXII, August 1900; Detroit News, August 12, 1956 and October 5, 1972; NR]

DETROIT [UNIVERSITY OF MICHIGAN]
OBSERVATORY (1854,1857,1892)
Observatory Drive
Ann Arbor

Ann Arbor East
17.274770.4684480
Washtenaw

There are two distinct, but interconnected observatories on this site. The oldest, constructed in 1854, was called the Detroit Observatory because it was built with funds raised largely in Detroit by University of Michigan President Henry Philip Tappan. A two-story brick building with a stucco facing, 33 feet square, supports the wooden dome which is 21 feet in diameter. The dome is turned manually through a series of pulleys, still extant. The twelve inch refracting telescope was built by Henry Fitz of New York and bears the date 1857. It rests on a masonry pier which extends fifteen feet below grade. The site also includes a three-story rectangular brick building (1892), 40 feet wide and 120 feet long, with a dome 45 feet in diameter at its southernmost end.
[MHD, Site Files; NR]

DIME [COMMONWEALTH] BUILDING (1910)
719 Griswold Ave.
Detroit

Detroit
17.331270.4688360
Wayne

Classical details are evident on this twenty-three-story building designed by Daniel H. Burnham of Chicago. This steel-framed structure was U-shaped above the lower stories for the admission of sunlight. It is sheathed with white brick in the common bond pattern. The structure is 150 feet long and 130 feet wide, has a flat roof, rectangular windows, and iron spandrels on the twenty-second floor.
[Ferry, p. 188]

ENGINEERING BUILDING (1902)
E. University Ave.
Ann Arbor

Ann Arbor East
17.274350.4683830
Washtenaw

The Engineering Building at the University of Michigan was one of the first reinforced concrete buildings designed by Albert Kahn and George Mason. It is an L-shaped three-story building with a brick exterior and hipped roofs. One wing is 140 feet long, the other is 400 feet in length and both are 70 feet wide.
[Ferry, pp. 181, 188]

FISHER BUILDING (1928)
3011 W. Grand Blvd.
Detroit

Detroit
17.328930.4692675
Wayne

This magnificent structure, designed by Albert Kahn in the Gothic style, was part of the New Center, along with the General Motors Building, to provide a secondary business district to relieve congestion of the downtown area plus provide more accessibility to the suburbs. The transition between the two eleven-story wings to the peak of the twenty-eight-story tower, 440 feet high, was done by a series of setbacks. The building has flat roofs with the exception of the hip roof on top of the tower which was rare for that time. Round arched windows are on the lower and upper floors, while the rest are rectangular. The first three stories of the steel-framed structure are faced with pinkish-gray granite while the rest is sheathed with white marble. The L-shaped vaulted dome arcade is 30 feet wide, 44 feet high and lined with 40 varieties of domestic and European marble. The tower is 175 feet long and 85 feet wide, the west wing is 140 feet long and 60 feet wide, and the north wing is 290 feet long and 60 feet wide. A 175 foot long, 155 foot wide eleven-story garage with a 1,100 car capacity is attached to the north wing for convenience. The famous Fisher Theater, 165 feet long and 140 feet wide, is attached to the west wing.
[Ferry, pp. 333-335]

FORD BUILDING (1909)
615 Griswold Ave.
Detroit

Detroit
17.331320.4688240
Wayne

This eighteen-story building was designed by Daniel H. Burnham of Chicago. The prestigious Burnham was the chief consulting architect for the Chicago World's Fair of 1893. The steel frame was expressed by the clean sharp lines of the white terra-cotta facing. The structure had a few Classical details. The structure is 135 feet long, 105 feet wide, has a flat roof and rectangular windows. There are iron spandrels and round arched windows on the top floor. The building is U-shaped with the interior light-court walls sheathed with common bond brick.
[Ferry, p. 187]

FORT WAYNE BARRACKS (1848)
6053 W. Jefferson Ave.
Detroit

Detroit
17.327230.4684925
Wayne

One of the most monumental buildings of the Federal architectural period, this barracks was designed by Lieutenant Montgomery C. Meigs. The three and one-half story building is divided into five bays or sections separated by two foot firewalls. The walls are made of Erie limestone 24 inches thick. Well-lighted rooms were heated by large open fireplaces. Floors are made of brick, concrete and wood, supported by heavy oak joints and beams. The roof is cantilevered into the walls and supports the third floor by thick wrought iron rods suspended from the ridgepole. Musket loopholes are provided on the upper floors at each end of the building. The barracks also illustrates the use of bearing walls for the structure of multi-story buildings which was prevalent at this time. It is 35 feet wide and 165 feet long and has a gabled roof, rectangular windows and common bond stonework. A 10 foot wide common bond brick bay is attached to the entire rear length of the building. The barracks is now part of the Historic Fort Wayne Museum.
[Ferry, p. 31; MHD, Site Files]

GENERAL MOTORS BUILDING (1922)
3044 W. Grand Blvd.
Detroit

Detroit
17.329075.4692615
Wayne

Albert Kahn designed this vast corporate headquarters building in the Italian Renaissance style. Although it is only fifteen stories high it was the second largest building in capacity in the world. The site chosen for this structure was removed from the congested downtown area so there was no need to reach for the sky and provisions could be made for ample lighting and air circulation. Four massive cross-wings were arranged so as to form large open courts. Each wing was 50 feet wide and 250 feet long. A five-story annex was built across the back forming three open courts. The overall dimensions of the building are 504 feet long, 322 feet wide, and 212 feet high. The gross area is 1,124,254 square feet for the main building and 195,282 square feet for the annex. The steel-framed structure has reinforced concrete floors and marble interior walls. The steel is encased in concrete or vitrified clay for fireproofing.
[Legacy, p. 20; Ferry, p. 215]

General Motors Building (1922), Detroit

D.J. HEALY COMPANY (1910)
1426 Woodward Ave.
Detroit

Detroit
17.331190.4688780
Wayne

The advent of the skyscraper owed itself to the development of the steel or concrete skeleton-frame system that supported the entire load of the structure, thus eliminating the need for massive bearing walls. Therefore, terra-cotta and other lightweight economical materials could be used for exterior sheathing of the framework and forming curtain walls. An example of this in Detroit is the 95 feet long, 65 feet wide, flat-roofed six-story D.J. Healy Company Building, designed by Postle and Mahler of Chicago, which was constructed of reinforced concrete with cream-colored facing. The external terra-cotta grille of unbroken

piers and spandrels expressed the underlying frame structure. The building exhibits some Renaissance features. Large windows were used with the upper portion of each using translucent glass to reduce glare. The face of the lower stories have since been altered for commercial appeal. The sixth floor windows are basket-handle arched, the rest are rectangular. The brickwork is common bond.
[Ferry, p. 184; Condit, Carl W., American Buildings (Chicago: University of Chicago Press, 1968), p. 114]

MICHIGAN STATE FAIR RIDING COLISEUM (1922)
State Fairgrounds
Detroit

Highland Park
17.325900.4700950
Wayne

The roof area of this structure consists of a "Rain-bo" steel truss designed by the Pratt Roof Truss Company, established by Walter M. Pratt. The coliseum is 420 feet by 225 feet while the actual rink area is 264 feet by 124 feet. The ceiling is comprised of slate tiles covered by shingles which create an antique effect that follows the entire design of the building. The roof is designated to be replaced during the next few years as leakage is occurring. The coliseum is one of the largest trussed structures in the Detroit area and is still used for various public events.

MICHIGAN STATE PRISON: WEST CELLBLOCK (1842)
Armory Court and Cooper St.
Jackson

Jackson North
16.713925.4681350
Jackson

The Michigan State Legislature authorized the construction of the first state prison in 1837, to be built at Jackson. The first permanent building erected there was the West Cellblock, completed in 1842. An East Cellblock, completed in 1857, as well as the stone walls originally surrounding these buildings, are no longer extant. The West Cellblock is a rectangular brick building, 50 feet wide and 100 feet long, with a gabled roof topped by six cupolas for ventilation. It originally contained 328 cells, each three and one-half feet by nine feet by seven feet high, entirely of cast iron construction, arranged in five tiers which were at least six feet from any outside wall. The roof is supported by massive timber Fink trusses. A new state prison was built in Jackson in 1934 and the Michigan National Guard now utilizes the West Cellblock for miscellaneous storage.
[MHD, Site Files; History of Jackson County (Chicago: Interstate Publishing, 1881), pp. 572-574]

MURDOCK HOME (1831)
Union St. and Cass St.
Berrien Springs

Berrien Springs
16.554630.4644000
Berrien

This is a rare example of a two-story log house, the oldest surviving example in Michigan. It was constructed in 1831 by Francis Murdock, the first lawyer in Berrien County. The existence of this house was recently discovered when the sheet metal siding which had hidden the logs was removed. It was then moved one mile to its present site, behind the Berrien County Courthouse (1838) in 1973. It is a two-story structure with a gabled roof, 24 feet wide and 32 feet long. The logs are double-locked at the corners. The cracks between the logs, originally blocked by horsehair, are now filled with concrete.
[MHD, Site Files]

Murdock Home (1831), Berrien Springs

OLD STONE BARN (1857)
323 W. Michigan Ave.
Marshall

Marshall
16.667860.4681700
Calhoun

This attractive stone building has been used for numerous purposes since it was constructed in 1857 by William Prindle of Marshall. Although it was initially used as a barn, it has also served as a livery stable, stagecoach station, and gasoline station. It was purchased by the Town of Marshall in 1928, converted into a town hall by architect Howard Young, and has been used for that purpose since 1930. It is a two-story fieldstone structure, 100 feet wide and 60 feet long, with a hipped roof. [MHD, Site Files]

PALMS APARTMENT HOUSE (1902)
1001 E. Jefferson Ave.
Detroit

Detroit
17.332360.4688600
Wayne

The six-story Palms Apartment House was designed by Albert Kahn and George D. Mason. It was built in 1901-1902 in the Jacobian style with limestone walls and reinforced concrete floors. There are two cast iron bays on the west side of the building. Reinforced concrete was in a rudimentary stage of development and was just coming into use in Europe and the United States at the turn of the century. The Palms Apartment House was Kahn's first experiment with the use of reinforced concrete. There was considerable risk involved in building with concrete in those days for the use of concrete in construction was so new that handbooks were not available and formulas were virtually nonexistent. The building still stands and is in use today. It has a flat roof and is 95 feet long and 90 feet wide. The windows are rectangular and the stonework is common bond. The building is U-shaped to help admit light.
[Legacy, p. 10; Ferry, pp. 180-181]

PARKER BLOCK (1883)
1075 Woodward Ave.
Detroit

Detroit
17.331150.4688550
Wayne

Iron had served European countries at this time for beams and columns, but its use on exteriors of buildings was largely an American phenomenon. Multiple architectural design pieces were much cheaper when made of cast iron than to be cut out of stone and wood, and cast iron lasted longer. Laborious craftsmanship was impractical in the age of limited budgets

and fixed cost estimates. In Detroit, where the shortage of stone quarries and skilled stone workers had always been a problem, the economic advantages of substituting iron for cut stone was particularly welcome. The architectural aspects of cast iron was more appealing than its structural applications in Michigan since there was a plentiful supply of brick and lumber for the underlying structure of commercial buildings. Round iron columns had been introduced to support wood beams and joists but in Detroit, at least, the iron facade was purely ornamental. Iron panels were bolted together and attached to conventional brick exterior walls. The Parker Block Building, designed by Gordon W. Lloyd, is an example of these iron-fronted buildings. The rest of the six-story steel-framed building is brick. It is 95 feet long, 60 feet wide and has a flat roof. The windows of the two upper floors are round arched, the rest are rectangular.
[Ferry, pp. 88-90]

PENOBSCOT BUILDING (1928)
645 Griswold Ave.
Detroit

Detroit
17.331290.4688290
Wayne

Detroit took third place nationally, after New York and Chicago, in building operations during the 1920's. During this period Smith, Hinchman and Grylls built several skyscrapers along Griswold Avenue, Detroit's "Wall Street". One of these was the forty-seven-story Penobscot Building which was the tallest building in Michigan until the seventy-story Detroit Plaza Hotel is completed in 1976. The simple limestone mass sheathing the steel frame is devoid of architectural details which was a significant achievement for that era since most architects relied on historical styles for their design. Thus emancipated from the shackles of history, it was a bold expression of a new era in architecture. The structure is H-shaped in plan up to the thirtieth floor where a series of cubic setbacks continue to rise up to the apex which is terminated by a slender aircraft beacon atop the flat roof. The windows are rectangular while those of the upper levels are round arched. The structure is 140 feet long, 140 feet wide, 520 feet high, and has one million square feet of floor space. The stonework is common bond.
[Ferry, pp. 328-330]

Palms Apartment House (1902), Detroit

PHELPS SANITARIUM (1900)
197 N. Washington Ave.
Battle Creek

Battle Creek
16.649065.4687810
Calhoun

M.S. Phelps built this sanitarium with stones gathered from the Packard-Austin farm in Battle Creek. His sanitarium went bankrupt in 1904 and the building was acquired by C.W. Post, the cereal magnate. It again served as a sanitarium in 1907-1910, operated by Bernard MacFadden. Dr. John Harvey Kellogg, the internationally known director of the Battle Creek Sanitarium and the brother of W.K. Kellogg, the cereal magnate, purchased this building in 1914. It served as an annex to the Kellogg's main facility located across the street from 1914 until 1942, at which time it became the main facility of the Battle Creek Sanitarium.

During the period 1914-1942, this building was used as nurses' quarters and was the home of J.H. Kellogg's Race Betterment Foundation. Today, it is largely vacant, the upper stories used for storage. It is a five-story fieldstone structure, with hipped roofs, stone cornices, and a wooden porch extending around three sides of the building. It is approximately 300 feet long, 70 feet wide, with two wings (60 feet wide by 200 feet long) at the north and south ends of the structure. This was reputed to have been the largest fieldstone building in North America when it was built.
[Battle Creek Enquirer-News, July 20, 1975, pp. E-1, E-2, F-4]

Phelps Sanitarium (1900), Battle Creek

PRESSED BRICK HOUSE (c.1845)
201 N. Hannah St.
Albion

Spring Arbor
16.686035.4679020
Calhoun

This Greek Revival home, 30 feet by 40 feet, is a one and one-half story structure with a hipped roof and undereave windows. It is a rare example of "pressed brick" construction. Gravel and clay were pressed into wooden forms and dried in the sun. The resulting bricks (4 inches by 4 inches by 8 inches) were laid in the standard fashion and then covered by a thin cement coating to protect them from the elements.
[MHD, Site Files]

WOODWARD BUILDING (1915)
19 Clifford St.
Detroit

Detroit
17.331130.4688770
Wayne

This eight-story building was designed by Albert Kahn. Kahn felt that exposed concrete was satisfactory for extensive industrial sites, however, he wanted a more appealing finished surface for downtown Detroit office buildings. He used white terra-cotta, which resembled classic white stone, on the piers of the Woodward Building. Iron spandrels were another external feature of this building. The flat-roofed structure is 95 feet long and 65 feet wide with reinforced concrete floors, and tile and concrete fireproofing the steel framework. The windows are rectangular with the exception of the basket-handle arched third floor windows. The rear brickwork is common bond.
[Ferry, p. 186]

BIRKITT [MITCHELL] DAM (1933)
Franklin St., across Bear River
Petoskey

Petoskey
16.659048.5025090
Emmet

This concrete dam is all that remains of the Birkitt Hydroelectric Development, constructed in 1932-1933 by the City of Petoskey. It was designed and built under the direction of Peter T. Mitchell, City Manager and City Engineer for Petoskey during the 1930's. The dam developed a head of 31 feet. This small (500 KW) power plant was phased out in the 1940's, when Petoskey built a diesel generating plant. The surviving dam structure, which also serves as a bridge, is of reinforced concrete construction, approximately 100 feet long, and varies from 12 feet to 40 feet in width. One pair of gates at the southern end of the dam are closed off with a concrete wall, while a pair of waste gates and a siphon spillway at the northern end of the dam are still in use.

DETROIT-WINDSOR VEHICULAR TUNNEL (1930)
Under Detroit River to Windsor, Ontario
Detroit

Detroit
17.331900.4687560
Wayne

This is the third major subaqueous vehicular tunnel constructed in the United States, after the Holland Tunnel and the George A. Posey Tube. It was completed in 1930 at a cost of $23 million. The supervising and designing engineers were Parsons, Klapp, Brinkerhoff and Douglas of New York and Detroit, Burnside A. Value was the executive engineer, and Soren A. Thoreson served as engineer of designs. The general contractors were the Parkland Construction Company and Porter Brothers and Robert Porter of Spokane, Washington. The tunnel is 5,135 feet long from portal to portal and provides a 22 foot roadway with a 13 and one-half foot clearance. Beginning from the American side, the tunnel consists of an approach tunnel (cut-and-cover) 627 feet long; a shield-driven tunnel 591 feet long extending to the edge of the riverbed; a subaqueous segment 2,200 feet long built by the trench and tube method; a shield-driven Canadian segment 1,115 feet long; and a cut-and-cover approach tunnel 602 feet in length. The American approaches utilize a five per cent grade, while the Canadian approaches have a grade of 3.97 per cent. The trench for the subaqueous section was 45 feet deep, 90 feet wide at the top, 20 feet wide at the bottom, and required the excavation of 275,000 cubic yards of soil from the riverbed. Nine steel tubes, each 248 feet long with an outside diameter of 31 feet,

were floated on barges, and then encased in concrete and given an 18 inch concrete lining before being sunk. The tubes were then connected and the bulkheads between them removed.
[Detroit-Windsor Tunnel Authority, The Tunnel Construction Story; Engineering News-Record, Vol. 103, October 17, 1929, pp. 600-606]

FORT WAYNE (c.1845-1850) | Detroit
6053 W. Jefferson Ave. | 17.327230.4684925
Detroit | Wayne

Fort Wayne was built by Lieutenant Montgomery C. Meigs at the major bend in the Detroit River due to border tensions that developed between the United States and Canada. The fort was completed in 1849 after seven years of construction and was based on the principles laid down by the great French military engineer, Sebastien Vauban. The square stronghold originally had sand embankments and a red cedar scarp wall with embrasures of oak. In 1864 the cedar scarp was replaced by a brick and concrete scarp wall 2,200 feet in circumference, 17 feet high, seven and one-half feet thick, and backed by earthworks extending five feet above the wall. The oak embrasures were replaced by concrete. The counterscarp-glacis (external ridge of earth), creating a dry moat, protected the brick walls of the fort from direct hits from bombardment. The fort is complete with casemates, entrance tunnel, powder magazines, and a stone barracks. Brick administrative buildings were added outside the fort after 1870. Although the fort was never attacked, it served as a troop training center. It was transferred to the City of Detroit in 1949 and is now a military museum.
[Ferry, p. 31; MHD, Site Files; NR]

FORT WAYNE POWDER MAGAZINE (1848) | Detroit
6053 W. Jefferson Ave. | 17.327230.4684925
Detroit | Wayne

The unusual construction of this one-story powder magazine minimized the effect of any possible explosion by directing the force of the explosion upwards. This was accomplished by setting the building back into an earth embankment with a buttressed retaining wall providing a three foot airspace between the building and surrounding earth. There are two rows of stone horizontal cross-braces between the two foot thick retaining wall, and the five foot thick side walls and four foot thick end walls

of the structure. The masonry used uneven sized blocks of limestone. The ceiling is made of a single-span common bond brick arch 15 feet wide and heavily overlaid with concrete. The building has a gabled roof and is 30 feet long and 25 feet wide.
[MHD, Site Files; NR]

GRANDSTAND: JACKSON COUNTY FAIRGROUNDS (1917,1962)
200 W. Ganson St.
Jackson

Jackson North
16.713530.4681300
Jackson

The Grandstand at the Jackson County Fairgrounds is an early example of massive reinforced concrete construction on a structure other than a bridge or industrial building. The original grandstand, completed in 1917, is 404 feet long and 85 feet wide. A one-story steel-framed addition to the space under the stands (used for concessions, restrooms, and betting facilities), measuring 30 feet wide and 404 feet long, was built in 1962. Reinforced concrete columns and beams support the concrete stands, which are covered by a shingled wooden roof supported by steel roof trussing which is supported in the front (facing the track) by six steel I-beams and in the rear by the reinforced concrete columns. The concrete was poured from wheelbarrows by convicts from nearby Jackson State Prison. This is the largest grandstand in Michigan outside of Detroit.

GTW RR: DURAND COAL TIPPLE (c.1920)
End of Brookfield St.
Durand

Durand
17.255310.4755590
Shiawassee

Reinforced concrete coal tipples like the one at the Durand repair yards of the Grand Trunk Western Railroad were familiar sights at railroad yards during the early twentieth century, when the coal-burning steam locomotive was the only motive power on most railroads. This tipple is 30 feet wide, 50 feet long, and approximately 75 feet high, with a gabled roof.

GTW RR: Durand Coal Tipple (c.1920), Durand

GTW RR: GRAND HAVEN COAL TIPPLE (c.1910)
Madison St., west of 2nd St.
Grand Haven

Muskegon
16.562065.4768035
Ottawa

This reinforced concrete coal tipple, a holdover from the age of coal-fired steam locomotives, is similar to the tipples that are still extant in Lansing and Durand (see other entries). It is 20 feet wide, 30 feet long, and approximately 100 feet high, with a gabled roof. The arched opening at the base of the tipple, through which the locomotive tender would be driven, is 15 feet wide and approximately 30 feet high. A small square tower rising another 15 feet above the main roof housed the hoisting equipment used to raise the coal to the top of the storage bin.

GTW RR: ST. CLAIR RIVER TUNNEL (1891)
Under St. Clair River, Port Huron to Sarnia
Port Huron

Port Huron
17.383150.4757160
St. Clair

The Grand Trunk Western Railroad Company's main East-West trunkline linking Chicago with the Eastern seaboard faced a serious bottleneck at Port Huron, where the line crossed the St. Clair River. All the cars (over 332,000 by 1888) had to be transported across the river by ferry. A tunnel had been proposed at this location as early as 1874, but it was not until 1884 that the railroad established the St. Clair River Tunnel Company to proceed with surveys. Under the direction of Joseph Hobson, Chief Engineer, a series of borings were made in 1885 and these showed that the strata under the river consisted of soft clay permeated with water, an extremely unstable material. Plans for the project lay dormant until 1888, when the Company decided to proceed and the Dominion Government agreed to grant a subsidy of fifteen per cent of the estimated total cost of $2.5 million. After several attempts to sink vertical entrance shafts in 1888 failed because of flooding, it was decided to proceed by making open cuts to the tunnel portals and then to utilize a shield and line the entire tunnel with cast iron. Tunneling began on the American side in July 1889 and in September on the Canadian side. The tunnel shields similar to that designed by Alfred Beach in 1868, but modified by Hobson, were built by the Hamilton, Ontario Tool and Bridge Works. They were 15 feet 3 inches long, had an outside diameter of 21 feet 6 inches, were made of steel plates one inch thick, and weighed eighty tons. The shields were forced ahead two feet at a time by hydraulic rams. When the tunnel began to pass under the river, solid brick bulkheads containing airlocks were built behind the shields to

enable the use of compressed air. As the air pressure was raised from 10 pounds to 28 pounds above atmospheric pressure, numerous workers suffered from the "bends" and three died. With an average of 700 men employed on the project, tunneling proceeded rapidly and the two shields met under the river on August 30, 1890. The tunnel officially opened on September 19, 1891. It represented a major engineering achievement, because of its size and the innovative techniques which were utilized in construction. Beginning from the American side and proceeding westerly, the tunnel consists of an open cut 2,533 feet long; a segment passing under dry land 1,716 feet long with a two per cent downward grade; the river segment 2,290 feet long with a one per cent downward grade; the Canadian segment passing under dry land 1,994 feet long with a one per cent downward grade; and the Canadian open cut of 3,192 feet. The total length of the tunnel proper is 6,000 feet and with approaches 11,725 feet. Over 2 million cubic feet of soil was excavated for the tunnel segment. The cast iron tube which comprises the tunnel is 20 feet in diameter and weighs 28,000 tons. The extremely difficult soil conditions encountered at this site were overcome by a combination of tunneling innovations -- the use of a cast iron tunnel lining, compressed air, and a modified Beach shield. The St. Clair River Tunnel is virtually unchanged since its completion. It was electrified in 1908 and the tracks in the tunnel were lowered slightly in 1950.
[Engineering News, XXIV (1890), pp. 291-293, 425-426, 457; NR]

KALAMAZOO STATE HOSPITAL WATER TOWER (1895) — Kalamazoo
Oakland Drive — 16.615080.4681480
Kalamazoo — Kalamazoo

This water tower was designed by B.F Stratton to ensure that the Michigan Asylum for the Insane (now the Kalamazoo State Hospital) had an adequate water supply. An excellent example of Medieval Revival architecture, this is really a tower within a tower, both of brick construction. The tanks, located at the top of the tower, are enclosed by a yellow clay tile curtain wall. The base of the outer tower is six feet thick, while the base of the inner tower is four feet thick. This structure is approximately 175 feet high. There are three steel tanks -- a single 220,000 gallon tank for hard water and two 7,500 gallon tanks for soft water. Standing as the highest structure in Kalamazoo, the tower helped save the city from fire when the city water mains burst during the Burdick Hotel fire in 1909.
[Kalamazoo Foundation Tower Fund, Save the Tower; NR]

GTW RR: St. Clair River Tunnel (1891), Port Huron

MC RR: DETROIT RIVER TUNNEL (1909)
Jefferson Ave. and 10th St.
Detroit

Detroit
17.330440.4687080
Wayne

The Michigan Central Railroad constructed this tunnel in order to ease the transfer of its cars across the Detroit River to its Canadian lines. It replaced an inconvenient and unreliable car ferry. A contract was awarded to the Butler Brothers, Hoff Company of New York on August 1, 1906, with all work to be completed by June 1909. W.S. Kinnear served as chief engineer, B. Douglas was the tunnel engineer, and J.C. Mock served as the electrical engineer for the project. Built at a cost of $10 million, the tunnel is 2.5 miles long, with an American approach of 3,675 feet and a two per cent grade, a Canadian approach of 6,500 feet

with a 1.5 per cent grade, and a river section 2,620 feet in length. A combination of the cut-and-cover and the shield methods were used for the approaches, while the river section used the trench and tube method of construction. A trench ranging from 30 to 50 feet in depth and about 48 feet in width at its bottom was dredged in the riverbed by the Dunbar-Sullivan Dredging Company of Buffalo. Ten steel sections 262 feet long, each containing twin steel tubes 23 feet 4 inches in diameter, were lowered into the trench with the aid of steel tanks which were gradually filled with water. The steel tubes simply served as shells which were encased in concrete and given a three foot thick interior concrete lining.
["Detroit River Tunnel," Engineering News, Vol. 58, No. 18, October 31, 1907, pp. 453-455]

MC RR: LANSING COAL TIPPLE (c.1920)
Southwest of the end of Randall St.
Lansing

Lansing North
16.701380.4736485
Ingham

Reinforced concrete coal tipples like the one still standing at the site of the Michigan Central Railroad's Lansing Yards were familiar sites in railroad yards during the first decades of the twentieth century, when the coal-burning steam locomotive was the only motive power used by most railroads. This tipple is 30 feet wide, 33 feet long, and approximately 75 feet high, with a gabled roof covering an area approximately 10 feet by 33 feet, and a sharply pitched roof covering the remainder of the structure.

NORVELL DAM AND BRIDGE (1909)
Mill Rd., over Raisin River
Norvell Township

Manchester
16.732060.4670075
Jackson

This combination bridge and dam consists of four stone arches of layered sandstone blocks and is 18 feet wide, 90 feet long, and approximately 20 feet high. The arches, each 15 feet high and 15 feet wide, support the eight foot high Norvell Dam, as well as Mill Road.
[Jackson Citizen-Patriot, September 8, 1974]

Kalamazoo State Hospital Water Tower (1895), Kalamazoo

TIGER STADIUM [NAVIN FIELD] (1912)
Trumbell Ave. and Michigan Ave.
Detroit

Detroit
17.329500.4688590
Wayne

The Detroit Tigers began playing at this site at Bennett Park in a primitive facility consisting of a field of two inches of loam over cobblestones and wooden stands seating 8,500 fans. A new steel and concrete stadium seating 23,000 was opened on April 20, 1912. It was named after Frank Navin, then President of the Detroit Tigers. The general contractor was Hawkins and Conkey of Cleveland, while the Detroit Iron Works erected the steel framework. The Osborn Engineering Company of Cleveland designed the new facility, which was built at a cost of about $300,000. In 1924, Navin had the stands double-decked from first base to third base and a press box was built on the roof. In 1936 more remodeling was done. The right field pavilion and bleachers were double-decked, increasing the capacity to 36,000. Even more changes were brought about in 1938, when more seats were added, raising the capacity to 53,000. The stadium was renamed to Briggs Stadium on April 21, 1938. It became Tiger Stadium in 1961 and remains so today. Overhead lights were added in 1948, but no major changes were really made since 1938.
[Moss, Richard J., "Tiger Stadium," (Michigan History Division, 1976)]

YPSILANTI WATER TOWER (1889)
Summit St. and Cross St.
Ypsilanti

Ypsilanti East
17.283460.4680150
Washtenaw

This magnificent water tower was designed by W.R. Coats and erected in 1889 at a cost of $21,132. It stands 147 feet high and consists of a lower segment, 85 feet high, of stone construction, which is topped off by a shingled cedar roof, 62 feet high. The stone outer wall, which is 42 feet in diameter, is 3 feet 4 inches thick at the base and 2 feet thick at the top. There are in addition three interior stone walls, which are parallel to each other and are perpendicular to the outer wall. Along with the outer walls, they support the water tank, which rests directly on steel I-beams. The steel water tank is 40 feet in diameter, 27 feet high, and has a capacity of 250,000 gallons. This water tower was erected on the highest point in Ypsilanti and dominates this small college town. It is still an integral part of the city's water system.

Ypsilanti Water Tower (1889), Ypsilanti

HAER INVENTORY

1 NAME OF STRUCTURE: Sixth Street Bridge

2 DATE: 1886

3 NATURE OF STRUCTURE: Swing Bridge

4 INDUSTRIAL CLASSIFICATION: BT&A:MOVE:SWING (65.2)

5 LOCATION STREET & NUMBER: Sixth Street, across Saginaw River — CITY OR TOWN: Saginaw — COUNTY: Saginaw — STATE: MI

6 USGS QUAD MAP & UTM GRID REF: Saginaw 17.263190.4815235

7 OWNER OF PROPERTY: City of Saginaw — ADDRESS: City Hall, 1315 South Washington Saginaw, MI

8 CONDITION: EXCELLENT GOOD X FAIR DETERIORATED RUINS UNEXPOSED ALTERED ACCESSIBLE TO PUBLIC

9 DESCRIPTION & BACKGROUND HISTORY NUMBER OF STRUCTURES DIMENSIONS FABRIC STRUCTURE & FORM SURVIVING MACHINERY, FITTINGS AND EQUIPMENT APPROX AREA OF SITE ALTERATIONS PRESENT USE ENGINEER ARCHITECT DESIGNER IMPORTANT EVENTS & INDIVIDUALS

The Sixth Street Bridge was constructed by the Smith Bridge Company of Toledo, Ohio in 1886 and originally carried Genesee Avenue across the Saginaw River further upstream in downtown Saginaw. It was moved to its present site in 1904 when a new bridge was erected for Genesee Avenue. It is 30 feet wide, 555 feet long, and rests on cut stone piers and abutments. There are four distinct sections of this bridge. There are two approach trestles extending from both the north and south banks of the river, a single fixed Pratt truss span, and the swing span, also a Pratt truss. Proceeding from south to north, the approach trestle is 120 feet long, the fixed truss span is 150 feet long, the swing span in 185 feet in length, and the other approach trestle is 100 feet long.

10 PHOTOGRAPHS & SKETCH MAP ON REVERSE SIDE

11 RELATED SOURCES OF INFORMATION HISTORICAL REFERENCES (PUBLISHED ARTICLES MANUSCRIPTS REPORTS DRAWINGS PHOTOGRAPHIC RECORDS CONTACTS (NAMES & ADDRESSES OF ANYONE WITH EYE WITNESS ACCOUNTS OR RELEVANT INFORMATION), TAPE RECORDINGS

Nameplate on bridge.
James C. Mills, History of Saginaw County (Saginaw, 1918), p. 243.

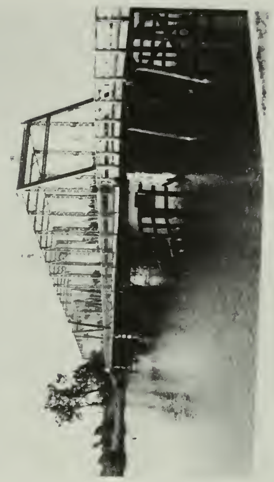
12 DANGER OF DEMOLITION OR DAMAGE YES X NO
NATURE OF THREAT

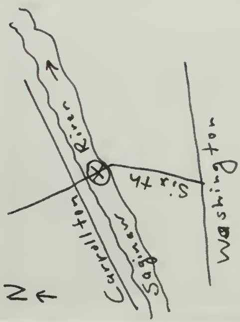
13 PRIORITY: 1

14 EXISTING SURVEYS AND DATES: NHL NR HAER HABS STATE COUNTY LOCAL OTHER

15 INVENTORIED BY YOUR NAME: Charles K. Hyde — ADDRESS — AFFILIATION: HAER Michigan Inventory — DATE: 6/20/76

PLEASE RETURN TO THE HISTORIC AMERICAN ENGINEERING RECORD, NATIONAL PARK SERVICE WASHINGTON DC 20240




N
Carrollton
Saginaw
River
Sixth
Washington

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