United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Grand Trunk Western Railroad Grand Haven Coal Tipple

other names/site number

2. Location

street & number North of Jackson Street between N 1st and N 2nd Streets ☐ not for publication

city or town Grand Haven ☐ vicinity

state Michigan code MI county Ottawa code 139 zip code 49417

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this **x** nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property **x** meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide _x_ local

Signature of certifying official/Title Date

Michigan State Historic Preservation Officer
State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register ___ determined eligible for the National Register

___ determined not eligible for the National Register ___ removed from the National Register

___ other (explain:)

Signature of the Keeper Date of Action

Grand Haven Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property

Ottawa Co., MI
County and State

5. Classification

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

	private
x	public - Local
	public - State
	public - Federal

Category of Property
(Check only **one** box.)

	building(s)
	district
	Site
x	Structure
	Object

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

Contributing	Noncontributing	
		buildings
		district
		site
2		structure
		object
2	0	**Total**

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

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions.)

TRANSPORTATION/Rail-Related

Current Functions
(Enter categories from instructions.)

OTHER/Landmark

7. Description

Architectural Classification
(Enter categories from instructions.)

Other: Concrete Coal Tipple

Materials
(Enter categories from instructions.)

foundation: Reinforced Concrete
walls: Reinforced Concrete
roof: Reinforced Concrete
other:

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Grand Trunk Western Railroad Grand Haven coal tipple is located in a city park along the Grand River, occupying a portion of the former Grand Trunk Western railroad yards, north of Grand Haven's central business district along Jackson Street. It is the tallest structure in Grand Haven. The gabled monolithic reinforced concrete coal tipple rises seventy-nine feet on arched piers, and is composed of a large coal storage section and a small gabled unit above that housed hoist machinery. Coal cars were routed beneath the tipple and emptied into hopper pits beneath the railroad siding, from which hoist buckets raised the coal up to the storage bin. Chutes from the side of the tipple were used to fill the coal tenders of the steam locomotives. A small single-story reinforced concrete power house building is located adjacent to the tipple. This coal tipple structure built by the Grand Trunk Western Railroad in 1925 is one of four primary resources representing Grand Haven's railroad-related history. The others are the 1870 Detroit, Grand Haven & Milwaukee Railroad depot located at 01 N Harbor, which is listed in the Michigan State Register of Historic Sites, the 1895 Goodrich Steamship Ticket Agency Building at 1 S Harbor (both located within a historic district being nominated to the National Register of Historic Places), and the National Register-listed Pere Marquette Steam Locomotive #1223, located in the city park adjacent to the coal tipple.

See Continuation Sheet.

Narrative Description

See Continuation Sheet.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property
Ottawa Co., Michigan
County and State

Name of multiple listing (if applicable)

Section number 7 Page 1

Narrative Description

The Grand Haven coal tipple is a massive monolithic reinforced concrete structure that rises 79 feet, nearly seven stories, and is the city's tallest structure. Its footprint covers an area 38 feet by 30 feet, with a perimeter created by 10 concrete piers that define three bays on the structure's longer southwest-northeast axis and two bays on the shorter northwest-southeast axis. The three ground level bays of the south elevation facing Jackson Street are composed of chamfered-corner arches between the piers. The central arch is wider than the flanking sections, with most of the wall plane consisting of a slightly recessed panel of monolithic poured concrete, although its lower portion is pierced by a chamfered-corner void that extends across the full width of the bay. Close examination of the structure reveals it was built using 2-inch-by-8-inch or 2-inch-by-10-inch wood concrete forms, confirmed by photographs of the coal tipple when it was under construction in 1925 (Stroebe 2015). The narrower bay that extends to the west corner pier is composed of a slightly recessed monolithic concrete wall plane pierced by two six-over-three light steel sash windows, while the bay that extends to the east corner pier, identical in width to the western, is entirely open between the structural piers. The ground story's arches rise to and support a wide horizontal concrete belt course that defines the base of the structure's second level. The second level's three bays continue the tripartite division of the ground level, and are composed of recessed rectangular wall planes lacking fenestration. This level functioned as the structure's coal storage section. The narrower corner bays terminate at the gabled concrete roof's eave, but the wider central bay continues up to a third level, which terminates in a gabled concrete roof. There is a pedestrian access door in this third level within a recessed concrete panel adjacent to the west corner. Surviving structural steel elements appearing periodically in the wall plane indicate this door was accessed by an external stair supported by steel brackets, which extended from the ground story, and has been removed. This small square tower element, which rises another 15 feet above the main roof, housed the hoisting equipment used to raise the coal to the top of the storage bin (Hyde 1976: 287).

The two bay wide end elevations were aligned to railroad tracks that formerly ran beneath and to the side of the structure. The original tracks associated with this structure have been removed. The west elevation ground level consists of a wide round arched void, which occupies about 2/3 of the structure footprint and is taller than the arches in the south elevation, a dimension that was required to allow access by steam locomotives. The flanking bay to the south is tall and narrow, with chamfered corners, and is pierced by a double entry door. The second level resembles the south elevation in having three bays defined by recessed monolithic poured concrete wall planes rising from a broad horizontal base. This elevation terminates in the end gable of the concrete roof. A pedestrian door pierces the gable above the pier north of the structure's corner. Remains of steel structural elements in the wall plane reveal an external steel stair leading to this door has been removed. The structure's third level visible from this elevation consists of an end-gabled bay containing a steel louvered vent beneath the concrete roof.

The ground level of the structure's opposite east end elevation consists entirely of a broad elliptical arch, which is 15 feet wide and 30 feet high (Hyde 1976: 287). The levels above are identical to the west end elevation, with the exception that the gable above the second level is pierced centrally by a six-light steel hopper window rather than an off-center door. The north elevation at the ground level is composed of three chamfered-corner arches with chest-high concrete walls, which rise to a broad horizontal section beneath the second level of three recessed concrete wall planes identical to the opposite south elevation. The small third level unit above the roof plane is pierced by two steel frame six-light hopper windows.

The single story rectangular plan concrete structure that is located adjacent to the southeast corner of the tipple

served as a power house for the structure. Measuring approximately 10 feet by 18 feet, like the coal tipple, it is of reinforced concrete construction, including the shallow-pitch end-gabled roof. The east end is pierced by a double width entry and the west end by a single pedestrian entry, both now occupied by replacement doors. The south side elevation is pierced by two steel frame six-over-three light windows, while the north elevation is pierced by an off-center window of the same type, and a small louvered steel vent.

In use, the tipper operated as follows: a hopper car of coal was spotted over a subsurface pit, now filled in, beneath the structure's arches. The car's bottom hopper doors were opened and the coal dropped by gravity into the pit from which a bucket hoist lifted the coal to the storage bin at the top of the tower. The adjacent concrete shed contained the power source and mechanical equipment to activate the hoist bucket, which was controlled by an operator in the hoist tower. The locomotive tender was spotted under the coal discharge chute adjacent to the structure and a lever activated by the fireman opened a door in the chute to allow the coal to pour into the tender by gravity.

Grand Haven Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property

Ottawa Co., MI
County and State

8. Statement of Significance

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

- [x] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [x] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

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

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

Engineering
Transportation

Period of Significance
1925-1960

Significant Dates
1925

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation
N/A

Architect/Builder
Ogle Construction Co., Chicago

Period of Significance (justification)

The period includes the time of construction of the structure by the Grand Trunk Western Railroad through the time when the railroad ceased using steam locomotives and the associated coaling stations that fueled them.

Criteria Considerations (explanation, if necessary)

Grand Haven Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property

Ottawa Co., MI
County and State

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance and applicable criteria.)

Statement of Significance

Under Criterion A the Grand Haven Grand Trunk Western Railroad coal tipple structure is historically significant at the local level for its association with the Grand Trunk Western Railroad that served the city. The railroad was one of Michigan's primary carriers in the twentieth century and this line that terminated at Grand Haven was an important cross-state route to railroad car ferries that crossed Lake Michigan from the city. The rail car ferries at Grand Haven were a significant part of the Lake Michigan car ferry service, which involved more companies and longer routes and was the most extensive of all rail ferry operations in North America (Meints 2013: 310). The use of the railroad car ferries across Lake Michigan provided an appealing alternative for east-west railroad traffic because traveling port-to-port across Lake Michigan allowed the railroads to bypass the notorious rail transportation bottleneck at Chicago. Under National Register Criterion C the structure is significant at the local level under Engineering. Constructed in 1925, the coal tipple is an excellent example of an early twentieth century standard plan coaling facility built by one of the nation's leading contractors in the field, the Ogle Construction Co. of Chicago. It is one of fifteen thus far identified surviving coal tipples (also called coal towers or coal stations) in Michigan and is also one of the most intact. The period of significance for the coal tipple corresponds to its date of construction in 1925 and the period of use by Grand Trunk Railroad steam locomotives in western Michigan, through ca. 1960.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

See Continuation Sheet.

Developmental history/additional historic context information (if appropriate)

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form.)

See Continuation Sheet

The Grand Haven Coal Tipple

In 1869 the Detroit, Grand Haven & Milwaukee Railroad, later part of the Grand Trunk Western system, bought the Grand River frontage west and north from Water Street, filled it, and moved their operations there. Eventually company yards that included the Grand Haven coal tipple also supported a turntable, a grain elevator, an engine house, a freight warehouse, a car ferry dock, an icehouse, a depot, and a water tank. Along with a 50,000 gallon water tower, the coaling station was built in 1925 as part of railroad facility modernization (Seibold 2004: 367). The stark concrete structure housed a belt-driven hoist that provided coal to locomotives through the two steel chutes on the river side of the structure. The tipple was powered by an electric motor in the small concrete engine house structure adjacent to the tower. The trains also stopped at the yard for water and sand, which was loaded into the locomotives at the same time as the coal. When the Grand Trunk Railroad transferred its ferry service to Muskegon in 1933, the coal tipple fell into disuse, returning to service briefly in 1949 when the ferry dock in Muskegon collapsed. The concrete tower ceased all operation in the 1950s after diesels replaced steam locomotives and its steel hardware was removed (Ewing 2013a: 83).

The son of a former operator of the Grand Haven coal tipple described its operation (Stroebe 2012, 2015). Fifty-ton-capacity hopper cars were routed onto a railroad siding that ran beneath the structure. Under the tracks was a pit with sloped sides that emptied into a skip hoist hopper. This was a railed structure with internal skip cars that ran up and down the hoist. These would travel down into the hopper and scoop out the coal, bring it to the top of the tower, and dump it into the elevated storage bin. There were two steel coal chutes that fed from the bottom of the storage hopper to a track on the river (north) side of the structure. The two chutes could coal two engines at once, allowing simultaneous servicing of two-locomotive trains, a "double header." He stated that the Pere Marquette (C&O) engines may also have used the tipple due to its proximity to their lines, but activity ceased by the early 1950s when both the GTWRR and the PMRR/C&O phased out steam and ran diesels (Stroebe 2012).

The Grand Haven coal tipple was part of a large upgrading of railroad facilities completed by the Grand Trunk Western Railroad in 1924-1925. In 1924 the railroad committed to spend $6,239,511 in Michigan to improve its lines and facilities, during which "modern reinforced concrete mechanical coal handling" facilities at Grand Haven, Durand and Battle Creek were built (Whittenberger 1924). In 1924 railroad trade journals reported that "Grand Trunk Western Railroad . . . has awarded a contract to the Ogle Construction Co., Chicago, for the construction of a 500-ton concrete coaling station at Battle Creek, Mich.; a 350-ton concrete coaling station at Durand, Mich.; and *a 300-ton concrete coaling station at Grand Haven, Mich*." (italics added) (*Railway Engineering and Maintenance* 1924: 335; *Railway Age* 1924: 264). The Ogle Construction Co. was one of the leading national coaling station design/build contractors in the first half of the 20th century. The Grand Haven coal tipple represents a standard Ogle plan, evident in resemblance to other structures built at the same time in Michigan, such as in Durand, and by identical structures built by the company for the Frisco Railway in Kansas, Missouri, and Alabama (*Frisco Employees Magazine* 1930: 2). The Sanborn Fire Insurance maps confirm that the structure did not exist until after 1920, and by the 1931 edition, Sheet 10 illustrates a concrete "Coal Tipple / Fire-Proof Construction" structure with a ladder "Fire Escape" on its west side, with an adjacent concrete "power house" that is also labeled "Fireproof Construction" (Sanborn 1920, 1931).

Grand Haven General Railroad Context

The site of the City of Grand Haven was initially occupied in the 1820s because the confluence of the Grand River and Lake Michigan was advantageous for a fur trading post serving the valley. Later, the lumber industry developed and the mills along the river provided an economic anchor into the third quarter of the nineteenth century. However, the city's future commercial growth was dependent on the construction of rail and steamship connections. The railroad yards came to dominate the city's riverfront along Water Street (now Harbor Drive).

The extension of the Detroit & Milwaukee (D&M) Railway line to Ferrysburg/Grand Haven in 1858 was a primary catalyst that shaped the growth and character of the city. Connected by water to the outside world via the Grand River and Lake Michigan since its founding in 1834, the city began to grow more rapidly with the linkage to the national railroad grid provided by the D&M. The intent of the Detroit & Milwaukee rail line was to provide service from Detroit to Milwaukee using a cross-Lake Michigan connection from Grand Haven. Together, the rail lines and the steamship capability fueled the city's economic development. Eventually, all railroads entering Grand Haven had tracks leading to the Goodrich Steamship wharfs at the foot of Washington Avenue (Ewing 2013c: 460). The railroad facilitated Grand Haven's success as a port through its ongoing program of battling drifting sand that constantly threatened to render the harbor entrance too shallow for use by commercial shipping. To control the problem, Congress appropriated funds as early as 1852, but with minimal effect. In 1859 the D&M built a 2,500 foot long pier extending into the Lake (Seibold 2004: 360), and Grand Haven's reputation as a transportation hub was assured.

The Detroit & Milwaukee Railway Co. was founded in 1855 by the merger of the Oakland & Ottawa and the Detroit & Pontiac railroads. The Detroit & Pontiac had been chartered in 1834 and was built from Detroit to Royal Oak in 1838 and extended to Pontiac in 1844. The Oakland & Ottawa was chartered in 1848 to build from Pontiac westward to Grand Haven. The merged companies as the D&M ran out of money before reaching Grand Haven and the Great Western Railway of Canada provided funding to complete the railroad. In 1857, the year before the railroad reached Grand Haven, the Great Western assumed control, and in 1860, only two years after reaching Grand Haven, the D&M Railway Co. was foreclosed upon and reorganized as the D&M Railroad Co. (Meints 1992: 59; Meints 2013:60, 171). In the earliest years, the D&M's depot was on the north side of the Grand River in Ferrysburg, with passengers and freight transferred to Grand Haven by a ferry. In 1870, after financial and logistical support provided by other connecting railroads and financial incentives provided by the City of Grand Haven anchored by a $52,000 levy approved by citizens, the railroad was extended across the Grand River into downtown Grand Haven and the railroad depot and freight yards were relocated to the city (Dunbar and May 1980: 318; Ewing 2013a: 80-81).

In 1878 the D&M went into receivership again, and was sold to the Great Western Railway, which reorganized and incorporated it as the Detroit, Grand Haven, & Milwaukee (DGH&M) Railway (Meints 1992: 59). The Great Western Railway of Canada merged with the Grand Trunk Railway of Canada to form the Grand Trunk Western Railroad in 1883, but the DGH&M generally retained a separate identity. The Canadian company saw the cross-Michigan railroad line as a feeder to its main line connections with Quebec and Ontario and the northeastern United States. The Grand Trunk Western Railroad eventually reached into four U.S. states including Minnesota, Illinois (to Chicago), Ohio, and Indiana (along its route to Chicago), but the company operated primarily in Michigan where the bulk of its lines were located. Aside from its connection to Detroit and main line to Chicago, the Grand Trunk Western served Grand Haven and Muskegon as major carferry points, Grand Rapids, Jackson, Bay City, Caseville, and Kalamazoo.

To ensure direct access to Milwaukee the Grand Trunk Car Ferry Line was established in Grand Haven in 1902, and the DGH&M and Grand Trunk Railroads contracted with the Crosby Transportation Company to operate vessels on the cross-lake route that were large enough to ferry rail cars. In 1905 the Grand Trunk Railroad as parent company of the DGH&M assumed responsibility for the car ferry and passenger operations and ordered its first car ferry, the *Grand Haven*. In 1928 the DGH&M including the car ferries was absorbed by the Grand Trunk Western Railway Company of Canada, which was controlled by Canada National Railway (Meints 1992: 63). This occurred soon after upgrading the depot and yard facilities and the building of the multi-story monolithic

concrete coaling station/coal tipple that dominates the riverfront skyline today (Ewing 2013b: 16, 40; Seibold 2004: 364-365).

The rail car ferries at Grand Haven were a significant part of the Lake Michigan car ferry service, which involved more companies and longer routes and was the most extensive of all rail ferry operations in North America (Meints 2013: 310). The use of car ferries provided an appealing alternative to railroads in their nationwide grid because traveling port-to-port across Lake Michigan allowed them to bypass the notorious land route transportation bottleneck at Chicago. The railroads then had easier access through Wisconsin to western states and markets. The lake ferries and lake commerce were the primary reasons Grand Haven served as a railroad hub and prospered through the early decades of the twentieth century. In 1902, for example, thirty-six trains were entering and leaving Grand Haven each day, and at the height of car ferry service, as many as ninety trains (including Interurbans) arrived or departed daily (Seibold 2004 365).

Grand Haven's waterfront held a rail transportation complex that included a turn table, an engine repair house, fifteen sets of tracks to accommodate rail traffic, a huge seven-story grain elevator and the car ferry terminal (Seibold 2004: 365). Car ferry service operated year-round twenty-four hours a day, seven days a week. For thirty years, 1903 until 1933, the railroads and car ferries determined the character of Grand Haven's riverfront and greatly influenced the city's economic life. During World War I, when the nation's railroads were taken over by the U.S. Railroad Administration (USRA), the Lake Michigan car ferries operating from Grand Haven and other ports were deemed of national importance. The USRA formed the Lake Michigan Car Ferry Association to operate two boats of the Grand Trunk fleet, five of the Pere Marquette Railroad, and four of the Ann Arbor line. After the war the lines returned to civilian control.

At the beginning of the Great Depression, Grand Haven was one of the busiest rail and port locations in the Great Lakes. But in 1933 the car ferries transferred their operation to Muskegon, primarily because the United States Merchant Marine Act of 1916 as amended in 1930 required 75% ownership of merchant marine companies by citizens of the United States. The DGH&M Railroad was controlled by the U.S.-owned Great Western Railroad until 1928 when the line was transferred to the Canadian-owned Grand Trunk Western Railroad, after which it no longer qualified to do business in the U.S. The Pennsylvania Railroad, which ran to Muskegon, signed an agreement to form the Grand Trunk-Pennsylvania Transportation Company that was 75% owned by the Pennsylvania and 25% by the Grand Trunk Western (Seibold 2004: 366). Grand Trunk Western signed over its four car ferries to the new company, resulting in the transfer of car ferries from Grand Haven to Muskegon. The car ferries left Grand Haven in the summer of 1933. After World War II, the car ferries returned to Grand Haven for a brief period when the Muskegon facilities were closed for repair, but all service was soon shifted to Muskegon. The loss of the ferries was a financial blow to the DGH&M, because their presence beginning in 1903 had offset the loss of lumber shipping after the sawmills had closed. When the car ferries moved from Grand Haven to Muskegon, the railroad was left with passenger service and limited freight transportation. In 1955 the last passenger train departed from the Grand Trunk Depot, which was vacated in 1966, and in early 1975 the Grand Trunk Western requested permission to end freight service to Grand Haven and abandon the track from Coopersville to the city (Ewing 2013a: 81; Ewing 2013d: 117). The GTWRR was the last rail system in Michigan to discontinue use of its steam locomotives. In 1960 the last regularly scheduled passenger train using a steam locomotive in the nation pulled out of the Durand station (State of Michigan 2015).

Coal Tipples/Coal Towers/Coaling Stations

Coal facilities designed to feed steam locomotives were constructed in several different styles and are variously termed coal tipples, coal towers, and/or coaling stations. The largest facilities were giant steel and concrete

structures reaching six to eight stories high. These giant coal bins often straddled several main tracks and locomotives stopped underneath or adjacent to them to fill up their tenders. On the other extreme, some small towns or industrial complexes with small steam engines filled their tenders by scooping coal from a pile or coal car on a sidetrack with a power shovel. During the nineteenth and twentieth centuries, there were numerous coal stations throughout Michigan, with almost all towns that had locally based locomotives having a coal facility.

Coaling stations were located at intervals along a route so that locomotives of through trains could fill up quickly with minimal delay to their schedules (Michiganrailroads.com 2015). The size of the coaling station depended on the amount required to service locomotive traffic on the line, with a typical locomotive having a fuel bunker or tender coal capacity of two to seven tons, a size that appears to remain the standard into the 1920s (Berg 1893: 131; *Railway Review* 1920a: 641). Coaling stations were necessary on main tracks when the distance between stations was longer than the carrying capacity of the locomotive tender. Engine runs for coal and freight trains were configured so that coaling was only required at terminal points, but passenger train runs often travelled greater distances as determined by population centers, requiring coaling stations at intermediary points (Berg 1893: 132). Rail traffic volume determined whether sidings would be employed or re-coaling could be accomplished on the main line, and demanded the most efficient means of refueling possible so as not to hinder traffic and profit.

Patents for coal tipples relating to industry date at least as early as 1889 and a coal tipple for loading ships was patented in 1877 (US Patent Office 1889, 1878: 213). Books provided descriptions and plans for structures. For example, an entire chapter entitled "Coaling Stations for Locomotives" was provided in the 1893 publication, *Buildings and Structures for American Railroads, A Reference Book* (Berg 1893). It confirmed that coaling stations were widespread and that the type of station constructed depended on many factors including efficiency of operation. In the 1890s the range of delivery systems included shoveling directly into the tender from adjacent cars, loading by crane and bucket, platforms loading into tenders, high elevation chutes dumping sideways or from an overhead bridge into tenders, and "special systems, usually patented" (Berg 1893: 131).

This book relates that patented systems by the turn-of-the-twentieth century included: the Collins Locomotive Hoist, which used the locomotive to draw coal cars to a height where coal could be delivered over a chute to the tender; the Dodge Coaling System, where a coal car was hauled by a cable up an inclined plane to a coaling shed, where the coal was dumped and transferred over horizontal conveyors to the tender; the Dockstader System of a side-dump coal car and oscillating system, where a specially designed coal car was dumped sideways to deliver coal directly to the tender without shoveling; and the most efficient method of routing drop-bottom coal cars directly from the mine sources to high trestles, using gravity and dimensional chutes to fill locomotive tenders (Berg 1893: 140-141). Types of coal station structures in use by railroads in the 1890s included derrick sheds, stationary crane-and-bucket systems, traveling cranes, coaling platforms, coaling platforms with tipping trolleys, elevated coal sheds, coal bunkers and coal chutes that had an elevated track adjacent to gravity-fed covered bins or chutes with counterweighted aprons, referred to as Kerr Chutes or Clifton Chutes (Berg 1893: 141- 165). The system most closely approximating that employed at later stations such as Grand Haven was a "coaling station with vertical bucket elevator," a structure that used a bucket elevator to raise coal from an underground pit to overhead bins that loaded tenders via chutes (Berg 1893: 157). Similar structures employed trough elevators or conveyors, and a precursor of the later coaling towers is illustrated, constructed by the Michigan Central Railroad near Jackson (Berg 1893:160).

More efficient systems were necessary to power the nation's railroads. The expense of rehandling coal from storage to the locomotives was an incentive to minimize the amount stored or to arrange to load an engine

directly from storage (Howland et al. 1921: 294). By the early twentieth century, specialized structures for rapid loading of coal into steam locomotive tenders had evolved into large coaling towers. Most of the earlier structures were built of wood, although by 1909 concrete and steel were "coming into extensive use" (Orrock 1909: 144). During this period entire textbooks dealing with developing technologies were written for railroad engineers, including *Reinforced Concrete Railway Structures*, published in 1914 (Ball 1914). In general, when locomotive requirements were 100 to 250 tons of coal per day, a derrick-and-bucket plant, a locomotive crane or clam shell bucket and chute were "advisable," while for fueling larger quantities a trestle-and-chute or mechanical plant trestle were "most economical" (Willard 1915: 262-263). Concrete structures were advocated as requiring lower maintenance and being more permanent, although initially costlier. In 1909 a balanced bucket tower type single track concrete coaling station of 300 tons was estimated to cost between $12,000 and $15,000, while a four pocket single track wood structure for 140 tons cost $8,000-$9500 (Orrock 1909: 145, 149).

By the 1920s the "coaling elevator" was in general use on America's railroads. Hopper cars brought coal from the crusher to the coaling tower and dropped their loads into a pit constructed either underneath or beside the tower. A steam or electric powered bucket conveyor mechanism lifted the coal from the pit to the top of the tower and dumped it into the tower's elevated storage bin. With a locomotive tender positioned at the coaling chute, the chute was pulled down so the coal could pour into the tender's coal bunker (Howlett et al. 1921: 298-99).

Coaling Stations/Coal Towers/Coal Tipples in Michigan

Literally hundreds of railroads criss-crossed Michigan in the age of steam. A list of railroad companies that operated in Michigan contained in Meints's *Michigan Railroads and Railroad Companies* fills 120 pages (Meints 1992: 34-154), and all required coaling stations of some sort. Coaling stations of wood were not considered to be permanent structures and few, if any, survive today. While steel structures were more structurally stable, when they fell into disuse they were usually scrapped. Concrete structures were more likely to survive abandonment because of their substantial nature, lack of salvage value and expenses associated with demolition. Still, it appears few of even this type of coaling station survive today in Michigan.

No statewide context for coaling towers exists. Dr. Charles Hyde's 1970s HABS/HAER inventory of the state lists three coal tipples: Grand Haven (Hyde 1976: 287), Durand (p. 285) and Lansing (p. 290). To acquire data relating to the number of coal tipples in Michigan, review of available literature and resources included "railway fan" message boards and discussion groups relating to "coaling stations," "coal tipples," "coal towers," and related terms that were valuable for the state-wide breadth of coverage they provided. The Michiganrailroads.com website, the Railroad Preservation Network, the Trainorders.com website and the Railroadfan.com website together identified up to fifteen existing coaling stations and 28 other coal towers that had been demolished or removed (Michiganrailroads.com 2015; RYPN 2004; Railroadfan.com 2010, 2015; Trainorders.com 2015). It appears the Michiganrailroads.com coaling station data was created circa. 2003, the Railroad Preservation Network in 2004, and the Railroadfan.com in 2010, with unsystematic updates occurring on various website discussion boards through 2014. It is presumed that the following list of Michigan coaling stations generated from these sites is not entirely up to date, and that the number of surviving structures may be overstated. Coal Tipples at Frankfort and Saginaw that were confirmed to have been demolished or removed in the last several years were deleted from this list.

Existing Coal Tipples in Michigan (not subject to field verification)
Augusta (Michigan Central RR)
Baldwin (Pere Marquette)
Clarendon (Michigan Central RR)

Detroit/Livernois (Michigan Central RR)
Durand (Grand Trunk Western)
Escanaba (Chicago &Northwestern RR)
Grand Haven (Grand Trunk Western)
Lake (Pere Marquette)
Ludington Yard (Pere Marquette)
Ludington Ferries (Pere Marquette)
Lansing (Aurelius) (Grand Trunk Western)
New Buffalo (Pere Marquette)
New Buffalo (Michigan Central RR)
Pontiac Yard (Grand Trunk Western)
Scottville (may not be extant)

Of the fifteen probable surviving coaling stations in this list, four, including the Grand Haven structure, are associated with the Grand Trunk Western Railroad. Of the 15 of the 43 total existing or removed/demolished coaling stations for which images are available, only the Durand coaling station appears very similar to the Grand Haven structure. It differs primarily in that it has two track level bays underneath rather than the single track present at Grand Haven. Of the four Grand Trunk Western structures, Grand Haven, Durand and Lansing were built in 1925 and all were built by the Ogle Construction Co. While the construction date of the Pontiac coal tower is unknown, it is probably of similar vintage, and may be by the same contractor.

The Lansing concrete "coal tower" was much larger than the Grand Haven or Durand structures, capable of coaling locomotives on four tracks (two main tracks and one siding in each direction), with a fifth track on another siding for transferring coal from railroad cars to the massive storage facility above (michiganrailroads.com 2015). That the Grand Haven coal tipple was built from a standard plan is indicated by its association with Ogle Construction Co. (see below) and the similarity in appearance to the Durand structure. Use of a standard plan appears to be confirmed by the images of coaling stations completed by the Ogle Construction Co. for the Frisco Railroad in Neodesha, Kansas, Chaffee, Missouri and/or Carbon Hill, Alabama, which appear to be identical to the Grand Haven structure (*Frisco Employees Magazine* 1930).

The Ogle Construction Co.
The Ogle Construction Co. was founded in 1911 by Robert A. Ogle and Carl F. Bledsoe, the latter a civil engineer who had gained experience as a structural engineer in the railway construction department of the Otto Gas Engine Works. In 1922 he became president of the company after Ogle's death in 1921 (*Railway Maintenance Engineer* 1922a: 82). The Ogle Construction Co. was an industry leader in the first half of the twentieth century, offering services to design, build, and equip "Coaling Stations and Sanding Stations" with "Coal Hoists, Sand Driers, Coal Spouts, Sand Spouts, Coal Buckets and Loaders and Sand Elevating Drums" (*American Railway Engineering Association* 1928: 377). A railroad industry trade journal providing a "Classified List for Buyers" reveals a range of service areas for railroads offered by the company, listed under headings for "Bridge Turning Machinery," "Coal Handling Machinery," "Coaling Stations, Tipples, Washing Plants, Etc.," "Hoisting and Conveying Machinery," and "Stand Pipes for Water Stations" (*Railway Review* 1920b: 96-100).

Ogle appears to have been one of the three most prominent manufacturers of coaling stations in the country from the early twentieth century through the end of steam locomotion in the mid-twentieth century. The C&O Railroad contracted with several engineering companies that specialized in coaling stations as all or part of their

business. Companies "most often used" by C&O included "Ogle Construction Co. of Chicago, Roberts & Schaefer Co. of Chicago and Fairbanks, Morse & Co." (Chesapeake & Ohio 2006). All of these firms were based in Chicago. Roberts & Schaefer Co. was building stations, including concrete tipples, prior to 1910 (Roberts & Schaefer 1910). In 1917-18 it built sixty-seven coaling stations, including thirty-three 100 to 1200-ton capacity facilities for a single railroad, as well as a 2000 ton facility that served six tracks, which was believed to be the largest in world at that time, and a reinforced concrete 500 ton coaling station built that same year for the Pere Marquette at Grand Rapids, Michigan (Howlett et al. 1921: 792). Fairbanks, Morse & Co. Fairbanks, Morse & Co. was established in 1904 and by 1921 had built 440 coaling stations for 100 railroads (Howlett 1921: 688).

In 1921, a few years before building the Grand Haven coaling station, the Ogle Construction Co. contributed an entry to a reference book published by the American Railway Engineering Association (Howson et al. 1921: 760-761). This article states "The main purpose of the Ogle Construction Co. since its organization ten years ago, has been to design and build locomotive coaling stations capable of fulfilling the requirements of modern service and to equip them with mechanical appliances which would dependently and economically perform that service even under the most adverse conditions" (Howland et al. 1921: 760). Further, the article states that there were over 300 Ogle Balanced Bucket Coaling Stations in service on fifty-six railroads at that time, of frame, steel and concrete construction varying in size from fifty to 1000 tons storage capacity, capable of delivering one or several grades of coal to one or more tracks, with many also capable of storing, drying and supplying sand (for traction). Ogle recommended frame stations for economy and short construction time, while the more costly all steel station was fireproof and could be easily relocated. However, "the permanence, fireproof character and inappreciable maintenance of concrete stations, amply justify their somewhat higher initial cost, particularly at locations where larger quantities of coal are handled and where probabilities of alteration or abandonment are remote" (Howson et al. 1921: 760).

Operation of the Ogle coaling machinery was essentially "a One Man station" because once started it functioned automatically with little attention required from the operator (Howson et al. 1921: 760). It required little power to operate because it had relatively few working parts – an automatic reversing hoist and an automatic loader and a bucket. Designed specifically for coaling operations, Ogle's patented automatic reversing hoist handled buckets from one-half ton to two and one-half tons capacity, with hoisting capability ranging between 30 and 125 tons per hour (Ibid.). Power was transmitted through friction clutches and reduction gears to the drum, and a steel cable ran from the drum to the bucket, which was used to lift the bucket to the top of the tower to discharge the load into the storage bin. A clutch was released to stop the travel of the drum and hold the bucket in place until empty, after which an automatic reversing mechanism engaged the clutch to the reversing shaft, reversing the travel of the drum and lowering the bucket so it could be refilled (Howson 1921: 761). In a single bucket installation, which appears to have been the type employed at Grand Haven, one loader was used and was operated by the bucket and a counterweight. The bucket was designed to be of the same capacity as the loader so that no coal from the bin was wasted. The Ogle Coal Delivery Spout was gravity fed from the storage bin, pivoted at the bin, was easily manipulated from any position on the tender, and had a breaking joint to prevent damage in case the locomotive moved while being loaded (Ibid.).

An Ogle Company representative attended each coaling station installation to train railroad employees in the "proper operation, care, and adjustment of the machinery" to ensure uninterrupted coaling service. The company had "a corps of engineers who are experienced in the designing, erection and equipment of locomotive coaling stations that are adapted to the requirements of modern operation," and were "entirely at the service of the roads . . . prepared at all times to render expert advice in the solution of problems relating to coaling equipment"

(Howson et al. 1921: 760).

Ogle took out a number of patents as it developed and improved upon its coal handling machinery and structures. Carl Bledsoe, who co-founded Ogle Construction Co. in 1911 and served as secretary until becoming president after Ogle's death in 1921, was involved in many of the patents, including the hoist mechanism (filed 1916), coal chute safety cut off (filed 1925), and coal bin distributing chute (filed 1927) (United States Patent Office 1917, 1930, 1931).

Trade journals from the period of the 1920s reveal that the Ogle Construction Co. was awarded contracts by many railroads for the construction of coaling stations in the Midwest. In fact, the company had a nationwide reach. By 1922, a decade after its founding, the Ogle Company had constructed over 300 coal stations: since "the first unit of the Ogle Balanced Bucket Coaling Station had been installed on the Chicago & Northwestern Railway in 1911 . . . In all, there are 335 Ogle Equipped Coaling Stations on sixty railroads" (*Railway Review* 1922). A more recent summary credits Ogle with building over 600 coaling stations for sixty-six North American railroads between 1911 and 1929 (Brown 2009: 33). Some of these towers were wooden using an outside frame, but most were concrete or steel. Concrete structures were the predominant type of coaling tower across North America after World War I.

Part of the company's success was due to an active promotional and marketing campaign appealing to a railroad company's bottom line. A full-page 1915 advertisement on page 1 of the program for the *Seventh Annual Convention of the International Railway Fuel Association* states, "Ogle Automatic Locomotive Fuel Stations are a Necessity in Economical Fuel Handling for Locomotives. They are Automatic in Operations, Saving Labor Costs, They are Simple and Rigid in Construction, Saving Maintenance Cost, Their Reliability and Efficiency Save on Operating Costs," "We Will Be Pleased to Furnish Plans and Proposition for Steel, Timber or Concrete Construction" (*International Railway Fuel Association* 1915). Other advertisements were blunter. Typical is a full page spread proclaiming, "Save the Waste and Save the Profit. Quicker Coaling Means Faster Service. Automatic Electric Skip Hoist Equipment and Reinforced Concrete Structures Save Labor, Save Time, Save Maintenance" (*Frisco Employees Magazine* 1930: 2). The automatic efficiency of the Ogle coaling station was present in single track tipples such as that at Grand Haven, but was further enhanced by other company designs that could simultaneously service two or even four locomotives. The GTWRR Lansing coal tipple, for example, was able to handle locomotives on two main tracks and two sidings (michiganrailroads.com 2015).

Another full page Ogle advertisement in a 1917 edition of the *Railway Age Gazette* that illustrates a coaling station very similar to but larger than Grand Haven appealed both to efficiency and to patriotism. Published during World War I it proclaimed, "We Will Furnish Our Part of the Sinews of War to the 'The Third Arm of the Nation's Defense' The Railways - The Ogle Way of Handling Fuel for Locomotives Means the Speeding Up of Power for Hauling Trains" (*Railway Age Gazette* 1917). The company was also very active at trade shows and conventions. In March 1918 Ogle Construction Co. had two booths at the National Railway Appliances Association Exhibit at the Coliseum in Chicago, which included scale models of its stations (*Railway Maintenance Engineer* 1918a).

During this period, in addition to concrete coaling stations, Ogle offered frame and steel stations. A railroad cyclopedia published in 1921 illustrated Ogle frame and steel coaling stations and rectangular and cylindrical reinforced concrete coaling stations (Howlett et al. 1921: 295, 298). Specific examples from 1922 that also show the national reach of Ogle include: the Chicago, St. Paul, Minneapolis & Omaha Railroad 150 ton frame coaling station in Emerson, Nebraska; the Missouri Pacific Railroad's 300 ton reinforced concrete coaling station at Bald

Knob, Arkansas; and the Great Northern Railroad's steel plant at Minneapolis Junction, Minnesota (*Railway Maintenance Engineer* 1922b, 1922c). Ogle also offered to supply railroads components to build coal stations in house. For example, in 1922 they provided "coal handling machinery" to the Green Bay & Western Railroad for a 200 ton frame coaling station at Whitehall, Wisconsin, that was "to be erected by company forces" (*Railway Maintenance Engineer* 1922d).

Including the projects cited above, a sampling of trade journal data from the late 1910s to the early 1920s further demonstrates the nationwide reach of the company leading up to the time the Grand Haven coaling station was built. In 1918 a single issue of *Railway Maintenance Engineer* reported that Ogle was involved in sixteen coaling stations built and/or equipped for:

- the Central of Georgia Railroad, a 300 ton reinforced concrete structure at Goodwater Alabama;
- the Elgin, Joliet & Eastern Railroad, a two 100 ton concrete structure at South Chicago and Gary, Indiana;
- the New York Central Railroad, a 200 ton steel structure at Minerva, Ohio;
- the Missouri, Oklahoma & Gulf Railroad, a 100 ton steel structure at Henryetta, OK;
- the Illinois Central Railroad, a 200 ton timber structure at Carbondale, Ilinois;
- the Colorado & Southern Railroad, five 150 ton timber structures at Fort Collins, Colorado, Cheyenne, Wyoming, and Amarillo, Wichita Falls and Childress, Texas;
- the Chicago, St. Paul, Minneapolis & Oklahoma Railroad, a 150 ton timber structure at Omaha, Nebraska;
- the Chicago, Indianapolis & Louisville Railroad, a 200 ton timber structure at Indianapolis;
- the Chicago & Eastern Illinois Railroad, a 300 ton timber structure at Jackson, Indian and a 200 ton timber structure at Momence, Illinois;
- the Baltimore & Ohio Railroad, an undescribed structure at Wilmington, Delaware; and during the 1920s
- the C&O Railroad seven 300-ton cylindrical concrete coaling stations for single or double tracks, located in Virginia, West Virginia and Kentucky (*Railway Maintenance Engineer* 1918b; COHS 2015).

The Ogle Construction Co. was still building coal-related railroad structures in the late 1940s and other railroad structures after steam locomotives ceased operation in the 1950s (*Steel* 1948). After diesels replaced steam as primary locomotive power for railroads, while coal stations were obsolete, Ogle apparently refocused on its sand delivery systems that had provided traction for steam engines and would still be relevant for diesels. The company filed in 1950 for a patent for sand storage tank equipment to deliver sand from an overhead tank to diesel locomotive sand boxes (US Patent Office 1952, 1955). The patent application text is virtually identical to the previous coal station delivery system patents but substitutes sand for coal. Perhaps most tellingly, while the patent applied for in 1947 (awarded 1952) states the sand delivery equipment is "for diesel, steam, or electric locomotives," another company patent from 1950 (awarded 1955) is explicitly stated to be "for diesel locomotives."

Significance Summary

The significance of the Grand Haven coal tipple has been recognized by several previous studies. During the 1970s it was included in an early statewide HABS/HAER inventory of Michigan (Hyde 1976: 287). In the 1980s the structure was individually identified as a Landmark, significant in representing the railroad history of the city, in an early survey of Grand Haven historic resources (PreservationUrbanDesign 1982: 26-27, 61). The Grand

Haven Historic Conservation District Commission designated the coal tipple as a city Historic Landmark in 1993 (GHHCDC 1995).

The Grand Haven structure is one of approximately fifteen coal tipples that survive in Michigan, and was built by the Ogle Construction Co. of Chicago, one of the leading national coal tipple contractors in the first half of the 20th century.

The Grand Trunk Western Grand Haven coal tipple is one of four key historic resources in Grand Haven representing the history of railroads that were a primary foundation of the city's growth (the others being the Detroit & Milwaukee Railroad depot, the Goodrich Steamship lines ticket agency building and the Pere Marquette locomotive).

The coal tipple is a key cultural landscape component and landmark in Grand Haven. At approximately seven stories in height (79 feet), this multi-story structure along the Grand River is the tallest in the city and dominates the skyline of the northern city limits and its riverfront setting.

Grand Haven Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property

Ottawa Co., MI
County and State

Previous documentation on file (NPS):

___preliminary determination of individual listing (36 CFR 67 has been requested)
___previously listed in the National Register
___previously determined eligible by the National Register
___designated a National Historic Landmark
___recorded by Historic American Buildings Survey #_____
___recorded by Historic American Engineering Record # _____
___recorded by Historic American Landscape Survey # _____

Primary location of additional data:

_X_ State Historic Preservation Office
___Other State agency
___Federal agency
___Local government
___University
___Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 0.5
(Do not include previously listed resource acreage.)

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
1	16	562681	4768613	3			
2				4			

Verbal Boundary Description (Describe the boundaries of the property.)
Property in the City of Grand Haven, Ottawa County, MI, described as follows: A rectangle, centered on the UTM reference, with long sides 110 ft. long and parallel with long sides of coal tipple and at equal distance from it on either side, and width of 70 ft. with outer ends parallel with ends of the coal tipple and power house and SE and NE ends at equal distance from the outer ends of the two structures. The coal tipple is 38 feet SW-NE and 30 feet NW-SE, and adjacent power house is 18 feet SW-NE by 10 feet NW-SE.

Boundary Justification (Explain why the boundaries were selected.)
This boundary contains the actual structural footprint of the coal tipple and associated power house within the city park.

11. Form Prepared By

name/title William Rutter
organization _____ date 6/15/15
street & number 21830 S. Birch Lodge Drive, P.O. Box 135 telephone 906-399-9907
city or town Trout Lake state MI zip code 49793
e-mail werutter@gmail.com

Grand Haven Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property

Ottawa Co., MI
County and State

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: See Continuation Sheet.

City or Vicinity:

County: **State:**

Photographer:

Date Photographed:

Description of Photograph(s) and number:

1 of _1__.

Property Owner:

(Complete this item at the request of the SHPO or FPO.)

name City of Grand Haven

street & number 519 Washington Avenue telephone 616-847-3493

city or town Grand Haven state MI zip code 49417-1486

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Grand Trunk Western Railroad
Grand Haven Coal Tipple
Name of Property
Ottawa, Michigan
County and State

Name of multiple listing (if applicable)

Section number 9 Page 1

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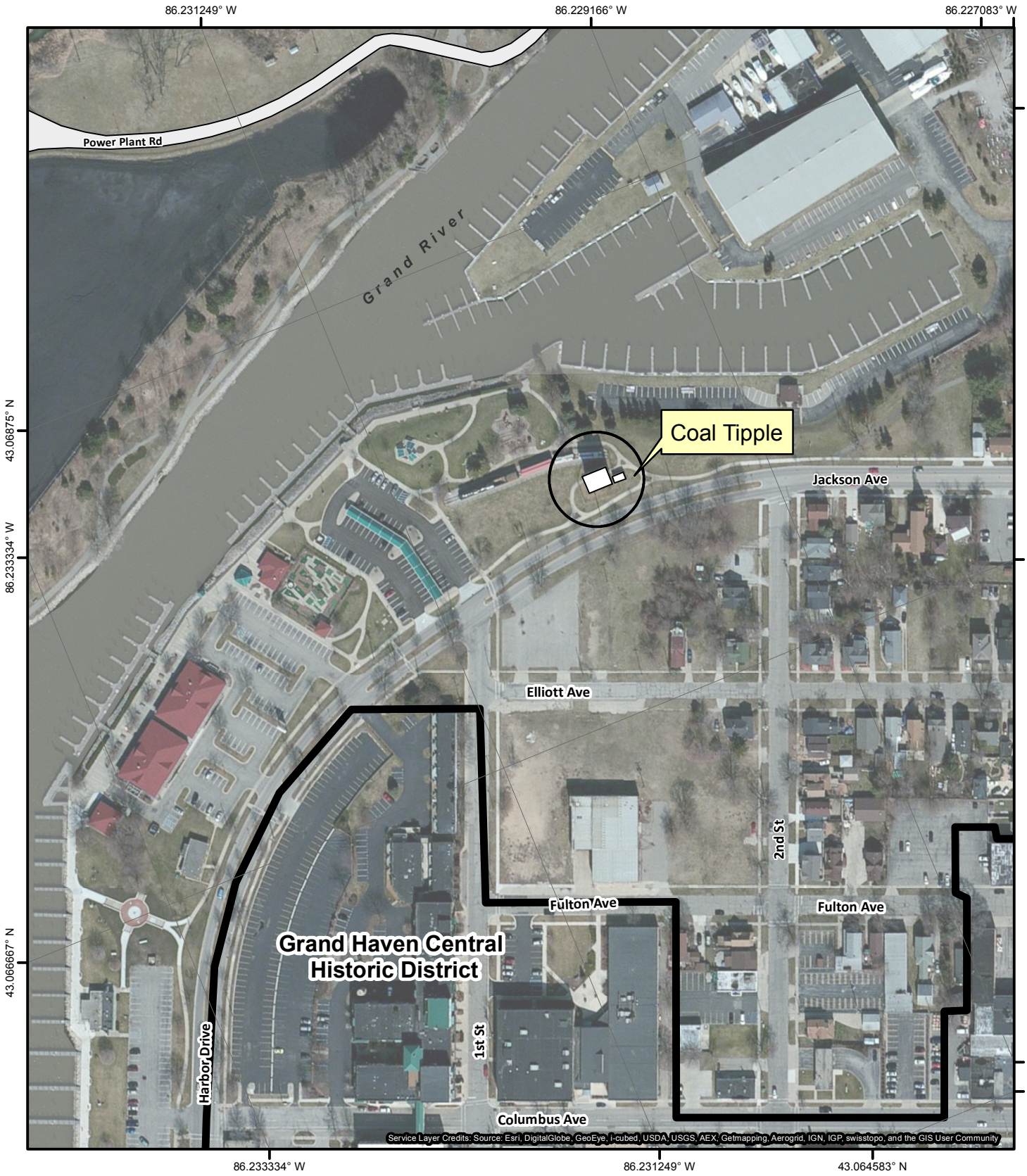

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 IntlFeet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 13,123,359.5801
False Northing: 0.0000
Central Meridian: -84.3667
Standard Parallel 1: 42.1000
Standard Parallel 2: 43.6667
Latitude Of Origin: 41.5000
Units: Foot
Coordinate Grid displayed in Decimal Degrees

FIGURE 1
GRAND HAVEN GRAND TRUNK WESTERN RAILROAD COAL TIPPLE
Grand Haven, Ottawa County, Michigan

Legend
Grand Haven Central Historic District Boundary

BB&E

Map prepared January 2016

0 75 150 300
Feet


1223
PERE MARQUETTE
1223
PERE MARQUETTE
1223


PERE MARQUETTE
A986
G.T.W.
27915


GRAND TRUNK WESTERN


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