1290

NPS Form 10-900
(January 1992)
Wisconsin Word Processing Format (Approved 1/92)

OMB No. 10024-0018

United States Department of Interior
National Park Service

National Register of Historic Places Registration Form

OCT - 2006

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an 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 entries and narrative items on continuation sheets (NPS Form 10-900A). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Monroe Water Tower
other names/site number N/A

2. Location

street & number	16th Avenue and 20th Street						N/A	**not for publication**	
city or town	Monroe						N/A	**vicinity**	
state	Wisconsin	**code**	WI	**county**	Green	**code**	045	**zip code**	53566

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 _ nationally statewide X_ locally. (_ See continuation sheet for additional comments.)

10/3/06

Signature of certifying official/Title — Date
State Historic Preservation Officer-WI

State or Federal agency and bureau

In my opinion, the property _ meets _ does not meet the National Register criteria.
(_ See continuation sheet for additional comments.)

Signature of commenting official/Title — Date

State or Federal agency and bureau

Monroe Water Tower	Green County	Wisconsin
Name of Property	County and State	

4. National Park Service Certification

I hereby certify that the property is:

✓ entered in the National Register.
___ See continuation sheet.
__ determined eligible for the National Register.
___ See continuation sheet.
__ determined not eligible for the National Register.
___ See continuation sheet.
__ removed from the National Register.
__ other, (explain:)

Edson H. Beall — 11·15·05

Signature of the Keeper — Date of Action

5. Classification

Ownership of Property (check as many boxes as as apply)

	Private
x	public-local
	public-State
	public-Federal

Category of Property (Check only one box)

	building(s)
	district
x	structure
	site
	object

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

contributing	noncontributing	
		buildings
		sites
1		structures
		objects
1	0	total

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

Number of contributing resources is previously listed in the National Register
0

6. Function or Use

Historic Functions (Enter categories from instructions)	**Current Functions** (Enter categories from instructions)
INDUSTRY/PROCESSING/EXTRACTION/waterworks	VACANT/not in use

7. Description

Architectural Classification (Enter categories from instructions)	**Materials** (Enter categories from instructions)	
NO STYLE	Foundation	Limestone
	walls	Brick
	roof	Metal
	other	Metal

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for the 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 of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Architecture
Community Planning and Development

Period of Significance

1889-1955

Significant Dates

1889
1914

Significant Person
(Complete if Criterion B is marked)

N/A

Cultural Affiliation

N/A

Architect/Builder

Monroe Water Works
Des Moines Bridge and Iron Company

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographic References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous Documentation on File (National Park Service):
- 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 #

Primary location of additional data:
X State Historic Preservation Office
- Other State Agency
- Federal Agency

x Local government
- University

Other
Name of repository:

10. Geographical Data

Acreage of Property less than one acre

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

	Zone	Easting	Northing
1	16	283415	4719037
2			
3			
4			

☐ See Continuation Sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

name/title	Carol Lohry Cartwright				
organization	For the Monroe Historical Society			**date**	June 15, 2005
street & number	W7646 Hackett Rd.			**telephone**	262-473-6820
city or town	Whitewater	**state**	WI	**zip code**	53190

Monroe Water Tower	Green County	Wisconsin
Name of Property	County and State	

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

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.

Photographs Representative black and white photographs of the property.

Additional Items (Check with the SHPO or FPO for any additional items)

Property Owner

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

name/title	Mike Kennison				
Organization	Monroe Water Utility			**date**	June 2005
street&number	1065 5th Avenue			**telephone**	
city or town	Monroe	**state**	WI	**zip code**	53566

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects, (1024-0018), Washington, DC 20503.

Start description on line below

Site Description

The Monroe Water Tower sits in Lincoln Park in a residential area of Monroe, a small city located in south-central Wisconsin. Lincoln Park takes up an entire block and was established because it was the undeveloped location of the water tower. The park is located about eight blocks south of Monroe's downtown commercial district. The park is now developed with playground equipment and recreation facilities.

The park is raised sharply from the surrounding streets. On top of the rise that makes up the park, the topography is relatively flat with edges that slope down. Most of the park landscaping consists of large lawn space punctuated by numerous mature trees. The park has other structures, including a modern park shelter and restroom building, swings, two children's play areas, and a softball field. Since the water tower sits in the southeastern corner of the park, there is an abundant amount of open space for use by the community for recreation. Sidewalks sit around the park and the streets are improved with curbs and gutters.

Because the developed park and its modern structures are not part of the historic water tower site, the boundary was drawn to exclude them. Although the tower sits in a picturesque park setting, only the land immediately around the tower was included in this nomination.

Water Tower Description

The water tower is a tall, conical structure constructed of cream bricks topped by a large steel water tank. The masonry part of the tower stands 80 feet high and has a diameter of 28 feet. The tower sits on a thick limestone foundation that extends into the ground. The foundation is slightly flared where it meets the ground, suggesting that it is wider underground than above ground. The foundation is covered with a thick stucco cement coating that has fallen away in places.

The cream bricks of the tower are laid up in common bond and the tower has few openings. On the southwest side, there is a shallow entry pavilion with a segmentally-arched opening decorated with a segmental double brick arch. An entry door made up of vertical boards covers the entrance. It has strap hinges and a cast iron lift handle. The door appears to be from the period of the tower's construction. There are eight porthole style openings about half way up the tower and just under the steel tank, sitting about an equal distance apart. On the northwest side of the tower, just under the tank, is a segmentally-arched opening decorated with a brick segmental arch. It is enclosed with plywood,

but is the opening that provides access to the outside of the tank. A narrow metal balcony sits under the opening and is attached to a metal ladder that curves up around the north to the northeast side of the tower and tank. It ends at an opening in the metal balcony that circles the tank.

Originally, at the top of the masonry structure, there was a ring of brick corbelling that supported the original tank. These bricks were removed in the late twentieth century and a metal strap was attached to provide support where the brick trim was removed. Otherwise, there are no important changes to the original masonry structure.

The steel tank was replaced in 1914. Originally, a wooden tank with the same capacity as the current tank, 100,000 gallons, sat on top of the tower. Wooden tanks were common in the late nineteenth century due to their lower cost. By the 1910s, though, steel tanks were more popular. This tank has the same diameter as the brick tower. It is constructed of steel panels riveted together at intervals around the tank. The panels of the upper part of the tank are larger than the panels on the lower part of the tank and there is a band of narrow steel panels at the very bottom of the structure. The metal roof is a low-pitched conical roof and a round ladder leads from the metal walkway to the roof eaves. The metal walkway is supported by large metal brackets and has a metal balustrade in a triangular pattern.

Inside the tower is a second, interior, brick tower that encloses the main pipe that feeds water to the steel tank. This interior enclosure is constructed with the same materials and in the same manner as the outside tower. Attached to the outside wall and this interior tower is a wooden staircase that rises to the tank. This open staircase has plain wooden handrails and the only decorations are round knobs on the posts of the landings. Another vertical wood door with strap hinges and a vertical cast iron handle covers an entrance into the interior tower. Behind this door is the large shut-off or on mechanism attached to the central pipe. There are no decorative elements attached to either the interior of the outside tower or the interior tower.

The masonry structure of the tower appears to be structurally sound, but in need of maintenance. The steel tank, although appearing to be in good condition, has serious leaks and cannot be used. Recently, the tower was threatened with demolition in favor of a new tower structure. These plans are currently on hold and personnel from the water utility are contemplating repairs that would put the tower back in service. The Monroe Historical Society, when informed that the tower was threatened, began a campaign to preserve it. This nomination is part of that preservation effort.

End of Description of Physical Appearance

Insert Statement of Significance

Significance Statement[1]

The old Monroe Water Tower is eligible for the National Register of Historic Places under two criteria. It is architecturally significant under criterion C, as a good example of a type of construction, the late nineteenth century small town water tower. The tower is a fine example of the type of water tower construction that was popular in Wisconsin during this period. It is distinctive in that it has both an outer tower structure and an interior tower structure, providing extra support for the tank and two layers of protection for the pipe. The tower also has fine late nineteenth century brick construction. The high quality materials and methods of construction created a masonry landmark in Monroe. The tank, itself, although not original, is from the historic period and is a good example of standardized water tank construction from the early twentieth century.

The old Monroe Water Tower is also eligible for the National Register of Historic Places under criterion A. It is locally historically significant for community development because it represents the establishment of a municipal water system in Monroe, a milestone event in the history of the community. The development of municipal water systems was part of the overall growth and development of utilities that dramatically changed the way people lived in the twentieth century. Water works systems also ushered in the era of public utilities and began the discussion of what role local government played in providing public services, like utilities. Today, local governments are expected to provide a myriad of public services. Municipal water systems were one of the first of these public services that urban dwellers rely on today. The water tower is the largest and most prominent symbol of the development of the Monroe water works, a symbol of the history of this important public service.

Historical Background

The earliest settlers came to the Monroe site and made claims in 1834 and 1835 and, in 1839, Monroe was named the Green County seat. During the 1840s, the community grew into a village with a small

[1] This footnote references the period of significance, significant dates, and architect/builder for Monroe Water Tower and its water tank. The references for the dates of construction are; "The Water-Works' Progress," *Monroe Sentinel*, 6 November 1889, p. 1; "The Kind of Water Works System We Are Going to Have," *Monroe Sentinel*, 13 November 1889, p. 1; *Green County Real Estate Journal*, 14 December 1889, p. 1; Contractor's Bond for the steel tank manufactured and installed by the Des Moines Bridge & Iron Company, 7 January 1914, copy from the Monroe Historical Society, Monroe, Wisconsin. The period of significance includes the dates of construction for both the masonry tower and the replacement water tank and the historic period that the water tower was in operation. The period of significance ends at the 50 year cut off date.

commercial district, some small industries, including a sawmill, and residential housing. During the state's business boom in the 1850s, Monroe's population increased from a few hundred to over 2,000 residents. In 1858, the community incorporated Monroe as a village. New industries of the decade included a grist mill and a planing mill, and new commercial businesses multiplied. One of the important ethnic groups to come to the area were the Swiss, who established a strong cheese industry.[2]

During the 1870s, carriage, wagon, and farm implement manufacturing dominated Monroe's industrial base. Monroe also served as a center for trading agricultural products to larger markets. In 1870, Monroe had a population of 3,470 and it continued to increase by several hundred every decade to 1900. By 1876, the community had become a large center for commercial businesses including banking and retailing and was the largest community in the county .[4]

Although the first rail link came to Monroe in 1858, in the 1880s, the Chicago, Milwaukee and St. Paul Railroad extended its road to the area and by 1888, the railroad established direct service between Milwaukee and Mineral Point through Monroe. In 1882, Monroe received its charter as a city and its industrial and commercial economic base continued to thrive. In 1884, a new four-story "luxury" hotel opened and quickly became a social and civic center for the community for decades.[5]

At the time the Monroe water works was built and placed into service (1889-1890), Monroe was poised to continue its economic success. In 1892, the new Grant County Courthouse was pushed to completion.[6] County government was and would continue to be an important economic base in the community. In 1896, the growth of the public library resulted in an expansion into a downtown building and in 1905, the library moved into a new building. In that same year, one of the progressive physicians in the community established a hospital.[7]

As Monroe entered the twentieth century, it had a thriving downtown commercial district serving the outlying area, a modern county courthouse, a number of new public services and buildings, even a hospital. The 1880s and 1890s had been a whirlwind of activity that brought the city into the modern age.[8]

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[2] E. C. Hamilton, *The Story of Monroe*, Monroe, Wis.: E. C. Hamilton, 1976, pp. 5-43.
[3] *Ibid.*, pp. 66-69.
[4] *Ibid.*, pp. 157, 171, 176.
[5] *Ibid.*, pp. 177-179.
[6] *Ibid.*, pp. 188-199.
[7] *Ibid.*, pp. 188-199.
[8] *Ibid*, pp. 183-188.

Monroe Water Tower and Water Works History

Unlike many communities, bringing the water works system to Monroe was not fraught with community politics and arguments. Perhaps it was because the performance of the local fire department was being questioned in the newspapers or because the community had more progressive leadership than other cities. In any event, in May of 1889, W. H. Wheeler of Beloit approached the city council about drilling an artesian well to supply a water works that he would build.[9] At a public meeting attended by "businessmen and influential citizens," Wheeler outlined his proposal and the city council agreed to fund the well. It was implied that once the well was completed, Wheeler would be given a franchise to build and operate a water works system.[10]

By the next month, the local paper reported that contractors drilling the well had reached about 250 feet, but by September there were major problems. The city council convened a special session to discuss the fact that the contractors had lost their drills at about 600 feet down and had stopped working. Wheeler may have determined that to get the water franchise, he had to take control of the well or the city would abandon the project. He reached a deal with the city that in return for a 20 year water works franchise, he would try to recover the drills, complete the well at the existing location or at a new location, and complete the water works system with four miles of water mains by January of 1890. He also agreed to reimburse the city for the money it had already spent on the well.[11]

This schedule seemed overly ambitious, but Wheeler pulled out all the stops to get the project moving again. By mid-October, work on wells was progressing and crews had begun to erect the masonry water tower. By late October, the Monroe Water Works Company, as Wheeler called his enterprise, indicated they were ready to take orders for water service. In early November, a notice in the local paper addressed a rumor that the water provided by the water works would not be pure because the wells were shallow and the site was in a low area. The company assured the public that the shallow wells were only temporary to provide water for fire fighting for the coming winter. Later, the company would sink a deeper well to provide residential customers the "purest quality of soft water of any strata in the earth."[12]

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[9] *Ibid.*, pp. 198-199.
[10] "The Artesian Well," *The Real Estate Journal*, 15 May 1889, p. 4.
[11] *The Real Estate Journal*, 15 June 1889, p. 1; "The Water Works," *Monroe Sun*, 14 September 1889, p. 1; "City Water Supply," *Green County Real Estate Journal*, 16 September 1889, p. 4.
[12] "The Water Works, *Green County Real Estate Journal*, 15 October 1889, p. 4; "Water Works Notice," *Monroe Sentinel*, 30 October 1889, p. 1; "Pure Water Guaranteed," *Green County Real Estate Journal*, 1 November 1889, p. 4.

In early November of 1889, the *Monroe Sentinel* reported that the water tower was almost completed and ready for the water tank. The paper reported that the tank would be wooden and would provide water pressure "sufficient to throw a stream from the fire hose over the largest buildings, from the hydrants, conveniently located at the street corners." The paper quoted Wheeler as saying that wooden tanks were more reliable and would not freeze up like metal tanks. Wheeler further explained that the system would be both a direct pressure and gravity system. Direct pressure would come from the pumps, and the new water tower with its 100,000 gallon capacity elevated tank would provide gravity pressure. The tank would be better able to keep a constant pressure because the mains could draw on it during heavy demand.[13]

Wheeler told the *Sentinel* that just having a pump system could not provide the water pressure for peak demand due to the fact that to run the pumps economically, they could not run at top capacity. When a need for water for a fire, for example, occurred, the boilers would have to be stoked to drive the pumps to provide enough pressure. In the gravity system, the water pressure would remain high as it flowed from the elevated tank while the pumps were brought up to capacity. Wheeler also explained the advantages of a water tower over a standpipe. He stated that the standpipe, which also stored water under pressure, could have problems if domestic use drew down the water pressure and there were an immediate need for water for a fire. Once, again, the pumps would have to be brought up to capacity to provide enough pressure. Wheeler assured the newspaper that the elevated tank system installed in Monroe was the best alternative, providing water pressure whether the pumps were at capacity or not.[14]

Wheeler went on to assure the newspaper that the pumps would also be manned by an engineer living in the pump house. The newspaper, evidently pleased with Wheeler's details, concluded that "Monroe is to have as complete, effective, and neat water works outfit as is to be found in the State. Already our citizens are waking up to the possibilities of enlargement to our city's development which this best of all public improvements will make possible to us."[15]

Not to be outdone by the *Sentinel*, the rival *Monroe Sun* published their own description of the new water works system and added a few more details. The *Sun* reported that the new system would have six miles of water mains varying in size between four and ten inches in diameter. The pipes would be made of cast iron. The water works system was expected to cost $75,000 and the newspaper also

[13] "The Water-Works' Progress;" "The Kind of Water Works System We Are Going to Have."
[14] "The Kind of Water Works System We Are Going to Have."
[15] *Ibid.*

concluded that it would be one of the best in the state and would be an important factor in the growth of the city.[16]

In early December, it was reported that the water mains for the system were almost all in place and that the water tower and tank were completed. It appeared that the water works company would meet their deadline after all. In fact, on December 14, it was reported that all was ready for a test of the system on New Year's Day. In February of 1890, an additional test of the water works was made and the system was found to be satisfactory. The water system put out four streams of water at one time and one stream was thrown a distance of 175 feet, 40 feet longer than the contract with the city had required. Like most early water works systems, some mains failed and needed repair, but the water company indicated the system would be fully operational shortly.[17]

The *Monroe Sentinel* outlined the benefits of the new water works system for the community. It noted that the city now had "efficient fire protection," and would have an adequate supply of water for domestic use. The paper stated that the economic benefits of the system far outweighed its cost to consumers. For example, insurance rates would go down due to better fire protection and property values would rise because of this public improvement. Throughout the development of the Monroe water works system, despite delays in the initial well construction and the problems getting the system on-line in the middle of winter, the local press and city leaders continued to support the new system as a benefit to the community.[18]

Certainly the water works system benefited Monroe, but it was questionable how much it benefited the private company that operated it. The 20-year franchise deal with Wheeler contained a city buy-out clause after 15 years, but as early as 1898, Wheeler approached the city to take over the system. The city declined at that time, but after the 15 years provided for in the contract, the city exercised its option and purchased the water works for $85,000 in 1906. Since that time, the City of Monroe has officially owned the water works, now known as the Monroe Water Utility. However, city tax money does not support it; rather, income from water fees pays for the operation of the system.[19]

Only one major change was made to the water tower throughout its over 100-year history. That is, the wooden water tank, which Wheeler lauded to the newspaper, had to be replaced by 1913. The city put

[16] "Water Works," *The Monroe Sun*, 16 November 1889, p. 8.
[17] "Genuine Hustlers," *Green County Real Estate Journal*, 2 December 1889, p. 1; *Green County Real Estate Journal*, 14 December 1889, p.1; "The City Water Works," *Monroe Sentinel*, 19 February 1890, p. 1.
[18] "The City Water Works."
[19] Information from Mike Kennison, Monroe Water Utility, Monroe, Wisconsin.

a new tank out for bids, requesting specifications for both a steel tank and a new wooden tank. By this time, wooden tanks were still being used for water towers, but steel tanks were becoming more popular due to their longevity and sturdy construction. A number of manufacturers were now making standardized steel tanks for water towers. One such company was the Des Moines Bridge and Iron Company. Founded in Des Moines, Iowa in 1892, the company moved to Pittsburgh in 1908 to be closer to the steel mills that provided the raw materials for their products. Over the next 100 years, the company became a conglomerate in engineering, construction, and steel processing known as PITT-DES MOINES, INC.[20]

With the new tank in place, the Monroe Water Tower remained in operation until 1993, when it was taken out of service. The water tower is currently not in use due to the failure of the 1914 tank. According to the water utility, the tank leaks and cannot be repaired. Recently, the city of Monroe discussed demolishing the structure in favor of a new tower. This idea is now on hold and the city may consider a way to make the tower functional. The Monroe Historical Society, sponsor of this nomination, supports the preservation of the old tower.

Area of Significance: Architecture

The Monroe Water Tower is architecturally significant because it represents an important type of construction, a late-nineteenth century masonry water tower with elevated water tank, a type of construction commonly built for small town water systems in Wisconsin. The masonry water tower with elevated tank could not hold as much water as a large standpipe, but for small communities, it was sufficient to provide the water pressure necessary for both consumer and fire protection needs for many years. Interestingly, this type of water tower was not discussed much in engineering references of the turn of the twentieth century. It was only mentioned as an alterative to the recommended standpipe. However, this alternative, probably because it was less expensive, became such a popular choice for small communities that by the 1910s, it was given more attention in the engineering manuals. In the twentieth century, the water tower with elevated tank became the most common water storage method in Wisconsin and these early towers and tanks represent the formative years of this type of construction.

[20] Information on PITT-DES MOINES, INC. from an article published in the *Pittsburgh Business Times*, 14 August 1998, found at the following internet web address; www.bizjournals.com/pittsburgh/stories/1998/08/17/story5.html.

The Development of Water Works

Clean, fresh, water is so important to sustaining life that in ancient times water and its conveyances were often worshipped or were the center of festivals and ceremonies. The technology to draw fresh water from the ground or to bring water from a distant place was an important step in allowing humans to exist away from natural water sources such as rivers and lakes. The earliest technology was the well, but, as early as the eighth century B.C., a system of bringing water through a pipe to Jerusalem is discussed in the Bible.[21]

The Romans were, of course, famous for their aqueducts constructed above ground, but the Greeks also built a system of open or subterranean channels to convey water. The immense masonry bridges of the Roman aqueduct system took water conveyance to a new level. The first Roman aqueduct was opened in 312 B. C., bringing water to Rome from a distance of 11 miles. By the first century, A.D., the system conveying water to Rome consisted of 255 miles of aqueducts that had a capacity of 200,000,000 gallons per day. Eventually, the Roman aqueducts could convey almost 400,000,000 gallons of water per day to serve the reservoirs, fountains, and public baths of the city.[22]

During the medieval period, the French in the province of Artosis began obtaining water by the use of natural hydrostatic pressure. In this method, small holes are bored into the ground water and the water is raised by the pressure of the water source. This type of well became known as an "Artesian" well, after the ancient name for Artosis, Artesium. Although the French were the first to make this type of well popular in the western world, there is evidence that artesian wells were dug during ancient times in Asia and the Middle East.[23]

During the European Renaissance, there was a return to the idea of building aqueducts to carry water from a distance. In the mid-1600s, the Bridge of Maintenon, a three-tiered arched structure over 4,000 feet long and 200 feet high, was constructed to bring water to the French city of Marseille. In 1613, an 18-foot wide channel brought water to London from natural springs about 20 miles away. The earliest use of pumps to raise and store water for public systems was documented in Germany in the mid-1500s. London used pumps in 1582 to raise water from the Thames for this purpose.[24]

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[21] William R. Hill, "Some of the Early Methods of Collecting, Storing and Distributing Water," *Proceedings of the Eighteenth Annual Meeting of the American Water Works Association*, New York: American Water Works Association, 1898, pp. 37-38.
[22] *Ibid.*, pp. 38-39.
[23] *Ibid.*, p. 40.
[24] *Ibid.*, pp. 40-41

The use of pumps, both water-powered and steam-powered, continued during the 1700s in Europe, as water systems became larger and more complex. In the new United States, pumps were used in the early water works system in Philadelphia in 1801. In that system, water was pumped from the Schuylkill River into a brick aqueduct that led to a building with two wood and copper tanks on the roof. Pumps at the building brought the water up into the tanks. From the tanks, the water was distributed to the city in either crude pipes or bored logs. The use of bored logs was common before pipe technology improved. The Romans used lead or earthenware pipes that were not suitable for water under pressure. In London's early water system, the distributing pipes were made of bored trunks of elms about six to seven inches in diameter. Because of their small size, additional lines needed to be laid side-by-side to provide enough capacity. At the end of the eighteenth century, London switched to cast iron pipes.[25]

During the 1800s, waterworks systems became more and more standardized. In 1956, E. Sherman Chase presented a paper to the American Water Works Association that discussed the progress in water works systems during the previous 75 years. Sherman indicated that the basic principles of water works engineering had not radically changed during those years (1871-1956). He stated, "the fundamentals of mechanics and hydraulics had already been discovered and formulated by scientists and engineers [by 1871]." Rather, the major improvements in water works systems came from advanced technology in the acquisition and distribution of the water.[26]

Chase stated in his paper that the sources of water supply in 1956 were similar to what was available in 1871: lakes, streams, reservoirs, and ground water. What was improved by 1956 was the means to construct better reservoirs and more efficient ways get water from above or below ground sources. In the 1800s, Chase indicates that the use of pumps and pipes was common, but the types and materials had dramatically changed by 1956. In the 1800s, distribution pipes were often constructed of cast iron, but were usually too small in size. Other types of pipes and inadequate joints often failed under pressure. By 1956, larger pipes and better joints had solved this problem, and the use of reinforced concrete for large transmission mains had drastically improved the capacity of water works systems.[27]

Much of the change in water works between the nineteenth and mid-twentieth century involved the

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[25] *Ibid.*, pp. 41-43.
[26] E. Sherman Chase, "75 Years of Progress in Water Supply Engineering," *Journal American Water Works Association*, Vol. 48, No. 8, August, 1956, p. 915.
[27] *Ibid.*, pp. 916-921.

improvement of pumps. Prior to 1900, steam-driven plunger pumps were common. The development of the multistage centrifugal pumps made them obsolete. Electric power provided a more consistent energy source for pumping and allowed for the development of automatic controls. Better-designed pumps, more powerful engines, and a steady power source dramatically improved the ability of municipal water works systems to provide adequate water pressure to customers after 1900.[28] In reviewing several sources on water works systems from the late nineteenth century, the conclusions that Chase made in 1956 were valid. The basic components of a water works system at the end of the nineteenth century was similar to the system developed in Philadelphia in 1801; a water source, a water storage and pumping system to provide water pressure, and a distribution system of underground pipes. Above-ground reservoirs, standpipes, and water towers with elevated tanks were the most common methods of providing water pressure and storage to meet peak demand. Pumps were generally enclosed in pump houses. Since this nomination is for an historic water tower, the discussion will now concentrate on that component of a water works system.

Standpipes and Water Towers

By the 1880s, it was common for municipalities or water districts that had no hills or mountains nearby that were suitable for raised reservoirs, or where the water needed did not justify the expense of construction of a raised reservoir, to build wide standpipes or water towers with tanks that could hold an extra supply of water that provided water pressure and capacity to the system during times of peak demand. The standpipes and water towers were located at the highest practical elevation to maximize the water pressure.

J. T. Fanning, one of the foremost late nineteenth century authorities on water-supply engineering, laid out specific plans for water works in his 1886 book, *A Practical Treatise on Hydraulic and Water-Supply Engineering*, an update of his seminal 1877 book called *A Practical Treatise on Water-Supply Engineering*. This volume provides information on water systems that is typical of other books and papers published during this period and provides a context for which water works components from that period can be analyzed.[29]

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[28] *Ibid.*, pp. 923-924.

[29] The author undertook a review of several books and numerous articles published in the *Proceedings of the American Water Works Association* for the 1880s and the 1890s and found that information on water towers and tank reservoirs was very similar from resource to resource. The author is using J. T. Fanning, *A Practical Treatise on Hydraulic and Water-Supply Engineering*, New York: Van Nostrand, 1886 and John Goodell, *Water-Works for Small Cities and Towns*, New York: The Engineering Record, 1899, as the best and most comprehensive sources for information on water towers and tanks of this period.

Fanning, along with other engineers during this period, promoted the construction of tall standpipes that would provide extra capacity and water pressure, particularly for fire departments. A standpipe is essentially a tall, conical structure that can store water. The standpipe adds water pressure and supply for improved fire fighting and serves as a back-up for when water use is at peak demand or the pumps are not running. These large structures needed firm foundations to withstand the weight of the water and the force of the wind. Fanning recommended that narrow standpipes be enclosed because they were particularly vulnerable to high winds and tornadoes.[30]

Fanning's description of standpipes was "state of the art" for providing water storage and pressure at that period, but such structures were costly. Fanning briefly indicates that smaller tanks were being constructed on masonry towers or iron trestles and that in small villages of the "middle states," wooden tanks were sometimes constructed on wooden trestles.[31]

At the turn of the twentieth century, John Goodell published *Water-Works for Small Cities and Towns.* By this time, many southern Wisconsin communities had installed or would soon be installing water works systems. Like Fanning, Goodell suggested wide conical standpipes as the best reservoirs for communities that are relatively level or where the amount of water needed would not justify the expense of a large, raised, reservoir. But, he also noted that in flat areas, the water in the lower part of a standpipe does not provide any pressure, and that this factor had led to the construction of water towers either as tanks sitting on metal trestles or on top of masonry shafts. He also noted that this form of water tower construction was more economical.[32]

As an example of this type of water tower, Goodell described a structure in Oberlin, Ohio, where a steel reservoir tank was supported by a tall masonry pedestal or tower. The tower had a six-foot rubble stone foundation topped with a six inch water table. The limestone-constructed tower stood about 40 feet high and held a 35-foot steel tank that was not enclosed. A window was placed in the tower about half way up and a door with a small iron balcony sat near the top from which a ladder then rose to the tank. This description is remarkably like many water towers in Wisconsin's small towns in the late nineteenth century. Goodell appears to favor the standpipe, but apparently finds this type of tower an acceptable example of a water tower structure.[33]

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[30] Fanning, pp. 585-590.
[31] *Ibid.*, p. 602.
[32] Goodell, pp. 235-244.
[33] *Ibid.*, p. 245.

By the 1910s, the cost effectiveness of water towers made them so popular, the engineering literature began to address them in more detail. A water works engineering manual from 1910 gives elevated tanks or water towers equal standing with standpipes. The manual states that elevated tanks could be made of steel, wood, or reinforced concrete, supported by a "suitable tower." The manual goes on to state that an elevated tank on a trestle is less expensive, and that it was even less "objectionable in appearance" than a standpipe. A key feature for Wisconsin's climate was that this type of structure had less trouble from ice.[34]

The 1910 manual highly recommended supporting water tanks with masonry structures because "this form of construction readily lends itself to effective architectural treatment. . ." The statement is made within the context that erecting masonry structures was not usually done. This is interesting because in Wisconsin by that time, the use of masonry structures to support water tanks was common. The manual also indicated that wooden water tanks were frequently used because of their low cost, but that construction problems sometimes led to dangerous failures. The manual states that a few reinforced concrete tanks had been designed but that there were problems.[35]

In a 1918 water works engineering manual, water towers with elevated water tanks were finally recommended as service-reservoirs for small communities or for large factories. Standpipes were still addressed as being a good choice for places with suitable elevated sites, but in flat regions, the elevated tank was actually recommended over the standpipe. The wooden water tank was still discussed as an option, but it was indicated that serious failures had occurred when the hoops holding the tank together failed or corroded. The manual highly recommended steel tanks and stated that when "properly designed, they can resist safely any wind pressure to which they may be subjected. They are easily inspected, cleaned, and painted. . ." Steel tanks were especially recommended for capacities of over 40,000 gallons of water.[36]

Earlier in this discussion, the paper presented by E. Sherman Chase to the American Water Works Association in 1956 was used to summarize developments in water works during the later nineteenth century and the first half of the twentieth century. Chase also summarized the development of water storage facilities. He indicated that historic standpipes were generally constructed of steel or wrought-

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[34] F. E. Turneaure and H. L. Russell, *Public Water-Supplies*, New York, John Wiley & Sons, 1910, pp. 711, 723.
[35] *Ibid.*, pp. 734-735.
[36] Edward Wegmann, *Conveyance and Distribution of Water for Water Supply*, New York: Van Nostrand, 1918, pp. 377, 384.

iron and that reinforced concrete standpipes had been tried in the early twentieth century. He also stated that elevated tanks on towers had been used for a long time, but that the tall, narrow tanks of the nineteenth century had given way to more shallow and wide tanks with ellipsoidal bottoms.[37] During the second half of the twentieth century, two types of water towers began to supplement and/or replace the old standpipes and masonry water towers for municipal water systems. These tank styles included the ellipsoidal elevated tank sitting on a metal tower structure and the large single pedestal spherical tanks that remind people of mushrooms. A taller and narrower ellipsoidal tank was a popular choice for industrial and institutional use. These styles remain popular today. The internet web site for the Pittsburgh Tank and Tower Company, a manufacturer of water and other liquid storage tanks, makes both ellipsoidal tanks elevated on a metal tower structure and single pedestal spherical water towers. A newer popular design is a large pillar with a circular tank. The pillar allows for storage, pumping equipment, and even office space below the elevated tank.

The Monroe Water Tower is an example of the late nineteenth century type of water tower construction that was not necessarily "state of the art" when it was built, but became so popular that it eventually became the leading type of water storage structure in small towns of the late nineteenth and early twentieth centuries. This type of construction was economical and well-suited to small communities with early water systems. Although late nineteenth century engineers recommended standpipes, their cost limited their construction to larger cities like Milwaukee, Racine, and Janesville. The masonry tower and elevated water tank may not have been the engineer's first choice, but it was a successful adaptation of the standpipe that became the best choice for communities with limited water pressure and storage needs. Its lower cost, no doubt, played a major role with the water company entrepreneurs, who built most of the late nineteenth century water works systems in small towns for profit. These types of towers allowed for the development of high-quality water works systems in small towns.

In manuals from the 1910s, when the tower and elevated water tank became standard for small communities and industries, it was recommended that the masonry or metal structures of these water towers have strong foundations and high-quality construction to withstand the wind and water pressure. Metal or wooden towers were often built during the late nineteenth and early twentieth centuries, but for community water systems, a masonry structure was either the first choice of builders or quickly replaced the non-masonry towers. In Monroe, a brick masonry structure was the choice from the beginning, and its size and high-quality brick construction made it a solid structure that has held up to Wisconsin's varied rough weather (wind, snow, ice, etc.) for well over 100 years.

[37] Chase, p. 921.

In fact, Monroe's masonry water tower has a feature that gives it additional strength. Unlike some towers, there is an inner tower surrounding the pipe leading to the tank that gives the tank additional support and better protects the pipe from the elements. This interior tower makes the Monroe Water Tower an even more interesting example of its type of construction.

Although not elaborately decorated, the Monroe Water Tower has a high level of late nineteenth century brick construction. The brickwork and the quality of bricks make for an attractive, as well as sturdy, structure. The only small alteration is that a band of brick corbelling was removed from the top of the tank. Otherwise, the brick details and construction techniques are extant. The only other major alteration to the water tower is that the original wooden tank was replaced with a steel tank in 1914, a tank that is still extant. This tank was a manufactured tank that represents the typical steel tank available at that time. In the 1918 manual for water supply engineering, steel tanks were discussed as a good alternative to wooden tanks and that they were becoming manufactured in standardized form by many companies. The 1914 water tank is an example of just such a manufactured tank.

Monroe's water tower is locally architecturally significant as a good example of a type of construction that, at first, was an economical adaptation for a more costly standpipe, but quickly became the standard for water tower construction for small town water works. This water tower represents the early growth and development of this type of structure that would dominate water works systems in Wisconsin. It has a high level of integrity, with its brick construction and original openings intact. Even the water tank, although not original, dates from the historic period. It is an architectural landmark of the Monroe "skyline," a landmark that many in the community are determined to preserve.

Area of Significance: Community Planning and Development

The Monroe Water Tower is locally historically significant because it represents the establishment of the city water system, an event that was critical in the development of Monroe into a modern community. It is also a notable artifact of the important era of the development of utilities in Monroe, utilities that would be important in the growth and development of the community in the twentieth century. The development of a water works, electrical power, and telephone service, among other public projects, gave Monroe a boost as the community competed for businesses and residents in the late nineteenth century. The development of these systems was a milestone that separated the old lifeways of the nineteenth century with the modern lifeways of the twentieth century.

Historic Development of Water Works Systems

Prior to 1880, there were 598 public water works systems in the United States, but there were 929 municipalities with a population of 2,500 or more, meaning that only 64 percent of substantial-sized communities in the country had municipal water systems. And, most of that 64 percent were installed between 1870 and 1880. These water works systems were generally installed not because of a desire for clean drinking water, but for fire protection. In fact, many of the early water systems used polluted water from lakes, rivers, and streams. Although some people rushed to take advantage of municipal water, statistics from several communities in Pennsylvania show that at the turn of the twentieth century, the vast majority of people had not hooked up to water systems that had been in operation for as many as 20 years.[38]

Often because of the poor quality of the water, most people felt that they could get as good or better quality of water from their wells or cisterns. Most people did not understand until after 1900 that there were problems associated with this water. If the water pumped from backyard wells looked and smelled good, it was assumed to be good. People did not understand that their well's proximity to their outhouses, often quite close, resulted in contaminated ground water, and very few people associated common diseases like dysentery and typhoid with poor water.[39]

Since people were generally content with their private wells, the push for municipal water works systems came from other community concerns. The most important of these was fire protection with controlling dust in the streets in summer another popular concern. Fire fighting was often the concern that "sold" a water works system. Bucket brigades, pumping from private wells or cisterns, or even pumping from public cisterns or wells in the local business district had limited success in controlling fires, which often turned into multi-building conflagrations. Broad support could usually be found for improved water availability for fire fighting and controlling dust, but most people could not see a personal need to connect with a water works system. Because of this, some water systems took a long time to be built, while others failed when an insufficient number of people subscribed to them. Only when people could see the convenience of indoor plumbing and when water works prices were kept low did public water works become successful.[40]

In Wisconsin, the earliest water works system came to the state's largest city. In 1872, Milwaukee began its system, which it owned and operated. But, the Milwaukee experience was far from the norm.

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[38] John H. Murdoch, Jr., "75 Years of Too Cheap Water," *Journal American Water Works Association*, Vol. 48, No. 8, August, 1956, pp. 925-926.
[39] *Ibid.*, p. 926-927.
[40] *Ibid.*, pp. 928-929.

The development of the water works in Madison was, initially, more typical of water works development in small towns in Wisconsin. In 1881, a private company offered to build a water works in Madison in exchange for a 20-year franchise agreement. City leaders were eager to accept this offer and the private company established the Madison City Waterworks Company. Some citizens balked at the idea of a privately-owned water works system and before the private company could be officially contracted to build the system, the city council passed a resolution prohibiting private ownership of a water works. In 1882, the city of Madison contracted for wells, a pumping station, and 12 miles of pipe, which was the beginning of their public system.[41]

Most other communities in Wisconsin granted franchises to private companies to build water works systems, just as they granted franchises with private companies for electric and telephone services. But, while electric and telephone services tended to remain private, it was not long before municipalities began to take over water works systems. The reasons were that in some cases there were conflicts with poor service and high rates, or the water companies did not make the profits they had anticipated, possibly because of the slow rate of customer hook-ups, and asked the municipal governments to buy or take over the service. In any event, by 1900, most water works systems were built by municipalities.[42]

The development of the Monroe water works is identical to the above scenario. An entrepreneur proposed a water works system to the community and its city leaders embraced the idea. There was no referendum or lengthy public discussion. Rather, only a public meeting where the community's business and political leaders attended decided the matter. The city leaders apparently saw the benefits the water system could bring in the way of community development and convinced the community to go along. That the water system came into the community right after electric and telephone service appeared may have been no coincidence. Apparently, the citizens of Monroe welcomed these improvements.

The water works system was the culmination of public utility development in the1880s. The Monroe Fire Department, organized in 1870, purchased its first steam fire engine in 1883. In 1884, a two-story brick engine house was built (not extant) to house the fire department's two companies. One of the on-going problems with the fire department was lack of available water supply. Prior to the purchase

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[41] John D. Buenker, *The History of Wisconsin Volume IV The Progressive Era, 1893-1914*, Madison: State Historical Society of Wisconsin, 1998, p. 153; David V. Mollenhoff, *Madison A History of the Formative Years*, Dubuque: Kendall/Hunt Publishing Company, 1982, pp. 208-211.
[42] Buenker, pp. 152-156.

of the steam engine, the department had little but the bucket brigade to save buildings. Even after the engine purchase, the lack of sufficient water caused problems. City officials encouraged citizens to build cisterns and developed reservoirs for the downtown.[43]

Just one year before the water works was built, in May of 1888, the city granted a franchise to the Monroe Electric Light Company to operate a generating plant that would provide electric service to residents. By fall of 1888, new electric lights on street corners were turned on. The electric plant had some problems maintaining continuous service, but by 1904, 24-hour electricity was available to city residents. Also in 1888, the Wisconsin Telephone Company completed lines to Monroe and gradually limited local telephone service became available. The era was capped with the development of the water works, built in 1889 and fully operational in 1890.[44]

The late nineteenth century was an era of progress in Monroe. The industrial and commercial growth of the 1860s and 1870s, along with the growth of county government made Monroe the largest community in its region. Monroe was ripe for the establishment of a water system and seemed to embrace it as a means for further growth and development. The new courthouse building in the 1890s and the new library and hospital in 1905 illustrates the continued commitment of Monroe's citizens to improved public services.

Utilities like electricity, water, and telephone service, combined with paved streets, parks, and public amenities like bandstands were a part of the changes in the late nineteenth century that brought communities into the modern era. Since many of these services were operated or regulated by the local government, they expanded local government's role in the lives of its citizens. Taxpayers eventually expected more and more services in the twentieth century, a trend that has yet to end. Early water systems were a part of this trend, even though they often began as private enterprises. They had to be built with the cooperation of the local government and after the turn of the twentieth century, they were often built and operated by the local government.

The Monroe Water Tower is locally historically significant because it is the most important historic resource in the community related to the event that established the water works system. The water

[43] Hamilton, pp. 66-69.
[44] *Ibid*, pp. 183-188.

works system was part of the important era of the growth and development of community utilities in Monroe. These utilities helped Monroe develop into the modern twentieth century community it is today.

End of Statement of Significance

Insert References

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End of References

Insert Boundary Descriptions

BOUNDARY DESCRIPTION

The boundary for this property is as follows: a line forming a circle 20 feet from the foundation of the tower running entirely around the structure.

BOUNDARY JUSTIFICATION

This boundary was drawn to encompass the part of the park that makes up the site of the tower, while drawing out close-by structures including the picnic shelter and rest room as shown on the site map. These structures have no association with the historic site of the tower.

End of Boundary Descriptions

Insert Photo Descriptions

MONROE WATER TOWER, Monroe, Green County, Wisconsin. Photos by Carol Lohry Cartwright, April 2005. Negatives on file at the Wisconsin Historical Society, Madison, Wisconsin.

Views:

1 of 7: Site view, from the southeast.

2 of 7: Southwest elevation, from the southwest.

3 of 7: Northeast elevation, from the northeast.

4 of 7: Southeast elevation, from the southeast.

5 of 7: Close-up view of water tank.

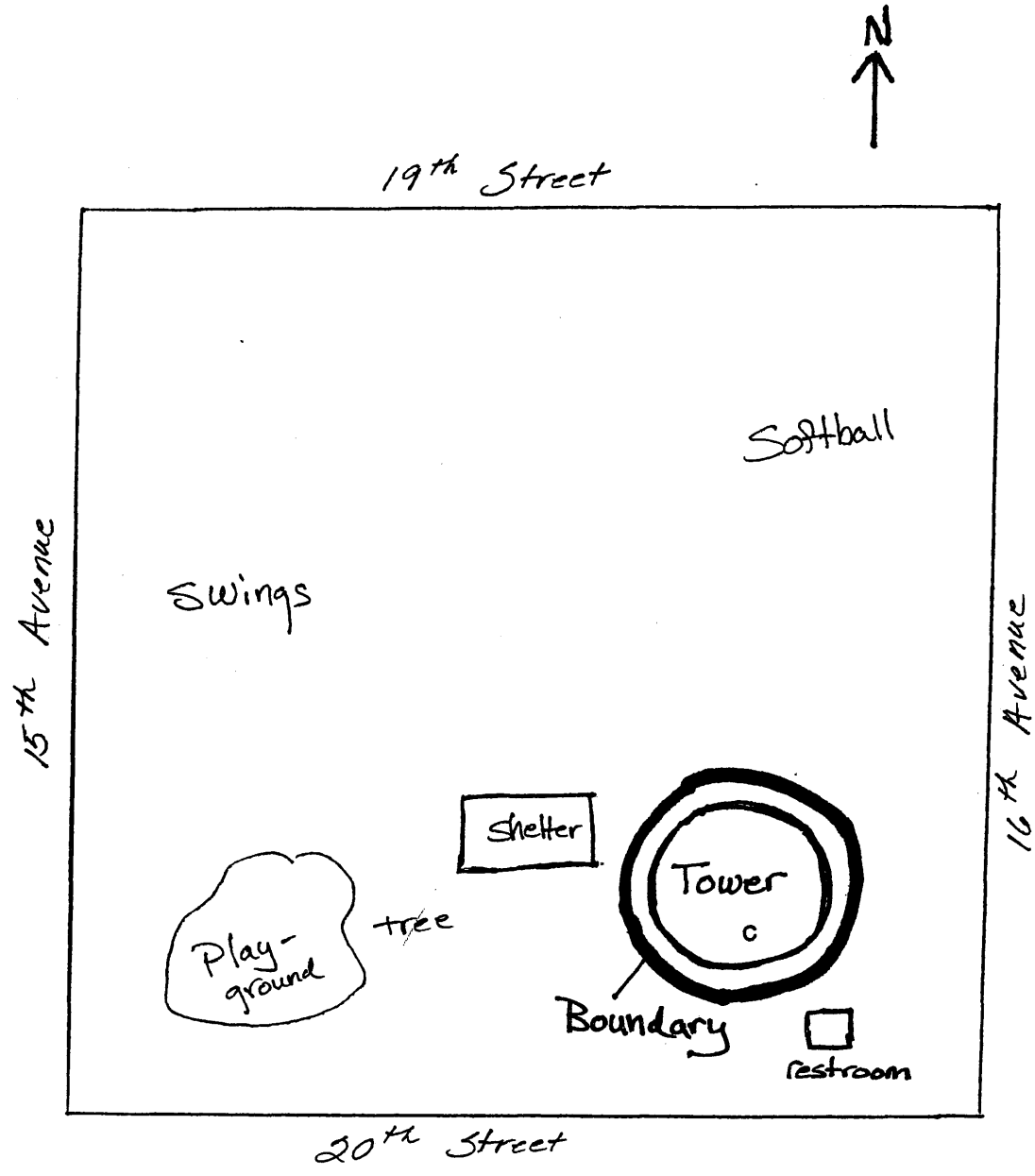
6 of 7: Interior, showing staircase and interior wall of outer tower.

7 of 7: Interior, showing interior tower.

End of Photo Descriptions

MONROE WATER TOWER
MONROE, GREEN COUNTY, WISCONSIN

*SITE MAP**



=Boundary

**Not to Scale*

C=contributing