Posted 01-22-2025

Osseo City Council
AGENDA

WORK SESSION
Monday, January 27th, 2025
6:00 p.m., Council Chambers

MAYOR: DUANE POPPE | COUNCILMEMBERS: MARK SCHULZ, JULIANA HULTSTROM, MARK COOK, NICK TORRES

1. **Call to Order**

2. **Roll Call** (quorum is 3)

3. **Approval of Agenda** (requires unanimous additions)

4. **Discussion Items**
   A. Discuss Water Tower Issues

5. **Adjournment**

The City of Osseo's mission is to provide high-quality public services in a cost-effective, responsible, innovative, and professional manner given changing needs and available resources.

City of Osseo City Council
Work Session Meeting Item

Agenda Item: **Discuss Water Tower Issues**

Meeting Date: January 27th, 2025
Prepared by: Shane Mikkelson, City Administrator

Attachments: Conditions Assessment Report

Policy Consideration:
Discuss Osseo's two water towers.

Background:
There are two water towers in the City of Osseo. We have labeled them the North Tower (City Hall) and the South Tower (County Road 81). Staff have been discussing the deterioration of both the North and South Towers. It is time that there is a discussion about what you would like staff to do to investigate options for these towers.

We met with one Water Tower Restoration company and received some numbers regarding restoration of the North Tower. Staff was quoted a price of $844,000 to repair and paint the North tower. That would include current lead paint removal, sandblasting the structure, repainting the inside and outside of the tower and checking the work in year two and five. This company also stated that they do a 10-year maintenance plan that would spread out the costs over ten years for the city. This would come with an interest rate since we would be paying off the original amount over time. If the maintenance option is selected, the historic water tower could be completed and ready for unveiling in time for the 2025 Lions Roar and 150th Celebration.

The South Tower is the only remaining workable water tower in Osseo. This tower sits over the only well Osseo could use if we wanted to serve our own water instead of getting water from another city. This tower would need the same maintenance work as the North Tower, but it is a bigger tower to paint. We do not have any specific numbers on repairing this tower, but we were told that if the tower was taken down that the total price for the take down and the sale of the steel should be close to a wash. It should also be noted that we have leased antennae on the South Tower, which generates a small income.

The current staff recommendation is to use funds from the water fund to invest in the North Tower and provide some direction on the options for the South Tower. Currently the water fund has $1,800,000 and a debt service of $525,000.

Staff is asking the council to consider the following items when giving direction. This is not an exhaustive list just some staff thoughts.

North Tower Considerations:

1. Keep or take down
2. Complete preservation work this year or wait
    a. If a maintenance plan is selected, the bidding process would be streamlined and work could be completed this year
3. Cash up front or enter into a maintenance plan to pay for expenses and maintenance over time
4. Preservation would include lighting and color options

South Tower Considerations:

1. Keep or take down
    a. If the South tower is taken down, can other things be put in its place (Cell Tower, Digital Sign)?
2. Water dependence on outside water partners
    a. Water treatment is not currently available and a large infrastructure investment would be needed to build a facility
3. Cash up front or maintenance plan to pay for expenses

Recommendation/Action Requested:
Provide direction to staff on the North and South Water Towers.

CONDITIONS ASSESSMENT
FOR THE OSSEO WATER TOWER

415 CENTRAL AVENUE
OSSEO, MINNESOTA 55369

REPORT SUBMITTED JANUARY 10, 2020

PREPARED BY

MACDONALD & MACK
ARCHITECTS
with Mattson Macdonald Young Engineers

FUNDED BY

CLEAN WATER LAND & LEGACY AMENDMENT

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INTRODUCTION

LOCATION

Osseo Water Tower
415 Central Avenue
Osseo, Minnesota 55369

STUDY SUMMARY

This study was commissioned by the City of Osseo, Minnesota and funded by a Minnesota Historical and Cultural Heritage Grant. The City wishes to preserve the Osseo Water Tower as a historic object, as it not only represents Osseo, but also represents the City's development and prosperity in the years following its construction in 1915. It is listed in the National Register of Historic Places as representative of the hemispherical bottom type of water tower that "exemplifies the evolution of water supply sytems during the period from the 1890s to about 1940[1]."

Photograph taken by the southeast leg of the tower.

The primary purpose of this report is four-fold:

- First, to provide a brief historic overview of the structure and its alterations.
- Second, to provide preservation guidelines based on the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Third, to document the current condition of the water tower through pictures, drawings, and text.
- Fourth, to make treatment recommendations for preservation of the tower and provide cost estimates and phasing recommendations for this work.

Photograph of the hemispherical bottom, taken from the ground near the standpipe.

METHODOLOGY

Field survey investigations were conducted during the summer and fall of 2019 in order to record and analyze the physical condition of the tower and to determine possible treatment options. Site work included conditions observations, photographs, and verifying accuracy of existing drawings. All investigations were non-invasive.

1 National Register of Historic Places, Osseo Water Tower, Osseo, Hennepin, Minnesota, National Register # 100001023.

Osseo Water Tower tank, photograph looking northeast.

PROJECT PARTICIPANTS

MacDonald and Mack Architects led the project. Todd Grover served as Principal-in-Charge. Staff member Sarah Lembke had a major role in on-site investigations and took part in building analysis and report writing.

MacDonald and Mack Architects was assisted by structural engineer Kenneth Green of Mattson Macdonald Young Structural Engineers.

ACKNOWLEDGMENTS

The authors wish to thank the following individuals who were generous with their time and knowledge and assisted in this Conditions Assessment.

Nancy Abts, Osseo City Planner
Nick Waldbillig, Osseo Public Works Director

The authors would also like to thank the Minnesota Historical and Cultural Heritage Grants Office for funding and the expertise they contributed in review of this project

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HISTORIC OVERVIEW

The history of the Osseo Water Tower is well-represented through previous studies done on the structure, as well as its National Register Nomination. Therefore, for this report, the following is an overview of the historical context and developmental history to aid the City of Osseo in making decisions regarding its preservation. Information in the historical context below is summarized from the National Register Nomination, included in Appendix A.

HISTORICAL CONTEXT

The City of Osseo is recognized historically as a center for potato farming in the state of Minnesota. The Great Northern Railroad contributed to its success, as it allowed for large amounts of the product to be transported frequently. In 1914, it was reported that the average potato export per day during the Spring was 150 train carloads.

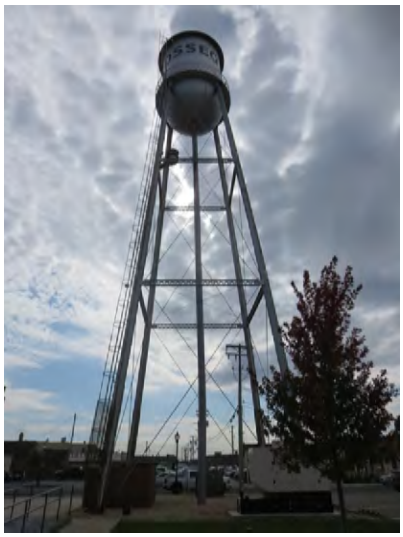
A starch factory was also located in Osseo. This gave farmers a leg up on the competing towns, especially in years with good harvests, when refineries in Minneapolis offered lower prices due to abundance. In large part due to the success of the potato industry, the town experienced great growth in the early 1900s. In 1900 the population was recorded at 346, and by 1910 it had risen to 390.

Although this growth caused the village council to discuss the estabishment of a water works system periodically, it was the Osseo Commercial Club that turned the discussion to action by focusing on the town's potential for continued growth and monetary benefits. They highlighted that establishment of water works would provide a huge savings in fire insurance – about $3,750 annually in 1914 rates – and that the cost of fire protection was prohibitive to further development. In 1915 a special election allocated $14,000 for the construction of the water works plant, and the hemispherical-bottomed tower was constructed that year.

In 1920 the population of Osseo was 433, and by 1960, the population had grown to 2,104. In 1962, a second water tower (double-ellipsoidal in form) was constructed in anticipation of more growth. The population topped out at 2,974 in 1980.

Historic photograph C. 1916, from AKAY Consulting Postcard Collection.

SUMMARY OF SIGNIFICANCE



Tower, looking south.

The Osseo Water Tower was listed on the National Register of Historic Places due to its local significance in association with the history of community planning and development in Osseo. It has been said that the growth of the community would not have been possible if the water service had not been established.

The water tower is also significant due to its engineering, as it is an excellent example of the hemispherical bottom type of water tower. Hemispherical bottom tanks typically held between 50,000 and 100,000 gallons of water, which made it common for smaller communities. These towers were typically constructed of riveted steel and had conical roofs. Although this type of water tower was fairly common between the 1890s and 1940, it is quickly becoming scarce in Minnesota, as many have been demolished in favor of water towers with greater tank capacities. The structure's period of significance goes from 1915 when it was built through 1962 when another water tower was constructed for the City of Osseo to keep up for the growing demand on the water service.

TIMELINE OF WORK AND PREVIOUS STUDIES

Since its construction in 1915, there have been few modifications to the historic water tower, and it has excellent historic integrity. The following is a chronological listing of dates relating to the structure.

1915	Minneapolis Steel & Machinery Co. constructed the tower.
1962	A second water tower was constructed in the City of Osseo to supplement the service provided by the hemispherical-bottomed tank.
1983	Roof hatch put in place. Electrical wire protectors were removed.
1983 – May 1984	Painting project that included cleaning, painting the entire tower tank and supports, and re-lettering the water tower.
September 1998	Osseo City Council awarded Kangas Tank the bid for repainting the entire exterior of the tank. Work likely took place in 1999.
2003	Water tower was decommissioned. The interior of the tank was inspected. Major findings of this report included 15 gallons of heavy sediment in the bottom of the tank and evidence of birds and nesting material in the vent/finial at the top of the tank. Existing clean out plugs were stuck and one of them had to be broken to do the inspection. A new one was installed at the commencement of its cleaning.
2013	A conditions assessment was completed by KLM Engineering which provided recommendations for stabilizing the Water Tower. The report verified that lead-based paint was used on the exterior of the tank and recommended removal of the paint within 3 years. It also recommended improving the access to the roof and interior of the tank. Minor modifications to the shell and roof ladders were carried out during this project.
2017	The Osseo Water Tower was listed in the National Register of Historic Places.

Historic photograph from The Osseo Review December 15, 1915.

National Register of Historic Places plaque on the northeast leg of the tower.

TREATMENT PHILOSOPHY

The Secretary of the Interior has four treatments that apply to changes made to historic buildings and structures. These treatments include Preservation, Restoration, Rehabilitation, and Reconstruction. Considering its maintenance, the previous alterations made, level of repairs required, and future plans for the structure, we recommend that the structure be treated following the Standards for Preservation.

The City of Osseo plans to maintain the structure as a historical object indefinitely. The original features of the structure have been retained over the years, and any modifications will be limited to work that must be done to ensure that the structure can be maintained safely.

STANDARDS FOR PRESERVATION

Original drawing from tank construction in 1915.

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

CHARACTER-DEFINING FEATURES

Defining the significant features is a vital step in determining appropriate treatments for the structure that follow the Secretary of the Interior's Standards for Preservation. The overall visual character, as well as the details and craftmanship that embody the structure are discussed below.

TANK

The tank is a cylinder with a hemispherical bottom. The overall shape of the tank is a major character-defining feature.

The rivets and detailing of the tank are also important to its character. Its body is comprised of individual sheets of steel that are riveted together at the seams, the horizontal sheets are riveted in a continuous line around the entire circumference of the tank, and the vertical seams of each subsequent row of sheets are off-set from those below. The hemispherical portion of the tank has one circular ring of rivets at the bottom near the riser pipe, and then many wedge-shaped portions are riveted vertically to connect to the edge of the cylinder.

The black letters "OSSEO" painted on two sides of the tank and the silver coating on the entire tower also contributes to its overall character. The National Register Nomination states that hemispherical-bottom water towers typically were painted silver on the tank and structure, had black lettering, and a red roof.

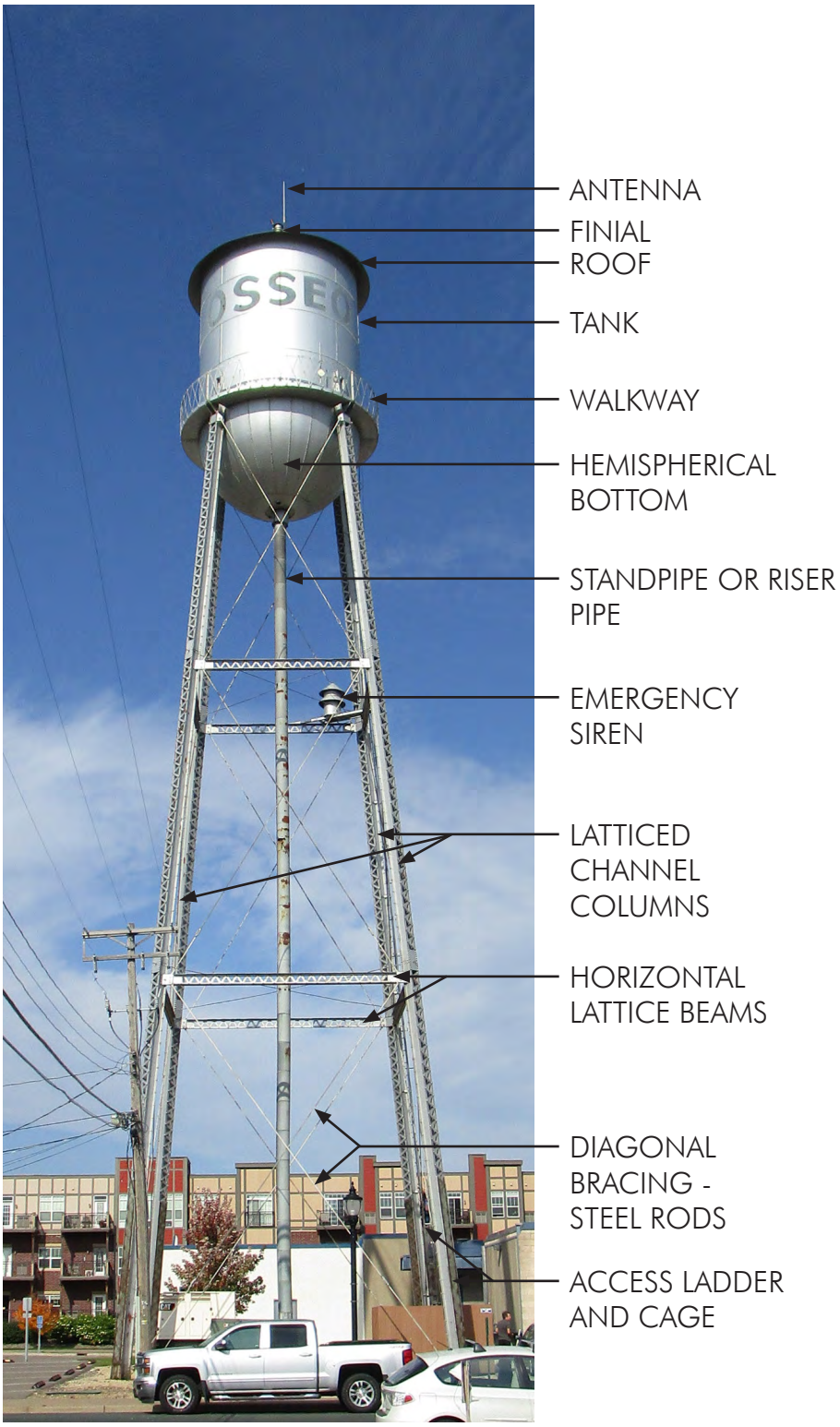
The standpipe, or riser pipe shaft, is also a character-defining feature, as it was necessary for its historic function of transporting water into and out of the tank. It extends from the ground to the middle of the hemispherical bottom. The shaft consists of an intake pipe, an outake pipe, and an overflow pipe which are embedded in concrete and sheathed in galvanzied sheet metal.

View of the cage ladder on the northeast leg of the tower and the hemispherical tank bottom.

Original drawing from tank construction in 1915.

ROOF

The steel conical roof completes the overall shape of the tank. According to the drawings, the roof has a slope of about nine inches rise per foot of length, which is roughly a 36.87 percent slope. The edge of the roof overhangs the vertical sides of the tank by about one and a half feet. There are rivets that hold all of the pieces of steel together and that connect the roof to the tank. The finial at the top of the roof is also a character-defining feature. The finial was a vital portion of the tower when it was in service, as it was a vent for the tank. There is a steel ladder that extends up from the main ladder all the way to the roof. There is also a single manway, on the roof. A manway is a roof hatch that can be used to access the interior of the tank.



Osseo Water Tower, photograph facing north.

STRUCTURE

The structural members are important character-defining features of the tower. The structure is comprised of a four-column, lattice-channel system that is riveted to the sides of the tank just above its hemispherical bottom. There are also four horizontal steel beams that run between the columns on two levels. Due to the splayed positioning of the columns, the uppermost beams are smaller than the bottom set. There are cables that run from the columns to the standpipe. There are also horizontal cables that run diagonally between the columns that create an "X" shape for additional stability. The exposed members are painted silver, like the body of the tank.

ACCESS SYSTEMS

The permanent access systems are also character-defining features of the tower. There is a steel ladder on the northeast column of the tower that runs from the ground all the way up to the roof. It is connected to the structure by steel straps that are bolted to the channels of the column. The ladder is surrounded by a cage made of hoops of steel. The cage does not appear in the historic photographs, and we do not know if it existed during the Period of Significance.

There is also a circular walkway around the tank that is connected to the tower at the junction between the hemispherical bottom and the cylindrical portion of the tank. It has a railing that curves all the way around the walk. There are strips of steel that are attached to the rail in a lattice pattern to make up the guards. This was present during the Period of Significance.

Photograph of the north side of the tower, showing the painted letters and ladder cage.

CONDITIONS AND RECOMMENDATIONS

Flaking paint on the "O" on the north side of the tower.

Paint damage on the tank exterior.

Photograph of riser shaft showing the corroded steel and the insufficient joint between the shaft and the tank.

TANK

Since the water tower is no longer in use and the tank was inspected in 2013, we did not conduct an inspection of the interior. The 2013 report noted that the coating on the interior of the tank was in fair condition on the bottom and is delaminating at the top/roof portion. It also noted that the interior wet coating is likely lead-based paint.

As the 2013 report recommends, the interior does not need to be recoated if the structure is to remain out of service. However, if the city decides to recoat the interior in the future, we recommend that a sample be tested at that time to determine if the coating contains lead.

The exterior of the tank appears to be in good condition, but there are a few minor condition issues. The paint is flaking in areas. The damage to the coating is most prevalent on the hemispherical bottom at the seams and on the rivets. The paint damage on the cylindrical portion of the tank is mostly on the black letters. In addition to the paint condition, the surface of the steel itself is damaged in some areas. There are little divots and dents, which are likely a result of improper paint removal techniques.

We recommend the coating be removed from the tank using the gentlest means possible and that it be repainted. Paint removal from a structure such as this is very difficult. Access can be a problem because the structure is so far off the ground. There are also many seams, rivets, and semi-concealed places that make using a typical chemical paint stripper impossible for some portions of the structure. Lead safe procedures also need to be followed for the paint removal, as tests in 2013 confirmed that the exterior paint contains lead.

For these reasons, feasibility of different options for paint removal and painting preparation will need to be considered. Some methods of paint removal are wire brushing, walnut shell blasting, soda blasting, bead blasting, and sand blasting. Some sort of abrasive blasting is likely the only feasible way to remove paint and properly prepare the existing structure for repainting. However, since abrasive paint removal techniques have caused damage to the steel surface of the tank in the past, we recommend a test paint removal be conducted during the construction document phase of the project. This may include consulting with a contractor who has experience with rehabiliation of historic steel. Following this process, the feasibility of different types of removal can be explored and understood while developing the construction documents for the preservation project. The contractor will also be able to assist with

cost estimating, as various methods will have different cost implications, and it would be advantageous to get a more detailed cost estimate so the City can properly budget for the preservation work. The goal is to choose a removal method that most effectively prepares the structure for repainting, while not causing damage to the steel. During construction, the method of removal and process will need to be well-controlled, meet lead-safe standards which require tenting the structure, and a removal mockup must be approved by a historical architect at that time.

After the paint is removed and all debris and loose rust is removed from the structure, we recommend it be repainted with a high-performance coating, such as is manufactured by the Tnemec Company or PPG. We recommend that the tank have a zinc/epoxy/urethane system that is specifically rated for use on steel water tanks. The high-performance system must be compatible with both the steel substrate and its various primer, layers, and top-coat.

The original paint scheme is hard to determine from the black and white historic photographs from 1915 and 1916. The earliest written documentation of the paint scheme and letters is from a painting project completed in 1983. Although there is a lack of evidence for the paint scheme during the Period of Significance, the National Register Nomination states, "Most water towers of the period sported a silver tower and tank, black lettering, and a red roof." Therefore unless contradictory evidence is found, we recommend replicating the existing paint colors and letter configuration. The tank, roof, and structure should be silver, and the letters should remain black. The existing configuration of the letters should be replicated.

The connection between the tank and the riser shaft has not withstood the amount of movement caused by wind. This has caused the riser to tilt. In addition, most of the sheet metal panels have corroded and the concrete is visible through some of the holes. Several of the panels are also dented.

The connection detail between the pipe and the expansion joint cover needs to be redesigned to withstand the dynamic movement of the tank. The damage to the sheet metal is likely due to water infiltration through the top of the shaft. See the structural section of this report for more information about a new structural joint. In addition to a new expansion joint and cover at the top of the shaft, we recommend that the sheet metal panels that have holes or dents be replaced with new galvanized steel. We recommend that the overlapped joints of the steel riser sheets be properly sealed so that wind-driven rain cannot enter the seams between the steel sheets.

Expansion joint between the riser and the tank.

Historic photograph from The Osseo Review December 15, 1915.

Historic photograph C. 1916, from AKAY Consulting Postcard Collection.

Erosion at southeast concrete footing and corrosion at steel.

Corrosion and vegetation growth at base of southwest tower leg.

Corrosion at mesh on southwest leg of tower.

ROOF

Due to safety concerns, we were not able to access the roof for this report. See the section "Access Systems" for conditions and recommendations. The 2013 report noted several holes in the metal roof near the finial at the apex of the roof. They recommended welding plates over the holes. They also recommended removing the existing paint and repainting the entire roof.

We do not know if the holes were all patched or if there are any new holes in the roof. The roof has not been repainted.

We recommend that the roof be inspected before the development of construction documents and any holes that were not previously patched be covered with sheet metal welded in place. We recommend that the roof be recoated with the same high-performance coating system that is used for the rest of the structure. Paint removal strategies will need to follow lead safe abatement practices and follow all applicable State and Federal regulations.

The 2013 report recommended replacing the finial with a new 24-diameter mushroom vent to "improve ventilation, provide access to the tank interior during reconditioning, and aid in compliance with OSHA Confined Space Entry requirements." We do not know if this vent was replaced.

We recommend that the vent be inspected when the structure is recoated. If the vent has not been replaced, and work is necessary, then we recommend that this work be done concurrent with the painting project. If its condition requires it to be replaced, we recommend that the new vent be carefully designed to balance ventilation requirements and form to adhere to the Secretary of the Interior's Standards for Preservation.

There is a communications antenna attached to the finial at the top of the tower. We do not know if the antenna is active.

We recommend finding out if the antenna is active. If it is not, we recommend it be removed from the finial, as it is not part of the original structure.

STRUCTURE

The last documented painting project that included the structural members was completed in 1984. The paint on the steel lattice legs

and horizontal members is chipping. The steel is corroding in the areas where it is exposed to the elements.

We recommend that all paint be removed, and the entire structure be repainted using the guidelines discussed in this report for the tank. Please see the recommendations about paint removal and recoating in that section.

Some of the cotter pins are damaged or missing from the pinned connections of the cross rods.

We recommend that new cotter pins be installed in these locations. Please see the structural section of this report for more details on the cotter pins and for the full structural conditions assessment and recommendations.

The foundation of the water tower is concrete. There is some damage to the exposed portions of the concrete, especially at the northwest leg of the tower. The top of the concrete on the interior of this support is also spalling off. All of the steel legs have some corrosion at their bases near the concrete.

The damage to the concrete appears to be from salt from the adjacent driveway. Although some salt exposure may be unavoidable, we recommend that snow not be piled up on the gravel underneath the tower. Please see the Structural Report for more information about the foundation.

ACCESS SYSTEMS

There are several safety and logistical issues with the access systems for the tank. The tower must be accessed on a routine basis to replace a light bulb at the top of the tower and carry out other maintenance. The main ladder up the side of the roof is in decent condition, but there are a few issues. The paint is flaking off the ladder. The treads also have poor traction. Some of the metal hoops and connection pieces on the cage are slightly bent and the paint is peeling off.

We recommend that a safety consultant be engaged in the design process for the repainting and structural repair work to determine what additional safety measures may need to be permanently implemented for routine maintenance done on the tower.

If the safety consultant determines the ladder and cage should remain, we recommend that they be painted when the rest of the water tower is painted. We also recommend that an anti-slip tape or other skid-resistant

Peeling paint on southwest tower leg.

Peeling paint on structure, photograph facing south.

Bottom of ladder cage at northeast leg of tower.

Ladder and cage at northeast leg of the tower.

Photograph looking up from the inside of the ladder cage.

Peeling paint and exposed steel on the ladder cage.

material be applied to the tops of the ladder rungs to increase traction and reduce the potential for falls during wind, rain, and other inclement weather.

The section of the ladder from the ground to the walkway has a ladder safety system consisting of a cable that runs the length of the ladder vertically. This system requires a harness with a front "D-ring" and a cable grabber. The cable grabber must be unpinned and repined at each cable support.

If the ladder is to remain, this system is acceptable if the proper equipment is used. A harness with only a back "D-ring" should not be used, as the tie-off mechanism in this configuration would create a trip hazard. In addition, we recommend that an additional tie-off be used when the cable grabber is unpinned. At each cable support, a rebar hook should be tied to a ladder rung before the grabber is unpinned and removed after the grabber is in place and before the climber continues their ascent or descent.

When stepping from the ladder onto the walkway, you must swing your legs over the existing railing. This is hard to do and unnecessarily dangerous.

We also recommend that a section of the railing be modified to facilitate an easier transition from the ladder to the walkway. This can be accomplished by creating an opening in the railing or gate so that you can simply step onto the walkway instead of swinging up and around it. This must be done in a way that is sympathetic to the existing railing configuration.

Once on the walkway, a rope must be used to tie off. This limits the ability to move all the way around the walkway without getting tangled. The walkway railing is also not tall enough. According to the 2013 report, the railing also does not meet structural loading requirements.

We recommend that a safety consultant be engaged in assessing the guardrail and walkway for safety during the painting and structural upgrades project. We recommend that a permanent cable be installed around the circumference of the walkway so that maintenance personnel can continuously tie-off. It is possible that a safety consultant would determine that improving the walkway tie-offs would allow the existing guardrail to remain unaltered. If the guardrail still needs to be upgraded, supplemental supports could be added behind the existing guardrail and a top rail could be added at the OSHA-compliant height. The existing guardrail could then be left in place. All additions should be designed

to have as minimal of an impact as possible on the overall appearance of the tower.

The ladder section from the walkway to the roof does not have a cable. This means that anyone on this ladder would have to unclip and clip to different rungs of the ladder as they are going up. Although there is a cage on this ladder, a cage is no longer fulfills OSHA requirements, and a cable system for continous tie-offs is required.

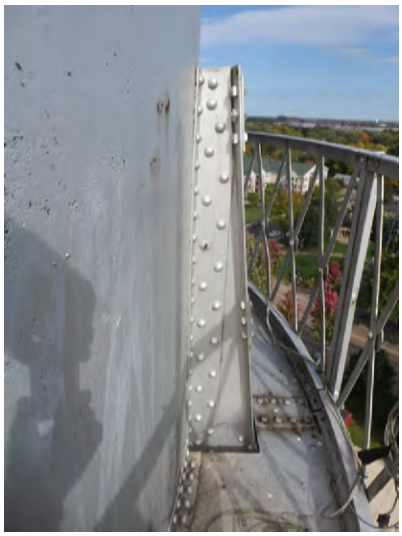
We recommend that a safety consultant be engaged in the design process for the repainting and structural repair work to determine what additional safety measures may need to be permanently implemented for routine maintenance done on the tower.

The 2013 report recommended that an OSHA-compliant handrail be installed around the entire roof edge. It also recommends that a swinging gate be installed at the top of the shell ladder per OSHA requirements.

Although it would be ideal to have a railing installed all the way around the roof for safety reasons on an in-service water tower, we do not recommend one be installed on this water tower. A permanent guardrail would significantly impact the historic character of the water tower, as no railing ever existed at the roof. Since the water tower has been decomissioned, maintenance inspections are not required to be performed frequently enough to warrant installing a guardrail at the roof edge. When there are inspections, temporary measures may be taken to ensure safety on the roof.

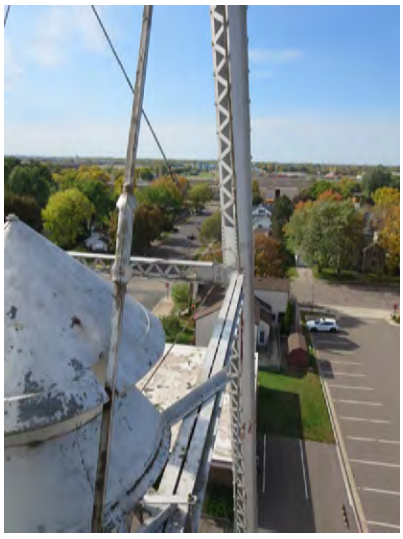
The 2013 report also recommended that an additional manway be installed to access the tank interior. A manway is a roof hatch that allows workers to crawl into the interior of the tank. To our knowledge, an additional manway has not been installed.

For safety reasons, there should be at least two manways, so no one gets stuck inside when inspecting or doing work on the interior, and so adequate ventilation can be provided during work. We recommend that a new manway be installed while the tower is being painted. A new manway would necessitate that a small roof hatch be cut into the existing metal roof. The manway itself would not be seen from the ground. Guards are recommended around the manway and should be designed to have a minimal effect on the historic fabric and overall appearance. We recommend the guards be painted to visually blend with the rest of the structure.



Riveted connection of tower leg to the tank.

Photograph showing balcony walkway cut out at leg and the guardrail.



Close up view of emergency siren at northeast corner of the water tower.

Photograph looking up at the emergency siren and its platform from the ground.

There are various security measures installed on the water tower. There are wire mesh sheets over the bottom of the lattice legs to prevent someone from climbing them. There is also a locked gate at the bottom of the main ladder and there is wire mesh around the cage at the bottom. The wire mesh on the legs and at the ladder is corroding and bent. In the 2013 report, it was suggested that a roof hatch lock be installed.

We recommend that these security measures be left in place. We recommend the wire mesh be replaced with new wire mesh in a metal that is compatible with the steel legs. The pattern should match the diamond pattern of the existing mesh, as this is visually compatible with the structure.

EMERGENCY SIREN

There is an emergency siren installed on the northeast corner of the water tower on a platform that rests on two of the upper lateral support beams. The siren sounds daily at noon and 6:00 pm. It was purchased by the city for the fire department in 1921. Osseo's Centennial Booklet published in 1975 states (page 73) that a siren was installed in the "back of the store buildings between 2nd and 3rd streets, later moved to the water tower." There is no documentation that tells us exactly when the siren was moved, however, it could have been located on the tower before 1955. The sounding of the siren, or "whistle" has nostalgic value for the community.

The platform is painted wood on metal channels. The wood is rotting and has some green algae growth. The siren itself is painted metal. The paint is flaking off it. There is also some debris in and around the siren and its platform. The cords from the siren run down the inside of the northeast support leg.

We recommend leaving the siren in its location as it has served its purpose on the tower for at least 45 years and likely more. The wood will continue to rot if left in place. We recommend that the siren platform be removed and a new metal platform be installed during the painting project. The metal to remain should be painted. We also recommend that the debris be cleaned off the siren.

Mattson Macdonald Young
structural engineers

Bassett Creek Business Center
901 North 3rd Street, #100
Minneapolis, MN 55401

612-827-7825 voice
612-827-0805 fax

October 22, 2019

Todd Grover
MacDonald & Mack Architects, LTD
Minneapolis Grain Exchange Building
400 South Fourth Street, Suite 712
Minneapolis, Minnesota 55415

RE: Osseo Historic Water Tower
Osseo, MN
MMY Project No.: 19002.00

Dear Todd:

We were contacted to review the existing conditions of the Water Tower located in Osseo, MN. Mattson Macdonald Young visited the site on October 2, 2019 and October 9, 2019 to review the existing conditions specific to the structural performance of the structure. This was done as a cursory visual observation of the water tower to form an opinion of the structural condition and to identify areas of damage, deterioration or deficiency. The following is a summary of our observations and opinions:

Purpose and Scope
It is our understanding that the owner desires to obtain a Condition Assessment Report for the Historic Water Tower, located at 25 4th Street NW, in Osseo, MN. This report is intended to become a part of that larger report and is concerned with the building structural framing and foundations. Attention is focused on any damage, deficiencies or deterioration observed with recommendations for necessary repairs or enhancements.

This report concerns only the structural frame and elements that are an integral part of the load resisting system for the structure. It is our understanding that other qualified professionals have been retained to observe and report on the building architectural elements, historic interpretation, egress and life safety compliance.

Observations that were performed are considered a cursory "walk-through" of the building. Select measurements of existing framing were made to aid in our analysis. Structural analysis and calculations were performed for the determining the adequacy of the existing framing and foundations with the water tower tank emptied. This is not intended to be a complete analysis of all framing members or address filling the tank.

Qualifications of the Personnel
Kenneth J Green P.E. is the author of this report, the lead investigator and the Structural Engineer of Record (SER). Ken has over 30 years of experience in the field of structural engineering and has performed condition reviews of numerous buildings and structures similar to the subject building.

Methods of Investigation
The method of investigation was by casual observation and was limited to those structural elements that were exposed to view and accessible. No attempt was made to perform an exhaustive investigation of all structural elements.

Copies of some of the original construction documents were made available for our use, which included a portion of the structural framing.

Description of Structure
The water tower was constructed in 1915 and is a hemispherical-bottom water tower, approximately 127′ tall. The cylindrical tank and bottom are riveted steel plates varying in thickness from 1/4″ to 5/16″. The roof is made of riveted 12 gage steel plates. The tank is supported on four latticed channel columns, with two levels of horizontal lattice beams and vertical square bar bracing. There are also horizontal rods that brace the standpipe but are not likely considered part of the tower support structure.

The tank has a balcony walkway that allows for access around the base of the tank and is made of steel plates and channels. The railing of the balcony is a lattice work of steel plates supporting a steel angle as the top rail.

The foundation is cast concrete footings. Based on the provided drawings and a newspaper article that provides some description, the foundations are presumed to be truncated square pyramid shapes, 7′ deep with a maximum footprint of 8′ square, tapering to 3′ square at grade level.

Observations
The tower framing was observed from the ground and from the access ladder that is connected to the northeastern column. The tank was observed from the ladder and the walkway. The roof and interior of the tank was not accessed.

In general, the water tower was found to be in good condition given the age of the structure. Specific areas of observed deterioration or damage are addressed below:

1. Tower Framework
    a. Lattice Columns: The lattice columns are made of two 12″ deep steel channel and 2-1/2″ wide steel lattice plates, riveted into a box shape. The columns have some deterioration evident at the base of the columns.
    b. Diagonal Bracing: There are three levels of diagonal bracing on the tower. The bracing is steel square rods with turnbuckles and steel pins. The large diameter pins go through a pair of plates and are intended to be kept in place by cotter pins. A number of cotter pins are missing or broken. There is also deterioration of the paint and some more pronounce rust evident.
    c. Horizontal beams: The horizontal beams are lattice work beams consisting of two pairs of steel angles and lattice plates. The ends have solid plates for making the connection to the columns and to connect the diagonal bracing. There is some deterioration of the paint but does not appear to have surface corrosion at this time.
2. Tank and Balcony Walkway
    a. Tank: The tank is made of riveted steel plates. There are no observable structural issues with the tank. There are a number of locations of peeling paint and surface rust. There are also locations where pitting of the plate was observed.
    b. Walkway: The walkway consists of riveted plates and edge channels. The walkway has some surface rust with some minimal section loss evident.
3. Foundations
    a. The majority of the foundations are obscured by the surface rock and soil. The concrete of the foundation at the southern two columns is partially exposed. The exposed foundations have some deterioration evident in rounded edges and some material loss.

Opinions and Recommendations
In general, the structure is in overall good condition given its age. The framework is intact and performing adequately. There are isolated areas of damage or deterioration in the building that should be addressed. Calculations that were performed to determine general adequacy of the structure were performed.

Tower Framework
The tower framework is in overall good condition. There are locations of surface rust and a few locations where deterioration has reduced the section. The rust at the base of the columns will require additional maintenance and is likely partially due to the use of deicing salt on the nearby surfaces. Removal and repainting with removal of the surface rust is recommended.

The missing or broken cotter pins at the diagonal bracing need to be replaced. The concern is that the steel pins holding the diagonal braces may come loose during a wind event, when the diagonals are tensioned and relaxed. This could lead to a catastrophic failure of the tower.

Tank and Balcony Walkway
The tank and balcony are structurally adequate. The surfaces will require repainting.

Foundations
The deterioration at the edges of the exposed concrete foundations is of some concern. The spalling of the corners is likely due to some deicing salts attacking the concrete.

The tank is essentially empty of any water and is intended to be kept in this condition. The tower was analyzed for the empty tank with wind loading as determined by ASCE 7. The tower framework is structurally adequate. The foundations appear undersized for the worst case wind loading, with an empty tank. This condition occurs only during a quartering wind – wind that would be coming in line with diagonal columns (i.e., from the northwest). This loading is unlikely to have been considered when the tank was designed. The wind load on the tank and tower would cause tension on the column, lifting on the foundation. The weight of the foundation, with a small portion of soil, is the restraining force. In this condition, the uplift force is approximately 40% greater than the restraining force.

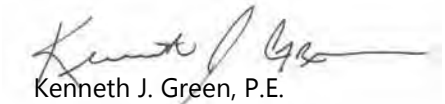
[Note: the wind loading criteria is open to some interpretation. It has been considered as a Risk Category II structure, which is similar to typical buildings. Risk Category I is typically used for agricultural buildings where there is low risk of loss of human life. Risk Category II and IV are for larger structures and places of gathering, as well as essential facilities, such as Fire Stations. Given the location relative to the Fire Station, an argument could be made to increase the Risk Category to IV, this would increase the wind load, making the foundations further overloaded. The other item that could be considered is the Exposure Category which refers to the near ground level surface conditions. Exposure B is for typical urban and suburban locations where there are buildings and structures approximately 30' in height within a horizontal range of the tower. Exposure C is more rural where there are open areas, such as fields or smaller lakes. To the northeast and southwest, there are flat open areas that would be considered Exposure C, which has a higher wind force than Exposure B. Exposure C was considered for the analysis.]

Limiting Conditions
The opinions and recommendations contained in this report are based on a cursory observation of the building. No attempt was made to perform an exhaustive investigation of all conditions and building elements. It is possible that conditions exist that cannot be discovered or judged as a result of this limited nature of investigation. The work provided in the preparation of the report concerns the structural system only.

Please contact me at 612-827-7825 or keng@mattsonmacdonald.com with any questions regarding this.

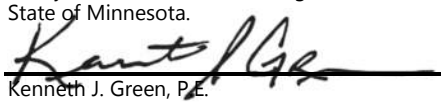
Sincerely,

MATTSON MACDONALD YOUNG, INC.



Kenneth J. Green, P.E.
Mattson Macdonald Young Inc.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



Kenneth J. Green, P.E.

Date: 10/22/2019 MN Reg. No. 26449 .

PHOTOS

Photo 1 - Water Tower Overall, facing south

Photo 2 - Northeastern column base

Photo 3- Southeastern column base

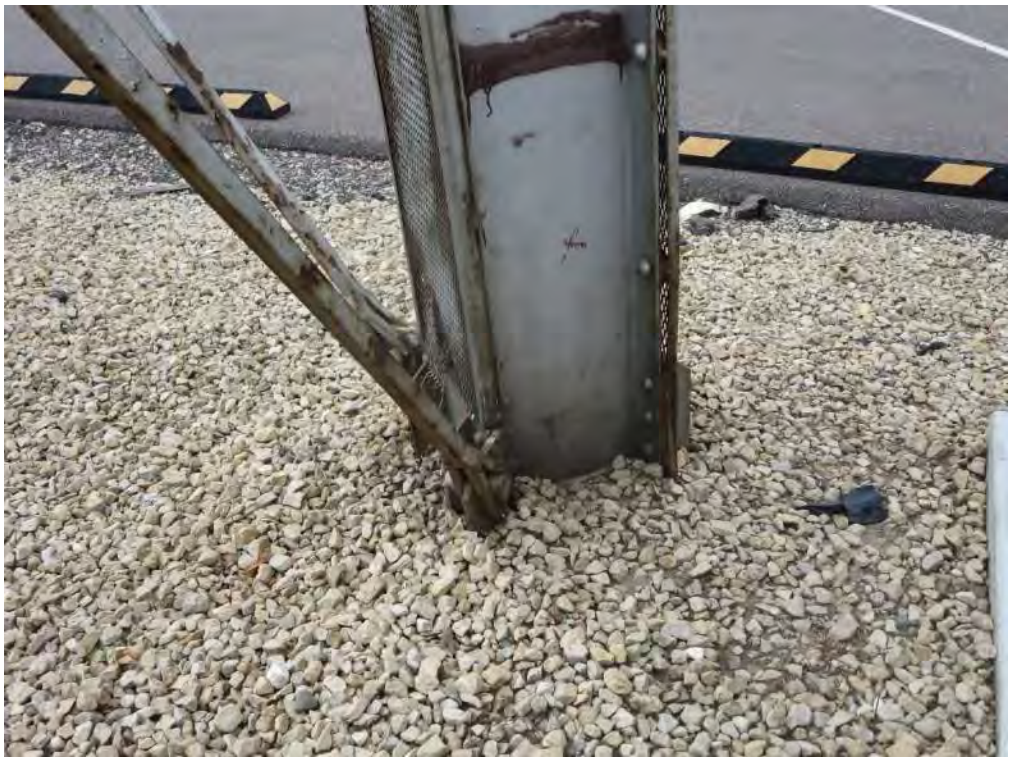


Photo 4 - Northwestern column base

Photo 5 - Southwestern column base

Photo 6 - Horizontal beam - note top cotter pin broken at top, bottom cotter pin missing

Photo 7 - Horizontal beam - note: cotter pins intact

Photo 8 - Looking down at bracing - note rust and deteriorated paint

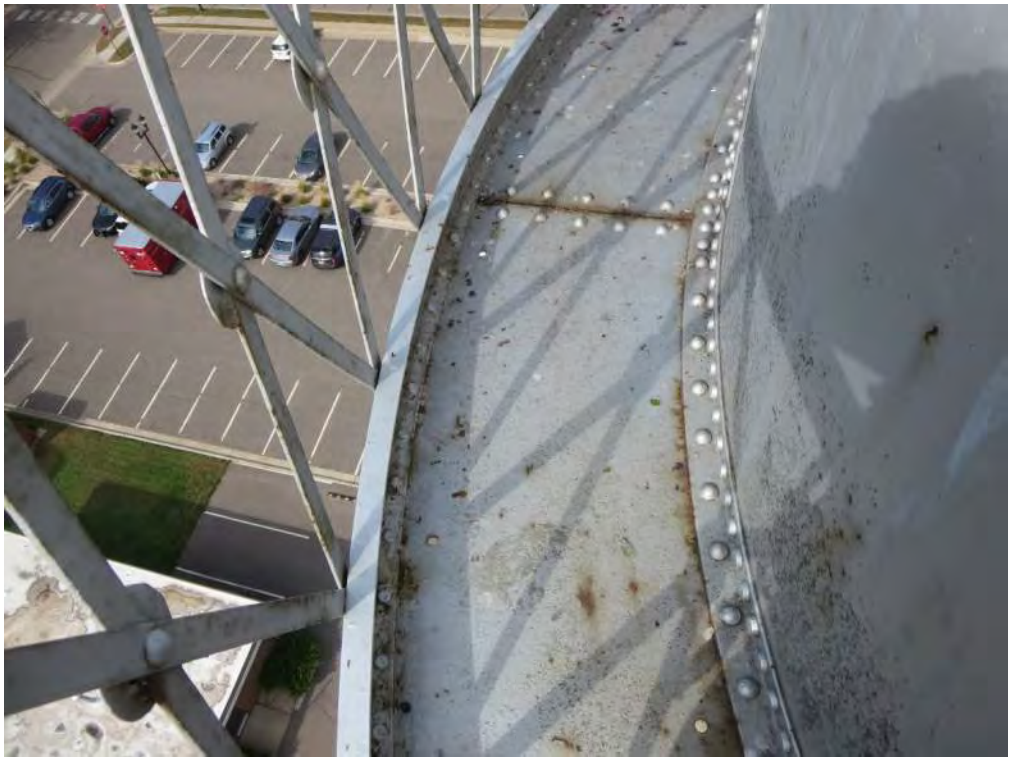


Photo 9 - Walkway around tank - note surface rust

Photo 10 - Tank wall - note pealed paint and rust in letters

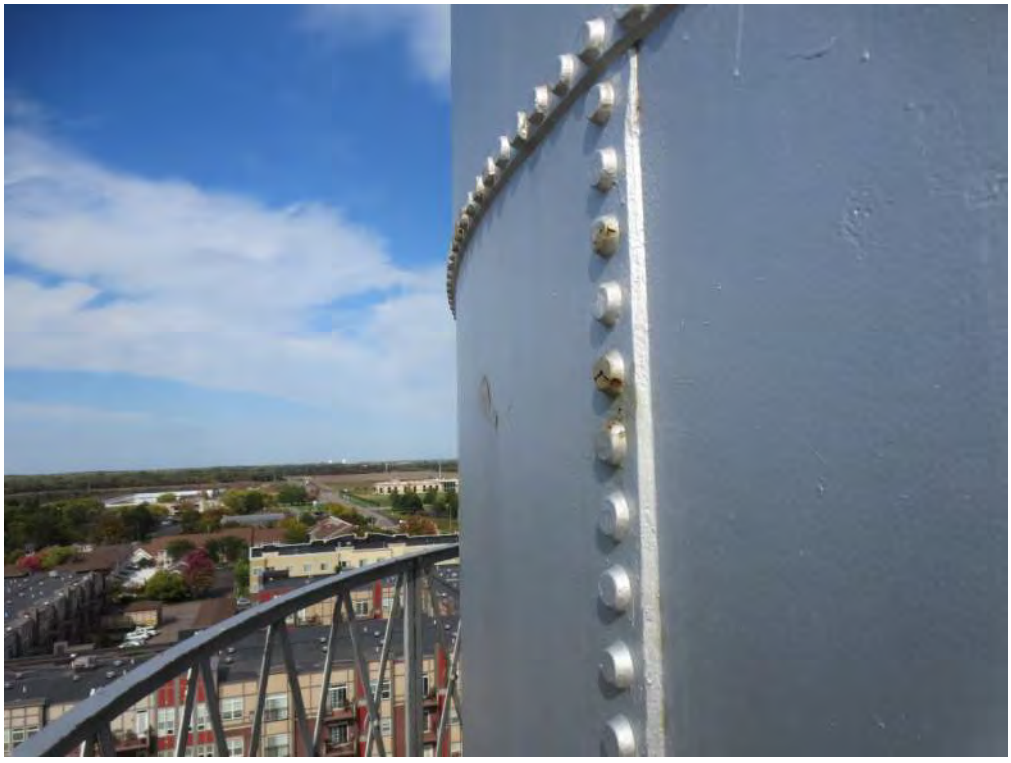


Photo 11 - Tank plate joint - rust evident at some rivets

Photo 12 - Support bracket below walkway - surface rust and some deterioration evident

Photo 13 - Ladder connection to walkway - note rust and peeled paint

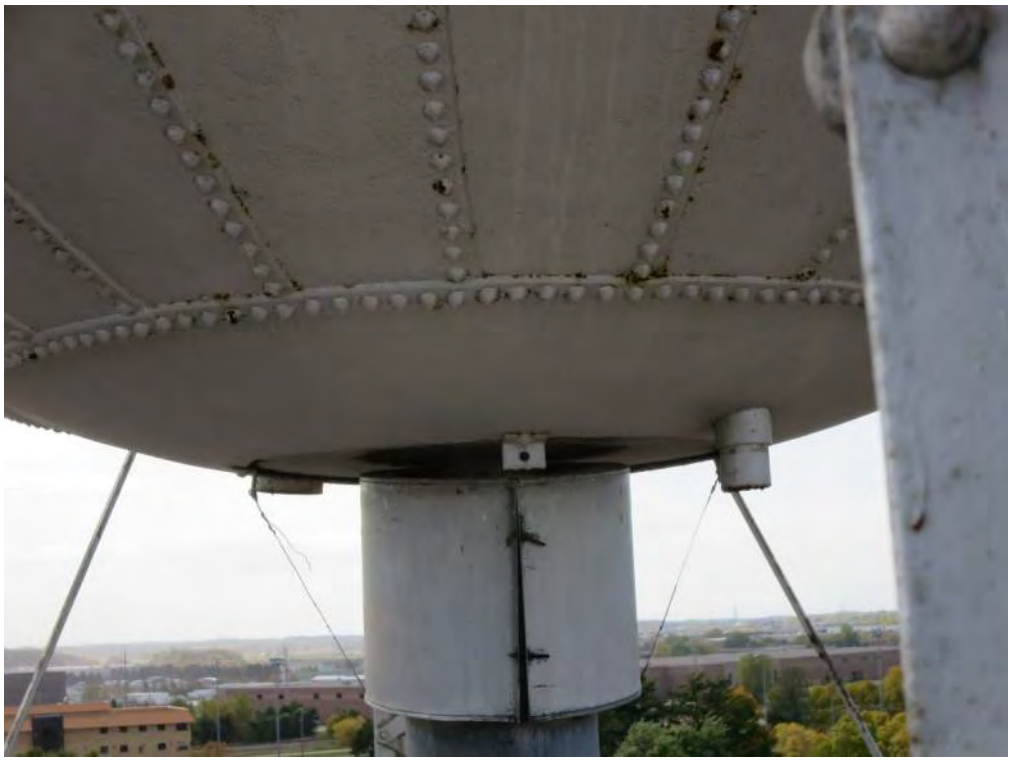


Photo 14 - Base of tank

Photo 15 - Base of tank and bracing - note dark spots on bracing are surface rust locations

COST ESTIMATE

The water tower is in stable condition and none of the recommended repairs are considered to be urgent for the water tower to remain standing. However, the modifications that we recommend for safety issues should be addressed within the next one to two years. The primary item to address is the safety of the walkway.

Another item we recommend be addressed within the next one to two years is investigation of the communications antenna. If this is no longer in service, it should be removed.

We recommend that all other work be done within three to five years. This includes the paint removal and repainting. Due to the difficulty and expense of construction mobilization at the water tower, we recommend all other work be done at the same time for efficiency. The numbers below assume all work is completed concurrently.

We generally recommend a contingency of 10-20% on construction cost estimates at this stage in the planning process. Professional fees would also be an additional cost.

STRUCTURAL REPAIRS ON THE TOWER	**$105,831**
OSHA and Safety-Related Upgrades	$56,530
Cotter Pins	$4,000
Riser Repairs	$40,025
Siren Repairs	$4,276
Remove Antenna from Finial	$1,000
EXTERIOR PAINT REMOVAL AND REPAINTING	**$304,500**
Lead-Based Paint Removal	$131,250
Sandblasting	$94,500
Painting	$78,750
MOBILIZATION AND SCAFFOLDING	**$75,000**
POTENTIAL FOUNDATION REPAIR/REINFORCING	**$112,160**
TOTAL	**$597,491**

APPENDIX A:
NATIONAL REGISTER NOMINATION

NPS Form 10-900 OMB No. 1024-0018

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.

1. Name of Property

Historic name: Osseo Water Tower

Other names/site number: _____

Name of related multiple property listing:

n/a

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

2. Location

Street & number: 25 4th Street NW

City or town: Osseo State: MN County: Hennepin

Not For Publication: N/A Vicinity: N/A

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

Applicable National Register Criteria:

X A ___B X C ___D

4/20/17

Signature of certifying official/Title: Amy Spong, Deputy SHPO, MNHS **Date**

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

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	☐
Public – Local	☒
Public – State	☐
Public – Federal	☐

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☐
Site	☐
Structure	☒
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

Number of contributing resources previously listed in the National Register 0

6. Function or Use
Historic Functions
(Enter categories from instructions.)
GOVERNMENT/public works

Current Functions
(Enter categories from instructions.)
GOVERNMENT/public works

7. Description

Architectural Classification

(Enter categories from instructions.)

OTHER: hemispherical tank, steel water tower

Materials: (enter categories from instructions.)

Principal exterior materials of the property: METAL/steel

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The 1915 Osseo Water Tower is sited on a parcel of city property at the north end of the city's historic downtown commercial area, which flanks the historic route of the Jefferson Highway, stretching three and a half blocks south from the water tower to MN-81.

The Osseo Water Tower is a well-preserved example of a hemispherical bottom water tower, typical of municipal towers constructed between ca.1890-ca.1940. The tower features a cylindrical, riveted-steel tank with a suspended, hemispherical bottom. The 50,000-gallon tank, which is capped by a conical roof, is elevated on a four-post, lattice-girder trestle tower that rises to 127 feet, 3 inches. The tower's four posts are riveted to poured-concrete footings. An 8-inch standpipe connects the tank with the underground water system. A steel plaque reading "1915 Minneapolis Steel and Machinery Co Builders Minneapolis Minn." is riveted to the tower's northeast leg just below a caged access ladder.

Narrative Description

The community of Osseo, Minnesota is located in northwestern Hennepin County, near the northwest edge of the Minneapolis metropolitan area (Figure 1). The city is situated between the cities of Brooklyn Park on the east and Maple Grove on the west, carrying an historic association with each. The original town of Osseo (including the site of the water tower) is currently wedged between Highway 169, which runs north to south from Minneapolis on the south, and MN-81, which runs diagonally on the west edge of town. The route of the historic Jefferson Highway runs north to south along Central Avenue, bisecting the community.

Figure 1. USGS 7.5 Minute Topographic Map – Osseo Quad – 2013

Figure 2. Aerial Site View – 2016

(SOURCE: www.maps.google.com. Last accessed 06/20/2016.)

The location of the 1915 Osseo water tower is indicated (Latitude: 45.120535 Longitude: -93.402923).

The 1915 Osseo Water Tower is sited on a .75-acre parcel of city property in the northwest corner of the intersection of Central Avenue and 4th Street NW (Figure 2). The parcel is located west of Central Avenue (historic route of the Jefferson Highway), across the roadway from Boerboom Veterans Park. A 1967 building housing the Osseo City Hall, the public library, and the fire department is located immediately east of the water tower. A mid-twentieth century, one-story commercial building is situated on the west.

The water tower site, which measures approximately 35-feet square, is covered in gravel. A non-historic, steel utility box is located within the boundaries of the tower site. A wooden fence enclosing the City's dumpster is sited immediately adjacent to the east boundary. The tower has an approximate 8-foot setback from 4th Street NW on the south and two feet from the public sidewalk that runs the length of the block.

The water tower site is adjoined by parking areas associated with the City property and by a commercial building on the west. With the exception of the water tower site, a small lawn north of the commercial building, and the planted parking strip in front (east) of the City Hall, the entire block upon which the Osseo Water Tower is sited has been paved.

The Osseo Water Tower is situated at the north end of the city's historic downtown commercial area, which flanks the historic route of the Jefferson Highway, stretching three and a half blocks south from the water tower to MN-81. A cross-section of commercial, governmental and residential properties are located in the immediate vicinity of the tower site (Image 1). By and large, these properties post-date the water tower, with a number dating to the recent past – this is particularly true north of the tower property where large-scale residential development is underway.

Image 1. Context View - 2016

(Image by AKAY Consulting July 05, 2016)

View of the Osseo downtown, looking north along the historic route of the Jefferson Highway (now Central Avenue) with the water tower in view.

The 1915 Osseo Water Tower (Image 2) features a cylindrical, riveted-steel tank with a suspended, hemispherical bottom. A riveted, conical roof with a finial caps the tank, which is encircled by a girder balcony stiffener. The 50,000-gallon tank is elevated on a four-post, lattice-girder trestle tower that rises to 127 feet, 4 inches. A lattice plate has been added to the lower section of each leg to prevent unauthorized access to the tower. Diagonal tie rods provide additional stability to the tower. The tower's four posts are riveted to a poured-concrete pad. An 8-inch standpipe connects the tank with the underground water system. A steel plaque reading "1915 Minneapolis Steel and Machinery Co Builders Minneapolis Minn." is riveted to the tower's northeast leg. A caged access ladder rises on the same leg of the tower from a point just above the plaque to the roof peak.

The Osseo Water Tower is currently painted silver with the city name appearing in black, block lettering. Typically, hemispherical water towers of a similar construction period were painted silver (both tower and tank) with a red roof and black lettering. Because it is in black and white, an historic image of the Osseo Water Tower neither confirms nor refutes that as the historical scheme.

Image 2. Osseo Water Tower - 2016

(Image by AKAY Consulting July 05, 2016)

View of the Osseo water tower looking northeast across 4th Street NW.

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.)

- [ ] 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

Osseo Water Tower
Name of Property

Hennepin, Minnesota
County and State

Areas of Significance
(Enter categories from instructions.)
COMMUNITY PLANNING & DEVELOPMENT
ENGINEERING

Period of Significance
1915-1962

Significant Dates
1915

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

Cultural Affiliation

Architect/Builder
Minneapolis Steel and Machinery Co.

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Osseo Water Tower is eligible for listing on the National Register of Historic Places under Criterion A. The tower is considered locally significant in its association with the history of community planning and development in Osseo, specifically as it relates to the development of municipal waterworks service to protect existing built resources from threat of fire, provide piped water service to its residents and businesses, and to support the future growth of the community.

The Osseo Water Tower is also eligible for listing on the National Register of Historic Places under Criterion C. The water tower is considered locally significant as an example of engineering practices applied to a structure that embodies the distinctive characteristics of a property type of a specific period: the Osseo Water Tower represents a specific type of water tower, the hemispherical bottom, that exemplifies the evolution of water supply systems during the period from the 1890s to about 1940. The elevated steel water tank was developed in the 1890s and by the early twentieth century was the typical type utilized in communities across the state and nation. Once a common landmark on the Minnesota landscape, this particular form of the water tower is quickly vanishing as the requirements of communities grow beyond the capacity of the early tower and are thus replaced by larger capacity structures.

The Period of Significance is 1915 through 1962 marking the year in which the water tower was placed in service through the construction of the city's second water tower. The period embraces the years in which the public works system, and water tower specifically, presented a significant impact on the city's ability to serve its residents - construction of the second tower marking the diminished impact of the 1915 structure. The Significant Date is 1915 – the year in which the water tower was constructed and placed in service.

The Osseo Water Tower, located in the corporate limits of Osseo in Hennepin County, Minnesota, is an all-steel water tower constructed in 1915 to store water and maintain water pressure in the city water system. Establishment of a water works system was a periodic topic of discussion by Osseo residents and the Village Council as early as 1900. It was the Osseo Commercial Club that, in late 1914, provided the needed boost to turn discussion into action. The water tower is a typical example of the property type of that period, featuring a suspended, hemispherical tank on a four-post, lattice-girder trestle tower. The water tower retains a high level of historic integrity and remains a prominent visual feature on the community's landscape.

Beginning in late 1914 the Osseo Commercial Club was actively engaged in bringing both water and electrical services to the village. The group promoted the services as indispensable to any town with an eye on growth. The benefits of a municipal waterworks were a topic of considerable discussion; the significant savings on fire insurance, protection against material loss to fire, and the important selling point those features would present to business enterprises interested in relocating being the focus of the case made by the Commercial Club. A few short months after a January 1915 special election to bond for the systems was accomplished, the local

newspaper was reporting on multiple new buildings under construction, with others projected for the coming months. The establishment of municipal waterworks and electrical services were widely seen as the reason for that growth and what was projected to be a banner year in the village of Osseo.

The development of a waterworks system is a common element of historic municipal planning. As a result, water towers have been historically, and remain today, highly visible structures on the Minnesota landscape. Water towers come in a variety of shapes and sizes, the form and scale utilized in a specific town indicative of its era of construction and the size of the community for which it was built. From the 1890s through about 1940, the hemispherical bottom type of water tower was commonly used in young communities, making them commonplace but no less significant in their association with the history of the community in which they were located.

With storage capacities typically ranging from 50,000 to 100,000 gallons, the utility of a hemispherical bottom water tower was limited to smaller communities. Rising populations and the subsequent increased demand for water have made hemispherical water towers obsolete in many cases. This is particularly true in large metropolitan areas such Minneapolis-Saint Paul where towers with storage capacities exceeding 1,000,000 gallons have replaced most of the smaller towers.

The 1915 Osseo Water Tower stands as one of only seven historic municipal, hemispherical towers remaining within a 50-mile radius of Osseo; at one time there having been at least 17 towers of that type in the same area. It should be noted that the number of non-extant municipal towers of the hemispherical type is undoubtedly higher than 17 – more extensive research into Metropolitan resources is necessary to fully appreciate the loss of historic municipal water towers of the hemispherical type in the Twin Cities.

The Osseo Water Tower is an excellent representative of the type that featured distinctive characteristics including all steel materials, a conical roof, a riveted tank with a suspended, hemispherical bottom, and a tower of four lattice-channel posts with diagonal tie rods. The retention of a high degree of historic integrity marks the Osseo Water Tower as well-preserved example of a representative and vanishing form.

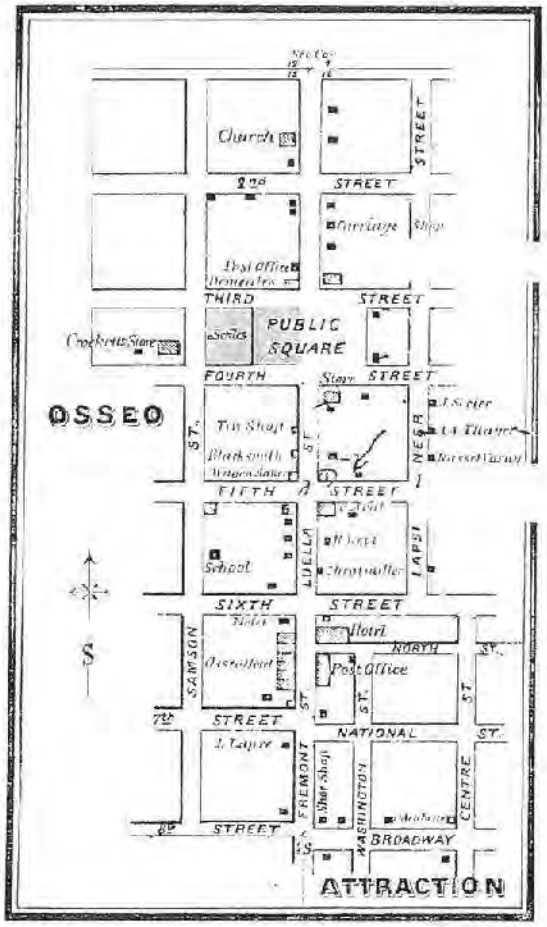
Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Historical Background

In July of 1852, Pierre Bottineau and his companions arrived on the prairie in the vicinity of what became Osseo exclaiming, "This is Paradise." Within a short period, others settled on "Bottineau Prairie" and soon established the necessities for survival and subsequent growth. Warren Sampson opened a general store and post office in 1854. In 1856 the settlement, first

known as Palestine, was renamed Osseo and platted. Local histories suggest that Osseo is a Native American name, "Waseia," meaning "there is light" or, more commonly, "son of the evening star." Further speculation about the source of the city's name connects it to poet Henry Wadsworth Longfellow who mentions Osseo in the well-known poem of Indian legends, "The Song of Hiawatha".[1]

Figure 3. Historic Plat – 1873



(SOURCE: *Map of Hennepin County, Minnesota*, 1873)

Osseo, which was platted in 1856, was laid out in a linear fashion with a public square as a central feature. Subsequent to this map, the public square was reconfigured, with a park remaining on the west half of the block on the east side of Luella Street (now Central Avenue). The highlighted block marks the location where the City Hall and water tower were constructed.

[1] Osseo Centennial Committee, *100 Year History of the City of Osseo: Osseo Centennial, 1875-1975*. Souvenir Centennial Booklet (Osseo: Osseo Centennial Committee, 1975), 6.

Originally governed by the townships of Brooklyn and Maple Grove, on February 24, 1875 Osseo was incorporated as a Village by an act of the state legislature.[2] The Common Council was then established with a composition of a president, three councilmen, a recorder, and a treasurer. The first Council was sworn in on March 19, 1875.[3]

The 1880 arrival of the Great Northern Railroad in Osseo was an important factor in early development for town and county, which subsequently became a center for potato farming. The spring of 1914 was a banner year for the potato harvest, the crop that year being noted as the largest in the city's history; an average of 150 train carloads of potatoes were shipped out of Osseo each day. The scale of the harvest and the resulting need to transport the product resulted in construction of an additional line by the Great Northern Railroad specifically to accommodate the extra loads during the potato harvest.[4] In addition, a starch factory was located in town, which benefited area farmers, particularly in seasons when abundant crops lowered market prices in Minneapolis. At those times, the factory processed an average of 10,000 pounds of crude starch daily and employed 20 men.[5]

Along with the agricultural prosperity came projections of growth for the city. When comparing their community with the nearby city of Robbinsdale, which was (by that town's own reckoning, at least) already considered a suburb of Minneapolis, Osseo real estate men projected a similar trajectory of growth. Such growth would be predicated in part upon the extension of Twin City lines north from Robbinsdale to Osseo and beyond. Businessmen also noted that good roads were essential to the future growth and prosperity of Osseo.[6]

The establishment of a nationwide system of good roads was a significant factor in the growth and development of communities located along and in the vicinity of a major route. Just months after Osseo made the important commitment to construct a waterworks and electric plant, the establishment of the Jefferson Highway was underway. The country's first north to south transcontinental roadway, the Jefferson Highway ran between Winnipeg and New Orleans. On its diagonal route through the state of Minnesota, the highway passed along the Osseo downtown main street (now Central Avenue) on its way to St. Paul.

In January of 1916, letters went out from the office of the Minnesota state engineer to commercial clubs in communities located along the potential 500-mile route of the Jefferson Highway through Minnesota asking the groups to create committees for the purpose of promoting completion of the road and facilitating activities to boost interest.[7] The Osseo Commercial Club was undoubtedly fully engaged in the effort to secure the route through the village. The finalized route of the Jefferson Highway in Minnesota passed through Albert Lea, Faribault, St. Paul, Minneapolis, St. Cloud, Little Falls, Wadena, Itasca State Park, Bemidji, Red

[2] Ibid.

[3] *Village Council Minutes*, March 19, 1875.

[4] "Osseo Prize Potato Section of the State," *The Minneapolis Sunday Tribune*, July 19, 1914:10.

[5] *100 Year History*, 19.

[6] "Osseo Prize Potato Section of the State," *The Minneapolis Sunday Tribune*, July 19, 1914:10.

[7] "Jefferson Highway Plans Boosted Here," *The Minneapolis Morning Tribune*, January 06, 1916:14

Lake Falls, and Thief River Falls. Along that route, threaded among the larger towns, were smaller communities such as Osseo, which likewise benefitted from the tourist traffic that passed along the roadway.

The Jefferson Highway initially provided a tremendous boost to the nation's emerging automobile industry, its highway system, and tourism with towns such as Osseo seeing the benefit of increased traffic to their community. Such increase in traffic was one element of many necessary to ensure the long-term prosperity of the village and it is but one more example of the multi-pronged effort made by the Osseo Commercial Club on behalf of the community.

Figure 4. Historic Plat – 1913

(SOURCE: *Map of Hennepin County and Environs*, 1913)

By 1913 Osseo had extended its boundaries to the east and to the south. In addition, the public square had been reconfigured, with Luella Street (now Central Avenue) cut north to south through its center. In 1916 the Jefferson Highway was routed along Luella Street, becoming another feature to bring growth to the city. The arrow indicates the site upon which the water tower was constructed in 1915.

Beginning in 1914 the Osseo Village Council began to explore the costs associated with establishing electric and water service – discussions that had been periodically engaged in over the previous decades. It was the Osseo Commercial Club that provided the push needed to turn discussion into action. News accounts reported on the group's investigations to secure those services for Osseo, the group's position being that such services were "indespensable [sic] in any town, and ones which materially reduce the excessively high rates on insurance and lights." The Commercial Club underscored the savings to City and citizens that water works and electric plants would provide. They estimated an annual savings of $3,750 on fire insurance, plus savings on the City sprinkling bill. They also projected strong returns on the establishment of a municipal electric plant that would put the City in a position to reap the financial benefits of electric service fees rather than paying royalties and dividends to another provider.[8]

The group also discussed the dangers of not having a water works system, with members noting that, although the city had been fortunate to not have a disastrous fire, the risk was ever-present without adequate protection. Minnesota Governor A.O. Eberhart said as much in a statement on State Fire Protection Day on October 9, 1914. The governor noted that loss due to fire in 1913 had amounted to $3,920,972. Although personal responsibility for safety related to fire hazard would go a long way to prevent fire, municipal fire departments played a critical role in putting down fire and limiting destruction.[9]

Further, the Association of Underwriters rated Osseo as having no fire protection at all. As a result, the cost of fire insurance was almost prohibitive, which posed a significant deterrent to development. Construction of a water works system would result in an "enormous" savings in insurance rates and increase its attractiveness to new enterprises looking for a beneficial location for expansion.[10]

At a meeting called for mid-December 1914, the Commercial Club, with a Minneapolis consulting engineer on hand and a large audience in attendance, appointed a committee to bring the issue of establishing a waterworks and electric plant, to be constructed and operated by the City of Osseo, before the Village Council by year's end.[11]

At the Village Council meeting held on December 28, 1914, the special committee of the Osseo Commercial Club presented a petition requesting that the Council submit to voters a proposition to bond the village in the amount of $20,000 to build and equip a waterworks plant and an electric plant. The Village Council acted positively, moving to present their recommendation to

[8] "Commercial Club Meeting Take Action For Fire Protection," *The Osseo Review*, December 09, 1914:1.

[9] "Fire Prevention Day," *The Osseo Review*, October 08, 1914:1.

[10] "Electric Light Plant and Water Works System," *The Osseo Review*, December 30, 1914:1 and "Special Election Jan. 12 Electric Lights – Water Works," *The Osseo Review*, January 06, 1915:1.

[11] "Electric Lights and Water Works in Sight for Osseo," *The Osseo Review*, December 16, 1914:1.

bond in the amount of $9,000 for an electric plant and $11,000 for a waterworks system.[12] A special election was scheduled for January 12, 1915.

News accounts in advance of the election make it apparent that the proposal to bond for the construction of the systems had many detractors, indicating the issue as one of longstanding discussion that had finally come to the fore; the moment was described as a time to "prove our progressiveness or our regressiveness." The author of the article (clearly an advocate for establishment of both systems) goes on to say of the need for a water works,

> "Water works means the protection from loss by fire. It means a saving to the village property holders of thousands of dollars annually. It means a convenience you have all longed to have for years. It means that your property in Osseo will be worth many thousands of dollars more on the market. It means that every person carrying insurance at a cheap rate may save the difference between the insurance they carry and the amount would really burn out for. Would you let your home and its contents burn for the insurance you carry? No! Not one of you would. It is worth three or four times that much to you. Today you can burn out and lose all. With the water works to reach your home, you can save three times its value besides getting more insurance at a still cheaper rate."[13]

The avocation of Osseo's local boosters was effective, with both propositions passing with a sound majority. The positive outcome was lauded as confirmation that Osseo was indeed "a progressive village and not a regressive one."[14] The prognostication that the establishment of the public systems would result in growth and development in village soon bore fruit. By early February, six new families had moved to town and a new agricultural implement firm by the name of Rohe and Cook had established themselves in the community.[15] By April *The Osseo Review* was predicting 1915 to be for the city of Osseo the "Greatest Advance in History." The paper's statement was based on improvements in the amount of $40,000 underway and contracted for at that time. These improvements included construction of several residences, a new Lutheran church, and the electric and waterworks plants.[16]

At the Village Council meeting on March 29, 1915, Mayor Hechtman appointed a committee to arrange for "the issue and sale of the electric light and waterworks bonds." Ordinance No. 56 (the first reading of which was undertaken at that same meeting) outlined the specifics of the plan for electrification – the bond would contract with the Minneapolis General Electric Co. for the erection and maintenance of "light poles, wires, and other fixtures in the streets, alleys, and public grounds in the Village of Osseo, MN."[17]

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12 *Village Council Minutes*, December 28, 1914.

13 "Special Election Jan. 12 Electric Lights – Water Works," *The Osseo Review*, January 06, 1915:1.

14 "Progress Wins – Light and Water for Osseo," *The Osseo Review*, January 13, 1915:1.

15 "New Business Houses Added to Osseo," *The Osseo Review*, February 10, 1915:1.

16 "Buildings and Improvements Surpass All Records," *The Osseo Review*, April 28, 1915:1.

17 *Village Council Minutes*, March 29, 1915.

Bids for the Osseo water system were received at the May 04, 1915 council meeting. Companies that submitted proposals included the Des Moines Bridge & Iron Works ($13,400.00, not including a well), Ilstrup & Olson ($13,750.00, not including the well), C.F. Bosworth ($14,597.39, not including a well), W.D. Lowell ($12,983.50, not including a well), Wm. C. Foster ($13,555.00, not including a well), Pastoret Construction Co. ($13,2488.00, not including a well), Chicago Bridge & Iron Works ($3,635, tank only), Hill-Mauring-Whalen Co. ($14,000.00, not including a well). Other companies bid for construction of the well. Those included J.F. McCarthy, Artesian Well Co., and F.J. Kapp, each pricing their services by the linear foot. The Council awarded contracts to the low bids – W.D. Lowell was awarded the tower contract and J.F. McCarthy the well contract. Specifics of the contract required that the contractor install a Smith-Vaile pump (manufactured by the Platt Iron Works, Co. of Dayton), a Fairbanks-Morse Co. motor, Eddy valves and hydrants, and that the contractor furnish a tower and tank built by the Minneapolis Steel and Machinery Company.[18]

On May 5, 1915 it was reported that, due to a legal technicality with the January election, a second special election authorizing the bonding was to be held. Completion of both the electrical plant and waterworks being contingent upon a legally successful bonding process, Osseo residents took to the polls on May 17, 1915.[19] Although in their reporting on the issue *The Osseo Review* did not note any variation in the specifics of the bonds, Village Council minutes include the formal resolution specific to the waterworks, which reflects a significant increase in the bond for the water works:

> "Resolved; by the Common Council of the said Village of Osseo, that said village establish, build, construct, and equip a public water works plant for the supply of water for public and private use in said village, and that said village borrow the sum of Fourteen Thousand Dollars ($14,000.00) for the erection and construction of said water works plant and that for said purpose the said Village of Osseo issue it negotiable bonds in the sum of Fourteen Thousand ($14,000) Dollars."

Results of the special election were positive. With more than 5/8s of duly qualified electors casting their ballot, the measure passed 83 to 22.[20] By late June 1915 construction of the electrical system was well underway with the new "Great White Way" set for completion by the end of July.[21]

Village Council minutes in the coming months record the process of paying off the bond debt, which was held by German American Bank in Minneapolis. With twenty-eight $500.00 bonds issued with a 6% per annum rate of interest, the City paid a total debt of $14,670 with bi-annual payments beginning July 01, 1918.[22]

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[18] Ibid., May 04, 1915.

[19] "Village Must Hold Another Election," *The Osseo Review*, May 05, 1915:1.

[20] *Village Council Minutes*, May 19, 1915.

[21] "Electric Lights for Osseo Before August First," *The Osseo Review*, May 23, 1915:1.

[22] *Village Council Minutes*, minutes book pp. 378-379.

Progress on the waterworks was also underway during the summer of 1915. On July 21 the newspaper reported that the Western Steel and Construction Co. of Minneapolis was at work pouring the concrete bases for the tower. Each 8- by 8-foot footing was described as being 7-feet- deep and containing 6 yards of concrete. Two large, 3-inch anchor bolts extended through the center with heavy, railroad steel cross-pieces at the bottom. The cross-pieces were 41feet 9 inches apart from center to center and were heavy enough to withstand anything the elements may throw against them. Completion of the 100-foot tower and 50,000-gallon tank was expected to take 4-6 weeks. At the same time, contractor W.D. Lovell was in town laying the water mains and hydrants, with service to be functional before winter set in.[23]

While work on the electric and water systems continued, the village prepared for a celebration. The Osseo Light and Water Carnival was scheduled for September 16-18, 2015. The event, which was billed as "The Greatest Municipal Prosperity and Improvement Celebration in the History of Northern Hennepin County," featured Osseo's Concert Band, "the Aztec from Old Mexico;" Frau Helene of Norway; Big Austin, a 2,800-pound horse said to be the biggest in the country; and many other special acts and activities.[24]

On November 24, 1915, the local newspaper reported that the water tower tank was full, the plant had been fully tested, and hydrants and pipes had been flushed. The only remaining work was completion of the pump house, which would protect the pump from the elements.[25]

As noted, the promise of reduced fire insurance rates and protection against material loss due to fire was a key selling point in the campaign to establish a waterworks system. In years prior, fire fighting in Osseo relied solely on a "bucket brigade." As early as 1900, residents were calling for more effective means of protecting the city from the threat of fire. The immediate response was the installation of hand pumps at critical locations. Such pumps required six men, three on each side of the pump, to create a strong stream of water. As small as the city remained at that time, a 300-foot hose reached most buildings.[26] The 1913 addition of a "No. 8, 40 gallon Chemical Engine with 50-foot of hose," at a cost to the City of $222.50, was a decided advancement in the city's fire protection capability.[27]

Shortly after the construction of the waterworks system, Village Council minutes record various activities related to fire protection. In September of 1915, the Council received communication from the "Department of Insurance relative to the 2% of fire insurance premiums payable to the Village each year, provided a regular fire organization was maintained."[28]

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[23] "Improvements Going On Village a Prosperous One," *The Osseo Review*, July 21, 1915:1.

[24] Advertisement for "Light and Water Carnival." *The Osseo Review*, August 04, 1915.

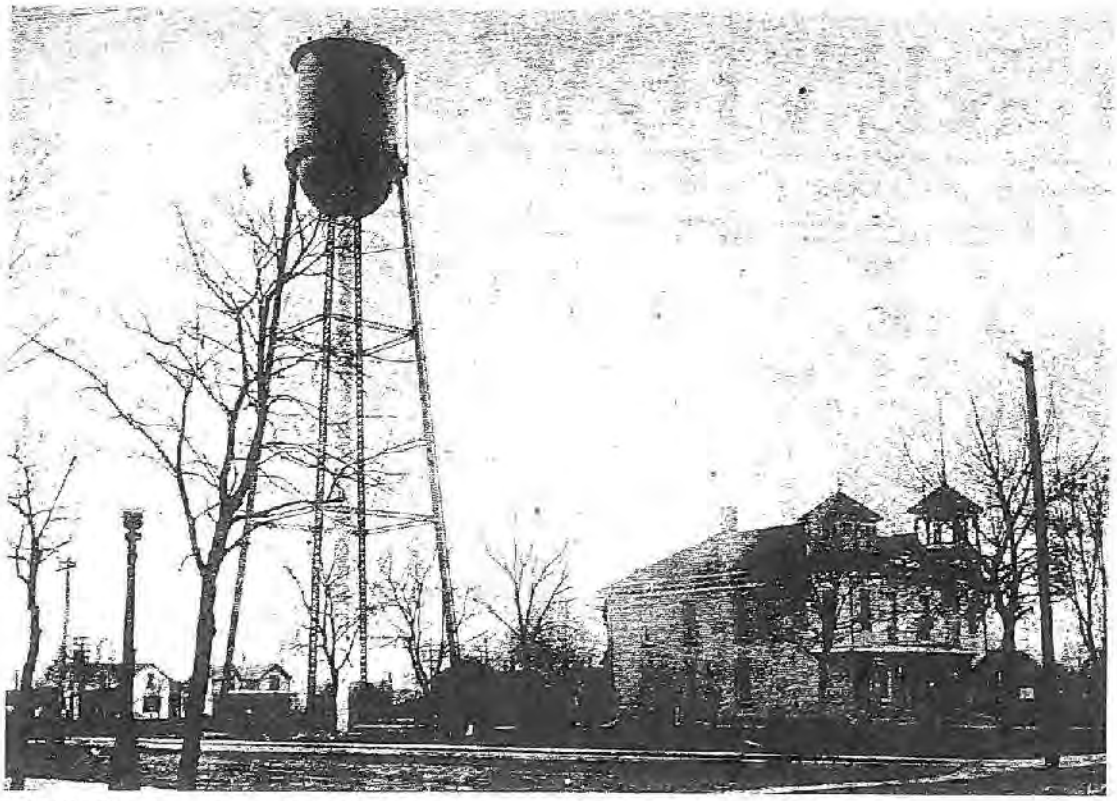
[25] "Tank Full of Water," *The Osseo Review*, November 24, 1915:1.

[26] *100 Year History*, 72.

[27] *Village Council Minutes*, minutes book, 294.

[28] Ibid., 389.

Image 3. Historic Image – 1915



(SOURCE: *The Osseo Review*, December 15, 1915.

View of the newly constructed Osseo water tower, looking northwest across 4th Street NW at what would in 1916 be adopted as the route of the Jefferson Highway.

It was the Commercial Club that called a meeting with the State Department of Insurance, resulting in the formal creation of the Osseo Fire Department. Chartered on December 10, 1915, the department had a crew of 36 men led by Chief George Heesen and Assistant Chief, George Neumann.[29] The Council supported the newly formed department, with multiple entries in Council minutes reflecting presentations by the Osseo Fire Department requesting equipment, etc. noted over subsequent months. In February of 1916, the Council moved to purchase 500 feet of "Helmet" hose from the Eureka Fire Hose Manufacturing Co. at a cost of $.80/foot.[30]

Osseo's first fire truck was purchased in 1929. Where once the ringing of church bells sounded a fire alarm, the construction of the water tower eventually resulted in the location of a siren at that site.[31]

[29] *100 Year History*, 73.

[30] *Village Council Minutes*, February 1916.

[31] *100 Year History*, 73.

Establishment of the Osseo waterworks, of which the water tower was the most visible element, was a critical element in a multi-pronged approach taken by the Osseo Commercial Club to ensure the future growth and prosperity of their community. As a means of protecting existing buildings, providing affordable fire insurance, and supplying piped water to businesses and homes, the waterworks was an important feature to the citizens of the community. Just as importantly, having a waterworks served as a strong enticement to individuals and businesses looking to establish themselves in a progressive community.

Positive signs of growth presented themselves very soon after the January 1915 bond issue special election, with a handful of new homes under construction that summer and at least one business choosing Osseo to establish a new enterprise. Population statistics indicate a steady growth over subsequent decades, a reversal of the trend between 1890 and 1900 when there was a 2% loss of population.

It is difficult to know the precise expectations of the Osseo Commercial Club – how large did they anticipate the town could grow? So many variables were at play over the years following the 1915 establishment of the waterworks and electric system, with many of those being beyond the control of both the Club and the Village Council. Osseo remains today a small village, now nestled in the wedge of two major highways with little physical room for expansion. However, from a population of 390 in 1910 to its peak at 2,974 in 1980 Osseo grew by 662% - a growth that would have been impossible were it not for a waterworks and electric system (Table 1.)

TABLE 1. Historical Population of Osseo[32]

Census	Population	Percentage Change +/-
1880	206	----
1890	353	71.4
1900	346	-2.0
1910	390	12.7
1920	433	11.0
1930	561	29.6
1940	738	31.6
1950	1,167	58.1
1960	2,104	80.3
1970	2,908	38.2
1980	2,974	2.3
1990	2,704	-9.1
2000	2,434	-10.0
2010	2,430	-0.2
2016	2,661	8.68

In 1962, a second water tower was constructed to serve the growing community. That tower is located in a light industrial area in the southwest corner of town, just west of Highway 81 and

[32] http://www.census.gov/prod/www/decennial.html. Last accessed 06/28/2016.

north of 85th Avenue. Typical of the period, the second tower is a double-ellipsoidal in form. With the addition of a second water tower, Osseo was in a position to meet the demands of an increasing population.

The Hemispherical Bottom Type

The concept of storing water at a raised elevation for the purpose of creating sufficient pressure to distribute it to a population has existed in various forms since antiquity. With the advancements of the Industrial Age and the requirements that came with the development of the railway system in America, the concept of water distribution that began with the aqueducts of Rome was transformed into the design of elevated water tanks (a.k.a., water towers). The earliest examples of water towers appeared in the U.S. in the 1880s to supply the boilers of steam engines and, when towns and cities grew up along a railroad line, water tower engineering was refined to provide fire protection and to pipe water to the growing communities. Water tower forms and scale changed through time, a reflection of technological advancements as well as an indication of increased demand resulting from an ever-growing population.

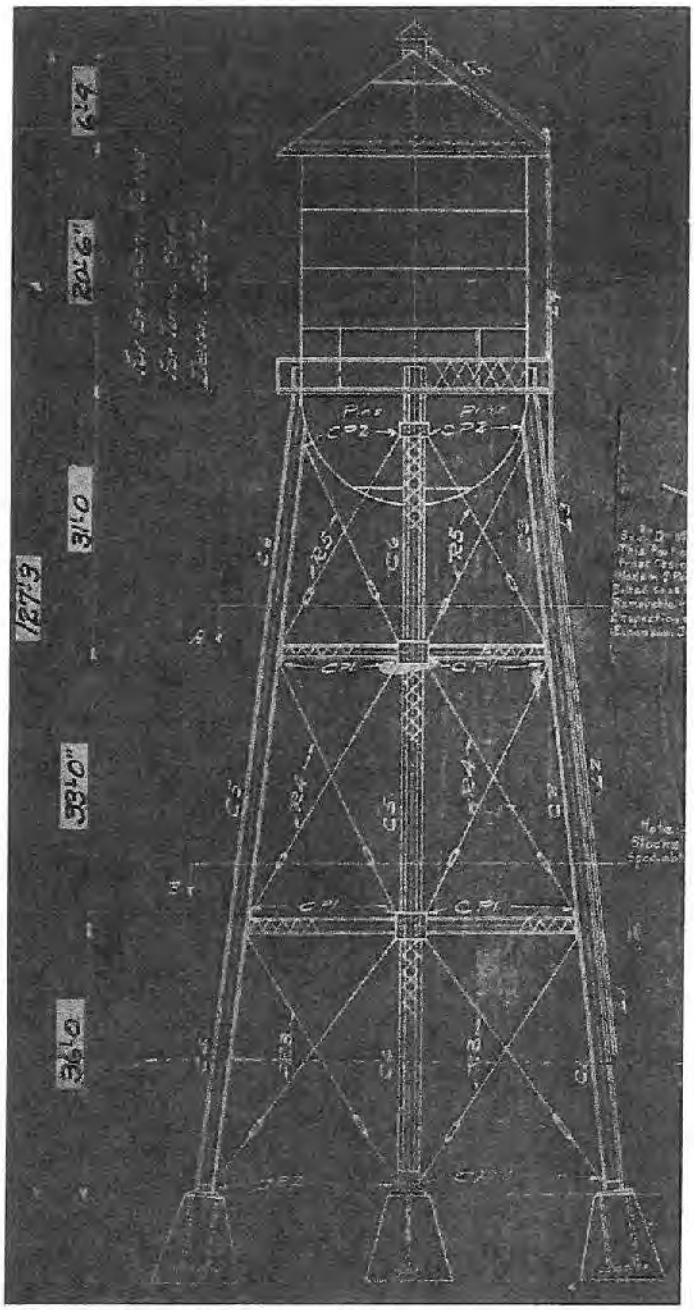
The hemispherical bottom water tower was considered the standard of the industry from the late 1890s to about 1940. The hemispherical form had the significant advantage of reducing stresses. Further, the tank's shape made securing it to the tower easier and provided ready access for ongoing maintenance. The form was also thought to be more pleasing to the eye.[33]

Hemispherical tanks with a capacity of over 50,000-gallons (a 100,000-gallon elevated tank being considered large through ca.1910) typically had a conical roof of light, steel plate and a projecting eave. A flagstaff was often used both as ornamentation and to provide rigidity to the roof.[34] Ladders were recommended to run along one of the legs beginning near the ground and extending to the roof. Such ladders required steel clip connections at regular intervals.[35] The balcony provided access to the tank but, just as importantly, acted as a support girder (often referred to as a stiffener) around the perimeter of the tank. Design guidelines recommended that plate steel with drain holes be utilized for the balcony deck rather than wood.[36]

The task of painting the water tower required considerable effort; the proper finish reduced maintenance and assured the longevity of the structure. Beginning with a clean surface was paramount, followed by a primer and a finish coat. Red lead oxide, lampblack, and linseed oil were the primary elements of the paint primer with asphaltic varnish used as the finish coat.[37] Most water towers of the period sported a silver tower and tank, black lettering, and a red roof.

[33] J.N. Hazlehurst, *Towers and Tanks for Waterworks. The Theory and Practice of Their Design and Construction* (New York: John Wiley & Sons, 1907). 178.
[34] Ibid., 197.
[35] Ibid., 199.
[36] Ibid., 256.
[37] Ibid., 256.

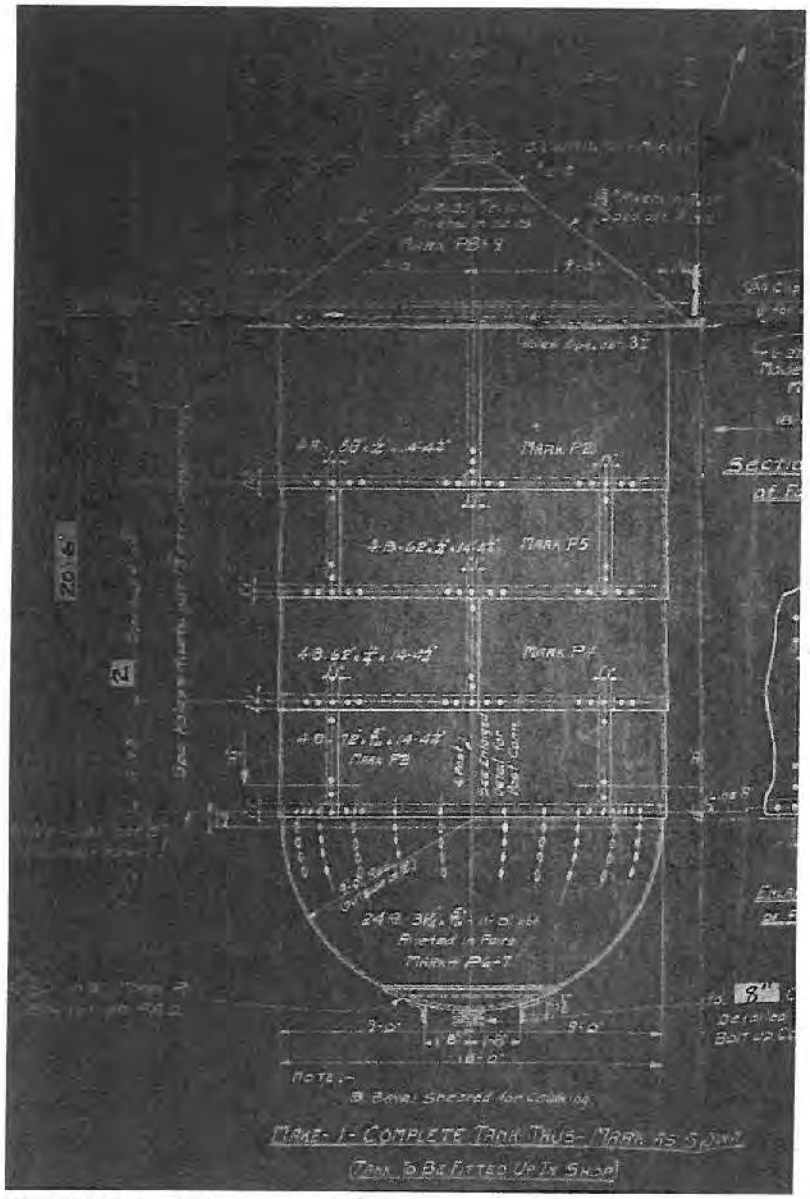
FIGURE 6. Osseo Water Tower Plans – 1915



(SOURCE: City of Osseo, Vertical Files)

Design plan for the 1915 Osseo Water Tower supplied to the Osseo Village Council by Minneapolis Steel & Machinery Co.

FIGURE 7. Osseo Water Tower Plans – 1915



(SOURCE: City of Osseo, Vertical Files)

Water tower construction plans supplied to the Osseo Village Council by Minneapolis Steel & Machinery Co. include this detail of the tower's 50,000-gallon holding tank.

The earliest examples of the hemispherical bottom were constructed of riveted plates, with the use of welding technology coming into play with the advent of World War II. The major companies active in water tower construction developed variations on the hemispherical form. In the mid-1920s, the Pittsburgh-Des Moines Steel Company (PDM) began using what the company termed an elliptical bottom; by diminishing the elongation of the tank form, the overall height of the tower could be lessened. The structure was otherwise the same as a hemispherical tower, utilizing laced channel columns and a conc roof. At that time, unofficial company trademarks were introduced in the design of the towers' balcony stiffeners. PDM utilized a running "V" while others adopted an "X" or vertical supports. This practice provided a ready means for identifying the builder of the water tower.[38]

The Osseo Water Tower retains all of the hallmark elements of a pre-World War II, hemispherical bottom type, including a riveted tank, conical roof, a four-post lattice tower with cross bracing and a balcony stiffener with a running "X" design, marking the tower as a construction by a company other than the Pittsburgh-Des Moines Steel Company.

Although the Minneapolis Steel and Machinery Co., the builder of the Osseo Water Tower, erected water towers across Minnesota and the Midwest, no comprehensive survey of water towers in Minnesota has been completed to fully document their contributions. It is not known how many were built in Minnesota or, of those constructed by the company, which remain and in what condition. Two other companies, the Chicago Bridge and Iron Company (now CBI, Inc.) and the Pittsburgh-Des Moines Steel Company (now PDM, Inc.), dominated the water tower construction business in the Midwest. As the typological descriptions on the pages to follow indicate, the majority of advancements in water tower engineering are attributed to one or the other of these two dominant companies.

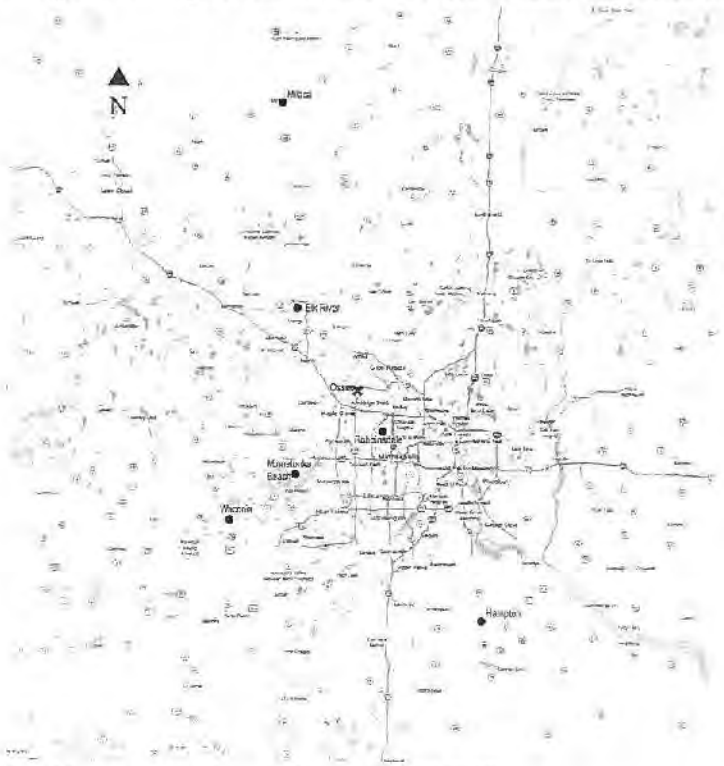
The Osseo Water tower stands as one of only seven municipal, hemispherical towers remaining in a 50-mile radius of Osseo; at one time there having been at least 17 towers of that type in the same area (Figures 8-9). In addition to Osseo, the cities that retain their hemispherical bottom water towers are: Elk River, Hampton, Milaca, Robbinsdale, Minnetonka Beach, and Waconia (Table 2). It should be noted that the number of non-extant, municipal towers of the hemispherical type is undoubtedly higher than the 17 that were identified in this nomination; more extensive research into Metropolitan resources is needed to fully appreciate the loss of historic towers of the type.

[38] Jim Foster, *Towering Over America: The 100 Year History of Pitt-Des Moines, Inc.* (Des Moines, IA: Pitt-Des Moines, Inc., 1992), 39.

Table 2. Hemispherical Water Towers Within 50-miles of Osseo

CITY	STATUS	
	Extant	**Non-Extant**
Annandale		x
Anoka		x
Belle Plaine		x
Buffalo		x
Cokato		x
Dassell		x
Elk River	NRHP	
Hampton	x	
Medina		x
Milaca	x	
Minnetonka Beach	x	
Minnetrista		x
New Brighton		x
Robbinsdale	x	
Tonka Bay		x
Waconia	x	

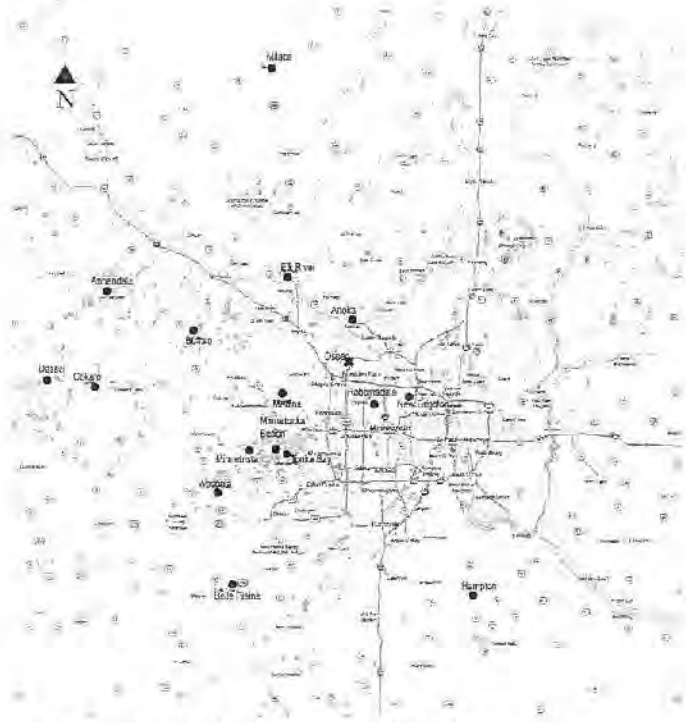
Figure 8. Extant Municipal Hemispherical Water Towers Within 50-miles of Osseo



(Base Map: maps.google.com. Accessed 02/01/2015)

The locations of EXTANT municipal water towers of the hemispherical type are indicated.

Figure 9. Known Non-Extant Municipal Hemispherical Water Towers Within 50-miles of Osseo



(Base Map: maps.google.com. Accessed 02/01/2015)

The locations of NON-EXTANT municipal water towers of the hemispherical type are indicated.

Once a commonplace feature on the Minnesota horizon, historic water towers of all types are quickly disappearing as community populations grow beyond the holding capacity of their early towers and expensive maintenance issues present economic challenges. While the research for this nomination focused on identifying hemispherical towers located in a 50-mile radius surrounding Osseo, information about water towers across the state was accumulated.

Some important evidence to emerge from the process undertaken to nominate the Osseo Water Tower to the National Register indicates that the majority of hemispherical water towers remaining in use in Minnesota are located in small communities in outlying areas, far from quickly expanding cities and major population areas. The research also documents the proliferation of post-hemispherical period water towers that, in Minnesota, most commonly take the form of the elevated spheroid or hydro-pillar types. Further, it appears there is a slow-growing recognition of the significance of the hemispherical water tower to the history and identity of towns across the state, but that a community's desire to preserve their historic water tower collides with the prohibitive cost of doing so.[39]

[39] In a radius of 51-100 miles around Osseo, 22 of 34 known hemispherical water towers remain. In a radius greater than 100 miles from Osseo, 34 at least of 100 known hemispherical water towers remain with 18 of the 100 confirmed as non-extant including the once National Register listed tower at Crosby.

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_____. "Fire Prevention Day." October 08, 1914.

_____. "Improvements Going on Village a Prosperous One." July 21, 1915.

_____. "Meeting of Commercial Club – 11 More Bargain Days." January 20, 1915.

_____. "Minneapolis Firms Secure Contracts for Waterworks." May 05, 1915.

_____. "New Buildings Under Way and Prospects." March 31, 1915.

_____. "New Business Houses Added To Osseo." February 10, 1915.

_____. "Osseo Light and Water Carnival, Sept. 16=17=18." August 04, 1915.

_____. "Potato Market Opens." July 23, 1914.

_____. "Progress Wins – Light and Water for Osseo." January 13, 1915.

_____. "Special Election Jan. 12 Electric Lights – Water Works." January 06, 1915.

_____. "Special Election Notice." January 06, 1915.

_____. "Tank Full of Water." November 24, 1914.

_____. "Village Must Hold Another Election." May 05, 1915.

_____. "Vote For Waterworks Pride of Any Village." May 12, 1915.

_____ "Water Tower and City Hall." December 15, 1915.

Internet Sources

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Minnesota Communities Data. www.lakesnwoods.com. Last accessed 02/24/2015.

Minnesota Historical Society. National Register of Historic Places. http://nrhp.mnhs.org. Last accessed 02/28/2015.

Topographic Map. http:/store.usgs.gov. Accessed 02/11/2015.

Minnesota Department of Health. "A Look at Water Towers." http://www.health.state.mn.us/divs/eh/water/com/waterline/featurestories/watertowers.html. Accessed 02/21/2015.

Minnesota Historical Society Collections Online (Historic images). http://greatriversnetwork.org/index.php?brand=cms&q=water+tower. Last accessed 006/22/2016.

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
_x_ Local government
____ University
____ Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _G-MHCG-1403-03508_

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9. Geographical Data

Acreage of Property less than one acre

Use either the UTM system or latitude/longitude coordinates

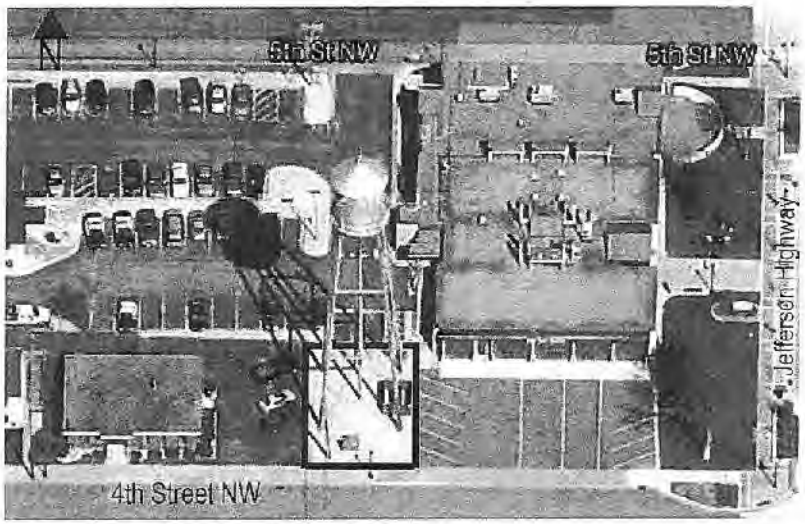
Latitude/Longitude Coordinates
Datum if other than WGS84:
(enter coordinates to 6 decimal places)
1. Latitude: 45.120535 Longitude: -93.402923

Or
UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

Verbal Boundary Description (Describe the boundaries of the property.)

The Osseo Water Tower is located in the northwest corner of the intersection of Central Avenue and 4th Street NW in Osseo, Hennepin County, Minnesota. The structure is located within a .75-acre, City-owned parcel with the property boundary associated with the tower specifically being a concrete pad measuring approximately 35- by 35-feet.



The property boundary is outlined.

Boundary Justification (Explain why the boundaries were selected.)

The boundary encompasses the Osseo Water Tower and the approximately 35- by 35-foot area upon which the structure was constructed in 1915.

10. Form Prepared By

name/title: Alexa McDowell, Architectural Historian
organization: AKAY Consulting
street & number: 4252 Oakland Avenue
city or town: Minneapolis state: MN zip code: 55407
e-mail akaymcd@hotmail.com
telephone: 515-491-5432
date: 11-02-2016

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property: Osseo Water Tower

City or Vicinity: Osseo

County: Hennepin State: MN

Photographer: Alexa McDowell

Date Photographed: 07-05-2016

Description of Photograph(s) and number, include description of view indicating direction of camera:

1 of 14 Context View: Looking north along Osseo's commercial district lining Central Avenue (historic route of Jefferson Highway)
MN_HennepinCounty_OsseoWaterTower_0001.tif

2 of 14 Context View: Looking west along 4th Street
MN_HennepinCounty_OsseoWaterTower_0002.tif

3 of 14 Context View: Looking west through Boerboom Veterans Park
MN_HennepinCounty_OsseoWaterTower_0003.tif

4 of 14 Context View: Looking southwest across the intersection of Central Avenue and 5th Street
MN_HennepinCounty_OsseoWaterTower_0004.tif

5 of 14 Context View: Looking southeast across the intersection of 1st Avenue NW and 5th Street NW
MN_HennepinCounty_OsseoWaterTower_0005.tif

6 of 14 Context View: Looking east along 4th Street NW
MN_HennepinCounty_OsseoWaterTower_0006.tif

7 of 14 View: View of the water tower looking northwest with the fire department at right
MN_HennepinCounty_OsseoWaterTower_0007.tif

8 of 14 View: View of the water tower looking southeast
MN_HennepinCounty_OsseoWaterTower_0008.tif

9 of 14 View: View of the water tower looking northeast
MN_HennepinCounty_OsseoWaterTower_0009.tif

10 of 14 View: View of the water tower base and pad, looking northeast
MN_HennepinCounty_OsseoWaterTower_0010.tif

11 of 14 View: View of the water tower's 50,000-gallon tank
MN_HennepinCounty_OsseoWaterTower_0011.tif

12 of 14 View: View of the water tower structure from beneath the tower
MN_HennepinCounty_OsseoWaterTower_0012.tif

13 of 14 Detail: View of the mounting of leg to concrete footing
MN_HennepinCounty_OsseoWaterTower_0013.tif

14 of 14 Detail: View of the builder's plaque located on the NE leg
MN_HennepinCounty_OsseoWaterTower_0014.tif

Additional Information: Water Tower Typologies

The use of the hemispherical bottom water tower falls with a continuum of the development of the municipal water system; while dominating the industry for nearly fifty-years the hemispherical bottom form was neither the first nor the last in the evolution of the water tower.

The ***Flat Bottom*** is the earliest American form utilized for elevated water tanks. Such tanks, commonly associated with railroad lines, were generally wood construction – both tank and tower. However, PDM's predecessor firm, Jackson & Moss, constructed a 55,000-gallon wood tank on a steel tower in LaPorte City, Iowa in 1896. The company also erected a flat bottom steel tank on a brick tower in Correctionville, Iowa in 1915. As one would expect, extant examples of the flat bottom type are rare; the Elysian Water Tower at Elysian, Minnesota (formerly listed on the National Register of Historic Places) was razed in 1989. A flat bottom with a wood tank in Stewart, Minnesota was replaced in ca.1920 by a hemispherical bottom, which remains today. The survey also found examples of the type were historically used in Anoka, Blooming Prairie, Carver, Cosmos, Elmore, New Prague, Nicollet, and Princeton (all non-exant). Flat bottom, steel tank water towers remain in Beardsley and Lindstrom.

TYPOLOGY 1: FLAT BOTTOM (ca.1870-1890s)

(SOURCE: http://www.loc.gov/pictures/item/mn0103.photos.091440p/resource/. Accessed 03/02/2015.)

As the above image of the Elysian Water Tower at Le Sueur, MN (razed 1989) illustrates, early water towers (in this case, wooden) utilized a flat bottom. In the 1890s, that form gave way the hemispherical tank.

TYPOLOGY 1: FLAT BOTTOM (Elevated)

(SOURCE: http://reflections.mndigital.org/cdm/singleitem/collection/mcc/id/76/rec/7. Accessed 03/02/2015.)

This ca.1900 image documents the wood, flat bottom elevated tank at Stewart, Minnesota.

(SOURCE: https://c2.staticflickr.com/4/3581/3334919542_7029b6de7f_b.jpg. Accessed 02/02/2015.)

Stewart's current hemispherical water tower, which replaced the flat bottom tank in ca.1920, remains in use. Although unusually elongated in form, the tower is considered a hemispherical type.

TYPOLOGY 1: FLAT BOTTOM

(SOURCE: http://reflections.mndigital.org/cdm/singleitem/collection/nico/id/3410/rec/1. Accessed 03/01/2015).

The towers at Nicollet, Minnesota (ca.1908): flat bottom, wood tank at left and hemispherical bottom at right.

TYPOLOGY 2: HEMISPHERICAL BOTTOM (1890s-ca.1940)

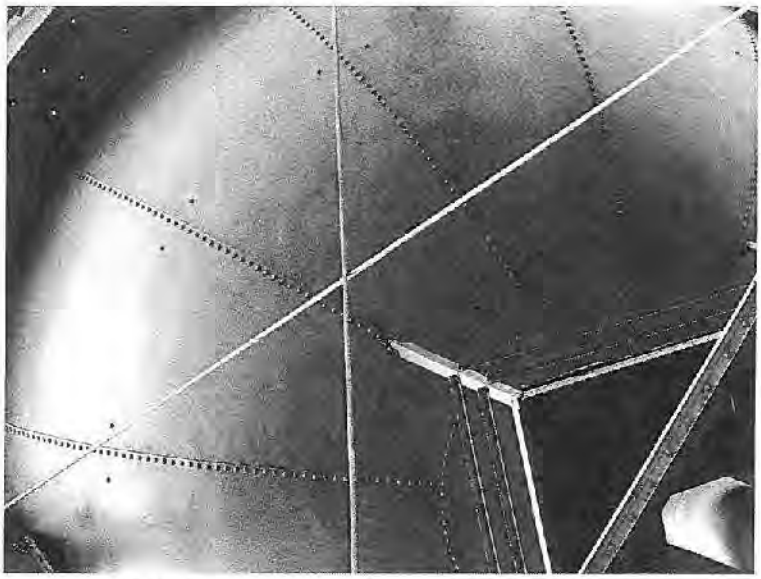
The ***Hemispherical Bottom*** was considered the standard of the industry from the late 1890s to about 1940; the Osseo Water Tower is an example of the hemispherical bottom. The hemispherical form had the significant advantage of reducing stresses. Further, the tank's shape made securing it to the tower easier and provided ready access for ongoing maintenance. The form was also thought to be more pleasing to the eye. Hemispherical tanks, typically with a capacity of over 50,000-gallons (a 100,000-gallon elevated tank being considered large through ca.1910), most often had a conical roof of light, steel-plate and a projecting eave. A flagstaff was often used both as ornamentation and to provide rigidity to the roof. Ladders were recommended to run along one of the legs beginning near the ground and extending to the roof. Such ladders required steel clip connections at regular intervals. The balcony provided access to the tank but, just as importantly, acted as a support girder (often referred to as a stiffener) around the perimeter of the tank. Design guidelines recommended that plate steel with drain holes be utilized for the balcony deck rather than wood.

The task of painting the water tower required considerable effort; the proper finish reduced maintenance and assured the longevity of the structure. Beginning with a clean surface was paramount, followed by a primer and a finish coat. Red lead oxide, lampblack, and linseed oil were the primary elements of the paint primer with asphaltic varnish used as the finish coat. Most water towers of the period sported a silver tower and tank, black lettering, and a red roof.

(SOURCE: AKAY Consulting , Floodwood, MN, September 2014)

The hemispherical bottom water tank was the dominant form utilized from the 1890s through ca.1940. The major companies active in water tower construction developed some variations on the hemispherical form. In the mid-1920s, the Pittsburgh-Des Moines Steel Company (now PDM) began using what they termed an elliptical bottom; by diminishing the elongation of the tank form, the overall height of the tower could be lessened. The structure was otherwise the same as a hemispherical tower, utilizing laced channel columns and a cone roof.

TYPOLOGY 2: HEMISPHERICAL BOTTOM



(SOURCE: AKAY Consulting, Floodwood, MN, September 2014)

The tank's riveted construction is seen in this detail view of the hemispherical bottom.

(SOURCE: AKAY Consulting, Wanamingo, MN, January 2015)

The hemispherical at Wanamingo, with its historic paint scheme, stands in a prominent location overlooking the downtown commercial area.

TYPOLOGY 2: HEMISPHERICAL BOTTOM

(SOURCE: mnhsonlinecollection.org. Accessed 02/27/2015)

Although proportionately varied from the typical hemispherical, the Robbinsdale water tower (extant) is of the hemispherical bottom type.

TYPOLOGY 3: DOUBLE ELLIPSOIDAL (1930s-present)

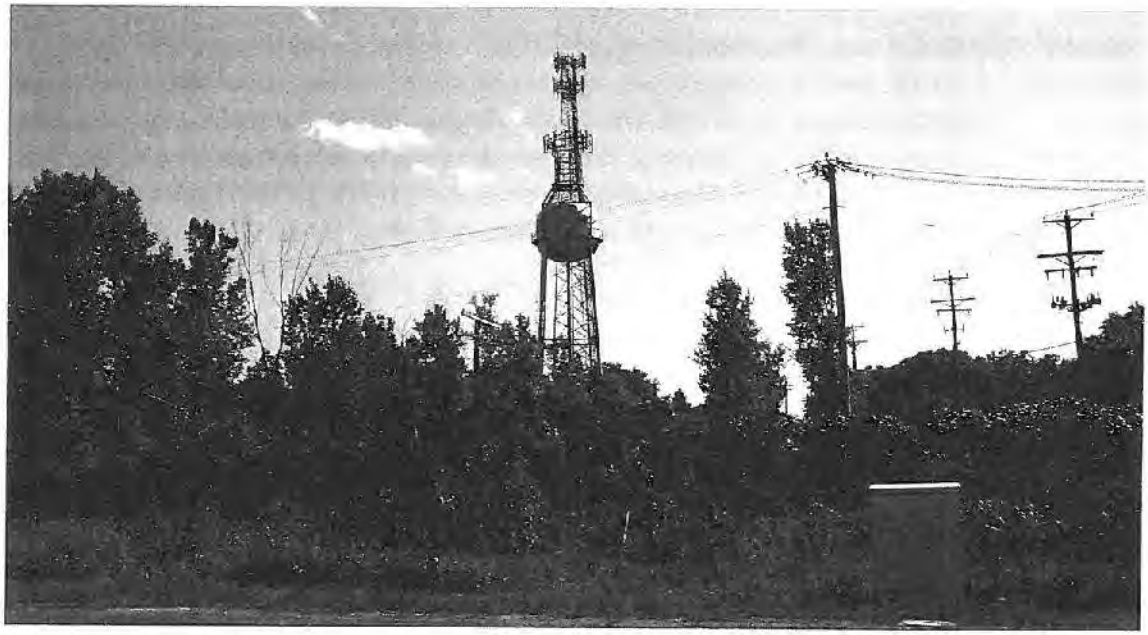
The ***Double Ellipsoidal*** was introduced in the 1930s in response to the demand for larger capacity tanks. Like the hemispherical type, double ellipsoidal water tanks were first constructed using rivets. Beginning during the World War II era, double ellipsoidal tanks more commonly utilized welded construction. The examples illustrate the variation in appearance of the double ellipsoidal tank, reflecting the tanks wide capacity range (50,000 to 500,000 gallons). The type is the most widely seen of those constructed in the post-war era.

(SOURCE: AKAY Consulting Postcard Collection)

As the hemispherical replaced the earlier flat bottom water towers, the hemispherical form was supplanted by the double ellipsoidal. That change is illustrated in this image of the towers in Albert Lea, Minnesota – while the double ellipsoidal (near center) remains in use today, the hemispherical (at left) is non-extant.

The following examples illustrate the variation in appearance of the double ellipsoidal tank, reflecting the tanks wide capacity range (50,000 to 500,000 gallons).

TYPOLOGY 3: DOUBLE ELLIPSOIDAL

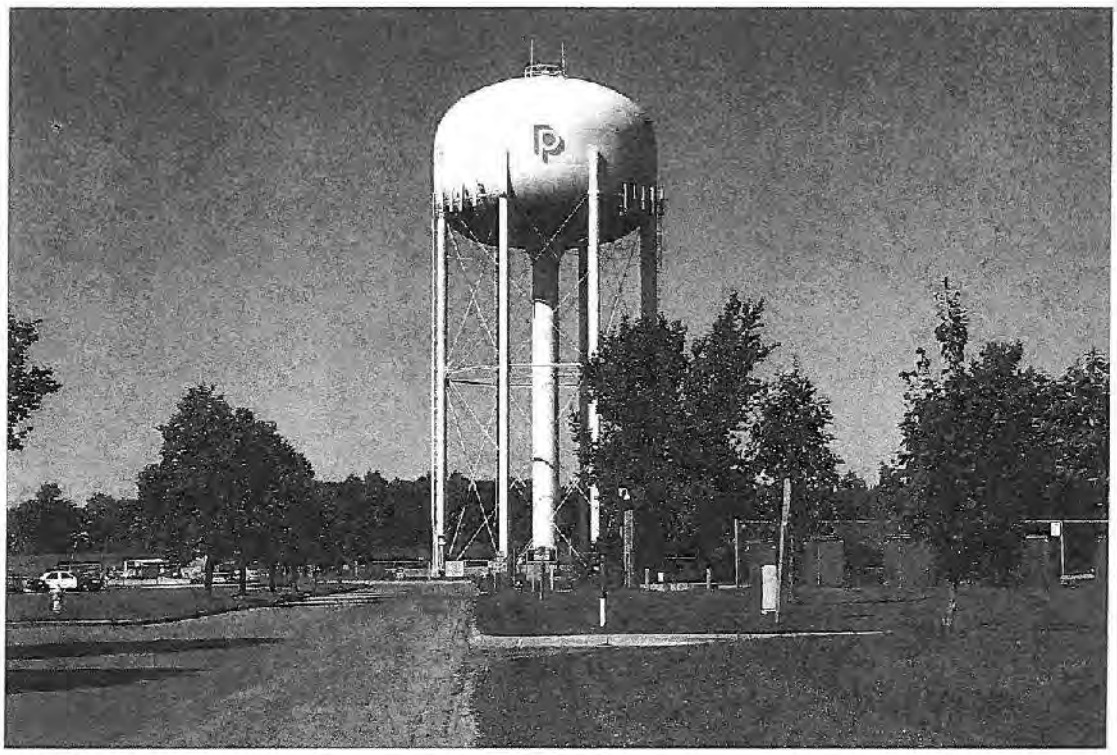


(SOURCE: AKAY Consulting, Medina, MN, September 2014)

The double ellipsoidal in Medina is relatively small in scale and capacity. Still, its height makes it an attractive spot for the collocation of telecommunications antennae.

(SOURCE: AKAY Consulting, Big Lake, MN September 2014)

TYPOLOGY 3: DOUBLE ELLIPSOIDAL

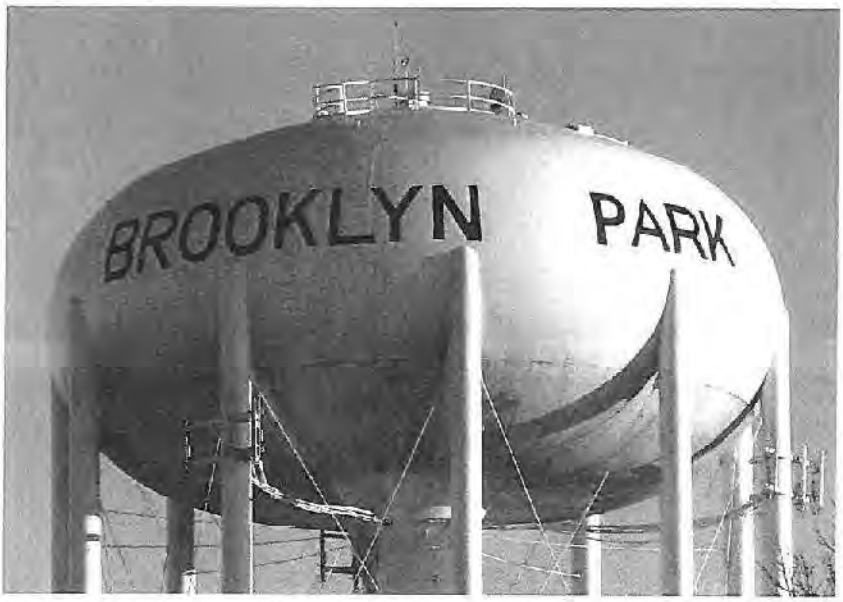


(SOURCE: AKAY Consulting, Plymouth, MN September 2014)

Plymouth has four water towers, two of which are categorized as double ellipsoidal in form. The tower in the top image dates to 1961.

TYPOLOGY 4: SPHEROID ELEVATED TANK - TOROSPHERICAL – (ca.1945-present)

The ***Spheroid*** elevated water tank (a sub-type of which is the ***Torospherical***) was introduced post-war and, given its large capacity (2,000,000 gallons), is common in large communities and urban areas. Both the Chicago Bridge and Iron Company and Pittsburgh-Des Moines developed large capacity spheroid tanks. A spheroid tank is comprised of plates of variable curvature with no vertical shell, with plates in tension requiring two sets of supports. As a result, the form can be identified by the use of a large center standpipe with slender outer columns and wind bracing.



(SOURCE: http://www.myfurnaceandac.com/images/brooklynpark_watertower_original.jpg. Accessed 02/20/2015)

(SOURCE: http://mw2.google.com/mw-panoramio/photos/small/16344293.jpg. Accessed 03/01/2015)

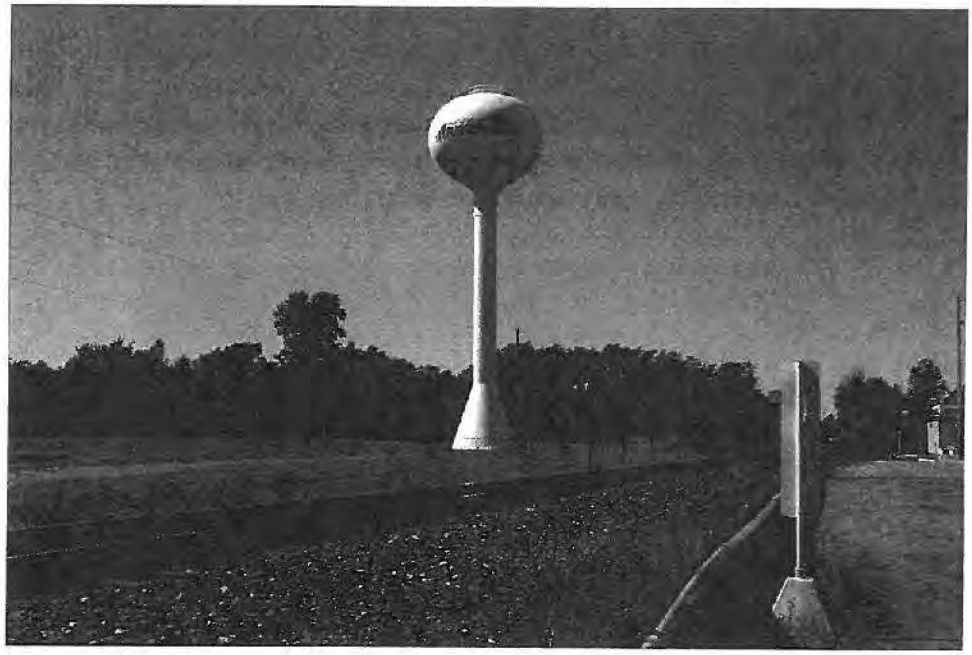
TYPOLOGY 5: SPHEROID ELEVATED TANK – PEDESTAL SPHERE (ca.1945-present)

The ***Pedestal Sphere*** came into use with the development of welded technology. Both the Chicago Bridge and Iron Company and the Pittsburgh-Des Moines Company developed this type of spherical tank with capacities of up to 200,000 gallons set on a supporting cylinder enclosing the standpipe. As the examples show, the welded design allowed for considerable variation in the shape of the tank. The pedestal sphere, along with the more economical water ball, replaced the previously dominant hemispherical and elliptical bottom forms.

(SOURCE: http://1.bp.blogspot.com/-qMBuOzQgXjs/UDPImqZzorI/AAAAAAAABJ8/mY6ySKKQOIE/s1600/ Dual-Water+towers+by+Plaster.jpg. Accessed 02/28/2015).

As the image above illustrates, the community of Brandon replaced their ca.1915 hemispherical water tower with an elevated spheroid – the process of constructing the new tower was captured in this image from August of 2012, with the older tower removed shortly thereafter. As the following examples show, the welded designs allowed for considerable variation in shape. The "spaceship" form (like the new tower at Brandon) is now a common element on the Minnesota horizon.

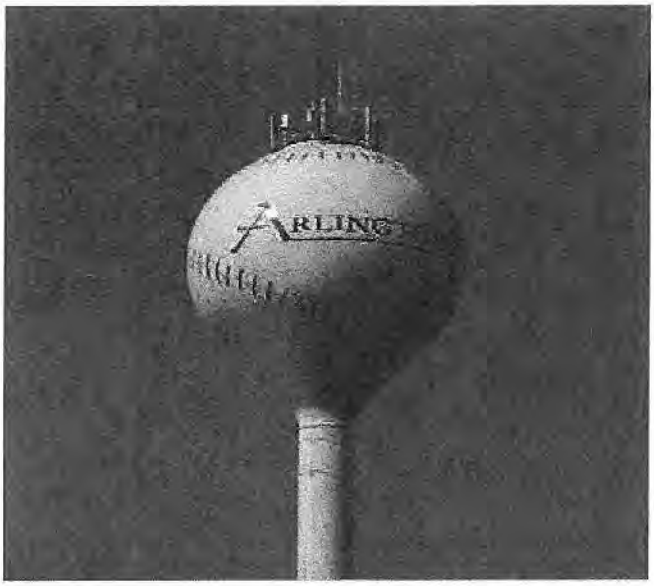
TYPOLOGY 5: SPHEROID ELEVATED TANK – PEDESTAL SPHERE



(SOURCE: AKAY Consulting, Annandale, MN, September 2014)

(SOURCE: http://www.mikiemetric.net/USAPics/Water%20Towers/BlaineDonutTower.jpg. Accessed 03/02/2015)

TYPOLOGY 5: SPHEROID ELEVATED TANK – PEDESTAL SPHERE



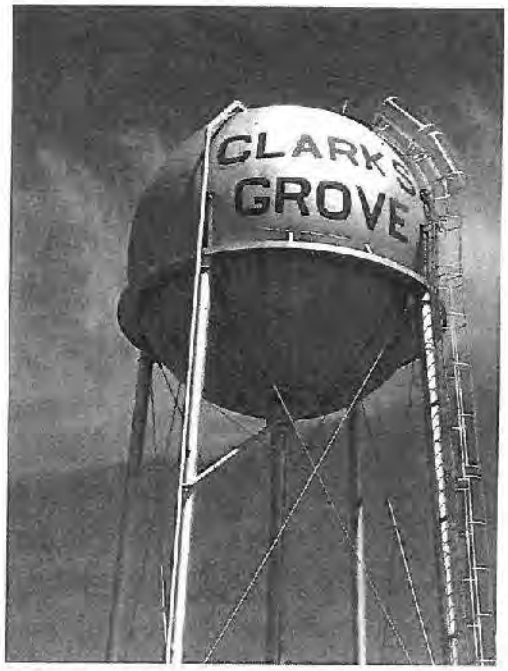
(SOURCE: http://smartdrycarpetcleaning.com/wp-content/uploads/2014/02/arlington.jpg. Accessed 02/25/2015)

(SOURCE: http://www.mikiemetric.net/USAPics/Water%20Towers/BlaineDonutTower.jpg. Accessed 02/25/2015)

TYPOLOGY 6: WATERBALL (ca.1945-present)

Like the pedestal sphere, the ***Water Ball*** was a post-war era development. The small tank set on slender posts was more economical than the pedestal sphere, but its small capacity limited its use to small communities.

(SOURCE: AKAY Consulting, Rockville, MN March 2015)

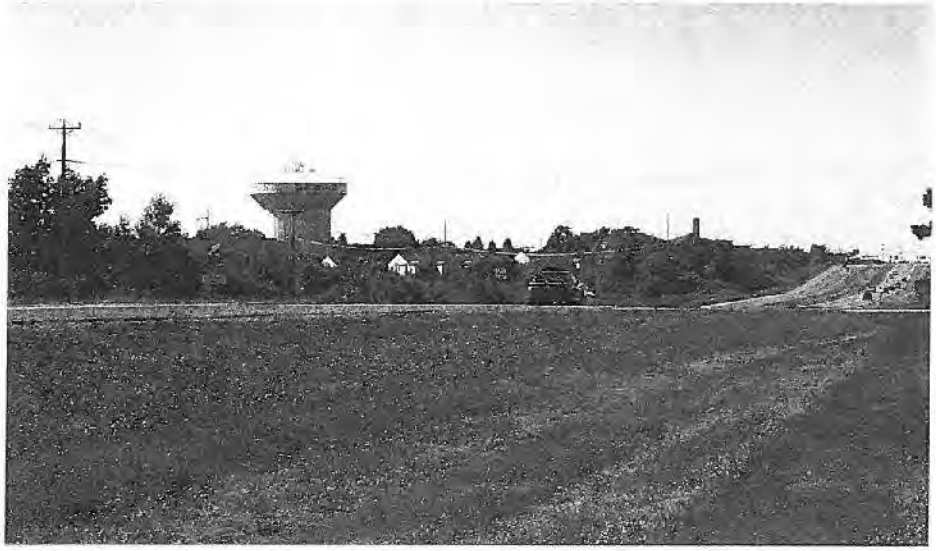


(SOURCE: AKAY Consulting, Clarks Grove, MN June 2016)

TYPOLOGY 7: HYDROPILLAR (ca.1990s – Present)

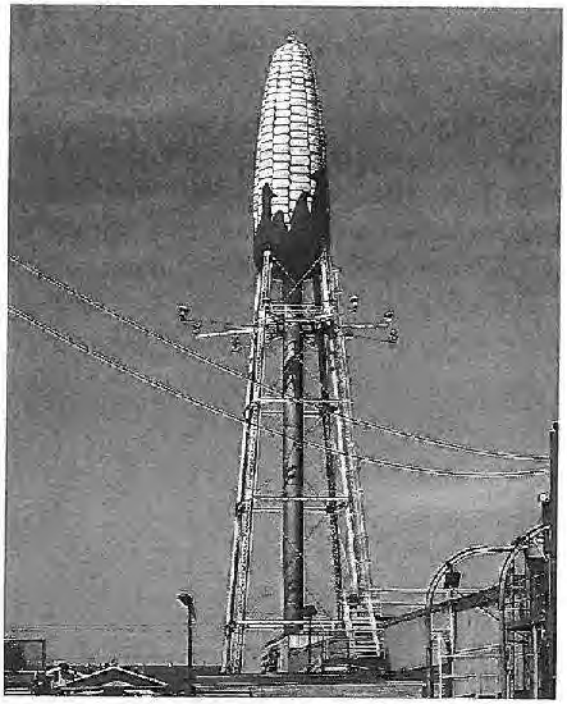
The ***Hydropillar*** was developed and patented by PDM in 1962. The hydropillar has a large diameter fluted standpipe supporting a tank with a vertical shell and ellipsoidal bottom and top. The form allowed for a wide range of capacity tanks and created a base that doubled as an enclosed space commonly utilized for storage; large door at the base (not visible in this view) provides access to the interior. This tower type is quickly becoming the dominant form in the Metropolitan area – its ability for large capacity storage (a number identified during the survey have capacities in excess of 1,000,000-gallons) makes it useful to cities facing an ever-increasing population.

(SOURCE: AKAY Consulting, St. Michael, MN, September 2014)

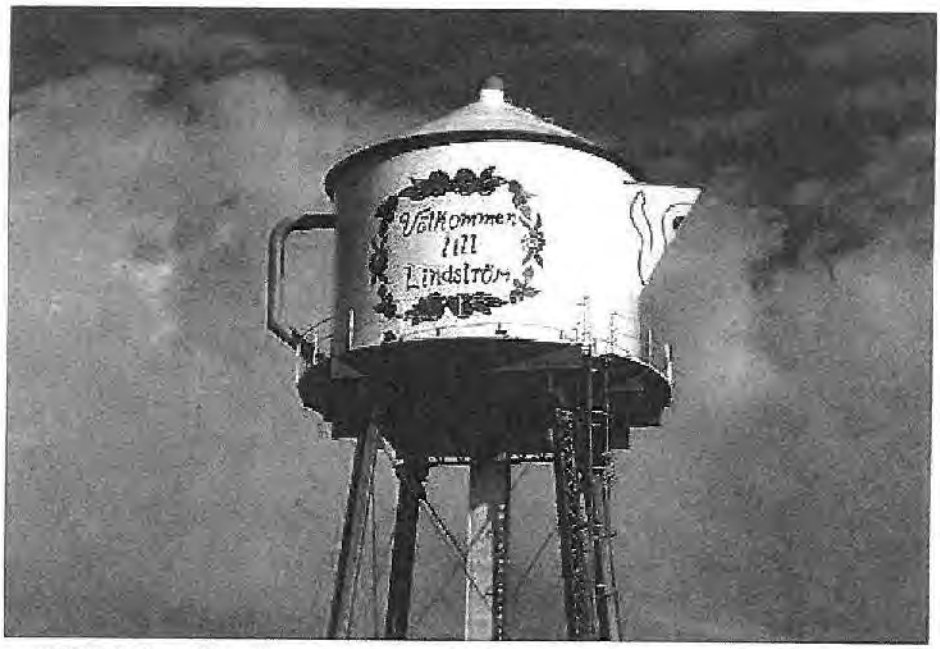


(SOURCE: AKAY Consulting, Plymouth, MN, September 2014)

TYPOLOGY 8: NOVELTY



(SOURCE: http://media-cache-ec0.pining.com/736x/c4/73/21/e47321da4c3a115a6e2ac7a18368b3e9.jpg. Accessed 02/28/2015).



(SOURCE: http://blog.lib.umn.edu/crd/rural_design/Lindstrom.jpg. Accessed 02/20/2015).

The towers at Rochester (top) and Lindstrom are, perhaps, Minnesota's most widely recognized water towers. Worth noting … the paint scheme of the Lindstrom tower post-dates the flat bottom tower by decades; the change coming after the tower was decommissioned.

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.460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 100 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 Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

OsseoWaterTower_0001 1 of 14

Context View: Looking north along Osseo's commercial district lining Central Avenue (historic route of Jefferson Highway)

OsseoWaterTower_0002

Context View: Looking west along 4th Street

OsseoWaterTower_0003

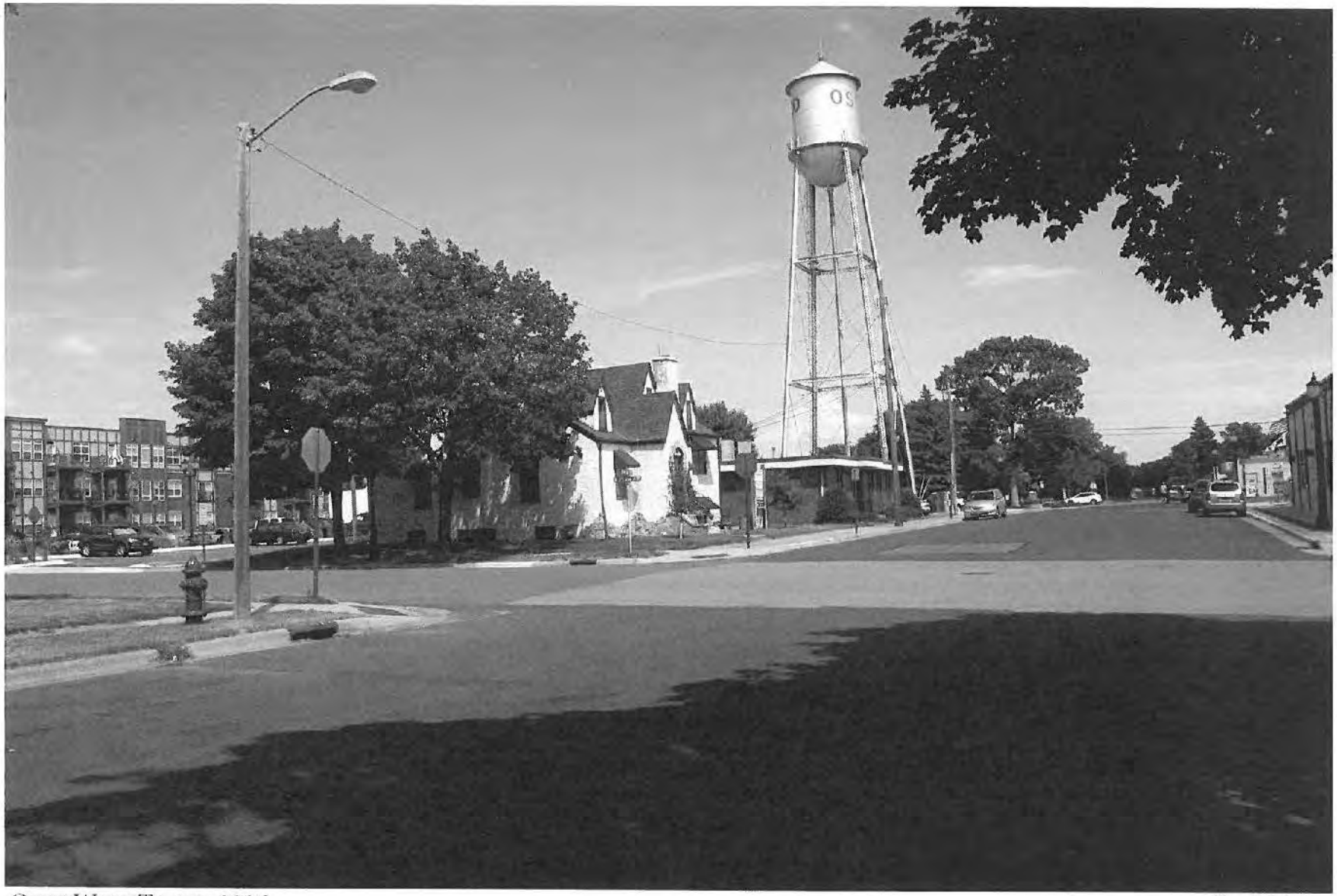
Context View: Looking west through Boerboom Veterans Park

OsseoWaterTower_0004

Context View: Looking southwest across the intersection of Central Avenue and 5th Street

OsseoWaterTower_0005

Context View: Looking southeast across the intersection of 1st Avenue NW and 5th Street NW



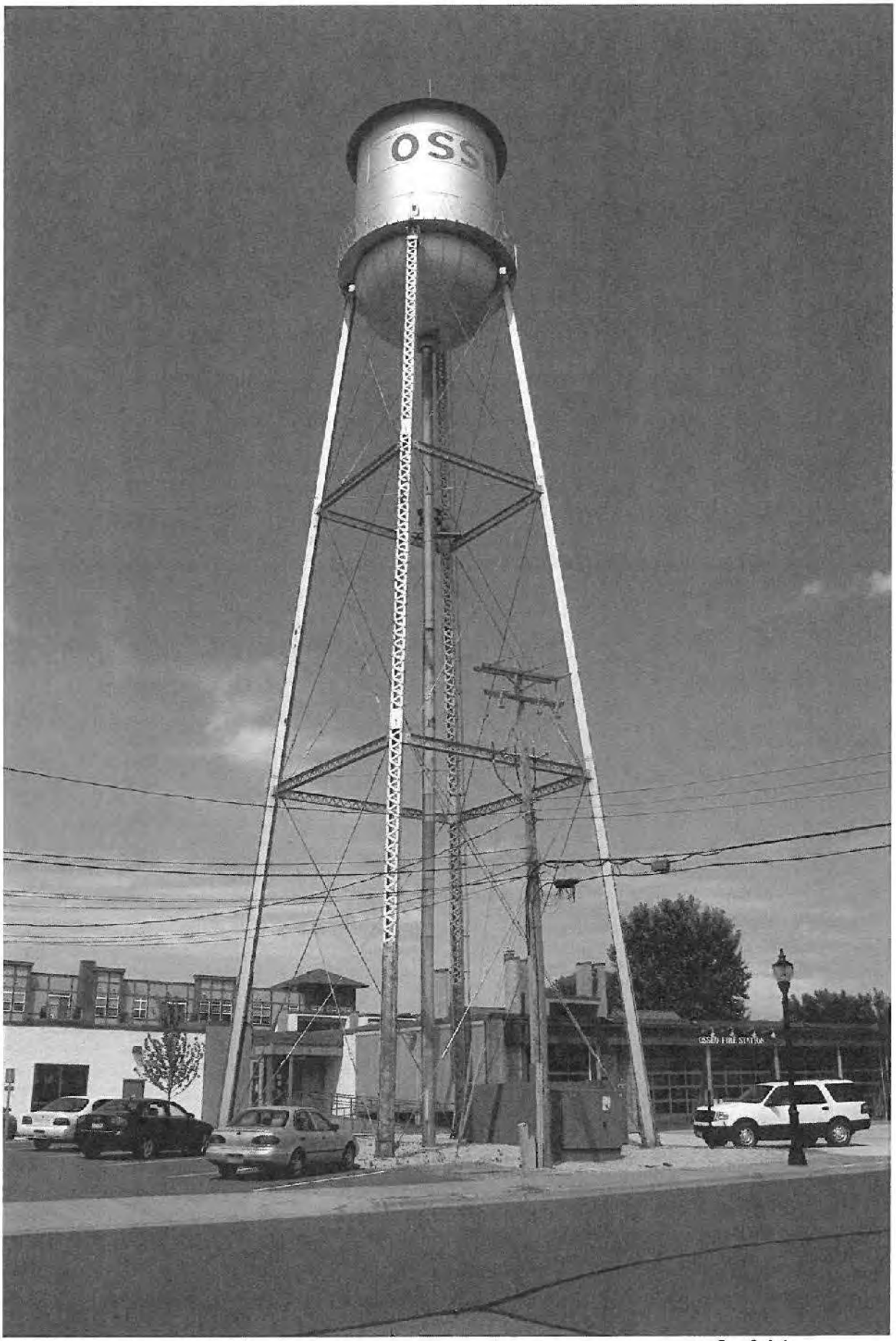
OsseoWaterTower_0006 6 of 14
Context View: Looking east along 4th Street NW

OsseoWaterTower_0007

View: View of the water tower looking northwest with the fire department at right

OsseoWaterTower_0008 8 of 14

View: View of the water tower looking southeast

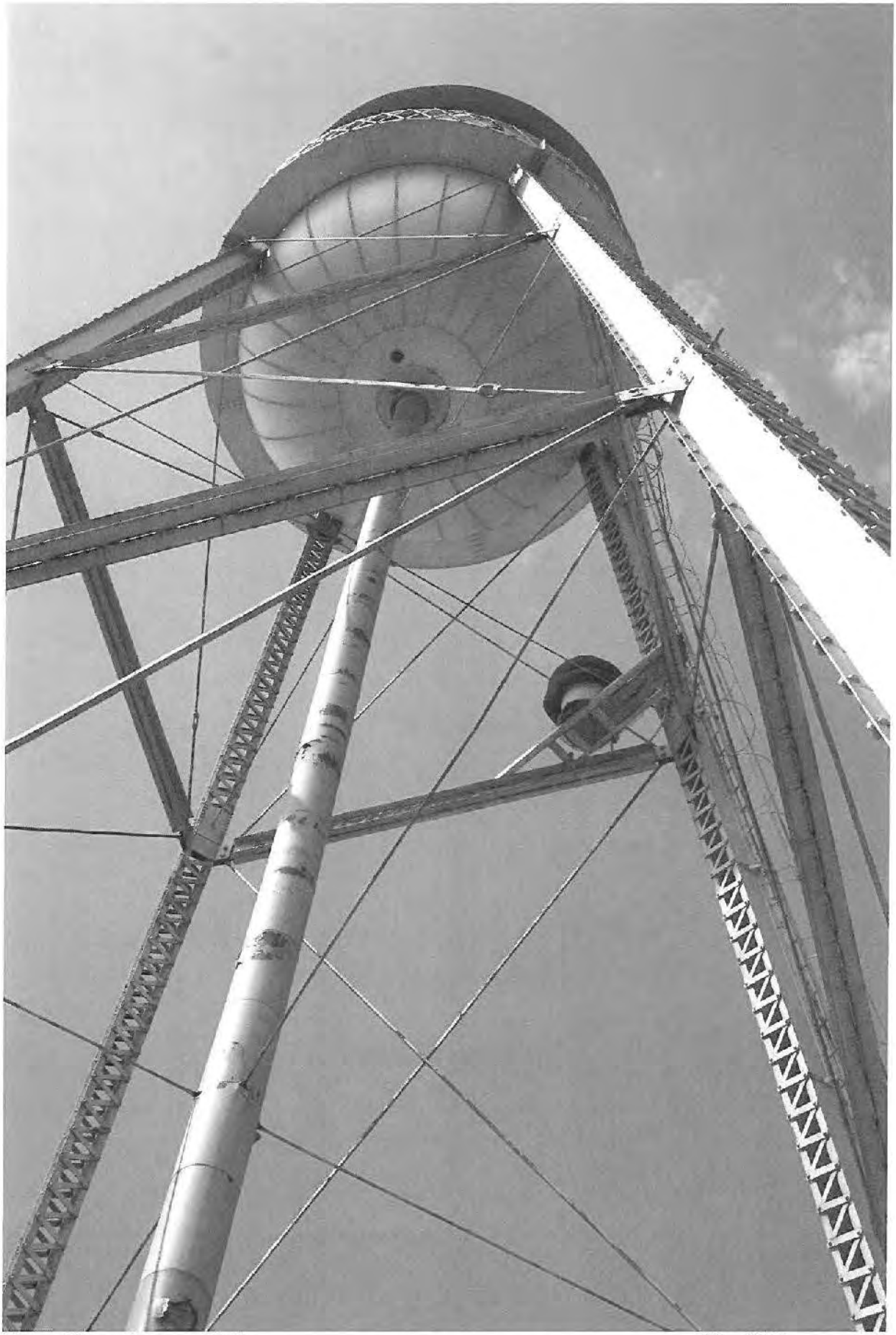


OsseoWaterTower_0009 9 of 14
View: View of the water tower looking northeast

OsseoWaterTower_0010

View: View of the water tower base and pad, looking northeast

OsseoWaterTower_0011 11 of 14
View: View of the water tower's 50,000-gallon tank



OsseoWaterTower_0012 12 of 14

View: View of the water tower structure from beneath the tower

OsscoWaterTower_0013

Detail: View of the mounting of leg to concrete footing

OsseoWaterTower_0014

Detail: View of the builder's plaque located on the NE leg

APPENDIX B:
WIND LOADING AND RISK CATEGORIES

Mattson Macdonald Young
structural engineers

Bassett Creek Business Center
901 North 3rd Street, #100
Minneapolis, MN 55401

612-827-7825 voice
612-827-0805 fax

To: Todd Grover
MacDonald & Mack Architects

From: Ken Green

Date: December 10, 2019

Project: Osseo Historic Water Tower

Regarding: Wind Loading and Risk Categories

Message:

This memo is to clarify the concern brought up in our draft report regarding the adequacy of the existing foundation for the historic water tower in Osseo.

The Minnesota State Building Code is based on the 2012 International Building Code. Both of these recognize a Risk Category, I through IV, associated with a building or structure use and the risk to human life and the community in the event of a structural failure. The affect on the design includes increased design wind and snow loads, which would reduce the possibility of a collapse.

Category II could be considered the default category – the one a majority of the buildings would fall under. Category I is defined as "Buildings and other structures that represent a low hazard to human life in the event of failure…" and include mainly agricultural buildings and minor storage facilities. Category III is for structures "that represent a substantial hazard to human life in the event of failure" and Category IV is "Buildings and other structures designated as essential facilities, including but not limited to: …Fire, rescue, ambulance and police stations and emergency vehicle garages."

An unused isolated water tower would be able to be considered as a lower risk category, potentially Risk Category I. However, given the water tower's historic value and its proximity to the fire station, a higher risk category would be recommended. If it were to collapse to the east, the water tower is tall enough to potentially block the drive lanes of the adjacent fire station, temporarily cutting off exiting from the fire station and disability its ability to function as a n essential facility. The foundations and some of the bracing members of the water tower are undersized when treated as Risk Category III or IV structure but are sufficient under the lower risk categories.

Note that the term "Risk Category" replaced the term "Occupancy Category" in the most recent Minnesota State Building Code. While functionally similar in the way they apply varying levels of acceptable risk to different structures, the new terminology recognizes that failure of a particular structure can affect more than itself and its occupants. The old terminology and concept has been incorporated into building codes for a number of years but not at the time when the water tower was designed and constructed and possibly not the fire station either. The existing structures can be considered "grandfathered" into code acceptance provided no substantial modifications are made to the structures.