

*****ATTACHMENTS*****

CITY OF SHEBOYGAN

REQUEST FOR CITY PLAN COMMISSION CONSIDERATION

ITEM DESCRIPTION: Application for Conditional Use with exceptions by the Sheboygan Water Utility to construct a new raw water intake and pump station at 72 Park Avenue. SR-5 Zone

REPORT PREPARED BY: Steve Sokolowski

REPORT DATE: November 5, 2021

MEETING DATE: November 9, 2021

FISCAL SUMMARY:

STATUTORY REFERENCE:

Budget Line Item: N/A
Budget Summary: N/A
Budgeted Expenditure: N/A
Budgeted Revenue: N/A

Wisconsin Statutes:
Municipal Code: N/A

BACKGROUND / ANALYSIS:

The Sheboygan Water Utility is proposing to construct a new raw water intake and pump station at 72 Park Avenue. The applicant states the following:

- The Sheboygan Raw Water Improvements Project includes a new raw water intake, pump station and associated yard piping, and shoreline protection improvements. The proposed location for this new structure is on an existing easement from Vollrath Park; it will not cross property lines as the Utility has secured this easement in advance. The proposed land use is an extension of the existing adjacent water treatment plant. This new facility will ensure reliability of clean drinking water serving the City of Sheboygan for decades into the future by replacing an existing shorewell built in 1887 and providing redundancy for water intake and electrical infrastructure on site.
- The pump station is proposed to be located on existing flat land adjacent to the lake and north of the existing plant. This location allows the shorewell to reach the required depth for the new water intake while maintaining the floor of the structure at two (2) feet above the regional flood elevation. The building has been placed as far away from the lake as possible within the easement to mitigate lake effects and minimize impact on the adjacent park. The intake will originate on the coast of Lake Michigan and terminate 5,500 to 7,000 linear feet into the lake. The shoreline protection improvements will span approximately 250 linear feet along the coast
- The building itself is designed to blend in with the existing plant facilities. The existing buildings on site have brick masonry facades with limestone accents. Most repeat features such as limestone headers and glass block windows from the 1920s filter plant. The new building will have a brick façade with limestone accents and glass block windows to match

these existing features. It will also have a peaked standing seam roof which has been selected to match the color of the existing metal roofs. Care has been taken to minimize impact on the adjacent parkland using cutoff light fixtures and acoustic louvers.

- The proposed building is 3,900sf (50 x 78) and 31.3 feet tall.

Site improvements include pavement landscaping and fencing:

- The proposed fencing is a black ornamental fence that matches existing railings on site. Along the lakeshore, use chain link fence is proposed in keeping with the existing fencing along the lake.
- The proposed landscaping is to be coordinated with the adjacent disc golf improvements. The plans include removal of trees and brush on the slope adjacent to the new facility and reseeding of the area to stabilize the slope. A variance is requested from landscaping ordinance in order to integrate landscaping requirements of the adjacent disc golf course project once that project reaches a level of development sufficient to coordinate improvements.
- The proposed paved drive to access the facility has been coordinated with City of Sheboygan fire department for fire truck access.
- New metal enclosed switchgear and pad mount transformers, will be placed north of the new structure.
- A sanitary lift station serving the building will also be located north of the building, with underground equipment and only a concrete pad visible from above.
- Existing materials stored outdoors will be removed.

Existing Conditions:

- The water utility provides retail water service to customers in the City of Sheboygan and wholesale water service to the Village of Kohler and the City of Sheboygan Falls.
- The water utility withdraws raw water from Lake Michigan through two (2) intakes, collects the water at an existing shore well, pumps the water to a water treatment plant, and sends the treated water into the distribution system.
- The two (2) existing lake intakes include a 30-inch steel intake installed in 1909 that extends 5,200 feet from shore and a 36-inch concrete intake installed in 1959 that extends 2,100 feet from shore.
- The 1909 lake intake draws 12 million gallons per day (mgd) of lake water and is past its useful life. The applicant plans to retire this intake within the next five years due to its age and its susceptibility to frazil ice formation.
- The 1959 intake has a capacity of 22 mgd, is 62 years old, and may last several more decades. Good engineering practice requires a water system to have at least two (2) lake intakes to provide redundancy during maintenance and emergencies. Therefore, the water

utility proposes to construct a new 60-inch lake intake to replace the 1909 intake and to maintain the existing 1959 intake as a backup.

- The water utility also proposes to construct a new 54-inch stub out for a second lake intake that would someday replace the 1959 intake.
- Both existing intakes discharge into a shore well built in 1887. An existing low lift pump station, built in 1929, pumps water from the shore well to the water treatment plant. The applicant planned to keep both the existing shore well and pump station in service as long as the Docket 5370-CW-117 5 existing 1959 lake intake continues to be in service.
- However in the most recent Sanitary Survey Report, the Wisconsin Department of Natural Resources (DNR) identified that the low lift pumps, motors, and controls are below Lake Michigan's water level. The DNR stated that this is a non-conforming feature that the applicant needs to correct.
- Therefore, the water utility proposes to construct a new shore well and low lift pump station with new vertical turbine pumps that will be located approximately 12 feet above current lake levels. The new shore well would draw water from the proposed 60-inch intake and the 54-inch stub out once it is extended into the lake at some future date. The water utility expects that the proposed new shore well and pump station would address the DNR's non-conforming feature.

Additional information regarding the pump station and intake project proposal:

- The water utility's existing water system consists of two (2) surface water intakes, six (6) elevated storage tanks and reservoirs, and 208 miles of water main.
- The water utility proposes to construct a new 60-inch raw water prestressed concrete cylinder pipe (PCCP) intake with a length of 6,500 feet that would extend into Lake Michigan to a depth of approximately 50 feet.
- The project also includes a second, 54-inch PCCP raw water intake that would be stubbed out at a length of 400 feet.
- Additional project features include: a new shore well and raw water pump station housed in a 3,900 square foot building, a screen system, four low lift pumps (two pumps Docket 5370-CW-117 4 rated at 10,500 gpm and two pumps rated at 6,600 gpm) with variable frequency drives, two 400 kW emergency generators, chemical feed equipment, 20-inch and 36-inch ductile iron connector pipe, and shoreline protection.
- The proposed new water intake will result in lower intake velocities and thus reduce the turbulence that promotes frazil ice formation, resulting in reductions in daytime pumping and electricity costs. The new lake intake will draw water at a greater distance from shore and at a greater depth than the existing intakes. It is reasonable to expect these changes to result in less turbid water at the water treatment plant, reductions in treatment chemical requirements, and less sludge formation and resulting disposal costs. These changes will help improve the efficiency of the applicant's operations.
- The water utility estimated that the project will cost \$46,000,000.

- The water utility expects to construct the project from April 2022 to June 2024.

STAFF COMMENTS:

The Plan Commission may want to have the applicant explain:

- Approvals required from DNR and Army Corp of Engineers and their status.
- What sections of the fence are to be ornamental and what sections are to be wire mesh?
- The proposed location of the pump station building and project will impact a couple of holes on the frisbee golf course in Vollrath Park. It is staff's understanding that the water utility will be working with the Parks Department to relocate these frisbee golf holes in the park.

The applicant is requesting the following exceptions:

- To have a building setback of 42 feet to the Lake Michigan Ordinary Highwater Mark of Lake Michigan – Minimum 75 foot setback from the Lake Michigan Ordinary Highwater Mark is 75 feet.
- To have a nine (9) foot tall security fence – Maximum fence height is eight (8) feet tall.

The zoning ordinance permits the Plan Commission to approve a nine (9) foot tall fence with a conditional use permit. The fence itself is eight (8) feet tall but it is proposed to have three (3) strands of barbwire for security purposes of this critical infrastructure. This will match the existing security fence already located along the lake front of the property.

- Requesting an exception from the locational landscaping requirements - Applicant shall meet the four (4) locational landscaping requirements.

Variance is requested for landscaping ordinance in order to allow for coordination with adjacent upcoming park disc golf course improvements. Foundation planting requirements are not applicable or consistent with the rest of the plant.

ACTION REQUESTED:

Staff recommends approval of the conditional use permit and exceptions subject to the following conditions:

1. Prior to building permit issuance, the applicant shall obtain all licenses and permits as well as meet all required codes including but not limited to building, plumbing, electrical, HVAC, fire, water, sewer, storm drainage, health, State (DNR) Federal (Army Corp), etc. (Applicant shall be in contact with building inspection, fire, police, etc.). An occupancy permit will be granted only at such time as the applicant has met all requirements.
2. Applicant shall obtain all necessary permits for the construction, the storage and the handling of hazardous chemicals and/or fuels (applicant shall be in contact with building inspection, fire department, etc.).
3. The facility will meet all zoning requirements including but not limited to noise, vibration, hazardous materials, etc.

4. Submittal/approval of a proposed storm drainage plan prior to building permit issuance.
5. Submittal and approval of a proposed landscape plan prior to building permit issuance.
6. If proposing to install a fence/gate and/or retaining wall, the structure shall be installed per Section 15.720(3)(c) of the City of Sheboygan Zoning Ordinance. The applicant shall install black ornamental fence around the pump station structure and may install a chain link fence to match the existing chain link fencing along the lake.
7. If using dumpsters, the dumpster(s) shall be screened/enclosed and constructed of like materials and colors of the facility.
8. All ground level and rooftop mechanicals shall be screened and/or enclosed and constructed of like materials and colors of the facility (HVAC equipment, etc.).
9. Outdoor storage of materials, products or equipment shall be prohibited.
10. All new lighting shall be installed per Section 15.707 of the City of Sheboygan Zoning Ordinance. There shall be no spillover light onto adjacent properties or the streets.
11. Applicant shall obtain the necessary sign permits prior to installation. Applicant shall work with staff with regards to constructing a well-designed signage for the site that utilizes colors and materials similar to the building. Proposed and future signage at this site will be individual letter signs (no flat panel or interior lit cabinet signs). Staff may bring the proposed signage design back to the Plan Commission for review/approval.
12. All areas used for parking/maneuvering of vehicles shall be paved.
13. All areas that are not required to be paved shall be landscaped with grass and/or approved landscaping.
14. Any new ingress/egress driveway openings shall be improved to standard City specifications. All existing access drives that are no longer used shall be removed and all unused driveways shall be closed and improved to standard City specifications.
15. Absolutely no portion of the new building and/or site improvements shall cross the property lines including but not limited to buildings, balconies, decks, foundations, walls, gutters, eaves, roof, parking, fencing/retaining walls, signs, landscaping, etc.
16. Any work within City of Sheboygan Public rights-of-way shall be discussed with the City Engineering Department and constructed to standard City specifications (including, but not limited to, new and old ingress/egress driveway openings, curb, gutter, sidewalk, pavement, utilities, street trees, grading, etc.).
17. Applicant will provide adequate public access along all streets and sidewalks and will take all appropriate actions to minimize the time period that adjacent properties and streets/sidewalks are impacted by the development (utilities, streets, etc.).
18. Applicant shall immediately clean any and all sediments, materials, tracking, etc. that may be spilled off-site on private or public lands and streets.
19. Streets and infrastructure damaged and/or disturbed during construction of all private and/or public improvements shall be promptly repaired by the applicant.
20. Applicant is responsible for working with all private and public utilities in order to adequately service this apartment complex development proposal (applicant will need to provide the necessary easements and/or relocate utilities as necessary).
21. Prior to building permit issuance, the City of Sheboygan Architectural Review Board shall review/approve the proposed building design.
22. If there are any amendments to the approved conditional use permit (including but not limited to site plan, architectural design, use, etc.), the applicant will be required to submit a new conditional use application reflecting those amendments.

ATTACHMENTS:

Conditional Use and required attachments

PARCEL NO. _____

MAP NO. _____

ZONING CLASSIFICATION: _____

Office Use Only

APPLICATION/FILE NO. _____

REVIEW DATE: _____

FILING FEE: \$250.00 (Payable to City of Sheboygan)

CITY OF SHEBOYGAN APPLICATION FOR CONDITIONAL USE PERMIT

Requirements Per Section 15.905
Revised May 2018

Completed application is to be filed with the Department of City Development, 828 Center Avenue, Suite 208. To be placed on the agenda of the City Plan Commission, application must be filed two weeks prior to date of meeting. Applications will not be processed if all required attachments and filing fee of \$250 (payable to the City of Sheboygan) is not submitted along with a complete and legible application. Application filing fee is non-refundable.

1. APPLICANT INFORMATION

APPLICANT: Sarah Sutherland

ADDRESS: 125 S. Wacker Dr. Suite 700 E-MAIL: sutherlandins@cdmsmith.com

PHONE: (312)780-7738 FAX NO. ()

2. DESCRIPTION OF THE SUBJECT SITE/PROPOSED PROJECT

NAME OF PROPOSED/EXISTING BUSINESS: Sheboygan Water Utility

ADDRESS OF PROPERTY AFFECTED: 72 Park Avenue, Sheboygan WI 53081

LEGAL DESCRIPTION: _____

To be provided by City Attorney for recently approved easement

BRIEF DESCRIPTION OF **EXISTING** OPERATION OR USE: _____

Existing easement from Vollrath Park for Sheboygan Water Utility Use.

DETAILED DESCRIPTION OF **PROPOSED** OPERATION OR USE INCLUDING ANY CHANGES TO THE EXISTING USE: _____

New raw water intake and pump station.

BRIEF DESCRIPTION OF ALL REQUESTED VARIANCES FROM PROVISIONS OF THE ZONING ORDINANCE, WHICH ARE RELATED TO THE PROPOSED OPERATION OR USE: - Water plant is a permitted conditional use within SR-5 zoning.

- Variance is requested for a <75' setback from ordinary high water mark.
- Variance is requested for use of chainlink fence along Lake Michigan, consistent with existing conditions.
- Variance is requested for landscaping ordinance in order to allow for coordination with adjacent upcoming park disc golf course improvements. Foundation planting requirements are not applicable or consistent with the rest of the plant.

3. JUSTIFICATION OF THE PROPOSED CONDITIONAL USE

Written justification for the proposed conditional use, indicating reasons why the applicant believes the proposed conditional use is appropriate.

How is the proposed conditional use (independent of its location) in harmony with the purposes, goals, objectives, policies and standards of the City of Sheboygan Comprehensive Master Plan? _____

New raw water intake and pump station will ensure reliability of clean drinking water serving the City of Sheboygan.

Does the conditional use, in its proposed location, result in any substantial or undue adverse impact on nearby property the character of the neighborhood, environment, traffic, parking, public improvements, public property or rights-of-way? _____

New pump station is designed to match existing plant, maintaining the character.

Consideration has been made to mitigate impacts on the surrounding environment including the use of cut-off light fixtures, acoustic louvers, and relocation of exterior stored materials.

How does the proposed conditional use maintain the desired consistency of land uses in relation to the setting within which the property is located? _____

Conditional use extends existing SWU plant use into existing easement.

Is the proposed conditional use located in an area that will be adequately served by utilities, or services provided by public agencies? If not, please explain. _____

Area will be adequately served by utilities under this project including electric, gas, sewer, and water. Access has been coordinated with Fire department for fire truck access.

4. NAMES AND ADDRESS (Indicate N/A for "Not Applicable" items)

OWNER OF SITE: Sheboygan Water Utility. Contact: Joe Trueblood

ADDRESS: 72 Park Avenue, Sheboygan WI **E-MAIL:** joetrueblood@sheboyganwater.org

ARCHITECT: CDM Smith: Lee Lohman

ADDRESS: 125 S. Wacker Dr. Suite 700 **E-MAIL:** LohmanLA@cdmsmith.com

CONTRACTOR: N/A

ADDRESS: N/A **E-MAIL:** N/A

5. CERTIFICATE

I hereby certify that all the above statements and attachments submitted hereto are true and correct to the best of my knowledge and belief.



APPLICANT'S SIGNATURE

Sarah Sutherlin

PRINT ABOVE NAME

10.18.2021

DATE



Memorandum

To: Steve Sokolowski, City of Sheboygan Department of Planning and Development

From: Sarah Sutherlin, CDM Smith on behalf of Sheboygan Water Utility

Date: 11.02.2021

Subject: Sheboygan Raw Water Improvements Project – Written Explanation

The Sheboygan Raw Water Improvements Project includes a new raw water intake, pump station and associated yard piping, and shoreline protection improvements. The proposed location for this new structure is on an existing easement from Vollrath Park; it will not cross property lines as the Utility has secured this easement in advance. The proposed land use is an extension of the existing adjacent water treatment plant. This new facility will ensure reliability of clean drinking water serving the City of Sheboygan for decades into the future by replacing an existing shorewell built in 1887 and providing redundancy for water intake and electrical infrastructure on site.

The pump station is proposed to be located on existing flat land adjacent to the lake and north of the existing plant. This location allows the shorewell to reach the required depth for the new water intake while maintaining the floor of the structure at 2' above the regional flood elevation. The building has been placed as far away from the lake as possible within the easement to mitigate lake effects and minimize impact on the adjacent park. The requested setback is 41.7'. The intake will originate on the coast of Lake Michigan and terminate 5,500 to 7,000 linear feet into the lake. The shoreline protection improvements will span approximately 250 linear feet along the coast.

Other site improvements include pavement, landscaping and fencing. The proposed fencing is an 8' tall black ornamental metal picket type fence that matches existing railings on site. Along the lakeshore, a variance to use a 8' tall chain link fence is requested, which is in keeping with the existing fencing along the lake. The proposed landscaping is to be coordinated with the adjacent disc golf improvements. The plans include removal of trees and brush on the slope adjacent to the new facility and reseeding of the area to stabilize the slope. A variance is requested from landscaping ordinance in order to integrate landscaping requirements of the adjacent disc golf course project once that project reaches a level of development sufficient to coordinate improvements. The proposed paved drive to access the facility has been coordinated with City of Sheboygan fire department for fire truck access. New metal enclosed switchgear and padmount transformers, will be placed north of the new structure. A sanitary lift station serving the building will also be located north of the building, with underground equipment and only a concrete pad visible from above. Existing materials stored outdoors will be removed.

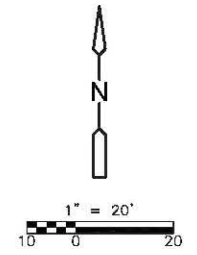
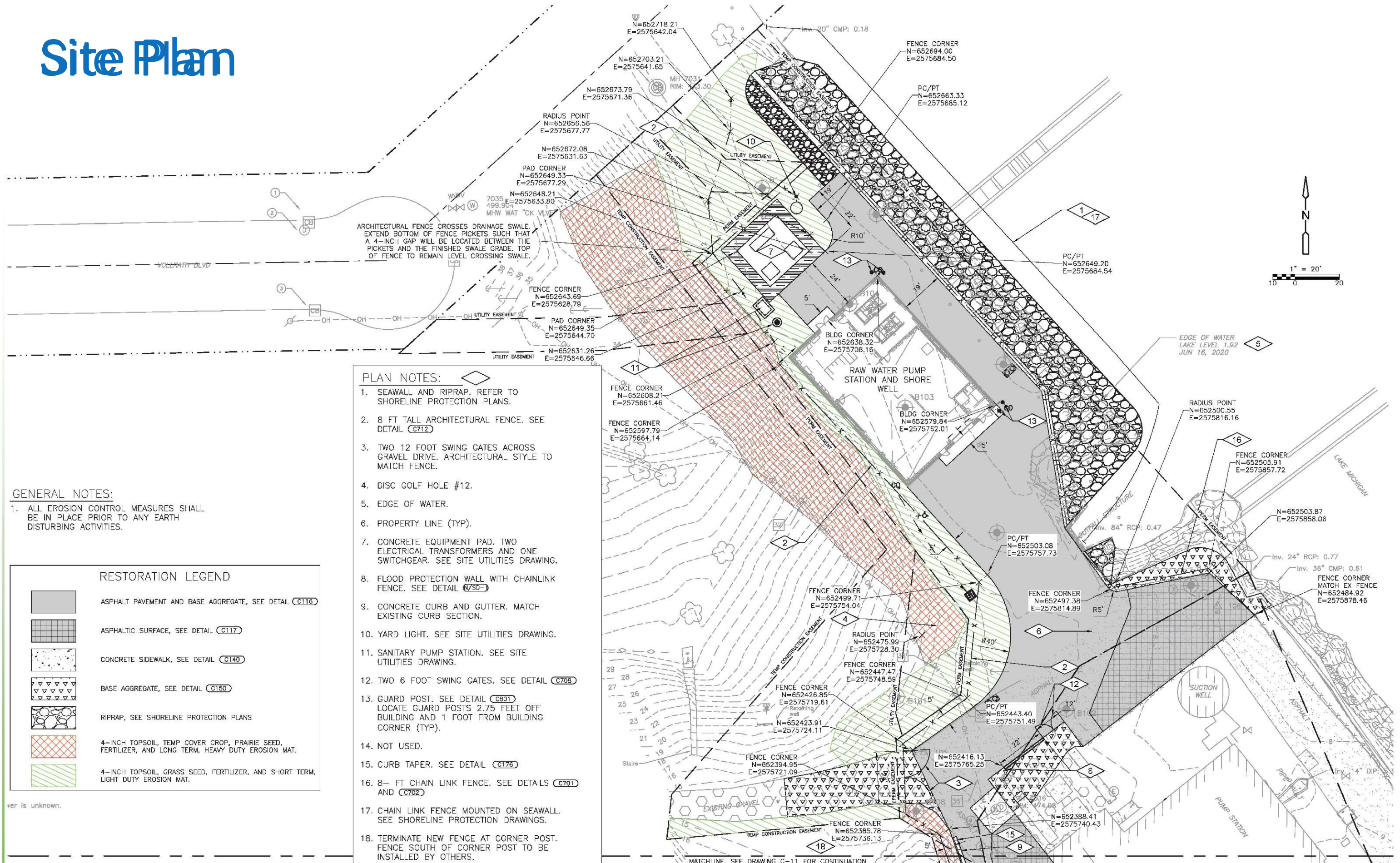
Sheboygan Raw Water Improvements Project – Written Explanation

10.18.2021

Page 2

The proposed building has a floor area of 3900 SF and an overall height of 31'-3". It is designed to blend in with the existing water treatment plant facilities. The existing buildings on site have brick masonry facades with limestone accents. Most repeat features such as limestone headers and glass block windows from the 1920s filter plant. The proposed new building will have a brick façade with limestone accents and glass block windows to match these existing features. It will also have a peaked standing seam roof which has been selected to match the color of the existing metal roofs. Care has been taken to minimize impact on the adjacent parkland using cutoff light fixtures and acoustic louvers.

Site Plan



- PLAN NOTES:**
- SEAWALL AND RIPRAP. REFER TO SHORELINE PROTECTION PLANS.
 - 8 FT TALL ARCHITECTURAL FENCE. SEE DETAIL (C712)
 - TWO 12 FOOT SWING GATES ACROSS GRAVEL DRIVE. ARCHITECTURAL STYLE TO MATCH FENCE.
 - DISC GOLF HOLE #12.
 - EDGE OF WATER.
 - PROPERTY LINE (TYP).
 - CONCRETE EQUIPMENT PAD. TWO ELECTRICAL TRANSFORMERS AND ONE SWITCHGEAR. SEE SITE UTILITIES DRAWING.
 - FLOOD PROTECTION WALL WITH CHAINLINK FENCE. SEE DETAIL (V/SB)
 - CONCRETE CURB AND GUTTER. MATCH EXISTING CURB SECTION.
 - YARD LIGHT. SEE SITE UTILITIES DRAWING.
 - SANITARY PUMP STATION. SEE SITE UTILITIES DRAWING.
 - TWO 6 FOOT SWING GATES. SEE DETAIL (C708)
 - GUARD POST. SEE DETAIL (C801)
LOCATE GUARD POSTS 2.75 FEET OFF BUILDING AND 1 FOOT FROM BUILDING CORNER (TYP).
 - NOT USED.
 - CURB TAPER. SEE DETAIL (C176)
 - 8- FT CHAIN LINK FENCE. SEE DETAILS (C701) AND (C702)
 - CHAIN LINK FENCE MOUNTED ON SEAWALL. SEE SHORELINE PROTECTION DRAWINGS.
 - TERMINATE NEW FENCE AT CORNER POST. FENCE SOUTH OF CORNER POST TO BE INSTALLED BY OTHERS.

- GENERAL NOTES:**
- ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY EARTH DISTURBING ACTIVITIES.

RESTORATION LEGEND

- ASPHALT PAVEMENT AND BASE AGGREGATE, SEE DETAIL (C116)
- ASPHALTIC SURFACE, SEE DETAIL (C117)
- CONCRETE SIDEWALK, SEE DETAIL (C140)
- BASE AGGREGATE, SEE DETAIL (C150)
- RIPRAP, SEE SHORELINE PROTECTION PLANS
- 4-INCH TOPSOIL, TEMP COVER CROP, PRAIRIE SEED, FERTILIZER, AND LONG TERM, HEAVY DUTY EROSION MAT.
- 4-INCH TOPSOIL, GRASS SEED, FERTILIZER, AND SHORT TERM, LIGHT DUTY EROSION MAT.

ver is unknown.

MATCH INF. SFF DRAWING G-11 FOR CONTINUATION

Elevations



EAST ELEVATION

1/16" = 1'-0"



NORTH ELEVATION

1/16" = 1'-0"



WEST ELEVATION

1/16" = 1'-0"



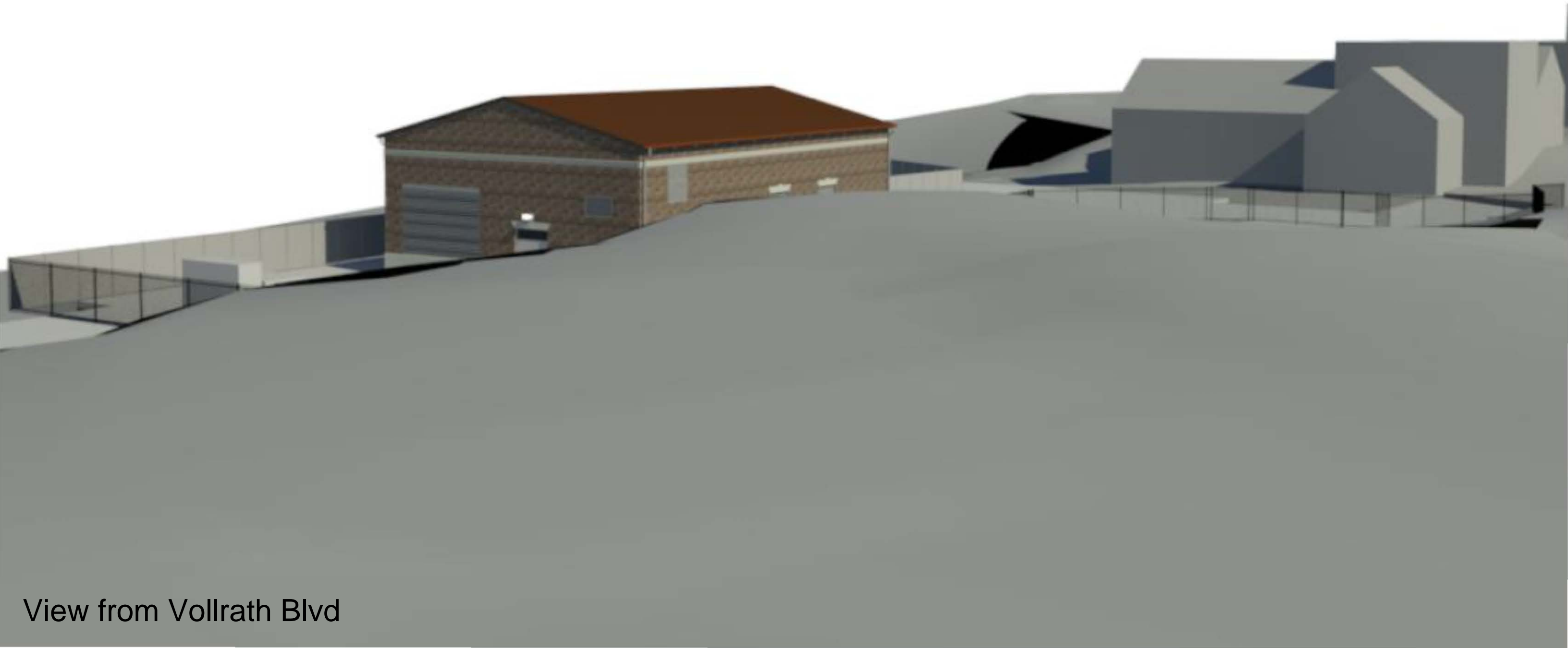
SOUTH ELEVATION

1/16" = 1'-0"

View 1

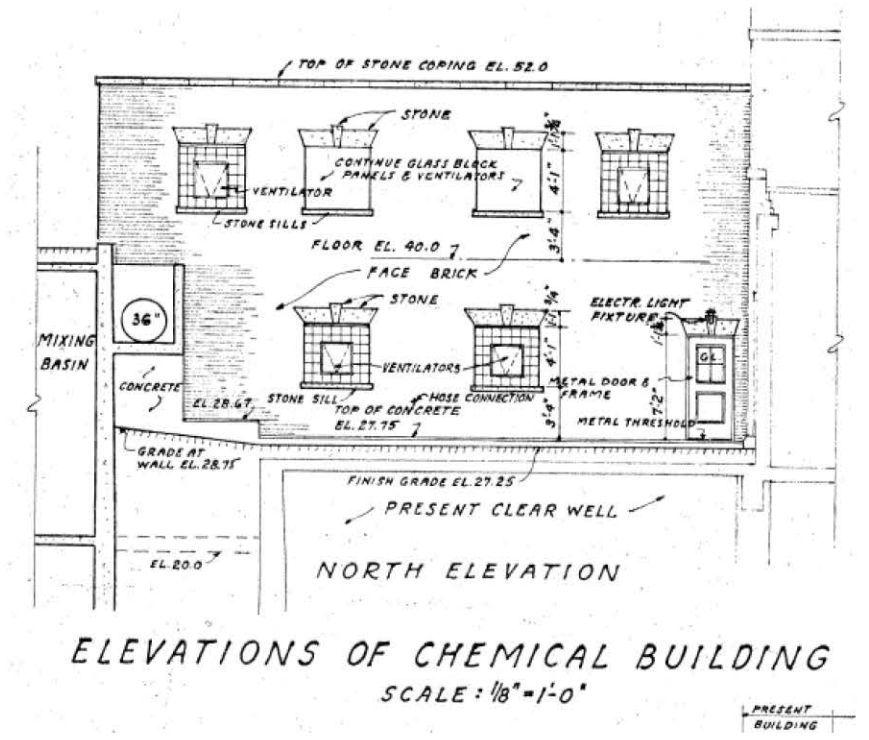


Aerial view of existing water plant



View from Vollrath Blvd

View 2



View from Vollrath Park

View 3



Typical existing materials



View from existing water plant

View 4



Existing filter plant building



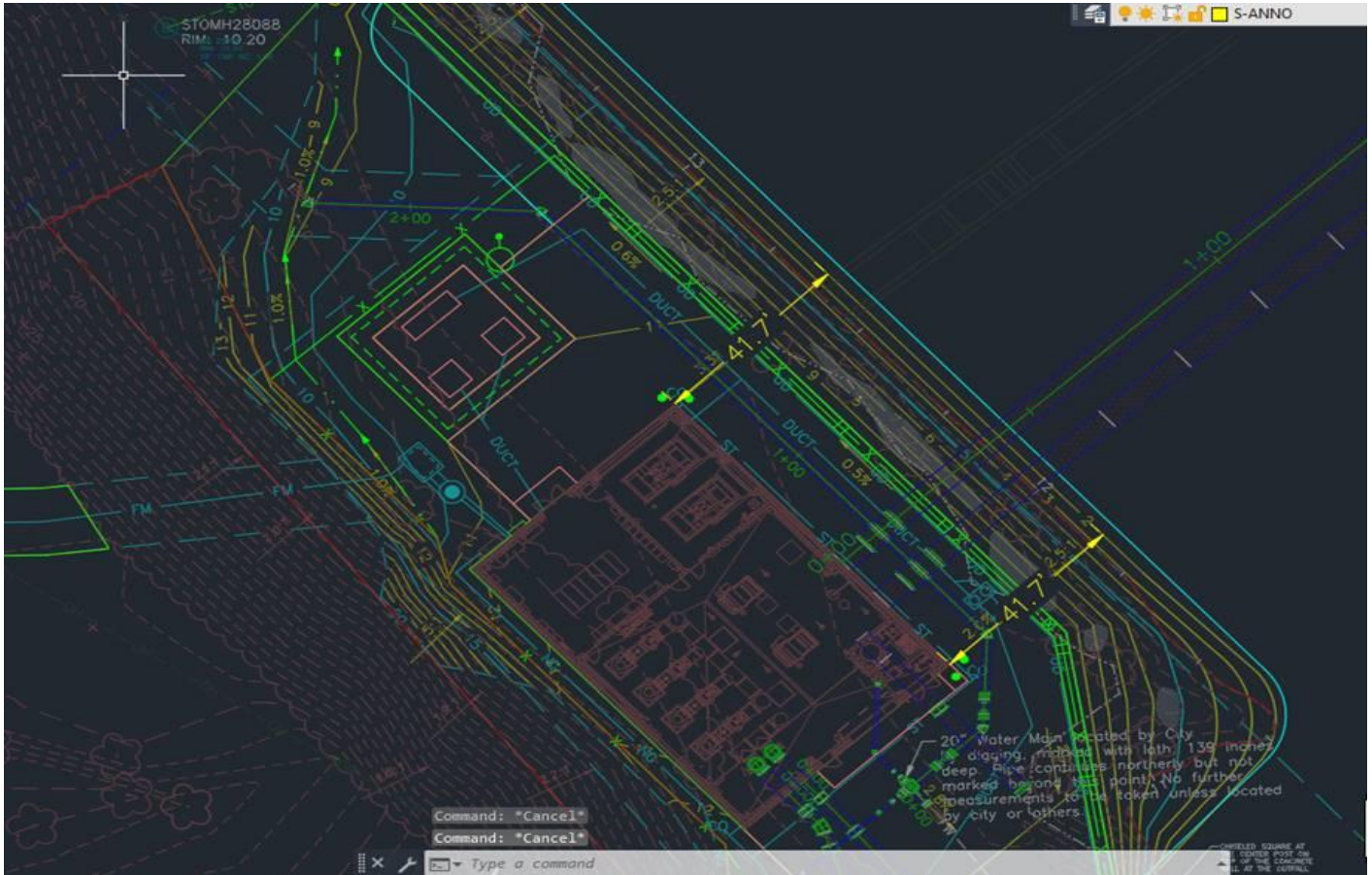
View from Lake Michigan

View 5

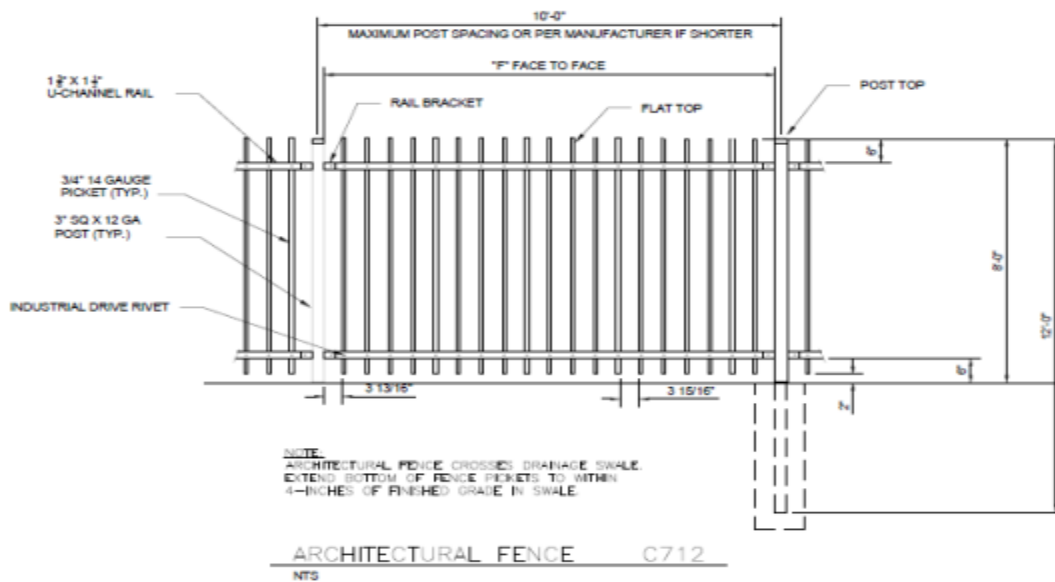


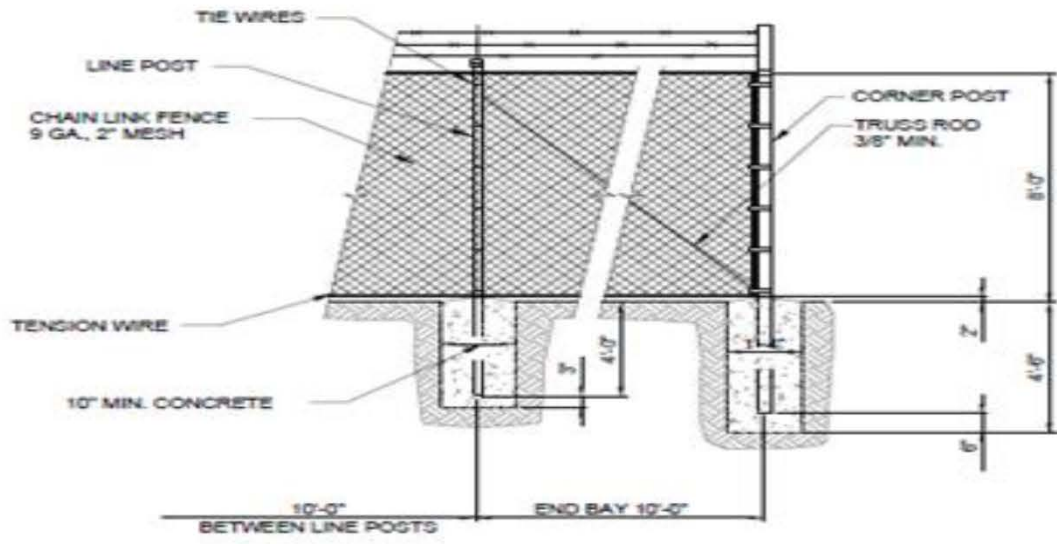
View from the North

What is the actual setback to the ordinary highwater mark so we can request the exact setback exception? Requested setback is 41.7'.



Is the variance for the fence with regards to material and height? What is the height of the proposed fence? The variance requested is for the use of chainlink fence along the lakeshore. Architectural fence is a painted metal picket type fence. Both fence types are 8' tall. I've included snapshots below for each of the proposed designs.

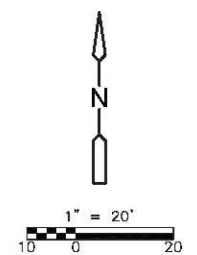
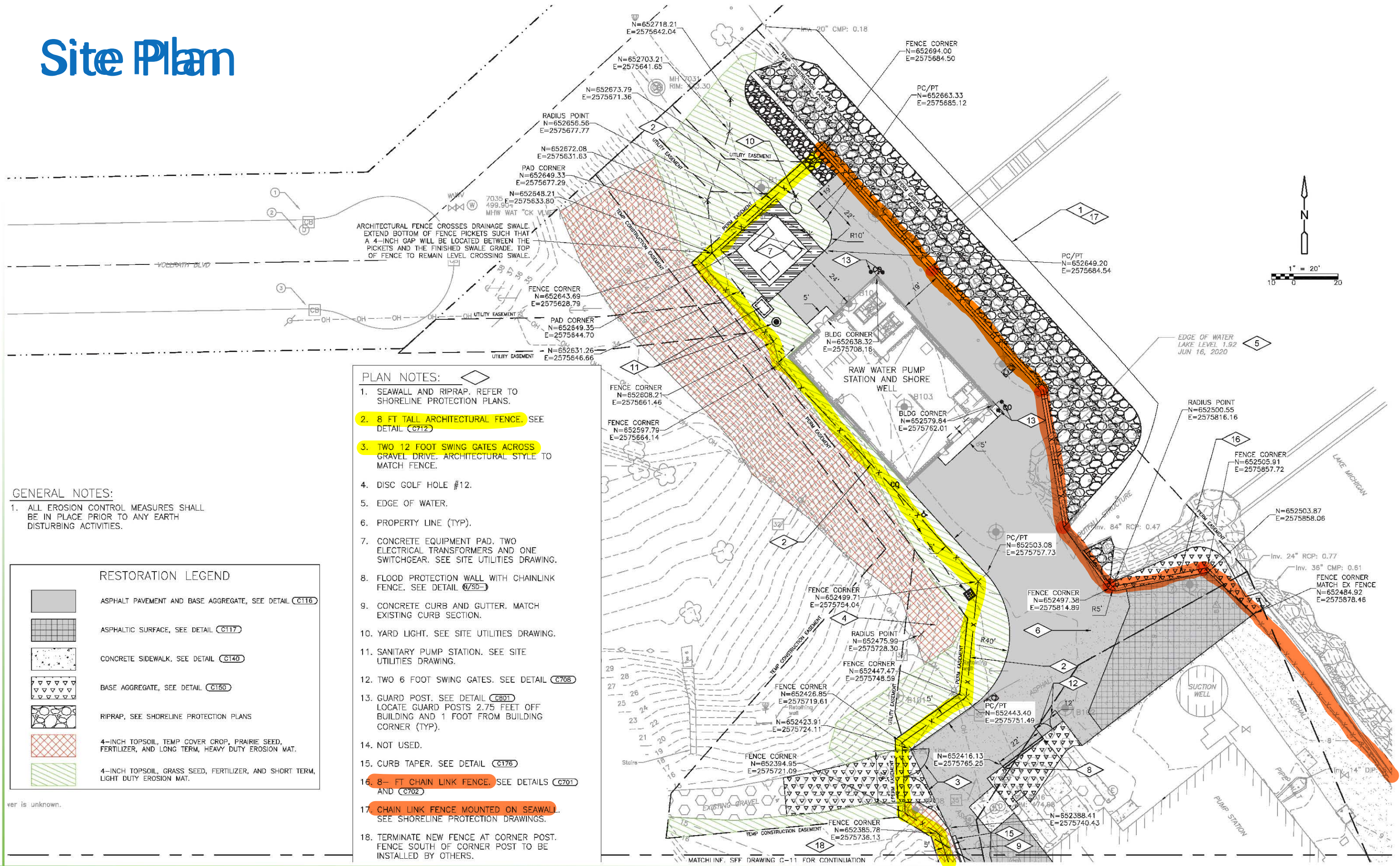




CHAIN LINK FENCE CORNER WITH BARBED WIRE C702
 NTS



Site Plan



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 - 8- FT CHAIN LINK FENCE.** SEE DETAILS (C701) AND (C702)
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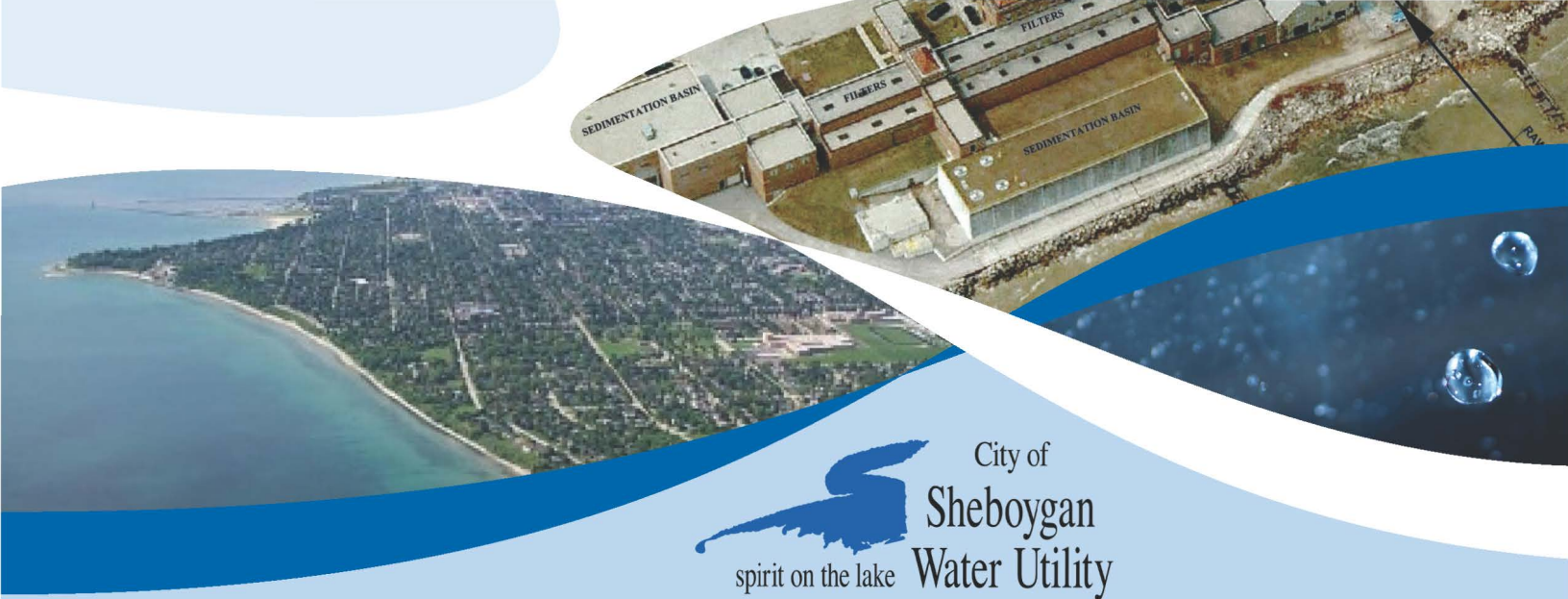












Replacing Critical Infrastructure: A New Intake Pipeline System, Shore well, and Low Lift Pumping Station for Sheboygan

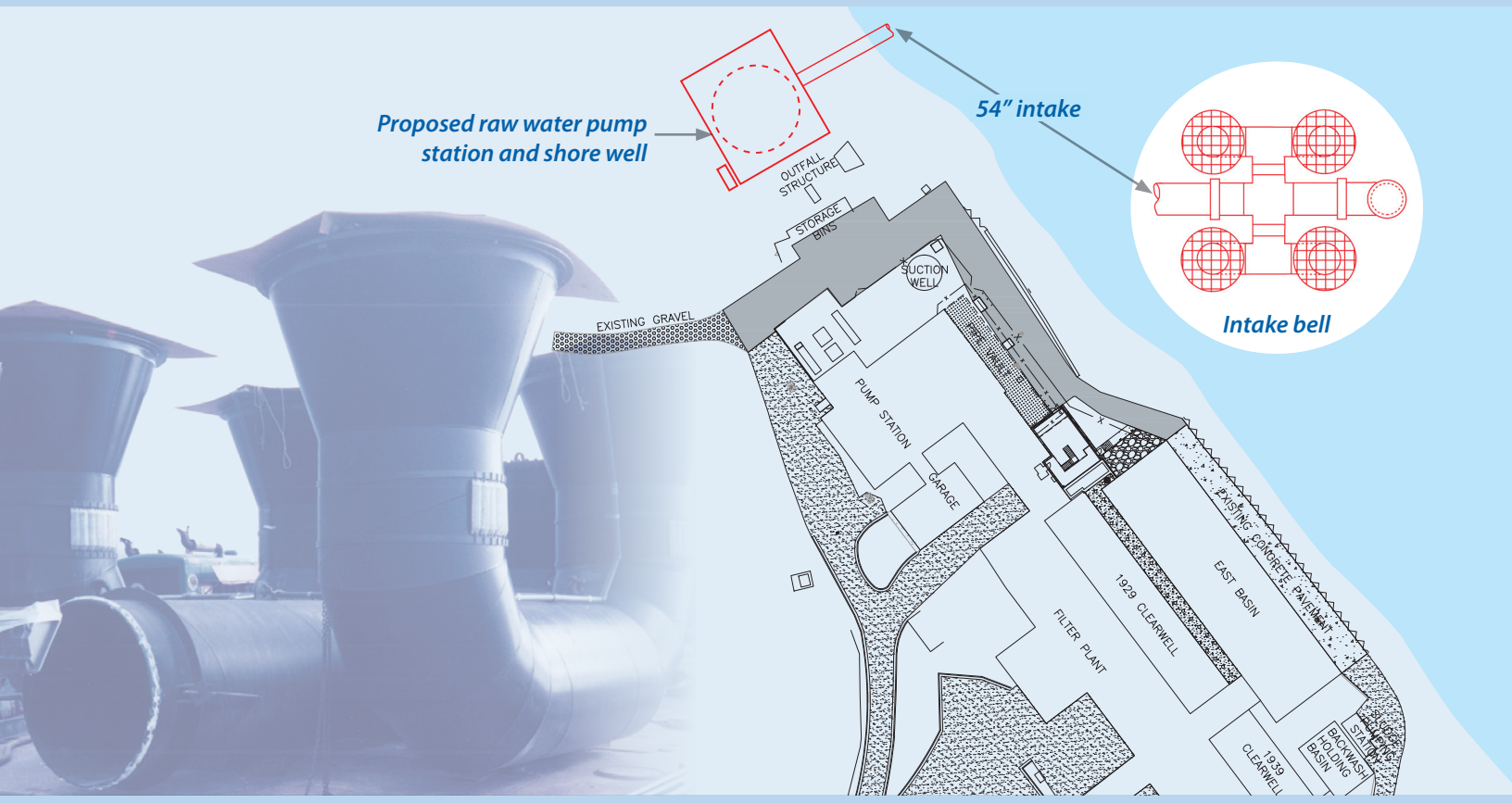
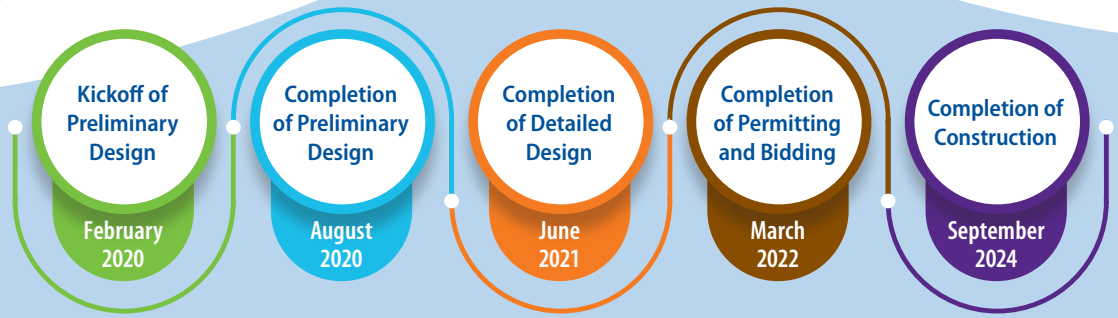
The Sheboygan Water Utility has been planning to replace critical raw water infrastructure for many years. This includes all of the systems needed to acquire water from Lake Michigan and then send it through the water treatment plant. These critical systems provide water to all citizens of Sheboygan, Sheboygan Falls, and Kohler. Preliminary engineering design work will begin in 2020. Construction work will begin as early as 2022. This will be the Utility's largest project since 1959. Funding is anticipated to come from Safe Drinking Water loans and/or revenue bonds. Ongoing water rate increases will be needed to pay for the project.

Why now?

- **Aging Infrastructure**
 - » Existing 30-inch intake and shorewell have passed typical 100 year service life of an intake system
- **Inadequate Intake Capacity**
 - » 36-inch intake alone cannot meet maximum day demand
 - » 30-inch intake alone cannot meet average day demand
- **Intake Vulnerability to Icing**
 - » Both intakes are vulnerable to winter icing and runoff
- **Low Lift Pump Station at Risk of Flooding**
 - » Motors are below historical high Lake Michigan Level
 - » WDNR identified this as a non-conforming deficiency



Project Schedule



Regulated by the WI Public Service Commission and WI Department of Natural Resources, the Sheboygan Water Utility is dedicated to providing the safest possible water to our customers at the most economical price. The Water Utility receives no tax monies but operates entirely on its water revenues.

Project Partners



US Army Corps of Engineers.



For More Information

For updated project info, please see Sheboyganwater.org/intakeproject/updates

Joe Trueblood, P.E.
 Superintendent of Sheboygan Water Utility
joetrueblood@sheboyganwater.org
 (920) 459-3800
 72 Park Ave., Sheboygan, WI 53081

sheboyganwater.org

Replacing Critical Infrastructure: A New Intake Pipeline System, Shore Well, and Low Lift Pumping Station for Sheboygan

MARCH 17, 2020 BY MAYOR'S OFFICE

Water treatment plants and water distribution systems contain many pieces of critical infrastructure necessary for modern life. Although designed with a 100-year lifetime, this infrastructure eventually needs replacement. In fact, water and sewer systems often have the most long-lived assets in a municipality.

Since 1888, water has been pumped from 72 Park Avenue to supply the needs of the community. Not long after 1888, a well was dug by hand to bedrock near the lakeshore, and a 20" intake pipeline was constructed about 2,000 feet out into Lake Michigan. This pipe terminated in the well below the ground level. Pumps then drew lake water out of the well.

Currently the Sheboygan Water Utility operates and maintains two intake pipelines including a 30" pipe installed in 1909 and a 36" pipe installed in 1959. Every drop of water for Sheboygan, Sheboygan Falls, and Kohler passes through one of these pipes and then into the shore well. Over the years, the Water Utility made upgrades to the shore well, but the core structure is more than 100 years old.

When raw (untreated) lake water reaches the shore well, pumps must then add enough energy to lift the water through the treatment process itself. These pumps make up the low lift pumping station. After the water completes its journey through the treatment process, a high lift pumping station then gives it enough energy to travel throughout the water distribution system in the city.

For many years, the Water Utility has been developing plans for the replacement of its intake pipeline system, shore well, and low lift pumping station. The 30" 1909 intake pipeline has surpassed its normal working lifetime, and is too small to provide an average water demand on its own. The 36" 1959 intake pipeline has about 40 years of working lifetime left, but, due to a short length of only 2,100 feet, it remains subject to icing and river runoff events.

Although inspections have shown it to be in good repair, the shore well has surpassed a normal working lifetime. If it collapsed or experienced some other failure, water supply would become difficult, if not impossible, to maintain.

These three components: intake pipeline, shore well, and low lift pumping station operate in conjunction with each other. If one link is broken, the remaining elements fall apart.

The Sheboygan Water Utility is poised to replace these pieces of critical infrastructure in the next few years. Working with consulting engineers, the Water Utility has evaluated the feasibility of various ways to complete the replacements. During construction of replacements, the current systems must remain fully operational. Space is extremely limited at the Water Utility, unless expansion into the Vollrath Park area occurs. And the project financing must be spread over time to avoid large rate increases.

The new raw water facility will incorporate an intake pipeline, shore well, and low lift pumping station in a building located on vacant land north of the water treatment plant. Although this will displace a disc golf hole, the course can be routed around the new structure. This location will allow construction of the new facility without impacting the existing water treatment plant. Due to its location detached from the plant, the new facility could also be used in the future to pump raw water to a water treatment plant located elsewhere.

Preliminary engineering design is underway. Many details remain unresolved. The Water Utility has initiated communications with its regulatory agencies — the Public Service Commission of Wisconsin (PSC) and the Wisconsin Department of Natural Resources (DNR) — to help ensure a good project outcome. The PSC will ensure that expenditures are reasonable and suitable. The DNR will ensure that water treatment meets all requirements in an efficient manner, allowing easy expansion in the future.

Although the project will be costly, critical water infrastructure is an investment in ongoing and future reliability in the supply of safe drinking water to the community. Depending on final configurations, the best current cost estimates range from \$30M to \$40M. The Sheboygan Water Utility will seek long term financing of either 30-year or 40-year water revenue loans in order to spread the cost over a portion of the new infrastructure's lifetime. The high cost stems from expensive underwater construction, thousands of feet of large piping, underwater crib structures to anchor the pipeline, deep shoreline excavation, electrical supply and instrumentation controls, a new building with mechanicals, and lakeshore construction to withstand severe weather and wave conditions.

The Sheboygan Water Utility remains committed to providing the community with a reliable, economical, and safe source of drinking water. The Water Utility operates entirely on water revenues, and this project will have no impact on property taxes or any fees other than water rates. Project updates, including cost information, will be routinely posted at sheboyganwater.org/intake project/updates.

RAW WATER IMPROVEMENTS (RWI) PROJECT: Replacing **critical infrastructure** to ensure a safe supply of water for the future

Joe R. Trueblood, P.E.
Superintendent
Sheboygan Water Utility



Water Utility plant and grounds circa 1935

What is the Sheboygan Water Utility (SWU)?

- ✓ A public utility providing drinking water to Sheboygan since 1909
- ✓ Regulated by WI PSC, WI DNR, and US EPA
- ✓ Operates entirely on water revenues, not on tax monies or City general fund
- ✓ Governed by the Sheboygan Board of Water Commissioners
- ✓ Customers include all City residents, City of Sheboygan Falls, and Village of Kohler

There are four steps involved in providing water.

- 1) Secure a source of raw or untreated water (Lake Michigan)
- 2) Pump the raw water through a water treatment process to make it safe (water treatment plant at 72 Park Ave)
- 3) Pump the treated water through a water distribution network to citizens (~207 miles of water mains, water towers, pressure booster stations)
- 4) Provide accurate metering, billing, and customer services



Water Utility plant and grounds 2020

SWU uses two raw water pipelines in Lake Michigan

- ✓ A 30" cast iron pipeline installed in 1909 at a length of 5,100 feet and depth of 46 feet
- ✓ A 36" concrete pipeline installed in 1959 at a length of 2,100 feet and depth of 25 feet
- ✓ The 30" can produce 11 million gallons per day (MGD)
- ✓ The 36" can produce 24 MGD
- ✓ Pipelines in Lake Michigan have a normal working lifetime of 100 years
- ✓ SWU produces an average of 12 MGD

The raw water pipelines deliver water to an underground structure known as a shore well.

- ✓ The shore well is a reservoir for pumps to deliver water to the water treatment plant
- ✓ The shore well dates to its original excavation in 1887
- ✓ Changes have been made over the years including structural evaluations
- ✓ Though serviceable, the shore well has exceeded its normal working lifetime.

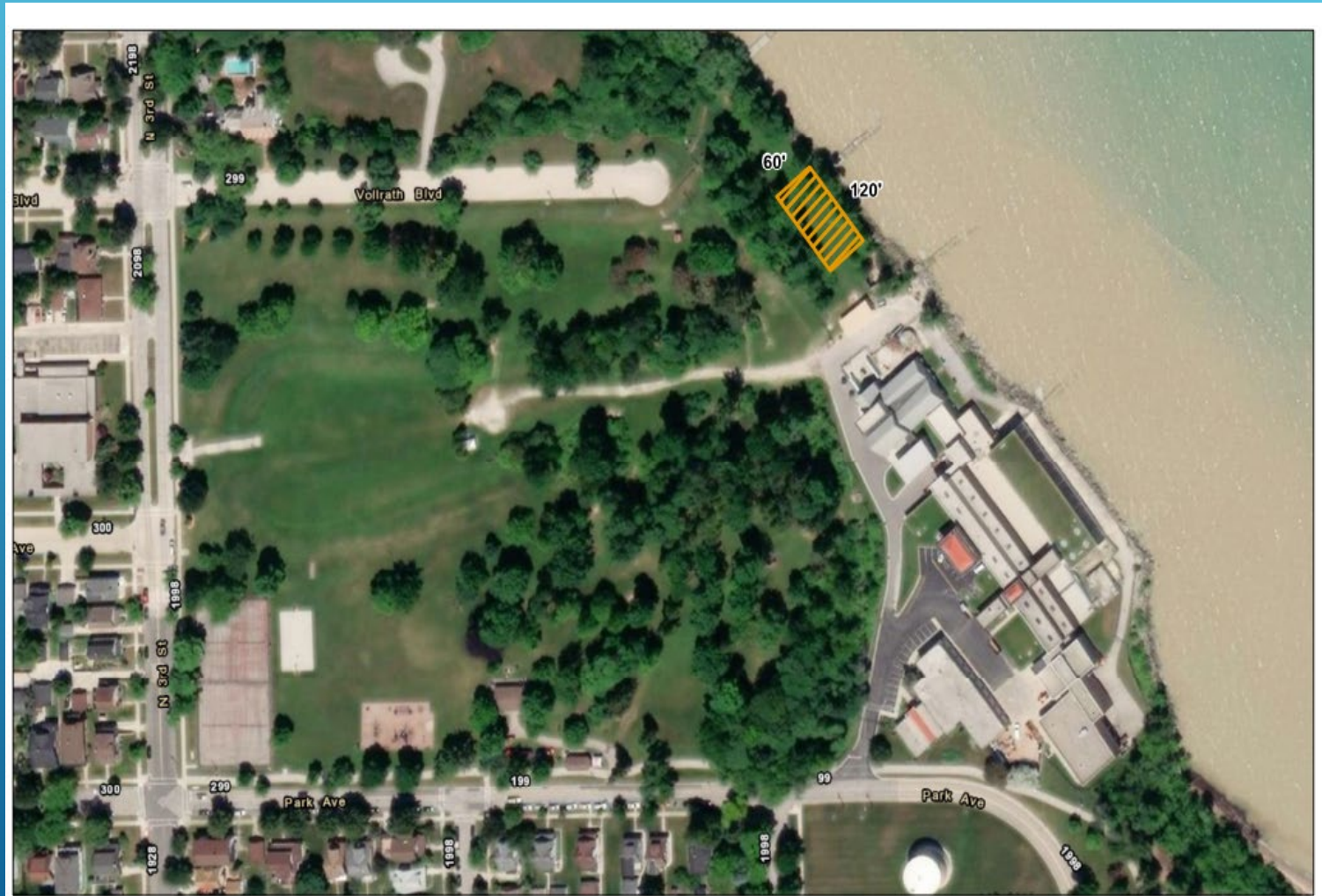
So what are the problems?

- ✓ The 30" intake and the shore well have exceeded normal working lifetime.
- ✓ If the 36" intake fails, the 30" cannot meet average daily demand.
- ✓ Both intake pipelines are subject to winter icing.
- ✓ The 36" intake is a substandard distance off-shore.
- ✓ WDNR has noted the low lift pumps are at or below Lake levels.
- ✓ There are no neighboring water utilities large enough for backup.

What should we do about these problems?

- ✓ In 2016 SWU completed a feasibility study focused on a new intake pipeline
- ✓ The study recommended installation of a new 54" intake pipeline
- ✓ The study also recommended construction of a new shore well
- ✓ The new shore well would include a new low lift pumping station
- ✓ These pieces of critical water infrastructure would be designed for 100 year lifetime

Anticipating the need for a future intake facility, SWU worked with the City to acquire an easement in 2004



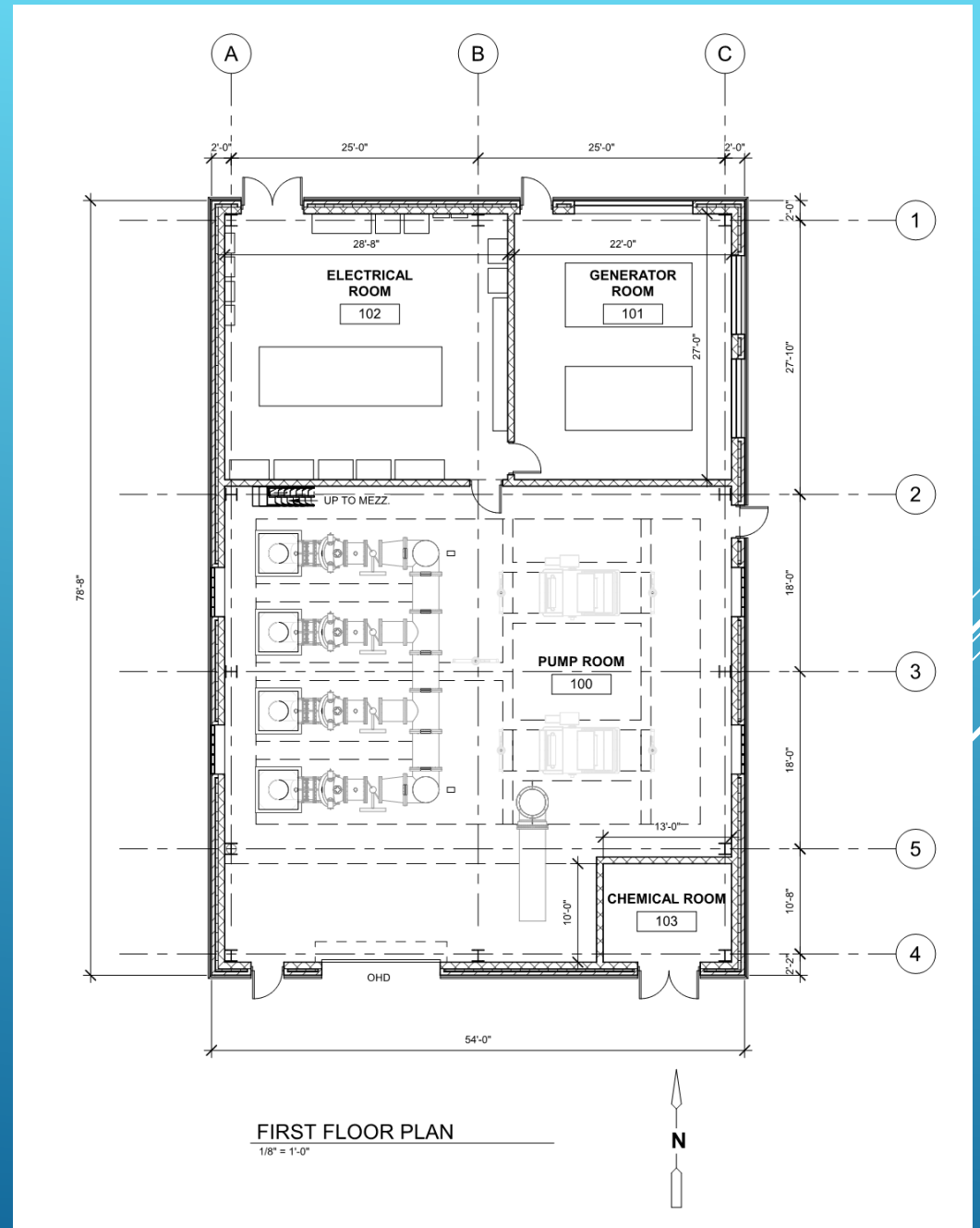
The new 54" intake pipeline would run out 6,000' with a possible emergency backup



The RWI building is a small (50'x80') masonry structure with architectural features inspired by the water treatment plant.



Within the building are the shore well, pumps, electrical equipment, and a chemical feed room.

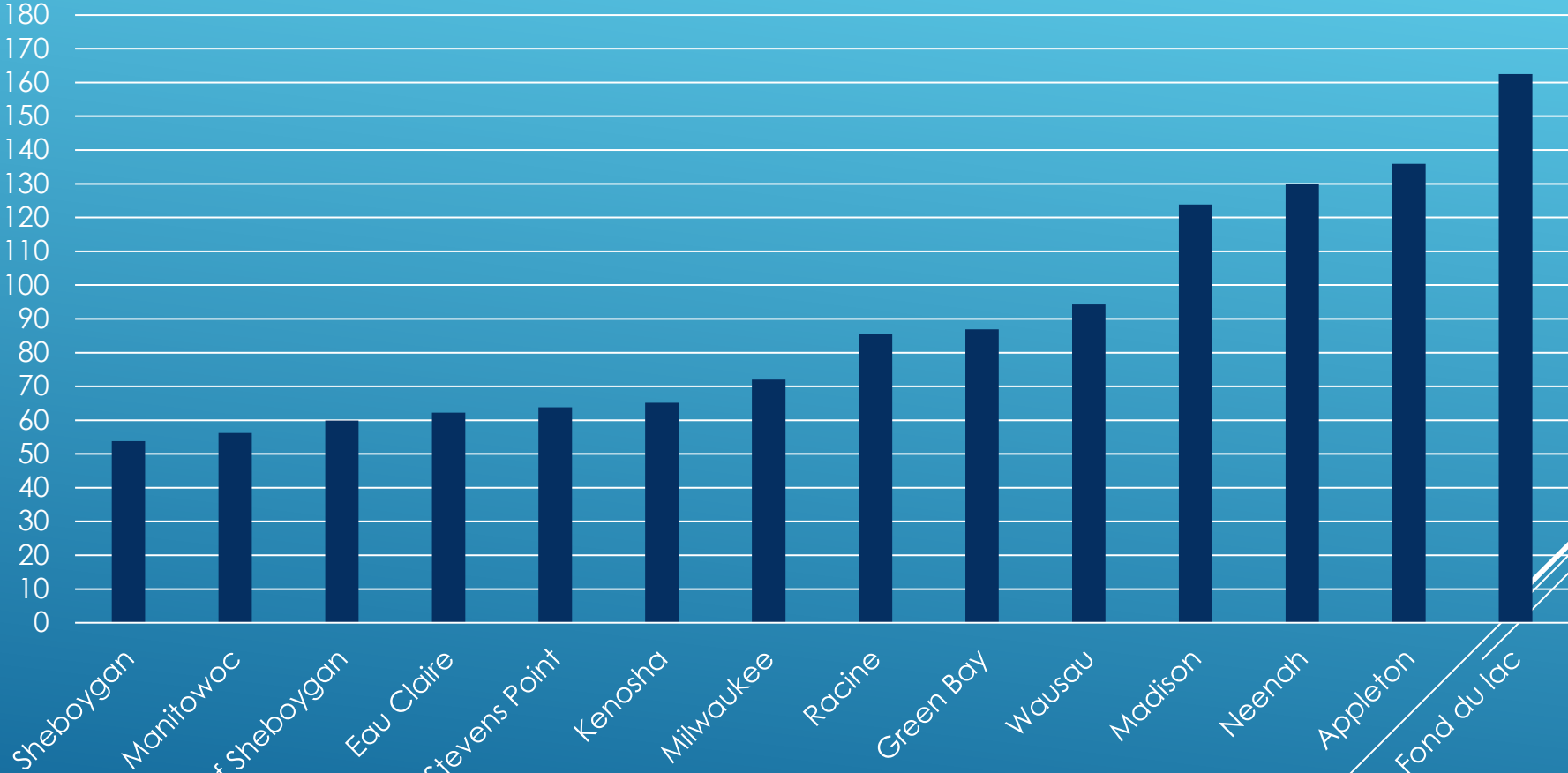


What will RWI cost: how do we pay for it?

- ✓ Current estimate of construction cost is \$35M for this 100 year lifetime **critical infrastructure**
- ✓ SWU has been working with WI Public Finance Professionals on funding plans.
- ✓ Options include 30 year WI safe drinking water loan, 25 or 30 or 40 year private market water revenue bonds, and possible FEMA BRIC grants.
- ✓ The funding plan would have no impact on property taxes or City budget: all SWU debt is paid out of water revenues.
- ✓ New annual debt service (\$1.6M - \$2.0M) will require ongoing rate cases over the coming decade. Would need about 22% revenue increase to cover annual debt service.
- ✓ Sheboygan Board of Water Commissioners is committed to spreading rate increases over time as much as possible

Current water rate comparison

Quarterly Water Bill (18,750 gallons)



■ Water Bill (\$)

How do we know it's a good investment?

- ✓ SWU worked with AECOM to complete a 50 year water demand study and the results were incorporated to right-size the design at 36 MGD
- ✓ WI PSC must provide construction authorization for such a large project and will minimize any stranded assets as part of their review process. They provide additional objective oversight on public utility expenditures.
- ✓ There is no other water provider in the County.
- ✓ SWU will buy-local whenever possible, helping keep dollars in the local economy.
- ✓ Delays will only increase the costs and increase the possibility of catastrophic water supply failure.

Where do we go from here?

- ✓ Final design is underway and scheduled for completion in June 2021
- ✓ During the spring 2021, SWU will submit to WI PSC for construction authorization
- ✓ Bidding would take place late in 2021
- ✓ With bid results, SWU would then seek Board and Council approval of final funding package
- ✓ Construction could begin as early as 2022 and will take two seasons