



Board of Public Works

Regular Meeting

335 South Broadway
De Pere, WI 54115
<https://www.deperewi.gov/>

Agenda

Monday, October 11, 2021	7:30 PM	Council Chambers and Virtual
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Pursuant to Wisconsin Statutes 19.84, Notice is hereby given to the public that a meeting of the **Board of Public Works** of the City of De Pere will be held on **October 11, 2021 at 7:30 PM** in the **COUNCIL CHAMBERS, 2ND FLOOR CITY HALL, 335 S. BROADWAY STREET. DE PERE.**

The public may attend the meeting either in person in the Council Chambers or electronically/telephonically. Electronic or telephonic access to the meeting is provided below:

Computer/smart phone accessing <https://www.gotomeet.me/DePere>

OR

You can also dial in using your phone.

United States (Toll Free): [1 866 899 4679](tel:18668994679)

United States: [+1 \(312\) 757-3117](tel:+13127573117)

Access Code: 154-883-285

This meeting may also be rebroadcast on Spectrum Cable Channel 4 and AT&T U-verse Channel 99 throughout the week and available on demand at <http://depercitywi.igmp2.com/>.

I. Call to Order

1. Roll Call

II. Public Comment Period

III. Items

1. Approval of the Board of Public Works September 13, 2021 Meeting Minutes
2. Consideration and Possible Action on Updating the Policy for the Installation of Gap Sidewalks along Vacant Parcels to Include Language for the Deferral of Gap Sidewalk Installation Orders
3. Consideration and possible action on Phragmites Management Plan*
4. Consideration and possible action on Municipal Service Center Expansion*
5. Consideration and possible action on 2021-2022 Snow & Ice Removal Rates
6. Consideration and possible action on City Engineer Parking & Traffic Recommendations*
7. Discuss City Engineer Recommendation for No-Action Parking & Traffic Discussion Items

IV. Future Agenda Items

V. Adjournment

***Items with an asterisk require City Council approval.**

Any person wishing to attend this meeting who, because of disability, requires special

accommodations should contact the Clerk-Treasurer's office at 339-4050 by Noon, Monday, October 11, 2021 so that arrangements can be made.

Agenda Sent To:

MAYOR

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City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Board of Public Works

FROM: Betty Sellenheim

SUBJECT: Approval of the Board of Public Works September 13, 2021 Meeting Minutes

ATTACHMENTS:

- 2021 0913 BOPW Draft Minutes (PDF)



Board of Public Works

Regular Meeting

335 South Broadway
De Pere, WI 54115
<https://www.deperewi.gov/>

Draft Minutes

Monday, September 13, 2021

7:30 PM

Council Chambers and Virtual

I. Call to Order

The meeting was called to order at 7:30 PM by Mayor James Boyd

Attendee Name	Title	Status	Arrived
James Boyd	Mayor	Present	
Dan Carpenter	Aldersperson	Present	
Jonathon Hansen	Aldersperson	Present	
Shana Defnet Ledvina	Aldersperson	Present	
Dean Raasch	Aldersperson	Present	

Others present:

Scott Thoresen, Public Works Director
Eric Rakers, City Engineer
Betty Sellenheim, Recording Secretary
Kristen Johnson, Assistant City Attorney
David Roy
Lisa Pulshis
Zak Krueger
Johanna Beal
Don Roffers
Matt Weber (Remote)
Mindy Sheikh (Remote)

II. Public Comment Period

None

III. Items

1. Approval of the August 9, 2021 Board of Public Works Meeting Minutes

Aldersperson Ledvina approved the August 9, 2021 Board of Public Works Meeting minutes, seconded by Aldersperson Raasch. Upon vote, the motion passed with a 5-0 vote.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Shana Defnet Ledvina, Aldersperson
SECONDER:	Dean Raasch, Aldersperson
AYES:	Boyd, Carpenter, Hansen, Defnet Ledvina, Raasch

2. Consideration and possible action on Elimination of Grant and Allard Street Signal Improvements

Aldersperson Raasch moved to approve the elimination of Grant and Allard Street Signal Improvements, seconded by Aldersperson Carpenter.

Aldersperson Hansen asked staff to update the Board and audience. Eric Rakers, City Engineer, provided an update as outlined in the agenda packet.

Mayor Boyd stated that if changes were made in the future, the funding from the school would not be available and expressed concerns about the traffic flow that will continue to be an issue for turning onto and off of Grant Street, primarily during peak times in the

morning and afternoon. Alderperson Carpenter expressed that Brown County be contacted for funding in the case of continued issue, since it is a Brown County Highway. Alderperson Raasch stated that in the future there may be other and better options for the traffic flow issues that Brown County is currently unwilling to consider.

Mayor Boyd moved to open the meeting for public comment at 7:37 PM, seconded by Alderperson Raasch. Upon vote, the motion passed unanimously.

David Roy of 835 Grant St expressed his appreciation to staff for following up with Brown County and working on the elimination of the project.

John Hannon of 813 Grant St asked if there would be any parking changes if the signals are not installed. Mayor Boyd stated the parking would stay as it is if the signals are not installed.

Mayor Boyd moved to return to regular session at 7:39 PM, seconded by Alderperson Raasch. Upon vote, the motion passed unanimously.

Alderperson Carpenter mentioned that Grant Street will be resurfaced in a few years but then not touched by the County until about 2040.

Mayor Boyd moved to open the meeting for public comment at 7:39 PM, seconded by Alderperson Ledvina.

Lisa Pulshis of 1014 Grant St expressed concerns with the offset intersection of Apollo and Suburban, vehicular traffic, and pedestrian traffic along with increased families with children residing in the area.

Mayor Boyd moved to return to regular session at 7:41 PM, seconded by Alderperson Raasch. Upon vote, the motion passed unanimously.

Scott Thoresen, Director of Public Works, reiterated that no work will occur at Apollo and if it does, changes will need to be made at Allard. Mayor Boyd asked if the intersection of Grant and Apollo had been looked at in the past by Parking and Traffic. Mr. Rakers stated it has been looked at multiple times and a few years ago, the crosswalk was relocated.

The motion passed with a 5-0 vote.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dean Raasch, Alderperson
SECONDER:	Dan Carpenter, Alderperson
AYES:	Boyd, Carpenter, Hansen, Defnet Ledvina, Raasch

3. Consideration and possible action on the request for deferral of the sidewalk installation at 635 Diversity Drive until June 30, 2023

Alderperson Carpenter moved to approve the deferral of the sidewalk installation at 635 Diversity Drive until June 30, 2023, seconded by Alderperson Ledvina.

Aldersperson Hansen stated he was unsure this location should be granted the same extension as it was a corner lot that would be heavily used by and impact more pedestrians than 2562 East Scarlet Oak Circle, which was previously granted an extension. Eric Rakers, City Engineer, explained that there needed to be a consistent policy in place for all locations.

Motion passed with a 5-0 vote.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Aldersperson
SECONDER:	Shana Defnet Ledvina, Aldersperson
AYES:	Boyd, Carpenter, Hansen, Defnet Ledvina, Raasch

4. Consideration and Possible Action on Amendment to Sections 82-1 & 82-2 Related to Garbage Collection at Residential Sources

Aldersperson Carpenter moved to approve moved to approve amendments to Sections 82-1 and 82-2 Related to Garbage Collection at Residential Sources, seconded by Aldersperson Hansen.

The motion passed with a 5-0 vote

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Aldersperson
SECONDER:	Jonathon Hansen, Aldersperson
AYES:	Boyd, Carpenter, Hansen, Defnet Ledvina, Raasch

5. Consideration and possible action on proposed changes to policy on placement of banners on city owned poles.

Aldersperson Hansen moved to approve the proposed changes to banner policy, seconded by Mayor Boyd.

Aldersperson Hansen asked about the banner sizes being allowed with the revised policy. Scott Thoresen, Public Works Director, stated the sizes were based on the poles but one of the main revisions was to allow St. Norbert College to keep banners up for two years without needing to renew annually with the City. Aldersperson Hansen asked if any other private entities with banners. Mr. Thoresen stated that St. Norbert was the primary entity utilizing the policy.

Aldersperson Carpenter asked if St. Norbert pays the Park Department for the installation of the signs, plus the fee. Mr. Thoresen stated he believed they did.

The motion passed with a 5-0 vote.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Jonathon Hansen, Aldersperson
SECONDER:	James Boyd, Mayor
AYES:	Boyd, Carpenter, Hansen, Defnet Ledvina, Raasch

6. Discuss Aldersperson Hansen's request regarding alternative disposal options for bulk item collection

Aldersperson Hansen outlined his request regarding alternative disposal options for bulk item collection. He further explained the ideas from the requesting constituent to promote alternatives on social media and/or hand out flyers to individual homes.

Alderson Carpenter expressed concerns with items being dropped off at resale locations that are garbage and the resale location is stuck with the cost of disposal. He added that he is not opposed to the idea but suggested staff would reach out to locations that might accept items and verify they are interested or accepting before posting their information. Mayor Boyd agreed with Alderson Carpenter's suggestions. Alderson Ledvina added that some locations limit the size of items they accept due to lack of storage space and mentioned that many items get scavenged from the curb. Scott Thoresen, Public Works Director, explained that the City does not allow picking from the curb, but is not highly enforced unless it becomes a nuisance. Mr. Thoresen also reiterated that you do not know what might be an invisible issue with an item (for example: bugs, structural, etc.). Mr. Thoresen stated that in many cases, residents utilize the curbside collection because they do not have the means or methods of hauling items to another location. Alderson Raasch mentioned a program that was discussed in the past for having a company go through the items brought to the Rubbish Drop-off Site and it was determined it would not be worth the time. Alderson Raasch added that likely the resident placing an item at the curb believes, understands, and has a reason to dispose of it rather than donating. Mayor Boyd suggested posting alternative options on future Facebook posts for the curbside bulk item collections. Alderson Raasch suggested that all resale stores be listed with a disclaimer for residents to call to ensure their items would be accepted and have it listed on the City website instead of a special campaign. Mr. Thoresen also suggested Facebook Marketplace be listed as an alternative as well.

RESULT:	DISCUSSED
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IV. Future Agenda Items

None

V. Adjournment

Mayor Boyd moved to adjourn the meeting at 8:00 PM, seconded by Alderson Raasch. The motion passed with a 5-0 vote.

Respectfully submitted,
Betty Sellenheim



City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Consideration and Possible Action on Updating the Policy for the Installation of Gap Sidewalks along Vacant Parcels to Include Language for the Deferral of Gap Sidewalk Installation Orders

ATTACHMENTS:

- 2021 1011 CI_BOPW_Gap_Sidewalk (PDF)

CITY OF DE PERE MEMO



To: Honorable Mayor Boyd
Members of the Board of Public Works
From: Eric P. Rakers, P.E., City Engineer
Date: October 11, 2021

RE: Consideration and Possible Action on Updating the Policy for the Installation of Gap Sidewalks along Vacant Parcels to Include Language for the Deferral of Gap Sidewalk Installation Orders

At the June Board of Public Works Meeting, the Board approved the project approach and timeline for gap sidewalk installation. Since then, two parcels have requested for extensions of the sidewalk installation order to coincide with upcoming home construction. In both of these instances, a year extension was granted. The purpose of this item is to set a policy for deferral of gap sidewalk installation orders to provide consistency moving forward.

Background and Discussion

Annually, Engineering Staff reviews vacant parcels for the installation of sidewalks. On September 12, 2016, the Board of Public Works approved the following policy regarding sidewalk installation:

“Concrete sidewalks shall be constructed in the right-of-way as set forth herein where the following conditions exist:

- 1. Along the streets adjacent to a lot on which a building is constructed;*
- 2. At least 80% of the lots are developed or 80% of the frontage is on lots that are developed, per side of the street; or*
- 3. On all streets in subdivisions after it has been ten (10) or more years since the acceptance of the first building permit for the subdivision phase.”*

Based on this guidance, 14 parcels were identified to have sidewalks requiring installation at the time of consideration. Two parcels, 635 Diversity Drive and 2562 E. Scarlet Oak Circle, were granted an extension until June 30, 2023 to complete sidewalk installation to coincide with future home construction.

On July 1, 2023 staff will consider one of the following for each of these parcels:

1. If the sidewalk is already installed by the property owner, the sidewalk installation order will be cancelled.
2. If home construction has started, the sidewalk installation order will be cancelled. Sidewalk installation is already a requirement of final occupancy for that home.

3. If home construction has not started, the sidewalk will be installed by the City and the cost of work will be charged back to the property owners.

Recommendation

Staff recommends that the Board add the following language to the gap sidewalk installation policy for the deferral of gap sidewalk installation orders:

“To accommodate new home construction, the Board of Public Works may defer sidewalk gap orders up to one year after the initial order construction date. After which, sidewalk shall be installed by the Department of Public Works if there is no home construction taking place.”



City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Consideration and possible action on Phragmites Management Plan*

ATTACHMENTS:

- 2021 1011 Phragmites Memo (PDF)
- Chris Acy-FWWA Email (PDF)
- phragmite_control_management (PDF)

CITY OF DE PERE MEMO



To: Honorable Mayor Boyd
Members of the Board of Public Works

From: Eric P. Rakers, P.E., City Engineer

Date: October 11, 2021

RE: **Consider Phragmites Management Plan***

Over the past several years staff and elected officials have received complaints regarding invasive Phragmites near several ponds and in some swales, in particular the Trailside Pond on the east side. The purpose for this memo is to bring a proposed plan for the Board to consider.

Phragmites is a long-lived (essentially immortal) very large perennial grass that spreads aggressively by rhizome, or underground stems which can expand the clone as much as 50 feet in a single year. Each rhizome stores energy that allows the plant to regrow even following mowing or herbicide application to the standing plant. Dense stands of Phragmites negatively affect the biodiversity and ecological functions of invaded habitats, impair the recreational use of wetlands and shorelines, decrease property values, and increase fire risk.

According to Wisconsin State Statute an invasive plant species are any species of plant that is not native to our area and causes or is likely to cause harm to the economy, environment, and/or human health.

Per Chris Acey of Fox-Wolf Watershed Alliance, on management of phragmites *“the biggest challenge is the extensive underground rhizome system of the plant. Each rhizome stores energy that allows the plant to regrow even following mowing or herbicide being applied to the standing plant. From trainings and conversations I have heard that the best management strategy is to combine several management techniques over a long period of time (6-7 years). A lot of success has been reported from cutting the phragmites plants and then applying herbicide. This allows the herbicide to have a maximum impact on the rhizome which significantly reduces the ability of the plant to re-sprout from that rhizome. Several projects trying to reduce phragmites populations found that management for less than 6-7 years reduced the population for a few years but the plants would come back to pre-management levels”*.

The requirement to continue management is reinforced by publications including *“A Guide to the Control and Management of Invasive Phragmites”* (see attached). Under Part 2, *Control Methods*, the guide states *“Control programs can result in significant reduction of phragmites, but this requires commitment to an integrated approach and a long-term management strategy. Few techniques are fully effective when used alone and reinvasion by Phragmites is likely when the management strategy is not maintained.”* This publication goes on to state

“The use of herbicide treatments (initial and spot treatment) is recommended as the primary control method and the first step toward effective control.”

Treatment Options

There are several treatment options below as provided by the Great Lakes Phragmites Collaborative website (<https://www.greatlakesphragmites.net/management/techniques/>).

Herbicides

In many cases, herbicide is the most effective method of non-native Phragmites management when it is used as part of a comprehensive integrated management approach.

There are at least two herbicides (glyphosate and imazapyr) that are effective at managing non-native Phragmites stands and are commercially available under a variety of names in the United States and Canada. These chemicals are not species specific, so care must be taken to avoid harming native plants. Imazapyr remains active in the soil longer than glyphosate, and therefore, can have greater non-target impacts if used in areas with greater plant diversity. Additionally, different chemical formulations are available for application over land and over water. It is important to use the formulation approved for aquatic use, because overland formulas can harm amphibians, fish, and invertebrates.

Prescribed Burn

Prescribed fire can be an effective tool for removing dead standing biomass of invasive Phragmites. This technique can be used as part of a comprehensive management program when proper permits and safety protocols are in place.

Fire is not effective as a stand-alone management technique because it does not affect the root system and may stimulate growth and increase density. Removing the biomass can allow for more effective future treatments and can stimulate native plant regeneration. Ideally, burning should be conducted during the dormant season following herbicide application.

Mechanical control

Like prescribed fire, removal of Phragmites biomass by mowing or cutting is not effective as a stand-alone method because it does not affect the root system and may stimulate growth and increase density. However, at sites where burning is not an option it is a useful way to reduce the biomass of dead standing stalks after herbicide management.

In areas where fire is not an option, mechanical removal can be a good choice. The method for removal depends on site characteristics, including size of area to

be covered and if soils can support large machinery. If mowing activities will be conducted without the use of herbicide, mowing or cutting should be completed before the plant starts producing seeds, to lessen risks of introduction into adjacent habitats that are not yet invaded. Long-term research on the effects of repeated mowing would be valuable.

Manual Removal

For small stands of Phragmites, manual removal may be possible if there are many hands to help with the work. It can be a viable option for small areas where managing with herbicide is not possible.

Grazing

Research suggests that long-term, low intensity grazing by goats and cattle can reduce non-native Phragmites density and increase species diversity in wetlands.

However, grazing does not directly impact the root systems and grazing at the wrong time of year can increase Phragmites vigor and stem density. Other issues include possible changes in nutrient cycling, negative impact on remaining native plants, and physical disturbance of fragile systems. There is limited support for this method in the United States, but it is an active area of research.

Smothering/Tarping with Black Plastic

Covering cut Phragmites with thick black plastic during the growing season can be effective in limiting its growth at small sites.

High heat and lack of light will eventually kill the plants beneath the plastic. This method is most effective in small areas exposed to direct sunlight. Phragmites is capable of sending runners or rhizomes out from beneath the plastic to establish new plants outside of the treatment area. The areas covered with plastic also are not suitable for native plant growth and thus this method can reduce habitat for various wetland species. This method may be of use in delicate ecosystems with small stands of Phragmites where the use of herbicides could be difficult. This method is not considered viable for treating large stands.

Flooding

Flooding cut or burned stands of Phragmites can be used as part of a multi-method approach in wetlands where managers have control of water levels.

Many of the techniques used above are not viable for the City such as a prescribed burn, grazing, and flooding. Others may be marginally viable such as manual removal for new growth or smothering/tarping with black plastic. However, both would be very limited in use at this time.

Based on a review of information, staff feels that a combined approach of herbicide with mowing may be more viable. “A Guide to the Control and Management of Invasive *Phragmites*” recommends the following approach

Post-herbicide Mowing

*Mechanical treatments are used most effectively following an herbicide treatment to remove dead stems and promote native plant growth. This also aids in the identification of new *Phragmites* growth for subsequent herbicide spot treatment and opens up the canopy to promote the growth of native species. When burning is not feasible, mechanical treatment is recommended.*

Post-herbicide mowing should not occur until at least 2 weeks after application to allow plant absorption of the herbicide. To remove dead stems on dry sites after an herbicide treatment, mechanically cut the treated plants once within a period from fall until March 1.

Pre-herbicide Mowing

*In some cases, where *Phragmites* stands are very dense and the plants are very tall, a pre-herbicide mow may improve the likelihood of success when done properly.*

*In order to minimize impacts to nesting birds and wildlife as well as allow sufficient time for new *Phragmites* stems to leaf out and develop the seed head, it's best to cut dead *Phragmites* stems in winter prior to herbicide treatment (before March 1). If winter mowing is not possible, it may still be beneficial to conduct a pre-herbicide mow after July 15; however, it is critical that mowing be conducted a minimum of 4 weeks prior to herbicide application in order to allow sufficient leaf and seed head growth.*

Recommendation

Staff recommends implementing a yearly program to address *Phragmites* around storm water ponds and drainage swales by allocating \$20,000 annually starting in 2023. The goal will be to minimize the continued spread and obtain control near ponds and swales where the flow of storm water is being impeded. Staff will obtain request for proposals for spraying with funding from the storm water utility. Staff will work with the select firm to determine if mowing should be completed in conjunction with herbicide application. If mowing is recommended, staff will complete the mowing. Funds are not included in the 2022 budget; however if funds become available staff will obtain proposals for 2022 and bring to the Board for approval.

Betty Sellenheim

From: Chris Acy <Chris@fwwa.org>
Sent: Friday, April 03, 2020 3:47 PM
To: Eric Rakers
Cc: Jessica Schultz
Subject: Phragmites Information
Attachments: wrd-ais-guide-phragmites_622427_7.pdf; stdprod-089643.pdf

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hey Eric,

Jessica Schultz let me know that you are looking for management techniques to address Phragmites populations around De Pere. While I have not been directly involved with Phragmites removal projects, I have gathered a working knowledge from trainings and speaking with professionals with experience treating Phragmites. From these trainings and conversations, I have come across multiple resources for the best management techniques. By far, the best resource is the Great Lakes Phragmites Collaborative. This Collaborative is a network of agencies, organizations and citizens who work together to provide a central resource for information on Phragmites biology, management, and research. Researchers who test different treatments are able to share their findings directly with land managers who can put them in practice. Managers are then able to report their own success stories and insight from their own projects. What results is a strong resource of what management technique works best in different situations.

These two links from the Great Lakes Phragmites should be very useful for you.

Here is a link to several best management practices guides for Phragmites.

<https://www.greatlakesphragmites.net/resources/factsheets-guidelines/>

Here is a link to the management techniques section of the Great Lakes Phragmites Collaborative is below for you to peruse each of the different options.

<https://www.greatlakesphragmites.net/management/techniques/>

I am also attaching two of the most complete and insightful guides for Best Management Practices regarding treatment of Phragmites to this email.

To sum up Phragmites treatment, the biggest challenge is the extensive underground rhizome system of the plant. Each rhizome stores energy that allows the plant to regrow even following mowing or herbicide being applied to the standing plant. From trainings and conversations, I have heard that the best management strategy is to combine several management techniques over a long period of time (6-7 years). A lot of success has been reported from cutting the Phragmites plants and then applying herbicide. This allows the herbicide to have a maximum impact on the rhizome which significantly reduces the ability of the plant to re-sprout from that rhizome. Several projects trying to reduce Phragmites populations found that management for less than 6-7 years reduced the population for a few years but the plants would come back to pre-management levels. So active management seems to be needed for (6-7 years) for long term success. The attached Best Management Practices guides will provide more robust information and specifics into treatment.

As for what has been done by the DNR for Phragmites in our area, the DNR had received a grant to treat P sites in the Lake Michigan Basin including the De Pere area. The DNR hired contractors to spray herbicides on Phragmites patches. However, this grant ended at the end of 2019 and is not likely to be replaced.

I hope that the information I provided above and the resources are useful and what you needed! Please don't hesitate to let me know if I can help in any other way!

All the best,
Chris

Christopher Acy
Aquatic Invasive Species Coordinator
Winnebago Waterways Program
Fond du Lac, Calumet, Winnebago Counties
Fox-Wolf Watershed Alliance
PO Box 1861, Appleton, WI 54912
920.460.3674

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A Guide to the
Control and Management
of
**INVASIVE
PHRAGMITES**

A Guide to the
Control and Management
of
INVASIVE
PHRAGMITES





Partial funding for this program is supported by a Cooperative Agreement from the U.S. Department of the Interior, Fish and Wildlife Service. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.



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Introduction

AN AGGRESSIVE, NONNATIVE VARIETY OF PHRAGMITES (*Phragmites australis*), ALSO KNOWN AS COMMON REED, IS THREATENING THE ECOLOGICAL HEALTH OF MICHIGAN WETLANDS AND COASTAL SHORELINES.

This invasive variety of phragmites is becoming widespread throughout the Great Lakes and is displacing the native variety of the same species, as well as many other native plants. Near-mono-typic stands of this phragmites have replaced high-quality, complex communities of native plants over thousands of acres of Michigan wetlands and coastal areas. The rapid expansion of this variety of phragmites has resulted in adverse ecological, economic and social impacts on the natural resources and people of the Great Lakes.

The goal of this guide is to provide information about effective methods to control and manage phragmites. This guide presents a compilation of techniques, based on four years of research and more than 10 years of land man-

agers' on-the-ground experience, to control the nonnative variety of phragmites, hereafter referred to simply as phragmites. Control of phragmites is one step toward a greater goal of restoring native wetland plant communities and protecting fish and wildlife habitat. The easiest way to control phragmites is to begin a control program as soon as it is observed on your property, before the plants become well established. In many areas, especially those with established phragmites, complete eradication may not be achievable. However, through periodic management, it is possible to maintain phragmites infestations at levels that allow for regeneration of native wetland plant communities and protection of fish and wildlife habitat.

Because this guide discusses tools that are not readily applied by the average landowner, it is intended primarily for land or resource managers from agencies, organizations, and businesses and extension agents or others in a similar position.

left: Dense stand of phragmites that has displaced native vegetation. B. Avers



The Problem

Once phragmites invades, it causes adverse ecological, economic and social impacts including:

- * *Threats to coastal and interior wetlands, which are Michigan's most biologically diverse and productive ecosystems.*
- * *Domination of native vegetation, displacing desirable native plant species such as sedges, rushes and cattails, and reduction of plant diversity.*
- * *Reduction of wildlife habitat diversity resulting in loss of food and shelter.*
- * *Alteration of water regime, causing "drying" of marsh soils through increased evaporation and trapping of sediments.*
- * *Reduction of property values due to use impairment.*
- * *Restriction of shoreline views due to tall, dense stands.*
- * *Reduction of access for swimming, fishing and hunting.*
- * *Creation of potentially serious fire hazard to structures due to dry biomass during the dormant season.*

Understanding Phragmites

TO BETTER CONTROL AND MANAGE PHRAGMITES IT IS HELPFUL TO UNDERSTAND THE PHYSICAL CHARACTERISTICS OF THE PLANT, AS WELL AS HOW AND WHEN IT REPRODUCES AND SPREADS.

In Michigan, phragmites is found growing in coastal and interior marshes, bogs, fens, swamps, lake margins, road-side ditches and other low wet areas. Typically it prefers the wetland-upland interface, though it can be found in dry uplands.

Phragmites continues to expand within Michigan, in part because it reproduces through wind dispersal of seeds and vigorous vegetative reproduction through rhizomes. Rhizomes broken by natural actions, such as waves, or man-made actions, such as dredging or disking, readily reroot in new locations. Rapid expansion also is facilitated by other disturbances that give phragmites a competitive edge, such as discharge of nutrients, wetland drainage, fire and road salt.

on page 2: Tall, dense stand of phragmites restricting views and access to water, and creating potential fire danger. J. Schafer

Illustration of the nonnative phragmites plant

[USDA NRCS PLANTS DATABASE]

SEED HEAD PLUMES

*purple-brown-silver;
6-20 inches long and up to 8 inches broad*

FLAT, STIFF LEAVES

*0.5-2.0 inches wide near the base,
tapering to a point at the end*

RHIZOME

*horizontal, underground stem;
sends out roots and shoots from its nodes*



*Nonnative (background, left; dark
leaves) and native phragmites (front,
right; light green leaves) at Montezuma
National Wildlife Refuge, NY.
B. Blossy, Cornell University*



Native Phragmites

typically has the following distinguishing traits:

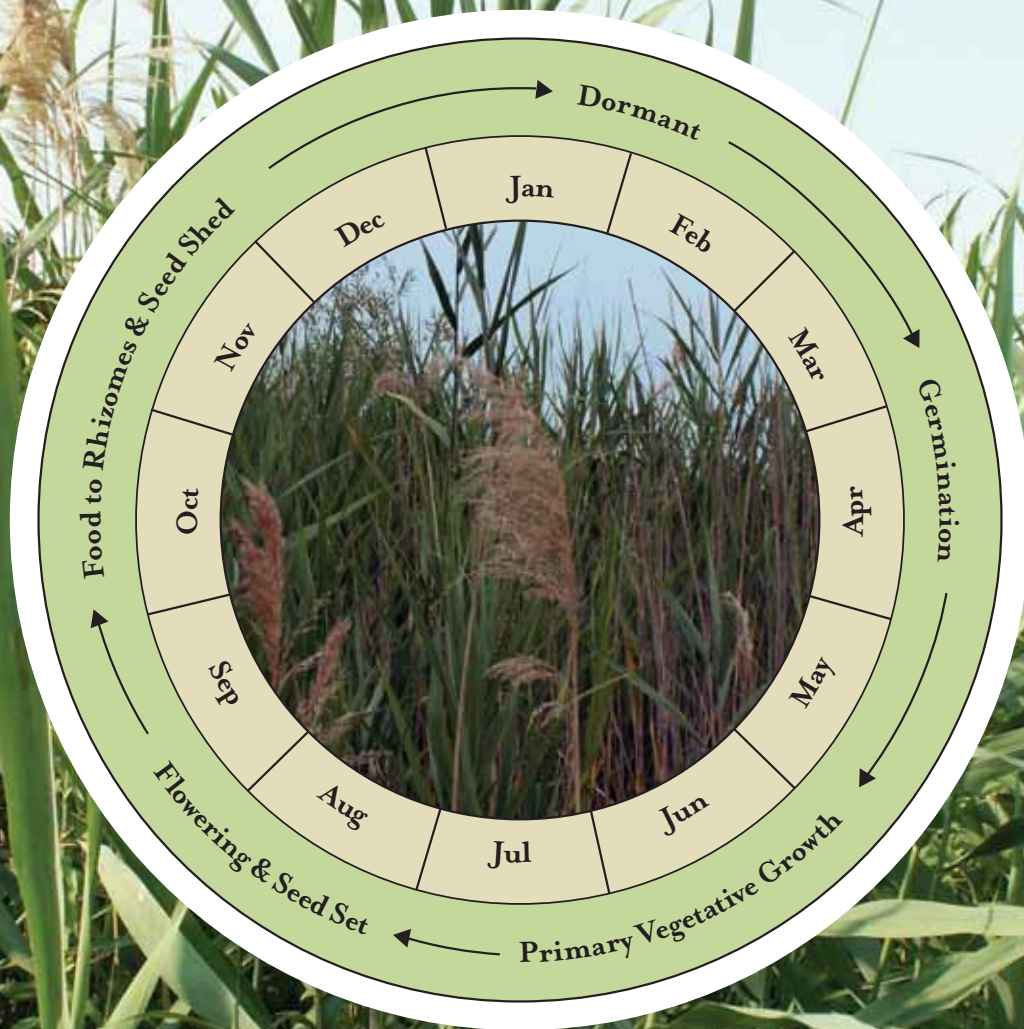
- * *Stems are reddish in the spring and summer and are smooth, shiny and flexible, while nonnative phragmites stems are tan and rough, dull and rigid.*
- * *Leaves of native phragmites are lighter yellow-green, as opposed to dark blue-green.*
- * *Rhizomes rarely exceed 15 millimeters in diameter and are yellow, as opposed to white to light yellow.*
- * *Co-occurs with other plants, while nonnative phragmites typically grows as a monoculture.*

Plant Description

PHRAGMITES IS A PERENNIAL, WARM SEASON GRASS THAT CAN GROW IN DENSE STANDS AND IS LONG LIVING.

Plants can reach 15 feet in height, yet more than 80 percent of the yearly biomass is contained below ground in a dense mass of roots and rhizomes. Stalks support flat, stiff leaves that are 0.5–2.0 inches wide near the base, tapering to a point at the end. Phragmites has gray-green foliage during the growing season, with distinctive purple-brown-silver seed head plumes appearing by late July. These plumes form at the end of stalks, are 6–20 inches long and up to 8 inches broad, and have many branches. Phragmites turns tan in the fall and most leaves drop off, leaving only the stalk and plume-topped shoot throughout winter.

Before attempting to control phragmites it is important to be able to identify the native phragmites and other native plants that grow under similar conditions in Michigan's coastal and interior wetlands. Field guides and other resources can be used to identify other wetland plants, and a website through Cornell University (<http://www.invasiveplants.net/phragmites/phrag/morph.htm>) can be used to identify native and nonnative phragmites.



Life Cycle

PHRAGMITES REPRODUCES THROUGH RHIZOMES, HORIZONTAL STEMS GROWING UNDER THE GROUND.

Rhizomes generate roots and stalks at regularly spaced nodes. An individual plant can multiply into a large stand through its rhizomes. Rhizomes may exceed 60 feet in length, grow more than 6 feet per year and readily grow into new plants when fragmented.

In addition to facilitating reproduction, phragmites rhizomes can penetrate the soil to a depth of more than 6 feet. This allows the plant to reach low-lying groundwater and tolerate a variety of conditions, including dry upland sites and wetlands with water depths exceeding 2 feet.

Mature plants produce as many as 2,000 seeds annually. Germination occurs in the spring, generally on exposed moist soils. Although seed viability is considered low and germination is a slower process than spreading by rhizome fragments, new stands of phragmites will develop from seed. Water depths greater than 2 inches typically prevent germination of seeds.

Effective control of phragmites hinges upon attacking the right portion of the plant at the proper times within the life cycle to slow or stop current and future growth.

left:
Approximate timing of the life cycle stages
of phragmites throughout the year.
Photos: D. Avers.



Control Methods

This section will provide an overview of four broad control methods and recommendations based on field experience. Prior to implementation of any control methods, safety factors and permit requirements must be taken into consideration. Many control actions require permits from local, state and/or federal agencies.

CONTROL PROGRAMS CAN RESULT IN SIGNIFICANT REDUCTION OF PHRAGMITES, BUT THIS REQUIRES COMMITMENT TO AN INTEGRATED APPROACH AND A LONG-TERM MANAGEMENT STRATEGY.

Few techniques are fully effective when used alone, and reinvasion by phragmites is likely when the management strategy is not maintained. The methods to be used for a particular site will depend upon existing conditions and management goals. Effective control of phragmites, particularly larger well-established stands, is likely to require multiple treatments using a combination of methods.

The use of herbicide treatment(s) (initial and spot treatments) is recommended as the primary control method and the first step toward effective control. After the initial herbicide treatment, one or more follow-up methods at each site will be required, such as: prescribed fire, mechanical treatment, or water level management. These follow-up methods will not only help provide multiple stresses on the plants, but also will prepare the site for subsequent years' herbicide treatments. Creating stresses through a regime of multiple treatments on the plants is the most effective way to control phragmites.

left: Aerial phragmites herbicide application at Nyanquing Point State Wildlife Area, Saginaw Bay, MI. D. Avers



Herbicides

TWO BROAD-SPECTRUM HERBICIDES, GLYPHOSATE AND IMAZAPYR, ARE COMMERCIALY AVAILABLE AND KNOWN TO CONTROL PHRAGMITES EFFECTIVELY WHEN USED PROPERLY.

These chemicals are nonselective and will enter any plant species through contact with the leaves or stems. Therefore, impacts on other native plants may occur if the product is applied incorrectly. Both herbicides are available in separate formulas for application either on aquatic (wet) or terrestrial (dry) sites.

Improper use of the terrestrial formulations in an aquatic habitat may harm fish and macroinvertebrates and is a violation of federal and state laws.

Glyphosate and imazapyr can be used individually or combined to control phragmites (Table 1). While the cost per

left: Spot treating phragmites with a backpack sprayer. L. Esman

below: Table 1.
Herbicide Application Information

		IMAZAPYR	GLYPHOSATE	COMBINATION
TREATMENT TIMING		Apply to actively growing green foliage after full leaf elongation and up to first killing frost (i.e., June up to first killing frost)	Apply after plants are in full bloom in late summer up to the first killing frost (i.e., late August up to first killing frost)	Apply after plants are in full bloom in late summer up to the first killing frost (i.e., late August up to first killing frost)
HERBICIDE RATE	HIGH VOLUME	Six pints per acre	Six pints per acre	Three pints glyphosate and three pints imazapyr per acre
	LOW VOLUME	1 - 1.5% solution	1 - 1.5% solution	No recommended rate is available
COST		High	Low	Medium
EFFECTIVENESS		High Allows treatment earlier in the growing season	Medium Good results where water level management is available	High Recommended for most sites

Table 2. *Herbicide Application Methods*

METHOD	PHRAGMITES STAND CHARACTERISTICS	SITE CONDITIONS	TREATMENT TECHNIQUE	PRECAUTIONS
INJECTING STEMS	Scattered or isolated	Effective in areas where impacts to desirable, native plant species must be avoided.	Cut plants to waist height. Add one drop of herbicide to hollow stems with a squirt bottle or syringe.	Seed heads should be removed from the site after cutting to prevent seed spread.
HAND SWIPING	Scattered or isolated	Effective in areas where impacts to desirable, native plant species must be avoided.	Cover (wipe) each individual stem using a cotton wicking glove worn over a chemical resistant glove.	Use care not to over-saturate or drip herbicides on native vegetation.
BACKPACK SPRAYER	Scattered to moderately dense stands	Use on low-wind days to prevent drift outside the treatment area. Use care- fully to avoid native plants.	Spray close to leaves using low pressure.	Utilize flat fan nozzles to minimize non-target exposure.
WICK OR DAUBER	Moderately dense to dense stands greater than 1 acre	Targets phragmites without impacting shorter plant species. Useful when com- plete eradication of all plants is not desired.	Saturate absorbent material with low pressure sprayers attached to an ATV or tractor. The area must be covered twice, in opposite directions.	Herbicide will not be effective on stems broken or damaged by the equipment.
BOOM SPRAYER	Dense stands greater than 1 acre	Use on low-wind days to prevent drift outside the treatment area. Use care- fully to avoid native plants.	Attach low pressure boom sprayers to an ATV or tractor.	Herbicide will not be effective on stems broken or damaged by the equipment.
AERIAL APPLICATION	Dense stands greater than 5 acres	Use on low-wind days to prevent drift outside the treatment area. Use care- fully to avoid native plants.	Spray area from helicopter booms using proper droplet size, boom length and nozzle type.	Large scale application may affect adjacent plant commu- nities. Using a skilled pilot is imperative.

-HERBICIDES-

gallon of imazapyr can be significantly higher than glyphosate, results from recent studies suggest that imazapyr used alone or in combination with glyphosate can control phragmites for a longer period of time (Getsinger et al., 2007). In most cases, herbicides should be used in conjunction with burning or mechanical methods, and reapplied in subsequent years to spot-treat individual plants or patches of plants that were not eliminated completely in the first application.

Numerous methods may be used to apply these herbicides depending on the size of the phragmites stand and existing site conditions, as identified in Table 2. Application rates for low-volume spot treatment methods, such as injecting stems, hand swiping, wicks and backpack spraying, are calculated by percent of solution (e.g., 2 ounces of herbicide in 1 gallon of water yields a 1.5-percent solution). Application rates for high-volume treatment methods, such as boom sprayers, hand gun and aerial applications, are calculated on a per-acre rate.

To ensure the herbicide is taken up by the plants, a state-approved nonionic surfactant must be used in conjunction with the herbicide(s) at the rate recommended on the label. Spray should be

applied to wet the leaves and, when present, the flower plumes of the target plants. Excessive application, such that the chemicals are dripping off the plants, should be avoided because it is more costly, can cause increased injury to desirable nontarget species and often decreases the success of control. Visual effects, such as browning or withering of the plants, may not occur for several weeks. If the herbicide is applied close to the first killing frost, symptoms may not have time to appear before the plant dies back for the year. In this case, control effectiveness may not be determined until the following growing season.

When using herbicides, always read and follow directions on the manufacturer's label. These directions must be followed in order to achieve legal, safe and effective treatment of phragmites. Only trained individuals should apply herbicides. Pesticide use certification, which can be obtained in Michigan through the Department of Agriculture, is required prior to the use of imazapyr and recommended prior to the use of glyphosate. Permits are required in Michigan when applying herbicide to phragmites in standing water or below the ordinary high-water mark of the Great Lakes and Lake St. Clair.

Consult the Michigan Department of Environmental Quality (MDEQ) website at <http://www.michigan.gov/deqinlandlakes> or contact the MDEQ Environmental Assistance Center (EAC) at 1-800-662-9278 for more information about Aquatic Nuisance Control Permits. Contact local municipal offices for information on city or township requirements.



Because phragmites stands burn hot and fast, safety is paramount when using prescribed fire and a burn plan should be prepared prior to initiating any work. Preparation of a burn plan will help prevent unintended spot-fires and minimize adverse impacts to wildlife, sensitive plant species and adjacent property owners. Prescribed fire must be handled carefully and should be conducted only by properly trained individuals. More information can be found on the Michigan

Prescribed Fire Council website at <http://www.firecouncil.org>.

Approval from the local municipality and fire department will likely be required prior to the prescribed fire.

left: Using prescribed fire after an initial herbicide treatment, Erie Marsh Preserve, MI. H. Braun

Prescribed Fire

PREScribed FIRE IS A TOOL THAT CAN BE USED AFTER AN HERBICIDE TREATMENT TO REMOVE EXCESS BIOMASS, POTENTIALLY KILL ANY LIVING RHIZOMES AND PROMOTE NATIVE PLANT GROWTH.

In situations where prescribed fire can be implemented it is easier to locate phragmites regrowth and spot-treat those plants with herbicides once a site has been cleared of the thick, dead stems. In situations where it can be implemented safely and effectively, prescribed fire is a cost-effective and ecologically sound tool to help control phragmites. Prescribed fire is recommended where phragmites exists in large dense stands. Use of prescribed fire without first treating with herbicides does not control phragmites, and instead may encourage rhizome growth and cause phragmites populations to become more vigorous.

Prescribed fire should be conducted the year following herbicide treatment, either in late summer (mid-July through August) or winter (January until prior to spring green-up). Both options are very effective in controlling phragmites and encouraging native plant growth.

Prescribed fire conducted in late summer as a second-year treatment following an herbicide treatment is preferred. A prescribed fire in late summer destroys seed

heads, removes dead stems, and helps kill any phragmites plants that survived the initial herbicide treatment. Burning during this time frame also will provide for green-up of native plants before first frost. Late summer prescribed fires should be conducted when conditions are as dry as possible to achieve a complete burn of plants.

If it is anticipated that a prescribed fire cannot be accomplished during the summer period, then an earlier burn in the winter (January until prior to spring green-up) following an herbicide treatment is recommended. A winter burn can prepare the site for subsequent herbicide treatments and removes dead stems, allowing sunlight to stimulate new growth of many plant species. Once a site has been cleared of the thick, dead stems, it will be easier to locate phragmites regrowth and spot-treat those plants with herbicides. Be aware, however, that burning during this time frame can also stimulate growth of phragmites plants that survived the initial herbicide treatment (Getsinger et al., 2007).



In Michigan, mowing and cutting phragmites below the ordinary high-water mark of the Great Lakes and Lake St. Clair requires a permit from the MDEQ, Land and Water Management Division.

Permit applications can be obtained from the MDEQ website at

<http://www.michigan.gov/deqwetlands>

Mowing stands of phragmites in inland wetlands may also require a permit. Before initiating any cutting or mowing regimen, contact the MDEQ EAC at 1-800-662-9278 for more information about Land and Water Management permits.

left: Using a brush hog to mechanically remove dead phragmites stems after an herbicide treatment; St. Clair Flats Wildlife Area, MI. J. Schafer

Mechanical Treatment

MECHANICAL TREATMENTS ARE USED MOST EFFECTIVELY FOLLOWING AN HERBICIDE TREATMENT TO REMOVE DEAD STEMS AND PROMOTE NATIVE PLANT GROWTH. THIS ALSO AIDS IN THE IDENTIFICATION OF NEW PHRAGMITES GROWTH FOR SUBSEQUENT HERBICIDE SPOT TREATMENTS. WHEN BURNING IS NOT FEASIBLE, MECHANICAL TREATMENT IS RECOMMENDED.

Mechanical treatment should be limited to only those areas where phragmites is present, and should not include broad-scale mowing of other wetland vegetation.

Mechanical control of phragmites includes the use of weed whips, small mowers, brush hogs, and flail mowers or hand-cutting of stems and seed heads. The use of mechanical equipment is highly dependent on the size and wetness of the site and the density of phragmites. Weed whips or handheld cutting tools are ideal for use on wet or dry sites with low plant densities. Small mowers can be used effectively on low density sites. Larger mowers can be used on sites with a higher density of plants, but the site must be dry enough to support the weight of the mower in order to avoid soil disturbance.

If mechanical treatment methods are chosen as part of a phragmites management plan, it is critical to adhere to the following timing recommendations. Mechanical treatments should not occur until at least 2 weeks after herbicide treatment to allow plant absorption of the herbicide. To remove dead stems on dry sites after an herbicide treatment, mechanically cut the treated plants once within a period from late summer or fall until prior to spring green-up. On wet sites, mechanically cut the treated plants once when the ground is frozen to minimize soil disruption. Mowing/cutting should occur only during time frames that will avoid soil disturbance.

Once an area has been mowed or cut, thatch should be raked, bagged and disposed of in an appropriate location to prevent seed spread and to allow sunlight



-MECHANICAL TREATMENT-

to reach the soil surface. This ensures that the native seed bank will have an advantage during the subsequent growing season. Use of a flail-type mower can eliminate the need for thatch removal, since it will destroy most plant parts adequately.

Under limited circumstances, for example, when isolated plants or low density stands of phragmites exist and herbicide treatment is not feasible, mechanical treatments alone may be used to reduce phragmites and encourage native plants. In these situations, cutting individual plants or mowing small areas of phragmites once during late summer/fall (September to first killing frost) appears to have the best results because it eliminates the surface biomass of the plant when it is using most of its energy for flower and seed production. Cutting/mowing in late summer also eliminates potential disruption to the breeding and nesting seasons for most birds. If a mower is used instead of handheld tools, then the mower deck should be set to a mowing height greater than 4 inches to

minimize impact on small animals and native plants. Mechanical treatments are not intended to create the appearance of a manicured lawn, but to allow reestablishment of native wetland vegetation. Cutting/mowing should occur only in those areas where phragmites is present.

Mechanical methods must be used carefully to avoid stimulating growth of phragmites. Mowing alone leaves the plants' rhizomes behind. Regeneration from those rhizomes may cause an increase in stand density. Improper use of mechanical methods, such as cutting during the wrong time of year, cutting too frequently, too short, or where native plants are present, can disrupt wildlife and destroy existing native plants. Disking soil is not recommended as a mechanical control method for phragmites, since it results in the spread of rhizomes and the production of new plants. Equipment used to manage phragmites must be cleaned properly of all debris before it is removed from the treatment site to prevent the unintended spread of seeds or rhizomes to other areas.

left: Using a weed whip to mechanically treat a small stand of phragmites; Nayanquing Point State Wildlife Area, MI. D. Avers



Water Level Management "FLOODING"

IN IMPOUNDED SITES WHERE WATER LEVELS CAN BE READILY MANIPULATED, PHRAGMITES CAN BE CONTROLLED EFFECTIVELY THROUGH AN HERBICIDE TREATMENT FOLLOWED BY PRESCRIBED BURNING AND FLOODING.

In Michigan, a permit from the MDEQ, Land and Water Management Division, is required prior to manipulating water levels in impoundments. The permit application can be found at <http://www.michigan.gov/deqwetlands>.

Although phragmites is intolerant of persistent flooding, increasing water level alone is not effective in controlling it.

Traditional moist soil management, in which impoundments are drawn down to produce mud flats in early summer, may encourage growth of phragmites.

If phragmites is on site or in the surrounding landscape, managers should use caution when timing drawdowns. Drawdowns should be conducted in late summer (late July) to maintain and promote native vegetation and to avoid reestablishment of phragmites.

*left: Pumping station used for controlling water levels in a wetland impoundment; St. Clair Flats Wildlife Area, MI.
J. Schafer*



Recommended Management Strategies

BECAUSE OF THE PHYSIOLOGY OF PHRAGMITES, WELL-ESTABLISHED STANDS ARE DIFFICULT TO CONTROL WITH ONLY ONE HERBICIDE TREATMENT.

An initial herbicide treatment stresses the plants, making them particularly vulnerable to subsequent treatments. Creating multiple stresses on the plants is the most effective way to control phragmites. Herbicide treatment in conjunction with prescribed fire, mechanical treatment or flooding have proven to be effective in controlling phragmites and allowing native plants to reestablish.

Before control methods are implemented, it is important to evaluate the site properly to determine the density of phragmites within the overall stand of plants, the wetness of the site and the size of the area infested by phragmites. Using this information and recognizing that control of phragmites likely will require a long-term commitment, a comprehensive management plan can be formulated and implemented.

The following three management strategies have been developed based on past efforts to control phragmites. The three strategies provide information and steps in controlling phragmites under certain conditions. These strategies basically follow one of the three general approaches in table 3. Together these strategies and approaches to managing phragmites can be used to develop more comprehensive management plans.



left: Dead stems of phragmites the summer after an aerial herbicide treatment and natural vegetation regrowth; St. Clair Flats Wildlife Area, MI. J. Schafer

Management Strategy

for large, dense stands of phragmites on a wet or dry site

1. *Treat phragmites stands with herbicide in early summer or late summer, depending upon the type of herbicide used (see Herbicides section). Wait at least two weeks to allow plant exposure to the herbicide.*
2. *Conduct the prescribed fire in the year following herbicide treatment either in (a) late summer (mid-July through August) or (b) winter (January until prior to spring green-up), if prescribed fire cannot be accomplished during the summer.*
3. *Check site the following growing season for phragmites regrowth and spot-treat with herbicide if needed.*

If prescribed fire is not possible, mechanically treat wet sites when ground is frozen to minimize soil disturbance. On dry sites, mechanically cut treated plants once after an herbicide treatment

beginning in late summer or fall until prior to spring green-up. Herbicide spot treatment will be needed during the next growing season.

*left: Large, dense stand of phragmites.
B. Avers*

Management Strategy

for large, dense stands of phragmites in impoundments

Note:

For small, scattered stands of phragmites within an impoundment, steps 1–5 may not all be necessary. In these cases, treat with herbicide and maintain water levels throughout the next growing season. Spot treatment with herbicide may be needed the following year.

1. *Treat phragmites stands with herbicide in late summer (late August and September), followed immediately by flooding to a minimum water depth of 6 inches. (It is not necessary to dewater the site prior to herbicide application.)*
2. *Allow the site to remain flooded until the next summer, and then dewater in late July.*
3. *Keep the site as dry as possible until mid-August, at which time use prescribed fire.*
4. *Immediately following the burn, flood the site to a minimum water depth of 6 inches and maintain this water depth for at least one year.*
5. *Check site the following growing season for phragmites regrowth and spot-treat with herbicide if needed.*

If prescribed fire is not feasible for a site, it is recommended that the site be mechanically treated during the winter in

a frozen condition to remove the dead plants that have persisted from the herbicide treatment.

Management Strategy

for low-density stands of phragmites on a wet or dry site

1. *Treat phragmites stands with herbicide in early summer or late summer, depending upon the type of herbicide used (see Herbicides section). Wait at least 2 weeks to allow plant exposure to the herbicide.*
2. *Mechanically treat site beginning in late summer or fall until prior to spring green-up, or when the ground is frozen for wet sites with hand tools, weed whips or small mowers where dense stands of phragmites are present.*
3. *Check site the following growing season for phragmites regrowth and spot-treat with herbicide if needed.*

*left: Low-density stand of phragmites
at St. Clair Flats State Wildlife Area, MI.
J. Schafer*

Table 3. Three integrated multi-year approaches to managing phragmites.

		APPROACH 1	APPROACH 2	APPROACH 3
Year 1	Jan			
	Feb			
	Mar			
	April			
	May			
	June	herbicide treatment with imazapyr		
	July		OR	
	Aug			
	Sep	herbicide treatment with glyphosate or imazapyr/glyphosate combo		
	Oct			
	Nov			mechanical treatment
	Dec			
Year 2	Jan		prescribed burn	
	Feb			
	Mar			
	April			
	May			
	June		spot treat with imazapyr (if necessary)	
	July	prescribed burn		OR
	Aug			
	Sep		spot treat with glyphosate (if necessary)	
	Oct			
	Nov			
	Dec			
Year 3	Jan			
	Feb			
	Mar			
	April			
	May			
	June		spot treat with imazapyr	
	July		OR	
	Aug			
	Sep		spot treat with glyphosate	
	Oct			
	Nov			
	Dec			



Long-Term Management and Monitoring

MANAGEMENT OF A SITE TO CONTROL PHRAGMITES DOES NOT END WITH THE SUCCESSFUL IMPLEMENTATION OF ONE OR MORE OF THE CONTROL METHODS DESCRIBED ABOVE, BUT RATHER BEGINS WITH THESE INITIAL STEPS.

Because of the pervasiveness of this species and its ability to aggressively recolonize through seed or rhizomes, long-term management and monitoring are necessary.

The control methods described above are likely to be successful in controlling phragmites for one to two years without additional action. However, phragmites typically begins to recover three years after treatment and will become reestablished if follow-up management is not implemented. After removal from a site, phragmites will continue to recolonize from remnant and neighboring populations and the existing seed bank in the soil.

Annual maintenance is essential to the success of any habitat restoration plan and should focus on selectively removing pioneer colonies of phragmites. Once areas of phragmites have been controlled (e.g., greater than 85-percent reduction), it is recommended that an annual maintenance control program be implemented. Successful long-term management plans should incorporate one or more of the control methods, including spot treatment with herbicide, mowing during the recommended time and/or use of prescribed fire. For example, annual spot treatments of pioneer colonies of phragmites with herbicides can provide up to 100-percent control of phragmites and discourage its spread, while enhancing the recovery and growth of native plants.

left: Restoration site in year three of a phragmites control plan, Bay City State Recreation Area, MI. Note dead stands of phragmites and native vegetation that has reestablished. B. Avers



-LONG-TERM MANAGEMENT AND MONITORING-

To reach the goal of reestablishing and restoring native wetland plant communities, controlling invasive species is a necessary step. Implementing selective control, as needed, will not only keep phragmites from reestablishing dominance, but also will pave the way for the recovery of beneficial native species of wetland vegetation. Seeding an area after phragmites control to restore native wetland communities typically is not necessary since native seeds normally are present in the soil. It is recommended that native vegetation be allowed to reestablish naturally. However, if monitoring determines that native plants are not responding, some sites may require seeding or planting using native genotypes to reach restoration goals.

Monitoring and adaptive management are integral components of a successful phragmites control plan. A detailed monitoring plan should be developed prior to implementation of control measures. Monitoring provides the data needed to determine the effectiveness of

initial control efforts and the types of follow-up control methods that are necessary. Monitoring may be as simple as establishing and using fixed photo points on the site to record changes over time, or more involved, such as comparison of aerial photographs taken over time or the use of quantitative measurements and inventories of vegetation using sampling grids or transects. At a minimum, each treated site should be inspected annually during the growing season.

In the future there may be an effective biological control for phragmites, just as beetles can now be used to control purple loosestrife in certain situations. Currently there are no commercially available biological methods for the control of phragmites; however, several insects and microorganisms native to Europe are known to attack phragmites. Ongoing research at Cornell University is exploring the possibility of using these species as a means of biological control (<http://invasiveplants.net>).

*left: Great Lakes coastal wetland at
St. Clair Flats State Wildlife Area, MI.
J. Schafer*





A Call to Action

WHETHER THE GOALS ARE TO RESTORE NATIVE PLANT COMMUNITIES AND WILDLIFE HABITAT OR IMPROVE A LAKESIDE VIEW AND RECREATIONAL OPPORTUNITIES, THE CHARGE IS THE SAME—TO CONTROL PHRAGMITES IN COASTAL AND INTERIOR WETLANDS OF MICHIGAN.

Before an agency or organization engages in efforts to control phragmites, it is important to establish realistic goals and realize that achievement of these goals will involve an ongoing commitment and an annual investment of time and resources. Agencies and organizations have the opportunity to work together and may be much more effective by pooling resources to achieve control in targeted geographic areas.

While phragmites control can involve a significant expenditure of resources, the environmental and social benefits derived from restoring native wetland communities to the coastal and interior wetlands of Michigan are even greater.

Many species—and people—benefit from wetlands: (top to bottom) recreational bird watcher; black tern, J. Schafer; fox snake, J. Schafer; king rail, endangered, USFWS. far left (page 32): Mallard ducklings, Al & Elaine Wilson

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Lansing, MI 48909

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www.michigan.gov/deqinlandlakes

email: deq-lwm-anc@michigan.gov

Reference Information

MORE INFORMATION ON PHRAGMITES CONTROL CAN ALSO BE FOUND
IN THE FOLLOWING:

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City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Public Works

FROM: Scott Thoresen

SUBJECT: Consideration and possible action on Municipal Service Center Expansion*

ATTACHMENTS:

- Consider MSC Expansion Project Phasing 10-7-2021 (DOCX)
- Municipal Services Center Renovation Estimated Project Costs 10-7-2021 (PDF)

CITY OF DE PERE MEMO



To: Honorable Mayor Boyd
Board of Public Works Members
From: Scott J. Thoresen, Director of Public Works
Date: October 7, 2021
RE: Consideration and possible action on MSC Expansion*

The MSC is in need of expansion for storage of the City's equipment and vehicles at its current location. The City had an evaluation of the MSC facility done in 2010. The evaluation of the MSC operations showed the City's operations have out grown equipment & vehicle storage capacity at the MSC. Equipment and vehicles are tightly parked end to end, creating inefficiencies for equipment and vehicle movements as well as increased safety risks. The evaluation looked at different equipment and vehicle layouts utilizing the existing storage but it was obvious that there is not enough space for all the equipment and vehicles. This has resulted in increased storage of equipment and vehicles outside exposed to all the weather elements. In addition, the City has acquired numerous equipment and vehicles since the study was done in 2010 creating even more of a need for additional storage.

Earlier this year, the BOPW and Council approved hiring SEH for design services for the MSC expansion on the existing site. As part of the design process, the consultant was required to determine the expansion needs for the operations at the MSC. (See attached layout for expansion). The estimated costs to do everything are estimated at \$14,885,785. Staff originally had estimated the costs of the project to be approximately \$6,000,000. Staff requested SEH to look at the possibility of phasing the project and came up with three (3) phases. The estimated costs of the three (3) phases are:

- Phase 1a = \$8,689,315
- Phase 1b = \$3,709,200
- Phase 2 = \$2,487,270

Phase 1a would provide additional building space so the City's existing equipment would not have to be parked outside. Phase 1b would eliminate the existing issues with vehicles being tightly parked end to end which cause inefficiencies for equipment and vehicle movements as well as safety risks. Phase 2 creates additional cold storage for the site which again reduces the amount of materials and other items being stored outside.

The intent of the discussion is to get direction from the BOPW and Council on how we should have our consultant proceed with the design for the MSC expansion. Our current contract with SEH requires the consultant to fully design and put bidding documents together for a full expansion. If the BOPW and Council do not want to proceed with a full expansion due to costs, then we need to revise our contract with SEH as to what the City wants done.



NOT FOR
CONSTRUCTION

Project Owner

City of De Pere
Municipal Services Center Renovation
Phasing Plan

925 S Sixth St
De Pere, WI 54115

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SEH Project Checked By Drawn By

Project Number Checked By JRL

Project Status

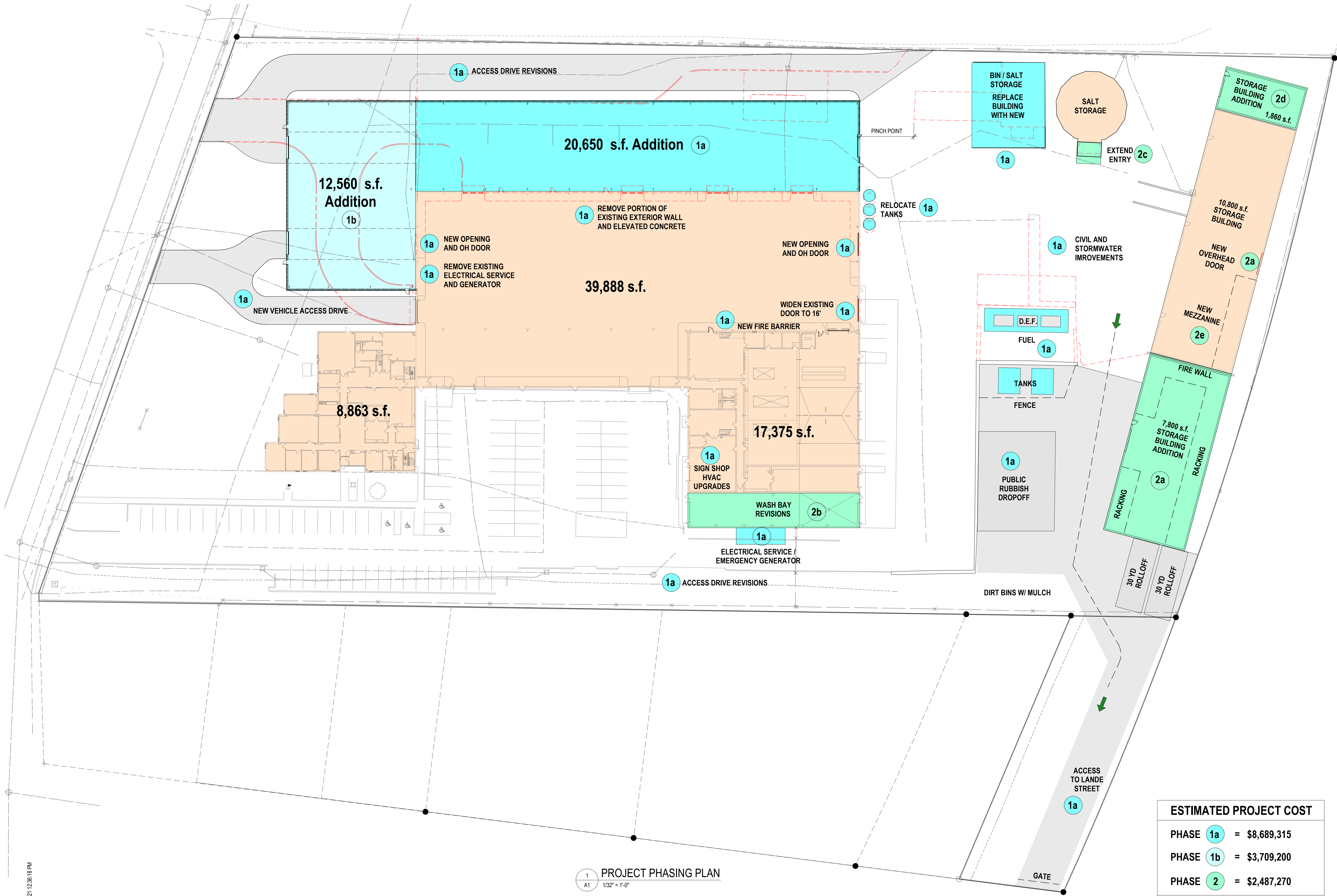
Issue Date 10-5-21

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE

PROJECT PHASING PLAN

A1

Packet Pg. 66



10/5/2021 12:35:18 PM

1
A1 PROJECT PHASING PLAN
1/32" = 1'-0"

ESTIMATED PROJECT COST	
PHASE 1a	= \$8,689,315
PHASE 1b	= \$3,709,200
PHASE 2	= \$2,487,270
TOTAL	= \$14,885,785



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De Pere MSC Expansion - Estimate - Phase 1a

Phase 1a Cost Estimate

10/5/2021

SUBSTRUCTURE - Phase 1a

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Building Concrete Slab/Foundation	S.F.	\$20.00	20,650	\$413,000
				\$413,000

CONSTRUCTION - Phase 1a

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Metal Building Addition	S.F.	\$130.00	20,650	\$2,684,500
CMU Cavity Walls to 8'-8" High	S.F.	\$24.00	4,000	\$96,000
New Openings and OH Door	Ea.	\$40,000.00	3	\$120,000
New Fire Barrier	Ea.	\$35,500.00	1	\$35,500
Remove Portion of Exterior Wall/Elevated Concrete	S.F.	\$15.50	3,000	\$46,500
Paint - Walls and Structure	S.F.	\$6.00	20,650	\$123,900
Demolition/New Salt Storage Building	S.F.	\$140.00	3,200	\$448,000
				\$3,554,400

SERVICES - Phase 1a

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Civil - Site Work	Ea	\$800,000.00	1	\$800,000
Fuel Island Equipment/Fuel Tank	Ea	\$195,000.00	1	\$195,000
Plumbing/Fire Protection	Ea	\$125,000.00	1	\$125,000
HVAC	Ea	\$225,000.00	1	\$225,000
Fiber Optic Cable Relocation	Ea	\$16,500.00	1	\$16,500
Electrical	Ea	\$900,000.00	1	\$900,000
				\$2,261,500

SUB TOTAL - Phase 1a

DESCRIPTION		
Sub Total		\$6,228,900
Construction Bidding/Administration/ RPR	4.50%	\$280,300
General Conditions	15.00%	\$934,335
Contingency	20.00%	\$1,245,780
Total		\$8,689,315



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De Pere MSC Expansion - Estimate - Phase 1b

Phase 1b Cost Estimate

10/5/2021

SUBSTRUCTURE - Phase 1b

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Building Concrete Slab/Foundation	S.F.	\$20.00	12,560	\$251,200
				\$251,200

CONSTRUCTION - Phase 1b

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Metal Building Addition	S.F.	\$130.00	12,560	\$1,632,800
CMU Cavity Walls to 8'-8" High	S.F.	\$24.00	2,000	\$48,000
New OH Door	Ea.	\$12,000.00	2	\$24,000
New Fire Barrier	Ea.	\$35,500.00	1	\$35,500
Paint - Walls and Structure	S.F.	\$6.00	12,560	\$75,360
				\$1,815,660

SERVICES - Phase 1b

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Civil - Site Work	Ea	\$200,000.00	1	\$200,000
Plumbing/Fire Protection	Ea	\$100,480.00	1	\$100,480
HVAC	Ea	\$125,098.00	1	\$125,098
Electrical	Ea	\$232,360.00	1	\$232,360
				\$657,938

SUB TOTAL - Phase 1b

DESCRIPTION		
Sub Total		\$2,724,798
Construction Bidding/Administration/RPR	4.50%	\$152,849
General Conditions	15.00%	\$286,593
Contingency	20.00%	\$544,960
Total		\$3,709,200



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De Pere MSC Expansion - Estimate - Phase 2

Phase 2 Cost Estimate

10/5/2021

SUBSTRUCTURE - Phase 2

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Building Concrete Slab/Foundation	S.F.	\$20.00	9,660	\$193,200
				\$193,200

CONSTRUCTION - Phase 2

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Building Addition - 2a and 2d	S.F.	\$90.00	9,660	\$869,400
New OH Door - 2a	Ea.	\$17,500.00	1	\$17,500
New Fire Wall - 2e	Ea.	\$12,000.00	1	\$12,000
Paint - Walls and Structure - 2a and 2d	S.F.	\$6.00	9,660	\$57,960
Extend Entry at Salt Storage - 2c	Ea.	\$40,000.00	1	\$40,000
Wash Bay Revisions - 2b	S.F.	\$24.00	3,500	\$84,000
				\$1,080,860

SERVICES - Phase 2

DESCRIPTION	UNIT	Unit Cost	Designed	Cost
Civil - Site Work - 2a thru 2e	Ea	\$150,000.00	1	\$150,000
Wash Bay Equipment	Ea	\$10,000.00	1	\$10,000
Plumbing/Fire Protection - 2a thru 2e	Ea	\$52,500.00	1	\$52,500
HVAC - 2a thru 2e	Ea	\$100,000.00	1	\$100,000
Electrical - 2a thru 2e	Ea	\$196,430.00	1	\$196,430
				\$508,930

SUB TOTAL - Phase 2

DESCRIPTION		
Sub Total		\$1,782,990
Construction Bidding/Administration/RPR	4.50%	\$80,234
General Conditions	15.00%	\$267,448
Contingency	20.00%	\$356,598
Total		\$2,487,270



City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Public Works

FROM: Scott Thoresen

SUBJECT: Consideration and possible action on 2021-2022 Snow & Ice Removal Rates

ATTACHMENTS:

- 2021-2022 snow & ice removal rates 10-6-2021 (DOC)
- 2021-2022 Snow & Ice Removal Rates(PDF)

City of De Pere

Public Works Department

Memo

To: Honorable Mayor Boyd
Members of the Board of Public Works
From: Scott J. Thoresen, Director of Public Works
Date: October 6, 2021
Subject: Consider 2021-2022 Snow & Ice Removal Rates

The City's Snow Removal Ordinance Sec. 22-18 (f), regulating snow removal from sidewalks, requires the Director of Public Works to report the cost for the removal of snow and compacted snow and ice to the Board of Public Works. The Board is then required to establish snow and ice removal rates that will be in effect for the year 2021-2022 snow season. These rates are charged to property owners who fail to remove snow and ice from the sidewalk resulting in the City performing the work.

After review of the labor and equipment utilized for sidewalk snow removal during last year's storms, I have computed (see attached spreadsheet) the following unit costs for inspection, billing and removal utilizing a projected 3.0% increase in 2021 labor rates in addition to updating the equipment rates and salt rates. It takes on an average approximately one hour to perform the inspections, removal of snow and ice, and billing for each lot.

Item	2021 Unit Cost	2022 Unit Cost	2021 Cost Per 90 Ft Lot	2022 Cost Per 90 Ft Lot
Snow Removal	\$1.06	\$1.09	\$95.40	\$98.10
Compacted Snow/Ice Removal	\$1.67	\$1.71	\$150.30	\$153.90

- Recommended minimum charge of \$80.00 per lot. 2021 minimum charge was \$80 per lot. The minimum charge has been \$80.00 per lot since 2021.

Staff recommends the above-mentioned 2021-2022 rates be approved.

2021-2022 Snow Removal Rates

Labor	Equipment Operator	Office Assistant	City Forester	Total
Hours	0.5	0.25	0.5	
**Rate (hourly wage & benefits)	\$41.23	\$32.65	\$56.88	
Labor Cost	\$20.62	\$8.16	\$28.44	\$57.22

Equipment	Trackless		Pickup Truck	Total
Hours	0.5		0.5	
Rate	\$67.24		\$13.68	
Equipment Cost	\$33.62		\$6.84	\$40.46

Total Cost				\$97.68
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Compute Unit Cost Per 90 Foot Lot for Snow Removal

Unit Cost = Total Cost / 90

\$1.09

2021-2022 Ice Removal Rates

Labor	Equipment Operator	Office Assistant	City Forester	Total
Hours	1	0.25	0.5	
**Rate (hourly wage & benefits)	\$41.23	\$32.65	\$56.88	
Labor Cost	\$41.23	\$8.16	\$28.44	\$77.83

Equipment	Trackless		Pickup Truck	Total
Hours	1		0.5	
Rate	\$67.24		\$13.68	
Equipment Cost	\$67.24		\$6.84	\$74.08

Salt				Total
Quantity	50 pounds			
Cost per Ton	\$75.04			\$1.88
Salt Cost				\$1.88

Total Cost				\$153.79
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Compute Unit Cost Per 90 Foot Lot for Ice Removal

Unit Cost = Total Cost / 90

\$1.71

**Note: Rate = 1.4(for benefits) * hourly rate

Equipment Operator hourly rate =		\$29.45
Office Assistant hourly rate =		\$23.32
City Forester hourly rate =		\$40.63



City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Consideration and possible action on City Engineer Parking & Traffic Recommendations*

ATTACHMENTS:

- 2021 1011-CI-BOPW-PTTeam-Recommendations (PDF)

CITY OF DE PERE

Public Works Department

925 S. Sixth Street, De Pere, WI 54115 | 920-339-4060 | www.de-pere.org



City Engineer Parking and Traffic Recommendations September 15, 2021 Meeting

Parking and Parking Lot Items:

- Consider parking restrictions on Richco Court near the entrance to Green Bay Highway Products due to difficulty utilizing the driveway when vehicles are parked adjacent or in front.
 - Street is a local industrial street and cul de sac.
 - Roadway width is 34 feet from face of curb to face of curb.
 - Trucks are parking near entrance making it difficult to turn out of this location.

Recommendation:

- Staff recommends updating parking under Section 150-22, Schedule G as follows:

Insert:

No Parking

<i>Street</i>	<i>Side of Street</i>	<i>From Curbline</i>	<i>To Curbline</i>
<i>Richco Court</i>	<i>N</i>	<i>260/E American Boulevard</i>	<i>530/E American Boulevard</i>
<i>Richco Court</i>	<i>S</i>	<i>390/E American Boulevard</i>	<i>490/E American Boulevard</i>

- Consider changing No Parking on Huron Street west side to No Stopping, Standing, or Parking near the George Street intersection.
 - The west side of the street off of George Street is labeled No Parking, but drivers are still using this as a drop off area which is permitted in a no parking area. This restricts traffic flow off of George Street.

Recommendation:

- Staff recommends modifying the parking as follows under Section 150-22, Schedule G, Parking

Delete:

No Parking

<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. Of Curbline</i>
<i>Huron Street</i>	<i>W</i>	<i>George St</i>	<i>85/S</i>

And Insert:

No Standing, Stopping or Parking between Signs

<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. Of Curbline</i>
<i>Huron Street</i>	<i>W</i>	<i>George St</i>	<i>85/S</i>

3. Update ordinance to add No Parking on the west side of Tenth Street from Main Avenue to Oak Street.
 - This area is now being used as the travel lane with the implementation of two way left turn lane (TWLTL) in this block.

Recommendation:

- Staff recommends modifying the parking as follows under Section 150-22, Schedule G, Parking

Insert:

No Parking

<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. Of Curbline</i>
<i>Tenth Street</i>	<i>W</i>	<i>Main Ave</i>	<i>Oak St</i>

Signs – Other

4. Consider School Zone signs near Altmayer School.
 - The Ryan Road sign just south of Diversity Drive was removed when WPS removed a utility pole in 2019.
 - A new sign is required on Diversity Drive west of the Ryan Road intersection with the construction of the Pine Trail Crossing Subdivision.

Recommendation:

- Staff recommends reinstalling the sign on Ryan Road, south of Diversity Drive for north bound traffic and a new sign on Diversity Drive, west of the Ryan Road intersection for east bound traffic.

5. Consider School Zone signs on Lourdes Street near Our Lady of Lourdes School.
 - With updates to West De Pere Schools on Ninth Street and the addition of a parking lot off of Lourdes Street, a lot of new traffic is using Lourdes.

Recommendation:

- Staff recommends installing school zone signs on Lourdes Street.



City of De Pere, Wisconsin

Request For Board of Public Works Action

MEETING DATE: October 11, 2021

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Discuss City Engineer Recommendation for No-Action Parking & Traffic Discussion Items

ATTACHMENTS:

- 2021 1011-CI-BOPW-PTTeam-Discussion (PDF)

CITY OF DE PERE

Public Works Department

925 S. Sixth Street, De Pere, WI 54115 | 920-339-4060 | www.de-pere.org



Discuss City Engineer Recommendations on No Action Parking and Traffic Discussion Items September 15, 2021

Signs - Other

1. Consider installing a Park sign on Ontario near Legion Park
 - Ontario Street is a local street with the majority of traffic being from the neighborhood.
 - Staff will review the locations of other Park signs and consider a policy.

Staff will review other signs at parks to see if a sign should be installed at this location.
2. Consider four way stop at Ryan Road and Diversity Drive.
 - This is a two way stop intersection with the stop on Diversity Drive.
 - This intersection is the primary access for pedestrians from the Pine Trail Crossing Subdivision to the school.
 - The intersection was built with bumpouts on the east side and no parking on the west side providing good visibility for pedestrians and motorists.
 - Staff put out traffic counters and found the average daily traffic (ADT) for Ryan Road is 470 north of Diversity and 520 south while the ADT on Diversity Drive is 820 east of Ryan Road and 440 west.
 - The Manual on Uniform Traffic Control Devices (MUTCD) addresses the installation of all-way stops under Section 2B.07 and is included below. This intersection does not meet the warrants below.
 - Traffic volumes are not met.
 - There have not been any documented accidents at the intersection in the last 12 months.
 - The posted speed limit is 25 mph. The 85th percentile speed is not above 40 mph. If speeding becomes an issue, enforcement action will be taken.
 - Neither street is a collector street.
 - Visibility is good at the intersection.
 - As noted in the MUTCD below, four way stops can create safety concerns for pedestrians due to *all road users expecting other road users to stop*.

No action at this time.

Section 2B.07 Multi-Way Stop Applications

Support:

Multi-way stop control can be useful as a safety measure at intersections if

certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The restrictions on the use of STOP signs described in Section 2B.04 also apply to multi-way stop applications.

Guidance:

The decision to install multi-way stop control should be based on an engineering study.

The following criteria should be considered in the engineering study for a multi-way STOP sign installation:

- A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.
- B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right turn and left-turn collisions as well as right-angle collisions.
- C. Minimum volumes:
 - 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and
 - 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but
 - 3. If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.
- D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Option:

Other criteria that may be considered in an engineering study include:

- A. The need to control left-turn conflicts;
- B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
- C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and
- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.