



AGENDA
CHARTER TOWNSHIP OF MERIDIAN
ENVIRONMENTAL COMMISSION
JOINT COMMISSION MEETING AND
REGULAR MEETING
July 10, 2019 7:00 pm

1. CALL MEETING TO ORDER AT 7:00 PM
2. JOINT COMMISSION MEETING WITH LAND PRESERVATION ADVISORY BOARD

REGULAR MEETING

3. APPROVAL OF THE AGENDA
4. APPROVAL OF THE MINUTES
5. PUBLIC REMARKS
6. NEW BUSINESS
 - a. Wetland Permit Application: Central Meridian Trail Connector
7. OLD BUSINESS
8. CHAIR'S REPORT
9. STAFF REPORT
10. COMMISSION/LIASON/WORKGROUP REPORTS
 - A. Planning
 - B. Land Preservation
 - C. Energy
 - D. Brownfield Redevelopment Authority
 - E. Green Team
 - F. Transportation
11. PUBLIC REMARKS
12. ADJOURNMENT

All comments limited to 3 minutes, unless prior approval for additional time for good cause is obtained from the Supervisor.
Appointment of Supervisor Pro Tem and/ or Temporary Clerk if necessary.

Individuals with disabilities requiring auxiliary aids or services should contact the Meridian Township Board by contacting:
Township Manager Frank L. Walsh, 5151 Marsh Road, Okemos, MI 48864 or 517.853.4258 - Ten Day Notice is Required.
Meeting Location: 5151 Marsh Road, Okemos, MI 48864 Township Hall



CHARTER TOWNSHIP OF MERIDIAN
ENVIRONMENTAL COMMISSION REGULAR MEETING
MUNICIPAL BUILDING, 5151 MARSH RD, OKEMOS
WEDNESDAY, JUNE 5 2019 7:00 PM

PRESENT: Vice Chair, Ned Jackson; Commissioner, John Sarver; Commissioner, Susan Masten; Commissioner, Jim Kielbaso; and Commissioner Kirk Lapham
ABSENT: Chair, Bill McConnell (out of the country); Commissioner, Linds Burghardt (caring for mother); Commissioner, Aparna Krishnamurthy (exam)
STAFF: LeRoy Harvey, Environmental Programs Coordinator; Ben Holland, Engineering Intern; HOMTV Crew
CITIZENS: John Scott-Craig, Chair, Planning Commission; Lynne Page; Susan Andrews; Fred Cowles, President of Middle Grand River Organization of Watersheds (MGROW)

GREEN INFRASTRUCTURE (GI) PRESENTATION: Fred Cowles of MGROW shared a presentation on Green Infrastructure. See PPT at <http://www.meridian.mi.us/Home/ShowDocument?id=18567> and view on-demand at <http://meridianmi.swagit.com/play/06052019-977>. Cowles shared a comprehensive overview of green infrastructure and a description of MGROW (www.mgrows.org). Highlights:

- **Definition:** GI uses plants, soils, and nature itself to manage stormwater and create healthier urban environments. GI is an approach to water management that protects, restores, or mimics the natural water cycle.
- **How?** Water runoff -- GI slows it down, spreads it out, and lets it soak in
- **Types:** green roofs, planter boxes, rain gardens, bioswales/bioretenion cells, vegetated swales/tree trenches, ponds, porous pavements, green streets/complete streets, wetland/riparian areas, rainwater harvesting, etc.
- **Benefits:** Stormwater Management, Climate Adaptation, Urban Heat Island Reduction, Biodiversity, Air Quality Improvements, Clean Water, Healthy Soils, Recreation, Quality of Life
- **Ways to implement:**
 - Regional Stormwater Planning
 - Low Impact Development Requirements
 - Stormwater Ordinances
 - Zoning & Building Codes
 - Shared Parking
 - Volume Reduction Requirements
 - Minimum Street Setbacks
 - Counting GI as Landscaping
 - Promote Tree Canopy
 - Riparian Setbacks
 - Re-evaluating Street Width and Parking Requirements
 - Stormwater Utility Fee Structure

PUBLIC REMARKS: Lynne Page encourages the Township to explore ways to promote apartment recycling including offering incentives, highlighting participating apartment complexes, and other strategies. A commissioner mentioned that the Environmental Stewardship Awards might be another

promotional tool. Ms. Page also encouraged Commissioners and the public to review and comment upon an upzoning request off Bennett (#19060). (north side of Bennett/West of Hullet)

APPROVAL OF MINUTES: Minutes approved with changes.

NEW BUSINESS: Wetland Permit Application for the Central Meridian Trail Connector will likely be on the July Agenda.

OLD BUSINESS: Wetland Banking Discussion: There is the possibility of a joint commission meeting with the Land Preservation Advisory Board in July. The LPAB will discuss at their June meeting.

Environmental Stewardship Awards

CHAIR'S REPORT: Vice Chair Jackson mentioned speaking to Bill McConnell about the Transportation Commission's interest in keeping downtown Okemos walkable, bikable, etc.

STAFF REPORT:

- Ben Holland, former Commissioner, is now working as an Engineering Aide with Department of Public Works.
- LeRoy Harvey shared an update (see attachment below).

COMMISSION/LIAISON/WORKGROUP REPORTS:

- Planning: John Scott-Craig reports that:
 - An \$25,000 Economic Study will be conducted on Downtown Haslett.
 - Village of Okemos public hearing – brownfield work will start this year
 - Delta Dental Landscaping public hearing (landscaping)
 - Development (Old Leo's) in the floodplain (Grand River and Okemos Rd)
 - New Farmers Market Plan will likely be approved. (permeable surface)
 - Hearing on Bennett Rd. housing complex next week. (ecologically-sensitive)
 - Form-based code discussion will occur soon – pilot area between Park Lake and Brookfield
 - Brownfield – Elevation Project – in Smith Drain
- Land Preservation:
 - Commissioner Kielbaso mentioned a 40-acre addition to the Towar Woods with help from a grant from the US Forest Service
 - June 15 at 10am – there will be a work day to remove invasive species on the Serafine Property. Meet at the dead end of Del Mar
 - Kelsey Dillon recently had 100+ students at the Davis-Foster Farm project planting seeds with mudballs
- Energy:
 - The Meridian Energy Team is sponsoring 5 solar open houses in June
 - The focus is on the neighborhood level – invite neighbors, friends, co-workers
 - Still working on the 100% goal of renewables. We've had discussions with Michigan Energy Options
- Brownfield Redevelopment Authority: June 20 meeting is scheduled. Several topics already mentioned.
- Green Team: Mentioned in Staff Update

PUBLIC REMARKS: None

MEETING ADJOURNED: 8:30pm

Staff Update – June/LeRoy

Solar Rain Garden and Bioswale is being designed at the municipal complex.

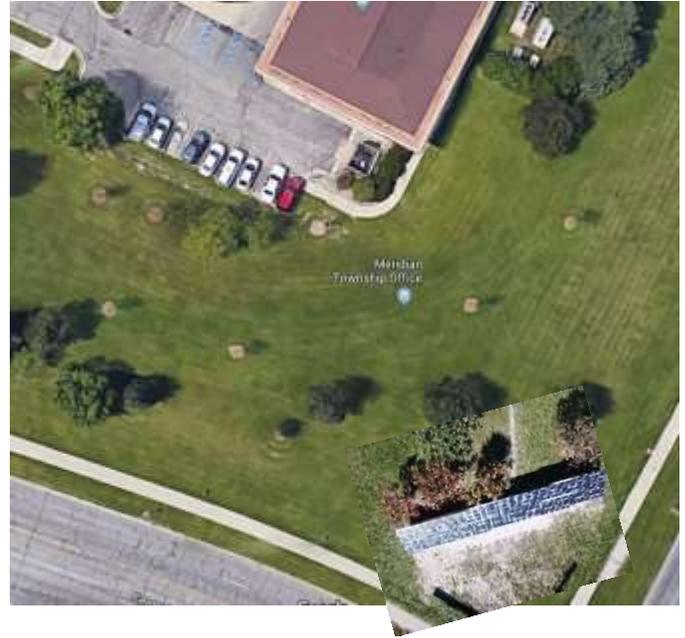
Rain Garden Factsheet/Resources

Park Lake/Burcham Roundabout Work Morning 6/10 at 10am -

Public Works Brochure (in the works ;-)

Recycling

- Multifamily – Hamilton Trace Apartments (Elizabeth Stepnowski)
- Electronics Recycling



Secrets to Success in Apartments

- On-going education and outreach
- Strong economic incentives to increase motivation
- Support from specific properties and management
- Clear and effective container signage
- Adequate indoor and outdoor recyclables storage
- On-site volunteers/staff engaged in recycling success

Other:

Energy: Tours in June, Streetlighting Update: June 12 at 12:30 in Lansing – Interest?, Submission to Michigan Sustainability Conference:
https://www.michigan.gov/egle/0,9429,7-135-3308_3333-393527--,00.html for Solarize Meridian.

PAH – hope to bid for non-coal-tar sealcoat on Municipal Lot after Celebrate Meridian

Environmental Stewardship Awards:

<https://www.surveymonkey.com/r/envirosteward>



To: Environmental Commission

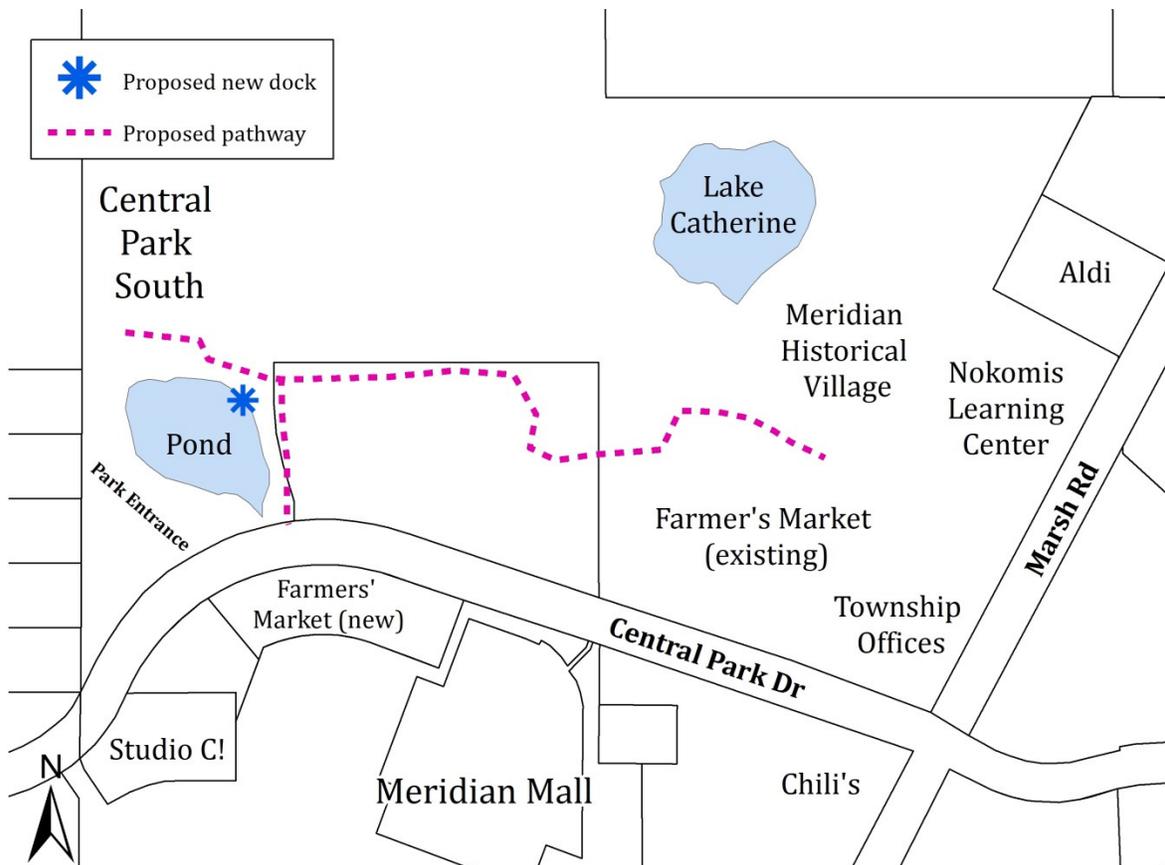
From: Peter Menser, Principal Planner

Date: July 2, 2019

Re: Wetland Use Permit #19-02 (Meridian Township Parks Department), fill regulated wetlands to construct pedestrian/bicycle trail on the north side of Central Park Drive, west of Marsh Road.

The Meridian Township Parks Department has requested a wetland use permit to fill approximately 1,830 square feet of wetland area at 5151 Marsh Road to facilitate the development of a pedestrian/bicycle pathway. The 12 foot wide paved pathway is proposed to run approximately 2,400 linear feet from Central Park South to the Meridian Historical Village. The pathway will be installed on portions of two parcels; 1990 Central Park Drive, an undeveloped 8.81 acre parcel owned by Meridian Township, and 5151 Marsh Road, a 137 acre parcel owned by Meridian Township and used for Township offices, sports fields, and parkland.

Location Map



**Wetland Use Permit #19-02 (Meridian Township Parks Department)
Environmental Commission (July 10, 2019)
Page 2**

The project entails installation of the pathway, a new fishing dock at the Central Park South pond, and the replacement of the bridge over the drain between the existing Farmers' Market and the Meridian Historical Village. The pathway is mostly paved, with the exception of an area through a wetland where the pathway transitions to a wooden boardwalk. A wetland use permit is required for proposed wetland impacts to the bridge replacement over the drain, which will include filling approximately 1,830 square feet of wetland area. A special use permit (SUP #19061) is being reviewed concurrently for work in the floodplain to construct the pathway.

The Township's wetland consultant Fishbeck, Thompson, Carr, & Huber, Inc. (FTCH) delineated the wetland around the project area in 2018. The wetland area delineated by FTCH, which is a portion of an approximately 131 acre wetland, has both emergent, scrub-shrub, and forested wetland characteristics. Wetland 15-2C is regulated by both the State of Michigan and Meridian Township as it is over five acres in size and associated with an adjacent body of water (pond).

The Wetland Protection Ordinance requires wetland mitigation at a minimum ratio of 1.5 to 1 in order to satisfy the Township requirement of no net loss of wetlands. Approximately 4,100 square feet of wetland mitigation located on the north side of the Central Park South pond is proposed to compensate for the loss of wetland.

The Planning Commission will hold a public hearing on the wetland use permit at its meeting on July 8, 2019 and is likely to take action on the request at its meeting on July 22, 2019 after receiving feedback from the Environmental Commission.

Staff Analysis

There are eleven general criteria provided in the Wetland Protection Ordinance, Section 22-157(2) of the Code of Ordinances, that must be considered when deciding whether to grant a wetland use permit. These include (paraphrased):

- a. The relative extent of public and private need for the proposed activity.
- b. Availability of prudent and feasible alternatives.
- c. Extent and permanence of beneficial or detrimental effects from the activity.
- d. Probable impact of the proposal in relation to the cumulative effect by other activities in the watershed.
- e. Probable impact on recognized historic, cultural, scenic, ecological, or recreational values, as well as on public health and safety or fish and wildlife.
- f. Economic value of the proposed land change.
- g. The size and quality of the wetland being considered.
- h. The findings of necessity for the proposed activity by other agencies.
- i. Amount of wetland remaining in the general area and proximity to a waterway.
- j. Proximity to any water body.
- k. Extent to which upland soil erosion adjacent to the wetland is controlled.

**Wetland Use Permit #19-02 (Meridian Township Parks Department)
Environmental Commission (July 10, 2019)
Page 3**

The Township's environmental consultant has reviewed the wetland use permit application and recommends issuance of Wetland Use Permit #19-02 subject to the following conditions:

1. Construct a mitigation wetland on the north shore of the site's pond, as indicated on Sheet No. C3.0 of the project plans. The mitigation wetland must be at least 2,745 square feet in size to compensate for filled wetland at a ratio of 1.5:1. The mitigation wetland should consist of emergent wetland.
2. Submit a wetland mitigation plan, including a grading plan, planting plan, construction methods and timing, a species list of the native, wetland seed mixture (including scientific and common names), and seeding rates.
3. Submit a wetland restoration plan for the temporary wetland impact areas adjacent to the pond's fishing deck and the wetland boardwalk, including the proposed wetland seed mixture, seeding rate, seeding schedule, and seedbed preparation.
4. Monitor the wetland mitigation area and the temporary wetland impact areas for five years after construction to verify the presence of wetland vegetation and hydrology. After the first full growing season, provide the Township an annual monitoring report by January 31 of the following year.
5. The performance standards for the wetland mitigation and restoration areas are:
 - a. Sixty percent cover of native wetland plant species.
 - b. Ten percent cover or less of invasive species.

A permit application is currently under review by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for the proposed wetland fill. If the Environmental Commission considers recommending approval of the wetland use permit, staff suggests conditioning the approval on the applicant receiving the EGLE permit as well as the conditions identified by the Township's wetland consultant.

Environmental Commission Options

The Environmental Commission has the option to recommend approval, approval with conditions, or denial of Wetland Use Permit #19-02. A motion to recommend approval in accordance with the conditions proposed by the Township's wetland consultant is provided.

- **Motion to recommend approval of Wetland Use Permit #19-02 to fill 1,830 square feet of regulated wetland to construct a pedestrian/bicycle pathway on the north side of Central Park Drive, west of Marsh Road subject to the conditions proposed by the Township's wetland consultant and approval of the project by EGLE.**

Attachments

1. Joint permit application dated June 25, 2019.
2. Site plan prepared by Wolverine Engineers & Surveyors, Inc. dated April 29, 2019 (revision date June 25, 2019) and received by the Township on June 27, 2019.
3. Wetland delineation prepared by FTCH dated September 6, 2018.
4. Township wetland consultant review letter dated June 25, 2019.

Digital MDEQ/USACE Joint Permit Application Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas

Digitally signed by:
nForm_nCore_MiWaters_Cert
HCV761WATRPWA01.dnz-ad.state.mi.us
Date: 2019.06.25 11:22:21 -04:00
Reason: Copy Of Record
Location: State of Michigan

version 1.3

(Submission #: HNN-9CQS-T09NZ, version 4)

Details

Form Alias Digital MDEQ/USACE Joint Permit Application (JPA) for Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas

Submission # HNN-9CQS-T09NZ

Submission Reason New

Status Submitted

Fee \$100.00 (Paid)

Form Input

Instructions

[To download a copy or print these instructions. Please click this link \(recommended\).](#)

The MDEQ/USACE "Joint Permit Application" (JPA)

READ THOROUGHLY BEFORE STARTING THE FORM

It is recommended to download a pdf of this page at www.michigan.gov/jointpermit for reference while filling out the form. Please also refer to this website for additional information regarding this form, including a glossary and other helpful resources on information required to be submitted in this form.

This is the Joint Permit Application (JPA) for construction activities where the land meets the water. This application covers permit requirements derived from state and federal rules and regulations for activities involving:

Wetlands
Floodplains
Marinas
Dams
Inland Lakes and Streams
Great Lakes Bottomlands
Critical Dunes
High Risk Erosion Areas

This application prevents duplication of state and federal forms for these activities and provides concurrent review under all pertinent state and federal laws. In the case of U.S. Army Corps of Engineers (USACE) jurisdiction, the Department will also send a copy of this Joint Permit Application to the USACE for simultaneous processing. The Department will provide coordination between state and federal agencies during the application review.

This application form is set up with the following sections to be completed by the applicant (note that it is recommended to gather all this information prior to starting this form):

Contact Information:

Applicant, Property Owner(s), Consultant(s), and any other Authorized Representative(s)

Authorizations are required from the property owner for:

- when the applicant is not the owner,
- when there is a consultant/representative for the applicant,

- when spoils disposal locations are not on site,
- when other permissions are necessary based on project specifics and are identified by the form.

Project Location Information:

Address, coordinates, and directions to the site, etc.

Background Information:

Existing site conditions, other related permits, existing easements/encumbrances, other related application numbers (pre-application meetings, Wetland Identification Program, etc.)

Permit Application Category and Public Notice Information:

This section asks what permit application category you believe fits your project. While this is not required to submit the application, knowing this will also help you submit the right permit application fee and avoid a correction request and processing delays.

The choices of permit application categories to select in the form are:

General Permit, \$50 fee (Link to General Permit Categories)

Minor Project, \$100 fee (Link to Minor Project Categories)

Public Notice Individual Permit, range from \$500-\$4,000 depending on type of activity. Additional fees may be applied for some special project requirements such as hydraulic analysis, dam projects, and critical dune or high risk erosion areas. See Fee Schedule on website for more information.

Unsure, select this and the permit reviewer will make the determination on permit type after the application is submitted based on the project details. However, some fee is required to be submitted with the application. If an additional fee is required, the Department will send a correction request that will show the remaining amount required. The application will not be considered complete without the proper fee.

Adjacent Landowner contact information for Public Notice projects is required by law. This includes any parcels touching the project parcel and parcels across the street.

Project Description:

Information on the Proposed Use and Purpose of the project (who and what the project is intended for and why is it needed). This includes a written summary of the project as well as a list of project uses and types to select from as follows:

Project Use Selections:

Private

Commercial

Public/Gov/Tribal

Federal/State funded

Non-Profit

Other

Project Type Selections:

Agriculture

Airport

Development- Condo/ Subdivision/Residential

Development-Commercial/ Industrial

Drain-County

Drain-Private

Drawdown

Lake, Drawdown

Wetland Forestry

Landfill

Marina/Mooring Facility

Marine Railway

Mining-Mineral,

Mining-Sand and Gravel

Private Residence

Restoration-Wetland

Restoration-Stream

Transportation

Septic System Surveying or Scientific Measuring Device

Utility-Electrical, Fiber optic

Utility-Oil and gas pipelines

Utility-Sewer/water line

Other

Construction Details including sequencing, timeframes, SESC measures, etc.

Alternatives Analysis detailing all options considered and why this is the least impactful feasible and prudent proposal. The depth of this analysis is typically commensurate with the size and purpose of the project and at minimum should include variables such as alternate locations (including other properties), configurations and sizes (layout and design), and methods (construction technologies), and other constraints (local regulations, resource issues). Discussion should also include why the "do nothing" alternative is not feasible or prudent.

Project Compensation:

Narrative of how proposed impacts will be compensated (mitigated or other minimization measures), including amount, location, and method; or why mitigation should not be required. This can be traditional mitigation and/or other techniques used to minimize overall loss of functions.

Resource and Activity Type. This section is intended to determine what additional sections of the application are generated (as seen on the left side of the screen) for further information gathering. This includes questions regarding what Resource feature is involved (e.g., wetland, stream, floodplain, pond, dam, critical dune, etc.) and if there are identified Special Activities (i.e., activities requiring a specific series of questions to be answered). Be sure to choose all that apply to your project. If your activity is not listed, choose "None of the Above" and move on to the next question. More specific activity questions will appear later based on the resource section answers.

Resource Information and Impacts Sections (Multiple Sections). These are a series of sections that will appear on the left side of the screen based on your answers to the Resource and Activity Types section. You will input further information on the existing resources to be impacted (e.g., wetland type, permanent or temporary impact, water elevation data, drainage area, etc.) and all proposed Project Activities with their Dimensions (e.g., length, width, depth, square footage). For example, when "Wetland" is selected as a resource that your project will involve, a "Wetland Project Information and Impacts" section will appear on the left side of the screen that includes questions specific to gathering information about the wetland.

For projects including Floodplains, Marinas, Dams, Critical Dunes, or High Risk Erosion Areas individual sections will appear on the left side of the screen that include different sets of specialized questions as required by those programs. These sections do not share a specific format. Help tips will guide you in filling out these sections.

For projects including wetlands, ponds, inland lakes, streams, or the Great Lakes resources, individual sections will appear on the left side of the screen that are similar in format to each other. Each of these resource sections asks initial general information and then has additional questions regarding the Types of Activities proposed for each resource. The outline for these resource activity impacts questions is Activity Type, Dimensions Table, and Special Questions.

There are four overall "Types of Activities" groups for wetlands, ponds, inland lakes, streams or the Great Lakes:

- Fill Activities
- Dredge Activities
- Structure Activities
- Other Activities

Under each of these Types of Activity questions, specific activity lists will be shown that are typical for that type (fill, dredge, structure, other) and resource (wetland, lake, stream, etc). Follow these steps to accurately fill out the Activity Type Questions:

1. Start with the Fill question and choose any activities on the list that is included in your project. If your activity is not shown, then select "None of the Above" and move to the next question.
2. When you select an activity listed under Fill, Dredge, Structure, or Other, a dimensions table will appear under that question. This table is where you enter EACH activity OF THE TYPE YOU SELECTED and associated dimensions. Be sure that all the activities you selected are also listed in the table with the dimensions. Multiple activities covering the same footprint may be combined on one line in the table (for example, riprap on slopes of driveway fill can be entered on the same impact dimensions line and does not necessarily need to be broken out).
3. Continue to answer the Activity Type questions (Fill, Dredge, Structure, Other) until all have been answered with either a specific Activity listed under that Type or "None of the Above". If you did not find your activity in any list then select "Other, Other" and provide a description of your activity in the space that appears. Please be as descriptive as possible.

Proposed mitigation questions may appear within specific resource types sections based on your answers. Enter any proposed mitigation in the appropriate section (wetland, stream, etc.) and if no mitigation is proposed you must provide commentary with an explanation as to why it is not required. Mitigation plans according to the mitigation checklist ([link](#)) are required for a complete application. When mitigation is proposed be sure to also select mitigation in the Permit Application Type section under the second question.

In the above sections, uploads will be prompted as required by the answers to questions. These should be uploaded in these location (ex, mitigation plans should be uploaded in the mitigation section). Please do not wait to upload one large document with all plans combined at the end. Note that each individual upload is limited to 10M.

Upload of Proposed Site Plans.

Any plans or explanatory narratives not requested in previous sections should be uploaded in this section. Construction Plans

including overhead view, cross sections, and profiles showing each impact either to-scale or with dimensions are required and typically would be uploaded here. Plan labels should correspond with labels entered in the form for each activity selected. The application will not be complete without the proper site plans. If drawings are not received with all required dimensions and resources identified, then the Department will send a correction request and your application processing will be delayed. However, please limit drawings, plans, and narratives submitted to the items necessary for permit review. For example, entire bid package documents and CAD drawings are often not helpful for permit review and may cause delays from wading through extraneous information. Plans, profiles and cross sections specific to the resource impacts are the most helpful.

Review:

This section allows you to see the entire form with the answers you entered. Please review for accuracy prior to hitting the submit button. A print option is provided on this screen (print to PDF is recommended). Once the application is submitted you may not make changes to it until the application has been assigned to a staff person.

Certify & Submit:

This is the final section of the application form. The "Submit Form" button selection certifies that all information in the application is true and accurate and that you have the authority to apply for the permit as indicated. This application will become part of public record.

We recommend that you have the above information ready prior to starting this application. You will be able to save in-progress applications and come back later, but all required uploads and questions are necessary before the system will allow submittal of the application. Some sections of this application form load faster than others depending on the complexity of the questions. Thanks for your patience while you work through the application. For assistance with this form visit: <https://www.michigan.gov/jointpermit>

[Click here for additional information on maps, drawings, and other attachment](#)

Contact Information

Applicant Information

Contact

First Name **Last Name**
LUANN MAISNER

Organization Name
MERIDIAN TOWNSHIP

Phone Type **Number** **Extension**
Business 5178534604

Email
MAISNER@MERIDIAN.MI.US

Address
2100 GAYLORD C SMITH CT
HASLETT, MI 48840

Is the Property Owner different from the Applicant?

No

Has the applicant hired an agent or cooperating agency (agency or firm assisting applicant) to complete the application process?

Yes

Upload Attachment for Authorization from Agent

[Authorization letter from Meridian TWP.pdf - 03/21/2019 10:58 AM](#)

Comment

NONE PROVIDED

Agent Contact

Contact

First Name **Last Name**
HUSSEIN KHANJAR

Organization Name
WOLVERINE ENGINEERS AND SURVEYORS, INC

Phone Type **Number** **Extension**
Business 5176769200

Email
Husseink@wolveng.com

Address
312 NORTH ST
MASON, MI 48854

Are there additional property owners or other contacts you would like to add to the application?
No

Project Location

DEQ Site Reference Number (Pre-Populated)
-1218853060970978068

Project Location
42.72956284193838,-84.41924173904147

NONE PROVIDED

Project Location Address
1990 CENTRAL PARK DRIVE
OKEMOS, MI 48864

County
Ingham

Is there a Property Tax ID Number(s) for the project area?
No

Is there Subdivision/Plat and Lot Number(s)?
No

Is this project within Indian Lands?
No

Local Unit of Government (LUG)
Meridian Township

Directions to Project Site
TAKE OKEMOS RD NORTH TO CENTRAL PARK DRIVE IN MERIDIAN TOWNSHIP, MAKE RIGHT AND THE PROJECT LOCATION WILL BE ON THE LEFT

Background Information

Has the DEQ and/or United States Army Corps of Engineers (USACE) conducted a pre-application meeting/inspection for this project?
No

Has the DEQ completed a Wetland Identification Program (WIP) assessment for this site?
No

Environmental Areas are coastal wetlands on the shorelines of the Great Lakes. Enter this number only if a designated Environmental Area is in the proposed project area. Environmental Areas are designated locations along the Great Lakes shoreline. If you don't know whether there is an environmental area within the project area, leave blank. Additional information on Environmental Areas can be found by clicking the following link:
[Click Here for Link](#)

Environmental Area Number (if known):
 NONE PROVIDED

Has the United States Army Corps of Engineers (USACE) completed either an approved or preliminary jurisdictional determination for this site?
 No

Were any regulated activities previously completed on this site under a DEQ and/or USACE permit?
 No

Have any activities commenced on this project?
 No

Is this an after-the-fact application?
 No

Are you aware of any unresolved violations of environmental law or litigation involving the property?
 No

Is there a conservation easement or other easement, deed restriction, lease, or other encumbrance upon the property?
 No

Are there any other federal, interstate, state, or local agency authorizations associated with this project?
 Yes

List all other federal, interstate, state, or local agency authorizations.

Agency	Type of Approval	Number	Date Applied	Approved/Denied/Undetermined
INGHAM COUNTY DRAIN OFFICE	SOIL EROSION	NONE PROVIDED	NONE PROVIDED	NONE PROVIDED

Comments
 THE SOIL EROSION PERMIT APPLICATION IS NOT SUBMITTED YET

Permit Application Category and Public Notice Information

Indicate the type of permit being applied for.
 DEQ Minor Project for wetlands, lakes, streams, floodplains, or Great Lakes

General Permit Categories
[Link to General Permit Categories with Descriptions](#)

Minor Project Categories
[Link to Minor Permit Categories with Descriptions](#)

Floodplain Minor Project Categories
 See R323.1316 in the linked document for a description of the minor project categories for Floodplain projects.
[Link to Minor Project Category descriptions for Floodplain Only projects](#)

If you are applying for a minor project permit, which project type(s) is being proposed?
 Floodplain Only MP Deck
 Floodplain Only MP Boardwalk

If you are applying for a general permit, which project type(s) is being proposed?
 No GP Category (MP Category only)

Project Description

Project Use: (select all that apply - Private, Commercial, Public/Government/Tribal, Receiving Federal/State Transportation Funds, Non-profit, or Other)

Public/Government/Tribal

Project Type (select all that apply):

Other: PARKS AND RECREATIONAL DEVELOPMENT

Please enter your answers in the text box for the next four questions. If you have a long description, please use the document upload at the end of the section. Please make every effort to enter your information directly into the application text boxes. If the answer is in an attachment, please identify that in the text box below.

Project Summary: Provide a summary of all proposed activities including the intended use and reason for the proposed project.

THIS PROJECT CONSISTS OF CONSTRUCTING 2400 LF OF 12 FT WIDE BITUMINOUS PAVEMENT TRAIL, INCLUDING 360 LF OF BOARDWALK WILL BE CONSTRUCTED OVER THE WETLAND. THE REASON FOR THIS PROJECT IS TO CONNECT THE MERIDIAN CENTRAL PARK TO THE SOUTH CENTRAL PARK .

Project construction sequence, methods, and equipment: Describe how the proposed project timing, methods, and equipment will minimize disturbance from the project construction, including but not limited to soil erosion and sedimentation control measures.

INSTALL HELICAL PIERS FOR BOARDWALK AND FISHING DECK FOUNDATION.

Project Alternatives: Describe all options considered as alternatives to the proposed project, and describe how impacts to state and federal regulated waters will be avoided and minimized. This may include other locations, materials, etc.

GMEN THE PROPOSED LOCATIONS FOR THE PATHWAY ENDS AND GIVEN THE WETLANDS DELINEATION BOUNDARIES, AND USING THE HELICAL PEIRS WILL PROVIDE THE LEAST IMPACT TO THE WETLANDS AND PROVIDE THE LEAST RESTRICTION TO THE FLOODWAY.

Project Compensation: Describe how the proposed impacts to state and federal regulated waters will be compensated, OR explain why compensatory mitigation should not be required for the proposed impacts. Include amount, location, and method of compensation (i.e., bank, on-site, preservation, etc.)

THE MIXED USE PATHWAY WILL BE CONSTRUCTED WITH MATERIALS AND METHODS THAT WILL ESSENTIALLY ELIMINATE OR WILL HAVE A MINIMAL IMPACT

Upload any additional information as needed to provide information applicable to your project regarding project purpose sequence, methods, alternatives, or compensation.

NONE PROVIDED

Comment

NONE PROVIDED

Resource and Activity Type

Important! Answer all questions completely. Properly identifying your project in this section generates the proper application sections. Incomplete applications will require corrections before they can be fully processed.

SELECT THE ACTIVITIES from the list below that are proposed in your project (check ALL that apply). If you don't see your project type listed, select "Other Project Type". These activities listed require additional information to be gathered later in the application.

Other Project Type

The Proposed Project will involve the following resources (check ALL that apply).

Wetland

100-year Floodplain

Major Project Fee Calculation Questions

Is filling of 10,000 cubic yards or more proposed (cumulatively) within wetlands, streams, lakes, or Great Lakes?

No

Is dredging of 10,000 cubic yards (cumulatively) or more proposed within streams, lakes, or Great Lakes? (wetlands not included)

No

Is new dredging or adjacent upland excavation in suspected contamination areas proposed by this application?

No

Is a subdivision, condominium, or new golf course proposed?

No

Wetland Project Information and Impacts

PLEASE READ

This section is for entering information regarding the impacts to Wetlands only. Do not input information that pertains to other resources (inland lakes, streams, floodplains, etc.). The initial questions are related to wetlands on the project site in general. The Proposed Activities questions are grouped into Fill, Dredge, Structures, Other and are only for wetland impacts related to these activities.

[Click HERE for more information on Wetlands Protection Program.](#)

Has a professional wetland delineation been completed for this site?

Yes

Attach a copy of wetland delineation report with data form.

[Delineation report.pdf - 03/27/2019 11:24 AM](#)

Comment

NONE PROVIDED

Total acres of wetland affected by this project.

Category	Affected area (acres)
Permanent	0.2
Temporary	0
	Sum: 0.2

CORRECTION REQUEST (CORRECTED)

Provide a written description of the 0.2 acre impact to wetlands

The 0.2 acre impact to wetland is not demonstrated in the tables, and needs a written description to be clear to the reader. Please provide a narrative statement listing each proposed construction item located in WETLAND and the associated square feet of wetland to be impacted.

2 COMMENTS

Hussein Khanjar (husseink@wolveng.com) (5/24/2019 8:58 AM)

a. The elevation of the existing wetland closely matches the 100-year floodplain in this area. We have determined the fill volume in the wetland area to match the volume of the fill in the 100-year floodplain for this area (142 CYD). If the additional fill volume from the wetland elevation to the proposed final grade is required for any reason just let us know and we can provide this data as well.

Hussein Khanjar (husseink@wolveng.com) (5/1/2019 3:41 PM)

The 0.2 Acres refer to three areas shown on sheets C9.0 and C9.1 included with our revised submittal. Fishing pier = 1,000 sft (temporary) Boardwalk = 4,660 sft (temporary) Crossing = 3,150 sft (permanent)

Is filling or draining of 1 acre or more (cumulatively) of wetland proposed?

No

Select all wetland types that will be affected by this project:

Emergent

The following questions gather information on the specific Types of Activities your project includes that will impact WETLANDS. There are four overall Types of Activities: Fill, Dredge, Structure, Other. Under each of the Activity Type questions, specific activity lists will be shown. If the activity is not shown in the list given, select None of the Above and move to the next question. When you select an activity under Fill, Dredge, Structure, or Other, a table will appear

under that type. Only enter the dimensions of the activity that are within wetland. Multiple activities covering the same footprint may be combined on one line in the table. Continue to answer the Activity Type questions (Fill, Dredge, Structure, Other) until all have been answered with either a specific Activity listed under that Type or "None of the Above". If you did not find your activity in any list then select "Other, Other" and provide a description of your activity.

If your project includes placing fill in wetland then select the proposed activities from the following list. If your activity is not shown, then select "None of the Above" and move to the next question. Only enter an impacted area in one of the impact tables (do not duplicate impact entries):

Path/Sidewalk

Complete this table for projects involving Fill. Enter each activity/ location that corresponds with each activity selected in the previous question and enter the dimensions. Activities may be entered in one line of the table if they occupy the same impact footprint and cannot be broken out separately (Example: Activity - Driveway and Riprap slope). Multiple activities in different locations should be listed on different lines of the table.

Activity	Length (feet)	Width (feet)	Depth (feet)	Area (square feet)	Volume (cubic feet)	Volume (cubic yards)
PATHWAY	50	27	5	1350	6750	250
PATHWAY	200	24	2.1	4800	10080	373
				Sum: 6150	Sum: 16830	Sum: 623

Source of Fill Material:

On-site (show on plan)

Type of Fill.

Sand

Is riprap proposed?

No

Select from the following list for Excavation/Dredge Activities (if your proposed project is primarily a structure enter the impact as a structure. Only enter an impacted area in one of the impact tables in one impact section):

None of the above

If your project includes STRUCTURES IN WETLAND then select all of the proposed activities in the following list. If your activity is not shown, then select "None of the Above" and move to the next question. Only enter an impacted area in one of the impact tables (do not duplicate impact entries):

Boardwalk

Deck/Platform

Projects involving Structures:

Activity	Length (feet)	Width (feet)	Depth (feet)	Area (Sq. feet)	Volume (cubic feet)	Volume (cubic yards)
BOARDWALK	360	12	2	4320	8640	320
DECK	55.12	16	2	881.92	1763.84	65
DECK	20	36	2	720	1440	53
				Sum: 5921.92	Sum: 11843.84	Sum: 438

CORRECTION REQUEST (CORRECTED)

Clarify Wetland Impact area (2 parts)

Please clarify the volume of fill or excavation related to the boardwalk and fishing deck. Specifically list the volume of excavation associated with installing pilings or leveling the existing grade to prepare to install the pilings of the boardwalk and fishing pier. Also identify the disposal location of spoils (non-wetland, non-flood plain, and on township owned property). Part 2: Sheet C8.0 shows 180 feet of 15" RCP and a new bioswale over the 15" pipeline. This appears to be work in wetland and a replacement of existing pipe. This work is not listed in the application but shown on plans and does not appear to be associated with or included in the trail head path work. Provide wetland impact details of area and volume for the pipe replacement.

1 COMMENT

Hussein Khanjar (husseink@wolveng.com) (5/1/2019 3:44 PM)

Please see the newly added "Correction Request Statement" file for further explanation of work in referenced project areas.

Is the structure proposed on pilings or fill or both?

Pilings

How high above the ground is the bottom of the structure?

2.5

If your project includes Other Activities in WETLAND not listed in this section, then select from the proposed activities in the following list. If your activity in Wetland has not been listed in this Wetland Section, then select "Other" and enter a description of your activity. Only enter an impacted area in one of the impact tables (do not duplicate impact entries). If you selected a Fill, Excavation/Dredging, or Structure activity above in this section, but do not have an activity listed as Other, then select None of the Above for this question.

Structure Removal (except dam removal)

Wetland Mitigation

The DEQ may impose as a condition of any wetland permit, other than a General permit, a requirement form compensatory mitigation. The wetland mitigation requirement may be waived for projects affecting less than one-third of an acre of wetland if no reasonable opportunity for mitigation exists.

Mitigation plans according to the mitigation checklist (link) are required for a complete application

[Wetland Mitigation Information](#)

Is Wetland Mitigation being proposed as part of this proposed project?

No

Explain why no mitigation is proposed.

THE WETLAND DISTURBANCE IS LESS THAN 1/3 OF AN ACRE.

Floodplain

Proposed Activity

Deck
Boardwalk

Please provide a name for the stream, river, channel, or waterbody:

N/A

100-Year Floodplain Elevation (feet)

842.1

100-Year Floodplain Elevation Datum:

NAVD88

Is compensating cut provided for this project?

No

Is this project located in the floodway?

No

Were one or more Hydraulic Analyses completed for this project?

No

Local Unit of Government (LUG) Acknowledgement Letter Upload

NONE PROVIDED

Comment

NONE PROVIDED

Is there an existing building on site?

No

Upload of Proposed Site Plans

REQUIRED Application, maps, and drawings:

*Overall Project Site Plan

*Cross-Sectional Drawings

For Part 315 Dam Safety applications attach detailed signed and sealed engineering plans for a Part 315 dam repair, dam alteration, dam abandonment, or dam removal.

[Examples site plan and cross-sectional drawings](#)

[For additional information on maps, drawings, and other attachments visit michigan.gov/jointpermit](http://michigan.gov/jointpermit)

Required on all Site Plan uploads. Please identify that all of the following items are included on your plans that you upload with this application.

Site Plan Features	Existing and Proposed Plan Set
Scale, Compass North, and Property Lines	Yes
Fill and Excavation areas with associated amounts in cubic yards	Yes
Any rivers, lakes, or ponds and associated Ordinary High Water Mark (OHWM)	Yes
Exterior dimensions of Structures, Fill and Excavation areas associated with the proposed project	Yes
Dimensions to other Structures and Lot Lines associated with the project	N/A
Topographic Contour Lines from licensed surveyor or engineer when applicable	Yes

CORRECTION REQUEST (CORRECTED)

Clarify plan table on sheet C4.0

The plan table shows 1173.63 cy of cut and 1260.80 cy of fill, however it is unclear if these volumes pertain to flood plain only or flood plain and wetland combined. Please update the plan table to show the volumes associated with Part 31 and Part 303.

1 COMMENT

Hussein Khanjar (husseink@wolveng.com) (5/1/2019 3:50 PM)

Table has been removed from plans as it related to cut and fill for the entire project and not just work within floodplain/wetland areas. Please see "Correction request statement" and notes/cross-sections shown on sheets C7.0 & C8.0 for additional cut/fill information.

Upload Site Plans and Cross Section Drawings for your Proposed Project

[MERIDIAN TRAIL AND RESTROOM - DNR SUBMITTAL SET - 062519.pdf - 06/25/2019 11:21 AM](#)

Comment

NONE PROVIDED

Additional Required and Supplementary Documents

[Correction request statement - JAL_042619.pdf - 05/01/2019 03:54 PM](#)

[RE_HNN-9CQS-T09NZ - LUANN MAISNER, MERIDIAN TOWNSHIP Flood Plain and Wetland Impacts..pdf - 05/24/2019 09:03 AM](#)

Comment

NONE PROVIDED

Fees

The application fee identified in this section is a calculation based on answers to the questions in this application. This calculation is an estimate of the total fee and will be reviewed by the application processor to determine if any additional fees are required for a complete application.

Minor Project Fee:
+\$100.00

CORRECTION REQUEST (CORRECTED)

Fee

The application fee for the project is \$500.00 minus the payment of \$100.00 submitted with your application, leaving a balance due of \$400.00.

1 COMMENT

Hussein Khanjar (husseink@wolveng.com) (5/1/2019 3:56 PM)

We acknowledge that an additional fee of \$400.00 is due however this field does not appear to be editable. Please let us know how and where to submit additional funds and we will complete payment ASAP.

Total Fee Amount:

\$100.00

Status History

	User	Processing Status
6/25/2019 11:16:31 AM	Hussein Khanjar	Draft
6/25/2019 11:21:56 AM	Hussein Khanjar	Submitted

Audit

Event	Event Description	Event By	Event Date
Submission Locked	Submission Locked	Carol Valor	4/15/2019 12:51 PM
Submission Unlocked	Submission Unlocked	Carol Valor	4/15/2019 2:10 PM

Revisions

Revision	Revision Date	Revision By
Revision 1	3/15/2019 12:47 PM	Hussein Khanjar
Revision 2	5/1/2019 3:25 PM	Hussein Khanjar
Revision 3	5/24/2019 8:55 AM	Hussein Khanjar
Revision 4	6/25/2019 11:16 AM	Hussein Khanjar

CONTRACT 1: HISTORIC VILLAGE GATEWAY AND RESTROOM

CONTRACT 2: CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR

1990 CENTRAL PARK DR, OKEMOS, 48864 MI

SECTION 15, MERIDIAN TOWNSHIP
INGHAM COUNTY, MICHIGAN

PUBLIC UTILITIES

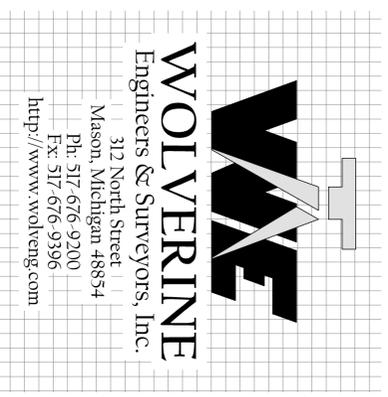
THE EXISTING UTILITIES LISTED BELOW AND SHOWN REPRESENT THE BEST INFORMATION AVAILABLE AS OBTAINED FROM SERVICE PROVIDER AND FIELD OBSERVATION. THIS INFORMATION DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO SATISFY HIMSELF AS TO THEIR ACCURACY OR OF HIS RESPONSIBILITY TO NOTIFY THE PROPER UTILITIES BEFORE COMMENCING WORK. THE FOLLOWING UTILITIES ARE LOCATED IN OR NEAR THE RIGHT OF WAY FOR THIS PROJECT.

NAME AND ADDRESS OF UTILITY	TYPE OF UTILITY
CONSUMERS ENERGY 1155 W. PARMALL RD. JSC 1733 JACKSON, MI 49201 PH: 517-788-1191 TYLER LAWRENCE	GAS/POWER
AT&T 337 N. ABBOTT RD. EAST LANSING, MI 48823 PH: 517-862-1882 WILLIE DILLARD, JR.	TELEPHONE LINES
INGHAM COUNTY DRAIN COMMISSION 707 BUHL STREET MASON, MI 48854 PH: 517-676-8395 FAX: 517-543-6446 PAT LINDEMANN	STORM SEWER
MERIDIAN TOWNSHIP 5151 MARSH ROAD OKEMOS, MI 48864 PH: 517-853-4000	SOIL EROSION

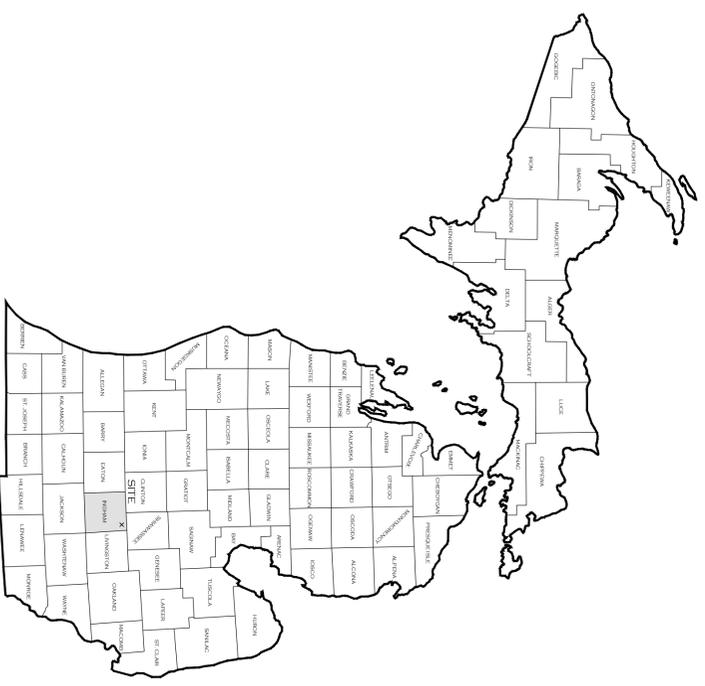
OWNERS OF PUBLIC UTILITIES WILL NOT BE REQUIRED TO MOVE POLES OR STRUCTURES THAT ARE NOT WITHIN GRADING OR STRUCTURE LIMITS IN ORDER TO FACILITATE THE OPERATION OF CONSTRUCTION EQUIPMENT. UNLESS IT IS DETERMINED BY THE ENGINEER THAT SUCH LINES OR STRUCTURES CONSTITUTE A HAZARD TO THE PUBLIC OR ARE EXTRA-ORDINARILY DANGEROUS TO THE CONTRACTOR'S OPERATIONS. (SEE SPECIAL PROVISIONS FOR UTILITY COORDINATION)

PARCEL DESCRIPTION:
COM @ THE SW COR SEC. 15 - N 0 DEG 34' 19"E. ON SEC LN 495.07 FT. - NELY ON CURVE LEFT ON R/W LN CENTRAL PARK DR 18.47 FT HAVING A 340 FT RADIUS AND A CHD OF 18.46 FT BRG N 24 DEG 46' 1"E. TO A PT OF REVERSE CURVATURE - NELY ON CURVE RT ON R/W 705.69 FT HAVING A 665 FT RADIUS & A CHD OF 673.04 FT BRG N 53 DEG 36' 53"E. TO THE POB - N 0 DEG 31' 51"E. 53.79 FT - N 16 DEG 28' 11"W. 95.26 FT - N 12 DEG 46' 09"W. 83.31 FT - N 04 DEG 34' 10"W. 83.88 FT - N 0 DEG 31' 51"E. 93.08 FT - S 89 DEG 28' 09"E. 831.33 FT - S 0 DEG 23' 50"E. 600.76 FT TO N/R/W LN - N 70 DEG 35' 39"W. ON R/W 515.35 FT ON R/W - SWEELY 294.70 FT ALONG AN ARC OF A 655 FT RADIUS CURVE LEFT TO THE POB SEC 15. 14N1R1W 8.81 AC

OWNER/AGENT CONTACT INFORMATION
OWNER: MERIDIAN TOWNSHIP
AGENT CONTACT: LUANN MAISNER
2100 GAYLORD C. SMITH COURT
HASLETT, MI 48840
PH: 517.853.4604
EMAIL: MAISNER@MERIDIAN.MI.US



LOCATION MAP
NOT TO SCALE

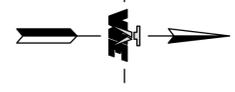
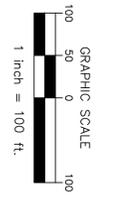
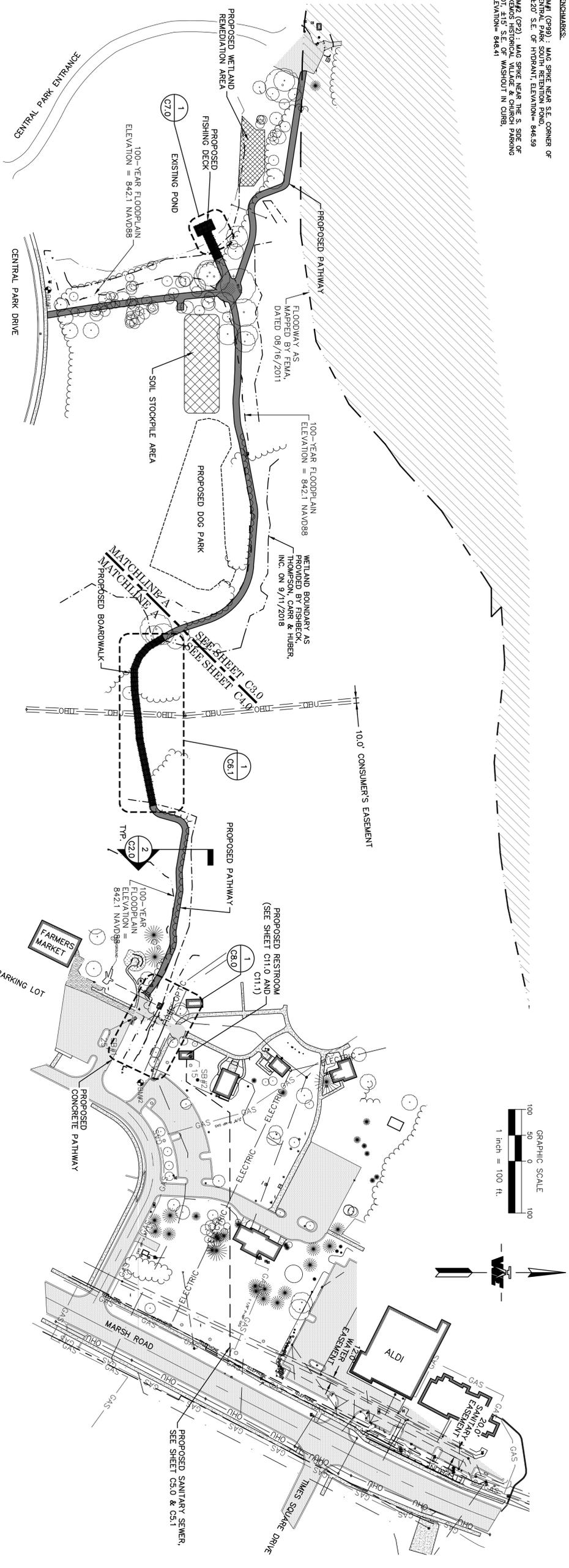


Sheet List Table

SHEET NUMBER	SHEET TITLE
C1.0 (#1) + (#2)	COVER
C2.0 (#2)	PATHWAY LAYOUT PLAN
C3.0 (#2)	PATHWAY PLAN AND PROFILE
C4.0 (#2)	BOARDWALK PLAN & PROFILE
C5.0 (#1)	SANITARY SEWER PLAN AND PROFILE
C5.1 (#1)	SANITARY SEWER PLAN
C6.0 (#2)	BOARDWALK DETAILS
C6.1 (#2)	BOARDWALK DETAILS
C7.0 (#2)	DECK PLAN AND PROFILE
C8.0 (#1)	ENLARGED PLAN (AREA 1)
C9.0 (#2)	SESC PLAN (WEST)
C9.1 (#1)	SESC PLAN (EAST) & NOTES
C9.2 (#1) + (#2)	SESC DETAILS
C10.0 (#1) + (#2)	DETAILS & NOTES
C10.1 (#1) + (#2)	DETAILS & NOTES 2
C11.0 (#1)	RESTROOM PLAN & ELEVATIONS

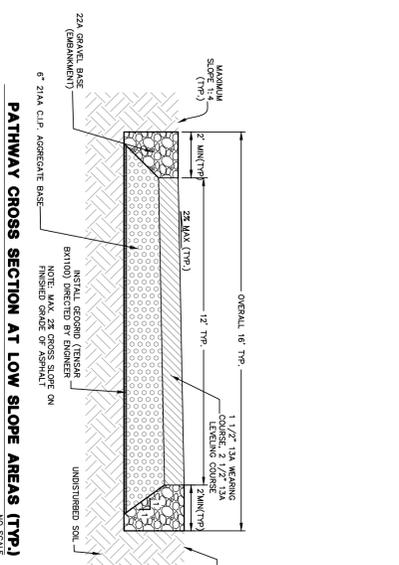
* (#1) : CONTRACT 1
* (#2) : CONTRACT 2

BENCHMARKS:
 BM#1 (CP99) : MASH SPIKE NEAR SE CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±2.0' S.E. OF HYDRANT, ELEVATION= 846.59
 BM#2 (CP2) : MASH SPIKE NEAR THE S. SIDE OF OWENS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±1.5' S.E. OF WASHOUT IN CURB, ELEVATION= 845.41

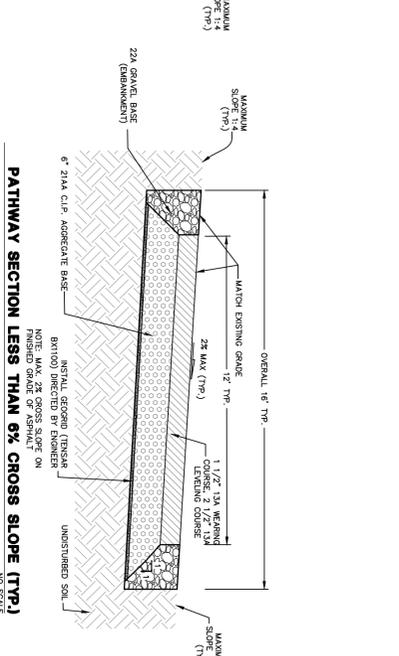


1 OVERALL SITE PLAN
 C2.0 SCALE: 1" = 100'

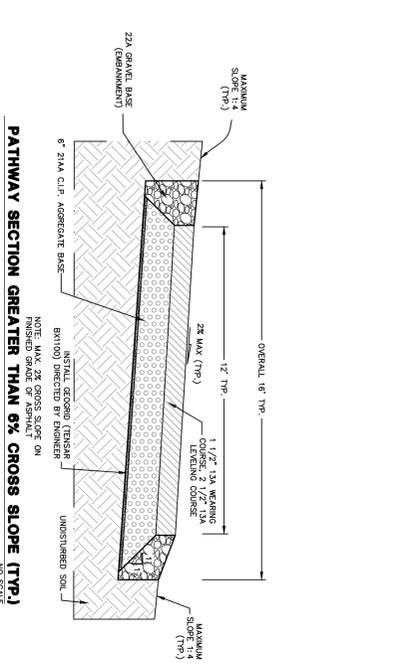
- EXISTING LEGEND**
- 90'--- MARK
 - 50'--- CONTOUR - MAN
 - 30'--- CONTOUR - MEN
 - 15'--- SANITARY SEWER
 - 15'--- STORM SEWER
 - 15'--- WATER MAIN
 - 15'--- OVERHEAD UTILITIES
 - 15'--- CURB
 - 15'--- WETLAND BOUNDARY
 - 15'--- SURFACE WATER
 - 15'--- TREE LINE
 - 15'--- STRUCTURE
 - 15'--- ASPHALT
 - 15'--- CONCRETE
 - 15'--- GRAVEL
 - 15'--- BRICK
 - 15'--- LANDSCAPING
- EXISTING LEGEND**
- SANITARY MANHOLE
 - CLEAN OUT
 - GAS VALVE
 - PUMP
 - STORM MANHOLE
 - STORM CATCH BASIN
 - STORM DIV. SECTION
 - HYDRANT
 - WATER MAIN VALVE
 - SERVICE VALVE
 - WELL
 - WATER MANHOLE
 - LIGHT POLE
 - LIGHT POLE
 - GUY POLE
 - GUY WIRE
 - TRANSFORMER
 - TELEPHONE BOX
 - TELEPHONE RISER
- EXISTING LEGEND**
- LANDSCAPE STONE
 - MAILBOX
 - DECIDUOUS TREE
 - EVERGREEN TREE
 - SHRUB
 - SOIL BORING
 - BENCHMARK
 - ELECTRICAL RISER
 - ELECTRICAL PANEL
 - ELECTRICAL METER
 - GAS METER
 - AIR CONDITIONER
 - AIR UNIT FLAG
 - STREET SIGN



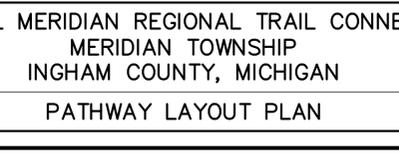
2 TYPICAL ASPHALT PAVEMENT CROSS SECTIONS
 C2.0 NOT TO SCALE



3 PROPOSED PATH CROSS SECTION
 C2.0 NOT TO SCALE



4 PROPOSED CONCRETE CROSS SECTION
 C2.0 NOT TO SCALE



Know what's below.
 Call before you dig.

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY OF THE INFORMATION PROVIDED. THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION SHALL BE DETERMINED BY THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2010.

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	04/29/19	JAL	GENERAL UPDATES
2	06/25/19	JAL	GENERAL UPDATES

WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517 676-9200
 Fax: 517 676-9396
 http://www.wolveng.com

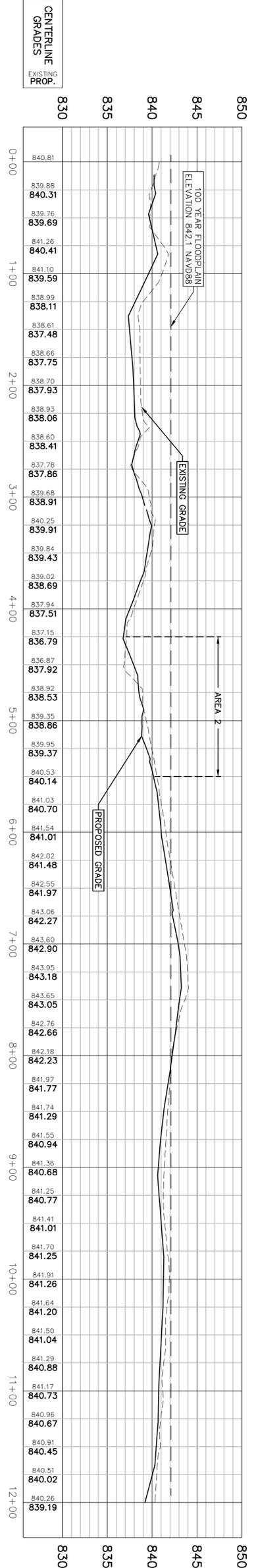
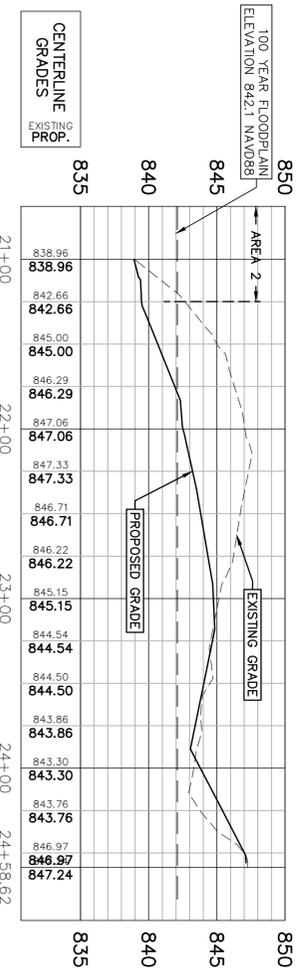
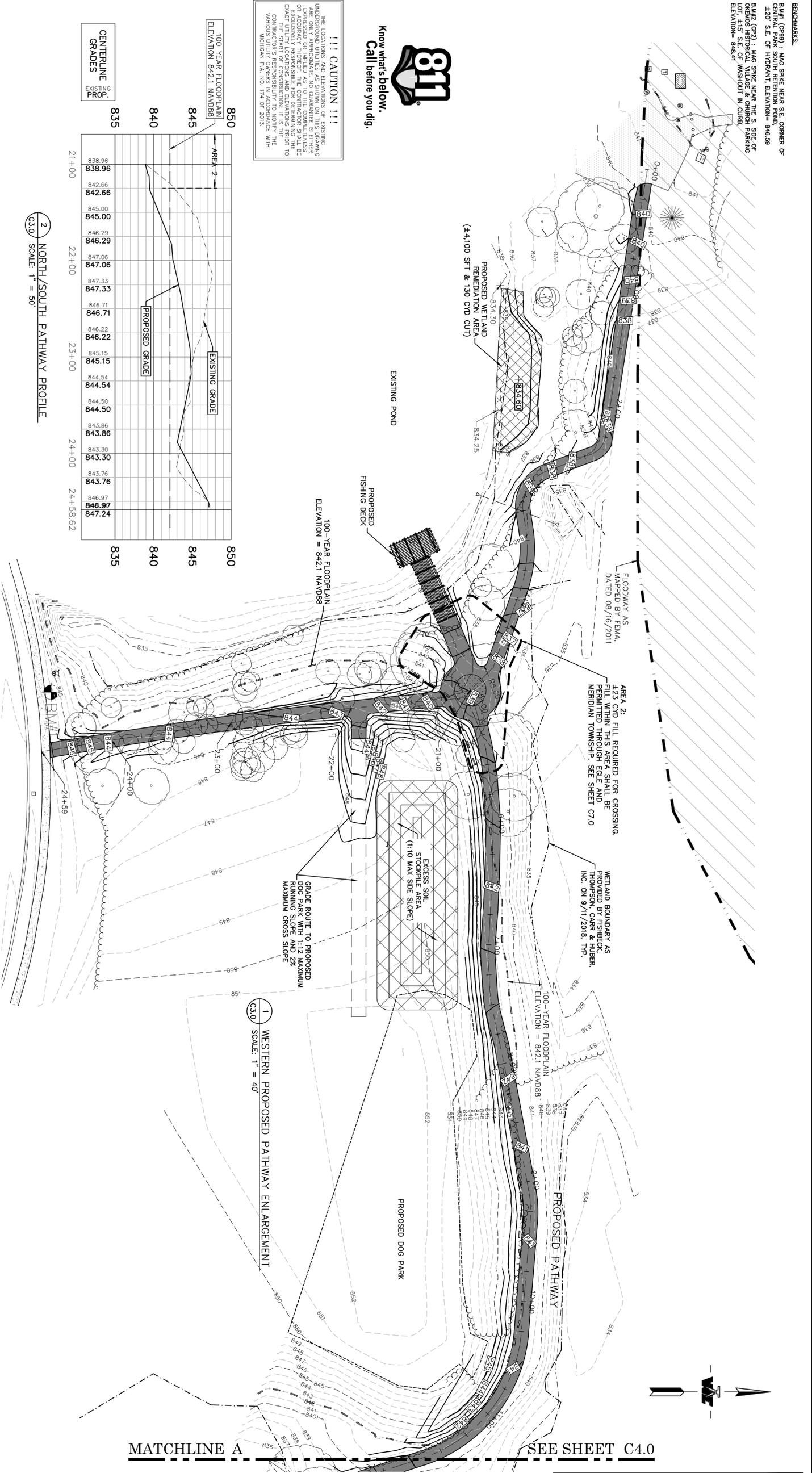
PROJECT	CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR MERIDIAN TOWNSHIP INGHAM COUNTY, MICHIGAN
APPROVED	DBH
CHECKED	DBH
DRAWN	HTR
JOB NO.	18-0066
DATE	4/18/2019
SCALE	AS NOTED
SHEET NO.	C2.0

BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR SE CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION = 846.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OZEMUS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION = 849.51



Know what's Below.
 Call before you dig.

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE CORRECTNESS OR ACCURACY OF ANY INFORMATION. THE USER ASSUMES EXCLUSIVE RESPONSIBILITY FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO ANY CONSTRUCTION. CONTRACTORS RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. 100, 174, OR 2515.



MATCHLINE A

SEE SHEET C4.0

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	04/29/19	JAL	REVISE GRADING
2	05/20/19	JAL	REVISE GRADING & WALK LAYOUT
3	06/05/19	JAL	ADD ADDITIONAL NOTES TO DOG PARK AREA
4	06/25/19	JAL	UPDATE WETLAND AREA & GRADING

WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517 676-9200
 Fax: 517 676-9396
 http://www.wolveng.com

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN

PATHWAY PLAN AND PROFILE

JOB NO. 18-0066
 DATE 3/18/2019
 SCALE AS NOTED
 SHEET NO. C3.0

PROJECT: DBH
 CHECKED: DBH
 DRAWN: HTK

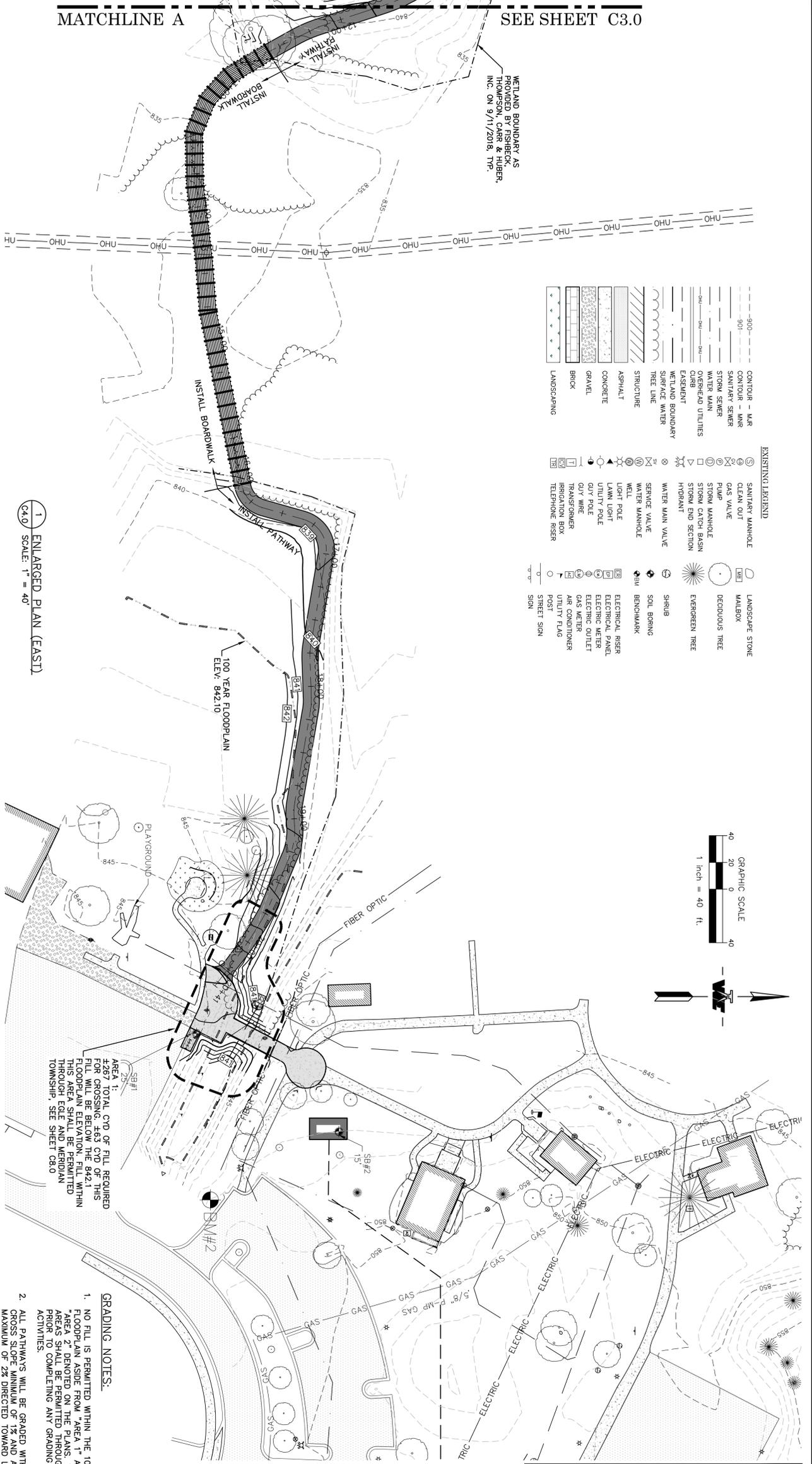
BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR SE CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION= 846.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OWENOS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION= 848.41

WETLAND BOUNDARY AS PROVIDED BY FISHBEEK, HOMPSON, CARR & HUBER, INC. ON 9/11/2018, TYP.

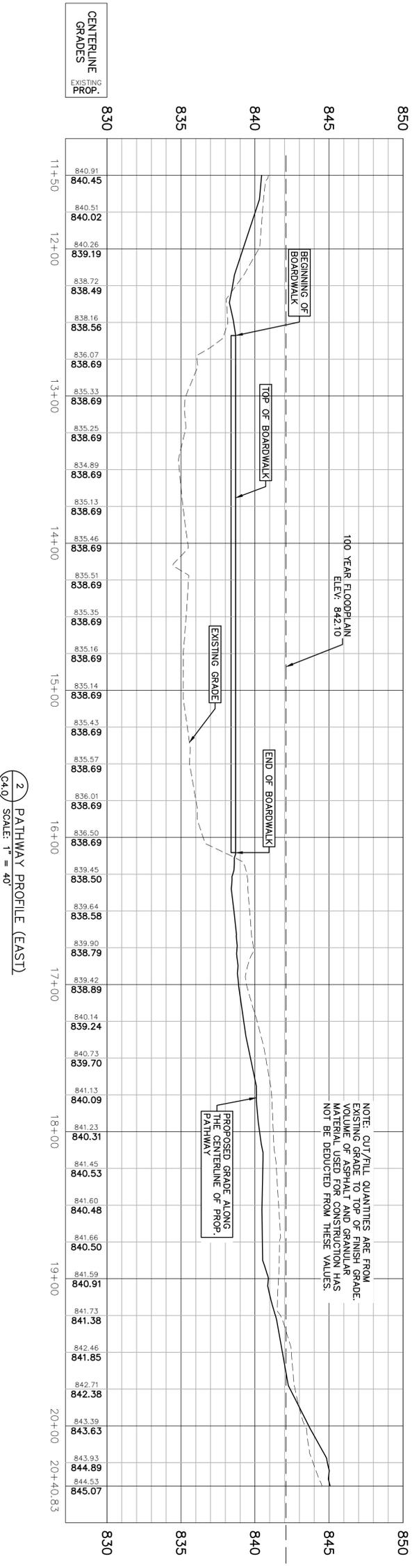
MATCHLINE A SEE SHEET C3.0

EXISTING LEGEND

---900---	CONTOUR - MAR	○	LANDSCAPE STONE
-901-	CONTOUR - MAR	□	MAILBOX
---902---	SANITARY SEWER	○	DECIDUOUS TREE
---903---	STORM SEWER	○	EVERGREEN TREE
---904---	WATER MAIN	○	SHRUB
---905---	OVERHEAD UTILITIES	○	SOIL BORING
---906---	CURB	○	BENCHMARK
---907---	ESSENTIAL	○	ELECTRICAL RISER
---908---	WETLAND BOUNDARY	○	ELECTRICAL PANEL
---909---	SURFACE WATER	○	ELECTRIC METER
---910---	TREE LINE	○	ELECTRIC OUTLET
---911---	STRUCTURE	○	GAS METER
---912---	ASPHALT	○	AIR CONDITIONER
---913---	CONCRETE	○	UTILITY FLAG
---914---	GRAVEL	○	POST
---915---	BRICK	○	STREET SIGN
---916---	LANDSCAPING	○	



1 ENLARGED PLAN (EAST)
 SCALE: 1" = 40'



- GRADING NOTES:**
- NO FILL IS PERMITTED WITHIN THE 100-YEAR FLOODPLAIN ASIDE FROM AREA 1 AND AREA 2. DENOTED ON THE PLANS, THESE AREAS SHALL BE PERMITTED THROUGH EGLE AND MERIDIAN TOWNSHIP, SEE SHEET C8.0.
 - ALL PATHWAYS WILL BE GRADED WITH A CROSS SLOPE MINIMUM OF 1% AND A MAXIMUM OF 2% DIRECTED TOWARD LOWEST ADJACENT GRADE.
 - NO FINAL GRADE SHALL BE CONSTRUCTED TO IMPROVE OR RESULT IN A CONDITION FOR PUBLIC USE.
 - MERIDIAN TOWNSHIP MINIMUM 1:1 COMPENSATION REQUIRED FOR ALL FILL IN THE FLOODPLAIN
 - MERIDIAN TOWNSHIP MINIMUM 2:1 COMPENSATION REQUIRED FOR ALL FILL IN WETLAND AREAS

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.



JOB NO.	18-0066
DATE	11/12/18
SCALE	1" = 40'
SHEET NO.	C4.0

APPROVED	DBH
CHECKED	DBH
DRAWN	HTK

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN
 PATHWAY & BOARDWALK PLAN & PROFILE

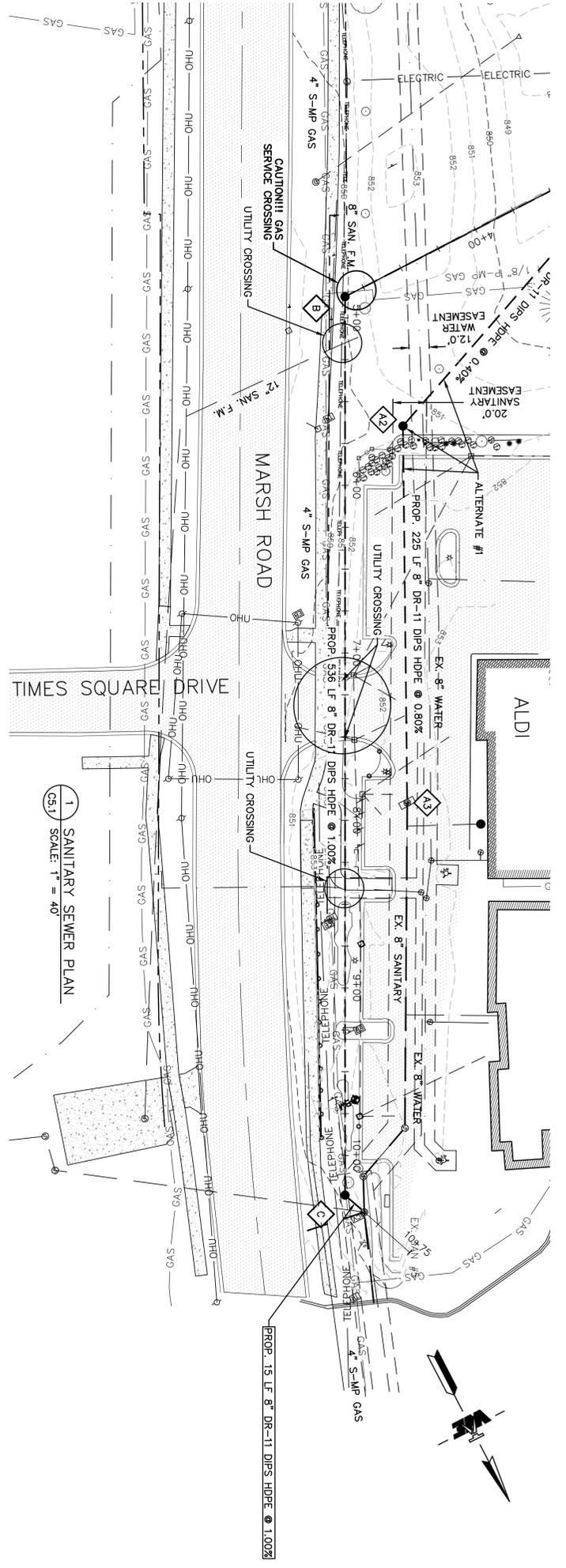
WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517-676-9200
 Fax: 517-676-9396
 http://www.wolveng.com

REVISION	DATE	DRAWN	DESCRIPTION
1	04/29/19	JAL	UPDATE GRADING
2	05/20/19	JAL	UPDATE GRADING

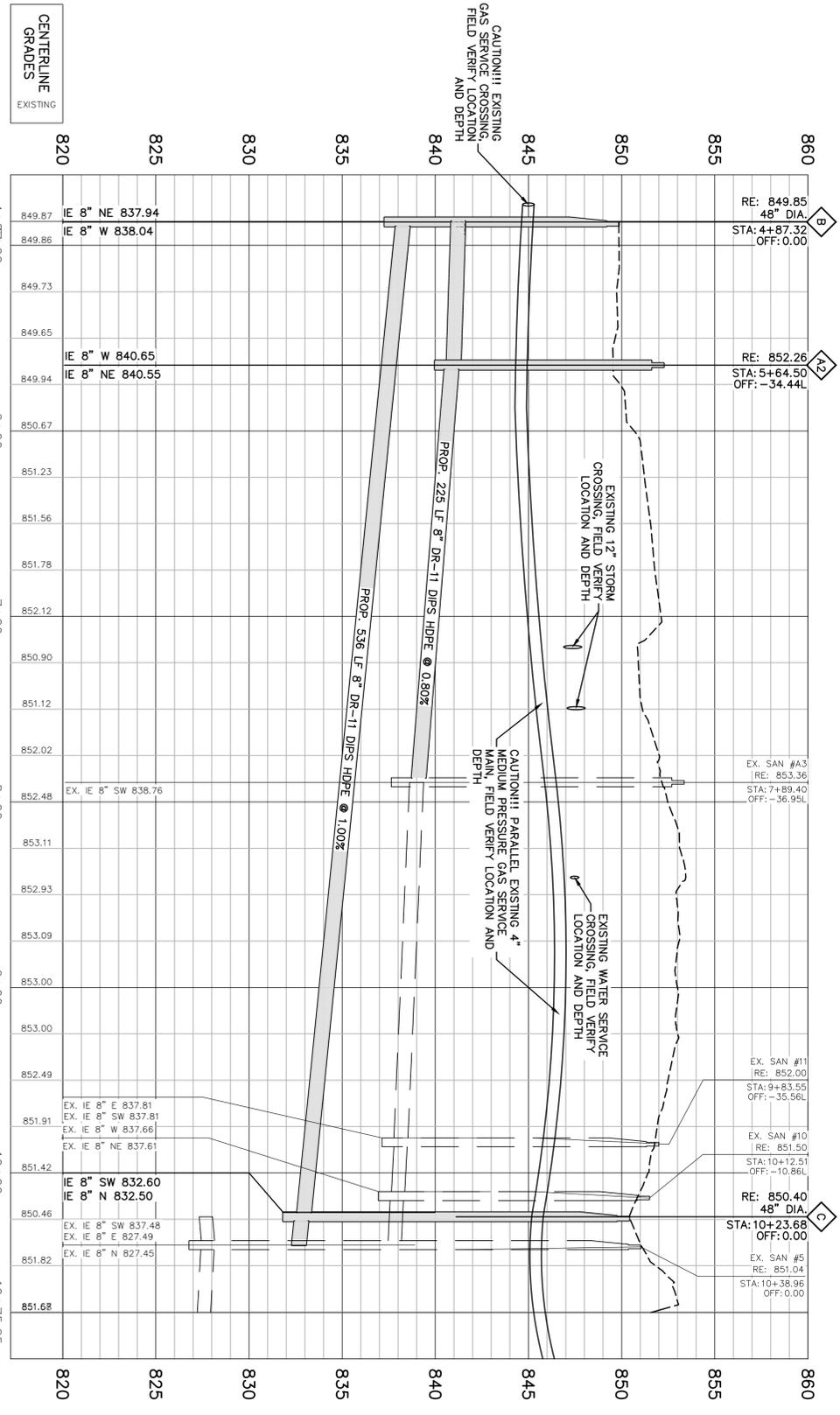
BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR SE. CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION= 848.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OZEMOS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION= 848.41

- "ALTERNATE #1"**
 CONNECT VIA HDD FROM INSIDE THE MANHOLE - DO NOT CUT INTO PAVEMENT.
 SUGGESTED PROCEDURE PER MERIDIAN TWP.:
 1. SEND PILOT DRILL FROM LAWN AREA TO THE EXISTING MANHOLE.
 2. CORE MANHOLE FROM WITHIN AND CONNECT A STEEL CABLE WITH A WINCH AND CONNECT
 3. NEW PIPEROCK STEEL CABLE AND PUSH NEW
 4. SIMULTANEOUSLY WINCH AND PUSH NEW PIPE INTO PLACE, AND
 5. SEAL MANHOLE CONNECTION USING A LINK-SEAL DEVICE AND NON-SHRINK GROUT.

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THIS PLAN ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY OF THE INFORMATION PROVIDED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO ANY CONSTRUCTION. CONTRACTORS RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2013.



1 SANITARY SEWER PLAN
 SCALE: 1" = 40'



2 SANITARY SEWER PROFILE
 SCALE: HORIZ: 1" = 40', VERT: 1" = 4'



COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION

WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517 676-9200
 Fax: 517 676-9396
 http://www.wolveng.com

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN
SANITARY SEWER PLAN

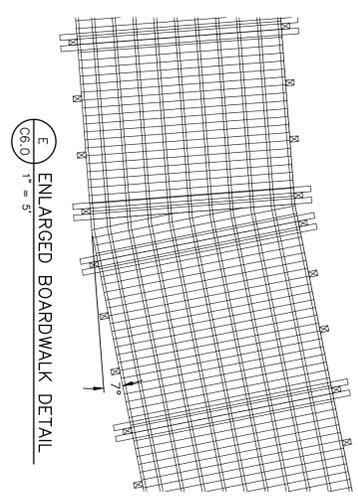
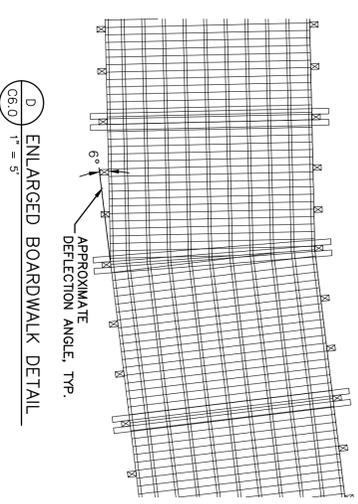
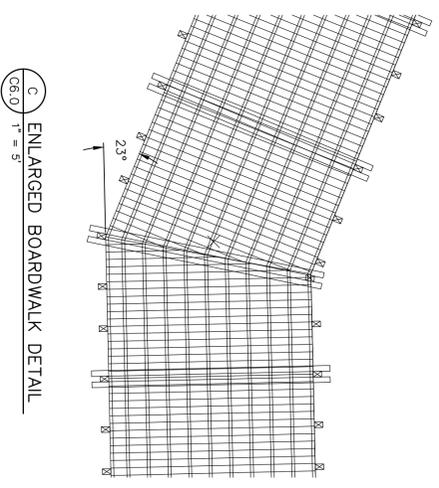
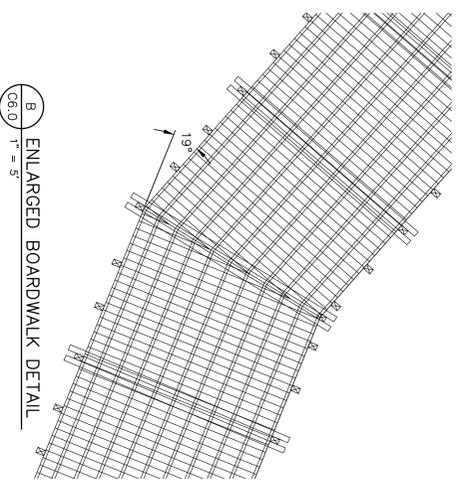
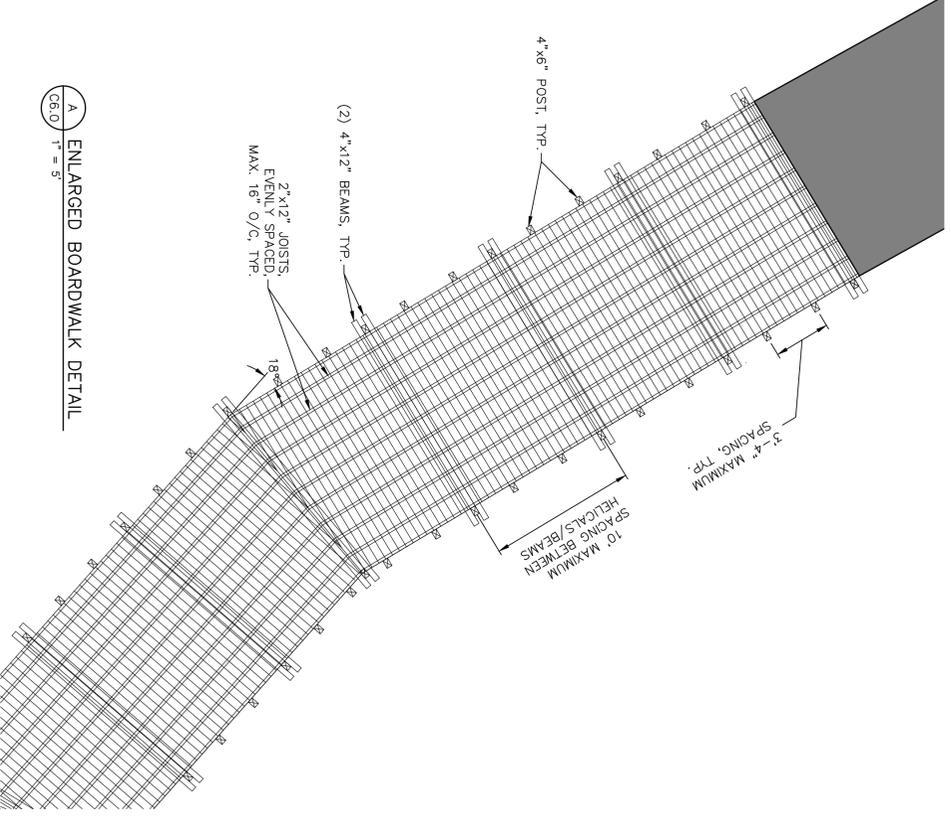
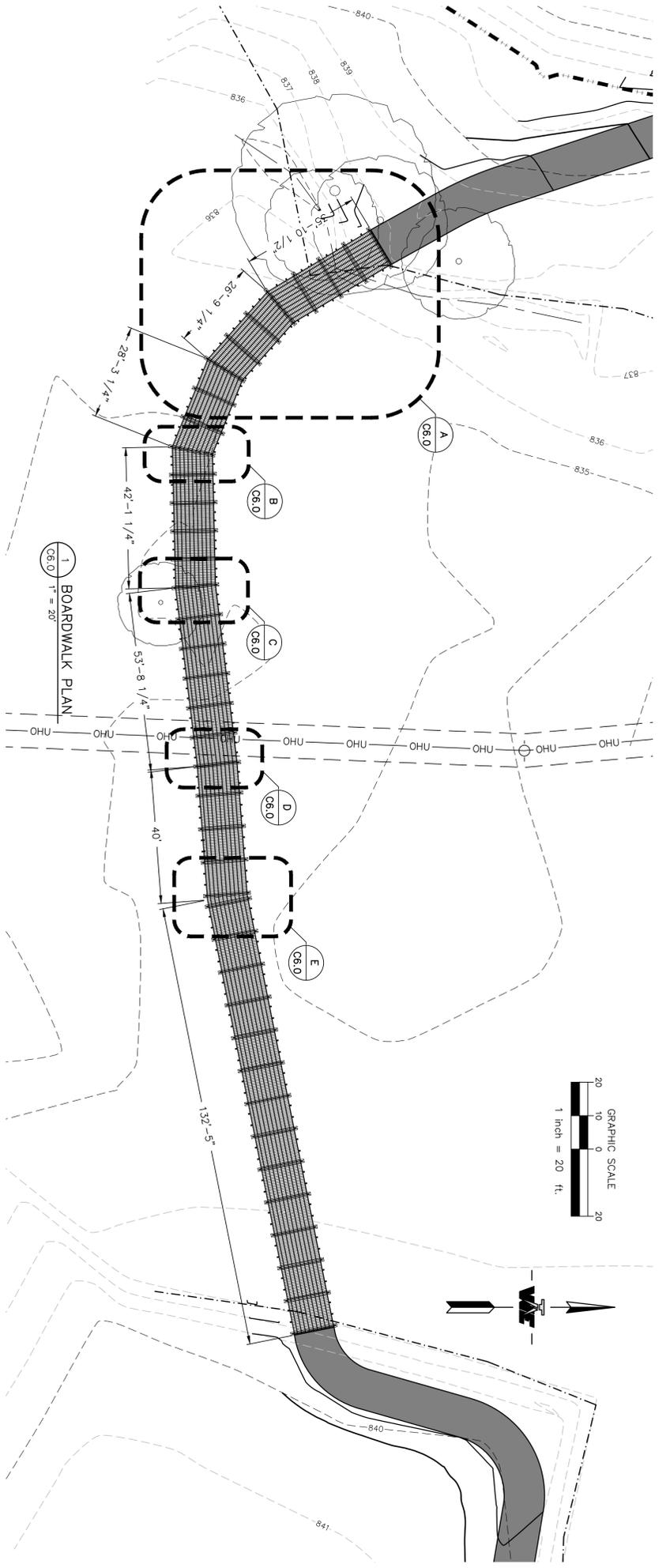
APPROVED: DBH
 CHECKED: DBH
 DRAWN: HTK

JOB NO.: 18-0066
 DATE: 5/23/2019
 SCALE: 1" = 40'
 SHEET NO.: C5.1

BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR SE CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION= 846.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OWEN'S HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION= 848.41

BOARDWALK CONSTRUCTION NOTES

1. ALL LUMBER SHALL BE KILN DRIED SOUTHERN PINE #2 OR APPROVED EQUAL. THE CONTRACTOR SHALL ENSURE THAT ALL QUALITY CONTROL REQUIREMENTS AS SPECIFIED IN SECTION 912 OF MOST STANDARD SPECIFICATIONS FOR CONSTRUCTION (2012 EDITION) ARE ADHERED TO.
2. ALL LUMBER SHALL BE PRESSURE TREATED TO REFUSAL WITH WOOD PRESERVATIVE. PRESSURE TREATING SHALL BE TO 0.60 MINIMUM FOR WOOD IN CONTACT WITH GROUND. ALL OTHER PRESERVATIVE TREATING SHALL BE TO 0.40 MINIMUM. COCA WOOD PRESERVATIVE SHALL NOT BE USED. ENGINEER SHALL APPROVE AN ALTERNATIVE MATERIAL.
3. AVOID HORIZONTAL EXPOSURE OF END GRAIN OR PROVIDE ADEQUATE PROTECTION BY FLASHING OR SEALING. AVOID SITUATIONS WHERE MOISTURE MAY BE TRAPPED BY USING SPACERS AND/OR FLASHING, CHALKING, SEALANT, OR PLASTIC ROOF CEMENT.
4. ALL BOLTS, WASHERS, AND OTHER HARDWARE USED FOR CONSTRUCTION SHALL BE GALVANIZED TO PREVENT CORROSION AND STAINING. USE GALVANIZED FLAT WASHERS UNDER HEADS OF LAG BOLTS, SCREWS AND NUTS.
5. DECK SCREWS USED FOR CONSTRUCTION SHALL BE CLIMACOATED, HOT DIPPED, GALVANIZED PLATED, OR APPROVED EQUAL, TO PREVENT CORROSION AND STAINING. DECK SCREWS SHALL BE #8x4" WITH AN UNTHREADED UPPER SHAFT TO PREVENT BOARD JACKING, PROVIDING A TIGHTER FASTENING.
6. GAP ON DECKING SHALL BE 1/8" MIN.
7. THERE SHALL BE NO END GRAIN NAILING AND TOE NAILING UNLESS SPECIFIED BY THE ENGINEER.
8. THE BOARDWALK SHALL BE CONSTRUCTED IN SUCH A MANNER THAT WILL MINIMIZE THE AMOUNT OF DISTURBANCE TO THE WETLAND AREA. ALL RESTORATION TO DISTURBED AREAS SHALL ADHERE TO THE REQUIREMENTS OF MDEQ WETLAND PERMIT, AND SHALL BE INCLUDED IN THE COST OF THE BOARDWALK.
9. 4"x12" BEAMS SHALL BE ATTACHED TO POSTS WITH CARRIAGE BOLTS WITH WASHERS ON BOTH SIDES. COUNTERSINK NUT ENDS FLUSH WITH FACE OF TIMBER.



!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR EXCLUSIVITY OF THE INFORMATION PROVIDED. THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION SHALL BE DETERMINED BY THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2013.

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION

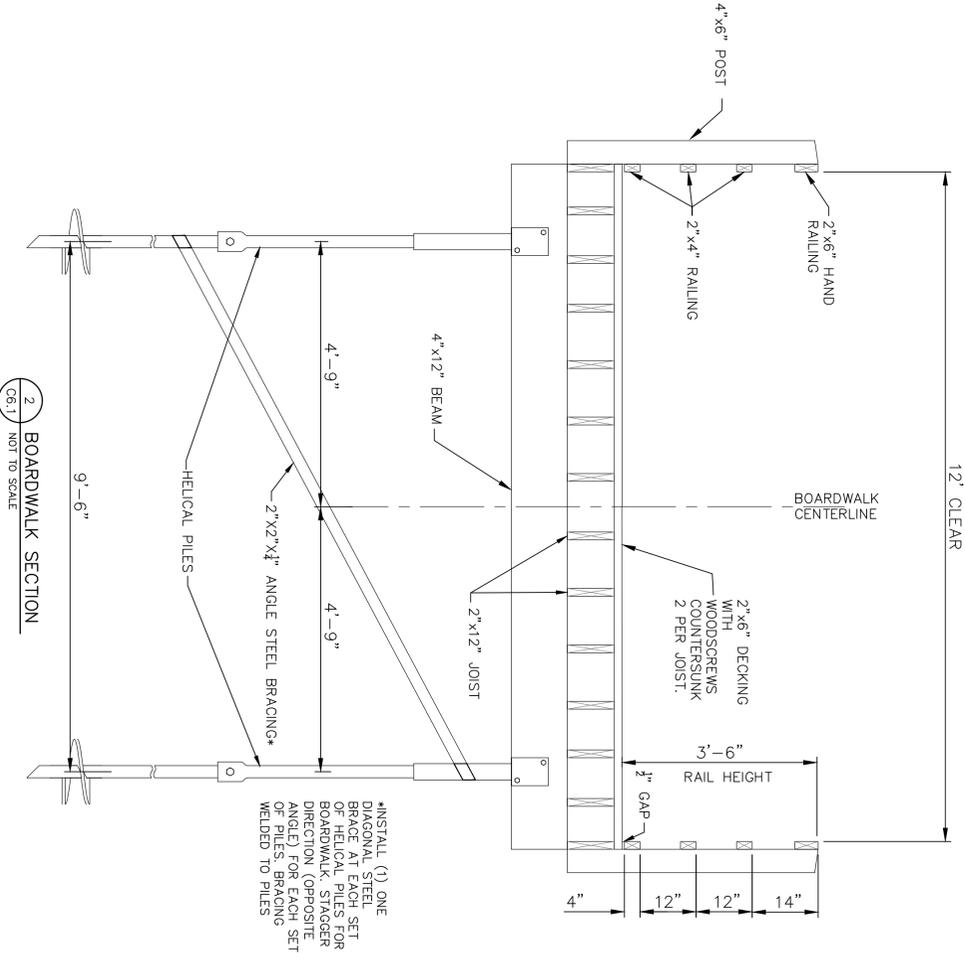
WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517-676-9200
 Fax: 517-676-9396
 http://www.wolveng.com

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN

BOARDWALK DETAILS

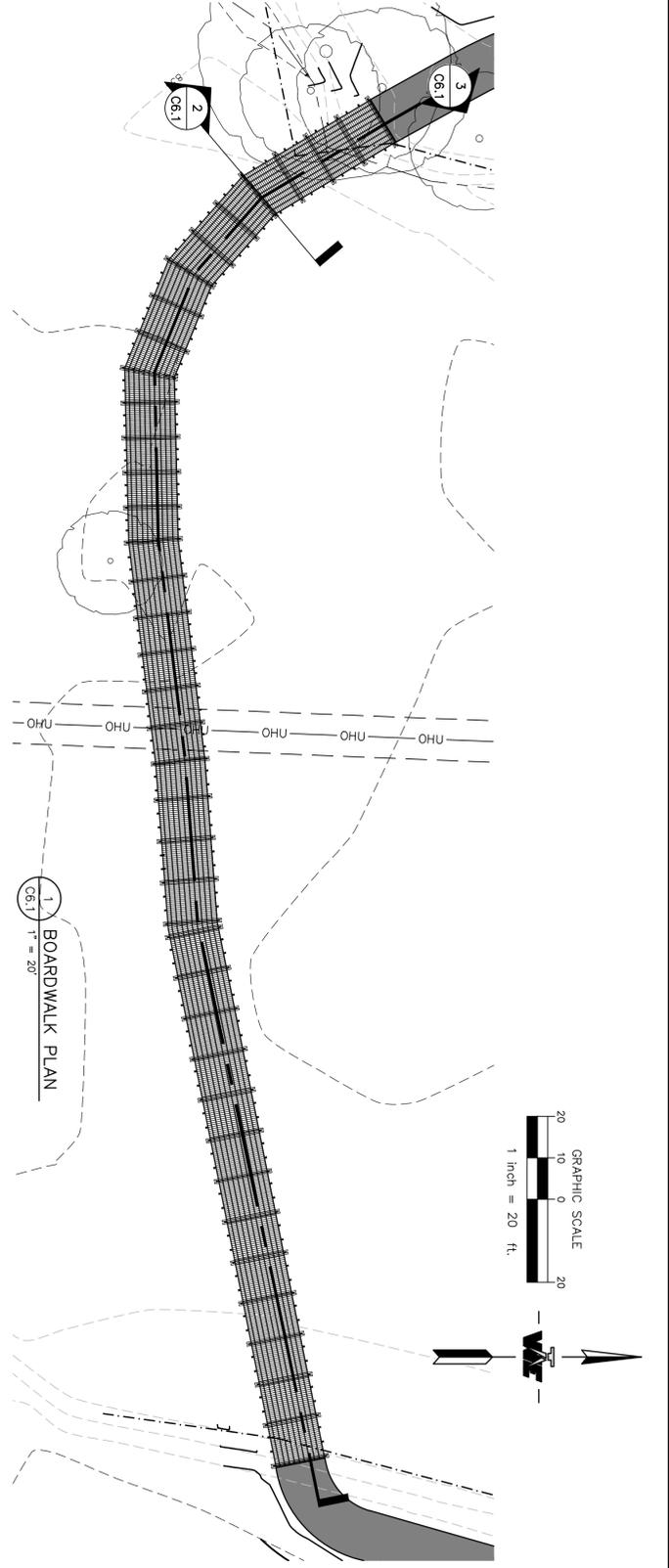
APPROVED	PROJECT
DBH	DBH
CHECKED	DATE
DBH	3/20/19
DRAWN	SCALE
HTK	AS NOTED
JOB NO.	SHEET NO.
18-0066	C6.0

BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR S.E. CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION = 848.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OWENOS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION = 838.41

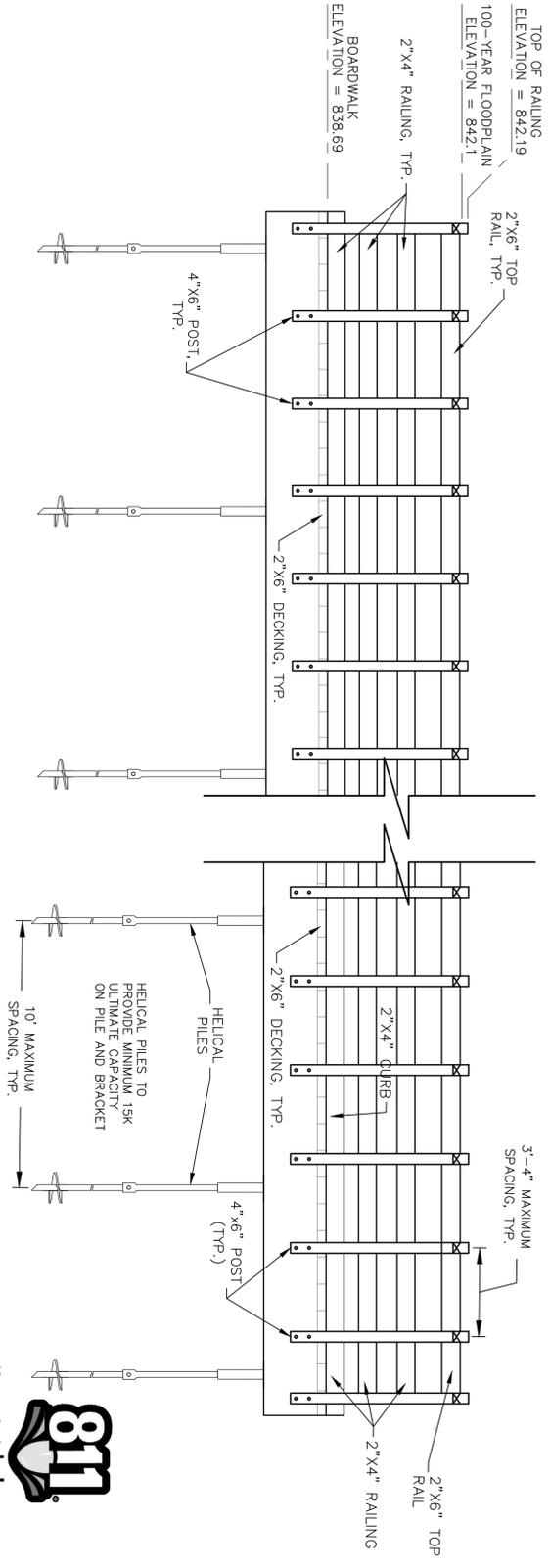


*INSTALL (1) ONE DIAGONAL STEEL BRACE AT EACH SET OF HELICAL PILES FOR BOARDWALK. STAGGER DIRECTION (OPPOSITE ANGLE) FOR EACH SET OF PILES. BRACING WELDED TO PILES

2 BOARDWALK SECTION
 C6.1 NOT TO SCALE



1 BOARDWALK PLAN
 C6.1 T = 20



HELICAL PILES TO PROVIDE MINIMUM 15K ULTIMATE CAPACITY ON PILE AND BRACKET

3 BOARDWALK SECTION
 C6.1 NOT TO SCALE



Know what's below. Call before you dig.

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR EXCLUSIVITY OF THE INFORMATION PROVIDED. THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTORS ARE ADVISED TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2013.

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	06/25/19	JAL	UPDATE GRADING & ELEVATIONS

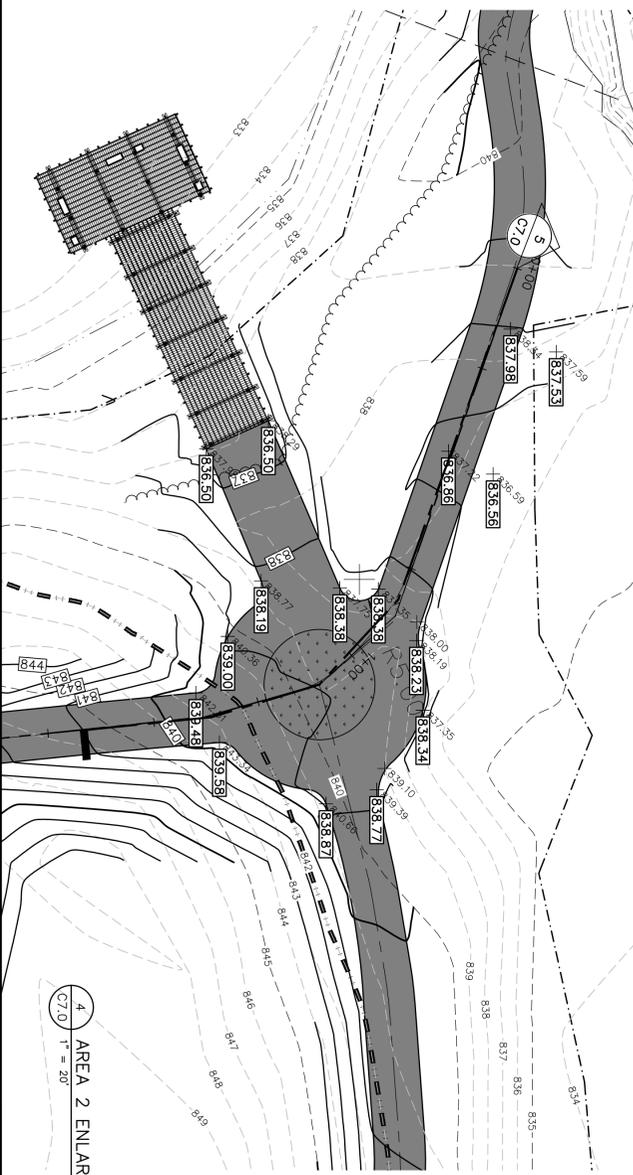
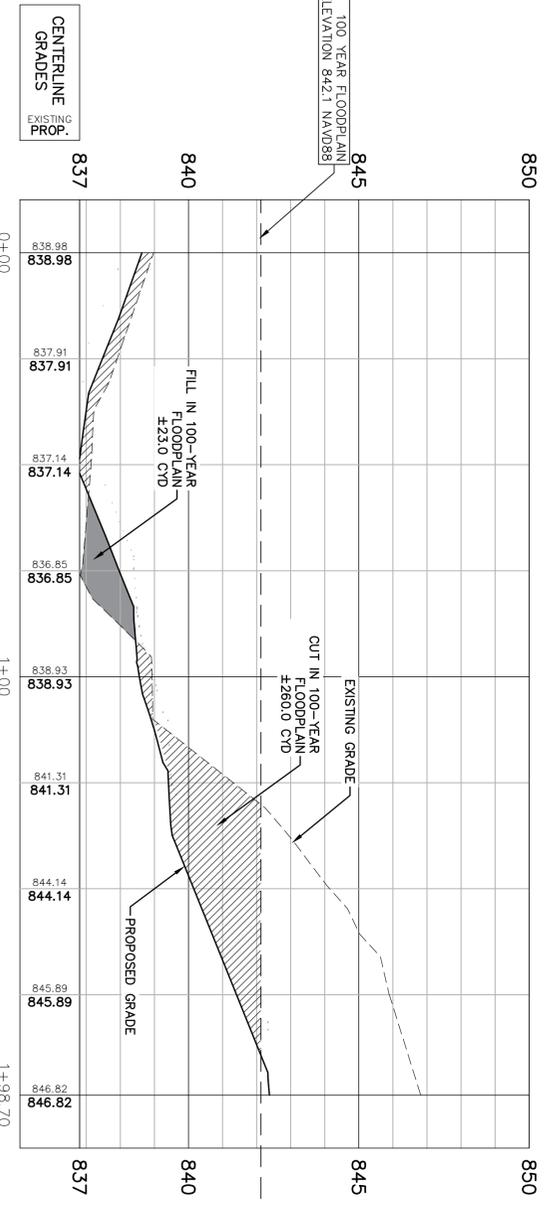
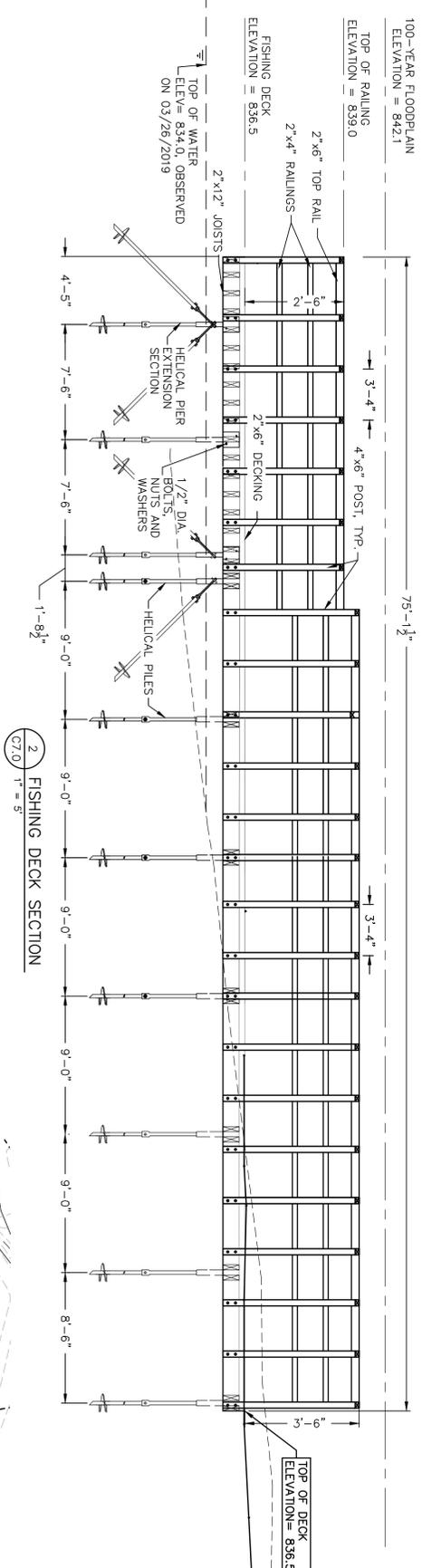
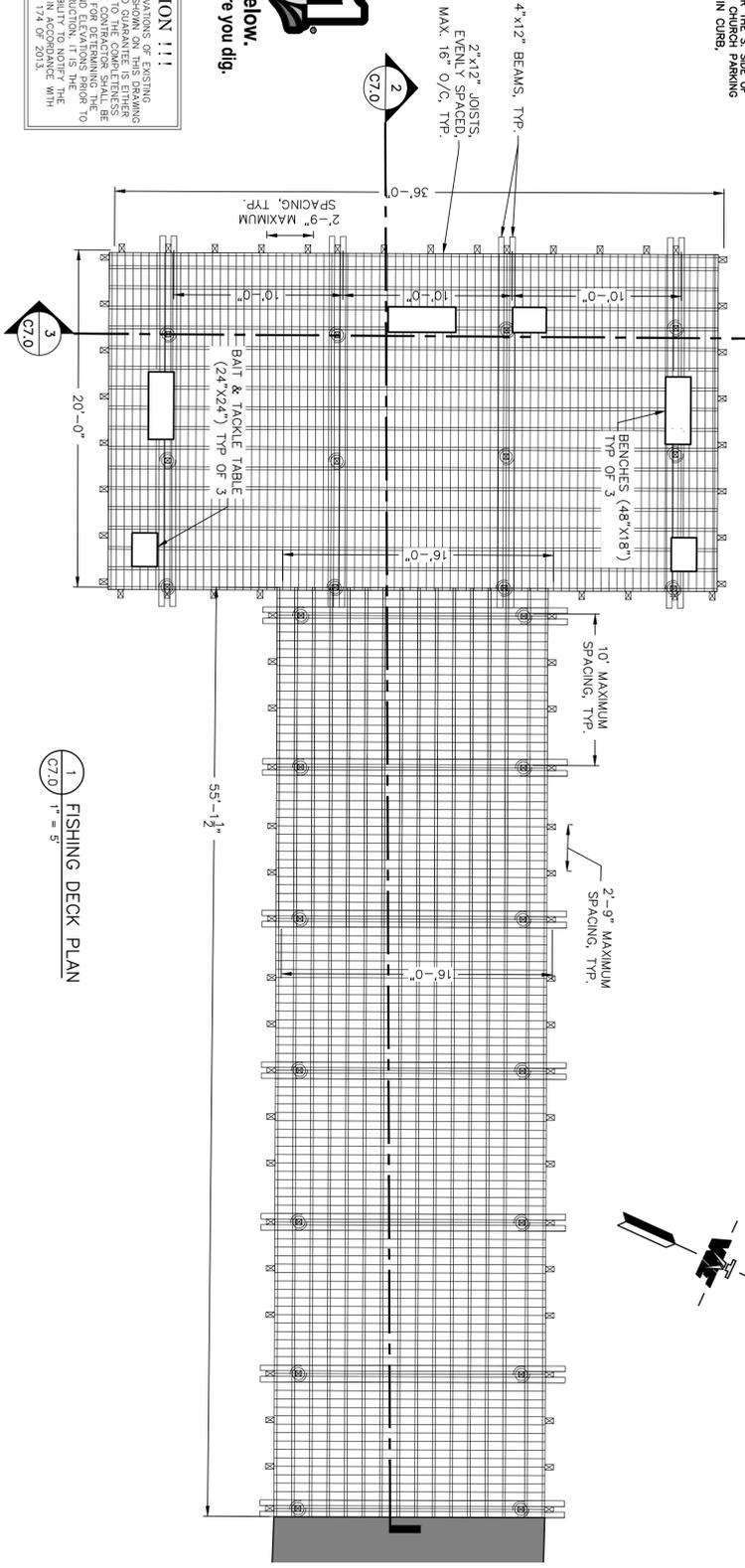
WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517-676-9200
 Fx: 517-676-9396
 http://www.wolveng.com

PROJECT	CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR MERIDIAN TOWNSHIP INGHAM COUNTY, MICHIGAN
APPROVED	DBH
CHECKED	DBH
DRAWN	HTK
JOB NO.	18-0066
DATE	3/18/19
SCALE	AS NOTED
SHEET NO.	C6.1

BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR SE CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION= 846.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OKENOS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION= 846.41

811
 Know what's below.
 Call before you dig.

!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY OF THE INFORMATION. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2013.

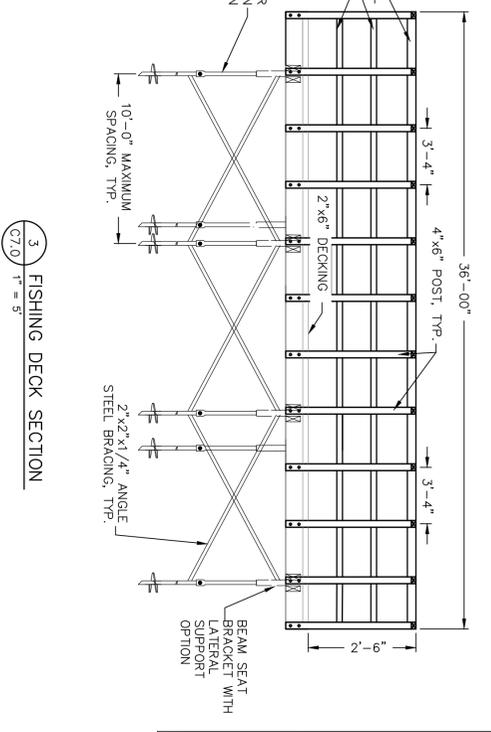


CUT/FILL QUANTITY (BELOW 100-YEAR FLOOD ELEVATION)

LOCATION	WETLAND REMOVAL (SFT)	CUT VOLUME (CVD)	FILL VOLUME (CVD)
AREA 1	-1890	0	63
AREA 2	0	-260	23
FISHING DECK*	0	0	14.9
BOARDWALK*	0	0	47.6
WETLAND MITIGATION	4,100	-130	0
WETLAND TOTAL	2,210	-390	148.5
ADDED WETLAND AREA		2,210	-241.5

*FILL IS COMPRISED OF WOOD MEMBERS AND DECKING MATERIALS BELOW 100-YEAR FLOODPLAIN
 **DOES NOT INCLUDE PERMANENT WETLAND REMOVAL OR REMEDIATION AREAS

NOTE:
 HELICAL PILES TO PROVIDE 15K LBS ULTIMATE CAPACITY ON PIERS AND BRACKETS



COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	04/29/19	JAL	REVISE GRADING
2	05/23/19	JAL	UPDATE GRADING AND PATH TO AVOID WETLAND
3	06/25/19	JAL	UPDATE CUT/FILL QUANTITIES AND ELEVATIONS

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN

FISHING DECK PLAN AND PROFILE-DETAILS

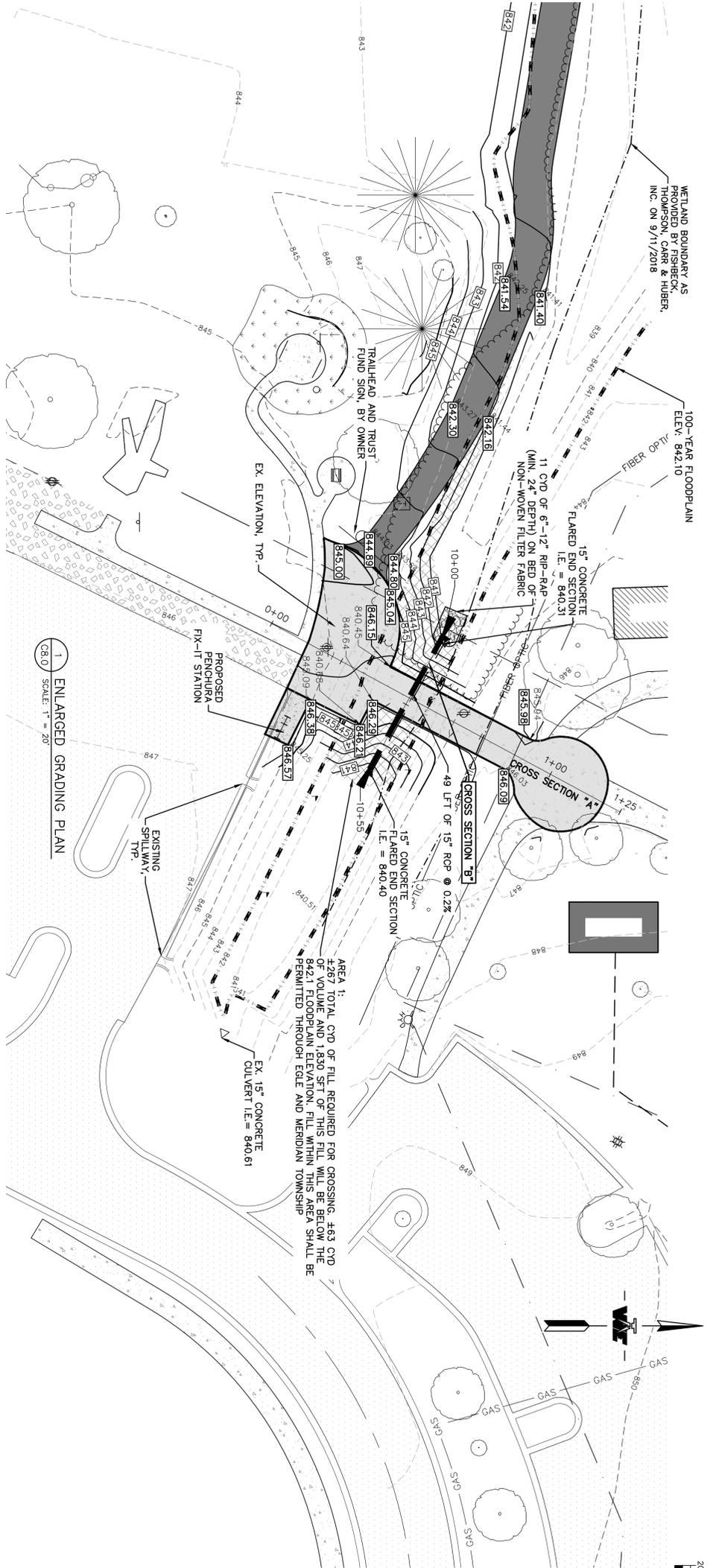
PROJECT: DBH
 CHECKED: DBH
 DRAWN: HTK
 JOB NO.: 18-0066
 DATE: 3/18/19
 SCALE: AS NOTED
 SHEET NO.: C7.0

WOLVERINE
 Engineers & Surveyors, Inc.

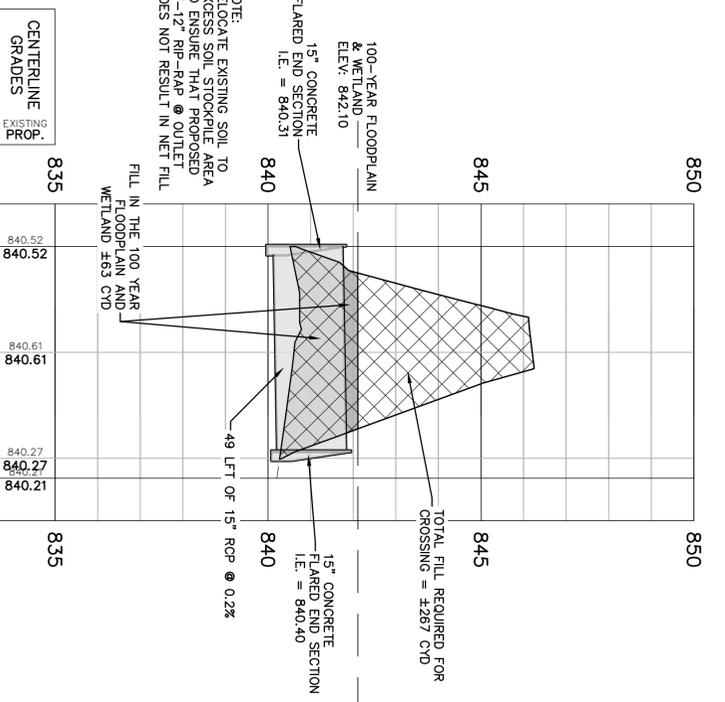
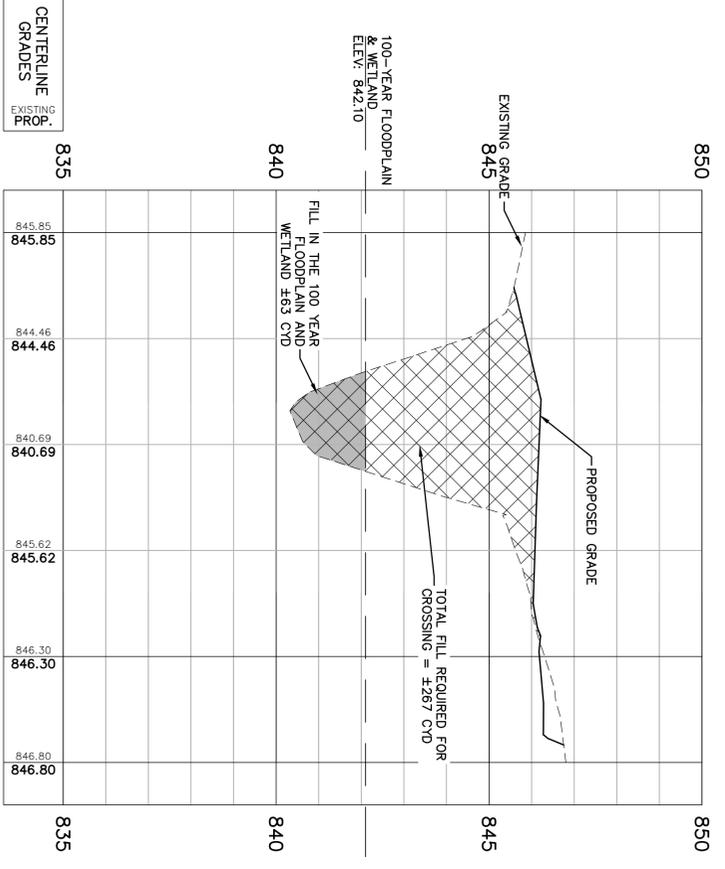
312 North Street
 Mason, Michigan 48854
 Ph: 517 676-9200
 Fax: 517 676-9396
 http://www.wolveng.com

BENCHMARKS:
 BM#1 (CP99) : MAG SPIKE NEAR S.E. CORNER OF CENTRAL PARK SOUTH RETENTION POND, ±20' S.E. OF HYDRANT, ELEVATION= 846.59
 BM#2 (CP2) : MAG SPIKE NEAR THE S. SIDE OF OZEMUS HISTORICAL VILLAGE & CHURCH PARKING LOT, ±15' S.E. OF WASHOUT IN CURB, ELEVATION= 846.41

WETLAND BOUNDARY AS SHOWN BY THOMSON, CARP & FISHER, INC. ON 9/11/2018



!!! CAUTION !!!
 THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY OF THE INFORMATION. CONTRACTORS SHALL EXERCISE CAUTION AND RESPONSIBILITY FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO ANY CONSTRUCTION. CONTRACTORS RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITY OWNERS IN ACCORDANCE WITH MICHIGAN P.A. NO. 174 OF 2015.



NOTE:
 RELOCATE EXISTING SOIL TO EXCESS SOIL STOCKPILE AREA TO ENSURE THAT PROPOSED 6"-12" RIP-RAP @ OUTLET DOES NOT RESULT IN NET FILL

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	04/29/19	JAL	REVISE STORM/GRADING
2	05/20/19	JAL	REVISE GRADING, ADD FILL NOTES
3	06/19/19	JAL	REVISE GRADING AND QUANTITIES

WOLVERINE
 Engineers & Surveyors, Inc.
 312 North Street
 Mason, Michigan 48854
 Ph: 517 676-9200
 Fax: 517 676-9396
 http://www.wolveng.com

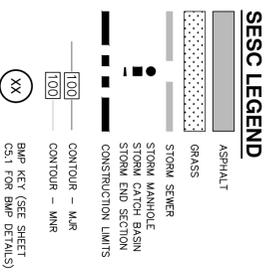
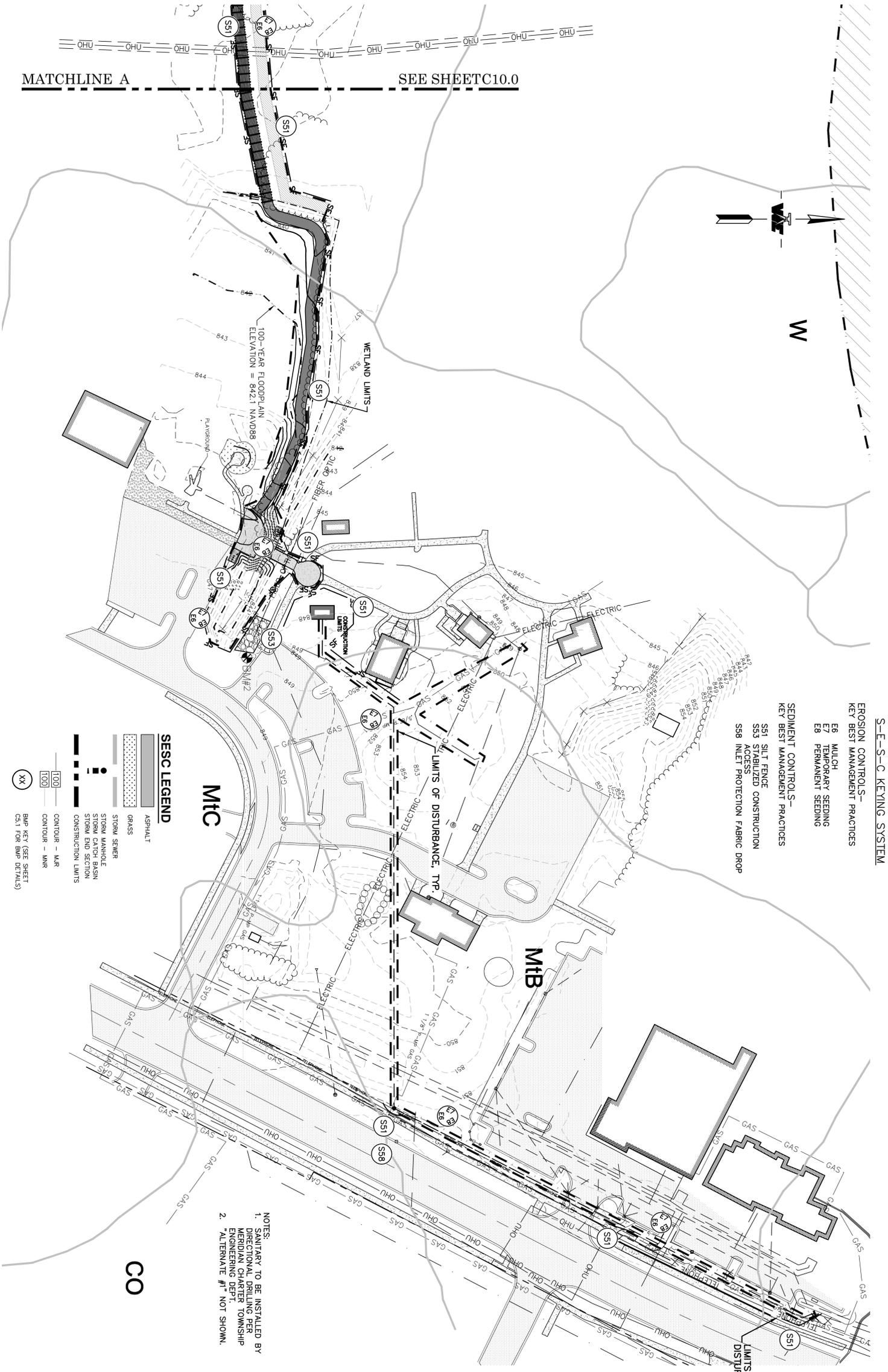
CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
 MERIDIAN TOWNSHIP
 INGHAM COUNTY, MICHIGAN
ENLARGED PLAN (AREA 1)

PROJECT	APPROVED
DBH	DBH
DBH	DBH
HTK	HTK
JOB NO. 18-0066	DATE 11/12/18
SCALE AS NOTED	SHEET NO. C8.0



Know what's below.
Call before you dig.

!!! CAUTION !!!
THE LOCATION AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER MADE OR IMPLIED AS TO THE LOCATION OR DEPTH OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO THE START OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS AGENCIES AND OBTAIN PERMISSION WITH INDIANAN, P. NO. 174 OF 2013.



- S-E-S-C KEYING SYSTEM**
- EROSION CONTROLS-
KEY BEST MANAGEMENT PRACTICES**
- EF MULCH
 - ET TEMPORARY SEEDING
 - EP PERMANENT SEEDING
- SEDIMENT CONTROLS-
KEY BEST MANAGEMENT PRACTICES**
- SS1 SILT FENCE
 - SS3 STABILIZED CONSTRUCTION ACCESS
 - SS8 INLET PROTECTION FABRIC DROP

- NOTES:**
1. SANITARY TO BE INSTALLED BY DIRECTIONAL DRILLING PER MERIDIAN CHARTER ENGINEERING DEPT.
 2. "ALTERNATE #1" NOT SHOWN.

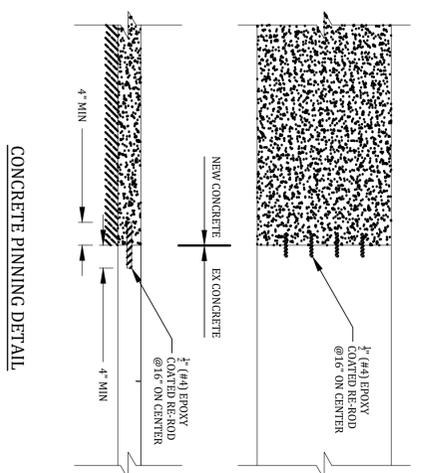
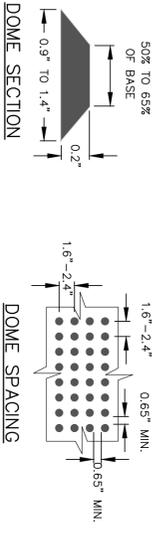
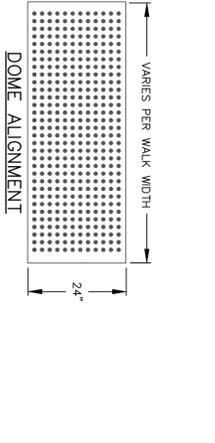
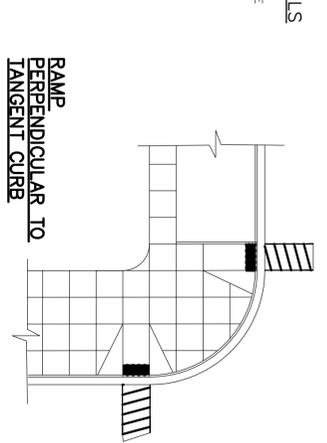
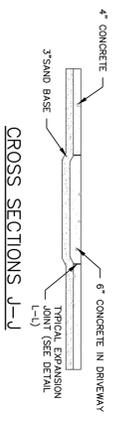
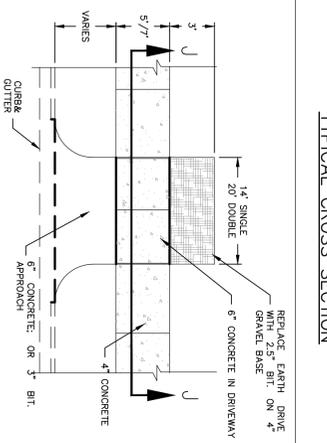
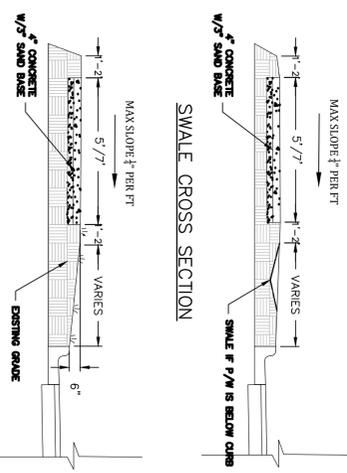
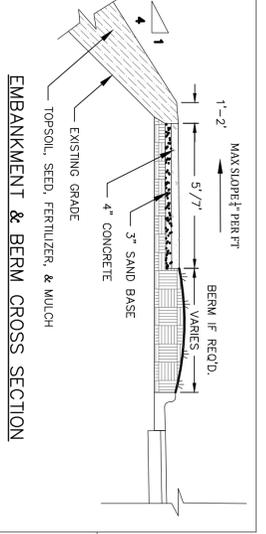
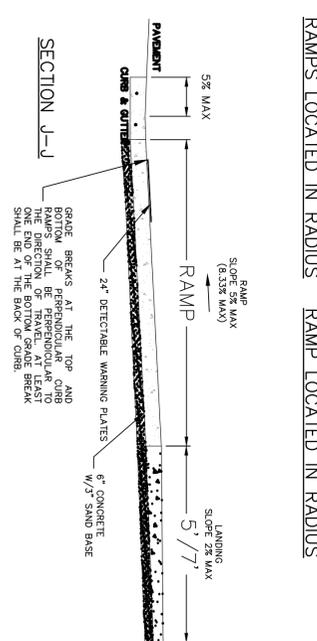
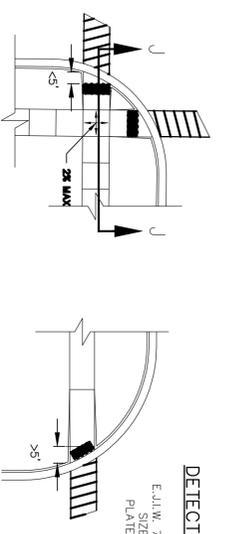
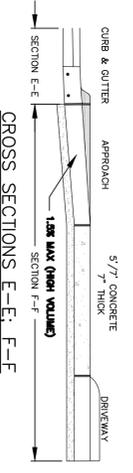
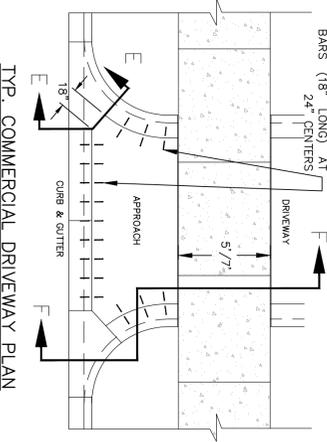
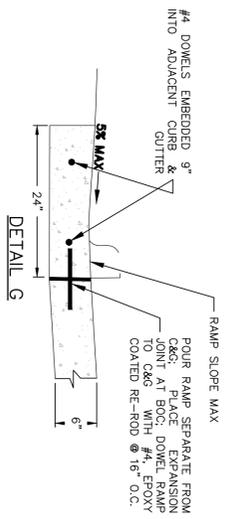
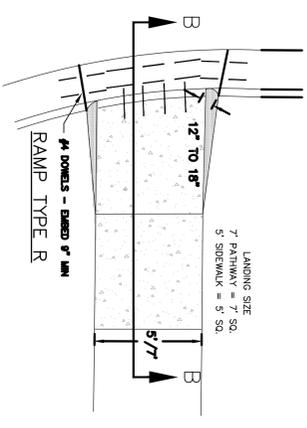
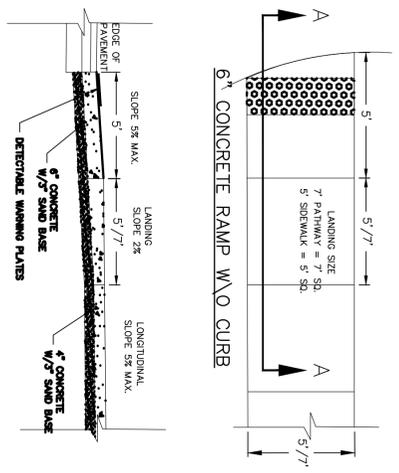
COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION
1	05/20/19	JAL	GENERAL PLAN UPDATES
2	06/25/19	JAL	GENERAL PLAN UPDATES

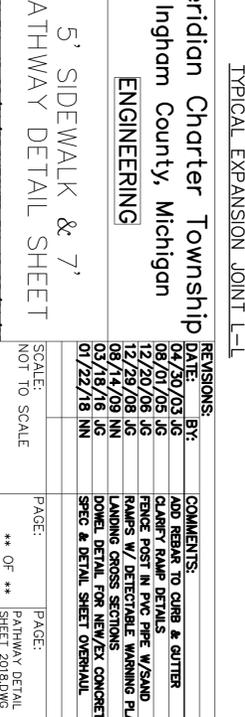
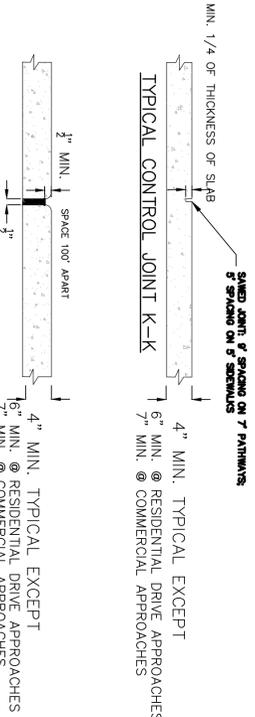
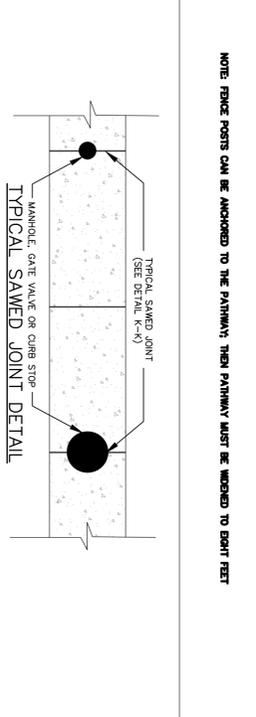
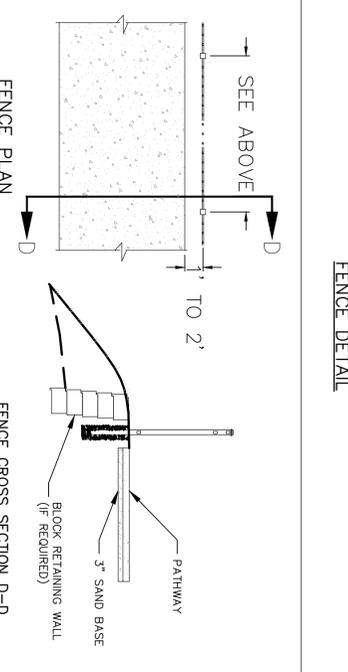
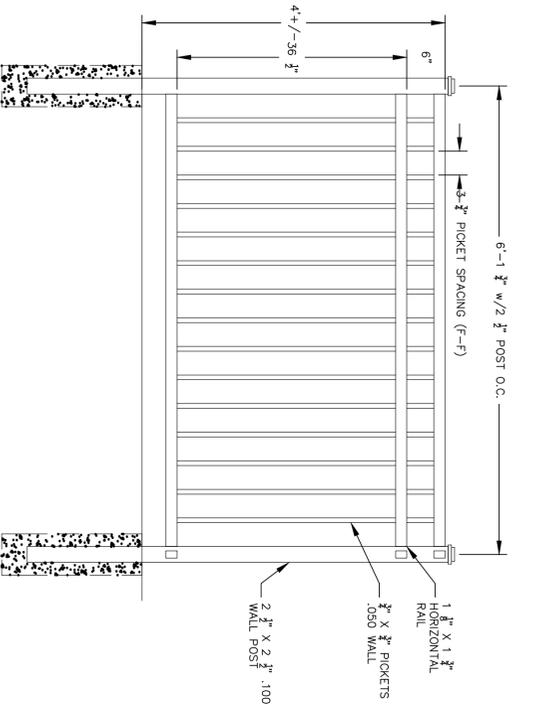
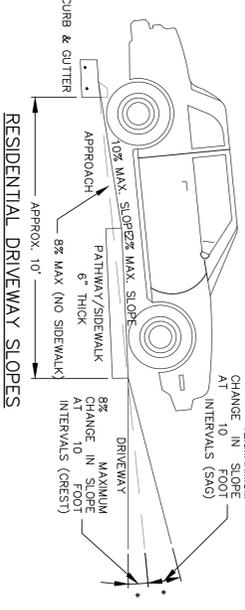
PROJECT	CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
PROJECT	MERIDIAN TOWNSHIP
PROJECT	INGHAM COUNTY, MICHIGAN
SHEET TITLE	SESC PLAN (EAST) & NOTES
APPROVED	DBH
CHECKED	DBH
DRAWN	HTK
JOB NO.	18-0066
DATE	11/12/18
SCALE	1" = 60'
SHEET NO.	C9.1

WOLVERINE
Engineers & Surveyors, Inc.

312 North Street
Mason, Michigan 48854
Ph: 517-676-9200
Fx: 517-676-9396
http://www.wolveng.com



- GENERAL NOTES**
1. SIDEWALKS/PATHWAYS SHALL BE 4" THICK CONCRETE EXCEPT AT DRIVEWAYS.
 2. SIDEWALKS/PATHWAYS THRU DRIVES SHALL BE 6" (RESIDENTIAL), 7" (MULTI-RESIDENTIAL & COMMERCIAL).
 3. 3" OF COMPACTED SAND BASE SHALL BE PLACED UNDER ALL SIDEWALKS/PATHWAYS.
 4. ALL BITUMINOUS APRONS SHALL BE 2 1/2" THICK, UNLESS NOTED OTHERWISE.
 5. PROPERTY IRONS SHALL BE MAINTAINED BY THE CONTRACTOR.
 6. ALL BITUMINOUS SHALL BE MAINTAINED BY THE CONTRACTOR.
 7. ALL AGGREGATE BASE SHALL BE 22A, 4" THICK.
 8. ALL TREE AND BUSH REMOVAL SHALL BE CONSIDERED PART OF SUB-GRADE PREPARATION.
 9. LOCATION OF NEW PLANT MATERIAL SHALL BE AS DIRECTED BY THE ENGINEER, AND SHALL BE INSTALLED IN ACCORDANCE WITH GUIDELINES ESTABLISHED BY THE ALA ON PROTECTED.
 10. ACCORDANCE WITH GUIDELINES ESTABLISHED BY THE ALA ON PROTECTED.
 11. BITUMINOUS DRIVES SHALL BE SAWCUT 18" ON EITHER SIDE OF PROPOSED PATHWAY.



COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION

WOLVERINE
Engineers & Surveyors, Inc.

312 North Street
Mason, Michigan 48854
Ph: 517-676-9200
Fx: 517-676-9396
http://www.wolveng.com

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
MERIDIAN TOWNSHIP
INGHAM COUNTY, MICHIGAN

DETAILS & NOTES

APPROVED	PROJECT	CHECKED	DRAWN	JOB NO.	DATE	SCALE

REVISIONS	DATE	BY	COMMENTS

SCALE	PAGE	PAGE

DRAWN BY: JG 08/01/05 CHECKED BY: YI 08/07/05

5' SIDEWALK & 7' PATHWAY DETAIL SHEET

SCALE: NOT TO SCALE

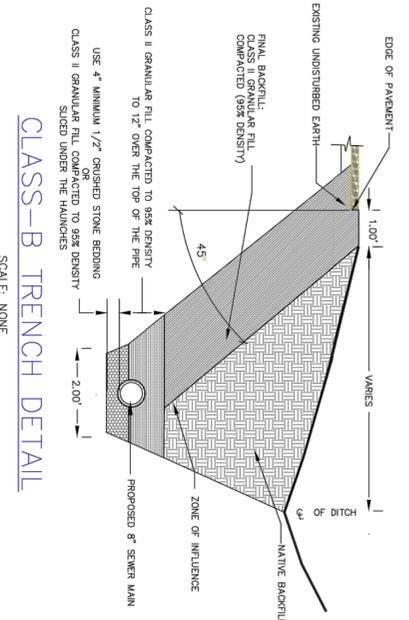
PAGE: ** OF **

PAGE: PATHWAY DETAIL SHEET 2018/DWG

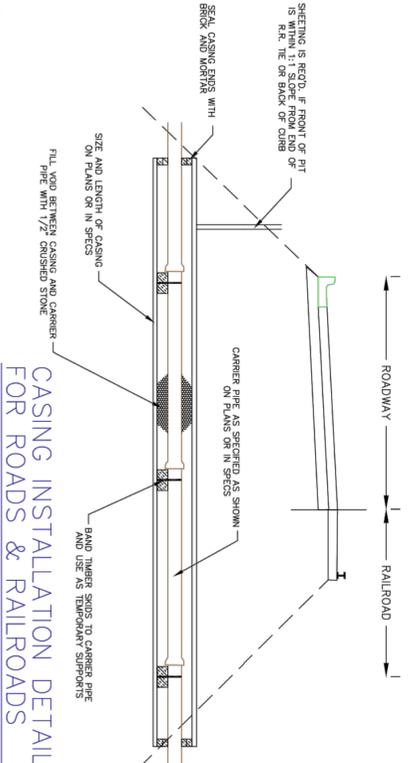
DATE: 11/12/18

SCALE: AS NOTED

SHEET NO: C10.0

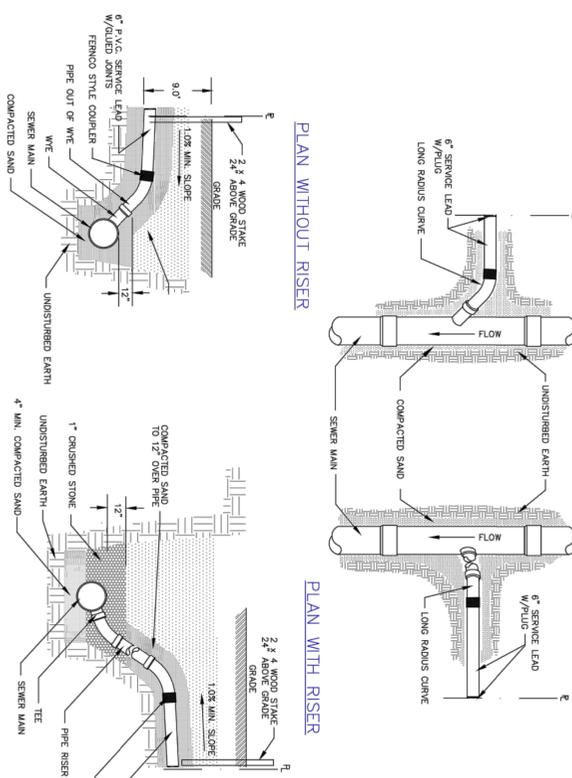


TYPICAL TRENCH DETAIL (SDR26 PVC ONLY)
NO SCALE

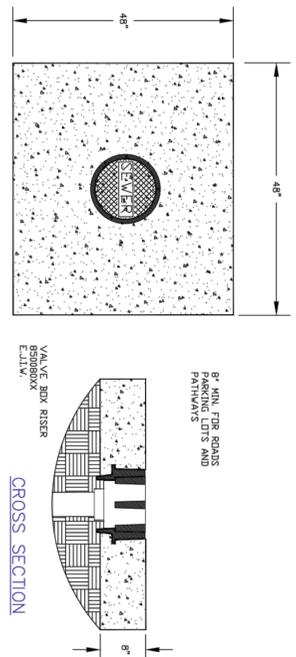


CASING INSTALLATION DETAIL FOR ROADS & RAILROADS
CASING AND CARRIER PIPE TO BE INSTALLED BY METHOD OTHER THAN OPEN CUT

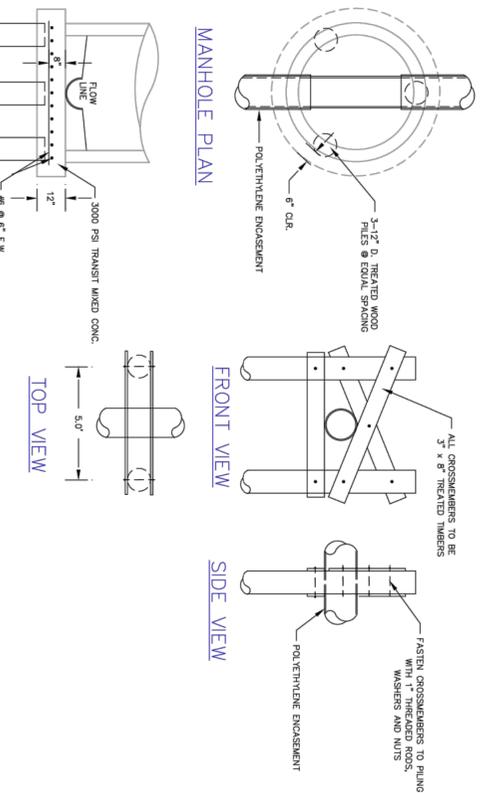
NOTES
1. WORK IN ROADS AND IN RAILROAD RIGHT-OF-WAYS SHALL BE IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AGENCY'S REQUIREMENTS.
2. CASING PIPE SHALL BE ASTM 139, GRADE B OR ASTM A-53, GRADE B OR API 5-L, GRADE B OR API 5-L WITH MINIMUM WALL THICKNESS.



SERVICE/CONNECTION DETAIL

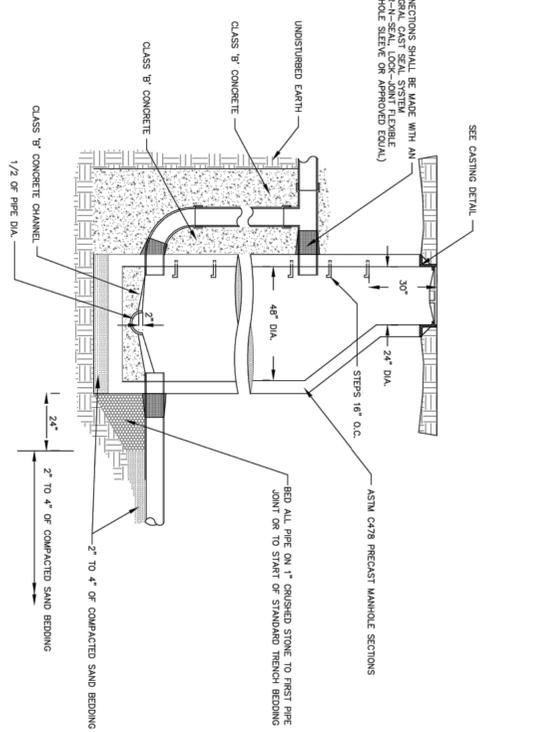
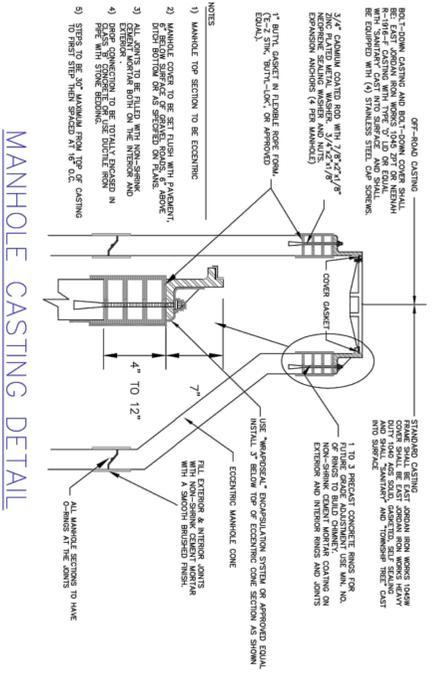


CLEANOUT BOXES IN CONCRETE

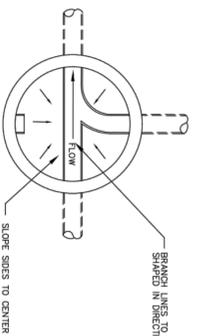


MANHOLE SECTION

PLING DETAILS



MANHOLE FLOWLINE PLAN



Meridian Charter Township
Ingham County, Michigan
PUBLIC WORKS DEPARTMENT

STANDARD DETAILS FOR SANITARY SYSTEM

REVISIONS:	DATE	BY:	COMMENTS:
	4/96	JG	COMPUTER GENERATED
	7/2/99	JG	ADD BUILTS TO CASTING DETAIL
	1/13/00	JG	ADD SDR 26 DETAIL
	5/12/08	JG	ADD APPROPRIATE & NON-SHINK GROUT
	7/31/12	JG	CLARIFIED CRUSHED STONE
	5/15/15	JG	ADD CLEANDOUT BOX IN CONCRETE

SCALE: NONE
SHEET - OF - SANDTAL.DWG

DRAWN BY: NK 3/7/83
CHECKED BY: JB 3/7/83

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS AND ANYTHING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION

WOLVERINE
Engineers & Surveyors, Inc.
312 North Street
Mason, Michigan 48854
Ph: 517-676-9200
Fx: 517-676-9396
http://www.wolveng.com

CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR
MERIDIAN TOWNSHIP
INGHAM COUNTY, MICHIGAN
DETAILS & NOTES 2

APPROVED	PROJECT	CHECKED	DRAWN	DATE	SCALE	SHEET NO.
DBH	C10.1	DBH	HTK	11/12/18	AS NOTED	C10.1

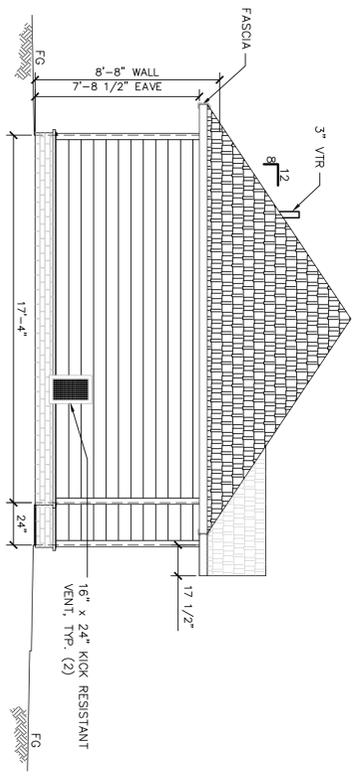
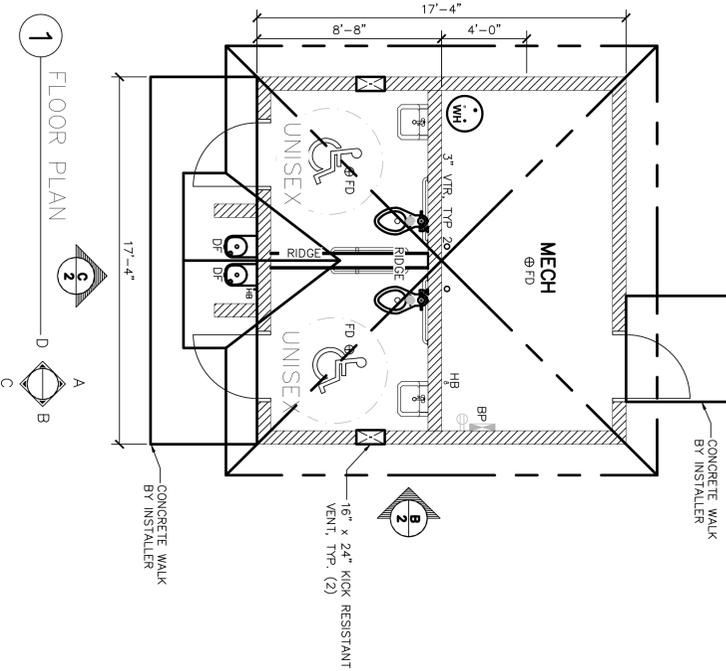
LEGEND	
SYMBOL	DESCRIPTION
□	EXTERIOR WALL LIGHTS
□	INTERIOR WALL LIGHTS
□	INTERIOR GELING LIGHTS
□	ELECTRICAL OUTLET
○	FLOOR DRAIN
⊕	WALL HYDRANT
⊕	ELECTRIC EXHAUST FAN
⊕	EXHAUST FAN 210CFM
⊕	16" x 24" KICKPROOF WALL
⊕	16" x 24" KICKRESISTANT VENT, TYP. (2)
⊕	TOWEL DISPENSER
⊕	SOAP DISPENSER

THESE PLAN VIEW AND ELEVATION DRAWINGS ARE A PRELIMINARY ARCHITECTURAL REPRESENTATION OF THE BUILDING. ALL DIMENSIONS, FEATURES AND COMPONENTS SHOWN ON THESE PRELIMINARY DRAWINGS MAY OR MAY NOT BE PART OF THE QUOTE. PLEASE REFER TO THE SCOPE OF SUPPLY AND SERVICES LETTER PROVIDED WITH YOUR QUOTE FOR ROMTEC'S PROPOSED SCOPE OF SUPPLY.

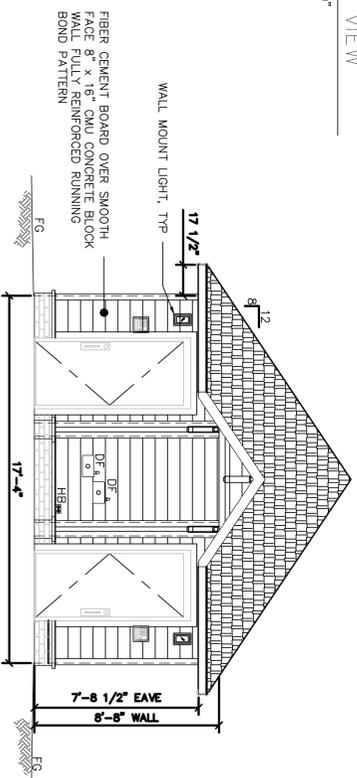
WALL TYPE SCHEDULE

8" REINFORCED CONCRETE MASONRY BLOCK WALL WITH MORTAR JOINTS, GROUTED SOLID ALL CELLS RUNNING BOND PATTERN.

8" WOOD FRAMED WALL



B ELEVATION VIEW
SCALE: 1/4" = 1'-0"



C ELEVATION VIEW
SCALE: 1/4" = 1'-0"

FIBER CEMENT BOARD OVER SMOOTH FACE 8" x 16" CMU CONCRETE BLOCK WALL FULLY REINFORCED RUNNING BOND PATTERN

WALL MOUNT LIGHT, TYP.

ROMTEC
18240 NORTH BAY ROAD, ROSELAND, OR 97130
503.638.1111
PRELIMINARY

COPYRIGHT © 2018 WOLVERINE ENGINEERS AND SURVEYORS, INC. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF WOLVERINE ENGINEERS AND SURVEYORS, INC. AND THE SAME MAY NOT BE REPRODUCED, COPIED, DISTRIBUTED OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF WOLVERINE ENGINEERS AND SURVEYORS, INC.

REVISION	DATE	DRAWN	DESCRIPTION

WOLVERINE
Engineers & Surveyors, Inc.
312 North Street
Mason, Michigan 48854
Ph: 517-676-9200
Fx: 517-676-9396
http://www.wolveng.com

PROJECT	CENTRAL MERIDIAN REGIONAL TRAIL CONNECTOR MERIDIAN TOWNSHIP INGHAM COUNTY, MICHIGAN
SHEET TITLE	RESTROOM PLAN & ELEVATIONS
APPROVED	DBH
CHECKED	DBH
DRAWN	HTK
JOB NO.	18-0066
DATE	11/12/18
SCALE	1/4" = 1'-0"
SHEET NO.	C11.0



September 6, 2018
Project No. 181200/181201

Ms. LuAnn Maisner
Parks and Recreation Director
Charter Township of Meridian
2100 Gaylord Smith Court
Haslett, MI 48840

Re: Wetland Delineation – Pathway and Bridge Replacement Project
Central Park, Charter Township of Meridian
Ingham County, Michigan

Dear Ms. Maisner:

On July 30 and August 1 and 13, 2018, Fishbeck, Thompson, Carr & Huber, Inc. (FTCH) staff conducted a field investigation and delineated wetlands near the proposed pedestrian pathway in Central Park, an existing pedestrian bridge, and the proposed location of a restroom facility in the Meridian Historic Village (Figure 1). The pedestrian bridge is located at the east end of the proposed pathway, and it crosses a ditch and connects a parking lot to the Historic Village. The proposed restroom location is approximately 100 feet northeast of the bridge, on the southern edge of the Historic Village. The area of investigation is located in the southwest quarter of Section 15 of Town 4 North, Range 1 West. The results of the investigation are included in this report.

The wetland delineation was conducted in a manner consistent with the 1987 *Corps of Engineers Wetlands Delineation Manual* and 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2)*. The wetlands identification and delineation procedures outlined in these manuals require evaluation of site vegetation, soils, and hydrologic characteristics. Dominant wetland vegetation, hydric soil, and wetland hydrology must all be present for an area to be classified as a wetland. Hydrophytic vegetation decisions are based on the wetland indicator status of species that are dominant in the plant community. Species with indicator statuses of obligate wetland (OBL), facultative wetland (FACW), and facultative (FAC) are considered wetland species, while species with indicator statuses of facultative upland (FACU) and upland (UPL) are considered upland species. FAC species are also commonly present in upland plant communities.

Literature Review

The Charter Township of Meridian (Township) wetland map for Section 15 indicates the proposed pathway crosses the southern lobe of Wetland 15-2C, and the rest of Wetland 15-2C is located north of the pathway. Wetland 15-2C encompasses approximately 131.76 acres and consists of a forested/emergent/scrub-shrub/open water wetland complex. According to the Township wetland map, this wetland is associated with the Mud Lake Drain.

According to the U.S. Department of Agriculture Natural Resources Conservation Service *Web Soil Survey*, Wetland 15-2C contains Houghton muck (100% hydric rating) and Colwood-Brookston loams (80% hydric rating). The remainder of the area of investigation contains several different soil series ranked as not hydric or 28% hydric (Appendix 1).

The National Wetlands Inventory map indicates forested and emergent wetlands are present in generally the same areas as those with mapped hydric soil (Appendix 2).

Site Investigation

The wetland investigation was limited to the proposed pathway route, the bridge, and the proposed restroom location. Wetland boundaries were evaluated within approximately 50 feet of these features. A portion of the pathway route was evaluated on July 30, 2018, for the Township's Parks and Recreation Department as part of the Large Dog Park wetland delineation. The resulting wetland boundary data was incorporated into Figure 1 (i.e. the wetland boundary on the east side of the proposed large dog park).

The proposed pathway traversed rolling terrain and followed an existing gravel and dirt path or mowed turf. The ground at the western end of the proposed pathway sloped down to the south to an approximate 1.9-acre pond. Wetland trees and shrubs grew along the pond's northern shoreline (see photograph in Appendix 3). The adjacent upland consisted of mowed turf. The eastern edge of the pond contained a wider band of emergent wetland. Wetland conditions were confirmed at Sampling Point SP-A, near the southeast end of the pond. The wetland boundary along the north and east sides of the pond was flagged with pink ribbon labelled A1 through A14.

Site topography sloped up from the east side of the pond to the proposed large dog park, which sits at the top of a hill. The upland plant community directly east of the pond was dominated by northern prickly-ash (*Zanthoxylum americanum*, FACU), common buckthorn (*Rhamnus cathartica*, FAC), and eastern cottonwood (*Populus deltoides*, FAC).

Township Wetland 15-2C is located north of the proposed pathway. Much of this wetland consisted of emergent wetland dominated by reed canarygrass (*Phalaris arundinacea*, FACW) and common lakeshore sedge (*Carex lacustris*, OBL). The emergent wetland was present in a low, flat area containing muck soil. Forested wetland was present at the toe of slope extending up to the pathway route and was dominated with swamp white oak (*Quercus bicolor*, FACW), American elm (*Ulmus americana*, FACW), and common buckthorn. Upland forest dominated by sugar maple trees (*Acer saccharum*, FACU) was present between the forested wetland and the pathway route.

A gully containing shallow water was present at the southwest end of Township Wetland 15-2C. Wetland Sampling Point SP-B was evaluated on the terrace adjacent to west of the gully. The terrace was approximately 4 to 5 feet higher than the base of the gully. Dominant wetland vegetation was observed at this location, despite the overstory being dominated by sugar maple trees (an upland species). Wetland hydrology and soil were not present. Therefore, wetland was not confirmed on the terrace. The wetland boundary was flagged at the toe of the slope around the edge of the gully with pink ribbon labelled B1 through B5.

Because wetland flagging was limited to within approximately 50 feet of the pathway route, Figure 1 indicates breaks in the wetland boundary on the north side of the pathway in the western half of the area of investigation. The wetland boundary east of the gully was flagged with pink ribbon labelled C1 through C10. A wetland sampling point was not evaluated in this area due to the obvious presence of wetlands (muck soil, saturation at the ground surface, and dominant wetland vegetation consisting of reed canarygrass and common lakeshore sedge).

The next delineated wetland boundary to the east was associated with a linear depression containing narrowleaf cattails (*Typha angustifolia*, OBL), common reed (*Phragmites australis*, FACW), and common lakeshore sedge. Steep side slopes in this area suggest this area was historically excavated. Data obtained from Wetland Sampling Point SP-D confirmed the presence of wetland within this area. The wetland boundary was flagged with pink ribbon labelled D1 through D17.

Township Wetland 15-2C extends to the south between the proposed large dog park to the west and the athletic field to the east. This depression contains electrical power lines and an emergent wetland dominated by common cattail (*Typha latifolia*, OBL) and reed canarygrass. The proposed pathway crosses the wetland in this area. Forested wetland was present west of the utility right-of-way. The wetland boundary along the west edge

of the forested wetland was delineated as part of the wetland evaluation of the proposed large dog park. This portion of the wetland boundary was flagged with pink ribbon labelled B1 through B9. Flag B9 is located just north of the proposed pathway and connects to Flag D17.

The eastern quarter of the proposed pathway skirts the edge of an athletic field. North of the field, the site slopes down into a drainageway. The drainageway conveys stormwater from parking lots and developed areas into Township Wetland 15-2C. Scrub-shrub wetland was present along the edge of the drainageway, west of the pedestrian bridge. The area east of the bridge appeared channelized and consisted of a linear emergent wetland.

Data obtained from Sampling Point SP-E east of the pedestrian bridge confirmed saturated soil and dominant wetland vegetation (i.e. broadleaf cattails). Excessive soil moisture impaired soil characterization; therefore, the wetland determination was based upon the observed vegetation and hydrology. The wetland boundary on the north side of the bridge was flagged with pink ribbon labelled E1 through E5. The wetland boundary on the south side of the bridge and along the edge of the athletic field was flagged with pink ribbon labeled E6 through E19.

The proposed restroom location consisted of mowed turf on elevated terrain. No wetland indicators were observed at this location.

Photographs of wetland determination sampling points and associated plant communities are included in Appendix 3. A U.S. Army Corps of Engineers Wetland Determination Data Form was completed to describe site vegetation, soil, and hydrology at each sampling location (Points SP-A, SP-B, SP-D, and SP-E) (Appendix 4). The wetland sampling points and boundary flags were surveyed with a handheld GPS unit with submeter accuracy.

Conclusions

According to Michigan's Natural Resources and Environmental Protection Act, Act 451, Section 30301(d), wetlands "contiguous to the Great Lakes or Lake St. Clair, an inland lake or pond, or a river or stream" or "more than 5 acres in size" are regulated by the State of Michigan. In addition, the Township regulates wetlands greater than two acres in size which are not contiguous to a water body and wetlands between 0.25 acre and two acres in size that are determined to be essential to the preservation of the natural resources of the Township.

Most of the wetland boundaries delineated in this investigation are portions of the southern wetland boundary for Wetland 15-2C. In addition, wetland was delineated on the north and east sides of a pond at the western end of the area of investigation. Wetland 15-2C and wetland associated with the pond are regulated by both the State of Michigan and the Township because they are greater than 5 acres in size and/or are associated with a body of water (the Mud Lake Drain and the pond).

A wetland use permit would be required from the Township for the following activities within wetlands regulated by the Township:

- Placing fill or permitting the placement of fill in the wetland.
- Dredging, removing, or permitting the removal of soil or minerals from the wetland.
- Constructing, operating, or maintaining any use or development in the wetland.
- Draining surface water from the wetland.
- Discharging water into the wetland.

In addition, the Township requires that all structures and grading activities during site development shall be set back 40 feet from the delineated wetland boundary and a natural vegetation strip shall be maintained within 20 feet of the wetland boundary.

Ms. LuAnn Maisner
Page 4
September 6, 2018



If you have any questions regarding this letter, the wetland permitting process, or any other wetland-related issues, please contact me at 616.464.3738 or ehtripp@ftch.com.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

A handwritten signature in black ink, reading "Elise Hansen Tripp". The signature is written in a cursive style with a large initial "E".

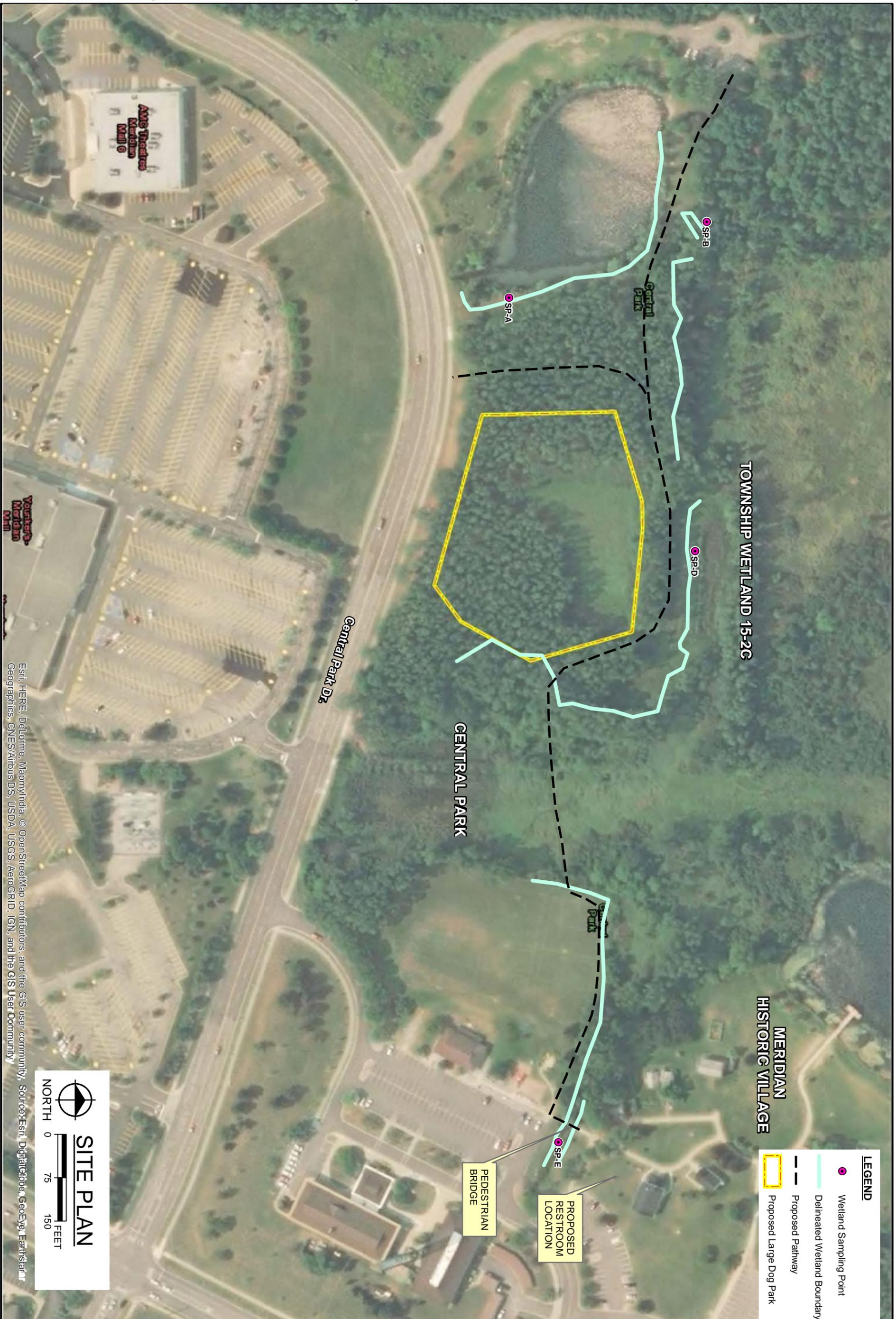
Elise Hansen Tripp, PWS

pmb

Attachments

By email

cc/att: Mr. Peter Menser – Township of Meridian
Mr. Mark Kieselbach – Township of Meridian



LEGEND

- Wetland Sampling Point
- Delineated Wetland Boundary
- - - Proposed Pathway
- Proposed Large Dog Park

MERIDIAN HISTORIC VILLAGE

TOWNSHIP WETLAND 15-2C

CENTRAL PARK

Central Park Dr.

PROPOSED RESTROOM LOCATION

PEDESTRIAN BRIDGE

SITE PLAN

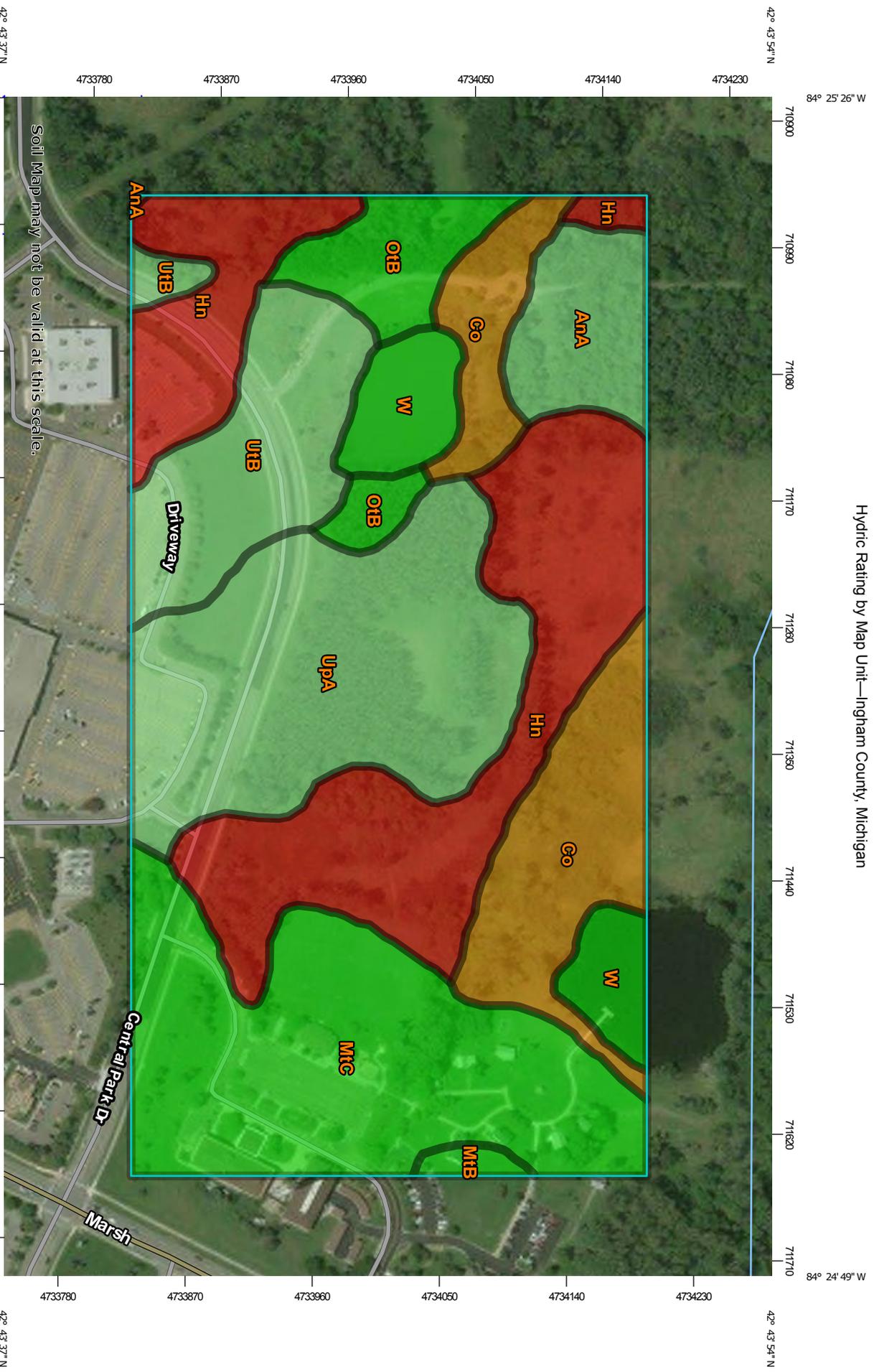
NORTH

0 75 150 FEET

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar

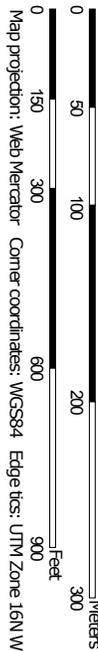
	<p>engineers</p> <p>scientists</p> <p>architects</p> <p>constructors</p> <p><small>fishbeck, thompson, carr & huber, inc.</small></p>	<p><small>Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.</small></p>	<p>Charter Township of Meridian Central Park South, Meridian Twp., Ingham County, Michigan</p> <p>Central Park Pathway and Bridge Rehabilitation</p>	<p>PROJECT NO. 181201</p> <p>FIGURE NO. 1</p> <p><small>© Copyright 2018 All Rights Reserved</small></p>
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

Hydric Rating by Map Unit—Ingham County, Michigan

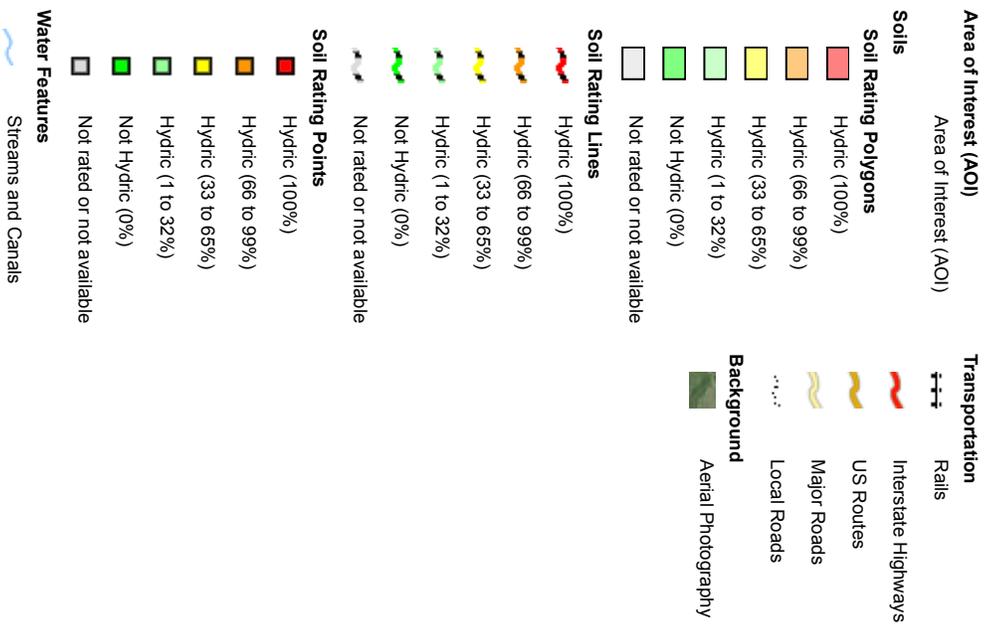


Soil Map may not be valid at this scale.

Map Scale: 1:3,830 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ingham County, Michigan
Survey Area Data: Version 15, Oct 5, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2011—Mar 10, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnA	Aubbeenaubbee-Capac sandy loams, 0 to 3 percent slopes	8	3.0	4.8%
Co	Colwood-Brookston loams	80	7.6	12.0%
Hn	Houghton muck, 0 to 1 percent slopes	100	14.9	23.6%
MtB	Metea loamy sand, 2 to 6 percent slopes	0	0.4	0.6%
MtC	Metea loamy sand, 6 to 12 percent slopes	0	13.1	20.8%
OtB	Oshtemo-Spinks loamy sands, 0 to 6 percent slopes	0	3.1	4.9%
UpA	Urban land-Capac-Colwood complex, 0 to 4 percent slopes	28	12.0	19.1%
UtB	Urban land-Marlette complex, 2 to 12 percent slopes	5	5.9	9.4%
W	Water	0	3.0	4.8%
Totals for Area of Interest			63.1	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower



Central Park, Okemos, MI



July 18, 2018

Wetlands

-  Estuarine and Marine Deepwater
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Lake
-  Estuarine and Marine Wetland
-  Other
-  Freshwater Pond
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service, National Standards and Support Team,
wetlands_team@fws.gov

Wetland Delineation: Central Park Pathway and Bridge Charter Township of Meridian Ingham County, Michigan

Pond at West End of Pathway Route



North side, looking east



East side, looking south



Wetland at SP-A



Sampling Point SP-A



Terrace at SP-B



Sampling Point SP-B



Gully adjacent to SP-B



Township Wetland 15-2C,
Viewed from Wetland Boundary (C Flags)



Wetland at SP-D



Sampling Point SP-D



Forested Wetland between proposed Large Dog Park and Athletic Field



Pathway Route traversing Emergent Wetland west of Athletic Field.

Wetlands Associated with Pedestrian Bridge



Sampling Point SP-E



Emergent Wetland at SP-E

Wetlands Associated with Pedestrian Bridge



Wetland west of the Bridge, as viewed from the northwest



June 28, 2019
Project No. 190844

Mr. Mark Kieselbach
Charter Township of Meridian
5151 Marsh Road
Okemos, MI 48864

Re: Wetland Use Permit #19-02 Application Review
Central Meridian Regional Trail Connector
Meridian Department of Parks and Recreation

Dear Mr. Kieselbach:

The Charter Township of Meridian Parks and Recreation Department (Township P&RD) is requesting to construct pathways and a fishing deck in Meridian Central Park and South Central Park. Site improvements will impact wetlands regulated by the Township.

At the request of the Township, FTCH reviewed the Township P&RD's Wetland Use Permit (WUP) request, including the following:

- A digital MDEQ/USACE Joint Permit Application (JPA) prepared by the Applicant, including revisions dated March 15, 2019, May 1, 2019, and May 24, 2019;
- A set of project design drawings prepared by Wolverine Engineers & Surveyors, Inc. (WES), dated June 24, 2019; and
- An email from Jesse Lewter of WES to Ms. Carol Valor of the Michigan Department of Environment, Great Lakes and Energy (EGLE) which provides responses to Ms. Valor's JPA review questions and comments.

Additionally, FTCH delineated wetland boundaries at the project site in Summer 2018 and summarized its findings in a report entitled *Wetland Delineation – Pathway and Bridge Replacement Project, Central Park, Charter Township of Meridian, Ingham County, Michigan*, dated September 6, 2018.

This letter provides a brief description of the resources that would be impacted by the proposed work, evaluates WUP Application #19-02, according to review standards in the Township Wetland Protection Ordinance (Article IV of Chapter 22 of the Code of Ordinances of the Charter Township of Meridian), and makes recommendations to the Township regarding issuance or denial of the WUP application.

Overview of Proposed Wetland Impacts

The proposed activities are in the southwest quarter of Section 15, Town 4 North, Range 1 West, Ingham County, Michigan. The Township wetland map for Section 15 indicates the proposed pathway crosses the southern lobe of Wetland 15-2C, an approximately 131.76 acre, forested/emergent/scrub-shrub/open water wetland complex. This wetland is regulated by the Township under Article IV (Wetland Protection) of Chapter 22 of the Township's Code of Ordinances because it is greater than two acres in size. The west end of the proposed pathway is located north of a 1.9-acre pond which has a narrow fringe of wetland along its shore. This wetland is regulated by the Township because it is contiguous with a body of water. The proposed fishing deck is located in this pond.



The Applicant has submitted a WUP application to the Township requesting the following:

- Construct a 12-foot wide, paved pedestrian pathway that is a total of 2,400-feet long. The pathway includes a 360-foot long wooden boardwalk that will cross Township Wetland 15-2C. The boardwalk will be installed on helical piers (i.e. support pilings) and will be elevated approximately 2.5 feet above the surface of the wetland. Therefore, the only permanent impact to the wetland will be installation of the helical piers, which are screwed into the soil. No soil will be excavated from the wetland or placed in it during installation of the piers. The boardwalk will cover 4,650 square feet of wetland but will not alter its vegetation (other than the clearing of woody vegetation), soils or hydrology.
 - FTCH Note: the pathway route avoids wetland impacts to the greatest extent possible. Portions of the pathway will be constructed within 40 feet of the wetland boundary. FTCH concurs avoidance of the Township's 40-foot wetland buffer is unavoidable due site constraints.
- Construct a construction route to the boardwalk that will temporarily impact 4,660 square feet of wetland on the north side of the proposed boardwalk.
- Construct a fishing deck on the pond and a connecting boardwalk that crosses associated wetland. The deck and boardwalk will be constructed through the installation of helical piers. The boardwalk will cross approximately 304 square feet of wetland (16-foot wide boardwalk x 19 linear feet of wetland crossing).
 - FTCH Note: The area of wetland crossing associated with the fishing deck boardwalk was not specified in the WUP application. However, the boardwalk will be elevated above the wetland so no permanent impact to the wetland is anticipated.
- Temporarily impact 1,000-square feet of wetland along the pond's shoreline during construction of the fishing deck.
- Install 49-linear feet of 15-inch diameter, reinforced concrete pipe in a linear emergent wetland at the east end of the project area and backfill 1,830-square feet of associated wetland. The existing wood bridge will be replaced with paved sidewalk over the enclosed drain. The total volume of fill required for the crossing is 267 cubic yards; 63 cubic yards of this fill is below the 842.1 100-year floodplain elevation, which is assumed to be the wetland boundary.
 - FTCH Note: FTCH noted an error pertaining to the wetland boundary on the design drawings at the east end of the project area. Parallel wetland boundaries should be noted near the toe of slope along the linear wetland directly east and west of the pedestrian bridge. As drawn, the southern wetland boundary west of the bridge incorrectly crosses the drainageway and connects to the northern wetland boundary west of the bridge. The southern wetland boundary east of the bridge is not noted on the plans (or it may be obscured by the 100-year floodplain elevation line in this area).
 - FTCH Note: The WUP application notes the wetland boundary closely matches the 100-year floodplain boundary. Therefore, the applicant based the wetland fill area on the 100-year floodplain fill area. FTCH concurs with this approach, which provided a reasonable method for estimating wetland fill west of the pedestrian bridge, in the area of wetland boundary confusion noted above.
- Place 11-cubic yards of riprap at the west end of the installed pipe.
- Construct a 4,100-square feet wetland mitigation area on the north side of the pond to compensate for 1,830-square feet of permanent wetland impacts resulting from this project.



- FTCH Note: The mitigation area will compensate for partially filling the linear, emergent wetland at the east end of the project area. FTCH recommends replacement of emergent wetland require construction of the same type of wetland at a 1.5:1 ratio. Therefore, the required area of mitigation wetland is 2,745-square feet (i.e. the area in which wetland hydrology and dominant wetland vegetation will establish).
- FTCH Note: The proposed wetland remediation area noted on the project design drawings (i.e. the wetland mitigation area) extends up to 9 feet into the delineated wetland. The area extending into the existing wetland does not qualify as mitigation wetland. The shaded mitigation area noted on the plans also extends up the adjacent slopes one to two feet above the wetland boundary elevation. Some of the outer northern limits of the mitigation area may be too high to achieve wetland hydrology; however, the total mitigation area noted on the drawings is larger than required to meet the 1.5:1 mitigation ratio, thereby providing some assurance that the required mitigation wetland area will be achieved.

Review of WUP Application

The review standards used to evaluate WUP applications are found in Section 22-157 of Article IV (Wetland Protection) of Chapter 22 of the Township's Code of Ordinances. WUPs are not to be issued unless the proposed activity is found to be in the public interest, the permit is necessary to realize the benefits from the activity, and the proposed activity is otherwise lawful in all respects. Section 22-157(2) lists eleven general criteria to be considered when evaluating whether or not a proposed activity is in the public interest. An evaluation of the proposed activity, according to each of the eleven criteria, is as follows:

Section 22-157(2)(a) *The relative extent of the public and private need for the proposed activity.*

- No information regarding the relative extent of the public and private need for the trail extension and fishing deck construction was provided.

Section 22-157(2)(b) *The availability of feasible and prudent alternative locations and methods to accomplish the expected benefits from the activity.*

- The WUP application's discussion of feasible and prudent alternatives was limited to the following: "Given the proposed locations for the pathway ends and given the wetlands delineation boundaries, and using the helical piers will provide the least impact to the wetlands and provide the least restriction to the floodway."
- The availability of feasible and prudent alternative locations and methods was not discussed in the WUP application.
- The pathway route appears to avoid wetland impacts to the greatest extent possible. Construction of pathway within the 40-foot wetland buffer appears unavoidable in order to meet the project goal of connecting Meridian Central Park to the South Central Park with a paved pedestrian pathway.
- FTCH concurs that use of helical piers provides the least impact to site wetlands for construction of boardwalks and the fishing deck, compared to other methods of construction.
- The No Action alternative pertaining to filling wetlands at the east end of the project area has several negative results, as indicated by the Applicant:
 - The existing linear wetland collects trash and debris from the parking lot. These items are unsightly and difficult to remove.

- The linear wetland is in a public area, has steep slopes, and is six feet lower than the surrounding landscape. The Township has safety concerns for staff that maintain this area and the public who visit the park.
- The linear wetland is not visually appealing and is located at the entrance to the Central Park South and the Meridian Historical Village.

Section 22-157(2)(c) *The extent and permanence of the beneficial or detrimental effects which the proposed activity may have on the public and private uses to which the area is suited, including the benefits the wetlands provide.*

- The project area is well suited for construction of a pathway connecting two Township parks. The pathway alignment avoids wetland impacts to the greatest extent possible. Minimal impact to wetlands will result where the pathway crosses regulated wetland due to construction of boardwalks on helical piers and elevation of the boardwalk 2.5 feet above the ground surface. No impact to wetland soil or hydrology is anticipated due to construction of boardwalks and the fishing deck on helical piers.
- There are public and private benefits to providing a pathway connection between two Township parks and constructing the fishing deck: improved recreational opportunities with resulting health benefits, and improved access to nature.
- Site wetlands provide the following functions and values: water storage, water quality improvement, groundwater recharge, wildlife habitat, and aesthetic value. No significant impacts to these functions and values are anticipated due to construction of the boardwalk and fishing deck.
- The linear wetland that will be partially filled is of low quality due to the presence of invasive species. Wetland functions lost from partially filling the linear wetland will be mitigated through construction of new wetland on the north side of the pond.

Section 22-157(2)(d) *The probable impact of each proposal in relation to the cumulative effect created by other existing and anticipated activities in the watershed.*

- There are no identified cumulative impacts of the proposed project.

Section 22-157(2)(e) *The probable impact on recognized historic, cultural, scenic, ecological, or recreational values and on the public health or safety, or fish or wildlife.*

- The project provides recreational value through providing improved pedestrian access between Meridian Central Park and South Central Park and a fishing deck on a pond. The pond is a popular fishing location where fishing is currently limited to the shore. Both the pathways and the fishing deck will improve ADA accessibility to the parks.
- The project addresses a public safety concern by partially filling a steep ditch.
- No other impacts on recognized historic, cultural, scenic, ecological or recreational values are apparent for the proposed activities. In addition, no impacts to fish and wildlife are apparent.

Section 22-157(2)(f) *Economic value, both public and private, of the proposed land change to the general township area.*

- The question of economic value associated with the proposed activity is beyond the scope of the issues FTCH was retained to address. Accordingly, FTCH offers no opinion, recommendations, or advice with respect to this criterium.



Section 22-157(2)(g) *The size and quality of the wetland being considered.*

- The proposed pathway crosses the southern lobe of Township Wetland 15-2C, a 131.76 acre, forested/emergent/scrub-shrub/open water wetland complex. Forested and emergent wetland are present along the pathway route. A utility corridor containing high voltage electrical lines is also present in the emergent wetland along the pathway route. The pathway will cross under the power lines, which run from north to south.
- The boardwalk to the fishing deck will cross a relatively narrow band of emergent wetland along the edge of the pond.
- The linear wetland which will be filled is adjacent to parking lots and appeared to be in a manmade ditch. Invasive species dominate the wetland in the proposed fill area.

Section 22-157(2)(h) *The findings of necessity for the proposed activity which have been made by other agencies.*

- FTCH is not aware of any findings of necessity for the proposed activity which have been made by other agencies.

Section 22-157(2)(i) *Amount of wetland remaining in the general area and proximity to a waterway.*

- Site wetlands are part of a large wetland complex that contains Township Wetlands 15-2A, 15-2B, 15-2C, 15-2D, 10-16, 10-17, 16-11A, 16-11B, 16-11C, and 21-1B.
- The Mud Lake Drain and the Pine Lake Drain flow through Township Wetland 15-2C. These waterways are designated county drains.

Section 22-157(2)(j) *Proximity to any waterbody.*

- Lake Lansing is located approximately 1.6 mile northeast of the proposed wetland pathway crossing.
- The proposed fishing deck is located on an approximately 1.9-acre pond.
- An approximately two-acre pond is located approximately 0.1 mile northwest of the proposed wetland fill area.

Section 22-157(2)(k) *Extent to which upland soil erosion adjacent to the protected wetland is controlled.*

- A soil erosion and sedimentation control (SESC) plan was submitted as part of the project design drawings in the WUP application (Sheets C9.0, C9.1, and C9.2).
- Proposed SESC measures include:
 - Installation of silt fence and stormwater inlet protection;
 - Maintenance of soil erosion controls weekly and after every storm event;
 - Temporary seeding of disturbed areas, as needed;
 - Permanent stabilization of soil with vegetation within five days of final grade or final activity in an area.

Recommendations

Based upon our review of the submitted materials, it is our opinion that the proposed project meets the Township's requirements for permit issuance. FTCH recommends a WUP be issued for the following activities and impacts:

- Construct a 12-foot wide, paved pedestrian pathway, including a 360-foot long wooden boardwalk that crosses Township-regulated wetland and paved pathway within the 40-foot wetland buffer. The boardwalk will be installed on helical piers and elevated approximately 2.5 feet above the surface of the wetland.
- Construct a fishing deck on a pond and a connecting boardwalk which crosses approximately 304 square feet of associated wetland. The deck and boardwalk will be constructed through the installation of helical piers and elevated approximately 2.5 feet above the surface of the wetland.
- Construct construction routes that will temporarily impact 4,660 square feet of wetland on the north side of the proposed boardwalk and 1,000-square feet of wetland along the pond's shoreline during construction of the fishing deck.
- Backfill 1,830-square feet of linear, emergent wetland at the east end of the project area with 63-cubic yards of soil below the wetland boundary elevation (267 cubic yards of total fill).
- Place 11-cubic yards of riprap at the west end of the stormwater pipe installed in the filled wetland.

The WUP permit should be issued with the following conditions:

- Construct a mitigation wetland on the north shore of the site's pond, as indicated on Sheet No. C3.0 of the project plans. The mitigation wetland (i.e. the area containing dominant wetland vegetation, wetland hydrology and wetland soil) must be at least 2,745-square feet in size to compensate for filled wetland at a ratio of 1.5:1. The mitigation wetland should consist of emergent wetland.
- Submit a wetland mitigation plan, including a grading plan, planting plan, construction methods and timing, a species list of the native, wetland seed mixture (including scientific and common names), and seeding rates.
- Submit a wetland restoration plan for the temporary wetland impact areas adjacent to the pond's fishing deck and the wetland boardwalk, including the proposed wetland seed mixture, seeding rate, seeding schedule, and seedbed preparation.
- Monitor the wetland mitigation area and the temporary wetland impact areas for five years after construction to verify the presence of wetland vegetation and hydrology. After the first full growing season, provide the Township an annual monitoring report by January 31 of the following year.
- The performance standards for the wetland mitigation and restoration areas are:
 - Sixty percent cover of native wetland plant species.
 - Ten percent cover or less of invasive species.

Mr. Mark Kieselbach
Page 7
June 28, 2019



We appreciate the opportunity to assist in the review of this file. If you have any questions or require additional information, please contact me at 616.464.3738 or ehtripp@ftch.com.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

A handwritten signature in black ink that reads "Elise Hansen Tripp". The signature is written in a cursive, flowing style.

Elise Hansen Tripp, PWS

pmb

By email

cc: Mr. Peter Menser – Township