

Agenda

Natural Features Protection Review Board



City of Kalamazoo

Tuesday, August 26, 2025

4:00 PM

City Commission Chambers at City Hall - 241 W. South Street

A. CALL TO ORDER/ROLL CALL

1. Excuse Absent Board Members (**Action: Motion to Excuse Absent Board Members**)

B. ADOPTION OF AGENDA

(Action: Motion to approve the agenda)

1. Agenda Approval (**Action: Motion to Approve Agenda**)

C. APPROVAL OF MINUTES

1. Approval of the minutes from the Natural Features Protection Review Board meeting on July 22nd, 2025 (**Action: Motion to Approve the meeting minutes from the Natural Features Protection Review Board meeting, as presented, on July 22nd, 2025**)

D. PUBLIC COMMENTS

E. BOARD MEMBER COMMENTS

F. NEW BUSINESS

1. 2600 Mount Olivet Road Pump Station 14 Reconstruction

G. UNFINISHED BUSINESS

- 1.

H. STAFF REPORTS AND UPDATES

I. COMMUNICATIONS AND ANNOUNCEMENTS

J. ADJOURNMENT



**Natural Features
Protection Review
Board
Minutes
July 22nd, 2025
Held at City Hall
Commission Chambers 4:00 p.m.**

A. Call to Order: Director Martin called the meeting to order at 4:04 p.m.

Members absent: Director Murgia

- 1. Excuse Absent Board Members: The motion to excuse absent board members was made by Director Fredrickson and supported by Director Hollander, and the motion passed unanimously.**

B. Adoption of Agenda

Motion to adopt the agenda made by Director Hollander, supported by Director Stemple, motion passed unanimously.

C. Approval of the Meeting Minutes

Motion to approve the minutes from June 24th, 2025, NFP Review Board Meeting made by Director Hollander, supported by Director Rowe, motion passed unanimously.

D. General Citizen Comments

E. Board Comments

No comments



F. New Business

Question?

Public Comments:

Asking for information on 322 Stockbridge, Edison Neighborhood Association will hold a meeting in their Neighborhood. NFP doesn't have any updates on Agendas and Minutes on the City's website since 2023, and we will look into. Meetings are the 4th Tuesday of every month and the updated Agenda's and Meeting minutes are located on the City Clerk's page. [Minutes & Agendas City of Kalamazoo](#)

Unfinished Business

1. NFP Board Work Session – Nolan presented a short Presentation of the newest information.
2. Tree Committee is for public right-of-way trees and NFP is for private development, checking with Forestry to see if we can get someone to come in and speak to us concerning the tree list and how we can standardize them for both committees and update the Tree Ordinances for the City. Director Fredrickson brought up that we have to be careful on a tree list that is provided and approved because we could get everyone using the same 5 plants and then it would could reverse the issue and have a monoculture. She stated it might be an extreme example but just an example but will want to avoid invasives.
3. Discussion of NFP Guide, focusing on helping developers navigate requirements. Emphasizes the importance of providing clear guidance and resources to improve the development process.
4. The City of Kalamazoo GIS tool can be very helpful to someone that wants to look up background of the area where they want to develop.
5. Director Hollander brought up that being on the other side of a project it should be clearer as a procedure, process and costs for applicants.

Staff Reports and Update

None

Communications and Announcements:

The Kalamazoo Paddle for the Planet, 15 years after the oil spill event, was held Saturday, July 26th at Historic Bridge Park, Waddles Road in Battle Creek at 9 am

Adjourn Meeting

Director Fredrickson adjourned the meeting at 4:59 pm



NFP Review Board Staff Report

City of Kalamazoo

TO: The Natural Features Protection Review Board

FROM: Nolan Bergstrom, NFP Board Liaison

DATE: August 26, 2025

SUBJECT: 2600 Mount Olivet Road Pump Station 14 Reconstruction

RECOMMENDATION:

It is recommended the Natural Features Protection (NFP) Review Board approve the NFP Site Plan for the 2600 Mount Olivet Pump Station #14 Reconstruction Project conditioned upon:

- Submission of the MNFI Rare Species Review Report.
- Full Approval by the Site Plan Review Committee.

BACKGROUND:

The subject parcel is owned by the City of Kalamazoo in the Burke Acres Neighborhood at 2600 Mount Olivet Road. The property is Spring Valley Park and is the location of Pump Station #14. The parcel is zoned Residential, Multi-dwelling or RM-15. The proposed work is a utility consolidation project to upgrade Pump Stations 5 and 14 with additional water treatment to remove iron and PFAS to meet regulatory standards. The existing pump stations do not currently have a way to remove these pollutants. Water treatment is recommended to remove levels of iron and [per- and polyfluoroalkyl substances \(PFAS\)](#) that may negatively impact human health if not treated. [Station 5 has been a part of the Municipal System since 1914.](#) Station 14 is aging. The City of Kalamazoo is working with [Tetra Tech](#) to complete this work.

The project was originally slated for NFP Board Review in 2023 but withdrew the application alongside the site plan application. The project had a checklist meeting at the end of April 2025 and is working through the site plan process concurrent to the NFP Board Review. In May 2025, the NFP Board reviewed the 2045 E Michigan Project, which is where Pump Station #5 is located. The project is seeking NFP Board approval to obtain full site plan approval and site permits.

FINDINGS:

The property is within the NFP Overlay District due to:

Primary Natural Feature: Adjacent to Hydrology (Proximity to Spring Valley Lake)

Secondary Natural Feature: Hydrology

Tertiary Natural Feature: Woodlands & potentially protected trees.

MNFI Rare Species Review: Yes.

The property is also within 1-, 5-, and 10-year [wellhead capture zones](#).

The following NFP Site Development Standards Apply to this project:

- **Water Resources Standard** – There is surface hydrology near / within the site. The water resources setback (25 ft) is shown on the plans with no new structures shown within the setback areas. The Michigan Safe Drinking Water Act separation distances are shown which dictate well placement. Any vegetative buffers would be outlined in a Stormwater Agreement per [§ 50-6.2D\(5\)](#)
- **Wetland Standard** – Similar standards to Water Resources. Permits from State or Federal Agencies are required to be on-file, if needed.
- **Protected Tree Standard** – There are no proposed tree removals for this project.
- **Woodland Protection Standard** – There are no proposed woodland impacts with this project. Tree Protection fencing specifications and locations are shown on the plans.
- **Natural Heritage Areas Standard** – MNFI Rare Species review is required for this project.
- **Plant Selection** – Plant selection needs to adhere to [§ 50-6.2J\(4\)](#) and tree plantings will come from the Tree Replacement List ([Table 6.2-5](#)) IF Required.
- **Stormwater Management** – A Soil Erosion and Soil Control Plan is required and stormwater management will adhere to NFP Guidelines per [§ 50-6.2J\(6\)](#). The project is also located within multiple wellhead capture zones.

After staff review, the plan appears to meet NFP standards and qualifies for conditional approval based upon the following:

- Submission of MNFI Rare Species Review Report.
- Full Approval by the Site Plan Review Committee.

SUPPLEMENTAL SITE PLAN REVIEW APPLICATION FOR NATURAL FEATURES PROTECTION

For projects located within the Natural Features Protection (NFP) Overlay District, separate site plan approval is required before the full site plan can be approved. This review is done either by the NFP Review Board or administratively by staff to verify conformance with NFP Overlay District zoning code ([Chapter 50, NFP](#)). The NFP Overlay District map can be found on the [City's GIS mapping website](#) (select "Planning & Zoning" layer and make sure "NFP Overlay" is clicked on).

The NFP Supplemental Application must be completed and submitted with the regular Site Plan Review Application and checklists. The NFP Review Board meets monthly to review and approve applications. City staff can assist in scheduling a project at an upcoming NFP Review Board meeting. While the review process offers some flexibility, projects often seek NFP approval between the Pre-Application meeting and regular Site Plan Review meeting.

Section I. Project & Applicant Information

All projects must complete Section I. If the project will not impact any natural features on the site, and does not trigger additional stormwater controls or treatment, applicants should sign and submit Section I only. Staff will review and determine if the application can be approved administratively.

Section II. Natural Features Checklist & Attachments

For projects proposing improvements or changes to the site that impact natural features, change grading, or involve work in or near NFP setbacks, Sections II and III must be completed. Section II identifies which natural features are present and standards apply. Section III will assist you in determining what documentation and additional plan sets are needed for a complete application. Once a complete application is submitted to the City, the project will be scheduled for the next available NFP Review Board meeting and an application fee of \$110 will apply.

QUESTIONS

Contact the NFP staff liaison with any questions about your NFP Supplemental Application at (269) 337-8045 or development@kalamazoocity.org.

SECTION I. PROJECT AND APPLICANT INFORMATION

Please provide all of the project and applicant information requested below. Include the date of your regular site plan review meeting, if one has been scheduled or already taken place.

APPLICANT NAME:	ERIC SAJTAR (first) (last)		
APPLICANT ADDRESS:	415 E. STOCKBRIDGE (number) (street name)		
	KALAMAZOO (city)	MI (state)	49001 (Zip)
APPLICANT EMAIL:	SAJTARE@KALAMAZOOCITY.ORG	PHONE:	269-491-3882
PARCEL ADDRESS/PIN:	3600 Mount Olivet Road PIN: 06-11-245-002		
PROJECT DESCRIPTION:	Install five new well condos (12'x19'), demolish five old well condos (8'x12'), replace well field raw water main and underground electrical, construct chlorine dosing building, install natural gas generator w/ canopy and retaining wall, remove		
OWNER NAME: <i>(if different)</i>	City of Kalamazoo Public Services-Water Resour (first) (last)		
HAS REGULAR SITE PLAN REVIEW MEETING OCCURRED?	☐ Yes ☒ No	DATE OF SITE PLAN REVIEW MEETING:	

NFP APPLICATION REQUIRED?

Is the project limited to interior work <u>only</u> with no exterior ground changes or increase in impervious coverage?	
☐ YES	If YES, Sections II & III of this application are not needed. Sign below & submit only this page with your site plan review or permit application.
☒ NO	If NO, proceed to Sections II & III. Do NOT sign below.

By signing below, the applicant certifies that no natural features will be disturbed as part of this project.

Print name: ERIC SAJTAR

Signature: Eric Sajtari
Digitally signed by Eric Sajtari
 DN: C=US, E=sajtare@kalamazoo.org, O=City of Kalamazoo, OU=Water Resources Division, CN=Eric Sajtari
 Date: 2025.07.31 19:45:08-04'00'

Date: 07/31/2025

SECTION II. NFP SITE PLAN CHECKLIST & ATTACHMENTS

Use the checklist to determine what documentation and additional plans sets must be prepared for this application. All plan sets, maps, and additional information must be attached to this application to be considered complete. If you checked “no” to certain NFP items in questions 1-7 in Section II, record “N/A” on the checklist.

REQUIRED: NFP SITE PLAN SET

All applications must include separate sheets in the plan set showing the following:

1. Existing conditions map showing an inventory of all protected natural features and any associated natural features setbacks with distances (use checklist below)
2. Future development plan overlaid onto the existing conditions and natural features inventory; indicate where and to what extent protected natural features will be disturbed, removed, altered, or impacted in any way and which natural features will be protected during and after construction

Future development plan must include:

- **Boundary with extent of re-grading**, construction, or site preparation activities
 - **All existing and new building footprints** (mark whether existing buildings will be removed or maintained)
 - **New and existing parking** surfaces or structures, sidewalks, trails, and other impervious or semi-impervious surfaces including decks, patios, viewing platforms, etc. (list proposed surface materials and whether existing surfaces will be maintained or removed)
 - **Proposed location of fencing and screening**, whether permanent, natural, or construction silt fencing and/or natural feature protection fencing (with specifications)
 - **Stormwater facilities** showing boundary of ground disturbance, grading or construction activities, if located near natural features
 - **New utilities** and/or relocation of existing utilities showing corridors that could impact natural features
3. Landscape plan detailing the minimum elements needed to meet zoning code requirements and all proposed additional landscaping elements or features (include table with species name)
 4. Any additional plans or tables detailing which natural features will be restored or replaced after construction, if required (e.g., riparian buffer installation or slope restoration plan may be required under certain circumstances when the ordinance allows changes within these protected areas)

WETLANDS	Present:	Included on page #:	Notes:
Mark existing wetland boundaries with notes about wetland conditions. <i>Attach a copy of EGLE permit or permit application for work impacting Part 303 wetlands regulated by the State.</i>	☒ Yes ☐ No	C-111	
WATER RESOURCES	Present:	Included on page #:	Notes:
Mark the location of all water resources on the parcel and those within 25 feet of the parcel boundaries. <i>Attach a copy of EGLE permit or permit application for work impacting Part 301 waters regulated by the State.</i>	☒ Yes ☐ No	C-111	
Show required setbacks with dimensions; describe existing or future ground cover within riparian setbacks.		C-111	
TREES	Present:	Included on page #:	Notes:
Mark the location of all “protected” trees that are proposed to be removed and those that will remain and require protection fencing.	☐ Yes ☒ No	C-902	NO TREE REMOVALS
Include a table with species name, size (DBH and height), and condition of “protected” trees that are proposed to be removed and list replacement tree information.		if yes, include	NO TREE REMOVALS
Provide a note with justification for removal.		if yes,	N/A
WOODLANDS	Present:	Included on page #:	Notes:
Delineate the boundary of all woodlands on the parcel noting where woodlands likely extend onto adjacent parcels.	☐ Yes ☒ No	if yes, include	NO TREE REMOVALS
Mark all areas of woodland that will be retained and removed (i.e., cleared).		if yes, include	NO TREE REMOVALS
Include a table or note with the required preservation ratio (based on existing woodland coverage), percentage proposed to be removed, and rationale for selecting area for removal.		if yes, include	NO TREE REMOVALS
SLOPES	Present:	Included on page #:	Notes:
Provide a slope analysis that shows the boundaries of all “protected” slopes and mark the required setback(s).	☐ Yes ☒ No	if yes, include	NO PROTECTED SLOPES
Include a note with co-existing feature that triggers “protected” slope status (e.g., wooded, within 500 ft of water resource).		if yes, include	NO PROTECTED SLOPES

NATURAL HERITAGE AREAS	Present:	
Is an MNFI* rare species review required? <i>Parcels can be pre-screened using the City's GIS website, click on the "Planning & Zoning" layer and "NFP Overlay" layer; then click on parcel and see MNFI status.</i>	☒ Yes ☐ No	MNFI IS ATTACHED
If an MNFI rare species review is required, attach the resulting report.		

*Michigan Natural Features Inventory (MNFI) Rare Species Reviews can be requested at:

<https://mnfi.anr.msu.edu/services/rare-species-reviews>

ACCEPTED DATA SOURCES & ANALYSIS

All data sources, analysis, and professionals are subject to approval by the City Planner according to Chapter 50-6.2. The following guidance may be useful when selecting a professional or methodology for inventorying natural features.

1. WETLANDS

- Wetland delineation report performed by a qualified consultant including a map denoting delineated boundary of all wetlands, OR
- Most recent US Fish & Wildlife Service's National Wetlands Inventory boundary (State of Michigan mapper: <https://www.michigan.gov/egle/about/organization/water-resources/wetlands/inventory-maps>)

2. PROTECTED TREE IDENTIFICATION

- May be performed by an qualified professional (including ISA Certified Arborist or similar); a full tree inventory is not required if all necessary information can be obtained and communicated using another survey, inventory, or site assessment methodology

3. WOODLANDS

- A qualified professional, such as an ISA Certified Arborist, landscape architect, or license engineer may perform a desktop analysis or field survey to delineate woodlands
- When a variances is being requests to remove more woodland cover than is allowed under the preservation ration, the following is required
 - Woodland assessment report with determination that the Trees per Area (TPA) meets the NFP definition of a woodland and mapped delineation of woodland
 - Woodland assessment report with a determination that Basal Area is equivalent to the TPA in the NFP definition and meets definition of a woodland and mapped delineation of woodland
 - In addition to determination of whether stand of trees meets NFP definition of a woodland, assessment must include information on general species diversity,
 -

composition of species, any notable trees (either notable species or size), invasive species composition, and general health and age observations of tree stand

4. PROTECTED SLOPES

- Topographic survey performed in the field by a qualified consultant to delineate areas of a slope with grade of 20% or greater
- Desktop analysis performed using U.S. Geological Survey digital topographic maps, LIDAR, digital elevation map, or equivalent data showing 2' intervals or finer resolution, performed by a qualified consultant or engineer

Lauryn Roberts
Tetra Tech

April 11, 2025

**Re: Rare Species Review #5386 – The City of Kalamazoo Flow Consolidation Project,
Kalamazoo County, MI**

Hello:

The location for the proposed project was checked against known localities for rare species and unique natural features, which are recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database. This continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features. The absence of records in the database for a particular site may mean that the site has not been surveyed. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR), Wildlife Division. Responsibility to protect endangered and threatened species is not limited to the lists below. Other species may be present that have not been recorded in the database.



MSU EXTENSION

Michigan Natural
Features Inventory

PO Box 13036
Lansing MI 48901

(517) 284-6200
Fax (517) 373-9566

mnfi.anr.msu.edu

Several at-risk species and/or natural communities have been documented within 1.5 miles of the project location and it is possible that adverse impacts will occur. This response reflects a desktop review of the database and MNFI cannot fully evaluate this project without visiting the area. MNFI offers several levels of [Rare Species Reviews](#), including field surveys which I would be happy to discuss with you.

Sincerely,

Nicolette Sexton

Nicolette Sexton
Environmental Review Assistant
Michigan Natural Features Inventory

Comments for Rare Species Review #5386

It is important to note that it is the applicant's responsibility to comply with both state and federal threatened and endangered species legislation. Therefore, if a state listed species occurs at a project site, and you think you need an endangered species permit, please contact Amy Bleisch at DNR-Wildlife Division, DNR-StateTEPermit@michigan.gov and review details on the [MDNR's Threatened/Endangered Species](#) resource page. If a federally listed species is involved and, you think a permit is needed, please contact Jessica Pruden, U.S. Fish and Wildlife Service, East Lansing office, 517-351-8316, or Jessica_Pruden@fws.gov.

NOTE: Special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts. Please consult MNFI's [Rare Species pages](#) for additional information on Michigan's rare plants and animals.

NOTE: Several rare freshwater mussels have been documented near the project area. Freshwater mussels (*Unionida*) require a fish host to complete their life cycle. Eggs are fertilized and develop into larvae within the gills of the female mussel. These larvae, called glochidia, are released into the water and must attach to a suitable fish host to survive and transform into the adult mussel. As zebra mussel (*Dreissena polymorpha*) infestation has led to the extirpation of many native mussel communities, boat hulls and trailers, fishing gear and scuba equipment should be thoroughly cleaned before moving between waterbodies, to prevent the spread of zebra mussel larvae and adults.

Stream Group Designations

NOTE: Michigan rivers and streams have been grouped according to existing information of mussel distribution and individual species conservation status. The Mussel Protocol Stream Groups are designed to document the **potential** presence or absence of state or federally listed mussel species. The layer was created by modeling the habitat suitability for each mussel species and may not correspond directly with a documented location for a listed mussel. A segment may be predicted as suitable for a number of mussel species, so the stream group number was assigned to the most restrictive of the potential mussel species present.

The stretch of the Kalamazoo River within 0.2 mile of the project area is designated a Group 1 mussel stream which means that State special concern mussel species occur here and that certain surveys and possibly relocation procedures apply. I encourage you to read the [Michigan Freshwater Mussel Survey Protocols and Relocation Procedures](#) publication if in-stream work and/or land clearing activities occur that result in streambed disturbance and erosion and sedimentation into the river. A copy of the publication is being provided to you in this mailing.

The [Mussel Map Viewer](#) is an interactive tool to allow users to explore listed native mussels across the Michigan landscape. Watershed level species lists are available alongside the Mussel Protocol Stream Groups.

Table 1: Occurrences of Threatened & Endangered Species within 1.5 miles of Project Site

Element Category	Scientific Name	Common Name	Federal Status	State Status	G Rank	S Rank	EO Rank	First Observed Date	Last Observed Date
Animal	<i>Alasmidonta viridis</i>	Slippershell		T	G4G5	S2S3	E	2017	2017
Animal	<i>Bombus affinis</i>	Rusty-patched bumble bee	LE	E	G2	SH	H	1963-07-25	1975-07-12
Animal	<i>Bombus affinis</i>	Rusty-patched bumble bee	LE	E	G2	SH	H	1963-08-12	1963-08-12
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-05-30	1965-08-09
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-08-12	1963-08-12
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-09-04	1963-09-04
Animal	<i>Clonophis kirtlandii</i>	Kirtland's snake		E	G2	S1	H	1879	1879-07-11
Animal	<i>Cyclonaias tuberculata</i>	Purple wartyback		T	G5	S2	H	1981-08-31	1981-08-31
Animal	<i>Falco peregrinus</i>	Peregrine falcon		T	G4	S3	A	2010	2022
Animal	<i>Terrapene carolina carolina</i>	Eastern box turtle		T	G5T5	S2S3	H?	1999-08-10	1999-08-10
Plant	<i>Asclepias hirtella</i>	Tall green milkweed		T	G5	S2	D	2001-06-04	2001-06-04
Plant	<i>Collinsia verna</i>	Blue-eyed Mary		T	G5	SNR	H	1838-08-27	1877-05-06
Plant	<i>Panax quinquefolius</i>	Ginseng		T	G3G4	S2S3	H	1838-07-27	1838-07-27
Plant	<i>Silphium integrifolium</i>	Rosinweed		T	G5	S2	CD	1947	1999-10-08

Comments for Table 1

Most of the above EO's are historical and/or far removed from the project area and are not of concern. However, impacts are possible for the slippershell, eastern box turtle, tall green milkweed, and rosinweed EO's. See species comments below:

Species Comments for Table 1

Rosinweed (*Silphium integrifolium*)

Habitat

Rosinweed occurs in prairie remnants along roads and railroad tracks or in cemeteries, in wet-mesic prairies and fens on peaty mucks and loams, and on dry-mesic to mesic loams and sandy loams. This species has been observed along E Michigan Ave. less than 0.3 mile southwest of the project area. Impacts may occur in portion of the project area (PS 5 Site) along E Michigan Ave. where suitable habitat appears to occur.

Management Recommendations

To maintain this species, protect the habitat and hydrological and natural disturbance regimes. This species likely requires natural disturbances associated with prairie habitat such as fire or brush removal to prevent woody plant succession. Significant increases in vegetative and reproductive vigor have been observed following early spring and fall burns. Much of this habitat type has been lost or severely degraded. Many prairie remnants are vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

For more information, see the [Silphium integrifolium](#) species page on the MNFI website.

Tall green milkweed (*Asclepias hirtella*)

Habitat

Grows in wet-mesic to dry sandy loam soils at inland sites as well as on alkaline clay in lakeplain prairies. This species has been observed within 0.2 miles of the project area and suitable habitat appears to occur within the project area (PS 5 Site).

Management Recommendations

Conserve habitat and maintain hydrological and natural disturbance regimes. This species most likely requires open conditions. Prevent woody plant encroachment by using prescribed fire or manual brush removal. Significant increases in vegetative and reproductive vigor have been observed following early spring and fall burns; late spring burns and summer can damage plants. Much of this habitat has been lost and degraded via conversion to agriculture, development, alterations of hydrology via drains and fire suppression. Many prairie remnants are also vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

For more information, see the [Asclepias hirtella](#) species page on the MNFI website.

Slippershell (*Alasmidonta viridis*)

Habitat

The slippershell typically occurs in creeks and headwaters of rivers in sand or gravel substrates. Occasionally, they occur in larger rivers and lakes and in mud substrates. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The slippershell requires clear, clean water and substrates for survival. Like other mussels, threats include: siltation, poor water quality, point and non-point source pollution, and alteration of natural flow regimes. Maintenance or establishment of vegetated riparian buffers can help protect mussel habitats from these threats. Additionally, zebra mussels and other exotic species are a major threat to all mussels. Hence, control and management of exotic species also help protect native mussel species. And as with all mussels, protection of their hosts habitat is also crucial.

For more information, see the [Alasmidonta viridis](#) species page on the MNFI website.

Eastern box turtle (*Terrapene carolina carolina*)

Habitat

The Eastern Box Turtle is Michigan's only truly terrestrial turtle. It typically occurs in forested habitats with sandy soils near a source of water such as a stream, pond, lake, marsh or swamp. They also may be found in adjacent thickets, old fields, pastures, or vegetated dunes. Access to unshaded nesting sites in sandy, open areas, is critical for successful reproduction. This species has been observed within 0.5 mile of the project area (PS 5 Site) and suitable habitat appears to occur within the project area.

Management Recommendations

Conservation efforts should concentrate on protecting large tracts of habitat especially on public land to provide the box turtle additional protection from the effects of development. Wetland hydrology and quality should be maintained by preventing improper off-road vehicle use, implementing minimum development set-back distances, leaving buffer zones during timber harvest, grazing and agricultural operations, minimizing use of herbicides and pesticides in or near wetlands, and/or controlling invasive plants. Upland nesting areas should be identified, protected and in some cases created. Construction of new roads should be minimized or routed to avoid separating foraging and/or overwintering habitat from nesting areas. Finally, the public should be educated about the laws protecting reptiles and amphibians and encouraged to leave wild turtles in their natural habitats rather than collecting them for pets.

For more information, see the [Terrapene carolina carolina](#) species page on the MNFI website.

Table 2: Occurrences of Special Concern Species and Natural Communities within 1.5 miles of Project Site

Element Category	Scientific Name	Common Name	Federal Status	State Status	G Rank	S Rank	EO Rank	First Observed Date	Last Observed Date
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2000-07	2018-07-19
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2019-07-17	2019-07-17
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2019-07-17	2019-07-17
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017

Animal	<i>Bombus auricomus</i>	Black and gold bumble bee		SC	G5	S2	H	1960-07-04	1960-07-04
Animal	<i>Bombus auricomus</i>	Black and gold bumble bee		SC	G5	S2	H	1963-08-02	1963-08-02
Animal	<i>Cambarunio iris</i>	Rainbow		SC	G4G5	S3	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona compressa</i>	Creek heelsplitter		SC	G5	S3	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2000-08-01	2000-08-01
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lithobates palustris</i>	Pickerel frog		SC	G5	S3S4	H	1911-08-30	1911-08-30
Animal	<i>Mesomphix cupreus</i>	Copper button		SC	G5	S1	H		
Animal	<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	E	2006-04-14	2023-08-01
Animal	<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	E	2017	2023-06-29
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2018-08-14	2018-08-14
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2019-07-17	2019-07-17
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2019-07-17	2019-07-17
Animal	<i>Sphaerium fabale</i>	River fingernail clam		SC	G5	SNR	H		
Animal	<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	E	2018-08-14	2018-08-14
Animal	<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	E	2019-07-17	2019-07-17
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	H	1934	1934
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	E	2019-07-17	2019-07-17
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	H	1929-09-09	1929-09-09
Plant	<i>Angelica venenosa</i>	Hairy angelica		SC	G5	S3	H	1947	1947-07-26

Plant	<i>Arnoglossum plantagineum</i>	Prairie indian-plantain		SC	G5	S3	H	1838	1838-07-25
Plant	<i>Berula erecta</i>	Cut-leaved water parsnip		SC	G4G5	S2	H	1947	1947

Comments for Table 2

Many of the above EO's are historical and/or far removed from the project area and are not of concern. However, impacts are possible for the paper pondshell, round pigtoe, flutedshell, and elktoe mussel EO's. See species comments below:

Species Comments for Table 2

Paper pondshell (*Utterbackia imbecillis*)

Habitat

Paper pondshell is most often observed in lakes, ponds and impoundments with soft mud or sand substrates (Watters et al.). This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

Approximately 70% of North American unionids are imperiled. Threats include alteration of physical habitat, host fish population declines, invasive species introduction and compromised water quality (Bringolf et al. 2007). As with all species of this group, paper pondshell has been found to be highly vulnerable to chemical pollutants (Conners and Black 2004) and heavy metals (Pip 1995) found in many herbicides and pesticides, and in other forms of point and non-point source pollution. Sedimentation of waterways causes harm to a wide variety of freshwater organisms. Management of all native mussels must include maintaining healthy habitat structure and high water quality standards. Zebra mussels must be prevented from spreading to new waterways through the careful cleaning of fishing gear, boats and trailers, and scuba equipment in order to protect paper pondshell populations from infestation.

For more information, see the [*Utterbackia imbecillis*](#) species page on the MNFI website.

Round pigtoe (*Pleurobema sintoxia*)

Habitat

The round pigtoe occurs in mud, sand, or gravel substrates of medium to large rivers. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

Like other mussels, threats to the round pigtoe include: natural flow alterations, siltation, channel disturbance, point and non-point source pollution, and exotic species. Maintenance or establishment of

vegetated riparian buffers can help protect mussel habitats from many of their threats. Control of zebra mussels is critical to preserving native mussels. And as with all mussels, protection of their hosts habitat is also crucial.

For more information, see the [Pleurobema sintoxia](#) species page on the MNFI website.

Flutedshell (*Lasmigona costata*)

Habitat

The flutedshell is found in small and medium rivers, and in Lake St. Clair and Lake Erie. They are often found in sandy mud and cobble substrates. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The flutedshell is being impacted by point source pollution, non-point source pollution, alteration of natural stream flow patterns, barriers to host fish passage, direct alteration of habitat, and invasive zebra mussels.

Limit or eliminate point source discharges of ammonia, chloride, sulfate, heavy metals, and other substances toxic to native mussels. Avoid use of aquatic herbicides containing copper. Maintain riparian buffers along streams and promote land conservation programs to help reduce excessive erosion, sedimentation, and nutrient input from non-point sources. Maintain integrity of headwater streams and wetlands, which support the ecological function of downstream river habitats. Improve passage for fish by removing unnecessary dams and upgrading poor stream/road crossings such as culverts that are too small or are perched. Flutedshell and other native mussels require fish hosts to complete their life cycle and rely on fish passage to travel to new habitats and facilitate gene flow among mussel populations. Avoid dredging, channelization, and other in-stream impacts whenever possible.

The spread of zebra mussels into Michigan's streams and lakes remains a serious threat throughout the flutedshell's range. Reduce the impact of zebra mussels by avoiding the transport of water or aquatic plants – which can contain zebra mussel larvae – from one body of water to another while boating, fishing, hunting, and researching. Washing boats, trailers, and gear, and letting them dry overnight reduces the potential for spreading zebra mussels.

For more information, see the [Lasmigona costata](#) species page on the MNFI website.

Elktoe (*Alasmidonta marginata*)

Habitat

The Elktoe is found in small to large sized streams and small to medium rivers. It is a riffle species, preferring swifter currents over packed sand and gravel substrates. The Elktoe is typically only found in clean, clear water (Cummings and Mayer 1992). This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The elktoe needs clean, fast-flowing water to survive. Therefore, changes to its habitat, such as river

impoundment, siltation and channel disturbances, including dredging, negatively affect this species. Pollution from point (industrial and residential discharge) and non-point (siltation, herbicide and surface run-off) sources is also a threat to mussels and should be limited and monitored to insure compliance with the Clean Water Act. Control of zebra mussels is critical to preserving native mussels. It is essential to protect not only the habitat of the elktoe, but also the white sucker, northern hog sucker, shorthead redhorse, rockbass and warmouth, as they serve as hosts for the glochidia.

For more information, see the [Alasmodonta marginata](#) species page on the MNFI website.

Codes to accompany table

State Protection Status Code Definitions

E = Endangered

T = Threatened

SC = Special concern

Federal Protection Status Code Definitions

LE = listed endangered

LT = listed threatened

LELT = partly listed endangered and partly listed threatened

PDL = proposed delist

E(S/A) = endangered based on similarities/appearance

PS = partial status (federally listed in only part of its range)

C = species being considered for federal status

Global Heritage Status Rank Definitions (G RANK)

The priority assigned by [NatureServe](#)'s national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

G1 = critically imperiled globally because of extreme rarity (5 or fewer occurrences range-wide or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Q = Taxonomy uncertain

State Heritage Status Rank Definitions (S RANK)

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1 = Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.

S2 = Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3 = Rare or uncommon in state (on the order of 21 to 100 occurrences). S4 = apparently secure in state, with many occurrences.

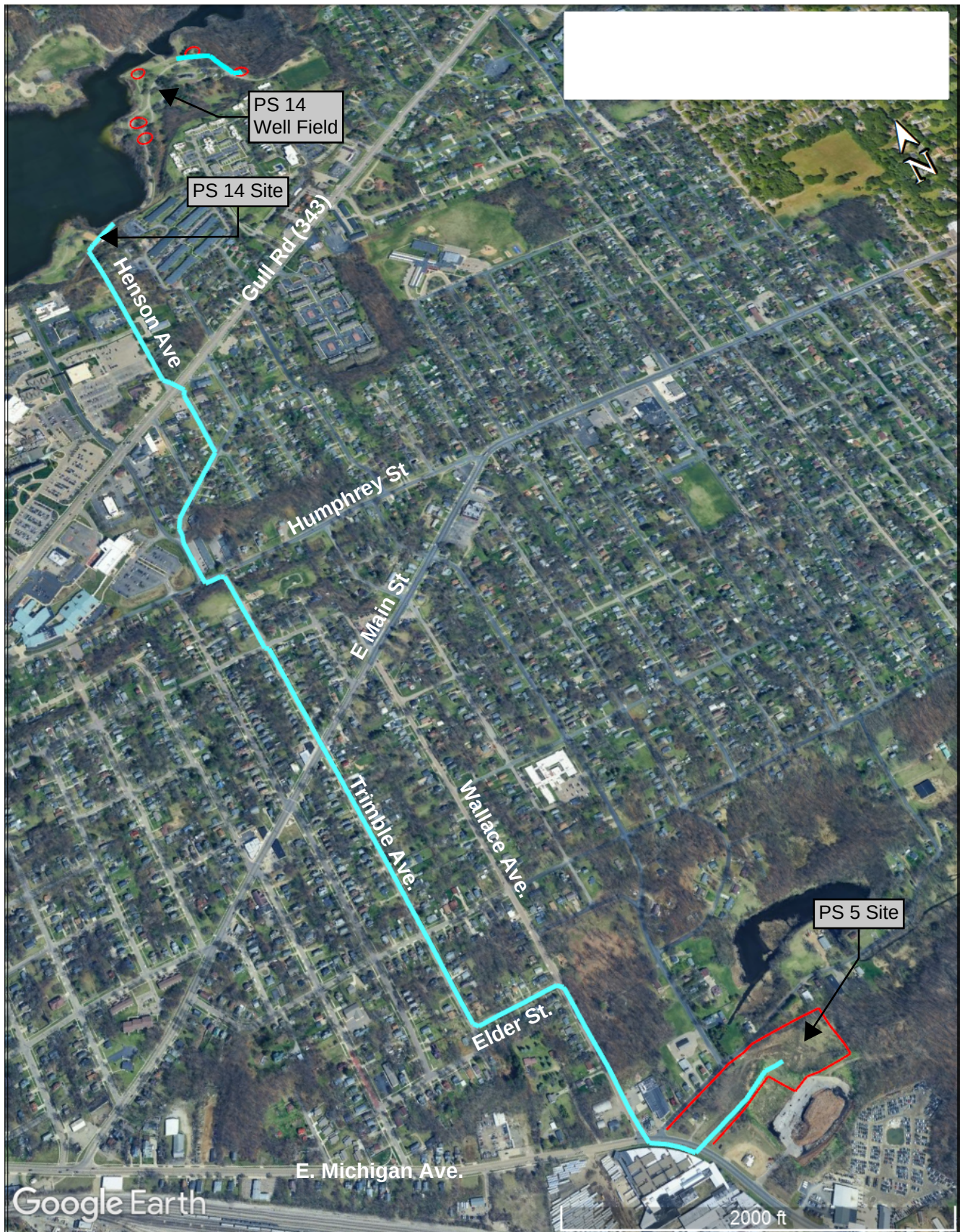
S5 = demonstrably secure in state and essentially ineradicable under present conditions.

SX = apparently extirpated from state.

EO Rank Codes

Element Occurrence (EO) ranks refer to the viability or ecological integrity of the occurrence; they provide an assessment of the likelihood that if current conditions prevail the EO will persist for a defined period of time, typically 20-100 years.

- A - Excellent estimated viability/ecological integrity
- A? - Possibly excellent estimated viability/ecological integrity
- AB - Excellent or good estimated viability/ecological integrity
- AC - Excellent, good, or fair estimated viability/ecological integrity
- B - Good estimated viability/ecological integrity
- B? - Possibly good estimated viability/ecological integrity
- BC - Good or fair estimated viability/ecological integrity
- BD - Good, fair, or poor estimated viability/ecological integrity
- C - Fair estimated viability/ecological integrity
- C? - Possibly fair estimated viability/ecological integrity
- CD - Fair or poor estimated viability/ecological integrity
- D - Poor estimated viability/ecological integrity
- D? - Possibly poor estimated viability/ecological integrity
- E - Verified extant (viability/ecological integrity not assessed)
- F - Failed to find
- F? - Possibly failed to find
- H - Historical
- H? - Possibly historical
- X - Extirpated
- X? - Possibly extirpated
- U - Unrankable
- NR - Not ranked



CITY OF KALAMAZOO
PUMP STATION 5 & 14 RECONSTRUCTION
CONTRACT 2

1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX (734) 213-3003

www.tetratech.com



DWSRF NO. 7866-01



CALL MISS DIG
(800) 482-7171

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL CALL (800) 482-7171 A MINIMUM OF THREE (3) FULL WORKING DAYS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

PROJECT LOCATION:
2045 EAST MICHIGAN AVENUE,
KALAMAZOO, MI 49048

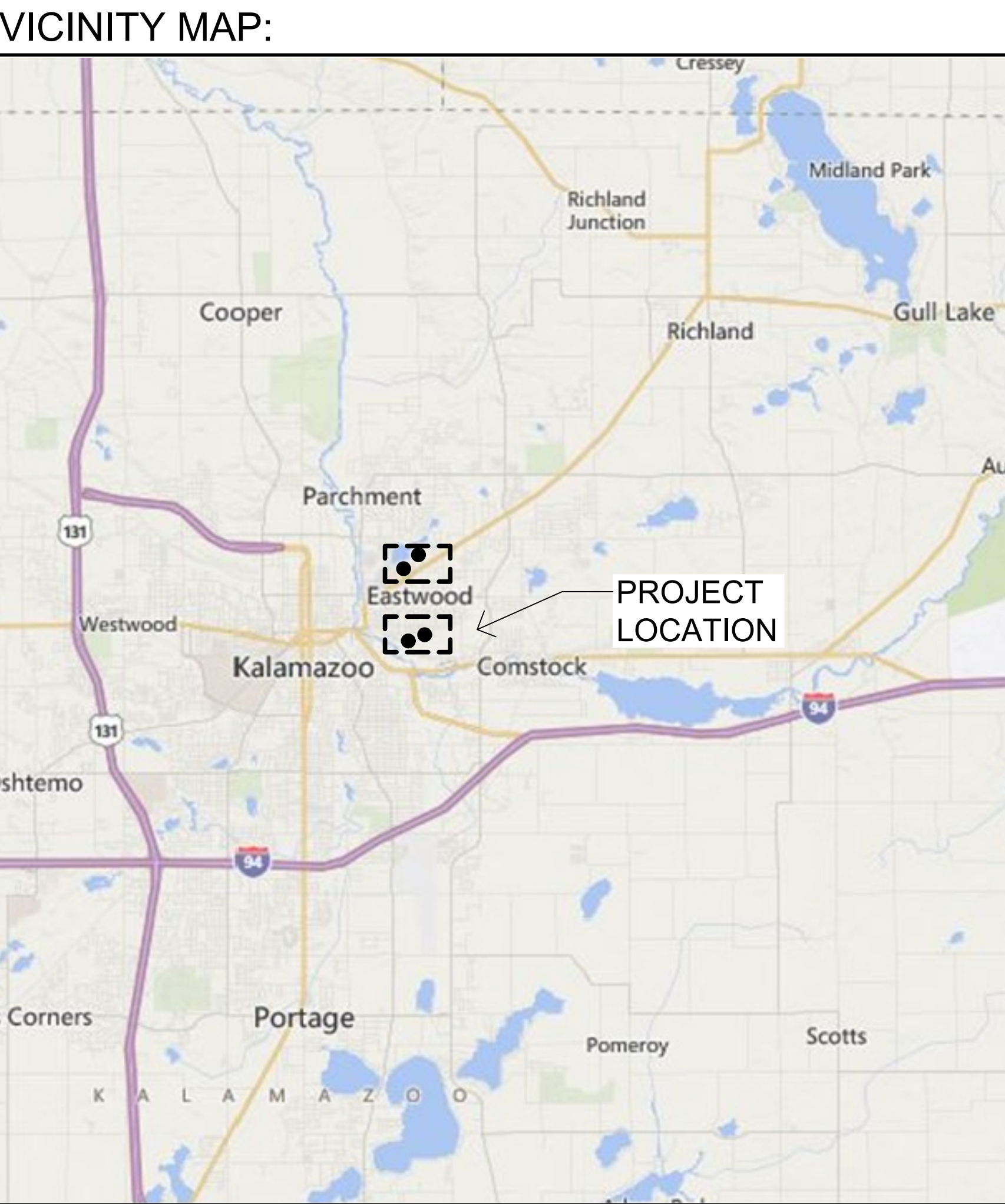
CLIENT INFORMATION:
CITY OF KALAMAZOO

Tt PROJECT No.:
200-19743-24012

CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:
PUMP STATION 5 & 14 CONSOLIDATION, CONTRACT 2
NEW CONSTRUCTION OF PUMP STATION 5 & 14 BUILDING, PROJECT SITE WORK,
WELL CONDOS, PIPING, WELL FIELD PUMPS, AND WATER MAIN UPDATES.

ISSUED:
DRAFT EGLE SUBMITTAL - 02/21/25



SHEET INDEX

WATER TREATMENT PLANT AND BACKWASH TANK SCHEMATIC
PS NO. 5 CHEMICAL FEED SCHEMATIC
PUMP STATION 14 CHEMICAL FEED SCHEMATIC
PUMP STATION 5 CHEMICAL FEED SCHEMATIC
EXISTING PUMP STATION 14 CHEMICAL ROOM
EXISTING PUMP STATION 14 CHEMICAL ROOM DEMOLITION PLAN

INSTRUMENTATION

TETRA TECH



NOT FOR
CONSTRUCTION

BYCITY OF KALAMAZOO, MICHIGAN
 DIVISION 5 & 14 RECONSTRUCTION, CONTRACT 2023-001

SHEET INDEX

PROJ:	200-19743-24012
DESN:	M. TEITSMA
DRWN:	N. KARLL
CHKD:	----

G-002

2/20/2025 5:21:02 PM - C:_AD\ACCD\CS\TETRA TECH INC\200-19743-24012 KZ00 PS5 AND PS14\PROJECT FILES\CAD\SHEETFILES\G-001 GENERAL NOTES.DWG - TROTTERKARLL, NIKI

NOTES

GENERAL NOTES (ALL DRAWINGS):

- THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWINGS. FOR ADDITIONAL INFORMATION REFER TO DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
- ALL EXISTING DIMENSIONS SHOWN WITH THE (+/-) SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION. FIELD VERIFY UTILITY LOCATIONS.
- THE INTENT OF THE DRAWINGS IS THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND TRANSPORTATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE PROJECT IN AN ACCEPTABLE MANNER, READY FOR USE BY THE OWNER.
- THE CONTRACTOR SHALL REVIEW AND COORDINATE THE SCHEDULING OF ALL CONSTRUCTION WITH THE OWNER AND SUBMIT DETAILED CONSTRUCTION SCHEDULE PRIOR TO BEGINNING WORK.
- ALL GENERAL NOTES APPLY TO THE SCOPE OF THIS PROJECT.
- THE GENERAL CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION MEETS OR EXCEEDS APPLICABLE CODES AND STANDARD PRACTICES, INCLUDING ALL FEDERAL, STATE AND LOCAL BUILDING AND ACCESSIBILITY REQUIREMENTS AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY VIOLATION OF THE SAME AND SHALL MAKE ALL WORK ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION INVOLVED WITHOUT EXTRA CHARGE.
- EACH TRADE SHALL VERIFY ALL REQUIREMENTS PERTAINING TO WORK PERFORMED IN THE PROJECT AND ANY REQUIRED PERMITS. ALL SUBCONTRACTORS SHALL DIRECT QUESTIONS, CHANGES OR REQUESTS THROUGH THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL SUBMIT ALL REQUESTS, CHANGES OR QUESTIONS TO THE OWNER'S REPRESENTATIVE IN WRITING.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL FEDERAL, STATE, AND LOCAL CODE REVIEW, PERMITTING AND ASSOCIATED FEES.
- THE CONTRACTOR SHALL MEET ALL OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA), PART 1910 AND EQUIVALENT OSHA AND FEDERAL STANDARDS.
- THE CONTRACTOR SHALL FOLLOW OWNER SOIL EROSION AND SEDIMENTATION CONTROL REQUIREMENTS (SESC).
- CONTRACTOR TO PROVIDE ANY AND ALL NECESSARY FENCES, BARRICADES, OR TRAFFIC CONTROLS TO ENSURE VEHICLE AND PERSONNEL SAFETY AND ADEQUATELY PROTECT THE SITE AT ALL TIMES.
- PROVIDE ADEQUATE PROTECTION TO PREVENT DAMAGE TO ADJACENT STRUCTURES.
- CONTRACTOR SHALL COORDINATE WITH OWNER AND ENGINEER FOR ALL RELOCATING AND REROUTING OF EQUIPMENT, PIPING, CONDUIT, ETC.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL AND WORK SITE SAFETY ON THIS PROJECT, INCLUDING SHEETING, BRACING, SIGNAGE, AND MEETING ALL STATE, FEDERAL AND LOCAL SAFETY CODES.
- ALL HARDWARE SHALL BE 304 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHER, ANCHORS, STRUTS, ETC. FOR ALL DRAWINGS. ANY REFERENCES IN ANY SPECIFICATION OR ANY DRAWING REFERRING TO 304 STAINLESS STEEL SHALL HAVE PRECEDENCE OVER STANDARD DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.
- ALL EXISTING SITE CONDITIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY.
- NO PIPES, CONDUIT, ETC. MAY BE EMBEDDED IN CONCRETE FLOORS, WALLS, OR CEILING UNLESS APPROVED BY ENGINEER.
- UNDERGROUND UTILITIES ARE APPROXIMATE LOCATIONS ONLY. UNDERGROUND UTILITY LOCATIONS HAVE NOT BEEN FIELD VERIFIED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL UNDERGROUND UTILITIES. ALL EX. UTILITIES MAY NOT BE SHOWN.
- CONTRACTOR SHALL NOT UTILIZE ANY PAVED ROADWAYS FOR TRACK EQUIPMENT OPERATION OR STORAGE. ALL DAMAGED ROADWAYS CAUSED BY CONTRACTOR TO BE REPAIRED AT CONTRACTORS EXPENSE.
- THE CONTRACTOR AND SUBCONTRACTOR SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT THEMSELVES WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUBSURFACE SOIL AND GROUND WATER CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR AND IF NOT SPECIFICALLY CALLED OUT IN THE CONTRACT DOCUMENTS, WILL BE INCIDENTAL TO THE COST OF INSTALLATION.
- ALL DISTURBED AREAS SHALL BE RESTORED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PROPERTY, INCLUDING EXISTING FENCING, LAWN, TREES AND SHRUBBERY.
- CONTRACTOR TO PROVIDE DEWATERING AS REQUIRED FOR THE WORK.
- DO NOT LEAVE ANY OPENINGS UNCOVERED AT END OF WORKING DAY.
- THE ELEVATIONS SHOWN ON THE CIVIL DRAWINGS ARE BASED ON NAVD88 DATUM. ELEVATIONS ON ALL OTHER SHEETS ARE BASED ON NGVD29 DATUM. NGVD29 ELEVATIONS ARE 0.436' HIGHER THAN NAVD88 ELEVATIONS.

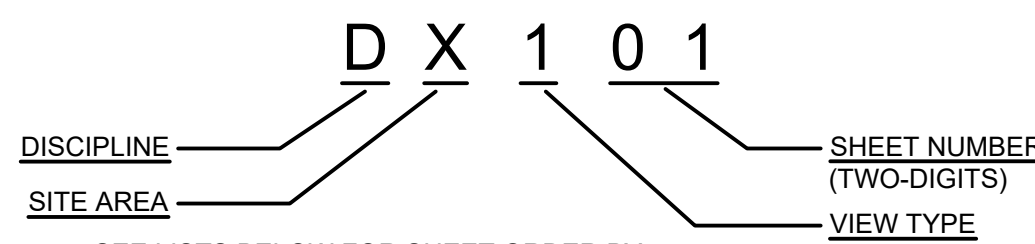
GENERAL DEMOLITION NOTES (ALL DRAWINGS):

- DEMOLITION DRAWINGS MAY NOT SHOW ALL DEMOLITION WORK REQUIRED UNDER THIS CONTRACT. OTHER CONTRACT DRAWINGS MAY ALSO SHOW DEMOLITION WORK. COORDINATE DEMOLITION WITH REQUIREMENTS LISTED IN SECTION 01110 OF THE PROJECT MANUAL.
- SITE INVESTIGATION PRIOR TO BIDS IS STRONGLY RECOMMENDED TO DETERMINE THE COMPLETE EXTENTS OF DEMOLITION REQUIRED. THESE DRAWINGS DO NOT INDICATE ALL MATERIALS THAT ARE TO BE REMOVED OR REROUTED IN AREA OF PROPOSED WORK.
- PRIOR TO STARTING WORK THE DEMOLITION CONTRACTOR IS TO FIELD VERIFY NOTED AREAS OF DEMOLITION TO DETERMINE ACTUAL SCOPE OF DEMOLITION, AND TO REVIEW SCOPE WITH THE OWNER'S REPRESENTATIVE TO CONFIRM SPECIFIC ITEMS TO BE SALVAGED AND STORED FOR REUSE.
- COORDINATE WITH OWNER DURING ANY INTERRUPTION OF SERVICE, SO THAT THAT OPERATION OF THE PROCESS EQUIPMENT IS NOT EFFECTED. SEE SPECIFICATIONS 01110 - SUMMARY OF WORK FOR ADDITIONAL REQUIREMENTS. REVIEW WORK ITEMS WITH ENGINEER PRIOR TO PERFORMING WORK.
- PRIOR TO THE START OF ANY DEMOLITION WORK, COORDINATE WITH PLANT OPERATORS THE LOCATION OF ALL UTILITIES. PLANT LOCK OUT/TAG OUT PROCEDURES SHALL BE STRICTLY FOLLOWED.
- EXPANSION AND ANCHOR BOLTS REMAINING IN WALL, CEILINGS OR FLOORS SHALL BE POUNDED OR CUT FLUSH WITH SURFACE. IN FINISHED AREAS THEY SHALL BE RECESSED AND PATCHED TO MATCH EXISTING FINISH.
- ALL OPENINGS REMAINING IN FLOORS, WALLS, OR CEILINGS, INCLUDING SLEEVES, AFTER PIPING AND DUCT DEMOLITION SHALL BE PATCHED TO MATCHING EXISTING FINISH AND AS DETAILED ON DRAWINGS.
- CAP AND BLIND FLANGE MATERIAL TO BE SAME AS PIPE BEING CAPPED.
- PROMPTLY PATCH AND REPAIR DAMAGE CAUSED TO ADJACENT BUILDING ELEMENTS BY DEMOLITION WORK. RESTORE EXPOSED FINISHES OF PATCHED AREAS IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
- OWNER RESERVES RIGHT TO RETAIN ANY EQUIPMENT OR MATERIALS REMOVED UNDER THIS CONTRACT. CONTRACTOR IS RESPONSIBLE TO HAUL AND DISPOSE OF OFFSITE ALL REMAINING REMOVED EQUIPMENT, MATERIAL, PIPING, CONDUIT, SOILS AND DEBRIS, NOT RETAINED BY OWNER, IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS, AND ORDINANCES.
- CONTRACTOR IS RESPONSIBLE TO PROVIDE AND MAINTAIN SHORING, BRACING, OR STRUCTURAL SUPPORT TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ITEMS TO BE SELECTIVELY DEMOLISHED OR STABILIZED AND ITEMS WHICH ARE IMMEDIATELY ADJACENT TO THOSE BEING REMOVED. CONTRACTOR SHALL HIRE A LICENSED STRUCTURAL ENGINEER TO PROPERLY DESIGN ANY SHORING OR TEMPORARY SUPPORTS THAT MAY BE REQUIRED DURING THE DEMOLITION PHASE.
- NO BURNING SHALL BE PERMITTED ON THIS PROJECT.
- BLASTING IS PROHIBITED ON THIS PROJECT.
- WHEN EQUIPMENT ITEMS ARE INDICATED FOR DEMOLITION, ALL ANCILLARY UTILITIES, ELECTRICAL ITEMS, CONCRETE SUPPORTS AND STRUCTURAL STEEL SUPPORTS SHALL BE COMPLETELY REMOVED UNLESS INDICATED OTHERWISE. ALL THE ABOVE MENTIONED ITEMS MAY NOT BE INDICATED ON THE DRAWINGS. SITE VISIT PRIOR TO BID DATE IS RECOMMENDED TO QUANTIFY COMPLETE EXTENT OF EQUIPMENT DEMOLITION.
- CONCRETE FLOOR SLABS UNDER DEMOLISHED CONCRETE EQUIPMENT PADS, THAT WILL BE EXPOSED IN THE FINISHED CONSTRUCTION SHALL BE PATCHED SMOOTH AND ANY DOWELS OR ANCHORS SHALL BE CUT OFF 2" BELOW THE SURFACE AND PATCHED SMOOTH. IF REQUIRED, EXISTING FLOOR SURFACE SHALL BE CHIPPED OR ROUGHENED AND PATCH APPLIED OVER BONDING AGENT.
- ALL PIPING SHOWN AS BEING DEMOLISHED SHALL BE COMPLETELY REMOVED INCLUDING INSULATION, HANGERS, EXPANSION AND ANCHOR BOLTS AND PIPE SUPPORTS. CAP PIPES LEFT IN PLACE AS REQUIRED. CONTRACTOR SHALL REMOVE PIPE CONTENTS AS WELL WHICH MAY CONTAIN WATER, SLUDGE, WASTEWATER, ETC.
- FLOORS, WALLS, AND CEILING SURFACES ARE TO BE CLEANED IN EACH AREA AFTER DEMOLITION IS COMPLETE. THE WALLS SHALL BE WET BRUSHED, SCRAPED, SWEEP, ETC. AS REQUIRED TO REMOVE DIRT, LOOSE CRYSTAL, SCALE, RUST, AND DUST FROM SURFACES PRIOR TO PAINTING OF PIPING. FLOORS ARE TO BE POWER WASHED.
- FLOOR DRAINS SHALL BE PROTECTED FROM DIRT AND DEBRIS.
- PIPE, CONCRETE, ASPHALT, ETC. TO BE REMOVED AND REPLACED IS TO BE REPLACED IN KIND UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL MATERIALS GENERATED DURING DEMOLITION WORK CONFIRM WITH OWNER DEMOLITION ITEMS, PER NOTE 10.

ABBREVIATIONS

A AB ABBREV ABRSV ADDM ADH AFF AFG AFS AHD AL ALT AMP AMT APRX ARCH ASPH ASSY A/C	ANCHOR BOLT ABANDONED ABBREVIATION ABRASIVE ADDENDUM ADHESIVE ABOVE FINISHED FLOOR ABOVE FINISHED GRADE ABOVE FINISHED SLAB AHEAD ALUMINIUM ALTERNATE AMPERE AMOUNT APPROXIMATE(LY) ARCHITECT(URAL) ASPHALT ASSEMBLY AIR CONDITIONING	B BI BITUM B/L BLDG BLK BM BOT BP BRG	BLACK IRON BITUMINOUS OR BITUMASTIC BASELINE BUILDING BLOCK BENCH MARK BOTTOM BASE PLATE BEARING	C CFM CFS CI CJ CKT CIL CLF CLR CMU CND CNR CO2 COL COM CONC CONN CONSTR CONT CONTR COORD CSG CY CYL C&G C/C	CUBIC FEET PER MINUTE CUBIC FEET PER SECOND CAST IRON CONSTRUCTION JOINT CIRCUIT CENTER LINE CHAIN LINK FENCE CLEAR OR CLEARANCE CONCRETE MASONRY UNIT CONDUIT CORNER CARBON DIOXIDE COLUMN COMMON CONCRETE CONNECTION CONSTRUCT(ION) CONTINUOUS CONTRACT(OR) COORDINATE CASING CUBIC YARD CYLINDER CURB AND GUTTER CENTER TO CENTER	D DAT DBL DC DEMO DESC DET DI DIA DIM DIP DIR DMH D DWG	DATUM DOUBLE DIRECT CURRENT DEMOLITION DESCRIPTION DETAIL DUCTILE IRON DIAMETER DIMENSION DUCTILE IRON PIPE DIRECTION DROP MANHOLE DRAIN DRIVEWAY DRAWING	E EA ECC EF EFF E/L EL ELAST ELEC EMER EP EPDM EQUIP ESTM EW EXC EXP EXST EXST GR EXT	EACH ECCENTRIC EACH FACE EFFLUENT EASEMENT LINE ELEVATION ELASTOMERIC ELECTRICAL EMERGENCY EDGE OF PAVEMENT ETHYLENE PROPYLENE DIENE MONOMER EQUIPMENT EASEMENT EACH WAY EXCAVATE EXPANSION EXISTING EXISTING GRADE EXTERIOR	F FD FDN FHY FIG FIN FIN FLR FIN GR FL FLG FLL FLTR FM FPM FPS FT	FLOOR DRAIN FOUNDATION FIRE HYDRANT FIGURE FINISH(ED) FINISH FLOOR FINISH GRADE FLUORIDE FLANGE(D) FLOW LINE FILTER FORCE MAIN FEET PER MINUTE FEET PER SECOND FOOT OR FEET	G GA GAL GALV GND GPD GPH GPM GPS GR	GAUGE GALLON(S) GALVANIZED GROUND GALLONS PER DAY GALLONS PER HOUR GALLONS PER MINUTE GALLONS PER SECOND GRADE	H HD HDR HGR HGT HORIZ HP HVAC HWL HWY HZ	HEAVY-DUTY HYDRAULIC HANGER HEIGHT HORIZONTAL HORSEPOWER HEATING, VENTILATION, AND AIR CONDITIONING HIGH WATER LEVEL HIGHWAY HERTZ	I ID IN INF INT INTR INV IP IPS	INSIDE DIAMETER INCH(ES) INFLUENT INTERSECTION INTERIOR INVERT IRON PIPE INTERNATIONAL PIPE STANDARD	J JB JT	JUNCTION BOX JOINT	K K KV KVA KW KWH	KIP (1,000 LB) KILOVOLT KILOVOLT-AMPERE KILOWATT KILOWATT-HOUR	L L LATL LAV LEN LB LF LP LVR LWL	LEFT LATERAL LAVATORY LENGTH POUND(S) LINEAR FEET LIGHT POLE LOW VOLT LOW WATER LEVEL	M M MAINT MAN MAS MATL MAX ME MECH MEG MFR MG MGD MI MILE(S) MIN MISC MJ ML MO MON MPH MPT MS MSP MW MWL MWP	METER MAINTAIN OR MAINTENANCE MANUAL(LY) MASONRY MATERIAL MAXIMUM MITERED END MECHANICAL MATCH EXISTING GRADE MANUFACTURE(R) MILLION GALLONS MILLION GALLONS PER DAY MANHOLE MILES(S) MINIMUM, MINUTE(S) MISCELLANEOUS MECHANICAL JOINT MIXED LIQUOR MASONRY OPENING MONUMENT MILES PER HOUR MALE PIPE THREAD MOTOR STARTER MOTOR STARTER PANEL MANWAY MEAN WATER LEVEL MAXIMUM WORKING PRESSURE	N N NE NE NIC NO NOM NP NPT NPW NRS NTS NW N/A	NORTH NORTHEAST NOT IN CONTRACT NUMBER NOMINAL NATIONAL PIPE THREAD NATIONAL PIPE TAPER (THREAD) NON-POTABLE WATER NON-RISING SYSTEM NOT TO SCALE NORTHWEST NOT APPLICABLE	O OC OD ODP OF OH OHW OPP OPT OR OSY O&M	ON CENTER OUTSIDE DIAMETER OPEN DRIP PROOF OUTSIDE FACE OVER HEAD OVER HEAD WIRE OPPOSITE OPTIONAL OFFICIAL RECORDS OUTSIDE SCREW AND YOK OPERATION AND MAINTENANCE	P PA PC PCM PI PL P/L PNV POB POJ POL PP PPD PPM PREFAB	PROCESS AIR POINT OF CURVE PERMANENT CONTROL MONUMENT POINT OF INTERSECTION PLATE PROPERTY LINE PINCH VALVE POINT OF BEGINNING PUSH-ON JOINT POLYMER POWER POLE POUNDS PER DAY PARTS PER MILLION PREFABRICATED	Q Q QTY	FLOW QUANTITY	R RAD RAS RC RCB RCP RD REBAR REF REINF REMOVE(ABLE) REQ'D RF RM RPM RR RVT R/W	RADIUS RETURN ACTIVATED SLUDGE REINFORCED CONCRETE REINFORCED CONCRETE BOX REINFORCED CONCRETE PIPE ROAD REINFORCING STEEL REFERENCE REINFORCE(D)(ING)(MENT) REMOVE(ABLE) REQUIRED RAISED FACE ROOM REVOLUTIONS PER MINUTE RAILROAD RIVETED RIGHT-OF-WAY	S SCFM SD SF SIG SIM SMH SPEC SPRT SQ SST STA STD STK STL STR STRUCT SURF SYM SYMM S/W	STANDARD CUBIC FEET PER MINUTE STORM DRAIN SQUARE FOOT OR FEET SIGNAL SIMILAR SEWER MANHOLE SPECIFICATION SUPPORT SQUARE STAINLESS STEEL STATION STANDARD STAKE STEEL STRAIGHT STRUCTURAL SURFACE SYMBOL SYMMETRICAL SIDEWALK	T TAN TB TBM TB-xx TD TDH TE TEFC TEL TENV THD THK TLM TOB TOC TOS TOT TP TYP T&B	TANGENT TOP OF BEAM TEMPORARY BENCH MARK TEST BORING-xx (e.g. TB-1) TRENCH DRAIN TOTAL DYNAMIC HEAD TOTALLY ENCLOSED TOTALLY ENCLOSED FAN COOLED TELEPHONE TOTALLY ENCLOSED NON-VENTILATED THREADED THICK(NESS) TELEMETRY TOP OF BANK TOP OF CURB TOE OF SLOPE TOTAL TELEPHONE POLE TYPICAL TOP AND BOTTOM	U UD UG ULT UON UGE UTC UTIL	UNDERDRAIN UNDERGROUND ULTIMATE UNLESS OTHERWISE NOTED UNDERGROUND ELECTRIC UNDERGROUND TELEPHONE CABLE UTILITY	V VAR VEL VFD VOL	VOLT(S) VARIES VELOCITY VARIABLE FREQUENCY DRIVE VOLUME	W WH WL WM WS WSP WTP W/ W/O	WALL HYDRANT WATER LINE WATER MAIN WATER SURFACE WELDED STEEL PIPE WATER TREATMENT PLANT WITH WITHOUT	X XFER	TRANSFER	Y YD YH YR	YARD(S) YARD HYDRANT YEAR(S) YR
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SHEET NUMBERING & STRUCTURE DESIGNATION



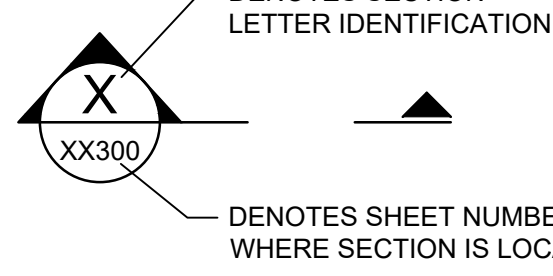
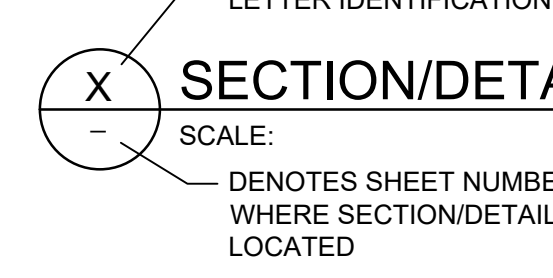
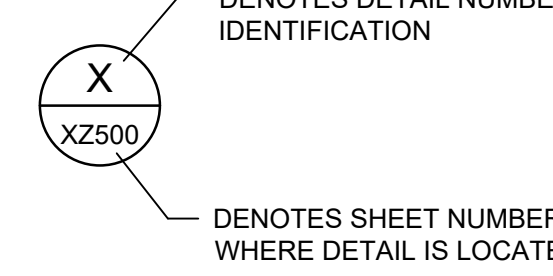
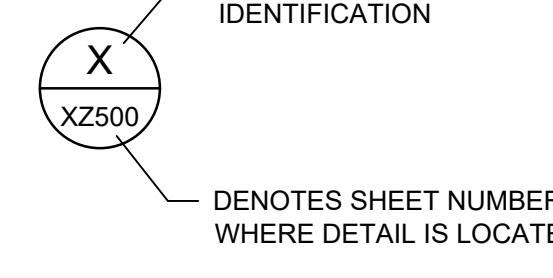
SEE LISTS BELOW FOR SHEET ORDER BY:
DISCIPLINE, AREA DESIGNATION, AND VIEW TYPE.

DISCIPLINE	
ABBREVIATION	DESCRIPTION
G	GENERAL
V	SURVEY
C	CIVIL
L	LANDSCAPING
S	STRUCTURAL
A	ARCHITECTURAL
F	FIRE PROTECTION
P	PLUMBING
D	PROCESS
M	MECHANICAL
E	ELECTRICAL
I	INSTRUMENTATION

AREA		
DESIGNATION	SHEET SERIES	DESCRIPTION (SEE SITE AREA KEY FOR LOCATION)
-	X-000	GENERAL DRAWINGS SCHEMATIC DRAWINGS SITE DRAWINGS YARD PIPING DRAWINGS
A	XA000	EXISTING PUMP STATION 14
B	XB000	EXISTING PUMP STATION 5
C	XC000	WATER TREATMENT PLANT
D	XD000	BACKWASH TANK
E	XE000	CHEMICAL BUILDING
Z	XZ000	DETAILS

VIEW TYPE		
TYPE	SHEET SERIES	DESCRIPTION
0	000	GENERAL
1	100	PLAN VIEWS
2	200	ELEVATIONS
3	300	SECTIONS
4	400	LARGE-SCALE VIEWS
5	500	DETAILS
6	600	SCHEDULES, DIAGRAMS, AND CONTROLS
8	800	3D PERSPECTIVES, ISOMETRICS, AND PHOTOGRAPHS
9	900	DEMOLITION

REFERENCE SYMBOLS

SECTION REFERENCE	
SECTION/DETAIL TITLE	
DETAIL REFERENCE	
DETAIL REFERENCE	

TETRA TECH



NOT FOR
CONSTRUCTION

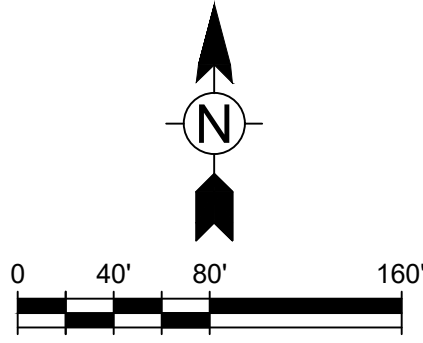
CITY OF KALAMAZOO, MICHIGAN

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

GENERAL NOTES
AND
ABBREVIATIONS

PROJ: 200-19743-24012
DESN: M. TEITSMA
DRWN: N. KARLL
CHKD:

G-003



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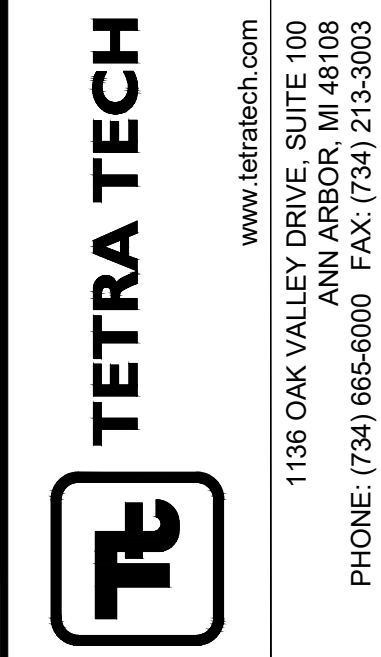
CITY OF KALAMAZOO, MICHIGAN

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PUMP STATION #14

WELL LOCATION OVERALL PLAN

C-111



NOT FOR
CONSTRUCTION

[illegible]

CITY OF KALAMAZOO, MICHIGAN

PUMP STATION #14

WELL LOCATION DETAILS

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PROJ:	200-19743-24012
DESN:	
DRWN:	
CHKD:	

C-112

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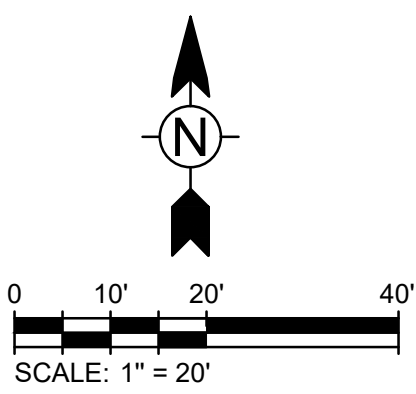
NOT FOR
CONSTRUCTION

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CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION #5
DEMOLITION - WEST

PROJ:	200-19743-24012
DESN:	D. WARREN
DRWN:	A. SMITH
CHKD:	

C-201



Bar Measures 1 inch, otherwise drawing not to scale

A — B — C — D — E — F



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CONSTRUCTION

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION #5
SITE PLAN - EAST

PROJ:	200-19743-24012
DESN:	D. WARREN
DRWN:	A. SMITH
CHKD:	

C-205

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CITY OF KALAMAZOO
PUMP STATION 5 & 14 RECONSTRUCTION
CONTRACT 2

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DWSRF NO. 7866-01



2600 Mount Olivet Road

CALL MISS DIG
(800) 482-7171

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL CALL (800) 482-7171 A MINIMUM OF THREE (3) FULL WORKING DAYS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

PROJECT LOCATION:

2045 EAST MICHIGAN AVENUE,
KALAMAZOO, MI 49048

CLIENT INFORMATION:

CITY OF KALAMAZOO

Tt PROJECT No.:

200-19743-24012

CLIENT PROJECT No.:

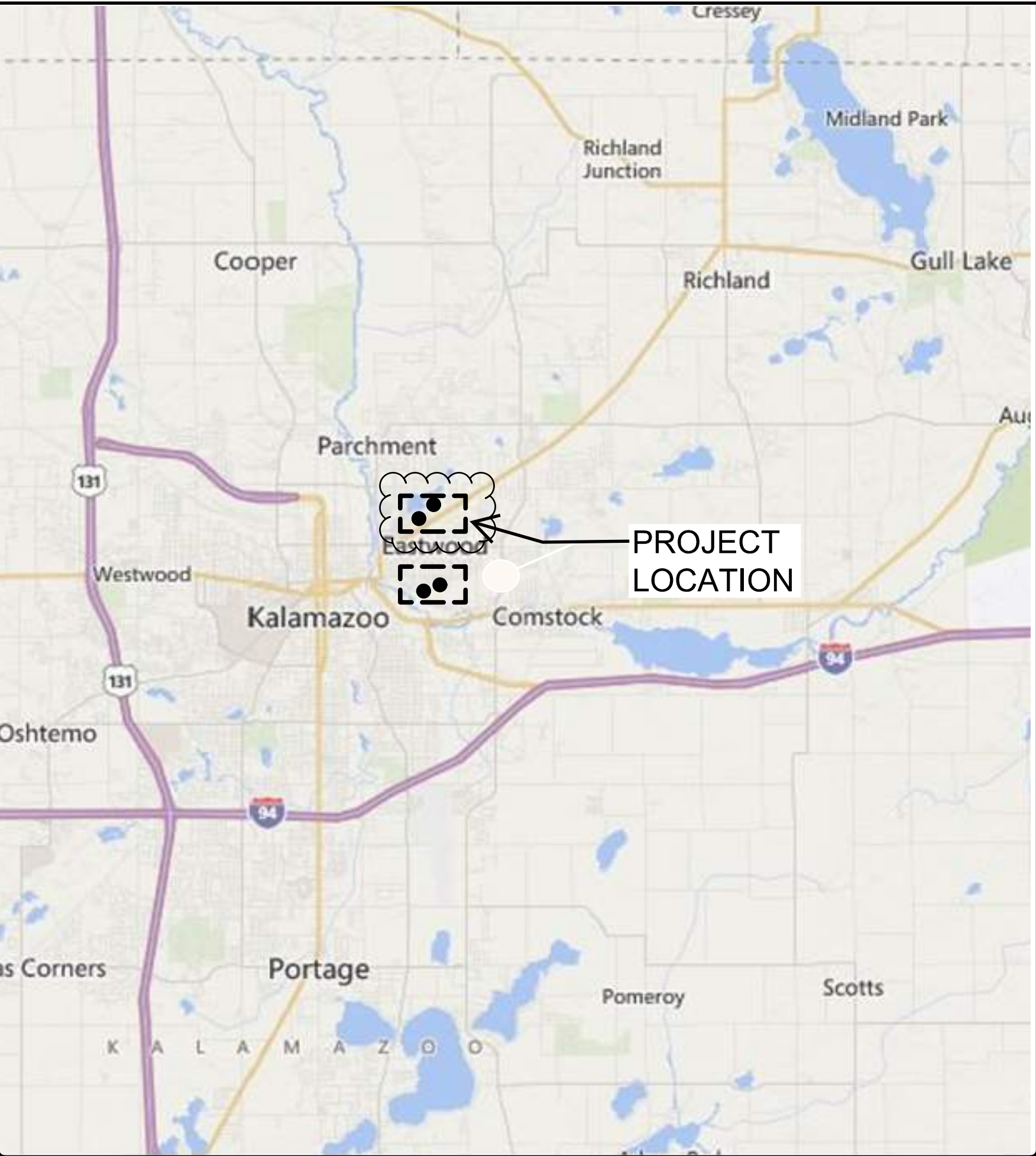
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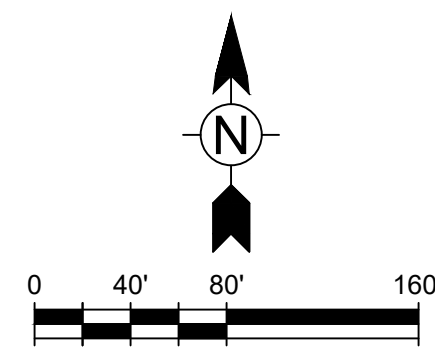
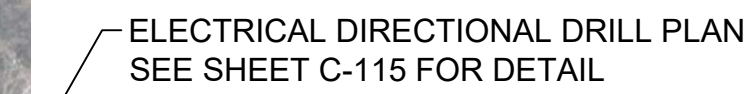
PUMP STATION 5 & 14 CONSOLIDATION, CONTRACT 2
NEW CONSTRUCTION OF PUMP STATION 5 & 14 BUILDING, PROJECT SITE WORK,
WELL CONDOS, PIPING, WELL FIELD PUMPS, AND WATER MAIN UPDATES.

ISSUED:

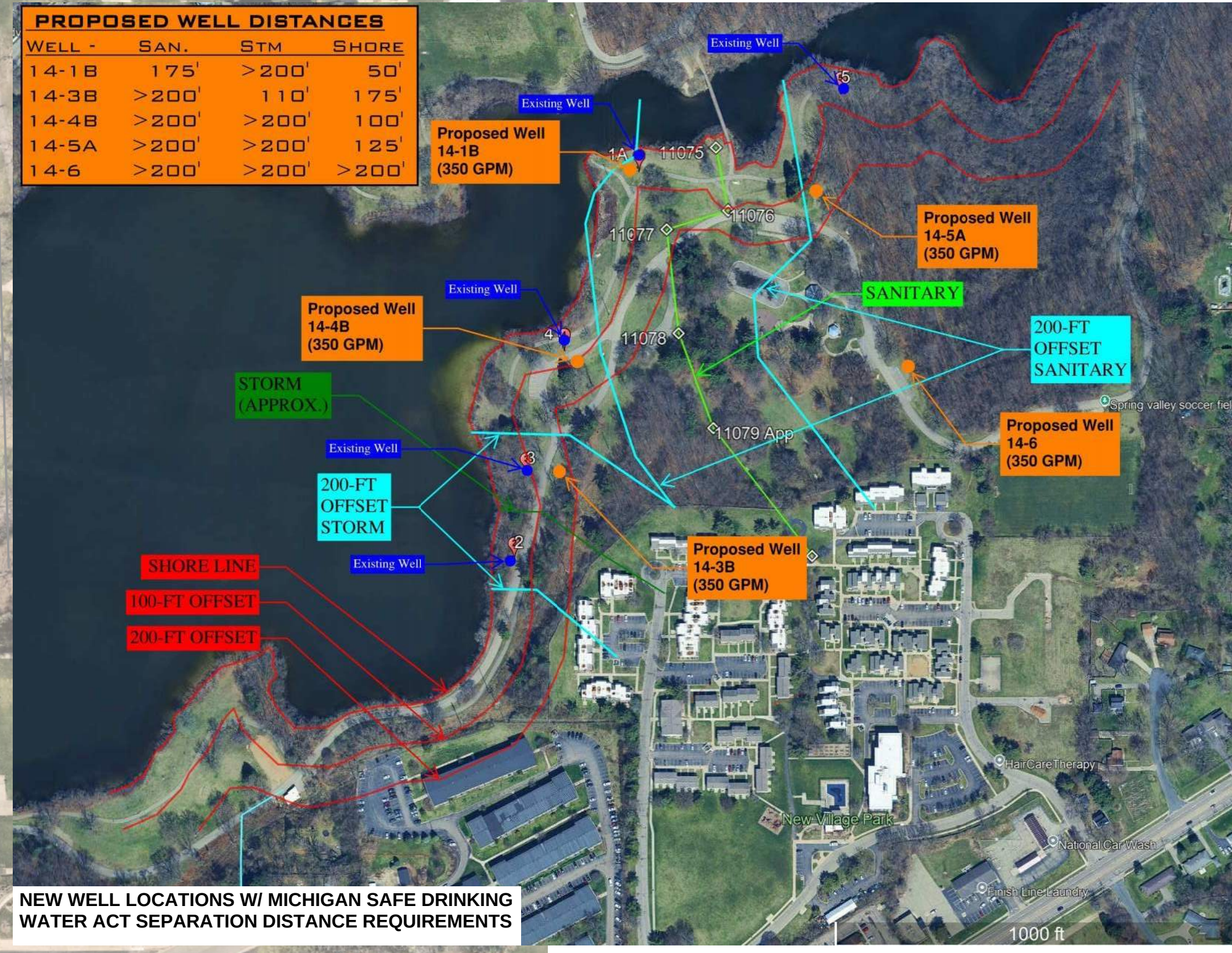
ISSUED FOR SITE PLAN
REVIEW 05-12-2025

VICINITY MAP:





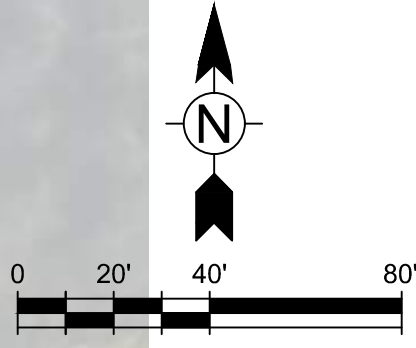
PROPOSED WELL DISTANCES			
WELL -	SAN.	STM	SHORE
14-1B	175'	>200'	50'
14-3B	>200'	110'	175'
14-4B	>200'	>200'	100'
14-5A	>200'	>200'	125'
14-6	>200'	>200'	>200'



CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION #14
WELL LOCATION OVERALL PLAN

PROJ:	200-19743-24012
DESN:	
DRWN:	
CHKD:	

C-111



CITY OF KALAMAZOO, MICHIGAN

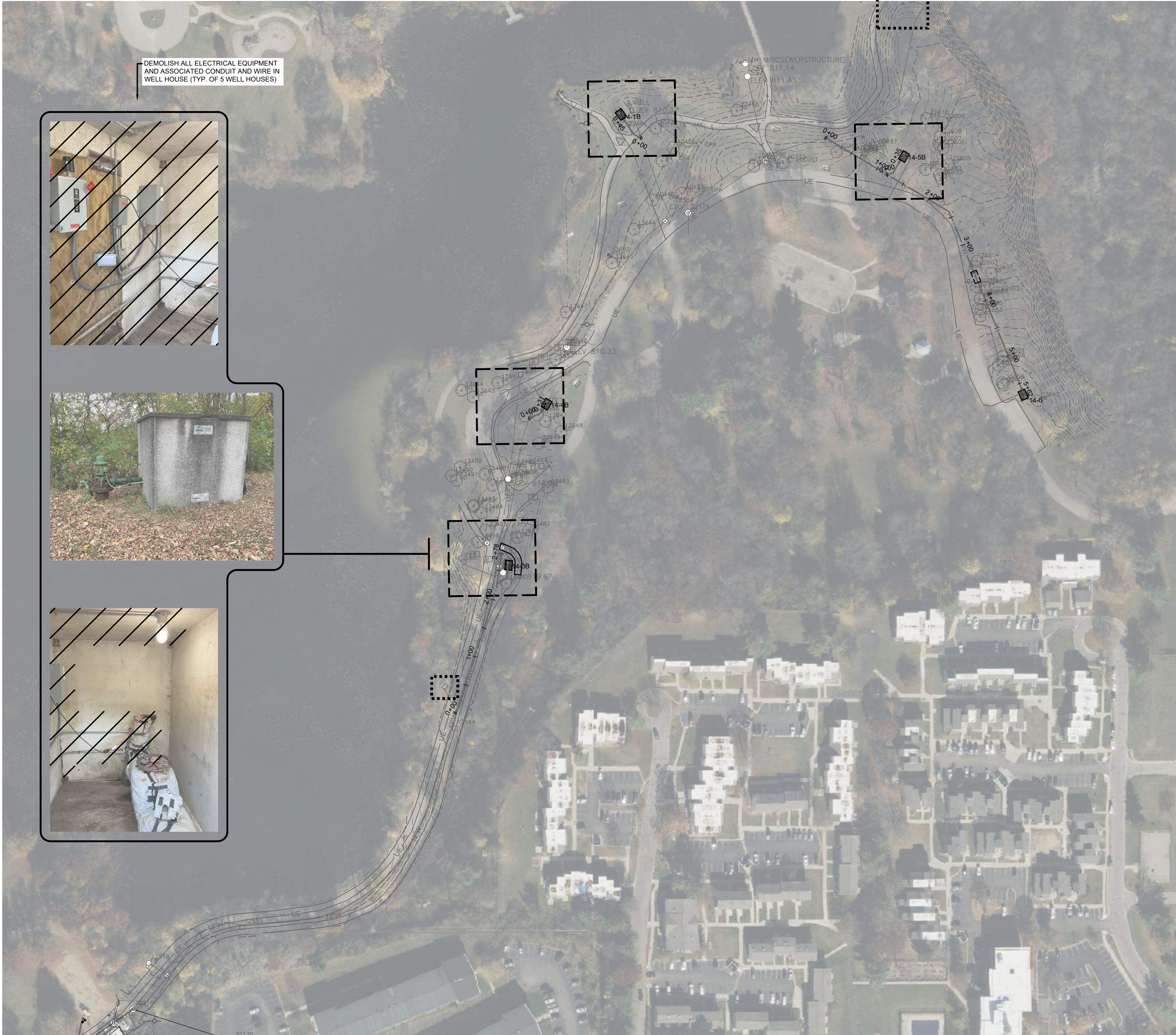
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PUMP STATION #14

ELECTRICAL CONDUIT PLAN

C-115

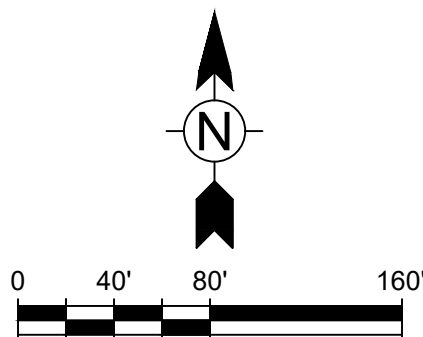
4/27/2025 6:49:17 PM - C:\USERS\JASON.SHANK\A\CC\DOC\S\TETRA TECH INC\200-19743-24012 KZOO PS5 AND PS14\PROJECT FILES\CAD\SHEETFILES\EA902 SITE PLAN PS 14 SITE PLAN DEMO.DWG - SHANK, JASON



DEMOLISH ALL ELECTRICAL EQUIPMENT AND ASSOCIATED CONDUIT AND WIRE IN WELL HOUSE (TYP. OF 5 WELL HOUSES)

NOTES:

1. CONTRACTOR TO DEMOLISH ALL DIRECT BURIED CONDUITS, DUCT BANKS, ASSOCIATED CONDUIT AND WIRE, AND ASSOCIATED MANHOLES IN THEIR ENTIRETY FROM PUMP STATION NO.14 TO EACH WELL HOUSE AS SHOWN. THIS INCLUDES ABANDONED DUCT BANKS, AND CURRENT DUCT BANK PROVIDING POWER TO EXISTING WELL HOUSES.
2. CONTRACTOR TO FIELD VERIFY.
3. CONTRACTOR TO DEMOLISH EXISTING WELLHOUSES AS SHOWN (5 IN TOTAL).

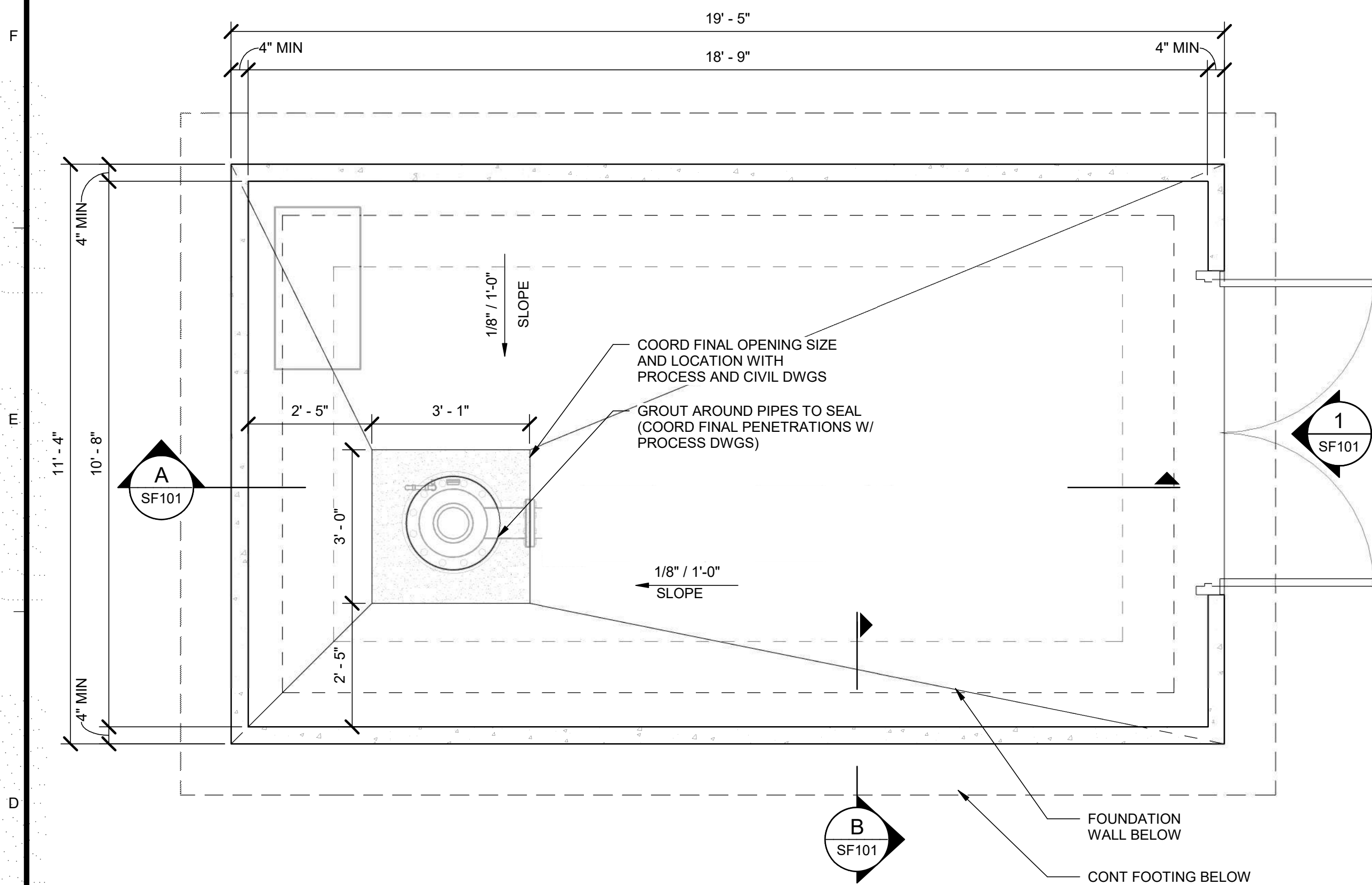


CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION #14
EXISTING SITE PLAN - DEMOLITION

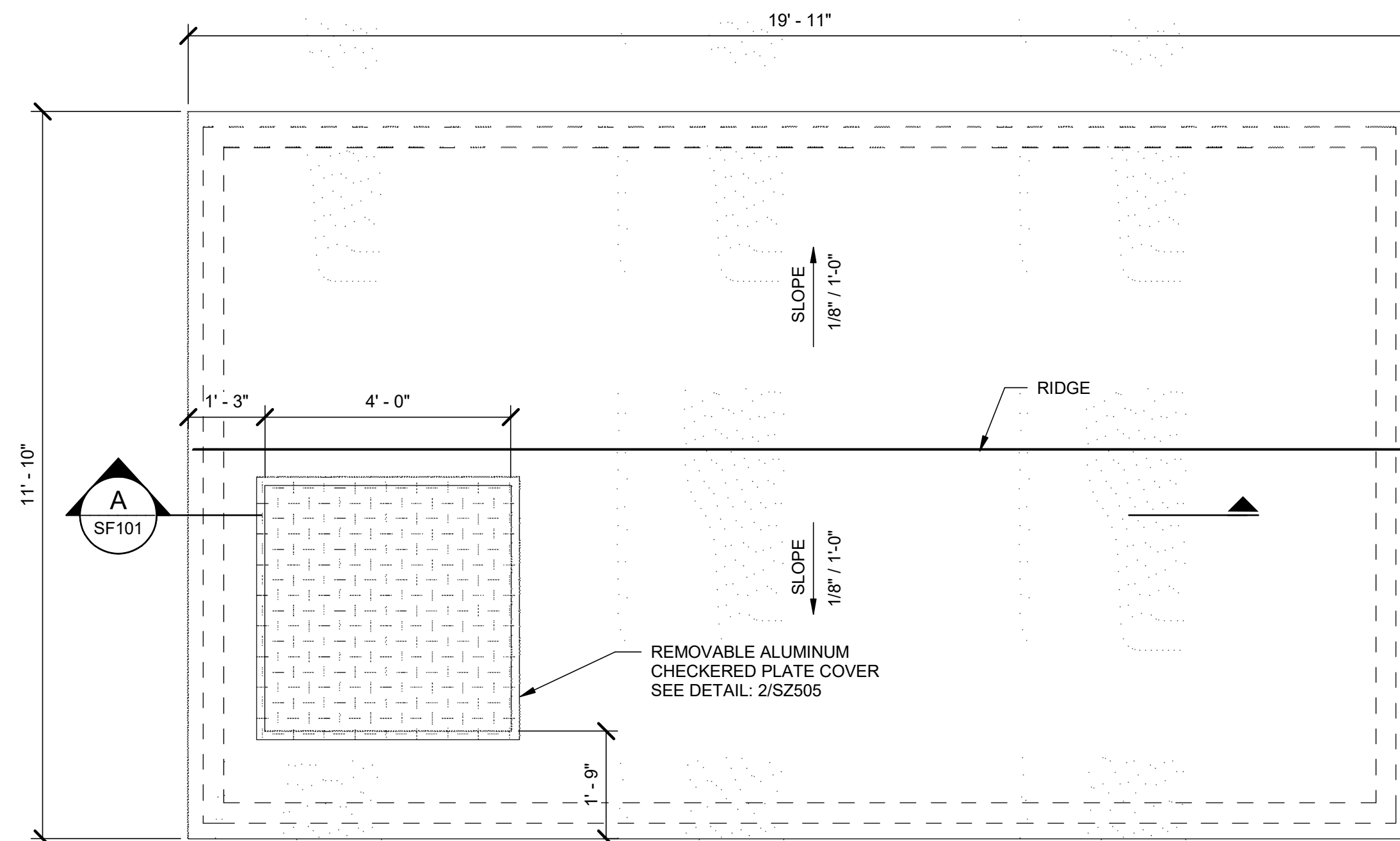
PROJ: 200-19743-24012
DESN: J. JONES
DRWN: V. LEE
CHKD:

EA902

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SLAB AND FOUNDATION PLAN

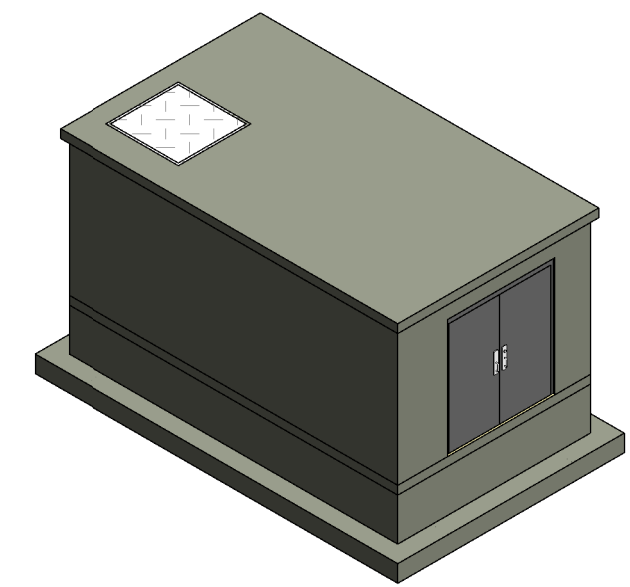


ROOF FRAMING PLAN

SCALE: 1/2" = 1'-0"

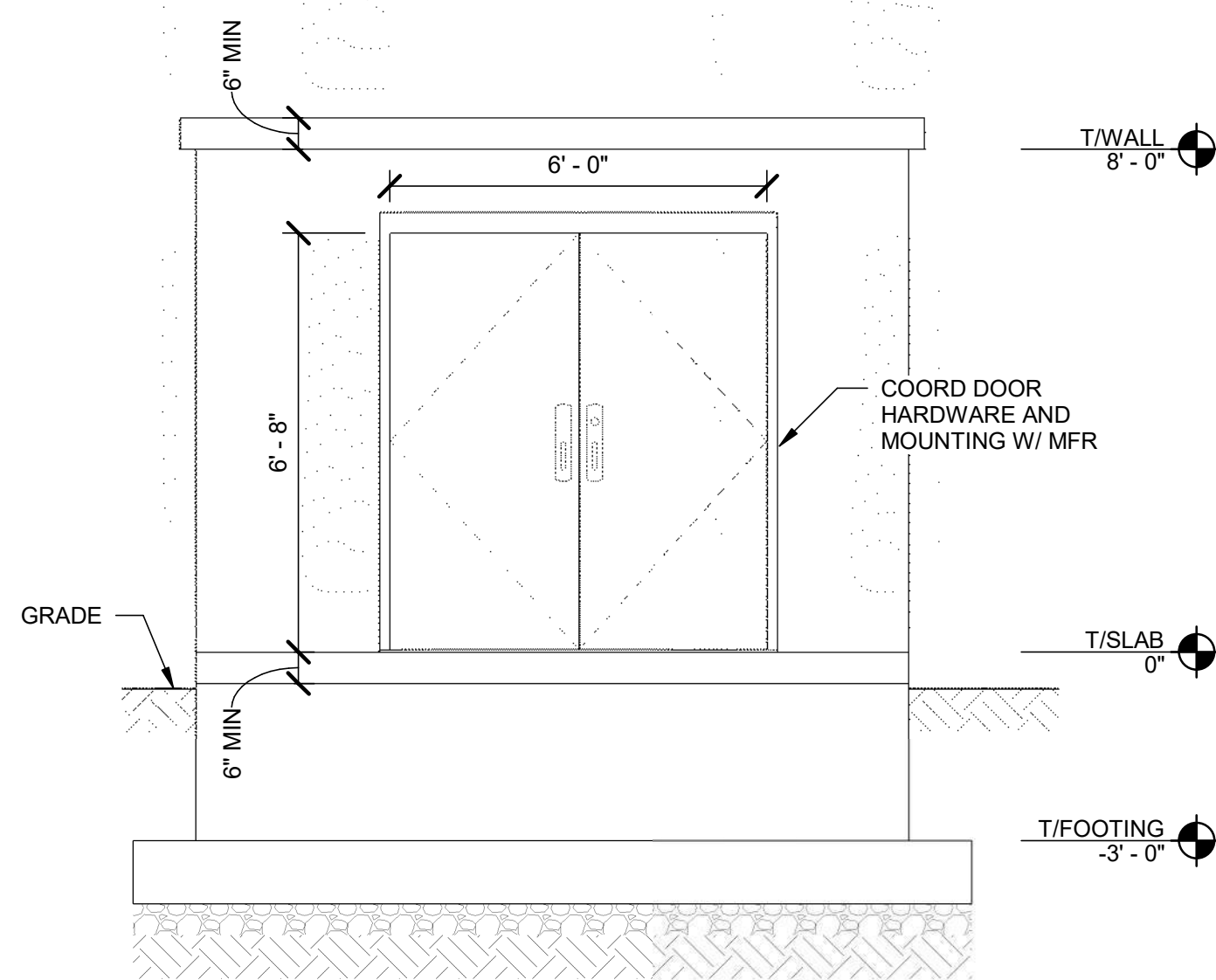
SLAB PLAN NOTES:

1. SEE SHEETS S-001-S-004 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. SEE CIVIL DRAWINGS FOR PRE-CAST CONDO LOCATION.
3. COORDINATE ALL PIPE SUPPORTS AND SLAB PENETRATIONS W/ PROCESS DWGS AND EQUIPMENT MANUFACTURERS PRIOR TO CONSTRUCTION.
4. REFER TO TYPICAL DETAIL 3/SZ501 FOR ADDITIONAL REINFORCEMENT AT OPENINGS.
5. COORDINATE FINISHED FLOOR ELEVATION (0'-0") WITH THE APPROPRIATE DATUM PROVIDED IN THE CIVIL DRAWINGS.
6. COORDINATE FINAL WALL THICKNESS WITH ANY DOOR, WINDOW, LOUVRE, ETC. MOUNTING REQUIREMENTS. SEE MECHANICAL DWGS.
7. MANUFACTURER SHALL SUBMIT SIGNED AND SEALED DETAILED DRAWINGS AND CALCULATIONS BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN TO THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION.
8. CONNECTION OF PRECAST BUILDING TO FOUNDATION SHALL BE DESIGNED AND DETAILED BY THE BUILDING MANUFACTURER.
9. PRECAST BUILDING MANUFACTURER SHALL COORDINATE SIZES OF ROUGH OPENINGS WITH SPECIFIC DOOR FRAMES, LOUVRES, ETC.

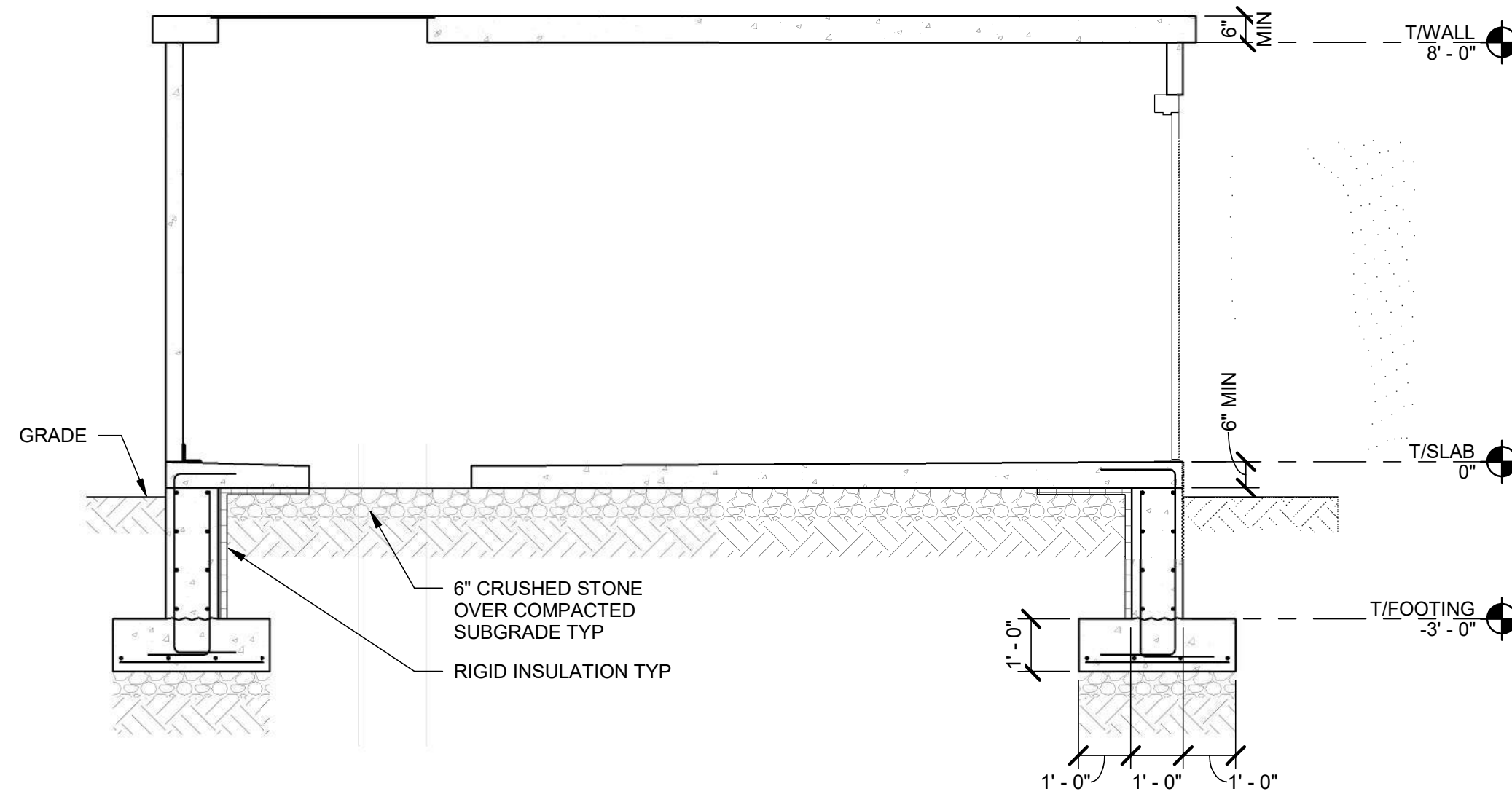


3D VIEW

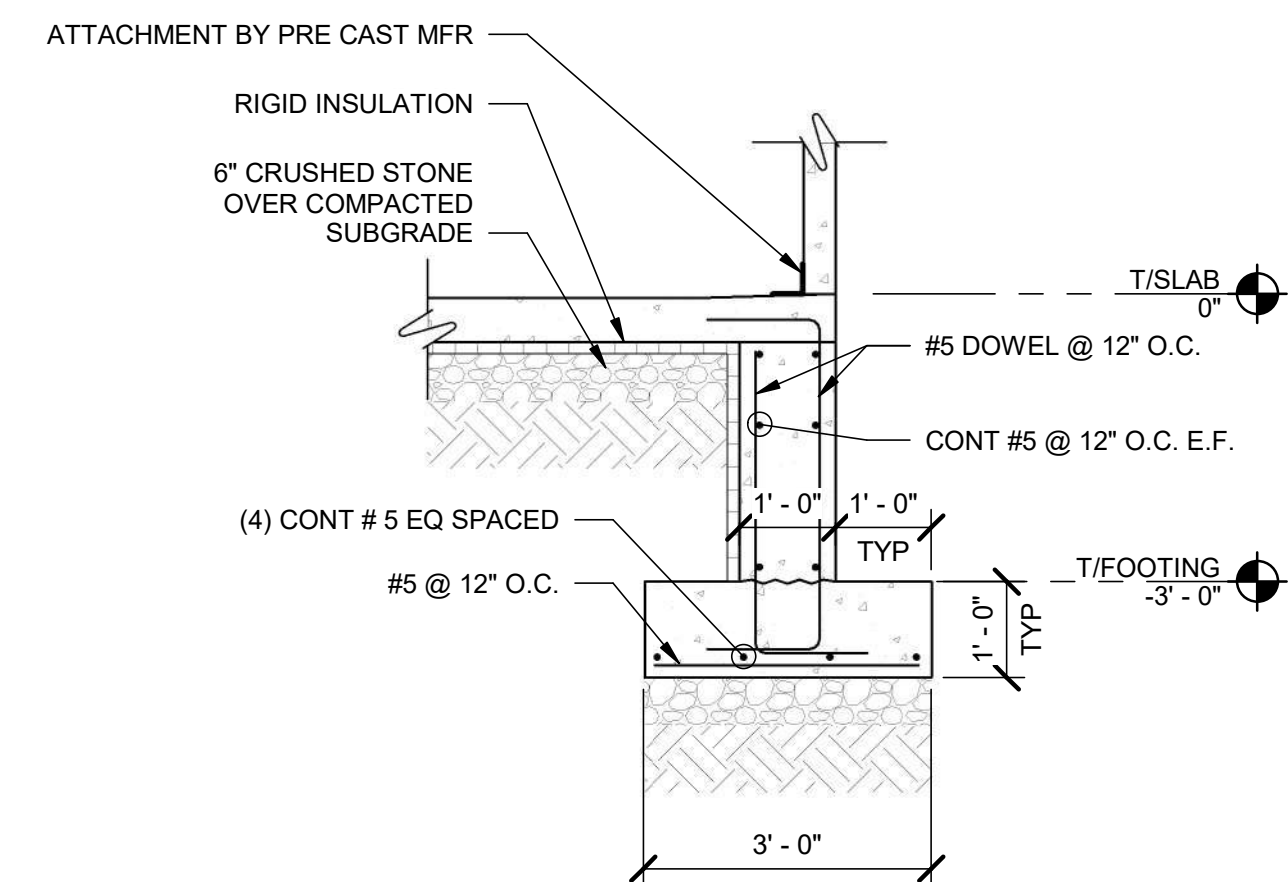
SCALE:



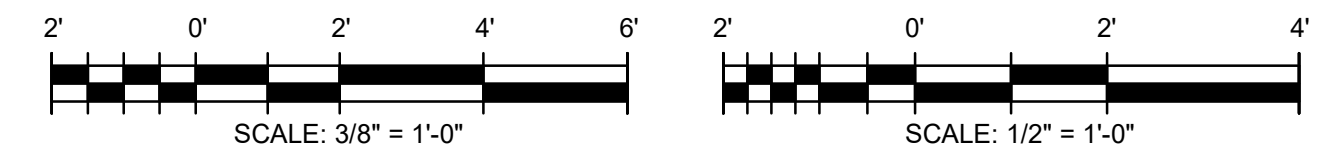
1 FRONT
SF101 SCALE: 3/8" = 1'-0"



A SECTION
SF101 SCALE: 3/8" = 1'-0"



B SECTION
SF101 SCALE: 1/2" = 1'-0"



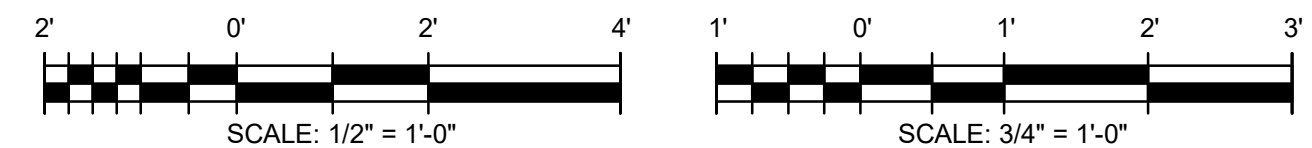
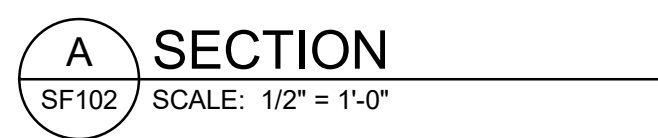
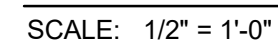
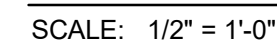
Bar measures 1 inch, otherwise drawing is not to scale

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CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
WELL CONDO PRECAST PLANS AND
SECTION

PROJ:	200-19743-24012
DESN:	J.THOMAS
DRWN:	T.BAUER
CHKD:	T.MADDELA

SF101



1. SEE SHEETS S-001-S-004 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. SEE CIVIL DRAWINGS FOR PRE-CAST CONDO LOCATION.
3. COORDINATE ALL PIPE SUPPORTS AND SLAB PENETRATIONS W/ PROCESS DWGS AND EQUIPMENT MANUFACTURERS PRIOR TO CONSTRUCTION.
4. REFER TO TYPICAL DETAIL 3/SZ501 FOR ADDITIONAL REINFORCEMENT AT OPENINGS.
5. COORDINATE FINISHED FLOOR ELEVATION (0'-0") WITH THE APPROPRIATE DATUM PROVIDED IN THE CIVIL DRAWINGS.
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DESN:	J.THOMAS
DRWN:	T.BAUER
CHKD:	T.MADDELA

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TEL: (734) 665-6000 FAX: (734) 213-3003
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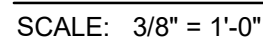
CITY OF KALAMAZOO, MICHIGAN

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PROJ:	200-19743-24012
DESN:	J.THOMAS
DRWN:	T.BAUER
CHKD:	T.MADDELA

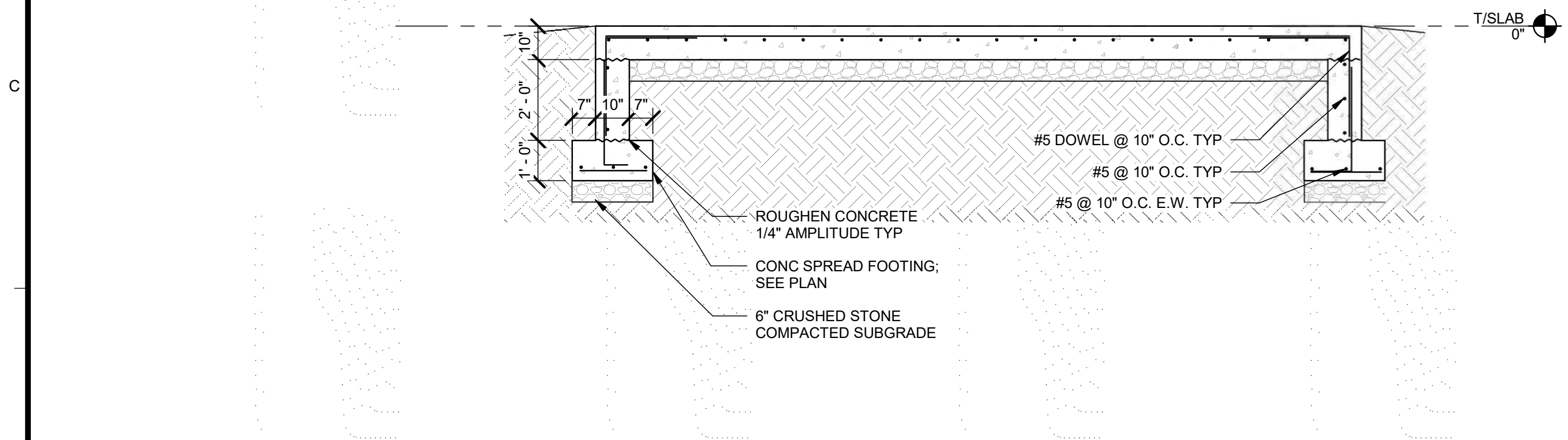
SF102

Bar measures 1 inch, otherwise drawing is not to scale

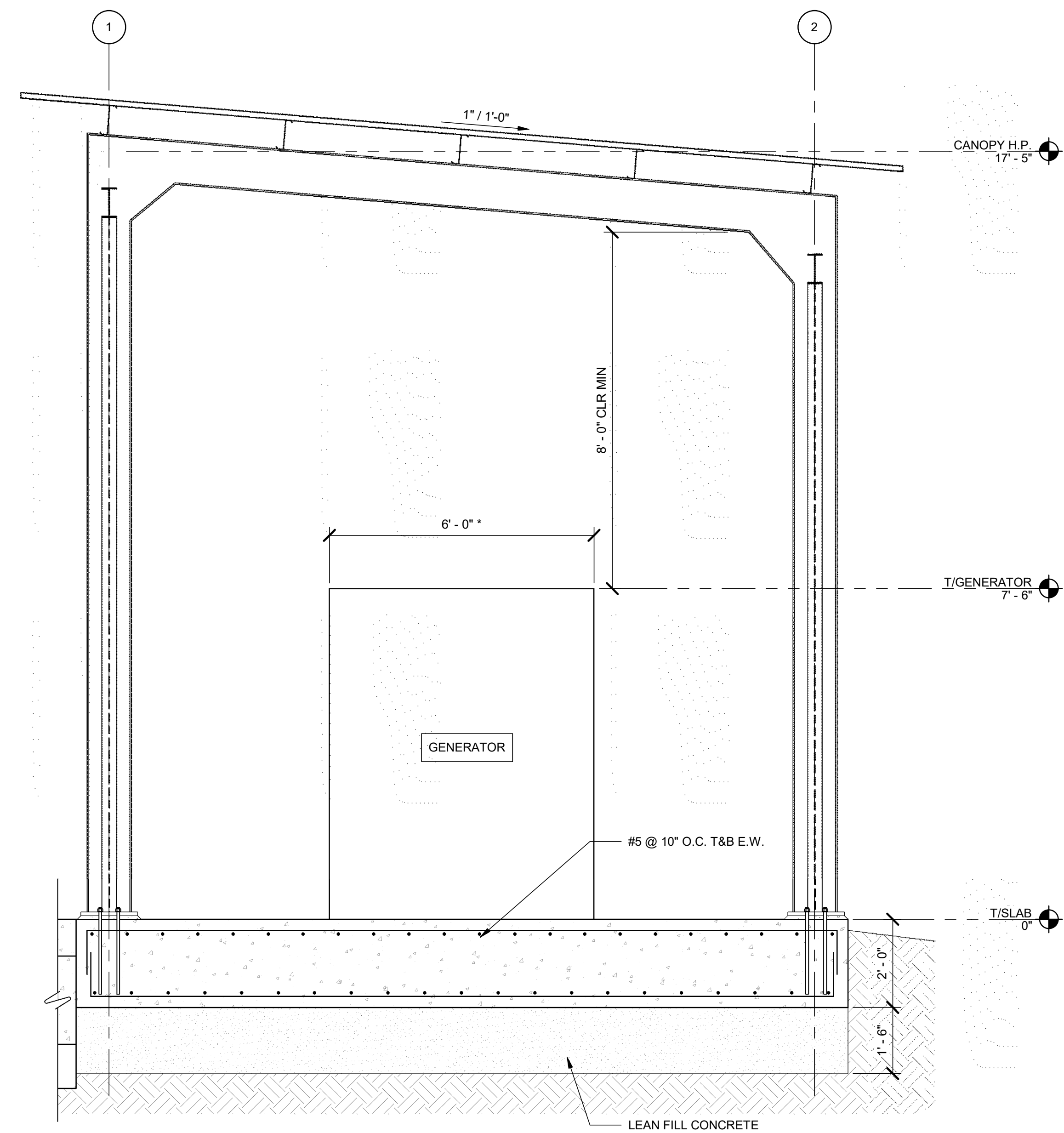


SCALE: 3/8" = 1'-0"

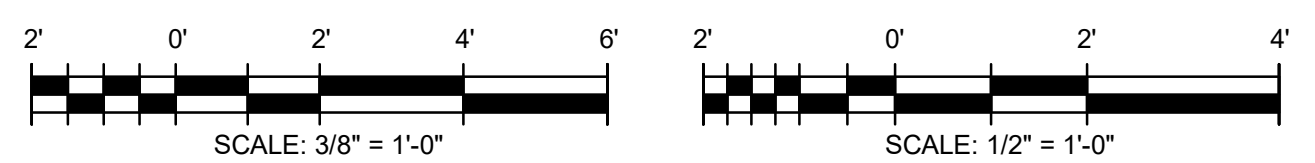




B GENERATOR PAD SECTION
SF301 SCALE: 3/8" = 1'-0"



C GENERATOR PAD SECTION
SF301 SCALE: 1/2" = 1'-0"

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
STATION 14 GENERATOR CANOPY SECTIONS

PROJ:	200-19743-24012
DESN:	J.THOMAS
DRWN:	T.BAUER
CHKD:	T.MADDELA

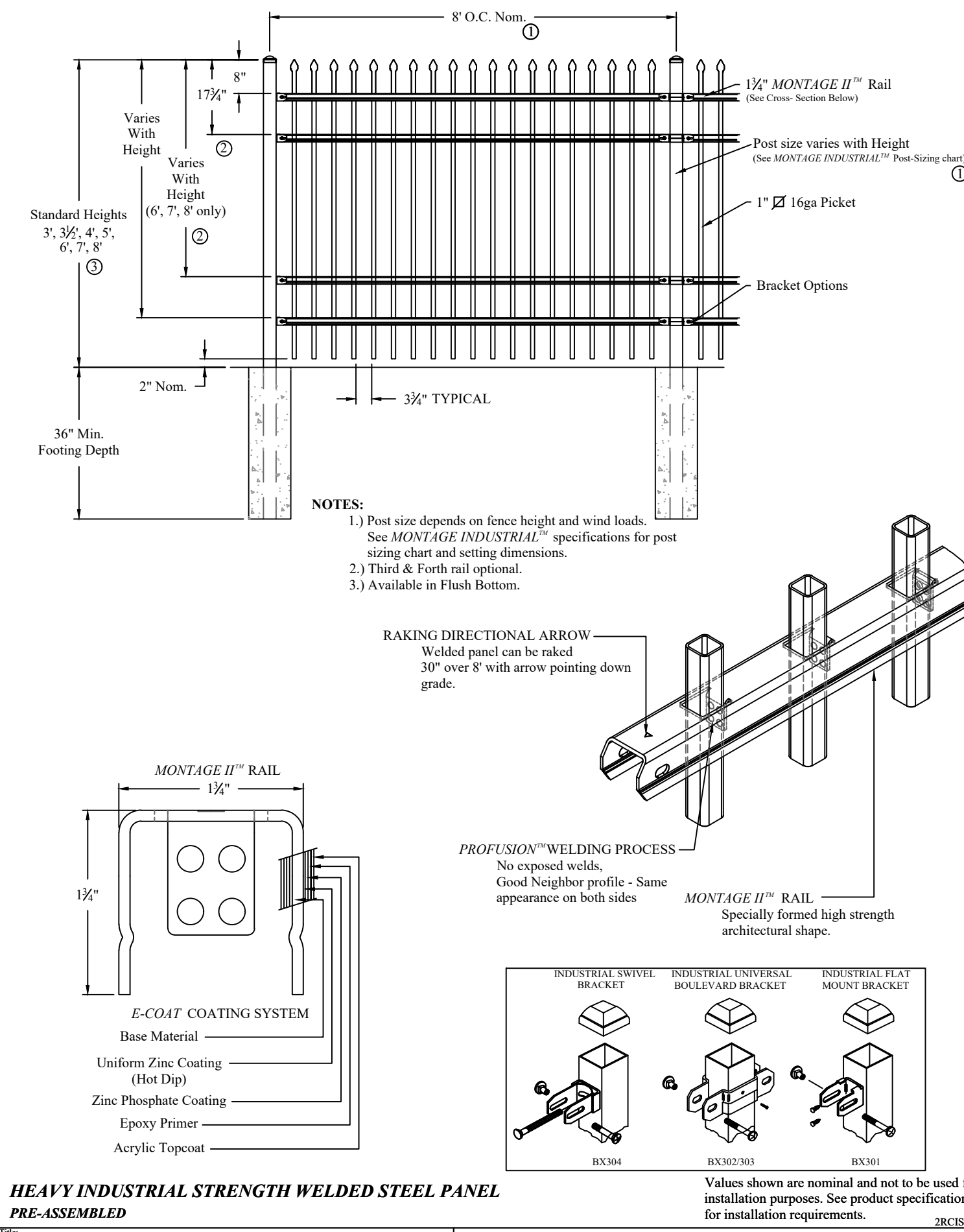
A detailed cross-section diagram of a modular block wall. The wall is constructed from interlocking blocks, with a 2" polystyrene foam core and 28" blocks. The wall is shown with a cap on top and a ground level line. Behind the wall is free draining backfill extending at least 12" behind the wall. A geogrid layer is shown behind the wall, and a crushed stone leveling pad is at the base. A perforated sock drain is located at the base of the wall, as specified by the engineer. The diagram is labeled with various components and their dimensions.

Labels and dimensions in the diagram include:

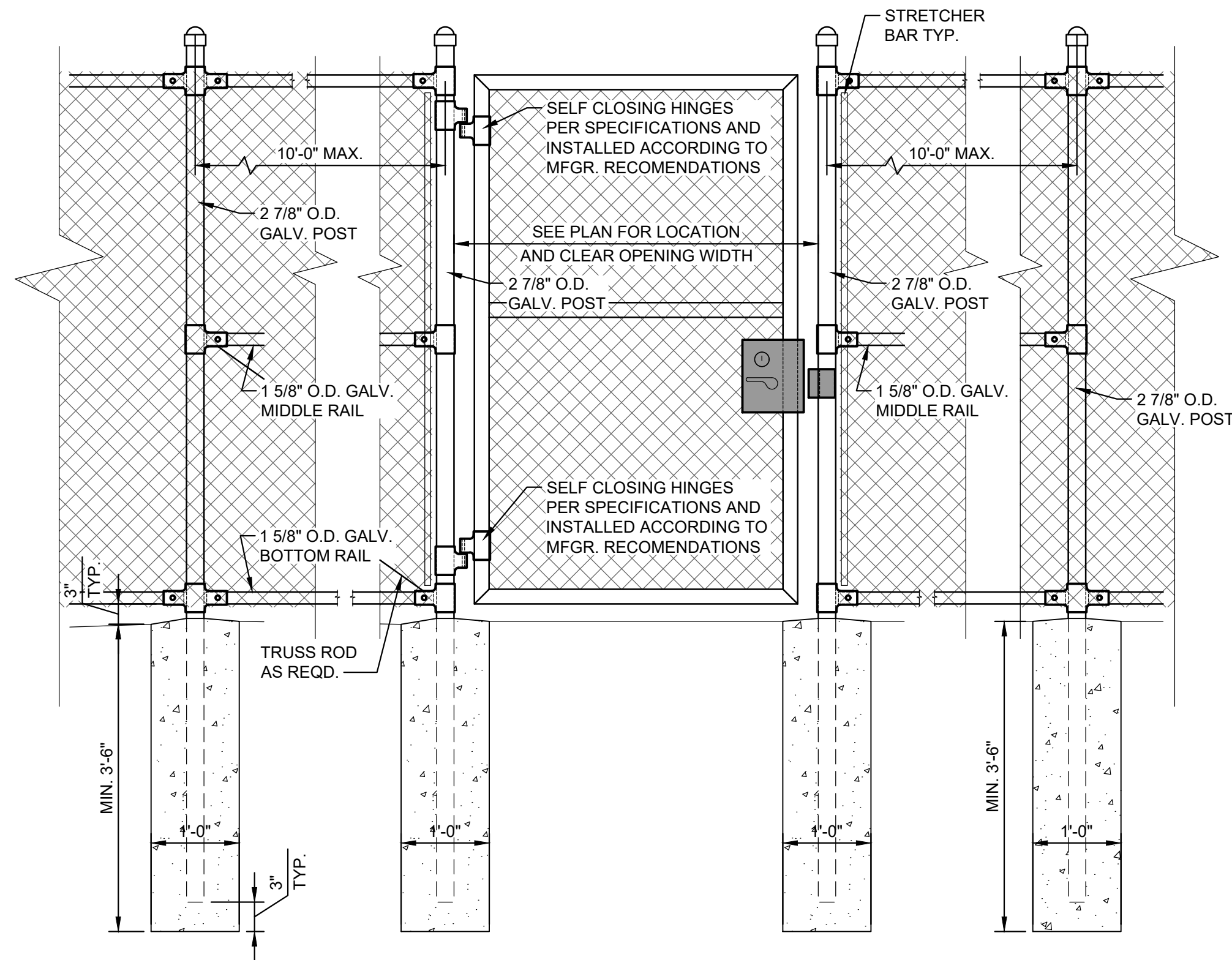
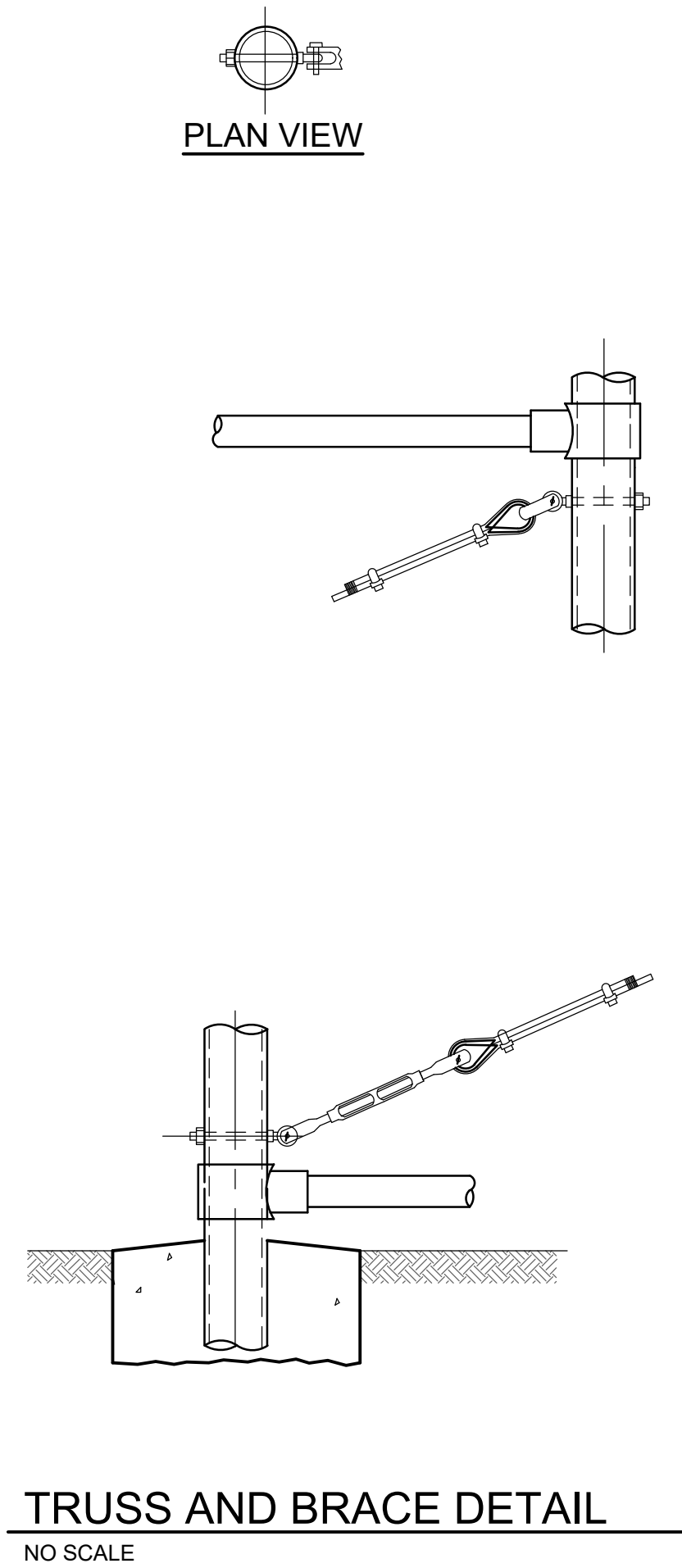
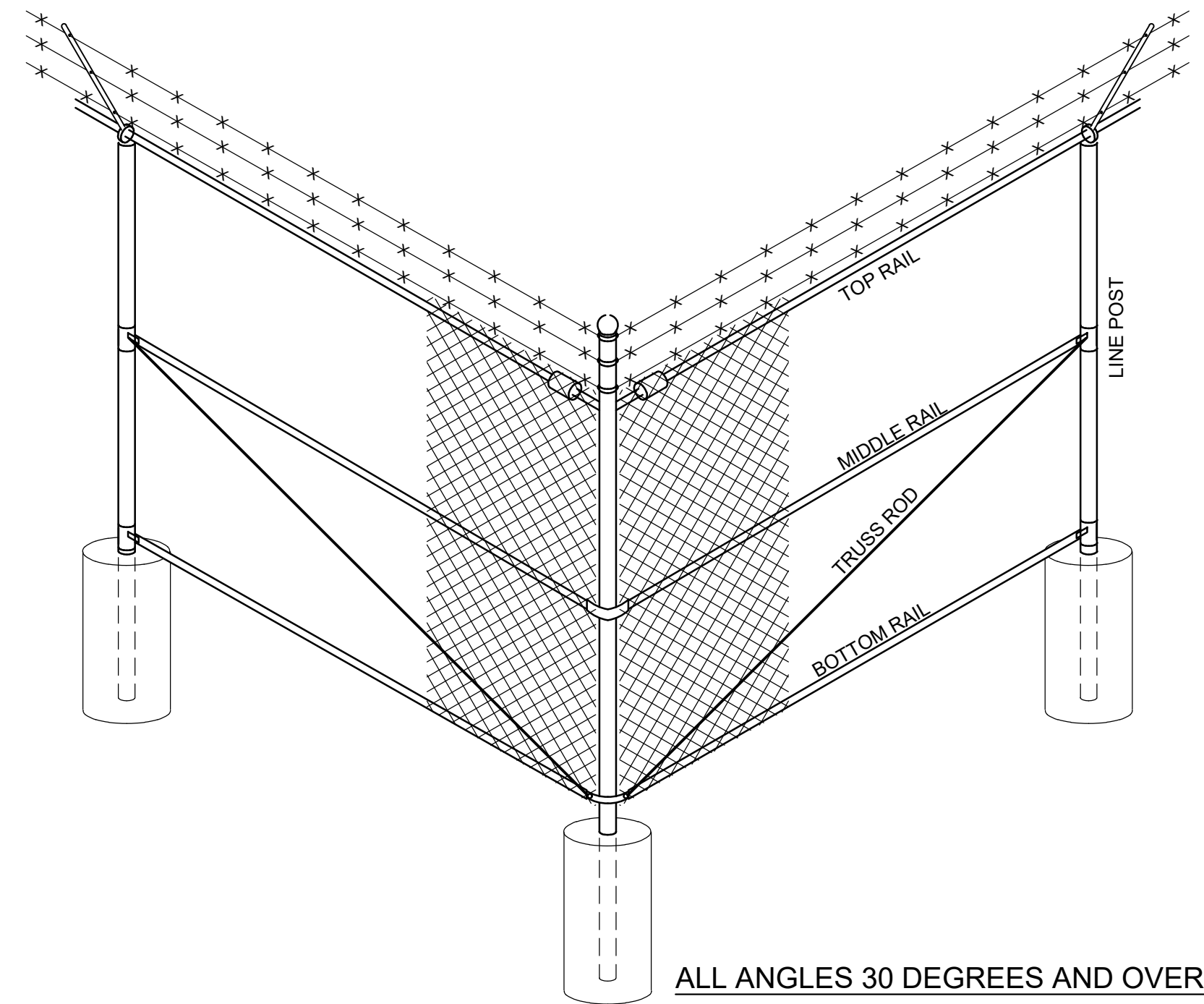
- CAP
- GROUND LEVEL
- FREE DRAINING BACKFILL TO EXTEND AT LEAST 12" BEHIND WALL
- 2" POLYSTYRENE FOAM
- 28" BLOCK
- GEOGRID LAYER (TYPE 1)
- CRUSHED STONE LEVELING PAD
- PERFORATED SOCK DRAIN (AS SPECIFIED BY ENGINEER)

MODULAR BLOCK WALL SECTION

NO SCALE

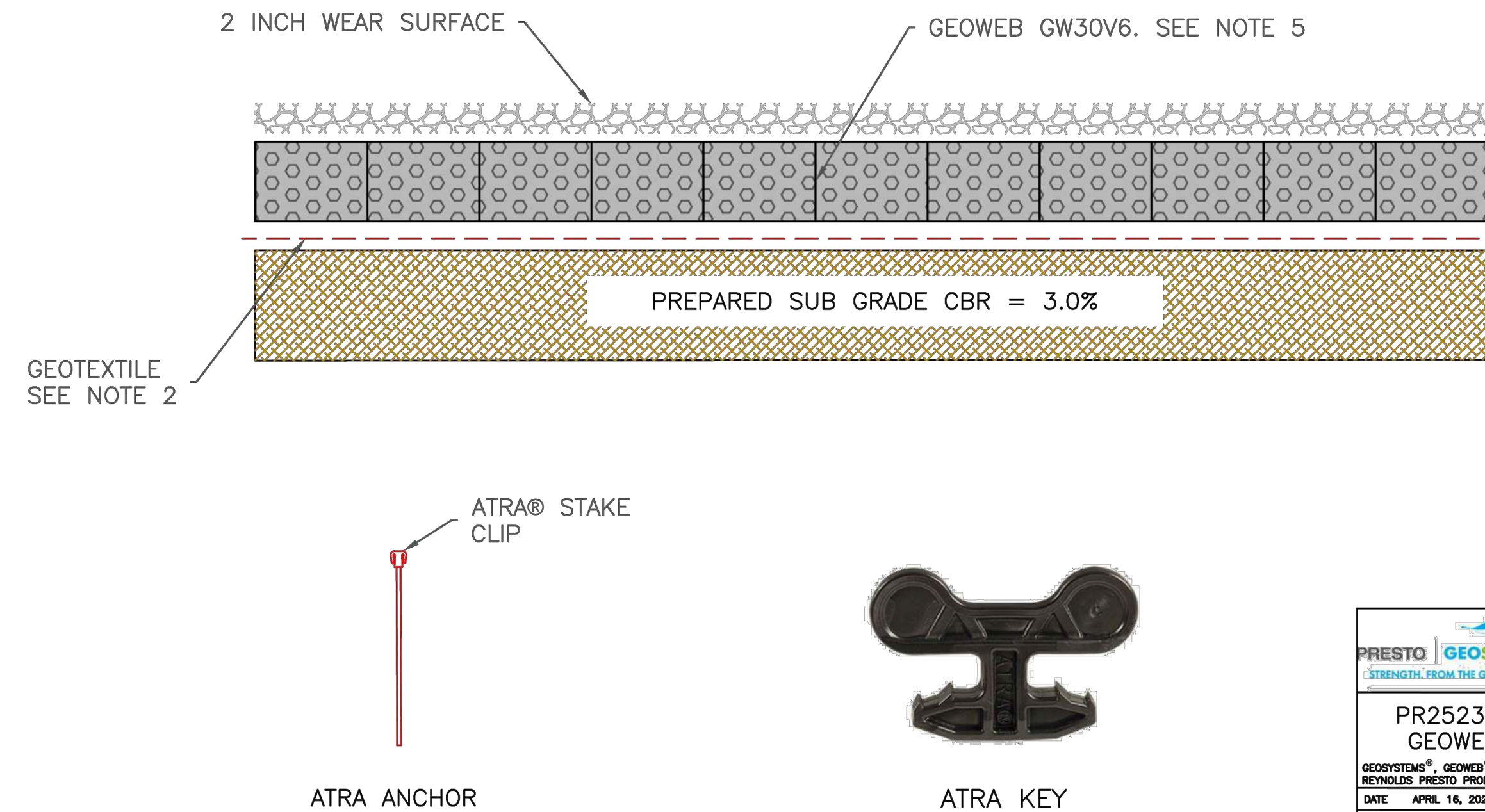


MEMBER												
BRACE OR RAIL				LINE POST				END, CORNER AND PULL POST		GATE POST		GATE OPENING
ROUND		HIGH COLUMN		ROUND		HIGH COLUMN		ROUND		ROUND		
OD	WEIGHT #/FT	SIZE	WEIGHT #/FT	OD	WEIGHT #/FT	SIZE	WEIGHT #/FT	OD	WEIGHT #/FT	OD	WEIGHT #/FT	
1 5/8"	2.27			2 3/8"	3.65			2 7/8"	5.79	4"	5.79	<4' - 10'



SECURE ACCESS GATE DETAIL

1. This evaluation is copyrighted and is based on the use of GEOWEB® manufactured by Reynolds Presto Products, Inc. All rights reserved. Any use of this evaluation for any geocell product other than that manufactured by Reynolds Presto Products, Inc is strictly prohibited and makes this evaluation invalid.
2. Provide a minimum 8 oz. non-woven geotextile separation layer and install per Manufacturer recommendations including overlaps based on sub grade CBR.
3. The GEOWEB panels shall be connected with ATRA® keys at each interleaf and end to end connection.
4. Provide ATRA Anchors to keep panels open for infill as required.
5. GEOWEB infill shall be crushed aggregate with maximum size of 2.0 inches. Overfill the GEOWEB panels and compact to provide a minimum 2-inch wear surface. Limit the drop of infill to prevent panel distortion.
6. Refer to the GEOWEB Load Support [Installation Guide](#) for installation procedures.



 		REYNOLDS PRESTO PRODUCTS, INC.	
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PR25235 SLOPED ACCESS GEOWEB LOAD SUPPORT			
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DATE April 16, 2025		FILE NAME SHEET 1	
SCALE NTS		SHEET 1 OF 1	



TETRA TECH

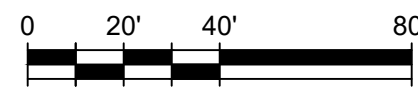
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION 5 & 14
CIVIL - DETAILS

PROJ:	200-19743-24012
DESN:	D. WARREN
DRWN:	A. SMITH
CHKD:	

C-504



— EXISTING WATER MAIN
—**RW**— RAW WATER MAIN
—**UE**— UNDERGROUND ELECTRIC



CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PUMP STATION #14
LANDSCAPING PLAN

PROJ:	200-19743-24012
DESN:	
DRWN:	
CHKD:	

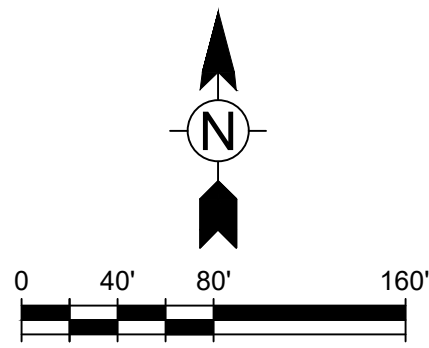


TETRA TECH

1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003
www.tetratech.com

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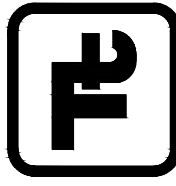


ELECTRICAL DIRECTIONAL DRILL PLAN
SEE SHEET C-115 FOR DETAIL

LEGEND

- TREE PROTECTION FENCING
- EXISTING WATER MAIN
- RW*— RAW WATER MAIN
- UE*— UNDERGROUND ELECTRIC
- SILT FENCE

- NOTE:
- TREE PROTECTION FENCE
 - FENCING MUST BE BUILT USING POSTS SIX FEET IN HEIGHT, SPACED NO MORE THAN EIGHT FEET APART ON CENTER AND BURIED AT LEAST TWO FEET BELOW GRADE.
 - FENCE MUST HAVE TWO CROSS BEAMS PLACED APPROXIMATELY AT TWO AND SIX FEET ABOVE GRADE.
 - PLASTIC MESH BARRIER FENCE SHALL BE AFFIXED TO THE FRONT OF THE POSTS.

**TETRA TECH**

www.tetratech.com
1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48106-1508
PHONE: (734) 665-6000 FAX: (734) 213-3003

MARK	DATE	DESCRIPTION	BY
	05/01/25	ISSUED FOR BIDS	

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
**PUMP STATION 14
TREE PROTECTION PLAN
SESC PLAN**

PROJ: 200-19743-24012
DESN:
DRWN:
CHKD:

C-902

Lauryn Roberts
Tetra Tech

April 11, 2025

**Re: Rare Species Review #5386 – The City of Kalamazoo Flow Consolidation Project,
Kalamazoo County, MI**

Hello:

The location for the proposed project was checked against known localities for rare species and unique natural features, which are recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database. This continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features. The absence of records in the database for a particular site may mean that the site has not been surveyed. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR), Wildlife Division. Responsibility to protect endangered and threatened species is not limited to the lists below. Other species may be present that have not been recorded in the database.



MSU EXTENSION

Michigan Natural
Features Inventory

PO Box 13036
Lansing MI 48901

(517) 284-6200
Fax (517) 373-9566

mnfi.anr.msu.edu

Several at-risk species and/or natural communities have been documented within 1.5 miles of the project location and it is possible that adverse impacts will occur. This response reflects a desktop review of the database and MNFI cannot fully evaluate this project without visiting the area. MNFI offers several levels of [Rare Species Reviews](#), including field surveys which I would be happy to discuss with you.

Sincerely,

Nicolette Sexton

Nicolette Sexton
Environmental Review Assistant
Michigan Natural Features Inventory

Comments for Rare Species Review #5386

It is important to note that it is the applicant's responsibility to comply with both state and federal threatened and endangered species legislation. Therefore, if a state listed species occurs at a project site, and you think you need an endangered species permit, please contact Amy Bleisch at DNR-Wildlife Division, DNR-StateTEPermit@michigan.gov and review details on the [MDNR's Threatened/Endangered Species](#) resource page. If a federally listed species is involved and, you think a permit is needed, please contact Jessica Pruden, U.S. Fish and Wildlife Service, East Lansing office, 517-351-8316, or Jessica_Pruden@fws.gov.

NOTE: Special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts. Please consult MNFI's [Rare Species pages](#) for additional information on Michigan's rare plants and animals.

NOTE: Several rare freshwater mussels have been documented near the project area. Freshwater mussels (*Unionida*) require a fish host to complete their life cycle. Eggs are fertilized and develop into larvae within the gills of the female mussel. These larvae, called glochidia, are released into the water and must attach to a suitable fish host to survive and transform into the adult mussel. As zebra mussel (*Dreissena polymorpha*) infestation has led to the extirpation of many native mussel communities, boat hulls and trailers, fishing gear and scuba equipment should be thoroughly cleaned before moving between waterbodies, to prevent the spread of zebra mussel larvae and adults.

Stream Group Designations

NOTE: Michigan rivers and streams have been grouped according to existing information of mussel distribution and individual species conservation status. The Mussel Protocol Stream Groups are designed to document the **potential** presence or absence of state or federally listed mussel species. The layer was created by modeling the habitat suitability for each mussel species and may not correspond directly with a documented location for a listed mussel. A segment may be predicted as suitable for a number of mussel species, so the stream group number was assigned to the most restrictive of the potential mussel species present.

The stretch of the Kalamazoo River within 0.2 mile of the project area is designated a Group 1 mussel stream which means that State special concern mussel species occur here and that certain surveys and possibly relocation procedures apply. I encourage you to read the [Michigan Freshwater Mussel Survey Protocols and Relocation Procedures](#) publication if in-stream work and/or land clearing activities occur that result in streambed disturbance and erosion and sedimentation into the river. A copy of the publication is being provided to you in this mailing.

The [Mussel Map Viewer](#) is an interactive tool to allow users to explore listed native mussels across the Michigan landscape. Watershed level species lists are available alongside the Mussel Protocol Stream Groups.

Table 1: Occurrences of Threatened & Endangered Species within 1.5 miles of Project Site

Element Category	Scientific Name	Common Name	Federal Status	State Status	G Rank	S Rank	EO Rank	First Observed Date	Last Observed Date
Animal	<i>Alasmidonta viridis</i>	Slippershell		T	G4G5	S2S3	E	2017	2017
Animal	<i>Bombus affinis</i>	Rusty-patched bumble bee	LE	E	G2	SH	H	1963-07-25	1975-07-12
Animal	<i>Bombus affinis</i>	Rusty-patched bumble bee	LE	E	G2	SH	H	1963-08-12	1963-08-12
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-05-30	1965-08-09
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-08-12	1963-08-12
Animal	<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	H	1963-09-04	1963-09-04
Animal	<i>Clonophis kirtlandii</i>	Kirtland's snake		E	G2	S1	H	1879	1879-07-11
Animal	<i>Cyclonaias tuberculata</i>	Purple wartyback		T	G5	S2	H	1981-08-31	1981-08-31
Animal	<i>Falco peregrinus</i>	Peregrine falcon		T	G4	S3	A	2010	2022
Animal	<i>Terrapene carolina carolina</i>	Eastern box turtle		T	G5T5	S2S3	H?	1999-08-10	1999-08-10
Plant	<i>Asclepias hirtella</i>	Tall green milkweed		T	G5	S2	D	2001-06-04	2001-06-04
Plant	<i>Collinsia verna</i>	Blue-eyed Mary		T	G5	SNR	H	1838-08-27	1877-05-06
Plant	<i>Panax quinquefolius</i>	Ginseng		T	G3G4	S2S3	H	1838-07-27	1838-07-27
Plant	<i>Silphium integrifolium</i>	Rosinweed		T	G5	S2	CD	1947	1999-10-08

Comments for Table 1

Most of the above EO's are historical and/or far removed from the project area and are not of concern. However, impacts are possible for the slippershell, eastern box turtle, tall green milkweed, and rosinweed EO's. See species comments below:

Species Comments for Table 1**Rosinweed (*Silphium integrifolium*)****Habitat**

Rosinweed occurs in prairie remnants along roads and railroad tracks or in cemeteries, in wet-mesic prairies and fens on peaty mucks and loams, and on dry-mesic to mesic loams and sandy loams. This species has been observed along E Michigan Ave. less than 0.3 mile southwest of the project area. Impacts may occur in portion of the project area (PS 5 Site) along E Michigan Ave. where suitable habitat appears to occur.

Management Recommendations

To maintain this species, protect the habitat and hydrological and natural disturbance regimes. This species likely requires natural disturbances associated with prairie habitat such as fire or brush removal to prevent woody plant succession. Significant increases in vegetative and reproductive vigor have been observed following early spring and fall burns. Much of this habitat type has been lost or severely degraded. Many prairie remnants are vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

For more information, see the [Silphium integrifolium](#) species page on the MNFI website.

Tall green milkweed (*Asclepias hirtella*)

Habitat

Grows in wet-mesic to dry sandy loam soils at inland sites as well as on alkaline clay in lakeplain prairies. This species has been observed within 0.2 miles of the project area and suitable habitat appears to occur within the project area (PS 5 Site).

Management Recommendations

Conserve habitat and maintain hydrological and natural disturbance regimes. This species most likely requires open conditions. Prevent woody plant encroachment by using prescribed fire or manual brush removal. Significant increases in vegetative and reproductive vigor have been observed following early spring and fall burns; late spring burns and summer can damage plants. Much of this habitat has been lost and degraded via conversion to agriculture, development, alterations of hydrology via drains and fire suppression. Many prairie remnants are also vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

For more information, see the [Asclepias hirtella](#) species page on the MNFI website.

Slippershell (*Alasmidonta viridis*)

Habitat

The slippershell typically occurs in creeks and headwaters of rivers in sand or gravel substrates. Occasionally, they occur in larger rivers and lakes and in mud substrates. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The slippershell requires clear, clean water and substrates for survival. Like other mussels, threats include: siltation, poor water quality, point and non-point source pollution, and alteration of natural flow regimes. Maintenance or establishment of vegetated riparian buffers can help protect mussel habitats from these threats. Additionally, zebra mussels and other exotic species are a major threat to all mussels. Hence, control and management of exotic species also help protect native mussel species. And as with all mussels, protection of their hosts habitat is also crucial.

For more information, see the [Alasmidonta viridis](#) species page on the MNFI website.

Eastern box turtle (*Terrapene carolina carolina*)

Habitat

The Eastern Box Turtle is Michigan's only truly terrestrial turtle. It typically occurs in forested habitats with sandy soils near a source of water such as a stream, pond, lake, marsh or swamp. They also may be found in adjacent thickets, old fields, pastures, or vegetated dunes. Access to unshaded nesting sites in sandy, open areas, is critical for successful reproduction. This species has been observed within 0.5 mile of the project area (PS 5 Site) and suitable habitat appears to occur within the project area.

Management Recommendations

Conservation efforts should concentrate on protecting large tracts of habitat especially on public land to provide the box turtle additional protection from the effects of development. Wetland hydrology and quality should be maintained by preventing improper off-road vehicle use, implementing minimum development set-back distances, leaving buffer zones during timber harvest, grazing and agricultural operations, minimizing use of herbicides and pesticides in or near wetlands, and/or controlling invasive plants. Upland nesting areas should be identified, protected and in some cases created. Construction of new roads should be minimized or routed to avoid separating foraging and/or overwintering habitat from nesting areas. Finally, the public should be educated about the laws protecting reptiles and amphibians and encouraged to leave wild turtles in their natural habitats rather than collecting them for pets.

For more information, see the [Terrapene carolina carolina](#) species page on the MNFI website.

Table 2: Occurrences of Special Concern Species and Natural Communities within 1.5 miles of Project Site

Element Category	Scientific Name	Common Name	Federal Status	State Status	G Rank	S Rank	EO Rank	First Observed Date	Last Observed Date
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2000-07	2018-07-19
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2019-07-17	2019-07-17
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2019-07-17	2019-07-17
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017
Animal	<i>Alasmodontia marginata</i>	Elktoe		SC	G4	S3?	E	2017	2017

Animal	<i>Bombus auricomus</i>	Black and gold bumble bee		SC	G5	S2	H	1960-07-04	1960-07-04
Animal	<i>Bombus auricomus</i>	Black and gold bumble bee		SC	G5	S2	H	1963-08-02	1963-08-02
Animal	<i>Cambarunio iris</i>	Rainbow		SC	G4G5	S3	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona compressa</i>	Creek heelsplitter		SC	G5	S3	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2000-08-01	2000-08-01
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2019-07-17	2019-07-17
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	E	2017	2017
Animal	<i>Lithobates palustris</i>	Pickerel frog		SC	G5	S3S4	H	1911-08-30	1911-08-30
Animal	<i>Mesomphix cupreus</i>	Copper button		SC	G5	S1	H		
Animal	<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	E	2006-04-14	2023-08-01
Animal	<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	E	2017	2023-06-29
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2018-08-14	2018-08-14
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2019-07-17	2019-07-17
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4?	S3	E	2019-07-17	2019-07-17
Animal	<i>Sphaerium fabale</i>	River fingernail clam		SC	G5	SNR	H		
Animal	<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	E	2018-08-14	2018-08-14
Animal	<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	E	2019-07-17	2019-07-17
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	H	1934	1934
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	E	2019-07-17	2019-07-17
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	H	1929-09-09	1929-09-09
Plant	<i>Angelica venenosa</i>	Hairy angelica		SC	G5	S3	H	1947	1947-07-26

Plant	<i>Arnoglossum plantagineum</i>	Prairie indian-plantain		SC	G5	S3	H	1838	1838-07-25
Plant	<i>Berula erecta</i>	Cut-leaved water parsnip		SC	G4G5	S2	H	1947	1947

Comments for Table 2

Many of the above EO's are historical and/or far removed from the project area and are not of concern. However, impacts are possible for the paper pondshell, round pigtoe, flutedshell, and elktoe mussel EO's. See species comments below:

Species Comments for Table 2

Paper pondshell (*Utterbackia imbecillis*)

Habitat

Paper pondshell is most often observed in lakes, ponds and impoundments with soft mud or sand substrates (Watters et al.). This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

Approximately 70% of North American unionids are imperiled. Threats include alteration of physical habitat, host fish population declines, invasive species introduction and compromised water quality (Bringolf et al. 2007). As with all species of this group, paper pondshell has been found to be highly vulnerable to chemical pollutants (Conners and Black 2004) and heavy metals (Pip 1995) found in many herbicides and pesticides, and in other forms of point and non-point source pollution. Sedimentation of waterways causes harm to a wide variety of freshwater organisms. Management of all native mussels must include maintaining healthy habitat structure and high water quality standards. Zebra mussels must be prevented from spreading to new waterways through the careful cleaning of fishing gear, boats and trailers, and scuba equipment in order to protect paper pondshell populations from infestation.

For more information, see the [Utterbackia imbecillis](#) species page on the MNFI website.

Round pigtoe (*Pleurobema sintoxia*)

Habitat

The round pigtoe occurs in mud, sand, or gravel substrates of medium to large rivers. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

Like other mussels, threats to the round pigtoe include: natural flow alterations, siltation, channel disturbance, point and non-point source pollution, and exotic species. Maintenance or establishment of

vegetated riparian buffers can help protect mussel habitats from many of their threats. Control of zebra mussels is critical to preserving native mussels. And as with all mussels, protection of their hosts habitat is also crucial.

For more information, see the [Pleurobema sintoxia](#) species page on the MNFI website.

Flutedshell (*Lasmigona costata*)

Habitat

The flutedshell is found in small and medium rivers, and in Lake St. Clair and Lake Erie. They are often found in sandy mud and cobble substrates. This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The flutedshell is being impacted by point source pollution, non-point source pollution, alteration of natural stream flow patterns, barriers to host fish passage, direct alteration of habitat, and invasive zebra mussels.

Limit or eliminate point source discharges of ammonia, chloride, sulfate, heavy metals, and other substances toxic to native mussels. Avoid use of aquatic herbicides containing copper. Maintain riparian buffers along streams and promote land conservation programs to help reduce excessive erosion, sedimentation, and nutrient input from non-point sources. Maintain integrity of headwater streams and wetlands, which support the ecological function of downstream river habitats. Improve passage for fish by removing unnecessary dams and upgrading poor stream/road crossings such as culverts that are too small or are perched. Flutedshell and other native mussels require fish hosts to complete their life cycle and rely on fish passage to travel to new habitats and facilitate gene flow among mussel populations. Avoid dredging, channelization, and other in-stream impacts whenever possible.

The spread of zebra mussels into Michigan's streams and lakes remains a serious threat throughout the flutedshell's range. Reduce the impact of zebra mussels by avoiding the transport of water or aquatic plants – which can contain zebra mussel larvae – from one body of water to another while boating, fishing, hunting, and researching. Washing boats, trailers, and gear, and letting them dry overnight reduces the potential for spreading zebra mussels.

For more information, see the [Lasmigona costata](#) species page on the MNFI website.

Elktoe (*Alasmidonta marginata*)

Habitat

The Elktoe is found in small to large sized streams and small to medium rivers. It is a riffle species, preferring swifter currents over packed sand and gravel substrates. The Elktoe is typically only found in clean, clear water (Cummings and Mayer 1992). This species has been observed within the stretch of the Kalamazoo River that falls within 0.2 mile of the project area (PS 5 Site).

Management Recommendations

The elktoe needs clean, fast-flowing water to survive. Therefore, changes to its habitat, such as river

impoundment, siltation and channel disturbances, including dredging, negatively affect this species. Pollution from point (industrial and residential discharge) and non-point (siltation, herbicide and surface run-off) sources is also a threat to mussels and should be limited and monitored to insure compliance with the Clean Water Act. Control of zebra mussels is critical to preserving native mussels. It is essential to protect not only the habitat of the elktoe, but also the white sucker, northern hog sucker, shorthead redhorse, rockbass and warmouth, as they serve as hosts for the glochidia.

For more information, see the [Alasmodonta marginata](#) species page on the MNFI website.

Codes to accompany table

State Protection Status Code Definitions

E = Endangered

T = Threatened

SC = Special concern

Federal Protection Status Code Definitions

LE = listed endangered

LT = listed threatened

LELT = partly listed endangered and partly listed threatened

PDL = proposed delist

E(S/A) = endangered based on similarities/appearance

PS = partial status (federally listed in only part of its range)

C = species being considered for federal status

Global Heritage Status Rank Definitions (G RANK)

The priority assigned by [NatureServe](#)'s national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

G1 = critically imperiled globally because of extreme rarity (5 or fewer occurrences range-wide or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Q = Taxonomy uncertain

State Heritage Status Rank Definitions (S RANK)

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1 = Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.

S2 = Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3 = Rare or uncommon in state (on the order of 21 to 100

occurrences). S4 = apparently secure in state, with many occurrences.

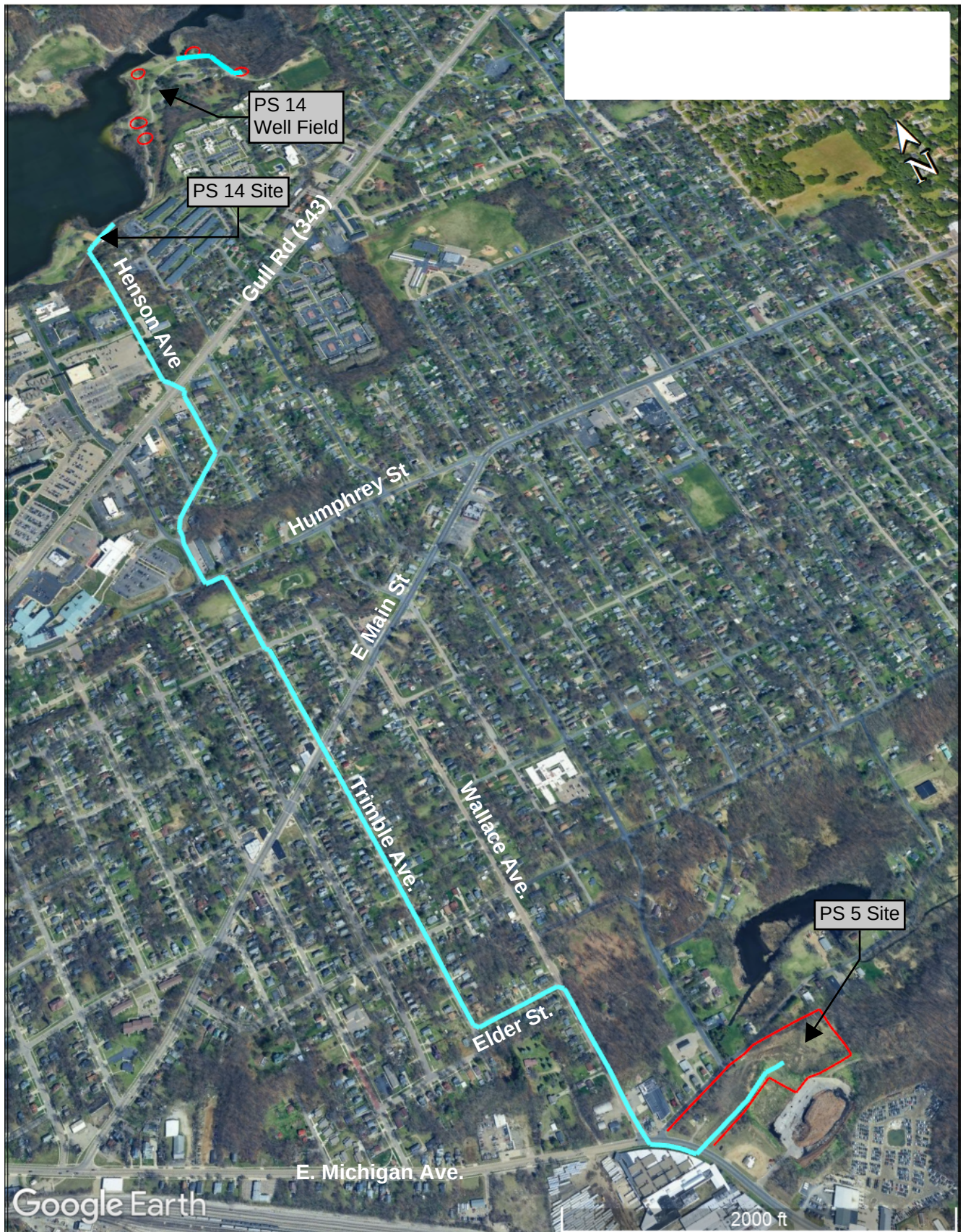
S5 = demonstrably secure in state and essentially ineradicable under present conditions.

SX = apparently extirpated from state.

EO Rank Codes

Element Occurrence (EO) ranks refer to the viability or ecological integrity of the occurrence; they provide an assessment of the likelihood that if current conditions prevail the EO will persist for a defined period of time, typically 20-100 years.

- A - Excellent estimated viability/ecological integrity
- A? - Possibly excellent estimated viability/ecological integrity
- AB - Excellent or good estimated viability/ecological integrity
- AC - Excellent, good, or fair estimated viability/ecological integrity
- B - Good estimated viability/ecological integrity
- B? - Possibly good estimated viability/ecological integrity
- BC - Good or fair estimated viability/ecological integrity
- BD - Good, fair, or poor estimated viability/ecological integrity
- C - Fair estimated viability/ecological integrity
- C? - Possibly fair estimated viability/ecological integrity
- CD - Fair or poor estimated viability/ecological integrity
- D - Poor estimated viability/ecological integrity
- D? - Possibly poor estimated viability/ecological integrity
- E - Verified extant (viability/ecological integrity not assessed)
- F - Failed to find
- F? - Possibly failed to find
- H - Historical
- H? - Possibly historical
- X - Extirpated
- X? - Possibly extirpated
- U - Unrankable
- NR - Not ranked



CITY OF KALAMAZOO
PUMP STATION 5 & 14 RECONSTRUCTION
CONTRACT 2

1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX (734) 213-3003

www.tetratech.com



DWSRF NO. 7866-01



CALL MISS DIG
(800) 482-7171

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL CALL (800) 482-7171 A MINIMUM OF THREE (3) FULL WORKING DAYS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

PROJECT LOCATION:

2045 EAST MICHIGAN AVENUE,
KALAMAZOO, MI 49048

CLIENT INFORMATION:

CITY OF KALAMAZOO

Tt PROJECT No.:

200-19743-24012

CLIENT PROJECT No.:

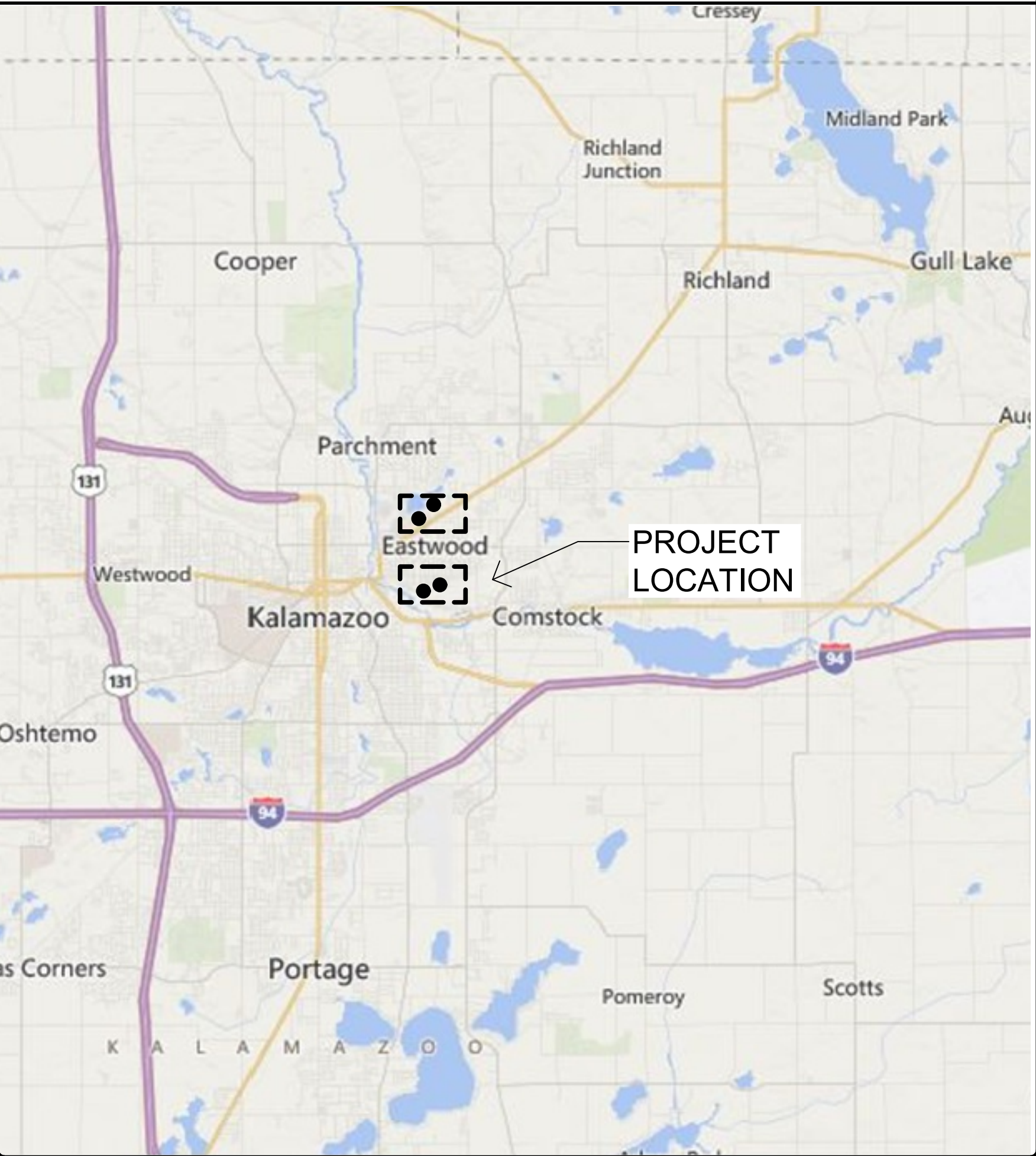
PROJECT DESCRIPTION / NOTES:

PUMP STATION 5 & 14 CONSOLIDATION, CONTRACT 2
NEW CONSTRUCTION OF PUMP STATION 5 & 14 BUILDING, PROJECT SITE WORK,
WELL CONDOS, PIPING, WELL FIELD PUMPS, AND WATER MAIN UPDATES.

ISSUED:

DRAFT EGLE SUBMITTAL - 02/21/25

VICINITY MAP:



SHEET INDEX

D-006	WATER TREATMENT PLANT AND BACKWASH TANK SCHEMATIC
D-007	PS NO. 5 CHEMICAL FEED SCHEMATIC
D-008	PUMP STATION 14 CHEMICAL FEED SCHEMATIC
D-009	PUMP STATION 5 CHEMICAL FEED SCHEMATIC
DA101	EXISTING PUMP STATION 14 CHEMICAL ROOM
DA901	EXISTING PUMP STATION 14 CHEMICAL ROOM DEMOLITION PLAN

SHEET NO.	INSTRUMENTATION
I-001	INSTRUMENTATION LEGEND ELIMINAR
I-002	INSTRUMENTATION NOTES ELIMINAR
I-103	INSTRUMENTATION STATION 14 SYSTEM CONFIGURATION DRAWING ELIMINAR
IZ501	INSTRUMENTATION DETAILS ELIMINAR



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SHEET INDEX

PROJ:	200-19743-24012
DESN:	M. TEITSMA
DRWN:	N. KARLL
CHKD:	----

G-002

2/20/2025 5:21:02 PM - C:_AD\ACCD\CS\TETRA TECH INC\200-19743-24012 KZOO PS5 AND PS14\PROJECT FILES\CAD\SHEETFILES\G-001 GENERAL NOTES.DWG - TROTTERKARLL, NIKI

NOTES

GENERAL NOTES (ALL DRAWINGS):

- THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWINGS. FOR ADDITIONAL INFORMATION REFER TO DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
- ALL EXISTING DIMENSIONS SHOWN WITH THE (+/-) SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION. FIELD VERIFY UTILITY LOCATIONS.
- THE INTENT OF THE DRAWINGS IS THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND TRANSPORTATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE PROJECT IN AN ACCEPTABLE MANNER, READY FOR USE BY THE OWNER.
- THE CONTRACTOR SHALL REVIEW AND COORDINATE THE SCHEDULING OF ALL CONSTRUCTION WITH THE OWNER AND SUBMIT DETAILED CONSTRUCTION SCHEDULE PRIOR TO BEGINNING WORK.
- ALL GENERAL NOTES APPLY TO THE SCOPE OF THIS PROJECT.
- THE GENERAL CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION MEETS OR EXCEEDS APPLICABLE CODES AND STANDARD PRACTICES, INCLUDING ALL FEDERAL, STATE AND LOCAL BUILDING AND ACCESSIBILITY REQUIREMENTS AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY VIOLATION OF THE SAME AND SHALL MAKE ALL WORK ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION INVOLVED WITHOUT EXTRA CHARGE.
- EACH TRADE SHALL VERIFY ALL REQUIREMENTS PERTAINING TO WORK PERFORMED IN THE PROJECT AND ANY REQUIRED PERMITS. ALL SUBCONTRACTORS SHALL DIRECT QUESTIONS, CHANGES OR REQUESTS THROUGH THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL SUBMIT ALL REQUESTS, CHANGES OR QUESTIONS TO THE OWNER'S REPRESENTATIVE IN WRITING.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL FEDERAL, STATE, AND LOCAL CODE REVIEW, PERMITTING AND ASSOCIATED FEES.
- THE CONTRACTOR SHALL MEET ALL OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA), PART 1910 AND EQUIVALENT OSHA AND FEDERAL STANDARDS.
- THE CONTRACTOR SHALL FOLLOW OWNER SOIL EROSION AND SEDIMENTATION CONTROL REQUIREMENTS (SESC).
- CONTRACTOR TO PROVIDE ANY AND ALL NECESSARY FENCES, BARRICADES, OR TRAFFIC CONTROLS TO ENSURE VEHICLE AND PERSONNEL SAFETY AND ADEQUATELY PROTECT THE SITE AT ALL TIMES.
- PROVIDE ADEQUATE PROTECTION TO PREVENT DAMAGE TO ADJACENT STRUCTURES.
- CONTRACTOR SHALL COORDINATE WITH OWNER AND ENGINEER FOR ALL RELOCATING AND REROUTING OF EQUIPMENT, PIPING, CONDUIT, ETC.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL AND WORK SITE SAFETY ON THIS PROJECT, INCLUDING SHEETING, BRACING, SIGNAGE, AND MEETING ALL STATE, FEDERAL AND LOCAL SAFETY CODES.
- ALL HARDWARE SHALL BE 304 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHER, ANCHORS, STRUTS, ETC. FOR ALL DRAWINGS. ANY REFERENCES IN ANY SPECIFICATION OR ANY DRAWING REFERRING TO 304 STAINLESS STEEL SHALL HAVE PRECEDENCE OVER STANDARD DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.
- ALL EXISTING SITE CONDITIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY.
- NO PIPES, CONDUIT, ETC. MAY BE EMBEDDED IN CONCRETE FLOORS, WALLS, OR CEILING UNLESS APPROVED BY ENGINEER.
- UNDERGROUND UTILITIES ARE APPROXIMATE LOCATIONS ONLY. UNDERGROUND UTILITY LOCATIONS HAVE NOT BEEN FIELD VERIFIED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL UNDERGROUND UTILITIES. ALL EX. UTILITIES MAY NOT BE SHOWN.
- CONTRACTOR SHALL NOT UTILIZE ANY PAVED ROADWAYS FOR TRACK EQUIPMENT OPERATION OR STORAGE. ALL DAMAGED ROADWAYS CAUSED BY CONTRACTOR TO BE REPAIRED AT CONTRACTORS EXPENSE.
- THE CONTRACTOR AND SUBCONTRACTOR SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT THEMSELVES WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUBSURFACE SOIL AND GROUND WATER CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR AND IF NOT SPECIFICALLY CALLED OUT IN THE CONTRACT DOCUMENTS, WILL BE INCIDENTAL TO THE COST OF INSTALLATION.
- ALL DISTURBED AREAS SHALL BE RESTORED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PROPERTY, INCLUDING EXISTING FENCING, LAWN, TREES AND SHRUBBERY.
- CONTRACTOR TO PROVIDE DEWATERING AS REQUIRED FOR THE WORK.
- DO NOT LEAVE ANY OPENINGS UNCOVERED AT END OF WORKING DAY.
- THE ELEVATIONS SHOWN ON THE CIVIL DRAWINGS ARE BASED ON NAVD88 DATUM. ELEVATIONS ON ALL OTHER SHEETS ARE BASED ON NGVD29 DATUM. NGVD29 ELEVATIONS ARE 0.436' HIGHER THAN NAVD88 ELEVATIONS.

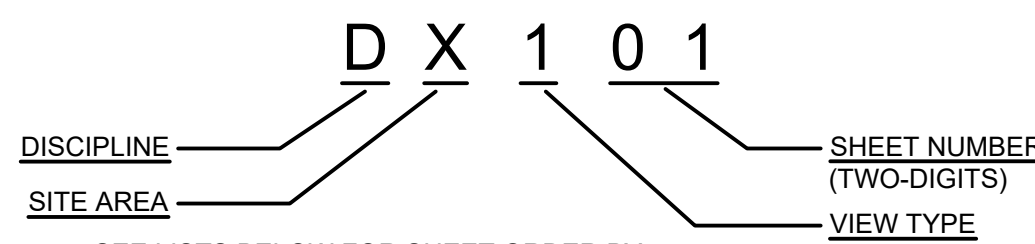
GENERAL DEMOLITION NOTES (ALL DRAWINGS):

- DEMOLITION DRAWINGS MAY NOT SHOW ALL DEMOLITION WORK REQUIRED UNDER THIS CONTRACT. OTHER CONTRACT DRAWINGS MAY ALSO SHOW DEMOLITION WORK. COORDINATE DEMOLITION WITH REQUIREMENTS LISTED IN SECTION 01110 OF THE PROJECT MANUAL.
- SITE INVESTIGATION PRIOR TO BIDS IS STRONGLY RECOMMENDED TO DETERMINE THE COMPLETE EXTENTS OF DEMOLITION REQUIRED. THESE DRAWINGS DO NOT INDICATE ALL MATERIALS THAT ARE TO BE REMOVED OR REROUTED IN AREA OF PROPOSED WORK.
- PRIOR TO STARTING WORK THE DEMOLITION CONTRACTOR IS TO FIELD VERIFY NOTED AREAS OF DEMOLITION TO DETERMINE ACTUAL SCOPE OF DEMOLITION, AND TO REVIEW SCOPE WITH THE OWNER'S REPRESENTATIVE TO CONFIRM SPECIFIC ITEMS TO BE SALVAGED AND STORED FOR REUSE.
- COORDINATE WITH OWNER DURING ANY INTERRUPTION OF SERVICE, SO THAT THAT OPERATION OF THE PROCESS EQUIPMENT IS NOT EFFECTED. SEE SPECIFICATIONS 01110 - SUMMARY OF WORK FOR ADDITIONAL REQUIREMENTS. REVIEW WORK ITEMS WITH ENGINEER PRIOR TO PERFORMING WORK.
- PRIOR TO THE START OF ANY DEMOLITION WORK, COORDINATE WITH PLANT OPERATORS THE LOCATION OF ALL UTILITIES. PLANT LOCK OUT/TAG OUT PROCEDURES SHALL BE STRICTLY FOLLOWED.
- EXPANSION AND ANCHOR BOLTS REMAINING IN WALL, CEILINGS OR FLOORS SHALL BE POUNDED OR CUT FLUSH WITH SURFACE. IN FINISHED AREAS THEY SHALL BE RECESSED AND PATCHED TO MATCH EXISTING FINISH.
- ALL OPENINGS REMAINING IN FLOORS, WALLS, OR CEILINGS, INCLUDING SLEEVES, AFTER PIPING AND DUCT DEMOLITION SHALL BE PATCHED TO MATCHING EXISTING FINISH AND AS DETAILED ON DRAWINGS.
- CAP AND BLIND FLANGE MATERIAL TO BE SAME AS PIPE BEING CAPPED.
- PROMPTLY PATCH AND REPAIR DAMAGE CAUSED TO ADJACENT BUILDING ELEMENTS BY DEMOLITION WORK. RESTORE EXPOSED FINISHES OF PATCHED AREAS IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
- OWNER RESERVES RIGHT TO RETAIN ANY EQUIPMENT OR MATERIALS REMOVED UNDER THIS CONTRACT. CONTRACTOR IS RESPONSIBLE TO HAUL AND DISPOSE OF OFFSITE ALL REMAINING REMOVED EQUIPMENT, MATERIAL, PIPING, CONDUIT, SOILS AND DEBRIS, NOT RETAINED BY OWNER, IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS, AND ORDINANCES.
- CONTRACTOR IS RESPONSIBLE TO PROVIDE AND MAINTAIN SHORING, BRACING, OR STRUCTURAL SUPPORT TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ITEMS TO BE SELECTIVELY DEMOLISHED OR STABILIZED AND ITEMS WHICH ARE IMMEDIATELY ADJACENT TO THOSE BEING REMOVED. CONTRACTOR SHALL HIRE A LICENSED STRUCTURAL ENGINEER TO PROPERLY DESIGN ANY SHORING OR TEMPORARY SUPPORTS THAT MAY BE REQUIRED DURING THE DEMOLITION PHASE.
- NO BURNING SHALL BE PERMITTED ON THIS PROJECT.
- BLASTING IS PROHIBITED ON THIS PROJECT.
- WHEN EQUIPMENT ITEMS ARE INDICATED FOR DEMOLITION, ALL ANCILLARY UTILITIES, ELECTRICAL ITEMS, CONCRETE SUPPORTS AND STRUCTURAL STEEL SUPPORTS SHALL BE COMPLETELY REMOVED UNLESS INDICATED OTHERWISE. ALL THE ABOVE MENTIONED ITEMS MAY NOT BE INDICATED ON THE DRAWINGS. SITE VISIT PRIOR TO BID DATE IS RECOMMENDED TO QUANTIFY COMPLETE EXTENT OF EQUIPMENT DEMOLITION.
- CONCRETE FLOOR SLABS UNDER DEMOLISHED CONCRETE EQUIPMENT PADS, THAT WILL BE EXPOSED IN THE FINISHED CONSTRUCTION SHALL BE PATCHED SMOOTH AND ANY DOWELS OR ANCHORS SHALL BE CUT OFF 2" BELOW THE SURFACE AND PATCHED SMOOTH. IF REQUIRED, EXISTING FLOOR SURFACE SHALL BE CHIPPED OR ROUGHENED AND PATCH APPLIED OVER BONDING AGENT.
- ALL PIPING SHOWN AS BEING DEMOLISHED SHALL BE COMPLETELY REMOVED INCLUDING INSULATION, HANGERS, EXPANSION AND ANCHOR BOLTS AND PIPE SUPPORTS. CAP PIPES LEFT IN PLACE AS REQUIRED. CONTRACTOR SHALL REMOVE PIPE CONTENTS AS WELL WHICH MAY CONTAIN WATER, SLUDGE, WASTEWATER, ETC.
- FLOORS, WALLS, AND CEILING SURFACES ARE TO BE CLEANED IN EACH AREA AFTER DEMOLITION IS COMPLETE. THE WALLS SHALL BE WET BRUSHED, SCRAPED, SWEEP, ETC. AS REQUIRED TO REMOVE DIRT, LOOSE CRYSTAL, SCALE, RUST, AND DUST FROM SURFACES PRIOR TO PAINTING OF PIPING. FLOORS ARE TO BE POWER WASHED.
- FLOOR DRAINS SHALL BE PROTECTED FROM DIRT AND DEBRIS.
- PIPE, CONCRETE, ASPHALT, ETC. TO BE REMOVED AND REPLACED IS TO BE REPLACED IN KIND UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL MATERIALS GENERATED DURING DEMOLITION WORK CONFIRM WITH OWNER DEMOLITION ITEMS, PER NOTE 10.

ABBREVIATIONS

A AB ABBREV ABRSV ADDM ADH AFF AFG AFS AHD AL ALT AMP AMT APRX ARCH ASPH ASSY A/C	ANCHOR BOLT ABANDONED ABBREVIATION ABRASIVE ADDENDUM ADHESIVE ABOVE FINISHED FLOOR ABOVE FINISHED GRADE ABOVE FINISHED SLAB AHEAD ALUMINIUM ALTERNATE AMPERE AMOUNT APPROXIMATE(LY) ARCHITECT(URAL) ASPHALT ASSEMBLY AIR CONDITIONING	B BI BITUM B/L BLDG BLK BM BOT BP BRG	BLACK IRON BITUMINOUS OR BITUMASTIC BASELINE BUILDING BLOCK BENCH MARK BOTTOM BASE PLATE BEARING	C CFM CFS CI CJ CKT C/L CLF CLR CMU CND CNR CO2 COL COM CONC CONN CONSTR CONT CONTR COORD CSG CY C/L C&G C/C	CUBIC FEET PER MINUTE CUBIC FEET PER SECOND CAST IRON CONSTRUCTION JOINT CIRCUIT CENTER LINE CHAIN LINK FENCE CLEAR OR CLEARANCE CONCRETE MASONRY UNIT CONDUIT CORNER CARBON DIOXIDE COLUMN COMMON CONCRETE CONNECTION CONSTRUCT(ION) CONTINUOUS CONTRACT(OR) COORDINATE CASING CUBIC YARD CYLINDER CURB AND GUTTER CENTER TO CENTER	D DAT DBL DC DEMO DESC DET DI DIA DIM DIP DIR DMH D DWG	DATUM DOUBLE DIRECT CURRENT DEMOLITION DESCRIPTION DETAIL DUCTILE IRON DIAMETER DIMENSION DUCTILE IRON PIPE DIRECTION DROP MANHOLE DRAIN DRIVEWAY DRAWING	E EA ECC EF EFF E/L EL ELAST ELEC EMER EP EPDM EQUIP ESTM EW EXC EXP EXST EXST GR EXT	EACH ECCENTRIC EACH FACE EFFLUENT EASEMENT LINE ELEVATION ELASTOMERIC ELECTRICAL EMERGENCY EDGE OF PAVEMENT ETHYLENE PROPYLENE DIENE MONOMER EQUIPMENT EASEMENT EACH WAY EXCAVATE EXPANSION EXISTING EXISTING GRADE EXTERIOR	F FD FDN FHY FIG FIN FIN FLR FIN GR FL FLG FLL FLTR FM FPM FPS FT	FLOOR DRAIN FOUNDATION FIRE HYDRANT FIGURE FINISH(ED) FINISH FLOOR FINISH GRADE FLUORIDE FLANGE(D) FLOW LINE FILTER FORCE MAIN FEET PER MINUTE FEET PER SECOND FOOT OR FEET	G GA GAL GALV GND GPD GPH GPM GPS GR	GAUGE GALLON(S) GALVANIZED GROUND GALLONS PER DAY GALLONS PER HOUR GALLONS PER MINUTE GALLONS PER SECOND GRADE	H HD HDR HGR HGT HORIZ HP HVAC H/L HWY HZ	HEAVY-DUTY HYDRAULIC HANGER HEIGHT HORIZONTAL HORSEPOWER HEATING, VENTILATION, AND AIR CONDITIONING HIGH WATER LEVEL HIGHWAY HERTZ	I ID IN INF INT INTR INV IP IPS	INSIDE DIAMETER INCH(ES) INFLUENT INTERSECTION INTERIOR INVERT IRON PIPE INTERNATIONAL PIPE STANDARD	J JB JT	JUNCTION BOX JOINT	K K KV KVA KW KWH	KIP (1,000 LB) KILOVOLT KILOVOLT-AMPERE KILOWATT KILOWATT-HOUR	L L LATL LAV LEN LB LF LP LVR LWL	LEFT LATERAL LAVATORY LENGTH POUND(S) LINEAR FEET LIGHT POLE LOW VOLT LOW WATER LEVEL	M M MAINT MAN MAS MATL MAX ME MECH MEG MFR MG MGD MI MIN MISC MJ ML MO MON MPH MPT MS MSP MW MWL MWP	METER MAINTAIN OR MAINTENANCE MANUAL(LY) MASONRY MATERIAL MAXIMUM MITERED END MECHANICAL MATCH EXISTING GRADE MANUFACTURE(R) MILLION GALLONS MILLION GALLONS PER DAY MANHOLE MILE(S) MINIMUM, MINUTE(S) MISCELLANEOUS MECHANICAL JOINT MIXED LIQUOR MASONRY OPENING MONUMENT MILES PER HOUR MALE PIPE THREAD MOTOR STARTER MOTOR STARTER PANEL MANWAY MEAN WATER LEVEL MAXIMUM WORKING PRESSURE	N N NE NE NIC NO NOM NP NPT NPW NRS NTS NW N/A	NORTH NORTHEAST NOT IN CONTRACT NUMBER NOMINAL NATIONAL PIPE THREAD NATIONAL PIPE TAPER (THREAD) NON-POTABLE WATER NON-RISING SYSTEM NOT TO SCALE NORTHWEST NOT APPLICABLE	O OC OD ODP OF OH OHW OPP OPT OR OSY O&M	ON CENTER OUTSIDE DIAMETER OPEN DRIP PROOF OUTSIDE FACE OVER HEAD OVER HEAD WIRE OPPOSITE OPTIONAL OFFICIAL RECORDS OUTSIDE SCREW AND YOK OPERATION AND MAINTENANCE	P PA PC PCM PI PL P/L PNV POB POJ POL PP PPD PPM PREFAB	PROCESS AIR POINT OF CURVE PERMANENT CONTROL MONUMENT POINT OF INTERSECTION PLATE PROPERTY LINE PINCH VALVE POINT OF BEGINNING PUSH-ON JOINT POLYMER POWER POLE POUNDS PER DAY PARTS PER MILLION PREFABRICATED	Q Q QTY	FLOW QUANTITY	R RAD RAS RC RCB RCP RD REBAR REF REINF REMOVE(ABLE) REQ'D RF RM RPM RR RVT R/W	RADIUS RETURN ACTIVATED SLUDGE REINFORCED CONCRETE REINFORCED CONCRETE BOX REINFORCED CONCRETE PIPE ROAD REINFORCING STEEL REFERENCE REINFORCE(D)(ING)(MENT) REMOVE(ABLE) REQUIRED RAISED FACE ROOM REVOLUTIONS PER MINUTE RAILROAD RIVETED RIGHT-OF-WAY	S SCFM SD SF SIG SIM SMH SPEC SPRT SQ SST STA STD STK STL STR STRUCT SURF SYM SYMM S/W	STANDARD CUBIC FEET PER MINUTE STORM DRAIN SQUARE FOOT OR FEET SIGNAL SIMILAR SEWER MANHOLE SPECIFICATION SUPPORT SQUARE STAINLESS STEEL STATION STANDARD STAKE STEEL STRAIGHT STRUCTURAL SURFACE SYMBOL SYMMETRICAL SIDEWALK	T TAN TB TBM TB-xx TD TDH TE TEFC TEL TENV THD THK TLM TOB TOC TOS TOT TP TYP T&B	TANGENT TOP OF BEAM TEMPORARY BENCH MARK TEST BORING-xx (e.g. TB-1) TRENCH DRAIN TOTAL DYNAMIC HEAD TOTALLY ENCLOSED TOTALLY ENCLOSED FAN COOLED TELEPHONE TOTALLY ENCLOSED NON-VENTILATED THREADED THICK(NESS) TELEMETRY TOP OF BANK TOP OF CURB TOE OF SLOPE TOTAL TELEPHONE POLE TYPICAL TOP AND BOTTOM	U UD UG ULT UON UGE UTC UTIL	UNDERDRAIN UNDERGROUND ULTIMATE UNLESS OTHERWISE NOTED UNDERGROUND ELECTRIC UNDERGROUND TELEPHONE CABLE UTILITY	V VAR VEL VFD VOL	VOLT(S) VARIES VELOCITY VARIABLE FREQUENCY DRIVE VOLUME	W WH WL WM WS WSP WTP W/ W/O	WALL HYDRANT WATER LINE WATER MAIN WATER SURFACE WELDED STEEL PIPE WATER TREATMENT PLANT WITH WITHOUT	X XFER	TRANSFER	Y YD YH YR	YARD(S) YARD HYDRANT YEAR(S) YR
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SHEET NUMBERING & STRUCTURE DESIGNATION



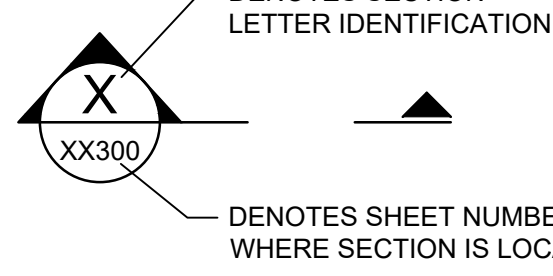
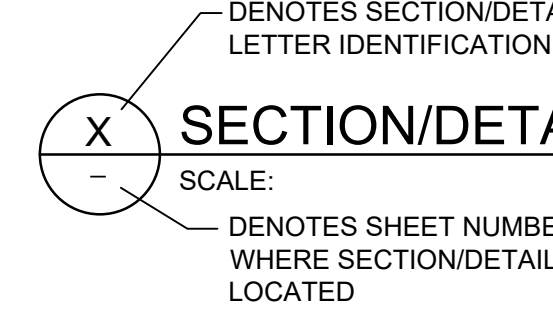
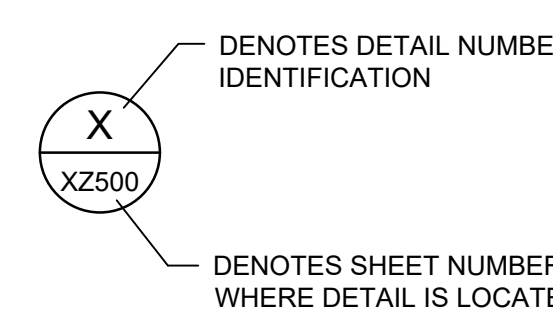
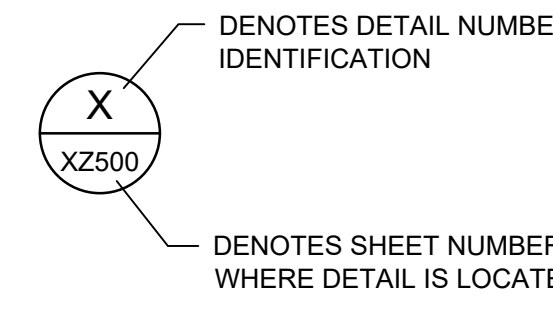
SEE LISTS BELOW FOR SHEET ORDER BY:
DISCIPLINE, AREA DESIGNATION, AND VIEW TYPE.

DISCIPLINE	
ABBREVIATION	DESCRIPTION
G	GENERAL
V	SURVEY
C	CIVIL
L	LANDSCAPING
S	STRUCTURAL
A	ARCHITECTURAL
F	FIRE PROTECTION
P	PLUMBING
D	PROCESS
M	MECHANICAL
E	ELECTRICAL
I	INSTRUMENTATION

AREA		
DESIGNATION	SHEET SERIES	DESCRIPTION (SEE SITE AREA KEY FOR LOCATION)
-	X-000	GENERAL DRAWINGS SCHEMATIC DRAWINGS SITE DRAWINGS YARD PIPING DRAWINGS
A	XA000	EXISTING PUMP STATION 14
B	XB000	EXISTING PUMP STATION 5
C	XC000	WATER TREATMENT PLANT
D	XD000	BACKWASH TANK
E	XE000	CHEMICAL BUILDING
Z	XZ000	DETAILS

VIEW TYPE		
TYPE	SHEET SERIES	DESCRIPTION
0	000	GENERAL
1	100	PLAN VIEWS
2	200	ELEVATIONS
3	300	SECTIONS
4	400	LARGE-SCALE VIEWS
5	500	DETAILS
6	600	SCHEDULES, DIAGRAMS, AND CONTROLS
8	800	3D PERSPECTIVES, ISOMETRICS, AND PHOTOGRAPHS
9	900	DEMOLITION

REFERENCE SYMBOLS

SECTION REFERENCE	
SECTION/ DETAIL TITLE	
DETAIL REFERENCE	
DETAIL REFERENCE	

TETRA TECH



NOT FOR
CONSTRUCTION

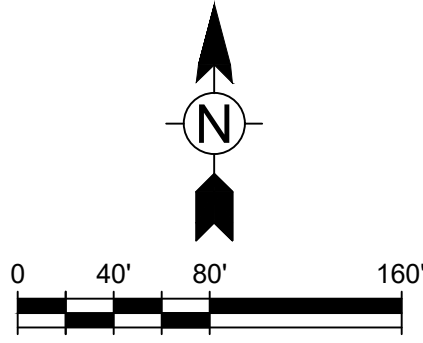
CITY OF KALAMAZOO, MICHIGAN

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

GENERAL NOTES
AND
ABBREVIATIONS

PROJ: 200-19743-24012
DESN: M. TEITSMA
DRWN: N. KARLL
CHKD:

G-003



NOT FOR
CONSTRUCTION

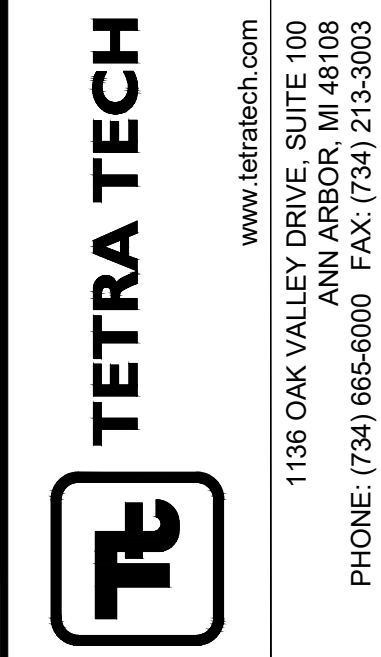
CITY OF KALAMAZOO, MICHIGAN

PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PUMP STATION #14

WELL LOCATION OVERALL PLAN

C-111



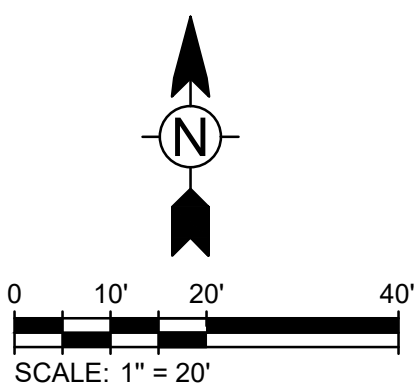
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CONSTRUCTION

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION #14
WELL LOCATION DETAILS
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PROJ:	200-19743-24012
DESN:	
DRWN:	
CHKD:	

C-112



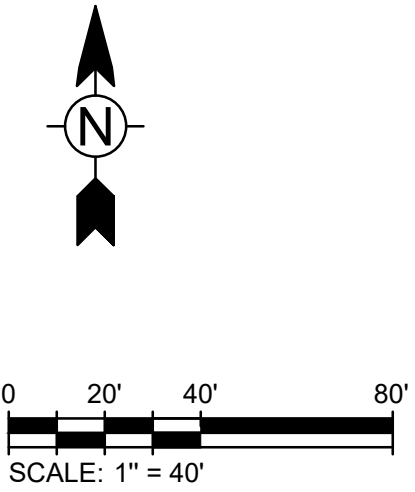
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NOT FOR
CONSTRUCTION

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PUMP STATION #5
DEMOLITION - WEST

C-201

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2

PROJ:	200-19743-24012
DESN:	D. WARREN
DRWN:	A. SMITH
CHKD:	

C-203



1136 OAK VALLEY DRIVE, SUITE 100
ANN ARBOR, MI 48108
PHONE: (734) 665-6000 FAX: (734) 213-3003
www.tetrattech.com

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CONSTRUCTION

[illegible]

CITY OF KALAMAZOO, MICHIGAN
PUMP STATION 5 & 14 RECONSTRUCTION, CONTRACT 2
PUMP STATION #5
SITE PLAN - EAST

PROJ:	200-19743-24012
DESN:	D. WARREN
DRWN:	A. SMITH
CHKD:	

C-205