

CITY OF MUSKEGON

CITY COMMISSION MEETING

OCTOBER 25, 2022 @ 5:30 P.M.

**MUSKEGON CITY COMMISSION CHAMBERS
933 TERRACE STREET, MUSKEGON, MI 49440**

AGENDA

- ☐ **CALL TO ORDER:**
- ☐ **PRAYER:**
- ☐ **PLEDGE OF ALLEGIANCE:**
- ☐ **ROLL CALL:**
- ☐ **HONORS, AWARDS, AND PRESENTATIONS:**
 - A. Presentation on New Website by Pete Wills**
- ☐ **PUBLIC COMMENT ON AGENDA ITEMS:**
- ☐ **CONSENT AGENDA:**
 - A. Approval of Minutes** City Clerk
 - B. Fireworks Display Contract** City Clerk
 - C. Interim City Manager Stipend** City Manager
 - D. Sale – 653 Yuba** Planning
 - E. Special Events** DPW
 - F. CWSRF & DWRF FY23 Engineering Assistance** DPW
 - G. MDOT Resolution** DPW
 - H. Skate Park RFQ** DPW
 - I. Source Water Intake Protection Plan Update** DPW
 - J. Splashpad RFQ** DPW
 - K. Stormwater Management Ordinance** DPW
 - L. Rezoning 398 Catawba Ave – 2nd Reading** Planning
 - M. Ordinance Amendment – Reduced Housing Unit Size Minimums – 2nd Reading** Planning
 - N. First Amendment to Purchase Agreement for NBR Labs Development** Development Services

☐ **PUBLIC HEARINGS:**

A. Infill Housing Project Brownfield Plan Public Hearing (4th Amendment)
Economic Development

☐ **UNFINISHED BUSINESS:**

☐ **NEW BUSINESS:**

A. City Manager Contract Mayor's Office

B. Sale of 1227 Pine Street City Manager

☐ **ANY OTHER BUSINESS:**

☐ **PUBLIC COMMENT ON NON-AGENDA ITEMS:**

- ▶ **Reminder: Individuals who would like to address the City Commission shall do the following:**
- ▶ Fill out a request to speak form attached to the agenda or located in the back of the room.
- ▶ Submit the form to the City Clerk.
- ▶ Be recognized by the Chair.
- ▶ Step forward to the microphone.
- ▶ State name and address.
- ▶ Limit of 3 minutes to address the Commission.
- ▶ (Speaker representing a group may be allowed 10 minutes if previously registered with City Clerk.)

☐ **CLOSED SESSION:**

☐ **ADJOURNMENT:**

ADA POLICY: THE CITY OF MUSKEGON WILL PROVIDE NECESSARY AUXILIARY AIDS AND SERVICES TO INDIVIDUALS WHO WANT TO ATTEND THE MEETING UPON TWENTY-FOUR HOUR NOTICE TO THE CITY OF MUSKEGON. PLEASE CONTACT ANN MARIE MEISCH, CITY CLERK, 933 TERRACE STREET, MUSKEGON, MI 49440 OR BY CALLING (231) 724-6705 OR TTY/TDD DIAL 7-1-1-22 TO REQUEST A REPRESENTATIVE TO DIAL (231) 724-6705.

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Approval of Minutes
Submitted By: Ann Marie Meisch, MMC	Department: City Clerk
Brief Summary: To approve the minutes of the September 16, 2022 Special Meeting (City Manager Interviews), September 20, 2022 Special Meeting (City Manager Selection), September 20, 2022 Joint meeting with Muskegon Public Schools, September 27, 2022 Regular Meeting, and October 7, 2022 Special Meeting (City Manager-2 nd Interview/Selection).	
Detailed Summary: N/A	
Amount Requested: N/A	Amount Budgeted: N/A
Fund(s) or Account(s): N/A	Fund(s) or Account(s): N/A
Recommended Motion: To approve the minutes.	
For City Clerk Use Only: Commission Action:	

CITY OF MUSKEGON
SPECIAL CITY COMMISSION MEETING

September 16, 2022 @ 9:00 am
Muskegon City Hall, 933 Terrace Street, Muskegon, MI 49440
In the Commission Chambers, Room 107

MINUTES

Present: Mayor Johnson, Commissioners German, Gorman, Emory, Ramsey, St. Clair, and Hood.

Absent: None.

2022-82

City Manager Interviews.

City Commissioners interviewed the six final candidates for City Manager as listed below. Each candidate was given approximately 45 minutes to answer a prepared list of questions by the City Commission.

Dennis Durham – Located in West Des Moines, IA. Mr. Durham is currently the City Administrator for the City of Windsor, IA for the past two years. Previously he was the City Manager for the City of Carlton, OR for two years, City Manager for the City of Parchment, MI for ten years, Deputy City Manager for the City of Kalamazoo, MI for two years, Assistant City Manager for the City of Kalamazoo, MI for one year, and Assistant City Manager for the City of Portage, MI for six years.

Dennis' education includes a Bachelor of Arts Degree from Michigan State University, graduate-level coursework in Business Administration from the University of Colorado at Denver Co for one year, and graduate-level coursework in Public Administration at Western Michigan University for one year.

Jerry Gabrielatos – Located in West Linn, OR. Currently City Manager at West Linn, OR for the past two years. Previously he was the Assistant City Manager at Albert Lea, MN for one-year. Mr. Gabrielatos also served various roles in the Chicago City Council including Senior Advisor (1st Ward) for one year, Chief of Staff (45th Ward) for one year, and Director of Constituent Services (1st Ward) for four years.

Jerry's education includes a Bachelor's Degree in Political Science and History and a Master's Degree in Public Policy and Administration from Northwestern University.

LeighAnn Mikesell – Located in the City of Muskegon. Ms. Mikesell is currently Interim City Manager for the City of Muskegon since April 2022. Previously she was Deputy City Manager from July 2021 to present, Director of Development Services for two years, and Director of Municipal Services from November 2017 to February 2019 all with the City of Muskegon. Previously, Ms. Mikesell worked for the Michigan Department of Transportation as an Operations Manager for 15 years.

LeighAnn's education includes a Bachelor's Degree in Civil Engineering from the University of Michigan.

Joe Neeb – Located in the City of Roswell, New Mexico. Mr. Neeb is currently the City Manager for the City of Roswell for the past five years. Previously he was City Administrator for the City of Spearfish for seven years, Town Manager for the Town of Dyer for six years, Town Manager for the Town of Fortville for four years, and Town Manager for the Town of Morristown for three years.

Joe's education includes an Associates of Arts Degree in Liberal Arts from Concordia College, a Bachelor of Science Degree in Business Administration from Indiana Wesleyan University, and a Masters Degree in Business Administration from Indiana Wesleyan University.

Jonathan Seyferth – Located in the Muskegon area. Mr. Seyferth is currently the Township Manager for the Charter Township of Gaines, MI since May 2021. Previously he was with the City of Coopersville, MI, for six years and three of those years he served as City Manager. Mr. Seyferth also served on Muskegon Area First and was the Executive Director of Downtown Muskegon Now for a combined total of four years.

Jonathan's education includes a Bachelor of Science degree from Central Michigan University, a Master of Science in International Administration from Central Michigan University, and a Master of Public Administration Degree from the University of Colorado Denver.

Gerald C. Smith – Located in Creedmoor, NC. Mr. Smith is currently the City Manager for the City of Creedmoor since March 2021. Previously he was the City Manager for the City of Maquoketa, IA for four years, the City Manager for the City of Junction City, KS for one year, and Director of General Services for the City of Kansas City, MO six years.

Gerald's education includes a Bachelors of Arts and Urban History and Political Science, and a Master's of Public Administration Degree from Northern Illinois University.

After the interviews, the City Commission decided to meet on September 20, 2022 at 2 pm to deliberate on their final selection.

Shaw Walker Environmental Assessment Financial Assistance.

Staff is recommending an appropriation of \$25,000 to match the Downtown Development Authority's commitment to environmental and other due diligence items faced by Parkland Properties related to purchase of the Shaw Walker Building.

Motion by Commissioner Hood, seconded by Commissioner St. Clair to approve the appropriation of \$25,000 for environmental investigation and other due diligence for the Shaw Walker/Watermark Building as presented so long as the City of Muskegon gets a copy of the results and the City is to be reimbursed from the City of Muskegon Brownfield Authority Tax Increment Financing prior to any other disbursement.

Roll Call Vote:

Ayes: Johnson, Hood, Ramsey, German, Gorman, Emory, and St. Clair.

Nays: None.

MOTION PASSES.

Public Comments were received.

ADJOURN.

Motion by Commissioner Ramsey, seconded by Commissioner Gorman to adjourn the meeting at 5:47 pm.

MOTION PASSES.

Respectfully Submitted,

Ann Marie Meisch, MMC – City Clerk

CITY OF MUSKEGON
SPECIAL CITY COMMISSION MEETING

September 20, 2022 @ 2:00 pm
Muskegon City Hall, 933 Terrace Street, Muskegon, MI 49440
In the Commission Chambers, Room 107

MINUTES

Present: Mayor Johnson, Commissioners German (arrived 2:13 pm), Gorman, Emory, Ramsey, St. Clair, and Hood.

Absent: None.

2022-83

Deliberation on City Manager Interviews.

After a long discussion of City Manager candidates, a majority of the Commissioners agreed the two finalists are LeighAnn Mikesell and Jonathan Seyferth. Gerald Smith, Jerry Gabrielatos, Dennis Durham, and Joe Neeb were removed from consideration.

It was decided to schedule a second interview for finalists Mikesell and Seyferth in October.

ADJOURN.

Motion by Commissioner Ramsey, seconded by Commissioner Emory to adjourn the meeting at 3:04 pm.

MOTION PASSES.

Respectfully Submitted,

Ann Marie Meisch, MMC – City Clerk

MUSKEGON Public Schools

Strong Schools, Stronger Communities

2022-84

Superintendent's Office • 1458 5th Street • Muskegon MI 49441 • (231) 720-2004 phone

Minutes 9/20/2022

Board of Education - Special Board Meeting

September 20, 2022 at 5:00 PM in Room 123 at the New Administration Building

1. Lynnette Marks called the meeting to order at 5:02 PM

2. Roll Call

Muskegon Public Schools

☒ Bill O'Brien ~~☒ Louis Churchwell~~ ☒ Christine Hamel ☒ Lynnette Marks

☒ Billie Bruce ☒ Zachary Anderson ☒ Kwame Kamau James

Muskegon City

☒ Ken Johnson(5:03) ☒ Willie German Jr.(5:17) ☒ Rebecca St. Clair ☒ Rachel Gorman

☒ Teresa Emery ☒ Michael Ramsey

3. No Public Comment Registration

4. No Addition or Removal of Agenda Items

5. New Business

a. Traffic flow around schools

i. Partnership between us with the new MMS design layout. Buses have been separated from road traffic and parent drop off areas.

b. St. Jean's Church property update

- i. MPS purchased the property for the land needs at MHS
- ii. There has been some interest in the buildings on the property. We have had a nonprofit and the city interested in the brick building for a teen drop in site.
- iii. The Nelson Mansion deal fell through. So that will not be moved off site. Still looking at options for that.
- iv. St. Jeans has some major damage, MPS will likely have to repurpose to flat ground.

c. Angell School sale and plan

i. Sold to Franklin Fudail for a boxing/tutoring program. Along with some other business space in the building. That is not what happened and instead a Charter school was opened, very disappointing.

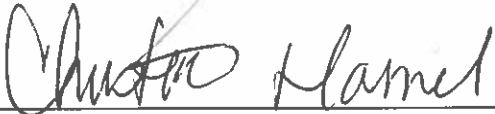
d. Nelson School plan

- i. Nelson building is currently housing MCEC this year. There is a lot of construction at MHS and they needed the space that MCEC used to use. Looking at trying to house Marquette at Nelson for 1 year as well. Building will probably be vacant again in 2024.
- ii. What would happen to the building after that?
 - 1. MPS is open to it being used for something else. Discussions around Grocery store, housing, ect.
 - 2. How is the building being maintained right now?
 - a. Just like any school building. Everything is being kept up.

e. Charles Hackley Middle School update

- i. The first level is up and they are working on the second level. Walls should be up for winter so some inside work can be done.
- ii. What is happening to the old MMS building?
 - 1. Might make a good Community center or housing.

2. Might be available 2024
3. Trinity Health Care has a program that takes old school buildings and makes them into Community Centers. MPS should look into this.
- f. Summer youth programming
 - i. Covid has hurt us a little, trying to ramp things up again.
 - ii. The City of Muskegon is reviving the Parks and Recreation department. Looking to hire a director by next year.
- g. School officers - plans, expected role of the officers
 - i. Looking to add an SRO at MMS like we have here at MHS.
- h. Projects for collaboration - how do we assist each other?
 - i. Communication is Key.
 - ii. City needs to know what is going on at MPS to help discuss and answer any questions they receive from the community.
 - iii. Realtor meeting discussion for this year again. Making sure local realtors know what is happening at MPS to let families know who move into the district.
 - iv. Look at having the Family Coordinator go to welcome families along with the Commissioner.
6. Public Comment
 - a. *We allow up to 3 minutes for any guest who would like to comment to the Board of Education. We will not discuss nor respond tonight; however, if needed, the appropriate school official will contact you. At this time, if you would like to make a public comment, please state your name and address. Speakers are asked to express themselves in a civil manner, with due respect for the dignity and privacy of others who may be affected by your comments*
 - b. Randy Vanderweit - McLaughlin Neighborhood President
7. Announcements
 - a. Ken Johnson - Thank you all this is great groundwork.
8. Lynnette Marks adjourned the meeting at 6:30 pm


Signature

 Secretary
Date

Ann Marie Meisch, City Clerk

Adopted 10/25/2022

CITY OF MUSKEGON

CITY COMMISSION MEETING

SEPTEMBER 27, 2022 @ 5:30 P.M.

MUSKEGON CITY COMMISSION CHAMBERS

933 TERRACE STREET, MUSKEGON, MI 49440

MINUTES

The Regular Commission Meeting of the City of Muskegon was held at City Hall, 933 Terrace Street, Muskegon, Michigan at 5:30 p.m., Tuesday, September 27, 2022, Vice Mayor Willie German, Jr., opened the meeting with prayer, after which the Commission and public recited the Pledge of Allegiance to the Flag.

Present: Mayor Ken Johnson, Vice Mayor Willie German, Jr., Commissioners Teresa Emory, Rebecca St.Clair, Rachel Gorman, Michael Ramsey, and Eric Hood, Interim City Manager LeighAnn Mikesell, City Attorney John Schrier, and Deputy City Clerk Kimberly Young.

PUBLIC COMMENT ON AGENDA ITEMS: No public comments were received.

2022-85 CONSENT AGENDA:

A. Approval of Minutes City Clerk

SUMMARY OF REQUEST: To approve the minutes of the August 23, 2022 Regular Meeting and the August 31, 2022 Special Commission meeting.

STAFF RECOMMENDATION: To approve the minutes.

B. Getty Street Study Engineering Agreement Public Works

SUMMARY OF REQUEST: Staff is requesting authorization to enter into an agreement with the cities of Norton Shores and Muskegon Heights to share the cost of the Getty Street Traffic Study.

Conversion of four-lane roads, such as Getty Street, to three-lane roads have been proven to be safer and to provide better access or non-vehicular users with little or no impact to travel times when properly studied and executed. Staff feels that Getty Street could be a great candidate for this treatment, and has worked with Norton Shores and Muskegon Heights to solicit a study to determine if the project should move forward.

Presented to you tonight is a three-party shared engineering services agreement with the cities of Norton Shores and Muskegon Heights. The agreement designates our staff as the lead contacts for the project, designates Muskegon

as the lead agency for payment, and requires Norton Shores and Muskegon Heights to pay their portions to Muskegon based on the centerline miles of Getty Street in each community. The agreement has been reviewed by the City attorney, and has already been approved by the city commission of Norton Shores and Muskegon Heights at prior meetings.

Award to the consultant helping with the traffic study was approved at the August 9, 2022 Commission Meeting. The agreement presented tonight has a lower cost to the City than the original request, due to how the cost sharing is split among the three communities.

AMOUNT REQUESTED: N/A (Approved 8/9/22) AMOUNT BUDGETED: \$50,000

FUND OR ACCOUNT: 202 (Major Streets)

STAFF RECOMMENDATION: To authorize staff to enter into an agreement with the cities of Norton Shores and Muskegon Heights to share the cost of the Getty Street Traffic Study.

C. 30" Water Main Meter Public Works/Water Filtration Plant

SUMMARY OF REQUEST: A water meter is needed on the new 30" water main near the Water Filtration Plant. Prein & Newhof have provided an agreement for engineering services for the design, bidding, and construction phases of this project.

A 30" water main was recently constructed from the Water Filtration Plant to the Muskegon Channel. While the primary purpose of this water main was to provide a second connection to the Muskegon County Northside water system, it also serves the City of Muskegon's water system.

An existing water meter near the channel measures all water flow into the Muskegon County Northside water system, but it does not capture any water used between the channel and the Water Filtration Plant. Installing a water meter near the Water Filtration Plant will measure all the water flowing through this main, both to the Muskegon County Northside system and to the City. Metering this water as it leaves the Water Filtration Plant is critical to overseeing water plan operations, managing the water fund, and ensuring regulatory compliance.

As part of the Water Filtration Plan's Reliability Study, Prein & Newhof investigated two options for metering this water. Because of Prein & Newhof's familiarity with this project from their work developing these two options, we did not solicit proposals from other firms. The proposal includes engineering services during the design, bidding, and construction phases of the water meter project. The construction portion of the project will be posted for bids and presented to the Commission for approval at a later date.

This project is a budgeted capital improvement project for FY 2022-23.

AMOUNT REQUESTED: \$41,000

AMOUNT BUDGETED: \$150,000

FUND OR ACCOUNT: 591-901-801-092034

STAFF RECOMMENDATION: To authorize staff to enter into an agreement with Prein & Newhof for a not to exceed cost of \$41,000.00 for engineering services related to the installation of a water meter near the Water Filtration Plant.

D. Interim City Manager Stipend City Manager

SUMMARY OF REQUEST: Extend stipend paid for the additional duties being performed in the Interim City Manager role.

The \$450 weekly salary stipend is set to expire on September 30, 2022. It is being proposed to extend the stipend for a one month time period, ending October 29, 2022 to allow time for the new City Manager to get settled into the position with the assistance of the Interim Manager. If the Interim Manager is selected, the stipend will cease once a contract is negotiated and accepted by the City Commission.

AMOUNT REQUESTED: \$1,800

AMOUNT BUDGETED: Included in salary line

FUND OR ACCOUNT: 101-10172-5100

STAFF RECOMMENDATION: To approve the weekly stipend as presented.

Motion by Commissioner Ramsey, second by Commissioner Hood, to accept the consent agenda as presented.

ROLL VOTE: Ayes: Ramsey, German, Gorman, Emory, St.Clair, Johnson, and Hood

Nays: None

MOTION PASSES

NEW BUSINESS:

A. New City Manager Selection – Next Steps City Clerk

SUMMARY OF REQUEST: The City Commission has carried out several steps of the hiring process for a new city manager and has narrowed the candidate filed to two remaining candidates. The City Commission will discuss and decide what the next steps are in the process. The City Commission will also select a meeting date and time to continue the process.

The Commission discussed the next steps for City Manager interviews and will be inviting the finalists to give a presentation regarding Diversity, Equity, and Inclusion (DEI), Community Engagement, and Environmental Sustainability and how to keep these in mind while continuing Economic Development. There will also be questions regarding community policing and public safety. Finalists interviews will be conducted on Friday, October 7, 2022 at 2:30 p.m.

PUBLIC COMMENT ON NON-AGENDA ITEMS: Public Comments were received.

ADJOURNMENT: The City Commission meeting adjourned at 6:10 p.m.

Respectfully Submitted,

Kimberly Young - Deputy City Clerk

CITY OF MUSKEGON
SPECIAL CITY COMMISSION MEETING

October 7, 2022 @ 2:30 pm
Muskegon City Hall, 933 Terrace Street, Muskegon, MI 49440
In the Commission Chambers, Room 107

MINUTES

Present: Mayor Johnson, Commissioners German, Gorman, Emory, Ramsey, St. Clair, and Hood (arrived 2:38 PM).

Absent: None.

2022-87

City Manager Interviews – Second Round.

LeighAnn Mikesell and Jonathan Seyferth were interviewed as finalists for the City Manager's position. Each candidate gave a presentation and then asked a list of prepared questions.

The City Commission deliberated on both candidates. Commissioners St. Clair, German, and Hood indicated a desire to start the recruiting process again. After great discussion, the City Commission voted on a candidate to be offered the position of City Manager.

Motion by Commissioner Gorman, seconded by Commissioner Emory to authorize the City Attorney and Mayor to negotiate a contract for City Manager with Jonathan Seyferth.

Roll Call Vote:

Ayes: Gorman, Emory, St. Clair, Johnson, and Ramsey. (5)

Nays: Commissioners German and Hood. (2)

MOTION PASSES.

ADJOURN.

Motion by Commissioner Ramsey, seconded by Commissioner Emory to adjourn the meeting at 5:53 pm.

MOTION PASSES.

Respectfully Submitted,

Ann Marie Meisch, MMC – City Clerk

WATCH MUSKEGON

Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: October 25, 2022		Title: 4 th of July Fireworks	
Submitted By: Ann Meisch		Department: City Clerk	
Brief Summary: The City Clerk's Office is requesting approval of a contract with Pyrotecnico for a fireworks display in downtown Muskegon on July 4, 2023.			
Detailed Summary & Background:			
Goal/Focus Area/Action Item Addressed:			
Amount Requested: \$40,000		Amount Budgeted: \$60,000	
Fund(s) or Account(s):		Fund(s) or Account(s):	
Recommended Motion: To approve the fireworks contract with Pyrotecnico.			
Approvals: <i>Get approval from division head at a minimum prior to sending to the Clerk.</i> Immediate Division Head ☐ Information Technology ☐ Other Division Heads ☐ Communication ☐ Legal Review ☐		Guest(s) Invited / Presenting Yes ☐ No ☐	
For City Clerk Use Only:			
Commission Action:			

PYROTECNICO FIREWORKS, INC.

This Fireworks Display Agreement ("Agreement") entered into this on October 12, 2022 by and between PYROTECNICO FIREWORKS, INC. ("Pyrotecnico") and **City of Muskegon, MI** (CUSTOMER).

Pyrotecnico, for and in consideration of the terms hereinafter mentioned, agrees to furnish to the CUSTOMER _Fireworks Display(s) and related services ("Fireworks Display"), including the services of Pyrotecnico's on-site representative to take charge of and perform the Fireworks Display under the supervision and direction of the CUSTOMER. The Firework Display to be given on **July 4, 2023**, (the "Display Date"), weather permitting.

Customer agrees to pay Pyrotecnico the sum of **\$40,000.00** (the "Contract Price"). Pyrotecnico will invoice CUSTOMER a deposit of **\$20,000.00** is due **February 15, 2023**, and the final balance shall be due Net 10 from the Display Date. A service fee of 1 ½% per month shall be added if the account is not paid in full within 30 days of the Display Date. CUSTOMER agrees to pay any and all collection costs, including reasonable attorney's fees and court costs incurred by Pyrotecnico for any amount due under this Agreement.

Pyrotecnico and CUSTOMER agree that should inclement weather prevent the performance of the Fireworks Display on the Display Date, the parties shall agree to a mutually convenient alternate date, within three (3) months of the Display Date. If the show is rescheduled prior to Pyrotecnico's truck leaving the facility, CUSTOMER shall remit to Pyrotecnico an additional **\$6,000.00** for additional expenses in presenting the Fireworks Display on an alternate date. If the show is rescheduled after Pyrotecnico's truck leaves the facility, CUSTOMER shall remit to Pyrotecnico an additional **\$16,000.00** for additional expenses incurred. The determination to cancel the show because of inclement or unsafe weather conditions shall rest within the sole discretion of Pyrotecnico. In the event the CUSTOMER does not choose to reschedule another date or cannot agree to a mutually convenient date, Pyrotecnico shall be entitled to **\$20,000.00**.

Pyrotecnico agrees to furnish all necessary fireworks display materials and personnel for fireworks display in accordance with the program approved by the parties. Quantities and varieties of products in the program are approximate. After final design, exact specifications will be supplied upon request. Should this display require any Union, permit, or fire department related costs; their fees are not included in the Contract Price.

CUSTOMER will timely secure and provide the following: (a) Sufficient area for the display, including a minimum spectator set back distance of **425 FEET** at all points from the discharge area; (b) Funds for all permits, licenses, and approvals as required by local, state and federal laws for the Fireworks Display; (c) Protection of the display area by roping-off or similar facility; (d) Adequate police protection to prevent spectators from entering display area; (e) Search of the fallout area at first light following a nighttime display; and (f) Provide credit as "Fireworks by Pyrotecnico" in all advertising and marketing materials.

Pyrotecnico will maintain general liability, property damage, transportation and workers compensation insurance. All those entities/individuals who are listed on the certificate of insurance, provided by Pyrotecnico, will be deemed to be an additional insured on such policy. This insurance coverage specifically does not include coverage for any independent acts of negligence of any additional insured.

CUSTOMER shall indemnify, defend and hold harmless Pyrotecnico and its shareholders, directors, officers, employees, agents, representatives and insurers from any and all demands, claims, causes of action, judgments or liability (including the costs of suit and reasonable attorneys' fees) arising from damage to or destruction of property (including both real and personal) or bodily or personal injuries (including death), whether arising from tort, contract or otherwise, that occur directly or indirectly from (a) the negligence or willful misconduct of CUSTOMER or its employees, agents, contractors or representatives, (b) the failure of CUSTOMER to comply with its obligations under this Agreement, or (c) any claims or actions arising out of Pyrotecnico's use of the show site. This Agreement contains the entire agreement between the Parties for this show and any prior agreements are terminated. This Agreement may only be amended, revised or terminated in writing, executed by the Party against which enforcement is asserted. The parties hereto do mutually and severally guarantee terms, conditions, and obligations under this Agreement to be binding upon the parties, themselves, their successors and assigns.

PYROTECNICO :

By (sign): _____
Name: _____
Title: _____
Date: _____
Address: **PO Box 149**
New Castle PA 16103
Phone: **(724) 652-9555**
Email: **contracts@pyrotecnico.com**

CUSTOMER:

By (sign)_: _____
Name: _____
Title: _____
Date: _____
Address: _____
Phone: _____
Email: : _____



CONTACT/INSURANCE INFORMATION FORM

You must return this form with your signed Agreement for the Certificate of Insurance to be issued, and for the permit application to be completed and submitted. If information isn't applicable, please state such by indicating "N/A".

Customer Name (Entity Contracting Pyrotecnico): _____

Primary Point of Contact Name: _____

Phone: _____ Fax: _____

Email: _____

Billing Address: _____

City, State & Zip: _____

Accounts Payable Contact: _____

Accounts Payable Email: _____

Date(s) of Show: _____ Display Start Time(s): _____

Rain/Postponed Date(s): _____

Day-of-Show Contact Name: _____

Day-of-Show Mobile Phone Number: _____

Day-of-Show Email: _____

Display Site Location(s) and
Address(es): _____

If Pyrotecnico has produced a show at this site, has the geography changed (i.e, new structures, new terrain, etc.)? If yes, please describe:

Additionally Insured – If Applicable:



Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Interim City Manager Stipend
Submitted By: LeighAnn Mikesell	Department: City Manager
Brief Summary: Extend stipend paid for the additional duties being performed in the Interim City Manager role.	
Detailed Summary: The \$450 weekly salary stipend is set to expire October 29, 2022. It is being proposed to extend the stipend until 2 weeks after the new City Manager starts to allow time for the him to get settled into the position with the assistance of the Interim Manager.	
Amount Requested: \$2,700	Amount Budgeted: Included in salary line
Fund(s) or Account(s): 101-10172-5100	Fund(s) or Account(s): 101-10172-5100
Recommended Motion: To approve the weekly stipend as presented.	
Check if the following Departments need to approve the item first: Police Dept. ☐ Fire Dept. ☐ IT Dept. ☐ For City Clerk Use Only: Commission Action:	

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Sale – 653 Yuba
Submitted By: Hope Griffith	Department: Planning Department
Brief Summary: City staff is seeking authorization to sell the City owned vacant lot to Ramos Enterprises LLC.	
Detailed Summary: Ramos Enterprises LLC Crowley will be constructing a commercial structure on the lot owned by the City of Muskegon within eighteen (18) months. The property is zoned B-4 (General Business). The buyer made an offer of \$3,000 which is less than 75% of the True Cash Value (TCV) per policy (TCV is \$4,600 @ 75% would be \$3,450). This property does have direct access to the City water & the storm sewer. The sanitary sewer would have an added expense to the buyer as it would need to go uphill where the residential homes are located. There has been no interest in developing this property. The City has owned this property since 1997. This property is a popular dumping site, and the sale would alleviate the City's expense of cleaning the property.	
Amount Requested: None.	Amount Budgeted: \$0
Fund(s) or Account(s): Public Improvement	Fund(s) or Account(s): N/A
Recommended Motion: Authorize the Code Coordinator to work with the developer and complete the sale of the City owned buildable lot as described and to have the Mayor and Clerk sign the purchase agreement and deed.	
Check if the following Departments need to approve the item first: Police Dept. ☐ Fire Dept. ☐ IT Dept. ☐ For City Clerk Use Only: Commission Action:	

653 Yuba

Aerial:







REAL ESTATE PURCHASE AGREEMENT

THIS AGREEMENT is made October 25, 2022 ("Effective Date"), by and between the **CITY OF MUSKEGON**, a municipal corporation, with offices at 933 Terrace, Muskegon, Michigan 49440 ("Seller"), and **RAMOS ENTERPRISES LLC**, of 2444 South Getty St., Muskegon, MI ("Buyer").

1. **General Agreement and Description of Premises.** Seller agrees to sell, and Buyer agrees to buy, the real estate, and all improvements thereon, with all beneficial easements, and with all of Seller's right, title and interest in all adjoining public ways, located in the City of Muskegon, Muskegon County, Michigan ("Premises"), and specifically described as:

CITY OF MUSKEGON REVISED PLAT OF 1903 LOTS 14-19 AND THAT PART OF VACATED ALLEY ADJACENT BLOCK 168 ALSO VACATED SOUTH 23 FEET OF HALL AVENUE.

Parcel #: 61-24-205-168-0014-00

Subject to the reservations, restrictions and easements of record, provided said reservations, restrictions and easements of record are acceptable to Buyer upon disclosure and review of the same, and subject to any governmental inspections required by law.

2. **Purchase Price and Manner of Payment.** The purchase price for the Premises shall be Three Thousand and no/100 Dollars (\$3,000), payable in cash, money order, bank certified check, wiring at the closing.

3. **Taxes and Assessments.** All taxes and assessments that are due and payable at the time of Closing shall be paid by Seller prior to or at Closing. All taxes and special assessments that become due and payable after Closing shall be the responsibility of Buyer.

4. **Title Insurance.** Seller agrees to deliver to Buyer, on or before the closing date, a commitment for title insurance, issued by Transnation Title Insurance Company, for an amount not less than the purchase price stated in this Agreement, guaranteeing title on the conditions required herein. In the event the reservations, restrictions or easements of record disclosed by said title commitment is, in the sole discretion of Buyer, deemed unreasonable, Seller shall have forty-five (45) days from the date Seller is notified in writing of such unreasonableness of restriction and such unmarketability of title, to remedy such objections. If Seller resolves such restrictions and remedies the title (by obtaining satisfactory title insurance or otherwise) within the time specified, Buyer agrees to complete this sale as herein provided, within ten (10) days of written notification thereof. If Buyer closes on the Premises, any objections to the title are deemed waived. If Seller fails to resolve such restrictions or remedy the title within the time above specified or fails to obtain satisfactory title insurance, this Agreement will be terminated at Buyer's option. The premium for the owner's title policy shall be paid by Seller.

5. **Covenant to Construct Improvements and Use.** Buyer acknowledges that, as part of the consideration inuring to the City, Buyer covenants and agrees to construct on the premises one (1) commercial structure, up to all codes, within eighteen (18) months of the closing of this transaction. The commercial structure shall be substantially completed within eighteen (18) months and, in the event said substantial completion has not occurred, or the restriction of this paragraph relating to tree removal is violated, in the sole judgment of the City, the property and all improvements then installed shall revert in title to the City, without any compensation or credit to Buyer, and free of all liens. The covenants in this paragraph shall survive the closing and run with the land.

6. **Survey.** Buyer at its own expense may obtain a survey of the Premises, and Buyer or its surveyor or other agents may enter the Premises for that purpose prior to Closing. If no survey is obtained, Buyer agrees that Buyer is relying solely upon Buyer's own judgment as to the location, boundaries and area of the Premises and improvements thereon without regard to any representations that may have been made by Seller or any other person. In the event that a survey by a registered land surveyor made prior to closing discloses an encroachment or substantial variation from the presumed land boundaries or area, Seller shall have the option of effecting a remedy within thirty (30) days after disclosure, or tendering Buyer's deposit in full termination of this Purchase Agreement and paying the cost of such survey. Buyer may elect to purchase the Premises subject to said encroachment or variation.

7. **Condition of Premises and Examination by Buyer.** NO IMPLIED WARRANTIES OF HABITABILITY, QUALITY, CONDITION, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER IMPLIED WARRANTIES SHALL OPERATE BETWEEN SELLER AND BUYER, AND BUYER EXPRESSLY WAIVES ANY AND ALL SUCH IMPLIED WARRANTIES. BUYER UNDERSTANDS AND AGREES THAT THE PREMISES ARE TAKEN "AS IS," SUBJECT TO THE EXPRESS COVENANTS, CONDITIONS AND/OR EXPRESS WARRANTIES CONTAINED IN THIS PURCHASE AGREEMENT. BUYER FURTHER SAYS THAT HE HAS PERSONALLY INSPECTED THE PREMISES AND IS SATISFIED WITH THE CONDITION OF THE LAND, AND THE BUILDINGS AND IMPROVEMENTS THEREON, AND THAT THE PROPERTY IS BEING PURCHASED AS A RESULT OF SUCH INSPECTION AND INVESTIGATION AND NOT DUE TO ANY REPRESENTATIONS MADE BY OR ON BEHALF OF SELLER. SELLER KNOWS OF NO HAZARDOUS SUBSTANCES OR CONTAMINATION, AND BUYER WAIVES ANY CLAIM AGAINST SELLER IN THE EVENT SUCH SUBSTANCES ARE FOUND.

8. **Closing.** The closing date of this sale shall be on or before 90 days after the Effective Date ("Closing"). The Closing shall be conducted at Transnation Title Insurance Company, 570 Seminole Road, Ste. 102, Muskegon, MI 49444. If necessary, the parties shall execute an IRS closing report at the Closing.

9. **Delivery of Deed.** Seller shall execute and deliver a quit claim deed to Buyer at Closing for the Premises.

10. **Affidavit of Title.** At the Closing, Seller shall deliver to Buyer an executed Affidavit of Title.

11. **Date of Possession.** Possession of Premises is to be delivered to Buyer by Seller on the date of Closing.

12. **Costs.** Seller shall be responsible to pay the Michigan transfer tax, if any, in the amount required by law. In addition, Seller shall be responsible to pay for the recording of any instrument that must be recorded to clear title to the Premises, to the extent required by this Agreement. Buyer shall pay for the cost of recording the deed to be delivered at Closing as well as half of the closing costs.

13. **General Provisions.**

a. **Paragraph Headings.** The paragraph headings are inserted in this Agreement only for convenience.

b. **Pronouns.** When applicable, pronouns and relative words shall be read as plural, feminine or neuter.

c. **Merger.** It is understood and agreed that all understandings and agreements previously made between Buyer and Seller are merged into this Agreement, which alone fully and completely expresses the agreement of the parties.

d. **Governing Law.** This Agreement shall be interpreted and enforced pursuant to the laws of the State of Michigan.

e. **Successors.** All terms and conditions of this Agreement shall be binding upon the parties, their successors and assigns.

f. **Severability.** In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision of this Agreement, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision(s) had never been contained herein.

g. **Survival of Representations and Warranties.** The representations, warranties, covenants and agreements contained in this Agreement and in any instrument provided for herein shall survive the Closing and continue in full force and effect after the consummation of this purchase and sale.

h. **Modification of the Agreement.** This Agreement shall not be amended except by a writing signed by Seller and Buyer.

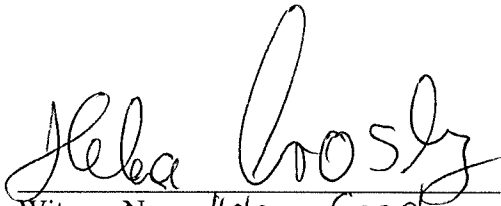
The parties have executed this Real Estate Purchase Agreement on the date written below their names, to be effective as of the day and year first above written.

WITNESSES:

SELLER: CITY OF MUSKEGON

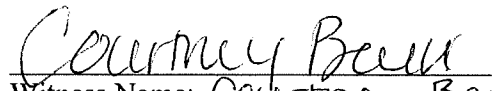
By _____
Ken Johnson, Mayor
Date: _____

By _____
Ann Marie Meisch, MMC, Clerk
Date: _____


Witness Name: Helena Crosby

BUYER: Ramos Enterprises LLC.


David Ramos
Date: 9-22-22


Witness Name: Courtney Beyer


Mary Beth Ramos
Date: 9/22/2022

WATCH MUSKEGON

Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: 10/25/2022		Title: Special Events
Submitted By: Jacqui Erny		Department: DPW
Brief Summary: Staff is seeking approval to the proposed changes to the Special Event Policy.		
Detailed Summary & Background: Attached is the Special Event Policy with the proposed changes as presented at the October 10, 2022 Worksession meeting. Changes include: • Additional fee waiver opportunities to Veteran's groups, Neighborhood Associations, and non-profits. This addition comes with removing the existing fee waiver application. • Additional \$50 fee for road closures beyond two blocks. • Removal of free parking passes for Pere Marquette events.		
Goal/Focus Area/Action Item Addressed: Proceed with events and activities.		
Amount Requested: \$0	Amount Budgeted:	
Fund(s) or Account(s): N/A	Fund(s) or Account(s): N/A	
Recommended Motion: Approve the changes to the Special Event Policy.		
Approvals: <i>Get approval from division head at a minimum prior to sending to the Clerk.</i> Immediate Division Head ☒ Information Technology ☐ Other Division Heads ☐ Communication ☐ Legal Review ☐		Guest(s) Invited / Presenting Yes ☐ No ☒
For City Clerk Use Only: Commission Action:		

CITY OF MUSKEGON SPECIAL EVENT POLICY



The City of Muskegon has many parks and facilities available for use. A Special Event Application is required for any public event held on City property or requiring City services. While there are several City departments involved in the special event process, this policy centralizes the administration of special events with the Department of Public Works. Email specialevents@shorelinecity.com or call (231) 724-6907 for any questions.

For events where alcohol is served, applicants must also obtain approval from the State of Michigan Liquor Control Commission and the Muskegon Police Department (231-724-6750), in addition to completing the Special Event Application. Liquor license approval is a separate process from the Special Event Application, with its own fees and regulations. The final authority for signing special liquor licenses is with the Public Safety Director. For State of Michigan liquor license regulations and information, please visit the State of Michigan's website at www.michigan.gov/lara.

SPECIAL EVENT APPLICATION PROCEDURE

I. Special Event Application ("Application") Submission & Fee Schedule

All Applications shall be filed with the Department of Public Works at least thirty (30) days prior to the event. The non-refundable Application fee must be paid at the time the Application is submitted.

Application fee schedule:

Events occurring during peak event season April 15 – September 30	Events occurring outside of peak season January 1 – April 14 / October 1 – Dec. 31
\$100 fee for applications submitted 60 days or more prior to the event date	\$100 fee for applications submitted 60 days or more prior to the event date
\$250 fee for applications submitted 45-59 days prior to the event date	\$200 fee for applications submitted 45-59 days prior to the event date
\$400.00 fee for applications submitted 30-44 days prior to the event	\$300.00 fee for applications submitted 33-44 days prior to the event
Applications submitted less than 30 days prior to the event date will not be accepted.	\$400 fee for applications submitted less than 30 days prior to the event

Application and parade event fees may be waived for Veteran's groups. In addition, the City's recognized Neighborhood Associations are entitled to ~~one~~two Application and event fee waivers per year in addition to National Night Out -festivities, provided that the Application is submitted to the Department of Public Works at least 30 days in advance of the event date. Up to two application fees may be waived for a non-profit organization in its lifetime. The non-profit must serve City of Muskegon residents to qualify.

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The Application shall be submitted on the appropriate form. **The Application fee must be paid at the time of Application submission or the Application will not be considered.** The *City of Muskegon Request for Special Event Application* form can be found on the City's website at www.muskegon-mi.gov, or you may email specialevents@shorelinecity.com or call (231) 724-6907 to have one mailed, or visit the Department of Public works at 1350 E Keating Ave, Monday – Friday from 8:00 am. Until 4:300 p.m. excluding holidays.

Block Parties. The City has a separate Block Party Policy and Application. Contact the Department of Public Works at specialevents@shorelinecity.com or 231-724-6907 for further information about block parties.

4th of July weekend. Margaret Drake Elliott Park is not available for special events on the 4th of July,

including the entire weekend if July 4 falls on a Friday, Saturday, or Sunday. The park is reserved for picnicking during this holiday.

Reserving event dates for multiple years. As long as prior year event fees are paid in full, established events may reserve their event date(s) and location for future years. A completed special event application must be received by February 1 of each year in order to hold the date(s) and location.

II. Event Requirements

All Special Event permittees must adhere to the following rules and regulations. Failure to do so may result in the applicant having any conditional approvals revoked, being held responsible for any damages and/or denial of future event Applications.

(a) **Public Safety Personnel.** While the presence of public safety personnel (police/fire/medical) may not be required at all special events, it shall be the discretion of the Public Safety Director if city police and/or fire officials may be required. The applicant/organization will be responsible for payment of public safety personnel services. See Fee Schedule (Section IV) for fee estimates. If an event is cancelled with less than 72 hours' notice, the applicant/organization will be responsible for paying two hours' pay per officer, per union contract requirements. Applicants are not allowed to provide their own public safety staff (police/fire/medical) without prior approval of the City of Muskegon's Public Safety Director.

(b) **Liability Insurance.** The applicant must provide proof of liability insurance in the amount of \$1,000,000 naming the City of Muskegon as an additional insured. You may use an insurance agent of your choice. An acceptable certificate of insurance must be submitted no later than 10 days before the event date. Please inform your insurance agent that the wording on the certificate must read:

"The City of Muskegon, all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and board members, including employees and volunteers thereof; it is understood and agreed that by naming the City of Muskegon as additional insured, coverage afforded is considered to be primary and any other insurance the City of Muskegon may have in effect shall be considered secondary and/or excess."

(c) **Restroom Facilities.** All outdoor events shall provide adequate restroom facilities (i.e. portable toilets) including handicapped-accessible facilities per ADA requirements. Restroom placement shall not impede sidewalk traffic.

(d) **Digging & Staking.** Digging or staking into paved areas, including roadways, sidewalks, and public parking areas, is not permitted. Digging or staking into non-paved ground shall be cleared through Miss Dig in order to avoid damage to underground utilities. The Applicant Organization is responsible for contacting Miss Dig (1-800-482-7171, or dial 811) a minimum of 5 *working days* prior to event set-up. The applicant will also be responsible for paying an electrician to locate underground utility lines and a City employee to location irrigation/water lines, if required. A penalty of \$100 will be charged for an unapproved staking and the Applicant Organization will be responsible for the cost of any damages to underground utilities, including irrigation lines, caused by digging or staking.

(e) **Electrical and Water Hook-up** The applicant must adapt to electrical power available on-site, or provide their own generator. When using City electrical panels, the applicant shall read the meter before and after the event, and report those numbers to the City's special event coordinator upon request. City fire hydrants may be used as a water source for a fee (see Fee Schedule - Section IV) for cost. It is the responsibility of the applicant to provide acceptable hoses for potable water usage, which meet Health Department requirements.

(f) **Inspections.** The event location is subject to all building, plumbing, mechanical, electrical, and fire codes. It is the permittee's responsibility to schedule an inspection by any and all required inspectors and pay the required inspection fee(s). The City's building inspection department (SAFEbuilt), requires an inspection of assembly tents that are 400 sq ft or greater. See Fee Schedule (Section IV) for costs. For events having multiple tents, contact the City's Building Official for inspection fees.

(g) **Food trucks.** Any food trucks or vendors using deep fryers and/or propane cylinders must be inspected and approved by the Fire Marshal prior to participation in a special event. These vendors are required to have no less than a 5 lbs ABC-type fire extinguisher which has a current inspection tag and a class K type fire extinguisher for any deep-frying equipment wherein oils and/or grease is used as a medium. Contact the Fire Marshall for an inspection at (231) 724-6793.

(h) **Camping/Campgrounds.** Approval must be given by the City Commission to have camping at your event at least 60 days before the event. The Department of Public Works will submit the request to the City Commission. Events that include overnight camping or a campground area also require a permit from the Muskegon County Health Department and Department of Environment, Great Lakes and Energy. To obtain information about this permit, call (231) 724-6208. A copy of an approved permit must be provided to the City.

(i) **Event Set-up and Tear-down.** For events utilizing any public roadway, no tents, booths, vendors, or equipment shall be set up in the roadway prior to 6:00 p.m. the day before the event. All signs, tents, booths, vendors, and equipment must be removed from the roadway prior to 6:00 a.m. the day after the event.

(j) **Site Clean-up and Trash Disposal.** The Applicant shall be responsible for clean-up of City facilities after the event. This includes the removal of trash from the site (do not leave full trash cans on site). Applicants shall provide their own Dumpster. The City shall have the right to enforce cleanup measures, including but not limited to entry and cleaning of property by City personnel with costs charged to the owner, occupant, or applicant. City staff may require a walk-through after the event to ensure satisfactory clean-up.

(k) **Merchandise Sales.** Sales of all merchandise for Special Events must be out of the public right-of-way, unless prior authorization is received.

(l) **Events Using Water.** Events utilizing a body of water such as Muskegon Lake and/or Lake Michigan require Coast Guard (414-747-7100) and/or Department of Natural Resources (269-685-6851) special event approval.

(m) **Pyrotechnics.** Events utilizing any kind of pyrotechnics must contact the Fire Marshal (231-724-6793) and must also obtain the appropriate permits from the City Clerk's Office (231-724-6705).

(n) **Compliance with all regulations.** Special Event applicants/organizations are responsible to ensure that all applicable laws and ordinances are followed. Failure to comply with all city ordinances, rules and regulations may result in the denial of future special event requests.

III. Special Event Application Processing

(a) **Application Intake.** Department of Public Works Office staff shall be responsible for intake of Special Event Applications and dissemination to appropriate City staff for review and approval. The Application fee must be submitted with the Application. Liquor license Applications shall be filed with the Public Safety Director.

(b) **Event Approval.** The City will issue a conditional approval or denial no later than 30 days after the Application date whenever possible. Preliminary approval may be given to allow the applicant to advertise the event, with final details to be worked out with staff. An approval letter will be issued, listing conditions of approval.

(c) **Application Denial.** If City staff reviews an Application and denies same, it shall be stated in writing the reasons for the denial. An appeal of that decision may be made to the City Commission, whose decision shall be final.

(d) **Unpaid Invoices Due the City.** Any past due fees/invoices owed to the City will result in denial of the event Application and/or future Special Event requests until paid in full.

(e) **Meetings with Staff.** City staff will meet with applicants to discuss event details if needed. Contact the City's special event coordinator in the Department of Public Works to request a meeting. There may also be instances when City staff may require a meeting with the applicant. Failure to attend a requested meeting may result in denial of the Application.

(f) **Street Closures/Barricading.** Requests for City road closings/barricading require approval of the Public Safety Director and the DPW Superintendent. DPW Office staff will forward requests to the appropriate personnel once the Application and fee are submitted. The applicant is responsible for all associated costs, which may include barricades, public safety services, etc. There is an additional \$50 fee for each block closed beyond 2 blocks. City Commission approval may be required in some cases. If a street closure is approved for an event, the Applicant must provide written notification to all businesses and residences located along the affected street(s) at least *10 days* prior to the event date. Changes to street closures requested within 30 days of the event date will incur a \$50 fee. *No route and/or road closure changes will be allowed within 14 days of an event.*

(f)(1) **Time Restrictions** Streets shall not be closed prior to 6:00 p.m. the day before the event and must be open by 6:00 a.m. the day following the conclusion of the event.

(f)(2) **Parking along event routes.** The applicant shall be responsible for posting "No Parking" signs along the closed streets of an event route at least **48 hours** in advance of the event date. The City's Department of Public Works may have No Parking signs available for use. However, the applicant/organization must attach 5 ½" by 8 ½" addendums to the signs noting the name of the event and date and time the parking restrictions will be in effect.

(g) **Runs/Walks.** For races, runs, walks, or parades, the applicant must submit a map with the Application, showing the proposed route. In addition, if any streets will be closed or partially closed, the applicant must provide written notification to all residents and businesses along the route as stated above in paragraphs (f) and (f)(1). The City's special event coordinator can provide the names and addresses of affected homes and businesses to be notified. The applicant is responsible for any public safety and/or DPW costs for street closures (barricades, police presence at intersections if needed, etc).

(g)(1) **Use of Lakeshore Trail bike path.** For events utilizing the Lakeshore Trail bike path, there is a trail use fee that will be billed upon completion of the event (see Fee Schedule) to help cover trail maintenance expenses. In addition, any events using the path must post signage at trail entry points on the day of the event, notifying users that there is an event occurring on the trail. Signs may be generic, such as "EVENT ON BIKE PATH TODAY" (organizations using the path for events may share signs to reduce costs). The City's Parks Supervisor can assist you in locating sign placement locations.

(h) **Site Plan.** The City may require submittal of a site plan showing the event grounds and the location of tents, vendors, portable toilets, and other structures.

IV. Special Event Fee Schedule (Use of City Equipment, Labor Charges, Liquor Licenses, Inspections, Park use fees)

ITEM / SERVICE	RENTAL FEE (plus labor if necessary)
55-gallon metal trash can	\$5.00 each
Plastic trash bags (1 case)	\$40.00 per case or actual cost
Snow fence – 50 ft per roll <u>Standard Traffic Cone</u>	\$30.00 per roll <u>\$1.00 each</u>
Fence posts – 1 needed for every 10 ft Tall “Grab” Cone	\$3.00 per post <u>\$3.00 each</u>
Picnic tables	\$10.00 each
Fire hydrant use (installation & removal of hydrant tree, water testing, and water usage)	\$100.00 flat rate per hydrant
DPW/Parks personnel labor costs (Transportation of Barricades/Cones/tables, etc)	\$60.00/hour Truck/ trailer rental may also be charged
PUBLIC SAFETY SERVICES / FEES	
NOTE: Liquor License fees are lowest when applied for at least 45 days in advance of the event date. Liquor licenses will not be issued within 15 days of an event.	
Special liquor license (non-profit)/New event	\$150.00 (if applied for at least 45 days in advance of event)
Special liquor license (non-profit)/Return event Organization located outside City of Muskegon	\$125.00 (if applied for at least 45 days in advance of event)
Special liquor license/Return event, in-City rate	\$ 75.00 (if applied for at least 45 days in advance of event)
Special liquor license (all) within 15-44 days of event	\$250.00
Liquor license/Temporary authorization – existing business/club	\$40.00 (\$60 if within 15-44 days of event)
Public safety labor charges (police/fire/medical)	\$60.00 per hour (time and ½)
Public safety labor charges (police/fire/medical)	\$120.00 per hour (triple time/holidays)
INSPECTIONS	
Inspection of assembly tent	\$50.00 (if multiple tents, contact building official for fees)
Electrical or plumbing inspections	Contact the building inspection department to see if these are required
Fire Department inspection of food trucks	Included with application fee
PARK USE FEES	
Hackley Park exclusive use fee with Liquor License	\$100/hour or \$500/day
Hackley Park use fee per quadrant	\$50/day per quadrant
Harbour Towne Beach user fee	\$1500.00 per event
Trail bicycle/walking paths	\$200 per event
Pere Marquette Park user fees (applicable May 15 through September 15)	
Events less than 100 people	\$100 per event (includes 1 parking pass)
Events with 100 - 250 people	\$200 per event (includes 2 parking passes)
Events with 250 - 500 people	\$350 per event (includes 5 parking passes)
Events with 500 - 2000 people	\$500 per event (includes 10 parking passes)
Events over 2000 people	\$1500.00 per event (includes 20 reserved parking spaces- and 20 parking passes)
Parking spaces for event use	\$10 per parking space reserved per day and each vehicle must have Beach Parking pass
Exclusive use fee of Ovals parking lot area	\$250 per day and each vehicle must have Beach Parking pass
Camping at Pere Marquette Park	\$20 per night per camper or tent*
	*The City Commission may opt to collect a percentage of camping revenue for larger events in lieu of the \$20 per unit

~~Route changes for parades, races/walks or any event requiring street closures – Any changes made within 30 days of~~

| ~~the event date will incur a \$50 fee. No road closure changes are allowed with 14 days of an event.~~

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25 th , 2022	Title: CWSRF & DWRP FY23 Engineering Assistance
Submitted By: Leo Evans	Department of Public Works
Brief Summary: Staff is requesting authorization to approve the Professional Services Agreement and a Contract Amendment with Prein & Newhof related to water and sewer engineering services on a variety of projects.	
Detailed Summary & Background: Staff has been working to pursue multiple water/sewer projects as a part of the State of Michigan Revolving Loan programs (DWRP / SRF) during the State 2023 Fiscal Year. The projects included for engineering within the new Professional Services Agreement are as follows and would be constructed during 2024. <u>Glenside Phase 2 & 3</u> The first phase of this project was completed in 2020 and included work on Westwood Street. Phase 2 is focused on Hadden Street and was designed last year though the project was shelved before being moved into construction. Phase 3 includes the remainder of the southwest portion of the Glenside neighborhood. These projects are geared towards eliminating water/sewer utilities that are located in non-existent alleys that are inaccessible for maintenance. These projects require a meeting with the neighborhood to review options to fund the ineligible portions of the project which will be scheduled later this fall or early this winter. If an amicable solution cannot be found for addressing the ineligible pieces these projects will likely be shelved and not pursued in earnest. <u>Wilcox and Thompson Avenues</u> This project is focused on repairing two of the major sewer lines in the Bluffton area that contributed largely towards the inflow and infiltration that our sewer system saw in 2019-2020. The work will also replace the water lines within the roadways and see roadway reconstruction on both streets. <u>Morton Avenue</u> This project is targeted towards a water reliability issue in the Lakeside neighborhood and seeks to improve flows in the impacted portion of the neighborhood by improving the connection between the larger water mains in Lincoln Street and Denmark Street. The project will also address one section of sewer that has shown signs of failure between Meuer Court and Leon Street. <u>Harbour Towne and Edgewater Lift Stations</u> These projects will be targeted towards rehabilitation and system upgrades for the existing lift stations which are nearing end of life. <u>Lead Service Lines</u> This project will seek to contract the replacement of around 500 lead service lines in the city. A targeted area has not yet been identified, but will be advised by the work that is currently underway to verify and catalogue our existing service line materials throughout the city.	

The project included in the amendment is a reduction to a previously approved professional services agreement (9/14/2021) to eliminate the remaining funds in that approval which were dedicated towards the completion of Glenside Phase 2 (Hadden Street) as those costs are now being shifted to the new Professional Services Agreement and are incorporated above.

Portions of the engineering work required for these projects are included in the 22/23 budget and should they all move forward the projects will continue to have allocations included in the 23/24 and 24/25 fiscal years. The projects represent an approximately \$16M Investment of which the state is prepared to award a combination of grants and principal forgiveness of around \$10M, leaving approximately \$1M in cash costs due during construction (Glenside) and around \$5M to be financed through the DWRP/CWSRF loan programs for 20 years at a 1.875% interest rate. These projects are situated to be large benefactors of the Federal/State infrastructure dollars that were allocated under the IIJA (Infrastructure Investment and Jobs Act).

Staff has reviewed the proposal from Prein and Newhof and feels they are the best suited firm to handle these projects based on their past experience. A qualifications for bid process was used in 2019 that shortlisted Prein & Newhof along with two other firms to provide engineering services for these projects for the next 5-years.

Goal/Focus Area/Action Item Addressed:

Financial Infrastructure / Identify specific major capital projects across all departments

Amount Requested: \$1,319,600 (TOTAL)
\$423,600 (23/24 – Prelim + Design + Bidding)
\$448,000 (24/25 – ½ Construction Eng.)
\$448,000 (25/26 – ½ Construction Eng.)

Amount Budgeted: \$500,000 (22/23)

Fund(s) or Account(s):
590/591-UNASSIGNED

Fund(s) or Account(s):
590/591-UNASSIGNED

Recommended Motion:

Authorize staff to sign the professional services agreement and the professional services agreement amendment with Prein & Newhof to provide comprehensive engineering services for the cities fiscal year 2024 DWRP and CWSRF projects and modify the previously approved professional services agreement.

Approvals:

Immediate Division Head ☒ Information Technology ☐
Other Division Heads ☒ Communication ☐
Legal Review ☒

Guest(s) Invited / Presenting

Yes ☐

No ☒

For City Clerk Use Only:

Commission Action:

September 23, 2022

Mr. Leo Evans, P.E.
City of Muskegon
Department of Public Works
1350 Keating Avenue
Muskegon, MI 49442

Re: Proposal for Professional Engineering Services for FY 23 SRF/DWRF Implementation

Dear Mr. Evans:

We appreciate this opportunity to provide a proposal for professional engineering services to assist you with your SRF/DWRF projects for Fiscal Year 2023. This is a continuation of services for projects outlined in your 2021 Project Plans for Water and Wastewater system improvements.

The specific projects covered under this proposal include the following:

- Glenside Phase II – Hadden Street (Design is Complete)
- Glenside Phase III – Winchester Drive and Montague Avenue west of Wickham
- Morton Avenue – Lincoln to Denmark
- Wilcox and Thompson Avenues – Plum to Edgewater including Edgewater, Cherry, and Walnut Streets
- Harbor Towne and Edgewater Lift Station Rehabilitations

We have reviewed the projects and have developed the following scope of services based on the project descriptions in the SRF and DWRF Project Plans. We assume that the City will follow the 4th quarter funding schedule, which requires project documents to be completed and ready for bidding by spring 2023, and construction will occur through the 2024 construction season.

Design and Bidding Phase

- Gather and review record plans, private utility information and any available records pertinent to the proposed project areas;
- Complete topographic survey of all projects;
- Complete approximately one soil boring per 500 feet of project length;
- Complete design of proposed sanitary sewer, water main, service laterals, water services and road reconstruction as detailed in the SRF and DWRF Project Plans;
- Assist City in tracking and developing easement documents for replacement of water services on private property;
- Assist City in locating and communicating with residents to determine locations of laterals in the Glenside Phase III project limit;
- Review limits of Glenside Phase II in relation to Glenside Phase III and make adjustments as necessary to provide a constructible project to fit in the construction season;
- Attend three design review meetings;
- Prepare and submit permit applications (City to pay any permit fees);

- Prepare opinion of probable cost based on final design;
- Prepare Alternative Justifiable Expense (AJE);
- Prepare project specifications including specific SRF/DWRF requirements;
- Assist City with preparation of bidding packages (assumes 5 contracts) and contract documents;
- Assist City with advertising for bids, providing responses to questions, preparing addendums;
- Attend pre-bid meeting and prepare minutes;
- Review bids, prepare bid tabulations, and provide recommendations;
- Assist City with Parts I, II, and III SRF and DWRF forms and administration;
- Prepare Notice of Award and Notice to Proceed; and
- Assist City with preparation of final contracts for signing by Contractor

Construction Phase

- Schedule and attend preconstruction meetings and prepare minutes;
- Track and review shop drawings;
- Provide construction staking;
- Provide testing (soil density, gravel, asphalt, and concrete, etc.);
- Provide construction observation for all utility work and reconstruction of Hadden Street assuming 21 weeks of construction, this will require two Construction Observers at certain times (1,230 hours);
- Provide construction observation for all utility work and reconstruction of Glenside Phase III assuming 24 weeks of construction, this will require two Construction Observers at certain times (1,505 hours);
- Provide construction observation for all utility work and reconstruction of Morton Avenue assuming 14 weeks of construction, (730 hours);
- Provide construction observation for all utility work and reconstruction of Thompson and Wilcox assuming 18 weeks of construction, this will require two Construction Observers at certain times (930 hours);
- Provide as needed construction observation and attendance at start-up for Edgewater and Harbor Towne Lift Stations.
- Schedule and attend monthly progress meetings for each contract as needed, and prepare minutes for each;
- Respond to RFIs, prepare payment applications and change orders;
- Assist with SRF/DWRF administration;
- Prepare punch lists and close out documents; and
- Complete record plans and property iron replacement following completion.

Fee

Based on the scope of work described above, we propose to complete the work for a not to exceed cost of \$1,319,600. Our estimated time/work level of effort is attached. Our hourly rates are adjusted each January. Given the current labor and inflation climate, we have included an increase of 8% in hourly rates in 2023 and 2024.

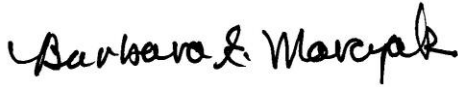
Mr. Leo Evans
September 23, 2022
Page 3

Please note that there are still some uncertainties in the projects that may not have been accounted for. Once the construction contracts are awarded and construction schedules are provided, we will review the hours allocated for the construction phase services with you to determine whether adjustments need to be made.

Thank you for the opportunity to provide this proposal. Please contact us if you have any questions.

Sincerely,

Prein&Newhof



Barbara E. Marczak, P.E.



Jason Washler, P.E.

Enclosures: Estimated work effort/fee, Professional Services Agreement

Professional Hours Worksheet

City of Muskegon - SRF/DWRF 2023

Staff Member	Sen. PM	Sen. PM	Sen. PM	PM	Sen Eng II	Eng.	CADD/GIS	Sen. Observer	Observer	Eng II	Survey	Office Tech	Expense		Mileage	Total Cost
	Marczak	Staff	VerHuel	Hulst	DeNooyer	Staff	Staff	TBD	TBD	Assink	Staff	Van Kuik	Item	Cost		
Preliminary Design																
Kickoff Meeting	4			4	4	6									35	\$2,400
Preliminary Engineering	4			5	5	20										\$4,200
Meeting with Stakeholders for Glenside	3			20	3										35	\$3,700
Soil Borings (Glenside III)		2		1										\$5,800		\$6,900
Soil Borings (Morton)		2		1										\$5,300		\$6,300
Soil Borings (Wilcox)		2		1										\$5,550		\$6,600
Topo Survey and Aerial Mapping (Glenside III)				1							114		Mapping	\$6,310		\$28,100
Topo Survey (Morton)				1							90					\$16,700
Topo Survey (Wilcox)				1							85					\$15,800
Topo Survey (Harbor and Edgewater LS)				1							22					\$4,200
Glenside III Sanitary Lateral Survey				12	100											\$14,900
QA/QC	4		4	2	2											\$1,800
Review Meeting	4			4		4									35	\$1,700
Preliminary Subtotals	19	6	4	54	114	30	0	0	0	0	311	0		\$22,960	105	\$113,300

Design Glenside II																
Hadden Design	2			4	10		20									\$5,000
SESC Permit Application				1		2						4	Printing	\$600		\$1,400
EGLE Sewer Permit Application				1												\$100
EGLE Water Permit Applications - Received																\$0
Specifications for Hadden				2		1										\$400
Cost Estimate	1			1	2	10										\$1,600
QA/QC				1	1		1									\$400
Design Glenside III																
Easements water services and sanitary laterals				1	20											\$2,800
Glenside III Design	4			20	144		283									\$62,400
Glenside Staging, Phasing Design				2	2											\$500
SESC Permit Application				1		2						4	Printing	\$600		\$1,400
EGLE Sewer Permit Application				1		2										\$400
EGLE Water Permit Application				1		2						5	Printing	\$600		\$1,500
Specifications for Phase III				2	5	15						10			15	\$3,500
Meeting w/ Client (1)	2			2	2										35	\$900
Cost Estimate	1			2	5	15										\$2,700
QA/QC	10	5		10	5		4	5								\$5,700
2022 Rates Inflation																\$6,500

Professional Hours Worksheet

City of Muskegon - SRF/DWRF 2023

Staff Member	Sen. PM Marczak	Sen. PM Staff	Sen. PM VerHuel	PM Hulst	Sen Eng II DeNooyer	Eng. Staff	CADD/GIS Staff	Sen. Observer TBD	Observer TBD	Eng II Assink	Survey Staff	Office Tech Van Kuik	Expense		Mileage	Total Cost
													Item	Cost		
Design Morton																
Easements water services				1		5										\$700
Morton Design	4			20	10	80	150									\$34,500
Morton Staging, Phasing, MOT Design				1		1										\$200
SESC Permit Application				1		2						4	Printing	\$600		\$1,400
EGLE Sewer Permit Application				1		2										\$400
EGLE Water Permit Application				1		2						5	Printing	\$600		\$1,500
Specifications for Morton				5		20						10				\$3,700
Meeting w/ Client (1)	2			2		2									35	\$900
Cost Estimate	1			5		15										\$2,500
QA/QC	20	5		5	5			5								\$6,100
2022 Rates Inflation																\$4,200
Design Thompson																
Easements water services				1		10										\$1,200
Thompson Design	4			20	5	210	274									\$65,300
Thompson Staging, Phasing, MOT Design				5		5										\$1,200
SESC Permit Application				1		2						4	Printing	\$600		\$1,400
EGLE Sewer Permit Application				1		2										\$400
EGLE Water Permit Application				1		2						10	Printing	\$600		\$1,900
Specifications for Thompson				5		20						20				\$4,600
Meeting w/ Client (1)	2			2		2									35	\$900
Cost Estimate	1			5		15										\$2,500
QA/QC	20	5		10	5		4	5								\$7,400
2022 Rates Inflation																\$6,900
Design Lift Station																
Lift Station Design			12	7		58	36					10	Century	\$10,400	235	\$26,600
2022 Rates Inflation																\$2,100
Design Subtotals	74	15	12	152	221	504	772	15	0	0	0	86		\$14,600	355	\$275,700
Bid Phase																
Advertise and Issue Bid Package			5	2	4	15						30				\$5,900
Bidder Questions			5	20	5											\$4,300
Pre-bid Meeting	8			10											20	\$2,800
Addenda				20	2	15						5				\$5,100
Attend Bid				2											20	\$300
Review Bids/Recommend Award	1			15	5	15						8				\$5,300
Prepare Contracts-SRF/DWRF admin.	30			1		10						15	Printing	\$600.00		\$8,300
2022 Rates Inflation																\$2,600
Bid Phase Subtotals	39	0	10	70	16	55	0	0	0	0	0	58		\$600	40	\$34,600

Professional Hours Worksheet

City of Muskegon - SRF/DWRF 2023

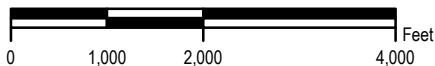
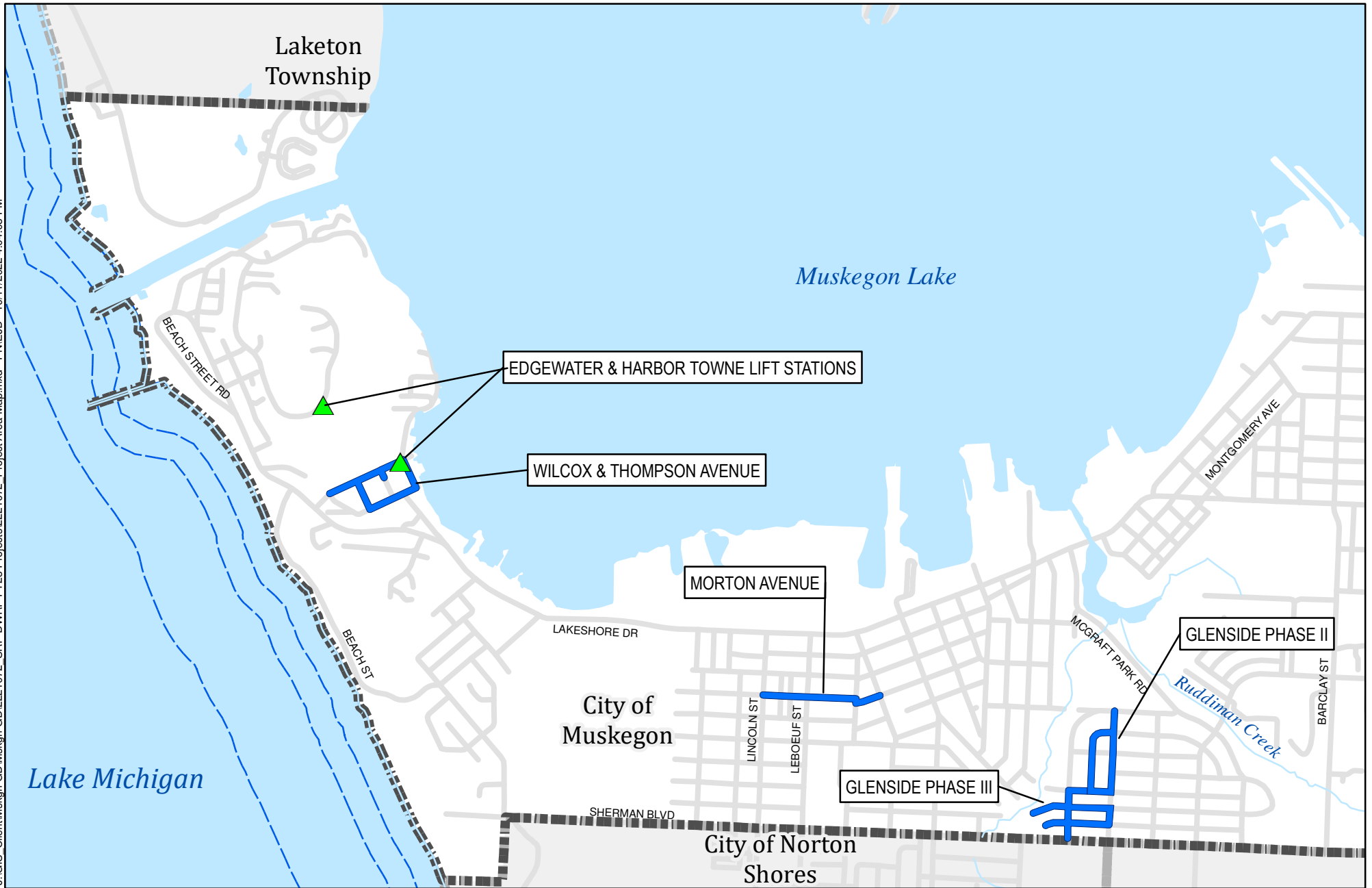
Staff Member	Sen. PM	Sen. PM	Sen. PM	PM	Sen Eng II	Eng.	CADD/GIS	Sen. Observer	Observer	Eng II	Survey	Office Tech	Expense		Mileage	Total Cost
	Marczak	Staff	VerHuel	Hulst	DeNooyer	Staff	Staff	TBD	TBD	Assink	Staff	Van Kuik	Item	Cost		
Construction Engineering Services																
Hadden																
Preconstruction Meeting and Minutes	2			2	4										20	\$1,200
Preconstruction Video (2 hours)									2						20	\$200
Construction Staking Hadden											190					\$35,000
Hadden CO (21 weeks, 110 days)								800	410				Misc. Test.	\$5,000	1,100	\$132,000
Project Administration	10			42	115											\$22,800
Respond to RFIs				5	10											\$2,000
Change Orders (3 per contract)				6	30											\$4,800
Pay Apps (5)				5	20											\$3,300
Progress Meetings (monthly per contract)	4			8	8										30	\$2,900
Punch List Visits (2)				6	20				10						30	\$4,500
Record Plans/Closeout				2	20		40		10							\$9,500
Iron Replacement (Included in survey)																\$0
2022 Rates Inflation																\$36,300
Glenside III																
Preconstruction Meeting and Minutes	2			2	4										20	\$1,200
Preconstruction Video (2 hours)									2						20	\$200
Construction Staking Glenside III											194					\$35,700
Glenside III CO (24 weeks, 135 days)									1485				Misc. Test.	\$5,000	1,350	\$151,900
Project Administration	10			48	120											\$24,300
Respond to RFIs				5	10											\$2,000
Change Orders (3 per contract)				6	30											\$4,800
Pay Apps (6)				6	24											\$4,000
Progress Meetings (monthly per contract)	4			10	10										30	\$3,400
Punch List Visits (2)				6	20				10						30	\$4,500
Record Plans/Closeout				2	20		40		10							\$9,500
Iron Replacement (Included in survey)																\$0
2022 Rates Inflation																\$40,200
Morton																
Preconstruction Meeting and Minutes	2			2		4									20	\$1,100
Preconstruction Video (2 hours)									2						70	\$200
Construction Staking Morton											128					\$23,600
Morton CO (14 weeks, 72 days)								720					Misc. Test.	\$4,000	720	\$81,900
Project Administration	10			28		40										\$9,900
Respond to RFIs				5		10										\$1,800
Change Orders (3 per contract)				3		6										\$1,100
Pay Apps (4)				4		20										\$2,700
Progress Meetings (monthly per contract)	3			6		6									100	\$2,100
Punch List Visits (3)				4		10			10						72	\$2,700
Record Plans/Closeout				2		10	24									\$4,700
Iron Replacement (Included in survey)							4									\$600
2022 Rates Inflation																\$22,000

Professional Hours Worksheet

City of Muskegon - SRF/DWRF 2023

Staff Member	Sen. PM	Sen. PM	Sen. PM	PM	Sen Eng II	Eng.	CADD/GIS	Sen. Observer	Observer	Eng II	Survey	Office Tech	Expense		Mileage	Total Cost
	Marczak	Staff	VerHuel	Hulst	DeNooyer	Staff	Staff	TBD	TBD	Assink	Staff	Van Kuik	Item	Cost		
Thompson																
Preconstruction Meeting and Minutes	2			2		6									20	\$1,300
Preconstruction Video (2 hours)									2						70	\$200
Construction Staking Thompson											127					\$23,400
Thompson CO (18 weeks, 92 days)						15			920				Misc. Test.	\$4,000	920	\$96,800
Project Administration	10			40		60										\$13,700
Respond to RFIs				5		10										\$1,800
Change Orders (3 per contract)				3		6										\$1,100
Pay Apps (4)				4		20										\$2,700
Progress Meetings (monthly per contract)	8			8		8									100	\$3,400
Punch List Visits (3)				10		10			10						72	\$3,500
Record Plans/Closeout				5		10	32		20							\$8,200
Iron Replacement (Included in survey)							4									\$600
2022 Rates Inflation																\$26,100
Harbor Towne Edgewater LS																
Preconstruction Meeting and Minutes				4						4					24	\$1,000
Project Administration Assistance (assuming 8 weeks)	4		8	8						8		2				\$4,100
Respond to RFIs/Bulletin Prep.										4						\$500
Pay Applications (two applications)										4						\$500
Shop Drawing Review (6 items)			2							8						\$1,200
Observation Checks			4							40					188	\$5,400
Electrical (Century A&E)														\$3,700.00		\$4,100
System Start-up			1							12					47	\$1,600
Operation & Maintenance Manuals										2						\$200
Record Plan/Closeout Documentation							4			2						\$800
2022 Rates Inflation																\$3,200
Construction Engineering Subtotals	71	0	15	304	465	251	148	1520	2903	84	639	2		\$5,000	1,200	\$896,000
Project Grand Total	164	21	41	580	816	840	920	1,535	2,903	84	950	146		\$43,160	1,700	\$1,319,600

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1 inch = 2,000 feet

LEGEND

 Proposed Project Areas

CITY OF MUSKEGON
MUSKEGON COUNTY, MI

FY23 SRF/DWRF PROJECT LOCATION MAP

OCTOBER, 2022

Prein&Newhof

2221072

Project No.

Professional Services Agreement

This Professional Services Agreement is made this 10th day of October, 2022 (“Agreement”) by and between Prein & Newhof, Inc. (“P&N”), of 3355 Evergreen Drive, NE, Grand Rapids, MI 49525, and City of Muskegon (“Client”), of 933 Terrace Street, Muskegon, MI 49443.

WHEREAS Client intends to:

Implement FY 2023 projects defined in the City of Muskegon’s FY 2023 SRF and DWRP Project Plans including Glenside Phase II (Hadden Street), Glenside Phase III, Morton, Thompson/Wilcox and Edgewater/Harbor Towne Lift Station projects.

NOW THEREFORE, for and in consideration of the terms and conditions contained herein, the parties agree as follows:

ARTICLE 1 – DESIGNATED REPRESENTATIVES

Client and P&N each designate the following individuals as their representatives with respect to the Project.

For Client

Name: Leo Evans, P.E.
Title: Director of Public Works
Phone Number: 231-724-6920
Facsimile Number: 231-727-6904
E-Mail Address: leo.evans@shorelinecity.com

For P&N

Name: Barbara Marczak, P.E.
Title: Team Leader
Phone Number: 231-798-0101
Facsimile Number: 231-798-0337
E-Mail Address: bmarczak@preinnewhof.com

ARTICLE 2 – GENERAL CONDITIONS

This Agreement consists of this Professional Services Agreement and the following documents which by this reference are incorporated into and made a part of this Agreement.

- ☐ P&N Standard Terms and Conditions for Professional Services
- ☒ P&N Proposal dated September 22, 2022
- ☒ P&N Standard Rate Schedule
- ☐ P&N Supplemental Terms and Conditions
- ☒ Other: P&N Modified Standard Terms and Conditions for Professional Services (Limitation of Liability)

ARTICLE 3 – ENGINEERING SERVICES PROVIDED UNDER THIS AGREEMENT:

Client hereby requests, and P&N hereby agrees to provide, the following services:

- ☒ P&N Scope of Services per Proposal dated September 22, 2022
- ☐ Scope of Services defined as follows:

NA

ARTICLE 4 – COMPENSATION:

- ☐ Lump Sum for Services Described in Article 3 above - \$.
Additional services to be billed per P&N's Standard Rate Schedule in effect on the date the additional service are performed.
- ☐ Hourly Billing Rates plus Reimbursable Expenses per P&N's Standard Rate Schedule in effect on the date services are performed.
- ☒ Other: Hourly rates and expenses as described in September 22, 2022 proposal. Maximum not to exceed \$1,319,600.00 without City of Muskegon authorization.

ARTICLE 5 – ADDITIONAL TERMS (If any)

None

This Agreement constitutes the entire Agreement between P&N and Client and supersedes all prior written or oral understandings. This Agreement may not be altered, modified or amended, except in writing properly executed by authorized representatives of P&N and Client.

Accepted for:

Accepted for:

Prein&Newhof, Inc.

City of Muskegon

By: _____

By: _____

Printed Name: Jason Washler, P.E.

Printed Name: Leo Evans, P.E.

Title: Vice President

Title: Director of Public Works

Date: October 10, 2022

Date: _____

Standard Terms & Conditions

- A. General** - As used in this Prein&Newhof Standard Terms and Conditions for Professional Services (hereinafter “Terms and Conditions”), unless the context otherwise indicates: the term “Agreement” means the Professional Services Agreement inclusive of all documents incorporated by reference including but not limited to this P&N Standard Terms and Conditions for Professional Services; the term “Engineer” refers to Prein & Newhof, Inc.; and the term “Client” refers to the other party to the Professional Services Agreement.

These Terms and Conditions shall be governed in all respects by the laws of the United States of America and by the laws of the State of Michigan.

- B. Standard of Care** - The standard of care for all professional and related services performed or furnished by Engineer under the Agreement will be the care and skill ordinarily used by members of Engineer’s profession of ordinary learning, judgment or skill practicing under the same or similar circumstances in the same or similar community, at the time the services are provided.
- C. Disclaimer of Warranties** - Engineer makes no warranties, expressed or implied, under the Agreement or otherwise.
- D. Construction/Field Observation** - If Client elects to have Engineer provide construction/field observation, client understands that construction/field observation is conducted to reduce, not eliminate the risk of problems arising during construction, and that provision of the service does not create a warranty or guarantee of any type. In all cases, the contractors, subcontractors, and/or any other persons performing any of the construction work, shall retain responsibility for the quality and completeness of the construction work and for adhering to the plans, specifications and other contract documents.
- E. Construction Means and Methods** - Engineer shall not have control or charge of and shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for any safety precautions and programs in connection with the construction work, for the acts or omissions of the Contractor, Subcontractors, or any other persons performing any of the construction work, or for the failure of any of them to carry out the construction work in accordance with the plans, specifications or other contract documents.
- F. Opinions of Probable Costs** - Client acknowledges that Engineer has no control over market or contracting conditions and that Engineer’s opinions of costs are based on experience, judgment, and information available at a specific period of time. Client agrees that Engineer makes no guarantees or warranties, express or implied, that costs will not vary from such opinions.
- G. Client Responsibilities**
1. Client shall provide all criteria, Client Standards, and full information as to the requirements necessary for Engineer to provide the professional services. Client shall designate in writing a person with authority to act on Client’s behalf on all matters related to the Engineer’s services. Client shall assume all responsibility for interpretation of contract documents and construction observation/field observation during times when Engineer has not been contracted to provide such services and shall waive any and all claims against Engineer that may be connected thereto.
 2. In the event the project site is not owned by the Client, the Client must obtain all necessary permission for Engineer to enter and conduct investigations on the project site. It is assumed that the Client possesses all necessary permits and licenses required for conducting the scope of services. Access negotiations may be performed at additional costs. Engineer will take reasonable precaution to minimize damage to land and structures with field equipment. Client assumes responsibility for all costs associated with protection and restoration of project site to conditions existing prior to Engineer’s performance of services.
 3. The Client, on behalf of all owners of the subject project site, hereby grants permission to the Engineer to utilize a small unmanned aerial system (sUAS) for purposes of aerial mapping data acquisition. The Client is responsible to provide required notifications to the property owners of the subject project site and affected properties where the sUAS services will be performed. The Engineer will operate the sUAS in accordance with applicable State and Federal Laws.
- H. Hazardous or Contaminated Materials/Conditions**
1. Client will advise Engineer, in writing and prior to the commencement of its services, of all known or suspected Hazardous or Contaminated Materials/Conditions present at the site.
 2. Engineer and Client agree that the discovery of unknown or unconfirmed Hazardous or Contaminated Materials/Conditions constitutes a changed condition that may require Engineer to renegotiate the scope of or terminate its services. Engineer and Client also agree that the discovery of said Materials/Conditions may make it necessary for Engineer to take immediate measures to protect health, safety, and welfare of those performing Engineer’s services. Client agrees to compensate Engineer for any costs incident to the discovery of said Materials/Conditions.
 3. Client acknowledges that Engineer cannot guarantee that contaminants do not exist at a project site. Similarly, a site

which is in fact unaffected by contaminants at the time of Engineer's surface or subsurface exploration may later, due to natural phenomena or human intervention, become contaminated. The Client waives any claim against Engineer, and agrees to defend, indemnify and hold Engineer harmless from any claims or liability for injury or loss in the event that Engineer does not detect the presence of contaminants through techniques commonly employed.

4. The Client recognizes that although Engineer is required by the nature of the services to have an understanding of the laws pertaining to environmental issues, Engineer cannot offer legal advice to the Client. Engineer urges that the Client seek legal assistance from a qualified attorney when such assistance is required. Furthermore, the Client is cautioned to not construe or assume that any representations made by Engineer in written or conversational settings constitute a legal representation of environmental law or practice.
5. Unless otherwise agreed to in writing, the scope of services does not include the analysis, characterization or disposal of wastes generated during investigation procedures. Should such wastes be generated during this investigation, the Client will contract directly with a qualified waste hauler and disposal facility.

I. Underground Utilities – To the extent that the Engineer, in performing its services, may impact underground utilities, Engineer shall make a reasonable effort to contact the owners of identified underground utilities that may be affected by the services for which Engineer has been contracted, including contacting the appropriate underground utility locating entities and reviewing utility drawings provided by others. Engineer will take reasonable precautions to avoid damage or injury to **underground** utilities and other underground structures. Client agrees to hold Engineer harmless for any damages to below ground utilities and structures not brought to Engineers attention and/or accurately shown or described on documents provided to Engineer.

J. Insurance

1. Engineer will maintain insurance for professional liability, general liability, worker's compensation, auto liability, and property damage in the amounts deemed appropriate by Engineer. Client will maintain insurance for general liability, worker's compensation, auto liability, and property damage in the amounts deemed appropriate by Client. Upon request, Client and Engineer shall each deliver certificates of insurance to the other evidencing their coverages.
2. Client shall require Contractors to purchase and maintain commercial general liability insurance and other insurance as specified in project contract documents. Client shall cause Engineer, Engineer's consultants, employees, and agents to be listed as additional insureds with respect to any Client or Contractor insurances related to projects for which Engineer provides services. Client agrees and must have Contractors agree to have their insurers endorse these policies to reflect that, in the event of payment of any loss or damages, subrogation rights under these Terms and Conditions are hereby waived by the insurer with respect to claims against Engineer.

K. Limitation of Liability - The total liability, in the aggregate, of Engineer and Engineer's officers, directors, partners, employees, agents, and consultants, whether jointly, severally or individually, to Client and anyone claiming by, through, or under Client, for any and all injuries, losses, damages and expenses, whatsoever, arising out of, resulting from, or in any way related to the Project or the Agreement, including but not limited to the performance of services under the Agreement, from any cause or causes whatsoever, including but not limited to the negligence, professional errors or omissions, strict liability or breach of contract or warranty, expressed or implied, of Engineer or Engineer's officers, directors, partners, employees, agents, consultants, or any of them, shall not exceed the amount of the compensation paid to Engineer under this Agreement, ~~or the sum of fifty thousand dollars and no cents (\$50,000.00), whichever is less.~~ Recoverable damages shall be limited to those that are direct damages. Engineer shall not be responsible for or held liable for special, indirect or consequential losses or damages, including but not limited to loss of use of equipment or facility, and loss of profits or revenue.

Client acknowledges that Engineer is a corporation and agrees that any claim made by Client arising out of any act or omission of any director, officer, or employee of Engineer, in the execution or performance of the Agreement, shall be made against Engineer and not against such director, officer, or employee.

L. Documents and Data

1. All documents prepared or furnished by Engineer under the Agreement are Engineer's instruments of service, and are and shall remain the property of Engineer.
2. Hard copies of any documents provided by Engineer shall control over documents furnished in electronic format. Client recognizes that data provided in electronic format can be corrupted or modified by the Client or others, unintentionally or otherwise. Consequently, the use of any data, conclusions or information obtained or derived from electronic media provided by Engineer will be at the Client's sole risk and without any liability, risk or legal exposure to Engineer, its employees, officers or consultants.
3. Any extrapolations, conclusions or assumptions derived by the Client or others from the data provided to the Client, either in hard copy or electronic format, will be at the Client's sole risk and full legal responsibility.

- M. Differing Site Conditions** - Client recognizes that actual site conditions may vary from the assumed site conditions or test locations used by Engineer as the basis of its design. Consequently, Engineer does not guarantee or warrant that actual site conditions will not vary from those used as the basis of Engineer's design, interpretations and recommendations. Engineer is not responsible for any costs or delays attributable to differing site conditions. .
- N. Terms of Payment** - Unless alternate terms are included in the Agreement, Client will be invoiced on a monthly basis until the completion of the **Project**. All monthly invoices are payable within 30 days of the date of the invoice. Should full payment of any invoice not be received within 30 days, the amount due shall bear a service charge of 1.5 percent per month or 18 percent per year plus the cost of collection, including reasonable attorney's fees. If Client has any objections to any invoice submitted by Engineer, Client must so advise Engineer in writing within fourteen (14) days of receipt of the invoice. Unless otherwise agreed, Engineer shall invoice Client based on hourly billing rates and direct costs current at the time of service performance. Outside costs such as, but not limited to, equipment, meals, lodging, fees, and subconsultants shall be actual costs plus 10 percent. In addition to any other remedies Engineer may have, Engineer shall have the absolute right to cease performing any services in the event payment has not been made on a current basis.
- O. Termination** - Either party may terminate services, either in part or in whole, by providing 10 calendar days written notice thereof to the other party. In such an event, Client shall pay Engineer for all services performed prior to receipt of such notice of **termination**, including reimbursable expenses, and for any shut-down costs incurred. Shut-down costs may, at Engineer's discretion, include expenses incurred for completion of analysis and records necessary to document Engineer's files and to protect its professional reputation.
- P. Severability and Waiver of Provisions** - Any provision or part of the Agreement held to be void or unenforceable under any laws or regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Client and P&N, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable **provision** that comes as close as possible to expressing the intention of the stricken provision. Non-enforcement of any provision by either party shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of the Agreement.
- Q. Dispute Resolution** - If a dispute arises between the parties relating to the Agreement, the parties agree to use the following procedure prior to either party pursuing other available remedies:
1. Prior to commencing a lawsuit, the parties must attempt mediation to resolve any dispute. The parties will jointly appoint a mutually acceptable person not affiliated with either of the parties to act as mediator. If the parties are unable to agree on the mediator within twenty (20) calendar days, they shall seek assistance in such regard from the Circuit Court of the State and County wherein the Project is located, who shall appoint a mediator. Each party shall be responsible for paying all costs and expenses incurred by it, but shall split equally the fees and expenses of the mediator. The mediation shall proceed in accordance with the procedures established by the mediator.
 2. The parties shall pursue mediation in good faith and in a timely manner. In the event the mediation does not result in resolution of the dispute within thirty (30) calendar days, then, upon seven (7) calendar days' written notice to the other party, either party may pursue any other available remedy.
 3. In the event of any litigation arising from the Agreement, including without limitation any action to enforce or interpret any terms or conditions or performance of services under the Agreement, Engineer and Client agree that such action will be brought in the District or Circuit Court for the County of Kent, State of Michigan (or, if the federal courts have exclusive jurisdiction over the subject matter of the dispute, in the U.S. District Court for the Western District of Michigan), and the parties hereby submit to the exclusive jurisdiction of said court.
- R. Force Majeure** - Engineer shall not be liable for any loss or damage due to failure or delay in rendering any services called for under the Agreement resulting from any cause beyond Engineer's reasonable control.
- S. Assignment** - Neither party shall assign its rights, interests or obligations under this Agreement without the express written consent of the other party.
- T. Modification** - The Agreement may not be modified except in writing signed by the party against whom a modification is sought to be enforced.
- U. Survival** - All express representations, indemnifications, or limitations of liability included in the Agreement shall survive its completion or termination for any reason.
- V. Third-Party Beneficiary** - Client and Engineer agree that it is not intended that any provision of this Agreement establishes a third-party beneficiary giving or allowing any claim or right of action whatsoever by a third party.
- W. Fee Escalation** - Proposed fees include a three percent (3%) per year cost of living adjustment. Should CPI increase by more than 3% in a year, Engineer reserves the right to adjust fees at the beginning of the following year by the amount of the prior year CPI increase.

Professional Services Agreement Amendment

Amendment Number : 2

Project Name: SRF/DWRF Project – Sanford and Hadden Streets

P&N Representative: Barbara E. Marczak, P.E.

Client: City of Muskegon

Client Representative: Leo Evans, P.E.

AGREEMENT: The Agreement Amendment modifies the original agreement for professional services dated: August 30, 2021

Client hereby requests and authorizes a change in services in accordance with the following:

SCOPE OF SERVICES MODIFICATION:

Delayed construction of Hadden Street to FY23 SRF/DWRF funding cycle. Construction phase services for Hadden are removed from this contract.

SCHEDULE OF SERVICES MODIFICATION:

NA

BUDGET MODIFICATION:

\$149,010.00 decrease. Revised budget will be \$651,190.00.

METHOD OF COMPENSATION:

- ☐ Lump Sum for Defined Scope of Services
- ☒ Hourly Billing Rates plus Reimbursable Expenses
- ☐ Other:

ADDITIONAL PROVISIONS (IF ANY):

None.

Prepared by:
Prein&Newhof, Inc.

Accepted for:
City of Muskegon

By: _____
Print Name: Jason Washler, P.E.
Title: Vice President
Date: _____

By: _____
Print Name: Leo Evans, P.E.
Title: Director of Public Works
Date: _____

City of Muskegon - CWSRF/DWRF FY23 Projects

DWRF Projects

<i>Title</i>	<i>Total Cost</i>	<i>DWRF Eligible Cost</i>	<i>LSL included</i>	<i>Description</i>
Glenside Neighborhood - Phase II Mod	\$3,270,000	\$1,078,000	\$758,000	Flipping water/sewer from alley service to street service
Glenside Neighborhood - Phase III Mod	\$3,869,000	\$1,645,000	\$453,000	Flipping water/sewer from alley service to street service
Wilcox Avenue and Thompson Avenue	\$2,384,000	\$1,100,000	\$506,000	Water/Sewer reconstruction on Wilcox Avenue and Thompson Avenue
Morton Avenue	\$1,917,000	\$1,384,000	\$569,000	Lincoln to Denmark Upsize and Replace water main and reconstruct street
Lead Service Lines	\$4,000,000	\$4,000,000	\$4,000,000	Lead Service Line Replacements
		\$9,207,000	\$6,286,000	

CWSRF Projects

<i>Title</i>	<i>Total Cost</i>	<i>CWSRF Eligible Cost</i>	<i>Ineligible Private Lat. Cost</i>	<i>Description</i>
Glenside Neighborhood - Phase II	\$3,270,000	\$1,700,000	\$492,000	Flipping water/sewer from alley service to street service
Glenside Neighborhood - Phase III Mod	\$3,869,000	\$1,642,000	\$582,000	Flipping water/sewer from alley service to street service
Morton Avenue	\$1,917,000	\$533,000		Replace sewer from Meurer Ct. to Leon St.
Harbor Towne and Edgewater LS	\$500,000	\$500,000		Rehabilitate lift station, new pumps, controls and station piping
Wilcox Avenue and Thompson Avenue	\$2,384,000	\$1,284,000		Replace sewer in the area of Wilcox and Thompson Ave.
		\$5,659,000		

Totals	\$15,940,000	\$14,866,000
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Estimated based on DRAFT PPL DWRF (75%)	\$6,905,250
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Estimated forgiveness/grant SRF (50%)	\$2,829,500
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Total grant/forgiveness	\$9,734,750
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City DWRF/CWSRF loan (1.875%)	\$5,131,250
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City funded (ineligible private laterals)	\$1,074,000
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WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25 th , 2022		Title: MDOT Resolution
Submitted By: Leo Evans		Department of Public Works
Brief Summary: Staff is requesting authorization for the Clerk to sign the attached resolution for MDOT.		
Detailed Summary & Background: The city maintains an existing performance resolution with MDOT (Michigan Department of Transportation) that is attached with all of our work that is completed under a permit for MDOT. The original resolution was approved by the Commission and signed by the Clerk in 2017 and is attached for reference. MDOT has subsequently made minor revisions to the standard resolution language and is requesting the City sign an updated copy.		
Goal/Focus Area/Action Item Addressed: N/A		
Amount Requested: N/A	Amount Budgeted: N/A	
Fund(s) or Account(s): N/A	Fund(s) or Account(s): N/A	
Recommended Motion: Authorize the Clerk to sign the attached resolution for MDOT.		
Approvals: Immediate Division Head ☒ Information Technology ☐ Other Division Heads ☒ Communication ☐ Legal Review ☒		Guest(s) Invited / Presenting Yes ☐ No ☒
For City Clerk Use Only: Commission Action:		

PERFORMANCE RESOLUTION FOR
MUNICIPALITIES

This Performance Resolution (Resolution) is required by the Michigan Department of Transportation for purposes of issuing to a Municipality an "Individual Permit for Use of State Highway Right of Way", and/or an "Annual Application and Permit for Miscellaneous Operations within State Highway Right of Way".

RESOLVED WHEREAS, the _____
(County, City, Village, Township, etc.)

hereinafter referred to as the "MUNICIPALITY," periodically applies to the Michigan Department of Transportation, hereinafter referred to as the "DEPARTMENT," for permits, referred to as "PERMIT," to construct, operate, use and/or maintain utilities or other facilities, or to conduct other activities, on, over, and under State Highway Right of Way at various locations within and adjacent to its corporate limits;

NOW THEREFORE, in consideration of the DEPARTMENT granting such PERMIT, the MUNICIPALITY agrees that:

1. Each party to this *Resolution* shall remain responsible for any claims arising out of their own acts and/or omissions during the performance of this *Resolution*, as provided by law. This *Resolution* is not intended to increase either party's liability for, or immunity from, tort claims, nor shall it be interpreted, as giving either party hereto a right of indemnification, either by Agreement or at law, for claims arising out of the performance of this Agreement.
2. If any of the work performed for the MUNICIPALITY is performed by a contractor, the MUNICIPALITY shall require its contractor to hold harmless, indemnify and defend in litigation, the State of Michigan, the DEPARTMENT and their agents and employee's, against any claims for damages to public or private property and for injuries to person arising out of the performance of the work, except for claims that result from the sole negligence or willful acts of the DEPARTMENT, until the contractor achieves final acceptance of the MUNICIPALITY Failure of the MUNICIPALITY to require its contractor to indemnify the DEPARTMENT, as set forth above, shall be considered a breach of its duties to the DEPARTMENT.
3. Any work performed for the MUNICIPALITY by a contractor or subcontractor will be solely as a contractor for the MUNICIPALITY and not as a contractor or agent of the DEPARTMENT. The DEPARTMENT shall not be subject to any obligations or liabilities by vendors and contractors of the MUNICIPALITY, or their subcontractors or any other person not a party to the PERMIT without the DEPARTMENT'S specific prior written consent and notwithstanding the issuance of the PERMIT. Any claims by any contractor or subcontractor will be the sole responsibility of the MUNICIPALITY.
4. The MUNICIPALITY shall take no unlawful action or conduct, which arises either directly or indirectly out of its obligations, responsibilities, and duties under the PERMIT which results in claims being asserted against or judgment being imposed against the State of Michigan, the Michigan Transportation Commission, the DEPARTMENT, and all officers, agents and employees thereof and those contracting governmental bodies performing permit activities for the DEPARTMENT and all officers, agents, and employees thereof, pursuant to a maintenance contract. In the event that the same occurs, for the purposes of the PERMIT, it will be considered as a breach of the PERMIT thereby giving the State of Michigan, the DEPARTMENT, and/or the Michigan Transportation Commission a right to seek and obtain any necessary relief or remedy, including, but not by way of limitation, a judgment for money damages.
5. The MUNICIPALITY will, by its own volition and/or request by the DEPARTMENT, promptly restore and/or correct physical or operating damages to any State Highway Right of Way resulting from the installation construction, operation and/or maintenance of the MUNICIPALITY'S facilities according to a PERMIT issued by the DEPARTMENT.

6. With respect to any activities authorized by a PERMIT, when the MUNICIPALITY requires insurance on its own or its contractor's behalf it shall also require that such policy include as named insured the State of Michigan, the Transportation Commission, the DEPARTMENT, and all officers, agents, and employees thereof and those governmental bodies performing permit activities for the DEPARTMENT and all officers, agents, and employees thereof, pursuant to a maintenance contract.
7. The incorporation by the DEPARTMENT of this *Resolution* as part of a PERMIT does not prevent the DEPARTMENT from requiring additional performance security or insurance before issuance of a PERMIT.
8. This *Resolution* shall continue in force from this date until cancelled by the MUNICIPALITY or the DEPARTMENT with no less than thirty (30) days prior written notice provided to the other party. It will not be cancelled or otherwise terminated by the MUNICIPALITY with regard to any PERMIT which has already been issued or activity which has already been undertaken.

BE IT FURTHER RESOLVED that the following position(s) are authorized to apply to the DEPARTMENT for the necessary permit to work within State Highway Right of Way on behalf of the MUNICIPALITY.

Title and/or Name:

I HEREBY CERTIFY that the foregoing is a true copy of a resolution adopted by

the _____
(Name of Board, etc.)

(Name of Board, etc.)

of the _____ of _____
(Name of MUNICIPALITY) (County)

(Name of MUNICIPALITY)

(County)

at a _____ meeting held on the _____ day

of _____ A.D. _____

Signed

Title

Print Signed Name

PERFORMANCE RESOLUTION FOR GOVERNMENTAL AGENCIES

2017-02(E)

This Performance Resolution is required by the Michigan Department of Transportation for purposes of issuing to a municipal utility an "Individual Permit for Use of State Highway Right of Way", or an "Annual Application and Permit for Miscellaneous Operations Within State Highway Right of Way".

RESOLVED WHEREAS, the City of Muskegon
(city, village, township, etc.)

hereinafter referred to as the "GOVERNMENTAL AGENCY," periodically applies to the Michigan Department of Transportation, hereinafter referred to as the "DEPARTMENT," for permits, referred to as "PERMIT," to construct, operate, use and/or maintain utilities or other facilities, or to conduct other activities, on, over, and under State Highway Right of Way at various locations within and adjacent to its corporate limits;

NOW THEREFORE, in consideration of the DEPARTMENT granting such PERMIT, the GOVERNMENTAL AGENCY agrees that:

1. Each party to this Agreement shall remain responsible for any claims arising out of their own acts and/or omissions during the performance of this Agreement, as provided by law. This Agreement is not intended to increase either party's liability for, or immunity from, tort claims, nor shall it be interpreted, as giving either party hereto a right of indemnification, either by Agreement or at law, for claims arising out of the performance of this Agreement.
2. If any of the work performed for the GOVERNMENTAL AGENCY is performed by a contractor, the GOVERNMENTAL AGENCY shall require its contractor to hold harmless, indemnify and defend in litigation, the State of Michigan, the DEPARTMENT and their agents and employee's, against any claims for damages to public or private property and for injuries to person arising out of the performance of the work, except for claims that result from the sole negligence or willful acts of the DEPARTMENT, until the contractor achieves final acceptance of the GOVERNMENTAL AGENCY. Failure of the GOVERNMENTAL AGENCY to require its contractor to indemnify the DEPARTMENT, as set forth above, shall be considered a breach of its duties to the DEPARTMENT.
3. Any work performed for the GOVERNMENTAL AGENCY by a contractor or subcontractor will be solely as a contractor for the GOVERNMENTAL AGENCY and not as a contractor or agent of the DEPARTMENT. The DEPARTMENT shall not be subject to any obligations or liabilities by vendors and contractors of the GOVERNMENTAL AGENCY, or their subcontractors or any other person not a party to the PERMIT without the DEPARTMENT'S specific prior written consent and notwithstanding the issuance of the PERMIT. Any claims by any contractor or subcontractor will be the sole responsibility of the GOVERNMENTAL AGENCY.
4. The GOVERNMENTAL AGENCY shall take no unlawful action or conduct, which arises either directly or indirectly out of its obligations, responsibilities, and duties under the PERMIT which results in claims being asserted against or judgment being imposed against the State of Michigan, the Michigan Transportation Commission, the DEPARTMENT, and all officers, agents and employees thereof and those contracting governmental bodies performing permit activities for the DEPARTMENT and all officers, agents, and employees thereof, pursuant to a maintenance contract. In the event that the same occurs, for the purposes of the PERMIT, it will be considered as a breach of the PERMIT thereby giving the State of Michigan, the DEPARTMENT, and/or the Michigan Transportation Commission a right to seek and obtain any necessary relief or remedy, including, but not by way of limitation, a judgment for money damages.

5. The GOVERNMENTAL AGENCY will, by its own volition and/or request by the DEPARTMENT, promptly restore and/or correct physical or operating damages to any State Highway Right of Way resulting from the installation construction, operation and/or maintenance of the GOVERNMENTAL AGENCY'S facilities according to a PERMIT issued by the DEPARTMENT.
6. With respect to any activities authorized by a PERMIT, when the GOVERNMENTAL AGENCY requires insurance on its own or its contractor's behalf it shall also require that such policy include as named insured the State of Michigan, the Transportation Commission, the DEPARTMENT, and all officers, agents, and employees thereof and those governmental bodies performing permit activities for the DEPARTMENT and all officers, agents, and employees thereof, pursuant to a maintenance contract.
7. The incorporation by the DEPARTMENT of this resolution as part of a PERMIT does not prevent the DEPARTMENT from requiring additional performance security or insurance before issuance of a PERMIT.
8. This resolution shall continue in force from this date until cancelled by the GOVERNMENTAL AGENCY or the DEPARTMENT with no less than thirty (30) days prior written notice provided to the other party. It will not be cancelled or otherwise terminated by the GOVERNMENTAL AGENCY with regard to any PERMIT which has already been issued or activity which has already been undertaken.

BE IT FURTHER RESOLVED, that the following position(s) are authorized to apply to the DEPARTMENT for the necessary permit to work within State Highway Right of Way on behalf of the GOVERNMENTAL AGENCY.

Title and/or Name: _____

Director of Public Works _____

Administrative Supervisor _____

I HEREBY CERTIFY that the foregoing is a true copy of a resolution adopted by

the Muskegon City Commission

(Name of Board, etc)

of the City of Muskegon

(Name of GOVERNMENTAL AGENCY)

of Muskegon

(County)

at a regular Commission meeting held on the 10th day

of January A.D. 2017.

Signed



Title City Clerk

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25 th , 2022	Title: Skate Park Request For Qualifications
Submitted By: Leo Evans	Department of Public Works
Brief Summary: Staff is requesting authorization to accept the Skate Park proposal submitted by Grindline Skateparks, Inc.	
Detailed Summary & Background: Staff solicited proposals for firms to assist in Phase 1 (Conceptual Design) and Phase 2 (Financing) for the development of a new skate park in the City located primarily within Rotary Park adjacent to the Boys and Girls Club. A copy of the request for qualifications is attached. Five proposals were received and scored by a team of three (Matt Schwemin – City Parks Supervisor, Steve Fink – County DPW/Facilities Engineer, and Don Steigman – Local Skate Park Advocate). Additional seats on the review team were offered to the Boys and Girls Club and Rotary, they both declined to participate in the selection, but wished to remain actively involved and engaged in the development of the project. After independent scoring and rigorous group discussion Grindline Skateparks was determined to be the firm providing the best proposal for this project. Scoresheets are attached showing the average score for each proposal in each category. Grindline also received an excellent reference from the City of Detroit in regards to the Riverside Skate Park built in 2019. A copy of the proposal submitted by Grindline Skateparks is included for reference with this commission packet. We are roughly 2 weeks behind where we had hoped to be at this stage as it took longer than anticipated to complete the scoring and reference checks but we should still be in a good position to host an initial kickoff meeting in November.	
Goal/Focus Area/Action Item Addressed: Destination Community & Quality of Life / Enhanced Parks and Recreation Department and Services	
Amount Requested: \$9,440 (TOTAL)	Amount Budgeted: \$10,000 (22/23)
Fund(s) or Account(s): 101-770 (Parks Maint)	Fund(s) or Account(s): 101-770 (Parks Maint)
Recommended Motion: Award the contract for Phase 1 and 2 services on the Skate Park Development to Grindline Skateparks, Inc. and authorize work to commence.	

Approvals:			Guest(s) Invited / Presenting	
Immediate Division Head	☒	Information Technology		☐
Other Division Heads	☒	Communication		☒
Legal Review	☒			☒
For City Clerk Use Only:				
Commission Action:				

Request For Proposals Scoresheet

Skatepark

Reviewed by:	Matt Schwemin, Steve Fink, Don Steigman					
Date:	11-Oct-22	A.	B.	C.	D.	E.
Firm:	Frontier Skateparks / Greenwald Builders	MCSA / Spohn Ranch	S.E.H.	Carbonsix	Grindline Skateparks	
Location:	Meadowview, VA	East Grand Rapids, MI	Appleton, WI / Muskegon	Grand Rapids, MI	Seattle, WA	

Scoring Criteria		Possible Points				
Qualifications of Team	100	82	90	58	87	92
Understanding of Service	100	77	82	75	83	95
Priced Proposal	100	70	97	85	82	97
Total Score	300	229	269	218	252	284
Rank		4	2	5	3	1

Qualifications of Team - Highlight similar past experiences, and technical competence as it relates to the specific project details and previously completed projects. Include a summary of the items and phases of work that would be self-performed by your firm and any items/phases that would be performed by sub-contractors. Include a brief summary with resumes of the key staff for the project, including any key staff that work for proposed subcontractors. Qualifications of Team limited to three (3) pages of text (Not including resumes and pictures).

Understanding of Service - Include a narrative description of your plan for accomplishing the project. Provide a timeline for the project including key milestones to be met and identify dates for completion of project deliverables. Identify critical areas of the project and your plan for addressing the critical needs. Understanding of Services limited to one (1) page of text (Not including example pictures).

Priced Proposal - Confirm that your firm can complete Phases 1 and 2 for the identified allocation of \$10,000. Cost for the remaining phases will be negotiated based on the design and cost estimates prepared in Phase 1 and the successful identification of a funding mechanism for the project.

GRINDLINE

SKATEPARKS, INC.

Request for Proposals:
Design Services for a Skatepark in
The City of Muskegon, MI.

MUSKEGON



West Michigan's Shoreline City
www.shorelinecity.com





GRINDLINE

SKATEPARKS, INC.

City of Muskegon
Clerk's Office
Skate Park
933 Terrace Street
Muskegon, MI. 49440

Design Services for a Skatepark in The City of Muskegon, MI.

Dear Mr. Evans,

Grindline Skateparks appreciates the opportunity to submit a proposal to the City of Muskegon for design services of a skatepark located at 900 West Western Avenue Muskegon, MI 49441. Grindline was incorporated in Washington State on April 8, 2002 and has since been evolving the art and science of skateparks with a track record of over 300 successful Skatepark design and construction projects nationally and internationally on our resume. When it comes to skatepark specialists, our ability to translate the needs of a community into a new landscape of skateboard terrain is unrivaled by any other company in the world. Grindline can complete all skatepark specific design services including Site Analysis, Community Outreach, Conceptual Design, Cost Estimating, and final Construction Documents.

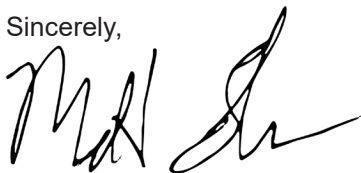
Grindline will manage this project as the Prime Design Consultant to provide a single point of contact throughout the life of this project and we will leverage our existing relationship with ROWE Professional Services Company to provide Civil Engineering, for the project. ROWE's local staff has the necessary skills and qualifications required to support and compliment Grindline in providing a successful project for the Township. ROWE is currently working with Grindline on similar projects in Port Huron, Pontiac, and Flint, MI.

It is our understanding that the City of Muskegon proposes to design and construct a "state of the art" park utilizing the latest skate park design principles and construction with high quality materials to ensure durability and longevity. The skatepark shall answer to the community and City's needs and typically include a mix of street-scape type and transitional style elements to accommodate primarily skateboarders, scooters, and BMX riders. It should be designed to develop and expand a variety of experience and skills, and encourage progressive skill building at all levels. The size of the skatepark is currently planned to be designed around approximately 10,000 square feet. The design shall not only be focused on the functionality, but also engage with the surrounding area and blend into the area with a cohesive sense of place. We understand that during the design phase, the Boys and Girls Club property can afford to lose no more than 8 parking spaces, and should allow for ample room for a driveway or road to be built alongside the east side of the Boys and Girls club building. The design should also include two sidewalks that connect from the Boys and Girls Club parking lot and the Rotary Park. We also are aware that the pine trees on the proposed site should be preserved. There should also be a fence and no features constructed on top of the storm water sewer outfall in the event of needed maintenance.

Within our submission, you will find information about our team, previous project experience, and our design methodology. Our combination of world class skatepark design and knowledge make our team the best fit for your project. Collectively, we are enthusiastic about this project and the prospect of developing a skatepark that will meet the needs of the City and serve as an active recreation destination for the youth and families of the community.

As the CEO of Grindline Skateparks, I am authorized to represent the firm in any negotiations and sign any legally binding contracts for this project.

Sincerely,



Matt Fluegge

GRINDLINE SKATEPARKS, INC.

Our Company

GRINDLINE SKATEPARKS INC.

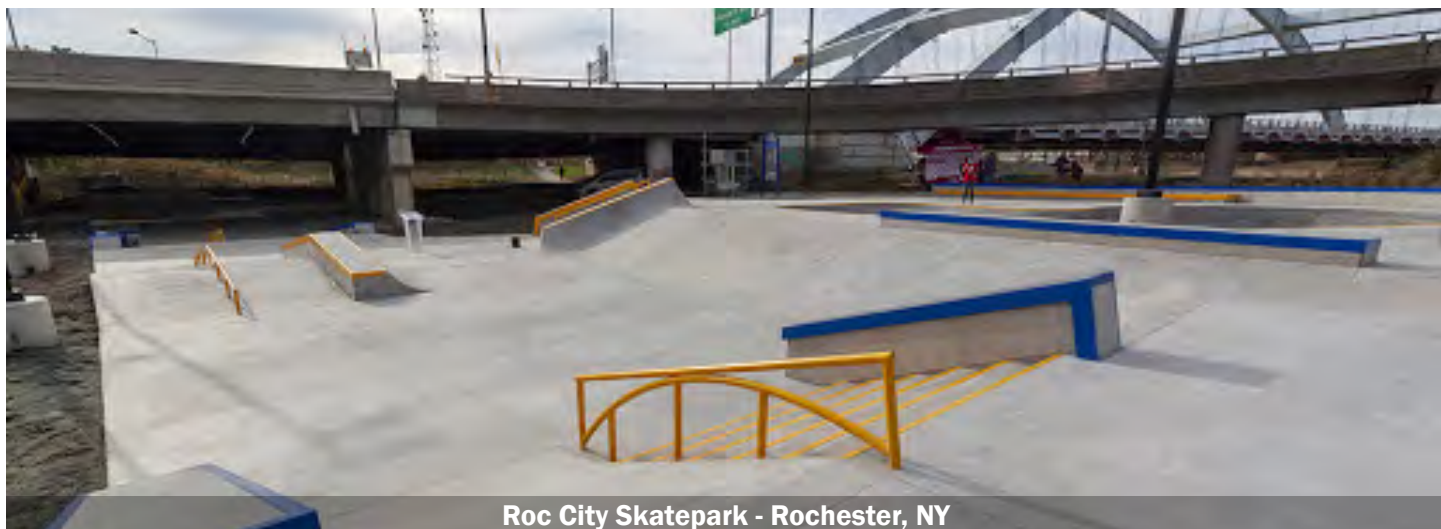
Since 2002, the Grindline team has designed, sculpted, and skated millions of tons of concrete across the United States and around the World. Grindline has developed the full spectrum of skate terrain including street courses, bowl complexes, snake runs, pump tracks, hobbit trails, professional training facilities, skateable sculptures and all those features yet to be named. We translate the needs of local skaters into skatepark designs that will progress with them into the future. Our parks range in size from the largest skatepark in North America all the way down to a single skate obstacle. Regardless of square footage, skaters are riding our parks from dawn to dusk. We have designed and constructed over 300 skateparks to date, from Orcas Island in Washington State to the Holy Lands of Israel, giving us an intimate understanding of building community through skateboarding.

Grindline has extensive knowledge and experience with skatepark design and construction in climates similar to Troy. Similar to other Grindline projects, we will implement specific design and construction techniques to prevent frost heaving or damage from freeze thaw cycles such as air entrained concrete, low slump, minimal water to cement ratio in the concrete mix design and footings placed below frost lines. We recommend the majority of concrete placement during the spring through early fall months to avoid concrete placement in cold weather. We recommend the majority of concrete placement during the summer or early fall months to avoid concrete placement in cold weather. If the schedule does dictate pouring concrete in winter months, we are well versed in cold weather concreting (ACI 306.1) and follow all guidelines set forth by the American Concrete Institute, including but not limited to, taking appropriate measures to thaw sub-grade prior to placement, hot water concrete batching, not non-chloride accelerator, insulated concrete blankets during cure, and tenting and heating during the finishing process. Note - cold weather/hot weather concreting can impact costs significantly, and should be a consideration when developing the overall schedule and budget for the project.

As a contractor specializing in concrete construction, we are highly aware of the effects from the growing amount of hardscape on the environment. On every job, Grindline incorporates green construction techniques such as:

- Recycled concrete for sub base materials
- Fly-ash in our concrete and shotcrete mixes
- On-site stormwater management
- Recycling of construction materials such as formwork and site spoils

Grindline has the appropriate financial and staffing resources to undertake a project of this scope and size. It is the normal means of business for Grindline to manage, design, and construct multiple projects at any given time such that each meets its specific objectives. Our office is staffed such that any given task can be performed on more than one project at any given time. Our multiple construction crews allow for us to construct multiple projects simultaneously. Our positive financial position includes a \$250,000 revolving line of credit with a local commercial bank, surplus cash reserves held with a local bank, over \$380,000 in positive working capital, a bonding program with an A+-rated Surety (Travelers) that supports \$6,000,000 aggregate of projects with a \$2,000,000 single project limit as well as revolving credit accounts with local and national material suppliers.



Roc City Skatepark - Rochester, NY

Our Philosophy



Star Skatepark - Star, ID

A successful skatepark is the result of an entire community coming together to work toward a common purpose. It's our responsibility to engage all interest groups throughout the development of their park and motivate them to work together. We aim to empower skate advocates and community groups by giving them the tools and knowledge they need to make informed decisions about their park. The development process relies on a commitment to collaboration and communication amongst stakeholders. We facilitate the exchange of ideas and information related to aesthetics, safety, crime prevention, as well as programming, and meld these "needs" and "wants" into a successful skatepark. Our principal design philosophy is based on our recognition that every community and project site is unique, requiring a skatepark design tailored to its location. To do so, our approach is based on four fundamentals:

- Open collaboration with the client and community through community involvement & public outreach
- Timeless Designs that appeal to all ages and skill levels
- Integration & Context
- Efficient Engineering, Sustainable Design and Budget Management

DESIGNING FOR DIFFERENT SKILL LEVELS

Grindline's designs offer a Ladder of Progression for skaters to incrementally develop their skills and advance their sport. The skatepark is more than a sum of all its individual elements, it is the overall experience of the park that brings end users back—day after day, week after week.

Beginner

Small and low street elements are among the most important to a balanced skatepark formula. These features can be equally enjoyed by skaters of all skill levels, but are especially fun for beginners.

Intermediate

Intermediate street elements and mellow transitional features are key to successful skatepark planning. These features are accessible to the majority of skaters, and therefore are in higher demand. For skaters working towards advanced street skills, we can include various stair sets and sizes for "step by step" development.

Advanced

Grindline is renowned for including bigger and more challenging transitions that encourage higher speeds and large airs that seasoned skateboarders desire. With endless flow, advanced transitional features attract advanced users from near and far on a weekly basis. For advanced street skaters, the elements incrementally grow in size and difficulty that encourages their continued progression and growth.

Our Creativity

LOCAL IDENTITY & UNIQUE FEATURES

It is important that skateparks incorporate the feel of the local community in creative ways. Grindline has extensive experience of working with communities during the public outreach process to determine how to tie a skatepark in with the community through the use of historical, cultural, geographical, or other thematic elements. Below are some examples.



Natural Connections

Hana Skatepark, Hana, Hawaii

The community of Hana, Hawaii wanted the skatepark to reflect how important surf-ing is in the community and **the volcanic nature of the Hawaiian Islands**. Grindline came up with an organic flowing design with multiple volcanos centrally located. The organic flow reflects the local nature of surfing, while paying homage to the volcanic nature of the Hawaiian Islands.



Regional Context

A-Dog Memorial Park, Burlington, VT

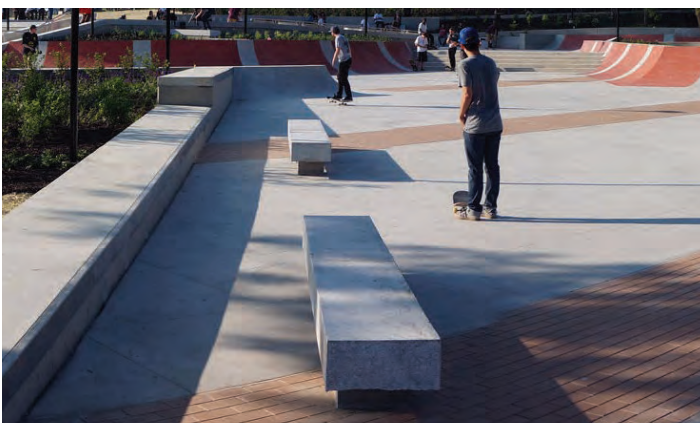
Burlington's new skatepark features a skateable sail sculpture to tie in with **Burlington's rich sailing history** on adjacent Lake Champlain. It also features a manual pad that is shaped like the state of Vermont for a regional tie in.



Cultural Connections

S'klallam Tribe Skatepark, Port Gamble, WA

The place of the salmon in the S'klallam tribe's history and culture cannot be overstated. **The ve stair above set was painted to represent the scales of the salmon** in order to honor it's presence in the lives of the members of the S'klallam tribe.



Historical Re-use

Paine's Park, Philadelphia, PA

Paine's Park in Philadelphia **features recycled granite from both Love Park and City Hall**, both of which were legendary skate spots in the late 90's and early 2000's. As the park is supposed to be the legal replacement for skater's tired of getting kick out of Love Park, we brought an existing skate spot back to life for the skate-boarders of Philadelphia..



Multi-Purpose Features

McVicker Park Skatepark, Lake Elsinore, CA

At McVicker Park, we created a unique seating/skating experience dubbed "Skatium seating." There was an elevation change from the parking lot to the skatepark where the City wanted to build concrete bleachers for event seating. By including transitions at the end of each riser, **Grindline made the bleachers a unique skateable entrance** to the park when not being used for events.



ROWE PROFESSIONAL SERVICES COMPANY

Large-Firm Resources. Personal Attention.



I-69 / I-475 RECONSTRUCTION



MARATHON ROAD BRIDGE



LAND SURVEYING



LAKESIDE PARK



Civil Engineering



Surveying



Aerial Imagery



Landscape Architecture



Planning



Aerial Mapping

Established

1962

Professionals

230+

Offices

8

ENR Top Firm

#76

Website: www.rowepsc.com

Social Media: [f](#) [@](#) [t](#) [v](#) [in](#)



Civil Engineering

Construction Management and Engineering

- Roads/Bridges
- Traffic Engineering
- Pavement Management Systems
- Sidewalks and Bicycle Paths
- Streetscapes

Utility Planning and Analysis

- Sanitary Sewers
- Storm Water Management
- Water Mains
- Water Storage and Wells
- Water and Wastewater Treatment
- Pumping Stations
- Rate Studies

Land Development Services

- Due Diligence
- Site Planning
- Detailed Engineering
- Construction Administration
- Wetland Permitting and Mitigation

Surveying

LiDAR

- Aerial
- Mobile
- Stationary

Survey Types

- Architectural
- Cadastral and Boundary
- Land Title (ALTA/ACSM)
- Retracement
- Right-of-Way
- Topographic Mapping

Additional Surveying Services

- Aerial Control
- Construction Layout and Control
- Government Corners
- Remonumentation
- Mortgage Reports
- Wetland Mapping

Landscape Architecture

- Streetscapes and Enhancements
- Park Design
- Parks and Recreation Plans
- Trailways

Planning

Plan Types

- Land Use
- Comprehensive
- Master
- Parks and Recreation
- Downtown Development
- Tax Increment
- Strategic

Additional Planning Services

- Zoning Ordinances and Maps
- Grant Application Preparation
- Implementation Manuals
- Zoning, Site Plan, and ZBA Review

Michigan

- Flint (HQ)
- Lapeer
- Kentwood
- Farmington Hills
- Mt. Pleasant
- Grayling
- Myrtle Beach

South Carolina

Flint, MI (HQ)

540 S. Saginaw Street
Suite 200
Flint, MI 48502
(810) 341-7500

Lapeer, MI

128 N. Saginaw Street
Lapeer, MI 48446
(810) 664-9411

Kentwood, MI

4345 44th Street SE
Suite A
Kentwood, MI 49512
(616) 272-7125

Farmington Hills, MI

27280 Haggerty Road
Suite C-2
Farmington Hills, MI 48331
(248) 675-1096

Mt. Pleasant, MI

127 S. Main Street
Mt. Pleasant, MI 48858
(989) 772-2138

Grayling, MI

2342 Industrial Street
Suite A
Grayling, MI 49738
(989) 348-4036

Oscoda, MI

212 N. State Street
Oscoda, MI 48750
(Field Office)
(800) 837-9131

Myrtle Beach, SC

6009 Kings Hwy
Myrtle Beach, SC 29577
(843) 444-1020

Grindline Skateparks, Inc.



Matt Fluegge - *CEO, Principal in Charge*

As Grindline's CEO and Senior Project Manager, Matt has the authority and responsibility for the daily management of the project. He develops project scope and budgets, generates accurate cost estimates, oversees preparation of project documents, communicates with clients, and manages schedules. Matt has extensive interdisciplinary experience from leading design teams and working with architects, engineers, surveyors, and artists. Matt reviews and approves all project deliverables, attends site meetings, handles changes in the scope of contracts and gets final acceptance of the projects.



James Klinedinst - *Construction Project Manager*

For this project James will provide cost estimating and QC of construction documents during design. During construction, he'll provide construction support for our onsite foreman and construction crews. James works closely with the design and construction crews to bring projects in on schedule and on budget, with the quality of craftsmanship that Grindline is famous for. He is a highly skilled AutoCAD and Rhino technician with extensive insight towards graphic and drafting multimedia. James is responsible for the preparation of Grindline's construction documents, taking the project from conceptual design to detailed construction bid documents.



Brett Johnson - *Skatepark Designer*

Brett Johnson initially joined the Grindline Team as an intern while in his 3rd year of Washington State University's Voiland College of Engineering and Architecture. With his degree in Civil Engineering and specialty in Structural Engineering, Brett brings highly valuable engineering knowledge to the world of skatepark design. Brett is one of Grindline's Skatepark Designers and AutoCAD Draftsmen. He applies his engineering focus on designing safe and economical skateparks for a changing environment and increases the efficiency in the use of skatepark construction materials.

ROWE Professional Services



Alex Temple, PE - *Lead Civil Engineer*

Alex will coordinate the civil engineering for this project. He has been involved with various recreation and site development projects with ROWE and is a Northville resident. Working from our southeast Michigan office, Alex is within minutes of the site and will be responsive to assist the team. Alex will be an active part of this team by providing the team with background information and experience. He will be available for meetings throughout the project as necessary.



Douglas R. Schultz, PLA - *Lead Landscape Architect*

Doug came to ROWE 21 years ago with nine years of professional experience. He has worked with Alex on various projects as well as other skate park and park improvement projects with ROWE and Grindline within existing park locations. Doug will lead the site design for the project and coordinate quality assurance/quality control (QA/QC) process for ROWE's work.



Matt Fluegge
Chief Executive Officer

EDUCATION

Post Graduate Project Management Program
University of Washington

Bachelor of Landscape Architecture
Washington State University

PROFESSIONAL EXPERIENCE

2003 - Present
Principal Project Manager - Design
Grindline Skateparks

2003 - Present
Principal Project Manager - Build
Grindline Skateparks

Qualifying Party for State Contractor's License
ID, OR, CA, AZ, HI, NM, WV, FL, NC, SC, LA, MS,
MT, WA, VA, UT, GA, TN

OSHA 30 Certification

CESCL Certified Erosion & Sediment Control Lead
WA/OR

BIO

As Grindline's CEO, Matt has overall responsibility for managing the operations and administration for Grindline Skateparks. With 19 years of skatepark experience and 300+ projects completed, Matt ensures that all contract obligations are fulfilled and maintains a high level of communication with clients for the duration of their project. Matt oversees all of Grindline's construction and design projects. He is responsible for developing project scope and budgets, generating accurate cost estimates, overseeing preparation of project documents, communicating with clients, and scheduling projects. Matt has extensive experience working with architects, engineers, surveyors, and artists on interdisciplinary design teams.

PROJECTS

2022

Anacortes, WA (design)
Bainbridge Island, WA
Edmonds, WA
Buffalo, NY Phase 3
Ellicottville, NY

2021

Anchorage, AK
Salida, CO
Wilkeson, WA (Bacon and Eggs)
Auburn, NY
Buffalo, NY Phase 3
Black Diamond, WA
Washington, DC
Baltimore, MD
Jamestown, NY
Springville, NY
Newton County, GA
Seattle Center, WA
Sun Prairie, WI
North Bend, WA
San Juan Capistrano, CA
Dover, DE

2020

Salem, MA
Sun Prairie, WI
Atlanta, GA
Parklane Portland, OR
Milwaukee, WI (TURF)
ROC City Skatepark
*Galveston, TX
Hudson, OH
*Zionsville, IN
Hapeville, GA
Wauwatosa, WI
Wilmington, DE
Zelienople, PA

2019

Anchorage, AK
Spokane, WA
Kalama, HI
Round Rock, TX
Manchester, VT
St. Helena, CA
Adidas Corporate HQ Portland, OR
Ann Arbor, MI
Lake Elsinore, CA
Edmonds, WA
Detroit, MI
Oregon City, OR
Cookeville, TN
North Bend, WA
Maple Valley, WA
Wenatchee, WA

2018

N. Houston BMX Park, TX
Smithfield, UT
Orcas Island, WA
Chico, CA
St Bernard Parish, LA
Allentown, PA

Bainbridge, WA
Smithfield, UT
Baltimore, MD
Columbus, OH
Maple Valley, WA
Oklahoma City, OK
Plymouth, MA
Reading, PA
Stony Point, NY

2017

Issaquah, WA
Palisade, CO
Seattle "Lake City", WA
Wilmington, OH
Darrington, WA
Sheboygan, WI
Leavenworth, WA
Lapwai, ID
Bellevue, WA
Pine Point, MN
San Diego, CA
Coeur d'Alene, ID
Olympia, WA
Madisonville, KY

2016

Monroe, WA
Amherst, NY
Buckley, WA
San Francisco 'Hilltop', CA
Anaheim, CA
Middleton, ID
Lake Stevens, WA
Sonoma, CA
Bryan, TX
Colfax, CA
Boise, ID
Ashdod, Israel
Star, ID
Marshfield, MA
Union Gap, WA
Coeur D' Alene, ID

2015

Portage, WI
Snoqualmie, WA
Montague, MA
Tuscaloosa, AL
Kenmore, WA
New Hanover County, NC
McCook, NE
Atlanta, GA
Portland "Beech", OR
Tuscon, AZ
Pine Ridge, SD
Wounded Knee, SD
Hopkinsville, KY
Amherst, NY
Yellow Springs, OH
Vista, CA
Cypress, TX
Oakland, CA
Zelienople, PA
Israel "Hadera"

Israel "Netanya"

2014

Baker, MT
Tulalip Tribes, WA
Marshfield, MA
Issaquah, WA
Louisville, KY
Cave Junction, OR
Wilkeson, WA
Newburgh, NY
Wilmington, DE

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Philadelphia, PA
Bingen, WA Phase II
Carnegie, PA
Arlington, TX
Seattle "Benefit", WA
Skatercity, Denmark
Spring, TX
Bob Burnquist, CA
Corpus Christi, TX
Scappoose, OR
Rockton, IL
Lakeland, TX
Sturgeon Bay, WI
Milford, CT
Waco, TX
Israel "Rishon"
Israel "B'er Shiva"
Port Gamble, WA

2012

Seattle, WA
- Judkins Park
- Roxhill Park
Medford, NJ
South Kitsap, WA
Cleveland, OH
Tehaleh, WA
Sante Fe, NM
Lahaina, HI
College Park, MD
Seatac, WA
Hana, HI
El Paso, TX
Redlake, MN
Westpoint, MS
Copenhagen, Denmark
Pine Ridge, SD

2011

Atlanta, GA - 4th Ward
Ithaca, NY
Herzelia, Israel
Kfar Saba, Israel
San Marcos Phase 2
San Antonio, TX
Parkersburg, WV
Tacoma, WA - Kandle Park
Vashon, WA

And more...

GRINDLINE



James Klinedinst

Project Manager

EDUCATION

Post Graduate Project Management Program,
University of Washington

Engineering Technology
Western Washington University

PROFESSIONAL EXPERIENCE

2005 - Present
Project Manager
Grindline Skateparks

2017 - Present
Skatepark Assessment Specialist
Grindline Skateparks

20 Years of Construction Experience

OSHA 30 Certification

CESCL Certified Erosion & Sediment Control Lead

BIO

James works closely with the design and construction crews to bring projects in on schedule and on budget, with the quality of craftsmanship that Grindline is famous for. He is a highly skilled AutoCAD and Rhino technician with extensive insight towards graphic and drafting multimedia. James is responsible for cost estimating and construction estimating for bids. He works alongside the design team to cost estimate projects and produce real-time costing based on actual construction costs. James is ready to offer prompt response to anything that may arise during the bid and construction process. James has 18 years of skatepark experience and 300+ completed projects with his time at Grindline.

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Zelienople, PA

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Wenatchee, WA

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Baltimore, MD
Columbus, OH
Maple Valley, WA
Oklahoma City, OK
Plymouth, MA
Reading, PA
Stony Point, NY

2017

Issaquah, WA
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Seattle "Lake City", WA
Wilmington, OH
Darrington, WA
Sheboygan, WI
Leavenworth, WA
Lapwai, ID
Bellevue, WA
Pine Point, MN
San Diego, CA
Coeur d'Alene, ID
Olympia, WA
Madisonville, KY

2016

Monroe, WA
Amherst, NY
Buckley, WA
San Francisco 'Hilltop', CA
Anaheim, CA
Middleton, ID
Lake Stevens, WA
Sonoma, CA
Bryan, TX
Colfax, CA
Boise, ID
Ashdod, Israel
Star, ID
Marshfield, MA
Union Gap, WA
Coeur D' Alene, ID

2015

Portage, WI
Snoqualmie, WA
Montague, MA
Tuscaloosa, AL
Kenmore, WA
New Hanover County, NC
McCook, NE
Atlanta, GA
Portland "Beech", OR
Tuscon, AZ
Pine Ridge, SD
Wounded Knee, SD
Hopkinsville, KY
Amherst, NY
Yellow Springs, OH
Vista, CA
Cypress, TX
Oakland, CA
Zelienople, PA
Israel "Hadera"

Israel "Netanya"

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Vashon, WA

And more...

GRINDLINE



Brett Johnson

Lead Designer

EDUCATION

Bachelors in Civil Engineering
Washington State University

Pierce College
University of Washington

PROFESSIONAL EXPERIENCE

2020 - Present
Lead Designer
Grindline Skateparks

2015 - 2020
Design Associate
Grindline Skateparks

BIO

Brett Johnson initially joined the Grindline Team as an intern while in his 3rd year of Washington State University's Voiland College of Engineering and Architecture. With his degree in Civil Engineering and specialty in Structural Engineering, Brett brings highly valuable engineering knowledge to the world of skatepark design. He uses his skateboarding experience, 3D modeling capabilities, and his advanced CAD drafting skills to both produce and display informed, functional, and buildable skatepark terrain. Brett applies his engineering focus on designing safe and economical skateparks for a changing environment and increases the efficiency in the use of skatepark construction materials.

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Olympia, WA
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Lake Stevens, WA
Sonoma, CA
Bryan, TX
Colfax, CA
Boise, ID
Star, ID
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Union Gap, WA
Coeur D' Alene, ID

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Snoqualmie, WA
Montague, MA
Kenmore, WA
New Hanover County, NC
Atlanta, GA
Portland "Beech", OR
Pine Ridge, SD
Wounded Knee, SD
Hopkinsville, KY
Amherst, NY
Yellow Springs, OH
Vista, CA
Cypress, TX
Oakland, CA
Zelienople, PA
Israel "Hadera"
Israel "Netanya"



Qualifications

ROWE Professional Services Company, founded in 1962, is one of Michigan's leading professional consulting firms, employing more than 230 people in Michigan and South Carolina. ROWE will provide services for this project from our Farmington Hills and Flint offices. ROWE provides civil engineering, land surveying, aerial photography/mapping, landscape architecture, planning, and land development services to its valued clients nationwide.

ROWE has worked with Northville Township on various projects including its current 5 Year Community Recreation Plan. We are currently working with Grindline on similar projects in Port Huron and City of Flint, MI.

Alex Temple, PE *Lead Civil Engineer*



Alex will coordinate the civil engineering for this project. He has been involved with various recreation and site development projects with ROWE and is a Northville resident. Working from our southeast Michigan office, Alex is within minutes of the site and will be responsive to assist the team.

Alex will be an active part of this team by providing the team with background information and experience. He will be available for meetings throughout the project as necessary.

Douglas R. Schultz, PLA *Lead Landscape Architect*



Doug came to ROWE 21 years ago with nine years of professional experience. He has worked with Alex on various projects as well as other skate park and park improvement projects with ROWE and Grindline within existing park locations. Doug will lead the site design for the project and coordinate quality assurance/quality control (QA/QC) process for ROWE's work.

Scope of Work

Project Understanding - Based off the information provided by the City in the RFP, our current understanding of the project is as follows:

- **Conceptual Design** – Includes participation in a kick-off meeting with the designated group of stakeholders to review the proposed location, establish the target size of the park (+/- 10,000 SFT), and identify the potential elements. Upon completion of the kick-off meeting the selected firm shall create preliminary site renderings and cost estimates.
- **Community Outreach** – Includes presenting the conceptual design material and cost estimates in a community meeting format and soliciting feedback from the wider public, possibly through a survey.
- **Concept Revision** - Includes refinement of the conceptual designs and preparation of final renderings and cost estimates for the selected alternative. Cost estimates should be all inclusive of construction costs, engineering fees, permit fees, future maintenance costs, etc... The goal is to ensure that fundraising efforts successfully cover all necessary costs for construction and perpetual care.
- **Concept Finalization** – Includes hosting a second community meeting to present the final design details.
- **Detailed Design** – Upon identification of an appropriate fundraising mechanism for the project, the selected vendor will be directed to complete a detailed design for the site including all appropriate survey, plans, specifications, and complete contract documents for bidding.
- **Bid Solicitation** – Vendor shall assist the city in obtaining bids for the entire project, and/or for any individual components of the project that are not directly performed by the selected vendor. The city's preference is to hire a vendor that can design and construct the skate park. City purchasing policy guidelines shall be followed for any items sent for bidding, and any vendors involved in the construction phase shall be required to comply with all standard City policies and procedures regarding contracting.
- The Boys and Girls Club property can afford to lose no more than 8 parking spaces as a result of this project.
- The design should allow ample room for a driveway/road to be constructed along the east side of the Boys and Girls Club building in the future if/when that is ever needed.
- The design should include two (2) sidewalk connections between the Boys and Girls Club parking lot and Rotary Park. Two (2) connections exist currently; they can be maintained in their existing state, or rerouted as a part of the design.
- The mature pine trees on the south end of the identified area should be preserved if possible with a preference to incorporate them into the design.
- The skate park should include fencing along the perimeter where necessary to comply with standard practices. Appropriate separation and access should be maintained between the existing playground features and the proposed skate park.
- There should be no primary features constructed on top of the storm sewer outfall in the event it requires future maintenance. Consideration could be given to potentially removing the enclosed storm sewer outlet and incorporating an open channel for the outlet into the design of the park.

Scheduling - Each of our Project Managers have completed formal educational training, receiving post graduate certificates from University of Washington Project Management Program. We are well versed in Critical Path Method (or CPM) scheduling for both design and construction, and will tailor our customized CPM Master Schedule Template to your project specifically. Through close communication with the Project Team we will develop a list of appropriate tasks throughout the lifecycle of project, while identifying key deliverables and milestones within each of the project phases. Our experience with Microsoft Project software allows us to revise schedules on the fly if needed and communicate that information back to the project team. During construction each of our foreman is equipped with mobile daily reporting software which allows our PM's to get information that may impact schedule and/or budget from the field immediately so that we can alert the Owner's Representative and determine the best course of action.

Budget Control - With Grindline's vast experience in Skatepark projects, we understand the unique set of challenges that accompany the design/build approach. Here at Grindline we see the Design/Build approach as an opportunity to maximize a project budget through the following:

1. Preliminary organized framework that is easy for all parties to understand and decipher.
2. Complete budget transparency through design and construction.
3. Treating the budget as a living document where changes can be easily tracked and traced.
4. Engaging all stakeholders to prioritize the project elements and maintain sort of a project "menu" based on those priorities.
5. Organized accounting and project tracking throughout in order to provide backup upon request for any project costs incurred.

A revised budget document will be prepared and submitted at every design submittal phase throughout the design process. For use of preliminary estimating, we maintain a significant data base of past bids and proposals from the last 18 years and are constantly updating material and labor costs in the areas we work in. Grindline works on a nationwide basis with both public and private projects and we continually document budget trends to assist clients in developing realistic budgets. As we move through the project we will constantly value engineer the project to maximize your budget. As the design develops, we will reach out to and solicit local subcontractors for hard costs in order to lock in a project program based on the refined budget document.

If the projected costs are significantly below budget levels, we will present and discuss possible project scope expansions to take advantage of project scale in lowering unit costs. Should the projected costs exceed the budget, we will revisit the design elements, materials and methods to determine where changes can be made without sacrificing important project goals. In both cases, the final decisions on scope increases or reductions remains with the Township, and in both cases, the project would not intentionally move forward without a resolution to the issue.

Progress Reports and Required Meetings – We have provided review/coordination meetings in our scope of work at important milestones but the interval and timing of actual Progress Review Meeting will be determined at the Project Kick-off meeting. Prior to each Progress Review Meeting, the Design Team will submit an updated schedule and all completed or partially completed plans, specifications and estimates which have been developed or altered since the last Progress Review Meeting

PHASE 1A: PROJECT STARTUP

i. Obtain site information: Grindline will review existing site information and determine what additional information is required to complete the design. We will schedule and acquire an Existing conditions Survey for the skatepark site.

ii. Project Kick Off Meeting: Grindline will meet virtually with the City committee and any other key stakeholders to discuss and analyze project objectives including scope, schedule and budget. A communication plan will be made to identify preferred communication methods. Key meetings and deliverables will be scheduled and areas requiring coordination such as public meetings, online forums and exchange/review of documents will be identified. The discussion will identify any outstanding issues with the project, and propose solutions for any issues identified.

iii. Site Analysis: Grindline and the Project Team will perform a Site Analysis to review the existing conditions, explore opportunities and constraints of the site, evaluate and review current usage of existing skatepark, adjacent park facilities, and programming spaces to assist in design development.

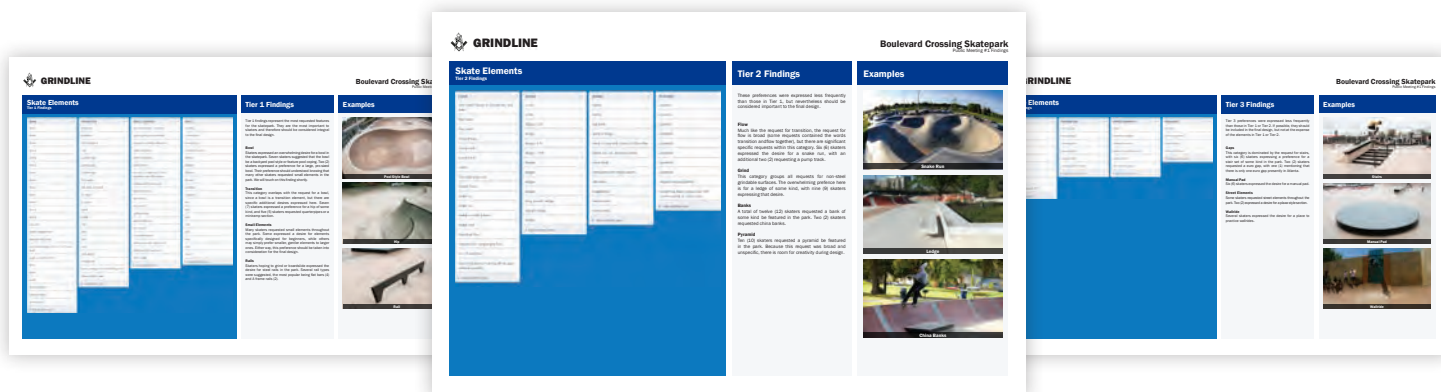
Existing Site Conditions - The proposed site area for the skatepark is on a flat area adjacent to the lake. These will factor into how drainage is planned heavily. The area also has two intersecting walking paths, meaning implementing elements of CPTED will be feasible. The site has a handful of trees but besides this is grass meaning a minimal impact on natural vegetation will happen when adding the skatepark. Stormwater will be directed to a bioretention and infiltration area designed to accommodate the required storm events. Only areas that need to be cleared for construction will be cleared minimizing the impact the existing natural vegetation.

Current and Planned Improvements - The skatepark must integrate with existing and future adjacencies at the Receptions. Restrooms, walkways, connection paths, park seating, non-skatepark play areas, and parking all play roles in the skatepark placement on site. We will look at the siting of current skatepark as well as connections to and from the skatepark.

External Circulation & Public Safety - We look at how users get to the skatepark, whether by car, board, bike, foot, public transportation, and determine if any improvements need to be included in the current and future phases of the project to allow safe access to the skatepark. And, as in any park where younger citizens will gather, we put CPTED principles into practice to discourage or impede criminal behavior and, at the same time, encourage honest citizens to keep a watchful eye.

Internal Circulation - Proper placement of amenities, traffic patterns, and circulation through the park are reviewed. We scrutinize the location and placement of the proposed skate features to create smooth flow through the skatepark and avoid potential collision routes or blind spots. We identify safe paths for spectators in the skatepark by properly locating entrances to the facility and including passive zones for viewing or resting areas.

iv. Virtual Public Design Workshop #1: Grindline proposes a Virtual Public Design Workshop on the same day as the kick off meeting and site visit to get input from stakeholders on the type of features to be included in the skatepark design. The goals of this workshop is introduce Grindline to community, explain the design/public input process, and share how the community drives the project development. We provide end users with the project specific knowledge the need to make informed decisions that will determine the ultimate vision for the skatepark. In order to address varied ideas and ideals about skatepark design, this workshop will be highly interactive. In addition to vetting important issues through meaningful discussion, we encourage other types of 'hands on' involvement such as writing, sketching, and real time modeling of park ideas/elements alongside our team. We then build consensus by identifying commonalities among different stakeholders to drive the skatepark design. Our social media channels are always open to collect feedback from the community in the event members cannot attend in person or wish to comment later the process.



ABOVE: ANALYSIS OF FINDINGS FROM PUBLIC MEETINGS

v. Coordination Meeting #1 Grindline will summarize all information collected in task 1a - 1d in a Project Startup Report and submit for review by the Project Team. Via phone conference/online meeting, the Grindline and the Project Team will meet to discuss the Project Startup Report and analyze the direction for moving forward with the design of the Skatepark. Solutions will be proposed for any issues identified in the Project Startup Report

PHASE 1A DELIVERABLES

Project Startup report addressing the following:

- Site Inventory / Analysis identifying site opportunities and constraints
- Recommendations for renovations and repairs to the existing park with associated costs for each item Updated schedule and preliminary budget
- Summary of Input from Virtual Public Design Workshop #1

PHASE 1B & 2: CONCEPTUAL DESIGN

Skate parks are more than athletic facilities. They are gathering places and can be focal points for other activities like concerts, competitions or community events. Facilities must be designed to meet skating demands, incorporate areas for spectators, and to appropriately blend with their existing surroundings. Through the use of custom materials and the placement of green space in and around the design, the skatepark ties into the overall form and function of its setting. Conceptual Designs illustrate our skatepark philosophy to key stakeholders and the community in interactive, full color presentations of the custom skate features and facilities included in the project. 3D models allow us to clearly and effectively communicate our skatepark concepts to the client and community as well as assist in the development of accurate cost estimates and material take-offs. The result is a design produced from the ideas and recommendations of ALL stakeholders involved with the project.

i. Preliminary Concept: Based on the findings in the Project Startup and direction from the Project Team, Grindline will develop 3 Preliminary Conceptual Designs and submit for review. These will be submitted in both a plan view with elevations and multiple three-dimensional renderings, and include both the actual skatepark and proposed amenities. The submission will also include a revised budget document and quantity of material estimates for review.

ii. Virtual Public Design Workshop / Coordination Meeting #2: In a virtual meeting like Public Design Workshop #1, Grindline will present the Preliminary Concept and get feedback. Concepts will be presented through a combination of photos, Power Point slides, large presentation boards, and interactive 3-D models. Input collected at this meeting will be used to create the final concept.

iii. Final Concept: Based on input and direction from Task 2b, Grindline will create a Final Concept and submit for review. Similar, to Task 2a, will be submitted in both a plan view with elevations and multiple three-dimensional renderings, and include both the actual skatepark and proposed amenities. The submission will also include cost and quantity of material estimates for review.

PHASE 1B & 2 DELIVERABLES

- Preliminary and Final Concepts submitted in 3d renders and site plan
- Updated budget and quantity of material estimates with each submittal



Manchester Skatepark Concept - Manchester, VT

PHASE 3 CONSTRUCTION DOCUMENTS

Cutting edge design and drafting software are important tools for our designers, draftsmen and engineers use to convert concepts into permit ready construction drawings. The latest versions of AutoCAD and Rhinoceros software give us the ability to develop dimensionally correct design concepts from the beginning of design development. Viewing the 3D model alongside a full set of construction documents and technical specifications give us an opportunity to check adherence to local building codes and engineering requirements. Drawings are produced in ACI, ASTM, CSI, or state organizational formats. We are also well versed with ASTM Section F2334 – Standard for Above Ground Public Use Skatepark Facilities, ASTM F2480 - 06 Standard Guide for In-ground Concrete Skateparks, as well as Skaters for Public Skateparks Public Skatepark Development Guide, the industry's most frequently used reference publications.

i. Coordination Meeting #3: Grindline will meet with the Project Team via phone / internet to discuss the Final Concept. The final approved concept will be used to create detailed plans and specifications for construction and meet any permitting requirements.

ii. Construction Documents: Construction Documents will be submitted at a 50%, 90%, and 100% level and will include high quality, professional construction drawings, details, specifications and cost estimates for all aspects of the skate improvements. The documents will include an updated estimate of probable costs and material quantities for the skatepark.

Construction document submissions will include the following:

- Site Plan & Details
- Grading Plan (by others)
- Erosion Control Plan (by others)
- Drainage Plan (by others)
- Skatepark Materials Plan
- Skatepark Vertical Controls
- Skatepark Horizontal Controls
- Skatepark Jointing Plan
- Skatepark Sections
- Skatepark and Site Details
- Technical Specifications
- Final cost estimate and quantity of materials estimate for skatepark

iii. & iv. Coordination Meetings #4 and #5: After each Construction Document submittal, Grindline will meet with the Project Team via phone / internet to have a “page turn” review of the submittal and gather feedback and direction on revisions to be included in the next submittal.

PHASE 3 DELIVERABLES

- Final Approved Concept
- 50%, 90% and 100% Construction Documents including plans, specs and updated cost / quantity of materials estimates for the project.
- Updated Schedule for remainder of the project



PHASE 4: CONSTRUCTION SUPPORT SERVICES (optional)

i. Bid Assistance: The Design Team will provide pre-qualification language that the Town can insert into the bid documents to ensure that only capable firms with a successful track record of building skateparks similar to the scope and scale of this one can bid on the project. The Design Team will attend the pre-bid meeting is available to respond to any RFI's during bidding. Preparation of an addendum shall be completed by the Design Team and reviewed/approved by the Town if required.

ii. Construction Support: The Design Team will attend the pre-construction meeting and conduct site visits/ field inspections during construction. Each field visit/inspection would be followed up with a field report and digital photos noting any items needing correction, as well as general comments based on the field visit. An onsite inspection would be given upon substantial completion and the Design team would produce a report listing all punchlist items to be completed prior to acceptance of the project. The Design Team will also complete the following services during construction.

PHASE 4 DELIVERABLES

- Provide pre-qualification language for bid package
- Attend pre-construction meeting.
- Review and approve all required shop drawings and submittals.
- Field report for each site visit
- Punchlist report
- Review all payment requests for the project to ensure project completeness.
- Review and assist any change orders that may come up in the project.
- Prepare and deliver as-built plans of the project at the conclusion of the construction.
- Provide a copy of all records to the Client

PROGRAMMING, OPERATIONS & MAINTENANCE

At Grindline our motto is "Grindline for Life". When you hire Grindline we embrace your community and are with you long after the Grand Opening. While a Grindline skatepark is a self-sufficient venue for year-round recreation, planning and care will add to the success of the project. Grindline has done numerous projects with multiple phases (such as Hideaway Park in Winter Park) and we provide maintenance plans to enhance the lifespan of your skatepark. Grindline has valuable relationships with organizations such as Skate Like a Girl, United States Skateboarding Education Association, and the Stronghold Society who collectively advocate for skateboarding and host programs to give local youth access to the sport. Programs such as skate lessons, skate camps, contests and demonstrations provide opportunities to further support the skateboarding community.

Our collective experience in the field of skatepark design and construction also gives us the knowledge to assess skateparks in terms of physical condition and carry out maintenance and repair actions to extend the life of a skatepark. On aging skateparks, we can evaluate the current function and condition of the skatepark, provide cost of repairs, and create a service plan for ongoing maintenance and/or repair.



Tibbett's Valley Skatepark - Issaquah, WA



Andy Macdonald at the Riverside Skatepark Grand Opening

Detroit's massive revitalization effort includes redevelopment of multiple parks along the east side of the Detroit River. Riverside Park is now a park and promenade extending along the city's three-mile riverfront, revitalizing a patchwork of abandoned factory sites and drawing residents and tourists back downtown. **The 21,000 sq ft skatepark at its epicenter includes replicas of the Heart Plaza manual pad fashioned in the style of a Motown vinyl record and the Fort Street handrail, a local iconic (yet illegal) street skating spot recently decommissioned by the installation of parking bollards.**

Riverside Skatepark Detroit, MI

OWNER

City of Detroit, MI

GRINDLINE'S SCOPE

Skatepark Designer & Contractor

DESIGN

February – August 2017

CONSTRUCTION

July 2018 – February 2019

BUDGET

Design: \$22,350

Construction: \$726,500

SIZE

21,000 SQ FT

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

CONTACT

Tim Karl, LLA

Chief of Landscape Architecture

City of Detroit

(313) 224-3484

Email: tkarl@detroitmi.gov



The City of Salida in Partnership with Friends of Salida Skatepark (FOSS), a non-profit organization committed to making this project happen, requested Design/Build Proposals for a new skatepark located at the forefront of Centennial Park, which already hosted an indoor aquatic center, as well as several outdoor active use areas. Grindline was selected as the Design/Builder for the project based a qualification based selection criteria. The existing site conditions required that the skatepark footprint to meander through the park's existing mature trees, while carefully avoiding encroachment into any root system areas. The Grindline design team worked closely with both the City and FOSS to produce a skatepark with a variety of terrain as requested while utilizing the site context to design a park that appears as though it must have always been there. Additional aesthetic attention was given to the park by using an integral concrete color plan which reflected the Rocky Mountains, colored brick stamped banks, and even a heart shaped center island in one of the flow bowls to pay homage to the City's mantra, "Heart of the Rockies."

Salida, CO Salida Skatepark

OWNER

City of Salida, CO

GRINDLINE'S SCOPE

Skatepark Designer & Contractor

DESIGN

August 2020

CONSTRUCTION

November, 2020 - August 2022

BUDGET

Design: \$81,122

Construction: \$711,416

SIZE

14,700 SQ FT

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

Kevin Lane

Foreman

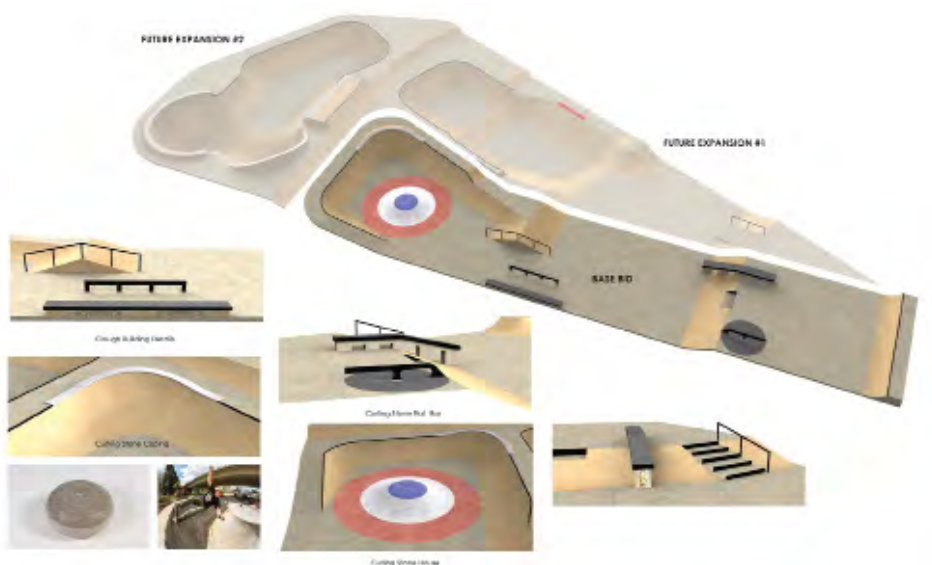
CONTACT

Mike 'Diesel' Post

Director of Parks and Recreation

719-966-9378

diesel.post@cityofsalida.co



The Portage Family Skate Park (PFSP) is an example of the power of teamwork and perseverance. Rather than putting together a skatepark committee comprised solely of skaters, the PFSP assembled a diverse team comprised of leaders from many different areas of the local community in the early 2000s. In 2016, after years of fundraising, Grindline was hired to design a phased skatepark with a total size of 10,000 sq ft. Grindline worked with the City and PFSP to design a park that met the needs of the community and also conduct construction administration, ensuring the project was built to plan and spec. The first of three phases of the Portage Skatepark was finally built. The community soon began teaching skateboard basic programs at the park through the Parks & Recreation Department. In 2020 the Portage Family Skatepark secured the funding necessary to construct phase 2 and Grindline was hired to construct it. Grindline was able to complete the phase 2 construction during the height of the Covid pandemic safely while making sure the budget and schedule were maintained. No change orders were needed for the project. The PFSP is diligently fundraising for phase 3 with the goal of construction in 2022.

Portage Family Skatepark Portage, WI

OWNER

City of Portage, WI

GRINDLINE'S SCOPE

Skatepark Designer
General Contractor Phase 2

CONSTRUCTION

Design - June 2016
Phase 2 Construction - Summer 2020

BUDGET

Design - \$26,880
Construction Admin. Phase 1
\$14,875
Construction Phase 2 \$134,500

SIZE

10,000 SQ FT

PROJECT TEAM

Matt Fluegge
Project Manager

Micah Shapiro
Lead Designer

CONTACT

Kyle Little
President
Portage Family Skate Park Project
portageskatepark@gmail.com
(608) 697-5960



In Spring 2013 Grindline was contracted by the City of Star to create a conceptual design for a skatepark that was to be incorporated into the Hunter Creek Sports Complex. The concept and associated cost estimate was to be used for grant applications and other fundraising activities. Through a series of community meetings and online forums, Grindline presented and refined concepts until a preferred concept was achieved. **Design aesthetics include incorporating the city logo and unique color patterns throughout the park.** The concept was approved by city council December 2013, and the community began an active fundraising campaign to acquire the construction funds. Once the funding was secured in spring of 2016 Grindline returned to Star to construct the skatepark. The project was completed in November 2016 and has opened to rave reviews.

Star, Id Star Idaho Skatepark

OWNER

City of Star, ID

GRINDLINE'S SCOPE

Skatepark Designer
& Contractor

DESIGN

June - December 2013

CONSTRUCTION

June - November 2016

BUDGET

Design: \$34,220

Construction: \$397,880

SIZE

16,000 SQ FT

PROJECT TEAM

Matt Fluegge
Senior Project Manager

Dave Palmer
Site Foreman

Eddie Lawrence
Site Superintendent

Mackay & Sposito
Civil Engineering
Landscape Architecture

PROJECT TEAM

Tom Erlebach
Star Skatepark Committee
Chairperson
208 863 0195
tominstar@cableone.net



After 15 years of use and harsh Vermont winters the existing Manchester skatepark was severely dilapidated and in need of replacement. The Town of Manchester, together with the Manchester Skatepark Committee, decided to develop a world-class skatepark in Southern Vermont to replace the existing skatepark. The Town received \$50,000 in matching funds, a donation of land, and a pledge to manage and maintain the park. Consensus was for a phased design with a total size of approximately 20,000 sq ft. The design was a collaborative effort with Grindline, Town Staff, Skatepark Committee members, and community members working together to toward the best possible design. Additional funding came in while Grindline was onsite constructing phase 1, and an additional 1,000 sq ft were added to construction phase of the project. The project opened in Fall of 2019, and the community is currently raising funds for phase 2 to be constructed in the spring of 2020.

Manchester Skatepark Manchester, VT

OWNER

City of Manchester

GRINDLINE'S SCOPE

Skatepark Designer & Builder

DESIGN

July 2018 – May 2019

CONSTRUCTION

June – Sept. 2019

BUDGET

Design: \$29,500

Construction \$305,000

SIZE

Design 20,000 sq ft phased skatepark
Construction of Phase 1 (6,000 sq ft)

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

CONTACT

John P. O'Keefe

Town Manager

(802) 362-1313

j.okeefe@manchester-vt.gov



Grindline was selected as the Design/Build firm to renovate the Rhodes Park Skatepark. The existing skatepark consisted of metal ramps on a large slab located under Interstate 84 in downtown Boise. The goal was to create a facility that would provide for the needs of local end users as well as serve as a world class regional attraction. Funding was provided by the Albertson's Foundation, a local non-profit organization, as well as the Boise Skateboard Association, the advocacy group that got the project off the ground. The design needed to balance the challenges of being located under a major transportation artery and working around numerous underground utilities onsite with the criteria of being a world class facility. Grindline collaborated with all stakeholders to come up with a unique design that met the needs of local users and will be a regional attraction for skateboard tourism. **Rhodes Park opened in April 2016 and is already a popular venue for X Games competition.**

Boise, ID Rhodes Park Skatepark

OWNER

City of Boise, ID

GRINDLINE'S SCOPE

Skatepark Designer & Contractor

DESIGN

February - July 2015

CONSTRUCTION

August 2015 - May 2016

BUDGET

Design: \$75,432

Construction: \$1,130,000

SIZE

35,000 SQ FT

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

Dave Palmer

Site Superintendent

CONTACT

Ken Fisher

Owner Rep.

208-867-3652

kjfisher@cablone.net

Josh Davis

Boise Skateboard Association

208-869-2487

jmlsd@gmail.com



After 15 years of use and harsh Vermont winters the existing Manchester skatepark was severely dilapidated and in need of replacement. The Town of Manchester, together with the Manchester Skatepark Committee, decided to develop a world-class skatepark in Southern Vermont to replace the existing skatepark. The Town received \$50,000 in matching funds, a donation of land, and a pledge to manage and maintain the park. Consensus was for a phased design with a total size of approximately 20,000 sq ft. The design was a collaborative effort with Grindline, Town Staff, Skatepark Committee members, and community members working together to toward the best possible design. Additional funding came in while Grindline was onsite constructing phase 1, and an additional 1,000 sq ft were added to construction phase of the project. The project opened in Fall of 2019, and the community is currently raising funds for phase 2 to be constructed in the spring of 2020.

Manchester Skatepark Manchester, VT

OWNER

City of Manchester

GRINDLINE'S SCOPE

Skatepark Designer & Builder

DESIGN

July 2018 – May 2019

CONSTRUCTION

June – Sept. 2019

BUDGET

Design: \$29,500

Construction \$305,000

SIZE

Design 20,000 sq ft phased skatepark
Construction of Phase 1 (6,000 sq ft)

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

CONTACT

John P. O'Keefe

Town Manager

(802) 362-1313

j.okeefe@manchester-vt.gov



The story of Cookeville Skatepark is a prime example of collaboration done right. The City of Cookeville first expressed the desire to redevelop an abandoned swimming pool into a 12,000 sq ft skatepark in the spring of 2016. They worked together with HFR to prepare an LPRF grant application to the State of Tennessee. **HFR developed a preliminary floor plan and site plan along with an estimate of probable construction costs for the application.** Upon award of the grant, HFR was selected by the City to continue the design process of the project. **HFR then turned to Grindline to administer two public meetings for the conceptual design of the park.** The result is a beautifully balanced design combining flowy street features and bowls of varying depths to accommodate skaters of all ability levels. The existing pool house was being re-purposed into an ADA accessible restroom facility for the skatepark in addition to receiving some general building improvements.

Parkview Park Skatepark City of Cookeville, TN

OWNER

City of Cookeville

GRINDLINE'S SCOPE

Prime Designer & Contractor

DESIGN

Summer 2018

CONSTRUCTION

April 2019

BUDGET

Design: \$16,183.49

Construction: \$399,800

SIZE

10,000 SQ FT

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

CONTACT

Rick Woods

Director

Cookeville Leisure Services
and Public Facilities

rwoods@cookeville-tn.gov

(931) 520-5284



Jake's Skatepark at Rash Field in Baltimore is named in memory of Jake Owen, a South Baltimore resident, avid skater, and sports lover, who was tragically killed in 2011 by a cell phone-distracted driver. Jake's Skatepark will be located on the west side of Rash Field in Baltimore's revitalized Inner Harbor. **The park's unique design was inspired by the shape of nearby Fort McHenry, the military base turned historical landmark where the Star Spangled Banner was written during the War of 1812.**

Jake's Skatepark Baltimore, MD

OWNER

Waterfront Partnership of Baltimore

GRINDLINE'S SCOPE

Skatepark Designer

DESIGN

May 2017 - February 2019

BUDGET

Design: \$38,000

Construction: \$477,000

SIZE

8,700 SQ FT

PROJECT TEAM

Matt Fluegge

Project Manager

Micah Shapiro

Lead Designer

CONTACT

Ben Hyman

Director of Special Projects

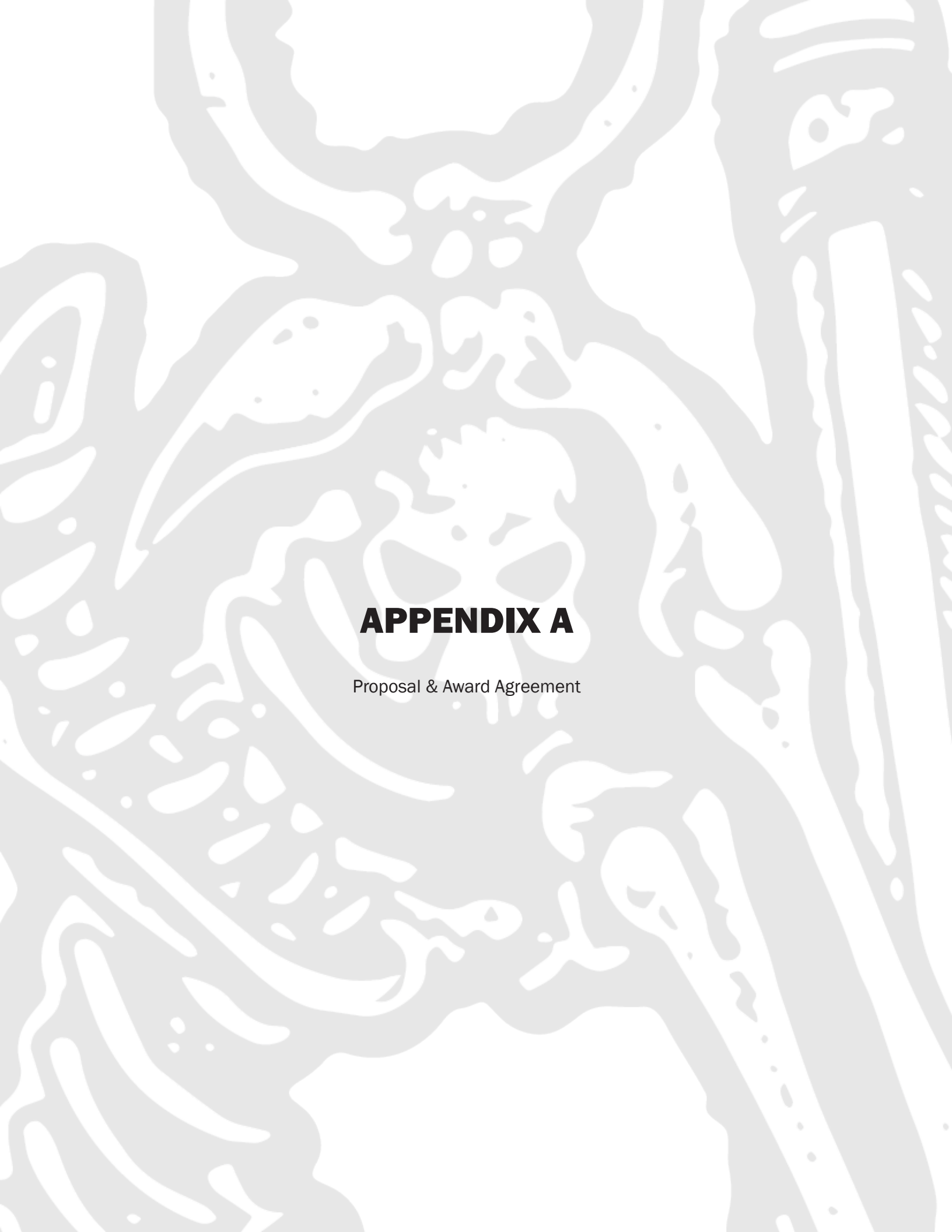
Waterfront Partnership Of Baltimore

ben@waterfrontpartnership.org

443-779-3308 x5310

Muskegon Skatepark Design Fee Proposal

<i>Item</i>	<i>Labor</i>	<i>Quantity</i>	<i>Unit</i>	<i>Rate</i>	<i>Cost</i>	<i>Totals</i>
PRELIMINARY DESIGN (Phases 1 & 2)						
Project Startup, Site Visit, 1st Open House						
	Principal	2 hrs		\$165.00	\$330.00	\$800.00
	Lead Design	2 hrs		\$145.00	\$290.00	
	Design Associate	2 hrs		\$90.00	\$180.00	
Preliminary Design Development						
	Principal	4 hrs		\$165.00	\$660.00	\$4,320.00
	Lead Design	24 hrs		\$145.00	\$3,480.00	
	Design Associate	2 hrs		\$90.00	\$180.00	
Final Conceptual Design						
	Principal	4 hrs		\$165.00	\$660.00	\$4,320.00
	Lead Design	24 hrs		\$145.00	\$3,480.00	
	Design Associate	2 hrs		\$90.00	\$180.00	
Total Services						\$9,440.00

The background of the page features a large, stylized, light gray illustration of a tree. The tree's branches are thick and gnarled, with a central trunk on the right side. In the upper-middle section of the tree, a human skull is integrated into the branches, facing forward. The overall style is graphic and somewhat macabre.

APPENDIX A

Proposal & Award Agreement

PROPOSAL & AWARD

The undersigned having become thoroughly familiar with and understanding of all the proposal documents attached hereto, agrees to provide the services as specified herein, for the total fees as stipulated herein, subject to negotiation.

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this proposal which will become a binding contract if accepted by the City of Muskegon.

I hereby state that I have read, understand and agree to be bound by all of the terms of this proposal document.

Signature  Title Chief Executive Officer

Print Name Matt Fluegge Date September 20th 2020

Firm Name Grindline Skateparks Inc.

Address 4619 14th Ave SW, Seattle WA 98106

Telephone No. 206 612 3401

E-Mail matt@grindline.com

Fax No. _____

MUSKEGON



West Michigan's Shoreline City

www.shorelinecity.com

CITY OF MUSKEGON

REQUEST FOR QUALIFICATIONS

PROJECT NAME:

Skate Park

DATE OF ISSUANCE:

August 22nd, 2022

DATE PROPOSAL DUE:

September 20th, 2022

ISSUING OFFICE:

City of Muskegon
c/o – Leo Evans
1350 East Keating Avenue
Muskegon, MI 49442
Tel. (231) 724-6920

TABLE OF CONTENTS

PROPOSAL & AWARD	3
INSTRUCTIONS TO BIDDERS.....	4
SPECIFIC PROJECT INFORMATION.....	6
CONTENTS OF PROPOSAL	9
EVALUATION	9
TENTATIVE SCHEDULE FOR AWARD	10
INSRUANCE REQUIREMENTS.....	11

ATTACHMENT A – PROJECT VICINITY MAP

Note: Should any of the pages or documents listed above be missing from your packet, or if you have any questions regarding this RFQ, please contact Leo Evans at the City of Muskegon via (231) 724-6920 or via E-mail at Leo.Evans@shorelinecity.com

PROPOSAL & AWARD

The undersigned having become thoroughly familiar with and understanding of all the proposal documents attached hereto, agrees to provide the services as specified herein, for the total fees as stipulated herein, subject to negotiation.

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this proposal which will become a binding contract if accepted by the City of Muskegon.

I hereby state that I have read, understand and agree to be bound by all of the terms of this proposal document.

Signature _____ Title _____

Print Name _____ Date _____

Firm Name _____

Address _____

Telephone No. _____

E-Mail _____

Fax No. _____

INSTRUCTIONS TO BIDDERS

PROPOSALS

All proposals must be submitted following the proposal format supplied by the City of Muskegon in this document and shall be subject to all requirements of this document.

The City may consider as irregular any proposal in which there is an alteration of or departure from the format stated in the documents, and at its option may reject the same.

Each bidder will include in their proposal a listing of each principal firm and the names of any proposed sub-consultant/contractor and the name and address of each office which may be involved in the project.

Before executing any subcontract, the successful firm shall submit the name and principals of any proposed subcontractor for prior approval.

SUBMITTAL OF PROPOSALS

Three (3) copies of the proposal documents shall be submitted in a sealed envelope:

City of Muskegon
Attn: Clerk's Office
RE: Skate Park
933 Terrace Street
Muskegon, MI. 49440

The envelope shall be clearly marked on the exterior denoting the name of the firm submitting the proposal and the name of the particular RFP for which the proposal is offered.

The proposals shall be submitted by no later than 2:00 PM on Tuesday, September 20th, 2022.

AWARD / REJECTION OF PROPOSALS

The City reserves the right to reject any and all proposals and to waive any irregularity in proposals received whenever such rejection or waiver is in the best interest of the City. The bidder to whom the award is made will be notified at the earliest possible date. All bidders submitting proposals will be notified when the award is made.

Award will not be completed until confirmed and recommended by the City Commission.

CITY RESPONSIBILITIES

The City of Muskegon will provide information as to the City's requirements for the project and make available pertinent information which may be useful in the project work.

The City will designate a person to act as the City's Project Manager (Leo Evans) with respect to the work to be performed. Such person will have the authority to transmit instructions, receive information, interpret and define the City's policies and decisions with respect to elements pertinent to the project.

The City will examine all studies, reports, estimates, proposal, and other documents prepared by the bidder and render in writing, if necessary, decisions pertinent thereto within a reasonable time.

The City will direct the consultant in writing to begin the work on each phase of the project upon receipt of written evidence from the firm of the appropriateness of such action.

The City will direct the bidder in writing to furnish any special services, sub-consultants and/or extra work that may be required on the project upon receipt of written evidence from the firm detailing as to cost, time schedule, and reason for such special service or extra work.

SPECIFIC PROJECT INFORMATION

INTRODUCTION TO PROJECT

The City of Muskegon is seeking proposals from qualified full-service firms to assist in the design and construction of a new skate park within the City of Muskegon. The City of Muskegon previously had a skate park which has become obsolete and is essentially fully abandoned. Some work has been done by the City and Stakeholders to kick start the campaign for construction of a new park, the information compiled to date is available here:

<https://www.muskegon-mi.gov/skate-park-project/>

The location of the proposed skate park has been identified and is included in Attachment A.

The proposed work will be broken into phases as follows:

Phase 1 – Conceptual Design

- Conceptual Design – Includes participation in a kick-off meeting with the designated group of stakeholders to review the proposed location, establish the target size of the park (+/- 10,000 SFT), and identify the potential elements. Upon completion of the kick-off meeting the selected firm shall create preliminary site renderings and cost estimates.
- Community Outreach – Includes presenting the conceptual design material and cost estimates in a community meeting format and soliciting feedback from the wider public, possibly through a survey.
- Concept Revision - Includes refinement of the conceptual designs and preparation of final renderings and cost estimates for the selected alternative. Cost estimates should be all inclusive of construction costs, engineering fees, permit fees, future maintenance costs, etc... The goal is to ensure that fundraising efforts successfully cover all necessary costs for construction and perpetual care.
- Concept Finalization – Includes hosting a second community meeting to present the final design details.

Phase 2 - Financing

- Fundraising – This phase is to be completed primarily by City staff and the various project stakeholders, with some amount of minimal clarification and expertise required from the selected vendor. City Staff and stakeholders will utilize the final renderings and cost estimates to identify the grant funding, private fundraising, and public financing options available to complete construction and start a maintenance fund for the proposed skate park.

Phase 3 – Detailed Design & Bidding

- Detailed Design – Upon identification of an appropriate fundraising mechanism for the project, the selected vendor will be directed to complete a detailed design for the site including all appropriate survey, plans, specifications, and complete contract documents for bidding.
- Bid Solicitation – Vendor shall assist the city in obtaining bids for the entire project, and/or for any individual components of the project that are not directly performed by the selected vendor. The city's preference is to hire a vendor that can design and construct the skate park. City purchasing policy guidelines shall be followed for any items sent for bidding, and any vendors involved in the construction phase shall be required to comply with all standard City policies and procedures regarding contracting.

Phase 4 – Construction

- Construction Oversight and Project Management – Selected vendor will be responsible to provide management of the construction project from inception through final completion. Work will include addressing any requests for information, ensuring the project remains on schedule, maintaining the project budget, and preparing detailed As-Built drawings upon completion of the project.

Special Considerations

- The Boys and Girls Club property can afford to lose no more than 8 parking spaces as a result of this project.
- The design should allow ample room for a driveway/road to be constructed along the east side of the Boys and Girls Club building in the future if/when that is ever needed.
- The design should include two (2) sidewalk connections between the Boys and Girls Club parking lot and Rotary Park. Two (2) connections exist currently; they can be maintained in their existing state, or rerouted as a part of the design.
- The mature pine trees on the south end of the identified area should be preserved if possible with a preference to incorporate them into the design.
- The skate park should include fencing along the perimeter where necessary to comply with standard practices. Appropriate separation and access should be maintained between the existing playground features and the proposed skate park.
- There should be no primary features constructed on top of the storm sewer outfall in the event it requires future maintenance. Consideration could be given to potentially removing the enclosed storm sewer outlet and incorporating an open channel for the outlet into the design of the park.

At this time the City has committed an amount of \$10,000 to be allocated to the selected vendor for completion of Phases 1 and 2 of the project. Commitments for the later Phases of the project will be subject to a successful fundraising campaign in Phase 2.

A proposed schedule for the project is included later in this RFP.

Questions on the above phasing can be submitted to Leo Evans via email (Leo.Evans@shorelinecity.com). Questions received prior to Monday, September 12th, 2022 will receive a response prior to the acceptance of the RFP. Requests received after that date will receive a response pending staff availability.

CONTENTS OF PROPOSAL SUBMITTAL

At a minimum, each proposal shall include the following items:

QUALIFICATIONS OF TEAM

Highlight similar past experiences, and technical competence as it relates to the specific project details and previously completed projects. Include a summary of the items and phases of work that would be self-performed by your firm and any items/phases that would be performed by sub-contractors.

Include a brief summary with resumes of the key staff for the project, including any key staff that work for proposed subcontractors.

Qualifications of Team limited to three (3) pages of text
(Not including resumes and pictures)

UNDERSTANDING OF SERVICES

Include a narrative description of your plan for accomplishing the project. Provide a timeline for the project including key milestones to be met and identify dates for completion of project deliverables. Identify critical areas of the project and your plan for addressing the critical needs.

Understanding of Services limited to one (1) page of text
(Not including example pictures)

PRICED PROPOSAL

Confirm that your firm can complete Phases 1 and 2 for the identified allocation of \$10,000.

Cost for the remaining phases will be negotiated based on the design and cost estimates prepared in Phase 1 and the successful identification of a funding mechanism for the project.

EVALUATION

Staff and Stakeholders will review the submitted proposals and make a recommendation to the City Commission for award of the contract for Phases 1 and 2 based on the current purchasing policies of the City. Subsequent Phases will require separate Commission approval.

TENTATIVE SCHEDULE FOR AWARD

Issue RFPAugust 22nd, 2022

Proposal Due DateSeptember 20th, 2022

Staff / Stakeholder Proposal ScoringSeptember 20th – 26th, 2022

City Commission Consideration of BidsOctober 11th, 2022

Phase 1 Start DateAfter Notice to Proceed issued by City Staff

 City / Stakeholder Kickoff Meeting.....November 2022

 Community Meeting #1February 2023

 Community Meeting #2April 2023

Phase 1 Completion Date.....May 1st, 2023

Phase 2 Start DateMay 2023

Phase 2 Completion Date.....TBD

Phase 3-4.....TBD

INSURANCE REQUIREMENTS

The Bidder will be required to comply with the following insurance and indemnity requirements BEFORE ANY AGREEMENTS CAN BE EXECUTED:

- a. **Hold Harmless Agreements:** To the fullest extent permitted by law, Vendor agrees to defend, pay on behalf of, indemnify, and hold harmless the City, its elected and appointed officials, employees, volunteers and others working on behalf of the City against any and all claims, demands, suits, or loss, including any costs connected therewith, and for any damages which may be asserted, claimed or recovered against or from the City, its elected and appointed officials, employees, volunteers, or others working on behalf of the City, by reason of personal injury, including bodily injury and death, property damage, including loss of use thereof, and/or the effects of or release of toxic and/or hazardous material which arises out of or is in any way connected or associated with this contract. The obligation to defend and hold harmless extends to Consultant's employees, agents, subcontractors, assigns and successors.
- b. **Vendor Insurance Requirements:** Vendor shall not commence work under this contract until obtaining the insurance required under this paragraph. All coverage shall be with insurance companies licensed and admitted to do business in the State of Michigan and Best Rated A VIII. All coverage shall be with insurance carriers acceptable to the City.
- c. **Workers' Compensation Insurance:** The Vendor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including Employer's Liability coverage, in accordance with all applicable Statutes of the State of Michigan.
- d. **General Liability Insurance:** The Vendor shall procure and maintain during the life of this contract, commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$1,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury and Property Damage. Coverage shall include the following extensions: (a) Contractual Liability; (b) Products and Completed Operations; (c) Independent Contractor's Coverage; (d) Broad Form General Liability Extensions or equivalent.
- e. **Motor Vehicle Liability:** The Vendor shall procure and maintain during the life of this contract Motor Vehicle Liability Insurance, including Michigan no-fault coverage, with limits of liability of not less than \$1,000,000 per occurrence or combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles.

- f. Professional Liability Insurance: The Vendor shall procure and maintain during the life of this contract and during the performance of all services Professional Liability Insurance covering all performances from the beginning of the consultant's services on a "claims made basis" and shall maintain coverage from commencement of this contract until six (6) months following completion of the consultant's work with limits of liability not less than \$500,000 per claim. This section is only applicable for RFP's requesting professional services (Architect, Engineer, etc...)
- g. Additional Insured: Commercial General Liability and Motor Vehicle Liability Insurance, as described above, shall include an endorsement stating the following shall be "Additional Insured": The CITY OF MUSKEGON, all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and board members, including employees and volunteers thereof.
- h. Cancellation Notice: Workers' Compensation Insurance, General Liability Insurance, Motor Vehicle Liability Insurance, and Professional Liability Insurance, as described above, shall include an endorsement stating the following: "It is understood and agreed that Thirty (30) Days Advance Written Notice of Cancellation, Non-Renewal, Reduction and/or Material Change shall be sent to: CITY OF MUSKEGON ENGINEERING DEPARTMENT.
- i. Proof of Insurance Coverage: The Consultant shall provide the City at the time the contracts are returned by him for execution, certificates and policies as listed below:
 - 1. Two (2) copies of Certificate of Insurance for Workers' Compensation Insurance
 - 2. Two (2) copies of Certificate of Insurance for Commercial General Liability Insurance
 - 3. Two (2) copies of Certificate of Insurance for Vehicle Liability Insurance
 - 4. Two (2) copies of Certificate of Insurance for Professional Liability Insurance
 - 5. If so requested, certified copies of all policies mentioned above will be furnished.

If any of the above coverage expires during the term of this contract, the Consultant shall deliver renewal certificates and/or policies to the City at least ten (10) days prior to the expiration date.

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Source Water Intake Protection Plan Update
Submitted By: Joe Buthker	Department: Public Works - Filtration
Brief Summary: The Water Filtration Plant's Source Water Intake Protection Plan is due for an update, and the City has been awarded an EGLE grant to cover half of the project's total cost.	
Detailed Summary & Background: City staff worked with Tetra Tech in 2017 to develop Muskegon's first Source Water Intake Protection Plan (SWIPP). This document is due to be updated as EGLE recommends updates every 6 years. The purpose of a SWIPP is to protect the long-term viability of a drinking water supply by reducing the potential risk of surface and subsurface contamination from affecting the source water protection area. The project will culminate with an updated SWIPP that will focus on protecting our drinking water source, form a basis for informed decision-making regarding land use within the community, form a basis for dealing with future regulations, and produce an approvable report with all required elements. Staff requested Tetra Tech provide the City with a proposal to update the plan. Tetra Tech has extensive experience from its creation of the original plan, and the City will be working with some of the same integral staff that created the original plan. Tetra Tech has already worked alongside City staff on a successful grant application for this project. This project is budgeted for \$30,000 in FY 2022-23, and the grant the City was awarded from EGLE will reimburse \$15,000 of project-related expenses.	
Goal/Focus Area/Action Item Addressed: <i>Action Item 2022 - 4.2: Take advantage of external revenue sources</i>	
Amount Requested: \$30,000.00	Amount Budgeted: \$30,000.00
Fund(s) or Account(s): 591 Source Water Protection	Fund(s) or Account(s): 591 Source Water Protection
Recommended Motion: Authorize staff to enter into an agreement with Tetra Tech to update the City of Muskegon's Source Water Intake Protection Plan.	

Approvals: *Get approval from division head at a minimum prior to sending to the Clerk.*

Immediate Division Head ☒ Information Technology ☐

Other Division Heads ☐ Communication ☐

Legal Review

Guest(s) Invited / Presenting

Yes ☐

No ☒

For City Clerk Use Only:

Commission Action:



September 28, 2022

Mr. Joe Buthker, Water Plant Superintendent
Muskegon Water Filtration Plant
City of Muskegon
1900 Beach Street
Muskegon, MI 49441

Re: Surface Water Intake Protection Plan Proposal

Dear Mr. Buthker:

The approximately 80,000 customers you serve expect the Muskegon water filtration plant to not only provide potable water, but also be economical in the process. In this time of shrinking governmental financial support and difficult local economic times, your water treatment process should give you the best value for each dollar, and the best way to do that is to ensure that your source water is as free from contaminants as is practicable.

Thank you for the opportunity to provide this proposal to assist you with creating the Surface Water Intake Protection Plan for the City of Muskegon based on your EGLE Grant requirements. We are confident that Tetra Tech offers unsurpassed value with our water resource planning and assessment services. Attachment A details our proposed scope of services to assist you with the activities associated with and development of a Surface Water Intake Protection Plan for the area contributing to the Muskegon Water Treatment Plant.

We propose a lump sum compensation amount of \$30,000 for this work.

If you concur with our proposal, please sign in the space provided below and return one original signed copy of this proposal to indicate your authorization to proceed. The agreement for this project is comprised of this letter, Attachment A, and the accompanying Standard Terms and Conditions.

We appreciate the opportunity to be of service to the City of Muskegon. Please feel free to call if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Gary Markstrom'.

Gary Markstrom, P.E.
Unit Vice President

A handwritten signature in blue ink, appearing to read 'Stephen Pennington'.

Steve Pennington, Ph.D.
Project Manager

Encl.: Scope of Services
Standard Terms and Conditions

PROPOSAL ACCEPTED BY CITY OF MUSKEGON

BY: _____

TITLE: _____ **DATE:** _____

Muskegon, Michigan

Source Water Intake Protection Plan

Scope of Work

September 28, 2022

INTRODUCTION

Tetra Tech understands the goal of the City of Muskegon Water Filtration Plant management is to produce abundant, clean, safe, and aesthetically pleasing water for its customers. To effectively and efficiently do so, it is imperative that the source water being withdrawn is of the highest quality feasible before it is treated, polished, and eventually distributed.

Tetra Tech completed a SWIPP for the Muskegon Filtration Plant in 2017 and enlists the expertise of some of the same integral staff to update that plan. Tetra Tech will provide a team of water resource and land use management experts that will work with you to identify both real and potential threats to the area source water supply. The intent is to produce a plan that contains policies, procedures, and action items designed to ensure the safety of your water supply, now and in the future.

BACKGROUND

The Muskegon Water Filtration Plant is a conventional water treatment plant with a capacity of 40 million gallons per day. Customers include not only the City of Muskegon, but also North Muskegon, Muskegon Township, Roosevelt Park, County Northside, Fruitport, and Norton Shores. Water is withdrawn from Lake Michigan.

Michigan Department of Environmental Quality (MDEQ) performed an assessment of the City's source water in 2003 to determine the susceptibility to or the relative potential of contamination. The susceptibility rating is on a six-tiered scale from very low to high and is based primarily on geologic sensitivity, water chemistry, and contaminant sources. The susceptibility of the source water is *moderately high*. MDEQ was rebranded as Department of Environment, Great Lakes, and Energy (EGLE) but the acronyms are still used interchangeably in guidance documents.

Tetra Tech completed a SWIPP for the Muskegon Water Filtration Plant in December 2017. Muskegon has received a grant to update the SWIPP. The following activities will provide an update to that plan by or before the end of the grant period: August 30, 2023.

DESCRIPTION OF APPROACH AND SCOPE OF SERVICES

Tetra Tech anticipates the following as goals of the Surface Water Intake Protection Plan (SWIPP):

- ***To focus limited resources to protect the drinking water source(s).*** The SWIPP will provide your community with recommendations for actions within the **source water area (SWA)** that potentially can directly affect your water supply. It is within this SWA that a spill or improper use of **potential contaminants** may cause these contaminants to migrate toward the water **intake**. By addressing where the source waters are most susceptible to contaminants, and where potential contaminants are located, the SWIPP will clearly identify the potential risks and actions that should be undertaken to mitigate the introduction of contaminants.
- ***To form the basis for informed decision-making regarding land use within the community.*** Recommendations in the SWIPP will guide the City planning authorities to make informed decisions regarding proposed land uses within the SWA that are compatible with both your drinking water resource and the **vision** of growth embraced by the city and neighboring communities.
- ***To form the basis for dealing with future regulations.*** The SWIPP will be designed to functionally meet proposed requirements for your surface-water supply. Actions needed to address the City's needs and requirements will be made through this report.

- ***To produce an approvable report with all seven required elements*** including: Defining responsible agency roles, designating a source water protection area (completed by MDEQ in 2003 assessment), contingency plans, the updated contaminant sources, alternate sources, new sources, and a public education plan.

The following proposed scope of work reflects Tetra Tech's understanding of the EGLE requirements.

TASK 1: DEVELOP A SURFACE WATER INTAKE PROTECTION PLAN (SWIPP)

1.1: Document Review and Planning Meeting

Tetra Tech will review the Source Water Assessment and will meet with the City of Muskegon to refine the scope for this project.

1.2: Update the 2017 Muskegon Source Water Intake Protection Plan

The current assumption is that little has changed regarding the identified land use threats in the 2017 plan based on the the 2003 Susceptibility Determination. Essentially, the first four elements of an approvable SWIPP are covered by the assessment, so it will need to be updated. Tetra Tech will update the assessment information as agreed upon during the implementation of Task 1.1. Based on our preliminary review of the existing assessment, it is anticipated that the following plan updates will be necessary:

- Contact List for SWIPP

The City of Muskegon will provide contact names for the SWPP team and Tetra Tech will update the plan (from the assessment information) to reflect current team members.

- The Assessment Inventory

Tetra Tech will search the government environmental databases and update the assessment information for other land uses to be considered for inclusion in the SWIPP. It is anticipated that the following databases will be reviewed:

- o EGLE leaking underground storage tank (LUST) sites;
- o EGLE registered underground storage tank (UST) sites;
- o EGLE Environmental Cleanup Site Information System (ECSI) sites;
- o EGLE Source Information System (for water discharge permit sites including National Pollutant Discharge Elimination System (NPDES) permits, Water Pollution Control Facility (WPCF) permits, storm water discharge permits, and on-site sewage (septic) system permits);
- o EGLE Underground Injection Control (UIC) database;
- o EGLE Active Solid Waste Disposal Permits list;
- o Michigan Department of Transportation (MDOT) - Hazardous Materials database;
- o State Fire Marshall registry of above-ground fuel storage tank sites;
- o State Fire Marshall Hazardous Material Handlers and Hazardous Material Incidents (HAZMAT) sites;
- o U.S. EPA BASINS software, version 2.1;
- o U.S. EPA Envirofacts database;
- o U.S. EPA Resource Conservation Recovery Act (RCRA) generators or notifiers list;
- o U.S. EPA RCRA Treatment, Storage, and Disposal Facility (TSDF) Permits list;
- o U.S. EPA National Priorities List (NPL);
- o U.S. EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLA) List;

- o U.S. EPA RCRA Corrective Action Activity List (CORRACTS);
- o U.S. Department of Transportation (DOT) Hazardous Materials Information Reporting System (IIMIRS).

In addition to the database review results, Tetra Tech will review the following:

- Aerial photographs;
- If needed, Tetra Tech will verify the database search results using windshield surveys and interviews with City officials. Tetra Tech will update the Potential Contaminant Source Inventory Map that is provided in the assessment with the current potential contaminant sources.

1.3: Recommendations/Response Plan and Timeline

Based on discussions with the City, and Tetra Tech's expertise, a list of recommendations will be developed and prioritized. A timeline for the implementation of the recommendations will also be developed. Tetra Tech will review the existing emergency response and make additional recommendations for the most likely contaminants that might occur.

1.4: Cost Estimates and Alternative Funding Sources

Cost estimates for implementing the recommendations will be developed. Where applicable, alternative funding sources will be presented for which the City may consider applying to offset the cost of implementing the recommendations.

1.5: Perpetuating the Plan

The EGLE has a recommendation that SWIPPs be updated every six years. Tetra Tech will recommend steps the City can take to ensure the plan data is being continually updated, thus ensuring that if future policy changes are required they are based on the best available information.

TASK 2.0 PUBLIC ENGAGEMENT PLAN (PEP)

In partnership with the City, Tetra Tech proposes to design a community engagement process that will support the Surface Water Intake Protection (SWIP) planning effort. The PEP team will ensure seamless alignment of public engagement activities and ongoing communication through participation in select meetings with the project team (City staff, the West Michigan Shoreline Regional Development Commission, and others).

It is anticipated that the following tasks will be part of the PEP.

Task 2.1: Public Meetings:

Host three public meetings, to be staged at logical intervals throughout the project, as follows:

1. An initial public meeting to announce the launch of the SWIPP project, sharing a high-level orientation that includes project goals, timeline, and public engagement opportunities;
2. A second public meeting to present the early findings from the project team's benchmarking of peer communities; feedback will be welcomed and collected in the interest of forming the plan's final content; and
3. Finally, a third public meeting will share the SWIPP in its final form, including a description of the prioritization process as well as the context of how the SWIPP reflects feedback gathered through the public engagement process and the work of the SWIPP Team, with anticipated next steps and implications.

One consultant will be present at each of the public meetings. Each meeting is anticipated to require 90 minutes.

Task 2.3: Progress Meetings

Lead by Tetra Tech, the PEP team will participate in progress meetings with the City of Muskegon and project team. Project progress meetings are in the Project Management Task outlined below. It is not anticipated that all personnel will be physically present and that some people may phone or video cast into the meetings.

Task 2.4: Meeting Minutes and Content

The PEP Team will review all existing documentation from previous public engagement efforts as well as prepare, refine, and finalize supporting documentation (e.g., meeting agendas/summaries; presentation materials) and other content (e.g., to be used for the project website, press releases, social media, mailings) as needed to advance the work.

Additionally, this proposal reflects a modest accommodation for the necessary project-related email and phone communication to occur throughout the course of the project.

TASK 3.0 PROJECT MANAGEMENT AND DELIVERABLES

Project management will consist of weekly internal monitoring of the project status and budget. Progress with the City's SWIPP steering committee are also important and we propose three meetings occurring at the following times:

- Kickoff
- An intermediate meeting to review progress and interim deliverables.
- A meeting to review the draft report and plan for the first public presentation.

We anticipate delivering a digital copy of the draft SWIPP. Upon receiving the City's final comments, we will update the SWIPP and deliver a PDF copy of the final report. We anticipate the final SWIPP to be a 10- to 20-page document inclusive of figures.

We suggest that the SWIPP be structured as per the EGLE guidance with the following program headings:

- Basic Information
- Defining roles and duties of government units and water supply agencies
- Designating the source water protection area (SWP)
- Identification of potential sources of contaminants within the SWP area
- Identifying available management approaches for protection of the source water
- Contingency plans and alternative drinking water sources
- Assuring proper siting of new water sources
- Encouraging public participation

ASSUMPTIONS

The following assumptions were considered in developing a scope of work and pricing for this proposal:

- The current water production is the same as it was when the existing SWIPP was completed.
- The SWIPP will be delivered in PDF format.
- Presentations to the City Council are not included.
- Meeting room costs (if necessary) will be borne by the City of Muskegon.
- There will be no more than three progress meetings with the City team.

- No water quality monitoring or modeling will be done on this assignment.
- Implementation and development of recommendations (e.g., writing model zoning ordinances for upstream communities) are not included in the scope.

IMPLEMENTATION SCHEDULE

Based on the above Scope of Services, Tetra Tech anticipates the date for completion of the Source Water Intake Protection Plan to be prior to the grant period ending August 30, 2023. The following timeline will be used for milestones:

	SWIPP Elements	Targeted Completion Date
1	Defining roles and duties of government units and water supply agencies.	November 2022
2	Designating a source water protection area for each water supply source based on the state's defined source water area.	March 2023
3	Identifying potential contaminant sources within each source water protection area.	March 2023
4	Establishing management approaches for protection of source water, including but not limited to education and regulatory approaches.	May 2023
5	Creating contingency plans for public water supply sources including the location of alternate drinking water sources.	May 2023
6	Assuring proper siting on new water sources to minimize potential contamination.	Mar 2023
7	Encouraging public participation.	March - July 2023
8	Completion and Submittal of SWIPP	August 15, 2023

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25 th , 2022	Title: Splashpad RFQ
Submitted By: Leo Evans	Department of Public Works
Brief Summary: Staff requests authorization to issue a request for qualifications to replace the downtown splash pad.	
Detailed Summary & Background: During the summer of 2022 the downtown splash pad was subject to frequent breakdowns and disruptions in service. An extensive amount of resources were put towards the project on numerous occasions to provide what little operational use the site was able to provide in 2022. Late in 2022 the system failed again and it was determined in the best interest to close it for the remainder of the year rather than continue to try and limp the system along. Repair options for the existing system are still being evaluated, however even if a repair is feasible it is unlikely to be more than a stopgap measure and there is a high likelihood of numerous service interruptions and resource requirements during the 2023 season. Staff is requesting approval to issue the attached request for qualifications to begin the next phase of this project which will start to envision a long term replacement for the site. The process is planned for a similar rollout to how the playgrounds at Reese and Beukema were completed. Proposals received through the RFQ process will be reviewed and shortlisted by a team of stakeholders and then presented to the Commission and Public for additional feedback. Construction of a new site for use in 2023 is a potential that we will request of those submitting a proposal for the project. No funds are currently allocated towards this project and financial resources would need to be identified to support the completion of this project. To that end staff is preparing an application to the Michigan Spark Grant program, which aims to distribute 65 million dollars from Michigan's federal Investment in Infrastructure and Jobs Act (IIJA) disbursement into the state's parks systems. The application period closes December 19th, with awards to follow in three tranches in the winter, spring and summer of 2023.	
Goal/Focus Area/Action Item Addressed: Destination Community & Quality of Life / Enhanced Parks & Recreation Department and Services	
Amount Requested: N/A	Amount Budgeted: N/A
Fund(s) or Account(s): N/A	Fund(s) or Account(s): N/A
Recommended Motion: Authorize staff to issue a request for qualifications for the replacement of the downtown splash pad.	

Approvals:			Guest(s) Invited / Presenting	
Immediate Division Head	☒	Information Technology		☐
Other Division Heads	☒	Communication	☒	Yes ☐
Legal Review	☒			No ☒
For City Clerk Use Only:				
Commission Action:				

MUSKEGON



West Michigan's Shoreline City

www.shorelinecity.com

CITY OF MUSKEGON

REQUEST FOR PROPOSALS

PROJECT NAME:

Splash Pad Reconstruction

DATE OF ISSUANCE:

October 26th, 2022

DATE PROPOSAL DUE:

November 22nd, 2022

ISSUING OFFICE:

City of Muskegon
c/o – Leo Evans
1350 East Keating Avenue
Muskegon, MI 49442
Tel. (231) 724-6920

TABLE OF CONTENTS

PROPOSAL & AWARD.....	3
INSTRUCTIONS TO BIDDERS	4
SPECIFIC PROJECT INFORMATION.....	6
CONTENTS OF PROPOSAL.....	8
EVALUATION.....	8
TENTATIVE SCHEDULE FOR AWARD	9
INSRUANCE REQUIREMENTS	10

ATTACHMENT A – PROJECT VICINITY MAP

Note: Should any of the pages or documents listed above be missing from your packet, or if you have any questions regarding this RFP, please contact Leo Evans at the City of Muskegon via (231) 724-6920 or via E-mail at Leo.Evans@shorelinecity.com

PROPOSAL & AWARD

The undersigned having become thoroughly familiar with and understanding of all the proposal documents attached hereto, agrees to provide the services as specified herein, for the total fees as stipulated herein, subject to negotiation.

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this proposal which will become a binding contract if accepted by the City of Muskegon.

I hereby state that I have read, understand and agree to be bound by all of the terms of this proposal document.

Signature _____ Title _____

Print Name _____ Date _____

Firm Name _____

Address _____

Telephone No. _____

E-Mail _____

Fax No. _____

INSTRUCTIONS TO BIDDERS

PROPOSALS

All proposals must be submitted following the proposal format supplied by the City of Muskegon in this document and shall be subject to all requirements of this document.

The City may consider as irregular any proposal in which there is an alteration of or departure from the format stated in the documents, and at its option may reject the same.

Each bidder will include in their proposal a listing of each principal firm and the names of any proposed sub-consultant/contractor and the name and address of each office which may be involved in the project.

Before executing any subcontract, the successful firm shall submit the name and principals of any proposed subcontractor for prior approval.

SUBMITTAL OF PROPOSALS

Three (3) copies of the proposal documents shall be submitted in a sealed envelope:

City of Muskegon
Attn: Clerk's Office
RE: Skate Park
933 Terrace Street
Muskegon, MI. 49440

The envelope shall be clearly marked on the exterior denoting the name of the firm submitting the proposal and the name of the particular RFP for which the proposal is offered.

The proposals shall be submitted by no later than 2:00 PM on Tuesday, November 22nd, 2022.

AWARD / REJECTION OF PROPOSALS

The City reserves the right to reject any and all proposals and to waive any irregularity in proposals received whenever such rejection or waiver is in the best interest of the City. The bidder to whom the award is made will be notified at the earliest possible date. All bidders submitting proposals will be notified when the award is made.

Award will not be completed until confirmed and recommended by the City Commission.

CITY RESPONSIBILITIES

The City of Muskegon will provide information as to the City's requirements for the project and make available pertinent information which may be useful in the project work.

The City will designate a person to act as the City's Project Manager (Leo Evans) with respect to the work to be performed. Such person will have the authority to transmit instructions, receive information, interpret and define the City's policies and decisions with respect to elements pertinent to the project.

The City will examine all studies, reports, estimates, proposal, and other documents prepared by the bidder and render in writing, if necessary, decisions pertinent thereto within a reasonable time.

The City will direct the consultant in writing to begin the work on each phase of the project upon receipt of written evidence from the firm of the appropriateness of such action.

The City will direct the bidder in writing to furnish any special services, sub-consultants and/or extra work that may be required on the project upon receipt of written evidence from the firm detailing as to cost, time schedule, and reason for such special service or extra work.

SPECIFIC PROJECT INFORMATION

INTRODUCTION TO PROJECT

The City of Muskegon is seeking proposals from qualified companies to design and construct a new splash pad to replace the existing splash pad located in the 200 Block of West Western Avenue adjacent to the City Farmers Market, the Post Office and Alcoa Square.

Approximate Location - <https://goo.gl/maps/SDBbbc9SyiQWZjy59>

The existing splash pad is currently non-functional and the City is requesting that companies provide the following documents as a part of this RFP related to the replacement of the existing facility:

- Site specific conceptual design including renderings and site amenities as necessary to properly convey the proposed design for the site.
- Full turnkey cost estimate for the demolition of the existing site and construction of the new facility. Inclusive of any administration, permitting, and other soft costs.
- A conceptual project schedule based on receiving a notice to proceed in January 2023.

Plans for the existing splash pad and site are included as an attachment to this document for reference along with an aerial view of the site showing the approximate existing public utility features of the site. Pictures can be provided upon request for interested firms that are unable to visit the site in person.

Site Design Considerations

- Proposed site design cannot permanently impact the surrounding amenities including seat walls, art work, landscaping, trees, etc...
- Design should be at least as large as the existing splash pad which is approximately a 40 FT diameter circle (1,250 SFT). Designs can be larger to utilize more of the surrounding space provided there are no impacts to the adjacent features.
- Design should have primary features be above ground installations.
- Design should be geared towards all ages of youth use.
- The design must be universally accessible.
- The design should be based on a non-recirculating system. The existing system was designed for recirculation and later converted to non-recirculating. The design should include an estimated annual water usage for purposes of estimating the operating costs.

- City is requesting turnkey cost proposals for this project in the range of \$400,000.
- The proposal should include a conceptual schedule for the project based on a notice to proceed in January 2023 and identifying a target date that the site could be operational.

Questions on the above phasing can be submitted to Leo Evans via email (Leo.Evans@shorelinecity.com). Questions received prior to Monday, November 14th, 2022 will receive a response prior to the acceptance of the RFP. Requests received after that date will receive a response pending staff availability.

CONTENTS OF PROPOSAL SUBMITTAL

At a minimum, each proposal shall include the following items:

CONCEPTUAL DESIGN RENDERINGS

Presentation quality, site specific design renderings showing the general layout of the site from various views. Renderings should be set to convey a clear and concise conceptual layout; highlight the overall size of the splash pad; how the proposed design fits into the existing site; specific noteworthy features/amenities of the site; and options for color schemes. The site should highlight Muskegon and in particular the downtown city core.

TURNKEY COST ESTIMATE

Provide a cost estimate for the full scope of the project inclusive of all features needed from start to finish on the project. City has identified a target cost of \$400,000 for the project and will provide additional scoring points to projects that can deliver a successful project below that threshold.

PROJECT SCHEDULE

Provide a conceptual schedule for the project based on a January 2023 notice to proceed for consideration by the staff/commission/stakeholders.

EVALUATION

Staff and Stakeholders will review the submitted proposals and make a recommendation to the City Commission based on a qualifications based selection.

TENTATIVE SCHEDULE

Issue RFP October 26th, 2022

Proposal Due Date November 22nd, 2022

Staff / Stakeholder Proposal Scoring November 22nd – December 19th, 2022

City Commission Consideration of Bids..... January 2023

Notice to Proceed..... January 2023

Construction Completion As outlined in proposal

INSURANCE REQUIREMENTS

The Bidder will be required to comply with the following insurance and indemnity requirements BEFORE ANY AGREEMENTS CAN BE EXECUTED:

- a. **Hold Harmless Agreements:** To the fullest extent permitted by law, Vendor agrees to defend, pay on behalf of, indemnify, and hold harmless the City, its elected and appointed officials, employees, volunteers and others working on behalf of the City against any and all claims, demands, suits, or loss, including any costs connected therewith, and for any damages which may be asserted, claimed or recovered against or from the City, its elected and appointed officials, employees, volunteers, or others working on behalf of the City, by reason of personal injury, including bodily injury and death, property damage, including loss of use thereof, and/or the effects of or release of toxic and/or hazardous material which arises out of or is in any way connected or associated with this contract. The obligation to defend and hold harmless extends to Consultant's employees, agents, subcontractors, assigns and successors.
- b. **Vendor Insurance Requirements:** Vendor shall not commence work under this contract until obtaining the insurance required under this paragraph. All coverage shall be with insurance companies licensed and admitted to do business in the State of Michigan and Best Rated A VIII. All coverage shall be with insurance carriers acceptable to the City.
- c. **Workers' Compensation Insurance:** The Vendor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including Employer's Liability coverage, in accordance with all applicable Statutes of the State of Michigan.
- d. **General Liability Insurance:** The Vendor shall procure and maintain during the life of this contract, commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than \$1,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury and Property Damage. Coverage shall include the following extensions: (a) Contractual Liability; (b) Products and Completed Operations; (c) Independent Contractor's Coverage; (d) Broad Form General Liability Extensions or equivalent.
- e. **Motor Vehicle Liability:** The Vendor shall procure and maintain during the life of this contract Motor Vehicle Liability Insurance, including Michigan no-fault coverage, with limits of liability of not less than \$1,000,000 per occurrence or combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles.

- f. Professional Liability Insurance: The Vendor shall procure and maintain during the life of this contract and during the performance of all services Professional Liability Insurance covering all performances from the beginning of the consultant's services on a "claims made basis" and shall maintain coverage from commencement of this contract until six (6) months following completion of the consultant's work with limits of liability not less than \$500,000 per claim. This section is only applicable for RFP's requesting professional services (Architect, Engineer, etc...)
- g. Additional Insured: Commercial General Liability and Motor Vehicle Liability Insurance, as described above, shall include an endorsement stating the following shall be "Additional Insured": The CITY OF MUSKEGON, all elected and appointed officials, all employees and volunteers, all boards, commissions and/or authorities and board members, including employees and volunteers thereof.
- h. Cancellation Notice: Workers' Compensation Insurance, General Liability Insurance, Motor Vehicle Liability Insurance, and Professional Liability Insurance, as described above, shall include an endorsement stating the following: "It is understood and agreed that Thirty (30) Days Advance Written Notice of Cancellation, Non-Renewal, Reduction and/or Material Change shall be sent to: CITY OF MUSKEGON ENGINEERING DEPARTMENT.
- i. Proof of Insurance Coverage: The Consultant shall provide the City at the time the contracts are returned by him for execution, certificates and policies as listed below:
1. Two (2) copies of Certificate of Insurance for Workers' Compensation Insurance
 2. Two (2) copies of Certificate of Insurance for Commercial General Liability Insurance
 3. Two (2) copies of Certificate of Insurance for Vehicle Liability Insurance
 4. Two (2) copies of Certificate of Insurance for Professional Liability Insurance
 5. If so requested, certified copies of all policies mentioned above will be furnished.

If any of the above coverage expires during the term of this contract, the Consultant shall deliver renewal certificates and/or policies to the City at least ten (10) days prior to the expiration date.

WATCH MUSKEGON

Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Stormwater Management Ordinance
Submitted By: Dan VanderHeide	Department: Public Works
Brief Summary: A new stormwater ordinance for adoption that puts the City in responsible charge for stormwater management reviews for new developments and other similar situations.	
Detailed Summary & Background: The City has used the Muskegon County Drain Commissioner's Office for storm water management reviews of new development since about October of 2016. In 2021 the City began the process of taking back management of our own storm water reviews to increase quality and control over the process and to speed review times. Staff has been working with ENG. Inc. to prepare a new storm water ordinance that will allow the City to formally take back control of storm water management with an ordinance and other documents in compliance with our state permitting requirements and EGLE procedures. The City attorney has reviewed the ordinance. Developers will see little change to the process, as the new ordinance and rules are designed very similar to the County standards we now use, and reviews will continue to be performed by ENG. Inc., the same consultant that performs reviews for the County. What changes do occur are anticipated to be positive to both the City and developers, with the goal of increasing service and practicality of application. The ordinance and associated procedures manual were presented for review at the October 10 Work Session meeting. Both documents will require review by the state, however in a quirk of procedure the state will not approve the documents until adopted. Given the similarity of these documents and rules to those of other Muskegon County governments and similar governments throughout the state, staff and the consultant anticipate minimal comments from the state, if any.	
Focus Area Addressed: Sustainability in financial practices and infrastructure.	
Amount Requested: N/A	Amount Budgeted: N/A
Fund(s) or Account(s):	Fund(s) or Account(s):
Recommended Motion: Move to repeal Sections 26-300 through 26-400 of Chapter 26 Article V, and to adopt Sections 26-500 through 26-585 of Chapter 26 Article V, of the Code of Ordinances of the City of Muskegon, Michigan, and to adopt the Stormwater Management Standards guidance documents dated October of 2022.	
Approvals: Immediate Division Head ☒ Information Technology ☐ Other Division Heads ☒ Communication ☐ Legal Review ☒	Guest(s) Invited / Presenting Yes ☐ No ☒
For City Clerk Use Only: Commission Action:	

CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

ORDINANCE NO. ____

THE CITY COMMISSION OF THE CITY OF MUSKEGON HEREBY ORDAINS:

1. Chapter 26 Article V of the Code of Ordinances of the City of Muskegon, Michigan, Sections 26-300 through 26-400 are repealed.
2. Chapter 26 Article V of the Code of Ordinances of the City of Muskegon, Michigan, Sections 26-500 through 26 –585 are adopted to read as follows:

ARTICLE V
Stormwater Management

DIVISION 1
Generally

Sec. 26-500 Definitions.

The following words, terms, and phrases, when used in this Article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

AUTHORIZED ENFORCEMENT AGENCY

The director of the Department of Public Works or the director's designees.

BASE FLOOD

The 100-year flood with a magnitude which has a one percent (1%) chance of occurring or being exceeded in any given year.

BEST MANAGEMENT PRACTICES (BMPs)

A practice, or combination of practices and design criteria, to minimize stormwater runoff and prevent the discharge of pollutants into stormwater discharged from a site and designed in accordance with the City's Stormwater Management Standards.

BUILDING OPENING

Any opening of a solid wall such as a window or door, through which floodwaters could penetrate.

CITY

The City of Muskegon, Michigan, acting by and through its Department of Public Works for the purposes of the Article, unless the context refers to the City of Muskegon as a whole.

CITY STORMWATER STANDARDS

The most current version of the *City of Muskegon Stormwater Management Standards* published pursuant to this Article.

CLEAN WATER ACT

The Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq., as amended, and the applicable regulations promulgated thereunder.

CONSTRUCTION SITE STORMWATER RUNOFF

Stormwater runoff from a development site following an earth change.

COUNTY ENFORCING AGENCY

A county agency or a conservation district designated by a county board of commissioners under Section 9105 of Part 91, Soil Erosion and Sedimentation Control, of the Natural Resource and Environmental Protection Act, Public Act 451 of 1994 (MCL 324.9101 et seq.).

DESIGN ENGINEER

A registered and licensed professional engineer in the state responsible for the design of a drainage plan.

DETENTION

A system that is designed to capture stormwater and release it over a given period of time through an outlet structure at a controlled rate.

DEVELOPED or DEVELOPMENT

The installation or construction of impervious surfaces on a development site that require, pursuant to state law or local ordinance, the City's approval of a site plan, plat, site condominium, special land use, planned unit development, rezoning of land, land division approval, private road approval or other approvals required for the development of land or the erection of buildings or structures.

DEVELOPER

Any person proposing or implementing the development of land.

DEVELOPMENT SITE

Any land that is being or has been developed, or that a developer proposes for development

DISCHARGER

Any person or entity who directly or indirectly discharges stormwater from any property. The term "discharger" also means any employee, officer, director, partner, contractor, or other person who participates in, or is legally or factually responsible for, any act or omission which is or results in a violation of this Article.

DRAIN

Any drain as defined in the Michigan Drain Code of 1956, Public Act 40 of 1956 (MCL 280.1 et seq.), other than an established county or intercounty drain.

DRAINAGE

The collection, conveyance, or discharge of groundwater and/or surface water.

DRAINAGE PLAN

See "Plan."

DRAINAGEWAY

The area within which surface water or groundwater is carried from one part of a lot or parcel to another part of the lot or parcel or to adjacent land.

DRAIN COMMISSIONER or WATER RESOURCES COMMISSIONER

The county agency charged with the management of county and intercounty drains established pursuant to the Michigan Drain Code of 1956, Public Act 40 of 1956 (MCL 280.1 et seq.), and responsible for site plan drainage review pursuant to the Land Division Act, Public Act 288 of 1967, as amended by Public Act 591 of 1996 (MCL 560.101 et seq.), and the Mobile Home Commission Act, Public Act 96, of 1987 (MCL 125.2301 et seq.).

EARTH CHANGE

A human made change in the natural cover or topography of land, including cut and fill activities. The term "earth change" includes, but is not limited to, any excavating, surface grading, filling, landscaping, or removal of vegetative roots. The term "earth change" does not include the practice of plowing and tilling soil for the purpose of crop production.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

The agency of the federal government charged with environmental protection.

EROSION

The process by which the ground surface is worn away by action of wind, water, gravity, or a combination thereof.

EXEMPTED DISCHARGES

Discharges other than stormwater as specified in Section **26-537**.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The agency of the federal government charged with emergency management.

FLOOD or FLOODING

A general and temporary condition of partial or complete inundation of normally dry land areas resulting from the overflow of water bodies or the unusual and rapid accumulation of surface water runoff from any source.

FLOOD PROTECTION ELEVATION

The base flood elevation plus one foot at any given location.

FLOODPLAIN

The area of land adjoining any watercourse or waterbody that will be inundated by the baseflood.

FLOODPROOFING

Any structural and/or nonstructural additions, changes, or adjustments to structures or property that reduce or eliminate flood damage to land or improvements, including utilities and other structures.

FLOODWAY

The channel of any watercourse and the adjacent land areas that must be reserved to carry and discharge a base flood without cumulatively increasing the water surface elevation more than 1/10 of a foot due to the loss of flood conveyance or storage.

GRADING

Any stripping, clearing, stumping, excavating, filling, leveling or stock- piling of soil or any combination thereof and the land in its excavated or filled condition.

HAZARDOUS MATERIALS

Any material, including any substance, waste, or combination thereof, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

ILLICIT CONNECTION

Any method or means for conveying an illicit discharge into water bodies or the City's stormwater drainage system.

ILLCIT DISCHARGE

Any discharge to the City's stormwater drainage system or water bodies that does not consist entirely of stormwater, discharges pursuant to the terms of an NPDES permit, or exempted discharges as defined in this Article.

IMPERVIOUS SURFACE

A surface, such as a paved or gravel driveway, roof, parking area or road, that prevents the infiltration of water into the soil.

LIVESTOCK PRODUCTION FACILITY

An agricultural activity, in which 100 or more livestock are fed, bred and/or raised within a confined area, other than an open pasture either inside or outside an enclosed building.

LOWEST FLOOR

The lowest floor or the lowest enclosed area, including a basement, but not including an unfinished or flood-resistant enclosure which is usable solely for parking of vehicles or building access.

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE)

The State department charged with protection of the environment. Previously known as Michigan Department of Environmental Quality (MDEQ).

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)

A publicly owned conveyance system designed or used for collecting or conveying stormwater. (May also be referred to as "stormwater drainage system").

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT

A permit issued by EPA, or by a state under authority delegated pursuant to 33 U.S.C. § 1342(b), that authorizes the discharge of pollutants to waters of the United States. The permit may be applicable on an individual, group, or general area-wide basis.

NON-STORMWATER DISCHARGE

Any discharge to the stormwater drainage system that is not composed entirely of stormwater.

OVERLAND FLOW-WAY

Surface area that conveys a concentrated flow of stormwater runoff.

PLAN

Written narratives, specifications, drawings, sketches, maps, written

standards, supporting calculations, operating procedures, or any combination of these, which contain information pursuant to this Article.

POLLUTANT

A substance discharged which includes, but is not limited to, the following: any dredged spoil, solid waste, vehicle fluids, yard wastes, animal wastes, agricultural waste products, sediment, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological wastes, radioactive materials, heat, wrecked or discharged equipment, rock, sand, cellar dirt, and industrial, municipal, commercial and agricultural waste, or any other contaminant or other substance defined as a pollutant under the Clean Water Act.

PREMISES

Any building, lot, parcel of land, or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

PROPERTY OWNER

Any person having legal or equitable title to property or any person having or exercising care, custody, or control over any property.

REDEVELOPMENT

Redevelopment projects are those that change the existing site footprint or offer new opportunities for stormwater control. Projects that do not disturb the underlying or surrounding soil, remove surrounding vegetation, or increase the area of impervious surface are not considered redevelopment projects. For roadway projects, reconstruction of the subbase is considered redevelopment, whereas an overlay of the pavement surface is not.

RETENTION

A system which is designed to capture stormwater and contain it until it infiltrates the soil or evaporates.

SOIL EROSION

The stripping of soil and weathered rock from land creating sediment for transportation by water, wind or ice, and enabling formation of new sedimentary deposits.

STATE WATER QUALITY STANDARDS

All applicable state rules, regulations, and laws pertaining to water quality, including the provisions of Section 3106 of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, Public Act 451 of 1994 (MCL 324.3106).

STORM DRAIN

Any portion of the stormwater drainage system, including any natural outlet,

which carries storm and surface waters and drainage or unpolluted industrial process water, such as permitted by Section 26-537. (May also be referred to as “storm sewer”).

STORMWATER MANAGEMENT FACILITY

The method, structure, area, system, or other equipment or measures which are designed to receive, control, store, or convey stormwater.

STORMWATER MANAGEMENT SYSTEM

All of the stormwater management facilities used on a site.

STORMWATER PERMIT

A permit issued by the City pursuant to this Article.

STORMWATER REVIEW AND APPROVAL

Review and approval of a site stormwater management system conducted by the City pursuant to state law.

STORMWATER POLLUTION PREVENTION PLAN (SWPP)

A document which describes the best management practices and activities to be implemented by a person to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

STORMWATER RUNOFF

The runoff and drainage of precipitation resulting from rainfall or snowmelt or other natural event or process.

STREAM

A river, stream or creek which may or may not be serving as a drain, or any other water body that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water.

WASTEWATER

Any water or other liquid, other than uncontaminated stormwater, discharged from a facility.

WATER BODY

A river, lake, stream, creek or other watercourse or wetlands.

WATERSHED

A region draining into a water body.

WETLANDS

Land characterized by the presence of hydric soils and water at a frequency

and duration sufficient to support wetland vegetation or aquatic life.

Sec. 26-501 Statutory authority and title.

This Article (Article V of Chapter 26 of the City Code of Ordinances) is adopted in accordance with the Home Rule City Act, as amended, Public Act 279 of 1909 (MCL 117.1 et seq.); the Michigan Drain Code of 1956, Public Act 40 of 1956 (MCL 280.1 et seq.); the Land Division Act, Public Act 288 of 1967 (MCL 560.101 et seq.); the Revenue Bond Act, Public Act 94 of 1933 (MCL 141.101 et seq.); and the Natural Resources and Environmental Protection Act, Public Act 451 of 1994 (MCL 324.101 et seq.); Section 401(p) of the Federal Water Pollution Control Act (also known as the Clean Water Act), as amended (33 U.S.C. § 1342(p) and 40 CFR 9, 122, 123 and 124); and other applicable state and federal laws.

This Article shall be known and may be cited as the City of Muskegon Stormwater Management Ordinance.

Sec. 26-502 Findings.

The City finds that:

1. Water bodies, roadways, structures, and other property within, and downstream of the City are at times subjected to flooding;
2. Flooding is a danger to the lives and property of the public and is also a danger to the natural resources of the City and the region;
3. Land development alters the hydrologic response of watersheds, which may result in increased stormwater runoff rates and volumes, increased flooding, increased stream channel erosion, and increased sediment transport and deposition;
4. Stormwater runoff produced by land development may contribute to increased quantities of waterborne pollutants; Increases of stormwater runoff, soil erosion, and nonpoint source pollution may have occurred as a result of land development, and may cause deterioration of the water resources of the City and downstream municipalities;
5. Stormwater runoff, soil erosion, and nonpoint source pollution, may have resulted in a deterioration of the water resources of the City and downstream municipalities;
6. Increased stormwater runoff rates and volumes, and the sediments and pollutants associated with stormwater runoff, absent reasonable regulation and control, can adversely affect the City's water bodies and water resources, and those of downstream municipalities;
7. Stormwater runoff, soil erosion, and nonpoint-source pollution can be controlled and minimized by the regulation of stormwater runoff from development;

8. Post-Construction Storm Water Runoff Program requirements for new and redevelopments within the City are set forth in the *State of Michigan National Pollutant Discharge Elimination System Permit Application for Discharge of Storm Water to Surface Waters of the State from a Municipal Separate Storm Sewer System* (DEQ, 2013 Rev. 10/2014);
9. Adopting the standards, criteria and procedures contained in this Article and implementing the same can address many of the deleterious effects of stormwater runoff;
10. Adopting these standards is necessary for the preservation of the public health, safety and welfare;
11. Adopting these standards is necessary to comply with the NPDES MS4 Permit.
12. Illicit discharges may contain pollutants that can significantly degrade the City's water bodies and water resources;
13. Illicit discharges enter the MS4 through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the stormwater drainage system or spills connected by drain inlets);
14. Establishing the measures for controlling illicit discharges and connections contained in this Article and implementing the same will address many of the deleterious effects of illicit discharges.

Sec. 26-503 Purpose.

It is the purpose of this Article to establish minimum stormwater management requirements and controls to accomplish, among others, the following objectives:

1. To reduce artificially induced flood damage;
2. To minimize increased stormwater runoff rates and volumes from identified new land development;
3. To minimize the deterioration of existing watercourses, culverts and bridges, and other structures;
4. To encourage water recharge into the ground where geologically favorable conditions exist;
5. To prevent an increase in nonpoint source pollution;
6. To maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;
7. To minimize the impact of development upon stream bank and streambed stability;
8. To reduce erosion from development or construction projects;

9. To preserve and protect water supply facilities and water resources by means of controlling increased flood discharges, stream erosion, and runoff pollution;
10. To reduce stormwater runoff rates and volumes, soil erosion, and nonpoint source pollution, wherever practicable, from lands that were developed without stormwater management controls meeting the purposes and standards of this Article;
11. To reduce the adverse impact of changing the land use along water bodies and, to that end, this Article establishes minimum standards to protect water bodies from degradation resulting from changing land use where there are insufficient stormwater management controls;
12. To regulate the contribution of pollutants to the MS4 by stormwater discharges by any user;
13. To prohibit illicit discharges and connection to the MS4;
14. To establish legal authority to carry out all inspection, surveillance, monitoring and enforcement procedures necessary to ensure compliance with this Article.

Sec. 26-504 Applicability, exemptions, and general provisions.

1. This Article shall apply to all new development and all redevelopment projects, including private, commercial and public projects that disturb one (1) acre or more, and projects less than one (1) acre that are part of a larger common plan of development or sale that would disturb one (1) acre or more as required by the NPDES MS4 Permit.
2. Further, this Article shall apply to any development or redevelopment site which:
 - a) requires approval of a plat under Chapter **78**;
 - b) requires approval of a site plan under Chapter **26**, a building permit, or any other permit for work which will alter stormwater drainage characteristics of the site;
 - c) is exempt from site plan and permit approval, but work will alter stormwater drainage characteristics of the site, and there is an increase in impervious surface exceeding 10,000 square feet; provided, however, that this Article shall not apply to the following:
 - i. The construction of, or addition, extension or modification to, an individual single family or a two-family detached dwelling;
 - ii. Street and utility projects that do not modify the footprint of the street or increase impervious area within the public right of way.
 - iii. Non-motorized improvements (sidewalk, pathway) within public rights-of-way that disturb less than one (1) acre;

- iv. The installation or removal of individual mobile homes within a mobile home park. This exemption shall not be construed to apply to the construction, expansion, or modification of a mobile home park;
 - v. Farm operations and buildings, except dwellings, directly related to farm operations. This exemption shall not apply to livestock production facilities as defined in this Article, greenhouses and other similar structures;
 - vi. Plats with preliminary plat approval and other developments with final land use approval prior to the effective date of this Article, where such approvals remain in effect.
3. Redevelopment and additions requiring a stormwater permit shall comply with City Stormwater Management Standards for the redeveloped or newly constructed portion of the site, except that the City reserves the right to require the entire site be brought up to the current standards. The City also reserves the right to define the last land use for a redevelopment site as the interim vacant condition.
4. This Article shall apply to all discharges entering the stormwater drainage system generated on any developed and undeveloped lands unless explicitly exempted.

Sec. 26-505 through Sec. 26-510. (Reserved)

DIVISION 2
Stormwater Permit

Sec. 26-511 Permit required.

- 1. A developer shall not engage in any development without first receiving a stormwater permit from the City pursuant to this Article via the City's site plan approval process contained in the zoning regulations in Chapter 26.
- 2. The granting of a stormwater permit shall authorize only such development for which the permit is issued, subject to the terms of the permit, and it shall not be deemed to approve other development or other land use activities or replace other required permits.

Sec. 26-512 Review procedures.

- 1. The City shall grant a stormwater permit after approval of the site plan (Chapter 26) and before issuance of a building permit[s], and may impose terms and conditions in accordance with Section 26, only upon compliance with all of the following requirements:
 - a) Completed stormwater permit application form.
 - b) The developer has submitted a drainage plan for the site complying with Section

26-513 for the approval of post-construction stormwater runoff BMPs.

- i. The drainage plan contains a description of an adequate, temporary stormwater management facilities to control construction site stormwater runoff and prevent offsite sedimentation, satisfying the requirements of Section 26, and the developer has obtained a soil erosion permit from the County Enforcing Agency, if necessary.
- ii. The drainage plan contains permanent onsite stormwater management facilities complying with the City's Stormwater Management Standards, and the performance and design standards as set forth in Division 8 of this Article.
- c) The developer has submitted restrictive covenant language for review and subsequent recording at the County Register of Deeds, if required for the development.
- d) Written construction plan approval obtained from the County Drain or Water Resources Commissioner, or intercounty drainage board, if required.
- e) The developer has paid or deposited the stormwater permit review fee pursuant to Section 26.
- f) The developer has paid or posted the applicable financial guaranty pursuant to Section 26.
- g) The developer provides all easements necessary to implement the approved drainage plan and to otherwise comply with this Article, including, but not limited to, Section 26. All easements shall be acceptable to the City in form and substance and shall be recorded with the County Register of Deeds.
- h) The developer provides the required maintenance agreement for routine, emergency, and long-term maintenance of all structural and vegetative BMPs installed and implemented to meet the performance standards. This agreement shall be in compliance with the approved drainage plan and this Article including, but not limited to, Section 26.
 - i) The maintenance agreement shall be acceptable to the City in form and substance and shall be subsequently recorded with the County Register of Deeds.
- a) Limitations of Review. The City will review private developments for offsite impact, but will not review the internal storm sewer and drainage system for the site.

Sec. 26-513 Drainage plan.

A preliminary drainage plan meeting the requirements of Section 26 shall be included on the site plan submitted to the City for site and development plan review. The drainage plan submitted for stormwater permit review shall be shown on the approved site plan if planning commission or administrative staff review is required, or on a site plan meeting the requirements in the City Stormwater Standards. The drainage plan shall identify and contain all of the information required in the City Stormwater Standards.

Sec. 26-514 Review fees; escrow.

1. All expenses and costs incurred by the City directly associated with processing, reviewing and approving or denying a stormwater permit application shall be paid or reimbursed to the City from the funds paid directly to the City. The City reserves the right to request a separate escrow account be established by the developer, as provided in Subsection (b) of this section. The City may draw funds from a developer's escrow account to reimburse the City for out-of-pocket expenses incurred by the City relating to the application. Such reimbursable expenses include, but are not limited to, expenses related to the following:
 - a. Services of the City Attorney directly related to the application.
 - b. Services of the City Engineer directly related to the application.
 - c. Services of other independent contractors working for the City, which are directly related to the application.
 - d. Review required by County Drain or Water Resources Commissioner.
 - e. Any additional public hearings required mailings and legal notice requirements necessitated by the application.
2. At the time a developer applies for a stormwater permit, the developer shall pay the required fees established by the City for a stormwater permit. The developer may also be required to deposit with the City, as an escrow deposit, an initial amount as determined by resolution of the City commission for such matters and shall provide additional amounts as requested by the City in such increments as are specified in said resolution. Any excess funds remaining in the escrow account after the application has been fully processed, reviewed, and the final City approval and acceptance of the development has occurred will be refunded to the developer with no interest to be paid on those funds. At no time prior to the City's final decision on an application shall the balance in the escrow account fall below the required initial amount. If the funds in the account are reduced to less than the required initial amount, the developer shall deposit into the account an additional amount as determined by City commission resolution,

before the application review process will be continued. Additional amounts may be required to be placed in the escrow account by the developer, at the discretion of the City.

Sec. 26-515 Financial guaranty.

1. The City shall not approve a stormwater permit until the developer submits to the City, in a form and amount satisfactory to the City, a letter of credit or other financial guaranty for the timely and satisfactory construction of all stormwater management facilities and site grading in accordance with the approved drainage plan. Upon (1) certification by a registered professional engineer that the stormwater management facilities have been completed in accordance with the approved drainage plan, and (2) receipt of construction record drawings for all private drainage systems meeting the minimum requirements of the City Stormwater Standards, the City may release the letter of credit or other financial guaranty, subject to final City acceptance and approval.
2. The amount of the financial guaranty shall be in accordance with the City's adopted fee structure, unless the City determines that a greater amount is appropriate, in which case the basis for such determination shall be provided to the developer in writing. In determining whether an amount greater is appropriate, the City shall consider the size and type of the development, the size and type of the on-site stormwater management system, and the nature of the off-site stormwater management facilities the development will utilize.
3. This Article shall not be construed or interpreted as relieving a developer of its obligation to pay all costs associated with onsite private stormwater runoff facilities as well as those costs arising from the need to make other drainage improvements in order to reduce a development's impact on a drain consistent with City Stormwater Standards.

Sec. 26-516 Certificate of occupancy.

No certificate of occupancy shall be issued until a stormwater permit has been issued and stormwater management facilities have been completed in accordance with the approved drainage plan and all applicable restrictive covenants, construction record drawings have been submitted and approved, and until the executed maintenance agreement is recorded with the County Register of Deeds; provided, however, the City may issue a temporary certificate of occupancy if an acceptable letter of credit or other financial guaranty has been submitted to the City.

Sec. 26-517 No change in approved facilities.

Stormwater management facilities, after construction and approval, shall be maintained in good condition, in accordance with the approved drainage plan, and shall not be subsequently altered, revised or replaced except in accordance with the approved drainage plan, or in accordance with approved amendments or revisions in the plan.

Sec. 26-518 Terms and conditions.

1. In granting a stormwater permit, the City may impose such terms and conditions as are reasonably necessary to effectuate the purposes of this Article. A developer shall comply with such terms and conditions.
2. Approval of the stormwater management system is considered to be granted by the City upon issuance of a stormwater permit, unless authorization is required to be granted by the County Drain or Water Resources commissioner under state law and this approval has not been offered.

Sec. 26-519 through Sec. 26-525 (Reserved)

DIVISION 3
**Stormwater Management System, Protection and Other
Standards, Soil Erosion Control**

Sec. 26-526 Responsibility for stormwater management system.

1. The City is not responsible for providing drainage facilities on private property for the management of stormwater on such property. It shall be the responsibility of the property owner to provide for, and maintain, private stormwater management facilities serving the property and to
2. Prevent and correct any conditions interfering with, or impeding, the management of stormwater, including the accumulation of debris that interferes with the drainage function of a water body.
3. Existing sites found to be in violation of this Article shall be subject to enforcement as outlined in Division 6 of Section 26.

Sec. 26-527 Stormwater management system.

All stormwater management facilities shall be constructed and maintained in accordance with all applicable federal, state and local ordinances, and rules and

regulations.

Sec. 26-528 Public health, safety and welfare.

Protection of the public health, safety and welfare shall be a primary consideration in the design of all stormwater management facilities.

Sec. 26-529 Protection of environmentally sensitive areas.

1. Environmentally sensitive areas shall be identified on the site plan with measures shown for protection of these areas as defined and in accordance with the City's Stormwater Management Standards.
2. The City may include provisions for the acceptable replacement of floodplain storage volume, where such storage volume is lost or diminished as a result of approved development.

Sec. 26-530 Flood protection and building openings.

1. All new buildings and substantial improvements to existing buildings shall be protected from flood damage up to the flood protection elevation and shall be in accordance with all applicable federal, state and City ordinances (Section 26 – Article VI and Section 2323 of the City of Muskegon Zoning Ordinance - Flood Hazard Areas).
 - a. Additionally, the lowest floor shall not be constructed below the following elevations:
 - i. One (1) foot above the design high water level of stormwater management facilities.
 - ii. Two (2) feet above the highest known groundwater elevation.
2. The lowest floor elevation established at the time of plat or development approval and on file in the City and/or County Drain or Water Resources Commissioner.
3. A waiver from elevations stated in Subsection (a) of this section may be granted by the City following receipt of a certification from a registered professional engineer demonstrating that the proposed elevation does not pose a risk of flooding. Floodproofing measures must be in accordance with FEMA Technical Bulletins and Michigan Building Codes.
4. Land Survey and Elevation Certificate. If the City and/or County Drain or Water Resources Commissioner has specified a minimum building opening at the time of plat or development approval, or if construction occurs within the one-hundred-year floodplain pursuant to Section 26 – Article VI and Section 2323 of the City's Zoning Ordinance upon completion of construction of the structure's

foundation and/or slab on grade, a registered land surveyor shall certify any minimum building opening elevation specified by this Article. This certificate shall attest that the building opening elevation complies with the standards of this Article. The permittee for the building permit shall submit the certificate to the City building inspections official prior to the commencement of framing and/or structural steel placement. If the surveyor should find that the minimum building opening elevation is below the elevation specified in Subsection (a) of this section, that opening must be raised using a method that meets with the approval of the City. After reconstruction, a registered land surveyor or engineer shall recertify that the minimum building opening elevation complies with the standards of this Article prior to the commencement of framing and/or structural steel placement

5. Waiver of Land Survey. The City building inspection official may grant a waiver of the required land survey under Subsection (c) of this section if the minimum building opening appears to be at or above the elevation of adjacent buildings that have already been certified, or if a grade map shows that the low opening elevation of the building is at least three (3) feet higher than the minimum building opening established pursuant to Subsection (a) of this section.

Sec. 26-531 Soil erosion and sedimentation control.

1. All persons who cause, in whole or in part, any earth change to occur shall provide soil erosion and sedimentation control so as to adequately prevent soils from being eroded and discharged or deposited onto adjacent properties or into a stormwater drainage system, a public street or right-of-way, wetland, creek, stream, water body, or floodplain.
2. Prior to making any earth change on a development site regulated by this Article, the property owner or developer shall first obtain a soil erosion and sedimentation control permit from the County Enforcing Agency issued in accordance with Part 91 of Public Act 451 of 1994 (MCL 324.9101 et seq.), if one is required.
3. A soil erosion and sedimentation control permit is required for any earth change that is greater than one acre or less than 500 feet from any lake or stream. Permits are obtained from the County Enforcing Agency.
4. The property owner and other persons causing or participating in the earth change shall comply with the terms of the soil erosion and sedimentation control permit.
5. During earth change activities on the development site, the City Engineer may inspect the site to ensure compliance with the approved construction site runoff controls.
6. During any earth change which exposes soil to an increased risk of erosion or

sediment tracking, the property owner and other persons causing or participating in the earth change shall do the following:

- a. Comply with the stormwater management standards of this Article.
- b. Prevent damage to any public utilities or services within the limits of grading and within any routes of travel or areas of work of construction equipment.
- c. Prevent damage to or impairment of any water body on or near the location of the earth change or affected thereby.
- d. Prevent damage to adjacent or nearby land.
- e. Maintain all required soil erosion and sedimentation control measures, including, but not limited to, measures required for compliance with the terms of this Article.
- f. Promptly remove all soil, sediment, debris, or other materials applied, dumped, tracked, or otherwise deposited on any lands, public streets, sidewalks, or other public ways or facilities, including catch basins, storm sewers, ditches, drainage swales, or water bodies. Removal of all such soil, sediment, debris or other materials within 24 hours shall be considered prima facie compliance with this requirement, unless such materials present an immediate hazard to public health and safety.
- g. Refrain from grading lands at locations near or adjoining lands, public streets, sidewalks, alleys, or other public or private property without providing adequate support or other measures so as to protect such other lands, streets, sidewalks or other property from settling, cracking or sustaining other damage.

Sec. 26-532 through Sec. 26-535. (Reserved)

DIVISION 4
Prohibitions and Exemptions

Sec. 26-536 Prohibited discharges.

1. Prohibition of illicit discharges.
 - a. No person shall discharge or cause to be discharged into the City's stormwater drainage system or waterbodies any materials, including but not limited to pollutants or waters containing any pollutants, other than stormwater, or an exempted discharge pursuant to Sections 26-

537, or discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

- b. The City is authorized to require dischargers to implement pollution prevention measures, utilizing BMPs, necessary to prevent or reduce the discharge of pollutants into the City's stormwater drainage system.

2. Prohibition of illicit connections.

- a. The construction, use, maintenance or continued existence of illicit connections to the stormwater drainage system is prohibited.
- b. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- c. A person is considered to be in violation of this Article if the person connects a line conveying wastewater to the MS4 or allows such a connection to continue.

Sec. 26-537 Exempted discharges.

The following non-stormwater discharges shall be permissible, provided that they do not result in a violation of state water quality standards or Section **26-536**:

1. Water supply line flushing;
2. Landscape irrigation;
3. Diverted streamflows;
4. Rising groundwater;
5. Uncontaminated groundwater infiltration to storm drains;
6. Uncontaminated pumped groundwater;
7. Discharges from potable water sources;
8. Foundation drains;
9. Air conditioning condensate;

10. Individual residential car washing;
11. Dechlorinated swimming pool water;
12. Street wash water;
13. Discharges or flows from emergency firefighting activities; and
14. Discharges for which a specific federal or state permit has been issued.

Sec. 26-538 Interference with natural or artificial drains.

1. It shall be unlawful for any person to stop, fill, dam, confine, pave, alter the course of, or otherwise interfere with, any natural or constructed drain or drainageway without first submitting a drainage plan to the City and receiving approval of that plan. Any deviation from the approved plan is a violation of this Article. This section shall not prohibit, however, necessary emergency action so as to prevent or mitigate drainage that would be injurious to the environment or the public health, safety, or welfare. When any of the activities mentioned in this section involves an established county drain, a drain use permit is required from the County Drain or Water Resources Commissioner.
2. No filling, blocking, fencing or above-surface vegetation planting shall take place within a floodplain/floodway.
3. For an overland flow-way:
 - a. Silt fence shall not be permitted below the top of the bank of a water body.
 - b. Chain-link fences may be permitted if the City determines that the fence will not obstruct or divert the flow of water.
 - c. If a fence is removed by the City or the County Drain or Water Resources Commissioner for drain access or drain maintenance, the fence may be replaced by the owner of the fence at the owner's expense.
 - d. No shrubs or trees shall be planted below the top of the bank of a water body, or within an easement for a waterway (for example, a backyard swale).
4. Shrubs, trees or other above-ground vegetation should not be planted over the top of an underground storm sewer or over the top of the easement within which the storm sewer has been installed.

Sec. 26-539 Storage of hazardous or toxic materials in drainageway.

Except as permitted by law, it shall be unlawful for any person to store or stockpile within a drainageway any hazardous or toxic materials unless adequate protection and/or containment has been provided so as to prevent any such materials from entering a drainageway.

Sec. 26-540 through Sec. 26-545. (Reserved)

DIVISION 5
Inspection, Monitoring, Reporting, and Recordkeeping

Sec. 26-546 Inspection and sampling.

To ensure compliance with the standards in this pervasively regulated area, the City may inspect and/or obtain stormwater samples from stormwater management facilities of any discharger to determine compliance with the requirements of this Article. Upon request, the discharger shall allow the City's properly identified representative to enter upon the premises of the discharger at all hours necessary for the purposes of such inspection or sampling. The City shall provide the discharger reasonable advance notice of such inspection and/or sampling. The City or its properly identified representative may place on the discharger's property the equipment or devices used for such sampling or inspection.

Sec. 26-547 Stormwater monitoring facilities.

A discharger of stormwater runoff shall provide and operate equipment or devices for the monitoring of stormwater runoff, so as to provide for inspection, sampling, and flow measurement of each discharge to a water body or a stormwater runoff facility, when directed in writing to do so by the City. The City may require a discharger to provide and operate such equipment and devices if it is necessary or appropriate for the inspection, sampling and flow measurement of discharges in order to determine whether adverse effects from or as a result of such discharges may occur. All such equipment and devices for the inspection, sampling and flow measurement of discharges shall be installed and maintained in accordance with applicable laws, ordinances and regulations.

Sec. 26-548 Accidental discharges.

1. The name and telephone number of the person making the report, and the name of a person who may be contacted for additional information on the matter. A properly reported accidental discharge shall be an affirmative defense to a civil infraction proceeding brought under this Article against a discharger for such discharge. It

shall not, however, be a defense to a legal action brought to obtain an injunction, to obtain recovery of costs or to obtain other relief as a result of or arising out of the discharge. A discharge shall be considered properly reported only if the discharger complies with all the requirements of Subsection (a) of this section.

2. Any discharger who accidentally discharges into a water body any substance other than stormwater or an exempted discharge shall immediately inform the City concerning the discharge. If such information is given orally, a written report concerning the discharge shall be filed with the City within five (5) days. The written report shall specify:
 - a. The composition of the discharge and the cause thereof.
 - b. The exact date, time, and estimated volume of the discharge.
 - c. All measures taken to clean up the accidental discharge, and all measures proposed to be taken to reduce and prevent any recurrence.

Sec. 26-549 Recordkeeping requirement.

Any person subject to this Article shall retain and preserve for no less than three (3) years any and all books, drawings, plans, prints, documents, memoranda, reports, correspondence and records, including records on magnetic or electronic media and any and all summaries of such records, relating to monitoring, sampling and chemical analysis of any discharge or stormwater runoff from any property.

Sec. 26-550 through Sec. 26-555 (Reserved)

DIVISION 6 Enforcement

Sec. 26-556 Sanctions for violation.

1. Any person violating any provision of this Article other than Sections **26-531**, **26-536** and **26-538**, and except as provided in Subsection (b) of this section, shall be responsible for a municipal civil infraction and subject to a fine of not less than \$500 for a first offense, and not less than \$1,000 for a subsequent offense, plus costs, damages, expenses, and other sanctions as authorized under Chapter 87 of the Revised Judicature Act of 1961 and other applicable laws, including, without limitation, equitable relief.
2. Each day such violation occurs or continues shall be deemed a separate offense and shall make the violator liable for the imposition of a fine for each day. The rights and remedies provided for in this section are cumulative and in addition to any other remedies provided by law. An admission or determination of responsibility shall not exempt the offender from compliance with the

requirements of this Article.

3. For purposes of this section, "subsequent offense" means a violation of the provisions of this Article committed by the same person within twelve (12) months of a previous violation of the same provision of this Article for which said person admitted responsibility or was adjudicated to be responsible.
4. Any person who neglects or fails to comply with a stop work order issued under Section **26-557** shall, upon conviction, be guilty of a misdemeanor punishable by a fine of not more than \$500 or imprisonment in the county jail for not more than 93 days, or both such fine and imprisonment, and such person shall also pay such costs as may be imposed in the discretion of the court.
5. Any person who aids or abets a person in a violation of this Article shall be subject to the sanctions provided in this section.

Sec. 26-557 Stop work order.

Where there is work in progress that causes or constitutes in whole or in part, a violation of any provision of this Article, the City is authorized to issue a stop work order so as to prevent further or continuing violations or adverse effects. All persons to whom the stop work order is directed, or who are involved in any way with the work or matter described in the stop work order, shall fully and promptly comply therewith. The City may also undertake, or cause to be undertaken, any necessary or advisable protective measures so as to prevent violations of this Article or to avoid or reduce the effects of noncompliance herewith. The cost of any such protective measures shall be the responsibility of the owner of the property upon which the work was performed.

Sec. 26-558 Failure to comply.

In addition to any other remedies, should any owner fail to comply with the provisions of this Article, the City may, after the giving of reasonable notice and opportunity for compliance, have the necessary work done, and the owner shall be obligated to promptly reimburse the City for all costs of such work.

Sec. 26-559 Emergency measures.

When emergency measures are necessary to moderate a nuisance, to protect public safety, health and welfare, and/or to prevent loss of life, injury or damage to property, the City is authorized to carry out or arrange for all such emergency measures. Property owners shall be responsible for the cost of such measures made necessary as a result of a violation of this Article and shall promptly reimburse the City for all of such costs.

Sec. 26-560 Cost recovery for damage to stormwater drainage system.

A discharger shall be liable for all costs incurred by the City as the result of causing a discharge that produces a deposit or obstruction, or causes damage to, or impairs a storm drain, or violates any of the provisions of this Article. Costs include, but are not limited to, those penalties levied by the EPA or EGLE for violation of an NPDES permit, attorney fees, and other costs and expenses.

Sec. 26-561 Collection of costs; lien.

Costs incurred by the City pursuant to Sections **26-531**, **26-536** and **26-538** shall be a lien on the premises which shall be enforceable in accordance with the Revenue Bond Act, Public Act 94 of 1933 (MCL 141.101 et seq.). Any such charges which are delinquent for six (6) months or more may be certified annually to the City Treasurer, who shall enter the lien on the next tax roll against the premises and the costs shall be collected and the lien shall be enforced in the same manner as provided for in the collection of taxes assessed upon the roll and the enforcement of a lien for taxes. In addition to any other lawful enforcement methods, the City shall have all remedies authorized by such Act.

Sec. 26-562 Appeals.

1. Any person to whom any provision of this Article has been applied may appeal in writing, not later than thirty (30) days after the action or decision being appealed from, to the City commission the action or decision whereby any such provision was so applied. Such appeal shall identify the matter being appealed, and the basis for the appeal. The City commission shall consider the appeal and make a decision whereby it affirms, rejects or modifies the action being appealed. In considering any such appeal, the City commission may consider the recommendations of the City Engineer and the comments of other persons having knowledge of the matter. In considering any such appeal, the City commission may grant a variance from the terms of this Article so as to provide relief, in whole or in part, from the action being appealed, but only upon finding that the following requirements are satisfied:
 - a. The application of the Article provisions being appealed will present or cause practical difficulties for a development or development site; provided, however, that practical difficulties shall not include the need for the developer to incur additional reasonable expenses in order to comply with the Article; and
 - b. The granting of the relief requested will not substantially prevent the goals and purposes sought to be accomplished by this Article, nor result in less effective management of stormwater runoff.

Sec. 26-563 Suspension of MS4 access.

1. Suspension due to illicit discharges in emergency situations. The City may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge, which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4. If the violator fails to comply with a suspension order issued in an emergency, the City may take such steps as deemed necessary to prevent or minimize damage to the MS4 or the environment, or to minimize danger to the health or welfare of persons.
2. Suspension due to the detection of illicit discharge. Any person discharging to the MS4 in violation of this Article may have the person's MS4 access terminated if such termination would abate or reduce an illicit discharge. The City will notify a violator of the proposed termination of the violator's MS4 access. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this section, without the prior approval of the City.

Sec. 26-564 Tracking enforcement.

The City shall implement a method for tracking instances of non-compliance. The tracking procedure shall ensure that detailed information about non-compliance and follow up enforcement action is adequately documented, including at a minimum:

1. Name of the person responsible for violating the ordinance;
2. Date and location of violation;
3. Description of the violation, including how the violation was identified;
4. Description of the enforcement response;
5. Schedule for returning to compliance
6. Date the violation was resolved.

Sec. 26-565 through Sec. 26-570. (Reserved)

DIVISION 7

Stormwater Easements and Maintenance Agreements

Sec. 26-571 Applicability of requirements.

The requirements of this division concerning stormwater easements and maintenance agreements shall apply to all persons required to submit a drainage plan to the City for review and approval.

Sec. 26-572 Stormwater easements.

The developer shall provide all stormwater easements necessary to implement the approved drainage plan and to otherwise comply with this Article in form and substance required by the City, and shall record such easements as directed by the City. The easements shall ensure access for proper inspection and maintenance of stormwater management facilities and shall provide adequate emergency overland flow-ways. Easements for private stormwater management systems shall be conveyed by each landowner to the entity responsible for operation and maintenance of the stormwater management system. The City will not accept easements over private stormwater management systems.

Sec. 26-573 Maintenance agreements.

1. A maintenance agreement is required for all developments requiring stormwater review. The developer shall provide all stormwater maintenance agreements necessary to implement the approved drainage plan and to otherwise comply with this Article in form and substance as required by the City. The maintenance agreement shall be signed and submitted to the City for review and approval at the time application for a stormwater permit is made. After construction of the stormwater management system has been verified and approved or accepted by the City, the Developer shall execute a final maintenance agreement with the City, record such agreements with the County Register of Deeds, and provide a copy of the recorded document to the City. The City reserves the right to require the maintenance agreement be recorded prior to issuance of a stormwater permit.
2. Maintenance agreement provisions. The maintenance agreement shall, among other matters, ensure access for proper inspection by the City or their designee, allow for maintenance or corrective actions of stormwater BMPs, and include provisions for the tracking of maintenance activities, and transfer of operation and maintenance responsibility to ensure the performance standards are met in perpetuity.
 - a. Maintenance Plan. The maintenance agreement shall include a maintenance plan and schedule for routine, emergency and long-term maintenance of all structural and vegetative stormwater BMPs installed and implemented to meet the performance standards, with a detailed annual estimated budget for the initial three (3) years, and a clear statement that only future maintenance activities in accordance with the maintenance plan shall be permitted without the necessity of securing new permits.
 - b. Maintenance Documentation. Written notice and submittal of maintenance documentation shall be provided to the City by the property owner at the interval set forth in the maintenance agreement and subject to the

provisions of Sections 26-546 through 26-562.

- c. Failure to Perform Maintenance. If it has been found by the City, following notice and an opportunity to be heard by the property owner, that there has been a material failure or refusal to undertake maintenance as required under this Article and/or as required in the approved maintenance agreement as required hereunder, the City shall then be
 - i. authorized, but not required, to hire an entity with qualifications and experience in the subject matter to undertake the monitoring and maintenance as so required, in which event the property owner shall be obligated to advance or reimburse payment for all costs and expenses associated with such monitoring and maintenance, together with a reasonable administrative fee. The maintenance agreement required under this Article shall contain a provision spelling out the requirements; and if the applicant objects in any respect to such provision or the underlying rights and obligations, such objection shall be resolved prior to the commencement of construction of the proposed development on the property. If the property owner fails to pay the costs incurred by the City under this Section, the costs shall be a lien on the property and enforced as provided in Division 6 of Section 26.
3. Tracking Operation and Maintenance. The City shall implement a tracking system to include procedures for filing and retrieval of all recorded maintenance agreements, maintenance plans, and stormwater management system maps to document location and ages of stormwater BMPs. The City shall also track annual inspection reports required to be submitted from the developer, and any inspection conducted by the City to document condition of stormwater BMPs and maintenance performed.

Sec. 26-574 Prohibition of orphan drains.

Prior to issuance of a stormwater permit, all stormwater management systems must have a single entity responsible for long-term operation and maintenance. The City will not approve an “orphan” drainage system serving multiple landowners without recorded stormwater easements and maintenance agreements.

Sec. 26-575 through Sec. 26-580. (Reserved)

DIVISION 8 Performance and Design Standards

Sec. 26-581 Resolution to implement performance and design standards.

The City Commission may adopt a resolution establishing detailed design and

performance standards for stormwater management facilities, consistent with the terms of this Article, and in order to further implement the goals and purposes set forth in this Article. Amendments to the design and performance standards must be approved by the City Commission.

Sec. 26-582 Performance standards.

In order to achieve the goals and purposes of this Article, sites shall meet the stormwater management performance standards for water quality treatment, channel protection, flood control, and other site-specific standards as published in the City's Stormwater Management Standards.

Sec. 26-583 Alternatives for meeting performance standards.

1. The City may establish programs and procedures for alternative means to meet the channel protection performance standard if onsite retention is determined to be not feasible.
2. Requirements for programs and procedures (if any) adopted by the City are given in the City's Stormwater Management Standards.

Sec. 26-584 Design standards.

Stormwater BMPs shall be designed to meet the performance standards as described in Section **26-582**. Stormwater management system design shall be in accordance with the City's Stormwater Management Standards.

Sec. 26-585 Responsibility to implement best management practices (BMPs).

The owner or operator of a commercial or industrial establishment shall provide, at the owner's or operator's own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the City's stormwater drainage system or waterbodies through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premises, which is or may be the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the MS4. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

3. This Ordinance is to become effective ten (10) days after adoption.

Ayes:

Nays:

First Reading:

Second Reading:

CERTIFICATE

The undersigned, being the duly qualified Clerk of the City of Muskegon, Muskegon County, Michigan, does hereby certify that the foregoing is a true and complete copy of an ordinance adopted by the City Commission of the City of Muskegon, at a regular meeting of the City Commission on the ____ day of _____, 2022, at which meeting a quorum was present and remained throughout, and that the meeting was conducted and public notice was given pursuant to and in full compliance with Act No. 267, Public Acts of Michigan of 1976, as amended, and that minutes were kept and will be or have been made available as required thereby.

Date: _____, 2022

Ann Marie Meisch, MMC
City Clerk

Publish: Notice of Adoption to be published once within ten (10) days of final adoption.

**CITY OF MUSKEGON
NOTICE OF ADOPTION**

TO: ALL PERSONS INTERESTED

Please take notice that on _____, 2022, the City Commission of the City of Muskegon repeals Chapter 26, Article V, Section 26 – 300 through Section 26 – 400 and adopts Section 26-500 through 26-585 of the Muskegon City Code, summarized as follows:

1. Sections 26-300 through 26-400 are repealed.
2. Section 26-500 is adopted to provide Definitions for the Stormwater Management ordinance.
3. Section 26-501 is adopted to provide Statutory Authority for the Stormwater Management ordinance.
4. Section 26-502 is adopted to provide Findings for the Stormwater Management ordinance.
5. Section 26-503F:\EDSI\FILES\00100\1693.02\ORDIN\14Y6777.DOCX is adopted to provide the Purpose for the Stormwater Management ordinance.
6. Section 26-504 is adopted to provide Applicability, exemptions and general for the Stormwater Management ordinance.
7. Section 26-505 is adopted to provide Definitions for the Stormwater Management ordinance.
8. Section 26-511 is adopted to require a stormwater permit for the Stormwater Management ordinance.
9. Section 26-512 is adopted to provide the review procedures for a stormwater permit for the Stormwater Management ordinance.
10. Section 26-513 is adopted to provide a drainage plan for the Stormwater Management ordinance.
11. Section 26-514 is adopted to provide the review fees and escrow for the Stormwater Management ordinance.
12. Section 26-515 is adopted to provide for a financial guaranty for the Stormwater Management ordinance.
13. Section 26-516 is adopted to provide for a certificate of occupancy for the Stormwater Management ordinance.
14. Section 26-517 is adopted to provide a prohibition on altering a stormwater management facility, except as provided in a drainage plan for the Stormwater Management ordinance.
15. Section 26-518 is adopted to provide the terms and conditions of a stormwater permit for the Stormwater Management ordinance.
16. Section 26-526 is adopted to provide the responsibility for a stormwater management system for the Stormwater Management ordinance.
17. Section 26-527 is adopted to provide for a stormwater management system for the Stormwater Management ordinance.

18. Section 26-528 is adopted to provide the primary considerations for a stormwater management system for the Stormwater Management ordinance.
19. Section 26-529 is adopted to provide for the protection of environmentally sensitive areas in the stormwater management system for the Stormwater Management ordinance.
20. Section 26-530 is adopted to provide for flood protection and building openings in the stormwater management system for the Stormwater Management ordinance.
21. Section 26-531 is adopted to regulate soil erosion and sedimentation control in the stormwater management system for the Stormwater Management ordinance.
22. Section 26-536 is adopted to prohibit certain discharges in the stormwater drainage system.
23. Section 26-537 is adopted to provide for discharges exempt for certain non-stormwater discharges.
24. Section 26-538 is adopted to prohibit the interference with natural and artificial drains.
25. Section 26-539 is adopted to prohibit the storage of hazardous or toxic materials in the drainageway.
26. Section 26-546 is adopted to provide for the inspection of sampling of stormwater.
27. Section 26-547 is adopted to provide for stormwater monitoring facilities.
28. Section 26-548 is adopted to provide for the reporting of accidental discharges.
29. Section 26-549 is adopted to require recordkeeping requirements.
30. Section 26-556 is adopted to provide for sanctions for violations.
31. Section 26-557 is adopted to provide for stop work orders.
32. Section 26-558 is adopted to provide for ramifications for failing to comply with this ordinance.
33. Section 26-559 is adopted to provide for emergency measures discharges exempt for certain non-stormwater discharges.
34. Section 26-560 is adopted to provide for cost recovery for damage to a stormwater drainage system.
35. Section 26-561 is adopted to provide for collection of costs and right to lien property.
36. Section 26-562 is adopted to provide for a right to appeal discharges exempt for certain non-stormwater discharges.
37. Section 26-563 is adopted to provide for the suspension of MS4 access.
38. Section 26-564 is adopted to provide for the tracking of enforcement.
39. Section 26-571 is adopted to prescribe the applicability of requirements.
40. Section 26-572 is adopted to provide for the requirement of stormwater easements.
41. Section 26-573 is adopted to provide for maintenance agreements.
42. Section 26-574 is adopted to prohibit orphan drains.
43. Section 26-581 is adopted to provide for resolutions to implement performance and design standards.
44. Section 26-582 is adopted to provide for performance standards.
45. Section 26-583 is adopted to provide for alternatives for meeting performance standards.

46. Section 26-584 is adopted to provide for design standards.
47. Section 26-585 is adopted to provide for the responsibility to implement best management practices (BMPs).

This ordinance is effective 10 days after adoption.

Copies of the ordinance may be viewed and purchased at a reasonable cost at the Office of the City Clerk in the City Hall, 933 Terrace Street, Muskegon, Michigan, during regular business hours.

This ordinance amendment is effective ten (10) days from the date of this publication.

Published: _____, 2022

CITY OF MUSKEGON

By _____
Ann Marie Meisch, MMC
City Clerk

PUBLISH ONCE WITHIN TEN (10) DAYS OF FINAL PASSAGE

STORMWATER MANAGEMENT STANDARDS

Procedures & Design Criteria for
Stormwater Management

City of Muskegon, Michigan

October 2022





STORMWATER MANAGEMENT STANDARDS

Procedures & Design Criteria for
Stormwater Management

Adopted:
October 2022

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PART 1 - GENERAL PROVISIONS

I. Purpose 1

 A. Compliance with State and Federal Stormwater Mandates 1

 B. Preferred Stormwater Management Strategies 2

II. Authority 6

 A. State Law and Code of City Ordinances.....6

 B. Provisions for Requirements in Addition to Minimum Standards 6

III. Applicability..... 6

 A. Review Required 6

IV. Severability Clause.....6

V. Adoption and Revision 6

VI. Fees 6

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

I. Submission and Approval 7

 A. Concept Review Meeting..... 7

 B. Submission..... 7

 C. Changes and Resubmission 7

 D. Approval 8

 E. Expiration of Approval 8

 F. Revocation of Approval 8

 G. Submission of Construction Record Drawings 8

II. Stormwater Drainage Requirements..... 8

 A. Drainage Plan..... 8

 B. Regional Stormwater Management Facility 9

 C. Off-site Mitigation and Payment-in-lieu 9

 D. Restrictive Covenants 10

 E. Maintenance Plan and Agreement 13

PART 3 - STORMWATER MANAGEMENT REQUIREMENTS

I. Summary 15

II. Standards 17

 A. Water Quality 17

 B. Channel Protection..... 18

 C. Flood Control..... 19

 D. Pretreatment..... 20

 E. Hot Spots 21

III. Design Process 22

 A. Identify Sensitive Areas 22

 B. Select Source Controls..... 23

 C. Size Runoff Controls 23

 D. Confirm an Adequate Outlet 23

E.	Select Best Management Practices (BMPs).....	23
----	--	----

PART 4- STORMWATER DESIGN CRITERA

I.	Soils Investigation.....	25
A.	Qualifications.....	25
B.	Background Evaluation	25
C.	Test Pit/Soil Boring Requirements	25
D.	Highest Known Groundwater Elevation	26
E.	Field Permeability Testing.....	26
F.	Design Infiltration Rates	26
G.	Minimum Allowable Infiltration Rate	28
II.	Calculation Methodology	29
A.	Calculating Runoff.....	29
B.	Rainfall	35
C.	Calculating Storage Volumes and Release Rates	36
D.	Groundwater Mounding.....	40
E.	Computing Tools.....	40
F.	LGROW Design Spreadsheet.....	41

PART 5 | BMP DESIGN CRITERIA

I.	Non-Structural Best Management Practices	44
A.	Minimal Disturbance Area	44
B.	Protect Natural Flow Pathways	45
C.	Protect Sensitive Areas.....	46
D.	Native Revegetation	47
E.	Stormwater Disconnect	48
II.	Structural Best Management Practices.....	49
A.	Storm Sewer	50
B.	Culvert or Bridge.....	53
C.	Open Channel	54
D.	Detention Basins.....	55
E.	Retention Basins	65
F.	Sediment Forebay.....	71
G.	Spill Containment Cell.....	72
H.	Infiltration Practices.....	75
I.	Bioretention/Rain Garden	80
J.	Constructed Filter	84
K.	Planter Box	88
L.	Pervious Pavement	92
M.	Capture Reuse	95
N.	Vegetated Roof.....	97
O.	Water Quality Device.....	98
P.	Bioswale and Water Quality Swale.....	99
Q.	Vegetated Swale	104
R.	Vegetated Filter Strip.....	108
S.	Level Spreader	113

List of Tables

Table 1	Minimum Required Stormwater Standard	16
Table 2	Stormwater Hot Spots	22
Table 3	Stormwater BMP Matrix	24
Table 4	Minimum Number of Soil Tests Required	25
Table 5	Determination of a Design Infiltration Rate	27
Table 6	Design Infiltration Rates by USDA Soil Texture Class	27
Table 7	Rational Method Runoff Coefficients (10- to 100-year rainfall frequencies)	29
Table 8	Surface Retardants Coefficients	30
Table 9	Curve Numbers (CNs) from TR-55	32
Table 10	Runoff Coefficients for Small Storm Hydrology Method	34
Table 11	Rainfall Amounts (inches)	35
Table 12	Manning's Roughness Coefficients	51
Table 13	Minimum and Maximum Slopes for Storm Sewers	62
Table 14	Hydraulic Conductivities for Filter Media	85
Table 15	Permanent Stabilization Treatment for Vegetated Swales	105

List of Figures

Figure 1	USDA Soil Textural Triangle	28
Figure 2	Extended Detention Hydrograph	37
Figure 3	Manning's Roughness Coefficients for Vegetated Swales	105
Figure 4a	Filter Strip Length (Sandy soils with HSG A)	109
Figure 4b1	Filter Strip Length (Sandy Loam soils with HSG B)	109
Figure 4b2	Filter Strip Length (Loam, Silt-Loam soils with HSG B)	110
Figure 4c	Filter Strip Length (Sandy Clay Loam soils with HSG C)	110
Figure 4d	Filter Strip Length (Clay Loam, Silty Clay, Clay soils with HSG D)	111

List of Appendices

Appendix 1	Watershed Policy Statements
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I. PURPOSE

This manual was produced to update and unify site plan review procedures within City of Muskegon. It is the purpose of these site development rules to establish a uniform set of minimum standards for the management of stormwater to be applied city-wide and meet the following objectives:

1. Ensure stormwater drainage systems are adequate to address stormwater management needs within a proposed development, and protect the drainage, property, and water rights of landowners outside of the proposed development.
2. Reduce flood damage due to development.
3. Minimize the degradation of existing watercourses.
4. Prevent an increase in nonpoint source pollution.
5. Maintain site hydrology to avoid detrimental changes in the balance between stormwater runoff, groundwater recharge, and evapotranspiration.

The City has applied the *Muskegon County Water Resources Commissioner Site Development Rules with Procedures and Design Standards for Stormwater Management Systems*, since adoption by City Commission on October 25, 2016. This manual was developed to update and unify site plan review procedures pertaining to stormwater within the City and supplement the City's newly adopted Stormwater Ordinance. This manual was developed to comply with state and federal stormwater guidelines.

A. Compliance with State and Federal Stormwater Mandates

Drains located within an urbanized area defined by the United States Environmental Protection Agency (EPA) are considered MS4s. The City is required to obtain an individual NPDES MS4 permit under Section 402 of the Federal Clean Water Act, as amended, and under Water Resources Protection (Part 31, Act 451, PA 1994) of the Michigan Natural Resource and Environmental Protection Act, as amended. An application for an MS4 permit was submitted to EGLE on April 1, 2016.

The MS4 permit requires the City to adopt an ordinance or other regulatory mechanism to address post-construction stormwater runoff from new development and redevelopment projects, including preventing or minimizing water quality impacts. The Post-Construction Stormwater Runoff Program of the MS4 permit requires among other things:

1. A water quality performance standard to ensure specified reductions in total suspended solids.
2. A channel protection performance standard to address resource impairments resulting from increases in bankfull flow rates and volumes.
3. A review procedure for the evaluation of infiltration best management practices (BMPs) to meet water quality and channel protection standards in areas of soil or groundwater contamination.
4. Measures to address associated pollutants in identified "hot spots," which include land uses with the potential for significant pollutant loading that could result in the contamination of surface water or groundwater, including public water supplies.
5. A long-term operation and maintenance plan and agreement allowing for inspection, including a mechanism for tracking the transfer of operation and maintenance responsibility and compliance.

The minimum standards in this manual meet the Post-Construction Storm Water Runoff Program requirements for new and redevelopments set forth in the *State of Michigan National Pollutant Discharge Elimination System Permit Application for Discharge of Storm Water to Surface Waters of the State from a Municipal Separate Storm Sewer System* (DEQ, 2013, Rev 10/2014).

TMDLs

The MS4 permit also requires identification and prioritization of actions to reduce pollutants in stormwater discharges to make progress in meeting Total Maximum Daily Load (TMDL) Water Quality Standards. TMDL water bodies in City of Muskegon are summarized below:

TDML Waterbody	Pollutant	Pollutants(s) of Concern
Little Black Creek	Biota	Sedimentation and Siltation
Black Creek	Biota	Sedimentation and Siltation
Ruddiman Creek	E. Coli	Human and wildlife, pathogens, refuse, illicit discharges

B. Preferred Stormwater Management Strategies

Regional Stormwater Management

The management of stormwater on a regional basis is encouraged where practical, particularly where site constraints may preclude effective onsite treatment of stormwater. A regional stormwater management approach allows for the use of superior performing BMPs that require more space and provides more flexibility for BMPs to be sited strategically to address a known water quality issue.

Developers are encouraged to pursue a regional approach for private facilities where practical. Specific requirements are provided in Part 2 section “Regional Stormwater Management Facility.”

Flood Control

The prevention and mitigation of property damage caused by flooding is priority for the City. The standards for flood control require among other things:

1. A minimum flood control volume to be retained or detained onsite with provisions for emergency overflow.
2. Confirmation of an adequate outlet for the discharge of stormwater offsite.

Alternatives for Channel Protection

An alternative approach using extended detention is allowed by EGLE for the urbanized area within the City of Muskegon when the full channel protection volume cannot be retained onsite, and offsite options are not available. These standards define the conditions under which the alternative approach will be approved for use. A flow chart outlining this process is shown on the following page. Specific requirements are provided in Part 3 section “Channel Protection.”

Off-site mitigation for channel protection is allowed where physical constraints of individual sites may preclude effective onsite treatment. Specific requirements are provided in Part 2 section “Off-site Mitigation.”

Payment-in-lieu for channel protection will only be allowed if a program is available from the City or as set forth in a Watershed Policy Statement. Specific requirements are provided in Part 2 section “Payment-in-lieu.”

Limiting site conditions can be addressed using off-site mitigation or payment-in-lieu (offsite options), the alternative approach (onsite option), or a combination of these options as the City sees fit, only if the use of all other onsite BMPs has been maximized.

Low Impact Development

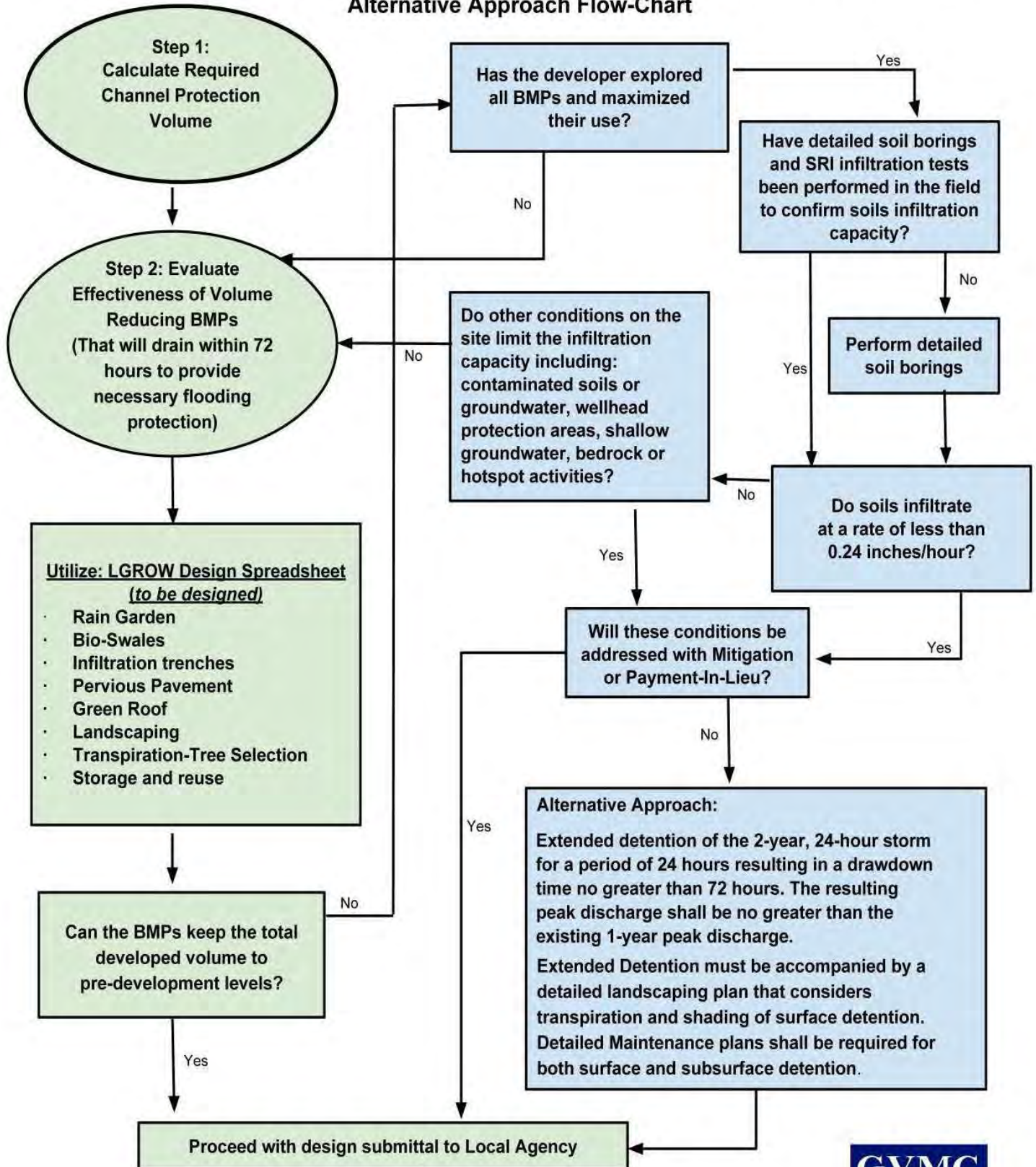
Where regional stormwater management is not available to developers, onsite Low Impact Development (LID) is the preferred stormwater management strategy to meet the multiple objectives identified previously. LID uses the basic principle modeled after nature to manage rainfall where it lands. The outcome of LID is mimicking existing site hydrology by using design techniques to infiltrate, filter, store, evaporate and detain runoff close to its source. Many of these techniques incorporate the use of vegetation and are collectively referred to as Green Infrastructure. A LID approach offers additional benefits in terms of increased property value and potential cost savings.² The size of stormwater storage facilities and infrastructure can often be reduced by incorporating LID principles into a site design up front.

The *Low Impact Development Manual for Michigan* (SEMCOG, 2008) was used to develop this manual. The standards in this manual incorporate LID principles into the design process and include design criteria for LID and small site BMPs.

¹ Maupin, Miranda, and Wagner, Theresa (2003). *Regional Facility vs. On-site Development Regulations: Increasing Flexibility and Effectiveness in Development Regulation Implementation*, City of Seattle, Seattle, Washington.

² United States Environmental Protection Agency (December 2007). *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, EPA 841-F-07-006

Lower Grand River Organization of Watersheds MS4 Stormwater Ordinance Committee Alternative Approach Flow-Chart



Stormwater Management Preferred Approach Incorporates Low Impact Development (LID)



Traditional Parking Lot Design



Preferred: LID Parking Lot Design



Traditional "Big Box" Site Layout



Preferred: Equivalent LID Site Layout

II. AUTHORITY

A. State Law and Code of City Ordinances

Under the Home Rule City Act, PA 279 of 1909 (MCL 117.1 et seq.), the City Commission has the power to enact, amend and repeal all ordinances that may be necessary or proper for carrying out the powers conferred, and the duties imposed upon the City by the charter and by the laws of the State.

The Code of City Ordinances, Zoning, Section 514 and Chapter 78 Subdivisions & Other Land Divisions, establish the site plan review procedure under the Land Division Act, PA 288 of 1967 (MCL 560.101 et seq.); Condominium Act, PA 59 of 1978 (MCL 559.101 et seq.) and local regulation of condominiums (MCL 559.241); the Mobile Home Commission Act, PA 96 of 1987 (MCL 125.2301 et seq.); and the Michigan Zoning Enabling Act, PA 110 of 2006 (MCL 125.3101 et seq.), as amended.

Chapter 26 Environment, Article V (Stormwater Management), provides for the regulation and control of stormwater runoff and establishes procedures for obtaining a stormwater permit as part of the site plan approval process. These published Stormwater Standards are established pursuant to and incorporated by reference into the Stormwater Ordinance.

B. Provisions for Requirements in Addition to Minimum Standards

This manual provides minimum standards to be complied with by Developers and in no way limit the authority of the City to adopt or publish and enforce higher standards as a condition of approval of the final plat or site plan. The City reserves the right to determine site-specific requirements other than those herein, based upon review of the plans. Any deviations from these standards shall be subject to approval by the City.

III. APPLICABILITY

A. Review Required

These standards apply to private and public development and redevelopment projects in City of Muskegon. These standards also apply to City owned facilities and City Public Works projects, including road projects.

Developments subject to review under these Standards, limited to City review, and exemptions are identified in Section 26-304 of the Stormwater Ordinance.

IV. SEVERABILITY CLAUSE

If any part of these rules is found to be invalid, such invalidity shall not affect the remaining portions of the rules which can be given effect without the invalid portion, and to this end the rules are declared to be severable.

V. ADOPTION AND REVISION

The City council has adopted these Stormwater Standards by approval of the Stormwater Ordinance at the October 25, 2022 City Commission meeting. The effective date of these standards is November 1, 2022. Revisions to the standards or fees will be subject to review and approval by City Council.

Revisions to the standards affecting MS4 permit requirements must be reviewed and approved by EGLE, if required by law.

VI. FEES

The fees for reviewing a plat or site development under these rules are set forth on the *Stormwater Review Application*.

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

I. SUBMISSION AND APPROVAL

These procedures have been developed in the context of the plat requirements specified in the Land Division Act, which lays out a two-step submittal and approval process. A preliminary plat and final plat are required by statute.

For other types of developments, submittal of a condominium subdivision plan, preliminary plan, or site plan is required, which will typically culminate in a final set of construction drawings.

A. Concept Review Meeting

A concept review meeting is strongly encouraged prior to submittal of a site plan. The purpose of the concept review meeting is to initiate communication and provide uniform direction to the Developer to maximize efficiency in design and reduce costs.

The Proprietor is responsible for contacting the City's office to request the meeting, submit the concept plan, and coordinate the location, date, and time for the meeting with all parties involved. Information provided by the Proprietor in the concept plan shall include at a minimum the items on the Stormwater Review Checklist.

If the conceptual layout of the drainage plan is approved, the Developer may begin completing design plans and calculations for application submittal under these Standards.

B. Submission

The following submittals are required for City review and approval prior to the start of any work on the proposed development requiring review under these rules. Soil borings and test pits, soil testing, vegetative cutting solely for land surveys, and normal maintenance shall not be considered a start of work under these rules. An application packet is available from the City.

Site Plan Review

1. Site Plan Review Application.
2. Stormwater Worksheet and calculations prepared by a professional engineer licensed in the State of Michigan.
3. Drawings. Initial submission requires one (1) print and one (1) electronic PDF file containing the information on the Stormwater Review Checklist prepared by a professional engineer or surveyor licensed in the State of Michigan. Resubmittals require only one (1) electronic PDF file.
4. Applicable fee (refer to Part 1 section "Fees").

Staged Development

Should the Developer plan to develop a given area but wish to begin with only a portion of the total area, the original preliminary plat or site plan shall include the proposed general layout for the entire area. The first phase of the development shall be clearly superimposed upon the overall plat or site plan in order to clearly illustrate the method of development that the Developer intends to follow. Each subsequent plat or site plan shall follow the same procedure until the entire area controlled by the Developer is developed.

Final acceptance by the City of only one portion or phase of a development does not ensure final acceptance of any subsequent phases or the overall general plat or site plan for the entire area; nor does it mandate that the overall general plat or site plan be followed as originally proposed, if deviations or modifications acceptable to the City are proposed.

C. Changes and Resubmission

Changes made without resubmission and approval may result in revocation of approval.

If the Developer finds it advantageous or necessary to make design changes, or if the information given to the

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

City does not represent the conditions as they exist on the ground, and revisions are required as a result, such revisions shall be made by the Developer and the drawings resubmitted to the City for approval.

D. Approval

Payment of all fees is prerequisite to approval (refer to Section 26-314 of the Stormwater Management Ordinance).

E. Expiration of Approval

Approval of construction drawings by the City's office is valid for two (2) calendar years. If an extension beyond this period is needed, the Proprietor shall submit a written request to the City for an extension. The City may grant one-year extensions of the approval and may require updated or additional information, if needed. Should modifications be made to the drawings, a new review may be required subject to the appropriate fees.

F. Revocation of Approval

Any approval issued by the City under these rules may be revoked or suspended for a violation of the conditions of approval, or a misrepresentation or failure to disclose relevant facts in the application submittal. The City will provide the Proprietor written notice of any revocation of approval.

G. Submission of Construction Record Drawings

Construction record drawings ("as-builts") shall be submitted to the City for developments reviewed under these rules. A letter of certification by a professional engineer shall accompany the construction record drawings or may be accepted in lieu of record drawings for some projects at the City's discretion. An Engineer's Certification of Construction is available from the City.

One (1) print, one (1) electronic PDF file, and one (1) electronic file meeting GIS digital submission requirements shall be submitted, and contain the information listed on the Stormwater Review Checklist.

Construction record drawings must be submitted prior to release of any review deposit. The City will review construction record drawings for completeness and respond with written comments or acceptance within thirty (30) days of submittal or resubmittal.

II. STORMWATER DRAINAGE REQUIREMENTS

A. Drainage Plan

Drainage Patterns

Proposed drainage for the development shall conform to existing watershed boundaries, natural drainage patterns within the site, or any established county drainage districts.

Staged Development

Each phase shall be self-sufficient from the standpoint of drainage.

Location of Stormwater Management Facilities

Stormwater management facilities within a development planned to have multiple lot owners shall be located on dedicated outlots, within road rights-of-way, or have separate easements granted to the entity responsible for operation and maintenance of the stormwater management system.

Parking lots, roadways, walkways, and roadside ditches shall not be flooded for use as stormwater detention.

Offsite Stormwater

Surface water flows from offsite land shall be routed around the development's onsite stormwater system whenever possible. An onsite detention basin shall not be used to pass this flow through the site. If water from offsite is directed through an onsite detention basin, the basin must either be designed as a regional stormwater management facility or be sized to additionally store the existing offsite water with no change in the allowable

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

release rate for the site.

Stormwater Discharge

The rate, volume, concentration, or constitution of stormwater discharged from a site for the specified design storms shall not create adverse impacts to downstream properties or the public stormwater management system. To that end, the following stormwater discharge requirements must be met for all sites:

- i. Post-development discharge shall not exceed the capacity of the existing infrastructure or the existing discharge rate from the site, whichever is lower.
- ii. Post-development discharge shall not cause adverse impact to offsite property due to concentrated runoff or ponded water of greater height, area, and duration.
- iii. Discharge shall not cause downstream erosion or sedimentation.
- iv. For a downstream drainage system that is inadequate to handle any increase to the existing design discharge from the site development, it is the Proprietor's responsibility to:
 1. Stabilize or upsize the existing conveyance system.
 2. Obtain flooding easements.
 3. Provide additional onsite stormwater controls.
- v. Discharge to groundwater shall not cause groundwater mounding sufficient to adversely impact structures or adjacent property.
- vi. Post-development discharge shall not cause impairments by the contribution of pollutants to surface water or groundwater.
- vii. Post-development discharge shall not cause impairments to coldwater streams due to thermal properties of the discharge.

It is the Developer's obligation to meet these requirements. Should a stormwater system, as built, fail to comply, it is the Developer's responsibility to have constructed at their expense, any necessary additional and/or alternative stormwater management facilities, subject to the City's review and approval.

B. Regional Stormwater Management Facility

Regional stormwater management facilities are designed to serve multiple developments or parcels with more than one property owner at the time of development or redevelopment.

The City may pursue projects to serve a particular city stormwater district, or may approve facilities proposed to be constructed by individual Developers. Private facilities must have a written agreement between responsible parties with recorded easements to ensure operation and maintenance of the facility in perpetuity. Agreements must specify maximum allowable runoff coefficients for each parcel contributing to the facility.

The regional facility should be constructed first, prior to any development or redevelopment. Written approval is required from the City if construction is to be delayed. Financial surety and temporary onsite measures must be provided until the facility is constructed.

C. Off-site Mitigation and Payment-in-lieu

Off-site Mitigation

Off-site mitigation refers to BMPs implemented at a location other than the proposed development or redevelopment, but within the same jurisdiction and watershed/sewershed as the original project to meet channel protection standards required by the MS4 permit. The watershed is the area represented by the DEQ, 10-digit Hydrologic Unit Code. The sewershed is the area where storm water is conveyed by an MS4 to a common outfall or point of discharge.

The City also requires that the off-site mitigation is protective of the same watercourse or waterbody to which the site discharges and is located downstream of the proposed development or redevelopment if possible.

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

Payment-in-lieu

Payment-in-lieu refers to the Proprietor paying a fee to the City, which is then applied towards a public stormwater management project that fulfills the channel protection and/or other stormwater requirements for the site. The stormwater management project may be either a regional stormwater management facility, a new BMP, or a retrofit to an existing BMP.

The City will only consider payment-in-lieu if the City has a planned or constructed improvement project meeting the requirements for off-site mitigation as identified in a Watershed Policy Statement. The cost of payment-in-lieu will be determined on a case-by-case basis and will represent the actual cost of implementing public water quality enhancements.

Criteria

The determination to approve off-site mitigation or payment-in-lieu will be based on multiple criteria and not solely on the difficulty or cost of implementing BMPs on site. Conditions under which the option to move off site would become available may include:

- i. Limited size of the lot outside of the building footprint to create the necessary infiltration capacity even with amended soils.
- ii. Soil instability as documented by a thorough geotechnical analysis.
- iii. A site use that is inconsistent with capture and reuse of stormwater.
- iv. Too much shade or other physical conditions that preclude adequate use of plants.
- v. The potential water quality impact from the original project site and the benefits realized at the off-site location.

The City may approve off-site mitigation or payment-in-lieu if the Developer demonstrates that site constraints preclude sufficient treatment and restoration of hydrology onsite, and the following minimum requirements are met:

1. Offset ratio. The offset ratio for the amount of storm water not managed onsite in relation to the amount of stormwater required to be mitigated at another site, or for which in-lieu payments will be made is as follows:
 - a. First Tier: Manage a minimum of 0.4 inches of storm water runoff onsite and provide a 1 to 1.5 offset ratio for the remaining amount of storm water managed offsite.
 - b. Second Tier: If it completely infeasible to manage the minimum onsite, provide a 1 to 2 offset ratio for the amount of storm water managed offsite.
2. Schedule. Off-site mitigation shall be completed within 24 months after the start of the original site construction.
3. Assurances. Offset and in-lieu projects shall be preserved and maintained in perpetuity through the procedures and tracking system administered by the City.

D. Restrictive Covenants

For plats and site condominiums, a copy of restrictive covenants or master deed language related to drainage shall be provided to the City along with construction drawings for approval. Covenants and deeds shall be recorded at the Register of Deeds prior to release of posted surety.

Block Grading Plan

A block grading plan shall be incorporated in the restrictive covenants of the plat or master deed to ensure proper drainage of individual lots. In addition, the Developer shall provide a copy of the block grading plan to the City for their permanent files. The block grading plan shall include the Lowest Allowable Floor Elevation and Lowest Allowable Opening Elevation for each lot and include the "basement type" for each lot (e.g., walkout, daylight, or standard basement) as indicated by the topography of each site and according to the approved design plans. The block grading plan shall state:

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

The block grading plan shows the direction of flow for the surface drainage for all lots. It is the lot owner's responsibility to ensure that the final grading of the lot is in accordance with the block grading plan. During the final lot grading and landscaping, the owner shall take care to ensure that the installation of fences, planting, trees, and shrubs do not interfere with nor concentrate the flow of surface drainage. No changes will be made in the grading of any lot areas used for drainage which would later affect surface runoff drainage patterns without the prior written consent of the City for all portions of the drainage system. Finish grading for home construction shall be completed in conformance with the master drainage plan for the development and in such a manner so as not to create the excessive ponding of stormwater on the sites within the development.

Minimum Floor and Opening Elevations

Provisions for flood protection and building opening are set forth in Section 26-330 of the Stormwater Management Ordinance. Documentation to support allowable minimum floor and opening elevations shall be submitted with construction drawings

Criteria for determining the Lowest Allowable Floor Elevation

- i. Proximity to detention/retention facilities due to groundwater mounding (which may not be apparent until after construction).
- ii. Groundwater elevations from monitor wells, test pits and/or soil borings including any soil mottling noted in the soil profile.
- iii. Regional and cyclical groundwater levels available online.
- iv. Hydrogeologic studies and groundwater modeling.

Criteria for determining the Lowest Allowable Opening Elevation

1. Proximity to open drain or natural watercourse, pond, or wetland and the 100-year flood elevation.
2. Proximity to detention/retention basin and design high water level.
3. Proximity to drainage swales and/or flood routes designed to convey the 100-year storm event runoff including overflows from detention/retention basins.
4. Proximity to an enclosed storm sewer system with open ends or catch basins that could surcharge during the 100-year storm event.
5. Type of building foundation (e.g., walkout, daylight, or standard basement) as dictated by the topography of each site.

Minimum floor and opening elevations shall be incorporated in the restrictive covenants of the plat or master deed, including benchmark references. It is the responsibility of the Proprietor to provide a sufficient number of benchmarks (NAVD 88 datum) to use as a reference for establishment of minimum floor and opening elevations for all lots. Lots not impacted by high groundwater or potential flooding from a 100-year storm event as determined by the Design Engineer shall be so noted as well. The restrictive covenant shall state:

The lowest allowable floor elevations are set at 2-foot or more above the highest known ground water elevation. The lowest allowable floor and/or opening elevations are set 2-foot or more above the 100-year floodplain or design high water level of the stormwater system. These elevations are set to reduce the risk of structural damage and the flooding of building interiors. A waiver from the set elevations may be granted by the City following receipt of a certification from a professional engineer or surveyor licensed in the State of Michigan demonstrating that the proposed elevation does not pose a risk of flooding. Minimum building floor and opening elevations and benchmark locations and elevations are indicated on the Block Grading Plan.

Footing Drains and Sump Pumps

Where footing drains and sump pumps are required or utilized, a stormwater lateral shall be provided for each parcel at the time of construction, unless a waiver is granted in writing by the City.. Provide direction in the restrictive covenants of the plat or condominium master deed for footing drain and sump pump outlets. If proposed to be directed to the storm sewer system, the restrictive covenant shall state:

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

Water from such sources as eave troughs and footing drains shall be directed to laterals provided for the lots. Water from footing drains shall be discharged to the lateral via a sump pump with check valve system. If no lateral is provided, the lot owner shall discharge said water in such a manner as to not impact neighboring land or public streets.

Floor drains, laundry facilities or other similar features shall not be connected to a footing drain or sump pump system discharging to footing laterals and the storm sewer system. Laundry facilities and sewage lift pumps must discharge into the sanitary sewage disposal system.

Provisions for interference with natural or artificial drain are set forth in Section 26-338 of the Stormwater Ordinance.

Easements for Side Yard and Surface Drainage

Private easements for enclosed yard drains and surface drainage are for the benefit of upland lots within the development or upland sites that currently drain across the proposed plat or site. Language shall be included within the restrictive covenants of the plat or condominium master deed that clearly notifies property owners of the location and purpose of private easements for side yard and surface drainage, as well as restrictions on use or modification of these areas. A separate, recordable easement form is not required. The restrictive covenant shall state:

Private easements for side yard and surface drainage are for the benefit of upland lots within the subdivision and any improper construction, development, or grading that occurs within these easements will interfere with the drainage rights of those upland lots. Private easements for surface drainage are for the continuous passage of surface water and each lot owner will be responsible for maintaining the surface drainage system across their property. No construction is permitted within a private easement for side yard and surface drainage. This includes fences, swimming pools, sheds, garages, patios, decks, or any other permanent structure or landscaping features. No dumping of grass clippings, leaves, brush, or other refuse is allowed within a drainage easement. These items obstruct drainage, restrict flow, and plug culverts. This can lead to higher maintenance costs and cause flooding situations.

Soil Erosion and Sedimentation Control Permits

It is the responsibility of the Developer to contact the Muskegon County Public Works Department (Enforcing Agency) to determine which lots if any need a permit for Soil Erosion and Sedimentation Control (Part 91, Act 451, PA 1994). The restrictive covenant shall state:

Each individual lot owner will be responsible for the erosion control measures necessary on their lot to keep loose soil from their construction activities out of the street, catch basins, and off of adjacent property. If any sedimentation in the street, catch basins, or adjacent lots of results from construction for a particular site, it is the responsibility of that lot owner to remove the sediment and restore the lot to prevent further erosion. This applies to ALL lot owners.

A Soil Erosion and Sedimentation Control Permit must be obtained from Muskegon County Department of Public Works prior to excavation for lots _____ through _____. All conditions set forth by permit shall be met throughout construction activity until permit is allowed to expire.

Responsibility for Maintenance of Open Water Bodies

The restrictive covenant shall state:

Lot owners are responsible for the management and maintenance of open water bodies for aesthetics, aquatic habitat, recreation, and water quality, including liability and costs. Lot owners are also responsible to prevent open waterbodies from becoming a nuisance due to smell or wildlife conditions and shall take positive action to prevent such conditions from occurring.

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

E. Maintenance Plan and Agreement

Provisions for maintenance agreements are set forth below and in Section 26-373 of the Stormwater Management Ordinance. Contact the City for necessary documents.

- A. A maintenance agreement is required for all developments requiring stormwater review. The developer shall provide all stormwater maintenance agreements necessary to implement the approved drainage plan and to otherwise comply with this Article in form and substance as required by the City. The maintenance agreement shall be signed and submitted to the City for review and approval at the time application for a stormwater permit is made. After construction of the stormwater management system has been verified and approved or accepted by the City, the Developer shall execute a final maintenance agreement with the City, record such agreements with the County Register of Deeds, and provide a copy of the recorded document to the City. The City reserves the right to require the maintenance agreement be recorded prior to issuance of a stormwater permit.
- B. Maintenance agreement provisions. The maintenance agreement shall, among other matters, ensure access for proper inspection by the City or their designee, allow for maintenance or corrective actions of stormwater BMPs, and include provisions for the tracking of maintenance activities, and transfer of operation and maintenance responsibility to ensure the performance standards are met in perpetuity.
 - a. Maintenance Plan. The maintenance agreement shall include a maintenance plan and schedule for routine, emergency, and long-term maintenance of all structural and vegetative stormwater BMPs installed and implemented to meet the performance standards, with a detailed annual estimated budget for the initial three (3) years, and a clear statement that only future maintenance activities in accordance with the maintenance plan shall be permitted without the necessity of securing new permits.
 - b. Maintenance Documentation. Written notice and submittal of maintenance documentation shall be provided to the City by the property owner at the interval set forth in the maintenance agreement and subject to the provisions of Sections 26-346 through 26-362.
 - c. Failure to Perform Maintenance. If it has been found by the City, following notice and an opportunity to be heard by the property owner, that there has been a material failure or refusal to undertake maintenance as required under this Article and/or as required in the approved maintenance agreement as required hereunder, the City shall then be
 - i. authorized, but not required, to hire an entity with qualifications and experience in the subject matter to undertake the monitoring and maintenance as so required, in which event the property owner shall be obligated to advance or reimburse payment for all costs and expenses associated with such monitoring and maintenance, together with a reasonable administrative fee. The maintenance agreement required under this Article shall contain a provision spelling out the requirements; and if the applicant objects in any respect to such provision or the underlying rights and obligations, such objection shall be resolved prior to the commencement of construction of the proposed development on the property. If the property owner fails to pay the costs incurred by the City under this Section, the costs shall be a lien on the property and enforced as provided in Division 6 of Section 26.

PART 2 - PROCEDURES FOR PLAN SUBMISSION AND APPROVAL

- C. Tracking Operation and Maintenance. The City shall implement a tracking system to include procedures for filing and retrieval of all recorded maintenance agreements, maintenance plans, and stormwater management system maps to document location and ages of stormwater BMPs. The City shall also track annual inspection reports required to be submitted from the developer, and any inspection conducted by the City to document condition of stormwater BMPs and maintenance performed.

A copy of the recorded maintenance agreement must be presented to the City prior to construction drawing approval and release of any review deposit.

I. SUMMARY

The following stormwater management requirements comply with the City's Stormwater Ordinance NPDES MS4 permit and shall apply to all new developments and redevelopments in the City of Muskegon:

1. Protection. The design process shall begin by identifying environmentally sensitive areas located on the site and laying out the site to maximize protection of the sensitive areas.
2. Source Controls. Non-structural BMPs shall be used for protection of environmental sensitive areas on the site, and to reduce the amount of stormwater runoff.
3. Runoff Controls. Stormwater runoff shall be managed onsite using structural BMPs to protect both water resources and real property. Minimum stormwater standards are summarized in **Table 1**. Higher standards may be required for sites that discharge to areas with known issues.
4. Watershed Policy Statements. Specific stormwater management policies (if any) established for identified watersheds or protection areas must be met in addition to these minimum standards.
5. Offsite Stormwater Management Options. Regional stormwater management facilities are encouraged, particularly where site constraints preclude effective onsite treatment of stormwater. Off-site mitigation and payment-in-lieu programs (if available) may be approved to meet channel protection standards.
6. Adequate Outlet. The design maximum release rate, volume or concentration of stormwater discharged from a site shall not exceed the capacity of the downstream stormwater infrastructure or cause impairment to the offsite receiving area.
7. BMP Design. BMPs must be designed to meet the minimum criteria provided. BMPs selected to meet the water quality treatment standard must also be shown to reduce TSS in stormwater runoff by at least 80% or to a concentration of no greater than 80 mg/L.
8. Groundwater. The highest known groundwater elevation and extent of mounding from infiltration BMPs shall be determined to ensure no adverse impacts internal and external to the development.
9. Soils. Test pits or soil borings are required for most structural BMPs to determine soil classification, depth to groundwater and the presence of other site constraints. Field permeability testing is not generally required but must be conducted to use the alternative approach for channel protection when soils are questionable.
10. Restrictive Covenants. Plats and site condominium developments must incorporate specific requirements for lot grading, minimum floor and opening elevations, footing drains, private easements for side yard drainage, and individual soil erosion and sedimentation control permits.
11. Operation and Maintenance. Stormwater BMPs must be designed to allow for operation and maintenance, demonstrated in the review submittals. A maintenance agreement between the Developer and the City is required. A maintenance plan and compliance tracking are required as part of the maintenance agreement.

PART 3 – STORMWATER REQUIREMENTS

Table 1 – Minimum Required Stormwater Standards

Standard/Where Required	Criteria
Water Quality “first flush” All sites.	Treat the runoff generated from one inch of rain over the project site (i.e., the 90% annual nonexceedance storm) through BMPs designed to reduce post-development TSS loadings by 80%, or achieve a discharge concentration not to exceed 80 mg/L.
Channel Protection Surface water discharges; not required for direct discharge to Lake Michigan or Muskegon Lake.	The post-development runoff rate and volume shall not exceed the pre-development rate and volume for all storms up to and including the 2-year, 24-hour storm. Retention of the volume increase is required. Where site conditions preclude infiltration (onsite and offsite), an alternative approach may be allowed consistent with the flowchart in Part 1: Extended Detention of the 2-year, 24-hour storm for a period of 24 hours resulting in a drawdown time no greater than 72 hours. The resulting peak discharge shall be no greater than the existing 1-year peak discharge.
Flood Control All sites: unless exception is allowed pending downstream storm sewer capacity and other factors. Not required on sites with a direct discharge to Lake Michigan or Muskegon Lake.	<u>Collection and Conveyance</u>: Design storm sewers and swales for the 10-year storm, and open channels for the 25-year storm. <u>Detention and Retention</u>: Store runoff from the 25-year storm with a maximum release rate of 0.13 cfs per acre. <u>Overflow Routes for Extreme Flood</u>: Identify overflow routes and the extent of high-water levels for the 100-year flood to ensure no adverse impacts offsite or internal to the site. Where overland flow routes do not exist: 1. Protect buildings with redundant storm sewer system sized for the 100-year storm; and 2. Increase size of detention and retention basins to store two (2) times the flood control volume.
Pretreatment When required by BMP, Refer to Table 3 .	Forebay volume equal to 15% of water quality volume (required for detention/retention basins); Vegetated Filter Strip; Vegetated Swale; or Water Quality Device.
Hotspot Industrial and commercial land uses in Table 2 . Part 201 and Part 213 sites (Brownfields).	Isolate transfer and storage areas to minimize need for treatment. Pretreatment BMP with impermeable barrier above groundwater and provisions for the capture of oil, grease, and sediments. Minimum spill containment volume: 400 gallons.

II. STANDARDS

A. Water Quality

Where Required

Treatment of the water quality volume is required for all sites to capture and treat the “first flush” of stormwater runoff that typically carries with it the highest concentration of pollutants.³

Standard

Capture and treatment of the runoff from the 90% annual nonexceedance storm is required for the project site. This storm is approximately equivalent to one inch of rain (0.93 inch for Michigan Climatic Zone 5 per DEQ memo “90 Percent Annual Nonexceedance Storms” dated March 24, 2006).

Treatment of the runoff volume from the 90% annual nonexceedance storm with properly designed BMPs to reduce TSS loading by 80% or achieve TSS discharge concentrations not to exceed 80 mg/L, is required.

Note: TSS is a surrogate for other pollutants normally found in stormwater runoff. Control of TSS to meet this requirement is expected to achieve control of other pollutants to an acceptable level that protects water quality.

Natural areas of the site left undisturbed and BMPs that provide water quality treatment need not be included in the calculations. This effectively results in the directly connected impervious areas and disturbed pervious areas of the site being used to calculate the water quality volume.

Treatment BMPs

Selected BMPs must meet the TSS target either alone or in combination. Pollutant (TSS) removal efficiencies for BMPs are provided in **Table 3**. Water quality volume can be provided through one of the following methods:

1. Settling (Permanent Pool or Detention)
2. Filtration
3. Infiltration
4. Absorption
5. Chemical/Mechanical Treatment

Permanent Pool. The volume of a permanent pool incorporated into a stormwater BMP and sized at 2.5 times the water quality volume.⁴ This is the volume below the ordinary static water level (also known as dead storage).

Detention. The storage volume provided by detention of stormwater. Extended detention is defined as holding the stormwater runoff volume and releasing it gradually over a period of 24 hours with a drawdown time no greater than 72 hours.

Filtration. The volume of stormwater runoff routed through a BMP that provides filtration (i.e., an underdrained BMP). In the case of a vegetated filter strip or vegetated swale, the filtering area must meet minimum standards for slope, length, drainage area and vegetative cover.

Infiltration. The volume of stormwater runoff infiltrated into the ground through a stormwater BMP.

Absorption and Chemical/Mechanical Treatment. The volume of stormwater runoff routed through a proprietary water quality device, or natural or engineered system.

³ Stenstrom, Michael K. and Kayhanian, Masoud (2005). *First Flush Phenomenon Characterization*. California Department of Transportation, Sacramento, California.

⁴ Barrett, Michael (2005). *BMP Performance Comparisons: Examples from the International Stormwater BMP Database*, Center for Research in Water Resources, PRC#119, University of Texas, 2005 Water Environment Federation.

B. Channel Protection

Where Required

Channel protection is required for surface water discharges. Channel protection is not required for direct discharges to Lake Michigan or Muskegon Lake, including directly connected storm sewer.

Standard

The post-development runoff rate and volume shall not exceed the pre-development rate and volume for all storms up to and including the 2-year, 24-hour storm. Retention of the volume increase is required.

Pre-development is defined as the last land use prior to the planned new development or redevelopment.

Retention can be provided through infiltration, or interception and evapotranspiration or reuse.

Note: Volume control for channel protection is required to mitigate increases in runoff rates and volumes for the more frequent (bankfull) rainfall events that have the greatest influence on shaping stream channels. An increase in runoff volume can expose channels to critical erosive velocities for a longer duration, causing accelerated channel adjustments to occur.

Alternative Approach

Where site constraints limit infiltration (onsite and offsite), and field permeability testing has confirmed the limits of the infiltration rate, an alternative approach may be allowed after all other onsite BMPs are maximized consistent with the flow chart in Part 1. A certification form (**Appendix 1**) signed by the Design Engineer must be submitted for approval before the alternative approach can be used. Site constraints that limit the use of infiltration may include:

1. Poorly draining soils (<0.24 inches per hour; typically, hydrologic soil groups C and D).
2. Bedrock.
3. High groundwater, or the potential of mounded groundwater to impair other uses.
4. Wellhead protection areas.
5. Stormwater hot spots.
6. Part 201 and Part 213 sites, and areas of soil or groundwater contamination.

The alternative approach shall consist of extended detention of the 2-year, 24-hour storm for a period of 24 hours resulting in a drawdown time no greater than 72 hours. The resulting peak discharge shall be no greater than the existing 1-year peak discharge.

Note: A developed peak discharge no greater than the existing 1-year peak discharge is required by EGLE. The intent is to release stormwater runoff in such a gradual manner that critical erosive velocities during the bankfull event will seldom be exceeded in downstream channels.

If the allowable opening area for extended detention becomes too small for practical design (less than the area of a ¾-inch diameter hole), a 4-inch underdrain below a biofiltration BMP (e.g., bioretention/rain garden, planter box, water quality swale) may be used.

Note: Studies have shown that underdrained biofiltration BMPs provide a significant percentage of volume reduction (23% to 73% for 25th and 75th percentiles),⁵ and a large percentage of rate reduction (80% or more).⁶

⁵ Geosyntec Consultants and Wright Water Engineers, Inc. (May 2012). *International Stormwater Best Management Practices (BMP) Database, Addendum 1 to Volume Reduction Technical Summary (January 2011), Expanded Analysis of Volume Reduction in Bioretention BMPs.*

⁶ University of New Hampshire Stormwater Center (2007). *2007 Annual Report.*

C. Flood Control

Where Required

Flood control is required for all sites.

Standard

Detention or retention of the 25-year storm with a maximum release rate of 0.13 cfs per acre is required.

Note: The 25-year storm is selected to balance flood risk management with economics based on federal studies comparing the cost of flood damage to storm return interval.⁷ The release rate of 0.13 cfs per acre is selected to be generally protective of floodplains in downstream watercourses and is based on result found in previous hydrologic studies on West Michigan streams.⁸ When volume control is not provided, an extremely low release rate is required to prevent an increase in peak flow rates in downstream watercourses or storm sewers. The increased volume and prolonged duration of runoff from multiple detention basins can have a cumulative effect to increase peak flow rate and duration in downstream reaches.

An alternate maximum release rate may be allowed under certain conditions, including, but not limited to:

1. Sites with specific discharge requirements per a Watershed Policy Statement.
2. Redevelopment sites discharging to a municipal storm sewer where the municipality has determined the sewer has adequate capacity for the existing peak runoff rate from the site. Detention need only be provided for any increase in impervious area.
3. Direct discharges to waterbodies or watercourses where the Developer demonstrates that the receiving waters possess capacity to convey the post-development discharge safely and with no negative downstream impacts due to increased flow rates, water levels or velocities. In addition, the peak flow of the receiving waters cannot be increased by the proposed development (i.e., there is a sufficient difference in the timing of the two hydrographs).
4. When the site is located adjacent to or within a floodplain, excavation of new floodplain in lieu of standard stormwater detention may be required. The excavated volume shall be equal to the standard detention basin storage volume. Only the volume above the 2-year and below the 100-year floodplain elevation can be counted to meet the volume requirement.

Overflow Routes for Extreme Flood

Overflow routes and the extent of high-water levels for the 100-year flood shall be identified for the site and for downstream areas between the site and the nearest acceptable floodway or outlet. Provisions shall be made to ensure no adverse impacts offsite or internal to the site. Where acceptable overflow routes do not exist:

1. Buildings shall be protected from flooding by two separate enclosed drainage systems, a primary and a redundant system, each independently protecting the building from flooding during the 100-year storm. Runoff shall be directed to the inlets of the primary system for up to a 10-year storm, to minimize the accumulation of debris over the redundant inlets; and
2. Detention and retention basins shall be increased in size to store two (2) times the flood control volume.

⁷ Johnson, William K. (January 1985). Significance of Location in Computing Flood Damage. ASCE Journal of Water Resource Planning and Management.

⁸ Camp, Dresser and McKee, Inc. (1991). Buck and Plaster Creek Stormwater Management Masterplan, prepared for the Kent City.

PART 3 – STORMWATER MANAGEMENT REQUIREMENTS

Note: The intent of the extreme flood criteria is to prevent flood damage from large but infrequent storm events by identifying and/or designing overland flow paths that are clear of structures and have grades below the lowest openings of structures. Overflow routes may include floodplains along open channels, overbank areas along vegetated swales, curb jumps in drives and parking lots, and other flow paths flood waters will take to reach an outlet, whether overland or underground.

D. Pretreatment

Where Required

Pretreatment is required prior to discharging stormwater runoff to the following structural BMPs to preserve the longevity and function of the BMP:

1. Detention basins
2. Retention basins
3. Infiltration practices
4. Bioretention/rain gardens
5. Constructed filters
6. Capture reuse

Treatment BMPs

Pretreatment provides for the removal of fine sediment, trash, and debris. Methods of pretreatment include:

1. Forebays (including spill containment cells and level spreaders)
2. Vegetated filter strips (including buffers and green roofs)
3. Vegetated swales (including natural flow paths)
4. Water quality devices

Standard

Sediment Forebay

A minimum pretreatment volume equivalent to 15% of the water quality volume is required for sediment forebays using gravity.

Note: This is a conservative approximation of results given by the Hazen Equation for sediment basin sizing using a 50% settling efficiency for a 50-micron particle (silt) at a maximum 4-foot settling depth with a 1-year peak inflow at a rainfall intensity of one inch per hour, consistent with recommendations in the *Low Impact Development Manual for Michigan* (SEMCOG, 2008).

Vegetated Filter Strip

Provide a 10-foot minimum sheet-flow length at a maximum slope of 2% with an impervious approach length no greater than 3.5 times the filter strip length, up to a maximum approach length of 75 feet.

Provide a 15-foot minimum sheet flow length for slopes between 2% and 6% with an impervious approach length no greater than three times the filter strip length, up to a maximum approach length of 75 feet.

Vegetated Swale

Provide a 20-foot minimum length at a maximum slope of 4% with a 1-foot-high check dam at the downstream end, and a maximum upstream drainage area of 0.13 acre per 2-foot of bottom width.

Note: Minimum lengths for vegetated filter strips and vegetated swales are selected to provide a workable length for small sites and right-of-way constraints, while providing an area for sediment to drop out of suspension. Vegetated filter strip sizing for pretreatment from *Design of Stormwater Filtering Systems* (Center for Watershed Protection, 1996). Vegetated swale upstream area ratio assumes a 1-year peak inflow (rainfall intensity of 2.20 inches per hour for a time-of-concentration of 15 minutes) from an impervious area, with a settling efficiency

PART 3 – STORMWATER MANAGEMENT REQUIREMENTS

of 50% for a 50-micron particle (silt).

Water Quality Device

Configured to trap floatables and sediment. Follow manufacturer's guidelines. See notes in **Table 3**.

E. Hot Spots

Where Required

Sites considered to be stormwater hot spots are identified in **Table 2**. These include activities with a high potential to cause contamination, and sites that have existing contamination. More specifically:

1. Industrial and commercial land use activities involving the production, transfer, storage and/or use of hazardous materials in quantities that pose a high risk to surface and groundwater quality (exceeding 55 gallons aggregate for liquids and 440 pounds aggregate for dry weights), as defined in Part 5 Rules: Spillage of Oil and Polluting Materials, Water Resources Protection (Part 31, Act 451, PA 1994).
2. "Brownfield" sites with soil or groundwater contamination under Part 201 Environmental Remediation and Part 213 Leaking Underground Storage Tanks (Act 451, PA 1994).

Standard

Pretreatment volume with a minimum of 400 gallons required for spill containment from hot spot land use activities.

Note: The minimum spill containment volume provides a reasonable capture size (e.g., a standard liquid propane truck has a hauling capacity of 1,000 gallons) that can be accommodated with a 6-foot diameter water quality device.

Pretreatment BMPs must have an impermeable barrier between the treated material and the groundwater and have provisions for the capture of oil, grease, and sediments.

Treatment BMPs

Specific stormwater management strategies for hotspots include the following:

1. Isolate transfer and storage areas from permeable surfaces and reduce exposure to stormwater.
2. Identify opportunities for use of infiltration BMPs in other areas of the site.
3. Where storage and transfer areas exposed to stormwater cannot be avoided:
 - a. Infiltration of runoff from pavement surfaces is discouraged in favor of a surface water discharge.
 - b. Pervious pavements that infiltrate into the groundwater are not permitted because they do not allow for any pretreatment or spill containment.
 - c. Perforated pipes for infiltration are not permitted due to the difficulty in isolating an accidental spill.
 - d. A standard catch basin and outlet pipe with a downturned end is not permitted because the area of the permanent pool is insufficient to prevent the captured low-density fluids from becoming entrained in the water when surface inflow enters the structure.

Evaluation Procedure

Brownfield sites must be evaluated before an infiltration approach can be approved so as not to exacerbate existing conditions. The following steps must be followed for sites with known contamination:

1. Include a qualified environmental consultant on the design team.
2. Show areas of known contamination on the site map.
3. Specify on the drawings how contractor is to address any contamination which may be found during construction.
4. The site evaluation process must follow the document entitled *Implementing Stormwater Infiltration Practices at Vacant Parcels and Brownfield Sites* (EPA, 2013).
5. Submit supporting documentation of the site evaluation process with the stormwater review package.

PART 3 – STORMWATER MANAGEMENT REQUIREMENTS

6. Contact EGLE Remediation and Redevelopment Division (RRD) staff for consultation. The final plan must have EGLE staff approval.

Table 2 – Stormwater Hot Spots

2017 North American Industry Classification System (NAICS)	
31 – 33	Manufacturing.
44 – 45	Retail Trade (441 Motor Vehicle and Parts Dealers, 444 Building Material and Garden Equipment and Supplies Dealers, 447 Gasoline Stations, 454 Non-store Retailers (e.g., fuel dealers)).
48 – 49	Transportation and Warehousing.
71	Arts, Entertainment, and Recreation (79393 Marinas).
81	Other Services (8111 Automotive Repair and Maintenance, 8113 Commercial and Industrial Machinery and Equipment Repair and Maintenance, 8123 Dry Cleaning and Laundry Services, 8129 Other Personal Services (e.g., photofinishing laboratory)).
42, 56	Salvage Yards (423930 Recyclable Material Merchant Wholesalers) and Recycling Facilities (562 Waste Management and Remediation Services).
	Brownfield Sites classified under Part 201 Environmental Remediation and Part 213 Leaking Underground Storage Tanks (Act 451, PA 1994) of the Michigan compiled laws.
	Areas with the potential for contaminating public water supply intakes.
	Other land uses and activities where petroleum products, chemicals or other polluting materials have a high probability of polluting surface or groundwater due to quantity of use, storage or waste products generated, as determined by the City.
Many of these sites will also be regulated under the EPA NPDES Industrial Stormwater Program. A detailed list of NAICS industries can be found at: https://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2017	

III. DESIGN PROCESS

The stormwater site design process is summarized in the steps below. This process is intended to minimize negative impacts from development sites that could be avoided through proper planning.

A. Identify Sensitive Areas

Identify existing environmentally sensitive areas on the site plan that may require special consideration or pose a challenge for stormwater management. For the purpose of these rules, sensitive areas include:

1. Waterbodies (lake and ponds)
2. Rivers and streams
3. Floodplains (and flood prone areas)
4. Riparian areas
5. Wetlands
6. Woodlands
7. Sand dunes
8. Natural drainageways
9. Soils and topography (erodible, steep, karst)
10. Susceptible groundwater supplies
11. Threatened and endangered species habitat

Sensitive areas are determined on a site-specific basis through survey, delineation, aerial photographs, or maps. Sensitive areas must be shown on the site map or drawings. The total acreage of protected areas must also be indicated and demonstrate a good faith effort to maximize protection of sensitive areas.

B. Select Source Controls

Source controls reduce the volume of runoff generated onsite, encourage infiltration and evapotranspiration, and prevent pollutants from entering the drainage system. Non-structural BMPs are used for this purpose. Maximize the use of non-structural BMPs as the most effective option for controlling stormwater to meet sensitive area protection requirements and reduce the size of site runoff controls.

C. Size Runoff Controls

After source controls have been maximized, site runoff controls are typically needed to manage the additional post-development stormwater runoff. Determine the standards applicable to the site to properly size runoff controls. Minimum required stormwater standards are summarized in **Table 1**.

D. Confirm an Adequate Outlet

Once all onsite source and runoff controls have been implemented, excess runoff can be discharged offsite. The design criteria specified in this manual is generally protective of the receiving waterbody. However, an adequate outlet must always be identified downstream of the development to receive the design rate, volume, and concentration of the post-development site runoff. Discharge from the site, including discharge from emergency overflow spillways and pipes, must not cause adverse impact to downstream property or infrastructure (refer to Part 2 section “Stormwater Discharge”).

E. Select Best Management Practices (BMPs)

Select appropriate BMPs to meet minimum required pollutant reduction, volume, and peak rate requirements. A list of common BMPs and their treatment ability is given in **Table 3**. The BMPs selected must be designed in accordance with the calculation methods and design criteria provided in this manual. BMPs proposed for use, but not included in this manual, will be evaluated on an individual basis.

PART 3 – STORMWATER MANGEMENT REQUIREMENTS

Table 3 – Stormwater BMP Matrix

Stormwater BMP	Treatment			
	Requires Pretreatment	TSS Removal Efficiency	Provides Pretreatment	Provides Spill Containment
Non-Structural BMPs				
Minimal Disturbance Area				
Protect Natural Flow Pathways			X	
Protect Sensitive Areas				
Native Revegetation			X	
Stormwater Disconnect				
Structural BMPs – Conveyance and Storage				
Storm Sewer		(22)		X
Culvert or Bridge				
Open Channel				
Detention Basin (dry)	X	(49)		
Detention Basin (wet)	X	(80)		
Detention Basin (extended/wetland)	X	(72)		
Retention Basins	X	(89)		
Sediment Forebay		(50)	X	
Spill Containment Cell		(50)	X	X
Structural BMPs – LID and Small Site				
Infiltration Practices	X	(89)		
Bioretention/Rain Garden ^	X	(86)		
Bioswale ^		(86)	X	
Constructed Filter	X	(86)	X	
Planter Box ^		(59)		
Pervious Pavement ^		(84)		
Pervious Pavement ^ (roof discharge to		(50)		
Capture Reuse	X	(*)		X
Vegetated Roof		(*)	X	
Water Quality Device		(*)	X	X
Water Quality Swale		(86)	X	X
Vegetated Swale		(81/50)	X	
Vegetated Filter Strip		(81/50)	X	
Level Spreader			X	
Blank No. BMP does not provide treatment. X Yes. () BMP may be used to meet water quality treatment criteria. Median TSS Removal Efficiency in percent. Source: Fraley-McNeal, L. (September 2007). <i>National Pollutant Removal Performance Database, Version 3</i>, Center for Watershed Protection. Bioretention/Rain Garden, Bioswale and Water Quality Swale same as Constructed Filter. Pervious Pavement average TSS Removal. Source: Rowe, Amy A., Borst, Michael, and O'Connor, Thomas P. (2007). <i>Pervious Pavement System Evaluation</i>, EPA, Office of Research and Development. Storm Sewer average TSS removal for standard catch basin. Source: Pitt, R. and Field, R. (1998). <i>An Evaluation of Storm Drainage Inlet Devices for Stormwater Quality Treatment</i>, WEFTEC'98 Water Environment Federation 71st Annual Conference & Exposition, Proceedings Volume 6, Facility Operations I&II. Sediment Forebay, Spill Containment Cell, and Vegetated Swale/Vegetated Filter Strip sized for pretreatment: 50% settling efficiency used. (/) BMP sized for water quality treatment / BMP sized for pretreatment only. (*) NJDEP certified; or submit independent third-party testing results of pollutant removal efficiency for review. http://www.nj.gov/dep/stormwater/treatment.html ^ TSS removal efficiency assumes underdrained BMP, use value for Infiltration Practices if BMP has no underdrain. Notes: Design criteria in this manual is provided to meet or exceed the median TSS removal efficiency.				

I. SOILS INVESTIGATION

A. Qualifications

Soils investigation by a qualified geotechnical consultant is required for retention and detention basins, infiltration practices, bioretention/rain gardens, constructed filters, planter boxes, and pervious pavement to determine the site soil infiltration characteristics and groundwater level. The geotechnical consultant shall be a professional engineer, soil scientist, or professional geologist.

B. Background Evaluation

An initial feasibility investigation shall be conducted to screen proposed BMP sites. The investigation involves review of the following resources:

1. Soil Survey prepared by the NRCS and USDA Hydrologic Soil Group (HSG) classifications.
2. Existing soil borings, wells, or geotechnical report on the site.
3. Onsite septic percolation testing.
4. Cyclical groundwater levels <http://waterdata.usgs.gov/mi/nwis/gw>

C. Test Pit/Soil Boring Requirements

A test pit (excavated trench) or soil boring shall be used for geotechnical investigation. Test pits may typically be selected for shallower investigations in locations where groundwater is sufficiently low.

The number of test pits or soil borings will vary depending on site conditions and the proposed development. The minimum number of test pits or soil borings shall be determined from **Table 4**.

Additional tests may be requested based on local conditions and initial findings (e.g., large variability in soil type, high groundwater table).

Table 4 – Minimum Number of Soil Tests Required

Type of BMP	Test Pit/Soil Boring	Depth of Test Pit/ Soil Boring	Field Permeability Test
			Design
Retention basin	1 per 5,000 square feet of bottom area; 1 minimum	10 feet below proposed bottom	1 per change in soil class; 1 minimum
Infiltration bed Pervious			
Infiltration trench	1 per 500 to 1,000 linear feet of BMP; 1 minimum	5 feet below proposed bottom	1 per change in soil class; 1 minimum
Bioswale			
Dry well Leaching	1 minimum	5 feet below proposed bottom	1 per change in soil class; 1 minimum
Bioretention/Rain Garden Planter box			
Detention basin	1 per 10,000 square feet of bottom area; 1 minimum	5 feet below proposed bottom	Not applicable

Excavate a test pit or soil boring in the location of the proposed BMP. The following conditions shall be noted and described, referenced from a top-of-ground elevation:

1. Depth to groundwater recorded during initial digging or drilling, and again upon completion of the excavation.
2. Depth to bedrock or hardpan.
3. Depth and thickness of each soil horizon including the presence of mottling.
4. Unified Soil Classification System for all soil horizons. USDA soil texture classification when required.

Test pit reports and soil boring logs shall include the date(s) data was collected and the location referenced to a site plan.

D. Highest Known Groundwater Elevation

The highest known groundwater elevation shall be determined by adjusting the measured groundwater elevation using indicators such as soil mottling and regional water level data. It should also take into consideration local conditions that may be temporarily altering water levels at the time of measurement. Such conditions could include, but not be limited to dewatering, irrigation well or large quantity withdrawals in the area, or areas of groundwater infiltration (such as a nearby retention basin).

E. Field Permeability Testing

Field permeability testing is generally not required but may be performed to determine a design infiltration rate. The City reserves the right to request that field permeability testing be performed. Field permeability testing must be conducted for questionable soils before the alternative approach for channel protection will be considered.

Acceptable field tests include:

1. Infiltration Rate of Soils in Field Using Double-Ring Infiltrimeters (ASTM D3385).
2. Modified double-ring infiltration testing, using smaller diameter metal or plastic casings, where bore hole is required to reach design depth. The “Methodology for double-ring infiltrimeter field test” outlined on page 440 in [Appendix E](#) of the Low Impact Development Manual for Michigan (SEMCOG, 2008) shall be followed for each test.

Laboratory tests are not allowed.

The minimum number of field permeability tests shall be determined from [Table 4](#). The City reserves the right to request additional field permeability tests be performed.

Tests shall be conducted in the location of the proposed BMP at the proposed bottom elevation. An alternate testing depth may be allowed if material is identical, and groundwater is not an issue.

Tests shall not be conducted in the rain or within 24 hours of significant rainfall events (>0.5 inch) or when the ground is frozen.

Test reports shall include the date(s) data was collected and the location referenced to a site plan.

F. Design Infiltration Rates

The procedure used to determine a design infiltration rate is summarized in [Table 5](#). The resulting design infiltration rate shall be the limiting value of the underlying soil or filter media/top dressing.

PART 4 – STORMWATER DESIGN CRITERIA

Table 5 – Determination of a Design Infiltration Rate

Description	Source	Maximum Design
1. Underlying soil		
Field permeability testing conducted	Test value divided by 2	10 in/hr
No testing, BMPs used for flood control	Table 6	3.6 in/hr
2. Filter media/top dressing	Table 14	As calculated

The infiltration rate determined from field permeability testing shall be divided by 2 to calculate the design infiltration rate, up to a maximum design infiltration rate of 10 inches per hour. The least permeable soil horizon within 4 feet below the proposed BMP bottom elevation shall be used to determine the design infiltration rate.

Where field permeability testing is not performed, and for all stormwater BMPs used for flood control, the design infiltration rates provided in **Table 6** shall be used to calculate the storage volume and minimum infiltration area of the BMP necessary to drain in the allotted drawdown time.

Note: A conservative value for the infiltration rate is used for retention basins due to the high probability for diminished performance due to clogging and the risk of failure.

When a filter material is used, or several materials are blended together in a homogenous mixture, the hydraulic conductivities provided in **Table 14** shall be used to calculate the design infiltration rate through the filter media/top dressing placed in retentive BMPs.

Table 6 – Design Infiltration Rates by USDA Soil Texture Class

Soil Texture Class	Effective Water Capacity ¹ (inches per inch)	Design Infiltration Rate ² (inches per hour)	HSG
Gravel	0.40	3.60	A
Sand	0.35	3.60	A
Loamy Sand	0.31	1.63	A
Sandy Loam	0.25	0.50	A
(Medium) Loam	0.19	0.24	B
Silty Loam / (Silt)	0.17	0.13	B
Sandy Clay Loam	0.14	0.11	C
Clay Loam	0.14	0.03	D
Silty Clay Loam	0.11	0.04	D
Sandy Clay	0.09	0.04	D
Silty Clay	0.09	0.07	D
Clay	0.08	0.07	D

¹Source: Maryland Department of Environment (2000). *Maryland Stormwater Design Manual*, Appendix D.13, Table D.13.1 (Rawls, Brakensiek and Saxton, 1982).

²Source: Wisconsin Department of Natural Resources (2004). *Site Evaluation for Stormwater Infiltration (1002)*, Table 2 (Rawls, 1998). *Note:* Values are reduced by approximately a factor of 2 from those given in Table D.13.1.

Table 6 provides design values of the infiltration rate and effective water capacity (void ratio) for soils based on their textural classification. Soil textural classes correspond to the USDA Soil Textural Triangle shown in **Figure 1**.

Note: Infiltration is the process by which water on the ground surface enters the soil. Infiltration rate is a measure of the rate at which soil is able to absorb rainfall or irrigation in inches per hour. The rate decreases as the soil

becomes saturated. The design infiltration rate assumes saturated conditions and closely approximates the hydraulic conductivity (typically given in feet per day) of the near-surface soil.

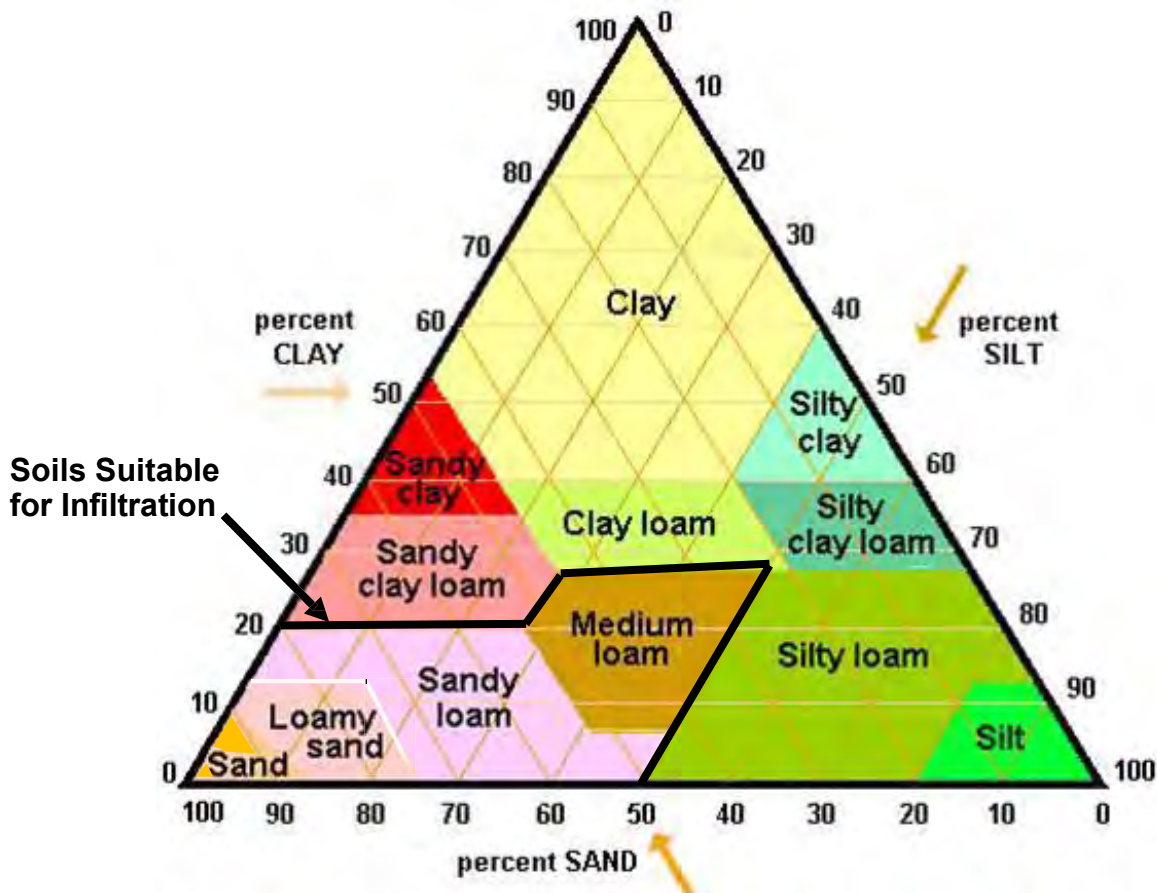
Note: The effective water capacity of a soil is the fraction of the void spaces available for water storage measured in inches per inch.

G. Minimum Allowable Infiltration Rate

Soil textures with design infiltration rates less than 0.24 inches per hour are deemed not suitable for infiltration BMPs.

Soils with design infiltration rates between 0.24 and 0.50 inches per hour may be used for LID and Small Site BMPs if suitable supplemental measures are included in the design. Supplemental measures may include subsoil amendment, underdrain placed at the top of the storage bed layer, or placement of wick drains.

Figure 1 – USDA Soil Textural Triangle



II. CALCULATION METHODOLOGY

The Rational Method and the NRCS Runoff Curve Number Method are typically used to calculate stormwater runoff, peak discharges, and runoff volumes for design of stormwater conveyance and storage systems.

The NRCS Method is presently the only acceptable method to calculate the channel protection volume.

The Small Storm Hydrology Method is used to calculate runoff volumes from the smaller rainfall amounts used for water quality treatment.

A. Calculating Runoff

1. Rational Method

The Rational Method may be used to calculate stormwater runoff volumes and peak discharges to size conveyance and storage systems for contributing drainage areas of 40 acres or less. The peak runoff rate is given by the equation:

$$Q = CIA \quad (4.1)$$

where:

- Q = peak runoff rate (cubic feet per second).
- C = weighted runoff coefficient of the drainage area.
- I = average rainfall intensity for a storm with a duration equal to the time of-concentration of the drainage area (inches per hour). Use rainfall amounts from **Table 11** and divide by the duration in hours to obtain the average rainfall intensity (I).
- A = drainage area (acres).

Runoff coefficients shall be selected from Table 7. Lawns and Open reflect average slopes (2% to 7%). Subtract 0.05 for flat pervious slopes (0% to 7%). Add 0.05 for steep pervious slopes (over 7%).⁹

Table 7 – Rational Method Runoff Coefficients (10- to 100-year rainfall frequencies)

Character of Surface	10	Return Period (years) 25	100
Asphalt and Concrete Pavement/Roofs	0.95	0.97	0.98
Brick Pavement and Gravel Surface	0.85	0.88	0.91
Lawns and Open (HSG A)*	0.15	0.17	0.20
Lawns and Open (HSG B)	0.20	0.27	0.38
Lawns and Open (HSG C)	0.35	0.45	0.55
Lawns and Open (HSG D)	0.50	0.57	0.67
Water	1.00	1.00	1.00

Source: Runoff coefficients are calculated to match 24-hour runoff volumes from CN Method with antecedent moisture condition II and initial abstract (I_a) = 0.2S using CNs for “Open Spaces, Good Condition” for Lawns and Open, and a CN of 95 for Brick Pavement and Gravel Surface.

*The runoff coefficient for Lawns and Open (HSG A) is adjusted to match values in American Society of Civil Engineers and the Water Pollution Control Federation (1969). *Design and Construction of Sanitary and Storm Sewers*, as the calculated value is less than 0.01. Frequency adjustment factors of 1.1 and 1.25 have been applied for the 25- and 100-year frequencies respectively, with a maximum value of 1.00. Adjustment factors from Mays (2001). *Stormwater Collection Systems Design Handbook*.

⁹ C.T. Hann, B.J. Barfield, J.C. Hayes (1994). *Design Hydrology & Sedimentology for Small Catchments*.

PART 4 – STORMWATER DESIGN CRITERIA

Time of concentration for the Rational Method is the sum of overland flow and channel flow. A minimum of 15 minutes shall be used.

Overland flow time may be calculated using the following formula:

$$t_o = \left(\frac{2Ln}{3\sqrt{s}} \right)^{0.4673} \quad (4.2)$$

where:

- t_o = time of overland flow (minutes)
- L = length (feet); the distance from the extremity of the subcatchment area in a direction parallel to the slope until a defined channel is reached. Overland flow will become channel flow within 1,200 feet in almost all cases*
- n = surface retardants coefficient (from **Table 8**)
- s = slope (feet per foot); the difference in elevation between the extremity of the subcatchment area and the point in question divided by the horizontal distance

Table 8 – Surface Retardants Coefficients

Type of Surface	Coefficient (n value)
Smooth impervious surface	0.02
Smooth bare packed soil	0.10
Poor grass, cultivated row crops, or moderately rough bare surface	0.20
Pasture or average grass	0.40
Deciduous timberland	0.60
Conifer timberland, deciduous timberland with deep forest litter, or dense grass	0.80
*Source: Formula, coefficients, and empirical observations from W.S. Kerby, J.M. Asce. Servis, Van Doren & Hazard Engineers, Topeka, Kansas. "Time of Concentration for Overland Flow" ENGINEER'S NOTEBOOK.	

Channel flow shall be calculated using Manning's equation:

$$V = \frac{An}{1.49R^{\frac{2}{3}}S^{\frac{1}{2}}} \quad (4.3)$$

where:

- V = velocity (feet per second)
- A = wetted area (square feet)
- n = Manning's roughness coefficient (from **Table 12**)
- R = hydraulic radius (feet)
- S = slope (feet per foot)

The time-of-concentration is then:

$$T_c = t_o + \frac{L_c}{60V} \quad (4.4)$$

where:

- T_c = time-of-concentration (minutes)
- t_o = time of overland flow (minutes)
- L_c = length of channelized flow (feet)
- V = velocity of channelized flow (feet per second)
- 60 = factor to convert seconds to minutes

2. Runoff Curve Number Method

The Runoff Curve Number Method developed by the NRCS may be used to calculate stormwater runoff volumes and peak discharges to size conveyance and storage systems. This method must be used when it is necessary to calculate runoff volumes for channel protection. The formulas are as follows:

$$Q_v = \frac{(P - 0.2S)^2}{(P + 0.8S)} \quad (4.5)$$

where:

- Q_v = surface runoff (inches). *Note:* $Q_v=0$ if $P \leq 0.2S$
- P = rainfall (inches)
- S = potential maximum retention after runoff begins (inches)

and where:

$$S = \frac{1000}{CN} - 10 \quad (4.6)$$

Surface runoff (Q_v) is calculated separately for each land use and soil type combination. Total runoff volume can then be calculated by the formula:

$$V_t = (Q_{v_{perv}} A_{perv} + Q_{v_{imp}} A_{imp}) \times 3630 \quad (4.7)$$

where:

- V_t = total runoff volume of the design storm (cubic feet)
- Q_v = surface runoff for the i^{th} land use (inches)
- A = contributing area associated with the i^{th} land use (acres)
- 3630 = factor to convert acre-inches to cubic feet

Curve Number (CN) values are taken from NRCS TR-55 and provided in **Table 9**.

The “Water” cover type shall be used for detention/retention basins with a permanent pool or surface water temporarily ponded during the rain event. The “Meadow” or “Open spaces” cover type may be used for vegetative BMPs, including those that temporarily pond surface water, to receive credit for channel protection.

Peak Discharge

The LGROW Design Spreadsheet, the DEQ procedure outlined in “Computing Flood Discharges for Small, Ungaged Watersheds” by Richard Sorrell, or computer software such as NRCS WinTR-55 may be used to calculate peak stormwater runoff rates.

PART 4 – STORMWATER DESIGN CRITERIA

A Michigan Unit Hydrograph is used in the LGROW Design Spreadsheet, the DEQ small ungaged watershed spreadsheet, and can be input into WinTR-55. The ordinates for the Michigan Unit Hydrograph for TR-55 are: [0.0, 0.5, 1.0, 0.8, 0.6, 0.4, 0.2 and 0.0].

Note: Using the standard NRCS unit hydrograph will overestimate peak runoff rates by 30 to 50 percent or more.

Table 9 – Curve Numbers (CNs) from TR-55

Land Use Description		Curve Number ¹			
Cover Type	Hydrologic Condition ²	Hydrologic Soil Group			
		A	B	C	D
Cultivated land	Good	64	75	82	85
Pasture or range land	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow		30	58	71	78
Orchard or tree farm ³	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 ⁴	55	70	77
Open spaces (grass cover) ⁵	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Paved parking lot, roof, driveway		98	98	98	98
Gravel ⁶		88	93	94	95
Bare Soil		77	86	91	94
Water ⁷		100	100	100	100

Source: U.S. Department of Agriculture Soil Conservation Service (1986). *Urban Hydrology for Small Watersheds, Technical Release No. 55*.

¹Antecedent moisture condition II and initial abstract (I_a) = 0.25

²Poor Condition: pasture or open space with less than 50% ground cover or heavily grazed with no mulch; woods - forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair Condition: pasture or open space with 50% to 75% grass cover and not heavily grazed; woods are grazed but not burned, and some forest litter covers the soil.

Good Condition: cultivated land (row crops, straight row) with conservation treatment (crop residue cover), also small grain; pasture or open space with 75% or more ground cover and lightly or only occasionally grazed; woods are protected from grazing, and litter and brush adequately cover the soil.

³CN's shown were computed for areas with 50% woods and 50% pasture (grass) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

⁴Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵CN's shown are equivalent to those of pasture.

⁶Surface only; not including right-of-way.

⁷Water added.

PART 4 – STORMWATER DESIGN CRITERIA

Time-of-concentration for the Runoff Curve Number Method shall be calculated using NRCS TR-55 methodology as outlined below. A minimum of 0.1 hour (6 minutes) shall be used.

The flow path is split into three concentrated flow, and open computed for each flow regime. The sum of the travel times:

where:

s = slope (feet/foot)
 v = velocity (feet per second)

sections – sheet flow, shallow channel flow. The travel time is The time-of-concentration is then

$$T_c = t_1 + t_2 + t_3 \quad (4.8)$$

(1) For sheet flow the travel time (t_1) in hours is given as:

$$t_1 = \frac{0.007(nL)^{0.8}}{P_2^{0.5} s^{0.4}} \quad (4.9)$$

where:

n = Manning's roughness coefficient (from TR-55 **Table 3-1**)
 L = flow length (feet)
 P_2 = 2-year, 24-hour precipitation depth (from **Table 11**)
 s = slope (feet/foot)

(2) Shallow concentrated flow velocities are calculated for paved and unpaved surfaces. The velocities are given as:

$$v = \begin{matrix} 16.1345s^{0.5} & \text{Unpaved} \\ 20.3282s^{0.5} & \text{Paved} \end{matrix} \quad (4.10)$$

The flow length (feet) is then divided by the velocity (feet per second) and a conversion factor of 3600 to obtain travel time (t_2) in hours: Open channel flow uses

$$t_2 = \frac{L}{3600 v} \quad (4.11)$$

(3) Manning's equation to calculate the velocity based on slope, flow area, and wetted perimeter (refer to Equation 4.3). The flow length (feet) is then divided by the velocity (feet per second) to obtain travel time (t_3) in hours (refer to Equation 4.11).

BMP Residence Time

BMP residence time shall be calculated as the storage volume divided by the 10-year peak inflow rate.

3. Small Storm Hydrology Method

The Small Storm Hydrology Method is used to calculate the water quality treatment volume. The method was developed to estimate the runoff volume from urban land uses for relatively small storm events where the Rational and NRCS Methods prove less accurate. Water quality volume is calculated by the formula:

$$V_{wq} = ARv(1)(3630) \quad (4.12)$$

where:

- V_{wq} = minimum required water quality volume (cubic feet)
- A = area (acres); the developed portion of the site, both impervious and pervious, not receiving treatment with a non-structural BMP
- Rv = area-weighted volumetric runoff coefficient (from **Table 10**)
- 1 = 90% non-exceedance storm rainfall amount (inches)
- 3630 = factor to convert acre-inches to cubic feet

Note: The Volumetric Runoff Coefficients (Rv) provided in **Table 10** are similar to the Rational runoff coefficient but are exclusive to the rainfall amount (1-inch).

Table 10 – Runoff Coefficients for Small Storm Hydrology Method

Rainfall Amount (inches)	Volumetric Runoff Coefficient, Rv					
	Directly Connected Impervious Area			Disturbed Pervious Area		
	Flat Roofs/ Unpaved	Pitched Roofs	Paved	Sandy Soils (HSG A)	Silty Soils (HSG B)	Clayey Soils (HSG C&D)
1.0	0.815	0.965	0.980	0.035	0.120	0.2015
Source: Adapted from SEMCOG (2008). <i>Low Impact Development Manual for Michigan</i> , Table 9.3. (R. Pitt (2003). <i>The Source Loading and Management Model (WinSLAMM): Introduction and Basic Uses</i>).						
The area-weighted volumetric runoff coefficient, Rv , is calculated as:						
$Rv = \frac{\sum_{x=1}^n (A_x/A) Rv_x}{n}$						

B. Rainfall

The rainfall duration-frequency table provided in **Table 11** shall be used with the Rational Method to determine rainfall intensity for rainfall duration equal to the time-of-concentration. Divide the rainfall amount by the duration in hours to obtain the rainfall intensity.

The 24-hour rainfall amounts provided in **Table 11** shall be used with the Runoff Curve Number Method.

An MSE4 rainfall distribution shall be used when a unit hydrograph approach is used (e.g., WinTR-55 computer program).

Table 11 – Rainfall Amounts (inches)

Duration	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
24-hr	2.25	2.57	3.21	3.87	4.94	5.91	6.99
12-hr	1.92	2.21	2.79	3.37	4.30	5.14	6.07
6-hr	1.60	1.87	2.37	2.86	3.65	4.34	5.10
3-hr	1.33	1.56	1.99	2.39	3.03	3.57	4.17
2-hr	1.18	1.39	1.78	2.13	2.68	3.15	3.66
1-hr	0.96	1.14	1.45	1.74	2.18	2.55	2.94
30-min	0.75	0.89	1.13	1.35	1.67	1.94	2.22
15-min	0.55	0.65	0.82	0.98	1.21	1.40	1.60
10-min	0.45	0.53	0.67	0.80	0.99	1.15	1.31
5-min	0.31	0.36	0.46	0.55	0.68	0.78	0.90
Source: NOAA (2013). <i>Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 8, Version 2.0</i> . Rainfall amounts from: CITY OF MUSKEGON CO AP. Station ID 20-5712.							

C. Calculating Storage Volumes and Release Rates

1. Water Quality

Treatment of the runoff generated from one inch of rain (the 90% annual nonexceedance storm) over the developed portion of the site is required. Water quality volume is calculated using the Small Storm Hydrology Method.

A 1-year frequency rainfall may be used with the time-of-concentration of the contributing drainage area to calculate the peak flow rate for sizing diversion structures and treatment BMPs.

Note: A 1-inch, 1-hour rainfall has approximately a 1-year frequency of occurrence. The use of a constant rainfall frequency allows for reasonable sizing of infrastructure for drainage areas with times-of-concentration less than 1 hour, since 1-inch of rain over these shorter durations results in high intensities and rainfall frequencies on the order of those used for flood control.

Calculation of the TSS removal efficiency for BMPs in a series is given in Part 4 section “TSS Accounting.”

2. Pretreatment

Pretreatment volume may be included in the total water quality volume, and is calculated as:

$$V_{pt} = 0.15(V_{wq}) \quad (4.13)$$

where:

V_{pt} = minimum required pretreatment volume (cubic feet)

V_{wq} = water quality volume (cubic feet)

3. Channel Protection

(1) Retention

Channel protection consists of retaining onsite the net increase in runoff volume between pre-development and post-development conditions for a 2-year, 24-hour storm using the Runoff Curve Number Method. Channel protection volume is calculated with the following equation:

$$V_{cp} = V_{t_{post}} - V_{t_{pre}} \quad (4.14)$$

where:

V_{cp} = minimum required channel protection volume (cubic feet)

$V_{t_{post}}$ = total runoff volume of the 2-year, 24-hour storm for post-development conditions

$V_{t_{pre}}$ = total runoff volume of the 2-year, 24-hour storm for pre-development conditions

The “Open Spaces” cover type in “fair” hydrologic condition shall be used for existing impervious surfaces. The “Woods” cover type in “good” hydrologic condition shall be used for existing woods. The “Meadow” cover type shall be used for all other existing land covers.

(2) Extended Detention

The storage volume of an extended detention basin shall be sized for that part of the 2-year volume difference not met by retention, with a maximum release rate that results in a 24-hour detention time.

The peak discharge for a 24-hour detention time may be calculated assuming triangular inflow and outflow hydrographs with a lag between the peaks of 24 hours. If the inflow peak occurs 12 hours into the 24-hour inflow hydrograph, the outflow peak should occur 36 hours into a 72-hour outflow hydrograph as shown in **Figure 2**. The extended detention peak discharge can then be computed with the following equation:

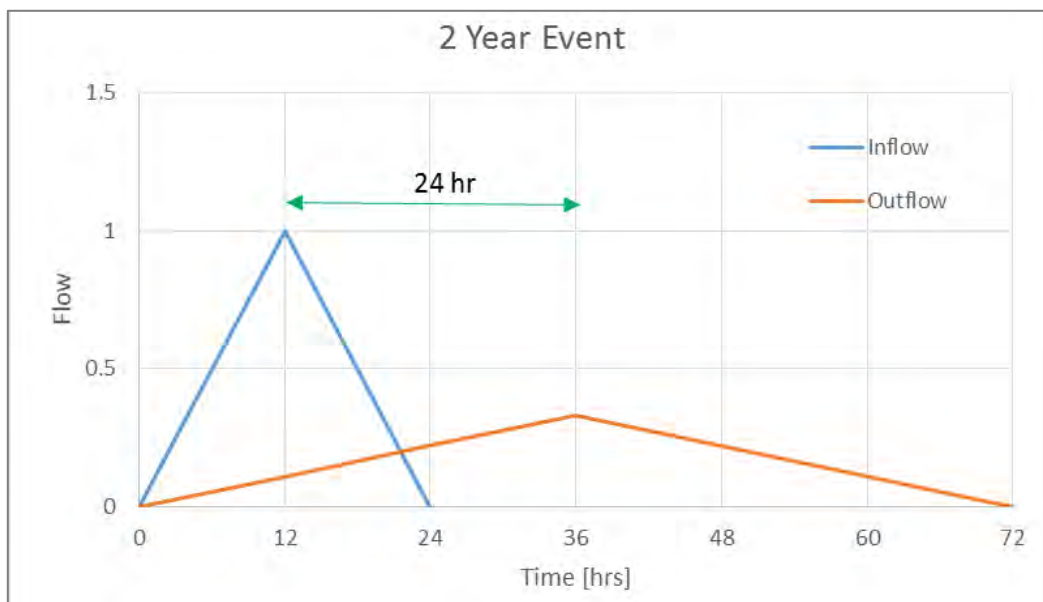
$$Q_{ED} = (V_{cp} - V_{ret}) / (36 * 3600) \quad (4.15)$$

where:

- Q_{ED} = peak extended detention release rate (cubic feet per second)
- V_{cp} = total channel protection volume required (cubic feet)
- V_{ret} = channel protection volume met by retention (cubic feet)
- $36 * 3600$ = half of the base time of outflow hydrograph (seconds)

The 2-year peak discharge after extended detention (Q_{ED}) must be equal to or less than the existing 1-year peak discharge. (Exceptions may be made for HSG A, where extended detention has been approved due to site constraints, but existing runoff is zero.) If the 1-year peak discharge limit is not met, the total channel protection volume provided must be increased to reduce the required extended detention volume. Simply using a lower extended detention release rate will violate the 72-hour drawdown time requirement.

Figure 2 – Extended Detention Hydrograph



4. Flood Control

(1) Detention

Detention of the 25-year rainfall event with a maximum allowable release rate of 0.13 cfs per acre is required, unless an exception is allowed.

a. Rational Method for Detention

If the Rational Method is used, the minimum required storage volume shall be calculated by the “Modified Chicago” Method.

The calculated storage volume shall be multiplied by 1.25 to obtain the minimum required storage volume.

Note: This additional adjustment is necessary since the Modified Chicago Method tends to underestimate the storage volume when compared to pond routing, particularly for short times-of-concentrations (15 to 30 minutes)¹⁰.

b. Runoff Curve Number Method for Detention

If the Runoff Curve Number Method is used, the minimum required storage volume shall be determined through routing using the LGROW Design Spreadsheet, or may be calculated by the formula:

$$V_{fc} = \frac{(Qp - Qout)}{Qp} Vt - Vbmp \quad (4.16)$$

where:

- V_{fc} = minimum required storage volume for flood control (cubic feet)
- Qp = peak runoff rate (cubic feet per second)
- $Qout$ = maximum allowable peak discharge (cubic feet per second)
- Vt = total post-development runoff volume for the 25-year, 24-hour storm (cubic feet)
- $Vbmp$ = volume (storage only) provided by upstream retentive BMPs (cubic feet)

Note: This formula provides a conservative approximation of the required storage volume.

¹⁰ Stahre, Peter and Urbonas, Ben (1990). Stormwater Detention for Drainage, Water Quality and CSO Management, pp. 268-274.

(2) **Retention**

Retention basins shall be sized for the 25-year, 24-hour rainfall event.

a. **Rational Method for Retention**

If the Rational Method is used, the minimum required storage volume shall be calculated by the “Modified Chicago” Method.

The calculated storage volume shall be multiplied by 1.25 to obtain the minimum required storage volume.

The discharge or exfiltration rate into the soil from the retention basin shall be calculated at:

$$Q_{out} = Ai / (12 \times 3600) \quad (4.17)$$

where:

- Q_{out} = discharge rate (cubic feet per second)
- A = infiltration area (square feet)
- i = design infiltration rate (inches per hour)
- 12 = factor to convert inches to feet
- 3600 = factor to convert hours to seconds

b. **Runoff Curve Number Method for Retention**

If the Runoff Curve Number Method is used, the minimum required storage volume shall be calculated by the formula:

$$V_{fc} = Vt - V_{inf} \quad (4.18)$$

where:

- V_{fc} = minimum required storage volume for flood control (cubic feet)
- Vt = total post-development runoff volume for the 25-year, 24-hour storm (cubic feet)
- V_{inf} = infiltrating volume (cubic feet), calculated the same as indicated in “Retentive BMPs Sized for Channel Protection or Water Quality”

5. Retentive BMPs Sized for Channel Protection or Water Quality

The BMP volume (V_{bmp}) credited towards meeting the channel protection or water quality volume is the storage volume of the BMP plus the volume infiltrated by the BMP during the infiltration time.

The infiltrating volume shall be calculated with an iterative process using the following equations, or with the LGROW Design Spreadsheet, which incorporates these equations. The infiltrating volume is calculated as:

$$V_{inf} = i * A * t_{inf} / 12 \quad (4.19)$$

The infiltration time shall be calculated by the formula:

$$t_{inf} = 2.0 + t_d (0.222 - 0.553 * \log_{10}(t_d / 72)) \quad (4.20)$$

where:

V_{inf} = infiltrating volume (cubic feet)

i = design infiltration rate (inches per hour)

A = infiltration area (square feet)

t_{inf} = infiltration time (hours); the period when the BMP is receiving runoff and capable of infiltrating at the design rate

12 = factor to convert inches to feet

Note: Based on extensive computer modelling, the infiltration time is found to be a function of the drain time through the BMP. An empirical formula was developed to model this function for drain times between 0 and 72 hours. This equation is not valid for drain times greater than 72 hours.

The drain time through the BMP is calculated as:

$$t_d = 12 * V_s / (A * i) \quad (4.21)$$

where:

t_d = BMP drain time (hours)

V_s = storage volume of the BMP (cubic feet)

i = design infiltration rate (inches per hour)

A = infiltration area (square feet)

12 = factor to convert inches to feet

D. Groundwater Mounding

A spreadsheet developed by the USGS is recommended to calculate the extent of groundwater mounding beneath infiltration BMPs. The USGS Scientific Investigations [Report 2010-5102](#) "Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins," may be used with the accompanying spreadsheet, which solves the Hantush (1967) equation to predict the extent of groundwater mounding based on user-specified site conditions. Other finite-difference groundwater flow models such as USGS MODFLOW are also acceptable.

E. Computing Tools

Hydrologic and hydraulic calculations can be performed using a variety of customized spreadsheets and computer software. The LGROW Design Spreadsheet shall be used to determine minimum required storage and treatment

volumes. Results of computer models that use detailed routing methods to optimize storage volume may be considered for more complex situations. Accompanying design calculations may include hand calculations or spreadsheets using the formulas specified in this manual, and computer models with submittal of clear and complete input and output.

F. LGROW Design Spreadsheet

The LGROW Design Spreadsheet is a Microsoft Excel spreadsheet application developed for Design and Review Engineers to show compliance with the stormwater standards. The spreadsheet allows the user to size BMPs in series or in parallel but is not intended to be used for the complete design of BMPs. A copy of the spreadsheet and tutorial is available from the City.

Runoff

The spreadsheet uses the Runoff Curve Number Method to compute runoff volumes by subcatchment. A tabular TR-55 approach is used with a Michigan Unit Hydrograph to compute peak runoff rates. The spreadsheet can be used to calculate the required channel protection volume and the flood control volume for both detention and retention. The Small Storm Hydrology Method is used to calculate the required water quality volume.

The 24-hour rainfall amounts, and rainfall distribution specified in Part 4 section “Rainfall” are incorporated into the spreadsheet. Time-of-concentration formulas from TR-55 are also incorporated into the spreadsheet to calculate peak discharges. Output is graphed as hydrographs and summarized in tabular form for a range of rainfall frequencies.

The spreadsheet allows the user to select non-structural and structural BMPs to meet required runoff rates and volumes.

TSS Accounting

The spreadsheet can be used to calculate the TSS reduction for a series of BMPs. The TSS removal efficiencies for the BMPs provided in **Table 3** are used to demonstrate a TSS reduction of 80% or more. When BMPs are used in series (i.e., a treatment train) to achieve the 80% reduction, the TSS removal efficiency of the treatment train is calculated as:

$$e_{TSS} = 1 - (1 - e_1)(1 - e_2) \cdots (1 - e_n) \quad (4.22)$$

where e_{TSS} is the removal efficiency of the treatment train, and e_n is the removal efficiency for the n^{th} BMP in the chain of n BMPs. This calculation assumes all water entering the treatment train is passed through to the next downstream BMP. The spreadsheet allows the user to calculate TSS reduction when either all or a portion of the water quality volume is passed downstream.

BMPs used for water quality treatment can be classified as retentive or pass-through. Retentive BMPs (e.g., infiltration practice) retain and treat some or all of the water quality volume. Pass-through BMPs (e.g., catch basin) treat all of the water entering and send this volume to the next BMP or subcatchment.

TSS accounting is done by tracking TSS through the subcatchments. In order to do this, it is assumed that one unit of TSS is the mass of TSS carried by one cubic foot of the water quality volume. The effective removal efficiency is the BMP removal efficiency multiplied by the portion of the water quality volume treated by the BMP. The TSS removed for each BMP is the effective removal efficiency multiplied by the TSS remaining in the treatment train.

The TSS removal efficiency for the subcatchment and/or site is the sum the TSS removed by all BMPs divided by the total TSS to be treated. The released water volume and the TSS remaining are both passed to the next downstream subcatchment.

Pond Routing

Detention storage volume for flood control is computed by numerically routing the hydrograph for the developed site through a detention basin (pond). The steps in the process are as follows:

1. The inflow hydrograph is interpolated from a collection of scaled hydrographs computed using TR-20 for various times-of-concentration and the ratio of initial abstract to total rainfall (I_a/P) values.

This is similar to the tabular TR-55 approach. The hydrograph collection was generated using the Michigan specific dimensionless unit hydrograph.
2. Structural BMP volumes are removed from the front of the hydrograph, effectively reducing the required flood control volume. The resulting hydrograph does not start until all retention volume is satisfied.
3. The inflow hydrograph adjusted for structural BMPs is routed through a detention pond model using the Modified Puls Method (see Section 8.4.8 of the MDOT Drainage Manual). The pond is assumed to be prismatic and defined by a bottom area, side slope, and orifice diameter. Pond routing is the calculation of the outflow hydrograph given the inflow hydrograph and pond characteristics. This calculation is based on the continuity equation written in differential form:

$$\frac{dV}{dt} = I - Q$$

where V is the volume of water in storage in the pond at time t , I is the inflow at time t , and Q is the outflow at time t . To calculate the outflow hydrograph, a finite difference method approximation of the continuity equation is used. This allows Q to be calculated as a time series:

$$\left(V_{i+1} + Q_{i+1} \frac{\Delta t}{2} \right) = (I_{i+1} + I_i - Q_i) \frac{\Delta t}{2} + V_i$$

where Δt is the time step, $i+1$ refers to the present time and i refers to a time Δt earlier. At time $i+1$ everything on the right-hand side of the equation is known, allowing the value of the left-hand side to be

$$\left(V + Q \frac{\Delta t}{2} \right)$$

determined. Since V and Q are both functions of the pond depth, H , given the pond characteristics a table can be constructed. This table is then used to find the pond depth at time $i+1$. Given this pond depth, the storage volume, V , and outflow, Q , can also be computed at time $i+1$. The calculation can then proceed to the remaining time steps resulting in the outflow hydrograph.

4. The pond model characteristics include bottom area, side slope, and orifice diameter. The spreadsheet computes the required orifice diameter to produce the desired peak discharge at an arbitrary depth of 5 feet. The sides are conservatively assumed to be vertical.
5. The spreadsheet runs a macro that iteratively adjusts the bottom area until the desired peak discharge and storage depth are met.

Application

The LGROW Design Spreadsheet can assist the Design Engineer in applying the correct land uses and Curve Numbers in calculating channel protection volume, accounting for travel time through BMPs, accounting for total TSS reduction from a series of BMPs, and quickly evaluating a variety of stormwater management options for a range of rainfall frequencies.

PART 4 – STORMWATER DESIGN CRITERIA

Design calculations submitted using the LGROW Design Spreadsheet can help to expedite the review process because reviewing engineers are familiar with the spreadsheet and can more quickly check for compliance with stormwater standards.

The Stormwater Worksheet is incorporated into the LGROW Design Spreadsheet and need not be submitted separately if the spreadsheet is used.

I. NON-STRUCTURAL BEST MANAGEMENT PRACTICES

Non-structural BMPs consist of protection measures that reduce the volume of stormwater runoff from the site. This differs from the goal of many structural BMPs which is to help mitigate the impact of stormwater runoff.

Design criteria is provided for the following non-structural BMPs:

- A. Minimal Disturbance Area
- B. Protect Natural Flow Pathways
- C. Protect Sensitive Areas
- D. Native Revegetation
- E. Stormwater Disconnect

Further information and examples are provided in the BMP Fact Sheets in [Chapter 6](#) of the *Low Impact Development Manual for Michigan* (SEMCOG, 2008):

All the following criteria must be met to receive credit for each non-structural BMP selected for use.

A. Minimal Disturbance Area

1. Summary

Description:	Identify and avoid disturbance to existing pervious areas during construction to reduce potential for erosion and increased runoff.
Application:	Larger sites with pervious areas; difficult to implement on small, high-density developments.
Pretreatment Required:	No.
Maintenance Plan:	Yes, for trees receiving a credit.
Calculation Credits:	
Volume Reduction:	Assign a CN reflecting open space in “good” condition, woods in “good” condition, or a combination. For small sites, individual trees can receive a credit of 800 square feet per tree, counted as woods in “good” condition. ¹
Rate Reduction:	By virtue of lower CN.
Water Quality:	Exempt from water quality criteria.
¹ Source: <i>Low Impact Development Manual for Michigan</i> (SEMCOG, 2008). Note: Trees in minimal disturbance areas receive a larger area credit than trees planted under “Native Revegetation” due to the assumption that the existing trees will typically be larger and more mature than planted trees at the time of site plan submittal and during ensuing years.	

2. Criteria

This BMP applies to those portions of buildable lots located outside of lot building zones, construction traffic areas, and staging areas that can be maintained as “minimal disturbance areas” during construction (i.e., wooded back portions of residential lots, green space required by ordinance).

Minimal disturbance area – Construction disturbance is limited to clearing of brush and minor grading. No clear-cutting, excavation, filling, stockpiling of material, or construction traffic is allowed. Area is vegetated after disturbance (if any).

- a. Identify minimal disturbance areas on site plan and construction drawings.
- b. Minimal disturbance areas must be protected by having the limits delineated/flagged/fenced in the field. Notes to this effect must be included on construction drawings.
- c. Minimal disturbance areas must not be subject to excessive equipment movement. Vehicle traffic and storage of equipment and/or materials is not permitted.
- d. Pruning or other required maintenance of vegetation is permitted. Additional planting with site-appropriate plants including turf grass is permitted.
- e. Areas receiving credit must be located on the development project.

B. Protect Natural Flow Pathways

1. Summary

Description:	Identify and map natural drainage features to maximize protection and benefits of use.
Application:	Lower-density developments.
Pretreatment Required:	No. This BMP can provide pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Assign a CN reflecting a meadow or open spaces in “good” condition.
Rate Reduction:	Due to longer time-of-concentration for natural flow pathway.
Water Quality:	Exempt from water quality criteria.

2. Criteria

- a. Identify all existing natural flow pathways on site plan.
- b. Identify natural flow pathways to be protected on site plan and construction drawings.
- c. Protected natural flow pathways on private property must have an easement or deed restriction to prevent future disturbance or neglect.
- d. Natural flow pathways to be protected must have the limits delineated/flagged/fenced in the field. Notes to this effect must be included on construction drawings.
- e. Identify flow pathways designed as part of the stormwater management system including strategies such as:
 - (1) Increased length.
 - (2) Increased roughness.
 - (3) Decreased slope.
- f. Ensure adequacy of flow pathway for post-development flows.

C. Protect Sensitive Areas

1. Summary

Description:	Identify, map, and prioritize sensitive areas on the site to be preserved and protected in perpetuity.
Application:	Plats; Condominiums; More difficult to implement as development density increases.
Pretreatment Required:	No.
Maintenance Plan:	No.
Calculation Credits:	Remove protected sensitive areas from stormwater management calculations or select an appropriate existing land use if necessary to include the area for sizing of conveyance systems.
Volume Reduction:	Exempt from channel protection criteria.
Rate Reduction:	Exempt from flood control criteria.
Water Quality:	Exempt from water quality criteria.

2. Criteria

This BMP includes protected areas on the development property located on separate out lots or set asides with language in the master deed or bylaws that requires protection and preservation, and that restricts land uses to those that do not increase runoff. For developments involving drains, a recordable conservation easement in the name of the drainage district must also be provided.

- a. Identify all sensitive areas on site plan.
- b. Identify all sensitive areas to be protected on the site plan and construction drawings.
- c. Sensitive areas to be protected must have the limits delineated/flagged/fenced in the field during construction and visible permanent boundary markers set to minimize encroachment (as appropriate). Notes and details to this effect must be included on construction drawings.
- d. Identify municipal ordinance requirements, if any, and incorporate sensitive area standards for development site. In the absence of a local ordinance, standards for riparian buffers shall consist of:
 - (1) Variable width depending on topography, minimum 25-foot width (Zone 1).
 - (2) Naturally vegetated.
- e. Minimal clearing is allowed for lot access and fire protection.
- f. For activities proposed within floodplains the Developer shall demonstrate any activity proposed within a 100-year floodplain will not diminish the flood storage capacity. Compensatory storage will be required at a minimum ratio of one-to-one (1:1) for all lost floodplain storage.
 - (1) The compensating cut must be available during a flood event.
 - (2) Water must be able to move freely from stream to storage.
 - (3) Excavation must be adjacent to the floodplain.
 - (4) Flood storage must be between the 2-year flood elevation and the 100-year flood elevation.
 - (5) Compensating storage shall NOT be provided through channel widening.

D. Native Revegetation

1. Summary

Description:	Restoration of disturbed pervious areas with deeper-rooted native plants in lieu of conventional turf grass to reduce runoff volume.
Application:	All development types: Limitations where rapid establishment of dense turf grass is needed to prevent erosion in concentrated flow situations.
Pretreatment Required:	No. This BMP can provide pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Assign a CN reflecting a meadow. For small sites, individual trees can receive a credit of 200 square feet per tree, counted as woods in “good” condition. ¹
Rate Reduction:	By virtue of lower CN.
Water Quality:	Exempt from water quality criteria.
¹ Source: SEMCOG (2008). <i>Low Impact Development Manual for Michigan</i> . Note: Trees in minimal disturbance areas receive a larger area credit than trees planted under “Native Revegetation” due to the assumption that the existing trees will typically be larger and more mature than planted trees at the time of site plan submittal and during ensuing years.	

2. Criteria

- a. Identify native revegetation areas on site plan and construction drawings.
- b. Native revegetation areas must be protected by having the limits delineated/flagged/fenced in the field. Notes to this effect must be included on construction drawings.
- c. Standards shall consist of:
 - (1) Variable width depending on topography, minimum 25-foot width (Zone 1).
 - (2) Native revegetation selected from the *Low Impact Development Manual for Michigan* (SEMCOG, 2008), [Appendix C](#).
- d. Areas receiving credit must be located on the development project.

E. Stormwater Disconnect

1. Summary

Description:	Minimize runoff volume by disconnecting impervious areas from the stormwater conveyance system.										
Application:	Rooftops; Driveways; Walkways; Patio areas; Minor roads.										
Pretreatment Required:	No.										
Maintenance Plan:	Yes.										
Calculation Credits:											
Volume Reduction:	Weight impervious CN with pervious CN for open spaces in “good” condition. The following weighted CNs can be assigned to the disconnected impervious area. They assume a pervious area twice the size of the impervious area. <table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>59</td><td>73</td><td>82</td><td>86</td></tr></table>			A	B	C	D	59	73	82	86
A	B	C	D								
59	73	82	86								
Rate Reduction:	By virtue of weighted CN.										
Water Quality:	Exempt from water quality criteria.										

2. Criteria

- a. Stormwater from rooftops and other impervious areas is considered disconnected if it is routed to a stabilized vegetated area, or an onsite depression storage area that meets the following criteria:
 - (1) Pervious area is not a structural BMP that must be designed to treat the runoff from the impervious surface.
 - (2) Impervious area must be limited to 1,000 square feet per discharge point.
 - (3) Roof downspouts and curb cuts must be at least 10 feet away from the nearest connected impervious surface to discourage “re-connections.”
 - (4) Disconnection in less permeable soils (HSGs C and D) may require the use of dry wells, french drains, or other temporary storage device to compensate for poor infiltration capability if ponding of water for extended period of time becomes problematic.
 - (5) For disconnects to stabilized vegetated areas:
 - (a.) Size of disconnect area shall be twice the size of the contributing impervious area.
 - (b.) Length of disconnect area must be at least the length of the flow path of the contributing impervious area (maximum 75 feet).
 - (c.) Slope of disconnect area must be no greater than 5%.
 - (d.) Disconnect area may be a “minimal disturbance area.”
 - (6) Disconnection must ensure no basement seepage.
 - (7) Identify disconnect areas on site plan and construction drawings.

II. STRUCTURAL BEST MANAGEMENT PRACTICES

Structural BMPs are constructed measures that convey, store, and treat stormwater in a site-specific location and help mitigate the impact of stormwater runoff.

Design criteria is provided for the following structural BMPs:

Conveyance and Storage

- A. Storm Sewer
- B. Culvert or Bridge
- C. Open Channel
- D. Detention Basins
- E. Retention Basins
- F. Sediment Forebay
- G. Spill Containment Cell

LID and Small Site

- H. Infiltration Practices
- I. Bioretention/Rain Garden
- J. Constructed Filter
- K. Planter Box
- L. Pervious Pavement
- M. Capture Reuse
- N. Vegetated Roof
- O. Water Quality Device
- P. Bioswale and Water Quality Swale
- Q. Vegetated Swale
- R. Vegetated Filter Strip
- S. Level Spreader

BMPs shall be designed in accordance with these standards.

Further information and examples for LID and Small Site BMPs are provided in the BMP Fact Sheets in [Chapter 7](#) the *Low Impact Development Manual for Michigan* (SEMCOG, 2008).

Note: Design criteria for BMPs used primarily for soil erosion and sedimentation control and channel stabilization (i.e., riprap, in-stream structures, natural channel design), and technical specifications for construction are beyond the scope of this manual.

A. Storm Sewer

1. Summary

Description:	Provides stormwater conveyance in an enclosed system.
Application:	Urban areas: Where above-ground conveyance is not desirable.
Types:	Pipe (solid wall, perforated).
Pretreatment Required:	No. This BMP can provide spill containment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Solid wall pipe: None. Perforated pipe (with slope): None.
Rate Reduction:	None.
Water Quality:	Count volume routed through catch basin.

2. Design Requirements

a. Sizing and Configuration

- (1) Storm sewer shall be designed to convey the peak discharge from a 10-year rainfall event.
- (2) A dual or redundant storm sewer may be required to convey the peak discharge from a 100-year rainfall event if acceptable overland flow routes do not exist (refer to Part 3 section "Flood Control").
- (3) Design velocities, capacities, and friction losses shall be based on Manning's equation:

$$Q = \frac{1.49 A R^{\frac{2}{3}} S^{\frac{1}{2}}}{n} \quad (4.21)$$

where:

- Q = discharge (cubic feet per second)
- A = wetted area (square feet)
- R = hydraulic radius (feet)
- S = slope (feet per foot)
- n = Manning's roughness coefficient

- (4) Manning's coefficients for closed conduit are included in **Table 12**.
- (5) Acceptable slopes for circular pipe ("n" = 0.013) are included in **Table 13**. Minimum and maximum grade for other Manning's n values must be calculated based on allowable minimum and maximum velocities (V).
- (6) As a general rule, the storm sewer system shall be designed without surcharging. Where this is not possible, surcharging may be allowed to one foot below the top of casting. However, minor losses must be considered in hydraulic grade line calculations.
- (7) Storm sewer pipe shall have a minimum diameter of 12 inches. Smaller pipe may be approved for private systems.
- (8) The minimum depth of cover shall be 24 inches from grade to the top of pipe.

- (9) Restricted conveyance systems designed to create backflow into stormwater storage facilities are not permitted. A storm sewer line shall not be used as both an inlet and outlet line to a stormwater storage facility.

Table 12 – Manning’s Roughness Coefficients

Conduit	Coefficients
Closed Conduits	
Asbestos-Cement Pipe	0.011 to 0.015
Brick	0.013 to 0.017
Cast Iron Pipe (Cement-lined and seal-coated)	0.011 to 0.015
Concrete (Monolithic)	
Smooth forms	0.012 to 0.014
Rough forms	0.015 to 0.017
Concrete Pipe	0.011 to 0.015
Corrugated-Metal Pipe (1/2-inch corrugated)	0.022 to 0.026
Paved invert	0.018 to 0.022
Spun asphalt-lined	0.011 to 0.015
Plastic Pipe (Smooth)	0.011 to 0.015
Vitrified Clay Pipes	0.011 to 0.015
Liner channels	0.013 to 0.017
Open Channels	
Lined Channels	
Asphalt	0.013 to 0.017
Brick	0.012 to 0.018
Concrete	0.011 to 0.020
Rubble or riprap	0.020 to 0.035
Vegetal	0.030 to 0.040
Excavated or Dredged	
Earth, straight and uniform	0.020 to 0.030
Earth, winding, fairly uniform	0.025 to 0.040
Rock	0.030 to 0.045
Unmaintained	0.050 to 0.140
Natural Channels (streams, top width at flood state <100 feet)	
Fairly regular section	0.030 to 0.070
Irregular section with pools	0.040 to 0.100
Source: American Society of Civil Engineers and the Water Pollution Control Federation (1969). <i>Design and Construction of Sanitary and Storm Sewers</i> .	

Table 13 – Minimum and Maximum Slopes for Storm Sewers

Pipe Size (inches)	Minimum % of Grade (Velocity = 2.5 feet per second)	Maximum % of Grade (Velocity = 10 feet per second)
12	0.32	4.88
15	0.24	3.62
18	0.20	2.84
21	0.16	2.30
24	0.14	1.94
27	0.12	1.66
30	0.10	1.44
36	0.08	1.12
42	0.06	0.92
48	0.06	0.76
54	0.04	0.60
60	0.04	0.54
66	0.04	0.48
Manning's "n" = 0.013		

b. End Treatment

- (1) Outlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second, up to maximum allowable design velocity of 8 feet per second.
- (2) Outlets into open channels or grassed swales shall enter at an angle of 90 degrees or less with the direction of flow.

c. Manholes and Catch Basins

- (1) Manhole spacing shall not exceed 400 feet for sewers less than 42 inches in diameter and 600 feet for larger sewers.
- (2) Manholes shall be placed at all changes in pipe direction, slope, pipe size, all inlet connection locations, and at the upper end of the storm sewer.
- (3) Where possible, pipe inverts at junctions shall be designed to minimize junction losses (match 0.8 points of pipe diameters).
- (4) Minimum inside diameter of all manholes, catch basins, and inlet structures shall be 48 inches, except that a 24-inch diameter structure may be allowed with a single 12-inch outlet pipe.
- (5) All structures receiving direct surface water runoff shall have a sump not less than 24 inches deep.
- (6) Catch basins shall be placed at low points of streets and yards. Spacing and/or number of inlet structures required to accommodate the design flows in streets, private drives, and parking areas shall be provided based on inlet capacity with no ponding occurring during a 10-year storm, and the following additional stipulations:
 - (a.) No more than 300 feet of pavement surface drainage will be allowed. No more than 200 feet of surface drainage will be allowed for grades exceeding 4%.
 - (b.) Consideration shall be given to pedestrian crossings when siting catch basins in intersections. Catch basins shall be placed upstream of pedestrian crossings when practical.
 - (c.) No more than 150 feet of street drainage will be allowed to flow around a corner.

(d.) No flow will be allowed across a public street intersection.

d. Sump Discharge

- (1) Sump discharge outlets for individual lots shall be a catch basin (minimum 4-foot diameter) with lead (6-inch minimum diameter); manufactured tees; or cored and booted lead.

e. Materials

- (1) All materials must comply with the authority having jurisdiction over the storm sewer system.
- (2) Storm sewer pipe within the influence of a public road shall be reinforced concrete pipe. All other storm sewer pipe shall be reinforced concrete or smooth interior wall polyethylene in accordance with MDOT Standard Specifications. Other materials shall be subject to approval.
- (3) Pipe joints shall be designed to prevent excessive infiltration or exfiltration.
- (4) Manholes and catch basins shall be in accordance with MDOT Standard Specifications.
- (5) Connections to manholes shall be made with a resilient connector for pipe diameters 24 inches or less. Concrete pipe connections shall be made by grouting the inside and outside wall of the structure.

B. Culvert or Bridge

1. Summary

Description:	Provides stormwater conveyance through a crossing structure.
Application:	Where crossing of open channels, wetlands, waterbodies, and grassed swales is required. Culverts can also provide equalization and outlet control.
Types:	Pipe Culvert; Box Culvert; Bridge.
Pretreatment Required:	No.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	None.

2. Design Requirements

a. Sizing and Configuration

- (1) Bridges shall be designed to provide a 4.3-foot minimum underclearance at normal flow for canoe traffic on navigable waterways, and a 2-foot minimum freeboard to the underside (low chord) of the bridge for a 100-year flood where conditions allow.
- (2) Footings shall extend at least 4 feet below the bottom of the channel.
- (3) Culverts serving a drainage area of less than 2 square miles shall be designed for the 25-year peak discharge in the developed watershed with a maximum outlet velocity of 8 feet per second. A maximum of one foot of inlet submergence may be permitted if this does not backup water out of the easement.
- (4) The effect of the 100-year storm shall be reviewed to ensure no adverse increase in water elevation off of the development property or flooding of structures within the development.

(5) Sizing of culverts and bridges shall be performed using the Bernouli Equation and include consideration of inlet and outlet control, entrance and exit losses, and tailwater condition. Published culvert nomographs and other computer software may be used.

(6) Minimum diameter of a drive culvert shall be 12 inches.

(7) Minimum diameter of a road crossing culvert shall be 18 inches or equivalent pipe arch.

b. End Treatment

(1) Headwalls, wingwalls, and all other end treatments shall be designed to ensure the stability of the surrounding soil. MDOT, Road Commission, or manufacturer's designs may be used.

(2) Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second, up to maximum allowable design velocity of 8 feet per second.

c. Materials

(1) All materials must comply with the authority having jurisdiction over the roadway.

(2) Culverts may be reinforced concrete pipe, corrugated steel pipe, or pipe arch in accordance with Road Commission or MDOT Standard Specifications. Smooth interior wall polyethylene may also be allowed.

C. Open Channel

1. Summary

Description:	Stormwater conveyance in an excavated channel.
Application:	Larger drainage areas with concentrated runoff.
Types:	Channel; Ditch.
Pretreatment Required:	No.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	None.

2. Design Requirements

a. Sizing and Configuration

(1) The open channel shall be designed to convey the 25-year peak discharge.

(2) Open channel design velocities, capacities, and friction losses shall be based on Manning's equation:

$$Q = \frac{1.49 A R^{\frac{2}{3}} S^{\frac{1}{2}}}{n} \quad (4.21)$$

where:

- Q = discharge (cubic feet per second)
- A = wetted area (square feet)
- R = hydraulic radius (feet)
- S = slope (feet per foot)
- n = Manning's roughness coefficient

- (3) Manning's Coefficients shall be determined from **Table 12**. A minimum Manning's Coefficient of 0.035 shall be used for open channels, unless special treatment is given to the bottom and sides (riprap, paving, mown sod, etc.).
- (4) Minimum bottom width shall be 2 feet.
- (5) Minimum longitudinal slope shall be 0.10%.
- (6) Side slopes shall be no steeper than 2:1 (horizontal to vertical).
- (7) The minimum velocity for open channels during the design event shall be 1.5 feet per second.
- (8) The maximum velocity shall be 4 feet per second. Riprap protection or equivalent shall be used where the velocity exceeds 4 feet per second, up to maximum allowable design velocity of 8 feet per second.

b. Connections and Crossings

- (1) Outlets into the open channel shall enter at an angle of 90 degrees or less with the direction of flow.
- (2) A minimum clearance of 5 feet is required between open channel inverts and underground utilities unless special provisions are approved.

D. Detention Basins

1. Summary

Description:	Provides stormwater storage with a surface outlet.
Application:	Practical for a wide range of applications including large sites.
Types:	Dry Basin; Extended Detention Basin; Wet Pond; Constructed Wetland; Underground Vault.
Pretreatment Required:	Yes, may be needed to meet TSS removal, facilitate maintenance, or preserve intended aesthetics of basin.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	Calculated release rate.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

- a. Calculate the allowable release rate and the required storage volume for flood control (refer to Part 4 section "Calculating Storage Volumes and Release Rates, Flood Control, Detention").
- b. Extended detention volume provided for water quality treatment and/or channel protection may be included in the flood control volume if it comprises no more than 30% of the flood control volume. Where channel protection and water quality treatment are provided through upstream retention

BMPs, these volumes may be subtracted from the total inflow volume.

- c. Size forebay(s) for pretreatment (refer to Part 4 section “Calculating Storage Volumes and Release Rates, Pretreatment”).
- d. Detention basins without an acceptable surface water overflow route shall be designed for 2 times the required flood control volume.

3. Design Requirements

a. Siting

- (1) Soil borings are required (refer to Part 4 section “Soils Investigation”).
 - (a.) A minimum of 2 feet is required between the bottom of dry detention basins and the highest known groundwater elevation.
 - (b.) Wet ponds and constructed wetlands shall have a reliable supply of baseflow or groundwater to support a permanent pool.
 - (c.) A constructed wetland must have a minimum contributing drainage area of 10 acres (5 acres for a pocket wetland).
 - (d.) Wet ponds and constructed wetlands proposed in HSG A and HSG B soils above the groundwater table shall have a clay or synthetic liner to minimize infiltration.
- (2) Setbacks shall be as follows:
 - (a.) Public and private sidewalk/non-motorized pathway: 5 feet
 - (b.) Adjacent property line: 10 feet
 - (c.) Building foundation: 30 feet
 - (d.) Private well: 50 feet
 - (e.) Public well: 200 feet from Type I or Type IIa wells, 75 feet from Type IIb or Type III wells (Safe Drinking Water Act, Act 399, PA 1976)
 - (f.) Septic system drainfield: 100 feet
 - (g.) Airport: Per Federal Aviation Administration guidelines (wet pond, constructed wetland)

b. Configuration

- (1) General
 - (a.) Distances of flow paths between inlets and outlets shall be maximized. A minimum basin length-to-width ratio of 2 to 1 is required.
 - (b.) If site constraints preclude placing pipes at opposite ends of the basin or meeting the length-to-width ratio, baffles (berms) may be used to lengthen the flow path.
 - (c.) Where steeper side slopes than those specified are unavoidable, safety railing, fencing, or other access barriers may be approved.
- (2) Dry Basin
 - (a.) The design high water depth should generally not exceed 10 feet above the bottom of the basin.
 - (b.) Side slopes shall not be steeper than 3:1 (H:V). Where basins are to be maintained as a mown lawn, side slopes shall be no steeper than 4:1 (H:V) to facilitate mowing.
 - (c.) The bottom of dry detention basins shall be graded to provide positive flow to the pipe outlet. A minimum longitudinal bottom slope of 1% shall be provided. Cross slopes shall be 2% minimum. If continuous flow is anticipated, a low-flow channel shall be provided, with necessary crossings, and sloped to eliminate standing water. If site grades prohibit achieving

these minimum slopes, the use of an underdrain with flatter slopes may be approved.

(3) Wet Pond

- (a.) At a minimum, the volume of the permanent pool for wet ponds shall be 2.5 times the water quality volume to account for reduced settling efficiency due to turbulence caused by wind.
- (b.) Wet ponds shall generally be wedge-shaped with inflow at the narrow end to prevent short-circuiting and stagnation. However, other shapes meeting the design intent may be approved.
- (c.) Permanent pools shall have a minimum depth of 3 feet across the deepest part of the basin to discourage aquatic plant infill and provide open water.
- (d.) The design high water depth should generally not exceed 10 feet above the permanent pool elevation.
- (e.) Side slopes shall not be steeper than 3:1 (H:V). Where basins are to be maintained as a mown lawn to the water's edge, side slopes shall be no steeper than 4:1 (H:V) to facilitate mowing.
- (f.) A minimum 8-foot-wide safety bench shall be constructed on the slopes of wet ponds with a permanent pool 3 feet or deeper. The safety bench shall have a maximum slope of 6:1 (H:V) and extend a minimum of 8 inches below the permanent pool level and a minimum of 8 inches above the permanent pool level.
- (g.) Warning signs prohibiting swimming and skating shall be posted for wet ponds.

(4) Constructed Wetland

- (a.) The emergent vegetation zone shall comprise 60 to 65% of the total surface area. Half shall be high marsh with a normal water depth of 6 inches or less, and half shall be low marsh with a normal water depth between 6 and 18 inches.
- (b.) The open water zone shall comprise 35% to 40% of the total surface area with a normal water depth of between 18 inches and 6 feet.
- (c.) At a minimum, the volume of the permanent pool for the open water zone shall be 2.5 times the water quality volume to account for reduced settling efficiency due to turbulence caused by wind.
- (d.) The design high water surface elevation shall not exceed the normal water surface elevation by more than 4 feet.
- (e.) Side slopes shall be 4:1 to 5:1 (H:V) wherever possible. Side slopes shall not be steeper than 3:1 (H:V).
- (f.) A minimum 8-foot-wide safety bench shall be constructed on the slopes of constructed wetlands with a permanent pool 3 feet or deeper. The safety bench shall have a maximum slope of 6:1 (H:V) and extend a minimum of 8 inches below the permanent pool level and a minimum of 8 inches above the permanent pool level.
- (g.) A micro pool shall be located at the outlet of the stormwater wetland to protect the low flow pipe from clogging and prevent sediment resuspension. The micro pool shall be 3 to 6 feet deep and have a minimum surface area equivalent to the forebay.
- (h.) A pocket wetland shall consist of a forebay and micropool with safety benches.

c. Inlet Design

- (1) Inlet pipes shall not be fully submerged at normal pool elevations.
- (2) Inlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second up to maximum allowable design velocity of 8 feet per second.
- (3) Pretreatment shall be provided in a sediment forebay, spill containment cell, or water quality

swale. For small sites, a water quality device may be used prior to the basin. Pretreatment for overland sheet flow entering the basin can be provided through a vegetated filter strip.

- (4) When spill containment is required, all pipes contributing runoff from the high-risk area must enter the pretreatment BMP.

d. Outlet Design

- (1) The outlet shall consist of a multi-stage outlet and include a low flow orifice or multiple orifice openings, a primary overflow (typically provided through the top of a grated riser pipe), and a secondary emergency overflow spillway.
- (2) Staged low flow outlet: When required, the lowest stage openings shall be sized to accommodate the water quality or channel protection volume. The flood control opening shall be placed at the resulting high-water level and sized so that the cumulative discharge from all openings is limited to the maximum allowable design discharge at the design high water level.

(3) Low Flow Outlet

- (a.) The low flow outlet may be designed using the orifice equation, rearranged to solve for area:

$$A = \frac{Q}{c \sqrt{2gH}} \quad (4.22)$$

where:

- A = required area (square feet)
- Q = required outflow (cubic feet per second)
- c = orifice coefficient (approximately 0.6)
- $2g$ = 2 times the gravitation constant ($g = 32.2$ feet per second)
- H = height of design high water level above center of orifice outlet (feet)

- (b.) Other types of outlet devices shall have full design calculations provided for review.
- (c.) The outlet shall be designed to prevent clogging and be accessible for maintenance.
- (d.) Pipes or orifice plates shall have a minimum diameter of 4 inches without additional protection against clogging.
- (e.) Pipe or orifice openings less than 4 inches in diameter shall be protected from clogging by directing inflow through a sufficiently large opening area protected with a properly sized filter or screen prior to the orifice.
- (f.) A gravel filtration jacket consisting of 3-inch washed stone and 1-inch washed stone must be placed around all perforated riser pipes in basins, wet ponds, and constructed wetlands. The orifice configuration must be wrapped with hard wire mesh with an appropriate opening size to prevent any stone from passing through the orifice. The 3-inch stone must be placed immediately adjacent to the riser pipe with the 1-inch stone covering the larger stone. The gravel jacket must extend sufficiently above all orifice patterns.
- (g.) Orifices used to maintain a permanent pool shall be designed to withdraw water a minimum of 2 feet below the normal water surface.

(4) Primary Overflow

- (a.) All detention basins must have a primary overflow at the design high water level.

- (b.) The primary overflow shall be designed to convey the 10-year undetained peak inflow at the maximum design high water level. The depth of water at the crest of the secondary emergency overflow is the maximum design high water level.
 - (c.) The downstream outlet pipe shall be designed to convey the 10-year undetained peak inflow from the primary overflow and the discharge from the low flow orifice(s) at the maximum design high water level.
 - (d.) Hoods and trash racks shall be placed on riser pipes. Grate openings shall be a maximum of 3 inches on center. A vertical flow area must be provided where leaves and debris are prone to clog a horizontally seated grate.
 - (e.) Riser pipes shall have a minimum diameter of 24 inches. Riser pipes greater than 4 feet in height shall be a minimum of 48 inches in diameter.
 - (f.) Riser pipes shall be constructed of reinforced concrete or corrugated metal and be set in a concrete base designed to prevent buoyancy. Plastic is not acceptable as a material unless riser is buried, due to lack of durability.
 - (g.) The riser must be placed near or within the embankment to provide for ready maintenance access.
 - (h.) When possible, a drain for completely dewatering the detention basin shall be installed for maintenance purposes.
 - (i.) Pipes placed through embankments shall have anti-seep collars.
 - (j.) Outlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second up to maximum allowable design velocity of 8 feet per second.
- (5) Secondary Emergency Overflow Spillway
- (a.) All detention basins must have a provision for emergency overflow (i.e., a spillway).
 - (b.) The spillway shall be designed for the 10-year undetained peak inflow with a maximum flow depth of one foot. The spillway shall be sized using the weir equation:
 - Rectangular weir: $Q = CLH^{\frac{3}{2}}$ (4.25)
 - Trapezoidal weir: $Q = 0.75CmH^{2.5} + CLH^{\frac{3}{2}}$ (4.26)
 - Triangular weir: $Q = 0.75CmH^{2.5}$ (4.27)
- where:
- Q = discharge (cubic feet per second)
 - C = coefficient of discharge (varies from 2.6 to 3.3)
 - m = Horizontal component of side slope
 - L = length of spillway crest (feet)
 - H = total head measured above spillway crest (feet)
- (c.) Freeboard. The top of berm elevation shall be a minimum of 0.5 foot above the design flow depth over the spillway. In no case shall the spillway depth (distance between spillway crest and top of berm) be less than 1 foot.
 - (d.) Overflow spillways shall be protected with concrete, riprap, or a permanent erosion control

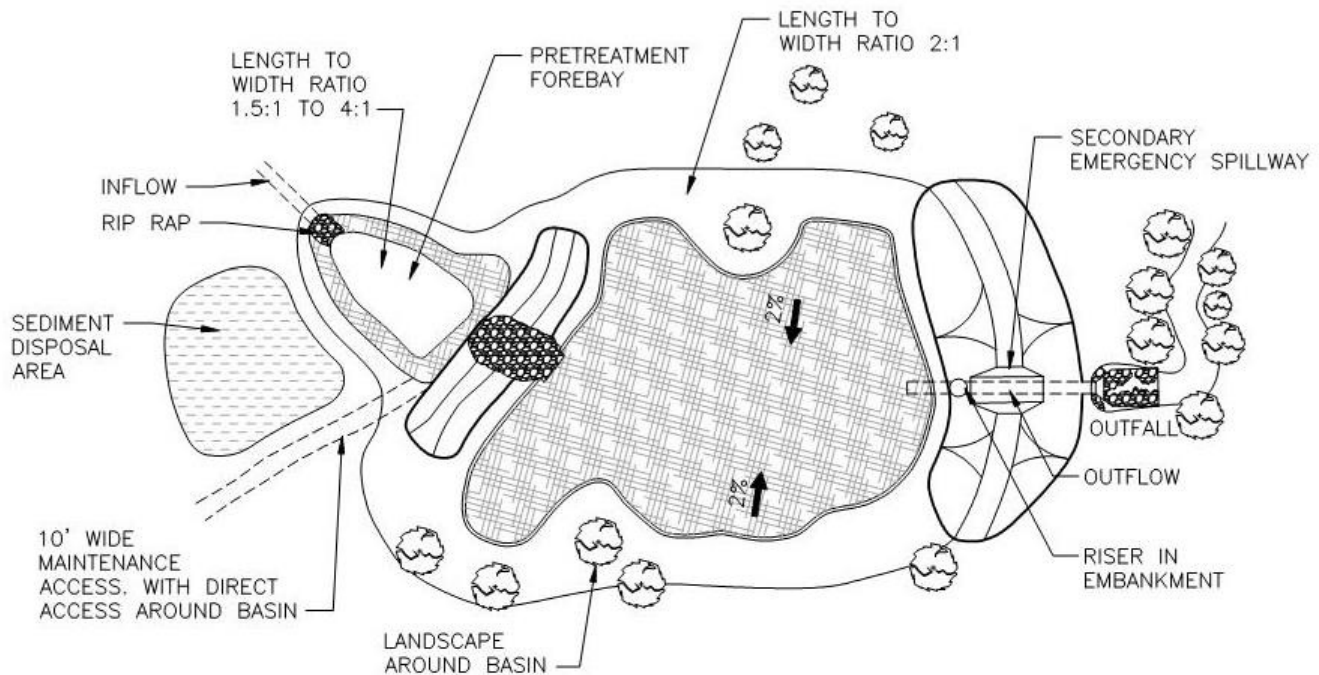
blanket (preferred) to prevent erosion of the structure. Protection shall extend across the entire spillway up to the top of berm, start on the basin side a minimum of 3 feet below the spillway crest and extend down the spillway to an apron a minimum of 6 feet beyond the toe of the spillway.

e. Access

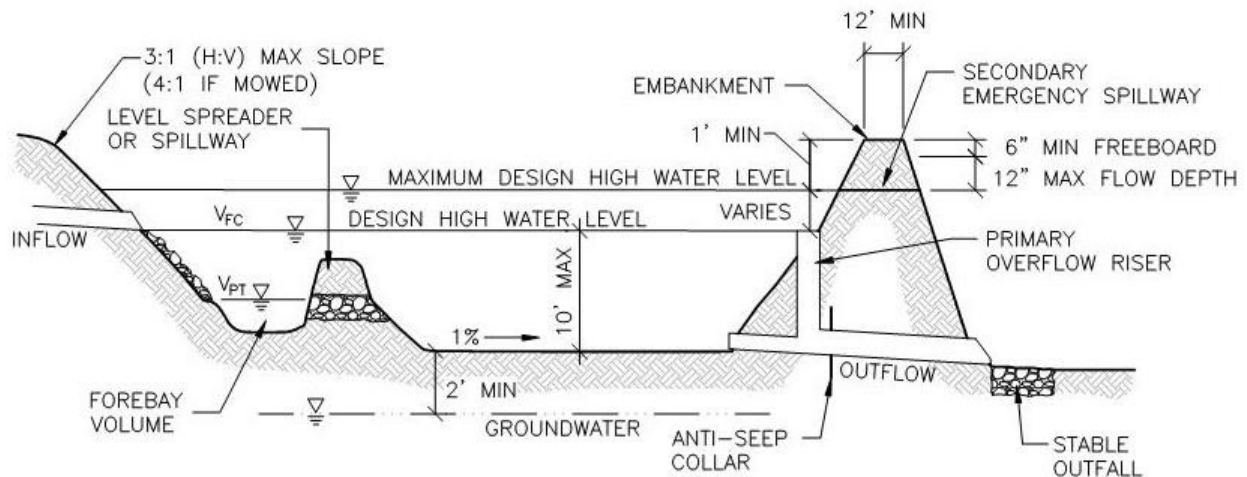
- (1) Outlet control structures shall be placed near or within the embankment to facilitate maintenance access.
- (2) Berm top width shall be a minimum of 4 feet, or 12 feet where vehicle access is required for maintenance.
- (3) A minimum 10-foot-wide maintenance access route from a public or private right-of-way shall be provided to the basin. The access way (including side slopes on trapezoidal and triangular spillways) shall have a vertical grade of no greater than 20% (5:1 H:V slope) and shall be stabilized to withstand the passage of heavy equipment. Direct access to the forebay, control structures and the outlet shall be provided.

4. Design Schematics

DRY DETENTION BASIN



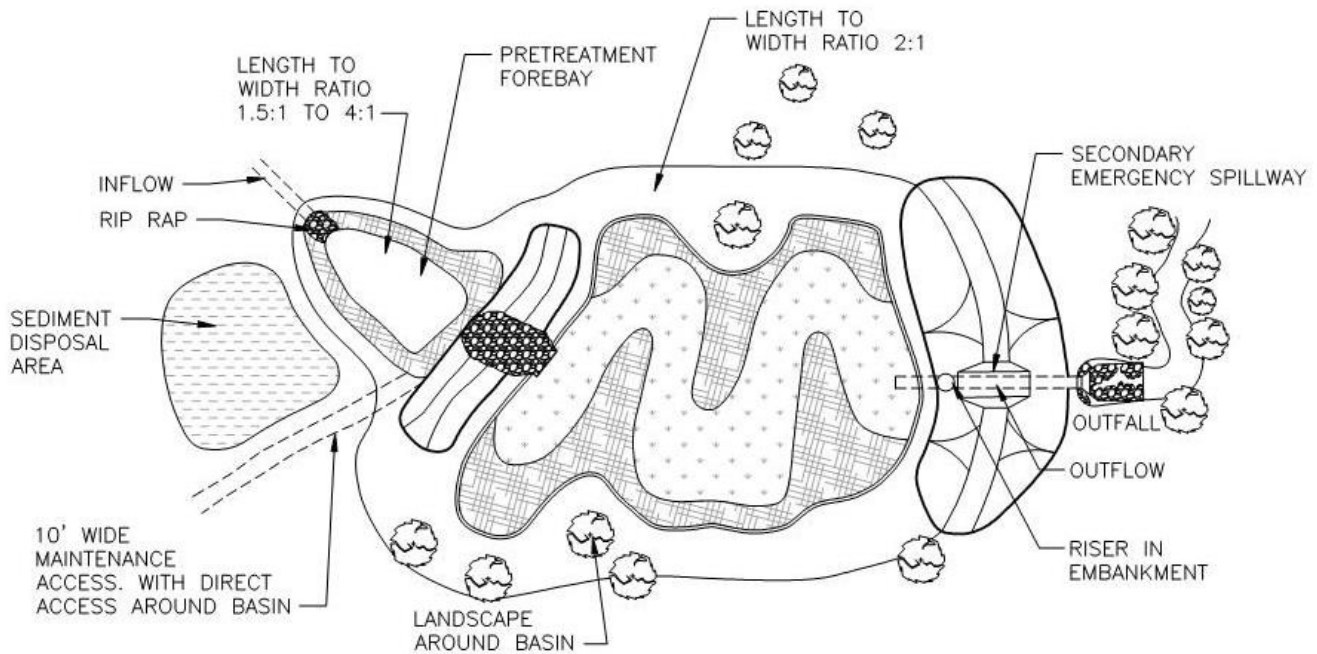
PLAN VIEW



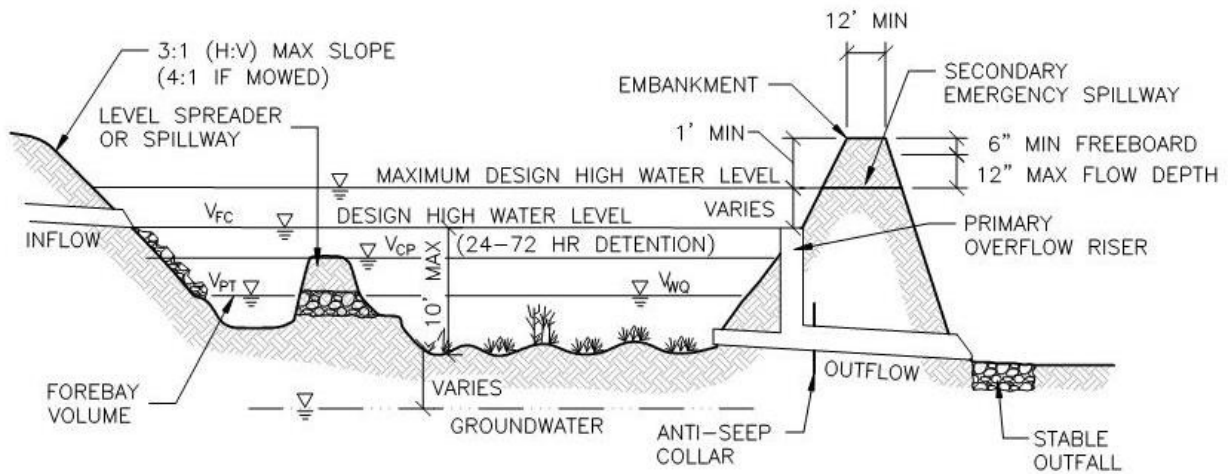
PROFILE

FINAL OUTLET CONFIGURATION MUST BE DESIGNED TO PREVENT CLOGGING

EXTENDED DETENTION BASIN



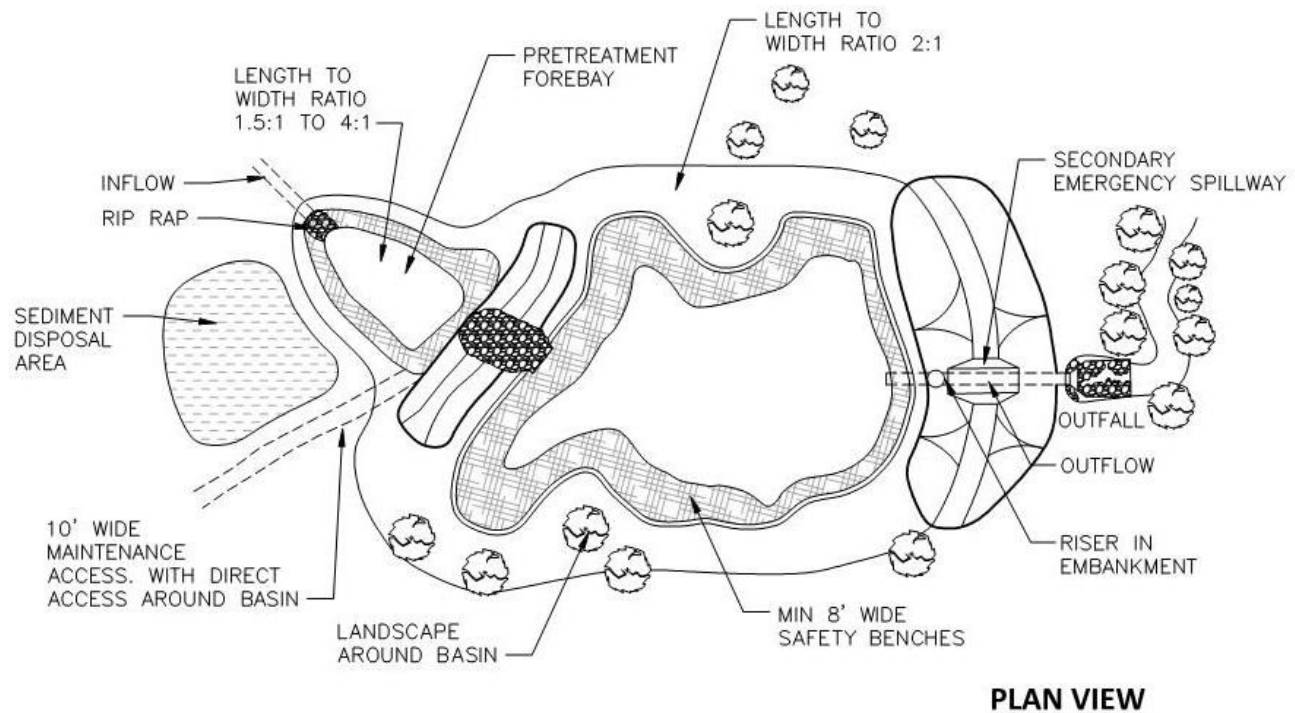
PLAN VIEW



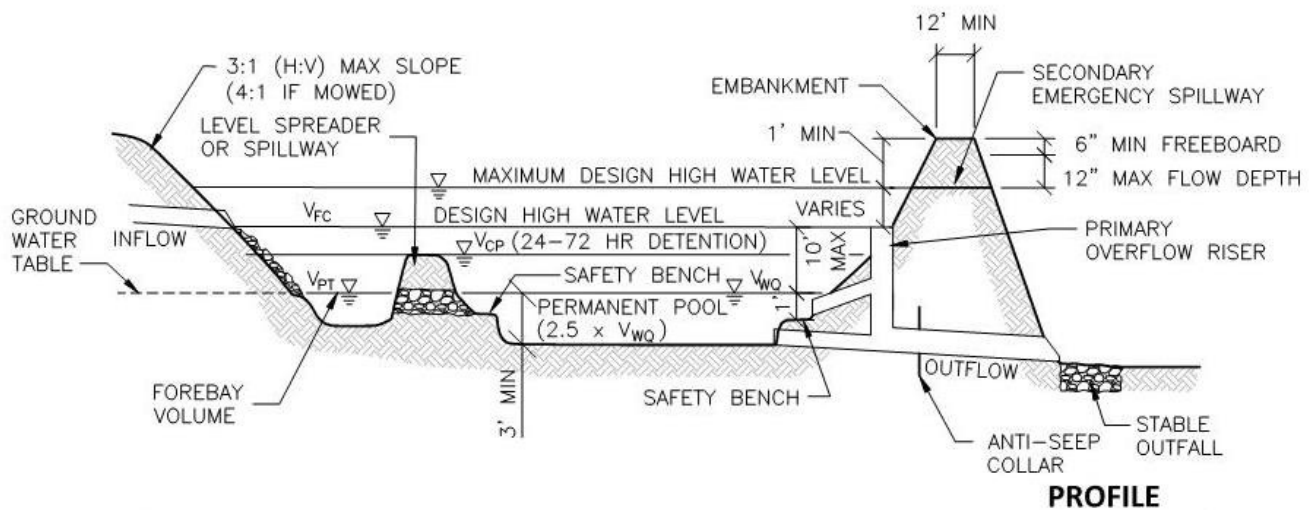
PROFILE

FINAL OUTLET CONFIGURATION MUST BE DESIGNED TO PREVENT CLOGGING

WET DETENTION BASIN (WET POND)



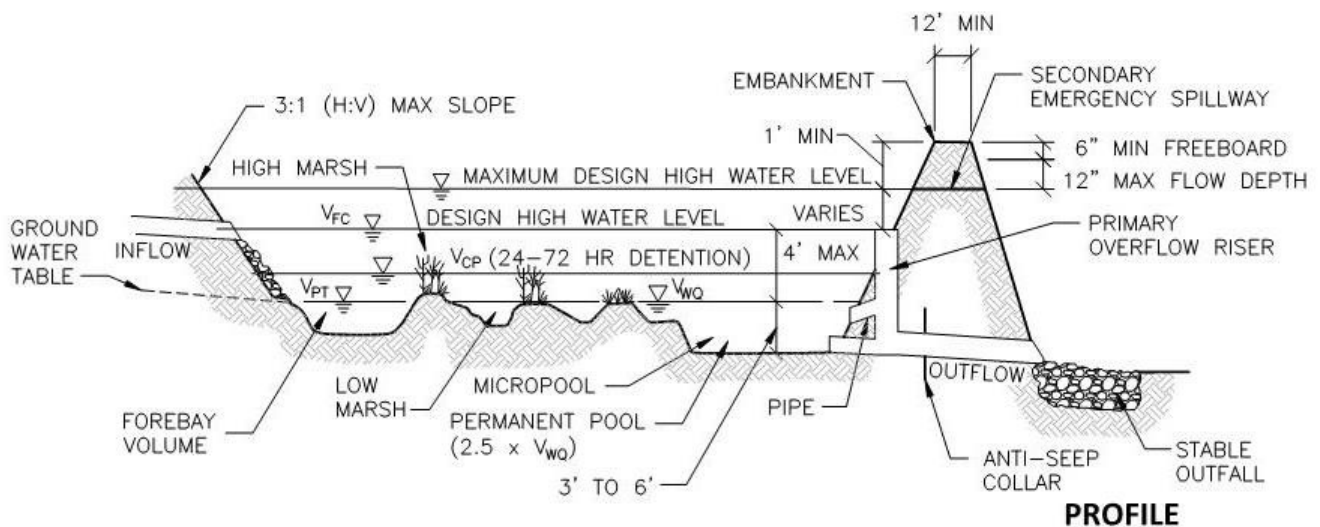
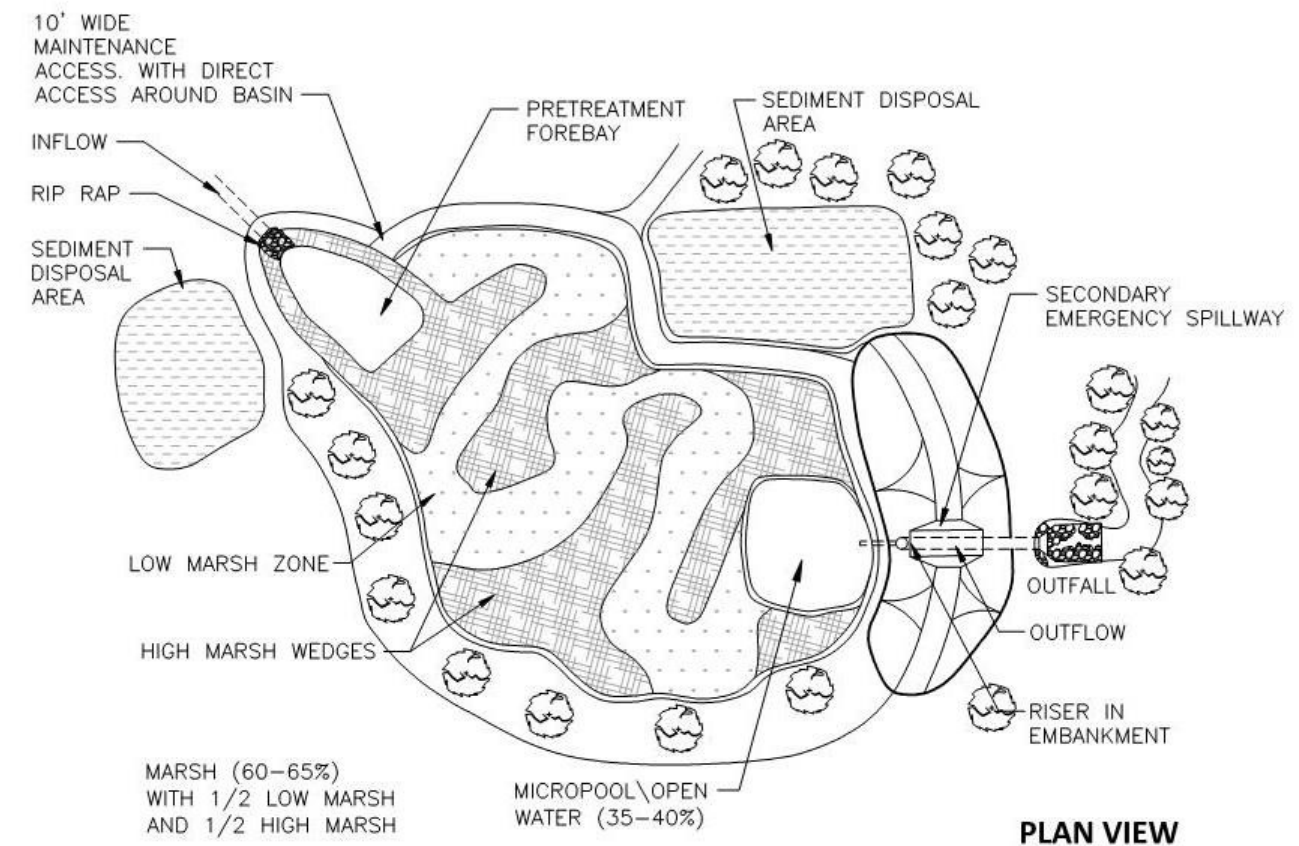
PLAN VIEW



PROFILE

FINAL OUTLET CONFIGURATION MUST BE DESIGNED TO PREVENT CLOGGING

CONSTRUCTED WETLAND



FINAL OUTLET CONFIGURATION MUST BE DESIGNED TO PREVENT CLOGGING

E. Retention Basins

1. Summary

Description:	Provides stormwater storage without a surface outlet.
Application:	Practical for a wide range of applications including large sites. Not recommended for regional use without supplemental measures and provisions for a positive outlet.
Types:	Dry Basin; Wet Pond.
Pretreatment Required:	Yes.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Count volume stored and infiltrated.
Rate Reduction:	Designed for flood control: 100%.
Water Quality:	Count volume stored and infiltrated.

2. Sizing Calculations

- Calculate the required storage volume for flood control (refer to Part 4 section “Calculating Storage Volumes and Release Rates, Flood Control, Retention”).
- Calculate the minimum infiltration area required to drain the required storage volume in the specified drawdown time using the design infiltration rate (refer to Part 4 section “Design Infiltration Rates”).

$$A = \frac{12V_s}{i(t_d)} \quad (4.28)$$

where:

- A = minimum infiltration area (square feet)
- V_s = storage volume (cubic feet)
- i = design infiltration rate (inches per hour)
- t_d = maximum allowable drawdown time (hours)
- 2 = factor to convert inches to feet

- Drawdown time shall be no more than 72 hours.
- The infiltration area shall be defined as the bottom of the basin, or the horizontal projection of the side slopes up to half of the design water depth above a permanent pool.
- Where channel protection and water quality treatment are provided through upstream retention BMPs, these volumes may be subtracted from the total inflow volume. If provided in the same retention basin, channel protection and water quality volumes are included in the flood control volume.
- Pretreatment: Size forebay(s) for the pretreatment volume (refer to Part 4 section “Calculating Storage Volumes and Release Rates”). Regional retention basins may require spill containment, forebays sized for the full water quality volume, additional pretreatment volume, or other measures to reduce the potential for groundwater contamination and protect the infiltration capacity of the BMP.
- Retention basins without an acceptable surface water overflow route shall be designed for 2 times the required flood control volume.

3. Design Requirements

a. Siting

- (1) Soil borings are required (refer to Part 4 section "Soils Investigation").
 - (a.) A minimum of 3 feet is required between the bottom of dry retention basins and the highest known groundwater elevation.
- (2) Setbacks shall be as follows:
 - (a.) Public and private sidewalk/non-motorized pathway: 5 feet
 - (b.) Adjacent property line: 10 feet
 - (c.) Building foundation: 30 feet
 - (d.) Private well: 50 feet
 - (e.) Public well: 200 feet from Type I or Type IIa wells, 75 feet from Type IIb or Type III wells (Safe Drinking Water Act, Act 399, PA 1976)
 - (f.) Septic system drain field: 100 feet
 - (g.) Airports: Per Federal Aviation Administration guidelines (wet ponds)
- (3) Perform groundwater mounding calculations to ensure no adverse impacts to adjacent structures.

b. Configuration

(1) General

- (a.) Where steeper side slopes than those specified are unavoidable, safety railing, fencing or other access barriers may be approved.

(2) Dry Basin

- (a.) The design high water depth should generally not exceed 7 feet above the bottom of the basin.
- (b.) Side slopes shall not be steeper than 3:1 (H:V). Where basins are to be maintained as a mown lawn, side slopes shall be no steeper than 4:1 (H:V) to facilitate mowing.
- (c.) The bottom of dry retention basins shall be flat to encourage uniform ponding and infiltration.

(3) Wet Pond (no surface water outlet)

- (a.) The design high water depth should generally not exceed 7 feet above the permanent pool elevation.
- (b.) Where excavation and reshaping of the retention area is necessary, side slopes shall not be deeper than 3:1 (H:V). Where basins are to be maintained as a mown lawn to the water's edge, side slopes shall be no steeper than 4:1 (H:V) to facilitate mowing.
- (c.) A minimum 8-foot safety bench shall be constructed on the slopes of wet ponds with a permanent pool 3 feet or deeper. The safety bench shall have a maximum slope of 6:1 (H:V) and extend a minimum of 8 inches below the permanent pool level and a minimum of 8 inches above the permanent pool level.
- (d.) Warning signs prohibiting swimming and skating shall be posted for wet ponds.

c. Inlet Design

- (1) Inlet pipes shall not be fully submerged at normal pool elevations.
- (2) Inlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second, up to maximum allowable design velocity of 8 feet per second.

- (3) Pretreatment is required for each inlet and shall be provided in a sediment forebay, spill containment cell, or water quality swale. For small sites, a water quality device with an 80% or greater TSS removal efficiency may be used prior to the basin. Pretreatment for overland sheet flow entering the basin can be provided through a vegetated filter strip.
- (4) When spill containment is required, all pipes contributing runoff from the high-risk area must enter the pretreatment BMP.

d. Overflow

(1) Primary Overflow

- (a.) When possible, retention basins must have a primary overflow at the design high water level.
- (b.) The primary overflow and downstream pipe shall be designed to convey the 10-year undetained peak inflow at the maximum design high water level. The depth of water at the crest of the secondary emergency overflow is the maximum design high water level.
- (c.) Hoods and trash racks shall be placed on riser pipes. Grate openings shall be a maximum of 3 inches on center. A vertical flow area must be provided where leaves and debris are prone to clog a horizontally seated grate.
- (d.) Riser pipes shall have a minimum diameter of 24 inches. Riser pipes greater than 4 feet in height shall be a minimum of 48 inches in diameter.
- (e.) Riser pipes shall be constructed of reinforced concrete or corrugated metal and be set in a concrete base designed to prevent buoyancy. Plastic is not acceptable unless riser is buried, due to lack of durability.
- (f.) When possible, a drain for completely dewatering the retention basin shall be installed for maintenance purposes.
- (g.) Pipes placed through embankments shall have anti-seep collars.
- (h.) Outlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second up to maximum allowable design velocity of 8 feet per second.

(2) Secondary Emergency Overflow Spillway

- (a.) All retention basins must have a provision for emergency overflow (i.e., a spillway).
- (b.) The spillway shall be designed for the 10-year undetained peak inflow with a maximum flow depth of one foot. The spillway shall be sized using the weir equation:

$$\text{Rectangular weir: } Q = CLH^{\frac{3}{2}} \quad (4.25)$$

$$\text{Trapezoidal weir: } Q = 0.75CmH^{2.5} + CLH^{\frac{3}{2}} \quad (4.26)$$

$$\text{Triangular weir: } Q = 0.75CmH^{2.5} \quad (4.27)$$

- (c.) Freeboard. The top of berm elevation shall be a minimum of 0.5 foot above the design flow depth over the spillway. In no case shall the spillway depth (distance between spillway crest and top of berm) be less than 1 foot.
- (d.) Overflow spillways shall be protected with concrete, riprap, or a permanent erosion control blanket (preferred) to prevent erosion of the structure. Protection shall extend across the entire spillway up to the top of berm, start on the basin side a minimum of 3 feet below the spillway crest and extend down the spillway to an apron a minimum of 6 feet beyond the toe of the spillway.

e. Access

- (1) Berm top width shall be a minimum of 4 feet, or 12 feet where vehicle access is required for maintenance.
- (2) A minimum 10-foot-wide maintenance access route from a public or private right-of-way shall be provided to the basin. The access way (including side slopes on trapezoidal and triangular spillways) shall have a vertical grade of no greater than 20% (5:1 H:V slope) and shall be stabilized to withstand the passage of heavy equipment. Direct access to the forebay, control structures and the outlet shall be provided.

f. Finishing and Top Dressing

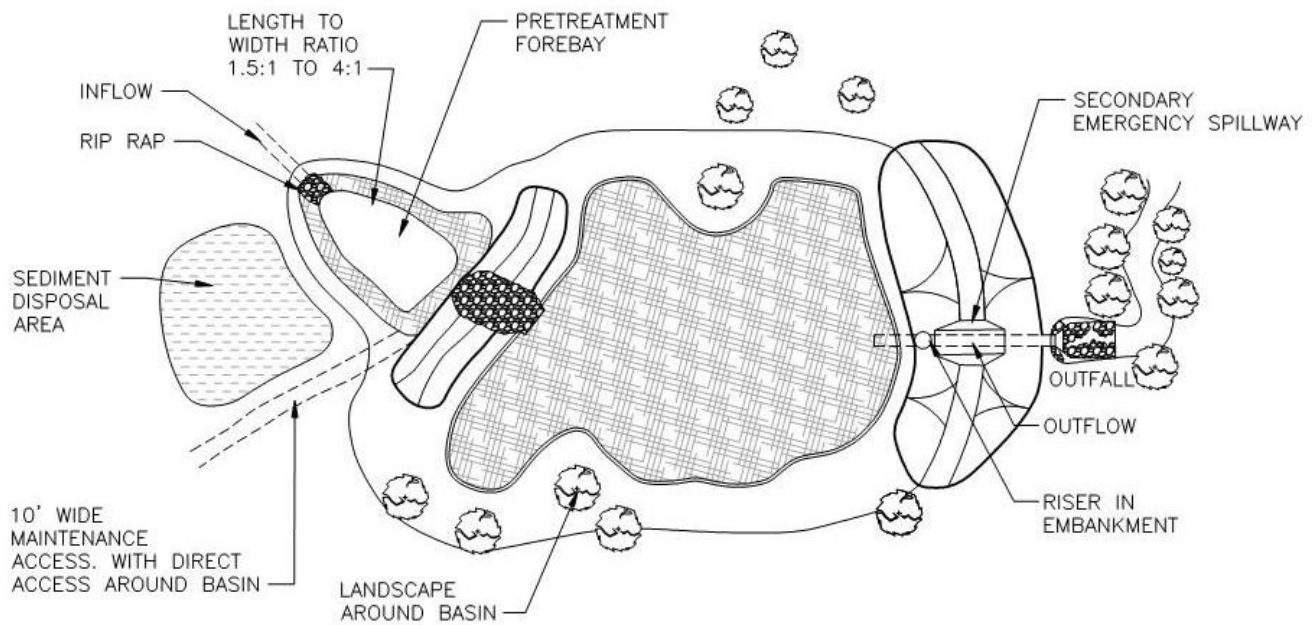
- (1) Care must be taken during the excavation and finishing process to make sure that soil compaction does not occur.
- (2) The bottom of dry retention basins shall be scarified or deep tilled to a depth of 6 to 12 inches after final grading has been established.
- (3) Top Dressing for basin bottom and side slopes
 - (a.) Native permeable soil (sand and gravel); or where turf establishment is desired
 - (b.) 3-inches of compost tilled into the top 6-inches of native permeable soil (equivalent to a 9-inch homogenous mixture of 70% sand; 30% compost); or
 - (c.) 4-inches of topsoil tilled into the top 6-inches of native permeable soil (equivalent to a 10-inch homogenous mixture with maximum 20% silts, 4% clay, and 80% to 92% sand).
 - (d.) The soil mix shall have a pH between 5.5 and 7.5.
- (4) Topsoil shall be sandy loam, loamy sand, or loam per USDA Soil Textural Triangle with 20% to 50% fines by volume (silt and clay with <10% clay), and 2% to 8% organic matter by dry weight.

g. Supplemental Measures

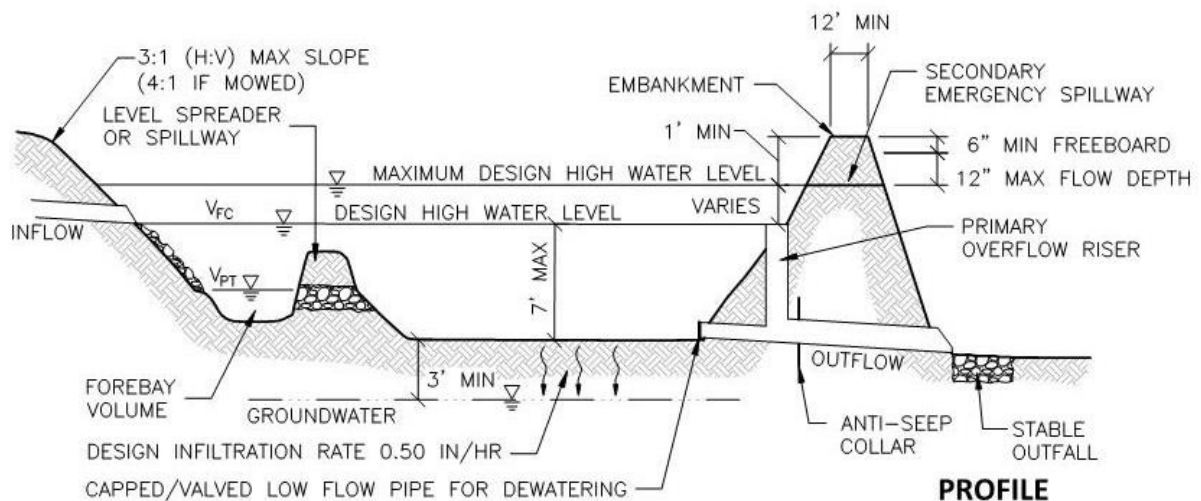
- (1) Supplemental measures may be required to ensure that a retention basin drains sufficiently as the soil becomes less permeable with use. The need for supplemental measures may be based on a number of indicators including:
 - (a.) Soils with a design infiltration rate between 0.50 and 1.63 inches per hour (Sandy Loam).
 - (b.) High probability for sedimentation (particularly fines).
 - (c.) Larger regional basin where there is less control over contributing area runoff.
 - (d.) Probability of groundwater rising higher than minimum isolation distance.
- (2) Supplemental measures may include:
 - (a.) Leaching basins, infiltration trench, or wick drains placed in the bottom of the basin.
 - (b.) Valved outlet to drain basin.
 - (c.) Conversion to a wet basin with sufficient storage volume provided above the permanent pool for reduced infiltration area.

4. Design Schematics

DRY RETENTION BASIN



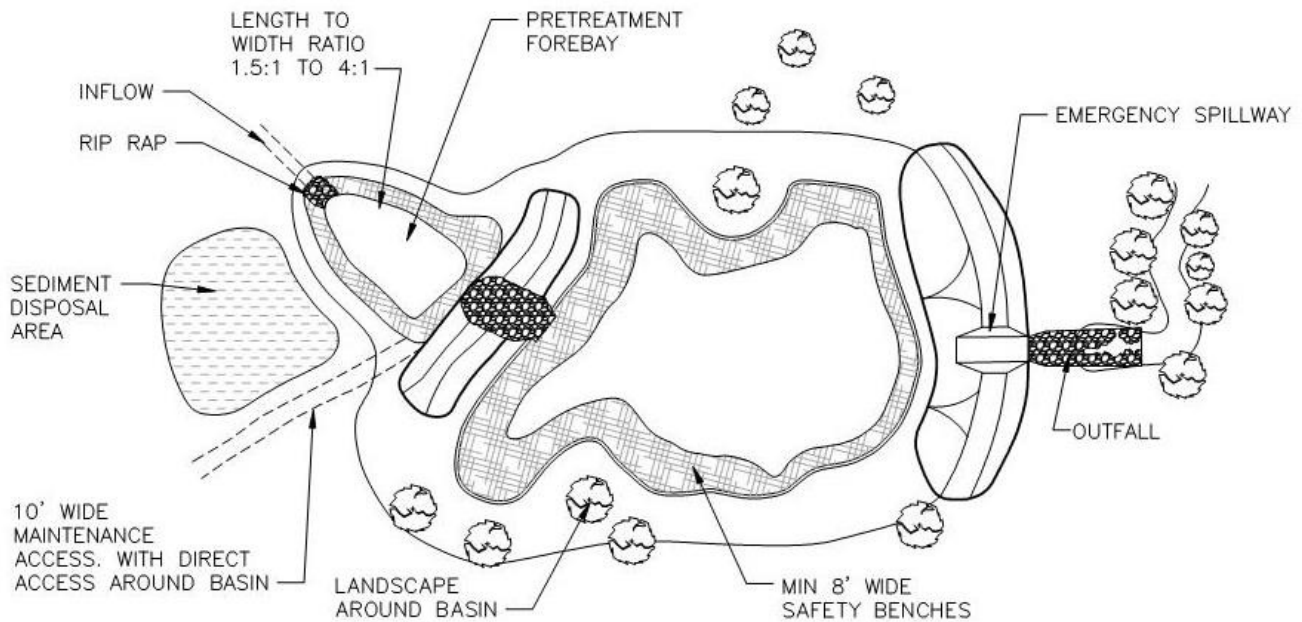
PLAN VIEW



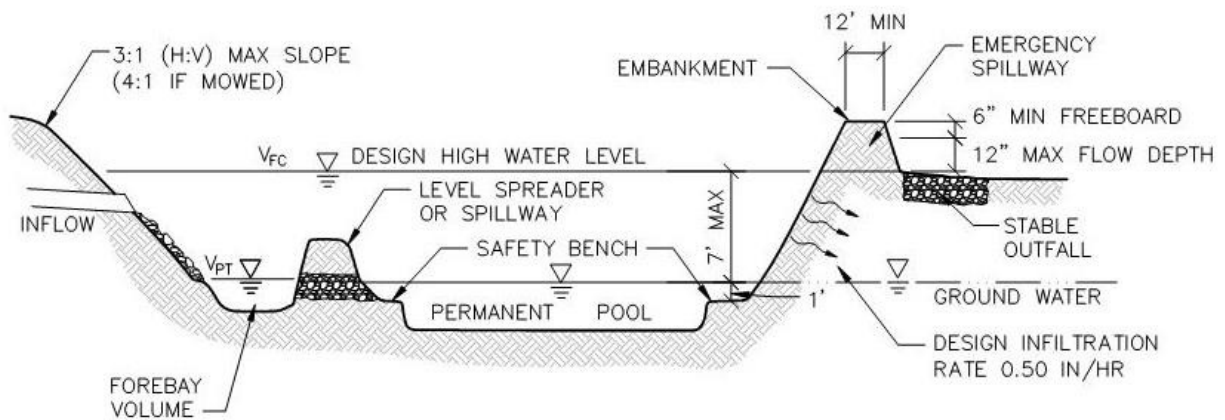
PROFILE

FINAL OUTLET CONFIGURATION MUST BE DESIGNED TO PREVENT CLOGGING

WET RETENTION BASIN



PLAN VIEW



PROFILE

F. Sediment Forebay

1. Summary

Description:	Stormwater pretreatment practice.
Application:	Typically used with a detention or retention basin.
Types:	Wet basin; Dry basin; Level spreader.
Pretreatment Required:	No. This BMP can provide pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

- Size for pretreatment (refer to Part 4 section “Calculating Storage Volumes and Release Rates, Pretreatment”).
- The pretreatment volume is the volume of the forebay to the elevation of the level spreader or overflow spillway including any permanent pool.

3. Design Requirements

- Siting
 - Where more than one inlet pipe is required, the calculated forebay volume shall be pro-rated by flow contribution of each inlet.
- Configuration
 - The sediment forebay shall be a separate sump, which can be formed by grading.
 - The minimum surface area shall be 25% of the pretreatment volume.
 - The length-to-width ratio shall be a minimum of 1.5:1 and a maximum of 4:1 to allow for adequate hydraulic length yet minimize scour velocities.
 - The top-of-berm elevation between the forebay and the basin shall be a minimum of one foot below the outer berm elevation.
 - The overflow spillway shall be sized using Equations 4.25 through 4.27 and designed to prevent erosion.

4. Design Schematics

- See “Detention Basin” and “Retention Basin” BMPs.

G. Spill Containment Cell

1. Summary

Description:	Lined stormwater pretreatment practice.
Application:	Typically used with a detention or retention basin.
Types:	Wet cell; Extended detention cell.
Pretreatment Required:	No. This BMP can provide pretreatment and spill containment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

- a. Size for pretreatment (refer to Part 4 section “Calculating Storage Volumes and Release Rates, Pretreatment”).
- b. The pretreatment volume is the volume of the spill containment cell to the elevation of the level spreader or overflow spillway including any permanent pool.
- c. The spill containment volume is the storage volume between the normal water level and the entrance of the outlet pipe. The minimum spill containment volume shall be provided to capture a slug pollutant load from an accidental spill of toxic materials.

3. Design Requirements

- a. Siting
 - (1) All inlets shall enter the spill containment cell unless the inlet collects stormwater exclusively from non-hotspot areas (i.e., office parking, courtyard, roof.)
- b. Configuration
 - (1) General
 - a. The minimum surface area shall be 25% of the pretreatment volume.
 - b. The length-to-width ratio shall be a minimum of 1.5:1, and a maximum of 4:1 to allow for adequate hydraulic length yet minimize scour velocities.
 - c. The top-of-berm elevation between the spill containment cell and the basin shall be a minimum of one foot below the outer berm elevation.
 - d. Side slopes shall not be steeper than 3:1 (H:V). Where basins are to be maintained as a mown lawn, side slopes shall be no steeper than 4:1 (H:V) to facilitate mowing.
 - e. Minimum depth of the permanent pool shall be 3 feet.
 - f. Unless protected by fencing, a minimum 4-foot-wide safety bench shall be constructed around the permanent pool. The safety bench shall have a maximum slope of 6:1 (H:V) and extend a minimum of 4 inches below the permanent pool level and a minimum of 4 inches above the permanent pool level.

c. Outlet Design

- (1) The outlet structure from the spill containment cell shall be designed to draw water from the central portion of the water column within the cell to trap floatables and contain sediments. The inlet of the transfer pipe shall be located a minimum of one foot below the normal water level, and a minimum of one foot above the bottom of the spill containment cell or manhole sump.
- (2) The transfer pipe(s) between the spill containment cell and the basin shall be sized for the peak inflow from a 10-year rainfall event.
- (3) Minimum pipe diameter shall be 12 inches.

d. Emergency Overflow

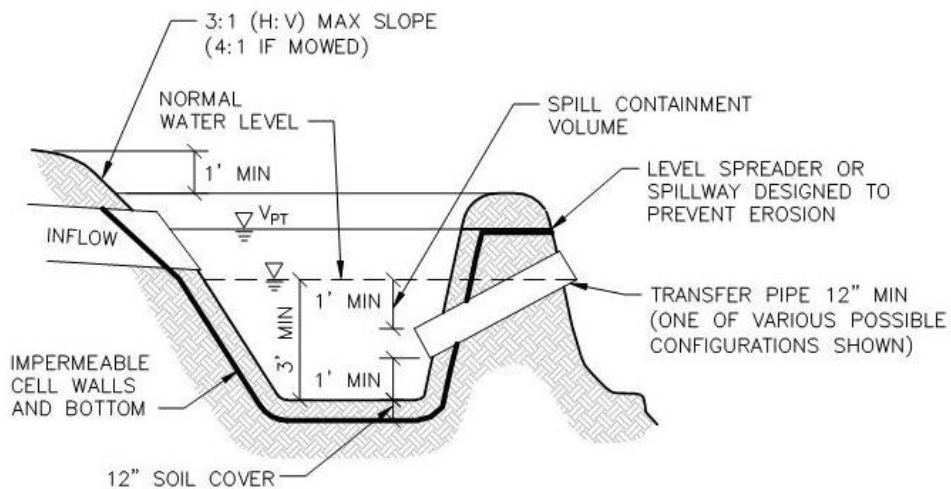
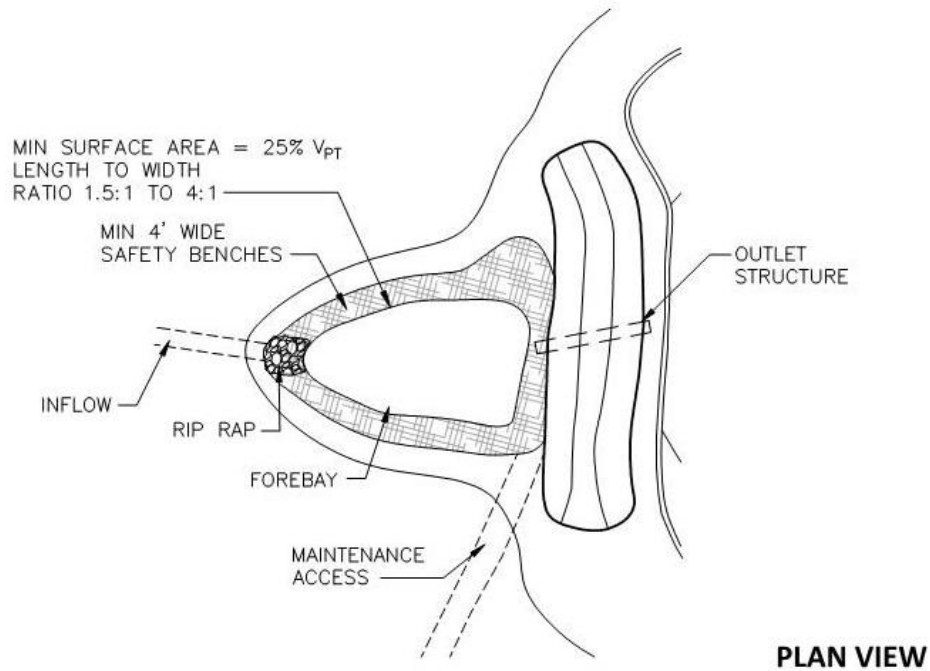
- (1) The crest of the level spreader or overflow spillway from the spill containment cell shall be set at the elevation of the calculated 10-year hydraulic head.
- (2) The overflow spillway from the spill containment cell shall be sized using Equations 4.25 through 4.27 and designed to prevent erosion.

e. Materials

- (1) The spill containment cell shall be lined with impermeable materials extending up to the design high water elevation. A minimum 18-inch-thick clay layer, or an impermeable liner protected with a minimum 12 inches of soil cover are acceptable alternatives. Maximum allowable permeability shall be 1×10^{-7} centimeters per second as determined by the geotechnical consultant for clay placement, or manufacturer's certificate for liner products.

4. Design Schematics

SPILL CONTAINMENT CELL



NOTE:
 SPILL CONTAINMENT CELL
 SHALL BE CONSTRUCTED IN
 PLACE OF THE FOREBAY
 WHERE REQUIRED

PROFILE

H. Infiltration Practices

1. Summary

Description:	Stormwater treatment and storage without a surface outlet.
Application:	Practices are typically applicable to small sites and drainage areas.
Types:	Dry Well; Leaching Basin; Infiltration Trench; Infiltration Bed; Infiltration Berm.
Pretreatment Required:	Yes.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Count volume stored and infiltrated.
Rate Reduction:	Designed for flood control: 100%. Designed for channel protection and/or water quality: Adjust time-of-concentration by dividing storage volume by 10-year peak flow rate.
Water Quality:	Count volume stored and infiltrated.

2. Sizing Calculations

- Infiltration practices may be sized for channel protection or water quality treatment. Use the methods outlined in Part 4 section "Calculating Storage Volumes and Release Rates" to calculate the required volumes. Use the methods under "Retention" to calculate the required storage volume of the BMP.
- Infiltration practices may be able to provide flood control for small drainage areas. Use the formulas included in Part 4 section "Calculating Storage Volumes and Release Rates, Flood Control, Retention" to calculate the storage volume of the BMP.
- Calculate the minimum infiltration area required to drain the required storage volume in the specified drawdown time using the design infiltration rate (refer to Part 4 section "Design Infiltration Rates").

$$A = \frac{12V_s}{i(t_d)} \quad (4.28)$$

where:

- A = minimum infiltration area (square feet)
- V_s = storage volume (cubic feet)
- i = design infiltration rate (inches per hour)
- t_d = maximum allowable drawdown time (hours)
- 12 = factor to convert inches to feet

- Total drawdown time shall be no more than 72 hours. Depth of surface ponding shall be no more than 2 feet and drain within 24 hours.
- Infiltration area shall be defined as:
 - Dry Well/Leaching Basin: Bottom of stone and ½ the height of the sides
 - Infiltration Trench: Bottom of trench (length x width) and ½ the height of each side
 - Infiltration Bed: Bottom area of the bed and ½ the height of each side
 - Infiltration Berm: Ponding area (length of berm x average width of ponding behind berm)

f. Calculate the storage volume of the BMP:

(1) Dry wells, infiltration trenches, infiltration beds:

Subsurface Storage Volume (cubic feet) = Length (feet) x Width (feet) x Depth (feet) x Void Ratio of Material

Where perforated pipe is used, the formula is modified:

Subsurface Storage Volume (cubic feet) = Volume of Pipe (cubic feet) + [Length (feet) x Width (feet) x Depth (feet) – Volume of Pipe (cubic feet)] x Void Ratio of Material

(2) Leaching basins:

Storage Volume (cubic feet) = πr^2 (square feet) x Depth (feet)

where:

r = radius of leaching basin (feet)

π = π (approximately 3.14)

Volume of storage in stone envelope around leaching basin may also be counted.

(3) Infiltration berm:

Surface Storage Volume (cubic feet) = Average Ponding Area (square feet) x Design High Water Depth (feet)

3. Design Requirements

a. Siting

(1) Soil borings are required (refer to Part 4 section “Soils Investigation”).

(a.) A minimum of 3 feet is required between the bottom of infiltration practices and the highest known groundwater elevation.

(b.) Void ratio for the imported material shall be based on the USDA soil textural class and effective water capacity in **Table 6**. A maximum design value of 0.40 shall be used for the void ratio of stone.

(2) Setbacks shall be as follows:

(a.) Adjacent property line: 10 feet

(b.) Building foundation: 10 feet

(c.) Private well: 50 feet

(d.) Public well: 200 feet from Type I or Type IIa wells, 75 feet from Type IIb or Type III wells (Safe Drinking Water Act, Act 399, PA 1976)

(e.) Septic system drain field: 50 feet

(3) Infiltration practices shall be located outside of the drip line of adjacent trees to avoid root intrusion.

b. Configuration

(1) General

(a.) A combination of surface and subsurface storage may be used to provide the required storage volume.

(2) Dry wells, infiltration trenches and infiltration beds

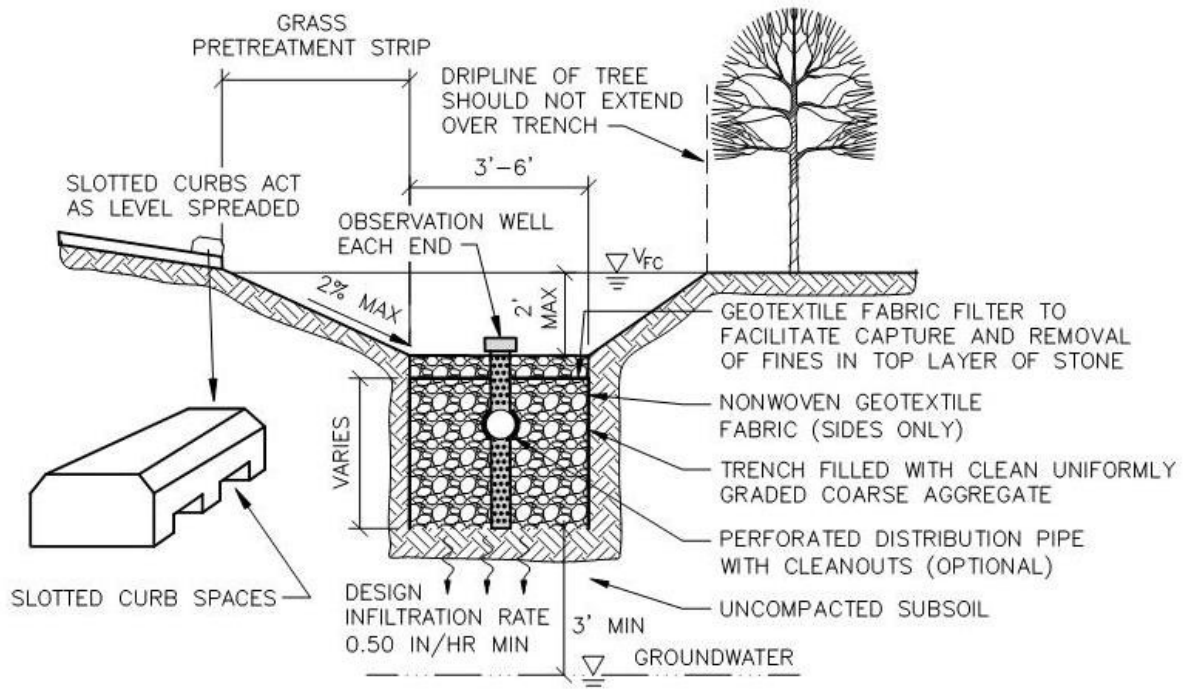
(a.) Infiltration trench width shall generally be as follows: 3-foot minimum to 6-foot maximum.

(b.) Coarse aggregates shall be uniformly graded, washed, and wrapped in a non-woven geotextile to provide separation between the aggregate and the surrounding soil and prevent fines from clogging the infiltration surface.

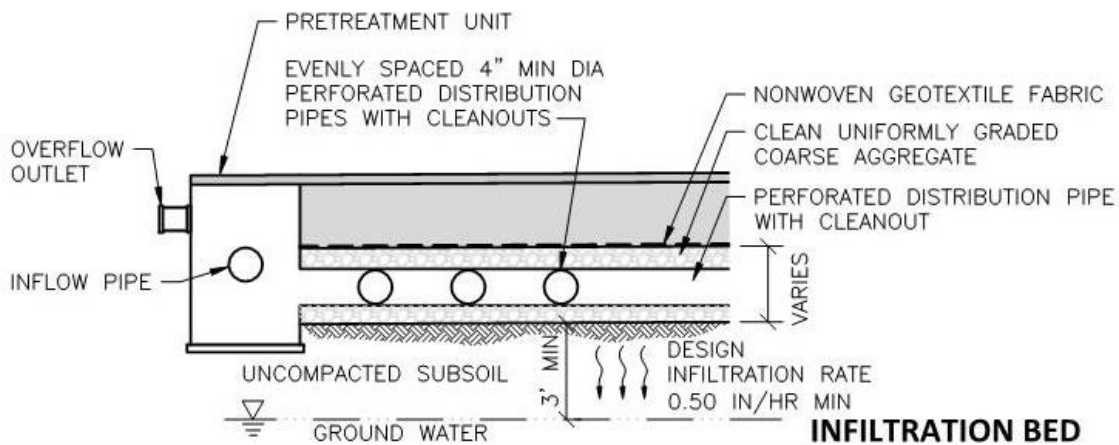
- (c.) An observation well shall be provided for each dry well, at each end of an infiltration trench, and at each corner of an infiltration bed with intermediate center wells added so as not to exceed maximum distance of 50 feet between wells.
 - (d.) Perforated pipes laid flat may be used to distribute runoff over the bottom of infiltration trenches and infiltration beds.
 - (e.) Cleanouts shall be provided at pipe ends.
 - (f.) Care must be taken during the excavation and finishing process to make sure that soil compaction does not occur.
- (3) Leaching Basins
 - (a.) Leaching basins shall have a minimum diameter of 4 feet, and meet the layout requirements for catch basins (refer to “Storm Sewer”).
 - (b.) Leaching basins shall have an open bottom and perforations around the circumference of the structure at no greater than 12-inch intervals horizontally and vertically the entire depth of the sump.
 - (c.) Bedding and backfill shall consist of clean stone with nonwoven geotextile fabric placed along the walls of the trench and wrapped around the stone and the basin.
- (4) Infiltration Berms
 - (a.) Infiltration berms shall be constructed along (parallel to) contours at a constant level elevation.
 - (b.) Maximum berm height shall be 2 feet to prevent excessive ponding behind berm.
 - (c.) Berm top width shall be a minimum of 2 feet.
 - (d.) Side slopes shall not be steeper than 4:1 (H:V) to facilitate mowing and ensure stable side slopes.
 - (e.) Well compacted cohesive soil shall be used to construct the berm.
 - (f.) The berm shall be well vegetated to prevent erosion if overtopped.
- c. Inlet Design
 - (1) Pretreatment is required for each inlet and for overland flow entering the infiltration practice. Exceptions may be allowed for small, paved drainage areas contributing directly to a leaching basin.
- d. Emergency Overflow
 - (1) All infiltration practices must have a provision for overflow at the high-water level.
 - (2) Infiltration practices without an acceptable surface water overflow route shall be designed for 2 times the required flood control volume.
- e. Access
 - (1) Inspection and maintenance access to the infiltration practice shall be provided.

4. Design Schematics

INFILTRATION PRACTICES



INFILTRATION TRENCH



INFILTRATION BED

I. Bioretention/Rain Garden

1. Summary

Description:	Provides stormwater treatment, storage, and uptake with or without a surface outlet.
Application:	Small sites and drainage areas. Underdrained BMP may be used on small sites to provide extended detention.
Types:	Bioretention: Natural-looking herbaceous. Rain garden: Landscaped and manicured. Infiltration; Underdrain at top of storage layer; Underdrain at bottom of storage layer; Lined.
Pretreatment Required:	Yes.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Infiltration: Count volume stored and infiltrated. Underdrained: Count volume stored and infiltrated between bottom of BMP and invert of underdrain.
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak flow rate.
Water Quality:	Count volume stored and infiltrated or routed through filter.

2. Sizing Calculations

- For underdrained BMP, follow criteria for “Constructed Filter.”
- Bioretention/rain gardens may be sized for channel protection or water quality treatment. Use the methods outlined in Part 4 section “Calculating Storage Volumes and Release Rates” to calculate the required volumes. Use the methods under “Retention” to calculate the required storage volume of the BMP.
- Bioretention/rain gardens may be able to provide flood control for small drainage areas. Use the formulas included in Part 4 section “Calculating Storage Volumes and Release Rates, Flood Control, Retention” to calculate the storage volume of the BMP.
- Minimum surface area (loading ratio): 0.06 times contributing impervious area, with a maximum impervious area of one acre (43,560 square feet) per bioretention cell.
- Calculate the minimum infiltration area required to drain the required storage volume in the specified drawdown time using the design infiltration rate (refer to Part 4 section “Design Infiltration Rates”). The bottom area of the BMP shall be used as the infiltration area.

$$A = \frac{12V_s}{i(t_d)} \quad (4.28)$$

where:

A = minimum infiltration area (square feet)

V_s = storage volume (cubic feet)

i = design infiltration rate (inches per hour)

t_d = maximum allowable drawdown time (hours)

12 = factor to convert inches to feet

- f. Total drawdown time shall be no more than 72 hours. Depth of surface ponding shall be no more than 12 inches and drain within 12 hours. Surface ponding depth may be increased up to 24 inches for bioretention areas and drain within 24 hours.

- g. Calculate the storage volume of the BMP:

Average Bed Area (square feet) = [Area at Design High Water Depth (square feet) + Bottom Area (square feet)] / 2

Surface Storage Volume (cubic feet) = Average Bed Area (square feet) x Design High Water Depth (feet)

Subsurface Storage Volume (cubic feet) = Length (feet) x Width (feet) x Depth (feet) x Void Ratio of Material

Note: Count subsurface storage volume only if permeability of media is greater than permeability of subsoil.

Total Storage Volume (cubic feet) = Surface Storage Volume (cubic feet) + Subsurface Storage Volume (cubic feet)

3. Design Requirements

- a. Siting

- (1) Soil borings are required (refer to Part 4 section "Soils Investigation").
 - (a.) A minimum of 3 feet is required between the bottom of bioretention/rain gardens capable of infiltration and the highest known groundwater elevation.
 - (b.) A minimum of 2 feet is required between the bottom of lined or underdrained bioretention/rain gardens and the highest known groundwater elevation.
 - (c.) An underdrain shall be provided for design infiltration rates of the underlying native soil less than 0.50 inches per hour, or if bioretention/rain garden will be lined.
 - (d.) Void ratio for the amended soil material shall be based on the USDA soil textural class and effective water capacity in **Table 6**. A maximum design value of 0.30 shall be used for the void ratio of the amended soil material. A maximum design value of 0.40 shall be used for the void ratio of stone.
- (2) Setbacks shall be as follows:
 - (a.) Adjacent property line: 10 feet
 - (b.) Building foundation: 10 feet
 - (c.) Private well: 50 feet
 - (d.) Public well: 200 feet from Type I or Type IIa wells, 75 feet from Type IIb or Type III wells (Safe Drinking Water Act, Act 399, PA 1976)
 - (e.) Septic system drain field: 50 feet

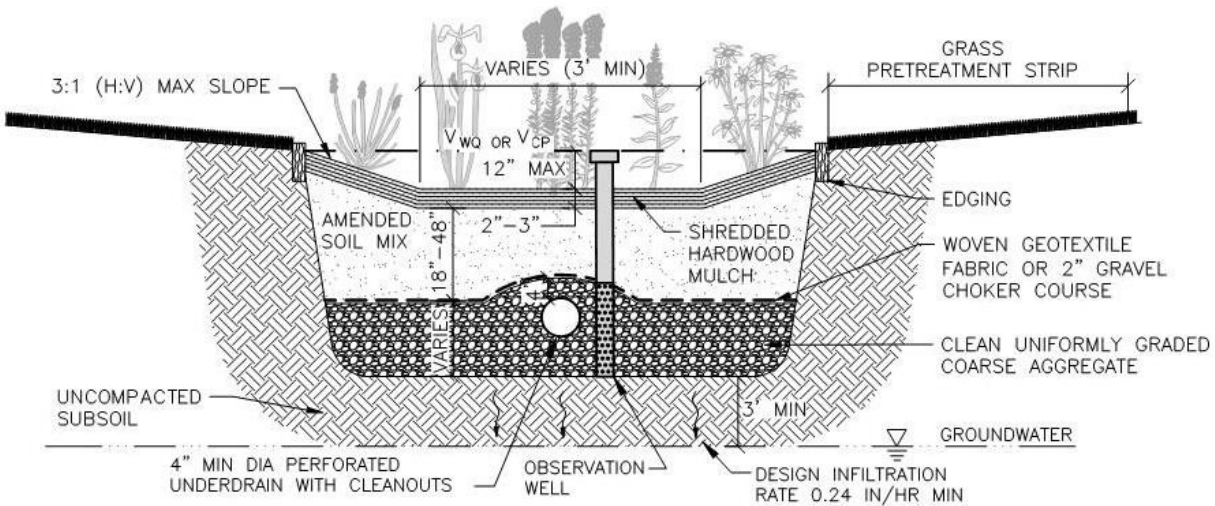
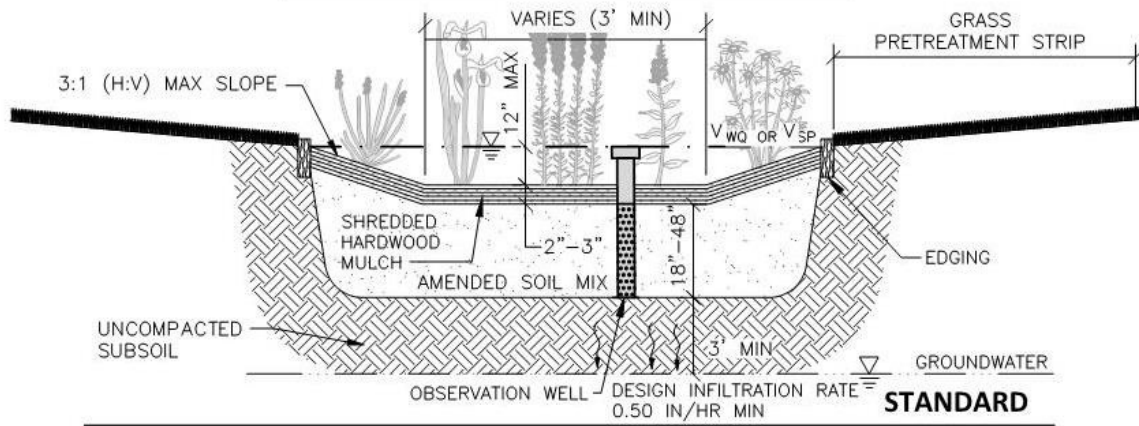
- b. Configuration

- (1) General
 - (a.) The bottom shall be flat to encourage uniform ponding and infiltration.
 - (b.) Minimum bottom width shall be 3 feet.
 - (c.) Bioretention/rain gardens located in areas with steep slopes shall be terraced to minimize earth disturbance and maximize infiltration area.
 - (d.) Care must be taken during the excavation and finishing process to make sure that soil compaction does not occur.

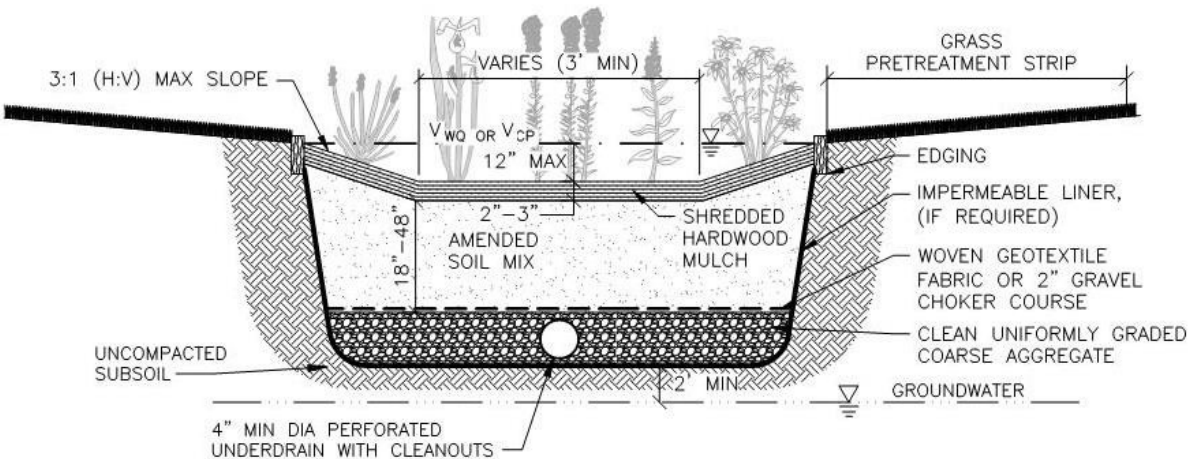
- (e.) Bioretention/rain gardens located in areas of existing soil contamination shall be lined to prevent infiltration.
 - (f.) Underdrains shall have a 4-inch minimum pipe diameter.
 - (g.) All underground pipes shall have clean-outs accessible from the surface.
 - (h.) Pipes shall be sloped to prevent siltation.
 - (i.) Side slopes shall not be steeper than 3:1 (H:V), unless landscape retaining walls are used.
 - (j.) An observation well shall be provided for each bioretention/rain garden without a bottom underdrain.
- (2) Rain gardens
 - (a.) A landscape plan shall be provided.
- c. Inlet Design
 - (1) Inlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second up to a maximum allowable design velocity of 8 feet per second.
 - (2) Pretreatment is required for each inlet and for overland flow entering the bioretention/rain garden.
- d. Emergency Overflow
 - (1) All bioretention/rain gardens must have a provision for overflow at the high-water level.
- e. Materials
 - (1) Amended soil material shall consist of 18 to 48 inches of the following materials, evenly mixed: Compost: minimum 20%; Sand: 20-80%; Topsoil: maximum 30% (with less than 10% clay content).
 - (a.) Alternative mix designs with ratios outside of the limits provided will be considered with justification.
 - (b.) The soil mix shall have a pH between 5.5 and 7.5.
 - (2) Topsoil shall be sandy loam, loamy sand, or loam per USDA Soil Textural Triangle with 20% to 50% fines by volume (silt and clay with <10% clay), and 2% to 8% organic matter by dry weight.
 - (3) Stone shall consist of clean, uniformly graded coarse aggregate.
 - (4) A woven geotextile fabric shall be placed between the amended soil and the stone when a stone layer is used.
 - (5) When used, impermeable liner shall have a maximum permeability of 1×10^{-7} centimeters per second certified by the manufacturer.
 - (6) Plant selection shall consider exposure and tolerance to salt, sediment and pollutants, and the design depth of surface storage. Native species are encouraged.
 - (a.) Bioretention: Plugs and seed.
 - (b.) Rain gardens: Container stock.
 - (7) Mulch shall be applied after planting.
 - (a.) Bioretention: Shredded hardwood mulch, straw mulch or mulch blanket shall be uniformly applied and tacked.
 - (b.) Rain gardens: Shredded hardwood mulch shall be uniformly applied to a depth of 2 to 3 inches.
- f. Access
 - (1) Inspection and maintenance access to the bioretention/rain garden shall be provided.

4. Design Schematics

BIORETENTION/RAIN GARDEN



BIORETENTION/RAIN GARDEN WITH STONE STORAGE LAYER



BIORETENTION/RAIN GARDEN WITH BOTTOM DRAIN

J. Constructed Filter

1. Summary

Description:	Provides stormwater treatment and storage with a surface outlet (underdrain).
Application:	Areas with high heavy metal pollutant loads. May be used on small sites to provide extended detention.
Types:	Sand; Gravel; Sand/compost mix; Other media. Dry; Static water level within filter media.
Pretreatment Required:	Yes.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak flow rate.
Water Quality:	Count volume routed through filter.

2. Sizing Calculations

- a. Use the methods outlined in Part 4 section “Calculating Storage Volumes and Release Rates” to calculate the required volumes for channel protection, water quality and/or pretreatment. Use the methods under “Retention” to calculate the required storage volume of the BMP.
- b. Calculate filter surface area required to drain the design volume in the specified drawdown time using hydraulic conductivity of filter media:

$$A = \frac{V(d_f)}{K(t_d)(h_f + d_f)} \quad (4.29)$$

where:

- A = minimum surface area of filter (square feet)
- V = design runoff volume (cubic feet)
- d_f = depth of filter media (1.5-foot minimum to 3-foot maximum)
- K = hydraulic conductivity (feet per day)
- t_d = maximum allowable drawdown time (days)
- h_f = average head; typically ½ of the maximum head on filter media (feet)

- c. Total drawdown time shall be no more than 72 hours. Maximum depth of surface ponding above the filter bed shall be 24 inches and drain within 24 hours.
- d. Check whether soil conductivity or hydraulics of underdrain governs.

3. Design Requirements

- a. Siting
 - (1) Soil borings are required (refer to Part 4 section “Soils Investigation”).
 - (a.) A minimum of 2 foot is required between the bottom of the constructed filter and the highest known groundwater elevation.
 - (b.) Design values for hydraulic conductivity of the filter media shall be as specified in **Table 14**. Values for other types of filter media will be reviewed for use on an individual basis.

Table 14 –Hydraulic Conductivities for Filter Media

Filter Media	Hydraulic Conductivity, K (feet per day)
Gravel	14 ¹
Compost (loose)	8.7 ²
Coarse Sand	3.5 ²
Peat	2 ²
Topsoil (< 10% clay)	1.3 ³
¹ Adapted from William E. Sanford, et. al. (1995). <i>Hydraulic Conductivity of Gravel and Sand as Substrates in Rock-reed Filters</i> , Table 3 (using lowest initial conductivity for sand and gravel (0.25 cm/s) and correction factors from Source 2 (p. 5-18) to obtain a design value). ² Center for Watershed Protection (1996). <i>Design of Stormwater Filtering Systems</i> . ³ D. Carpenter and L. Hallam (2007). <i>An Investigation of Rain Garden Planting Mixtures and the Implications for Design</i> . A composite value of hydraulic conductivity for mixture combinations shall be calculated as: $K = (\%xK1 + \%xK2 + \%xK3)/100$ $\frac{K(h_f + d_f)}{2d_f}$ Effective infiltration rate, i (in/hr) = $\frac{K(h_f + d_f)}{2d_f}$ for filter; i = K/2 for top dressing in	

b. Configuration

- (1) Filter media shall have a minimum depth of 18-inches and a maximum depth of 36 inches.
- (2) Stone bedding shall consist of at least 2 inches under the pipe and 4 inches above the pipe. An aggregate window extending to the filter surface may also be provided as a factor-of-safety.
- (3) A 4-inch minimum diameter underdrain shall be provided in the gravel layer with lateral spacing at 10 feet, and in any case no more than 25 feet.
- (4) All underground pipes shall have clean-outs accessible from the surface.
- (5) Pipes shall be sloped to prevent siltation.
- (6) Constructed filters located in areas of existing soil contamination shall be lined to prevent infiltration.

c. Inlet Design

- (1) A level spreader, distribution pipes or other flow dispersion measure shall be used for energy dissipation and to uniformly distribute the flow.
- (2) Pretreatment is required for each inlet and for overland flow entering the constructed filter.

d. Emergency Overflow

- (1) All constructed filters must be designed so that larger storms may safely overflow or bypass the filter. Flow splitters, multi-stage chambers or other devices may be used.

- (2) Sufficient space must be provided between the top of the filtering bed and the overflow to allow the maximum design head to be stored for filtration.

e. Materials

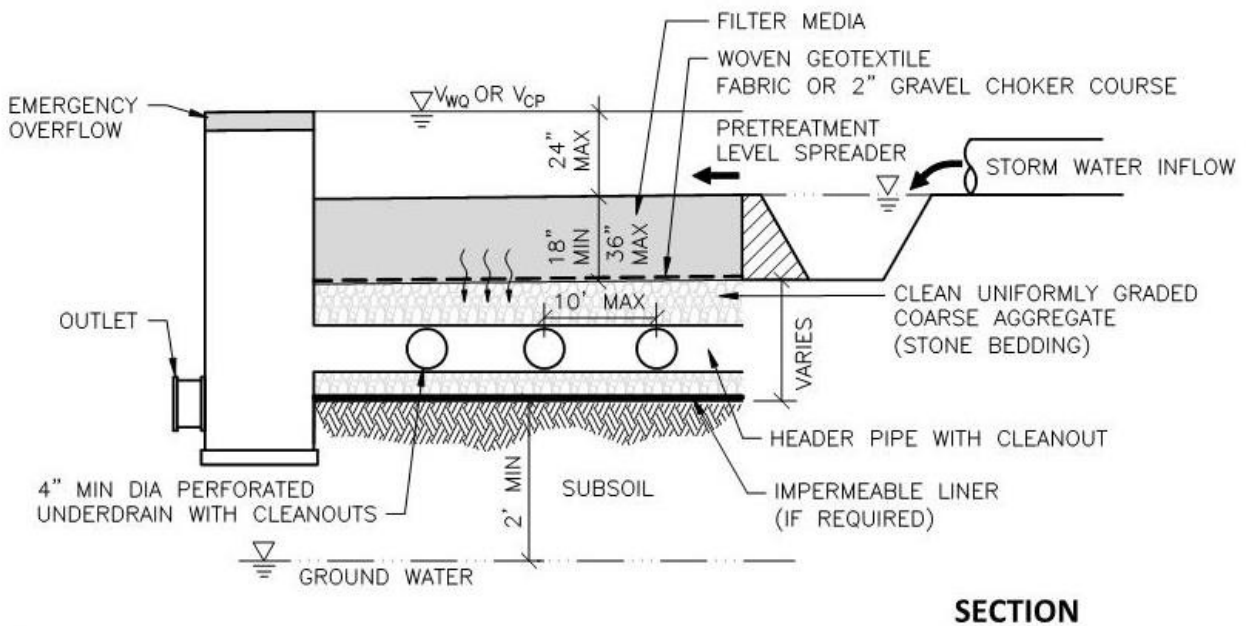
- (1) Stone bedding shall consist of clean, uniformly graded coarse aggregate (MDOT coarse or open-graded aggregate).
- (2) A woven geotextile fabric, or an additional 2 inches of gravel choker course shall be placed between the filter media layer(s) and the stone layer.
- (3) When used, impermeable liner shall have a maximum permeability of 1×10^{-7} centimeters per second certified by the manufacturer.

f. Access

- (1) Inspection and maintenance access to the constructed filter shall be provided.
- (2) For underground vault heights greater than 4 feet, ladder access shall be provided.

4. Design Schematics

CONSTRUCTED FILTER



K. Planter Box

1. Summary

Description:	A type of rain garden.
Application:	Small sites or highly urban areas. Underdrained BMP may be used on small sites to provide extended detention.
Types:	Infiltration; Underdrain at top of storage layer; Underdrain at bottom of storage layer; Lined.
Pretreatment Required:	No.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Infiltration: Count volume stored and infiltrated. Underdrained: Count volume stored and infiltrated between bottom of BMP and invert of underdrain.
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak flow rate.
Water Quality:	Count volume stored and infiltrated or routed through filter.

2. Sizing Calculations

- For underdrained BMP, follow criteria for “Constructed Filter.”
- Planter boxes may be sized for channel protection or water quality treatment. Use the methods outlined in Part 4 section “Calculating Storage Volumes and Release Rates” to calculate the required volumes. Use the methods under “Retention” to calculate the required storage volume of the BMP.
- Minimum surface area (loading ratio): 0.06 times contributing impervious area, with a maximum impervious area of 15,000 square feet per planter box.
- Calculate the minimum infiltration area required to drain the required storage volume in the specified drawdown time using the design infiltration rate (refer to Part 4 section “Design Infiltration Rates”).

$$A = \frac{12V_s}{i(t_d)} \quad (4.28)$$

where:

- A = minimum infiltration area (square feet)
- V_s = storage volume (cubic feet)
- i = design infiltration rate (inches per hour)
- t_d = maximum allowable drawdown time (hours)
- 12 factor to convert inches to feet

- Total drawdown time shall be no more than 12 hours. Depth of surface ponding shall be no more than 12 inches and drain within 4 hours.
- The bottom area of the BMP shall be used as the infiltration area.
- Calculate the storage volume of the BMP:

Surface Storage Volume (cubic feet) = Bed Area (square feet) x Design High Water Depth (feet)

Subsurface Storage Volume (cubic feet) = Length (feet) x Width (feet) x Depth (feet) x Void Ratio of Material

Note: Count subsurface storage volume only if permeability of media is greater than permeability of subsoil.

Total Storage Volume (cubic feet) = Surface Storage Volume (cubic feet) + Subsurface Storage Volume (cubic feet)

3. Design Requirements

a. Siting

- (1) Soil borings are required (refer to Part 4 section “Soils Investigation”).
 - (a.) A minimum of 3 feet is required between the bottom of the planter box and the highest known groundwater elevation.
 - (b.) A minimum of 2 foot is required between the bottom of a lined or underdrained planter box and the highest known groundwater elevation.
 - (c.) An underdrain shall be provided for design infiltration rates less than 0.50 inches per hour, or if planter box will be lined.
 - (d.) Void ratio for the amended soil material shall be based on the USDA soil textural class and effective water capacity in **Table 6**. A maximum design value of 0.30 shall be used for the void ratio of the amended soil material. A maximum design value of 0.40 shall be used for the void ratio of stone.

b. Configuration

- (1) A combination of surface and subsurface storage may be used to provide the required storage volume.
- (2) Minimum width of planter boxes shall be 30 inches, or 18 inches if flow-through.
- (3) Care must be taken during the excavation and finishing process to make sure that soil compaction does not occur.
- (4) Planter boxes located in areas of existing soil contamination shall be lined to prevent infiltration.
- (5) Underdrains shall have a 4-inch minimum pipe diameter.
- (6) All underground pipes shall have clean-outs accessible from the surface.
- (7) Pipes shall be sloped to prevent siltation.
- (8) A planting plan shall be provided.

c. Inlet Design

- (1) Inlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second, up to a maximum allowable design velocity of 8 feet per second.

d. Emergency Overflow

- (1) All planter boxes must have a provision for overflow at the high-water level.

e. Materials

- (1) Suggested structural elements of planter boxes are stone, concrete, brick, or pressure-treated wood.
- (2) Amended soil material shall consist of 12 to 36 inches of the following materials, evenly mixed: Compost: minimum 20%; Sand: 20-80% ; Topsoil: maximum 30% (with less than 10% clay content).
 - (a.) Alternative mix designs with ratios outside of the limits provided will be considered with

justification.

- (b.) The soil mix shall have a pH between 5.5 and 6.5.
 - (3) Topsoil shall be sandy loam, loamy sand, or loam per USDA Soil Textural Triangle with 20% to 50% fines by volume (silt and clay with <10% clay), and 2% to 8% organic matter by dry weight.
 - (4) Stone bedding shall consist of clean, uniformly graded coarse aggregate.
 - (5) A woven geotextile fabric shall be placed between the amended soil and the stone.
 - (6) Impermeable liner shall have a maximum permeability of 1×10^{-7} centimeters per second certified by the manufacturer.
 - (7) Plant selection shall consider exposure and tolerance to salt, sediment and pollutants, and the design depth of surface storage. Native species are encouraged.
 - (8) Plants shall be container stock.
- f. Access. Inspection and maintenance access to the planter box shall be provided.

L. Pervious Pavement

1. Summary

Description:	Provides stormwater treatment and storage with or without a surface outlet.
Application:	Parking lots, alleys and roads and drives with low-volume vehicular traffic and minimal turning motions.
Types:	Infiltration; Underdrain at top of storage layer; Underdrain at bottom of storage layer; Lined.
Pretreatment Required:	No.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Infiltration: Count volume stored and infiltrated (limited by design rainfall on pavement and roof). Underdrained: Count volume stored, and volume infiltrated between bottom of BMP and invert of underdrain (limited by design rainfall on pavement and roof).
Rate Reduction:	Infiltration: 100%. Underdrained: Calculated allowable release rate.
Water Quality:	Count volume stored and infiltrated, or volume filtered.

2. Sizing Calculations

- For underdrained BMP, follow criteria for “Constructed Filter.”
- Use the methods outlined in Part 4 section “Calculating Storage Volumes and Release Rates” to calculate the required volumes for water quality and channel protection.
- Use the formulas included in Part 4 section “Calculating Storage Volumes and Release Rates, Flood Control, Retention” to calculate the storage volume of the BMP for flood control.
- The bottom area of the BMP shall be used as the infiltration area.
- Maximum allowable drawdown time shall be 72 hours.
- Calculate the subsurface storage volume of the BMP:

$$\text{Subsurface Storage Volume (cubic feet)} = \text{Length (feet)} \times \text{Width (feet)} \times \text{Depth (feet)} \times \text{Void Ratio of Material}$$

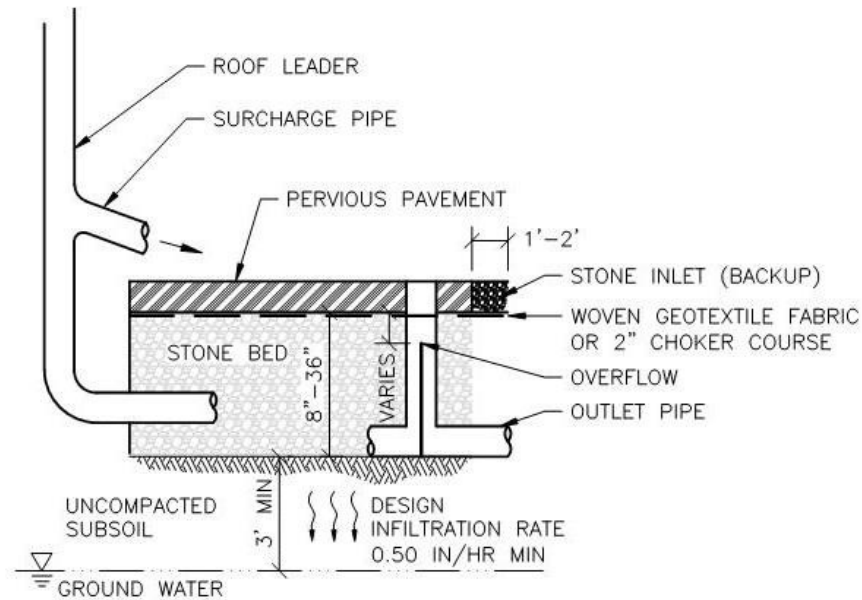
3. Design Requirements

- Siting
 - Soil borings are required (refer to Part 4 section “Soils Investigation”).
 - A minimum of 3 feet is required between the bottom of pervious pavement capable of infiltration and the highest known groundwater elevation.
 - A minimum of 2 foot is required between the bottom of lined or underdrained pervious pavement and the highest known groundwater elevation.
 - An underdrain shall be provided for design infiltration rates less than 0.50 inches per hour, or if stone bed will be lined.
 - A maximum design value of 0.40 shall be used for the void ratio of stone.

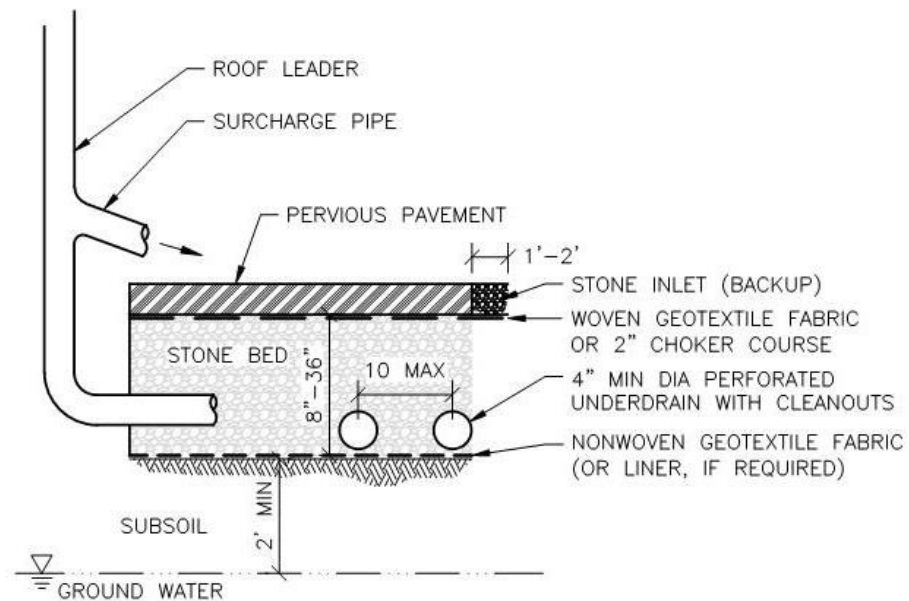
- (2) Runoff from offsite areas shall not be directed onto pervious pavement surface.
- b. Configuration
 - (1) The stone bed shall be flat to encourage uniform ponding and infiltration.
 - (2) For pervious pavements located in areas with steep slopes, stone beds shall be terraced to maximize infiltration area.
 - (3) Pervious pavements located in areas of existing soil contamination shall be lined to prevent infiltration.
 - (4) Underdrains shall have a 4-inch minimum pipe diameter with lateral spacing at 10 feet, and in any case no more than 25 feet.
 - (5) All underground pipes shall have clean-outs accessible from the surface.
 - (6) Pipes shall be sloped to prevent siltation.
- c. Inlet Design
 - (1) Pervious pavements shall have a backup method for water to enter the storage bed. Backup drainage may consist of an unpaved 1- to 2-foot-wide stone edge or inlets with sediment traps.
- d. Emergency Overflow
 - (1) Stone beds must have a provision for overflow below the level of the pavement surface when an underdrain is not already provided.
- e. Materials
 - (1) Stone bed shall consist of 8 to 36 inches of clean, uniformly graded coarse aggregate.
 - (2) A woven geotextile fabric or 2-inch gravel choker course shall be placed between the pervious pavement and stone bed.
 - (3) A nonwoven geotextile fabric or liner shall be placed between the stone bed and the subsoil for underdrained pavements.
 - (4) Impermeable liner shall have a maximum permeability of 1×10^{-7} centimeters per second certified by the manufacturer.

4. Design Schematics

PERVIOUS PAVEMENT



STANDARD



PERVIOUS PAVEMENT WITH BOTTOM DRAIN

M. Capture Reuse

1. Summary

Description:	Stormwater capture, storage, and removal from storm flow by reuse for irrigation or as greywater.
Application:	Most practical for roof runoff. Other collection areas may require pumping for reuse.
Types:	Rain barrels; Cisterns (both above ground and underground); Tanks; Ponds.
Pretreatment Required:	Yes. This BMP can provide spill containment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Count storage volume provided.
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak inflow rate.
Water Quality:	Count volume stored.

2. Sizing Calculations

- Determine water use (gallons per day) and add up for each month of the year.
- Obtain average monthly precipitation (inches) and evapotranspiration (ET) in inches.
www.enviroweather.msu.edu
- Multiply average monthly precipitation by contributing area and area-weighted Small Storm Hydrology Method runoff coefficient (assuming 90% of the storms produce one inch of rain or less) to obtain volume of recharge. A modified equation for the Small Storm Hydrology Method is given below:

$$V = PR_v A(3630) \quad (4.30)$$

where:

- V = recharge volume (cubic feet)
- P = rainfall (inches)
- R_v = area-weighted volumetric runoff coefficient (individual runoff coefficients are given in **Table 10**)
- A = contributing area (acres)
- 3630 = factor to convert acre-inches to cubic feet

- Multiply recharge volume by 7.48 gallons per cubic foot to convert to gallons.
- Calculate ET for open water surfaces. Multiply average monthly ET (inches) by surface area of pond (square feet) and divide by 12 to calculate the volume of water evaporated in cubic feet. Multiply by 7.48 gallons per cubic foot to convert to gallons.
- Select trial size container or pond volume.
- Calculate the water balance. A tabular method may be used similar to that illustrated below.
- Adjust size of container or pond to balance reuse efficiency and cost.

Volume of Water in Storage at End of Month =

Storage Volume at Start of Month + Recharge from Monthly Precipitation – ET – Monthly Water

Month	Vstart	+Recharge	-Et	-Use	=Vend*	Lost
1						
2	=Vend1					
Total	--				--	
*Limited by total volume of the selected container or pond. If value is greater than container volume, surplus is lost to overflow. If value is negative, it means that amount must be supplemented.						

3. Design Requirements

a. Siting

- (1) Storage units shall be positioned to receive rooftop runoff.
- (2) Protect storage units from direct sunlight to minimize algae growth.
- (3) Discharge points and storage units shall be clearly marked "Caution: Untreated Rainwater. Do Not Drink."

b. Configuration

- (1) If storage units are used to supplement greywater needs, a parallel conveyance system must be installed to separate greywater from other potable water piping systems.
- (2) Storage units shall be watertight with a smooth interior surface.
- (3) Covers and lids shall have a tight fit to keep out surface water, insects, animals, dust, and light.
- (4) Observation risers shall be provided for buried storage units.
- (5) Pumps and pressure tanks may be used to add pressure (most irrigation systems require at least 15 pounds per square inch).

c. Inlet Design

- (1) Screens shall be used to filter debris from runoff flowing into the storage unit.

d. Emergency Overflow

- (1) A positive outlet for overflow shall be provided a few inches from the top of the storage unit and sized to safely discharge the peak flow from the 10-year design storm when the storage unit is full.
- (2) Above-ground storage units shall have a release mechanism to drain and empty the unit between storm events.

N. Vegetated Roof

1. Summary

Description:	Provides stormwater treatment and storage with a surface overflow.
Application:	Most practical for flat rooftops.
Types:	Intensive (> 4 inches, wide variety of plants, public use); Extensive (≤ 4 inches, plants are herbs, mosses, succulents, and grasses).
Pretreatment Required:	No. This BMP can provide pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Count subsurface storage volume below the overflow (limited by design rainfall on roof).
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak inflow rate.
Water Quality:	Count subsurface storage volume.

2. Sizing Calculations

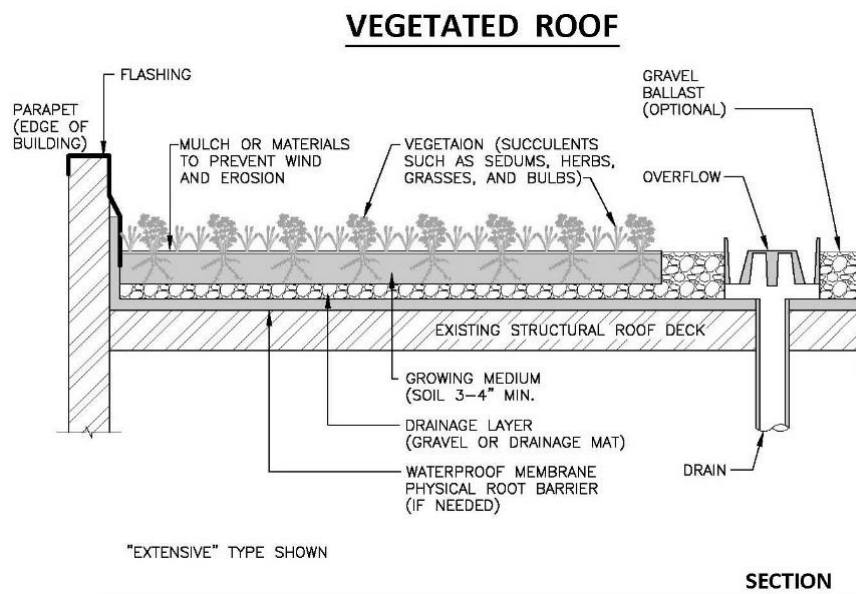
- For water quality, the minimum subsurface storage volume shall be equal to the volume from 1-inch of rain falling on the roof area.
- For channel protection, the subsurface storage volume below the overflow may be counted as retention.
- Calculate the subsurface storage volume of the BMP:

$$\text{Subsurface Storage Volume (cubic feet)} = \text{Length (feet)} \times \text{Width (feet)} \times \text{Depth (feet)} \times \text{Void Ratio of Material.}$$

3. Design Requirements

- Configuration: Follow manufacturer's and structural engineer's guidelines.
- Emergency Overflow: A positive outlet for overflow shall be provided.

4. Design Schematics



O. Water Quality Device

1. Summary

Description:	Stormwater treatment unit.
Application:	Practical for small sites and drainage areas.
Types:	Oil and grit separator; Hydrodynamic separator.
Pretreatment Required:	No. This BMP can provide pretreatment and spill containment
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

- a. Select water quality device unit/model based on manufacturer's recommendations.
- b. When the device is used to provide spill containment, the minimum spill containment volume shall be provided between the normal water level and the entrance of the outlet pipe to capture a slug pollutant load from an accidental spill of toxic materials.

3. Design Requirements

- a. Configuration
 - (1) The geometry of the water quality device shall promote the trapping of floatables and sediments.
 - (2) The water quality device shall be designed to prevent surcharging in pipes upstream of the device.
- b. Emergency Overflow
 - (1) A bypass overflow shall be designed to convey the 10-year peak discharge at a minimum without release of trapped sediments and pollutants.
 - (2) The outlet from the overflow shall not be submerged under normal conditions.

P. Bioswale and Water Quality Swale

1. Summary

Description:	Bioswale: Vegetated swale designed to capture and treat stormwater within a dry storage layer beneath the base of the channel. Water Quality Swale: Lined swale designed to provide spill containment.
Application:	Bioswale: Linear projects or areas. Water Quality Swale: Small sites in lieu of a spill containment cell when a permanent pool is not desirable.
Types:	Dry swale; Swale with check dams.
Pretreatment Required:	No. This BMP can provide pretreatment and spill containment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	Bioswale: Count volume stored and infiltrated.
Rate Reduction:	Adjust time-of-concentration by dividing storage volume by 10-year peak flow rate.
Water Quality:	Bioswale: volume stored and infiltrated or routed through filter. Water Quality Swale: Count volume routed through filter.

2. Sizing Calculations

- Size for pretreatment (refer to Part 4 section “Calculating Storage Volumes and Release Rates, Pretreatment”).
- The pretreatment volume is the volume of the voids within the filter media including any temporary surface storage volume to the elevation of the overflow and including any permanent pool within the outlet structure.
- The spill containment volume is the storage volume between the normal water level in the filter and the entrance of the outlet pipe. The minimum spill containment volume shall be provided to capture a slug pollutant load from an accidental spill of toxic materials.
- Depth of surface ponding shall be no more than 2 feet and drain within 24 hours. The bottom area of the BMP shall be used as the infiltration area. For bioswales, use Equation 4.28 to calculate drain time. For water quality swales, use Equation 4.29 and **Table 14** from “Constructed Filter” to calculate drain time.
- The swale shall be designed to pass the 10-year peak discharge with a minimum of 6-inches of freeboard to the top of bank.
- Volume Behind Check Dam (if used with bioswale)

(1) Calculate the wedge-shaped storage volume behind each check dam:

$$\text{Storage Volume (cubic feet)} = 0.5 \times \text{Length of Swale Impoundment Area per Check Dam (feet)} \times \text{Depth of Check Dam (feet)} \times [\text{Top Width of Check Dam (feet)} + \text{Bottom Width of Check Dam (feet)}] / 2$$

3. Design Requirements

a. Siting

- (1) All inlets shall enter the water quality swale unless the inlet collects stormwater exclusively from non-hotspot areas (i.e., office parking, courtyard, roof).

b. Configuration

- (1) The bottom of the water quality swale shall be flat to encourage uniform ponding and filtration. Bioswales shall have a maximum longitudinal slope of 1%.
- (2) The swale shall have a minimum bottom width of 2 feet and a maximum bottom width of 10 feet.
- (3) Side slopes shall be 3:1 (H:V) or flatter.
- (4) Sand filter shall have a minimum depth of 18 inches and a maximum depth of 36 inches.
- (5) Stone bedding shall consist of at least 2 inches under the pipe and 4 inches above the pipe. An aggregate window extending to the filter surface may also be provided as a factor-of-safety.
- (6) Underdrains shall have a 4-inch minimum pipe diameter.
- (7) All underground pipes shall have clean-outs accessible from the surface.
- (8) Pipes shall be sloped to prevent siltation.

c. Check Dam Design

- (1) Check dams may be used along bioswales to encourage ponding and infiltration.
- (2) Check dams shall be earthen or other impervious design. Rock check dams are not suitable for infiltration.
- (3) Maximum ponding depth behind check dams shall be 24 inches.
- (4) Minimum top width of earthen check dam shall be 2 feet.
- (5) Check dams shall be keyed into the bottom and sides of the swale a minimum of 1-foot on all sides. The height of the key must exceed the 10-year water surface elevation by a minimum of 6 inches on both sides.
- (6) The center of the check dam crest must be below the sides of the check dam by a minimum of 12 inches.
- (7) The crest of a downstream check dam shall be no lower than the downstream toe of the upstream check dam.
- (9) Erosion control measures (i.e., riprap, turf reinforcement mat) shall be used to protect the integrity of the check dam and downstream toe.

d. Inlet Design

- (1) Inlet pipes shall require energy dissipation. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 feet per second up to a maximum allowable design velocity of 8 feet per second.

e. Outlet Design

- (1) The containment structure in a water quality swale shall be constructed within a manhole and be designed to draw water from the central portion of the water column within the manhole to trap floatables and contain sediments in a minimum 3-foot sump.

f. Emergency Overflow

- (1) A positive outlet for overflow shall be provided.
- (2) A catch basin and outlet pipe may be used to convey the 10-year peak discharge. In water quality swales this must be a separate structure, or chamber within the containment manhole to prevent the captured low-density fluids from becoming entrained in the water when surface inflow enters the structure.

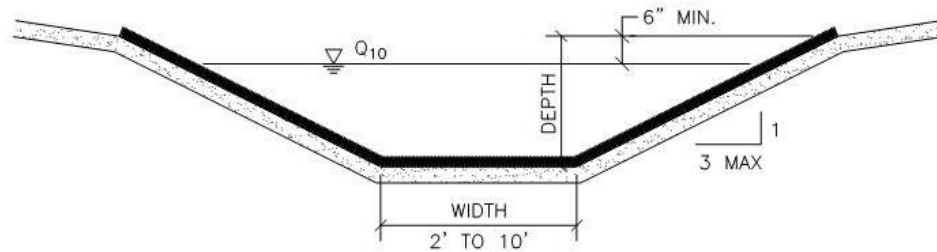
g. Materials

(1) Top Dressing

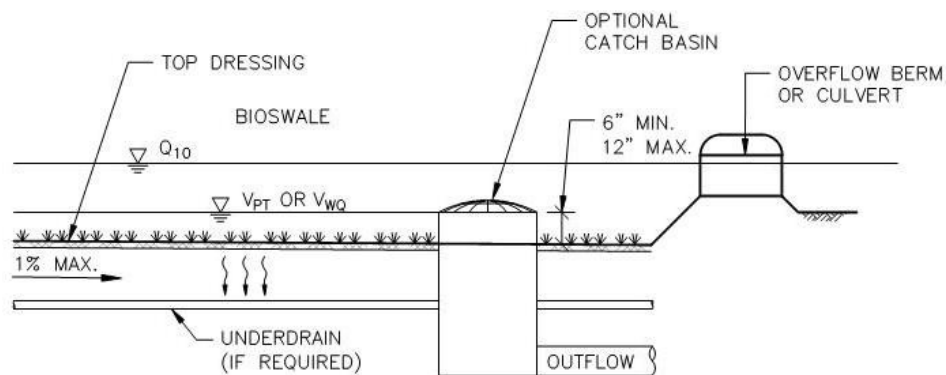
- (a.) Native or imported permeable soil (sand and gravel); or where turf establishment is desired
 - (b.) 3-inches of compost tilled into the top 6-inches of native permeable soil (equivalent to a 9-inch homogenous mixture of 70% sand; 30% compost); or
 - (c.) 4-inches of topsoil tilled into the top 6-inches of native permeable soil (equivalent to a 10-inch homogenous mixture with maximum 20% silts, 4% clay, and 80% to 92% sand).
 - (d.) The soil mix shall have a pH between 5.5 and 7.5.
 - (e.) Topsoil shall be sandy loam, loamy sand, or loam per USDA Soil Textural Triangle with 20% to 50% fines by volume (silt and clay with <10% clay), and 2% to 8% organic matter by dry weight.
- (2) Stone bedding shall consist of clean, uniformly graded coarse aggregate.
 - (3) A woven geotextile fabric or 2-inch gravel choker course shall be placed between the sand and the stone bedding.
 - (4) The water quality swale shall be lined with impermeable materials extending up to the design high water elevation. A minimum 18-inch-thick clay layer, or an impermeable liner protected with a minimum 12-inches of soil cover are acceptable alternatives. Maximum allowable permeability shall be 1×10^{-7} centimeters per second as determined by the geotechnical consultant for clay placement, or manufacturer's certificate for liner products.

4. Design Schematics

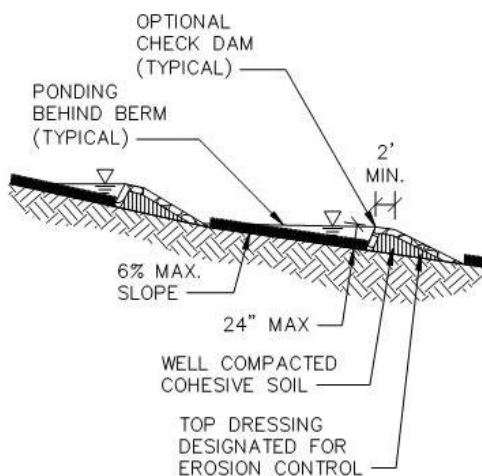
BIOSWALE



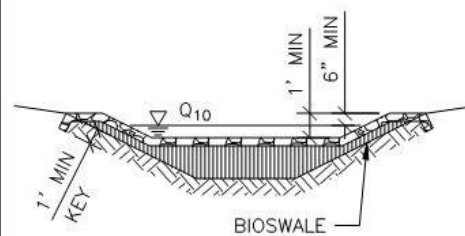
SECTION



PROFILE

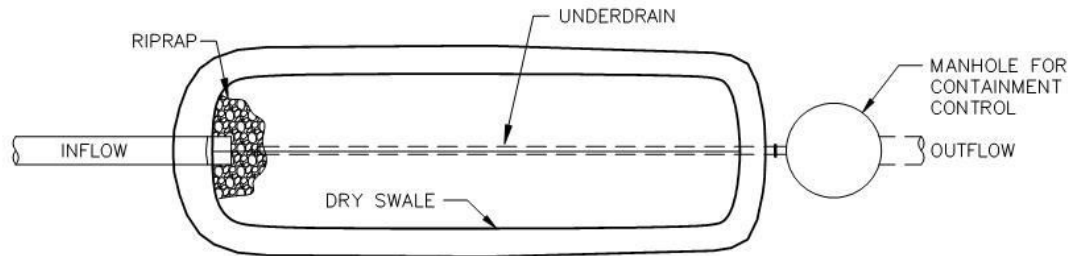


CHECK DAM PROFILE

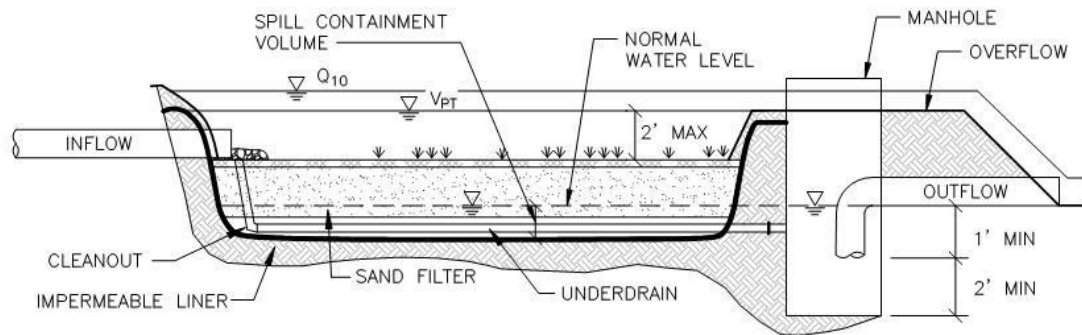


CHECK DAM DETAIL

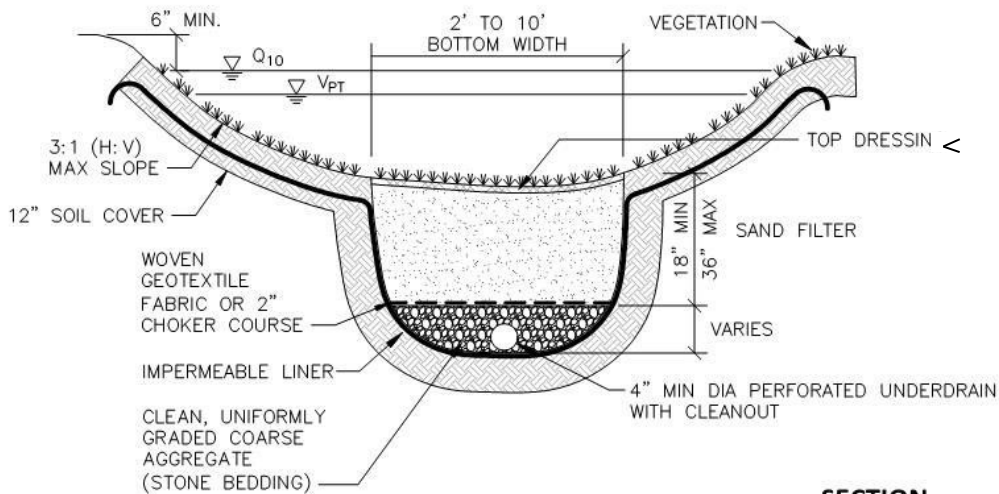
WATER QUALITY SWALE



PLAN VIEW



PROFILE



SECTION

Q. Vegetated Swale

1. Summary

Description:	Stormwater conveyance designed to slow and filter stormwater.
Application:	Small drainage areas with concentrated flow; side yard drainage.
Types:	Dry swale; Swale with check dams (no infiltration).
Pretreatment Required:	No. This BMP provides pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	Due to longer time-of-concentration for swale.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

a. Used for Pretreatment

- (1) Provide a 20-foot minimum length at a maximum slope of 4% with a 1-foot-high check dam at the downstream end, and a maximum upstream drainage area of 0.13 acre per 2 feet of bottom width.

b. Channel

- (1) The vegetated swale shall be sized to pass the 10-year peak discharge with a minimum of 6 inches of freeboard to the top of bank.
- (2) Calculate 10-year peak flow rate (refer to Part 4 section "Calculating Runoff").
- (3) Size swale using Manning's Equation:

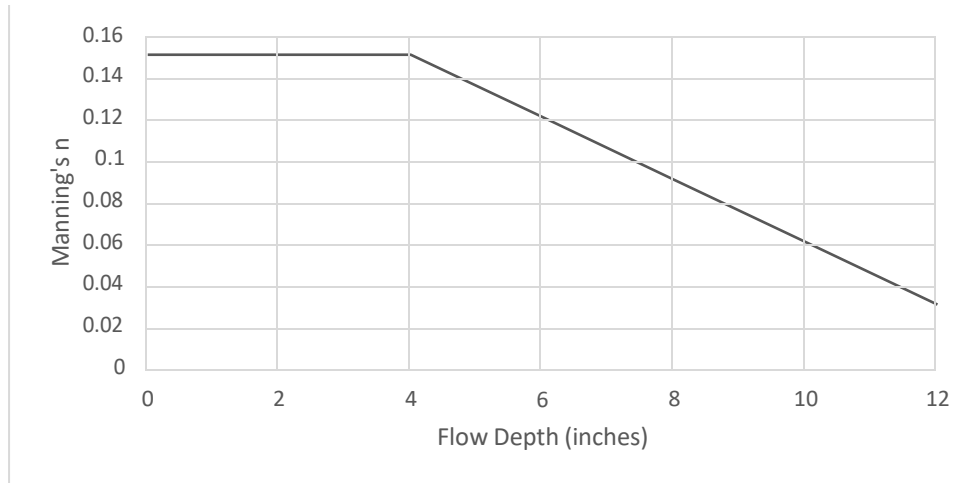
$$Q = \frac{1.49AR^{\frac{2}{3}}S^{\frac{1}{2}}}{n} \quad (4.21)$$

where:

- Q = discharge (cubic feet per second)
- A = wetted area (square feet)
- R = hydraulic radius (feet)
- S = slope (feet per foot)
- n = Manning's roughness coefficient

- (4) Select the more conservative (higher) value of Manning's roughness coefficient from **Table 12** or **Figure 3** below.

Figure 3 – Manning's Roughness Coefficients for Vegetated Swales



Source: SEMCOG (2008). *Low Impact Development Manual for Michigan*, Figure 7.62.

- (5) Check that flow velocities are within acceptable limits. The minimum velocity for open channels shall be 1.5 feet per second. The maximum velocity shall be 4 feet per second.

3. Design Requirements

a. Siting

- (1) Vegetated swales can be used for drainage areas up to 5 acres. Drainage areas greater than this may require open channels.
- (2) Minimum surface area to meet water quality standard by vegetative filtering:
 - (a.) The maximum bottom width to depth ratio for the water quality discharge shall be 12:1, or approximately equal to the grass height.
 - (b.) Minimum length per **Figures 4a** through **4d**.

b. Configuration

- (1) Trapezoidal, with a minimum bottom width of 2 feet and a maximum bottom width of 8 feet.
- (2) Side slopes shall be 3:1 (H:V) or flatter.
- (3) Longitudinal slope shall be a minimum of 1% and a maximum of 6%. Flatter slopes may be allowed on permeable soils.

c. Check Dam Design

- (1) Check dams may be used for energy dissipation along vegetated swales with longitudinal slopes greater than 3%.
- (2) Maximum ponding depth behind check dams shall be 18 inches.
- (3) Check dams shall be keyed into the bottom and sides of the swale a minimum of 1-foot on all sides. The height of the key must exceed the 10-year water surface elevation by a minimum of 6 inches on both sides.
- (4) The center of the check dam crest must be below the sides of the check dam by a minimum of 12 inches.
- (5) The crest of a downstream check dam shall be no lower than the downstream toe of the upstream check dam.

d. Materials

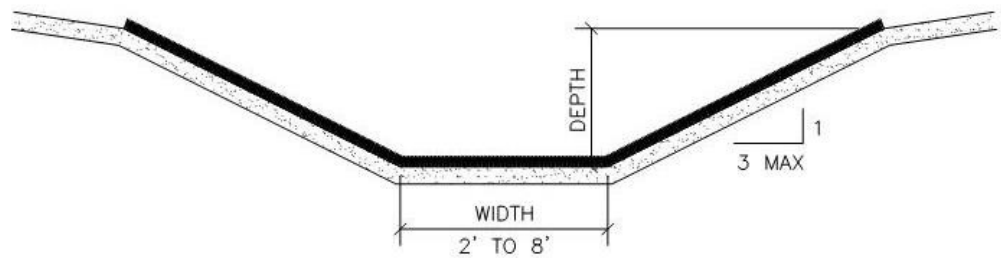
(1) Establishment of vegetation shall follow the guidelines outlined in **Table 15**.

Table 15 – Permanent Stabilization Treatment for Vegetated Swales

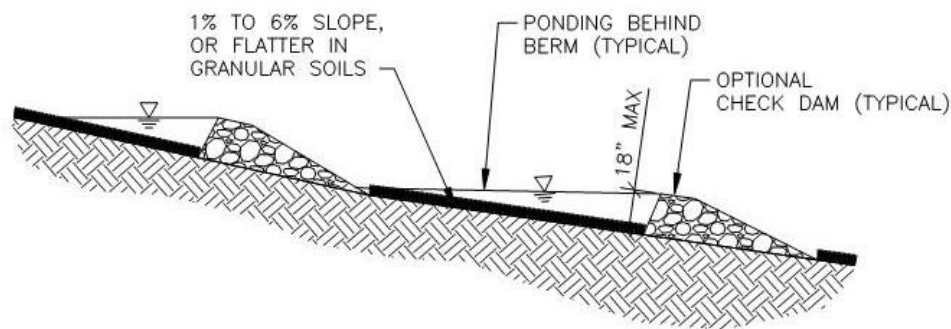
Swale Bottom Treatment	Swale Grade
Seed and Mulch	0.3% to 0.5%
Standard Mulch Blanket	0.5% to 1.5%
High Velocity Mulch Blanket or Sod	1.5% to 3.0%
Turf Reinforcement Mat or Check Dams	3.0% to 6.0%
Specific Design Required	> 6.0%
Source: <i>Michigan Department of Transportation Drainage Manual</i> (2006).	

4. Design Schematics

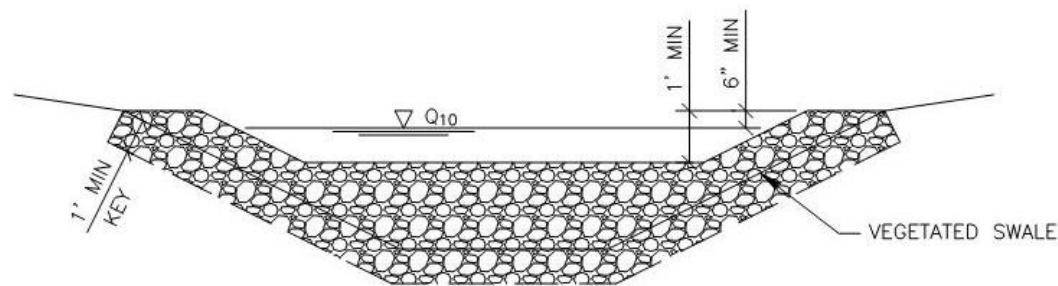
VEGETATED SWALE



SECTION



PROFILE



CHECK DAM DETAIL

R. Vegetated Filter Strip

1. Summary

Description:	Overland flow path designed to slow and filter stormwater.
Application:	Contributing drainage areas with sheet flow surface runoff.
Types:	Turf grass; other dense herbaceous groundcover vegetation.
Pretreatment Required:	No. This BMP provides pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	Adjust time-of-concentration.
Water Quality:	Count volume routed through BMP.

2. Sizing Calculations

a. Used for Pretreatment

- (1) Provide a 10-foot minimum sheet flow length at a maximum slope of 2% with an impervious approach length no greater than 3.5 times the filter strip length, up to a maximum approach length of 75 feet.
- (2) Provide a 15-foot minimum sheet flow length for slopes between 2% and 6% with an impervious approach length no greater than 3 times the filter strip length, up to a maximum approach length of 75 feet.

b. Used for Water Quality

- (1) Calculate the minimum required filter strip area by the equation:

$$A_{fs} = \frac{A}{6} \quad (4.27)$$

where:

A_{fs} = area of filter strip (square feet)

A = contributing drainage area (square feet)

Note: This equates to a loading ratio of 0.17 from the contributing drainage area (both impervious and pervious surfaces).

- (2) Calculate minimum required longitudinal length based on slope and type of vegetation using the graphs in **Figures 4a** through **4d**.

3. Design Requirements

a. Siting

- (1) Maximum upstream drainage area shall generally be 100 feet impervious or 200 feet pervious.

b. Configuration

- (1) The upstream edge of the filter strip shall be level and at an elevation at least one inch below the adjacent pavement.
- (2) A level spreader may also be required to evenly distribute flow across filter strip.

- (3) Slopes shall range from a minimum of 1% to a maximum of 8%. Optimal slopes range from 2% to 6%.
- (4) The maximum lateral slope shall be 1%.
- (5) Berms and curbs may be installed along the sides of the filter strip parallel to the direction of flow to prohibit runoff from laterally bypassing the filter strip.

Figure 4a – Filter Strip Length (Sandy soils with HSG A)

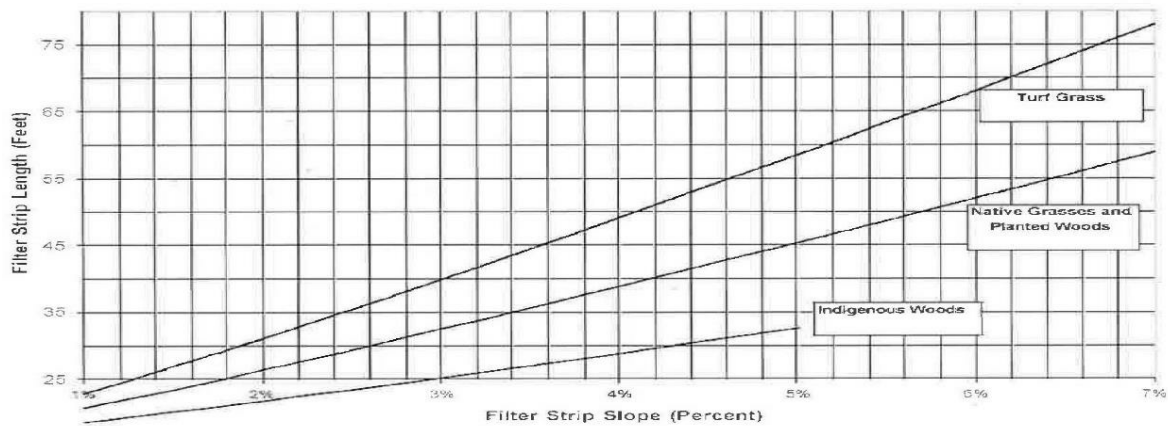


Figure 4b1 – Filter Strip Length (Sandy Loam soils with HSG B)

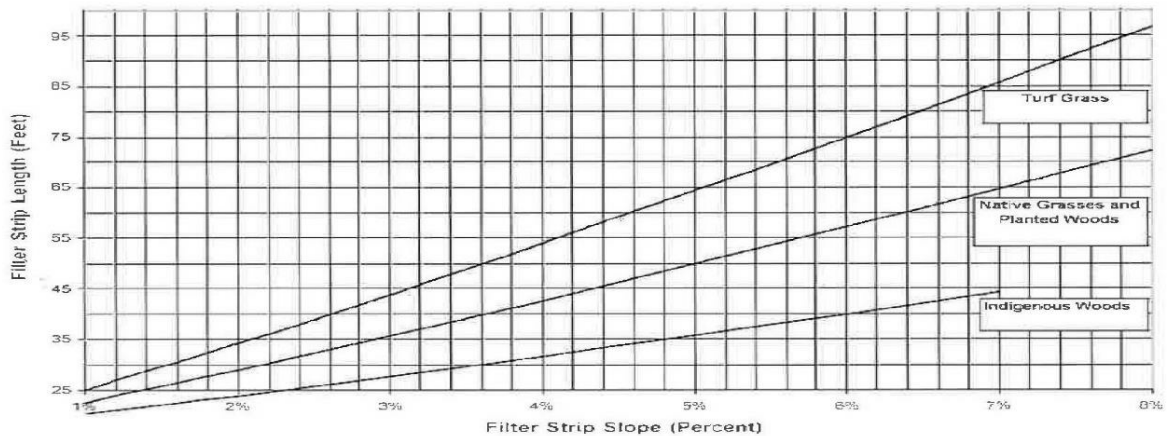
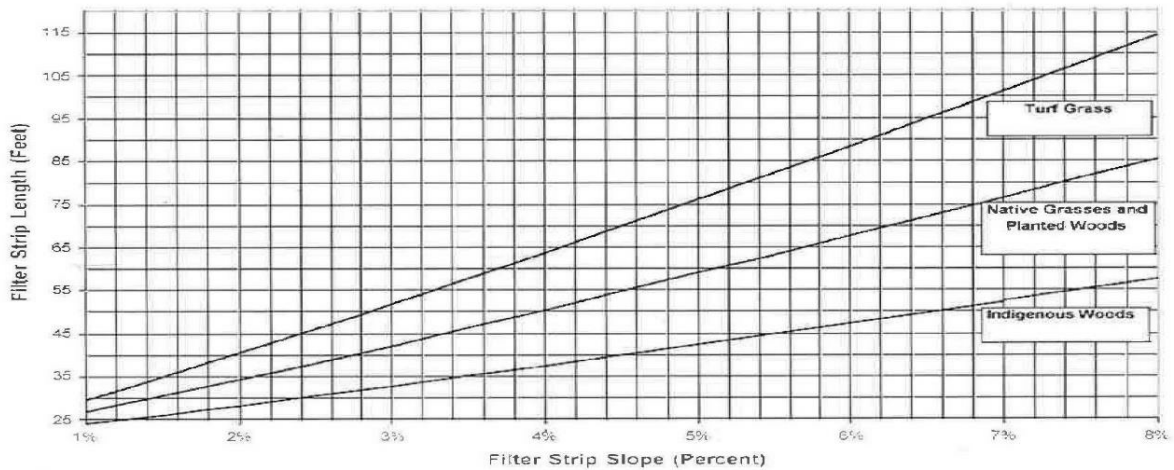


Figure 4b2 – Filter Strip Length (Loam, Silt-Loam soils with HSG B)



Source: SEMCOG (2008), *Low Impact Development Manual for Michigan*, Figures 7.52, 7.53 and 7.54 (New Jersey Stormwater Best Management Practices Manual, 2004)

Figure 4c – Filter Strip Length (Sandy Clay Loam soils with HSG C)

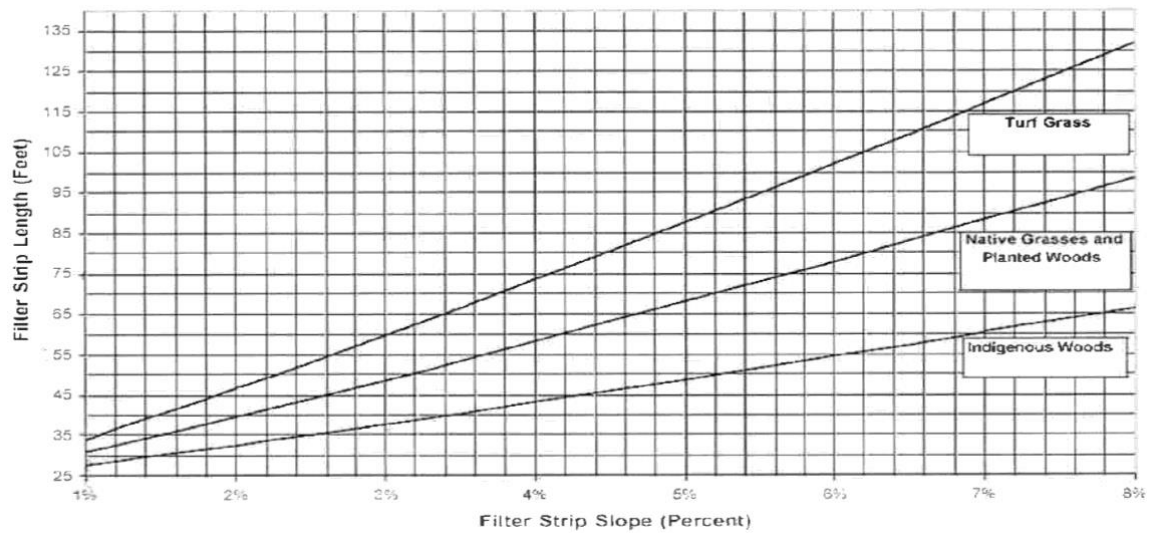
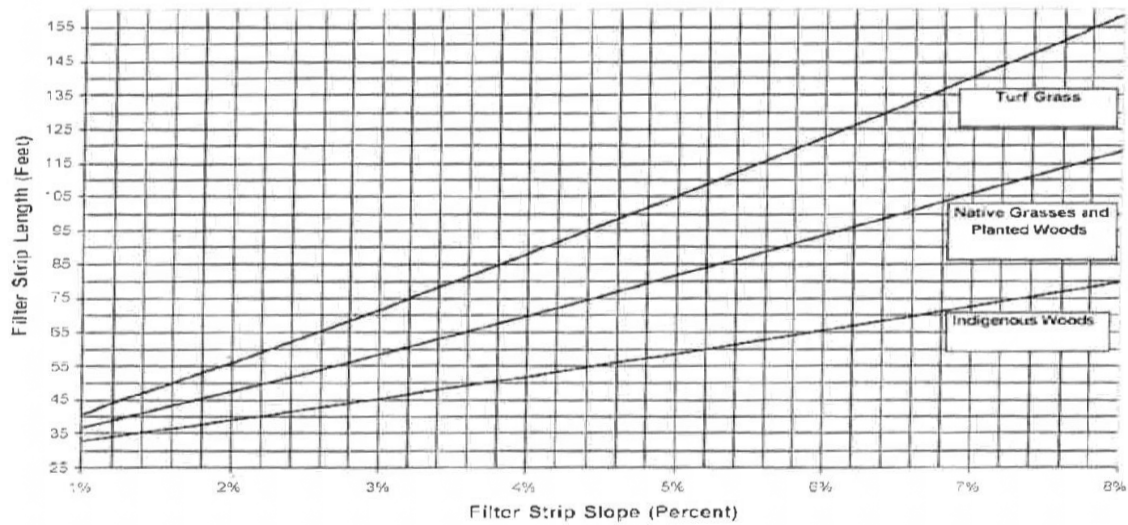


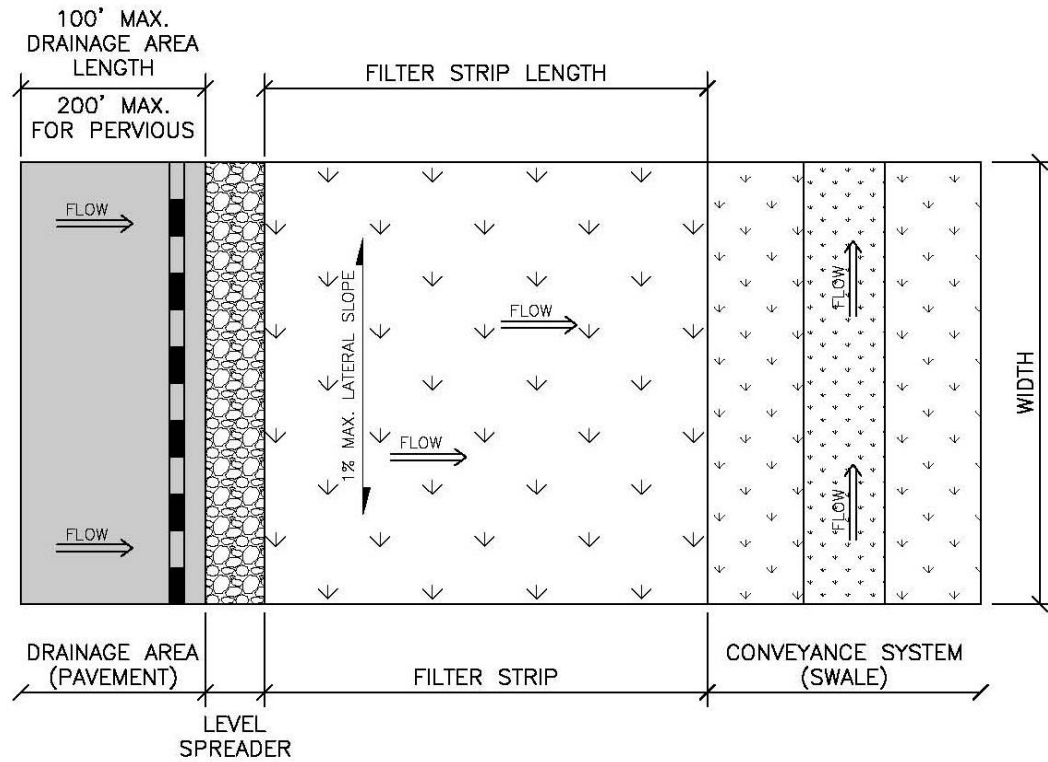
Figure 4d – Filter Strip Length (Clay Loam, Silty Clay, Clay soils with HSG D)



Source: SEMCOG (2008), *Low Impact Development Manual for Michigan*, Figures 7.55 and 7.56 (New Jersey Stormwater Best Management Practices Manual, 2004)

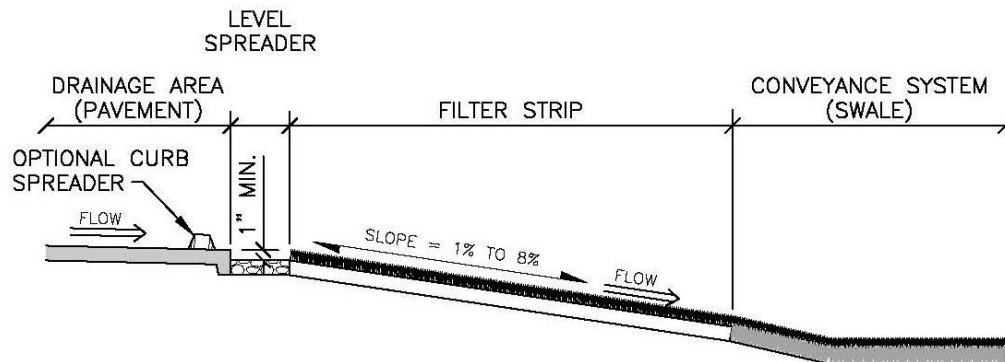
4. Design Schematics

VEGETATED FILTER STRIP



MIN. FILTER STRIP AREA = $1/6$ DRAINAGE AREA.

PLAN VIEW



PROFILE

S. Level Spreader

1. Summary

Description:	Shallow, level berm placed perpendicular to a flow path.
Application:	Used with other BMPs to disperse concentrated stormwater flows.
Types:	Inflow (prior to BMP); Outflow (at outlet of BMP).
Pretreatment Required:	No. This BMP provides pretreatment.
Maintenance Plan:	Yes.
Calculation Credits:	
Volume Reduction:	None.
Rate Reduction:	None.
Water Quality:	None.

2. Sizing Calculations

- a. The level spreader shall be sized to pass the 10-year peak flow.
- b. Calculate 10-year peak flow rate (refer to Part 4 section “Calculating Runoff”).

3. Design Requirements

- a. Siting
 - (1) Slopes below outflow level spreaders should be no greater than 8% in the direction of flow to discourage channelization.
- b. Configuration
 - (1) Construct level spreaders in compacted fill or of other non-erodible material.
 - (2) Minimum length: 10 feet.
 - (3) A bypass may be required for higher flows.
- c. Material
 - (1) Level spreaders may be constructed of compacted earth, rock, stone, concrete, treated timber or perforated pipe in stone.

APPENDIX 1 – WATERSHED POLICY

- Ruddiman Creek Watershed

Ruddiman Creek Watershed

A. BACKGROUND AND PURPOSE

The Ruddiman Creek watershed is located in portions of the Cities of City of Muskegon, Norton Shores, Roosevelt Park and City of Muskegon Heights. Ruddiman Creek discharges to City of Muskegon Lake and is located with the City of Muskegon Lake Area of Concern (AOC). Ruddiman Creek is presently not meeting its designated uses for wildlife, other indigenous aquatic life, and as a warm water fishery due primarily to a poor macroinvertebrate community. Ruddiman Creek is also not meeting its designated uses for fish consumption, and total and partial body contact.

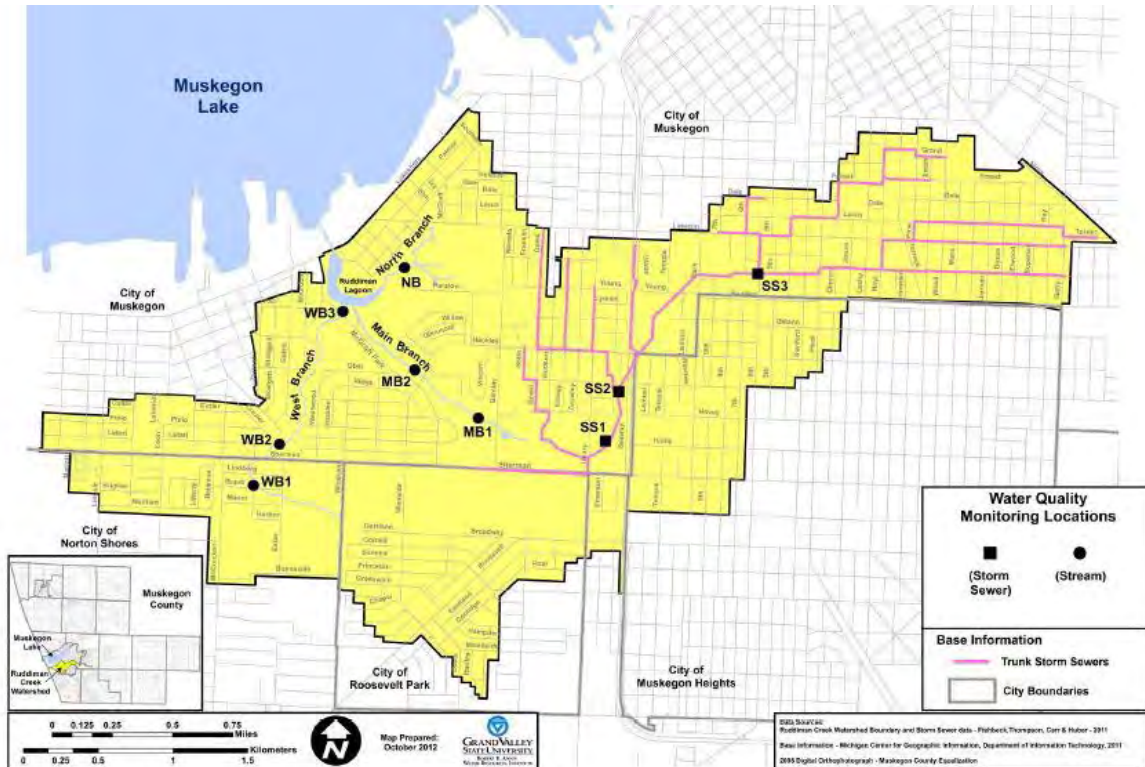


Fig. 2.1. Ruddiman Creek 2011-2012 monitoring locations

In 2010, the Grand Valley State University (GVSU) Annis Water Resources Institute (AWRI) received a FY 2010 Great Lakes Restoration Initiative (GLRI) grant to conduct studies to support a Ruddiman Creek Implementation-Ready Total Maximum Daily Load (TMDL) for biota to address the wildlife, other indigenous aquatic life, and warmwater fishery designated uses.

Conclusions are taken from the final report “Studies to Support an Implementation-Ready TMDL for Ruddiman Creek” dated February 2013. The technical information included in the report was used to support the Michigan Department of Environmental Quality (DEQ) in the development of a TMDL for biota.

The poor macroinvertebrate community was attributed primarily to the flashiness of the watershed hydrology (Nederveld, 2009); therefore, a hydrologic surrogate was used for the biota TMDL. The relationship between flashiness and Directly Connected Impervious Area (DCIA) was used to develop TMDL targets in terms of percent reduction in DCIA needed to reduce flashiness and improve biota.

A spreadsheet application referred to as a Scoping Tool was developed to relate P-51 macroinvertebrate scores with a Richards-Baker Flashiness Index (FI). The Scoping Tool was also used to relate changes in the amount of DCIA to changes in the FI by subwatershed. A BMP inventory sheet is included to account for progress made towards meeting the TMDL.

The purpose of the design criteria included in this section is to account for reductions in DCIA to reduce the flashiness of stormwater runoff associated with urbanization to meet TMDL targets and improve biota in Ruddiman Creek.

B. CONCLUSIONS

The Ruddiman Creek watershed is highly urbanized; impervious cover from developed land is over 50%, far exceeding the 10-15% threshold that has been suggested to cause biotic impairment in streams (Wang et al. 2001). As a consequence, the tributaries in the Ruddiman Creek watershed are subject to altered hydrology, characterized by high flashiness. The unnatural flow regime can physically dislodge benthic organisms; mobilize sediment, causing habitat impairment; and transport previously buried or sequestered contaminants, rendering them bioavailable to organisms (cf. Cooper et al. 2009; Johnson et al. 2011).

In terms of sediment, the primary form of sediment transported by storm flows is suspended sediment. Monitoring indicated that all branches of Ruddiman Creek meet the “Good to Moderate” threshold (≤ 80 mg/L) for annual mean suspended sediment concentrations (SSC) suggested by Alabaster and Lloyd (1982) for protection of fish communities. However, short term increases in SSC during storm events are much higher and may cause impacts to aquatic communities. Improvements in watershed hydrology resulting from BMPs are projected to reduce SSC by 25-50%.

C. TMDL

A biota TMDL for Ruddiman Creek has not been accepted by the United States Environmental Protection Agency (EPA), and therefore has not been implemented by the DEQ. However, loading capacities identified in the study are still recommended to restore the identified designated uses. Loading capacities for each branch of Ruddiman Creek are summarized in **Table 5.3** from the report:

Branch	Current Percent DCIA	Fraction DCIA Reduced*	WLA + LA	MOS	LC
Main	21%	0.35	13.5%	1.2	12%
North	7.5%	0.52	3.6%	1.2	2.9%
West	16%	0.68	5.0%	1.2	2.8%
DCIA = Directly Connected Impervious Area WLA = Waste Load Allocation (point sources) LA = Load Allocation (nonpoint sources) MOS = Margin of Safety LC = Load Capacity (the greatest amount of DCIA the watershed can support without violating the stream’s aquatic life criteria) *Modeling a Benchmark Scenario identified the reduction in DCIA needed to achieve reductions in FI resulting in minimum acceptable P51 macroinvertebrate scores.					

D. DESIGN CRITERIA

The following criteria shall apply for all new developments and redevelopments subject to review under these standards and located within the Ruddiman Creek watershed:

1. Standard design criteria for water quality and channel protection with an emphasis on reducing DCIA. **An increase in DCIA is not allowed.** The design engineer must treat any additional DCIA so it is effectively “reduced.”
2. DCIA is considered effectively “reduced” when:
 - a. Impervious surfaces are physically removed and replaced with pervious surfaces.
 - b. Impervious surfaces are disconnected from the storm sewer system by routing runoff to pervious area meeting minimum size, length, and slope requirements (e.g., a rain barrel with an overflow directed to yard, away from the storm sewer).
 - c. Impervious surfaces are disconnected from the storm sewer system by routing runoff to an infiltration BMP sized for the channel protection volume.
 - d. An underdrained LID BMP (e.g., rain garden, porous pavement, green roof) is engineered and implemented for channel protection and volume reduction with a hold time no less than 72 hours.

E. SCOPING TOOL

For redevelopments (and new developments if applicable) impacting existing DCIA, the design engineer shall complete the BMP Inventory Sheet in the Scoping Tool spreadsheet application and submit this documentation with the design calculation package.

APPENDIX 2 –ABBREVIATIONS, ACRONYMS, & DEFINITIONS

List of Abbreviations

Acronyms

ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CN	Curve Number
DEQ	Michigan Department of Environmental Quality (Michigan Department of Environment, Great Lakes and Energy (EGLE) as of April 7, 2019)
DNR	Michigan Department of Natural Resources
EPA	United States Environmental Protection Agency
GASB	Governmental Accounting Standards Board
GIS	Geographic Information System
GPS	Geographic Positioning System
GVMC	Grand Valley Metropolitan Council
HSG	Hydrologic Soil Group
LGROW	Lower Grand River Organization of Watersheds
LID	Low Impact Development
MCL	Michigan Compiled Laws
MDOT	Michigan Department of Transportation
MS4	Municipal Separate Storm Sewer
NAICS	North American Industry Classification System
NAVD 88	North American Vertical Datum of 1988
NJDEP	New Jersey Department of Environmental Protection
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
RRD	Remediation and Redevelopment Division
PA	Public Acts of Michigan
PDF	Portable Document Format
SEMCOG	Southeast Michigan Council of Governments
TMDL	Total Maximum Daily Load
TR-55	Technical Release 55
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WMSRDC	West Michigan Shoreline Regional Development Commission

List of Units

ft (')	feet
in (")	inches
ac	acre
cfs	cubic feet per second
cft	cubic feet
hr	hour
H:V	horizontal to vertical
in/hr	inches per hour
mg/L	milligrams per liter
min	minute

WATCH MUSKEGON

Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: October 25, 2022		Title: Rezoning 398 Catawba Ave – 2 nd Reading	
Submitted By: Mike Franzak		Department: Planning	
Brief Summary: Request to rezone the property at 398 Catawba Ave from R-3, Single Family High Density Residential to B-4, General Business, by Gordon Painting and Pressure Washing, LLC.			
Detailed Summary & Background: The Planning Commission recommended approval of the rezoning by a 7-0 vote.			
Goal/Focus Area/Action Item Addressed: <i>Goal 2: Economic development, micro-commercial areas in neighborhoods.</i>			
Amount Requested:		Amount Budgeted:	
Fund(s) or Account(s):		Fund(s) or Account(s):	
Recommended Motion: I move to rezone the property at 398 Catawba Ave from R-3, Single Family High Density Residential to B-4, General Business.			
Approvals:		Guest(s) Invited / Presenting	
Immediate Division Head	☒ Information Technology	☐	
Other Division Heads	☐ Communication	☐	Yes ☐
Legal Review	☐		No ☐
For City Clerk Use Only: Commission Action:			

Planning Commission Excerpt:

Hearing; Case 2022-26: Request to rezone the property at 398 Catawba Ave from R-3, Single Family High Density Residential to B-4, General Business, by Gordon Painting and Pressure Washing, LLC.

SUMMARY

1. The property is zoned R-3, High Density Single Family Residential.
2. The commercial building on site is considered grandfathered and has been used by Gordon Painting for many years.
3. The applicant would like to put an addition on to the building in order to start a power washing business alongside the painting business. However, non-conforming uses are only allowed to expand their buildings up to twenty-five percent.
4. The property is adjacent to a commercial/industrial corridor.
5. Staff had initially discussed rezoning the property to Light Industrial since it is adjacent to light industrial properties. However, these uses can be located in a General Business zone and will offer protection to the residential neighborhood that more intensive uses will not be able to be located there.
6. Notice was sent to all properties within 300 feet. At the time of this writing, staff had not received any comments from the public.

398 Catawba Ave



Zoning Map



Aerial Map



CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

ORDINANCE NO. _____

An ordinance to amend the zoning map of the City to provide for a zone change for 398 Catawba Ave from R-3 to B-4

THE CITY COMMISSION OF THE CITY OF MUSKEGON HEREBY ORDAINS:

The zoning map of the City of Muskegon is hereby amended to change the zoning for 398 Catawba Ave St from R-3 to B-4.

CITY OF MUSKEGON REVISED PLAT OF 1903 ENTIRE LOTS 7 & 10 PART LOTS 8 & 9 BLK 263 DESC AS COM @ NELY COR OF SD BLK BEING NELY COR LOT 9 SD BLK TH S 56D 39M 12S W ALG N LN SD LOT 9 40 FT TO POB TH S 33D 26M 50S E PAR WITH ELY LN SD LOT 9 132 FT TH S 19D 29M 54S E 69.80 FT TH N 89D 53M 26S E 20 FT TO SLY LN LOT 8 ALSO BEING WLY LN WOOD ST TH S 00D 06M 39S E 63.68 FT TH S 56D 39M 12S W ALG SLY LN LOT 7 57.33 FT TO SWLY COR LOT 7 TH N 33D 26M 50S W ALG WLY LN LOTS 7 & 10 264 FT TO NWLY COR LOT 10 TH N 56D 39M 12S E ALG NLY LN LOTS 10 & 9 92.44 FT TO POB SD PARCEL CONTAINS 0.52 AC M/L SUBJECT TO ANY & ALL ESMT OR RES OF REC OR APPARENT (DESC CHANGE 10/19/99)

This ordinance adopted:

Ayes: _____

Nayes: _____

Adoption Date: _____

Effective Date: _____

First Reading: _____

Second Reading: _____

CITY OF MUSKEGON

By: _____

Ann Meisch, MMC

City Clerk

CERTIFICATE (Rezoning 398 Catawba Ave from R-3 to B-4)

The undersigned, being the duly qualified clerk of the City of Muskegon, Muskegon County, Michigan, does hereby certify that the foregoing is a true and complete copy of an ordinance adopted by the City Commission of the City of Muskegon, at a regular meeting of the City Commission on the 11th day of October 2022, at which meeting a quorum was present and remained throughout, and that the original of said ordinance is on file in the records of the City of Muskegon. I further certify that the meeting was conducted and public notice was given pursuant to and in full compliance with the Michigan Zoning Enabling Act, Public Acts of Michigan No. 33 of 2006, and that minutes were kept and will be or have been made available as required thereby.

DATED: _____, 2022 _____

Ann Meisch, MMC

Clerk, City of Muskegon

Publish Notice of Adoption to be published once within ten (10) days of final adoption.

CITY OF MUSKEGON
NOTICE OF ADOPTION

Please take notice that on October 11, 2022, the City Commission of the City of Muskegon adopted an ordinance amending the zoning map to provide for the change of zoning for 398 Catawba Ave from R-3 to B-4:

CITY OF MUSKEGON REVISED PLAT OF 1903 ENTIRE LOTS 7 & 10 PART LOTS 8 & 9 BLK 263 DESC AS COM @ NELY COR OF SD BLK BEING NELY COR LOT 9 SD BLK TH S 56D 39M 12S W ALG N LN SD LOT 9 40 FT TO POB TH S 33D 26M 50S E PAR WITH ELY LN SD LOT 9 132 FT TH S 19D 29M 54S E 69.80 FT TH N 89D 53M 26S E 20 FT TO SLY LN LOT 8 ALSO BEING WLY LN WOOD ST TH S 00D 06M 39S E 63.68 FT TH S 56D 39M 12S W ALG SLY LN LOT 7 57.33 FT TO SWLY COR LOT 7 TH N 33D 26M 50S W ALG WLY LN LOTS 7 & 10 264 FT TO NWLY COR LOT 10 TH N 56D 39M 12S E ALG NLY LN LOTS 10 & 9 92.44 FT TO POB SD PARCEL CONTAINS 0.52 AC M/L SUBJECT TO ANY & ALL ESMT OR RES OF REC OR APPARENT (DESC CHANGE 10/19/99)

Copies of the ordinance may be viewed and purchased at reasonable cost at the Office of the City Clerk in the City Hall, 933 Terrace Street, Muskegon, Michigan, during regular business hours.

This ordinance amendment is effective ten days from the date of this publication.

Published _____, 2022

CITY OF MUSKEGON

By _____

Ann Meisch, MMC

City Clerk

PUBLISH ONCE WITHIN TEN (10) DAYS OF FINAL PASSAGE.

Account No. 101-80400-5354

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022	Title: Ordinance Amendment – Reduced Housing Unit Size Minimums – 2 nd Reading
Submitted By: Mike Franzak	Department: Planning
Brief Summary: Staff-initiated request to amend section 2319 of the zoning ordinance to reduce the minimum size requirements for single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) from 850 sf of floor area to 550 sf (total) and to also change the minimum size requirements for large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units from 650 sf of floor area to 375 sf (total).	
Detailed Summary & Background: A motion to recommend approval of the original request failed by a 2-3 vote at the August 11 Planning Commission meeting. At the August 23 City Commission meeting, staff requested to remove the item from the agenda in order to make some changes to the proposal and bring back to Planning Commission. The proposal was amended and brought back to the Planning Commission at their September 15 meeting, where they recommended approval of the new amendments by a 6-1 vote. The changes to the original amendment include requiring an additional 100 sf for each additional bedroom; additional language stating that all units located in single-family residential districts must comply with Section 400 of the zoning ordinance, which will prevent single-family houses from being split into additional units. It should also be noted that the current minimum housing size is measured by “floor area,” which is defined by the zoning ordinance as <i>“the area in a dwelling unit included in the determination of occupancy restrictions. It includes the sum of floor areas of bedrooms, and common living areas. The floor area of storage areas and closet, basements without a second egress, attached garages, breezeways, and enclosed and unenclosed porches shall be excluded.”</i> Staff is proposing to no longer use this method in determining the minimum size, but rather by measuring from the outside wall of the unit.	
Goal/Focus Area/Action Item Addressed: Goal 2: Economic Development, Housing, and Business/Diverse Housing Types/2.3 Increase Variety of Housing Types/2.4 Develop Subsidies to Improve Housing Affordability	
Amount Requested:	Amount Budgeted:
Fund(s) or Account(s):	Fund(s) or Account(s):

Recommended Motion: I move to approve the request to amend section 2319 of the zoning ordinance to reduce the minimum size requirements for single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) from 850 sf of floor area to 550 sf (total) and to also change the minimum size requirements for large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units from 650 sf of floor area to 375 sf (total).

Approvals:

Immediate Division Head ☒ Information Technology ☐
 Other Division Heads ☐ Communication ☐
 Legal Review ☐

Guest(s) Invited / Presenting

Yes ☐
 No ☐

For City Clerk Use Only:

Commission Action:

Planning Commission Excerpt:

Case 2022-22: Staff-initiated request to amend section 2319 of the zoning ordinance to reduce the minimum size requirements for single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) from 850 sf of floor area to 550 sf (total) and to also change the minimum size requirements for large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units from 650 sf of floor area to 375 sf (total).

SUMMARY

1. This case was presented at the August 11 Planning Commission meeting. The board did not recommend approval of the amendments at the meeting. At the following City Commission meeting, staff requested to take the case back to the Planning Commission with some changes and clarification, to which the City Commission approved.
2. Staff is now proposing to keep the requirement that an additional 100 sf is required for each additional bedroom.
3. Staff has added that all units located in single-family residential districts must comply with Section 400 of the zoning ordinance, which will prevent single-family houses from being split into additional units.
4. For one and two family homes, staff has proposed the clause that states that if the house is less than 850 sqft and is to be located on a lot that is large enough to split under the zoning regulations, it must be placed in such a fashion as to allow enough room to split the lot and create an additional buildable lot. This clause had previously been proposed for the for the mixed-use building section as well, but is not needed because these types of requirements are addressed elsewhere in the ordinance, specifically the form based code and multifamily sections of the code.
5. It should be noted the current minimum housing size is measured by “floor area,” which is defined by the zoning ordinance as *the area in a dwelling unit included in the determination of occupancy restrictions. It includes the sum of floor areas of bedrooms, and common living areas. The floor area of storage areas and closet, basements without a second egress, attached garages, breezeways, and*

enclosed and unenclosed porches shall be excluded. Staff is proposing to no longer use this method in determining the minimum size, but rather by measuring from the outside wall of the unit.

Summary of the case from the previous meeting:

6. In an effort to address housing affordability and to provide residents with a wide range of housing choices, staff is proposing to reduce the minimum housing size requirements listed in the Residential Design Criteria section of the zoning ordinance.
7. Currently, single-family houses and duplexes are required to have a minimum living area (excluding all basement area) of 850 sqft for a one bedroom dwelling. For each bedroom thereafter, an additional 100 sqft of living space is required.
8. Living area is defined in the zoning ordinance as the area in a dwelling unit included in the determination of occupancy restrictions. It includes the sum of floor areas of bedrooms, and common living areas. The floor area of storage areas and closet, basements without a second egress, attached garages, breezeways, and enclosed and unenclosed porches shall be excluded.
9. Staff is proposing to reduce the minimum size of single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) to 550 sqft total (excluding all basement area) per unit, measured by the outside dimensions of the building, not by using the “living area” definition in the zoning ordinance. There would also be a stipulation that structures under the current minimum size of 850 sqft, which are to be placed on large lots, must be placed on the property in a way as to leave room for a potential lot split, if the property is large enough to split under its zoning designation regulations.
10. Staff is proposing to reduce the minimum size of apartment units in large multiplexes (6 units and above) and mixed-use buildings from 650 sqft of living space to 375 sqft total. The current size requirements are too large for developers to be able to provide traditional studio apartments.

Current ordinance excerpt:

SECTION 2319: [RESIDENTIAL DESIGN CRITERIA]

In the case of a one (1) family or two (2) family dwelling unit which is of standard construction, a mobile home, a premanufactured, or a precut dwelling structure, and any additions or alterations thereto, erected or placed in the City of Muskegon, other than a mobile home located in a licensed mobile home park approved under the provisions of Article V, MHP Mobile Home Park Districts, shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. The dwelling unit shall have a minimum living area (excluding all basement area) of eight hundred and fifty (850) square feet for a one (1) bedroom dwelling. For each bedroom thereafter, an additional 100 square feet of living space shall be provided.

In the case of a multi-family (more than 2 units) dwelling structure which is of standard construction, a mobile home, a premanufactured, or a precut dwelling structure, and any additions or alterations thereto, erected or placed in the City of Muskegon, other than a mobile home located in a licensed mobile home park approved under the provisions of Article V, MHP Mobile Home Park Districts, shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum living area (excluding all basement area) of six hundred and fifty (650) square feet for a one (1) bedroom unit, of eight hundred and seventy-five (875) square feet for a two (2) bedroom unit, and of twelve hundred (1200) square feet for a three (3) bedroom unit. For each bedroom thereafter, an additional 100 square feet of living space shall be provided.

Proposed ordinance:

All single-family houses, duplexes, rowhouses and small multiplexes (3-6 units), other than a mobile home located in a licensed mobile home park approved under the provisions of Article V, MHP Mobile Home Park Districts, shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size of 550 sqft, excluding all basement area. This shall be measured from the outside wall of the unit as described on the site plan.
2. If a principal structure is less than 850 sqft and is to be located on a lot that is large enough to split under the zoning regulations, it must be placed in such a fashion as to allow enough room to split the lot and create an additional buildable lot. The lot does not actually have to be split at the time of construction and may be done at a later date at the property owners discretion.
3. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, not may new homes be built for multiple dwellings.

All dwelling units within large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size (excluding all basement area) of 375 sqft. This shall be measured from the outside wall of the unit as described on the site plan.
2. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, not may new homes be built for multiple dwellings.

CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

ORDINANCE NO. _____

An ordinance to amend the section 2319 of the zoning ordinance to reduce the minimum size requirements for single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) from 850 sf of floor area to 550 sf (total) and to also change the minimum size requirements for large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units from 650 sf of floor area to 375 sf (total).

THE CITY COMMISSION OF THE CITY OF MUSKEGON HEREBY ORDAINS:

All single-family houses, duplexes, rowhouses and small multiplexes (3-6 units), other than a mobile home located in a licensed mobile home park approved under the provisions of Article V, MHP Mobile Home Park Districts, shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size of 550 sqft, excluding all basement area. This shall be measured from the outside wall of the unit as described on the site plan.
2. If a principal structure is less than 850 sqft and is to be located on a lot that is large enough to split under the zoning regulations, it must be placed in such a fashion as to allow enough room to split the lot and create an additional buildable lot. The lot does not actually have to be split at the time of construction and may be done at a later date at the property owners discretion.
3. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, not may new homes be built for multiple dwellings.

All dwelling units within large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size (excluding all basement area) of 375 sqft. This shall be measured from the outside wall of the unit as described on the site plan.
2. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, not may new homes be built for multiple dwellings.

This ordinance adopted:

Ayes: _____

Nayes: _____

Adoption Date:_____

Effective Date:_____

First Reading:_____

Second Reading:_____

CITY OF MUSKEGON

By: _____
Ann Meisch, MMC, City Clerk

CERTIFICATE

The undersigned, being the duly qualified clerk of the City of Muskegon, Muskegon County, Michigan, does hereby certify that the foregoing is a true and complete copy of an ordinance adopted by the City Commission of the City of Muskegon, at a regular meeting of the City Commission on the 11th day of October 2022, at which meeting a quorum was present and remained throughout, and that the original of said ordinance is on file in the records of the City of Muskegon. I further certify that the meeting was conducted and public notice was given pursuant to and in full compliance with the Michigan Zoning Enabling Act, Public Acts of Michigan No. 33 of 2006, and that minutes were kept and will be or have been made available as required thereby.

DATED: _____, 2022.

Ann Meisch, MMC

Clerk, City of Muskegon

Publish: Notice of Adoption to be published once within ten (10) days of final adoption.

CITY OF MUSKEGON
NOTICE OF ADOPTION

Please take notice that on August 23, 2022, the City Commission of the City of Muskegon adopted an ordinance to amend section 2319 of the zoning ordinance to reduce the minimum size requirements for single-family houses, rowhomes, duplexes and small multiplexes (up to 6 units) from 850 sf of floor area to 550 sf (total) and to also change the minimum size requirements for large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units from 650 sf of floor area to 375 sf (total).

All single-family houses, duplexes, rowhouses and small multiplexes (3-6 units), other than a mobile home located in a licensed mobile home park approved under the provisions of Article V, MHP Mobile Home Park Districts, shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size of 550 sqft, excluding all basement area. This shall be measured from the outside wall of the unit as described on the site plan.
2. If a principal structure is less than 850 sqft and is to be located on a lot that is large enough to split under the zoning regulations, it must be placed in such a fashion as to allow enough room to split the lot and create an additional buildable lot. The lot does not actually have to be split at the time of construction and may be done at a later date at the property owners discretion.
3. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, nor may new homes be built for multiple dwellings.

All dwelling units within large multiplexes (6 units and above), mixed-use buildings and accessory dwelling units shall conform to the following regulations in addition to all other regulations of this Ordinance:

1. Each dwelling unit shall have a minimum size (excluding all basement area) of 375 sqft. This shall be measured from the outside wall of the unit as described on the site plan.
2. All buildings located in single family residential districts must comply with Section 400.2 of the zoning ordinance. Multiple family dwellings are only allowed in single-family residential districts if the home has already been altered with prior approval to allow for multiple dwellings. One-family dwellings may not be altered to allow for multiple dwellings, nor may new homes be built for multiple dwellings.

Copies of the ordinance may be viewed and purchased at reasonable cost at the Office of the City Clerk in the City Hall, 933 Terrace Street, Muskegon, Michigan, during regular business hours.

This ordinance amendment is effective ten days from the date of this publication.

Published _____, 2022.

CITY OF MUSKEGON

By _____

Ann Meisch, MMC

City Clerk

PUBLISH ONCE WITHIN TEN (10) DAYS OF FINAL PASSAGE.

Account No. 101-80400-5354



Agenda Item Review Form

Muskegon City Commission

Commission Meeting Date: October 25th, 2022	Title: First Amendment to Purchase Agreement for NBR Labs Development
Submitted By: Jake Eckholm	Department: Development Services
Brief Summary: All due diligence items have been completed and grant funding secured for portions of the road addition to the Port City Industrial Park, necessitating minor additions to the original Purchase Agreement for the development site.	
Detailed Summary & Background: City Staff have been working with the development team from Northern Biomedical Research for most of the year on several critical details to move this project into construction, and we are approaching a final closing date. DPW and Development Services staff have achieved a \$630,000 Transportation Economic Development Fund Grant to help offset infrastructure costs to the expansion to the industrial park, and timelines for this construction are reflected in the amendment. We also have some remaining concrete millings and spoils from the deconstruction of the West Shoreline Correctional Facility that will be reused in construction of the public and private assets in the new section of the park, and this is referenced as well.	
Goal/Focus Area/Action Item Addressed: Focus Area 2: Progress toward completion of existing economic development projects	
Amount Requested: N/A	Amount Budgeted: N/A
Fund(s) or Account(s): N/A	Fund(s) or Account(s): N/A
Recommended Motion: Motion to approve the First Amendment to the 2725 Olthoff Purchase Agreement as presented	

Approvals:		Guest(s) Invited / Presenting:	
Immediate Division Head	☐	Information Technology	☐
Other Division Heads	☒	Communication	☐
Legal Review	☒		
For City Clerk Use Only:			
Commission Action:			

FIRST AMENDMENT TO PURCHASE AND SALE AGREEMENT

This First Amendment to Purchase and Sale Agreement (“**Amendment**”) is executed this _____ day of October, 2022, by and between 2725 Olthoff LLC, a Michigan limited liability company (“**Buyer**”) and the City of Muskegon, a Michigan municipal corporation (“**Seller**”).

WHEREAS, Buyer and Seller entered into that certain Purchase and Sale Agreement dated January 26, 2022 (“**Agreement**”) for the sale and purchase of certain real property located in the City of Muskegon, Muskegon County, Michigan, more particularly described in the Agreement (“**Property**”), a copy of which is in the possession of each Seller and Buyer; and

WHEREAS, Buyer and Seller desire to amend the Agreement as more particularly set forth below.

AGREEMENT

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Seller and Buyer agree as follows:

1. Exhibits. Exhibit B referred to in the Agreement shall be Exhibit 1 attached to this Amendment. Exhibit C referred to in the Agreement shall be Exhibit 2 attached to this Amendment.
2. Public Road. On or before June 1, 2023, Seller shall, at its sole cost and expense, cause Olthoff Drive, a public road and right of way, and public utilities to be extended along the western boundary of the Property, as set forth in Exhibit 3 attached to this Amendment (“**Road Extension**”). Seller’s obligation under this Section 2 shall survive the Close of Escrow and delivery of the Deed.
3. Easements. At the Close of Escrow, Seller and Buyer shall each execute and deliver original notarized copies of (a) the Access Easement Agreement in the form attached to this Amendment as Exhibit 4; and (b) an exclusive, perpetual easement granting Buyer the right to use a portion of the Retained Property between the Road Extension and the Property as approximately depicted on Exhibit 5 attached to this Agreement (“**Permanent Easement Area**”) for utilities and ingress and egress to and from Olthoff Drive and to construct driveways, entrances, walkways, landscaped areas, curbing, curb cuts, lighting, markings, directional signs, pavement and any other structures or improvements used for access the Permanent Easement Area, the form and contents of which will be mutually agreed upon by Buyer and Seller prior to the Close of Escrow.
4. Sanitary Sewer. On or before June 1, 2023, Seller shall, at its sole cost and expense, cause sanitary sewer utilities to (a) extend to the northern boundary of the Property and be stubbed to the Property in a location shown on Exhibit 6 attached to this Agreement and (b) extend to and across the “City Easement for Sewer Main” and the “Perpetual Access Easement” depicted on Exhibit 7 attached to this Agreement and southerly under the Road Extension and stubbed to Buyer’s central utilities plant to be constructed on the west side of the Property.
5. Storm Sewer. On or before June 1, 2023, Seller shall, at its sole cost and expense, cause storm sewer utilities to extend to the northern boundary of the Property and be stubbed to the Property in a location shown on Exhibit 8 attached to this Agreement

6. Close of Escrow. The Close of Escrow shall occur on or before November 1, 2022, or on an earlier date as shall be specified by Buyer on at least one week's notice to Seller; provided, however, that Buyer may delay the Close of Escrow up to sixty (60) days for the purpose of curing Defects by delivering written notice to Seller on or before November 1, 2022.

7. Concrete Millings. Following the date of this Amendment and continuing for twelve (12) months after the date of this Agreement, Seller shall allow Buyer and its agents and contractors and their equipment and machinery to enter onto the parcel of real property owned by Seller that is located adjacent to and south of the Property, having Parcel No. 61-15-102-200-001-00 ("**Adjacent Parcel**") to collect and remove the concrete millings located on the Adjacent Parcel ("**Millings**"). Seller conveys to Buyer all title and interest in and to the Millings removed from the Adjacent Parcel by Buyer and/or its agents and contractors.

8. Miscellaneous. In the event of a conflict between the terms of this Amendment and the terms of the Agreement, the terms of this Amendment shall govern and control. Except as specifically modified hereby, the Agreement will continue in full force and effect and is hereby ratified and confirmed as amended by this Amendment. All of the capitalized terms used in this Amendment, unless otherwise defined herein, shall have the same meaning as assigned to such terms in the Agreement. This Amendment will be construed, interpreted, and enforced under the laws of the State of Michigan. This Amendment is binding upon and will inure to the benefit of the parties and their respective successors and assigns under the Agreement. This Amendment may be executed in counterparts, each of which may be deemed an original, and both of which such counterparts together will constitute one and the same Amendment. An executed signature page sent by facsimile or electronic mail will be deemed an original executed signature page of this Amendment.

[Signatures on following page.]

Buyer and Seller have executed this First Amendment to Buy and Sell Agreement as of the date set forth above.

BUYER:

2725 OLTHOFF LLC,
a Michigan limited liability company

By: _____
Shane Woods
President and CEO

SELLER:

CITY OF MUSKEGON,
a Michigan municipal corporation

By: _____
Name: _____
Title: Mayor

By: _____
Name: _____
Title: Clerk

EXHIBIT 1

EXHIBIT B

PART OF LOTS 67 AND 68 OF THE PLAT OF PORT CITY INDUSTRIAL PARK NO. 6 AS RECORDED IN LIBER 22 OF PLATS PAGES 5-8, MUSKEGON COUNTY RECORDS, CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN AND MORE ALSO DESCRIBED AS;

COMMENCE AT THE SOUTH 1/4 CORNER OF SAID SECTION 35 ALSO BEING THE SOUTHEAST CORNER OF LOT 69, PORT CITY INDUSTRIAL CENTER NO. 6 AS RECORDED IN LIBER 22, PAGES 5-8, MUSKEGON COUNTY RECORDS;

THENCE NORTH 89 DEGREES 14 MINUTES 02 SECONDS EAST, A DISTANCE OF 7.91 FEET TO THE NORTH 1/4 CORNER OF SECTION 2, T9N, R16W, AS MONUMENTED BY F. F. SMITH & MID MICHIGAN ENGINEERING & SURVEY;

THENCE SOUTH 89 DEGREES 15 MINUTES 10 SECONDS EAST (R=S89°53'00"W D=S89°53'56"W) ALONG THE SOUTH LINE OF THE PLAT OF PORT CITY INDUSTRIAL PARK NO. 6 AS RECORDED IN LIBER 22 OF PLATS, PAGES 5-8, MUSKEGON COUNTY RECORDS, A DISTANCE OF 141.58 FEET TO THE POINT OF BEGINNING;

THENCE NORTH 01 DEGREE 28 MINUTES 35 SECONDS EAST, A DISTANCE OF 788.13 FEET;

THENCE SOUTH 89 DEGREES 06 MINUTES 57 SECONDS EAST (R & D=S89°56'00"E), A DISTANCE OF 1139.79 FEET TO THE WESTERLY RIGHT-OF-WAY LINE OF DEBAKER ROAD;

THENCE SOUTHWESTERLY, A DISTANCE OF 304.99 FEET (D=303.18 FEET) ALONG A CURVE TO THE RIGHT (CURVE DATA BEING RADIUS=642.00 FEET, LONG CHORD=302.13 FEET (D=300.37 FEET), LONG CHORD BEARING=SOUTH 23 DEGREES 45 MINUTES 47 SECONDS WEST (D=S22°50'42"W);

THENCE SOUTHERLY, A DISTANCE OF 369.14 FEET (R=370.18 FEET D=371.00 FEET) ALONG A CURVE TO THE LEFT CURVE DATA BEING RADIUS=303.00 FEET, LONG CHORD=346.69 FEET (D=348.26 FEET), LONG CHORD BEARING=SOUTH 02 DEGREES 09 MINUTES 26 SECONDS WEST (D=S01°33'47"W);

THENCE ALONG A LINE NON-TANGENT TO SAID CURVE, SOUTH 32 DEGREES 23 MINUTES 22 SECONDS EAST (R=S33°22'00"E D=S33°11'07"E), A DISTANCE OF 191.91 FEET TO A THE SOUTHEAST CORNER OF LOT 67 OF SAID PLAT;

THENCE NORTH 89 DEGREES 15 MINUTES 10 SECONDS WEST (R=S89°53'00"W D=S89°55'56"W) ALONG SAID SOUTH LINE OF THE PORT CITY INDUSTRIAL CENTER NO. 6, A DISTANCE OF 1127.94 FEET TO THE POINT OF BEGINNING.

TOGETHER WITH AND SUBJECT TO THE WEST 10 FEET, THEREOF, FOR A PRIVATE EASEMENT FOR PUBLIC UTILITIES.

SAID PARCEL CONTAINS 18.84 ACRES. MORE OR LESS.

EXHIBIT 2

EXHIBIT C

LOT 69 AND PART OF LOT 68 OF THE PLAT OF PORT CITY INDUSTRIAL PARK NO. 6 AS RECORDED IN LIBER 22 OF PLATS PAGES 5-8, MUSKEGON COUNTY RECORDS, CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN AND MORE ALSO DESCRIBED AS;

BEGINNING AT THE SOUTH 1/4 CORNER OF SAID SECTION 35 ALSO BEING THE SOUTHEAST CORNER OF LOT 69, PORT CITY INDUSTRIAL CENTER NO. 6 LIBER 22, PAGES 5-8, SAID POINT BEING THE POINT OF BEGINNING;

THENCE NORTH 89 DEGREES 14 MINUTES 02 SECONDS WEST (R=S89°59'00"W), A DISTANCE OF 633.62 FEET (R=634.53 FEET D=633.97 FEET) TO THE SOUTHWEST CORNER OF LOT 69 OF SAID PLAT;

THENCE NORTH 01 DEGREE 28 MINUTES 35 SECONDS EAST ALONG THE WEST LINE OF SAID LOT 69, A DISTANCE OF 889.87 FEET TO THE NORTHWEST CORNER OF SAID LOT 69 (R=N00°45'00"E R=891.68 FEET D=N00°40'22"E D=890.06 FEET);

THENCE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST, A DISTANCE OF 633.38 FEET TO THE NORTHWEST CORNER OF LOT 68 (R=89°56'00"E 633.30 FEET);

THENCE SOUTH 01 DEGREE 23 MINUTES 20 SECONDS WEST, A DISTANCE OF 99.95 FEET (D=S00°37'04"W 100.00 FEET);

THENCE SOUTH 89 DEGREES 06 MINUTES 57 SECONDS EAST (D & R=S89°56'00"E), A DISTANCE OF 149.54 FEET;

THENCE SOUTH 01 DEGREE 28 MINUTES 35 SECONDS WEST, A DISTANCE OF 788.13 FEET;

THENCE NORTH 89 DEGREES 15 MINUTES 10 SECONDS WEST (R=S89°53'00"W D=S89°55'56"W), A DISTANCE OF 141.58 FEET TO A NORTH 1/4 CORNER OF SECTION 2, T9N, R16W AS MONUMENTED BY F.F. SMITH & MID MICHIGAN ENGINEERING & SURVEY;

THENCE SOUTH 89 DEGREES 14 MINUTES 02 SECONDS WEST, A DISTANCE OF 7.91 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 15.64 ACRES, MORE OR LESS.

EXHIBIT 3

[Attached]

5/16/2022 4:04 PM

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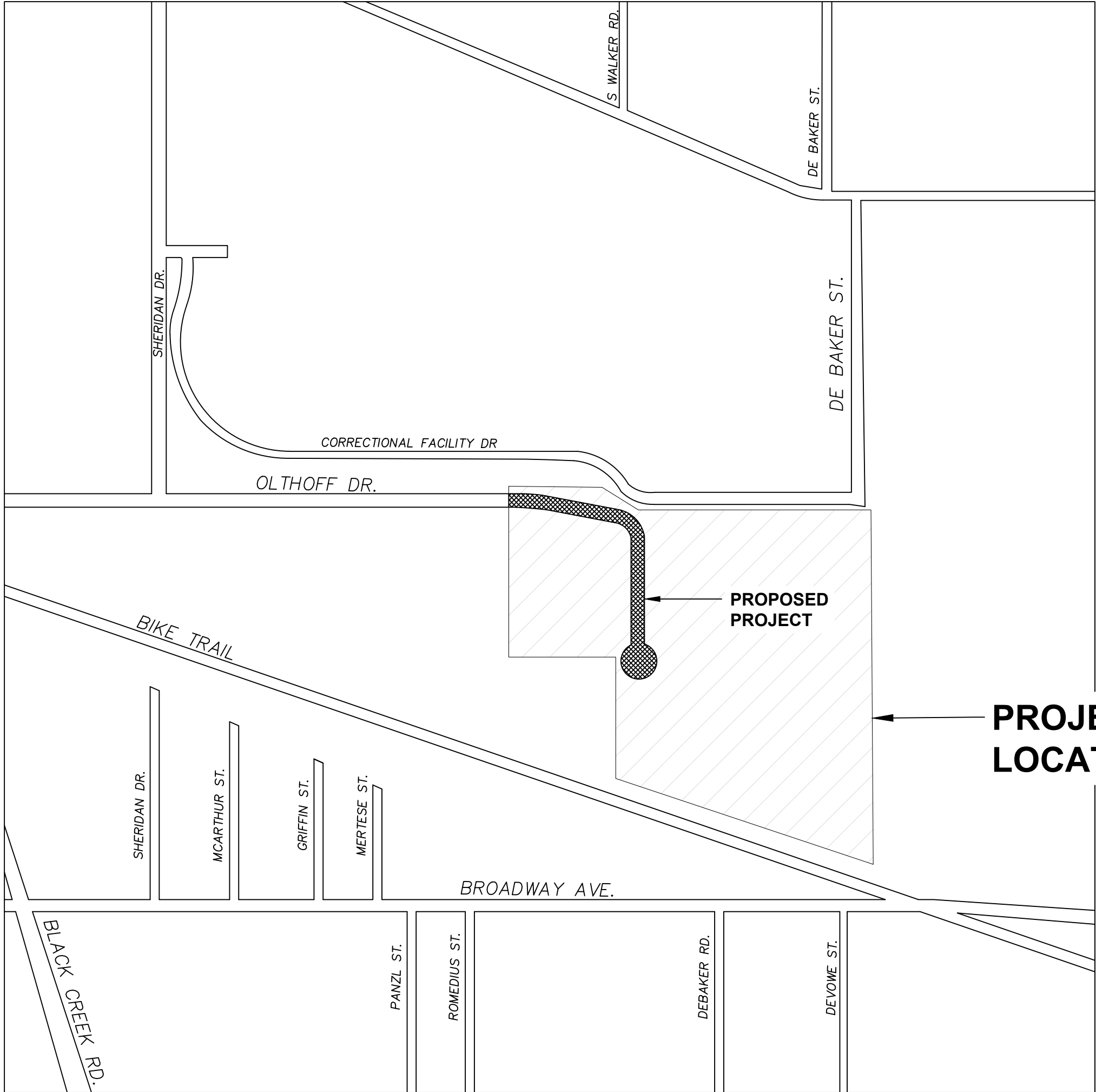
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Marion, Lucas, N

INDEX TO SHEETS

SHEET	DESCRIPTION
1	COVER SHEET
2	CROSS SECTIONS
3	DETAIL SHEET
4	DETAIL SHEET
5	EXISTING SITE PLAN
6	PROPOSED SITE PLAN
7	REMOVAL SHEET
8	ROAD IMPROVEMENTS - STA. 34+50 TO STA. 38+00
9	ROAD IMPROVEMENTS - STA. 38+00 TO STA. 42+00
10	ROAD IMPROVEMENTS - STA. 42+00 TO STA. 46+00
11	ROAD IMPROVEMENTS - STA. 46+00 TO STA. 51+00
12	UTILITY IMPROVEMENTS - STA.34+50 TO STA.38+00
13	UTILITY IMPROVEMENTS - STA.38+00 TO STA.42+00
14	UTILITY IMPROVEMENTS - STA.42+00 TO STA.46+00
15	UTILITY IMPROVEMENTS - STA.46+00 TO STA.51+00
16	UTILITY IMPROVEMENTS - SANITARY PIPE CONNECTION
17	CUL-DE-SAC DETAIL GRADES
18	PAVEMENT MARKING AND SIGNAGE PLAN

CITY OF MUSKEGON
PLAN AND PROFILE OF PROPOSED
INDUSTRIAL PARK ROADWAY
EXPANSION PROJECT
OLTHOFF DRIVE EXTENSION AND SITE IMPROVEMENT PLANS



VICINITY MAP
NO SCALE



GENERAL NOTES:

- UPON REQUEST AND APPROVAL, THE CONTRACTOR MAY OBTAIN A WATER SUPPLY FROM THE CITY OF MUSKEGON FIRE HYDRANTS AT NO COST, PROVIDED THAT THEY FOLLOW THE CONDITIONS OF THE CITY WATER DEPARTMENT.
- FOR PROTECTION OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL CALL MISS DIG, 1-800-482-7171, A MINIMUM OF THREE (3) WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO EXCAVATING IN THE VICINITY OF ANY UTILITY LINES. ALL MISS DIG PARTICIPATING MEMBERS WILL THUS BE NOTIFIED, THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING OWNERS, WHO MAY NOT BE PART OF THE MISS DIG ALERT SYSTEM.
- ALL PUBLIC UTILITIES HAVE BEEN SHOWN ON THE PLANS USING AVAILABLE INFORMATION, BUT ARE NOT GUARANTEED AS ACCURATE OR THAT UTILITIES OTHER THAN THOSE SHOWN ARE NOT PRESENT. THE CONTRACTOR SHALL CALL MISS DIG (1-800-482-7171) THREE (3) WORKING DAYS (EXCLUDING SAT., SUN., AND HOLIDAYS) BEFORE DIGGING.
- EXISTING TRAFFIC CONTROL SIGNS THAT NEED TO BE REMOVED TO ALLOW THE CONTRACTOR TO WORK WILL BE REMOVED BY THE CONTRACTOR AND STORED IN A SAFE PLACE TO AVOID DAMAGE. THE CONTRACTOR SHALL THEN REINSTALL THE SIGNS IN THEIR ORIGINAL LOCATION, OR AS DIRECTED BY THE ENGINEER, UPON COMPLETION OF THE CONSTRUCTION IN THAT AREA. REMOVAL AND REINSTALLATION OF THE SIGNS WILL BE INCLUDED IN THE BID ITEM OF "MINOR TRAF DEVICES." SIGNS THAT ARE DAMAGED OR LOST BY THE CONTRACTOR WILL BE REPLACED BY CITY FORCES, AND THE CONTRACTOR WILL PAY THE CITY FOR THE COST OF REPLACEMENT.
- THE CONTRACTOR SHALL SAWCUT ALL MEETS RELATIVE TO SIDEWALK OR PAVEMENT CONSTRUCTION, UNLESS WAIVED BY THE ENGINEER. PAYMENT FOR SAWCUTTING SHALL BE INCLUDED IN THE PAYMENT FOR THE BID ITEMS "CURB AND GUTTER, REM," AND "HMA SURFACE, REM." NO ADDITIONAL PAYMENT WILL BE ALLOWED FOR SAWCUTTING.
- THE CONTRACTOR SHALL PREVENT EROSION AND CONTROL SEDIMENTATION ASSOCIATED WITH THE PROJECT. CONTRACTOR SHALL KEEP SEDIMENTATION WITHIN THE RIGHT-OF-WAY AND OUT OF SURFACE WATERS, CONSTRUCT AND MAINTAIN TEMPORARY EROSION AND SEDIMENTATION CONTROLS (CONTROLS TO INCLUDE EROSION CONTROL, INLET PROTECTION, AND FABRIC DROPS ON ALL INLET STRUCTURES, NEW AND EXISTING), AND INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL REMOVE, ON A DAILY BASIS, SOIL TRACKED ONTO EXISTING PAVED ROADS, (VACUUM METHODS ARE PREFERRED BUT BROOM SWEEPING IS ACCEPTABLE, IF THE MATERIAL IS REMOVED). THE CONTRACTOR SHALL INSPECT ALL SOIL EROSION / SEDIMENTATION CONTROL MEASURES ON A WEEKLY BASIS OR AFTER EACH RAIN FALL EVENT. CONTRACTOR SHALL CLEAN, REPAIR, OR REPLACE ANY SOIL EROSION / SEDIMENTATION CONTROL MEASURE, AS NECESSARY, TO ENSURE PROPER FUNCTION. ALL SOIL EROSION / SEDIMENTATION CONTROLS SHALL REMAIN UNTIL ALL DISTURBED AREAS ARE STABILIZED. ALL SOIL EROSION / SEDIMENTATION CONTROLS (EXCEPT FOR THE EROSION CONTROL, INLET PROTECTION, AND FABRIC DROP), SHALL BE INCLUDED WITH THE BID ITEM "PROJECT CLEAN UP," AND NO OTHER ADDITIONAL PAYMENT SHALL BE MADE, THEREFOR.
- PAYMENT FOR GRADING AND COMPACTING THE CONC. CURB AND GUTTER AND HAND PATCHING SHALL BE INCLUDED IN PAYMENT FOR THE BID ITEMS "CURB AND GUTTER, CONC, DET F4" AND "HAND PATCHING."

BENCHMARK:

HORIZONTAL DATUM: NAD83 (2011) STATE PLANE COORDINATES SOUTH ZONE 2113
VERTICAL DATUM: NAVD88 (GEOID18)

BM - 300
ELEV. 638.57'

(CHECKED WITH CNTRL #3000 AND #3001)

NOTE:

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION, LATEST EDITION, THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD), LATEST EDITION, AND THE PROJECT SPECIFICATIONS.

MUSKEGON



West Michigan's Shoreline City
www.shorelinecity.com

UTILITIES

ELECTRIC

JOEL BROWN
CONSUMERS ENERGY
700 E STERNBERG RD
MUSKEGON, MI 49441
(231) 332-2682

CABLE

JIM STITZEL
COMCAST
700 W BROADWAY AVE
MUSKEGON, MI 49441
(810) 217-1642

GAS

VINCENT DUCA
DTE ENERGY
2359 OLTHOFF DR
MUSKEGON, MI 49444
(231) 578-0488 (CELL)

TELEPHONE

DAVID B. FLERMOEN
FRONTIER COMMUNICATIONS
860 TERRACE ST
MUSKEGON, MI 49440
(231) 727-1319

WATER & SEWER

DAVE BAKER
CITY OF MUSKEGON - DPW
1350 E KEATING AVE
MUSKEGON, MI 49442
(231) 724-4100

FIBER OPTIC

ERICA FILKINS
US SIGNAL COMPANY, LLC
201 IONIA AVE SW
GRAND RAPIDS, MI 49503
(616) 233-7144



3 WORKING DAYS
EXCLUDING SAT, SUN & HOLIDAYS

BEFORE YOU DIG
CALL MISS DIG

Know what's below.
Call before you dig.

DESCRIPTION OF PROJECT

THIS PROJECT INCLUDES THE CONSTRUCTION OF 0.29 MILES OF NEW ROAD AND THE EXPANSION OF SANITARY SEWER, WATERMAIN, AND STORM SEWER SYSTEMS FROM THE EXISTING WEST OLTHOFF DRIVE ALIGNMENT TO THE APPROXIMATE MIDDLE OF THE FUTURE INDUSTRIAL PARK DEVELOPMENT. ADDITIONALLY, THIS PROJECT INCLUDES SOME SITE IMPROVEMENTS FOR THE INDUSTRIAL PARK EXPANSION.

CITY APPROVAL
CITY OF MUSKEGON, MICHIGAN

BY: _____ DATE _____
LEO EVANS, P.E., DIRECTOR OF PUBLIC WORKS



HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD NE
GRAND RAPIDS, MI

SUITE 100
49506

PREPARED UNDER THE SUPERVISION OF:

RANDY WILCOX, P.E., PROJECT MANAGER

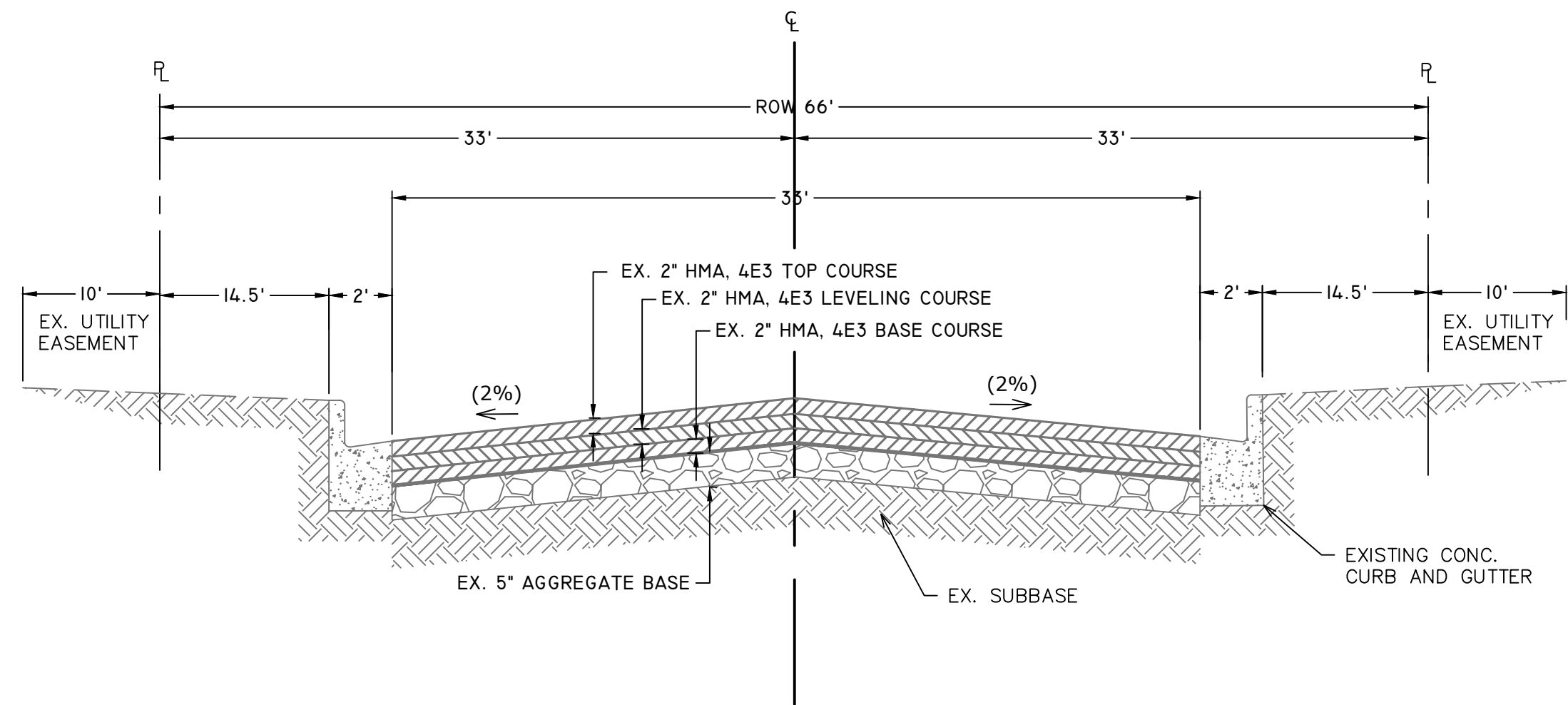
DATE

Project File No.
20210307

LL Notes No.

GPF No.

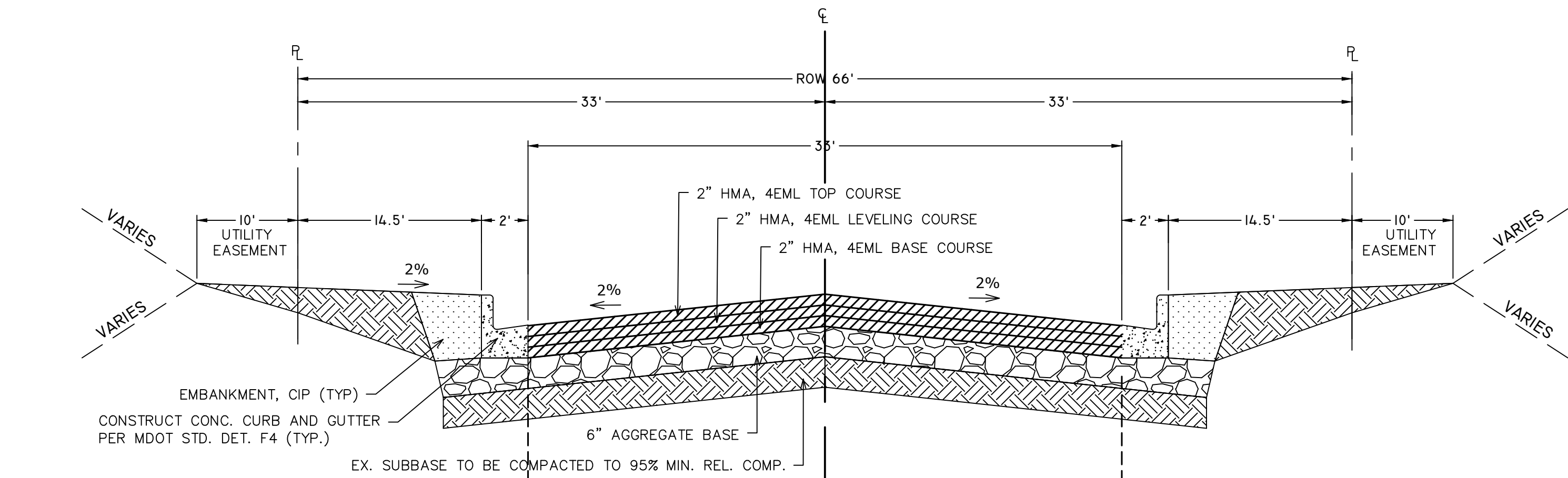
Sheet No.
1 of 18



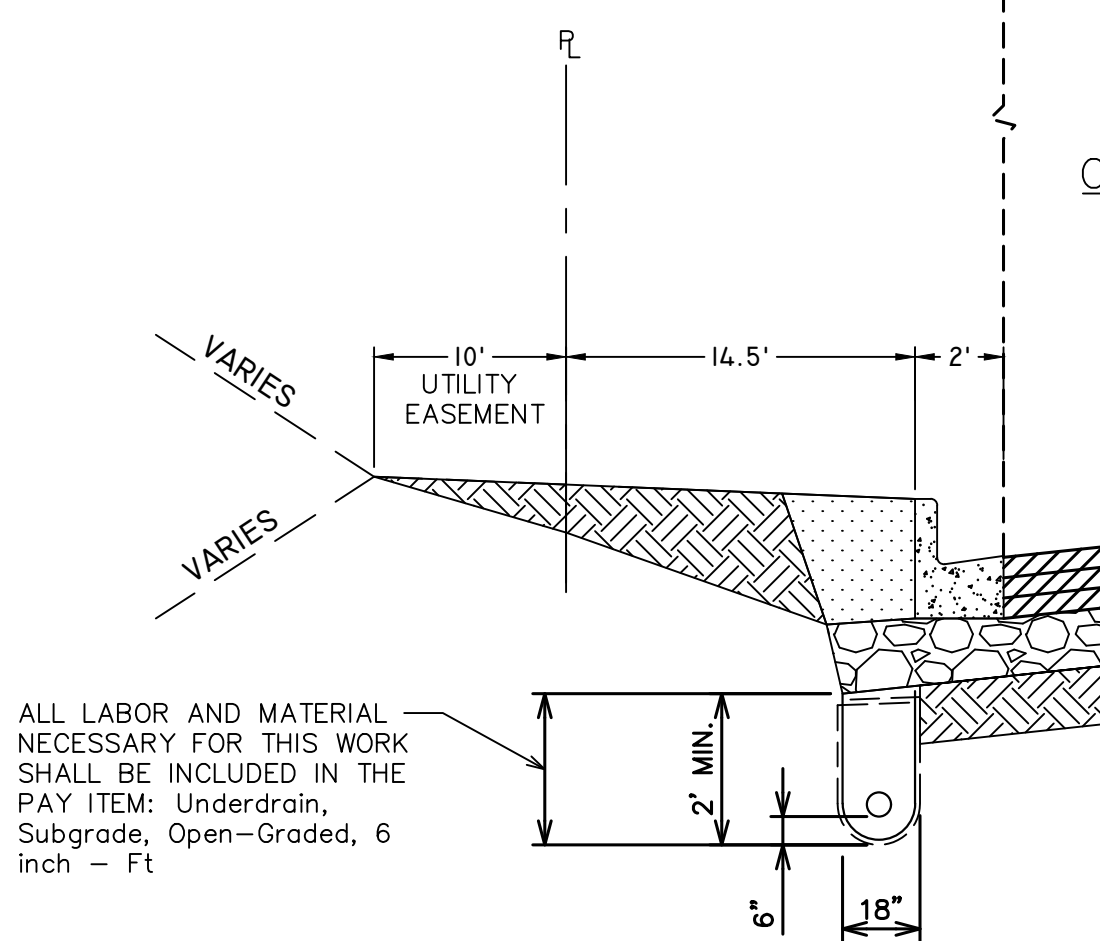
EXISTING OLTHOFF DRIVE CROSS SECTION
STA 34+50 TO 36+00

HMA APPLICATION TABLE.			
HMA MIX	RATE	PERFORMANCE GRADE	
HMA, 4EML (TOP COURSE)	110# / SYD	70-28(P)	2 INCH - ONE LIFT (AWI 260, MIN)
HMA, 4EML (LEVEL COURSE)	110# / SYD	64-28	2 INCH - ONE LIFT
HMA, 4EML (BASE COURSE)	110# / SYD	58-22	2 INCH - ONE LIFT
HAND PATCHING	110# / SYD	64-28	3 INCH - TWO LIFTS

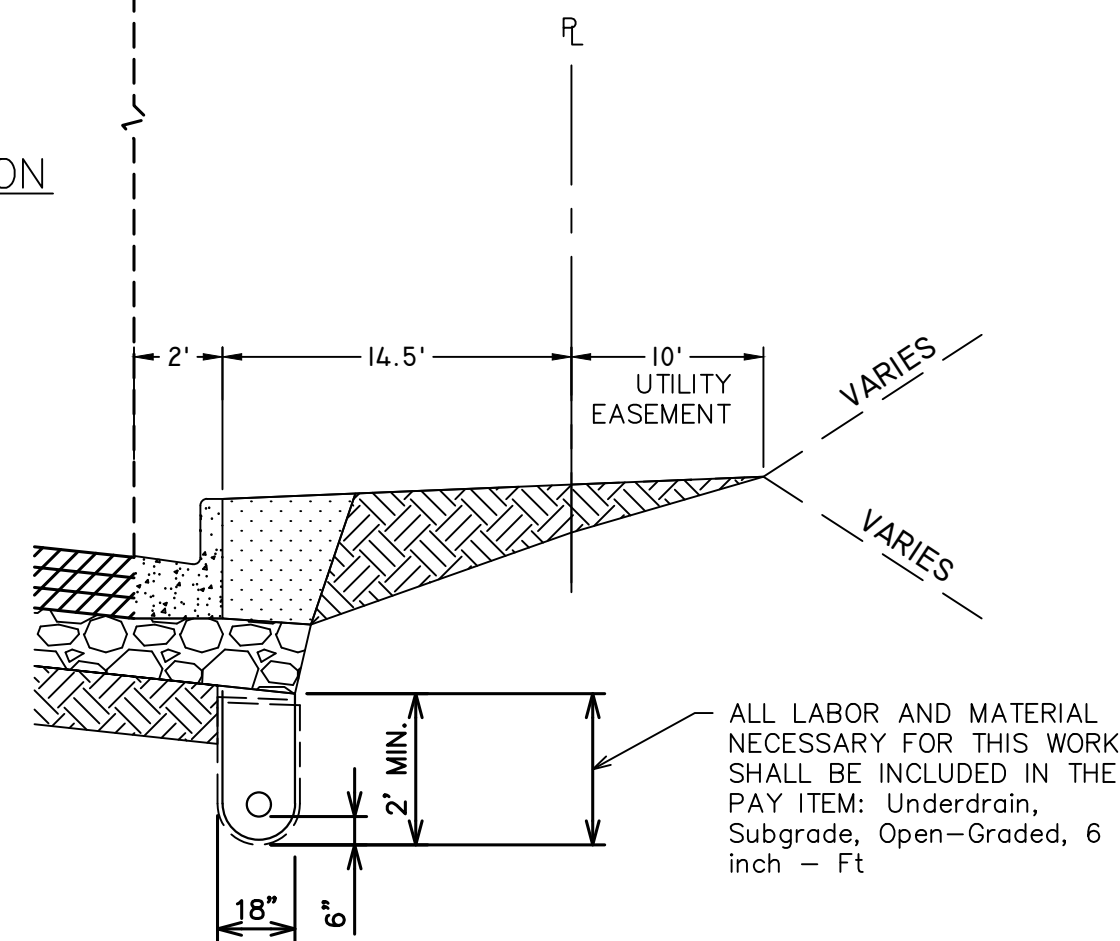
HMA BOND COAT, SS-IH, AT 0.05 GAL/SY, SHALL BE PLACED BETWEEN EACH LIFT. THE COST IS INCLUDED WITH THE "HMA, 4E3" BID ITEM.



OLTHOFF DRIVE EXTENSION CROSS SECTION
STA 34+50 TO 49+27



UNDERDRAIN DETAIL
STA 40+21 TO 49+24



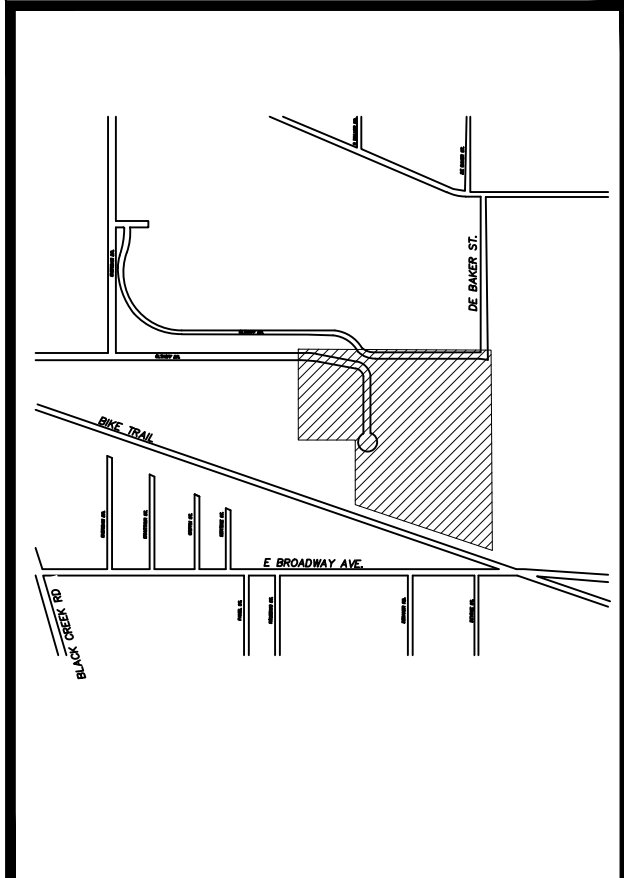
UNDERDRAIN DETAIL
STA 40+20 TO 49+24



**HUBBELL, ROTH & CLARK, INC**
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI. 49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)



DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	

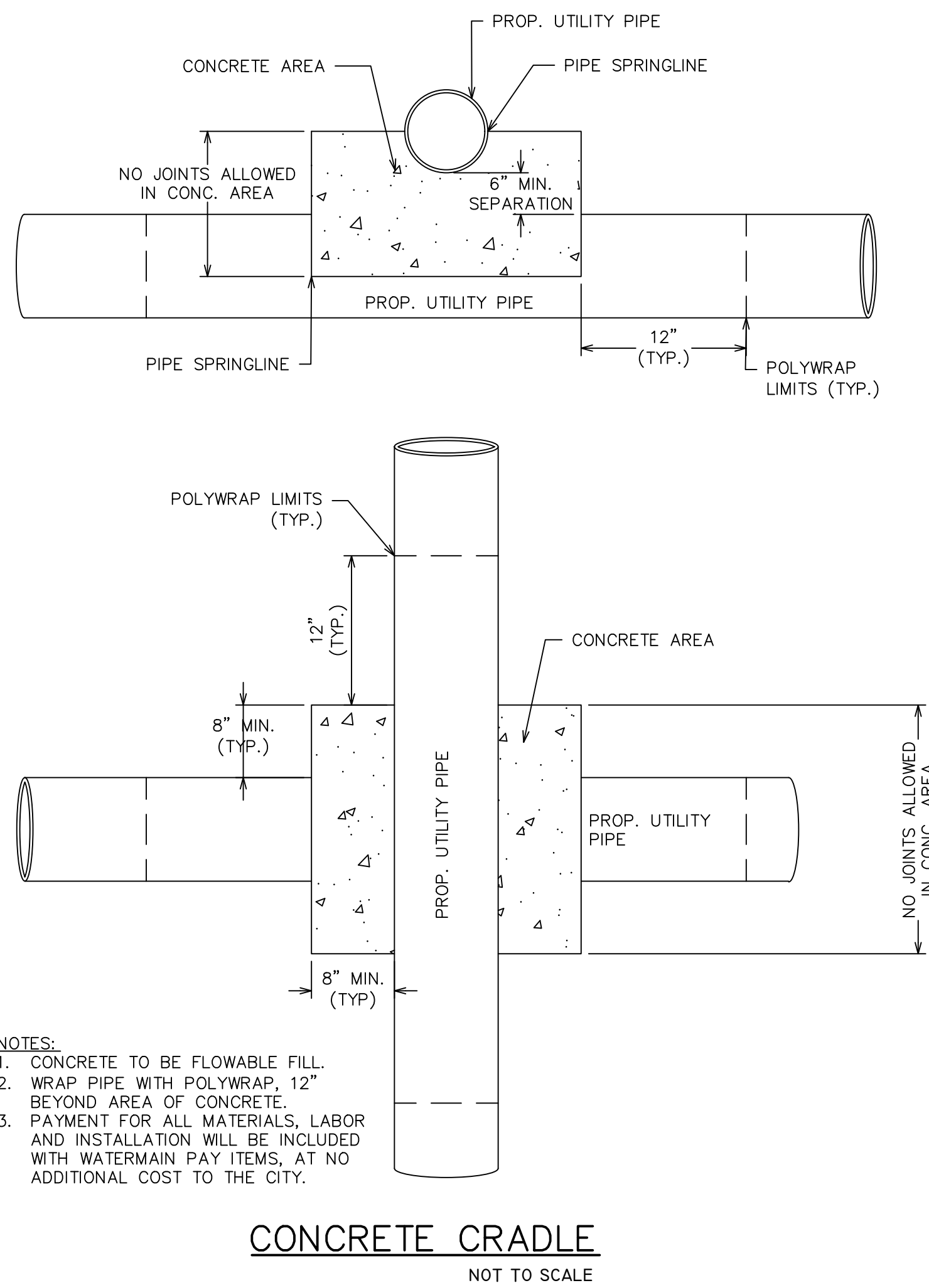
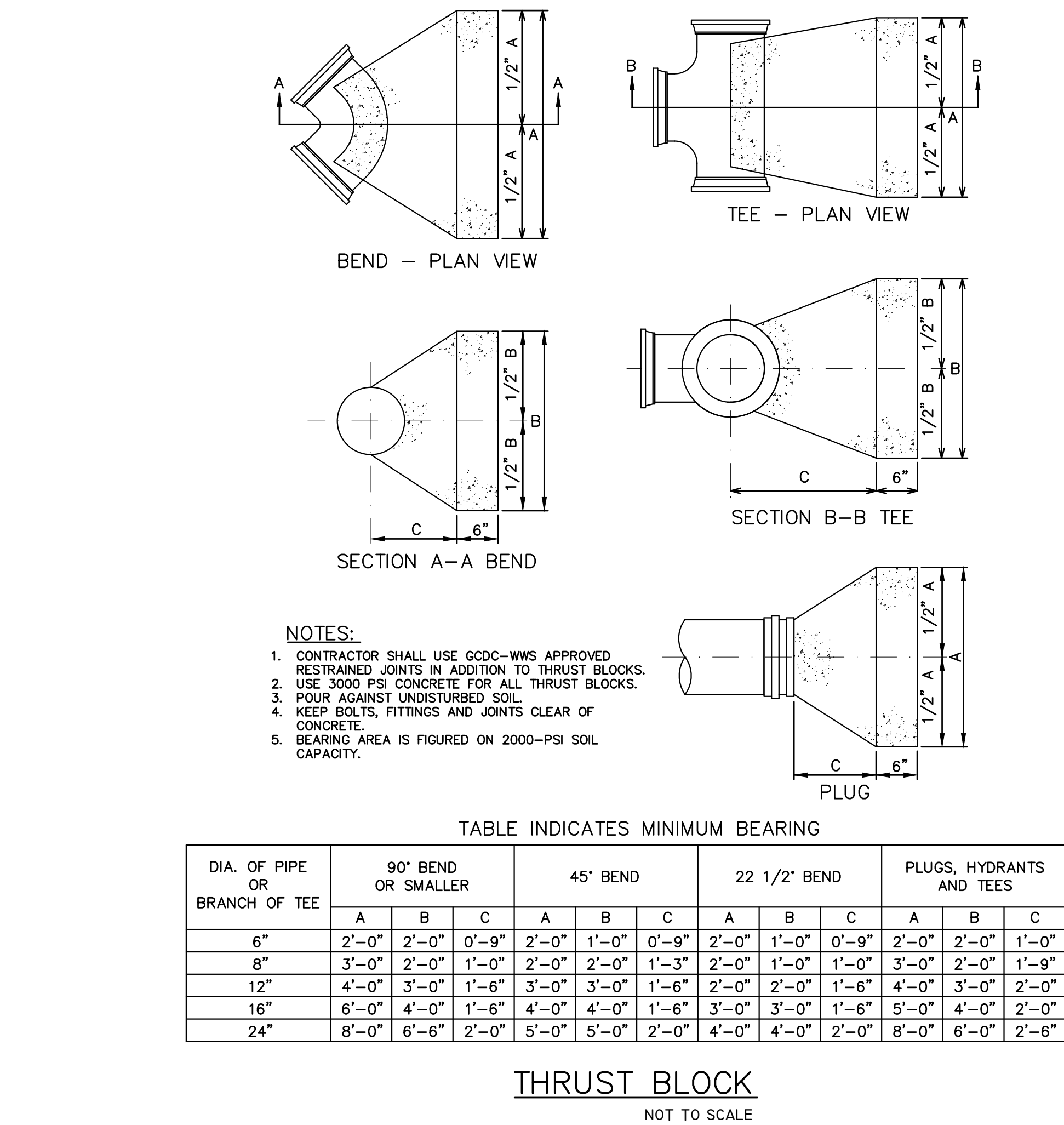
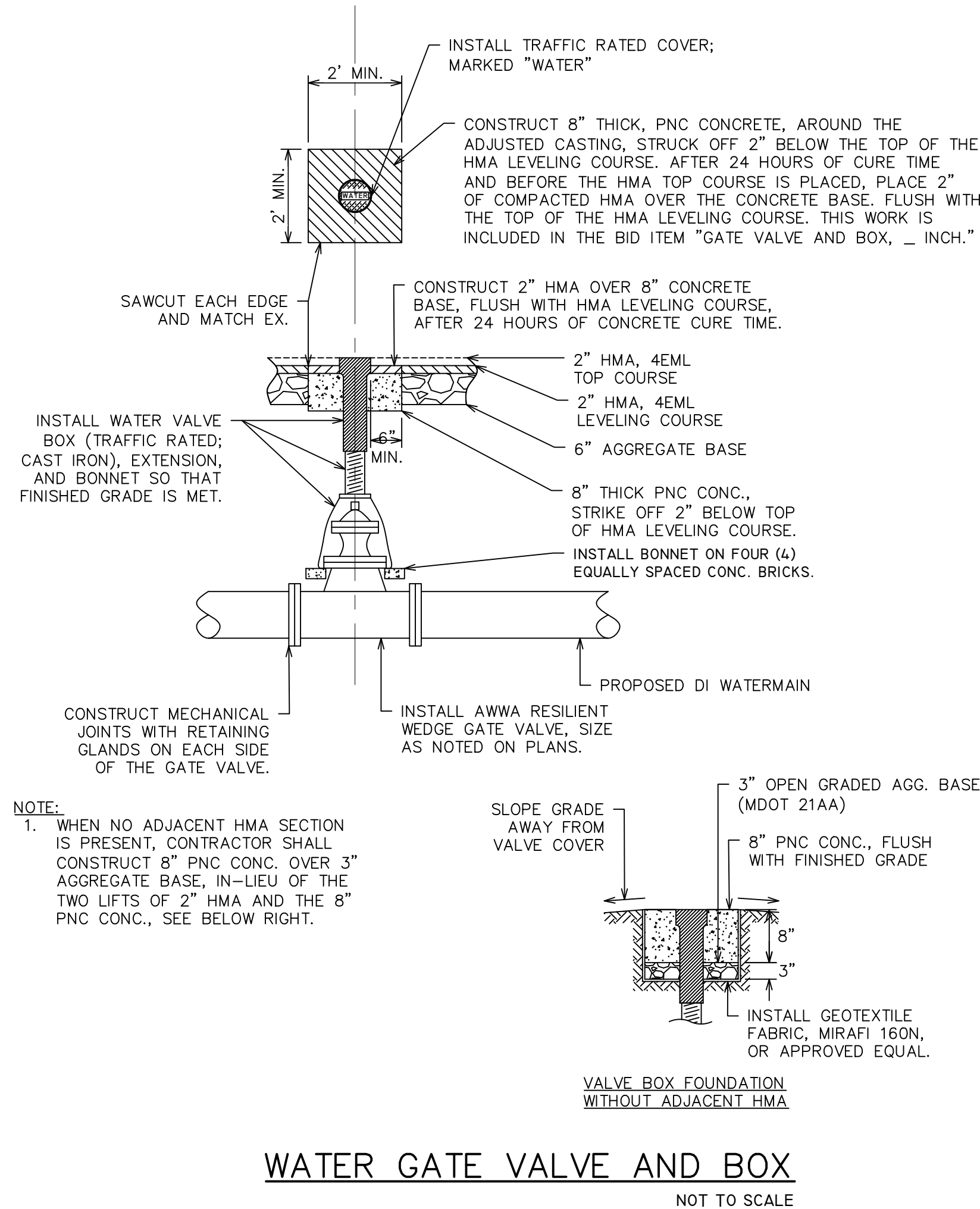
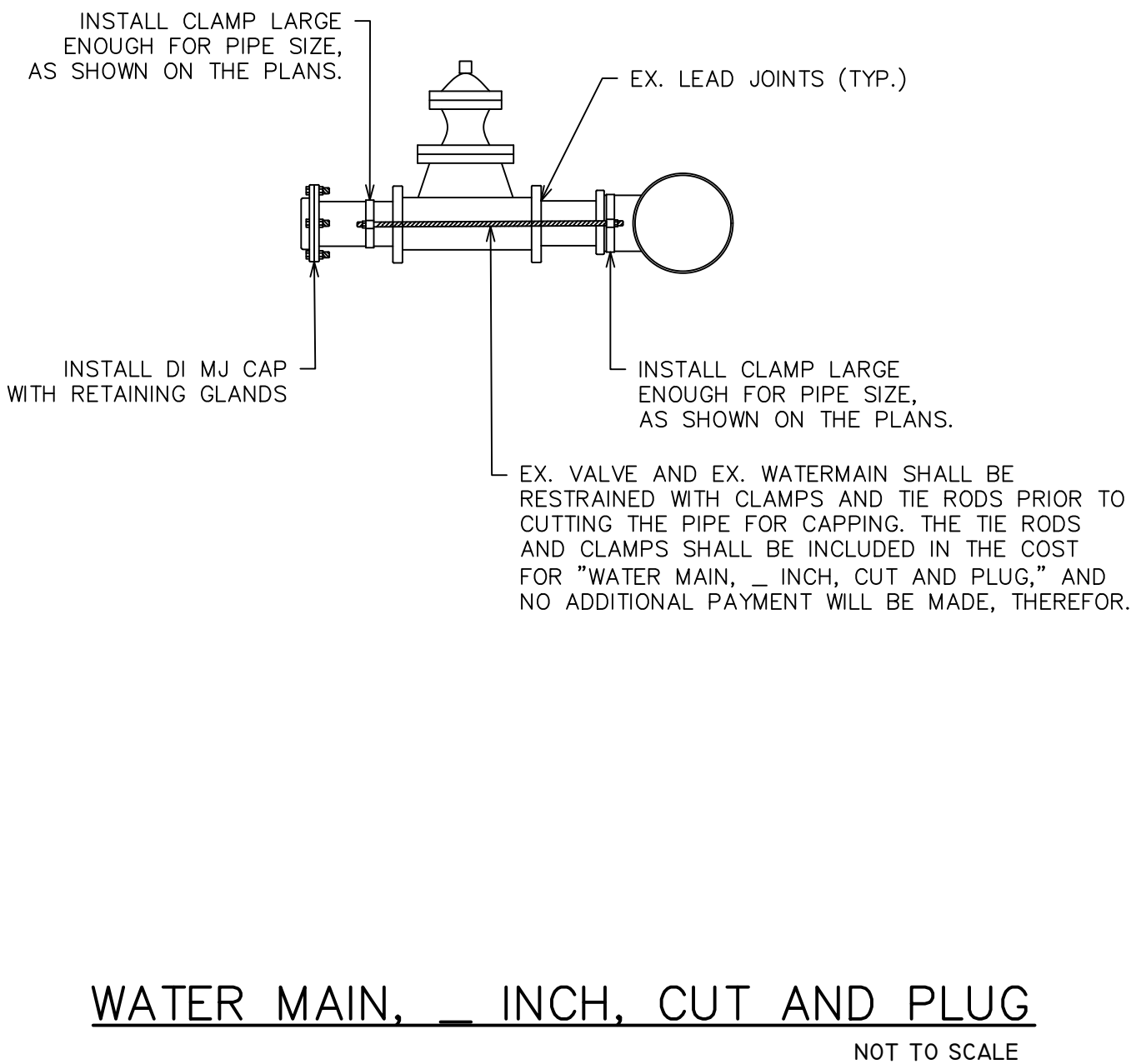
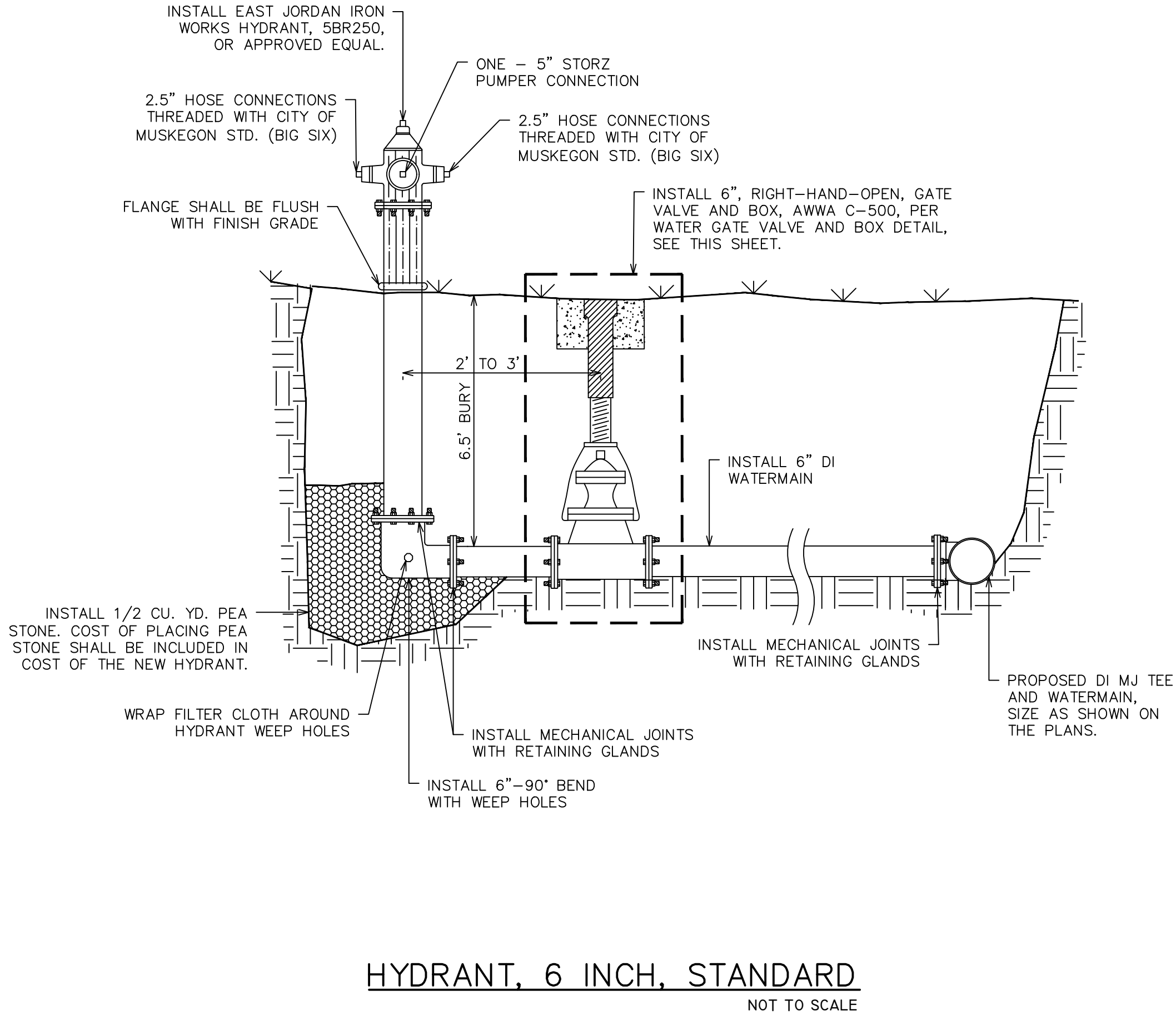


CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION

CROSS SECTIONS

HRC JOB NO. 20210307	SCALE
DATE May 2022	SHEET NO. 2 OF 18

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Marion, Lucas, N



PIPE RESTRAINT SCHEDULE									
PIPE SIZE	LENGTH OF RESTRAINT REQUIRED * (FEET)								DESIGN STRENGTH OF RESTRAINT REQ'D (KIPS)**
	22 1/2°	33 3/4°	45°	56 1/4°	67 1/2°	78 3/4°	90° TEE	45°	90° or TEE
6"	4'	8'	14'	20'	30'	37'	47'	3.0	6.0
8"	5'	10'	19'	28'	40'	52'	64'	4.0	12.0
10"	6'	14'	23'	36'	49'	63'	78'	5.0	18.0
12"	8'	17'	28'	42'	58'	75'	93'	8.0	26.0
14"	9'	18'	32'	47'	66'	87'	107'	10.0	36.0
16"	10'	20'	34'	51'	72'	94'	116'	14.0	46.0
18"	10'	22'	38'	58'	81'	105'	131'	18.0	59.0
20"	10'	22'	39'	59'	81'	106'	131'	22.0	73.0
24"	12'	26'	44'	68'	95'	123'	153'	31.0	103.0
30"	14'	31'	53'	79'	111'	143'	180'	47.0	162.0
36"	16'	36'	62'	93'	130'	169'	210'	69.0	234.0
42"	17'	39'	67'	101'	141'	184'	228'	93.0	319.0
48"	19'	43'	75'	113'	157'	206'	255'	123.0	417.0

* IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE, AT WHICH ONLY THE BRANCH WHERE FLOW CHANGES DIRECTION.
** IF THE RODS ARE USED, ADD 1/8" TO BAR DIA. AS CORROSION ALLOWANCE.

BASIS OF DESIGN FOR ABOVE TABLE:

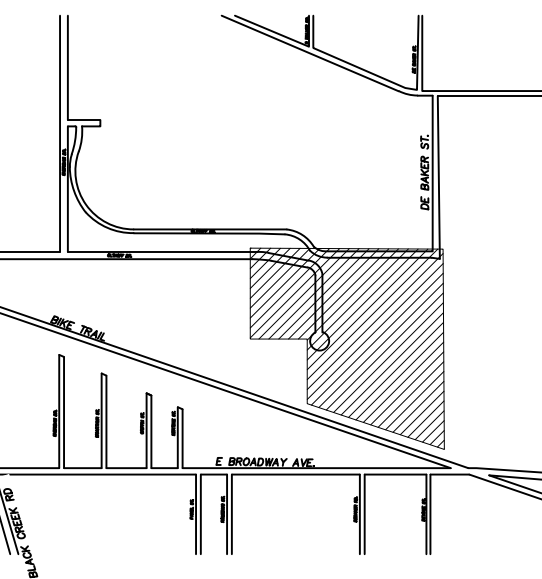
- COVER OVER PIPE = 5.0 FEET MINIMUM
- EARTH FRICTION COEFFICIENT = 0.4/1.5 SAFETY FACTOR = 0.26

NOTE
THE ABOVE LENGTH OF RESTRAINT REQUIRED IS MINIMUM. FOR LESS COVER OR POOR SOIL CONDITIONS, THE RESTRAINT LENGTH SHALL INCREASE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.



HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI. 49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	

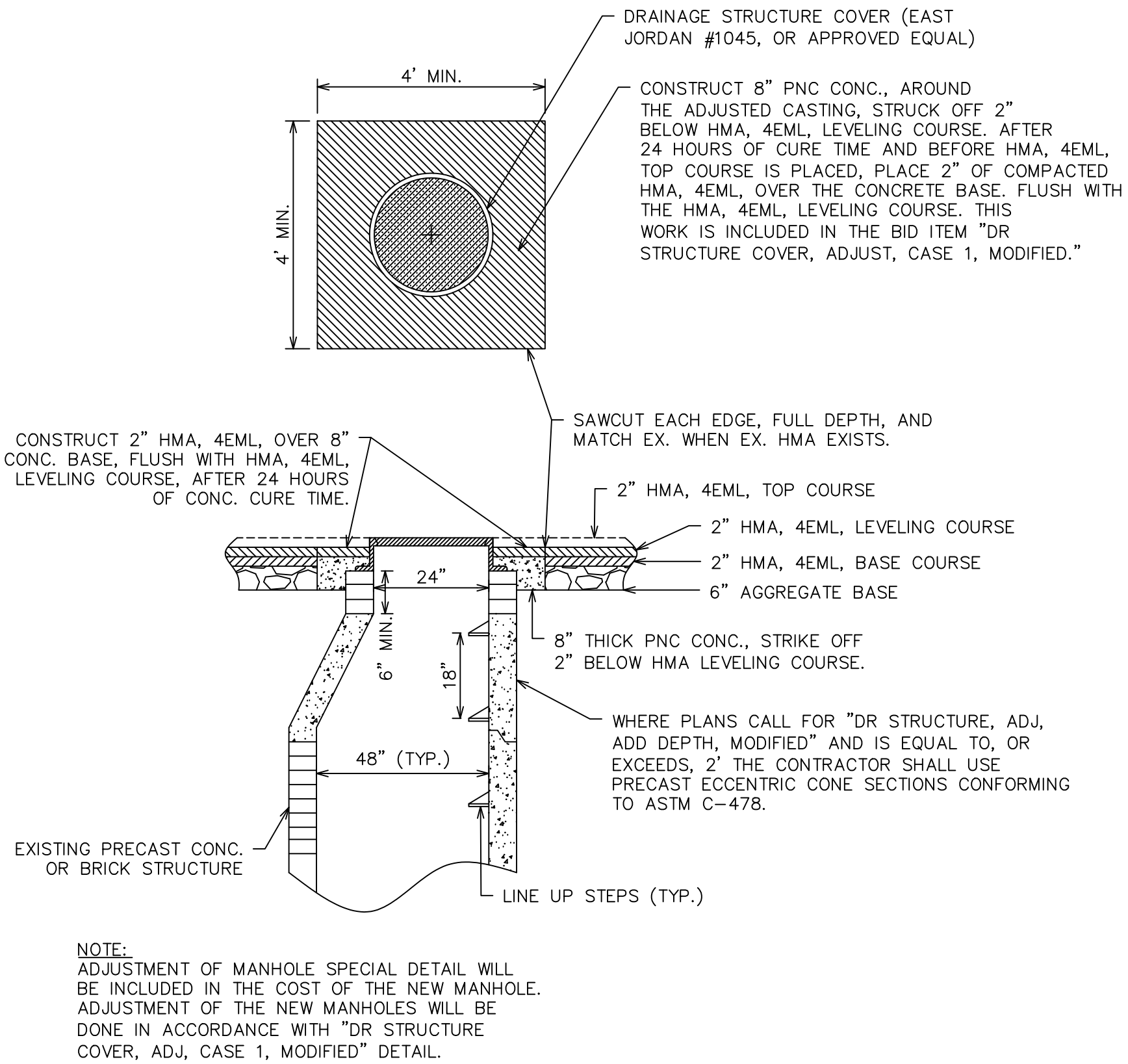


CITY OF MUSKEGON
OLTHOFF DRIVE
EXTENSION

DETAIL SHEET

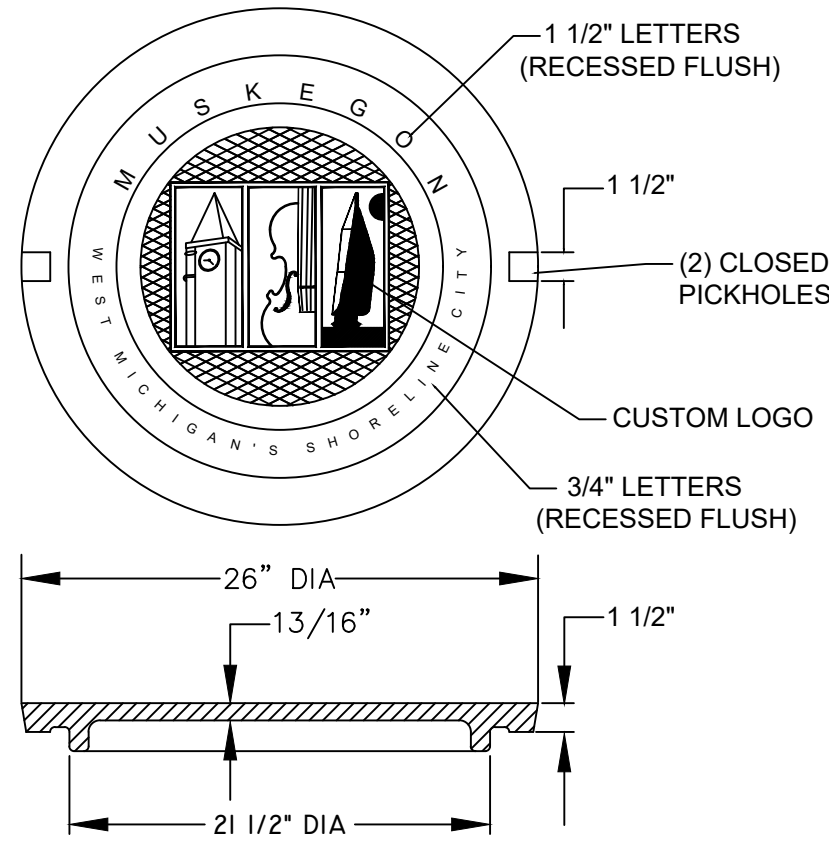
HRC JOB NO. 20210307	SCALE
DATE May 2022	SHEET NO. 3 OF 18

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Marion, Lucas, N



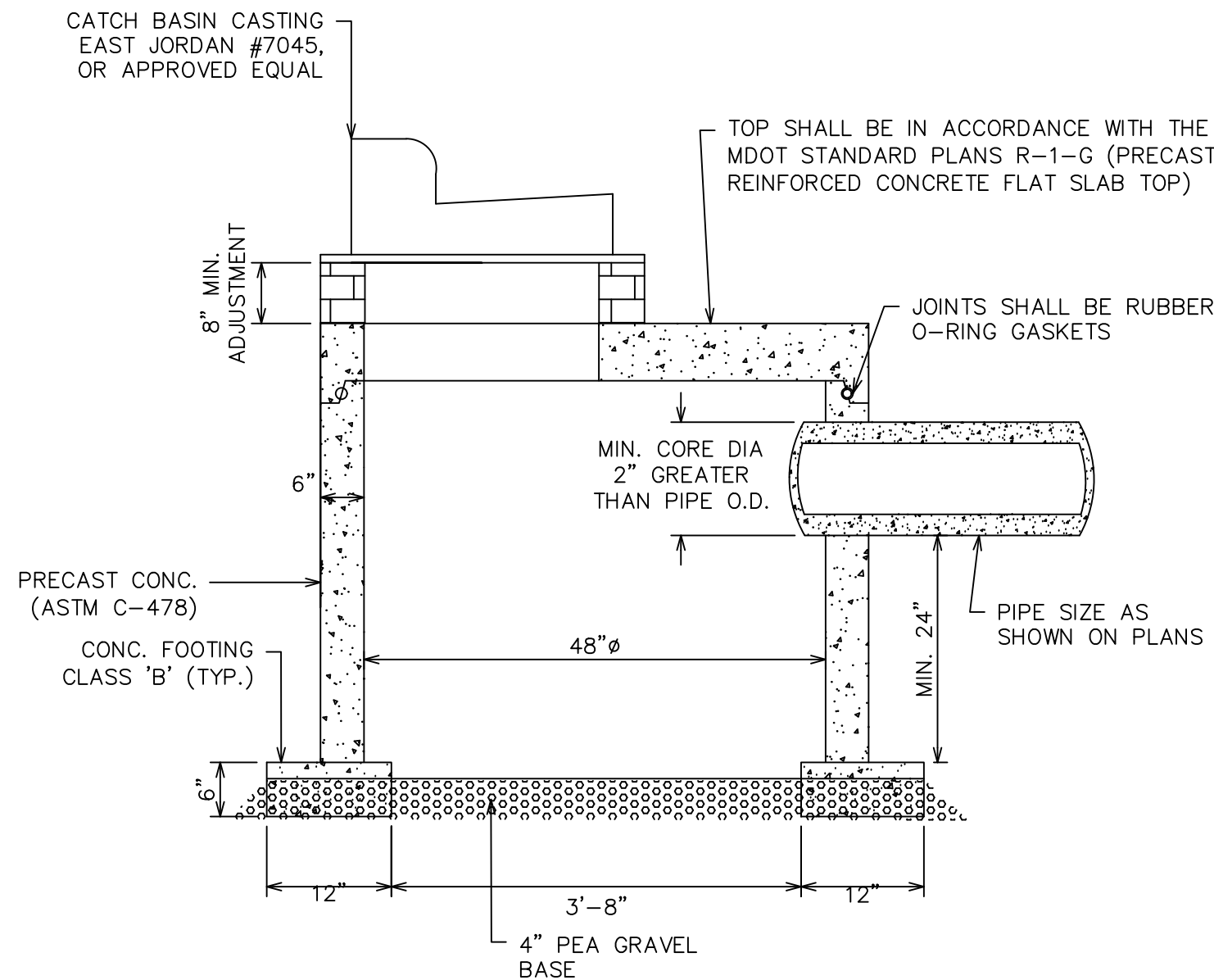
DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

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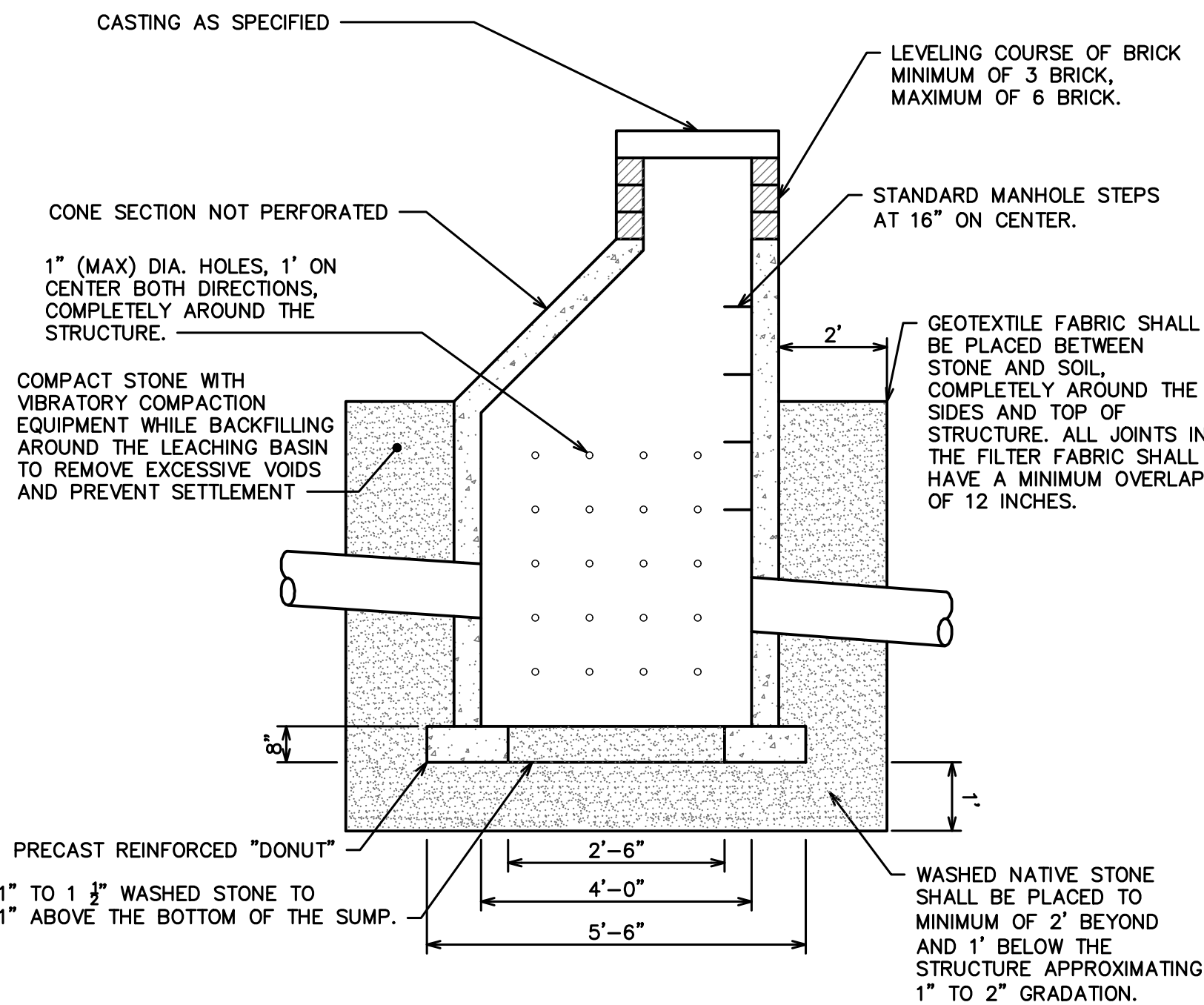
MANHOLE COVER

NO SCALE



CATCH BASIN, SPECIAL, 48 INCH DIA DETAIL

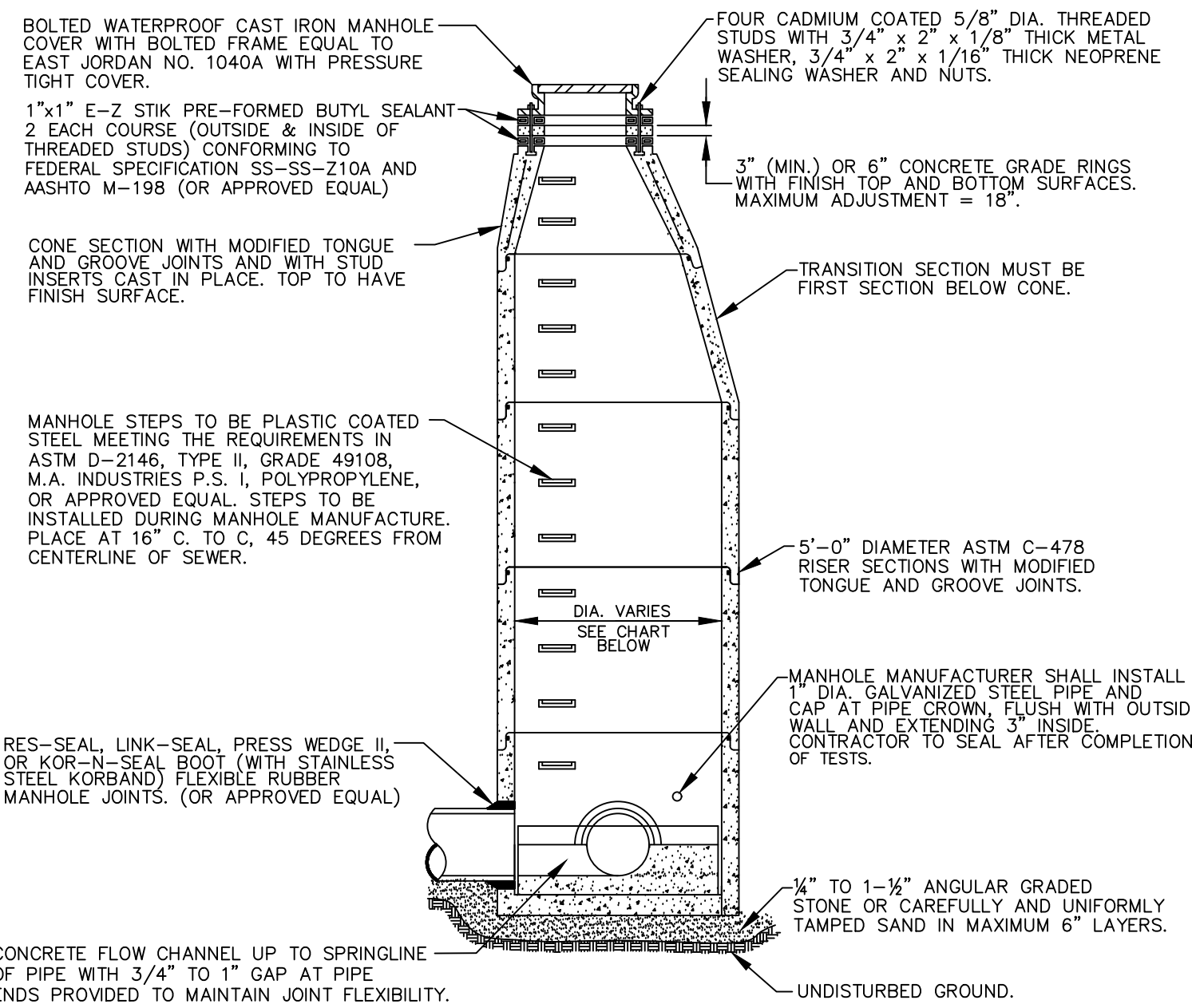
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LEACHING BASIN DETAIL

NO SCALE

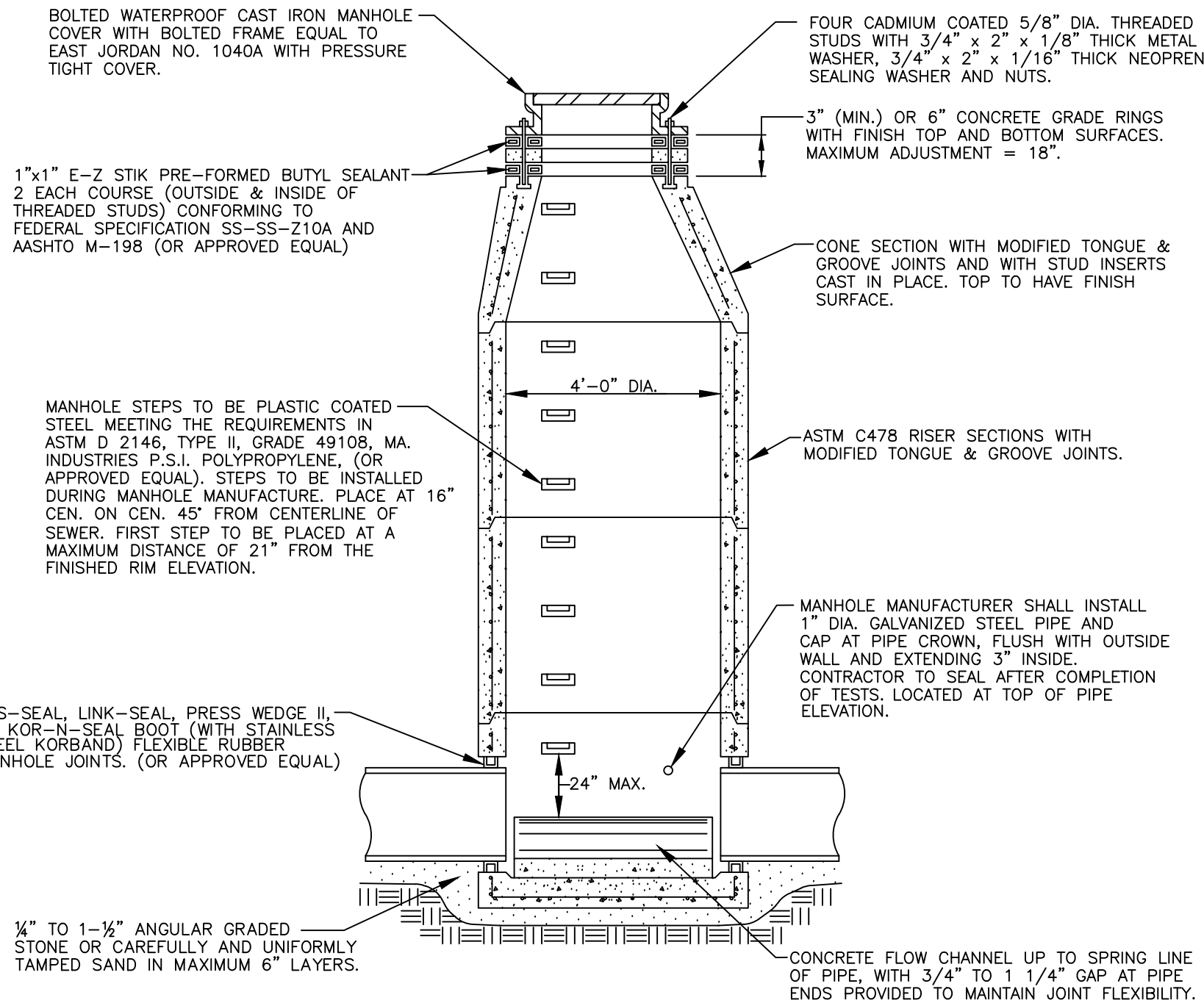
NOTE: ALL ITEMS INCLUDED IN: LEACHING BASIN, 48 INCH DIA



MANHOLE SIZING CHART

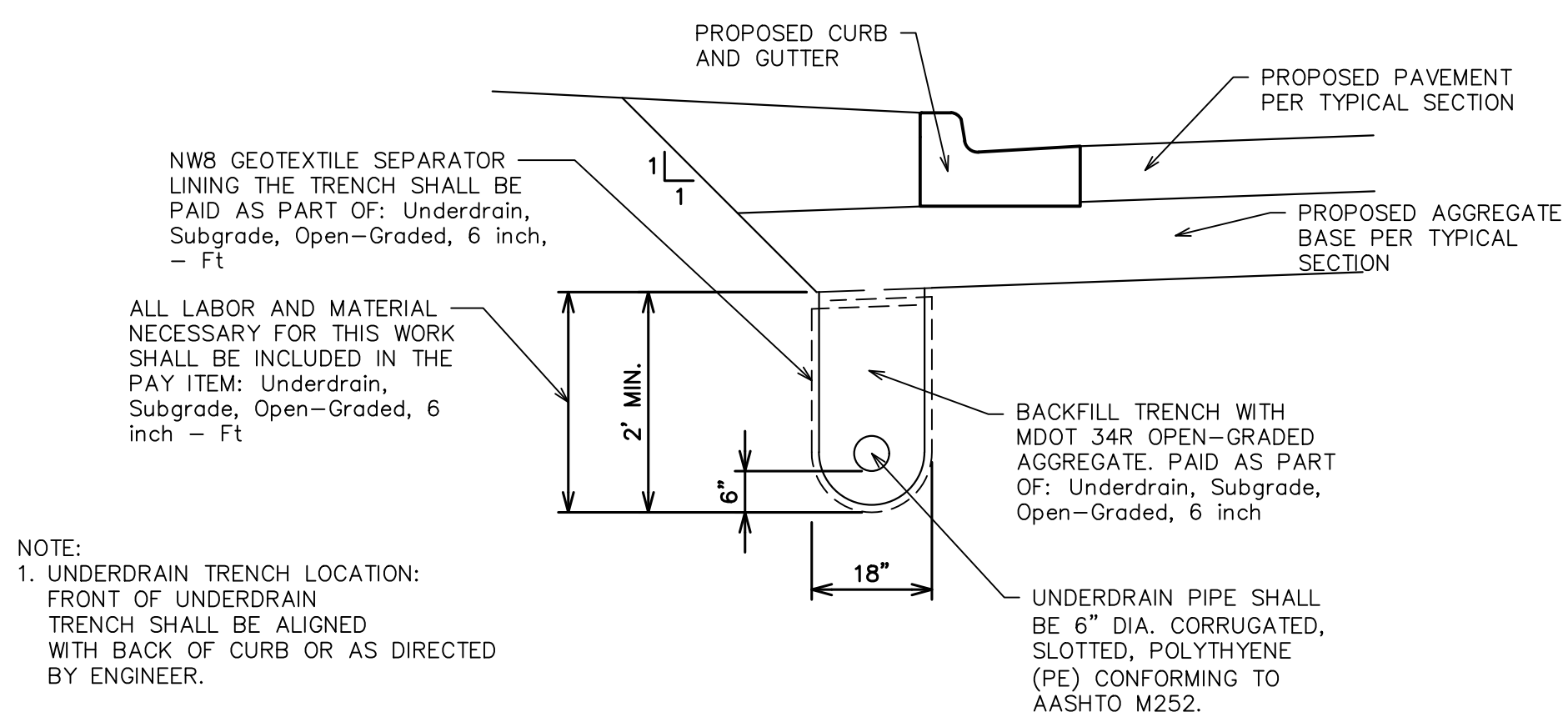
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
5'	36"	24"
6'	42"	36"
7'	60"	42"

STANDARD OVERSIZED MANHOLE



STANDARD MANHOLE

MAX. PIPE SIZE FOR STRAIGHT THRU INSTALLATION	MAX. PIPE SIZE FOR RIGHT ANGLE INSTALLATION
24"	18"



UNDERDRAIN, SUBGRADE, OPEN-GRADED, 6 INCH



West Michigan's Shoreline City
www.shorelinecity.com

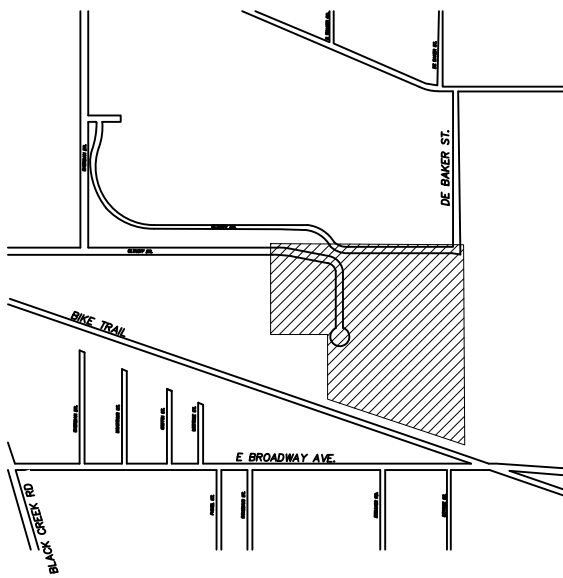
HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI. 49506

PHONE: (616) 454-4286
FAX: (616) 454-4278

WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)



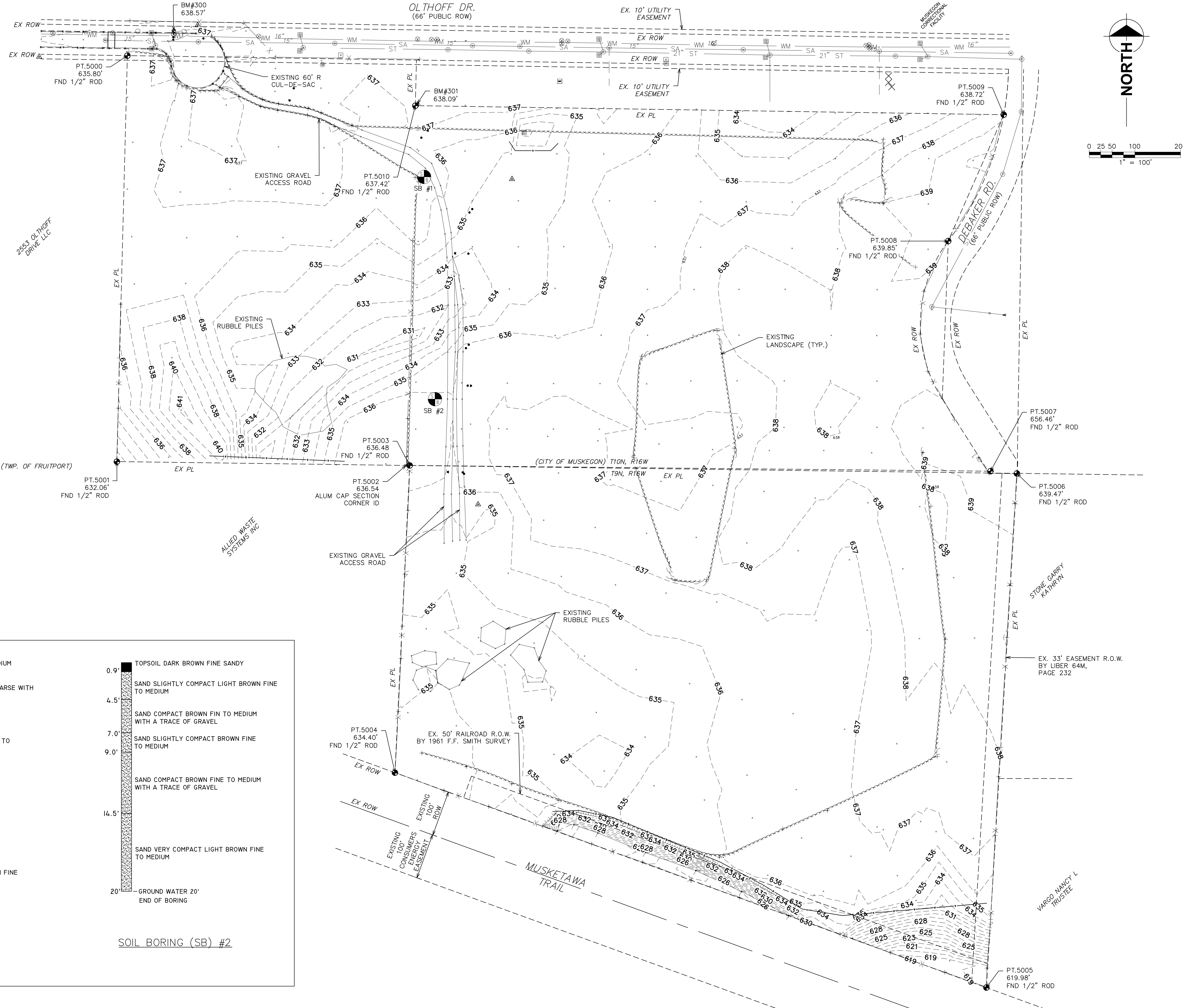
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DESIGNED	
DRAWN	
CHECKED	
APPROVED	



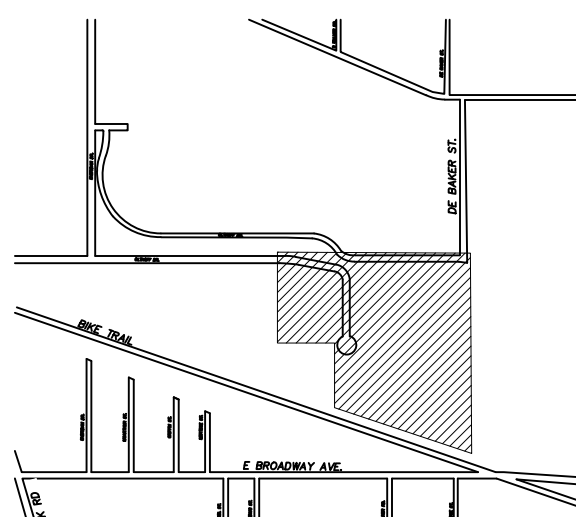
CITY OF MUSKEGON
OLTHOFF DRIVE
EXTENSION

DETAIL SHEET

HRC JOB NO. 20210307	SCALE
DATE May 2022	SHEET NO. 4 OF 18



DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
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APPROVED	

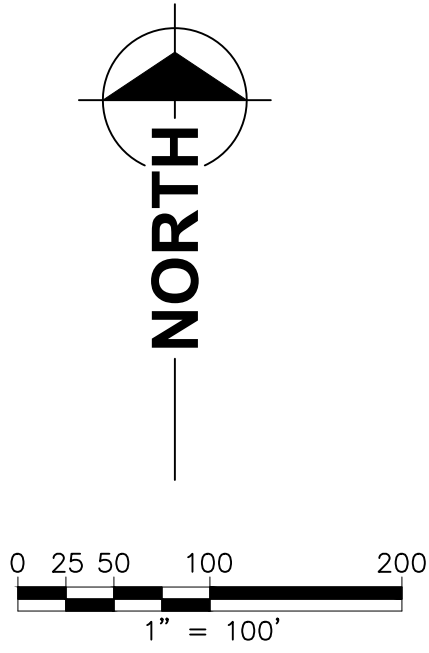
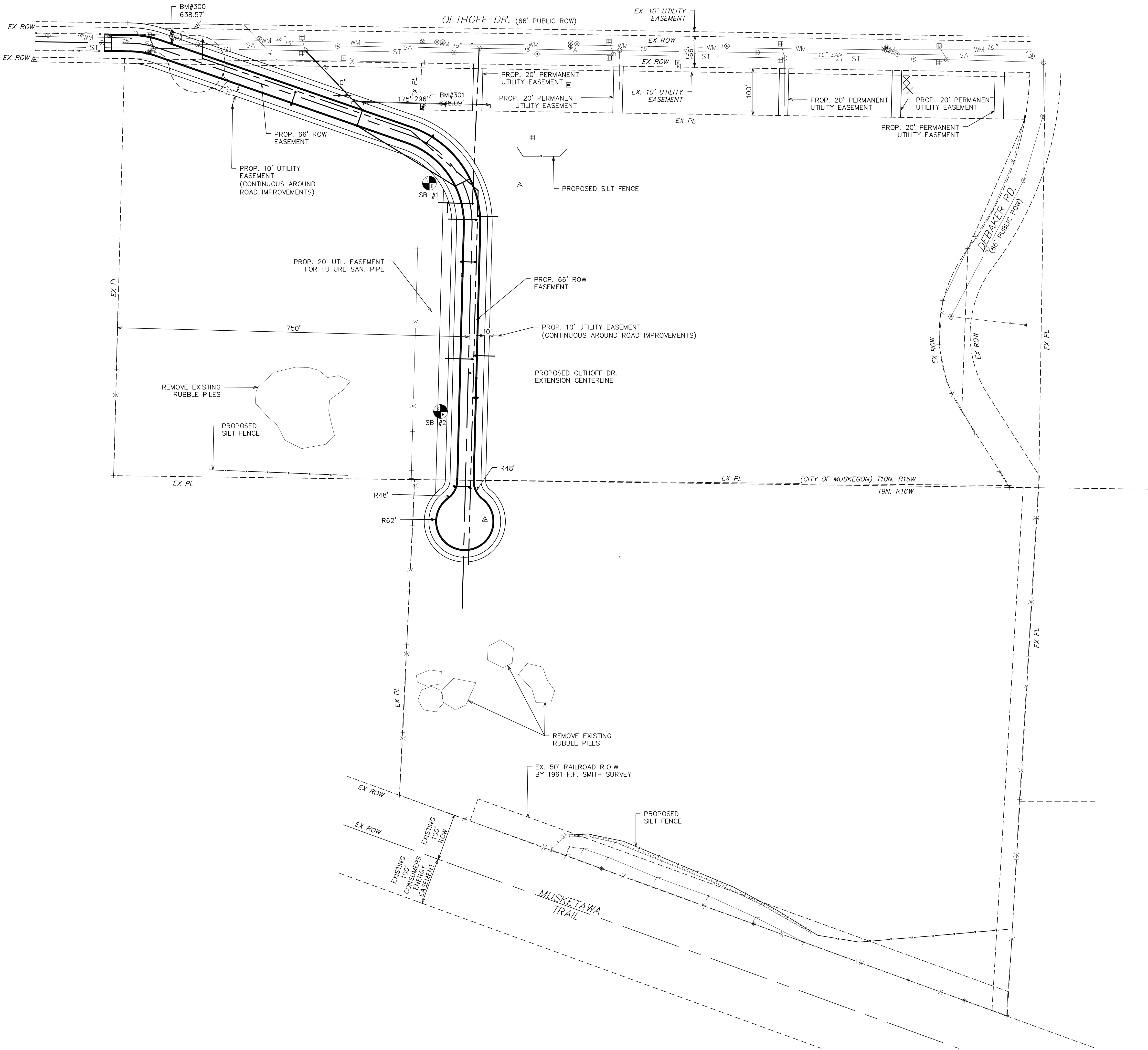


**CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION**

EXISTING SITE PLAN

HRC JOB NO. 20210307	SCALE 1"=100'
DATE May 2022	SHEET NO. 5 OF

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V:\202103\20210307\C\Sheets\Survey.dwg
Marion, Lucas, N



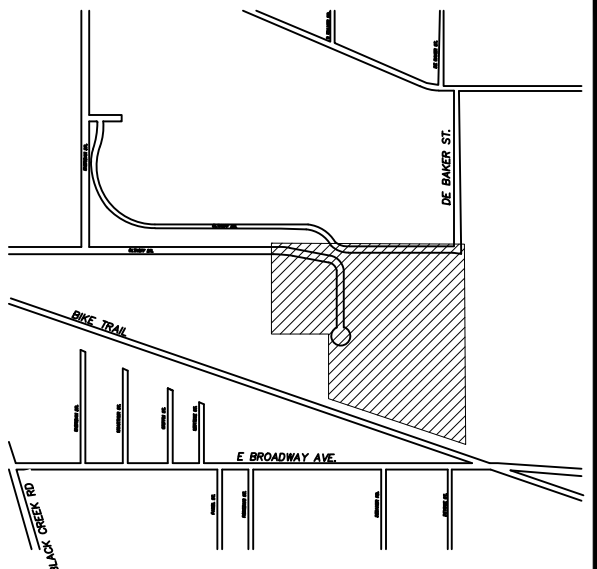
QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
1	LSUM	Mobilization, Max
4060	Cyd	Excavation, Earth
1	LSUM	Site Grading
1421	Ft	Erosion Control, Silt Fence
1	LSUM	Project Cleanup, Modified



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GRAND RAPIDS, MI 49506
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FAX: (616) 454-4278
WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)

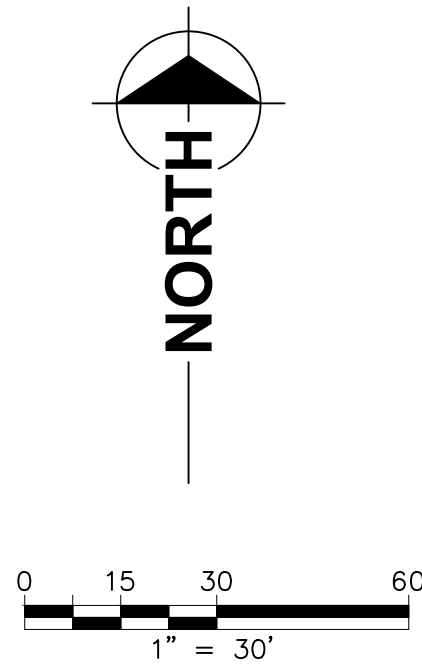
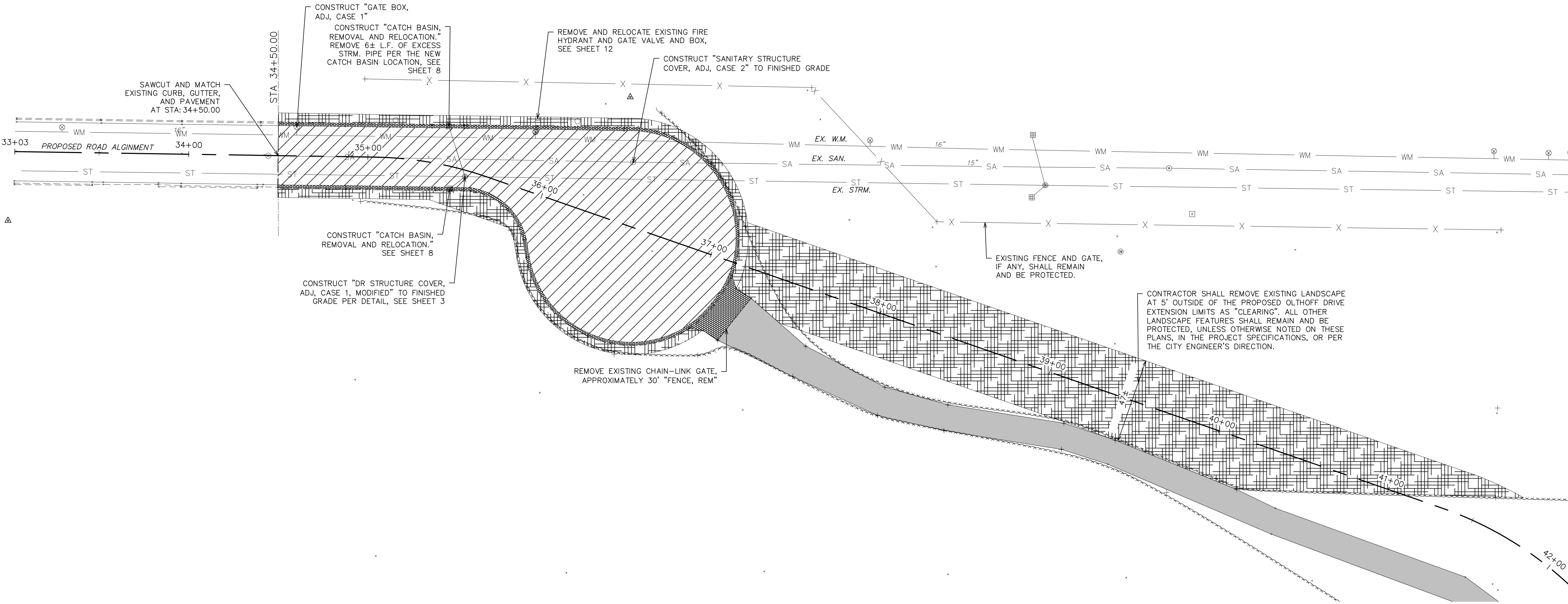
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
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APPROVED	



CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION

PROPOSED SITE PLAN

HRC JOB NO. 20210307	SCALE 1"=100'
DATE May 2022	SHEET NO. 6 OF 18



REMOVAL LEGEND	
	REMOVE EXISTING PAVEMENT SECTION. ("APPROXIMATELY 6" "HMA SURFACE, REM" APPROXIMATELY 6" "EXCAVATION, EARTH"—AB) CONTRACTOR SHALL REMOVE ENOUGH MATERIAL TO ALLOW FULL PROPOSED PAVEMENT SECTION.
	REMOVE EXISTING CONCRETE FEATURE ("CURB AND GUTTER, REM," AND "EXCAVATION, EARTH"—DWY), UNLESS OTHERWISE NOTED ON THESE PLANS, THE PROJECT SPECIFICATIONS, OR PER THE CITY ENGINEERING'S DIRECTION.
	REMOVE EXISTING LANDSCAPE AS "CLEARING".
	REMOVE EXISTING GRAVEL ACCESS ROAD AS "HMA SURFACE, REM" CONTRACTOR SHALL REMOVE THE EXISTING ACCESS ROAD 5' PAST THE LIMITS OF THE PROPOSED CUL-DE-SAC, SEE SHEET 11.

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	Acre	Clearing
6	Ft	Sewer, Rem, Less than 24 inch
630	Ft	Curb and Gutter, Rem
30	Ft	Fence, Rem
265	Cyd	Excavation, Earth
1	Ea	Dr Structure Cover, Adj, Case 1, Modified
2	Ea	Catch Basin, Removal and Relocation
4485	Syd	HMA Surface, Rem
1	Ea	Hydrant, Relocate, Case 2
1	Ea	Gate Box, Adj, Case 1
1	Ea	Sanitary Structure Cover, Adj, Case 2

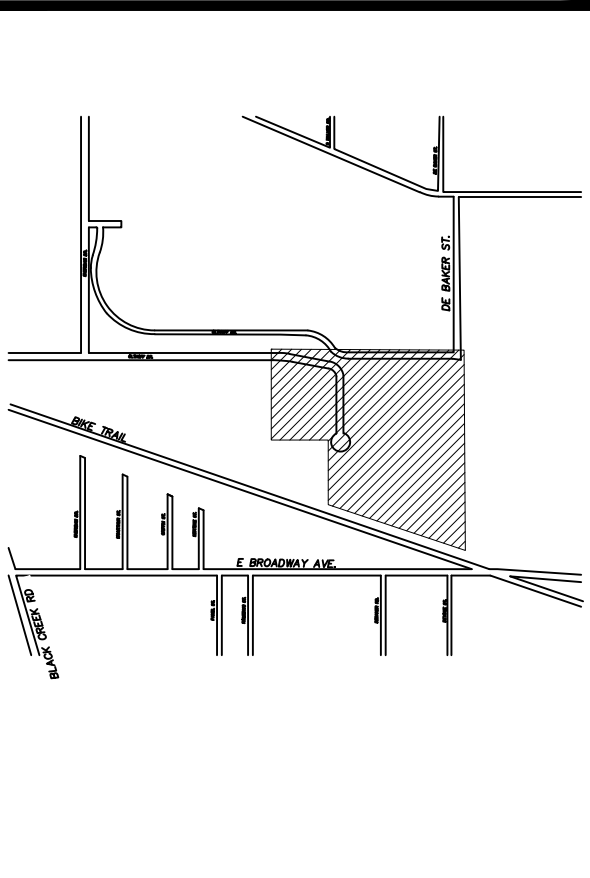




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GRAND RAPIDS, MI 49508
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WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)



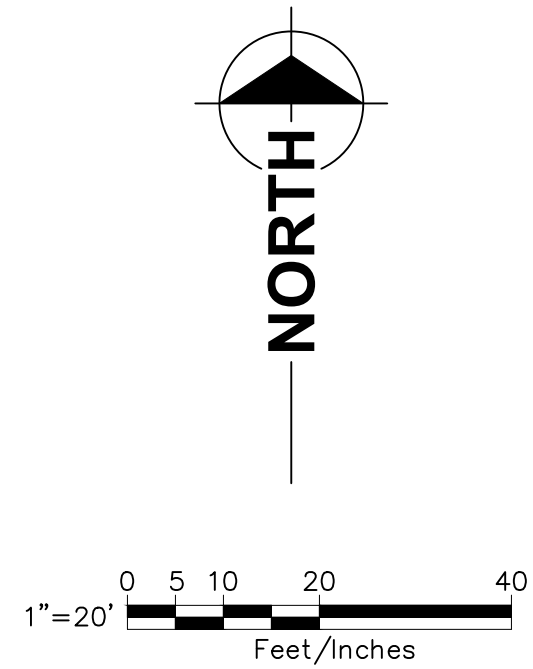
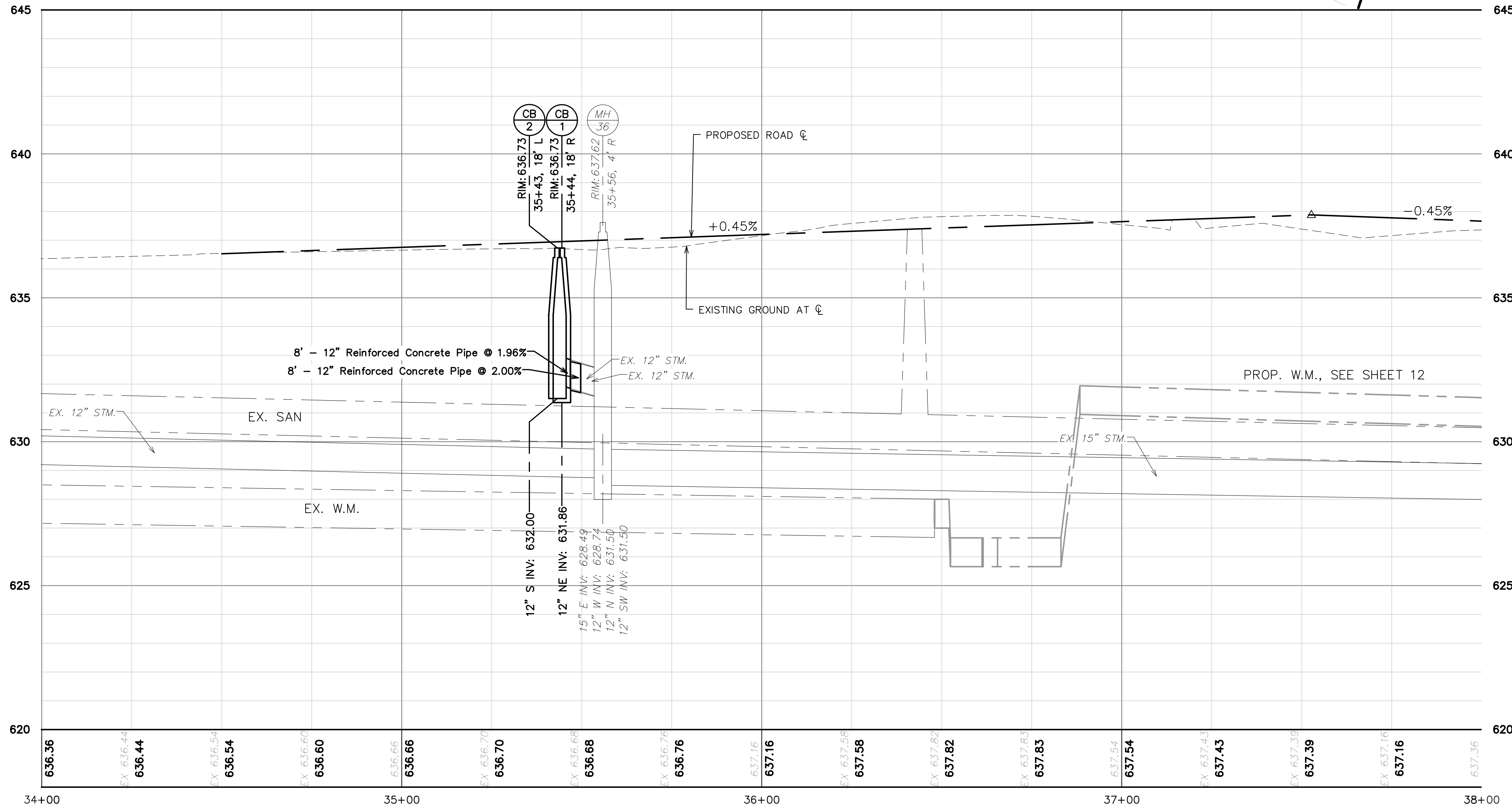
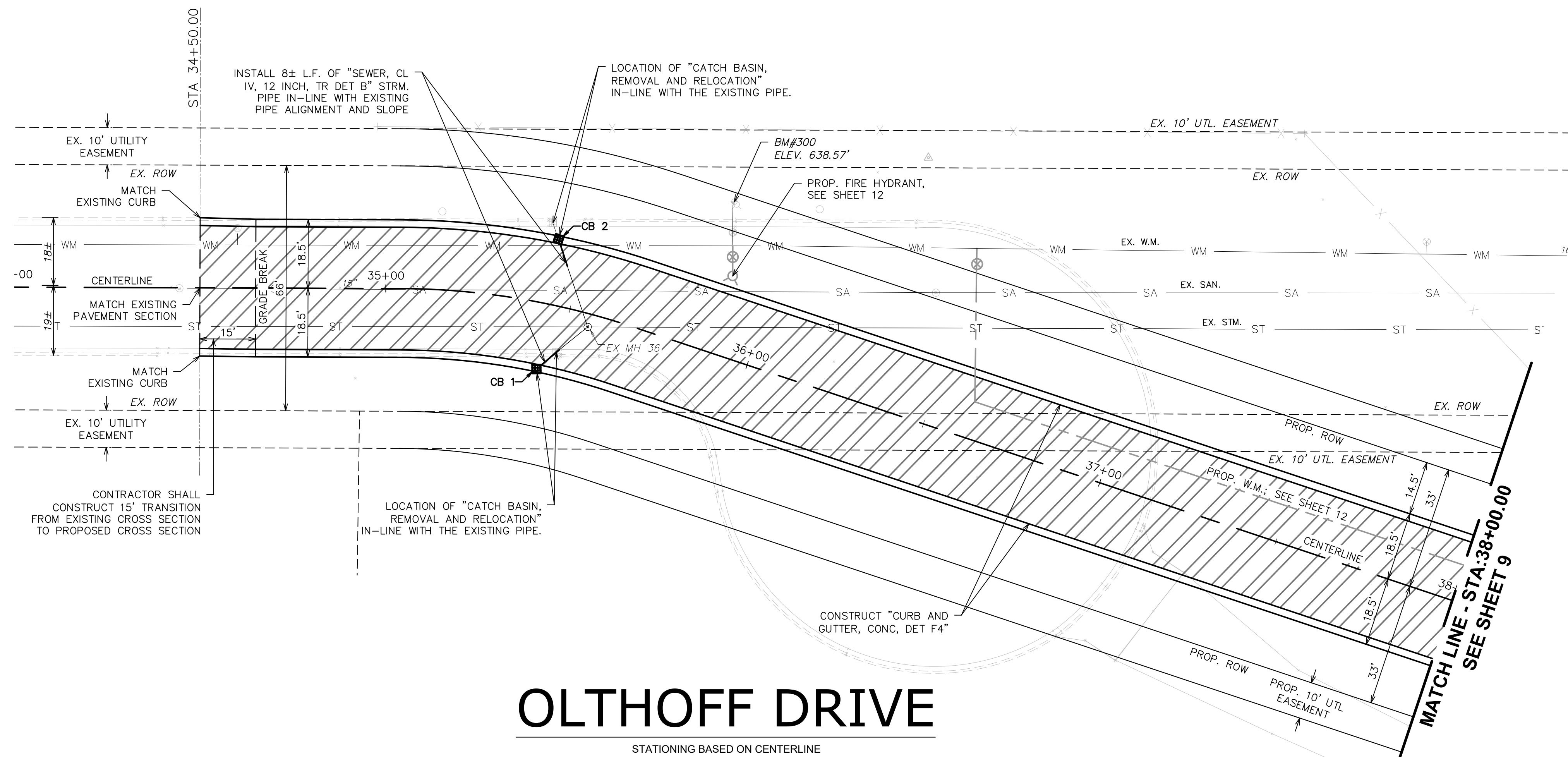
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	



**CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION**

REMOVAL SHEET

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 7 OF 18



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
90	Cyd	Embankment, CIP
4	Sta	Machine Grading
1675	Syd	Aggregate Base, 6 inch
16	Ft	Sewer, CI IV, 12 inch, Tr Det B
2	Ea	Catch Basin, Removal and Relocation
2	Ea	Dr Structure Cover, Type K, Modified
446	Ton	HMA, 4EML
700	Ft	Curb and Gutter, Conc, Det F4

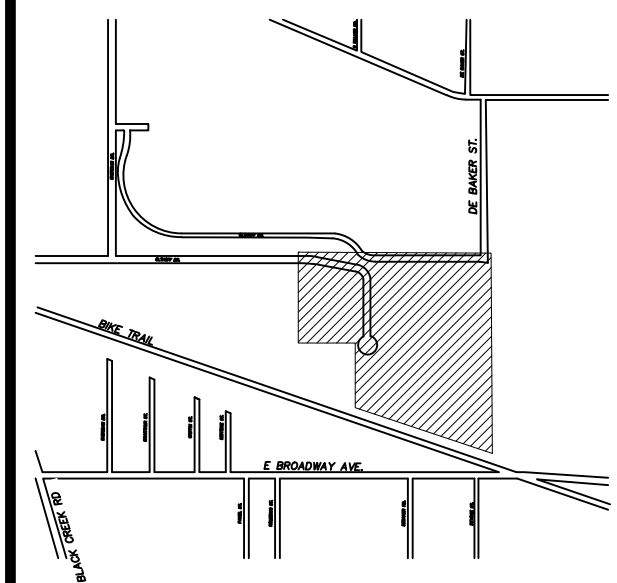
STRUCTURE SCHEDULE				
STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
CB 1	35+44, 18' R	4.0'	CB	K
CB 2	35+43, 18' L	4.0'	CB	K

CONSTRUCTION LEGEND	
	CONSTRUCT PAVEMENT SECTION 2" HMA, 4EML TOP COURSE 2" HMA, 4EML LEVELING COURSE 2" HMA, 4EML BASE COURSE AGGREGATE BASE, 6 INCH 6" C.N.S. @ 95% MIN. REL. COMP.



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CONSULTING ENGINEERS SINCE 1915

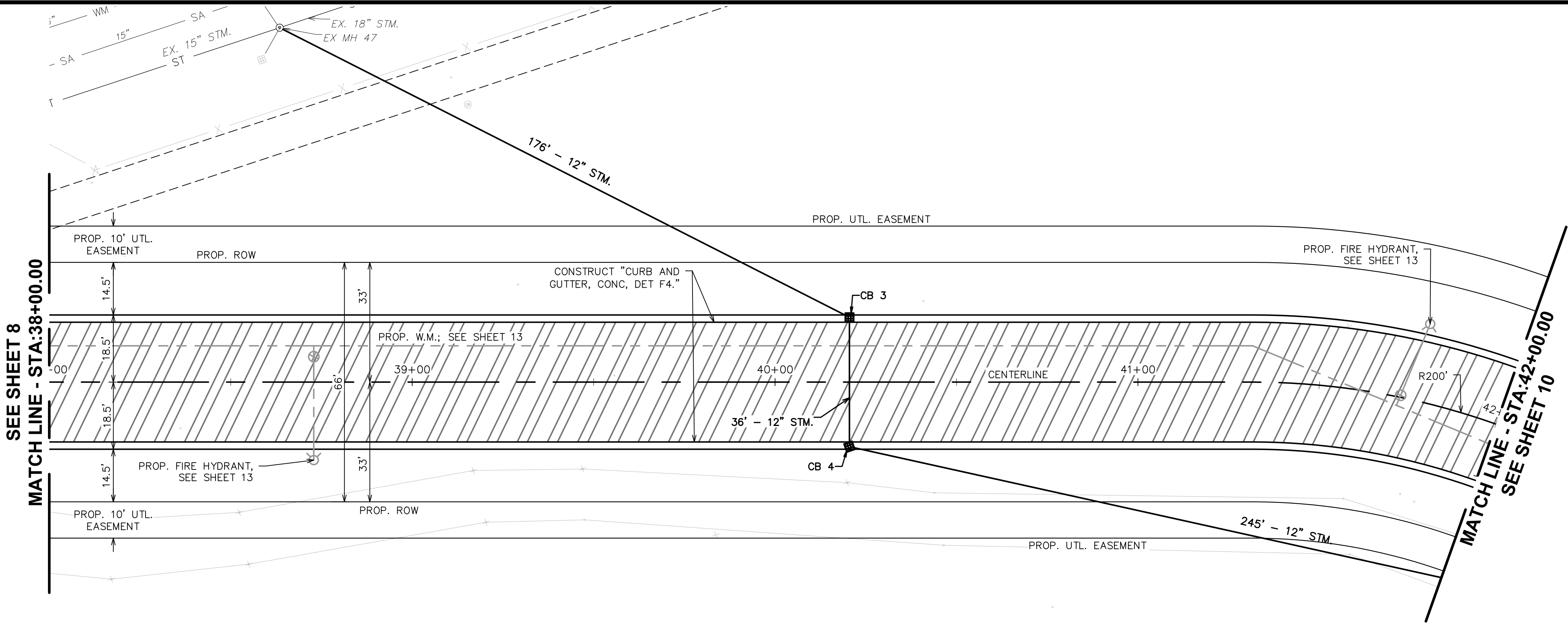
1925 BRETON ROAD, SE SUITE 100
GRAND RAPIDS, MI 49508

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**CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION**

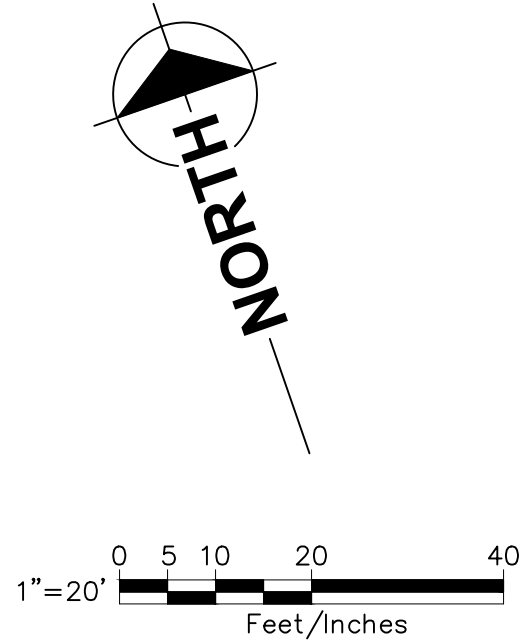
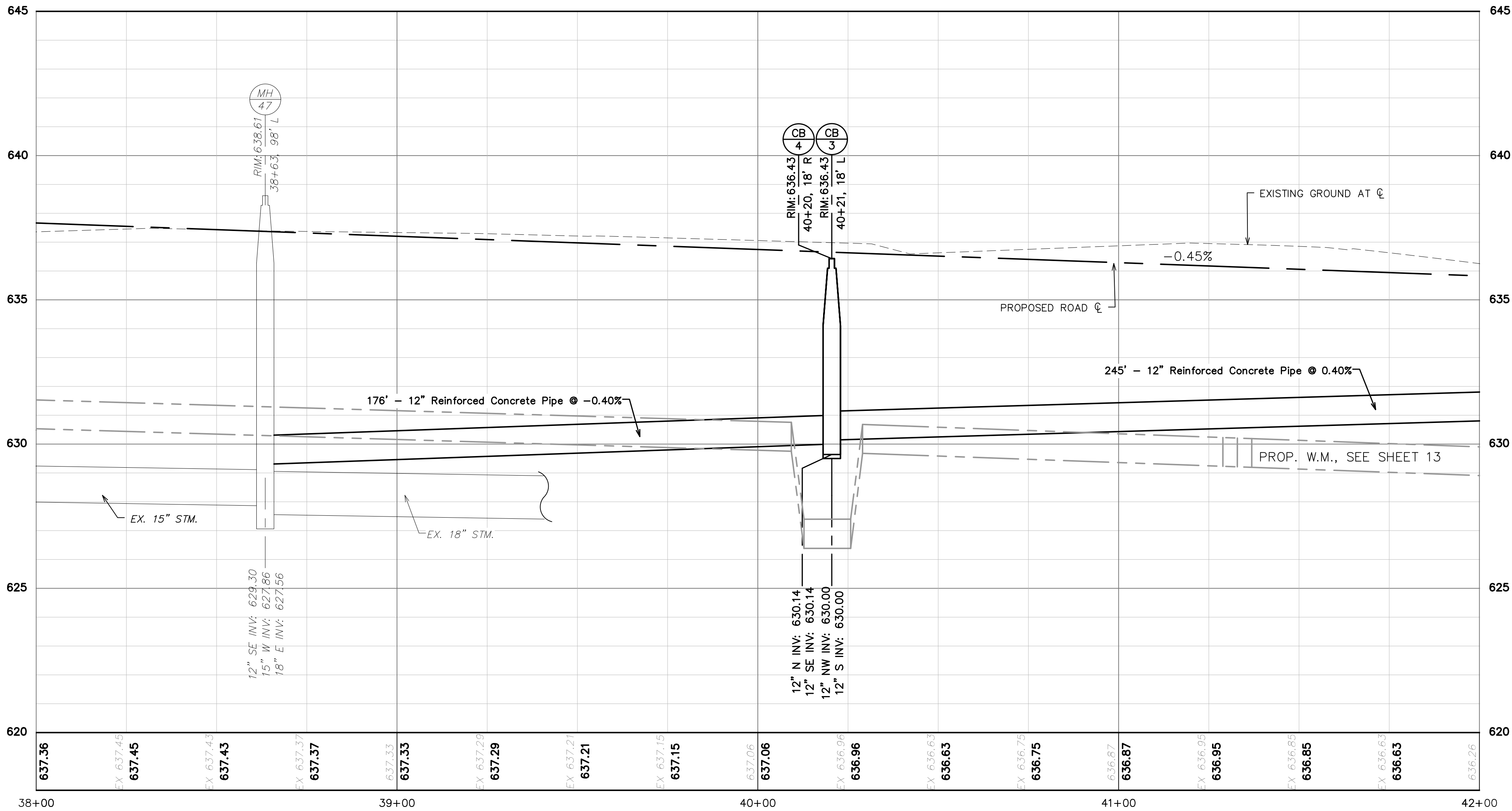
ROAD IMPROVEMENTS -
STA. 34+50 TO STA. 38+00

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 8 OF 18



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
103	Cyd	Embankment, CIP
4	Sta	Machine Grading
1914	Syd	Aggregate Base, 6 inch
343	Ft	Sewer, CI IV, 12 inch, Tr Det A
36	Ft	Sewer, CI IV, 12 inch, Tr Det B
343	Ft	Video Taping Sewer and Culv Pipe
1	Ea	Dr Structure, Tap, 12 inch
2	Ea	Catch Basin, Special, 48 inch dia
2	Ea	Dr Structure Cover, Type K, Modified
359	Ft	Underdrain, Subgrade, Open-Graded, 6 inch
509	Ton	HMA, 4EML
800	Ft	Curb and Gutter, Conc, Det F4

STRUCTURE SCHEDULE				
STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
CB 3	40+21, 18' L	4.0'	CB	K
CB 4	40+20, 18' R	4.0'	CB	K

CONSTRUCTION LEGEND	
	CONSTRUCT PAVEMENT SECTION 2" HMA, 4EML TOP COURSE 2" HMA, 4EML LEVELING COURSE 2" HMA, 4EML BASE COURSE AGGREGATE BASE, 6 INCH 6" C.N.S. @ 95% MIN. REL. COMP.





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1925 BRETON ROAD, SE
GRAND RAPIDS, MI

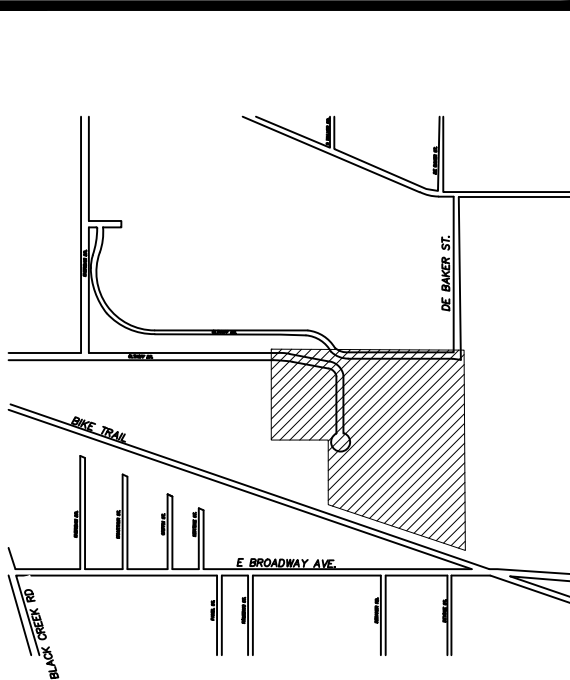
SUITE 100
49508

PHONE: (616) 454-4286
FAX: (616) 454-4278



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DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	



CITY OF MUSKEGON
OLTHOFF DRIVE
EXTENSION

ROAD IMPROVEMENTS -
STA. 38+00 TO STA. 42+00

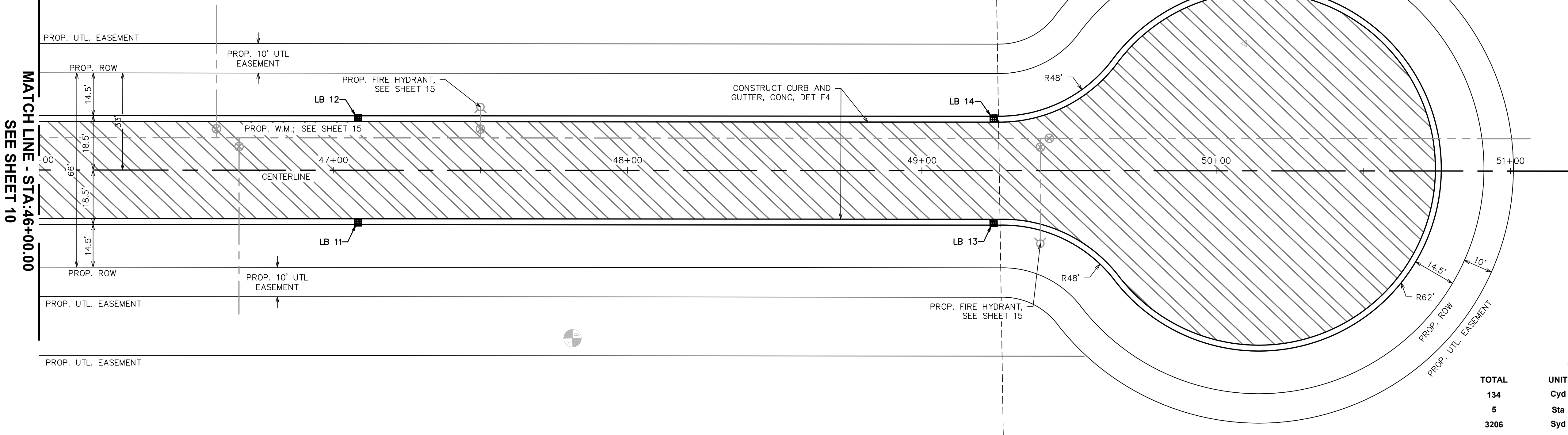
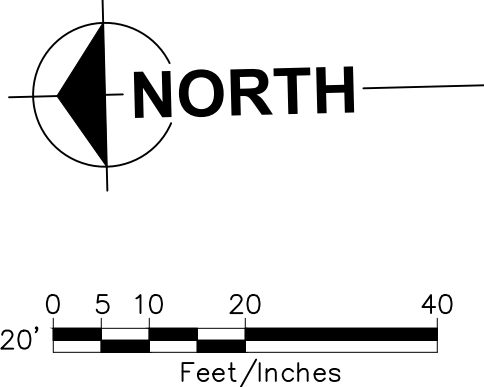
HRC JOB NO.
20210307

SCALE
1"=20'

DATE
May 2022

SHEET NO.
9
OF
18

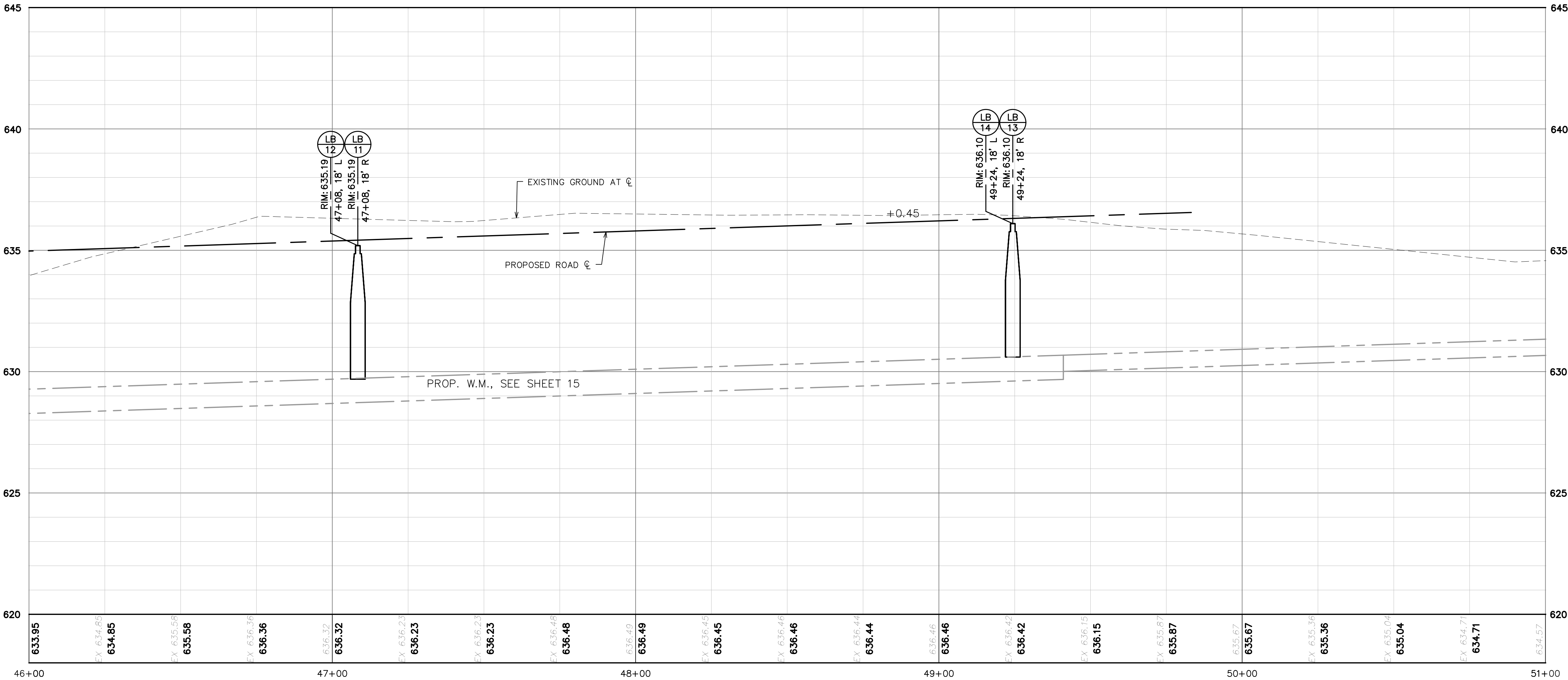
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Marion, Lucas, N



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

QUANTITIES THIS SHEET	
TOTAL	UNIT DESCRIPTION
134	Cyd Embankment, CIP
5	Sta Machine Grading
3206	Syd Aggregate Base, 6 inch
4	Ea Dr Structure Cover, Type K, Modified
4	Ea Leaching Basin, 48 inch dia
652	Ft Underdrain, Subgrade, Open-Graded, 6 inch
299	Ton HMA, 4EML
1045	Ft Curb and Gutter, Conc, Det F4

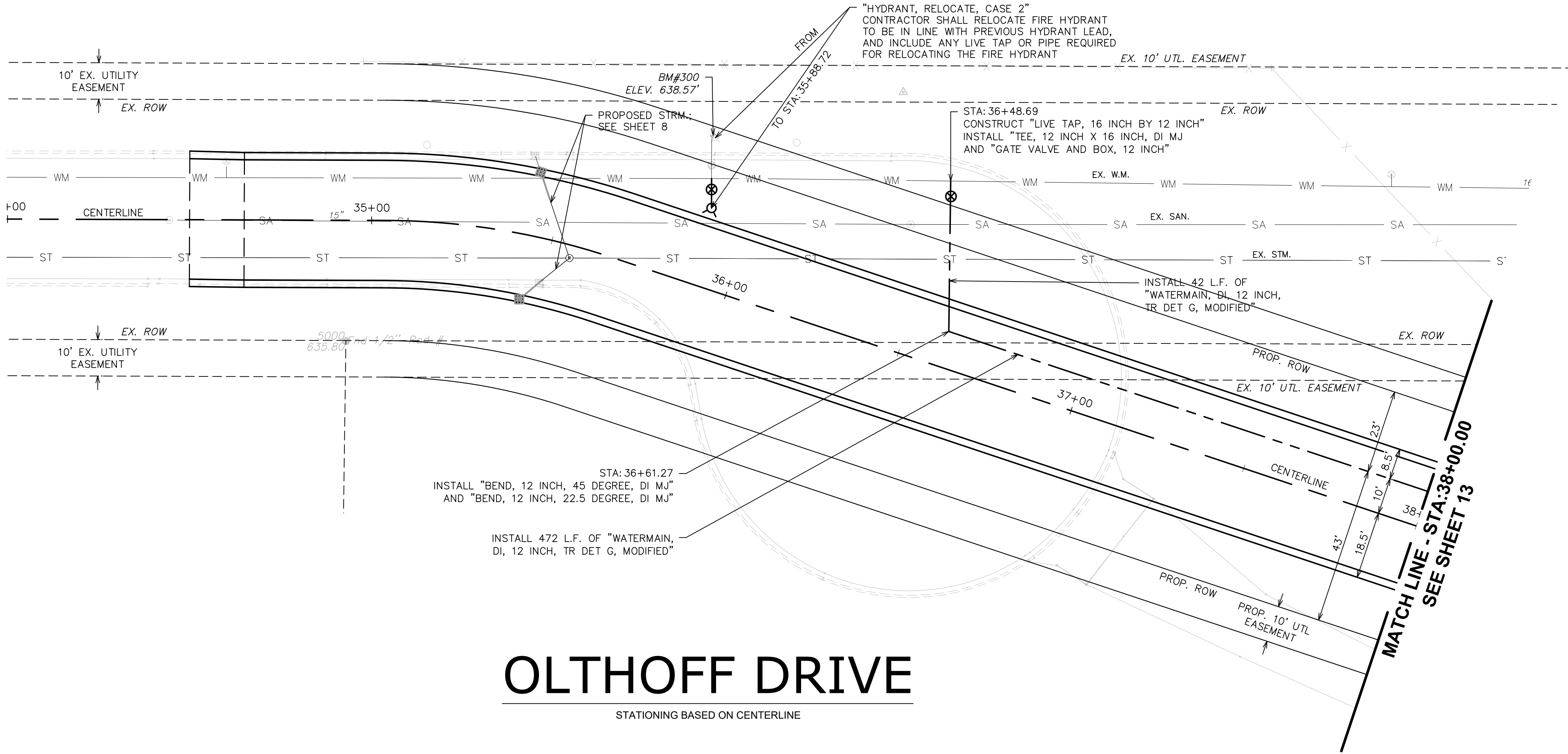


CONSTRUCTION LEGEND

CONSTRUCT PAVEMENT SECTION
2" HMA, 4EML TOP COURSE
2" HMA, 4EML LEVELING COURSE
2" HMA, 4EML BASE COURSE
AGGREGATE BASE, 6 INCH
6" C.N.S. @ 95% MIN. REL. COMP.

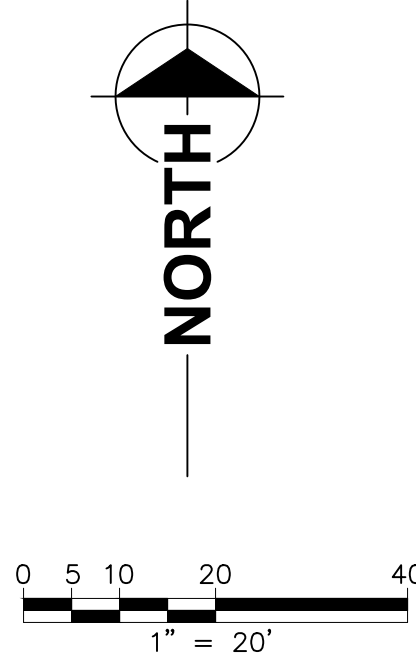
STRUCTURE SCHEDULE

STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
LB 11	47+08, 18' R	4.0'	LB	K
LB 12	47+08, 18' L	4.0'	LB	K
LB 13	49+24, 18' R	4.0'	LB	K
LB 14	49+24, 18' L	4.0'	LB	K

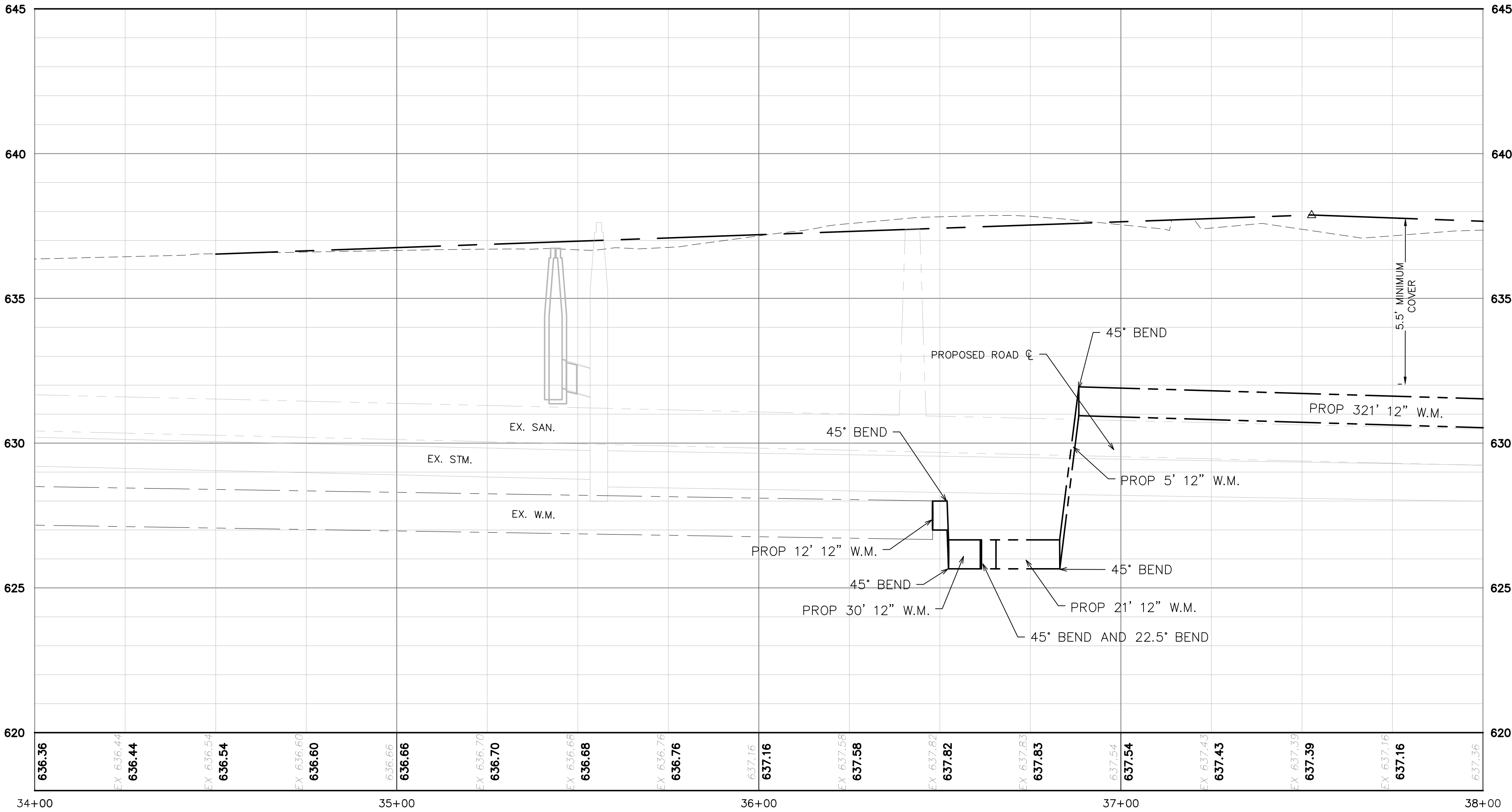


OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	Ea	Gate Valve and Box, 12 inch
1	Ea	Hydrant, Relocate, Case 2
1	Ea	Live Tap, 12 inch by 16 inch
180	Ft	Water Main, DI, 12 inch, Tr Det G
1	Ea	Bend, 12 inch, 22.5 Degree, DI MJ
5	Ea	Bend, 12 inch, 45 Degree, DI MJ
1	Ea	Tee, 16 inch X 12 inch, DI MJ



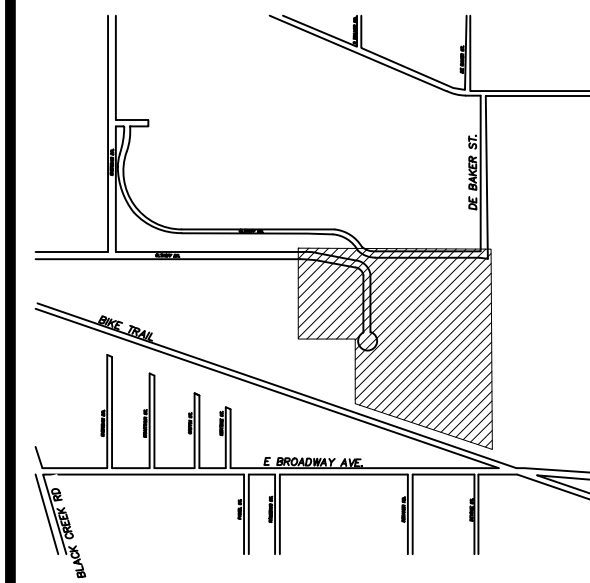
HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD, SE SUITE 100
GRAND RAPIDS, MI 49508

PHONE: (616) 454-4286
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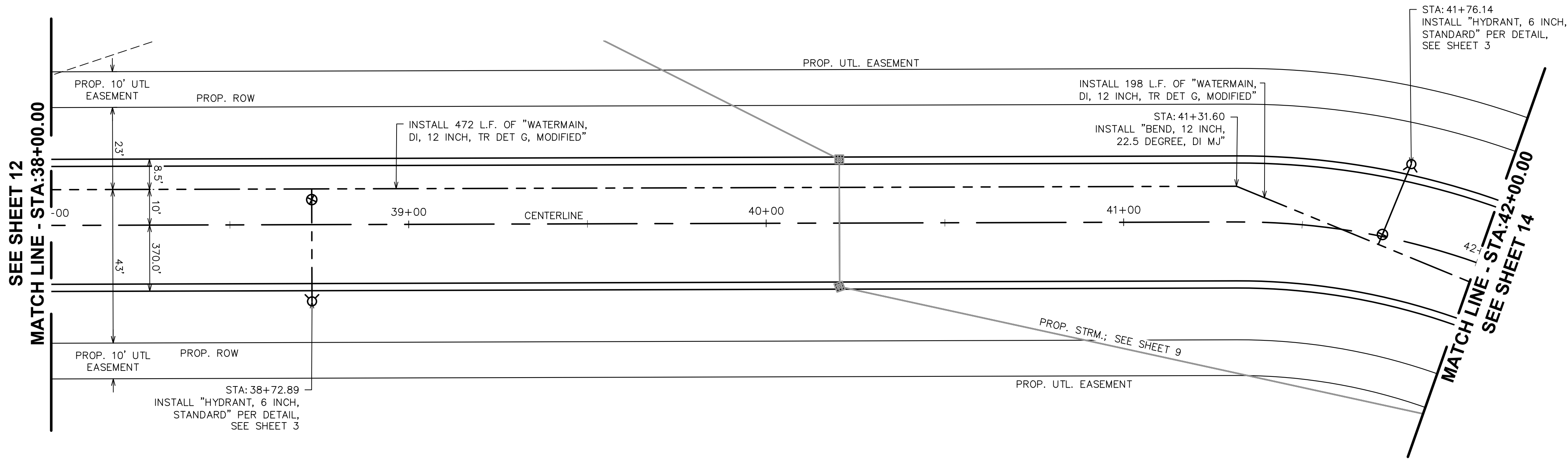
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
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APPROVED	



**CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION**

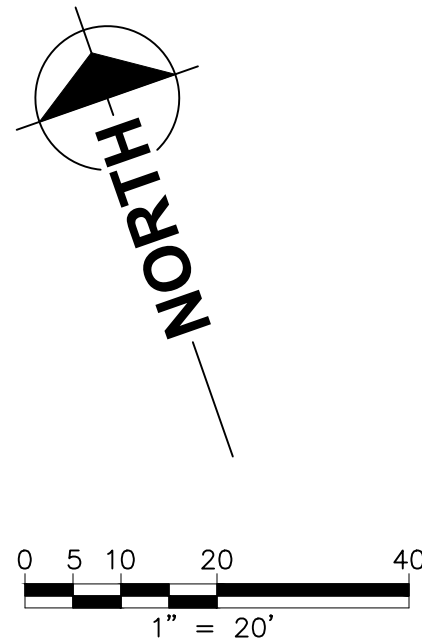
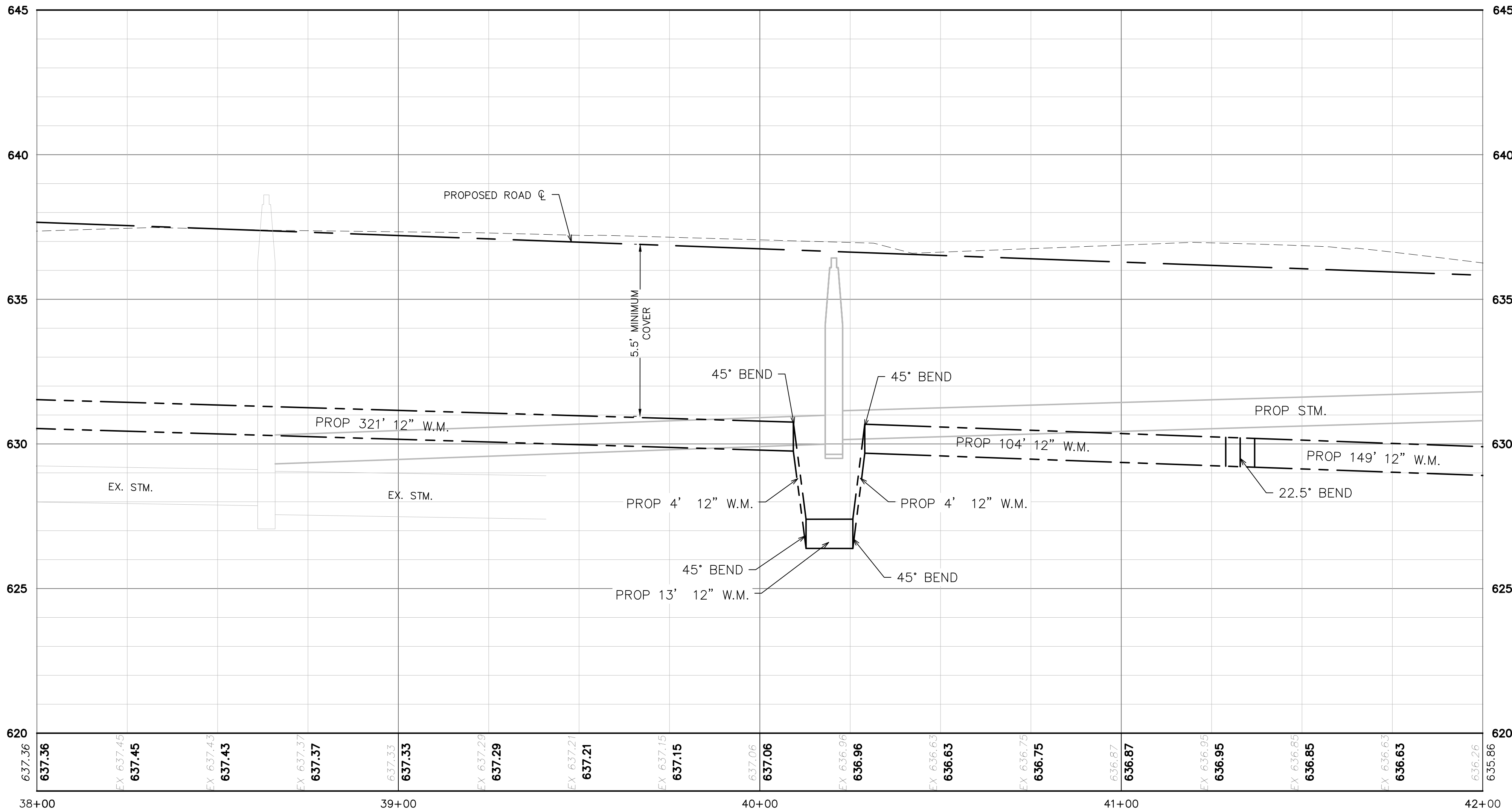
UTILITY IMPROVEMENTS –
STA.34+50 TO STA.38+00

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 12 OF 18



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
405	Ft	Water Main, DI, 12 inch, Tr Det G
1	Ea	Bend, 12 inch, 22.5 Degree, DI MJ
4	Ea	Bend, 12 inch, 45 Degree, DI MJ
2	Ea	Hydrant, 6 inch, Standard



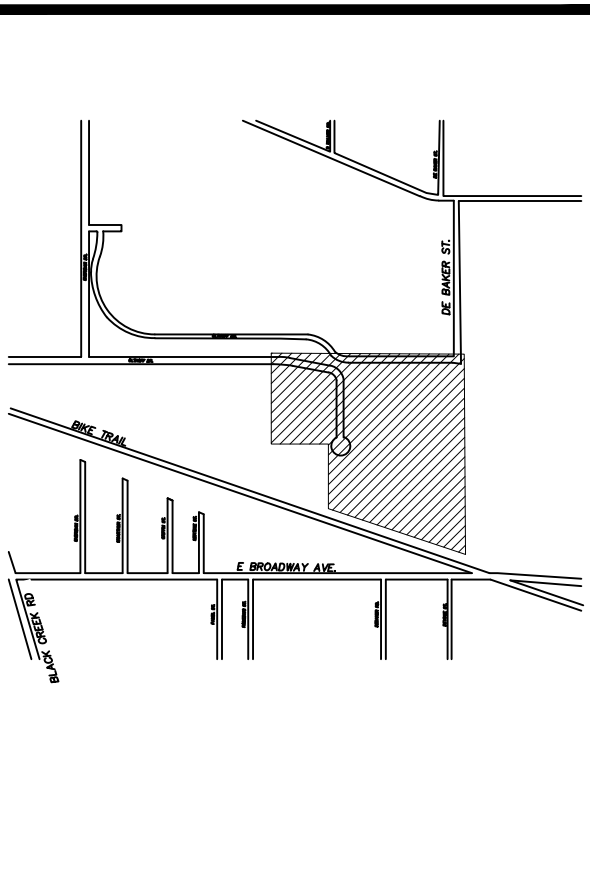
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HUBBELL, ROTH & CLARK, INC
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1925 BRETON ROAD, SE
GRAND RAPIDS, MI
SUITE 100
49508

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DATE	ADDITIONS AND/OR REVISIONS
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CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION

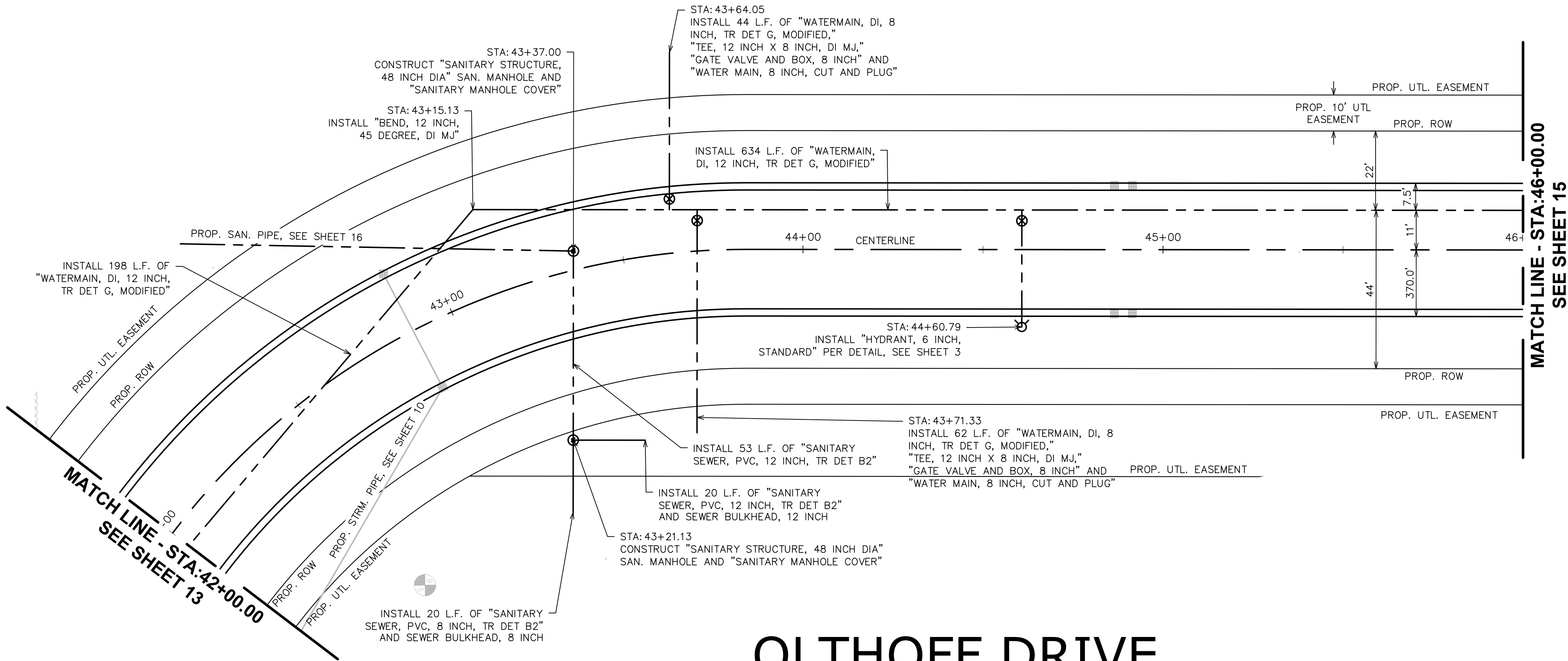
UTILITY IMPROVEMENTS –
STA.38+00 TO STA.42+00

HRC JOB NO.
20210307

DATE
May 2022

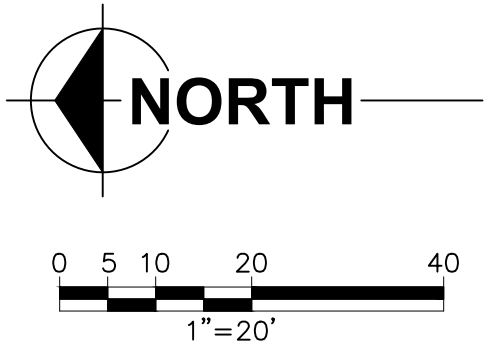
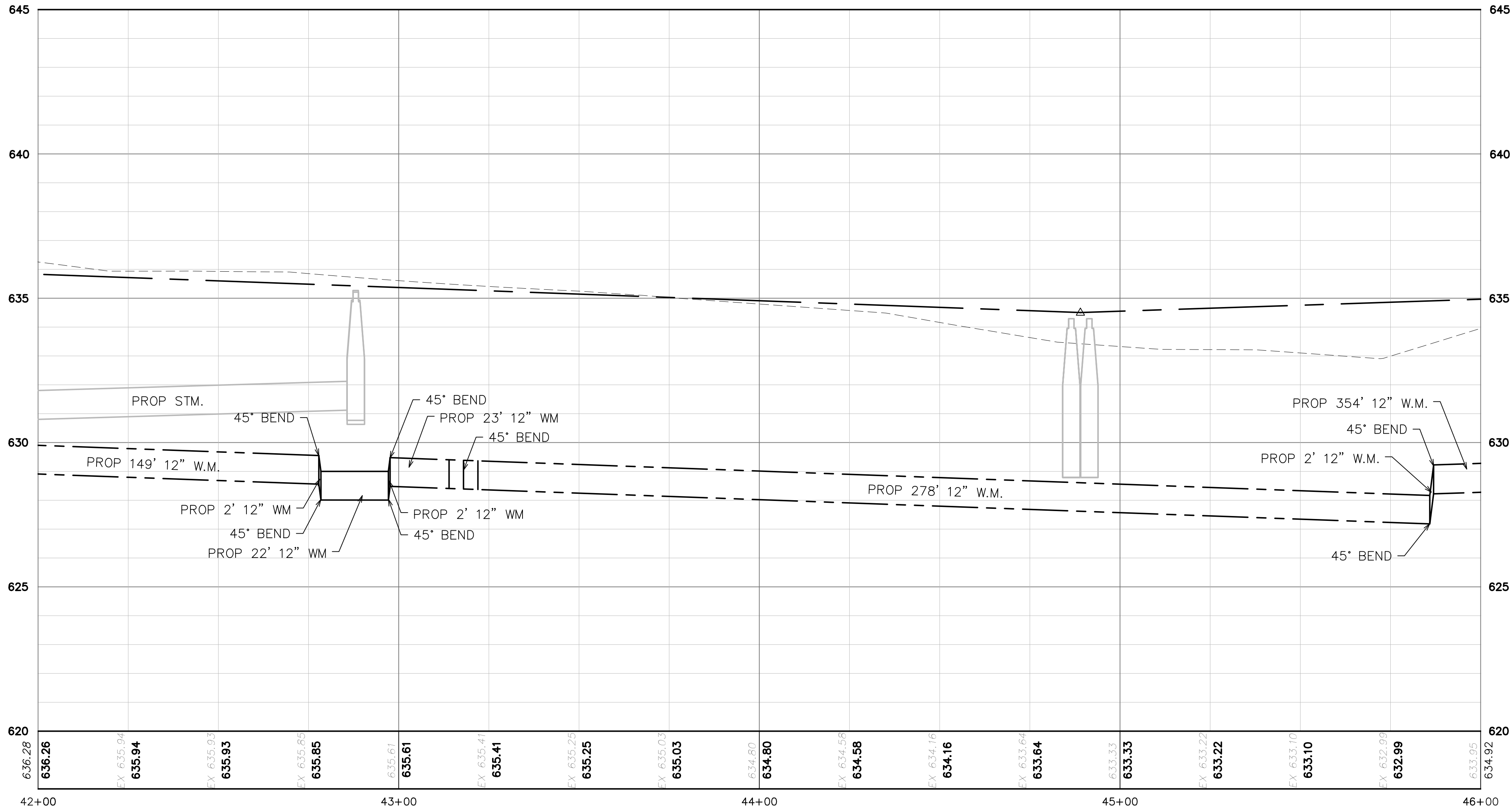
SCALE
1"=20'

SHEET NO.
13
OF
18



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
2	Ea	Sanitary Manhole Cover
2	Ea	Gate Valve and Box, 8 inch
2	Ea	Water Main, 8 inch, Cut and Plug
420	Ft	Water Main, DI, 12 inch, Tr Det G
106	Ft	Water Main, DI, 8 inch, Tr Det G
7	Ea	Bend, 12 inch, 45 Degree, DI MJ
1	Ea	Hydrant, 6 inch, Standard
2	Ea	Tee, 12 inch X 8 inch, DI MJ
20	Ft	Sanitary Sewer, PVC, 8 inch, Tr Det B2
73	Ft	Sanitary Sewer, PVC, 12 inch, Tr Det B2
2	Ea	Sanitary Structure, 48 inch dia



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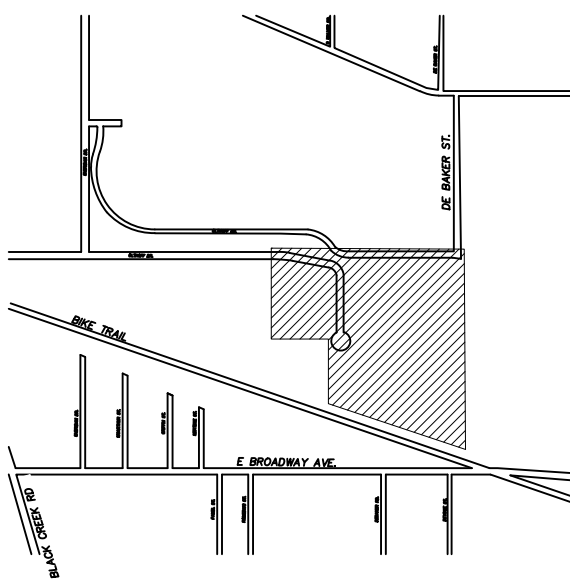
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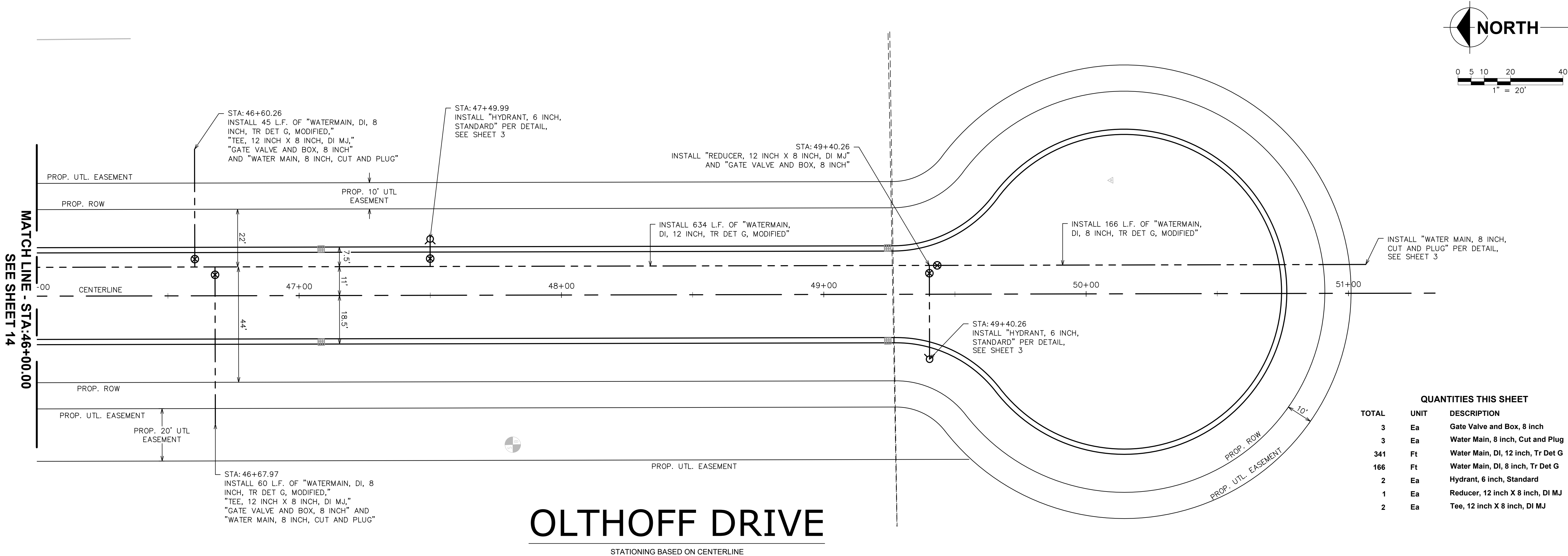
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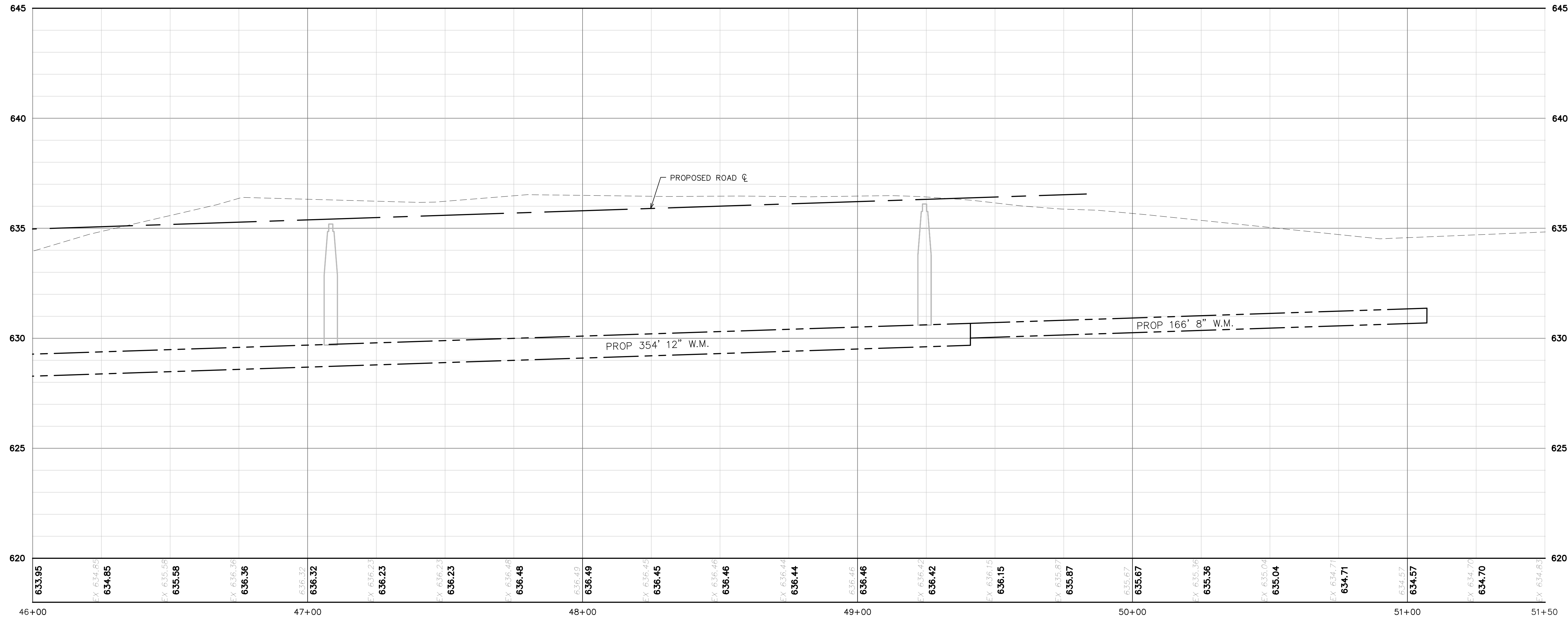
CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION

UTILITY IMPROVEMENTS –
STA.42+00 TO STA.46+00

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 14 OF 18

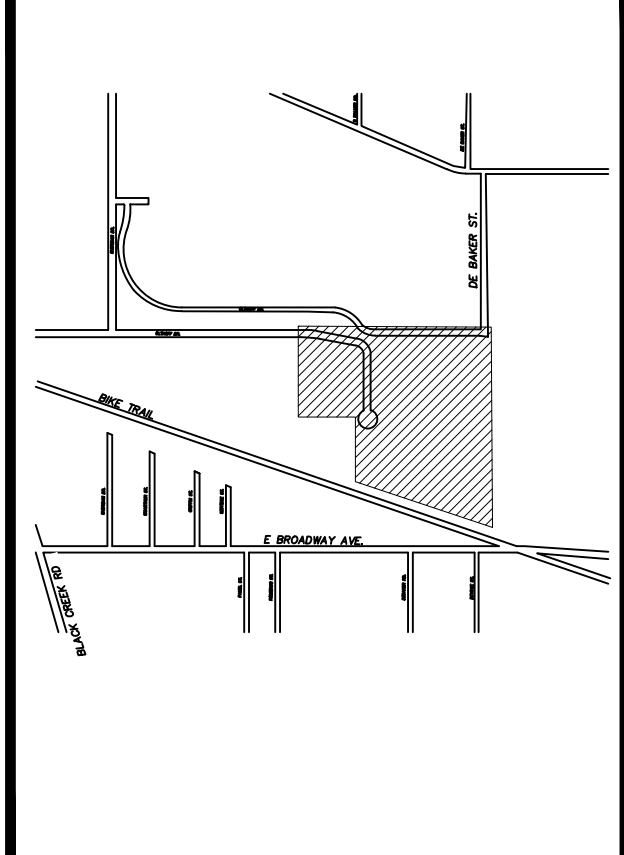


QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
3	Ea	Gate Valve and Box, 8 inch
3	Ea	Water Main, 8 inch, Cut and Plug
341	Ft	Water Main, DI, 12 inch, Tr Det G
166	Ft	Water Main, DI, 8 inch, Tr Det G
2	Ea	Hydrant, 6 inch, Standard
1	Ea	Reducer, 12 inch X 8 inch, DI MJ
2	Ea	Tee, 12 inch X 8 inch, DI MJ



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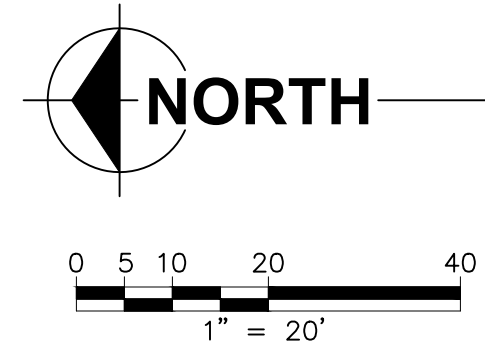
DATE	ADDITIONS AND/OR REVISIONS
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DRAWN	
CHECKED	
APPROVED	



CITY OF MUSKEGON
OLTHOFF DRIVE
EXTENSION

UTILITY IMPROVEMENTS –
STA.46+00 TO STA.51+00

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 15 OF 18

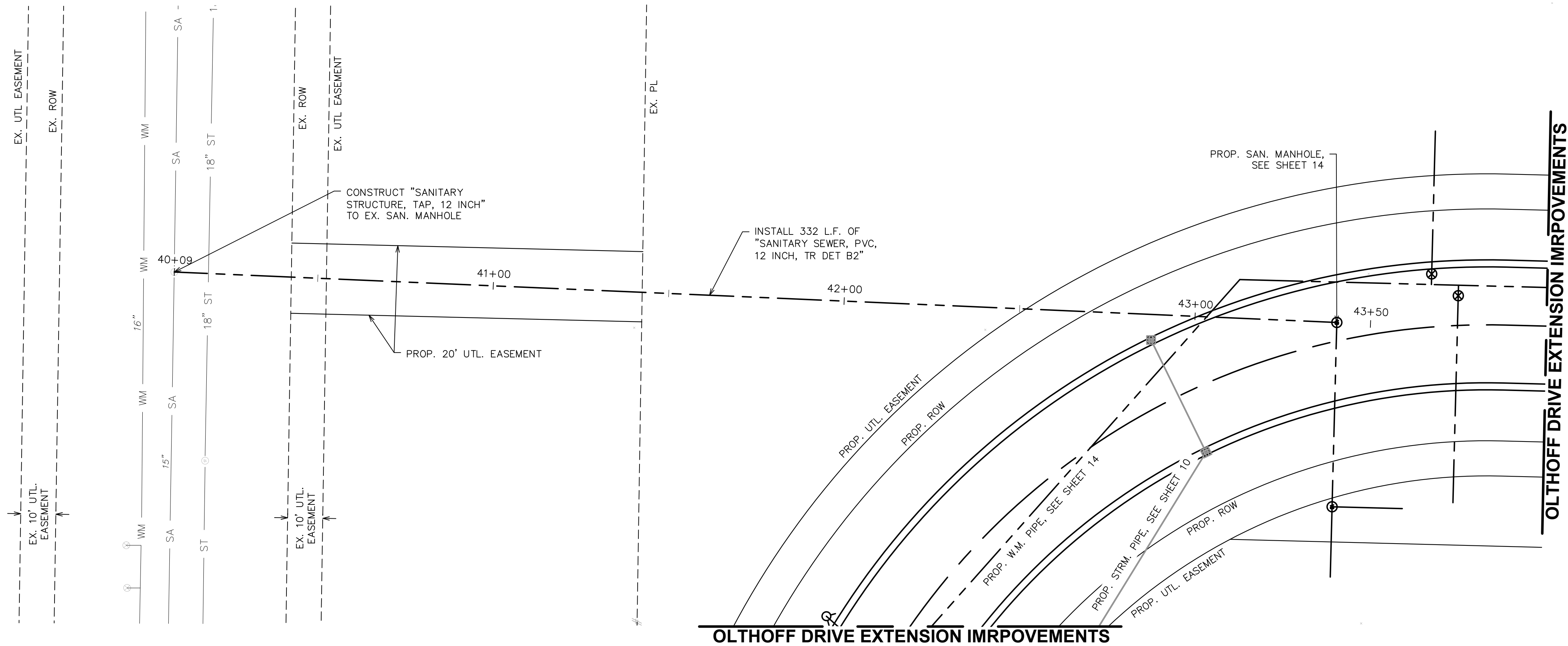


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1925 BRETON ROAD, SE SUITE 100
GRAND RAPIDS, MI 49508

PHONE: (616) 454-4286
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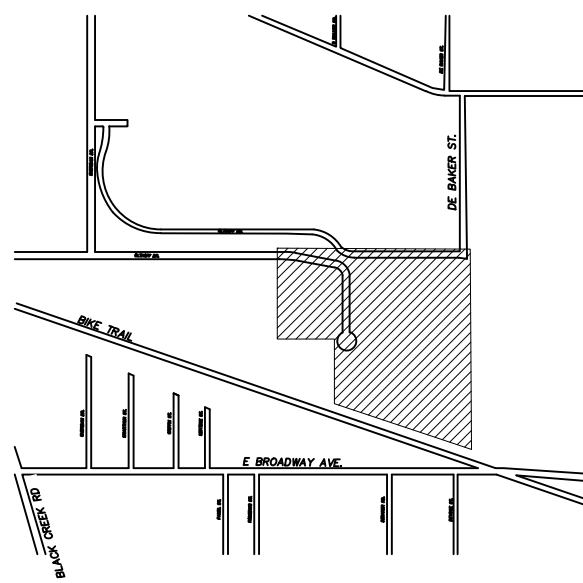
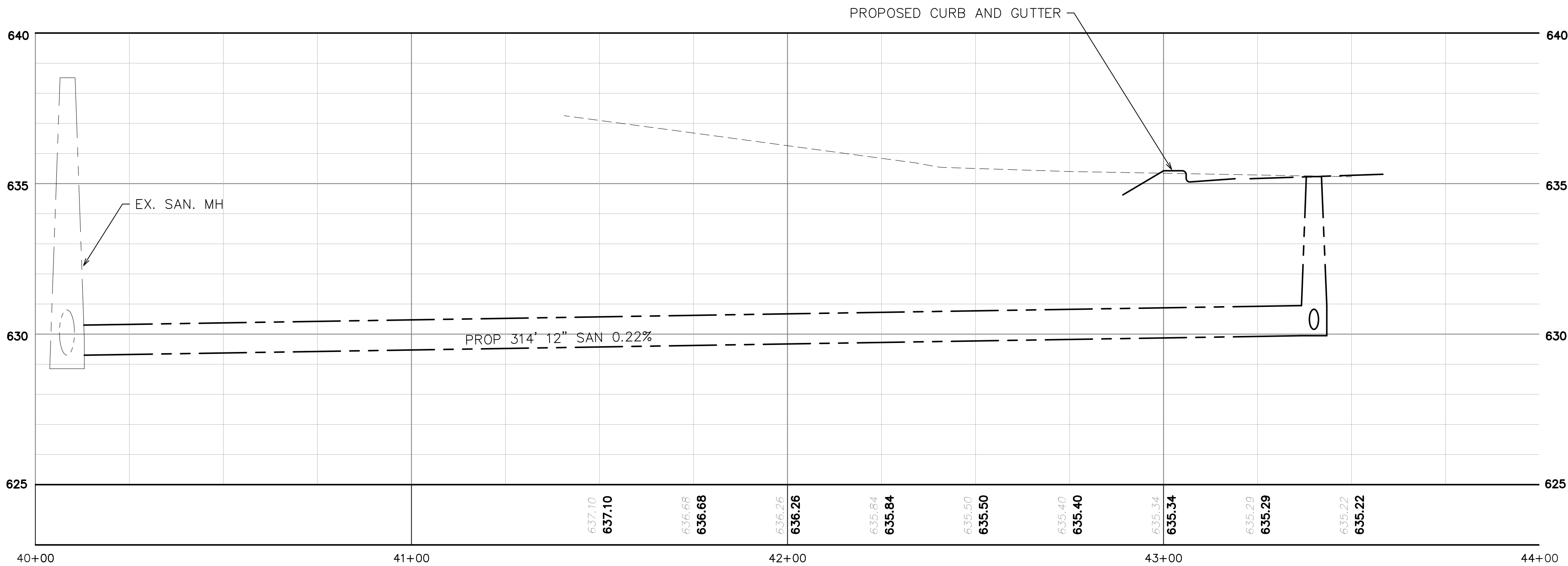


WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)



SAN. PIPE CONNECTION

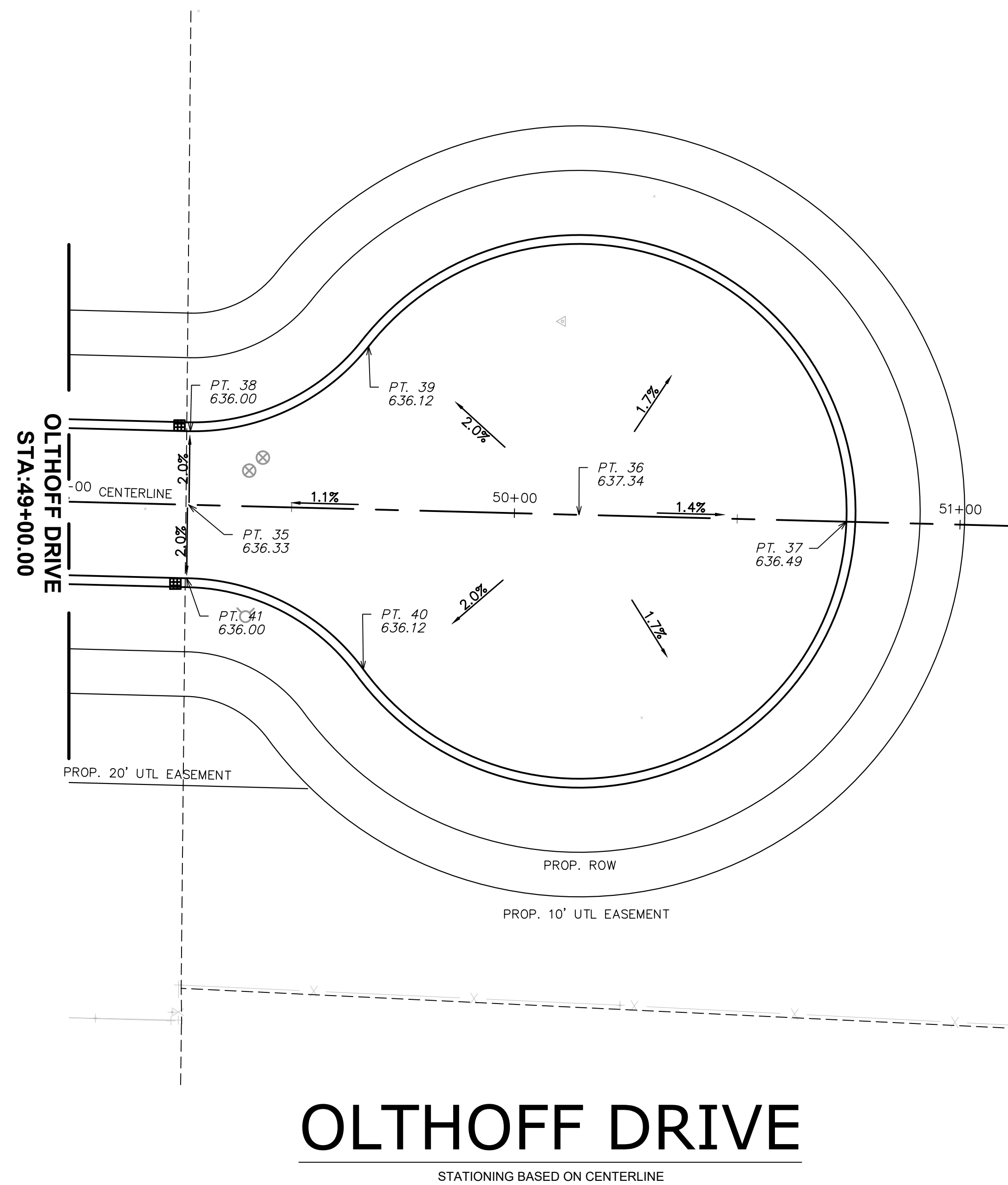
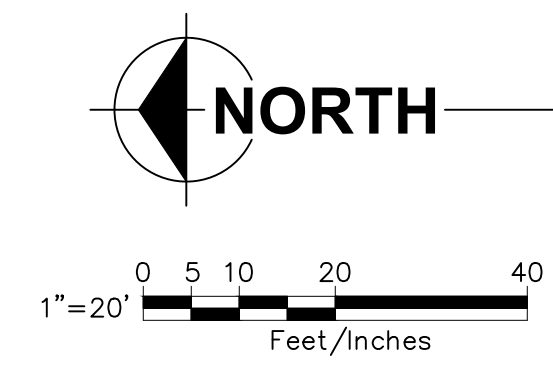
STATIONING BASED ON PIPE CENTERLINE



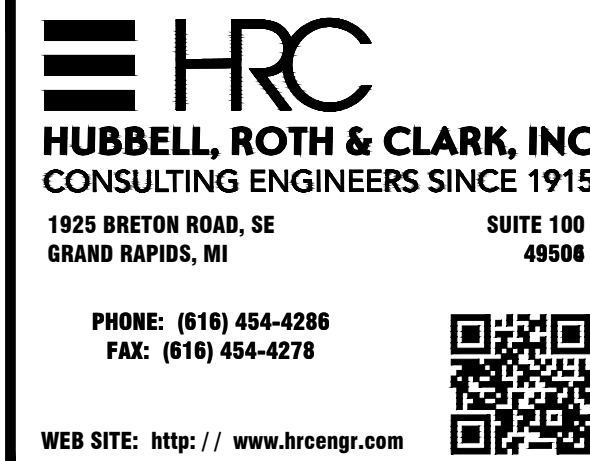
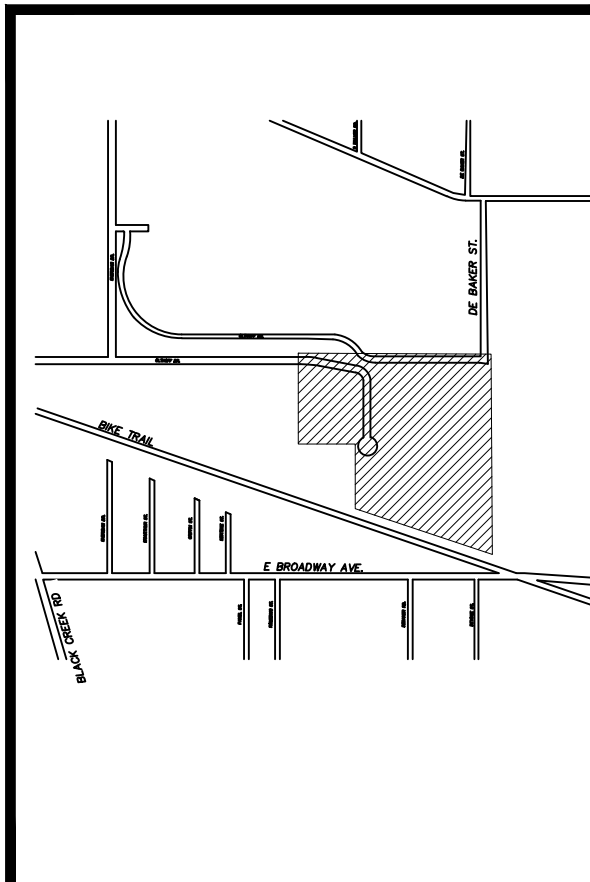
CITY OF
MUSKEGON
**OLTHOFF DRIVE
EXTENSION**

UTILITY IMPROVEMENTS –
SANITARY PIPE CONNECTION

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 16 OF 18



CONTROL POINTS				
Point	#	Elevation	Northing	Northing
35		636.33	626597.3972	12641460.6813
36		637.34	626509.8035	12641458.4237
37		636.49	626449.8234	12641456.8778
38		636.00	626596.9720	12641477.1759
39		636.12	626556.9937	12641496.1847
40		636.12	626558.1928	12641423.6937
41		636.00	626597.8223	12641444.1868

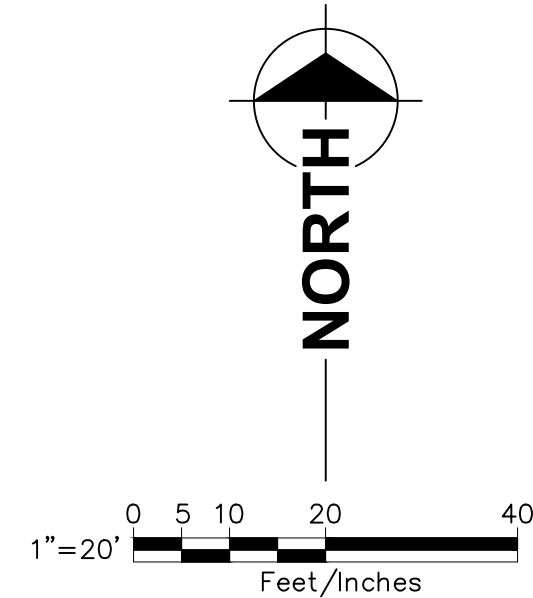
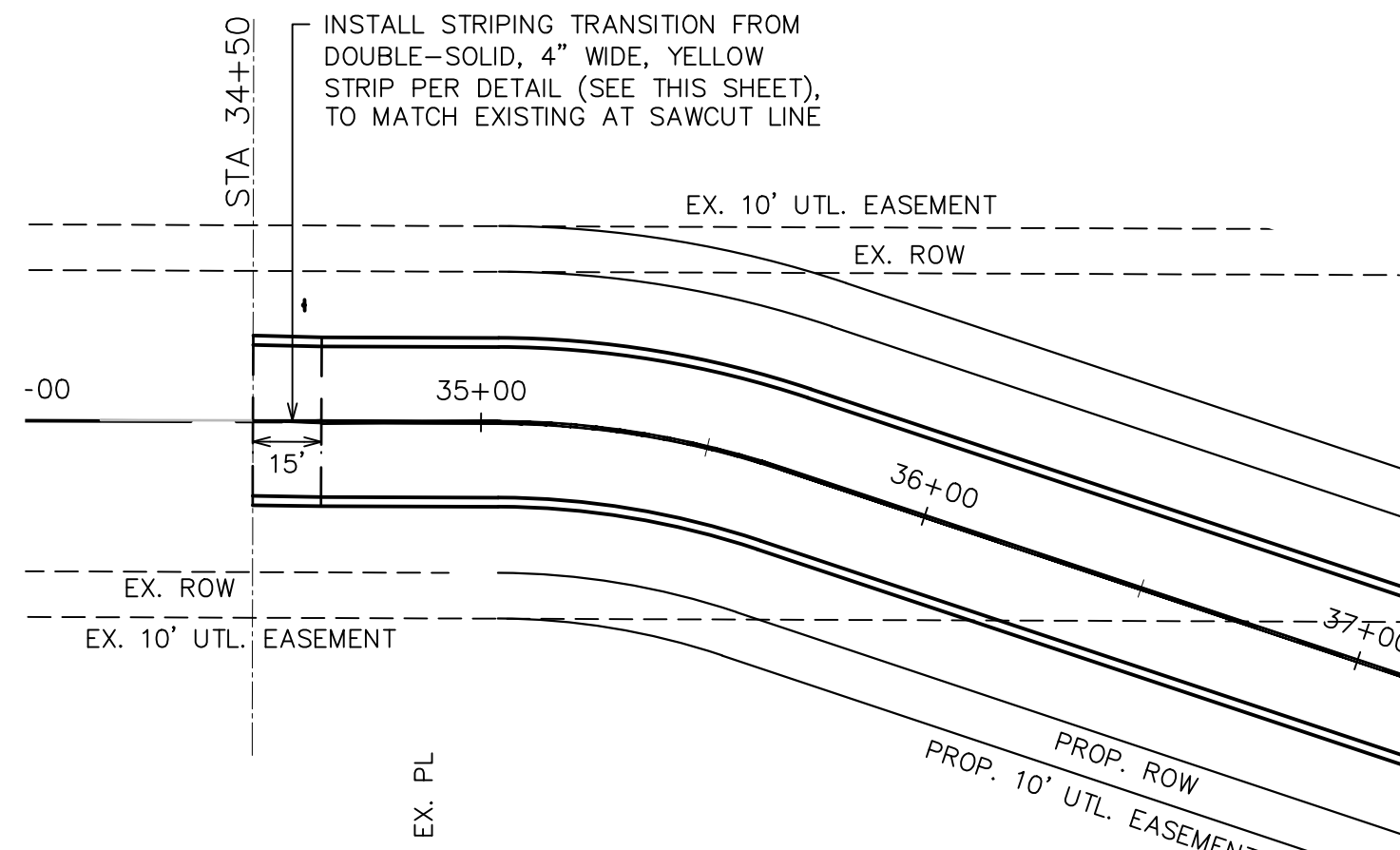
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**CITY OF
MUSKEGON
OLTHOFF DRIVE
EXTENSION**

CUL-DE-SAC DETAIL GRADES

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 17 OF 18

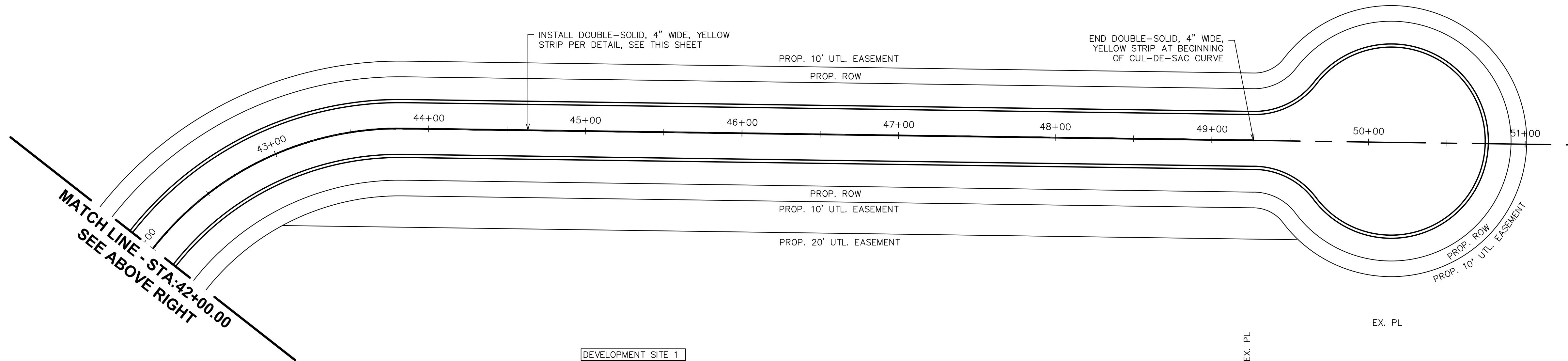
5/6/2022 4:08 PM
HRC_OLW.ctb
V:\202103\20210307\C\Sheets\Prov_Mrk_Sign.dwg
Marion, Lucas, N



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

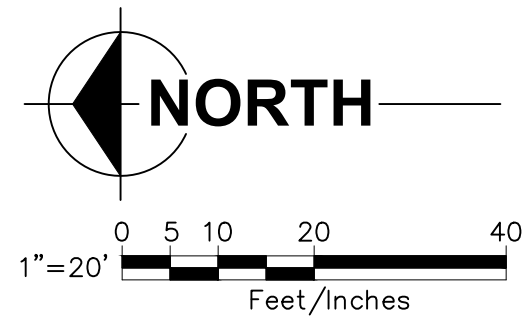
DEVELOPMENT SITE 2



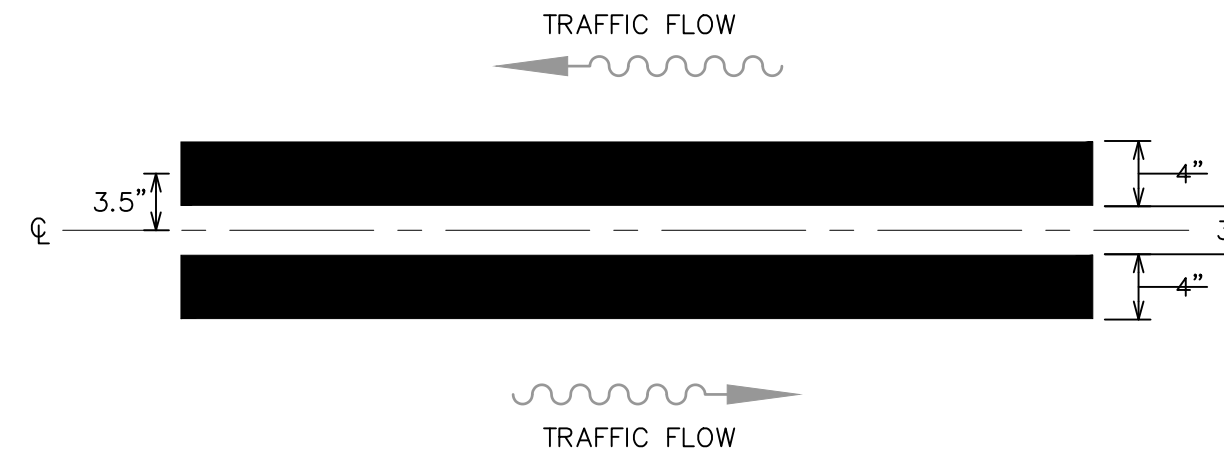
DEVELOPMENT SITE 1

OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
2954	Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow

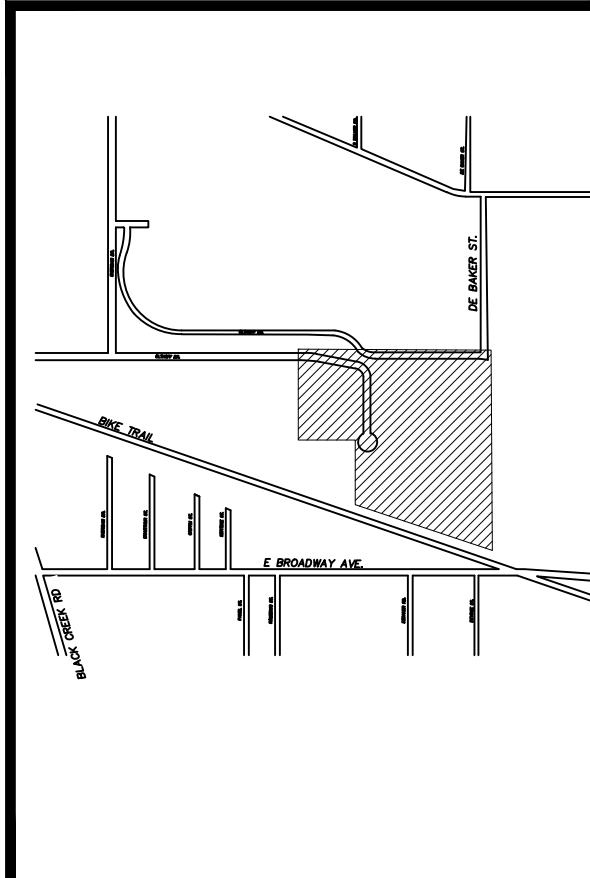


DOUBLE-SOLID, 4" YELLOW LINE



HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD, SE SUITE 100
GRAND RAPIDS, MI 49508
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	



CITY OF MUSKEGON
OLTHOFF DRIVE
EXTENSION

PAVEMENT MARKING
AND SIGNAGE PLAN

HRC JOB NO. 20210307	SCALE 1"=20'
DATE May 2022	SHEET NO. 18 OF 18

EXHIBIT 4

[Attached]

ACCESS EASEMENT AGREEMENT

*This instrument is exempt from Michigan real estate transfer tax pursuant to MCL 207.526(a).
This instrument is exempt from county real estate transfer tax pursuant to MCL 207.505(a).*

This ACCESS EASEMENT AGREEMENT (the “**Agreement**”) is made this _____ day of _____, 2022 (“**Effective Date**”), by and between 2725 Olthoff LLC, a Michigan limited liability company, of 55 Campau Avenue NW, Suite 300, Grand Rapids, Michigan 49503 (“**Grantee**”) and the City of Muskegon, a Michigan municipal corporation, of 933 Terrace, Muskegon, Michigan 49440 (“**Grantor**”).

RECITALS

A. Grantor is the owner of certain real property located in the City of Muskegon, Muskegon County, Michigan, legally described on the attached **Exhibit A** (the “**Grantor Property**”).

B. Pursuant to a Purchase and Sale Agreement between Grantor and Grantee dated January 26, 2022, as amended by that certain First Amendment to Purchase and Sale Agreement dated as of the date of this Agreement (collectively the “**Purchase Agreement**”), Grantor has, on or about the date of this Agreement, conveyed to Grantee certain real property located in the City of Muskegon, Muskegon County, Michigan, legally described on the attached **Exhibit B** (the “**Grantee Property**”).

C. The Grantee Property is located east of and is contiguous to the Grantor Property.

D. Pursuant to the Purchase Agreement, the City has agreed to cause Olthoff Drive, a public road and right of way, and public utilities to be extended along the western boundary of the Grantee Property in accordance with the Purchase Agreement (“**Road Extension**”) on or before June 1, 2023.

E. Grantor has agreed to grant Grantee a non-exclusive, perpetual easement for ingress and egress across the Grantor Property to access the Grantee Property in connection with Grantee’s construction of a life science research and office facility on the Grantee Property until the completion of the Road Extension as depicted on **Exhibit C**.

AGREEMENT

NOW THEREFORE, for good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, the parties agree as follows:

1. Grant of Access Easement. Grantor hereby grants and conveys to Grantee, its successors and assigns, a nonexclusive easement for pedestrian and vehicular ingress and egress on, over and across the Grantor Property until the Road Extension is completed and open to the public for vehicular travel. The Grantor Property may be used by Grantee, along with its agents, lessees, contractors, subcontractors, and employees, for the purposes described above, including, but not limited to, such use for ingress and egress of construction vehicles and heavy equipment and machinery, and any related purpose. Grantee may, during the term of this Agreement, remove trees and other vegetation within the easement area on the Grantor Property if Grantee determines that such removal is necessary in connection with Grantee's rights under this Agreement.

Grantee acknowledges that access may be disrupted from time to time due to the construction of the Road Extension. At times when access is disrupted, Grantor will provide alternate access options to suit the needs of the Grantee.

2. Repair and Maintenance of Easement Area. Grantor shall maintain the Grantor Property so as to afford continuous access and safe and unimpeded passage of vehicular and pedestrian traffic on, over and across the Grantor Property. Any damage caused to any improvements within the Grantor Property by the acts or neglects of the owner of the Grantor Property or the Grantee Property, or by such owners' agents, lessees, employees, contractors, or subcontractors shall be repaired or replaced solely by such owner, at its sole cost and expense.

3. Indemnity. Grantee agrees to defend, indemnify, and save harmless Grantor from and against any and all liability or claim thereof (including, but not limited to, reasonable attorney fees and costs), whether for injury to persons, including death, or damage to property, which may be imposed upon, incurred by or asserted against Grantor (i) arising in connection with or as a direct or indirect result of any activity by Grantee, its employees, agents, lessees, contractors, or subcontractors in, on or about the Grantor Property during the term of this Agreement; or (ii) arising out of any negligent act or omission to act by Grantee, its agents, employees, lessees, or contractors, or subcontractors during the term of this Agreement. The foregoing indemnity from Grantee shall not extend to liability resulting from the negligence of willful misconduct of Grantor, or Grantor's employees, agents, contractors or subcontractors.

4. Appurtenant Property. The easement granted and conveyed herein shall be deemed appurtenant to and shall be used only in connection with the Grantee Property and Grantor Property.

5. Covenants Running With the Land. All of the provisions of this Agreement are intended to be, and shall be construed as, covenants running with the land and shall be binding upon, inure to the benefit of, and be enforceable by the parties hereto and their respective lessees, transferees, successors and assigns for the term of this Agreement. However, neither party shall have any further rights or obligations under the terms of this Agreement from and after the date that such party transfers and conveys all of its rights and interests in its property.

6. Term. This Agreement shall commence on the Effective Date and shall continue until the Road Extension is complete and open to the public for vehicular travel, at which time this Agreement shall automatically terminate.

7. No Waiver of Default. No waiver of any default by any party shall be implied from an omission by another party to take any action in respect to a default if such default continues or is repeated. One or more waivers of any default in the performance of any term, provision or covenant of this Agreement shall not be deemed to be a waiver of any subsequent default of same. The rights and remedies given to any party to this Agreement shall be deemed to be cumulative and no one of such rights and remedies shall be exclusive of any of the others, or of any other right or remedy at law or in equity which any such party might otherwise have by virtue of a default under this Agreement, and the exercise of one such right or remedy by any such party shall not impair such party's standing to exercise any other right or remedy.

8. No Gift or Dedication. Nothing contained in this Agreement shall be deemed to be a gift or dedication of any portion of the Grantor Property to the general public or for any public purposes whatsoever, it being the intention that the easements created herein shall be strictly limited to and for the purposes expressed in this Agreement.

9. Amendments. This Agreement may not be amended, modified, rescinded, limited, or changed except by written agreement signed by the parties (or their successors and assigns).

10. Governing Law. This Agreement shall be construed, interpreted and applied in accordance with the laws of the State of Michigan.

11. Counterparts. This Agreement may be executed in one or more counterparts, and by separate counterpart signature pages, each of which shall be deemed to be an original. Facsimile or pdf signatures shall be acceptable.

12. Severability. If any term, provision or condition contained in this Agreement shall, to any extent, be invalid or unenforceable, the remainder of this Agreement (or the application of such term, provision or condition to persons or circumstances other than those in respect of which it is invalid or unenforceable) shall not be affected thereby, and each term, provision or condition of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

[Signatures on following pages.]

This Agreement shall be effective as of the date first above written.

GRANTOR

CITY OF MUSKEGON, a Michigan municipal corporation

By: _____

Name: Ken Johnson

Title: Mayor

By: _____

Name: Ann Meisch

Title: Clerk

STATE OF MICHIGAN)

)

COUNTY OF MUSKEGON)

Acknowledged before me in Muskegon County, Michigan, on _____, 2022, by Ken Johnson, the Mayor of the City of Muskegon, a Michigan municipal corporation, on behalf of the municipal corporation.

Notary Public, Muskegon County, Michigan

Acting in Muskegon County, Michigan

My commission expires: _____

STATE OF MICHIGAN)

)

COUNTY OF MUSKEGON)

Acknowledged before me in Muskegon County, Michigan, on _____, 2022, by Ann Meisch, the Clerk of the City of Muskegon, a Michigan municipal corporation, on behalf of the municipal corporation.

Notary Public, Muskegon County, Michigan

Acting in Muskegon County, Michigan

My commission expires: _____

GRANTEE

2725 OLTHOFF LLC, a Michigan limited liability company

By: _____

Name: Shane Woods

Its: President and CEO

STATE OF MICHIGAN)
)
COUNTY OF KENT)

Acknowledged before me in _____ County, Michigan, on _____, 202____, by Shane Woods, the President and CEO of 2725 Olthoff LLC, a Michigan limited liability company, on behalf of the limited liability company.

Notary Public, _____ County, Michigan
Acting in _____ County, Michigan
My commission expires: _____

**DRAFTED BY AND WHEN
RECORDED RETURN TO:**

Timothy R. Dudley
Rhoades McKee
55 Campau Avenue, NW, Suite 300
Grand Rapids, Michigan 49503

**EXHIBIT A
TO
ACCESS EASEMENT AGREEMENT**

LEGAL DESCRIPTION OF GRANTOR PROPERTY

Located in the City of Muskegon, County of Muskegon, State of Michigan:

LOT 69 AND PART OF LOT 68 OF THE PLAT OF PORT CITY INDUSTRIAL PARK NO. 6 AS RECORDED IN LIBER 22 OF PLATS PAGES 5-8, MUSKEGON COUNTY RECORDS, CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN AND MORE ALSO DESCRIBED AS; BEGINNING AT THE SOUTH 1/4 CORNER OF SAID SECTION 35 ALSO BEING THE SOUTHEAST CORNER OF LOT 69, PORT CITY INDUSTRIAL CENTER NO. 6 LIBER 22, PAGES 5-8, SAID POINT BEING THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 14 MINUTES 02 SECONDS WEST (R=S89°59'00"W), A DISTANCE OF 633.62 FEET (R=634.53 FEET D=633.97 FEET) TO THE SOUTHWEST CORNER OF LOT 69 OF SAID PLAT; THENCE NORTH 01 DEGREE 28 MINUTES 35 SECONDS EAST ALONG THE WEST LINE OF SAID LOT 69, A DISTANCE OF 889.87 FEET TO THE NORTHWEST CORNER OF SAID LOT 69 (R=N00°45'00" E R=891.68 FEET D=N00°40'22" E D=890.06 FEET); THENCE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST, A DISTANCE OF 633.38 FEET TO THE NORTHWEST CORNER OF LOT 68 (R=89°56'00"E 633.30 FEET); THENCE SOUTH 01 DEGREE 23 MINUTES 20 SECONDS WEST, A DISTANCE OF 99.95 FEET (D=S00°37'04"W 100.00 FEET); THENCE SOUTH 89 DEGREES 06 MINUTES 57 SECONDS EAST (D & R=S89°56'00" E), A DISTANCE OF 149.54 FEET; THENCE SOUTH 01 DEGREE 28 MINUTES 35 SECONDS WEST, A DISTANCE OF 788.13 FEET; THENCE NORTH 89 DEGREES 15 MINUTES 10 SECONDS WEST (R=S89°53'00"W D=S89°55 '56"W), A DISTANCE OF 141.58 FEET TO A NORTH 1/4 CORNER OF SECTION 2, T9N, R16W AS MONUMENTED BY F.F. SMITH & MID MICHIGAN ENGINEERING & SURVEY; THENCE SOUTH 89 DEGREES 14 MINUTES 02 SECONDS WEST, A DISTANCE OF 7.91 FEET TO THE POINT OF BEGINNING.

EXHIBIT B
TO
ACCESS EASEMENT AGREEMENT

LEGAL DESCRIPTION OF GRANTEE PROPERTY

Located in the City of Muskegon, County of Muskegon, State of Michigan:

Part of Lots 67 and 68 of the plat of PORT CITY INDUSTRIAL PARK NO. 6 as recorded in Liber 22 of Plats, pages 5-8, Muskegon County Records, City of Muskegon, Muskegon County, Michigan and more also described as: Commence at the South 1/4 corner of said Section 35 also being the Southeast corner of Lot 69, PORT CITY INDUSTRIAL CENTER NO. 6 as recorded in Liber 22, pages 5-8, Muskegon County Records; thence North 89 degrees 14 minutes 02 seconds East, a distance of 7.91 feet to the North 1/4 corner of Section 2, Town 9 North, Range 16 West, as monumented by F. F. Smith & Mid Michigan Engineering & Survey; thence South 89 degrees 15 minutes 10 seconds East (R=South 89 degrees 53 minutes 00 seconds West D=South 89 degrees 53 minutes 56 seconds West) along the South line of the plat of PORT CITY INDUSTRIAL PARK NO. 6 as recorded in Liber 22 of Plats, pages 5-8, Muskegon County Records, a distance of 141.58 feet to the Point of Beginning; thence North 01 degree 28 minutes 35 seconds East, a distance of 788.13 feet; thence South 89 degrees 06 minutes 57 seconds East (R & D=South 89 degrees 56 minutes 00 seconds East), a distance of 1139.79 feet to the Westerly right-of-way line of DeBaker Road; thence Southwesterly, a distance of 304.99 feet (D=303.18 feet) along a curve to the right (curve data being R=642.00 feet, long chord=302.13 feet (D=300.37 feet), long chord bearing = South 23 degrees 45 minutes 47 seconds West (D=South 22 degrees 50 minutes 42 seconds West); thence Southerly, a distance of 369.14 feet (R=370.18 feet D=371.00 feet) along a curve to the left, curve data being Radius=303.00 feet, long chord = 346.69 feet (D=348.26 feet), long chord bearing = South 02 degrees 09 minutes 26 seconds West (D=South 01 degrees 33 minutes 47 seconds West); thence along a line non-tangent to said curve, South 32 degrees 23 minutes 22 seconds East (R=South 33 degrees 22 minutes 00 seconds East D=South 33 degrees 11 minutes 07 seconds East), a distance of 191.91 feet to the Southeast corner of Lot 67 of said plat; thence North 89 degrees 15 minutes 10 seconds West (R=South 89 degrees 53 minutes 00 seconds West D=South 89 degrees 55 minutes 56 seconds West) along said South line of the PORT CITY INDUSTRIAL CENTER NO. 6, a distance of 1127.94 feet to the Point of Beginning.

EXHIBIT C

Easement

THAT PART OF THE SOUTH 1/2 OF SECTION 35, TOWN 10 NORTH, RANGE 16 WEST, MUSKEGON, MUSKEGON COUNTY, MICHIGAN DESCRIBED AS:

COMMENCING AT THE SOUTH 1/4 CORNER, SECTION 35, TOWN 10 NORTH, RANGE 16 WEST; THENCE ALONG THE NORTH AND SOUTH 1/4 LINE OF SAID SECTION, NORTH 01 DEGREES 26 MINUTES 16 SECONDS EAST 604.13 FEET TO THE POINT OF BEGINNING; THENCE NORTH 66 DEGREES 40 MINUTES 22 SECONDS WEST 483.58 FEET; THENCE NORTH 01 DEGREES 23 MINUTES 31 SECONDS EAST 99.83 FEET TO THE SOUTHERLY RIGHT OF WAY LINE FOR OLTHOFF DRIVE; THENCE ALONG SAID RIGHT OF WAY LINE, SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 449.08 FEET; THENCE SOUTH 01 DEGREES 36 MINUTES 39 SECONDS WEST 99.88 FEET; THENCE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 149.94 FEET; THENCE SOUTH 01 DEGREES 28 MINUTES 38 SECONDS WEST 246.22 FEET; THENCE NORTH 66 DEGREES 40 MINUTES 22 SECONDS WEST 161.36 FEET TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 2.63± ACRES (118,543± SQ. FT.). SUBJECT TO EASEMENTS, RESTRICTIONS, AND RIGHTS OF WAY APPARENT AND OF RECORD.

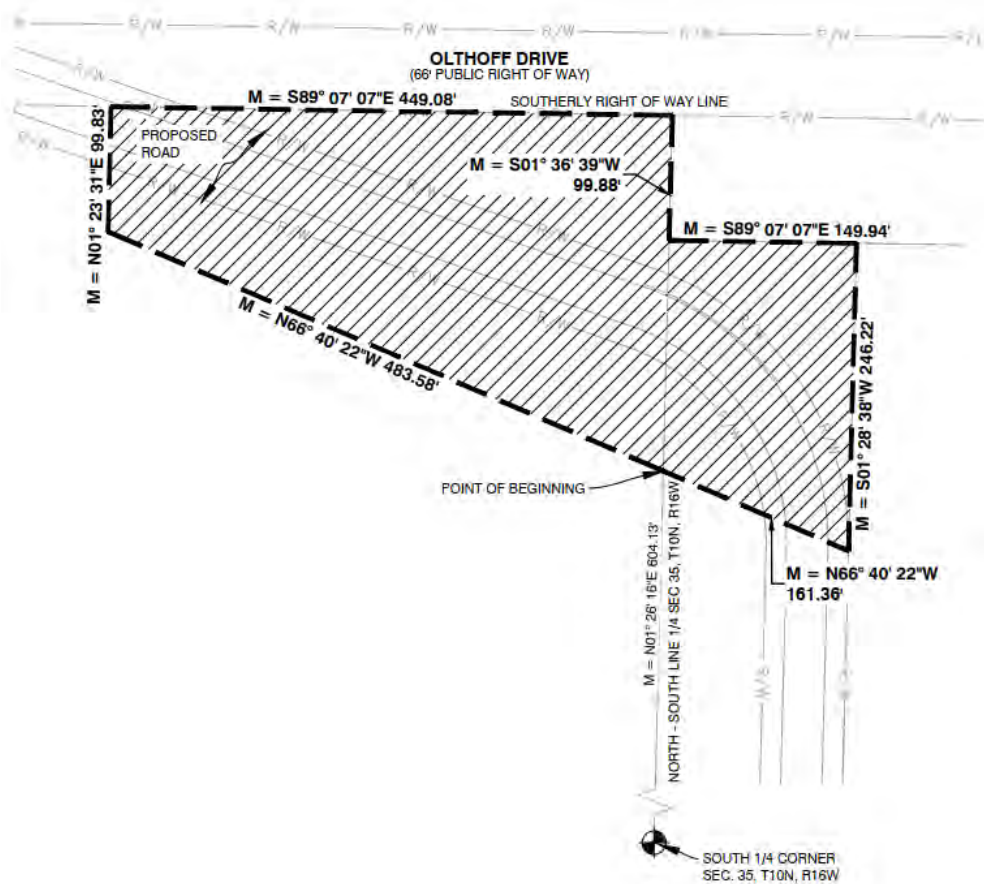


EXHIBIT 5

Approximate Depiction of Permanent Easement Area

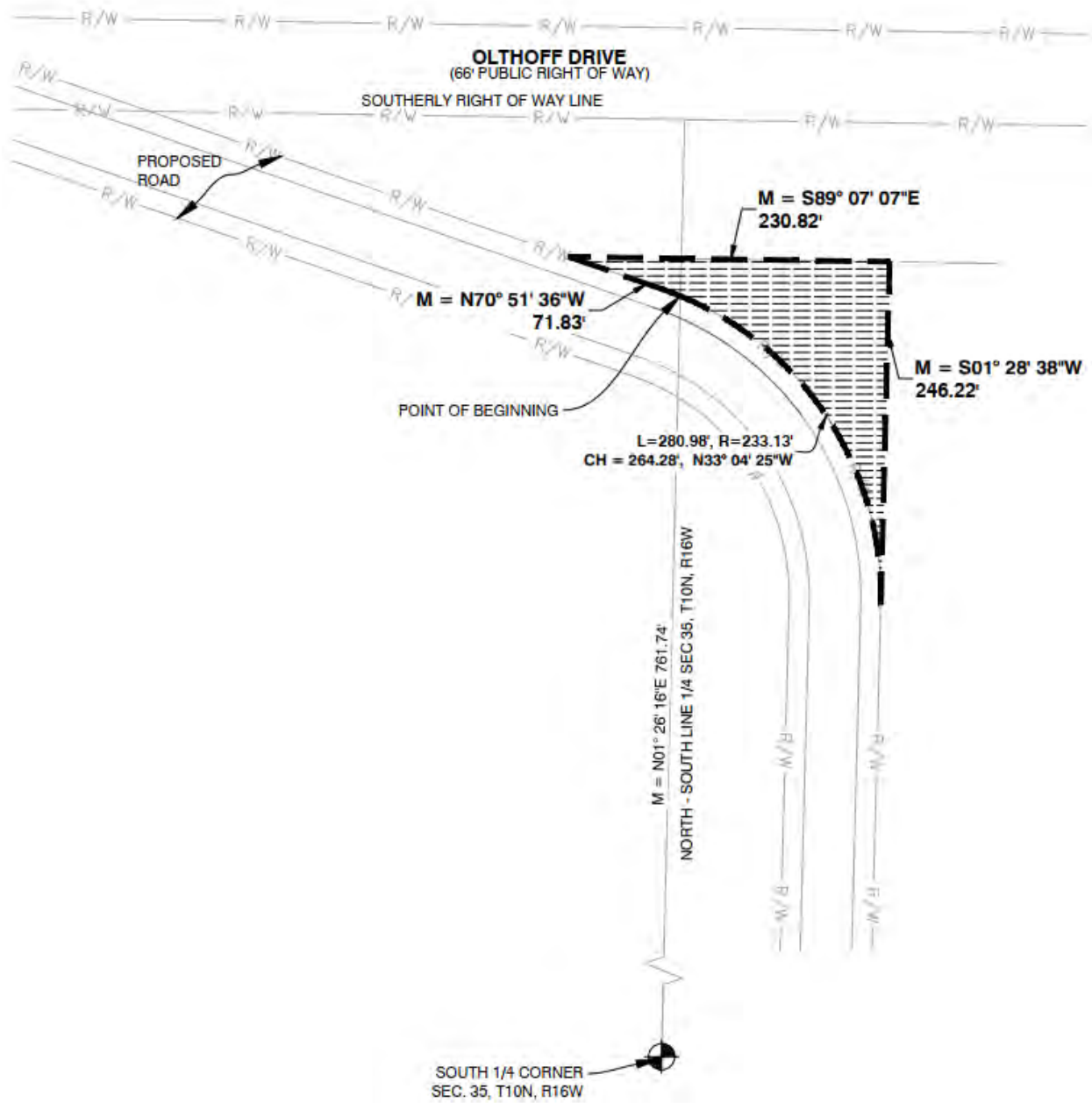


EXHIBIT 6

Sanitary Sewer

THAT PART OF THE SOUTHEAST 1/4 OF SECTION 35, TOWN 10 NORTH, RANGE 16 WEST, MUSKEGON, MUSKEGON COUNTY, MICHIGAN DESCRIBED AS:

COMMENCING AT THE SOUTH 1/4 CORNER, SECTION 35, TOWN 10 NORTH, RANGE 16 WEST; THENCE ALONG THE NORTH AND SOUTH 1/4 LINE OF SAID SECTION, NORTH 01 DEGREES 26 MINUTES 16 SECONDS EAST 888.61 FEET TO SOUTHERLY RIGHT OF WAY LINE OF OLTHOFF DRIVE; THENCE ALONG SAID SOUTHERLY LINE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 1003.97 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID SOUTHERLY LINE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 20.00 FEET; THENCE SOUTH 01 DEGREES 23 MINUTES 20 SECONDS WEST 100.00 FEET; THENCE NORTH 89 DEGREES 07 MINUTES 07 SECONDS WEST 20.00 FEET; THENCE NORTH 01 DEGREES 23 MINUTES 20 SECONDS EAST 100.00 FEET TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 0.04± ACRES (1,999± SQ. FT.). SUBJECT TO EASEMENTS, RESTRICTIONS, AND RIGHTS OF WAY APPARENT AND OF RECORD.

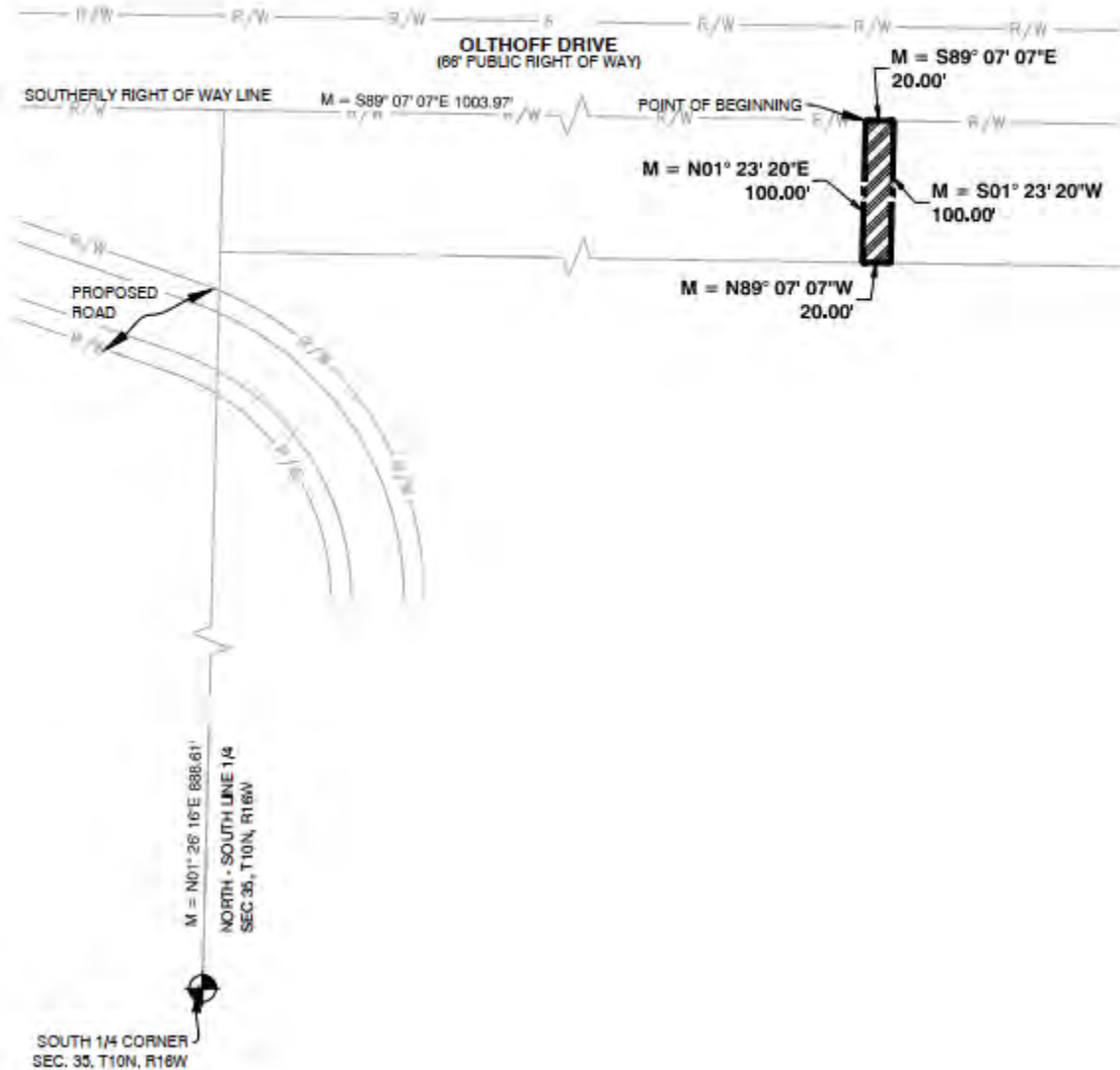


EXHIBIT 7

Sanitary Sewer

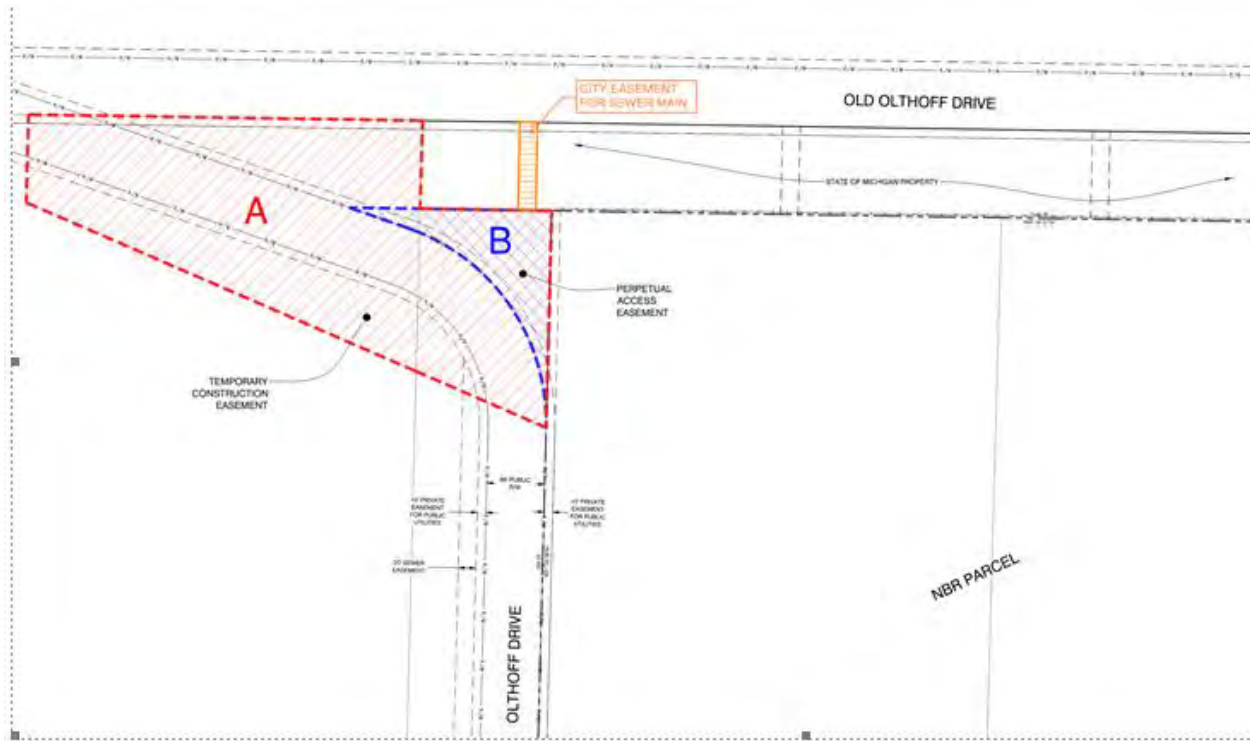
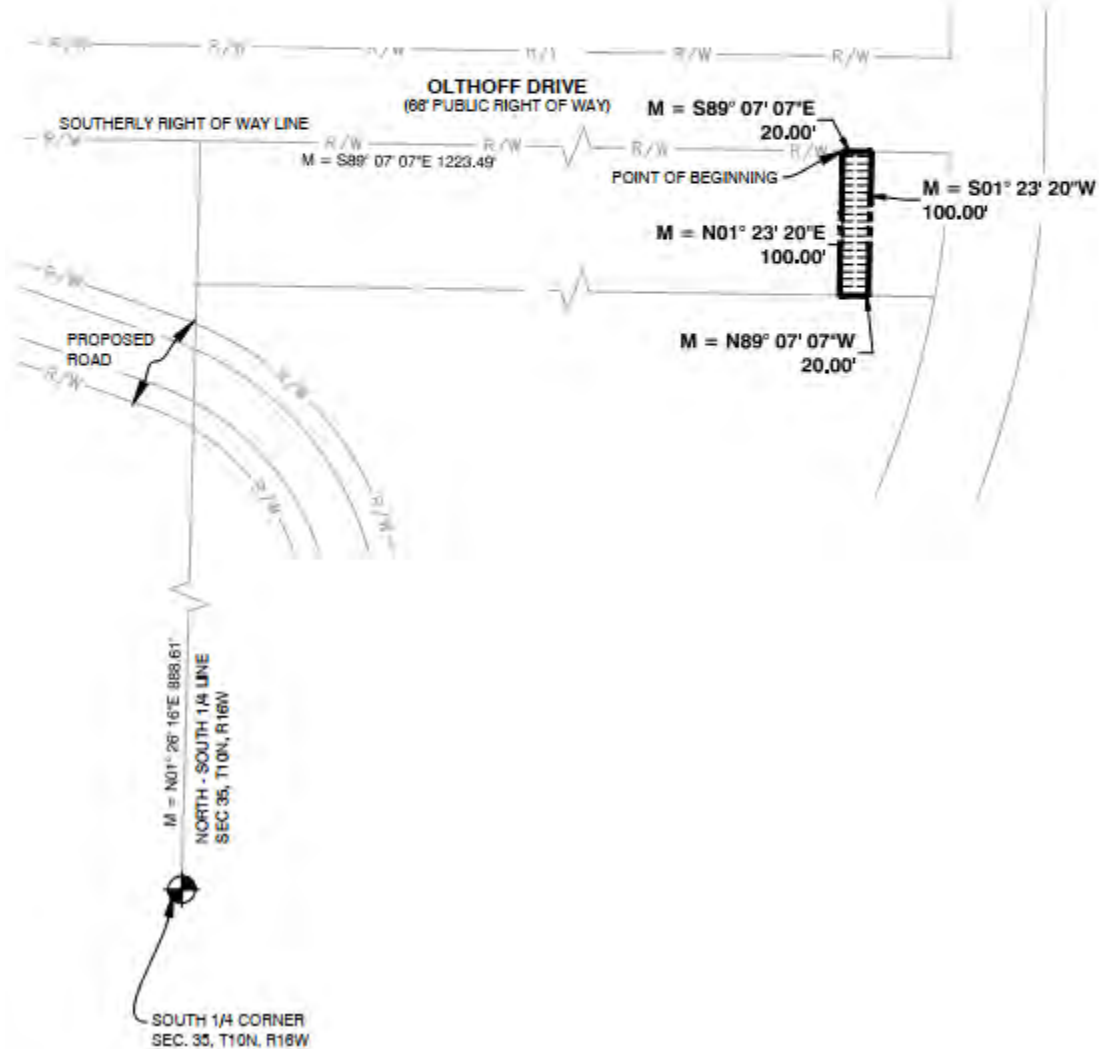


EXHIBIT 8

Storm Sewer

THAT PART OF THE SOUTHEAST 1/4 OF SECTION 35, TOWN 10 NORTH, RANGE 16 WEST, MUSKEGON, MUSKEGON COUNTY, MICHIGAN DESCRIBED AS:

COMMENCING AT THE SOUTH 1/4 CORNER SECTION 35, TOWN 10 NORTH, RANGE 16 WEST; THENCE ALONG THE NORTH AND SOUTH 1/4 LINE OF SAID SECTION, NORTH 01 DEGREES 26 MINUTES 16 SECONDS EAST 888.61 FEET TO SOUTHERLY RIGHT OF WAY LINE OF OLTHOFF DRIVE; THENCE ALONG SAID SOUTHERLY LINE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 1223.49 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID SOUTHERLY LINE SOUTH 89 DEGREES 07 MINUTES 07 SECONDS EAST 20.00 FEET; THENCE SOUTH 01 DEGREES 23 MINUTES 20 SECONDS WEST 100.00 FEET; THENCE NORTH 89 DEGREES 07 MINUTES 07 SECONDS WEST 20.00 FEET; THENCE NORTH 01 DEGREES 23 MINUTES 20 SECONDS EAST 100.00 FEET TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 0.04± ACRES (1,999 ± SQ. FT.). SUBJECT TO EASEMENTS, RESTRICTIONS, AND RIGHTS OF WAY APPARENT AND OF RECORD.



WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: 10-25-22	Title: Infill Housing Project Brownfield Plan Public Hearing (4th Amendment)
Submitted By: Pete Wills	Department: Economic Dev
Brief Summary: To hold a public hearing and approve the attached resolution which seeks to adopt an amendment to the City's Brownfield Plan (Infill Housing Project, 4th Amendment). On October 11th, the BRA approved the Plan Amendment and further recommends that the Muskegon City Commission approve the Plan Amendment.	
Detailed Summary & Background: Staff is seeking to amend the Scattered Site Brownfield Plan to update the number of eligible parcels within the Plan. The 4th Amendment removes two mixed-use projects (395 Houston and 301 W. Muskegon - Catholic Charities), 880 First St-208 W Clay-216 W Clay (880 First St development), Allen Edwin Homes (former Farmers Market), as well as a modified parcel at the former Froebel School. Developers for a few of the projects, listed above, are expected to pursue their own Brownfield Plan Amendment so as to directly benefit from the TIF capture. Removal of these parcels is necessary in order for them to accomplish that goal. Ten parcels have been removed from the Plan. The project will now focus on the redevelopment of 495 parcels that are scattered throughout the city. Some of these lots will be split, creating even more parcels. The plan incorporates two types of redevelopment projects; infill housing on vacant City lots and the rehab of existing homes (10 detached houses). • 417 Jackson (former Froebel school) – increased to \$1,000,000 in public infrastructure costs if water/sewer improvements become necessary. • 417 Jackson (former Froebel school) – retained \$2,000,000 in demo & abatement costs. • Staff anticipates potential construction of an additional 28 new infill houses as part of a potential redevelopment project of the Froebel site. • Removed the properties associated with the former Allen Edwin Homes development at the former farmers market. Removal of these parcels did not take out “cost of sale” expenditures because Allen Edwin intended to build and own themselves, so those never were included in the former “total houses built” estimate. It was included for the infrastructure expenses (alley additions). The site is too contaminated and will need its own brownfield if it is to be developed. The 4th Amendment also includes the following updates: • Developer's Reimbursement Costs: Infill Housing - \$11.4M / Demo & Abatement - \$2M / Public Infrastructure- \$1M / Reimbursable Costs of Construction (before 15% contingency): \$14.4M • Estimated Total Capital Investment: Infill Housing - \$107,200,000 / Home Rehab - \$500,000 / Total estimated capital investment: \$107,700,000 • The Plan anticipates eligible activities, paid through future capture of tax increments, to include \$11,400,000 cost of sale/seller concessions; \$2,000,000 for demolition and abatement; \$1,000,000 to construct public infrastructure at the former Froebel School; \$20,000 for	

brownfield plan preparation and development; a 15% plan contingency fee of \$2,163,000; and which reflects total eligible activities to be paid under this plan at \$16,582,000.

- The Authority intends to enter into Development & Reimbursement Agreements with future property owners/developers of properties included in the Plan to reimburse them for costs of eligible activities.
- The duration of this Plan is not to exceed 30 years and complete recapture of eligible costs through tax increment revenue are expected to occur within this period.
- The plan contemplates continued five-year capture of tax increments for a local Brownfield Revolving Loan Fund if there is time left in the 30-year plan after eligible costs are covered.

<https://www.muskegon-mi.gov/cresources/Brownfield-map-1-of-3.pdf>

<https://www.muskegon-mi.gov/cresources/Brownfield-map-2-of-3.pdf>

<https://www.muskegon-mi.gov/cresources/Brownfield-map-3-of-3.pdf>

Goal/Focus Area/Action Item Addressed:

Goal: Economic Development, Housing, and Business / Focus Area: diverse housing types / Action Item 2022-2.3: Increase variety of housing types

Amount Requested: N/A

Amount Budgeted: N/A

Fund(s) or Account(s): N/A

Fund(s) or Account(s): N/A

Recommended Motion: Discussion Only

Approvals: *Get approval from division head at a minimum prior to sending to the Clerk.*

Immediate Division Head ☒ Information Technology ☐

Other Division Heads ☒ Communication ☒

Legal Review ☐

Guest(s) Invited / Presenting

Yes ☐

No ☒

For City Clerk Use Only:

Commission Action:

**CITY OF MUSKEGON
BROWNFIELD REDEVELOPMENT
AUTHORITY**

BROWNFIELD PLAN AMENDMENT

INFILL HOUSING PROJECT (4th Amendment)

October 11, 2022

**Prepared for The City of Muskegon Brownfield
Redevelopment Authority**

Prepared by City of Muskegon Staff

PROJECT NAME

Infill Housing Project

DEVELOPER

City of Muskegon, a qualified unit of local government, as defined by Public Act 381 of 1996, as amended

ELIGIBLE PROPERTY LOCATION

There are 495 Eligible Properties for this project and the lots are scattered throughout the city. Please refer to the "Eligible Property Information Chart" and the "Eligible Property Map (Attachment A)" on the following pages.

TYPE OF ELIGIBLE PROPERTY

Blighted

SUBJECT PROJECT DESCRIPTION

The project will focus on the redevelopment of 495 parcels that are scattered throughout the city. Some of these lots will be split, creating even more parcels. The plan incorporates two types of redevelopment projects; infill housing on vacant City lots and the rehab of existing homes (10 detached houses).

The residential infill units will consist mostly of detached houses, with some rowhouses, duplexes and small multiplexes mixed in as the market dictates. The infill housing project includes the demolition of the former Froebel School (demo and abatement costs) in order to redevelop the property with a variety of residential units.

ELIGIBLE ACTIVITIES

Cost of Sale, Demo & Abatement, Public Infrastructure, Preparation of Brownfield Plan

DEVELOPER'S REIMBURSABLE COSTS

Infill Housing - \$11,400,000

Home Rehab - \$0

Demo & Abatement - \$2,000,000

Public Infrastructure - \$1,000,000

Total Reimbursable Cost – \$14,400,000

MAXIMUM DURATION OF CAPTURE

30 years

ESTIMATED TOTAL CAPITAL INVESTMENT

Infill Housing - \$107,200,000

Home Rehab - \$500,000

Total Estimated Capital Investment - \$107,700,000

INITIAL TAXABLE VALUE

\$0 (City & County Owned)

1. Introduction

The City of Muskegon, Michigan (the “City”), established the Muskegon Brownfield Redevelopment Authority (the “Authority”) on July 4, 1997, pursuant to Michigan Public Act 381 of 1996, as amended (“Act 381”). The primary purpose of Act 381 is to encourage the redevelopment of eligible property by providing economic incentives through tax increment financing for certain eligible activities.

The main purpose of this Brownfield Plan is to promote the redevelopment of and investment in certain “Brownfield” properties within the City. Inclusion of the subject properties within this Plan will facilitate the development of infill housing at eligible properties. By facilitating redevelopment of underutilized properties, the Plan is intended to promote economic growth for the benefit of the residents of the City and all taxing units located within and benefited by the Authority.

This Plan is intended to be a living document, which can be amended as necessary to achieve the purposes of Act 381. It is specifically anticipated that properties will be continually added to the Plan as new projects are identified. The Plan contains general provisions applicable to the Plan, as well as property-specific information for each project. The applicable Sections of Act 381 are noted throughout the Plan for reference purposes.

This Brownfield Plan contains the information required by Section 13(1) of Act 381, as amended. Additional information is available from the Muskegon City Manager or the Planning Director.

The Infill Housing Project was originally added to this Plan on April 14, 2019. It was amended for the first time on July 28, 2020; a second time on December 8, 2020; and a third time on December 13, 2021. This amendment seeks to modify the plan by removing the mixed-use projects, removing the Allen Edwin development and modifying the Froebel School development.

2. General Provisions

A. Costs of the Brownfield Plan (Section 13(1)(a))

Any site-specific costs of implementing this Plan are described in the site-specific section of the Plan. Site-specific sources of funding may include tax increment financing revenue generated from new development on eligible brownfield properties, state and federal grant or loan funds, and/or private parties. Where private parties finance the costs of eligible activities under the Plan, tax increment revenues may be used to reimburse the private parties. The initial costs related to preparation of the Brownfield Plan were funded by the City’s general fund. Subsequent amendments to the Plan may be funded by the person requesting inclusion of a project in the Plan, and if eligible, may be reimbursed through tax increment financing.

The Authority intends to pay for administrative costs and all of the things necessary or convenient to achieve the objectives and purposes of the Authority with fees charged to applicants to be included in the Plan, and any eligible tax increment revenues collected pursuant to the Plan, in accordance with the provisions of Act 381, including, but not limited to:

- i) the cost of financial tracking and auditing the funds of the Authority,
- ii) costs for amending and/or updating this Plan, and
- iii) costs for Plan implementation

Tax increment revenues that may be generated and captured by this Plan are identified in the site-specific sections of this Plan.

B. Method for Financing Costs of Plan (Section 13(1)(d) and (e))

The City or Brownfield Authority may incur some debt on a site-specific basis. Please refer to the site-specific section of this Plan for details on any debt to be incurred by the City or Authority. When a property proposed for inclusion in the Plan is in an area where tax increment financing is a viable option, the Authority intends to enter into Development Agreements with the property owners/developers of properties included in the Plan to reimburse them for the costs of eligible activities undertaken pursuant to this Plan. Financing arrangements will be specified in a Development and Reimbursement Agreement, and also identified in the Site Specific section of the Plan.

C. Duration of the Brownfield Plan (Section 13(1)(f))

The duration of this Plan is not to exceed 30 years. It is the goal of the city to build as many homes as possible over that time frame, however, it is unlikely that all 495 parcels will be developed. Since the “cost of sale” will vary for each home, as will construction costs, it is impossible to know exactly how long it will take to completely recapture eligible costs through tax increment revenues, although it is anticipated that it will be well within the 30 year time frame. In addition, once all activity costs are reimbursed, funds may be captured for the local site remediation revolving fund, if available. The duration of capture for the Project already began in 2020 and will continue until such time that all the eligible activities undertaken in this Plan are reimbursed, but in no event will the Plan exceed the maximum duration provided for in (MCLA 125.2663(1)(22)). The total costs of eligible activities include the cost of principal and interest on any note or obligation issued by the Authority to pay for the costs of eligible activities, the cost of principal and interest otherwise incurred to pay for eligible activities, the reasonable costs of a work plan or remedial action plan and the costs of preparation of Brownfield Plans and amendments.

D. Displacement/Relocation of Individuals on Eligible Properties (Section 13(1)(i),(j)(k)(l))

Eligible properties identified in this Plan will not require the displacement/relocation of existing residences, therefore the provisions of *Section 13(1)(i-l)* are not applicable at this time.

E. Local Site Remediation Revolving Fund (Section 8; Section 13(1)(m))

Whenever this Plan includes a property for which taxes will be captured through the tax increment financing authority provided by Act 381, it is the Authority's intent to establish and fund a Local Site Remediation Revolving Fund ("Fund"). The Fund will consist of tax increment revenues that exceed the costs of eligible activities incurred on an eligible property, as specified in Section 13(5) of Act 381. Section 13(5) authorizes the capture of tax increment revenue from an eligible property for up to 5 years after the time that capture is required for the purposes of paying the costs of eligible activities identified in the Plan. It is the intention of the Authority to continue to capture tax increment revenues for 5 years after eligible activities are funded from those properties identified for tax capture

in the Plan, provided that the time frame allowed by Act 381 for tax capture is sufficient to accommodate capture to capitalize a Fund. The amount of school operating taxes captured for the Revolving Fund will be limited to the amount of school operating taxes captured for eligible environmental response activities under this Plan. It may also include funds appropriated or otherwise made available from public or private sources.

The Revolving Fund may be used to reimburse the Authority, the City, and private parties for the costs of eligible activities at eligible properties and other costs as permitted by Act 381. It may also be used for eligible activities on an eligible property for which there is no ability to capture tax increment revenues. The establishment of this Revolving Fund will provide additional flexibility to the Authority in facilitating redevelopment of brownfield properties by providing another source of financing for necessary eligible activities.

3. Site Specific Provisions

A. Eligibility and Project Description (Sec. 13(1)(h))

The eligible properties included in the Infill Housing Project compromise approximately 173 acres of vacant land spread across 495 parcels in Muskegon, Michigan (See Attachment A). Some of these lots will be split, which will result in additional parcels.

Project Breakdown:

Parcels = 495

New homes = 570

Rehabbed homes = 10

“Cost of sale” concessions = \$11,400,000

Public Infrastructure = \$1,000,000

Demo & abatement = \$2,000,000

Reimbursable Costs of Construction (before 15% contingency) = \$14,400,000

The chart below depicts a listing of eligible properties and the basis for their eligibility.

Parcel No.	Address	Area Acreage	Basis of Brownfield Eligibility	Investment Cost	Reimbursable Cost
24-205-378-0006-00	1248 5th St	0.10	Cost of Sale	\$200,000	\$20,000
24-405-003-0007-00	740 Leonard Ave	0.37	Cost of Sale	\$400,000	\$40,000
24-405-003-0008-00	754 Leonard Ave	0.37	Cost of Sale	\$600,000	\$60,000
24-205-014-0020-00	558 Jackson Ave	0.61	Cost of Sale	\$400,000	\$40,000
24-205-015-0006-10	608 Jackson Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-205-019-0002-00	677 Jackson Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-205-020-0001-00	621 Jackson Ave	0.34	Cost of Sale	\$200,000	\$20,000
24-205-021-0001-00	601 Jackson Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-022-0001-00	579 Jackson Ave	0.19	Cost of Sale	\$200,000	\$20,000

24-205-022-0002-00	553 Jackson Ave	0.55	Cost of Sale	\$600,000	\$60,000
24-205-022-0003-20	530 Herrick St	0.41	Cost of Sale	\$600,000	\$60,000
24-205-023-0008-00	527 Herrick St	1.41	Cost of Sale	\$1,800,000	\$180,000
24-205-024-0001-00	417 Jackson Ave	7.20	Demo, COS, Public Infrastructure	\$8,600,000	\$3,560,000
24-205-068-0010-00	438 E Isabella Ave	0.21	Blight Elimination	\$200,000	\$0
24-205-076-0009-00	580 Catherine Ave	0.20	Cost of Sale	\$50,000	\$20,000
24-205-078-0003-00	441 E Isabella Ave	0.20	Blight Elimination	\$200,000	\$0
24-205-078-0004-00	435 E Isabella Ave	0.20	Cost of Sale	\$50,000	\$20,000
24-205-081-0001-10	591 Catherine Ave	0.11	Blight Elimination	\$200,000	\$0
24-205-092-0001-00	589 McLaughlin Ave	0.18	Blight Elimination	\$200,000	\$0
24-205-092-0004-00	559 McLaughlin Ave	0.19	Blight Elimination	\$200,000	\$0
24-205-191-0001-00	185 E Muskegon Ave	0.29	Blight Elimination	\$200,000	\$0
24-205-191-0009-00	209 E Walton Ave	0.49	Blight Elimination	\$200,000	\$0
24-205-232-0007-00	1047 Ambrosia St	0.57	Cost of Sale	\$1,400,000	\$140,000
24-205-236-0008-00	1075 Ambrosia St	0.35	Cost of Sale	\$1,200,000	\$120,000
24-205-245-0002-00	1192 Pine St	0.10	Cost of Sale	\$50,000	\$20,000
24-205-245-0002-10	1194 Pine St	0.09	Cost of Sale	\$50,000	\$20,000
24-205-250-0008-00	1155 Ambrosia St	0.61	Cost of Sale	\$1,200,000	\$120,000
24-205-254-0001-00	1338 Arthur St	0.13	Cost of Sale	\$200,000	\$20,000
24-205-261-0008-00	1205 Ambrosia St	0.41	Cost of Sale	\$1,200,000	\$120,000
24-205-266-0001-00	1386 Ransom St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-281-0002-10	1530 Hoyt St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-336-0008-00	382 W Muskegon Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-205-340-0001-00	619 W Webster Ave	0.08	Cost of Sale	\$2,000,000	\$200,000
24-205-345-0001-00	579 W Muskegon Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-345-0002-10	583 W Muskegon Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-345-0006-00	617 W Muskegon Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-347-0004-00	487 W Muskegon Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-352-0004-10	1078 2nd St	0.10	Blight Elimination	\$50,000	\$0
24-205-352-0008-00	180 Houston Ave	0.00	Cost of Sale	\$200,000	\$20,000
24-205-364-0008-10	1141 Jefferson St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-367-0008-00	1188 4th St	0.21	Blight Elimination	\$50,000	\$0
24-601-000-0001-00	250 Monroe Ave	0.02	Cost of Sale	\$200,000	\$20,000
24-601-000-0006-00	240 Monroe Ave	0.02	Cost of Sale	\$200,000	\$20,000
24-205-369-0004-00	395 Houston Ave	0.21	Cost of Sale	\$400,000	\$40,000
24-205-369-0006-30	1262 6th St	0.07	Cost of Sale	\$200,000	\$20,000
24-205-371-0004-10	507 Houston Ave	0.10	Blight Elimination	\$200,000	\$0
24-205-374-0007-00	462 Washington Ave	0.08	Blight Elimination	\$200,000	\$0
24-205-375-0003-20	1392 Park St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-375-0005-00	1387 7th St	0.24	Cost of Sale	\$400,000	\$40,000
24-205-375-0009-10	408 Washington Ave	0.16	Cost of Sale	\$200,000	\$20,000

24-205-375-0010-00	420 Washington Ave	0.09	Cost of Sale	\$400,000	\$40,000
24-205-376-0007-00	1360 7th St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-376-0007-20	388 Merrill Ave	0.20	Cost of Sale	\$400,000	\$40,000
24-205-377-0001-00	1245 5th St	0.12	Cost of Sale	\$200,000	\$20,000
24-205-377-0011-00	1261 5th St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-378-0006-10	1256 5th St	0.10	Cost of Sale	\$200,000	\$20,000
24-601-000-0008-00	239 Monroe Ave	0.02	Cost of Sale	\$200,000	\$20,000
24-601-000-0010-00	235 Monroe Ave	0.02	Cost of Sale	\$200,000	\$20,000
24-205-384-0007-20	1259 Sanford St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-386-0012-00	219 Merrill Ave	0.12	Cost of Sale	\$200,000	\$20,000
24-205-387-0005-00	271 Merrill Ave	0.19	Cost of Sale	\$400,000	\$40,000
24-205-387-0007-00	248 Mason Ave	0.14	Cost of Sale	\$50,000	\$20,000
24-205-388-0006-20	1342 6th St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-388-0007-00	1352 6th St	0.09	Cost of Sale	\$400,000	\$40,000
24-205-388-0008-00	292 Mason Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-389-0008-00	352 Mason Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-389-0009-00	346 Mason Ave	0.09	Cost of Sale	\$400,000	\$40,000
24-205-389-0012-00	1349 6th St	0.20	Cost of Sale	\$200,000	\$40,000
24-205-390-0011-20	288 Washington Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-391-0003-00	275 Mason Ave	0.18	Cost of Sale	\$400,000	\$40,000
24-205-391-0011-00	242 Strong Ave	0.08	Cost of Sale	\$200,000	\$20,000
24-205-394-0001-00	1280 Sanford St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-401-0001-10	1370 Sanford St	0.08	Blight Elimination	\$200,000	\$0
24-205-405-0013-00	1464 6th St	0.17	Cost of Sale	\$200,000	\$20,000
24-205-405-0014-00	1458 6th St	0.16	Cost of Sale	\$200,000	\$20,000
24-205-405-0019-00	237 Washington Ave	0.17	Blight Elimination	\$200,000	\$0
24-205-406-0007-00	329 Washington Ave	0.19	Blight Elimination	\$200,000	\$0
24-205-406-0018-00	314 W Grand Ave	0.17	Blight Elimination	\$200,000	\$0
24-205-407-0004-00	1456 Park St	0.18	Blight Elimination	\$200,000	\$0
24-205-407-0011-10	1457 7th St	0.12	Cost of Sale	\$50,000	\$20,000
24-205-408-0002-00	459 Washington Ave	0.46	Cost of Sale	\$600,000	\$60,000
24-205-408-0007-00	1468 8th St	0.19	Blight Elimination	\$400,000	\$0
24-205-418-0003-00	1514 Park St	0.19	Blight Elimination	\$200,000	\$0
24-205-419-0001-00	355 W Grand Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-419-0001-20	337 W Grand Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-419-0007-00	1542 7th St	0.08	Blight Elimination	\$200,000	\$0
24-205-419-0013-00	1535 6th St	0.16	Cost of Sale	\$200,000	\$20,000
24-205-419-0019-00	305 W Grand Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-420-0012-20	254 W Southern Ave	0.07	Cost of Sale	\$50,000	\$20,000
24-205-425-0007-00	1605 Sanford St	0.15	Cost of Sale	\$400,000	\$40,000
24-205-428-0007-00	340 W Forest Ave	0.15	Cost of Sale	\$200,000	\$20,000

24-205-430-0004-00	487 W Southern Ave	0.26	Cost of Sale	\$400,000	\$40,000
24-205-439-0006-10	408 W Dale Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-439-0007-00	1670 Park St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-440-0004-00	1660 7th St	0.31	Cost of Sale	\$400,000	\$40,000
24-205-441-0003-00	1639 5th St	0.17	Cost of Sale	\$200,000	\$20,000
24-205-441-0007-00	204 W Dale Ave	0.08	Blight Elimination	\$200,000	\$0
24-205-449-0001-00	1686 7th St	0.31	Cost of Sale	\$400,000	\$40,000
24-205-449-0009-00	324 W Larch Ave	0.14	Cost of Sale	\$200,000	\$20,000
24-205-449-0010-00	318 W Larch Ave	0.27	Cost of Sale	\$400,000	\$40,000
24-205-463-0003-00	1772 5th St	0.23	Cost of Sale	\$200,000	\$20,000
24-205-463-0004-00	1782 5th St	0.31	Cost of Sale	\$400,000	\$40,000
24-205-484-0004-00	1067 W Grand Ave	0.20	Blight Elimination	\$50,000	\$0
24-405-003-0001-00	704 Leonard Ave	0.38	Cost of Sale	\$400,000	\$40,000
24-405-003-0011-00	766 Leonard Ave	0.38	Cost of Sale	\$600,000	\$60,000
24-745-000-0033-00	1227 Fleming Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-406-0009-00	0 7TH ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-066-0011-00	0 CHESTNUT ST	0.09	Cost of Sale	\$200,000	\$20,000
24-232-004-0010-00	0 Jefferson St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-391-0006-20	0 MASON AVE	0.06	Cost of Sale	\$200,000	\$20,000
24-205-248-0002-00	0 Sophia St	0.12	Cost of Sale	\$200,000	\$20,000
24-205-493-0009-00	0 Southern Ave	0.35	Cost of Sale	\$200,000	\$20,000
24-612-000-0519-00	1003 Ducey Ave	0.22	Cost of Sale	\$200,000	\$20,000
24-612-000-0553-00	1007 Albert Ave	0.31	Cost of Sale	\$200,000	\$20,000
24-190-001-0020-00	1032 Evanston Ave	0.03	Cost of Sale	\$200,000	\$20,000
24-205-173-0001-00	105 E Western Ave	0.23	Cost of Sale	\$200,000	\$20,000
24-480-002-0018-00	1056 WINDSOR AVE	0.12	Cost of Sale	\$200,000	\$20,000
24-205-069-0006-00	1060 Williams St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-248-0002-20	1061 Wood St	0.13	Cost of Sale	\$200,000	\$20,000
24-612-000-0531-00	1065 James Ave	0.30	Cost of Sale	\$200,000	\$20,000
24-190-001-0001-00	1070 Evanston Ave	0.38	Cost of Sale	\$200,000	\$20,000
24-205-357-0001-10	1075 SANFORD ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-247-0009-00	1077 Sophia St	0.30	Cost of Sale	\$200,000	\$20,000
24-612-000-0492-00	1085 Marquette Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-215-012-0030-00	1085 E Holbrook Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-205-248-0003-00	1088 Sophia St	0.30	Cost of Sale	\$200,000	\$20,000
24-205-472-0013-00	1100 Washington Ave	0.26	Cost of Sale	\$200,000	\$20,000
24-205-078-0006-00	1114 WOOD ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-077-0001-00	1115 CHESTNUT ST	0.13	Cost of Sale	\$200,000	\$20,000
24-205-077-0002-00	1123 CHESTNUT ST	0.13	Cost of Sale	\$200,000	\$20,000
24-205-076-0001-10	1125 MAPLE ST	0.09	Cost of Sale	\$200,000	\$20,000
24-205-074-0006-10	1126 KENNETH ST	0.10	Cost of Sale	\$200,000	\$20,000

24-205-249-0002-00	1160 Ambrosia St	0.30	Cost of Sale	\$200,000	\$20,000
24-205-080-0006-00	1162 Williams St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-382-0001-00	1163 Sanford St	0.10	Cost of Sale	\$200,000	\$20,000
24-613-000-0768-00	1172 Marquette Ave	0.32	Cost of Sale	\$200,000	\$20,000
24-613-000-0755-00	1175 Morgan Ave	0.61	Cost of Sale	\$200,000	\$20,000
24-205-082-0007-00	1186 Maple St	0.22	Cost of Sale	\$200,000	\$20,000
24-613-000-0780-00	1200 Adams Ave	0.37	Cost of Sale	\$200,000	\$20,000
24-205-384-0011-00	1221 SANFORD ST	0.10	Cost of Sale	\$200,000	\$20,000
24-613-000-0781-00	1224 Adams Ave	0.39	Cost of Sale	\$200,000	\$20,000
24-613-000-0789-00	1227 ADAMS AVE	0.15	Cost of Sale	\$200,000	\$20,000
24-205-252-0010-10	1227 Pine St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-745-0002-00	1230 Channel Dr	0.26	Cost of Sale	\$200,000	\$20,000
24-611-000-0484-00	1243 Marquette Ave	0.34	Cost of Sale	\$200,000	\$20,000
24-205-320-0001-00	1249 9th St	0.98	Cost of Sale	\$200,000	\$20,000
24-611-000-0250-00	1258 Wesley Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-205-260-0001-30	1270 Pine St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-252-0003-00	1278 Terrace St	0.27	Cost of Sale	\$200,000	\$20,000
24-745-000-0016-00	1282 FLEMING AVE	0.11	Cost of Sale	\$200,000	\$20,000
24-611-000-0371-00	1284 James Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-771-000-0030-00	1294 Williams St	0.32	Cost of Sale	\$200,000	\$20,000
24-205-582-0001-00	1296 Lakeshore Dr	0.92	Cost of Sale	\$200,000	\$20,000
24-205-216-0017-00	130 E APPLE AVE	0.22	Cost of Sale	\$200,000	\$20,000
24-205-376-0001-10	1303 6TH ST	0.07	Cost of Sale	\$200,000	\$20,000
24-611-000-0415-00	1315 Ducey Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-205-264-0002-00	1318 Pine St	0.16	Cost of Sale	\$200,000	\$20,000
24-205-269-0002-00	1320 Spring St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-264-0003-00	1324 PINE ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-258-0010-00	1325 Terrace St	0.10	Cost of Sale	\$200,000	\$20,000
24-611-000-0234-00	1325 Wesley Ave	0.16	Cost of Sale	\$200,000	\$20,000
24-205-340-0006-20	1326 9th St	0.10	Cost of Sale	\$200,000	\$20,000
24-611-000-0376-00	1328 James Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-205-264-0004-00	1334 Pine St	0.26	Cost of Sale	\$200,000	\$20,000
24-611-000-0413-00	1341 Ducey Ave	0.30	Cost of Sale	\$200,000	\$20,000
24-205-749-0001-00	1351 Bluff St	0.81	Cost of Sale	\$200,000	\$20,000
24-613-000-0844-00	1355 Adams Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-267-0010-00	1355 Pine St	0.19	Cost of Sale	\$200,000	\$20,000
24-611-000-0472-00	1357 Marquette Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-613-000-0876-00	1364 Morgan Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-205-376-0007-15	1366 7th St	0.07	Cost of Sale	\$200,000	\$20,000
24-613-000-0839-00	1366 Leonard Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-267-0008-00	1373 Pine St	0.21	Cost of Sale	\$200,000	\$20,000

24-611-000-0352-00	1375 James Ave	0.40	Cost of Sale	\$200,000	\$20,000
24-205-342-0009-00	1390 Henry St	0.29	Cost of Sale	\$200,000	\$20,000
24-205-375-0010-10	1402 Park St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-273-0004-00	1408 Leahy St	0.12	Cost of Sale	\$200,000	\$20,000
24-611-000-0408-00	1419 Ducey Ave	0.26	Cost of Sale	\$200,000	\$20,000
24-611-000-0444-00	1428 Ducey Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-273-0016-00	1431 Hoyt St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-274-0006-00	1440 Jiroch St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-273-0015-00	1441 Hoyt St	0.18	Cost of Sale	\$200,000	\$20,000
24-205-274-0014-00	1451 Leahy St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-272-0017-00	1459 TERRACE ST	0.18	Cost of Sale	\$200,000	\$20,000
24-205-408-0013-00	1461 Park St	0.05	Cost of Sale	\$200,000	\$20,000
24-205-406-0014-00	1480 7th St	0.06	Cost of Sale	\$200,000	\$20,000
24-205-272-0011-10	1490 HOYT ST	0.09	Cost of Sale	\$200,000	\$20,000
24-205-585-0001-00	1490 Lakeshore Dr	33.40	Cost of Sale	\$200,000	\$20,000
24-205-280-0012-00	1499 Hoyt St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-279-0003-00	1518 Jiroch St	0.36	Cost of Sale	\$200,000	\$20,000
24-205-281-0002-00	1524 HOYT ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-280-0009-00	1527 Hoyt St	0.16	Cost of Sale	\$200,000	\$20,000
24-205-526-0012-00	1535 Lakeshore Dr	0.17	Cost of Sale	\$200,000	\$20,000
24-611-000-0453-00	1536 Ducey Ave	0.28	Cost of Sale	\$200,000	\$20,000
24-611-000-0397-00	1539 Ducey Ave	0.23	Cost of Sale	\$200,000	\$20,000
24-613-000-0893-00	1542 Adams Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-611-000-0214-00	1554 Marcoux Ave	0.18	Cost of Sale	\$200,000	\$20,000
24-611-000-0335-00	1556 Albert Ave	0.22	Cost of Sale	\$200,000	\$20,000
24-611-000-0275-00	1561 Albert Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-675-003-0023-00	159 E Laketon Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-185-100-0001-00	1608 ELWOOD ST	0.11	Cost of Sale	\$200,000	\$20,000
24-205-295-0001-00	1608 Smith St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-292-0025-10	1647 Terrace St	0.16	Cost of Sale	\$200,000	\$20,000
24-185-101-0011-00	1657 Elwood St	0.11	Cost of Sale	\$200,000	\$20,000
24-205-292-0023-10	1679 Terrace St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-609-0001-00	1682 Lakeshore Dr	0.77	Cost of Sale	\$200,000	\$20,000
24-128-400-0019-10	1690 Creston St	1.66	Cost of Sale	\$200,000	\$20,000
24-205-297-0024-00	1691 SMITH ST	0.14	Cost of Sale	\$200,000	\$20,000
24-205-292-0009-10	1692 Hoyt St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-297-0005-00	1694 PINE ST	0.13	Cost of Sale	\$200,000	\$20,000
24-205-206-0003-00	171 E WALTON AVE	0.20	Cost of Sale	\$200,000	\$20,000
24-185-111-0007-00	1710 Superior St	0.11	Cost of Sale	\$200,000	\$20,000
24-205-296-0017-00	1725 WOOD ST	0.11	Cost of Sale	\$200,000	\$20,000
24-205-298-0012-00	1728 Terrace St	0.29	Cost of Sale	\$200,000	\$20,000

24-205-611-0021-40	1737 Lakeshore Dr	0.28	Cost of Sale	\$200,000	\$20,000
24-185-119-0011-00	1769 Mcilwraith St	0.11	Cost of Sale	\$200,000	\$20,000
24-185-115-0010-00	1773 SUPERIOR ST	0.12	Cost of Sale	\$200,000	\$20,000
24-205-307-0007-00	1778 PINE ST	0.13	Cost of Sale	\$200,000	\$20,000
24-205-307-0010-00	1783 Smith St	0.14	Cost of Sale	\$200,000	\$20,000
24-210-000-9991-00	1820 Crozier Ave	1.78	Cost of Sale	\$200,000	\$20,000
24-880-000-0004-00	1826 RAY ST	0.11	Cost of Sale	\$200,000	\$20,000
24-675-004-0020-00	1838 Jiroch St	0.14	Cost of Sale	\$200,000	\$20,000
24-232-012-0008-00	1856 Commerce St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-206-0011-00	186 Myrtle Ave	0.46	Cost of Sale	\$200,000	\$20,000
24-215-002-0021-00	1867 AUSTIN ST	0.23	Cost of Sale	\$200,000	\$20,000
24-675-003-0009-00	1867 Hoyt St	0.14	Cost of Sale	\$200,000	\$20,000
24-890-000-0020-00	1874 MANZ ST	0.12	Cost of Sale	\$200,000	\$20,000
24-255-009-0001-00	1908 Superior St	0.11	Cost of Sale	\$200,000	\$20,000
24-215-012-0002-00	1916 Huizenga St	0.12	Cost of Sale	\$200,000	\$20,000
24-255-006-0026-00	1919 ELWOOD ST	0.13	Cost of Sale	\$200,000	\$20,000
24-215-007-0002-00	1920 S Getty St	0.63	Cost of Sale	\$200,000	\$20,000
24-675-024-0021-00	1930 CLINTON ST	0.14	Cost of Sale	\$200,000	\$20,000
24-215-011-0026-00	1931 Huizenga St	0.47	Cost of Sale	\$200,000	\$20,000
24-796-002-0019-00	1932 REYNOLDS ST	0.09	Cost of Sale	\$200,000	\$20,000
24-675-025-0004-00	1933 LEAHY ST	0.13	Cost of Sale	\$200,000	\$20,000
24-215-013-0004-00	1936 Brunswick St	0.13	Cost of Sale	\$200,000	\$20,000
24-255-010-0025-00	1947 S Getty St	0.34	Cost of Sale	\$200,000	\$20,000
24-215-012-0022-00	1957 Brunswick St	0.25	Cost of Sale	\$200,000	\$20,000
24-215-013-0007-00	1962 Brunswick St	0.25	Cost of Sale	\$200,000	\$20,000
24-796-003-0009-00	1967 REYNOLDS ST	0.14	Cost of Sale	\$200,000	\$20,000
24-796-003-0014-00	1968 HOYT ST	0.14	Cost of Sale	\$200,000	\$20,000
24-290-001-0003-00	1968 PARK ST	0.30	Cost of Sale	\$200,000	\$20,000
24-763-001-0019-00	1968 Smith St	0.20	Cost of Sale	\$200,000	\$20,000
24-290-001-0005-00	1974 Park St	0.17	Cost of Sale	\$200,000	\$20,000
24-255-007-0013-00	1984 Elwood St	0.24	Cost of Sale	\$200,000	\$20,000
24-215-013-0013-00	1992 Brunswick St	0.13	Cost of Sale	\$200,000	\$20,000
24-215-008-0015-00	1994 Continental St	0.12	Cost of Sale	\$200,000	\$20,000
24-232-004-0009-00	1995 Sanford St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-622-0004-00	2035 BOURDON ST	0.18	Cost of Sale	\$200,000	\$20,000
24-665-000-0485-00	2043 Dowd St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-647-0010-00	2048 Crozier Ave	0.01	Cost of Sale	\$200,000	\$20,000
24-205-209-0007-00	205 Amity Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-665-000-0486-00	2051 Dowd St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-266-0005-00	206 Irwin Ave	0.23	Cost of Sale	\$200,000	\$20,000
24-665-000-0487-00	2065 Dowd St	0.14	Cost of Sale	\$200,000	\$20,000

24-205-200-0005-00	207 E Walton Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-665-000-0488-00	2075 Dowd St	0.14	Cost of Sale	\$200,000	\$20,000
24-205-628-0009-00	2105 Torrent St	0.12	Cost of Sale	\$200,000	\$20,000
24-860-000-0117-00	2127 Austin St	0.12	Cost of Sale	\$200,000	\$20,000
24-205-209-0005-00	213 Amity Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-205-0004-00	213 Myrtle Ave	0.14	Cost of Sale	\$200,000	\$20,000
24-205-351-9991-00	215 W Muskegon Ave	0.06	Cost of Sale	\$200,000	\$20,000
24-860-000-0052-00	2155 Continental St	0.16	Cost of Sale	\$200,000	\$20,000
24-205-129-0001-00	216 Yuba St	0.30	Cost of Sale	\$200,000	\$20,000
24-205-129-0012-00	223 Erickson St	0.22	Cost of Sale	\$200,000	\$20,000
24-860-000-0159-00	2247 Valley St	0.15	Cost of Sale	\$200,000	\$20,000
24-665-000-0442-00	2250 Dowd St	0.23	Cost of Sale	\$200,000	\$20,000
24-205-666-0006-00	2259 Meurer Ct	0.59	Cost of Sale	\$200,000	\$20,000
24-860-000-0145-00	2262 Austin St	0.15	Cost of Sale	\$200,000	\$20,000
24-133-400-0008-03	2301 S Harvey St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-667-0006-00	2309 Meurer Ct	0.59	Cost of Sale	\$200,000	\$20,000
24-665-000-0413-00	2347 HUDSON ST	0.12	Cost of Sale	\$200,000	\$20,000
24-665-000-0424-00	2358 Dowd St	0.45	Cost of Sale	\$200,000	\$20,000
24-665-000-0417-00	2369 Hudson St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-236-0012-00	247 Delaware Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-129-0003-00	252 Yuba St	0.30	Cost of Sale	\$200,000	\$20,000
24-613-000-0681-00	254 Meeking St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-260-0016-00	269 Catherine Ave	0.28	Cost of Sale	\$200,000	\$20,000
24-613-000-0683-00	270 Meeking St	0.60	Cost of Sale	\$200,000	\$20,000
24-205-210-0009-00	280 Allen Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-199-0003-00	283 E Walton Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-199-0008-00	286 Myrtle Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-264-0012-00	291 McLaughlin Ave	0.18	Cost of Sale	\$200,000	\$20,000
24-205-210-0010-00	298 Allen Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-264-0011-00	301 McLaughlin Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-205-201-0009-00	302 Orchard Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-204-0013-00	304 Amity Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-260-0007-00	304 McLaughlin Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-205-210-0003-00	305 Amity Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-210-0011-00	306 Allen Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-204-0013-20	306 AMITY AVE	0.03	Cost of Sale	\$200,000	\$20,000
24-205-264-0010-00	307 McLaughlin Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-193-0001-00	307 E Muskegon Ave	0.64	Cost of Sale	\$200,000	\$20,000
24-205-141-0009-00	312 Jackson Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-201-0001-00	313 Myrtle Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-204-0001-00	313 Orchard Ave	0.21	Cost of Sale	\$200,000	\$20,000

24-205-283-0009-00	316 E Forest Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-554-0001-20	32 W Western Ave	0.51	Cost of Sale	\$200,000	\$20,000
24-205-389-0012-10	320 Mason Ave	0.13	Cost of Sale	\$200,000	\$20,000
24-205-008-0008-10	320 Wood St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-702-0012-08	3201 Millard Ave	0.29	Cost of Sale	\$200,000	\$20,000
24-205-194-0006-00	324 E Walton Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-247-0012-00	325 IONA AVE	0.09	Cost of Sale	\$200,000	\$20,000
24-205-149-0001-00	325 Jackson Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-194-0001-00	325 E Muskegon Ave	0.72	Cost of Sale	\$200,000	\$20,000
24-205-283-0009-10	326 E Forest Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-250-0005-10	328 Catherine Ave	0.08	Cost of Sale	\$200,000	\$20,000
24-205-297-0013-10	328 E Larch Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-613-000-0690-00	329 Leonard Ave	0.49	Cost of Sale	\$200,000	\$20,000
24-205-194-0007-00	332 E Walton Ave	0.16	Cost of Sale	\$200,000	\$20,000
24-205-250-0006-00	334 Catherine Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-264-0007-00	336 Catawba Ave	0.07	Cost of Sale	\$200,000	\$20,000
24-205-247-0011-10	337 Iona Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-290-007-0014-00	345 Shelby St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-419-0001-10	345 W Grand Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-008-0010-00	346 Wood St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-194-0009-00	346 E Walton Ave	0.58	Cost of Sale	\$200,000	\$20,000
24-205-563-0010-00	350 Shoreline Dr	4.94	Cost of Sale	\$200,000	\$20,000
24-205-742-0001-50	3510 Channel Dr	1.50	Cost of Sale	\$200,000	\$20,000
24-205-263-0012-10	355 McLaughlin Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-249-0012-10	357 E ISABELLA AVE	0.10	Cost of Sale	\$200,000	\$20,000
24-205-186-0024-00	36 E Muskegon Ave	0.12	Cost of Sale	\$200,000	\$20,000
24-205-263-0011-00	363 McLaughlin Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-613-000-0717-00	366 Bennett St	0.25	Cost of Sale	\$200,000	\$20,000
24-763-001-0026-10	367 E HOLBROOK AVE	0.11	Cost of Sale	\$200,000	\$20,000
24-205-249-0010-00	369 E ISABELLA AVE	0.09	Cost of Sale	\$200,000	\$20,000
24-205-211-0010-00	370 Allen Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-249-0004-00	370 Catherine Ave	0.12	Cost of Sale	\$200,000	\$20,000
24-205-269-0001-10	373 Catawba Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-203-0009-30	373 Orchard Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-249-0004-10	376 Catherine Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-249-0005-00	384 Catherine Ave	0.22	Cost of Sale	\$200,000	\$20,000
24-205-296-0015-00	384 E Larch Ave	0.16	Cost of Sale	\$200,000	\$20,000
24-205-139-0002-00	388 Jackson Ave	0.36	Cost of Sale	\$200,000	\$20,000
24-205-249-0006-00	390 CATHERINE AVE	0.23	Cost of Sale	\$200,000	\$20,000
24-205-140-0001-00	396 Erickson St	0.21	Cost of Sale	\$200,000	\$20,000
24-205-140-0015-00	397 Marquette Ave	0.20	Cost of Sale	\$200,000	\$20,000

24-205-407-0007-10	404 W Grand Ave	0.05	Cost of Sale	\$200,000	\$20,000
24-205-146-0003-00	411 Seaway Dr	0.05	Cost of Sale	\$200,000	\$20,000
24-205-094-0005-00	415 McLaughlin Ave	0.42	Cost of Sale	\$200,000	\$20,000
24-205-044-0008-00	420 Oak Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-140-0014-00	425 Octavius St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-015-0005-10	430 LANGLEY ST	0.09	Cost of Sale	\$200,000	\$20,000
24-205-146-0008-00	431 Seaway Dr	0.05	Cost of Sale	\$200,000	\$20,000
24-205-370-0007-00	432 Monroe Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-612-000-0600-00	434 Abbey St	0.37	Cost of Sale	\$200,000	\$20,000
24-205-094-0003-00	435 McLaughlin Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-376-0006-00	435 Monroe Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-013-0005-00	436 Charles St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-007-0006-00	438 Adams Ave	0.34	Cost of Sale	\$200,000	\$20,000
24-205-012-0001-00	445 Marquette Ave	0.99	Cost of Sale	\$200,000	\$20,000
24-205-045-0005-00	447 Oak Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-007-0005-00	448 Adams Ave	0.37	Cost of Sale	\$200,000	\$20,000
24-205-068-0011-00	448 E ISABELLA AVE	0.11	Cost of Sale	\$200,000	\$20,000
24-205-094-0002-00	449 McLaughlin Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-045-0017-00	450 Orchard Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-148-0011-00	451 Erickson St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-044-0012-00	452 Oak Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-007-0004-00	456 Adams Ave	0.35	Cost of Sale	\$200,000	\$20,000
24-205-079-0001-00	457 Catherine Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-044-0001-10	461 White Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-043-0012-00	462 White Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-149-0002-10	466 Erickson St	0.10	Cost of Sale	\$200,000	\$20,000
24-205-156-0003-00	468 Ottawa St	0.07	Cost of Sale	\$200,000	\$20,000
24-205-093-0006-00	477 MCLAUGHLIN AVE	0.19	Cost of Sale	\$200,000	\$20,000
24-205-066-0006-00	477 E Apple Ave	0.13	Cost of Sale	\$200,000	\$20,000
24-205-041-0008-10	480 Oak Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-149-0004-00	486 Erickson St	0.09	Cost of Sale	\$200,000	\$20,000
24-205-077-0009-00	488 Catherine Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-093-0005-00	489 MCLAUGHLIN AVE	0.19	Cost of Sale	\$200,000	\$20,000
24-205-066-0008-00	492 Ada Ave	0.19	Cost of Sale	\$200,000	\$20,000
24-205-042-0007-10	492 White Ave	0.22	Cost of Sale	\$200,000	\$20,000
24-205-347-0004-10	493 W Muskegon Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-430-0005-00	495 W Southern Ave	0.12	Cost of Sale	\$200,000	\$20,000
24-205-069-0004-00	499 ADA AVE	0.19	Cost of Sale	\$200,000	\$20,000
24-205-054-0004-00	499 Amity Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-066-0004-00	501 E APPLE AVE	0.21	Cost of Sale	\$200,000	\$20,000

24-205-077-0010-00	502 Catherine Ave	0.16	Cost of Sale	\$200,000	\$20,000
24-612-000-0620-00	502 Mary St	0.36	Cost of Sale	\$200,000	\$20,000
24-205-041-0010-00	502 Oak Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-069-0009-00	502 E Isabella Ave	0.29	Cost of Sale	\$200,000	\$20,000
24-205-022-0011-00	505 Alva St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-009-0009-00	509 Adams Ave	0.23	Cost of Sale	\$200,000	\$20,000
24-205-020-0003-00	509 McLaren St	0.46	Cost of Sale	\$200,000	\$20,000
24-205-149-0008-00	509 Octavius St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-066-0010-00	510 ADA AVE	0.20	Cost of Sale	\$200,000	\$20,000
24-205-080-0010-00	510 McLaughlin Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-069-0010-00	510 E Isabella Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-057-0011-00	512 E Apple Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-041-0011-00	514 OAK AVE	0.20	Cost of Sale	\$200,000	\$20,000
24-205-041-0012-00	518 Oak Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-205-159-0001-00	522 Ottawa St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-155-0010-00	523 Yuba St	0.22	Cost of Sale	\$200,000	\$20,000
24-205-041-0013-00	528 Oak Ave	0.24	Cost of Sale	\$200,000	\$20,000
24-205-042-0001-00	530 White Ave	2.15	Cost of Sale	\$200,000	\$20,000
24-205-009-0012-00	532 Leonard Ave	0.27	Cost of Sale	\$200,000	\$20,000
24-205-155-0009-00	535 Yuba St	0.17	Cost of Sale	\$200,000	\$20,000
24-205-048-0001-10	539 Oak Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-155-0007-00	540 Yuba St	0.05	Cost of Sale	\$200,000	\$20,000
24-612-000-0645-00	556 S Getty St	0.19	Cost of Sale	\$200,000	\$20,000
24-612-000-0639-00	561 Mary St	0.19	Cost of Sale	\$200,000	\$20,000
24-205-102-0016-00	576 E Dale Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-275-0009-00	58 E Grand Ave	0.13	Cost of Sale	\$200,000	\$20,000
24-205-049-0016-30	586 ORCHARD AVE	0.15	Cost of Sale	\$200,000	\$20,000
24-205-049-0016-40	594 Orchard Ave	0.15	Cost of Sale	\$200,000	\$20,000
24-205-049-0011-10	595 Oak Ave	0.18	Cost of Sale	\$200,000	\$20,000
24-205-160-0009-00	599 Yuba St	0.31	Cost of Sale	\$200,000	\$20,000
24-205-064-0008-00	612 ADA AVE	0.14	Cost of Sale	\$200,000	\$20,000
24-205-075-0005-00	613 E ISABELLA AVE	0.19	Cost of Sale	\$200,000	\$20,000
24-767-000-0005-00	615 Mulder St	0.11	Cost of Sale	\$200,000	\$20,000
24-205-040-0001-00	616 Oak Ave	4.15	Cost of Sale	\$200,000	\$20,000
24-205-049-0007-00	617 Oak Ave	0.22	Cost of Sale	\$200,000	\$20,000
24-205-052-0003-00	619 Amity Ave	0.45	Cost of Sale	\$200,000	\$20,000
24-205-345-0006-10	621 W Muskegon Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-344-0001-00	625 W Muskegon Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-205-340-0001-20	625 W Webster Ave	0.06	Cost of Sale	\$200,000	\$20,000
24-590-001-0016-00	628 Mulder St	0.30	Cost of Sale	\$200,000	\$20,000
24-205-340-0002-00	631 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000

24-205-049-0005-00	635 Oak Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-340-0002-10	637 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-040-0004-20	638 Oak Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-767-000-0011-00	641 Glen Ct	0.13	Cost of Sale	\$200,000	\$20,000
24-205-082-0012-00	642 McLaughlin Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-767-000-0001-00	643 Mulder St	0.11	Cost of Sale	\$200,000	\$20,000
24-205-340-0003-00	643 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-064-0012-00	644 Ada Ave	0.28	Cost of Sale	\$200,000	\$20,000
24-205-033-0001-20	645 Wesley Ave	5.56	Cost of Sale	\$200,000	\$20,000
24-205-340-0003-10	649 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-168-0014-00	653 Yuba St	0.72	Cost of Sale	\$200,000	\$20,000
24-205-015-0011-00	655 MARQUETTE AVE	0.13	Cost of Sale	\$200,000	\$20,000
24-205-034-0001-00	655 MULDER ST	0.16	Cost of Sale	\$200,000	\$20,000
24-205-064-0001-00	655 E Apple Ave	0.16	Cost of Sale	\$200,000	\$20,000
24-205-340-0003-20	655 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-340-0004-00	661 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-015-0011-10	663 Marquette Ave	0.12	Cost of Sale	\$200,000	\$20,000
24-205-340-0004-10	667 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-205-340-0005-00	673 W Webster Ave	0.09	Cost of Sale	\$200,000	\$20,000
24-590-002-0001-00	675 S Getty St	0.32	Cost of Sale	\$200,000	\$20,000
24-205-340-0005-10	679 W Webster Ave	0.06	Cost of Sale	\$200,000	\$20,000
24-205-414-0012-00	682 W Southern Ave	0.18	Cost of Sale	\$200,000	\$20,000
24-205-016-0001-00	685 Marquette Ave	0.14	Cost of Sale	\$200,000	\$20,000
24-205-340-0006-00	685 W Webster Ave	0.06	Cost of Sale	\$200,000	\$20,000
24-205-411-0004-00	687 Washington Ave	0.25	Cost of Sale	\$200,000	\$20,000
24-205-414-0004-00	689 W Grand Ave	0.38	Cost of Sale	\$200,000	\$20,000
24-205-340-0006-10	691 W Webster Ave	0.08	Cost of Sale	\$200,000	\$20,000
24-205-411-0013-00	692 W Grand Ave	0.26	Cost of Sale	\$200,000	\$20,000
24-205-558-0001-40	710 Shoreline Dr	1.35	Cost of Sale	\$200,000	\$20,000
24-205-043-0006-00	712 Wood St	0.10	Cost of Sale	\$200,000	\$20,000
24-405-003-0002-00	716 Leonard Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-405-003-0004-00	720 Leonard Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-037-0001-01	723 Sumner Ave	0.29	Cost of Sale	\$200,000	\$20,000
24-590-001-0011-00	725 Wesley Ave	0.23	Cost of Sale	\$200,000	\$20,000
24-405-003-0005-00	730 Leonard Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-590-001-0021-00	730 MARCOUX AVE	0.11	Cost of Sale	\$200,000	\$20,000
24-590-002-0010-00	733 MARCOUX AVE	0.27	Cost of Sale	\$200,000	\$20,000
24-205-039-0006-50	741 S GETTY ST	0.78	Cost of Sale	\$200,000	\$20,000
24-205-073-0008-00	748 CATHERINE AVE	0.20	Cost of Sale	\$200,000	\$20,000
24-405-003-0007-00	750 Leonard Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-405-003-0010-00	760 Leonard Ave	0.17	Cost of Sale	\$200,000	\$20,000

24-205-413-0014-00	766 W Southern Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-040-0011-20	768 Scott St	0.15	Cost of Sale	\$200,000	\$20,000
24-205-001-0003-96	770 Access Hwy	0.50	Cost of Sale	\$200,000	\$20,000
24-205-089-0026-00	776 Catawba Ave	0.14	Cost of Sale	\$200,000	\$20,000
24-205-434-0001-00	791 W Southern Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-045-0009-00	802 Wood St	0.37	Cost of Sale	\$200,000	\$20,000
24-442-000-0016-00	810 GRACE AVE	0.22	Cost of Sale	\$200,000	\$20,000
24-205-045-0011-00	818 Wood St	0.31	Cost of Sale	\$200,000	\$20,000
24-205-201-0012-00	821 Emerald St	0.08	Cost of Sale	\$200,000	\$20,000
24-205-048-0007-00	822 Williams St	0.22	Cost of Sale	\$200,000	\$20,000
24-205-191-0006-00	824 Cedar St	0.44	Cost of Sale	\$200,000	\$20,000
24-205-487-0012-00	828 W SOUTHERN AVE	0.23	Cost of Sale	\$200,000	\$20,000
24-595-000-0044-00	839 Turner Ave	0.11	Cost of Sale	\$200,000	\$20,000
24-612-000-0631-00	845 Ducey Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-665-000-0108-00	846 Wilson Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-205-203-0005-00	856 Emerald St	0.15	Cost of Sale	\$200,000	\$20,000
24-612-000-0626-10	861 Marquette Ave	0.33	Cost of Sale	\$200,000	\$20,000
24-595-000-0040-00	861 Turner Ave	0.10	Cost of Sale	\$200,000	\$20,000
24-121-300-0066-00	873 STEVENS ST	0.13	Cost of Sale	\$200,000	\$20,000
24-205-049-0019-70	874 Scott St	0.15	Cost of Sale	\$200,000	\$20,000
24-250-000-0153-00	876 E Isabella Ave	0.13	Cost of Sale	\$200,000	\$20,000
24-121-300-0116-00	877 Amity Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-047-0015-00	881 Scott St	0.16	Cost of Sale	\$200,000	\$20,000
24-121-300-0049-00	892 Orchard Ave	0.20	Cost of Sale	\$200,000	\$20,000
24-205-478-0014-00	900 W GRAND AVE	0.18	Cost of Sale	\$200,000	\$20,000
24-205-189-0011-00	902 Pine St	0.38	Cost of Sale	\$200,000	\$20,000
24-121-300-0062-00	907 Orchard Ave	0.17	Cost of Sale	\$200,000	\$20,000
24-205-478-0004-00	909 Washington Ave	0.21	Cost of Sale	\$200,000	\$20,000
24-250-000-0157-00	912 E ISABELLA AVE	0.25	Cost of Sale	\$200,000	\$20,000
24-665-000-0269-00	912 W HACKLEY AVE	0.20	Cost of Sale	\$200,000	\$20,000
24-205-053-0004-10	914 SCOTT ST	0.10	Cost of Sale	\$200,000	\$20,000
24-205-054-0014-00	919 Scott St	0.20	Cost of Sale	\$200,000	\$20,000
24-205-210-0001-00	923 Emerald St	0.10	Cost of Sale	\$200,000	\$20,000
24-170-000-0012-00	929 E FOREST AVE	0.14	Cost of Sale	\$200,000	\$20,000
24-202-000-0018-00	942 AURORA AVE	0.14	Cost of Sale	\$200,000	\$20,000
24-612-000-0575-00	982 Ducey Ave	0.36	Cost of Sale	\$200,000	\$20,000
TOTALS		174.71		\$127,100,000.00	\$14,400,000.00
495 Total Properties					

Eligible Activities, Financing, Cost of Plan (Sec. 13(1) (a) (b) (c) (d) (g))

Eligible activities include cost of sale, demo & abatement, public infrastructure and brownfield plan preparation and development (see chart below).

Eligible Activities Chart

Eligible Activity	Cost
Cost of Sale	\$11,400,000
Blight Elimination	\$0
Demo & Abatement	\$2,000,000
Public Infrastructure	\$1,000,000
Brownfield Plan Preparation and Development	\$20,000
Sub-total	\$14,420,000
Contingency (15%)	\$2,163,000
Total Eligible Activities to be paid under this Plan	\$16,582,000

The eligible activities described above will occur on the Property and are further described as follows:

1. **Cost of Sale:** If the sale of a home results in a loss to the developer, the difference between the cost of construction and the sale price is considered the cost of sale or a seller concession. Some of these concessions could come from title work, acquisition costs and selling costs. For this Plan, it is anticipated that each home may result in the loss of \$20,000 per unit.
2. **Demo & Abatement:** The cost to demolish the property and return it to a developable state, which may include lead and asbestos abatement.
3. **Public Infrastructure:** The cost to construct public infrastructure like alleys and water/sewer lines.
4. **Brownfield Plan Preparation and Development:** Costs incurred to prepare and develop this brownfield plan, as required per Act 381 of 1996, as amended.

It is intended that the above eligible activities will be reimbursed with interest at 5%.

Effective Date of Inclusion in the Brownfield Plan

The amended Infill Housing Project was added to this Plan on 10/11, 2022 and will be amended accordingly upon adoption of this Plan Amendment.

**City of Muskegon
Brownfield Redevelopment Authority
County of Muskegon, State of Michigan**

RESOLUTION APPROVING REVISED BROWNFIELD PLAN AMENDMENT

City of Muskegon Infill Housing Project, 4th Amendment

Minutes of a regular meeting of the Board of the City of Muskegon Brownfield Redevelopment Authority, County of Muskegon, State of Michigan, held on the 11th day of October 2022, at 10:30 a.m., prevailing Eastern Time.

PRESENT: Members Brad Hastings, Michael Johnson Sr, Heidi Sytsema, Jay Wallace Jr, Doug Pollock, LeighAnn Mikesell, Martha Bottomley

ABSENT: Members John Riegler, Jeanette Moore, Sherri Black, Michael Kleaveland

The following preamble and resolution were offered by Member LeighAnn Mikesell and supported by Member Michael Johnson Sr.:

WHEREAS, a Brownfield Plan has been adopted pursuant to Act 381, Public Acts of Michigan, 1996, as amended ("Act 381"), a copy of which is on file with the Secretary of the City of Muskegon Brownfield Redevelopment Authority (the "Authority"); and

WHEREAS, the Authority is authorized to approve amendments to the Brownfield Plan and recommends the Amendment, which updates the number of eligible properties within the City of Muskegon Infill Housing Project, for approval to the City of Muskegon, County of Muskegon, State of Michigan (the "City").

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. Approval of Brownfield Plan. The Board hereby adopts and approves the Brownfield Plan Amendment for the City of Muskegon Infill Housing Project (4th Amendment), and recommends the approval of the Brownfield Plan Amendments by the Muskegon City Commission.

2. Public Hearing. The Board hereby requests city personnel to provide a notice of Public Hearing on the proposed Brownfield Plan Amendments, and further requests that such hearing notice be provided to all taxing jurisdictions. Notice of the time and place of the hearing shall be given pursuant to Act 267, Public Acts of Michigan, 1976, as amended ("Open Meetings Act").
3. Deliver Resolution and Brownfield Plan to City. The Chair of the Authority is directed to deliver a certified copy of this resolution and the Brownfield Plan Amendments to the City Clerk.
4. Disclaimer. By adoption of this resolution and approval of the Brownfield Plan Amendments, the Authority assumes no obligation or liability to the owner, developer or lessor of the Eligible Property for any loss or damage that may result to such persons from the adoption of this resolution and Brownfield Plan Amendments.
5. Work Plan Transmittal. The Chair of the Authority shall be authorized to transmit to the Michigan Strategic Fund, the Michigan Economic Development Corporation and/or the Michigan Department of Environmental Quality, on behalf of the Authority, a final Act 381 Work Plan that has been reviewed and approved by the Authority.
6. Repealer. All resolutions and parts of resolution in conflict with the provisions of this resolution are hereby repealed or amended to the extent of such conflict.

AYES: Brad Hastings, Michael Johnson Sr, Heidi Sytsema, Jay Wallace Jr, Doug Pollock,
LeighAnn Mikesell, Martha Bottomley

NAYS:

RESOLUTION DECLARED ADOPTED.


Martha Bottomley, Chair
City of Muskegon Brownfield Redevelopment Authority

I hereby certify that the foregoing is a true and complete copy of a resolution adopted by the Board of the City of Muskegon Brownfield Redevelopment Authority, County of Muskegon, State of Michigan, at a regular meeting held on October 11, 2022, and that said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

A handwritten signature in cursive script, reading "Martha Bottomley". The signature is written in black ink and is positioned above the printed name and title.

Martha Bottomley, Chair
City of Muskegon Brownfield Redevelopment Authority

RESOLUTION APPROVING THE BROWNFIELD PLAN AMENDMENT

City of Muskegon Infill Housing Project, 4th Amendment

City of Muskegon

County of Muskegon, Michigan

2022-October 25

Minutes of a Regular Meeting of the City Commission of the City of Muskegon, County of Muskegon, Michigan (the "City"), held in the City Commission Chambers on the 25th of October, 2022 at 5:30 p.m., prevailing Eastern Time.

PRESENT:

ABSENT:

The following preamble and resolution were offered by Commissioner _____ and supported by Commissioner _____.

WHEREAS, in accordance with the provisions of Act 381, Public Acts of Michigan, 1996, as amended ("Act 381"), the City of Muskegon Brownfield Redevelopment Authority (the "Authority") has prepared and approved a Brownfield Plan Amendment to include the Infill Housing Project (4th Amendment) in the Plan; and

WHEREAS, the Authority has forwarded the Brownfield Plan Amendment to the City Commission requesting its approval of the Brownfield Plan Amendment; and

WHEREAS, the City Commission has provided notice and a reasonable opportunity to the taxing jurisdictions levying taxes subject to capture to express their views and recommendations regarding the Brownfield Plan Amendment, as required by Act 381; and

WHEREAS, not less than 10 days has passed since the City Commission provided notice of the proposed Brownfield Plan to the taxing units; and

WHEREAS, the City Commission held a public hearing on the proposed Brownfield Plan on October 25th, 2022.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. That the Brownfield Plan constitutes a public purpose under Act 381.

2. That the Brownfield Plan meets all the requirements of Section 13(1) of Act 381.
3. That the proposed method of financing the costs of the eligible activities, as identified in the Brownfield Plan and defined in Act 381, is feasible and the Authority has the authority to arrange the financing.
4. That the costs of the eligible activities proposed in the Brownfield Plan are reasonable and necessary to carry out the purposes of Act 381.
5. That the amount of captured taxable value estimated to result from the adoption of the Brownfield Plan is reasonable.
6. That the Brownfield Plan in the form presented is approved and is effective immediately.
7. That all resolutions or parts of resolutions in conflict herewith shall be and the same are hereby rescinded.

Be it Further Resolved that the Mayor and City Clerk are hereby authorized to execute all documents necessary or appropriate to implement the provisions of the Brownfield Plan.

AYES:

NAYS:

RESOLUTION DECLARED APPROVED.

Ann Marie Meisch, City Clerk

Kenneth D. Johnson, Mayor

I hereby certify that the foregoing is a true and complete copy of a resolution adopted by the City Commission of the City of Muskegon, County of Muskegon, State of Michigan, at a regular meeting held on October 25, 2022 and that said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, as amended, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Ann Marie Meisch, City Clerk

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022		Title: City Manager Contract
Submitted By: Mayor Johnson		Department: Mayor's Office
Brief Summary: To approve an agreement with Jonathan Seyferth as City Manager beginning November 28, 2022.		
Detailed Summary & Background: The City Commission interviewed several candidates for City Manager and voted to offer the position to Jonathan Seyferth by a 5-2 vote. An agreement has been reached with the candidate for an annual salary of \$148,000 beginning November 28, 2022.		
Goal/Focus Area/Action Item Addressed:		
Amount Requested: NA	Amount Budgeted:	
Fund(s) or Account(s):	Fund(s) or Account(s):	
Recommended Motion: To approve the agreement as presented.		
Approvals: <i>Get approval from division head at a minimum prior to sending to the Clerk.</i> Immediate Division Head ☐ Information Technology ☐ Other Division Heads ☐ Communication ☐ Legal Review ☐		Guest(s) Invited / Presenting Yes ☐ No ☐
For City Clerk Use Only: Commission Action:		

EMPLOYMENT AGREEMENT

CITY OF MUSKEGON – JONATHAN SEYFERTH
Effective November 28, 2022

This employment agreement is made and entered into by and between the CITY OF MUSKEGON ("CITY") and JONATHAN SEYFERTH ("MANAGER").

Recitals

A. The CITY desires to employ MANAGER as the City Manager of the City of Muskegon as provided in the Charter of the City of Muskegon and desires to establish conditions of employment, provide certain benefits and set working conditions for said MANAGER.

B. MANAGER desires to be employed as City Manager of the City of Muskegon in accordance with the terms and provisions of the Agreement.

C. This Agreement supersedes all discussions and agreements.

Agreement

NOW THEREFORE, THE CITY AND MANAGER AGREE AS FOLLOWS:

1. EMPLOYMENT. CITY employs MANAGER as City Manager to perform the functions and duties specified in the City Charter and ordinances and to perform such other legally permissible and proper duties and functions as the City Commission may, from time to time, assign, and MANAGER accepts such employment.

MANAGER agrees to remain in the employment of the CITY until termination is effected as hereinafter provided. MANAGER agrees to devote full time to his duties as City Manager and may undertake other incidental employment, subject to the right of the City to require Manager to terminate other incidental employment.

2. SALARY. Effective November 28, 2022, CITY agrees to pay MANAGER, as compensation for services rendered, an annual salary of \$148,000 per year. MANAGER shall be entitled to cost of living adjustments approved by the City Commission for department heads on the first of each year, commencing January 1, 2023, and a merit adjustment will be considered and, if granted, would be effective July 1 of each year, commencing July 1, 2023.

3. FRINGE BENEFITS. In addition to the base salary, CITY shall afford MANAGER the fringe benefits provided for as follows:

3.1 **Residency Premium:** City will pay to MANAGER a premium for being a resident consistent with the Muskegon City Residency Program as amended. Presently, the incentive is 6% of base wages, paid bi-weekly, while the Manager resides in the City of Muskegon city limits. There is also a match toward a down payment and a forgivable loan program, subject to certain limitations.

3.2 **Health Insurance:** City shall provide the same HMO health insurance plan provided to other department heads. MANAGER shall contribute toward the health insurance premium at the same rate as other department heads and follow the same wellness program required of other department heads. MANAGER may opt out of the health insurance and receive an annual stipend equal to the stipend offered to other department heads.

3.3 **Disability Insurance:** City provides short-term and long-term (60% of pre-disability earnings up to \$5,000 per month) disability insurance.

3.4 **Life, Vision and Dental Insurance:** City provides life insurance (200% of base salary to a maximum of \$200,000), vision insurance, and dental insurance.

3.5 **Flexible Spending Account:** Employees may contribute pre-tax income to a flexible spending account for medical and dependent care.

3.6 **Health Care Savings Plan:** City offers a Health Care Savings Plan. There is a mandatory 2% employee pre-tax contribution and a 3% City match.

3.7 **Defined Contribution Plan:** City provides a defined contribution plan through the Municipal Employees Retirement System (MERS). There is a mandatory employee contribution of 3% and a City contribution of 9% of W-2 wages.

3.8 **Holidays:** City offers the standard 12 recognized holidays.

3.9 **Vacation Time:** City will credit 112 hours to MANAGER'S vacation bank effective on November 28, 2022 and 200 hours on the first of each year, commencing January 1, 2023. 160 hours can be carried over from one calendar year to the next.

3.10 **Personal Leave:** City grants 16 hours of personal leave per year, which cannot be carried over from one year to the next.

3.11 **Sick Leave:** Sick leave is earned at 3.6923 hours bi-weekly (96 hours per year). Sick leave may be accumulated to a maximum of 1056 hours. Once an employee has accumulated 160 hours, an employee may be paid (50%) or deposit into a deferred compensation plan (100%). There are certain restrictions on the payout.

3.12 **Bereavement Leave:** In the event of death in the immediate family of an employee, consisting only of spouse, parent, grandparent, child, brother, sister, mother-in-law, father in-law, son-in-law, daughter-in-law, brother-in law, sister-in-law, grandchild, and grandparent-in-law and the employee attends the funeral service, such employee shall be granted up to 30 hours leave of absence with full pay. In the event of death in the step family of an employee, consisting only of step-parent, step-grandparent, step-child, step-brother, step-sister, step mother-in-law, step father-in-law, step son-in-law, step daughter-in-law, step brother-in-law, step sister-in-law, step-grandchild, and step-grandparent-in-law, and the employee attends the funeral service, shall be granted up to 20 hours leave with pay. In the event of death in the family of such employee other than above, 10 hours leave is granted with pay, and shall be taken on the day of the funeral and provided the employee attends the funeral.

3.13 **Jury Duty:** If an employee is summoned to report for jury duty, the employee will be paid the difference between normal wages earned on affected days and jury fees allotted by the courts.

3.14 **Membership Dues:** City will pay membership dues to Michigan Municipal League Local Government Management Association, ICMA membership, and one civic organization. City will reimburse expenses to attend the two Michigan Municipal League conferences, the ICMA annual conference and ICMA conferences in the state.

3.15 Diversity, Equity, and Inclusion (DEI) Training. The City's Mayor and Manager shall review options for a DEI training program, the time commitment, and cost of various programs. The City's Mayor and Manager shall recommend to the City Commission a DEI program for the Manager to attend/participate, with corresponding release time and budget for reimbursement costs.

3.6 Use of City Vehicle. Manager shall receive a vehicle allowance of \$300 per month and may use a City vehicle for any travel outside of Muskegon County and the adjoining counties. i.e., outside of Muskegon County, Oceana County, Newaygo County, Kent County and Ottawa County.

In addition to the fringe benefits set forth above, and to the extent that this paragraph does not duplicate or conflict with the above paragraph which shall prevail, the MANAGER shall have the same fringe benefits as are available to the highest compensated department head employed by the CITY from time to time.

4. TERM. It is understood by both CITY and MANAGER that employment may be terminated at the will of either party.

5. SEVERANCE PAY UPON TERMINATION BY CITY. If CITY terminates MANAGER'S employment without "cause", or if termination occurs pursuant to section 7 (except the last paragraph thereof), MANAGER shall receive the following:

a) severance pay in an amount equal to six month's severance pay with one additional month of severance pay for every year of employment, not to exceed twelve months of severance pay; and

b) 50% of any unused sick leave pay and 100% of any unused vacation time pay.

"Cause" is defined as i) conduct involving harm, even nominal, or threats to the City or its employees, elected officials, customers, residents, or others with an actual or potential relationship with the City; ii) conduct that materially damages the City's image; iii) conduct that reasonably makes it difficult or impossible for City employees, elected officials, customers, residents, or others with an actual or potential relationship with the City to deal with the City; iv) public attacks, physical or verbal, on the City or its employees, elected officials, customers, residents, or others with an actual or potential relationship with the City; or v) failure to

significantly improve performance after a 120 day written notice of specific and significant performance deficiency(ies).

If termination is for "cause", MANAGER is not entitled to the severance pay or pay for unused sick leave or vacation time.

6. TERMINATION OF EMPLOYMENT BY MANAGER. MANAGER may terminate employment at any time after providing the CITY with a thirty (30) day notice.

7. SEVERANCE PAY UPON TERMINATION BY MANAGER. In the event the CITY refuses, following written notice, to comply with any material provisions of this agreement which would financially benefit MANAGER, or MANAGER resigns following the simultaneous suggestion, whether formal or informal, by a majority of the members of the City Commission that MANAGER resign without "cause" to terminate employment, or Manager resigns after receiving a credible threat, as determined by the City, to Manager's safety and the City fails or refuses to undertake reasonable security precautions, then, in that event, the MANAGER may at his option be deemed to be terminated without "cause" at the date of such failure to comply or simultaneous suggestion. In such case, the MANAGER shall be deemed to have been terminated by the CITY without "cause" and entitled to the severance benefits set forth above.

In the event the MANAGER terminates his employment for reasons other than those stated in this paragraph, he shall receive fifty percent (50%) of his unused sick leave bank and all unused vacation pay, but no other severance pay or benefit, except as required by law.

8. MERGER OF NEGOTIATIONS. This agreement constitutes the entire contract of employment between CITY and MANAGER. No statement, promise, agreement, or obligation that conflicts with the terms of this agreement shall modify, enlarge, or invalidate this agreement or any provisions hereof.

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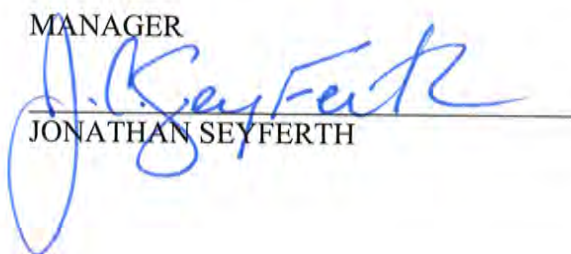
IN WITNESS WHEREOF, the CITY and MANAGER have executed this
agreement this _____ day of _____, 2022.

CITY OF MUSKEGON

By _____
Ken Johnson, Its Mayor

and _____
Ann Marie Meisch, Its Clerk

MANAGER



JONATHAN SEYFERTH

WATCH MUSKEGON

Agenda Item Review Form Muskegon City Commission

Commission Meeting Date: October 25, 2022		Title: Sale of 1227 Pine Street
Submitted By: LeighAnn Mikesell		Department: City Manager
Brief Summary: Staff is requesting approval of the purchase agreement for 1227 Pine Street.		
Detailed Summary & Background: 1227 Pine Street was constructed through the agreement with Dave Dusendang to construct infill housing with ARPA funding.		
Goal/Focus Area/Action Item Addressed: Create an environment that effectively attracts new residents and retains existing residents by filling existing employment gaps, attracting new and diverse businesses to the city, and expanding access to a variety of high-quality housing options in Muskegon. Diverse housing types		
Amount Requested: N/A	Amount Budgeted: N/A	
Fund(s) or Account(s):	Fund(s) or Account(s):	
Recommended Motion: to approve the purchase agreement for 1227 Pine Street.		
Approvals: Immediate Division Head ☐ Information Technology ☐ Other Division Heads ☒ Communication ☐ Legal Review ☐		Guest(s) Invited / Presenting Yes ☐ No ☒
For City Clerk Use Only: Commission Action:		

WEST MICHIGAN REGIONAL PURCHASE AGREEMENT

DATE: 10/21/2022 (time) _____ MLS # _____

SELLING OFFICE: Grand Rapids Keller Williams East BROKER LIC.#: 650298151 REALTOR® PHONE: 616-363-1660

LISTING OFFICE: West Urban Realty REALTOR® PHONE: 6163662459

1. **Effective Date:** This Agreement is effective on the date of Seller's acceptance of Buyer's offer or Buyer's acceptance of any counteroffer, as the case may be, and this date shall hereafter be referred to as the "Effective Date". Further, any reference to "days" in this Agreement refers to calendar days. The first calendar day begins at 12:01 a.m. on the day after the Effective Date. Any reference to "time" refers to local time.

2. **Agency Disclosure:** The Undersigned Buyer and Seller each acknowledge that they have read and signed the Disclosure Regarding Real Estate Agency Relationships. The selling licensee is acting as (choose one):

- ☐ Agent/Subagent of Seller ☐ Buyer's Agent ☐ Dual Agent (with written, informed consent of both Buyer and Seller)
☐ Transaction Coordinator

Primary Selling Agent Name: David Gregory Email: david@smalleganrealestate.co Lic.#: 6501447362

Alternate Selling Agent Name: Mike Smallegan Email: Mike@smalleganrealestate.com Lic.#: 6506048009

3. **Seller's Disclosure Statement:** (This paragraph applies to sales of one-to-four family residential units.)

☐ Buyer has received the Seller's Disclosure Statement, dated _____. Seller certifies to Buyer that the Property is currently in the same condition as Seller previously disclosed in that statement. Seller agrees to inform Buyer in writing of any changes in the content of the disclosure statement.

☐ Buyer has not received the Seller's Disclosure Statement. Buyer may terminate this Agreement, in writing, any time prior to receipt of the Seller's Disclosure Statement. Once Buyer has received the Seller's Disclosure Statement, Buyer may terminate this Agreement, in writing, within 72 hours of receipt if the disclosure was received in person, or within 120 hours if received by registered mail. Exceptions:

☒ Seller is exempt from the requirements of the Seller Disclosure Act.

4. **Lead-Based Paint Addendum:** Transactions involving homes built prior to 1978 require a written disclosure which is hereby attached and will be an integral part of this Agreement.

5. **Property Description:** Buyer offers to buy the property located in the ☒ City ☐ Village ☐ Township of Muskegon,

County of Muskegon County, Michigan, commonly known as (insert mailing address: street/city/state/zip code)

1227 Pine Street, Muskegon, MI 49442

with the following legal description and tax parcel ID numbers:

PP# 24-205-252-0010-10

The following paragraph applies only if the Premises include unplatted land:

Seller agrees to grant Buyer at closing the right to make (insert number) _____ division(s) under Section 108(2), (3), and (4) of the Michigan Land Division Act. (If no number is inserted, the right to make divisions under the sections referenced above stays with any remainder of the parent parcel retained by Seller. If a number is inserted, Seller retains all available divisions in excess of the number stated; however, Seller and/or REALTOR® do not warrant that the number of divisions stated is actually available.) If this sale will create a new division, Seller's obligations under this Agreement are contingent on Seller's receipt of municipal approval on or before _____, of the proposed division to create the Premises.

6. **Purchase Price:** Buyer offers to buy the Property for the sum of \$ 180000
 one hundred eighty thousand U.S. Dollars

7. **Seller Concessions**, if any: \$10,800

8. **Terms:** The Terms of Purchase will be as indicated by "X" below: (Other unmarked terms of purchase do not apply.)

SOURCE OF FUNDS TO CLOSE: Buyer represents that the funds necessary to close this transaction on the terms specified below are currently available to Buyer in cash or an equally liquid equivalent.

If the Property's value stated in an appraisal obtained by Buyer or Buyer's lender is less than the Purchase Price, Buyer shall within three (3) days after receipt of the appraisal: 1) renegotiate with the Seller, 2) terminate the transaction, in which case Buyer shall receive a refund of Buyer's Earnest Money Deposit, or 3) proceed to close the transaction at the agreed Purchase Price.

☐ **CASH.** The full Purchase Price upon execution and delivery of Warranty Deed. Buyer Agrees to provide Buyer Agent/Dual Agent verification of funds within five (5) days after the Effective Date, and consents to the disclosure of such information to Seller and/or Seller's Agent. If verification of funds is not received within 5 days after the Effective Date, Seller may terminate this Agreement at any time before verification of funds is received by giving written notice to Buyer. Any appraisal required by Buyer shall be arranged and paid for by Buyer within ten (10) days after the Effective Date of this Agreement.

☒ **NEW MORTGAGE.** The full Purchase Price upon execution and delivery of Warranty Deed, contingent upon Buyer's ability to obtain a 30 _____ type FHA _____ (year) mortgage in the amount of 96.5 % of the Purchase Price bearing interest at a rate not to exceed 8 % per annum (rate at time of loan application), on or before the date the sale is to be closed. Buyer agrees to apply for a mortgage loan, and pay all fees and costs customarily charged by Buyer's lender to process the application, within _____ days after the Effective Date, not to impair Buyers' credit after the date such loan is offered. ☐ Seller ☒ Buyer will agree to pay an amount not to exceed \$0 representing repairs required as a condition of financing. Buyer ☐ agrees ☐ does not agree to authorize Buyer's Agent/Dual Agent to obtain information from



Buyer's Initials



Seller's Initials

Buyer's lender regarding Buyer's financing, and consents to the disclosure of this information to Seller and/or Seller's Agent.
Exceptions:

☐ SELLER FINANCING (choose one of the following): ☐ CONTRACT or ☐ PURCHASE MONEY MORTGAGE

In the case of Seller financing, Buyer agrees to provide Seller with a credit report within 72 hours after the Effective Date. If the credit report is unacceptable to Seller, Seller shall have the right to terminate this offer within 48 hours of Seller's receipt, or if Buyer fails to provide said credit report to Seller within the time frame allotted, Seller shall have the right to terminate this offer within 48 hours. Seller is advised to seek professional advice regarding the credit report.

\$_____ upon execution and delivery of a _____
form (name or type of form and revision date), a copy of which is attached, wherein the balance of \$ _____
will be payable in monthly installments of \$ _____ or more including interest at _____ % per annum,
interest to start on date of closing, and first payment to become due thirty (30) days after date of closing. The entire unpaid balance
will become due and payable _____ months after closing. Any appraisal required by Buyer shall be arranged and
paid for by Buyer within ten (10) days after the Effective Date of this Agreement. Exceptions:

☐ EQUITY (choose one of the following): ☐ Formal Assumption or ☐ Informal Assumption
Upon execution and delivery of: ☐ Warranty Deed subject to existing mortgage OR ☐ Assignment of Vendee Interest
in Land Contract, Buyer to pay the difference (approximately \$ _____) between the Purchase Price above
provided and the unpaid balance (approximately \$ _____) upon said mortgage or land contract, which Buyer
agrees to assume and pay. Buyer agrees to reimburse Seller for accumulated funds held in escrow, if any, for payment of future
taxes and insurance premiums, etc. Any appraisal required by Buyer shall be arranged and paid for by Buyer within ten
(10) days after the Effective Date of this Agreement. Exceptions:

☐ OTHER: _____

9. **Contingencies:** Buyer's obligation to consummate this transaction (choose one):

- ☒ **IS NOT CONTINGENT** - is not contingent upon the sale or exchange of any other property by Buyer.
☐ **IS CONTINGENT UPON CLOSING** - is contingent upon closing of an existing sale or exchange of Buyer's property located at:

A copy of Buyer's agreement to sell or exchange that property is being delivered to Seller along with this offer. If the existing sale
or exchange terminates for any reason, Buyer will immediately notify Seller, and either party may terminate this Agreement in
writing, within 3 days of Buyer's notice to Seller. If either party terminates, Buyer shall receive a refund of any applicable Earnest
Money Deposit.

☐ **IS CONTINGENT UPON THE SALE AND CLOSING** - is contingent upon the execution of a binding agreement and the closing
of a sale or exchange of Buyer's property located at _____
on or before _____. Seller will have the right to continue to
market Seller's Property until Buyer enters into a binding agreement to sell or exchange Buyer's property and delivers a copy
thereof to Seller. During such marketing period, Seller may enter into a binding contract for sale to another purchaser on such
price and terms as the Seller deems appropriate. In such event, this Agreement will automatically terminate, Buyer will be notified
promptly, and Buyer's Earnest Money Deposit will be refunded. Exceptions:

10. **Fixtures & Improvements:** The following is not intended to be an all-inclusive list of items included with the Property. All
improvements and appurtenances are included in the Purchase Price, if now in or on the Property, unless rented, including the
following: all buildings; landscaping; attached smart home devices; attached security systems; lighting fixtures and their shades and
bulbs; ceiling fans; hardware for draperies and curtains; window shades and blinds; built-in kitchen appliances, including garbage
disposal and drop-in ranges; wall to wall carpeting, if attached; all attached mirrors; all attached TV mounting brackets; all attached
shelving; attached work benches; stationary laundry tubs; water softener; water heater; incinerator; sump pump; water pump and
pressure tank; heating and air conditioning equipment (window units excluded); attached humidifiers; heating units, including add-on
heating stoves and heating stoves connected by flue pipe; fireplace screens, inserts, and grates; fireplace doors, if attached; liquid
heating and cooking fuel tanks; TV antenna and complete rotor equipment; satellite dish and necessary accessories and complete
rotor equipment; all support equipment for inground pools; screens and storm windows and doors; awnings; installed basketball
backboard, pole and goal; mailbox; flagpole(s); fencing, invisible inground fencing and all related equipment, including collars;
detached storage buildings; underground sprinkling, including the pump; installed outdoor grills; all plantings and bulbs; garage door
opener and control(s); and any and all items and fixtures permanently affixed to the Property; **and also includes:**
Dishwasher, Microwave

but does not include:

11. Heating and Cooking Fuels: Liquid heating and cooking fuels in tanks are included in the sale and will transfer to Buyer at time of possession unless usage is metered (in which case it is not included in the sale). Sellers are responsible for maintaining heating and cooking liquid fuels at an operational level and shall not permit fuels to fall below 10% in the tank(s) at the time of possession, except that the tank(s) may be empty only if now empty. Further, Seller is precluded from removing fuel from tank(s) other than what is expended through normal use. Exceptions:

12. Assessments (choose one):

If the Property is subject to any assessments,

- ☒ Seller shall pay the entire balance of any such assessments that are due and payable on or before the day of closing (regardless of any installment arrangements), except for any fees that are required to connect to public utilities.
- ☐ Seller shall pay all installments of such assessments that become due and payable on or before day of closing. Buyer shall assume and pay all other installments of such assessments.

13. Property Taxes: Seller will be responsible for any taxes billed prior to those addressed below. Buyer will be responsible for all taxes billed after those addressed below.

Buyer is also advised that the state equalized value of the Property, principal residence exemption information and other real property tax information is available from the appropriate local assessor's office. Buyer should not assume that Buyer's future tax bills on the Property will be the same as Seller's present tax bills. Under Michigan law, real property tax obligations can change significantly when property is transferred.

☐ No proration. (Choose one):

- ☐ Buyer ☐ Seller will pay taxes billed summer _____ (year);
- ☐ Buyer ☐ Seller will pay taxes billed winter _____ (year);

☒ Calendar Year Proration (all taxes billed or to be billed in the year of the closing). Calendar year tax levies will be estimated, if necessary, using the taxable value and the millage rate(s) in effect on the day of closing, broken down to a per diem tax payment and prorated to the date of closing with Seller paying for January 1 through the day before closing.

☐ Fiscal Year Proration - Taxes will be prorated as though they are paid in (choose one): ☐ advance. ☐ arrears.

Fiscal Year will be assumed to cover a 12-month period from date billed, and taxes will be prorated to the date of closing. Fiscal year tax levies will be estimated, if necessary, using the taxable value and millage rate(s) in effect on the day of closing, broken down to a per diem tax payment and prorated to the date of closing with Seller paying through the day before closing. Exceptions:

14. Well/Septic: Within ten (10) days after the Effective Date, (choose one) ☒ Seller or ☐ Buyer will arrange for, at their own expense, an inspection of the primary well used for human consumption (including a water quality test for coliform bacteria and nitrates) and septic systems in use on the Property. The inspection will be performed by a qualified inspector in a manner that meets county (or other local governmental authority, if applicable) protocol.

If any report discloses a condition unsatisfactory to Buyer, or doesn't meet county standards that are a condition of sale, Buyer may, within three (3) days after Buyer has received the report, by written notice to Seller, either terminate this Agreement and receive a refund of Buyer's Earnest Money Deposit, or make a written proposal to Seller to correct those unsatisfactory conditions. If Buyer fails to make a written proposal within the above referenced time period, then Buyer will be deemed to have accepted the well/septic as-is. Seller will respond in writing within three (3) days to Buyer's request. If Seller fails to respond or to arrive at a mutually agreeable resolution within three (3) days after Seller's receipt of Buyer's proposal, Buyer will have three (3) days to provide written notice of termination of this Agreement and receive a refund of any applicable Earnest Money Deposit. If Buyer fails to terminate the contract, Buyer will proceed to closing according to the terms and conditions of this Agreement.

Other:

15. Inspections & Investigations:

Inspections: Buyer, or someone selected by Buyer, has the right to inspect the buildings, premises, components and systems, at Buyer's expense. Any damage, misuse, abuse, or neglect of any portion of the Property or premises as a result of inspections will be Buyer's responsibility and expense.

Investigations: It is Buyer's responsibility to investigate (i) whether the Property complies with applicable codes and local ordinances and whether the Property is zoned for Buyer's intended use; (ii) whether Buyer can obtain a homeowner's insurance policy for the Property at price and terms acceptable to Buyer; (iii) and whether or not the Property is in a flood zone.

All inspections and investigations will be completed within 10 days after the Effective Date. If the results of Buyer's inspections and investigations are not acceptable to Buyer, Buyer may, within the above referenced period, by written notice to Seller, either terminate this Agreement and receive a refund of Buyer's Earnest Money Deposit, or make a written proposal to Seller to correct those unsatisfactory conditions. If Buyer fails to make a written proposal within the above referenced time period, then Buyer will be

1227 Pine Street, Muskegon, MI 49442

Subject Property Address/Description



Buyer's Initials

Date

Time



Seller's Initials

deemed to have accepted the Property as-is. Seller may negotiate with Buyer, or by written notice to Buyer, accept Buyer's proposal or terminate this Agreement. If Seller fails to respond, or to arrive at a mutually agreeable resolution within three (3) days after Seller's receipt of Buyer's proposal, Buyer shall have three (3) days to provide written notice of termination of this Agreement and receive a refund of any applicable Earnest Money Deposit. If Buyer fails to terminate this Agreement within said three (3) day period, Buyer will be deemed to accept the Inspections & Investigations and will proceed to closing according to the terms and conditions of this Agreement.

☐ Buyer has waived all rights under this Inspections & Investigations paragraph.

Exceptions:

16. **Municipal Compliances:** Seller will arrange and pay for current certificates of occupancy, sidewalk compliance, and smoke detector ordinances, if applicable.

17. **Title Insurance:** Seller agrees to convey marketable title to the Property subject to conditions, limitations, reservation of oil, gas and other mineral rights, existing zoning ordinances, and building and use restrictions and easements of record. An **expanded coverage** ALTA Homeowner's Policy of Title Insurance in the amount of the Purchase Price shall be ordered by Seller and furnished to Buyer at Seller's expense, and a commitment to issue a policy insuring marketable title vested in Buyer, including a real estate tax status report, will be made available to Buyer within **ten (10) days** after the Effective Date. If Buyer so chooses, or if an expanded policy is not applicable, then a **standard** ALTA Owners' Policy of Title Insurance shall be provided.

If Buyer objects to any conditions, Buyer may, within three (3) days of receipt of the Title Commitment, by written notice to Seller, either terminate this Agreement and receive a refund of Buyer's Earnest Money Deposit, or make a written proposal to Seller to correct those unsatisfactory conditions. If Buyer fails to make a written proposal within the above referenced time period, then Buyer will be deemed to have accepted the Title Commitment as-is. Seller may negotiate with Buyer, or by written notice to Buyer, accept Buyer's proposal or terminate this Agreement. If Seller fails to respond, or to arrive at a mutually agreeable resolution within three (3) days after Seller's receipt of Buyer's proposal, Buyer shall have three (3) days to provide written notice of termination of this Agreement and shall receive a refund of any applicable Earnest Money Deposit. If Buyer fails to terminate this Agreement within said three (3) day period, Buyer will be deemed to accept the Title Commitment as-is and will proceed to closing according to the terms and conditions of this Agreement. Exceptions:

18. **Property Survey:** Broker advises that Buyer should have a survey performed to satisfy Buyer as to the boundaries of the Property and the location of improvements thereon.

☐ Buyer or ☐ Seller (choose one) shall within ten (10) days of the Effective Date, order, at their expense, a boundary survey with iron corner stakes showing the location of the boundaries, improvements and easements in connection with the Property. Upon receipt of the survey, Buyer will have three (3) days to review the survey. If the survey shows any condition, in Buyer's sole discretion, which would interfere with Buyer's intended use of the Property, the marketability of the title, or zoning non-compliance, then Buyer may, within said three (3) day period, terminate this Agreement, in writing, and Buyer will receive a full refund of Buyer's Earnest Money Deposit.

☒ No survey. Buyer has waived all rights under this paragraph.

When closing occurs, Buyer shall be deemed to have accepted the boundaries of the Property and the location of such improvements thereon. Exceptions:

19. **Home Protection Plan:** Buyer and Seller have been informed that home protection plans may be available. Such plans may provide additional protection and benefit to the parties. Exceptions:

20. **Prorations:** Rent; association dues/fees, if any; insurance, if assigned; interest on any existing land contract, mortgage or lien assumed by Buyer; will all be adjusted to the date of closing. For the purposes of calculating prorations, it is presumed that Seller owns the Property through the day before closing.

21. **Closing:** If agreeable to Buyer and Seller, the sale will be closed as soon as closing documents are ready, but not later than 12/07/2022. An additional period of fifteen (15) days will be allowed for closing to accommodate the correction of title defects or survey problems which can be readily corrected, or for delays in obtaining any lender required inspections/repairs. During this additional period, the closing will be held within 5 days after all parties have been notified that all necessary documents have been prepared. Buyer and Seller will each pay their title company closing fee, if applicable, **except in the case of VA financing where Seller will pay the entire closing fee.** Exceptions:

22. **Pre-Closing Walk-Through:** Buyer (choose one) ☒ reserves ☐ waives the right to conduct a final walk-through of the Property within three (3) days of the scheduled closing date. The purpose of the walk-through is to determine that the Property is in a substantially similar condition as of the Effective Date, any contractually agreed upon items have been fulfilled, and that any included personal property is still located at the Property. Buyer shall immediately report to Seller any objections to these conditions and Buyer's requested corrective action.

23. **Possession:** Seller will maintain the Property in its present condition until the completion of the closing of the sale. Possession to be delivered to Buyer, subject to rights of present tenants, if any.

☒ At the completion of the closing of the sale.

☐ At _____ ☐ a.m. ☐ p.m. on the _____ day **after** completion of the closing of the sale, during which time Seller

1227 Pine Street, Muskegon, MI 49442

Subject Property Address/Description

Date

Time



Buyer's Initials



Seller's Initials

will have the privilege to occupy the Property and hereby agrees to pay Buyer \$_____ as an occupancy fee for this period payable at closing, WITHOUT PRORATION. Payment shall be made in the form of cash or certified funds.

If Seller fails to deliver possession to Buyer on the agreed date, Seller shall become a tenant at sufferance and shall pay to Buyer as liquidated damages \$_____ per day plus all of the Buyer's actual reasonable attorney's fees incurred in removing the Seller from the Property.

If Seller occupies the Property after closing, Seller will pay all utilities during such occupancy. Buyer will maintain the structure and mechanical systems at the Property. However, any repairs or replacements necessitated by Seller's misuse, abuse, or neglect of any portion of the Property will be Seller's responsibility and expense.

On the agreed delivery date, Seller shall deliver the Property free of trash and debris and in broom-clean condition, shall remove all personal property (unless otherwise stated in this or an additional written agreement), shall make arrangements for final payment on all utilities, and shall deliver all keys to Buyer. Exceptions:

24. **Earnest Money Deposit:** For valuable consideration, Buyer gives Seller until 11:59 PM (time) on 10/22/2022 (date), to deliver the written acceptance of this offer and agrees that this offer, when accepted by Seller, will constitute a binding Agreement between Buyer and Seller. An Earnest Money Deposit in the amount of \$ 1000 shall be submitted to Grand Rapids Keller Williams East (insert name of broker, title company, other) within 72 hours of the Effective Date of this Agreement, and shall be applied against the Purchase Price. If the Earnest Money Deposit is not received within 72 hours of the Effective Date or is returned for insufficient funds, Seller may terminate this Agreement until such time as the Earnest Money Deposit is received. If Seller terminates this Agreement under this provision, Seller waives any claim to the Earnest Money Deposit. If the sale is not closed due to a failure to satisfy a contingency for a reason other than the fault of Buyer, the Earnest Money Deposit shall be refunded to Buyer. If the sale is not closed as provided in this Agreement and Buyer and Seller do not agree to the disposition of the Earnest Money Deposit, then Buyer and Seller agree that the Broker holding the Earnest Money Deposit may notify Buyer and Seller, in writing, of Broker's intended disposition of the Earnest Money Deposit. If Buyer and Seller do not object to such disposition in writing within fifteen (15) days after the date of Broker's notice, they will be deemed to have agreed to Broker's proposed disposition; if either Buyer or Seller object and no mutually agreeable disposition can be negotiated, Broker may deposit the funds by interpleader with a court of proper jurisdiction or await further actions by Buyer and Seller. In the event of litigation involving the deposit, in whole or in part, either the Seller or the Buyer that is not the prevailing party, as determined by the court, will reimburse the other for reasonable attorneys' fees and expenses incurred in connection with the litigation, and will reimburse the Broker for any reasonable attorneys' fees and expenses incurred in connection with any interpleader action instituted. If the entity holding the Earnest Money Deposit is not the Broker, then to the extent that the terms of any escrow agreement conflict with this paragraph, then the terms and conditions of the escrow agreement shall control.

25. **Professional Advice:** Broker hereby advises Buyer and Seller to seek legal, tax, environmental and other appropriate professional advice relating to this transaction. Broker does not make any representations or warranties with respect to the advisability of, or the legal effect of this transaction. Buyer further acknowledges that REALTOR® above named in the Agreement hereby recommends to Buyer that an attorney be retained by Buyer to pass upon the marketability of the title and to ascertain that the required details of the sale are adhered to before the transaction is consummated. Buyer agrees that Buyer is not relying on any representation or statement made by Seller or any real estate salesperson (whether intentionally or negligently) regarding any aspect of the Property or this sale transaction, except as may be expressly set forth in this Agreement, a written amendment to this Agreement, or a disclosure statement separately signed by Seller.

26. **Disclosure of Information:** Buyer and Seller acknowledge and agree that the Purchase Price, terms, and other details with respect to this transaction (when closed) are not confidential, will be disclosed to REALTORS® who participate in the applicable Multiple Listing Service, and may otherwise be used and/or published by that Multiple Listing Service in the ordinary course of its business.

27. **Other Provisions:**
12 month builders warranty

28. **Mergers and Integrations:** This Agreement is the final expression of the complete agreement of Buyer and Seller, and there are no oral agreements existing between Buyer and Seller relating to this transaction. This Agreement may be amended only in writing signed by Buyer and Seller and attached to this Agreement.

29. **Fax/Electronic Distribution and Electronic Signatures:** Buyer and Seller agree that any signed copy of this Agreement, and any amendments or addendums related to this transaction, transmitted by facsimile or other electronic means shall be competent evidence of its contents to the same effect as an original signed copy. Buyer and Seller further agree that an electronic signature is the legal equivalent of a manual or handwritten signature, and consent to use of electronic signatures. Buyer and Seller agree that any notice(s) required or permitted under this Agreement may also be transmitted by facsimile or other electronic means.

30. **Wire Fraud:** Seller and Buyer are advised that wire fraud is an increasingly common problem. If you receive any electronic

1227 Pine Street, Muskegon, MI 49442

Subject Property Address/Description



Buyer's Initials

Date

Time



Seller's Initials

communication directing you to transfer funds or provide nonpublic personal information (such as social security numbers, drivers' license numbers, wire instructions, bank account numbers, etc.), **even if that electronic communication appears to be from the Broker, Title Company, or Lender, DO NOT** reply until you have verified the authenticity of the email by direct communication with Broker, Title Company, or Lender. **DO NOT** use telephone numbers provided in the email. Such requests may be part of a scheme to steal funds or use your identity.

31. Buyer's Approval and Acknowledgment: Buyer approves the terms of this offer and acknowledges receipt of a copy of this offer.

Buyer 1 Address: Jelani McKenzie dotloop verified 10/25/22 5:45 PM EDT FTJ-XGPE-VD06-ON1R **Buyer**
 Buyer 1 Phone: (Res.) 231-689-8815 (Bus.) Jelani Mckenzie
 Print name as you want it to appear on documents.
 Buyer 2 Address: Devin Jones dotloop verified 10/25/22 5:56 PM EDT PLML-NYYI-MTZA-SJV **Buyer**
 Buyer 2 Phone: (Res.) 231-329-5477 (Bus.) Devin Jones
 Print name as you want it to appear on documents.

32. Seller's Response: The above offer is approved: ☐ As written. ☒ As written except:

Sales Price to be \$181000
 Builders home warranty effective from date of occupancy permit issued by the city of muskegon

Counteroffer, if any, expires 10/25/2022, at 5pm (time). Seller has the right to withdraw this counteroffer and to accept other offers until Seller or Seller's Agent has received notice of Buyer's acceptance.

33. Certification of Previous Disclosure Statement: Seller certifies to Buyer that the Property is currently in the same condition as disclosed in the Seller's Disclosure Statement dated _____ (choose one): ☐ Yes ☐ No. Seller agrees to inform Buyer in writing of any changes in the content of the disclosure statement prior to closing.

34. Notice to Seller: Seller understands that consummation of the sale or transfer of the Property described in this Agreement will not relieve Seller of any liability that Seller may have under the mortgages to which the Property is subject, unless otherwise agreed to by the lender or required by law or regulation. Buyer and Seller are advised that a Notice to Seller & Buyer of Underlying Mortgage form is available from the respective agents via the West Michigan REALTOR® Boards.

35. Listing Office Address: 255 W Western Ave, Muskegon, MI 49440 Listing Broker License # 6505429509
Listing Agent Name: Mariana Murillo VanDam Listing Agent License # Mariana Murillo VanDam

36. Seller's Approval and Acknowledgment: Seller approves the terms of this Agreement and acknowledges receipt of a copy. If Seller's response occurs after Buyer's offer expires, then Seller's response is considered a counteroffer and Buyer's acceptance is required below.

X (Seller's Signature, Date, Time): LeighAnn Mckell dotloop verified 10/25/22 3:54 PM EDT TNNB-9Y9Y-SNRM-CTAS
 _____ Is Seller a U.S. Citizen or Resident Alien? ☒ Yes ☐ No*
 _____ Print name as you want it to appear on documents.

X (Seller's Signature, Date, Time): _____
 _____ Is Seller a U.S. Citizen or Resident Alien? ☐ Yes ☐ No*
 _____ Print name as you want it to appear on documents.

Seller's Address: _____ Seller's Phone (Res.) _____ (Bus.) _____
 * If Seller(s) is not a U.S. Citizen or Resident Alien, there may be tax implications and Buyer and Seller are advised to seek professional advice.

37. Buyer's Receipt/Acceptance: Buyer acknowledges receipt of Seller's response to Buyer's offer. In the event Seller's response constitutes a counteroffer, Buyer accepts said counteroffer. All other terms and conditions in the offer remain unchanged.

X (Buyer's Signature, Date, Time): _____
X (Buyer's Signature, Date, Time): _____

38. Seller's Receipt: Seller acknowledges receipt of Buyer's acceptance of counter offer.

X (Seller's Signature, Date, Time): LeighAnn Mckell dotloop verified 10/25/22 3:54 PM EDT WDAG-HMTG-RPF-1051
X (Seller's Signature, Date, Time): _____

1227 Pine Street, Muskegon, MI 49442
 Subject Property Address/Description

Date _____ Time _____



Buyer's Initials



Seller's Initials