

State of Wisconsin
 Department of Natural Resources
 Bureau of Water Quality
 PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Notice of Intent (NOI)
Contaminated Groundwater from Remedial
Action Operations
 WPDES Permit No. WI-0046566-07-0
 Rev. 06/2018

Notice: Pursuant to chs. NR 200 and 205, Wis. Adm. Code, this notice of intent (NOI) is required to request coverage under the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0046566-07-0 for discharges of contaminated groundwater to waters of the state of Wisconsin. Failure to complete this form in its entirety may result in a returned NOI or a denied NOI. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin Open Records law [ss. 19.31-19.39, Wis. Stats.].

SECTION I: FACILITY/PROJECT LOCATION INFORMATION			
Facility/Project Name Ditch A Interim Action		Facility Mailing Address (i.e. PO Box, Street, or Route) 2700 Industrial Parkway South	
Facility/Project Physical Address (i.e. Street or Route) 2700 Industrial Parkway South		City, State, Zip Code Marinette, WI 54143	
County Marinette	Facility Phone No. (715) 735-7411	Facility Fax No.	Facility Email Address
SECTION II: FACILITY CONTACT INFORMATION			
Facility Operator/Plant Manager Ben Verburg		Title Principal Engineer	
Company Arcadis U.S., Inc.		Contact Mailing Address (i.e. PO Box, Street, or Route) 126 North Jefferson Street, Suite 400	
City, State, Zip Code Milwaukee, WI 53202		Contact Phone No. (414) 277-6214	Alternative Phone No.
Contact Fax No. (414) 276-7603		Contact Email Address ben.verburg@arcadis.com	
Discharge Monitoring Contact Name Ben Verburg		Title Principal Engineer	
Company Arcadis U.S., Inc.		Contact Mailing Address (i.e. PO Box, Street, or Route) 126 North Jefferson Street, Suite 400	
City, State, Zip Code Milwaukee, WI 53202		Contact Phone No. (414) 277-6214	Alternative Phone No.
Contact Fax No. (414) 276-7603		Contact Email Address ben.verburg@arcadis.com	
Authorized Representative Name Eric Bretl		Title Director of Operations, Marinette	
Company Tyco Fire Products, L.P.		AR Mailing Address (i.e. PO Box, Street, or Route) 1 Stanton Street	
City, State, Zip Code Marinette, WI 54143		AR Phone No. (715) 735-7411	Alternative Phone No.
AR Fax No.		AR Email Address	

SECTION III: FACILITY OWNER MAILING ADDRESS (if different from Authorized Representative)		
Facility Owner Name Tyco Fire Products, L.P.	Title	
Parent Company Tyco Fire Products, L.P.	Owner Mailing Address (i.e. PO Box, Street, or Route) 1 Stanton Street	
City, State, Zip Code Marinette, WI 54143	Owner Phone No. (715) 735-7411	Alternative Phone No.
Contact Fax No.	Contact Email Address	

SECTION IV: DISCHARGE CHARACTERIZATION					
Type of Wastewater (check all that apply):	Discharge Frequency (e.g. Annual, Monthly, Daily)	Average Daily Flow (gallons of water discharged per day)	Type of Wastewater (check all that apply):	Discharge Frequency (e.g. Annual, Monthly, Daily)	Average Daily Flow (gallons of water discharged per day)
<input checked="" type="checkbox"/> Treated wastewater from groundwater remediation project	Daily	Ditch A 24,000 (assumes avg. 100 gpm for 4 hrs/day; actual value may vary)	<input type="checkbox"/> Cleaning or decontamination wastewaters from the cleaning of treatment equipment for a remediation project		
<input type="checkbox"/> Infiltration or injection of a substance or remedial material for remediation of soil or groundwater			<input type="checkbox"/> Other (describe type)		
<input type="checkbox"/> Treated wastewater from dewatering of construction trenches or pits			<input type="checkbox"/> Other (describe type)		
<input type="checkbox"/> Landspreading or spray irrigation of agricultural chemical contaminated wastewater			<input type="checkbox"/> Other (describe type)		

SECTION V: ELIGIBILITY CHECKLIST

1. Is the wastewater discharged from and/or to properties within tribal lands (i.e. land owned by or held in trust for the tribes and land within recognized reservation boundaries)?

Yes. **Your discharge is not eligible for this General Permit.** *If all discharges from your facility go to or come from properties in tribal lands, you do not require regulation under a WPDES discharge permit. Therefore, skip the rest of the NOI and sign the last page. We will remove you from our tracking system. The Tribe or United States Environmental Protection Agency (EPA) regulates discharges within tribal lands.*

No. **Proceed to question 2.**

2. Is the wastewater discharged to a Publicly Owned Treatment Works (i.e. sanitary sewer)? A septic system is not considered a sanitary sewer.

Yes. **Your discharge is not eligible for this General Permit.** *If all discharges from your facility go to a sanitary sewer, you do not require regulation under a WPDES discharge permit. Therefore, skip the rest of the NOI and sign the last page. We will remove you from our tracking system. If at some point in the future operations at your facility result in a discharge, you will need to inform the Department. If only some or no discharges from your facility go to the sanitary sewer, please proceed to question 3.*

No. **Proceed to question 3.**

3. Are any of the following wastewaters discharged or mixed with the above wastewaters to surface water or groundwater: Contact or noncontact cooling water, water from boiler cleaning operations, air compressor condensate contaminated with oil and grease, softener regeneration backwash, municipal wastewater, domestic wastewater, or process wastewaters from the production of any material or product, or other wastewater not otherwise cover by this general permit?

Yes. **Your discharge is not eligible for this General Permit.** *Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.*

No. **Proceed to question 4.**

4. What is the receiving water for your discharge? If your facility has more than one outfall, indicate in the space provided which outfalls go to groundwater and which go to surface waters. (*check all that apply*)

Groundwater Discharge (*any wastewater that is allowed to infiltrate or seep into the soil from a permeable surface including but not limited to any drain field, agricultural field, ditch, swale, depression, trench or pit, adsorption pond, infiltration pond, rain garden, prairie, or vegetative area that may impact groundwater quality*). **If you will only be discharging to groundwater, please proceed to question 5.**

Outfall #(s):

Wetland Discharge (*any discernible, confined and discrete conveyance system including but not limited to any pipe, ditch, channel, tunnel, conduit, swale, or storm sewer that will carry wastewater to a wetland. Wetlands mean an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions*). **If you will only be discharging to wetlands, please proceed to question 5.**

Outfall #(s):

Note: *The Department will need to determine if your discharge would cause significant adverse impacts to wetlands*

Surface Water Discharge (*any discernible, confined and discrete conveyance system including but not limited to any pipe, ditch, channel, tunnel, conduit, swale, or storm sewer that will carry wastewater to a creek, stream,*

pond, marsh, bay, reservoir, river, lake, or other surface water within the state of Wisconsin). **Proceed to question 4A.**

Outfall #(s): Ditch A

A. What is the name(s) of the surface water your discharge enters?

Unnamed Ditch

Proceed to question 4B.

B. What is the Water Body Identification Code (WBIC) of the surface water your discharge enters?

583200

Proceed to question 4C.

Note: The WBIC for a specific surface water can be found at: <http://dnr.wi.gov/water/waterSearch.aspx>.

C. Is the discharge directly to a surface water classified as an outstanding or exceptional resource waters as defined in ch. NR 102, Wis. Adm. Code.?

Yes. **Your discharge is not eligible for this General Permit.** Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.

No. **Proceed to question 4D.**

D. Is the discharge directly to a surface water classified as a public water supply (i.e. Lake Superior, Lake Michigan and Lake Winnebago) in ch. NR 104, Wis. Adm. Code?

Yes. **Your discharge is not eligible for this General Permit.** Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.

No. **Proceed to question 5.**

5. Does the discharge contain water treatment additives (i.e. biocides such as microbicides, fungicides, molluscicides, chlorine, etc.) or water quality conditioners (i.e. scale and corrosion inhibitors, pH adjustment chemicals, oxygen scavengers, conditioning agents, water softening compounds, etc.) that may enter surface water or groundwater without receiving wastewater treatment or that are used in a treatment process but are not expected to be removed by wastewater treatment?

Yes. **For each additive used, please fill out and attach an Additive Review Worksheet.** Additive Review Worksheets must be completed to receive coverage under this general permit. The Additive Review Worksheet is not required for additives with active ingredients consisting of chlorine, hypochlorite, sulfuric acid, hydrochloric acid or sodium hydroxide. Also, chemicals used in an industrial process generating wastewater that eventually receives treatment or chemicals added as part of wastewater treatment process (such as ferric chloride, alum or pickle liquor) are not considered water treatment additives and need not require an additive review. **Proceed to question 6.**

No. **Proceed to question 6.**

6. Will chlorine-based compounds be used to control the growth of micro-organisms in the treatment system or used to decontaminate the treatment system after completion of the remediation project?

Yes. **Proceed to question 6A.**

No. **Proceed to question 7.**

A. Will chemicals be used to dechlorinate the wastewater prior to discharge to surface water?

Yes. **The wastewater will be dechlorinated with chemicals. Proceed to question 7.**

No. **The wastewater will not be dechlorinated with chemicals. Proceed to question 7.**

7. Is a discharge management plan attached to this NOI that includes all the information necessary from Section 3 of the permit?

Yes. **Proceed to question 8.**

No. **This form will be considered incomplete and returned to you.**

8. Has the groundwater at the site been analyzed for contaminants and are the results attach to the discharge management plan?

Yes. **Proceed to question 9.**

No. **This form will be considered incomplete and returned to you.**

9. If a treatment facility is required for the treatment of contaminated groundwater, have the plans and specifications been submitted to or approved by the department under s. 281.41, Wis. Stats., and ch. NR 108, Wis. Adm. Code?

Yes. **Proceed to Section VI.**

No. **Please contact wastewater plan review staff to find out how to get the plans approved. Proceed to Section VI.**

Note: Department wastewater plan review staff can be found here:

<http://dnr.wi.gov/topic/wastewater/planreviewers.html>.

Additionally, department plan submittal requirements can be found here:

<http://dnr.wi.gov/topic/wastewater/AdequateSubmittal.html>.

SECTION VI: CERTIFICATION

This form must be signed by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2., Wis. Adm. Code. To delegate signatory authority to a duly authorized representative, please submit a Delegation of Signature Authority (DSA) form (Form 3400-220).

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Representative Name

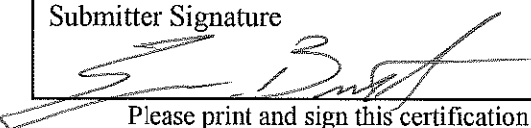
Title

Authorized Representative Signature

Date Signed

State of Wisconsin
Department of Natural Resources
Bureau of Water Quality
PO Box 7921, Madison WI 53707-7921
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Notice of Intent (NOI)
Contaminated Groundwater from Remedial
Action Operations
WPDES Permit No. WI-0046566-07-0
Rev. 06/2018

Submitter Name (If different from Authorized Representative) <i>ERIK BRETT</i>	Title <i>DIR. OPERATIONS</i>
Submitter Signature 	Date Signed <i>AUG 27, 2018</i>

Please print and sign this certification page. Scan and email the completed form, certification page and any other supporting information to the department regional general permit reviewer at least thirty (30) business days before the expected start date of discharge. A listing of the general permit reviewers for each region with mailing addresses and phone numbers can be found at <http://dnr.wi.gov/topic/wastewater/GeneralPermits.html>. Please scroll to the "How to Apply" section and click the department region that the discharge is located in.

Tyco Fire Products, L.P.

DITCH INTERIM ACTION TYCO FIRE TECHNOLOGY CENTER

Discharge Management Plan for
WPDES Permit No. WI-0046566-07-0

BRRTS Activity # 02-38-580694

August 2018

DITCH INTERIM ACTION

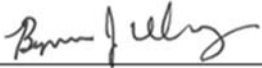
Discharge Management Plan for
WPDES Permit No. WI-0046566-07-0



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Ben Verburg, P.E.
Principal Engineer

Our Ref.:
WI001605.0012

Date:
August 27, 2018



Michael Bedard
Project Lead

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1 INTRODUCTION

1.1 Project Background

Tyco Fire Products, L.P. (Tyco) is proposing an interim measure to treat groundwater and on-site ditch water that is contaminated with per- and poly-fluoroalkyl substances (PFAS) related to the Ansul Fire Technology Center (Site) located at 2700 Industrial Parkway South, Marinette, Wisconsin (see Figure 1). Due to the discovery of PFAS in on-site ditch waters during the Site investigation, Tyco is proposing to implement an interim action on its property at a location referred to as Site A in the city of Marinette in Marinette County, Wisconsin. Site A is located within an on-site ditch, which discharges to an unnamed tributary to the Little River at approximately 45.07084° Latitude and -87.64212° Longitude in Section 13 of Township 30 North and Range 23 East.

1.2 Purpose

Two PFAS compounds are the primary focus for the interim action: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) and are collectively referred to in this document as “PFAS”.

Per ch. Natural Resources (NR) 708.11 Wis. Admin. Code, Tyco evaluated the on-site surface water data and determined that an interim action was necessary to limit the discharge of PFAS in on-site surface water to off-site surface water. The interim action will focus on the removal of PFAS in on-site ditch water to the extent practicable using best available technology. Regulatory and technology considerations relative to the approach include:

1. There are no Wisconsin quality standards for PFAS listed in chs. NR 102, NR 104, NR 105, NR 106, NR 207, and NR 217.
2. There are no groundwater quality standards for PFAS listed in ch. NR 140.
3. Treatment of PFAS within on-site ditch waters will require impacts below the ordinary high-water mark (OHWM) of unnamed ditch (called Ditch A in this application) within the city of Marinette and therefore, the footprint and disturbance area for the interim action will be minimized to the extent practicable.
4. PFAS are resistant to most chemical and microbial treatment technology.
5. Mature technologies associated with petroleum cleanups (e.g., air stripper) are not effective due to low volatility of PFAS.

Discharge of the effluent from the PFAS treatment system requires coverage under the WPDES Permit No. WI-00465566-07-0 (WPDES Permit), for Contaminated Groundwater from Remedial Action Operations. This Discharge Management Plan (Plan) was developed to meet the requirements in Section 3 of the WPDES Permit and must be submitted along with the Notice of Intent (NOI) to obtain permit coverage.

1.3 Site Description

The Ansul Fire Technology Center is a fire suppressant training, testing, research, and development facility. The Site encompasses approximately 380 acres with approximately 9 acres used as the Outdoor Testing/Training Area (OTA). The remaining area of the Site is used for manufacturing, warehousing, office, classroom, parking or is undeveloped. The location of the OTA is presented on Figure 2.

The Site is bordered by industrial and commercial properties to the west, and industrial, commercial, and Marinette School District property to the north. Agricultural land, a cemetery, a community center under construction, and undeveloped land owned by the University of Wisconsin Board of Regents and private owners, border the Site to the east and south.

1.4 Geology and Hydrogeology

The surficial geology in the Marinette area has been mapped as glacial lake deposits, consisting mainly of clay, silt, and sand, overlying Ordovician dolomite bedrock (Oakes et al., 1973). Previous site investigations have found a generally consistent sequence in shallow soils; including:

- A sand unit, consisting of brown fine to medium sand interbedded with silt or silty-sand, extending from the surface to between 30 and 50 feet below ground surface (ft bgs).
- A confining unit, consisting of lake-deposited silt and clay, above areas of glacial till, typically comprising silt, sand and gravel. The confining unit is as little as 12 feet thick at the Site, but thickens eastward

Site data and publicly available construction reports for wells located in the area show that the bedrock surface slopes southeastward toward Green Bay. Bedrock may be as shallow as 35 ft bgs beneath portions of the Site but deepens to around 100 ft bgs along the Green Bay shore.

The regional groundwater flow direction in the Marinette area is generally east toward Green Bay (Oakes et al., 1973). The water table depth in the area is typically shallow; at the Site the depth-to-water is normally less than 5 ft bgs. Water-levels measured in the Site monitoring well network, which is focused in the central and northeast portion of the Site, predict groundwater flow toward the east or northeast.

The Site is located in a low-relief plane bounded by Green Bay, the Peshtigo River, and the Menominee River. The area near the Site is drained by ditches, which may be in hydraulic connection with groundwater. An on-Site Ditch A is present primarily on the west side of the OTA and is oriented generally north to south through the Site. Stormwater runoff from the OTA that does not infiltrate appears to flow south, then through a series of connecting streams, then east to Green Bay. Historically, the on-Site ditch may have flowed north from the Site to connecting ditches, then east to Green Bay.

1.5 Potable Wells and Extent of Contaminant Plume

The City of Marinette municipal water supply, which is sourced from Lake Michigan, serves the majority of the residents within the City limits. There are a limited number of private potable water supply wells within the City limits and numerous private irrigation wells are known to exist within the municipal supply area. Tyco has had extensive communications with WDNR, the City of Marinette, the Town of Peshtigo and the general public regarding the PFAS plume and private drinking water wells.

2 SOURCE OF GROUNDWATER POLLUTION

Aqueous film-forming foams (AFFF) manufactured by Tyco and/or others have been used in the OTA at the Site as part of research and development, quality and firefighting training activities. Site investigation activities in 2016 to 2018 at the Site indicated the presence of PFAS compounds in groundwater and soil. Data from these investigations has been submitted to WDNR (see BRRTS # 02-38580694)

The groundwater data collected to date suggest that PFAS concentrations detected in off-site groundwater may be due to PFAS transport through groundwater and historical stormwater runoff to the on-site and off-site ditches

PFAS was detected in on-site ditch water samples collected in May and June 2018. The most relevant data associated with this permit application is for the samples collected at locations SW-24, SW-25 and SW-27 (see Figure 3). While the investigation to understand the nature and extent of PFAS in groundwater and soil near the OTA is ongoing, the interim action for Ditch A is being proposed to address the potential transport of PFAS from site groundwater into on-site ditch water.

While the presence of multiple PFAS compounds will be included in the laboratory analyses for samples collected under this discharge management plan, the primary purpose of the treatment system will be for PFOA and/or PFOS mitigation, which have been present in various formulations of these AFFF.

3 PROPOSED TREATMENT SYSTEM

In preparation for development of the proposed interim measures, Arcadis completed a detailed Site review utilizing preliminary hydraulic data (e.g., stream gauging), desktop research, and select analytical modeling to evaluate base flow conditions. From this data set, the base flow condition in Ditch A was estimated at 100 gallons per minute (gpm). Seasonal variability in flow conditions are expected (e.g., storm events); initial estimates of seasonal variability were made using United States Geological Survey Streamstats. Seasonal variability will be further assessed during the operation and maintenance of the interim action. In addition, wetland and waterway boundaries within the proposed project areas were determined by conducting a wetland and waterbody delineation survey in the vicinity of the proposed project. Resulting wetland and waterbody boundaries were incorporated into engineering and design plans to avoid and minimize wetland and waterway impacts to the extent practicable, while still accomplishing the engineering design of the project.

Granular activated carbon (GAC) was selected as the surface water treatment technology due to advantages in ease of operation, ability to reactivate and regenerate carbon, flexibility to modify the system in the field, and the ability to add pre-treatment unit operations in the field if needed to address water chemistry (e.g., total organic carbon removal).

Interim measures evaluated for the project included both a passive and active treatment approach utilizing GAC. Passive measures included the incorporation of GAC filter socks into a check dam structure within the ditches. However, the contact time necessary for passive measures to be effective under the base flow conditions was not feasible to achieve adequate treatment of PFAS. An alternative passive approach involved damming of the ditches and establishment of a large backwater area with sufficient hydraulic head to push surface water through a passive membrane system. This approach was dismissed due to the potential for adverse impacts to upstream flood elevations. In addition, passive membrane

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systems can be subject to fouling due to natural silt deposition. Therefore, an active surface water extraction, treatment, and reintroduction system was selected as the most effective alternative. Treated water will be reintroduced immediately downstream of the intake to the treatment system.

The treatment system for Site A will be installed as shown in Appendix A, Sheets C1 and C2. The check dam will be placed approximately at the southern Site property boundary with construction access adjacent to the ditch through Tyco property. A temporary access road approximately 8 feet wide will be contained within the work area limits (Attachment A, Sheet C2) and cleared for piping and access. If needed, gravel may be used temporarily to allow equipment access. The surface water will be extracted and conveyed to a treatment system contained in Conex boxes (or similar structure) on the Site and conveyed and reintroduced immediately downstream of the inlet. Conveyance piping and/or flexible hose will be located above grade, adjacent to the OHWM.

A check dam will be placed perpendicular to water flow. The check dam will be permeable and constructed of Wisconsin Department of Transportation heavy rip rap (D50 = 1.33 feet). The purpose is to assist with the routing of surface water to the collection sump and is not intended to restrict surface water flow. Additional construction details are included on Appendix A, Sheets C4 and C5. Flow to the treatment system originates from the sump pump, which is installed in a sump upstream of the check dam inside the ditch (see details in Appendix A, Sheet C5). Flow in the ditch will enter the sump through a grate, which will stop any large objects from entering the sump. The pump will operate based on a level condition upstream of the check dam and will turn on or off depending on level set points. Once the water level in the ditch reaches a designated set point, the pump will turn on and convey water to an equalization tank located at the treatment system (see Appendix A, Sheets M1 and P1). When the water level reaches the low set point upstream of the check dam, the sump pump will turn off. Water is conveyed from the sump to the treatment system through pipe or flexible hose.

The equalization tank will also be controlled by water level. If the water within the sump reaches a high set point, the sump pump will turn off. Water from the equalization tank will be conveyed to bag filters and GAC vessels using a feed pump controlled by a variable frequency drive (VFD). The VFD allows operators to control the speed of the pump. A flow meter, which can present total flow and instantaneous flow will be installed just downstream of the feed pump. Bag filters installed upstream of the GAC vessels will serve to remove naturally occurring particulates with the water. Pressure gauges on the upstream and downstream sides of the bag filters will allow operators to determine when they need to be replaced. Similarly, pressure gauges on the upstream and downstream sides of the GAC vessels will allow the operators to determine whether a GAC changeout is required. The activated carbon effectiveness will be further monitored through the collection of samples per this Discharge Management Plan, as described in Section 4. Sampling of treatment system effluent will help establish breakthrough timeframes and evaluate whether additional measures (e.g., pre-treatment) are applicable to increase treatment system efficiency. Once the water flows through the GAC vessels, it will be conveyed through pipe or flexible hose back to the downstream side of the check dam. Rip rap will be placed at the discharge point to prevent erosion caused by the discharge flow. Appendix A, Sheet P1 shows the general treatment process and equipment, and details on the construction of the check dam are provided on Appendix A, Sheet C5.

The system will contain a control panel, which will control the entirety of the system. If any alarm condition exists, the operators will be notified via a cellular modem. Power to the system will temporarily be

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supplied by a diesel generator, but the electrical design includes the option to connect to a power drop (shown on Appendix A, Sheet E1).

4 OPERATION AND MAINTENANCE OF TREATMENT SYSTEM

Due to the intermittent nature of the flow in the ditch at Site A, pumping from the sump upstream of the check dam to the equalization tank will likely occur during rainfall events, and will be controlled by high and low-level sensors. After treatment through the bag filter and GAC filters, samples will be taken from a sample port on the effluent line of the treatment system, prior to discharge to surface water at the outfall. The outfall will be located downstream of the check dam.

In accordance with Section 4.2 of the Permit, Table 4-1 includes the parameters that will be monitored during discharges from the treatment system.

Table 4-1: Site A Discharge Monitoring Requirements

Parameter ¹	Limit Type	Limit and Units	Sample Frequency	Sample Type
Flow		gpd	Daily	Estimated
pH	Daily Min-Max	6.0 – 9.0 su	Weekly	Grab
Oil & Grease (Hexane)	Daily Max	10 mg/L	Weekly	Grab
Total Suspended Solids ²	Daily Max	40 mg/L	Weekly	Grab
PAH ³	Monthly Avg.	0.1 µg/L	Weekly	Grab
BTEX ⁴ , total	Monthly Avg.	750 µg/L	Weekly	Grab

¹ PFOA and PFOS also will be included in the analyte list for discharge samples.

² Per Section 4.2.1.3 of the Permit, Total Suspended Solids (TSS) monitoring is only required where groundwater is pumped from construction pits or trenches. Therefore, TSS monitoring is not required for this system, but will be conducted to evaluate effectiveness of the treatment system.

³ EPA test method 610 to be used to test for PAH compounds. Compliance to be demonstrated by reporting no detection of any PAH compounds, or by reporting the sum of PAH group detected amounts are less than 0.1 µg/L.

⁴ BTEX = benzene, toluene, ethylbenzene and xylene

The total daily volume of wastewater discharged will be recorded for each day that there is a discharge. For all other parameters in Table 4-1, the discharge frequency will be weekly during the first four weeks of discharge. If the discharge continues after the first four weeks, the sampling frequency will be reduced to monthly. After one year of discharges, the sampling frequency will be reduced to quarterly. However, if

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any of the limits are exceeded, the sampling frequency will resume on a weekly basis, or more frequently, if requested by the department.

5 REQUIRED LOCAL, STATE AND FEDERAL PERMITS

A listing of all required local, state and federal permits, licenses and approvals to construct and implement the remedial or interim action is as follows:

- WPDES Permit No. WI-0046566-07-0; Contaminated Groundwater from Remedial Action Operations
- WDNR Waterway Individual Permit for Miscellaneous Structures
- WDNR Wetlands Individual Permit for Wetlands Impacts
- USACE Nationwide Permit 18 for Minor Discharges

6 EROSION AND SEDIMENT CONTROL PRACTICES

The project will be completed in a manner that minimizes the potential for erosion and sedimentation during the proposed construction and allows for effective restoration of disturbed areas. The total disturbance for the project will be less than one acre and therefore, it is not anticipated that a WPDES Construction Stormwater Permit will be required. However, the project will involve impacts within and adjacent to state and federally regulated aquatic resources and has been consequently designed to minimize erosion and sedimentation within these resources to the greatest extent possible. Erosion control during project activities will be accomplished through the following:

- Minimizing the quantity and duration of soil exposure.
- Protecting erodible areas (e.g., steep slope or exposed, loose sandy soil areas) during construction by reducing the velocity of and redirecting runoff.
- Installing and maintaining erosion and sediment control measures prior to earth disturbing activities.
- Stabilized construction entrance(s).
- Construction Road Stabilization (as needed).
- Disturbed areas will be graded, seeded, and mulched, as necessary. Seasonally-appropriate seed mixes and appropriate erosion control devices and measures will be installed and maintained until the site is successfully revegetated.
- Inspecting disturbed areas and maintaining erosion and sediment controls as necessary until final stabilization is achieved.

The main form of temporary erosion control will be filter socks. This method was chosen because it does not require significant earth disturbance and is easily moved. As shown on Appendix A, Sheet C4, there are two filter sock installation methods; one for earth installation and one for pavement installation. Both provide sufficient erosion control. Specific placement of filter socks (or similar) is depicted on Appendix A, Sheet C2. Temporary best management practices were designed in accordance with WDNR technical standards.

DITCH INTERIM ACTION

Disturbed areas will be restored to pre-existing contours and seeded using an appropriate seed mix, including annual ryegrass, to establish vegetative cover. Straw or similar type of mulch may be used to help seed germination.

No permanent surface type changes are proposed for the project and, as a result, no increase in impervious surfaces will occur. All impacts resulting from the project will be temporary and therefore post-construction stormwater management efforts will be limited to the restoration of pre-construction contours and the stabilization of soils via establishment of vegetation to prevent erosion.

7 SUMMARY OF ANALYTICAL RESULTS

Table 7-1 contains a summary of the analytical results detected at the site at ditch sampling locations SW-24, SW-25 and SW-27 (see Figure 3). The only parameters that have been analyzed in the on-site ditch water that are included in the WPDES permit include pH and Total Suspended Solids (both included in the Surface Water Discharge sampling requirements in Section 4.2.1 of the WPDES Permit).

Table 7-1: Summary of Analytical Results for On-Site Ditch Water Sampling at Site A

	Units	SW-24	SW-24	SW-25	SW-27	SW-27	Effluent Limit
		5/31/2018	7/16/2018	5/31/2018	5/31/2018	7/16/2018	
Alkalinity	mg/l	NA	140	NA	NA	100	-
PFOS	ng/l	180	210	1100 D	570 D	1100 D	-
PFOA	ng/l	6000 D	1600 D	3800 D	2200 D	990 D	-
pH	pH units	NA	7.1	NA	NA	6.9	-
Total Dissolved Solids	mg/l	NA	820	NA	NA	330	-
Total Organic Carbon 2	mg/l	NA	10	NA	NA	7.9	-
Total Suspended Solids	mg/l	310	14	58	27	64	40 mg/L

Notes:

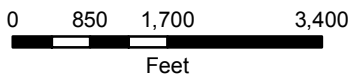
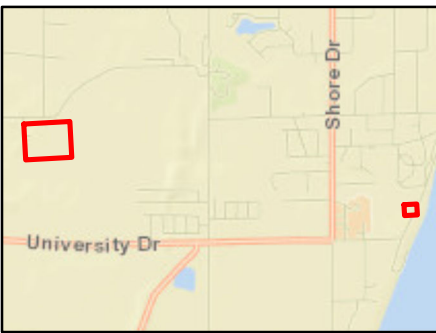
D = Dilution required for sample analysis

PFOS = Perfluorooctanesulfonic acid (C8)


PFOA = Perfluorooctanoic acid (C8)

FIGURES






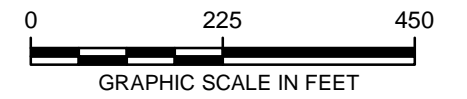
NOTES:
PRIVILEGED AND CONFIDENTIAL
ATTORNEY-CLIENT
PRIVILEGED/ATTORNEY WORK
PRODUCT

ANSUL FTC SITE MARINETTE, WISCONSIN	
SITE A LOCATION MAP	
	<small>Design & Consultancy for natural and built assets</small>
FIGURE 1	



LEGEND:

 OUTDOOR TESTING/TRAINING AREA



NOTES:

- 1. IMAGERY SOURCE: 4/27/2016, DIGITALGLOBE, VIVID - USA.

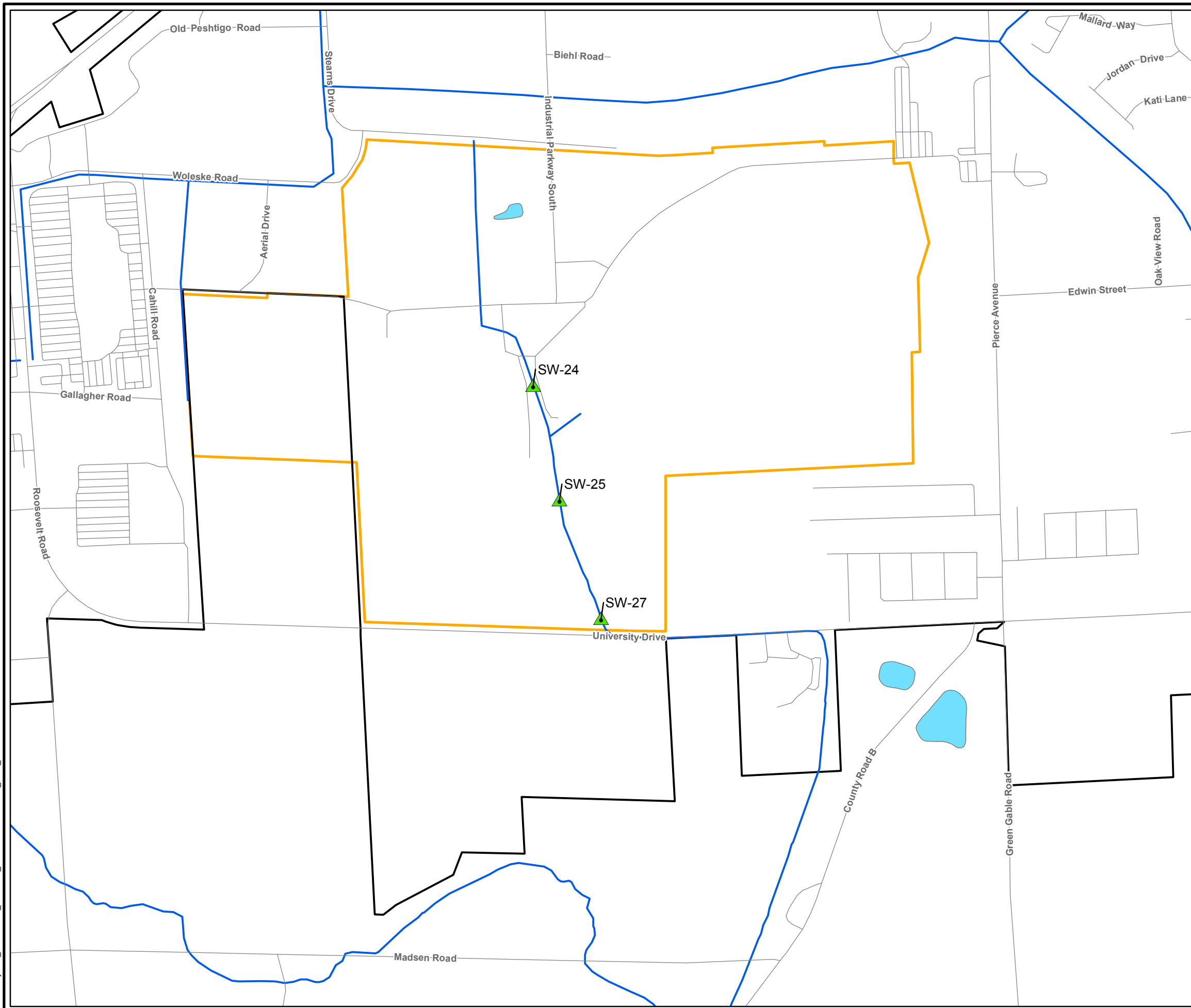
TYCO FIRE PRODUCTS, LP
MARINETTE, WISCONSIN

OUTDOOR TESTING/TRAINING AREA



FIGURE
2

City: Minneapolis/Citrix Div/Group: IMDVC Created By: Last Saved By: mgress
TYCO Marinette, WI
Z:\GIS\Projects_ENV\TYCO_Marinette_WI\IMXD\2018-08\SW_Locs_20180824.mxd 8/24/2018 2:10:54 PM

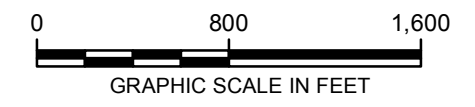


LEGEND:

- SURFACE WATER SAMPLE
- APPROXIMATE SITE PROPERTY BOUNDARY
- APPROXIMATE MARINETTE CITY BOUNDARY
- ROAD
- DITCH/STREAM
- WATERBODY

- NOTES:**
1. CITY BOUNDARY DATA SOURCE: WISCONSIN LEGISLATIVE TECHNOLOGY SERVICES BUREAU, WISCONSIN COUNTY CLERKS AND LAND INFORMATION OFFICES, ACCESSED FALL 2017.
 2. DITCH/STREAM AND WATERBODY DATA SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL HYDROGRAPHY DATASET, ACCESSED FALL 2017.
 3. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.

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SURFACE WATER SAMPLE LOCATIONS

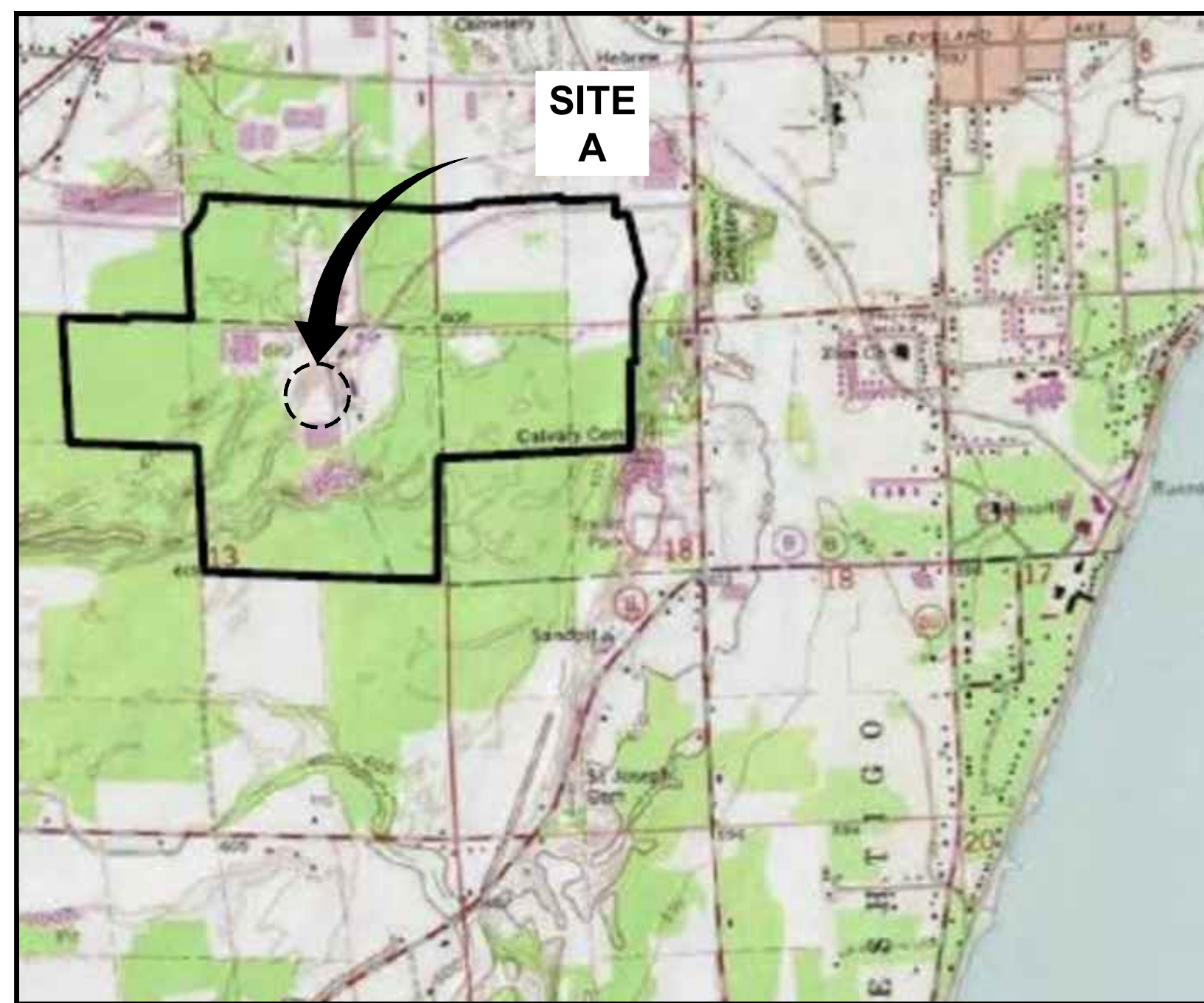
ARCADIS | **FIGURE 3**

APPENDIX A

Ditch Interim Action Design Drawings



DITCH INTERIM ACTION DESIGN



DATE ISSUED
AUGUST 20, 2018

**ANSUL FTC SITE
MARINETTE, WISCONSIN**

INDEX TO DRAWINGS

- G1 TITLE AND INDEX
- G2 ABBREVIATIONS AND GENERAL NOTES
- G3 SPECIFICATIONS (SHEET 1 OF 5)
- G4 SPECIFICATIONS (SHEET 2 OF 5)
- G5 SPECIFICATIONS (SHEET 3 OF 5)
- G6 SPECIFICATIONS (SHEET 4 OF 5)
- G7 SPECIFICATIONS (SHEET 5 OF 5)
- C1 OVERALL SITE PLAN
- C2 DITCH A SITE PLAN
- C3 CIVIL DETAILS
- C4 CHECK DAM DETAILS
- M1 GENERAL LAYOUT
- P1 PIPING AND INSTRUMENTATION DIAGRAM
- E1 ELECTRICAL SINGLE LINE DIAGRAM

LOCATION MAP
0 2000' 4000'
GRAPHIC SCALE



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DATE: 08/20/18
PROJECT NO.: W1001605.0001
FILE NAME: DRAFT-1_G1_BID.DOCX
DESIGNED BY: BV
DRAWN BY: EE
CHECKED BY: MA

MARINETTE, WI
ANSUL FTC SITE
TITLE AND INDEX
DITCH INTERIM ACTION DESIGN

SHEET TITLE

TITLE AND INDEX

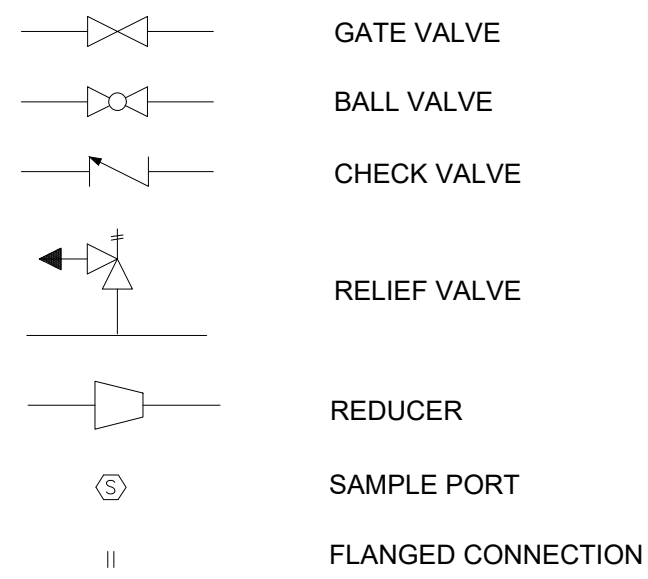
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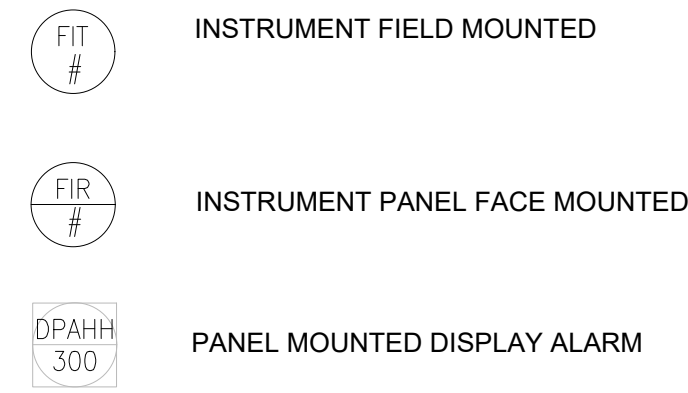
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VALVE SYMBOLS



INSTRUMENTATION SYMBOLS

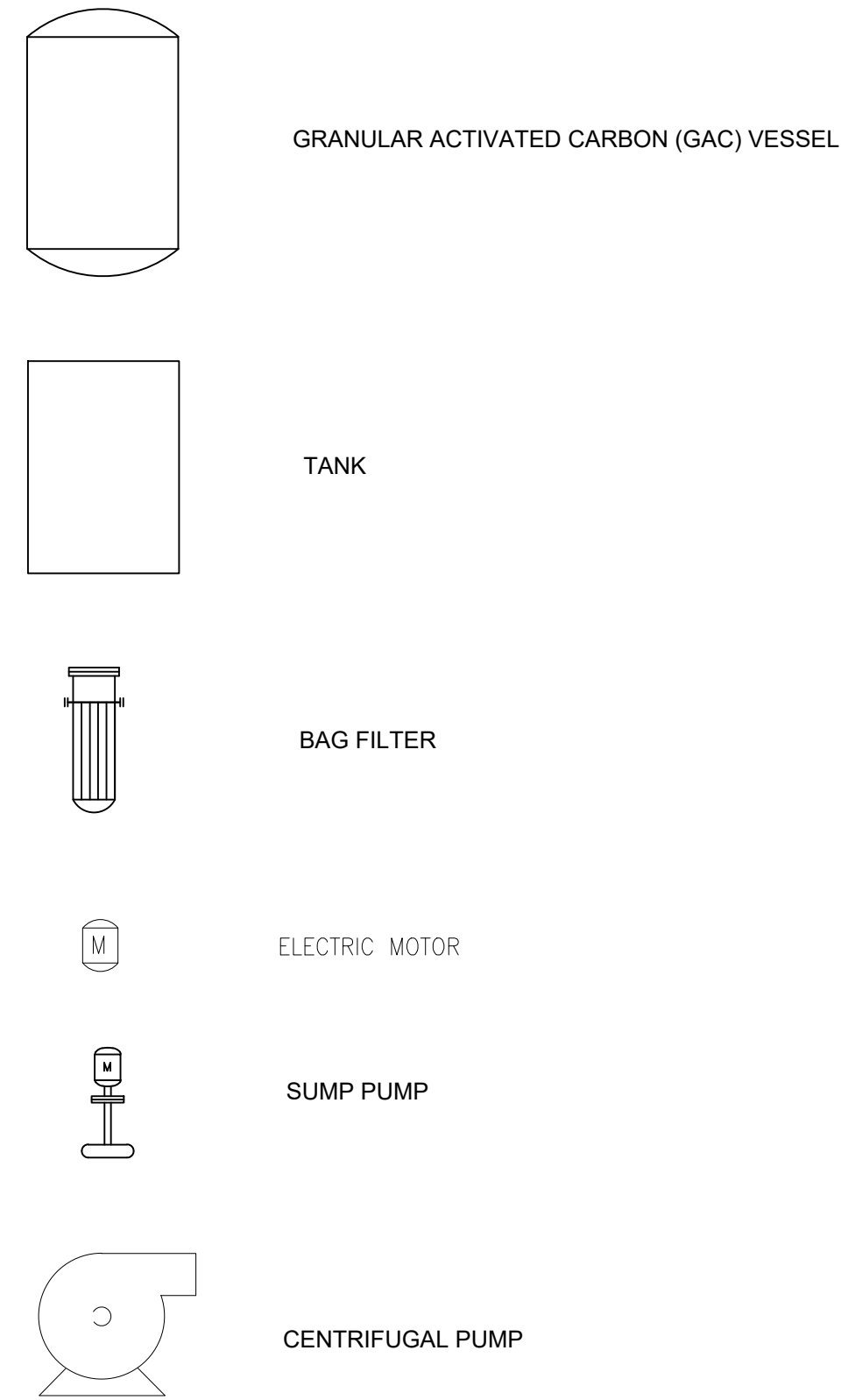


ABBREVIATIONS

&	AND
@	AT
1PH	SINGLE-PHASE
1P	SINGLE-POLE
2/C	TWO-CONDUCTOR
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
3PL	THREE-PLY
3W	THREE-WIRE
4/C	FOUR-CONDUCTOR
4OUT	QUADRUPLE RECEPTACLE OUTLET
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4W	FOUR-WIRE
CS	CARBON STEEL
CPVC	CHLORINATED POLYVINYLCHLORIDE
DGR	DIRECTED GROUNDWATER RECIRCULATION
EQ	EQUALIZATION
EX	EXTRACTION
GAC	GRANULAR ACTIVATED CARBON
GAL	GALLONS
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
HDPE	HIGH DENSITY POLYETHYLENE
HP	HORSE POWER
ID	INSIDE DIAMETER
INJ	INJECTION
IW	INJECTION WELL
MIN	MINIMUM
MAX	MAXIMUM
MCE	MODULAR CONTROL EQUIPMENT
MCP	MAIN CONTROL PANEL
MW	MONITORING WELL
NO	NUMBER
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
PB	PANEL BOARD
PVC	POLYVINYLCHLORIDE
SCH	SCHEDULE
SDR	SIZE DIAMETER RATIO
SST	STAINLESS STEEL
TYP	TYPICAL
VAC	VOLTS ALTERNATING CURRENT

- NOTES:**
- CONTRACTOR SHALL CLEAR TREES AS NECESSARY AND CUT STUMPS FLUSH WITH GRADE.
 - ALL ELECTRICAL WORK SHALL MEET ALL FEDERAL AND LOCAL CODES.
 - CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL UTILITIES, STRUCTURES, AND EASEMENTS PRESENT ON AND AROUND THE SITE. ANY DAMAGE TO THESE UTILITIES DUE TO WORK PERFORMED SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
 - CONTRACTOR SHALL RESTORE SITE TO THE EXISTING CONDITIONS UPON COMPLETION OF THE WORK.
 - CONTRACTOR SHALL SEED AND STRAW ONCE THE WORK IS COMPLETED IN ACCORDANCE WITH THE WDNR STORM WATER BEST PRACTICES.
 - IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE WORK AND PERSONNEL DURING CONSTRUCTION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE UTILITIES FOR RECOMMENDED RELOCATION, PROTECTION, AND CONTROLS.
 - CONTRACTOR SHALL MAINTAIN BENDING RADII GREATER THAN THE DEFLECTION ANGLES LESS THAN THE HDPE MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION OF HORIZONTAL OR VERTICAL CURVES.
 - SIGNS, MARKERS, AND FLAGS SHALL BE INSTALLED BY THE CONTRACTOR FOR ALL UNDERGROUND UTILITIES.
 - UTILITY LOCATION WORK SHALL BE PERFORMED BY THE CONTRACTOR.
 - MAINTAIN THE SITE DRAINAGE SUCH THAT ALL SURFACE WATER WITHIN EARTH DISTURBING LIMITS IS DIVERTED THROUGH EROSION AND SEDIMENT CONTROL MEASURES.

EQUIPMENT SYMBOLS



INSTRUMENT IDENTIFICATION LEGEND

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE,	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		NOT USED	NOT USED	NOT USED
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	INTRUSION		GLASS GAGE (UNCALIBRATED)		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE OR INTER-MEDIATE
N	SEQUENCE STRATEGY		NOT USED	NOT USED	NOT USED
O	NOT USED		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)	PULSE	
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT STATUS	Y AXIS		RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

CODES/STANDARDS:

AI	ASPHALT INSTITUTE
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ACI	AMERICAN CONCRETE INSTITUTE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION STANDARD
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
ISA	INTERNATIONAL SOCIETY OF AUTOMATION
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEC	NATIONAL ELECTRICAL SAFETY CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
UL	UNDERWRITERS LABORATORY



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DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI
ANSUL FTC SITE
DITCH INTERIM ACTION DESIGN
ARCADIS PROJ. NO. W001605.0001

SHEET TITLE
ABBREVIATIONS AND GENERAL NOTES

SCALE:
G2
SHEET ___ OF 1

User: \\VALLER Spec\AUS\NCS\MOD File\G:\PROJECT\YCW001605\CADD\DITCH INTERIM ACTION\DWG TRENCH EXCAVATION AND BACKFILL.dwg Date: 8/20/2018 11:55:11 AM Scale: 1:1 Plot Date: 8/20/2018 11:55:11 AM Plot Date: 8/20/2018 11:55:11 AM Plot Date: 8/20/2018 11:55:11 AM

TRENCH EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. SCOPE:

- 1. WORK IN THIS SECTION INCLUDES TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.
B. RELATED DOCUMENTS:
1. DRAWINGS.
2. SYSTEM REQUIREMENTS DOCUMENT.

1.2 REFERENCES

- A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.
B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
C. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA)
D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
1. ASTM D698 - STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 FT-LBF/FT3 (600 KN-M/M3)).
2. ASTM D2487 - STANDARD PRACTICE FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM).
3. ASTM D6913 - STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS
4. ASTM D7928 - STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS

1.3 SUBMITTALS

- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. PRODUCT DATA:
a. A CATALOGUE CUT SHEET FOR MARKER TAPE.
b. FOR EACH SOURCE OF PIPE AND MANHOLE EMBEDMENT FILL MATERIALS:
1) SOURCE OF THE PIPE AND MANHOLE EMBEDMENT FILL MATERIALS.
2) WRITTEN CERTIFICATION FROM THE MANUFACTURER OR SUPPLIER THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
3) RESULTS OF TESTING PERFORMED BY THE MANUFACTURER OR SUPPLIER THAT CONFIRM THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
c. A 50 POUND REPRESENTATIVE SAMPLE OF THE MATERIAL FROM EACH SOURCE OF MANHOLE AND EMBEDMENT FILL MATERIAL FOR VISUAL EXAMINATION AND CONFORMANCE TESTING.
d. ALTERNATIVE METHODS FOR PIPE INSTALLATION MAY BE CONSIDERED BY THE CONTRACTOR, SUBJECT TO REVIEW AND APPROVAL BY THE COMPANY (INCLUDING DIRECTIONAL DRILLING). FOR ALTERNATIVE METHODS TO BE CONSIDERED A LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER DETAILED INFORMATION NECESSARY TO FULLY DESCRIBE THE NEW ALTERNATIVE METHOD(S).
B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. CERTIFICATIONS:
a. TRENCH SHORING AND WALKWAY DESIGN SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF WISCONSIN.
2. QUALITY CONTROL:
a. LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER REQUIRED INFORMATION FOR TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. OBTAIN BACKFILL MATERIAL FROM EXCAVATION AND TRENCHING INCLUDED IN THIS CONTRACT. ADDITIONAL MATERIAL, IF REQUIRED, SHALL BE OBTAINED FROM THE ON SITE STOCKPILES OR ON-SITE BORROW AREAS IDENTIFIED BY THE ENGINEER.
B. FURNISH NATURAL SAND OR SAND MANUFACTURED FROM STONE FOR PIPE EMBEDMENT FILL MATERIAL.
C. PRIOR TO USE, VERIFY WITH THE COMPANY THAT BACKFILL MATERIALS CONFORM TO THE REQUIREMENTS FOR THEIR INTENDED USE.
D. BACKFILL MATERIAL FOR PIPES; ELECTRICAL CONDUIT; AND VALVE HOUSES AND STRUCTURES SHALL CONFORM TO THE MATERIAL REQUIREMENTS FOR FILL SPECIFIED IN THE EARTHWORK NOTES.
E. FURNISH TRENCH SHORING AND WALKWAY MATERIALS, WHERE REQUIRED, IN ACCORDANCE WITH THE CERTIFIED TRENCH SHORING AND WALKWAY DESIGN.
F. OBTAIN CONSTRUCTION WATER FOR MOISTURE CONDITIONING BACKFILL FROM THE ON SITE WATER FILLING STATIONS SHOWN ON THE DRAWINGS.

2.2 EQUIPMENT

- A. FURNISH EQUIPMENT TO PERFORM TRENCHING AND BACKFILLING AND PIPE AND MANHOLE EMBEDMENT FILL MATERIAL PLACEMENT IN ACCORDANCE WITH THIS SECTION.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

- A. VERIFY EXISTING GRADES IN ACCORDANCE WITH THE SURVEYING NOTES.
B. IF A VERTEBRATE PALEONTOLOGICAL OR ARCHAEOLOGICAL ARTIFACT DISCOVERY IS MADE DURING TRENCHING, STOP WORK IN THE AREA OF DISCOVERY AND NOTIFY THE COMPANY. WORK IN THE AREA OF DISCOVERY SHALL NOT RESUME UNTIL AUTHORIZED BY THE COMPANY.
C. IDENTIFY AND STAKE EXISTING ABOVE AND BELOW GROUND UTILITIES IN VICINITY OF TRENCHING. STAKING AND/OR MARKING SHALL BE IN ACCORDANCE WITH THE SURVEYING NOTES AND AS APPROVED BY THE COMPANY.
D. PROTECT EXISTING ABOVE AND BELOW GROUND UTILITIES.
E. IN AREAS OF TRENCHING AND BACKFILLING, DO NOT INTERRUPT THE EXISTING UTILITY SERVICE UNLESS AUTHORIZED BY THE COMPANY.
F. DO NOT DAMAGE OR DISTURB PERMANENT SURVEY MONUMENTS, FINISHED CONSTRUCTION AREAS AND STRUCTURES, EXISTING UTILITIES AND STRUCTURES. DAMAGE SHALL BE REPAIRED OR REPLACED TO THE ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
G. PERFORM CLEARING, GRUBBING AND STRIPPING IN ACCORDANCE WITH THE CLEARING, GRUBBING, AND STRIPPING NOTES.
H. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE

WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

I. INSTALL CONSTRUCTION SAFETY FENCE IN ACCORDANCE WITH THE EARTHWORK NOTES.

J. STABILIZE DISTURBED AREAS IN ACCORDANCE WITH TEMPORARY OR PERMANENT SEEDING AND APPLY MULCH WITHIN TIME FRAMES IDENTIFIED IN THE CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS.

K. IMPLEMENT DUST CONTROL.

3.2 TRENCHING

- A. TRENCHES FOR INSTALLATION OF PIPES, AND OTHER STRUCTURES SHALL BE TO THE DEPTHS, ELEVATIONS, AND DIMENSIONS SHOWN ON THE DRAWINGS. STOCKPILE EXCESS MATERIAL FROM TRENCHING AT LOCATIONS DESIGNATED BY THE COMPANY. STOCKPILE MATERIALS IN ACCORDANCE WITH THE EARTHWORK NOTES.
B. USE SHORING METHODS ACCEPTED BY THE COMPANY. SHORING SHALL CONFORM TO APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SHORING AND WALKWAY DESIGN CERTIFIED BY THE WISCONSIN-REGISTERED PROFESSIONAL ENGINEER. PROVIDE APPROPRIATE NON-SKID SURFACE WALKWAYS FOR ACCESS ACROSS OPEN TRENCHES, SUCH AS CONSTRUCTED WOODEN WALKWAYS, AND INSTALLED IN ACCORDANCE WITH THE DESIGN CERTIFIED BY THE WISCONSIN-REGISTERED PROFESSIONAL ENGINEER. STORE SHORING AND WALKWAY MATERIALS ON-SITE PRIOR TO BEGINNING TRENCHING ACTIVITIES. MAINTAIN THE SAFETY AND STABILITY OF EXCAVATIONS AND TRENCHES BY PROPERLY INSTALLING SUPPORTS ACCORDING TO THE CERTIFIED DESIGN AND THE MANUFACTURER'S REQUIREMENTS.
C. PROTECT AND MAINTAIN THE TRENCH BOTTOM. REMOVE ROCK FRAGMENTS OR RAVELED MATERIALS THAT COLLECT ON THE TRENCH BOTTOM. BACKFILL OVER-EXCAVATIONS WITH FILL IN ACCORDANCE WITH THIS SECTION AND THE EARTHWORK NOTES. EXCAVATE UNSUITABLE SOIL ENCOUNTERED AT THE TRENCH BOTTOM AND BACKFILL TO TRENCH BOTTOM ELEVATION WITH FILL IN ACCORDANCE WITH THE EARTHWORK NOTES.
D. WHERE TRENCHES WILL BE EXCAVATED IN FILL AREAS, PERFORM TRENCHING ONLY AFTER FILL HAS REACHED AT LEAST 24 INCHES ABOVE THE TOP OF THE PIPE DESIGN ELEVATION UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
E. EXCAVATE FOR STRUCTURES TO AT LEAST 6 INCHES BELOW FOUNDATION ELEVATIONS AND PLACE AGGREGATE BASE OR BACKFILL TO THE FOUNDATION ELEVATIONS SHOWN ON THE DRAWINGS. AGGREGATE BASE AND FILL SHALL BE IN ACCORDANCE WITH THE AGGREGATE BASE AND EARTHWORK NOTES.
F. FOR PIPE INSTALLATION, LIMIT THE MAXIMUM LENGTH OF OPEN TRENCH TO 200 FEET IN ADVANCE AND 200 FEET BEHIND PIPE UNLESS OTHERWISE AUTHORIZED BY THE COMPANY.
G. CONTINUOUSLY DEWATER TRENCHES WHEN WATER IS PRESENT. PERFORM DEWATERING IN ACCORDANCE WITH THE EARTHWORK NOTES.
H. DO NOT LEAVE THE BOTTOM OF TRENCHES ROUGH OR UNEVEN; SMOOTH OUT THE BOTTOM OF TRENCHES TO THE REQUIRED DESIGN.

3.3 BACKFILLING

- A. GENERAL:
1. DO NOT BACKFILL WITH FROZEN OR SATURATED MATERIAL.
2. DO NOT BACKFILL OVER FROZEN, WET, OR SOFT TRENCH BOTTOM OR SIDE SLOPES. REMOVE MATERIALS THAT ARE FROZEN, WET, OR SOFT AS SPECIFIED IN THIS SECTION.
3. DO NOT DISTURB OR DAMAGE PIPING, OR STRUCTURES DURING BACKFILLING; DAMAGED MATERIALS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
4. DO NOT USE COMPACTION EQUIPMENT THAT EXERTS GREATER THAN 10 POUNDS PER SQUARE INCH (PSI) GROUND PRESSURE OVER PIPING THAT IS COVERED BY LESS THAN 12 INCHES OF BACKFILL MATERIAL.
C. PLACEMENT OF PIPE EMBEDMENT FILL FOR PIPES:
1. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH THICK LOOSE LIFTS AND COMPACT EACH LIFT TO THE ELEVATION OF THE BOTTOM OF THE PIPE.
2. COMPACT EACH LIFT OF PIPE EMBEDMENT FILL WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT.
3. GRADE THE PIPE EMBEDMENT FILL TO THE BOTTOM OF THE PIPE DESIGN ELEVATION PRIOR TO PLACING PIPE.
4. PLACE PIPE ON TOP OF THE COMPACTED AND GRADED PIPE EMBEDMENT FILL.
5. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH-THICK LOOSE LIFTS TO THE DEPTH SHOWN ON THE DRAWINGS. COMPACT EACH LIFT WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT, OR BY OTHER MEANS, METHODS, AND TECHNIQUES SUCH THAT INTIMATE CONTACT WITH THE PIPE IS MAINTAINED.
D. PLACEMENT OF BACKFILL MATERIAL FOR PIPES:
1. AFTER PLACEMENT AND COMPACTION OF PIPE EMBEDMENT FILL TO THE LIMITS SHOWN ON THE DRAWINGS, PLACE BACKFILL MATERIAL IN MAXIMUM 4 INCH THICK LOOSE LIFTS TO A MINIMUM DEPTH OF 12-INCHES ABOVE THE PIPE. AFTER 12-INCHES OF MATERIAL HAS BEEN PLACED ABOVE THE PIPE, PLACE BACKFILL MATERIAL IN MAXIMUM 8 INCH THICK LOOSE LIFTS.
2. COMPACT THE BACKFILL MATERIAL IN EACH LIFT TO THE SPECIFICATIONS FOR FILL MATERIAL SPECIFIED IN THE EARTHWORK NOTES TO A MINIMUM ELEVATION OF 3 FEET ABOVE THE TOP OF PIPE USING A WALK-BEHIND PAD-FOOT COMPACTOR, HAND TAMPER, OR VIBRATORY PLATE COMPACTOR, OR BY OTHER MEANS, METHODS, AND TECHNIQUES.
3. CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED OVER THE TOP OF PIPES UNTIL A MINIMUM OF 3 FEET OF BACKFILL MATERIAL HAS BEEN PLACED AND COMPACTED ABOVE THE TOP OF PIPES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
E. PLACE MARKER TAPE IN BACKFILL BELOW FINISHED ELEVATION ABOVE UNDERGROUND PIPES, CONTROL CABLES, AND ELECTRICAL CONDUITS AS SHOWN ON THE DRAWINGS. PLACE MARKER TAPE TO THE DEPTH SHOWN ON THE DRAWINGS.

3.4 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

- A. CQC SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE CQA PROJECT PLAN.
B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE COMPANY TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.
C. CQC CONTRACTOR WILL MONITOR TRENCHING AND BACKFILLING AS SPECIFIED IN THIS SECTION AND THE CQA PROJECT PLAN.
D. CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON THE PIPE EMBEDMENT FILL AND BACKFILL PLACEMENT TO CONFIRM COMPLIANCE WITH THIS SECTION AND THE CQA PROJECT PLAN. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS SHOVELS, HAND AUGERS, AND BACKHOES, AND LABOR TO ASSIST CQC CONTRACTOR IN OBTAINING SAMPLES FROM EXCAVATIONS, TRENCHING, STOCKPILES, AND BORROW AREAS. THE PERFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE CQA PROJECT PLAN AND THE EARTHWORK NOTES.
E. CQC CONTRACTOR AND COMPANY WILL REVIEW AND VERIFY AS-BUILT BOTTOM OF TRENCH ELEVATIONS PRIOR TO BACKFILLING.

F. TOLERANCES:

- 1. TOP OF PIPE AND EMBEDMENT FILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.2 FEET OF THE MINIMUM THICKNESS SHOWN ON THE DRAWINGS.
2. BACKFILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.1 FEET OF THE EXISTING GROUND OR FINISHED ELEVATION SHOWN ON THE DRAWINGS.

G. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE ENGINEER.

3.5 SURVEY CONTROL

- A. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF THE PIPE AND MANHOLE EMBEDMENT FILL AND BACKFILL IN ACCORDANCE WITH THE SURVEYING NOTES.
B. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF STRUCTURES AND PIPES, INCLUDING INVERT ELEVATIONS, IN ACCORDANCE WITH THE SURVEYING NOTES.

AGGREGATE BASE

PART 1- GENERAL

1.1 DESCRIPTION

- A. SCOPE:
1. WORK IN THIS SECTION INCLUDES MATERIAL AND PLACEMENT REQUIREMENTS FOR HEAVY DUTY AGGREGATE SURFACING FOR ROADS AND AGGREGATE SURFACES AS SHOWN ON THE DRAWINGS.
B. RELATED DOCUMENTS:
1. DRAWINGS.
2. SYSTEM REQUIREMENTS DOCUMENT.

1.2 REFERENCES

- A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.
B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
C. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA).
D. ASTM D6913 - STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS

1.3 SUBMITTALS

- A. FOR EACH SOURCE OF AGGREGATE BASE MATERIAL, SUBMIT THE FOLLOWING TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS:
1. SOURCE OF THE MATERIAL ALONG WITH WRITTEN CERTIFICATION FROM THE SUPPLIER THAT THE AGGREGATE BASE MATERIAL CONFORM TO THE REQUIREMENTS OF WISCONSIN DOA MASTER SPECIFICATIONS AND THIS SECTION; AND
2. TEST RESULTS AS REQUIRED BY WISCONSIN DOA DEMONSTRATING THAT THE AGGREGATE BASE MATERIAL CONFORMS TO THE REQUIREMENTS OF WISCONSIN DOA AND THIS SECTION.
B. PRIOR TO COMMENCEMENT OF WORK DESCRIBED IN THIS SECTION, SUBMIT TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, A LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES.

- C. PRIOR TO COMMENCEMENT OF WORK DESCRIBED IN THIS SECTION, SUBMIT TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, A TRAFFIC CONTROL PLAN, INCLUDING ROAD SIGNS, OTHER TRAFFIC CONTROL DEVICES AND FLAGGING REQUIREMENTS, IN ACCORDANCE WITH WISCONSIN DOA.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. PACKING, SHIPPING, HANDLING AND UNLOADING:
1. DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK. DELIVER AGGREGATE BASE IN AMPLE TIME TO PREVENT DELAY OF THE WORK.
B. ACCEPTANCE AT SITE:
1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE. CONTRACTOR SHALL NOTIFY THE ENGINEER, IN WRITING, IF ANY LOSS OR DAMAGE EXISTS TO EQUIPMENT OR COMPONENTS.

PART 2- PRODUCTS

2.1 MATERIALS

- A. FURNISH AGGREGATE BASE MATERIAL CONFORMING TO THE REQUIREMENTS OF WISCONSIN DOA MASTER SPECIFICATIONS.
B. OBTAIN MATERIAL FOR FILL IN ACCORDANCE WITH THE EARTHWORK NOTES.

2.2 EQUIPMENT

- A. FURNISH EQUIPMENT FOR PLACEMENT OF AGGREGATE BASE IN ACCORDANCE WITH THIS SECTION.

PART 3- EXECUTION

3.1 EXISTING CONDITIONS

- A. VERIFY EXISTING CONDITIONS AND SUBGRADE ELEVATIONS IN ACCORDANCE WITH THE SURVEYING NOTES, PRIOR TO PLACEMENT OF AGGREGATE BASE.
B. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.
C. PLACE AGGREGATE BASE AFTER COMPLETION OF THE FOLLOWING:
1. WRITTEN CONFIRMATION OF COMPLIANCE OF AGGREGATE BASE MATERIAL BY THE ENGINEER.
2. WRITTEN CONFIRMATION OF COMPLIANCE OF UNDERLYING LAYERS, INCLUDING ACCEPTANCE OF SURVEY RESULTS FOR SUBGRADE, BY THE ENGINEER.
D. STOCKPILE MATERIALS IN ACCORDANCE WITH THE EARTHWORK NOTES.
E. IMPLEMENT DUST CONTROL.

3.2 SUBGRADE PREPARATION

- A. PREPARE THE SUBGRADE IN ACCORDANCE WITH THE EARTHWORK NOTES PRIOR TO PLACEMENT OF AGGREGATE BASE.

3.3 AGGREGATE BASE

- A. CONSTRUCT THE AGGREGATE BASE LAYER TO THE THICKNESS, ELEVATIONS, AND LIMITS SHOWN ON THE DRAWINGS.
B. AGGREGATE BASE SHALL BE FREE OF DEBRIS, FOREIGN OBJECTS, ORGANICS, AND OTHER DELETERIOUS MATERIALS.
C. SPREAD AND PLACE THE AGGREGATE BASE IN ACCORDANCE WITH WISCONSIN DOA MASTER SPECIFICATIONS.
D. COMPACT THE AGGREGATE BASE IN ACCORDANCE WITH OHIO C&MS ITEM 304.05.

3.4 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

- A. CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE CQA PROJECT PLAN.
B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE ENGINEER TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.
C. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF AGGREGATE BASE MATERIAL IN NEW LOCATIONS.
D. CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON AGGREGATE BASE TO ESTABLISH COMPLIANCE WITH THIS SECTION AND OHIO C&MS REQUIREMENTS. THE PERFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE CQA PROJECT PLAN.

- E. TOLERANCES:
1. ROAD ALIGNMENTS, SHALL BE WITHIN ±0.1 FEET OF THE LOCATIONS SHOWN ON THE DRAWINGS. TEMPORARY CONSTRUCTION ACCESS ALIGNMENT SHALL BE WITHIN ±0.3 FEET OF THE LOCATIONS SHOWN ON THE DRAWINGS.
2. PLACE AGGREGATE BASE TO WITHIN ±0.1 FEET OF THE THICKNESS SHOWN ON THE DRAWINGS.
3. PLACE AGGREGATE BASE TO WITHIN ±0.1 FEET OF THE ELEVATIONS SHOWN ON THE DRAWINGS.
4. PLACE AGGREGATE BASE FOR TEMPORARY CONSTRUCTION ACCESS AND OTHER AREAS WITHIN ±0.2 FEET OF THE ELEVATIONS SHOWN ON THE DRAWINGS.

- F. BASIS OF ACCEPTANCE: THE ENGINEER WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE ENGINEER.

3.5 SURVEY CONTROL

- A. SURVEY ALIGNMENT, LOCATIONS, AND ELEVATIONS FOR AGGREGATE BASE IN ACCORDANCE WITH THE SURVEYING NOTES.



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SEALS

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Table with 2 columns: DATE, PROJECT NO., FILE NAME, DESIGNED BY, DRAWN BY, CHECKED BY. Values: 08/20/18, WI001605.0001, DRAFT-4_G4-SPECIFICATIONS (SHEET 2 OF 5), BV, EE, MA

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SHEET TITLE

SPECIFICATIONS (SHEET 2 OF 5)

SCALE:

G4

SHEET ___ OF 1

GEOTEXTILES

PART 1- GENERAL

1.1 DESCRIPTION

- A. SCOPE:
1. WORK IN THIS SECTION INCLUDES MATERIAL AND ACCEPTANCE, HANDLING, STORAGE, AND INSTALLATION REQUIREMENTS FOR GEOTEXTILES.
B. RELATED DOCUMENTS:
1. DRAWINGS.
2. SYSTEM REQUIREMENTS DOCUMENT.

1.2 REFERENCES

- A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.
B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
1. ASTM D4355 - STANDARD TEST METHOD FOR DETERIORATION OF GEOTEXTILES BY EXPOSURE TO LIGHT, MOISTURE AND HEAT IN A XENON ARC TYPE APPARATUS
2. ASTM D4533 - STANDARD TEST METHOD FOR TRAPEZOID TEARING STRENGTH OF GEOTEXTILES.
3. ASTM D4632 - STANDARD TEST METHOD FOR GRAB BREAKING LOAD AND ELONGATION OF GEOTEXTILES.
4. ASTM D5261 - STANDARD TEST METHOD FOR MEASURING MASS PER UNIT AREA OF GEOTEXTILES.
5. ASTM D6193 - STANDARD PRACTICE FOR STITCHES AND SEAMS.
6. ASTM D6241 - STANDARD TEST METHOD FOR STATIC PUNCTURE STRENGTH OF GEOTEXTILES AND GEOTEXTILE-RELATED PRODUCTS USING A 50-MM PROBE.
7. ASTM D7178 - STANDARD PRACTICE FOR DETERMINING THE NUMBER OF CONSTRICTIONS M OF NON-WOVEN GEOTEXTILES AS A COMPLEMENTARY FILTRATION PROPERTY.
D. RAINWATER AND LAND DEVELOPMENT, WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) STORM WATER DISCHARGE PERMIT PROGRAM UNDER AUTHORITY OF CH. NR 216, WISCONSIN ADMINISTRATIVE CODE.
E. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA).

1.3 SUBMITTALS

- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. PRODUCT DATA:
a. MANUFACTURER'S LITERATURE, ILLUSTRATIONS, SPECIFICATIONS AND ENGINEERING DATA INCLUDING: DIMENSIONS, MATERIALS, SIZE, WEIGHT, AND PERFORMANCE DATA.
2. SHOP DRAWINGS:
a. ASSEMBLY AND INSTALLATION.
B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. SOURCE QUALITY CONTROL:
a. CERTIFICATION OF MINIMUM AVERAGE ROLL VALUES 95 PERCENT LOWER CONFIDENCE LIMITS AND THE CORRESPONDING TEST METHODS FOR GEOTEXTILE PROPERTIES LISTED IN THE TABLES IN THIS SECTION.
b. MANUFACTURER'S WRITTEN RECOMMENDED MAXIMUM EXPOSURE PERIOD AFTER THE GEOTEXTILE IS UNWRAPPED FROM ITS OPAQUE COVER;
c. RECOMMENDED LONG-TERM STORAGE REQUIREMENTS AND LIMITATIONS.
2. QUALITY CONTROL CERTIFICATES:
a. MANUFACTURING QUALITY CONTROL CERTIFICATES SIGNED BY THE QUALITY CONTROL MANAGER APPLICABLE TO EACH ROLL OF GEOTEXTILE AS SPECIFIED IN THIS SECTION.
1) THE SUBMITTAL SHALL INCLUDE A LIST OF ROLL NUMBERS TO BE SHIPPED INDICATING WHICH ROLLS WERE SAMPLED AND TESTED.
2) THE CERTIFICATES SHALL STATE THAT THE GEOTEXTILES ARE CONTINUOUSLY INSPECTED AND ARE NEEDLE-FREE.
3) THE QUALITY CONTROL CERTIFICATES SHALL ALSO INCLUDE:
a) LOT NUMBERS, ROLL NUMBERS, AND OTHER IDENTIFICATION;
b) SAMPLING METHODS; AND
c) RESULTS OF QUALITY CONTROL TESTS, INCLUDING DESCRIPTIONS OF TEST METHODS USED (THE MANUFACTURER'S QUALITY CONTROL TESTS TO BE PERFORMED ARE SPECIFIED IN THIS SECTION)

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. PACKING, SHIPPING, HANDLING AND UNLOADING:
1. DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK. DELIVER GEOTEXTILE MATERIALS AND APPARATUSES IN AMPLE TIME TO PREVENT DELAY OF THE WORK.
2. HANDLING SHALL BE PERFORMED SUCH THAT DAMAGE TO GEOTEXTILE MATERIALS DOES NOT OCCUR.
3. GEOTEXTILE MATERIALS DAMAGED DURING UNLOADING, HANDLING, AND STORAGE SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
B. STORAGE AND PROTECTION:
1. STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION. KEEP ALL MATERIAL OFF THE GROUND, USING PALLETS, PLATFORMS, OR OTHER SUPPORTS.
2. PROTECTION FROM SUNLIGHT, MOISTURE, EXCESSIVE HEAT OR COLD, PUNCTURE, MUD, DIRT, AND DUST OR OTHER DAMAGING CONDITIONS.
C. ACCEPTANCE AT SITE:
1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE. CONTRACTOR SHALL NOTIFY THE COMPANY, IN WRITING, IF ANY LOSS OR DAMAGE EXISTS TO EQUIPMENT OR COMPONENTS. REPLACE LOSS AND REPAIR DAMAGE TO NEW CONDITION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PART 2- PRODUCTS

2.1 GEOTEXTILE

- A. GEOTEXTILE MATERIALS SHALL BE FURNISHED THAT CONFORM TO OR EXCEED THE FOLLOWING REQUIREMENTS:
1. MINIMUM AVERAGE ROLL VALUES WITH 95 PERCENT LOWER CONFIDENCE LIMITS CONFORMING TO OR EXCEEDING THE REQUIRED PROPERTY VALUES SPECIFIED IN TABLE 02714-1 FOR GEOTEXTILE SEPARATOR FOR ROADS AND SURFACE WATER MANAGEMENT FEATURES
2. MANUFACTURED FROM FIRST QUALITY POLYMERS, WITH NO MORE THAN 20 PERCENT RECLAIMED POLYMER USED IN PRODUCTION.

2.2 MANUFACTURING QUALITY CONTROL

- A. FOR GEOTEXTILE FURNISHED BY THE ENGINEER AND THE CONTRACTOR, THE GEOTEXTILE MATERIAL SHALL BE SAMPLED AND TESTED TO DEMONSTRATE THAT THE MATERIAL CONFORMS TO THE REQUIREMENTS OF THIS SECTION. ANY GEOTEXTILE ROLL THAT DOES NOT COMPLY WITH THE MANUFACTURING QUALITY CONTROL REQUIREMENTS SHALL NOT BE DELIVERED TO THE SITE.
1. PERFORM MANUFACTURING QUALITY CONTROL TESTS TO DEMONSTRATE THAT THE PROPERTIES CONFORM TO THE VALUES SPECIFIED IN TABLE 02714-1. PERFORM THE FOLLOWING MANUFACTURING QUALITY CONTROL TESTS AT A MAXIMUM INTERVAL OF ONE TEST FOR EACH 50,000 SQUARE FEET MANUFACTURED FOR THE FOLLOWING ASTM TEST METHODS, D4533, D4632, D5261, AND D6241. ALL TESTED ROLLS OF MATERIAL USED TO CERTIFY COMPLIANCE SHALL BE DELIVERED TO THE SITE. TEST DATA FOR ROLLS NOT DELIVERED TO THE SITE SHALL NOT BE ACCEPTED.
B. FOR GEOTEXTILE FURNISHED BY THE ENGINEER AND THE CONTRACTOR, IF A GEOTEXTILE SAMPLE FAILS TO

CONFORM TO THE QUALITY CONTROL REQUIREMENTS OF THIS SECTION, THEN SAMPLE AND TEST ROLLS MANUFACTURED AT THE SAME TIME AND IN THE SAME LOT AS THE FAILING ROLL. CONTINUE TO SAMPLE AND TEST THE ROLLS UNTIL THE EXTENT OF THE FAILING ROLLS ARE BRACKETED BY PASSING ROLLS. DO NOT SUPPLY FAILING ROLLS.

2.3 PACKAGING

- A. GEOTEXTILE ROLLS SHALL BE WRAPPED IN RELATIVELY IMPERMEABLE AND OPAQUE PROTECTIVE COVERS.
B. COVERS WHICH BECOME TORN OR DAMAGED SHALL BE REPAIRED BY THE CONTRACTOR WITH SIMILAR MATERIALS.
C. GEOTEXTILE ROLLS SHALL BE MARKED OR TAGGED IN ACCORDANCE WITH ASTM D4873 WITH THE FOLLOWING INFORMATION:
1. MANUFACTURER'S NAME.
2. PRODUCT IDENTIFICATION.
3. LOT OR BATCH NUMBER.
4. ROLL NUMBER.
5. ROLL DIMENSIONS.
D. GEOTEXTILE ROLLS NOT LABELED IN ACCORDANCE WITH THIS SECTION OR ON WHICH LABELS ARE ILLEGIBLE SHALL BE REJECTED AND REPLACED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY ROLLS NOT LABELED IN ACCORDANCE WITH THIS SECTION.
E. IF MANUFACTURING QUALITY CONTROL SAMPLING IS LESS THAN 100 PERCENT OF ROLLS, IDENTIFY SAMPLED ROLLS WITH A HIGHLY VISIBLE MARK OR LABEL, DISTINCT FROM UNSAMPLED ROLLS.

2.4 SHIPPING

- A. GEOTEXTILES FURNISHED BY THE CONTRACTOR SHALL NOT BE SHIPPED PRIOR TO FINAL REVIEW AND CONFIRMATION OF COMPLIANCE OF MANUFACTURER'S QUALITY CONTROL SUBMITTALS IN ACCORDANCE WITH THIS SECTION AND CONFORMANCE TESTING PERFORMED BY THE CONSTRUCTION QUALITY CONTROL (CQC) CONTRACTOR IN ACCORDANCE WITH THE COA PROJECT PLAN.

2.5 EQUIPMENT

- A. FURNISH EQUIPMENT FOR ACCEPTANCE, HANDLING, STORAGE, AND INSTALLATION OF GEOTEXTILE IN ACCORDANCE WITH THIS SECTION.

PART 3- EXECUTION

3.1 INSTALLATION

- A. DO NOT COMMENCE GEOTEXTILE INSTALLATION UNTIL COMPLETION OF CONFORMANCE TESTING AND WRITTEN CONFIRMATION OF COMPLIANCE OF UNDERLYING LAYERS, INCLUDING ACCEPTANCE OF CONTRACTOR'S SURVEY RESULTS, BY THE ENGINEER.
B. HANDLE GEOTEXTILES SO AS TO ENSURE THEY ARE NOT DAMAGED.
C. AFTER UNWRAPPING THE GEOTEXTILES FROM THEIR OPAQUE COVERS, DO NOT LEAVE THEM EXPOSED FOR A PERIOD IN EXCESS OF THE MANUFACTURER'S WRITTEN RECOMMENDED EXPOSURE PERIOD. GEOTEXTILES THAT ARE ALLOWED TO BE EXPOSED FOR A PERIOD IN EXCESS OF THE MANUFACTURER'S WRITTEN RECOMMENDED EXPOSURE PERIOD SHALL BE REMOVED AND REPLACED AT CONTRACTOR'S EXPENSE.
D. DURING INSTALLATION OF GEOTEXTILES, TAKE PRECAUTIONS TO PREVENT DAMAGE TO UNDERLYING LAYERS, INCLUDING RUTTING IN SUBGRADE. REPAIR DAMAGED SUBGRADE IN ACCORDANCE WITH THE EARTHWORK NOTES.
E. TAKE CARE NOT TO ENTRAP STONES, DUST, OR MOISTURE BELOW OR IN THE GEOTEXTILES.
F. EXAMINE THE GEOTEXTILE SURFACE AFTER INSTALLATION TO ENSURE THAT NO POTENTIALLY HARMFUL FOREIGN OBJECTS ARE ENTRAPPED UNDER OR WITHIN THE GEOTEXTILE. REMOVE SUCH OBJECTS THAT ARE ENTRAPPED AND REPAIR THE GEOTEXTILE IN ACCORDANCE WITH THIS SECTION. REPLACE DAMAGED GEOTEXTILES THAT ARE UNABLE TO BE REPAIRED.
G. ANCHOR OR WEIGHT GEOTEXTILES WITH SANDBAGS, OR BY OTHER MEANS, METHODS, AND TECHNIQUES, TO PREVENT DAMAGE AND DISPLACEMENT FROM WIND. INSTALL SANDBAGS DURING INSTALLATION AND MAINTAIN THEM UNTIL OVERLYING LAYERS ARE PLACED. IMMEDIATELY REMOVE DAMAGED OR LEAKING SANDBAGS.
H. SEAMS AND OVERLAPS:
1. DO NOT INSTALL HORIZONTAL SEAMS ON SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL (10H:1V). SEAMS SHALL BE ALONG, NOT ACROSS, THE SLOPES.
2. OVERLAP GEOTEXTILE ON FLAT AREAS A MINIMUM OF 12 INCHES.
3. OVERLAP GEOTEXTILE SEPARATOR USED FOR UNDERLYING RIPRAP SURFACE WATER MANAGEMENT FEATURES DESCRIBED IN THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES A MINIMUM OF 12 INCHES. NO SEAMING IS REQUIRED.
J. REPAIR:
1. REPAIR HOLES OR TEARS IN THE GEOTEXTILES USING PATCHES MADE FROM THE SAME GEOTEXTILE MATERIAL. EXTEND GEOTEXTILE PATCHES A MINIMUM OF 1 FOOT BEYOND THE DAMAGED AREA. SECURE THE PATCH IN PLACE BY HEAT LEISTER, SEWING, OR CAREFULLY PLACING AGGREGATE IN A MANNER TO ENSURE THAT THE PATCH IS NOT DISPLACED.
2. REMOVE SOIL OR OTHER MATERIAL THAT MAY HAVE BEEN ENTRAPPED UNDER OR WITHIN THE TORN GEOTEXTILES.
K. PLACEMENT OF SOIL AND AGGREGATE MATERIALS:
1. PLACE MATERIALS ON TOP OF GEOTEXTILES IN A MANNER TO ENSURE THAT:
a. THE GEOTEXTILES AND THE UNDERLYING MATERIALS ARE NOT DAMAGED;
b. SLIPPAGE AND DISPLACEMENT DOES NOT OCCUR BETWEEN THE GEOTEXTILE AND THE UNDERLYING LAYERS DURING PLACEMENT;
c. EQUIPMENT IS NOT DRIVEN DIRECTLY ON THE GEOTEXTILE; AND
d. MATERIAL TO BE PLACED ON THE GEOTEXTILE IS DUMPED ONTO THE PRECEDING LIFT AND THE MATERIAL IS CASCADED ONTO THE GEOTEXTILE IN A MANNER THAT DOES NOT SHOVE OR DISPLACE THE GEOTEXTILE.
2. PLACE THE MATERIAL OVERLYING THE GEOTEXTILE AS SOON AS PRACTICABLE AND, WHERE APPLICABLE, FROM THE BASE OF THE SLOPE UPWARDS. UNLESS OTHERWISE AUTHORIZED BY THE COMPANY, EQUIPMENT OPERATING ON MATERIAL OVERLYING THE GEOTEXTILE SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS.

Table with 2 columns: Allowable Equipment Ground Pressure (psi) and Thickness of Overlying Layer (ft.). Values range from <5 to >20 psi and 1.0 to 3.0 ft.

3.2 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

- A. CQC SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE COA PROJECT PLAN.
B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE ENGINEER TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.
C. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO COMMENCEMENT OF WORK DESCRIBED IN THIS SECTION.
D. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS AN OFF-ROAD FORKLIFT, AND LABOR TO ASSIST CQC CONTRACTOR IN OBTAINING CONFORMANCE SAMPLES FROM MATERIALS DESCRIBED IN THIS SECTION. THE CONFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE COA PROJECT PLAN.
E. THE CQC CONTRACTOR HAS THE OPTION OF COLLECTING CONFORMANCE SAMPLES AT THE MANUFACTURING FACILITY.

- F. CQC CONTRACTOR WILL MONITOR THE GEOTEXTILE INSTALLATION IN ACCORDANCE WITH THIS SECTION AND THE COA PROJECT PLAN.
G. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE COMPANY.

3.3 CLEANING

- A. CLEAN EXPOSED SURFACE OF ALL GREASE, DIRT AND OTHER FOREIGN MATERIALS.
B. TOUCH UP ALL MARRED OR ABRADED SURFACES.

TABLE 02714-1 REQUIRED PROPERTY VALUES FOR GEOTEXTILE CUSHION

Table with 5 columns: PROPERTIES, QUALIFIER, UNITS, SPECIFIED PROPERTY VALUES, TEST METHOD. Rows include Identification Requirements (Type, Polymer composition, Mass per unit area) and Mechanical Requirements (Grab strength, Elongation, Trapezoidal tear strength, Static puncture strength) and Durability Requirements (Ultraviolet resistance).

- Notes:
(1) Minimum of values measured in machine and cross-machine directions with 1 x 2-inch clamp on Constant Rate of Extension (CRE) machine.
(2) Minimum value measured in machine and cross-machine direction.
(3) All values represent minimum average roll values (except Apparent opening size).
(4) Table was developed using both Ohio C&MS and ODNR Standards.
(5) mm = millimeter
% = percent
oz/yd² = ounce per square yard
lb sec⁻¹ = per second
lb = pound
psi = pounds per square inch

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Table with 2 columns: FIELD, VALUE. Fields include DATE (08/20/18), PROJECT NO. (W001605.0001), FILE NAME (DRAFT-5_G5-SPECIFICATIONS (SHEET 3 OF 5)), DESIGNED BY (BV), DRAWN BY (EE), CHECKED BY (MA).

Project location and title: MARINETTE, WI ANSUL FTC SITE DITCH INTERIM ACTION DESIGN

SHEET TITLE: SPECIFICATIONS (SHEET 3 OF 5) SHEET 05 OF 1

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LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

- A. INSULATED CABLE IN RACEWAYS:**
- APPLICATION: USE FOR CIRCUITS LOCATED INDOORS AND OUTDOORS.
 - MATERIAL: SINGLE CONDUCTOR COPPER CABLE COMPLYING WITH ASTM B3 AND ASTM B8 WITH FLAME-RETARDANT, MOISTURE- AND HEAT-RESISTANT INSULATION RATED FOR 90 DEGREES C IN DRY OR WET LOCATIONS, LISTED BY UL AS TYPE XHHW-2 COMPLYING WITH UL 44.
 - WIRE SIZES: NOT SMALLER THAN NO. 12 AWG FOR POWER AND LIGHTING AND NO. 14 AWG FOR 120-VOLT CONTROL CIRCUITS.
 - SOUTH WIRE, GENERAL CABLE, AMERICAN INSULATED WIRE, THE OKONITE COMPANY, OR APPROVED EQUAL
- B. CABLE CONNECTORS, SOLDERLESS TYPE:**
- FOR WIRE SIZES NO. 4 AWG AND ABOVE, USE EITHER COMPRESSION TYPE OR BOLTED TYPE WITH SILVER-PLATED CONTACT FACES.
 - FOR WIRE SIZES UP TO AND INCLUDING NO. 6 AWG, USE COMPRESSION TYPE. ALARM AND CONTROL WIRE SHALL BE TERMINATED USING FORKED TYPE CONNECTORS AT TERMINAL BOARDS.
 - FOR WIRE SIZES NO. 250 KCMIL AND LARGER, USE CONNECTORS WITH AT LEAST TWO CABLE CLAMPING ELEMENTS OR COMPRESSION INDENTS AND PROVISION FOR AT LEAST TWO BOLTS FOR JOINING TO APPARATUS TERMINAL.
 - PROPERLY SIZE CONNECTORS TO FIT FASTENING DEVICE AND WIRE SIZE. CONNECTORS SHALL BE RATED FOR 90 DEGREE C, 600 VOLTS.
 - T&B STA-KON, BURNDY HYLUG, OR APPROVED EQUAL.
- C. CABLE SPLICES:**
- FOR WIRE SIZES NO. 8 AWG AND LARGER, SPLICES SHALL BE MADE UP WITH COMPRESSION TYPE COPPER SPLICE FITTINGS. SPLICES SHALL BE TAPED AND COVERED WITH MATERIALS RECOMMENDED BY CABLE MANUFACTURER TO PROVIDE INSULATION EQUAL TO THAT ON CONDUCTORS.
 - FOR WIRE SIZES NO. 10 AWG AND SMALLER, SPLICES MAY BE MADE UP WITH PRE-INSULATED SPRING CONNECTORS.
 - FOR WET LOCATIONS, SPLICES SHALL BE WATERPROOF. COMPRESSION TYPE SPLICES SHALL BE WATERPROOFED BY SEALANT-FILLED, THICK WALL, HEAT SHRINKABLE, THERMOSETTING TUBING OR BY POURING THERMOSETTING RESIN INTO MOLD THAT SURROUNDS THE JOINED CONDUCTOR. SPRING CONNECTOR SPLICES SHALL BE WATERPROOFED WITH SEALANT FILLER.
 - SPLICES SHALL BE SUITABLY SIZED FOR CABLE, RATED 90 DEGREES C, AND 600 VOLTS.
 - COMPRESSION-TYPE SPLICES: BURNDY HYLINK, T&B COLOR-KEYED COMPRESSION CONNECTORS, OR APPROVED EQUAL.
 - SPRING CONNECTORS: BUCHANAN B-CAP, T&B WIRE CONNECTOR, OR APPROVED EQUAL.

INSTRUMENTATION AND COMMUNICATION CABLE

- A. SINGLE-PAIR SHIELDED INSTRUMENT CABLES:**
- TINNED COPPER, XLPE-INSULATED STRANDED CONDUCTORS, NOT LESS THAN NO.16 AWG, TWISTED PAIR, WITH OVERALL PVC OR CPE JACKET. RATED FOR NOT LESS THAN 600 VOLTS AND COMPLYING WITH UL 1581.
 - BELDEN COMPANY, OKONITE COMPANY, OR APPROVED EQUAL.
- B. ETHERNET CATEGORY 6 CABLE:**
- CATEGORY 6 SHIELDED TWISTED PAIR SOLID CABLE WITH PVC JACKET AND SHIELDED 8P8C MODULAR CONNECTORS. FACTORY TERMINATED CABLE IS REQUIRED.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

- A. STRUT, FITTINGS, AND ACCESSORIES:**
- 1. GENERAL**
- UNLESS OTHERWISE SHOWN OR INDICATED, STRUT SHALL BE 1-5/8 INCHES BY 1-5/8 INCHES. DOUBLE STRUTS SHALL BE TWO PIECES OF THE SAME STRUT, WELDED BACK-TO-BACK AT THE FACTORY.
 - ATTACHMENT HOLES, WHEN REQUIRED, SHALL BE FACTORY-PUNCHED ON HOLE CENTERS APPROXIMATELY EQUAL TO THE CROSS-SECTIONAL WIDTH AND SHALL BE 9/16-INCH DIAMETER.
 - FITTINGS, BRACES, BRACKETS, HARDWARE, AND ACCESSORIES SHALL BE TYPE 316 STAINLESS STEEL.
 - STRUT NUTS SHALL BE SPRING CAPTURED TYPE 316 STAINLESS STEEL.
 - SQUARE AND ROUND WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
2. STRUT MATERIALS SHALL BE SUITABLE FOR WET LOCATIONS. STRUT SHALL BE 12-GAGE TYPE 316 STAINLESS STEEL.
- B. HANGER RODS:**
- STAINLESS STEEL, NOT LESS THAN 3/8-INCH DIAMETER, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED.
- C. MISCELLANEOUS HARDWARE:**
- BOLTS, SCREWS, AND WASHERS SHALL BE STAINLESS STEEL.
 - HEX NUTS: SHALL BE STAINLESS STEEL AND INCLUDE NYLON INSERTS.

RIGID CONDUITS

- A. PVC-COATED RIGID STEEL CONDUIT, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES:**
- MATERIAL: RIGID, HEAVY-WALL, MILD STEEL, HOT-DIP GALVANIZED, SMOOTH URETHANE INTERIOR COATING, TAPERED THREADS, CAREFULLY REAMED ENDS, 3/4-INCH NPS MINIMUM SIZE WITH FACTORY EXTERIOR COATING OF 40-MIL THICK PVC.
 - COLOR: COLOR OF COATING SHALL BE THE SAME ON ALL CONDUIT AND FITTINGS.
 - ROBROY INDUSTRIES, PERMA-COTE INDUSTRIES, OR APPROVED EQUAL
- B. SEALING BUSHING**
- FOR CONDUITS PASSING THROUGH EXTERIOR MASONRY BLOCK WALLS OR THROUGH CORE-DRILLED HOLES IN EXTERIOR SUBSURFACE WALLS, EXTERIOR CONCRETE WALLS, FLOOR SLABS, ROOF SLABS, AND FOR CONDUIT PASSING THROUGH INTERIOR CONCRETE WALLS OR FLOORS AND INTERIOR MASONRY BLOCK WALLS.
 - CSMI SEALING BUSHING AT THE INSIDE OF THE STRUCTURE AND TYPE CSMC SEALING BUSHING AT THE OUTSIDE OF THE STRUCTURE BY O-ZIGEDNEY, OR APPROVED EQUAL.

FLEXIBLE CONDUIT AND FITTINGS

- A. FLEXIBLE CONDUIT (NON-HAZARDOUS CLASS I, DIVISION 2 HAZARDOUS AREAS)**
- MATERIAL: FLEXIBLE GALVANIZED STEEL CORE WITH SMOOTH, ABRASION-RESISTANT, LIQUID-TIGHT, POLYVINYL CHLORIDE COVER, CONTINUOUS COPPER GROUND BUILT IN FOR SIZES 3/4-INCH THROUGH 1.25-INCH. MATERIAL SHALL BE UL LISTED.

2. ANACONDA SEALTITE TYPE UA BY ANAMET ELECTRICAL, INC., LIQUATITE TYPE L.A. BY ELECTRIC-FLEX COMPANY, OR APPROVED EQUAL.
- B. PVC-COATED CONDUIT FITTINGS**
- MATERIAL AND CONSTRUCTION: MALLEABLE IRON WITH STANDARD FINISH AND 40-MIL PVC EXTERIOR COATING. FITTINGS SHALL ADAPT THE CONDUIT TO STANDARD THREADED CONNECTIONS, AND SHALL HAVE AN INSIDE DIAMETER NOT LESS THAN THAT OF THE CORRESPONDING STANDARD CONDUIT SIZE.
 - ROBROY INDUSTRIES, PERMACOTE INDUSTRIES, OCAL, INC, OR APPROVED EQUAL.

PULL, JUNCTION, AND TERMINAL BOXES

- A. GENERAL**
- PULL, JUNCTION, AND TERMINAL BOXES RATED AT NEMA 4X. BOXES SHALL BE APPROPRIATE FOR EACH LOCATION IN ACCORDANCE WITH NEMA REQUIREMENTS AND AS REQUIRED FOR AREA CLASSIFICATIONS.
 - TERMINAL STRIPS AND TERMINAL BLOCKS IN TERMINAL BOXES SHALL BE MOUNTED ON TERMINAL BOX SUB-PANELS.
- B. MATERIALS AND CONSTRUCTION - WET, CORROSIVE, OR HAZARDOUS LOCATIONS:**
- PULL BOXES IN WET, CORROSIVE, OR OUTDOOR AREAS SHALL BE NEMA 4X.
 - BOXES FOR AREAS CLASSIFIED AS HAZARDOUS LOCATIONS, WHERE REQUIRED BY NEC, SHALL BE EXPLOSION-PROOF AND COMPLY WITH UL 886.
 - MATERIAL:
 - IN CORROSIVE LOCATIONS, WHERE CONDUIT SYSTEM IS PVC-COATED, BOXES SHALL BE CAST METAL WITH FACTORY-APPLIED 40-MIL PVC COATING, TYPE 316 STAINLESS STEEL, OR NON-METALLIC THERMOPLASTIC OR FIBERGLASS REINFORCED PLASTIC MATERIAL.
 - GASKET:
 - PROVIDE NEOPRENE GASKETS FOR WET AND CORROSIVE LOCATIONS.
 - GASKETS SHALL BE AN APPROVED TYPE DESIGNED FOR THE PURPOSE. IMPROVISED GASKETS ARE NOT ACCEPTABLE.
 - ACCESS: STAINLESS STEEL COVER BOLTS.
 - FEATURES:
 - EXTERNAL MOUNTING LUGS.
 - DRILLED AND TAPPED CONDUIT HOLES.
 - BOXES WHERE CONDUITS ENTER BUILDING OR STRUCTURE BELOW GRADE SHALL HAVE 1/4-INCH DRAIN HOLE AT BOTTOM OF THE BOX.

C. TERMINAL BLOCKS:

- ALLEN-BRADLEY COMPANY, BULLETIN, MODEL 1492, GENERAL ELECTRIC COMPANY MODEL CR151K, OR EQUAL.
- MATERIAL AND CONSTRUCTION: NEMA-RATED NYLON MODULAR TERMINAL BLOCKS, 600-VOLT RATED, CONTROL AND ALARM CIRCUIT TERMINALS SHALL BE SCREWED TYPE WITH PERMANENTLY AFFIXED NUMERIC IDENTIFIERS BESIDE EACH CONNECTION. POWER TERMINALS SHALL BE COPPER AND RATED FOR THE CIRCUIT AMPACITY.

D. MATERIALS & CONSTRUCTION - UNDERGROUND

- PULLBOXES UNDERGROUND SHALL BE PRECAST POLYMER CONCRETE.
- HUBBELL QUAZITE, OR APPROVED EQUAL.

SEALED FITTINGS

- A. GENERAL:**
- MATERIAL: CAST GRAY IRON ALLOY, OR CAST MALLEABLE IRON, OR COPPER FREE ALUMINUM BODIES WITH ZINC ELECTROPLATE AND LACQUER OR ENAMEL FINISH.
 - AMPLE OPENING WITH THREADED CLOSURE FOR ACCESS TO CONDUIT HUB FOR MAKING DAM.
 - IN CORROSIVE LOCATIONS, FITTINGS SHALL INCLUDE FACTORY-APPLIED 40-MIL PVC COATING.
 - CONSTRUCT FITTING TO ALLOW 40 PERCENT CROSS-SECTIONAL FILL.
 - SEALING FIBER FOR FORMING THE DAM WITHIN THE HUB AND SEALING COMPOUND SHALL BE SUITABLE FOR USE WITH FITTINGS FURNISHED, AND SHALL BE PRODUCTS OF FITTING MANUFACTURER.
 - SEALING FITTING, FIBER, AND SEALING COMPOUND SHALL CONFORM TO UL 886.
 - CROUSE HINDS COMPANY, APPLETON ELECTRIC COMPANY, OR APPROVED EQUAL

DISCONNECT SWITCHES

- A. SINGLE THROW, CIRCUIT DISCONNECT SWITCHES:**
- TYPE: FUSED OR UNFUSED, HORSEPOWER RATED, HEAVY-DUTY, SINGLE THROW, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES IN THE "OFF" POSITION AND SAFETY HANDLE.
 - RATING: VOLTAGE AND CURRENT RATINGS AND NUMBER OF POLES AS REQUIRED FOR MOTOR OR EQUIPMENT CIRCUITS BEING DISCONNECTED. SWITCHES SHALL BEAR A UL LABEL AND SHALL COMPLY WITH THE REQUIREMENTS OF UL 98, NEMA KS 1, AND NEMA 250.
 - SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR APPROVED EQUAL.
 - ENCLOSURE: NEMA 4X.

MANUAL TRANSFER SWITCH

- A. DOUBLE THROW, CIRCUIT DISCONNECT SWITCHES:**
- TYPE: UNFUSED, HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES IN THE "OFF" POSITION AND SAFETY HANDLE.
 - RATING: VOLTAGE AND CURRENT RATINGS AND NUMBER OF POLES AS REQUIRED FOR MOTOR OR EQUIPMENT CIRCUITS BEING DISCONNECTED. SWITCHES SHALL BEAR A UL LABEL AND SHALL COMPLY WITH THE REQUIREMENTS OF UL 98, NEMA KS 1, AND NEMA 250.
 - SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR APPROVED EQUAL.
 - ENCLOSURE: NEMA 4X

GENERATOR RECEPTACLE

- A. POWER RECEPTACLES:**
- 480V INTERLOCKED RECEPTACLE WITH ENCLOSED SAFETY SWITCH SERVICE OUTLET. PROVIDE SERVICE OUTLETS, QUANTITY AS SHOWN OR INDICATED, FOR PORTABLE EQUIPMENT.
 - MATERIAL: COPPER-FREE ALUMINUM ENCLOSURES WITH OPERATING HANDLE NEMA 4, WITH GASKETED, HINGED DOOR.
 - SWITCH: HEAVY DUTY, THREE-POLE, WITH VISIBLE BLADES, QUICK MAKE-A-BREAK MECHANISM WITH REINFORCED, POSITIVE-PRESSURE-TYPE BLADE AND FUSE CLIPS. SWITCH SHALL BE MECHANICALLY INTERLOCKED WITH RECEPTACLE. SWITCH CANNOT BE CLOSED UNTIL PLUG IS FULLY INSERTED AND PLUG CANNOT BE WITHDRAWN OR INSERTED UNLESS SWITCH IS OPEN.
 - RECEPTACLE: SINGLE GROUND RECEPTACLE, THREE WIRE, FOUR-POLE, 600-VOLT. PROVIDE MATCHING PLUGS
 - APPLETON, TYPE WSR, AND TYPE APS PLUGS BY CROUSE-HINDS, OR APPROVED EQUAL.
 - ENCLOSURE: NEMA 4X.

LOW VOLTAGE RECEPTACLES

- A. GROUND FAULT INTERRUPTING RECEPTACLES:**
- DUPLEX GROUNDING RECEPTACLE, TWO-POLE, THREE-WIRE, NEMA 5-20R CONFIGURATION, 125-VOLT AC, 20 AMPERES, GRAY COLOR WITH GROUND FAULT CIRCUIT INTERRUPTING (GFCI) PROTECTION.
 - GROUND FAULT INTERRUPTING RECEPTACLES SHALL COMPLY WITH UL 943.
 - PROVIDE TYPE 302 STAINLESS STEEL COVER-PLATE CONFORMING TO UL 514D. PROVIDE WEATHER-PROOF-WHILE-IN-USE COVER WHERE SHOWN ON THE DRAWINGS AS "WP" OR "WPU", AND PROVIDE WHERE LOCATED IN WET OR CORROSIVE LOCATION.
 - GFR5362SGY BY HUBBELL, INC., 2091-GRY BY PASS & SEYMOUR, OR EQUAL.
 - WEATHER-RESISTANT GROUND FAULT INTERRUPTING RECEPTACLES: 2095TRWRGRY BY PASS & SEYMOUR, OR EQUAL.

PANELBOARD

- A. GENERAL**
- RATING: VOLTAGE RATING, CURRENT RATING, NUMBER OF PHASES, NUMBER OF WIRES AND NUMBER OF POLES AS SHOWN OR INDICATED ON THE DRAWINGS.
 - CIRCUIT BREAKERS: MOLDED CASE, BOLT-IN THERMAL MAGNETIC TYPE WITH NUMBER OF POLES AND TRIP RATINGS AS SHOWN OR INDICATED. WHERE INDICATED ON THE DRAWINGS, CIRCUIT BREAKERS SHALL BE GROUND FAULT CIRCUIT INTERRUPTING TYPE EQUIPPED WITH SOLID STATE SENSING AND FIVE-MILLIAMP SENSITIVITY.
 - CIRCUIT BREAKERS FOR 480-VOLT PANELBOARDS SHALL HAVE MINIMUM INTERRUPTING RATING OF 64,000 AMPERE RMS SYMMETRICAL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. CIRCUIT BREAKERS FOR OTHER PANELBOARDS SHALL HAVE MINIMUM INTERRUPTING RATING OF 22,000 AMPERE RMS SYMMETRICAL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
 - BUS BARS: BUS BARS SHALL BE 98 PERCENT CONDUCTIVITY COPPER. FOUR-WIRE PANELBOARDS SHALL HAVE SOLID NEUTRAL BAR. EACH PANEL SHALL HAVE GROUND BUS BAR.
 - MAIN: PANELBOARDS SHALL HAVE MAIN CIRCUIT BREAKER, UNLESS THE DRAWINGS SPECIFICALLY INDICATE MAIN LUGS ONLY.
 - CONNECT BRANCH CIRCUIT BREAKERS FOR SEQUENCE PHASING.
 - ENCLOSURES: PANEL ENCLOSURES SHALL BE NEMA 4X
 - CONSTRUCTION: CODE-GRADE STEEL, AMPLE GUTTER SPACE, FLUSH DOOR, FLUSH SNAP LATCH AND LOCK. PANELBOARDS SHALL COMPLY WITH NEMA PB 1 AND UL 67.
 - TRIM: SURFACE
 - DIRECTORY: TYPED OR COMPUTER-PRINTED CARD, WITH TRANSPARENT PROTECTIVE COVER IN FRAME ON BACK OF DOOR GIVING CIRCUIT NUMBERS AND AREA OR EQUIPMENT SERVED.
 - IDENTIFICATION: IDENTIFICATION SHALL INDICATE PANEL NUMBER AND VOLTAGE.
 - PROVIDE SURGE PROTECTION DEVICE IF INDICATED ON THE DRAWING.

B. INTEGRATED PANEL BOARD AND TRANSFORMER

- UNIT SHALL CONSIST OF ENCAPSULATED DRY-TYPE TRANSFORMER, PRIMARY, AND SECONDARY MAIN CIRCUIT BREAKERS, AND SECONDARY PANEL BOARD ALL IN ONE ENCLOSURE.
- TRANSFORMER RATING: KVA, PRIMARY VOLTAGE, SECONDARY VOLTAGE, FREQUENCY, AND NUMBER OF PHASES SHALL BE AS SHOWN OR INDICATED ON THE DRAWINGS.
- BRANCH CIRCUITS: MOLDED CASE CIRCUIT BREAKERS, PLUG-IN THERMAL MAGNETIC TYPE WITH NUMBER OF POLES AND TRIP RATINGS AS SOWN OR INDICATED ON THE DRAWINGS.
- MINI-POWER ZONE BY SQUARE D, MINI-POWER CENTER BY EATON, PANEL TRAN BY ACME ELECTRIC CORPORATION, OR EQUAL.



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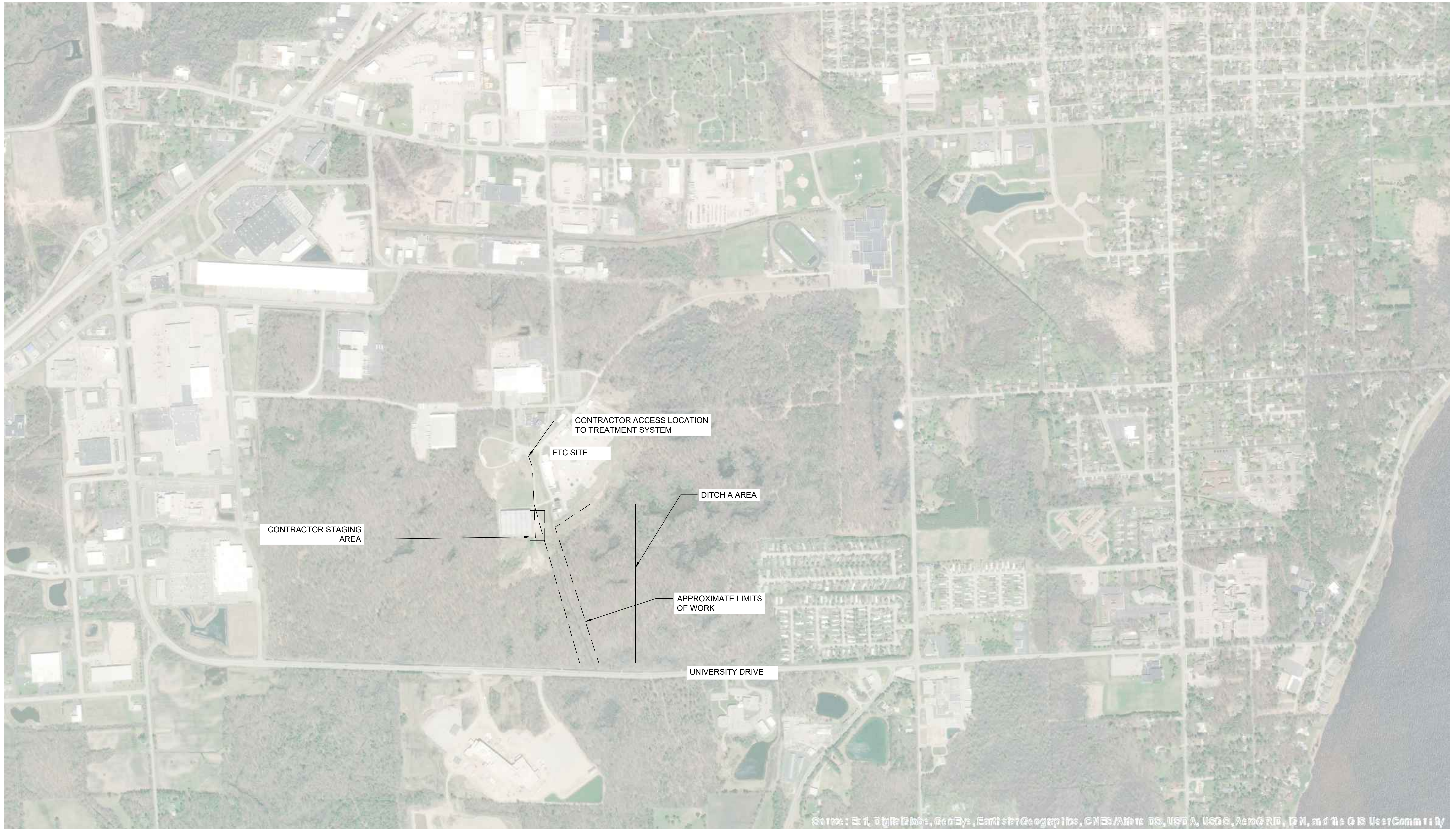
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	DESIGNED BY: BV
	DRAWN BY: EE
	CHECKED BY: MA

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PROJECT NO.:	W001605.0001
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DESIGNED BY:	BV
DRAWN BY:	EE
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MARINETTE, WI

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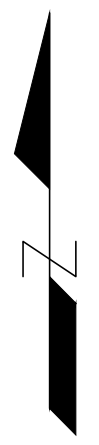
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- NOTES:**
1. AERIAL IMAGE, DITCH EXTENTS, AND EQUIPMENT ASSOCIATED WITH THE TREATMENT SYSTEM ARE IN APPROXIMATE LOCATIONS.
 2. CONTRACTOR SHALL PROVIDE RIP-RAP AT THE POINT OF DISCHARGE INTO THE DITCH.
 3. CONTRACTOR SHALL PLACE PIPE ON A BEDDING OF STONE IN LOW AREAS ALONG WATERWAY TO ALLOW FOR RUNOFF FLOW.
 4. CONTRACTOR SHALL CLEAR, GRUB, AND REMOVE TREES AS NECESSARY TO ACCESS THE CHECK DAM FROM THE NORTH.
 5. CONTRACTOR SHALL SEED AND STRAW ACCORDING TO THE WDNR BEST MANAGEMENT PRACTICES. ANNUAL RYEGRASS, OR EQUAL, SHALL BE USED.
 6. CONTRACTOR SHALL PROVIDE EROSION CONTROL PER THE WDNR STORMWATER BEST MANAGEMENT PRACTICES WITHIN THE LIMIT OF WORK.
 7. CONTRACTOR SHALL PROVIDE 8 FT WIDE ACCESS ROAD FROM FTC SITE TO CHECK DAM USING NO. 1 STONE WHERE APPROPRIATE.

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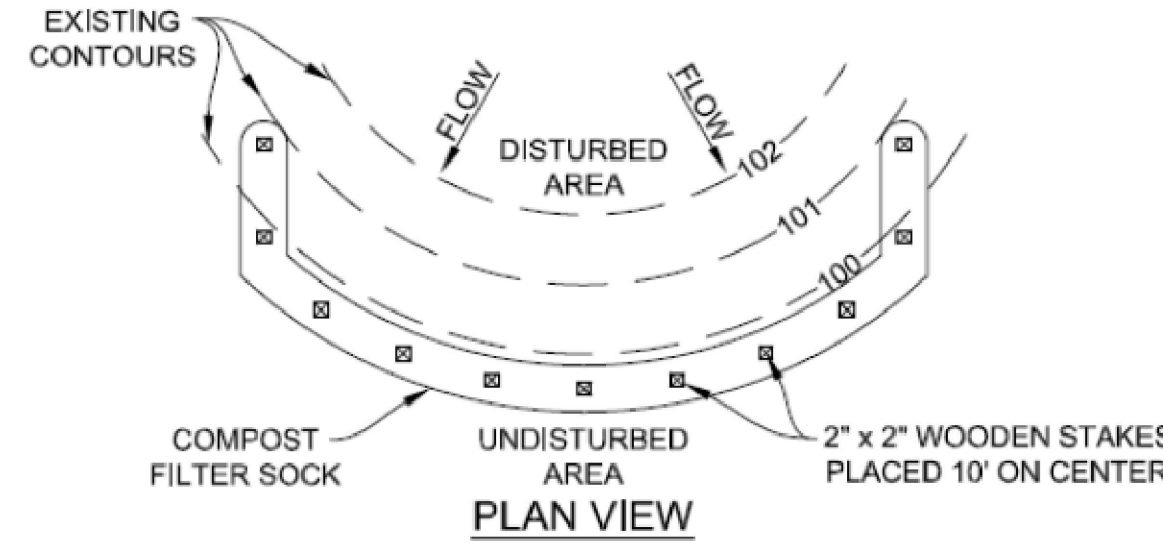
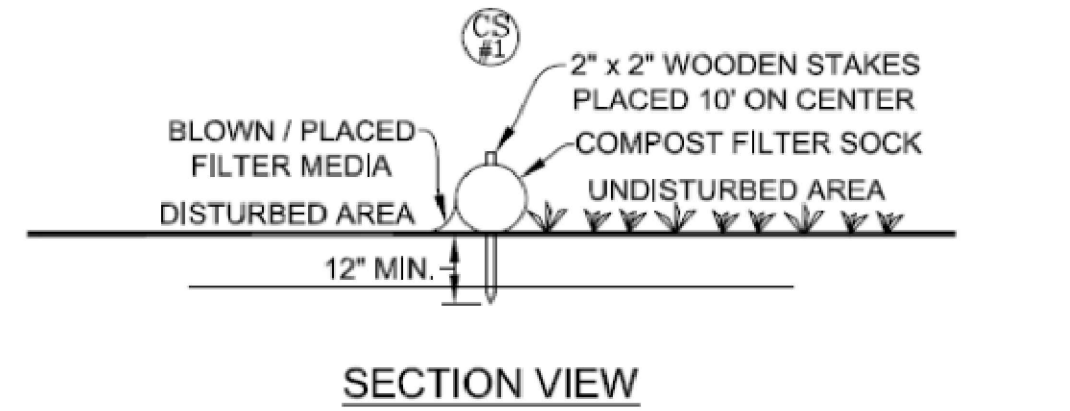
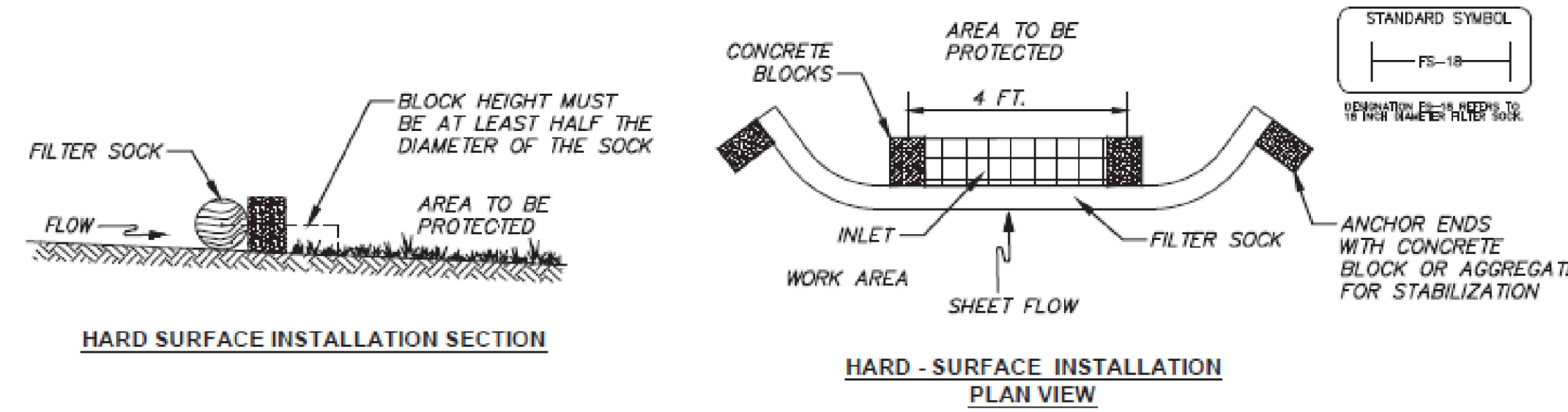
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CHECKED BY:	MA

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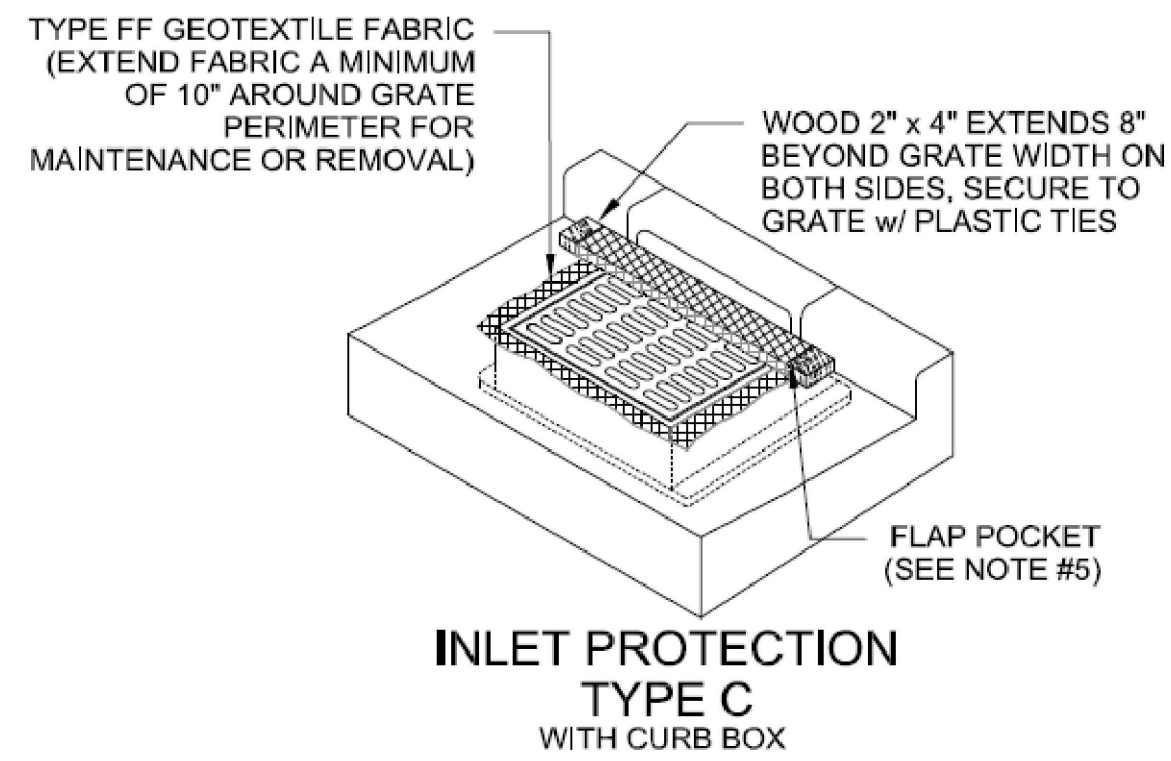
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SEDIMENT AND EROSION CONTROL GENERAL NOTES:

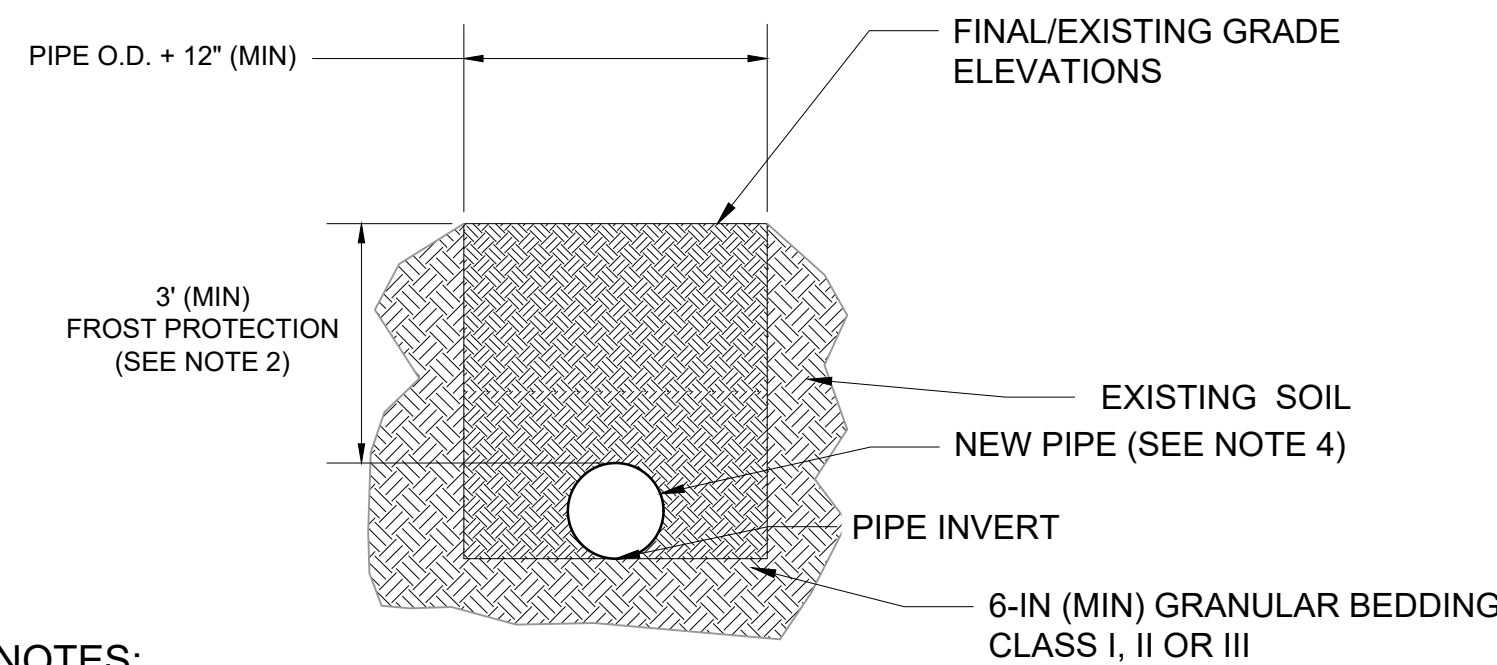
- BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSTALLED PER THE PLAN AND SPECIFICATIONS, AND APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
- ACTIONS MUST BE TAKEN TO MINIMIZE THE TRACKING OF MUD AND SOIL FROM CONSTRUCTION AREAS ONTO PUBLIC ROADWAYS AND PLANT ACCESS DRIVES. SOIL TRACKED ONTO THE ROADWAY SHALL BE REMOVED DAILY.
- SOIL STOCKPILES SHALL BE LOCATED AWAY FROM STREAMS, PONDS, SWALES, AND CATCH BASINS. STOCKPILES SHALL BE ADEQUATELY CONTAINED THROUGH THE USE OF SILT FENCE.
- IF THE CONTROL DEVICE BECOMES INEFFECTIVE DUE TO WEATHERING, DECOMPOSING, OR DAMAGE, REPLACE THE AFFECTED SECTION IMMEDIATELY.
- SEDIMENT MUST BE REMOVED WHEN IT REACHES APPROXIMATELY 1/3 THE HEIGHT OF THE SILT FENCE OR CHECK DAM, ESPECIALLY IF HEAVY RAINS ARE EXPECTED.
- THE DRAWINGS AND SPECIFICATIONS INDICATE MINIMUM MEASURES AND BMP'S TO PROTECT AGAINST EROSION AND PROVIDE SEDIMENT CONTROL. ADDITIONAL BMP'S AND ESC MEASURES MAY BE REQUIRED BY THE CONTRACTOR TO MINIMIZE SEDIMENT FROM LEAVING THE CONSTRUCTION ZONE.
- CONTRACTOR SHALL PERFORM ALL ACTIVITIES PER THE MOST RECENT LOCAL, STATE AND FEDERAL STORM WATER MANAGEMENT PROGRAM RULES AND REGULATIONS.



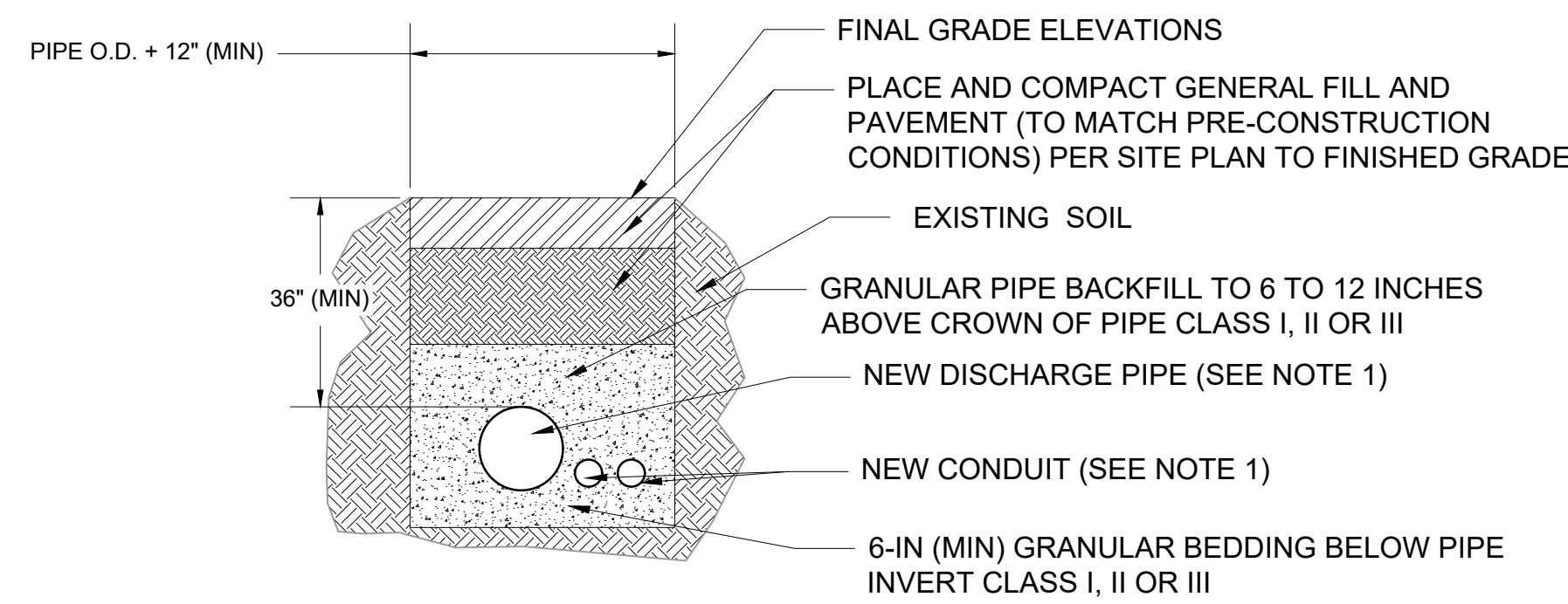
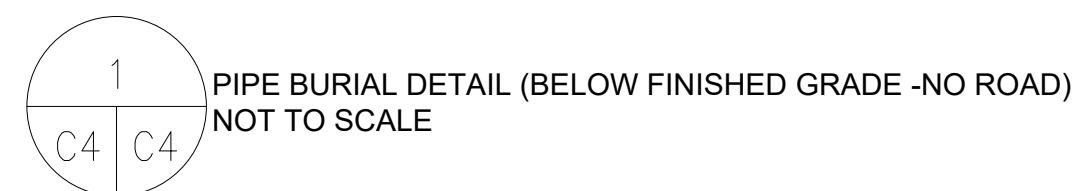
COMPOSITE FILTER SOCK NOT TO SCALE



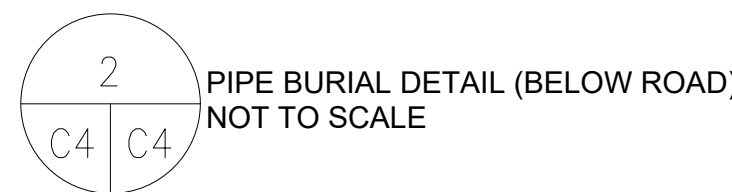
TYPICAL INLET PROTECTION NOT TO SCALE



- NOTES:
- CONSTRUCTION TRAFFIC SHALL MAINTAIN AT LEAST 10' OF SEPARATION FROM BURIED PIPES AT ALL TIMES.
 - ALL PIPES SHALL BE BURIED SO THAT THE PIPE CROWN IS A MINIMUM OF 3' BELOW FINISHED GRADE.
 - TRENCHED PIPES SHALL BE MARKED WITH FLAGS OR SIGNS AT 50' INTERVALS TO NOTIFY POTENTIAL TRAFFIC OF THE PIPE'S EXISTENCE.

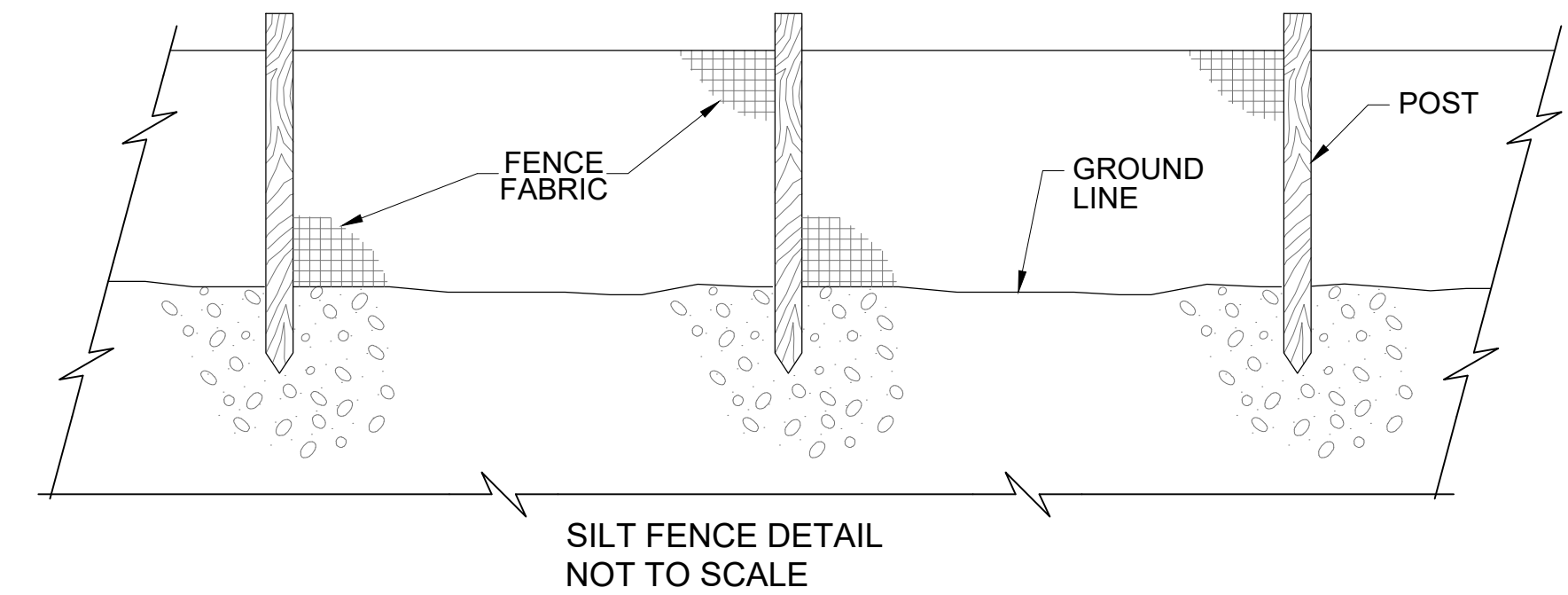


- NOTES:
- PROVIDE A MINIMUM OF 6" OF SEPARATION BETWEEN NEW PIPES.

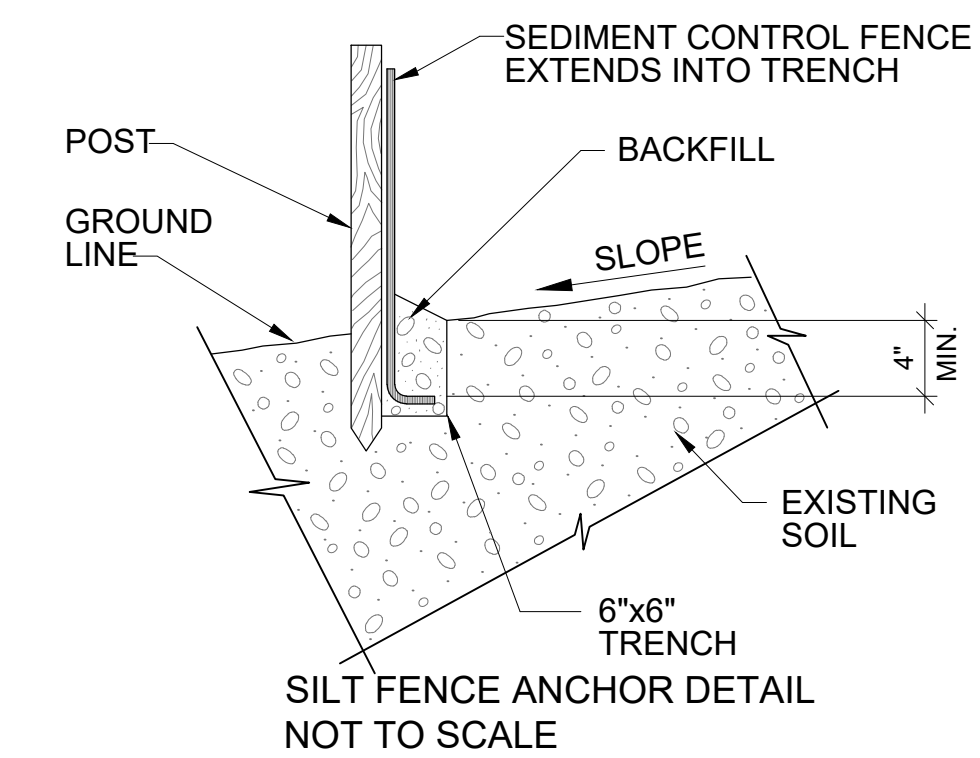


FILTER SOCK CONSTRUCTION SPECIFICATIONS

- BEFORE INSTALLING, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN 1-INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF THE FILTER SOCK.
- FILL SOCK UNIFORMLY WITH COMPOST OR ALTERNATE FILTER MEDIA TO DESIRED LENGTH, WITH ENOUGH MATERIAL THAT THE SOCKS DO NOT DEFORM.
- PLACE SOCKS ALONG CONTOURS, WITH THE ENDS TURNED UPSLOPE AT 30 TO 45 DEGREES FOR A LENGTH OF AT LEAST 5 FEET TO PREVENT RUNOFF BYPASS.
- FOR UNTRENCHED INSTALLATION, BACKFILL MULCH OR COMPOST ON THE UPSTREAM SIDE OF THE SOCK AND TAMP TO PREVENT UNDERCUTTING AND PIPING.
- ANCHORING MUST CONFORM TO THE FOLLOWING LIST: (A) MINIMUM 2-INCH SQUARE CROSS SECTION HARDWOOD; (B) DRIVEN AT LEAST 12 INCHES BELOW GRADE, OR 8 INCHES IF IN DENSE CLAY SOILS; (C) PROTRUDE ABOVE FILTER SOCKS AT LEAST 3 INCHES; (D) DRIVEN IN AT 45-DEGREE ANGLE UPSLOPE; (E) SPACED AT NO MORE THAN 4 FEET APART, OR 8 FEET APART IF THE FILTER SOCK IS ENTRENCHED 4 INCHES INTO THE GROUND.
- DO NOT USE ENTRENCHED INSTALLATION ON FILTER SOCKS SMALLER THAN 12 INCHES IN DIAMETER.
- FOR HARD SURFACE INSTALLATION, SUCH AS ON PAVEMENT, ANCHORING MAY BE NECESSARY WHERE STRAIGHT SECTIONS EXCEED 4 FEET. SEE DETAIL ABOVE. WHEN NO ANCHORING IS USED, THE PRACTICE MUST BE CHECKED DAILY, REGARDLESS OF WHETHER RAINFALL OCCURS. ANCHORED INSTALLATION IS ALWAYS PREFERRED TO NON-ANCHORED INSTALLATION, IF POSSIBLE.
- FOR AT-GRADE INLET PROTECTION, FILTER SOCKS MUST COMPLETELY ENCLOSE THE DRAIN. IF USED AS CURB INLET PROTECTION, THE EFFECTIVE HEIGHT OF THE FILTER SOCK MUST NOT BE HIGHER THAN THE HEIGHT OF THE CURB; USE 8-INCH DIAMETER FILTER SOCK FOR STANDARD HIGHWAY APPLICATIONS.
- IF MULTIPLE SECTIONS OF FILTER SOCK ARE NEEDED FOR A CONTINUOUS RUN, OVERLAP ENDS OF SEPARATE SECTIONS A MINIMUM OF 2 FEET AND STAKE ENDS.
- TO REACH TALLER HEIGHTS, IT IS POSSIBLE TO STACK FILTER SOCKS.
- REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF HALF THE EXPOSED HEIGHT OF SOCK AND REPLACE SOCK. REPLACE FILTER SOCK IF TORN. REINSTALL FILTER SOCK IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER SOCKS.
- FOR VEGETATED, PERMANENT OR SEMI-PERMANENT INSTALLATIONS, MAINTAIN THE PLANTS AS IS APPROPRIATE FOR THE SPECIES USED.



SILT FENCE DETAIL NOT TO SCALE



- NOTES:
- CONTRACTOR SHALL FURNISH AND INSTALL SEDIMENT CONTROL FENCE.
 - FENCE FABRIC SHALL BE FASTENED SECURELY TO FENCE POSTS WITH TIES OR STAPLES
 - WHEN TWO SECTIONS OF FENCE FABRIC ADJOIN EACH OTHER JOIN IN ACCORDANCE WITH WDNR STORMWATER BEST MANAGEMENT PRACTICES.
 - MAINTENANCE SHALL BE PERFORMED AS REQUIRED BY THE WDNR STORMWATER BEST MANAGEMENT PRACTICES.
 - INSTALL SILT FENCE IN ACCORDANCE WITH THE WDNR STORMWATER BEST MANAGEMENT PRACTICES.



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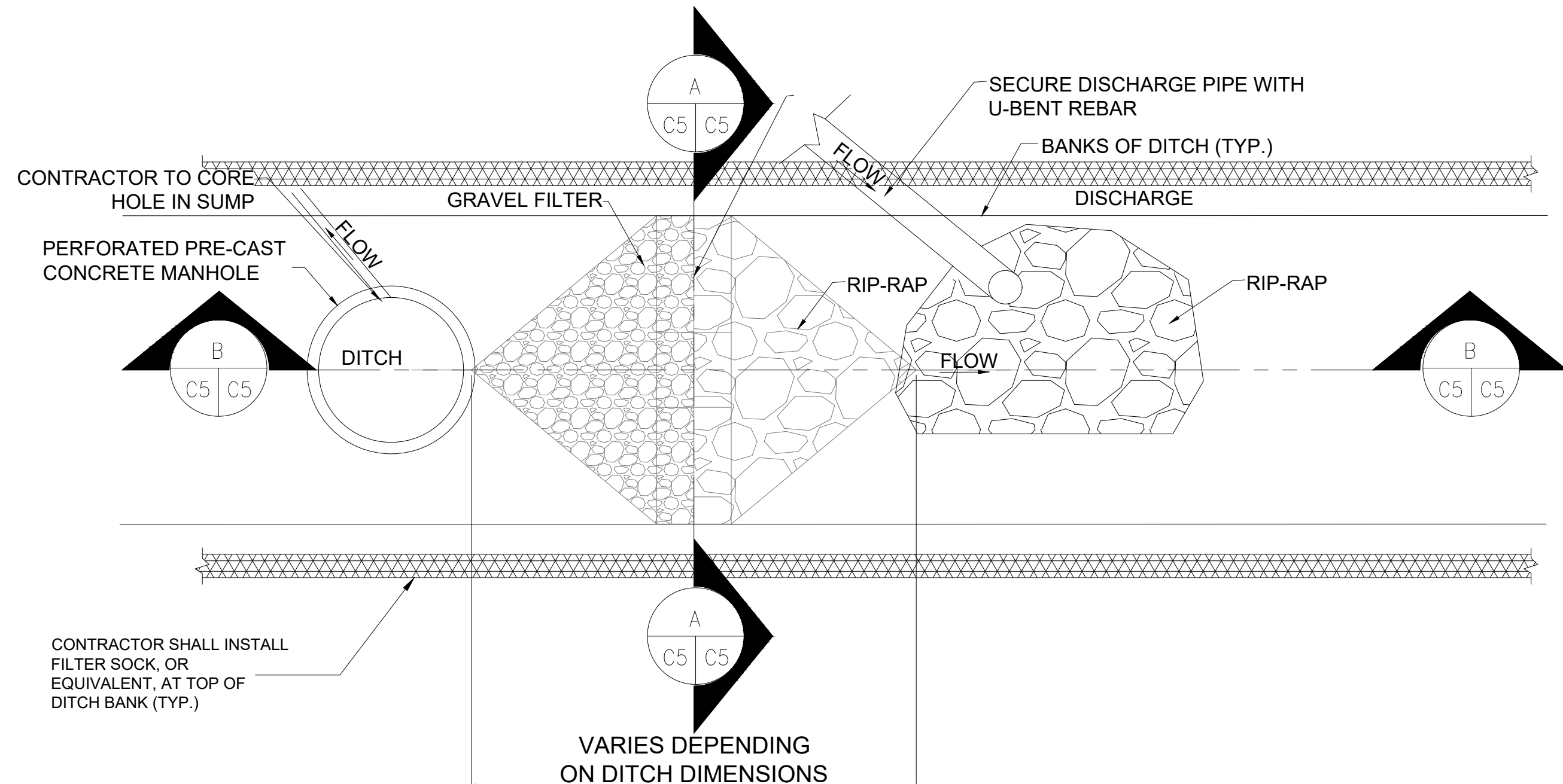
DATE:	08/20/18
PROJECT NO.:	W1001605.0001
FILE NAME:	DRAFT-10_CIVIL DETAILS
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI
ANSUL FTC SITE
DITCH INTERIM ACTION DESIGN
ARCADIS PROJ. NO. W1001605.0001

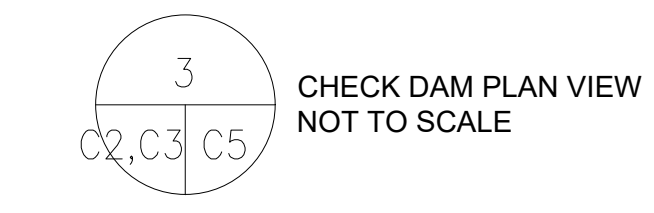
SHEET TITLE
CIVIL DETAILS
SCALE:
C3
SHEET ___ OF ___

User: EBERT, Liz; Date: 8/20/2018; Time: 11:58 AM; Plot Date: 8/20/2018; Time: 11:58 AM; Scale: 1:1; Saved Date: 8/20/2018; Time: 11:58 AM; File: \\ARCADIS-US.COM\OFFICE\DATA\MILWAUKEE-WI\PROJECT\TYCO\W001605\CADD\DWG\INTERIM ACTION\DITCH_11_CHECK DAM DETAIL.DWG

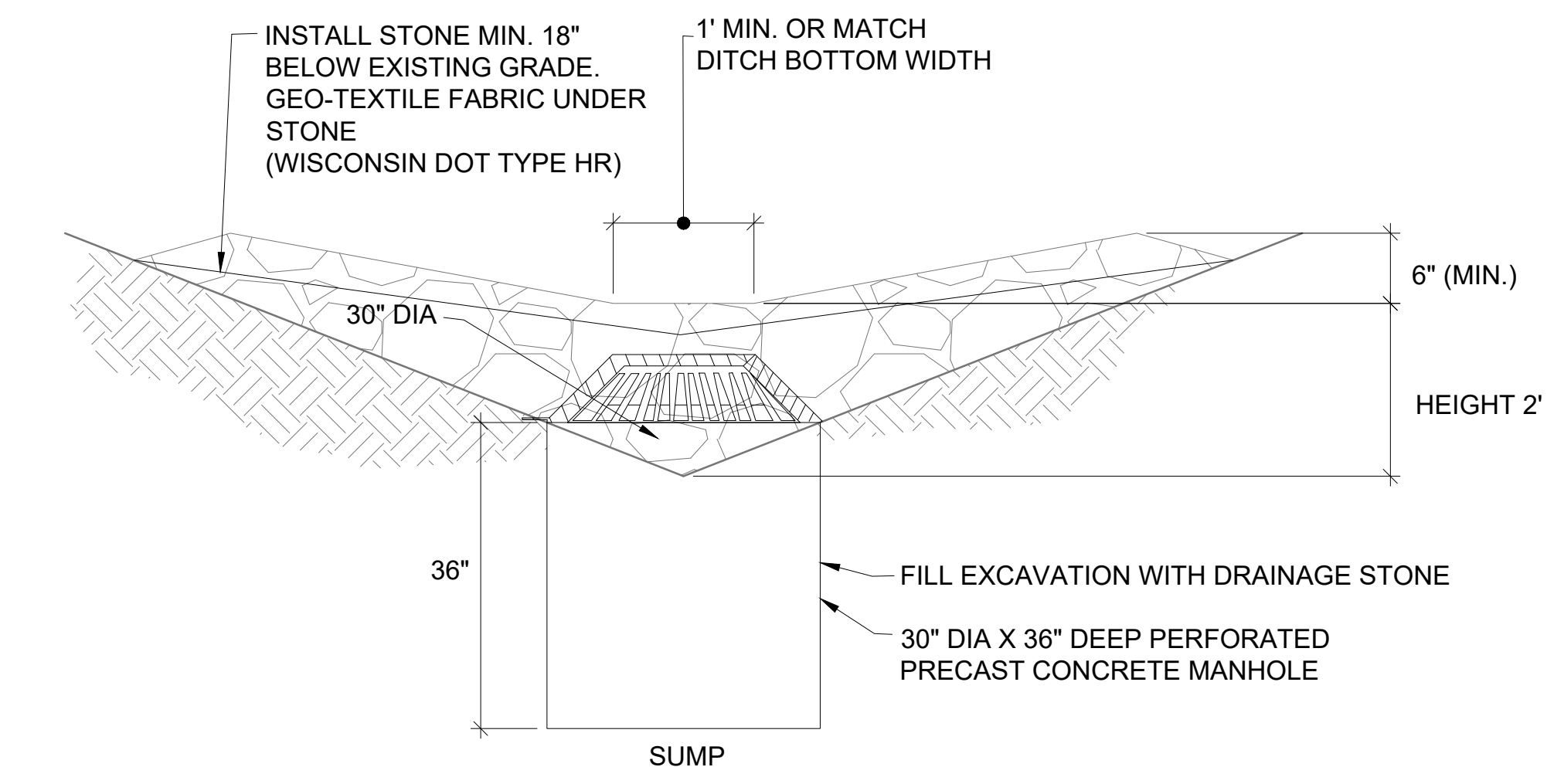
NOTES:
 1. CONTRACTOR SHALL FILL SUMP EXCAVATION WITH DRAINAGE STONE.



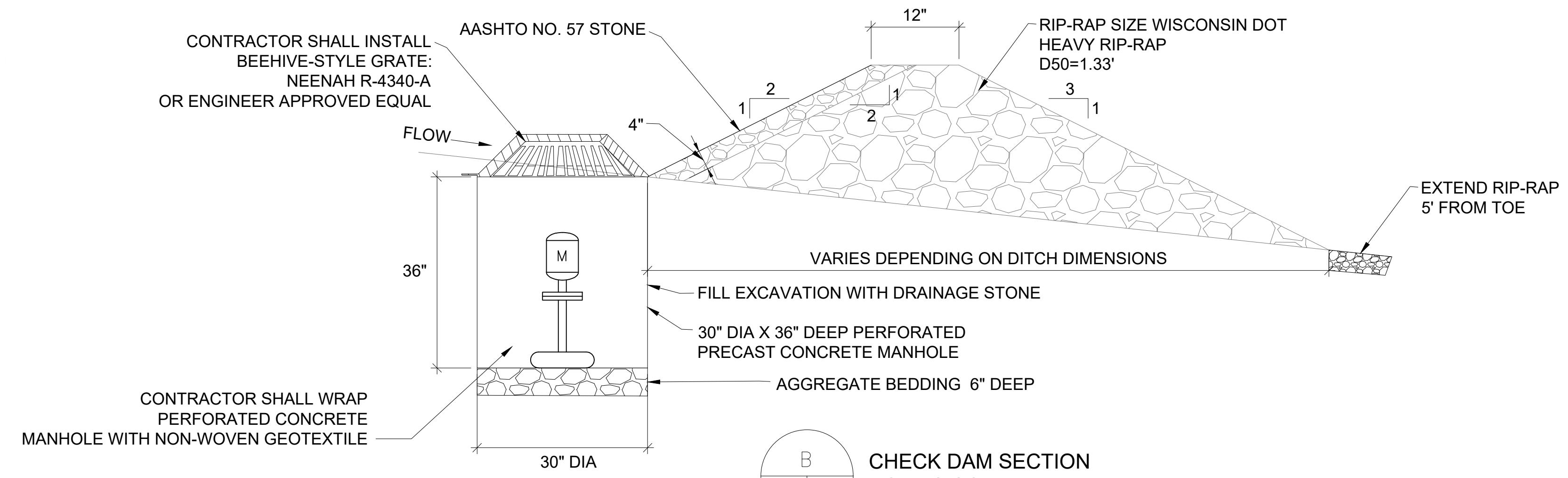
NOTES:
 1. CONSTRUCT STONE CHECK DAM IN ACCORDANCE WITH WDNR STORMWATER BEST PRACTICES.



CHECK DAM PLAN VIEW NOT TO SCALE



CHECK DAM SECTION NOT TO SCALE



CHECK DAM SECTION NOT TO SCALE



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DATE:	08/20/18
PROJECT NO.:	WI001605.0001
FILE NAME:	DRAFT-11_CHECK DAM DETAIL
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI
 ANSUL FTC SITE
 DITCH INTERIM ACTION DESIGN

SHEET TITLE
 CHECK DAM DETAILS

SCALE:
 C4
 SHEET ___ OF ___

ARCADIS PROJ. NO. WI001605.0001



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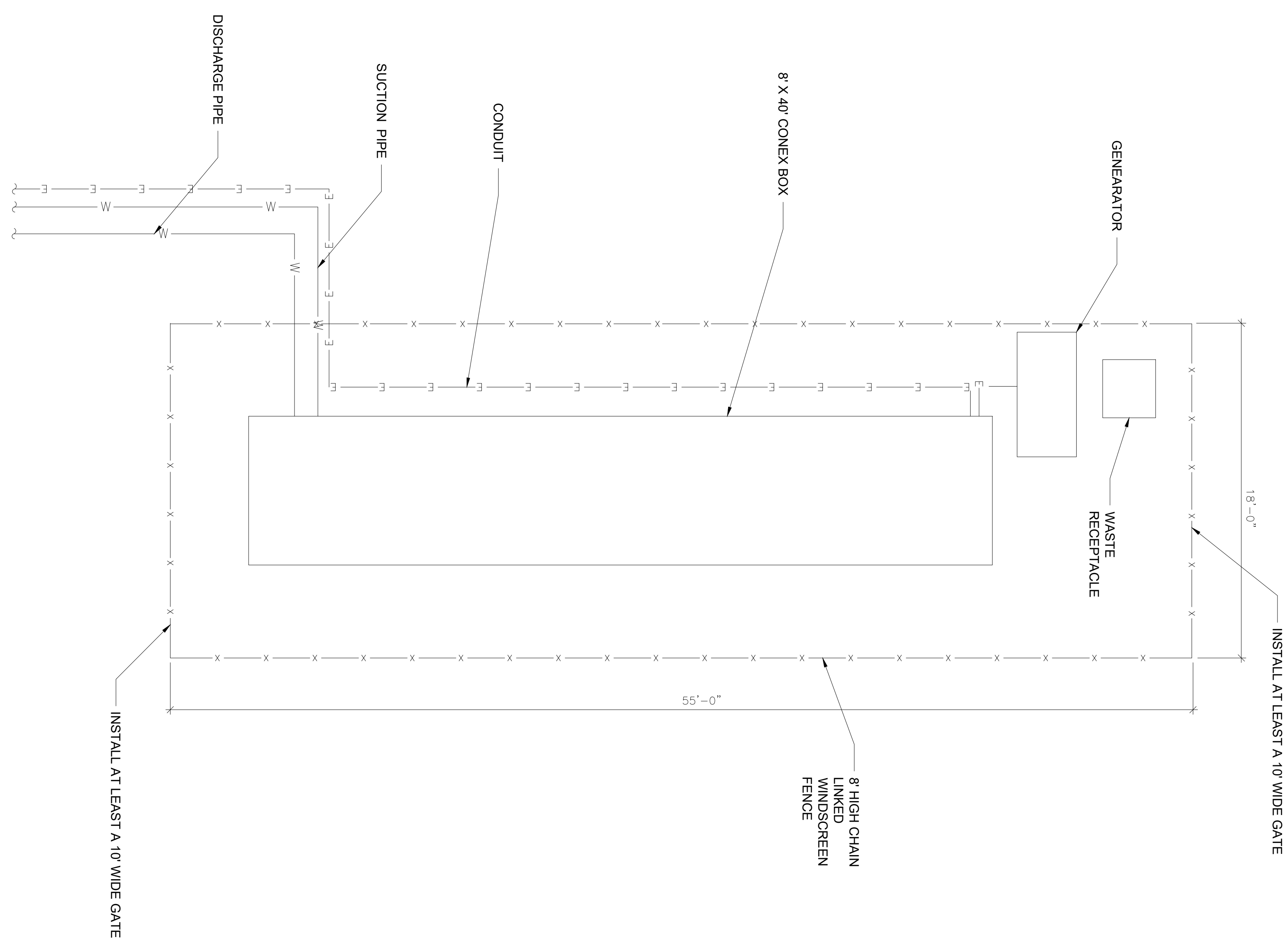
NO.	DATE	ISSUED FOR	BY	SEALS
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	

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DATE:	PROJECT NO.:	FILE NAME:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
08/20/18	W001605.0001	DRAFT-12_MECHANICAL LAYOUT	MA	EE	BV

MARINETTE, WI
ANSUL FTG SITE
DITCH INTERIM ACTION DESIGN
ARCADIS PROJ. NO. W001605.0001

SHEET TITLE
SYSTEM GENERAL LAYOUT
SCALE:
M 1
SHEET 1 OF 1

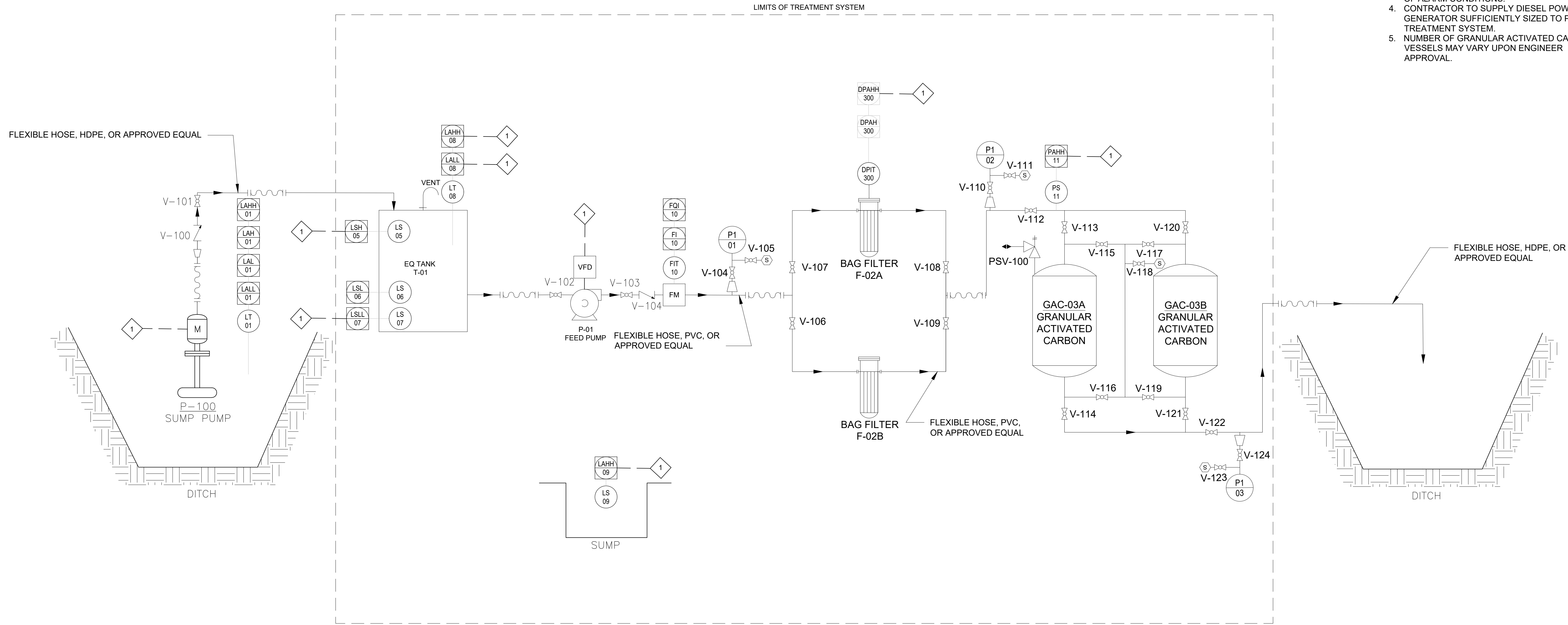


- NOTES:
1. CONTRACTOR SHALL CLEAR TREES AS NECESSARY. STUMPS SHALL BE LEVEL WITH GROUND SURFACE.
 2. ALL ELECTRICAL WORK SHALL MEET ALL FEDERAL AND LOCAL CODES.
 3. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL UTILITIES, STRUCTURES, AND EASEMENTS PRESENT ON AND AROUND THE SITE. ANY DAMAGE TO THESE UTILITIES DUE TO WORK PERFORMED SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
 4. CONTRACTOR SHALL RESTORE SITE TO THE EXISTING CONDITIONS UPON COMPLETION OF THE WORK.

User: EBBERT_Spc\USNS\WOOD File: \\ARCADIS\USNS\WOOD\PROJECTS\W001605\CADD\DITCH INTERIM ACTION\DWG PIPING AND INSTRUMENTATION\DWG Scale: 1:1 Saved Date: 8/17/2018 Time: 10:22 Plot Date: Eberf, Lz: 8/20/2018, 12:05 Layout: P1

	CAPACITY	TOTAL DYNAMIC HEAD (TDH) REQUIRED	PIPE SIZE	PUMP TYPE	EQ TANK	MIN. TOTAL POUNDS OF CARBON	MINIMUM EMPTY BED CONTACT TIME (EBCT)	MINIMUM HYDRAULIC LOADING
SYSTEM A	100 GPM	34 FT	4" OR APPROVED EQUAL	GRINDER, SEWAGE, OR APPROVED EQUAL	3,000 GAL POLYETHYLENE TANK	10,000 LBS	15 MIN	1.5-2.5 GPM/SQ FT

- NOTES:
- CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, INSTRUMENTATION AND ASSOCIATED ELECTRICAL WORK WITHIN THE TREATMENT SYSTEM EXTENTS AND P-100 AND ASSOCIATED CONTROLS AND VALVES.
 - LSHH-01 SHALL CONNECT TO CONTROL PANEL AT TREATMENT SYSTEM.
 - CONTRACTOR TO INCLUDE REMOTE ALARM NOTIFICATION DEVICE TO SEND NOTIFICATIONS OF ALARM CONDITIONS.
 - CONTRACTOR TO SUPPLY DIESEL POWER GENERATOR SUFFICIENTLY SIZED TO POWER TREATMENT SYSTEM.
 - NUMBER OF GRANULAR ACTIVATED CARBON VESSELS MAY VARY UPON ENGINEER APPROVAL.



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DATE: 08/20/18
PROJECT NO.: W006105.0001
FILE NAME: DRAFT-13_PIPING AND INSTRUMENTATION
DESIGNED BY: BV
DRAWN BY: JA
CHECKED BY: MA

MARINETTE, WI
ANSUL FTC SITE

DITCH INTERIM ACTION DESIGN

SHEET TITLE

PIPING AND INSTRUMENTATION DIAGRAM

SCALE:

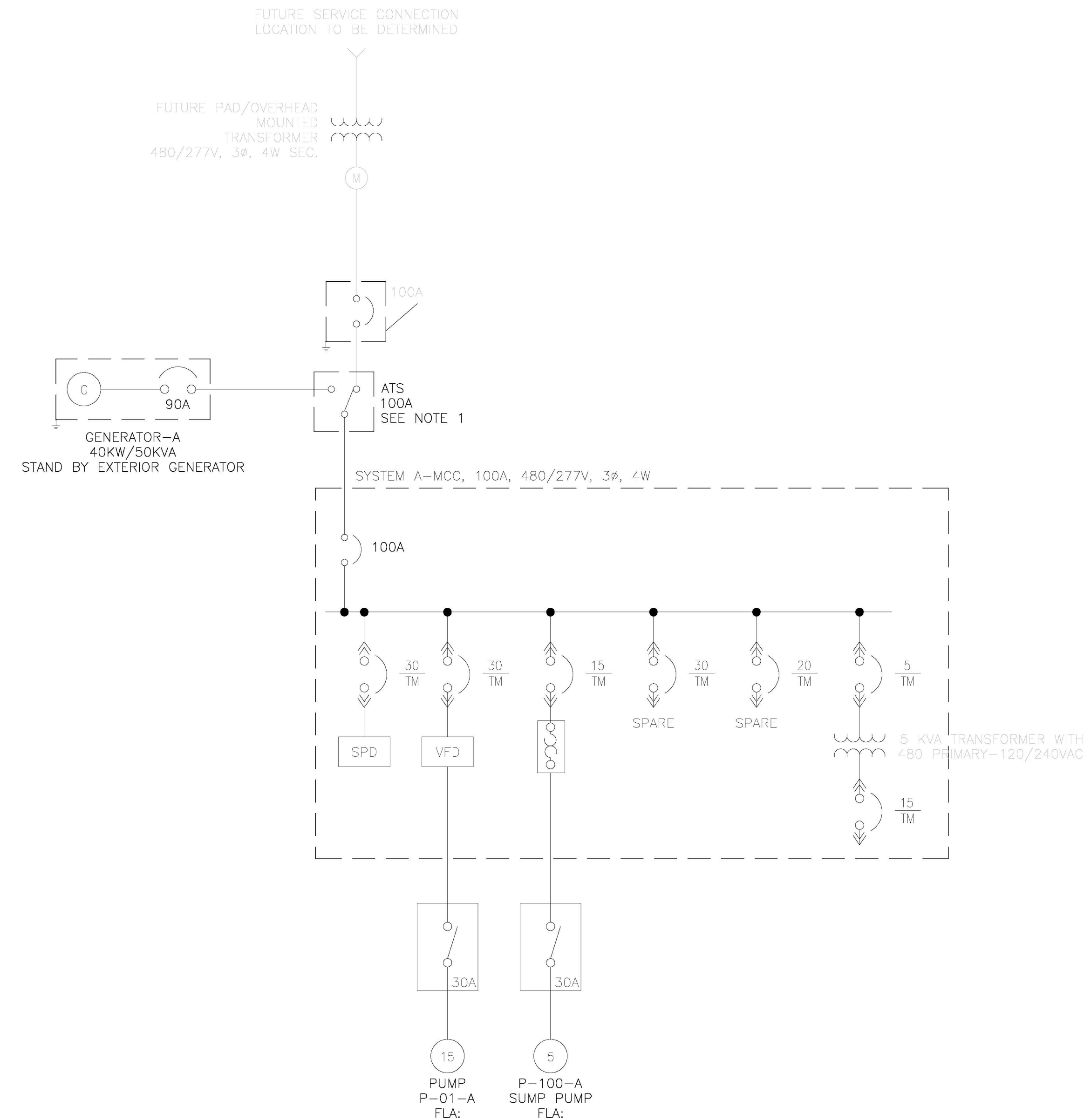
P1
SHEET 1 OF 1

ARCADIS PROJ. NO. W001605.0001

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NOTES:

1. ALL EQUIPMENT/SERVICE CONNECTED UPSTREAM OF ATS SHALL BE INSTALLED AT A LATER DATE.



SYSTEM A-MCC (480 VAC)									
DEVICE	VOLTAGE	PHASE	HP	DUTY FACTOR	BREAKER SIZE (AMPS)	CONNECT LOAD - 480V (AMPS)**	DEMAND LOAD - 480V (AMPS)**	KVA	
PUMP P-01-A	480	3	15.00	100.0%	30	21.00	21.00	17.44	
P-100-A SUMP PUMP	480	3	5.00	100.0%	15	7.60	7.60	6.31	
SUBTOTALS :						29	29	23.75	
TOTAL ELECTRICAL LOAD:								28.57	CONNECTED AMPS
**VALUES TAKEN FROM 2017 NEC								28.57	DEMAND AMPS
MAIN BREAKER INFORMATION								36	MINIMUM BREAKER SIZE
								80	MAIN BREAKER



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PROJECT NO.: W1001605.0001
FILE NAME: DRAFT-14_SINGLE LINE
DESIGNED BY: JS
DRAWN BY: ZP
CHECKED BY: BV

MARINETTE, WI

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ARCADIS PROJ. NO. W1001605.0001

SHEET TITLE

ELECTRICAL SINGLE LINE DIAGRAM

SCALE:

E1

SHEET ___ OF ___

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