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

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

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

SECTION III: FACILI	TY OWNER MAI	LING ADDRE	CSS (if different from Aut	norized Representati	ive)	
Facility Owner Name			Title			
Tyco Fire Products, L.I	P.					
Parent Company			Owner Mailing Address	(i.e. PO Box, Street	, or Route)	
Tyco Fire Products, L.P.			1 Stanton Street			
City, State, Zip Code			Owner Phone No.	Alternative P	hone No.	
Marinette, WI 54143			(715) 735-7411			
Contact Fax No.			Contact Email Address			
SECTION IV: DISCH	ARCE CHARACT	FRIZATION				
SECTION IV. DISCH					Avorago	
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)	
Treated wastewater from groundwater remediation project	Daily	Ditch A 24,000 (assumes avg. 100 gpm for 4 hrs/day; actual value may vary)	Cleaning or decontamination wastewaters from the cleaning of treatment equipment for a remediation project			
Infiltration or injection of a substance or remedial material for remediation of soil or groundwater			Other (describe type)			
Treated wastewater from dewatering of construction trenches or pits			Other (describe type)			
Landspreading or spray irrigation of agricultural chemical contaminated wastewater SECTION V: ELIGIBI	LITY CHECKLIST		Other (describe type)			

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

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 <u>not</u> 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,

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

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: <u>http://dnr.wi.gov/water/waterSearch.aspx</u>.

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, molluscicdes, 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.**

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

No. Proceed to question 7.				
A. Will chemicals be used to dechlorinate the wastewater pr	ior to discharge to surface water?			
Yes. The wastewater will be dechlorinated	with chemicals. Proceed to question 7.			
No. The wastewater will not be dechlorina	ted with chemicals. Proceed to question 7.			
7. Is a discharge management plan attached to this NOI that the permit?	includes all the information necessary from Section 3 of			
Yes. Proceed to question 8.				
No. This form will be considered incomplete and a	returned to you.			
8. Has the groundwater at the site been analyzed for contam management plan?	inants and are the results attach to the discharge			
Yes. Proceed to question 9.				
No. This form will be considered incomplete and a	returned to you.			
9. If a treatment facility is required for the treatment of cont been submitted to or approved by the department under s. 22	aminated groundwater, have the plans and specifications 81.41, Wis. Stats., and ch. NR 108, Wis. Adm. Code?			
Yes. Proceed to Section VI.				
No. Please contact wastewater plan review staff to Section VI.	find out how to get the plans approved. Proceed to			
Note: Department wastewater plan review staff can be foun <u>http://dnr.wi.gov/topic/wastewater/planreviewers.html</u> .	d here:			
Additionally, department plan submittal requirements can b http://dnr.wi.gov/topic/wastewater/AdequateSubmittal.html	e found here:			
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 <u>dnr.wi.gov</u> 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	Title
Representative)	
ERIC BRETZ	DIR. OPERATIONS
Submitter Signature	Date Signed
5- Brat-	Aug 27,2018
Please print and sign this certification page. Scan a	nd email the completed form, certification page and any other

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

Noelle Slater Technical Expert

Jul By

Ben Verburg, P.E. Principal Engineer

Redard

Michael Bedard Project Lead

DITCH INTERIM ACTION

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

Prepared for: Tyco Fire Products, L.P

Prepared by: Arcadis U.S., Inc. 126 North Jefferson Street Suite 400 Milwaukee Wisconsin 53202 Tel 414 276 7742 Fax 414 276 7603

Our Ref.: WI001605.0012

Date: August 27, 2018

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

CONTENTS

1	Introduction				
	1.1 Project Background	1			
	1.2 Purpose	1			
	1.3 Site Description	2			
	1.4 Geology and Hydrogeology	2			
	1.5 Potable Wells and Extent of Contaminant Plume	2			
2	Source of Groundwater Pollution	3			
3	Proposed Treatment System	3			
4	Operation and Maintenance of Treatment System	5			
5	Required Local, State and Federal Permits	6			
6	Erosion and Sediment Control Practices	6			
7	Summary of Analytical Results	7			

FIGURES (LOCATED IN FIGURES TAB)

1	Site A L	ocation	Мар
---	----------	---------	-----

- 2 Outdoor Testing/Training Area Map
- 3 On-Site Ditch Water Sampling Location Map

TABLES

Table 4-1: Site A Discharge Monitoring Requirements	5
Table 7-1: Summary of Analytical Results for On-Site Ditch Water Sampling at Site A	7

APPENDICES

A Ditch Interim Action Design Drawings

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.
- 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

DITCH INTERIM ACTION

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

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.

Parameter ¹	Limit Type	Limit and Units	Sample Frequency	Sample Type
Flow		gpd	Daily	Estimated
рН	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

 Table 4-1: Site A Discharge Monitoring Requirements

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 μ g/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

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.

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).

	l leite	SW-24	SW-24	SW-25	SW-27	SW-27	Effluent
	Units	5/31/2018	7/16/2018	5/31/2018	5/31/2018	7/16/2018	Limit
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	-
рН	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 = Perfluorooctanesu	Ilfonic acid (C8)					
PFOA = Perfluorooctanoic	PEOA = Perfluorooctanoic acid (C8)						

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

FIGURES





PRIVILEGED AND CONFIDENTIAL

PRIVILEDGED/ATTORNEY WORK

ATTORNEY-CLIENT

PRODUCT

PARCADIS Design & Consultancy for natural and built assets

1

University Dr





OUTDOOR TESTING/TRAINING AREA

TYCO FIRE PRODUCTS, LP MARINETTE, WISCONSIN

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









APPENDIX A

Ditch Interim Action Design Drawings



DITCH INTERIM ACTION DESIGN



	LOCATION MAP	
0	2000'	4000'
	GRAPHIC SCALE	





COPYRIGHT: 2015

NO.	DATE	ISSUED FOR
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVI

AUGUST 20, 2018

ANSUL FTC SITE MARINETTE, WISCONSIN



ΒY	SEALS	DATE:	08/20/18	MARINETTE, WI SHE	EET TITLE
 	NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE	
	FOR	FILE NAME:	DRAFT-1_G1_BID_DOC	ods title and index	
	CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	
		DRAWN BY:	EE		
		CHECKED BY:	MA		
EE				ARCADIS PROJ. NO. WI001605.0001	

INDEX TO DRAWINGS

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

|--|

SHEET

G 1

OF 1

TITLE AND INDEX

VALVE SYMBOLS





INSTRUMENT IDENTIFICATION LEGEND

EQUIPMENT SYMBOLS



GRANULAR ACTIVATED CARBON (GAC) VESSEL



TANK



BAG FILTER



ELECTRIC MOTOR



SUMP PUMP

CENTRIFUGAL PUMP

	FIRST L	ETTER	SUCCEEDING LETTERS					
	MEASURED OR INITIATING VARIABLE,	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER			
A	ANALYSIS							
В	BURNER FLAME		NOT USED	NOT USED	NOT USED			
С	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			
	CURRENT (ELECTRICAL)							
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			
0	NOT USED		ORIFICE (RESTRICTION)		OPEN			
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)	PULSE				
Q	QUANTITY	INTEGRATE OR TOTALIZE						
R	RADIOACTIVITY		RECORD OR PRINT					
L S	SPEED, FREQUENCY	SAFETY		I SWIICH				
				I MULTIFUNCTION				
	VIBRATION			LOUVER				
W	WEIGHT OK FORCE							
		X AXIS	U UNCLASSIFIED	UNULASSIFIED	UNCLASSIFIED			
ř	STATUS	Y AXIS		RELAT OK COMPUTE				
	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT				

CODES/STANDARDS:

AI	ASPHALT INSTITUTE
ASHTO	AMERICAN ASSOCIATION OF STATE HIG
ACI	AMERICAN CONCRETE INSTITUTE
NSI	AMERICAN NATIONAL STANDARDS INS
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEE
ASTM	AMERICAN SOCIETY FOR TESTING AND
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATIO
EEE	INSTITUTE OF ELECTRICAL AND ELECT
SA	INTERNATIONAL SOCIETY OF AUTOMAT
IEC	NATIONAL ELECTRICAL CODE
IEMA	NATIONAL ELECTRICAL MANUFACTURE
IESC	NATIONAL ELECTRICAL SAFETY CODE
IFPA	NATIONAL FIRE PROTECTION ASSOCIA
OSHA	OCCUPATIONAL SAFETY AND HEALTH
JL	UNDERWRITERS LABORATORY

CONSULTANTS	NO. DATE	ISSUED FOR BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHE
ARCADIS			NOT	PROJECT NO .:	WI001605.0001	_ ANSUL FTC SITE	
			FOR	FILE NAME:	DRAFT-2_G2 ABBRE	/IATIONS	
LEGAL ENTITY: ARCADIS U.S. Inc.			CONSTRUCTION	DESIGNED BY:	BV	_ DITCH INTERIM ACTION DESIGN	/
ARCHITECTURAL AND			_	DRAWN BY:	EE		
ENGINEERING SERVICES, INC.				CHECKED BY:	MA	_	
COPYRIGHT: 2015	0 08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW EE	_			ARCADIS PROJ. NO. WI001605.0001	

INSTRUMENTATION SYMBOLS

INSTRUMENT FIELD MOUNTED

INSTRUMENT PANEL FACE MOUNTED

PANEL MOUNTED DISPLAY ALARM

IGHWAY AND TRANSPORTATION OFFICIALS

STITUTE

ERS D MATERIALS

ION STANDARD

RONIC ENGINEERS TION

ERS ASSOCIATION

ATION

ADMINISTRATION

ABBREVIATIONS

) X	AND
7)	AT
е РН	SINGLE-PHASE
	SINGLE-PULE
2/0	TWO-CONDUCTOR
3/C	THREE-CONDUCTOR
BPH	THREE-PHASE
BPLY	THREE-PLY
BW	THREE-WIRE
I/C	FOUR-CONDUCTOR
	OLIADRUPLE RECEPTACLE OUTLET
S	CARBON STEEL
CPVC	CHLORINATED POLYVINYLCHLORIDE
DGR	DIRECTED GROUNDWATER RECIRCULATION
Q	EQUALIZATION
ΞX	EXTRACTION
SAC	GRANULAR ACTIVATED CARBON
ΞAI	GALLONS
	GALLONS PER DAY
12	HORSE POWER
D	INSIDE DIAMETER
NJ	INJECTION
W	INJECTION WELL
ЛIN	MINIMUM
ΛAX	MAXIMUM
ICE	MODULAR CONTROL EQUIPMENT
/CP	MAIN CONTROL PANEL
1\\/	
	NI IMBER
עכ	
ъВ	PANEL BOARD
PVC	POLYVINYLCHLORIDE
SCH	SCHEDULE
SDR	SIZE DIAMETER RATIO
SST	STAINLESS STEEL
ΥP	TYPICAL
/AC	VOLTS ALTERNATING CURRENT

NOTES:

- 1. CONTRACTOR SHALL CLEAR TREES AS NECESSARY AND CUT STUMPS FLUSH WITH GRADE.
- 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.
- 5. CONTRACTOR SHALL SEED AND STRAW ONCE THE WORK IS COMPLETED IN ACCORDANCE WITH THE WDNR STORM WATER BEST PRACTICES.
- 6. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE WORK AND PERSONNEL DURING CONSTRUCTION.
- 7. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE UTILITIES FOR RECOMMENDED RELOCATION, PROTECTION, AND CONTROLS.
- 8. CONTRACTOR SHALL MAINTAIN BENDING RADII GREATER THAN THE DEFLECTION ANGLES LESS THAN THE HDPE MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION OF HORIZONTAL OR VERTICAL CURVES.
- 9. SIGNS, MARKERS, AND FLAGS SHALL BE INSTALLED BY THE CONTRACTOR FOR ALL UNDERGROUND UTILITIES.
- 10. UTILITY LOCATION WORK SHALL BE PERFORMED BY THE CONTRACTOR.
- 11. MAINTAIN THE SITE DRAINAGE SUCH THAT ALL SURFACE WATER WITHIN EARTH DISTURBING LIMITS IS DIVERTED THROUGH EROSION AND SEDIMENT CONTROL MEASURES.

IEET TITLE

SCALE:

ABBREVIATIONS AND GENERAL NOTES

OF <u>1</u> SHEET

G2

EARTHWORK

PART 1 - GENERAL

- 1.1 DESCRIPTION
- A. SCOPE:
- 1. GENERAL EARTHWORK.
- 2. SITE PREPARATION
- INSTALLATION OF CONSTRUCTION SAFETY FENCING,
- 4. EXCAVATION
- 5. DEWATERING
- 6. STOCKPILING
- 7. SUBGRADE PREPARATION 8. FILL PLACEMENT.
- 9. TEMPORARY SHEETING, SHORING AND BRACING
- B. RELATED DOCUMENTS:
- 1. DRAWINGS.
- 2. SYSTEM REQUIREMENTS DOCUMENT.
- C. COORDINATION:
- 1. COORDINATION OF SURVEY REQUIREMENTS AS SPECIFIED IN THE SURVEYING NOTES.
- 2. COORDINATION OF EARTHWORK ACTIVITIES WITH CONTRACTOR'S EROSION AND SEDIMENT CONTROL (ESC) PLAN SPECIFIED IN THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES, SURFACE WATER MANAGEMENT AND EROSION CONTROL AND AS SHOWN ON THE DRAWINGS.
- 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 D4318 STANDARD TEST METHODS FOR LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS 4. ASTM D4523 STANDARD TEST METHODS FOR MAXIMUM INDEX DENSITY AND UNIT WEIGHT OF SOILS USING A
- VIBRATORY TABLE 5. ASTM D6913 - STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS
- 6. ASTM D6938 STANDARD TEST METHODS FOR IN-PLACE DENSITY AND WATER CONTENT OF SOIL AND
- SOIL-AGGREGATE BY NUCLEAR METHODS (SHALLOW DEPTH)
- 7. ASTM D7928 STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS
- 8. ASTM D7928 STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS
- E. RAINWATER AND LAND DEVELOPMENT, WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) STORM WATER DISCHARGE PERMIT PROGRAM UNDER AUTHORITY OF CH. NR 216, WISCONSIN ADMINISTRATIVE CODE. 1.3 SUBMITTALS
- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
- SCHEDULE FOR ACTIVITIES INCLUDED IN EACH SCOPE OF WORK, WITH EQUIPMENT AND RESOURCES IDENTIFIED. 2. LAYOUT OF CONSTRUCTION SITE ACCESS AND TEMPORARY ACCESS ROADS AND HAUL ROADS, CONSTRUCTION SAFETY FENCE, CHAIN-LINK FENCE AND GATES, RADIOLOGICAL CONTROL FENCE, AND TEMPORARY PIPES, IF
- REQUIRED. 3. PRODUCT DATA:

a. SUBMIT GRADATION ANALYSES AND A PROCTOR TEST REPORTS FOR STRUCTURAL FILL MATERIALS.

- B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
- 1. VERIFICATION, ACKNOWLEDGEMENT, AND ACCEPTANCE OF THE EXISTING CONDITIONS AND MATERIAL STOCKPILES.
- 2. EXCAVATION AND DEWATERING MEANS, METHODS, AND TECHNIQUES.
- 3. STOCKPILE MANAGEMENT PLAN, INCLUDING SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL, STOCKPILING BY TYPE OF MATERIAL, STOCKPILE MAINTENANCE, STOCKPILE REMOVAL AND RELOCATION, AND SITE GRADING AND STABILIZATION.
- 4. INTENDED USE OF CONSTRUCTION LAYDOWN AREA(S) AND ADDITIONAL CONSTRUCTION LAYDOWN AREAS NOT IDENTIFIED ON THE DRAWINGS.
- 5. MEANS, METHODS, AND TECHNIQUES FOR MATERIAL HANDLING, INCLUDING REMOVAL OF UNSUITABLE SUBGRADE AND VISIBLE ROCK PARTICLES LARGER THAN SPECIFIED, AND FOR FILL, SHALE AND ROCK FILL SPECIFIED IN THIS SECTION.
- 6. MEANS, METHODS, AND TECHNIQUES FOR INSTALLATION AND REMOVAL OF EXCAVATION AND TRENCH SUPPORTS. 7. MEANS, METHODS, AND TECHNIQUES FOR DUST CONTROL.
- 8. PLAN AND MEASURES FOR HOT WEATHER WORK AND COLD WEATHER WORK ACTIVITIES AT TEMPERATURES BELOW 32 DEGREES FAHRENHEIT (°F).

.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.
- B. STORAGE AND PROTECTION:
- 1. STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION.
- C. ACCEPTANCE AT SITE:
- 1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- A. GENERAL FILL:
- 1. CL, CL-ML, CH, OR CH-MH MATERIAL IN ACCORDANCE WITH UNIFIED SOIL CLASSIFICATION SYSTEM (USCS).
- B. OBTAIN FILL MATERIALS 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.
- C. FILL MATERIALS OBTAINED ON-SITE MAY INCLUDE NATIVE MATERIAL. THE GENERAL LOCATION AND DEPTH OF EACH TYPE OF MATERIAL IN THE EXCAVATION AND TRENCHING AREAS ARE SHOWN ON THE DRAWINGS, BASED ON THE REFERENCE THESE DOCUMENTS AND DETERMINE LOCATION, LIMITS, AND DEPTH OF EACH TYPE OF MATERIAL, AVAILABLE QUANTITY OF FILL MATERIALS, AND DETERMINE THE CHARACTERISTICS OF THE SUBSURFACE SOIL CONDITIONS TO BE ENCOUNTERED.

- D. FILL AND BACKFILL MATERIALS SHALL BE FREE OF DEBRIS. FOREIGN OBJECTS, LARGE ROCK FRAGMENTS, ORGANICS, AND DELETERIOUS MATERIALS. VISIBLE ROCK PARTICLES SHALL BE A MAXIMUM DIMENSION OF HALF THE LOOSE LIFT THICKNESS. MATERIAL FOR FILL SHALL CONFORM TO THE REQUIREMENTS LISTED IN THIS SECTION. MATERIALS WITH OTHER USCS CLASSIFICATIONS MAY BE USED UPON APPROVAL OF THE ENGINEER.
- E. RESIDUUM AND WEATHERED SHALE MATERIALS OBTAINED FROM ON-SITE EXCAVATIONS SHALL BE CONSIDERED NONDURABLE AND MAY BE PLACED AS FILL OR BACKFILL AS SPECIFIED IN THIS SECTION AND THE TRENCH EXCAVATION AND BACKFILL NOTES.
- F. OBTAIN WATER FOR MOISTURE CONDITIONING FILL AND FOR DUST CONTROL FROM THE ON SITE WATER FILLING STATIONS SHOWN ON THE DRAWINGS.
- G. FURNISH ORANGE HDPE CONSTRUCTION SAFETY FENCE, 4 FEET IN HEIGHT, OPENING SIZE APPROXIMATELY 4 INCHES X 1 INCH, MINIMUM TENSILE STRENGTH OF 300 POUNDS PER FOOT OF WIDTH; OR FENCE OF GALVANIZED STEEL WELDED WIRE FABRIC AS SPECIFIED IN THIS SECTION AND/OR SHOWN ON THE DRAWINGS. POSTS SHALL BE T-SHAPED (T-POST), 1¹/₂ INCH X 1¹/₂ INCH, MINIMUM 3/16 INCH THICK X 5 FEET LONG, AND MADE OF STEEL, OR AS OTHERWISE AUTHORIZED BY THE COMPANY. PROTECTIVE CAPS SHALL BE PLACED ON THE TOPS OF ALL T POSTS. TO DELINEATE RADIOLOGICAL CONTROL AREAS, INSTALL POSTS, SIGNAGE, AND PROVIDE AND INSTALL YELLOW/MAGENTA ROPE.
- H. FURNISH SIGNS FOR CONSTRUCTION SAFETY FENCE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- I. SIGNS FOR RADIOLOGICAL CONTROL FENCE WILL BE PROVIDED BY THE COMPANY AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- 2.2 TEMPORARY SHEETING, SHORING AND BRACING A. THE TYPE OF SHEETING USED, DESIGN, AND METHOD OF INSTALLATION, INCLUDING EMBEDMENT AND BRACING, SHALL BE DETERMINED BY CONTRACTOR AS REQUIRED BY THE CONTRACT DOCUMENTS.
- 2.3 EQUIPMENT
- A. FURNISH EQUIPMENT TO PERFORM EARTHWORK IN ACCORDANCE WITH THIS SECTION.
- B. FURNISH HAND COMPACTION EQUIPMENT, SUCH AS WALK-BEHIND PAD-FOOT COMPACTORS. HAND TAMPERS, OR VIBRATORY PLATE COMPACTORS, FOR COMPACTION IN AREAS INACCESSIBLE TO LARGE COMPACTION EQUIPMENT. C. FURNISH WATER TANK TRUCKS OR WATER WAGONS, WATER STORAGE TANKS, PRESSURE DISTRIBUTORS, OR OTHER EQUIPMENT DESIGNED TO APPLY WATER UNIFORMLY AND IN CONTROLLED QUANTITIES AT VARIABLE SURFACE WIDTHS IN ORDER TO PROVIDE THE REQUIRED IN-PLACE MOISTURE CONTENT AND TO PREVENT DRYING OF SOIL SURFACES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

PART 3- EXECUTION

- 3.1 EXISTING CONDITIONS
- A. VERIFY EXISTING GRADES IN ACCORDANCE WITH THE SURVEYING NOTES. 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. PERFORM CONSTRUCTION ACTIVITIES IN SUCH A MANNER THAT EQUIPMENT OPERATING IN RADIOLOGICAL CONTROL AREAS DOES NOT OPERATE OUTSIDE OF RADIOLOGICAL CONTROL AREAS. EQUIPMENT OPERATING IN RADIOLOGICAL CONTROL AREAS SHALL BE DECONTAMINATED BY THE CONTRACTOR, RADIOLOGICALLY SURVEYED, AND RELEASED BY THE COMPANY PRIOR TO EXITING RADIOLOGICAL CONTROL AREAS FOR USE IN OTHER AREAS.
- D. IF A VERTEBRATE PALEONTOLOGICAL OR ARCHAEOLOGICAL ARTIFACT DISCOVERY IS MADE DURING EXCAVATION, 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.
- E. MANAGE MATERIAL STOCKPILES AS SPECIFIED IN THIS SECTION.
- F. IMPLEMENT DUST CONTROL.
- 3.2 SITE PREPARATION
- A. INSTALL CONSTRUCTION SAFETY FENCE, RADIOLOGICAL CONTROL FENCE, AND ASSOCIATED SIGNS AT CONSTRUCTION LIMITS AND LIMITS OF THE RADIOLOGICAL CONTROL AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. RELOCATE CONSTRUCTION SAFETY FENCE AND RADIOLOGICAL CONTROL FENCE AS REQUIRED TO SUPPORT CONSTRUCTION ACTIVITIES. INSTALL SIGNS AND BARRICADES AROUND TRENCHES, AND EXCAVATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- B. MAINTAIN AND REPAIR CONSTRUCTION SAFETY FENCE, RADIOLOGICAL CONTROL FENCE, AND CHAIN-LINK FENCE AND GATES FOR THE DURATION OF THE CONTRACT WORK. MAINTAIN FENCING TO MINIMIZE VERTICAL SAGGING.
- C. PRIOR TO EARTHWORK ACTIVITIES, PERFORM CLEARING, GRUBBING, AND STRIPPING AS NECESSARY
- D. CONSTRUCT THE ACCESS CORRIDORS, PARKING, AND OTHER VEHICLE TRAVEL AREAS IN ACCORDANCE WITH THE DRAWINGS AND THE AGGREGATE BASE NOTES. MAINTAIN AND REPAIR THESE AREAS FOR THE DURATION OF THE CONTRACT.
- E. FOR EXCAVATIONS WITHIN 3 FEET OF EXISTING SUBSURFACE STRUCTURES OR UTILITIES, HAND-EXCAVATE WHERE NECESSARY AND USE SHORING OR OTHER MEANS, METHODS, AND TECHNIQUES. PROTECT STRUCTURES AND UTILITIES DURING EARTHWORK ACTIVITIES AS SHOWN ON THE DRAWINGS AND AS APPROVED BY THE ENGINEER.
- 3.3 EXCAVATION
- A. DO NOT REMOVE SOIL FROM THE SITE OR DISPOSE OF SOIL EXCEPT AS AUTHORIZED BY THE ENGINEER.
- B. 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.
- 3.4 EXCAVATION DEWATERING
- A. MANAGE GROUNDWATER AND SURFACE WATER RUNOFF AND RUN-ON IN EXCAVATIONS AND TRENCHES IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION AND THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.
- B. COLLECT WATER THAT ACCUMULATES IN THE EXCAVATION OR TRENCH IN A TOE DRAIN OR OTHER SUITABLE SUMP. AND PUMP TO A LOCATION APPROVED BY THE ENGINEER.
- C. VERIFY THAT COLLECTED WATER DOES NOT HAVE AN OIL SHEEN PRIOR TO PUMPING. IF SHEEN IS PRESENT, NOTIFY THE ENGINEER PRIOR TO PUMPING. IF THE ENGINEER DETERMINES THAT OIL IS PRESENT, COLLECT SHEEN WITH ADSORBENT CLOTH OR OTHER MEANS, METHODS, AND TECHNIQUES AS REQUIRED BY THE CONTRACT DOCUMENTS.
- D. PREVENT SURFACE WATER RUN-ON FROM ADJACENT AREAS FROM ENTERING EXCAVATIONS AND TRENCHES BY INSTALLING TEMPORARY DIVERSION BERMS OR OTHER SURFACE WATER MANAGEMENT FEATURES IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

3.5 STOCKPILING

- A. STOCKPILE MATERIALS FROM CLEARING, GRUBBING, STRIPPING, EXCAVATION, AND TRENCHING ACTIVITIES IN SEPARATE STOCKPILES. DELETERIOUS MATERIALS AND UNSUITABLE SOIL FROM THE ABOVE MENTIONED ACTIVITIES SHALL ALSO BE PLACED IN SEPARATE STOCKPILES. STOCKPILE LOCATIONS SHALL BE AS SHOWN ON THE DRAWINGS OR AS DESIGNATED BY THE ENGINEER.
- B. STOCKPILE OTHER MATERIALS INCLUDING TOPSOIL FROM OFF-SITE SOURCES AT ON-SITE LOCATIONS DESIGNATED BY THE ENGINEER. MAINTAIN MATERIAL STOCKPILES IN ACCORDANCE WITH THIS SECTION.

	CONSULTANTS	NO.	DATE	ISSUED FOR	BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHE
ARCADIS						NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE	
						FOR	FILE NAME:	DRAFT-3_G3-SPECIFI	ATIONS (SHEET 1 OF 5)	
LEGAL ENTITY: ARCADIS U.S., Inc.						CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	
ARCHITECTURAL AND							DRAWN BY:	EE		
ENGINEERING SERVICES, INC.							CHECKED BY:	MA		
		0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE				ARCADIS PROJ. NO. WI001605.0001	

C. EXCAVATION FOR TRENCHES IS ADDRESSED IN THE TRENCH EXCAVATION AND BACKFILL NOTES.

- C. PLACE EXCAVATED SOIL IN STOCKPILES WITH STABLE SLOPES. GRADE STOCKPILES TO DRAIN, SEAL THEM BY TRACKING PERPENDICULAR TO THE SLOPE CONTOURS, AND MAINTAIN THEM ON A DAILY BASIS DURING PERIODS WHEN MATERIAL IS TAKEN FROM OR ADDED TO THE STOCKPILES.
- D. ENCAPSULATE STOCKPILES WITH APPROVED CRUSTING AGENT OR STABILIZE STOCKPILES 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.
- 3.6 SUBGRADE
- A. SUBGRADE SHALL BE FREE OF DEBRIS, FOREIGN OBJECTS, ORGANICS, AND OTHER DELETERIOUS MATERIALS.
- B. SUBGRADE FOR ROADS AND CHANNELS IN FILL SECTIONS SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS IN THIS SECTION FOR FILL.
- C. IN EXCAVATIONS OR OTHER AREAS WHERE WATER ACCUMULATES, IMPLEMENT MEASURES TO REMOVE THE WATER IN ACCORDANCE WITH THIS SECTION. MAINTAIN THE SUBGRADE FREE OF STANDING WATER AND IN A FIRM CONDITION. WHICH CONFORMS TO THE REQUIREMENTS OF THIS SECTION. MAINTAIN DEWATERED AREAS IN THIS CONDITION UNTIL OVERLYING CONSTRUCTION IS COMPLETE.
- 3.7 FILL
- A. PLACE FILL MATERIAL THAT CONFORMS TO THE MATERIAL REQUIREMENTS OF THIS SECTION. PLACE FILL MATERIAL TO THE LIMITS AND ELEVATIONS SHOWN ON THE DRAWINGS.
- B. PLACE FILL MATERIAL ON SURFACES THAT ARE FREE OF DEBRIS, BRANCHES, VEGETATION, MUD, ICE, AND OTHER DELETERIOUS MATERIALS.
- C. PLACE FILL MATERIAL IN LOOSE LIFTS WITH A MAXIMUM THICKNESS OF 8 INCHES. IN AREAS WHERE COMPACTION IS TO BE PERFORMED USING HAND-OPERATED EQUIPMENT, PLACE FILL MATERIAL IN LOOSE LIFTS WITH A MAXIMUM THICKNESS OF 4 INCHES.
- D. CONTINUOUSLY REMOVE VISIBLE ROCK PARTICLES WITH A MAXIMUM DIMENSION LARGER THAN HALF OF THE LOOSE LIFT THICKNESS.
- E. PLACE FILL IN HORIZONTAL LIFTS, BENCHING INTO EMBANKMENTS FOR THE FULL LIFT DEPTH.
- F. PRIOR TO PLACING A LIFT OF FILL MATERIAL OVER A PREVIOUSLY COMPACTED LIFT, THOROUGHLY SCARIFY THE PREVIOUS LIFT TO A DEPTH OF APPROXIMATELY 2 INCHES BY DISCING, RAKING, OR TRACKING. MOISTURE CONDITION THE PRECEDING LIFT IN ACCORDANCE WITH THIS SECTION IF ITS SURFACE MOISTURE CONTENT IS NOT WITHIN THE RANGE OF ACCEPTABLE MOISTURE CONTENTS SPECIFIED IN THIS SECTION.
- G. THE TRAFFICKING OF SCARIFIED SURFACES BY TRUCKS OR OTHER EQUIPMENT, EXCEPT COMPACTION EQUIPMENT AND WATER TRUCKS WHEN NECESSARY, IS NOT PERMITTED.
- H. THE MAXIMUM ACCEPTABLE SOIL CLOD SIZE AFTER PROCESSING SHALL BE 3 INCHES OR HALF THE THICKNESS OF THE LIFT, WHICHEVER IS LESS. REDUCE CLOD SIZE BY DISCING, RAKING, TRACKING, USING A SOIL STABILIZER, OR OTHER MEANS, METHODS, AND TECHNIQUES.
- I. COMPACT GENERAL FILL MATERIAL IN EACH LIFT TO AT LEAST 95 PERCENT OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. IN AREAS UNDER ROADS, COMPACT THE UPPERMOST LIFT OF FILL MATERIAL TO AT LEAST 98 PERCENT OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. COMPACT FILL MATERIAL AT A MOISTURE CONTENT WITHIN ±3 PERCENTAGE POINTS OF THE STANDARD PROCTOR OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698.
- J. MOISTURE CONDITION THE FILL MATERIAL TO ACHIEVE THE COMPACTION REQUIREMENTS SPECIFIED IN THIS SECTION. DURING WETTING OR DRYING, REGULARLY DISC, RAKE, OR OTHERWISE MIX THE MATERIAL TO THOROUGHLY BLEND THE MOISTURE THROUGHOUT THE LIFT.
- K. DO NOT PLACE FILL ON A FROZEN SURFACE, OR PLACE FROZEN FILL. IF FILL PLACEMENT IS NECESSARY IN AREAS WITH FROZEN SURFACES, REMOVE FROZEN MATERIAL PRIOR TO PLACING SUBSEQUENT FILL LIFTS.
- L. DO NOT COMPACT FILL MATERIAL AT TEMPERATURES BELOW 32°F UNLESS AUTHORIZED BY THE ENGINEER.
- M. DO NOT PLACE FILL DURING PERIODS OF SIGNIFICANT PRECIPITATION UNLESS AUTHORIZED BY THE ENGINEER.
- N. REMOVE, REWORK, OR REPLACE FILL THAT DOES NOT CONFORM TO COMPACTION REQUIREMENTS.
- 3.8 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA
- A. CONTRACTOR WILL MONITOR MATERIAL STOCKPILES FOR NON-COMPLIANT MATERIALS.
- B. THE CQC CONTRACTOR WILL PERFORM CONFORMANCE TESTING ON MATERIALS TO CONFIRM COMPLIANCE WITH THIS SECTION. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS SHOVELS, HAND AUGERS, AND BACKHOES, AND LABOR TO OBTAIN CONFORMANCE SAMPLES FROM EXCAVATIONS, STOCKPILES, AND BORROW AREAS. CONFORMANCE TESTING SHALL INCLUDE STANDARD PROCTOR (ASTM D698), PARTICLE SIZE DISTRIBUTION (ASTM D6913 OR D7928), ATTERBERG LIMITS (ASTM D4318) AND USCS CLASSIFICATION (ASTM D2487) AT A MINIMUM FREQUENCY OF ONE TEST PER 10,000 CY OF MATERIAL, BASED ON IN-PLACE COMPACTED VOLUME. A MINIMUM OF 3 PROCTOR TESTS SHALL BE PERFORMED FOR EACH MATERIAL.
- C. THE CQC CONTRACTOR WILL OBSERVE AND DOCUMENT PROOF ROLLING OF THE SUBGRADE FOR MASS FILL AREAS AND INSPECTION OF THE EXCAVATED SUBGRADE UNDER FOUNDATIONS, SLABS ON GRADES AND SITE STRUCTURES. PROOF ROLLING DOCUMENTATION PROVIDED TO THE ENGINEER WILL INCLUDE DESCRIPTION OF AREAS THAT PASS PROOF ROLLING AND AREAS THAT FAIL PROOF ROLLING; FOR AREAS THAT FAIL PROOF ROLLING, CONTRACTOR WILL OBSERVE AND DOCUMENT THE CONTRACTOR'S METHOD OF REPAIR FOR THE AREA.
- D. THE CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON GENERAL FILL TO CONFIRM COMPLIANCE WITH THIS SECTION. COMPACTION TESTING (ASTM D6938) SHALL BE PERFORMED AT A MINIMUM FREQUENCY OF 1 TEST PER ACRE PER LIFT FOR AREA FILLS, 1 TEST PER 2,500 SF OF LIFT AREA WITHIN THE FOOT PRINT OF FOUNDATIONS, SLABS ON GRADE OR SITE STRUCTURES. AND AT LEAST 1 TEST PER 250 LINEAR FEET ALONG LINEAR FEATURES SUCH AS ROADS, BERMS AND TRENCHES.
- E. IF THE CQC CONTRACTOR TESTS INDICATE THAT ANY PORTION OF THE FILL OR SUBGRADE DO NOT CONFORM TO THE REQUIREMENTS OF THIS SECTION, THE CONTRACTOR WILL DELINEATE THE EXTENT OF THE NON-CONFORMING AREA. CONTRACTOR SHALL REWORK THE NONCONFORMING AREA UNTIL IT CONFORMS TO THE REQUIREMENTS OF THIS SECTION.
- F. TOLERANCES:
- 1. PERFORM THE EARTHWORK CONSTRUCTION TO WITHIN ±0.1 FEET OF THE ELEVATIONS 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 COMPANY 3.9 SURVEY CONTROL
- A. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF EXCAVATIONS, STOCKPILES, PREPARED SUBGRADE, AND FIL IN ACCORDANCE WITH THE SURVEYING NOTES.

L				
ET TITLE		SCALE:		
Ç	SPECIFICATIONS (SHEET 1 OF 5)		G3	
		SHEET -	OF	1

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



ENGINEERING SERVICES, INC. COPYRIGHT: 2015

- 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.
- 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.
- NO. DATE ISSUED FOR DESIGN PACKAGE ISSUED FOR REVIEW 0 08/20/18

WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE

- C. CQC CONTRACTOR WILL MONITOR TRENCHING AND BACKFILLING AS SPECIFIED IN THIS SECTION

- 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 SPEFICIATIONS.
- 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.

ΒY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHEET TITLE
 	NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE	
	FOR	FILE NAME:	DRAFT-4_G4-SPECIFIC	ATIONS (SHEET 2 OF 5)	
	CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	
		DRAWN BY:	EE		
		CHECKED BY:	MA		
EE				ARCADIS PROJ. NO. WI001605.0001	

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.

SCALE:

SPECIFICATIONS (SHEET 2 OF 5)

SHEET OF

G4

<u>GEOTEXTILES</u> PART 1- GENERAL		CONFORM TO TH MANUFACTURED THE ROLLS UNTIL	E QUALITY CONTROL REQUIREMEN AT THE SAME TIME AND IN THE SA . THE EXTENT OF THE FAILING ROL	ITS OF THIS SECTION, THEN SAMI ME LOT AS THE FAILING ROLL. CO LS ARE BRACKETED BY PASSING	'LE)NT ROI
1.1 DESCRIPTION		RULLS. 2.3 PACKAGING			
 A. SCOPE: 1. WORK IN THIS SECTION INCLUDES MATERIAL AND ACCEPTANCE, HANDLING, STORAGE, AND INSTALLA REQUIREMENTS FOR GEOTEXTILES. B. RELATED DOCUMENTS: DRAWINGS. SYSTEM REQUIREMENTS DOCUMENT. 1.2 REFERENCES 	ATION	 A. GEOTEXTILE ROL B. COVERS WHICH I C. GEOTEXTILE ROL INFORMATION: 1. MANUFACTURER 2. PRODUCT IDENTI 3. LOT OR BATCH N 	LS SHALL BE WRAPPED IN RELATIN BECOME TORN OR DAMAGED SHAL LS SHALL BE MARKED OR TAGGED S NAME. FICATION. UMBER.	VELY IMPERMEABLE AND OPAQUE L BE REPAIRED BY THE CONTRAC IN ACCORDANCE WITH ASTM D48	PR(TOF 373 V
A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTEDB. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).	OTHERWISE.	4. ROLL NUMBER. 5. ROLL DIMENSION	S.		
 C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM). 1. ASTM D4355 - STANDARD TEST METHOD FOR DETERIORATION OF GEOTEXTILES BY EXPOSURE TO LICE 	GHT, MOISTURE	D. GEOTEXTILE ROL BE REJECTED AN ACCORDANCE W	LS NOT LABELED IN ACCORDANCE D REPLACED. THE CONTRACTOR \$ ITH THIS SECTION.	WITH THIS SECTION OR ON WHIC SHALL NOTIFY THE ENGINEER OF	H L/ ANY
 AND HEAT IN A XENON ARC TYPE APPARATUS ASTM D4533 - STANDARD TEST METHOD FOR TRAPEZOID TEARING STRENGTH OF GEOTEXTILES. ASTM D4632 - STANDARD TEST METHOD FOR GRAB BREAKING LOAD AND ELONGATION OF GEOTEXTIL ASTM D5261 - STANDARD TEST METHOD FOR MEASURING MASS PER UNIT AREA OF GEOTEXTILES. 	LES.	E. IF MANUFACTURI WITH A HIGHLY V 2.4 SHIPPING	NG QUALITY CONTROL SAMPLING I ISIBLE MARK OR LABEL, DISTINCT F	S LESS THAN 100 PERCENT OF RO FROM UNSAMPLED ROLLS.)LLS
 ASTM 06193 - STANDARD PRACTICE FOR STITCHES AND SEAMS. ASTM 06241 - STANDARD TEST METHOD FOR STATIC PUNCTURE STRENGTH OF GEOTEXTILES AND GEOTEXTILE-RELATED PRODUCTS USING A 50-MM PROBE. ASTM 07178 - STANDARD PRACTICE FOR DETERMINING THE NUMBER OF CONSTRICTIONS M OF NON- GEOTEXTILES AS A COMPLEMENTARY FILTRATION PROPERTY. 	WOVEN	A. GEOTEXTILES FL OF COMPLIANCE CONFORMANCE ACCORDANCE W	RNISHED BY THE CONTRACTOR SH OF MANUFACTURER'S QUALITY CC TESTING PERFORMED BY THE CON ITH THE CQA PROJECT PLAN.	IALL NOT BE SHIPPED PRIOR TO F NTROL SUBMITTALS IN ACCORDA STRUCTION QUALITY CONTROL ((INA NCE CQC
 D. RAINWATER AND LAND DEVELOPMENT, WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM	VPDES) STORM	2.5 EQUIPMENT			
E. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA).	IVE CODE.	A. FURNISH EQUIPM WITH THIS SECTI	IENT FOR ACCEPTANCE, HANDLING ON.	6, STORAGE, AND INSTALLATION C	≀F G
.3 SUBMITTALS		PART 3- EXECUTION			
 PRODUCT DATA: a. MANUFACTURER'S LITERATURE, ILLUSTRATIONS, SPECIFICATIONS AND ENGINEERING DATA INCLU DIMENSIONS, MATERIALS, SIZE, WEIGHT, AND PERFORMANCE DATA. 	JDING:	A. DO NOT COMMEN CONFIRMATION (RESULTS, BY THE	ICE GEOTEXTILE INSTALLATION UN DF COMPLIANCE OF UNDERLYING L E ENGINEER.	TIL COMPLETION OF CONFORMAI AYERS, INCLUDING ACCEPTANCE	√CE OF
a. ASSEMBLY AND INSTALLATION.		B. HANDLE GEOTEX	TILES SO AS TO ENSURE THEY ARE	NOT DAMAGED.	
 B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING: 1. SOURCE QUALITY CONTROL: a. CERTIFICATION OF MINIMUM AVERAGE ROLL VALUES 95 PERCENT LOWER CONFIDENCE LIMITS AN CORRESPONDING TEST METHODS FOR GEOTEXTILE PROPERTIES LISTED IN THE TABLES IN THIS S 		C. AFTER UNWRAPF IN EXCESS OF TH ALLOWED TO BE PERIOD SHALL BI	PING THE GEOTEXTILES FROM THE E MANUFACTURER'S WRITTEN REC EXPOSED FOR A PERIOD IN EXCES E REMOVED AND REPLACED AT CO	R OPAQUE COVERS, DO NOT LEA COMMENDED EXPOSURE PERIOD. S OF THE MANUFACTURER'S WRI NTRACTOR'S EXPENSE.	VE T GE TTEI
 MANUFACTURER'S WRITTEN RECOMMENDED MAXIMUM EXPOSURE PERIOD AFTER THE GEOTEXTIL FROM ITS OPAQUE COVER; 	LE IS UNWRAPPED	D. DURING INSTALL INCLUDING RUTT	ATION OF GEOTEXTILES, TAKE PRE ING IN SUBGRADE. REPAIR DAMAG	CAUTIONS TO PREVENT DAMAGE ED SUBGRADE IN ACCORDANCE	to WITI
 a. MANUFACTURING QUALITY CONTROL CERTIFICATES SIGNED BY THE QUALITY CONTROL MANAGEF EACH ROLL OF GEOTEXTILE AS SPECIFIED IN THIS SECTION. 		E. TAKE CARE NOT F. EXAMINE THE GE OBJECTS ARE EN REPAIR THE GEC	TO ENTRAP STONES, DUST, OR MO OTEXTILE SURFACE AFTER INSTAL TRAPPED UNDER OR WITHIN THE (TEXTILE IN ACCORDANCE WITH TH	ISTURE BELOW OR IN THE GEOTE LATION TO ENSURE THAT NO PO GEOTEXTILE. REMOVE SUCH OBJ IS SECTION. REPLACE DAMAGED	.XTIL ENT ECT GE(
 THE SUBMITTAL SHALL INCLUDE A LIST OF ROLL NUMBERS TO BE SHIPPED INDICATING WHICH SAMPLED AND TESTED. THE CERTIFICATES SHALL STATE THAT THE GEOTEXTILES ARE CONTINUOUSLY INSPECTED AN NEEDLE-FREE. 	ROLLS WERE D ARE	TO BE REPAIRED G. ANCHOR OR WEI PREVENT DAMAG	GHT GEOTEXTILES WITH SANDBAG	S, OR BY OTHER MEANS, METHO D. INSTALL SANDBAGS DURING IN)S, A STA
 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 USEI 	D (THE	H. SEAMS AND OVE 1. DO NOT INSTALL SEAMS SHALL BE	CAYERS ARE PLACED. IMMEDIATI RLAPS: HORIZONTAL SEAMS ON SLOPES T ALONG, NOT ACROSS, THE SLOPE	ELY REMOVE DAMAGED OR LEAK HAT ARE STEEPER THAN 10 HORI S.	NG : ZON
MANUFACTURER'S QUALITY CONTROL TESTS TO BE PERFORMED ARE SPECIFIED IN THIS SE 1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING A PACKING, SHIPPING, HANDLING AND UNLOADING	CTION)	 OVERLAP GEOTE OVERLAP GEOTE OVERLAP GEOTE DESCRIBED IN THE SEAMING IS BEOMING IS	XTILE ON FLAT AREAS A MINIMUM (XTILE SEPARATOR USED FOR UND IE SURFACE WATER MANAGEMENT	OF 12 INCHES. ERLYING RIPRAP SURFACE WATE AND EROSION CONTROL NOTES	R M. A M
 DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK. DELIVER MATERIALS AND APPARATUSES IN AMPLE TIME TO PREVENT DELAY OF THE WORK. HANDLING SHALL BE PERFORMED SUCH THAT DAMAGE TO GEOTEXTILE MATERIALS DOES NOT OCCU GEOTEXTILE MATERIALS DAMAGED DURING UNLOADING, HANDLING, AND STORAGE SHALL BE REPLA 	GEOTEXTILE IR. CED AT THE	J. REPAIR: 1. REPAIR HOLES O EXTEND GEOTEX HEAT LEISTER S	R TEARS IN THE GEOTEXTILES USII TILE PATCHES A MINIMUM OF 1 FOR SWING OR CAREFULLY BLACING AN	NG PATCHES MADE FROM THE SA DT BEYOND THE DAMAGED AREA	.ME SE
CONTRACTOR'S EXPENSE. B. STORAGE AND PROTECTION:		DISPLACED. 2. REMOVE SOIL OF	OTHER MATERIAL THAT MAY HAVE	E BEEN ENTRAPPED UNDER OR W	ITHI
 STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION. KEEP ALL MATE GROUND, USING PALLETS, PLATFORMS, OR OTHER SUPPORTS. PROTECTION FROM SUNLIGHT, MOISTURE, EXCESSIVE HEAT OR COLD, PUNCTURE, MUD, DIRT, AND D DAMAGING CONDITIONS. 	NIAL OFF THE	K. PLACEMENT OF S 1. PLACE MATERIAL a. THE GEOTEXT b. SLIPPAGE ANI	SOIL AND AGGREGATE MATERIALS: S ON TOP OF GEOTEXTILES IN A M ILES AND THE UNDERLYING MATER DISPLACEMENT DOES NOT OCCU	ANNER TO ENSURE THAT: RIALS ARE NOT DAMAGED; R BETWEEN THE GEOTEXTILE AN	D Tŀ
 C. ACCEPTANCE AT SITE: 1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE CONTRACTOR SHALL NOTIFY THE COMPANY, IN WRITING, IF ANY LOSS OR DAMAGE EXISTS TO EQUIP COMPONENTS. REPLACE LOSS AND REPAIR DAMAGE TO NEW CONDITION IN ACCORDANCE WITH MAI INSTRUCTIONS. 	E SITE. MENT OR NUFACTURER'S	DURING PLAC c. EQUIPMENT IS d. MATERIAL TO CASCADED OI 2. PLACE THE MATE	EMENT; NOT DRIVEN DIRECTLY ON THE GI BE PLACED ON THE GEOTEXTILE IS NTO THE GEOTEXTILE IN A MANNEF RIAL OVERLYING THE GEOTEXTILE	EOTEXTILE; AND DUMPED ONTO THE PRECEDING THAT DOES NOT SHOVE OR DISF AS SOON AS PRACTICABLE AND,	LIF ²LA(WH
PART 2- PRODUCTS		BASE OF THE SLO MATERIAL OVERI	OPE UPWARDS. UNLESS OTHERWIS YING THE GEOTEXTILE SHALL COM	SE AUTHORIZED BY THE COMPAN IPLY WITH THE FOLLOWING REQU	Y, E(JIRE
 A. GEOTEXTILE MATERIALS SHALL BE FURNISHED THAT CONFORM TO OR EXCEED THE FOLLOWING REC 1. MINIMUM AVERAGE ROLL VALUES WITH 95 PERCENT LOWER CONFIDENCE LIMITS CONFORMING TO O THE REQUIRED PROPERTY VALUES SPECIFIED IN TABLE 02714-1 FOR GEOTEXTILE SEPARATOR FOR F 	QUIREMENTS: R EXCEEDING ROADS AND		Allowable Equipment Ground Pressure (psi) <5 <10	Thickness of Overlying Layer (ft.) 1.0 1.5	
SURFACE WATER MANAGEMENT FEATURES 2. MANUFACTURED FROM FIRST QUALITY POLYMERS, WITH NO MORE THAN 20 PERCENT RECLAIMED PO PRODUCTION.	DLYMER USED IN		<20 >20	2.0 3.0	
2.2 MANUFACTURING QUALITY CONTROL		3.2 FIELD QUALITY CONTRO	DL/ACCEPTANCE CRITERIA		
A. FOR GEOTEXTILE FURNISHED BY THE ENGINEER AND THE CONTRACTOR, THE GEOTEXTILE MATERIAL SAMPLED AND TESTED TO DEMONSTRATE THAT THE MATERIAL CONFORMS TO THE REQUIREMENTS ON ANY GEOTEXTILE ROLL THAT DOES NOT COMPLY WITH THE MANUFACTURING QUALITY CONTROL RECOMMENDATION AND ADDREED TO THE OTEXTS.	L SHALL BE OF THIS SECTION. QUIREMENTS	A. CQC SHALL BE P B. CONTRACTOR SH ACTIVITIES REQU	ERFORMED IN ACCORDANCE WITH IALL COORDINATE CONSTRUCTION IIRED OF THE CQC CONTRACTOR.	THE CONTRACT DOCUMENTS AN ACTIVITIES THROUGH THE ENGI) TH VEEI
 PERFORM MANUFACTURING QUALITY CONTROL TESTS TO DEMONSTRATE THAT THE PROPERTIES CO VALUES SPECIFIED IN TABLE 02714-1. PERFORM THE FOLLOWING MANUFACTURING QUALITY CONTRO MAXIMUM INTERVAL OF ONE TEST FOR EACH 50,000 SQUARE FEET MANUFACTURED FOR THE FOLLOW METHODS. D4533, D4632, D5261, AND D6241, ALL TESTED POLLS OF MATERIAL LICED TO CERTIFY CON- METHODS. D4533, D4632, D5261, AND D6241, ALL TESTED POLLS OF MATERIAL LICED TO CERTIFY CON- 	DNFORM TO THE DL TESTS AT A WING ASTM TEST	C. CONTRACTOR SH D. CONTRACTOR SH CONTRACTOR IN	IALL NOTIFY THE ENGINEER PRIOR IALL PROVIDE EQUIPMENT, SUCH A OBTAINING CONFORMANCE SAMPI	TO COMMENCEMENT OF WORK I S AN OFF-ROAD FORKLIFT, AND L ES FROM MATERIALS DESCRIBE)esc .abc d in
BE DELIVERED TO THE SITE. TEST DATA FOR ROLLS NOT DELIVERED TO THE SITE SHALL NOT BE ACC B. FOR GEOTEXTILE FURNISHED BY THE ENGINEER AND THE CONTRACTOR, IF A GEOTEXTILE SAMPLE F	CEPTED.	CONFORMANCE PROJECT PLAN. E. THE CQC CONTR FACILITY	TESTING TO BE PERFORMED AND T ACTOR HAS THE OPTION OF COLLE	ESTING FREQUENCIES SHALL BE	IN A
	NO. DATE	ISSUED F	FOR BY	SEALS	D
- AKUAUIS				NOT FOR	P F
AL ENTITY: ADIS U.S., Inc. HITECTURAL AND INEERING SERVICES, INC.				CONSTRUCTION	D

0 08/20/18

COPYRIGHT: 2015

DESIGN PACKAGE ISSUED FOR REVIEW

E AND TEST ROLLS TINUE TO SAMPLE AND TEST DLLS. DO NOT SUPPLY FAILING

ROTECTIVE COVERS. OR WITH SIMILAR MATERIALS. WITH THE FOLLOWING

F. CQC CONTRACTOR WILL MONITOR THE GEOTEXTILE INSTALLATION IN ACCORDANCE WITH THIS SECTION AND THE CQA 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.

	TA	BLE 02714	-1					
R	EQUIRED PROPERTY	VALUES FOR	R GEOTEXTILE CUS	HION				
PROPERTIES QUA	LIFIER U	INITS	SPECIFIED (3) PROPERTY VALUES	S TEST METHOD				
Identification Requireme	ents							
Туре (-)	(-)		(-)	Nonwoven needle-punched				
Polymer composition	minimum		%	95 polypropylene or				
()			polyester by weig	ht				
Mass per unit area D5261	minimum		oz/yd²	16 ASTM				
Mechanical_Requirements								
Grab strength	minimum	Ib	370	ASTM D4632(1)				
Elongation	minimum	%	50	ASTM D4632(1)				
Trapezoidal tear streng	th minimum	Ib	145	ASTM D4533(2)				
Static puncture strengt	h minimum	lb	900	ASTM D6241				

Durability Requirements

Ultraviolet resistance minimum % 70 ASTM D4355

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.

Minimum value measured in machine and cross-machine direction.
 All values represent minimum average roll values (except Apparent opening size).
 Table was developed using both Ohio C&MS and ODNR Standards.

(5) mm = millimeter

% = percent

oz/yd² = ounce per square yard

= per second sec⁻¹ IЬ = pound

psi = pounds per square inch

LABELS ARE ILLEGIBLE SHALL Y ROLLS NOT LABELED IN

S, IDENTIFY SAMPLED ROLLS

AL REVIEW AND CONFIRMATION E WITH THIS SECTION AND C) CONTRACTOR IN

GEOTEXTILE IN ACCORDANCE

E TESTING AND WRITTEN F CONTRACTOR'S SURVEY

THEM EXPOSED FOR A PERIOD EOTEXTILES THAT ARE EN RECOMMENDED EXPOSURE

O UNDERLYING LAYERS, TH THE EARTHWORK NOTES.

TILES.

NTIALLY HARMFUL FOREIGN TS THAT ARE ENTRAPPED AND EOTEXTILES THAT ARE UNABLE

AND TECHNIQUES, TO ALLATION AND MAINTAIN THEM G SANDBAGS.

NTAL TO 1 VERTICAL (10H:1V).

MANAGEMENT FEATURES MINIMUM OF 12 INCHES. NO

E GEOTEXTILE MATERIAL. ECURE THE PATCH IN PLACE BY E THAT THE PATCH IS NOT

HIN THE TORN GEOTEXTILES.

THE UNDERLYING LAYERS

T AND THE MATERIAL IS ACE THE GEOTEXTILE.

HERE APPLICABLE, FROM THE EQUIPMENT OPERATING ON EMENTS.

THE CQA PROJECT PLAN.

ER TO ACCOMMODATE THE

SCRIBED IN THIS SECTION.

BOR TO ASSIST CQC N THIS SECTION. THE

ACCORDANCE WITH THE CQA

T THE MANUFACTURING

EE				ARCADIS PROJ. NO.	WI001605.0001			
		CHECKED BY:	MA					
	_	DRAWN BY	EE					
	CONSTRUCTION	DESIGNED BY:	BV	DITCH	INTERIM	ACTION	DESIGN	
	FOR	FILE NAME:	DRAFT-5_G5-SPECIFIC	ATIONS (SHEET 3 O	F 5)			
	NOT	PROJECT NO.:	WI001605.0001		ANSUL	FIC SILE		
BY		DATE.						
	SEALS		08/20/18		MARIN	ETTE WI		SHEET TITLE

SPECIFICATIONS (SHEET 3 OF 5)

G5 SHEET _____ OF ____

SCALE:

HOD

-punched

ylene or

ASTM

632(1)

533(2)

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CARLES		
 A.INSULATED CABLE IN RACEWAYS: 1. APPLICATION: USE FOR CIRCUITS LOCATED INDOORS AND OUTDOORS. 2. 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. 3. WIRE SIZES: NOT SMALLER THAN NO. 12 AWG FOR POWER AND LIGHTING AND NO. 14 AWG FOR 120-VOLT CONTROL CIRCUITS. 4. SOLITHWIRE, GENERAL CABLE, AMERICAN INSULATED WIRE, THE OKONITE COMPANY 		
OR APPROVED EQUAL		
 B. CABLE CONNECTORS, SOLDERLESS TYPE: 1. FOR WIRE SIZES NO. 4 AWG AND ABOVE, USE EITHER COMPRESSION TYPE OR BOLTED TYPE WITH SILVER-PLATED CONTACT FACES. 2. 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. 3. 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. 4. PROPERLY SIZE CONNECTORS TO FIT FASTENING DEVICE AND WIRE SIZE. CONNECTORS SHALL BE RATED FOR 90 DEGREE C, 600 VOLTS. 5. T&B STA-KON, BURNDY HYLUG, OR APPROVED EQUAL.		
 C.CABLE SPLICES: 1. 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. 2. FOR WIRE SIZES NO. 10 AWG AND SMALLER, SPLICES MAY BE MADE UP WITH 		
 PRE-INSULATED SPRING CONNECTORS. 3. 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: 1. 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. 2. BELDEN COMPANY, OKONITE COMPANY, OR APPROVED EQUAL. 		
B. ETHERNET CATEGORY 6 CABLE: 1. 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		
 a. 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. b. 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. c. FITTINGS, BRACES, BRACKETS, HARDWARE, AND ACCESSORIES SHALL BE TYPE 316 STAINLESS STEEL 		
 d. STRUT NUTS SHALL BE SPRING CAPTURED TYPE 316 STAINLESS STEEL. e. 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: 1. STAINLESS STEEL., NOT LESS THAN 3/8-INCH DIAMETER, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED.		
C.MISCELLANEOUS HARDWARE: 1. BOLTS, SCREWS, AND WASHERS SHALL BE STAINLESS STEEL. 2. HEX NUTS: SHALL BE STAINLESS STEEL AND INCLUDE NYLON INSERTS.		
RIGID CONDUITS		
 A.PVC-COATED RIGID STEEL CONDUIT, ELBOWS, COOPLINGS, FITTINGS AND OUTLET BODIES: 1. 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. 2. COLOR: COLOR OF COATING SHALL BE THE SAME ON ALL CONDUIT AND FITTINGS. 3. ROBROY INDUSTRIES, PERMA-COTE INDUSTRIES, OR APPROVED EQUAL 		
 B. SEALING BUSHING 1. 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. 2. CSMI SEALING BUSHING AT THE INSIDE OF THE STRUCTURE AND TYPE CSMC SEALING BUSHING AT THE OUTSIDE OF THE STRUCTURE BY O-Z/GEDNEY, OR APPROVED EQUAL. 		
FLEXIBLE CONDUIT AND FITTINGS		
A.FLEXIBLE CONDUIT (NON-HAZARDOUS CLASS I, DIVISION 2 HAZARDOUS AREAS) 1. 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.		
	NO.	DATE

SHALL BE EXPLOSION-PROOF AND COMPLY WITH UL 886. 3. MATERIAL: a. 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. 4. GASKET a. PROVIDE NEOPRENE GASKETS FOR WET AND CORROSIVE LOCATIONS. b. GASKETS SHALL BE AN APPROVED TYPE DESIGNED FOR THE PURPOSE. IMPROVISED GASKETS ARE NOT ACCEPTABLE. 5. ACCESS: STAINLESS STEEL COVER BOLTS. 6. FEATURES: a. EXTERNAL MOUNTING LUGS.

- b. DRILLED AND TAPPED CONDUIT HOLES. HAVE 1/4-INCH DRAIN HOLE AT BOTTOM OF THE BOX.

B.PVC-COATED CONDUIT FITTINGS

TERMINAL BOX SUB-PANELS.

A.GENERAL

- C.TERMINAL BLOCKS:
- MODEL CR151K, OR EQUAL.
- D.MATERIALS & CONSTRUCTION UNDERGROUND 2.HUBBELL QUAZITE, OR APPROVED EQUAL

SEALED FITTINGS

- A.GENERAL:
- DAM.
- COATING.
- FITTING MANUFACTURER.

DISCONNECT SWITCHES

- A. SINGLE THROW, CIRCUIT DISCONNECT SWITCHES:
- SAFETY HANDLE.
- 250.
- APPROVED EQUAL.
- 4. ENCLOSURE: NEMA 4X.

MANUAL TRANSFER SWITCH

- A.DOUBLE THROW, CIRCUIT DISCONNECT SWITCHES:
- IN THE "OFF" POSITION AND SAFETY HANDLE.
- 250. APPROVED EQUAL.
- 4. ENCLOSURE: NEMA 4X

ISSUED FOR LEGAL ENTITY: ARCADIS U.S., Inc. ARCHITECTURAL AND ENGINEERING SERVICES, INC. COPYRIGHT: 2015 0 08/20/18 DESIGN PACKAGE ISSUED FOR REVIE

2. ANACONDA SEALTITE TYPE UA BY ANAMET ELECTRICAL, INC., LIQUATITE TYPE L.A. BY ELECTRIC-FLEX COMPANY, OR APPROVED EQUAL.

1. 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. 2. ROBROY INDUSTRIES, PERMACOTE INDUSTRIES, OCAL, INC, OR APPROVED EQUAL.

PULL, JUNCTION, AND TERMINAL BOXES

1. PULL, JUNCTION, AND TERMINAL BOXES RATED AT NEMA 4X. BOXES SHALL BE APPROPERIATE FOR EACH LOCATION IN ACCORDANCE WITH NEMA REQUIREMENTS AND AS REQUIRED FOR AREA CLASSIFICATIONS. 2. TERMINAL STRIPS AND TERMINAL BLOCKS IN TERMINAL BOXES SHALL BE MOUNTED ON

B.MATERIALS AND CONSTRUCTION - WET, CORROSIVE, OR HAZARDOUS LOCATIONS: 1. PULL BOXES IN WET, CORROSIVE, OR OUTDOOR AREAS SHALL BE NEMA 4X. 2. BOXES FOR AREAS CLASSIFIED AS HAZARDOUS LOCATIONS, WHERE REQUIRED BY NEC,

c. BOXES WHERE CONDUITS ENTER BUILDING OR STRUCTURE BELOW GRADE SHALL

1. ALLEN-BRADLEY COMPANY, BULLETIN, MODEL 1492, GENERAL ELECTRIC COMPANY

2. 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.

1.PULLBOXES UNDERGROUND SHALL BE PRECAST POLYMER CONCRETE.

1. MATERIAL: CAST GRAY IRON ALLOY, OR CAST MALLEABLE IRON, OR COPPER FREE ALUMINUM BODIES WITH ZINC ELECTROPLATE AND LACQUER OR ENAMEL FINISH. 2. AMPLE OPENING WITH THREADED CLOSURE FOR ACCESS TO CONDUIT HUB FOR MAKING

3. IN CORROSIVE LOCATIONS, FITTINGS SHALL INCLUDE FACTORY-APPLIED 40-MIL PVC

4. CONSTRUCT FITTING TO ALLOW 40 PERCENT CROSS-SECTIONAL FILL. 5. 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

6. SEALING FITTING, FIBER, AND SEALING COMPOUND SHALL CONFORM TO UL 886 7. CROUSE HINDS COMPANY, APPLETON ELECTRIC COMPANY, OR APPROVED EQUAL

1. TYPE: FUSED OR UNFUSED, HORSEPOWER RATED, HEAVY-DUTY, SINGLE THROW, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES IN THE "OFF" POSITION AND

2. 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

3. SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR

1. TYPE: UNFUSED, HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES

2. 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

3. SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR

GENERATOR RECEPTACLE

A.POWER RECEPTACLES:

1. 480V INTERLOCKED RECEPTACLE WITH ENCLOSED SAFETY SWITCH SERVICE OUTLET. PROVIDE SERVICE OUTLETS, QUANTITY AS SHOWN OR INDICATED, FOR PORTABLE EQUIPMENT

- 2. MATERIAL: COPPER-FREE ALUMINUM ENCLOSURES WITH OPERATING HANDLE NEMA 4, WITH GASKETED, HINGED DOOR.
- 3. 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.
- 4. RECEPTACLE: SINGLE GROUND RECEPTACLE, THREE WIRE, FOUR-POLE, 600-VOLT. PROVIDE MATCHING PLUGS
- 5. APPLETON, TYPE WSR, AND TYPE APS PLUGS BY CROUSE-HINDS, OR APPROVED EQUAL. 6. ENCLOSURE: NEMA 4X.

LOW VOLTAGE RECEPTACLES

A.GROUND FAULT INTERRUPTING RECEPTACLES:

- 1. 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.
- 2. GROUND FAULT INTERRUPTING RECEPTACLES SHALL COMPLY WITH UL 943.
- 3. PROVIDE TYPE 302 STAINLESS STEEL COVER-PLATE CONFORMING TO UL 514D. PROVIDE WEATHERPROOF-WHILE-IN-USE COVER WHERE SHOWN ON THE DRAWINGS AS "WP" OR "WPU", AND PROVIDE WHERE LOCATED IN WET OR CORROSIVE LOCATION.
- 4. GFR5362SGY BY HUBBELL, INC., 2091-GRY BY PASS & SEYMOUR., OR EQUAL.
- 5. WEATHER-RESISTANT GROUND FAULT INTERRUPTING RECEPTACLES: 2095TRWRGRY BY PASS & SEYMOUR, OR EQUAL.

PANELBOARD

A.GENERAL

- 1. RATING: VOLTAGE RATING, CURRENT RATING, NUMBER OF PHASES, NUMBER OF WIRES AND NUMBER OF POLES AS SHOWN OR INDICATED ON THE DRAWINGS
- 2. 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.
- 3. 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.
- 4. 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.
- 5. MAIN: PANELBOARDS SHALL HAVE MAIN CIRCUIT BREAKER, UNLESS THE DRAWINGS SPECIFICALLY INDICATE MAIN LUGS ONLY.
- 6. CONNECT BRANCH CIRCUIT BREAKERS FOR SEQUENCE PHASING.
- 7. ENCLOSURES: PANEL ENCLOSURES SHALL BE NEMA 4X
- 8. CONSTRUCTION: CODE-GRADE STEEL, AMPLE GUTTER SPACE, FLUSH DOOR, FLUSH SNAP LATCH AND LOCK. PANELBOARDS SHALL COMPLY WITH NEMA PB 1 AND UL 67.
- 9. TRIM: SURFACE 10. DIRECTORY: TYPED OR COMPUTER-PRINTED CARD, WITH TRANSPARENT PROTECTIVE COVER IN FRAME ON BACK OF DOOR GIVING CIRCUIT NUMBERS AND AREA OR
- EQUIPMENT SERVED.
- 11. IDENTIFICATION: IDENTIFICATION SHALL INDICATE PANEL NUMBER AND VOLTAGE.
- 12. PROVIDE SURGE PROTECTION DEVICE IF INDICATED ON THE DRAWING.
- B. INTEGRATED PANEL BOARD AND TRANSFORMER
- 1. UNIT SHALL CONSIST OF ENCAPSULATED DRY-TYPE TRANSFORMER, PRIMARY, AND SECONDARY MAIN CIRCUIT BREAKERS, AND SECONDARY PANEL BOARD ALL IN ONE ENCLOSURE.
- 2. TRANSFORMER RATING: KVA, PRIMARY VOLTAGE, SECONDARY VOLTAGE, FREQUENCY,
- AND NUMBER OF PHASES SHALL BE AS SHOWN OR INDICATED ON THE DRAWINGS. 3. 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.
- 4. MINI-POWER ZONE BY SQUARE D, MINI-POWER CENTER BY EATON, PANEL TRAN BY ACME ELECTRIC CORPORATION, OR EQUAL.

	BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHEET TITLE	SCALE:
			PROJECT NO .:	WI001605.0001	ANSUL FTC SITE		
		FOR	FILE NAME:	DRAFT-6_G7-SPECIFIC	ATIONS (SHEET 4 OF 5)		
		CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	SPECIFICATIONS (SHEET 4 OF 5)	6
			DRAWN BY:	EE			
			CHECKED BY:	MA			SHEET OF 1
W	EE				ARCADIS PROJ. NO. WI001605.0001		

ARCADIS PROJ. NO. WI001605.0001	CHECKED BY: MA	IGN PACKAGE ISSUED FOR REVIEW EE	0 08/20/18 DES		COPYRIGHT: 2015
	DRAWN BY: EE				ARCHITECTURAL AND ENGINEERING SERVICES, INC.
DITCH INTERIM ACTION DESIGN	NSTRUCTION DESIGNED BY: BV	CO1			LEGAL ENTITY: ARCADIS U.S., Inc.
3-SPECIFICATIONS (SHEFT 5 OF 5)	NOT PROJECT NO.: WIOO1605.00				ARCADIS
MARINETTE, WI	DATE: 08/20/18	ISSUED FOR BY SEALS	NO. DATE	CONSULTANTS	
MANUFACTURER'S RECOMMENDED REPAIR COMPOUND, APPLIED IN ACCORDANC MANUFACTURER'S DIRECTIONS. REPAIR HOT-DIP GALVANIZED COATINGS IN ACCORDANCE WITH ASTM A780.	O FULL HEIGHT OF FABRIC, WITH MINIMUM E ONE STRETCHER BAR FOR EACH GATE AND POST, EXCEPT WHERE FABRIC IS INTEGRALLY	STRETCHER BARS: ONE-PIECE LENGTHS EQUAL T CROSS_SECTION OF 3/16-INCH BY 3/4-INCH. PROVID END-POST, AND TWO FOR EACH CORNER- AND PULL- WOVEN INTO THE POST	D S RECOMMENDATIONS AND	HAT IS IN COMPLIANCE WITH MANUFACTURER	C. HANDLING OF MATERIALS: 1. HANDLE MATERIAL IN MANNER TI THAT AVOIDS DAMAGING COATIN
A. REPAIR COATINGS DAMAGED IN THE SHOP OR AT THE SITE BY RECOATING WITH	ND LOOP-TYPE CAPS FOR LINE POSTS.	2. PROVIDE CONE-TYPE CAPS FOR TERMINAL POSTS A	MBER. PROVIDE FOR FREE DF THE FENCING.	IANNER THAT WOULD CREATE A HUMIDITY CHA	2. DO NOT STORE MATERIAL IN A M MOVEMENT OF AIR UNDER PROT
FENCE OPPOSITE FABRIC SIDE. PEEN ENDS OF BOLTS OR SCORE THREADS TO PI REMOVAL OF NUTS.	S. PROVIDE ONE CAP FOR EACH POST UNLESS POST-TOP CAP AND BARBED WIRE SUPPORTING	WEATHER-TIGHT CLOSURE CAP, FOR TUBULAR POSTS EQUAL PROTECTION IS AFFORDED BY COMBINATION F ARM, WHERE BARBED WIRE IS REQUIRED.	D AWAY FROM OTHER	VEATHERPROOF COVER, OFF THE GROUND ANI	B. STORAGE OF MATERIALS: 1. STORE ALL MATERIALS UNDER W
 F. TIE WIRES: USE U_SHAPED WIRES CONFORMING TO DIAMETER OF PIPE. CLASP F FABRIC FIRMLY WITH ENDS TWISTED AT LEAST TWO FULL TURNS. BEND ENDS OF TO MINIMIZE HAZARD TO PERSONS AND CLOTHING. G. FASTENERS: INSTALL NUTS FOR TENSION BAND AND HARDWARE BOLTS ON SIDE 	NUM PER SQUARE FOOT OF WIRE SURFACE,	STEEL WIRE COATED WITH 0.40-OUNCES OF ALUMI MINIMUM, IN COMPLIANCE WITH ASTM F1664. 1. LOCATE AT BOTTOM OF FABRIC ONLY. POST CAPS: PRESSED STEEL, WROUGHT IRON,	VITH ALL FACTORY-APPLIED CCURATELY REPRESENTING	IPLY WITH CLFMI CLF 2445. CTURER'S ORIGINAL, UNOPENED PACKAGING W TIFYING INFORMATION INTACT, LEGIBLE AND AC TTALS.	A. DELIVERY OF MATERIALS: A. DELIVERY OF MATERIALS: 1. PACKAGING AND MARKING: COMI 2. DELIVER MATERIALS IN MANUFAC TAGS, LABELS AND OTHER IDENI MATERIAL ON APPROVED SUBMI
 CHAIN-LINK FABRIC. 2. FASTEN BOTTOM TENSION WIRE WITHIN BOTTOM SIX INCHES OF CHAIN-LINK FAI 3. TIE TENSION WIRE TO EACH POST WITH NOT LESS THAN SIX-GAGE GALVANIZED E. STRETCHER BARS: THREAD THROUGH OR CLAMP TO FABRIC FOUR INCHES ON CE AND SECURE TO POSTS WITH METAL BANDS SPACED 15 INCHES ON CENTERS. 	ON CENTERS. USE NINE-GAGE, ALUMINUM ALLOY 1100-H4, SPACED TWO FEET ON CENTERS. E, ALUMINUM ALLOY 1100-H4, PVC-COATED WIRE TWO FEET ON CENTERS.	TIES TO MATCH FENCE FABRIC, SPACED 12 INCHES (2. FOR TYING FABRIC TO RAILS AND BRACES, PVC-COATED WIRE TIES TO MATCH FENCE FABRIC, S 3. FOR TYING FABRIC TO TENSION WIRE, USE 11-GAGE HOG RING TIES TO MATCH FENCE FABRIC, SPACED T	FICATIONS FOR ALL FENCING WING: /ITH ASTM A428. /TM A90.	ECHNICAL PRODUCT INFORMATION, AND SPECI LIARY SYSTEM COMPONENTS. ATERIALS PROPOSED COMPLY WITH THE FOLLO ING ON WIRE FABRICATIONS, IN COMPLIANCE WITH AS N PIPE FABRICATIONS, IN COMPLIANCE WITH AS	a. COPIES OF MANUFACTURER'S TE COMPONENTS, INCLUDING AUXIL b. DATA SUBSTANTIATING THAT MA 1) WEIGHT OF ALUMINUM COATIN 2) WEIGHT OF ZINC COATING ON
 SELVAGE. JOIN ROLL OF CHAIN-LINK FABRIC BY WEAVING A SINGLE PICKET INTO THE END: ROLL TO FORM CONTINUOUS MESH. D. TENSION WIRE: STRETCH TENSION WIRE TAUT AND FREE OF SAG, FROM END TO END OF EACH STRETCH OF FENCE AND POSITION AT A HEIGHT THAT WILL ENABLE THE WIRE T FASTENED TO CHAIN-LINK FARRIC BY SECURING WITHIN THE TOP 12 INCHES OF 	LIES AT END AND GATE POSTS, AND AT BOTH L BRACE LOCATED AT MID_HEIGHT OF FABRIC. ER LINEAR FOOT FOR HORIZONTAL BRACE AND AGONAL TRUSS. = ALLIMINI M ALLOY 1100-H4 EVG-COATED WIRE	POST BRACE ASSEMBLY: PROVIDE BRACING ASSEMB SIDES OF CORNER AND PULL POSTS, WITH HORIZONTA 1. USE 1.900-INCH OD PIPE WEIGHING 2.72 POUNDS P 3/8-INCH DIAMETER ROD WITH TURNBUCKLE FOR DIA AUXILIARY FENCING MATERIALS AND ACCESSORIES WIRE TIES: 1 FOR TYING FARRIC TO LINE POSTS LISE NINE-GAGE	J. SEMBLY, IDENTIFYING ALL ACES, SUPPORTS AND OTHER SHOW GATE SWING, OR OTHER ND SECTIONS, WITH REQUIRED AGE, ATTACHMENTS, AND A	H EQUAL TO ONE FOOT OF TYPICAL FENCE ASS , WEIGHTS, AND FINISHES OF RAILS, POSTS, BR FENCE HEIGHTS, AND LOCATIONS OF GATES. \$ CCESSORIES. INCLUDE PLANS, ELEVATIONS, AN CLEARANCES, AND DETAILS OF POST ANCHOR/	 SHOP DRAWINGS: DRAWINGS AT SCALE OF 1/4-INCH MATERIALS, DIMENSIONS, SIZES, FENCING COMPONENTS. SHOW I OPERATION, HARDWARE, AND AC INSTALLATION AND OPERATING OBRACING.
 SPACED AT MAXIMUM 12 INCHES ON POSTS AND TWO FEET ON RAILS. CONNECT TENSION BARS TO POSTS AND FRAMES BY MEANS OF ADJUSTABLE B AND BANDS SPACED NOT MORE THAN 14 INCHES APART. LEAVE APPROXIMATELY TWO INCHES BETWEEN FINISH GROUND SURFACE AND 	APES PRODUCED FROM STRUCTURAL-QUALITY 1 MINIMUM YIELD STRENGTH OF 45,000 POUNDS TO ASTM F1043, AS SPECIFIED.	ROLL-FORMED STEEL: PROVIDE ROLLED STEEL SHA STEEL CONFORMING TO ASTM A1011, GRADE 45, WITH PSI. PROTECTIVE COATING SYSTEM SHALL CONFORM		FOLLOWING:	18. CLFMI, STEP-BY-STEP INSTALLAT 18. SUBMITTALS A. ACTION SUBMITTALS: SUBMIT THE F
 INSTALL FABRIC ON LAND SIDE OF FENCE, AND ANCHOR TO FRAMEWORK SO TH FABRIC REMAINS IN TENSION AFTER PULLING FORCE IS RELEASED. FASTEN TO TERMINAL POSTS AND GATE POSTS WITH TENSION BARS THREADED THROUGH AND SECURED WITH TENSION BANDS AT MAXIMUM INTERVALS OF 14 INCHES. THE TO LINE_POSTS GATE FRAMES AND TOP AND BOTTOM RAILS WITH THE WIRE 	E CENTER RAILS BETWEEN LINE POSTS, WHERE CH OD PIPE WEIGHING 2.27 POUNDS PER LINEAR	Post. Center Rails Between Line Posts: Provide Shown, consisting OF 1.660-ing Foot.	/ETAL INDUSTRIAL CHAIN LINK VANIZED) WELDED, FOR FENCE	R STRENGTH AND PROTECTIVE COATINGS ON N R PIPE, STEEL, HOT-DIPPED ZINC-COATED (GAL)	 ASTM F1043, SPECIFICATION FOF FENCE FRAMEWORK. ASTM F1083, SPECIFICATION FOF STRUCTURES. CLEMI CLE 2445, BEODUCT MANULARIA
UNDER PROPER TENSION. INSTALL BRACE ASSEMBLIES AT END-POSTS AND AT SIDES OF CORNER- AND PULL-POST PANELS. PANELS ADJACENT TO GATES SHA INTERMEDIATE HORIZONTAL RAILS AND DIAGONAL BRACING. DIAGONAL BRACIN SHALL RUN FROM CENTER OF FIRST LINE-POST TO BOTTOM OF TERMINAL-POST C. CHAIN-LINK FABRIC:	IEAR FOOT. 3, WITH EXPANSION-TYPE COUPLING 0.051-INCH ES LONG, FOR EACH JOINT. RELY TO EACH GATE, CORNER, PULL, AND END	 TOP RAIL: PROVIDE TOP RAILS, UNLESS OTHERWISE FOLLOWING: 1. 1.900 INCH OD PIPE WEIGHING 2.72 POUNDS PER LIN 2. PROVIDE IN MANUFACTURER'S LONGEST LENGTHS THICK RAIL SLEEVES, APPROXIMATELY SEVEN INCHI 3. PROVIDE MEANS FOR ATTACHING TOP RAIL SECUE 	H. ZINC-IRON ALLOY-COATED	INC. ATING TO CHAIN LINK FENCING. ALLATION OF CHAIN-LINK FENCE. FENCE FITTINGS. STEEL SHEET, ZINC-COATED (GALVANIZED) OR IP PROCESS	 ASTM B6, SPECIFICATION FOR ZII ASTM F552, TERMINOLOGY RELA ASTM F567, PRACTICE FOR INSTA ASTM F626, SPECIFICATION FOR ASTM A653, SPECIFICATION FOR (GALVANNEALED) BY THE HOT-DI
 TO RECEIVE TOP RAIL. TOP RAILS: RUN RAIL CONTINUOUSLY THROUGH POST CAPS OR EXTENSION ARI BENDING TO RADIUS FOR CURVED RUNS. PROVIDE EXPANSION COUPLINGS AS RECOMMENDED BY FENCING MANUFACTURER TO FORM CONTINUOUS RAIL BET TERMINAL POSTS. BRACE ASSEMBLIES: INSTALL BRACES SO POSTS ARE PLUMB WHEN DIAGONAL I 	IMUM SIZES AND WEIGHTS: AR FOOT.	Line Posts: Provide Line Posts of Following Mini 1. Up to six feet fabric height: 1.90 inches od Pipe Weighing 2.72 Pounds Per Line	FABRIC. DT-DIP GALVANIZED COATINGS. F. NK FENCE FABRIC. ED, CARBON, STRUCTURAL, FMABILITY, AND ULTRA-HIGH G	ALUMINUM-COATED STEEL CHAIN-LINK FENCE AIR OF DAMAGED AND UNCOATED AREAS OF HO METALLIC-COATED STEEL WIRE FOR CHAIN-LIN TION FOR STEEL, SHEET AND STRIP, HOT-ROLLE GH-STRENGTH LOW-ALLOY WITH IMPROVED FO	 6. ASTM A491, SPECIFICATION FOR 7. ASTM A780, PRACTICE FOR REPA 8. ASTM A817, SPECIFICATION FOR 9. ASTM A1011/A1011M, SPECIFICAT 9. HIGH-STRENGTH LOW-ALLOY, HID STRENGTH.
 B. POSTS AND RAILS: 1. LINE POSTS: INSTALL POSTS TO CONCRETE STRUCTURE SPACED NOT MORE TH FEET ON CENTERS. PROVIDE CAPS ON TOP OF EACH POST TO EXCLUDE MOIST 	EAR FOOT.	Sizes: 1. Up to six feet fabric height: 2.375 inches od Pipe Weighing 3.65 pounds per lin	IN AND STEEL PRODUCTS STEEL HARDWARE. UM-COATED IRON OR STEEL E.	DN FOR ZINC COATING GALVANIZED) COATINGS ON IRC DN FOR ZINC COATING (HOT-DIP) ON IRON AND (D FOR WEIGHT [MASS] OF COATING ON ALUMINI	 ASTM A123, SPECIFICATION FOR 4. ASTM A153/A153M, SPECIFICATIC 5. ASTM A428/A428M, TEST METHOD ARTICLES.
3.2 ERECTION A. COMPLY WITH CLFMI STEP-BY-STEP INSTALLATION GUIDE AND ASTM F567. DO NO INSTALLATION AND ERECTION OF FENCING UNTIL FINAL GRADING IS COMPLETED.	ver, and pull posts of following minimum	FITTINGS: COMPLY WITH ASTM F626. END, CORNER, AND PULL POSTS: PROVIDE END, CORN	ATED, WELDED AND SEAMLESS C STEEL ARTICLES WITH ZINC D	FOR WEIGHT [MASS] OF COATING ON IRON AND	1. ASTM A53, SPECIFICATION FOR F 2. ASTM A90/A90M, TEST METHOD F OR ZINC-ALLOY COATINGS.
A. EXAMINE CONDITIONS UNDER WHICH THE WORK WILL BE ERECTED AND NOTIFY ENGINEER IN WRITING OF CONDITIONS DETRIMENTAL TO PROPER AND TIMELY COMPLETION OF THE WORK. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.	L PIPE WITH STANDARD-WEIGHT WALLS. STEEL PLY WITH ASTM F1083, SCHEDULE 40 PIPE WITH TED WITH ZINC, AS SPECIFIED.	PIPE SHALL BE COMMERCIAL GRADE, PLAIN-END STEE STRIP USED FOR MANUFACTURE OF PIPE SHALL COM MINIMUM YIELD STRENGTH OF 25,000 PSI AND PROTEC	Ŗ	HEET G1	B. RELATED DOCUMENTS: 1. SEE INDEX TO DRAWINGS ON SH 1.2 REFERENCES A STANDARDS REFERENCED IN THIS O
1/16-INCH IN 10 FEET WITHOUT WARP OR RACK IN THE FINISHED WORK. PART 3 - EXECUTION 3.1 INSPECTION	3-1/2 4 6-5/8 8-5/8	5.500 5.0 4.000 3.5 6.625 6.0 8.625 8.0	D INCIDENTALS AS SHOWN,	ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AN URNISH AND INSTALL FENCING. OR INDICATED.	A. SCOPE: 1. CONTRACTOR SHALL PROVIDE A SPECIFIED, AND REQUIRED TO FI 2. EXTENT OF FENCING IS SHOWN (
 2.5 SOURCE QUALITY CONTROL A. FABRICATION TOLERANCES: 1. FABRIC, POSTS, RAILS, AND OTHER SUPPORTS SHALL BE STRAIGHT OR UNIFOR CURVED TO PROVIDE THE PROFILES SHOWN, TO DIMENSIONAL TOLERANCE OF 	2-1/2	1.900 1.5 2.375 2.0 2.875 2.5 2.500 2.5			1.1 DESCRIPTION
 J. WELDED JOINTS: 1. REPAIR ZINC COATINGS AT WELDED JOINTS BY APPLYING ZINC-RICH PAINT THA COMPLIES WITH ASTM A780. 	1-3/8 1-5/8	ACTUAL OD (INCHES) INPO SIZE (INCHE 1.315 1.0 1.660 1.3	DE 6 INCHES (MINIMUM) OTHER SURFACE	DDITIONAL TOPSOIL AS NECESSARY TO PROVIE AREA UNLESS OTHERWISE NOTED TO RECEIVE	D. CONTRACTOR SHALL PROVIDE AL OF TOPSOIL AT ALL DISTURBED A TREATMENT. CHAIN LINK FENCING
C. HARDWARE AND ACCESSORIES: ZINC WEIGHTS IN COMPLIANCE WITH TABLE 1 ASTM A153.	L OD AND EQUIVALENT NOMINAL NPS SIZE AND	GENERAL: THE FOLLOWING TABLE PRESENTS ACTUAL TRADE SIZE OF ROUND MEMBERS:	A URBANCE FOR REUSE	STOCKPILE TOPSOIL FORM THE AREA OF DIST	C. CONTRACTOR SHALL STRIP, AND UPON FINAL SITE RESTORATION.
 e. PIPE: ASTM A53 2. PROVIDE MINIMUM WEIGHTS OF ZINC AS FOLLOWS: a. PIPE: 1.8-OUNCES OF ZINC PER SQUARE FOOT. APPLY TYPE A COATING BOTH AND OUTSIDE ACCORDING TO ASTM F1043, AS DETERMINED BY ASTM A90. b. ROLLED-FORM SHEET STEEL: 4.0-OUNCES OF ZINC PER SQUARE FOOT OF SUR ABEA 		 A. FABRIC GAGE: PROVIDE THE FOLLOWING: a. NO. 9-GAGE WIRES. b. MESH SIZE: PROVIDE THE FOLLOWING: TWO-INCH MESH. FRAMEWORK 	AVE ITS STUMP AND E REMOVAL OF ANY HARACTERISTICS OF -INCH LIFTS AND 2.2	RED ON THE DAM EMBANKMENT SHALL ALSO H OR LARGER. EXCAVATION RESULTING FROM TH 3E BACKFILLED WITH MATERIAL MEETING THE C T MATERIAL. BACKFILL SHALL BE PLACED IN 12: 5% OF STANDARD PROCTOR.	B. ANY WOODY DEBRIS ENCOUNTEF ROOTS REMOVED TO 2 INCHES O STUMPS AND/OR ROOTS SHALL B THE EXISTING DAM EMBANKMENT COMPACTED TO A MINIMUM OF 92
 b. ROLLED-FORM SHEET STEEL: ASTM A653 c. HARDWARE AND ACCESSORIES: ASTM A153 d. FITTINGS: ASTM F626 	URER'S TRADE NAME, COUNTRY OF ORIGIN, ? GAGE. !E OF SHARP EDGES.	CORE WIRE GAGE, AND FINISHED OUTSIDE DIAMETER	LITY. NO ON-SITE	E DISPOSED OF OFF-SITE AT A PERMITTED FACI	A. ANY CLEARING DEBRIS SHALL BE BURNING OF CLEARING DEBRIS W
 GALVANIZING: ZINC FOR GALVANIZING SHALL BE OF HIGH GRADE OR SPECIAL H GRADE CONFORMING TO ASTM B6 WITH MAXIMUM ALUMINUM CONTENT OF 0.01 PERCENT. GALVANIZE METAL USING HOT-DIP PROCESS IN ACCORDANCE WITH FOLLOWING: a. STRUCTURAL IRON AND STEEL SHAPES: ASTM A123 	XAL DIAGONALS OF APPROXIMATELY-UNIFORM COMPLIANCE WITH ASTM A817, TYPE 1, REAKING STRENGTH OF 2,170 POUNDS AND BRIC SHALL BE AS RECOMMENDED BY CLFMI	WITH PARALLEL SIDES AND HORIZONTAL AND VERTIC DIMENSIONS, OF SIZE AND GAGE SPECIFIED AND IN C COLD-DRAWN CARBON STEEL WIRE WITH MINIMUM BI COATED WITH ALUMINIZED FINISH, AS SPECIFIED. FAI FOR HEAVY INDUSTRIAL USAGE.	IR EQUAL.	THE REQUIREMENTS OF OHIO DOT, ITEM 653 O	A. IMPORTED TOPSOIL SHALL MEET PART 3 - EXECUTION 3.1 GENERAL
I. ACOMINIZED FINISH WITH NOT LESS THAN 0.40 CONCES ACOMINOW FER SQUARE COMPLYING WITH ASTM A491, CLASS II. I. FRAMEWORK AND APPURTENANCES: PROVIDE THE FOLLOWING FINISHES FOR ST FRAMEWORK. AUXILIARY SYSTEM COMPONENTS. AND MISCELLANEOUS ACCESSC	ND LESS IN HEIGHT, COMPLYING WITH CLFMI A OF APPROXIMATELY-UNIFORM SQUARE MESH	CHAIN-LINK FENCE FABRIC: . ONE-PIECE FABRIC WIDTHS, FOR FENCING 12 FEET AN CLF 2445. . WIRE MESH SHALL BE WOVEN THROUGHOUT IN FORM	σ		1. DRAWINGS. PART 2 - PRODUCTS 2.1 GENERAL
FOR THER SHOWN ON THE DRAWINGS. PLATES AND COMPLETED WELDS SHALL B GALVANIZED ALONG WITH THE POSTS. 4. FINISHING H. CHAIN-LINK FENCE FABRIC:	S ON WIRE AND PIPE FABRICATIONS IN PIPE FABRICATIONS IN ACCORDANCE WITH	 PROVIDE WEIGHTS OF ZINC AND ALUMINUM COATING ACCORDANCE WITH CLFMI CLF 2445. PROVIDE THICKNESS OF PVC COATING ON WIRE AND CLFMI CLF 2445. 	CIDENTALS REQUIRED	ded. De All Labor, Materials, equipment and ing Ary Clearing and grubbing work.	MARCH 31 AND WILL BE AVOID 2. CONTRACTOR SHALL PROVID TO COMPLETE THE NECESSA B. RELATED DOCUMENTS:
GUINELY, FOR STEEL RODS, 3/8-INCH DIAMETER, MERCHANT QUALITY WITH TURNI G. MOUNTING PLATES: PROVIDE MOUNTING PLATES THAT ARE WELDED TO THE POS	E DIMENSIONS. AND WIRE COMPANY GAGE. PROTECTIVE COATINGS TO METAL. PROTECTIVE COATINGS ARE IN ADDITION TO	2. ROLL-FORMED SECTION SIZES ARE NOMINAL OUTSIDE 3. WIRE GAGES SHALL CONFORM TO AMERICAN STEEL / 3. HEAT-FORM ARCS AND CHORDS BEFORE APPLYING P 4. HEAT-FORM ARCS AND CHORDS BEFORE APPLYING P 5. SIZES SPECIFIED ARE GIVEN FOR UNCOATED METAL.	ITHIN THE AREA OF REES GREATER THAN EEN OCTOBER 1 AND	AND GRUB THE SITE OF ANY WOODY DEBRIS W ENCEMENT OF CONSTRUCTION. REMOVAL OF T METER AT BREAST HEIGHT SHALL OCCUR BETW	A. SCOPE: 1. CONTRACTOR SHALL CLEAR , WORK PRIOR TO THE COMME OR EQUAL TO 3 INCHES DIAM
E. STRETCHER BAR BANDS: PRESSED STEEL, GALVANIZED, 0.078-INCH TO 0.108-INCH DEPENDING ON POST DIAMETER, SPACED NOT GREATER THAN 15 INCHES ON CEN SECURE STRETCHER BARS TO END-, CORNER-, PULL-, AND GATE-POSTS. BANDS MAY ALSO BE USED WITH SPECIAL FITTINGS FOR SECURING RAILS TO CORNER-, PULL-, AND GATE-POSTS 	NON	2 - PRODUCTS MATERIALS GENERAL: TUBE SIZES SPECIFIED ARE NOMINAL OUTSIDE DIMEN	PAR 2.1 A		<u>SITE CLEARING AND GRUBBING</u> PART 1 - GENERAL 1.2 DESCRIPTION

User: JVALLEN Spec:AUS-NCSMDD File: G:\APRDJECT\TYCD\W1001605\CADD\DITCH INTERIM ACTION\DITCH A ONLY PACKAGE\SUBMITTED 08202018_DRAFT AND PC STAMP REMOVED\DRAFT-7_G8-SPECIFICATIONS (SHEET 5 OF 5). DWG Scale: 1:1 SavedDate: 8/17/2018 Time: 11:04 Plot Date: Allen, Jonathan V.; 8/20/2018; 12:01

INDERICAN STEEL AND WIRE COMPAN
RM TO AMERICAN STEEL AND WIRE COMPAN
RDS BEFORE APPLYING PROTECTIVE COATIN
FOR UNCOATED METAL. PROTECTIVE COAT

N CENTERS TO LS TO END-,

WALL SLEEVE AND SEAL SYSTEM:

- URNBUCKLE. E POSTS AS ALL BE

- JARE FOOT,
- DR STEEL ESSORIES: IAL HIGH 0.01 WITH THE

- OTH INSIDE). SURFACE LE 1 OF

- THAT

- IFORMLY E OF

- DO NOT BEGIN ETED.
- RE THAN TEN IOISTURE AND
- IN ARMS, SS AS L BETWEEN DNAL ROD ARE ND AT BOTH S SHALL HAVE RACING POST.
- SO THAT IN TO IUGH MESH ES. NIRES
- LE BOLTS
- AND BOTTOM
- ENDS OF

- ACH IRE TO BE S OF
- IK FABRIC. IIZED WIRE.
- ON CENTERS, RS.
- ASP PIPE AND IS OF WIRE
- SIDE OF TO PREVENT

VITH DANCE WITH

AE: DRAFT-7_G8-SPECIFICATIONS (SHEET 5 OF 5)	NO.: WIDO1605.0001 ANSUL FTC SITE	08/20/18 MARINETTE, WI	
	SITE	, WI	

SPECIFICATIONS (SHEET 5 OF 5)	 PVC-COATED CONDUIT FITTINGS MATERIAL AND CONSTRUCTION: MALLEABLE IRON WITH STANDARD FINISH AND 40-MIL PVC EXTERIOR OF ADAPT THE CONDUIT TO STANDARD THREADED CONNECTIONS AND SH DIAMETER NOT LESS THAN THAT OF THE CORRESPONDING STANDARD MANUFACTURERS: MANUFACTURERS: ROBROY INDUSTRIES PERMACOTE INDUSTRIES OCAL, INC APPROVED EQUAL. 	FLEXIBLE CONDUIT (NON-HAZARDOUS CLASS 1, DIVISION 2 HAZARDOUS AREAS) A. MATERIAL: A. MATERIAL: 1) FLEXIBLE GALVANIZED STEEL CORE WITH SMOOTH, ABRASION-RESIST/ CHLORIDE COVER. CONTINUOUS COPPER GROUND BUILT IN FOR SIZES MATERIAL SHALL BE UL LISTED. B. MANUFACTURERS: 1) ANACONDA SEALTITE TYPE UA BY ANAMET ELECTRICAL, INC. 2) LIQUATITE TYPE L.A. BY ELECTRIC-FLEX COMPANY 3) OR APPROVED EQUAL.	 SEALING BUSHING A. FOR CONDUITS PASSING THROUGH EXTERIOR MASONRY BLOCK WALLS OR T HOLES IN EXTERIOR SUBSURFACE WALLS, EXTERIOR CONCRETE WALLS, FLC FOR CONDUIT PASSING THROUGH INTERIOR CONCRETE WALLS OR FLOORS / BLOCK WALLS. B. CSMI SEALING BUSHING AT THE INSIDE OF THE STRUCTURE AND TYPE CSMC OUTSIDE OF THE STRUCTURE BY 0-Z/GEDNEY, OR APPROVED EQUAL. 	RIGID CONDUITS 1. PVC-COATED RIGID STEEL CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLE". A. MATERIAL: 1.) RIGID, HEAVY-WALL, MILD STEEL, HOT-DIP GALVANIZED, SMOOTH URET TAPERED THREADS, CAREFULLY REAMED ENDS, 3/4-INCH NPS MINIMUN EXTERIOR COATING OF 40-MIL THICK PVC. B. COLOR: 1.) COLOR OF COATING SHALL BE THE SAME ON ALL CONDUIT AND FITTING C. MANUFACTURERS: 1.) ROBROY INDUSTRIES 2.) PERMA-COTE INDUSTRIES 3.) OR APPROVED EQUAL	 PRECAST CONCRETE SECTIONS: ASTM C478. BASE RISER SECTION WITH INTEGRAL FLOOR. PROVIDE GRADE RISER SECTIONS WITH RUBBER GASKET JOINTS. PROVIDE GRADE RINGS AS SHOWN WITH MINIMUM HEIGHT OF 4 INCHES AND M/ RUBBER GASKET JOINTS: ASTM C443. RESILIENT CONNECTORS: ASTM C923 PROVIDE RESILIENT CONNECTORS FOR CONNECTING PIPES AS SHOWN. MANHOLE STEPS: ASTM C478, REINFORCED POLYPROPYLENE. CASTING: ASTM A48, CLASS 35B HEAVY DUTY, GRAY IRON, UNCOATED. EJ SERIES 1040 FRAME AND COVER WITH FACTORY INSTALLED GASKET SEAL. 	 PRODUCT DATA: MANUFACTURERS LITERATURE, ILLUSTRATIONS, SP ENGINEERING DATA INCLUDING DIMENSIONS, MATERIALS, SIZE WEIG DATA. PART 2 - PRODUCTS 2.1 WALL SLEEVE A. WALL SLEEVE CONSTRUCTED OF 1/4-INCH CARBON STEEL WITH EPOXY C MANUFACTURED BY TRUMBULL INDUSTRIES, INC. OR EQUAL. B. COORDINATE WALL SLEEVE SIZE BASED ON PIPE AND MECHANICAL SEAL 2.2 MECHANICAL SEAL A. PROVIDE ENGINEERED MECHANICAL SEAL SYSTEM CONSISTING OF EPDM INTERLOCK AND EXPAND TO SEAL ANNULAR SPACE BETWEEN PIPE AND V SHALL BE MANUFACTURERED BY GPT INDUSTRIES, LINK SEAL SYSTEM OI B. COORDINATE MECHANICAL SEAL SYSTEM BASED ON PIPE AND WALL SLEEVE PART 3 - EXECUTION 3.1 INSTALLATION A. INSTALL MECHANICAL SEAL SYSTEM PER MANUFACTURE'S INSTRUCTIONS B. INSTALL MALL SLEEVE IN ACCORDANCE WITH DETAILS AS SHOWN ON STF B. INSTALL MALL SLEEVE IN ACCORDANCE WITH DETAILS AS SHOWN ON STF B. INSTALL NON-SHRINK GROUT SEAL AS SHOWN ON THE DRAWINGS. PRECAST MANHOLE 	PART 1 - GENERAL 1.1 DESCRIPTION A. SCOPE: 1. PROVIDE FABRICATED CARBON STEEL WALL SLEEVE AND MECHANIC, LOCATIONS SHOWN. B. RELATED DOCUMENTS 1. DRAWINGS 1.2 SUBMITTALS A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
SHEET OF 1	DATING. FITTINGS SHALL ALL HAVE AN INSIDE CONDUIT SIZE.	.NT, LIQUID-TIGHT, POLYVINYL 3/4-INCH THROUGH 1.25-INCH.	HROUGH CORE - DRILLED OR SLABS, ROOF SLABS, AND NND INTERIOR MASONRY SEALING BUSHING AT THE	- BODIES: HANE INTERIOR COATING, SIZE WITH FACTORY	XIMUM HEIGHT OF 15 INCHES.	AT AND PERFORMANCE SYSTEM REQUIREMENTS. SEALANT UNITS THAT VALL SLEEVE. SYSTEM R EQUAL. EVE DIMENSIONS.	AL SEAL SYSTEM AT



	CONSULTANTS	NO. DATE	ISSUED FOR	BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SH
					NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE	
					FOR	FILE NAME:	DRAFT-8_OVERALLSITE	PLAN	
LEGAL ENTITY:					CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	
ARCHITECTURAL AND						DRAWN BY:	EE		
ENGINEERING SERVICES, INC.					-	CHECKED BY:	МА		
COPYRIGHI: 2015		0 08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE				ARCADIS PROJ. NO. WIO01605.0001	

NES /Albre DS, NSD A, USO S, Aemo R.D., Je N, and The G IS User Co	
EET TITLE OVERALL SITE PLAN	SCALE: <u>C</u> 1 SHEET <u>OF 1</u>

	AREA YSTEM 1 FOR DETAILS) DE COUAR (2 FUPE ED AT GRADE LIMIT OF WORK AREA EXISTING WETLAND	EXITING WETLAND EXISTING WETLAND EXISTING WETLAND EXISTING WETLAND EXISTING WATELAND EXISTING WATELAND		
	APPROXIMATE LOCAT	TION OF CHECK DAM	EXISTING WETLAND Con Evel. Earth star Geograp Mas. CN 38 /Alfate DS. USDA.	
CONSULTANTS LEGAL ENTITY: ARCADIS U.S., Inc. ARCHITECTURAL AND ENGINEERING SERVICES, INC. COPYRIGHT: 2015	NO. DATE ISSUED FOR I I I <th>BY SEALS DATE: 08/20/18 I NOT PROJECT NO.: WI001605.0001 I FOR FILE NAME: DRAFT-9_SOUT I DRAWN BY: EE I I CHECKED BY: MA</th> <th>MARINETTE, WI ANSUL FTC SITE INSITEAERIAL DITCH INTERIM ACTION DESIGN ARCADIS PROJ. NO. WI001605.0001</th> <th>SHE</th>	BY SEALS DATE: 08/20/18 I NOT PROJECT NO.: WI001605.0001 I FOR FILE NAME: DRAFT-9_SOUT I DRAWN BY: EE I I CHECKED BY: MA	MARINETTE, WI ANSUL FTC SITE INSITEAERIAL DITCH INTERIM ACTION DESIGN ARCADIS PROJ. NO. WI001605.0001	SHE



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.
- 8. CONTRACTOR SHALL PROVIDE EROSION CONTROL PER THE WDNR STORMWATER BEST MANAGEMENT PRACTICES WITHIN THE LIMIT OF WORK.
- 9. CONTRACTOR SHALL PROVIDE 8 FT WIDE ACCESS ROAD FROM FTC SITE TO CHECK DAM USING NO. 1 STONE WHERE APPROPRIATE.

SCALE:

SHEET

С2

_____ OF ____

IEET TITLE

DITCH A SITE PLAN



COPYRIGHT: 2015

0 08/20/18 DESIGN PACKAGE ISSUED FOR REVI

BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHEET TITLE		SCALE:
	NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE			
	FOR	FILE NAME:	DRAFT-10_CIVIL DETA	ILS			
	CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN		CIVIL DETAILS	\bigcirc
	-	DRAWN BY:	EE				
	-	CHECKED BY:	МА				SHEET OF _1
W EE				ARCADIS PROJ. NO. WI001605.0001			



	ΒY	SEALS	DATE:	08/20/18		MARIN	ETTE, WI		SHEET
		NOT	PROJECT NO .:	WI001605.0001		ANSUL	FTC SITE		
		FOR	FILE NAME:	DRAFT-11_CHECK DAM	DETAIL				
		CONSTRUCTION	DESIGNED BY:	BV	DITCH	INTERIM	ACTION	DESIGN	
			DRAWN BY:	EE					
			CHECKED BY:	MA					
W	EE				ARCADIS PROJ. NC). WI001605.0001			

COPYRIGHT: 2015	ENGINEERING SERVICES, INC.	ARCAUIS U.S., Inc. Architectural and	LEGAL ENTITY:		ションション
					CONSULTANTS
0					NO.
08/20/18					DATE
DESIGN PACKAGE ISSUED FOR					ISSUED FOR

DISCHARGE PIPE

SUCTION PIPE

CONDUIT

8' X 40' CONEX BOX

GENE

User:EEBERT Spec:AUS-NCSMOD File:\\ARCADIS-US.COM\OFFICEDATA\MILWAUKEE-WI\APROJECT\TYCO\WI001605\CADD\DITCH INTERIM ACTION\DITCH A ONLY PACKAGE\SUBMITTED 08202018_DRAFT AND PC STAMP REMOVED\DRAFT-12_MECHANICAL LAYOUT.DWG Scale:1:1 SavedDate:8/20/2018 Time:12:00 Plot Date: Ebert, Liz; 8/20/2018; 1

	0	
	-	
	TT .	
	S	
İ.		

- .-^ Z
- ωN CONTRACTOR SHALL CLEAR TREES AS NECESSARY. STUMPS SHALL BE LEVEL WITH GROUND SURFACE.
 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.
- 4.

TITLE

SHEET	
	\leq
OF	

SCALE:

GENERAL LAYOUT

SYSTEM

LEGAL ENTITY:	
ARCADIS U.S., Inc.	
ARCHITECTURAL AND	
ENGINEERING SERVICES,	IN
COPYRIGHT: 2015	

NO.	DATE	ISSUED FOR	BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHEET
					PROJECT NO.:	WI006105.0001	ANSUL FTC SITE	
				FOR	FILE NAME:	DRAFT-13_PIPING AND	INSTRUMENTATION	
				CONSTRUCTION	DESIGNED BY:	BV	DITCH INTERIM ACTION DESIGN	PIF
				-	DRAWN BY:	JA		
				-	CHECKED BY:	МА		
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	-			ARCADIS PROJ. NO. WI001605.0001	

LEGAL ENTITY: ARCADIS U.S., Inc. ARCHITECTURAL AND ENGINEERING SERVICES, INC. COPYRIGHT: 2015

NO. DATE	ISSUED FOR	BY	SEALS	DATE:	08/20/18	MARINETTE, WI	SHEET TITLE	SCALE:
			NOT	PROJECT NO .:	WI001605.0001	ANSUL FTC SITE		
			FOR	FILE NAME:	DRAFT-14_SINGLE LII	E		
			CONSTRUCTION	DESIGNED BY:	JS	DITCH INTERIM ACTION DESIGN	ELECTRICAL SINGLE LINE DIAGRAM	F 1
			-	DRAWN BY:	ZP			
			-	CHECKED BY:	BV			SHEET OF 1
0 08/20/18 D	DESIGN PACKAGE ISSUED FOR REVIEW	ZP	-			ARCADIS PROJ. NO. WI001605.0001		

- ---- -----GENERATOR-A 40KW/50KVA STAND BY EXTERIOR GENERATOR

SYSTEM A-MCC (480 VAC)											
	VOLTAGE	PHASE	HP	DUTY FACTOR	BREAKER SIZE (AMPS)	CONNECT LOAD - 480V (AMPS)**	DEMAND LOAD - 480V (AMPS)**	kVA			
	480	3	15.00	100.0%	30	21.00	21.00	17.44			
	480	3	5.00	100.0%	15	7.60	7.60	6.31			
		-									
		29	23.75								
						TOTAL ELEC	TRICAL LOAD:	28.57	CONNECTED AMPS		
017 NEC								28.57	DEMAND AMPS		
ΠΟΝ								36	MINIMUM BREAKER SIZE		
								80	MAIN BREAKER		

NOTES:

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

Arcadis U.S., Inc.

126 North Jefferson Street Suite 400 Milwaukee, Wisconsin 53202 Tel 414 276 7742 Fax 414 276 7603

www.arcadis.com