

**Capacity, Management, Operations & Maintenance
(CMOM)**

City of De Pere, Brown County, Wisconsin

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CHAPTER 1 - GOALS

Set Your Goals

The goals of the utility provide direction for collection system operation and maintenance. Setting and achieving goals will move your utility towards an efficient and highly functioning system your community will appreciate.

Collection system goals can be: investigative, rehabilitative, operational, construction-related, budgetary or legal. Goals should be specific, realistic, and achievable. Try to set goals that are measurable quantitatively, such as the task of cleaning a certain percentage of your collection system each year, or reducing the number of basement back-ups or sanitary sewer overflows from the previous year. At the end of each year, evaluate your progress at meeting your goals. Based on your outcomes, set new goals for the next year.

Goals

Describe the specific goals you have for your collection system.

Below are some examples of goals you may want to work on in the upcoming year. Remember to set implementation dates. Every community will have different goals based on their sewer system and budget.

-  Review and update your sewer use ordinance
-  Review and establish safety procedures for your employees
-  Create informational materials to educate your users
-  Implement a Grease Control Inspection Program
-  Clean ___% of your sewer system
-  Identify illegal sump pump hookups
-  Locate specific areas of blockages, identify/control source
-  Design and implement a sewer televising schedule
-  Review budget for repair and rehabilitation projects

Goals can also be qualitative, such as developing a fact sheet to be sent out with the sewer bill with information on illegal sump pump hookups or promotion of low flow shower heads or low flow toilets. Educating your users is an important goal.

CHAPTER 1 – GOALS

INTRODUCTION

This document constitutes the Capacity, Management, Operation & Maintenance (CMOM) Program for the City of De Pere sanitary sewer system. The Wisconsin Administrative Code NR 210.23 (reference Appendix E) requires that all owners of collection systems, including satellite systems, develop and implement a CMOM program by August 1, 2016. A CMOM program regulates the **Capacity** of the sanitary sewer system to convey wastewater; **Manages** the system to prevent problems; **Operates** the system efficiently; and **Maintains** the system to perform at its optimum potential. The goal of the CMOM is to improve maintenance of the system to keep the City in a “preventive” versus “reactive” mode.

The outline of the Wisconsin CMOM booklet published by the Wisconsin Department of Natural Resources was used to format the enclosed CMOM Program.

The City of De Pere consists of approximately 24,000 residents on 12.3 square miles along the Fox River.

The wastewater from the City’s collection system discharges to the Green Bay Metropolitan Sewerage District (GBMSD) wastewater treatment facility located in West De Pere. The GBMSD wastewater treatment plant was purchased from the City on January 1, 2008. The solids generated at the De Pere plant are piped to the Green Bay facility for processing.

The Wisconsin Department of Natural Resources requires that a CMOM program be created by all communities. The CMOM program includes the following components:

- Goals
- Organization including ownership, personnel, internal communication and public information and education.
- Legal authority over sewer use, industrial and residential control programs, private and public sewer components and enforcement actions.
- Operation and Maintenance activities suggested to optimize the performance of the system.
- Design and performance standards to ensure proper installation and design of the system.
- Overflow emergency response plan to ensure the health and safety of the public.
- Capacity assurance review to identify problem areas.
- Annual self audit to manage system performance.
- Special studies to pinpoint areas in the system that may need additional attention.
- Compliance Maintenance Annual Report to promote awareness and responsibility for wastewater conveyance and treatment needs.

GOALS

Specific goals set for the City of De Pere sanitary sewer system are as follows:

- Review older sections of the city where there is high inflow and infiltration. Also to identify solutions for decreasing inflow and infiltration in these areas.
- Eliminate roof drain inflow from downtown business districts.
- Update the City ordinance to require the installation of sump pumps in all properties with foundation plans. Require sump pumps at these locations to discharge to storm sewers (where available) or to grade.
- Continue to replace or line between 1% and 2% of the sanitary sewer system each year.
- Update the ordinance to require businesses with grease traps to provide evidence of cleaning.

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CHAPTER 2 - ORGANIZATION

Know Your Organization

Your organization is very important to how your collection system is managed, operated and maintained. Decisions about capital projects and budget decisions usually come from the governing body of elected officials or owners of the collection system. Committees that serve the governing body are often formed to address and deal with specific issues, such as water and sewage matters. The decisions are usually implemented by those employed by the municipality.

The successful implementation of a CMOM Program is directly related to the organization's structure and communications. In some communities the collection system is part of the wastewater utility, while in others it is part of the streets department. For larger communities, it may be a separate entity. Communications by your organization, both internal and external, are vital to productivity and success of a CMOM Program.

Organization

Do you have the following written organizational elements? Check those that you have.

Ownership and Governing Body Description

An ownership and governing body description should be presented in a narrative format that describes the community, its governing body and committees that serve it. Discuss the governing body decision-making process, especially as it pertains to the collection system and wastewater treatment plant. Discuss policies for laterals, easements and right-of-ways.

Organizational Chart

An organizational chart shows the teams and work interrelationships in the organization, especially the collection system workforce, managers, supervisors and committee chairs.

Personnel and Position Descriptions

Position descriptions for each worker and manager should clearly define collection system work duties and tasks as well as communication responsibilities. Check that all work needs are covered and assigned appropriately.

Internal Communication Procedures

Written internal communication procedures should be known to all employees. Procedures should cover emergencies such as basement back-ups, sewage overflows, pump failures, electrical outages, worker accidents, as well as everyday operations and maintenance activities. A phone tree with both home and cell phone numbers should be in place to improve communications.

Public Information and Education Program

Because a collection system is a large community asset that is out-of-sight, out-of-mind, it is important to communicate the benefits of a CMOM Program to the public. This can be done through mailings, informational meetings and the community website as well as person-to-person contacts.

Identify actions homeowners and businesses can take to extend the life of a collection system and their private laterals. Explain how your community communicates these ideas to the public.

CHAPTER 2 – ORGANIZATION

MUNICIPAL ORGANIZATION

The City of De Pere operates under a Mayor-Council-City Administrator form of government as provided by State law. The City Administrator is the professional chief administrative officer for all City operations and is appointed by the Common Council. He reports directly to the Mayor and City Council and is responsible for executing the policies established by the De Pere City Council.

De Pere is divided into four (4) Aldermanic Districts; with two alderpersons elected to each district for a total of eight (8) alderpersons. The City Council takes up various matters affecting the city, such as implementing new polices, enacting ordinances, and carrying the business of the City.

The City administration offices are located at City Hall, 335 S. Broadway, De Pere, WI 54115. Phone (920) 339-4044.

The City Administration Contacts:

- Lawrence Delo, City Administrator
- Judy Schmidt-Lehman, City Attorney

The City is organized into 11 departments: Building Inspection, City Attorney's Office, Public Works, Finance Department, Fire Department, Health Department, Information Technology, Parks Department, Human Resources, Planning Department, and Police Department.

The management, operation, and control of the sewer system for the City is vested in the Board of Public Works.

The public works department is responsible for the planning, design, construction, and maintenance of the City's infrastructure including fleet maintenance.

The Department of Public Works is located at the Municipal Service Center, 925 S. Sixth Street, De Pere, WI 54115. Phone (920) 339-4060.

Department of Public Works Administration Contacts:

- Scott Thoresen, P.E., Director of Public Works
- Eric Rakers, P.E., City Engineer
- Chase Kuffel, Assistant City Engineer
- Tony Fietzer, Street Superintendent
- Eric Zygarlicke, Water Department Supervisor
- Daryl Carter, DPW Foreperson
- Betty Sellenheim, Administrative Assistant
- Amanda Barber, Office Assistant

Sewer service laterals are the responsibility of individual property owners. All users are required to keep their own service pipes in good repair and protected from frost, at their own risk and expense, and prevent any unnecessary overburdening of the sewer system. The sewer service lateral is defined to be the building drain and lateral pipe extending from

the building to the main line sewer. Additional information on sewer laterals can be found in Chapter 3.

ORGANIZATIONAL CHART

The Organizational Chart for the City of De Pere Department of Public Works may be referenced in Exhibit 2-1.

PERSONNEL DESCRIPTIONS

The City has detailed job descriptions for each of their positions referenced in the Organizational Chart. The following is a summary of the workforce supervisors, managers, and support staff charged with collection system work duties and tasks.

Director of Public Works

Job Summary: Directs, administers and supervises all activities of the department including Engineering, Streets, and Water. The Director of Public Works is responsible for planning, constructing and maintaining the public sewer collection system.

City Engineer

Job Summary: Responsible for directing and supervising activities of the Engineering Division, including planning, design, and supervision of public works construction projects including the sewer collection system.

Assistant City Engineer

Job Summary: Under direction of City Engineer, performs professional engineering work in the planning and design of various public works projects related to the sewer collection system maintenance and construction.

Street Superintendent

Job Summary: Responsible for supervision of personnel engaged in street division activities including sewer system maintenance and related Public Works activities.

Water Department Supervisor

Job Summary: Oversees daily operations of the water department. Assists with sewer system maintenance through leak detection and repair of water system that infiltrates the sanitary sewer.

DPW Foreperson

Job Summary: This position leads, coordinates, organizes, and assigns the work of the Public Works Street Division personnel. Duties include: To operate public works

equipment, prepare reports and maintain records. Act as lead worker upon specific assignments by Street Superintendent.

Engineering Technicians

Job Summary: Inspect construction projects to assure conformance with plans and specifications and advise appropriate personnel of variance needing correction. Assist contractors, public corporations, and private individuals in locating municipally-owned facilities. Assist in the basic design of sanitary sewers and other public works projects. Draft preliminary and final construction drawings. Prepare record drawings. Gather information and data by field and office research. Assist in the preparation of construction plans and bidding documents and prepare quantity and cost estimates. Document the contracting, repair and inspection of all sanitary sewers or laterals in the public right of way or City of De Pere easements. Assist in maintaining records for Engineering Department activities. Assist in the preparation of technical and general reports. Review and analyze Closed-Circuit Televising (CCTV) studies and reports for determining sanitary sewer projects and contracts.

DPW Equipment Operator

Job Summary: This position performs work that is semi-skilled in nature pertaining to the operation of a variety of heavy automotive/mechanical equipment in the performance of various public works construction, maintenance, and operation activities. Duties include: Operate public works equipment for sewers, and other related public works construction and maintenance activities. Perform sewer cleaning, televising and repair of sewers.

DPW Maintenance Worker

Job Summary: Perform work that is semi-skilled and manual in nature pertaining to the operation of trucks and equipment in the performance of various public works construction, maintenance, and operation activities related to the sanitary sewer collection system.

Public Works Administrative Assistant and Office Assistant

Job Summary: These positions provide administrative and clerical support for the Public Works Department. Duties include: To receive, screen, and relay telephone calls. Process documents related to construction support (e.g. project manuals, project bid tabs, bid ads, construction project addendums, contracts for awarded sanitary sewer system projects. Serve as secretary for the Board of Public Works. Prepare agenda and Public Works Board minutes.

INTERNAL COMMUNICATION PROCEDURES

The City responds to calls regarding sewage back-ups or water in the basement. During normal business hours two City employees will respond with the sewer jet and inspect the City pipe to locate a problem with the City's facilities. If the call is received outside of normal business hours two employees will be called in to respond. A contact list of Public Works staff with phone numbers is in place for employees to use during and after hours. Emergency response is discussed in more detail in Chapter 6.

PUBLIC INFORMATION AND EDUCATION PROGRAM

The City of De Pere recently enacted a program where residents are notified by mail when roots are observed in their lateral during televising inspections. A sample letter is referenced in Exhibit 2-2.

The City has discussed educating residents on the importance of maintain its sanitary collection system in several different ways. The goals section of this document discusses the use of the City's website, Facebook page, and brochures inserted with the utility bill to educate the public on ways to keep private laterals maintained or what can be placed in sewer.

CMOM MANAGEMENT

The designated CMOM Manager for the City of De Pere is Scott Thoresen, Director of Public Works. The Director of Public Works is responsible for reporting all Sanitary Sewer Overflow (SSO) events to the Wisconsin Department of Natural Resources and to the public according to s. NR 210.21 (3) to (6).

The person responsible for implementation of the CMOM program is Eric Rakers, City Engineer, operating in conjunction with Tony Fietzer, the Street Superintendent and the Department of Public Works personnel.

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CHAPTER 3 – LEGAL AUTHORITY

Understand Your Legal Authority

Adequate legal authority is the foundation of a successful CMOM Program. In order to operate and maintain your sewer system, you must have certain legal mechanisms in place. Legal authority provides the utility with the ability to establish sewer service charges; to regulate and control the type, volume and strength of wastewater being discharged into the sewer system; to regulate grease from restaurants and institutions; to connect new developments; to plan and specify sewer design, installation and maintenance; to require private sewer inspections and rehabilitation; and to enforce actions for noncompliance, permits, fees, and fines.

Legal Authority

Check those items for which you have legal authority.

Sewer Use Ordinance, last revised on _____

A sewer use ordinance is probably the most critical legal document you have for your sewer system. You should review it regularly and revise it as needed with legal counsel.

Pretreatment or Industrial Control Programs (list all significant users)

High flow and/or high strength wastes can impact the collection system and treatment plant, and thus legal controls need to be in place, either through user fees/surcharges, permits or a Pretreatment Program that limit such discharges.

Fat, Oil and Grease (FOG) Control (list all FOG contributing users)

A Grease Control and Inspection Program should be established to protect sewer pipes and lift stations from grease buildup and plugging of sewer pipes and equipment.

Illicit Discharges by Commercial or Industrial Users

All connections and discharges to a sewer system by a commercial or industrial user should be approved as regulated through the sewer use ordinance. Sewer televising can be one tool to locate unauthorized discharges.

Private Property Clear Water (sumps pumps, roof or foundation drains)

Legal authority to inspect private residences and to prohibit sump pumps or drains that contribute excess clear water to the sewer systems is very important in reducing inflow.

Private Lateral Inspections/Repairs

Legal authority to require inspection of private laterals and repairs as needed is very important in reducing infiltration and reducing the risk of basement backups for the homeowner.

Service and Management Agreements (list the agreements)

It is important for a utility to be able to enter into contracts for servicing equipment and/or intermunicipal agreements for operating/managing their collection system by other entities, if needed.

Enforcement Actions (discuss the steps and procedures)

An Enforcement Program and steps should be clearly spelled out, understood and documented so that in cases where enforcement needs to be taken, it is fair and legally defensible. Legal counsel should review and approve your Enforcement Program.

CHAPTER 3 – LEGAL AUTHORITY

SEWER USE ORDINANCE

The City of De Pere Municipal Code, as it pertains to sanitary sewers, may be found within Appendix A.

INDUSTRIAL CONTROL PROGRAM

The City of De Pere’s Municipal Code (reference Appendix A) addresses the measurement of flow, waste sampling, pretreatment and submission of information in Chapter 70 Sewer System Regulations.

The following is a list of the significant industrial users based on water use:

- Ahlstrom-Munksjo Nicolet LLC
- US Paper
- Sustana Fiber (City of De Pere customer directly discharges to GBMSD)

FAT, OIL AND GREASE (FOG) CONTROL

- A. Fat, Oil and Grease (FOG) Control NR 210.23 (4)(c)(5)
State the prohibited discharges and any special requirements and/or limits
State what grease controls currently exist in sewer use ordinance and what is
actually implemented and enforced
State and list what public information and education materials are used and
how often regarding FOG

The City of De Pere’s Municipal Code (reference Appendix A) addresses the general discharge prohibitions into the sewer system. Chapter 70 Sewer System Regulations Section 70-5 provides a list of things prohibited from being discharged to the system including fats, oils and grease.

Currently the City of De Pere is on a five year rotating schedule of routine cleaning and inspection via televising. The City of De Pere enforces grease traps being installed in businesses. These grease traps are inspected annually by the City Sanitarian for signs of leaking due to rusting/deterioration which suggests lack of cleaning. If there are signs of leaking the City Sanitarian requests cleaning records from the business.

The City reviews FOG deposits as part of its annual televising program. In the case of FOG being detected during televising, the City of De Pere sends written notice stating the nature

of the violation and provides a reasonable time for the satisfactory correction. Since 2010, there have been three areas where letters were sent to address FOG in the sewers.

There is a brochure posted on our Facebook page and also included in our digital bi-annual newsletter to the residents as a reminder to refrain from pouring fats, oils and grease down the drain.

ILLICIT DISCHARGES

The City of De Pere's Municipal Code (reference Appendix A) addresses all connections and discharges to a sewer system by a commercial or industrial user in Chapter 70 Sewer System Regulations.

The City of De Pere's Municipal Code addresses violations, enforcement and penalties in the event of an illicit discharge. See Chapter 29 Illicit Discharge and Connection to Storm Sewer Section 29-9 Violations, enforcement and penalties.

PRIVATE PROPERTY CLEAR WATER

The City of De Pere's Municipal Code, Chapter 70 prohibits the discharge of clear water to the sanitary sewer system. Specifically, Section 70-4 (j)(2) prohibits the connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or ground water to a lateral. Additionally, Section 70-5 (a)(14) prohibits storm water, surface water, ground water, roof runoff, surface drains or any other connections from inflow sources to the sanitary sewer.

The City of De Pere's Municipal Code addresses storm sewer and service line (lateral) installation for all new construction and street reconstruction projects, certain street resurfacing projects and other construction to prevent clear water discharge into the sanitary sewer. See Chapter 26 Water and Sewer Service Section 26-5.5 Storm sewer and service line (lateral) installation.

PRIVATE LATERAL INSPECTIONS/REPAIRS

The City of De Pere currently inspects sanitary mains via televising, in conjunction with scheduled street construction work for the current construction year and/or on a five year rotation. During sanitary sewer relay and lining, sanitary laterals that are vacant are televised. If vacant, the laterals are not reconnected. The City is currently in the process of replacing sanitary laterals in the public Right-of-Way on relay projects during the street construction or water main projects.

If at the time of preconstruction televising or other yearly scheduled televising there are roots observed in laterals, and the City sends a letter to the resident encouraging root treatment of the lateral. See Exhibit 2-2 for details.

SERVICE AND MANAGEMENT AGREEMENTS

The City of De Pere has sanitary agreements with.

- Ledgeview Sanitary District
- GBMSD (Green Bay Metropolitan Sewerage District)
- Town of Lawrence

ENFORCEMENT ACTIONS

The City of De Pere's Municipal Code (reference Appendix A) addresses violations and penalties, sewer service charges and billing practices in Chapter 70 Sewer System.

Section 70-7 provides a list of actions the City can pursue for violations and penalties.

Section 70-9 lists the billing practices for the City, specifically, Section 70-9 (b)(3) states that a person "shall be liable to the City for any expense, loss, or damage occasioned by such violation and upon conviction of any violation of this section shall be subject to a forfeiture of or not less than \$100.00 nor more than \$2,500.00 per violation, plus damages. Each day a condition is allowed to exist which is contrary to all or any part of this section shall constitute a new violation."

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CHAPTER 4 – OPERATION AND MAINTENANCE

Operation and Maintenance Activities

A comprehensive Collection System Operation and Maintenance (O&M) Program includes:

mainline + manholes + lift stations + private laterals.

Collection system O&M is the essential element of a CMOM Program. Just like your car, it will eventually fail to perform without regular maintenance and repairs.

What O&M tasks should you be doing? Studies have shown that optimizing collection system performance depends on specific maintenance tasks and frequencies. You should summarize and review your maintenance activities each year.

Operation and Maintenance Activities

Does your Collection System Annual Maintenance Program include the following activities? Check those items you have done in the last twelve months.

<input type="checkbox"/> Cleaning	(What % of system last year?)
<input type="checkbox"/> Root Removal	(What % of system last year?)
<input type="checkbox"/> Flow Monitoring	(What % of system last year?)
<input type="checkbox"/> Sewer Line Televising	(What % of system last year?)
<input type="checkbox"/> Manhole Inspections	(What % of total number of manholes last year?)
<input type="checkbox"/> Manhole Rehabilitation	(What % of total number of manholes rehabilitated last year?)
<input type="checkbox"/> Mainline Rehabilitation	(What % of sewer lines rehabilitated last year?)
<input type="checkbox"/> Private Sewer Inspections	(What % of system last year?)
<input type="checkbox"/> Private Sewer I/I Removal	(What % of system last year?)
<input type="checkbox"/> Lift Station O&M	(How many lift stations for the last year?)

Since every collection system is unique, work to find out which maintenance activities and frequencies will give you the best value for the O&M dollar spent. Recommended references for Collection System O&M Programs can be found on page 25.

CHAPTER 4 – OPERATION AND MAINTENANCE

This section documents operation and maintenance (O&M) activities on the City’s sewer system assets.

The City maintains information on the sewer system to assist in the O&M activities. The majority of information is maintained with GIS. The Sewage Collection System Map is located at: <http://gis.de-pere.org/PublicDIME/GeoPRIME.html> and can also be accessed from the City’s web site.

OPERATION AND MAINTENANCE TASKS

Activity	Percent of System Per Year
Cleaning	20
Root Removal	20
Flow Monitoring	Spot
Smoke Testing	0
Sewer Line Televising	20
Manhole Inspections	20
Manhole Rehabilitation	20
Mainline Rehabilitation	1.5
Private Sewer Inspection	0
Private Sewer I/I	0
Pipe Replacement and Pipe Lining	2

Cleaning

The City typically cleans 20% of their sanitary sewer system each year using their own forces and private contractors. Additionally areas with flat sewers are cleaned on a regular basis.

Root Removal

The City removes roots found during cleaning and televising. This work is performed by the City and also with the use of private contractors. Areas with significant and reoccurring root issues are identified for replacement or lining.

Flow Monitoring

The City performs spot flow monitoring in areas with high inflow and infiltration. The City recently received an I&I study from GBMSD and plans to use the results as a platform to target high I&I areas.

Smoke Testing

The City does not perform smoke testing. The goals section discusses the use of smoke testing to identify sources of inflow.

Sewer Line Televising

The City televises 20% of the sanitary sewer system each year in conjunction with the sewer cleaning. Televising is done by City forces and under an annual televising contract. The televising information is linked to the GIS data so it is readily accessed by selecting the pipes in the GIS map.

Manhole Inspections

All manholes in the sewer system were inspected between 2004 and 2005 by a consultant. Repairs recommended in this study were performed in the five years following. Manholes are currently inspected when the sewer mains are televised and when structure inspections are completed for streets scheduled for construction. Defects requiring repairs that are identified during cleaning and televising are tracked in the capital improvements worksheet. Defects identified during inspection for projects are added to the project plans for repair.

Manhole Rehabilitation

The City bids a manhole rehabilitation contract in the odd numbered years. This contract includes lining manholes, chemical grouting leaks in manholes and poured in place benches in manholes. The budget includes \$50,000 for rehabilitation of manholes.

Between 2010 and 2018 approximately 330 vertical feet of manholes or 1.22% were lined. The GIS map has an attribute to define manholes that are lined as well as the maintenance date.

Private Sewer Inspections

The City inspects sewer laterals at the main when televising the main sewer lines.

The City has a sanitary service line replacement policy as follows:

- If the street is being reconstructed, and the sanitary main is being replaced due to deterioration, sanitary service lines are replaced to the property line.
- If the sanitary sewer is being replaced due to deterioration, but not the street, the sanitary service lines are replaced to the property line.
- For street resurfacing, the City may choose to line the sanitary sewer main. If sewer lining is done, the sanitary service lines will not be lined or replaced.

- If water main and water services are being replaced and the sanitary service lines are close to the water service such that damage may occur, the sanitary service lines will be replaced.
- Property owners are responsible for sanitary service line replacement from the house to the sanitary sewer main if not part of the City project as identified above.
- The property owners will continue to own the sanitary service lines from the house to the sanitary sewer main and will be responsible for all maintenance.

Private Sewer Infiltration & Inflow (I&I) Removal

The City does not have a program established for eliminating private sewer infiltration and inflow removal. The goals section discusses a plan to resolve this issue.

Pipe Replacement and Pipe Lining

The City replaces and lines approximately 2% of the sewer system annually. Internal pipe joint repairs that are identified during televising are also completed during the pipe lining program.

INFILTRATION & INFLOW (I&I) ASSESSMENT

The manhole inspection report completed in 2005 identified manhole structure inflow and infiltration attributes that include: manholes subject to ponding water, the number of pick holes or vent holes present, the frame to cone seal condition, and the amount of frame to cone misalignment.

The City has a study performed by a consultant in March 2007 which is used to target high I&I areas in the city that need attention.

The City implemented a program for grouting and performing internal repairs on sanitary sewer mains in 2014. The focus of the program is to treat infiltration in sanitary sewers. Work is completed every two years.

The City has a study from GBMSD submitted in February 2016 which outlined potential high I&I areas based on data recorded on their flow meters.

SANITARY SEWER OVERFLOWS (SSOS)

The City does not have frequent or recurring building backups caused by system hydraulic constraints. Areas with flat sewers and dead end lines with low flows are included in a flushing program. The City Street Superintendent maintains the flushing report to track the locations and cleaning dates in an excel spreadsheet.

Discharges of untreated or inadequately treated sewage from any place in the sewage collection system are commonly referred to as sanitary sewer overflows (SSOs). All SSOs must be reported to the WDNR within 24 hours followed by a written report (see Exhibit 4-1, WDNR Form 3400-184) within five (5) days. When a sewage collection system has insufficient capacity to transport sewage from I/I entering it, or from plugged or broken sewer pipes, the system must relieve itself by overflowing from the sewer system or backing up through a building sewer into a basement.

If an SSOs occurs, the City follows the emergency procedures outlined in Chapter 6, *Emergency Procedures*.

EMPLOYEE SAFETY AND TRAINING

The City of De Pere has a safety committee that consists of employees from streets, engineering, water, and parks. This committee discusses safety equipment, safety procedures, and safety training. Employees who work in confined spaces participate in confined space training.

The City also conducts annual safety training for their employees. The training includes: First Aid, CPR, and Blood borne Pathogens.

For a discussion on emergency contact information see Chapter 6, *Emergency Procedures*.

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CHAPTER 5 – DESIGN AND PERFORMANCE STANDARDS

Design and Performance Standards

Design and performance standards are often contained in state or municipal codes. These standards establish requirements for collection system design, construction, inspection and final approval. Some municipalities have employees that review, approve, and/or inspect collection system design and construction. Other municipalities or utilities contract with a registered professional engineer to perform these services or require the company constructing sewers to hire a qualified professional to provide these services.

The CMOM Program summary should include the procedures followed to maintain control over the design, construction and inspection of the collection system.

Design and Performance Standards Procedures

Check those that apply to your collection system and include these documents in your written CMOM Program.

State Plumbing Code

Department of Commerce COMM 82, Wisconsin Administrative Code—Design, Construction, Installation, Supervision, Maintenance and Inspection of Plumbing must be followed when designing and constructing residential and commercial plumbing and pipes. An important installation is the connection of the private laterals to the sewer main. Often these connections, if not installed properly, can be significant sources of infiltration, so a municipal program that ensures proper construction and connection of private lateral pipes will significantly control infiltration.

State Sewerage System Code(s)

Department of Natural Resources Chapter NR 110, Wisconsin Administrative Code—Sewerage Systems must be followed when designing and constructing sewage conveyance systems.

Local Municipal Code Requirement

Local communities may have their own set of standards and requirements, specific to community needs, in the design and construction of building plumbing and sewerage systems.

Who designs your sewer system and what standards do they follow? Who inspects sewer construction work and what procedures are followed?

Check those that apply below and identify the standards and procedures that are followed for each.

- Municipal employees for sewer design work
- Municipal employees for sewer construction inspection work
- Contracted services for sewer design work
- Contracted services for sewer construction inspection work

CHAPTER 5 – DESIGN AND PERFORMANCE STANDARDS

CODES THAT APPLY TO THE CITY OF DE PERE

State Plumbing Code

The City of De Pere follows the Department of Safety and Professional Services (SPS), Wisconsin Administrative Code, Chapter SPS 382 – Design, Construction, Installation, Supervision, Maintenance and inspection of Plumbing, when designing and constructing residential and commercial plumbing and pipes.

https://docs.legis.wisconsin.gov/code/admin_code/sps/safety_and_buildings_and_environment/380_387/382

State Sewerage System Code

The City of De Pere follows the Department of Natural Resources Chapter NR 110, Wisconsin Administrative Code – Sewer Systems when designing and constructing or reconstructing new or modified sewerage systems.

https://docs.legis.wisconsin.gov/code/admin_code/nr/100/110

Local Municipal Code Requirements

The City of De Pere has developed and uses their own standard specification for the construction of sanitary sewers within the right of way or in easements. The “City of De Pere Standard Construction Specification” (reference Appendix B) for the construction of sanitary sewer and sanitary sewer laterals can be found on the City’s website.

<http://www.de-pere.org/departments/division.php?structureid=39>

The City of De Pere Municipal Code references the state codes. Various sections discuss responsibility for the cost of sewer and lateral extensions, required utility inspections and connections as well as other local regulations.

https://www.municode.com/library/wi/de_pere/codes/code_of_ordinances

Chapter 13	City Finances
Chapter 26	Water and Sewer Services; Sump Pump Installation
Chapter 66	Plumbing
Chapter 70	Sewer System Regulations

Regional Wastewater Treatment Plant Requirements

The Green Bay Metropolitan Sewerage District (GBMSD) provides wastewater treatment and sewage transport via interceptor sewers. GBMSD provides rules for supervision, protection, and use of their system and facilities through their sewer use ordinance and connection permits. Chapter 70 of the Municipal Code adopts and incorporates the Green Bay Metropolitan Sewerage District Sewer Use Ordinance.

<http://www.newwater.us/about/permits-ordinances/>

STANDARDS FOR DESIGN AND CONSTRUCTION

Both municipal employees and any contracted services must follow the state and local codes listed in this chapter for any sewer projects that they design and/or inspect the construction. These projects include, but are not limited to: new sewers, private sewers, sewer repair, and sewer rehabilitation projects.

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CHAPTER 6 – EMERGENCY OVERFLOW RESPONSE PLAN

Overflow Emergency Response Plan

Unanticipated collection system events are going to happen, and the better prepared you are, the more efficient, effective and less stressed your response will be. A CMOM Program should have an Overflow Emergency Response Plan with written procedures for responding to various collection system emergencies. Detailed records of emergencies and responses should be documented. The plan should be regularly reviewed and revised in response to the adequacy of past emergency actions.

Emergency Capability

Check those items which you have in place.

Alarm System and Routine Testing

When equipment failure or high wastewater flows occur, especially at lift stations, it is critical that: (1) you have adequate alarm systems in place to notify the proper collection system personnel of the problem; and (2) your alarm systems (visual, audible or dialer) are working; and (3) you can respond quickly. Alarm systems should be regularly tested to ensure their reliability. All lift stations should have an alarm system of some kind. Most should be telemetered.

Emergency Equipment

Emergency equipment such as back-up generators, portable pumps, alternative power sources, and pump trucks, should be either on-site or quickly/readily available for emergency operation. In cases where portable equipment is used, the capacity of holding pipes and wet wells should be known so that placement of portable equipment can be prioritized to minimize sanitary sewer overflows and basement backups.

Emergency Procedures

As part of an Emergency Response Plan, written detailed procedures should be established for all known emergencies that potentially could occur, such as SSOs, basement backups, power outages, lift station failures, sewer blockages, force main breaks, severe rain events and flooding. Emergency response situations should be routinely practiced as part of employee training.

Mutual Aid Agreements

Having a signed mutual aid agreement on file prior to an emergency can greatly facilitate planning and prioritizing by agencies responding to your requests for help. Consider participating in the Wisconsin Water/Wastewater Agency Response Network (WisWARN). See <http://www.wiswarn.org>

Communications/Notifications (WDNR, Internal, Public, Media)

During emergencies, communications are critical. It should be very clear to all response personnel what roles they have and who contacts whom. There should be an internal communication procedure as well as who will be notifying and communicating with external agencies, the public and the media.

Lessons Learned

Plan. Act. Review. Do (ReDo). What worked and did not work? Were any mistakes made? What could be improved? Use information gathered during review to revise procedures for future emergencies.

CHAPTER 6 – EMERGENCY OVERFLOW RESPONSE PLAN

ALARM SYSTEM & ROUTINE TESTING

The Ryan Road lift station is located on the west side of Ryan Road, South of Diversity Drive, within an easement on parcel ED-3072, 3030-3036 Ryan Road. The lift station collects flow from the Pine Trail Crossing subdivision to the north serving 60 residential lots and one multi-family lot located at the same parcel. The lift station discharges into a 4-inch PVC force main that is routed to the upstream manhole located on Diversity Drive, just east of Ryan Road.

The Ryan Road lift station is monitored using a Supervisory Control and Data Acquisition (SCADA) system. It is also inspected periodically by Street Division Staff and a Hired Maintenance Consultant. During the time of inspection the following items are checked.

Monthly Inspections

- Visually inspect the exterior of the wet well, monitor control center (MCC) panels and all equipment for vandalism
- Record run times/hours for each pump
- Check alarms
 - a. Pump Failure
 - b. Seal Failure
 - c. High and low levels
- Run each pump in “Hand”
- Ensure pump controls are turned to “Auto”
- Verify pumps are operating in “Auto”
- Hose down wet well with water from water truck
- Verify wet well lid, mechanical room lid, and MCC panel are locked
- Document all activities conducted on Lift Station Log
- Alternate lead and lag pumps

Semiannual Inspections

- Open wet well and inspect for grease and debris
- Clean wet well walls and components
- Inspect floats for proper operation and clean each float
- Observe check valve operation
- Inspect wet well, pipework and coating for damage
- Document all activities conducted on the lift station log
- Operate portable generators under load to ensure proper operation of generator and lift station under emergency power supply. Run test for a minimum of 15 minutes

- Full load amp reading and Meg Ohm reading are recorded in a Quarterly Lift Station Inspection Report. Pumps should be inspected for wear, debris or damage when motor hours are not within 10% of each other.
- Check relays, circuit breaker, electrical connections, contactors, floats, fuses, indicator lights, hand-off-auto (HOA) switches and other electrical components
- Clean wet well of all rags, grit, debris and grease using vacor truck
- Check alarms for proper operation
- Exercise isolation valves
- Isolate each check valve, remove cover plate, clean interior of rags and debris, inspect internal components of each check valve and replace as necessary

Annual Inspections

- Pull pumps and inspect impellers and volute for wear or damage

EMERGENCY EQUIPMENT

See Table 6-1 for the list of the City of De Pere’s – owned equipment available for use in an emergency.

EMERGENCY PROCEDURES

The initial response/contact to emergencies/backup is dependent on when the call is received. A flow chart of activities is shown in Exhibit 6-1 and 6-2.

The City of De Pere has in place the “City of De Pere Manager Packet Call-In Procedure” (see Appendix C) which is used by the All City Communications to address all emergency issues that may arise afterhours.

In the event of a sanitary sewer break and the City is unable to resolve the issue alone they have a list of contractors who can perform the work necessary. See Table 6-2 for details.

MUTUAL AID AGREEMENTS

The City of De Pere has a verbal agreement with all the surrounding municipalities and Brown County in the event there is an issue that cannot be resolved by City of De Pere personnel.

COMMUNICATIONS/NOTIFICATIONS (WDNR, Internal, Public, Media)

The amount/type of communication is dependent on the emergency/severity as follows:

Action	Agency/Contact	Responsibility
SSO	WDNR (Gary Kincaid -920-662-5136)	City Engineer
	Media/Press Gazette (Mark Treinen – MTREINEN@GANNETT.COM)	
	Public (As Required)	

Basement Backup (City Issue)	Public	Street Department and City Engineer
Basement Backup (Private Issue)	Public	Street Department

If an SSO occurs, the WDNR Sanitary Sewer Overflow Notification Summary Report (Form 3400-184) will be submitted to the WDNR. See Appendix F.

LESSONS LEARNED

If an emergency/backup is related to a city sewer, staff has a meeting to review the steps taken and review what worked and what didn't. Based on the meeting, updates are made to the emergency action plan. Additionally, based on what caused the obstruction, the plan to address is determined.

7

CHAPTER 7 – CAPACITY ASSURANCE

Capacity Assurance

How well do you know your sewer system?

A CMOM Program includes an assessment of the adequacy of the collection system to convey wastewater for new connections. It also reviews your system's current flow to determine where your trouble spots are located. Identifying problem areas allows your municipality to make the necessary repairs and improvements, or, at the very least, identify areas to be cleaned and maintained on a specific schedule so that flow capacity is maximized.

Capacity Assurance

Check those documents you have.

- Current and up-to-date sewer maps
- Sewer system plans and specifications
- Manhole location maps with numbered manholes and GPS coordinates
- Lift station pump and wet well capacity information
- Lift station O&M manuals

Check those items you have identified within your sewer system.

- Areas with flat sewers
- Areas with surcharging
- Areas with bottlenecks or constrictions
- Areas with chronic basement backups or sanitary sewer overflows (SSOs)
- Areas with excess debris, solids or grease accumulation
- Areas with heavy root growth
- Areas with excessive infiltration/inflow (I/I)
- Sewers and manholes with severe corrosion
- Sewers with severe defects that affect flow capacity
- Adequacy of capacity for new connections
- Lift station capacity and/or pumping problems
- Wet weather relief points or overflow structures (if any)

CHAPTER 7 – CAPACITY ASSURANCE REVIEW

CAPACITY ASSURANCE DOCUMENTS

Current Sewer Maps

The City of De Pere has its entire sanitary sewer system mapped in GIS (reference Exhibit 7.1). The City keeps it up-to-date as new sewers are added, old sewers are reconstructed and old sewers are lined. Exhibit 7.2 shows a “zoomed in” area of the system map showing the sewer pipe and manhole numbering system. The facility ID, size, type, invert elevations, installation date, slope, depth, televising link and length are recorded in the system. The direction of flow is shown on the map.

Below is an example of the data in the system for gravity sewer main between H6-FL6IEC & H6-E1SGA1.

Sanitary Gravity Mains

Facility ID: H6-ETIHC7	Material: Concrete	Upstream Invert: 604.662
Install Date: 1/1/1969	Diameter: 8 Inch	Downstream Invert: 603.037
Slope: 0.004787	Length: 339.435	Upstream Depth: 6.85
		Downstream Depth: 7.2

Sewer System Plans & Specifications

The City of De Pere has its own set of Standard Specifications for sanitary sewer construction (reference Appendix B).

Manhole Location Maps

The City of De Pere has information on all of their manholes as part of their sanitary sewer system map. The City keeps it up-to-date as new manholes are added, old manholes are reconstructed and old manholes are lined. Exhibit 7.2 shows a “zoomed in” area of the system map showing the sewer pipe and manhole numbering system. The facility ID, size, type access diameter, depth, rim elevation, installation date, inspection date and coordinates.

Below is an example of the data in the system for manhole number H6-FL6IEC.

Sanitary Manholes

Facility ID: H6-FL6IEC	Material: Precast	Depth: 7.2
Install Date: 1/1/1969	Diameter: 48 Inch	Access Dia.: 24 Inches
Rim Elevation: 610.237	Inspection Date: 3/11/2013	
Northing: 534262.81	Easting: 81335.45	

Lift Stations

The Ryan Road lift station is located on the west side of Ryan Road, South of Diversity Drive, within an easement on parcel ED-3072, 3030-3036 Ryan Road. The lift station collects flow from the Pine Trail Crossing subdivision to the north serving 60 residential lots and one multi-family lot located at the same parcel. The Ryan Road lift station is a submersible pump configuration with a 6 foot diameter wet well. There is a separate valve vault housing the lift station's check valves. At this time, the station does not have a dedicated back up power supply; however there is a dedicated receptacle for a trailer mounted generator. The lift station discharges into a 4-inch PVC force main that is routed to the upstream manhole located on Diversity Drive, just east of Ryan Road.

CAPACITY CONCERN AREAS

Flat Sewers

The City has areas of routine maintenance performed by the Street Department.

Areas with surcharging

No areas of concern.

Areas with bottlenecks or constrictions

No areas of concern.

Areas with chronic basement backups and sanitary sewer overflows (SSOs)

No areas of concern.

Areas with excess debris, solids and grease accumulation

The City has areas of routine maintenance performed by the Street Department.

Areas with heavy root growth

The City has areas of routine maintenance performed by the Street Department.

Areas with excessive infiltration/inflow (I&I)

The City has areas of concern pinpointed from studies performed for the City which are available at the Department of Public Works for reference.

Sewers and manholes with severe corrosion

No areas of concern.

Sewers with severe defects that affect flow capacity

No areas of concern.

Adequacy of capacity for new connections

No areas of concern.

Wet weather relief points or overflow structures (if any)

No areas of concern.

Critical Manhole Inspections

The City has areas of routine maintenance performed by the Street Department.

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CHAPTER 8 – ANNUAL SELF-AUDIT

Annual Self Audit

The success of your CMOM Program depends upon the careful review of your program annually. Where have you seen improvements and successes? How can you spend your budgeted money most effectively to make your program even better?

The Compliance Maintenance Annual Report (CMAR) Collection System section is, in part, an annual self-evaluation or audit of your collection system CMOM Program. Once you have entered your facility's data into the CMAR, it will create trend graphs for you. Trend graphs for various collection system performance indicators (see opposite page) can help you determine if your CMOM Program is effective. In theory, an effective O&M Program over time should result in a reduction in I/I (peaking factors), SSOs, basement backups, complaints, and equipment and pipe failures. Be sure to generate and observe trend graphs to see if you are making progress toward an optimum performing collection system.

Collection System Performance Indicators

-  Lift Station Failures (failures/lift station/year)
-  Sewer Pipe Failures (pipe failures/sewer mile/yr)
-  Sanitary Sewer Overflows (number/sewer mile/yr)
-  Basement Backups (number/sewer mile)
-  Complaints (number/sewer mile)
-  Peaking Factor Ratio (Peak Monthly:Annual Daily Average)
-  Peaking Factor Ratio (Peak Hourly:Annual Daily Average)

Special Studies

From time to time a utility or municipality may conduct special studies on its wastewater collection system.

Check and cite the year of any studies.

- Infiltration/Inflow (I/I) Analysis**—evaluates wastewater flow occurring throughout the collection system to identify specific infiltration and inflow components and whether these flow components are excessive.
- Sewer System Evaluation Survey (SSES)**—when I/I is excessive, an SSES study will assess costs for removing I/I versus conveying and treating it, and identifies a cost-effective collection system rehabilitation program to remove excessive I/I.
- System Evaluation and Capacity Assurance Plan (SECAP)**—contains elements of both the I/I and SSES analyses, but is typically more focused on SSO occurrences and developing recommendations to abate or eliminate SSOs, as it relates to capacity issues.
- Lift Station Evaluation Report**—an assessment of lift station conditions, capacity limitations, and recommendations for improvement.
- Others** _____

CHAPTER 8 – ANNUAL SELF AUDIT

COLLECTION SYSTEM PERFORMANCE INDICATORS

Lift Station Failures

There were no backups due to Ryan Road lift station failure.

Sewer Pipe Failures

None in 2019

Basement Backups

In 2018, the City had 3 basement backup occurrences. All backups occurred on the private side (lateral or private collector) of the sewer system. There were no backups due to obstructions in the City sewer.

In 2019, the City had one basement backup due to City facilities. The backup occurred due to a water main break with water backing up the lateral into the basement.

Complaints

In 2018, the City had 3 complaints. All backups occurred on the private side (lateral or private collector) of the sewer system. There were no backups due to obstruction in the City Sewer.

In 2019, the City had 24 complaints that were related to private lateral issues.

Peaking Factor Ratio (Peak Monthly: Annual Daily Average)

As shown in the 2016 CMAR, the peaking factor ratio for Peak Monthly: Annual Daily Average is 46.4.

As shown in the 2016 CMAR, the Peak Monthly flow last year was 179.68 MGD.

Peaking Factor Ratio (Peak Hourly: Annual Daily Average)

As shown in the 2016 CMAR, the peaking factor ratio for Peak Hourly: Annual Daily Average is 3.0.

As shown in the 2016 CMAR, the Peak Hourly flow last year was 11.43 MGD.

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CHAPTER 9 – SPECIAL STUDIES

CHAPTER 9 – SPECIAL STUDIES

INFILTRATION/INFLOW ANALYSIS

An Inflow/Infiltration Analysis was completed for the City in March 2007. A copy is on file at the Department of Public Works.

The City is participating in an Inflow/Infiltration analysis that is being completed by the Green Bay Metropolitan Sewerage District.

The City is completing an Inflow/Infiltration Study in 2020.

SEWER SYSTEM EVALUATION STUDY (SSES)

A Sewer System Evaluation Study was completed for the City in March 2007. A copy is on file at the Department of Public Works. From this report manhole repairs were made. The City continues to evaluate the sewer system through the annual televising program.

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN (SECAP)

The City of De Pere has been evaluating flows through the following techniques:

- High flows observed during cleaning and televising.
- Periodic capacity evaluation by flow depth monitoring.
- Flow rates provided by the Green Bay Metropolitan Sewerage District.

LIFT STATION EVALUATION REPORT

The Ryan Road lift station is newly constructed in 2018 and is monitored using Supervisory Control and Data Acquisition (SCADA). At this time no issues with the Ryan Road lift station are reported.

OTHER STUDIES

Storm Water Management Plan

A Storm Water Management Plan was completed for the City in 2016. A copy is on file at the Department of Public Works.

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CHAPTER 10 – COMPLIANCE MAINTENANCE ANNUAL REPORT

Wisconsin's Compliance Maintenance Program

The Compliance Maintenance Program is one of the successful cornerstones of the Wisconsin Department of Natural Resources regulatory Wisconsin Pollutant Discharge Elimination System (WPDES Program). The web-based Compliance Maintenance Annual Report (CMAR) is a self-evaluation report and grading system for Wisconsin's domestic wastewater treatment plants and sanitary sewer systems. Since its beginning in 1987, the Compliance Maintenance Program has been extremely successful in achieving its purpose of encouraging and, where necessary, requiring owners of publicly and privately owned domestic wastewater treatment works to take necessary actions to avoid water quality degradation, and prevent violations of WPDES permit effluent limits and conditions.

Compliance maintenance promotes an owner's awareness and responsibility for wastewater conveyance and treatment needs; maximizes the useful life and performance of treatment works through improved operation and maintenance; and initiates formal planning, design and construction to prevent WPDES permit violations. Through a conventional and readily understandable grading system, the CMAR brings awareness and understanding to governing officials about wastewater capital and management needs. Most importantly, it fosters communication among governing officials, operators and the Department about the wastewater treatment plant and collection system. Governing bodies must review each year's CMAR and pass a resolution regarding it. Low grades require recommendations or action plans by the community to address the cause of any problems or deficiencies and improve the system.

Owners of wastewater treatment facilities, as well as collection systems, including satellite systems, are required by Wisconsin Administrative Code Chapter NR 208—Compliance Maintenance to electronically submit an annual report. Electronic reporting began in 2005. Collection systems complete two sections of the CMAR, Sanitary Sewer Collection Systems and Financial Management. The Sanitary Sewer Collection System section can be found on the next four pages. Performance indicators and trend graphs are automatically generated as part of this section of the CMAR to help operators evaluate the success of their CMOM or O&M program. The questions in the CMAR are to guide operators in developing a CMOM Program, and in the operation & maintenance and financial management of their collection system.

For more information on the WPDES permit, Compliance Maintenance and CMOM Programs, see these web pages:



WPDES Permit Program: <http://dnr.wi.gov/org/water/wm/ww>



Compliance Maintenance Program: <http://dnr.wi.gov/org/water/wm/ww/cmar.html>



WDNR Collection System Maintenance brochures: <http://dnr.wi.gov/org/water/wm/ww/cmar/brochures.htm>



WDNR CMOM Web page: <http://dnr.wi.gov/org/water/wm/ww/cmar/cmom.htm>



The Water Environment Federation (WEF) CMOM Info: <http://www.cmom.net>

CHAPTER 10 – COMPLIANCE MAINTENANCE ANNUAL REPORT

See Appendix D for the City’s Compliance Maintenance Annual Report (CMAR), which was last updated June 23, 2020.

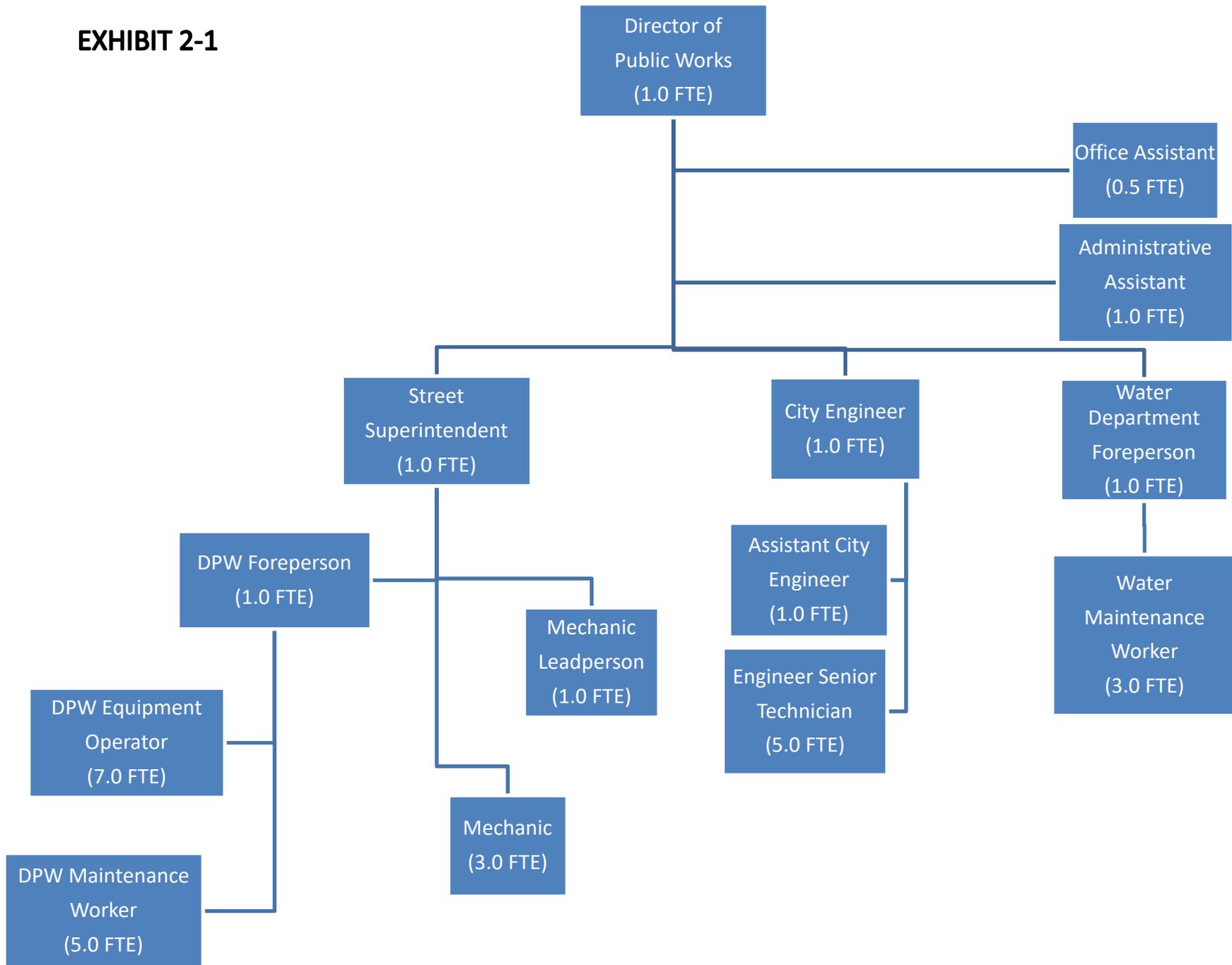
EXHIBITS

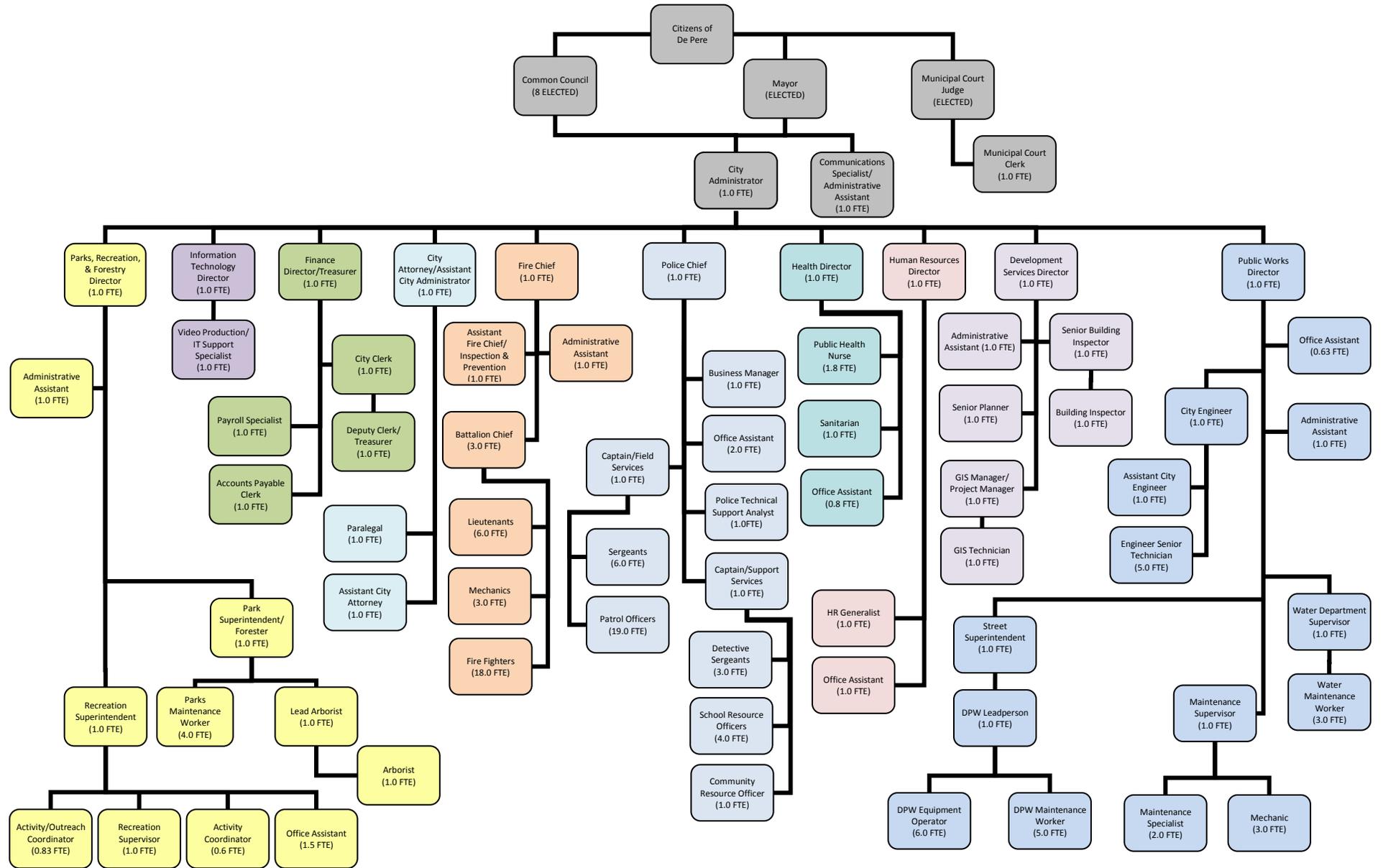
EXHIBITS #

DESCRIPTION

2-1	Public Works Organizational Chart
2-2	City of De Pere Organizational Chart
2-3	Sanitary Lateral Root Letter
4-1	Sanitary Sewage Overflow Notification Summary Report (Form 3400-184)
6-1	Sewer Backups – Normal Hours
6-2	Sewer Backups – After Normal Hours
7-1	GIS Map of Sanitary Sewer System
7-2	Sewer Pipe and Manhole Number System Example

EXHIBIT 2-1





CITY OF DE PERE

Public Works - Engineering Department



925 S. Sixth Street, De Pere, WI 54115 | 920-339-4061 | www.de-pere.org

DATE

PROPERTY OWNER
PROPERTY ADDRESS
PROPERTY ADDRESS

Re: Sanitary Sewer Lateral
PARCEL #
LOCATION
City of De Pere

Dear PROPERTY OWNER

During our routine inspection on our sanitary sewer main, we noticed that your sanitary lateral at 706 N. Adams Street has tree roots growing into the lateral. We would advise you to remove or treat the roots in your sanitary sewer lateral before the roots obstruct flow in your sanitary lateral. Because roots will continue to grow even after treatment, we recommend treatment on an annual basis.

Please call me at (920) 339-4061 with any questions.

Sincerely,

PUBLIC WORKS DEPARTMENT

Eric P. Rakers, P.E.
City Engineer

EPR/bms

Notice: An overflow is defined as a release of wastewater from a sewage collection system (SSO) or from a location within a sewage treatment facility (TFO) other than a permitted outfall structure, directly to a water of the state or land surface. Pursuant to s. 283.55(1)(dm), Wis. Stats., s. NR 210.21(4)(5)(6) Wis. Adm. Code and in accordance with reporting requirements in your WPDES permit, permittees shall submit a written report form for each overflow. This record is used to administer the water quality program, and any personally identifiable information may be provided to requesters as required under the Wisconsin Open Records law (ss. 19.31–19.39, Wis. Stats.).”

- Sanitary Sewer Overflow (SSO)**
 Treatment Facility Overflow (TFO)

Use one form per SSO location. Submit within five calendar days to your Department wastewater representative. Attach additional information as necessary to explain or document each overflow occurrence. A single SSO may be more than one day if the circumstance causing the overflow results in discharge duration more than 24 hours. If there is a stop and restart of the overflow within 24 hours, but it's caused by the same circumstances, report it as one SSO. If the discharges are separated by more than 24 hours, they should be reported as separate SSOs.

Notifications

Department Notification

Permittee (Municipality or Facility Name)	Permit No.
---	------------

Person Who Contacted the DNR

DNR Person Contacted	Date (mm/dd/yyyy)	Time of Day <input type="radio"/> am <input type="radio"/> pm	Within 24 hours? <input type="radio"/> Yes <input type="radio"/> No
----------------------	-------------------	---	--

Public Notification

Date (mm/dd/yyyy)	How the Public was Notified
-------------------	-----------------------------

Describe the actual or potential for human exposure or contact with overflowing wastewater

Other Notifications (if applicable)	Drinking Water Intake Owner	Date (mm/dd/yyyy)
	Regional Wastewater Treatment Facility	Date (mm/dd/yyyy)

(Satellite collection permittees are required to submit a copy of this report to the regional plant to which they discharge.)

Wet Weather Information (if applicable)

Was this overflow wet weather related? Yes No (skip this section)

Rainfall Start: _____ am pm _____ inches
 Date (mm/dd/yyyy) Start Time Rainfall Amount

Rainfall End: _____ am pm _____
 Date (mm/dd/yyyy) End Time

Contributing Soil or Other Conditions (saturated, frozen, soil type, snowmelt, etc.): _____

Overflow Details

Location (Street Address)

Location (GPS coordinates, WGS84 standard coordinate system)	Latitude: _____ (e.g. 43.075350)	Longitude: _____ (e.g. -89.379770)
--	-------------------------------------	---------------------------------------

Overflow Start: _____ am pm _____ hours _____ gallons
 Date (mm/dd/yyyy) Start Time Duration Volume

Overflow End: _____ am pm _____
 Date (mm/dd/yyyy) End Time

<p>Cause: (select all that apply)</p> <p><input type="checkbox"/> Rain <input type="checkbox"/> Plugged Pipe <input type="checkbox"/> Snow Melt <input type="checkbox"/> Broken Pipe <input type="checkbox"/> Flooding <input type="checkbox"/> Equipment Failure <input type="checkbox"/> Power Outage <input type="checkbox"/> Contractor Related <input type="checkbox"/> Other—Explain: _____</p>	<p>Overflow Occurred From: (select only one)</p> <p><input type="radio"/> Lift Station – Name: _____ <input type="radio"/> Manhole – MH#: _____ <input type="radio"/> Gravity Sewer Pipe <input type="radio"/> Pressure Sewer Pipe (Forcemain) <input type="radio"/> River or Stream Crossing— Select one: <input type="radio"/> Forcemain <input type="radio"/> Siphon <input type="radio"/> Permanent Overflow Structure <input type="radio"/> Treatment Plant Unit or Pipe : _____ <input type="radio"/> Other: _____</p>
--	--

**Sanitary Sewage Overflow
Notification Summary Report**

Form 3400-184 (R 7/17)

Page 2 of 2

Destination:

(select all that apply)

- Ditch – Name of surface water it drains to: _____
- Storm sewer – Name of surface water it goes to: _____
- Surface water – Name of waterbody: _____
- Ground – Seeps into soil: _____
- Other – Describe: _____

Overflow Explanation (This includes any information, whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.)

Immediate Corrective Action and Steps Taken to Reduce this Overflow Volume and Impacts

Long Term Plan to Reduce, Eliminate, Prevent Reoccurrence of this Overflow

Building Backups

Number of building backups occurring during this time in Area of Overflow: _____

Locations of Building Backups:
(list each one)

Certification

Authorized Representative Name

Authorized Representative Title

Email Address

Phone Number

I certify under penalty of law that this document 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.

Signature of Authorized Representative

Signed Date (mm/dd/yyyy)

Note: Submit this form to your DNR wastewater representative. Permittees who are required to submit monthly Discharge Monitoring Reports (DMRs) shall report this overflow on the DMR.

**DNR Follow-Up Action
(DNR Use Only)**

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FIGURE 6-1

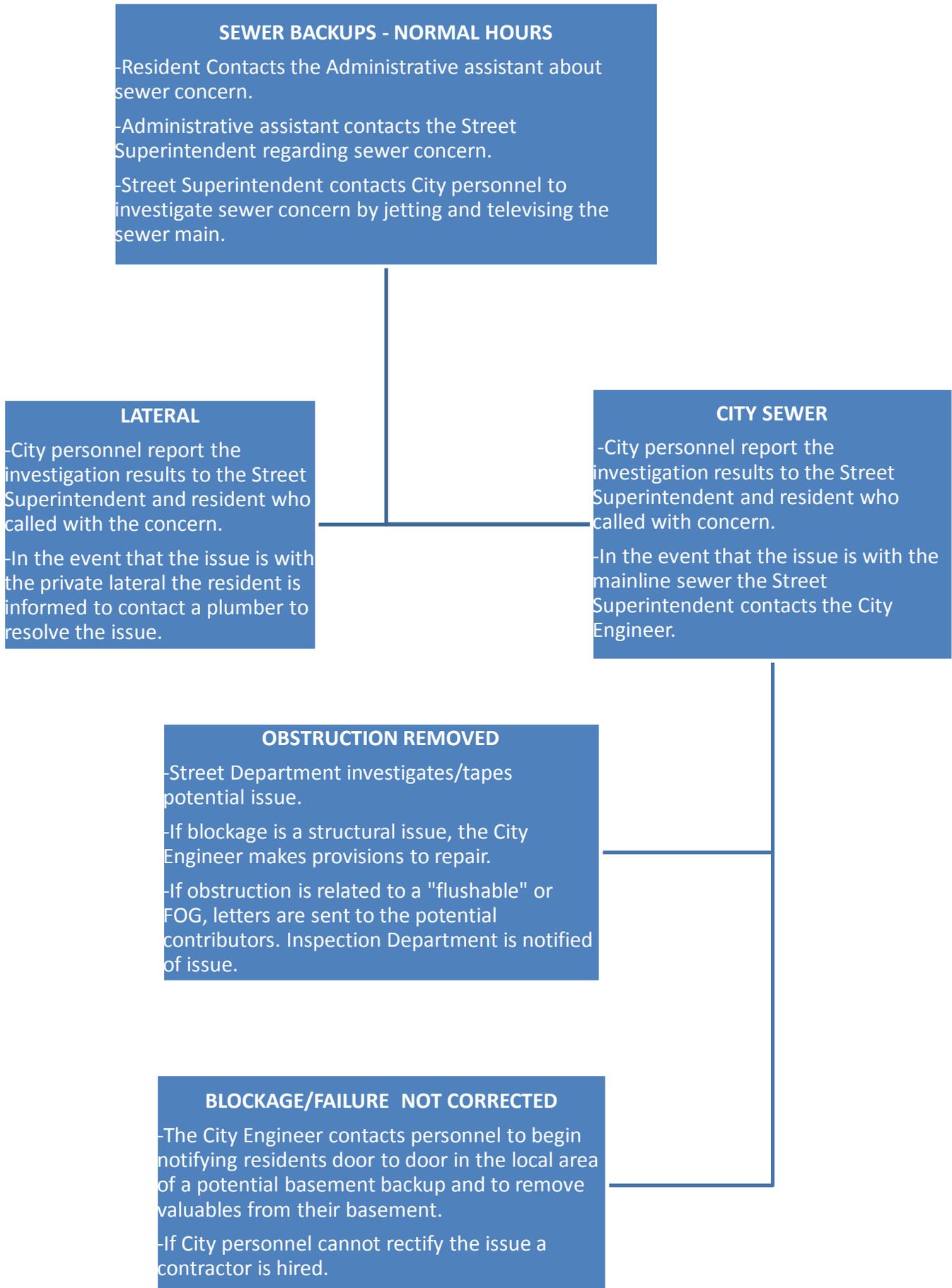


FIGURE 6-2

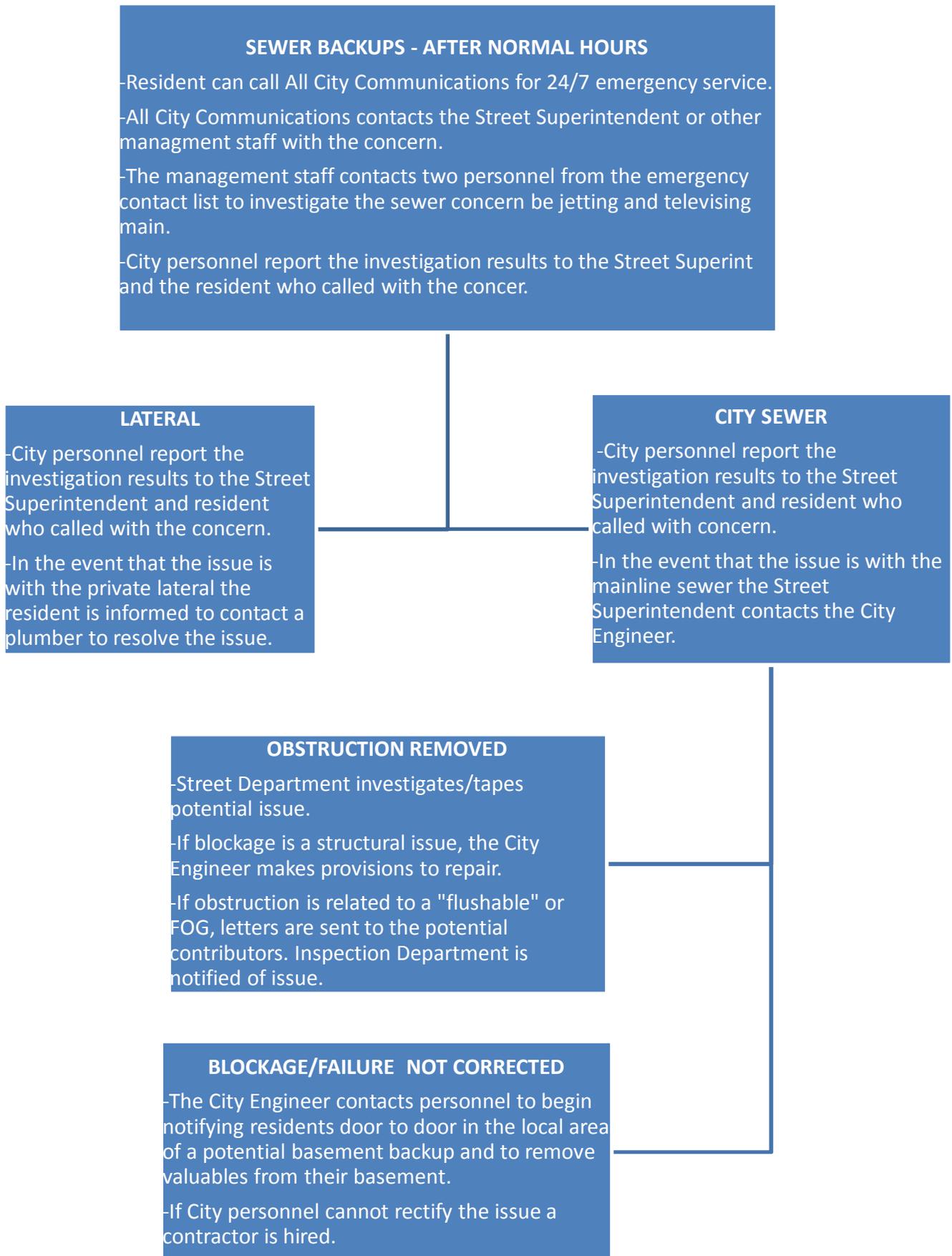
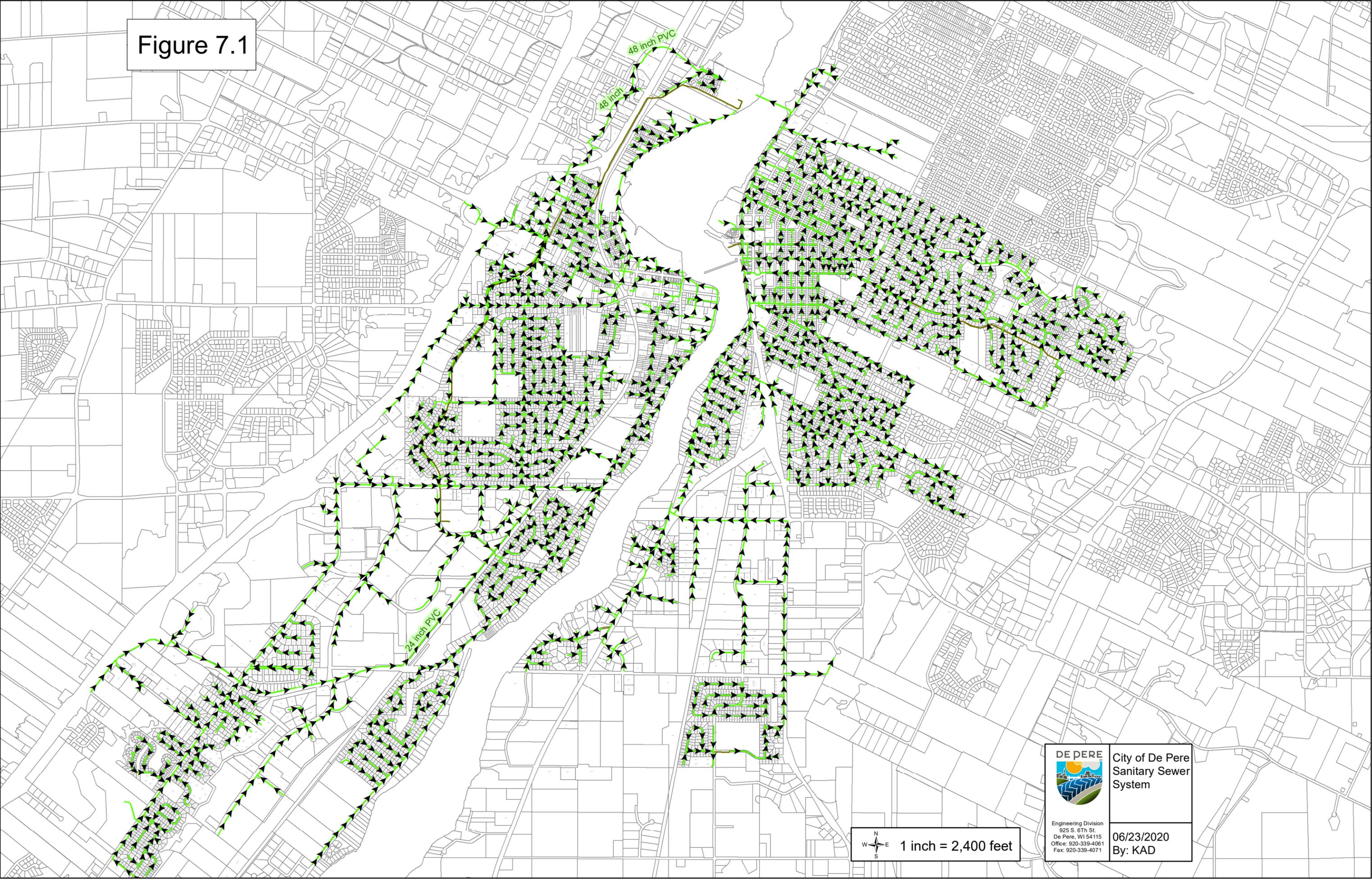


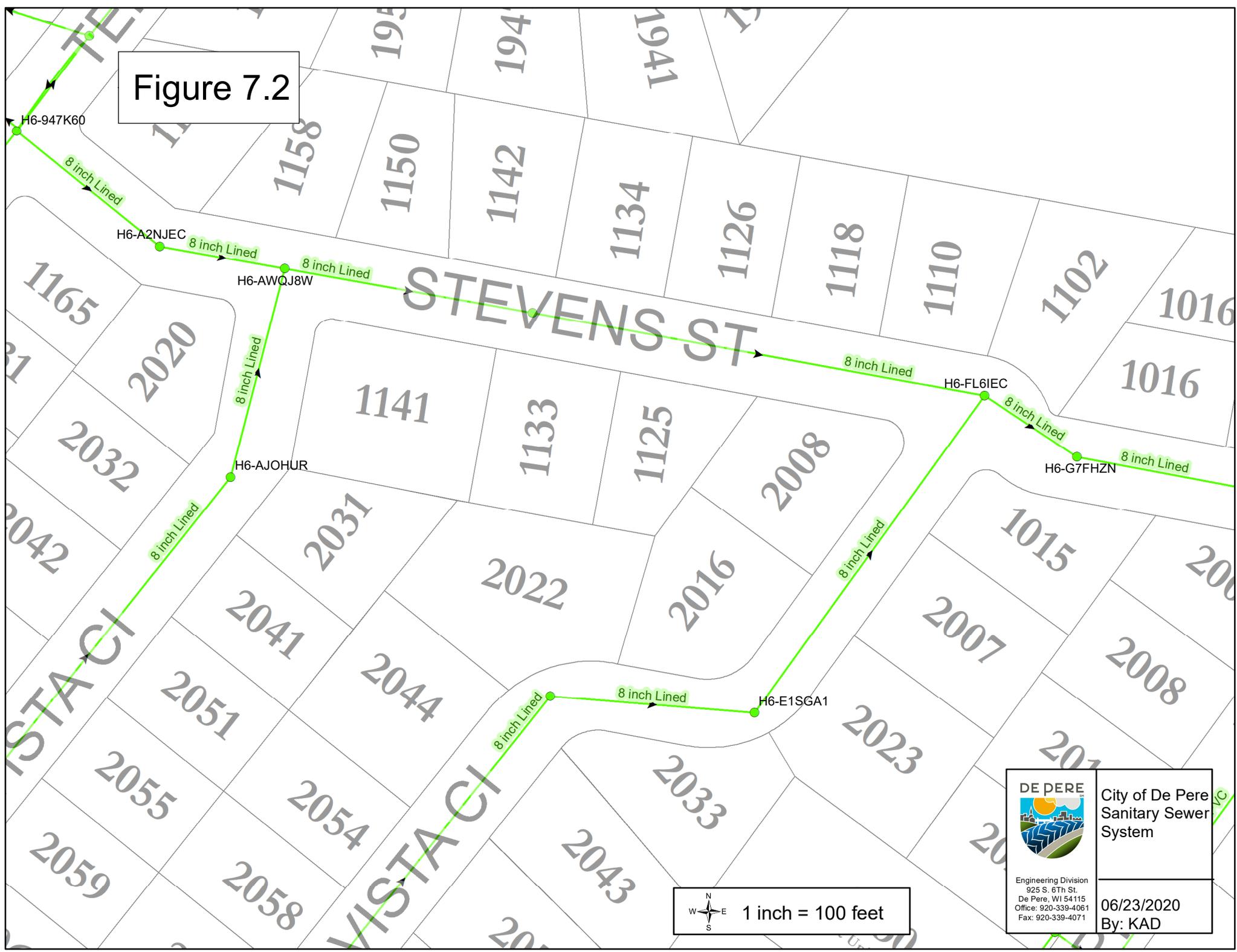
Figure 7.1



N
W E
S 1 inch = 2,400 feet

 Engineering Division 925 S. 61th St. De Pere, WI 54115 Office: 920-339-4061 Fax: 920-339-4071	City of De Pere Sanitary Sewer System
	06/23/2020 By: KAD

Figure 7.2



1 inch = 100 feet

	City of De Pere Sanitary Sewer System
	Engineering Division 925 S. 6TH St. De Pere, WI 54115 Office: 920-339-4061 Fax: 920-339-4071
06/23/2020 By: KAD	

TABLES

TABLES #

6-1

6-2

DESCRIPTION

Vehicle and Equipment List

Contractor Emergency Contact List

**TABLE 6-1
VEHICLE AND EQUIPMENT LIST**

EQUIP #	YEAR	EQUIPMENT DESCRIPTION	DEPT
8086	2004	STERLING 12 YD DUMP TRUCK - TANDEM	STRT
8090	2013	FREIGHTLINER TYMCO SWEEPER	STRT
8100	2004	BOBCAT A300	STRT
8101	2019	5600 TOOLCAT	STRT
8102	2018	FREIGHTLINER TYMCO SWEEPER	STRT
8103	2007	VOLVO L-90F FRONT END LOADER	STRT
8104	2018	JOHN DEERE 624K II FRONT END LOADER	STRT
8106	2009	JOHN DEERE 644J FRONT END LOADER	STRT
8107	2001	VOLVO L-45-B FRONT END LOADER	STRT
8108	2009	JOHN DEERE 772 GP MOTOR GRADER	STRT
8110	2001	TOYOTA FORK LIFT REBUILT 2010	STRT
8111	2002	MORBARK MODEL 13 TORNADO BRUSH CHIPPER	STRT
8112	2001	CH&E 6" TRASH PUMP MODEL 2976	STRT
8115	2009	MORBARK MODEL 15 TORNADO BRUSH CHIPPER	STRT
8118	2001	PMD-500 DT VAC-TRON CATCH BASIN CLEANER	STRT
8120	2009	SNOWGO SNOW BLOWER MD-3D	STRT
8134	2011	BARRICADE TRAILER	STRT
8131A	1990	SIGN TRAILER	STRT
7010	2009	CHEVROLET 3500 1-TON	MECH
7064	2008	FORD F-450 VERSALIFT AERIAL	MECH
8058	2009	CHEVROLET 3500 1-TON DUMP TRUCK - DIESEL	STRT
8059	2009	CHEVROLET 3500 1-TON DUMP TRUCK - DIESEL	STRT
8061	2010	FORD F-150 PICK UP	STRT
8062	2009	CHEVROLET 3500 1-TON DUMP TRUCK 4 X 4 - DIESEL	STRT
8063	2009	CHEVROLET 3500 1-TON DUMP TRUCK	STRT
8066	2004	FORD F-450 AERIAL TRUCK (SIGN SHOP)	STRT
8070	2007	PETERBILT 5YD DUMP TRUCK	STRT
8071	2010	PETERBILT VACTOR JETTER	STRT
8072	2006	INTERNATIONAL 12 YD DUMP TRUCK - TANDEM	STRT
8073	2009	PETERBILT 12 YD DUMP TRUCK - TANDEM	STRT
8074	2019	PETERBILT 5YD DUMP TRUCK	STRT
8075	1994	INTERNATIONAL 12 YD DUMP TRUCK	STRT
8076	2009	PETERBILT 12 YD DUMP TRUCK - TANDEM	STRT
8077	2019	PETERBILT 5YD DUMP TRUCK	STRT
8078	2005	PETERBILT 5 YD DUMP TRUCK	STRT
8079	2005	PETERBILT 5 YD DUMP TRUCK	STRT

8081	2019	PETERBILT 12 YD DUMP TRUCK - TANDEM	STRT
3001	2010	HOLDER	PARK
3002	2019	RAM PICK-UP 1500 4X4 (FORESTER)	PARK
3004	2000	CHEVROLET 1 TON DUMP TRK	PARK
3005	2015	TRACKLESS TP6	PARK
3007	2001	CHEVORLET PICK-UP 1500	PARK
3008	2017	RAM 1500 PICK-UP	PARK
3012	2020	PETERBILT UTILITY BUCKET TRUCK	PARK
3013	1998	CHEVROLET PICK-UP TRUCK	PARK
3015	2003	FORD F-250	PARK
3016	2006	CHEVROLET 1 TON DUMP TRK	PARK
3018	2004	INTERNATIONAL DUMP TRK	PARK
3019	2013	JOHN DEERE TRACTOR	PARK
3020	2011	FORD 3/4 TON PICK-UP TRK	PARK
3121	2005	MORBARK MODEL 13 TORNADO BRUSH CHIPPER	PARK
3302	1996	KAWASAKI MULE	PARK
3308	2007	CHEVROLET 1 TON DUMP TRK	PARK
3309	2018	RAM 3500 4X4 DUMP	PARK

**TABLE 6-2
CONTRACTOR EMERGENCY CONTACT LIST**

COMPANY	CONTACT INFORMATION
DeGroot Construction	Mark DeGroot, President (920)-469-0407 / (920)-621-3791 Larry Skaletski, Foreman (920)-465-8828 / (920)-621-2318 Scott Basten, Foreman (920)-884-2560 / (920)-621-3511
Dorner Inc.	Todd Dorner (920)-609-7614
Feaker Construction	Randy Feaker (920)-660-1436 Randy Barlament (920)-660-1302 Dan Feaker (920)-621-8472 Rob Butnick (920)-655-0919
Jossart Brothers Inc.	Jesse Jossart (920)-371-0813 Jason Hermsen (920)-371-0819
PTS Contractors	Mark Schleis, President (920)-863-8402 / (920)-621-1565 Steven Horn, Project Manager/Estimator (920)-822-1887 / (920)-371-2975

A

**APPENDIX A – CITY OF DE PERE
MUNICIPAL CODE**

Chapter 26 - WATER AND SEWER SERVICE^[1]

Footnotes:

--- (1) ---

Cross reference— City administration, ch. 10; construction site erosion control, ch. 42; plumbing code, ch. 66; sewer system regulations, ch. 70; public health, ch. 74; solid waste/curbside recyclable collection, ch. 82; housing code, ch. 94.

Sec. 26-1. - Management of water utility.

- (a) Pursuant to the provisions of Wis. Stats. § 66.068(7), the city water utility shall be operated and managed by the board of public works under direct supervision of the director of public works. The board's management of such utility shall be under the general control and supervision of the common council.
- (b) The board of public works shall have the general powers and duties in its operation and management of such utility, as provided by law; and shall adopt such rules and regulations for the management of such utility as such board deems necessary.

(Code 1974, § 8.01)

Sec. 26-2. - Water main installations.

- (a) Upon the installing of any water mains in any street, service lines shall also be installed.
- (b) Before a street is improved by the installing of curb and gutter or permanent surfacing, water service lines shall be installed.
- (c) A building site shall consist of a lot or a parcel of property, which in the opinion of the director of public works/city engineer or his or her designee is an approved building site. The location of the service line shall be determined by the director of public works/city engineer or his or her designee.
- (d) Upon the installation of a service line, the public works department shall be advised of the location of the service line, and the department of public works shall keep a permanent record of the installation.
- (e) The water utility shall cause the property owner benefited by the installation to be billed, if the address of the property owner is known, and the property owner shall pay the charges of the installation within 30 days after the date of the sending of the bill. If the charges are not paid within 30 days, the charges shall become a special assessment against the property benefited, shall be extended on the tax roll and collected as a special assessment, the same as for the installation of water mains.
- (f) For the property benefited by the installation of the water service line there shall be no tapping charge when a connection is made to the service line.

(Code 1974, § 8.02; Ord. No. 13-17, § 15, 8-20-2013)

Sec. 26-3. - Water main extensions; assessment.

Assessment for the extension of a water main shall be as provided in section 13-7 of this Code.

(Code 1974, § 8.03; Ord. No. 13-17, § 7, 8-20-2013)

Sec. 26-4. - Sanitary and storm sewer main extensions.

All new storm sewer and sanitary sewer main extensions within the city may be chargeable to benefited property by means of a special assessment to be levied upon the benefited property as determined by the common council pursuant to the procedures set forth in Wis. Stats. § 66.0703. Service lines (laterals) shall be installed at the time the storm sewer and sanitary sewer main extensions are installed for each building site, and such property may be assessed for benefits derived from such installation as determined by the common council in accordance with § 13-7 of this code.

(Ord. No. 14-12, § 2, 9-16-2014)

Editor's note— Ord. No. 14-12, § 2, adopted Sept. 16, 2014, repealed the former § 26-4, and enacted a new section as set out herein. The former § 26-4 pertained to sewer main extensions; assessment, and derived from Code 1974, § 8.04.

Sec. 26-5. - Storm drainage.

- (a) *Clear water.* Clear water shall include water from roof drains, surface drains, foundation water drains, cistern overflows, refrigerator cooling waters and water from air conditioning equipment.
- (b) *Discharge to sanitary sewers.* No person shall discharge any clear water by means of sump pump or roof drains into any sanitary sewer, and no person shall permit rainwater or surface water to drain directly into any sanitary sewer.
- (c) *Discharge to storm sewer.* All clear water shall discharge directly into a storm sewer where such sewer is available, and the director of public works may direct such connection if he or she deems it necessary and in the public interest.
 - (1) *Permit required.* No person shall open any street, alley or other public place for the purpose of connecting to a storm sewer or other terminal without first obtaining from the director of public works a written permit to open such street, alley or public place.
 - (2) *Inspection.* Any person receiving a permit to connect to a storm sewer shall notify the street superintendent whenever the work is ready for inspection. All work shall be left uncovered until examined and approved by him or her.
- (d) *Discharge to public streets.* No person shall discharge any clear water directly into a public street or alley from November 1 to March 31, inclusive. No person shall discharge any clear water directly into a public street or alley from April 1 to October 31, inclusive, without first obtaining from the director of public works, a written permit to do so.
- (e) *Discharge onto sidewalks.* No person shall permit the drainage of water directly onto any sidewalk or other public area.
- (f) *Other discharges.* Where a storm sewer is not available, the discharge of clear water shall be either:
 - (1) Into a underground conduit leading into a drainage ditch or dry well;
 - (2) Onto the ground surface at least one foot from the building foundation and directed toward the front or rear lot line.

Such discharge shall not be directed so as to flow on adjacent property nor shall the discharge be allowed to accumulate and create ponds of standing water or other public nuisance. Nothing contained in this subsection shall act to relieve a person from complying with the other provisions of this section.

- (g) *Correction; penalty.* Any person who is the owner of any building or land wherein there is a violation of the provisions of this section, shall cause the violation to be corrected within a maximum of 60 days after being notified in writing by the director of public works or sewer inspector, whose duty it shall be to enforce this section. Any person who shall thereafter continue to violate the provisions of this section shall be subject to the forfeiture provided for violation of this chapter. Nothing in this section shall preclude the city from maintaining any other appropriate action to prevent or remove a violation of this section.

(Code 1974, § 8.09; Ord. No. 13-17, §§ 13, 14, 8-20-2013)

Sec. 26-5.5. - Storm sewer and service line (lateral) installation.

- (a) *New construction.*
 - (1) *Installation.* Storm sewer main and lateral installation to each lot of record shall be constructed at the time of initial road improvements. The location of the lateral shall be as determined by the city engineer or designee.
 - (2) *Costs of installation.* The costs of such storm sewer main and lateral installation shall be paid for as provided in § 13-7(a) of this code.
- (b) *Street reconstruction.*
 - (1) *Installation.* Storm sewer main and lateral installation to each lot of record shall be constructed at the time of street reconstruction in those streets which do not have storm sewer. The location of the lateral installation shall be as determined by the city engineer or designee.
 - (2) *Costs of installation.* The costs of such storm sewer main and lateral installation shall be paid for as provided in § 13-7(c)(1) of this code.
- (c) *Street resurfacing.*
 - (1) *Installation.* Storm sewer main and lateral installation to each lot of record shall be constructed at during street resurfacing improvements when:

- a. Requested by a property owner along the street to be resurfaced; or
- b. When ordered by the director of public works to address drainage issues.

The location of the lateral installation shall be as determined by the city engineer or designee.

- (2) *Costs of installation.* The costs of such storm sewer main and lateral installation shall be paid for as provided in § 13-7(c)(1) of this code.

(d) *Without other construction.*

- (1) *Installation.* "Mini" storm sewer, defined herein to mean storm sewer main of a smaller diameter than the traditional storm sewer main, intended to provide drainage for sump pumps and backyard drains and laterals, may be installed behind the curb line when:

- a. Requested by a property owner to address storm drainage issues; or
- b. When ordered by the director of public works to address drainage issues.

The extent of "mini" storm sewer shall be determined by the city engineer or designee based upon the drainage needs of the immediate vicinity.

- (2) *Costs of installation.* The costs of such "mini" storm sewer and lateral installation shall be paid for as provided in § 13-7(c)2. of this code.

(Ord. No. 14-12, § 3, 9-16-2014)

Editor's note— Ord. No. 14-12, § 3, adopted Sept. 16, 2014, repealed the former § 26-5.5, and enacted a new section as set out herein. The former § 26-5.5 pertained to storm sewer service line installation, and derived from Ord. No. 10-01, § 1, adopted Jan. 19, 2010.

Sec. 26-6. - Sump pump installation.

- (a) *Installation required; discharge regulated.* The installation of sump pumps shall be required in all residential, commercial and industrial buildings constructed after July 17, 1973. The effluent from all sump pumps installed pursuant hereto shall be discharged directly into the storm sewer where such sewer is available or can be made available.
- (b) *Permits required; inspection.* Any person applying for the plumbing permit under this chapter shall certify to the issuing officer or department that a sump pump shall be installed within such building and shall submit plans and specifications relating to the connection of such pump to the storm sewer. The plumbing inspector or other officer, prior to issuing any permits, shall review and approve such plans and specifications. Any installation and connection hereunder shall be performed in such a manner as to allow for inspection by the plumbing inspector.

(Code 1974, § 8.10)

Sec. 26-7. - Sewer inspector.

- (a) *Qualifications.* There is hereby created an office of sewer inspector. The person chosen to fill the office of sewer inspector shall be well versed in the regulations of the city relating to storm drainage as set forth in sections 26-5 and 26-6.
- (b) *Method of appointment.* The sewer inspector shall be appointed by the mayor, subject to confirmation by the common council.
- (c) *Duties.* It shall be the duty of the sewer inspector to enforce the provisions of sections 26-5 and 26-6. The sewer inspector shall periodically submit to the board of public works a report on the results of his or her inspections and the status of compliance with the provisions of sections 26-5 and 26-6. In addition, the sewer inspector shall advise and assist the director of public works and his or her assistants in the discovery and solution of drainage and sewer related problems in the city.
- (d) *Authority.* The sewer inspector, in the discharge of his or her duties, shall have the right to enter upon any property and have free and unobstructed access to any building or premises, or its part, during reasonable hours. He or she is hereby authorized and empowered to issue any order in the best interest of the general public to enforce compliance with sections 26-5 and 26-6, to reinspect, as provided, to determine such compliance, to issue citations for noncompliance and to commence appropriate actions to enforce the penalties provided.

(Code 1974, § 8.11; Ord. No. 13-17, §§ 13, 15, 8-20-2013)

Sec. 26-8. - Water use restricted; emergency shortage; declaring bans.

Whenever the director of public works/city engineer shall advise the mayor in writing that the water supply of the city's water utility is being depleted and that normal levels of supply are not foreseen, or that a situation exists with respect to the city's water supply system requiring curtailed water use, the mayor may declare a water shortage emergency in the city and direct a ban on the use of water supplied by such facility for nonessential uses including, but not limited to, the watering of lawns, gardens, shrubbery and other domestic plant life. The mayor may use discretion in determining the extent of the restrictions based upon the seriousness of the supply depletion or system problem, and may direct a ban between specific dates or between the hours of 7:00 a.m. and 7:00 p.m.; may direct an alternating ban based on odd/even days of the month and property addresses; or may direct a ban composed of combinations of the foregoing restrictions. Any ban so imposed by the mayor shall remain in effect until such time as the mayor is advised that water supplies are sufficient to allow for cessation of such ban, whereupon the mayor shall direct that the ban is ceased. If the mayor declines to direct the cessation of such ban after having been advised by the water utility, in writing, that the cause for such ban no longer exists, the common council may consider the matter at any meeting upon the request of any member and may, by resolution, declare the cessation of such ban.

(Code 1974, § 8.12)

Sec. 26-9. - Connection to sewer and water system required.

Pursuant to the provisions of Wis. Stats. § 281.45, to ensure preservation of public health, comfort and safety, any person owning property upon which buildings are used for human habitation and where such property is located adjacent to an installed sewer and water main, or in a block through which one or both of these systems extend, shall connect to such sewer or water main within the time given in such official notice to connect from the city. If such person fails or neglects to connect as required in such notice within the time prescribed, the city may cause such connection to be made and the expense of such connection assessed as a special tax against the property. Furthermore, failure of the owner of such property to connect or cause the connection to be made as required may also subject such person to a municipal forfeiture of not less than \$10.00 nor more than \$1,000.00 for each act of violation and each day upon which any such violation occurs shall constitute a separate offense.

- (1) *Connection to sewer and water required.* Connections to the sewer and water system shall be made contemporaneous with one another provided both sewer and water service are located pursuant to the above provision.
- (2) *Excavation permit required.* No person shall open any street, alley or other public place for the purpose of connection to a sewer or water main without first obtaining from the director of public works or authorized agent a permit to open such street, alley or public place. The cost for such excavation permit shall be as provided at section 22-11 of this Code. Prior to issuance of such excavation permit, the applicant shall arrange for an inspection and connection to the water main by the water superintendent or designee.
- (3) *Connection permit required.* No person shall make any attachment or extension of a lateral to any building without first obtaining a lateral connection permit as provided at section 66-9 of this Code.
- (4) *Qualified applicant.* The permits referred to in this section shall only be granted upon application by a licensed and bonded plumber authorized by the agent or owner of the premises desiring to make such connection, extension, or alteration. The applicant shall state the name of the owner and that the applicant and owner will be bound by, and subject to, the rules and regulations prescribed in this chapter, chapter 66 of this Code, and any other applicable municipal or state regulation. Applications under this section shall give the exact location of the premises, the purpose of the connection, the time the work is to be done, and all other particulars reasonably required by the director of public works or designee in relation thereto.

(Code 1974, § 8.14; Ord. No. 06-06, § 1, 4-5-2006)

Sec. 26-10. - Water utility rules and regulations adopted.

The rules and regulations of the water utility as approved by the state Public Service Commission in Order Number 1610WR-1, for services rendered on and after March 3, 1980, are incorporated by reference and made a part of this chapter as though fully set forth in this section. A copy of such rules and regulations shall be filed with the city clerk.

(Code 1974, § 8.15)

Sec. 26-11. - Interconnections and cross connections.

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

Cross connection means any physical connection or arrangement between two otherwise separate systems, one of which contains potable water from the city water system, and the other, water from a private source, water of unknown or questionable safety, or steam, gases or chemicals, whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems.

(b) *Prohibitions; exceptions.* No person shall establish or permit to be established or maintain or permit to be maintained any cross connection. No interconnection shall be established whereby potable water from a private, auxiliary or emergency water supply other than the regular public water supply of the city may enter the supply or distribution system of such municipality, unless such private, auxiliary or emergency water supply and the method of connection and use of such supply shall have been approved by the board of public works and by the state department of natural resources in accordance with Wis. Admin. Code NR § 811.

(c) *Inspections.*

(1) It shall be the duty of the city water utility to cause inspections to be made of all properties served by the public water system where cross connections with the public water system is deemed possible. The frequency of inspections and reinspection based on potential health hazards involved shall be as established by such utility and as approved by the state department of natural resources.

(2) Upon presentation of credentials, the representative of the city water utility shall have the right to request entry at any reasonable time to examine any property served by a connection to the public water system of the city for cross connections. On request, the owner, lessee or occupant of any property so served shall furnish to the inspection agency any pertinent information regarding the piping systems on such property.

(d) *Discontinuation of service.*

(1) The city water utility is hereby authorized and directed to discontinue water service to any property wherein any connection in violation of this chapter exists, and to take such other precautionary measures deemed necessary to eliminate any danger of contamination of the public water system. Water service shall be discontinued only after reasonable notice and opportunity for hearing before the board of public works except as provided in subsection (d)(2) of this section. Water service to such property shall not be restored until the cross connection has been eliminated in compliance with the provisions of this chapter.

(2) If it is determined by the city water utility that a cross connection or an emergency endangers public health, safety or welfare and requires immediate action, and a written finding to that effect is filed with the clerk and delivered to the customer's premises, service may be immediately discontinued. The customer shall have an opportunity for hearing before the board of public works within ten days of such emergency discontinuance.

(e) *Other regulations not affected.* This chapter does not supersede the state plumbing code or chapter 66 of this Code, but is supplementary to them.

(Code 1974, § 8.16)

Sec. 26-12. - Private well regulation.

- (a) *Purpose.* The common council finds and determines that private wells are a known pathway for the entrance of contaminants into groundwater aquifers, which aquifers also supply the municipal water system. It is further determined that cross connecting of private wells and municipal water sources may lead to such contamination. Contamination of the city's water supply would severely and adversely affect the health, safety and general welfare of city residents, particularly since contamination once introduced is extremely difficult to correct. Therefore, it is necessary and in the public interest that all wells within the corporate limits of the city, whether existing or hereafter installed, shall be effectively monitored and regulated in regard to their creation, operation and abandonment as set forth in this section.
- (b) *Definitions.* The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them in this subsection, except where the context clearly indicates a different meaning:
- Municipal water system* means the system owned and operated by the city water utility for the provision to the public of piped water for human consumption.
- Noncomplying* means a well or pump installation which does not comply with the provisions of Wis. Admin. Code NR ch. 112, in effect at the time the well was constructed, a contamination source was discovered, the pump was installed, or work was done on either the well or pump installation.
- Pump installation* means the pump and related equipment used for withdrawing water from a well, including discharge piping, ground connection, pitless adapters, pressure tanks, pits, sampling faucets and well seals or caps.
- Unsafe* means a well or pump installation which produces water which is bacteriologically contaminated or contaminated with substances exceeding the standards of Wis. Admin. Code NR chs. 809 or 140, or for which a health advisory has been issued by the state department of natural resources.
- Unused* means a well or pump installation which is not in use or does not have a functional pumping system.
- Well* means an excavation or opening into the ground made by digging, boring, drilling, driving or other methods for the purpose of obtaining groundwater for consumption or other use.
- Well abandonment* means the filling and sealing of a well in accordance with the provisions of Wis. Admin. Code NR ch. 112.
- (c) *Registration of wells.* No new wells shall be constructed and installed nor shall any existing well be maintained unless the wells are registered with the water utility by the owner of the property upon which the wells are located, and unless all such wells are in complete requirements with the provisions of this section, section 26-11, and the provisions of Wis. Admin. Code NR ch. 112. The registration form shall require, at a minimum, the following information:
- (1) Specific location.
 - (2) Age of well.
 - (3) Depth of well.
 - (4) Width of well.
 - (5) Type of casing.
 - (6) Intended use.
- (d) *Permit required.* No well shall be constructed, installed or maintained unless a permit is issued by the water utility upon registration as required in subsection (c) of this section. Prior to issuance of the permit, the owner, upon the direction and supervision of the water utility, shall comply with the requirements below. If the water utility determines that the well conforms with the provisions of this section, a permit not to exceed five years shall be issued. Such permit may be subject to renewal at the request of any owner of such well only upon submitting information verifying that the conditions of this section are met. Permit applications and renewals shall be made on forms provided by the water utility. In order to permit a well to be constructed, installed or maintained, or for any such permit to be renewed, the water utility must be satisfied of the following requirements:
- (1) The well construction and pump installation meet or are upgraded to meet the requirements of Wis. Admin. Code NR ch. 112.

- (2) The well construction and pump installation have a history of producing bacteriologically safe water as evidenced by at least two samplings taken a minimum of two weeks apart. No exception to this condition may be made for unsafe wells unless the state department of natural resources approves in writing the continued use of the well.
 - (3) There are no cross connections between the well and the pump installation and the municipal water system.
 - (4) The proposed use of the well and pump installation is reasonably justified in addition to other water provided by the municipal water system.
- (e) *Permit fee.* Every person requesting a well permit shall pay a fee as determined by resolution of the common council.
- (f) *Additional conditions of permit.* The right to construct, install and maintain a well as authorized by permit under this section shall be expressly conditioned upon the owners and successors in interest complying with the following:
- (1) The owner shall permit the water utility or its designee access to the well for inspection and testing at any time during normal working hours.
 - (2) No repair or modification of any well may be performed unless prior notification is given to the water utility and the plan and resulting construction is reviewed and inspected by such utility.
 - (3) The city shall have the right to sample the water after completion of any such repairs or modification. Such sampling shall be at the owner's cost and may either be done by the city or by the owner at the city's direction.
 - (4) The city shall have the right to randomly test or to direct the owner to test the well not more than two times in any six-month period. The city may require additional testing if there is reason to believe some contamination may be present or that the results of previous tests may be invalid.
 - (5) The cost of any testing and sampling as provided in this section shall be paid by the owner upon invoice by the city.
 - (6) A permit issued in accordance with the provisions of this section shall be revoked by the water superintendent upon notice to the permittee that any of the following have occurred:
 - a. The owner of the well has refused access to a well for testing or has failed to follow a direction of order of the water utility in regard to testing or sampling.
 - b. The owner of any well has neglected to pay for any tests authorized with 30 days of billing or invoice.
 - c. Any test results demonstrate well contamination and do not meet reasonable health standards or are in violation of any state or municipal ordinance dealing with well operation.
 - d. The parties aggrieved by permit revocation may appeal the initial decision of the water superintendent to the board of public works by filing a written petition for review with the city clerk.
- (g) *Well abandonment.* Upon revocation of a well permit in accordance with this section or upon voluntary determination to abandon the use of any well previously permitted hereunder, all wells under the jurisdiction of this section shall be abandoned in accordance with the procedures of Wis. Admin. Code NR ch. 112. All debris, pump, piping, unsealed liners, and other obstructions which may interfere with this sealing operations shall be removed prior to abandonment. The owner of the well or the owner's agent shall notify the water utility superintendent at least 48 hours prior to commencement of any well abandonment activities. The abandonment of the well shall be observed by the water utility superintendent and an abandonment report form, supplied by the state department of natural resources, shall be submitted by the well owner to the water utility and the state department of natural resources within ten days of the completion of the well abandonment.
- (h) *Abandonment of unused or previously abandoned wells.* It shall be the responsibility of the landowner of any real property upon which a well is located to see to it that all wells located on the owner's property have been properly abandoned in accordance with the procedures of Wis. Admin. Code NR ch. 112, regardless of whether such owner has used such well. Upon discovery of any unused or previously abandoned well, the owner shall notify the water utility and comply, insofar as is practicable, with the procedures of subsection (g) of this section. In the case of a previously abandoned well, if the owner can produce proof of compliance with state well abandonment

requirements to the satisfaction of the utilities manager/engineer, compliance with this section may be deemed unnecessary. Such determination shall be at the discretion of the utilities manager/engineer upon considering the present and future possibility of ground water contamination at the well site.

- (i) *Failure to properly abandon well public nuisance.* Failure to abandon any well after revocation of a permit to follow the provisions of Wis. Admin. Code NR ch.112, in abandoning such well is hereby deemed a public nuisance, and the city may cause such well to be property abandoned and may assess the cost against the owner of the affected property and collect it as a special tax.
 - (j) *Penalty.* In addition to any and all other costs which may be incurred by property owner under the provisions of this section, any person who violates any provision of this section shall pay a forfeiture of not less than \$100.00 nor more than \$500.00. From the time of written notice of such violation, each day of continuing violation of any provision of this section shall be considered a separate violation for the purposes of imposing forfeitures stated in this subsection.
- (Code 1974, § 8.17; Ord. No. 14-20, § 2, 12-16-2014)

Sec. 26-13. - Reserved.

Sec. 26-14. - Water supply development charge created.

- (a) *Short title.* This section shall be known and may be cited as the City of De Pere's Water Supply Development Charge Ordinance.
- (b) *Introduction and purpose.* The purpose of this section is to establish a mechanism to recover the development costs imposed on the city by the water authority. The water authority charges the city for new connections to the city's water system in areas outside the city's boundaries as they existed on December 1, 2003. The purpose of this section is to pass those charges on to the property owner seeking the new connection since that property owner is directly responsible for the costs imposed on the city by the water authority.
- (c) *Permit.* Each person, corporation, partnership, public agency, or other entity (hereinafter referred to as "a water user") shall obtain a permit from the city before installing a new water meter. The city shall determine the size of the water meter necessary or appropriate to provide service to the water user.
- (d) *Charge; generally.* If the new water meter is for a new connection to the city's water system in an area that was annexed or added to the city's boundaries since December 1, 2003, the water user who obtains a permit under subsection (c) shall pay a water supply development charge to the city at the time of the application for the permit. Such water supply development charge shall be calculated as set forth in subsection (e), and shall equal the charge imposed by the water authority on the city.
- (e) *Schedule of charges.* The amount of the water supply development charge shall be based upon the size of the meter to be installed. The water supply development charge shall equal \$50.00 multiplied by a factor determined by the size of meter to be installed, with a maximum charge of \$260.00 per meter. The size of the meter, the appropriate factor, and the resulting water supply development charge is set forth on the following table:

Meter Size (inches)	Factor	Water Supply Development Charge
Under 1"	1.0	\$50.00
1"	1.6	80.00
1.5"	3.0	150.00
2" or greater	5.2	260.00

- (f) *Responsibility for payment of charges.* All required water supply development charges shall be paid in full prior to issuance of a permit under subsection (c). Payment of the water supply development charge is the responsibility of the property owner of record at the time a permit under subsection (c) of this section is requested.

- (g) *Collection of charges.* Water supply development charges paid to and collected by the city shall be placed in a segregated, interest-bearing account called the water supply development charge account. Such funds shall be accounted for separately from other of the city's general and utility funds.
 - (h) *Payment of charges to water authority.* All funds, excluding interest, accumulated in the water supply development charge account established by the city shall be turned over to the water authority semi-annually on dates established by the water authority. The water authority shall use the funds to reduce the fixed costs of the water authority. Any interest income earned by the monies in the water supply development charge account need not be turned over to the water authority, but may be used by the city to help pay administrative costs of implementing this section.
 - (i) *Waiver.* the city may waive the collection of a water supply development charge from any property owner if the city itself agrees to be responsible for the payment of such charge.
- (Ord. No. 05-03, § 1, 1-18-2005)

Sec. 26-15. - Water conservation.

- (a) *Introduction and purpose.* This section is enacted in cooperation with the Central Brown County water authority ("water authority") and its member communities — Allouez, Bellevue, DePere, Howard, Town of Lawrence, and Ledgeview Sanitary District No. 2 — to support the implementation of a water conservation and management plan. The goal of this conservation and management plan is to preserve the water resources of the region and to extend the value and life of the infrastructure assets used in supplying water, without jeopardizing public health, safety and welfare.
- (b) *Public education.* The city shall at least once a year provide to its customers information regarding water conservation methods. Information may be provided by community newsletter, local newspaper, radio, television, new homeowners and business information packets, or information provided to students and teachers through school newsletters. The information provided shall include: (1) information on water consumption and use by customers; (2) tips on water conservation; (3) recommended lawn length and mowing practices; (4) recommended lawn care water amounts; (5) information on use of automatic sprinkler systems; (6) when to water for best results; (7) information on flow control on hoses; (8) information on the impact of water usage on the environment and public water systems; (9) information on in-house water fixture reductions (i.e. showerhead, reduced toilet flush, laundry etc.); and (10) information on the impact to the public if conservation methods are not used. This information may be provided in conjunction with the water authority and other water authority members.
- (c) *Determination of water shortage.* A water shortage shall be deemed to exist when the water authority advises the city and the other member communities that the water authority may not be able to supply sufficient potable water to meet the current or expected level of customer demand due to conditions not under their control. The water authority shall declare a stage I water shortage if extreme dry weather conditions require moderate water conservation. The water authority shall declare a stage II water shortage if continuing extreme dry weather conditions require a high level of water conservation. The water authority may also declare a stage I or stage II water shortage if any other circumstances, including service losses caused by equipment failure, human error, weather, or other natural disaster, constrains the water authority's water supply to less than the current level of customer demand.
- (d) *Declaration of water shortage.* In the event of a water shortage as determined in subsection (c), the water authority shall issue a public declaration of the water shortage. Upon such declaration, the city shall place in effect the restrictive provisions hereinafter authorized. The city shall inform the public about the water use restrictions and the reasons for those restrictions. Information shall be provided in the same manner as set forth in subsection (b).
- (e) *Mandatory conservation during stage I water shortage.* Except as provided below, in the event the water authority declares a stage I water shortage, it shall be unlawful for any person, firm, or corporation to use or permit the use of potable water within the city for any of the purposes hereinafter set forth until the water authority, by public declaration, has declared the stage I water shortage to be lifted.

Exception—Watering of lawns is restricted to the following: House numbers ending in an even number may water on even numbered days of the month. House numbers ending in an odd number may water on the odd days of the month. However, all watering must be done between the hours of 6:00 p.m. to midnight. Watering of trees, shrubs and flowers may be done at any time using a hand held hose.

- (f) *Mandatory conservation during stage II water shortage.* In the event the water authority declares a stage II water shortage, it shall be unlawful for any person, firm, or corporation to use or permit the use of potable water within the city for any of the purposes hereinafter set forth until the water authority, by public proclamation, has declared the stage II water shortage to be lifted. No outside use of water is allowed. Outside use is referred to but not limited to the following: (i) no watering of lawn, flowers or shrubs; and (ii) no washing of vehicles, recreational equipment, driveways, decks, porches or structures.
- (g) *Penalties.* Any person who violates this chapter or any provision thereof shall be subject to a forfeiture as determined by resolution of the council, plus costs, fees, assessments and penalties as required by law. Each act of violation and every day upon which a violation occurs or continues constitutes a separate offense.

(Ord. No. 05-05, § 1, 2-1-2005; Ord. No. 14-20, § 1, 12-16-2014)

Chapter 70 - SEWER SYSTEM REGULATIONS^[1]

Footnotes:

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Editor's note— Ord. No. 07-31, § 1, adopted Dec. 18, 2007, repealed and recreated Ch. 70, §§ 70-1—70-3, 70-31—70-39, 70-71—70-79, and enacted a new Ch. 70 as set out herein. The former Ch. 70 pertained to sewerage system regulations and user charge system. For complete derivation see the Code Comparative Table at the end of this volume.

Cross reference— Streets, alleys and sidewalks, ch. 22; water and sewer service, ch. 26; construction site erosion control, ch. 42; platting and division of land, ch. 46; building code, ch. 54; plumbing code, ch. 66; zoning, app. A.

Sec. 70-1. - Purpose and intent of chapter.

- (a) The purpose of this chapter is to promote and protect the public health, safety and general welfare of the citizenry of the city, to enhance aquatic life, scenic and ecological values and enhance municipal, industrial and recreational use of water.
- (b) The city hereby adopts and incorporates herein the Green Bay Metropolitan Sewerage District Sewer Use Ordinance, dated March 2, 2006, and may be amended from time to time. In case of a direct conflict between this chapter and the GBMSD sewer use ordinance, the terms and conditions of the GBMSD sewer use ordinance shall prevail.
- (c) The objectives of this chapter are to:
 - (1) Prevent the introduction of pollutants into the city wastewater system which will interfere with the normal operation of the system;
 - (2) Prevent the introduction of pollutants into the wastewater system which do not receive adequate treatment at the GBMSD, and which will pass through the system into receive waters or the atmosphere or otherwise be incompatible with the system;
- (d) Pursuant to Wis. Stats. § 66.0813(3) the City of De Pere limits its wastewater treatment service area to the corporate limits of the City of De Pere as the same exists as of the effective date of this chapter. This section does not limit the obligation to serve as it existed as of the effective date of this chapter. This section may be amended to expand such service area as provided in Wis. Stats. § 66.0813(3).

(Ord. No. 07-31, § 1, 12-18-2007)

Sec. 70-2. - Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as follows:

Approving authority means the Board of Public Works of the City of De Pere.

Biochemical oxygen demand (BOD) means the quantity of oxygen utilized in the biochemical oxidation of organic matter in five days at 20 degrees Centigrade, expressed as milligrams per liter. Quantitative determination of BOD shall be made in accordance with procedures set forth in Federal Regulations, 40 CFR, Part 136.

Building drain means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the lateral.

City means the City of De Pere, Brown County, Wisconsin.

Debt service charge means a charge levied on the users of the sewer utility for the retirement of capital expenditures.

Director of public works includes his/her written designee.

Compatible pollutants means biochemical oxygen demand, suspended solids, phosphorus, ammonia, or pH, plus additional pollutants identified in the WPDES permit for the publicly owned treatment works receiving the pollutants if such works were designed to treat such additional pollutants to a substantial degree.

Floatable oil is oil, fat or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility. A wastewater shall be considered free of

floatable fat if it is properly pretreated and the wastewater does not interfere with the collection or treatment system.

GBMSD means the Green Bay Metropolitan Sewerage District.

Garbage means the residue from the preparation, cooking, and dispensing of food, and from the handling, storage, and sale of food products and produce.

Ground garbage means the residue from the preparation, cooking, and dispensing of food that has been shredded to such degree that all particles will be no greater than one-half inch in any dimension and will be carried freely in suspension under normal flow conditions in public sewers.

Incompatible pollutants or wastewater means wastewater with pollutants or of such a strength that will adversely affect or disrupt the wastewater treatment processes or effluent quality or sludge quality if discharged to a wastewater treatment sewerage system facility.

Industrial waste means the wastewater from industrial process, trade, or business, as distinct from sanitary sewage, and the discharge from sewage pretreatment facilities.

Lateral means the extension from the public sewer or other place of disposal beginning outside the building wall.

May is permissible.

Municipal wastewater means the spent water of a community. From the standpoint of source, it may be a combination of the liquid and water-carried wastes from residences, commercial buildings, industrial plants and institutions, together with any groundwater, surface water, and stormwater that may have inadvertently entered the sewerage system.

Natural outlet means any outlet, including storm sewers, into a watercourse, pond, ditch, lake or other body of surface water or groundwater.

Parts per million shall be a weight-to-weight ratio; the parts per million value multiplied by the factor 8.34 shall be equivalent to pounds per million gallons of water.

Person means any and all persons, including any individual, firm, company, municipal or private corporation, association, society, institution, enterprise, government agency, or other entity.

pH means the logarithm of the reciprocal of the hydrogen ion concentration. The concentration is the weight of hydrogen ions, in moles per liter of solution. Neutral water, for example, has a pH value of seven and a hydrogen ion concentration of 10^{-7} .

Phosphorus means elemental phosphorus determined by and in accordance with the procedure set forth in Federal Regulations, 40 CFR, Part 136.

Pollutant means contaminant present in wastewater, including but not limited to, dredged spoil, solid waste, incinerator residue, sewage, garbage refuse, oil, solvents, flammables, sewage sludge, munitions, chemical wastes, biological materials, radioactive substances, heat, wrecked or discarded equipment, rocks, sand, soil, toxic substances and residential, commercial, industrial, or agricultural waste.

Pretreatment means the reduction, elimination or the alteration of pollutant properties prior to, or in lieu of, discharge into the sanitary sewer.

Public sewer means a sewer which is provided by or subject to the jurisdiction of the city and will consist of the following increments:

- (1) Collector sewer: A sewer whose primary purpose is to collect wastewaters from individual point source discharges.
- (2) Interceptor sewer: A sewer whose primary purpose is to transport wastewater from collector sewers to a treatment facility.
- (3) Force main: A pipe which wastewater is carried under pressure.
- (4) Pumping station: A station positioned in the public sewer service at which wastewater is pumped to a higher level.

Sanitary sewage shall mean a combination of liquid and water-carried wastes discharged from toilets and/or sanitary plumbing facilities, together with such ground, surface, and storm waters as may have inadvertently entered the sewerage system.

Sanitary sewer shall mean a sewer that carries liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions, together with small quantities of ground, storm, and surface waters that are not admitted intentionally.

Septage shall mean the wastewater or contents of septic or holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms. Septage

does not include waste disposed at an authorized and designated dumping station for recreational vehicles.

Sewage is spent water of a community. The preferred term is "municipal wastewater".

Sewer service areas are the areas presently served by the municipal wastewater sewage collection system and those areas within the city identified by the current Brown County Sewage Plan.

Sewer service charge is a service charge levied on users of the wastewater collection and treatment facilities for payment of use-related capital expenses as well as the operation and maintenance costs, including replacement costs associated with said facilities.

Sewer system means the common sanitary sewers within a sewerage system which are primarily installed to receive wastewaters directly from facilities which convey wastewater from individual structures or from private property, and which include service connection "Y" fittings designed for connection with those facilities. The facilities which convey wastewater from individual structures, from private property to the public sanitary sewer, or its equivalent, are specifically excluded from the definition of "sewerage collection system".

Sewerage system means all structures, conduits and pipes, by which sewage is collected, treated, and disposed of, except plumbing inside and in connection with buildings served, and service pipes, from building to street main.

Sewer utility means the sewer collection system components owned by the City of De Pere.

Shall is mandatory.

Slug load means any substance released at a discharge rate and/or concentration which causes interference to wastewater treatment processes or plugging or surcharging of the sewer system.

Standard methods means the examination and analytical procedures set forth in the most recent edition of "Standard Methods for the Examination of Water, Sewage, and Industrial Wastes" published jointly by the American Public Health Association, the American Water Works Association and the Water Pollution Control Federation.

Storm drain (sometimes termed "storm sewer") means drain or sewer for conveying surface water, groundwater, subsurface water or unpolluted water from any source.

Stormwater runoff means that portion of the rainfall that is collected and drained into the storm sewers.

Suspended solids means solids that either float on the surface of, or are in suspension in, water, wastewater, septage, or other liquids, and that is removable by laboratory filtering as prescribed in Federal Regulations, 40 CFR, Part 136 and is referred to as nonfilterable residue.

Total Kjeldahl Nitrogen (TKN). The sum of free ammonia and organic nitrogen compounds as determined by standard laboratory procedures in accordance with 40 CFR Part 136, as amended from time to time. TKN is a measurable quantity which will be used as billing parameter for billing ammonia treatment costs.

Unpolluted water is water of quality equal or better than the effluent criteria in effect or water that would not cause violation of receiving water quality standards and would not be benefited by discharge to the sanitary sewers and wastewater treatment facilities provided.

Wastewater facilities means the structures, equipment, and processes required to collect, measure, meter, carry away, store, and treat domestic and industrial wastes and dispose of the effluent.

Wastewater treatment works means an arrangement of devices and structures for treating wastewater, septage, industrial wastes, and sludge. Sometimes used as synonymous with waste treatment. In the case of the City of De Pere Sewer Utility, these facilities are owned by GBMSD.

Watercourse shall mean a natural or artificial channel for the passage of water, either continuously or intermittently.

Wisconsin Pollutant Discharge Elimination System (WPDES) permit is a document issued by the Wisconsin State Department of Natural Resources which establishes effluent limitations and monitoring requirements for a wastewater treatment facility.

(Ord. No. 07-31, § 1, 12-18-2007)

Sec. 70-3. - Management, operation, and control.

The management, operation, and control of the sewer system for the city is vested in the board of public works; all records, minutes and all written proceedings thereof shall be kept by the director of public works and all financial records shall be kept by the city finance director.

(Ord. No. 07-31, § 1, 12-18-2007)

Sec. 70-4. - User rules and regulations.

(a) *General.* The rules, regulations, and sewer rates of the city set forth herein or as amended by the city, shall be considered a part of the contract with every person, company or corporation who is connected to or uses the city sewer system and every such person, company or corporation by connecting with the sewer system shall be considered as expressing his or her or their assent to be bound thereby. Whenever any of such rules and regulations are violated, the use or service may be shut off from the building or place of such violation (even though two or more parties are receiving service through the same connection) and may not be re-established except by order of the common council and on payment of all arrears, the costs, expenses and established charges of shutting off and putting on, and such other terms as the common council may determine, and a satisfactory understanding with the party that no further cause for complaint shall arise. The right is reserved to the common council to change the said rules, regulations, and sewer rates from time to time as they may deem advisable; and to make special rates and contracts in all proper cases.

The following rules and regulations for the government of licensed plumbers, sewer users and others, are hereby adopted and established.

(b) *Plumbers.* No plumber, pipe fitter, or other person will be permitted to do any plumbing or pipe fitting work in connection with the sewer system without first receiving a license from the State of Wisconsin and obtaining permission from the building inspection department. All service connections to the sewer main shall comply with state plumbing code.

(c) *Use of public sewers required.*

(1) It shall be unlawful for any person to place, deposit or permit to be deposited in any unsanitary manner on public or private property within the city, or in any area under the jurisdiction of the city's sewer utility, any human or animal excrement, garbage or other objectionable waste.

(2) It shall be unlawful to discharge to any natural outlet within the city, or in any area under the jurisdiction of the city's sewer utility, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this chapter and the NPDES permit.

(3) Except as provided in this section, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage, except where public sewerage is not available and the required permits have been obtained.

(4) The owner of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes situated within the city and abutting on any street, alley or right-of-way in which there is now located, or may in the future be located, any public sanitary sewer of the city is hereby required, at his or her expense, to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this chapter within 30 days of written notice to do so upon failure to do so, the city may cause such connection to be made and charge the property for such costs as a special charge under Wis. Stats. § 66.0627.

(d) *Watering metering.* Public and/or private water systems shall be metered within five days for connecting the lateral system to the sanitary sewer system. The owner shall be responsible for preparing the water piping for meter installation and contacting the city water utility to install the meter. Failure to install the metering will initiate a bill for sewer usage of \$50.00 a month from the time of sewer connection.

(e) *Application for sewer service.*

(1) No unauthorized person shall uncover, make any connections with, or opening into, use, alter, or disturb any sewer main or appurtenance thereof without first obtaining a written permit from the department of public works.

- (2) Every person desiring to connect to the sewer system shall file an application in writing with the department of public works on such forms as is prescribed for that purpose. The application must state fully and truthfully all the wastes which will be discharged. If the applicant is not the owner of the premises, the written consent of the owner must accompany the application. Person connected to the sewer system of the De Pere Sewer Utility are referred to herein as "users".
- (3) There shall be two classes of lateral permits:
 - a. For residential and commercial service; and
 - b. For service to establishments producing industrial wastes.In either case, the person shall make application on a special form furnished by the city. The permit application shall be supplemented by any plans, specifications or other information considered pertinent in the judgment of the city. A permit and inspection fee for a lateral permit shall be paid to the city at the time the application is filed. The industry, as a condition of permit authorization, must provide information describing its wastewater constituents, characteristics and type of facility.
- (4) A lateral permit will be issued and a sewer connection shall only be allowed if it can be demonstrated that the downstream sewerage facilities, including sewers, pump stations and wastewater treatment facilities have sufficient reserve capacity to adequately and efficiently handle the additional anticipated waste load.
- (5) If, in the opinion of the city, insufficient reserve capacity exists to adequately and efficiently handle the additional waste loads anticipated from a new industrial connection, such authority may:
 - a. Refuse to issue the sewer permit.
 - b. Require additional time before issuing the permit to increase the capacity of the sewer system so as to possess the capability to adequately and efficiently handle the additional anticipated waste load.
- (6) If the type or volume of material from industrial property for which a sewer permit was previously granted shall materially and substantially change, the person granted such permit previously shall, upon order of the city:
 - a. Make a new application to the utility in the same manner and form as previously made;
 - b. Cease and desist from such discharge or be subject to disconnection, fine and other penalties provided by this chapter.
- (7) The size, slope, alignment and materials of construction of a lateral, and the methods to be used in excavating, placing of the pipe, jointing, testing and backfilling the trench, shall all conform to the requirements of the building and plumbing codes or other applicable rules and regulations of the city. In the absence of code provisions, or in amplification thereof, the materials and procedures set forth in appropriate specifications of the American Practice No. 9 and Wisconsin Administrative Code shall apply.
- (8) All costs and expenses incident to the installation and connection of the lateral shall be borne by the owner. The owner shall indemnify the city from any loss or damage that may be directly or indirectly occasioned by the installation of the lateral.
- (f) *User to keep in repair.* All users shall keep their own service pipes in good repair and protected from frost, at their own risk and expense, and shall prevent any unnecessary overburdening of the sewer system. The service pipe shall be defined to be the building drain and lateral pipe extending from the building to the main line sewer.
- (g) *User use only.* No user shall allow others or other services to connect to the sewer system through his or her lateral.
- (h) *Vacating of premises and discontinuance of service.* Whenever premises served by the system are to be vacated, or whenever any person desires to discontinue service from the system, the city must be notified. Removal of the structure shall include removal of the lateral to the property line and capping of the lateral at the property line. The owner of the premises shall be liable for any damages to the property of the system other than through the fault of the system or its employees, representatives, or agents.

- (i) *User to permit inspection.* Every user shall permit the city sewer utility or its duly authorized agent, at all reasonable hours of the day, to enter their premises or building to examine the pipes and fixtures, and the manner in which the drains, and sewer connections operate.
 - (j) *Construction.*
 - (1) Whenever possible, the lateral shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by a means which is approved by the city.
 - (2) No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a lateral or building drain which in turn is connected directly or indirectly to a public sanitary sewer.
 - (3) The applicant for the lateral permit shall notify the city when the lateral is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the city or their representative.
 - (4) All excavations for lateral installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the city.
 - (k) *Installation of house laterals.* All service pipes (laterals) on private property will be installed in accordance with the State of Wisconsin Administrative Code, SPS 382. As required by SPS 382, all laterals shall be inspected: "The lateral and/or private interceptor main sewer shall be inspected upon completion of placement of the pipe and before backfilling and tested before or after backfilling." Prior to installation of any service the applicant shall obtain inspection permits from the building/plumbing inspector.
 - (l) *Septage acceptance location.* No septage shall be discharged to the city's sewerage system.
 - (m) *Additional authority.* The city may at any time establish specific connection and lateral charges for any main not covered by any other provisions in this chapter. It is further provided that the city may amend or alter any connection or lateral charge after its establishment under the terms of this chapter or previous ordinance or resolution.
- (Ord. No. 07-31, § 1, 12-18-2007; Ord. No. 13-17, §§ 10, 15, 8-20-2013)

Sec. 70-5. - Use of the public sewerage system.

- (a) *General discharge prohibitions.* No discharger shall contribute or cause to be discharged, directly or indirectly, any of the following described substances into the wastewater disposal system or otherwise to the facilities of the city.
 - (1) Any liquids, solids or gases which by reason of their nature or quantity are, or may be, sufficient either alone or by interaction to cause fire or explosion or be injurious in any other way to the operation of the city wastewater facilities or the GBMSD wastewater treatment works.
 - (2) Solid or viscous substances which will or may cause obstruction to the flow in a sewer or other interference with the operation of the wastewater system.
 - (3) Any wastewater having a pH less than 5.0 or higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, or personnel of the system.
 - (4) Any wastewater containing toxic pollutants in sufficient quantity, either singly or by interaction to injure or interfere with any wastewater treatment process, constitute a hazard to humans or animals, or to exceed the limitation set forth in State or Federal Categorical Pretreatment Standards.

A toxic pollutant shall include but not be limited to any pollutant identified in the Toxic Pollutant List set forth in NR 215 of the Wisconsin Administrative Code.
 - (5) Any noxious or malodorous liquids, gases, or solids which either singly or by interaction are capable of creating a public nuisance or hazard to life or are sufficient to prevent entry into the sewers for their maintenance and repair.
 - (6) Any substance which may cause the city and/or GBMSD effluent or treatment residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process.

- (7) Any substance which will cause the city and/or GBMSD to violate its WPDES and/or other disposal system permits.
 - (8) Any substance with objectionable color not removed in the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions.
 - (9) Any wastewater having a temperature which will inhibit biological activity in the GBMSD wastewater treatment works resulting in interference; but in no case, wastewater with a temperature at the introduction into GBMSD's wastewater treatment works which exceeds 65°C (150°F).
 - (10) Any slugload, which shall mean any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a single extraordinary discharge episode of such volume or strength as to cause interference to GBMSD's wastewater treatment works.
 - (11) Any unpolluted water including, but not limited to non-contact cooling water.
 - (12) Any wastewater containing any radioactive wastes or isotopes of such half-life or concentration as exceed limits established by the authority in compliance with applicable state or federal regulations.
 - (13) Any wastewater which causes a hazard to human life or creates a public nuisance.
 - (14) Any stormwater, surface water, groundwater, roof run-off or surface drainage or any other connections from inflow sources to the sanitary sewer. Such waters may be discharged to a storm sewer or other waterway with permission of the city.
 - (15) Any discharge into the sanitary sewerage system that is in violation of the requirements of GBMSD's ordinances and WPDES permit and the modifications thereof.
 - (16) All restaurants are required to install and maintain grease interceptors in accordance with the Wisconsin Plumbing Code.
 - (17) It shall be unlawful to discharge to any natural waterway within the sewer utility jurisdiction or in any area under the jurisdiction of the sewer utility any sewage or other polluted waters, without first obtaining a Wisconsin Pollutant Discharge Elimination System (WPDES) permit.
- (b) *Limitations on wastewater strength.*
- (1) National Categorical Pretreatment Standards: National categorical pretreatment standards as promulgated by the U.S. Environmental Protection Agency shall be met by all dischargers of the regulated industrial categories.
 - (2) State requirements: State requirements and limitations on discharges to GBMSD shall be met by all dischargers which are subject to such standards in any instance in which they are more stringent than federal requirements and limitations or those in this or any other applicable ordinance.
 - (3) Green Bay Metropolitan Sewerage District Requirements: GBMSD requirements and limitations on discharges to GBMSD publicly owned treatment works shall be met by all dischargers.
 - (4) Right of revision: The city reserves the right to amend this chapter to provide for more stringent limitations or requirements on discharges to GBMSD where deemed necessary to comply with the objectives set forth in this chapter.
 - (5) Dilution: No discharger shall increase the use of potable or process water in any way, nor mix separate waste streams for the purpose of diluting a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the standards set forth in this chapter.
 - (6) Accidental discharges: (A) Each discharger shall provide protection from accidental discharge of prohibited or regulated materials or substances established by this chapter. Where necessary, facilities to prevent accidental discharge of prohibited materials shall be provided and maintained at the discharger's cost and expense. Detailed plans showing facilities and operating procedures to provide this protection shall be submitted to the director of public works for review, and shall be approved by the same before construction of the facility. Review and approval of such plans and operating procedures by the director of public works shall not relieve the discharger from the responsibility to modify its facility as necessary to meet the requirements of this chapter.

(B) Dischargers shall notify the director of public works and the GBMSD immediately upon the occurrence of a "slugload", or accidental discharge of substances prohibited by this chapter. The notification shall include location of discharge, date and time thereof, type of waste, concentration and volume, and corrective actions. Any discharger who discharges a slugload of prohibited materials shall be liable for any expense, loss or damage to the city's wastewater facilities or the GBMSD's wastewater treatment works, in addition to the amount of any fines imposed on account thereof under state or federal law.

Signs shall be permanently posted in conspicuous places on discharger's premises, advising employees whom to call in the event of a slug or accidental discharge. Employers shall instruct all employees who may cause or discover such a discharge with respect to emergency notification procedure.

(Ord. No. 07-31, § 1, 12-18-2007)

Sec. 70-6. - Control of industrial and septage wastes.

(a) *Industrial discharges.* Each person discharging other than a "normal" sewage to a public sewer shall prepare and file with the approving authority a report that shall include pertinent data relating to the quantity and characteristics of their wastes in accordance with Wisconsin DNR requirements. Similarly, each person desiring to make a new connection to the public sewers for the purpose of discharging industrial wastes shall prepare and file with the approving authority a report that shall include actual or predicted data relating to the quantity and characteristics of the waste to be discharged in accordance with said DNR requirements.

If any waters or wastes are discharged, or proposed to be discharged to the public sewerage system contain substances or possess the characteristics enumerated in section 70-5 and which, in the judgment of the city, may be detrimental to the sewerage system, the city may:

- (1) Reject the wastes.
- (2) Require pretreatment to an acceptable condition for discharge to the sewerage system.
- (3) Require a control over the quantities and rates of discharge.
- (4) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under this article.
- (5) Require approval from the GBMSD prior to accepting the discharge.

(b) *Control manholes.*

- (1) Construction. Each person discharging industrial wastes into a public sewer shall cause to be constructed and maintained one or more control manholes or access points to facilitate observation, measurement, and sampling of wastes, including domestic sewage.
- (2) Measurement of flow. The volume of flow used for computing the sewer service and the cost recovery charges for domestic disposal shall be based upon the water consumption of the person as shown in the records of meter readings maintained by the City of De Pere Water Utility.
- (3) Provision for deductions. In the event that a person discharging industrial waste into the public sewers produces evidence satisfactory to the city that more than ten percent of the total annual volume of water used for all purposes does not reach the public sewer, then the determination of the water consumption to be used in computing the waste volume discharged into the public sewer may be made a matter of agreement between the city and the industrial waste discharger.

(c) *Metering of waste.* Devices for measuring the volume/strength of waste discharged may be required by the city if this volume/strength cannot otherwise be determined from the metered water consumption records. Where required by the city, metering devices for determining the volume/strength of water shall be installed, owned, and maintained by the city. The cost and expense for all metering shall be paid by the person discharging the wastewater.

(d) *Waste sampling.*

- (1) Industrial wastes discharged into the public sewers shall be subject to inspection and a determination of character and concentration of said wastes on a schedule set by the city.

- (2) Samples shall be collected in such a manner as to be representative of the composition of the wastes. The sampling may be accomplished either manually or by the use of mechanical equipment.
 - (3) Access to sampling locations shall be granted to the city or its duly authorized representatives at all times. Every care shall be exercised in the collection of samples to ensure their preservation in a state comparable to that at the time the sample was taken.
- (e) *Pretreatment.* When required, in the opinion of the city, to modify or eliminate wastes that are harmful to the structures, processes, or operation of the sewerage system, the discharger shall provide at his or her expense such preliminary treatment or processing facilities as may be required to render his or her wastes acceptable for admission to the public sewers.
- (f) *Grease and/or sand interceptors.* Grease, oil, and sand interceptors shall be provided by the industrial discharger and other operations depending on the character of the discharge and shall be located as to be readily and easily accessible for cleaning and inspection. Furthermore, grease interceptors shall be provided by restaurant dischargers. In the maintaining of these interceptors, the discharger shall be responsible for the proper removal and disposal by appropriate means of the captured material and shall maintain records of the dates and means of disposal which are subject to review by the city. Any removal and hauling of the collected materials not performed by the discharger(s) personnel, must be performed by currently licensed disposal firms.
- (g) *Analyses.*
- (1) All measurements, tests, and analyses of the characteristics of waters or wastes to which reference is made in this article shall be determined in accordance with 40 CFR Part 135. Sampling methods, locations, times, durations, and frequencies are to be determined on an individual basis subject to approval by the city.
 - (2) Determination of the character and concentration of the industrial wastes shall be made by the city. If the person discharging the waste contests the determination, the discharger may elect to have an independent laboratory determine the character and concentration of the waste. Said independent laboratory shall be certified under NR 149 and shall be acceptable to both the city and the person discharging the waste. All costs incurred by the independent laboratory in making the determination shall be assumed by the discharger or by other agreement with the city.
- (h) *Submission of information.* Plans, specifications, and any other pertinent information relating to proposed flow equalization, pretreatment, or processing facilities shall be submitted for review of the city prior to the start of their construction if the effluent from such facilities is to be discharged into the public sewers.
- (i) *Submission of basic data.* Each person who discharges industrial wastes to a public sewer shall prepare and file with the city a report that shall include pertinent data relating to the quantity and characteristics of the waste discharged to the sewerage system. Similarly, each person desiring to make a new connection to a public sewer for the purpose of discharging industrial wastes shall prepare and file with the city a report that shall include actual or predicted data relating to the quantity and characteristics of the waste to be discharged.
- (j) *Extension of time.* When it can be demonstrated that circumstances exist which would create an unreasonable burden on the person proposing to discharge a waste, to comply with the time schedule imposed herein, a request for extension of the time may be presented for consideration by the city.
- (Ord. No. 07-31, § 1, 12-18-2007; Ord. No. 13-17, § 15, 8-20-2013)

Sec. 70-7. - Violations and penalties.

- (a) *Damages.* No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure of pertinence or equipment which is a part of the sewerage system. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.
- (b) *Written notice of violation.* Any person connected to the sewerage system found to be violating a provision of this chapter shall be served by the city with a written notice stating the nature of the

violation and providing a reasonable time for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violation.

- (c) *Accidental discharge.*
 - (1) Any person found to be responsible for accidentally allowing a deleterious discharge into the sewer system which causes damage to the sewerage system and/or the GBMSD and/or receiving body of water shall, in addition to a fine, pay the amount to cover all damages.
 - (2) Reporting. Any person responsible for an accidental discharge which may have a detrimental impact on the sewerage system, shall immediately report the nature and amount of the discharge to the city and the GBMSD.
 - (d) *Continued violations.* Any person, partnership, or corporation, or any officer, agent, or employee thereof, who shall continue any violation beyond the aforesaid notice time limit provided shall be subject to such forfeiture as the common council may determine by resolution of the common council.
 - (e) *Liability to city for losses.* Any person violating any provision of this chapter shall become liable to the city for any expense, loss, or damage occasioned by reason of such violation which the city may suffer as a result thereof.
 - (f) *Damage recovery.* The system shall have the right of recovery from all persons, any expense incurred by said system for the repair or replacement of any part of the sewerage system damaged in any manner by any person by the performance of any work under their control, or by any negligent acts.
 - (g) *Penalties.* Any person who shall violate any of the provisions of this chapter or rules or regulations of the city or who shall connect a service pipe or discharge without first having obtained a permit therefore; or who shall violate any provisions of the Wisconsin Statutes, Wisconsin Administrative Code, or any other materials which are incorporated by reference, shall be subject to such forfeiture as may be determined by resolution of the common council.
 - (h) *Amendments.* The city, through its duly qualified governing body, may amend this chapter in part or in whole whenever it may deem necessary.
- (Ord. No. 07-31, § 1, 12-18-2007)

Sec. 70-8. - Sewer service charge system.

- (a) *Policy.* It shall be the policy of the city to obtain sufficient revenues to pay the costs of the operation and maintenance of the sewerage system, including debt service and replacement costs, through a system of sewer service charges as defined in this section. The system shall assure that each user of the sewerage system pays their fair and proportionate share of such facilities.
- (b) *Sewer service charges generally.* The city shall annually, or from time to time as the common council deems necessary, determine the cost of operating and maintaining the city's public sewer system. A service charge shall be the sum of the city's cost of operation and maintenance of the collection system and the treatment charge from GBMSD. The sewer service charge shall consist of a volume charge, or quantity charge, which represents treatment and transportation of wastewater and a fixed customer charge which includes the cost of infiltration/inflow and billing preparation. These costs shall be charged proportionally to all users of the sewer system.
- (c) *Sewer service charge.* A sewer service charge is hereby levied and assessed upon each improved lot, parcel of land, building, or premises for sewer service. As hereinafter enumerated, the common council shall have the authority to establish such charges by resolution from time to time as may be necessary.
 - (1) *Nonmonitored users.* The following schedule of rates or fraction thereof shall be the basis for determining charges to all users, except monitored users, for rendering sanitary sewage service, but excluding industrial waste.
 - a. *Service charge.* The sum of fixed customer charge and volume charge.
 - b. *Fixed customer charge.* The sum of volume charge, meter charge, administrative oversight, billing preparation charge, and infiltration/inflow charge.
 - c. *Volume charge.* A volume charge consisting of the GBMSD rate and the city rate shall be charged to all users based on water used as more fully set forth below.

1. *Green Bay Metropolitan Sewerage District rates.* The GBMSD rates shall be those unit rates determined and charged to the city by the GBMSD for volume, BOD, suspended solids, phosphorous, and TKN. The GBMSD rates shall be expressed as a rate per 1,000 gallons.
2. *City rate.* The city rate shall be expressed as a rate per 1,000 gallons.
3. *Volume rate.* The volume rate shall be the combination of the GBMSD rate and the city rate per 1,000 gallons of water, metered or sewage discharged.
4. The volume charge for residential users shall be based on the individual user's water use as follows:

Block 1	First 18,000 gal./month or 54,000 gal./quarter
Block 2	18,001 to 180,000 gal./month or 54,001 gal./quarter to 540,000 gal./quarter
Block 3	Over 180,000 gal./month or 540,000 gal./quarter

- (2) *Monitored users.* The following schedule of rates per month or fraction thereof shall be the basis for determining charges to all monitored users:
 - a. *Service charge.* The sum of monthly fixed customer charge, quantity charge, and sampling charge.
 - b. *Administrative fee.* The sum of expenses incurred in administering monitored user accounts.
 - c. *Quantity charge.* A quantity charge consisting of the GBMSD rate and the city rate shall be charged to all users based on the total volume of sewage and quantity of BOD, suspended solids, phosphorous, and TKN produced.
 - d. All monitored users shall have metering and/or sampling as required by the director of public works. Metering and/or sampling shall consist of water meters, automatic sewage flow meters, and/or automatic samplers where, in the opinion of the director of public works, such installations are required to determine accurate volume and strength measurements of sewage discharge. Periodic sampling and/or metering may be utilized to determine value and strength of sewage discharged where such methods give reasonably accurate results in the opinion of the director of public works. monitored users shall be charged based on the volume of sewage discharged and the quantities of BOD, suspended solids, phosphorous, and TKN in the sewage discharged to a public sewer.
 - e. The volume charge for metered users shall be based on the water use as follows:

Block 1	First 18,000 gal/month or 54,000 gal./qtr.
Block 2	18,001 to 180,000 gal./month or 54,001gal/qtr to 540,000 gal./qtr.
Block 3	Over 180,000 gal./month or 540,000 gal./qtr.

The volume charge for each metered user shall not exceed ten percent of the variable expenses for the collection system as adopted in the rate analysis.

- f. *Sampling charge.* A sampling charge consisting of all costs for personnel, material, and equipment used to collect and analyze samples from a customer's sewage to determine sewage strength shall be billed at cost directly to the user.
- (3) *Rate determinations.* The common council shall establish by resolution each year the rates referred to herein; and the common council shall have the right to amend, modify, adjust, or change the rates at any time as deemed necessary.

(Ord. No. 08-06; § 2, 4-15-2008)

Editor's note— Ord. No. 08-06, § 1, adopted Apr. 15, 2008, repealed the former § 70-8 and enacted a new § 70-8 as set out herein. The former § 70-8 pertained to wastewater service charges and derived from Code 1974, § 19.061; Ord. No. 07-31, § 2, 12-18-2007.

Sec. 70-9. - Billing practice.

- (a) *Billing periods.* Sewer service charges in this section for users without metering and/or sampling shall be included as a separate item on the regular bill for water service and shall be payable in accordance with the current rules and regulations of the city water utility, commencing with all bills due and payable on and after April 28, 2008. Monitored users that have metering and/or sampling shall be billed by the water department on a monthly basis.
- (b) *Payment.* Users billed by the water department shall make payment in accordance with the current rules and regulations of the water utility for payment of water bills. Such payments shall be made at the office of the water department or any other officially designated location at the same time that the water bills become due. Monitored users being billed directly by the water department shall make payment to the water department. Checks shall be made payable to the city clerk.
- (c) *Penalties for late payment of sewer service charges.*
- (1) *Delinquency.* Bills for sewer service charges levied and assessed in accordance with this chapter and resolutions adopted pursuant hereto and the rules and regulations of the city water utility shall become due and payable within 20 days after the date of billing. All overdue accounts shall be charged a penalty of one and one-half percent per month on the unpaid balance due, including penalties.
- (2) *Unpaid balances.*
- a. Each sewer service charge levied by or pursuant to this section shall constitute a lien upon the corresponding premises serviced by the sewer system as provided for in Wis. Stats. § 66.0821, and the city clerk shall record such lien in accordance with applicable statutes.
- b. Metered customers who discharge into any part or component of the city's public sewer system who are 45 or more days delinquent on any sewer charge levied hereunder may also be prohibited from further discharge into the city's public sewer system in accordance with the procedure as set forth herein.
1. Written notice of the metered customer's delinquency shall be given to the customer by the director of public works. Such notice shall include a provision advising the metered customer that failure to pay such delinquency in full within 15 days of receipt of the notice may result in the city's termination of the metered customer's access to the city's sewer system.
2. If payment in full is not made within the time given and if the metered customer has not provided the director of public works with a mutually satisfactory time line, not to exceed 60 days, in which such delinquency is to be fully satisfied, the director of public works may determine to terminate the customer's access to the city's public sewer system. In making such determination, the director of public works shall consider the following:
- i. The length of time the delinquency has continued;
- ii. The total amount of the delinquency;
- iii. The average monthly sewer service charge of the customer;
- iv. Whether prior unpaid delinquencies within the past five years were placed upon the tax roll by the city pursuant to Wis. Stats. § 66.0821.
- v. Other relevant financial information supplied by customer.
- If the director of public works determines to terminate the customer's access to the city's public sewer, a five-calendar day warning notice shall be personally delivered to the customer's city location. If the customer does not pay the entire delinquency, including penalties and interest within the five-calendar day period, the director of public works may cause such access to be terminated.
- If the director of public works determines not to terminate such access, the director shall employ such other means to ensure compliance with payment requirements by the customer as the director deems necessary, including, but not limited to, obtaining electronic fund transfer authorization from such customer.
- The director's determination hereunder is subject to the appeal process of subsection (d) below.

3. The metered customer shall be responsible to pay all costs associated with terminating or reconnecting such customer's access to the city's sewer system.
- (3) *Violations.* Any person violating any of the provisions of this section or tampering with metering or sampling shall be liable to the city for any expense, loss, or damage occasioned by such violation and upon conviction of any violation of this section shall be subject to a forfeiture of not less than \$100.00 nor more than \$2,500.00 per violation, plus damages. Each day a condition is allowed to exist which is contrary to all or any part of this section shall constitute a new violation.
- (4) *Ownership and occupancy.* Change of ownership or occupancy of premises under provisions of this section shall not be cause for reducing or eliminating charges due and penalties.
- (d) *Appeal procedures.* Any user affected by any decision, action, or determination, including cease and desist orders, made by the interpreting or implementing provisions of this chapter may file with the director of public works a written request for reconsideration within ten days of the date of such decision, action, or determination, setting forth in detail the facts supporting the user's request for reconsideration. The director of public works shall render a decision on the request for reconsideration to the user in writing within 15 days of receipt of request. If the ruling on the request for reconsideration made by the director of public works is unsatisfactory, the person requesting reconsideration may, within ten days after notification the action, file a written appeal with the board of public works.

(Ord. No. 08-06, § 3, 4-15-2008; Ord. No. 08-11, § 1, 5-20-2008)

Editor's note— Ord. No. 08-06, § 1, adopted Apr. 15, 2008, repealed the former § 70-9 and enacted a new § 70-9 as set out herein. The former § 70-9 pertained to local charge systems and derived from Code 1974, § 19.062; Ord. No. 07-31, § 2, 12-18-2007.

Secs. 70-10—70-120. - Reserved.

Editor's note— Ord. No. 08-06, § 1, adopted Apr. 15, 2008, repealed the former §§ 70-10—70-12 and §§ 70-118—70-120 which pertained to wastewater service charge billing; delinquency, local service charge billing; delinquency, WDNR and USEPA access to records, service to outlying territory, abrogation and greater restrictions, and interpretation, respectively and derived from Code 1974, §§ 19.09—19.14; Ord. No. 07-31, § 2, 12-18-2007.

Appendix A TOXIC POLLUTANTS

Advisory comment to reviewer: The city intends to adopt the federal priority pollutant list as their own.

Appendix B CATEGORICAL PRETREATMENT STANDARDS

Advisory comment to reviewer: The city intends to adopt National Categorical Pretreatment Standards as their own which at this time includes:

40 CFR 413
Effluent Guidelines and Standards,
Electroplating Point Source Category
Pretreatment Standards for Existing Sources
— dated January 28, 1981
40 CFR 429
Timber Products Processing Point
Source Category

B

APPENDIX B – CITY OF DE PERE STANDARD SPECIFICATIONS

CITY OF DE PERE



DEPARTMENT OF PUBLIC WORKS

2020 STANDARD SPECIFICATIONS

December 9, 2019

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CITY OF DE PERE

**SECTION 00 70 00
GENERAL CONDITIONS**

DEFINITIONS AND TERMS

Whenever any of the following listed terms appear in the contract documents, the intent and meaning shall be interpreted as follows:

AASHTO - American Association of State Highway Transportation Officials.

Addenda - All revisions of and supplements to the plans and specifications incorporated in or attached to and becoming an integral part of the contract documents.

Advertisement for Bids - The official notice inviting bids for proposed improvements.

Agreement - The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

ANSI - American National Standards Institute, Inc.

ASTM - American Society for Testing and Materials.

AWWA - American Water Works Association.

Bid - The offer or bid of the Bidder, submitted on the prescribed bid form, setting forth the prices of the work to be performed.

Bidder - Any individual, partnership or corporation submitting a bid for work contemplated, acting directly or through a duly authorized representative.

Bid Form - The approved form on which the City requires formal bids to be prepared and submitted for the work.

Bidding Documents - The Bidding Requirements and the proposed Contract Documents (including all Addenda).

Bidding Requirements - The advertisement or invitation to bid, Instructions to bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

Board of Public Works – The Board of Public Works of the City of De Pere

Board of Park Commissioners - The Board of Park Commissioners of the City of De Pere.

City - The City of De Pere, a municipal corporation of the State of Wisconsin, located in the County of Brown.

Completion Date - The calendar date shown in the bid on or before which the work contemplated under the contract shall be completed.

Contract - The written agreement between the City and the Contractor setting the obligations of the parties thereto. The contract includes the advertisement for bids, bid, contract form and contract bond, specifications, special provisions, plans, and notice to proceed, also any contract change orders and agreements that are required to complete the construction of the work in an acceptable manner, including authorized extensions thereof, all of which constitute one instrument.

Contract Bond - The approved form of security, executed by the Contractor and his surety or sureties, guaranteeing the faithful performance of the contract and the payment to persons entitled thereto, of all claims.

Contract Change Order - A written order, authorization or agreement executed by the Contractor and the City covering work not otherwise provided for, revisions in or amendments to the contract, or conditions specifically prescribed in the specifications as requiring contract change orders. Such document becomes a part of the contract when executed by the contracting parties.

Contract Time - The number of calendar days shown in the bid representing time allowed for the completion of the work contemplated under the contract.

Contractor - The party of the second part to the contract; the individual, partnership, joint venture, corporation or agency undertaking the execution of the work under the terms of the contract and acting directly or through a duly authorized representative.

Director of Public Works - The Director of Public Works of the City of De Pere or authorized designee.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Engineer - The City Engineer of the City of De Pere or authorized designee.

Inspector - The authorized representative of the Engineer assigned to make detailed inspection of any or all portions of the work or materials therefore.

Laws and Regulations; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

Notice to Proceed - A written notice to the Contractor of the time within which to begin the prosecution of the work.

Owner - The City of De Pere, Wisconsin.

Plans - All contract drawings, including reproductions and revisions thereof, pertaining to the work covered by the contract.

Schedule of Values - A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

Site - Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

Special Provisions - Special directions, provisions or requirements peculiar to the project under consideration and not otherwise thoroughly or satisfactorily detailed or set forth in the specifications. Special provisions set forth the final contractual intent as to the matter involved, and shall prevail over these specifications and plans whenever in conflict therewith.

Specifications - The body of directions, provisions and requirements contained herein, together with written agreements and all documents of any description, made or to be made, pertaining to the method of manner of performing the work, the quantities, and the quality of materials to be furnished under the contract.

Subcontractor - Any individual, partnership, joint venture or corporation to whom the Contractor sublets any part of the contract.

Successful Bidder - The Bidder submitting a responsive Bid to whom Owner makes an award.

Supplier - A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

Surety - The corporate body bound with and for the Contractor to insure acceptable performance of the contract and payment of all obligations pertaining to the work.

Underground Facilities - All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Work - Work shall be understood to mean the furnishing of all labor, materials, equipment and other incidentals necessary or convenient to the successful completion of the project, or a particular part of the project, in accordance with the requirements of the contract.

BIDDING REQUIREMENTS

BID FORMS. Bid forms for bidding may be obtained from the office of the Director of Public Works.

All papers bound with or attached to the bid form are considered a part thereof and shall not be detached or altered when the bid is submitted. The plans, specifications and other documents designated in the bid form will be considered a part of the bid whether attached or not.

INTERPRETATION OF QUANTITIES. A schedule of quantities of work to be done or materials to be furnished is given in the Bid Form.

Itemized quantities of work are to be considered as approximate and for the comparison of bids only. After the contract is awarded, the quantities of work listed may be increased or decreased a reasonable amount without invalidating the bid prices.

EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF WORK. The bidder is required to examine carefully the work site, bid form, plans, specifications, special provisions and contract forms for the work contemplated. The submission of a bid will be considered conclusive evidence that the bidder has made such examination and is satisfied to all conditions and contingencies.

No extra payment will be made over and above the contract price and no performance of the Contractor will be excused on account of any difference between the information relating to soil conditions provided by the City and the conditions disclosed at the site of the work during the progress of the contract.

INTERPRETATION OF CONTRACT DOCUMENTS. No oral representations or interpretations will be made to any bidder as to the meaning of the contract documents. Requests for an interpretation shall be made in writing and delivered to the Engineer at least ten (10) days before the time announced for opening the bids. Interpretations by the Engineer will be in the form of an addendum to the contract documents and, when issued, will be sent as promptly as is practical to all parties to whom the bid documents have been issued. All such addenda shall become part of the contract.

PREPARATION OF THE BID. The bidder shall submit its bid on forms included with the Bidding Documents. The bid shall be properly executed, and shall clearly specify a unit price for each item listed therein and shall also show the products of the respective unit prices and quantities, and the total amount of the bid obtained by adding the amounts of the several items.

In case of conflict between a unit bid price and the corresponding extended amount, the unit bid price will govern.

A bid submitted by an individual shall be signed by the bidder or by a duly authorized agent. A bid submitted by a partnership shall be signed by a member or a duly authorized agent thereof. A bid submitted by a corporation shall be signed by an authorized officer or duly authorized agent of such corporation, and the bid shall show the name of the State under the laws of which said corporation was chartered.

REJECTION OF BIDS. Bids may be rejected if they show any alterations of form, additions or amendments not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind. Bids in which the unit prices for some items are out of proportion to the prices for other items, or bids in which unit prices are not submitted for each item of work listed may be rejected.

BID GUARANTEE. No bid will be considered unless accompanied by a certified check, bank's draft, bank's check, or a surety bond payable to the City of De Pere as designated in the Advertisement for Bids.

SUBMISSION OF BIDS. Each bid shall be placed, together with the Bid Guarantee, in a sealed envelope, so marked as to indicate the project number and the name and address of the bidder.

Bids will be received at the office of the Director of Public Works until the hour of the date designated in the Advertisement for Bids.

WITHDRAWAL OF BIDS. All bids filed with the Director of Public Works will be kept secure and unopened and may not be withdrawn, except on written request of the bidder or authorized representative made prior to expiration of the time set for receiving bids. If such withdrawal is made, the prospective bidder shall not be entitled to bid on the contract at hand unless the same is re-advertised and the bid will be returned unopened to such bidder after the public opening of bids.

OPENING OF BIDS. Bids will be opened and read publicly at the time and place indicated in the Advertisement for Bids.

The City of De Pere reserves the right to postpone the date and time for opening of bids at any time prior to the date and time announced in the advertisement.

PREQUALIFICATION OF BIDDERS. Each bidder shall pre-qualify by submitting Proof of Responsibility on forms furnished by the Director of Public Works. Such forms shall be filed with the Director of Public Works not later than the time and date indicated in the Advertisement for Bids. Bidders are required to complete 30% of the Work with their own forces.

COMPETENCY OF BIDDERS. Any one or more of the following may be considered as sufficient for the rejection of the bid or bids and disqualification of the bidder: Developments subsequent to establishment of bidder's competency and qualifications which would reasonably be construed as affecting the responsibility of the bidder. Conviction of a violation of a State or Federal law or regulation relating to or reflecting on the competency of the bidder.

- (a) More than one bid for the same work from an individual, partnership, or corporation under the same or different names.
- (b) Evidence of collusion among bidders.
- (c) Lack of responsibility as shown by past work for the City.
- (d) Noncompliance with terms of previous or existing contracts.

- (e) Uncompleted work, which might hinder or prevent the prompt completion of additional work if awarded.
- (f) Uncompleted work on which the actual time used has exceeded the contract time set therefore, or on which work the performance or progress is not satisfactory.

AWARD AND EXECUTION OF CONTRACT

CONSIDERATION OF BIDS. The bids received will be compared on the basis of the summation of the products of the quantities of work listed and the contract unit prices offered. In case of discrepancy between the gross sum shown in the bid and that obtained by adding the products of the quantities of work and the unit prices, the unit prices will govern, and any errors found in said products and summation will be corrected.

The City reserves the right to reject any or all bids, to waive any technicalities, to re-advertise for bids, or to proceed to do the work otherwise, if in its judgment, the best interest of the City will thereby be served.

AWARD OF CONTRACT. The award of contract, if it be awarded, will be to the lowest responsible bidder whose bid complies with all necessary requirements.

Should no award be made within 60 days after the date of opening bids, the lowest responsible bidder may, upon the expiration of such period, request in writing that the award be made within a stipulated time, not less than 10 days, exclusive of Sundays and holidays, after the date of his request. Should no award be made within the time so stipulated, the bidder will thereby be relieved of his obligation to execute a contract and contract bond.

RETURN OF BID GUARANTEE. The bid guaranty of all except the three lowest responsible bidders will be returned promptly after the bids are checked and tabulated.

The bid guarantee of the lowest responsible bidder will be returned as soon as the contract, contract bond, and other documents required to be filed by the bidder has been properly executed and submitted in proper form to the City; provided, however, that in the event no award is made within the extended time stipulated by the lowest responsible bidder, the bidder's guarantee will be returned promptly upon expiration of such extended time.

The bid guarantees of the second and third lowest responsible bidders will be returned as soon as the contract, contract bond, and other documents required have been properly executed by the successful bidder and submitted in proper form to the City; provided that the guarantees of such second and third bidders will not be retained longer than 70 days after the date of opening of bids without their express consent.

CONTRACT BOND. The successful bidder, at the time of submitting the contract for execution by the City shall deposit with the Director of Public Works a good and sufficient Performance Bond in the full amount of the contract and a Payment Bond in the amount of 100 percent of the contract. Forms for the contract bond are those included in the Bidding Documents.

INSURANCE. The Contractor shall provide the following insurance:

General. All insurance is the responsibility of the Contractor. The Contractor and each separate Subcontractor shall purchase and maintain such insurance as will protect him/her, and indemnify and safe harmless the City from any and all claims for General and Automobile Liability and Worker's Compensation/Employer's Liability, including claims for damages resulting in bodily injury, including but not limited to death, and property damage and arising out of or resulting from the Contractor's direct or indirect operations under this contract, whether such operations be performed by himself/herself or by a Subcontractor or anyone directly or indirectly employed by any of them.

This insurance shall be written for not less than any limit of liability specified herein, or required by law, whichever is the greater, notwithstanding that the policy may have lower limits of liability applying elsewhere in the policy, and shall include contractual liability insurance as applicable to the Contractor's obligations.

The Contractor's and Subcontractor's insurance shall always be primary with respect to the City's responsibilities under this contract. Contractor shall name the City as an additional insured under all policies required hereunder (except Worker's Compensation).

The Contractor's and Subcontractor's insurance shall contain a provision that provides 30 days written notice of cancellation or change to the City.

No insurance required under the Contract shall be carried with an insurer not authorized to do business in Wisconsin by the Office of the Insurance Commissioner. All insurance providers must have an AM Best Rating of A-VII or higher. The City reserves the right to disapprove any insurance company.

The Contractor shall provide the City with a certificate of insurance outlining the required coverage and naming the City as an additional insured thereunder for purposes of the Contract.

Types of Insurance

(a) General Liability

(1) Coverage Form must be the most recent version of the Commercial General "Occurrence" policy, including:

- (a) Premises and Operations
- (b) Products and Completed Operations
- (c) Advertising and Personal Injury
- (d) Explosion, Collapse and Underground Hazard Coverage
- (e) Contractual Insurance
- (f) Broad Form Property Damage
- (g) Coverage for Independent Contractors
- (h) Care, Custody and Control coverages for City-owned materials at the worksite
- (i) Endorsement naming the City of De Pere, its employees, agents and assigns as Additional Insureds as respects work performed by the Contractor/Subcontractor for the City/Owner.

(2) Limits of Liability:

Bodily Injury/Property Damage Combined Single Limits:

Per Occurrence	\$1,000,000
Products/Completed Operations Aggregate	\$1,000,000
Personal Injury/ Advertising Injury	\$1,000,000
Medical Payments Limits	\$10,000
General Aggregate	\$1,000,000
Excess or Umbrella Liability	\$5,000,000

(b) Automobile Liability

(1) Coverages must include the following extensions:

Comprehensive Form

- (a) All Owned Autos
- (b) All Hired Autos
- (c) All Non-Owned Autos
- (d) Mobile Equipment
- (e) Specialized Equipment
- (f) Contractual Liability
- (g) Uninsured Motorists to Limit of Policy
- (h) Additional Insured Endorsement naming City of De Pere, its employees, agents and assigns

(2) Limits of Liability:

Combined Single Limit/Bodily Injury and Property Damage:

\$1,000,000 per person/per accident

Uninsured/Underinsured Motorists: Limits Equal to Above Combined Single Limit

(c) Aircraft Insurance

When Contractors or Subcontractors use their own, non-owned or hired aircrafts in operations of their business, they must provide evidence of Aircraft Liability and Property Damage Insurance equal to \$1,000,000 in limits per aircraft seat. The City/Owner, its employees, agents and assigns must be named as Additional Insured's as respects the particular project for which the craft is flown.

(d) Worker's Compensation and Employers' Liability Insurance

Limits of Liability: Statutory

(e) Professional Liability: \$3,000,000

(Errors and Omissions or other relevant coverage)

- (f) All required liability insurances shall be written on an “occurrence” policy form. Any deductibles or self-insured retentions shall be identified to the City and shall not exceed \$10,000 per occurrence.

Indemnification. The Contractor shall indemnify and hold harmless the City, its officers, agents and employees from and against all claims, damage, losses, and expenses including reasonable attorney’s fees arising out of or resulting from the performance of the work specified in this Contract, provided that any such claim damage, loss or expense is caused in whole or in part by any negligent or intentional act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a part indemnified hereunder.

In any and all claims against the City, its officers, agents and employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited in any way by any limitation of the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Workers’ Compensation Acts, disability benefit acts or other employee benefit acts.

Builders’ Risk Insurance. (This does not apply to additions and/or alterations on existing structures.)

Unless otherwise provided, the City shall purchase and maintain fire insurance, extended coverage, vandalism and malicious mischief upon the entire structure on which the work of this contract is to be done equal to 100% of the insurable value (Builders’ Risk-Completed Value).

The City may at its discretion, purchase All Risk Builders’ Risk Coverage.

Waiver of Subrogation. The City, Contractor and Subcontractor waive all rights of subrogation against each other for damages caused by fire and other perils covered by insurance provided for under the terms of the Contract, except such rights as they may have to the proceeds of the insurance held by the City as trustee. The loss, if any, is to be made adjustable with and payable to the City as trustee for the insured Contractor and Subcontractor as their interests may appear, except in such cases as may require payment of all or a proportion of said insurance to be made to the Mortgagee as his interest may appear.

EXECUTION OF CONTRACT. The Contract shall be executed by the Bidder, and the Contract Bond shall be executed by the principal and the sureties, and both shall be presented to the Director of Public Works within 10 days after the date of Notice of the Award of the Contract.

No contract will be considered binding upon the City until the final execution of the contract agreement. The date of final execution of the Contract shall be the date on which the final signature is affixed.

FAILURE TO EXECUTE CONTRACT. Failure on the part of the Successful Bidder to execute a Contract and an acceptable Contract Bond, within 10 days after the date of Notice of Award of

the Contract will be just cause for the annulment of the award and the forfeiture of the proposed guarantee to the City, not as a penalty but in payment of liquidated damages sustained as a result of said failure.

RIGHT OF BIDDER TO NULLIFY BID. Should the City fail to execute a Contract within 60 days after the filing by the Bidder of the Contract, together with Contract Bond and other documents required to be filed, all in proper form and order, the Bidder may nullify its acceptance of the Contract by filing due notice of such intent. Such notice shall be in writing and may be filed at any time after the expiration of 60 days after the filing by the Bidder of the required Contract Documents. Said notice shall stipulate the maximum number of days, not less than 10, exclusive of Sundays and holidays, within which the contract shall be executed by the City. Failure on the part of the City to execute the contract within the time so stipulated, shall be construed to be an acceptance on the part of the City of the nullification of the bid, and the bidder and surety will be relieved of all obligations to the City that may have been incurred under said contract and contract bond.

Said nullification is a purely voluntary act of the Bidder. Therefore, no liability or obligation toward the Bidder, surety, or any other party who may have an interest, directly or indirectly in such contract, will be incurred by the City.

Unless and until the bidder files such notice of nullification, and until such notice becomes effective, if filed, the contract may be executed by the City without prejudice to any of the terms and conditions thereof.

SCOPE OF WORK

INTENT OF PLANS AND SPECIFICATIONS. It is the intent of the plans and specifications to provide for the construction, execution and completion of a complete work or improvement, which the Contractor undertakes to do in full compliance with the plans, specifications, special provisions and contract. The Contractor shall perform all items of work covered and stipulated in the bid and perform altered and extra work and shall furnish, unless otherwise provided in the contract, all materials, implements, machinery, equipment, tools, supplies, transportation, and labor necessary to the prosecution and completion of the work.

INCREASED OR DECREASED QUANTITIES. It is agreed and understood that the quantities of any items of work shown on the plans or in the bid are subject to increase or decrease during the progress of the work. The Director of Public Works reserves the right to increase or decrease the quantities of any items of work, including increase or decrease of quantities by revision of plans, as may be considered necessary or desirable during the progress of the work to satisfactorily complete the construction. Such increases or decreases in quantities shall not be considered as a waiver of any conditions of the contract nor invalidate any of the provisions thereof.

REVISION OF PLANS. The right is reserved at any time during which the contract is in force to make such revisions in the plans or revisions in the terms of the contract as may be necessary. Revisions of the plans shall, insofar as practical, be ordered in writing before starting work on such revisions.

The work involved in such revisions shall be paid for at contract unit prices except as portions of it may qualify as extra work.

OMITTED ITEMS. The right is reserved to omit from the work any item or portion thereof found unnecessary to the improvement and such omission shall not be considered as a waiver of any conditions of the contract nor invalidate any of the provisions thereof. The Contractor will be paid for all work done toward the completion of the item or part thereof prior to such omission.

EXTRA WORK. The Director of Public Works may, at any time during the progress of the work covered by the contract, order other work or materials incidental thereto. All such work and materials that do not appear in the bid or contract as a specific item accompanied by a unit price, and which are not included under the price bid for other items in the contract, shall be designated as extra work. The Contractor hereby agrees to perform extra work whenever it is deemed necessary or desirable by the Director of Public Works to complete the project as originally contemplated, or as subsequently altered, and it shall be done in accordance with the requirements herein set forth.

Extra work shall be done under the supervision of the Engineer, whose decision shall be final and binding.

The Contractor shall not perform any extra work until a contract change order has been authorized. Claims for compensation for extra work performed which has not been authorized and not covered by a contract change order may be rejected.

The method of determining the basis of payment for extra work will be by unit bid price named in the bid for like items of work or by a supplemental schedule of prices bid by the Contractor in the bid when such bids are requested and when the unit bid price is not applicable. In the event that neither of the foregoing methods are applicable, the method of determining the basis of payment for extra work will be by unit prices submitted by the Contractor and accepted by the Director of Public Works, by a lump sum price submitted by the Contractor and accepted by the Director of Public Works, or by a cost plus 15% basis. Cost is hereby defined as including the actual cost of labor, foreperson over labor actually employed upon the extra work, labor liability insurance, the Contractor's payroll taxes, if any, and materials delivered upon and forming a part of the extra work, but excluding all administration and clerical expenses, all supervision and superintendents above foreperson and use and upkeep of small tools, plant and machinery and rent of storage yard. Prevailing rental rates on special tools and equipment and actual cost of special services will be allowed the Contractor without the above-specified 15% added thereto. The 15% basis shall not be charged on the Contractor's equipment rates. Contractor equipment shall only be paid when it is in use for construction of the extra work as determined by the Engineer.

INGRESS AND EGRESS. The Contractor shall at all times conduct the work in such a manner as to insure the least possible obstruction to pedestrian and vehicular traffic serving abutting properties along the project and to that end shall, at its own expense, provide and maintain in reasonably passable condition such temporary roads and temporary approaches as are deemed reasonable and practical by the Engineer.

CONTROL OF WORK

AUTHORITY OF ENGINEER. All work shall be done under the supervision of and performed to the satisfaction of the Engineer. The Engineer shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance (excluding safety), rate of progress of the work, interpretation of the plans and specifications, acceptable fulfillment of the contract, compensation, and disputes and mutual rights between Contractors under the specifications. The Engineer shall determine the amount and quantity of work performed and materials furnished, and the decision of the Engineer estimates shall be final. The Engineer's estimate in such event shall be a condition precedent to the right of the Contractor to receive money due under the contract.

The Engineer shall have executive authority to enforce and make effective such decisions and orders as the Contractor fails to carry out promptly and, in case of failure on the part of the Contractor to execute work ordered by the Engineer, the Engineer may, after giving notice in writing to the Contractor, proceed to execute such work as may be deemed necessary and the cost thereof shall be deducted from compensation due or which may become due the Contractor under the contract.

COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS. These specifications, the plans, special provisions and all supplemental documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative, to describe and provide for a complete work. In the case of a discrepancy between the plans and the specifications, the plans shall govern; between the special provisions and the specifications or the plans, the special provisions shall govern.

The Contractor shall take no advantage of any apparent error or omission in the plans or specifications, and the Engineer shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications.

LINE AND GRADE. The Engineer will furnish and set the construction survey stakes or reference points necessary to establish the alignment and grade for all types of work. These stakes and points shall constitute the field control by and in accordance with which the Contractor shall govern and execute the work. The Contractor shall furnish, at its own expense, such other facilities and labor as may be required by the Engineer in establishing such points and lines necessary to the prosecution of the work after the work is started. The Contractor shall furnish free of charge all additional stakes and other material necessary for making and maintaining the points and lines given. The Contractor shall set and shall be responsible for all additional stakes or markings needed to facilitate layout or construction of the work.

The Contractor shall be responsible for the preservation of all stakes and points, and if any of these survey stakes or points have been carelessly or willfully destroyed or disturbed by the Contractor, the cost to the City of replacing them may be charged against the Contractor and be deducted from the payment of the work.

COOPERATION OF CONTRACTOR. The City reserves the right at any time to contract for and perform other or additional work on or near the Work covered by any contract.

The Contractor shall control construction operations in such a manner as to minimize the extent of the land area disturbed during construction. Areas that are disturbed and are not needed in construction operations shall be restored by the Contractor and no payment shall be made to the Contractor for this resolution.

The Contractor shall arrange and conduct work so as not to interfere with the operations of other Contractors engaged upon or near the work and to join work to that of others in a proper manner, and in accordance with the spirit of the plans and specifications, and to perform work in the proper sequence in relation to that of other work, all as may be directed by the Engineer.

The Contractor shall be held responsible for any damage done by it or its agents to the work performed by another Contractor.

In case of a dispute arising between two or more Contractors engaged on the same improvement as to the respective rights of each under the specification, the Engineer shall determine the matter at issue and shall define the respective rights of the various interests involved in order to secure the completion of all parts of the work in general harmony and with satisfactory results. The Engineer's decision shall be final and binding on all parties concerned and shall not in any way be a cause for claims for extra compensation by any of the parties.

The Contractor shall have at all times during the progress of construction, irrespective of the amount of work sublet, a competent superintendent or designated representative capable of reading and thoroughly understanding the plans and specifications, as agent on the work, who shall receive instructions from the Engineer or authorized representatives. The superintendent or designated representative shall have full authority to execute the orders or directions of the Engineer without delay and to supply promptly such materials, tools, plans, equipment, and labor as may be required to properly perform the work.

REMOVAL OF UNAUTHORIZED AND UNACCEPTABLE MATERIALS AND WORKMANSHIP. Work performed without lines and grades being given, work performed beyond the lines and grades shown on the plans, or as given, except as herein provided, or any extra work performed without authority, will be considered as unauthorized and may not be measured or paid for by the City. Work so done may be ordered removed or replaced at the Contractor's expense.

Work which is not within reasonably close conformity with the plans and specifications and which results in an inferior or unsatisfactory product will be considered as unacceptable work.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, found to exist prior to the final acceptance of the work, shall be immediately removed and acceptably replaced or otherwise satisfactorily corrected by and at the expense of the Contractor.

OWNER MAY CORRECT UNACCEPTABLE WORK. If Contractor fails within a reasonable time after written notice from Engineer to correct unacceptable Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Plans and Specifications Documents, or if Contractor fails to comply with any other provision of the Contract documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

In exercising the rights and remedies, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefore. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work others destroyed or damaged by correction, removal, or replacement of Contractor's unacceptable Work.

Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's right and remedies.

ACCEPTANCE OF WORK. The Engineer will make an inspection of any section of work included in the contract as soon as practicable after notification by the Contractor and confirmation by the Inspector that such work has in their opinion been completed and final cleaning up performed. Whenever any section of the work constructed by the Contractor shall have been satisfactorily completed at the time of final inspection, the Engineer shall give written notice of final acceptance to the Contractor.

Should the inspection disclose any work, in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instructions for correction of the same, and the Contractor shall immediately comply with and execute such instructions for corrections of the same. Upon correction of the work, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed. In such event, the Engineer will make the final acceptance and notify the Contractor in writing of his acceptance as of the date of final inspection.

In the event that the testing of materials is incomplete at the time of final inspection and the work is satisfactorily completed, the Engineer shall give a written notice of partial acceptance, pending receipt of satisfactory test reports; whereupon, the final acceptance shall be given without any additional inspection.

CONTROL OF MATERIALS

SOURCE OF SUPPLY AND QUALITY. The specifications require the use of new, high quality materials throughout the work, except as may specifically be provided elsewhere in the

specifications, on the plans, or in the special provisions, incorporated in the work in such a manner as to produce completed construction which is workmanlike and acceptable in every detail.

PLANT INSPECTION. The Engineer may undertake the inspection of materials at the plant, if deemed necessary or desirable, or the Engineer may designate another agency for the purpose.

RIGHT TO INSPECT AND TEST MATERIALS. To ascertain if materials comply with contract requirements, samples shall, at the discretion of the Engineer, be taken at the source or at job destination, and as often as the Engineer deems it advisable or necessary.

The Contractor shall furnish without charge all samples required by the Engineer and shall afford such facilities as may be required for collecting and forwarding them.

The Contractor may be required to furnish, when requested by the Engineer, a written statement giving the origin, composition or process of manufacture of a material.

Unless otherwise provided in the contract, it shall be the intent of these specifications that conformity of materials to the specified requirements shall be met at the time, or just prior to the time, they are incorporated into the work.

All tests shall be made in accordance with the method described and designated herein or in the contract. References to ASTM specifications shall be understood to mean the Standards or Tentative Standards of the American Society for Testing and Materials. Reference to the AASHTO specifications shall be understood to mean the Standard or Interim Specifications for Highway Materials and Methods of Sampling and Testing of the American Association of State Highway Transportation Officials. Unless otherwise designated, references to various standard specifications and test methods shall be understood to mean the specification or test method which is current on the date of the advertisement for bids.

Test results obtained on samples of materials furnished by the Contractor shall be available to the Contractor.

The City reserves the right to deduct from monies which are due or may become due the Contractor any costs incurred in the sampling and testing of materials not used under the contract.

UNCOVERING WORK. If any work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys,

and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price.

If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction.

STORAGE OF MATERIALS. Materials shall be so stored as to insure the preservation of their quality and suitability for the work. Stored materials, even though approved before storage, shall be subject to an inspection prior to their use in the work and shall meet the requirements of the contract at the time they are used. Stored materials shall be located so as to facilitate inspection.

DEFECTIVE MATERIALS. All materials that are not in reasonably close conformity with the requirements of the specifications shall be considered defective and shall be rejected. Rejected materials shall be removed from the site of the work unless otherwise permitted by the Engineer. Any defective materials, which have been subsequently corrected, shall not be used or accepted until re-evaluated and approved by the Engineer. Materials which have been incorporated in the work and subsequently found to be defective may, with the permission of the Engineer, after a determination that reasonably acceptable work has been produced, be left in place. An appropriate adjustment will be made in the contract price for such materials or for the work in which such materials are incorporated.

LEGAL RELATIONS AND PUBLIC RESPONSIBILITY

LAWS TO BE OBSERVED. The Contractor shall at all times observe and comply with all federal, state, and local laws, regulations and ordinances which are in effect or which may be placed in effect during the contract period and which in any manner affect the conduct of the work. The Contractor shall indemnify and save harmless the City and all of its officers, agents and employees against any claim or liability arising from or based on the violation of any such law, ordinance, or regulation, whether by himself or his employees, subcontractors, or agents.

DESCRIPTION. The vendor/contractor agrees that, in performing under this purchase order/contract with the City of De Pere, it will not discriminate against any employee, applicant for employment or any other person or member of the public on the basis of age, race, creed, color, disability, marital status, sex, national origin, ancestry, arrest record, conviction record, military service, use or non-use of lawful products off the employer's premises during nonworking hours, declining to attend a meeting or to participate in any communication about religious matters or political matters, or any other basis provided under Wis. Stats. §111.321.

PERMITS AND LICENSING. The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

PATENTED DEVICES, MATERIALS AND PROCESSES. It is mutually understood and agreed that without exception contract prices are to include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. The Contractor and the surety in all cases shall indemnify and save harmless the City from any and all claims for infringement by reason of the use of any such patented design, device, material or process to be involved under the contract, and shall indemnify the City for any cost, expenses, and damages which it may be obliged to pay, by reason of any such infringement, at any time during the prosecution or after the completion of the work.

SAFETY, HEALTH AND SANITATION. The Contractor shall comply with all federal, state and local laws governing the safety, health and sanitation, and shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the Engineer may determine, reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

PUBLIC CONVENIENCE AND SAFETY. The Contractor shall avoid as far as possible the maintenance of any condition, which might be deemed at law to be an attractive nuisance. Where such condition is unavoidable or where apparent or potential hazards occur, incident to conduct of the work, the Contractor shall maintain a proper watch or provide other reasonable safeguards. The Contractor and its surety shall be responsible for all damage, bodily injury, or death arising through his negligence, either in maintaining an attractive nuisance or otherwise.

The Contractor shall notify the Engineer, the Police Chief and the Fire Chief at least 24 hours before it becomes necessary to blockade a street.

The Contractor shall notify the De Pere Water Department, the Wisconsin Public Service Corporation, Railroad Companies, and the owners of all other property that may be affected by the Contractor's operations at least 72 hours before breaking ground.

The Contractor shall not hinder or interfere with any persons in the protection of such property, or with the operation of utilities, at any time. The Contractor shall obtain all necessary information in regard to existing utilities. The Contractor shall protect such utilities from injury and shall avoid unnecessary exposure so that they will not cause injury to the public.

The Contractor shall obtain a permit from the De Pere Water Department for the use of City water.

BARRICADES, WARNING SIGNS AND FLAGGERS. When any section of a street is closed to traffic, the Contractor shall furnish, erect, and maintain barricades at each end of the closed section and at all intersecting streets. The Contractor shall furnish, erect, and maintain at these locations such warning signs and lights as may be deemed necessary by the Engineer. The Contractor shall place additional barricades, warning signs and lights as may be necessary to protect the work and safeguard vehicular and pedestrian traffic. All signing and barricading will be done in accordance with the latest WisDOT Manual of Traffic Control Devices.

Where it is necessary to maintain a street open to traffic, the Contractor shall furnish, erect and maintain such barricades, warning signs, warning lights, and flaggers as may be necessary to protect the work and safeguard vehicular and pedestrian traffic.

The Contractor shall maintain the roadway in such condition that the public can travel the same in convenience and safety.

The Contractor will be held responsible for all damages to the work due to failure of barricades, warning signs, warning lights, flaggers and other workers assigned to protect it, and whenever evidence of such damage is found prior to acceptance, the Engineer may order the damaged portion immediately removed and replaced by the Contractor at the Contractor's expense, if, in the Engineer's opinion, such action is justified.

USE OF EXPLOSIVES. The Contractor shall observe the utmost care and shall limit the number and size of the charges to as not to endanger life and property. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly **EXPLOSIVES**, and shall be in care of competent workers at all times. The methods of use, storing and handling of explosives and highly inflammable material shall conform with all state and local laws and regulations.

PROTECTION AND RESTORATION OF PROPERTY. The Contractor shall notify, in writing, the owners of all corporate or private property, which interferes with the work, advising them of the nature of the interference, and shall arrange with them for the disposition of such property. The Contractor shall furnish the Engineer upon request with copies of all such notifications and final agreements.

The Contractor shall use every reasonable precaution to prevent the damage or destruction of corporate or private property. The Contractor shall protect and carefully preserve all property marks until the City or an authorized surveyor or agent has witnessed or otherwise referenced their locations or relocation.

The Contractor shall be responsible for the damage or destruction of property of any character resulting from neglect, misconduct, or omission in manner or method of execution or non-execution of the work, or caused by defective work or the use of unsatisfactory materials, and shall restore such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or replacing it as may be directed, or shall otherwise make good such damage or destruction in an acceptable manner. Upon the Contractor's failure to do so, the Engineer may, after the expiration of a period of 48 hours after giving written notice, proceed to repair, rebuild or otherwise restore such property as may be deemed necessary, and the cost thereof shall be deducted from any compensation due or which may become due the Contractor under this contract.

RESPONSIBILITY FOR DAMAGE CLAIMS. The Contractor and its surety shall indemnify and save harmless the City and all of its officers, officials, agents and employees from all suits, actions or claims of any character brought because of any injuries or damages received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work, or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect or misconduct of said Contractor; or because of any claims or amount recovered for any infringement of patent, trademark or copyright; or from any claims or amounts arising or recovered under the worker's compensation law; or any other law, ordinance, order or decree; and so much of the money due the said Contractor under and by virtue of this contract as shall be considered necessary by the Board of Public Works for such purposes, may be retained for the use of the City; or, in case no money or insufficient money is retained, the Contractor's surety shall be held.

The City shall not be liable to the Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

It shall be the Contractor's responsibility to see that all of the contract operations incidental to the completion of this contract are covered by public liability and property damage liability insurance in order that the general public or any representative of the contracting authority may have recourse against a responsible party for injuries or damages sustained as a result of said contract operations. This requirement shall apply with equal force, whether the work is performed by the Contractor, or by a Subcontractor or by anyone directly or indirectly employed by either of them.

CONTRACTOR'S RESPONSIBILITY FOR WORK. Until acceptance of the Work by the Engineer, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements, or from any other cause, whether arising from the execution or non-execution of the Work. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any of the above causes before acceptance and shall bear the expense thereof, except damage to the Work due to unforeseeable causes beyond control of and without the fault

or negligence of the Contractor, including but not restricted to acts of God, of public adversaries or of governmental authorities. In case of suspension of work from any cause whatever, the Contractor prior to suspension shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and shall erect any necessary temporary barricades, signs or other facilities, at the Contractor's expense, as directed by the Engineer.

PERSONAL LIABILITY OF PUBLIC OFFICIALS. In carrying out any of the provisions of this contract or in exercising any power or authority granted to them thereby, there shall be no personal liability upon the City, its officers, officials, agents and employees, it being understood that in such matters they act as agents and representatives of the City. Any right of action by the Contractor against the City, or its agents or employees, is hereby expressly waived.

PROSECUTION AND PROGRESS

SUBLETTING OR ASSIGNMENT OF CONTRACT. The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the contract or any portion thereof, or of its right, title or interest therein, without written consent of the Engineer.

Consent to sublet any portion of the contract shall not be construed to relieve the Contractor of any responsibility for the fulfillment of the contract or to release the Contractor of liability under the contract and bond.

In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with its own organization work amounting to at least one-third of the original contract amount, unless a larger portion is specified in the contract.

Requests for permission to sublet any portion of the contract shall be in writing and accompanied by a Qualification Statement showing that the organization, which will perform the work, is experienced and equipped for such work.

PROSECUTION OF THE WORK. The Contractor shall not begin the work to be performed under the contract before receiving written notification from the Engineer to do so, and shall thereupon begin the work within ten days after the date of such written notice.

Notice of intention to start work shall be given to the Engineer at least 72 hours in advance of beginning work.

The Contractor shall employ an ample workforce and provide a construction plant properly adapted to the Work, of sufficient capacity and efficiency to accomplish the Work in a safe and workmanlike manner at the rate of progress specified.

The Contractor shall give personal attention to and shall supervise the Work to the end that it shall be prosecuted faithfully, and when not personally present on the Work, shall at all times be represented by a competent superintendent who shall receive and obey all instructions or orders given under the contract, and who shall have full authority to execute the same, and to supply materials, tools and labor without delay, and who shall be the legal representative of the Contractor. The Contractor shall be liable for the faithful observance of any instructions delivered to it or to its authorized representative.

In the event Work is prosecuted during adverse weather conditions, the Contractor will be required to exercise such precautions, necessary to produce satisfactory work, and shall protect the finished Work from the elements. It is agreed and understood that the cost thereof has been included in the unit prices bid for the various items of Work in the Contract and that no extra compensation will be allowed therefore.

OVERTIME WORK. Overtime and shift work may be established as a regular procedure. The Contractor may request overtime and shift work periodically to accommodate construction sequencing and/or weather delays. The Engineer shall evaluate the request and make a determination on approval. If approved, the Engineer will issue written permission. Such permission may be revoked at any time. No work other than overtime and shift work established

as a regular procedure shall be done between the hours of 6:00 P.M. and 7:00 A.M., nor on Saturdays, Sundays, or legal holidays, except such work as is necessary for the proper care and protection of the work already performed or except in case of an emergency.

All costs for overtime inspection, except those occurring as a result of overtime and shift work established as a regular procedure, and other approved circumstances, shall be paid by the Contractor. Overtime inspection shall include inspection required during holidays, Saturdays, Sundays, and any weekday between the hours of 6:00 P.M. and 7:00 A.M. Such costs will include but will not necessarily be limited to engineering, inspection, general supervision and other overhead expenses, which are directly chargeable to the overtime work. All such charges shall be deducted by the City from payment due the Contractor.

LIMITATION OF OPERATIONS. At any time when, in the judgment of the Engineer, the Contractor has obstructed the safe and convenient movement of vehicular and pedestrian traffic, or is carrying on operations on a greater portion of the project than is necessary for the proper prosecution of the Work, the Engineer may require the Contractor to finish the sections in which Work is in progress before Work is started on any additional section.

WORKFORCE. The Contractor shall at all times employ sufficient supervision and labor for prosecuting and several classes of work to full completion in the manner and time requested by the Contract.

All superintendents, forepersons and workers shall have sufficient skill and experience to properly perform the Work assigned. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform all work properly and satisfactorily.

Any person employed by the Contractor or by any Subcontractor who, in the opinion of the Engineer does not perform in a proper and skillful manner (or is intemperate or disorderly) shall, at the written request of the Engineer, be removed forthwith by the Contractor or Subcontractor employing such person, and shall not be employed again in any portion of the work without the approval of the Engineer.

METHODS AND EQUIPMENT. The Contractor shall provide and furnish all machinery, equipment, and tools necessary to perform the Work, which shall be in such condition and of such capacity as will produce Work of satisfactory quality within the contract time.

Failure on the part of the Contractor to provide adequate equipment, maintained in proper working order, may be sufficient cause for suspension of specific operations until compliance is obtained or may constitute cause for default of Contract.

Any plan or method of work suggested by the Engineer to the Contractor but not specified or required, if adopted or followed by the Contractor in whole or in part, shall be used at the risk and responsibility of the Contractor; and the City shall assume no responsibility therefore.

SUSPENSION OF WORK. The Engineer shall have the authority to order the partial or complete suspension of operation for such period or periods as may be deemed necessary, in the interest of public safety and convenience, or due to unsuitable weather and such other conditions as are considered unfavorable for prosecution of satisfactory work, or for such time as is necessary due to the failure on the part of the Contractor to carry out orders given or to perform any or all of the provisions of the contract. Authorizations or orders to suspend work shall be in writing. Unless otherwise specifically provided, no additional or extra compensation or additional contract time will be allowed due to such suspensions of operations.

DETERMINATION AND EXTENSION OF CONTRACT TIME. The time for completion of the Work contemplated under the Contract will be calendar days or completion date. For calendar day contracts, work will be specified in the Bid as a specific number of calendar days including Sundays and holidays on or before which the Work shall be completed. For completion date contracts, work will be specified in the bid as a date. Fifteen (15) percent of the contract time as specified is allocated to bad weather, which will not warrant an extension of contract time.

The Contract starting date, for purposes of determining contract time and extensions, will be construed to be the date construction operations are started or the tenth day following the date of written notification by the Engineer to the Contractor to begin work, whichever is earlier.

Contract time will not be charged during periods of complete suspension of operations, when ordered by the Engineer suspending operations.

Contract time will be extended by an amount as is mutually agreed upon by the Engineer and the Contractor, on the basis of contract change orders involving alterations in the contract affecting the prosecution of work, or involving extra or additional work, when such alterations are necessary for the purposes or convenience of the Engineer, or when such extra or additional work is of such character or is ordered to be done at such a time that the amount of time reasonably necessary to perform such work is disproportionate to the contract time originally set up in the bid.

Should the Contractor find it impossible to complete the Work on or before the time for completion as specified in the Contract, or extended as above set forth, the Contractor may, at any time prior to 3 days after completion of Work under the Contract, make a written request to the Engineer for an extension of time, setting forth therein reasons to justify the granting of the request. If the Engineer finds that the work was delayed because of conditions beyond the control of the Contractor, it may grant an extension of time for completion in such amount as it finds to be warranted and justified.

LIQUIDATED DAMAGES. Should the Contractor fail to complete the work within the time agreed upon in the contract, interim completion dates included in the work sequence, or within such extra time as may have been allowed by extensions, there shall be deducted from any monies due or that may become due the Contractor, for each and every calendar day, including Sundays and holidays, that the work shall remain uncompleted, a sum specified as follows:

LIQUIDATED DAMAGES		
ORIGINAL CONTRACT AMOUNT		DAILY CHARGE
FROM MORE THAN	TO AND INCLUDING	CALENDAR DAY
\$0	\$150,000	\$425
\$150,000	\$300,000	\$545
\$300,000	\$500,000	\$740
\$500,000	\$1,000,000	\$1055
\$1,000,000	_____	\$1370

This sum shall be considered and treated not as a penalty but as fixed, agreed and liquidated damages due the City from the Contractor by reason of inconvenience to the public, added cost of engineering and supervision, and other items which have caused an expenditure of public funds resulting from the Contractor’s failure to complete the Work within the time specified in the Contract.

Permitting the Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the City of any of its rights under the contract.

DEFAULT ON CONTRACT. If the Contractor fails to begin the Work under the Contract within the time specified, or discontinues the prosecution of the work, or for any other cause whatsoever fails to carry on the work in an acceptable manner, the Engineer shall give notice in writing to the Contractor and the Contractor’s surety of such delay or default, specifying the same.

If the Contractor, within a period of 10 days after the date of such notice, shall not proceed in accordance therewith, then the Board of Public Works or Director of Public Works shall have full power and authority to forfeit the rights of the Contractor and at its option, to call upon the surety to complete the work in accordance with the terms of the contract; or it may take over the work, including any or all materials and equipment on the ground as may be suitable and acceptable, and may complete the work by or on its own force account, or may enter into a new agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods such as, in its opinion, shall be required for the completion of said Contract in an acceptable manner. All costs and charges incurred by the City, together with the cost of completing the work under contract, shall be deducted from any monies due or which may become due on such Contract. In case the expenses so incurred by the City shall be less than the sum which would have been payable under the contract if it had been completed by said Contractor, then said Contractor shall be entitled to receive the difference subject to any claims for liens thereon which may be filed with the City, or any prior assignment filed with it, and in case such expense shall exceed the sum which would have been payable under the contract, the Contractor and the surety shall be liable and shall pay to the City the amount of such excess.

TERMINATION OF THE CONTRACTOR'S RESPONSIBILITY. Whenever the improvement contemplated and covered by the contract shall have been completely performed on the part of the Contractor and all parts of the Work had been approved and accepted by the Engineer, according to the contract, and the final estimate paid, the Contractor's obligations shall then be considered fulfilled, except as set forth in the contract bond.

EMERGENCY DEFERMENT OR CANCELLATION OF CONTRACT. The City and the Contractor, in the event of national emergency or a shortage of materials, labor, or equipment, beyond the control of the Contractor may upon a finding by the City that such emergencies or shortages do exist, and by reason of which such Contractor is unable to proceed with the construction contract, defer such construction in whole or in part, or cancel such construction contract, or any part thereof.

MEASUREMENT AND PAYMENT

TAX EXEMPT STATUS. The City of De Pere is tax exempt under Wis. Stats§77.54(9m), sales tax is not included for the storage, use, and consumption of tangible personal property sold to a Contractor which becomes a component of a facility that is owned by the City. A facility is defined as building, shelter, parking lot, parking garage, athletic field, athletic park, storm sewer, water supply system, or sewerage and waste water treatment facility, but does not include a highway, street or road. Payments for components utilized in the above constructed facilities shall not include a sales tax.

MEASUREMENT OF QUANTITIES. All work completed under the contract will be measured for final payment by the Engineer to determine the quantities of work performed, except when agreements have been made providing for compensation on the basis of plan quantities or when contract change orders have been executed providing for other methods of measurement. The Contractor will be paid for the actual amount of work performed in accordance with the contract, as shown by the final measurements or upon the basis of plan quantities.

SCOPE OF PAYMENT. The Contractor shall accept the compensation, as herein provided, in full payment for furnishing all materials, labor, tools and equipment necessary for performing all work contemplated and embraced under the contract; also for loss or damage arising from the nature of the work or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the Engineer; and for all insurance, compensation and risks of every description connected with the prosecution of the Work; also for all expenses incurred in consequence of the suspension or discontinuance of the Work as herein specified; and for any infringement of patent, trademark, or copyright; and for completing the Work according to the Contract.

The payment of any current estimate prior to final acceptance of the Work by the City shall in no way constitute an acknowledgment of the acceptance of the Work, nor in anyway prejudice or affect the obligation of the Contractor, at its expense, to repair, correct, renew or replace any defects or imperfections in the construction or in the strength or quality of the materials used in or about the construction of the Work under Contract and its appurtenances, or any damage due or attributable to such defects, which defects, imperfections or damage shall have been discovered on or before the final inspection and acceptance of the Work. The Engineer shall be the sole judge of such defects, imperfections or damage and the Contractor shall be liable to the City for failure to correct the same as provided herein.

No monies otherwise payable under the Contract shall become due and payable if the City so elects until the Contractor shall satisfy the City that it has fully settled or paid for all materials used in or upon the work and labor done in connection therewith.

INCREASED OR DECREASED QUANTITIES. Whenever the quantity of any item of work as given in the bid shall be increased or decreased as required to satisfactorily complete the work, payment for such item of work shall be made on the basis of the actual quantity completed at the original contract unit price.

Compensation for alterations in plans for quantities or work requiring contract change orders shall be as stipulated in such agreements.

EXTRA WORK. When extra work has been partially or completely performed, the Engineer may compute the amount thereof, which has been completed and may include such amount in partial payment estimated and in the final estimate certified to the Board of Public Works.

OMITTED ITEMS. The City shall have the right to cancel the portions of the contract relating to the construction of any items therein by the payment to the Contractor of a fair and equitable amount to be agreed upon by contract change order covering all items of cost incurred prior to the date of cancellation or suspension of the Work by order of the Engineer.

Acceptable materials ordered by the Contractor and not canceled prior to the date of cancellation of the Work by order of the Engineer and which are delivered on the work will be paid for at the actual cost to the Contractor and shall thereupon become the property of the City.

PARTIAL PAYMENTS. Partial payments based on the value of the Work performed or materials furnished, at contract or agreed unit or lump sum prices, will be made to the Contractor as the work progresses, except that partial payments will not be made as long as the Contractor fails to comply with any order of the Engineer in accordance with the Contract.

Once each month, provided that a payment of \$5,000 or more becomes due, the Engineer will make an estimate of the quantities of work performed and the value thereof at contract or agreed unit or lump sum price.

The Engineer may, upon presentation by the Contractor of receipted bills, freight bills or other satisfactory evidence of payment, include in the estimate prepared for partial payment the value of non-perishable materials which are to form a part of the completed work, produced or purchased, and delivered and stored in the vicinity of the work at such locations where they will be available for ready incorporation into the work.

From the total amount of the estimate, determined as provided above, the City shall, after deducting previous payments made, pay to the Contractor 95% of the amount of the approved invoice, retaining 5% of the estimate of work done until 50% of the work has been completed.

At 50% completion of the work, the previous retainage shall not yet be paid, but further partial payments shall be made in full to the Contractor without additional retainage being taken unless the Engineer certifies that the work is not proceeding satisfactorily. If the work is not proceeding satisfactorily, additional amounts may be retained. After substantial completion, an amount retained may be paid to the Contractor, keeping retained only such amount as is needed for the remaining work.

Should any defective work or material be discovered, or should a reasonable doubt arise as to the integrity of any part of the work completed previous to the final acceptance and payment, there will be deducted from the first estimate rendered after the discovery of such work an amount equal in value to the defective or questioned work, and this work will not be included in a subsequent estimate until the defects have been remedied or the causes for doubt removed.

All material and work covered by partial payments made thereupon become the property of the City, but this provision shall not be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the City to require the fulfillment of all terms of the contract.

ACCEPTANCE AND FINAL PAYMENT. When the project has been finally accepted, the Engineer will prepare the final estimate of the quantities of Work performed. After review of such final estimate, the Contractor will be paid the entire sum found to be due after deducting all previous payments and all amounts to be deducted under the provisions of the Contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

ASSIGNMENT OF PAYMENTS. All monies payable under the Contract, or any part thereof, shall be paid to the Contractor in accordance with the provisions of this Section, and no assignment or order executed by the Contractor directing payment of any portion or all of such funds to any other person or persons shall be recognized by the City.

CLAIMS FOR ADJUSTMENT IN COMPENSATION. Should the Contractor deem that an adjustment in compensation is due for work or materials not clearly covered in the Contract or not ordered by the Engineer as an extra, the Contractor shall notify the Engineer in writing the Contractor's intention to make claim for such adjustment before proceeding with the work involved in such claim.

Should the Contractor encounter physical conditions at the site of the work of any unusual nature, differing materially from those which might be reasonably encountered and generally recognized as inherent in work of the character provided for or implied in the plans and specifications, promptly, and before such conditions are unduly disturbed, the Engineer shall be notified, in writing, of the Contractor's intent to claim an adjustment in compensation. The Engineer shall thereupon promptly investigate the conditions, and, if the Engineer finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or the time required for performance of the contract, the contract will be modified in writing and an equitable adjustment made in accordance with the requirements of extra work.

Should the Contractor fail to give the Engineer written and timely notice of intent to claim an adjustment in compensation as hereinbefore provided and to afford the Engineer the opportunity to investigate any changed conditions claimed before they are unduly disturbed, Contractor thereby expressly waives such claim. In any event, the determination of the validity of the claim will rest with the City or its authorized representative.

GUARANTEE

GUARANTEE OF MATERIALS AND WORKMANSHIP. The Contractor shall guarantee all materials furnished and all work performed under the Contract against all defects in materials and workmanship for a period of one year following the date of acceptance of the Work, which date shall be understood to be the date of which final payment of all monies due the Contractor under the contract is authorized by the Director of Public Works.

Should any defect appear during the guarantee period, the Contractor shall make the required repairs or replacement upon receipt of written notification from the Director of Public Works to do so.

END OF SECTION

SECTION 01 45 23.10

TESTING AND INSPECTION OF PIPELINE & APPURTENANCES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Low pressure air test.
2. Inspection of gravity pipelines by lamping.
3. Televising gravity pipelines.
4. Deflection test for gravity pipelines that are not reinforced concrete pipe (PVC and other).
5. Pressure and leakage test for pressurized pipelines.
6. Continuity testing.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM D3034 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
2. ASTM C828 Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipe Line.
3. ASTM F679S Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
4. ASTM C1107 Spec. for Packaged Dry, Hydraulic –Cement Grout (Nonshrink)

B. American Water Works Association (AWWA)

1. AWWA C600 Installation of Ductile-Iron Water Mains and Their Appurtenances
2. AWWA C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
3. AWWA C651-14 Disinfecting Water Mains

1.3 SUBMITTALS

A. Quality Control Submittals

1. Test reports and results.
2. Proposed method to correct deficiencies.
3. Record of deficiency repair method and location.

1.4 PROJECT/SITE CONDITIONS

- A. Notify Engineer a minimum of 48 hours prior to any testing.
- B. Notify Engineer when testing equipment is setup and ready for testing.
- C. Testing shall be performed in the presence of the Engineer.

- D. Provide access to test equipment to enable the Engineer to monitor and record test results.
- E. Repeat failed test after correction of deficiencies until satisfactory tests are obtained.
- F. Proposed correction of deficiencies shall be approved by Engineer prior to correction.
- G. Repair visible leaks within the pipeline and/or pipeline appurtenances.

PART 2 – PRODUCTS

2.1 EQUIPMENT

- A. Low Pressure Air Test
 - 1. Inflatable pipe lugs.
 - 2. Bracing.
 - 3. Compressor.
 - 4. Hose and fittings.
 - 5. Pressure gauge.
- B. Gravity Sewer Lamping
 - 1. Battery operated light.
 - 2. Mirror.
- C. Televising of Pipelines
 - 1. Cleaning Equipment:
 - a. Mechanically operated cleaning equipment shall be of the movable dam type constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the pipe.
 - 1) Sewer cleaning balls or other such equipment which cannot be collapsed instantly is not acceptable cleaning equipment.
 - 2) Provide the movable dam with equal diameter as the pipe being cleaned.
 - 3) Provide a flexible scraper around the outer periphery to insure total removal of grease.
 - b. Truck mounted hydraulically propelled high velocity cleaning equipment.
 - 1) Provide a minimum of 500 feet of ¾ inch I.D. high pressure hose with a selection of two or more high velocity nozzles.
 - 2) 60 GPM nozzle capacity at a working pressure of 1000 to 1500 pound psi capable of producing a scouring action from 15° to 45° in all size pipe lines designated to be cleaned.
 - 3) Provide a high velocity gun adjustable from fine spray to narrow stream with a flow rate of 3 ½ to 27 GPM operating between 200 and 800 psi. for washing and scouring manhole walls and floors.
 - 4) Provide a 1500 gallon water tank capable of holding corrosive or caustic cleaning or sanitizing chemicals, if required by the Engineer, auxiliary engines and pumps, and hose reel.

2. Provide television equipment including:
 - a. Vehicle with cable and winch equipment for pulling camera through pipeline and equipment for placing pull cable.
 - b. Suitable mobile van or trailer enclosure for viewing closed circuit televising.
 - c. Camera and reeled transmitting cable.
 - 1) Provide a television camera with a minimum of 600 lines resolution specifically designed and constructed for such pipeline inspection.
 - 2) Provide lighting for the camera which will be suitable for a clear picture for the entire periphery of the pipe.
 - 3) Picture quality and definition shall be suitable for a clear view of the entire pipeline.
 - d. Closed circuit transmitter, receiver station, video recorder with audio capability and T.V. monitor.
 - e. Engineer’s on-site use of televisors, video tape player and television monitor during inspection and for a reasonable time after televising has been completed (but not to exceed 21 days).
 - f. Still camera for photos from T.V. monitor.

D. Deflection Test

1. The deflection test is required for all sewer main that is not reinforced concrete pipe.
2. Mandrel sizes for these mains shall be in accordance to the following tables that are used for PVC:
3. PVC SDR 35 (ASTM D3034)

Nominal Pipe Size (Inches)	Base ID (Inches)	Mandrel Size (Inches)
8	7.67	7.28
10	9.56	9.08
12	11.36	10.79
15	13.90	13.20

3. PVC (ASTM F679)

Nominal Pipe Size (Inches)	Wall Thickness	Base ID (Inches)	Mandrel Size (Inches)
18	T-1A	16.98	16.13
18	T-2B	17.06	16.20
21	T-1A	20.00	19.00
21	T-2B	20.10	19.09
24	T-1A	22.48	21.36
24	T-2B	22.59	21.46
27	T-1A	25.33	24.06
27	T-2B	25.45	24.17

- E. Standard Pressure and Leakage Test
 - 1. High pressure pump with electric or gas engine drive with capacity in excess of test conditions.
 - 2. Provide calibrated vessel for measuring water pumped into the main to replace leakage.
 - 3. Provide certified pressure gauge calibrated in pounds per square inch of sufficient capacity to conduct test.

PART 3 – EXECUTION

3.1 PREPARATION OF PIPELINE BEFORE TESTING

- A. Clean pipeline of any debris, soils, and construction material.
- B. Repair or replace piping, valves, fittings, manholes, inlets, and other parts of the piping system which have visible defects or leakage, before commencing tests, even though amount of leakage or pressure loss may be below the allowable limit.
- C. Provide traffic control and other safety equipment including confined space entry equipment, if required.

3.2 LOW PRESSURE AIR TEST

- A. Provide either the low pressure air test or the water infiltration test for sanitary sewers submerged by ground water.
- B. Preparation
 - 1. For testing consistency, wet interior pipe surface.
 - 2. Install appurtenances including, but not limited to, wyes, tees, laterals, stubs, and structure prior to test to ensure the system is being tested.
 - 3. Plug pipe outlets (including laterals) adequately to retain testing pressure.
 - 4. Visually inspect pipeline and repair visible defective joints and leaks.
- C. Testing Procedure
 - 1. Determine test time as follows:
 - a. Test times for pipeline segments with uniform pipe size shall be taken from test timetable list below.
 - b. Test times for pipeline segments longer than those shown and/or of non-uniform pipe size shall be calculated utilizing appropriate formulas in ASTM C828.

Test Timetable

	Pipe Diameter "D" in Inches										
	8	10	12	15	18	21	24	27	30	36	42
25	0.30	0.37	0.45	0.52	0.60	0.74	0.89	1.04	1.19	1.50	1.82
50	0.59	0.74	0.89	1.04	1.20	1.49	1.78	2.08	2.39	3.01	3.64
75	0.89	1.11	1.34	1.57	1.80	2.23	2.67	3.12	3.58	4.51	5.45
100	1.19	1.48	1.78	2.09	2.40	2.97	3.56	4.16	4.77	6.01	7.27
125	1.48	1.86	2.23	2.61	3.01	3.72	4.45	5.20	5.96	7.51	9.09
150	1.78	2.23	2.67	3.13	3.61	4.46	5.34	6.24	7.16	9.02	10.91
	Pipe Diameter "D" in Inches										
	8	10	12	15	18	21	24	27	30	36	42
175	2.08	2.60	3.12	3.65	4.21	5.21	6.23	7.28	8.35	10.52	12.73
200	2.37	2.97	3.56	4.17	4.81	5.95	7.12	8.32	9.54	12.02	14.54
225	2.67	3.34	4.01	4.70	5.41	6.69	8.01	9.36	10.73	13.52	16.36
250	2.97	3.71	4.45	5.22	6.01	7.44	8.90	10.40	11.93	15.03	18.18
275	3.26	4.08	4.90	5.74	6.61	8.18	9.79	11.44	13.12	16.53	20.00
300	3.56	4.45	5.34	6.26	7.21	8.92	10.68	12.48	14.31	18.03	21.81
325	3.86	4.82	5.79	6.78	7.81	9.67	11.58	13.52	15.50	19.53	23.63
350	4.16	5.19	6.23	7.30	8.41	10.41	12.47	14.56	16.70	21.04	25.45
375	4.45	5.57	6.68	7.83	9.02	11.16	13.36	15.60	17.89	22.54	27.27
400	4.75	5.94	7.12	8.35	9.62	11.90	14.25	16.64	19.08	24.04	29.09
425	5.05	6.31	7.57	8.87	10.22	12.64	15.14	17.68	20.27	25.54	30.90
450	5.34	6.68	8.01	9.39	10.82	13.39	16.03	18.72	21.47	27.05	32.72
475	5.64	7.05	8.46	9.91	11.42	14.13	16.92	19.76	22.66	28.55	34.54
500	5.94	7.42	8.90	10.43	12.02	14.87	17.81	20.80	23.85	30.05	36.36
525	6.23	7.79	9.35	10.96	12.62	15.62	18.70	21.84	25.04	31.55	38.18
550	6.53	8.16	9.79	11.48	13.22	16.36	19.59	22.88	26.24	33.06	39.99
575	6.83	8.53	10.24	12.00	13.82	17.10	20.48	23.93	27.43	34.56	41.81
600	7.12	8.90	10.68	12.52	14.42	17.85	21.37	24.97	28.62	36.06	43.63
I. Specified test time (minutes) required for pressure drop from 3 ½ to 2 ½ psi when testing one pipe diameter only.											
II. Interpolate test times for segment lengths not specifically listed.											

2. Pressurize pipeline to 4.0 psi and allow to stabilize (stabilization of air temperature may cause pressure drop).
3. When pressure has stabilized, start test at 3.5 psi and record time.
4. If pressure drops more than 1.0 psi during the determined test time, the test will be considered failed.
5. If the test section is below the ground water level, determine the height of the groundwater above the spring line of the pipe at each end of the test section and compute the average. For every foot of groundwater above the pipe spring line, increase the gage test pressures by 0.43 pounds per square inch.

3.3 INSPECTION OF GRAVITY PIPELINES BY LAMPING

- A. Whether televised or not, gravity pipelines shall be lamped and a record of the results of lamping furnished to the Engineer.
- B. Check vertical and horizontal alignment by sighting through newly constructed pipeline after illuminating opposite end with a flashlight.
- C. Light beam should be full throughout the section, but no less than two-thirds full under any circumstances.
- D. Relay any section of pipe found to be out of alignment.

3.4 TELEVISIONING GRAVITY PIPELINES

- A. Preparation of Pipeline Before Televising
 - 1. Clean pipelines and manholes to be televised to degree to allow visual inspection of sewer interior.
 - 2. Completely block off water or sewage from both upstream and downstream of section being televised providing bypass pumping, if necessary to prevent sewage backup.
 - 3. Stop any dewatering operations a sufficient time before televising to allow groundwater elevation to reach its normal level, but not less than 72 hours before televising.
 - a. Provide the following equipment and services:
 - 1) Street signs, barricaded detours, flashers.
 - 2) Traffic control personnel.
 - 3) Permits to work in public streets.
 - 4) Safety equipment including safety equipment for confined entry.
 - 4. Provide utilities required to perform the work such as water, electricity, etc.
- B. Televising the interior surface of the pipeline by pulling a camera through the pipeline showing on a T.V. monitor and recorded on video tape.
 - 1. Record on the audio system concurrently with the picture the following information:
 - a. Pipeline section being inspected designated by manhole numbers at each terminus of section.
 - b. Date of survey.
 - c. Type of pipe.
 - d. Owner of pipeline.
 - e. Name of televisor.
 - f. Principal client
 - g. Description of defect with location.
 - 2. Superimpose on television image (and on tape) the following information:
 - a. Date.
 - b. Section being televised.
 - c. Footage from entering manhole.
 - 3. Produce still photographs from monitor of any defective section of the pipeline.

C. Televising Operation

1. Move camera through the line in either direction at a uniform rate no greater than ½ foot per second by means of cable winches in each manhole.
2. Provide telephone or other suitable means of communications between the two winches, the pulling unit, and the monitor control.
3. Halt camera and video record for a minimum of five seconds at each joint, lateral connection, leak, unusual condition, roots, collapsed sections, presence of scale or other defect.
4. While video recording, provide an audio description of the line being televised, defects encountered, infiltration/inflow sources, etc.
5. Measure location of joints, connections or defects horizontal at the ground level by means of a target in front of the camera and a meter device accurate to 0.5 feet per 100 feet.

D. Televising Report

1. Provide a minimum of two copies of televising inspection report prepared by the televisor which includes the following items:
 - a. Manhole section televised (using construction manhole numbering system with corresponding video tape number of manhole).
 - b. Photos with location and date photographed of all joints, lateral connections, roots, collapsed pipes, presence of scale or other observed defects, estimates of infiltration/inflow amounts, etc.

E. Correction of Damage Caused By Televising Operations

1. Correct any damage to surfaces such as landscaping, pavement, sidewalks, roads, etc.
2. Dig up and repair streets or property, to remove equipment lodged in sewers.
3. Cleanup and/or provide restitution for damage caused to private property and sewer systems as a result of cleaning, televising or bypass pumping.

3.5 DEFLECTION TEST FOR GRAVITY PIPELINES THAT ARE NOT REINFORCED CONCRETE PIPE (PVC AND OTHER)

- A. Unless stated elsewhere, perform deflection tests per PVC gravity pipeline requirements.
- B. Pipe shall not exceed a deflection of 5%.
- C. Conduct test after final backfill has been in place a minimum of 30 days.
- D. Pull test mandrel without mechanical pulling devices.
- E. The pipeline will pass the test when the mandrel passes through the entire section of pipe between manholes or other structures in one pass pulled by hand without use of excessive force.
- F. Any section of pipeline failing to pass this test is to be repaired and retested.

3.6 PRESSURE AND LEAKAGE TEST FOR PRESSURIZED PIPELINES

- A. Provide pressure and leakage tests for pressurized pipelines including but not limited to water main and sewage force main.
1. Testing shall be in accordance with AWWA C605 for PVC pipe, as modified herein.
 2. Testing shall be in accordance with AWWA C600 for ductile iron pipe, as modified herein.
- B. Preparations
1. Install temporary plugs or caps, as required, prior to testing.
 2. Install thrust restraints before testing including temporary plugs or caps.
 - a. If high-early cement concrete thrust restraints are used, then test after 36 hours of thrust restraint replacement.
 - b. If standard cement concrete thrust restraints are used, then test after 7 days of thrust restraint replacement.
 3. At a minimum provide bedding, cover material and partial back fill for buried pipe, except joints maybe left uncovered until testing is completed.
 4. Install appurtenances including, but not limited to, hydrants, valves, services and air release valves prior to testing to ensure the entire system is being tested.
 5. Filling and flushing with water.
 - a. The Water Department will fill each valved section with maximum velocity of 1 ft. /sec. venting air completely from the pipeline and appurtenances.
 - b. Where permanent air vents are not located at high points or dead ends, install corporation stops/valves to vent air as the line is filled with water.
 - 1) Close all these corporation stops/valves before applying pressure or leakage tests.
 - 2) At the conclusion of the leakage and pressure test, remove and plug corporation stops/valves, or at the discretion of the Owner left in place.
 - c. Fill the main with water from the Municipal Service Center or from flushing the main to pressure the system to the testing pressure.
 - d. Discharge water without causing erosion, nuisance, or interruption of traffic.
 6. Provide test connections and pressurize the pipe to normal working pressure.
 - a. Inspect pipeline and repair visible leaks.
 - b. Re-pressurize pipeline to normal working pressure as many times as necessary until there are no visible leaks.
 7. Provide backflow protection acceptable to the owner of the water system when existing water mains are used to supply test water.
- C. Pressure Test
1. At the option of the Contractor, the pressure and leakage tests may be performed at the same time.
 2. Test pressure at the lowest point of elevation of the segment being tested shall be not less than 150 (calculate 1.5 times the working pressure or 150 lbs. per sq. inch whichever is more) or at 10 lbs. per sq. inch less than the pressure rating of the pipe, if less than 150 lbs. per sq. inch.
 3. Pressurize the system being tested to pressure required above by adding water with high pressure test pump.
 4. Repair any visible leaks occurring due to test pressure application.

5. Repeat pressurizing of system to test pressure until no visible leaks can be found.
6. Test period shall be two continuous hours with no visible leaks occurring.
7. Measure pipeline pressure during test period.
8. Maintain system pressure within plus or minus 5 lbs. per sq. inch of the required test pressure by adding water with the test pump.
9. The pressure test shall be completed on all new mains up to the connection of the existing mains as approved by the Engineer. Place the new main immediately adjacent to the existing main.

D. Leakage Test

1. Perform a leakage test after satisfactory completion of the pressure test.
2. Test pressure at the lowest point of elevation of the segment being tested shall be not less than 150 lbs. per sq. inch or at 10 lbs. per sq. inch less than the pressure rating of the pipe, if less than 150 lbs. per sq. inch.
3. Leakage is defined as the quantity of water supplied into the pipe section being tested to maintain a pressure within 5 lbs. per sq. inch of the specified leakage test pressure after the pipe has been filled with water and the pipeline air has been expelled.
4. Provide gauges, measuring device, pump, piping, connections, container of water and all other apparatus required to perform the test.
5. Leakage shall not exceed the number of gallons per hour as determined by the following formula:

$$L = \frac{SD\sqrt{P}}{133,200}$$

When:

L = Allowable Leakage in Gallons/Hr.
 S = Total Length of Pipe Tested in Feet
 D = Nominal Pipe Dia. In Inches
 P = Average Test Pressure in lbs./sq. in.

6. When the section under test contains various diameters of pipe, the available leakage will be the sum of the computed leakage for each size of pipe.
7. Test period shall be two continuous hours without exceeding the allowable leakage.
8. Repair pipeline as required to meet allowable leakage requirements, repeating the test after each repair.

3.7 CONTINUITY TESTING

- A. Perform a continuity test on tracer wire.
- B. Provide a power source which will transmit a measurable amount of DC current the length of the tracer wire being tested or length of pipeline being tested.
- C. Take current readings with the test current “off”, then “on” to differentiate between test current and stray current.
- D. In the event continuity of the tracer wire or pipeline is not achieved, perform required repairs and repeat the test until continuity is achieved.

END OF SECTION

SECTION 02 41 13

SELECTIVE SITE DEMOLITION AND ABANDONMENT

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

- 1. Pavements
- 2. Curb and Gutter
- 3. Sidewalks
- 4. Driveways
- 5. Concrete and Masonry Structures
- 6. Manholes
- 7. Catch Basins and Inlets
- 8. Pipe Culverts
- 9. Water Main, Hydrants, Valve Boxes, Curb Stops and Boxes

1.2 SUBMITTALS

- A. Provide tickets for the amount of slurry backfill or flowable fill inserted into pipes that are abandoned.

PART 2 – PRODUCTS

2.1 Materials

- A. Granular backfill materials shall conform to the requirements of Soil Class C-5 or C-6 in section “Soils and Aggregates”.
- B. Concrete for this section shall conform to the requirements of Class B concrete as follows:

Class	28-day Comp. Strength	Max. Size Coarse Aggregate (Inches)	Min. Cement Content (Bags/CY)	Air Content	Slump (Inches)	Max. Water/Cement Ratio
B	3000	1 1/2	4.75	6 +/- 1	3-4	.58

PART 3 – EXECUTION

3.1 BREAKING DOWN AND REMOVING STRUCTURES

A. General

1. Existing structures, with attached parts and connections, shown on the drawings to be removed or that interfere with the new construction, shall be entirely removed within the limits shown.
2. When a portion of an existing structure is to be retained, take care during construction operations so as to not damage the retained portion.
 - a. Complete operations necessary for the removal of any existing structure, which might endanger the new construction, prior to the construction of the new Work.
 - b. Do not use any equipment or devices which might damage structures, facilities, or property which are to be preserved and retained.
3. Old casting shall be salvaged to the City.

B. Pavement, Curb, Gutter, Sidewalk, Driveways, Crosswalk, and Similar Structures

1. Where portions of the existing structure are to be left in the surface of the finished Work, remove the structure to an existing joint, or saw cut the structure to a true line with a face perpendicular to the surface of the existing structure.
2. Sufficient removal shall be made to provide for proper grades and connections in the new Work.

C. Walls, Piers, Drains, Foundations, Concrete, and Masonry Structures

1. Remove entirely or break down to an elevation at least three (3) feet below the earth subgrade within the areas of a road bed and elsewhere to at least three (3) feet below the finished slopes or natural ground.
2. Rebuild and reconnect live sewers for proper operations.
3. Satisfactory by-pass service shall be maintained during construction operations.

D. Manholes, Inlets, and Catch Basins

1. Remove entirely or break down to an elevation at least three (3) feet below the subgrade within the areas of a road bed and elsewhere to at least three (3) feet below the finished slopes or natural ground.
2. Rebuild or reconnect live sewers for proper operation.
3. Satisfactory by-pass service shall be maintained during construction operations.

E. Pipe Culverts

1. Remove entirely all culverts that are to be removed, except as hereinafter provided for closing culverts.
2. Remove sidewalls or substructure units in water to an elevation no higher than the elevation of the natural stream or lake bed.
 - a. Where grading of the channel is required, remove such units to the proposed finished grade of the stream or lake bed.

- b. Remove all other sidewalls or substructure units down to at least two (2) feet below natural or finished ground.
 3. Where existing culverts are to be extended or otherwise incorporated into the new Work, remove only such part or parts of the existing culvert as necessary to provide a proper connection to the new Work.
 4. Remove pipe culverts designated for salvage in a manner that will preclude damage to the culverts.
- F. Hydrants, Valve Boxes, and Curb Stops and Boxes
1. Remove hydrants without damage at the hydrant lead and plug the lead with a plug fitting.
 2. Remove valve boxes entirely or at least to three (3) feet below the earth subgrade and elsewhere to at least three (3) feet below the finished slopes or natural ground.
 3. Remove curb boxes and the curb stop entirely. Plug end of water service by crimping, or with a standard plug fitting, as applicable.

3.2 ABANDONING STRUCTURES

- A. Manholes, Catch Basins, Inlets
1. Thoroughly clean structures to be abandoned.
 2. Plug existing pipe connections with brick or concrete block masonry and with concrete.
 3. Remove the walls of the structures to an elevation at least three (3) feet below the finished grade line, or to such elevation that may be designated on the drawings.
 4. Provide an outlet for water seepage at the bottom of the structure.
 5. Fill the structure with soil type C-5 or C-6.
- B. Water Main Pipe
1. Remove pipe to joint and plug end of pipe to be abandoned with a plug fitting.
 2. Fill abandoned pipe with flowable fill, blow sand, or other approved material.
 3. Provide air release locations and an access point for inserting the aggregate.
- C. Sewer Pipe
1. Plug existing pipe to be abandoned with brick or concrete block masonry and with concrete.
 2. Fill abandoned pipe with flowable fill, blow sand, or other approved material.
 3. Provide air release locations and an access point for inserting the aggregate.

3.3 DISPOSAL OF MATERIALS

- A. Deliver materials designated for salvage to owner's storage facility.
- B. All other materials shall be hauled and disposed of at a site provided by the Contractor:
1. Method of disposal shall be in conformance with all governing authorities.
 2. There shall be no limit on haul distance.

3.4 BACKFILLING

- A. Fill all trenches, holes and pits resulting from the breaking down or removal of miscellaneous structures with satisfactory soil, or with broken masonry and satisfactory soil, or with granular backfill.
 - 1. Place materials in layers not more than 12 inches in thickness.
 - 2. Thoroughly compact each layer by means of tampers, rollers, or vibrators.
 - a. Do not use water to expedite settlement of backfill except with the approval of the Engineer.
 - 3. Exclude broken masonry from the top 12 inches of the finished earth grades.
 - 4. Unless otherwise provided, backfill earth subgrade, or finished slopes, as may be necessary due to the location of the removed structure.

END OF SECTION

SECTION 31 05 10

SOILS AND AGGREGATES FOR EARTHWORK

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Engineered soils and aggregates materials
2. Bank run soils materials
3. Manufactured and special soils
4. Crushed concrete

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

- | | | |
|-----|------------|--|
| 1. | ASTM C33 | Spec. for Concrete Aggregates |
| 2. | ASTM C88 | Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate |
| 3. | ASTM C117 | Test for Material Finer than No. 200 Sieve in Mineral Aggregates by Washing. |
| 4. | ASTM C131 | Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Lost Angles Machine. |
| 5. | ASTM C136 | Sieve Analysis of Fine and Coarse Aggregates. |
| 6. | ASTM C144 | Spec. for Aggregate for Masonry Mortar. |
| 7. | ASTM C207 | Spec. for Hydrated Lime for Masonry Purposes. |
| 8. | ASTM C535 | Test for Resistance to Degradation of Large-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine. |
| 9 | ASTM C602 | Spec. for Agricultural Liming Materials. |
| 10. | ASTM D75 | Sampling Aggregates. |
| 11. | ASTM D422 | Particle Size Analysis of Soils. |
| 12. | ASTM D448 | Spec for Standard Sizes of Coarse Aggregate for Highway Construction. |
| 13. | ASTM D1140 | Test for Amount of Material in Soils Finer than the No. 200 Sieve. |
| 14. | ASTM D1241 | Spec. for Materials for Soil;-Aggregate Sub-base, Base, and Surface Courses. |
| 15. | ASTM D2216 | Laboratory Determination of Water (Moisture) content of Soil, Rock, and Soil Aggregate Mixtures. |
| 16. | ASTM D2487 | Classification of Soils for Engineering Purposes. |

2020 Specifications

City of De Pere

- | | | |
|-----|------------|---|
| 17. | ASTM D4318 | Test Method for Liquid Limit, Plastic Limit, and Plasticity of Soils. |
| 18 | ASTM D5268 | Standard Specification of Topsoil Used for Landscaping Purposes. |

1.3 SUBMITTALS

- A. Provide test reports showing the results of required material testing.
- B. Provide topsoil analysis performed in accordance with ASTM D5268 and demonstrating the topsoil meets Soil Conservation Service specified soil types. Also, submit results of test for nutrient levels and provide recommendations for fertilizer type and application.
- C. Daily delivery tickets for each load of material delivered to the site.

1.4 QUALITY ASSURANCE

- A. The Engineer will provide an independent testing.

PART 2 – PRODUCTS

2.1 ENGINEERED SOILS AND AGGREGATES (SOIL CLASS A)

A. General

- 1. Material shall be clean, sound, hard, dense, durable, field or quarry stone which is free from seams, cracks, or other structural defects. It shall be angular material from shot rock (blasted) or crushed rock having substantially all face of which have resulted from artificial crushing.
- 2. Loss due to sulfate soundness test shall not exceed 10 percent.
- 3. Loss due to abrasion test shall not exceed 40 percent.
- 4. Material shall not be frozen.

B. Gradation

- 1. Riprap dimensions shall confirm to the following:

AVERAGE DIMENSION RANGES FOR EACH RIPRAP GRADE (Inches)				
FRACTION OF GROSS IN-PLACE RIPRAP VOLUME OCCUPIED BY STONES	EXTRA HEAVY RIPRAP	HEAVY RIPRAP (A-1)	MEDIUM RIPRAP (A-2)	LIGHT RIPRAP (A-3)
0%	>30	>25	>20	>16
10%-14%	22-25	18-20	14-16	11-13
15%-21%	18-22	14-18	11-14	9-11
20%-28%	8-18	6.5-14	5-11	4-9
5%-7%	<8	<6.5	<5	<4
2% or less	<1	<1	<1	<1

2. Soil Class A-4 through A-5 Not Used.
3. Soil Class A-6 (1 ½ - inch Crushed Rock – ASTM D448-No.4) - Bedding Stone

Sieve Size	% Passing by Weight
2-inch	100
1 ½-inch	90-100
1-inch	20-55
¾-inch	0-15
⅜-inch	0-5

4. Soil Class A-7 (¾ -inch Crushed rock – ASTM D448-No. 67) – Bedding Stone

Sieve Size	% Passing by Weight
1-inch	100
¾-inch	90-100
⅜-inch	20-55
No. 4	0-10
No. 8	0-5

5. Soil Class A-8 (⅜-inch Crushed Rock Chips – ASTM D448-No.8) - Bedding Stone

Sieve Size	% Passing by Weight
½-inch	100
⅜-inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

2.2 ENGINEERED SOILS AND AGGREGATES (SOIL CLASS C) OR CRUSHED CONCRETE

A. General

1. Stone shall be hard, durable, granular material of uniform quality resulting from crushed rock or crushed bank run sand and gravel.
2. Material shall be free from clay lump, organic matter, shale, excess, elongated or flat pieces, and other deleterious substances.
3. Forty-five percent of the particles retained on a No. 4 sieve shall have at least fractured face.
4. Wear shall not exceed 50 percent.
5. Loss due to sulfate soundness test shall not exceed 18 percent by weight.
6. Total moisture content shall not exceed 7 percent unless approved by the Engineer to obtain the optimum moisture content for compaction. The optimum moisture content will be determined based on the soil testing.
7. Filler for blending shall have a maximum liquid limit of 25 percent and a maximum plasticity index of 6.
8. Material shall not be frozen.
9. Crushed concrete shall meet the following requirements:
 - a. Be 90% free of steel reinforcement.
 - b. Contain less than 10% asphaltic pavement, surfacing, or base.
 - c. Be from a City project or a source approved by the Engineer.

B. Gradation

1. Soil Class C-1 (Crushed Stone or Concrete) – 1 ¼” Crushed Aggregate Base Course

Sieve Size	% Passing by Weight
1 ¼-inch	95-100
¾-inch	70-93
⅜-inch	42-80
No. 4	25-63
No. 10	16-48
No. 40	8-28
No. 200	2-12

2. Soil Class C-2 (Crushed Stone or Concrete) – ¾” Crushed Aggregate Base Course

Sieve Size	% Passing by Weight
1-inch	100
¾-inch	95-100
⅜-inch	50-90
No. 4	35-70
No. 10	15-55
No. 40	10-35
No. 200	5-15

3. Soil Class C-3 (Crushed Gravel) – 1 ¼” Crushed Aggregate Base Course

Sieve Size	% Passing by Weight
1 ¼-inch	95-100
¾-inch	70-93
3/8-inch	42-80
No. 4	25-63
No. 10	16-48
No. 40	8-28
No. 200	4-10

4. Soil Class C-4 (Crushed Gravel) – ¾” Crushed Aggregate Base Course

Sieve Size	% Passing by Weight
1-inch	100
¾-inch	95-100
3/8-inch	50-90
No. 4	35-70
No. 10	15-55
No. 40	10-35
No. 200	8-15

5. Soil Class C-5 (Crushed Stone, Gravel or Concrete)- Granular Backfill

Sieve Size	% Passing by Weight
1-inch	100
¾-inch	85-100
3/8-inch	50-80
No. 4	35-60
No. 40	15-30
No. 200	5-15

2.3 ENGINEERED SOILS AND AGGREGATES (SLURRY BACKFILL)

A. General

1. Material shall be placed in a clean concrete mixer truck and thoroughly mixed.
2. No additional water will be allowed. The weights are damp weights.
3. Just prior to placing the slurry backfill, the mixer shall be run at mixing speed for one full minute to assure an even mixture.

B. Gradation/Mix Ratio

1. Slurry backfill ratio per cubic yard for structure abandonment and trench backfilling shall conform to the following table:

Per Cubic Yard	
Material	Weight/Amounts
Sand	1,350 lbs
A-7	750 lbs
A-6	1,150 lbs
Water	25 Gallons

2. Alternatives for the slurry backfill for pipe abandonment may be required due to site conditions and means and methods as determined by the Contractor. Changes in the slurry backfill shall be approved by the Engineer.
3. Sand for slurry backfill shall be a granular material having at least 90% passing the No. 4 Sieve and predominantly retained on the No. 200 Sieve.

2.4 ENGINEERED SOILS (BLOW SAND)

A. Blow Sand

1. Blow sand shall be M50 Grade Foundry Silica Sand or approved equal.

2.5 BANK RUN SOILS

A. Soil Class E-1 (Clay Soil)

1. Minimum 50 percent by weight passing the No. 200 sieve.
2. For the fraction passing the No. 40 sieve, the minimum plasticity index shall be 15.
3. Minimum Atterberg liquid limit of 30.
4. Free from organic material, boulders, cobbles, excessive amounts of gravel (greater than ¾ -inch), and other deleterious substances.

B. Soil Class F-1 (Topsoil)

1. Topsoil shall meet the definition and specification stated in ASTM D5268 and meets on of the following SCS (Soil Conservation Service) soil textures:
 - a. Loam.
 - b. Sandy loam.
 - c. Silt loam.
 - d. Silty clay loam.
 - e. Clay loam.
2. The topsoil shall consist of adequate mineral content to support the growth of the intended vegetation and shall not contain herbicides which would be detrimental for the intended use.
3. The topsoil shall have adequate fertility for quick establishment of vegetation.
4. The pH of the topsoil shall be between 6.0 and 7.0.
5. Topsoil shall be free from deleterious substance.
6. Pulverize and screen the topsoil such that 100 percent passed the 1-inch (25 mm) sieve and at least 90 percent passes the No. 10 (2.00 mm).

C. Soil Class G-1 (Clean Earth Fill)

1. Soil Class G-1 shall be any soil material excavated on the project site or obtained from borrow areas.
2. Soil materials unsuitable and, therefore, not approved for this classification are:
 - a. Soils with high organic contents such as: topsoil, peat, muck, organic silts, and clays, marls, etc.
 - b. Manmade or rubble filled soils containing such materials as: foundry sand, fly ash cinders, asphalt, and concrete rubble, etc.
 - c. Silty soils such as: rock flour, loess, etc.
 - d. Soils with gravel larger than 3-inch.
 - e. Silty clay or clays with high plasticity (CH soils as defined in ASTM D2487).
 - f. All soil contaminated with hazardous waste materials as defined by the EPA.

D. Soils Class G-2 (Clean Earth Fill)

1. Same as G-1 above except shall not contain gravel larger than 1 ½ - inch.

2.6 SOURCE QUALITY CONTROL

A. Provide documentation to establish acceptability of material for each soils class in accordance to the following standards:

1. Soils Class A and C:
 - a. ASTM C88.
 - b. ASTM C131 (for coarse aggregates smaller than 1 ½ inches).
 - c. ASTM C136.
 - d. ASTM C535 (for coarse aggregates 1 ½ inches and larger).
 - e. ASTM C117 (use when aggregate contains materials finer than No. 200 sieve).
2. Soils Class E:
 - a. ASTM C136 (test when gravel content is present).
 - b. ASTM D422.
 - c. ASTM D1140.
 - d. ASTM D4318.
 - e. ASTM D4318.
3. Soils Class F:
 - a. ASTM D2487.
4. Soils Class G:
 - a. ASTM D2487.

B. Provide source samples all soils and aggregates in accordance with ASTM D75.

C. Provide one (1) acceptable test for each type of material at each source.

PART 3 – EXECUTION

3.1 APPLICATION

- A. Use the soil classification as specified or stated on Drawings.
- B. Place material in accordance with the Drawings and appropriate Specification Sections for the type of work being performed.
- C. Unless specified otherwise, make medium riprap at least 18-inches thick, heavy riprap at least 24-inches thick, and extra-heavy riprap at least 30-inches thick.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Clearing, grubbing, and disposal.
 - 2. Stripping and stockpiling topsoil.
 - 3. Ash Tree Requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Topsoil
 - 1. Topsoil is defined as the upper soil horizon consisting of mineral layers of maximum humus (organic) accumulation.

PART 3 – EXECUTION

3.1 CLEARING, GRUBBING, AND DISPOSAL

- A. General – Clear and grub the area of construction as identified on the drawings.
- B. Clearing – Cut all brush, shrubs, stumps and trees to within 4 inches of the existing ground surface.
- C. Grubbing:
 - 1. Remove all stumps, roots, logs and timber.
 - 2. Grubbing shall consist of the removal and disposal of roots and stumps.
- D. Disposal:
 - 1. Contractor is responsible for the following:
 - a. Disposal of all material removed under clearing and grubbing.
 - b. Furnishing of a disposal site.
- E. Clearing operations shall be completed in a manner so as to prevent obstruction of traffic and to protect all remaining trees, shrubs, and other vegetation from injury.
- F. Clearing and grubbing of oak trees shall be completed in accordance with the WisDOT Standard Specifications for Highway and Structure Construction.

3.2 STRIPPING AND STOCKPILING TOPSOIL

A. Stripping

1. Remove all topsoil beneath:
 - a. Structures.
 - b. Roadways.
 - c. All paved areas.
2. Remove topsoil in:
 - a. Areas disturbed by utility construction.
 - b. Areas requiring cuts of significant fills (significant fills are fills which cannot be obtained by addition of topsoil only).

B. Stockpiling

1. Contractor shall stockpile topsoil obtained in the stripping operation for replacement.
 - a. For areas where topsoil is to be replaced after underground utility construction.
 - b. For areas involving site grading where topsoil is to be replaced in order to sustain vegetative growth.
2. In areas where topsoil will not be required as specified above, Contractor shall remove and dispose of excess material as defined in other sections.

3.3 ASH TREE REQUIREMENTS

- A. Burning of stumps, roots, brush, waste logs and limbs, timber tops, and debris resulting from clearing and grubbing is not allowed.
- B. The emerald ash borer (EAB) has resulted in a quarantine in Brown County by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and the Wisconsin Department of Natural Resources (DNR).
- C. Ash trees include the following species:
 1. Green ash (*F. pennsylvanica*) is found throughout the state, but is most common in southern Wisconsin.
 2. Black ash (*F. nigra*) is distributed over the entire state but is most frequently found in northern Wisconsin.
 3. Blue ash (*F. quadrangulata*) is a threatened species that is currently found only at a few sites in Waukesha County. The species is at the edge of its range in Wisconsin, but is common in states farther south. The species is not of commercial importance.
 4. White ash (*F. Americana*) is found throughout Wisconsin, but is most common in the southern third of the state.
 5. Mountain ash (*Sorbus Americana* and *S. decora*) is not a true ash and is not susceptible to EAB infestation.

D. Follow and obey the following Wisconsin Department of Agriculture, Trade, and Consumer Protection order:

1. ATCP 21.17 Emerald ash borer; import controls and quarantine.

IMPORTING OR MOVING REGULATED ITEMS FROM INFESTED AREAS; PROHIBITION. Except as provided in sub.(3), no person may do any of the following: (a) Import a regulated item under sub.(2) into this state if that item originates from an emerald ash borer regulated area identified in 7CFR 301.53-3. (b) Move any regulated item under sub. (2) out of an emerald ash borer regulated area that is identified in 7CFR 301.53-3 and located in this state.

Note: the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) periodically updates the list of regulated areas in 7CFR 301.53-3. Subsection (1) applies to new regulated areas as those areas are identified in the CFR.

REGULATED ITEMS. The following are regulated items for purposes of sub. (1):

1. The emerald ash borer, *Agrilus planipennis* (Fairmaire) in any living stage.
2. Ash trees.
3. Ash limbs, branches, and roots.
4. Ash logs, slabs or untreated lumber with bark attached.
5. Cut firewood of all non-coniferous species.
6. Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter.
7. Any other item or substance that may be designated as a regulated item if a DATCP pest control official determines that it presents a risk of spreading emerald ash borer and notifies the person in possession of the item or substance that it is subject to the restrictions of the regulations.

E. The quarantine means that ash wood products may not be transported out of the quarantined area. If ash trees are identified within clearing and grubbing limits, the following measures are required for the disposal:

1. Chipped ash trees
 - a. May be left on site if used as landscape mulch within the project limits if approved by the Engineer.
 - b. May be buried on adjacent properties to projects within the quarantined zone with prior approval from the Engineer.
 - c. Chips must be disposed of immediately and may not be stockpiled.
 - d. Chipper equipment must be cleaned following post-chipping activities to insure no spread of wood chip debris into non-quarantined counties.
2. Ash logs, branches, and roots
 - a. May be hauled to the City compost site for disposal if approved by the Engineer.

- b. Ash logs, branches, and roots must be disposed of immediately and may not be stockpiled.

END OF SECTION

SECTION 31 13 10

TREE PRESERVATION OF PUBLIC TREES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Protection of above ground branches and bark.
2. Protection of below ground root system and surrounding soil.

1.2 REFERENCES

A. City of De Pere Municipal Ordinance

1. Chapter 30 Parks and Recreation

PART 2 – PRODUCTS

2.1 MATERIALS

A. None

PART 3 – EXECUTION

3.1 ABOVE GROUND BRANCHES AND ROOTS

- A. Tree trimming required is to be coordinated with the Engineer. The City reserves the right to trim all City trees.
- B. Hand trim damaged branches larger than two inch with handsaws, pruners, lopers, chainsaws or other specifically designed tree trimming equipment.
- C. Notify the Engineer of damage to bark. Damaged bark shall be repaired as directed by the Engineer

3.2 BELOW GROUND ROOT SYSTEM AND SURROUNDING SOIL

A. Activities within the Protected Root Zone (PRZ)

1. The root system shall be left undisturbed in the PRZ for each tree as follows:

Tree diameter at 4.5 feet (dbh)	Radius of PRZ (Measured from face of trunk)
0-3 inches	3 feet
3-8 inches	6 feet
8-14 inches	8 feet
14-19 inches	10 feet
19+ inches	15 feet

2. Minimize compaction.
3. Do not store materials and equipment.

B. Protection of the PRZ

1. Provide protection of the PRZ including but not limited to:
 - a. Fencing
 - b. Temporary raised bridges over the area for equipment.
2. Auger/tunnel at a minimum depth of 36 inches for utility installations.

C. Damaged Roots

1. Hand prune damaged and exposed roots larger than one inch with handsaws, pruners, loppers, chainsaws or other specifically designed root pruning equipment.

D. Where trees are present near curb replacements, the root systems on the curb side shall be cut not more than four (4) inches beyond the edge of the new curb.

E. For new sidewalk, limit soil disturbance to not more than four inches beyond the edge of the new sidewalk.

F. The Engineer may route sidewalk around existing trees to minimize damage.

END OF SECTION

SECTION 31 23 00

EXCAVATION AND FILL FOR ROADWAY

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation.
2. Test Rolling.
3. Filling and compacting.
4. Disposal of surplus materials.
5. Finish grading.
6. Material testing.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. D4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
2. D1140 Test for Amount of Material in Soils Finer than the No. 200 Sieve
3. D1556 Test for Density of Soil in Place by the Sand-Cone Method
4. D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb. (4.54 kg) Rammer and 18-inch (457mm) Drop
5. D2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures
6. D938-07 Standard Test Methods for In-Place Density and water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.3 SUBMITTALS

- A. Submit copies of the results of quality control testing (include location where test was done) for aggregate to be supplied, including a sieve analysis.

1.4 DENSITY TESTING

- A. The Engineer will provide an independent testing laboratory to provide testing services.

PART 2 – PRODUCTS

2.1 SOIL MATERIALS

- A. Soil used for borrow, fill, and backfilling shall meet the requirements of soil class as stated in the drawings or in the Specifications.
- B. As a minimum, all soil shall meet the requirements of Soil Class G-1.
- C. Soil classes shall be as per Section “Soils and Aggregates”.

PART 3 – EXECUTION

3.1 EXCAVATION

- A. Excavation to subgrade elevation per the drawings.
- B. Excavate soil material determined to be unsuitable when directed by the Engineer.
- C. Vegetation of a height greater than one foot shall be cut and disposed of before ground is broken for excavation.
- D. Heavy sod and other perishable material underlying proposed roadway and sidewalk embankments shall be removed.
- E. Excavation Below Subgrade
 - 1. Remove deposits of frost-heave material, unstable silty soils, wet and unstable soil, material salvaged from old road cores in marshes, topsoil containing considerable amounts of humus or vegetable matter, rocks, or other undesirable foundation material to the depth below finished grade as the plans show or the engineer directs. If possible, slope and drain the excavation bottoms to prevent water accumulation.
 - 2. Use selected materials from roadway and drainage excavation having suitable engineering properties. Borrow, or granular backfill, as the plans or special provisions show or as the engineer directs, to backfill excavated areas.

3.2 SUBGRADE COMPACTION IN CUTS

- A. Compact subgrade to 95 percent standard proctor density to a minimum depth of 6 inches.

3.3 SUBGRADE COMPACTION IN FILLS

- A. Compact fill in layers not exceeding 8 inches in thickness.
- B. Compact to 95 percent standard proctor density.

3.4 MOISTURE REQUIREMENTS

- A. Proper soil moisture contents for compaction shall be maintained in all soils.
 - 1. Optimum moisture content as determined by Standard Proctor shall be used to determine acceptance moisture contents for soil compaction.
 - 2. Use the guidelines to determine moisture content range for compaction of various soils:

Moisture Requirements for Compaction of Various Soils

Material Description	Soil Class	Tolerable Range of Moisture Content About Optimum (%)
Coarse grained, cohesionless soils with less than 4% P200 or with less than 8% uniform gradation (i.e., clean sand or gravel).	“A” and “B”	Highest practical moisture content (saturation may be required)
Sandy clays, silty clay silts, and clays	“E” and “G”	-2 to +4
All other soil types	All other soil classes	-1 to +3

Note: The above requirements are general guidelines for soil moisture content which may or may not apply to a specific soil material. In some circumstances, the required density may be attained at moisture contents outside the ranges indicated above.

3.5 TEST ROLLING

- A. Test roll finished cut or fill subgrades by rolling with a pneumatic-tire roller or a loaded dump truck with at least ten (10) cubic yards of materials.
 - 1. Method and equipment used shall be suitable for intended use.
 - 2. Take necessary precautions to protect existing structures from damage during test rolling.
 - 3. Test roll an area equal to the area of the proposed construction plus a minimum of three (3) feet on each side.
- B. Treat areas showing yielding or rutting under test rolling as follows:
 - 1. Replace and/or recompact as necessary to stabilize the area.
 - 2. Retest soil areas replaced or recompact.
 - 3. Remove poor soils and replace with aggregate and/or fabric as directed by the Engineer.

3.6 DISPOSAL OF SURPLUS MATERIALS

- A. Haul and dispose of all surplus materials.
- B. Provide disposal area for surplus materials.

3.7 FINISH GRADING

- A. Grade, trim, and shape subgrade to required grade and section.
 - 1. Adjust slopes by grading so that transition is smooth and gradual.
 - 2. The crests of cut banks shall be rounded and shaped.
 - 3. Refill, Regrade and compact washouts ruts.
 - 4. Remove all stones 3 inches or larger from grading limits.
- B. Vertical Grading Tolerances
 - 1. Rough grading tolerance.
 - a. Areas to be topsoiled – rough grade to within 0.2 foot of finish grades.
 - 2. Areas having paved surfaces (i.e., concrete, asphalt, etc.).
 - a. Maximum allowable variation from correct profile and section shall not be more than ¼ inch in 10 feet.

END OF SECTION

SECTION 31 23 23.33**FLOWABLE FILL****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Flowable fill material for backfill and abandonment.

1.2 REFERENCES**A. American Society of Testing and Materials (ASTM)**

- | | |
|------------------|---|
| 1. D4832-10 | Standard Test Method for Preparation & Testing of Controlled Low Strength Material (CLSM) Test Cylinders |
| 2. C618-12 | Standard Specifications for Coal Fly Ash & Raw or Calcined Natural Pozzolan for use in Concrete. (Use Fly Ash conforming to the chemical and physical requirements for mineral admixture, Class F listed, including Table 2 (except for Footnote A). Waive the loss on ignition requirement |
| 3. C403/C403M-08 | Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance. |
| 4. C150/C150M-11 | Standard Specification for Portland Cement. |
| 5. C33/C33M-11a | Standard Specification for Concrete Aggregates. |
| 6. C94/C94M-12 | Standard Specification for Ready-Mixed Concrete. |
| 7. C494/C494M-11 | Standard Specification for Chemical Admixtures for Concrete |
| 8. C685/C685M-11 | Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing |
| 9. C940-10a | Standard Specification for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced – Aggregate Concrete in the Laboratory |
| 10. D5971 | Sampling Freshly Mixed Controlled Low Strength Material |
| 11. D6103 | Flow Consistency of Controlled Low Strength Material |
| 12. D6023 | Unit Weight, Yield, Cement Content and Air Content (Gravimetric) of Controlled Low Strength Material |

B. American Concrete Institute (ACI)

1. SP-150-94 Controlled Low-Strength Materials

1.3 SUBMITTALS

- A. Provide flowable fill mix design containing cement and water.
- B. Provide documentation that the admixture supplier has experience of at least one year, with the products being provided and any equipment required to obtain desired performance of the product.

1.4 QUALITY ASSURANCE

- A. Flowable fill shall be manufactured by a ready-mix concrete producer with a minimum of 1 year experience in the production of similar products.
- B. For each type of material required for the work of this Section, provide primary materials that are the products of one manufacturer. If not otherwise specified here, materials shall comply with recommendations of ACI 229, “Controlled Low Strength Materials.”
- C. Flowable fill shall be sampled and testing in the field in conformance with either ASTM C 94 or C 685. Samples for tests shall be taken for every 115 cubic meters (150 cubic yards) of material, or fraction thereof, for each day’s placement. Tests shall include temperature reading and four compressive strength cylinders. Compressive strength sampling and testing shall conform to ASTM D 4832 with one specimen tested at 7 days, two at 28 days, and one held for each batch of four specimens. Sampling and testing shall be performed by a qualified, independent commercial testing laboratory. Test results should be submitted within 48 hours of completion of testing.

PART 2 – PRODUCTS**2.1 MATERIALS**

- A. Provide flowable fill containing, at a minimum, cementitious materials and water. Cementitious materials shall be portland cement, pozzolanic materials, or other self-cementing materials, or combinations thereof, at the contractor’s option, and following approval by the Resident Engineer. The flowable fill mix design may also contain, fine aggregate or filler, and/or chemical admixtures in any proportions such that the final product meets the strength, flow consistency and shrinkage requirements included in this specification, as approved by the Resident Engineer.
- B. Portland Cement: ASTM C150, Type 1 or Type 2 conforming to the State of Wisconsin Standard Specifications for Highway and Structure Construction. Alternative chemical grouts may be used based on field conditions if accepted by the Engineer.

- C. Water used for mixing the grouts shall be clean and potable and provided by the Contractor.
- D. Air Entraining Admixture: ASTM C260.
- E. Chemical Admixtures: ASTM C494.
- F. Aggregate: ASTM C33.

2.2 MIXTURE

- A. Mix design shall produce a consistency that will result in a flowable product at the time of placement which does not require manual means to move it into place.
- B. Flowable fill shall have a minimum strength of 100 psi and a maximum strength of 150 psi according to ASTM C39 at 28 days after placement.
- C. Flowable fill shall have minimal subsidence and bleed water shrinkage. Evaporation of bleed water shall not result in shrinkage of more than 10.4 mm per m (1/8 inch per foot) of flowable fill depth (for mixes containing high fly ash content). Measurement of a Final Bleeding shall be as measured in Section 10 of ASTM C 940 “Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
- D. Provide equipment as recommended by the Manufacturer and comply with manufacturer’s recommendations for the addition of additives, whether at the production plant or prior to placement at the site.

PART 3 – INSTALLATION

3.1 GENERAL

- A. Flowable fill refers to a cementitious slurry consisting of a mixture of fine aggregate or filler, water, and cementitious material(s), which is used as a fill or backfill in lieu of compacted earth.
- B. Mixture is capable of filling all voids in irregular excavations and hard to reach places (such as under undercuts of existing slabs), is self-leveling, and hardens in a matter of a few hours without the need for compaction in layers.

3.2 EXAMINATION

- A. Examine conditions of substrates and other conditions under which work is to be performed and notify Engineer, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.3 APPLICATION OF FLOWABLE FILL

- A. Secure tanks, pipes and other members to be encased in flowable fill.
- B. Insure that there are no exposed metallic pipes, conduits, or other items that will be in contact with the flowable fill after placement. If so, replace with non-metallic materials or apply manufacturers recommended coating to protect metallic objects before placing the flowable fill.
- C. Replacement or protection of metallic objects is subject to the approval of the Resident Engineer.
- D. Abandon pipe per the section on Selective Site Demolition and Abandonment.
- E. Alternatives for flowable fill for pipe abandonment may be required due to site conditions and means and methods by the Contractor. Changes in the flowable fill shall be approved by the Engineer.

3.4 PROTECTION AND CURING

- A. Protect exposed surfaces of flowable fill from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature.
- B. Curing method shall be subject to approval by Engineer.

END OF SECTION

SECTION 31 23 33

TRENCHING, BACKFILLING AND COMPACTING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Obstruction removal.
2. Dewatering.
3. Sheet piling and bracing.
4. Supporting of existing structures.
5. Disposal of surplus materials.
6. Trenching, backfilling and compacting.
7. Restoration.

B. This section applies to below ground pressure and gravity pipe lines.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb. (4.54 kg) Rammer and 18-inch (457mm) Drop
2. D6938-07 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.3 SUBMITTALS

A. Submit copies of the results of quality control testing (include location where test was done).

1. Materials source testing.

1.4 QUALITY ASSURANCE

A. The Engineer will obtain an independent testing laboratory to provide quality control testing.

B. Acceptable test results do not relieve the Contractor from making corrections to the tested work during the warranty period.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Conform to Section “Soils and Aggregates”.

- B. Native Backfill Material
 - 1. Backfill material shall be free of:
 - a. Vegetable or other organic material.
 - b. Concrete or concrete fragments.
 - c. Stones larger than 3 inches.
 - d. Frozen material,
 - e. Blasted rock.
 - f. All types of refuse.

- C. Granular Backfill Material
 - 1. Soil Class C-1, C-3, or C-5 in accordance with Section “Soils and Aggregates”.

- D. Clay Dam Backfill Material
 - 1. Soil Class E-1 clay soil in accordance with Section “Soils and Aggregates”.
 - 2. Use where stated on the Drawings or where stated elsewhere.

2.2 SOURCE QUALITY CONTROL

- A. Provide test soil and aggregate material in accordance with Section “Soils and Aggregates”.

PART 3 – EXECUTION

3.1 OBSTRUCTION REMOVAL

- A. Remove obstructions from within the construction limits as required; such as:
 - 1. Mounds of dirt, stone or debris.
 - 2. Street signs, culverts and end walls, advertising signs and guard posts (shall be replaced to original condition).

- B. Unless otherwise specified, the construction limits are:
 - 1. Street right-of-way.
 - 2. Easement boundaries.
 - 3. Project site property lines.
 - 4. As shown on the Plans.

- C. Strip and stockpile topsoil in accordance with section: “Site Clearing”.
- D. Remove pavement, curb and gutter, sidewalk, and driveway and other surfaces within the maximum trench width for restoration payment purposes at the ground surface or as shown on the drawings whichever is greater.
 - 1. Sawcut vertically pavement, curb and gutter, sidewalk, driveway and other surfaces to full depth prior to removal.
 - 2. Remove concrete surfaces to the nearest joint.

3.2 DEWATERING

- A. Determine groundwater conditions.
- B. Provide and maintain necessary means and methods to dewater excavations as required.
- C. Dispose of water.
- D. Prevent runoff and dewatering system discharge for entering excavation.
- E. Secure permits from regulatory and governmental agencies governing dewatering.
- F. Provide well, water, pumping equipment, generating equipment and/or power.
- G. Maintain a water supply to private and public wells affected by the dewatering operation.
- H. Correct damage caused to private wells due to dewatering.
- I. Dewater to a minimum depth of 12 inches below excavations.
- J. Maintain dewatering operation until backfill and compaction procedures are completed.
- K. Groundwater Disposal
 - 1. Convey groundwater to a point of discharge through pipelines.
 - a. Open ditches and trenches are not permitted.
 - b. Use of Owner’s utilities is not permitted without written consent.
 - 2. Maximum Sediment Content: 10 milligrams per liter.

3.3 TRENCH EXCAVATION

- A. Excavate trench to sufficient width and depth to permit proper utility construction at line and grade shown on the drawings.

- B. The bottom of the excavation shall conform to the pipe embedment details with a minimum width of the pipe outside diameter plus 12 inches.
- C. Do not open more than 200 feet of trench at any one time.
- D. Place excavated material in a location that will minimize inconvenience to public travel, adjacent property owners and other contractors.
- E. Disposal of Surplus Excavated Material
 - 1. Remove surplus excavated material from the site as soon it is determined it will not be used for backfill material.
 - 2. Dispose of pavement separately from soils material.
 - 3. Dispose of surplus material which includes:
 - a. Loading and hauling.
 - b. Dumping and leveling.
 - c. Provide a dump site (when not specified by Owner)
 - 1) Conform with governing authorities.
 - 2) No limit on haul distance.
 - 4. Do not dispose of excavated surplus material in state waters, floodplain, or wetlands without written approval of the appropriate regulatory agency.
- F. Sheeting and Bracing
 - 1. Sheet and brace trenches and excavations as required by applicable federal and state codes, by the Contract Documents, and as necessary to protect life and property.
 - a. When close sheeting is required, prevent soil from entering the trench either below or through such sheeting.
 - 2. Removal of Sheeting and Bracing
 - a. Remove sheeting and bracing as the excavation is backfilled in such manner to avoid disturbance of adjacent structures and to insure adequate protection of the completed pipe section.
 - b. If the sheeting and bracing cannot be removed without damage to the pipe or adjacent areas, leave in place.

G. Portable Trench Shoe Shield (Shoe)

1. A shield may be used with the following restrictions.
 - a. Construct as required by State or Federal authority.
 - b. Do not exceed trench limits.
 - c. Do not disturb or alter pipe and bedding.

H. Rock Removal

1. Remove and dispose of rock in accordance to Section “Rock Removal”.

3.4 TRENCH BACKFILLING AND COMPACTION

A. Provide pipe foundation material below the bedding as directed by the Engineer.

B. Notify Engineer of poor soils below the foundation and/or the pipe bedding.

C. Provide pipe embedment as required for the type of pipe installed per the appropriate Section.

D. Granular backfill shall be installed as follows unless specified otherwise on the Plans:

1. One foot beyond the limits of existing or proposed pavements, driveways, and sidewalks.
2. Ten feet beyond the limits of the railroad tracks.
3. The vertical limits shall be to the existing or proposed subgrade.

E. Native backfill may be used at locations not identified in D.

F. Backfill Compaction

1. Compact trenches using mechanical compaction methods.
2. Compact backfill in layers not exceeding 18 inches to the following densities:

Material Type	Density Requirement
Native Material	Equal to adjacent undisturbed material
Granular Backfill	Minimum of 95% of the Modified Proctor Density

G. Provide select backfill material as directed by the Engineer or as specified elsewhere.

H. Backfill trench to last pipe joint (not to exceed 10 feet) at the end of each work day.

1. Backfill during nights, weekends and when no work is in progress.
2. Take measures to protect work site.

3.5 SURFACE RESTORATION

- A. Remove surplus material (earth, rubbish, construction material, etc.) and restore areas affected by construction activities.
- B. Restore roads, streets, and highways meeting the following provision:
 - 1. Shape subgrade and grade for installation of required base course and pavement.
 - 2. Install base course to final pavement grade, compacted to 95% Modified Proctor density and fine graded.
 - 3. Maintain base course surface grade and control dust until paving is completed.
 - 4. If paving is by others, provide maintenance of the base course for the period of 6 months from the date of Substantial Completion.
- C. Restore the following surfaces to the thickness stated on the drawings or, if not stated on the drawings, then restored to the thickness of the existing surface or to the minimum thickness stated as follows, whichever is better.
 - 1. Portland Cement Concrete Pavement: 8 inch thickness
 - 2. Asphaltic Concrete Pavement: 4 inch thickness
 - 3. Base Course:
 - a. For a concrete street: 8 inch thickness
 - b. For an asphaltic concrete street: 15 inch thickness
 - 4. Unpaved Roads: 15-inch thickness
 - 5. Curb and Gutter:
 - a. Curb and gutter to match existing style and size
 - b. Minimum 6 inch aggregate base
 - 6. Sidewalk:
 - a. Minimum Sidewalk Thickness: 4 inches
 - b. Minimum alley thickness: 8 inches
 - c. Minimum 4 inch aggregate base
 - 7. Driveways and Parking Lots:
 - a. Concrete: thickness – 6 inches
 - b. Asphaltic Concrete: Minimum Thickness – 3 inches
 - c. Minimum 6 inch aggregate base
 - 8. Landscaping:
 - a. Perform as defined in section “Turf and Grasses”.
- D. Make restitution to the Owner of trees and shrubs damaged during construction.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Erosion Bales and Bags
2. Inlet Protection
3. Silt Fence
4. Erosion Mats
5. Ditch Checks
6. Stone Tracking Pad
7. Temporary Ditch Check – Sediment Logs

1.2 REFERENCES

A. Wisconsin DOT, Erosion Control, Product Acceptability lists for Multi-Modal Application (PAL), latest edition.

B. American Society for Testing and Materials (ASTM)

1. D1388 Test Method for Stiffness of Fabrics
2. D2487 Test Method for Classification of Soils for Engineering Purposes
3. D3776 Test Method for Mass Per Unit Area (Weight) of Woven Fabric
4. D4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc type Apparatus)
5. D4491 Test Method for Water Permeability of Geotextiles by Permittivity
6. D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles
7. D4751 Test Method for Determining Apparent Opening Size of a Geotextile
8. D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
9. D5035 Test Method for Breaking Strength and Elongation of Textile Fabric (Strip Method)
10. D5338 Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions

- C. Wisconsin Department of Natural Resources Stormwater Technical Standards, <http://dnr.wi.gov/runoff/stormwater/techstds.htm>

1.3 SYSTEM DESCRIPTION

- A. Provide additional erosion and sediment control to prevent erosion which may be caused due to selected construction methods.

1.4 SUBMITTALS

- A. Manufacturer’s certification for manmade products
- B. A list of ditch checks materials
- C. Gradations for aggregate used in erosion control practices

PART 2 – PRODUCTS

2.1 EROSION BALES AND BAGS

- A. Sand Bags
 - 1. Minimum unfilled size of 16 by 26 inches.
 - 2. Completely filled with a granular soil (P200<50%).
- B. Rock Filled Filter Bags
 - 2. Minimum unfilled size of 18 by 30 inches.
 - 3. Construct bag of high density polyethylene as manufactured by Erotex.
 - 4. Seal bag with a high density polyethylene draw string knitted directly into the bag opening in a rolled seam using minimum of 480 denier polyester sewing yarn.
 - 5. Fill bag with well graded coarse aggregate conforming to the following AASHTO M43 Size No. 76:

Sieve Size	% Passing by Weight
2 inch	---
1 ½ inch	---
1 inch	100
¾ inch	90-100
3/8 inch	20-55
No. 4	0-10
No. 8	0-5

C. Erosion Bales

1. Tightly compacted bales of grain straw or hay.
2. Use straw, if required to function for more than 15 days.

D. Support Post

2. Wood or steel construction, minimum length 4 feet.
3. Wood Posts: 2" x 2" or equivalent steel posts.

2.2 INLET PROTECTION

- A. Inlet protection shall with the Wisconsin Department of Natural Resources Conservation Practice Standard #1060 “Storm Drain Inlet Protection for Construction Sites”.

2.3 SILT FENCE

A. Geotextile Fabric

1. Fabric shall be either woven or non-woven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride.
2. Fabric shall have the minimum strength values in the weakest principal direction.
3. Non-woven fabric may be needle punched, heat bonded, resin bonded or combination thereof.
4. Fabric shall meet the following requirements:

a. If silty soils on-site then the following can be used:

1) Grab Tensile Strength	ASTM D4632	101 lbs. (450 N)
2) Apparent Opening Size	ASTM D4751	0.6mm (No 30)
3) UV Resistance Strength	ASTM D4355	70
Retained at 500 Hours (%)		
4) Permittivity (per second)	ASTM D4491	0.14

b. If sandy soils on-site then the following can be used:

1) Grab Tensile Strength	ASTM D4632	101 lbs. (450 N)
2) Apparent Opening Size	ASTM D4751	0.3mm to 0.8mm
3) UV Resistance Strength	ASTM D4355	70
Retained at 500 Hours (%)		
4) Permittivity (per second)	ASTM D4491	0.14

B. Support Posts

1. Wood or steel construction minimum length 48 inches.
2. Wood posts – 1 1/8" x 1 1/8" of hickory or oak, or equivalent steel posts.

- C. Silt fence shall with the Wisconsin Department of Natural Resources Conservation Practice Standard #1056 “Silt Fence”.

2.4 EROSION MATS

A. General

1. Erosion mat shall conform to the Wisconsin Department of Natural Resources Conservation Practice Standard.
2. Only mats conforming to the Class and Type listed in the Wisconsin Department of Transportation Erosion Control Product Acceptability List will be allowed.

B. Types

1. Non-Channel erosion mat shall conform to the Wisconsin Department of Natural Resources Conservation Practice Standard #1052 “Non-Channel Erosion Mat”.
 - a. Utilize Class I, Urban.
2. Channel erosion mat shall conform to the Wisconsin Department of Natural Resources Conservation Practice Standard #1053 “Channel Erosion Mat”.

C. Anchoring Devices/Stakes

1. Anchoring and components for temporary erosion mats shall be completely biodegradable as determined by ASTM D5338.
2. Materials shall be environmentally safe for soil and groundwater.
3. Do not use petroleum based plastics or composites.
4. Do not use materials which may present a hazard form splintering or spearing.
5. Design anchors to hold a minimum of two months and be substantially degraded within four months during the summer (warm soil conditions).

2.5 DITCH CHECKS

- A. Ditch checks shall with the Wisconsin Department of Natural Resources Conservation Practice Standard #1062 “Ditch Check (Channel)”.

- B. Submit a list of ditch checks materials to the Engineer for review.

2.6 STONE TRACKING PAD

- A. The Stone Tracking Pad materials shall conform with the Wisconsin Department of Natural Resources Conservation Practice Standard #1057 “Stone Tracking Pad and Tire Washing”.
- B. Approval is required for materials used to construct the tracking pad.
- C. Utilize 2-inch to 3-inch aggregate in areas where access is required to adjacent properties.

2.7 TEMPORARY DITCH CHECKS (TDC) – SEDIMENT LOGS

- A. TDC materials shall be one of the following approved products.

Product	Manufacturer
Curlex 12-inch Sediment Log	American Excelsior
AEC Premier 12-inch Wattle	American Excelsior
Stenlog 12	Erosion Control Blanket.com
Triangular Silt Dike	Triangular Silt Dike
Aspen Xcel Log	Western Excelsior
Ditch Chexx	Filtress
Bio-D Silt Check	Ro Lanka

PART 3 – EXECUTION

3.1 GENERAL

- A. Keep disturbed areas to a minimum.
- B. Stabilize and protect disturbed areas with temporary seed and mulch within 14 days of active disturbance of the soil surface.
- C. Place excavated trench material on the high side of the trench where appropriate.
- D. Discharge trench water to filter barrier prior to release into a drainage way.
- E. Install gravel mats at site vehicle entrance and site exit locations to prevent tracking of soil.
- F. Collect tracked soil and clean from paved roads near the construction site the same day it occurs.

- G. Sediment control measures shall be in place at the end of each working day.
- H. Locate soil stockpiles no closer than 25 feet of a roadway, wetland, or drainage control channel and control by covering the pile with tarpaulins, temporary seed and mulch or other suitable means, if the pile is exposed for 14 days or more.
- I. Protect storm inlets including inlets in paved roadways with erosion bales, geotextile fence or other suitable approved barriers.
- J. When it is necessary to cross waterways, provide crossing structures for machinery.
- K. Repair, replace, and maintain erosion and sedimentation structures until vegetation is re-established or permanent structures are installed.
- L. Remove temporary erosion control structures and accumulated sediment and/or debris when vegetation is established.
- M. Erosion control practices shall be as shown on the plans or directed by the Engineer. Additional erosion control practices installed due to the Contractors means and methods will be incidental to the Work.

3.2 EROSION AND SEDIMENT CONTROL DEVICES

- A. Installation of erosion bales shall be done in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1055 "Sediment Bale Barrier (Non-Channel)".
- B. Erosion Bags
 1. Place type (sand or rock filled) where shown on the Drawings at a minimum.
 2. Place bags end to end across surface water flow path.
 3. Place bags at right angles to the direction of water flow.
 4. Excavate shallow sump on the upstream side of bags.
 5. Entrench bags at least 4 inches into the ground.
 6. Place bags prior to disturbing upslope areas.
 7. Drive support posts a minimum of 12 inches into the subgrade and extend to the top of the bags.
 8. Remove from the site after final stabilization.
- C. Inlet Protection
 1. Installation of inlet protection shall be done in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1060 "Storm Drain Inlet Protection for Construction Sites".

D. Silt Fences

1. Installation of silt fence shall be done in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1056 "Silt Fence".

E. Erosion Mats**1. Installation:**

- a. See plan details for anchor trench (at ends, checks and edges) installation procedures.
 - 1) Anchor trenches shall be 12" deep.
 - 2) Compact anchor trench backfill.
 - 3) Place staples in end and check trenches spaced at 12 inches.
- b. Follow manufacture's specifications and instructions for placement unless project documents are more stringent.
- c. Roll width overlaps shall be 12" at edges. Pin or staple every 3 feet along overlap length.
- d. Roll end overlaps may be spliced by overlapping (in the direction of water flow) two feet with the upstream portion of the mat on top of the downstream portion. This overlap shall receive at least three pins or staples with a maximum spacing of 12".
- e. Pins or stakes shall be biodegradable with the length based on manufacturer's recommendation
- f. Pins or stakes shall be driven flush with the mat.
- g. Place mat flat conforming to contours in soil surface. Do not stretch mat.
- h. Place mat from toe of slope toward top of slope.
- i. Mat can be placed from downstream toward upstream or from upstream toward downstream.

2. Site Preparation:

- a. Place seed and fertilizer prior to placing permanent erosion geomat.
- b. Seed and fertilizer may be placed after permanent erosion mat installation with Engineer's approval.
- c. Ground surface shall be smooth and compact.
- d. Remove all rocks, dirt clods, stumps, roots, grass clumps, trash and other obstructions from lying in direct contact with the soil surface and the erosion mat.

3. Erosion Control Revegetative Mats (ECRM):

- a. ECRM are placed on top of the soil.

4. Turf Reinforcement Mats (TRM):

- a. TRM are buried below the surface.

5. Wisconsin Department of Natural Resources:

- a. Non-Channel erosion mat shall be installed on accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1052 “Non-Channel Erosion Mat”.
- b. Channel erosion mat shall be installed in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1053 “Channel Erosion Mat”.

F. Ditch Checks

- 1. Ditch check work shall be performed in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1062 “Ditch Check (Channel)”.

G. Stone Tracking Pad

- 1. Stone tracking pad work shall be performed in accordance with the Wisconsin Department of Natural Resources Conservation Practice Standard #1057 "Stone Tracking Pad and Tire Washing".

H. Temporary Ditch Checks (TDC) – Sediment Logs

- 1. TDC shall be capable of maintaining location and form during and after rainfall events.
- 2. TDC shall be placed at locations shown on the Drawings.
- 3. Place TDC generally perpendicular to the flow line of the ditch and extend far enough so the ground level on the ends of the TDC are a minimum 18-inches higher than the flow line.
- 4. Place TDC immediately after road ditch has been backfilled and shaped TDC shall be removed and replaced during subsequent trenching operations in the road ditch area.

3.4 MAINTENANCE

A. Inspect silt fences and filter barriers immediately after each rainfall and at least daily during prolonged rainfall.

- 1. Make any required repairs immediately.
- 2. Maintain temporary erosion and sedimentation control structures until permanent soil erosion controls are completed and/or vegetation is established.
 - a. Repair damaged structures.
 - b. Replace lost structures.
 - c. Remove sediment from deposition areas adjacent to erosion control structures without damaging structures on a regular basis.
 - d. Refill eroded areas as required for grade stabilization.

- B. If the fabric on silt fence or filter barrier decomposes or becomes ineffective prior to the end of the expected usable life and the barrier still be necessary, replace the fabric promptly.
- C. Remove sediment deposits after each major storm event and when deposits reach approximately one-half the height of the barrier.
- D. Remove any sediment deposits remaining in place after the silt fence or filter barrier is no longer required and dress to conform to the existing grade, prepared and seeded.
- E. Repair/restore any washed out areas.
- F. Maintenance period to be entire project period including the one year warranty.
- G. Owner may direct Contractor to remove the temporary erosion control measures any time during the one year correction period.
- H. Construct permanent erosion control measures immediately after earthwork is completed.

END OF SECTION

SECTION 31 34 19

GEOTEXTILE FABRICS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Geotextile fabric under riprap.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. D4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
2. D4533 Test Method for Trapezoid Tearing Strength of Geotextiles
3. D4491 Test Method for Water Permeability of Geotextiles by Permittivity
4. D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles
5. D4751 Test Method for Determining Apparent Opening Size of a Geotextile
6. D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

1.3 SUBMITTALS

- A. Provide, at the time of delivery of the geotextile fabric, a manufacturer's Certificate of Compliance that the geotextile fabric meets the requirements of this Section.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver geotextile fabric in a wrapping which will protect the fabric from ultraviolet radiation and from abrasion due to shipping and hauling.
- B. Store geotextile fabric in a dry location until installed.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Provide geotextile fabric consisting of either woven or non-woven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride. All fabric shall have a minimum strength values in the weakest principle direction. Non-woven fabric may be needle punched, heat bonded, resin bonded or combinations thereof.
- B. The geotextile fabric shall be insect, rodent, mildew and rot resistant.
- C. Clearly mark the geotextile fabric rolls showing the type of fabric.
- D. If sewn seams are used, provide a field sewn seam sample produced from the geotextile fabric and thread and with the equipment to be used on the project, prior to incorporation into the work.

2.2 MATERIALS

- A. Non-Woven Geotextile Fabric, Type HR
 - 1. Type HR non-woven geotextile fabric shall be used beneath heavy riprap, Soil Class A-1 and medium riprap, Soil Class A-2, and light riprap, Soil Class A-3.
 - 2. The fabric shall comply with the following physical properties:

Test	Method	Value
Grab Tensile Strength (lbs.)	ASTM D4632	300 min.
Puncture Strength (lbs.)	ASTM D4833	100 min.
Apparent Breaking Elongation (%)	ASTM D4632	15 min.
Apparent Opening Size (U.S. Standard Sieve)	ASTM D4751	30-140
Permittivity, sec. ⁻¹	ASTM D4491	.30 min.

¹ All numerical values represent minimum/maximum average roll values (i.e., the average of minimum test results on any roll in a lot should meet or exceed the minimum specified values).

- 3. The following fabrics are approved for Type HR:
 - a. Amoco (Nilex) -4512
 - b. Cartage – FX-160HS
 - c. Contech – C120NW
 - d. Mirafi – 1120N

PART 3 – EXECUTION

3.1 SEWING

- A. Sew factory and field seams with a thread having the same or greater durability as the material in the fabric.
- B. Use a 401 stitch conforming to Federal Standard No.751 a.
- C. Seams shall develop a tensile strength equal to or greater than 80 percent of the specified grab tensile strength of the fabric, unless otherwise specified.

3.2 NON-WOVEN GEOTEXTILE FABRIC, TYPE HR

- A. Grade the smooth and remove all stones, roots, sticks or other foreign material which would interfere with the fabric being completely in contact with the soil.
- B. Place the fabric loosely and parallel to the direction of water movement.
 - 1. Provide pinning or stapling to hold the geotextile in place.
 - 2. Join separate pieces of fabric by overlapping or sewing.
 - 3. Place the fabric in the overlapped joints with minimum overlap of 24 inches in the direction of flow.
- C. After placement, do expose the fabric longer than 48 hours prior to covering.
- D. Cover damaged areas with a patch of fabric using a three-foot overlap in all directions.
- E. Place riprap from the base of the slope upward.
- F. Do not allow free fall of riprap greater than 6 inches or less if required to prevent damage to the fabric.

END OF SECTION

SECTION 32 01 17

CRACK AND JOINT SEALING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Base Preparation – Asphalt and Concrete Pavements
2. Placing and Finishing
3. Traffic Control
4. Clean-up

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

1.3 SUBMITTALS

- A. Submit manufacturer’s certification that materials delivered comply with the requirements of this section and the referenced standard.
- B. Submit daily copy of the amount of material of joint sealant delivered and placed.
- C. Submit material manufacturer’s recommended melting procedures.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The material shall be hot pour elastic type. This material shall conform to the requirements of the Specification of Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements, ASTM D6690.
- B. The material shall be as a manufactured by HI-SPEC, CRAFCO, or equal.

- C. Material shall be packaged and shipped in a suitable commercial container clearly marked with:
1. Name of material.
 2. The name of the manufacturer.
 3. The brand name.
 4. Weight.
 5. Batch number.
 6. Pouring temperature recommended by the manufacturer.

PART 3 – EXECUTION

3.1 BASE PREPARATION – EXISTING ASPHALT AND CONCRETE PAVEMENTS

A. Asphalt Crack Preparation

1. All random or reflective cracks less than ½ inch wide shall be routed out to provide a sealant reservoir ½ inch (12.7mm) wide with a minimum depth ½ inch (12.7mm). This provides for a 1:1 width to depth ratio. Backer rod may be installed in the joint opening to control depth and sealant usage. Routing shall be accomplished by mechanical means and shall be extended 1 inch beyond each end of the crack. All joints and cracks shall be blown clean by compressed air (minimum air pressure, 80 pounds per square inch) with heat lancing and then crackfilled.

B. Asphalt Crackfilling Longitudinal Curb Joints

1. Routing shall be accomplished by mechanical means and shall be extended 1 inch beyond each end of the crack. All joints and cracks shall be blown clean by compressed air (minimum air pressure, 80 pounds per square inch) with heat lancing and then crackfilled.

C. Concrete Crack Preparation

1. All joints and cracks, including curb and gutter, shall be blown clean with compressed air (minimum air pressure, 80 pounds per square inch) with heat lancing and then crackfilled.

3.2 BASE PREPARATION – NEW CONCRETE PAVEMENTS

- A. All contraction and expansion joints in concrete pavement shall be sealed with a hot poured sealer. All sawed longitudinal joints shall be sealed with hot-poured sealer.
- B. The operation of sealing shall be performed as soon as practicable upon elapse of the curing period and in any event prior to the time traffic of any kind uses the pavement.
- C. Joints shall not be sealed until they have been inspected and approved by the engineer.

- D. Application of the joint sealer shall be made when the joint surfaces are clean and dry.
- E. Immediately before sealing the joint thoroughly clean the joints of all laitance, curing compound and other foreign material. Exposed joint faces shall be cleaned by sandblasting, or by water blasting with sufficient pressure to thoroughly and completely clean the joint. A multiple-pass technique shall be used until the surfaces are free of material that might prevent bonding. For final cleaning immediately prior to installation of the sealer, the joints shall be blown clean with oil-free compressed air. The joint faces must be surface dry when sealant is applied.

3.3 PLACING AND FINISHING

- A. The sealant must be melted in a double boiler, oil jacketed melter-applicator equipped with a mechanical agitator pump, gas pressure gauges, separate temperature thermometers for the oil bath, and melted material with accessible control valves and gauges. Follow the melting procedures recommended by the material supplier. Air temperatures are to be at or above 40 degrees F. Prior to the application of sealants, all prepared cracks shall be completely dry. If any moisture is evident on the street surface or vertical walls, the prepared crack application procedure shall be terminated.
- B. Joints shall not be sealed until they have been inspected and approved by the engineer.
- C. The sealing compound shall not be heated above the maximum safe heating temperature. The maximum safe heating temperature shall be determined from tests made on samples from each lot or shipment of the material delivered to the project. When so approved by the Engineer, the manufacturer's recommended maximum safe heating temperature may be used in lieu of test determinations when relatively small quantities of sealer are used. Any material heated above the maximum safe heating temperature shall be discarded.
- D. During periods of rain or inclement weather, crackfilling material shall not be placed without the approval of the Engineer. After the period of rain or inclement weather, all cracks and joints shall be blown clean and dry with compressed air. All joints, cracks and surface defects must be free of any moisture prior to placement of the crackfilling material.
- E. It may be required by the Engineer that Contractors use a backer tape or another acceptable method of sealing the bottom of the reservoir if the joint sealant seeps down into the bottom of the crack, causing a void or low spot in the finished joint.
- F. All completed cracks shall be completely cured prior to allowing traffic to come in contact with sealant. If, with the Engineer's approval, it is necessary to open traffic to

partially cured material, an adequate coating of mason sand or household toilet paper would be sufficient.

- G. On concrete streets the joints and cracks shall be pressure filled flush with the surface of the street and the material shall be applied immediately into the prepared crack or joint. On asphalt streets the joints and cracks shall be pressure filled with a wand or bander and squeegeed to a width three (3) times the width of the crack or joint and the material shall be applied immediately following heat lancing of the joints and cracks.
- H. In the event satisfactory sealing of a joint is not accomplished in a single pouring, the sealing compound shall be placed in two pourings. At least one-half of the required amount shall be placed in the first pouring, and the second pouring shall follow the first as soon as practicable after the first pouring has attained maximum shrinkage but not later than one hour after the first pouring. If the additional application is not poured within one hour, the joint/crack shall be re-cleaned at a lower pressure such that the first pour is not removed.

3.4 TRAFFIC CONTROL

- A. The Contractor shall maintain two lanes of traffic at all times on all streets unless approved by the Engineer. Barricades, warning signs and flagmen shall be provided in accordance with the State of Wisconsin Department of Transportation Manual of Traffic Control Devices, latest edition.

3.5 CLEAN UP

- A. All debris shall be kept within the barricaded construction area and shall not be allowed to fall within open traffic lanes. All debris shall be cleaned up prior to the end of the day and prior to the opening of traffic lanes. The Contractor shall properly dispose of such material.

END OF SECTION

SECTION 32 01 20

MUD-JACKING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Mud-Jacking Concrete
 - 2. Mud-Jacking Hole Restoration
 - 3. Clean-up

1.2 REFERENCES (Not Used)

1.3 SUBMITTALS

- A. Grout mix design.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Certified grout mix shall contain a minimum of 7 percent Portland Cement.

PART 3 – EXECUTION

3.1 MUDJACKING CONCRETE

- A. Holes for injecting the grout mix will be spaced not less than 12 inches nor more than 18 inches from a traverse joint or crack and spaced not more than six (6) inches from center of the hole to center of hole.
- B. The grout mix will have a consistency stiff enough to raise the concrete without blowing or leaking, and yet fluid enough to prevent pyramiding.
- C. The hole size for slab raising operations shall be a minimum of one inch (1”) up to a maximum of two inches (2”) in diameter.
- D. The holes shall be spaced as necessary to uniformly assure complete communication of slurry between holes.

- E. Slabs shall be raised to the required elevation and pitched at one-quarter (1/4) inch per twelve (12) inches of lineal run, or as directed by the Engineer.

3.2 MUD-JACK HOLE RESTORATION

- A. All jacking operation holes will be cleared of the grout mix and filled with a stiff 1:3 cement mix, which will be consolidated and finished smooth.
- B. Holes shall be cleaned the full depth of the slab by removing excess slurry and wire brushing exposed sidewalls.
- C. Prior to placement of the Portland Cement, the surface around the holes shall be damp.

3.3 CLEAN-UP

- A. Slabs raised shall be thoroughly scraped and swept after completion, but prior to patching.
- B. Surrounding grass areas adjacent to slab raising shall be left in a clean, non-debrised condition.

END OF SECTION

SECTION 32 11 23**CRUSHED AGGREGATE BASE COURSE****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Material testing.
2. Foundation preparation.
3. Crushed aggregate base course for roads, shoulders, and parking areas.
4. Preparation of crushed aggregate base course for paving.
5. Adjustment of utility accesses.

1.2 REFERENCES**A. American Association of State Highway and Transportation Officials (AASHTO):**

1. T2 Sampling Stone, Slag, Gravel, Sand, and Stone Block for Use as Highway Materials
2. T27 Sieve Analysis of Fine and Coarse Aggregates
3. T37 Sieve Analysis of Mineral Filler
4. T89 Determining the Liquid Limit of Soil
5. T90 Determining the Plastic Limit and Plasticity Index of Soils
6. T104 Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

B. American Society for Testing and Materials (ASTM):

1. D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54 kg) Rammer and 18-In. (457 mm) Drop.
2. D6938-07 ASTM D6938-07 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS**A. Submit copies of the results of quality control testing (include location where test was done):**

1. Materials testing by Contractor:
 - a. Provide source testing report and approval letter from Owner the material was supplied.

- B. Submit daily one copy of weight tickets showing the net weight for each truckload of crushed aggregate base material delivered and placed.

1.4 QUALITY ASSURANCE

- A. The Engineer will obtain an independent testing laboratory to provide quality control testing.

1.5 DELIVERY, STORAGE AND HANDLING

A. Stockpiling of Aggregates

- 1. Store aggregates to prevent contamination by foreign matter or by aggregates of different sizes.

B. Delivery of Aggregates

- 1. Vehicles used to transport aggregates shall be of a type to minimize loss of materials and excessive segregation of particles.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Aggregates

- 1. Aggregates shall consist of hard, durable particles of crushed stone or crushed gravel and a filler of natural sand, stone sand or other finely divided mineral matter.
 - a. Remove oversize material by screening or by crushing to required sizes.
 - b. Composite material shall be free from organic matter, shale, and lumps or balls of clay and shall conform to the gradation requirements below.
- 2. Liquid Limit and Plasticity Index:
 - a. Aggregate including any blended filler shall have a liquid limit of not more than 25 and a plasticity index of not more than 6.
- 3. Fracture Count:
 - a. At least 58 percent of particles retained on the No. 4 sieve shall have at least one fractured face.
- 4. Soundness:
 - a. When the fraction of aggregate retained on the No. 4 sieve is subjected to five cycles of the sodium sulfate soundness test, weighted loss shall not exceed 18 percent by weight.

- 5. Filler for Blending:
 - a. Additional mineral filler required to meet gradation requirements or for satisfactory binding of material shall be uniformly blended with base course material at the screening plant.
 - b. Mineral fillers shall be free from agglomerations or lumps and shall contain not more than 15 percent of material retained on a No. 4 sieve.
- 6. Moisture Content: Shall not exceed 7 percent.

B. Aggregate base course material produced from crushed concrete conforming to section 31 05 10 and this section shall be permitted if the material is from the project site or if allowed in the project manual.

C. Aggregate Gradation Requirements

1. Gradation No. 2 (1¼ inch material):

Sieve Size	% By Weight Passing	
	Crushed Gravel	Crushed Stone or Concrete
1 ¼ inch	95-100	95-100
¾ inch	70-93	70-93
3/8 inch	45-80	45-80
No. 4	30-63	30-63
No. 10	20-48	20-48
No. 40	8-28	8-28
No. 200	4-10(1)	2-12(1)

(1) Limited to 8.0 percent for base placed between new and old pavement.

2. Gradation No. 3 (¾ inch material):

Sieve Size	% By Weight Passing	
	Crushed Gravel	Crushed Stone or Concrete
1 inch	100	100
¾ inch	95-100	95-100
3/8 inch	50-90	50-90
No. 4	35-70	35-70
No. 10	15-55	15-55
No. 40	10-35	10-35
No. 200	8-15	5-15

2.2 SOURCE QUALITY CONTROL

- A. Test aggregate material per the following requirements:
 - 1. Sampling: AASHTO T2.
 - 2. Sieve Analysis:
 - a. AASHTO T27 for aggregates including fracture count.
 - b. AASHTO T37 for mineral fillers.
 - 3. Liquid Test: AASHTO T89.
 - 4. Plasticity Index: AASHTO T90.
 - 5. Soundness: AASHTO T104 using sodium sulfate.

PART 3 – EXECUTION

3.1 PREPARATION OF FOUNDATION

- A. Preparation of foundation for crushed aggregate base course shall be in accordance with requirements of Section "Excavation and Fill".
- B. Do not place the base course on a foundation that is soft or spongy or one that is covered by ice or snow.
- C. Do not place base material on a dry or dusty foundation when existing condition would cause rapid dissipation of moisture from base material and hinder or preclude its proper compaction.
 - 1. Apply water to such dry foundations and rework or recompact as necessary.

3.2 CRUSHED AGGREGATE BASE COURSE INSTALLATION

- A. Use gradations as follows:
 - 1. Base course: Gradation No. 2
 - 2. Top 3 inch layer of shoulders and aggregate driveways: Gradation No. 3
- B. Construct crushed aggregate base course to the width, thickness, section and location shown on the drawings.
 - 1. Maximum compacted thickness of any one layer shall not exceed 6 inches for 1¼ or ¾ inch material; 9 inches for 3 inch material.
 - a. When multiple courses are required, they shall be composed of approximately equal thicknesses.

C. Spreading Base Material

1. Proceed with the work such that the hauling equipment will travel over the previously placed material.
2. Route hauling equipment as uniformly as possible over all portions of the previously constructed layers of the base course.
3. Deposit the material on the foundation or previously placed layer in such a manner as to minimize segregation and to facilitate spreading to a uniform layer of the required dimensions.

D. Compaction

1. After a layer of aggregate has been placed and spread to the required thickness, width, and section, it shall be compacted.
2. If the material is deficient in moisture content, to attain the required density, add necessary moisture during compaction operations by means which provides a uniform application.
3. Each layer or course placed shall be compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557).
4. Areas where proper compaction is not obtainable due to segregation of materials, excess fines or other deficiencies shall be reworked or removed and replaced with material that will yield the desired results.
5. Prior to and during compaction operations, shape and maintain the material to the proper dimensions.

E. Maintenance

1. Provide maintenance of the base course until surface paving is complete or until the base is otherwise accepted.

F. Dust Abatement

1. Minimize the dispersion of dust from the base course by the application of water or other approved dust control materials.

G. Preparation of Base for Paving

1. The preparation of crushed aggregate base courses for paving shall include all necessary scarifying, shaping, and compacting to provide the required cross-sectional contour, a profile free from abrupt changes in elevation, and a surface free from pits, holes, depressions, or projections above the normal surface.
2. Remove any standing or ponded water, and ice or snow from the base before paving begins.

3.3 ADJUSTING UTILITY ACCESSES

- A. Adjust existing sanitary and storm manholes to proposed finished street grade.
- B. Adjust existing water valve boxes to proposed finished street grade.

END OF SECTION

SECTION 32 11 26.16

PULVERIZED ASPHALT AND AGGREGATE BASE COURSE

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 4. Material testing.
 - 5. Foundation preparation.
 - 6. Pulverize asphalt and aggregate base course installation.

1.2 REFERENCES

- A. Wisconsin Department of Transportation Section 325

1.3 QUALITY ASSURANCE

- A. The Engineer will obtain an independent testing laboratory to provide quality control testing.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Stockpiling of Aggregates
 - 1. Store aggregates to prevent contamination by foreign matter or by aggregates of different sizes.
- B. Delivery of Aggregates
 - 1. Vehicles used to transport aggregates shall be of a type to minimize loss of materials and excessive segregation of particles.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The maximum allowable recycled asphalt pavement (RAP) content in the salvaged material is 50%. This will be based on pulverizing depths. If RAP is above 50%, blending with virgin aggregate material will be required.
- B. 97% or more of RAP will pass a 2-inch sieve.

PART 3 – EXECUTION

3.1 PREPARATION OF FOUNDATION

- A. Pulverize the full depth (shown on plans or elsewhere) of the existing asphaltic pavement and aggregate until 97 percent or more will pass the 2-inch sieve. Windrow material as construction operations dictate.
- B. Preparation of foundation for pulverized asphalt and aggregate base course shall be in accordance with requirements of Section "Excavation and Fill".
- C. Do not place the base course on a foundation that is soft or spongy or one that is covered by ice or snow.
- D. Do not place base material on a dry or dusty foundation when existing condition would cause rapid dissipation of moisture from base material and hinder or preclude its proper compaction.
 - 1. Apply water to such dry foundations and rework or re-compact as necessary.

3.2 PULVERIZE ASPHALT AND AGGREGATE BASE COURSE INSTALLATION

- A. Construct surface base course to the width, thickness, section, and location shown on the drawings.
 - 1. Maximum compacted thickness of any one layer shall not exceed 8 inches.
- B. Spreading Base Material
 - 1. Proceed with the work such that the hauling equipment will travel over previously placed material.
 - 2. Route hauling equipment as uniformly as possible over all portions of the previously constructed layers of the base course.
 - 3. Deposit the material on the foundation or previously placed layer in such a manner as to minimize segregation and to facilitate spreading to a uniform layer of the required dimensions.
- C. Compaction
 - 1. After a layer of aggregate has been placed and spread to the required thickness, width, and section, it shall be compacted.
 - 2. Compact the re-laid material first with either a rubber tired roller or 12.5-ton or heavier vibratory padfoot roller and second with an 8-ton or heavier vibratory steel roller. Add water, as required, both before and during compaction.
 - 3. Each layer or course placed shall be compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor Test (ASTMD1557).
 - 4. Areas where proper compaction is not obtainable due to segregation of materials, excess fines or other deficiencies shall be reworked or removed and replaced with material that will that will yield the desired results.

5. Prior to and during compaction operations, shape and maintain the material to the proper dimensions.

D. Maintenance

1. Provide maintenance of the base course until surface paving is complete or until the base is otherwise accepted.

E. Dust Abatement

1. Minimize the dispersion of dust from the base course by the application of water or other approved dust control materials.

END OF SECTION

SECTION 32 12 16

ASPHALTIC CONCRETE PAVEMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Sampling and Testing Requirements
 - 2. Surface Preparation
 - 3. Asphaltic Concrete Paving

1.2 REFERENCES

- A. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, and all supplemental and interim supplemental specifications, as they may pertain, except the items: method of measurement and basis of payment shall not apply.

1.3 SUBMITTALS

- A. Submit copies of each asphaltic concrete mix design proposed for the project.
- B. Submit daily one (1) copy of weight tickets showing the net weight for each truckload of asphaltic concrete delivered and placed.

1.4 QUALITY ASSURANCE

- A. The City will perform density testing.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store asphalt cement in tanks free of foreign substances and caked asphalt.
- B. Stockpile aggregate to prevent excessive segregation.
- C. Storage period for hot mix shall not exceed 2 hours.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Conform to WisDOT Standard Specifications for Highway and Structures Construction Sections 450, 455, and 460.

2.2 EQUIPMENT

- A. All equipment shall conform to WisDOT Standard Specifications for Highway and Structure Construction Section 450.

2.3 SOURCE QUALITY CONTROL TESTING

- A. Materials to be tested:
 - 1. Aggregate.
 - 2. Asphaltic concrete mix design confirmation.
- B. Tests for source quality control testing shall be in accordance with WisDOT Standard Specifications for Highway and Structures Construction Sections 450, 455 and 460.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. Prepare a compacted foundation in accordance with Section "Crushed Aggregate Base Course".
- B. For existing pavement remove the following asphalt:
 - 1. Localized areas which tend to ravel, shove, or bleed.
 - 2. Areas unsuitable as a base.
 - 3. Unstable patching.
- C. Remove loose concrete and protruding joint material.
- D. Clean surface and joints of foreign material, e.g. dust, dirt, water, vegetation, etc.
- E. Control weeds with herbicide conforming to governing state or local authority, rules and regulations.

- F. Tack coat on existing asphaltic or concrete pavements at minimum rate of 0.025 gallon per square yard.
- G. Fill potholes and depressions with a leveling course of asphaltic concrete mix compacted to required density of surface course.
- H. Adjust and reset the casting after placing the binder course and prior to placing the surface course.

3.2 MIX PREPARATION

A. Aggregates

- 1. Separate into three sizes as defined under mix uniformity.
- 2. Store in separate bins until proportioned into mix.
- 3. When fillers are required, add through separate bin and feed.
- 4. Dry and heat aggregate.
- 5. Feed aggregate into mixer within 15°F plus or minus of required discharge temperature.

B. Asphalt Cement

- 1. Feed asphalt cement into mixer within 25°F plus or minus of required discharge temperature.

C. Mix Uniformity

- 1. Design mix tolerance (plus or minus):
 - a. Aggregates passing No. 4 and larger sieves: 6 percent.
 - b. Aggregates passing No. 4 and No. 100 sieves (inclusive): 4 percent.
 - c. Aggregates passing No. 200 sieves: 2 percent.
 - d. Bituminous Material: 0.4 percent.
- 2. Irrespective of tolerances, gradations shall be within the master range defined under aggregate gradation of this section.

3.3 ASPHALTIC CONCRETE INSTALLATION

- A. Do not place asphaltic concrete pavement when following conditions exist:
 - 1. Unstable or frozen base.
 - 2. During rain or snow.
 - 3. When air temperature is less than 35°F (1.5°C).

- B. Place to thickness, grade, section and location shown on the Drawings.
 - 1. When thickness of the lifts is not shown, thickness shall be 2 inches compacted.
 - 2. Finished surface shall be a true plane of 1/8 inch in 10 feet.

- C. Establish course thickness by placing in layers in accordance with WisDOT Standard Specifications Section 460.

- D. Hand Spreading
 - 1. Permitted only in areas inaccessible to finishing machines.
 - 2. Place by means of a shovel and shape with rake or lute.
 - 3. Do not rake over machine spread surfaces.

- E. Compaction
 - 1. Roll as soon as mixture will support roller without displacing or hair line cracking:
 - a. Initial pass shall be with drive roller toward paver.
 - b. Start at center and continue toward either edge.
 - c. Overlap successive trips.
 - 2. Subsequent strips laid shall start adjacent to previous laid strip and continue to opposite edge.
 - 3. Roll until:
 - a. Roller marks are eliminated.
 - b. Surface is of uniform density.
 - c. Required density is obtained.

- F. Bonding Joints
 - 1. Clean all joints.
 - 2. When joining new asphaltic concrete pavement to existing asphaltic concrete pavement, saw cut joints and tack coat.
 - 3. When joining new asphaltic concrete pavement to new asphaltic concrete pavement, saw cut end joints and tack coat cold joints.
 - 4. Milled joints may be acceptable if approved by the Engineer.

- G. Replace pavement full lane width with all joints saw cut and tacked when:
 - 1. Minimum density is not met.
 - 2. Minimum asphalt content is not met.
 - 3. There is significant segregation, raveling, rutting, or deformation.

3.4 FIELD QUALITY CONTROL

A. Density Testing

1. Perform by nuclear method in accordance with ASTM D2950.
2. Fifteen per production day or fifteen per 4,500 square yards placed, whichever number is greater.
3. Minimum density required shall be in accordance with WisDOT Standard Specifications Section 460.

END OF SECTION

SECTION 32 13 13**PORTLAND CEMENT CONCRETE PAVEMENT****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Sampling and testing requirements.
2. Surface preparation.
3. Portland cement concrete paving.

1.2 REFERENCES**A. American Association of State Highway and Transportation Officials (AASHTO):**

1. M148 Liquid Membrane-Forming Compounds for Curing Concrete
2. M153 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
3. M171 Sheet Materials for Curing Concrete
4. M182 Burlap Cloth Made from Jute or Kenaf
5. M213 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
6. M254 Corrosion Resistant Dowel Bars

B. American Society for Testing and Materials (ASTM):

1. A184 Spec. for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
2. A185 Spec. for Welded Steel Wire Fabric for Concrete Reinforcement
3. A615 Spec. for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
4. A617 Spec. for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
5. C31 Making and Curing Concrete Test Specimens in the Field
6. C33 Standard Specification for Concrete Aggregates
7. C39 Test for Compressive Strength of Cylindrical Concrete Specimens
8. C94 Spec. for Ready-Mixed Concrete
9. C143 Test for Slump of Portland Cement Concrete
10. C172 Sampling Fresh Concrete
11. C231 Test for Air Content of Freshly Mixed Concrete by the Pressure Method
12. C309 Standard Specifications for Liquid Membrane – Forming Compounds for Curing Concrete

13. C1315 Spec. for Liquid Membrane-Forming Compounds Having Special properties for Curing and Sealing Concrete
14. C920 Spec. for Elastomeric Joint Sealants
15. D1751 Spec. for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
16. D1752 Spec. for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
17. D3405 Spec. for Joint Sealants, Hot-Poured for Concrete and Asphalt Pavements
18. E329 Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction

C. American Association of State and Highway Transportation Officials

1. T96 Standard Method of Test for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine
2. T013 Standard Method of Test for Soundness of Aggregates by Freezing and Thawing
3. T104 Standard Method of Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

D. Wisconsin Department of Transportation (WisDOT), State of Wisconsin Standard Specifications for Highway Construction, Latest Edition (State Specifications)

1.3 SUBMITTALS

A. Design Mixes

1. Submit copies of the composition and strength testing results for design mix for each type of concrete.
2. Manufacturer's certification of the curing compound.

B. Certificates

1. Provide producer's certification that the supplied materials meet the applicable specification requirements.
2. Provide the material content per cubic yard for each class of concrete furnished.
 - a. Dry weight of concrete.
 - b. Saturated surface-dried weights of fine and coarse aggregates.
 - c. Quantity, type, and name of any admixtures used.
 - d. Weight of water.
3. Provide delivery tickets for each truck at the time of pour.
 - a. Delivery tickets are not required for job-mixed concrete.

C. Samples

1. Provide all material samples needed for the required testing.
2. The Engineer will create and test concrete cylinders.

1.4 QUALITY ASSURANCE/QUALITY MANAGEMENT PLAN

A. General Requirements

1. Provide a Quality Management Plan (QMP) conforming to the WisDOT State Specifications based on the size of the project.
2. Small Quantity projects for class I is defined as follows:
 - a. Less than 150 cubic yards of structure concrete placed under a single bid item.
 - b. Less than 2500 cubic yards of slip-formed pavement placed using a single mix design.
 - c. Less than 1000 cubic yards of non-slipped formed pavement placed using a single mix design.

B. Small Quantity Project Requirements

1. Installation testing to be completed by the Owner includes the following:
 - a. Slump
 - b. Air-entrainment
 - c. Compressive strength test
2. Other testing per the WisDOT State Specification Sections 415 is to be completed by the Contractor including:
 - a. Probing method for depth on slipped form pavement per Section 415.3.16.4.2.
 - b. Surface Testing and Correction per 415.3.10.
3. Submit an abbreviated QMP per the WisDOT State Specification Sections 710.2.2 (2) and (3) and 710.2.
 - a. Eliminate sections regarding measurement and payment and incentive and disincentive based on the results.
4. Additional tests may be conducted by the Contractor for those conducted by the Owner.

C. Large Quantity Projects

1. Installation testing per the WisDOT State Specifications is to be completed by the Contractor.
2. Modify the WisDOT QMP for concrete pavement based on the following:
 - a. Arrange one pre-pour meeting to discuss concrete placement.
 - b. Number of compressive strength tests to be as noted below.
 - c. Eliminate sections regarding measurement and payment and incentive and disincentive based on the results.

D. Compressive Strength Testing

1. Small Quantity Projects
 - a. Tests to be taken for each 200 cubic yards of concrete placed or at least once each day for each design mix.
 - b. Test one cylinder at 7 days.
 - c. Test two cylinders at 28 days.
 - d. Remaining cylinder will be tested in the event a prior test fails.
2. Large Quantity Projects
 - a. Tests to be taken for each 500 cubic yards of concrete placed or at least once for each ½ day for each mix.
3. 28 Day Test Requirements
 - a. Compressive strength is 4,000 psi.
 - b. No individual test falls more than 500 psi below specified compressive strength.
 - c. If differential strengths of the two specimens is 350 psi or greater, the low strength specimen shall be discarded and the strength of the remaining cylinder shall then be the test result. If the test is below 3500 psi, the test is considered a failure. Also, if either of the two 28 day specimens falls below 3000 psi, the test result is considered a failure.
4. Failure of compressive strength tests shall result in the following additional testing:
 - a. Provide two core samples of each portion of work affected and perform compressive strength tests.
 - b. Replace work if core samples do not equal or exceed specified compressive strength
 - c. Additional testing shall be completed at the Contractor's expense, including traffic control to perform and replace nonconforming work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Concrete

1. Conform to the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.
 - a. Class I concrete
 - b. Twenty-eight day compressive strength: 4,000 psi
 - c. Air entrainment:
 - 1) Slip formed concrete – 7.0 percent, +/- 1.5%
 - 2) Other concrete – 6.0%, +/- 1.5%
 - d. Slump:
 - 1). 2.5 inch or less – Slipformed
 - 2). 4.0 inch or less – Non-Slip Formed

B. Aggregates

1. Conform to WisDOT State Specifications
 - a. Slip formed concrete aggregate shall conform to Soil Class A-6 (1 1/2-Inch Crushed Rock) (WisDOT Size No. 2 Aggregate per 501.2.5.4.5)
 - b. Hand formed concrete aggregate shall conform to either:
 - i. Soil Class A-7 (3/4-Inch Crushed Rock) (WisDOT Size No. 1 Aggregate per 501.2.5.4.5)
 - ii. Soil Class A-6 (1 1/2-Inch Crushed Rock) (WisDOT Size No. 2 Aggregate per 501.2.5.4.5)
2. Conform to ASTM C33.
3. Aggregate Wear: Loss of abrasion and impact shall not exceed 50 percent by mass (AASHTO T96)
4. Aggregate Soundness: The weighted average sodium sulfate loss shall not exceed 12 percent by mass (AASHTO T104)
5. Freeze-Thaw: The weighted average loss shall not exceed 18 percent by mass (AASHTO T103)

C. Reinforcement

1. Conform to the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.

D. Joint Sealing

1. All concrete pavement joints shall be sealed.

E. Curing Material

1. Use linseed oil based material conforming to the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.

2.2 EQUIPMENT

A. Concrete Spreader

1. Shall be capable of striking off the surface of the concrete in a longitudinal direction of the slab at any required elevation.

B. Slip-Form Paver

1. Shall be designed to consolidate, screed, and float-finish freshly placed concrete in one complete pass.
2. Shall be equipped to vibrate the concrete for the full width and depth of course.
3. Machine design shall prevent the spreading or slumping of the concrete.

C. Finishing Machine (for Formed Pavement)

1. Shall be of the screeding and troweling type, equipped with at least two oscillating transverse screeds, adjustable tilt, and crown.
2. Machine shall be capable of striking off and consolidating concrete.

D. Vibrators

1. May be pan type or the internal type with immersed tube or multiple spuds.
2. Frequency Requirements:
 - a. Pan Type: 4,000 impulses per minute minimum.
 - b. Internal Type:
 - 1) Tube Vibrators: 5,000 impulses per minute minimum.
 - 2) Spud Vibrators: 7,000 impulses per minute minimum.

2.3 SOURCE QUALITY CONTROL

A. Material Acceptance Testing

1. Design mix.

B. Perform additional testing under the following circumstances:

1. Material failure.
2. Change in ready-mix source.
3. Design mix changes requested by Contractor.

PART 3 – EXECUTION

3.1 PRE-POUR MEETING

- A. Attend a pre-pour meeting prior to construction with a slip form paver for each paving event, as determined by the Engineer.

3.2 BASE PREPARATION

- A. Prepare in accordance with the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.
- B. Before placing concrete:
 - 1. Remove loose material from compacted base.
 - 2. Proof-roll prepared base surface to check for unstable areas and the need for additional compaction.
 - 3. Correct any deficiencies prior to paving.
 - 4. Adjust all fixtures (i.e., castings, frames, inlets, and valve boxes) per City standards
 - 5. Moisten the compacted base as required to prevent the base from removing water from the placed concrete.

3.3 PLACING AND FINISHING CONCRETE

- A. Place and finish in accordance with the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.
- B. Provide a concrete stamp per the detail.

3.4 CONCRETE CORES

- A. Concrete cores completed by the Contractor shall be repaired with like material as approved by the Engineer.

3.5 CONCRETE WORK WARRANTY

- A. Work shall be warrantied for a period of one year after substantial completion covering;
 - 1. Transverse cracking.
 - 2. Spalling.
 - 3. Popouts.
 - 4. Other detrimental impacts related to workmanship.
- B. Cost for repairs and traffic control shall be the responsibility of the Contractor.

3.6 OPENING ROADWAY TO TRAFFIC

- A. If additional strength tests are required to open the roadway to traffic prior to the 7-day break, the contractor shall cast cylinders to verify compressive strengths of 3000 pounds per square inch. Submit the compressive strength test results to the Engineer for verification. Compute the opening strength as the average of compressive strength test results for 2 cylinders. If the strength of a cylinder is less than 90 percent of the required strength, the Engineer will reject the resulting average.

- B. For concrete patches completed with high early strength concrete, the Engineer will complete a 3-day cylinder break to check strength prior to opening the roadway to traffic.

END OF SECTION

SECTION 32 16 13**CONCRETE CURB AND GUTTER****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Fine grading and compaction of subgrade.
2. Curb and gutter construction.
3. Backfilling and finish grading.
4. Landscaping.

1.2 REFERENCES**A. American Concrete Institute (ACI)**

1. ACI 305 Recommended Practice for Hot Weather Concreting
2. ACI 306 Recommended Practice for Cold Weather Concreting

B. American Society for Testing and Materials (ASTM):

1. A615 Spec. for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
2. C31 Making and Curing Concrete Test Specimens in the Field
3. C33 Spec. for Concrete Aggregate
4. C39 Test for Compressive Strength of Cylindrical Concrete Specimens
5. C94 Spec. for Ready-Mixed Concrete
6. C143 Test for Slump of Portland Cement Concrete
7. C150 Spec. for Portland Cement
8. C172 Sampling Fresh Concrete
9. C231 Test for Air Content of Freshly Mixed Concrete by the Pressure Method
10. C309 Standard Specifications for Liquid Membrane – Forming Compounds for Curing Concrete
11. C1315 Spec. for Liquid Membrane-Forming Compounds Having Special properties for Curing and Sealing Concrete
12. D1557 Test Methods for Moisture-Density Relations of Soils and Soils-Aggregate Mixtures Using 10-Lb. (4.54 Kg) Rammer and 18-In. (457 mm) Drop
13. D1751 Spec. for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
14. E329 Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction

- C. American Association of State and Highway Transportation Officials
 - 1. T96 Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - 2. T013 Standard Method of Test for Soundness of Aggregates by Freezing and Thawing
 - 3. T104 Standard Method of Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- D. Wisconsin Department of Transportation (WisDOT), State of Wisconsin Standard Specifications for Highway Structure Construction, Latest Edition (State Specification)

1.3 SUBMITTALS

- A. Concrete design mix of composition and strength testing results for design mix for each type of concrete.
- B. Producer's certification that the supplied materials meet the applicable specification requirements.
- C. Manufacturer's certification of the curing compound.

1.4 QUALITY ASSURANCE/QUALITY MANAGEMENT PLAN

- A. General Requirements
 - 1. Provide a Quality Management Plan (QMP) conforming to the WisDOT State Specifications for Class II concrete
- B. Testing to be completed as follows:
 - 1. Installation Testing by Owner:
 - a. Slump.
 - b. Air-entrainment.
 - c. Compressive strength test.
 - 2. Other testing per the WisDOT State Specification is to be completed by the Contractor.
 - 3. Additional tests may be conducted by the Contractor for those conducted by the Owner.
- C. The following shall be in accordance with the stated State Specifications and references:
 - 1. Inspection and Testing: ASTM E329.
 - 2. Sampling: ASTM C172.
 - 3. Slump: ASTM C143.
 - 4. Air-Entrainment: ASTM C231.
 - 5. Compressive Strength Test: ASTM C31 and C39.

- D. Compressive strength test shall consist of four standard test cylinders made from a single batch of concrete:
1. Tests to be taken for each 200 cubic yards of concrete placed or at least once each day.
 2. Test one cylinder at 7 days.
 3. Test two cylinders at 28 days.
 4. Remaining cylinder shall be tested in the event prior tests fail.
 5. 28 Day Test Requirements:
 - a. Compressive strength is 4,000 psi.
 - b. No individual test falls more than 500 psi below specified compressive strength.
 - c. If differential strengths of the two specimens is 350 psi or greater, the low strength specimen shall be discarded and the strength of the remaining cylinder shall then be the test result.
 - d. If the test result is below 3500 psi, the test is considered a failure. Also, if either of the two 28 day specimens falls below 3000 psi, the test result is considered a failure.
 6. Failure of compressive strength tests shall result in following additional testing:
 - a. Provide two core samples of each portion of work affected and perform compressive strength tests.
 - b. Replace work if core samples do not equal or exceed specified compressive strength.
 - c. Additional testing shall be completed at the Contractor's expense.

PART 2 – PRODUCTS

2.1 CONCRETE

- A. Conform to ASTM C94, WisDOT State Specifications, and the following:
1. Class II concrete
 2. Twenty-eight Day Compression Strength: 4000 psi.
 3. Aggregate shall conform to either of the following:
 - a. Soil Class A-7 (3/4-Inch Crushed Rock) (WisDOT Size No. 1 Aggregate per 501.2.5.4.5)
 - b. Soil Class A-6 (1 1/2-Inch Crushed Rock) (WisDOT Size No. 2 Aggregate per 501.2.5.4.5)
 4. Minimum Cement Content: 6 bags/c.y.
 5. Air Content: 6 percent \pm 1.5 percent.
 6. Maximum Water-Cement Ratio: .44
 7. Slump:
 - a. 2.5 inch or less – Slipformed
 - b. 4.0 inch or less – Non-slipformed

- B. Admixtures to lower freezing point of concrete are not permitted.

2.2 CEMENT

- A. Conform to ASTM C150, Type 1.

2.3 AGGREGATES

- A. Conform to WisDOT State Specifications
- B. Conform to ASTM C33.
- C. Aggregate Wear: Loss of abrasion and impact shall not exceed 50 percent by mass (AASHTO T96)
- D. Aggregate Soundness: The weighted average sodium sulfate loss shall not exceed 12 percent by mass (AASHTO T104)
- E. Freeze-Thaw: The weighted average loss shall not exceed 18 percent by mass (AASHTO T103)

2.4 EXPANSION JOINT

- A. Conform with ASTM D1751.
- B. Thickness: $\frac{3}{4}$ inch

2.5 REINFORCEMENT BAR

- A. Conform with WisDOT Standard Specifications for Highway Construction, Latest Edition, Section 505.
- B. Grade 60.
- C. Minimum Bar Size: #4, Epoxy Coated

2.6 CURING MATERIALS

- A. Use linseed oil based material conforming to the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.

2.7 CRUSHED AGGREGATE BASE MATERIAL

- A. Aggregates shall consist of hard, durable particles of crushed stone or crushed gravel and a filler of natural sand, stone sand or other finely divided mineral matter.
 - 1. Remove oversize material by screening or by crushing to required sizes.
 - 2. Composite material shall be free from organic matter, shale, and lumps or balls of clay and shall conform to the gradation requirements below.

- B. Liquid Limit and Plasticity Index
 - 1. Aggregate, including any blended filler, shall have a liquid limit of not more than 25 and a plasticity index of not more than 6.

- C. Fracture Count
 - 1. At least 45 percent of particles retained on the No. 4 sieve shall have at least one fractured face.

- D. Soundness
 - 1. When the fraction of aggregate retained on the No. 4 sieve is subjected to five cycles of the sodium sulfate soundness test, weighted loss shall not exceed 18 percent by weight.

- E. Filler for Blending
 - 1. Additional mineral filler required to meet gradation requirements or for satisfactory binding of material shall be uniformly blended with base course material at the screening plant.

- F. Moisture content shall not exceed 7 percent.
 - 1. Additional mineral filler required to meet gradation requirements or for satisfactory binding of material shall be uniformly blended with base course material at the screening plant.
 - 2. Mineral fillers shall be free from agglomerations or lumps and shall contain not more than 15 percent of material retained on a No. 4 sieve.

- G. Aggregate Gradation Requirements shall conform to C-2 or C-4 from Soils and Aggregate.

PART 3 – EXECUTION

3.1 PREPARATION OF SUBGRADE

- A. Prepare the subgrade by excavating to the lines, grades, and cross-sections shown on the drawings as required for placing curb and gutter.
- B. If subgrade excavation in cut is required, stockpile the surplus material for use in fill areas behind the curb and gutter, or dispose of at a site provided by the Contractor.
- C. If subgrade excavation in fill is required, then furnish, install, and compact granular sub-base material.
 - 1. Sub-base material shall be Soil Class C-2 or C-4 or suitable material from cut areas.
- D. Compact to minimum 95 percent modified proctor density (ASTM D1557).

3.2 PLACING AND GRADING BASE COURSE

- A. Provide a minimum of 6 inches of base material.
- B. The subgrade shall be prepared by fine grading to the lines, grades, and cross-sections shown on the drawings as required for placing the curb and gutter.
- C. Compact to minimum 95 percent modified proctor density (ASTM D1557).

3.3 CATCH BASINS/INLETS

- A. Adjust catch basins/inlets to curb and gutter elevation per City standards.

3.4 FORMS

- A. Conform to ACI 347.
- B. Provide forms of the size and type of material required to properly construct the curb and gutter as required.
- C. Properly brace or tie together forms to maintain position and shape.
- D. Clean and coat forms with clear, non-staining mineral or paraffin base form oil prior to placement of the concrete against the forms.

E. Removal of Forms

1. The forms may be removed provided the concrete obtains sufficient strength so as not to be damaged and will retain its shape.
2. Protect the curb and gutter until the concrete has attained design strength.

3.5 SLIPFORM CONSTRUCTION

- A. The use of slipform equipment will be acceptable.
- B. Coordinate the operations of mixing, delivering, and placing of the concrete to provide uniform progress with minimum stopping and starting of the curb machine.
- C. The curb machine shall be capable of placing the specified curb and gutter section with an adequate amount of vibration to preclude the possibility of honeycomb formation.

3.6 ENVIRONMENTAL CONSTRUCTION

- A. Hot Weather Concreting
 1. Follow ACI 305 whenever mean surrounding air temperature equals or exceeds 80°F (27°C).
 2. Do not place concrete whenever air temperature equals or exceeds 90°F (32°C).
- B. Cold Weather Concreting
 1. Follow ACI 306 whenever mean surrounding air temperature is below 40°F (4.5°C).
- C. Do not place concrete during rain, sleet, or snow unless protection is provided.

3.7 PLACING CONCRETE

- A. Construct curb and gutter to match the dimensions shown in the details.
- B. Construct curb and gutter on the prepared and moistened foundation in one course.
- C. Construct curb and gutter to the required lines and grades as shown on the drawings.
- D. Place concrete by using the slipform or fixed form method.
- E. Consolidate concrete as follows:
- F. Contraction Joints
 1. Sawcut at 10-foot intervals.

2. Cut to a minimum depth of two (2) inches.
3. Perform sawing as soon as practicable after concrete has set sufficiently to preclude raveling during the sawing and before any shrinkage cracks occur.

G. Place expansion joints as follows:

1. 300 feet maximum spacing on tangent sections.
2. Where radial curb and gutter meet tangent sections.
3. Adjacent to existing expansion joints in abutting concrete paving.
4. Three (3) feet from inlets.
5. Place at right angles to the flow line and surface of the gutters.

H. Place depressions for handicapped ramps and driveways as required and shown on the drawings.

I. Place a concrete stamp per the detail.

3.8 REINFORCEMENT

- A. Install two (2) - twenty (20) foot long number four (4) deformed reinforcement bars over all trenches that fall under any portion of the Concrete Curb & Gutter being constructed. The Engineer will determine the location of all deformed reinforcement bars.
- B. Install two (2) number four (4) epoxy coated deformed reinforcement bars, 12 inches long between new and existing slabs. The bars shall be drilled six inches into the existing concrete slab.

3.9 FINISHING

- A. Finish in accordance with the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition
- B. Thoroughly trowel and brush or lightly broom the face surfaces of the curb and gutter prior to concrete set.
- C. Round exposed edges of the curb and gutter to ¼ inch radius, both front and back, and edges adjacent to expansion joints.
- D. Pointed with mortar composed of three parts sand and one part Portland cement honeycombed areas as soon as possible after the curb and gutter has been placed.

3.10 CURB RAMPING

- A. Provide depressed and sloped curb at curb ramping locations and driveways shown on the Drawings or as directed by the Engineer.
- B. Provide appropriate longitudinal slope on curb as shown on the Drawings for curb ramps and for driveways or as directed by the Engineer.

3.11 CURING

- A. Start curing activities as soon as free water has disappeared from the surface of concrete after placing and finishing.
- B. Apply curing compound to all exposed surfaces by spraying a uniform coating in such a manner as to provide a continuous water impermeable surface. Apply in accordance with manufacturer's recommendations to limit loss of water to not more than 0.40 kg/m² in 72 hours.
- C. Under hot weather conditions, conform to ACI 305.
- D. Under cold weather conditions, conform to ACI 306.
- E. During curing period, protect concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

3.12 RESTORATION

- A. Backfilling
 - 1. Backfill low areas with Soils Class G-1 as defined in Section "Soils and Aggregates".
 - a. Between curb and property line.
 - b. In boulevard areas.
 - c. Shape to line and grade to permit landscaping.
 - d. Compact to 85 percent Modified Proctor density (ASTM D1557) and test roll.
- B. Landscaping
 - 1. Perform as defined in Section "Turf and Grasses".

3.13 CONCRETE WORK WARRANTY

- A. Work shall be warranted for a period of one year after substantial completion covering;
 - 1. Transverse cracking.
 - 2. Spalling.
 - 3. Popouts.
 - 4. Other detrimental impacts related to workmanship.

- B. Cost for repairs and traffic control shall be the responsibility of the Contractor.

END OF SECTION

SECTION 32 16 20

CONCRETE SIDEWALKS AND DRIVEWAYS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation.
2. Compaction aggregate base.
3. Sidewalk and driveway construction.

1.2 REFERENCES STANDARDS

A. American Society for Testing and Materials (ASTM)

- | | | |
|-----|-------|---|
| 1. | A185 | Specification for Welded Steel Wire Fabric for Concrete Reinforcement. |
| 2. | C31 | Making and Curing Concrete Test Specimens in the Field. |
| 3. | C33 | Specification for Concrete Aggregates. |
| 4. | C39 | Test for Compressive Strength of Cylindrical Concrete Specimens. |
| 5. | C94 | Specification for Ready-Mixed Concrete. |
| 6. | C143 | Test for Slump of Portland Cement Concrete. |
| 7. | C150 | Specification for Portland Cement. |
| 8. | C172 | Sampling Fresh Concrete. |
| 9. | C231 | Test for Air Content of Freshly Mixed Concrete by the Pressure Method. |
| 10. | C309 | Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete. |
| 11. | C1315 | Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete. |
| 12. | D1557 | Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Lb (4.54 kg) Rammer and 18-in. (457 mm) Drop. |
| 13. | D1751 | Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Type). |
| 14. | E329 | Standard Recommended Practice for Inspection Testing Agencies for Concrete, Steel and Bituminous Materials Used in Construction. |

B. American Concrete Institute (ACI)

1. ACI 304 Measuring, Mixing, Transporting, and Placing Concrete.
2. ACI 305 Recommended Practice for Hot Weather Concreting.
3. ACI 306 Recommended Practice for Cold Weather Concreting.
4. ACI 347 Recommended Practice for Concrete Formwork.

C. American Association of State and Highway Transportation Officials

1. T96 Standard Method of Test for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and impact in the Los Angeles Machine
2. T013 Standard Method of Test for Soundness of Aggregates by Freezing and Thawing
3. T104 Standard Method of Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

D. Wisconsin Department of Transportation (WisDOT), State of Wisconsin Standards Specifications for Highway Construction, Latest Edition (State Specifications)

1.3 SUBMITTALS

- A. Concrete design mix of composition and strength testing results for design mix for each type of concrete.
- B. Producer's certification that the supplied materials meet the applicable specification requirements.
- C. Manufacturer's certification for curing compound.

1.4 QUALITY ASSURANCE/QUALITY MANAGEMENT PLAN

A. General Requirements

1. Provide a Quality Management Plan (QMP) conforming to the WisDOT State Specifications for Class II concrete.

B. Testing to be completed as follows:

1. Installation Testing by Owner:
 - a. Slump.
 - b. Air-entrainment.
 - c. Compressive strength test.

2. Other testing per the WisDOT State Specification is to be completed by the Contractor.
 3. Additional tests may be conducted by the Contractor for those conducted by the Owner.
- C. The following shall be in accordance with the State Specifications and stated references:
1. Inspection and Testing: ASTM E329.
 2. Sampling: ASTM C172.
 3. Slump: ASTM C143.
 4. Air-Entrainment: ASTM C231.
 5. Compressive Strength Test: ASTM C31 and C39.
- D. Compressive strength test shall consist of four standard test cylinders made from a single batch of concrete:
1. Tests to be taken for each 200 cubic yards of concrete placed or at least once each day.
 2. Test one cylinder at 7 days.
 3. Test two cylinders at 28 days.
 4. Remaining cylinder shall be tested in the event prior tests fail.
 5. 28 Day Test Requirements:
 - a. Compressive strength is 4,000 psi.
 - b. No individual test falls more than 500 psi below specified compressive strength.
 - c. If differential strengths of the two specimens is 350 psi or greater, the low strength specimen shall be discarded and the strength of the remaining cylinder shall then be the test result.
 - d. If the test result is below 3500 psi, the test is considered a failure. Also, if either of the two 28 day specimens falls below 3000 psi, the test result is considered a failure.
 6. Failure of compressive strength tests shall result in following additional testing:
 - a. Provide two core samples of each portion of work affected and perform compressive strength tests.
 - b. Replace work if core samples do not equal or exceed specified compressive strength.
 - c. Additional testing shall be completed at the Contractor's expense.

PART 2 – PRODUCTS

2.1 CONCRETE

- A. Concrete shall conform to ASTM C94, the WisDOT State Specification, and the following:
 - 1. Class II concrete
 - 2. Twenty-eight Day Compressive Strength: 4,000 psi.
 - 3. Aggregate shall conform to either of the following:
 - a. Soil Class A-7 (3/4-Inch Crushed Rock) (WisDOT Size No. 1 Aggregate per 501.2.5.4.5)
 - b. Soil Class A-6 (1 1/2-Inch Crushed Rock) (WisDOT Size No. 2 Aggregate per 501.2.5.4.5)
 - 4. Minimum Cement Content: 6 bags/c.y.
 - 5. Air Content: 6 percent \pm 1.5 percent.
 - 6. Maximum Water-Cement Ratio: .44
 - 7. Slump:
 - a. 2.5 inch or less – Slipformed
 - b. 4.0 inch or less – Non-Slipformed

2.2 CEMENT

- A. Conform to ASTM C150, Type 1.

2.3 AGGREGATES

- A. Conform to WisDOT State Specifications
- B. Conform to ASTM C33.
- C. Aggregate Wear: Loss of abrasion and impact shall not exceed 50 percent by mass (AASHTO T96)
- D. Aggregate Soundness: The weighted average sodium sulfate loss shall not exceed 12 percent by mass (AASHTO T104)
- E. Freeze-Thaw: The weighted average loss shall not exceed 18 percent by mass (AASHTO T103)

2.4 CURING MATERIALS

- A. Use linseed oil based material conforming to the WisDOT Standard Specifications for Highway and Structure Construction, Latest Edition.

2.5 EXPANSION JOINT

- A. Conform to ASTM D1751.
- B. Thickness: ½ inch.

2.6 REINFORCEMENT BAR

- A. Conform with WisDOT Standard Specifications for Highway Construction, Latest Edition, Section 505.
- B. Grade 60.
- C. Minimum Bar Size: #4., Epoxy Coated

2.7 CURB RAMP DETECTABLE WARNING FIELD

- A. Provide detectable warning fields in curb ramps in accordance with the requirements of the current edition of the Standard Specification for the State Department of Transportation.
- B. Fields to be unpainted cast iron.
- C. Acceptable products are:
 - 1. Neenah Foundry
 - 2. Cast DWD by Pioneer Detectable LLC
 - 3. Other Engineer approved equal cast iron plate.

PART 3 – EXECUTION

3.1 PREPARATION OF THE SUBGRADE

- A. Excavate subgrade to line and grade shown on plans and details.
- B. Provide a minimum of 4 inches of base.
 - 1. Soil Class C-2 or C-4 as defined in Section "Soils and Aggregates".

- C. Compact to minimum 95 percent modified proctor density, ASTM D1557.
- D. Surplus material may be used in fill areas.
- E. Excess material shall be disposed at a site provided by Contractor.
- F. The foundation shall be six (6) inches wider than the sidewalk.

3.2 FORMS

- A. Conform to ACI 347.
- B. Forms shall be of the size, shape and type of material required to construct the sidewalk and driveway as required.
- C. Brace and tie together forms to maintain position and shape.
- D. Clean and coat forms with clear, non-staining mineral or paraffin base form oil prior to placement of concrete against forms.
- E. Surfaces in contact with concrete shall be free from frost, debris, and other deleterious material.
- F. Moisten the base prior to placement of concrete.
- G. Remove laitance and other unsound material before freshly placed concrete is placed against previously placed concrete.
- H. Have materials available to protect concrete from damage until it has hardened sufficiently to resist damage.
- I. Unless noted otherwise, furnish the following minimum thicknesses:
 - 1. Sidewalks: 4"
 - 2. Curb Ramps: 6" unless directed otherwise by the Engineer.
 - 3. Driveways: Residential: 6"
 - 4. Driveways: Industrial, Business, Commercial: 8"
 - 5. Alleys: 8"
- J. Sidewalk shall be 5 feet in width for new construction. Match width of existing sidewalk for reconstruction unless directed otherwise by the Engineer.

- K. The sidewalk shall slope a maximum of $\frac{1}{4}$ inch per foot towards the street or as shown on the Plan or as directed by the Engineer.
- L. Edges of sidewalks and edges adjacent to expansion joints or construction joints shall be finished with an edging tool having a radius of $\frac{1}{4}$ inch.

3.3 EXPANSION JOINTS

- A. Location and geometry of expansion joints shall be as shown on the Drawings or according to the following criteria:
 - 1. At right angle or tee intersections.
 - 2. At sidewalk and stoop intersections.
 - 3. Where sidewalk and driveway adjoin vertical surfaces.
 - 4. Where sidewalk and driveway adjoin existing concrete street pavements.
 - 5. Where sidewalk and driveway adjoin existing concrete driveways.
 - 6. Where driveway and sidewalk adjoin curb and gutter.
 - 7. Where 4" thick sidewalk meets 6" thick sidewalk at curb ramps.
 - 8. Maximum spacing 300 feet.
- B. Extend filler full width and depth of concrete, with top slightly below finished surface of concrete.

3.4 CONTRACTION JOINTS

- A. Locate in accordance with details and following criteria:
 - 1. Transverse joints in the sidewalk shall be spaced at an average spacing of 5 foot intervals.
 - 2. When matching existing concrete sidewalk results in a variable joint spacing, transverse joint spacing in the new sidewalk shall be modified to a minimum spacing of 4 feet and a maximum spacing of 6 feet, unless additional variation is approved by the Engineer.
 - 3. Transverse joints shall be placed down the center of the approach portion of the driveway.
 - 4. Joints shall not deviate more than five degrees from a right angle measured at intersecting joints or flatwork edge, and more than $\frac{1}{2}$ inch from a straight line.
- B. Joint Dimensions
 - 1. Depth:
 - a. Minimum 1 inch or one-fifth of slab depth whichever is greater.

2. Width:
 - a. Minimum $\frac{1}{8}$ inch for sawed joints, $\frac{1}{4}$ inch for other types.
 - b. Maximum $\frac{1}{4}$ inch for sawed joints, $\frac{3}{8}$ inch for other types.

3.5 ENVIRONMENTAL REQUIREMENTS

A. Hot Weather Concreting

1. Follow ACI 305 whenever mean surrounding air temperature equals or exceeds 80°F (27°C).
2. Do not place concrete whenever air temperature equals or exceeds 90°F (32°C).

B. Cold Weather Concreting

1. Follow ACI 306 whenever mean surrounding air temperature is below 40°F (4.5°C).

C. Do not place concrete during rain, sleet, or snow unless protection is provided.

3.6 PLACING CONCRETE

A. Conveying Concrete

1. Convey concrete from mixer to place of final deposit by methods that will prevent separation or loss of materials.
2. Equipment for chuting, pumping, or pneumatically conveying concrete shall be capable of providing a supply of concrete at site of work without separation of ingredients and without interruptions sufficient to permit loss of plasticity between successive placements.
3. Unless otherwise approved, conform to ACI 304.

B. Depositing Concrete

1. Place concrete on prepared and moistened foundation in a single lift.
2. Deposit concrete as nearly as practicable to its final position to avoid segregation due to rehandling or flowing.
3. Carry on concreting at such a rate that concrete is at all times plastic, and flows readily into spaces between reinforcing.
4. Do not deposit concrete that has partially hardened or that has been contaminated by foreign materials.
5. Do not use retempered or remixed concrete.
6. After concreting is started, it shall be carried on as a continuous operation until placing a section is completed.

7. Thoroughly consolidate concrete by suitable means during placement, and thoroughly work concrete around reinforcement and embedded fixtures, and into corners of forms.

C. Provide a concrete stamp per the detail.

3.7 REINFORCEMENT

- A. Install two (2) number four (4) epoxy coated deformed reinforcement bars over all trenches that fall under any portion of the concrete sidewalk or driveway being constructed. The Engineer will determine the final location of all deformed reinforcement bars. In general, reinforcement bars shall be extended into the adjacent concrete slab that is outside of the trench as follows:
 1. When the adjacent concrete slab is existing, drill 6" into the concrete.
 2. When the adjacent concrete slab is new, overlap the reinforcement bar at least 12 inches into the adjacent concrete slab.
- B. Install two (2) number four (4) epoxy coated deformed reinforcement bars, 12 inches long between new and existing slabs. The bars shall be drilled six inches into the existing concrete slab.

3.8 FINISHING

- A. Strike off concrete to a true and even surface.
- B. Finish float and trowel surface smooth.
- C. Brush or lightly broom surface at right angles to traffic.

3.9 CURING

- A. Start curing activities as soon as free water has disappeared from surface of concrete after placing and finishing.
- B. Apply curing compound to exposed surfaces by spraying a uniform coating to provide a continuous water impermeable surface. Apply in accordance with manufacturer's recommendations to limit loss of water to not more than 0.40 kg/m² in 72 hours.
- C. Maintain all exposed concrete surfaces moist for the first 7 days after placement.
- D. Under hot weather conditions conform to ACI 305.
- E. Under cold weather conditions conform to ACI 306.
- F. During curing period, protect concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

3.10 EXISTING CONCRETE FLATWORK

- A. When abutting to existing flatwork, provide the following:
 - 1. Saw cut existing concrete at construction limits.
 - 2. Install expansion joints between existing and new construction.

3.11 CURB RAMPS

- A. Install curb ramps where shown on Drawings or as directed by the Engineer.
- B. Provide detectable warning field run parallel to the direction of travel of the ramp to allow wheel chairs unimpeded access to the road or sidewalk.
- C. Elevation of the warning field is to be equal to the elevation of the curb cut to allow drainage.
 - 1. Equal elevations of the warning field, curb ramp and curb at the curb interface are also required so there is no tripping hazard or impediment to wheel chairs or walkers.
 - 2. Do not recess the warning field.
- D. Install warning fields 0 to 2 inch from back of curb.
 - 1. For installations on a radius, the leading edge of the detectable warning field is to remain within the 0 to 2 inch offset from back of curb.

2. The opposite corner adjacent to the curb will be a varying distance in order to keep the warning fields parallel to the direction of travel.
- E. Slope longitudinal sidewalk to meet the curb ramp with a slope 12 horizontal to 1 vertical or flatter.
- F. Install warning fields per standard detail 8D5, A through E, from the Wisconsin Department of Transportation Facility Development Manual.

3.12 CONCRETE WORK WARRANTY

- A. Work shall be warrantied for a period of one year after substantial completion covering;
 1. Transverse cracking.
 2. Spalling.
 3. Popouts.
 4. Other detrimental impacts related to workmanship.
- B. Cost for repairs and traffic control shall be the responsibility of the Contractor.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Furnishing and applying pavement line markings.

1.2 REFERENCES

- A. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, and all supplemental and interim supplemental specifications, as they may pertain, except the items: method of measurement and basis of payment shall not apply.

B. American Association of State Highway and Transportation Officials (AASHTO):

1. M247 Standard Specification for Glass Beads Used in Pavement Markings

1.3 SUBMITTALS

- A. Submit a certificate of compliance certifying that the epoxy and/or paint supplied under the contract conforms to these specifications.

- B. Submit a certificate of compliance certifying that the beads supplied under the contract conform to these specifications.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver paint and epoxy materials to the job site unopened, in manufacture's containers legibly marked with the contents, color, batch number, date manufactured, and manufacture's name and address. Do not use material more than one year old.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Conform to WisDOT Standard Specifications for Highway and Structures Construction Sections 646.

B. Glass Beads

1. Furnish glass beads conforming to AASHTO M247, except for gradation conform to the following:

Sieve Size	(%) Percent Passing by Weight	
	For Epoxy	For Paint
No. 20	100	95-100
No. 30	75-95	70-90
No. 40	---	60-80
No. 50	15-35	10-30
No. 80	---	0-3
No. 100	0-5	0-1

2.2 EQUIPMENT

A. All equipment shall conform to WisDOT Standard Specifications for Highway and Structure Construction Section 646.3.2.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

A. All surface preparation shall conform to WisDOT Standard Specifications for Highway and Structure Construction Section 646.3.1.

3.2 LINE MARKING

A. All line marking shall conform to WisDOT Standard Specifications for Highway and Structure Construction Section 646.3.3.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Topsoil
2. Salvaged Topsoil
3. Fertilizer
4. Seeding
5. Mulch

1.2 REFERENCES

A. Association of Official Seed Analysis (AOSA)

1. Rules for testing seed.

1.3 SUBMITTALS

A. Topsoil

1. Provide topsoil analysis performed in accordance with ASTM D5268 and demonstrating the topsoil meets Natural Resource Conservation Service (NRCS) specified soil types.
2. Submit results of tests for nutrient levels and provide recommendations for fertilizer type and application.

B. Fertilizer

1. Furnish certification from supplier attesting to:
 - a. Brand name, chemical analysis, and guarantee of analysis.

C. Seed

1. Furnish certification of conformance with AOSA "Rules for Testing Seed" and attest to:
 - a. Mix, age, weed content, purity, and germination.

D. Mulch Material

1. Furnish sample of mulch material when requested by the Engineer.

E. Erosion Mat

1. Furnish sample of erosion mat material along with a certification of its physical properties.

PART 2 – PRODUCTS

2.1 TOPSOIL

- A. Consists of adequate mineral content to support the growth of the intended vegetation, consists of Soils Class F-1 or F-2 (Soils and Aggregates) as required and shall meet the definition and specification stated in ASTM D5268, and meets one of the following NRCS soil textures:

1. Loam.
2. Sandy Loam.
3. Silt Loam.
4. Silty Clay Loam.
5. Clay Loam.

- B. The topsoil shall consist of adequate mineral content to support the growth of the intended vegetation and shall not contain herbicides which would be detrimental for the intended use.

- C. The topsoil shall have adequate fertility for quick establishment of vegetation.

- D. The pH of the topsoil shall be between 6.0 and 7.0.

- E. Topsoil shall be free from deleterious substances.

- F. Topsoil shall be free from roots, sticks, weeds, brush, stones or other litter and waste products.

- G. Pulverize and screen the topsoil such that 100 percent passes the 1-inch (25 mm) sieve and at least 90 percent passes the No. 10 (2.00 mm).

2.2 SALVAGED TOPSOIL

- A. Consists of the natural loam, sandy loam, silt loam, silty clay loam or clay loam humus-bearing soils available from the overlying portions of the areas contemplated by the plans.
- B. Salvaged topsoil shall be free from deleterious substances, roots, sticks, weeds, brush, stones or other litter and waste products.
- C. Pulverize and screen the salvaged topsoil such that 100 percent passes the 1-inch (25 mm) sieve and at least 90 percent passes the No. 10 (2.00 mm).

2.3 FERTILIZER

- A. Fertilizer shall meet the recommendations of the supplier.

2.4 SEED

- A. Conform with the requirements of the governing authority for seeding and for restrictions on noxious weed seed.
- B. Seed mixture shall be composed of seeds of the purity, germination, and proportion by weight as follows:

Seed Mix #10 – Heavy Soil

Percent	Variety	Min. % Purity	Min. % Germination
40	Kentucky Bluegrass	98	85
25	Red Fescue	97	85
20	Perennial Ryegrass	97	90
10	White Clover	95	90
5	Redtop	92	85
100% Total			

Seed Mix #20

Percent	Variety	Min. % Purity	Min. % Germination
6	Kentucky Bluegrass	98	85
24	Hard Fescue (varieties below)	97	85
40	Turf Type Tall Fescue (varieties below)	98	85
30	Perennial Ryegrass	97	90
100% Total			

Hard Fescue Varieties: Choose one or both:

- Scaldis Hard Fescue
- SR3100 Hard Fescue

Turf type tall fescue varieties: Choose two of the five:

- Tulsa turf type tall fescue
- Regiment turf type tall fescue
- Crossfire turf type tall fescue
- Shortstop turf type tall fescue
- SR8200 turf type tall fescue

Seed Mix #30

Percent	Variety	Min. % Purity	Min. % Germination
10	Kentucky Bluegrass	98	85
30	Red Fescue	97	85
15	Improved Fine Perennial Ryegrass	97	90
25	Hard Fescue (varieties below)	97	90
10	Salt Grass	98	85
10	Birdsfoot Trefoil	95	80
100% Total			

Seed Mix #40

Percent	Variety	Min. % Purity	Min. % Germination
35	Kentucky Bluegrass	98	85
20	Hard Fescue	97	85
20	Red Fescue	97	85
25	Improved Fine Perennial Ryegrass	96	85
100% Total			

C. Temporary Nurse Crop

1. When required the Contractor shall furnish one of the following seed mixtures:

Species	Min. % Purity	Min. % Germination	Lbs. per Acre
Oats	98	90	80
Rye	98	85	100

2.5 MULCH

- A. Mulch shall consist of straw, hay, marsh hay, or wood chips which are free of noxious weeds and other objectionable foreign matter.
 - 1. If wood chips are used, the mulch area shall be treated with one (1) pound of available nitrogen per 1,000 square feet.
- B. Mulch binder shall conform to one of the following:
 - 1. Emulsified asphalt shall meet the requirements for Type SS-1 AASHTO M140.
 - 2. Terra Tack I, or equal.

PART 3 – EXECUTION

3.1 TOPSOILING (TOPSOIL OR SALVAGED TOPSOIL)

- A. Topsoil all areas which are required to be seeded. Place topsoil to the following depth of 4 inches when settled.
- B. Topsoil placement for seeding lawns:
 - 1. Mechanically level subgrade to allow uniform placement of topsoil.
 - 2. Remove rocks, roots, clods, and other foreign material.
 - 3. Place topsoil to required depth.
 - 4. Mechanically level topsoil.
 - 5. Rake topsoil smooth and remove all lumps.
 - 6. Seed as required.

3.2 SALVAGED TOPSOIL STRIPPING

- A. Remove available topsoil from the site of work in such amounts and to such depths as available or required and the transporting and stockpiling of such topsoil in accordance with the plans, required in the contract or directed by the Engineer.
- B. All areas from which topsoil is procured shall be cleared, if necessary, by means of mowing weeds or other vegetation to a height of approximately six inches and freed from any litter such as brush, rock or foreign material of objectionable size or quantity.
- C. The humus-bearing soil shall then be stripped off to such depth as available, or as necessary to produce sufficient volumes required by the contract, taking all practicable care to avoid incorporation of any of the underlying sterile soil therewith.
- D. The topsoil thus stripped from these areas will be stockpiled and leveled as directed so that it can be reclaimed.

- E. Any appreciable volumes excavated in excess of the amounts required to accomplish these requirements shall be disposed of by the Contractor at the Contractor’s cost and expense.

3.3 SEEDING

- A. Selection of seed mixtures, rate of seeding and intended use of the mixtures shall be as follows:

Seed Mixture	Rate of Seeding (lbs. per 1,000 sq. ft.)	Intended Use
No. 10	3-4	Average loam or heavy clay soils
No. 20	5-6	Light, sandy or gravelly soils. All ditches, inslopes.
No. 30	5-6	For medians and on slopes generally within 15 feet of the shoulder where a salt tolerant turf is preferred.
Seed No. 40	Rate of Seeding 3-4	In urban area or other areas where a lawn type turf is desired.

- B. Seeding period shall be as recommended by the seed supplier.

- C. Seeding

1. Utilize a machine or combination of machinery which will produce the following:
 - a. Apply seed uniformly at the rate specified.
 - b. Cover seed with approximately ¼ inch of topsoil.
 - c. Roll lightly.
 - d. Apply seed at right angles to surface drainage.

3.4 MULCHING

- A. Complete mulching as follows:

1. Within 48 hours after seeding has been completed.
2. Place all mulch uniformly to a loose depth of 1 to 1½ inches (2 to 3 tons per acre).
3. Mulching operation shall begin at the top of slopes and proceed downward.
4. Do not mulch under high winds.

- B. Mulching shall be secured using one of the following methods:

1. Method "A":
 - a. Secure mulch with heavy twine or netting.
 - 1) Twine to be fastened with pegs or staples to form a grid of 6- to 10-foot spacing.

2. Method "B":
 - a. Anchor mulch in soil by means of a mulch tiller.
 - b. Mulch shall be impressed in the topsoil to a depth of 1½ to 2½ inches in one pass of the tiller.

3.5 SEQUENCE

- A. Topsoil, seed, and mulch restoration shall be completed prior to final asphaltic concrete pavement placement.

3.6 MAINTENANCE

- A. Maintain all seeded areas until all the following conditions are met.
 1. Seeding: Establish a good stand of grass (uniform in density and color) satisfactory to Owner.
 2. Capable of resisting erosion.
- B. Watering of turf shall be included in maintenance.

END OF SECTION

SECTION 33 00 01**CONCRETE PIPE - REINFORCED****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Circular storm sewer.
2. Elliptical storm sewer pipe.

1.2 REFERENCES**A. American Association of State Highway and Transportation Officials (AASHTO):**

1. M198 Joints of Circular Concrete Sewer
2. M273 Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers with less than 2 ft. of Cover Subjected to Highway Loadings

B. American Society for Testing and Materials (ASTM):

1. C76 Standard Specification for Reinforce Concrete Culvert, Storm Drain, and Sewer Pipe.
2. C443 Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
3. C444 Standard Specification for Perforated Concrete Pipe
4. C497 Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
5. C506 Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
6. C507 Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, Sewer Pipe
7. C877 Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
8. C990 Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
9. C1433 Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers

1.3 SUBMITTALS

- A. Manufacturer's certification that the material delivered has been satisfactorily tested in accordance with ASTM C497.
- B. Provide a detail design of the pipe joints and gasket.
- C. Manufacturer's certification that culvert box sections and culvert box endwalls conform with ASTM 1433.
- D. Provide manufacturer's certification that the material for sealing bands conforms with ASTM C-877.

1.4 QUALITY ASSURANCE

- A. Pipe shall be available to Owner's Representative for inspection.
- B. Material brands and/or pipe shall not be mixed.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Upon delivery insure that the pipe is clearly marked with the following information:
 - 1. Specification designation.
 - 2. Pipe class or strength designation.
 - 3. Date of manufacture.
 - 4. Name or trademark of manufacturer.
 - 5. Plant identification.
 - 6. Letters E or Q indicating elliptical or quadrant reinforcement.
- B. Store material to protect from damage and do not stack in layers.

PART 2 – PRODUCTS

2.1 CIRCULAR PIPE

- A. Conform to ASTM C76 of the classification stated in the drawings.
- B. Provide bell and spigot joints conforming to ASTM C443 with flat rubber gaskets meeting standard gasket requirements.

2.2 ELLIPTICAL PIPE

- A. Conform to ASTM C507 of the classification stated on the drawings.
- B. Provide tongue and groove joints with flexible plastic Type B gaskets conforming to AASHTO M198 and joint sealants conforming to ASTM C990.

PART 3 – EXECUTION

3.1 APPLICATION

- A. Storm Sewer
 - 1. Use circular pipe ASTM C76 "B" or "C" wall unless stated otherwise on drawings.
 - 2. Use elliptical pipe, arch pipe and box sections only where shown on drawings.
 - 3. Use perforated pipe only where shown on drawings.

3.2 FIELD QUALITY CONTROL

- A. Inspect and reject pipe for the following defects:
 - 1. Improper marking.
 - 2. Fractures or cracks passing through wall, except for a single end crack that does not exceed depth of joint.
 - 3. Defects indicating non-compliance with proportioning, mixing and molding of the concrete.
 - 4. Surface defects indicating honeycombed or open texture.
 - 5. Ends are not normal to the wall and center line of the pipe.
 - 6. Damaged or cracked ends.
 - 7. Any continuous crack having a width of 0.01 inch or more and extending for a length of 12 inches or more.

END OF SECTION

SECTION 33 00 02**POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS**

1.1 SUMMARY

A. Section Includes:

1. PVC pipe for mainline gravity sewer.
2. PVC pipe for sewer services.
3. PVC pipe for water main
4. PVC pipe for pressure sewer (force main)

B. The products described are not installed under this Section.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A307-00 Specification for Carbon Steel Bolts and Studs, 60,000psi Tensile Strength
2. D1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride)(CPVC) Compounds
3. D1785 Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Schedules 40, 80, and 120
4. D2241 Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
5. D2466 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
6. D2467 Specification for Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
7. D2564 Standard Specifications for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe Systems
8. D2672 Standard Specifications for Joints for IPS PVC Pipe Using Solvent Cement
9. D2855 Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
10. D3034 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
11. D3139 Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
12. D3212 Specifications for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
13. F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
14. F679 Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe Fittings

B. American Water Works Association (AWWA)

1. C104 Cement Mortar Lining for Cast Iron and Ductile Iron Pipe and Fittings for Water
2. C110 Gray Iron and Ductile Iron Fittings, 3-inch through 48-inch for Water and Other Liquids
3. C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Rittings
4. C153 Ductile-Iron Compact Fittings, 3-inch through 16-inch, for Water and Other Liquids
5. C900 Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch for water
6. C905 Standard for Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14-inch through 36-inch

1.3 SUBMITTALS**A. Submit the following:**

1. Certification of production date of all materials.
2. Manufacturer's certification that the materials delivered were manufactured, sampled, tested, and inspected in accordance with these specifications and appropriate referenced standards.
3. Product data sheet.
4. Manufacturer's recommendations for assembly.

1.4 QUALITY ASSURANCE**A. Make pipe available to the Engineer's Representative for inspection.****B. Pipe shall be considered defective and will be rejected when:**

1. Pitted or cratered.
2. Flaking.
3. Straightness varies more than 1/2 inch in 10 feet.
4. Any defect which prevents assembly according to manufacturer's recommendations.
5. Not utilized within six months of date of production.
6. Pipe is not properly marked.

C. Material brands and/or pipe classes shall not be mixed.**D. Pipe Marking – pipe and fittings shall be marked as follows:**

1. Manufacturer's name, trademark or logo.
2. Nominal size.
3. PVC cell classification.
4. Pipe stiffness designation, dimension ratio, or schedule size and pressure class.
5. ASTM or AWWA specification designation.
6. National Sanitation Foundation approval (pipe for potable water).
7. Production date.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inspect the pipe shipment to identify shifted loads, broken packaging or rough treatment, which could be an indication of damage.
- B. Unload the pipe in a manner which will not put stress on the pipe or strike anything causing damage.
- C. Place and store the pipe package units on level ground stacked no more than 8 feet high. Do not store close to heat sources.
- D. Store gaskets away from excessive exposure to heat, direct sunlight, ozone, oil or grease.
- E. Store Solvent cement in tightly sealed containers away from excessive heat.
- F. Handle pipe in a manner to prevent impact blows, abrasion damage, gouging or cutting.
- G. When handling pipe in cold weather, provide additional care to prevent damage due to impact. Impact strength is reduced in cold weather.

PART 2 – PRODUCTS**2.1 NON-PRESSURE RATED PIPE**

- A. Mainline Gravity Sewer and Sewer Services
 - 1. Pipe fittings and repair couplings shall be manufactured and tested in accordance with the following standards:
 - a. Sizes 8 inch through 15 inch and depths up to 30 feet: ASTM D3034, PSM SDR-35 PVC
 - b. Sizes 18 inch through 48 inch and depths up to 30 feet: ASTM F679, PS46 PVC, T-1 minimum cell classification
 - 2. Elastomeric Gaskets: Conform with ASTM F477
 - 3. Elastomeric Joints: Conform with ASTM D3212
 - 4. Solvent Weld Joints: Not permitted.
 - 5. Repair couplings for transition between ABS composite pipe and PVC shall be Fernco eccentric couplings with stainless steel shear rings, bands, nuts, and housings.

B. Sewer Services

1. Pipe shall be manufactured and tested in accordance with ASTM D2665.
2. Fittings to conform with ASTM F1866.
3. Pipe for sizes 4-inch and 6-inch: Schedule 40.
4. Solvent Weld Joints: ASTM D2672.
 - a. Solvent Cements: ASTM D2564
 - b. Joints shall be made in accordance with ASTM D2855.

2.2 PRESSURE RATED PIPE

A. Water Main

1. Manufacture and test the pipe and joints in accordance with the following standards:
 - a. Pipe sizes 4-inch through 12-inch: AWWA C900 pressure Class 235, thickness Class DR 18.
 - b. Pipe sizes 14-inch through 36-inch: AWWA C905, pressure Class 235, thickness Class DR 18.
2. Elastomeric gaskets shall be manufactured as defined in ASTM F477.
3. Joints shall conform to ASTM D3139.
4. Fittings:
 - a. Standard ductile iron mechanical or push-on joint conforming to AWWA C110 or compact ductile iron mechanical or push-on joint conforming to AWWA C153.
 - b. Cement mortar lined conforming to AWWA C104.
 - c. Rubber gasket joints conforming to AWWA C111.
 - d. Tee-head bolts and hexagonal nuts shall be 304 stainless steel with anti-seize mechanism.

B. Thrust Restrained Joint PVC pipe for Trenchless Construction of Water Main

1. Manufacture and test the pipe and joints in accordance with the following standards:
 - a. Pipe sizes 4-inch through 12-inch: AWWA C900, pressure Class 150, thickness Class DR 18.
 - b. Pipe sizes 14-inch through 36-inch: AWWA C905, pressure Class 150, thickness Class DR 18.
2. Provide twin elastomeric gaskets manufactured in accordance with ASTM F477.
3. Design joint so be used with non-metallic couplings with high-strength flexible thermoplastic splines inserted into mating precision-machined grooves in the pipe and coupling to provide full 360 degree restraint.
4. Fittings:
 - a. Standard ductile iron mechanical or push-on joint conforming to AWWA C110 or compact ductile iron mechanical or push-on joint conforming to AWWA C153.
 - b. Cement mortar lined conforming to AWWA C104.
 - c. Rubber gasket joints conforming to AWWA C111.
 - d. Bolts and nuts shall be 304 stainless steel with anti-seize mechanism.

END OF SECTION

SECTION 33 00 03

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Pressure pipe and fittings for water distribution.

1.2 REFERENCES

A. American Water Works Association (AWWA)

1. C901 Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ in.(13 mm) Through 3 in. (76 mm) for Water Service
2. C906 Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 in. (100 mm) Through 63 in. (1,575 mm), for Water Distribution and Transmission

B. American Society for Testing and Materials (ASTM):

A307-00 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

1. D638 Standard Test Method for Tensile Properties of Plastics
2. D1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
3. D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique
4. D1598 Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
5. D1599 Standard Test Method for Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings
6. D2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
7. D2290 Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method
8. D2837 Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
9. D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
- 10.. D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

C. National Sanitation Foundation

1. NSF No. 14 Plastics Piping Components and Related Materials

1.3 SUBMITTALS

A. Product Data

1. Provide product data on pipe and fittings including dimensions.

B. Quality Assurance/Control Submittals

1. Certification that the tests required by this specification section were performed and meet the stated minimum requirements.
2. Evidence from the pipe manufacturer that the personnel completing joints is qualified to perform the thermal butt fusion.
3. Manufacturer's instructions and procedures for joining the pipe and pipe fittings.

1.4 QUALITY ASSURANCE

A. Pipe shall be available to Owner's Representative for inspection.

B. Material manufacturer, pipe diameters and pressure classes shall not be mixed.

C. Personnel completing the joints shall be certified by the pipe manufacturer as being qualified to perform the thermal butt fusion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Upon delivery inspect pipe and fittings for damage, cracks, holes, or foreign inclusions.

B. Check date of production to verify the pipe will be installed within six (6) months of date of production.

C. Store pipe and accessories on flat level ground with no rocks or other objects under the pipe.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Pipe Sizes 4-inch and Larger

1. Pipe and fittings shall be high density polyethylene (HDPE) meeting AWWA C906 standards.
2. Materials used for the manufacture of the HDPE pipe and fittings shall be made from a PE 3608 resin compound meeting the minimum cell classification of PE 345434C in accordance with ASTM D3350 and the hydrostatic design basis of 1,600 psi determined in accordance with ASTM D2837.
3. Provide ductile iron outside diameter of nominal size shown on the Drawings or stated in the Bid Schedule.
4. Provide pipe with a dimension ratio (DR) of 9, pressure class 200.
5. Pipe shall be installed within 6 months of the production date.

B. Pipe sizes up to 2 inches:

1. Polyethylene (PE) tubing shall conform to the requirements of AWWA C901, PE 3608, DR 9.

C. Pipe sizes greater than 2 inches up to 3 inches:

1. Polyethylene (PE) pipe shall conform to the requirements of AWWA C901, PE 3608, DR 9.

D. Fittings

1. Fittings shall meet the requirements of AWWA C901 or AWWA C906 whichever applies.
2. Fittings for pipe greater than 3 inches diameter shall be HDPE molded fittings and HDPE fabricated fittings of the same pressure rating and outside diameter as the connecting pipe.
 - a. The pipe manufacturer shall mold or fabricate and supply all HDPE molded fittings, fabricated fittings, accessories and adapters required to perform the Work. No Contractor fabricated fittings shall be used.
 - b. Molded fittings shall be manufactured with thermal butt-fused joints meeting the requirements of ASTM D3261.
 - c. Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings.
3. Fittings for pipe 3 inches diameter or less shall be capable of restraining PE pipe from pullout with the same pressure class as the connecting pipe.
 - a. Provide metal compression connections with ferrule and compression nut.
 - b. Provide a stainless steel insert stiffener to insert inside the tube.
 - c. Insert fittings shall not be used.

2.2 PIPE IDENTIFICATION

- A. Mark the pipe and fittings with the appropriate standard AWWA C901 or AWWA C906 whichever is applicable to affirm the product was manufactured, inspected, sampled, and tested in accordance with the standard.

- B. Pipe and fittings shall be marked with the following at intervals between markings of no greater than 5 feet:
 - 1. Nominal size and OD based on ductile iron OD sizing.
 - 2. Standard material code designation of PE 3408 or PE 3608 (as applicable).
 - 3. Dimension ratio.
 - 4. Pressure class 200
 - 5. AWWA C901 or AWWA C906, whichever is applicable.
 - 6. Manufacturer's production code to include day, month, year produced.

2.3 JOINTS

- A. HDPE Pipe and Pipe Fittings Greater than 3 inches Diameter
 - 1. Pipe and pipe fittings shall be designed for joining by thermal butt fusion.
 - 2. Joining method shall be capable of conveying water at the pressure designated by the pressure class.
 - 3. Joints shall be pipe end to pipe end and pipe end to fitting.

- B. Transition from HDPE to Ductile Iron Pipe or PVC Pipe
 - 1. Provide a molded flange connector adaptor with a ductile iron back-up flange for making a flange to flange connection. If the connecting pipe is plain end then use an EBAA Iron Inc. Megaflange 2100 Restrained Flange Adaptor on the connecting pipe.
 - 2. For buried connections use a mechanical joint connection adaptor with a mechanical joint flange backup connecting to a mechanical joint pipe ductile iron pipe and when connecting to a plain end PVC pipe provide an EBAA Iron Inc. use the series 15PF00 for Restraint for C900 PVC Pipe.
 - a. Provide extended T-bolts for the connection.
 - b. Provide stainless steel stiffener inserted in the pipe.
 - 3. From the transition joint pipe restrains shall be provided at all joints within the following distances of the transition joint:
 - a. 6" diameter pipe - 15 linear feet.
 - b. 8" diameter pipe - 19 linear feet.
 - c. 10" diameter pipe - 24 linear feet.
 - d. 12" diameter pipe - 28 linear feet.
 - e. 14" diameter pipe - 33 linear feet.
 - f. 16" diameter pipe - 36 linear feet.

- C. Transition from HDPE to stainless steel.
 - 1. Provide a molded flange connector adaptor with a stainless steel backup flange for making a flange to flange connection.
 - 2. Bolts and nuts shall be 304 stainless steel with anti-seize mechanism.

2.4 SOURCE QUALITY CONTROL

- A. The following tests shall be performed on the production pipe:
 - 1. Measurement of pipe dimensions in accordance with ASTM D2122
 - a. Pipe dimensions shall be within the tolerances stated in AWWA C906 or AWWA C901 whichever is applicable.
 - b. Wall thickness variability in any diametrical cross section of the pipe shall not exceed 12%.
 - c. The outside diameter measured at the cut-end of the pipe length shall not be more than 1.5% smaller than the average outside diameter specified in AWWA C906 or AWWA C901, whichever is applicable, when measured at any point not closer than 12 inches to the squarely cut-end of the pipe length.
 - 2. Thermal stability of a pipe specimen from mid-wall area in accordance with the method described in ASTM D3350. The minimum induction temperature shall be 220°C.
 - 3. Ring-tensile strength test of pipe specimens tested in accordance with ASTM D2290. Tensile strength shall be not less than 2,900 psi.
 - 4. Quick burst test of pipe specimens in accordance with ASTM D1599. The test pressure at failure shall not be less than that which results from the minimum hoop stress value of 2,900 psi.
 - 5. Elongation at break test of five pipe specimens cut equally spaced around the circumference of the pipe in the longitudinal direction tested in accordance with ASTM D638 using a cross-head separation of 2 inches per minute. The elongation at break for each test specimen shall not exceed 400%.
 - 6. Five-second pressure test of a section of pipe tested in accordance with ASTM D1598. The pipe shall not burst, crack, spit, or otherwise fail a test pressure four times the pipe pressure class applied for five seconds. This test is also required for fittings.
 - 7. Melt index of pipe specimens tested in accordance with ASTM D1238. The resultant index shall be less than 0.15.
 - 8. Density of pipe specimens tested in accordance with ASTM D2839. The result shall be minimum 0.955 grams per cubic centimeter.
 - 9. Bend-back test in accordance with AWWA C901 or AWWA C906 whichever is applicable. Any indication of cracking or crazing shall reject the pipe.

- B. Test the PE compounds by an accredited testing agency in accordance with the applicable requirements of NSF No. 14 to demonstrate the materials are suitable for use with potable water.

PART 3 – EXECUTION

3.1 POLYETHYLENE PIPE INSTALLATION

- A. In addition to the applicable sections for installing piping, conform to the following:
 - 1. Thermal butt fuse all joints as per ASTM D2657.
 - 2. Utilize certified personnel for jointing operation.

END OF SECTION

SECTION 33 00 04

CORRUGATED METAL CULVERT PIPE (CMCP) AND FITTINGS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Circular corrugated steel pipe.
 - 2. Flared end sections.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. M36 Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
 - 2. M190 Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
- B. American Society for Testing and Materials (ASTM):
 - 1. A760 Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

1.3 SUBMITTALS

- A. Shop Drawings
 - 1. Submit shop drawings for sectional plate pipe, sectional plate arches, or sectional plate pipe arches.
 - 2. Include shop detail, erection, and other drawings showing dimensions, sizes of material, details, and other information necessary for the complete fabrication and erection of the metal work
- B. Quality Assurance/Control Submittals
 - 1. Provide manufacturer’s certification.

1.4 QUALITY ASSURANCE

- A. Mark each piece of pipe as follows:
 - 1. Manufacturer’s name or trademark.
 - 2. Date of manufacture.
 - 3. Pipe size.

- B. Provide manufacturer's certification that samples representing each lot have been tested and inspected in accordance with ASTM A760/AASHTO M36 have been found to meet the requirements for material required per this Specification Section.

1.5 DELIVERY, STORAGE AND HANDLING

A. Shipping, Handling and Unloading

1. Package pipe and fittings to prevent damage during shipping.
2. Fittings shall be on a pallet.
3. Use lifts for loading or unloading to avoid shock.
4. Do not drop materials.
5. Do not drag pipe or strike with hard objects which could scratch coatings.

B. Acceptance at the Site.

1. Inspect pipe and pipe fittings when delivered to the site and prior to installation.
2. Reject pipe for any of the following:
 - a. Uneven laps.
 - b. Variation from a straight centerline of more than ½ inch.
 - c. Ragged or diagonal sheared edges.
 - d. Loose bolts or rivets.
 - e. Fasteners which are unevenly lined.
 - f. Poorly formed seams.
 - g. Illegible brand marking.
 - h. Poorly formed seams.
 - i. Dents or bends in the metal.
 - j. Elliptical shape on round pipe.
 - 1) The average inside diameter of the pipe shall not vary more than ½ inch or 1 percent, whichever is greater.
 - 2) Measure on the inside crest of the corrugations.
 - 3) Clearly mark rejected pipe as "Rejected" with OSHA yellow paint.

C. Storage and Protection

1. Provide safe storage for material.
2. Store materials to keep free from dirt and foreign matter.
3. Store fittings in a manner that will allow them to drain and protect them from freezing.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Pipe Material

1. Corrugated steel pipe material, manufactured and fabricated in accordance with ASTM A760/AASHTO M36.
2. Metallic Coating – Zinc (galvanized).
3. Circular pipe shall be Type I.
4. Corrugation size 2 2/3" x 1/2" for pipe sizes 12" diameter through 84" diameter.
5. Material sheet thickness:
 - a. 6" diameter - 0.052 inches
 - b. 8" diameter to 21" diameter – 0.064 inches
 - c. 24" diameter to 30" diameter – 0.079 inches
 - d. 36" diameter to 54" diameter – 0.109 inches
 - e. 60" diameter to 72" diameter – 0.138 inches
 - f. 78" diameter to 96" diameter – 0.168 inches
6. Flared end sections shall meet the same requirements as the connecting pipe.

B. Gaskets

1. Band of expanded rubber in accordance with ASTM A760/AASHTO M36.

C. Band Connectors

1. Corrugations to match the pipe sections in accordance with ASTM A760/AASHTO M36.

D. Coating

1. Provide Type A, fully bituminous-coated pipe in accordance with AASHTO Standard M190.

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 33 05 05

UTILITY PIPING – GENERAL PROVISIONS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Safety and related matters.
2. Interference with the work of others
3. Existing utilities and structures.
4. Conflict with utilities.
5. Work on streets, highways, railroad right-of-way, and work in waterways and wetlands.
6. Easements.
7. Protection of property markers.
8. Cold weather.
9. Cleaning of the work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 SAFETY AND RELATED MATTERS

A. Comply with all federal, state, and local rules and regulations concerning:

1. Construction safety including confined entry.
2. Noise control.
3. Dust and smoke control.
4. Stormwater.

B. Access to Services

1. Insure free access to all fire hydrants, valve boxes, manholes, curb stops, fire alarms, police call boxes, etc.

C. Protection of Work, Public, and Property

1. Provide safe passage for local vehicular and pedestrian traffic.
2. Provide vehicular and pedestrian access to properties abutting street where utilities are being constructed.

3. Provide all necessary barricades, warning lights, and signs, signals, flagmen, etc. in accordance with federal, state, and local regulations.

D. Organize and perform construction activities to minimize the creation of airborne dust and the tracking of mud and dirt into public streets.

1. If dust is generated, implement control measures such as:
 - a. Street sweeping and cleaning.
 - b. Water sprinkling or application of chemical dust suppressant.
 - c. Cover dusty materials in piles or in transit.
 - d. Protect buildings that may be adversely affected.
 - e. Protect new and existing machinery, motors, instrument panels or similar equipment with suitable dust screens.
 - 1) Provide proper ventilation with dust screens.

3.2 INTERFERENCE WITH THE WORK OF OTHERS

- A. Arrange work in a manner as to not interfere with any other work.
 1. Coordinate work with other contracts through Owner's Representative.

3.3 EXISTING UTILITIES AND STRUCTURES

- A. The existing utilities and structures as shown on the drawings may not be all inclusive.
- B. The locations of existing utilities and structures are shown on the drawings for information to the Contractor, but should not be construed as a representative of the exact location.
- C. Maintain or provide:
 1. Service of water, sewers, gas, culverts, drains, electricity, or other utilities encountered.
 2. Temporary connections and outlets for all private and public utilities that are interrupting construction.
 3. Disposal for all drainage and sewage resulting from relocations and/or interruptions in accordance with regulations and permits of the controlling governmental agency(s).
- D. Correct any damage to below or above ground utilities and structures encountered during construction.

3.4 CONFLICT OF UTILITIES

A. Separation of Water Mains and Sewers

1. The following separations shall be minimum:
 - a. Parallel.
 - 1) 8 feet, measured center to center.
 - b. Vertical (when pipelines cross or when horizontal clearance is impossible).
 - 1) Water Main Below a Sewer: 18 inches clear. (Both pipes must be constructed of water main quality pipe and joints for ten feet either side of the crossing).
 - 2) Water Main Above a Sewer: 6 inches clear.
2. When crossing a sewer, center a full length of water main or sewer to position joints as far as possible from sewer.

B. Utility Location

1. Coordinate relocation of any utilities with the work schedule.

C. Crossing Existing Water Services

1. If water services are crossed during utility construction, and located above the utility, the Engineer may direct the contractor to insulate the water service.
2. If the depth of cover over the water service is less than six feet, insulate as required by the Engineer.

3.5 WORK ON STREET, HIGHWAY, RAILROAD RIGHT-OF-WAY AND WORK IN WATERWAYS AND WETLANDS

- A. Work on street, highway, railroad right-of-ways, or in waterways and wetlands are subject to provisions of special permits required and issued by governmental agencies having jurisdiction in addition to requirements of specifications for this work.
- B. Do not commence Work prior to receiving required permits.
- C. Provide special bonds when required by permit.
- D. Notify controlling authority prior to beginning and after completing any construction in right-of-ways or streams.
- E. Bear all expenses related to permit compliance.

3.6 EASEMENTS

- A. Owner will provide all easements.
- B. Work on the easements shall be in strict compliance with the terms of the easements agreements.
- C. Owner, easement grantee, and Contractor shall be in full agreement on the method of execution prior to beginning work.
 - 1. Only structures, trees, shrubs, and other obstructions are to be removed as mutually agreed.
 - 2. Restoration shall be equal to original condition or the conditions of the agreement.

3.7 PROTECTION OF ESTABLISHED PROPERTY MARKERS

- A. Protect all property markers (iron pipe, concrete, or wood posts, etc.) from movement from original position.
- B. Pay costs of replacement of property markers moved during construction.
- C. Re-establishment of removed property lot pins will be done by a Registered Land Surveyor in accordance with pertinent sections of the State of Wisconsin Statutes. The City of De Pere will have the right of approval of the Registered Land Surveyor. Certification of proper re-establishment of lot pins will be provided by the Contractor.

3.8 COLD WEATHER

- A. The Engineer reserves the right to order pipe laying discontinued whenever, in the Engineer's opinion, there is a danger of the quality of work being impaired because of cold weather.
- B. The Contractor shall be responsible for heating the pipe and jointing materials so as to prevent freezing of joints.
- C. No pipe shall be laid on frozen ground.
- D. When pipes are to be laid with rubber gaskets in cold weather, the gasket material shall be sufficiently warmed so as to facilitate making a proper joint.

- E. When pipes are to be laid with a solvent cemented joint in cold weather, care shall be taken to ensure the removal of all ice and snow from the jointed area prior to the application of the solvent cement.

3.9 CLEANING OF WORK

A. Pipelines

- 1. Interiors of utility pipelines (including existing) affected by construction procedures shall be free of all extraneous materials.
- 2. Pipelines shall be left clean at the completion of work.

B. Final Cleanup and Inspection

- 1. Remove the following:
 - a. Temporary offices and storage structures.
 - b. Temporary fencing and roads.
 - c. Surplus material and rubbish.
 - d. Material (liquid or solid) resulting from cleaning operations.
- 2. The Engineer and Owner may make a final inspection of the work during the progress of the final cleaning and repairing. Any portion of the work accepted by the Owner shall be kept clean by the Contractor until final acceptance of the entire project.
- 3. When the Contractor has completed the final cleaning operation, he shall notify the Engineer in writing that he is ready for final inspection.
- 4. After written notification to the Contractor, the Owner may elect to remove from the work site and/or adjacent properties, all rubbish, surplus or waste materials which the Contractor has neglected or refused to remove, and deduct the costs of removal from any monies due the Contractor.
- 5. During construction, the Contractor shall clean up as the Work proceeds. The premises shall be kept free of accumulations of waste materials and earth, rubbish and other debris resulting from the work. If in the judgment of the Engineer, the Contractor fails to keep the sites clean as described herein above, the Engineer will recommend to the Owner withholding all progress payments until the sites have been cleaned up to the Engineer's satisfaction.
- 6. All debris and waste materials and salvaged materials, unless required by the Specifications to be reused or delivered to the Owner, shall become the property of the Contractor and shall be removed by the Contractor from the construction sites.
- 7. Where truck crossings occur over sidewalks, they shall be kept free from all spilled earth and grading materials and shall at all times be maintained in a passable condition for foot traffic.

8. Generally, the transportation of materials to and from the sites shall be over regular streets. When the Contractor's operations or that of its shippers, haulers, or subcontractors are such that dirt, mud, or debris is spilled or otherwise deposited on streets, driveways, sidewalks, or other thoroughfares, the Contractor shall clean up the large chunks before the close of every day's operations or before it is broken up or becomes impacted on the surface. In case of dispute or Contractor's failure to perform this cleanup work, the Owner may clean the streets and walks, remove the rubbish, etc., and will charge the cost to the Contractor, by withholding monies due to cover all charged work.
9. After completion of work in any of the site work areas, the Contractor will remove all waste materials, rubbish and debris from and about the premises as well as all tools and surplus materials, and will leave the sites clean and ready for occupancy by the Owner. The Contractor will restore to their original condition any roads, utilities, walks, buildings, etc. disturbed or damaged by the Contractor's operations.
10. Open burning of debris will not be permitted unless specifically authorized in writing by the Owner, and then only following state, municipal or other local codes, ordinances, rules or regulations.
11. Payment for cleaning up and complying with all items in this Section shall be made incidental to construction.

END OF SECTION

SECTION 33 05 23

TRENCHLESS EXCAVATION CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Auger horizontal earth boring (boring and jacking).
2. Horizontal directional drilling.
3. Compaction methods.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A139 Standard Specification for Electric-Fusion (Arc) – Welded Steel Pipe (NPS 4 and over)

1.3 SUBMITTALS

- A. Certificate of compliance for the steel casing pipe.
- B. Horizontal and vertical location of the installed pipe during horizontal directional drilling.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Steel Casing Pipe

1. Meets the requirements of ASTM A139, Grade B.
2. No protective coating.
3. No hydrostatic test required.
4. Pipe shall be new and unused.
5. Pipe shall be straight and round.
6. Beveled ends for butt welding.
7. Straight seam or seamless pipe.
8. Minimum yield strength of 35,000 psi.
9. Pipe wall thickness to be determined by the Contractor designed for loads due to jacking and E80 loadings with the following minimums:

Nominal Pipe Diameter (inches)	Nominal Wall Thickness (inches)
Under 14	0.250
14 and 16	0.281
18	0.312
20	0.344
24	0.406
26	0.438
30	0.469
32	0.500
36	0.532
42	0.563

PART 3 – EXECUTION

3.1 INSTALLATION

A. Auger Horizontal Earth Boring (Boring and Jacking)

1. This method is to be used for the installation of a steel casing pipe under roads, railroads, streams and other obstacles as shown on the drawings.
2. Provide boring and receiving pits meeting the requirements of section "Trenching, Backfilling and Compacting."
3. The grades and slopes of the casing shall conform to the drawings.
 - a. Use a grade control head where grade is critical for sanitary and storm sewer.
 - b. Provide a water level or other device to measure the grade of the pipe casing while it is being installed.
 - c. Determine the grade of each end of the installed casing prior to removal of equipment.
4. Take care to ensure that developed thrust pressures do not disturb existing utilities in or around the bore pit area.
5. In soft unstable soil use an auger of slightly smaller diameter than the inside diameter of the casing so as not to create a void between the casing and the soil.
6. Pressure grout the void between the casing and the bore hole, if the outside diameter of the casing is over-excavated.
7. The casing pipe diameter shall be a minimum of 6" larger than the bell diameter of the carrier pipe.
8. Install casing horizontally and vertically to an accuracy of +0.5% of the length of the casing. Use an oversized casing where line and grade of the carrier pipe cannot be provided within this accuracy.
9. Provide continuous circumferential butt welds for a watertight straight and true casing pipe.
10. Support and brace the carrier pipe to prevent shifting.

11. Provide flowable fill between casing and carrier pipe conforming to the requirements for pipe abandonment under Section 31 05 10.

B. Horizontal Directional Drilling

1. This method is to be used for installation of the carrier pipe under roads, railroads, streams and other obstacles as shown on the drawings.
2. The drilling process shall be by mechanical cutting using a drill bit (cutting head) capable of drilling in rock.
3. A bentonite slurry shall be used to transport drill cuttings to the surface, stabilize the hole against collapse, lubricate and cool the cutting head.
4. The cutting head shall provide directional steering and monitoring of the actual position for a pipeline that is not straight.
5. During drilling of the pilot hole, continuously monitor the location of the cutting head and record locations at a maximum of 20 foot intervals to be used for as-built information.
6. The pilot hole exit shall provide an accuracy of 5 feet left or right, 1 foot up or down, and -5 feet to +15 feet in length from that shown on the drawings.
7. Provide tracer wire on carrier pipe.
8. Fill the annular space between the borehole and the carrier pipe with bentonite slurry.
9. Bentonite Slurry and Cuttings:
 - a. Collect slurry and cuttings by a mobile spoils recovery equipment and removed from the site.
 - b. Dispose of spoils at an acceptable site.
 - c. Do not dispose of drill cuttings (spoils) into sanitary, storm or other public drainage system.
 - d. Do not permit spoils to flow over land and contain all materials.
 - e. Upon completion of the boring and pipe installation, remove all spoils from the starting and termination pits. Restore pits to their original condition.
 - f. Cover stockpiled material when not being used to prevent runoff.
 - g. The pilot hole, preream, and pullback operations shall be in one continuous operation.

C. Compaction Methods

1. Restricted to use for lines smaller than 4" diameter in compressible soil conditions and less than 50 feet in length.
2. Do not use the backhoe bucket to push the tool or pipe.
3. Push rod, rotary or percussion methods are acceptable when the grade and slope is not critical.
4. Install the pipe horizontally and vertically to an accuracy of +1% of the length of the boring.

5. Provide boring and receiving pits meeting the requirements of section "Trenching, Backfilling and Compacting."
6. Where appropriate soil conditions permit use of compaction methods for installation of sewer laterals (4" and 6") to required grades, the following applies:
 - a. May use rotary method with track-type boring unit utilizing a rigid solid drill stem.
 - b. May use percussion method utilizing a launching platform and sighting device to obtain proper alignment.
 - c. Grade shall be maintained between 1.04% and 2.08%.
 - d. If grades cannot be maintained using these methods, then install using horizontal directional drilling.

END OF SECTION

SECTION 33 11 00**WATER DISTRIBUTION SYSTEMS****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Underground installation of pressure pipe, fittings and appurtenances.
2. Fire Hydrants
3. Valves
4. Polyethylene encasement for ductile iron pipe and fittings
5. Tracer wire
6. Insulation for pipe frost shield
7. Disinfection of water mains.

1.2 REFERENCES**A. American Water Works Association (AWWA):**

1. C105 Polyethylene Encasement of Ductile-Iron Pipe Systems
2. C219 Bolted, Sleeve-Type Couplings for Plain-End Pipe
3. C502 Dry-Barrel Fire Hydrants
4. C504 Rubber-Seated Butterfly Valves
5. C512 Air-Release, Air/Vacuum and Combination Air Valves for Waterworks Service
6. C515 Reduced Wall, Resilient Seated Gate Valves for Water Supply Services
7. C550 Protective Epoxy Interior Coatings for Valves and Hydrants
8. C600 Installation of Ductile-Iron Water Mains and Their Appurtenances
9. C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
10. C651 Disinfecting Water Mains
11. C800 Underground Service Line Valves and Fittings
12. C901 Polyethylene (PE) Pressure Pipe and Tubing, ½ Inch through 3 Inch for Water Service
13. C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 in. through 63 in. for Distribution and Transmission

- B. American Society for Testing and Materials (ASTM):
1. A48 Standard Specification for Grey Iron Castings
 2. A307-00 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 3. A575 Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
 4. B62 Standard Specification for Composition Bronze or Ounce Metal Castings
 5. B88 Standard Specification for Seamless Copper Water Tube
 6. B584 Standard Specification for Copper Alloy Sand Castings for General Applications
 7. C478 Standard Specification for Precast Reinforced Concrete Manhole Sections
 8. C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 9. C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
 10. C990 Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
 11. D2774 Standard Practice for Underground Installation of Thermoplastic Pressure Piping
 12. F1668 Standard Guide for Construction Procedures for Buried Plastic Pipe
- C. American Association of State Highway and Transportation Officials (AASHTO) :
1. H-20 Standard Specification for Highway Bridges
- D. Federal Specifications (FS):
1. SS-C-153C Cement, Bituminous, Plastic
- E. National Fire Protection Association
1. NFPA 291 Recommended Practice for Fire Flow Testing and Marking of Hydrants

1.3 SUBMITTALS

- A. A manufacturer's certification that the products were manufactured in accordance with the designated reference standards with these specifications and including test results and date of tests.
- B. Manufacturer's calculations and recommendations for joint restraint.
- C. Pipe location records.

PART 2 - PRODUCT

2.1 NO LEAD BRASS FITTINGS AND VALVES – GENERAL

- A. All fittings and valves shall be manufactured in accordance with AWWA Standard C-800, latest revision, and as further specified in these technical specifications.
 - 1. Exception: Any brass part of the fitting or valve in contact with potable water shall be made of a “No-Lead Brass”, defined for this specification as UNS Copper Alloy No. C89520 or C89833 in accordance with the chemical and mechanical requirements of ASTM B584 and AWWA C-800. This “No-Lead Brass” alloy shall not contain more than nine one hundredths of one percent (0.09% or less) total lead content by weight.
 - 2. Any brass part of the fitting or valve not in contact with potable water shall be made of 85-5-5-5 brass as defined for this specification as UNS Copper Alloy C83600 per ASTM B62, ASTM B584 and AWWA C-800.
- B. All brass fittings and valves shall be certified by an ANSI accredited test lab per NSF/ANSI standard 61, Drinking Water Components – Health Effects, Section 8 or NSF/ANSI Standards 372, Drinking Water System Components – Lead Content. Proof of certification is required.
- C. Brass fittings and valves shall comply with the United States of America Safe Drinking Water Act, and the U.S. Environmental Protection Agency.
- D. All brass fittings and valves shall have the manufacturer’s name or trademark permanently stamped or cast on it. Another marking identifying the “no lead” brass alloy, e.g., ‘NL’, shall be cast or permanently stamped on the fitting or valve.

2.2 FIRE HYDRANTS

- A. Conform to requirements of AWWA C502.
- B. Manufactured within one year of installation.
- C. Compression type shutoff with bronze by bronze seating design opening against the pressure and closing with the pressure.
- D. Main Valve Opening: 5 ¼”
- E. Minimum Barrel Diameter: 7”
- F. Provide traffic model with upper and lower barrels joined at the ground line by a separate and breakable and replaceable flange joint and providing 360 degrees rotation of upper barrel.
- G. Hydrant shall be designed to accept barrel extensions.

- H. Hydrant bolts and nuts shall be 304 stainless steel with anti-seize mechanism.
- I. Nozzles
 - 1. Provide three-way design with one 4 ½” NST pumper nozzle and two 2 1/2” NST hose nozzles.
 - 2. Provide nozzle caps with nut the same size as the operating nut and chain.
- J. Bury depth shall be 6.5 feet measured to the nearest ½ foot from the bottom of the connecting pipe to the ground line of the hydrant.
- K. Inlet connection shall be 6 inch mechanical joint with 304 stainless steel bolts and nuts with anti-seize mechanism.
- L. The hydrant top section shall be painted the color yellow, excluding the caps.
- M. The caps on the hydrant shall be painted per NFPA Standard 291, based on available fire flows as determined by the Engineer and shown on the plans.
 - 1. Class AA –Blue Caps M4137 Hydrant National Blue – Rated capacity of 1500 gpm or greater
 - 2. Class A –Green – Rated capacity of 1000-1499 gpm
 - 3. Class B –Orange – Rated capacity of 500-999 gpm
 - 4. Class C –Red – Rated capacity of less than 500 gpm
- N. Hydrant to have a 16” break-off section.
- O. 1 ½” pentagon operating nut to open left.
- P. Hydrant markers shall consist of a five (5) foot long 3/8 inch diameter fiberglass shaft attached to a heavy duty MIL SPEC zinc plated carbon steel spring mount with a flat bracket. The shaft shall be completely wrapped with alternating six (6) inch wide reflective tape strips so that there will be no exposed fiberglass. The reflective tape color shall match the hydrant cap color. Complete assembly shall be corrosion and UV resistant. Flat mounting bracket shall fit onto the 5/8-inch hydrant bolt.
- Q. Acceptable Manufacturers:
 - 1. Mueller A-423
 - 2. Waterous WB67250

2.3 VALVES

- A. General
 - 1. Valves shall be for buried service.
 - 2. Valve ends shall be push-on or mechanical joint for buried service.
 - 3. Operating stem shall turn counterclockwise to open.
 - 4. Shaft or stem shall be sealed using O-ring seals.
 - 5. Manufactured within one year of installation.

B. Butterfly Valves

1. Conform to requirements of AWWA C504 mechanical joint end valves, Class 150B
2. Used where water main is larger than 12 inches diameter.
3. Equip with traveling nut or worm gear operators.
4. Valve Body: Cast iron ASTM A126, Class B.
6. Valve Shaft: Stainless steel 304.
7. Valve Disc: Ductile iron ASTM A536 with 304 stainless steel disc edge.
8. Shaft seals shall be the self-adjusting split-V type or standard O-ring seals.
9. Operators:
 - a. The operator shall be furnished with a standard AWWA 2-inch square nut for manual wrench operation as specified in Section 19 of AWWA C-500 which shall be positively secured to the operator input shaft.
 - b. Valve to open counter clockwise.
 - c. A self-draining, self-aligning base 4-3/4 to 5 inch diameter concentric with the input shaft, shall be provided to accept a circular valve box base.
 - d. The valve shall seat closed at an angle of 90 degrees from full open.
 - e. The operator shall be self-locking, and the disc shall not creep or flutter under service conditions.
 - f. The operator shall be furnished with a permanent factory set stop at each of its travel.
 - g. Maximum input torque required to develop the rated output torque shall not exceed 150 foot-pounds for any size valve.
 - h. The operator shall be designed for the output torque shown in Table 1 of AWWA C504.
 - i. The operator case shall be completely watertight, sealed by means of approved gaskets, gasket compounds, O-rings or threaded plugs.
 - j. Operators shall be filled with suitable oil lubricant or thoroughly coated with an approved grease at the factory. If the operator lubricant is oil, suitable fill and drain plugs shall be provided.
10. Bolts and nuts for end connections shall be 304 stainless steel with anti-seize mechanism.
11. Acceptable Manufacturers: See special provisions.

C. Resilient Wedge (Gate) Valves

1. Conform to requirement of AWWA C515 mechanical joint connectors with 304 stainless steel bolts with anti-seize mechanism or push-on connectors.
2. Use where water main is 12 inches in diameter or smaller.
3. Stem shall be non-rising.
4. Bolts and nuts on the valve shall be 304 stainless steel.
5. Bolts and nuts for end connections shall be 304 stainless steel bolts with anti-seize mechanism.
6. Tapping valves shall have one end flanged with alignment lip to attach tapping sleeve, and the other end with a special flange to attach the drilling machine and adaptor.

7. Test Plugs:
 - a. The valve bonnet shall be provided with a ½ or 3/8 inch diameter threaded, solid, malleable or cast iron test plug.
8. Stem Seal:
 - a. The valve stem seal shall be O-rings. The compound shall be of Buna N or NBR rubber and have a durometer hardness of 70 +/- 5 when tested in accordance with ASTM Designation D-2240.
9. Operating Nut:
 - a. The valve shall be equipped with a standard 2 inch square operating nut with cast-on directional arrow.
 - b. Valve to open counter clockwise.
10. Valves will be fitted with a three (3) foot long diversified fabricators extension stem or equal.
11. Acceptable Manufacturers:
 - a. Mueller
 - b. Kennedy
 - c. American Flow Control/Waterous
 - d. Clow

D. Valve Boxes

1. Cast iron, three-piece screw type, 5 ¼ inch shaft, round or oval base sized for valve.
2. Threads shall be cast into top and bottom sections.
3. Cover shall be anti-rattle type mark with the word "water" on top.
4. Acceptable Manufacturers:
 - a. Tyler 6860DD
 - b. Bingham Taylor

2.4 POLYETHYLENE ENCASEMENT FOR DUCTILE IRON PIPE AND FITTINGS

A. Conform to requirements of AWWA C105.

B. Type: I

C. Class: "A" (natural color) or "C" (black).

D. Grade: "E-1"

E. Thickness: 8 mils

2.5 WATER MAIN

A. Pipe material and size shall be stated in the Proposal and shown in the Drawings.

B. If the material is not stated, water main is to be Polyvinyl Chloride Pipe (PVC).

2.6 WATER SERVICES

A. Pipe and Tubing

1. Pipe and/or tubing material and size shall be as stated in the proposal and shown on the drawings.
2. Copper tubing shall conform to the requirements of ASTM B88, Type K for sizes up to 2 inches diameter.
3. Polyethylene (PE) tubing shall be blue and conform to the requirements of AWWA C901, PE 3608, DR 9 for sizes up to 2 inches.
4. Polyethylene (PE) pipe shall be blue and conform to the requirements of AWWA C901, PE 3608, DR 11, for sizes greater than 2 inches up to 3 inches.
5. Polyvinyl Chloride Pipe (PVC) shall conform to the requirements of AWWA C900 for sizes 4 inches or greater.

B. Corporation Stops/Valves

1. Conform to the requirements of AWWA C800.
2. Ball type valve with double O-ring seals.
3. Outlet shall include a copper flare connection for copper tubing or compression connection with stiffeners for polyethylene tubing.
4. The pipe stiffener length for polyethylene tubing shall match the length of the fitting at the location of the compression nut.
5. Acceptable Manufacturers:
 - a. Ford F1000
 - b. McDonald
 - 1) 1" - 74701Q
 - 2) 1 ½" & 2" - 74701BQ

C. Curb Stops/Valves

1. Conform to the requirements of AWWA C800.
2. Ball type valve with double O-ring seals.
3. Inlet and outlet shall include a copper flare connection for copper tubing or compression connection with stiffeners for polyethylene tubing.
4. The pipe stiffener length for polyethylene tubing shall match the length of the fitting at the location of the compression nut.
5. Curb Stop to Curb Box Rod Connection
 - a. Material: Stainless steel 304
 - b. Bolt Size: ¼ - 20 x 1 ¼
 - c. Nylon Stainless Steel Locker
6. Acceptable Manufacturers:
 - a. Ford B44-444M
 - b. McDonald 6104Q
 - c. Mueller B25155

D. Tapping or Service Saddles

1. Stainless steel double strap designed for ductile iron pipe.

2. Full circumference wide band stainless steel double bolt designed for PVC pipe.
3. Required for PVC service taps and taps over 1" in diameter for ductile iron pipe.
4. All taps shall be made with a Rockwell 372, Romac, or equal service saddle.

E. Curb Boxes

1. Minneapolis pattern.
2. Cast iron lid with a 1 ¼" threaded brass pentagon plug and the work "Water" on top in raised letters with nut for trace wire.
3. Upper section shall be a minimum 1 ¼" I.D. steel pipe.
4. Base section shall be a minimum 1 ¼" I.D. cast iron.
5. The casting shall be thoroughly coated with bituminous pitch varnish or pipe dip.
6. Provide a McDonald 5660SS 48 inch stationary Type 304 Stainless Steel curb box rod.
7. Length shall be 7 foot bury with a 6 to 8 foot adjustment range.
8. Acceptable Manufacturers:
 - a. Mueller H-10300
 - b. Ford EM2-60-57
 - c. McDonald 5614

2.7 TRACER WIRE

A. Wire for Water Main Construction.

1. #10 AWG solid, 21% conductivity annealed copper-clad high carbon steel extra high strength wire.
2. 1150 lbs. average tensile break load.
3. 30 mil high molecular weight high density blue polyethylene jacket, 30 volt rating.

2.8 TRACER WIRE ACCESS BOX

A. Provide access box device in accordance with the following:

1. The covered access device (tracer wire access box) shall have:
 - a. Two pieces to allow for telescoping action adjustment and for frost control.
 - b. Top piece to extend below ground a minimum of 12 inches.
 - c. 2 ½ inch minimum diameter extension from the top piece of the access box to the top of the sewer pipe.
 - d. Lid to be heavy cast iron manufactured in accordance with ASTM A48 Class 25. The top of the lid to be permanently engraved with "WATER" by the manufacturer. The lid is to be furnished with a means of locking the lid such as a standard lockable pentagonal bolt head. Lid to be furnished with connection holes where the tracer wire is to be connected with stainless steel terminal bolts.
2. Acceptable access devices are:
 - a. The Valvco Water Tracer Wire Access Box manufactured by C. P. Test Services-Valvco, Inc, reference:
<http://www.fischer-harris.com/ValvcoTracerWireAccessBox.htm>
 - b. The Cathodic Test Box P200 series manufactured by Bingham & Taylor, reference: <http://www.binghamandtaylor.com/cathodic.htm>

3. In lieu of the above access devices furnish materials required as shown on the drawing detail for Tracer Wire Access.
4. In lieu of the above devices, a modified water valve box, approved by the Engineer will be considered, meeting the following requirements:
 - a. Cast iron, two-piece screw type, 5 ¼ inch shaft, with extension to top of sewer pipe.
 - b. Threads shall be cast into top section.
 - c. Cover shall be anti-rattle type mark with the word "WATER" on top.

2.9 COUPLINGS AND ADAPTERS

A. Flanged Coupling Adapters

1. Used for connecting plain end pipe to flanged equipment and fittings.
2. Ductile iron body and follower completely epoxy coated.
3. Plain rubber gasket.
4. Provide with anchor studs.

B. Bolted Couplings

1. Used for connecting plain end pipe to plain end pipe.
2. Steel sleeve completely epoxy coated.
3. Ductile iron follower.
4. Plain rubber gaskets.
5. Meet the requirements of AWWA C-219.

C. Tapping Sleeves

1. Tapping sleeves shall be rated at 200 psi working pressure up to 12" diameter and 150 psi working pressure above 12" diameter.
2. Sleeve and outlet flange shall be 304 stainless steel.
3. Sleeve gasket shall be full length of the sleeve waffle style 360 degree around the pipe.
4. Provide full face gasket between the outlet flange and the valve flange.
5. Tapping sleeves shall be Mueller H-034, Smith Blair 665, Dresser Style 630, or Romac.

D. Couplings and adapters shall be Dresser, Smith-Blair, or Romac Industries.

2.10 INSULATION BOARD

- A. Extruded polystyrene conforming to ASTM C578, Type IV.
- B. Each board shall be 2 inches thick x 4 feet wide x 8 feet long.

2.11 PIPE EMBEDMENT MATERIAL

- A. Soil Class A-7 - ¾" or A-8-3/8" crushed rock per section "Soils and Aggregates for Earthwork."
- B. Soil Class G-2 - "Clean earth fill per section "Soils and Aggregates for Earthwork."
- C. Sand or engineer approved material for steel casing void.

2.12 THRUST RESTRAINTS

A. Mechanical Restraints

- 1. Ductile Iron Pipe and Fittings:
 - a. Megalug Series 1100 follower gland or equal for mechanical joint restraints.
 - b. Clow "Super Lock," American "Lok-Ring" or U.S. Pipe "TR Flex" for push-on joint restraint.
- 2. Polyvinyl Chloride (PVC) Pipe:
 - a. Megalug Series 2000 PV restraint gland or equal for mechanical joint restraint.
 - b. EBAA Iron, Inc. Series 1600 for AWWA C-900 pipe push-on joint restraint and EBAA Iron, Inc. Series 2800 for AWWA C-905 pipe push-on joint restraint, or equal.
 - c. Sigma One-Lok
- 3. Alpha™ ends may be used in lieu of a mechanical restraint.
- 4. Polyvinyl Chloride (PVC) Pipe:
 - d. Megalug Series 2000 PV restraint gland or equal for mechanical joint restraint.
 - e. EBAA Iron, Inc. Series 1600 for AWWA C-900 pipe push-on joint restraint and EBAA Iron, Inc. Series 2800 for AWWA C-905 pipe push-on joint restraint, or equal.

B. Concrete Thrust Blocks

- 1. Ready-mixed concrete conforming to the following:

Class	28-day Compressive Strength (PSI)	Max. Size Coarse Aggregate	Min. Cement Content (Bags/CY)	Air Content (%)	Slump
B	3000	1 ½ Inch	4.75	6 +/-1	3 to 4 Inch

- 2. Job-mixed concrete is permitted for amounts one cubic yard or less and shall meet the same material and strength requirements as ready-mixed concrete.

PART 3 - EXECUTION

3.1 WATER MAIN PIPE INSTALLATION

A. General

1. Vertical and Horizontal Alignment:
 - a. Install pipe to maintain vertical and horizontal alignment as shown on the drawings.
 - b. Place pipe to required line and grade with a tolerance of plus or minus 0.1 feet.
 - c. Install pipe without unplanned high points in the line, and a minimum cover over the top of pipe of six (6) feet.
 - d. Provide fittings, valves and hydrants at the required locations with joints centered, spigots bottomed and valve and hydrant stems plumb.
2. Commence pipe installation only after the trench has been dewatered below the trench bottom and all necessary sheeting and bracing is in place.
3. Use full length pipe except where necessary at valves and fittings.
4. Cut pipe to provide a smooth end at a right angle to the longitudinal axis of the pipe.
5. Assemble pipe in accordance with the written recommendations of the manufacturer.
6. When the interruption or operation of an existing pressure pipeline system is necessary to complete construction, conform to the following:
 - a. Owner will operate system at Contractor's request.
 - b. Confine requests to Owner's normal working schedule.
 - c. Do not operate controls or appurtenances.
7. Excavate to existing water main. Adjust line and grade if necessary to avoid use of extra fittings.
8. Unless otherwise ordered, pipe shall be laid with the bell ends facing the direction of laying. When the grade exceeds two feet of rise per one hundred feet of trench, the bells shall face upgrade.
9. Permissible joint deflection shall conform to the following table:

Maximum Permissible Joint Deflection – Rubber Gasket Joint			
Pipe Size	Max. Def. Degrees	Max. Def. in. per 18 ft	Radius Of Curve - ft
6	5-00	19	205
8	5-00	19	205
10	5-00	19	205
12	5-00	19	205

10. Remove and salvage plugs, flush pipes and incidental sections of existing water main as requested by Engineer.
11. Maintain five (5) feet between fittings.
12. Do not insert pipe beyond the stop marks at joints.
13. Bolts are to be tightened with a torque wrench to the manufacturer’s recommendations.

B. Open Cut Method

1. Pipe construction of any pipe material shall follow the recommended procedures of ASTM F1668.
2. Trench requirements shall conform to section "Trenching, Backfilling and Compacting".
3. Keep pipe clean during and after laying.
4. Do not roll, drop, or dump pipe appurtenances into the trench.
5. When laying operations are interrupted or terminated, temporarily seal pipe ends to prevent entry of water, debris, small animals, or other types of contamination. Prevent flotation of the sealed pipe.

C. Trenchless Excavation Method

1. Boring and Jacking:
 - a. Provide casing pipe bored and jacked in-place in accordance with section "Trenchless Excavation Construction," at line and grade to accommodate the carrier pipe.
 - b. Install carrier pipe at line and grade through casing pipe blocked to prevent contact with the casing pipe.
 - c. Fill the annular space between casing pipe and carrier pipe with sand or pea gravel.
2. Horizontal Directional Drilling:
 - a. Install pipe directly by horizontal directional drilling in accordance with section "Trenchless Excavation Construction" at the line and grade shown on the drawings.
 - b. Design pipe as required above that specified to accommodate tensile stress during the installation process.

D. Ductile Iron Pipe Installation

1. Install pipe and appurtenances in accordance with AWWA C600.
2. Install pipe and fittings with polyethylene encasement in accordance with AWWA C105.
3. Pipe shall be cut at right angles to the centerline of the pipe. Cutting shall be done in a neat workmanlike manner without damage to the pipe so as to leave a smooth end. All pipes shall be cut with an approved mechanical cutter. The cut end of a pipe to be used with a rubber gasket joint shall be tapered by grinding or filing about 1/8 inch back at an angle of approximately 30 degrees with the centerline of the pipe, and any sharp or rough edges shall be removed.

E. Polyvinyl Chloride (PVC) Pipe Installation

1. Install pipe and appurtenance in accordance with AWWA C605.
2. Pipe bending is not permitted.
3. For shorter than standard pipe lengths, field cuts may be made with either hand or mechanical saws or plastic pipe cutters. Ends shall be cut square and perpendicular to the pipe axis. Spigots shall have burrs removed and ends smoothly beveled by a mechanical beveler or by hand with a rasp or file. Field spigots shall be stop-marked with felt tip marker or wax crayon for proper length of assembly insertion. The angle

and depth of field bevels and lengths to stop-marks shall be comparable to factory pipe spigots.

F. Polyethylene (PE) Pipe Installation

1. Install pipe in accordance with ASTM D2774.

G. Pipe Embedment

1. Prestressed concrete cylinder pipe and ductile iron pipe Class "C" embedment:

- a. Bedding:

- 1) 4" below pipe place Soil Class A-7 or A-8 material.
- 2) 6" below pipe place Soil Class A-7 or A-8 material if trench bottom is rock.
- 3) Place and work bedding material by hand to insure all excavated voids are filled.

- b. Haunching and Initial Backfill:

- 1) From bedding material to one-sixth of pipe outside diameter use Soil Class A-7 material placed and worked by hand to insure all excavated voids are filled.
- 2) From one-sixth of pipe outside diameter to 12" above the pipe use Soil Class G-2 material compacted in-place to 95% standard proctor density using hand tampers or impact tampers.

2. Plastic Pipe - Class "B" Embedment:

- a. Bedding, Haunching and Initial Backfill:

- 1) 4" below pipe to 12" above the pipe, place Soil Class A-7 or A-8 material work by hand to insure all excavated voids are filled.
- 2) If in rock, place Soil Class A-7 or A-8 material 6" below pipe to 12" above the pipe and work by hand to insure all excavated voids are filled.

3. Block pipe installed through steel casing so as not to touch steel casing and fill the annular space between steel casing and carrier pipe.

3.2 THRUST RESTRAINTS

A. Provide at mechanical joint and push-on joint connections including valves, hydrants, and fittings including plugs, caps, tees, reducers and bends.

1. Alpha™ ends may be used in lieu of a mechanical restraint.

B. Provide thrust restraint with mechanical restraints and concrete thrust blocks which physically prevent joint separation. Thrust blocks are to be constructed to transfer the thrust load from the pipe to the undisturbed soil of the trench wall.

1. When using mechanical restraints, restrain the fitting joints within the following minimum pipe length on each side of the fitting unless manufacturer's submitted calculations and recommendations indicate otherwise:

Restrained/Tied Pipe Length Chart					
Minimum Length Requiring Restraints					
Fitting Type	6 inch	8 inch	10 inch	12 inch	16 inch
11.25° Bend	10	10	10	10	10
22.5° Bend	10	10	10	10	10
30° Bend	10	10	10	10	10
45° Bend	10	10	10	10	10
60° Bend	10	20	20	20	20
90° Bend*	20	20	30	40	40

Restrained/Tied Pipe Length Chart					
Minimum Length Requiring Restraints					
Tee (Side Tied)	20	20	30	40	40
Stubs or Dead Ends	20	20	30	40	50
Cross with Plugged End	20	20	30	40	40
Valve at End of Line	20	20	30	40	40

*Use of 90° Bends requires Engineer Approval

2. Where grade changes are made in the line by means of bends, secure the top bends by mechanical restraints and secure the bottom bends by means of poured in-place concrete thrust blocks and provide mechanical restraints within a pipe length of 30' of the joint.
- C. Install mechanical restraints in accordance with the manufacturer’s recommendations. Use a torque limiting twist off nut without the need for a torque wrench to insure proper actuation of the restraint wedge.
 - D. Encase mechanical restraints, associated materials, and the restrained pipe with polyethylene. Encasements are to extend five (5) feet beyond restraint.
 - E. Restrain hydrants with mechanical restraints or with tie rods connecting all joints between the hydrant and the main line.

3.3 HYDRANTS

- A. Install where shown on the Drawings in accordance with AWWA C600.
- B. Install hydrants plumb with the nozzles parallel with or at right angles to the road as determined by the Owner.
- C. Set to grade with breakaway flange not more than 2 inches above or below the grade established by the Engineer.
- D. Provide drainage at the base of the hydrant placing crushed rock pipe bedding material.

- E. If groundwater is above the drain port or the drain port is within 8 feet of a sanitary sewer or storm inlet, then plug the port.
- F. Repair any paint chips or finish deficiencies that occur during construction.

3.4 VALVES

- A. Install in accordance with AWWA C600.
- B. Provide resilient wedge (gate) valves for sizes to 12 inches.
- C. Provide butterfly valves for sizes over 12 inches.
- D. Valves shall be supported on 6 inches of soil class A-7 or A-8 crushed rock pipe bedding material.
- E. Install valves in the closed position.
- F. Provide a valve box centered plumb over the operating nut of the valve and placed such that the box will not transmit shock or stress to the valve. Adjust the top of the valve box flush with finished grade.
- G. Provide and connect air release, vacuum relief valves to the main with a tee fitting and isolation valve. Install per manufacturer's recommendations.

3.5 CONNECTIONS TO EXISTING WATER MAIN

- A. Cut-in Connection
 1. Cut existing main only large enough to accept a mechanical joint ductile iron fitting or valve directly connected to one end of the existing pipe.
 2. Connect the other end using a ductile iron cut-in sleeve connected to the fitting or valve and the other cut end of the existing water main connected by mechanical joint end of the cut-in sleeve.
 3. Fittings shall be mechanical joint ductile iron or Hymax.
- B. Tapped Connection
 1. Connect to the existing water main using a tapping sleeve and tapping valve.
 2. The cut in the existing water main shall be full diameter.
 3. Provide the type of connection stated in the drawings.

3.6 INSULATION FOR PIPE FROST SHIELD

- A. Provide where shown on the Drawings.
- B. Install insulation board in an inverted U around the pipe.

- C. The top width of the insulation board frost shield shall be the same as the trench width centered over the pipe.
- D. The sides of the U shall be 2' high with the bottom of the legs at least to the springline of the pipe.
- E. Install the insulation board in layers to provide a minimum thickness of 4" or the thickness stated on the Drawings.
- F. Install such that there are no voids under the insulation.

3.7 POLYETHYLENE ENCASEMENT

- A. Wrap underground ductile iron pipe.
- B. Wrap underground fittings, valves and valve boxes.
- C. Wrap mechanical restraints and accessories.
- D. Wrap all portions of hydrants below grade.
- E. Install in accordance with AWWA C105.
- F. Provide Class "C" polyethylene when exposure to sunlight will exceed two weeks.
- G. The polyethylene wrap shall be cut approximately five (5) feet longer than that of the pipe section and fittings. After assembling the pipe joint, the polyethylene shall be overlapped approximately one (1) foot and at all joints sealed with approved adhesive tape. Additional taping shall be used a three (3) foot intervals along the pipe. Any rips, punctures or other damage to the polyethylene shall be wrapped immediately with adhesive tape. Before installing the polyethylene wrap the exterior of the pipe shall be free of foreign material.
- H. When valves, tees, crosses, etc., cannot be wrapped practically in a tube, flat sheet or split tube shall be used. All seams shall be taped securely.
- I. The bedding and cover material shall be placed with care so as to prevent damage to the polyethylene wrap. Any rips or punctures in the wrap shall be repaired immediately.

3.8 TRACER WIRE

- A. Provide for water main.
- B. Tape wire directly to pipe at a minimum of three points per 20 foot length of pipe.

- C. Extend on all hydrants from the water main and the hydrant lead up the hydrant and into a tracer wire access box then continue back down to the water main so that a continuous strand of wire is achieved. The access box will be located adjacent to the hydrant, on the street side.
- D. Water main tracer wire at the curb box will be brought to the surface and with eighteen (18) inches of slack fastened to the curb box with plastic wire tie. The lateral will be marked with an eight (8) feet long, treated four by four (4"x4").
- E. Extend wire up to the surface at access points.
- F. Splices
 - 1. Maximum of one splice between access points.
 - 2. Splice connections shall be made using solder connections or other connections approved by Engineer.
- G. Connect tracer wire to ductile iron by welding when connecting new water main to existing ductile iron water main.

3.9 WATER SERVICES

- A. Location
 - 1. Install service laterals per the detail.
- B. Corporation Stops
 - 1. Install a 2 o'clock and 10 o'clock position on the pipe circumference.
 - 2. Do not install taps closer than 2 feet from the end of the pipe and not closer than 18" between taps.
 - 3. Tap ductile iron pipe in accordance with AWWA C600.
 - 4. Install service connections to PVC pipe in accordance with AWWA C605 using service saddles.
 - 5. Install corporation stops with the pipeline at normal working pressure to visually observe any leaks.
 - 6. Tap the service with the use of manual feed equipment using a cutter designed specifically for the material being tapped.
 - 7. Provide seven (7) feet of depth at the property line.
 - 8. Construct services without any coupling from the corporation to the curb box.
 - 9. Water services from the main to the curb box shall be HDPE or PVC per the "Materials Section".
 - 10. Water services from the curb box to existing copper water service shall be copper, unless HDPE is approved by the Engineer. HDPE may be allowed to accommodate bending the water service to connect to a shallower existing service. Connect tracer wire to copper water service with clamp.

- C. Install service pipe with horizontal curve from the service connection back to the straight trench to the property line.
- D. Install curb stops at the property or as shown on the Drawings.
 - 1. Provide curb box centered over the operating nut of the valve.
 - 2. Provide shut-off extension rod on the curb stop valve operator.
 - 3. Provide a stainless steel bolt and locking nut to connect the curb stop to the stainless steel curb box rod.
 - 4. Top of the curb box shall be adjusted flush with the finished grade.
 - 5. Mark the location with a treated four by four (4"x4") board installed four (4) feet in the ground and four (4) feet out of ground. Water marker shall be painted blue.
 - 6. If an existing water service being replaced is shallow, the Engineer may direct the Contractor to replace the water service beyond the sidewalk.
 - 7. Provide valve box adapter around curb box if located in concrete.
- E. Construct a clay dam around the lateral at the end of the new lateral, prior to the curb stop.
 - 1. Clay dam is to be 12" thick.
 - 2. Install in place of the bedding stone and initial backfill.
- F. Insulate water service if within 12" to the bottom of a sewer.
- G. Do not install water main above a storm sewer without approval from the Engineer.

3.10 FIELD QUALITY CONTROL

- A. Provide the following pipe tests:
 - 1. Perform pressure and leakage test for pressurized pipelines prior to connecting water services.
 - 2. Perform a secondary leakage test after all services and curb stops are installed.
 - a. Notify all residents of test.
 - b. Test shall be performed at water system pressure following the procedure identified in Section 01 45 23.
 - c. Close all curb stops in the section during the test.
 - 3. Continuity testing for tracer wire installed.

3.11 DISINFECTION AND BACTERIOLOGICAL TESTING

- A. Provide disinfection and bacteriological testing according to AWWA C651-14 and section NR 811.73, Wisconsin Administrative Code.
- B. If piping was contaminated during storage, construction, or repair, the pipe shall be flushed to remove any foreign material that may have entered the pipe prior to disinfection.

C. Disinfect with Tablet Method.

1. Place the required number of tablets as follows:
 - a. The inlet end of each pipe section, including branch lines. The number of tablets shall be per the following:

Pipe Diameter (Inches)	13 or less feet (Number of Tablets)	18 feet (Number of Tablets)	20 feet (Number of Tablets)
4	1	1	1
6	1	1	1
8	1	2	2
10	2	3	3
12	3	4	4
16	4	6	7

Refer to AWWA C651-14 for larger diameters

- b. Each hydrant, hydrant lead, and other appurtenances.
 2. Attach tablets with food-grade adhesive to the top inside surface of the pipe.
 - a. Use adhesive approved by USDA for contact with edible products.
 - b. Adhesive shall be Permatex Form-A-Gasket No. 2, Permatex Clear RTV Silicone, or equal.
 - c. Permatex Form-A-Gasket No. 1 is not acceptable.
 3. Fill in a manner such that the water velocity within the main will not exceed 1 fps.
 4. Water is to remain in the pipe for a minimum of 24 hours. If the water temperature is less than 41 degrees F, the water is to remain in the pipe a minimum of 48 hours.
- D. Verify Chlorine Residual. Confirm the chlorine residual after 24 or 48 hours is greater than 0.2 ppm.
- E. Flush Chlorinated Water. Chlorinated water shall be flushed until the chlorine residual returns to background level for the distribution system. Water with a chlorine residual greater than distribution system must be de-chlorinated prior to discharge to the ground surface or storm sewer.
- F. Verify by Bacteriological Testing. Following flushing, the water main shall be tested for coliform analyses as follows:
 1. New water mains.
 - a. Two sets of samples collected 16 hours apart; or
 - b. Two sets of samples collected after the fresh water has remained in the main for at least 16 hours. The sets shall be collected no less than 15 minutes apart.
 - c. A set of samples includes: one sample every 1200 feet, one sample at the end of the newly installed line and one sample at each branch greater than one pipe length.

2. Repaired mains that are depressurized and partially or wholly depressurized.
 - a. One set of samples after flushing.
 - b. The line may be reactivated prior to completion of the bacteriological analyses.
 - c. A set of samples includes: one sample downstream of the repair site (if flow direction is unknown, then one sample from each end of the repair site) and every 200 feet of pipe that was shut down.
 3. Repaired mains that were maintained under pressure at all times. No bacteriological testing is required.
- G. Water from all new mains must successfully pass a bacteriological test in accordance with the requirements of the Department of Natural Resources before the main is placed in service. This test shall be taken by the City of De Pere.
- H. Upon successful completion of disinfection, place the water main in service to maintain system pressure.

ND OF SECTION

SECTION 33 31 00**SANITARY SEWER SYSTEMS****PART 1 – GENERAL****1.1 SUMMARY****A. Section Includes**

1. Gravity sanitary sewer installation.
2. Precast concrete and concrete masonry manholes.
3. Manhole castings.
4. Manhole drops.
5. Sewer services.
6. Tracer wire.

1.2 REFERENCES**A. American Society for Testing and Materials (ASTM):**

1. ASTM A48 Standard Specification for Gray Iron Castings
2. ASTM C139 Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
3. ASTM A240 Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
4. ASTM C270 Standard Specification for Mortar for Unit Masonry
5. ASTM C476 Standard Specification for Grout for Reinforced and Non-reinforced Masonry
6. ASTM C478 Standard Specification for Precast Reinforced Concrete Manhole Sections
7. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
8. ASTM C913 Standard Specification for Precast Concrete Water and Wastewater Structures
9. ASTM C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
10. ASTM C1173 Standard Specification for Flexible Transition Couplings for Underground Piping Systems
11. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
12. ASTM D4101 Standard Specification for Propylene Plastic Injection and Extrusion Materials

B. American Association of State highway and Transportation Officials (AASHTO):**C. Federal Specifications (FS):**

1. FS SS-C-153C Cement, Bituminous, Plastic.

1.3 SUBMITTALS

- A. A manufacturer's certification for each product stating that the products were manufactured in accordance with the designated reference standards with test results and date of tests.

PART 2 – PRODUCTS**2.1 PIPE****A. Pipe Material**

- 1. PVC Sewer Pipe shall be in accordance with Section 33 00 02 Polyvinyl Chloride (PVC) Pipe and Fittings.
- 2. Pipeline material shall be PVC Pipe unless stated elsewhere in the proposal schedule or as shown on drawings
- 3. Pipe diameters shall be as shown on drawings.

B. Wyes, Tees, Risers and Fittings

- 1. Wyes, tees and fittings shall be the same type of material and class as the mainline pipe.
- 2. Risers and fittings shall be the same material and class as the service connections.
- 3. Tees can only be used for connecting to existing sanitary sewers when approved by the Engineer.
- 4. Wye branches for a lined sewer shall be a saddle type connector compatible with the lined pipe. Acceptable manufacturers:
 - a. Fernco Tap Saddle
 - b. GPK gasketed sewer fittings,
 - c. Approved equals (saddle wye gasket branch and gasket skirt with straps) will be considered.

2.2 TRANSITION COUPLINGS**A. Couplings for transition between dissimilar pipe diameters or dissimilar pipe materials**

- 1. Fernco Inc. or Mission Rubber Company are acceptable manufacturers.
- 2. Conform to ASTM C1173.
- 3. Provide stainless steel shear rings, bands, nuts and housings of marine grade stainless steel conforming to ASTM A240.

2.3 MANHOLES**A. Precast Reinforced Concrete Manholes**

- 1. Components including base sections, riser sections, grade rings (adjustment rings), eccentric cone, flat slab top and manhole reducing bench shall meet ASTM C478.
- 2. Base section shall include base riser section with integral monolithic bottom extending minimum of 6 inches beyond riser section.
- 3. Tops for manholes shall be eccentric cone or, if required elsewhere, flat slab top.

4. Adjusting rings
 - a. Precast concrete minimum of 2 inches thick.
 - b. Rubber: Infra-Riser, Pro-Ring, or approved equal.
 5. Eccentric cones, flat slab tops and adjusting rings.
 - a. Shall have a 24 inch diameter opening.
 - b. Shall support AASHTO H-20 loadings.
 6. Joints between components.
 - a. Joint design shall be in accordance with ASTM C990.
 - b. Gasket shall be the 1 ¼ inch thick butyl rubber material meeting requirements of AASHTO M-198 Type B flexible plastic gasket and ASTM C990 butyl rubber sealant.
 7. Connector between Precast Reinforced Manhole Structures
 - a. Resilient flexible connector shall meet ASTM C923.
 - b. The seal between the flexible connector and the manhole shall be by casting the connector integrally with the manhole wall.
 - c. The seal between the connector and the pipe shall be by compression of the resilient material against the outside of the pipe.
 - d. Factory made manholes shall use A-Lok, Z-Lok, or equal.
 - e. Where an existing manhole is core drilled in the field, the flexible connector shall be NPC Inc., Kor-N-Seal or Press-Seal Gasket Corporation PSX:Positive Seal.
- B. Bituminous plastic cement shall meet Federal Specification SS-C-153C, Type I.
- C. Manhole Steps
1. Steel reinforced copolymer polypropylene meeting ASTM C478.
 2. Copolymer polypropylene shall meet ASTM D4101.
 3. Steel reinforcement shall be ASTM A615, Grade 60, ½ inch minimum steel reinforcing rod.
 4. Step shall be 12 inches wide and project from the wall between 5 inches and 7 inches.
 5. Minimum design live load shall be a single concentrated load of 300 lbs. when in place.
- D. Castings
1. Shall be ASTM A48, Class 35B, gray iron.
 2. Manhole frame and covers shall be non-rocking.
 3. Manhole covers for sanitary sewer shall be self-sealing with concealed pick hole.
 4. Shall be of uniform quality free from blowholes, shrinkage, discoloration and other defects.
 5. Shall be heavy duty designed for AASHTO H-20 loads.
 6. Type 1 Frame and Cover: Neenah Foundry No. R1500 unless stated elsewhere in the proposal or as shown on the drawings.
- 2.4 PIPE EMBEDMENT MATERIAL
- A. Soil Class A-7 or A-8 crushed rock per section “Soils and Aggregates”.

2.5 TRACER WIRE

- A. Tracer wire will be continuous, single-strand #12 solid copper THHN wire with a continuous coating of polyethylene insulation suitable for direct burial in wet locations.
- B. Tracer wire on sanitary laterals will have green colored insulation.

PART 3 – EXECUTION

3.1 GRAVITY SEWER INSTALLATION

A. General

- 1. Vertical and Horizontal Alignment
 - a. Install sewer pipe to maintain vertical and horizontal alignment as shown on the Drawings.
 - b. Use laser equipment mounted in a manner to permit beam to shine through pipe.
 - c. Use a target to check each pipe installed.
 - d. Check laser beam alignment and grade a minimum of every 100 feet.
 - e. Use a fan to control air temperature variations in pipe and reduce bending of laser beam.
- 2. Commence pipe installation only after the trench has been dewatered below the trench bottom and all necessary sheeting and bracing is in place.
- 3. Install pipe starting at the downstream end and proceed toward the upstream.
- 4. Install plastic pipe in accordance with ASTM D2321, as revised by these specifications.

B. Pipe Embedment

- 1. Plastic Pipe – Class “B” Embedment:
 - a. Bedding, Haunching and Initial Backfill
 - 1) 4” below pipe to 12” above the pipe, place Soil Class A-7 or A-8 material work by hand to insure all excavated voids are filled.
 - 2) If in rock, place Soil Class A-7 or A-8 material 6” below pipe to 12” above the pipe and work by hand to insure all excavated voids are filled.

C. Pipe Installation

- 1. Open Cut Method:
 - a. Trench requirements shall conform to Section “Trenching, Backfilling, and Compacting.”
 - b. Do not use support blocking.
 - c. Proceed pipe laying upgrade with spigot pointing in direction of flow.
 - d. Lay each pipe true to line and grade within tolerances required for laming.
 - e. When pipe installation is not in progress, provide the forward end of the pipe with a temporary plug to prevent foreign material from entering.
 - f. Push “home” the spigot end of the pipe joint in the socket before proceeding to install the next pipe.
When connecting to an existing sewer not terminating in a manhole, uncover the end of the existing sewer prior to laying sewer to allow horizontal and vertical adjustments.

- g. Install pipe such that pipe joints are located far enough from the manhole outside wall to permit future pipe repair without damaging the manhole and the joints shall not fall within manhole walls.
- 2. Trenchless Excavation Method
 - a. Auger horizontal earth boring (boring and jacking)
 - 1) Bore and jack steel casing pipe at location and diameter or larger shown on the
 - 2) Drawings in accordance with Section “Trenchless Excavation Construction” at line and grade to accommodate the gravity carrier pipe.
 - 3) Install the gravity carrier pipe at line and grade through the casing pipe blocked to prevent contact with the casing pipe.
 - 4) Fill the annular space between casing pipe and gravity carrier pipe with sand or Engineer approved equal.
 - b. Horizontal directional drilling
 - 1) Install gravity carrier pipe in accordance with Section “Trenchless Excavation Construction” at line and grade and location shown on the Drawings.
 - 2) Fill the annular space between the bore hole and the gravity carrier pipe with a bentonite slurry.
- D. Manholes
- 1. General Installation Requirements:
 - a. Depths shown on Drawings shall be considered approximate.
 - b. Establish flow lines and casting elevations from grade stakes and cut sheets.
 - c. Provide 6 feet minimum height from top of casting to flowline.
 - d. Place bases on a minimum of four (4) inches of bedding material:
 - 1) Soil Class A-7 or A-8.
 - 2) Place and work by hand to insure all excavated voids are filled.
 - 3) The maximum amount of adjusting rings is twelve inches.
 - e. Seal exterior of lift holes with bituminous plastic cement.
 - f. Fill the following with mortar and finished smooth.
 - 1) Interior joints and lift holes.
 - 2) Annular space around pipes: interior bottom half only.
 - g. Construct manholes in accordance with the appropriate detail drawings.
 - h. Install structures plumb.
 - 2. Detailed Installation:
 - a. Unless indicated otherwise, provide precast concrete manhole construction.
 - b. Four foot diameter shall be considered standard.
 - c. Pitch casting to match street crowns where applicable.
 - d. Provide precast risers in a combination of lengths to minimize the number of joints.
 - e. Install Butyl Rubber Joint Sealant at risers:
 - 1) Rope configuration.
 - 2) Install to be compressed by subsequent riser.
 - f. Manhole adjusting
 - 1) Manholes must have only **ONE** concrete ring (2”, 4”, or 6”) on top of the cone section.
 - a) Asphaltic Concrete Pavement - Secure ring to the pre-cast cone section with a 3 and ½ inch wide Kent Seal or equal.
 - b) Concrete Pavement – Secure ring to pre-cast cone section with concrete vibrated in place during the paving operation.

- 2) For manholes in pavement, above the concrete ring attach ½ inch thru 3 inch thick tapered rubber ring using two (2) 5/16 inch bead above and below the ring, of sealant type as recommended by the rubber ring manufacturer. There shall be a minimum of 2" in depth of rubber rings.
 - g. The maximum amount of adjusting rings is twelve inches. Do not enter manhole with pipe through cone section.
The pipe shall enter the barrel of the manhole through a flexible, watertight gasket or connector.
 - h. Precast flat top may be used in lieu of a cone section when elevation is limited.
Provide Type 1 frames and covers for each manhole unless otherwise shown on the plan details.
 - i. Manhole Drops:
 - 1) Conform to the detail Drawings.
 - 2) Furnish where designated on Drawings.
 - j. Inverts:
 - 1) Shall conform to the following:
 - a) Shape to the lower half diameter of the largest connecting pipe.
 - b) Slope concrete bench upward to manhole wall.
 - c) Maintain a uniform flow line slope through manhole which matches minimum pipe slope.
 - 2) Precast manholes shall be furnished with a manufacturer installed invert.
 - k. Future Sewer Connections:
 - 1) Pipe stubs shall be provided as shown on the drawings.
 - 2) Stubs shall extend a maximum of 12 inches from outer wall of structure unless otherwise stated.
 - 3) Stub shall be capped or bulkheaded and water tight.
- E. Sewer Services
1. Laterals:
 - a. Unless otherwise specified, terminate laterals at the property line.
 - b. In the absence of grade stakes, install laterals deep enough to pick up the lowest service point, or a minimum depth of 10 feet, whichever is greater.
 - c. Install laterals in conformance with all plumbing codes and ordinances.
 - d. Provide cleanouts required by plumbing codes and ordinances as part of the lateral installation.
 - e. When a lateral is not connected for immediate use:
 - 1) Mark the location with a 4" x 4" pressure treated board, installed 4 feet in the ground and 4 feet out of the ground. Sanitary marker shall be painted green.
 - 2) Provide a watertight cap on the lateral end.
 - f. Install sewer lateral and water services with location and separation per the details.
 - g. Construct a clay dam around the lateral at the right-of-way, or at end of the new lateral.
 - 1) Clay dam is to be 12" thick
 - 2) Install in place of the bedding stone and initial backfill
 2. Risers:
 - a. Risers shall be located at the mainline pipe unless noted otherwise on the plans or in the special provisions.
 - b. Bends shall be 45 degrees.
 - c. Riser pipe shall be placed on a minimum of four (4) inches of bedding material.

- 3. Service Branches:
 - a. New Sewers: Install a factory assembled wye branch wherever possible.
 - b. Existing and Lined Sewers:
 - 1) Provide “Y” branches with a saddle type connector compatible to the pipe material being used.
 - 2) Provide concrete or hard wood blocking under the wye.

F. Connecting New Pipe to Existing Pipe

- 1. If pipe are of the same material and size, then use a coupling of the same pipe material designed for coupling of the same material and size.
- 2. If pipe are of dissimilar material or size or there is no coupling made of the same material, then provide a transition coupling with a stainless steel shear ring or approved equal. Provide bushings or inserts to maintain the flow line through the connection.

G. Joints

- 1. Construct joints in compliance with manufacturer’s recommendations.
- 2. Utilize full length pipe except at manholes or service branches.

3.2 INSULATION FOR PIPE FROST SHIELD

- A. Provide where shown on the Drawings.
- B. Install insulation board in an inverted U around the pipe.
- C. Install insulation board with the top insulation board the same width as the trench centered over the pipe.
- D. Install the sides of the U-shape two feet high with the bottom of the legs at least to the springline of the pipe.
- E. Install the insulation board in layers to provide a minimum thickness of 4 inches or the thickness stated on the Drawings.
- F. Install such that there are no voids under the insulation.

3.3 BULKHEADS

- A. Bulkhead new construction to protect existing sewers from water, dirt, and debris.
- B. Do not remove bulkheads until new construction is accepted for use.
- C. Prior to removal of bulkhead, remove all material (liquid or solid) which accumulated behind bulkheads.

3.4 CLEANING AND REPAIRING SEWER LINES

- A. Clean as follows:
 - 1. All new sewer lines installed under this contract.
 - 2. Any existing sewer lines which are affected by construction.
- B. Furnish water and jetting equipment for cleaning operation.
- C. Repair all visible leads and defects, whether or not the sewer lines have been subject to all required tests.
- D. Remove any stuck cleaning, inspection or testing equipment from sewer lines.

3.5 TRACER WIRE

- A. Provide for all non-metallic service laterals within public right-of-way.
- B. Lateral or branch tracer wire splice connections will be typical Western Union-type solder splice made by stripping the coating off the main run tracer wire and then tightly wrapping the branch tracer wire around the main run tracer wire a minimum of 8 times. Both wire splices would then be soldered with a self-flux, 50-50 rosin core solder and tightly wrapped with a 1 ½ “ wide by 3.2 mm Scotchfill™ electrical insulation tape, or equivalent then coated with 3M Scotchkote™ electrical coating, or equivalent so that no copper wire is exposed. A stripping tool shall be used to remove the plastic coating on the wire. The Contractor will be responsible to have all the correct types of tools necessary to install the tracer wire materials as specified above and to ensure that the tools are in good working order.
- C. Tracer wire will be securely attached to the mainline sewer pipe, within (6) six inches of each end of the pipe, and at equally spaced locations with a maximum spacing of (6) six feet. Any exposed copper wire will be sealed and covered with materials approved by the Engineer.
- D. Tracer wire at the end of laterals on new sewer construction shall be brought to the surface at the right-of-way perpendicular to the end of the lateral and will be inserted into a three (3) foot long piece of a one (1) inch PVC with a double slotted cap and securely attached to the treated four by four (4”x4”). The top of the four by four will be placed such that four (4) feet extends above the finished grade. The one (1) inch PVC shall be placed such that eighteen (18) inches extend above the finished grade. The tracer wire at the top of the PVC will protrude out of one of the slots and back into the PVC pipe through the other slot with at least eighteen inches of slack.
- E. Tracer wire at the end of laterals on sanitary sewer replacements with connections to existing laterals shall be as follows:
 - 1. Wrapped around the curb stop.

2. If the lateral is not located near the curb stop, provide a ½ -inch diameter by 4 ft. long rod to connect the tracer wire at the connection to the existing lateral.

3.6 FIELD QUALITY CONTROL

- A. Provide the following service in accordance with the section on Testing and Inspection of Pipeline Appurtenances.
 1. Televiser all sanitary sewers.
 2. Lamp sanitary sewers if required by the Engineer.
 3. Perform a low pressure air test.
 4. Perform a deflection test on all plastic pipes.
 5. Perform a continuity test on all tracer wire.

END OF SECTION

SECTION 33 41 00**STORM SEWER SYSTEMS**

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Gravity storm sewer installation.
2. Precast concrete manholes.
3. Precast concrete inlets.
4. Manhole, inlet and catch basin castings.
5. Sewer services.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A48 Standard Specification for Gray Iron Castings
2. ASTM A240 Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
3. ASTM C139 Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
4. ASTM C91 Standard Specification for Masonry Cement
5. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes
6. ASTM C270 Standard Specification for Mortar for Unit Masonry
7. ASTM C476 Standard Specification for Grout for Reinforced and Nonreinforced Masonry
8. ASTM C478 Standard Specification for Precast Reinforced Concrete Manhole Sections
9. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
10. ASTM C564 Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
11. ASTM C913 Standard Specification for Precast Concrete Water and Wastewater Structures
12. ASTM C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
13. ASTM C990 Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
14. ASTM C1173 Standard Specification for Flexible Transition Couplings for Underground Piping Systems
15. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
16. ASTM D4101 Standard Specification for Propylene Plastic Injection and Extrusion Materials

B. American Association of State highway and Transportation Officials (AASHTO):

1. AASHTO H-20 Standard Specification for Highway Bridges.

2. AASHTO M198 Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets.

C. Federal Specifications (FS):

1. FS SS-C-153C Cement, Bituminous, Plastic.

1.3 SUBMITTALS

- A. A manufacturer's certification for each product stating that the products were manufactured in accordance with the designated reference standards with test results and date of tests.

PART 2 – PRODUCTS

2.1 PIPE

A. Sewer Pipe

1. Concrete sewer pipe shall be in accordance with 33 00 01 Concrete Pipe-Reinforced.
2. PVC Sewer Pipe shall be in accordance with Section 33 00 02 Polyvinyl Chloride (PVC) Pipe and Fittings.
3. CMCP shall be in accordance with Section 33 00 04 Corrugated Metal Culvert Pipe and Fittings.
4. Pipeline material shall be as stated in the proposal schedule or as shown on drawings
5. Pipe diameters shall be as shown on drawings.

B. Wyes, Tees, Risers and Fittings

1. Wyes, tees and fittings shall be the same type of material and class as the mainline pipe.
2. Risers and fittings shall be the same material and class as the service connections.
3. Allowable lateral connections for mainline pipe greater than 12" diameter is as follows below. Installation shall conform to manufacturer's recommendation based on pipe type.
 - a. RCP Pipe - NPC Kor-N-Tee, Multi-Tite Gasket, ProFlow Gasket, or Engineer approved equal.
 - b. PVC/PP – Kor-N-Tee Saddle, Multi-Tite Pipe Saddle, or Engineer approved equal.
 - c. Lateral, Fernco Multi-Tite Pipe Gaskets or Saddle Connector as recommended by the manufacturer may be used where mainline pipe is greater than 12" diameter.

2.2 TRANSITION COUPLINGS

A. Couplings for transition between dissimilar pipe diameters or dissimilar pipe materials

1. Fernco Inc. or Mission Rubber Company are acceptable manufacturers.
2. Conform to ASTM C1173.
3. Provide stainless steel shear rings, bands, nuts and housings of marine grade stainless steel conforming to ASTM A240.

2.3 MANHOLES AND INLETS

A. Precast Reinforced Concrete Manholes and Inlets

1. Components including base sections, riser sections, grade rings (adjustment rings), eccentric cone, flat slab top and manhole reducing bench shall meet ASTM C478 and rectangular, inlets and catch basins shall meet ASTM C913.
2. Base section shall include base riser section with integral monolithic bottom extending minimum of 6 inches beyond riser section.
3. Tops for manholes shall be eccentric cone or, if required elsewhere, flat slab top.
4. Adjusting rings
 - a. Precast concrete: minimum of 2 inches thick.
 - b. Rubber: Infra-Riser, Pro-Ring, or approved equal.
 - 1) Inlet rings shall be tapered longitudinally when the inlet is not at the low point.
5. Eccentric cones, flat slab tops and adjusting rings.
 - a. Shall have a 24 inch diameter opening.
 - b. Shall support AASHTO H-20 loadings.
6. Joints between components.
 - c. Joint design shall be in accordance with ASTM C990.
 - d. Gasket shall be the 1 ¼ inch thick butyl rubber material meeting requirements of AASHTO M-198 Type B flexible plastic gasket and ASTM C990 butyl rubber sealant.
7. Connection between Manhole Structures and Storm Sewer Pipe.
 - a. Provide a non-shrink grout.

B. Bituminous plastic cement shall meet Federal Specification SS-C-153C, Type I.

C. Manhole Steps

1. Steel reinforced copolymer polypropylene meeting ASTM C478.
2. Copolymer polypropylene shall meet ASTM D4101.
3. Steel reinforcement shall be ASTM A615, Grade 60, ½ inch minimum steel reinforcing rod.
4. Step shall be 12 inches wide and project from the wall between 5 inches and 7 inches.
5. Minimum design live load shall be a single concentrated load of 300 lbs. when in place.

D. Castings

1. Shall be ASTM A48, Class 35B, gray iron.
2. Manhole frame and covers shall be non-rocking.
3. Shall be of uniform quality free from blowholes, shrinkage, discoloration and other defects.
4. Shall be heavy duty designed for AASHTO H-20 loads.
5. Manhole Castings: Neenah Foundry No. R1500, unless stated elsewhere in the proposal or as shown on the drawings.
6. Type A Field Inlet Casting: Neenah Foundry No. 1500 with R2100 Grate Type "A".
7. Type B Inlet Casting: Neenah Foundry No. 3067-L, 7007B curb box with language for dump no waste drains to freshwater.
8. Beehive Grate and Casting: Neenah Foundry No. R-2560-D3.

2.4 MORTAR

A. Cement

1. Furnish masonry cement conforming to ASTM C91, type S.
2. Furnish hydrated lime conforming to ASTM C207.

B. Sand

1. Use sand conforming to 501.2.5, WisDOT State Specifications, except as follows:
 - a. Ensure that sand subjected to the mortar strength test has a tensile or compressive strength at 3 days and 7 days of not less than 85 percent of that developed by mortar of the same proportions and consistency, made of the same cement and standard Ottawa sand.
 - b. Use sand uniformly graded from coarse to fine conforming to the following gradation requirements:

SIEVE	PERCENT PASSING BY WEIGHT
No. 8	95-100
No. 100	25 Maximum
No. 200	10 Maximum

C. Mortar

1. Use mortar composed of 3 parts of sand for mortar, and one part of either a mixture of 50 percent portland cement and 50 percent of masonry cement, or a mixture of 75 percent portland cement and 25 percent hydrated lime.
2. Use a machine to mix the mortar unless the engineer allows otherwise.
 - a. Prepare machine-mixed mortar in an engineer-approved mixer and mix not less than 1 ½ minutes.
 - b. If preparing hand-mixed mortar, mix the sand and cement thoroughly in a clean, tight mortar box until uniform in color, then add clean water in a quantity that forms a stiff paste.
 - c. Do not use mortar mixed longer than 30 minutes or that develops its initial set.

2.5 GEOTEXTILE FABRIC FOR FILTRATION AND SEPARATION

A. Fabric shall be non-woven polyester, polypropylene or polyethylene conforming to the following minimums:

1. Grab Tensile Strength: 180 lbs.
2. Puncture strength: 68 lbs.
3. Apparent Breaking Elongation: 30%
4. Apparent Opening Size (Sieve Size): 50
5. Permittivity

2.6 PIPE EMBEDMENT MATERIAL

- A. Soil Class A-7, or A-8 crushed rock per section “Soils and Aggregates.”

2.7 TRACER WIRE

- A. Tracer wire will be continuous, single-strand #12 solid copper THHN wire with a continuous coating of polyethylene insulation suitable for direct burial in wet locations.
- B. Tracer wire on storm sewer laterals will have brown colored insulation.

2.8 ENDWALLS

- A. Reinforced concrete apron endwalls shall be installed on the outlets of reinforced concrete storm sewer as called for on the plans. The concrete apron endwalls shall be constructed to conform to Section 33 00 01 Reinforced Concrete Pipe.
- B. Corrugated metal apron endwalls shall be installed on outlets corrugated metal culverts as called for on the plans. The metal apron endwalls shall be constructed to conform to Section 33 00 04 Corrugated Metal Culvert Pipe.

PART 3 – EXECUTION**3.1 GRAVITY SEWER INSTALLATION****A. General****1. Vertical and Horizontal Alignment**

- a. Install sewer pipe to maintain vertical and horizontal alignment as shown on the Drawings.
 - b. Use laser equipment mounted in a manner to permit beam to shine through pipe.
 - c. Use a target to check each pipe installed.
 - d. Check laser beam alignment and grade a minimum of every 100 feet.
 - e. Use a fan to control air temperature variations in pipe and reduce bending of laser beam.
- 2. Commence pipe installation only after the trench has been dewatered below the trench bottom and all necessary sheeting and bracing is in place.
 - 3. Install pipe starting at the downstream end and proceed toward the upstream.
 - 4. Install plastic pipe in accordance with ASTM D2321, as revised by these specifications.

B. Pipe Embedment**1. Circular Concrete Pipe – Class “C” Embedment:**

- a. Bedding:
 - 1) 4” below pipe place Soil Class A-7 or A-8 material.
 - 2) 6” below pipe place Soil Class A-7 or A-8 material if trench bottom is rock.
 - 3) Place and work bedding material by hand to insure all excavated voids are filled.

- b. Haunching and Initial Backfill:
 - 1) From bedding material to one-sixth of pipe outside diameter, use Soil Class A-7 or A-8 material place and worked by hand to insure all excavated voids are filled.
 - 2) From one-sixth of pipe outside diameter to 12" above the pipe, use Soil Class G-2 material compacted in-place to 95% standard proctor density using hand tampers or impact tampers.
 2. Plastic Pipe and Corrugated Metal Pipe – Class “B” Embedment:
 - b. Bedding, Haunching and Initial Backfill
 - 1) 4" below pipe to 12" above the pipe, place Soil Class A-7 or A-8 material work by hand to insure all excavated voids are filled.
 - 2) If in rock, place Soil Class A-7 or A-8 material 6" below pipe to 12" above the pipe and work by hand to insure all excavated voids are filled.
 3. Perforated Pipe – Class “B” Embedment
 - a. Bedding, Haunching and Initial Backfill
 - 1) 4" below pipe to 12" above the pipe, place Soil Class A-7 or A-8 material work by hand to insure all excavated voids are filled.
 - 2) If in rock, place Soil Class A-7 or A-8 material 6" below pipe to 12" above the pipe and work by hand to insure all excavated voids are filled.
- C. Pipe Installation
1. Open Cut Method:
 - a. Trench requirements shall conform to Section “Trenching, Backfilling, and Compacting.”
 - b. Do not use support blocking.
 - c. Proceed pipe laying upgrade with spigot pointing in direction of flow.
 - d. Lay each pipe true to line and grade within tolerances required for lamping.
 - e. When pipe installation is not in progress, provide the forward end of the pipe with a temporary plug to prevent foreign material from entering.
 - f. Push “home” the spigot end of the pipe joint in the socket before proceeding to install the next pipe.

When connecting to an existing sewer not terminating in a manhole, uncover the end of the existing sewer prior to laying sewer to allow horizontal and vertical adjustments.
 - g. Install pipe such that pipe joints are located far enough from the manhole outside wall to permit future pipe repair without damaging the manhole and the joints shall not fall within manhole walls.
 2. Trenchless Excavation Method
 - a. Auger horizontal earth boring (boring and jacking)
 - 1) Bore and jack steel casing pipe at location and diameter or larger shown on the Drawings in accordance with Section “Trenchless Excavation Construction” at line and grade to accommodate the gravity carrier pipe.
 - 2) Install the gravity carrier pipe at line and grade through the casing pipe blocked to prevent contact with the casing pipe.
 - 3) Fill the annular space between casing pipe and gravity carrier pipe with sand or Engineer approved equal.

- b. Horizontal directional drilling
 - 1) Install gravity carrier pipe in accordance with Section “Trenchless Excavation Construction” at line and grade and location shown on the Drawings.
 - 2) Fill the annular space between the bore hole and the gravity carrier pipe with a bentonite slurry.
- D. Manholes and Inlets
- 1. General Installation Requirements:
 - a. Depths shown on Drawings shall be considered approximate.
 - b. Establish flow lines and casting elevations from grade stakes and cut sheets.
 - c. Provide four feet eight inches (4’-8”) minimum height from top of casting to base.
 - d. Place bases on a minimum of four (4) inches of bedding material:
 - 1) Soil Class A-7 or A-8.
 - 2) Place and work by hand to insure all excavated voids are filled.
 - e. Seal exterior of lift holes with bituminous plastic cement.
 - f. Fill the following with mortar and finished smooth.
 - 1) Interior joints and lift holes.
 - 2) Annular space around pipes
 - g. Construct manholes and inlets in accordance with the appropriate detail drawings.
 - h. Install structures plumb.
 - 2. Detailed Installation:
 - a. Unless indicated otherwise, provide precast concrete manhole construction.
 - b. Four foot diameter shall be considered standard.
 - c. Pitch casting to match street crowns where applicable.
 - d. Provide precast risers in a combination of lengths which minimize the number of joints.
 - e. Install Butyl Rubber Joint Sealant at Risers:
 - 1) Rope configuration.
 - 2) Installed to be compressed by subsequent riser.
 - f. Manhole and Inlet Adjusting.
 - 1) Manholes and inlets must have only ONE concrete ring (2”, 4”, or 6”) on top of the cone section.
 - a) Asphaltic Concrete Pavement – Secure ring to the pre-cast cone section with a 3 and ½ inch wide Kent Seal or equal.
 - b) Concrete Pavement – Secure ring to pre-cast cone section with concrete vibrated in place during the paving operation.
 - 2) For manholes in pavement, above the concrete ring attach a ½ inch thru 3 inch thick tapered rubber ring using two (2) 5/16 inch bead above and below the ring, of sealant type as recommended by the rubber ring manufacturer. There shall be a minimum of 2” in depth of rubber rings.
 - 3) For inlets in pavement, above the concrete ring attach a ½ inch thru 3 inch thick rubber ring using two (2) 5/16 inch bead above and below the ring, of sealant type as recommended by the rubber ring manufacturer. The ring shall be tapered along the flow line for at all locations excluding inlets at low points. There shall be a minimum of 2” in depth of rubber rings.
 - 4) The maximum amount of adjusting rings is 12 inches.
 - g. Do not enter manhole with pipe through cone section.

- h. Pipe connections to manholes
 - 1) Grout pipe in-place inside and outside the manhole with mortar or gasket providing a soil tight seal.
 - i. Precast flat top may be used in lieu of a cone section when elevation is limited.
 - j. Provide Type 1 frames and covers for each manhole unless otherwise shown on the plan details.
 - k. Inverts:
 - 1) Shall conform to the following:
 - a) Shape to the lower half diameter of the largest connecting pipe.
 - b) Slope concrete bench upward to manhole wall.
 - c) Maintain a uniform flow line slope through manhole which matches minimum pipe slope.
 - 2) Precast manholes shall be furnished with a manufacturer installed invert.
 - l. Future Sewer Connections:
 - 1) Pipe stubs shall be provided as shown on the drawings.
Stubs shall extend a maximum of 12 inches from outer wall of structure unless otherwise stated.
 - 2) Stub shall be capped or bulkheaded and water tight.
- E. Sewer Services
- 1. Laterals:
 - a. Unless otherwise specified, terminate laterals at the property line.
 - b. In the absence of grade stakes, install laterals deep enough to pick up the lowest service point.
 - c. Install laterals in conformance with all plumbing codes and ordinances.
 - d. Provide cleanouts required by plumbing codes and ordinances as part of the lateral installation.
 - e. When a lateral is not connected for immediate use:
 - 1) Mark the location with a 4" x 4" pressure treated board installed 4 feet in the ground and 4 feet out of the ground. Storm marker shall be painted brown.
 - 2) Provide a watertight cap on the lateral end.
 - f. Install sewer laterals and water service with location and separation per the details.
 - 2. Risers:
 - a. Risers shall extend from the main and be installed to maintain at least ten feet of depth on the lateral at the right-of-way or at the height shown on the plans.
 - b. Bends shall be 45 degrees.
 - c. Riser pipe shall be placed on a minimum of four (4) inch of bedding material.
 - 3. Service Branches:
 - a. New Sewers:
 - 1) Install a factory assembled wye branch wherever possible.
 - 2) For concrete pipe, core drill and use a flexible water tight tee connector that mechanically expands in the cored opening.
 - b. Existing Sewers:
 - 1) Provide "Y" branches with a saddle type connector compatible to the pipe material being used.
 - 2) For concrete pipe, core drill and use a flexible water tight tee connector that mechanically expands in the cored opening.

F. Connecting New Pipe to Existing Pipe

1. If pipe are of the same material and size, then use a coupling of the same pipe material designed for coupling of the same material and size.
2. If pipe are of dissimilar material or size or there is no coupling made of the same material, then provide a transition coupling with a stainless steel shear ring. Provide bushings or inserts to maintain the flow line through the connection.

G. Joints

1. Construct joints in compliance with manufacturer's recommendations.
2. Utilize full length pipe except at manholes or service branches.

H. Endwalls

1. Reinforced concrete endwalls shall be connected to concrete pipe with steel bolts conforming to WisDOT Standard Specifications for Highway Construction, Latest Edition.
2. Reinforced concrete endwalls shall be connected to PVC Pipe with a band on the PVC and steel bolt on the endwall.
3. Corrugated metal endwalls and pipe shall be banded.

3.2 INSULATION FOR PIPE FROST SHIELD

- A. Provide where shown on the Drawings.
- B. Install insulation board in an inverted U around the pipe.
- C. Install insulation board with the top insulation board the same width as the trench centered over the pipe.
- D. Install the sides of the U-shape two feet high with the bottom of the legs at least to the springline of the pipe.
- E. Install the insulation board in layers to provide a minimum thickness of 4 inches or the thickness stated on the Drawings.
- F. Install such that there are no voids under the insulation.

3.3 BULKHEADS

- A. Bulkhead new construction to protect existing sewers from water, dirt, and debris.
- B. Do not remove bulkheads until new construction is accepted for use.
- C. Prior to removal of bulkhead, remove all material (liquid or solid) which accumulated behind bulkheads.

3.4 CLEANING AND REPAIRING SEWER LINES

- A. Clean as follows:
 - 1. All new sewer lines installed under this contract.
 - 2. Any existing sewer lines which are affected by construction.
- B. Furnish water and jetting equipment for cleaning operation.
- C. Repair all visible leads and defects, whether or not the sewer lines have been subject to all required tests.
- D. Remove any stuck cleaning, inspection or testing equipment from sewer lines.

3.5 TRACER WIRE

- A. Provide for all non-metallic service laterals within public right-of-way.
- B. Lateral or branch tracer wire splice connections will be typical Western Union-type solder splice made by stripping the coating off the main run tracer wire and then tightly wrapping the branch tracer wire around the main run tracer wire a minimum of eight (8) times. Both wire splices would then be soldered with a self-flux, 50-50 rosin core solder and tightly with a 1 1/2 " wide 3.2 mm Scotchfill™ electrical insulation tape, or equivalent then coated with 3M Scotchkote™ electrical coating, or equivalent so that no copper wire is exposed. A Klein™ stripping tool shall be used to remove the plastic coating on the wire. The Contractor will be responsible to have all the correct types of tools necessary to install the tracer wire materials as specified above and to ensure that the tools are in good working order.
- C. Tracer wire will be securely attached to the mainline sewer pipe, within (6) six inches of each end of the pipe, and at equally spaced locations with a minimum spacing of (6) six feet. Any exposed copper wire will be sealed and covered with materials approved by the Engineer.
- D. Tracer wire at the end of laterals will be brought to the surface at the right-of-way perpendicular to the end of the lateral and will be inserted into a three (3) foot long piece of a one (1) inch PVC with a double slotted cap and securely attached to an eight (8) feet long, treated four by four ("4x4"). The top of the four x four will be placed such that thirty (30) inches extend above the finished grade. The one (1) inch PVC shall be placed such that eighteen (18) inches extend above the finished grade. The tracer wire at the top of the PVC will protrude out of one of the slots and back into the PVC pipe through the other slot with at least eighteen inches of slack.

- E. Tracer wire at the end of laterals on storm sewer replacements with connections to existing laterals shall be as follows:
 - 1. Wrapped around the curb stop.
 - 2. If the lateral is not located near the curb stop provide a ½ -inch diameter by 4 foot long rod to connect the tracer wire at the connection to the existing lateral.

3.6 FIELD QUALITY CONTROL

- A. Provide the following service in accordance with the section on Testing and Inspection of Pipeline Construction.
 - 1. Televisе all storm sewers.
 - 2. Perform a deflection test on all mains that are not reinforced concrete.
 - 3. Perform a continuity test on all tracer wire.

END OF SECTION



DEPARTMENT OF PUBLIC WORKS

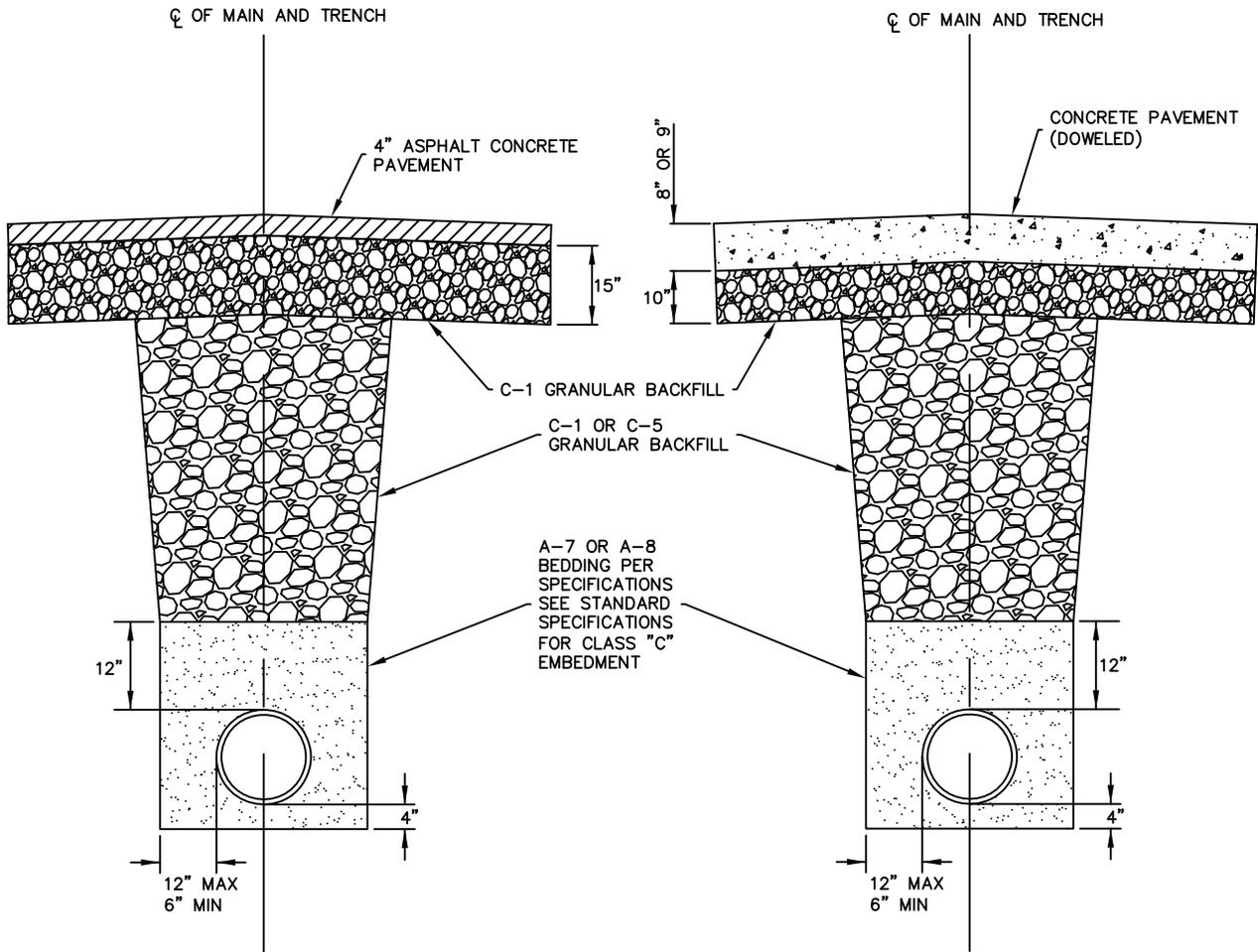
STANDARD DETAILS

DECEMBER 9, 2019

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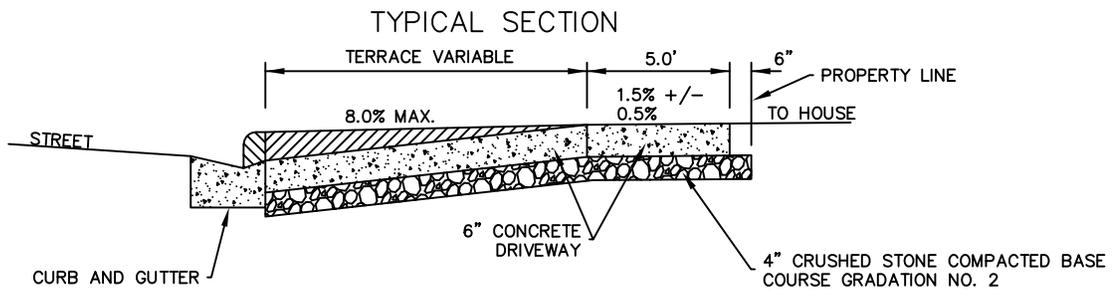
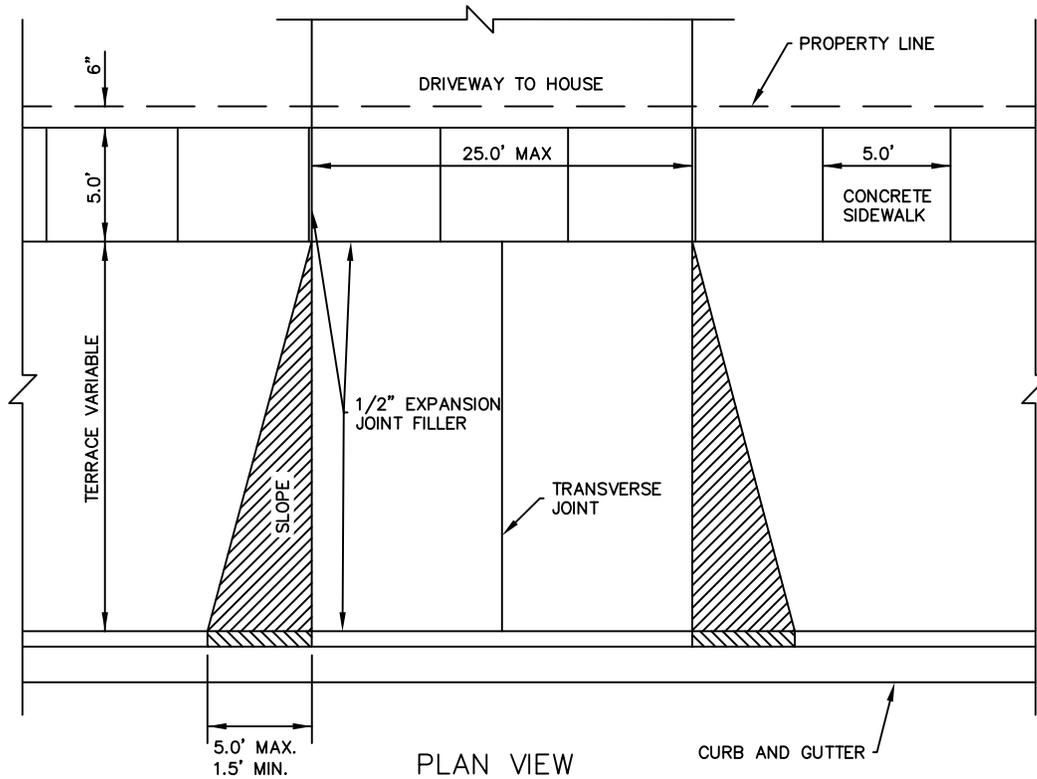
ASPHALT PAVEMENT BACKFILL

CONCRETE PAVEMENT BACKFILL

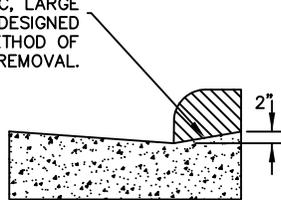
NOTES:

1. SIDE SLOPE BELOW ELEVATION ON FOOT ABOVE OF PIPE SHALL BE VERTICAL.
2. BACKFILL TO ONE FOOT ABOVE THE TOP OF THE PIPE SHALL BE TAMPED UNDER AND AROUND THE PIPE.

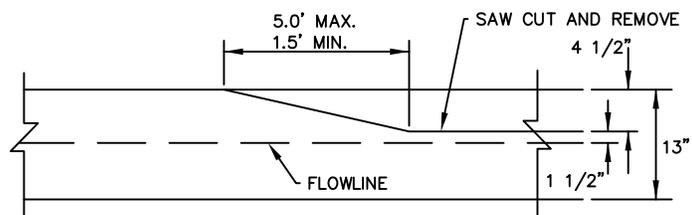
 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: TRENCHING AND BACKFILLING
	DIVISION: 31
	DRAWING NO: TB-1
	DATE: 12/2018 BY: KAD CHECKED: EPR



ALL CURB CUTS WILL BE MADE BY A RAIL MOUNTED, HYDRAULICALLY CONTROLLED OR HIGH CYCLE ELECTRIC, LARGE DIAMETER CONCRETE SAW DESIGNED SPECIFICALLY FOR THIS METHOD OF THE CURB HEAD REMOVAL.



CURB CUT SIDE VIEW



CURB CUT BACK VIEW



ENGINEERING DIVISION

925 S. SIXTH ST
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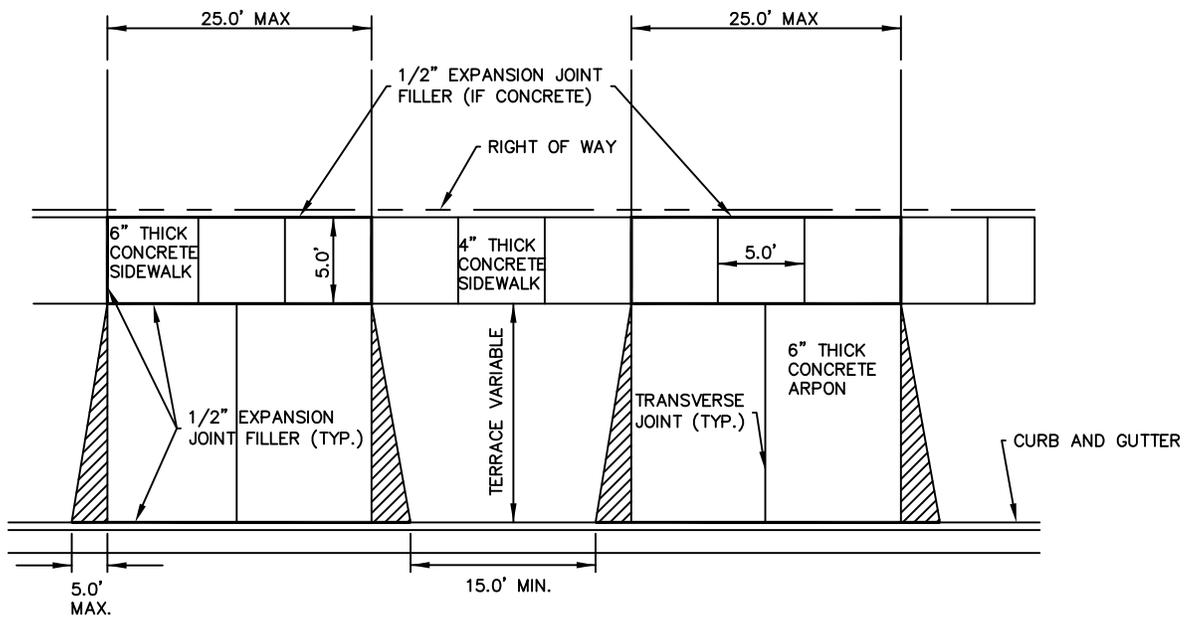
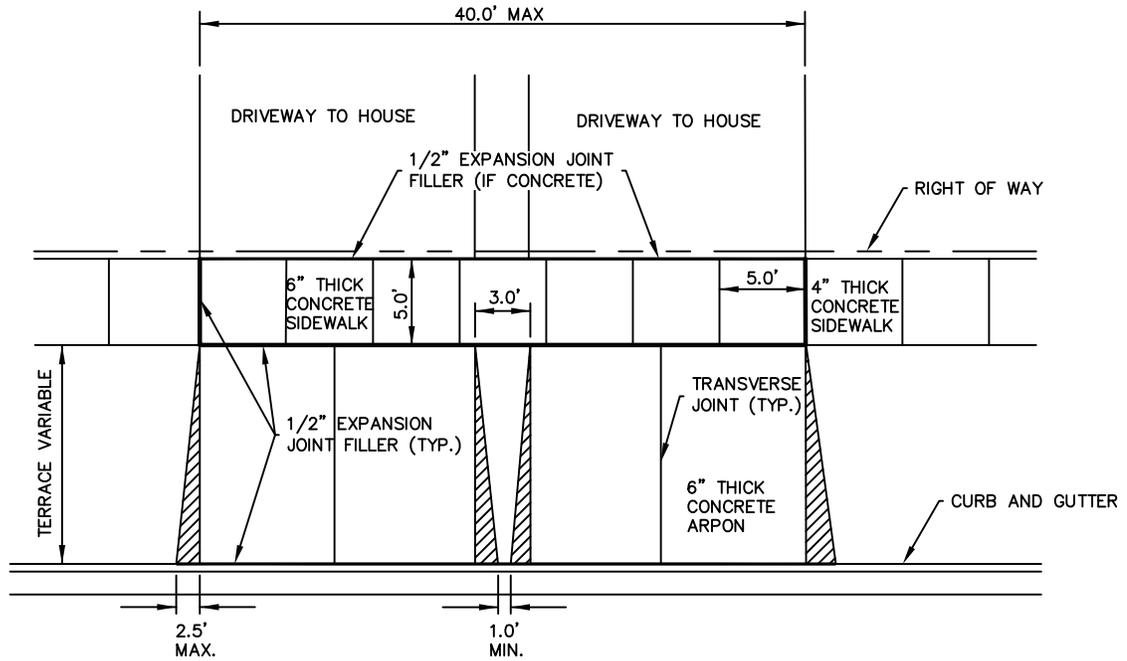
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
RESIDENTIAL
CONCRETE DRIVEWAYS

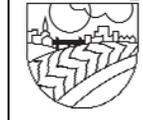
DIVISION: 32

DRAWING NO:
C-1

DATE: 12/2018
BY: KAD
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DE PERE



ENGINEERING DIVISION

925 S. SIXTH ST
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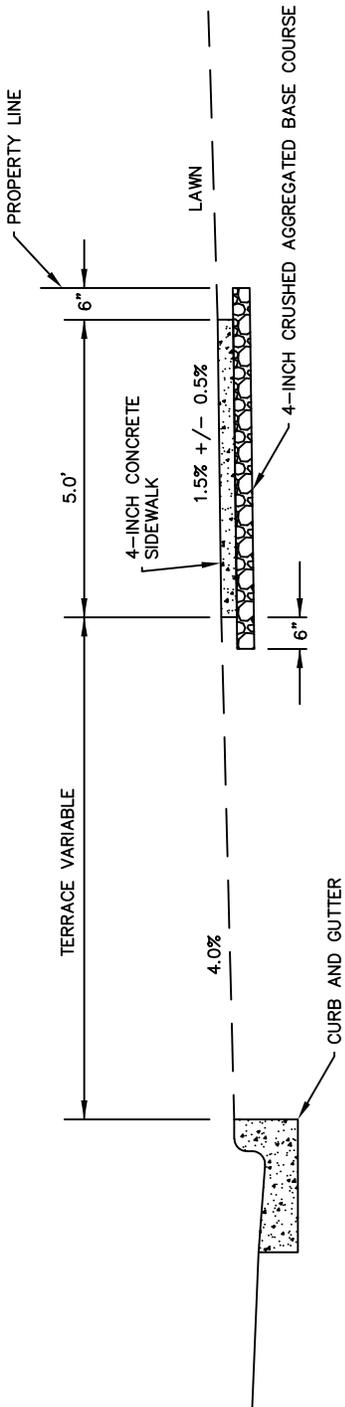
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
DUPLEX DRIVEWAYS

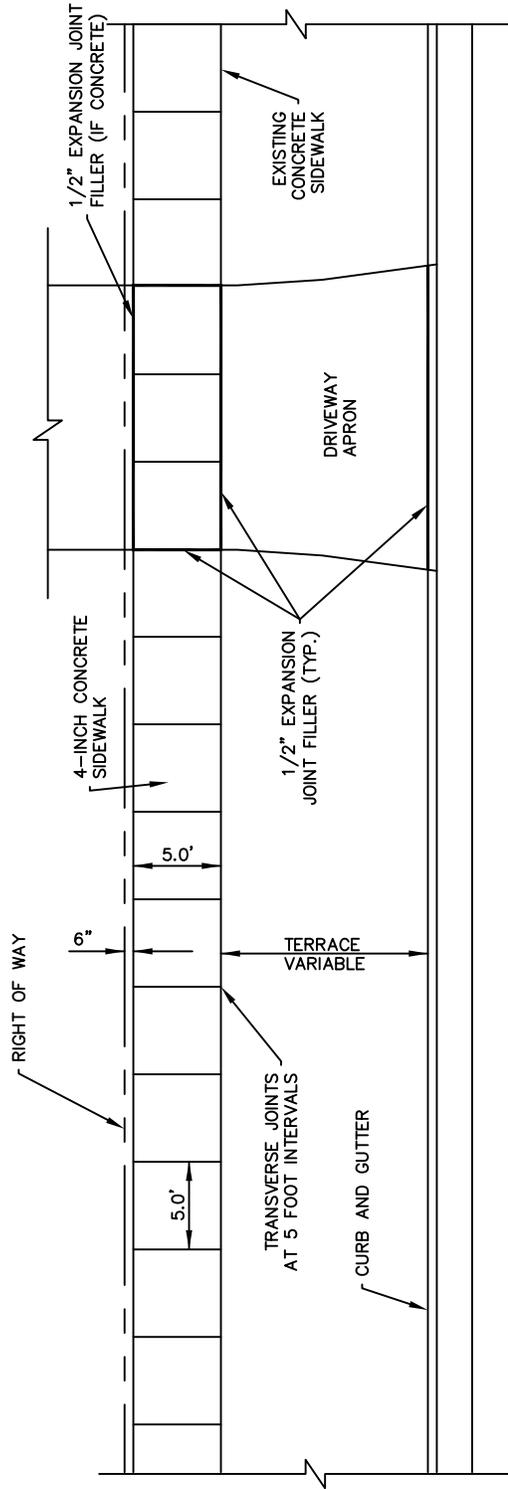
DIVISION: 32

DRAWING NO:
C-2

DATE: 12/2018
BY: KAD
CHECKED: EPR



TYPICAL SECTION



PLAN VIEW

NOTE:

1. CONCRETE DRIVEWAY THICKNESS:
 - RESIDENTIAL - 6" DEPTH
 - COMMERCIAL/INDUSTRIAL - 8" DEPTH



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 925 S. SIXTH ST
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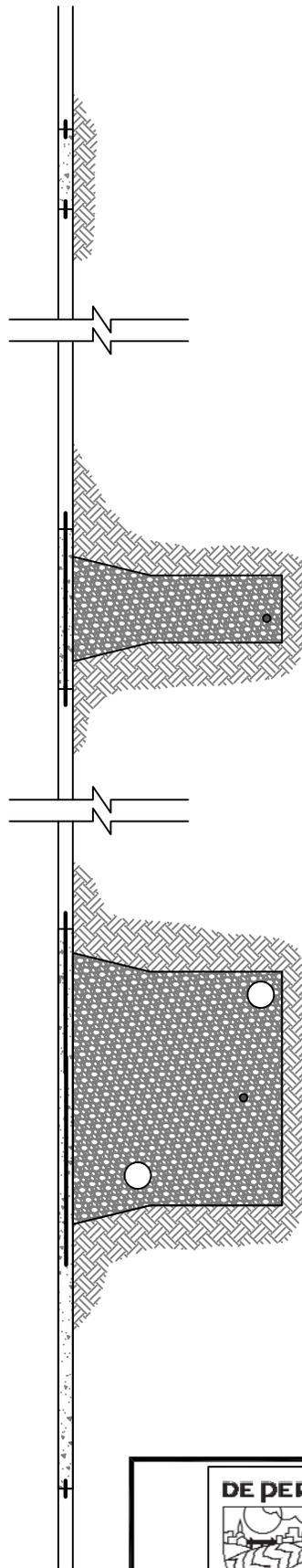
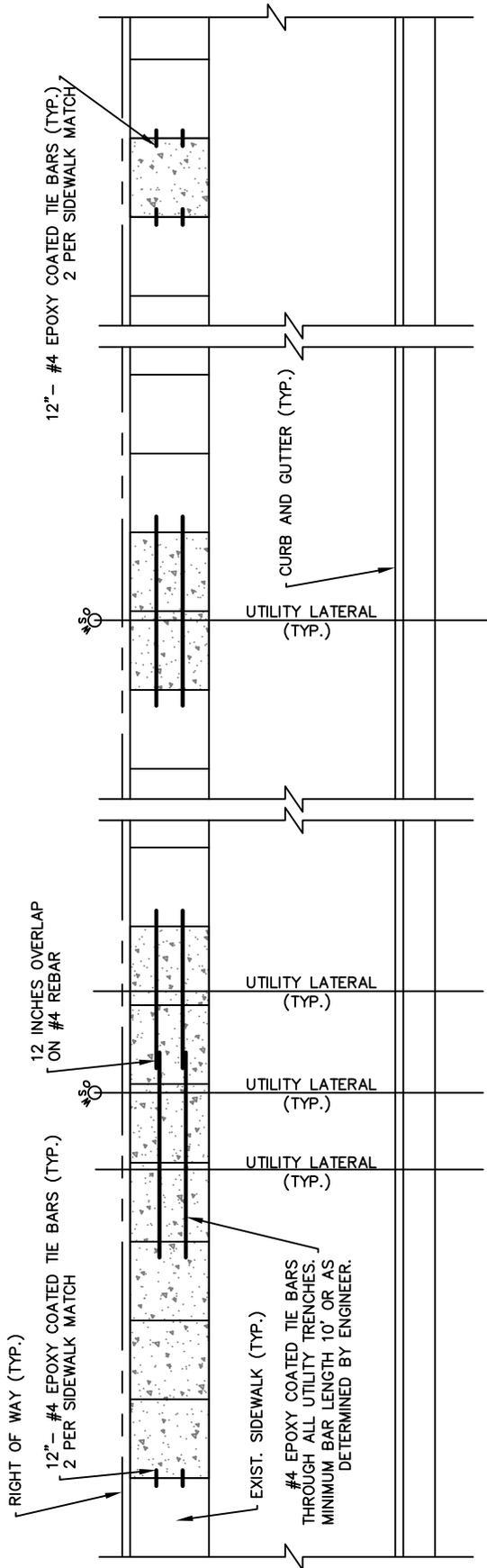
OFFICE 920-339-4061
 FAX 920-339-4071

TITLE:
 CONCRETE SIDEWALKS
 AND DRIVEWAY

DIVISION: 32

DRAWING NO:
 C-3

DATE: 12/2018
 BY: KAD
 CHECKED: EPR



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925 S. SIXTH ST
DE PERE, WI 54115

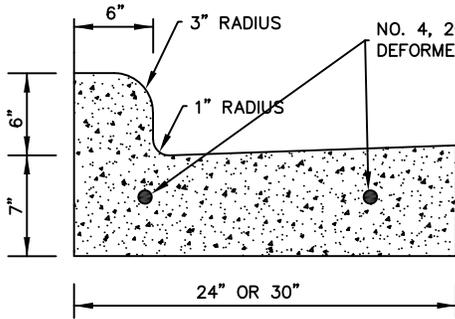
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CONCRETE SIDEWALK
REINFORCEMENTS

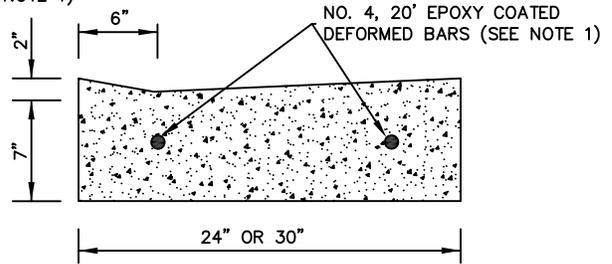
DIVISION: 32

DRAWING NO:
C-4

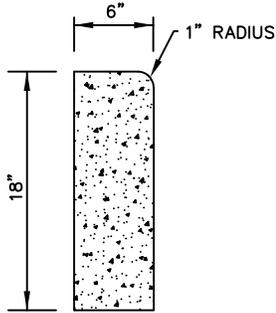
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BY: KAD
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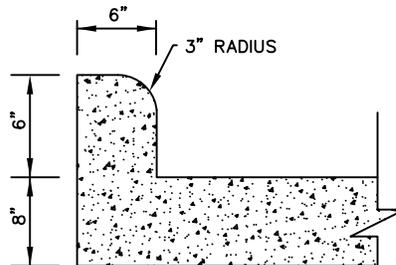
CURB AND GUTTER



GUTTER



CURB



INTEGRAL CURB

NOTES:

1. 2-NO. 4, 20' EPOXY COATED DEFORMED BARS SHALL BE INSTALLED CENTERED OVER EACH SERVICE AND UTILITY TRENCH OR AS DIRECTED BY THE ENGINEER. FOR TRENCHES LYING UNDER THE CURB AND RUNNING PARALLEL TO THE CURB THE BARS SHALL BE INSTALLED FULL LENGTH OF THE TRENCH.
2. ALL EXPOSED EDGES OF THE CONCRETE SHALL BE FINISHED WITH AN EDGING TOOL HAVING A RADIUS OF 1/4 INCH UNLESS OTHERWISE NOTED.



ENGINEERING DIVISION

925 S. SIXTH ST
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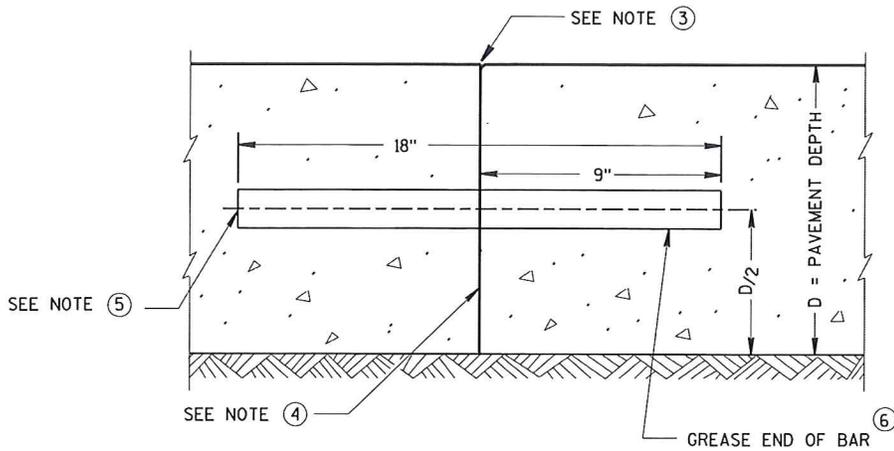
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CONCRETE CURB
CURB AND GUTTER
AND GUTTER

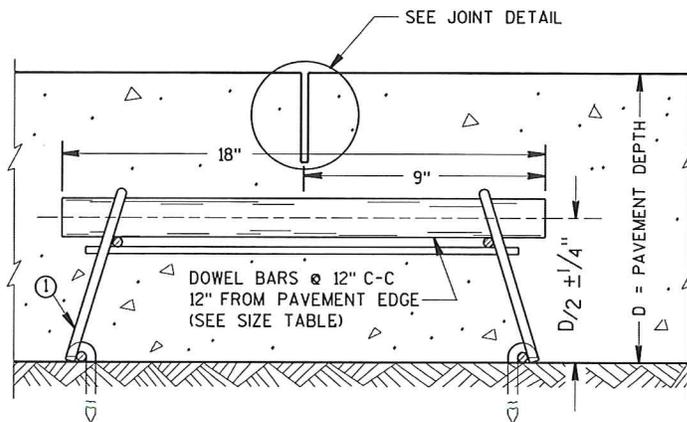
DIVISION: 32

DRAWING NO:
C-5

DATE: 12/2018
BY: KAD
CHECKED: EPR



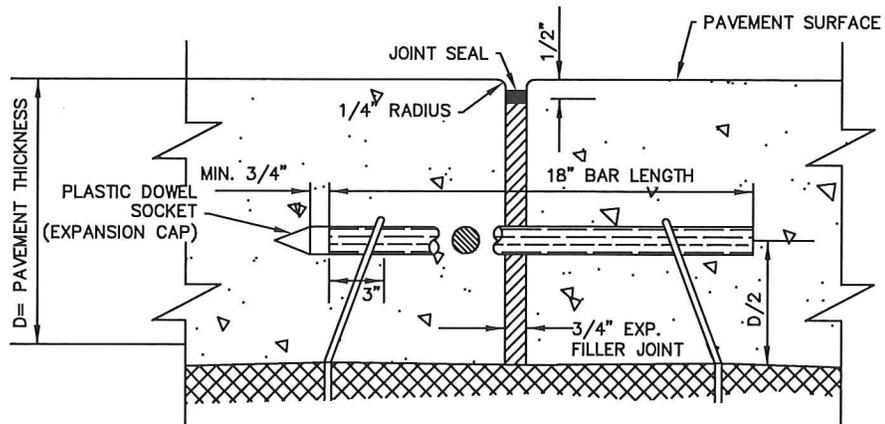
TRANSVERSE CONSTRUCTION JOINT



DOWELED CONSTRUCTION JOINT

PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	12'
7", 7 1/2"	1"	14'
8", 8 1/2"	1 1/4"	15'
9", 9 1/2"	1 1/4"	15'
10" & ABOVE	1 1/2"	15'



EXPANSION JOINT

NOTES:

- OBTAIN ENGINEER'S APPROVAL FOR THE USE OF ALTERNATE DESIGNS OF THE DOWEL ASSEMBLY. USE MECHANICAL DOWEL BAR INSERTERS OR DOWEL ASSEMBLIES WHEN CONSTRUCTION CONTRACTION JOINTS.
- SECURE BASKETS WITH ANCHORS TO HOLD DOWEL BARS IN CORRECT POSITION AND ALIGNMENT. TYPE, LOCATION, NUMBER AND LENGTH OF ANCHORS ARE DEPENDENT UPON FIELD CONDITIONS.
- FORM OR SAW CONSTRUCTION JOINTS. PROVIDE A 1/4-INCH RADIUS AT FORMED JOINTS.
- PROVIDE A SMOOTH VERTICAL FACE FOR THE ENTIRE DEPTH OF THE PAVEMENT WHEN FORMING CONSTRUCTION JOINTS.
- INSTALL DOWEL BARS AT CONSTRUCTION JOINTS BY FORMING OR DRILLING. INSTALL FORMED DOWEL BARS 12 INCHES C-C AND 12 INCHES FROM PAVEMENT EDGE. REMOVE EXCESS CONCRETE FROM THE FREE END OF THE DOWEL BAR IF DOWEL BARS ARE FORMED THROUGH A HEADER BOARD. INSTALL DRILLED DOWEL BARS ACCORDING TO DRILLED DOWEL BAR CONSTRUCTION JOINT DETAIL.
- APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF THE DOWEL BARS TO PREVENT BONDING.



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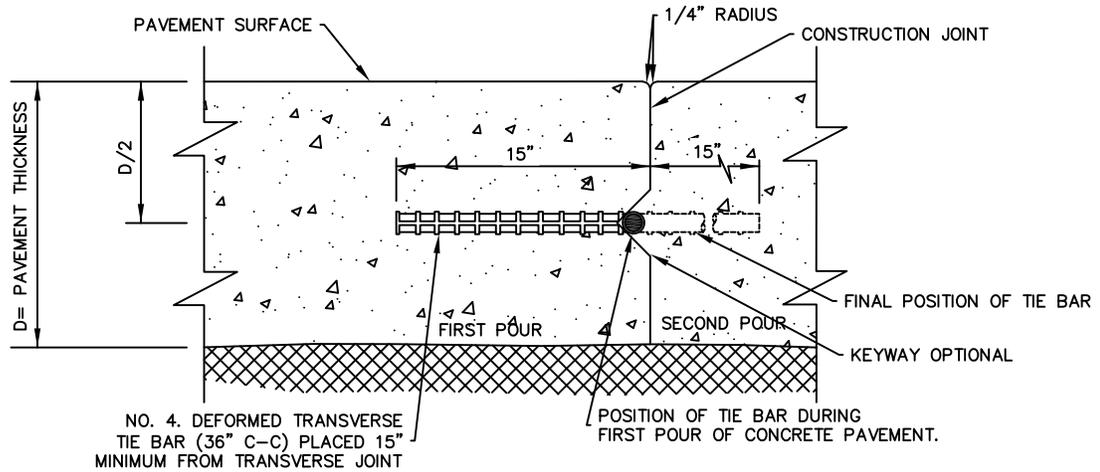
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
TRANSVERSE
JOINTS

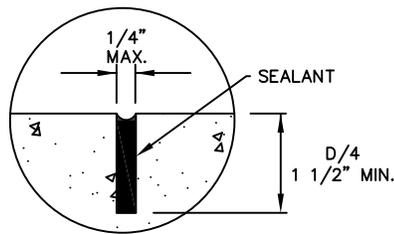
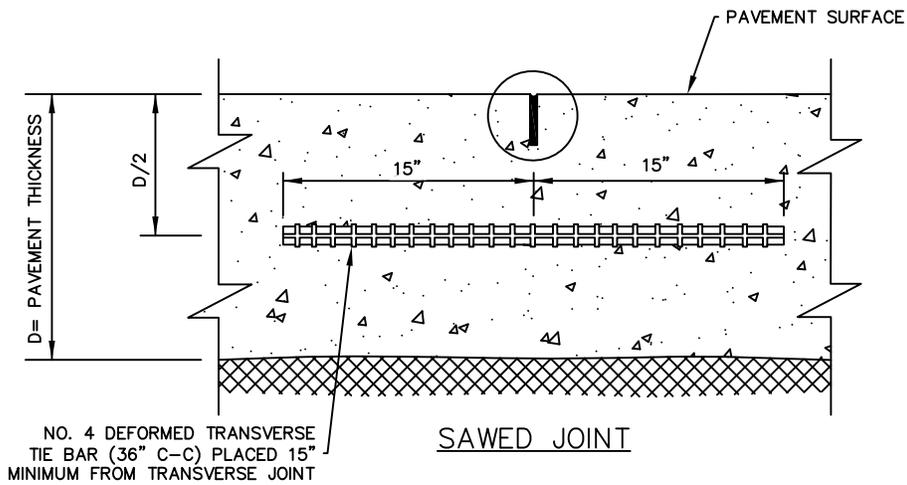
DIVISION: 32

DRAWING NO:
C-6

DATE: 12/2019
BY: KAD
CHECKED: EPR



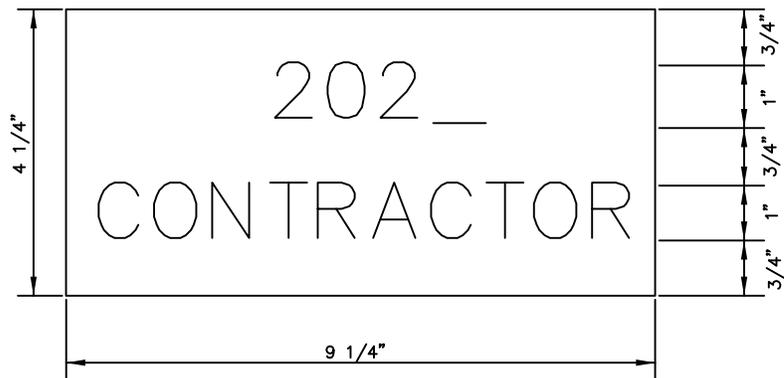
CONSTRUCTION JOINT



NOTE:

1. ALL TIE BARS, PAVEMENT TIES AND DOWELS SHALL BE EPOXY COATED.

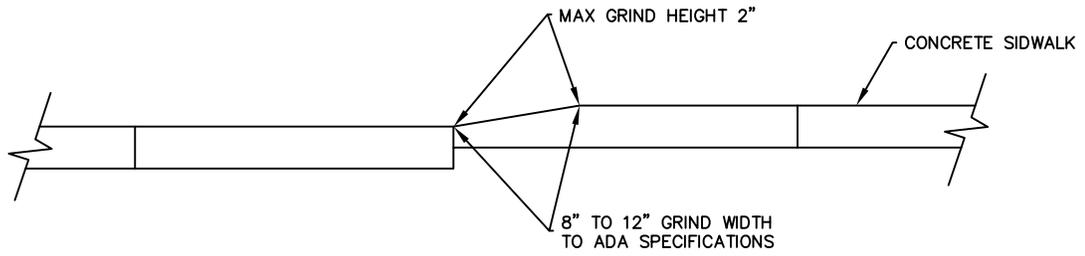
 <p>DE PERE</p> <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: LONGITUDINAL JOINTS
	DIVISION: 32
	DRAWING NO: C-7
	DATE: 12/2019 BY: KAD CHECKED: EPR



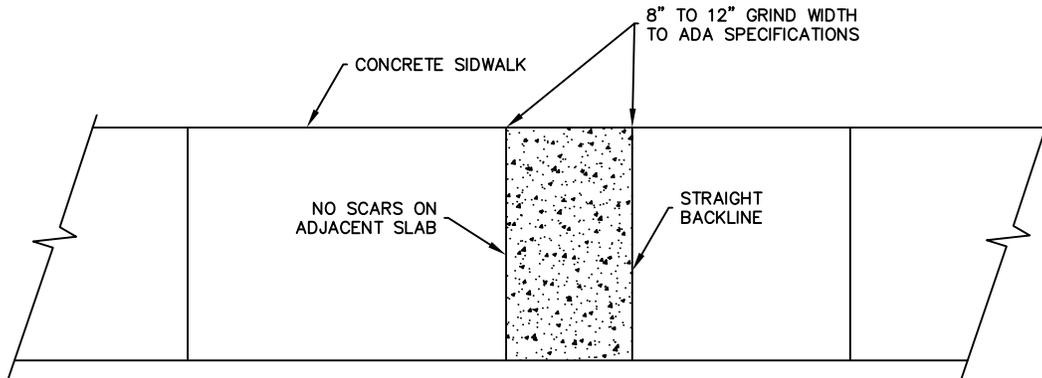
NOTE:

1. THE ENDS OF ALL CONCRETE WORK SHALL BE MARKED WITH A STAMP AS SHOWN, WITH THE CURRENT YEAR.
2. THE DATE OF CONSTRUCTION SHALL BE STAMPED ON ALL CONCRETE PAVEMENTS AND ALLEYS WITH 1-INCH NUMERALS AT THE ENDS OF EACH SECTION PAVED.

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: CONCRETE STAMP
	DIVISION: 32
	DRAWING NO: C-8
	DATE: 12/2019 BY: KAD CHECKED: EPR

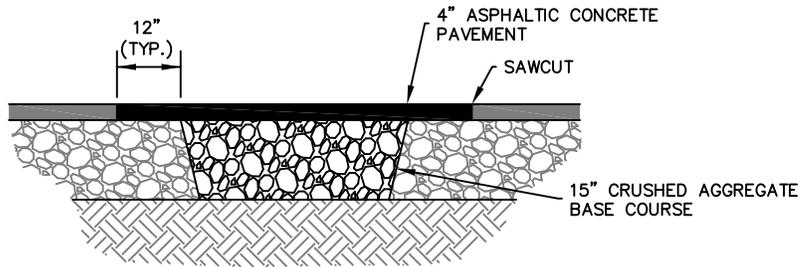


TYPICAL SECTION

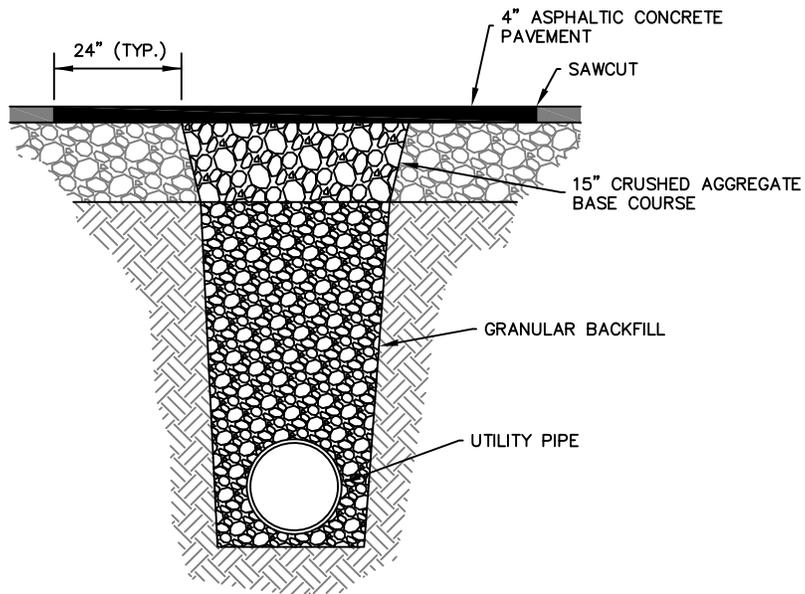


PLAN VIEW

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	<p>TITLE: CONCRETE SIDEWALKS GRINDING DETAIL</p>
	<p>DIVISION: 32</p>
	<p>DRAWING NO: C-9</p>
	<p>DATE: 12/2018 BY: KAD CHECKED: EPR</p>



WORK WITHIN ASPHALT AND AGGREGATE

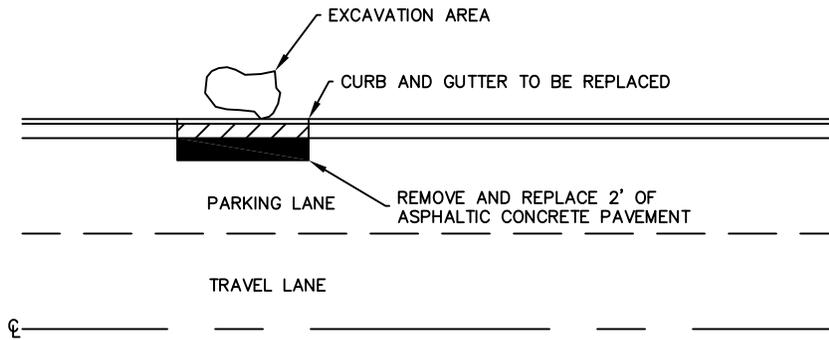
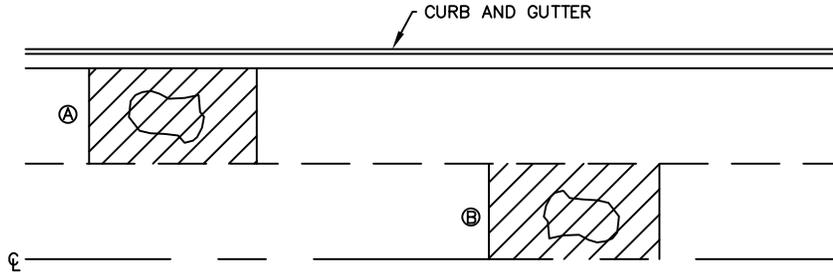


EXCAVATION EXTENDS INTO THE SUBGRADE

 ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	TITLE: EXCAVATION IN ASPHALT PAVEMENT
	DIVISION: 32
	DRAWING NO: P-1
	DATE: 12/2018 BY: KAD CHECKED: EPR

EXCAVATION IN ASPHALT

- Ⓐ - EXCAVATION IN PARKING LANE
- REPAIR PARKING LANE
- Ⓑ - EXCAVATION IN TRAVEL LANE
- REPAIR TRAVEL LANE

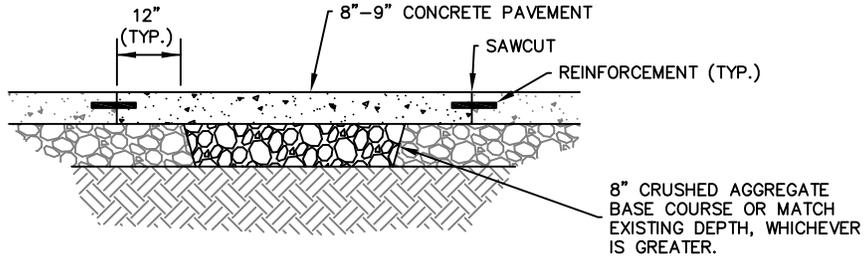


CURB AND GUTTER REMOVAL ON ASPHALTIC CONCRETE PAVEMENT

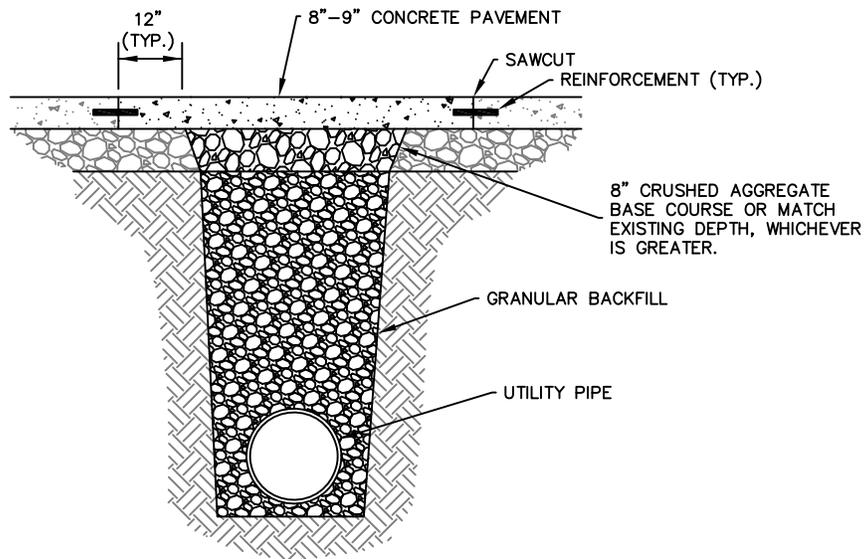
NOTE:

1. IF EXCAVATION OCCURS BEHIND THE CURB AND GUTTER AND INVOLVES CURB AND GUTTER REMOVAL AND REPLACEMENT, A TWO (2) FEET WIDE STRIP OF ASPHALT CONCRETE PAVEMENT SHALL BE REMOVED AND REPLACED.

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: PATCH WORK IN ASPHALT PAVEMENT
	DIVISION: 32
	DRAWING NO: P-2
	DATE: 12/2018 BY: KAD CHECKED: EPR



WORK WITHIN CONCRETE AND AGGREGATE



EXCAVATION EXTENDS INTO THE SUBGRADE

NOTE:

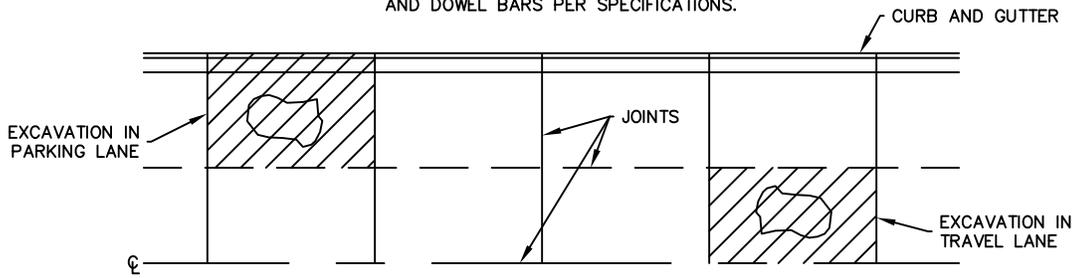
1. INSTALL REINFORCEMENT PER SPECIFICATIONS.

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: EXCAVATION IN CONCRETE PAVEMENT
	DIVISION: 32
	DRAWING NO: P-3
	DATE: 12/2019 BY: KAD CHECKED: EPR

EXCAVATION ON CONCRETE STREETS LESS THAN 15 YEARS

NOTE:

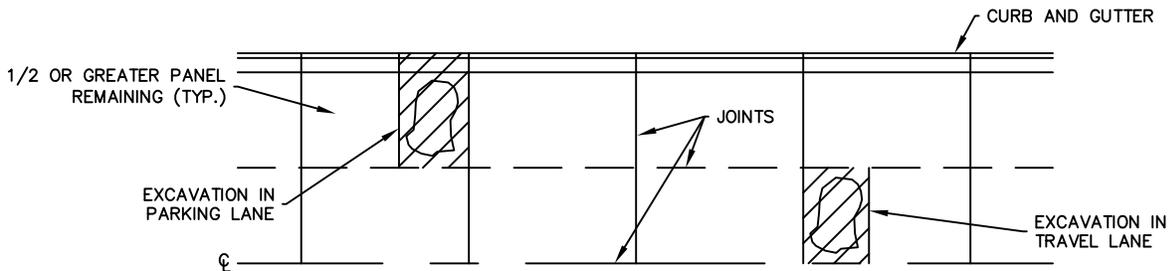
1. REPAIR TO A JOINT LINE. INSTALL TIE BARS AND DOWEL BARS PER SPECIFICATIONS.



EXCAVATION ON CONCRETE STREETS GREATER THAN 15 YEARS

NOTES:

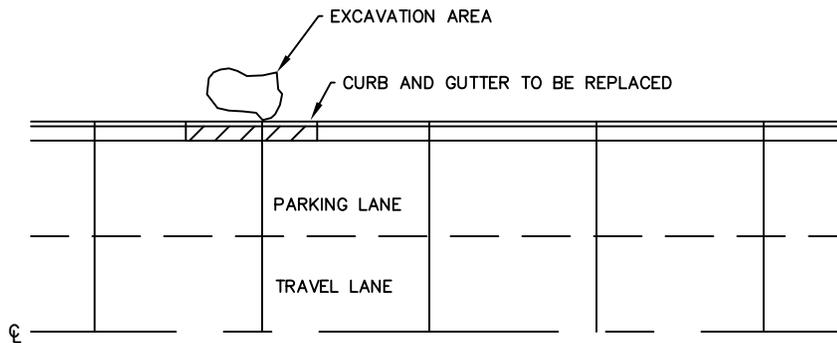
1. REMOVE TO THE JOINT IF REMAINDER OF PANEL IS CRACKED.
2. SAWCUT 12 INCHES BEYOND TRENCH WALL OR DAMAGED CONCRETE. MINIMUM PATCH MUST BE 7 FEET.
3. INSTALL TIE BARS AND DOWEL BARS PER SPECIFICATIONS.



CURB AND GUTTER REMOVAL ON ASPHALTIC CONCRETE PAVEMENT

NOTE:

1. IF EXCAVATION OCCURS BEHIND THE CURB AND GUTTER AND INVOLVES CURB AND GUTTER REMOVAL AND REPLACEMENT. INSTALL TIE BARS PER SPECIFICATIONS.



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

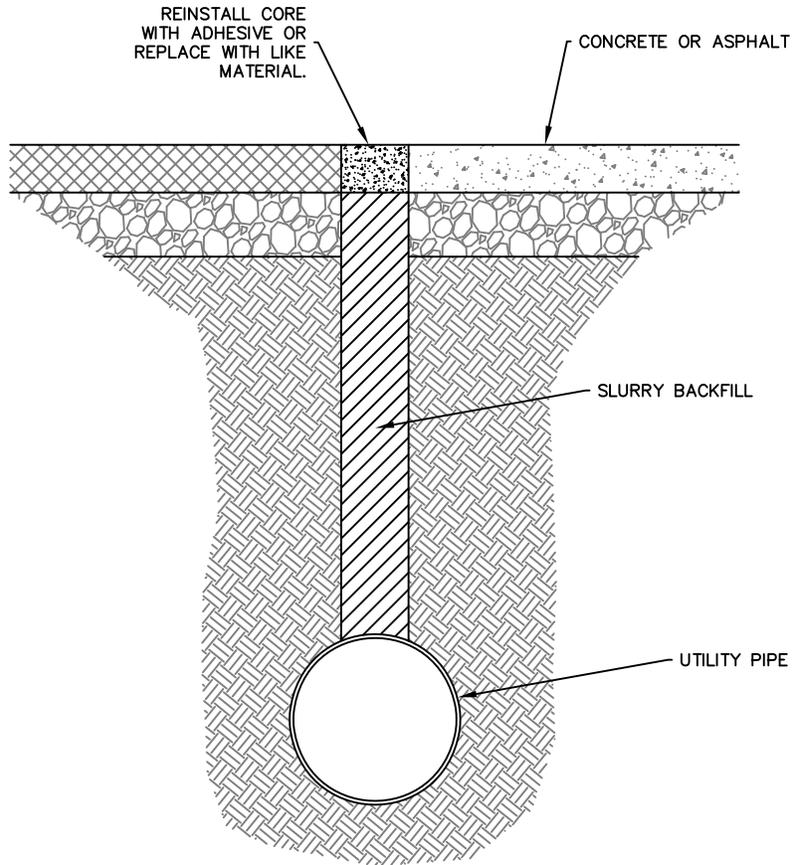
TITLE:
PATCH WORK IN
CONCRETE PAVEMENT

DIVISION: 32

DRAWING NO:
P-4

DATE: 12/2019
BY: KAD
CHECKED: EPR

CORING OR BORE HOLE REPLACEMENT DETAIL



NOTE:

1. IF CORE IS TO BE REPLACED, IT SHALL BE INSTALLED IMMEDIATELY AFTER PLACEMENT OF THE SLURRY. IT SHALL BE FLUSH WITH THE ADJACENT PAVEMENT.



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

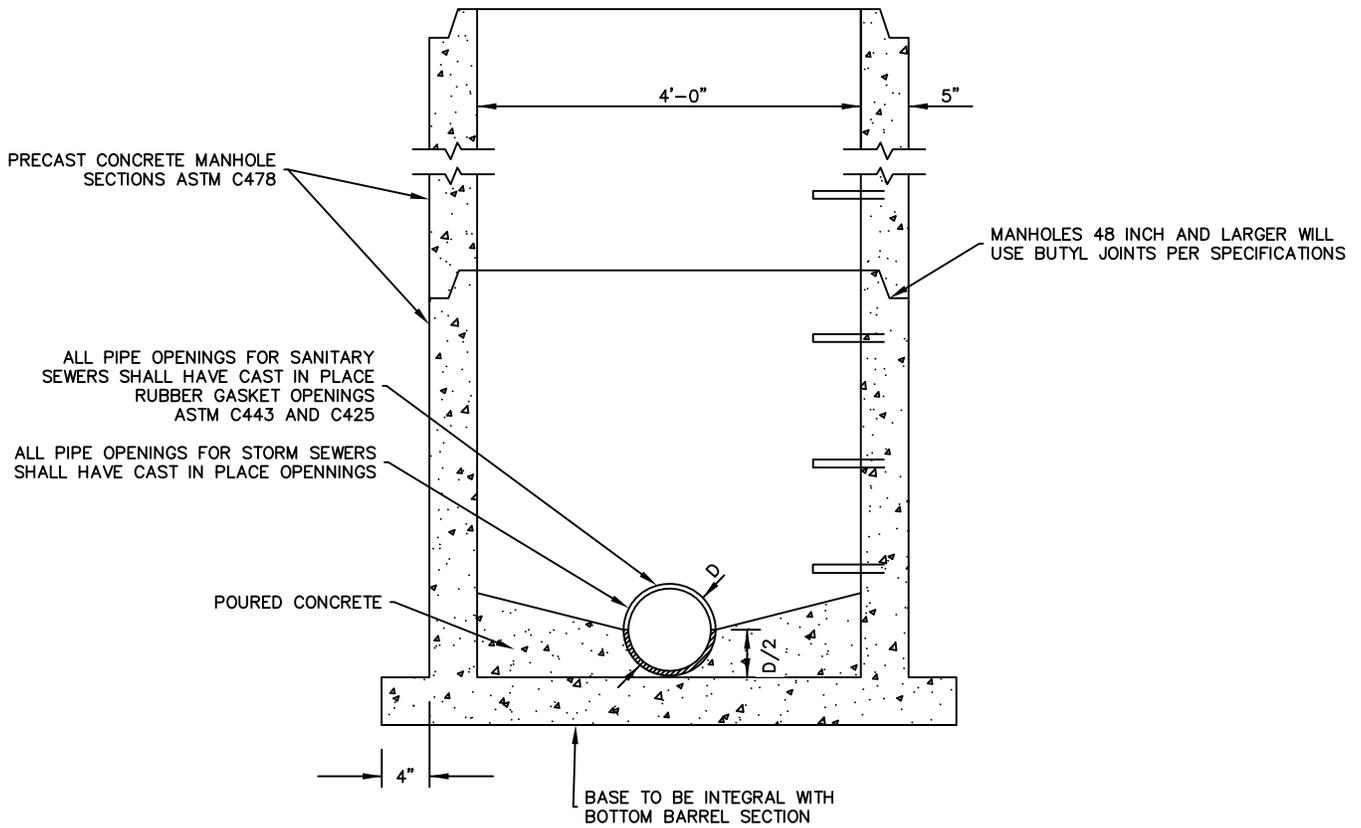
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CORE OR BORE HOLE
REPLACEMENT DETAIL
IN CONCRETE OR
ASPHALT

DIVISION: 32

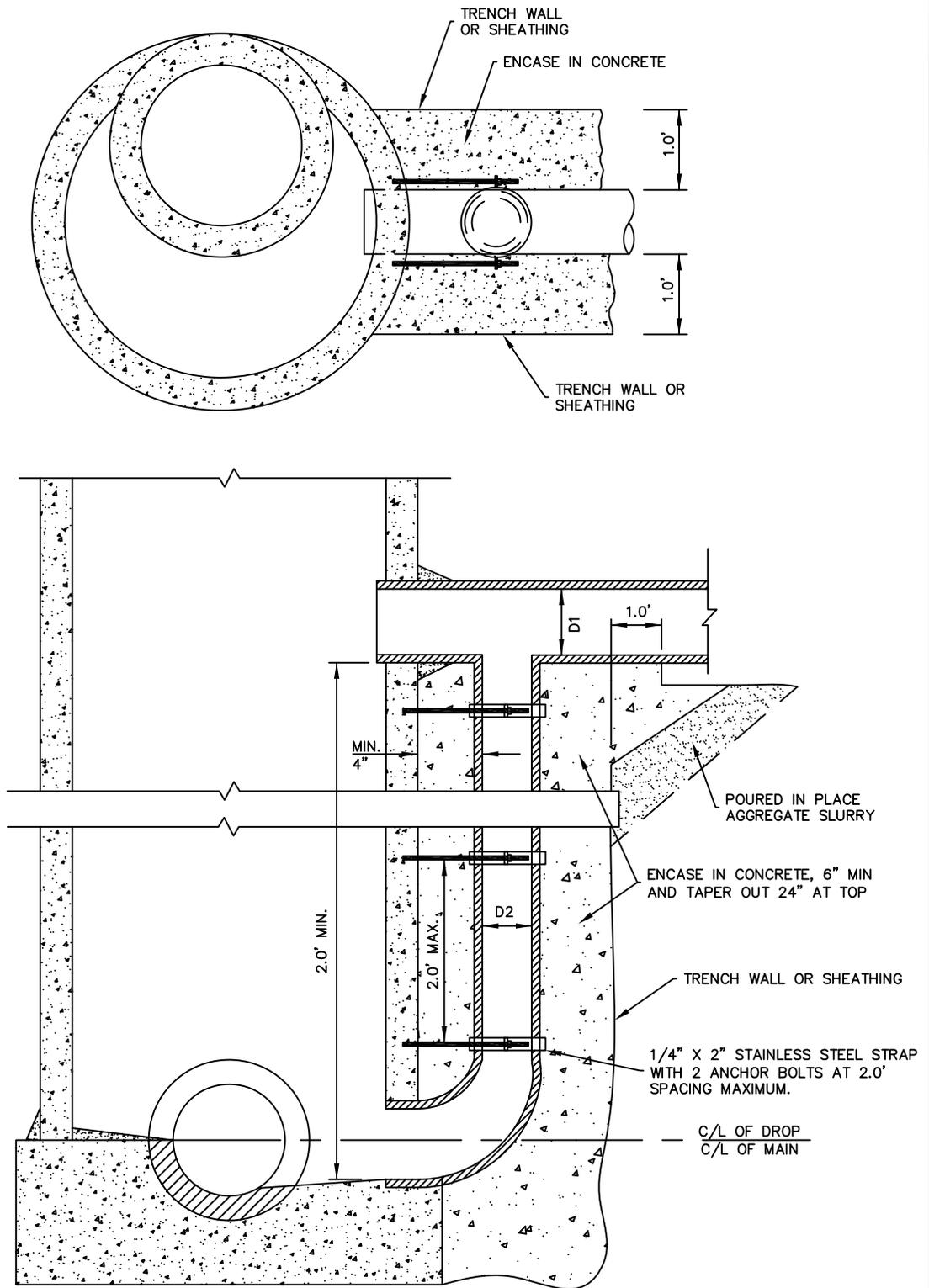
DRAWING NO:
P-5

DATE: 12/2018
BY: KAD
CHECKED: EPR



ENGINEERING DIVISION
 925 S. SIXTH ST
 DE PERE, WI 54115
 OFFICE 920-339-4061
 FAX 920-339-4071

TITLE: PRECAST CONCRETE MANHOLE
DIVISION: 33
DRAWING NO: S-1
DATE: 12/2018 BY: KAD CHECKED: EPR



PIPE SCHEDULE OUTSIDE DROP MANHOLE	
LATERAL D1	DROP PIPE D2
24	18
21	15
18	12
15	10
12	10
10	8
8	8



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

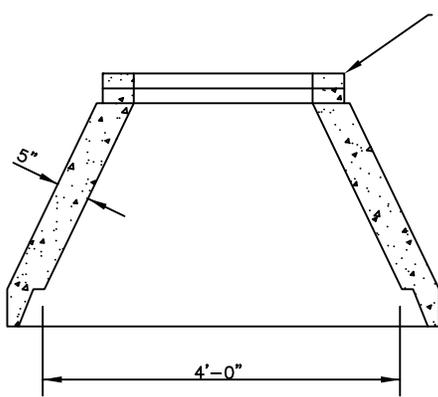
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
OUTSIDE DROP
MANHOLE

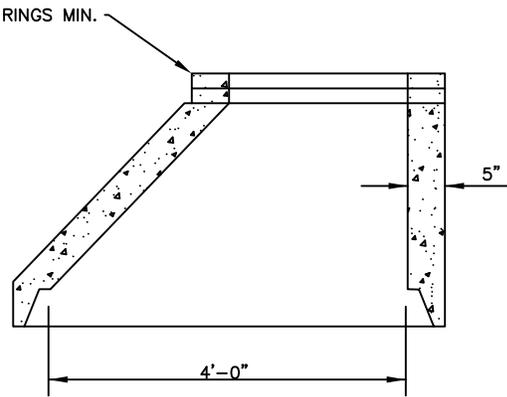
DIVISION: 33

DRAWING NO:
S-2

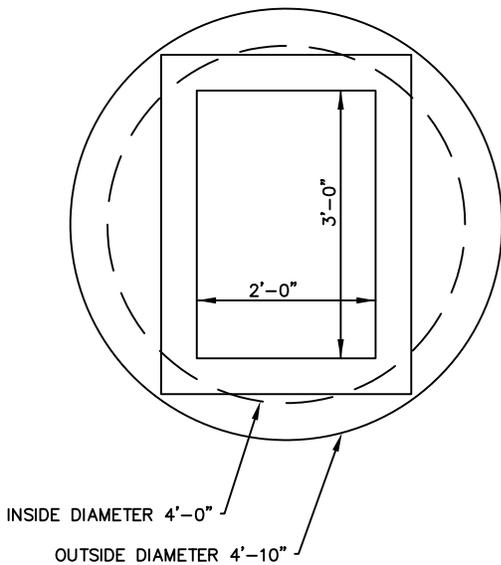
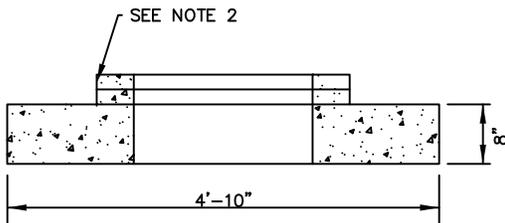
DATE: 12/2018
BY: KAD
CHECKED: EPR



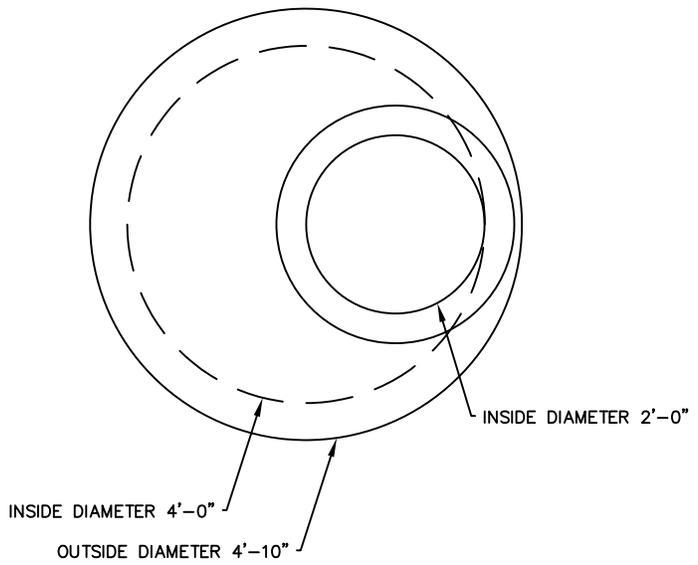
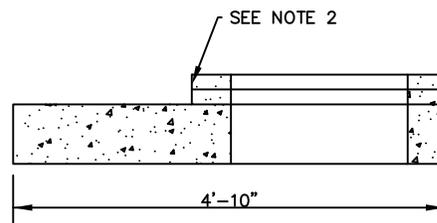
CONCENTRIC CONE
WHERE DIRECTED BY ENGINEER



ECCENTRIC CONE STANDARD



INLET MANHOLE COVER



MANHOLE COVER

NOTE:

1. THE TOP ADJUSTING RING (MINIMUM OF 2" AND MAXIMUM OF 3") ON ALL MANHOLES AND INLETS THAT FALL WITHIN THE PAVEMENT SHALL BE RUBBER RISER RINGS.
2. ASPHALT STREET:
 - MIN. 2-2" ADJUSTMENT RINGS, BOTTOM RING CONCRETE AND THE TOP RING RUBBER.
 CONCRETE STREET:
 - MINIMUM 2" RUBBER RING ON TOP WITH CONCRETE VIBRATED UNDER RUBBER RING OR AN ADDITIONAL 2" CONCRETE RING.



ENGINEERING DIVISION
925 S. SIXTH ST
DE PERE, WI 54115

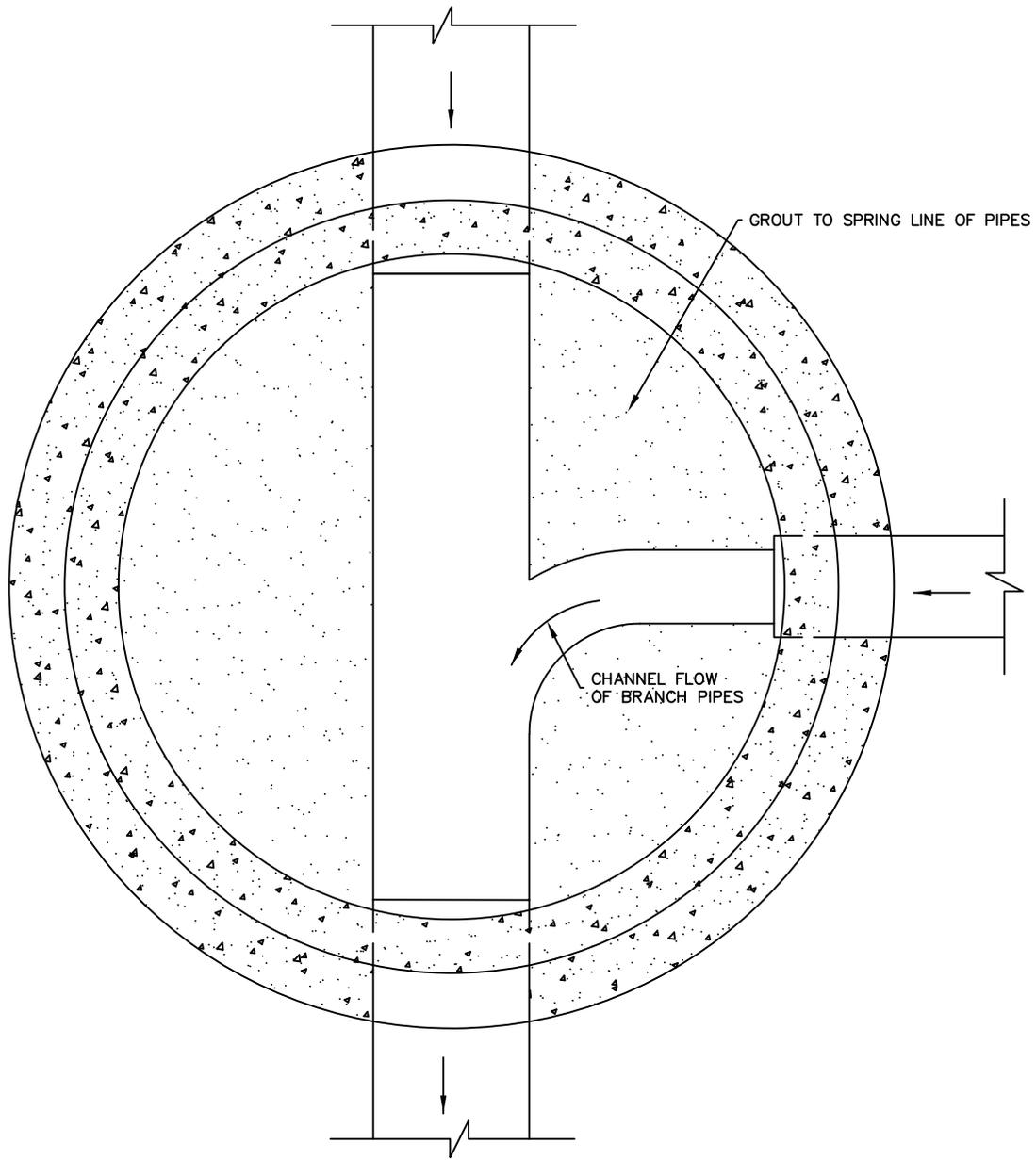
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
PRECAST CONCRETE
CONES AND COVERS
ASTM C478

DIVISION: 33

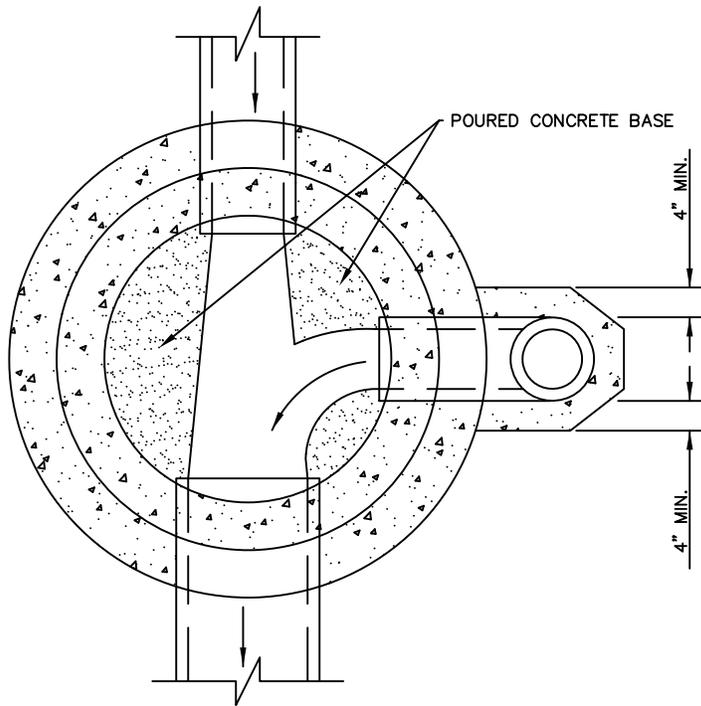
DRAWING NO:
S-3

DATE: 12/2018
BY: KAD
CHECKED: EPR

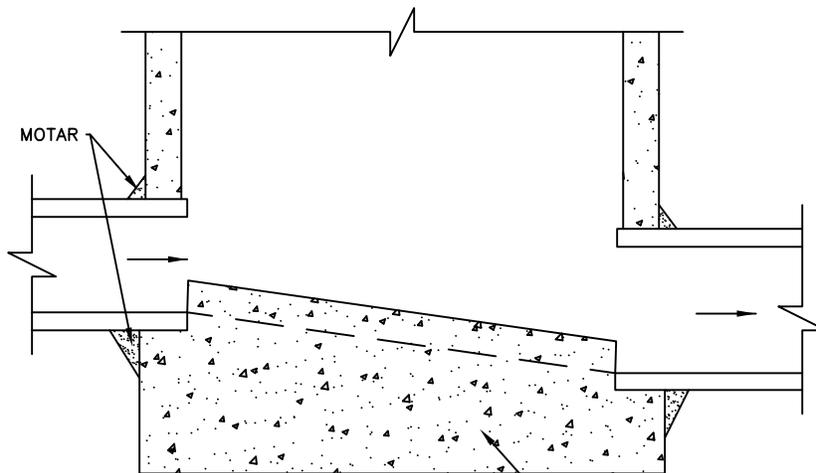


STANDARD MANHOLE

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: CHANNELIZATION
	DIVISION: 33
	DRAWING NO: S-4
	DATE: 12/2018 BY: KAD CHECKED: EPR



DROP MANHOLE



PIPE SIZE CHANGE



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

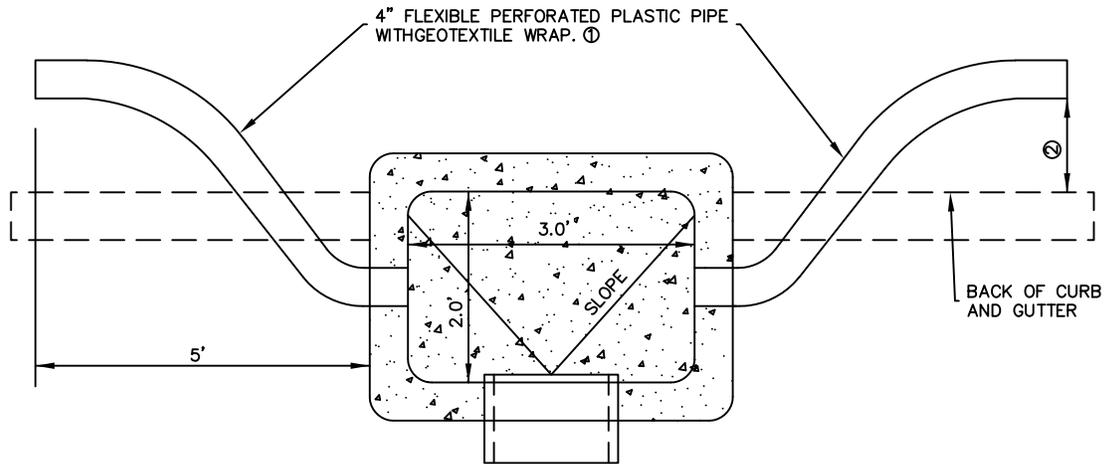
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CHANNELIZATION

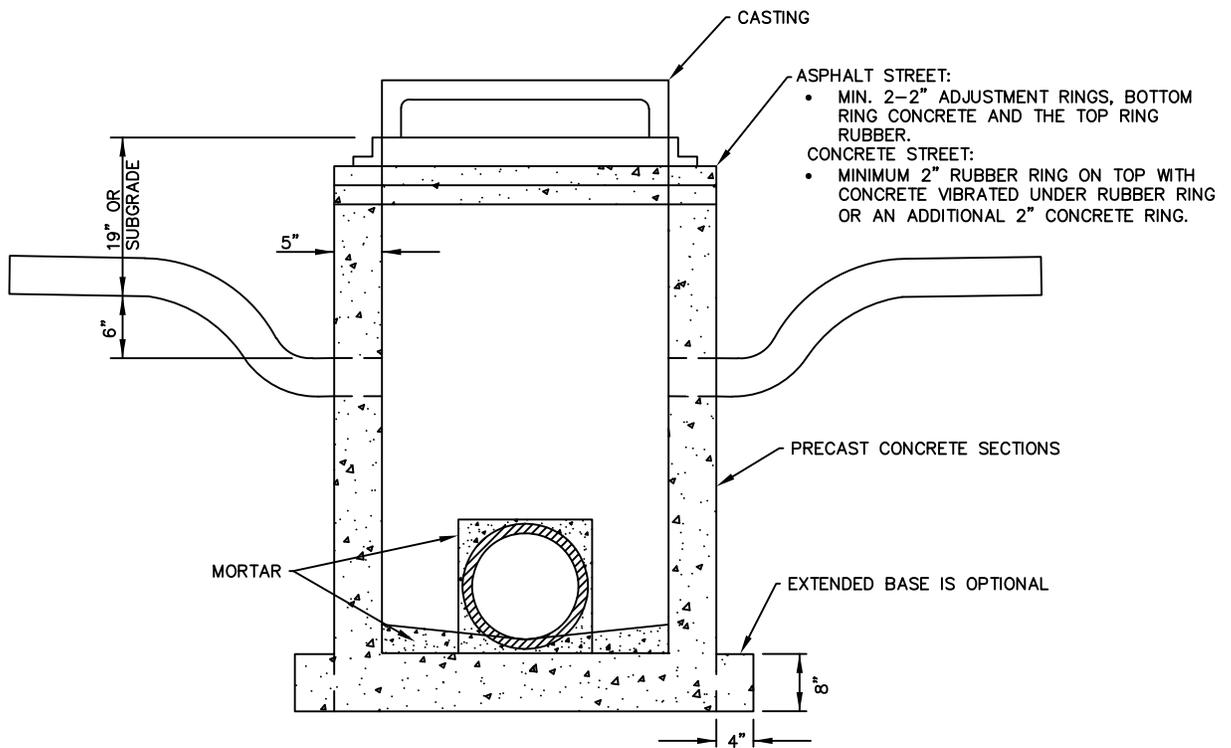
DIVISION: 33

DRAWING NO:
S-5

DATE: 12/2018
BY: KAD
CHECKED: EPR



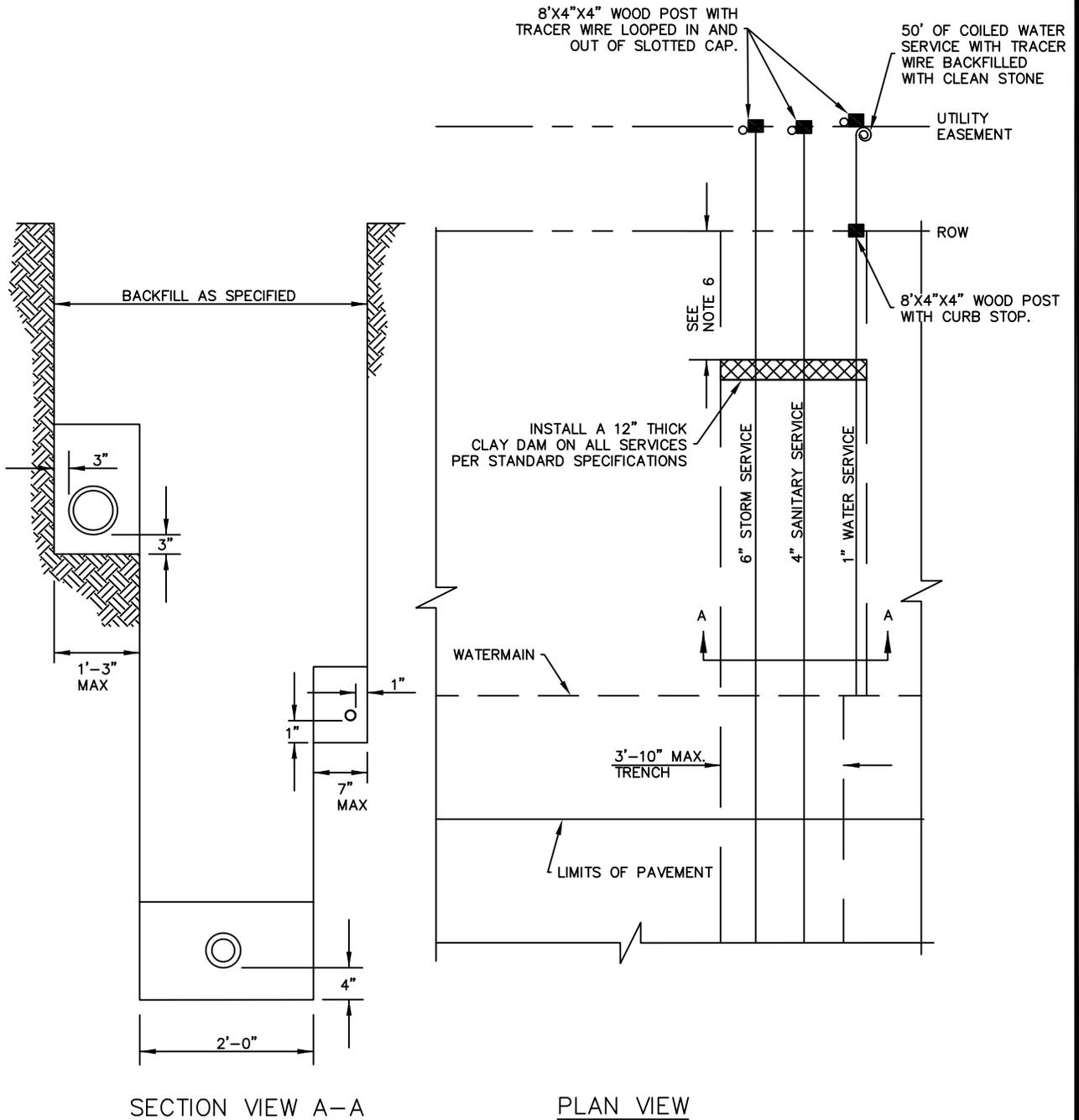
- ① IF THERE IS LESS THEN 5' OF CURB AND GUTTER BEING REPLACED, EXTEND TO THE LIMITS OF THE CURB AND GUTTER REPLACEMENT.
- ② EDGE DRAIN TO BE LOCATED AT EDGE OF CRUSHED AGGREGATE BASE COURSE.



NOTES:

1. THE MINIMUM DEPTH OF TYPE B INLETS FROM GRATE TO BOTTOM OF BASE SHALL BE 4'-8".
2. PROVIDE INLET BARRIERS FOR NEW CONSTRUCTION.
3. TYPE B INLETS SHALL MEET ALL SPECIFICATIONS OF ASTM C478.
4. 1", 2" OR TAPERED RUBBER RINGS ARE ACCEPTABLE TO PROVIDE FOR FIELD CONDITIONS.

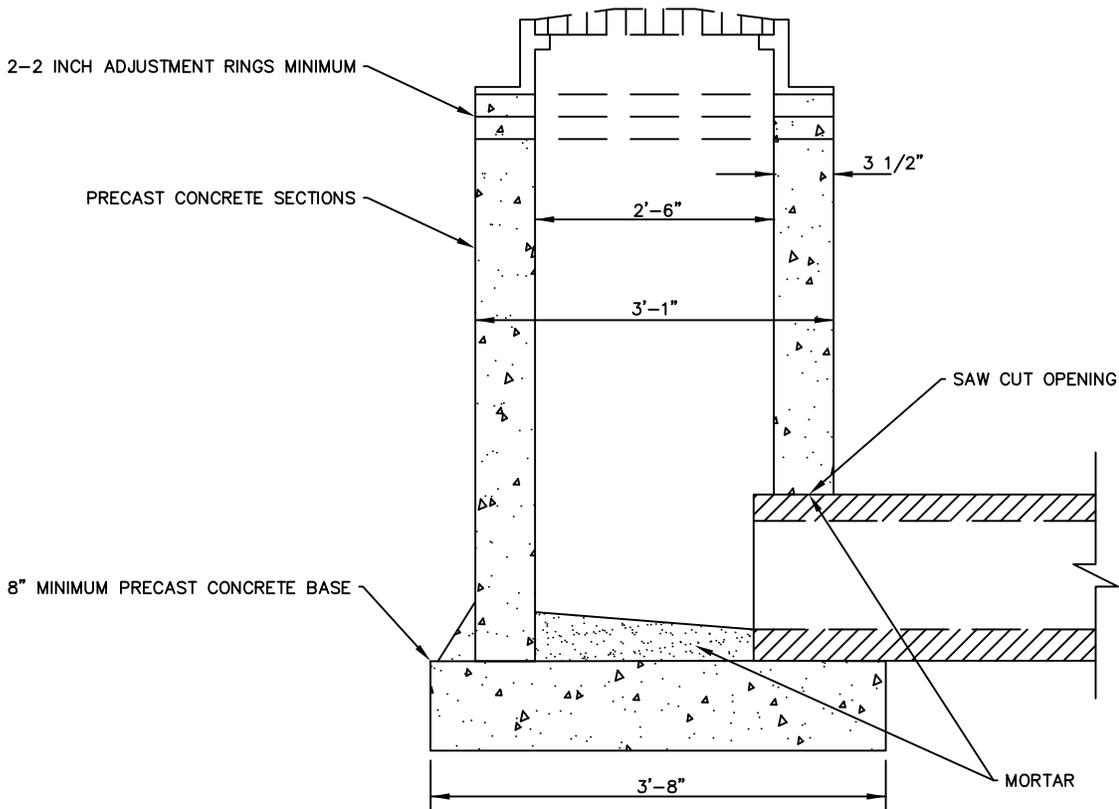
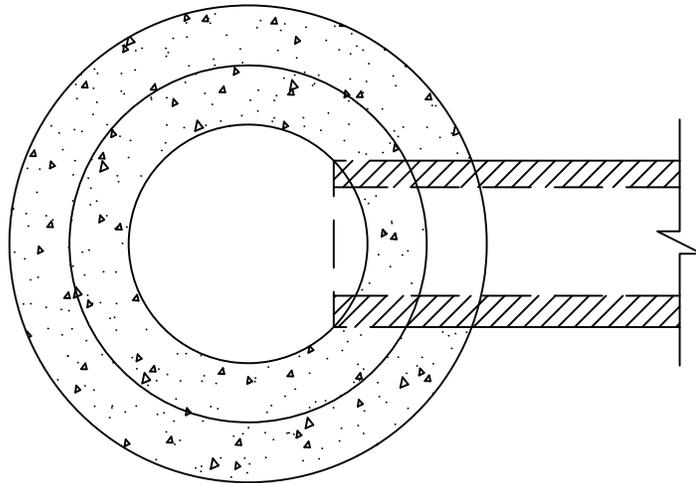
 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: TYPE B INLET
	DIVISION: 33
	DRAWING NO: S-6
	DATE: 12/2018 BY: KAD CHECKED: EPR



NOTES:

1. ON A NORTH-SOUTH STREET, STORM SERVICES SHALL BE PLACED ON THE NORTH SIDE OF TRENCH.
2. ON AN EAST-WEST STREET, STORM SERVICES SHALL BE PLACED ON THE WEST SIDE OF TRENCH.
3. STORM SERVICES SHALL BE PLACED TO A DEPTH OF 4 FEET AT THE PROPERTY LINE OR AS DIRECTED.
4. SANITARY SEWER SERVICES SHALL BE A MINIMUM OF 10 FEET OR A MAXIMUM OF 11 FEET OF DEPTH AT THE PROPERTY LINE.
5. GRANULAR BACKFILL SHALL BE PLACED A MINIMUM OF 6 INCHES OVER THE SERVICES.
6. LOCATION OF CLAY DAM TO BE DETERMINED BY ENGINEER BASED ON SIDEWALK AND OTHER PAVED SURFACES

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: SANITARY, STORM AND WATER SERVICES
	DIVISION: 33
	DRAWING NO: S-7
	DATE: 12/2019 BY: KAD CHECKED: EPR



NOTE:

1. THE MINIMUM DEPTH OF FIELD INLETS FROM GRATE TO BOTTLM OF BASE SHALL BE 4'-8".



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

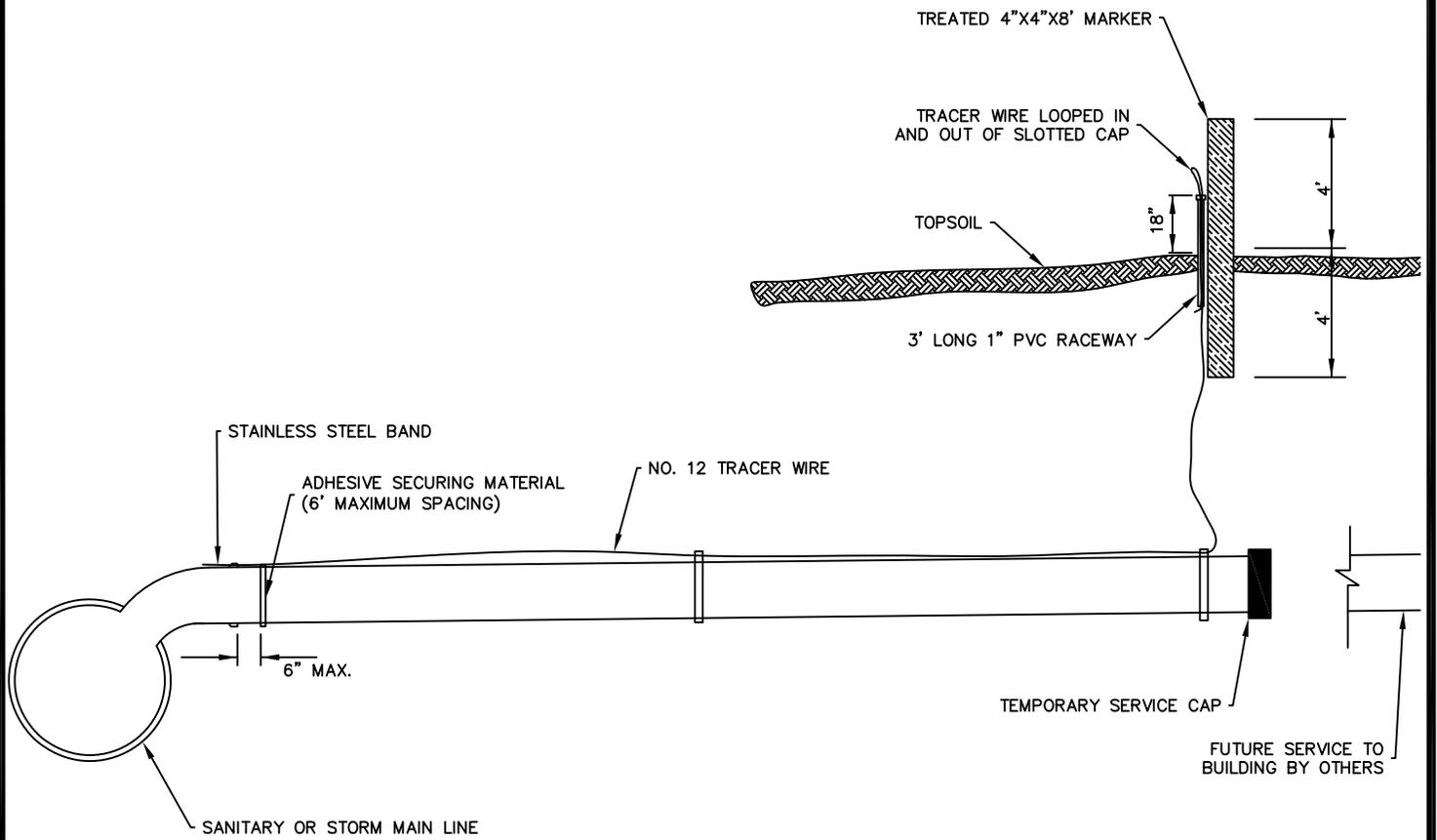
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
TYPE A FIELD INLET

DIVISION: 33

DRAWING NO:
FI-1

DATE: 12/2018
BY: KAD
CHECKED: EPR



NOTE:

1. TRACER WIRE - BROWN FOR STORM AND GREEN FOR SANITARY.



ENGINEERING DIVISION
 925 S. SIXTH ST
 DE PERE, WI 54115

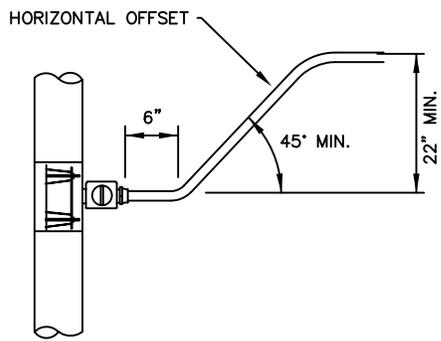
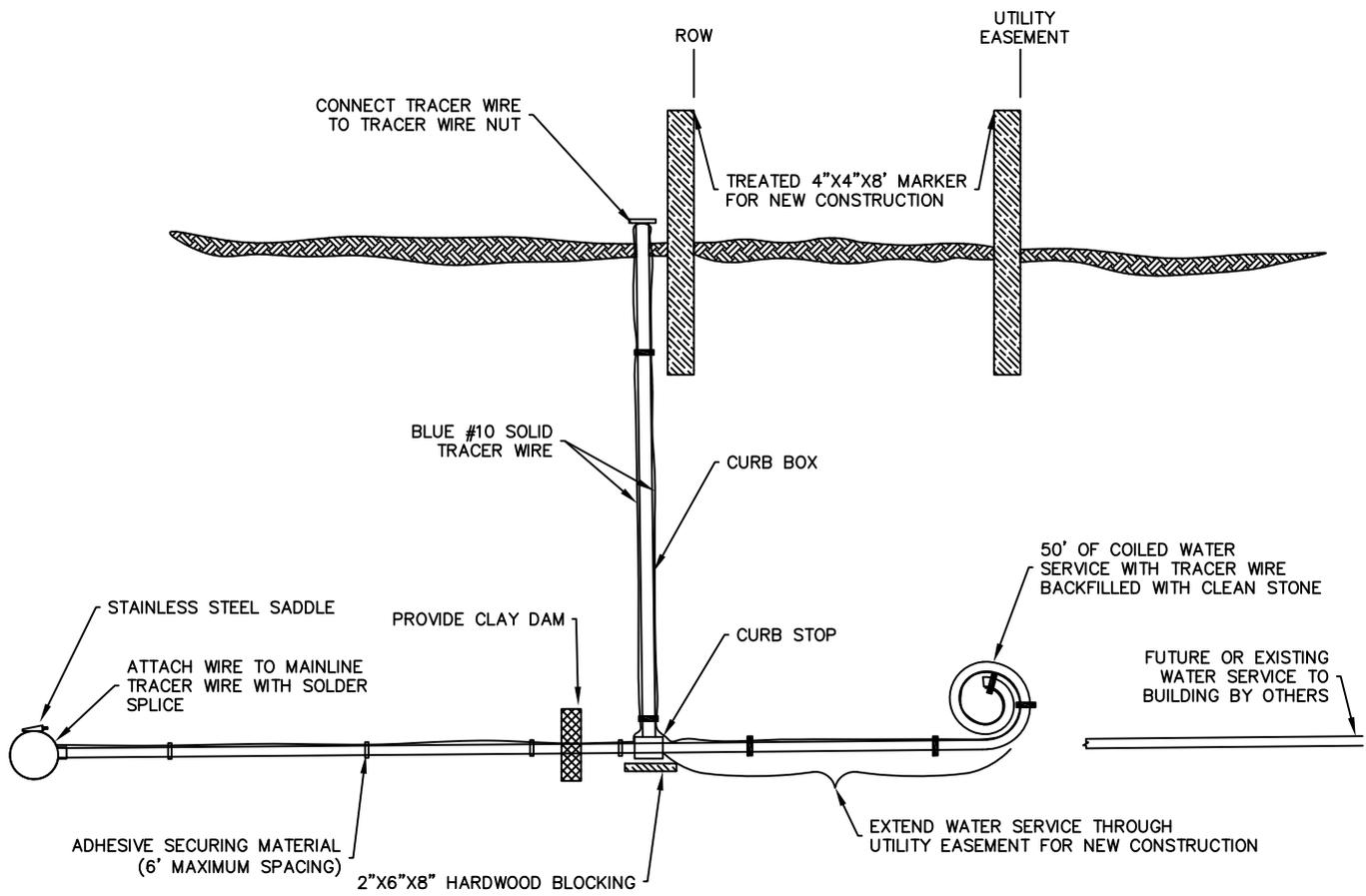
OFFICE 920-339-4061
 FAX 920-339-4071

TITLE:
 SEWER TRACER WIRE

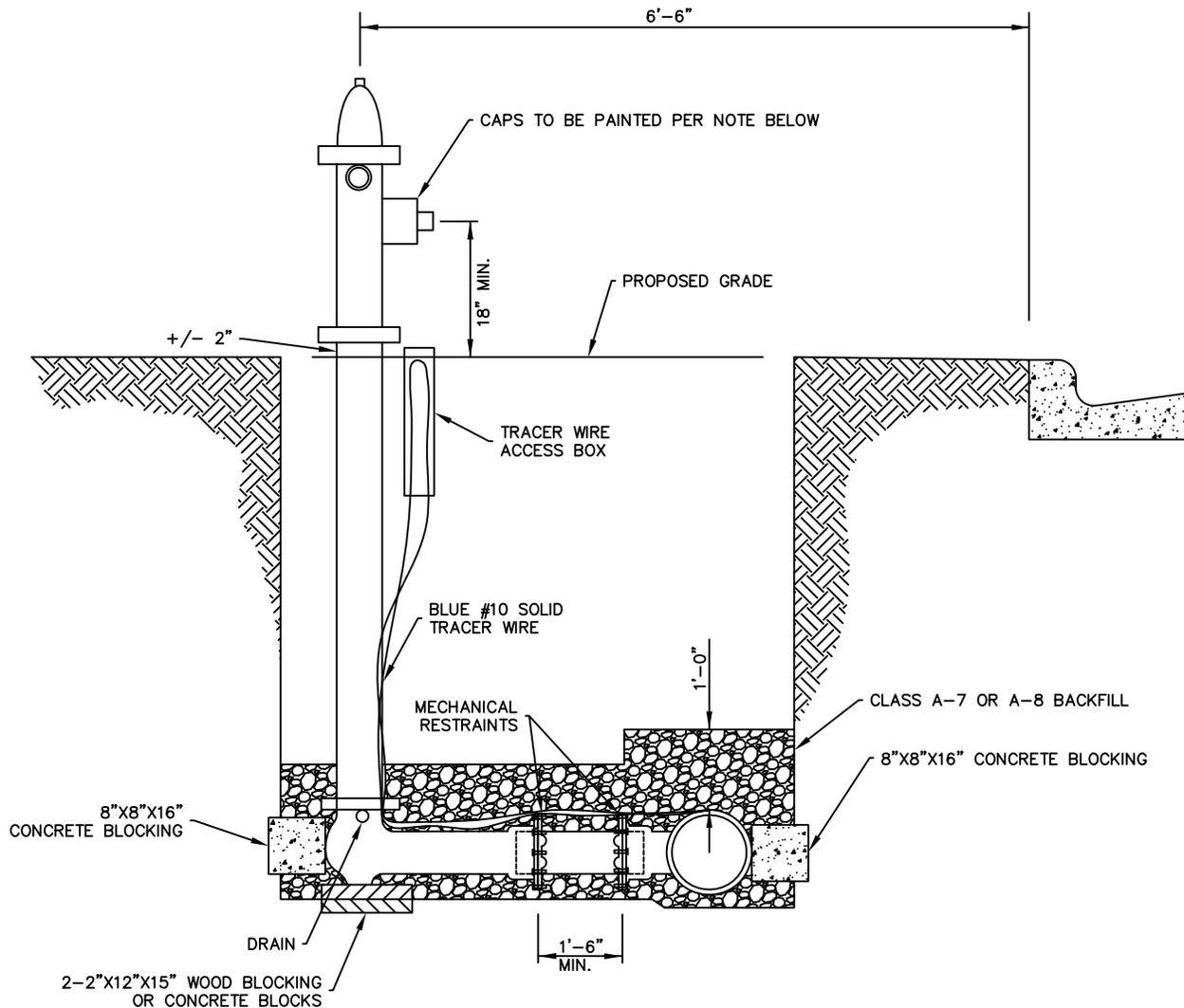
DIVISION: 33

DRAWING NO:
 TW-1

DATE: 12/2018
 BY: KAD
 CHECKED: EPR



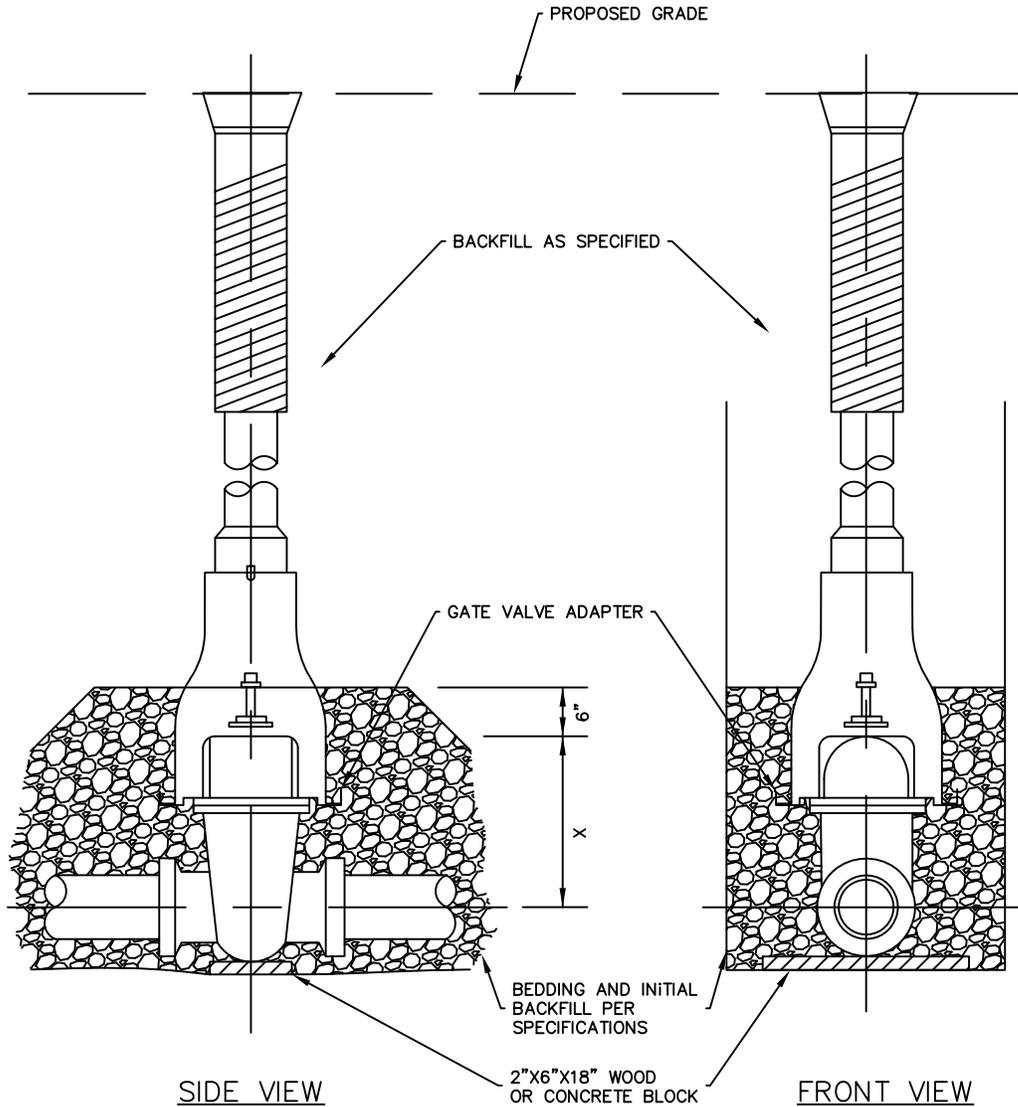
 DE PERE ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	TITLE: WATER TRACER WIRE
	DIVISION: 33
	DRAWING NO: TW-2
	DATE: 12/2019 BY: KAD CHECKED: EPR



NOTES:

1. HYDRANTS SHALL BE SET VERTICAL.
2. CONCRETE BLOCKING AND WOOD BLOCKING SHALL BE INSTALLED AGAINST FIRM NATURAL GROUND AS REACTION BACKING FOR TEE AND HYDRANT SHOE.
3. REGARDLESS OF DEPTH OF MAIN, THE BREAKAWAY FLANGE MUST BE +/- 2 INCHES ABOVE THE PROPOSED GRADE.
4. ALL HYDRANTS SHALL BE CLEANED AND REPAINTED TO ELIMINATE ANY SCRATCHED AND SURFACE IMPERFECTIONS. THIS SHALL BE ACCOMPLISHED AFTER THE HYDRANT HAS BEEN INSTALLED, BACKFILLED AND TESTED.
5. ENCASE ENTIRE HYDRANT IN POLYETHYLENE ENCASEMENT.
6. TRACER WIRE SHALL BE RUN UP HYDRANT.
7. BLOCKING AND MEGA LUGS REQUIRED.
8. HYDRANT CAPS TO BE PAINTED PER THE NFPA STANDARD 291, BASED ON FLOWS AS DETERMINED BY THE ENGINEER:
 - A. CLASS AA- LIGHT BLUE - RATED CAPACITY OF 1500 GPM
 - B. CLASS A - GREEN - RATED CAPACITY OF 1000-1499 GPM
 - C. CLASS B - ORANGE - RATED CAPACITY OF 500-999 GPM
 - D. CLASS C - RED - RATED CAPACITY OF LESS THAN 500 GPM

 <p>DE PERE</p>	TITLE: HYDRANT
	DIVISION: 33
	DRAWING NO: W-1
	DATE: 12/2018 BY: KAD CHECKED: EPR
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	

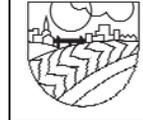


PIPE DIA. INCHES	X=SETTING INCHES
6	12
8	13
10	17
12	21

NOTES:

1. ENCASE ENTIRE VALVE IN POLYETHYLENE ENCASMENT.
2. VALVE BOXES SHALL BE SET VERTICAL.
3. JOINT RESISTANT PER SPECIFICATIONS.
4. VALVE EXTENTION STEM REQUIRED.

DE PERE



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

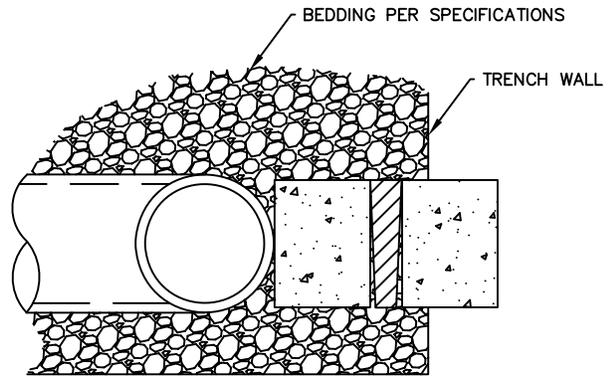
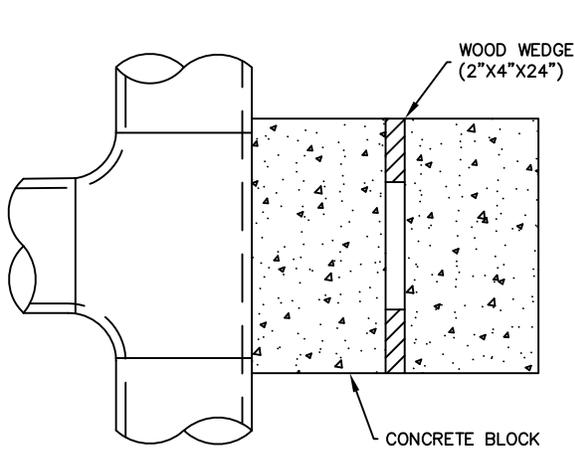
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
RESILIENT SEATED
GATE VALVE

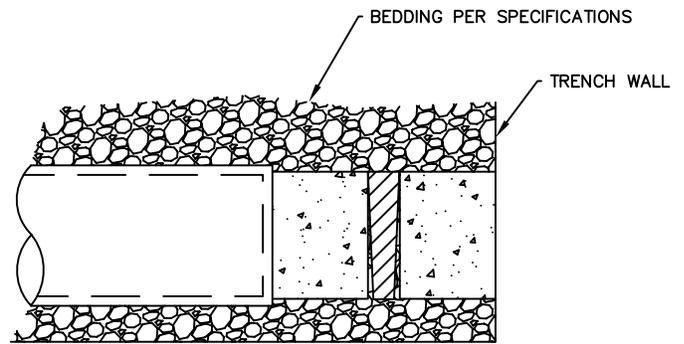
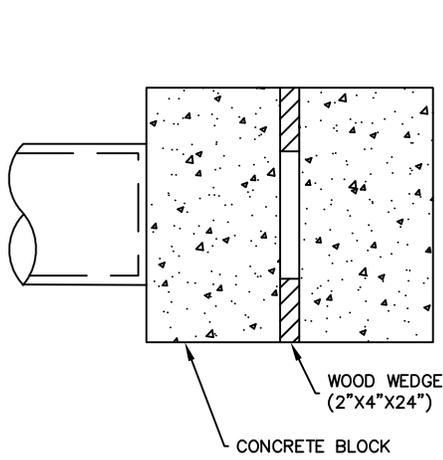
DIVISION: 33

DRAWING NO:
W-2

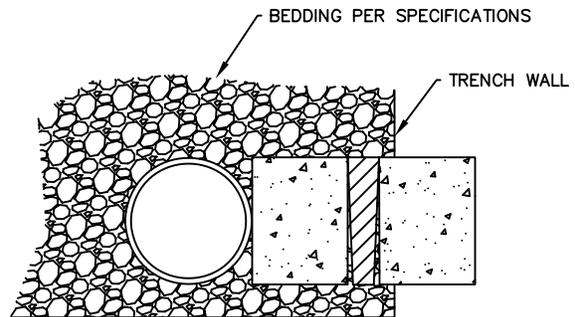
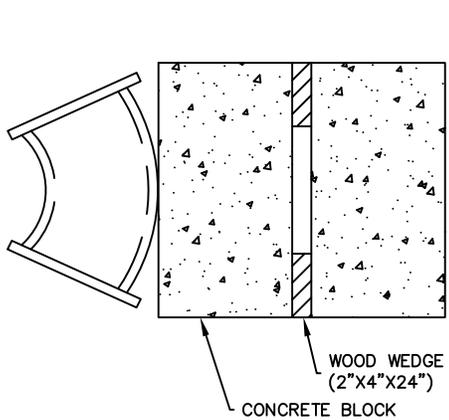
DATE: 12/2018
BY: KAD
CHECKED: EPR



TEE



CAP AND PLUG

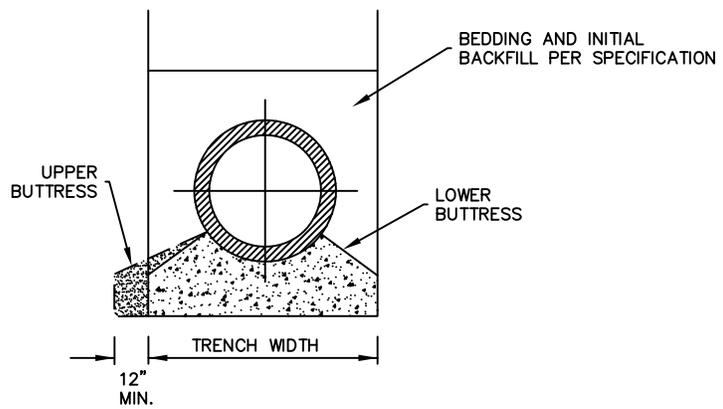
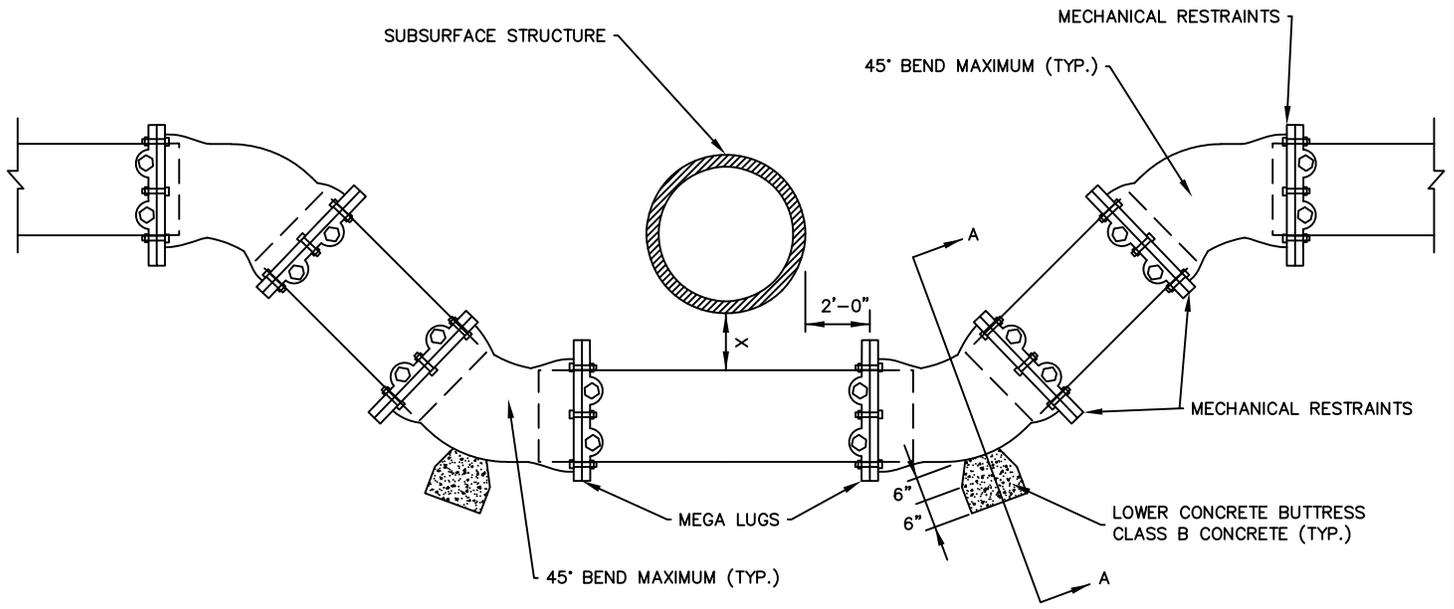


BEND

NOTES:

1. USE 8"X8"X16" CONCRETE BLOCK FOR 6" OR 8" DIA. PIPE.
2. USE 12"X8"X16" CONCRETE BLOCK 10" AND 12" DIA. PIPE.
3. CONCRETE BLOCKING SHALL BE INSTALLED AGAINST FIRM NATURAL GROUND.

 <p>ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071</p>	TITLE: BUTTRESS FOR TEES PLUGS AND BENDS
	DIVISION: 33
	DRAWING NO: W-3
	DATE: 12/2018 BY: KAD CHECKED: EPR



SEPERATION TABLE

DESCRIPTION	X=DISTANCE
STRUCTURE	12"
UNDER SEWER	18"
OVER SEWER	6"

- NOTES:
1. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE ENCASMENT BEFORE PLACEMENT OF BUTTRESSES.
 2. MECHANICAL RESTRAINTS WILL BE REQUIRED IN ADDITION TO BLOCKING.

 ENGINEERING DIVISION 925 S. SIXTH ST DE PERE, WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	TITLE: WATER MAIN OFFSET
	DIVISION: 33
	DRAWING NO: W-4
	DATE: 12/2018 BY: KAD CHECKED: EPR

C

APPENDIX C – CITY OF DE PERE

MANAGER PACKET

CALL IN PROCEDURE

City of De Pere Manager Packet Call-In Procedure



Contents

PROBLEM GUIDE	2
MANAGER PHONE NUMBERS	3
MECHANICAL DIVISION	4
STREET DIVISION	4
PARK DIVISION	5
WATER DIVISION	5
ENGINEERING DIVISION	6
SECRETARIAL DIVISION	6
MUNICIPAL SERVICE CENTER	7
EMERGENCY CALL-IN PROCEDURE	7

Appendix

- Brown County Emergency Highway Division
- City Lighting Locates
- City Hall Elevator Emergency Procedure
- City Hall Elevator Emergency Access
- Community Center Call-In Procedures
- Community Center Security System On-Call
- De Pere Traffic Signal Maintenance
- Swimming Pool Emergency Contractor

PROBLEM GUIDE

Problems/Issue/Call	Recommended Call In	Notes
Boat Launch – Ticket Machine	Call Don Melichar first, Park/Forestry personnel next, then Eric Allen.	Call Best Equipment if unsuccessful in contacting Park Personnel – 920-716-7732 .
Community Center – Key Card Issue/doors will not open/lock	Paula, John, Marty, Don, Eric Allen & Tom Blohowiak - Mechanical Division.	Possibly programming error deactivated card or failed reader. Johnson Controls is the provider.
Community Center – Electrical issue, tripped breakers	Eric Allen, Jeff Wickman and Tom Blohowiak - Mechanical Division	
All City Buildings – Heating/Cooling issue	Eric Allen, Jeff Wickman and Tom Blohowiak	Hurckman is the HVAC Contractor. Phone: 920-499-8771 .
Elevator	Call Eric Allen, Tom Blohowiak or Elevator Service as listed	Refer to appendix for Elevator Service
Emergency Locate	See Procedure	
Park Shelter Problem	Park, Recreation and Forestry	
Park Problems/Concerns – General	Park, Recreation and Forestry	
Railroad Gate Closed	Street Division	Call C&N Railroad 1-800-616-3432
Sewage/Water Back Up in Basement	Street Division	Call in one employee and go with to help out. If you cannot get ahold of anyone call the Village of Allouez at 920-621-8756 and meet them on site.
Street – Icy Roads	Street Division	Call In six employees
Street - Lights	Eric Allen & Mechanical Division	
Street – Pot Hole/Road Hazard	Street Division	Call In one employee
Street – Sign Down	Street Division	Call In one employee
Street – Street Flooding	Street Division	Call In two employees
Street – Street Sweeping	Street Division	Call In one employee
Street - Traffic Control/Barricades	Street Division	Call In two employees
Street – Traffic Signal Issue	Street Division	If hazard call Brown County Highway Department – See Appendix.
Swimming Pool	Eric Allen, Jeff Wickman and Tom Blohowiak, Mechanical Division	If no one can be reached contact Splash, City's pool contractor- See Appendix.
Tree or Limb hanging	Call Don Melichar, Jerry Hasenberg, Kyle Rouce, Kevin VandenBush, Park/Forestry personnel, then other personnel	Call In two employees
Tree or Limb on the ground	Call Don Melichar, Jerry Hasenberg, Kyle Rouce, Kevin VandenBush, Park/ Forestry personnel, then other personnel	Most situations require two employees (manager's discretion).
Water Bubbling up in Road/Sidewalk/Ground	Call Water Division On-Call Person	

MANAGER PHONE NUMBERS

<u>NAME</u>	<u>TITLE</u>	<u>PHONE</u>
Scott Thoresen	Director of Public Works	920-639-1003
Marty Kosobucki	Director of Parks, Recreation and Forestry	920-639-1015
Tony Fietzer	Street Superintendent	920-639-1001
Don Melichar	Park Superintendent/City Forester	920-639-3415
Eric Rakers	City Engineer	920-639-1000
Eric Zygarlicke	Water Department Supervisor	920-574-1443
Tom Blohowiak	Maintenance Supervisor	920-639-1336
Chase Kuffel	Assistant City Engineer	920-639-1019
Paula Rahn	Recreation Superintendent	920-639-1038
John McDonald	Recreation Supervisor	920-296-5583

MSC "ON CALL" PHONE [920-639-8344](tel:920-639-8344)

Brown County Dispatch.....[920-339-4078](tel:920-339-4078) or [920-391-7459](tel:920-391-7459)

MECHANICAL DIVISION

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CURRENT CLASSIFICATION</u>
Bernie Skoviak	920-619-1438	9/9/97	Mechanic
Craig Thiem	920-676-0115	9/13/10	Mechanic
Eric Allen	920-606-5517	4/17/14	Maintenance Specialist
Marcus Webster	920-327-9112	1/22/18	Mechanic
Jeff Wickman	920-621-7308	4/22/19	Maintenance Specialist

STREET DIVISION

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CURRENT CLASSIFICATION</u>
Tim Jonet	920-655-0941	7/12/93	DPW Equipment Operator
Daryl Carter	920-639-0797	11/4/93	DPW Equipment Operator
Ron Czarnecki	920-819-0892	6/26/00	DPW Equipment Operator
Chad Thomson	920-680-1526	7/3/00	DPW Equipment Operator
Bruce Sigl	920-590-3061	12/11/00	DPW Maintenance Worker
Robert Pfothenhauer	920-336-1167	1/22/01	DPW Equipment Operator
Carrie Glime	920-360-1863	2/20/06	DPW Maintenance Worker
Jesse Wegner	920-676-8534	4/21/14	DPW Maintenance Worker
Pat VanRite	920-621-3765	7/14	DPW Maintenance Worker
Dean Moreau	920-360-2124	6/25/18	DPW Maintenance Worker
Brandon Roffers	920-676-9973	7/15/19	DPW Maintenance Worker
Tony LeRoy	920-660-4538	11/4/19	DPW Maintenance Worker

PARK DIVISION

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CURRENT CLASSIFICATION</u>
Robert Haen	920-615-9144	4/26/17	Park Maintenance Lead
John Hallam	920-826-6368	2/28/06	Park Maintenance Worker
Kevin Vanden Bush	920-845-2015	3/6/06	Park Maintenance Worker
James Greve	920-378-5776	4/17/17	Park Maintenance Worker
Jerry Hasenberg	920-585-4513	10/3/18	Arborist
Kyle Rouce	262-210-8986	5/18/20	Arborist

WATER DIVISION

One employee of the Public Works Department is on standby duty outside the normal business hours of 6:30 am to 3:00 pm, Monday through Friday. Standby duty includes weekends and these Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day, day after Thanksgiving Day, Christmas Eve, Christmas Day, and New Year's Day. All calls for Water-related emergencies should be directed to the MSC "On-Call" phone.

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CLASSIFICATION</u>
MSC "On Call" Phone	920-639-8344		Public Works Department
Kim Johnson	920-265-2281	5/11/92	Water Department Maintenance Worker
Jessica Dart	920-621-4447	10/19/15	Water Department Maintenance Worker
Jason Cummings	970-209-1271	11/28/16	Water Department Maintenance Worker

ENGINEERING DIVISION

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CLASSIFICATION</u>
Robert Krzewina	920-339-9474	2/10/92	Engineer Senior Technician
Scott Lax	920-737-3361	3/28/11	Engineer Senior Technician
Kelly Demeny	920-606-1897	8/18/14	Engineer Senior Technician
Matt LeClair	920-681-1470	3/27/17	Engineer Senior Technician
Jenna LaRoche	920-629-7227	1/2/18	Engineer Senior Technician

SECRETARIAL DIVISION

<u>EMPLOYEE</u>	<u>PHONE NO.</u>	<u>HIRE DATE:</u>	<u>CLASSIFICATION</u>
Grace Lahtela	920-412-6466	7/24/17	Administrative Assistant - Park
Amanda Barber	920-530-1128	6/28/17	Office Assistant - DPW
Betty Sellenheim	920-647-6416	3/11/19	Administrative Assistant - Engineering

MUNICIPAL SERVICE CENTER
EMERGENCY CALL-IN PROCEDURE
Department of Public Works/Department of Parks, Recreation and Forestry

PURPOSE: The purpose of this policy/procedure is to establish procedures for Department of Public Works and Parks, Recreation and Forestry personnel responsible for taking action in the case of an emergency.

- Provide adequate response to all emergencies that may arise during non-working hours in a timely and efficient manner.
- Provide a workable method for implementing corrective action in response to emergencies.
- Protect the health, safety, and general welfare of the Citizens of De Pere.

POLICY: The Department of Public Works, and Department of Parks, Recreation and Forestry will respond to all emergencies on a twenty-four hour, seven-day week basis and will provide reasonable support to correct the problem or to provide temporary relief until such time as permanent action can be taken.

PROCEDURE:

1. Complaints or requests for action to any City personnel should be directed to the appropriate Division Head, Supervisor, or De Pere Police Department.
2. Unless otherwise directed, the De Pere Police Department shall contact the Brown County Dispatch Center with any after hour issues. Dispatch will contact MSC "On Call" phone.
3. Upon receiving a call from dispatch or Police Department, the MSC "On Call" person shall determine if the health, safety and general welfare of the public is in immediate danger, or if the situation calls for urgent reaction on the City's part.
 - a. If the nature of call warrants immediate action, the MSC "On Call" person shall determine if they can resolve the issue themselves. If there is a need for assistance or they cannot address the issue the MSC "On Call" person shall navigate through the process of contacting appropriate personnel to resolve the issue.
 - b. If the nature of the call does not warrant immediate action, the MSC "On Call" person shall document the issue and delay corrective action until normal working hours. The MSC "On Call" person shall notify the appropriate division manager the following business day of the corrective action that may be needed.

4. When the MSC "On Call" person determines the nature of the call warrants immediate action they cannot resolve they shall:
 - a. Determine the division for the most qualified person to address the concern.
 - b. Begin contacting personnel within the division for the most qualified to perform the work.
 - c. If all personnel within the division for the most qualified to perform the work cannot be contacted, the MSC "On Call" person shall use their discretion in finding the most qualified person in other divisions to perform the work.
 - d. When contacting personnel, the MSC "On Call" person shall consider timeliness of response as a factor in calling personnel in.

5. An employee called in for an emergency should respond to the Municipal Service Center within 30 minutes of receiving the call. An emergency for purposes of this provision is a circumstance or condition, which the employer reasonably believes, required immediate corrective action or which, in the public interest, does not permit inaction until the next regularly scheduled workday. An employee called for an emergency shall be required to perform work necessary to satisfy the emergency for which he/she was called in, and may also be required to perform duties, tasks or work necessary to satisfy other emergencies or tasks which occur while the employee is present and performing work required by the call-in.

6. If the MSC "On Call" person is not sure how to address emergency they shall contact the appropriate division manager.

D

APPENDIX D – COMPLIANCE MAINTENANCE ANNUAL REPORT (CMAR)

Compliance Maintenance Annual Report

De Pere Sewage Collection System

Last Updated: Reporting For:
6/18/2020 **2019**

Financial Management

1. Provider of Financial Information Name: <input type="text" value="Joe Zegers"/> Telephone: <input type="text" value="(920) 339-4041"/> (XXX) XXX-XXXX E-Mail Address (optional): <input type="text" value="jzegers@deperewi.gov"/>		
2. Treatment Works Operating Revenues 2.1 Are User Charges or other revenues sufficient to cover O&M expenses for your wastewater treatment plant AND/OR collection system ? ● Yes (0 points) <input type="checkbox"/> <input type="checkbox"/> ○ No (40 points) If No, please explain: <input type="text"/> 2.2 When was the User Charge System or other revenue source(s) last reviewed and/or revised? Year: <input type="text" value="2019"/> ● 0-2 years ago (0 points) <input type="checkbox"/> <input type="checkbox"/> ○ 3 or more years ago (20 points) <input type="checkbox"/> <input type="checkbox"/> ○ N/A (private facility) 2.3 Did you have a special account (e.g., CFWP required segregated Replacement Fund, etc.) or financial resources available for repairing or replacing equipment for your wastewater treatment plant and/or collection system? ● Yes (0 points) ○ No (40 points)		0
REPLACEMENT FUNDS [PUBLIC MUNICIPAL FACILITIES SHALL COMPLETE QUESTION 3]		
3. Equipment Replacement Funds 3.1 When was the Equipment Replacement Fund last reviewed and/or revised? Year: <input type="text" value="2019"/> ● 1-2 years ago (0 points) <input type="checkbox"/> <input type="checkbox"/> ○ 3 or more years ago (20 points) <input type="checkbox"/> <input type="checkbox"/> ○ N/A If N/A, please explain: <input type="text"/>		
3.2 Equipment Replacement Fund Activity		
3.2.1 Ending Balance Reported on Last Year's CMAR	\$ <input type="text" value="150,000.00"/>	
3.2.2 Adjustments - if necessary (e.g. earned interest, audit correction, withdrawal of excess funds, increase making up previous shortfall, etc.)	\$ <input type="text" value="0.00"/>	
3.2.3 Adjusted January 1st Beginning Balance	\$ <input type="text" value="150,000.00"/>	
3.2.4 Additions to Fund (e.g. portion of User Fee, earned interest, etc.)	\$ <input type="text" value="0.00"/>	
	+	

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3.2.5 Subtractions from Fund (e.g., equipment replacement, major repairs - use description box 3.2.6.1 below*) - \$ 0.00

3.2.6 Ending Balance as of December 31st for CMAR Reporting Year \$ 150,000.00

All Sources: This ending balance should include all Equipment Replacement Funds whether held in a bank account(s), certificate(s) of deposit, etc.

3.2.6.1 Indicate adjustments, equipment purchases, and/or major repairs from 3.2.5 above.

3.3 What amount should be in your Replacement Fund? \$ 150,000.00

0

Please note: If you had a CWFP loan, this amount was originally based on the Financial Assistance Agreement (FAA) and should be regularly updated as needed. Further calculation instructions and an example can be found by clicking the SectionInstructions link under Info header in the left-side menu.

3.3.1 Is the December 31 Ending Balance in your Replacement Fund above, (#3.2.6) equal to, or greater than the amount that should be in it (#3.3)?

- Yes
- No

If No, please explain.

4. Future Planning

4.1 During the next ten years, will you be involved in formal planning for upgrading, rehabilitating, or new construction of your treatment facility or collection system?

- Yes - If Yes, please provide major project information, if not already listed below.
- No

Project #	Project Description	Estimated Cost	Approximate Construction Year
1	Sewer Lining	266000	2020
2	Sewer and Manhole Repair	200000	2020
3	Sewer Televising and Repair	625000	2020
4	Sewer Relay for Street Reconstruction	188000	2020
5	Sewer Televising/Repairs	500000	2021
6	Sewer Lining/Relay	800000	2021
7	Sewer Televising/Repairs	500000	2022
8	Sewer Lining/Relay	800000	2022
9	Sewer Televising/Repairs	500000	2023
10	Sewer Lining/Relay	800000	2023

5. Financial Management General Comments

ENERGY EFFICIENCY AND USE

6. Collection System

6.1 Energy Usage

6.1.1 Enter the monthly energy usage from the different energy sources:

COLLECTION SYSTEM PUMPAGE: Total Power Consumed

Number of Municipally Owned Pump/Lift Stations:

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	Electricity Consumed (kWh)	Natural Gas Consumed (therms)
January	0	
February	0	
March	0	
April	0	
May	0	
June	0	
July	0	
August	65	
September	112	
October	88	
November	96	
December	95	
Total	456	0
Average	91	0

6.1.2 Comments:

6.2 Energy Related Processes and Equipment

6.2.1 Indicate equipment and practices utilized at your pump/lift stations (Check all that apply):

- Comminution or Screening
- Extended Shaft Pumps
- Flow Metering and Recording
- Pneumatic Pumping
- SCADA System
- Self-Priming Pumps
- Submersible Pumps
- Variable Speed Drives
- Other:

6.2.2 Comments:

6.3 Has an Energy Study been performed for your pump/lift stations?

No

Yes

Year:

By Whom:

Describe and Comment:

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6.4 Future Energy Related Equipment

6.4.1 What energy efficient equipment or practices do you have planned for the future for your pump/lift stations?

No activities are planned as the lift station was just constructed in 2019.

Total Points Generated	0
Score (100 - Total Points Generated)	100
Section Grade	A

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De Pere Sewage Collection System

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Sanitary Sewer Collection Systems

1. Capacity, Management, Operation, and Maintenance (CMOM) Program

1.1 Do you have a CMOM program that is being implemented?

- Yes
- No

If No, explain:

1.2 Do you have a CMOM program that contains all the applicable components and items according to Wisc. Adm Code NR 210.23 (4)?

- Yes
- No (30 points)
- N/A

If No or N/A, explain:

1.3 Does your CMOM program contain the following components and items? (check the components and items that apply)

- Goals [NR 210.23 (4)(a)]

Describe the major goals you had for your collection system last year:

Continue to rehabilitate sewers in areas of street improvements, including sanitary laterals in the right of way. Identify sewers in easements, alleys, and street resurfacing for lining.

Did you accomplish them?

- Yes
- No

If No, explain:

- Organization [NR 210.23 (4) (b)]

Does this chapter of your CMOM include:

- Organizational structure and positions (eg. organizational chart and position descriptions)
- Internal and external lines of communication responsibilities
- Person(s) responsible for reporting overflow events to the department and the public

- Legal Authority [NR 210.23 (4) (c)]

What is the legally binding document that regulates the use of your sewer system?

Sewer Use Ordinance

If you have a Sewer Use Ordinance or other similar document, when was it last reviewed and revised? (MM/DD/YYYY) 2007-12-18

Does your sewer use ordinance or other legally binding document address the following:

- Private property inflow and infiltration
- New sewer and building sewer design, construction, installation, testing and inspection
- Rehabilitated sewer and lift station installation, testing and inspection
- Sewage flows satellite system and large private users are monitored and controlled, as necessary
- Fat, oil and grease control
- Enforcement procedures for sewer use non-compliance
- Operation and Maintenance [NR 210.23 (4) (d)]

Does your operation and maintenance program and equipment include the following:

- Equipment and replacement part inventories
- Up-to-date sewer system map

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- A management system (computer database and/or file system) for collection system information for O&M activities, investigation and rehabilitation
- A description of routine operation and maintenance activities (see question 2 below)
- Capacity assessment program
- Basement back assessment and correction
- Regular O&M training

Design and Performance Provisions [NR 210.23 (4) (e)]

What standards and procedures are established for the design, construction, and inspection of the sewer collection system, including building sewers and interceptor sewers on private property?

- State Plumbing Code, DNR NR 110 Standards and/or local Municipal Code Requirements
- Construction, Inspection, and Testing
- Others:

Overflow Emergency Response Plan [NR 210.23 (4) (f)]

Does your emergency response capability include:

- Responsible personnel communication procedures
- Response order, timing and clean-up
- Public notification protocols
- Training
- Emergency operation protocols and implementation procedures

Annual Self-Auditing of your CMOM Program [NR 210.23 (5)]

Special Studies Last Year (check only those that apply):

- Infiltration/Inflow (I/I) Analysis
- Sewer System Evaluation Survey (SSES)
- Sewer Evaluation and Capacity Management Plan (SECAP)
- Lift Station Evaluation Report
- Others:

0

2. Operation and Maintenance

2.1 Did your sanitary sewer collection system maintenance program include the following maintenance activities? Complete all that apply and indicate the amount maintained.

Cleaning	<input style="width: 60px; text-align: right;" type="text" value="20"/>	% of system/year
Root removal	<input style="width: 60px; text-align: right;" type="text" value="20"/>	% of system/year
Flow monitoring	<input style="width: 60px; text-align: right;" type="text" value="0"/>	% of system/year
Smoke testing	<input style="width: 60px; text-align: right;" type="text" value="0"/>	% of system/year
Sewer line televising	<input style="width: 60px; text-align: right;" type="text" value="20"/>	% of system/year
Manhole inspections	<input style="width: 60px; text-align: right;" type="text" value="20"/>	% of system/year
Lift station O&M	<input style="width: 60px; text-align: right;" type="text" value="0"/>	# per L.S./year
Manhole rehabilitation	<input style="width: 60px; text-align: right;" type="text" value="2"/>	% of manholes rehabbed
Mainline rehabilitation	<input style="width: 60px; text-align: right;" type="text" value="2"/>	% of sewer lines rehabbed
Private sewer inspections	<input style="width: 60px; text-align: right;" type="text" value="0"/>	% of system/year

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Private sewer I/I removal % of private services
 River or water crossings % of pipe crossings evaluated or maintained

Please include additional comments about your sanitary sewer collection system below:

3. Performance Indicators

3.1 Provide the following collection system and flow information for the past year.

Total actual amount of precipitation last year in inches
 Annual average precipitation (for your location)
 Miles of sanitary sewer
 Number of lift stations
 Number of lift station failures
 Number of sewer pipe failures
 Number of basement backup occurrences
 Number of complaints
 Average daily flow in MGD (if available)
 Peak monthly flow in MGD (if available)
 Peak hourly flow in MGD (if available)

3.2 Performance ratios for the past year:

Lift station failures (failures/year)
 Sewer pipe failures (pipe failures/sewer mile/yr)
 Sanitary sewer overflows (number/sewer mile/yr)
 Basement backups (number/sewer mile)
 Complaints (number/sewer mile)
 Peaking factor ratio (Peak Monthly:Annual Daily Avg)
 Peaking factor ratio (Peak Hourly:Annual Daily Avg)

4. Overflows

LIST OF SANITARY SEWER (SSO) AND TREATMENT FACILITY (TFO) OVERFLOWS REPORTED **

Date	Location	Cause	Estimated Volume (MG)
None reported			

** If there were any SSOs or TFOs that are not listed above, please contact the DNR and stop work on this section until corrected.

5. Infiltration / Inflow (I/I)

5.1 Was infiltration/inflow (I/I) significant in your community last year?

- Yes
- No

If Yes, please describe:

5.2 Has infiltration/inflow and resultant high flows affected performance or created problems in your collection system, lift stations, or treatment plant at any time in the past year?

- Yes

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<ul style="list-style-type: none">● No <p>If Yes, please describe:</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
5.3 Explain any infiltration/inflow (I/I) changes this year from previous years:
<div style="border: 1px solid black; padding: 2px;">No changes</div>
5.4 What is being done to address infiltration/inflow in your collection system?
<div style="border: 1px solid black; padding: 2px;">The City continues to rehabilitate the system through relay and lining of the sewer main and sewer laterals in the right of way. We are in the process of completing and I&I evaluation.</div>

Total Points Generated	0
Score (100 - Total Points Generated)	100
Section Grade	A

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Grading Summary

WPDES No: 0047341

SECTIONS	LETTER GRADE	GRADE POINTS	WEIGHTING FACTORS	SECTION POINTS
Financial	A	4	1	4
Collection	A	4	3	12
TOTALS			4	16
GRADE POINT AVERAGE (GPA) = 4.00				

Notes:

- A = Voluntary Range (Response Optional)
- B = Voluntary Range (Response Optional)
- C = Recommendation Range (Response Required)
- D = Action Range (Response Required)
- F = Action Range (Response Required)

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Resolution or Owner's Statement

Name of Governing
Body or Owner:

City of De Pere

Date of Resolution or
Action Taken:

2020-06-16

Resolution Number:

20-65

Date of Submittal:

ACTIONS SET FORTH BY THE GOVERNING BODY OR OWNER RELATING TO SPECIFIC CMAR SECTIONS (Optional for grade A or B. Required for grade C, D, or F):

Financial Management: Grade = A

Collection Systems: Grade = A

(Regardless of grade, response required for Collection Systems if SSOs were reported)

ACTIONS SET FORTH BY THE GOVERNING BODY OR OWNER RELATING TO THE OVERALL GRADE POINT AVERAGE AND ANY GENERAL COMMENTS

(Optional for G.P.A. greater than or equal to 3.00, required for G.P.A. less than 3.00)

G.P.A. = 4.00

E

APPENDIX E – WISCONSIN ADMINISTRATIVE

CODE NR 210.23

document, to construct or implement projects that will address the cause of the sanitary sewer overflow or sewage treatment facility overflow.

Note: The department may initiate enforcement action under s. 283.89, Stats., for any sanitary sewer overflow or sewage treatment facility overflow.

(3) PERMITTEE RESPONSE TO OVERFLOWS. Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions shall be implemented consistent with an emergency response plan developed under s. NR 210.23 (4) (f). Remedial actions may include the following:

(a) Interception and rerouting of untreated or partially treated wastewater around the point of failure, if that failure is in the sewage collection system.

(b) Use of vacuum trucks or other appropriate mechanisms to recover as much of the wastewater discharged as possible and properly dispose of such wastewater and wash down water.

(c) Cleanup of debris at the overflow site.

(d) Adequate sampling to determine the amount, characteristics, and impact of the overflow.

(4) PERMITTEE REPORTING. Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

(a) The permittee shall notify the department by telephone, fax, or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow.

(b) The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:

1. The date and location of the overflow.
2. The surface water to which the discharge occurred, if any.
3. The duration of the overflow and an estimate of the volume of the overflow.

4. A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe.

5. The estimated date and time when the overflow began and stopped or will be stopped.

6. The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture, and other relevant information.

7. Steps taken or planned to reduce, eliminate and prevent recurrence of the overflow and a schedule of major milestones for those steps.

8. A description of the actual or potential for human exposure and contact with the wastewater from the overflow.

9. Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps.

10. To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow.

11. The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available under sub. (1), including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

Note: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at http://dnr.wi.gov/topic/wastewater/documents/3400-184_ssoreportform.pdf. As indicated on the form, additional information may be submitted to supplement the information required by the form.

(c) The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences.

(d) A permittee that is required to submit wastewater discharge monitoring reports under s. NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

(e) Satellite sewage collection system permittees shall submit reports required under this subsection to all owners of sewerage systems which receive wastewater from the satellite sewage collection system.

(5) PUBLIC NOTIFICATION. A permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under s. NR 210.23 (4) (f). Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

(6) NOTIFICATION OF DRINKING WATER SYSTEM OWNERS. The department may require the permittee to notify the owner of a drinking water intake located in a surface water receiving any sanitary sewer overflows and sewage treatment facility overflows. Such conditions shall be included in the WPDES permit.

History: CR 12-027: cr. Register July 2013 No. 691, eff. 8-1-13.

NR 210.22 Building Backups. (1) Except for the reporting requirement established in s. NR 210.21 (4) (b) 10., building backups shall be subject only to requirements of this section.

(2) A building backup caused by the blockage or failure of the building sewer or any other component of a plumbing system as defined in s. SPS 381.01 (179), and discrete or individual building backups caused, or primarily caused, by excessive flow or hydraulic constraints within the sewage collection system shall not be subject to the requirements of s. NR 210.21 (1).

Note: Section SPS 381.01 (179) reads: "Plumbing system" includes the water supply system, the drain system, the vent system, plumbing fixtures, plumbing appliances and plumbing appurtenances that serve a building, structure or premises.

(3) Whenever there are recurring building backups caused, or primarily caused, by excessive flow or hydraulic constraints within a sewage collection system, the department may reissue or modify a WPDES permit to require actions by the permittee, including preparation and implementation of a system evaluation and capacity assurance plan as provided in s. NR 210.24, to reduce or eliminate such recurring building backups.

(4) Whenever there are building backups caused, or primarily caused, by excessive flow or hydraulic constraints within the sewage collection system and there are no sanitary sewer overflows within the same part of the sewage collection system, the building backups shall be reported in accordance with the requirements of ch. NR 208.

History: CR 12-027: cr. Register July 2013 No. 691, eff. 8-1-13.

NR 210.23 Capacity, Management, Operation, and Maintenance Programs. (1) CMOM PROGRAM REQUIRED.

All permittees subject to this chapter, including the owners of satellite sewage collection systems and combined sewer systems, shall implement a capacity, management, operation, and maintenance program.

(2) **IMPLEMENTATION DEADLINE.** The holder of a WPDES permit shall implement a capacity, management, operation and maintenance program under this section no later than August 1, 2016, or no later than an earlier date specified in the permit.

(3) **GENERAL STANDARDS.** A CMOM program shall ensure the following general standards are met:

(a) The sewage collection system is properly managed, operated, and maintained at all times.

(b) The sewage collection system provides adequate capacity to convey all peak design flows.

(c) All feasible steps are taken to eliminate excessive infiltration and inflow as defined in s. NR 110.03 (13c), cease sanitary sewer overflows and sewage treatment facility overflows and mitigate the impact of such overflows on waters of the state, the environment, and public health.

Note: When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, the relationship between the control of storm water and the control of infiltration/inflow into the sewage collection system, costs and affordability of implementation and risks to public health, the environment, and welfare of the community served by the sewage collection system.

(d) A process is in place to notify the public and other directly affected parties of any incidents of overflows from the sewerage system.

(e) Annual reports are submitted in accordance with the provisions of ch. NR 208.

(4) **COMPONENTS OF CMOM PROGRAM.** (a) *Goals.* Major goals of the CMOM program shall be consistent with the general standards identified in sub. (3).

(b) *Organization.* Persons who are responsible for implementing the CMOM program shall be identified including administration, management, and maintenance personnel or positions, lines of authority of such personnel or positions, internal and external communication responsibilities, and the person or persons who shall report all overflow events to the department and to the public according to s. NR 210.21 (3) to (6).

(c) *Legal authority.* Legally binding authorities, such as sewer use ordinances and service agreements, shall ensure the following:

1. Infiltration and inflow sources, including infiltration and inflow into building sewers, private interceptor sewers, or other such sources on private property, are subject to oversight and control, as necessary.

2. New sewers and connections, including building sewers and private interceptor sewers are designed, constructed, installed, tested, and inspected to meet all applicable current engineering and construction standards.

3. New and rehabilitated sewers, lift stations and other collection system components or appurtenances are installed, tested, and inspected to meet all applicable current standards.

4. If applicable, sewage flows from municipal satellite or other privately owned sewage collection systems are, as necessary, monitored, and controlled. Notwithstanding all other provisions of this chapter, any publicly owned treatment works may establish specific requirements to regulate sewage flows from satellite sewage collection systems.

5. Solid or viscous pollutants, such as fats, oils, and greases, are not discharged into the sewage collection system in amounts that will cause or contribute to obstruction to the flow in the sewer.

Note: This provision is similar to that contained in s. NR 211.10 (2) (c).

6. Procedures are in place to implement enforcement actions for non-compliance with established legal authorities.

(d) *Operation and maintenance.* Operation and maintenance equipment, activities and protocols, including identification of

personnel or positions responsible, shall, as appropriate and applicable to the system, include the following:

1. Adequate maintenance facilities and equipment including equipment and replacement parts inventories, especially critical replacement parts.

2. A map of the sewage collection system.

Note: A geographic information system-based map of the sewage collection system meets this requirement.

3. A management system for the collection and use of information to identify and prioritize appropriate operation and maintenance activities, including identification of structural deficiencies and implementation actions to address such deficiencies.

4. A description of routine preventive operation and maintenance activities such as inspections, televising, cleaning, flow monitoring, root removal, and rehabilitation.

Note: Protocols for cleaning sewers should include methods for disposal of sand, grit, and other solids in a manner that will not contaminate surface water or groundwater or create a risk to public health. Proper disposal of such material includes, but is not limited to, placement in a licensed solid waste landfill, return of the material to the headworks of the sewage treatment facility or placing the material in a properly designed and operated treatment unit.

5. A program to periodically assess the capacity of the sewage collection system and treatment facilities.

6. The identification of activities to prevent and correct frequent and recurring building backups caused by sewage collection system hydraulic constraints.

7. Appropriate training on a regular basis.

(e) *Design and performance standards.* The following standards and procedures shall be established or adopted to maintain control over the design, construction, and inspection of the sewage collection system, including building sewers and private interceptor sewers on private property:

1. Standards and specifications for the design and installation of new sewers, lift stations, and other appurtenances and for rehabilitation and repair projects.

Note: Chapter NR 110 must be followed when designing and constructing sewage collection systems. Chapter SPS 382 must be followed when designing and constructing plumbing. Permittees may have supplemental standards and requirements specific to community needs.

2. Procedures and requirements for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

(f) *Overflow emergency response plan.* An overflow emergency response plan shall identify measures to protect public health and the environment from sanitary sewer overflows and sewage treatment facility overflows and building backups caused by excessive flow or other hydraulic constraints in the sewage collection system and shall include protocols to ensure the following:

1. Responsible personnel are made aware of all overflows.

2. There is a prompt and appropriate response to and investigation of all overflows to protect, to the extent possible, water quality, the environment, and public health.

3. There is appropriate reporting and notification as required under s. NR 210.21 (4) to (6). The overflow emergency response plan shall identify the public health and other officials who will receive notification and identify the protocols and procedures for notification of the public who may be affected by an overflow. Whenever there is a significant or potentially significant risk to public health, public notification shall include personal contacts with persons who may be at risk from the effects of the overflow.

Note: To the extent practicable, local public health and other responsible officials should be consulted in developing those portions of the overflow emergency response plan that involve reporting and notification of those officials. Permittees should consider use of the following communication methods when establishing public notification protocols: electronic mail or other electronic communication, posting on internet web sites, notification of local print and media (television, radio) outlets, posting notices on public buildings, personal notification, etc.

4. Appropriate personnel are aware of and follow the plan and are appropriately trained.

5. Emergency operations appropriate to the event are implemented.

(5) CMOM PROGRAM DOCUMENTATION AND AUDIT. All permittees subject to the requirements of this section shall do all of the following:

(a) Develop and maintain written documentation of the CMOM program components. Such documentation shall be available for department review on request. The department may request a permittee to provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of a WPDES permit.

Note: Annual verification of CMOM program documentation is required under ch. NR 208.

(b) At least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the standards in sub. (3).

(6) EXCEPTIONS. If the owner of a sewage collection system believes any component part or parts of the CMOM program requirements in this section are not appropriate or applicable for a specific sewage collection system, the CMOM program documentation required under sub. (5) shall fully explain why that component part is not applicable.

(7) COMPLIANCE. Whenever a permittee's CMOM program does not meet the conditions established under this section, including the identification of and explanation for exceptions identified in sub. (6), the department may require specific actions to establish and implement a CMOM program or component parts of a CMOM program. The specific requirements may be included as conditions in a permit.

History: CR 12-027: cr. Register July 2013 No. 691, eff. 8-1-13; correction in (3) (c) made under s. 13.92 (4) (b) 7., Stats., Register July 2013 No. 691.

NR 210.24 System Evaluation and Capacity Assurance Plan. (1) The department may require permittees that own and operate a sewerage system to prepare and implement a system

evaluation and capacity assurance plan that meets the requirements in s. NR 110.10 (4) whenever the department determines that one or more of the following conditions exists:

(a) Noncompliance with the prohibitions in s. NR 210.21 (1).

(b) Noncompliance with effluent limitations at the sewage treatment facility caused by excessive flow.

(c) Implementation of the CMOM program requirements in s. NR 210.23 is not sufficient to attain the requirements of s. NR 210.21 (1).

(d) Frequent or recurring building backups caused by excessive flow or other hydraulic constraints in the sewerage system.

(e) A system evaluation and capacity assurance plan is necessary to determine if the conditions of s. NR 210.21 (1) (a) to (d) exist.

(2) The system evaluation and capacity assurance plan is subject to review and approval under s. 281.41, Stats.

(3) The department may include in a permit compliance schedules that require implementation of actions contained in an approved system evaluation and capacity assurance plan and that are determined necessary to meet the requirements of this chapter.

(4) Permittees that are implementing actions to conform with an approved facilities plan under ss. NR 110.08, 110.09, and 110.10 and that, when such facilities plan is implemented, will meet the requirements of this chapter and s. NR 205.07 (1) (u) shall not be subject to the requirements of this section.

History: CR 12-027: cr. Register July 2013 No. 691, eff. 8-1-13.

NR 210.25 Emergency Operation — Lift Stations.

All lift stations that are a component of a sewage collection system shall be equipped for emergency operation in accordance with s. NR 110.14 (12).

History: CR 12-027: cr. Register July 2013 No. 691, eff. 8-1-13.