



Board of Public Works

Regular Meeting

335 South Broadway
De Pere, WI 54115
<http://www.de-pere.org>

Agenda

Monday, December 10, 2018

7:30 PM

De Pere City Hall Council Chambers

Pursuant to Wisconsin Statutes 19.84, Notice is hereby given to the public that a meeting of the **Board of Public Works** of the City of De Pere will be held on **December 10, 2018** at **7:30 PM** in the **De Pere City Hall Council Chambers**, 335 S. Broadway Street, De Pere, WI 54115.

This meeting can be viewed LIVE at www.depere.tv. This meeting is also rebroadcast on TW Cable Channel 4 and AT&T U-verse Channel 99 throughout the week and available on demand at www.depere.tv.

I. Call to Order

1. Roll Call
2. Approval of BOPW November 12, 2018 Meeting Minutes.
3. Public Hearing to Levy Special Assessments
 - A. Notice of Public Hearing
 - B. Recommendation from the Board of Public Works
 - C. Final Resolution Authorizing Levying Special Assessments
 - a. Resolution BOPW #18-05, Final Resolution Authorizing Storm Sewer Main and/or Lateral Construction and Levying Special Assessments Against Benefited Property (2730 Ryan Rd)

II. Public Comment

III. Items

1. Consider 2018-2019 Sewer Rate Study*
2. Consider Definitely De Pere Streetscape Projects*
3. Discuss Tree Replacement for Street Construction Projects
4. Recommendation regarding the release of a 20 foot storm sewer-drainage easement, while retaining an existing 12 foot utility easement, at 701-711 Millennium Court (Parcels ED-2310 & ED-2309). Submitted by David Anderson, Town & Country Development LLC, authorized representative for Irish Construction & Investments LLC.*
5. Recommendation regarding the release of a utility easement and right-of-way easement, to be replaced with typical 12 foot street fronted utility easements and 6 foot side lot line utility easements via certified survey map (CSM), at the 500 BLK Ninth Street (Parcel WD-D0218-2). Submitted by Steven M. Bieda, Mau & Associates, authorized representative for Raymond J. Hoffmann.*
6. Consider Purchasing AquaHawk Water Meter Software*
7. Consider Updates to 2019 General Conditions and Standard Specifications
8. Consider Updates to the 2019 Prequalification of Contractor Form

IV. Future Agenda Items

V. Adjournment

*** Items with an asterisk require City Council approval.**

Any person wishing to attend this meeting who, because of disability, requires special accommodations should contact the Clerk-Treasurer's office at 339-4050 by Noon, Monday December 10, 2018 so arrangements can be made.

Agenda Sent To:

Mayor

Alderspersons

Department Heads

TV, Newspapers & Radio Stations

Kress Family Library

De Pere Chamber of Commerce

Definitely De Pere

Craig and Valerie Oestreich

Kyle Pockat, Schenck

Tina Quigley, Definitely De Pere

Steven M. Bieda, Mau and Associates

Raymond Hoffmann

Irish Construction & Investment LLC

Selner Properties LLC

David Anderson, Town & Country
Development

Notice is hereby given that a majority of the members of the Common Council of the City of De Pere may attend this meeting to gather information about a subject (s) over which they have decision making responsibility.

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Public Works

FROM: Grace Lahtela

SUBJECT: Approval of BOPW November 12, 2018 Meeting Minutes.

ATTACHMENTS:

- Draft Minutes BOPW 11-12-18 (PDF)



Board of Public Works

Regular Meeting

335 South Broadway
De Pere, WI 54115
<http://www.de-pere.org>

Draft Minutes

Monday, November 12, 2018

7:30 PM

De Pere City Hall Council Chambers

I. Call to Order

The meeting was called to order at 7:30 PM by Mayor Michael J. Walsh

Attendee Name	Title	Status	Arrived
James Boyd	Aldersperson	Late	7:40 PM
Dan Carpenter	Aldersperson	Present	
Jonathon Hansen	Aldersperson	Present	
Dean Raasch	Aldersperson	Present	
Michael J. Walsh	Mayor	Present	

Others present were Scott Thoresen, Director of Public Works, Eric Rakers, City Engineer, Larry Delo, Administrator, and Grace Lahtela, Recording Secretary.

2. Approval of BOPW October 8, 2018 Meeting Minutes

Aldersperson Carpenter moved to approve the October 8, 2018 Board of Public Works meeting minutes, Aldersperson Raasch seconded the motion. Upon vote, the motion passed unanimously.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Aldersperson
SECONDER:	Dean Raasch, Aldersperson
AYES:	Dan Carpenter, Jonathon Hansen, Dean Raasch, Michael J. Walsh
EXCUSED:	James Boyd

II. Public Comment

None.

III. Items

- Consider Preliminary Resolution for Special Assessments for Sanitary Sewer System, Water System - New Water Main, Existing Water System, New Development Storm System, and/or Storm Water Management for Ryan Road from 800 feet north of Diversity Drive to 430 feet south of Diversity Drive.*

Eric Rakers, City Engineer, presented the preliminary resolution for special assessments for sanitary sewer system, water system, new development storm system, and storm water management for Ryan Road from 800 feet north of Diversity Drive to 430 feet south of Diversity Drive. There are three entities impacted by the assessment; the developer of the subdivision, the school district, and Craig and Valerie Oestreich at 2730 Ryan Road. The developer and school district have separate signed agreements on how the assessment will be paid. Staff recommends that the property owned by Craig and Valerie Oestreich be assessed, but have a 10 year payback period. In addition, they would have a 5 year interest free deferment for the sanitary sewer and water main assessment or until connection is made. If connection is not made before, it will be required after 5 years. Discussion followed.

Aldersperson Hansen questioned the breakdown of the total assessment charges for 2730 Ryan Road.

Mayor Walsh moved to open the meeting to public comment at 7:37 pm, seconded by Aldersperson Hansen. Upon vote, the motion passed unanimously.

Craig Oestrich commented on the total costs that he will be responsible for.

Aldersperson Raasch moved to return to regular order at 7:40 pm, seconded by Aldersperson Hansen. Upon vote, the motion passed unanimously.

Aldersperson Carpenter questioned the calculation of sewer charges if connection has not been made to the water system.

Aldersperson Boyd arrived to the meeting at 7:40 pm.

Mayor Walsh motioned to approve the resolution and send to council to schedule the public hearing to include a 10 year payback period for the assessment and also include a 5 year interest fee deferment, seconded by Aldersperson Raasch. Upon vote, the motion passed unanimously.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Michael J. Walsh, Mayor
SECONDER:	Dean Raasch, Aldersperson
AYES:	Boyd, Carpenter, Hansen, Raasch, Walsh

2. Consider Preliminary Resolution for Special Assessment for Storm Sewer Main and/or Laterals for 2730 Ryan Road.

Eric Rakers, City Engineer, presented the preliminary resolution for storm sewer and/or storm lateral construction for 2730 Ryan Road.

Aldersperson Carpenter moved to open the meeting to public comment at 7:45 pm, seconded by Aldersperson Raasch. Upon vote, the motion passed unanimously.

Craig Oestrich commented on the special assessment and the 5 year payback plan.

Mayor Walsh moved to return to regular order at 7:47 pm, seconded by Aldersperson Raasch. Upon vote, the motion passed unanimously.

Mayor Walsh motioned to approve the preliminary resolution for special assessment for storm sewer main and/or laterals for 2730 Ryan Road with the deferment and schedule a public hearing at the December 10, 2018 Board of Public Works meeting, seconded by Aldersperson Hansen. Upon vote, the motion passed unanimously.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Michael J. Walsh, Mayor
SECONDER:	Jonathon Hansen, Aldersperson
AYES:	Boyd, Carpenter, Hansen, Raasch, Walsh

3. Consider Proposed Assessment Deferral Updates to Special Assessment Ordinance.*

Eric Rakers, City Engineer, reviewed the proposed deferral updates to the special assessment ordinance for existing rural properties.

Aldersperson Raasch moved to approve the proposed assessment deferral updates to the special assessment ordinance, seconded by Aldersperson Boyd. Upon vote, the motion passed unanimously.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dean Raasch, Alderperson
SECONDER:	James Boyd, Alderperson
AYES:	Boyd, Carpenter, Hansen, Raasch, Walsh

4. Consideration to Approve Proposal to Improve Nicolet Alley.*

Larry Delo, City Administrator reviewed the proposal for improvements to Nicolet Alley. In the 2018 budget, there was funding under Tax Increment District 9 for Nicolet Square improvements. As part of the project, RFP's for design services for the alley were sent out. Staff recommends accepting the proposal from local artists Shanna Koltz and Naomi Moes Jenkins. This will be considered a design and art installation project, and with the items not permanent, it would not need to go out for bids for construction. Adjacent business owners were contacted and they are in favor of the project.

Discussion followed.

Alderperson Hansen moved to open the meeting to public comment at 7:55 pm, seconded by Alderperson Boyd. Upon vote, the motion passed unanimously.

Artists Shanna Koltz and Naomi Moes Jenkins were present to discuss their conceptual design and vision for the Nicolet Alley improvements.

Discussion followed.

Mayor Walsh moved to return to regular order at 8:15 pm, seconded by Alderperson Raasch. Upon vote, the motion passed unanimously.

Alderperson Carpenter moved to approve the proposal for improvements to Nicolet Alley, seconded by Alderperson Raasch. Upon vote, the motion passed unanimously.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Alderperson
SECONDER:	Dean Raasch, Alderperson
AYES:	Boyd, Carpenter, Hansen, Raasch, Walsh

5. Consider Changing Parking on O'Hearn Street.*

Eric Rakers, City Engineer, presented the parking concerns and citizen requests to consider parking restrictions on O'Hearn Lane. A survey was sent to residents on the street to see what recommendations were preferred. Option 1, which is the most restrictive and the current parking policy, is no stopping or standing during school hours when children are present. Option 2 is to change the restriction to state no parking during school hours when children are present. Option 3 is the least restrictive which would be to implement a 3 hour parking restriction during school hours. The police department has been monitoring the area, and is in favor of option 2. With the survey results being so close, staff recommendation would be to agree with the police recommendation and change policy to option 2, no parking during school hours when children are present.

Mayor Walsh motioned to open the meeting to public comment at 8:20 pm, seconded by Alderperson Boyd. Upon vote, the motion passed unanimously.

Suzanne DeLeeuw 1731 O'Hearn Lane, Vickie Kelley Seeman 1733 O'Hearn Lane, and Susan Casper 1738 O'Hearn Lane spoke regarding the parking problems and safety concerns on O'Hearn. There are cars blocking, turning around and parking in driveways and current parking restrictions are not being enforced by the police department. They questioned the possibility of having parking restrictions on one side of the street to allow for cars to get through.

Engineer Rakers stated that the road width 36 feet. This is wider than our current policy of 32 foot width for parking on both sides of the street.

Discussion followed.

Alderpersn Boyd stated that an increase in issues is due to changes in the drop off and pick up policies for the busses, and the parking concerns should be addressed by the school district.

Mayor Walsh moved to return to regular order at 8:40 pm, seconded by Alderpersn Boyd. Upon vote, the motion passed unanimously.

Alderpersn Raasch commented that the issues are not just parking issues, but the school has to figure out drop off and pick up procedures. The district is aware of the issues and has property behind the school that can be used. These problems need to be addressed by the school board.

Discussion followed.

Mayor Walsh motioned to approve option 2, following police department recommendations, seconded by Alderpersn Boyd.

Discussion followed.

Mayor Walsh requested that the police department be contacted and that intense patrolling be done in that area if possible.

Alderpersn Hansen commented that he would like to see parking restricted to one side of the street.

Upon vote, the above motion passed 3-2, with Alderpersn Hansen and Alderpersn Raasch voting nay.

RESULT:	ADOPTED [3 TO 2]
MOVER:	Michael J. Walsh, Mayor
SECONDER:	James Boyd, Alderpersn
AYES:	James Boyd, Dan Carpenter, Michael J. Walsh
NAYS:	Jonathon Hansen, Dean Raasch

IV. Future Agenda Items

None

V. Adjournment

Mayor Walsh moved to adjourn the meeting, seconded by Alderpersn Boyd. Upon vote, the motion passed unanimously and the meeting was adjourned at 8:55 pm.

Respectfully submitted,
Grace Lahtela

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Resolution BOPW #18-05, Final Resolution Authorizing Storm Sewer Main and/or Lateral Construction and Levying Special Assessments Against Benefited Property (2730 Ryan Rd)

ATTACHMENTS:

- CI_BOPW_Final_Resolution_Ryan_Road_Assessment_12-10-2018 (DOCX)
- CI_BOPW_Final_Resolution_18-05_12-10-2018 (DOCX)
- CI_Special_Assessment_Schedule_B&C_Ryan_Road_Existing_Residential_Storm (PDF)
- CI_Special_Assessment_Schedule_D_Ryan_Road_Existing_Development_Storm (PDF)
- CI_Special_Assessment_Ryan_Road_Assessment_Map (PDF)

City of De Pere

Public Works Department

Memo

To: Honorable Mayor Walsh
Members of the Board of Public Works

From: Eric Rakers, P.E., City Engineer

Date: November 12, 2018

Subject: Resolution BOPW 18-05, Final Resolution Authorizing Levying Special Assessment for Storm Sewer Main and/or Laterals for 2730 Ryan Road

The purpose for this item is to approve a final resolution for special assessment for storm sewer and/or storm lateral construction associated with street reconstruction in 2018 at 2730 Ryan Road

Background

The City is constructing new storm sewer and corresponding laterals in conjunction with Project 18-14 Pine Trail Crossing Street and Utility Construction.

Storm sewer lateral installation at 2730 Ryan Road conforms to the City Municipal Code Section 26-5-5 (b) which states:

(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.

The assessment for this service was calculated per Code Section 13-7.

As calculated per Code Section 13-7 and approved by the Board of Public Works (BOPW), the costs for the 2018 storm sewer special assessment is as follows:

- Residential Properties
 - Storm Lateral Assessment - \$1650.24 per each
 - Storm Main Assessment - \$364.24 per parcel

2730 Ryan Road is the only property affected by this special assessment on this project.

Property owners have been notified several times of this project including:

- April 13, 2018 – Office Visit Regarding Upcoming Construction and Assessments
- July 18, 2018 – Letter Regarding Anticipated Assessments
- October 30, 2018 - Letter Notifying of Board of Public Works Meeting
- November 12, 2018 – Preliminary Resolution at Board of Public Works
- November 16, 2018 – Notice of Public Hearing

Code Section 13-7 d. further identifies procedures and pay options for the storm sewer special assessments as follows:

- d. *Public hearing. The board shall hold a public hearing on the assessments and after the hearing may by resolution approve, disapprove, modify, or refer the report with such directions as it deems necessary. The board shall provide for the following payment alternatives if it determines to assess for any of the improvements:*
 - i. *No interest imputed if payment of assessment made in full within 30 days of invoice;*
 - ii. *Payment in such number of yearly installments as deemed reasonable by the board, together with interest thereon at the rate of one percent over the interest rate paid by the city on its latest bonding issue, with payment in full due upon transfer of the property;*
 - iii. *Deferred payment of assessment with interest to accrue at the rate of one percent over the interest rate paid by city on its last bond issue, with the total becoming due on the earliest of the following:*
 - A. *Transfer of the benefited property to any other person or entity;*
 - B. *Subdivision of the benefited property;*
 - C. *Connection to the storm sewer;*
 - D. *The expiration of 25 years from the date of the adoption of the final assessment resolution, at which time the assessment plus accrued interest shall be made in full against the benefited property.*
 - iv. *Interest on alternatives ii. and iii. above shall stop accruing after a period of ten years.*

Note under item ii., the BOPW can establish a number of yearly establishments for payback. Also, under iii., property owners are not required to pay until they connect to the storm lateral, sell or subdivide the property, or 25 years, whichever occurs first.

Recommendation

Staff recommends that the Board of Public Works adopt the final resolution.

RESOLUTION BOPW #18-05

FINAL RESOLUTION AUTHORIZING STORM SEWER MAIN AND/OR LATERAL
CONSTRUCTION AND LEVYING SPECIAL ASSESSMENTS AGAINST BENEFITED
PROPERTY
(2730 RYAN ROAD)

WHEREAS, the Board of Public Works of the City of De Pere having declared its intention to exercise its police power to levy special assessments pursuant to Wis. Stats. §66.0703, for improvements constructed within the areas described below and special assessments to be levied on a reasonable basis upon the property benefited thereby. Said improvements to include storm sewer main and/or laterals. Said improvements shall be constructed in, and the properties benefiting therefrom are contained within, the following described areas or abutting streets:

STORM SEWER MAIN AND LATERALS

2730 Ryan Road – Parcel ID: ED-R27

WHEREAS, the Board of Public Works has published a Notice of Public Hearing regarding such improvements and, pursuant thereto, a public hearing has been held at the City Hall Council Chambers on the 10th day of December, 2018 at 7:30 p.m., whereupon the Board of Public Works heard all interested parties or their agents or attorneys;

NOW, THEREFORE, BE IT HEREBY RESOLVED, by the Board of Public Works of the City of De Pere, Wisconsin, that:

1. The report of the Board of Public Works of the City of De Pere, as compiled by the Director of Public Works, pertaining to the construction of the above described improvements, including plans and specifications therefore is hereby adopted and approved.

2. The Board of Public Works, based on its view of the property and its review of such report, determines that the above described properties are benefited by such public improvements and that the benefits and amounts assessed against each parcel on the basis shown in the report, representing an exercise of police power, are determined to be on a reasonable basis and are hereby confirmed and approved.

3. Payment for the public improvements shall be made by assessing the cost therefore against the above described benefited properties as indicated in such report.

4. The assessments hereby levied for said improvements shall be:

- (1) paid in cash within thirty (30) days of invoice; or
- (2) paid in five (5) annual installments, together with interest on the unpaid balance at a rate of 3.782% if payment starts the year invoiced; or
- (3) deferred with interest to accrue at the rate of 3.782% with the total becoming due on the earliest of the following:
 - i. Transfer of the benefited property to any other person or entity;
 - ii. Subdivision of the benefitted property;
 - iii. Connection to the storm sewer;
 - iv. The expiration of 25 years from the date of the adoption of the final assessment resolution, at which time the assessment plus accrued interest shall be made in full against the benefited property.

Interest on alternatives shall stop accruing after a period of ten years.

5. The total amount assessed benefited properties shall not exceed the total cost of the improvements.

6. The Clerk-Treasurer is hereby directed to publish this resolution in the Green Bay Press Gazette as a Class 1 Notice.

7. The Clerk-Treasurer is further directed to mail a copy of this resolution to the property owners whose names appear on the assessment roll whose address is known or can, with reasonable diligence, be ascertained.

8. If any section, sentence, or clause of this resolution or any special assessment set forth or referenced herein shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining sections or assessments approved herein, which shall remain in full force and effect.

9. This resolution shall remain in full force and effect from and after its passage and publication according to law.

Adopted by the Board of Public Works of the City of De Pere, Wisconsin, this 10th day of December, 2018.

APPROVED:

Michael J. Walsh, Mayor and Chair of the Board
of Public works

Ayes:_____

Nays:_____

Schedule B
2018 Storm Sewer Improvement Cost Existing Development Residential up to Two Units per Building
Calculations Based on Municipal Code 13-7 - Approved By the Board of Public Works on February 12, 2018
City of De Pere
Date: 3/5/2018

Mainline Cost

Project	Bid Item	Bid Item Description	Unit	Quantity	Cost	Total	Comment
15-01	ST-04	Remove and Replace 12" PCV or RCP Storm Sewer	LF	648	\$49.00	\$31,776.50	
15-07	ST-01	Remove and Replace 12" PCV or RCP (Class III) Storm Sewer	LF	797	\$50.51	\$40,276.67	
16-02	ST-06	Provide 12" PVC Storm Sewer	LF	609	\$45.00	\$27,405.00	
16-07	ST-02	Remove and Replace 12" PVC or RCP (Class III) Storm Sewer	LF	119	\$62.00	\$7,378.00	
17-01	ST-02	Remove and Replace 12" PVC or RCP (Class III) Storm Sewer	LF	479	\$47.00	\$22,489.50	
17-02	ST-03	Provide 12" PVC or RCP Class III Storm Sewer	LF	1555	\$38.00	\$59,071.00	
17-07	ST-02	Remove and Replace 12" PVC or RCP CL III Storm Sewer	LF	91	\$36.00	\$3,276.00	
Total				4297		\$191,672.67	
Average Cost Per Foot						\$44.61	

Schedule B
2018 Storm Sewer Improvement Cost Existing Development Residential up to Two Units per Building
Calculations Based on Municipal Code 13-7 - Approved By the Board of Public Works on February 12, 2018
City of De Pere
Date: 3/5/2018

Storm Sewer Manhole						
Project	Bid Item	Bid Item Description	Unit	Quantity	Cost	Total
15-01	ST-09	Remove and Replace 4' Diameter Storm Manhole	VF	55.89	\$377.00	\$21,070.53
15-07	ST-06	Install 4' Diameter Storm Manhole	VF	60.30	\$454.61	\$27,412.98
16-02	ST-20	Remove and Replace 4' Diameter Storm Manhole	VF	73.74	\$275.00	\$20,278.50
16-07	ST-07	Remove and Replace 4' Diameter Storm Manhole	VF	24.96	\$490.00	\$12,230.40
17-01	ST-10	Remove and Replace 4' Diameter Storm Manhole	VF	26.80	\$365.00	\$9,782.00
17-01	ST-12	Provide 4' Diameter Storm Manhole	VF	31.40	\$350.00	\$10,990.00
17-02	ST-12	Provide 4' Diameter Storm Manhole	VF	96.20	\$310.00	\$29,822.00
17-07	ST-06	Remove and Replace 4' Diameter Storm Manhole	VF	4.10	\$600.00	\$2,460.00
Total				373.39		\$134,046.41
Cost Per Foot						\$359.00
Cost for a 5 foot Deep Manhole						\$1,794.99
Average Per Foot Cost with a 300 Foot Spacing						\$5.98

Schedule B
2018 Storm Sewer Improvement Cost Existing Development Residential up to Two Units per Building
Calculations Based on Municipal Code 13-7 - Approved By the Board of Public Works on February 12, 2018
City of De Pere
Date: 3/5/2018

Lateral Cost				
Project	Bid Item	Bid Item Description	Unit	Quantity
16-02	ST-17	Provide 6" PVC Storm Sewer Lateral	LF	3053
16-07	ST-04	Provide 6" PVC Storm Sewer	LF	187
17-01	ST-06	Provide 6" PVC Storm Sewer Lateral	LF	2463
17-02	ST-05	Provide 6" Storm Sewer Lateral	LF	1564
Total				7268
Average Cost Per Foot				\$291,284.30
Average Cost per Lot at 30 Feet of Lateral (100% to Resident)				\$40.08
				\$1,202.41
				Average length of lateral is based on a 60 foot right of way and several laterals being connected to inlets.

Storm Wye Cost				
Project	Bid Item	Bid Item Description	Unit	Quantity
16-02	ST-10	Provide 6" Connection (Core or Tee) to 36" Storm Sewer	EA	14
16-02	ST-11	Provide 6" Connection (Core or Tee) to 24" Storm Sewer	EA	14
16-02	ST-12	Provide 6" Connection (Core or Tee) to Existing Storm Sewer on Eighth Street.	EA	15
16-02	ST-13	Provide Storm Tee 15"x6"	EA	12
16-02	ST-14	Provide Storm Tee 12"x6"	EA	9
17-01	ST-07	Provide 12"x6" Storm Tee	EA	7
17-01	ST-08	Provide 8"x6" Storm Tee	EA	20
17-02	ST-06	Provide Storm Branch 18"x6"	EA	7
17-02	ST-07	Provide Storm Branch 15"x6"	EA	22
17-02	ST-08	Provide Storm Branch 12"x6"	EA	17
17-02	ST-09	Provide Storm Branch 8"x6"	EA	3
Total				140.00
Average Cost Per Wye				\$24,190.00
				\$172.79

Schedule C

**2018 Storm Sewer Improvement Cost Existing Development Residential up to Two Units
per Building**

**Calculations Based on Municipal Code 13-7 - Approved By the Board of Public Works on
February 12, 2018**

City of De Pere

Date: 3/5/2018

Storm Mainline Cost

Item Description	Cost Per LF	Comment
12" Storm Sewer Main	\$44.61	300 foot spacing with a 5' depth
4' Diameter Storm Manhole	\$5.98	
Mainline Cost Per Street Foot	\$50.59	60 foot wide lot
Cost Per Side of Street	\$25.29	
Cost Per Lot	\$1,517.68	
Assessable Amount (20%)	\$303.54	Remaining 80% funded by Storm Water Utility
Engineering and Administration	\$60.71	
Total Mainline Costs	\$364.24	

Storm Lateral Cost

Item Description	Cost Per EA	Comment
6" Storm Lateral	\$1,202.41	30 foot average length. Some laterals will be connected to inlets.
Storm Wye Cost	\$172.79	
Assessable Amount (100%)	\$1,375.20	
Engineering and Administration	\$275.04	
Total Lateral Costs	\$1,650.24	

Total Cost

Mainline	\$364.24
Storm Lateral	\$1,650.24
Total Cost	\$2,014.48

SCHEDULE D - SCHEDULE OF PRELIMINARY ASSESSMENTS

PRELIMINARY ASSESSMENTS

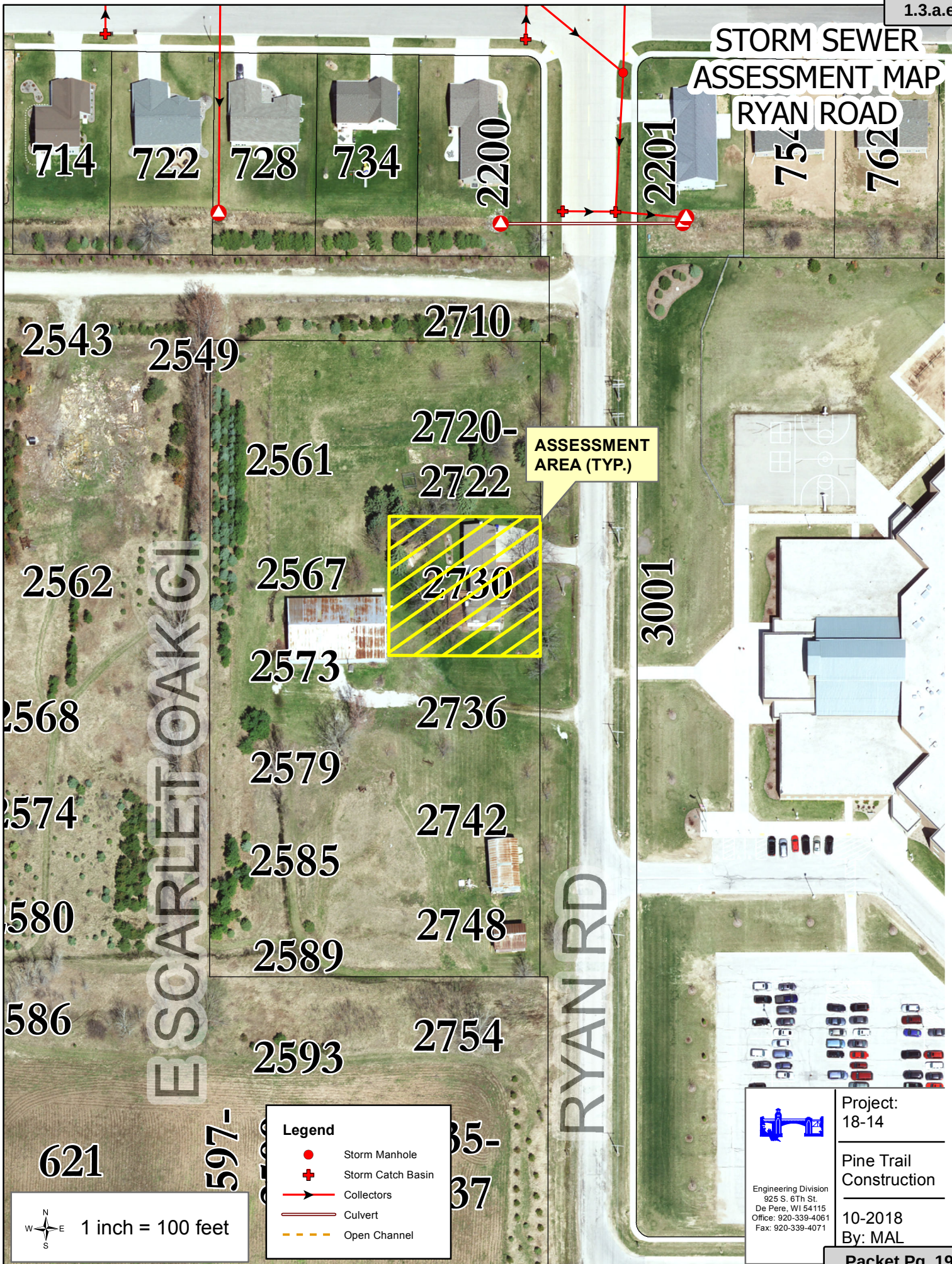
TYPE OF IMPROVEMENT: STORM SEWER MAIN AND LATERALS

LOCATION - 2730 RYAN ROAD

COST PER UNIT - STORM MAIN: \$364.24
COST PER UNIT - STORM LATERAL: \$1,650.24

PROPERTY OWNER	LOT NO. PROPERTY ADDRESS PARCEL NUMBER	STORM MAIN ASSESSMENT		STORM LATERAL ASSESSMENT		TOTAL ASSESSMENT	COMMENT
		UNIT	COST	UNIT	COST		
CRAIG A & VALERIE M OESTREICH 2730 RYAN RD DE PERE, WI 54115-9634	2730 RYAN RD ED-R27	1	\$364.24	1	\$1,650.24	\$2,014.48	
	TOTAL	1	\$364.24	1	\$1,650.24	\$2,014.48	

STORM SEWER
ASSESSMENT MAP
RYAN ROAD



Engineering Division
925 S. 6Th St.
De Pere, WI 54115
Office: 920-339-4061
Fax: 920-339-4071

Project:
18-14

Pine Trail
Construction

10-2018
By: MAL

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Board of Public Works

FROM: Scott Thoresen

SUBJECT: Consider 2018-2019 Sewer Rate Study*

To: Honorable Mayor and Members of Public Works Committee
 From: Joe Zegers, Finance Director
 Date: December 6, 2018
 Subject: 2018-2019 Sewer Rate Study

I have attached the Wastewater Rate Study prepared by Schenck for your consideration for the December 10, 2018 Public Works Committee meeting. A representative from Schenck will attend the meeting and go through the details of the report for you. The report includes the recent Green Bay Metropolitan Sewerage District (GBMSD) 2019 rates which were approved by their Commission December 5th, 2018. The adopted 2019 GBMSD budget is attached for your review.

The attached projected operating statements reflect a zero rate increase for sewer bills targeting the 1st quarter billing mailed to general customers in the billing received in late March 2019. The statements reflect a slight rate decrease for billings to the paper mill customers beginning with their January 2019 invoice as they are billed monthly. The analysis indicates an estimated \$371,578 surplus for 2018 and a projected \$647,727 surplus for 2019.

The model with the present 2019 City rates shows the **average** quarterly residential bill remaining at the 2018 average of \$140.83 for the 1st quarter of 2019 which is shown on page 5 of the report. The report also shows on page 6 & 7 the stable costs for the four operating paper mills from 2018 to 2019. The new rates directly pass on the GBMSD treatment and daily monitoring rates to the paper mills and also include a treatment administrative fee of \$16,800 per year as well as revising the collection fee for the Sonoco and Expera mills that do not have their own dedicated line that goes directly to the treatment plant as in the case of Fox River Fiber.

You will also find an additional page at the end of the attachment of a calculation of the additional increase needed on the general customer sewer bills to generate additional cash for the sewer utility. The table shows additional percent increases of 1% to 5% above the unchanged general customer rates indicated in the study that would be required to generate additional cash in \$50,000 increments. This is presented for your review and consideration if you want to propose raising the unchanged 2018 sewer rate above the amount in the rate study. The cash balance at December 31, 2017 was \$455,144 which after the projected 2018 results on page 1 of the report is estimated to be roughly \$825,000 at December 31, 2018. The sewer utility's cash position has greatly improved over the last two years and represents roughly 8% of the sewer utility operating budget for 2019. I would recommend approving the sewer rates as presented in the report for 2019 given the cash position improvement and the realization that water rates for 2019 are projected to increase in the 2019 budget substantially pending the results of the City's water rate increase application to the Public Service Commission. Feel free to contact me should you have any questions on this and I will also be at the Board of Public Works meeting on December 10th, 2018.

ATTACHMENTS:

- De Pere Sewer Rate Study 2018 DRAFT (revised) (PDF)
- 20181206143839293 (PDF)

DRAFT

3.1.a

CITY OF DEPERE
WASTEWATER UTILITY
PROPOSED RATES
DECEMBER 2018

Attachment: De Pere Sewer Rate Study 2018 DRAFT (revised) (7699 : Consider 2018-2019 Sewer Rate

**City of DePere Wastewater Utility
Proposed Rates
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City of DePere Wastewater Utility
Projected Operating Statements

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PROJECTED OPERATING STATEMENTS

Revenues and Other Sources

User charges - general customers

User charges- paper mills

NEW Water treatment charges

Fixed administrative charges

Collection charges - variable

Forfeited discounts

Collection on receivable from NEW Water

Total Revenues Other Sources

Expenses and Other Uses

Treatment charges

General customers

Paper mills - pass through

Fixed Charge

General customers

Paper mills - pass through

Operation and maintenance

Sewer share of meter reading expenses

Capital replacement outlay

NEW Water annual debt service requirements

Current principal and interest payments

Total Expenses and Other Uses

Excess Revenues (Expenses)

				with increase
	Actual 2016	Actual 2017	Projected 2018	Estimated 2019
\$	4,699,496	\$ 4,933,193	\$ 5,050,000	\$ 5,155,230
	3,900,760	4,247,920	3,940,137	4,228,857
	39,600	50,400	81,890	67,200
	217,817	259,335	528,525	326,603
	69,528	46,722	48,000	48,000
	-	320,970	160,485	160,485
	8,927,201	9,858,540	9,809,037	9,986,374
	1,865,059	1,829,585	1,456,271	1,427,923
	3,169,260	3,240,660	3,009,980	2,683,987
	398,390	557,908	663,385	845,538
	730,626	1,007,260	1,325,098	1,544,870
	942,942	864,428	1,132,906	1,134,410
	151,966	115,553	120,000	125,000
	1,033,253	959,971	1,282,000	1,127,000
	31,275	31,275	31,275	31,275
	385,635	413,116	416,544	418,644
	8,708,406	9,019,756	9,437,459	9,338,647
\$	218,795	\$ 838,784	\$ 371,578	\$ 647,727

**City of DePere Wastewater Utility
Calculation of Revenue Requirement and Proposed Rates - Treatment**

GENERAL CUSTOMERS

Costs to be recovered:

Treatment charges
Fixed portion allocated to variable
Less: Collection on receivable from NEW Water
Less: Recovery of administrative expenses
Totals

2019 Estimated	
Fixed	Variable
845,538	1,427,923
(300,000)	300,000
(160,485)	-
(67,200)	-
<u>\$ 317,853</u>	<u>\$ 1,727,923</u>

FIXED CHARGES - GENERAL CUSTOMERS

Meter Size	Number of Customers	User Charge Factor	Per Quarter	Per Year	Annual Revenue
3/4"	8,442	1.00	\$ 3.30	\$ 13.20	\$ 111,434
1"	136	2.50	8.25	33.00	4,488
1 1/2"	121	5.00	16.50	66.00	7,986
2"	82	8.00	26.40	105.60	8,659
3"	46	15.00	49.50	198.00	9,108
4"	22	45.00	148.50	594.00	13,068
	<u>8,849</u>				<u>\$ 154,744</u>

VARIABLE CHARGES - GENERAL CUSTOMERS

Metered Flow

Gallons Billed

Actual 2017	Projected 2018	Estimated 2019
498,986,600	504,894,374	505,000,000

Proposed Treatment Rate - General Customers

Variable Costs

Proposed Rate per thousand	Metered Water Flow	Recovery of Costs
\$ 4.52	505,000,000	\$ 2,282,600

PAPER MILLS

Actual Expenses

Wastewater treatment charges
Paper Mills- variable charge
Paper Mills- fixed charge

Actual 2016	Actual 2017	Projected 2018	Estimated 2019
\$ 3,169,260	\$ 3,240,660	\$ 3,009,980	\$ 2,683,987
\$ 730,626	\$ 1,007,260	\$ 1,325,098	\$ 1,544,870

Treatment Rates - Paper Mills

Variable treatment charges will be a direct pass-through from NEW Water
Fox River Fiber is included in the NEW Water budget as a separate customer. Fixed treatment charges of \$553,358 have been directly allocated to them. In addition \$752,968 of the fixed charge to the City has been allocated to the remaining paper mills.

Treatment Fixed Administrative Fee

Allocation of 10% of 2019 budgeted administrative costs - total \$680,685
Charged equally to four paper mills - rate of \$1,400 per month

Allocation of Costs

\$ 1,400

City of DePere Wastewater Utility
Projected Expenses and Calculation of Revenue Requirement - Collection System

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PROJECTED EXPENSES AND OTHER USES

	Actual 2016	Actual 2017	Projected 2018	Projected 2019	Allocation of Expenses	
					Fixed	Variable
Operation and maintenance	\$ 942,942	\$ 864,428	\$ 1,132,906	\$ 1,134,410	\$ 165,000	\$ 969,410
Sewer share of meter reading expenses	151,966	115,553	120,000	125,000	125,000	-
Capital replacement outlay	1,033,253	959,971	1,282,000	1,127,000	900,000	227,000
NEW Water annual debt service requirements	31,275	31,275	31,275	31,275	31,275	-
Current principal and interest payments	385,635	413,116	416,544	418,644	418,644	-
Total Expenses and Other Uses	<u>\$ 2,545,071</u>	<u>\$ 2,384,343</u>	<u>\$ 2,982,725</u>	<u>\$ 2,836,329</u>	<u>\$ 1,639,919</u>	<u>\$ 1,196,410</u>

REVENUE REQUIREMENT- COLLECTION SYSTEM

Expenditures and Other Uses	
Recovered through fixed charges to general customers	\$ 1,639,919
Recovered through volume charges to all customers	<u>1,196,410</u>
Total Revenue Requirement - Collection System	<u>\$ 2,836,329</u>

Attachment: De Pere Sewer Rate Study 2018 DRAFT (revised) (7699 : Consider 2018-2019 Sewer Rate

**City of DePere Wastewater Utility
Proposed Rates - Fixed and Volume Charges - Collection System**

FIXED CHARGES - GENERAL CUSTOMERS

	2019 Estimated
Costs to be recovered:	
Operation and maintenance - fixed portion	165,000
Sewer share of meter reading expenses	125,000
Capital replacement outlay	900,000
NEW Water annual debt service requirements	31,275
Current principal and interest payments	418,644
Total	\$ 1,639,919

Meter Size	Number of Customers	User Charge Factor	Per Quarter	Per Year	Annual Revenue
3/4"	8,442	1.00	\$ 28.00	\$ 112.00	\$ 945,504
1"	136	2.50	70.00	280.00	38,080
1 1/2"	121	5.00	140.00	560.00	67,760
2"	82	8.00	224.00	896.00	73,472
3"	46	15.00	420.00	1,680.00	77,280
4"	22	45.00	1,260.00	5,040.00	110,880
	8,849				\$ 1,312,976

DAILY MONITORING CHARGE - PAPER MILLS

Charges are a direct pass through from NEW Water - estimated at \$3,100 per month

VOLUME CHARGE- ALL CUSTOMERS

Costs to be Recovered	2019 Estimated
Operation and maintenance - variable portion	\$ 1,196,410
Less: Allocated to customers where calculated charges exceed 15% of revenue requirement	(145,400)
Net to be Recovered through Volume Charges	\$ 1,051,010

Gallons sold and wastewater flows

	2019 Estimated
General customers - water gallons sold	505,000,000
Paper Mills with < 15% (wastewater)	65,134,000
Total	570,134,000

Proposed Rates

	Proposed Rate	Billable Flows	Recovery of Costs
Variable Costs	\$ 2.782	570,134,000	\$ 1,586,113

**City of DePere Wastewater Utility
Proposed Rate Increase - General Customers Summary**

WASTEWATER RATES

Current Rates		
Volume charge - treatment		
Treatment	\$4.52/ thousand gallons	
Treatment Fixed charge- quarterly		
3/4"	\$	3.30
1"		8.25
1 1/2"		16.50
2"		26.40
3"		49.50
4"		148.50
Volume charge - collection - quarterly		
Collection	\$2.782/ thousand gallons	
Collection Fixed charge - quarterly		
3/4"	\$	28.00
1"		70.00
1 1/2"		140.00
2"		224.00
3"		420.00
4"		1,260.00

Proposed Rates - 2019		
Volume charge - treatment		
Treatment	\$4.52/ thousand gallons	
Treatment Fixed charge- quarterly		
3/4"	\$	3.30
1"		8.25
1 1/2"		16.50
2"		26.40
3"		49.50
4"		148.50
Volume charge - collection - quarterly		
Collection	\$2.782/ thousand gallons	
Collection Fixed charge - quarterly		
3/4"	\$	28.00
1"		70.00
1 1/2"		140.00
2"		224.00
3"		420.00
4"		1,260.00

AVERAGE RESIDENTIAL BILL

In thousand gallons		
Per Year	Per Quarter	
Average water use	60.00	15.00

	Current Rates	
	Per Year	Per Quarter
Wastewater	\$ 563.32	\$ 140.83

	Proposed Rates - 2019		Quarterly Increase
	Per Year	Per Quarter	
Wastewater	\$ 563.32	\$ 140.83	\$ -

**City of DePere Wastewater Utility
Proposed Rate Increase - Paper Mill Summary**

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COLLECTION RATES

Current Rates

Volume charge- collection- monthly

Collection \$2.782/ thousand gallons

Up to a maximum of 15% of Collection System Expenses
allocated to the Flow Rate - for 2018: \$136,600

NEW Water Daily Monitoring Charge - monthly

Direct pass-through from NEW Water \$3,100 per month estimate

TREATMENT RATES

Administrative fee

City of DePere - Fixed Treatment Administrative Fee

\$1,900 per month

Variable rates

NEW Water unit charges - pass through

Flow \$0.69897/ thousand gallons
BOD \$0.35126/ pound
TSS \$0.28304/ pound
Phosphorus \$0.75833/ pound
TKN \$0.70556/ pound

Fixed rates

NEW Water fixed charge - pass through

Allocated to Paper Mills based upon actual units each month
\$ 749,008

Proposed Rates - 2019

Volume charge- collection- monthly

Collection \$2.782/ thousand gallons

Up to a maximum of 15% of Collection System Expenses
allocated to the Flow Rate - for 2019: \$145,400

NEW Water Daily Monitoring Charge - monthly

Direct pass-through from NEW Water \$5,000 per month estimate

City of DePere - Fixed Treatment Administrative Fee

\$1,400 per month

NEW Water unit charges - pass through

Flow \$0.72428/ thousand gallons
BOD \$0.29558/ pound
TSS \$0.26732/ pound
Phosphorus \$0.44398/ pound
TKN \$0.74148/ pound

NEW Water fixed charge - pass through

Allocated to Paper Mills (not including Fox River Fiber) based upon actual
units each month \$ 941,425

Attachment: De Pere Sewer Rate Study 2018 DRAFT (revised) (7699 : Consider 2018-2019 Sewer Rate

**City of DePere Wastewater Utility
Proposed Rate Increase - Paper Mill Average Bills**

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SONOCO US MILLS

	Per Year	Per Month
Average units		
Flow (in thousand gallons)	36,334	3,028
BOD (in pounds)	1,556,633	129,719
TSS (in pounds)	533,597	44,466
Phosphorus (in pounds)	469	39
TKN (in pounds)	24,058	2,005

	Current Rates	
	Per Year	Per Month
Treatment variable charges	\$ 740,539	\$ 61,712
Treatment fixed charges	269,643	22,470
Treatment fixed administrative fee	22,800	1,900
Collection	94,396	7,866
NEW Water daily monitoring charge	18,600	1,550
Total	<u>\$ 1,145,978</u>	<u>\$ 95,498</u>

	Proposed Rates - 2019		Monthly Increase
	Per Year	Per Month	
	\$ 647,113	\$ 53,926	\$ (7,785)
	338,912	28,243	5,772
	16,800	1,400	(500)
	101,081	8,423	557
	20,000	1,667	117
	<u>\$ 1,123,907</u>	<u>\$ 93,659</u>	<u>\$ (1,839)</u>

EXPERA

	Per Year	Per Month
Average units		
Flow (in thousand gallons)	384,498	32,042
BOD (in pounds)	1,412,080	117,673
TSS (in pounds)	165,353	13,779
Phosphorus (in pounds)	434	36
TKN (in pounds)	24,058	2,005

	Current Rates	
	Per Year	Per Month
Treatment variable charges	\$ 828,865	\$ 69,072
Treatment fixed charges	254,663	21,222
Treatment fixed administrative fee	22,800	1,900
Collection	136,600	11,383
NEW Water daily monitoring charge	18,600	1,550
Total	<u>\$ 1,261,528</u>	<u>\$ 105,127</u>

	Proposed Rates - 2019		Monthly Increase
	Per Year	Per Month	
	\$ 758,100	\$ 63,175	\$ (5,897)
	320,085	26,674	5,452
	16,800	1,400	(500)
	145,400	12,117	733
	20,000	1,667	117
	<u>\$ 1,260,385</u>	<u>\$ 105,032</u>	<u>\$ (95)</u>

BG Industrial

	Per Year	Per Month
Average units		
Flow (in thousand gallons)	87,864	7,322
BOD (in pounds)	278,088	23,174
TSS (in pounds)	1,197,792	99,816
Phosphorus (in pounds)	732	61
TKN (in pounds)	4,800	400

	Current Rates	
	Per Year	Per Month
Treatment variable charges	\$ 502,060	\$ 41,838
Treatment fixed charges	224,702	18,725
Treatment fixed administrative fee	22,800	1,900
Collection	136,600	11,383
NEW Water daily monitoring charge	18,600	1,550
Total	<u>\$ 904,762</u>	<u>\$ 75,397</u>

	Proposed Rates - 2019		Monthly Increase
	Per Year	Per Month	
	\$ 469,913	\$ 39,159	\$ (2,679)
	282,428	23,536	4,811
	16,800	1,400	(500)
	145,400	12,117	733
	20,000	1,667	117
	<u>\$ 934,541</u>	<u>\$ 77,878</u>	<u>\$ 2,482</u>

FOX RIVER FIBER

Average units

	Per Year	Per Month
Flow (in thousand gallons)	310,393	25,866
BOD (in pounds)	1,955,364	162,947
TSS (in pounds)	975,698	81,308
Phosphorus (in pounds)	26,407	2,201
TKN (in pounds)	260,639	21,720

Current Rates			
	Per Year	Per Month	
Treatment variable charges	\$ 1,258,973	\$ 104,914	
Treatment fixed charges	576,090	48,008	
Treatment fixed administrative fee	22,800	1,900	
Total	<u>\$ 1,857,863</u>	<u>\$ 154,822</u>	

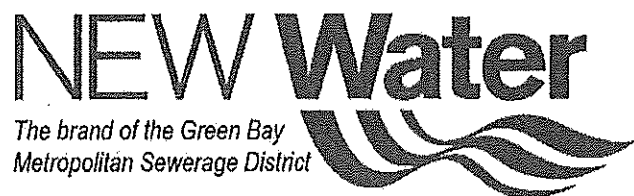
Proposed Rates - 2019				Monthly Increase
	Per Year	Per Month		
	\$ 1,158,197	\$ 96,516	\$ (8,398)	
	603,445	50,287	2,280	
	16,800	1,400	(500)	
	<u>\$ 1,778,442</u>	<u>\$ 148,204</u>	<u>\$ (6,618)</u>	

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2019 Adopted Budget

December 5, 2018

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)



NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
DATES AND EVENTS

July 18, 2018	First Discussion of 2019 Budget with Commission
August 22, 2018	First Budget Workshop
September 6, 2018	Budget Meeting with Customers
September 26, 2018	Second Budget Workshop and 2019 Tax Abatement Schedule
October 2018	Elected Officials Board Meetings
October 24, 2018	Third Budget Workshop (if needed)
December 5, 2018	2019 Budget Public Hearing and Adoption
December 6, 2018	2019 Adopted Budget Distributed to Customers

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
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5-Year Capital Investment Plan Report

Summary of Revenues and Expenses Legends

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Municipal, Procter & Gamble and Fox River Fiber Rate Comparisons

Municipal Rate Comparison

Parameter	COS Title	2018 COS Rate (FRF Adjusted)	2019 COS Rate (FRF Adjusted)
Volume (1,000 GALS)	Flow	\$0.69897	\$0.72428
Biochemical Oxygen Demand (LBS)	BOD	\$0.35126	\$0.29558
Suspended Solids (LBS)	TSS	\$0.28304	\$0.26732
Phosphorus (LBS)	PHOS	\$0.75833	\$0.44398
Total Kjeldahl Nitrogen (LBS)	TKN	\$0.70556	\$0.74148

Note: Fixed Charge is billed separately as shown on page 3, Flow and Load Projections.

Procter & Gamble Operation & Maintenance Rate Comparison

Parameter	COS Title	2018 COS Rate (FRF Adjusted)	2019 COS Rate (FRF Adjusted)
Volume (1,000 GALS)	Flow	\$0.58847	\$0.58964
Biochemical Oxygen Demand (LBS)	BOD	\$0.28878	\$0.23376
Suspended Solids (LBS)	TSS	\$0.22148	\$0.20216
Phosphorus (LBS)	PHOS	\$0.69239	\$0.29866
Total Kjeldahl Nitrogen (LBS)	TKN	\$0.64105	\$0.67460

Note: Capital Charges for P&G to be billed separately.

Fox River Fiber Operation & Maintenance Rate Comparison

Parameter	COS Title	2018 COS Rate (FRF Adjusted)	2019 COS Rate (FRF Adjusted)
Volume (1,000 GALS)	Flow	\$0.44504	\$0.48322
Biochemical Oxygen Demand (LBS)	BOD	\$0.33742	\$0.28558
Suspended Solids (LBS)	TSS	\$0.27266	\$0.25893
Phosphorus (LBS)	PHOS	\$0.72553	\$0.43155
Total Kjeldahl Nitrogen (LBS)	TKN	\$0.67474	\$0.71272

Note: The Fixed Charge for Fox River Fiber to be billed separately by City of De Pere.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Summary of Revenues and Expenses

	2017 Budget	2017 Actual	2018 Budget	% of Overall Expenses	Projected 2018 Year-End	2019 Budget	% of Overall Expenses	2019 Budget Favorable/ (Unfavorable) Variance	% Variance
Revenues									
Municipal User Fees (3)	\$ 33,599,315	\$ 36,690,267	\$ 34,221,844	85.7%	\$ 36,306,733	\$ 34,341,032	85.1%	\$ 119,188	0.3%
P&G User Fees	1,360,778	1,425,553	1,441,121	3.6%	1,445,108	1,342,045	3.3%	(99,076)	-6.9%
Mills Direct Charges	233,462	159,788	109,756	0.3%	122,317	117,200	0.3%	7,444	6.8%
P&G Capital Charges	1,044,650	1,044,650	1,037,677	2.6%	1,037,677	1,163,822	2.9%	126,145	12.2%
General Reserve Interest	4,682	43,715	2,175	0.0%	101,545	14,019	0.0%	11,844	544.6%
Other Revenues	789,457	971,164	767,024	1.9%	939,053	1,177,702	2.9%	410,678	53.5%
PERF Reserve Transfers	\$ 37,012,344	\$ 40,335,137	\$ 37,579,597	94.2%	\$ 39,952,434	\$ 38,155,821	94.5%	\$ 576,224	1.5%
DEBT and ICR Reserve Transfers	2,095,257	2,095,257	2,334,123	5.8%	2,334,123	2,027,034	5.0%	(307,089)	-13.2%
General Fund Transfers	-	(4,913,593)	-	-	(3,888,801)	175,000	0.0%	175,000	0.0%
Total Revenues	\$ 2,095,257	\$ (2,818,336)	\$ 2,334,123	5.8%	\$ (1,534,678)	\$ 2,202,034	5.6%	\$ (132,089)	-5.7%
Expenses									
Salaries & Benefits	\$ 10,236,902	\$ 10,317,994	\$ 10,401,955	26.1%	\$ 10,152,049	\$ 10,741,619	26.6%	\$ (339,664)	-3.3%
Power	2,499,473	2,372,303	1,923,964	4.8%	2,686,609	1,537,400	3.8%	386,564	20.1%
Contracted Services	2,788,143	2,320,270	3,588,058	9.0%	2,923,413	2,986,020	7.3%	622,038	17.3%
Maintenance & Repairs	1,582,415	1,678,763	1,942,867	4.9%	1,698,119	1,688,721	4.2%	254,146	13.1%
Chemicals	548,890	555,939	945,239	2.4%	845,739	1,045,447	2.6%	(100,208)	-10.6%
Natural Gas & Fuel Oil	961,931	934,379	487,404	1.2%	1,036,413	327,449	0.8%	159,955	32.8%
Solid Waste Disposal	211,325	186,079	180,686	0.5%	168,340	283,828	0.7%	(103,142)	-57.1%
Interceptor System (1)	682,855	954,145	690,490	1.7%	1,292,364	1,106,301	2.7%	(415,811)	-60.2%
Office & Administrative	529,641	496,506	631,146	1.6%	755,323	614,468	1.5%	16,678	2.6%
Insurance	237,593	240,937	250,375	0.6%	229,379	274,830	0.7%	(24,455)	-9.8%
Supplies	149,838	196,664	220,187	0.6%	192,655	218,826	0.5%	1,361	0.6%
Employee Training & Development	152,673	146,275	175,094	0.4%	136,203	186,978	0.5%	(11,884)	-6.8%
Travel and Meetings	80,868	61,101	75,815	0.2%	65,988	70,791	0.2%	5,024	6.6%
DNR Environmental Fees	146,000	117,501	136,000	0.3%	123,809	131,000	0.3%	5,000	3.7%
Total O & M Expenses	\$ 20,688,547	\$ 20,578,856	\$ 21,649,280	54.2%	\$ 22,308,403	\$ 21,193,678	52.5%	\$ 455,602	2.1%
Debt Service (2)	\$ 16,457,706	\$ 16,457,706	\$ 15,253,439	38.2%	\$ 15,253,439	\$ 16,216,177	40.2%	\$ (962,738)	-6.3%
Annual Capital	1,961,348	480,239	3,011,000	7.5%	857,914	2,948,000	7.3%	63,000	2.1%
Total Debt Service, Annual Capital & Rate Stabilization	\$ 18,419,054	\$ 16,937,945	\$ 18,264,439	45.8%	\$ 16,111,353	\$ 19,164,177	47.5%	\$ (899,738)	-4.9%
Total Expenses	\$ 39,107,601	\$ 37,516,801	\$ 39,913,719	100.0%	\$ 38,417,756	\$ 40,357,855	100.0%	\$ (444,136)	-1.1%

Notes:

- 1) Interceptor System includes all expenses related to Interceptors, Meter and Lift Stations, including chemicals, power, phones, pretreatment program, and water.
- 2) Debt Service for 2019 reflects collection and payments for 2020 Debt Payments.
- 3) Municipal User Fees equal municipal customers plus Fox River Fiber.

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Flow and Load Projections - with FRF Adjustment

65.0%

	1,000 gal	VOLUME	BOD		TSS		PHOS		TKN		Fixed Charge	
	Gallons (1000 gallon)	Amount	Pounds	Amount	Pounds	Amount	Pounds	Amount	Pounds	Amount	Amount	Total Amount
City of Green Bay	5,100,000	\$3,693,848	8,251,296	\$2,438,919	7,400,568	\$1,978,349	186,688	\$82,441	1,373,832	\$1,018,669	\$5,264,268	\$14,476,493
City of De Pere	1,300,000	941,569	3,720,000	1,099,558	2,230,000	596,132	27,324	12,131	282,816	209,702	1,786,963	4,646,058
Fox River Fiber	300,000	144,567	1,285,500	367,113	720,500	186,559	16,500	7,121	198,000	141,119	603,445	1,450,323
Village of Allouez	710,000	514,241	726,648	214,793	1,015,872	271,567	21,192	9,408	152,952	113,411	617,637	1,741,047
Village of Ashwaubenton	1,421,000	1,029,207	2,083,008	615,696	2,452,980	655,740	57,252	25,419	294,780	218,573	1,499,690	4,044,325
Village of Bellevue	660,000	476,027	799,260	236,245	852,108	227,789	22,140	9,830	168,504	124,942	587,039	1,663,672
Village of Hobart	205,000	148,478	285,636	84,428	363,888	97,276	7,488	3,325	60,884	44,996	219,195	587,687
Village of Howard	830,000	601,155	777,816	229,907	1,842,084	492,433	25,272	11,220	299,256	221,892	902,923	2,459,531
Village of Luxemburg	194,000	140,511	42,590	12,589	86,941	23,215	1,568	696	17,800	13,050	74,372	264,432
Village of Pulaski	197,000	142,684	59,172	17,490	50,328	13,454	7,632	3,388	41,040	30,430	78,273	285,720
Village of Starnico	189,416	137,191	407,588	120,459	436,404	116,661	10,500	4,662	63,536	47,111	266,290	692,384
Town of Ledgeview Sanitary District #2	185,000	133,992	232,932	68,850	259,176	69,284	7,320	3,250	53,616	39,755	174,037	489,169
Town of Lawrence - Utility District	115,000	83,293	222,899	65,885	396,929	106,109	6,152	2,731	44,364	32,885	191,286	482,198
Pittsfield Sanitary District	12,600	9,126	16,260	4,806	27,423	7,331	432	192	3,370	2,489	14,377	38,331
Scott Municipal Utility	120,000	86,914	184,226	48,542	280,034	74,860	4,329	1,922	33,001	24,470	144,365	381,073
Dyckesville Sanitary District	29,000	21,004	36,699	10,847	61,893	16,545	975	433	7,605	5,639	32,555	87,024
Hauled Waste	31,762	65,066	432,448	191,210	596,623	215,962	16,060	9,332	67,465	59,786	-	541,357
Total Municipal	11,599,778	\$8,371,271	19,543,958	\$5,827,337	19,073,651	\$5,149,286	417,824	\$187,502	3,162,421	\$2,348,940	\$12,456,715	\$34,341,032
Procter & Gamble	1,377,689	\$812,338	482,124	\$112,703	1,914,408	\$387,010	1,956	\$584	43,596	\$29,410	\$-	\$1,342,045
Total Mill	1,377,689	\$812,338	482,124	\$112,703	1,914,408	\$387,010	1,956	\$584	43,596	\$29,410	\$-	\$1,342,045
Grand Total	12,977,467	\$9,183,609	20,026,082	\$5,940,040	20,988,059	\$5,536,276	419,780	\$188,086	3,206,017	\$2,378,350	\$12,456,715	\$35,683,077
Units												
Costs												

Note: Fixed Charge is billed 1/12 of annual amount each month.

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
User Fees by Source

	2019 Budget	2018 Budget	2017 Actual	2016 Actual	2015 Actual
City of Green Bay	\$14,476,493	\$14,454,434	\$14,974,753	\$13,827,312	\$12,487,909
City of De Pere	4,646,056	4,488,162	5,434,550	5,037,348	4,977,851
Fox River Fiber	1,450,323	1,441,655	1,163,311	1,084,874	1,391,549
Village of Allouez	1,741,047	1,784,148	1,780,075	1,749,897	1,707,690
Village of Ashwaubenon	4,044,325	4,135,024	4,069,542	3,977,249	3,739,334
Village of Bellevue	1,663,872	1,719,315	1,740,876	1,593,290	1,637,450
Village of Hobart	597,697	579,416	568,425	459,957	383,540
Village of Howard	2,459,531	2,500,257	2,410,582	2,408,423	1,992,062
Village of Luxemburg	264,432	234,408	225,721	174,364	159,572
Village of Pulaski	285,720	342,869	318,328	317,468	281,687
Village of Suamico	692,384	708,374	725,354	669,926	668,187
Town of Ledgeview Sanitary District #2	489,169	500,436	505,389	469,136	565,832
Town of Lawrence - Utility District	482,198	420,176	455,156	374,940	311,614
Pittsfield Sanitary District	38,331	37,616	37,351	38,741	39,288
Scott Municipal Utility **	381,073	0	0	0	0
Dyckesville Sanitary District	87,024	85,402	84,852	87,100	67,928
New Franken Sanitary District **	0	44,143	43,742	45,153	46,422
Royal Scott Sanitary District **	0	88,780	90,566	84,184	75,002
Town of Scott Sanitary District #1 **	0	171,078	169,977	178,443	181,977
Bayshore Sanitary District **	0	69,278	67,899	70,015	54,530
Hauled Waste *	541,357	416,872	1,823,820	1,280,178	2,485,872
Total Municipal	\$34,341,032	\$34,221,844	\$36,690,269	\$33,927,998	\$33,255,295
Procter & Gamble	1,342,045	1,441,121	1,425,552	1,275,813	1,149,433
Total Mill	\$1,342,045	\$1,441,121	\$1,425,552	\$1,275,813	\$1,149,433
Total User Fees	\$35,683,077	\$35,662,965	\$38,115,821	\$35,203,811	\$34,404,729

* Hauled Waste for 2015, 2016, & 2017 was significantly higher due to special projects with the three cheese facilities.

** Scott Municipal Utility is a consolidation of New Franken Sanitary District, Royal Scott Sanitary District, Town of Scott Sanitary District #1, and Bayshore Sanitary District.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Municipal Cost of Service

	<u>Total</u>	<u>VOLUME</u> 1,000 gal	<u>BOD</u> pounds	<u>TSS</u> pounds	<u>PHOS</u> pounds	<u>TKN</u> pounds	<u>Fixed Charge</u> N/A
Unit Value		11,568,016	19,111,510	18,477,028	401,764	3,094,956	11,568,016
Units (1)							
Cost of Service							
Municipal							
Operating Cost	\$18,196,901	\$ 7,787,315	\$4,467,033	\$3,734,896	\$ 119,967	\$2,087,690	\$ -
Pretreatment Cost Allocation	200,671	0	98,629	65,809	4,323	31,909	0
Capital Cost	7,404,220	515,421	408,597	292,689	50,284	148,939	5,988,290
Solids Project - Capital Cost	7,997,883	3,470	661,868	839,910	3,594	20,616	6,468,425
Total Cost	\$33,799,675	\$ 8,306,206	\$5,636,127	\$4,933,304	\$ 178,169	\$2,289,154	\$12,456,715
Unit Operating Cost		\$0.67318	\$0.23890	\$0.20570	\$0.30936	\$0.68486	
Unit Capital Cost		\$0.04486	\$0.05601	\$0.06130	\$0.13411	\$0.05478	
Unit Combined Cost		\$0.71803	\$0.29491	\$0.26700	\$0.44347	\$0.73964	
Fox River Fiber (FRF) Adjustment (2)		\$0.00625	\$0.00067	\$0.00033	\$0.00051	\$0.00184	
Adjusted Unit Combined Cost		\$0.72428	\$0.29558	\$0.26732	\$0.44398	\$0.74148	

(1) Exclude Hauled Waste flows and loads.

200.00 200.00 12.00 50.00

(2) FRF Adjustment removes interceptor costs from FRF Cost of Service.

GBMSD MUNICIPAL BUDGET RATE
HISTORY

	<u>VOLUME</u>	<u>BOD</u>	<u>SS</u>	<u>PHOS</u>	<u>TKN</u>
2019	\$0.72428	\$0.29558	\$0.26732	\$0.44398	\$0.74148
2018	\$0.69897	\$0.35126	\$0.28304	\$0.75833	\$0.70556
2017	\$0.72126	\$0.41913	\$0.36651	\$0.58901	\$0.76448
2016	\$0.79357	\$0.43068	\$0.41292	\$0.60597	\$0.64043
2015	\$0.80448	\$0.39331	\$0.34822	\$0.56768	\$0.65358

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Hauled Waste Cost of Service

	<u>Total</u>	<u>VOLUME</u>	<u>BOD</u>	<u>TSS</u>	<u>PHOS</u>	<u>TKN</u>	<u>Fixed Charge</u>
Unit Value		1,000 gal	pounds	pounds	pounds	pounds	N/A
Units		31,762	432,448	596,623	16,060	67,465	0
Cost of Service							
Operating Cost	\$293,392	\$21,381	\$101,091	\$120,611	\$4,796	\$45,512	\$0
Pretreatment Cost Allocation	0	0	0	0	0	0	0
Capital Cost	119,204	43,392	34,399	24,641	4,233	12,539	0
Solids Project - Capital cost	128,761	292	55,721	70,710	303	1,736	0
Direct Charges	0	0	0	0	0	0	0
FRF Adjustment	0	0	0	0	0	0	0
Total Cost	\$541,357	\$65,066	\$191,210	\$215,962	\$9,332	\$59,786	\$0

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Procter & Gamble Cost of Service

	<u>Total</u>	<u>VOLUME</u> 1,000 gal	<u>BOD</u> pounds	<u>TSS</u> pounds	<u>PHOS</u> pounds	<u>TKN</u> pounds	<u>Capital Charge</u> N/A
Unit Value: Units		1,377,689	482,124	1,914,408	1,956	43,596	1,377,689
Cost of Service							
Operating Cost	\$1,342,045	\$812,338	\$112,703	\$387,010	\$584	\$29,410	\$0
Pretreatment Cost Allocation	0	0	0	0	0	0	0
Capital Cost	505,311	0	0	0	0	0	505,311
Solids Project - Capital Cost	658,511	0	0	0	0	0	658,511
Direct Charges	74,822	0	0	0	0	0	0
Total Cost	\$2,580,690	\$812,338	\$112,703	\$387,010	\$584	\$29,410	\$1,163,822
Unit Cost		\$0.58964	\$0.23376	\$0.20216	\$0.29866	\$0.67460	
Unit Capital Cost (1)		\$0.00000	\$0.00000	\$0.00000	\$0.00000	\$0.00000	
Unit Combined Cost		\$0.58964	\$0.23376	\$0.20216	\$0.29866	\$0.67460	

BUDGET RATE HISTORY	VOLUME	BOD	TSS	PHOS	TKN
2019	\$0.58964	\$0.23376	\$0.20216	\$0.29866	\$0.67460
2018	\$0.58847	\$0.28878	\$0.22148	\$0.69239	\$0.64105
2017	\$0.58553	\$0.26840	\$0.20301	\$0.43617	\$0.64104
2016	\$0.05342	\$0.25789	\$0.18371	\$0.38906	\$0.49819
2015	\$0.52549	\$0.26270	\$0.19420	\$0.40750	\$0.50956

Note: (1) Capital Charges for P&G to be billed separately.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Fox River Fiber Cost of Service

Unit Value	<u>Total</u>	<u>VOLUME</u> 1,000 gal	<u>BOD</u> pounds	<u>TSS</u> pounds	<u>PHOS</u> pounds	<u>TKN</u> pounds	<u>Fixed Charge (1)</u> N/A
Units		300,000	1,285,500	720,500	16,500	198,000	-
Cost of Service							
Operating Cost	\$ 786,546	\$ 201,953	\$ 300,467	\$ 145,640	\$ 4,927	\$ 133,560	\$ -
Pretreatment Cost Allocation	11,419	-	8,634	2,566	178	2,041	-
Capital Cost	746,130	13,457	72,003	44,165	2,213	10,847	603,445
Solids Project	-	-	-	-	-	-	-
Subtotal Cost of Service	\$ 1,544,095	\$ 215,410	\$ 379,104	\$ 192,371	\$ 7,317	\$ 146,449	\$ 603,445
Direct Charges	42,377	-	-	-	-	-	-
Less FRF Adjustment	(93,772)	(70,443)	(11,991)	(5,812)	(197)	(5,330)	-
Total Cost	\$ 1,492,701	\$ 144,967	\$ 367,113	\$ 186,559	\$ 7,121	\$ 141,119	\$ 603,445
Unit Cost		\$0.71803	\$0.29491	\$0.26700	\$0.44347	\$0.73964	
FRF Adjustment		(0.23481)	(0.00933)	(0.00807)	(0.01192)	(0.02692)	
Unit Cost (with FRF Adjustment)		\$0.48322	\$0.28558	\$0.25893	\$0.43155	\$0.71272	

BUDGET RATE HISTORY	VOLUME	BOD	TSS	PHOS	TKN
2019	\$0.48322	\$0.28558	\$0.25893	\$0.43155	\$0.71272
2018	\$0.44504	\$0.33742	\$0.27266	\$0.72553	\$0.67474
2017	\$0.53436	\$0.40685	\$0.35735	\$0.56875	\$0.73482
2016	\$0.63165	\$0.41777	\$0.40379	\$0.58647	\$0.61550
2015	\$0.59821	\$0.38082	\$0.33967	\$0.55008	\$0.63145

Note (1): The Fixed Charge for Fox River Fiber to be billed separately by the City of DePere.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
GREEN BAY METROPOLITAN SEWERAGE DISTRICT
2019 Adopted Budget - December 5, 2018
Allocation of Capital and Debt Service Costs (1)

	FY2019	Allocations	
		Municipal	Procter & Gamble (1)
Debt Service			
Debt Service - Municipal Only			
Clean Water Fund Loans			
4198-12 West Fox River Interceptor	\$142,753	\$142,753	\$0
4198-16 East River Lift Station	132,340	132,340	0
4198-18 Scott Bayshore Interceptor	45,735	45,735	0
4198-21 East Tower Drive Interceptor	182,822	182,822	0
4345-06 De Pere Ashwaubenon Creek Interceptor	217,218	217,218	0
4198-29 Phase Two Interceptor Rehabilitation	216,211	216,211	0
4198-45 De Pere Facility East Service Area Interceptor Rehabilitation	186,825	186,825	0
Ninth Street Interceptor Rehabilitation (2019 New)*	121,954	121,954	0
Ninth Street Interceptor Extension - American Drive (New 2019)*	92,759	92,759	0
East River Interceptor Rehabilitation (2018 New)*	0	0	0
Other General Obligation Debt			
2008 Sewerage System Improvement Bond - Re Issued March 2018	\$473,436	\$473,436	0
Total Debt Service - Municipal Only (2)	\$1,812,053	\$1,812,053	\$0
Debt Service - Common to All			
Clean Water Fund Loans			
4198-02 Bar Screen Replacement	\$100,662	\$94,103	\$6,560
4198-09 Service Water System	64,974	60,460	4,215
4198-24 Electrical Generation Facility	208,276	194,704	13,572
4198-25 RAS/WAS Improvements	662,989	619,785	43,204
4198-27 Solids Process Improvement	352,516	329,544	22,972
4198-32 GBF: Administration & Maintenance Building HVAC Replacement *	206,426	192,973	13,452
4198-35 Combined Treatment Facilities Projects	300,683	281,089	19,594
4198-37 Consolidation/Conveyance Project	881,055	823,641	57,415
4198-44 R2E2 Solids Management	981,276	908,476	72,801
4198-48 DPF: UV Disinfection System Upgrade	271,032	253,370	17,662
4345-04 De Pere Facility	257,638	240,849	16,789
4198-99 Green Bay Facility Solids Management Plan Construction (R2E2)*	7,026,502	6,505,207	521,295
4198-52 GBF: Disinfection System Upgrade *	48,414	45,259	3,155
DPF: Primary Substation & Emergency Generator (2017 New)*	825,992	772,165	53,826
GBF & DPF: Clarifier Rehabilitation and Odor Control (2018 New)*	334,190	312,412	21,778
DPF: Service Water System Rehabilitation/Replacement (2018 New)*	(0)	(0)	(0)
GBF: Gravity Belt Thickener Replacement (2020 New)	319,751	298,915	20,837
DPF: Tertiary Filter Replacement (2019 New)	257,048	240,298	16,751
Other General Obligation Debt			
2008 Sewerage System Improvement Bond	276,264	258,281	18,003
Promissory Note to City of De Pere	160,485	150,027	10,458
Green Bay Facility Solids Management Plan - Design	868,250	803,835	64,415
Total Debt Service - Common to All (2)	\$14,404,124	\$13,385,371	\$1,018,753
Debt Service Offsets			
Georgia-Pacific - Capital Payment	(\$429,694)	(\$429,694)	\$0
4198-29 City of De Pere Rehabilitation Interceptor Ashwaubenon Creek Payment	(53,472)	(53,472)	0
Less Debt Payments Funded from ICR Reserve **	(903,768)	(903,768)	0
City of Green Bay Interceptors Payment	(292,430)	(292,430)	0
Town of Lawrence Interceptors Payment ((9th Street Seg 5 Ext., Ashw. Creek 2,3,4,6,7, and Ashw. Interceptor 2,3, & 4)	(197,077)	(197,077)	0
New Franken Sanitary District Interceptors Payment	(21,621)	(21,621)	0
Royal Scott Sanitary District #1 Interceptor Payment	(8,902)	(8,902)	0
4198-45 De Pere Eastside Interceptor Rehabilitation	(120,071)	(120,071)	0
Total Debt Service Offsets	(\$2,027,034)	(\$2,027,034)	\$0
TOTAL DEBT SERVICE	\$14,189,143	\$13,170,390	\$1,018,753
ANNUAL CAPITAL OUTLAY			
2019 Requests - Allocated to All	\$2,463,000	\$2,309,184	\$153,816
2019 Requests - Allocated to Municipal Only	485,000	485,000	0
TOTAL ANNUAL CAPITAL OUTLAY	\$2,948,000	\$2,794,184	\$153,816
TOTAL ANNUAL CAPITAL AND DEBT SERVICE	\$17,137,143	\$15,964,573	\$1,172,570
REVENUES AND TRANSFERS			
Interest Income	(\$14,019)	(\$14,019)	\$0
Miscellaneous Revenue - Capital ***	(\$134,233)	(\$125,486)	(\$8,747)
Total Non-Rate Revenues (Capital-Related)	(\$323,252)	(\$314,505)	(\$8,747)
Net Annual Capital and Debt Service	\$16,813,891	\$15,650,068	\$1,163,822

(1) Based on Revised Cost of Service Allocations from CDM Smith, Inc. June 2016 (Table 5). Debt Collection is for 2020 debt service payments.

(2) Total Debt Collected in 2019 Budget for 2020 Debt payments. Metropolitan Sewerage Districts are permitted to abate taxation by having sufficient funds available in its designated debt service fund to pay those debt obligations for the following year.

Metropolitan Sewerage Districts Subchapter I 200.13(2),(5) permits Sewerage Districts to levy a tax upon property for its performance of duties.

* Note: 2018 & 2019 Payments for Debt Service over collected for these projects due to timing on submittal loan. The 2008 Improvement Bond Re-issued savings 03-2018.

** Note: Less Debt Payments funded from ICR Reserve.

*** Note: Miscellaneous Revenues are from Sampling & Lab Analysis from De Pere, Village of Ashwaubenon, Village of Hobart, Village of Suamico, Yacht Club, West Shore Pipeline, and ICR Leases.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Summary of Debt Service Schedule

Issue	Description	Original Amount	2019 Budget for 2020	Loan Date	Last Payment
			Debt Payments		
4198-16	East River Lift Station	1,924,428	132,340	10/25/2000	May 2020
4198-12	West Fox River Interceptor	2,159,850	142,753	10/25/2000	May 2020
4345-06	De Pere Ashwaubenon Creek Interceptor	3,222,103	217,218	12/31/2007	May 2020
4198-09	Service Water System	948,212	64,674	7/11/2001	May 2021
4198-02	Bar Screens Replacement	1,490,715	100,662	7/11/2001	May 2021
4198-18	Scott Bayshore Interceptor	695,592	45,735	2/27/2002	May 2021
4345-04	De Pere Facility	3,881,879	257,638	12/31/2007	May 2021
4198-27	Solids Process Improvement	5,347,693	352,516	12/8/2004	May 2024
4198-21	East Tower Drive Interceptor	2,761,526	182,822	4/13/2005	May 2024
Dec. 2007	Promissory Note to City of De Pere	2,000,000	160,485	12/28/2007	Dec 2027
Sept. 2008	2008 General Obligation - Sewerage System Improvement Bond Re Issue 03/2018	6,505,000	749,700	3/15/2028	May 2028
4198-25	RAS/WAS Improvements	10,460,782	662,989	3/19/2018	May 2028
4198-35	Combined Treatment Facilities Projects	4,211,341	300,683	12/9/2009	May 2029
4198-37	Consolidation/Conveyance Project	12,821,922	881,055	12/9/2009	May 2029
4198-29	Phase Two Interceptor Rehabilitation	3,421,382	216,211	11/10/2010	May 2030
4198-24	Electrical Generator Project	3,246,148	208,276	12/22/2010	May 2030
4198-32	GBF: Administration & Maintenance Building HVAC Replacement *	3,133,312	208,425	4/10/2013	May 2032
4198-45	De Pere Facility East Service Area Interceptor Rehabilitation	3,146,593	186,825	12/12/2012	May 2032
4198-48	DPF: Disinfection System Upgrade *	4,272,020	271,032	1/8/2014	May 2033
4198-44	Green Bay Facility Solids Management Plan Construction (R2E2)	15,209,242	981,276	8/13/2014	May 2034
4198-52	GBF: Disinfection System Upgrade *	1,850,000	48,414	12/23/2015	May 2035
4198-99	Green Bay Facility Solids Management Plan Construction (R2E2)*	116,000,000	7,026,502	10/14/2016	May 2035
July 2013	General Obligation Bond Green Bay Facility Solids Management Plan - Design (R2E2)	20,000,000	868,250	8/20/2013	May 2038
Total Existing Debt		\$232,335,511	\$14,264,483		
(New)	DPF: Primary Substation & Emergency Generator (2017 New) *	14,700,000	825,992	12/15/2018	May 2038
(New)	GBF & DPF: Clarifier Rehabilitation and Odor Control (2018 New)*	28,500,000	334,190	1/30/2020	May 2040
(New)	DPF: Service Water System Rehabilitation/Replacement (2018 New)*	1,420,000	(0)	6/30/2019	May 2040
(New)	Ninth Street Interceptor Rehabilitation (2019 New)*	3,000,000	121,954	5/30/2020	May 2040
(New)	Ninth Street Interceptor Extension - American Drive (New 2019)*	1,250,000	92,759	5/30/2020	May 2040
(New)	East River Interceptor Rehabilitation (2018 New)*	3,106,000	0	5/30/2020	May 2040
(New)	DPF: Tertiary Filter Replacement (2019 New)	8,004,000	257,048	1/30/2020	May 2040
(New)	GBF: Gravity Belt Thickener Replacement (2020 New)	4,642,000	319,751	2/30/2020	May 2040
Total New Debt		62,622,000	\$1,951,694		
Grand Total with New Debt		\$294,957,511	\$16,216,177		

Note: * Over collected debt payment from prior years due to timing of project expenditure projection.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Annual Capital

Item Description	Common to All - Municipal Only	Amount
Business Services		
<u>Information Technology</u>		
GBF: Replace PLC Input/Output Hardware	Common to All	\$ 125,000
Total Business Services		\$ 125,000
Operations		
<u>Maintenance</u>		
DPF: Air Handling Unit Replacement	Common to All	\$ 250,000
GBF: Replacement MCC - Administration Building ADP-1,-2; MCC-A1,-A2	Common to All	330,000
GBF: Replacement MCC - South Plant MCC-N1,-N2,-N3	Common to All	370,000
Total Operations		\$ 950,000
Technical Services		
<u>Engineering</u>		
MS 6,8, & 9 Rehabilitation	Municipal Only	\$ 435,000
Annual Manhole Rehabilitation	Municipal Only	50,000
Administration Building Office Space Upgrades	Common to All	1,350,000
Total Engineering		\$ 1,835,000
Total Technical Services		\$ 1,835,000
Environmental Programs		
<u>Laboratory</u>		
Automated BOD Analyzer	Common to All	\$ 38,000
Total Laboratory		\$ 38,000
Total Environmental Programs		\$ 38,000
Total Annual Capital Items		\$ 2,948,000

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 6, 2018
Allocation of Operation and Maintenance Costs

Expenses are first allocated to cost components (Flow, BOD, TSS, PHOS, TKN) and then allocated to Municipal and Mill customers based on projected annual wastewater flows and loadings.

ITEM	Total	Common to All					Municipal Only		Mill Only	
		Flow	BOD	TSS	PHOS	TKN	Flow	Industry	Flow	Direct
Salaries & Benefits										
Laboratory & Research & Environmental Services										
Operational Testing	\$ 606,075	\$ 84,850	\$ 72,729	\$ 54,546	\$ 36,365	\$ 42,425	\$ 127,276	\$ 145,458	\$ -	\$ 42,425
Water Quality Testing	905,289	0	0	0	0	0	0	0	0	0
Total Laboratory Services	\$ 1,511,364	\$ 990,140	\$ 72,729	\$ 54,546	\$ 36,365	\$ 42,425	\$ 127,276	\$ 145,458	\$ -	\$ 42,425
Treatment										
Pump Station	\$ 114,681	\$ 114,681	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Primary Treatment	154,087	154,087	0	0	0	0	0	0	0	0
Grit Removal	20,067	0	20,067	0	0	0	0	0	0	0
Aeration	221,051	0	110,526	0	0	110,526	0	0	0	0
Final & Chlorine Contact Basins	197,032	0	0	0	0	0	0	0	0	0
Filtration	29,360	0	0	0	0	0	0	0	0	0
Primary Thickeners	76,547	459	68,739	459	0	0	0	0	0	0
Waste Activated Sludge Thickeners	164,029	0	98,417	62,331	0	3,281	0	0	0	0
Dewatering - Belt Presses/Inchination	426,474	1,115	161,076	256,356	1,115	4,812	0	0	0	0
Primary Sludge	185,899	1,115	16,731	166,937	1,115	0	0	0	0	0
Secondary Sludge	240,575	0	144,345	91,419	0	4,812	0	0	0	0
Incineration	510,973	1,396	187,947	314,668	1,396	5,567	0	0	0	0
Primary Sludge	232,622	1,396	20,936	208,895	1,396	0	0	0	0	0
Secondary Sludge	278,351	0	167,011	105,773	0	5,567	0	0	0	0
Digestion	236,599	646	87,026	145,702	646	2,578	0	0	0	0
Struvite Harvesting	156,076	213	28,704	48,057	78,251	850	0	0	0	0
Power Generation	198,822	543	73,131	122,439	543	2,166	0	0	0	0
Solids, General	224,033	600	83,410	136,943	600	2,480	0	0	0	0
Total Treatment	\$ 2,729,832	\$ 500,134	\$ 837,126	\$ 1,177,303	\$ 63,011	\$ 132,259	\$ -	\$ -	\$ -	\$ -
Maintenance/Engineering										
Maintenance	\$ 2,379,896	\$ 741,548	\$ 617,403	\$ 458,218	\$ 10,691	\$ 383,540	\$ 123,755	\$ -	\$ 44,742	\$ -
Engineering	908,224	282,992	235,615	174,867	4,080	146,368	47,228	0	17,075	0
Total All Above	\$ 7,529,317	\$ 2,514,814	\$ 1,762,873	\$ 1,864,934	\$ 134,147	\$ 704,591	\$ 298,258	\$ 145,458	\$ 61,817	\$ 42,425
Business Services & Information Systems										
	\$ 2,187,229	\$ 744,632	\$ 522,194	\$ 552,426	\$ 39,737	\$ 208,712	\$ 88,349	\$ -	\$ 13,082	\$ 17,797
Total Salaries & Benefit Costs	\$ 9,716,546	\$ 3,259,746	\$ 2,285,067	\$ 2,417,360	\$ 173,883	\$ 913,304	\$ 386,607	\$ 145,458	\$ 74,898	\$ 60,222
Power										
Metro Pump	\$ 208,058	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 208,058	\$ -	\$ -	\$ -
Mill Pump	11,614	0	0	0	0	0	0	0	11,614	0
Secondary Effluent Pump	13,356	0	0	0	0	0	0	0	0	0
Process Air Compressors	595,333	0	386,966	0	0	208,367	0	0	0	0
Solids Building	205,694	574	74,594	127,752	574	2,199	0	0	0	0
Primary Sludge (40)	95,730	574	8,616	85,966	574	0	0	0	0	0
Secondary Sludge (60)	109,964	0	65,978	41,786	0	2,169	0	0	0	0
All Other Plant	503,345	156,837	130,580	96,912	2,281	81,118	28,174	0	9,463	0
Total Power	\$ 1,537,400	\$ 170,767	\$ 582,140	\$ 224,664	\$ 2,896	\$ 291,684	\$ 234,232	\$ -	\$ 21,077	\$ -
Fuel										
Fuel - Diesel for Generators	\$ 33,000	\$ 33,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Building	126,144	39,305	32,725	24,287	567	20,329	6,559	0	2,372	0
Incineration & Process	168,305	470	61,035	104,530	470	1,800	0	0	0	0
Primary Sludge (40)	78,329	470	7,050	70,340	470	0	0	0	0	0
Secondary Sludge (60)	89,976	0	53,986	34,191	0	1,800	0	0	0	0
Total Fuel	\$ 327,449	\$ 72,775	\$ 93,760	\$ 128,818	\$ 1,037	\$ 22,129	\$ 6,559	\$ -	\$ 2,372	\$ -

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Allocation of Operation and Maintenance Costs

Expenses are first allocated to cost components (Flow, BOD, TSS, PHOS, TKN) and then allocated to Municipal and Mill customers based on projected annual wastewater flows and loadings.

ITEM	Total	Common to All					Municipal Only			Mill Only		
		Flow	BOD	TSS	PHOS	TKN	Flow	Industry	Flow	Flow	Direct	Flow
Chemicals												
Sodium Hypochlorite	\$ 110,290	\$ 110,290	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Gravity Belt Polymer	75,960	0	45,576	28,865	0	1,519	0	0	0	0	0	0
Gravity Thickener Polymer	0	0	0	0	0	0	0	0	0	0	0	0
Belt Press Polymer	362,052	1,011	131,297	224,862	1,011	3,871	0	0	0	0	0	0
Primary Sludge (40)	188,499	1,011	15,165	151,312	1,011	0	0	0	0	0	0	0
Secondary Sludge (60)	193,553	0	116,132	73,550	0	3,871	0	0	0	0	0	0
Lime and Clay	0	0	0	0	0	0	0	0	0	0	0	0
Primary Sludge (40)	0	0	0	0	0	0	0	0	0	0	0	0
Secondary Sludge (60)	0	0	0	0	0	0	0	0	0	0	0	0
Sodium Bisulfite	56,000	0	0	0	0	0	0	0	0	0	0	0
Ferri Chloride	31,140	15,570	0	0	0	15,570	0	0	0	0	0	0
Odor Control	15,000	4,254	4,022	3,364	157	2,238	709	0	0	256	0	0
Magnesium Chloride	165,516	226	30,440	50,964	82,984	902	0	0	0	0	0	0
Sodium Hydroxide - Air Pollution	120,061	328	44,161	73,938	328	1,308	0	0	0	0	0	0
Sodium Hydroxide - Nutrient Removal	0	0	0	0	0	0	0	0	0	0	0	0
Activated Carbon	0	0	0	0	0	0	0	0	0	0	0	0
Aqua Ammonia	7,000	19	2,575	4,311	19	76	0	0	0	0	0	0
Other Chemicals	146,276	146,276	0	0	0	0	0	0	0	0	0	0
Total Chemicals	\$ 1,089,295	\$ 333,974	\$ 258,071	\$ 386,302	\$ 100,069	\$ 9,914	\$ 709	\$ -	\$ -	\$ 256	\$ -	\$ -
Maintenance & Repairs												
Maintenance & Repairs	\$ 1,625,373	\$ 506,448	\$ 421,861	\$ 312,944	\$ 7,302	\$ 261,942	\$ 84,519	\$ -	\$ -	\$ 30,557	\$ -	\$ -
All Other Expenses												
Solid Waste	\$ 283,828	\$ 793	\$ 102,929	\$ 176,279	\$ 793	\$ 3,035	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Primary Sludge (40)	132,094	793	11,888	118,620	793	0	0	0	0	0	0	0
Secondary Sludge (60)	151,734	0	91,041	57,659	0	3,035	0	0	0	0	0	0
DNR Environmental Fees	131,000	956	44,101	46,528	29,581	9,834	0	0	0	0	0	0
Other Miscellaneous	4,331,913	1,349,774	1,123,803	834,053	19,460	698,123	225,259	0	0	81,440	0	0
Biogas Treatment	19,500	53	7,173	12,009	53	212	0	0	0	0	0	0
Total All Other	\$ 4,766,241	\$ 1,351,576	\$ 1,278,006	\$ 1,068,869	\$ 49,887	\$ 711,204	\$ 225,259	\$ -	\$ -	\$ 81,440	\$ -	\$ -
Total Treatment Plant O & M	\$ 19,062,304	\$ 5,695,286	\$ 4,928,705	\$ 4,538,957	\$ 335,013	\$ 2,210,177	\$ 937,887	\$ 145,458	\$ 210,600	\$ 60,222	\$ -	\$ -
Field Services O & M												
Pretreatment	\$ 190,161	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 190,161	\$ -	\$ -	\$ -	\$ -
Municipal Interceptors	891,729	0	0	0	0	0	891,729	0	0	0	0	0
Mill Interceptors	2,448	0	0	0	0	0	0	0	2,448	0	0	0
Fox River Fiber Force Main	19,493	0	0	0	0	0	0	0	0	0	19,493	0
Municipal Metering Stations	241,532	0	0	0	0	0	241,532	0	0	0	0	0
Mill Metering Stations	26,441	0	0	0	0	0	0	0	0	0	26,441	0
Municipal Lift Stations	348,453	0	0	0	0	0	348,453	0	0	0	0	0
Subtotal	\$ 1,718,257	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,479,714	\$ 190,161	\$ 2,448	\$ 45,934	\$ -	\$ -
All Other (Field Services Salaries after distribution)	413,117	0	0	0	0	0	355,765	45,720	589	11,044	0	0
Total Interceptor System O & M	\$ 2,131,374	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,835,479	\$ 235,881	\$ 3,037	\$ 56,978	\$ -	\$ -
Total O & M Costs	\$ 21,193,678	\$ 5,695,286	\$ 4,928,705	\$ 4,538,957	\$ 335,013	\$ 2,210,177	\$ 2,773,365	\$ 381,339	\$ 213,636	\$ 117,200	\$ -	\$ -
Distribution to Participants												
MUNICIPAL	\$ 19,693,940	\$ 5,090,674	\$ 4,810,048	\$ 4,124,940	\$ 333,452	\$ 2,180,123	\$ 2,773,365	\$ 381,339	\$ -	\$ -	\$ -	\$ -
FOX RIVER FIBER	42,377	0	0	0	0	0	0	0	0	0	42,377	0
PROCTER & GAMBLE	1,457,361	604,612	118,658	414,017	1,561	30,054	0	0	0	213,636	74,822	0
Total	\$ 21,193,678	\$ 5,695,286	\$ 4,928,705	\$ 4,538,957	\$ 335,013	\$ 2,210,177	\$ 2,773,365	\$ 381,339	\$ 213,636	\$ 117,200	\$ -	\$ -

Note: Other Miscellaneous summarizes expenses of contracted services, office & administrative, equipment, plant and property insurance, supplies employee training, & development, and travel & meetings.

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Interceptor System O & M

Account Name	Maintenance	Field Services	Procter & Gamble Meter Station	Procter & Gamble Interceptor	Fox River Fiber Force Main	Total
Salaries - Procter & Gamble (P&G) Interceptor	\$ -	\$ 1,177		\$ 1,177		\$ 1,177
Benefits - P&G Interceptor	-	371		371		371
Salaries - P&G Meter Station	2,831	10,592	13,423			13,423
Benefits - P&G Meter Station	891	3,335	4,226			4,226
Salaries - Fox River Fiber - Force Main		4,708			4,708	4,708
Benefits - Fox River Fiber - Force Main		1,482			1,482	1,482
Salaries - Fox River Fiber - Meter Station	600	8,238			8,838	8,838
Benefits - Fox River Fiber - Meter Station	189	2,594			2,783	2,783
Repair & Maintenance (R & M) - P&G Interceptor				900		900
R & M - P&G Meter Station			7,352			7,352
Phones - P&G			1,440			1,440
Power - P&G						-
R & M - Force Main					1,610	1,610
R & M - Meter Station					72	72
Chemicals						-
Total	\$ 4,511	\$ 32,497	\$ 26,441	\$ 2,448	\$ 19,493	\$ 48,382

Account Name	Maintenance	Field Services	GBMSD Meter Stations	GBMSD Interceptors	Lift Station	Pretreatment
Salaries - Pretreatment	\$ -	\$ 134,619				\$ 134,619
Salaries - GBMSD Interceptors	3,282	87,799		91,081		
Salaries - GBMSD Meter Stations	-	91,800	91,800			
Salaries - East Bayshore Lift Stations	28,137	39,545			67,682	
Salaries - East River Lift Station	12,715	14,123			26,838	
Salaries - Old Plank Lift Station	3,370	7,297			10,667	
Salaries - Interplant Force Main	-	12,240		12,240		
Salaries - Chemical Feed Building	-	2,354	2,354			
Benefits - Pretreatment	-	42,382				42,382
Benefits - GBMSD Interceptors	1,033	27,642		28,675		
Benefits - GBMSD Meter Stations	-	28,901	28,901			
Benefits - East Bayshore Lift Stations	8,858	12,450			21,308	
Benefits - East River Lift Station	4,003	4,446			8,449	
Benefits - Old Plank Lift Station	1,061	2,297			3,358	
Benefits - Interplant Force Main	-	3,853		3,853		
Benefits - Chemical Feed Building	-	741	741			
Pretreatment Program						13,180
R & M - East Bayshore System Lift Stations					39,390	
R & M - East Bayshore Force Main					1,300	
R & M - East River Lift Station					11,596	
R & M - GBMSD Interceptors - Field Services				47,100		
R & M - GBMSD Interceptors - Engineering				705,000		
R & M - Old Plank Lift Station					7,500	
R & M - Interplant Force Main				3,780		
R & M - GBMSD Meter Stations			62,580			
R & M - Chemical Feed Building			1,396			
Phones - Meter/Lift Stations			34,360			
Phones - Chemical Feed Building			-			
Power - Meter Stations			18,000			
Power - Chemical Feed Building			1,400			
Power - Old Plank Lift Station					1,425	
Power - East Bayshore Lift Stations					25,500	
Power - East River Lift Station					33,000	
Water - East River Lift Station					1,500	
Chemicals - Old Plank Lift Station					4,500	
Chemicals - De Pere Conveyance					47,320	
Chemicals - Chemical Feed Building					-	
Chemicals - Bayshore Interceptor					35,120	
Total			\$ 241,532	\$ 891,729	\$ 346,453	\$ 190,161

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Salaries and Benefits before Distribution

Description	Commission	Business Services	Laboratory & Research	Treatment	Maintenance	Engineering	Information Technology	Field Services	Environmental Programs	Total
Gross Salaries	\$ 2,500	\$ 1,123,328	\$ 578,670	\$ 2,012,792	\$ 1,793,289	\$ 707,190	\$ 560,314	\$ 744,185	\$ 585,667	\$ 8,107,933
Long Term Disability	-	4,936	2,841	9,478	8,892	3,462	2,824	3,527	2,802	38,763
Dental Insurance	-	10,296	6,772	20,986	22,096	7,153	6,773	4,905	3,143	82,124
Health Insurance	-	153,589	100,262	279,419	300,787	75,364	78,226	75,364	44,074	1,107,085
Life Insurance	-	3,732	984	5,386	6,178	2,716	2,653	1,720	1,365	24,734
Wisconsin Retirement	-	68,178	35,375	125,580	113,407	45,518	36,112	46,865	35,524	506,558
FICA & Medicare	191	81,791	44,268	152,197	137,187	53,600	42,864	56,930	44,803	613,831
Worker's Compensation	6	4,469	16,724	58,170	51,826	13,221	1,289	21,507	5,852	173,064
Uniforms	-	-	2,238	12,492	13,204	-	-	3,100	-	31,034
Employee Assistance	-	3,158	-	-	-	-	-	-	-	3,158
Wellness Program	-	-	-	53,332	-	-	-	-	-	53,332
Totals	\$ 2,697	\$ 1,453,477	\$ 788,134	\$ 2,729,832	\$ 2,446,866	\$ 908,224	\$ 731,055	\$ 958,103	\$ 723,230	\$ 10,741,619

Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Salaries and Benefits after Distribution to Interceptors & Meter Stations

Description	Commission	Business Services	Laboratory Services	Treatment	Maintenance	Engineering	Information Technology	Field Services	Environmental Programs	Total
Gross Salaries	\$ 2,500	\$ 1,123,328	\$ 578,670	\$ 2,012,792	\$ 1,742,354	\$ 707,190	\$ 560,314	\$ 329,693	\$ 585,667	\$ 7,642,508
Long Term Disability	-	4,936	2,841	9,478	8,648	3,462	2,824	1,545	2,802	36,536
Dental Insurance	-	10,296	6,772	20,986	21,580	7,153	6,773	707	3,143	77,410
Health Insurance	-	153,589	100,262	279,419	293,832	75,364	78,226	18,768	44,074	1,043,534
Life Insurance	-	3,732	984	5,386	6,023	2,716	2,653	456	1,365	23,315
Wisconsin Retirement	-	68,178	35,375	125,580	110,225	45,518	36,112	7,336	35,524	463,848
FICA & Medicare	191	81,791	44,268	152,197	133,290	53,600	42,864	35,880	44,803	588,884
Worker's Compensation	6	4,469	16,724	58,170	50,739	13,221	1,289	15,633	5,852	166,103
Uniforms	-	-	2,238	12,492	13,204	-	-	3,100	-	31,034
Employee Assistance	-	3,158	-	-	-	-	-	-	-	3,158
Wellness Program	-	-	-	53,332	-	-	-	-	-	53,332
Totals	\$ 2,697	\$ 1,453,477	\$ 788,134	\$ 2,729,832	\$ 2,379,896	\$ 908,224	\$ 731,055	\$ 413,117	\$ 723,230	\$ 10,129,662

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
Employees Headcount Report

DIVISIONS AND DEPARTMENTS	DEPARTMENT	2018 BUDGET HEADCOUNT	2019 BUDGET HEADCOUNT
Business Services including Non-Departmental *		13	13
Laboratory & Research		8	8
Treatment including Health and Safety		25	24
Maintenance		24	23
Engineering		7	7
Information Technology		6	6
Field Services		9	9
Watershed Management		4	5
Regulatory Compliance		1	1
Total Headcount without Commissioners **		97	96
Commissioners		5	5

Positions Changes	
Division	Department
Operations	Maintenance
Operations	Treatment
Environmental Programs	Watershed Management
	Eliminated Maintenance Mechanic Position
	Eliminated Operations Project Coordinator
	Added Grant and Contract Specialist

Notes:

- * Non-Departmental Division includes Executive Director & Human Resources
- ** Total Full-Time and Part-Time positions

Divisions and Departments classification for referencing

BUSINESS SERVICES	TECHNICAL SERVICES	OPERATIONS	ENVIRONMENTAL PROGRAMS	NON-DEPARTMENTAL
Accounting	Engineering	Maintenance	Watershed Management	Commission
Public Affairs and Education	Field Services	Treatment	Regulatory Compliance	District Wide
Information Technology		Health and Safety	Laboratory & Research	Executive Director and HR
Administrative Services			Sustainability	Procter & Gamble
				Fox River Fiber

Definition of Positions

Regular Full-time Employee – Individuals who work 40 hours per week for an extended period of time and have successfully completed a probationary period.
Regular Part-time Employee – Individuals who work less than 40 hours per week for an extended period of time.

NEW Water
Green Bay Metropolitan Sewerage District
2019 Adopted Budget - December 5, 2018
OUT-OF-AREA TRAVEL - Outside EPA Region 5 (Wisconsin, Minnesota, Illinois, Ohio, Indiana, Michigan)

Title	Division	Event
Director of Business Services	Business Services	National Association of Clean Water Agencies (NACWA) Winter Conference - Albuquerque, NM
Accounting Manager	Business Services	Institute of Management Accountants (IMA) Conference, TBD
Public Affairs & Education Coordinator	Business Services	Public Relations Society of America (PRSA) - Communication Conference, TBD
Information Technology Manager	Business Services	Microsoft Ignite Conference, Orlando, FL
System Administrator	Business Services	Microsoft Ignite Conference, Orlando, FL
System Administrator	Business Services	System Administration, Network and Security Institute (SANS) Cybersecurity Training, Scottsdale, AZ
Project Manager	Technical Services	Water Environment Federation (WEF) Residuals & Biosolids Conference, Fort Lauderdale, FL
Director Of Technical Services	Technical Services	Water Environment Federation (WEF) Research Forum - Austin, TX
Pretreatment Coordinator	Technical Services	National Association of Clean Water Agencies (NACWA) Pretreatment Seminar, TBD
Treatment Manager	Operations	Water Environment Federation (WEF) Residuals & Biosolids Conference, Fort Lauderdale, FL
Treatment Leader	Operations	Water Environment Federation (WEF) Residuals & Biosolids Conference, Fort Lauderdale, FL
Treatment Leader	Operations	Water Environment Federation (WEF) Nutrient Removal and Recovery Conference, TBD
Treatment Manager	Operations	Water Environment Federation (WEF) Utility Management Conference, Nashville, TN
Executive Director	Non-Departmental	National Association of Clean Water Agencies (NACWA) Winter Conference - Albuquerque, NM
Executive Director	Non-Departmental	US Water Alliance Conference, Austin, TX
Executive Director	Non-Departmental	National Association of Clean Water Agencies (NACWA) Environmental Policy - Washington, DC
Executive Director	Non-Departmental	National Association of Clean Water Agencies (NACWA) Leadership Meeting - Miami, FL
Executive Director	Non-Departmental	Environmental Protection Agency (EPA) Meeting - Washington, DC
Executive Director	Non-Departmental	Other Meetings - TBD
Commissioner	Non-Departmental	National Association of Clean Water Agencies (NACWA) Winter Conference - Albuquerque, NM
Watershed Programs Manager	Environmental Programs	Healthy Soils for Healthy Waters - Ames, Iowa
Water Specialist	Environmental Programs	International Association of Great Lakes Research, (IAGLR), Brock Port, NY
Water Resources Specialist	Environmental Programs	International Association of Great Lakes Research, (IAGLR), Brock Port, NY
Water Resources Specialist	Environmental Programs	Global Lake Ecological Observatory Network - TBD

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

12/5/2018

**GREEN BAY METROPOLITAN SEWERAGE DISTRICT
2019 BUDGET: 5-YEAR CAPITAL INVESTMENT PLAN**

2019 Budget - Adopted - December 5, 2018	2019	2020	2021	2022	2023
MAJOR CAPITAL: WASTEWATER TREATMENT FACILITIES					
GBF: Blower System Efficiency Upgrade	-	-	-	205,000	4,635,000
GBF: R2E2 Solids Management Project	3,135,000	-	-	-	-
GBF: Metro & Mill Pumping and Plant Drain Systems Upgrades	-	100,000	340,000	5,905,000	5,925,000
GBF: Gravity Belt Thickener Replacement	281,000	4,436,000	-	-	-
GBF: Reclaimed Water System ** See Notes **	1,690,000	1,700,000	-	-	-
DPF: Service Water System Rehabilitation/Replacement	100,000	1,320,000	-	-	-
DPF: Primary Substation & Emergency Generator	14,079,000	-	-	-	-
GBF & DPF: Clarifier Rehabilitation	600,000	4,530,000	5,330,000	8,330,000	-
GBF: Primary Clarifier Odor Control	-	-	330,000	7,375,000	-
GBF & DPF: Headworks Upgrades	-	-	340,000	3,850,000	5,750,000
GBF: Maintenance Building Addition	-	300,000	1,250,000	1,950,000	-
Interplant Wastewater Force Main - Phase 2	-	-	-	38,000	848,000
DPF: Tertiary Filter Replacement	351,000	3,516,000	4,212,000	-	-
TOTAL WASTEWATER TREATMENT FACILITIES	20,236,000	15,902,000	11,802,000	27,651,000	17,158,000
MAJOR CAPITAL: INTERCEPTORS					
Ninth Street Interceptor Rehabilitation ** See Notes **	125,000	2,966,000	-	-	-
East River Interceptor Rehabilitation ** See Notes **	55,000	3,766,000	-	-	-
West Fox River Interceptor Relay and Rehabilitation	-	-	-	209,000	4,956,000
Ninth Street Interceptor Extension - American Drive	-	1,250,000	-	-	-
Fox River Crossing Rehabilitation	-	67,000	1,588,000	-	-
East Fox River Interceptor Rehabilitation	-	119,000	2,815,000	-	-
West Tower Drive Interceptor Rehabilitation	-	-	-	-	70,000
East Bayshore System Relief & Replacement	-	-	-	-	150,000
East Tower Drive Interceptor Rehabilitation - Phase 1	-	-	-	-	80,000
East River Lift Station - Upsizing & Rehabilitation	-	-	77,000	1,823,000	-
East Bayshore Lift Stations - Replacement	-	-	35,000	520,000	-
TOTAL INTERCEPTORS, METER STATIONS & LIFT STATIONS	180,000	8,168,000	4,515,000	2,552,000	5,236,000
DEPARTMENT ANNUAL CAPITAL INVESTMENTS					
MAINTENANCE SECTION					
GBF: Replace MCC - Administration Building ADP-1,-2; MCC-A1, -A2	330,000	-	-	-	-
GBF: Replace MCC - South Plant MCC-N1, -N2, -N3	370,000	-	-	-	-
DPF: Replace outdated MCCs	-	125,000	-	-	-
DPF: Replace diffuser socks in aeration system (10-year rotation)	-	-	57,000	-	-
GBF: Replace Air Handling Units	-	432,000	527,000	230,000	-
DPF: Replace roof - Sludge Control Tank Building	-	-	79,000	-	-
Vehicle ID# 107 Replacement (Field Services)	-	-	-	63,000	-
Vehicle ID# 111 Replacement (Field Services)	-	40,000	-	-	-
DPF: Actuated Slide Gates & Basin Drains	-	-	200,000	-	-
GBF: Air Compressor Replacement	-	-	400,000	-	-
DPF: Air Handling Unit Replacement	250,000	-	-	-	-
GBF: Power Roof Vent Replacement	-	375,000	-	-	-
DPF: Power Roof Vent Replacement	-	125,000	-	-	-
GBF: Tunnel Unit Heater Replacement Phase 2	-	50,000	-	-	-
GBF: Tunnel Unit Heater Replacement Phase 3	-	-	50,000	-	-
DPF: Tunnel Unit Heater Replacement	-	-	-	50,000	-
GBF: Transformer Replacement Project	-	125,000	-	-	-

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

12/5/2018

**GREEN BAY METROPOLITAN SEWERAGE DISTRICT
2019 BUDGET: 5-YEAR CAPITAL INVESTMENT PLAN**

2019 Budget - Adopted - December 5, 2018	2019	2020	2021	2022	2023
GBF: SW Pump Replacement	-	-	400,000	-	-
GBF: Perimeter Fence Replacement	-	141,000	-	-	-
Maintenance Section subtotal	960,000	1,413,000	1,713,000	343,000	-
INFORMATION TECHNOLOGY SECTION					
GBF: Fiber Optic Network Enhancement/Upgrade	-	-	80,000	-	-
GBF: Building Network Cabling Enhance/Upgrade	-	-	45,000	-	-
GBF: County Wide Radio Communications	-	-	-	-	50,000
GBF: County Wide Radio Communications Phase II	-	-	-	-	50,000
GBF: Replace PLC Input/Output Hardware	125,000	125,000	125,000	125,000	-
GBF: Laboratory Information Management System	-	-	-	-	450,000
GBF & DPF: Telephone System	-	150,000	-	-	-
GBF & DPF: Disaster Recovery/Backup System	-	-	-	-	75,000
GBF: eDocs, Imaging/ Management/Collaboration	-	-	-	-	90,000
Information Technology Section subtotal	125,000	275,000	250,000	125,000	715,000
ENGINEERING SECTION					
Meter Station #1 Flow Tube and Flow Meter Replacement	-	90,000	-	-	-
MS 6, 8, & 9 Rehabilitation	435,000	-	-	-	-
Annual Manhole Rehabilitation	50,000	50,000	50,000	50,000	50,000
Administration Building Office Space Upgrades	1,350,000	-	-	-	-
Engineering Services Section subtotal	1,835,000	140,000	50,000	50,000	50,000
WATERSHED MANAGEMENT SECTION					
Watershed Management Section subtotal	-	-	-	-	-
FIELD SERVICES SECTION					
MS-05 Flow Tube Replacement	-	100,000	-	-	-
Lift Station alarm notification system	-	-	-	-	200,000
ERLS - Grinder system	-	250,000	-	-	-
Field Services Section subtotal	-	350,000	-	-	200,000
LABORATORY & RESEARCH SECTION					
Automated BOD Analyzers	38,000	-	38,000	-	-
Laboratory Services Section subtotal	38,000	-	38,000	-	-
TOTAL ANNUAL CAPITAL INVESTMENTS	2,948,000	2,178,000	2,051,000	518,000	965,000
TOTAL CAPITAL INVESTMENTS	23,364,000	26,248,000	18,368,000	30,721,000	23,359,000

Notes:

Major Capital - Treatment Facilities GBF Reclaimed Water System project: Funded via contributed capital from Brown County and/or Industrial Customer.

Major Capital - Interceptors: Ninth Street Interceptor Rehabilitation project: \$100,000 overcollected in 2015 for anticipated Annual Capital project.

Major Capital - Interceptors: East River Interceptor Rehabilitation project: \$715,000 collected in 2018 Budget for anticipated project.

This 5-year report projects costs going forward. It does not capture actual expenditures from previous years and the totals do not accurately reflect the total capital costs of projects that are in progress.

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

Green Bay Metropolitan Sewerage District
2019 Budget – Adopted
Summary of Revenues and Expenses Legends

Revenues:

Favorable Revenue Variances: means more revenue than projected or budgeted. It is a positive occurrence to receive more revenues than anticipated.

Unfavorable Revenue Variances: means less revenue than projected or budgeted. It is usually a negative occurrence.

Municipal User Fees:	Volume, Biochemical Oxygen Demand, Suspended Solids, Phosphorus, Kjeldahl Nitrogen, Direct Charges, and Hauled Waste
Mill User Fees:	Volume, Biochemical Oxygen Demand, Suspended Solids, Phosphorus, Kjeldahl Nitrogen, Direct Charges from Procter & Gamble, and Fox River Fiber
Mill Direct Charges:	Daily Sample Pickup and Laboratory Testing, Inspection, Monitoring, Dewatering, O&M, and Diggers Hotline
Mill Capital Charges:	Capital and Debt Service Charges
General Reserve Interest:	Interest Income from General Fund Accounts (unrestrictive funds) other than Investment Accounts
Other Revenues:	Rate Stabilization Offsets, Interest Income Offsets, Hauled Waste Truck Fees, Sampling, Laboratory Analysis, Yacht Club Lease, and Interceptor Cost Recovery Leases
Rate Stabilization Reserve Transfers:	A designated expense allocated to rate stabilization funds due to prior year collection or expenses designated to be funded by this reserve
Interceptor Cost Recovery (ICR) Reserve Transfers:	GBMSD has agreements with various municipal customers in which the municipalities have agreed to reimburse GBMSD for the cost of interceptors owned by GBMSD whose capacity has been allocated to the municipalities. Annual repayments are sent to the municipalities. This transfer is to offset the debt payment of these interceptors

Green Bay Metropolitan Sewerage District 2019 Budget – Adopted

Summary of Revenues and Expenses Legends

Plant and Equipment Replacement Designated capital expenses allocated to be funded by this
Fund Reserve Transfers (PERF): reserve.

General Fund Transfers: Designated expenses allocated to be paid by this fund.

Expenses:

Favorable Expense Variances: means less expenses than budgeted or projected.

Unfavorable Expense Variances: means more expenses than budgeted or projected.

Salaries & Benefits:	Salaries, Opt-Out Incentive Payout, Health, Dental, & Life Insurances, Retirement, Social Security, Fringe Benefits, Workers Compensation, Uniforms, Employee Referral Services, Long Term Disability, Wellness, Employee Assistance, and Uniforms
Power:	All Power for the facilities
Contracted Services:	Contractors, Legal, Audits, Studies, Occupational Health, Custodial and Lawn Services, Environmental Programs, Sponsorship, Temporary Assistance, Recruitment, Consultants, Hazardous Waste Disposal, Class and Compensation, Household Hazardous Waste Disposal, Continuous Improvement/Lean, In District Sustainability, Risk Based Asset Management, Watershed Based Planning, Reg/Muni Environment Service, and Contingency
Maintenance & Repairs:	Repair and Maintenance Building and Equipments, Small Tools, Fuel for GBMSD Vehicles and Boats, Freight, Water, Fire Protection, Equipment Leases and Rentals
Chemicals:	Sodium Hypochlorite and Bisulfite, Polymer, Ferric Chloride, Lime, and Laboratory Chemicals for the facilities
Natural Gas & Fuel Oil:	Diesel, Fuel, Natural Gas for Generators, Incineration, and Heating for the facilities

Green Bay Metropolitan Sewerage District 2019 Budget – Adopted

Summary of Revenues and Expenses Legends

Solid Waste Disposal:	Material (grit, screenings, ash, and dewatered sludge) hauled from GBMSD to landfill
Interceptor System:	Repair and Maintenance of Interceptors, Lift Stations, Meter Stations, Pretreatment, Power, Chemicals, Water, and Telephones
Office & Administrative:	Publishing, Postage, Data Processing, Employee Recognition, Public Information, Portable, Telephones, Safety Shoes and Glasses, Memberships and Dues, Publications and Subscriptions, Licenses and Permits, Meeting Expenses, Bank Service Charges, Bond Issuance Cost, Community Outreach, Education & Public Outreach (EPO)
Insurances:	Automobile, Property, Boiler and Machinery, Liability, Umbrella, Commercial Crime, and Public Officials
Supplies:	Employee Security Badges, Safety & First Aid Equipment and Supplies, Small Computer Hardware and Software, Other Office Supplies, such as: Calculators, Pens, Pencils, Paper, Binders, Folders, Dividers, Tape, Batteries, Toner & Ink Cartridges etc., Cleaning/Janitorial Supplies, Building/Grounds Supplies, Shipping Supplies, etc.
Employee Training & Development:	Employee Development (Registration), Training, and Tuition Fees
Travel and Meetings:	Travel Lodging, Transportation, Meals and Mileage Expenses
DNR Environmental Fees:	Annual Environmental Fee statement from the DNR, which includes: charges from our NR101 discharge (includes a charge for all pounds of parameters that have permit limits), Hazardous Waste Disposal Fees, Air Emission Fees, and Laboratory Certification Fee. Other Fees such as Tier 2 report fees (related to hazardous material management on site) and other license or permit application fees which may arise

Green Bay Metropolitan Sewerage District
2019 Budget – Adopted
Summary of Revenues and Expenses Legends

Debt Service and Annual Capital

Debt Service:	Principal and Interest incurred for Long Term Capital projects from Clean Water Fund Loans, General Obligation Bonds, and Promissory Notes to financial institutions, such as: DNR, Associated Bank, Board of Commissioners of Public Lands, etc.
Annual Capital:	Maintenance Equipment and Interceptor repairs for less than a year expenses and completion
R2E2 Construction – Rate Stabilization:	An amount collected in advance of the debt service being due for the Solids Project (R2E2) to provide a transition to the overall rate impact on the financing for this project. The funds will be segregated and used to pay subsequent debt service on the R2E2 Project. The amount collected brings the overall 2013 rate increase to within the 9% amount estimated in the planning for R2E2 Project

Attachment: 20181206143839293 (7699 : Consider 2018-2019 Sewer Rate Study*)

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Public Works

FROM: Scott Thoresen

SUBJECT: Consider Definitely De Pere Streetscape Projects*

On April 5, 2017 the City Council approved \$150,000 of the excess stadium tax revenue for streetscape improvements. (See attached resolution) As part of the streetscape approval process, the BOPW needs to review the final project list and make a recommendation to the Council. (See attached April 11, 2017memo to the Finance/Personnel Committee)

Tina Quigley of Definitely De Pere will present a power point presentation at the BOPW meeting of the streetscape projects. (See attached power point presentation)

Staff has been working with Definitely De Pere on the proposed projects. Staff supports the proposed projects with the following conditions:

* Snow removal in the downtown areas where the streetscape projects are being proposed will be impacted. The City will need to work with the businesses to determine the most cost effective way to remove the snow.

* Ongoing maintenance of the permanent streetscape areas still needs to be determined and what is the most cost effective way to perform the maintenance.

Staff recommends approving the projects presented by Definitely De Pere with conditions noted above.

ATTACHMENTS:

- Stadium Tax Resolution 4-5-17 (PDF)
- Streetscape Project Process - Excess Stadium Tax Revenue 4-11-17 (PDF)
- Streetscape Presentation 12-10-18 (PDF)

RESOLUTION #17-27
REGARDING EXPENDITURE OF EXCESS
STADIUM TAX REVENUE

WHEREAS, pursuant to 2015 Wisconsin Act 114 (the Act), the State of Wisconsin authorized the return of excess stadium tax revenue collected between April 1, 2015 and September 30, 2015 to Brown County and municipalities located within Brown County; and

WHEREAS, under the Act, municipalities receiving such revenue are required to:

1. Deposit the revenue into a segregated account to use only for the purpose of providing property tax relief, tax levy supported debt relief, or economic development; and
2. Adopt a resolution specifying the purpose(s) for which the revenue will be spent and the amount of the revenue(s) to be spent for that purpose; and

WHEREAS, the State forwarded to the City its share of the revenue in the amount of \$1,287,473.72, which has earned \$12,874.74 in interest since its receipt, for a total current revenue amount of \$1,300,348.46; and

WHEREAS, on February 28, 2017, the Council, meeting in special session, evaluated various project proposals (more particularly described in Exhibit A, attached and incorporated by reference) for use of said revenues and determined to fund such projects as more fully set forth below.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

The Council hereby approves the following projects in the amounts and for the purposes set forth below:

Project Title	2015 Wis. Act Purpose	Expenditure Not to Exceed
Re-write of City Zoning Code	Property Tax Relief	\$ 45,000
Establish City vision/brand	Economic Development	\$ 100,000
De Pere public art initiative	Economic Development	100,000
De Pere streetscape project	Economic Development	\$ 150,000
Aquatic center design	Property Tax Relief/ Economic Development	\$ 200,000
Southwest Park playground equipment	Property Tax Relief/ Economic Development	\$ 80,000
Splashpad	Economic Development	\$ 300,000
Voyageur Park amphitheater/stage	Economic Development	\$ 125,000
Voyageur Park playground equipment	Property Tax Relief/ Economic Development	\$ 200,000
		\$1,300,000

BE IT FURTHER RESOLVED THAT:

All revenue not used through the above expenditure and all interest earned on the revenue shall be applied to future City debt payments as determined by the City Administrator and Finance Director.

BE IT FURTHER RESOLVED THAT:

Insofar as the Public Art and Streetscape Projects involve collaboration between City staff and Downtown De Pere, Inc. (d/b/a Definitely De Pere), the process for disbursement of such funds for said projects shall be as determined by the Finance/Personnel Committee.

BE IT FURTHER RESOLVED THAT:

The disbursement of funds processes for the remaining projects listed above shall be as set forth in the City's Purchasing Policy.

BE IT FURTHER RESOLVED THAT:

All City officials, officers, employees, and agents are authorized and directed to take such steps as are lawful and necessary in furtherance thereof.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 5th day of April, 2017.

APPROVED:

Michael J. Walsh, Mayor

ATTEST:

Carey Danen, Deputy Clerk

Ayes: _____

Nays: _____

City of De Pere MEMORANDUM



To: Finance/Personnel Committee
 From: Kimberly Flom, Economic Development & Planning Director
 Date: April 11, 2017
 RE: **Streetscape Project Process – Excess Stadium Tax Revenue**

Background/Summary

The City Council approved \$150,000 of excess stadium tax revenue for streetscape improvements based on a proposal submitted by Definitely De Pere (attached for review). Per the resolution passed on April 5, the Finance/Personnel Committee will review and approve the process for the Public Art and Streetscape projects.

The following process is proposed as a way to utilize the funds for the streetscape project in an efficient manner with the appropriate approvals. Because streetscape work will likely be completed in the City right of way, the Department of Public Works will work closely with Definitely De Pere.

1. Project Identification

- a. Definitely De Pere to prepare list of potential projects and design objectives.
- b. Definitely De Pere to meet with City representatives to review and analyze project list.
- c. Possible revisions to project list based on City input (cost, feasibility, impact on other projects).
- d. Definitely De Pere to provide final project list to Public Works Director.
- e. Any final revisions if needed based on Development Team comments.

2. Board of Public Works Review

- a. Department of Public Works to prepare list for Board of Public Works review.
- b. Board of Public works to review final project list and make a recommendation to Council.
- c. Council to review project list and Board of Public Works recommendation.

3. Project Implementation

- a. City staff will work on an implementation timeline and strategy for approved projects.
- b. City staff will be the lead in finalizing design (with Definitely De Pere input), acquiring final approvals, issuing bids, selecting contractors and overseeing work.

Recommendation

Staff recommends approval of the proposed process for the Streetscape projects funded using excess stadium tax revenue.

Streetscape Project Proposal

Downtown De Pere

Overview

- City Council approved \$150,000 in Stadium Tax Excess Funds for downtown streetscape improvements based on a proposal submitted by Definitely De Pere.
- Definitely De Pere hired a team of downtown planning consultants that worked pro bono to develop a Downtown Streetscape Design Plan. Community stakeholders were engaged in the process led by the following experts:
 - Errin Welty, Downtown Development Account Manager, WI Main Street Program
 - Michael Schroeder, Landscape Architect and Urban Designer, Minneapolis MN
 - Jay Schlingen, Downtown Professionals Network, Franklin TN
- The Downtown Streetscape Design Plan was used as a guide for the proposed streetscape projects included in this proposal.

Streetscape Project Goals

- Increase green space everywhere possible.
- Create spaces where human activity is visible and encouraged.
- Add art to the public realm.
- Increase foot-traffic and improve pedestrian comfort.
- Enhance aesthetics and calm traffic.



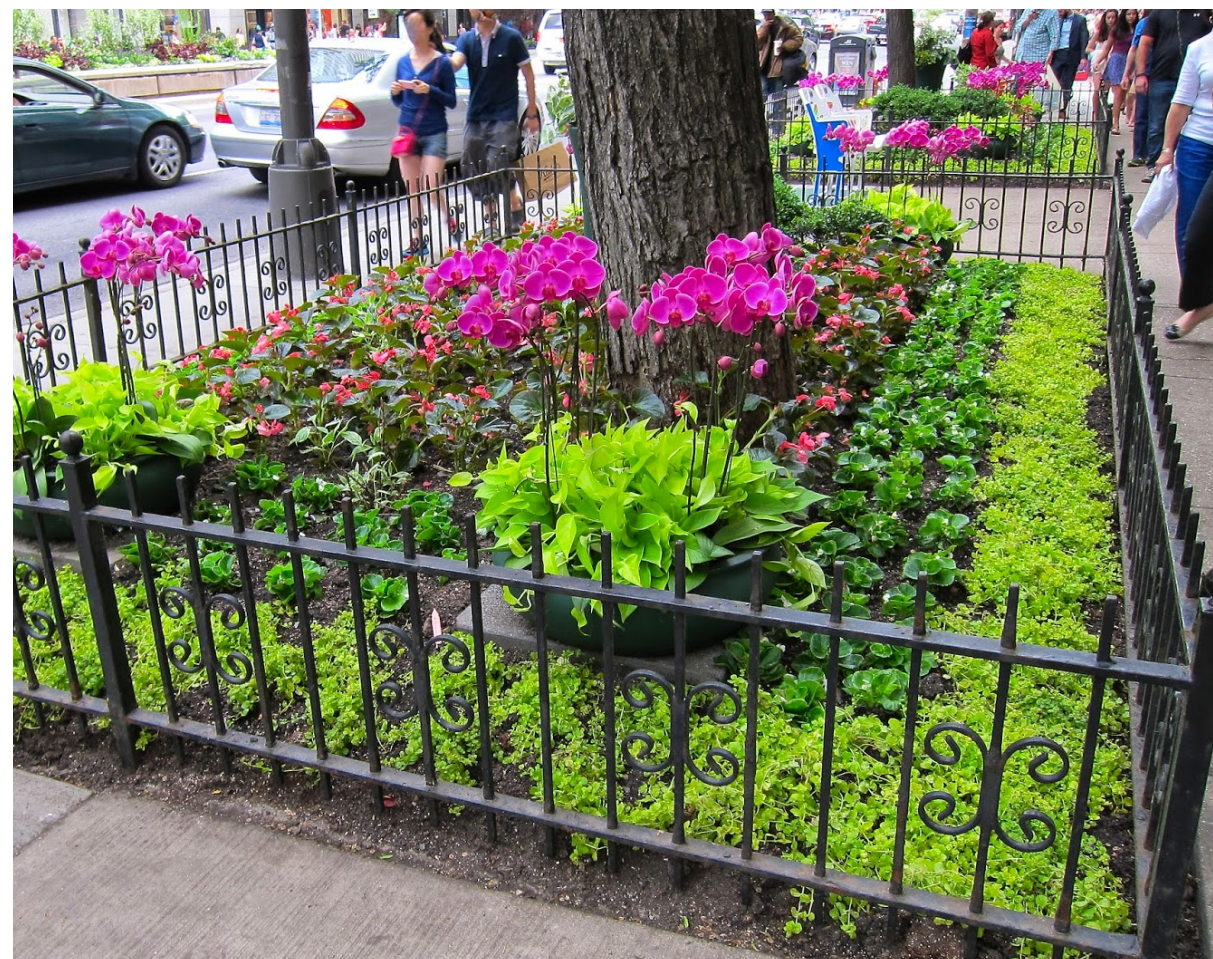
Proposed Projects

- Main Avenue Planter Beds
- George Street Bump-out Beds and Planters
- Sculpture Walk on Broadway

Main Avenue Project

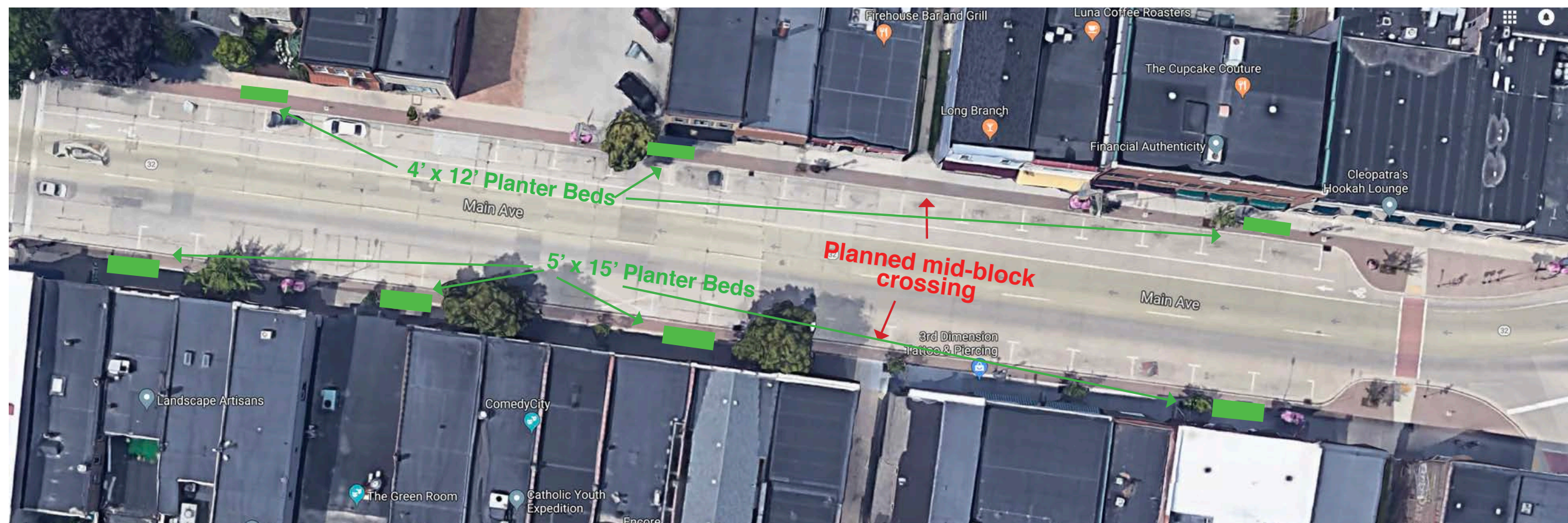
Imagine Main Avenue looking like Chicago's Magnificent Mile.

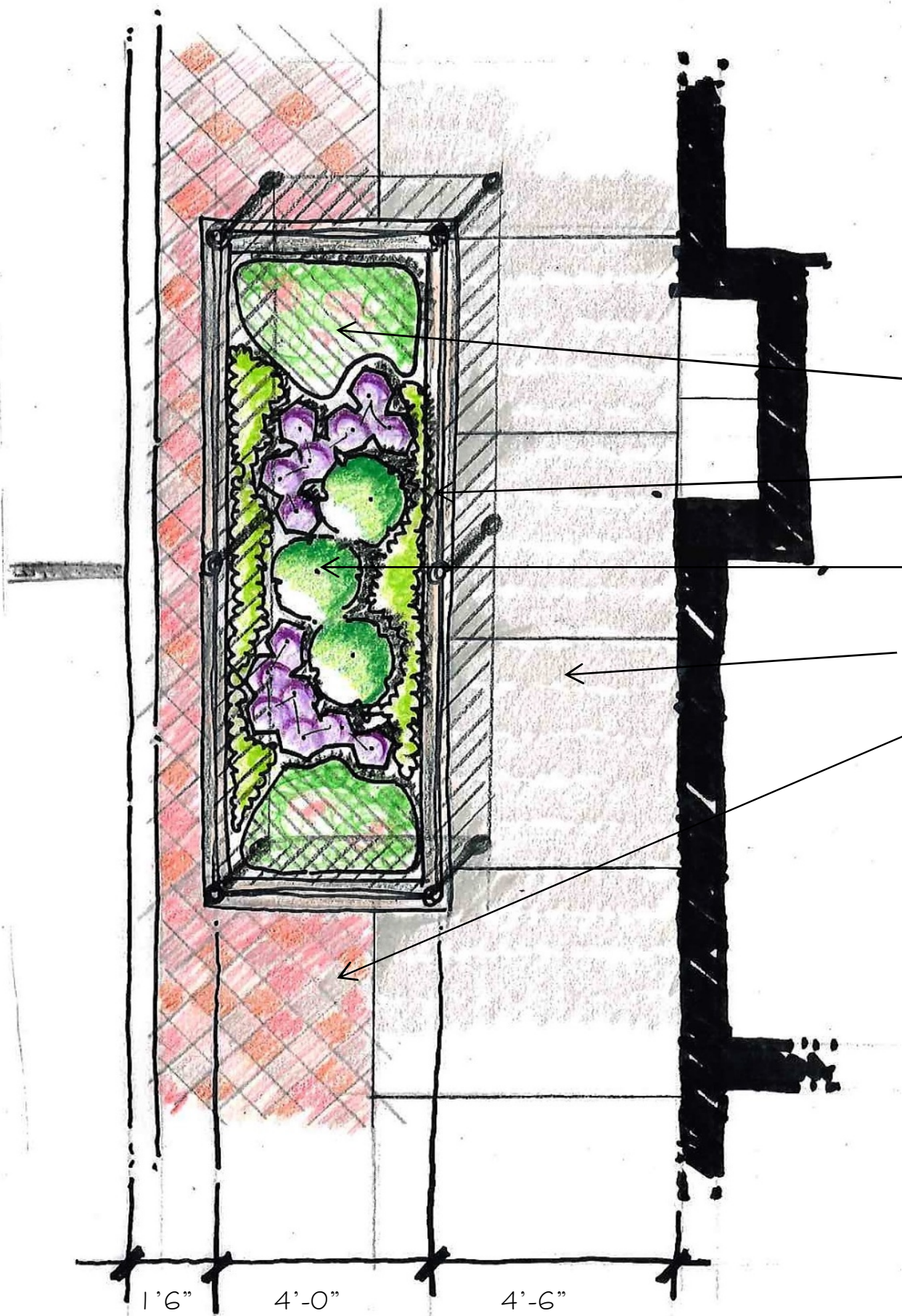
An attractive streetscape that includes an abundance of green space and seasonal flowers is an important part of creating a competitive business environment.



Main Ave Project Specs

- Install four (4) 5' x 15' beds on the south side of the street (sidewalk width 15', planter setback 2 1/2').
- Install three (3) 4' x 12' beds on the north side of the street (sidewalk width 10', planter centered off parking stall, setback 1 1/2').





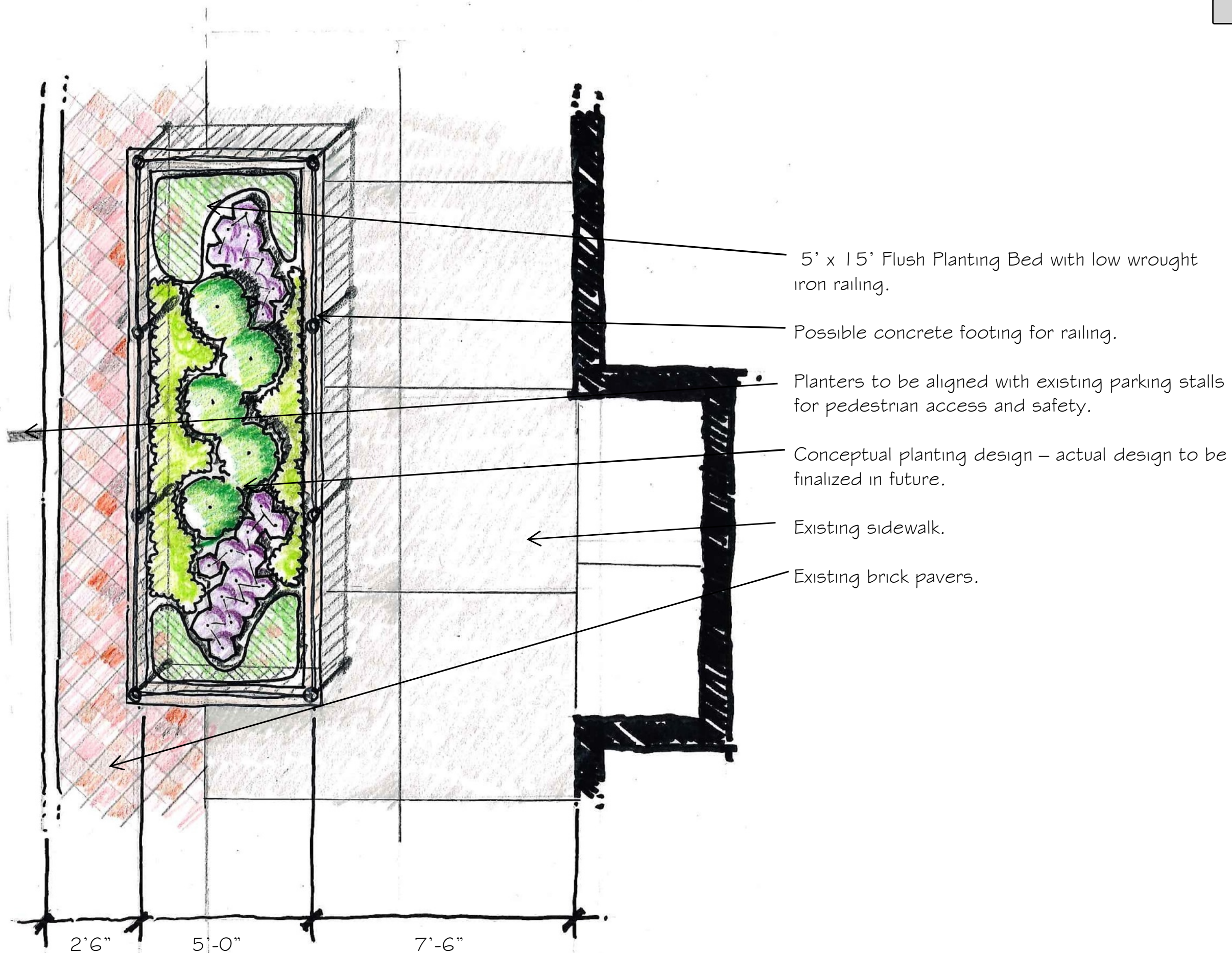
4' x 12' Flush planting bed with low wrought iron railing.

Possible concrete footing for railing.

Conceptual planting design – actual design to be finalized in future.

Existing sidewalk.

Existing brick pavers.



Main Ave Project Cost Estimates

Wrought Iron Fencing

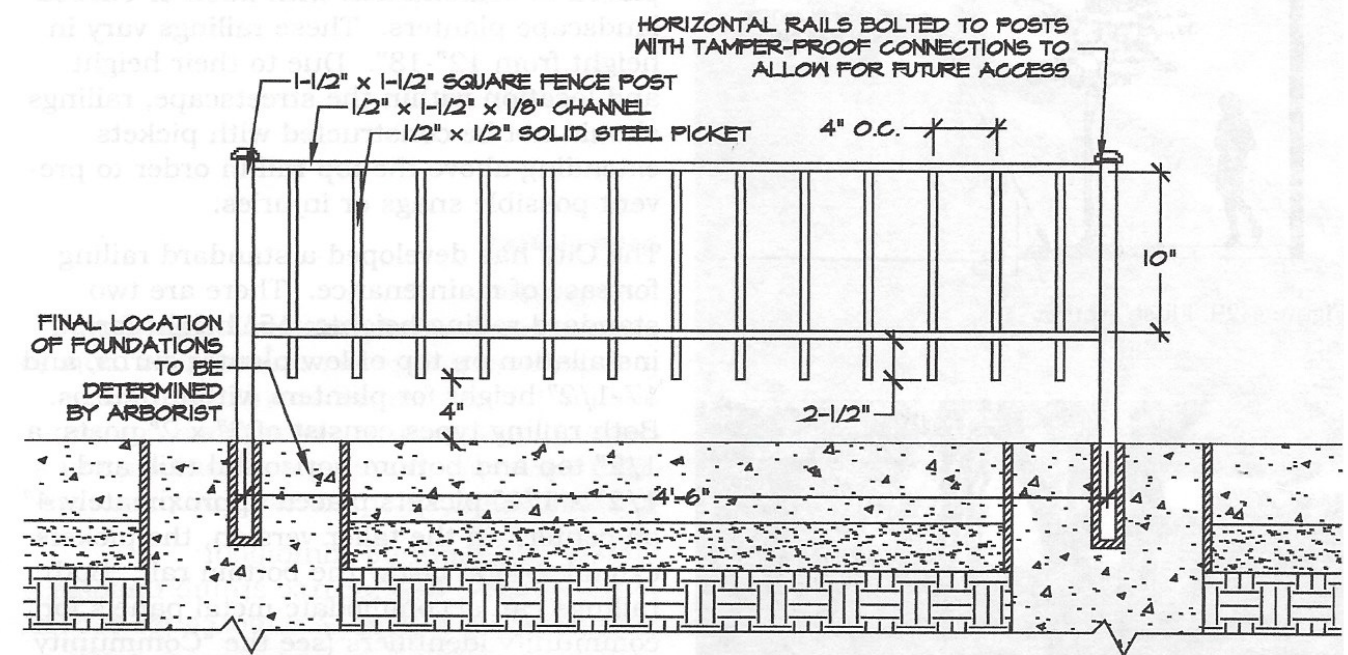
- 256 linear feet - \$20,000

Planter Bed

- Cut out concrete, remove gravel, add topsoil and plants
 - 5' x 15' beds at \$3,000 each = \$12,000
 - 4' x 12' beds at \$2,500 each = \$7,500

Planter Bed Cost - \$19,500

Total Project Cost - \$39,500



Main Avenue Maintenance and Considerations

- Planting height should respect views for businesses, pedestrians, and traffic.
- Plants that can tolerate salt and harsh winters will be selected.
- City will water. (28 of 48 existing pots will be 'retired')
Perennial plants and shrubs will require little maintenance once established.
- Property and/or business owners will assist with weeding, litter and snow removal.
- Contractor will be hired and paid for by the BID to remove snow from planter to curb.
- 25-30% annual plant replacement cost is anticipated.
- Replacement plants will be funded by the Beautification Committee.



George Street Project

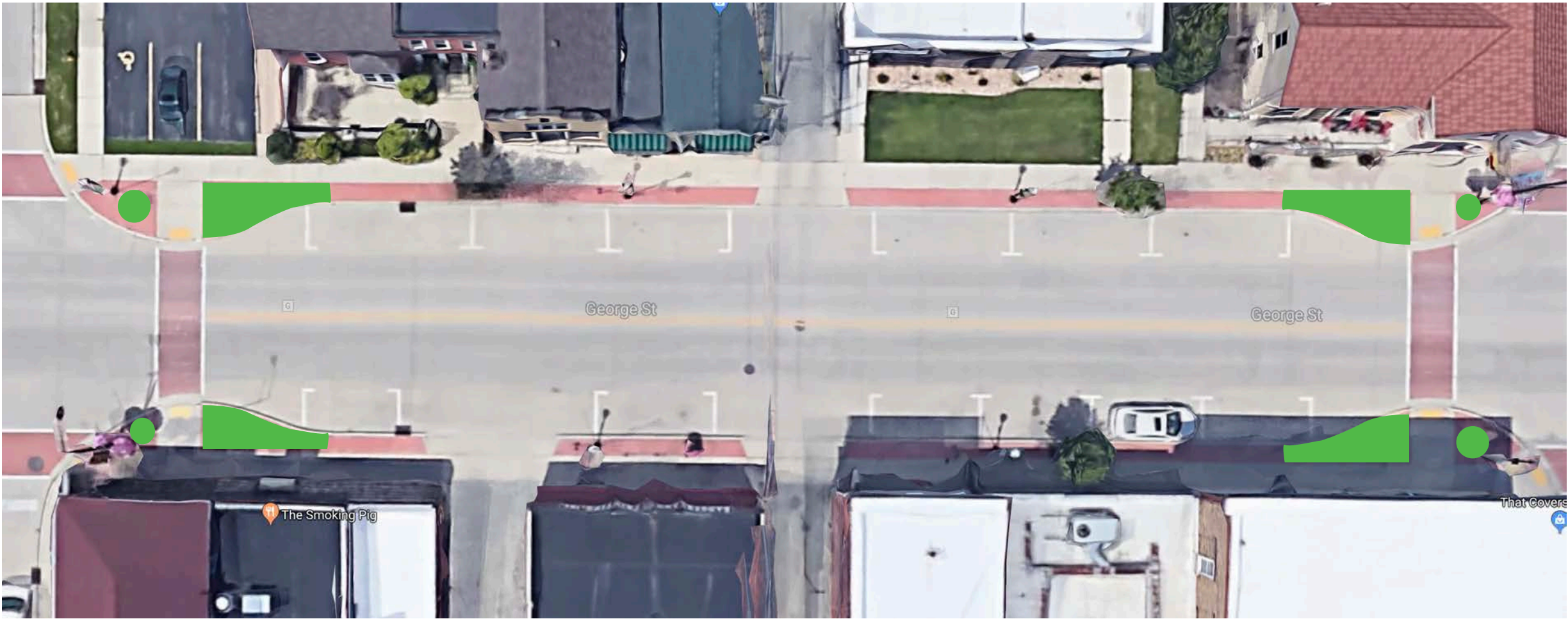
Enhance the visual and pedestrian experience by creating garden-like spaces where there is too much concrete.



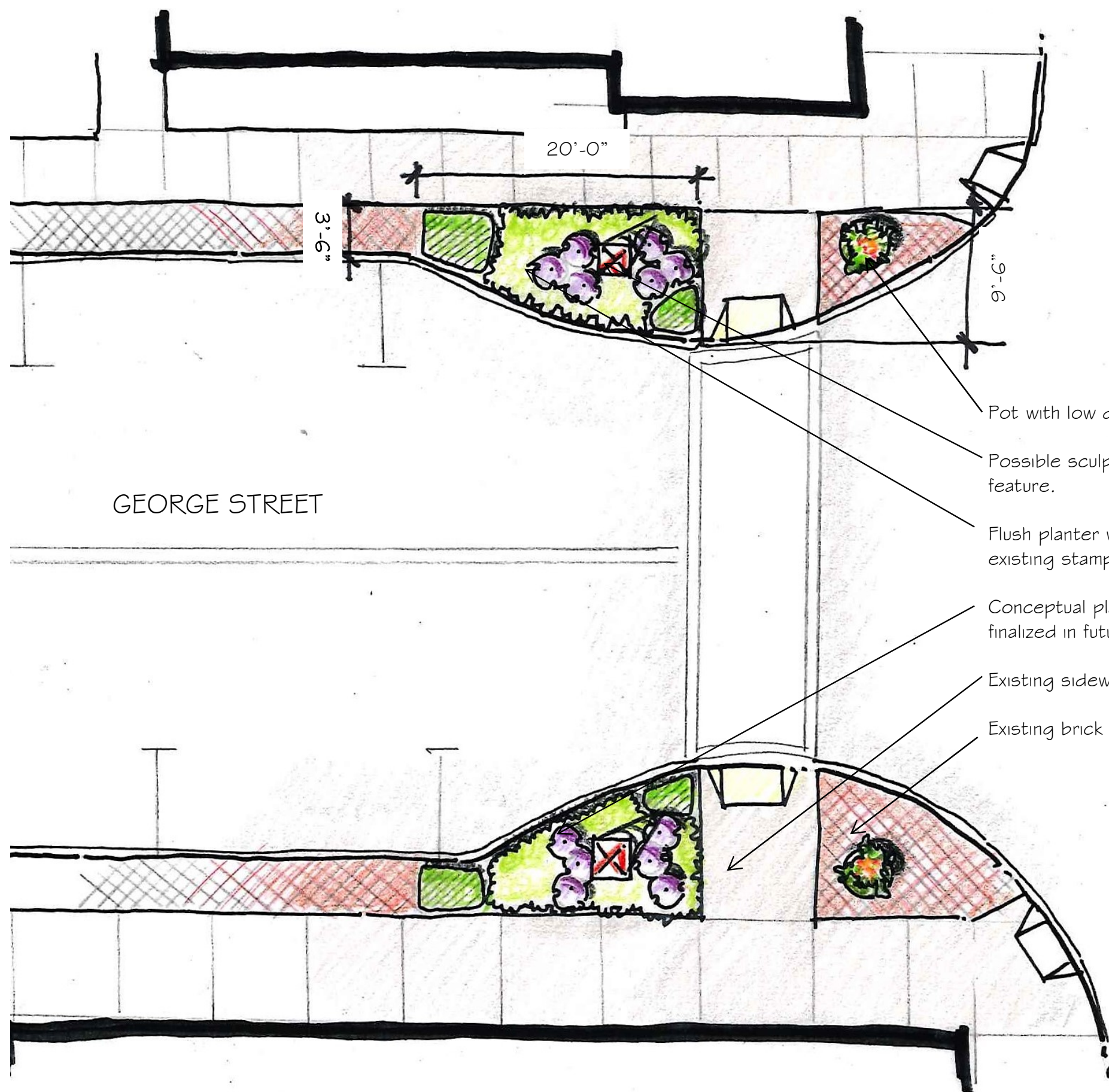
George Street Project Specs

Primary Block (between Michigan and Superior)

Remove all but a narrow band of stamped concrete at bump outs and place concrete planter at the corner.



Attachment: Streetscape Presentation 12-10-18 (7707 : Consider Definitely De Pere Streetscape Projects*)



Pot with low decorative seasonal plantings.

Possible sculpture or seasonal decorative feature.

Flush planter with no railing. Location aligns with existing stamped concrete area.

Conceptual planting design – actual design to be finalized in future.

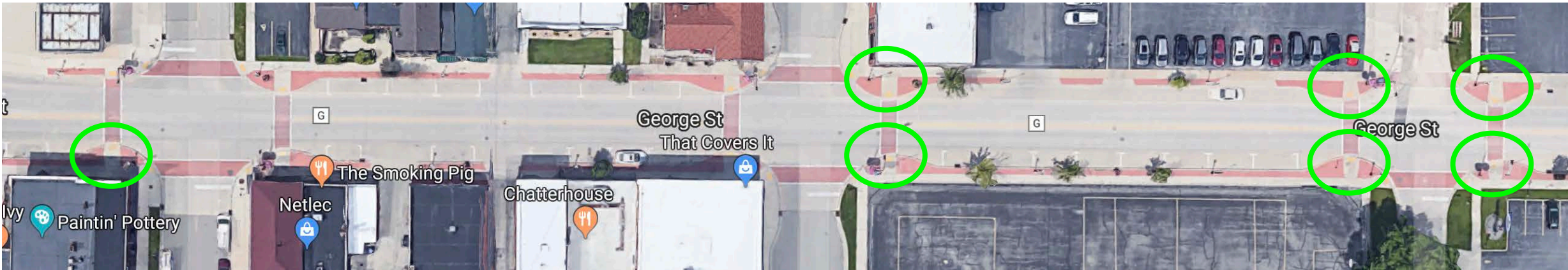
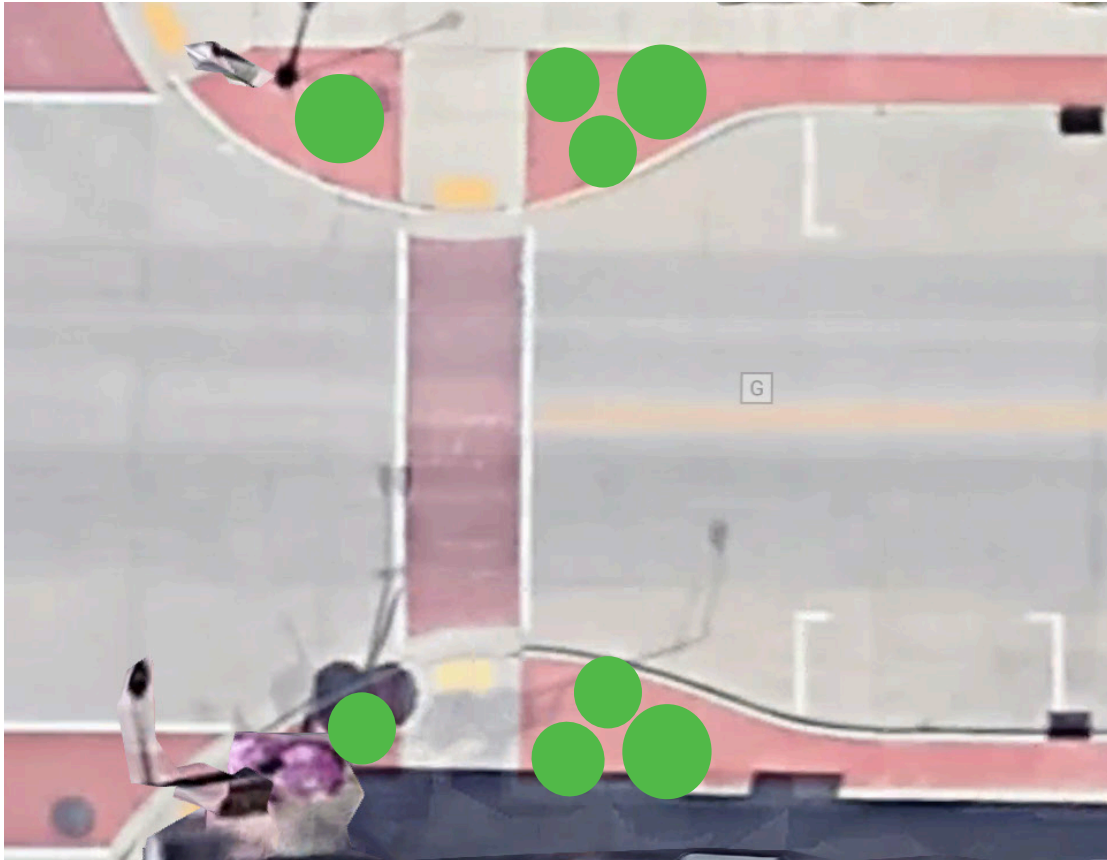
Existing sidewalk.

Existing brick pavers.

George Street Project Specs

Secondary Corners

Upgrade planters with a design that is large in scale and contemporary in design.



George Street Project Cost Estimates

Flush Planter Beds

- Cut out concrete, remove gravel, add top soil and plants - \$3,000 per bed
- Single concrete planter at corner - \$500 each

Planter Cluster

- Various size/shape concrete planters - \$2,500 per corner

Total Project Cost - Flush Planter Beds (4 primary corners) and Planter Cluster (7 secondary corners) **\$31,500**

George St Maintenance and Considerations

- Planting height should respect views for businesses, pedestrians, and traffic.
- Plants that can tolerate salt and harsh winters will be selected.
- City will water. (28 of 48 existing pots will be 'retired')
- Perennial plants and shrubs will require little maintenance once established.
- 25-30% annual plant replacement cost for the flush planter beds is anticipated.
- Replacement plants will be funded by the Beautification Committee.
- Beautification will fund the seasonal plants.
- Planters will be planted and decorated onsite.



Sculpture Walk Project on Broadway

The purpose of this project is to integrate art to enliven the streetscape. The project will feature an ongoing seasonal public art exhibit of original outdoor sculpture temporarily installed along Broadway. The pieces will be exhibited for 6 - 8 months.

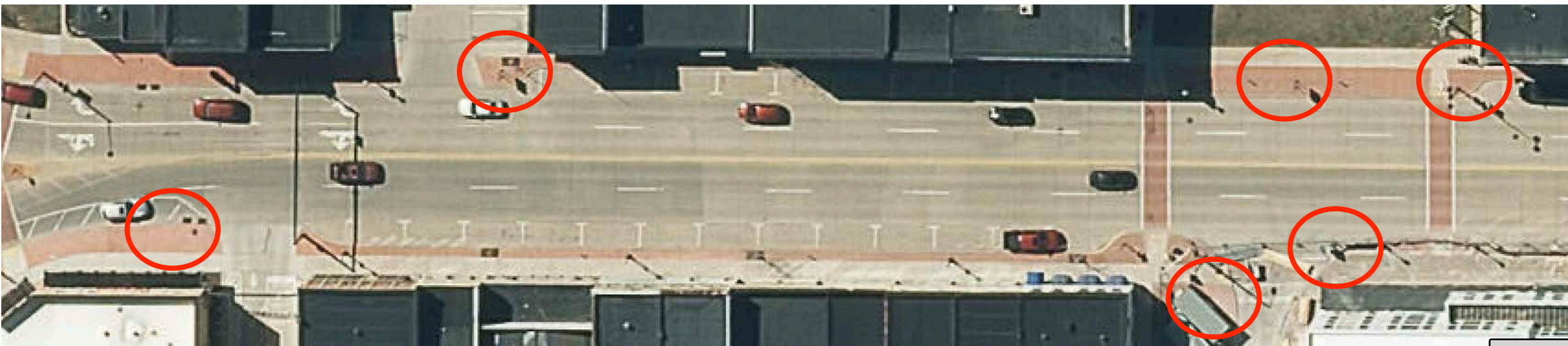


Anticipated Locations

North Broadway (George St to James St)



South Broadway (George St to Bridge Roundabout)



Attachment: Streetscape Presentation 12-10-18 (7707 : Consider Definitely De Pere Streetscape Projects*)

Sculpture Walk Project Cost Estimates

Year One Project Costs

Concrete pads - \$500 each

Artist stipend - \$1,000 each

10 locations = **\$15,000**



Sculpture Walk Maintenance and Considerations

- Artist stipend is intended for the use of artist work and to cover costs of transportation, installation and removal of artwork.
- The work will be welded to concrete pads for secure installation. The size will vary depending on location. Sculpture must be delivered with a steel mounting plate.
- Sculptures must be safe and able to withstand all weather conditions, extreme temperatures, and the interaction of the public.
- Sculptures remain the property of the artist and are 'on loan' for the duration of the exhibit.
- The Public Art Committee will develop a fundraising plan to sustain the program beyond year one.



Streetscape Project Budget

- Main Avenue Planter Beds - **\$39,500**
 - George Street Bump-out Beds and Planters **\$31,500**
 - Sculpture Walk **\$15,000**
- TOTAL PROJECT COSTS - **\$86,000**

Additional project priorities - Unique seating. Planter upgrade throughout downtown. New garbage cans. Distinctive street lighting.

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Public Works

FROM: Scott Thoresen

SUBJECT: Discuss Tree Replacement for Street Construction Projects

ATTACHMENTS:

- Discuss Tree Replacement for Street Construction Projects 12-4-18 (PDF)



Memorandum

To: Board of Public Works

From: Marty J. Kosobucki, Director of Parks, Recreation and Forestry *MJK*

Re: Paying for street trees lost in construction

Date: December 10, 2018

Summary: Recently Alderperson Hansen requested the Board of Park Commissioners consider paying for street trees that are taken down due to City construction projects. The Board of Park Commissioners discussed the topic, and with recommendations from City Administration, is deferring the topic to the Board of Public Works for consideration. The Board of Park Commissioners would like to provide the following input to the Board of Public Works on this matter.

The Park Board agrees that if street trees are taken down due to a City Construction project, the City should consider having the trees replaced under the following criteria.

- The cost of the tree(s) shall be paid for within the City's project cost.
- The City's Forestry Division will be responsible for managing the replanting of the trees.
- Replacement of the tree(s) will be limited to trees only removed at the time of construction.
 - It is possible trees can be impacted by construction and die 6 months (or more) later. Due to the difficulty in analyzing a tree's cause of death we do not recommended replacing trees after the construction project.
- The home owner is asked if they want the trees replaced prior to replanting any trees. (Some home owners do not want trees.) If the home owner requests to not have trees replaced, the City shall honor this request.
- The trees are replaced using the Tree Planting and Specification Manual adopted by the City. (This may lead to some or all trees not able to be replanted.)

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Planning

FROM: Peter Schleinz

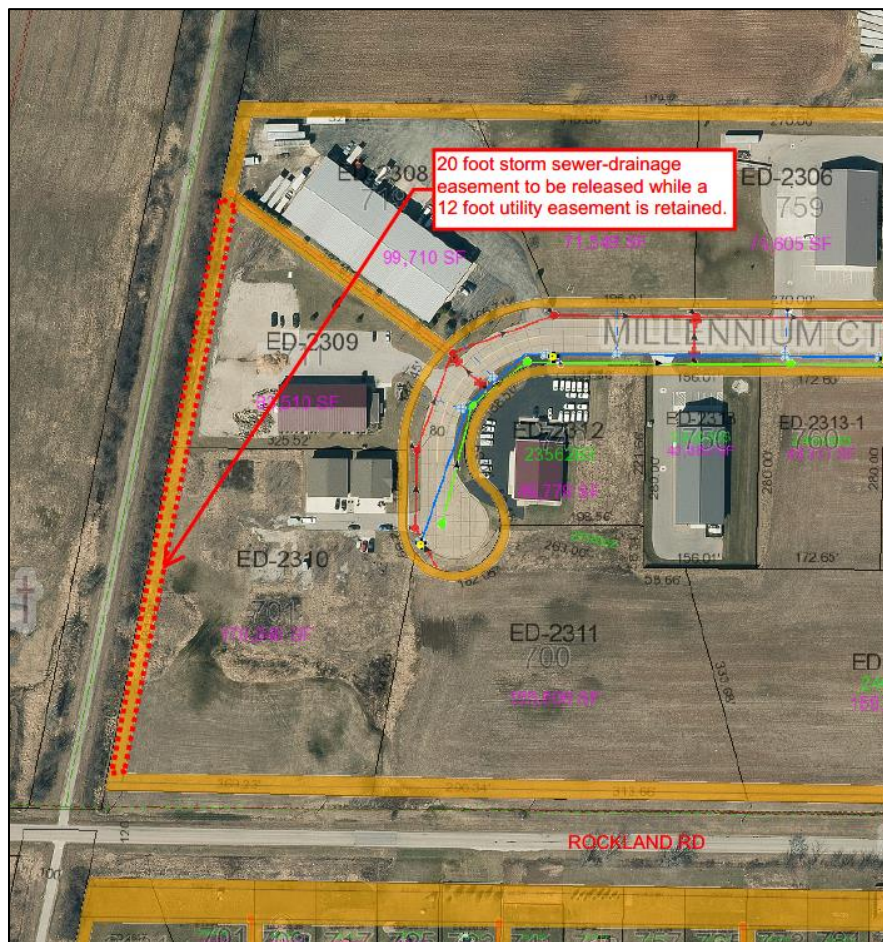
SUBJECT: Recommendation regarding the release of a 20 foot storm sewer-drainage easement, while retaining an existing 12 foot utility easement, at 701-711 Millennium Court (Parcels ED-2310 & ED-2309). Submitted by David Anderson, Town & Country Development LLC, authorized representative for Irish Construction & Investments LLC.*

ATTACHMENTS:

- Revised Report to Board of Public Works - Easement Release 701-711 Millennium (DOCX)
- Application Form (PDF)
- 021287_Eastside_IndustrialPark_2 (PDF)
- 2BI_OP_041999_EastSideIndustrialPark2ndAddn (PDF)

- ITEM:** Recommendation regarding the release of a 20 foot storm sewer-drainage easement, while retaining an existing 12 foot utility easement, at 701-711 Millennium Court (Parcels ED-2310 & ED-2309). Submitted by David Anderson, Town & Country Development LLC, authorized representative for Irish Construction & Investments LLC.*

SITE MAP



- REQUESTED ACTION:** Release/Reduction of Easement Request.*

In summary, releasing a 20 foot storm sewer-drainage easement, while retaining an existing 12 foot utility easement in the same location.

- COMMON DESCRIPTION:** 701-711 Millennium Court, more specifically located north from Rockland Road and parallel (on the east side) to the Fox River State Recreational Trail.

- PARCEL NUMBERS:** ED-2310 & ED 2309

- EXISTING ZONING:** I-3 PDD & I-3
(General Industrial District with a Planned Development District overlay
And General Industrial District)

- PROPOSED ZONING:** No proposed rezoning.

SURROUNDING LAND USES:	Industrial to the north. Residential to the south. Industrial and vacant/agricultural to the east. State recreational trail, city compost site, and agricultural to the west.	
COMPREHENSIVE PLAN:	Industrial Park.	
APPLICANT/OWNER NAME:	David Anderson, Managing Member Authorized Representative Town & Country LLC 1855 Cottonwood Court De Pere, WI 54115	Owner of Parcel ED-2310: Irish Construction & Investments LLC N4664 Olde Ireland Way Kaukauna, WI 54130-7445 Owner of Parcel ED-2309: Selner Properties LLC 2249 S. Broadway Green Bay, WI 54304
SITE HISTORY:	A 12 foot utility easement was established in 1987 via the "East Side Industrial Park" subdivision Volume 18, Page 42. A 20 foot storm-sewer drainage easement was established in 1999 via the "East Side Industrial Park Second Addition" subdivision Volume 21, Page 57 (doc. 170384). The subject area was originally used for agricultural purposes. In 2006 Parcel ED-2310 was zoned to have a PDD overlay that allowed 21 duplex-type structures to be built for business use but only 2 of the 21 structures were built. In 2008-09 the industrial zoned Parcel ED-2309 was developed.	
REVIEW:	When reviewing a release of easement request, staff considers the future need for utilities in the area as well as the location of alternative easements, recommendation of the Comprehensive Plan, and proposed future development. The easement to be released is for city storm sewer and drainage needs, which can be accommodated within the 12 foot easement to be retained on the west property lines. City Development Services and Engineering staff supports the request as the remaining easement is sufficient for City needs. The easement area for public utilities will not change in size or use for WPS, AT&T, Spectrum, etc.. At this time there are no other known facilities in the easements.	
REVIEW PROCESS:	For release of easement requests, the Board of Public Works provides a recommendation to the Common Council. The Common Council reviews the release, and if approved, formal Release of Easement documents are prepared by the City Attorney for signing by utilities and recording at the Register of Deeds office. The anticipated review date by Common Council is either December 18, 2018 or January 2, 2019.	
STAFF RECOMMENDATION:	Staff recommends APPROVAL of the Release of Easement request subject to the following: 1. Subject to release acceptance by any utilities that have authority to utilize the easement. 2. The release of easement should be recorded.	

Packet Pg. 89



CITY OF DE PERE

**APPLICATION FOR
EASEMENT RELEASE**

CITY OF DE PERE
RECEIVED
NOV 16 2018
PLANNING DEPT

Fee: \$ 368.00

Receipt #: 137912

Date: 11-16-18

Read all instructions provided before completing. If additional space is needed, attach additional pages. Type or use black ink.

SECTION 1: Applicant / Permittee Information

Applicant Name (Ind., Org. or Entity) <i>Town + Country Development, LLC</i>	Authorized Representative <i>David Anderson</i>	Title <i>Managing Member</i>	
Mailing Address <i>1855 Cottonwood Ct.</i>	City <i>De Pere</i>	State <i>WI</i>	ZIP Code <i>54115</i>
Email Address <i>dave@townandcountrydevelopment.com</i>	Phone Number (incl. area code) <i>920-360-1040</i>	Fax Number (incl. area code) <i>N/A</i>	

SECTION 2: Landowner Information (complete these fields when project site owner is different than applicant)

Name (Ind. Org. or Entity)	Contact Person	Title	
Mailing Address	City	State	ZIP Code
Email Address	Phone Number (incl. area code)	Fax Number (incl. area code)	

SECTION 3: Project or Site Location

Project Address/Description <i>701 Millenium Ct. De Pere, WI 54115</i>	Parcel No. <i>ED-2310</i>
---	------------------------------

SECTION 4: Easement Information

Existing Zoning:	<i>I3 with a PDD overlay</i>
Present Use of Parcel:	<i>Vacant and planned development for business use</i>
Proposed Use of Lots:	<i>Business use expansion per PDD</i>

Please submit the following:

- 1-Scaled map identifying easement to be released
- 2-Legal description for easement
- 3-Summary/description of reason why easement release is needed
- 4-Information from other utilities indicating they agree with release

SECTION 5: Certification and Permission

Certification: I hereby certify that I am the owner or authorized representative of the owner of the property which is the subject of this Permit Application. I certify that the information contained in this form and attachments is true and accurate. I certify that the project will be in compliance with all permit conditions. I understand that failure to comply with any or all of the provisions of the permit may result in permit revocation and a fine and/or forfeiture under the provisions of applicable laws.

Permission: I hereby give the City permission to enter and inspect the property at reasonable times, to evaluate this notice and application, and to determine compliance with any resulting permit coverage.

Name of Owner/Authorized Representative (please print) <i>David Anderson</i>	Title <i>Managing Member</i>	Phone Number <i>920-360-1040</i>
Signature of Applicant <i>[Signature]</i>		Date Signed <i>11/16/18</i>

TO BE COMPLETED BY CITY STAFF

Easement Release authorized by the De Pere Municipal Code, Chapter 46.

Required Information that applicant should include with application form:

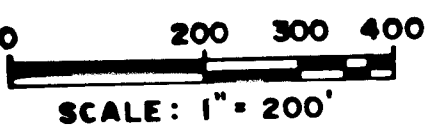
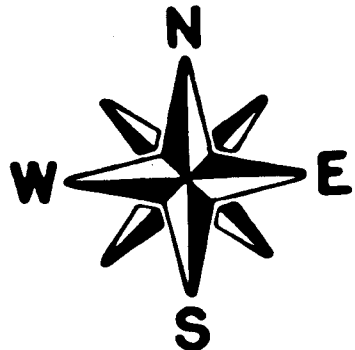
- Scaled map identifying the boundaries of the easement to be released.
 - Legal description that defines the easement.
 - Summary/description of why easement release is needed.
 - Information from other utilities indicating they agree with release.
-

Steps for approval:

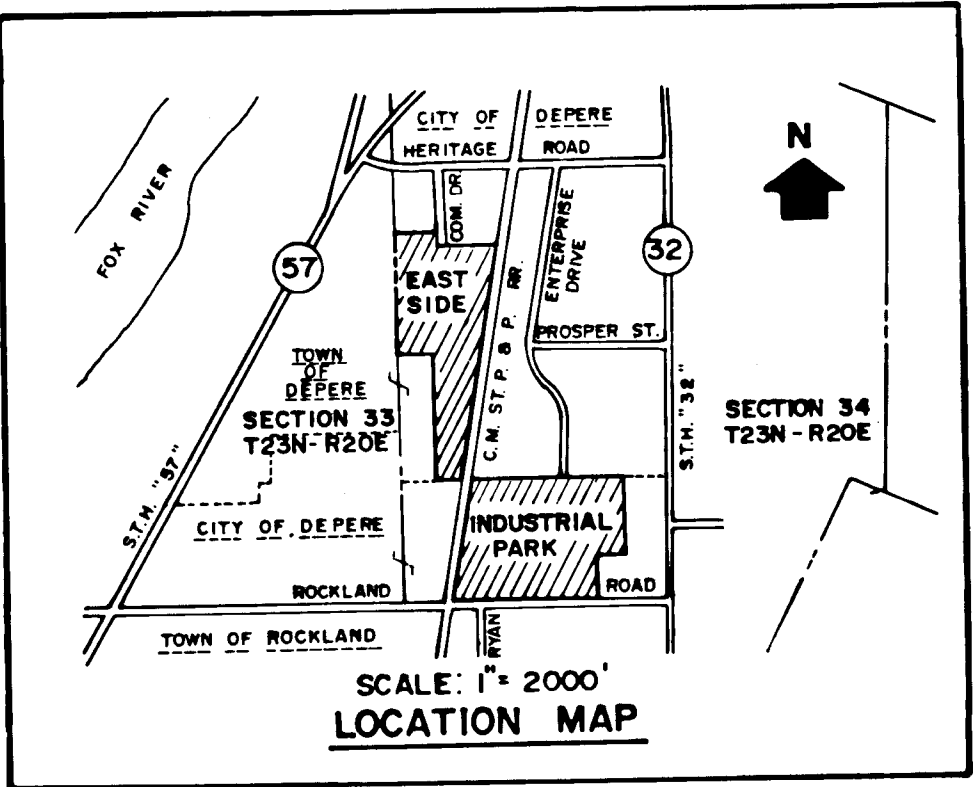
- 1.) Applicant submits application and above required information with review fee of \$368.
- 2.) City staff will review application. If staff believes easement is no longer needed, topic will be placed on next practicable Board of Public Works (BOPW) agenda.
- 3.) BOPW will either recommend or reject proposal.
- 4.) If rejected, applicant may terminate process – no refund.
- 5.) If approved and applicant wishes rejected project to continue, project will be prepared for next practicable Common Council meeting.
- 6.) Common Council either approves or denies proposal.
- 7.) If approved, City Attorney prepares legal documents for signature by utilities.
- 8.) If denied, project ends – no refund.
- 9.) City Attorney records documents with Register of Deeds, ending process.

EAST SIDE INDUSTRIAL PARK

PART OF PARCEL A OF VOLUME 4 OF CERTIFIED SURVEY MAPS, PAGE 223, BROWN COUNTY REGISTRY, LOCATED IN THE SOUTHWEST 1/4 OF THE NORTHWEST 1/4 AND ALSO PART OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 AND THE SOUTHEAST 1/4 OF THE SOUTHWEST 1/4 AND THE NORTHWEST 1/4 OF THE SOUTHWEST 1/4, ALL IN SECTION 34, T23N-R20E, CITY OF DEPERE, BROWN COUNTY, WISCONSIN.



- LEGEND**
- Existing 1" Dia. Iron Pipe
 - △ Existing Railroad Spike
 - Set 2" x 30" iron pipe weighing 3.65 lbs./lin.ft., min., over existing 1" iron pipe.
 - ⊙ Set 2" x 30" iron pipe weighing 3.65 lbs./lin.ft., min., over existing 3/4" iron rod.
- All linear measurements have been made to the nearest Hundredth of a foot and computed to the nearest Hundredth of a foot.
- All angular measurements have been to the nearest 3 seconds and computed to the nearest half of a second.
- Bearings are referenced to the West line of the Northwest 1/4, assumed to bear S00°51'35"E.



CURVE DATA

Curve	Arc	Chord	Chord Bearing	Radius	Central Angle	Tan.
C-6	18.74'	16.89'	S44°31'48.5"W	12.00'	89°29'07"	11.89'
C-7	18.96'	17.05'	N45°28'11.5"W	12.00'	90°30'53"	12.11'

WEST 1/4 CORNER SECTION 34, T23N-R20E. EXISTING BROWN COUNTY MONUMENT.

SOUTHWEST CORNER SECTION 34, T23N-R20E. EXISTING BROWN COUNTY MONUMENT. 1" IRON PIPE.

NORTHEAST CORNER OF THE NORTHWEST 1/4 OF THE NORTHWEST 1/4, SECTION 34, T23N-R20E. EXISTING BROWN COUNTY MONUMENT. 4" x 4" SQ. CONCRETE MONUMENT WITH BRASS CAP.

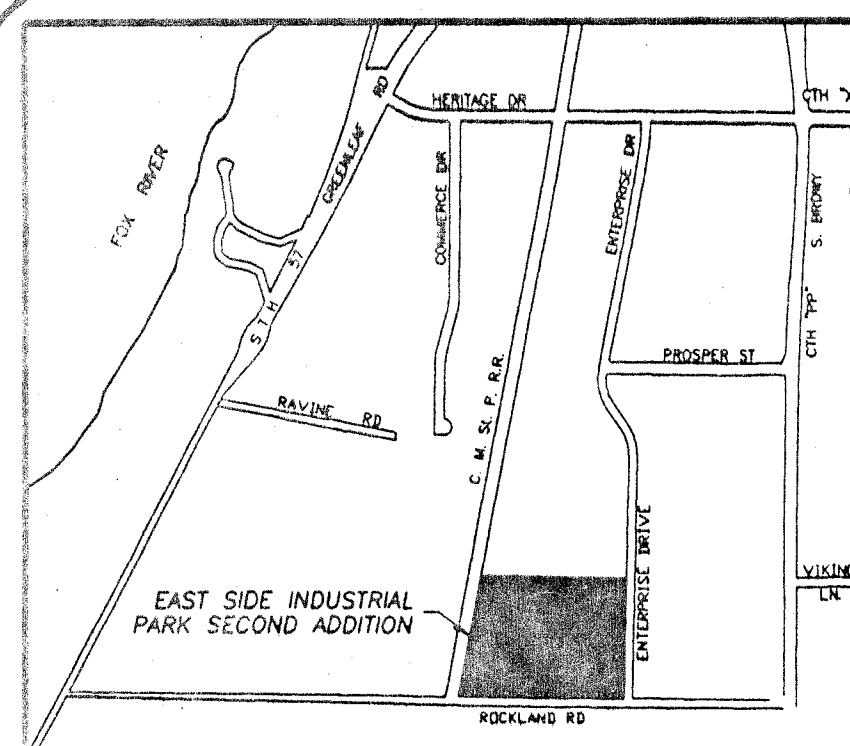
SOUTH 1/4 CORNER SECTION 34, T23N-R20E. EXISTING BROWN COUNTY MONUMENT. 4" x 4" CONCRETE MONUMENT WITH BRASS CAP.

CLOSING CORNER SECTION 34, T23N-R20E. EXISTING BROWN COUNTY MONUMENT. 5/8" IRON ROD.

REVISED THIS 10th DAY, OF FEBRUARY, 1987.

WISCONSIN
RICKY A. VAN GOETHEM
6-1529
Green Bay
Wis.
Jan. 14, 1987

DRAWN BY: DENNIS REIM

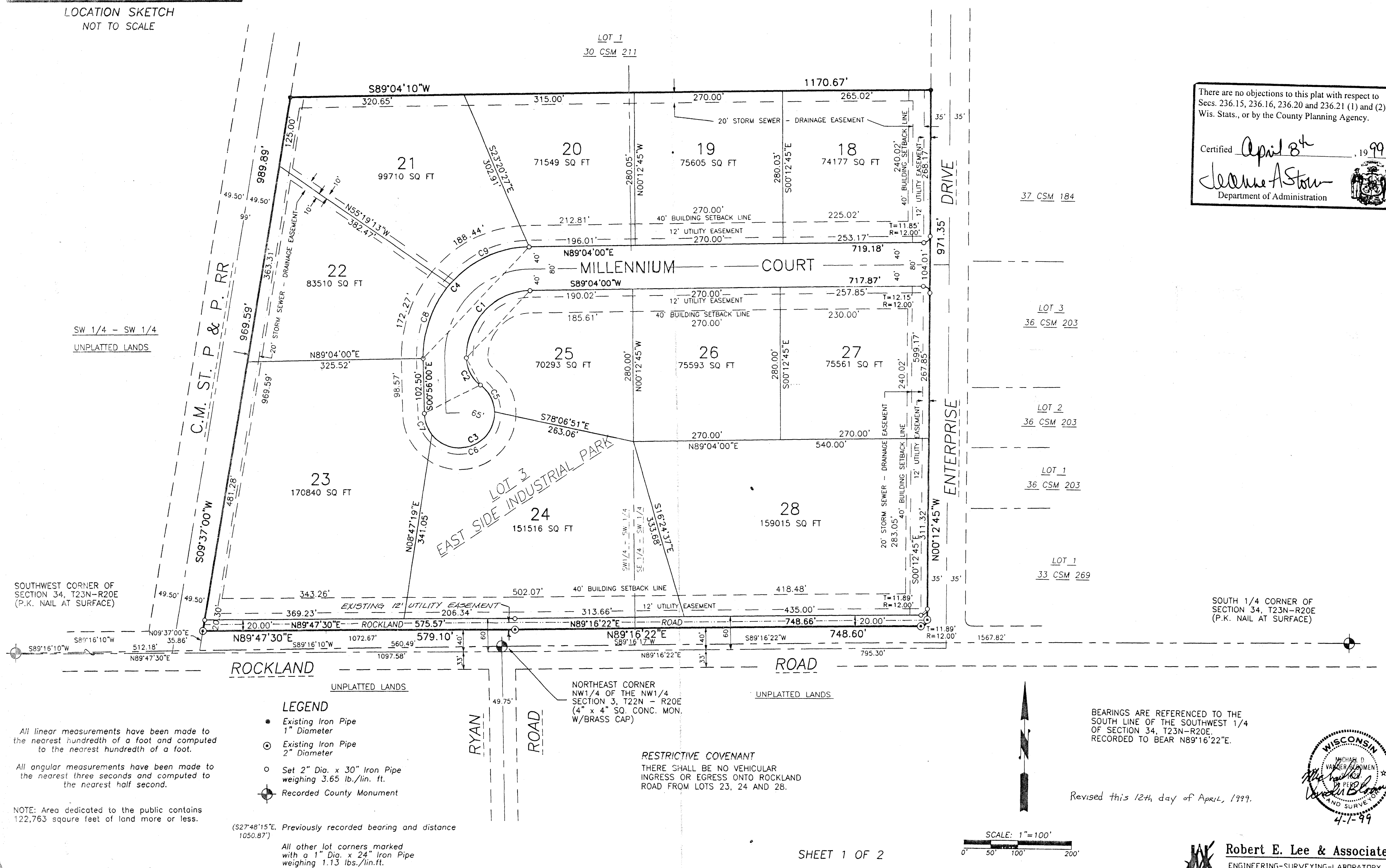
LOCATION SKETCH
NOT TO SCALE

CURVE DATA:

NUMBER	DELTA ANGLE	CHORD DIRECTION	TANGENT	RADIUS	ARC	CHORD	TAN BEARING	2ND TAN BEARING
C1	90°00'00"	S 44°04'00" W	120.00	120.00	188.50	169.71	S 00°56'00" E	S 00°56'00" E
C2	52°01'42"	S 26°56'51" E	31.72	65.00	59.02	57.02	S 00°56'00" E	S 52°57'42" E
C3	232°01'04"	S 63°02'50" W	INFINITE	65.00	263.22	116.83	S 52°57'42" E	S 00°56'38" E
C4	90°00'00"	N 44°04'00" E	200.00	200.00	314.16	282.84		
C5	51°17'08"	S 27°19'08" E	31.18	65.00	58.18	56.26		
C6	143°38'06"	S 70°08'29" W	198.09	65.00	162.95	123.51		
C7	37°05'50"	N 19°29'33" W	21.79	65.00	42.09	41.35		
C8	42°14'30"	N 20°11'15" E	77.26	200.00	147.45	144.13		
C9	47°45'30"	N 65°11'15" E	88.54	200.00	166.71	161.92		

EAST SIDE INDUSTRIAL PARK SECOND ADDITION

PART OF LOT 3, EAST SIDE INDUSTRIAL PARK, LOCATED IN THE
SOUTHEAST 1/4 OF THE SOUTHWEST 1/4 AND IN THE SOUTHWEST 1/4
OF THE SOUTHWEST 1/4 OF SECTION 34, T23N - R20E, CITY OF
DE PERE, BROWN COUNTY, WISCONSIN.



There are no objections to this plat with respect to
Secs. 236.15, 236.16, 236.20 and 236.21 (1) and (2),
Wis. Stats., or by the County Planning Agency.

Certified April 8th, 1999

Deanne A. Stow
Department of Administration

EAST SIDE INDUSTRIAL PARK SECOND ADDITION

PART OF LOT 3, EAST SIDE INDUSTRIAL PARK, LOCATED IN THE
SOUTHEAST 1/4 OF THE SOUTHWEST 1/4 AND IN THE SOUTHWEST 1/4
OF THE SOUTHWEST 1/4 OF SECTION 34, T23N - R20E, CITY OF
DE PERE, BROWN COUNTY, WISCONSIN.

SURVEYOR'S CERTIFICATE

I, Michael D. Vander Bloomen, Registered Land Surveyor, do hereby certify that under the direction of the City of De Pere, owner, I have surveyed, divided and mapped the Plat of the East Side Industrial Park Second Addition, being part of Lot 3, East Side Industrial Park, located in the Southeast 1/4 of the Southwest 1/4 and in the Southwest 1/4 of the Southwest 1/4 of Section 34, T23N, R20E, City of De Pere, Brown County, Wisconsin, described as follows:

Commencing at the Southwest corner of said Section 34, T23N, R20E; thence N89°16'10"E, 512.18 feet along the South line of the Southwest 1/4 of said Section 34 to the Easterly right of way line of the C.M. St. P & P. Railroad; thence N09°37'00"E, 35.86 feet along said Easterly line to the North right of way line of Rockland Road the POINT OF BEGINNING; thence N89°47'30"E, 579.10 feet along said North line; thence N89°16'22"E, 748.60 feet along said North line; thence 18.74 feet along the arc of a 12.00 foot radius curve to the left having a long chord which bears N44°31'49"E, 16.89 feet to the Westerly right of way line of Enterprise Drive; thence N00°12'45"W, 971.35 feet along said Westerly line to the South line of Volume 30 of Certified Survey Maps on page 211; thence S89°04'10"W, 1170.67 feet along said South line to the Easterly right of way line of the C.M. St. P & P. Railroad; thence S09°37'00"W, 989.89 feet along said Easterly line to the POINT OF BEGINNING...containing 1,230,145 square feet or 28.24 acres of land more or less.

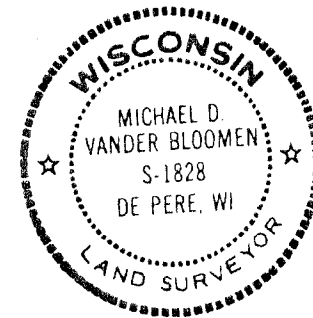
That such plat is a correct representation of all the exterior boundaries of the land surveyed and the subdivision thereof made. That I have fully complied with the provisions of Chapter 236 of the Wisconsin Statutes and the Subdivision regulations of the City of De Pere.

Dated this 1st day of April, 1999.

Michael D. Vander Bloomen

Michael D. Vander Bloomen, Registered Land Surveyor #1828
ROBERT E. LEE & ASSOCIATES, INC.

Revised this 12th day of April, 1999.



CORPORATE OWNER'S CERTIFICATE OF DEDICATION

CITY OF DE PERE, a corporation duly organized and existing under and by virtue of the laws of the State of Wisconsin, as owner, does hereby certify that said corporation caused the land described on this plat to be surveyed, divided, mapped and dedicated as represented on this plat.

CITY OF DE PERE, does further certify that this plat is required by s.236.10 or s.236.12 to be submitted to the following for approval or objection:
DEPARTMENT OF ADMINISTRATION, CITY OF DE PERE PLANNING COMMISSION, BROWN COUNTY PLANNING COMMISSION.

IN WITNESS WHEREOF, the said CITY OF DE PERE has caused these presents to be signed by MICHAEL J. WALSH, its Mayor, and countersigned by DAVID G. MINTEN, its clerk, at De Pere, Wisconsin, and its corporate seal to be hereunto affixed on this 16th day of June, 1999.

Michael J. Walsh
Michael J. Walsh Mayor

David G. Minten
David G. Minten Clerk

STATE OF WISCONSIN)
BROWN COUNTY) SS

Personally came before me this 15th day of June, 1999, MICHAEL J. WALSH, its Mayor, and DAVID G. MINTEN, clerk of the above named corporation, to me known to be the persons who executed the foregoing instrument and to me known to be such Mayor and Clerk of said corporation, and acknowledged that they executed the foregoing instrument as such officers as the deed of said corporation, by its authority.

Notary Public Kerry A. Krueger
Kerry A. Krueger
My commission expires December 8, 2002

REGISTER'S OFFICE
Brown Co., Wis.

Received for record the 17th day of June, A.D. 1999 at 1:24 o'clock P.M. and recorded in Vol. 21 of Plats on page 57.

Colly Wilgitz
Register of Deeds

There are no objections to this plat with respect to Secs. 236.15, 236.16, 236.20 and 236.21 (1) and (2), Wis. Stats., or by the County Planning Agency.

Certified April 8th, 1999
Jeanne Aston
Department of Administration

CITY COUNCIL RESOLUTION

Resolved that the plat known as "EAST SIDE INDUSTRIAL PARK SECOND ADDITION" which has been duly filed for approval of the Common Council of the City of De Pere, be and is hereby approved as required by Chapter 236 of the Wisconsin Statutes.

I hereby certify that the above is a true and correct copy of a resolution adopted by the Common Council of the City of De Pere on this 2nd day of March, 1999.

David G. Minten
David G. Minten Clerk

Approved for the City of De Pere Planning Commission this 15th day of June, 1999.

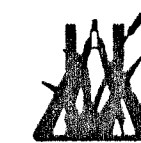
William R. Patzke
William R. Patzke
Director of Planning

TREASURER'S CERTIFICATE

As duly appointed/elected De Pere City Treasurer and Brown County Treasurer, we hereby certify that the records in our office show no unpaid taxes and no unpaid special assessments affecting any of the lands in the plat known as "EAST SIDE INDUSTRIAL PARK SECOND ADDITION", as of the dates listed below.

David G. Minten 6-15-99
David G. Minten Dated
De Pere City Treasurer

Kerry M. Blaney 6-16-99
Kerry M. Blaney Dated
Brown County Treasurer



Robert E. Lee & Associates, Inc.
ENGINEERING-SURVEYING-LABORATORY SERVICES
BOX 2100 GREEN BAY WI. 54306 414-336-6338

SHEET 2 OF 2

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Planning

FROM: Peter Schleinz

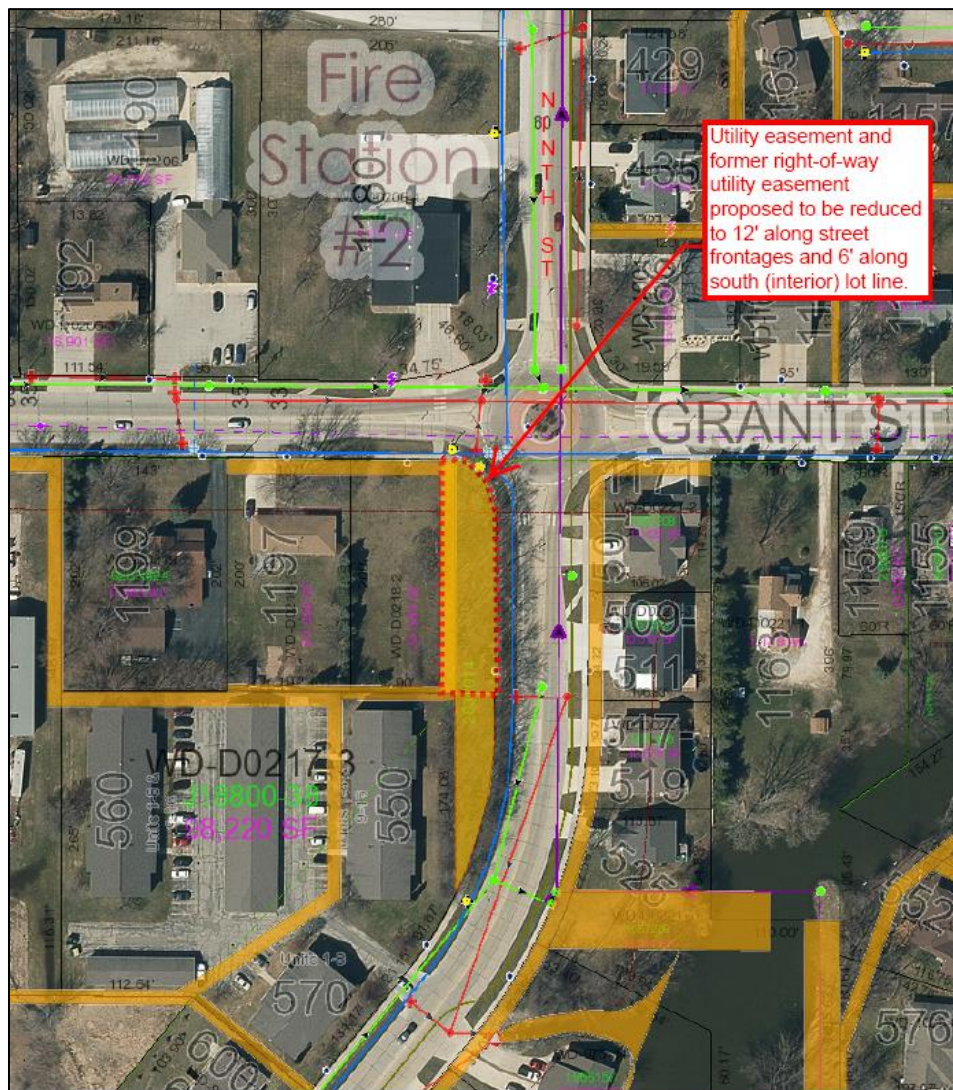
SUBJECT: Recommendation regarding the release of a utility easement and right-of-way easement, to be replaced with typical 12 foot street fronted utility easements and 6 foot side lot line utility easements via certified survey map (CSM), at the 500 BLK Ninth Street (Parcel WD-D0218-2). Submitted by Steven M. Bieda, Mau & Associates, authorized representative for Raymond J. Hoffmann.*

ATTACHMENTS:

- Revised Report to Board of Public Works - Easement Release - 500 BLK 9th (DOCX)
- Application Form (PDF)
- Exhibit (PDF)

- ITEM:** Recommendation regarding the release of a utility easement and right-of-way easement, to be replaced with typical 12 foot street fronted utility easements and 6 foot side lot line utility easements via certified survey map (CSM), at the 500 BLK Ninth Street (Parcel WD-D0218-2). Submitted by Steven M. Bieda, Mau & Associates, authorized representative for Raymond J. Hoffmann.*

SITE MAP



REQUESTED ACTION: Release/Reduction of Easement Request.*

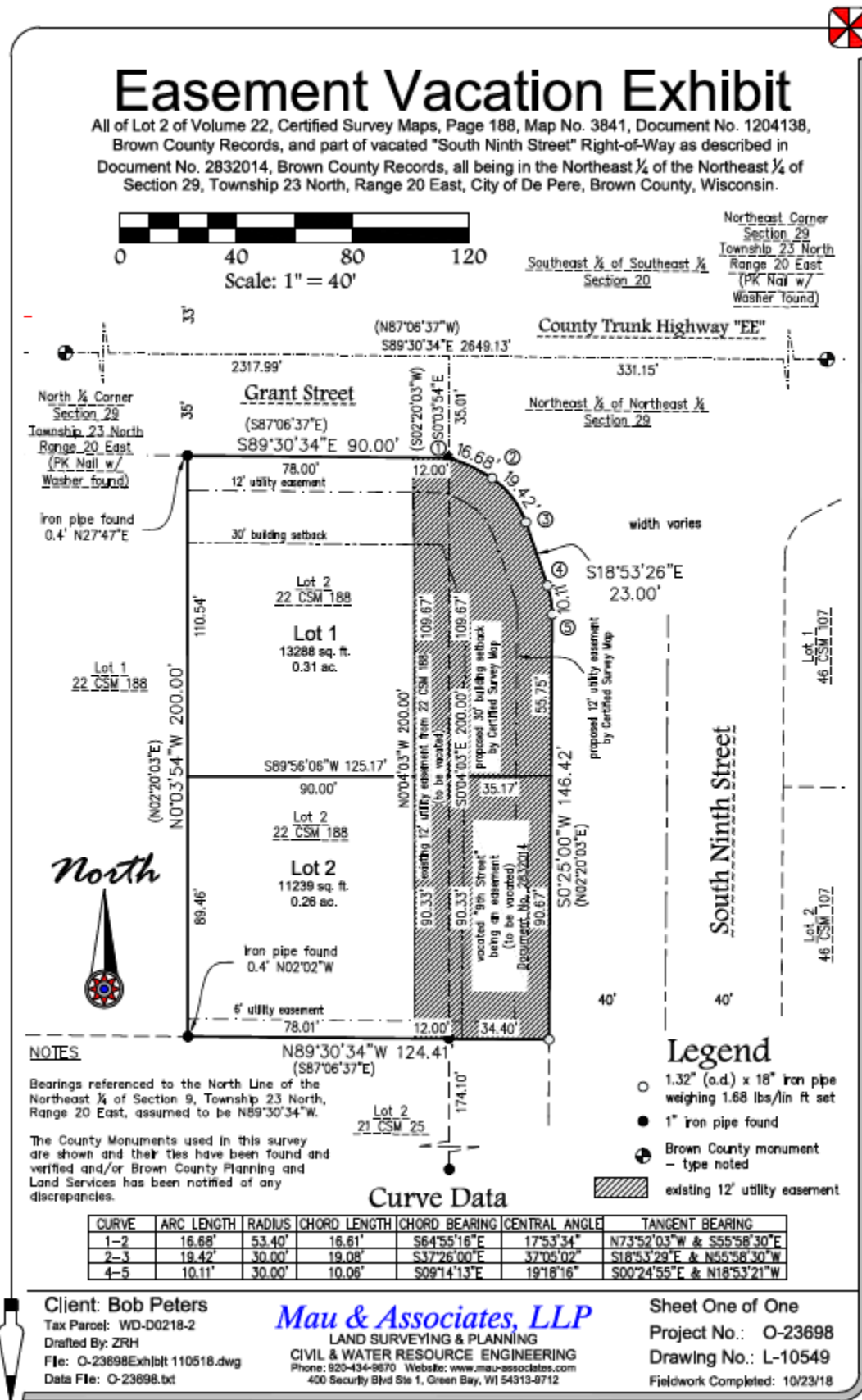
Release of existing utility easements that will be replaced by typical 12 foot street fronted utility easements along 9th Street and Grant Street when a certified survey map is created in the near future.

COMMON DESCRIPTION: 500 BLK S. 9th Street, located southwest from the 9th Street and Grant Street (CTH EE) intersection.

PARCEL NUMBERS: WD-D0218-2

EXISTING ZONING:	R-2 (Single and Tow-Family Residence District)	
PROPOSED ZONING:	No proposed rezoning.	
SURROUNDING LAND USES:	Fire station, single family & two family residential to the north and east. Single family, two family, & multi-family residential to the south & west	
COMPREHENSIVE PLAN:	Neighborhood Residential (Including Multi-Family)	
APPLICANT/OWNER NAME:	Steven M. Bieda, PLS Authorized Representative Mau & Associates LLP 400 Security Boulevard Green Bay, WI 54313	Owner of Parcel WD-D0218-2 Raymon J. Hoffman 1140 Aldrin Street De Pere, WI 54115-1258
SITE HISTORY:	A 12 foot and 6 foot storm-sewer drainage easement was established on the property in 1990 via certified survey map Volume 22, Page 188 (doc. 1204138). On July 15, 2018, the Common Council discontinued and vacated a portion of the 9th Street right-of-way, which was a wooded area, via Resolution #18-49. The vacated right-of way was retained as an easement and a portion of the right-of-way was attached to subject Parcel WD-D0218-2. The property owner proposes to divide the property into two lots and utilize part of the released easement for future development of two duplex buildings.	
REVIEW:	When reviewing a release of easement request, staff considers the future need for utilities in the area as well as the location of alternative easements, recommendation of the Comprehensive Plan, and proposed future development. The easement has wooded trees and is for city needs as well as for other utilities (WPS, AT&T, and Spectrum, etc.). The authorized representative has been in contact with non-city utilities regarding the need to retain the easement area. Not all responses have been received yet, but responses as of December 6, 2018, support the request. City Development Services and Engineering staff supports the request as the remaining easement is sufficient for City needs. At this time there are no other know facilities in the easements.	
REVIEW PROCESS:	For release of easement requests, the Board of Public Works provides a recommendation to the Common Council. The Common Council reviews the release, and if approved, formal Release of Easement documents are prepared by the City Attorney for signing by utilities and recording at the Register of Deeds office. The anticipated review date by Common Council is either December 18, 2018 or January 2, 2019.	
STAFF RECOMMENDATION:	Staff recommends APPROVAL of the Release of Easement request subject to the following: 1. Subject to release acceptance by any utilities that have authority to utilize the easement. 2. The release of easement should be recorded with the related CSM.	

EASEMENT EXHIBIT:



LEGAL DESCRIPTION FOR EASEMENT:

A twelve (12) foot wide public utility easement being located in part of Lot 2 of Volume 22, Certified Survey Maps, Page 188, Map No. 3841, Document No. 1204138, Brown County Records, and vacated Right-of-Way of "South Ninth Street" being described in Document No. 2832014, Brown County Records, all being in part of the Northeast ¼ of the Northeast ¼ of Section 29, Township 23 North, Range 20 East, City of De Pere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Northeast Corner of Lot 2, Volume 22, Certified Survey Maps, Page 188, Map No. 3841, Document No. 1204138, Brown County Records; thence 16.68 feet along the South Right-of-Way of County Trunk Highway "EE", also known as "Grant Street", being the arc of a 53.40 foot radius curve to the right whose long chord bears S64°55'16"E, 16.61 feet; thence 19.42 feet along said South Right-of-Way and its extension being the West Right-of-Way of "South Ninth Street" being the arc of a 30.00 foot radius curve to the right whose long chord bears S37°26'00"E, 19.08 feet; thence S18°53'26"E, 23.00 feet along said West Right-of-Way; thence 10.11 feet along said West Right-of-Way being the arc of a 30.00 foot radius curve to the right whose long chord bears S09°14'13"E, 10.06 feet; thence S00°25'00"W, 146.42 feet along said West Right-of-Way; thence N89°30'34"W, 46.40 feet along the South Line of said Lot 2; thence N00°04'03"W, 200.00 feet to said South Right-of-Way; thence S89°30'34"E, 12.00 feet along said South Right-of-Way to the Point of Beginning.



CITY OF DE PERE

**APPLICATION FOR
EASEMENT RELEASE**

CITY OF DE PERE
RECEIVED

DEC 4 2018

PLANNING DEPT

Fee: \$ 368.00

Receipt #: 138108

Date: 12/04/18

Read all instructions provided before completing. If additional space is needed, attach additional pages. Type or use black ink.

SECTION 1: Applicant / Permittee Information

Applicant Name (Ind., Org. or Entity) Mau & Associates, LLP	Authorized Representative Steven M. Bieda	Title Land Surveyor	
Mailing Address 400 Security Blvd., Suite 1	City Green Bay	State WI	ZIP Code 54313
Email Address sbieda@mau-associates.com	Phone Number (incl. area code) 920-434-9670	Fax Number (incl. area code)	

SECTION 2: Landowner Information (complete these fields when project site owner is different than applicant)

Name (Ind. Org. or Entity)	Contact Person Raymond J. Hoffman	Title Owner	
Mailing Address 1140 Aldrin Street	City De Pere	State WI	ZIP Code 54115
Email Address	Phone Number (incl. area code)	Fax Number (incl. area code)	

SECTION 3: Project or Site Location

Project Address/Description SW Corner of intersection of South 9th Street and Grant Street, De Pere, WI 54115	Parcel No. WD-D0218-2
--	--------------------------

SECTION 4: Easement Information

Existing Zoning:	R-2
Present Use of Parcel:	Vacant
Proposed Use of Lots:	Two duplex-style condominiums

Please submit the following:

- 1-Scaled map identifying easement to be released
- 2-Legal description for easement
- 3-Summary/description of reason why easement release is needed
- 4-Information from other utilities indicating they agree with release

SECTION 5: Certification and Permission

Certification: I hereby certify that I am the owner or authorized representative of the owner of the property which is the subject of this Permit Application. I certify that the information contained in this form and attachments is true and accurate. I certify that the project will be in compliance with all permit conditions. I understand that failure to comply with any or all of the provisions of the permit may result in permit revocation and a fine and/or forfeiture under the provisions of applicable laws.

Permission: I hereby give the City permission to enter and inspect the property at reasonable times, to evaluate this notice and application, and to determine compliance with any resulting permit coverage.

Name of Owner/Authorized Representative (please print) Steven M. Bieda	Title Land Surveyor	Phone Number 920-434-9670
Signature of Applicant 		Date Signed 11/30/18

TO BE COMPLETED BY CITY STAFF

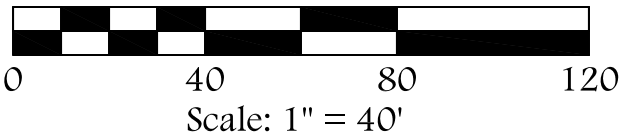
Easement Release authorized by the De Pere Municipal Code, Chapter 46.

Attachment: Application Form (7689 : Recommendation regarding the release of a utility easement and right-of-way easement, to be replaced)



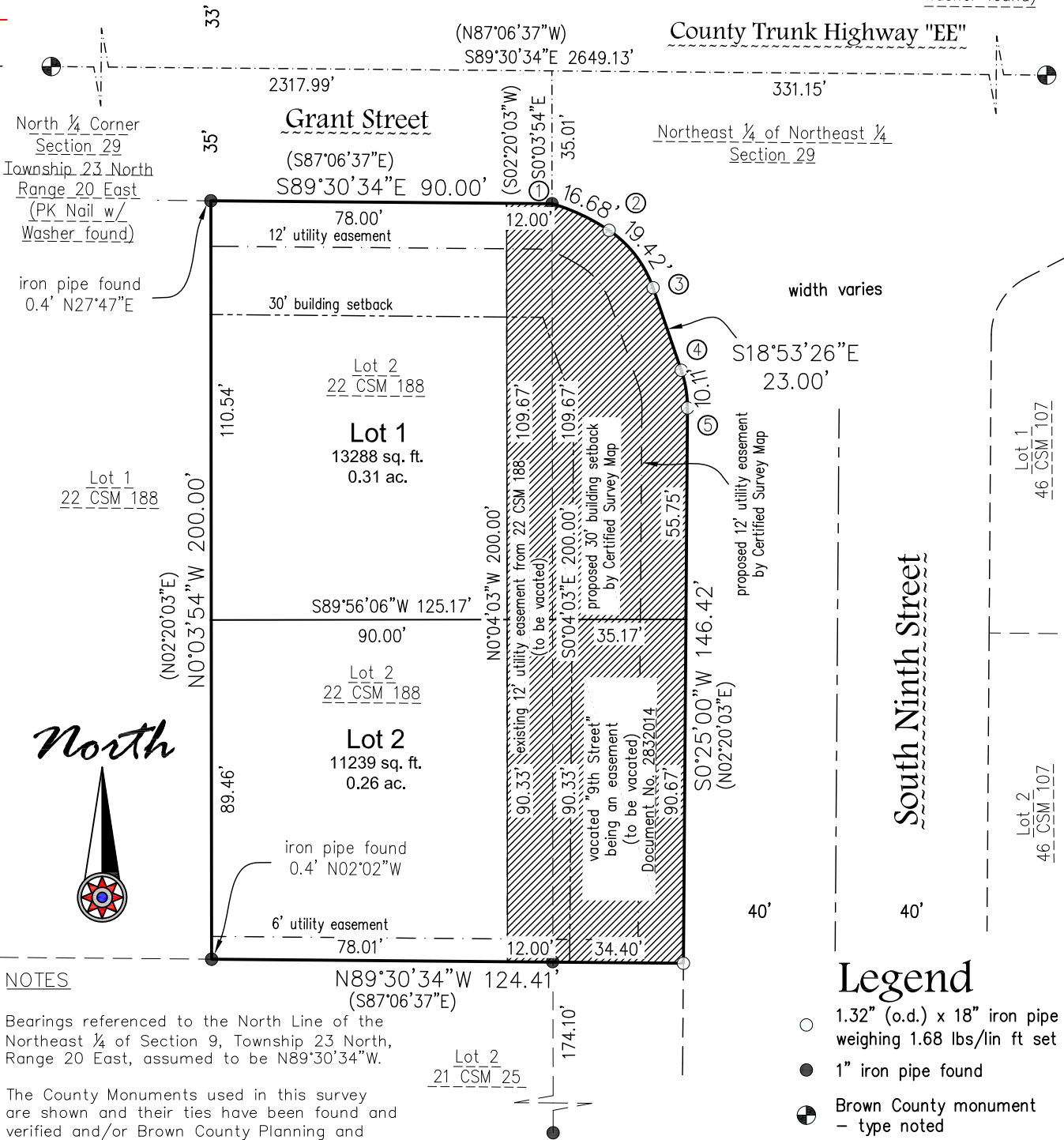
Easement Vacation Exhibit

All of Lot 2 of Volume 22, Certified Survey Maps, Page 188, Map No. 3841, Document No. 1204138, Brown County Records, and part of vacated "South Ninth Street" Right-of-Way as described in Document No. 2832014, Brown County Records, all being in the Northeast 1/4 of the Northeast 1/4 of Section 29, Township 23 North, Range 20 East, City of De Pere, Brown County, Wisconsin.



Northeast Corner
Section 29
Township 23 North
Range 20 East
(PK Nail w/
Washer found)

Southeast 1/4 of Southeast 1/4
Section 20



NOTES

Bearings referenced to the North Line of the Northeast 1/4 of Section 9, Township 23 North, Range 20 East, assumed to be N89°30'34"W.

The County Monuments used in this survey are shown and their ties have been found and verified and/or Brown County Planning and Land Services has been notified of any discrepancies.

Legend

- 1.32" (o.d.) x 18" iron pipe weighing 1.68 lbs/lin ft set
- 1" iron pipe found
- ⊕ Brown County monument - type noted
- ▨ existing 12' utility easement

Curve Data

CURVE	ARC LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING	CENTRAL ANGLE	TANGENT BEARING
1-2	16.68'	53.40'	16.61'	S64°55'16"E	17°53'34"	N73°52'03"W & S55°58'30"E
2-3	19.42'	30.00'	19.08'	S37°26'00"E	37°05'02"	S18°53'29"E & N55°58'30"W
4-5	10.11'	30.00'	10.06'	S09°14'13"E	19°18'16"	S00°24'55"E & N18°53'21"W

Client: Bob Peters

Tax Parcel: WD-D0218-2

Drafted By: ZRH

File: O-23698Exhibit 110518.dwg

Data File: O-23698.txt

Mau & Associates, LLP
LAND SURVEYING & PLANNING
CIVIL & WATER RESOURCE ENGINEERING
Phone: 920-434-9670 Website: www.mau-associates.com
400 Security Blvd Ste 1, Green Bay, WI 54313-9712

Sheet One of One

Project No.: O-23698

Drawing No.: L-10549

Fieldwork Completed: 10/23/18

Attachment: Exhibit (7689 : Recommendation regarding the release of a utility easement and right-of-way easement, to be replaced)

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Public Works

FROM: Scott Thoresen

SUBJECT: Consider Purchasing AquaHawk Water Meter Software*

In 2013, as part of a joint collaboration with Appleton, Grand Chute, Allouez, Bellevue, and Howard, the City entered into an agreement to joint purchase Sensus water meters. In 2014, the City started replacing the existing water meters with the new Sensus meters. Staff has replaced approximately 10,000 meters over the past four (4) years. Currently, we have less than five (5) water meters to install.

In addition, as part of joint collaboration with Appleton, Grand Chute, Allouez, Bellevue, and Howard, the City has been given the opportunity to purchase Aquahawk water meter software at a discounted price because of the volume of meters with the above five (5) communities. (See attached email) AquaHawk will provide the City and their customers on line access to consumption, leak notifications, and much more. (See attached slides) This software will enhance customer service and operational efficiencies. An example of improvement in operational efficiencies it currently takes approximately fifteen (15) minutes per meter alarm to determine what the issue(such as a water leak) and what customer has an issue with their meter. AquaHawk will notify immediately the problem and the address. In the case of the water leak, if the customer has their contact information in the system, it will call to let them know they have a water leak on their property so that they can investigate right away resulting in savings from water loss.

Staff is recommending purchasing the AquaHawk water meter software as outlined in the proposal (See attached proposal). Sufficient funding was budgeted for in the 2018 water utility budget. (See attached CIP worksheet)

ATTACHMENTS:

- AquaHawk email (PDF)
- AquaHawk Slides 12-3-18 (PDF)
- Proposal City of De Pere WI AquaHawk 12-3-18 (PDF)
- 2018 Water Distribution Management - Meter Software (PDF)

Scott Thoresen

From: Dave Vaclavik <manager@cbcwa.com>
Sent: Tuesday, September 6, 2016 2:46 PM
To: Scott Thoresen; Craig Berndt (craig@villageofallouez.com); Bill Balke; 'Nathan Loper'
Cc: 'Geoff Farr'
Subject: FW: CBCWA + AquaHawk

Thought I would forward this information. Nate, I would appreciate it if you would send this on to whoever should get it at Grand Chute. I know that a number of CBCWA members are interested and planning to budget in the 2017 or future budgets. It would be helpful for everyone to know what pricing structure they will fall in. Please advise if you will be moving forward with AquaHawk, the number of accounts and what calendar year you would be participating. Thanks,

From: Todd Brehe [mailto:todd@amcobi.com]
Sent: Tuesday, September 6, 2016 11:26 AM
To: Dave Vaclavik <manager@cbcwa.com>
Subject: RE: CBCWA + AquaHawk

Hi Dave-

Here are a couple price levels:

# of Accounts	Setup Fee (One-time)	Monthly Fee	Annual Amount	Effective Price per Account per Year (Yr. 2+)
2,000	\$7,500	\$500	\$6,000	\$3.00
5,000	\$7,500	\$800	\$9,600	\$1.92
7,500	\$10,000	\$1,100	\$13,200	\$1.76
10,000	\$10,000	\$1,250	\$15,000	\$1.50

Setup fees are based on meter count for each utility but the annual fee will be based on the number of meters we manage for the entire group. When the group is over 25,000 meters collectively, everyone's annual price will be = \$1.25/meter.

Right now the Village of Howard has 7,500 meters.

Thanks,

Todd

Todd A. Brehe
 AquaHawk
 T: (719) 694-1979 | M: (719) 321-3444
Todd@AmCoBi.com
 P.O. Box 51356 | Colorado Springs, CO 80949-1356
www.AquaHawk.com



From: Dave Vaclavik [<mailto:manager@cbcwa.com>]
Sent: Tuesday, September 6, 2016 9:52 AM
To: todd@amcobi.com
Subject: CBCWA

Todd, could you please remind me of the price breakpoints and the initial setup costs? I am in the process of polling our group. It appears that you will have some new customers. Dave

Dave Vaclavik, Manager
Central Brown County Water Authority
3100 Eaton Road
Bellevue, WI 54311

920-884-1077 x5
920-851-0629 (c)

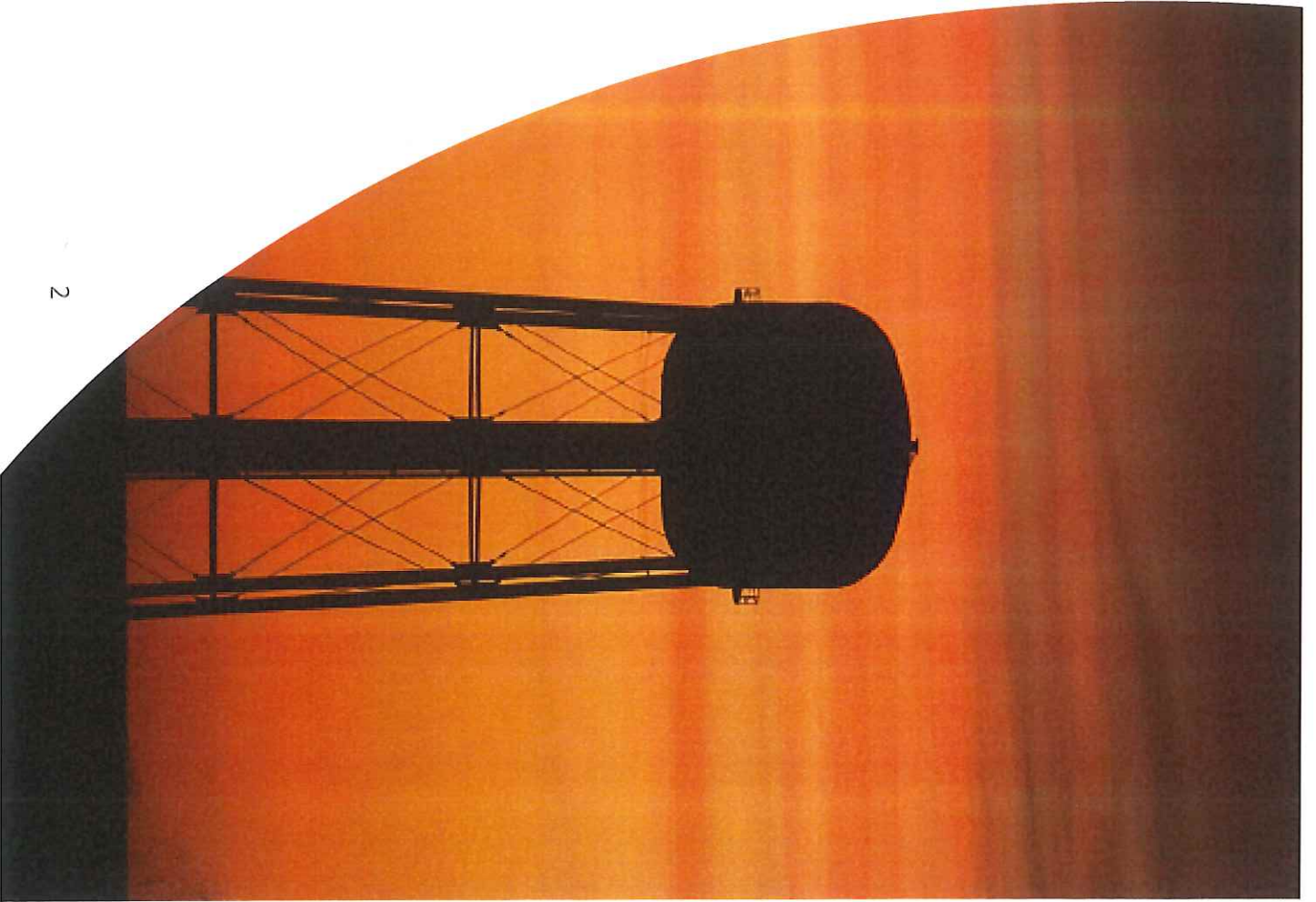
Attachment: AquaHawk email (7691 : Consider Purchasing AquaHawk Water Meter Software*)



City of De Pere, WI

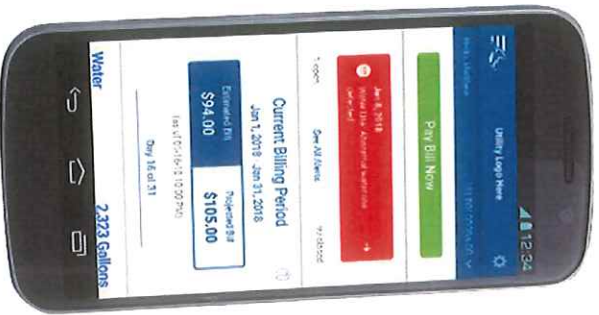
AmCoBi
P.O. Box 51356
Colorado Springs, CO 80949-1356
Bobby@AmCoBi.com
(719) 694-1980
www.AquaHawkAlerting.com

What
results can
you expect?



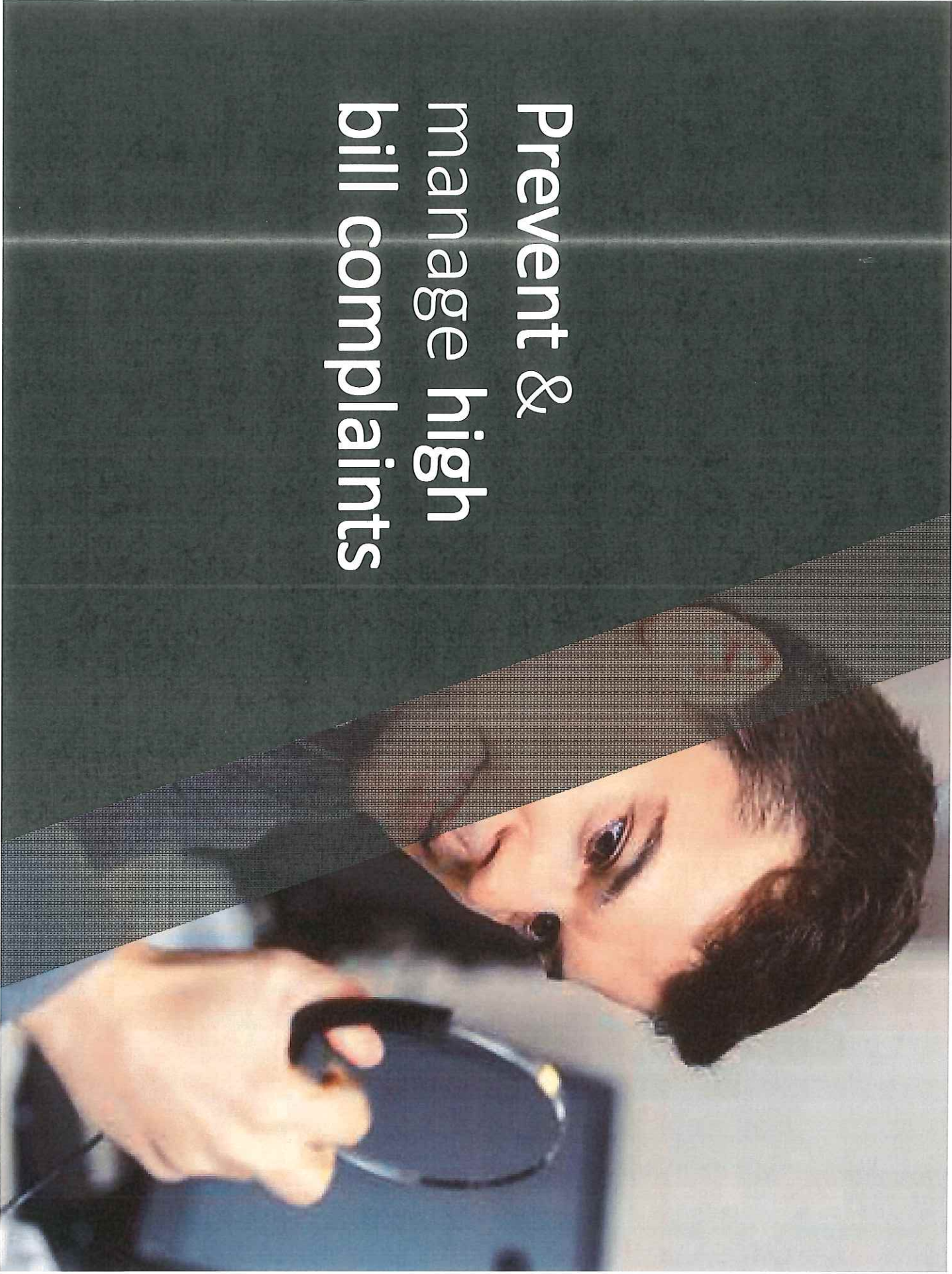
View Utility Consumption

Customers and view consumption data, notifications, and make payments 24 hours a day, 7 days per week.



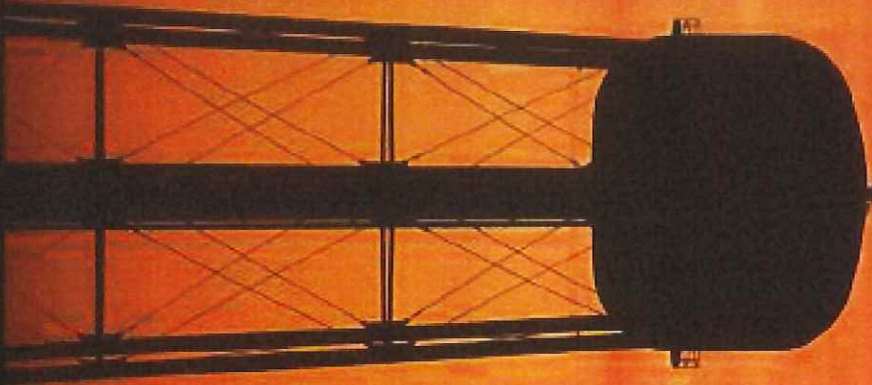
Identify leaks
quickly.
Notify
customers
easily.





Prevent & manage high bill complaints

Improve Employee Efficiency



Identify meter issues impacting revenue



Advanced leak detection & notification





Customer Benefits

**Save
money**

**Help
customers
manage
expenses**

**Improved
water
efficiency**

**Prevent
property
damage**



Customer Features

Customers can view:

- Hourly consumption by hour/day/week/month/year
- View and pay current bill amounts
- Receive timely notifications regarding leaks or other consumption issues
- View annual use comparisons over the same time last year
- View irrigation consumption patterns for efficient irrigation use
- Receive timely notifications about boil notices, water outages or other service interruptions
- Set thresholds on their account for:
 - A dollar amount during the billing cycle
 - A water use amount during the billing cycle
 - Set meter threshold amounts for hourly, daily, weekly, or monthly
 - Set a continuous use volume over a selected period of time such as 4, 8 16, or 24 hour period

PROPOSAL

An AquaHawk Proposal for:
City of De Pere, WI
11.26.18



Attachment: Proposal City of De Pere WI AquaHawk 12-3-18 (7691 : Consider Purchasing AquaHawk Water Meter Software*)

HELLO!

November 26, 2018

Mr. Scott Thoresen
Public Works Director
City of De Pere
335 S. Broadway
De Pere, WI 54115

Hi Mr. Thoresen-

Attached is a proposal for AmCoBi to provide the City of De Pere with a customer portal using the **AquaHawk™** solution and incorporating data from your Sensus FlexNet fixed base Advanced Metering Infrastructure (AMI) system.

This project will provide De Pere customers with online access to their consumption data, leak notifications, and much more. AquaHawk will help your utility enhance customer service, encourage client self-service, and improve operational efficiency.

We build long term relationships with our clients by consistently executing and delivering high value. Please contact us with any questions you have or additional information you need.

Sincerely,

Bobby Lee
AquaHawk
Office: (877) 410-0167 x1980
Mobile: (719) 661-6844
E-mail: Bobby@AmCoBi.com

Attachment: Proposal City of De Pere WI AquaHawk 12-3-18 (7691 : Consider Purchasing AquaHawk Water Meter Software*)

PROPOSAL

City of De Pere Background

The City provides wastewater, stormwater, and water services to residents and businesses in De Pere, WI. The City uses a Sensus FlexNet system to read 10,000 water meters remotely. Sensus hosts the City's RNI. De Pere is considering implementing a customer portal so that customers may benefit from the information and data recorded by the FlexNet system.

AmCoBi Background

AmCoBi is a privately-held software development and billing company founded in 2008 and based in Colorado Springs, Colorado. AmCoBi has grown rapidly over the years by delivering valuable solutions to municipal water providers and through a steady stream of referrals. AmCoBi offers Web portal solutions, water conservation evaluation services, and utility billing.

We currently work with 75 utilities and manage more than 650,000 meters in the AquaHawk system.

The AmCoBi Difference

AmCoBi develops solutions designed to help water providers deliver a higher standard of service to their customers and increase client satisfaction. Not only will AquaHawk encourage client self-service and provide a powerful tool for resolving high bill complaints, it offers tremendous public relations value.

Your customers will get a better understanding of how they're using water, be able to manage their expenses more effectively, and receive timely notifications when leaks or other issues are detected. By making it easy to communicate quickly with customers, in the communications mode they prefer, De Pere can encourage clients to fix leaks quickly and prevent the property damage they so often cause.

We believe our team is best equipped to deliver the results you're looking for. We have experienced strong growth by delivering comprehensive capabilities, at affordable prices, and by providing outstanding training and support.

AmCoBi will be a trusted partner throughout this entire project. We are committed to accomplishing your objectives. We also know that your requirements will evolve over time. AquaHawk has been architected to support future changes and enhancements.

PROPOSAL

An Expert Team

AmCoBi's software engineering team has decades of experience developing large scale, commercial Web and database applications for various industries including: utilities, computer networking, manufacturing, retail, and more.

AmCoBi's team is comprised of seven experienced software engineers. Several members have been a part of, and have managed, teams in Fortune 500 companies that developed and supported products sold worldwide.

The software team is responsible for developing the AquaHawk application. AquaHawk uses the Software-as-a-Service (SaaS) model and is hosted at one of the world's most reliable hosting providers.

The software team will be responsible for configuring AquaHawk, importing account information, integrating AMI and other data, and launching the production site.

AmCoBi's Client Care team will be responsible for managing the scope of work and ensuring that tasks are being completed according to designated timelines, as well as delivering progress reports to the City. The team will also provide online training and ongoing support.

AQUAHAWK

AquaHawk is a hosted customer portal solution that enables utilities to present water consumption data to their clients in a secure website. After registering online, customers gain access to their current usage, past usage, and other useful comparisons.

AquaHawk also offers the following capabilities:

- **Leak Detection & Notification:** Employees use this module to notify customers via automated call (AquaVoice™), text, or e-mail when potential leaks have occurred
- **Estimated Bill:** Customers can see the estimated cost of the water they've already used (any time during the billing cycle), as well as a projected end-of-period bill
- **Threshold Alerting:** Customers can establish a billing or usage threshold (\$ and/or gallons) and be notified when their bill amount/consumption exceeds, or is projected to exceed, that value.

New features are continually added to AquaHawk. As an example, an improved mapping feature will be released soon, and other reporting capabilities will be released in the near future.

Intuitive and Easy-to-Learn

AquaHawk was developed with utility customers in mind. It is an intuitive, easy-to-use application that requires minimal training to understand. Your customers will thank you for giving them the tools they need to better understand how they're using water and to manage expenses.

In addition, utility employees can be trained on the application quickly. AquaHawk has been engineered to simplify complex tasks so customer service and front desk employees can perform them effortlessly.

Affordably Priced

AquaHawk offers comprehensive capabilities at affordable prices. The AquaHawk service agreement may be terminated with a 30-day notice so the onus is on our company to continually earn your business.

Supports Future Customizations

We believe that your requirements will evolve over time. AquaHawk has been architected to support future changes and enhancements. In fact, numerous capabilities added to the system have been a direct result of the responses and feedback provided by our clients. De Pere's input will help guide the future direction of the AquaHawk system.

No Hardware or Software Purchases Required

AquaHawk uses the SaaS or subscription model so that the City does not need to purchase or install any hardware or software. Implementing the system requires minimal time and effort on the part of your IT team, and ongoing support and maintenance is provided by AmCoBi. AquaHawk can be deployed quickly--i.e. within 30 days.

AQUAHAWK

Seamless Data Integration

AmCoBi currently works with thirty-five (35) utilities that use the Sensus FlexNet system. Usage data can be integrated via an SFTP process.

One of AmCoBi's strengths is exchanging data between AquaHawk and other systems (e.g. billing, accounting, electronic payment services, etc.) to streamline the customer experience and minimize manual data entry.

Browser-based Operation

A unique instance of AquaHawk will be provided to De Pere. Authorized staff members and customers operate the system using a standard Web browser.

Reliable, High Performance Hosting

AmCoBi uses a reputable, high quality hosting provider for the AquaHawk solution. Their cloud-based computing platform is flexible, cost-effective, and instantly scales as more resources are required. The firm's service is secure, durable, and they maintain industry-recognized certifications and audits such as: ISO 27001 and SAS 70 Type II.

Their data centers have multiple layers of operational and physical security so you can be sure your data is safe and protected. Moreover, AquaHawk uses a commercial database noted for speed, fault tolerance, and high performance.

Backups are automated and geographically diverse replication prevents any data loss in the event of a hardware failure, network disruption, or large scale power outage. Disaster recovery is built-in.

Comprehensive Training and Support

The AquaHawk system is intuitive, user-friendly, and easy to learn. To ensure, however, that your staff members can manage the application effectively, AmCoBi also provides individualized online training and support. AmCoBi will assign a dedicated account manager so you'll always be able to reach a live person via telephone or e-mail.

95% of all calls are answered immediately. AmCoBi commits to following up telephone and e-mail inquiries within twenty-four (24) hours. We make extensive use of online conferencing tools for product training, support, and troubleshooting.

SCOPE OF WORK

Scope of Work

To initiate this project and make AquaHawk available to De Pere customers, the following tasks need to be completed:

- Configure the AquaHawk portal
- Import customer account and rate tier information
- Integrate consumption data from the FlexNet RNI
- Provide software training to employees
- Launch the production site and notify customers of the new service
- Provide ongoing support to employees.

The following is a draft timeline for implementing the AquaHawk solution:

Due Date	Task Description	Responsible Party
Week 1	The City signs an SaaS Services Agreement to proceed with this project.	De Pere
Week 1	Configure the AquaHawk portal for the City.	AmCoBi
Week 2	Import customer account and rate tier information.	AmCoBi
Week 2	Integrate AMI consumption into AquaHawk.	AmCoBi & Sensus
Week 3	Provide software training to employees.	De Pere & AmCoBi
Week 4	Launch the production site.	De Pere & AmCoBi

REFERENCES & PRICING

References

Please feel free to contact the following organizations to learn more about similar projects we've conducted:

Village of Howard

Mr. Geoff Farr
Public Works Director
336 Cornell Road
Green Bay, WI 54313
(920) 434-4060
gfarr@villageofhoward.com

City of Appleton

Mr. Nate Loper
Deputy Director of Public Works
100 N. Appleton Street
Appleton, WI 54912
(920) 832-5580
Nathan.Loper@Appleton.org

Village of Bellevue

Mr. William Balke, PE
Public Works Director
2828 Allouez Ave.
Bellevue, WI 54311
(920) 468-5225
billb@villageofbellevue.org

Pricing

Pricing for the AquaHawk service is comprised of the following:

- A **one-time setup fee** to configure the system, upload customer information and data, and for initial system training
- A **monthly fee** for each account in the system. This fee includes ongoing e-mail and telephone support
- **CMEP Export** - Sensus charges to enable the CMEP export on the RNI. Please contact Sensus to receive a SOW for this implementation.

Description	# of Meters	Setup Fee (One-time)	Monthly Fee	Total (Yr. 1)	Price per Account per Year (Yr. 2+)
AquaHawk v10.20	10,000	\$ 10,000	\$ 1,042	\$ 22,500	\$ 1.25

NOTE: This pricing is the agreed to pricing for the Central Brown County Water Authority Group.

SUMMARY

Summary

Should City of De Pere choose to move forward with the AquaHawk solution, AmCoBi will send a Software-as-a-Service Agreement for signature. A project plan and implementation schedule will also be delivered for your review and approval.

AquaHawk is helping numerous water utilities around the U.S. elevate the level of service they provide to customers, and it can help your City too. We commit to making this project a notable success. Let us know how we can best serve you.

Sincerely,

Bobby Lee
Director of Sales
AmCoBi

**CITY OF DE PERE FIVE-YEAR CAPITAL IMPROVEMENTS PLAN
2018 – 2024**

CAPITAL PROJECTS WORKSHEET

PROPOSED BY: Water Department

DATE PREPARED: August 11, 2018

DESCRIPTION OF PROJECT:

Water Distribution Management – Meter Software.

NEW: X or REPLACEMENT: _____

PROJECTED COST: \$25,000

PROPOSED METHOD OF FINANCING: \$ _____ % _____

GENERAL FUND _____ .

CAPITAL IMPROVEMENTS FUND _____ .

GENERAL OBLIGATION DEBT _____ .

SPECIAL ASSESSMENT _____ .

GRANTS _____ .

X OTHER **Water Utility = \$25,000** _____ .

ADDITIONAL ANNUAL OPERATING AND MAINTENANCE COSTS (Identify) _____ .

PROJECT JUSTIFICATION

The intent is to joint purchase with the other members of the Central Brown County Water Authority (CBCWA) the meter software AquaHawk that will provide the City and their customers on line access to consumption, leak notifications, and much more. This software will enhance customer service and operational efficiencies. An example of improvement in operational efficiencies it currently takes approximately fifteen (15) minutes per meter alarm to determine what the issue(such as a water leak) and what customer has an issue with their meter. AquaHawk will notify immediately the problem and the address. In the case of the water leak, if the customer has their contact information in the system, it will call to let them know they have a water leak on their property so that they can investigate right away resulting in savings from water loss.

PROJECT RANKINGS

CITY COUNCIL _____ .

STAFF RECOMMENDATION _____ **Goal No.** _____ .

Attachment: 2018 Water Distribution Management - Meter Software (7691 : Consider Purchasing AquaHawk Water Meter Software*)

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Consider Updates to 2019 General Conditions and Standard Specifications

ATTACHMENTS:

- CI-BOPW-2019_Specifications-12-10-2018 (DOCX)
- 2019 Standard Specification Updates (PDF)
- 2019 Standard Specifications (PDF)

City of De Pere

Public Works Department

Memo

To: Honorable Mayor Walsh
Members of the Board of Public Works
From: Eric P. Rakers, P.E., City Engineer
Date: December 10, 2018
Subject: Consider Updates to 2019 General Conditions and Standard Specifications

Listed in the memo are proposed updates to the City of De Pere's 2019 General Conditions and Standard Specifications. Specifications need to be updated on a regular basis to accommodate changes in the industry, as well as improving the clarity of the documents. The last update was completed in 2018. There are several changes to this document. Listed below is a summary of the major changes to the specifications.

New De Pere logo inserted

Section 00 70 00 General Conditions

- (1) Increased Liquidated Damages by 20%. These amounts have not been updated in over 8 years.

Section 32 16 20 – Concrete Sidewalks and Driveways

- (1) Under Section 3.3, Expansion Joints,
 - a. Under Section A, inserted the words “concrete street” to A.4.
 - b. Under Section A, inserted “5. Where sidewalk and driveway adjoin existing concrete driveways.”

Section 33 11 00 – Water Distribution Systems

- (1) Under Section 1.2, added the reference to the NFPA as follows:
 - E. National Fire Protection Association
 - “1. NFPA 291 Recommended Practice for Fire Flow Testing and Marking of Hydrants.”
- (2) Under Section 2.2, inserted the reference to NFPA 291 and updated the colors slightly from “Safety” to the NFPA. This is only a slight change in the shade of the colors.
- (3) Updated Section 2.6 B.5.b. for McDonald model numbers for corporation stops/valves.
- (4) Updated Section 3.11 G. so that the City is taking the water samples for the bacterial test for water main construction.

Attachment: CI-BOPW-2019_Specifications-12-10-2018 (7706 : 2019 Specification Updates)

Section 33 31 00 – Sanitary Sewer Systems

- (1) Under Section 2.3 A.4.b., added language to allow Pro-Ring adjustment rings for manholes.
- (2) Under Section 3.1 D.2.f.2) added language to require a minimum of 2” of depth of rubber rings at each manhole.

Section 33 41 00 – Storm Sewer Systems

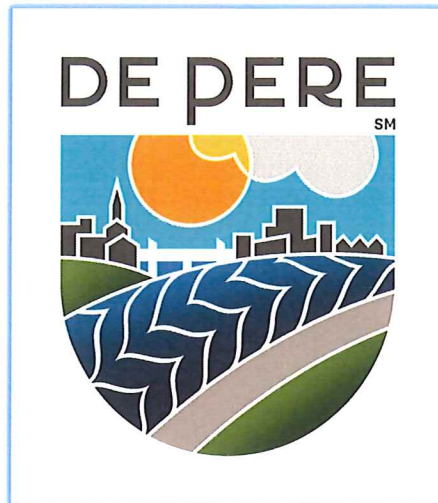
- (1) Under Section 2.1.B., added a new allowable gasket and clarified the use of saddles or gaskets based on the type of pipe.
- (2) Under Section 2.3 A.4.b., added language to allow Pro-Ring adjustment rings for manholes and inlets. Also added language requiring tapered rings for inlets located where streets are sloped.
- (3) Under Section 2.3.D.7., updated the model number and words on the inlet castings.
- (4) Under Section 3.1 D.2.f.2) added language to require a minimum of 2” of depth of rubber rings at each manhole.
- (5) Under Section 3.1 D.2.f.3) added language to require a minimum of 2” of depth of rubber rings at each inlet.

Standard Detail Updates

- (1) C-1 – Updated title to “Residential Concrete Driveways”
- (2) C-2 – Clarified expansion joint locations.
- (3) C-3 – Clarified expansion joint locations.
- (4) C-5 – Updated detail to require epoxy coated rebar.
- (5) S-3 – Updated detail to allow concrete from paving under rubber ring for concrete pavement construction.
- (6) S-6 - Updated detail to allow concrete from paving under rubber ring for concrete pavement construction.
- (7) S-7 – Updated detail to show concrete dams on laterals near the property line.
- (8) W-1 – Updated hydrant cap colors from “Safety” to NFPA 291.

Staff is requesting approval of the 2019 Standard Specification.

CITY OF DE PERE



DEPARTMENT OF PUBLIC WORKS

2019 STANDARD SPECIFICATIONS

December 10, 2018

2019 Specifications

City of De Pere

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	\$355 425
\$150,000	\$300,000	\$455 545
\$300,000	\$500,000	\$615 740
\$500,000	\$1,000,000	\$880 1055
\$1,000,000		\$1140 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

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- 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 ¼ 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 ¼ 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.
 - 4.5. Where sidewalk and driveway adjoin existing concrete driveways.
 - 5.6. Where driveway and sidewalk adjoin curb and gutter.
 - 6.7. Where 4" thick sidewalk meets 6" thick sidewalk at curb ramps.
 - 7.8. 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.

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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 Association1. 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.

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- 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 – ~~Safety-Light~~ Blue – Rated capacity of 1500 gpm or greater
 - 2. Class A – ~~Safety~~ Green – Rated capacity of 1000-1499 gpm
 - 3. Class B – ~~Safety~~ Orange – Rated capacity of 500-999 gpm
 - 4. Class C – ~~Safety~~ 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 will consist of a five (5) feet long 3/8 inch diameter fiberglass shaft with chrome plated carbon steel spring mount for flexibility. The shaft will have alternating six (6) inch wide red and white reflective striping.
- 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.

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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

b.2) 1 1/2" & 2" - 74701BQ

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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: 1/4 - 20 x 1 1/4
 - c. Nylon Stainless Steel Locker
6. Acceptable Manufacturers:
 - a. Ford B44-444M
 - b. McDonald 6104Q
 - c. Mueller B25155

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- 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 ~~Contractor-City of De Pere~~with results provided to the Engineer.
- H. Upon successful completion of disinfection, place the water main in service to maintain system pressure.

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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".

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- 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.
 - h. The pipe shall enter the barrel of the manhole through a flexible, watertight gasket or connector.
 - 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. Manhole Drops:
 - 1) Conform to the detail Drawings.
 - 2) Furnish where designated on Drawings.
 - l. 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.
 - m. 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.

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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.
- 3-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.

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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),

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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, R-32357007B curb box with language for dump no waste drains to river/freshwater.
8. Beehive Grate and Casting: Neenah Foundry No. R-2560-D3.

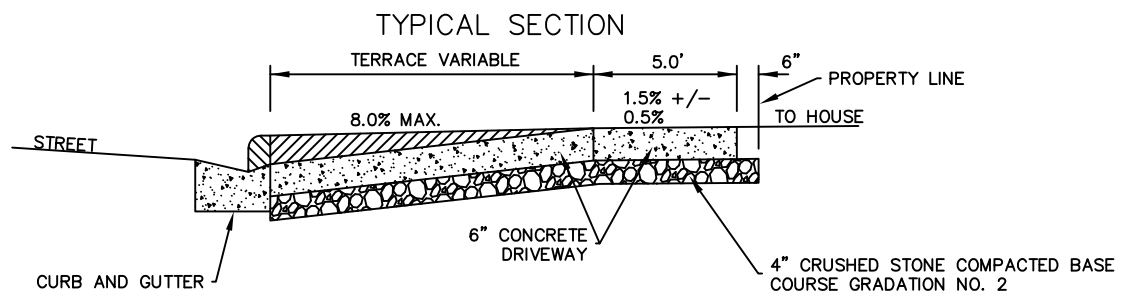
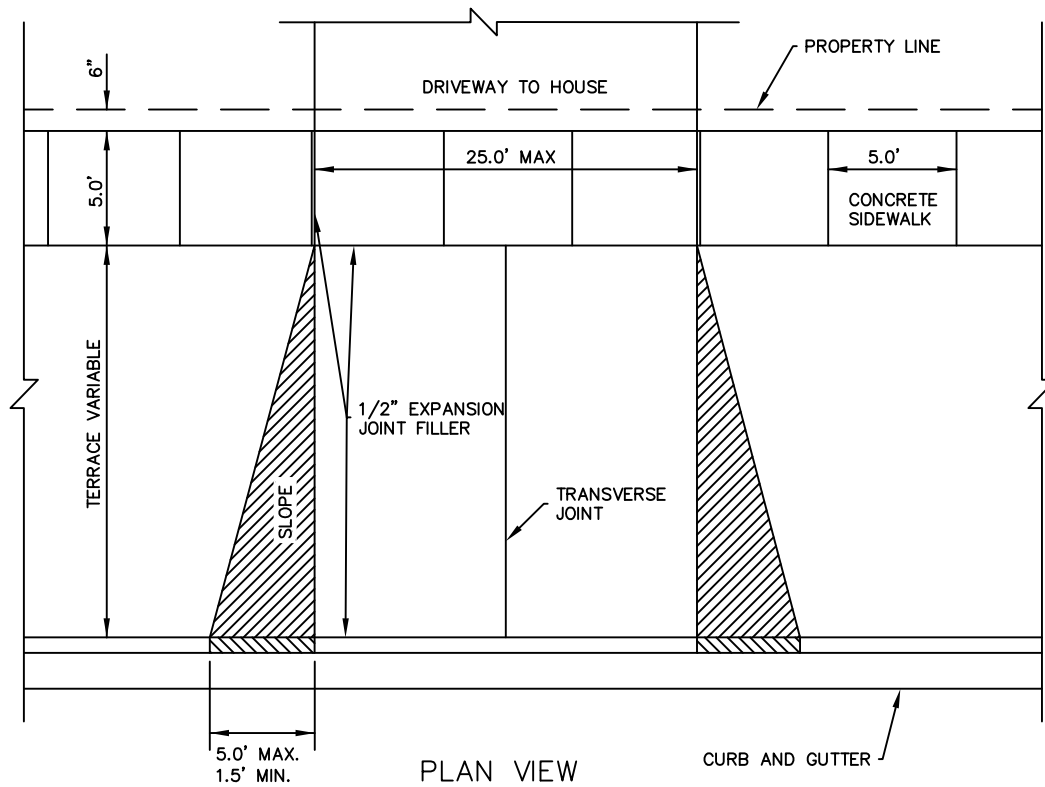
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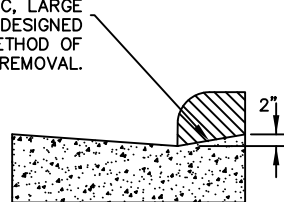
2019 Specifications

City of De Pere

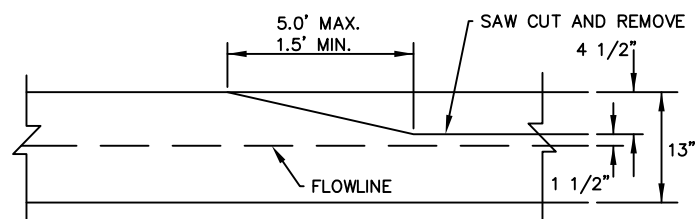
- e. Seal exterior of lift holes with bituminous plastic cement.
- f. Fill the following with mortar and finished smooth.
 - 1) Interior joints and lift holes.
 - 2) Annular space around pipes
- g. Construct manholes and inlets in accordance with the appropriate detail drawings.
- h. Install structures 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.~~
- ~~h.g.~~ Do not enter manhole with pipe through cone section.
- ~~i.h.~~ Pipe connections to manholes
 - 1) grout pipe in-place inside and outside the manhole with mortar or gasket providing a soil tight seal.
- ~~j.i.~~ Precast flat top may be used in lieu of a cone section when elevation is limited.
- ~~k.j.~~ Provide Type 1 frames and covers for each manhole unless otherwise shown on the plan details.
- ~~l.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.



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

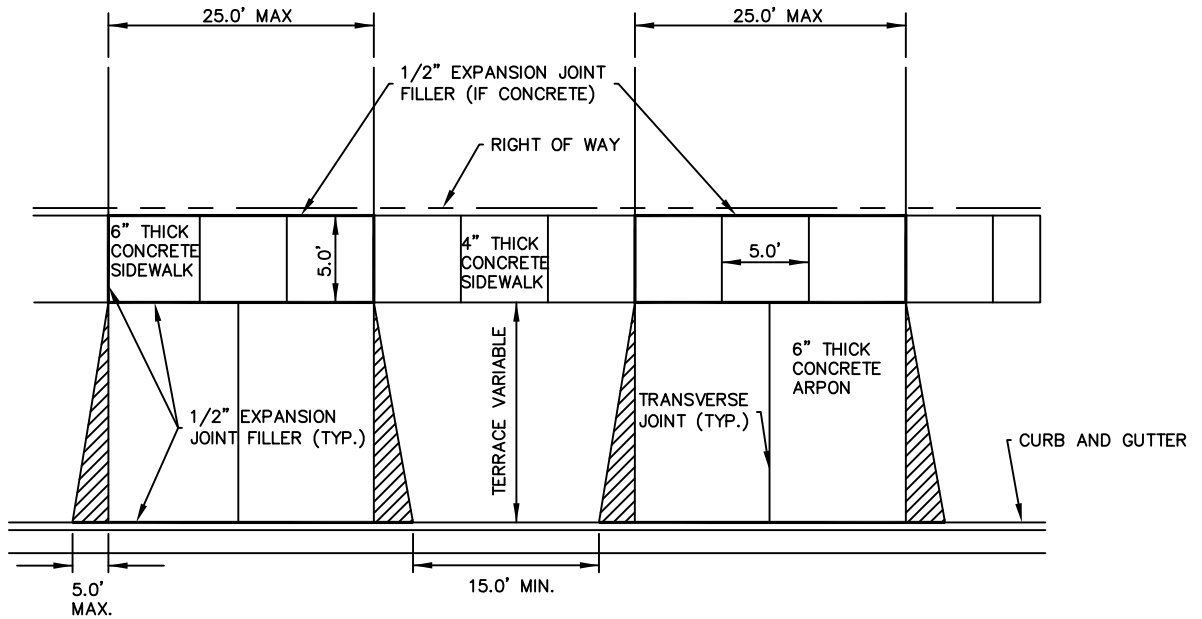
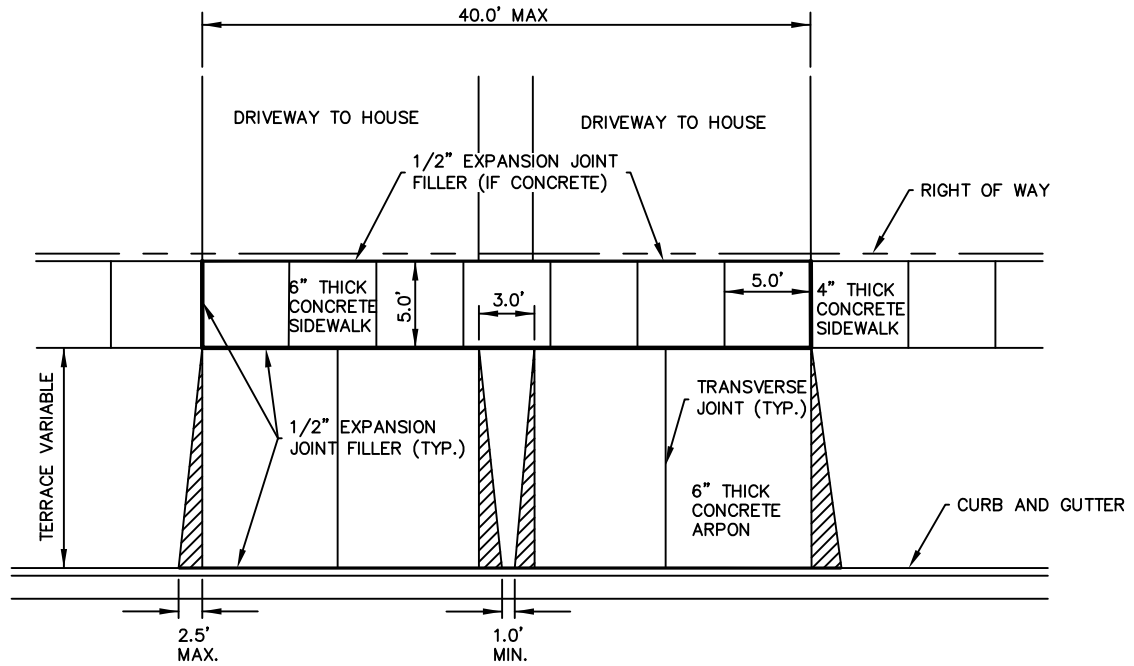
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DE PERE, WI 54115OFFICE 920-339-4061
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RESIDENTIAL
CONCRETE DRIVEWAYS

DIVISION: 32

DRAWING NO:
C-1DATE: 12/2018
BY: KAD

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Packet Pg. 140



ENGINEERING DIVISION

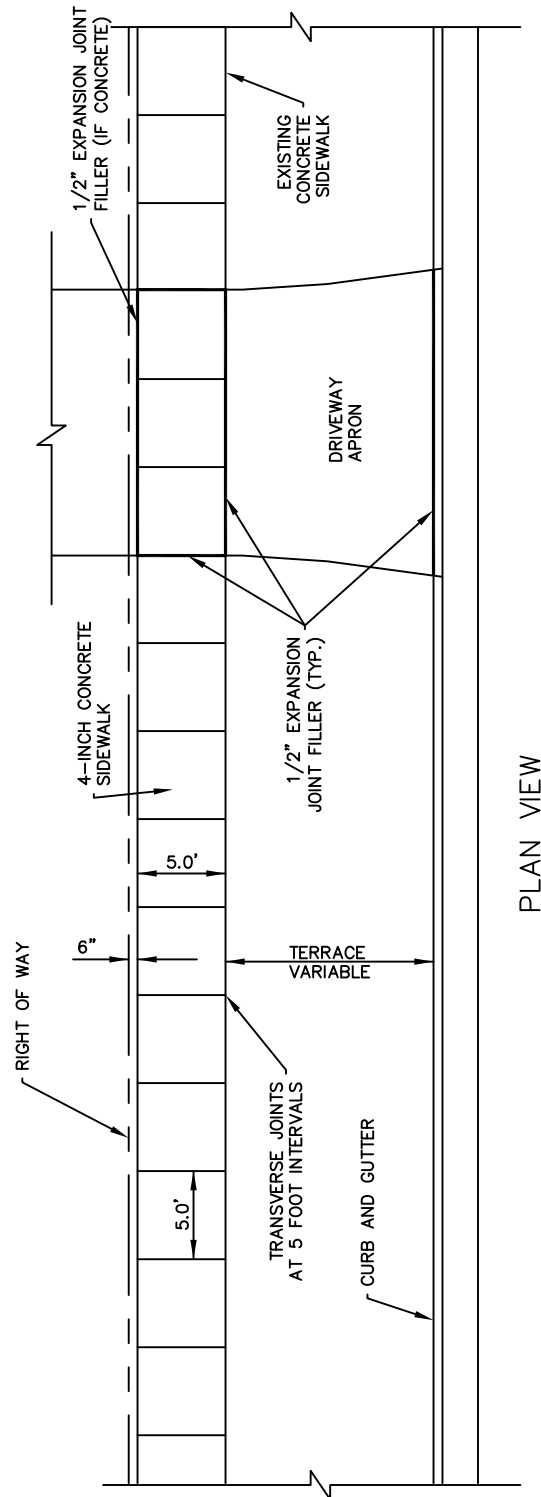
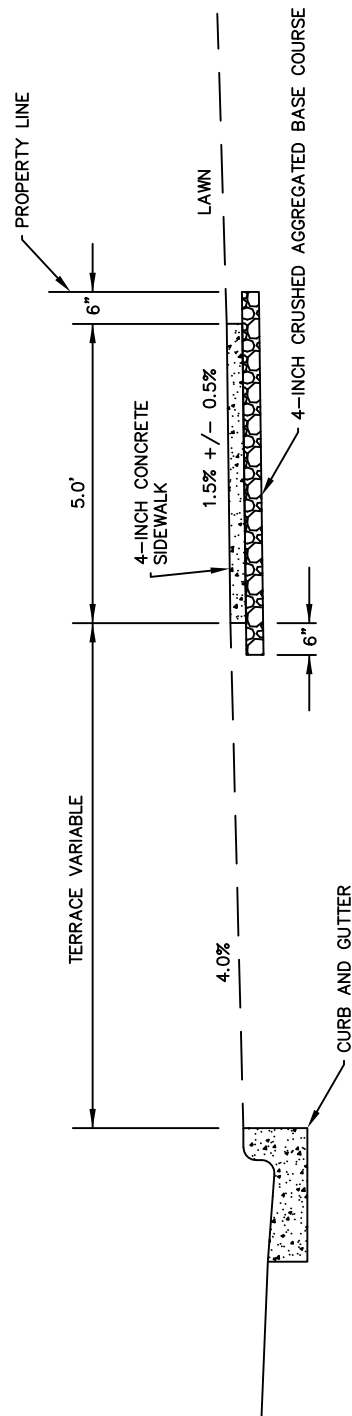
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DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
DUPLEX DRIVEWAYS

DIVISION: 32

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BY: KAD

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NOTE:

1. CONCRETE DRIVEWAY THICKNESS:

- RESIDENTIAL - 6" DEPTH
- COMMERCIAL/INDUSTRIAL - 8" DEPTH



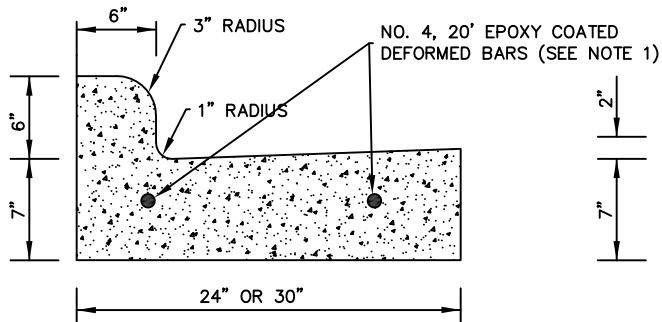
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925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
CONCRETE SIDEWALKS
AND DRIVEWAY

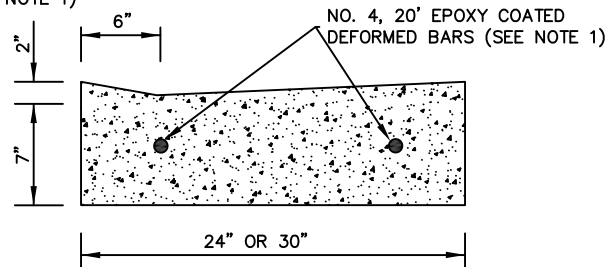
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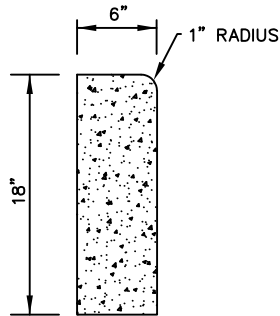
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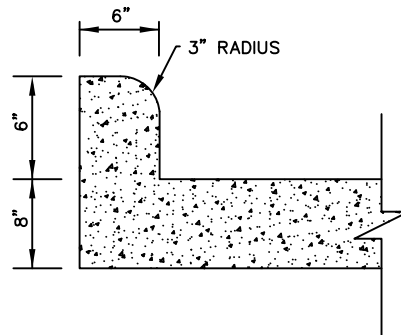
CURB AND GUTTER



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.



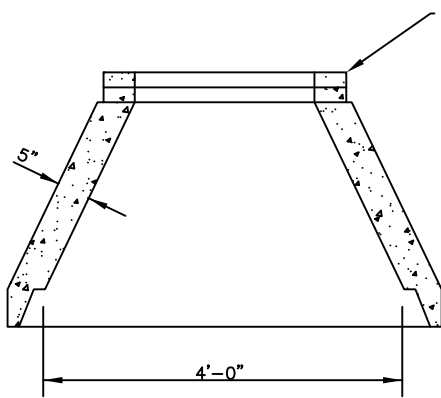
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
CONCRETE CURB
CURB AND GUTTER
AND GUTTER

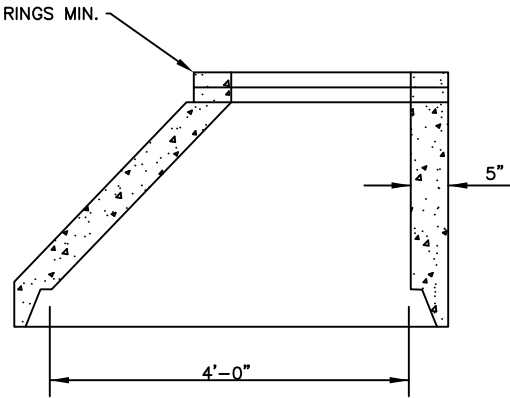
DIVISION: 32

DRAWING NO:
C-5DATE: 12/2018
BY: KAD
CHECKED:

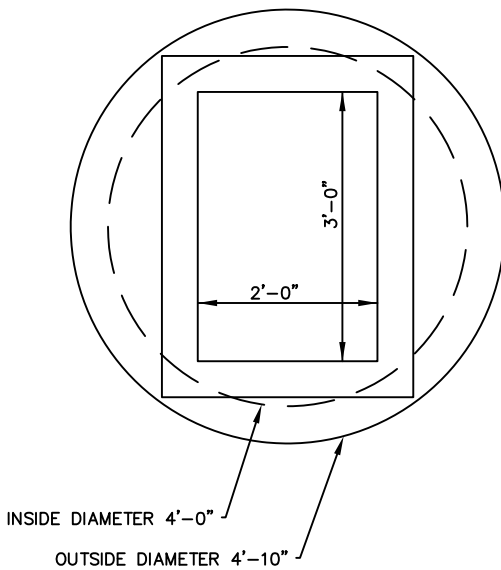
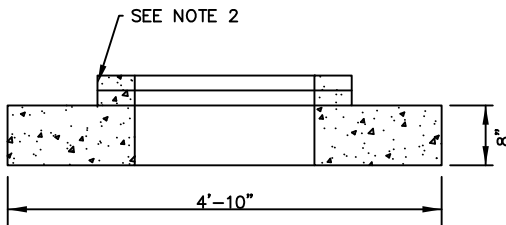
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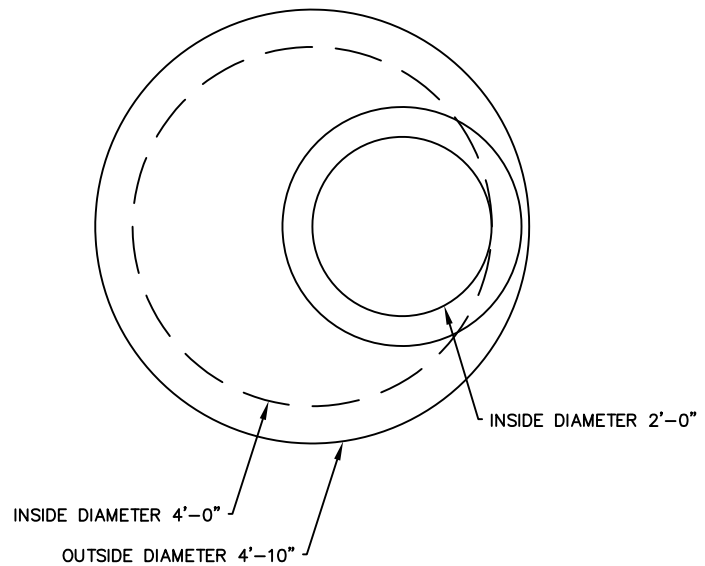
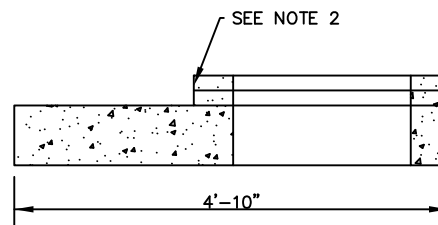
CONCENTRIC CONE
WHERE DIRECTED BY ENGINEER



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

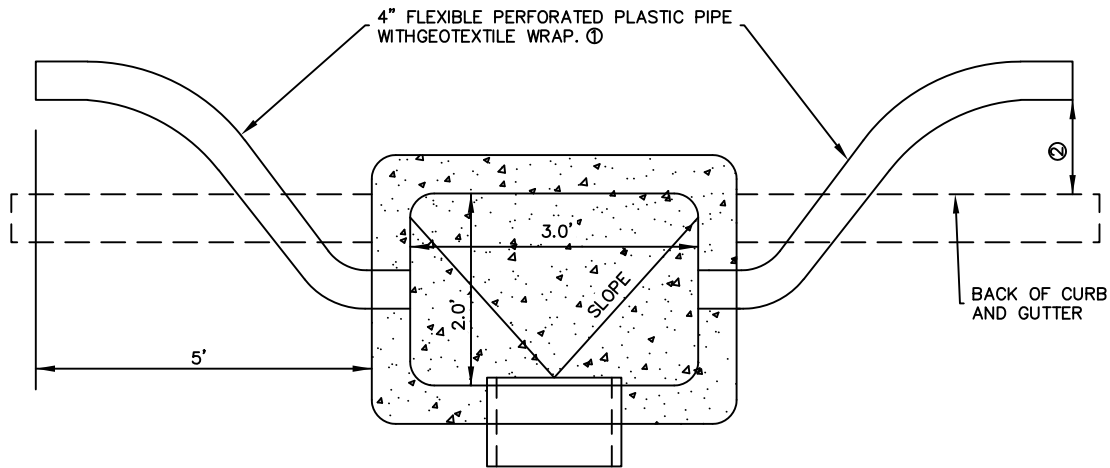
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PRECAST CONCRETE
CONES AND COVERS
ASTM C478

DIVISION: 33

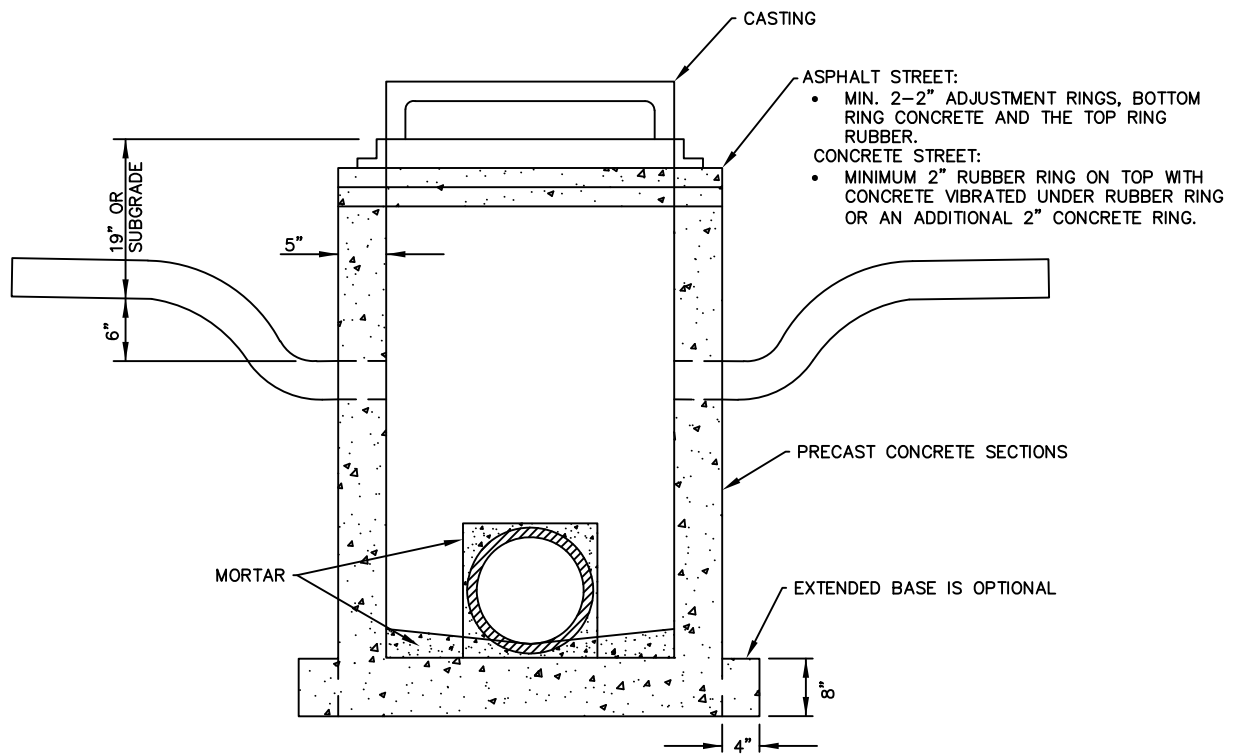
DRAWING NO:
S-3

DATE: 12/2018
BY: KAD
CHECKED:

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- 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.



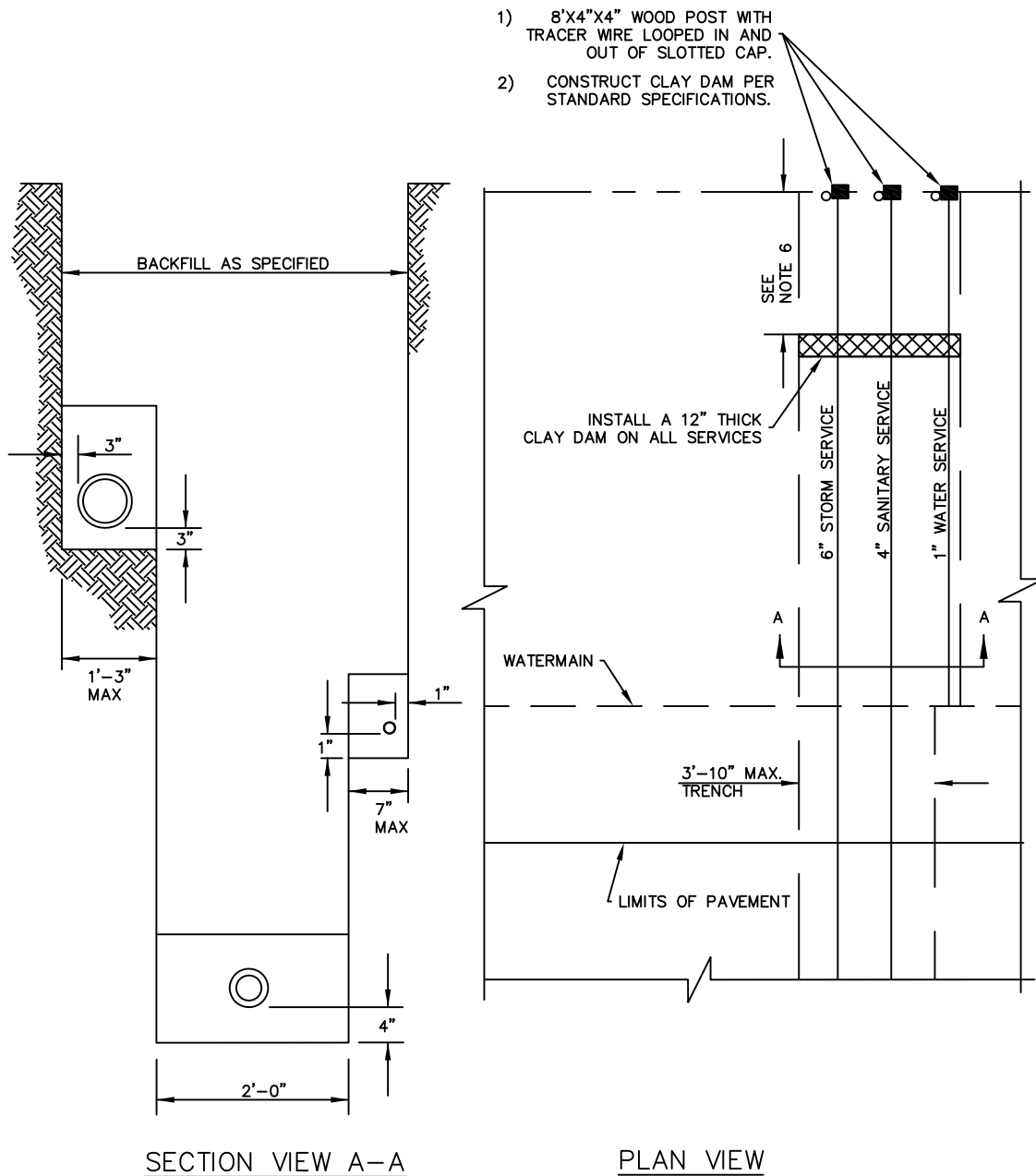
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
TYPE B INLET

DIVISION: 33

DRAWING NO:
S-6DATE: 12/2018
BY: KAD
CHECKED:

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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



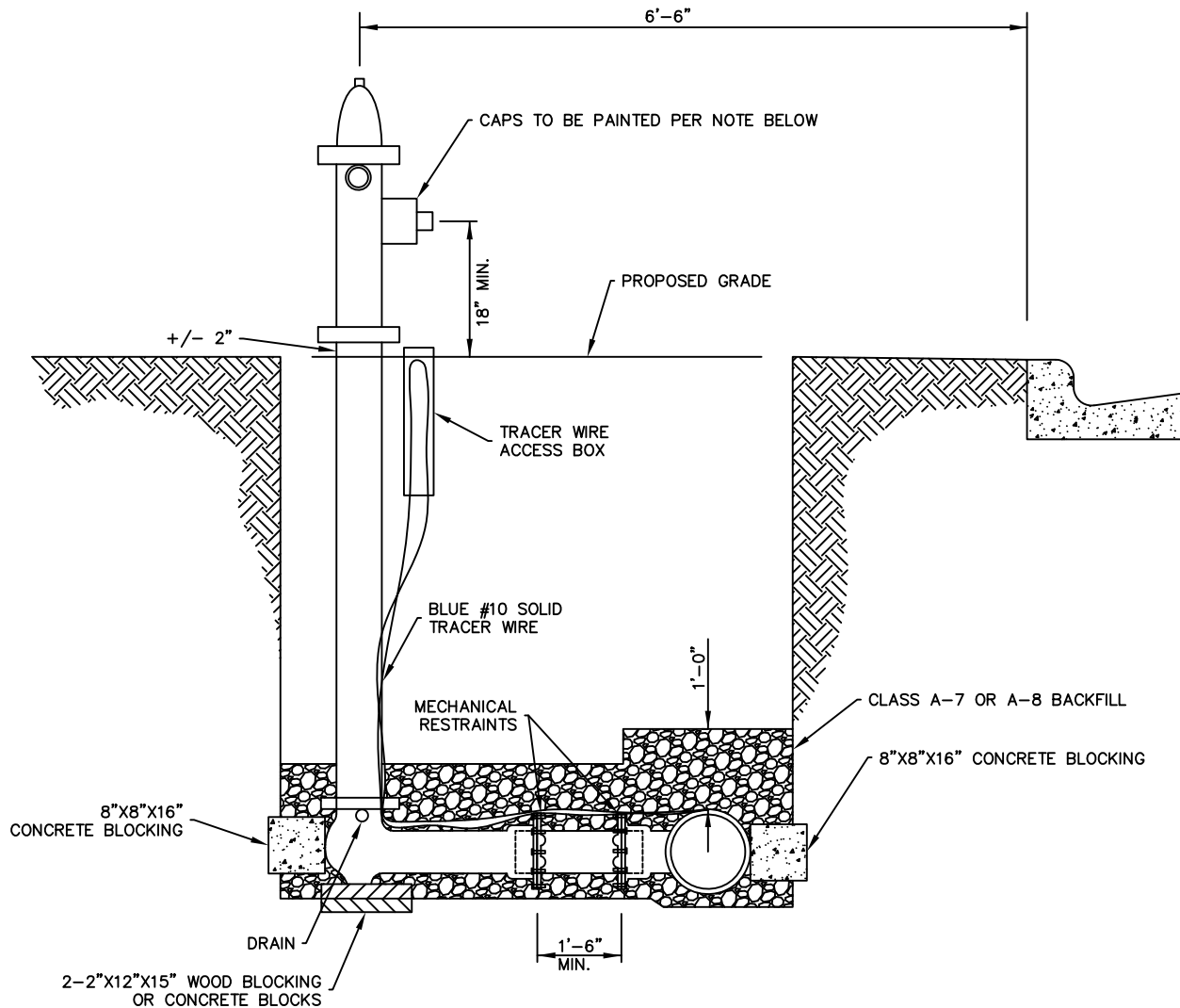
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
SANITARY, STORM
AND WATER
SERVICES

DIVISION: 33

DRAWING NO:
S-7DATE: 12/2018
BY: KAD
CHECKED:

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NOTES:

- HYDRANTS SHALL BE SET VERTICAL.
- CONCRETE BLOCKING AND WOOD BLOCKING SHALL BE INSTALLED AGAINST FIRM NATURAL GROUND AS REACTION BACKING FOR TEE AND HYDRANT SHOE.
- REGARDLESS OF DEPTH OF MAIN, THE BREAKAWAY FLANGE MUST BE +/- 2 INCHES ABOVE THE PROPOSED GRADE.
- 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.
- ENCASE ENTIRE HYDRANT IN POLYETHYLENE ENCASEMENT.
- TRACER WIRE SHALL BE RUN UP HYDRANT.
- BLOCKING AND MEGA LUGS REQUIRED.
- HYDRANT CAPS TO BE PAINTED PER THE NFPA STANDARD 291, BASED ON FLOWS AS DETERMINED BY THE ENGINEER:
 - CLASS AA- LIGHT BLUE - RATED CAPACITY OF 1500 GPM
 - CLASS A - GREEN - RATED CAPACITY OF 1000-1499 GPM
 - CLASS B - ORANGE - RATED CAPACITY OF 500-999 GPM
 - CLASS C - RED - RATED CAPACITY OF LESS THAN 500 GPM



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
HYDRANT

DIVISION: 33

DRAWING NO:
W-1DATE: 12/2018
BY: KAD
CHECKED:

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CITY OF DE PERE



DEPARTMENT OF PUBLIC WORKS

2019 STANDARD SPECIFICATIONS

December 10, 2018

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2019 Specifications**City of De Pere**

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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.

2019 Specifications

City of De Pere

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.

2019 Specifications

City of De Pere

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.

Attachment: 2019 Standard Specifications (7706 : 2019 Specification Updates)

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

2019 Specifications

City of De Pere

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

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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

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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

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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.

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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.

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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

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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 TELEVISION 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.

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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. |
| 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 be 90% free of steel reinforcement.
10. Crushed concrete shall contain less than 10% asphaltic pavement, surfacing, or base.

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 $\frac{3}{4}$ -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, loppers, 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 recompacted.

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. Sheeting 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.**

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- 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. Sheet piling 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 sheet piling is required, prevent soil from entering the trench either below or through such sheet piling.
 - 2. Removal of Sheet piling and Bracing
 - a. Remove sheet piling 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 sheet piling 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 93% 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 93% 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 from 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.

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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 manufactured by HI-SPEC 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.

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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

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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 batch in accordance with ASTM C94.
 - 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.

2019 Specifications**City of De Pere****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 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 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 ½ 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 ⅛ inch for sawed joints, ¼ inch for other types.
 - b. Maximum ¼ inch for sawed joints, ⅜ 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.

2019 Specifications

City of De Pere

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

Attachment: 2019 Standard Specifications (7706 : 2019 Specification Updates)

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).

2019 Specifications

City of De Pere

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			

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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 productions date of all materials.
2. Manufacturer's certification that the materials delivered were manufactured, sampled, tested, and inspected in accordance with this 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 ½ 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 ration, 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 ½” 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 – Light 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 will consist of a five (5) feet long 3/8 inch diameter fiberglass shaft with chrome plated carbon steel spring mount for flexibility. The shaft will have alternating six (6) inch wide red and white reflective striping.
- 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.

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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. 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 1/2" & 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: 1/4 - 20 x 1 1/4
 - 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.
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 566055 48 inch stationary Type 304 Stainless Steel curb box rod.
7. Length shall be 7 foot bury.
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.

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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 - $\frac{3}{4}$ " or A-8- $\frac{3}{8}$ " 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.
- 3. Alpha™ ends may be used in lieu of a mechanical restraint.
- 4. Polyvinyl Chloride (PVC) Pipe:
 - c. Megalug Series 2000 PV restraint gland or equal for mechanical joint restraint.
 - d. 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.

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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
11.25° Bend	10	10	10	10
22.5° Bend	10	10	10	10
30° Bend	10	10	10	10
45° Bend	10	10	10	10
60° Bend	10	20	20	20
90° Bend	20	20	30	40

Restrained/Tied Pipe Length Chart				
Minimum Length Requiring Restraints				
Tee (Side Tied)	20	20	30	40
Stubs or Dead Ends	20	20	30	40
Cross with Plugged End	20	20	30	40
Valve at End of Line	20	20	30	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 established grade.
- D. Provide drainage at the base of the hydrant placing crushed rock pipe bedding material.

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- 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.

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- 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 at 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.
- 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 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
 - 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.
 - h. The pipe shall enter the barrel of the manhole through a flexible, watertight gasket or connector.
 - 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. Manhole Drops:
 - 1) Conform to the detail Drawings.
 - 2) Furnish where designated on Drawings.
 - l. 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.
 - m. 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.

2019 Specifications**City of De Pere****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

- E. 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.
- F. 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 Polypropylene 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.

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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.

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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

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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.
 - g. 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.
 - h. 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.

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- 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.
 - 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.
 - 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 leaks 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. Televiser 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 10, 2018

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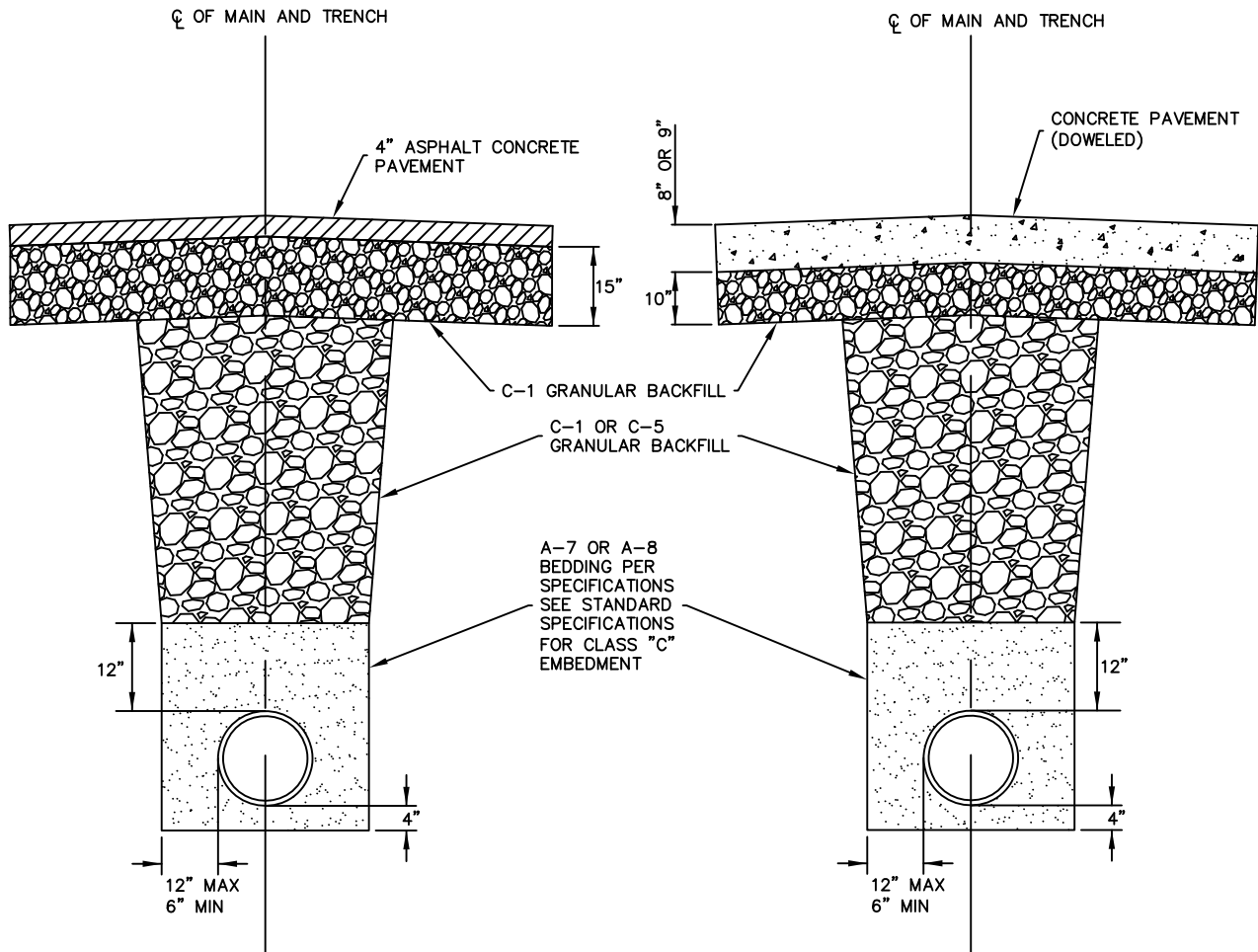
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ASPHALT PAVEMENT BACKFILL

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.



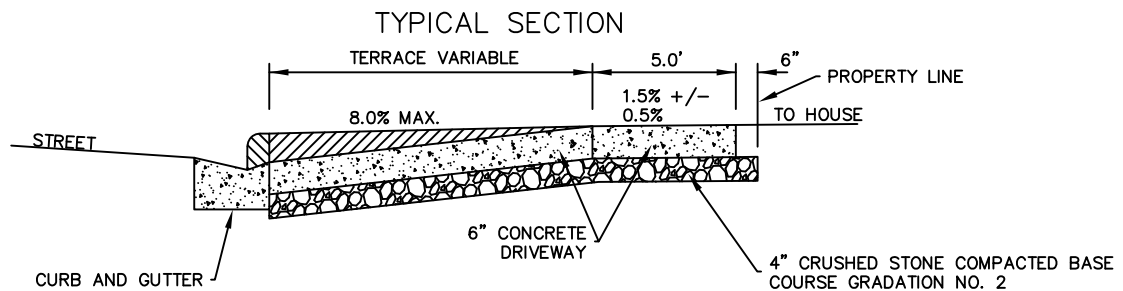
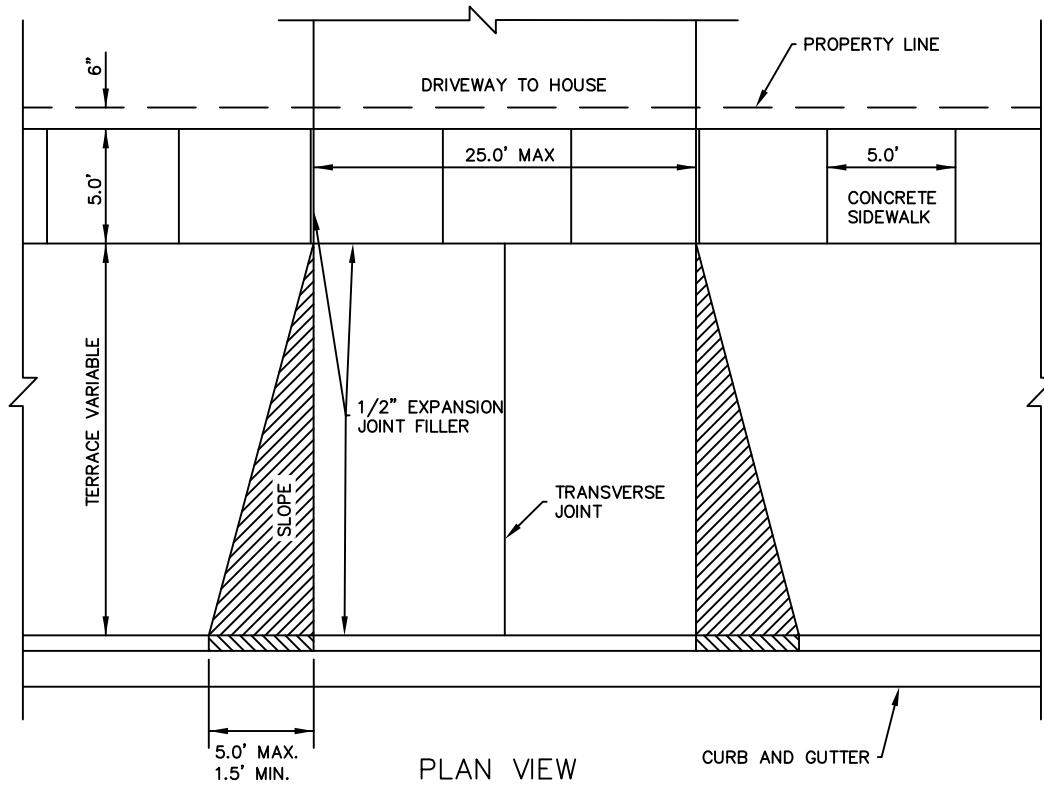
ENGINEERING DIVISION

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DE PERE, WI 54115OFFICE 920-339-4061
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TRENCHING AND
BACKFILLING

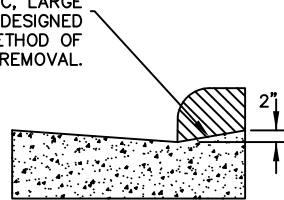
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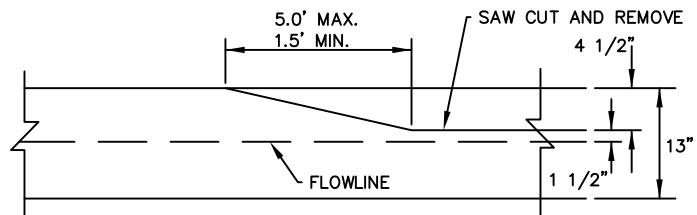
Packet Pg. 359



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



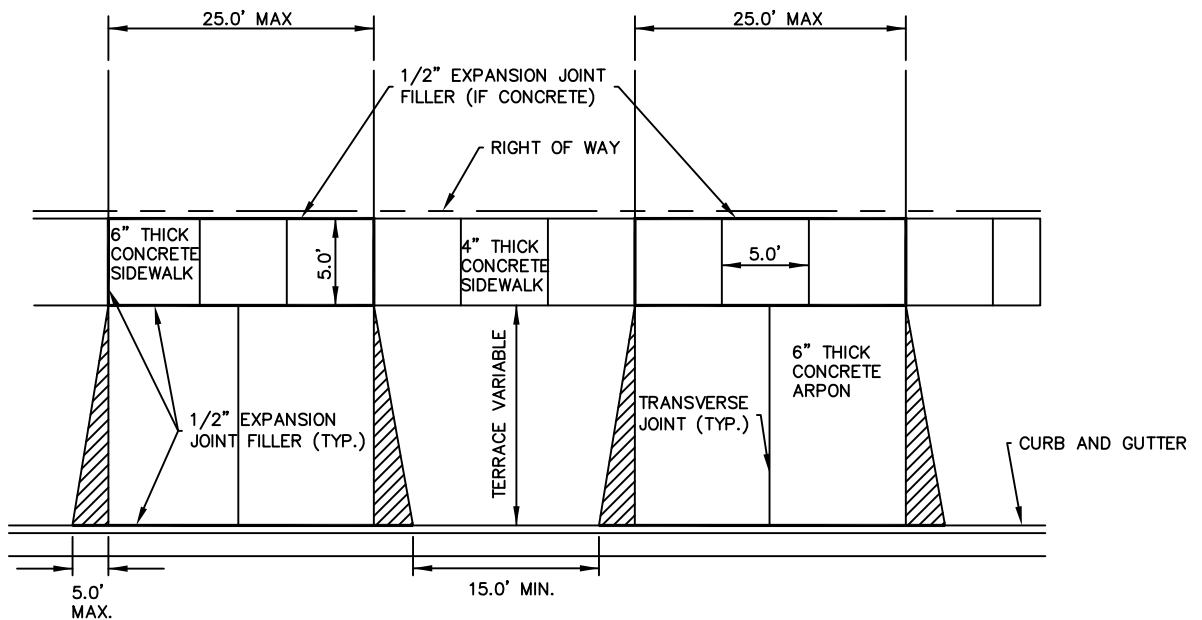
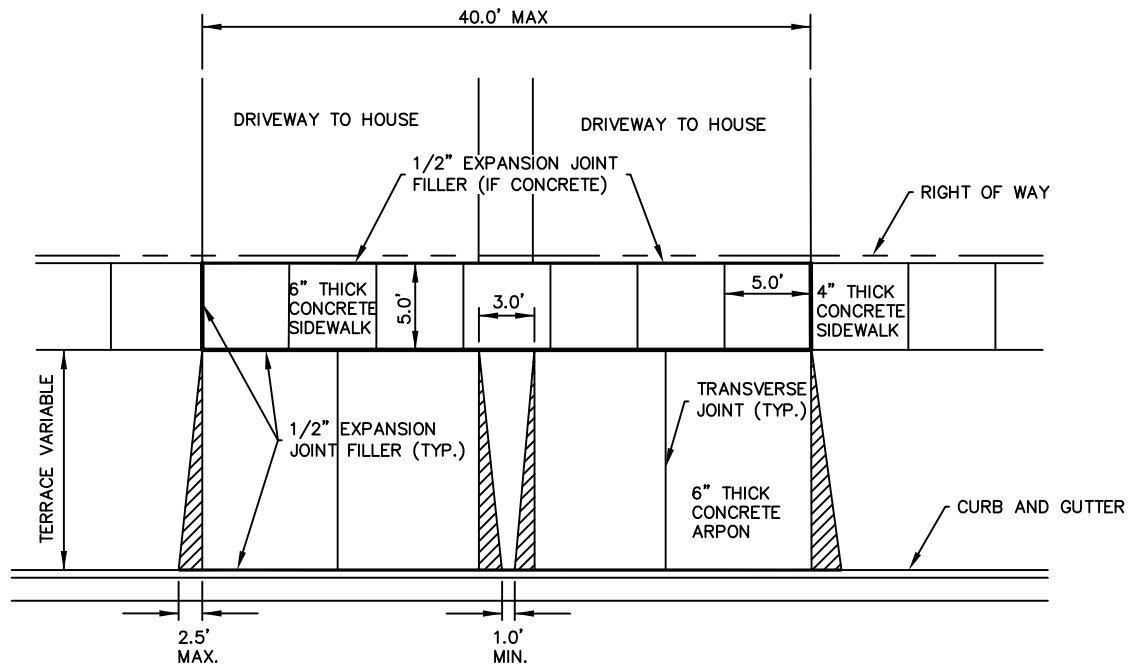
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
RESIDENTIAL
CONCRETE DRIVEWAYS

DIVISION: 32

DRAWING NO:
C-1DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 360



ENGINEERING DIVISION

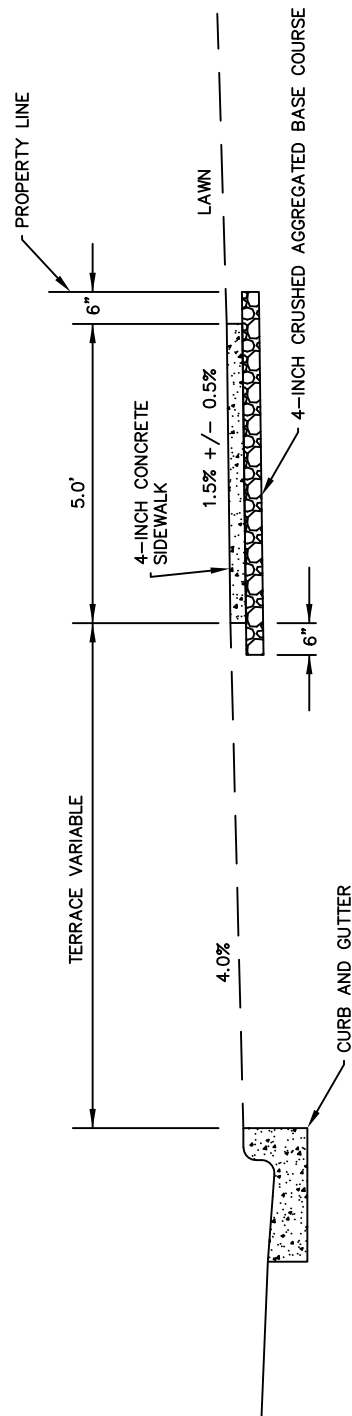
925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
DUPLEX DRIVEWAYS

DIVISION: 32

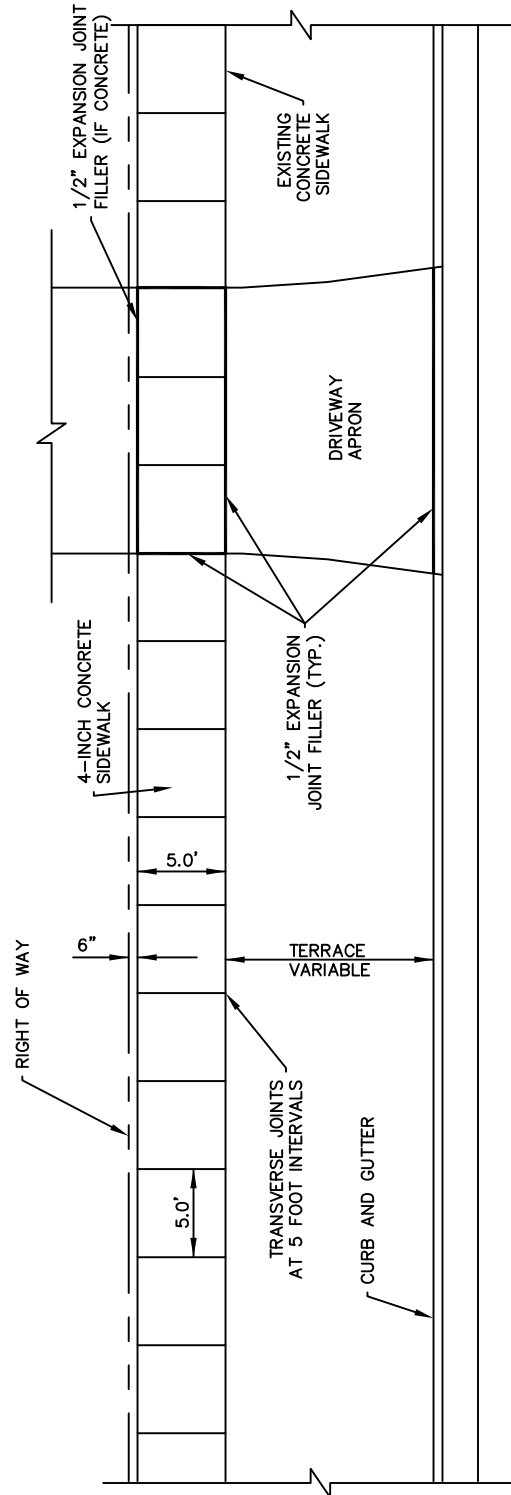
DRAWING NO:
C-2DATE: 12/2018
BY: KAD

CHECKED:

Packet Pg. 361



TYPICAL SECTION



NOTE:

1. CONCRETE DRIVEWAY THICKNESS:

- RESIDENTIAL - 6" DEPTH
- COMMERCIAL/INDUSTRIAL - 8" DEPTH



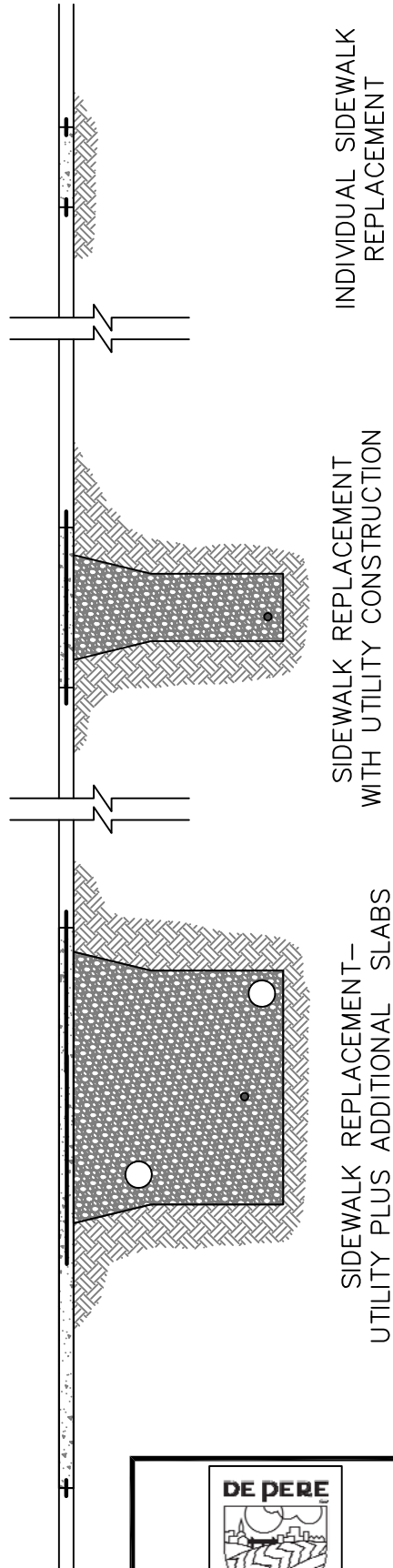
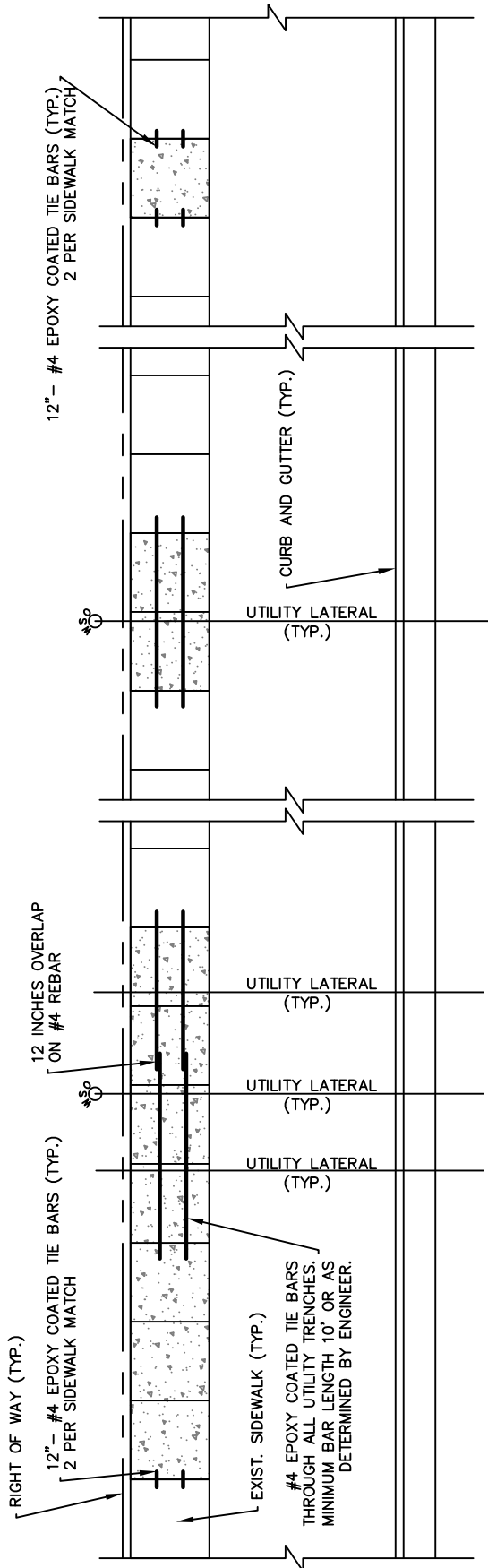
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
CONCRETE SIDEWALKS
AND DRIVEWAY

DIVISION: 32

DRAWING NO:
C-3DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 362



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

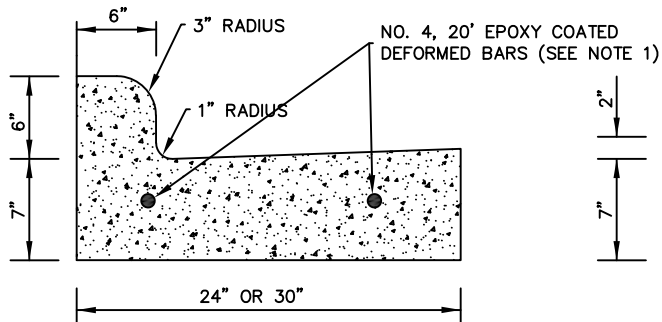
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CONCRETE SIDEWALK
REINFORCEMENTS

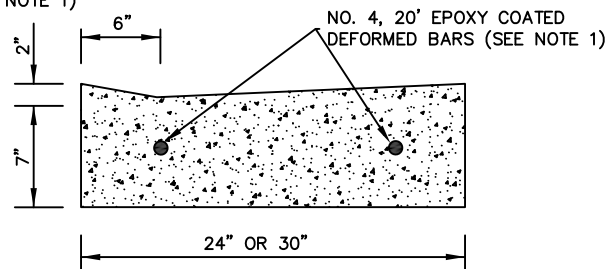
DIVISION: 32

DRAWING NO:
C-4

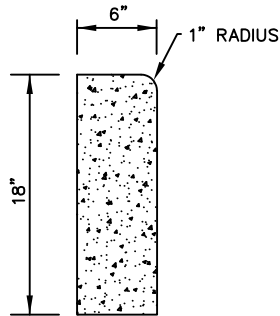
DATE: 12/2018
BY: KAD
CHECKED:



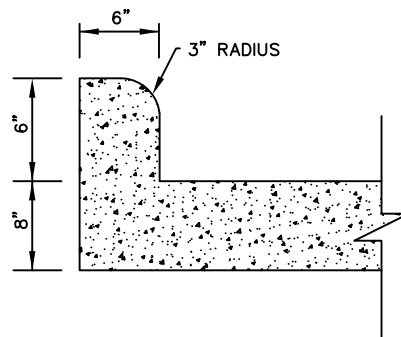
CURB AND GUTTER



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.



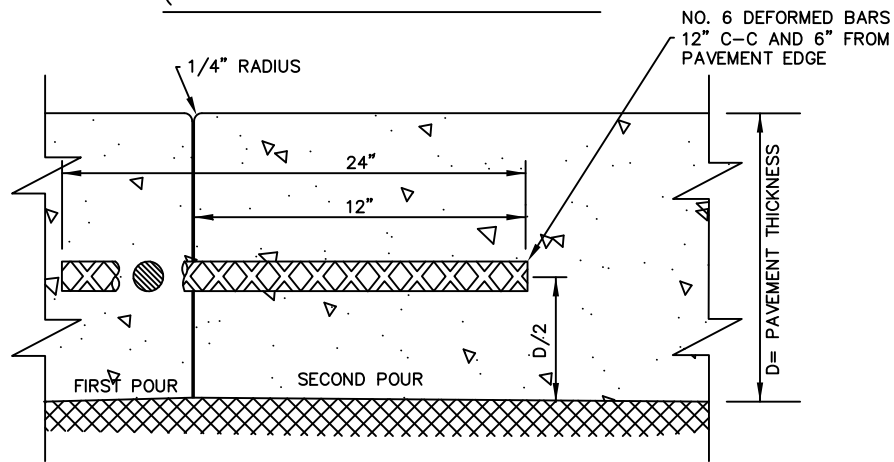
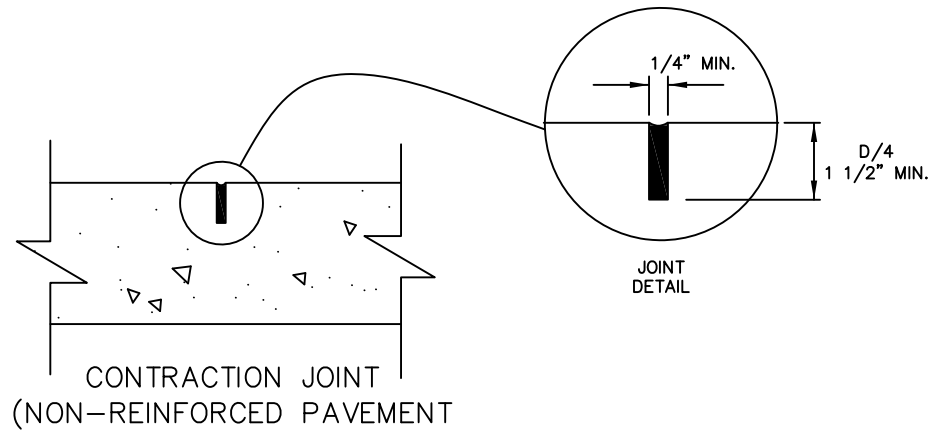
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
CONCRETE CURB
CURB AND GUTTER
AND GUTTER

DIVISION: 32

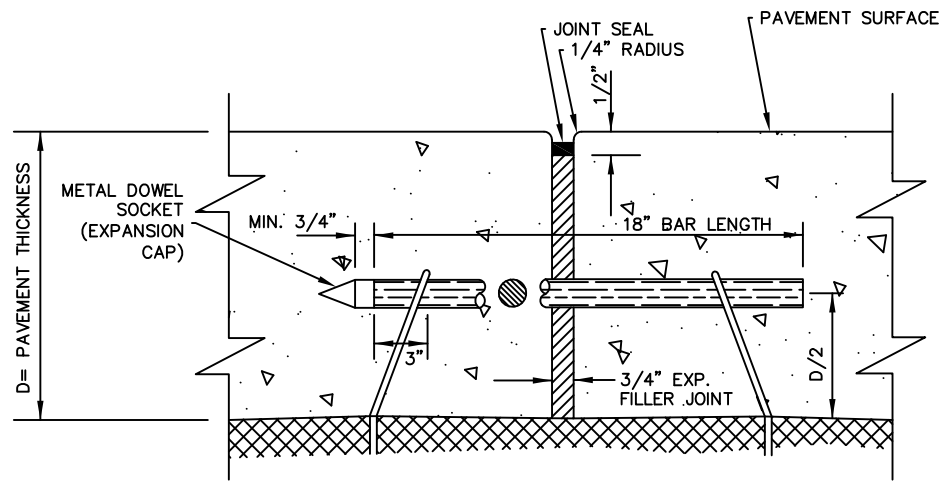
DRAWING NO:
C-5DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 364



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"



NOTES:

- ALL TIE BARS, PAVEMENT TIES AND DOWELS SHALL BE EPOXY COATED.
- RIGID BASKET ASSEMBLY FOR EXPANSION JOINT MUST HOLD DOWELS IN PERFECT ALIGNMENT.



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
TRANSVERSE
JOINTS

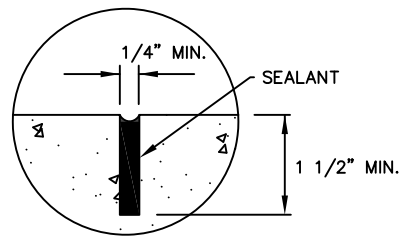
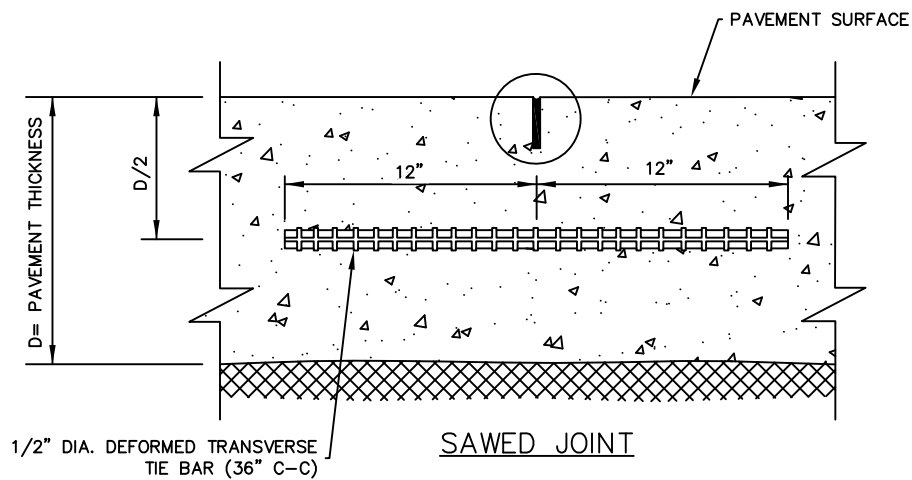
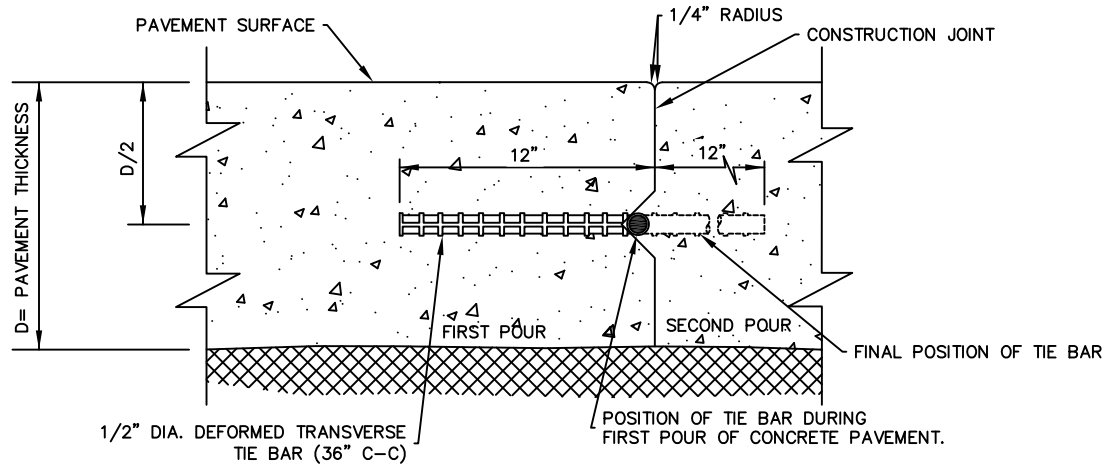
DIVISION: 32

DRAWING NO:
C-6

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 365

CONTRACTION JOINT



NOTE:

1. ALL TIE BARS, PAVEMENT TIES AND DOWELS SHALL BE EPOXY COATED.



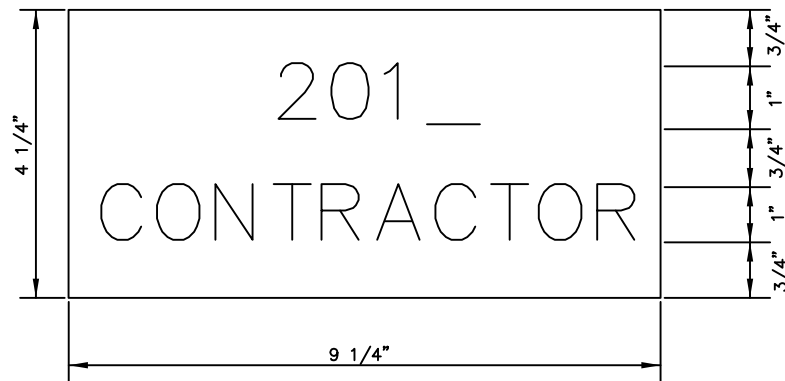
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
LONGITUDINAL
JOINTS

DIVISION: 32

DRAWING NO:
C-7DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 366



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.

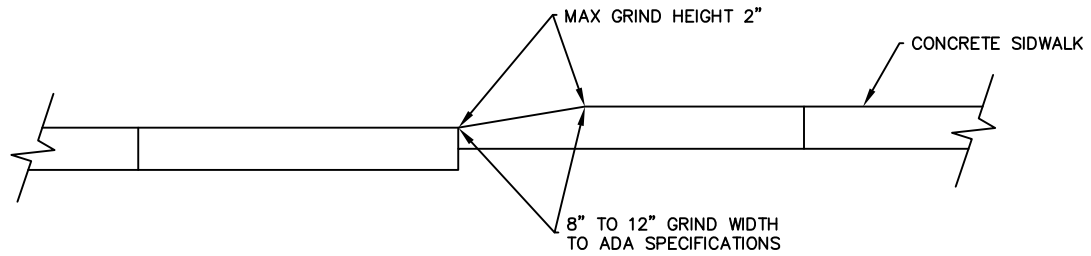


ENGINEERING DIVISION

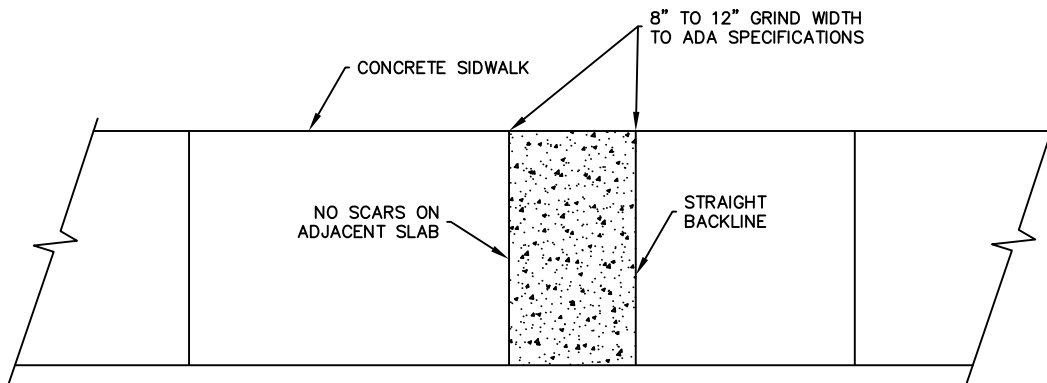
925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
CONCRETE STAMP

DIVISION: 32

DRAWING NO:
C-8DATE: 12/2018
BY: KAD
CHECKED:



TYPICAL SECTION



PLAN VIEW



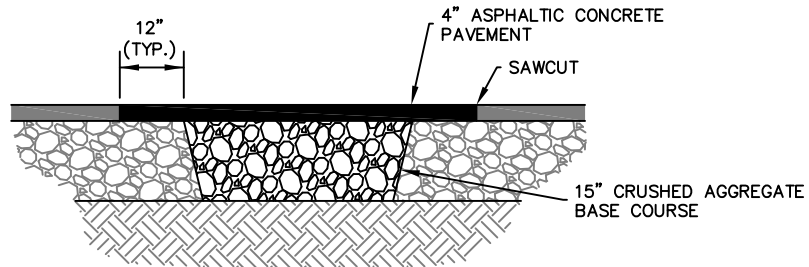
ENGINEERING DIVISION
925 S. SIXTH ST
DE PERE, WI 54115
OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
CONCRETE SIDEWALKS
GRINDING DETAIL

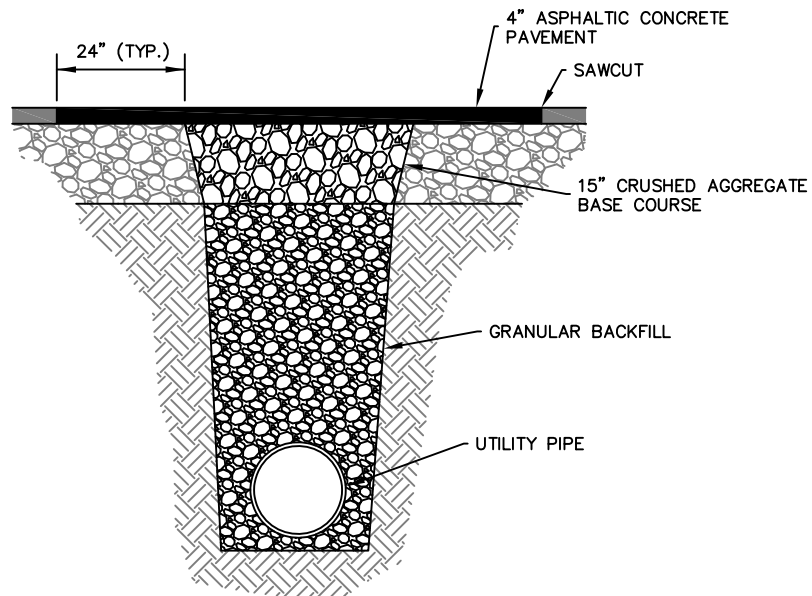
DIVISION: 32

DRAWING NO:
C-9

DATE: 12/2018
BY: KAD
CHECKED:



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

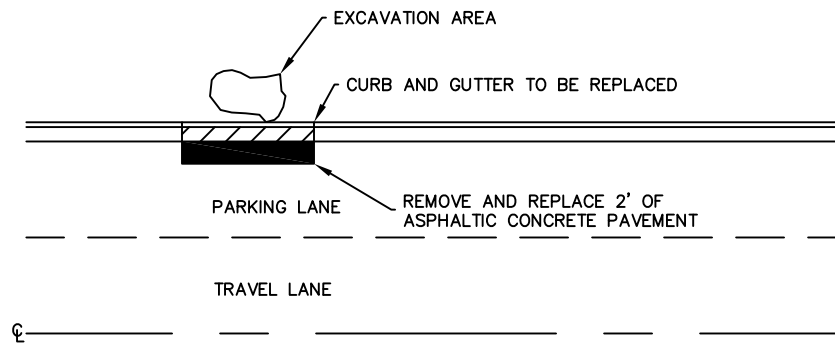
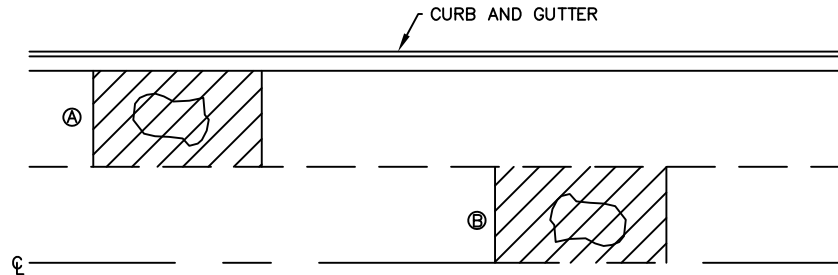
DRAWING NO:
P-1

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 369

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:

- 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.



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

TITLE:
PATCH WORK IN
ASPHALT PAVEMENT

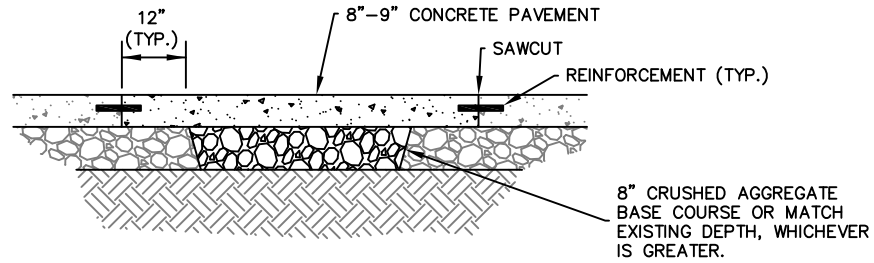
DIVISION: 32

DRAWING NO:
P-2

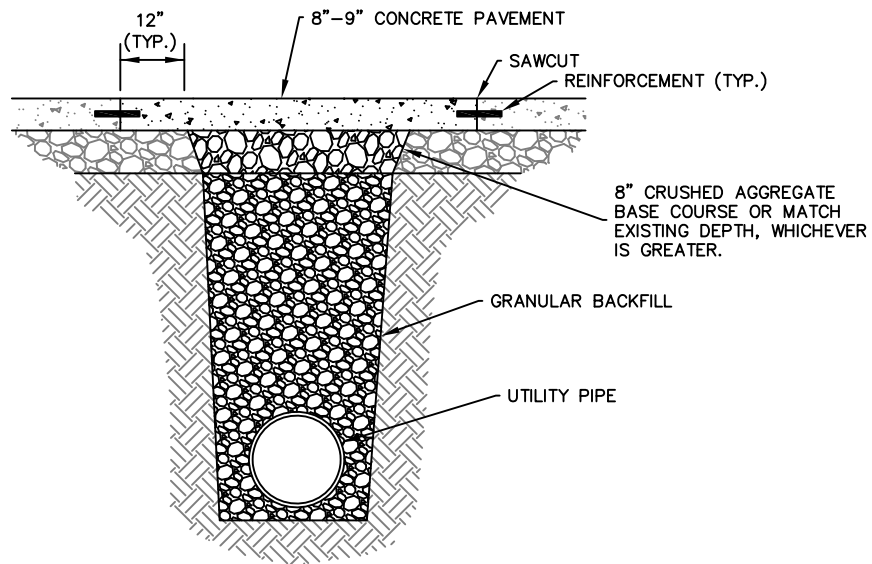
DATE: 12/2018
BY: KAD

CHECKED:

Packet Pg. 370



WORK WITHIN CONCRETE 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
CONCRETE PAVEMENT

DIVISION: 32

DRAWING NO:
P-3

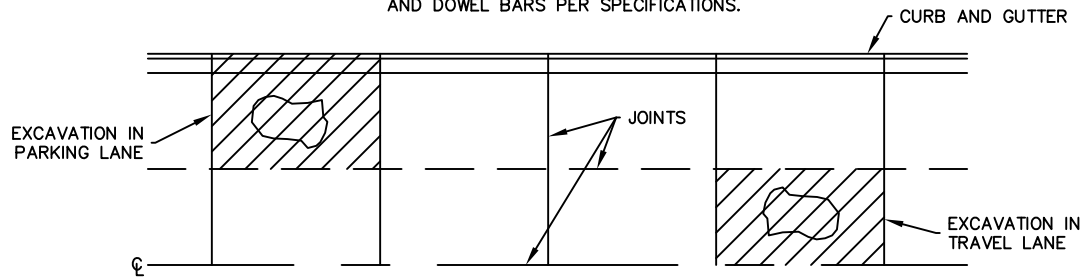
DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 371

EXCAVATION ON CONCRETE STREETS LESS THAN 15 YEARS

NOTE:

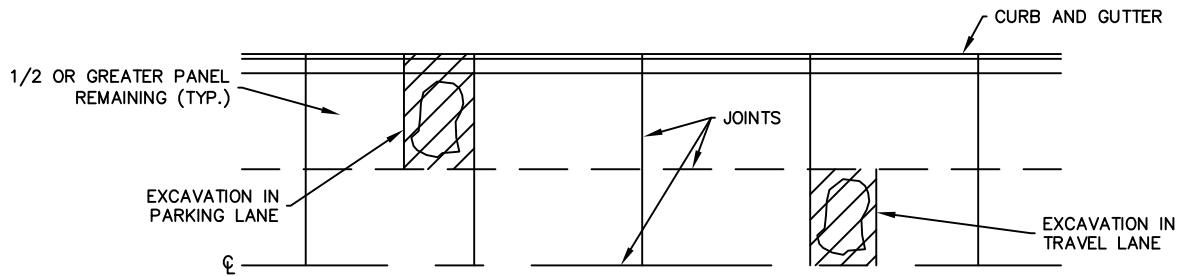
1. REPAIR TO A JOINT LINE. INSTALL TIE BARS AND DOWEL BARS PER SPECIFICATIONS.



EXCAVATION ON CONCRETE STREETS GREATER THAN 15 YEARS

NOTES:

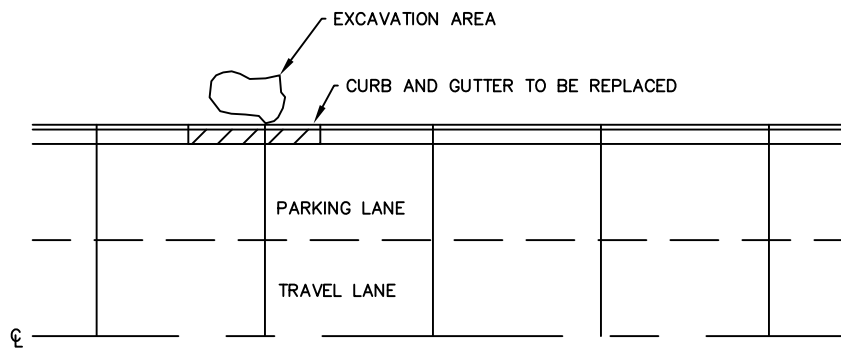
1. CONTRACTOR TO REMOVE TO THE JOINT IF REMAINDER OF PANEL IS CRACKED.
2. CONTRACTOR TO SAWCUT 12 INCHES BEYOND TRENCH WALL OR DAMAGED CONCRETE. MINIMUM PATCH MUST BE 7 FEET.
3. INSTALL TIE BARS AND DOWEL BARS PER SPECIFICATIONS.



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

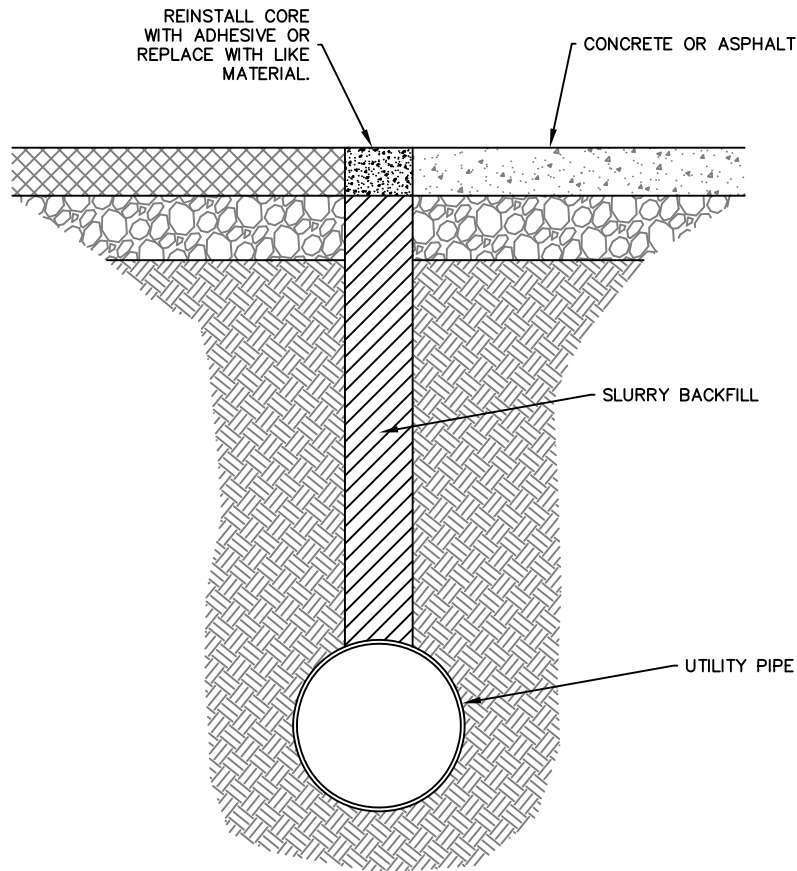
DIVISION: 32

DRAWING NO:
P-4

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 372

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

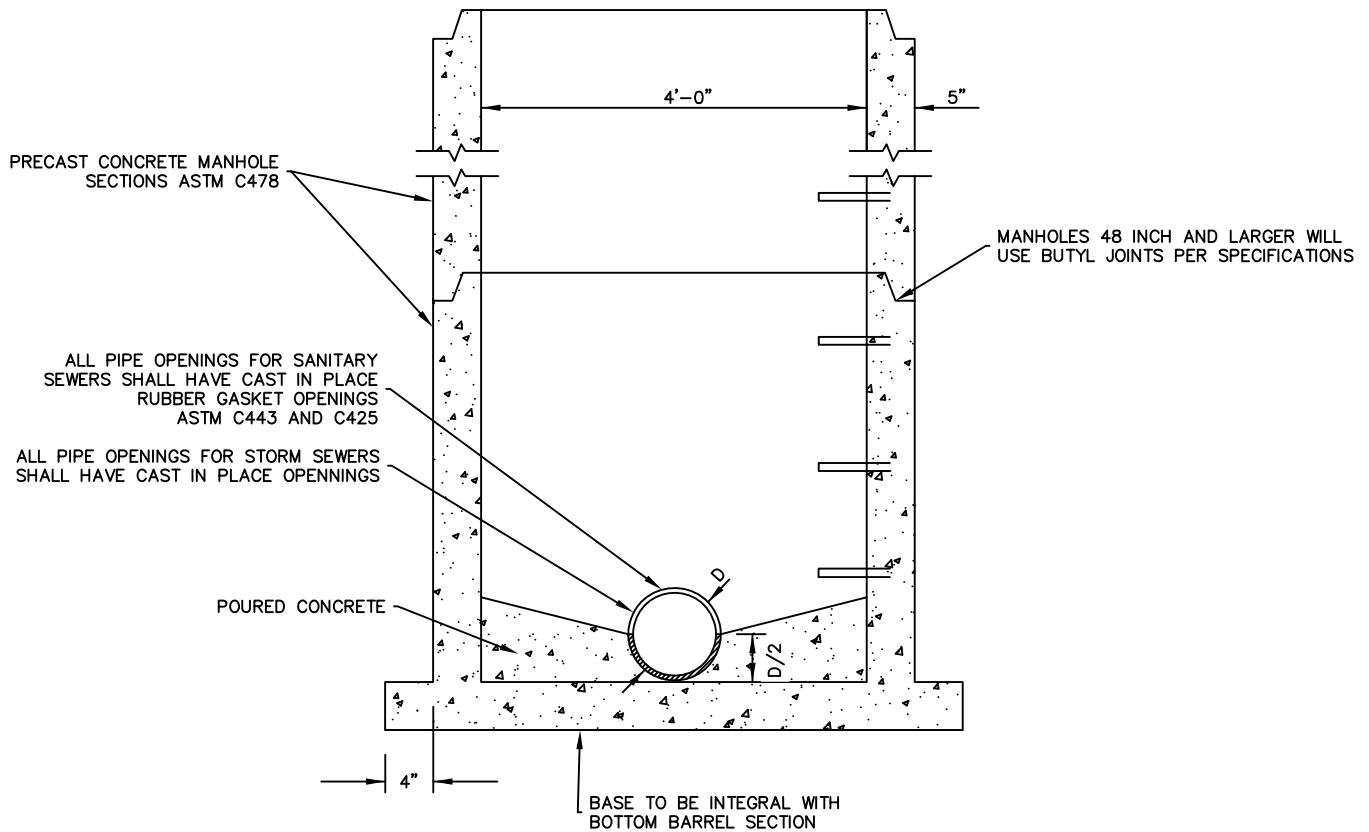
TITLE:
CORE OR BORE HOLE
REPLACEMENT DETAIL
IN CONCRETE OR
ASPHALT

DIVISION: 32

DRAWING NO:
P-5

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 373



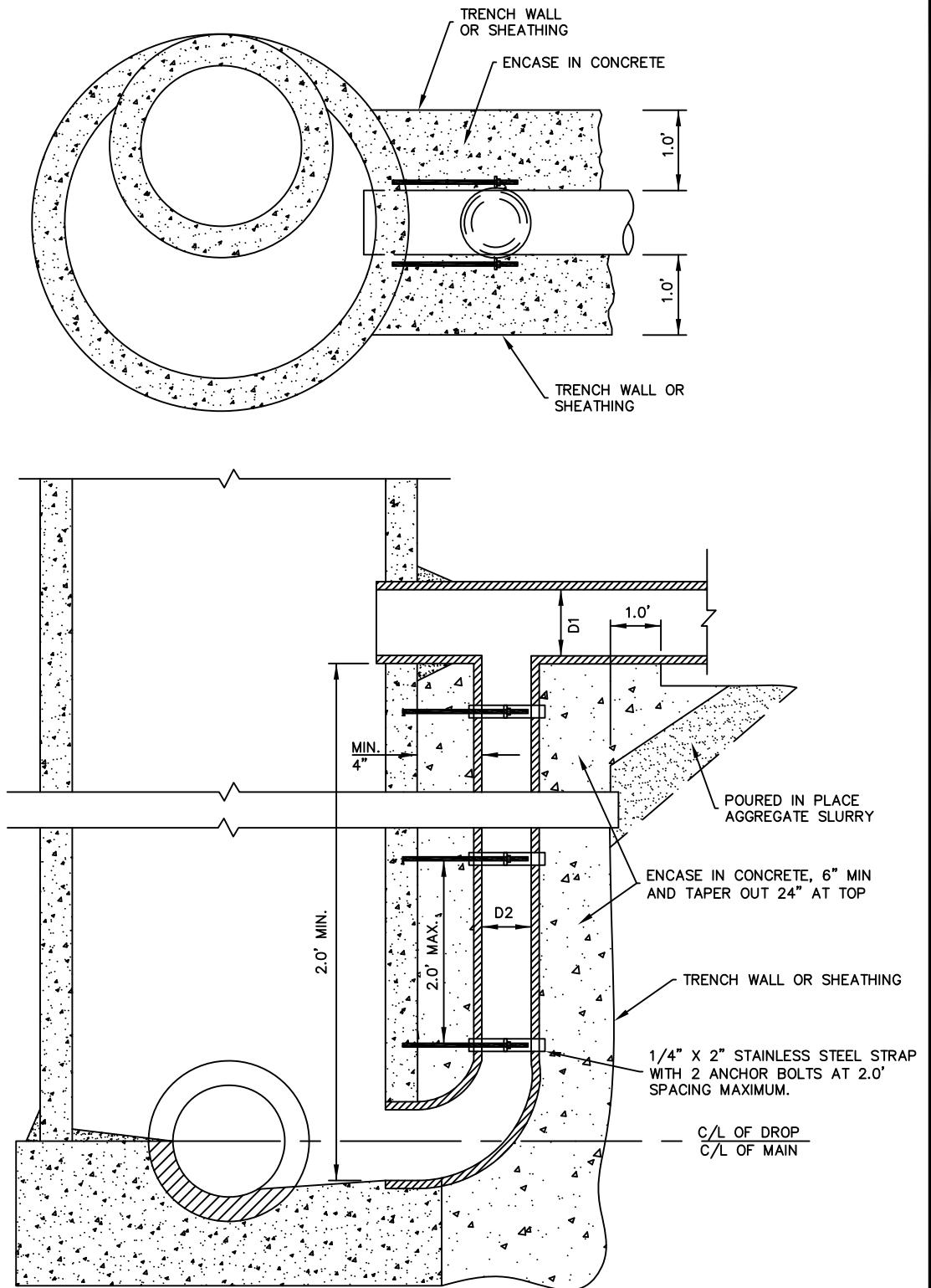
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
PRECAST CONCRETE
MANHOLE

DIVISION: 33

DRAWING NO:
S-1DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 374



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

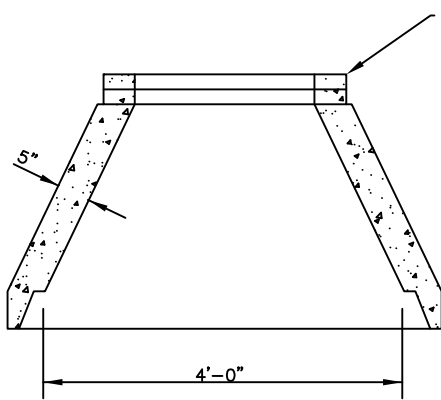
TITLE:
OUTSIDE DROP
MANHOLE

DIVISION: 33

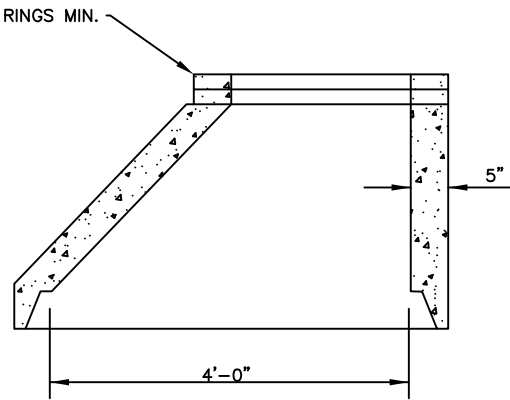
DRAWING NO:
S-2

DATE: 12/2018
BY: KAD
CHECKED:

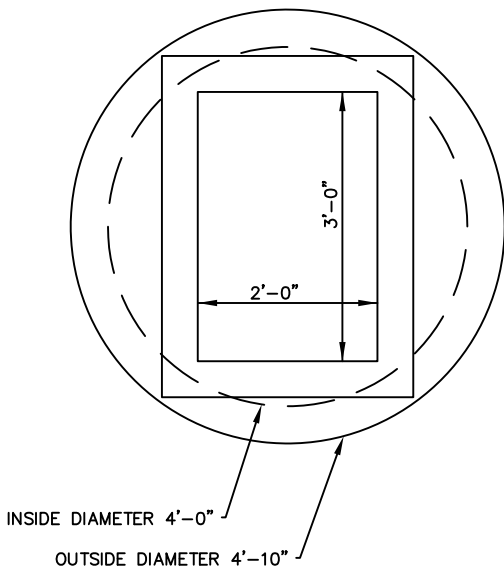
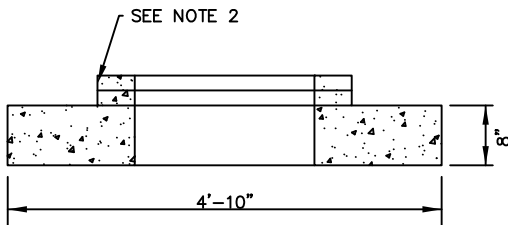
Packet Pg. 375



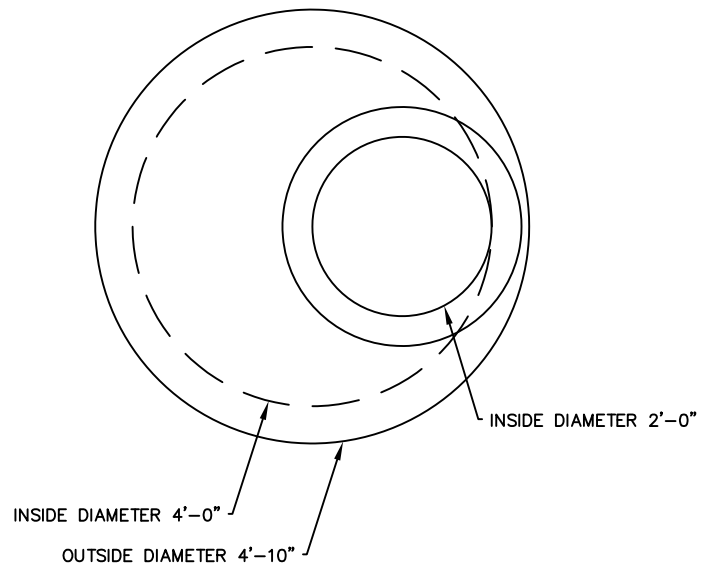
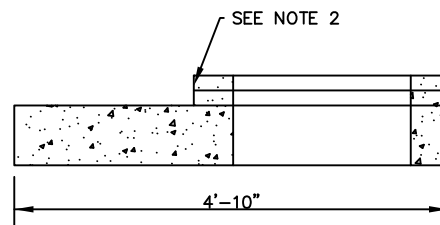
CONCENTRIC CONE
WHERE DIRECTED BY ENGINEER



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

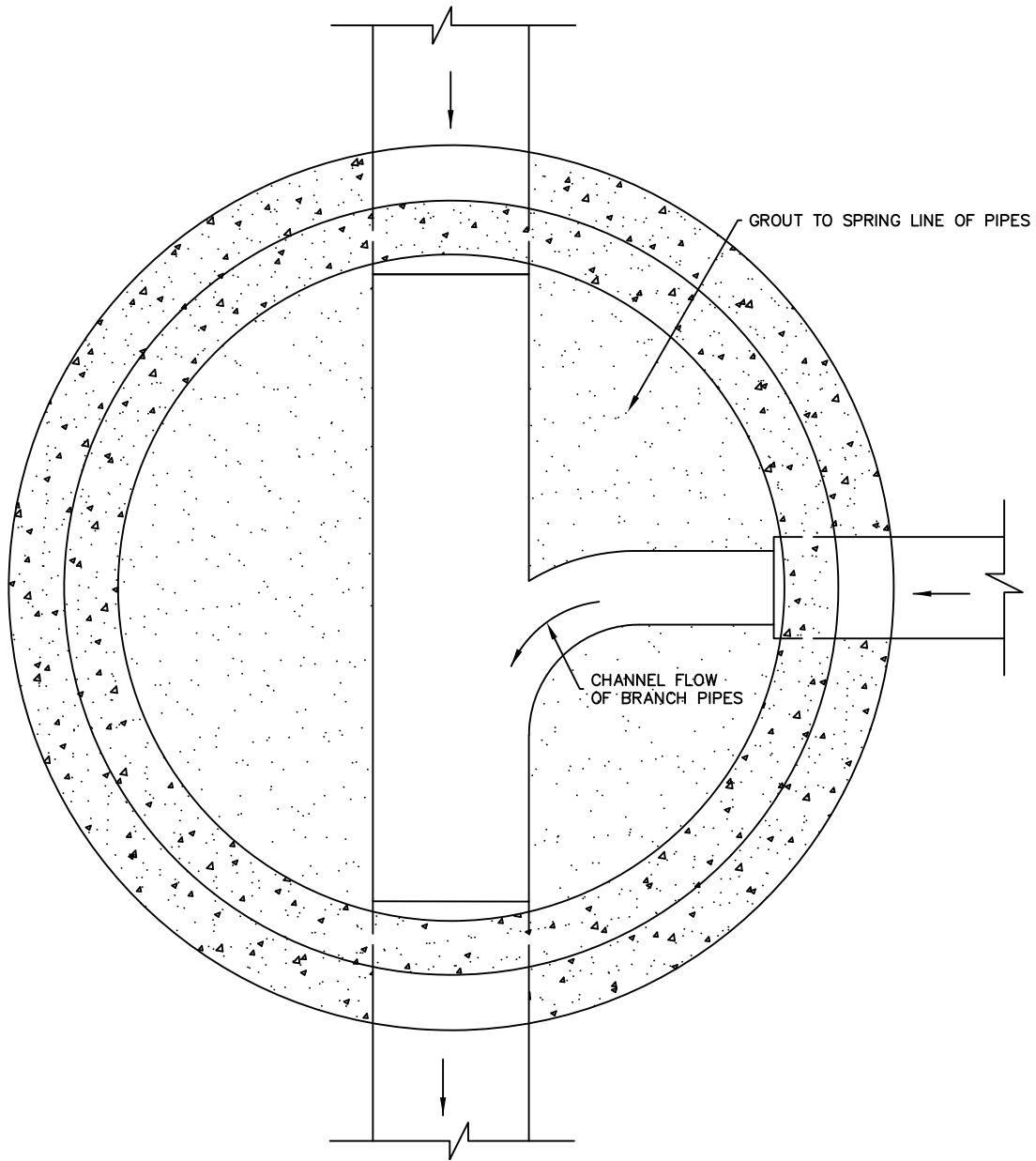
TITLE:
PRECAST CONCRETE
CONES AND COVERS
ASTM C478

DIVISION: 33

DRAWING NO:
S-3

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 376



STANDARD MANHOLE



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

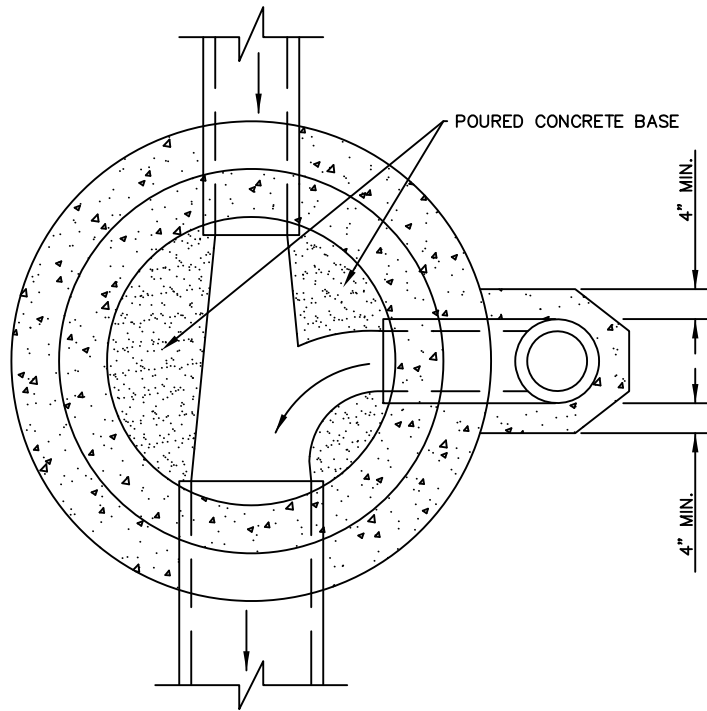
TITLE:
CHANNELIZATION

DIVISION: 33

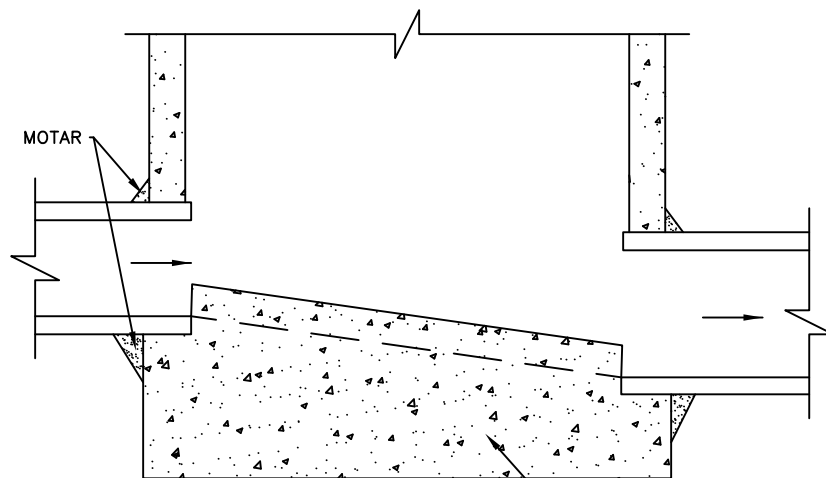
DRAWING NO:
S-4

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 377



DROP MANHOLE



PIPE SIZE CHANGE



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

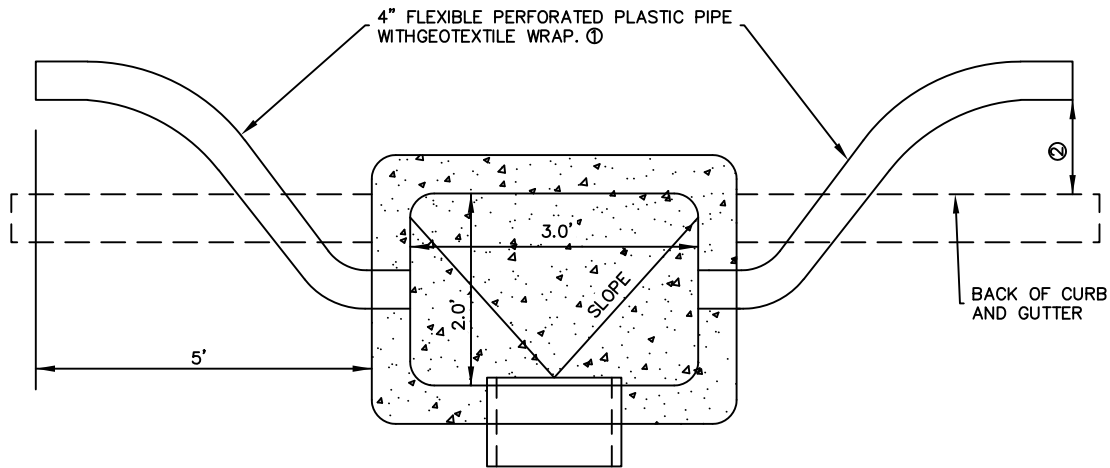
TITLE:
CHANNELIZATION

DIVISION: 33

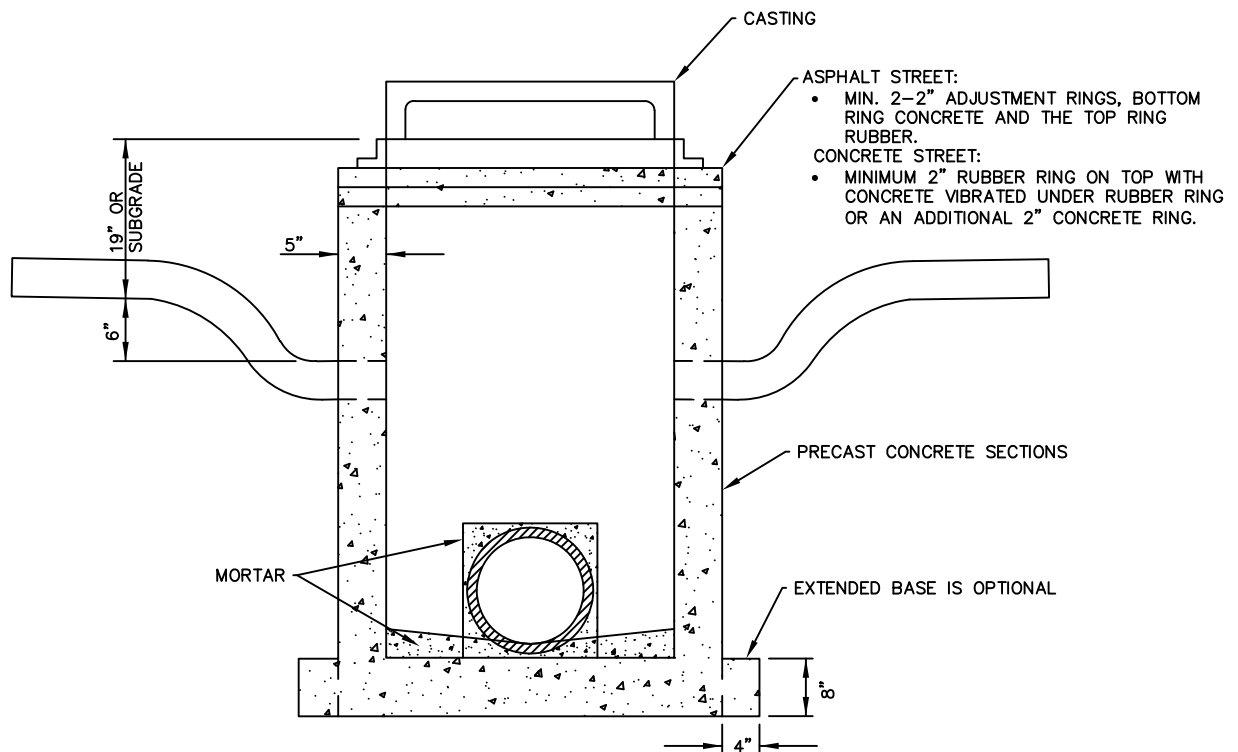
DRAWING NO:
S-5

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 378



- 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.



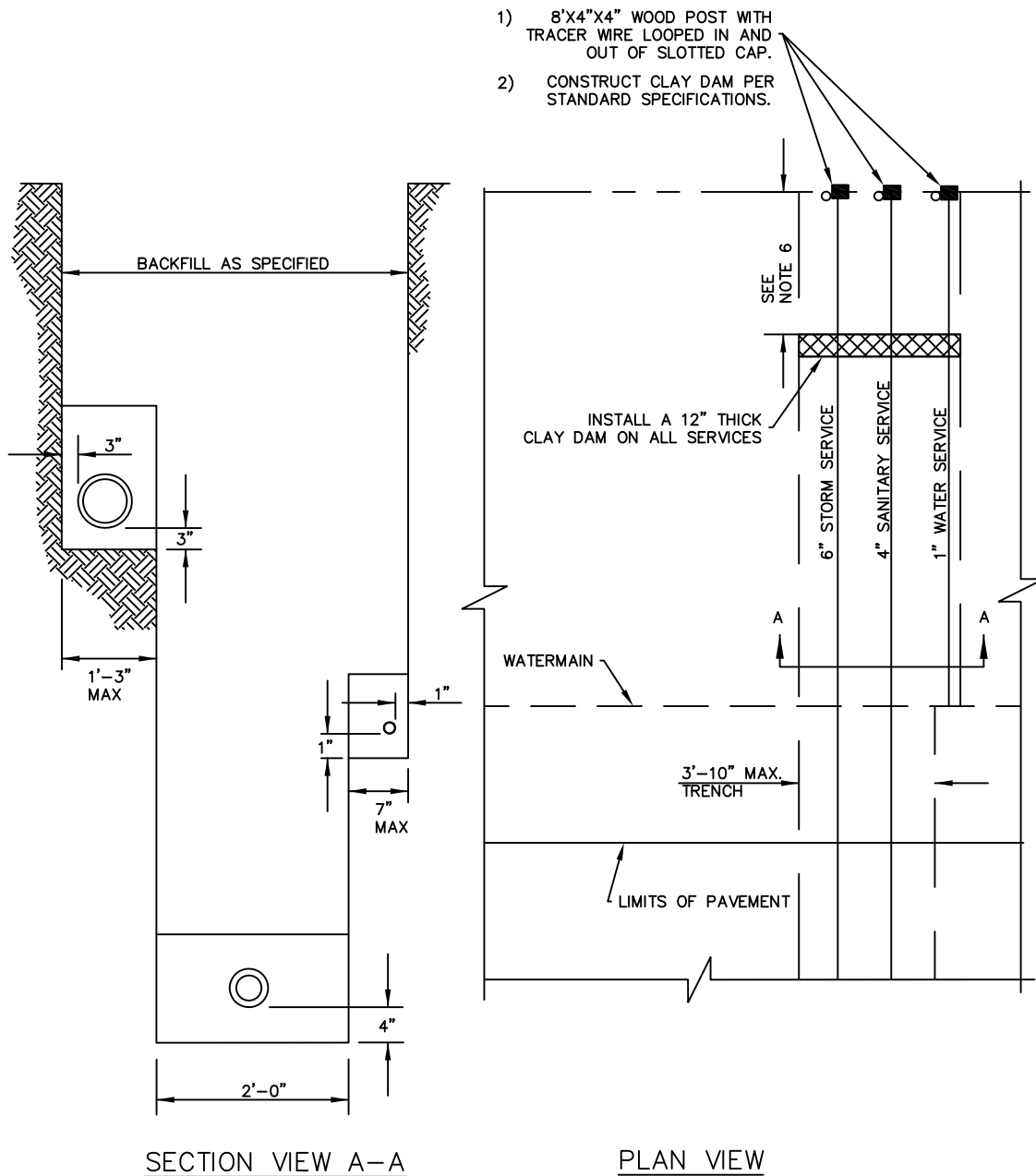
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
TYPE B INLET

DIVISION: 33

DRAWING NO:
S-6DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 379



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



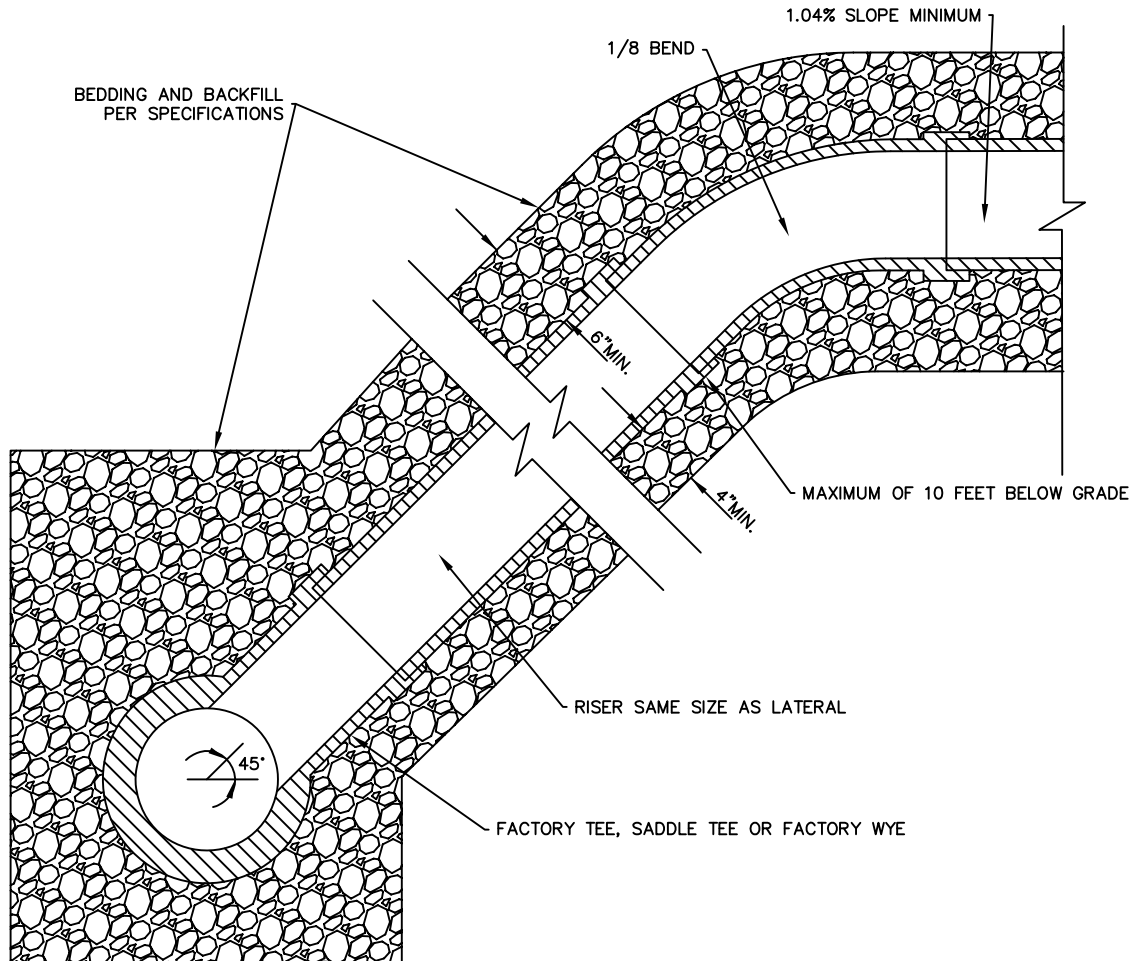
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
SANITARY, STORM
AND WATER
SERVICES

DIVISION: 33

DRAWING NO:
S-7DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 380



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115

OFFICE 920-339-4061
FAX 920-339-4071

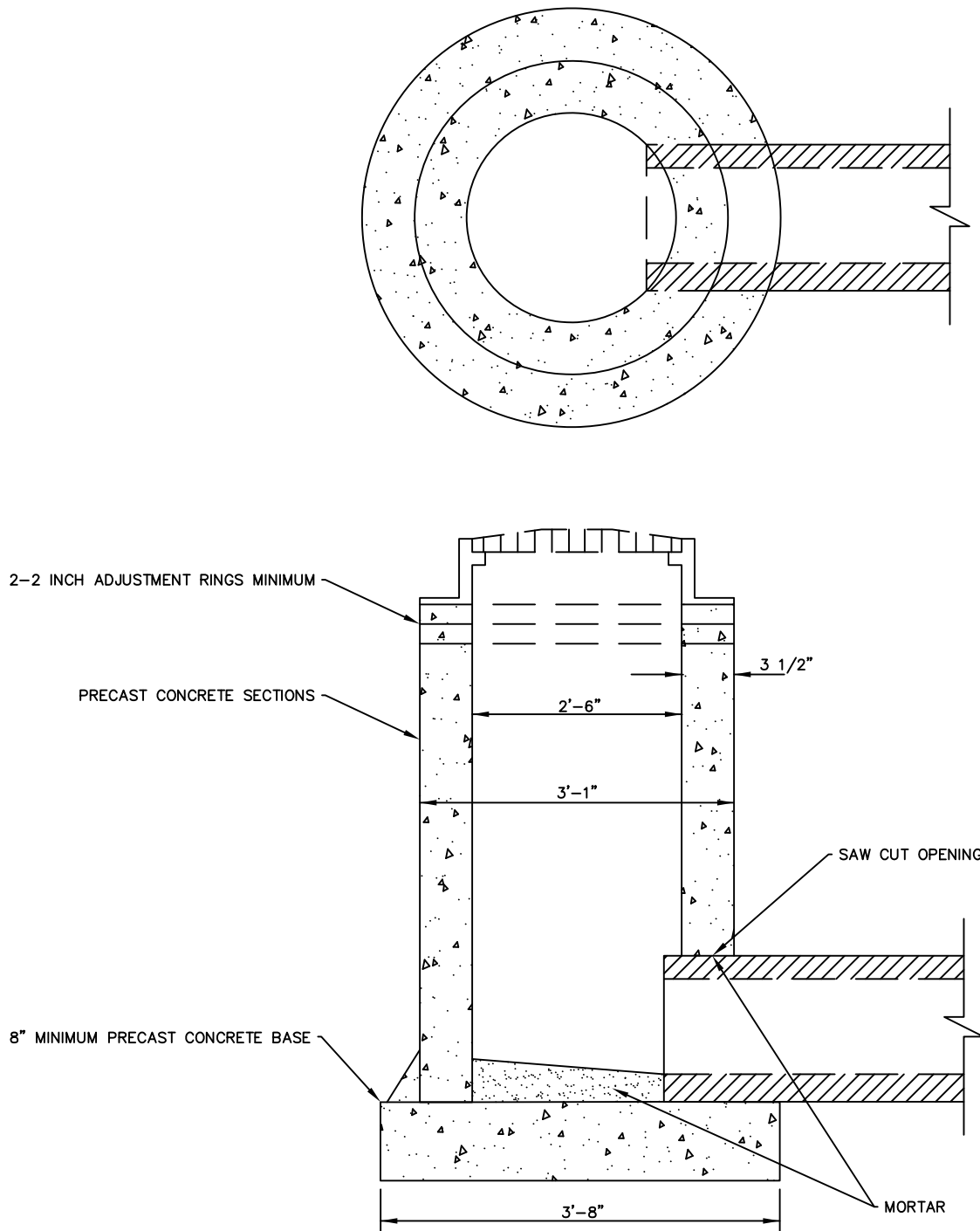
TITLE:
RISER FOR SERVICE
CONNECTIONS

DIVISION: 33

DRAWING NO:
S-8

DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 381



NOTE:

1. THE MINIMUM DEPTH OF FIELD INLETS FROM GRATE TO BOTTOM OF BASE SHALL BE 4'-8".



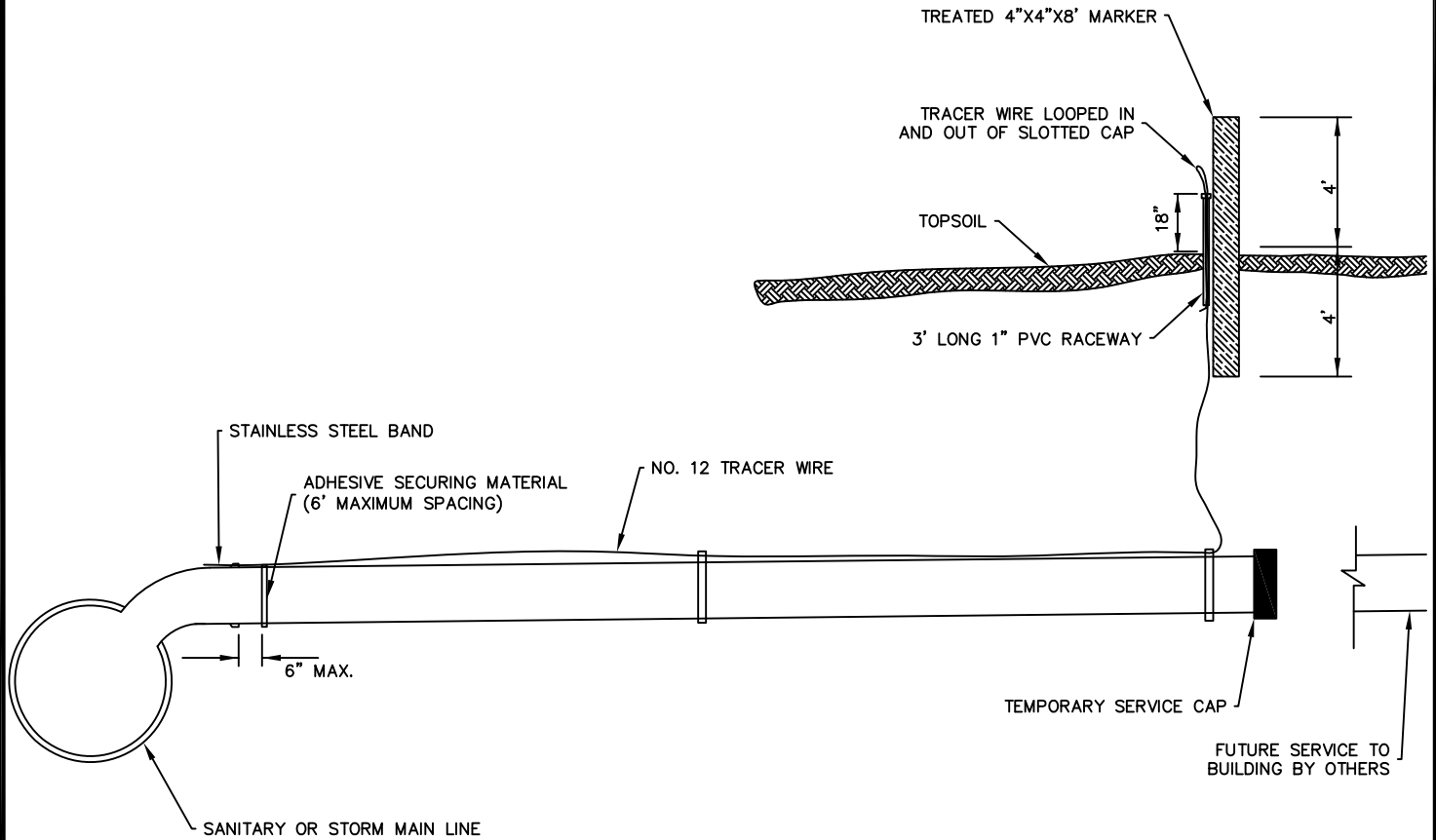
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
TYPE A FIELD INLET

DIVISION: 33

DRAWING NO:
FI-1DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 382



NOTE:

1. TRACER WIRE — BROWN FOR STORM AND GREEN FOR SANITARY.



ENGINEERING DIVISION

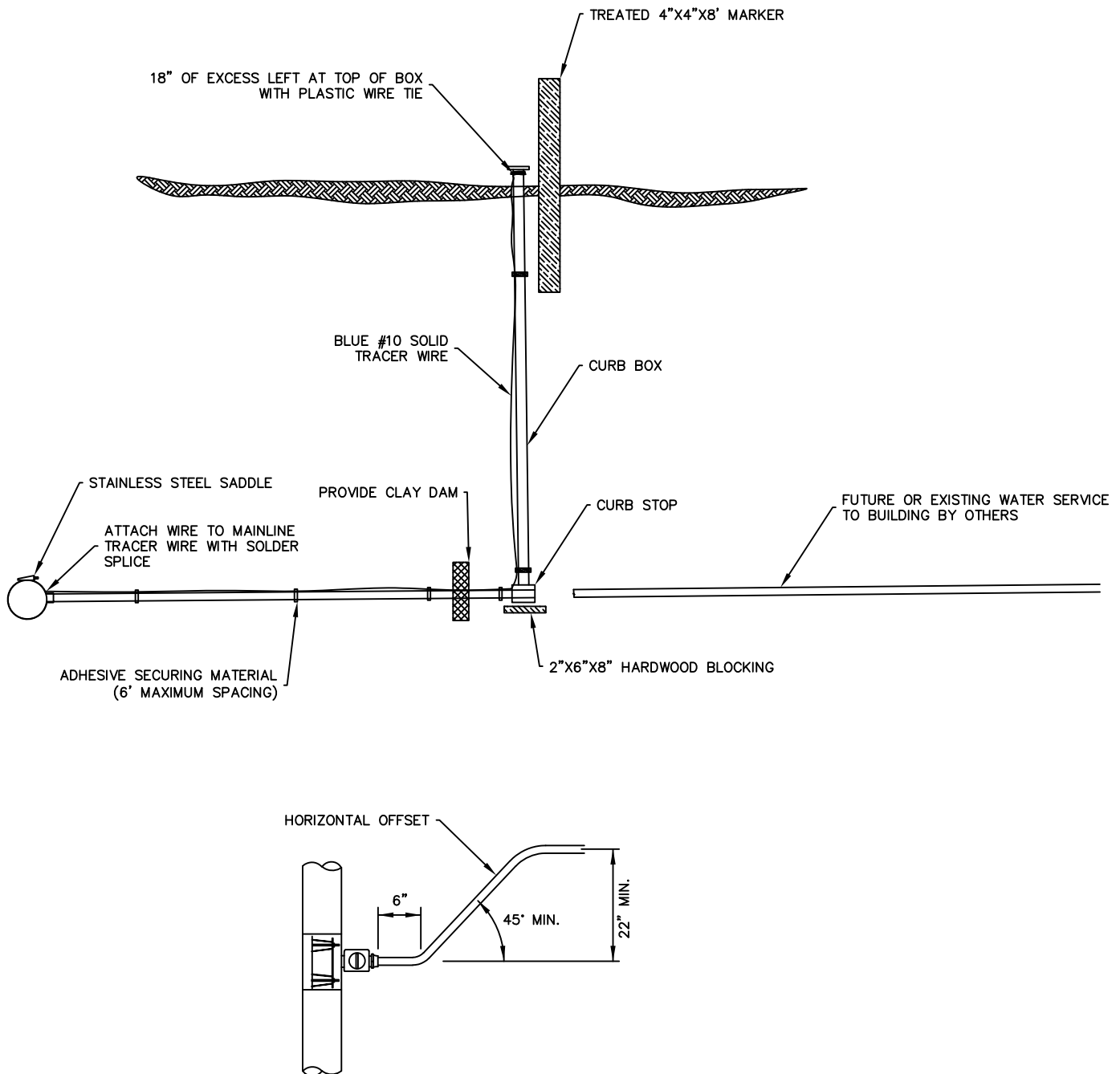
925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
SEWER TRACER WIRE

DIVISION: 33

DRAWING NO:
TW-1DATE: 12/2018
BY: KAD

CHECKED:

Packet Pg. 383



ENGINEERING DIVISION

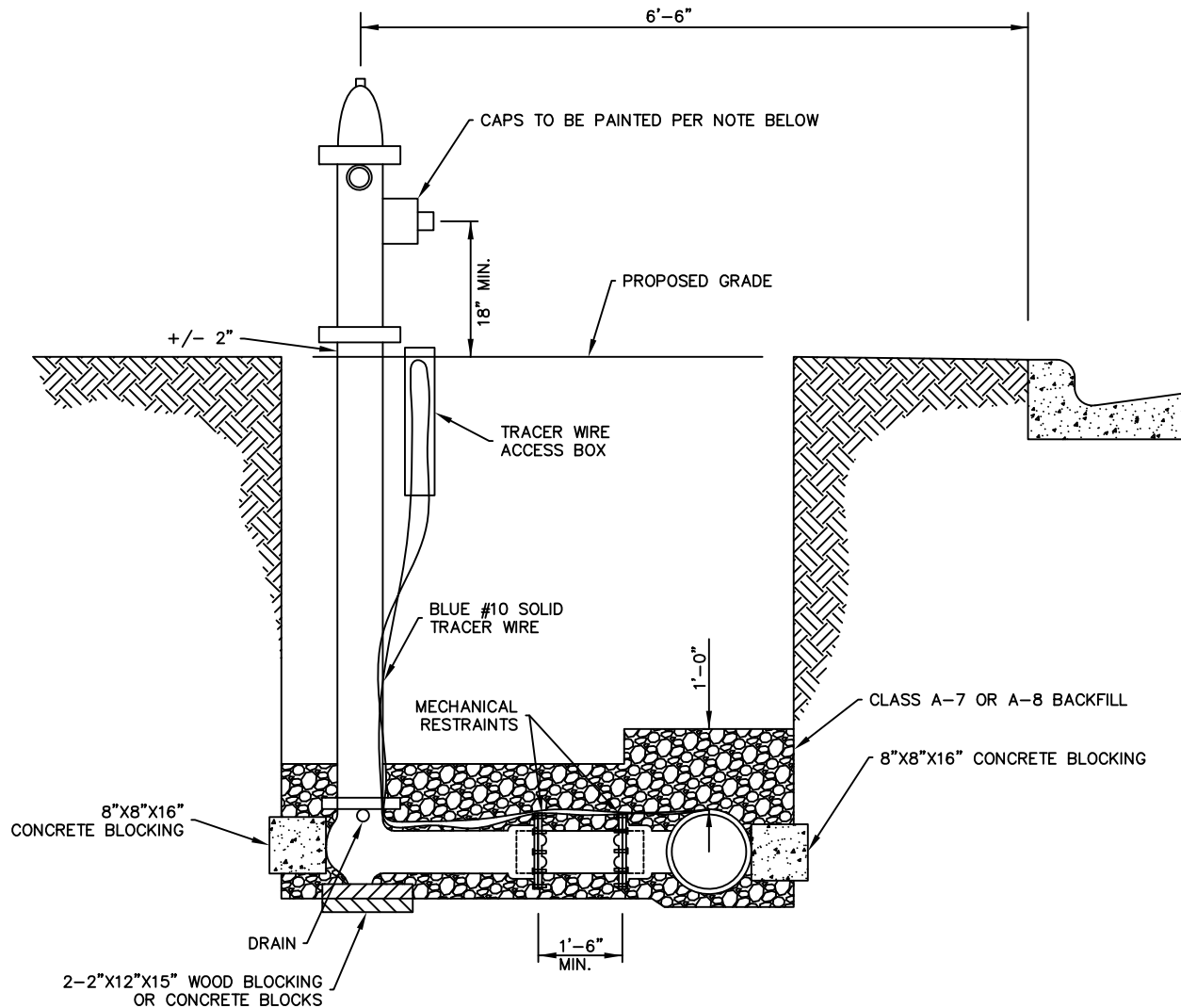
925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
WATER TRACER WIRE

DIVISION: 33

DRAWING NO:
TW-2DATE: 12/2018
BY: KAD

CHECKED:

Packet Pg. 384



NOTES:

- HYDRANTS SHALL BE SET VERTICAL.
- CONCRETE BLOCKING AND WOOD BLOCKING SHALL BE INSTALLED AGAINST FIRM NATURAL GROUND AS REACTION BACKING FOR TEE AND HYDRANT SHOE.
- REGARDLESS OF DEPTH OF MAIN, THE BREAKAWAY FLANGE MUST BE +/- 2 INCHES ABOVE THE PROPOSED GRADE.
- 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.
- ENCASE ENTIRE HYDRANT IN POLYETHYLENE ENCASEMENT.
- TRACER WIRE SHALL BE RUN UP HYDRANT.
- BLOCKING AND MEGA LUGS REQUIRED.
- HYDRANT CAPS TO BE PAINTED PER THE NFPA STANDARD 291, BASED ON FLOWS AS DETERMINED BY THE ENGINEER:
 - CLASS AA- LIGHT BLUE - RATED CAPACITY OF 1500 GPM
 - CLASS A - GREEN - RATED CAPACITY OF 1000-1499 GPM
 - CLASS B - ORANGE - RATED CAPACITY OF 500-999 GPM
 - CLASS C - RED - RATED CAPACITY OF LESS THAN 500 GPM



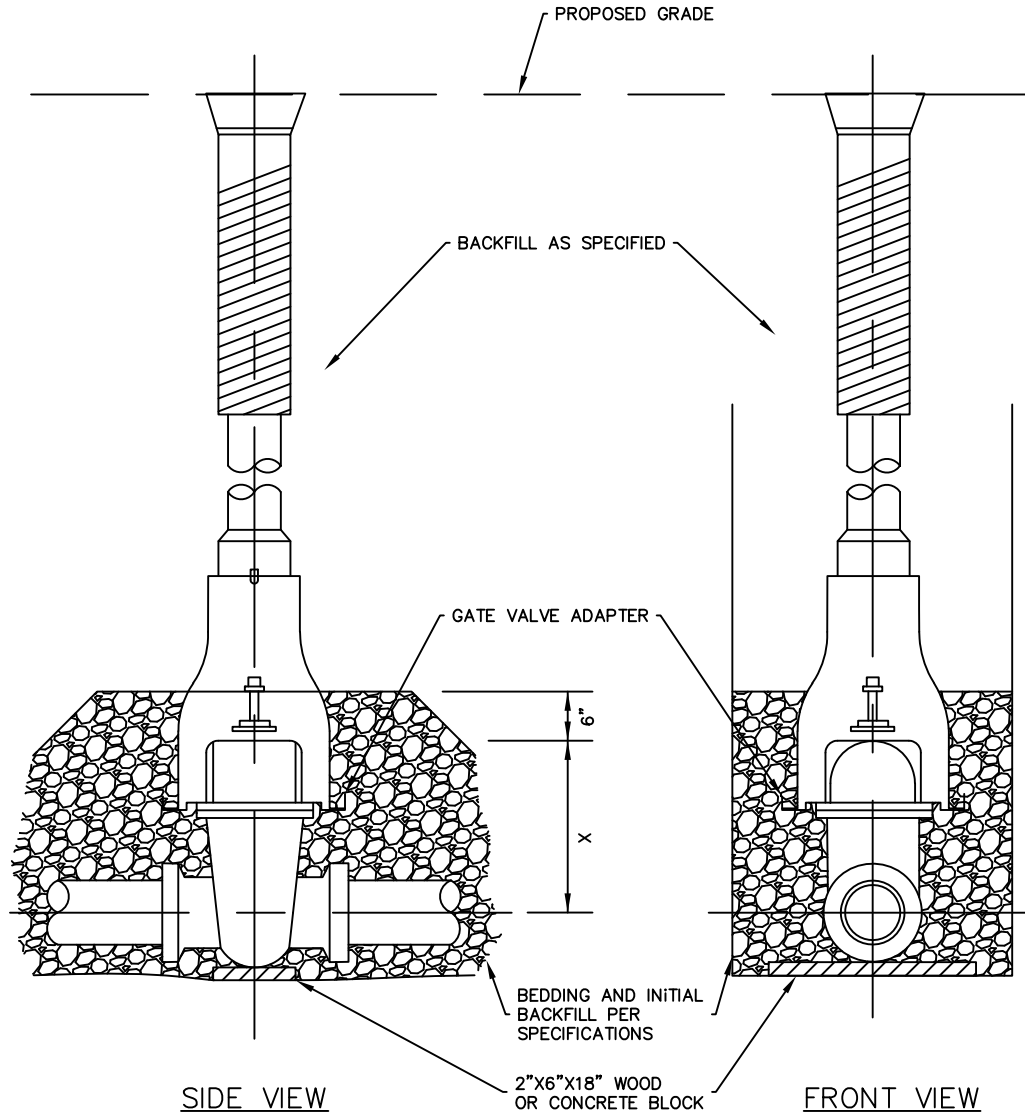
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
HYDRANT

DIVISION: 33

DRAWING NO:
W-1DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 385



PIPE DIA. INCHES	X=SETTING INCHES
6	12
8	13
10	17
12	21

NOTES:

1. ENCASE ENTIRE VALVE IN POLYETHYLENE ENCASEMENT.
2. VALVE BOXES SHALL BE SET VERTICAL.
3. JOINT RESISTANT PER SPECIFICATIONS.
4. VALVE EXTENSION STEM REQUIRED.



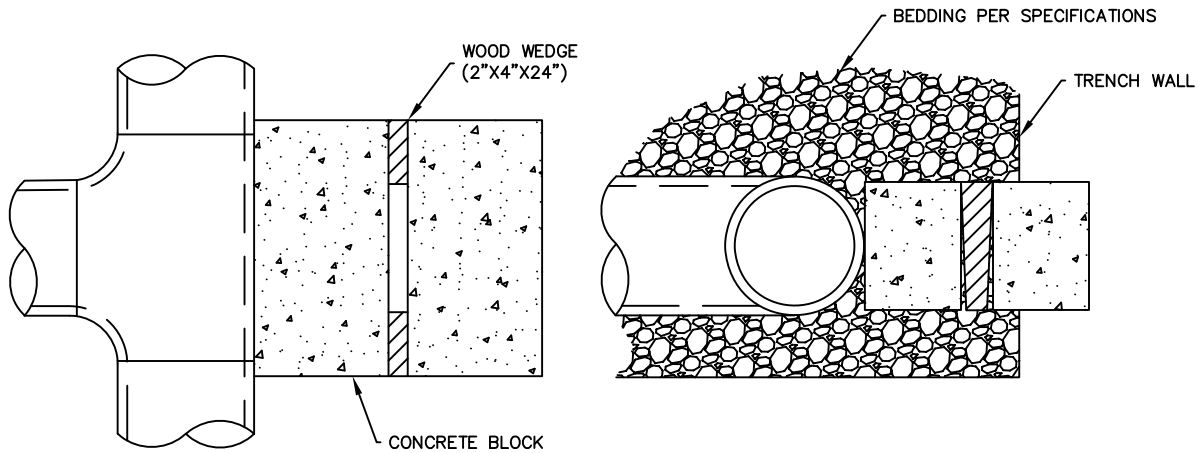
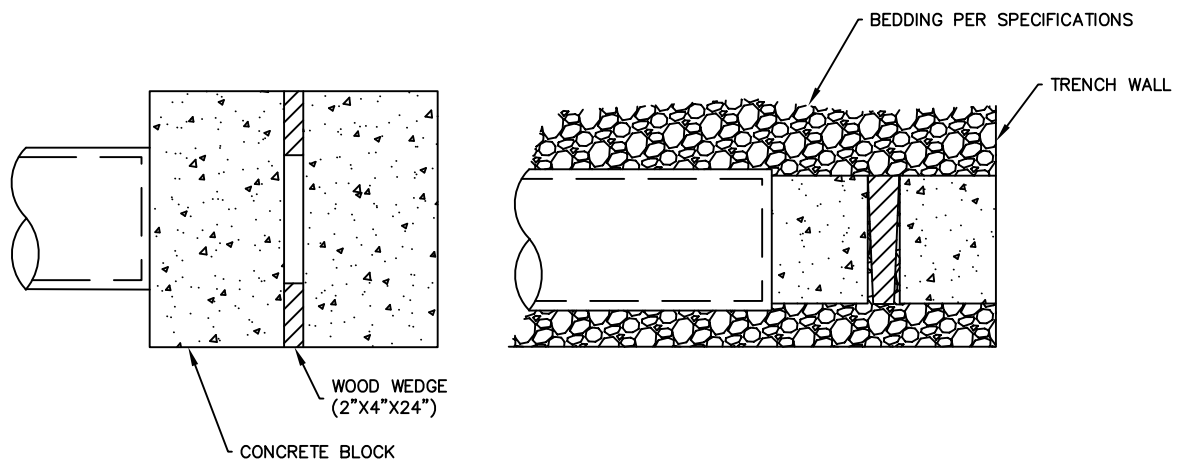
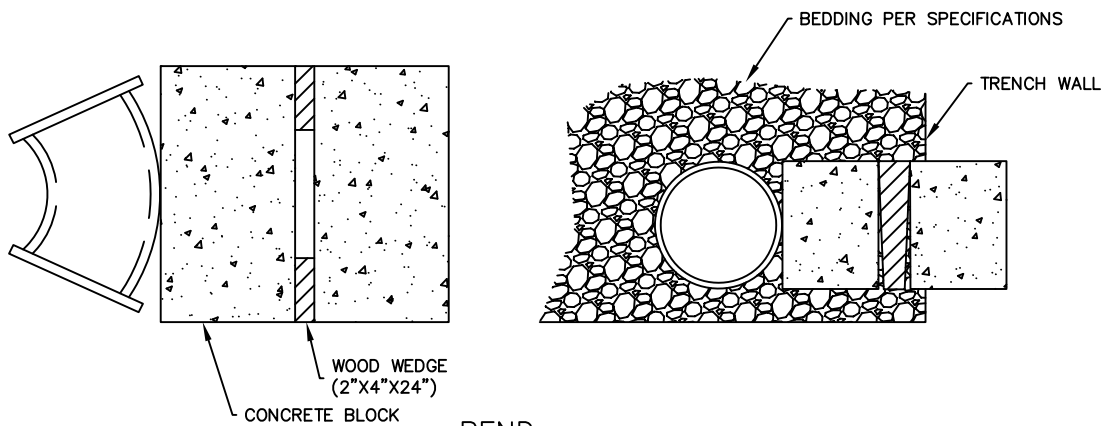
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
RESILIENT SEATED
GATE VALVE

DIVISION: 33

DRAWING NO:
W-2DATE: 12/2018
BY: KAD
CHECKED:

Packet Pg. 386

TEECAP AND PLUGBEND

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.



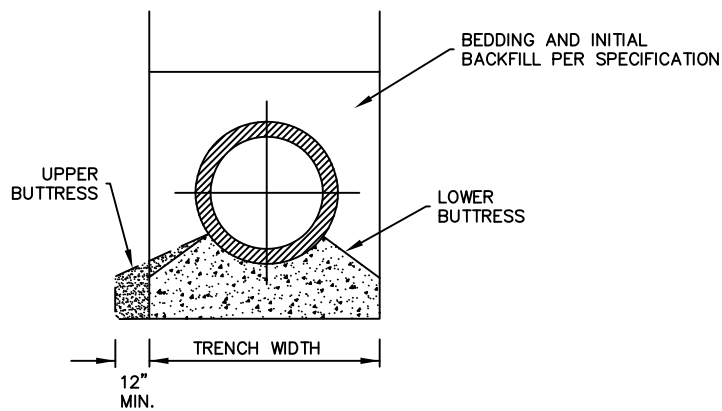
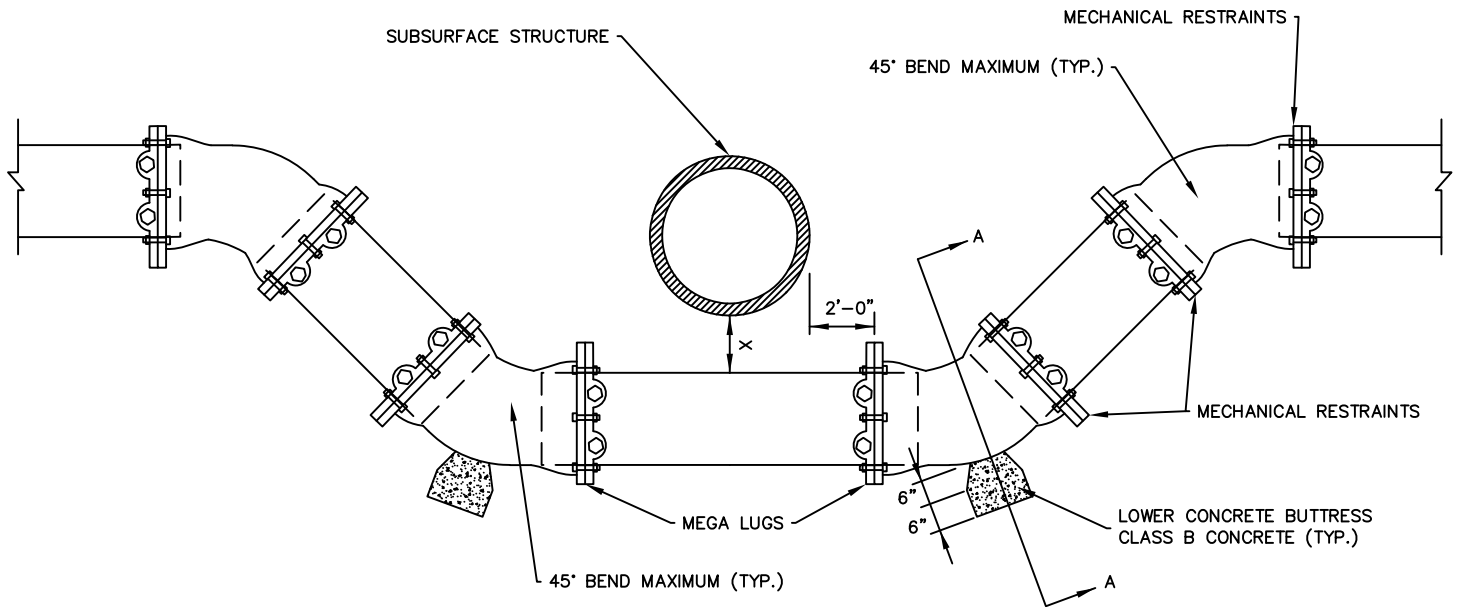
ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
BUTTRESS FOR TEES
PLUGS AND BENDS

DIVISION: 33

DRAWING NO:
W-3DATE: 12/2018
BY: KAD
CHECKED:

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SECTION A-A

SEPERATION TABLE

DESCRIPTION	X=DISTANCE
STRUCTURE	12"
UNDER SEWER	18"
OVER SEWER	6"

NOTES:

1. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE ENCASEMENT BEFORE PLACEMENT OF BUTTRESSES.
2. MECHANICAL RESTRAINTS WILL BE REQUIRED IN ADDITION TO BLOCKING.



ENGINEERING DIVISION

925 S. SIXTH ST
DE PERE, WI 54115OFFICE 920-339-4061
FAX 920-339-4071TITLE:
WATER MAIN OFFSET

DIVISION: 33

DRAWING NO:
W-4DATE: 4/2016
BY: SRL
CHECKED:

Packet Pg. 388

City of De Pere, Wisconsin

**Request For Board of Public Works Action**

MEETING DATE: December 10, 2018

DEPARTMENT: Engineering

FROM: Eric Rakers

SUBJECT: Consider Updates to the 2019 Prequalification of Contractor Form

ATTACHMENTS:

- CI_BOPW_2019_Prequalifications-12-10-2018 (DOCX)
- CE_Prequalification_Form_12-4-2018 (PDF)

City of De Pere

Public Works Department

Memo

To: Honorable Mayor Walsh
Members of the Board of Public Works

From: Eric P. Rakers, P.E., City Engineer

Date: December 10, 2018

Subject: Consider Updates to the 2019 Prequalification of Contractor Form

Listed below in this memo are proposed updates to the City of De Pere's 2019 Prequalification of Contractor form. The updates to the Prequalification of Contractor form are to accommodate changes to State Statutes and to better protect the City against contractors who have failed to complete construction contracts within the past 10 years. Listed below is a summary of the changes to the Prequalification of Contractor form:

1. The applicable Wisconsin State Statute for prequalification of contractors has changed from §66.29 to §66.0901.
2. Question 12 – *“Has any officer or partner of your organization been an officer or partner of some other organization within the past 10 years that failed to complete a construction contract during that period?”*
The time period has increased from 5 to 10 years.
3. Question 13 – *“Has any officer or partner of your organization within the past 10 failed to complete a construction contract handled in his or her own name?”*
Time period has increased from 5 to 10 years.

Staff is requesting approval of the 2019 Prequalification of Contractor Form.

Attachment: CI_BOPW_2019_Prequalifications-12-10-2018 (7705 : Prequalification Update)

CITY OF DE PERE - BOARD OF PUBLIC WORKS

PREQUALIFICATION OF CONTRACTOR

This statement, submitted by the undersigned to the Board of Public Works of the City of De Pere, is made in accordance with Wis.Stats.§66.0901. It is understood that the contents of this statement shall be confidential and shall not be disclosed except upon the written order of the undersigned; or for necessary use by the Board of Public Works in qualifying the undersigned; or in cases of action against, or by the undersigned or the City of De Pere.

The undersigned, being duly sworn, does depose and say that he is an authorized representative of

_____ and on

behalf of same submits the statement to obtain approval for bidding on construction projects in

20_____ for the following:

_____concrete paving

_____storm sewer

_____asphalt paving

_____sanitary sewer

_____curb and gutter

_____watermains

_____sidewalks

_____grading

Complete all of the following items; if not applicable, print N/A.

1. Name of Bidder _____

2. Bidder's address _____

3. Any questions regarding information provided on this form should be directed to

_____ at (_____) _____
Area code Telephone number

_____ Fax number _____ Mobile number

4. Type of organization (check one): Corporation _____

Partnership _____ Individual _____ Joint Venture _____

Other _____. If other, attach a brief statement describing the organization.

5. When organized? _____
6. If a corporation, when and where incorporated _____
_____.
7. Attach a statement listing the corporate officers, partners or other principal members of your organization and detailing the background and experience of the principal members of your personnel, including the officers.
8. How many years has your organization been engaged in the contracting business under the present firm name? _____.
9. General character of work performed by your firm _____
_____.
10. Attach a list of contracts on hand, for both public and private construction, including for each contract: the class of work; the contract amount; the percent completed; the estimated completion date; and the name and address of the owner or contracting officer.
11. Has your organization ever defaulted on a contract or failed to complete any work awarded to it? _____. If so, attach a statement explaining where and why.
12. Has any officer or partner of your organization been an officer or partner of some other organization within the past 10 years that failed to complete a construction contract during that period? _____. If so, attach a statement indicating the name of individual, other organization and reason therefore.
13. Has any officer or partner of your organization within the past 10 years failed to complete a construction contract handled in his or her own name? _____. If so, attach a statement indicating the name of individual, name of owner and reason therefore.
14. Attach a list of the major projects your organization has completed within the past 3 years, including for each project; the class of work; the contract amount; the completion date; and the name and address of the owner or contracting officer.
15. Attach a list of the major equipment which is available to your organization for the proposed work.
16. Attach a statement of your organization's experience in the construction of work similar in nature and importance to this project.
17. Credit available _____
Attach a letter from your bank(s) or other financial institution(s) advising line of credit set up for your organization.

18. Name of Bonding Company and name, address and telephone number of agent:

19. Financial Statement.

Condition at close of business on _____, 20_____.

A.	Cash	_____
B.	Accounts receivable	_____
C.	Real estate equity	_____
D.	Materials in stock	_____
E.	Equipment, book value	_____
F.	Furniture and fixtures book value	_____
G.	Other assets	_____
	TOTAL ASSETS	_____
Liabilities		
H.	Accounts, notes and interest payable	_____
I.	Other liabilities	_____
	TOTAL LIABILITIES	_____
	NET WORTH	_____

20. Additional information may be submitted if desired.

Dated at _____ this _____ day of _____, 20____.

Name of organization _____

By: _____

Title: _____

State of _____)
 _____)ss.
 County of _____)

_____ being duly sworn says that he is
 _____ of _____
 (Name of Organization)

and that the answers to the foregoing questions and all statements contained herein and in the attachments are true and correct.

Signed _____

Subscribed and sworn to before me

this day of _____, 20____.

 Notary Public

My commission expires _____.