CITY OF DE PERE

Engineering Division

925 S. Sixth Street, De Pere, WI | 920-339-4061 | www.deperewi.gov/engineering

June 28, 2022

ADDENDUM NO. 1
PROJECT 22-11
2022 UTILITY AND STREET CONSTRUCTION WATERVIEW HEIGHTS FIFTH ADDITION

TO: Prospective Bidders

FROM: City of De Pere

Notice is hereby given that the contract documents for the Project 22-11 are amended as hereinafter set forth. If you will be submitting a bid for Project 22-11, you must sign this addendum and include it with your submittal.

This addendum consists of 51 pages.

CHANGES TO PROJECT BID DOCUMENTS:

1. Delete Section 00 41 43, Bid Schedule and replace with Section 00 41 43R, Bid Schedule. Changes to the bid schedule include:
   a. Water Main:
      1) Decreased W-03, Provide 12" PVC Water Main (Natural Backfill) to 2100 LF.
      2) Decreased W-04, Provide 1" HDPE Water Service to 2530 LF.
      3) Added Bid Item W-18, Provide 1" HDPE with Plug, 50' in Length.
   b. Street and Drainage:
      1) Increased SD-04, Unclassified Excavation (Pond) to 18,800 CY.

CHANGES TO GENERAL REQUIREMENTS:

1. Section 01 10 00 Summary of Work:
   a. Under 1.9 Miscellaneous Provisions, insert:
      "F. Hauling fill to the site is not required. If the site is short of fill, areas on the future Lansdowne Street and Addison Street where the street is not being constructed will be eliminated from the scope of work. Other items such as restoration in these areas will be reduced accordingly. Additionally, the City may choose to direct fill to low areas on lots and the multi-family lot being developed as part of this project."
2. Section 01 22 03 Water System:
   a. Under 1.1 Summary, A. Section Includes, insert:
      "12. Water Services with Plug, 50' in Length W-18"

b. Insert 1.14 Water Services with Plug, 50' in Length as follows:
"1.14 WATER SERVICES WITH PLUG, 50' in LENGTH

A. The unit price for Water Service with Plug, 50' in Length work includes:
   1. General Work Items of Article 1.2.
   2. Pipe and fittings of material stated in the Unit Price Bid Schedule.
   3. Tracer wire.
   4. Disinfection of pipelines.
   5. Installed 50' of HDPE, coiled, with plug, at end of trench.
   6. Backfill over coiled water service.

B. Measurement of payment will be the number installed.

C. The unit of measurement for payment is each."

CHANGES TO PLANS:

1. Delete sheet 13 and insert sheet 13R
2. Delete sheet 14 and insert sheet 14R
3. Delete sheet 15 and insert sheet 15R
4. Delete sheet 30 and insert sheet 30R
5. Delete sheet 31 and insert sheet 31R
6. Delete sheet 32 and insert sheet 32R
7. Delete sheet 38 and insert sheet 38R
8. Delete sheet 50 and insert sheet 50R
9. Delete sheet 63 and insert sheet 63R
10. Delete sheet 64 and insert sheet 64R
11. Delete sheet 75 and insert sheet 75R

CHANGES TO EXHIBITS:

1. Delete Exhibit 1, Waterview Heights Fifth Addition Boring Log by PSI (Draft) and insert Exhibit 1, Geotechnical Engineering Services Report for the Waterview Heights Fifth Addition Subdivision by PSI.

Sincerely,

DEPARTMENT OF PUBLIC WORKS

E. P. Rakers

Eric P. Rakers, P.E.
City Engineer

Acknowledged by: _____ Date: _____

SECTION 00 41 43

CITY OF DE PERE

PROJECT 22-11

BID SCHEDULE – UNIT PRICE

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SANITARY SEWER					
SS-01	Provide 8” PVC Sanitary Sewer (Granular Backfill)	LF	4700	$_____	$_____
SS-02	Provide 4” PVC Sanitary Sewer Lateral	LF	3410	$_____	$_____
SS-03	Provide Sanitary Sewer Risers	VF	140	$_____	$_____
SS-04	Provide 8" x 4" Sanitary Wye	EA	80	$_____	$_____
SS-05	Provide 4’ Diameter Sanitary Sewer Manhole	VF	260	$_____	$_____
SS-06	Core Drill Sanitary Manhole	EA	3	$_____	$_____
SS-07	Connect to Existing Sanitary Sewer	EA	3	$_____	$_____
SS-08	Reconstruct Existing 4' Diameter Manhole	EA	1	$_____	$_____
SS-09	Remove Existing Sanitary Manhole and Reconnect Sanitary Sewer	LS	1	$_____	$_____
STORM SEWER					
ST-01	Provide 8” PVC Storm Sewer (Natural Backfill)	LF	235	$_____	$_____
ST-02	Provide 12” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	2410	$_____	$_____
ST-03	Provide 12” PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	480	$_____	$_____

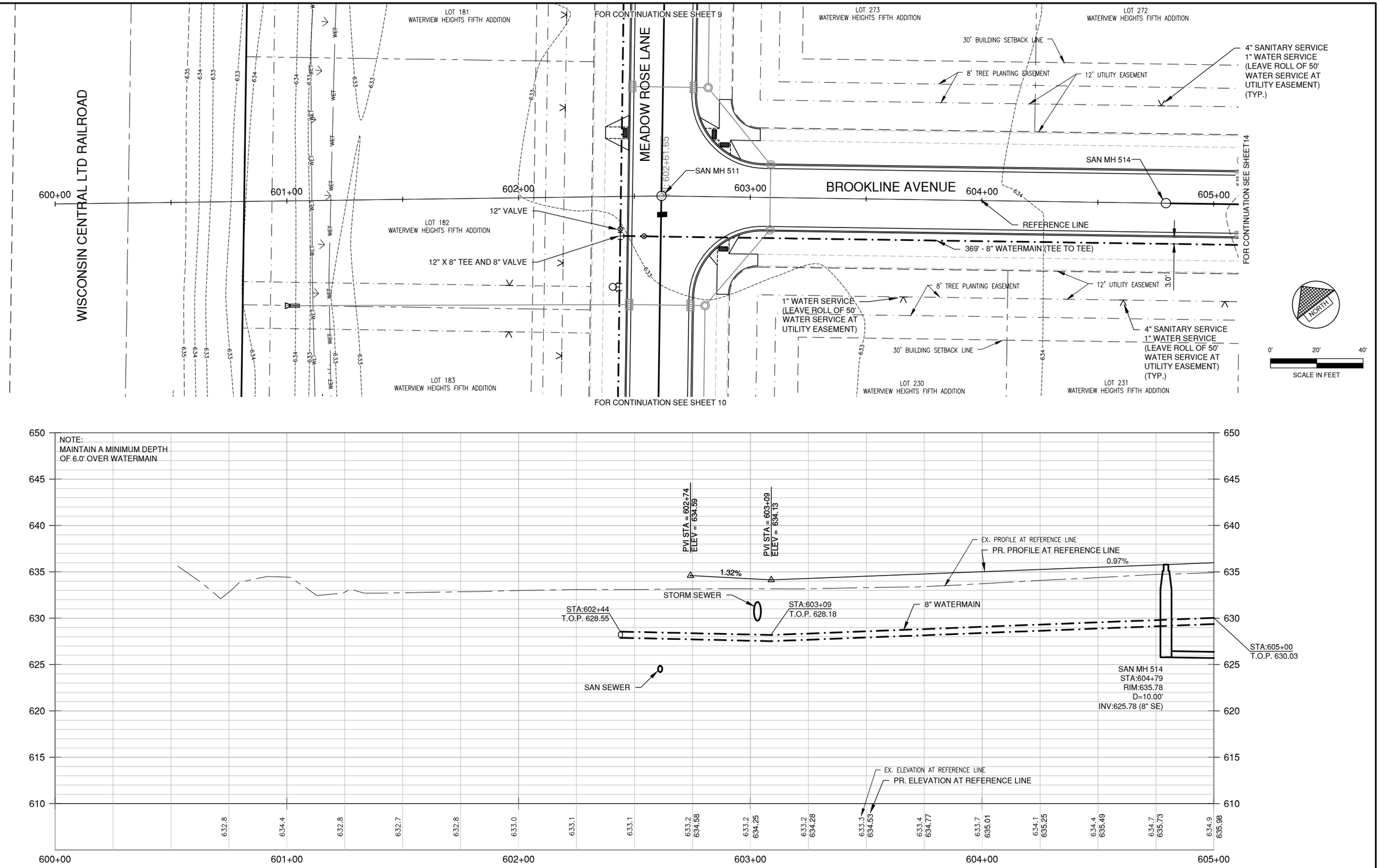
ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STORM SEWER CONTINUED					
ST-04	Provide 15” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	1230	$_____	$_____
ST-05	Provide 15” PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	30	$_____	$_____
ST-06	Provide 18” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	1115	$_____	$_____
ST-07	Provide 18” PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	60	$_____	$_____
ST-08	Provide 24” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	1090	$_____	$_____
ST-09	Provide 24” PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	85	$_____	$_____
ST-10	Provide 30” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	710	$_____	$_____
ST-11	Provide 36” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	620	$_____	$_____
ST-12	Provide 36” PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	60	$_____	$_____
ST-13	Provide 42” PVC, RCP Class III, or PP Storm Sewer (Natural Backfill)	LF	55	$_____	$_____
SS-14	Provide 6” PVC Storm Sewer Lateral	LF	2650	$_____	$_____
ST-15	Provide 8” x 6” Storm Branch or Inserta-Tee	EA	2	$_____	$_____
ST-16	Provide 12" X 6" Storm Branch or Inserta Tee	EA	18	$_____	$_____
ST-17	Provide 15" X 6" Storm Branch or Inserta Tee	EA	6	$_____	$_____

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STORM SEWER CONTINUED					
ST-18	Provide 18" X 6" Storm Branch or Inserta Tee	EA	5	$_____	$_____
ST-19	Provide 24" X 6" Storm Branch or Inserta Tee	EA	9	$_____	$_____
ST-20	Provide 30" X 6" Storm Branch or Inserta Tee	EA	12	$_____	$_____
ST-21	Provide 36" X 6" Storm Branch or Inserta Tee	EA	10	$_____	$_____
ST-22	Provide 4’ Diameter Storm Manhole	VF	210	$_____	$_____
ST-23	Provide 5’ Diameter Storm Manhole	VF	60	$_____	$_____
ST-24	Provide 6’ Diameter Storm Manhole	VF	15.5	$_____	$_____
ST-25	Provide 4’ Diameter Storm Manhole Inlet	VF	57	$_____	$_____
ST-26	Provide 5’ Diameter Storm Manhole Inlet	VF	20.5	$_____	$_____
ST-27	Provide Type A Inlet	EA	7	$_____	$_____
ST-28	Provide Type B Inlet	EA	36	$_____	$_____
ST-29	Provide 12” RCP Endwall	EA	6	$_____	$_____
ST-30	Provide 15” RCP Endwall	EA	1	$_____	$_____
ST-31	Provide 24” RCP Endwall	EA	2	$_____	$_____
ST-32	Provide 42” RCP Endwall	EA	1	$_____	$_____
ST-33	Pond Discharge Structure	EA	2	$_____	$_____

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
WATER MAIN					
W-01	Provide 8” PVC Water Main (Natural Backfill)	LF	2500	$_____	$_____
W-02	Provide 8” PVC Water Main (Granular Backfill)	LF	280	$_____	$_____
W-03	Provide 12” PVC Water Main (Natural Backfill)	LF	2100	$_____	$_____
W-04	Provide 1” HDPE Water Service	LF	2530	$_____	$_____
W-05	Provide 2" Corporation with Plug/Saddle with 2" Galvanized Pipe	EA	1	$_____	$_____
W-06	Provide 1” Corporation and Curb Stop	EA	80	$_____	$_____
W-07	Provide 6" Gate Valve	EA	3	$_____	$_____
W-08	Provide 8" Gate Valve	EA	13	$_____	$_____
W-09	Provide 12" Gate Valve	EA	8	$_____	$_____
W-10	Provide Connection to Existing Water Main	EA	2	$_____	$_____
W-11	Provide Connection to Existing Water Main 8”x 8” Tapping Tee and Valve	EA	2	$_____	$_____
W-12	Provide Hydrant (7' Bury)	EA	4	$_____	$_____
W-13	Provide Hydrant (6.5' Bury)	EA	11	$_____	$_____
W-14	Provide 6” PVC Hydrant Lead	LF	51	$_____	$_____
W-15	Provide 6” PVC Service	LF	23	$_____	$_____
W-16	Provide Water Main Offset	EA	3	$_____	$_____

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
WATER MAIN CONTINUED					
W-17	Abandon/Remove Water Main and Appurtenances	LS	1	$_____	$_____
W-18	Provide 1" HDPE with Plug, 50' in Length	EA	80	$_____	$_____
STREET AND DRAINAGE					
SD-01	Provide Clearing and Grubbing	LS	1	$_____	$_____
SD-02	Topsoil Stripping (Fill Areas)	SY	10000	$_____	$_____
SD-03	Unclassified Excavation (Street)	CY	5000	$_____	$_____
SD-04	Unclassified Excavation (Pond)	CY	18800	$_____	$_____
SD-05	Provide 1 1/4" Crushed Aggregate Base Course, 12" thick	SY	19900	$_____	$_____
SD-06	Provide 3/4" Crushed Aggregate Base Course (2' Wide)	SY	160	$_____	$_____
SD-07	Provide Asphaltic Concrete Pavement Type 4 LT 58-28 S, 1 3/4" Upper Layer	SY	15950	$_____	$_____
SD-08	Provide Asphaltic Concrete Pavement Type 3 LT 58-28 S, 2 1/4" Lower Layer	SY	15950	$_____	$_____
SD-09	Provide 24” Concrete Curb and Gutter (Slip Form)	LF	10350	$_____	$_____
SD-10	Provide 8" Concrete Pad for CBU	SY	30	$_____	$_____
SD-11	Provide 4" Concrete Sidewalk and Ramp	SY	1350	$_____	$_____
SD-12	Provide Detectable Warning Field (Natural)	EA	28	$_____	$_____
SD-13	Landscaping – Topsoil, Seed, Fertilizer and Hydroseeding	SY	33700	$_____	$_____

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STREET AND DRAINAGE CONTINUED					
SD-14	Landscaping – Topsoil, Seed Mix No. 10, Fertilizer and Temporary Erosion Control Blanket (Class I) for Pond Slopes	SY	5200	$_____	$_____
SD-15	Landscaping – Topsoil, Seed Mix No. 10, Fertilizer and Temporary Erosion Control Blanket (Class I) for Drainage Swales	SY	19000	$_____	$_____
SPECIAL CONSTRUCTION					
SC-01	Provide Silt Fence	LF	6000	$_____	$_____
SC-02	Provide Erosion Bales	EA	36	$_____	$_____
SC-03	Inlet Protection Type A	EA	13	$_____	$_____
SC-04	Inlet Protection Type D	EA	48	$_____	$_____
SC-05	Rip Rap Erosion Control	SY	90	$_____	$_____
SC-06	Tracking Pad	EA	3	$_____	$_____
SC-07	Install Cluster Mailbox Unit Locations	EA	4	$_____	$_____
				TOTAL AMOUNT BID:	**$_____**



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LAYOUT: ALI-06I S-WM

BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ----
DESIGNED BDR

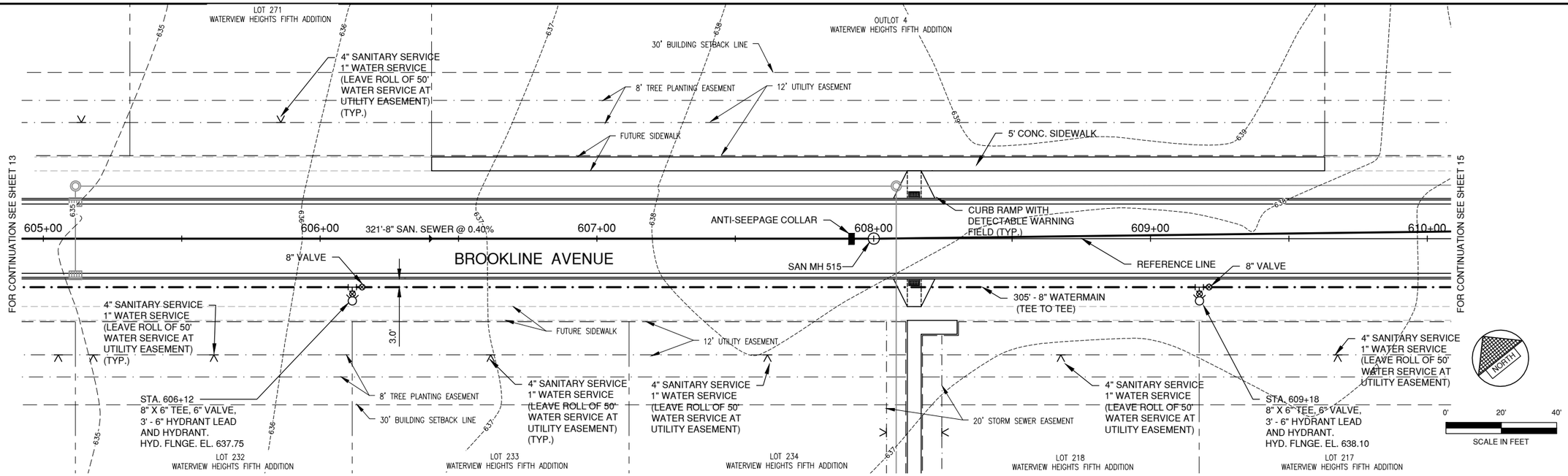
CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

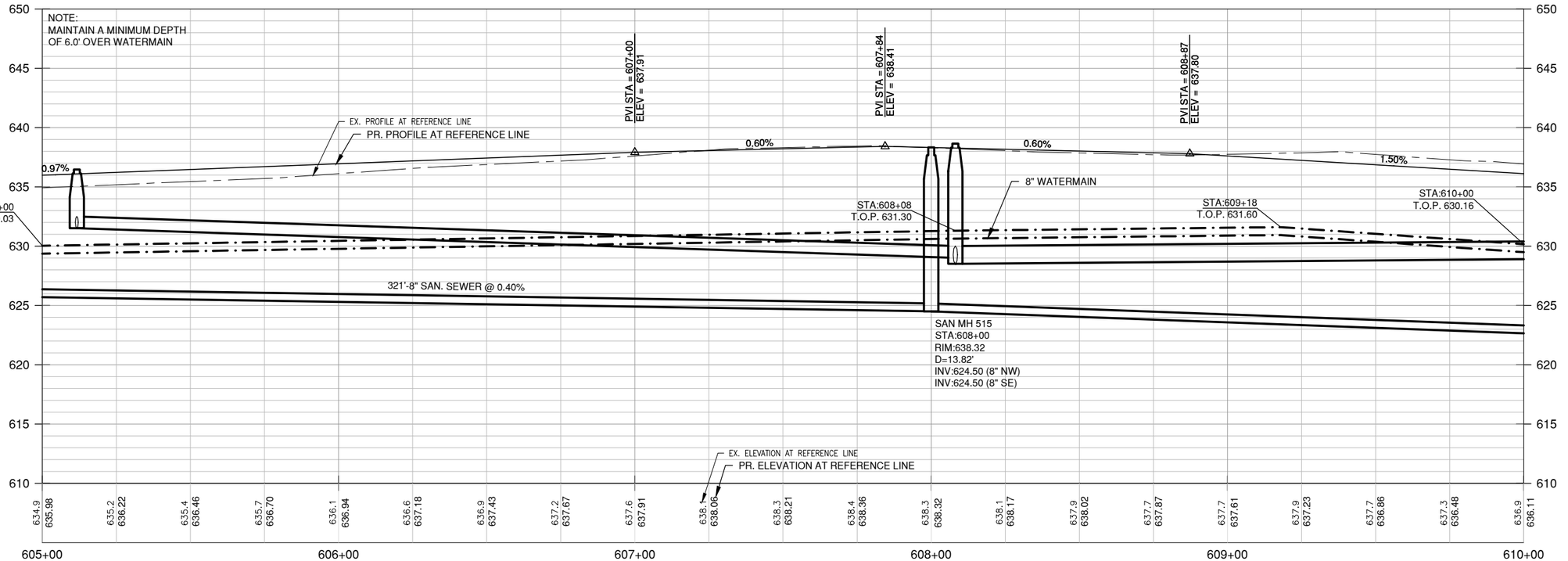
SANITARY SEWER AND WATERMAIN
BROOKLINE AVENUE
STA. 600+00 TO STA. 605+00

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

Robert E. Lee & Associates, Inc.
ENGINEERING, SURVEYING, ENVIRONMENTAL SERVICES
1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
920-662-9641 www.releeinc.com

SHEET NO. 13R





LAYOUT: ALI-06 S-WM
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Plot Date: Jun 22, 2022 - 2:25pm

BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ---
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

SANITARY SEWER AND WATERMAIN
BROOKLINE AVENUE
STA. 605+00 TO STA. 610+00

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

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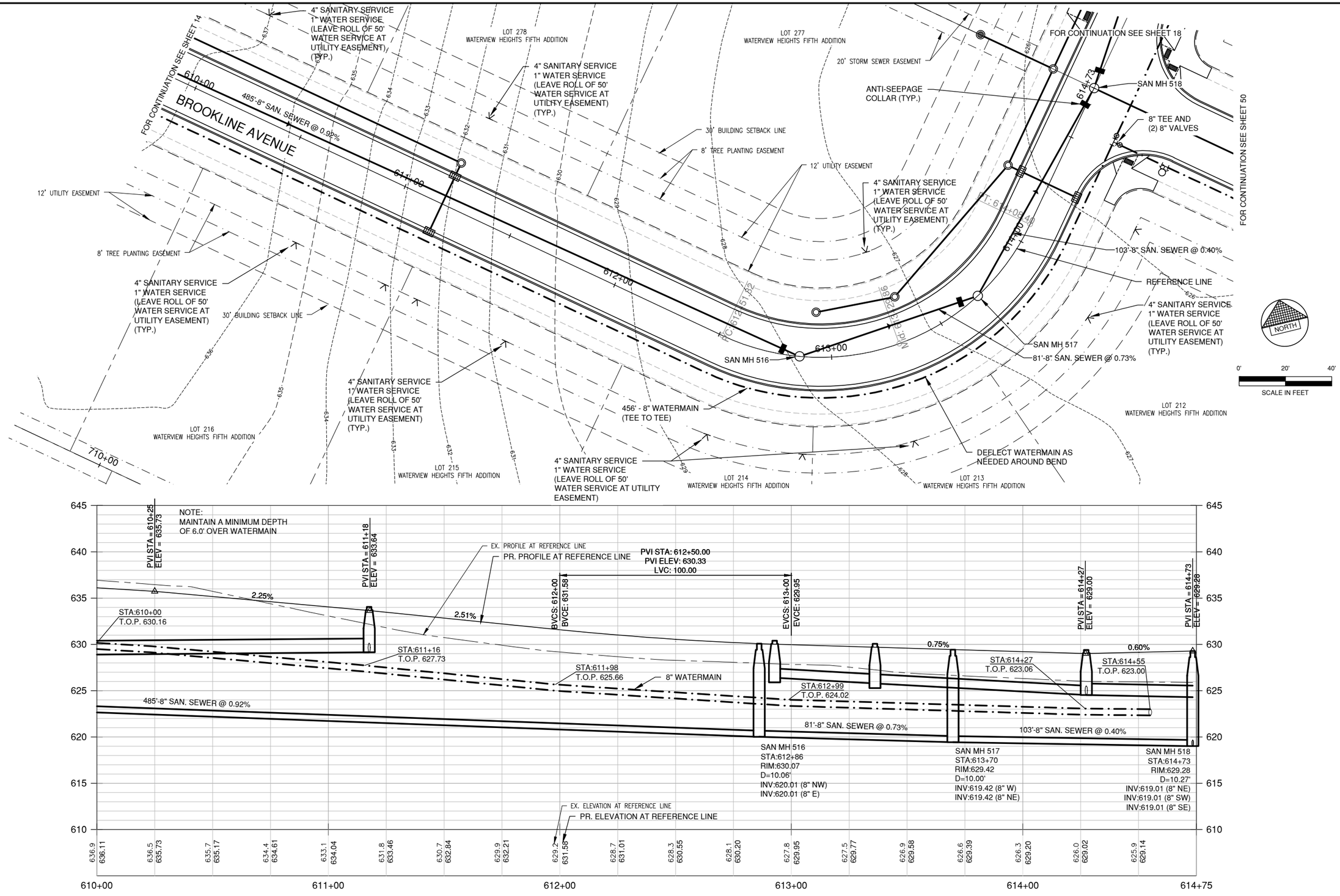
SHEET NO. 14R



BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

SANITARY SEWER AND WATERMAIN
BROOKLINE AVENUE
STA. 610+00 TO STA. 614+75

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

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1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
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SHEET NO. 15R

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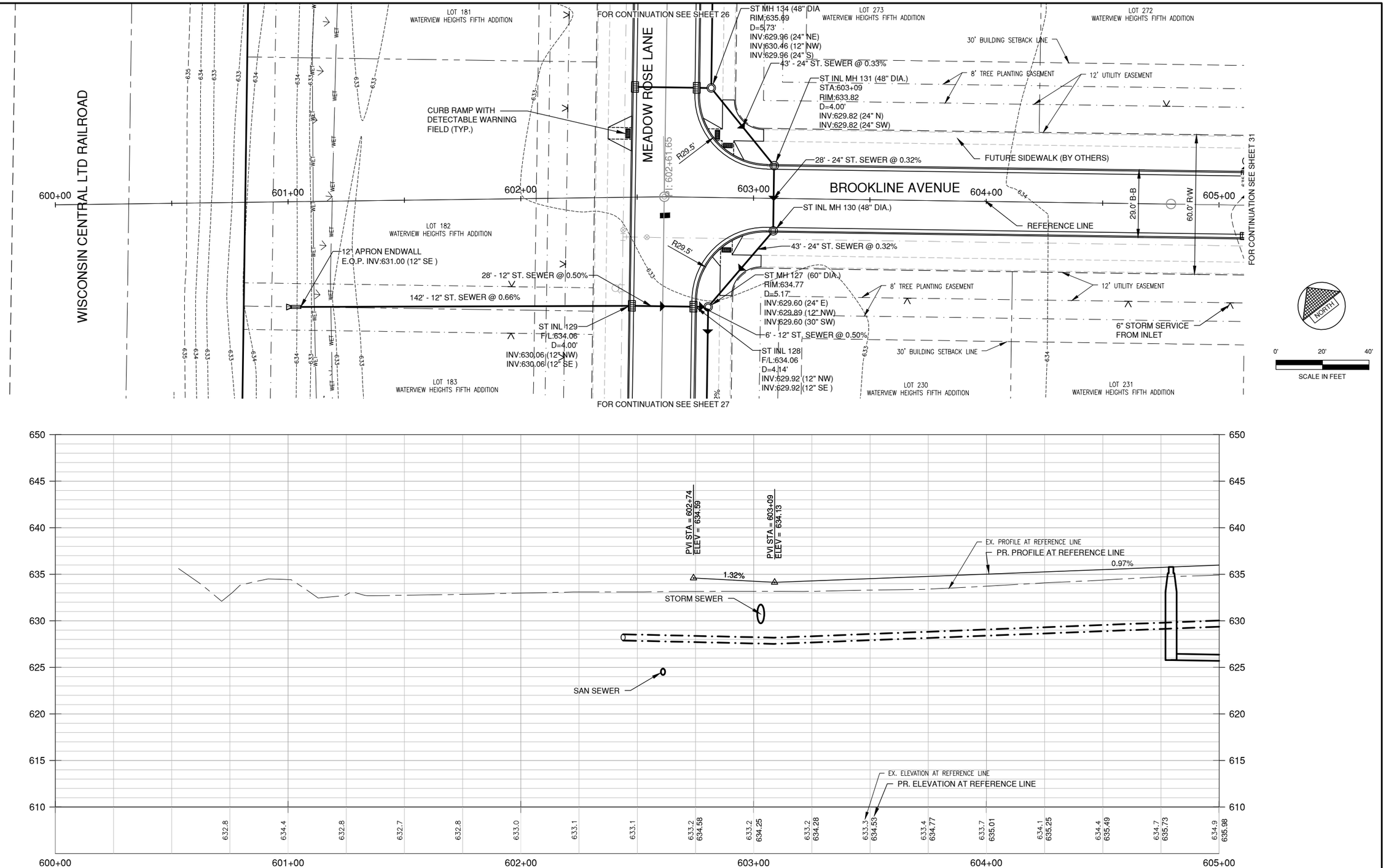

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Plot Date: Jun 22, 2022 - 2:35pm
LAYOUT: ALI-06 ST

BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

STORM SEWER AND STREET DESIGN
BROOKLINE AVENUE
STA. 600+00 TO STA. 605+00

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

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1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
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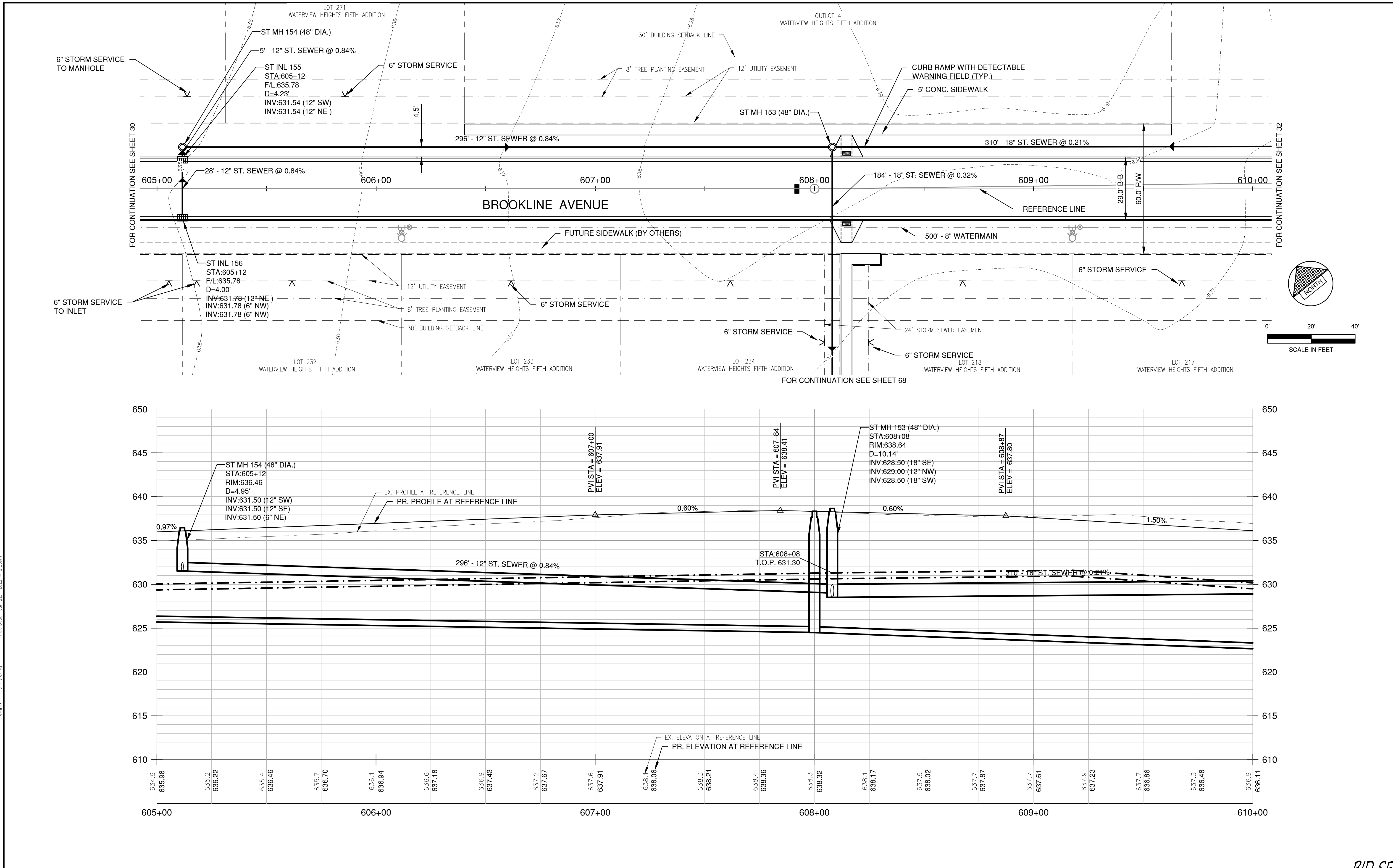
SHEET NO. 30R



NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

STORM SEWER AND STREET DESIGN
BROOKLINE AVENUE
STA. 605+00 TO STA. 610+00

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

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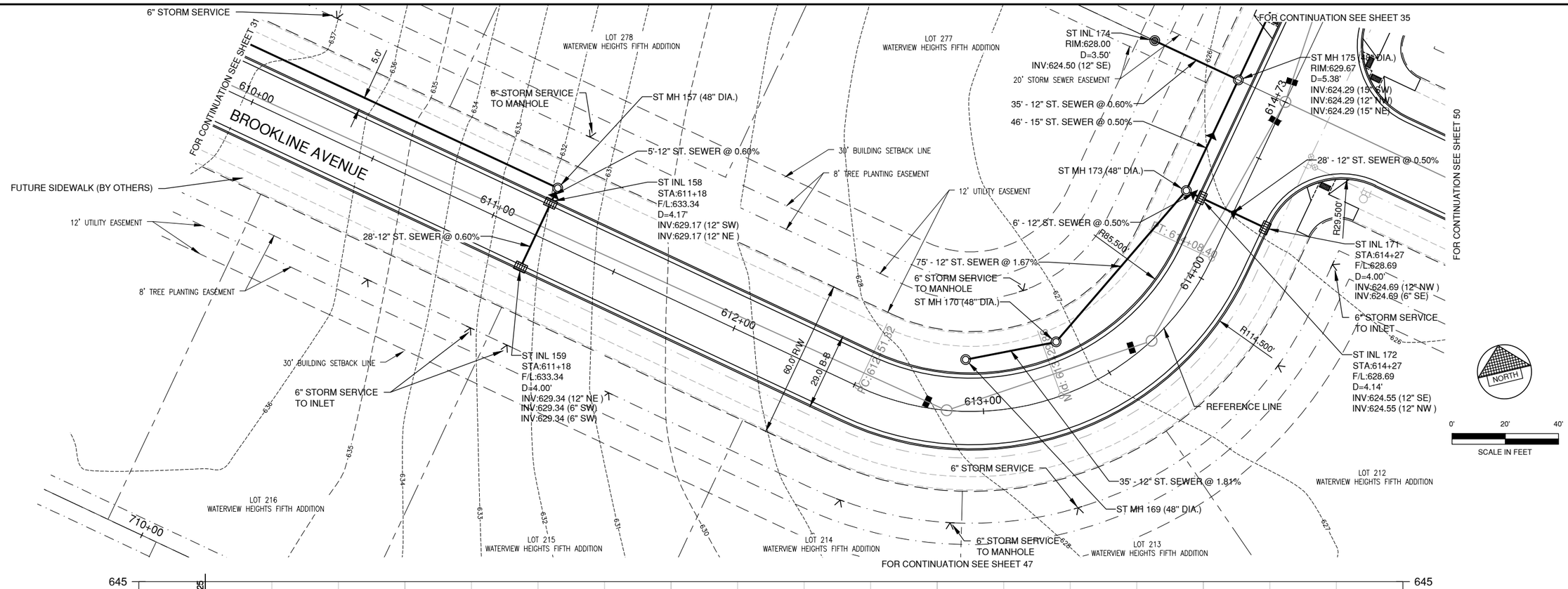
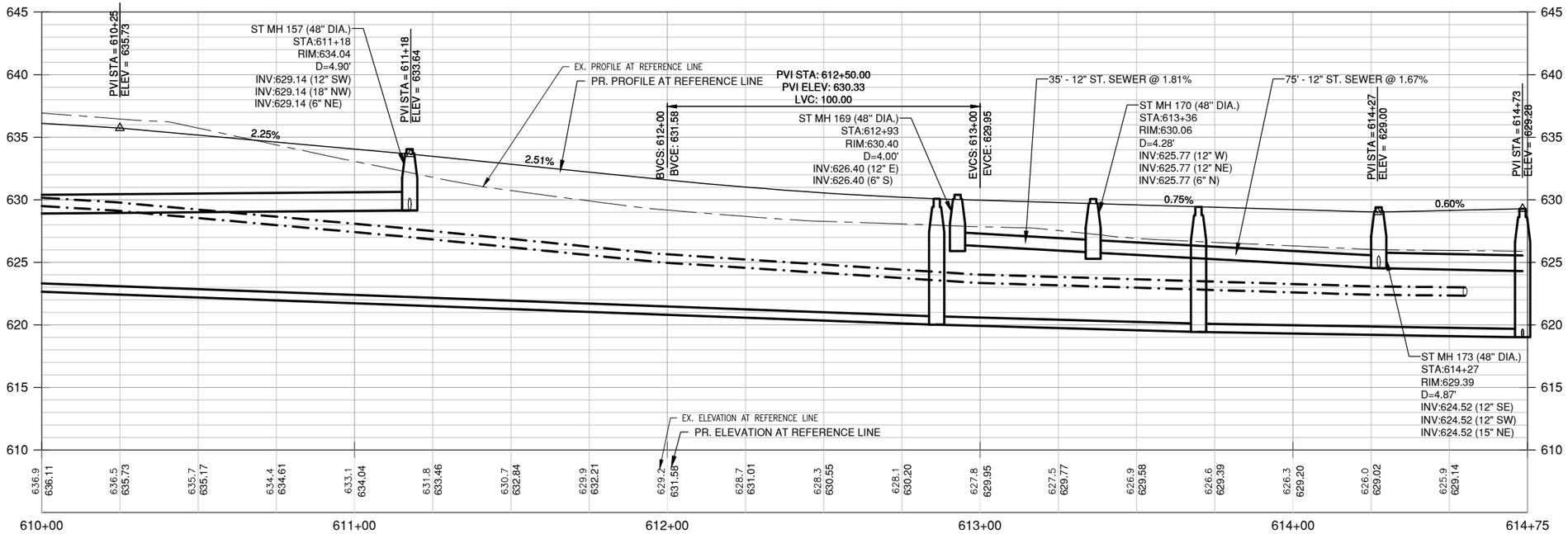
SHEET NO. 31R





BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/22/2022	BDR	PROFILE DATA SHOWS UP				

DRAWN JMS
CHECKED ---
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

STORM SEWER AND STREET DESIGN
BROOKLINE AVENUE
STA. 610+00 TO STA. 614+75

DATE 05/2022
FILE A_ALI-06
JOB NO. 0404471

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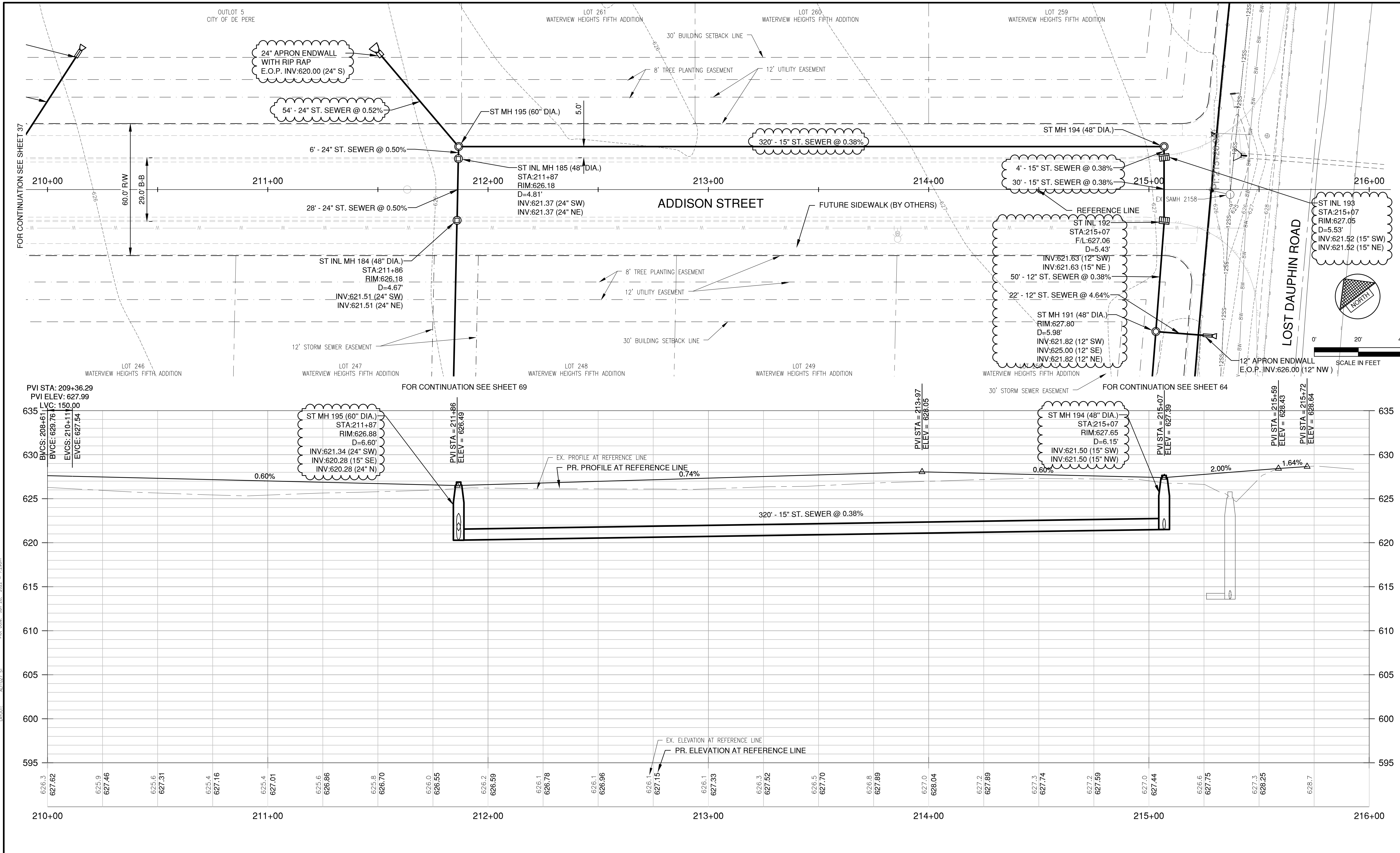
SHEET NO. 32R



BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/28/22	BDR	STORM SEWER ADJUSTMENTS				

DRAWN JMS-LLP
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

STORM SEWER AND STREET DESIGN
ADDISON STREET
STA. 210+00 TO STA. 216+00

DATE 03/2022
FILE A_ALI-02
JOB NO. 0404471

Robert E. Lee & Associates, Inc.
ENGINEERING, SURVEYING, ENVIRONMENTAL SERVICES
1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
920-662-9641 www.releeinc.com

SHEET NO. 38R

LOT 275
WATERVIEW HEIGHTS FIFTH ADDITION

LOT 276
WATERVIEW HEIGHTS FIFTH ADDITION

LOT 278
WATERVIEW HEIGHTS FIFTH ADDITION

LOT 277
WATERVIEW HEIGHTS FIFTH ADDITION

FOR CONTINUATION SEE SHEET 49

FOR CONTINUATION SEE SHEET 18 & 35

FOR CONTINUATION SEE SHEET 15 & 32

FOR CONTINUATION SEE SHEET 63

FOR CONTINUATION SEE SHEET 62

LOST DAUPHIN ROAD

ST MH 178 (48" DIA.)
RIM:629.40
D=5.34'
INV:624.06 (15" SW)
INV:624.45 (12" SE)
INV:624.06 (15" N)

6' - 12" ST. SEWER @ 0.75%

46' - 15" ST. SEWER @ 0.50%

ST MH 175 (48" DIA.)

35' - 12" ST. SEWER @ 0.60%

ST INL 174

46' - 15" ST. SEWER @ 0.50%

ST INL 172
RIM:628.69
D=4.14'
INV:624.55 (12" SE)
INV:624.55 (12" NW)

ST MH 173 (48" DIA.)
RIM:629.39
D=4.87'
INV:624.52 (12" SE)
INV:624.52 (12" SW)
INV:624.52 (15" NE)

6'-12" ST. SEWER @ 0.50%

116'-8" SAN. SEWER @ 0.40%

ST INL 177
RIM:628.70
D=4.21'
INV:624.49 (12" SE)
INV:624.49 (12" NW)

ST INL 176
RIM:628.70
D=4.00'
INV:624.70 (12" NW)

28' - 12" ST. SEWER @ 0.75%

SAN MH 518

8" TEE AND (2) 8" VALVES

198'-8" SAN. SEWER @ 2.42%

187' - 8" WATERMAIN (TEE TO CONNECTION)

STA. 513+62
8"X6" TEE, 3'-6" HYD LEAD
AND HYDRANT)
FLANGE EL. 629.60

ST INL 171
RIM:628.69
D=4.00'
INV:624.69 (12" NW)

28' - 12" ST. SEWER @ 0.50%

103'-8" SAN. SEWER @ 0.40%

112' - 12" ST. SEWER @ 0.38%

ST INL 188
RIM:627.60
D=4.10'
INV:623.50 (12" SW)
INV:623.50 (12" NE)

PI: 101+81.43

31' - 12" ST. SEWER @ 0.38%

ST INL 187
RIM:627.65
D=4.03'
INV:623.62 (12" SW)
INV:623.62 (12" NE)

PI: 100+97.57

PROVIDE WATERTIGHT CONNECTION TO EXISTING SAN MH. RECONSTRUCT BENCH AS NEEDED

REFERENCE LINE

SAN MH 520

PROVIDE WATERTIGHT CONNECTION TO EX. WATERMAIN WITH TAPPING SLEEVE AND VALVE

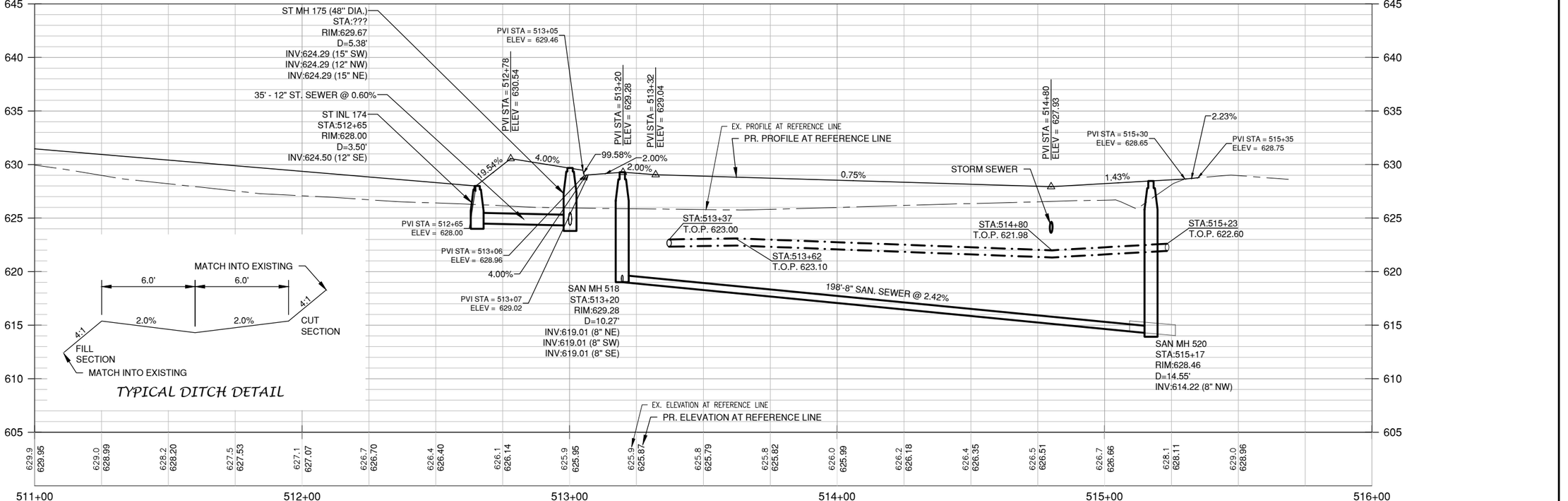
511+00 512+00 513+00 514+00 515+00 515+94

102+00 101+00

PI: 512+89.67

NORTH

0' 20' 40'
SCALE IN FEET



TYPICAL DITCH DETAIL

File: R:\0404\0404\0404471\dwg_ALI-05.dwg
Plot Date: Jun 28, 2022 - 7:28am
LAYOUT: ALI-05S

BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/28/22	BDR	STORM SEWER ADJUSTMENTS				

DRAWN RLB
CHECKED ----
DESIGNED BDR

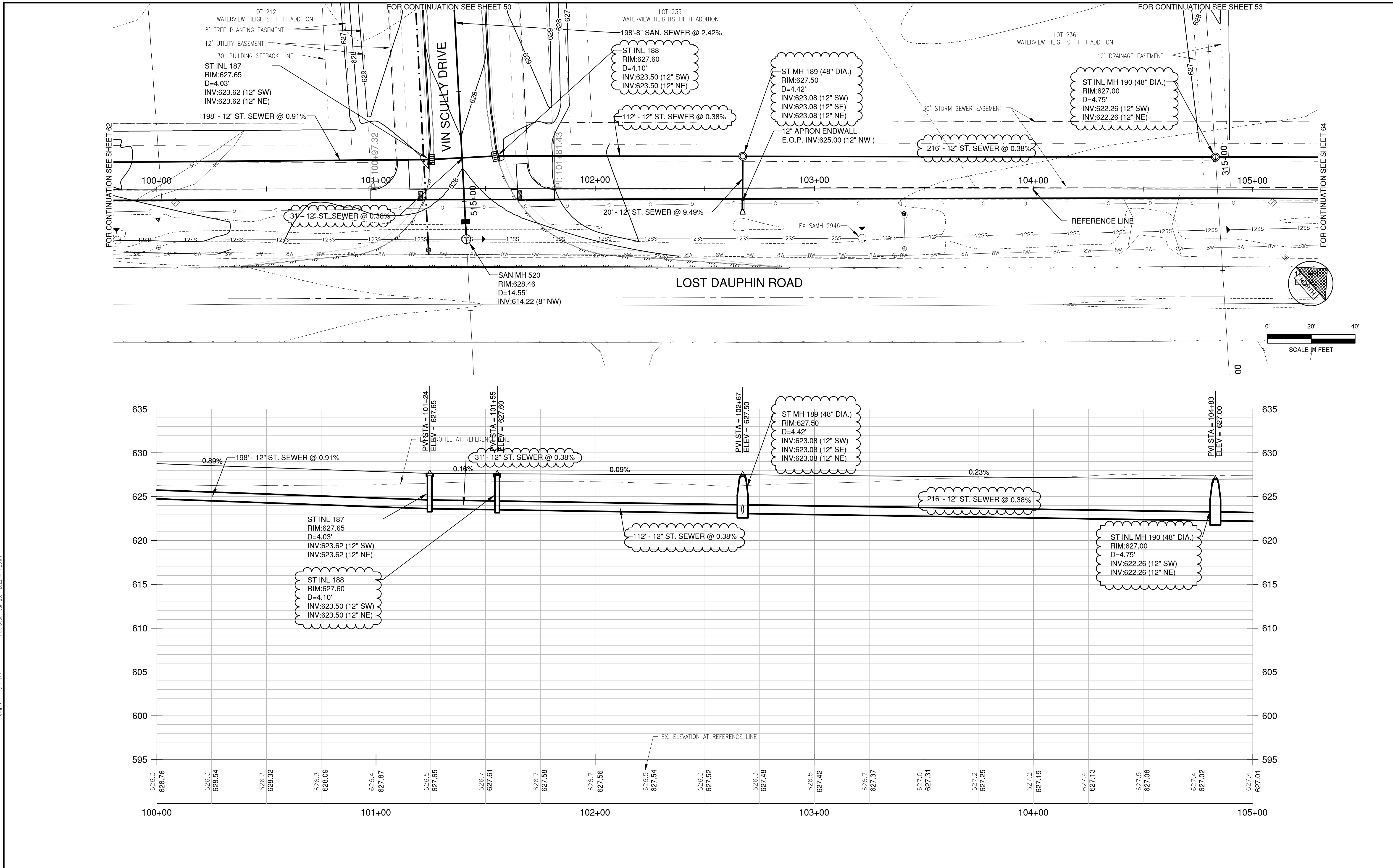
CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

VIN SCULLY LANE AND
BACK PROPERTY LINE BETWEEN
LANSDOWNE STREET AND BROOKLINE AVENUE
STA.511+00 TO STA. 516+00

DATE 03/2022
FILE A_ALI-05
JOB NO. 0404471

Robert E. Lee & Associates, Inc.
ENGINEERING, SURVEYING, ENVIRONMENTAL SERVICES
1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
920-662-9641 www.releeinc.com

SHEET NO. 50R



NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/28/22	BDR	STORM SEWER ADJUSTMENTS				

DRAWN RLB
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

LOST DAUPHIN ROAD
STA. 100+00 TO STA. 105+00

DATE 03/2022
FILE A_ALI-14
JOB NO. 0404471

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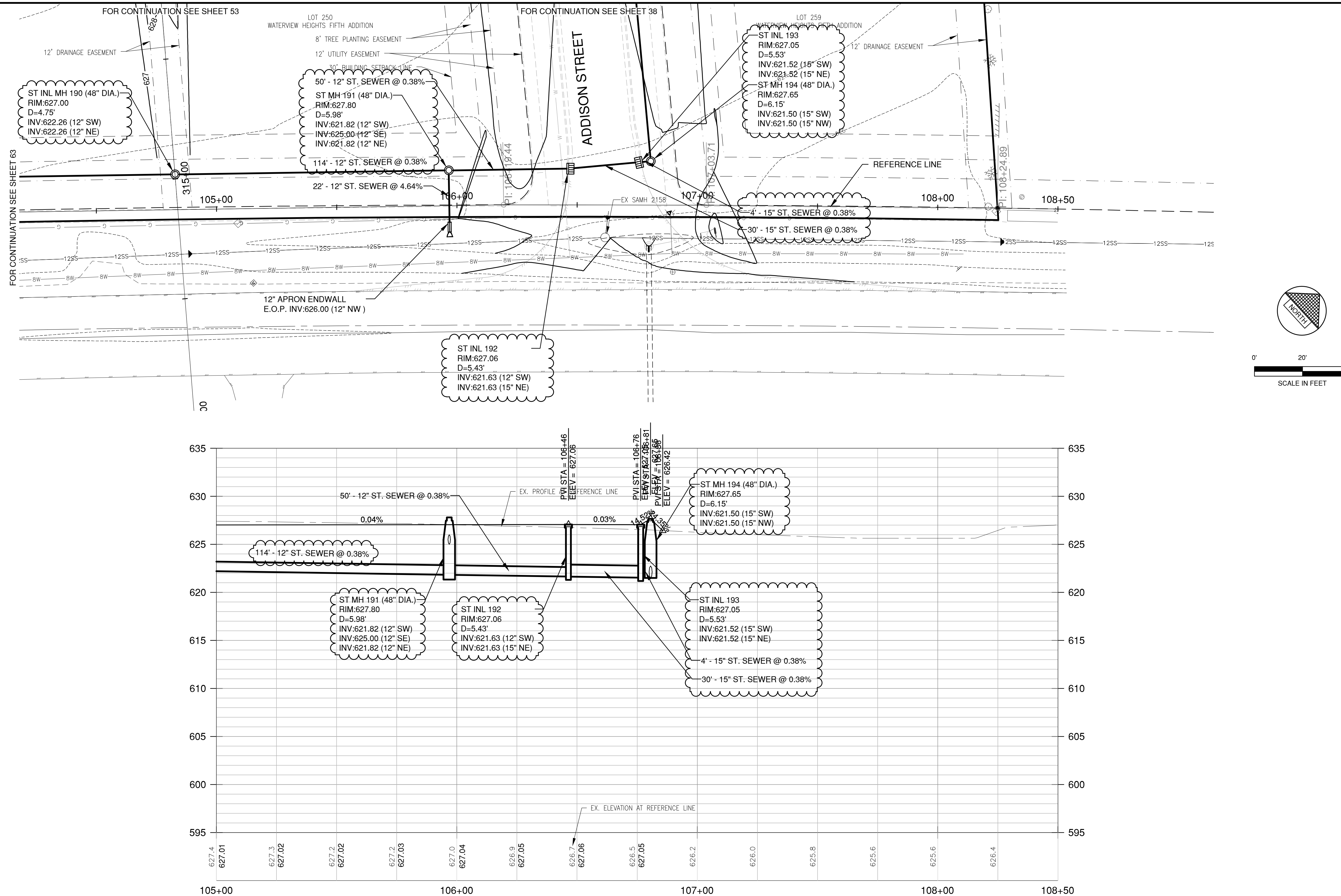

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/28/22	BDR	STORM SEWER ADJUSTMENTS				

DRAWN RLB
CHECKED ----
DESIGNED BDR

CONTRACT NO. 22-11
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

LOST DAUPHIN ROAD
STA. 105+00 TO STA.108+50

DATE 03/2022
FILE A_ALI-14
JOB NO. 0404471

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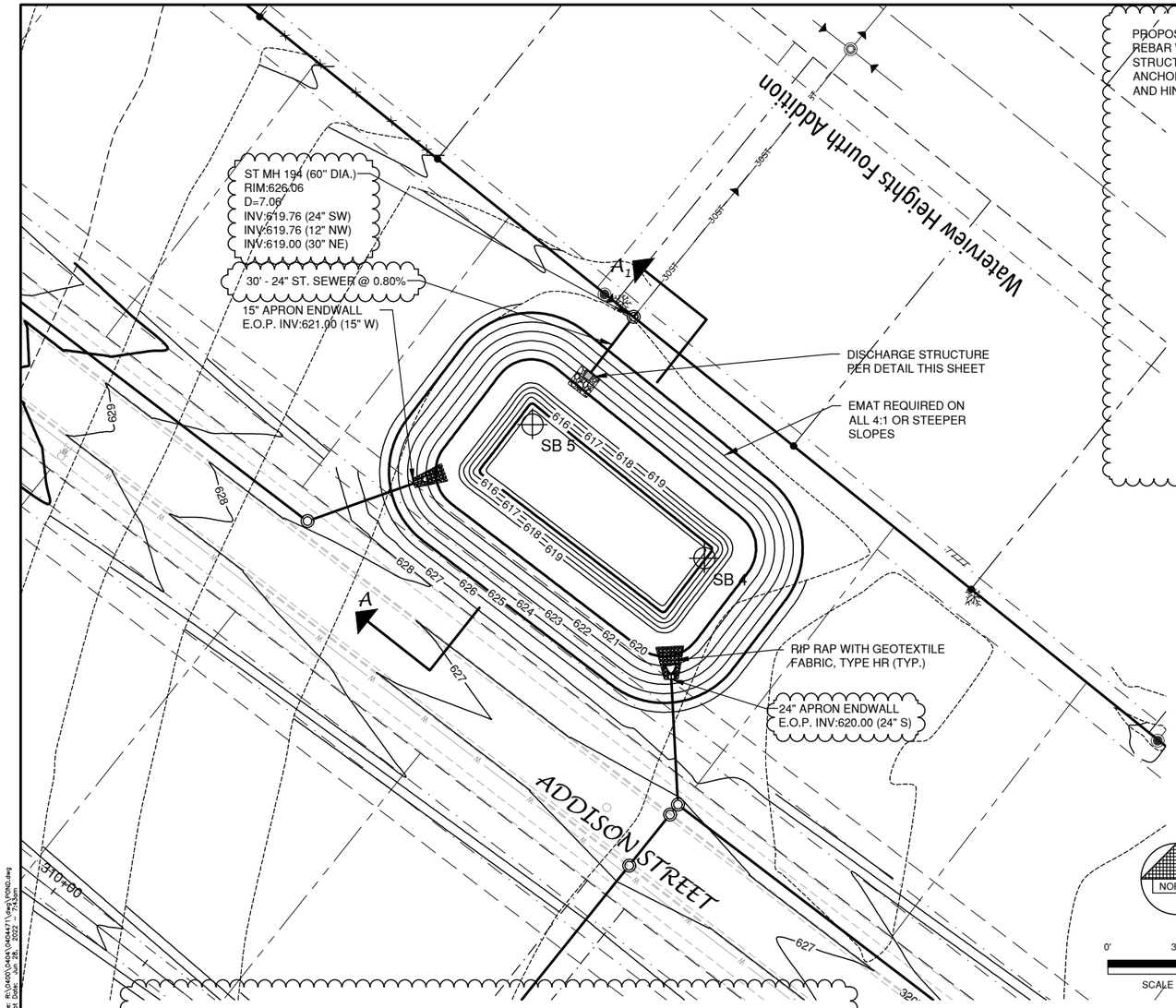
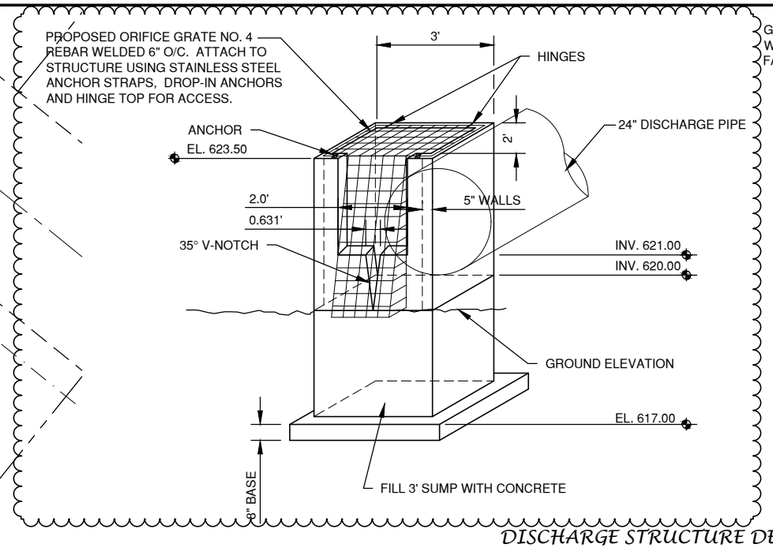
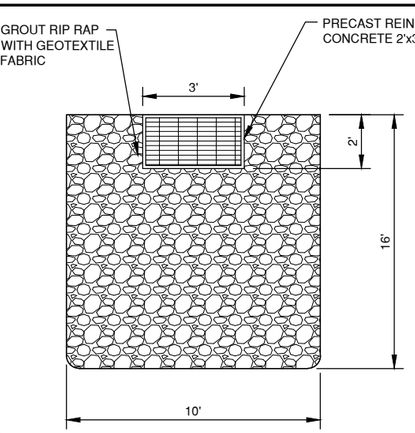
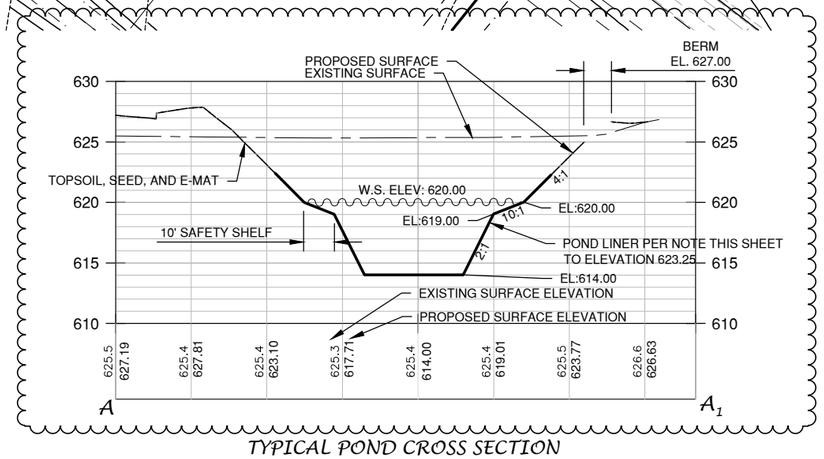




DISCHARGE STRUCTURE DETAIL





TYPICAL POND CROSS SECTION

POND FLOOD ELEVATION SUMMARY

YEAR STORM	PEAK WATER SURFACE ELEVATION
1-YEAR	621.67
2-YEAR	622.06
10-YEAR	623.65
100-YEAR	625.55

BID SET

NO.	DATE	APPROV.	REVISION	NO.	DATE	APPROV.	REVISION
1	6/28/22	BDR	STORM SEWER ADJUSTMENTS				

DRAWN BDR
CHECKED BBB
DESIGNED BDR

CONTRACT NO. 0404-22-XX
2022 UTILITY AND STREET CONSTRUCTION
WATERVIEW HEIGHTS FIFTH ADDITION
CITY OF DE PERE, BROWN COUNTY, WI

EAST POND PLAN AND DETAILS

DATE 04/2022
FILE POND
JOB NO. 0404471

Robert E. Lee & Associates, Inc.
ENGINEERING, SURVEYING, ENVIRONMENTAL SERVICES
1250 CENTENNIAL CENTRE BOULEVARD HOBART, WI 54155
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SHEET NO. 75R

File: P:\0400\0404\0404471\cad\POND.dwg
Plot Date: Jun 28, 2022 - 7:43am
LAYOUT: EAST POND

GEOTECHNICAL ENGINEERING SERVICES REPORT

For the:

Waterview Heights Fifth Addition Subdivision
Lost Dauphin Road
De Pere, Wisconsin

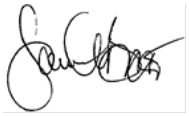
Prepared for:
City of De Pere
925 South Sixth Street
De Pere, Wisconsin 54115

Prepared by:

Professional Service Industries, Inc.
3009 Vandenbroek Road
Kaukauna, Wisconsin 54130
Phone (920) 735-1200

June 23, 2022

PSI Report Number: 00941736



James M. Becco, P.E.
Regional Vice President

Patrick Bray, E.I.T.
Branch Manager

Whitney Baumann
Staff Geologist

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Appendix (in order of appearance)
Figure 1 – Boring Location Plan
Soil Boring Logs
Laboratory Data Sheets
Storm Forms
General Notes

1 INTRODUCTION

1.1 GENERAL

This report presents the results of the subsurface exploration and subgrade evaluation for the proposed Waterview Heights Fifth Addition Subdivision in De Pere, Wisconsin. The work was performed for the City of De Pere, at the request of Mr. Eric Rakers.

1.2 PURPOSE

The purpose of this study was to evaluate the subsurface conditions at specific boring locations and to establish parameters for use by the design engineers and architects in preparing the underground utility, pavement, and stormwater management designs for the proposed project. An elevation of houses or other structures was not requested or performed.

1.3 SCOPE

The scope of services included the subsurface exploration, an evaluation of soil characteristics by field and laboratory testing, and an evaluation of the data obtained. Subgrade preparation recommendations and construction considerations are also provided. The scope of the field work, including the number, depth, and locations of the borings was determined by the client.

1.4 AUTHORIZATION

The description of services and authorization to perform this subsurface exploration and evaluation were in the form of a signed Agreement for Services between the City of De Pere and PSI, dated March 23, 2022, referencing PSI Proposal No. 0094-363689, dated January 17, 2022. The general conditions for the performance of the work were referenced in the proposal. This report has been prepared on behalf of, and exclusively for the use of the City of De Pere. The information contained in this report may not be relied upon by any other parties without the express written consent of PSI, and acceptance by such parties of PSI's General Conditions.

2 SITE AND PROJECT DESCRIPTION

2.1 SITE FEATURES

The subject site is located along the northwest side of Lost Dauphin Road, approximately 175 feet southwest of the intersection with Cross Gate Lane in De Pere, Wisconsin. At the time of the exploration, the project site consisted of agricultural fields. Wetland areas were present along the northwestern portion of the subject site and within Lot 187, shown on a site plan provided to PSI by the client. Railroad tracks were located to the northwest of the subject site, beyond the wetland areas. The surrounding parcels generally consisted of residential properties, with the exception of commercial properties located to the northwest. The Fox River was located to the southeast of the subject site. A review of historical aerial photographs available on Google Earth indicates that the site has been utilized as agricultural land from the

earliest photo taken in 1992 to the latest photo taken in 2021. The subject site is depicted on the enclosed Boring Location Plan (Figure 1).

The topography of the subject site is relatively hilly, with an elevation difference of about 8 feet between the boring locations. Existing elevations at the borings ranged between about EL. 633.6 and EL. 625.6. At the time of the exploration, the surface of the site at the boring locations was relatively soft, and an ATV drill rig was utilized to access the boring locations.

2.2 PROJECT DESCRIPTION

Based on the information provided by the client, it is understood that the proposed Waterview Heights Fifth Addition Subdivision project will consist of the construction of new asphalt roadways, sanitary sewer utilities, and stormwater management areas within the vacant lot located approximately 175 feet southwest of the intersection with Lost Dauphin Road and Cross Gate Lane. Residential structures are planned for the addition; however, an evaluation of these structures was not requested or performed in this evaluation.

It is understood that the project will include the construction of approximately 30-foot-wide asphalt pavement roadways with concrete curb and gutter. Design traffic loads were not provided to PSI for use in this evaluation. Sanitary sewer utilities are also planned for proposed project. Additional design details of the utilities, including material, bearing depth, and specific locations, were not available at the time of report preparation. When additional design information regarding the road design and proposed utilities becomes available, PSI must be notified to determine if a reevaluation or redirection of the recommendations provided herein is necessary.

It is understood that stormwater management areas are generally planned in the northeastern and southern portions of the subject site. The size, type, bottom elevation, and other design details were not provided at the time of report preparation.

3 EXPLORATION AND LABORATORY PROCEDURES

3.1 SCOPE SUMMARY

The field and laboratory data utilized in the evaluation of the subsurface materials was obtained by drilling exploratory test borings, securing soil samples by the split-spoon sampling method, and subjecting the samples to laboratory testing.

With respect to the stormwater management areas, the field and laboratory work for classification of the subgrade soils was performed to provide information for use by the basin design personnel when considering requirements of Chapter NR151 of the Wisconsin Administrative Code, and of WDNR Technical Standard 1002, “Site Evaluation for Stormwater Infiltration” guidelines. The design of the proposed stormwater management area was beyond the scope of services for this project.

3.2 FIELD EXPLORATION

Seven (7) soil test borings were performed to depths ranging from about 15 to 20 feet below existing grade. Borings B-1 through B-5 were performed to a depth of about 15 feet in the proposed stormwater management areas; and B-6 and B-7 were performed to a depth of 20 feet within the proposed sanitary sewer utility areas. The number, depths, and locations of the borings were determined by the client. The borings were staked in the field by the client. The surface elevations shown on the logs were provided by the client.

The soil test borings were performed with an ATV-mounted rotary drilling rig utilizing continuous flight hollow stem augers to advance the holes. Representative samples were obtained by the Standard Penetration Test (SPT) method using split-spoon sampling procedures in general accordance with ASTM D-1586 procedures. Samples were collected at 2.5-foot intervals to 10 feet, and then at 5-foot intervals thereafter to the end of the borings. As an exception, samples were obtained at 2 foot intervals at the borings performed within the proposed stormwater management areas. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three (3) successive increments of six (6) inches of penetration. The “N” value is obtained by adding the second and third incremental numbers. The SPT provides a means of estimating the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of evaluating the relative strength and compressibility characteristics of the subsoils.

The SPT soil samples were transferred into clean glass jars immediately after retrieval, and returned to the laboratory upon completion of the field operations. Samples will be discarded unless other instructions are received. All soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D-2488-75). The samples collected within the stormwater management areas were visually classified by a certified soil tester in general accordance with USDA National Resources Conservation Service textural soil classification procedures. A description of the subsurface conditions encountered at each boring location is shown on the enclosed Soil Boring Logs. After completion of the borings the boreholes were backfilled to the ground surface with bentonite chips.

A copy of the Soil Boring Logs and Boring Location Plan (Figure 1) are enclosed in the Appendix. The soil stratification shown on the logs represents the approximate soil conditions in the actual boring locations at the time of the exploration. The terms and symbols used on the logs are described in the General Notes found in the Appendix.

3.3 LABORATORY PHYSICAL TESTING

Soil samples obtained from the exploration were visually classified in the laboratory, and subjected to testing, which included moisture content determinations, Atterberg Limits, and grain size analysis by the mechanical method. Selected cohesive soil samples were tested in unconfined compression with an uncontrolled strain loading rate and/or with a calibrated hand penetrometer to aid in evaluating the soil strength characteristics. The values of strength tests

performed on soil samples obtained by the Standard Penetration Test Method (SPT) are considered approximate, recognizing that the SPT method provides a representative but somewhat disturbed soil sample.

The laboratory testing was performed in general accordance with the respective ASTM methods, as applicable, and the results are shown on the boring logs and Laboratory Data Sheets in the Appendix.

4 DESCRIPTION OF SUBSURFACE CONDITIONS

4.1 GENERAL

A description of the subsurface conditions encountered at the test boring locations is shown on the Soil Boring Logs. The lines of demarcation shown on the logs represent approximate boundaries between the various soil classifications. It must be recognized that the soil descriptions are considered representative for the specific test boring location, but that variations may occur between and beyond the sampling intervals and boring locations. Soil depths, topsoil and layer thicknesses, and demarcation lines utilized for preconstruction planning should not be expected to yield exact and final quantities. A summary of the major soil profile components is described in the following paragraphs.

4.2 SUBSURFACE CONDITIONS

The surface materials within the area of the proposed utility improvements (B-6 and B-7) generally consisted of about 4 to 7 inches of topsoil comprised of dark brown clay with silt and intermixed root matter. Beneath the topsoil materials, the underlying natural soils generally consisted of light brown, reddish brown, to dark reddish gray clay, silt, and silty clay to the maximum depths explored by the borings.

The natural cohesive soils encountered in the borings were generally medium stiff to stiff in relative density, with Standard Penetration resistances (N-values) typically between about 7 and 12 blows per foot (bpf), and unconfined compressive strengths typically ranging from about 2.0 to 4.5+ tons per square foot (tsf).

The surface materials within the proposed stormwater management areas (B-1 through B-5) consisted of about 1 to 4 inches of topsoil generally comprised of dark brown clay loam with intermixed root matter. Beneath the topsoil, the underlying natural soils predominantly consisted of reddish brown to dusky red silty clay loam and silty clay to the maximum depths explored by the borings.

As requested by the client, Atterberg Limits and mechanical grain-size analyses were performed on a composite of SPT soil samples obtained from B-2 at depths ranging from about 5 to 7 feet (EL. 624.2 to EL. 622.2) below existing grade. The test results indicate a Liquid Limit of 63, a Plastic Limit of 23, and a Plasticity Index of 40. The test results indicate the sample may be classified as CH by the USCS method, and as A-7-6 by the AASHTO method. The

Atterberg Limits and mechanical grain-size testing results can be found in the laboratory data sheets provided in the Appendix.

The foregoing discussion of soil conditions on this site represents a generalized soil profile as determined at the test boring locations. A more detailed description and supporting data for each test location can be found on the individual Soil Boring Logs.

4.3 GROUNDWATER OBSERVATIONS

Groundwater observations were made during the drilling operations, and in the open boreholes upon completion. Groundwater was not encountered during drilling or upon completion and removal of the augers in the boreholes. The borings caved at depths ranging from about 7 to 16 feet (EL. 622.2 to EL. 613.3) below existing grade; therefore, observations could not be made below the caved depths.

The groundwater observations reported herein are considered approximate. It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics. The water level of the Fox River may have an impact on the groundwater level fluctuations in the project area. Longer term monitoring would be required and is recommended to better evaluate groundwater levels on this site.

5 EVALUATION AND RECOMMENDATIONS

5.1 PAVEMENT SUBGRADE EVALUATION

On the basis of the data obtained in the exploration, the subgrade soils encountered at the borings generally consisted of clay soils. Based on laboratory testing and visual observations, the cohesive soils present have been assigned a classification of A-7-6 by the AASHTO soil classification method. The A-7-6 soils are generally rated as poor for pavement subgrade support based on their poor drainage, of high plasticity and high shrink-swell potential, high frost susceptibility, and their high potential to soften when exposed to moisture.

Evaluation of the visual soil classifications and laboratory testing information has been made in determining pertinent engineering properties of the subgrade soils. Based on the engineering properties determined from the subgrade soils tested, and with proper subgrade preparation and drainage, the following pavement subgrade design coefficients are recommended for pavement section thickness design. These values are representative of the support conditions typically exhibited by the clay subgrade materials encountered in the borings. All fill used to raise grades or replace unsuitable materials must have equal or greater support characteristics than the existing clay soils.

PAVEMENT SUBGRADE DESIGN COEFFICIENTS

AASHTO Soil Classification	A-7-6
Design Frost Index	F-4
Design Group Index	16
Soil Support Value	3.7
Estimated Subgrade Modulus (k)	100 pci

5.2 SELECTIVE SUBGRADE REMOVAL AND REPLACEMENT

Atterberg limits testing indicated that the clay soil sample obtained from B-2 between depths of about 5 to 7 feet is of high plasticity. Such soils are not the most desirable for pavement subgrade support due to their sensitivity to moisture and potential volume changes from freezing. Typically, deposits of these soils are recommended to be removed, however, it is generally not economically feasible to remove them from across the entire project area. Therefore, construction of the pavement on highly plastic subgrade soils would require a somewhat thicker pavement section with improved drainage (including a properly designed underdrain system) to help reduce the effects of moisture and annual freeze-thaw of the existing subgrade. As an alternative to removal and replacement, and as a means of improving the existing subgrade support values, the soils in could be treated with lime, lime kiln dust, fly ash, or Portland cement modification, which generally causes a significant improvement in strength and a reduction in the potential of the modified material to permanently deform (rut) under repeated traffic loads. It will also provide increased resistance to reduction in strength as a result of moisture and freeze-thaw cycling in the subgrade soils. In general, modification of the subgrade can provide higher strength, lower shrink-swell potential, less frost susceptibility, and less softening when wet. However, this must only be performed at the direction and under the supervision of the geotechnical engineer. A proper mix design must be performed prior to the performance of any modification to evaluate the potential of the existing subgrade soils for such treatment, and to determine the optimum treatment content and degree of subgrade improvement achievable. If remedial measures are not undertaken and adequate drainage not provided, an increased risk of future shrink/swell effects and the resulting pavement distress must be accepted.

5.3 SITE DRAINAGE

In general, the existing clay subgrade soils are considered to be poorly drained. Drainage action of the subgrade is dependent on the amount of fines (silt and clay) present. The presence of fines decreases the drainability of a soil, and therefore, increases its sensitivity to moisture and frost, which can result in increased instability. In addition, the proposed project is located in an area that experiences annual freezing cycles and the subgrade soils encountered have been classified as highly susceptible to frost action.

The detrimental effects of frost action within frost susceptible subgrade materials are manifested by non-uniform heave of pavements during winter months and/or the loss of strength of the subgrade during thawing periods. In order to maintain a relatively dry subgrade condition and reduce the potential for frost action, it will be necessary to control surface runoff

and water seepage as complete removal and replacement of the frost susceptible subgrade may not be economically feasible. Adequate longitudinal sloping should be provided to maintain runoff below the top of the pavement subgrade, and proper base course drainage must be provided.

6 CONSTRUCTION CONSIDERATIONS

6.1 PAVEMENT SUBGRADE PREPARATION

Approximately 1 to 7 inches of topsoil was present at the borings. However, some variation should be anticipated, especially within agricultural fields, where tilling and other related operations can result in thicker pockets of topsoil, or topsoil having become intermixed within underlying soils. All vegetation, topsoil, and any buried topsoil must be removed beneath the proposed roadways. It also should be noted that the subject site was previously utilized as an agricultural field. If any drain tiles are encountered during construction, they must be tied into new drainage structures (in accordance with any applicable regulatory requirements or restrictions). The existing drain tiles should not be abandoned since they may still actively drain areas of the subject site or adjacent properties.

After removal of any vegetation and topsoil, the exposed subgrade should be prepared as outlined in Section 211 of the WisDOT Standard Specifications. The subgrade should be thoroughly proofrolled to detect unstable, yielding or unsuitable soils, which must be removed or improved by appropriate preparation and compaction techniques. Scarification and drying of unsuitable soils, or removal and replacement with suitable fill, are two methods, which can be considered. This should be determined at the time of construction by a qualified soils engineer. Low areas may then be raised to the planned grades with suitable properly compacted fill where necessary. It must be recognized that the clay soils present on the site are highly moisture sensitive, and substantial difficulty with subgrade preparation can be expected if the soils are wet during construction.

In areas where organic, wet, soft or yielding subgrade conditions are encountered during subgrade preparation or a stable subgrade cannot be obtained, selective excavation below subgrade (EBS) and replacement may be required for proper support of new fills, or pavement reconstruction. Excavation below subgrade (EBS) should be performed as outlined in Section 205 of the WisDOT Standard Specifications. The necessity and ultimate extent of undercutting will be dependent upon the soil type encountered, moisture condition, and stability of the exposed subgrade at the time of construction. In areas of EBS, limited excavation below subgrade to a depth of 2 feet and replacement with granular fill, such as those specified in Section 305 of the WisDOT Standard Specification for ¾-inch or 1¼-inch materials, can generally be used to improve the stability of the subgrade. It must be recognized that soil stability is dependent on such factors as soil type and moisture content, weather conditions at the time of construction, and also construction disturbance. Thus, the necessity of EBS generally must be determined in the field at the time of construction, based upon observations made during subgrade preparation.

If relatively wet or unstable soils are encountered below EBS, it may be necessary to use an SAS (Subgrade Aggregate Separation) geotextile fabric and/or a select crushed material for stabilization (such as that specified in Section 312 of the WisDOT Standard Specifications) before placing backfill soils. The SAS geotextile fabric used in this application should meet the physical requirements identified in Section 645 of the WisDOT Standard Specifications and shown in the following table.

Test	Units	Values
Grab Tensile Strength	N	750 min.
Puncture Strength	N	300 min.
Apparent Opening Size	um	212 max.
Permittivity	s^{-1}	0.35 min.

The clayey soils present within the subgrade are considered to be highly sensitive to moisture and construction activity; therefore, every effort should be made to prevent ponding during reconstruction operations and maintain a relatively dry and stable working subgrade. If the soils become disturbed, removal and replacement may be required.

6.2 BORROW MATERIAL

Generally, granular material with low fines contents is recommended for use in regrading, or to replace unsuitable soils, such as those specified in Section 305 of the WisDOT Standard Specification for ¾-inch or 1¼-inch materials. The existing granular base materials and/or recycled asphaltic pavement materials may be used to balance grades, and are generally considered suitable for such purposes. Clayey and silty soils, organic materials, and wet granular soils are not considered suitable for such purposes. All fill used must have subgrade design coefficients equal to or greater than those previously specified.

6.3 FILL PLACEMENT AND COMPACTION

Fill should be placed in layers of not more than 9 inches in loose thickness before compaction. As an exception, when the fill consists of well-graded granular material and the compaction equipment is adequate for such purpose, the loose layer thickness may be increased to a maximum of 12 inches. Each lift must be compacted to a density of at least 95 percent of the maximum dry density as determined by the Standard Proctor method, ASTM designation D-698.

Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities. This is especially true of silty and clayey soils, where scarification and aeration may be required to achieve near-optimum moisture levels prior to compaction. It is recommended the fill soils be placed at moisture contents within a few percent of their optimum moisture content. Depending upon seasonal moisture conditions, some drying and/or reworking of these fine-grained soils may be necessary prior to placement.

The selection of fill materials for various applications should be done in consultation with the soils engineer. Similarly, the evaluation of the subgrade preparation, and placement and compaction of fill for structural application should be monitored and tested by a qualified representative of the soils engineer.
Compaction testing is recommended so that the pavement subgrade materials develop the subgrade design coefficients previously specified for adequate pavement section thickness design. Compaction should be performed with equipment suitable for such purpose, such as a sheepsfoot roller for clayey soils, and a vibratory smooth drum roller for granular material.

7 EVALUATION AND RECOMMENDATIONS

7.1 PIPE MATERIAL

In order to reduce the amount of pipe deflection, it must be recognized that proper selection and compaction of the pipe bedding and cover materials is essential. This should be done in accordance with the standard specification for sewer construction. Bedding material exhibiting a well-defined moisture density relationship must be compacted to 95 percent of ASTM D-698 (Standard Proctor).

It is understood that the project will include the installation of sanitary sewer utilities. Additional design details of the utility, including material, bearing depth, and specific locations, were not available at the time of report preparation. The natural soils encountered in the borings can generally be used for the support of utilities, manholes, or other structures where they are in a suitable and stable condition, and are of sufficient strength. Some undercutting of unsuitable materials, in conjunction with the replacement with crushed stone or other suitable granular backfill, may be necessary to establish a suitable bearing subgrade. Where undercutting is performed, the excavations must extend laterally beyond the perimeter of the utility for a distance at least equal to the thickness of the fill below the utility bottom. Backfill must be placed in layers of not more than nine (9) inches in thickness, at moisture contents at or near optimum, and be compacted to a minimum density of 95 percent of the maximum dry density as determined by ASTM designation D-698 (Standard Proctor). Utility piping, manholes and other structures supported on suitable natural soils, or newly placed and compacted structural fill used to replace unsuitable materials, may be designed for a net allowable soil bearing pressure of 2,000 to 4,000 psf depending on location and bearing depth. When the type and pipe size; bearing depth, and the installation method of the pipes are known, PSI must be informed in order to determine if any redirection or revision of the recommendations provided herein is necessary.

Isolated zones of softer/lower strength soils requiring undercutting and replacement with compacted structural fill may be encountered. Substantial instability with excavation sidewalls and the bearing subgrade may develop over portions of the route when the confining effect of the overburden is removed, especially within granular or soft clay soils. Suitable bracing and an adequate dewatering effort may be required, especially in close proximity to creeks or other low-lying areas. In addition, the use of a crushed stone or “mud” working mat may be required in order to achieve a stable bearing subgrade on which to place the piping and any associated

manholes. Prior to the placement of bedding and pipe materials, the suitability of the existing soils for support of the proposed utility systems must be determined via observation and testing by a representative of the soils engineer.
At least portions of the clay soils at the borings are of high plasticity. All manholes, utilities, and related underground structures must bear at an adequate depth and be constructed in a manner which will protect the soils from moisture fluctuations (drying or wetting) and subsequent volume changes (shrink/swell). Some removal and replacement or extension of below grade structures to bear upon deeper soils may be necessary. In addition, substantial due care must be taken during construction to prevent moisture fluctuation of the exposed bearing subgrade. Concrete must be placed on the same day that excavations are made, and it is recommended they be backfilled with granular soils as soon as possible. Clay soils are not recommended for use as backfill. It is recommended that all below grade elements be extended to bear below frost depth to reduce the chance for potential moisture fluctuations and shrink/swell effects within the highly plastic clay soils.

7.2 TRENCH BACKFILLING

Backfilling of the pipe and any trenches must be performed in accordance with the applicable chapters of the Standard Specification for Sewer and Water Line Construction. This will be dependent on the type of pipe selected, embedment depth and other factors.

It is recommended that well graded granular soils such as those specified in Tables 37 and 39 of the Standard Specification for Sewer and Water Construction be utilized as backfill in utility trenches to reduce the potential for consolidation and settlement of the backfill. All fill soils must be placed and compacted in accordance with the site grading specifications under engineering-controlled conditions, to provide suitable support for overlaying structures and roadways. Silt, clay, organic, and wet granular soils are not recommended for reuse as backfill within utility trenches due to the substantial difficulty of obtaining proper compaction in confined areas.

Placement of bedding and cover material shall be sufficient to protect the type of pipe selected as specified by the pipe manufacturer. Trench backfill should be placed in layers not more than 12 inches in loose thickness before compaction, except that the first lift of backfill placed over the pipe can be increased to 24 inches if necessary, to protect the pipe from compaction equipment. Subsequently thinner lifts may be required depending on the type and size of compaction equipment available.

Each lift of backfill above the pipe bedding and cover, especially in areas of overlying structures (pavement, sidewalks, light poles, etc.) must be compacted to a density of at least 95 percent of the maximum dry density as determined by the Standard Proctor method (ASTM D-698).

7.3 GROUNDWATER CONTROL

Because no groundwater was encountered in the upper levels of the boreholes during the exploration, no major difficulties during excavation and construction work is anticipated. A gravity drainage system and filtered sump pumps or other conventional dewatering procedures,

should be adequate to control isolated small volume perched water if encountered. However, if larger volume perched zones are encountered, or if groundwater levels rise due to seasonal variations, more comprehensive dewatering with a series of sump pumps may be required. It should also be noted that substantially higher groundwater levels can be present within and encroaching upon wetland or low-lying wet areas.

Groundwater levels can vary seasonally, with changes in precipitation, and due to other factors. They can also vary between and beyond boring locations from the estimates made at the time of the exploration. It should be noted that perched water may also be encountered along the project route or accumulate in the base course subsequent to construction. Proper drainage of the road must be provided.

Since the anticipated subgrade soils are subject to softening when exposed to free moisture, every effort should be made to keep excavations dry. Site grading should be performed to direct runoff away from the construction area, so that the potential for the softening of the subgrade soils is reduced.

While little or no groundwater was encountered at the time the borings were drilled, seasonal variations in precipitation and site drainage conditions can cause groundwater to be present in the upper soils. The water level of the Fox River may have an impact on the groundwater level fluctuations in the project area.

7.4 EXCAVATION CONSIDERATIONS

Sloping, shoring or bracing of the excavation sidewalls will be necessary. Excavating may be difficult due to the instability of vertical slopes, and will therefore require a flattening of trench sides, or some other means of protection, to facilitate construction and to protect life and property. Sloughing and caving may occur within unprotected excavations, especially encroaching upon or within wetland/low-lying areas where sidewall and subgrade instability can become severe, and substantially higher groundwater levels may be present. The degree of excavation instability problems is dependent upon the depth and length of time that excavations remain open, excavation bank slopes, water levels and the effectiveness of any dewatering systems. All excavation work must be performed in accordance with OSHA and local building code requirements.

All excavations must be performed with caution and utilize methods which will prevent undermining or destabilization of slopes, buildings, utilities, pavements, sidewalks or other structures. The use of a properly designed shoring and bracing, sheet piling, or underpinning system must be utilized as necessary to adequately protect buildings, utilities, pavements, and other structures. This must be performed by an experienced specialty contractor. Additionally, extreme care must be used during the installation of any bracing system, especially those using driven or vibratory methods, in order to avoid damaging existing buildings, utilities, and other structures. Consideration should be given to the performance of video and/or photographic documentation of the condition of nearby buildings, utilities, and other structures prior to installation.

Since the subgrade soils are generally sensitive to moisture, every effort should be made to provide adequate drainage across the site during construction, and to prevent ponding of runoff on the subgrade. These soils are also subject to erosion caused by runoff, and erosion control measures should be implemented where needed or required by local ordinances.

7.5 SUBGRADE FROST ACTION

The proposed road project is located in an area that experiences annual freezing cycles and the subgrade soils encountered have been classified as highly susceptible to frost action when free water is present. Therefore, some frost movement may be experienced.

8 STORMWATER MANAGEMENT CONSIDERATIONS

As requested by the client, the samples collected at B-1 through B-4 were visually classified in general accordance with USDA National Resources Conservation Service textural soil classification procedures. The stormwater management areas are generally planned in the northeastern and southern portions of the subject site. No additional design details were available at the time of report preparation.

The surface at the borings located within the proposed stormwater management areas (B-1 through B-4) consisted of about 1 to 4 inches of topsoil generally comprised of dark brown clay loam with intermixed root matter. Beneath the topsoil, the underlying natural soils predominantly consisted of reddish brown to dusky red silty clay loam and silty clay to the maximum depths explored by the borings. Groundwater was not encountered during auger advancement or upon completion and removal of the augers

With regard to the above soil and groundwater conditions encountered at the borings, NR 151.124(4)(c)1 and 2 – *Infiltration rate exemptions* indicates that infiltration practices located in an area where the infiltration rate of the soil measured at the proposed bottom of the infiltration system is less than 0.6 inches per hour using a scientifically credible field test method; or where the least permeable soil horizon to 5 feet below the proposed bottom of the infiltration system using the USDA method of soils analysis consists of sandy clay loam, clay loam, sandy clay, silty clay or clay may be credited toward meeting the requirements, but the decision to infiltrate under these conditions is optional. In addition, NR 151.124(4)(b)1 – *Separation distances* indicates that infiltration practices shall be located so that the characteristics of the soil and the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock are in accordance with the following Table (reproduced from NR 151.124):

Table 3. Separation Distances and Soil Characteristics		
Source Area	**Separation Distance**	**Soil Characteristics**
Industrial, Commercial, Institutional Parking Lots and Roads	5 feet or more	Filtering Layer*
Residential Arterial Roads	5 feet or more	Filtering Layer*
Roofs Draining to Surface Infiltration Practices	1 foot or more	Native or Engineered Soil with Particles Finer than Coarse Sand
Roofs Draining to Surface Infiltration Practices	Not Applicable	
All Other Impervious Source Areas	3 feet or more	Filtering Layer*

*Defined in NR 151.002(14r) as a "soil that has at least a 3-foot deep layer with at least 20 percent fines; or at least a 5-foot deep layer with at least 10 percent fines; or an engineered soil with an equivalent level of protection as determined by the regulatory authority for the site."

The laboratory testing of the bulk composite SPT sample obtained between depths of 5 to 7 feet (EL. 624.2 to EL. 622.2) at B-2 had 100% of the material passing the No. 200 sieve, a Liquid Limit of about 63, a Plastic Limit of about 23, and a Plasticity Index of about 40. The results indicate the tested soils to have a USCS classification of CH. Appendix D of the Wet Detention Pond (1001) document, which is published by the Wisconsin Department of Natural Resources Conservation Practice Standards, indicates that materials for a Type A Clay Liner (for sites with the highest potential for groundwater pollution) must contain 50% or more of the material passing the No. 200 sieve; and have an average liquid limit of 25 or greater, with no value less than 20; and have an average plasticity index of 12 or more, with no value less than 10. The tested sample meets these requirements. However, other specifications or requirements may apply, and may be included within other applicable state or local documents. In addition, soils may vary between and beyond the borings. Additional testing may be required.

The information shown above is a selected excerpt from NR151 that is intended only as general guidance for considering stormwater management in conjunction with the encountered subsurface conditions at the borings. Basin design must be performed by a qualified and experienced firm. In addition, the entirety of Chapter NR151 of the Wisconsin Administrative Code, the Site Evaluation for Stormwater Infiltration (1002) document, and other applicable references; along with appropriate state, local or other municipal requirements must be consulted as part of site specific stormwater design.

Stormwater management basins are not recommended to be placed in close proximity to basements or other below grade structures. Proper and careful consideration of soils and subsurface conditions must be given during site and design planning, and extreme care must be exercised during construction. Lateral migration of water may result in substantially increased sump pump activity and can quickly overcome the ability of such pumps to maintain a desirable water level, resulting in significant flooding. The potential for such conditions to

occur can greatly increase when basement floors are below the elevation of basin bottoms and/or when basins are placed in close proximity to structures (strongly not recommended). In addition, the presence of granular or other generally permeable soils, which is typically necessary in the areas of structures, especially within utility backfill, alongside basement walls, or within other development excavations, can act as extensive migration channels to rapidly carry large volumes of water from basins and into nearby basements. Building codes or municipal regulations may require that basement floor elevations be a specified distance above the water level of nearby basins. It is therefore recommended that the design engineer (or other appropriate representative) review applicable municipal requirements, and verify the design normal and design high water elevations of stormwater basins with respect to planned basement slab elevations.

9 GENERAL COMMENTS

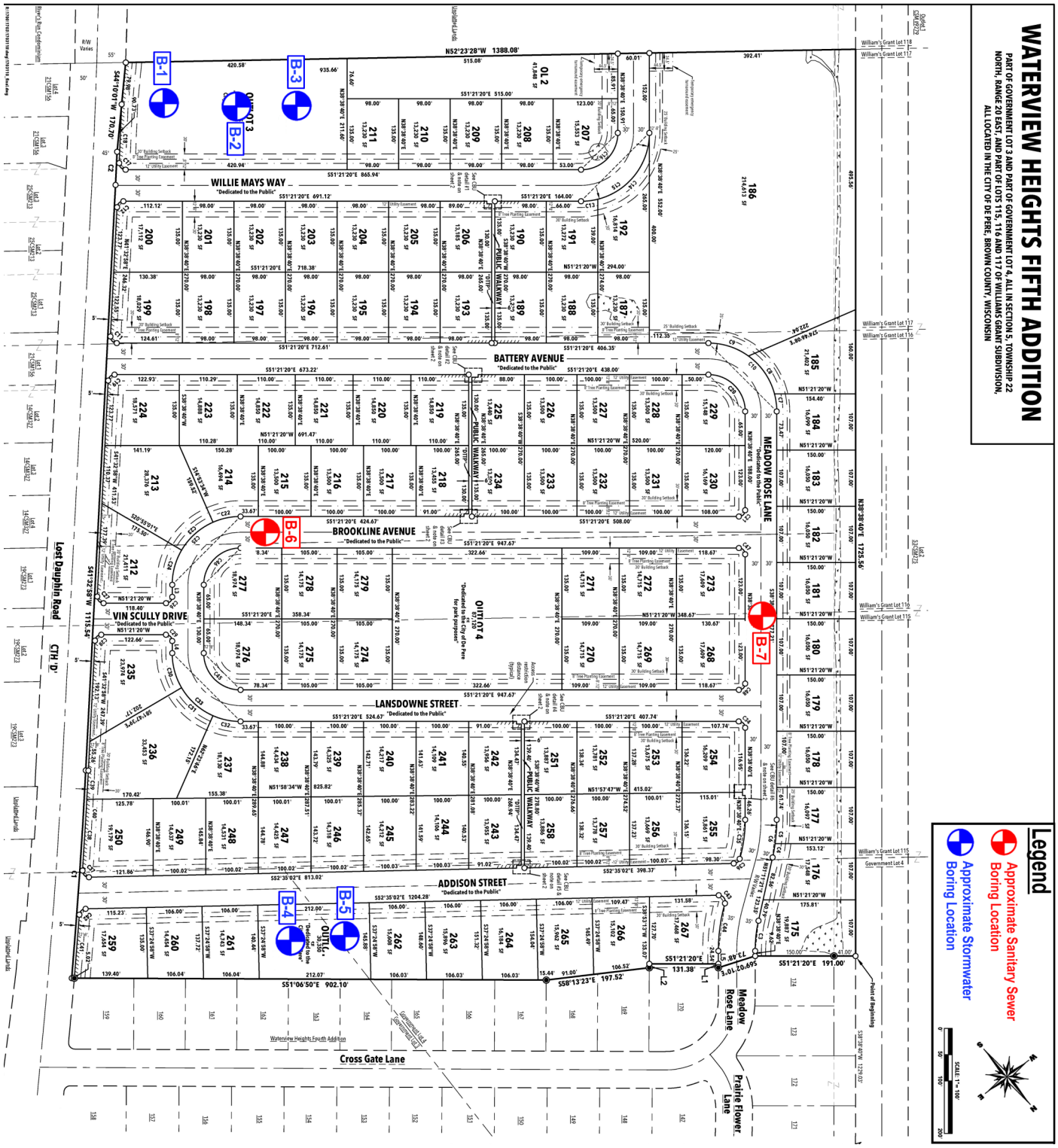
This geotechnical exploration has been prepared to aid in the evaluation of the subgrade conditions on this site. The recommendations presented herein are based on the available soil information and the design information provided. Any changes in the design information or building locations should be brought to the attention of PSI to determine if modifications in the recommendations are required. The final design plans and specifications should also be reviewed by PSI to determine that the recommendations presented herein have been interpreted and implemented as intended.

This geotechnical study has been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The findings, recommendations and opinions contained herein have been promulgated in accordance with generally accepted practice in the fields of foundation engineering, soils mechanics, and engineering geology. No other representations, expressed or implied, and no warranty or guarantee is included or intended in this report.

It is recommended that the earthwork and foundation operations be monitored by the soils engineer, to test and evaluate the bearing capacities, and the selection, placement and compaction of controlled fills.

APPENDIX

Figure 1 - Boring Location Plan
Soil Boring Logs
Laboratory Data Sheets
Storm Forms
General Notes



intertek psi

Waterview Heights Fourth Addition Subdivision
Lost Dauphin Road
De Pere, Wisconsin

FIGURE 1: Boring Location Plan

SCALE: SHOWN ABOVE

PROJECT NO: 00941736

PAGE 1 OF 1 **6/23/2022**

SOIL BORING LOG: B - 1

Project: Waterview Heihts Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 629.9	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 / 628.9	0-3" 10YR Dark brown CLAY LOAM, moist (TOPSOIL) 2.5YR 3/3 Dark reddish brown Silty CLAY LOAM,1,f,sbk,mfi,moist	1-SS	4	-	-	24	
2 / 627.9							
3 / 626.9	2.5YR 5/4 Reddish brown Silty CLAY, 1,thin,pl,mfi,moist	2-SS	16	3.5	-	27	
4 / 625.9							
5 / 624.9		3-SS	12	4.5+	4.7	24	
6 / 623.9							
7 / 622.9		4-SS	12	4.5+	2.6	24	
8 / 621.9							
9 / 620.9		5-SS	12	3.5	2.5	22	
10 / 619.9							
11 / 618.9		6-SS	8	3.25	-	21	⊥
12 / 617.9							
13 / 616.9	2.5YR 3/2 Dusky red SILTY CLAY,1, thin,pl,mfi,moist	7-SS	13	4.5	3.6	24	
14 / 615.9							
15 / 614.9		8-SS	9	4.25	2.9	24	
16 / 613.9							
	END OF BORING @ 16± FEET						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ⩒
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 11± feet below existing grade (EL. 618.9±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 2

Project: Waterview Heihts Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 629.2	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-4"10YR Dark brown CLAY LOAM, moist (TOPSOIL)						
1 628.2	2.5YR 3/3 Dark reddish brown SILTY CLAY LOAM, 1,f,sbk,mfi,moist	1-SS	4	-	-	22	
2 627.2							
3 626.2	2.5YR 5/4 Reddish brown Silty CLAY,1,thin,pl,mfi,moist	2-SS	8	1.5	1.2	36	
4 625.2							
5 624.2		3-SS	10	4.5+	3.5	24	
6 623.2							
7 622.2		4-SS	13	4.5+	2.1	22	⊥
8 621.2							
9 620.2		5-SS	10	3.5	4.5	21	
10 619.2							
11 618.2		6-SS	8	3.5	-	19	
12 617.2							
13 616.2	2.5YR 3/2 Dusky red SILTY CLAY,1,thin,pl,mfi,moist	7-SS	11	2.5	2.9	23	
14 615.2							
15 614.2		8-SS	10	4.0	3.5	24	
16 613.2							
	END OF BORING @ 16± FEET						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ⩒
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 7± feet below existing grade (EL. 622.2±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 3

Project: Waterview Heihts Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 630.3	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-1" 10YR Dark brown CLAY LOAM, moist (TOPSOIL)						
	2.5YR 3/3 Dark reddish brown Silty CLAY LOAM,1,f,sbk,mfi,moist						
1 / 629.3		1-SS	4	3.25	3.1	22	
2 / 628.3							
	2.5YR 5/4 Reddish brown Silty CLAY,1,thin,pl,mfi,moist						
3 / 627.3		2-SS	7	4.25	3.9	27	
4 / 626.3							
5 / 625.3		3-SS	9	1.0	2.0	13	
6 / 624.3							
7 / 623.3		4-SS	9	3.5	4.1	21	
8 / 622.3							
9 / 621.3		5-SS	12	2.25	-	22	⊥
10 / 620.3							
11 / 619.3		6-SS	10	3.0	3.3	21	
12 / 618.3							
13 / 617.3		7-SS	9	-	-	24	
	2.5YR 3/2 Dusky red SILTY CLAY,1,thin,pl,mfi,moist						
14 / 616.3							
15 / 615.3		8-SS	9	3.5	3.0	25	
16 / 614.3							
	END OF BORING @ 16± FEET						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ⩒
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 9± feet below existing grade (EL. 621.3±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 4

Project: Waterview Heihts Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 625.6	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 624.6	0-3" 10YR Dark brown CLAY LOAM, moist (TOPSOIL) 2.5YR 3/3 Dark reddish brown Silty CLAY LOAM,1,f,sbk,mfi,moist	1-SS	5	2.5	-	27	
2 623.6							
3 622.6	2.5YR 5/ Reddish brown Silty CLAY,1,thin,pl,mfi,moist	2-SS	13	1.5	1.0	34	
4 621.6							
5 620.6		3-SS	15	4.5+	-	23	
6 619.6							
7 618.6		4-SS	10	3.75	4.5	20	⊥
8 617.6							
9 616.6		5-SS	13	3.75	2.4	23	
10 615.6							
11 614.6		6-SS	11	3.25	3.1	23	
12 613.6							
13 612.6		7-SS	9	1.25	-	23	
14 611.6							
15 610.6		8-SS	8	2.25	2.6	23	
16 609.6	**END OF BORING @ 16± FEET**						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ⩒
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 7± feet below existing grade (EL. 618.6±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 5

Project: Waterview Heihts Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 625.7	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-4" 10YR Dark brown CLAY LOAM, moist (TOPSOIL)						
1 / 624.7	2.5YR 3/3 Dark reddish brown SILTY CLAY LOAM,1,f,sbk,mfi,moist	1-SS	5	-	-	26	
2 / 623.7							
3 / 622.7	2.5YR 5/4 Reddish brown Silty CLAY,1,thin,pl,mfi,moist	2-SS	8	4.5+	3.2	26	
4 / 621.7							
5 / 620.7		3-SS	9	4.5+	4.1	24	
6 / 619.7							
7 / 618.7		4-SS	11	3.75	2.5	23	
8 / 617.7							
9 / 616.7		5-SS	12	3.5	2.9	50	⊥
10 / 615.7							
11 / 614.7		6-SS	12	2.75	3.3	21	
12 / 613.7							
13 / 612.7		7-SS*	22	-	-	-	
14 / 611.7							
15 / 610.7		8-SS	9	2.25	-	21	
16 / 609.7							
	END OF BORING @ 16± FEET						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ⩒
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 10± feet below existing grade (EL. 615.7±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

* **No Sample Recovery**

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 6

Project: Waterview Heights Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 628.3	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-7": Dark brown CLAY, with silt and trace root matter, moist (TOPSOIL)			-	-	19	
1 / 627.3	Reddish brown CLAY, with silt, moist	1-SS	5	4.5+	3.9	26	
2 / 626.3							
3 / 625.3	Light brown SILT, with sand, very moist	2-SS	7	-	-	16	
4 / 624.3							
5 / 623.3	Reddish brown Silty CLAY, moist	3-SS	9	2.0	2.2	17	
6 / 622.3							
7 / 621.3							
8 / 620.3	Reddish brown CLAY, with silt, moist	4-SS	10	4.5+	4.1	16	
9 / 619.3							
10 / 618.3		5-SS	11	4.5	3.8	19	
11 / 617.3							
12 / 616.3							
13 / 615.3							
14 / 614.3	Reddish brown Silty CLAY, moist	6-SS	8	2.5	1.8	21	⊥
15 / 613.3							
16 / 612.3							
17 / 611.3							
18 / 610.3							
19 / 609.3	Dark reddish gray Silty CLAY, moist	7-SS	9	2.0	1.7	24	
20 / 608.3	**END OF BORING @ 20± FEET**						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ▽
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 15± feet below ground surface (EL. 613.3±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: B - 7

Project: Waterview Heights Fourth Addition Subdivision
Project No.: 00941736

Location: Lost Dauphin Road
De Pere, Wisconsin

Drill Date: June 2, 2022
Drilled By: AD/KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 633.6	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-4": Dark brown CLAY, with silt and trace root matter, moist (TOPSOIL)			-	-	28	
1 / 632.6	Reddish brown Silty CLAY, moist	1-SS	4	-	-	35	
2 / 631.6							
3 / 630.6	Reddish brown CLAY, with silt, moist	2-SS	11	4.5+	4.1	22	
4 / 629.6							
5 / 628.6							
6 / 627.6	Light brown SILT, with sand, very moist	3-SS	10	-	-	24	
7 / 626.6							
8 / 625.6	Reddish brown CLAY, with silt, moist	4-SS	12	3.5	3.2	19	
9 / 624.6							
10 / 623.6							
11 / 622.6	Reddish brown Silty CLAY, moist	5-SS	11	3.0	2.1	21	
12 / 621.6							
13 / 620.6							
14 / 619.6		6-SS	7	4.0	-	19	
15 / 618.6							
16 / 617.6							⊥
17 / 616.6							
18 / 615.6							
19 / 614.6	Dark grayish gray Silty CLAY, moist	7-SS	7	2.5	-	23	
20 / 613.6							
	END OF BORING @ 20± FEET						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered ▽
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 16± feet below ground surface (EL. 617.6±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

Professional Service Industries, Inc.
3009 Vandenbroek Road
Kaukauna, WI 54130

Phone: (920) 735-1200
Fax: (920) 735-1840

Report No: MAT:00941736-1-S1
Issue No: 1

Material Test Report

Client: CITY OF DE PERE
925 SOUTH 6TH STREET
DE PERE, WI 54115

CC:

Project:

Approved Signatory: Patrick Bray (Branch Manager)
Date of Issue: 6/13/2022

Sample Details

Sample ID:	00941736-1-S1
Client Sample ID:	
Date Sampled:	06/13/22
Sampled By:	PSI
Specification:	Standard Sieve
Supplier:	On-Site Material
Source:	Soil Boring
Material:	Reddish brown CLAY (CH, A-7-6)
Sampling Method:	Split Spoon
Soil Description:	Reddish brown CLAY (CH, A-7-6)
General Location:	B-2 (5ft to 7ft)
Location:	

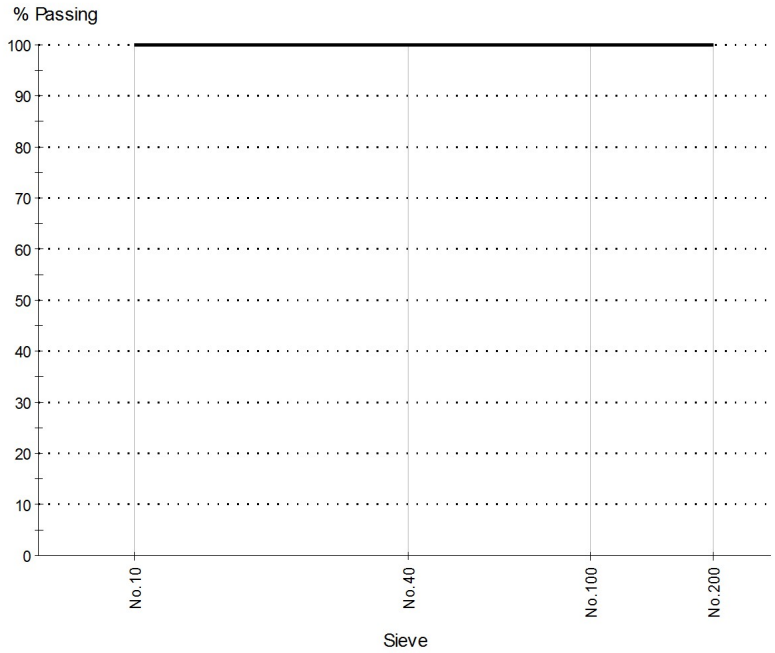
Sample Description:

Reddish brown CLAY (CH, A-7-6)

Atterberg Limit:

Liquid Limit: 63
Plastic Limit: 23
Plasticity Index: 40

Particle Size Distribution



COBBLES	GRAVEL		SAND			FINES (99.8%)	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.1%)	(0.1%)		

Grading: ASTM C 136, ASTM C 117

Date Tested: 6/13/2022
Tested By: Kenneth Stolt

Sieve Size	% Passing	Limits
No.10 (2.0mm)	100	
No.40 (425µm)	100	
No.100 (150µm)	100	
No.200 (75µm)	100	

D85: N/A **D60:** N/A **D50:** N/A
D30: N/A **D15:** N/A **D10:** N/A

Professional Service Industries, Inc.
3009 Vandenbroek Road
Kaukauna, WI 54130

Phone: (920) 735-1200
Fax: (920) 735-1840

Report No: MAT:00941736-1-S1
Issue No: 1

Material Test Report

Client: CITY OF DE PERE
925 SOUTH 6TH STREET
DE PERE, WI 54115

CC:

Project:

Approved Signatory: Patrick Bray (Branch Manager)
Date of Issue: 6/13/2022

Sample Details

Sample ID:	00941736-1-S1
Client Sample ID:	
Date Sampled:	06/13/22
Sampled By:	PSI
Specification:	Standard Sieve
Supplier:	On-Site Material
Source:	Soil Boring
Material:	Reddish brown CLAY (CH, A-7-6)
Sampling Method:	Split Spoon
Soil Description:	Reddish brown CLAY (CH, A-7-6)
General Location:	B-2 (5ft to 7ft)
Location:	

Other Test Results

Description	Method	Result	Limits
Approximate maximum grain size	ASTM D 4318		
Material retained on 425µm (No. 40) (%)			
Method of Removal			
Grooving Tool Type		Plastic	
Specimen preparation method			
Drying Method			
Special selection process			
Rolling Method for PL		Hand	
As Received Water Content (%)			
Liquid Limit Device Type		Manual	
Liquid Limit		63	
Plastic Limit		23	
Plasticity Index		40	
Liquid Limit Procedure		One-point (B)	
Tested By		Kenneth Stolt	
Date Tested		6/13/2022	

Comments

N/A

Wis. Dept. of Safety and Professional Services
Division of Industry Services

SOIL EVALUATION - STORM

In accordance with SPS 382.365 & 385, Wis. Adm. Code and WDNR Standard 1002

Attach complete site plan on paper not less that 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1) (m)].

County: **Brown**

Parcel I.D.: **WD-L496, WD-D0104**

Reviewed by:

Date:

Property Owner	Property Location: **Williams Grant**		
City of De Pere	Govt. Lot **1/4 1/4S T N R E (or)W**		
Property Owner's Mailing Address	Lot #	Block #	Subd. Name or CSM#
925 South Sixth Street			

City	State	Zip Code	Phone Number	☒ City ☐ Village ☐ Town	Nearest Road
De Pere	**Wi**	**5434**	**(920)339-4060**	**De Pere**	**Lost Dauphin Road**

Drainage area _____ ☐ sq. ft. ☐ acres

Optional:

Test Site Suitable for (check all that apply)

☐ Irrigation ☐ Bioretention trench ☐ Trench(es)

☐ Rain Garden ☐ Grassed swale ☐ Reuse

☐ Infiltration trench ☐ SDS (> 15' wide) ☐ Other _____

Hydraulic Application Test Method:

☒ Morphological Evaluation

☐ Double Ring Infiltrometer

☐ Other (specify)

Soil Moisture

Date of Borings: June 2, 2022

USDA-NRCS WETS Value: 10

☐ **Dry =1;**

☒ **Normal = 2;**

☐ **Wet = 3.**

1 Obs. # ☒ Boring ☐ Pit B-1

Ground surface elevation 629.86± Elevation of limiting factor <613.9±

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-3	3" topsoil								
2	3-24	2.5YR 3/3		sicl	1 f sbk	mfi		<15		0.04
3	24-144	2.5YR 5/4		sic	1 thin pl	mfi		<15		0.07
4	144-192	2.5YR 3/2		sic	1 thin pl	mfi		<15		0.07

Comment:

2 Obs. # ☒ Boring ☐ Pit B-2

Ground surface elevation 629.17± Elevation of limiting factor <613.2±

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-4	4" topsoil								
2	4-24	2.5YR 3/3		sicl	1 f sbk	mfi		<15		0.04
3	24-144	2.5YR 5/4		sic	1 thin pl	mfi		<15		0.07
4	144-192	2.5YR 3/2		sic	1 thin pl	mfi		<15		0.07

Comments:

CST/PSS Name (Please Print)	Signature	CST/PSS/Geologist Number
Patrick J. Patterson		G-229
Address	Date Evaluation Conducted	Telephone Number
821 Corporate Court, Waukesha, WI 53189	6/2/2022	262 521 2125

3 Obs. # ☒ Boring ☐ Pit B-3 Ground surface elevation 630.25± Elevation of limiting factor <614.2±

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-1	1" topsoil								
2	1-24	2.5YR 3/3		sicl	1 f sbk	mfi		<15		0.04
3	24-156	2.5YR 5/4		sic	1 thin pl	mfi		<15		0.07
4	156-192	2.5YR 3/2		sic	1 thin pl	mfi		<15		0.07

Comments:

4 Obs. # ☒ Boring ☐ Pit B-4 Ground surface elevation 625.63± Elevation of limiting factor <609.6±

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-1	3" topsoil								
2	1-24	2.5YR 3/3		sicl	1 f sbk	mfi		<15		0.04
3	24-192	2.5YR 5/4		sic	1 thin pl	mfi		<15		0.07

Comments

5 Obs. # ☒ Boring ☐ Pit B-5 Ground surface elevation 625.66± Elevation of limiting factor <609.7±

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	% Fines	Hydraulic App. Rate Inches/Hr.
1	0-1	4" topsoil								
2	1-24	2.5YR 3/3		sicl	1 f sbk	mfi		<15		0.04
3	24-192	2.5YR 5/4		sic	1 thin pl	mfi		<15		0.07

Comments:

GENERAL NOTES

SAMPLE IDENTIFICATION

1. Information on each log is a compilation of subsurface conditions, based on visual soil classifications of soil samples obtained from the field as assigned by a soils engineer, as well as from laboratory testing of samples, if performed. The strata lines on the logs may be approximate or the transition between the strata may be gradual rather than distinct. Water level measurements refer only to those observed at the times and locations indicated, and may vary with time, geologic condition and construction activity.
2. Unified Soil Classification System (USCS) designations are based on visual soil classification estimates on the basis of textural and particle size categorization and various soil behavior characteristics. If laboratory tests were performed to classify the soil, the USCS designation is shown in parenthesis.

USCS SOIL PARTICLE SIZE CLASSES

U.S. Std. Sieve			#200	#40	#10	#4	¾"	3"	12"	
Soil Type	Clay	Silt	Sand			Gravel		Cobbles	Boulders	
			Fine	Medium	Coarse	Fine	Coarse			
Millimeters	0.002	0.074	0.42	2	4.8	19	76	300		

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487-00)

Criteria for assigning group symbols and group names using laboratory tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean gravels w/ < 5% fines [E]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [C]	GW	Well-graded gravel [D]
			Cu < 4 and/or1 > Cc > 3 [C]	GP	Poorly graded gravel [D]
		Gravels w/ > 12% fines [E]	Fines classify as ML or MH	GM	Silty gravel [D,F,G]
			Fines classify as CL or CH	GC	Clayey gravel [D,F,G]
	Sands (More than 50% of coarse fraction passes the No. 4 sieve)	Clean sands w/ < 5% fines [I]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [C]	SW	Well-graded sand [H]
			Cu < 6 and/or 1 > Cc > 3 [C]	SP	Poorly graded sand [H]
		Sands w/ > 12% fines [I]	Fines classify as ML or MH	SM	Silty sand [F,G,H]
			Fines classify as CL or CH	SC	Clayey sand [F,G,H]
FINE-GRAINED SOILS (More than 50% passes the No. 200 sieve)	Silts and clays w/ liquid limit (LL) < 50	Inorganic	PI > 7 and plots on or above "A" line [J]	CL	Lean clay [K,L,M]
			PI < 4 and plots below "A" line [J]	ML	Silt [K,L,M]
		Organic	LL (Oven dried) / LL (Not dried) < 0.75	OL	Organic clay [K,L,M,N]
				OL	Organic silt [K,L,M,O]
	Silts and clays w/ liquid limit (LL) ≥ 50	Inorganic	PI plots on or above "A" line	CH	Fat clay [K,L,M]
			PI plots below "A" line	MH	Elastic silt [K,L,M]
		Organic	LL (Oven dried) / LL (Not dried) < 0.75	OH	Organic clay [K,L,M,P]
				OH	Organic silt [K,L,M,Q]
HIGHLY ORGANIC SOILS		Primarily organic matter, dark in color, and organic odor		PT	Peat

[A] Based on the material passing the 3-inch (75 mm) sieve
[B] If field sample contained cobbles or boulders, or both, add " with cobbles or boulders, or both" to group name
[C] $Cu = D_{60}/D_{10}$; $Cc = (D_{30})^2 / D_{10} \times D_{60}$
[D] If soil contains ≥ 15% sand, add "with sand" to group name
[E] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM
[G] If fines are organic, add "with organic fines" to group name
[H] If soil contains ≥ 15% gravel, add "with gravel" to group name
[I] Sands with 5 - 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay
[K] If soil contains 15 - 29% plus No. 200, add "with sand" or "with gravel"
[L] If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name
[N] PI ≥ 4 and plots on or above "A" line
[O] PI < 4 or plots below "A" line
[P] PI plots on or above "A" line
[Q] PI below "A" line

RELATIVE SOIL COMPOSITION

Trace - 0 - 15% of sample
With - 15 - 35% of sample
Soil modifier - > 35% of sample (i.e. sandy, silty, clayey, gravelly)

DRILLING & SAMPLING SYMBOLS

AU - Auger sample from cuttings
BS - Bag sample
HA - Hand auger sample
SS - Split spoon sample (2" O.D. by 1⅜" I.D.)
ST - Shelby Tube sample (2" or 3" O.D.)
WS - Wash sample from wash water return

SOIL PROPERTY SYMBOLS

N - N-value (blow count) is the standard penetration resistance based on the total number of blows required to advance a split spoon sampler one (1) foot, using a 140 lb. hammer with a 30 inch free fall. To avoid damage to sampling tools, driving is typically limited to 50 blows during any 6 inch interval. Additional description is provided below:

N-value (bpf)	Description
HW	Sampler penetrated soil under weight of hammer and rods; no driving required
25	25 blows to advance sampler 12 inches after initial 6 inches of seating
75/10"	75 blows to advance sampler 10 inches after initial 6 inches of seating
50/S3"	50 blows to advance sampler 3 inches during initial 6 inch seating interval

MC - Moisture content, %
Qu - Unconfined compressive strength, tons per square foot (tsf)
Qp - Calibrated hand penetrometer resistance, tsf
γd - Dry density, pounds per cubic foot (pcf)
LL - Liquid limit, % (ASTM D4318)
PL - Plastic limit, % (ASTM D4318)
PI - Plasticity index, % (ASTM D4318)
%P200 - Percent of sample passing the No. 200 sieve
RQD - Rock quality designation of NX-size core sample
RMR - Rock mass rating, as developed by Z.T. Bieniawski
PID - Photoionization detector (Hnu meter) volatile vapor level, ppm

SOIL RELATIVE DENSITY & CONSISTENCY CLASSIFICATION

NON-COHESIVE SOILS		COHESIVE SOILS		
Density	N-Value Range	Consistency	Qu Range (tsf)	Approximate N-value Range
Very loose	0 - 3	Very soft	0 - 0.25	0 - 2
Loose	3 - 7	Soft	0.25 - 0.5	2 - 5
Medium dense	7 - 15	Medium stiff	0.5 - 1.0	5 - 10
Dense	15 - 38	Stiff	1.0 - 2.0	10 - 14
Very dense	38+	Very Stiff	2.0 - 4.0	14 - 32
		Hard	4.0+	32+

SOIL STRUCTURE TERMINOLOGY

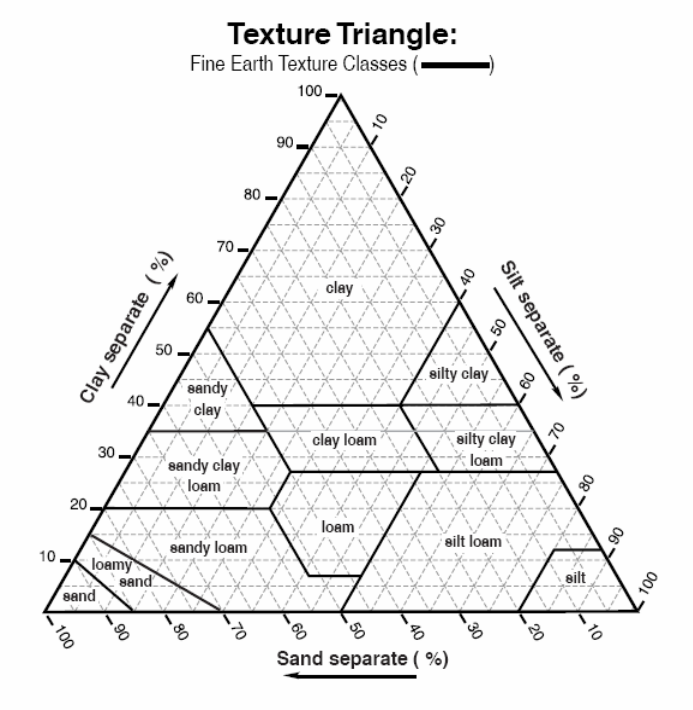
Interlayered - Alternating layers of different soil types
Layer - Inclusion greater than 3 inches thick
Seam - Inclusion ⅛ to 3 inches thick
Laminated - Alternating seams of different soil type
Intermixed - Pockets of different soil types, no layering
Pocket - Inclusion of material of different texture
Varved - Alternating layers or seams of sand, silt, and/or clay

GROUNDWATER & MOISTURE CONDITIONS

v - Approximate groundwater level as noted during drilling and sampling
▼ - Groundwater level as noted within the open borehole upon removal of the augers
¥ - Delayed groundwater level within open borehole
Dry - Absence of moisture, dry to the touch
Moist - Damp, but no visible water
Wet - Visible free water, saturated, usually below water table

NOTE: General Notes have been adapted from and incorporate portions of ASTM D2487 "Classification of Soils for Engineering Purposes (Unified Soil Classification System)" and ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)."

USDA SOIL CLASSIFICATION SYSTEM*



NOTE: **Soil Texture** encompasses only the fine earth fraction (≤ 2 mm). **Particle Size Distribution** (PSD) encompasses the whole soil, including both the fine earth fraction (≤ 2 mm; weight %) and rock fragments (> 2 mm; volume %).

TEXTURE CLASS

Texture Class or Subclass	Code	
	Conv.	NASIS
Coarse Sand	cos	COS
Sand	s	S
Fine Sand	fs	FS
Very Fine Sand	vfs	VFS
Loamy Coarse Sand	lcos	LCOS
Loamy Sand	ls	LS
Loamy Fine Sand	lfs	LFS
Loamy Very Fine Sand	lvfs	LVFS
Coarse Sandy Loam	cosl	COSL
Sandy Loam	sl	SL
Fine Sandy Loam	fsl	FSL
Very Fine Sandy Loam	vfsl	VFSL
Loam	l	L
Silt Loam	sil	SIL
Silt	si	SI
Sandy Clay Loam	scl	SCL
Clay Loam	cl	CL
Silty Clay Loam	sicl	SICL
Sandy Clay	sc	SC
Silty Clay	sic	SIC
Clay	c	C

TEXTURE MODIFIERS - Conventions for using "Rock Fragment Texture Modifiers" and for using textural adjectives that convey the "% volume" ranges for **Rock Fragments - Size and Quantity**.

Fragment Content % By Volume	Rock Fragment Modifier Usage
< 15	No texture adjective is used (noun only; e.g., *loam*).
15 to < 35	Use adjective for appropriate size; e.g., *gravelly*.
35 to < 60	Use "very" with the appropriate size adjective; e.g., *very gravelly*.
60 to < 90	Use "extremely" with the appropriate size adjective; e.g., *extremely gravelly*.
≥ 90	No adjective or modifier. If ≤ 10% fine earth, use the appropriate noun for the dominant size class; e.g., *gravel*. Use **Terms in Lieu of Texture**.

TEXTURE MODIFIERS - *(adjectives)*

ROCK FRAGMENTS: Size & Quantity [1]	Code		Criteria: Percent (By Volume) of Total Rock Fragments and Dominated By (*name size*): [1]
	Conv.	PDP/ NASIS	
ROCK FRAGMENTS (> 2 mm; ≥ Strongly Cemented)			
Gravelly	GR	GR	≥ 15% but < 35% gravel
Fine Gravelly	FGR	GRF	≥15% but < 35% fine gravel
Medium Gravelly	MGR	GRM	≥15% but < 35% med. gravel
Coarse Gravelly	CGR	GRC	≥ 15% but < 35% coarse gravel
Very Gravelly	VGR	GRV	≥ 35% but < 60% gravel
Extremely Gravelly	XGR	GRX	≥ 60% but < 90% gravel
Cobbly	CB	CB	≥ 15% but < 35% cobbles
Very Cobbly	VCB	CBV	≥ 35% but < 60% cobbles
Extremely Cobbly	XCB	CBX	≥ 60% but < 90% cobbles
Stony	ST	ST	≥ 15% but < 35% stones
Very Stony	VST	STV	≥ 35% but < 60% stones
Extremely Stony	XST	STX	≥ 60% but < 90% stones
Bouldery	BY	BY	≥ 15% but < 35% boulders
Very Bouldery	VBY	BYV	≥ 35% but < 60% boulders
Extremely Bouldery	XBY	BYX	≥ 60% but < 90% boulders
Channery	CN	CN	≥ 15% but < 35% channers
Very Channery	VCN	CNV	≥ 35% but < 60% channers
Extremely Channery	XCN	CNX	≥ 60% but < 90% channers
Flaggy	FL	FL	≥ 15% but < 35% flagstones
Very Flaggy	VFL	FLV	≥ 35% but < 60% flagstones
Extremely Flaggy	XFL	FLX	≥ 60% but < 90% flagstones

* As outlined in the NRCS Field Book for Describing and Sampling Soils, Version 2.0 (2002).