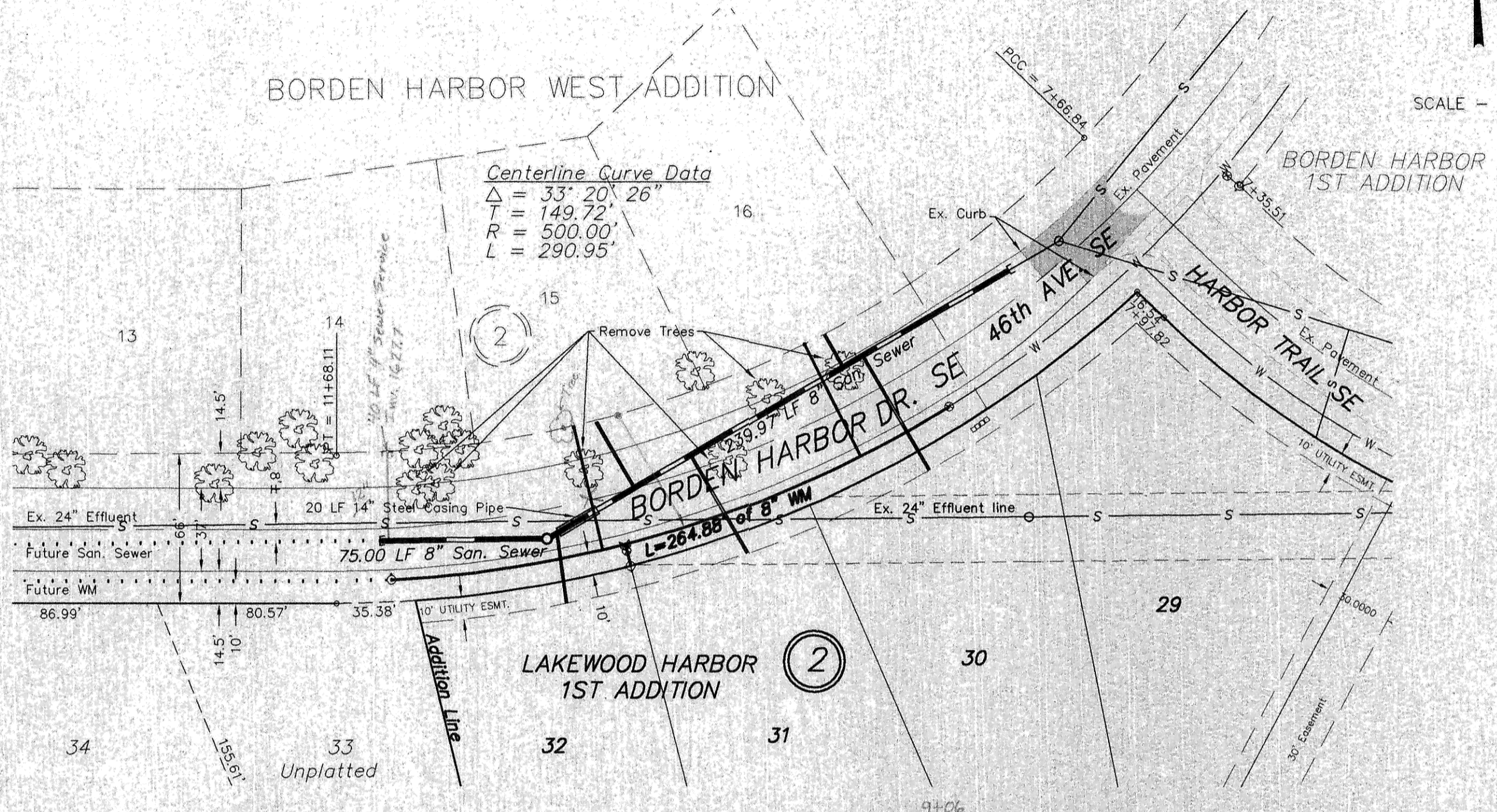


Sta. 11+48.75 5.38' Lt. And  
 =San. Sewer Sta. 0+00.00 Bk.  
 =San. Sewer Sta. 0+75.00 Bk.  
 Sta. 10+75.42 13.00' Lt. And  
 =San. Sewer Sta. 0+00.00 Bk.  
 =San. Sewer Sta. 2+65.97 Bk.  
 Manhole No. 1  
 Sta. 8+34.63 11.77' Rt.  
 =San. Sewer Sta. 0+26.00 Bk.  
 Connect  
 Sta. 8+08.48 7.46' Rt.  
 =San. Sewer Sta. 0+00.00 And.  
 Ex. Manhole

**APPROXIMATE WYE LOCATIONS**

STATION	DIRECTION	LOT	BLOCK
FROM EX. MANHOLE TO MANHOLE NO. 1:			
1+02	SE	30	2
1+11	NW	16	2
1+90	SE	31	2
2+19	NW	15	2
2+60	S	32	2

- CONSTRUCTION NOTES (THIS SHEET)**
- BACKFILL SHALL BE CLASS 'A'.
  - GRADING SHALL BE BY OTHERS, PRIOR TO CONSTRUCTION.
  - THE CONTRACTOR SHALL REMOVE AND DISPOSE OF OFFSITE ALL ASPHALT AND CURB AND GUTTER AS REQUIRED TO MAKE CONNECTIONS OF THE EXISTING UTILITIES. SAID WORK SHALL BE CONSIDERED INCIDENTAL TO THE "REMOVE PAVEMENT" BID ITEM.
  - THE CONTRACTOR SHALL VERIFY THE ELEVATION OF THE GROUND WATER AT THE TIME OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DEWATERING OF THE CONSTRUCTION SITE AS REQUIRED TO INSTALL THE PROPOSED UTILITIES.
  - THE CONTRACTOR SHALL SALVAGE THE 6" HYDRANT FROM STA. 23+64.77 ON THE EAST END OF HARBOR TRAIL SE AND RESET IT AT STA. 11+44.48 BORDEN HARBOR DRIVE SE AS REQUIRED. ALL WORK AND MATERIALS REQUIRED TO SALVAGE AND RESET HYDRANT SHALL BE CONSIDERED INCIDENTAL TO THE "RESET HYDRANT" BID ITEM.
  - THE CONTRACTOR SHALL EXPOSE THE 24" RCP EFFLUENT LINE AT THE CROSSING WITH THE 8" SANITARY SEWER IN ORDER TO VERIFY THE LOCATION AND ELEVATION OF THE 24" EFFLUENT LINE. THE CONTRACTOR SHALL EXPOSE THE PIPE AT THE BEGINNING OF THE PROJECT AND ALLOW THE ENGINEER A MINIMUM OF 24 HOURS TO MAKE CHANGES TO THE PLANS IF REQUIRED.



Lot	Block	4" Sewer Service	4" 45° Bend	4" 22 1/2° Bend	8" x 4" Wye Branch	Sewer Service Invert At The Cap	1" Copper Water Service Pipe	1" Water Service Connection	1" Ball Valve	Curb Stop & 1/4" Box
30	2	60	1	1	1	27.00				
16	2	17	1	1	1	25.50	56	1	1	
31	2	51	1	1	1	27.50				
15	2	34	1	1	1	26.50	56	1	1	
32	2	32	1	1	1	26.50				
<b>TOTAL</b>		<b>194</b>	<b>4</b>	<b>1</b>	<b>5</b>		<b>112</b>	<b>2</b>	<b>2</b>	

End Watermain Quantities  
 Sta. 11+44.48  
 End San. Sewer Quantities  
 Sta. 11+48.75

Sta. 10+43.02  
 8" x 6" Tee  
 3.00 LF 6" WM  
 6" Gate Valve & Box  
 7.00 LF 6" WM  
 6" Hydrant

Sta. 8+91.25  
 Remove & Salvage Plug  
 Connect  
 8" Gate Valve & Box

Begin Watermain Quantities  
 Sta. 8+91.25  
 Begin San. Sewer Quantities  
 Sta. 8+08.48

Manhole Number	1
Castings Elev.	37.31
Top P.C. Section	36.31
Invert Elev. (a)	23.53
Invert Elev. (b)	23.58
Invert Elev. (c)	23.58
Length P.C. Section	12.78'
	150" 8"

1655	PI 11+68.11 RT & LT ELEV = 38.14 VC = None	PI 8+50.00 RT & LT ELEV = 36.54 VC = None	PI 8+09.05 LT ELEV = 36.33 VC = None	1655
1650		PI 8+24.91 RT ELEV = 36.34 VC = None		1650
1645				1645
1640				1640
1635		RIM 37.31 CB RT & LT 0.5030%	RIM 35.98 CB LT 0.6128% CB RT 0.7971%	1635
1630		FUTURE 8" SAN. S. 75.00 LF 8" SAN. S. @ 0.4000% INV. CAP 23.88	Hyd 29.4 Valve 28.3 Tee 29.2 Invert Profile 8" WM Connect/Valve 27.9	1630
1625		239.97 LF 8" SAN. SEWER @ 0.4001%	Ex. 8" San. S. INV. EX. CAP 22.57 (VERIFY)	1625
1620		MANHOLE NO. 1 Sta. 10+75.42 13.00' Lt. And INV. NE 23.53 INV. W 23.58	INV. SE 22.10 INV. NE 22.23 INV. SW 22.48	1620
1615				1615
1610				1610

- APPROXIMATE QUANTITIES**
- San. Sewer Items**
- | Item                  | Quantity |
|-----------------------|----------|
| 8" Sanitary Sewer     | 315 LF   |
| 8" x 4" Wye Branch    | 5 EA     |
| Pitrun Gravel         | 5 TON    |
| Subcut Gravel         | 5 TON    |
| Concrete Manhole      | 1 EA     |
| 4" Sewer Service Pipe | 194 LF   |
| 4" 45° Bend           | 4 EA     |
| 4" 22 1/2° Bend       | 1 EA     |
| 1 1/2" Casing Pipe    | 20 LF    |
| Remove Tree           | 6 EA     |
| Remove Pavement       | 1 LS     |
- Watermain Items**
- | Item                                 | Quantity |
|--------------------------------------|----------|
| Pitrun Gravel                        | 5 TON    |
| 6" PVC Watermain                     | 10 LF    |
| 8" PVC Watermain                     | 265 LF   |
| 6" Hydrant                           | 1 EA     |
| Reset Hydrant                        | 1 EA     |
| 6" Gate Valve & Box                  | 1 EA     |
| 8" Gate Valve & Box                  | 1 EA     |
| Ductile Iron Fittings (incidental)   |          |
| 1" Water Copper Serv. Pipe           | 112 LF   |
| 1" Water Serv. Connection            | 2 EA     |
| 1" Ball Valve Curb Stop And 1/4" Box | 2 EA     |

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 BISMARCK, N.D. 58504 FAX (701) 223-2606  
 E-mail: shang@swensonhagen.com



**BORDEN HARBOR DRIVE SE**  
 FROM THE INT. WITH HARBOR TRAIL SE, SOUTHWEST  
 TO THE END OF LAKEWOOD HARBOR 1ST ADDITION

1610

WATER AND SEWER IMPROVEMENT PROJECT 2002-04  
 SHEET NO. 2 OF 5  
 MANDAN, ND MAY 5, 2002