

FHWA REGION	8	STATE	N.D.	PROJECT	SU-1-988(007)018	DATE	1998
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CITY OF MANDAN

FIRST STREET IMPROVEMENTS
 WATER AND SANITARY SEWER RECORD DRAWINGS
 FROM 7TH AVE. NW TO MANDAN AVE.

END PROJECT
 AT STA. 72+95.5 = A POINT 13.3' WEST OF THE
 INTERSECTION OF CENTERLINES OF MANDAN AVE. NE
 & 1st ST. NE IN MANDAN, NORTH DAKOTA



BEGIN PROJECT
 AT STA. -3+06.0 = A POINT 71.5' WEST OF THE
 INTERSECTION OF 7th AVE. NW & 1st ST. NW IN

PROJECT NO. SU-1-988(007)018

<p>Kadmas Lee & Jackson Consulting Engineers and Surveyors BISMARCK, NORTH DAKOTA</p>	<p>19</p>	<p>DATE 3 MAY 98 TO 15 SEPTEMBER 98</p>	<p>ROBERT J. SHANNON, P.E. PROJECT MANAGER BISMARCK, NORTH DAKOTA</p>	<p>GEORGE KEMPER LARRY STROHSHEIN RODNEY HOYLE SHAWN D. THEURER JIM PRYVATSKY</p>
		<p>I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.</p>	<p>RICHARD SCHNEIDER SHAWN D. THEURER JIM PRYVATSKY</p>	<p>KEMPER CONSTRUCTION NUMBER SU-1-988(007)018, MANDAN, NORTH MANDAN, NORTH DAKOTA</p>

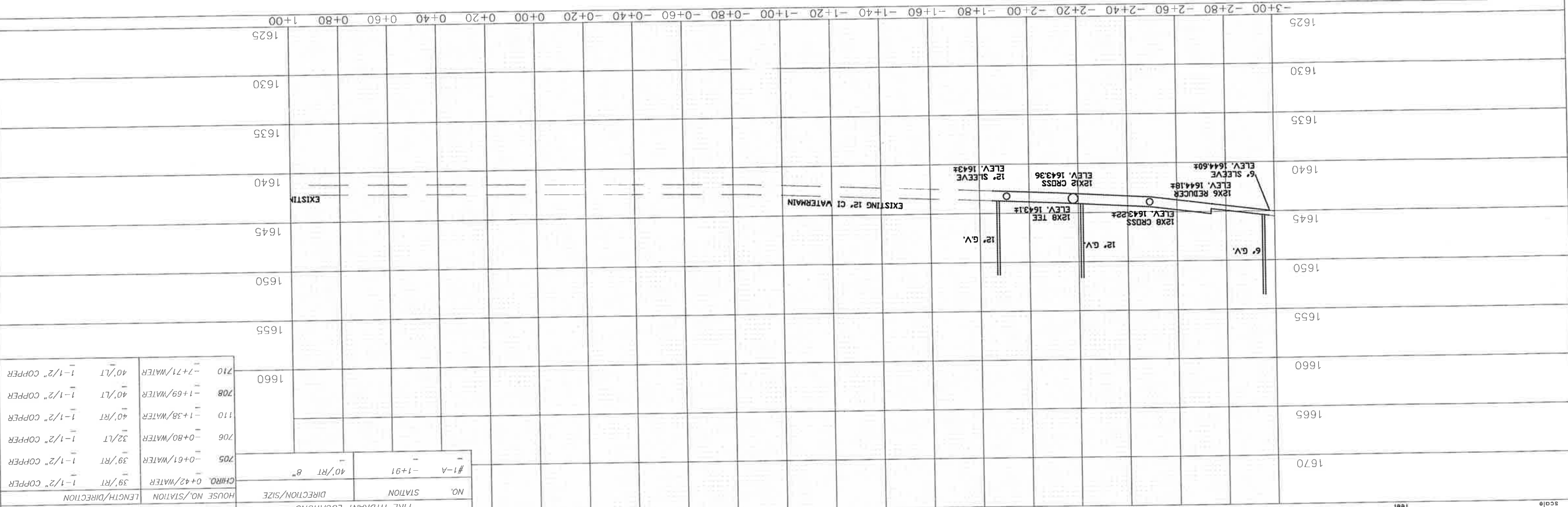
TOPOG LEGEND

EXISTING	NEW	
		FIRE HYDRANT
		GATE VALVE
		CURB STOP
		BEND
		TEE
		CROSS
		REDUCER
		SLEEVE
		SPRINKLER HEAD
		SANITARY MANHOLE
		CURB INLET
		CATCH BASIN
		STORM MANHOLE
		POWER POLE
		GUY WIRE & ANCHOR
		STREET LIGHT
		ELECTRICAL JUNCTION BOX
		TELEPHONE MANHOLE
		TELEPHONE PEDESTAL
		CABLE TV PEDESTAL
		WATER MAIN
		SANITARY SEWER MAIN
		STORM SEWER MAIN
		UNDERGROUND ELECTRIC
		UNDERGROUND TELEPHONE
		UNDERGROUND CABLE TV
		GAS LINE
		OVERHEAD POWERLINE
		CURB & GUTTER (CONCRETE)
		EDGE OF GRAVEL SURFACE
		EDGE OF ASPHALT SURFACE
		SIDEWALK OR DRIVEWAY (CONCRETE)
		BUILDING
		FENCE
		CULVERT
		DRAINAGE DIRECTION
		SIGN/POST
		OUTLET/PLUG-IN
		ELECTRIC METER
		WATER METER
		GAS METER
		TREE - CONIFEROUS/DECIDUOUS
		HEDGE OR BUSHES
		PROPERTY PIN - FOUND/SET
		MAILBOX
		CONTROL POINT
		LOT/BLOCK LINE

LEGEND

PROJECT NO.	SU-1-988(007)018
STATE	ND
REGION	8
MANDAN 1ST STREET MANDAN, NORTH DAKOTA	
STANDARD LEGEND	
Kadmas	CAPL. NO. DATE
Lee & Jackson	16200 1/23/98
Consulting Engineers and Surveyors	DRK. BY
CAS	

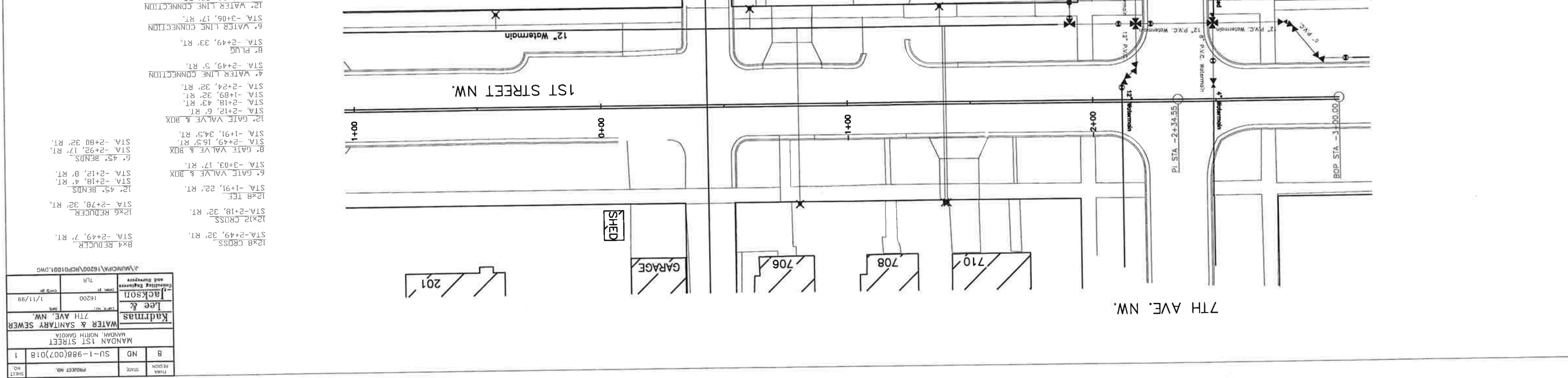
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NO.	DESCRIPTION	LOCATION	ELEVATION
CP-9A	REBAR	N 9978.753 E 9618.957	1650.75
CP-9	REBAR	N 9831.270 E 9781.066	1649.60

NO.	STATION	DIRECTION/SIZE	HOUSE NO./STATION	LENGTH/DIRECTION
#1-A	-1+91	40'/RT 8"	CHIRO	0+42/WATER
705	-0+61	39'/RT	705	-0+61/WATER
706	-0+80	32'/LT	706	-0+80/WATER
110	-1+38	40'/RT	110	-1+38/WATER
708	-1+69	40'/LT	708	-1+69/WATER
710	-7+71	40'/LT	710	-7+71/WATER

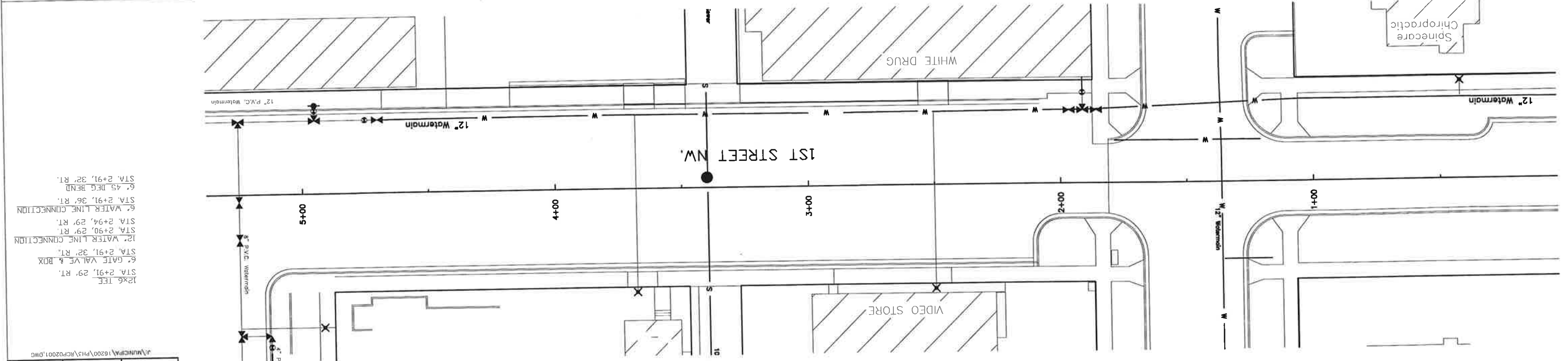
FIRE HYDRANT LOCATIONS			WATER & SANITARY SEWER SERVICE LOCATIONS		
NO.	STATION	DIRECTION/SIZE	HOUSE NO./STATION	LENGTH/DIRECTION	
CP-9A	REBAR	N 9978.753 E 9618.957	1650.75		
CP-9	REBAR	N 9831.270 E 9781.066	1649.60		



SHEET NO.	STATE	PROJECT NO.
1	ND	SU-1-988(007)018

MANDAN NORTH DAKOTA	WATER & SANITARY SEWER	7TH AVE. NW	Lee & Jackson	16200	1/1/199
MANDAN 1ST STREET			Lee & Jackson	16200	1/1/199

PROJECT NO.	SU-1-988(007)018 2
STATE REGION	ND
PROJECT NO.	8
MANDAN 1ST STREET	
MANDAN, NORTH DAKOTA	
WATER & SANITARY SEWER	
Kadmas	
Lee & Jackson	
DATE	1/22/99
DATE	1/22/99
DATE	1/22/99
DATE	1/22/99
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DATE	1/22/99
DATE	1/22/99
DATE	1/22/99
DATE	1/22/99

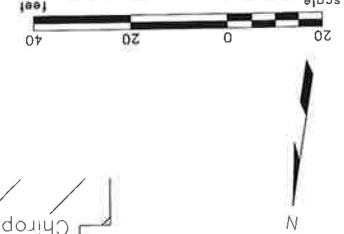
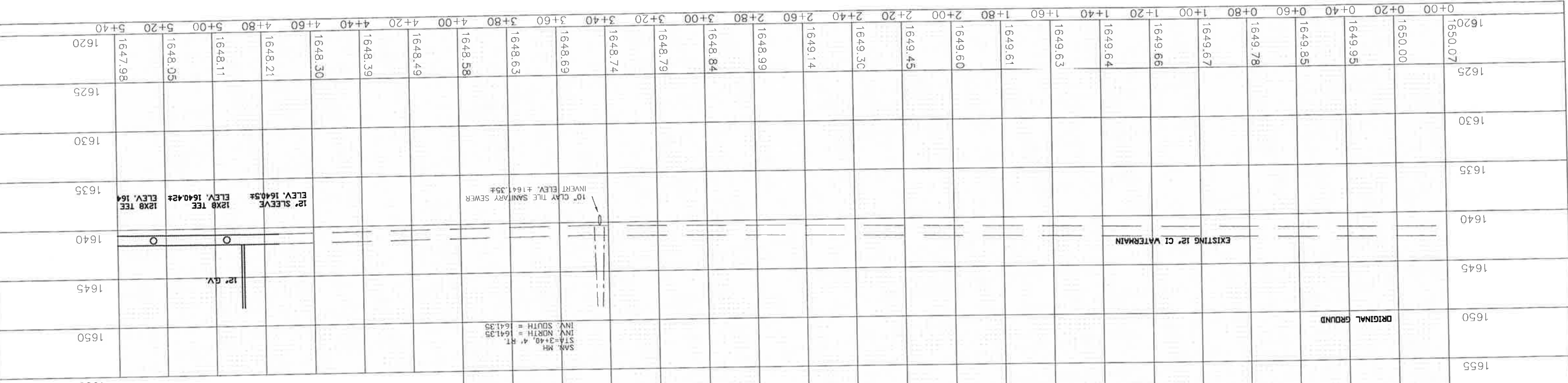


NO.	DESCRIPTION	ELEVATION
CP-7	REBAR	N 9378.053 E 10102.554 1648.11
CP-8	REBAR	N 9984.433 E 9999.929 1649.42
CP-9	REBAR	N 9377.270 E 9791.206 1649.68

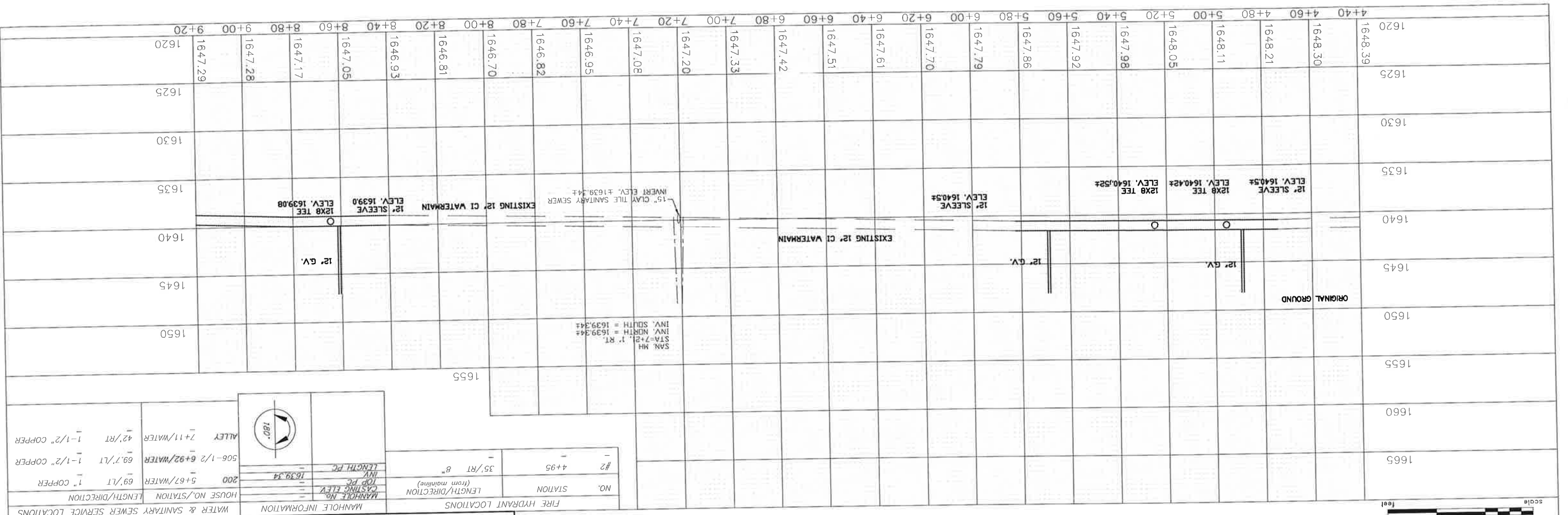
MANHOLE INFORMATION			
EXISTING	CASTING ELEV.	TOP PC	INV.
1641.35			
1641.35			

FIRE HYDRANT LOCATIONS			
NO.	STATION	LENGTH/DIRECTION (from manhole)	TYPE
0+00	00/RT	8" PVC	
0+00	00/RT	8" PVC	

HOUSE NO./STATION			
LENGTH/DIRECTION (FROM MAIN)	LENGTH/DIRECTION (FROM MAIN)	LENGTH/DIRECTION (FROM MAIN)	LENGTH/DIRECTION (FROM MAIN)
VIDEO 2+50/WATER	41'/LT	1-1/2" COPPER	
3+68/WATER	41'/LT	1-1/2" COPPER	
4+92/WATER	53'/LT	1 1/2" COPPER	



RECORD DRAWING



BENCH MARK LIST

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-68	REBAR	N 1052.61 E 1073.29	1647.83
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FIRE HYDRANT LOCATIONS

NO.	STATION	LENGTH/DIRECTION (from mainline)	CASTING ELEV.
#2	4+95	35' RT 8"	1639.34

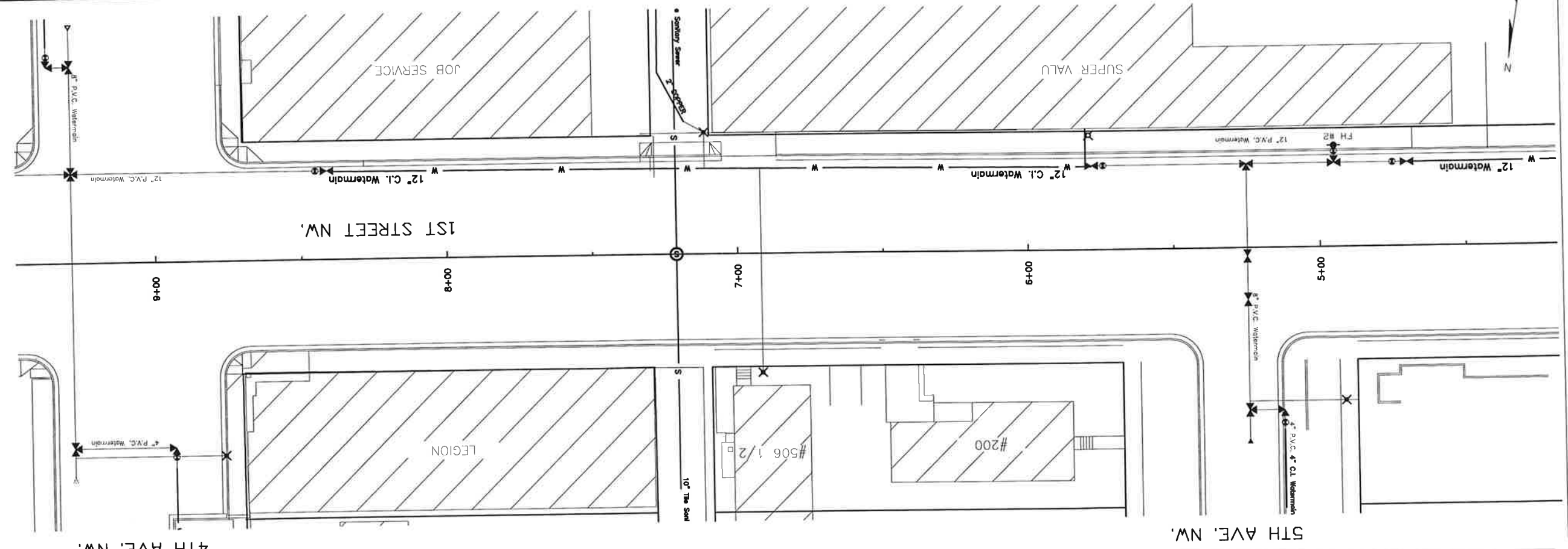
MANHOLE INFORMATION

MANHOLE NO.	LENGTH/DIRECTION	CASTING ELEV.
200	5+67/WATER	69' LT 1" COPPER
506-1/2	6+92/WATER	69' LT 1-1/2" COPPER
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WATER & SANITARY SEWER SERVICE LOCATIONS

HOUSE NO./STATION	LENGTH/DIRECTION
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12x8 TEE
STA. 4+95, 29' RT.
STA. 5+25, 56' LT.
8x4 TEE
STA. 5+25, 56' LT.
4' GATE VALVE & BOX
STA. 5+13, 60' LT.
8' GATE VALVE & BOX
STA. 4+95, 33' RT.
12" GATE VALVE & BOX
STA. 4+75, 29' RT.
STA. 5+75, 29' RT.
4' WATER LINE CONNECTION
STA. 5+13, 63' LT.
12" WATER LINE CONNECTION
STA. 4+70, 29' RT.
STA. 5+78, 29' RT.
4' 90° BEND
STA. 5+13, 56' LT.
8' PLUG
STA. 5+25, 66' LT.
8' WATER LINE ADJUSTMENT
STA. 5+25, 3' LT. TO 18' LT.



SHEET NO.	PROJECT NO.	REGION	STATE
3	SU-1-988(07)018	ND	B

MANDAN 1ST STREET
MANDAN, NORTH DAKOTA
Kadmas
5TH AVE., NW.
Leg & Jackon
1/22/99
16200
Civil Engr.
TLV/SOT
RS

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RECORD DRAWING

12X8 CROSS STA. 13+10, 29' RT. STA. 14+68, 29' RT. STA. 14+68, 29' RT. 12X6 TEE STA. 13+10, 64' LT. STA. 14+68, 29' RT. 8X6 TEE STA. 13+10, 64' LT. STA. 13+10, 64' LT. 12X8 TEE STA. 12+44, 29' RT. STA. 12+44, 29' RT. 12' GATE VALVE & BOX STA. 12+45, 36' RT. STA. 12+45, 36' RT. 8' GATE VALVE & BOX STA. 12+69, 67' LT. STA. 12+69, 67' LT. 6' GATE VALVE & BOX STA. 12+69, 75' LT. STA. 14+68, 17' RT. 12' WATER LINE CONNECTION STA. 12+69, 75' LT. STA. 14+68, 17' RT. 12' WATER LINE CONNECTION STA. 12+05, 29' RT. STA. 13+60, 29' RT. STA. 14+70, 29' RT. STA. 14+66, 29' RT. 6.90" BEND STA. 12+69, 64' LT. STA. 13+10, 75' LT. B' PLUG STA. 13+10, 70' RT. STA. 13+10, 75' LT.

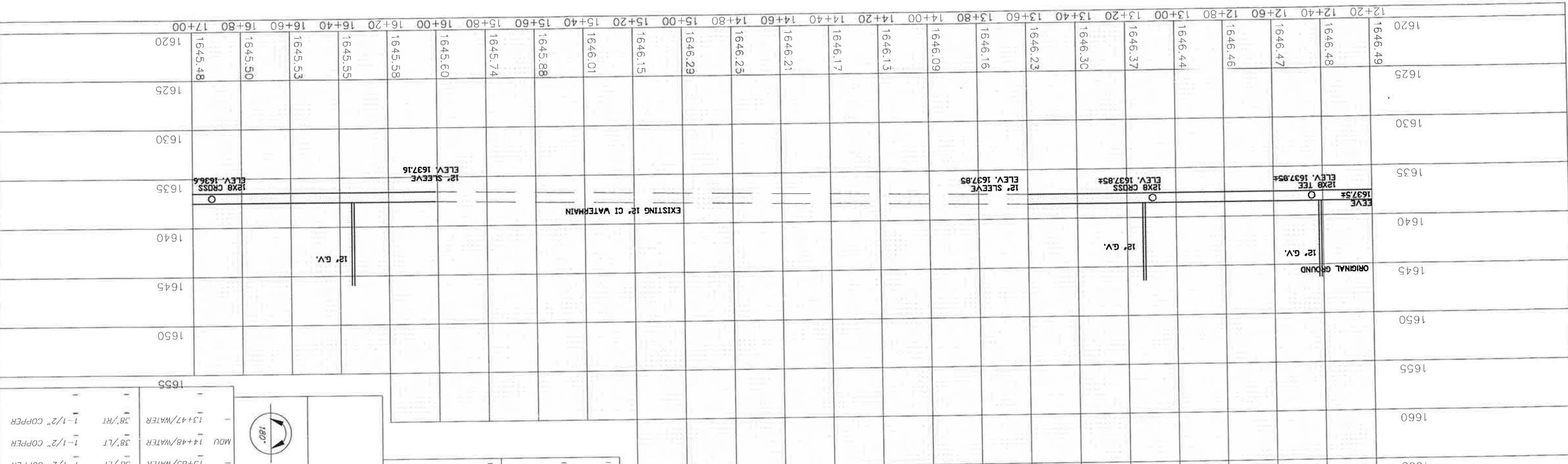
NO.	DESCRIPTION	LOCATION	ELEVATION
CP-63		N 1001.64 E 11404.26	1646.52
CP-64	REBAR	N 9916.99 E 10923.46	1646.61
CP-65	PK MSL	N 1004.45 E 11001.83	1646.33

BENCH MARK LIST	
NO.	DESCRIPTION
CP-63	
CP-64	REBAR
CP-65	PK MSL

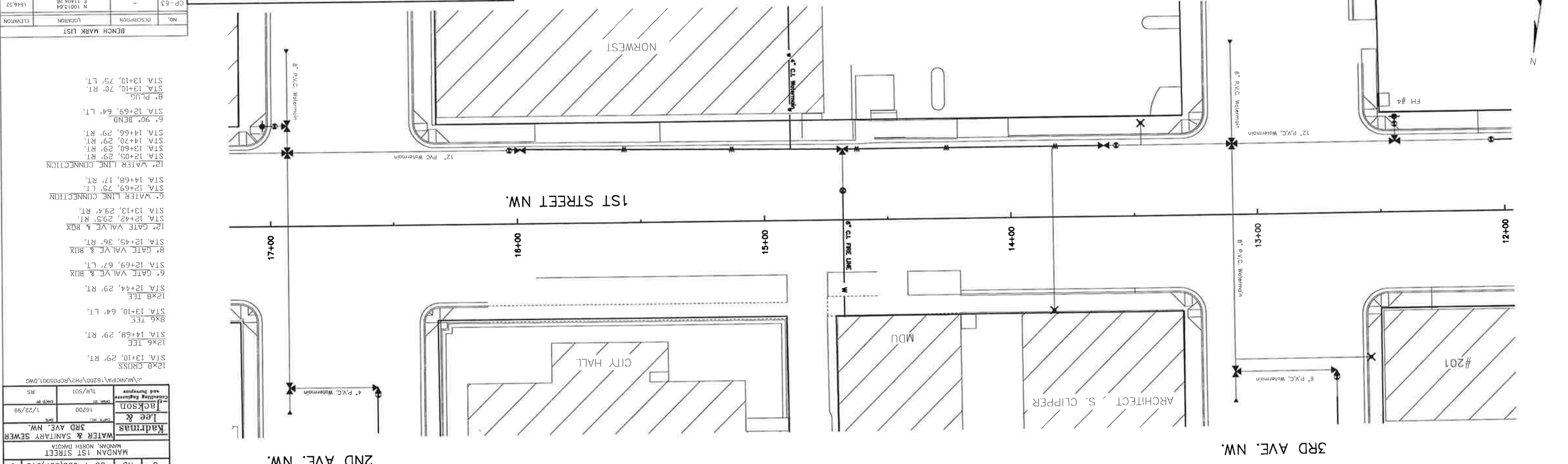
FIRE HYDRANT LOCATIONS	
NO.	STATION
#4	12+44

MANHOLE INFORMATION	
MANHOLE NO.	LENGTH/DIRECTION
201	12+55/WATER
MDU	14+48/WATER
13+47	13+47/WATER

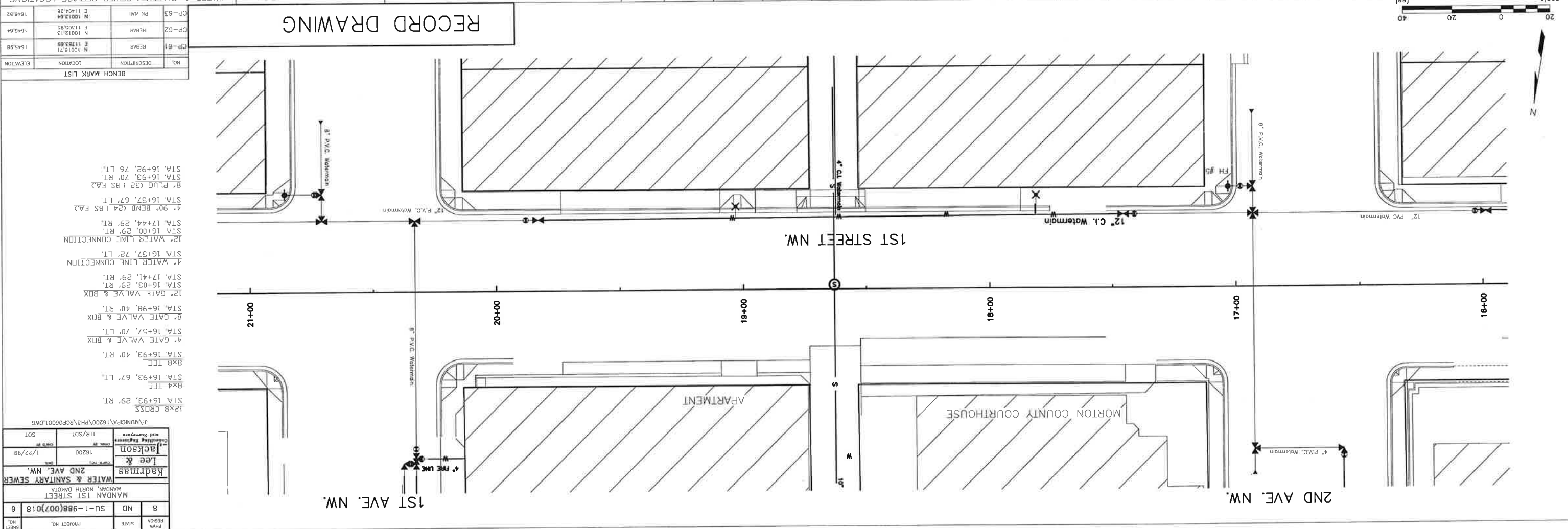
HOUSE NO./STATION	
LENGTH/DIRECTION	
59' LT	1-1/2" COPPER
38' LT	1-1/2" COPPER
38' LT	1-1/2" COPPER
38' RT	1-1/2" COPPER



RECORD DRAWING



16+00	1645.60	1625	1635	1645	1650	1655	1660	1665
16+20	1645.58							
16+40	1645.55							
16+60	1645.53							
16+80	1645.50							
17+00	1645.48							
17+20	1645.53							
17+40	1645.59							
17+60	1645.64							
17+80	1645.70							
18+00	1645.75							
18+20	1645.80							
18+40	1645.85							
18+60	1645.90							
18+80	1645.95							
19+00	1645.10							
19+20	1645.15							
19+40	1645.20							
19+60	1645.25							
19+80	1644.99							
20+00	1644.95							
20+20	1645.11							
20+40	1645.27							
20+60	1645.42							



NO.	DESCRIPTION	LOCATION	ELEVATION
CP-61	REAR	N 1183.68	1645.98
CP-62	REAR	N 1001.73	1646.64
CP-63	PK MANH	N 1001.64	1646.52

NO.	DESCRIPTION	LOCATION	ELEVATION
12	GATE VALVE & BOX	STA. 16+93, 29' RT.	
8	GATE VALVE & BOX	STA. 16+93, 40' RT.	
4	GATE VALVE & BOX	STA. 16+57, 70' LT.	
8	GATE VALVE & BOX	STA. 16+98, 40' RT.	
12	GATE VALVE & BOX	STA. 17+41, 29' RT.	
4	WATER LINE CONNECTION	STA. 16+57, 72' LT.	
12	WATER LINE CONNECTION	STA. 17+44, 29' RT.	
4	90° BEND 64 LBS EA2	STA. 16+57, 67' LT.	
8	PLUG 62 LBS EA2	STA. 16+93, 70' RT.	
8	PLUG 62 LBS EA2	STA. 16+92, 76' LT.	

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-61	REAR	N 1183.68	1645.98
CP-62	REAR	N 1001.73	1646.64
CP-63	PK MANH	N 1001.64	1646.52

MANDAN 1ST STREET WATER & SANITARY SEWER RADMAS LEG & JACKSON CONSULTING ENGINEERS AND SURVEYORS 1/22/99

NO.	DESCRIPTION	ELEVATION
CP-59	REBAR	1646.17
CP-60	REBAR	1646.54
CP-61	REBAR	1645.98

NO.	DESCRIPTION	ELEVATION
CP-59	REBAR	1646.17
CP-60	REBAR	1646.54
CP-61	REBAR	1645.98

NO.	STATION	LENGTH/DIRECTION (FROM MAIN)
CP-59	1646.17	
CP-60	1646.54	
CP-61	1645.98	

NO.	STATION	DIRECTION
#6	20+86	40'/RT 8"

NO.	STATION	LENGTH/DIRECTION (FROM MAIN)
CP-59	1646.17	
CP-60	1646.54	
CP-61	1645.98	

NO.	STATION	DIRECTION
#6	20+86	40'/RT 8"

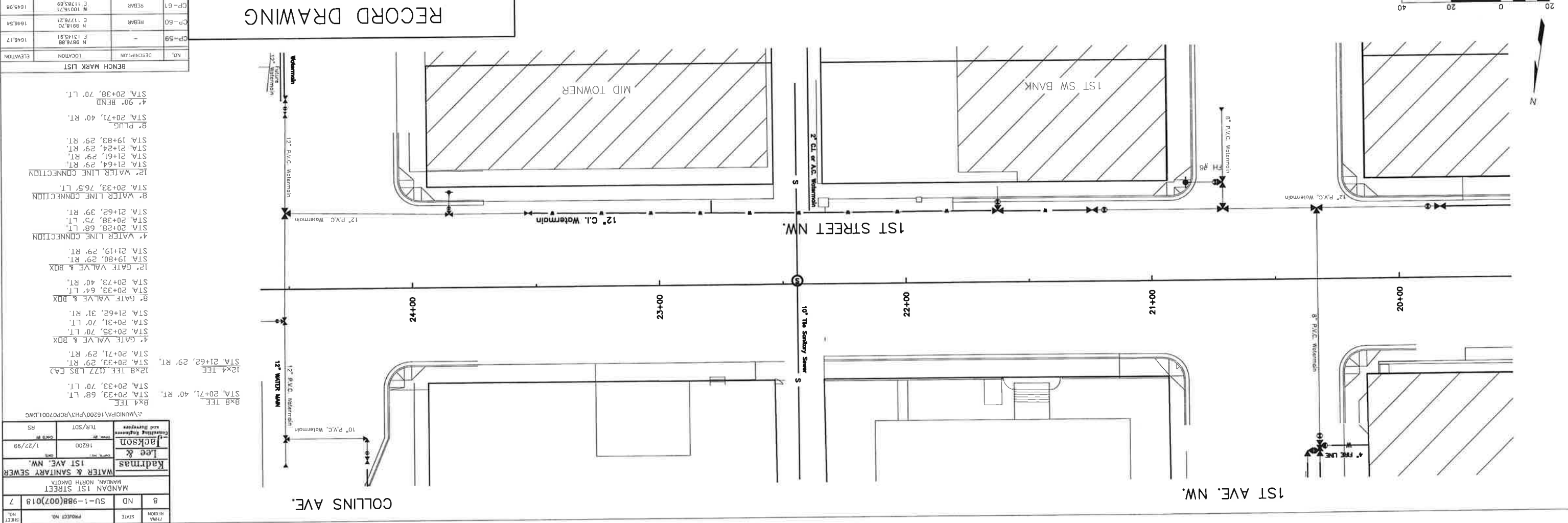
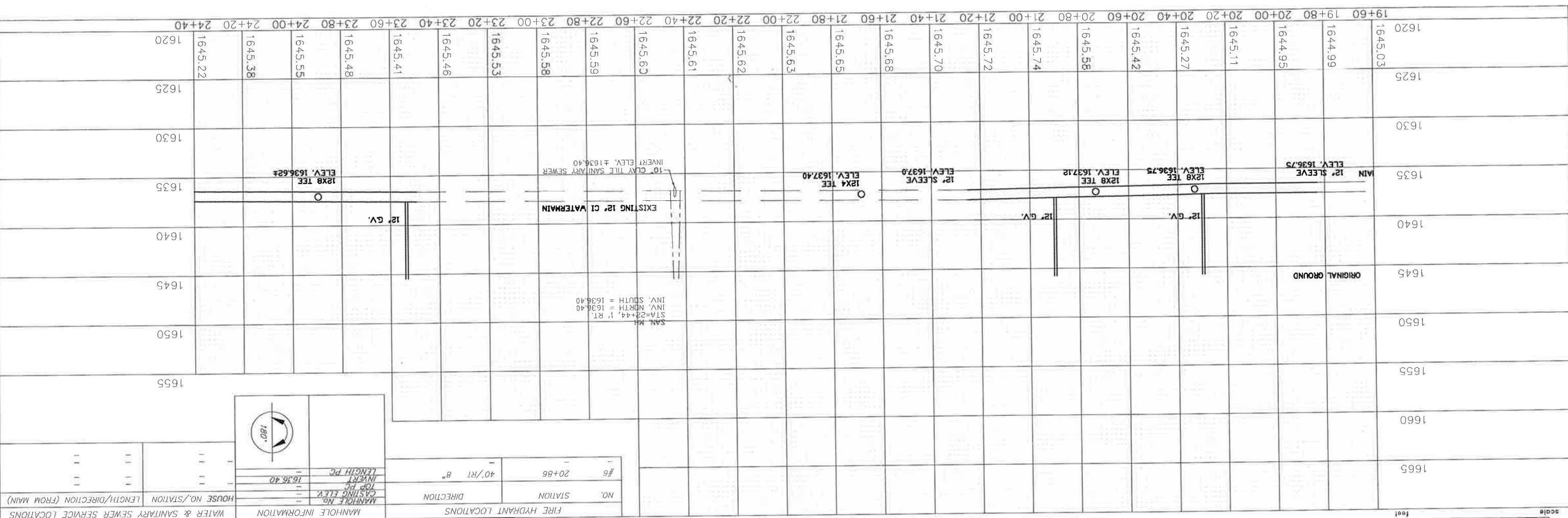
NO.	STATION	LENGTH/DIRECTION (FROM MAIN)
CP-59	1646.17	
CP-60	1646.54	
CP-61	1645.98	

NO.	STATION	DIRECTION
#6	20+86	40'/RT 8"

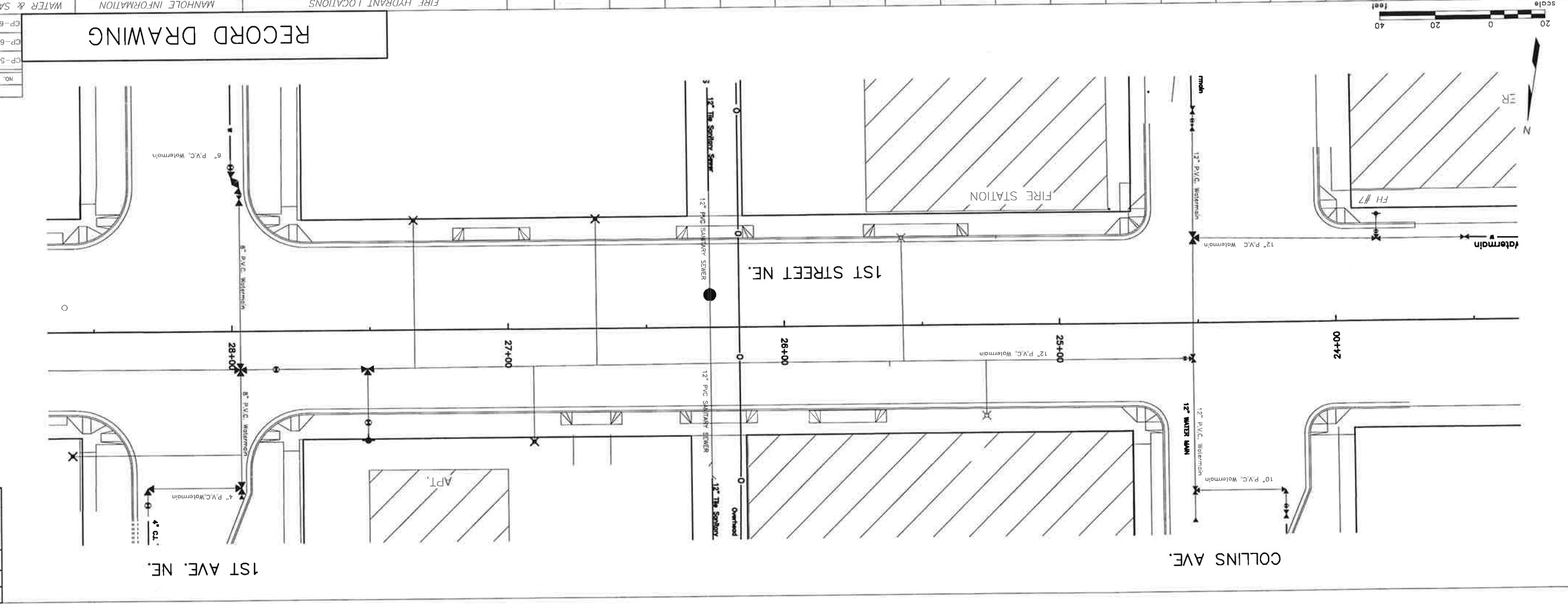
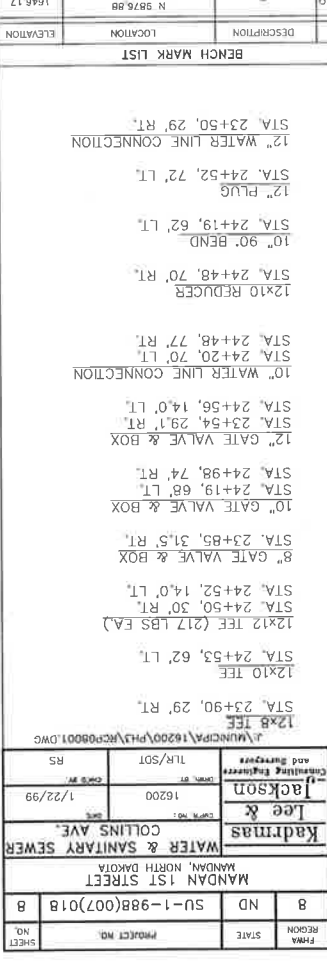
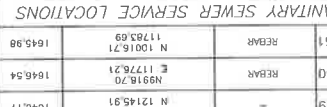
NO.	STATION	LENGTH/DIRECTION (FROM MAIN)
CP-59	1646.17	
CP-60	1646.54	
CP-61	1645.98	

NO.	STATION	DIRECTION
#6	20+86	40'/RT 8"

NO.	STATION	LENGTH/DIRECTION (FROM MAIN)
CP-59	1646.17	
CP-60	1646.54	
CP-61	1645.98	



1645.46	1645.41	1645.55	1645.48	1645.38	1645.22	1645.59	1645.29	1645.58	1644.71	1645.48	1644.66	1645.38	1644.61	1644.56	1645.19	1644.51	1645.10	1644.46	1645.00	1644.49	1644.97	1644.52	1644.93	1644.55	1644.90	1644.86	1644.57	1644.86	1644.60	1644.83	1644.63	1644.79	1644.50	1644.76	1644.50	1644.73	1644.51	1644.68	1644.52	1644.58	1644.69	1644.48	1644.69	1644.53	1620															
1625																																																												
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1655																																																												
1660																																																												
1665																																																												



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NO.	DESCRIPTION	ELEVATION
CP-55	REBAR	N 5841.81 E 1268.07
CP-56	REBAR	N 5841.81 E 1268.85
CP-57	REBAR	N 5841.81 E 1274.03

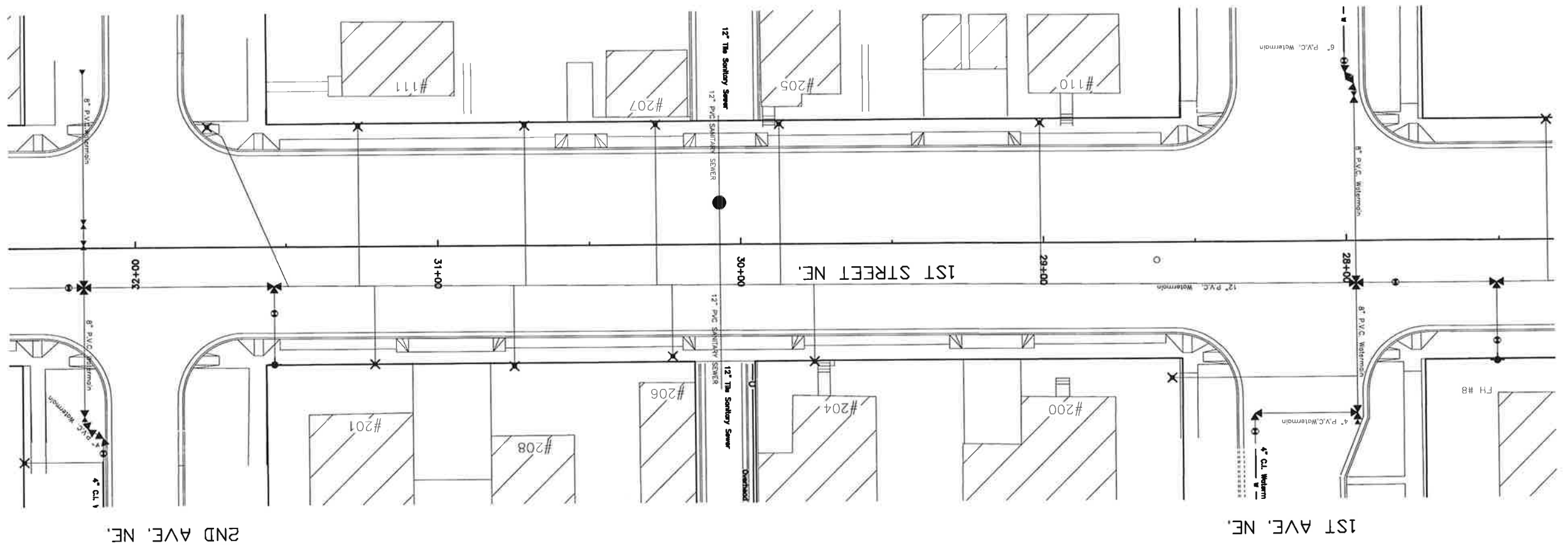
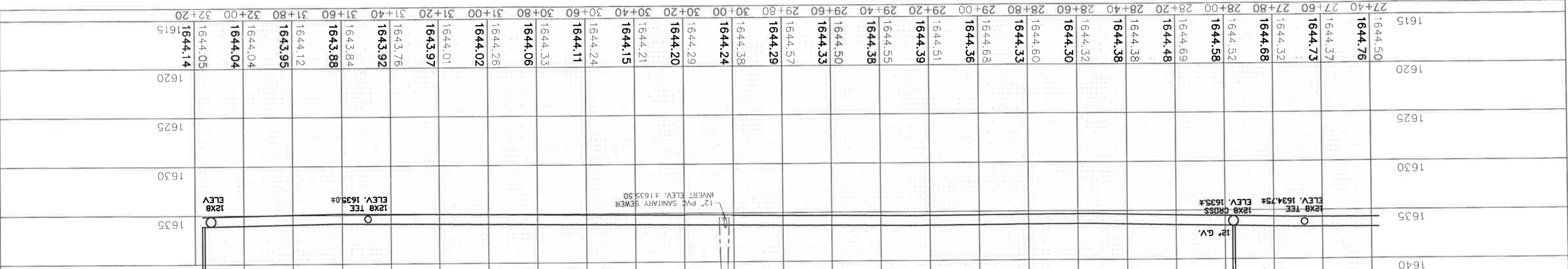
BENCH MARK LIST

NO.	DESCRIPTION	LOCATION	ELEVATION
12X8 CROSS		STA. 27+97, 14' LT.	
8X4 TEE		STA. 27+97, 57' LT.	
12X8 TEE		STA. 27+97, 14' LT.	
12X8 TEE		STA. 27+97, 57' LT.	
6" GATE VALVE & BOX		STA. 28+00, 29' RT.	
4" GATE VALVE & BOX		STA. 28+03, 63' LT.	
8" GATE VALVE & BOX		STA. 27+71, 33.5' LT.	
12" GATE VALVE & BOX		STA. 28+03, 14' LT.	
4" WATER LINE CONNECTION		STA. 28+31, 64' LT.	
6" WATER LINE CONNECTION		STA. 28+00, 62' RT.	
8X6 REDUCER		STA. 27+97, 57' RT.	
4" 90° BEND		STA. 28+31, 57' LT.	
6" 45° BENDS		STA. 27+97, 60' RT.	
8" PLUG		STA. 27+97, 64' LT.	

RECORD DRAWING

FIRE HYDRANT LOCATIONS		MANHOLE NO.		WATER & SANITARY SEWER SERVICE LOCATIONS	
NO.	STATION	DIRECTION/SIZE	CASTING ELEV.	HOUSE NO./STATION	LENGTH/DIRECTION (FROM MAIN)
-	#8	27+71	40.5'/LT 8"	-	-
-	-	-	-	MANHOLE NO. 2	LENGTH/DIRECTION
-	-	-	-	TOP PC	-
-	-	-	-	INVERT	1635.50
-	-	-	-	LENGTH PC	-

NO.	STATION	DIRECTION/SIZE	CASTING ELEV.	HOUSE NO./STATION	LENGTH/DIRECTION (FROM MAIN)
200	28+48/WATER	61'/LT	1-1/2" COPPER	1644.04	32+00
110	29+01/WATER	40'/RT	1-1/2" COPPER	1644.12	32+00
204	29+76/WATER	39'/LT	1-1/2" COPPER	1643.95	32+00
205	29+87/WATER	40'/RT	1-1/2" COPPER	1643.88	32+00
206	30+23/WATER	37'/LT	1-1/2" COPPER	1643.84	32+00
207	30+28/WATER	40'/RT	1-1/2" COPPER	1644.01	32+00
109	30+76/WATER	40'/RT	1-1/2" COPPER	1644.02	32+00
208	30+71/WATER	41'/LT	1-1/2" COPPER	1644.04	32+00



NO.	DESCRIPTION	LOCATION	ELEVATION
CP-53	REBAR	N 10092.78 E 13236.03	1645.27
CP-54	REBAR	N 10104.67 E 12897.03	1644.62
CP-55	REBAR	N 9855.42 E 12895.07	1645.15

RECORD DRAWING

WATER & SANITARY SEWER SERVICE LOCATIONS

NO.	STATION	LENGTH/SIZE	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#9	31+54	40'/LT 8"	1635.27			

MANHOLE INFORMATION

MANHOLE NO.	CASTING ELEV.
3	1635.27

FIRE HYDRANT LOCATIONS

NO.	STATION	LENGTH/SIZE	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#9	31+54	40'/LT 8"	1635.27			

WATER & SANITARY SEWER SERVICE LOCATIONS

NO.	STATION	LENGTH/SIZE	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#9	31+54	40'/LT 8"	1635.27			

MANHOLE INFORMATION

MANHOLE NO.	CASTING ELEV.
3	1635.27

FIRE HYDRANT LOCATIONS

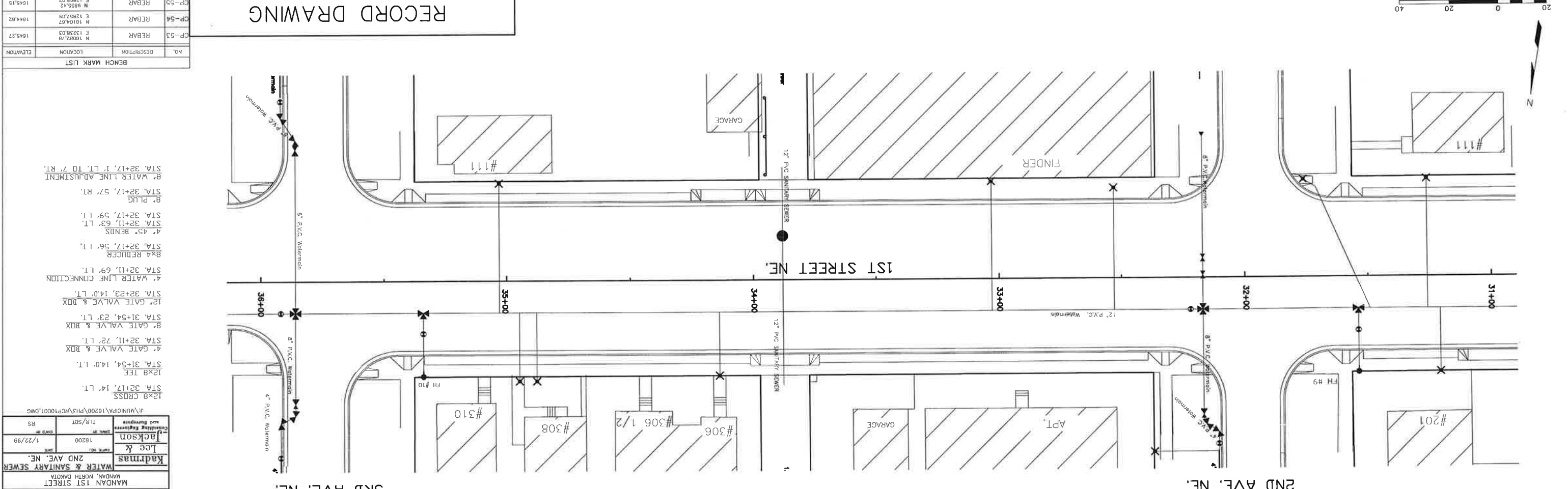
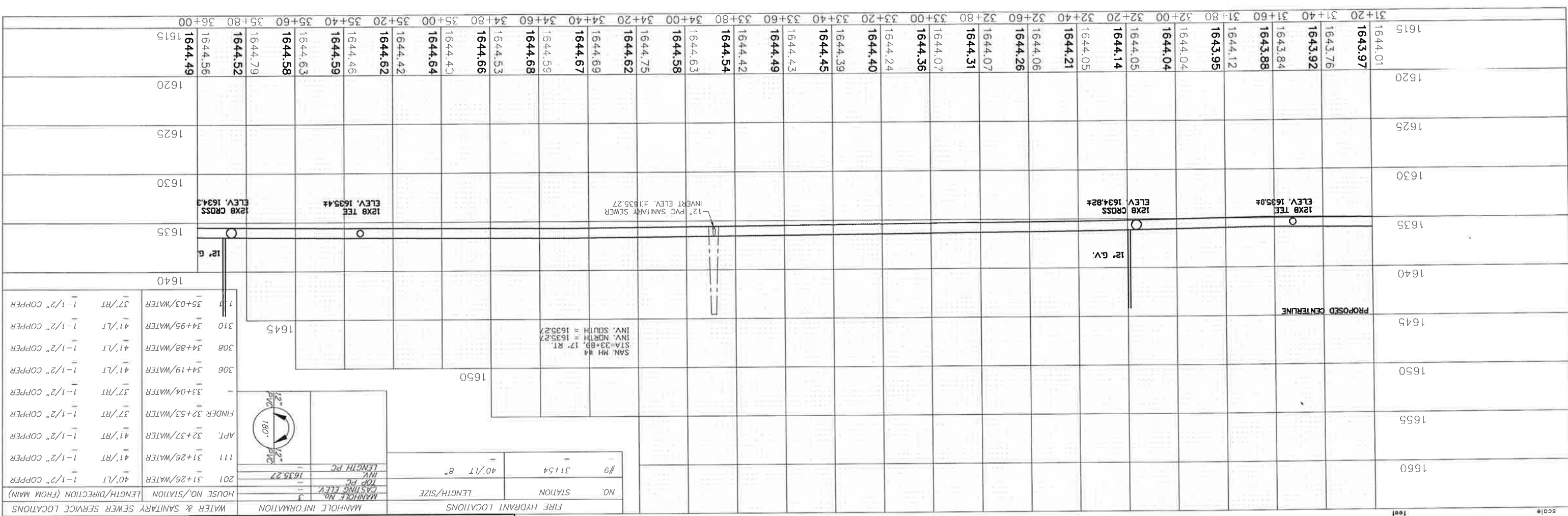
NO.	STATION	LENGTH/SIZE	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#9	31+54	40'/LT 8"	1635.27			

WATER & SANITARY SEWER SERVICE LOCATIONS

NO.	STATION	LENGTH/SIZE	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#9	31+54	40'/LT 8"	1635.27			

MANHOLE INFORMATION

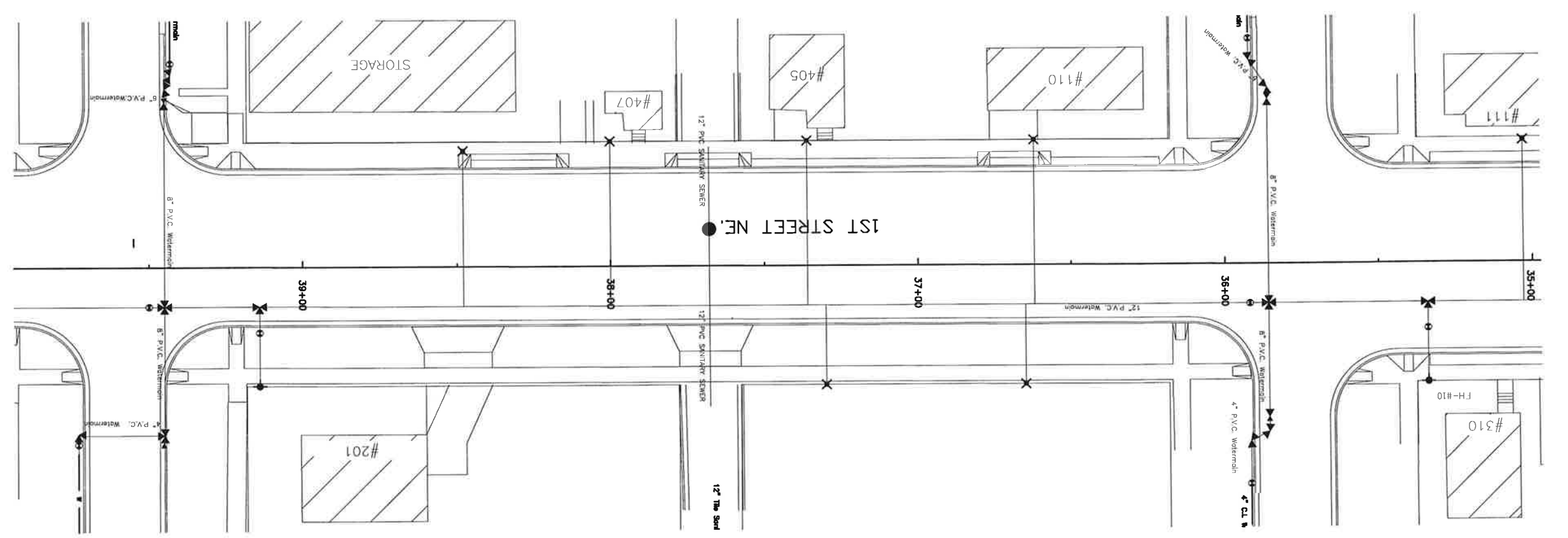
MANHOLE NO.	CASTING ELEV.
3	1635.27



SHEET NO.	11
PROJECT NO.	SU-1-98R(007)018
PHSA REGION	B
STATE	ND

MANDAN 1ST STREET	
MANDAN, NORTH DAKOTA	
WATER & SANITARY SEWER	
DATE	1/22/99
DESIGNER	Legg & Kadrmas
CLIENT	City of Mandan
SCALE	AS SHOWN
DESIGNED BY	TLR/SOT
PROJECT NO.	16200
CHECKED BY	

12"Ø CROSS	STA. 35+86, 14' LT.
12"Ø TEE	STA. 35+34, 14' LT.
4" GATE VALVE & BOX	STA. 35+92, 73' LT.
6" GATE VALVE & BOX	STA. 35+92, 73' RT.
8" GATE VALVE & BOX	STA. 35+34, 22.5' LT.
12" GATE VALVE & BOX	STA. 35+92, 14' LT.
4" WATER LINE CONNECTION	STA. 35+92, 74' LT.
6" WATER LINE CONNECTION	STA. 35+92, 74' RT.
8"Ø REDUCER	STA. 35+86, 52' LT.
8"Ø REDUCER	STA. 35+86, 52' RT.
4"Ø BENDS	STA. 35+92, 59' LT.
6"Ø BENDS	STA. 35+86, 57' RT.
8" WATER MAIN ADJUST	STA. 35+86, 6' LT. TO 10' RT.



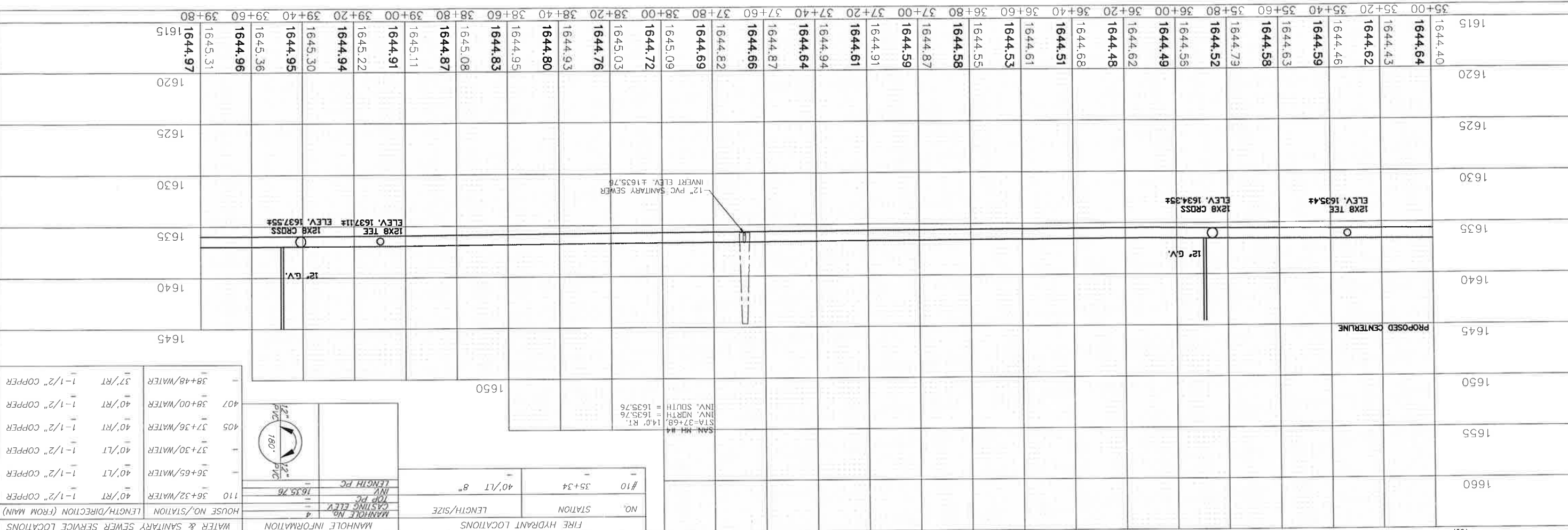
NO.	DESCRIPTION	LOCATION	ELEVATION
CP-51	REBAR	N 10062.31 E 19618.36	1646.35
CP-52	REBAR	N 9871.22 E 13225.72	1644.82
CP-53	REBAR	N 10082.76 E 13286.03	1645.27

BENCH MARK LIST			
NO.	DESCRIPTION	LOCATION	ELEVATION

FIRE HYDRANT LOCATIONS		
NO.	STATION	LENGTH/SIZE
#10	35+34	40'/LT 8"

MANHOLE INFORMATION		
MANHOLE NO.	TOP PC CASTING ELEV.	LENGTH PC
110	1635.76	

HOUSE NO./STATION		LENGTH/DIRECTION (FROM MAIN)	
110	36+32/WATER	40'/RT	1-1/2" COPPER
36+65/WATER	40'/LT	1-1/2" COPPER	
37+30/WATER	40'/LT	1-1/2" COPPER	
37+36/WATER	40'/RT	1-1/2" COPPER	
38+00/WATER	40'/RT	1-1/2" COPPER	
38+48/WATER	37'/RT	1-1/2" COPPER	



RECORD DRAWING



SHEET NO.	12
PROJECT NO.	SU-1-988(007)018
REGION	ND
STATE	8
FILE	MANDAN 1ST STREET

MANDAN 1ST STREET	
WATER & SANITARY SEWER	
DATE	1/6/99
DESIGNED BY	Lee & Jackson
CHECKED BY	Jackson
SCALE	AS SHOWN
PROJECT NO.	12000
DATE	1/6/99
PROJECT NO.	12000
DATE	1/6/99

12x8 CROSS	STA. 39+45, 56' LT.
8x4 TEE	STA. 39+45, 56' LT.
12x8 TEE	STA. 39+14, 56' LT.
4" WATER LINE CONNECTION	STA. 39+73, 57' LT.
6" GATE VALVE & BOX	STA. 39+43, 66' RT.
8" GATE VALVE & BOX	STA. 39+14, 22' LT.
12" GATE VALVE & BOX	STA. 39+50, 14' LT.
4" WATER LINE CONNECTION	STA. 39+73, 62' LT.
6" WATER LINE CONNECTION	STA. 39+43, 68' RT.
8x6 REDUCER	STA. 39+45, 68' RT.
4" 90° BEND	STA. 39+73, 55' LT.
6" 45° BENDS	STA. 39+43, 64' RT.
8" PLUG	STA. 39+43, 56' LT.

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-50	REBAR	N 1205.55	1644.91
CP-51	REBAR	E 12618.26	1644.91
CP-76	REBAR	N 10034.48	1644.08

BENCH MARK LIST			
NO.	DESCRIPTION	LOCATION	ELEVATION

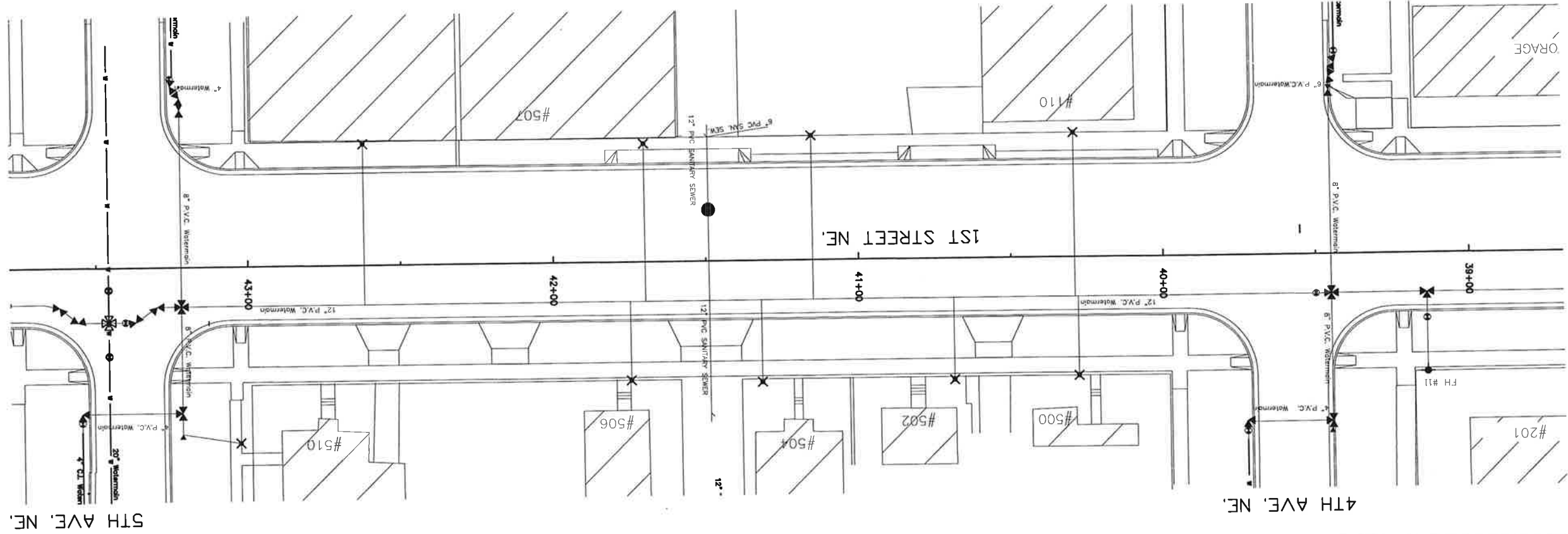
FIRE HYDRANT LOCATIONS		
NO.	STATION	LENGTH/SIZE
#11	39+14	40'/LT 8"

MANHOLE INFORMATION	
MANHOLE NO.	5
CASTING ELEV.	1635.06
LENGTH PC	
INV.	

WATER & SANITARY SEWER SERVICE LOCATIONS	
HOUSE NO./STATION	LENGTH/DIRECTION
39+24/WATER	99'/RT
40+27/WATER	40'/RT
40+28/WATER	40'/LT
40+69/WATER	41'/LT
41+32/WATER	39'/LT
41+70/WATER	38'/RT
41+75/WATER	40'/LT
41+15/WATER	40'/LT

12x20 CR	1640
EXISTING	
12" G.V.	
12x8 TEE	ELEV. 1637.11#
12x8 CROSS	ELEV. 1637.55#
12" PVC SANITARY SEWER	
INVERT ELEV. #1635.06	
12" PVC SANITARY SEWER	
INVERT ELEV. #1635.06	
12x8 CROSS	ELEV. 1635.17#

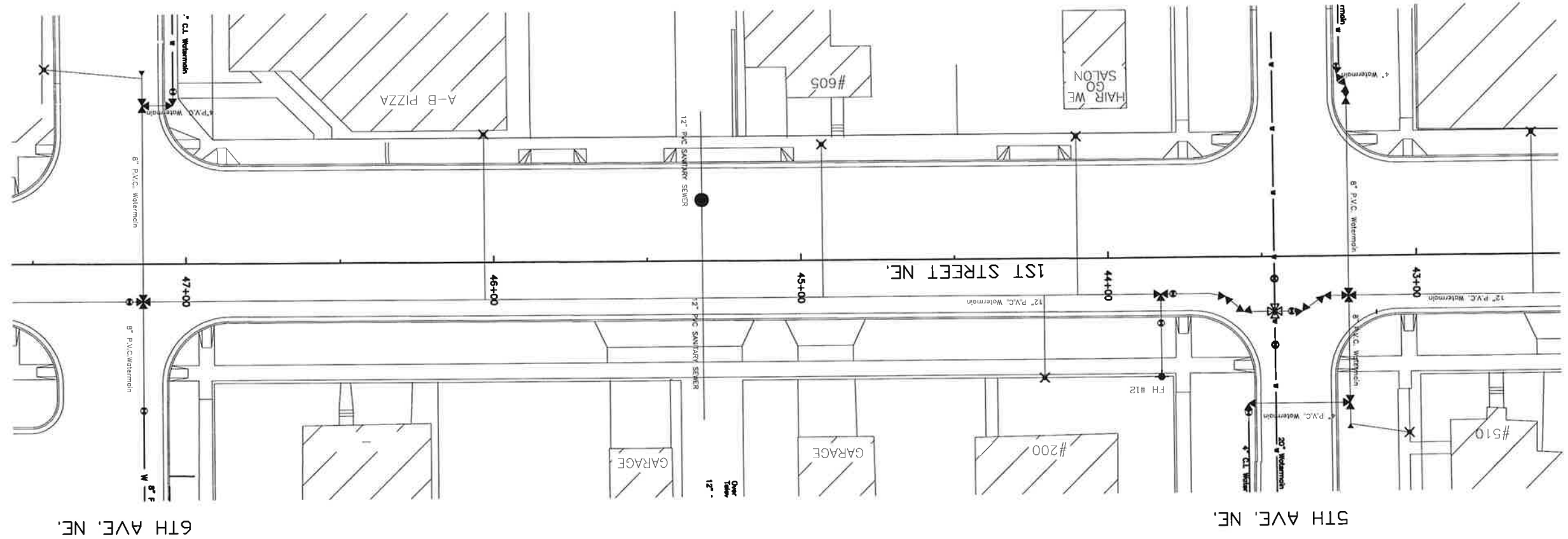
38+80	1645.08	1620	1625	1630	1635	1640	1645	1650	1655	1660
39+00	1644.91									
39+20	1645.22									
39+40	1644.95									
39+60	1645.36									
39+80	1644.96									
40+00	1645.31									
40+20	1644.97									
40+40	1645.13									
40+60	1645.33									
40+80	1645.06									
41+00	1645.23									
41+20	1644.84									
41+40	1645.12									
41+60	1644.78									
41+80	1644.92									
42+00	1645.15									
42+20	1644.82									
42+40	1644.53									
42+60	1644.72									
42+80	1644.40									
43+00	1644.61									
43+20	1644.25									
43+40	1644.51									
43+60	1644.00									
43+80	1644.41									
44+00	1644.02									
44+20	1643.95									
44+40	1644.21									
44+60	1643.81									
44+80	1644.11									
45+00	1643.92									
45+20	1643.92									
45+40	1644.11									
45+60	1643.81									
45+80	1644.00									
46+00	1643.64									
46+20	1643.80									
46+40	1643.60									
46+60	1643.78									
46+80	1643.95									
47+00	1643.76									
47+20	1643.95									
47+40	1644.10									
47+60	1643.73									
47+80	1644.00									
48+00	1643.71									
48+20	1644.00									
48+40	1643.73									
48+60	1644.10									
48+80	1643.71									



RECORD DRAWING



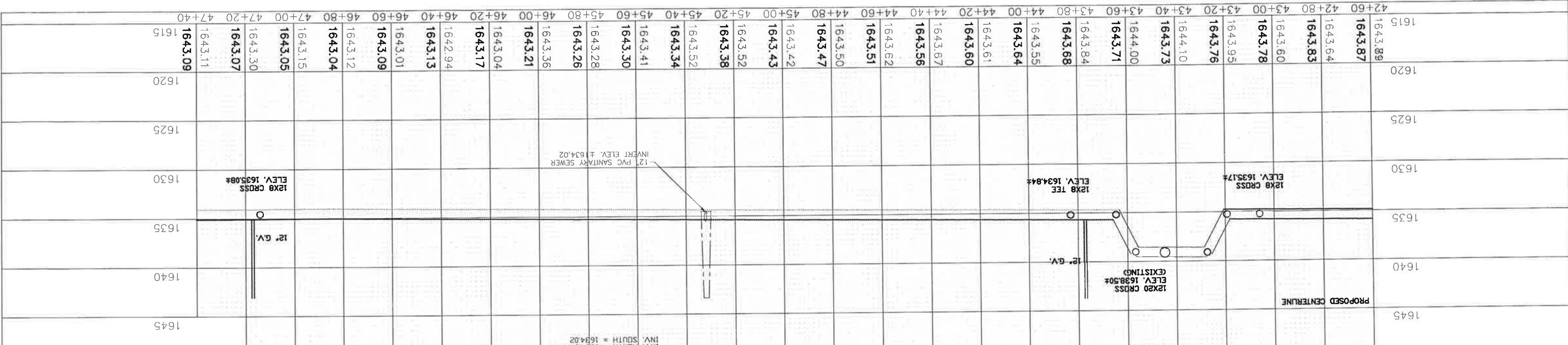
SHEET NO.	13
PROJECT NO.	SU-1-988(07)018
STATE	ND
REGION	8
DATE	11/22/99
DESIGNED BY	JACKSON
CHECKED BY	LEE & JACKSON
SCALE	AS SHOWN
PROJECT	MANDAN 1ST STREET WATER & SANITARY SEWER
LOCATION	MANDAN, NORTH DAKOTA
DATE	11/22/99
SCALE	AS SHOWN
PROJECT	MANDAN 1ST STREET WATER & SANITARY SEWER
LOCATION	MANDAN, NORTH DAKOTA



NO.	DESCRIPTION	LOCATION	ELEVATION
CP-76	REBAR	E 14032.41	1644.08
CP-77	REBAR	E 14001.00	1643.87
CP-86	REBAR	N 10082.50	1645.24

NO.	STATION	LENGTH/SIZE	MANHOLE NO.	INSTALLING ELEV.	TOP FC	LENGTH PC
#12	43+83	40.5'/LT 8"		1634.02		

HOUSE NO./STATION	LENGTH/DIRECTION	1-1/2" COPPER	39'/RT	42+62/WATER	39'/RT	1-1/2" COPPER	40'/LT	44+21/WATER	37'/RT	1-1/2" COPPER	41'/RT	46+03/WATER	
510	43+02/WATER	59'/LT	1-1/2" COPPER	507	42+62/WATER	39'/RT	1-1/2" COPPER	200	44+21/WATER	40'/LT	1-1/2" COPPER	605	44+93/WATER
1650	44+93/WATER	37'/RT	1-1/2" COPPER	1645	46+03/WATER	41'/RT	1-1/2" COPPER						



RECORD DRAWING

12" WATER LINE ADJUSTMENT
 STA. 43+30, TO 43+62, 14' LT. TO 19' LT.

6TH AVE. NE.

5TH AVE. NE.

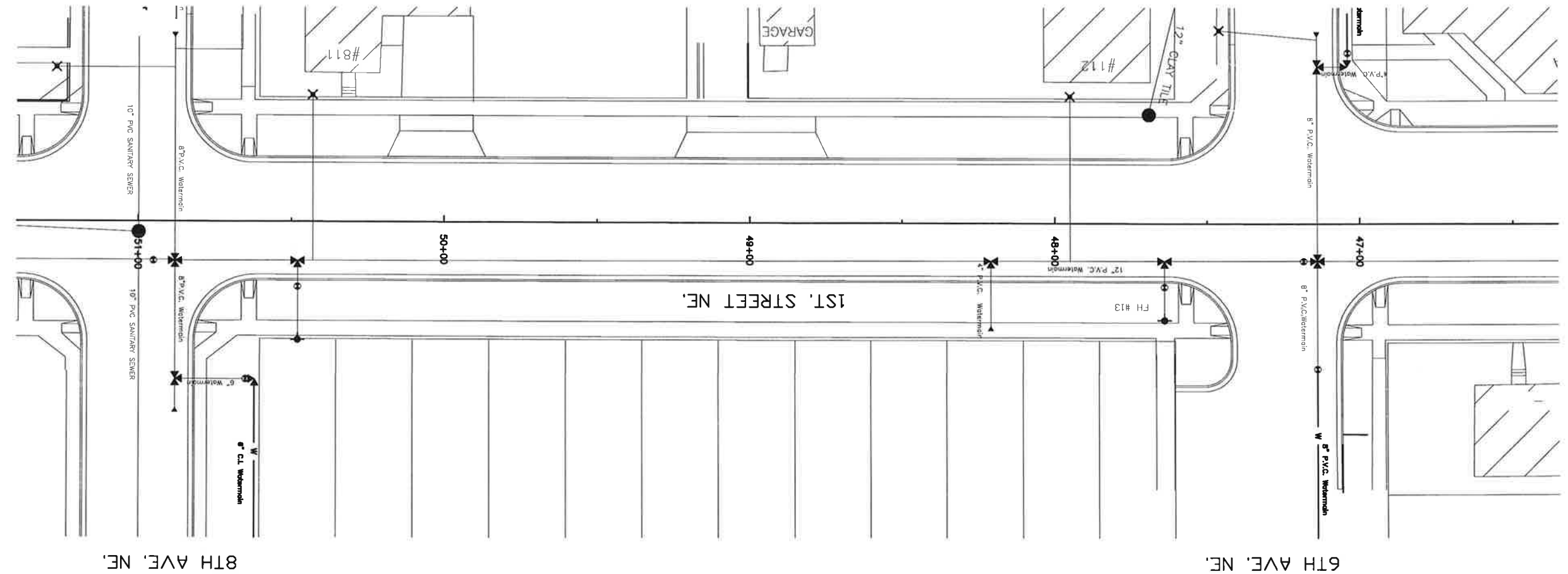
WATER & SANITARY SEWER SERVICE LOCATIONS

MANHOLE INFORMATION

FIRE HYDRANT LOCATIONS



12X8 CROSS STA 47+14, 14' LT.
9x4 TEE STA 47+14, 51' RT.
12X4 TEE STA 48+21, 14' LT.
12X8 TEE STA 47+64, 14' LT.
4" GATE VALVE & BOX STA 47+05, 58' RT.
8" GATE VALVE & BOX STA 47+14, 48' LT. (CITY INSTALLED)
12" GATE VALVE & BOX STA 47+64, 22' LT.
4" WATER LINE CONNECTION STA 47+05, 52.6' RT.
4" 90° BEND STA 47+04, 51' RT.
8" PLUS STA 47+14, 61' RT.
4" PLUS STA 48+21, 33' LT.



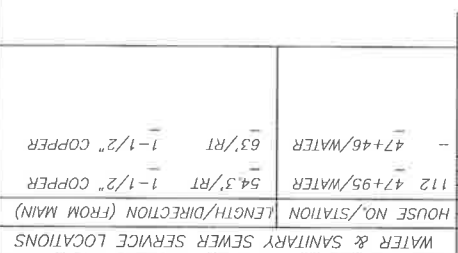
RECORD DRAWING

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-86	REBAR	N 1092.60 E 1393.50	1645.24
CP-87	REBAR	N 987.60 E 1393.61	1643.43
CP-90	REBAR	N 1098.55 E 1400.58	1649.95

FIRE HYDRANT LOCATIONS	
NO.	STATION
#13	47+64

MANHOLE INFORMATION	
MANHOLE NO.	CASTING ELEV.
7-A	1644.49

WATER & SANITARY SEWER SERVICE LOCATIONS	
HOUSE NO./STATION	LENGTH/DIRECTION (FROM MAIN)
112	47+95/WATER
63/RT	1-1/2" COPPER



STATION	ELEVATION	STATION	ELEVATION
46+40	1643.08	1620	1620
46+40	1643.13	1625	1625
46+40	1643.01	1630	1630
46+60	1643.09	1635	1635
46+60	1643.01	1640	1640
46+60	1643.12	1645	1645
46+80	1643.04	1650	1650
46+80	1643.15	1655	1655
47+00	1643.05	1660	1660
47+00	1643.11		
47+20	1643.07		
47+20	1643.30		
47+40	1643.09		
47+40	1643.11		
47+60	1643.35		
47+60	1643.12		
47+80	1643.95		
47+80	1643.21		
48+00	1644.12		
48+00	1643.31		
48+20	1643.94		
48+20	1643.41		
48+40	1643.93		
48+40	1643.50		
48+60	1644.03		
48+60	1643.60		
48+80	1644.07		
48+80	1643.70		
49+00	1643.71		
49+00	1643.80		
49+20	1643.72		
49+20	1643.90		
49+40	1643.76		
49+40	1644.00		
49+60	1643.83		
49+60	1644.10		
49+80	1643.98		
49+80	1644.20		
50+00	1644.32		
50+00	1644.30		
50+20	1644.58		
50+20	1644.39		
50+40	1644.42		
50+40	1644.49		
50+60	1644.49		
50+60	1644.59		
50+80	1644.91		
50+80	1645.01		
51+00	1645.22		
51+00	1645.45		
51+20	1645.13		
51+20	1645.89		
1615			



SHEET NO.	14
PROJECT NO.	SU-1-988(007)018
REGION	ND
STATE	8
DATE	1/22/99
DESIGNER	Lee & Jackson
CONTRACT NO.	16200
CLIENT	Kadmas
PROJECT NAME	MANDAN 1ST STREET
PROJECT ADDRESS	WATER & SANITARY SEWER
PROJECT LOCATION	6TH AVE. NE.
PROJECT NO.	RS

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-86	REBAR	E 1520.50	1645.24
CP-87	REBAR	E 1430.81	1643.43
CP-90	REBAR	E 1476.58	1649.95

12x8 CROSS STA 47+14, 14' LT.	
8x4 TEE STA 47+14, 51' RT.	
12x4 TEE STA 48+21, 14' LT.	
4" GATE VALVE & BOX STA 47+05, 58' RT.	
4" GATE VALVE & BOX STA 47+14, 48' LT. (CITY INSTALLED)	
12" GATE VALVE & BOX STA 47+64, 22' LT.	
4" WATER LINE CONNECTION STA 47+05, 52.6' RT.	
4" 90° BEND STA 47+04, 51' RT.	
8" PLUG STA 47+14, 61' RT.	
4" PLUG STA 48+21, 33' LT.	

BENCH MARK LIST			
NO.	DESCRIPTION	LOCATION	ELEVATION

RECORD DRAWING

FIRE HYDRANT LOCATIONS	
NO.	LENGTH/SIZE
#13	47+64 33"/LT 8"
MANHOLE INFORMATION	
MANHOLE NO.	Z-A
CASTING ELEV.	
TOP PC	
LENGTH PC	

WATER & SANITARY SEWER SERVICE LOCATIONS	
HOUSE NO./STATION	LENGTH/DIRECTION (FROM MAIN)
47+95/WATER	54.3'/RT 1-1/2" COPPER
47+46/WATER	63'/RT 1-1/2" COPPER

1650

1645

1640

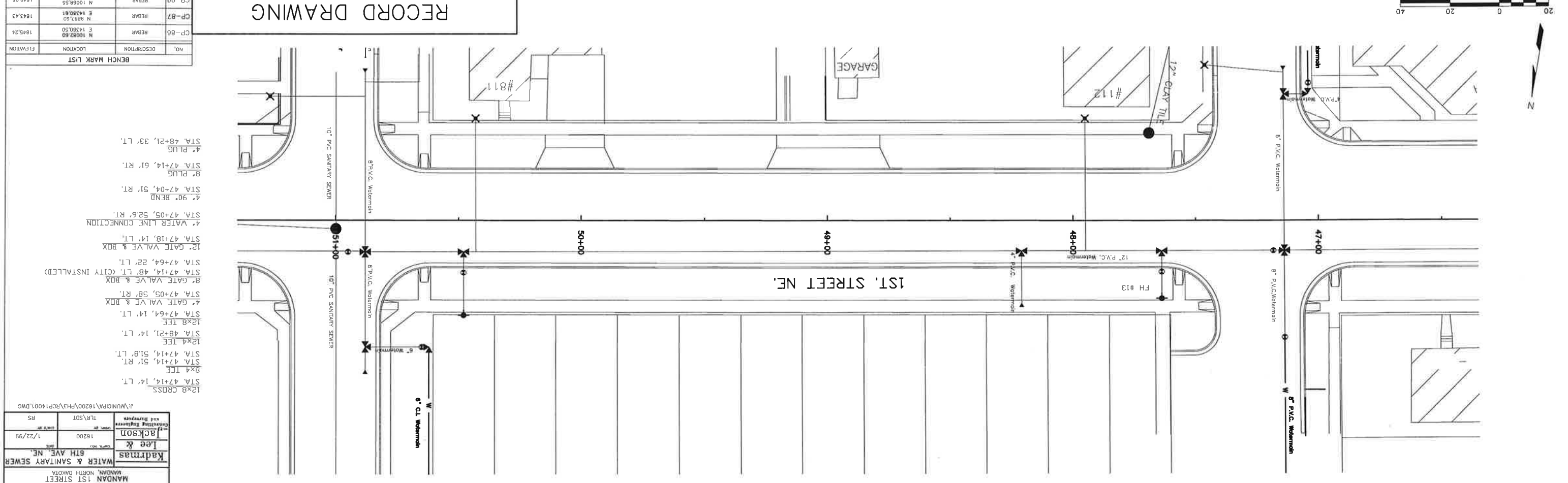
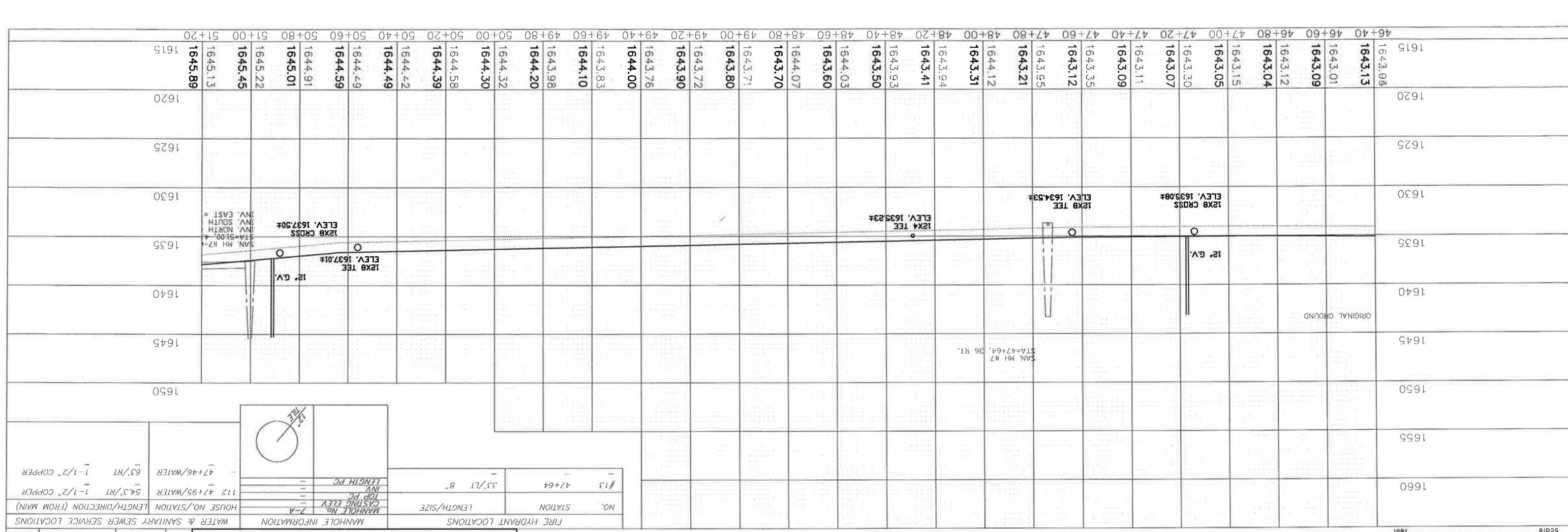
1635

1630

1625

1620

1615



12x8 CROSS STA. 50+88, 14.0' LT.
 9x6 TEE STA. 50+88, 53' LT.
 12x8 TEE STA. 50+49, 14.0' LT.
 6" GATE VALVE & BOX STA. 50+64, 53' LT.
 6" GATE VALVE & BOX STA. 50+48.5, 22.5' LT.
 12" GATE VALVE & BOX STA. 50+95, 14' LT.
 6" WATER LINE CONNECTION STA. 50+62, 53' LT.
 6" 90° BEND STA. 50+63, 53' LT.
 8" PLUG STA. 50+88, 62' LT.

BENCH MARK LIST

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-90	REBAR	N 1008.55 E 1480.58	1649.95
CP-91		N 989.28 E 1401.81	1644.98
CP-92	REBAR	N 1007.93 E 1514.93	1653.75

MANHOLE INFORMATION

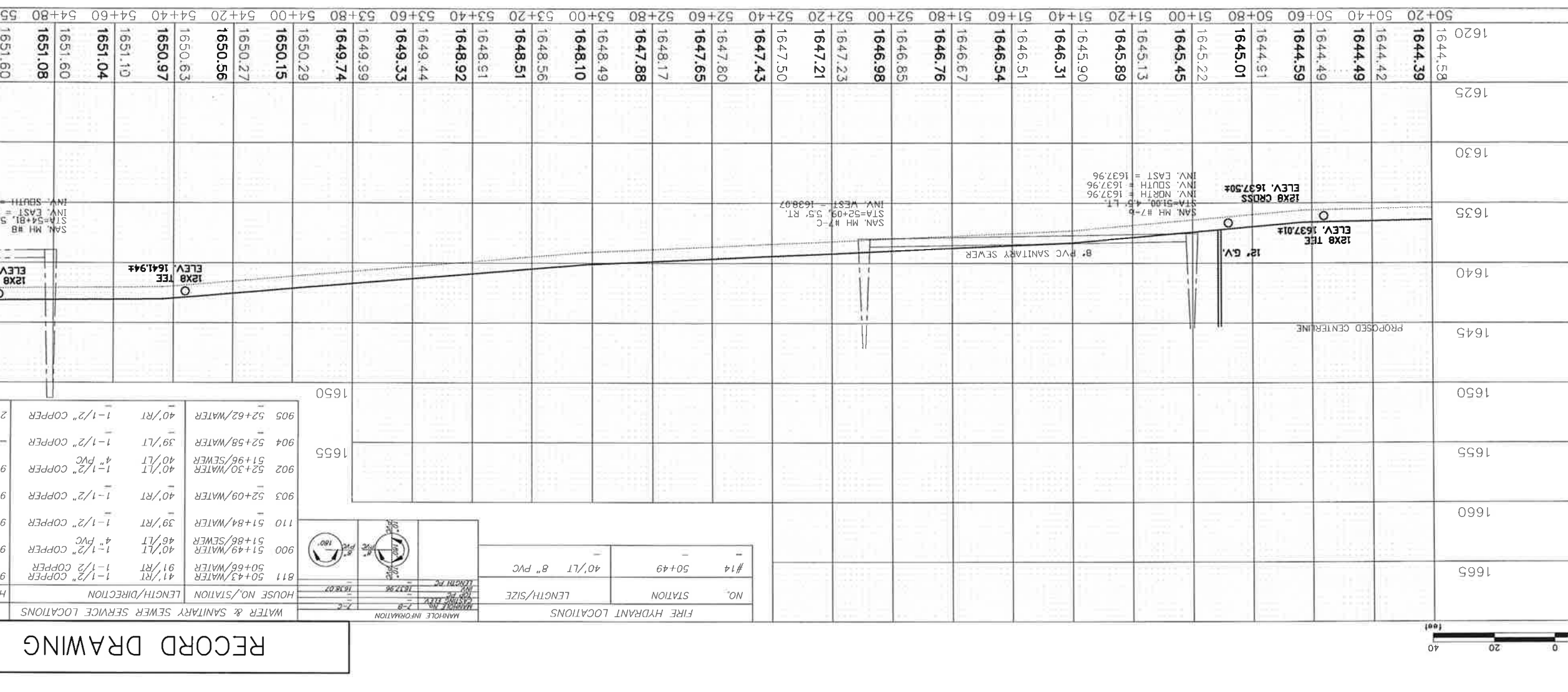
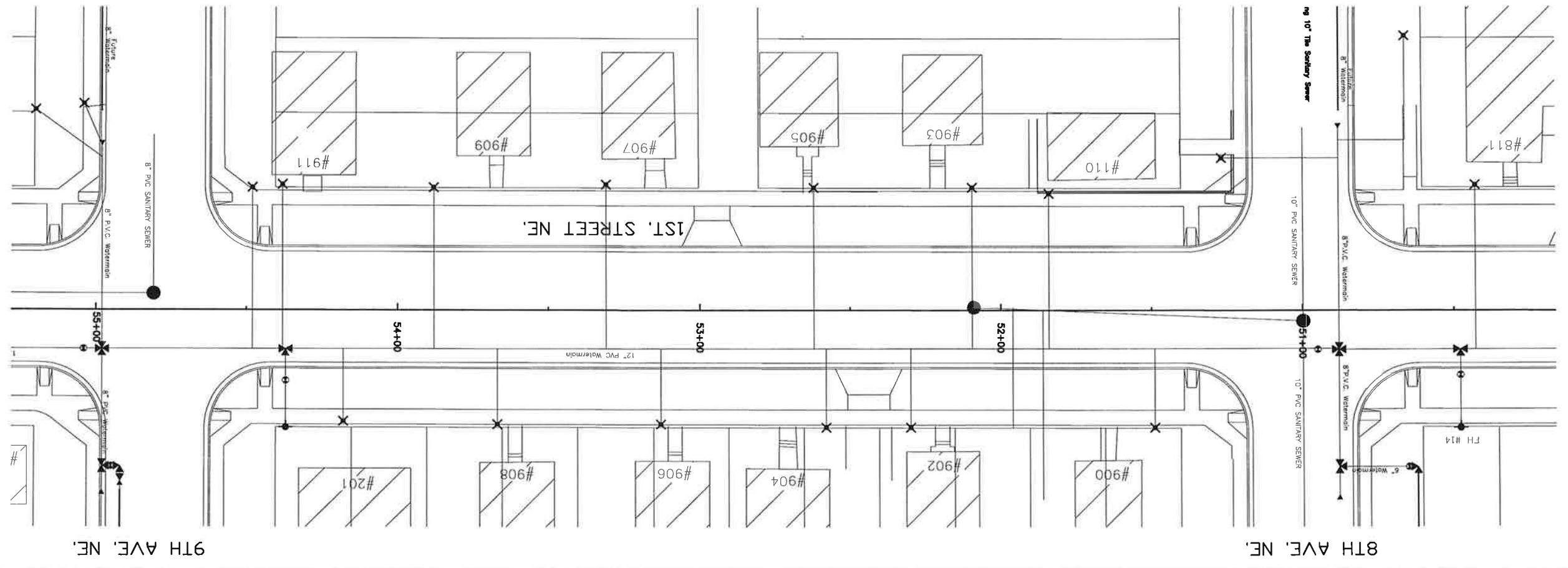
NO.	STATION	LENGTH/SIZE
#14	50+49	40'/LT 8" PVC

WATER & SANITARY SEWER SERVICE LOCATIONS

HOUSE NO./STATION	LENGTH/DIRECTION	HOUSE NO./STATION	LENGTH/DIRECTION
811 50+43/WATER	41'/RT	904 52+62/WATER	39'/LT
50+66/WATER	91'/RT	1-1/2" COPPER	
51+49/WATER	40'/LT	1-1/2" COPPER	
51+86/SEWER	46'/LT	4" PVC	
51+84/WATER	39'/RT	1-1/2" COPPER	
110 51+84/WATER	40'/LT	1-1/2" COPPER	
903 52+09/WATER	40'/RT	1-1/2" COPPER	
902 52+30/WATER	40'/LT	1-1/2" COPPER	
51+96/SEWER	40'/LT	4" PVC	
904 52+62/WATER	39'/LT	1-1/2" COPPER	
905 52+62/WATER	40'/RT	1-1/2" COPPER	
904 52+58/WATER	39'/LT	1-1/2" COPPER	
902 51+96/SEWER	40'/LT	4" PVC	
909 53+88/WATER	40'/RT	1-1/2" COPPER	
908 53+67/WATER	40'/LT	1-1/2" COPPER	
907 53+31/WATER	40'/RT	1-1/2" COPPER	
906 53+14/WATER	40'/LT	1-1/2" COPPER	
904 52+62/WATER	39'/LT	1-1/2" COPPER	
201 54+18/WATER	40'/RT	1-1/2" COPPER	
1650.63			
1650.56			
1650.27			
1650.15			
1650.29			
1649.74			
1649.99			
1649.33			
1649.44			
1648.92			
1648.51			
1648.56			
1648.10			
1648.49			
1648.17			
1647.88			
1647.50			
1647.21			
1647.23			
1646.98			
1646.85			
1646.67			
1646.76			
1646.54			
1646.51			
1646.31			
1645.90			
1645.13			
1645.22			
1645.01			
1644.49			
1644.42			
1644.39			
1644.58			

PROPOSED CENTERLINE

STATION	ELEVATION
50+20	1644.39
50+40	1644.42
50+60	1644.49
50+80	1644.51
51+00	1645.01
51+20	1645.13
51+40	1645.90
51+60	1646.51
51+80	1646.67
52+00	1646.98
52+20	1647.21
52+40	1647.43
52+60	1647.65
52+80	1647.88
53+00	1648.10
53+20	1648.56
53+40	1648.51
53+60	1649.33
53+80	1649.74
54+00	1650.15
54+20	1650.27
54+40	1650.63
54+60	1651.04
54+80	1651.08
55+00	1651.60
55+20	1651.12
55+40	1651.26
55+60	1651.14
55+80	1651.26
56+00	1651.14



RECORD DRAWING

BENCH MARK LIST

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-92	REMARK	N 10072.83 E 15140.97	1652.75
CP-93	REMARK	N 9650.42 E 1510.81	1650.57
CP-98	REMARK	N 9851.26 E 15058.10	1648.24

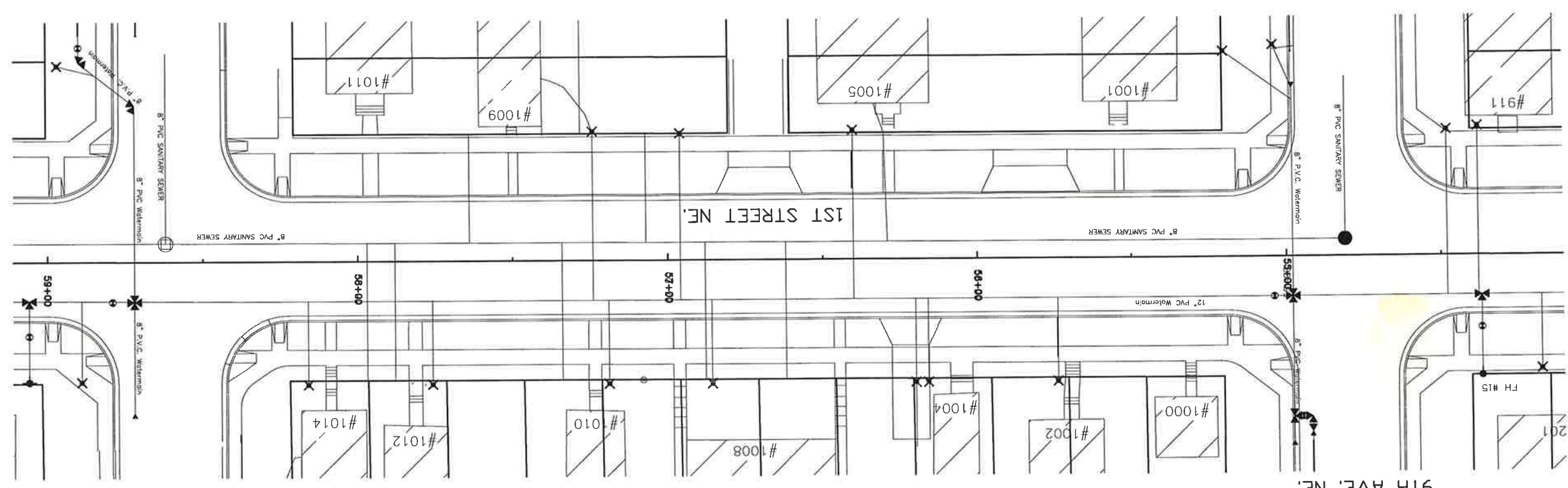
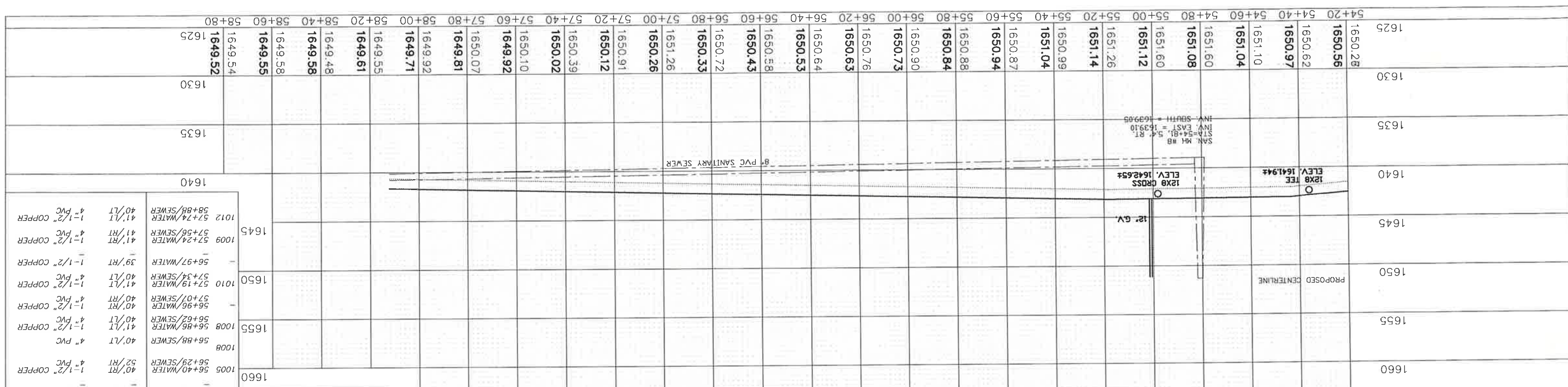
RECORD DRAWING

FIRE HYDRANT LOCATIONS

NO.	STATION	LENGTH/SIZE	MANHOLE NO.	CASTING ELEV.	TOP PC	INVERT	LENGTH PC
#15	54+36	40'/LT. 8"		1639.05			

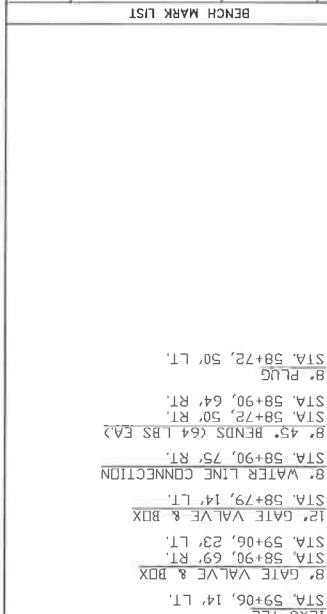
WATER & SANITARY SEWER SERVICE LOCATIONS

HOUSE NO./STATION	LENGTH/DIRECTION (FROM MAIN)	NO.	DESCRIPTION	ELEVATION
911 54+38/WATER	40'/RT 1-1/2" COPPER			
1001 55+20/WATER	66'/RT 1-1/2" COPPER			
1002 55+74/WATER	25.9'/LT 1-1/2" COPPER			
1004 56+16/WATER	41'/LT 1-1/2" COPPER			
1004+56+85/WATER	25.8'/LT 1-1/2" COPPER			
1005 56+40/WATER	40'/RT 1-1/2" COPPER			
1008 56+88/SEWER	40'/LT 4" PVC			
1008 56+86/WATER	41'/LT 1-1/2" COPPER			
1008 56+62/SEWER	40'/LT 4" PVC			
1010 57+19/WATER	41'/LT 1-1/2" COPPER			
1010 57+07/SEWER	40'/RT 1-1/2" COPPER			
1010 57+34/SEWER	40'/LT 1-1/2" COPPER			
1010 56+97/WATER	39'/RT 1-1/2" COPPER			
1009 57+24/WATER	41'/RT 1-1/2" COPPER			
1012 57+74/WATER	41'/LT 1-1/2" COPPER			
1012 58+88/SEWER	40'/LT 4" PVC			



12x8 CROSS STA. 54+98, 14.0' LT.
8x4 TEE STA. 54+97, 53' LT.
12x8 TEE STA. 54+97, 14' LT.
4" GATE VALVE & BOX STA. 54+94, 53' LT.
8" GATE VALVE & BOX STA. 54+32, 24' LT.
12" GATE VALVE & BOX STA. 55+04, 14' LT.
2" WATER LINE CONNECTION (PVC - CID) STA. 54+91, 57' LT.
4x2 REDUCER M.J. STA. 54+91, 55' LT.
4" 90° BEND STA. 54+91, 53' LT.
8" PLUG STA. 54+97, 61' LT.
8" PVC SANITARY SEWER STA. 54+97, 54' RT.

12x8 CROSS
 STA. 58+72, 14' LT.
 12x8 TEE
 STA. 59+06, 14' LT.
 8" GATE VALVE & BOX
 STA. 58+90, 69' RT.
 STA. 59+06, 23' LT.
 12" GATE VALVE & BOX
 STA. 58+79, 14' LT.
 8" WATER LINE CONNECTION
 STA. 58+90, 75' RT.
 8" 45" BENDS (64 LBS. EA.)
 STA. 58+72, 50' RT.
 STA. 58+90, 64' RT.
 8" PLUG
 STA. 58+72, 50' LT.



BENCH MARK LIST

NO.	DESCRIPTION	ELEVATION
CP-97	REBAR	1630.33
CP-98	REBAR	1648.24
CP-99	REBAR	1653.38

MANHOLE INFORMATION

NO.	STATION	LENGTH/SIZE
#16	59+06	40'/LEFT 8"

FIRE HYDRANT LOCATIONS

NO.	STATION	LENGTH/SIZE
#9	57+16	41'/LT 4"

WATER & SANITARY SEWER SERVICE LOCATIONS

NO.	DESCRIPTION	ELEVATION
CP-97	REBAR	1630.33
CP-98	REBAR	1648.24
CP-99	REBAR	1653.38

MANHOLE INFORMATION

NO.	STATION	LENGTH/SIZE
#9	57+16	41'/LT 4"

FIRE HYDRANT LOCATIONS

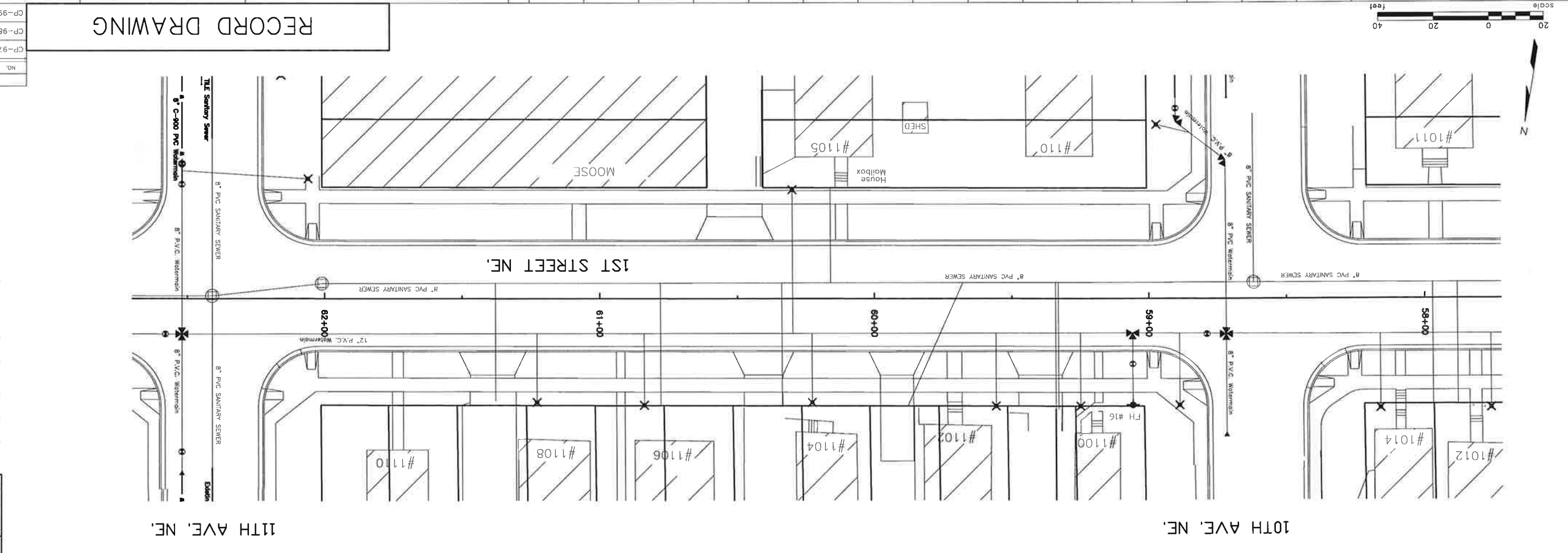
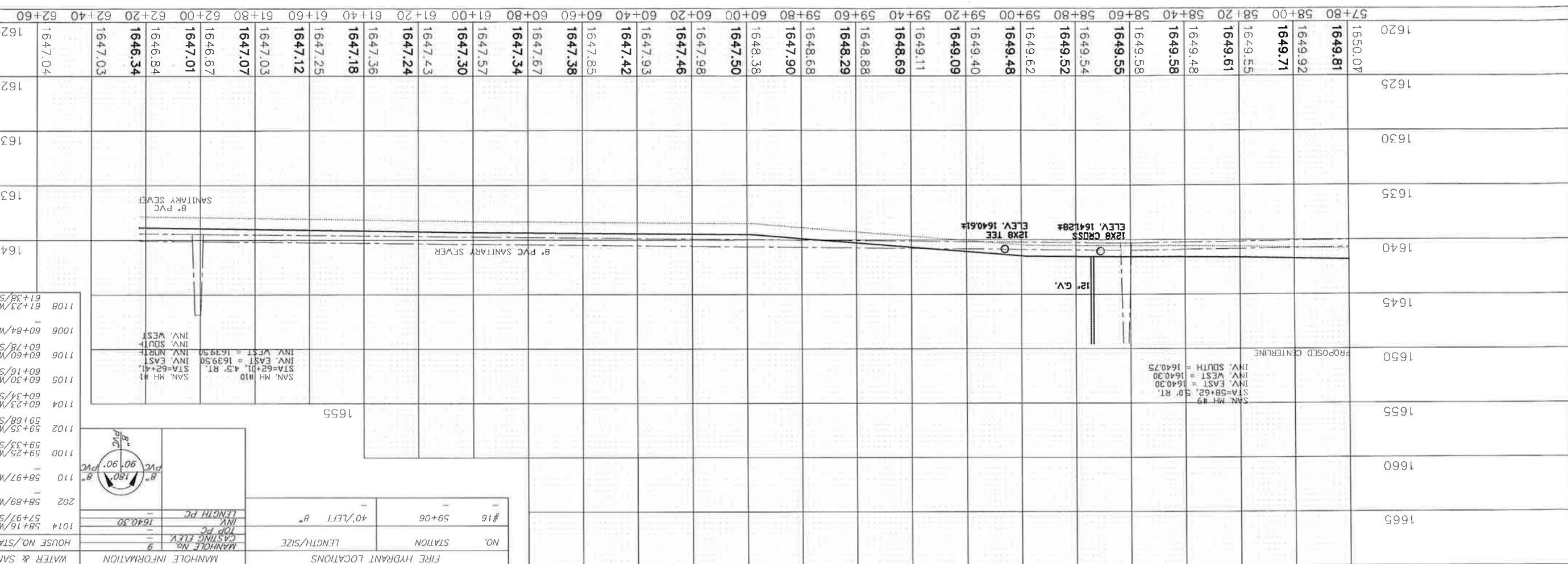
NO.	STATION	LENGTH/SIZE
#9	57+16	41'/LT 4"

WATER & SANITARY SEWER SERVICE LOCATIONS

NO.	DESCRIPTION	ELEVATION
CP-97	REBAR	1630.33
CP-98	REBAR	1648.24
CP-99	REBAR	1653.38

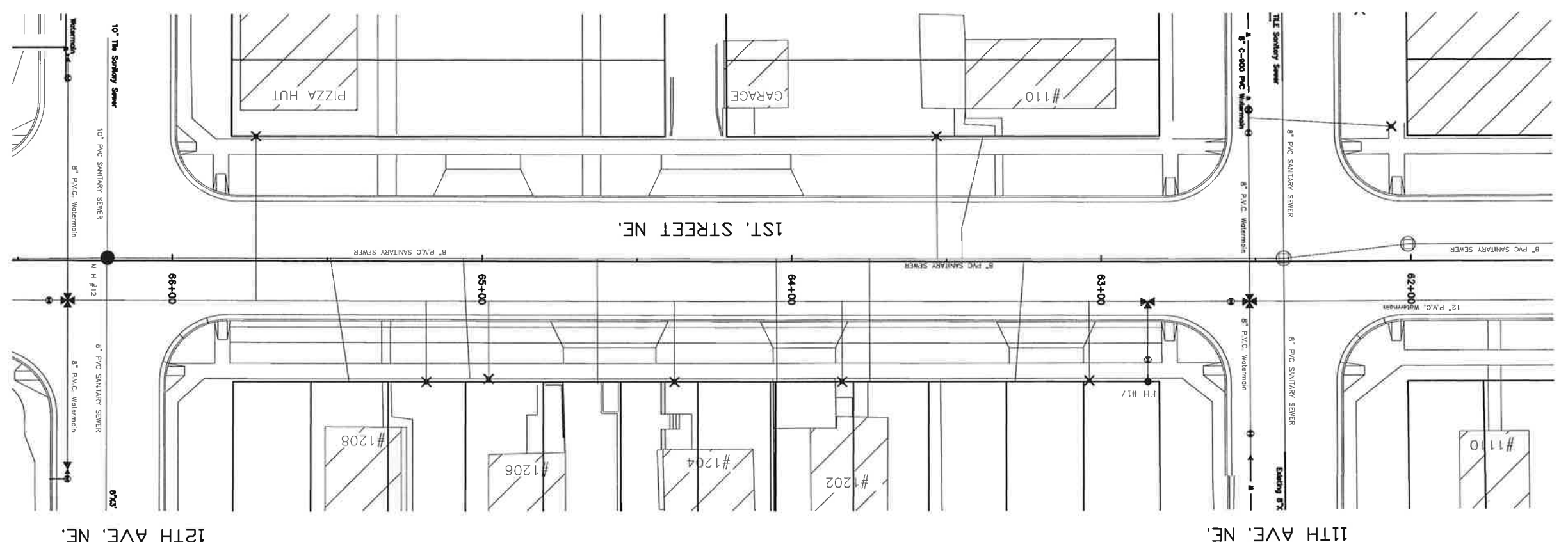
RECORD DRAWING

NO.	DESCRIPTION	ELEVATION
CP-97	REBAR	1630.33
CP-98	REBAR	1648.24
CP-99	REBAR	1653.38



SHEET NO.	18
PROJECT NO.	SU-1-988(007)018
STATE	ND
FRMA	8
MANDAN 1ST STREET WATER & SANITARY SEWER	
Kadmas	
Leg & Jacks	1/22/99
DATE	16200
DESIGNED BY	
CHECK BY	
TITLE/SHEET	RS

12x8 CROSS STA. 62+52, 14' LT.
 12x8 TEE STA. 62+85, 14' LT.
 8" GATE VALVE & BOX STA. 62+52, 41' RT.
 STA. 62+52, 37' LT.
 STA. 62+85, 33' LT.
 12" GATE VALVE & BOX STA. 62+58, 14' LT.
 STA. 62+46, 37'3" LT.
 8" WATER LINE CONNECTION STA. 62+52, 64' RT.
 STA. 62+52, 64' LT.

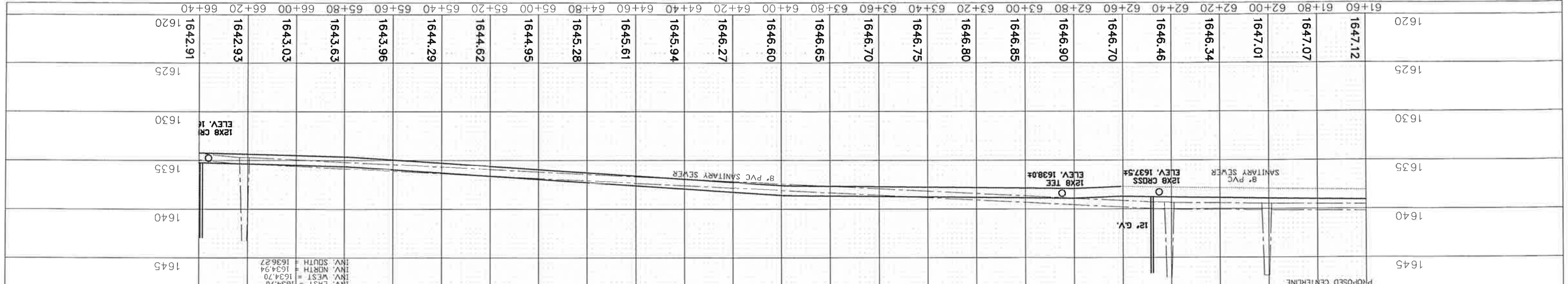


RECORD DRAWING

NO.	DESCRIPTION	LOCATION	ELEVATION
CP-96	REBAR	N 995.43 E 1538.74	1645.77
CP-97	REBAR	N 1068.80 E 1594.86	1630.53
CP-100	REBAR	-	1642.64

FIRE HYDRANT LOCATIONS		MANHOLE INFORMATION		WATER & SANITARY SEWER SERVICE LOCATIONS	
NO.	STATION	LENGTH	CASTING ELEV.	HOUSE NO./STATION	LENGTH/DIRECTION
#17	62+85	40'/LEFT	-	MOOSE 62+03/WATER	44'/RT
					1-1/2" COPPER

NO.	STATION	LENGTH	CASTING ELEV.	MANHOLE NO.	TOP FC	INVERT	LENGTH PVC
110	63+53/WATER	39'/RT	1639.50	110	1639.50	1639.40	-



PROJECT NO. SU-1-988(007)018
 STATE ND
 FRMA 8
 MANDAN 1ST STREET WATER & SANITARY SEWER
 Kadmas
 Leg & Jacks
 DATE 1/22/99
 CHECK BY
 DESIGNED BY

SHEET	NO.	PROJECT NO.
8	ND	SU-1-988(007)018 19

MANDAN 1ST STREET
 MANDAN, NORTH DAKOTA
WATER & SANITARY SEWER

Kadmas
 Leg & Jackson
 Consulting Engineers
 18200
 1/22/99

DATE: 1/22/99
 DRAWN BY: NS
 CHECKED BY: JMS

12x8 CROSS
 STA. 66+34, 14' LT.
 STA. 66+34, 72' LT.
 STA. 66+34, 95' RT.
 STA. 66+64, 35' LT.
 STA. 66+40, 14' LT.

4" GATE VALVE & BOX
 STA. 66+34, 66' RT.
 2" WATER LINE CONNECTION

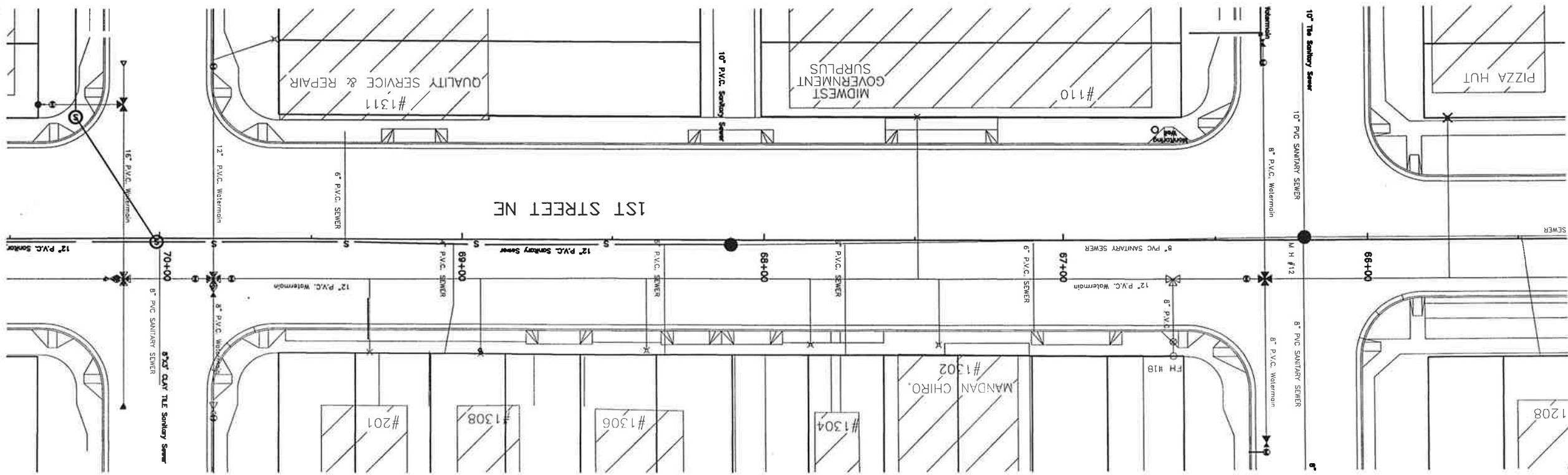
8" GATE VALVE & BOX
 STA. 66+34, 66' RT.
 4" WATER LINE CONNECTION

8" PLUG
 STA. 66+35, 64' RT.
 STA. 66+34, 71' LT.

8x4 REDUCER
 STA. 66+34, 71' LT.

13TH AVE. NE,

12TH AVE. NE,

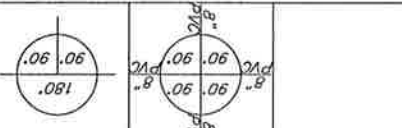


RECORD DRAWING

NO.	DESCRIPTION	LOCATION	ELEVATION
CP100	REBAR	--	1642.84
CP101	REBAR	--	1647.18
CP102	REBAR	--	1641.52

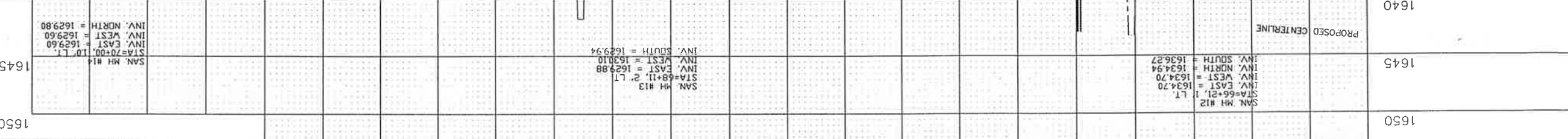
NO.	STATION	LENGTH/SIZE	MANHOLE NO.	CASTING ELEV.	LENGTH/PC
#18	66+64	39'/LEFT 8"	12	1634.70	1634.70
			13,010	1629.88	

HOUSE NO./STATION	LENGTH/DIRECTION
P.H. 65+73/WATER	39'/RT
67+42/WATER	29'/LT
67+05/SEWER	32'/LT
67+49/WATER	40'/RT
67+85/WATER	36'/LT
67+73/SEWER	40'/LT
68+39/WATER	38'/LT
68+33/SEWER	40'/LT
68+94/WATER	40'/LT
69+04/SEWER	40'/LT
69+60/WATER	33'/RT
69+39/SEWER	36'/RT
69+31/WATER	39'/LT



STATION	LENGTH/DIRECTION	PIPE TYPE
1502	29'/LT	1-1/2" COPPER
1502	32'/LT	6" PVC
1506	38'/LT	1-1/2" COPPER
1506	40'/LT	6" PVC
1508	40'/LT	1-1/2" COPPER
1508	40'/LT	6" PVC
1511	33'/RT	1-1/2" COPPER
1511	36'/RT	6" PVC
201	39'/LT	1-1/2" COPPER

1640

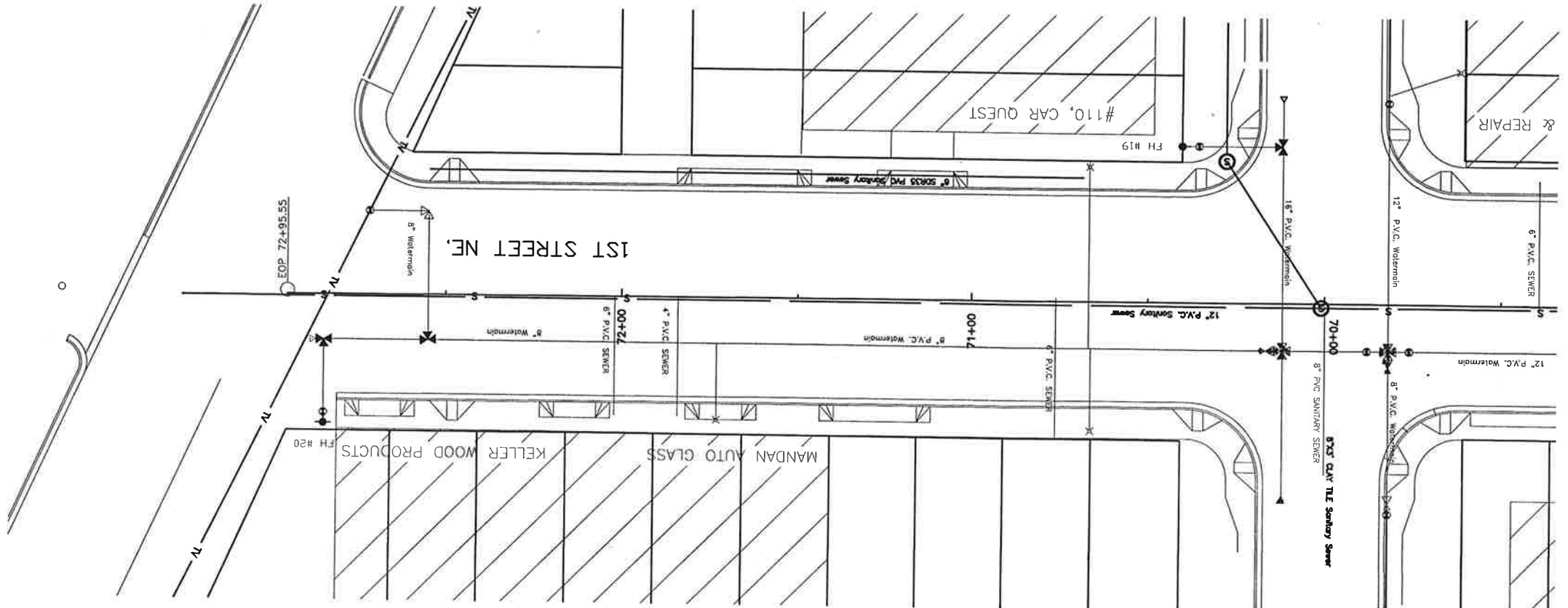


STATION	ELEVATION	DESCRIPTION
65+40	1644.29	1644.48
65+60	1643.96	1643.83
65+80	1643.63	1643.04
66+00	1643.03	1642.93
66+20	1642.91	1642.74
66+40	1642.91	1642.91
66+60	1642.43	1642.43
66+80	1643.01	1642.14
67+00	1642.92	1641.92
67+20	1642.83	1641.75
67+40	1642.74	1641.58
67+60	1642.58	1641.30
67+80	1642.34	1640.79
68+00	1642.10	1640.80
68+20	1641.50	1640.61
68+40	1640.90	1640.38
68+60	1640.52	1640.15
68+80	1640.36	1639.86
69+00	1640.20	1639.62
69+20	1639.60	1639.27
69+40	1639.81	1638.91
69+60	1639.62	1638.63
69+80	1639.25	1638.58
70+00	1638.86	1638.49
70+20	1638.52	1638.52
70+40	1638.80	1638.53



SHEET NO.	20
PROJECT NO.	SU-1-988(007)018
STATE	ND
FROM	MANDAN 1ST STREET
MANDAN, NORTH DAKOTA	
WATER & SANITARY SEWER	
Kadrmas & Lee	
Consulting Engineers	
DATE	1/22/99
SCALE	AS SHOWN
DATE	12/20/00
DATE	1/22/99
DATE	1/22/99

8" TEE STA 72+85, 14' LT.
 8" PLUG STA 72+85, 14' LT.
 12"x12" CROSS STA 69+82, 14' LT.
 16" PLUG PLASTIC STA 70+12, 57' LT.
 STA 70+12, 57' RT.
 12"x12" CROSS STA 70+12, 14' LT.
 16"x12" CROSS STA 70+12, 14' LT.
 8"x4" REDUCER STA 69+82, 61' LT.
 12"x8" REDUCER STA 69+82, 61' LT.
 4" GATE VALVE & BOX STA 70+12, 44' RT.
 STA 69+82, 60' LT.
 8" GATE VALVE & BOX STA 72+55, 23' RT.
 STA 72+85, 36' LT.
 12" GATE VALVE & BOX STA 69+82, 62' RT.
 STA 69+66, 14' LT.
 STA 29+88, 14' LT.
 4" WATER LINE CONNECTION STA 69+82, 62' LT.
 8" WATER LINE CONNECTION STA 72+72, 23' RT.
 12" WATER LINE CONNECTION STA 69+82, 66' RT.



FIRE HYDRANT LOCATIONS		WATER & SANITARY SEWER SERVICE LOCATIONS	
NO.	STATION	LENGTH/DIRECTION	LENGTH/DIRECTION
#19	70+41	39' / LEFT 8" PVC	1311 69+62 / WATER 20.0' / RT 1-1/2" COPPER
#20	72+85	44' / LEFT 8" PVC	110 70+66 / WATER 38' / RT 1-1/2" COPPER
LOT		LOT	
110		70+66 / WATER 38' / RT	70+76 / SEWER 40' / LT 1-1/2" COPPER
1311		69+62 / WATER 20.0' / RT	71+84 / SEWER 42.7' / RT 6" PVC

RECORD DRAWING



SAN. MH #11
 STA=70+00, 10' LT.
 INV. EAST = 1629.60
 INV. WEST = 1629.60
 INV. NORTH = 1629.80
 PROPOSED CENTERLINE

STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
69+40	1639.23	70+00	1638.88	70+60	1638.80	71+20	1638.51	71+80	1638.31
69+60	1639.62	70+20	1638.52	70+80	1638.26	71+40	1637.95	72+00	1638.25
69+80	1638.63	70+40	1638.80	71+00	1638.05	71+60	1637.91	72+20	1637.70
70+00	1638.91	70+60	1638.73	71+20	1638.58	71+80	1638.44	72+40	1638.13
70+20	1638.88	70+80	1638.48	71+40	1638.51	72+00	1637.92	72+60	1637.59
70+40	1638.53	71+00	1638.80	71+60	1638.37	72+20	1637.65	72+80	1637.51
70+60	1638.52	71+20	1638.05	71+80	1638.31	72+40	1637.92	73+00	1638.25
70+80	1638.88	71+40	1638.51	72+00	1638.25	72+60	1637.92	73+20	1638.42
71+00	1638.00	71+60	1638.37	72+20	1637.70	72+80	1637.59	73+40	1637.51
71+20	1638.58	71+80	1638.44	72+40	1637.70	73+00	1638.25	73+60	1638.42
71+40	1638.51	72+00	1637.92	72+60	1637.59	73+20	1638.42	73+80	1639.27
71+60	1638.44	72+20	1637.65	72+80	1637.51	73+40	1638.42	74+00	1639.27
71+80	1638.37	72+40	1637.92	73+00	1638.25	73+60	1638.42	74+20	1639.27
72+00	1638.25	72+60	1637.92	73+20	1638.42	73+80	1639.27		
72+20	1638.19	72+80	1637.65	73+40	1638.42				
72+40	1637.70	73+00	1638.25						
72+60	1637.59	73+20	1638.42						
72+80	1637.51	73+40	1638.42						
73+00	1638.25	73+60	1639.27						
73+20	1638.19								
73+40	1637.70								
73+60	1637.59								
73+80	1638.42								
74+00	1639.27								
74+20									

