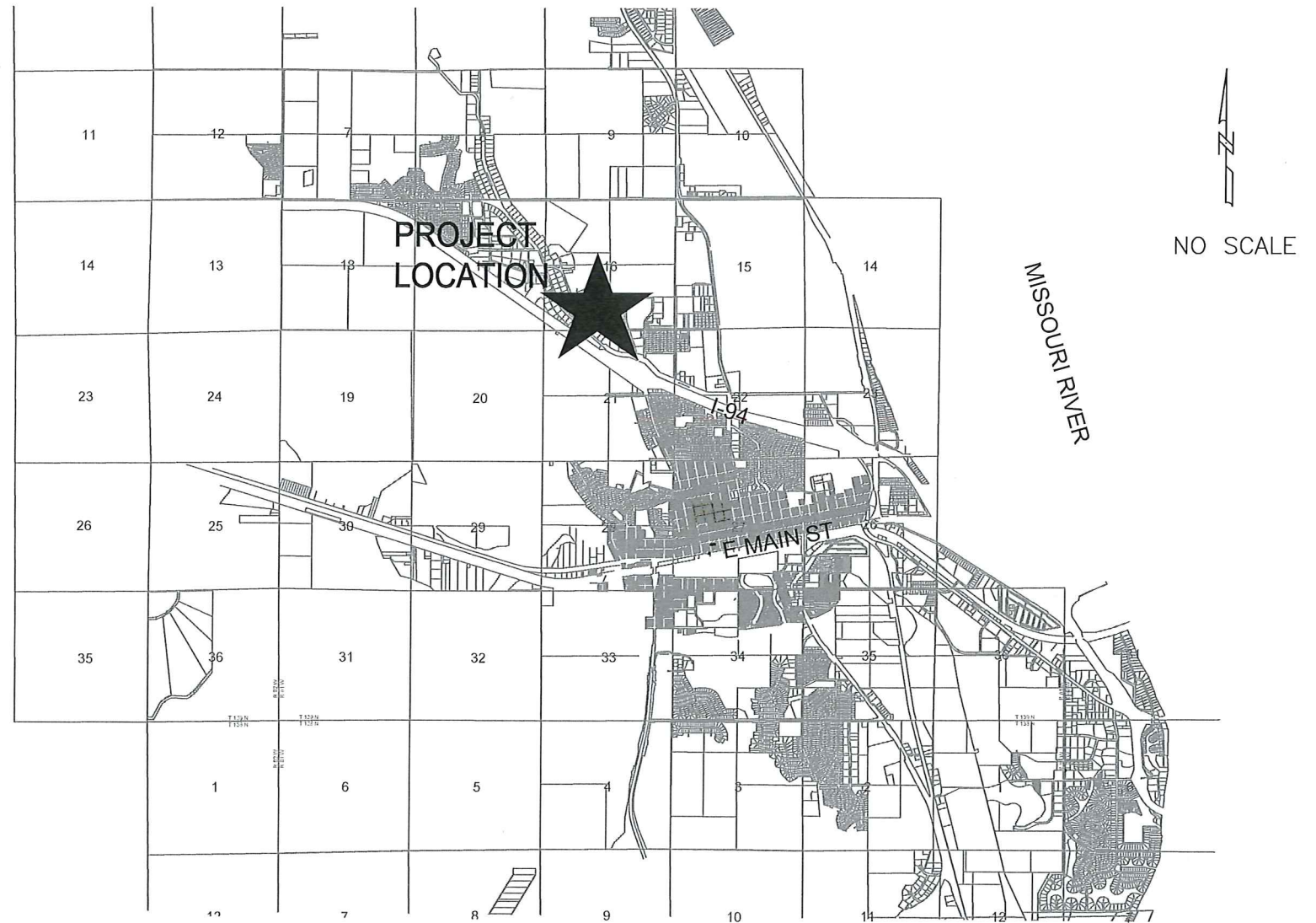


BIG SKY ESTATES - JUDE LANE WATER & SEWER IMPROVEMENTS CITY PROJECT NO. 2016-10 MANDAN, NORTH DAKOTA

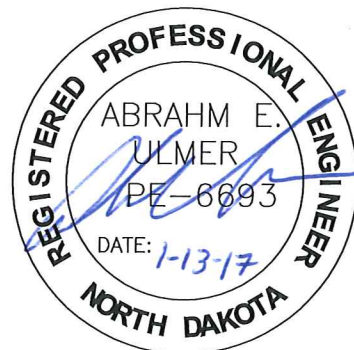
INDEX OF DRAWINGS

SHT NO	TITLE
1	TITLE SHEET
2	EXISTING CONDITIONS
3	PROJECT LAYOUT
4-6	JUDE LANE PLAN & PROFILE
7	WATER & SEWER DETAILS



DESIGN ENGINEER'S CERTIFICATE

I, ABRAHM E. ULMER, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NORTH DAKOTA, HEREBY CERTIFY THAT THE PLANS FOR BIG SKY ESTATES—JUDE LANE WATER & SEWER IMPROVEMENTS, CITY PROJECT NO. 2016-10, MANDAN, NORTH DAKOTA WERE PREPARED UNDER MY SUPERVISION AND ARE COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



ABRAHM E. ULMER, P.E.
REGISTERED PROFESSIONAL ENGINEER
NORTH DAKOTA REGISTRATION NO. 6693

CONSTRUCTED BY: BASARABA EXCAVATING
37610 12TH STREET NE
WILTON, ND 58579

AS-BUILT

| DATE: 01/2017 |

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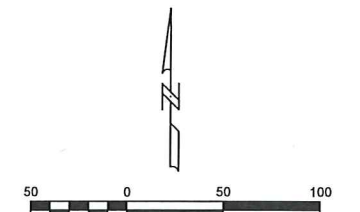
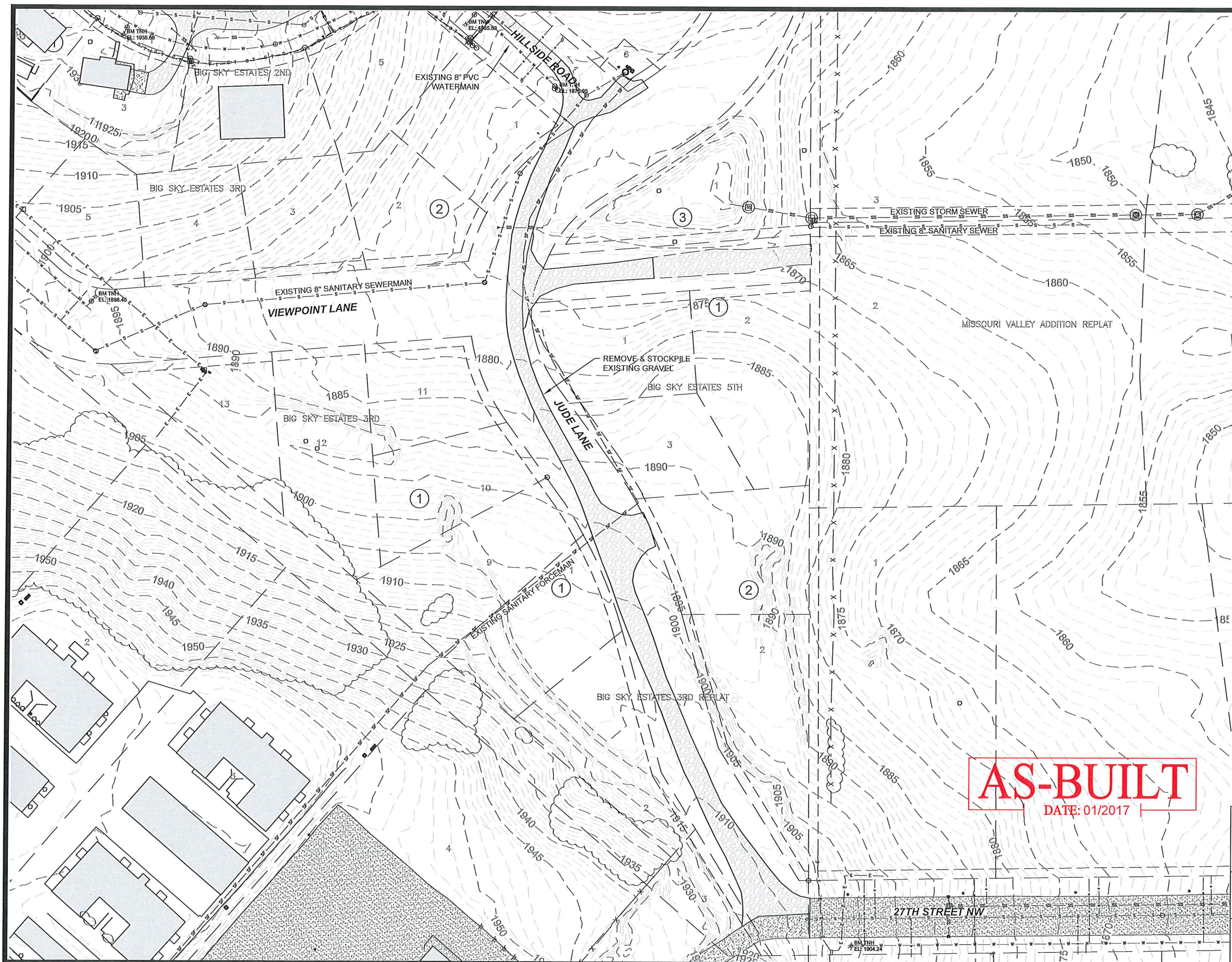
TITLE SHEET — ASBUILT
BIG SKY ESTATES — JUDE LANE
WATER & SEWER IMPROVEMENT

CITY PROJECT NO. 2016-10

SHEET 1 OF 7

APRIL, 2016

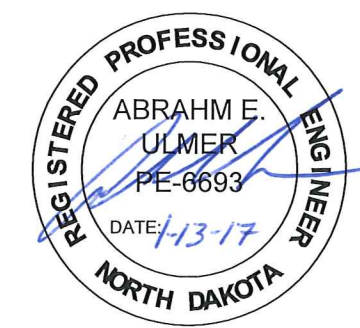
CAUTION
UTILITY LOCATIONS ARE
APPROXIMATE. CONTRACTOR IS
RESPONSIBLE FOR VERIFYING
LOCATION PRIOR TO EXCAVATION



VERT. DATUM: NAVD88
 HORIZ DATUM: 1983 STATE PLANE, ND SOUTH (3302)

LEGEND

- EXISTING TELEPHONE PEDESTAL
- EXISTING CABLE TV BOX
- EXISTING STREET LIGHT
- EXISTING ELECTRICAL LINE
- EXISTING BLOCK NUMBER
- EXISTING LOT NUMBER
- EXISTING CURB & GUTTER
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SEWERMAIN
- EXISTING STORM SEWER MANHOLE
- EXISTING STORM SEWER
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATERMAIN
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- 1810 EXISTING CONTOUR

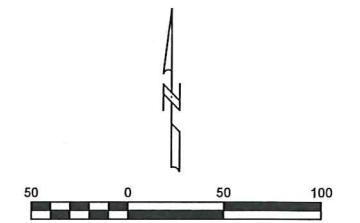
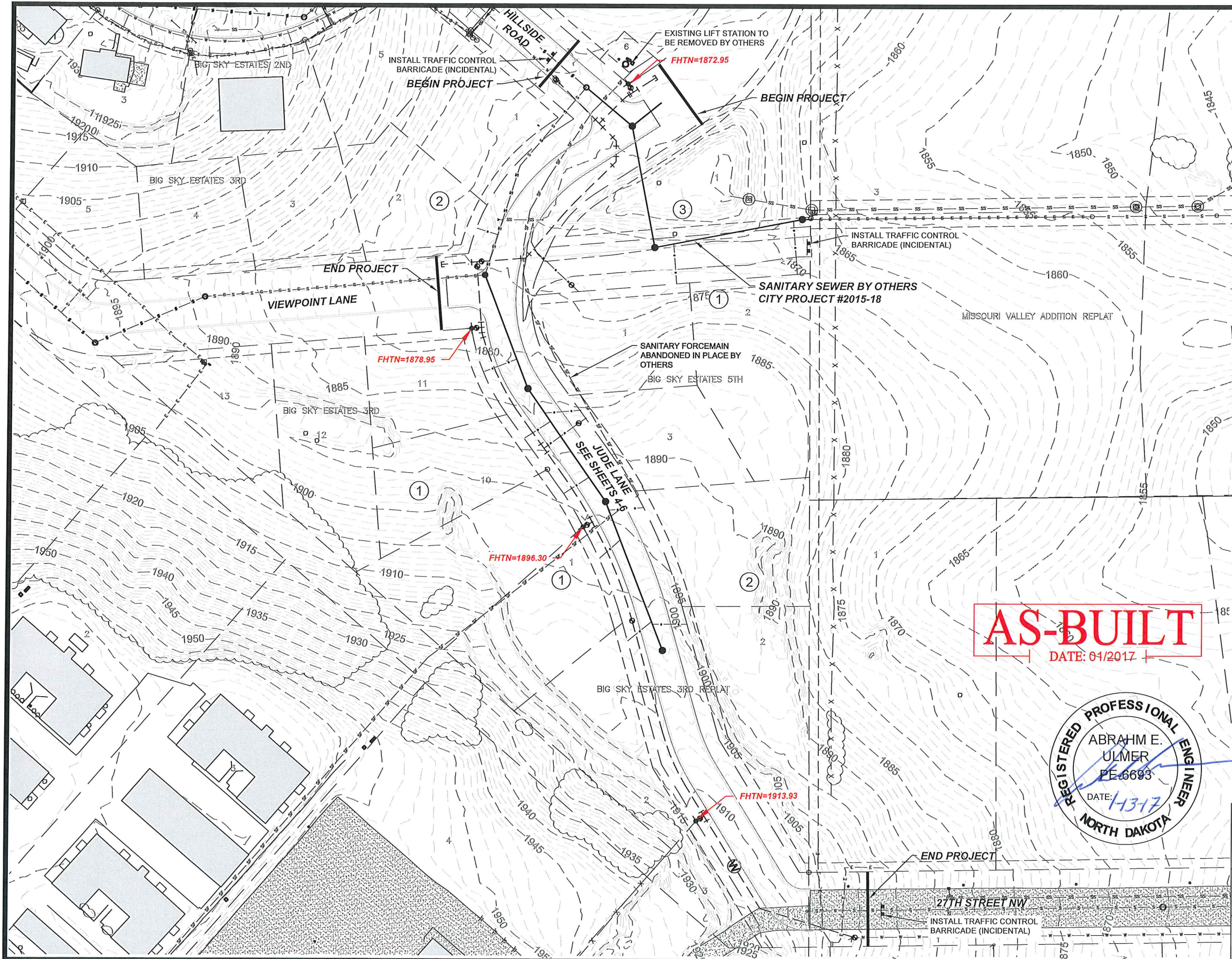


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EXISTING CONDITIONS - ASBUILT
 BIG SKY ESTATES - JUDE LANE
 WATER & SEWER IMPROVEMENTS
 CITY PROJECT NO. 2016-10
 SHEET 2 OF 7 APRIL, 2016

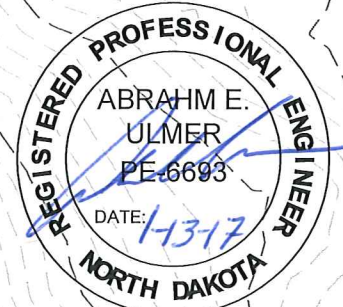


VERT. DATUM: NAVD88
 HORIZ DATUM: 1983 STATE PLANE, ND SOUTH (3302)

LEGEND

- EXISTING TELEPHONE PEDESTAL
- EXISTING CABLE TV BOX
- EXISTING STREET LIGHT
- EXISTING ELECTRICAL LINE
- EXISTING BLOCK NUMBER
- EXISTING LOT NUMBER
- EXISTING CURB & GUTTER
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SEWERMAIN
- EXISTING STORM SEWER MANHOLE
- EXISTING STORM SEWER
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATERMAIN
- EXISTING GRAVEL
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED CURB & GUTTER (BY OTHERS)
- FUTURE CURB & GUTTER
- PROPOSED CONTOUR
- PROPOSED SAN CLEANOUT
- PROPOSED SAN MANHOLE
- PROPOSED SAN SERVICE
- PROPOSED SANITARY SEWER
- PROPOSED GATE VALVE
- PROPOSED HYDRANT
- PROPOSED WATER SERVICE
- PROPOSED WATERMAIN

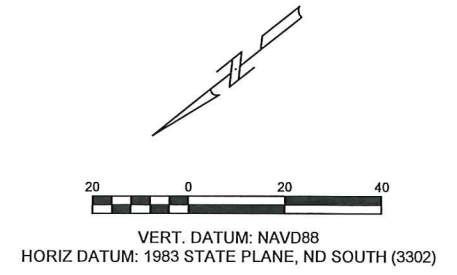
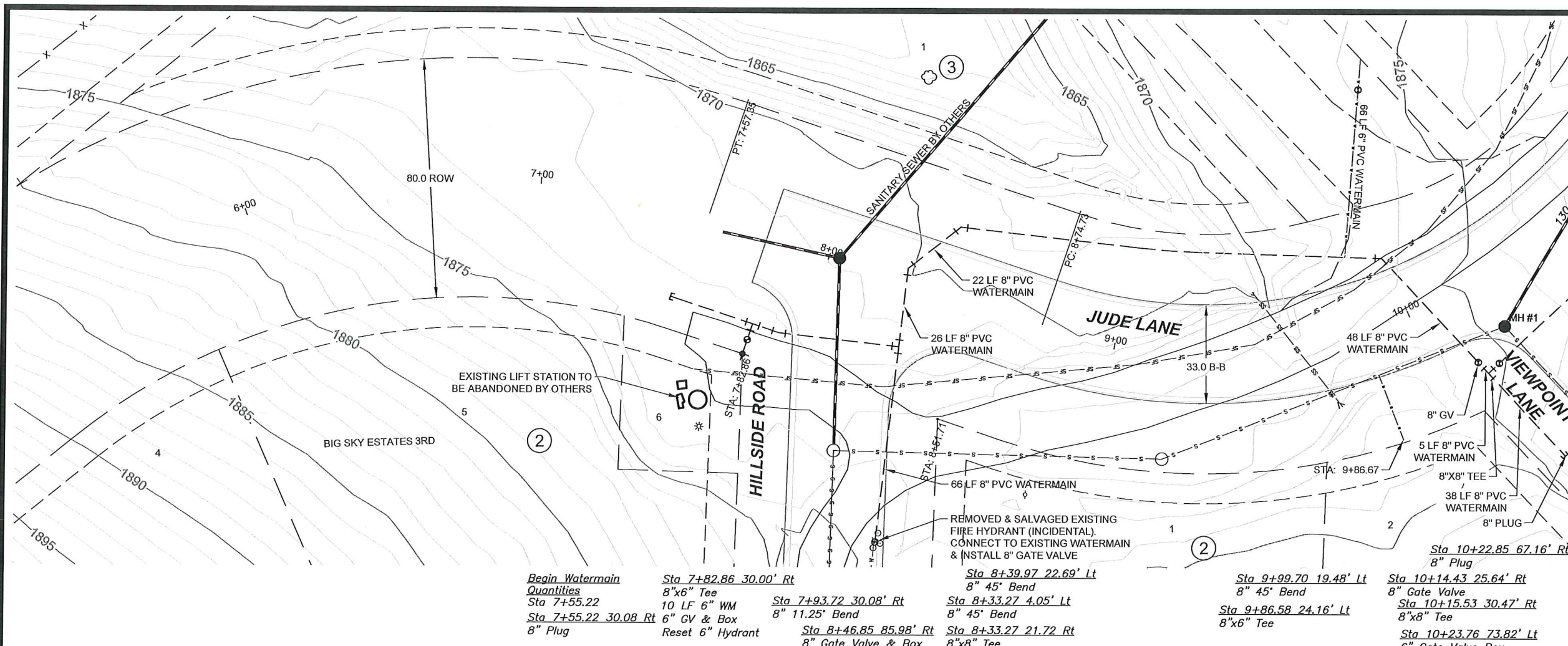
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PROJECT LAYOUT - ASBUILT
 BIG SKY ESTATES - JUDE LANE
 WATER & SEWER IMPROVEMENTS
 CITY PROJECT NO. 2016-10
 SHEET 3 OF 7 APRIL, 2016



1. GRADING OF SITE WILL NOT BE COMPLETED BY OTHERS PRIOR TO CONSTRUCTION
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3. EXISTING SANITARY FORCEMAIN SHALL BE ABANDONED BY OTHERS PRIOR TO START OF CONSTRUCTION.

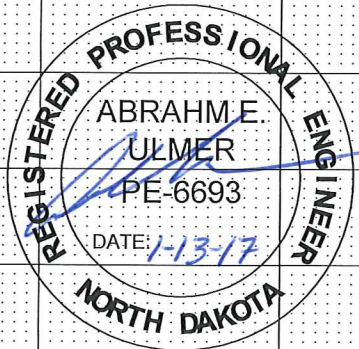
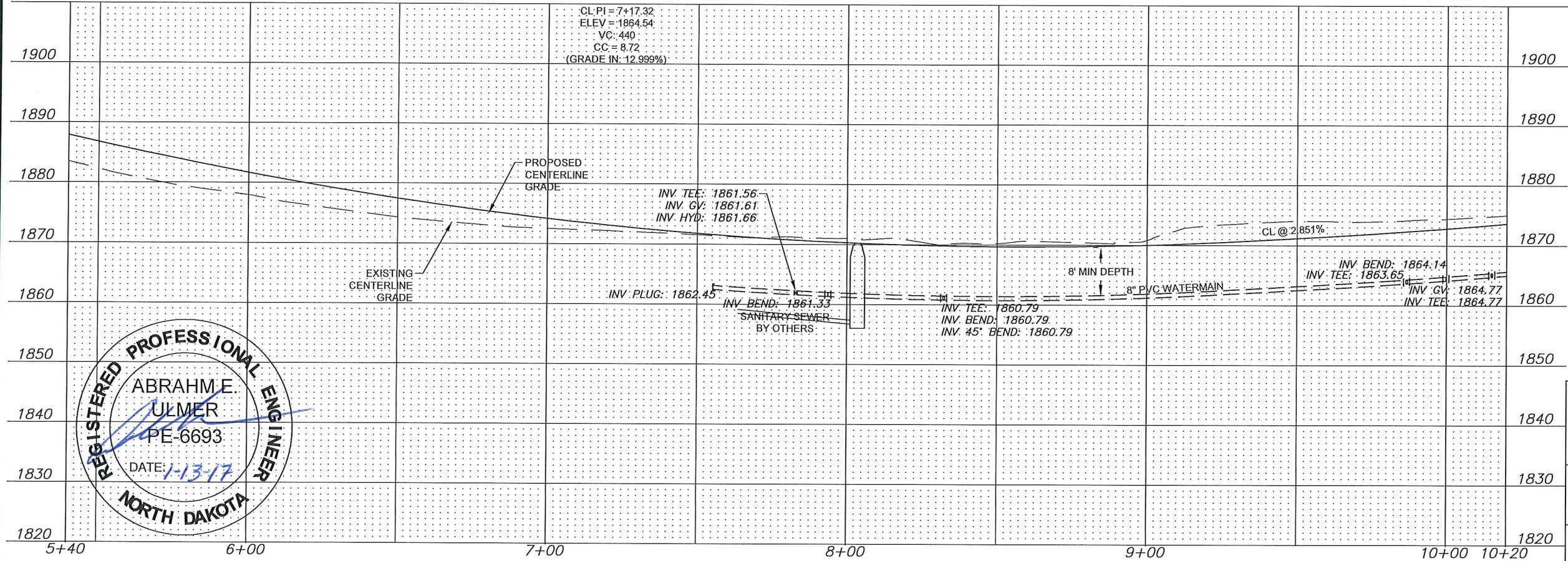
APPROXIMATE QUANTITIES (TOTAL PROJECT)

Spec No.	Sanitary Sewermain Items	Quantity
801-4.2	8" Sanitary Sewer Pipe	448 LF
801-4.50a	4" Inserta Tee	1 Ea
801-4.51	8"x6" Wye Branch	8 Ea
801-4.60	Bedding Material	135 Ton
801-4.62	Rock Excavation	25 CY
801-4.64	Telesive Sewermain	448 LF
1205-4.1	Concrete Manhole	3 Ea
1209-4.1	4" Sewer Service Pipe	24 LF
1209-4.2	6" Sewer Service Pipe	280 LF
1209-4.6	4" - 45° Bend	1 Ea
1209-4.7	6" - 45° Bend	8 Ea
SP	Remove & Replace Ex. Manhole	1 Ea

Spec No.	Watermain Items	Quantity
801-4.60	Bedding Material	440 Ton
901-4.10	6" Watermain	172 LF
901-4.11	8" Watermain	1303 LF
901-4.51	6" Gate Valve & Box	7 Ea
901-4.52	8" Gate Valve & Box	5 Ea
901-4.70	6" Hydrant	3 Ea
901-4.77	Reset Hydrant	2 Ea
1205-4.4	Air Release Valve & Manhole	1 Ea

Begin Watermain Quantities

Sta 7+55.22	10 LF 6" WM	Sta 7+93.72	30.08' Rt	8" 45° Bend	Sta 8+33.27	4.05' Lt	8" 45° Bend	Sta 9+99.70	19.48' Lt	8" 45° Bend	Sta 10+14.43	25.64' Rt	8" Gate Valve
Sta 7+55.22	30.08 Rt	6" CV & Box	8" 11.25° Bend	8" 45° Bend	Sta 8+46.85	85.98' Rt	8" 45° Bend	Sta 9+86.58	24.16' Lt	8"x8" Tee	Sta 10+15.53	30.47' Rt	8"x8" Tee
	8" Plug	Reset 6" Hydrant	Sta 8+46.85	85.98' Rt	Sta 8+33.27	21.72 Rt	8"x8" Tee				Sta 10+23.76	73.82' Lt	6" Gate Valve Box



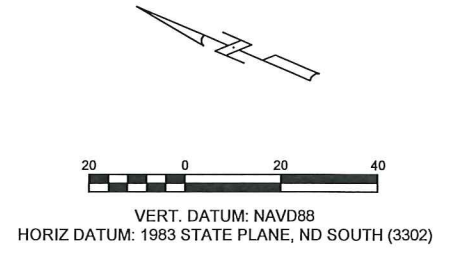
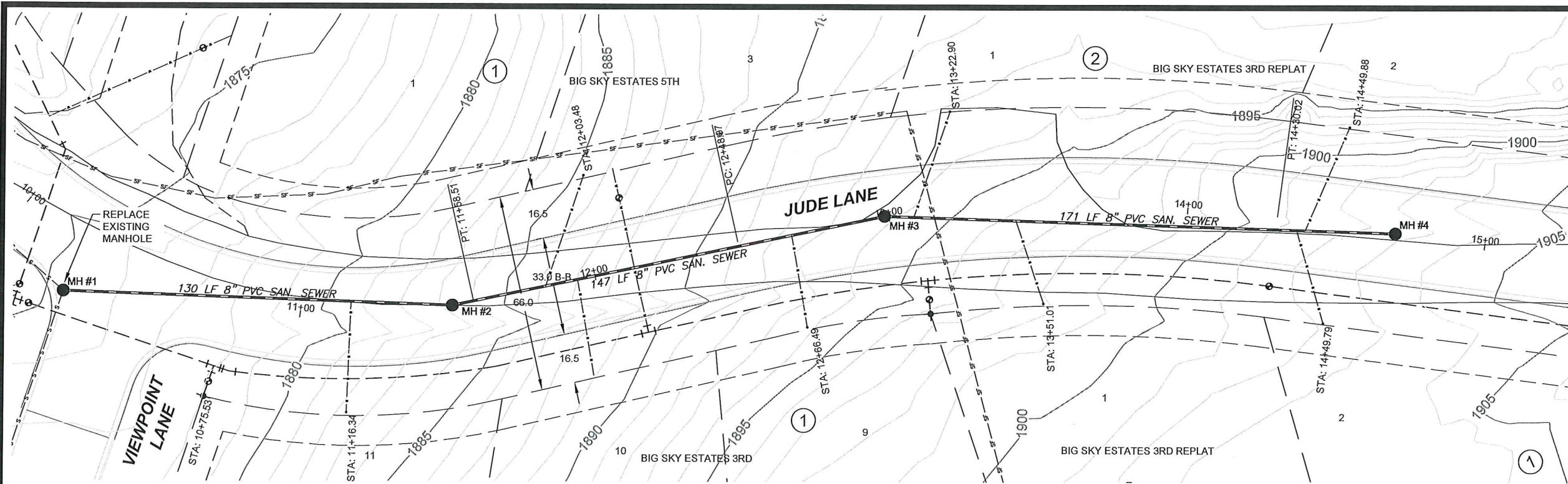
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JUDE LANE - ASBUILT
BIG SKY ESTATES - JUDE LANE
WATER & SEWER IMPROVEMENTS

CITY PROJECT NO. 2016-10



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3. EXISTING SANITARY FORCE MAIN SHALL BE ABANDONED BY OTHERS PRIOR TO START OF CONSTRUCTION.

Sta 10+19.60 29.20' Rt 8" Gate Valve

Sta 10+75.53 33.00' Rt 8"x6" Tee 10 LF 6" WM 6" GV & BOX 6" Hydrant

Sta 11+51.19 Manhole #2

Sta 12+13.26 23' Rt 8"x6" Tee 56 LF 6" WM 6" Gate Valve & Box

Sta 13+10.62 33.00' Rt 8"x6" Tee 56 LF 6" WM 6" Gate Valve & Box

Sta 14+30.53 23' Rt 8" Gate Valve

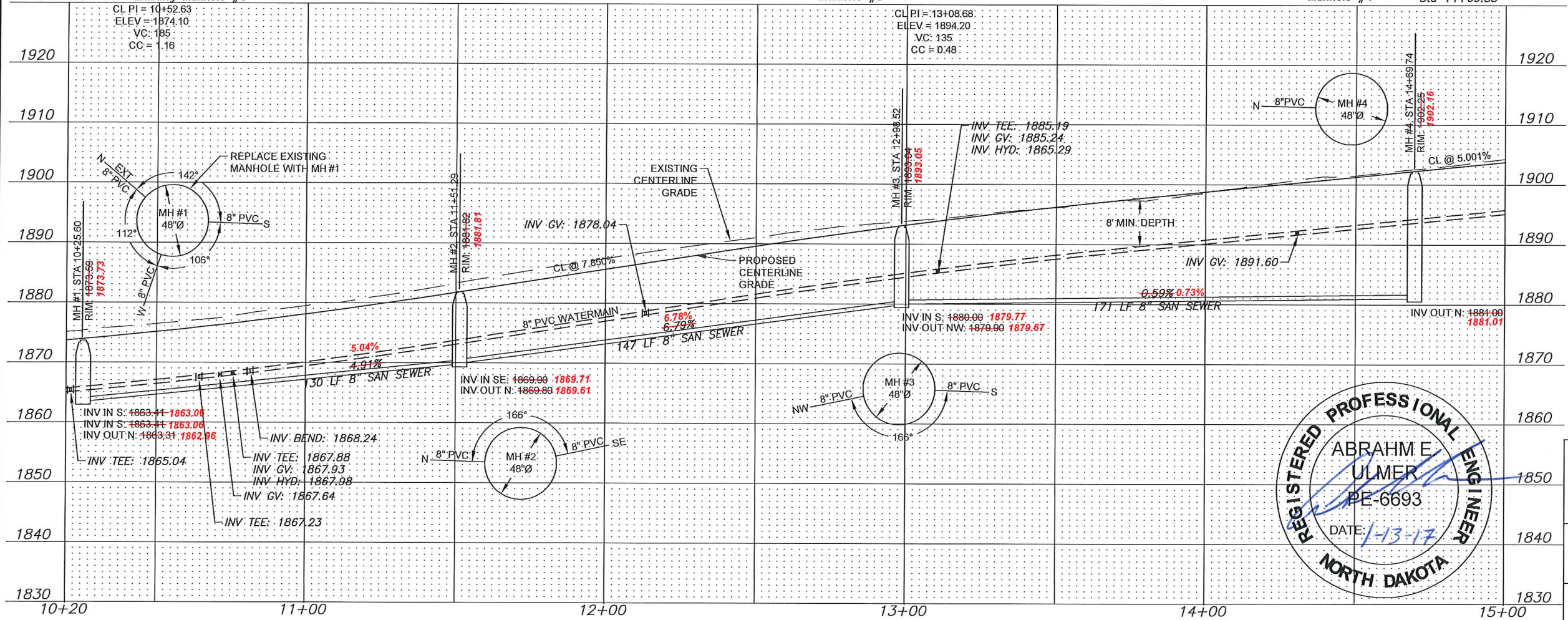
Begin Sanitary Sewermain Quantities Sta 10+26.34 Existing Manhole #1

Removed & Replaced Sta 10+81.36 24.03' Rt 8" 11.25' Bend

Sta 12+98.46 Manhole #3

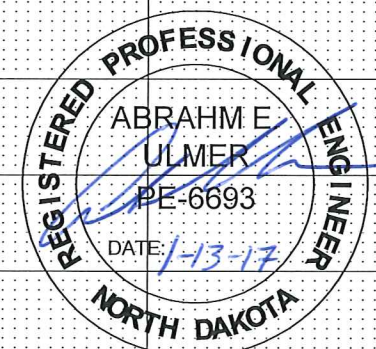
Sta 14+69.88 Manhole #4

End Sanitary Sewermain Quantities Sta 14+69.88



AS-BUILT
DATE: 01/2017

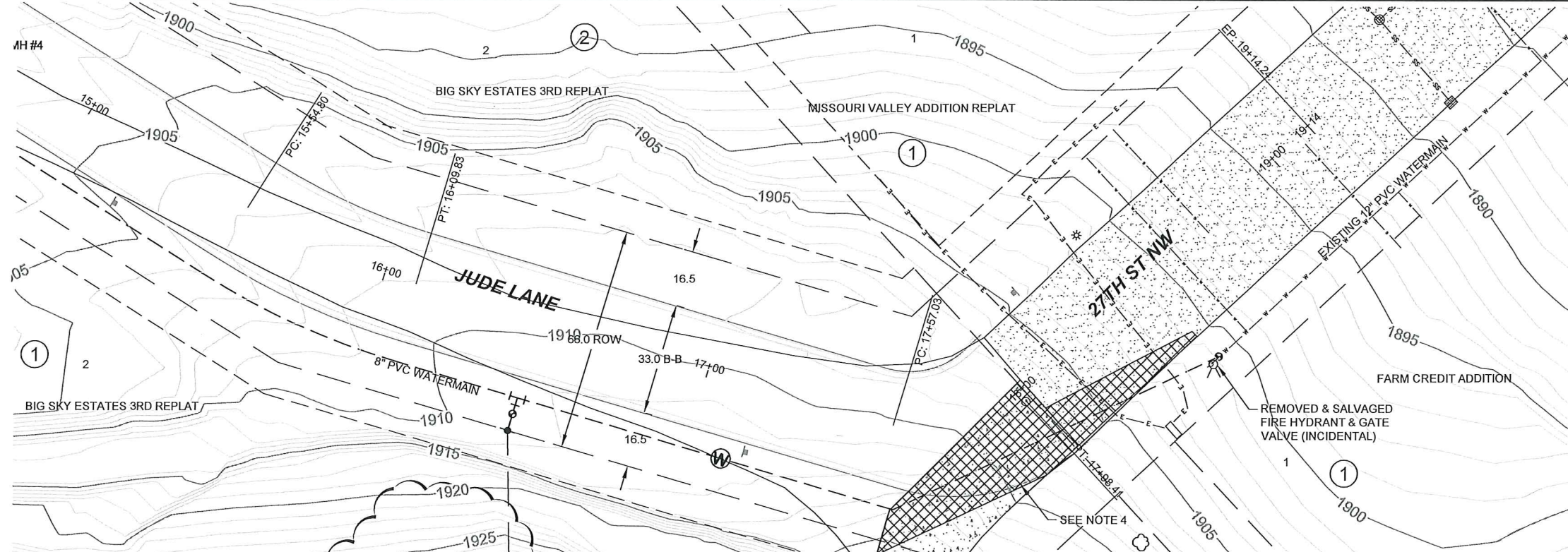
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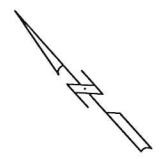



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JUDE LANE -- ASBUILT
BIG SKY ESTATES -- JUDE LANE
WATER & SEWER IMPROVEMENTS

CITY PROJECT NO. 2016-10





 VERT. DATUM: NAVD88
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3. EXISTING SANITARY FORCEMAIN SHALL BE ABANDONED BY OTHERS PRIOR TO START OF CONSTRUCTION.
4. REMOVE & DISPOSE OF EXISTING CONCRETE. REPLACE WITH 6" COMPACTED GRAVEL. CONCRETE SHALL BE SAW CUT FULL DEPTH PRIOR TO REMOVAL.

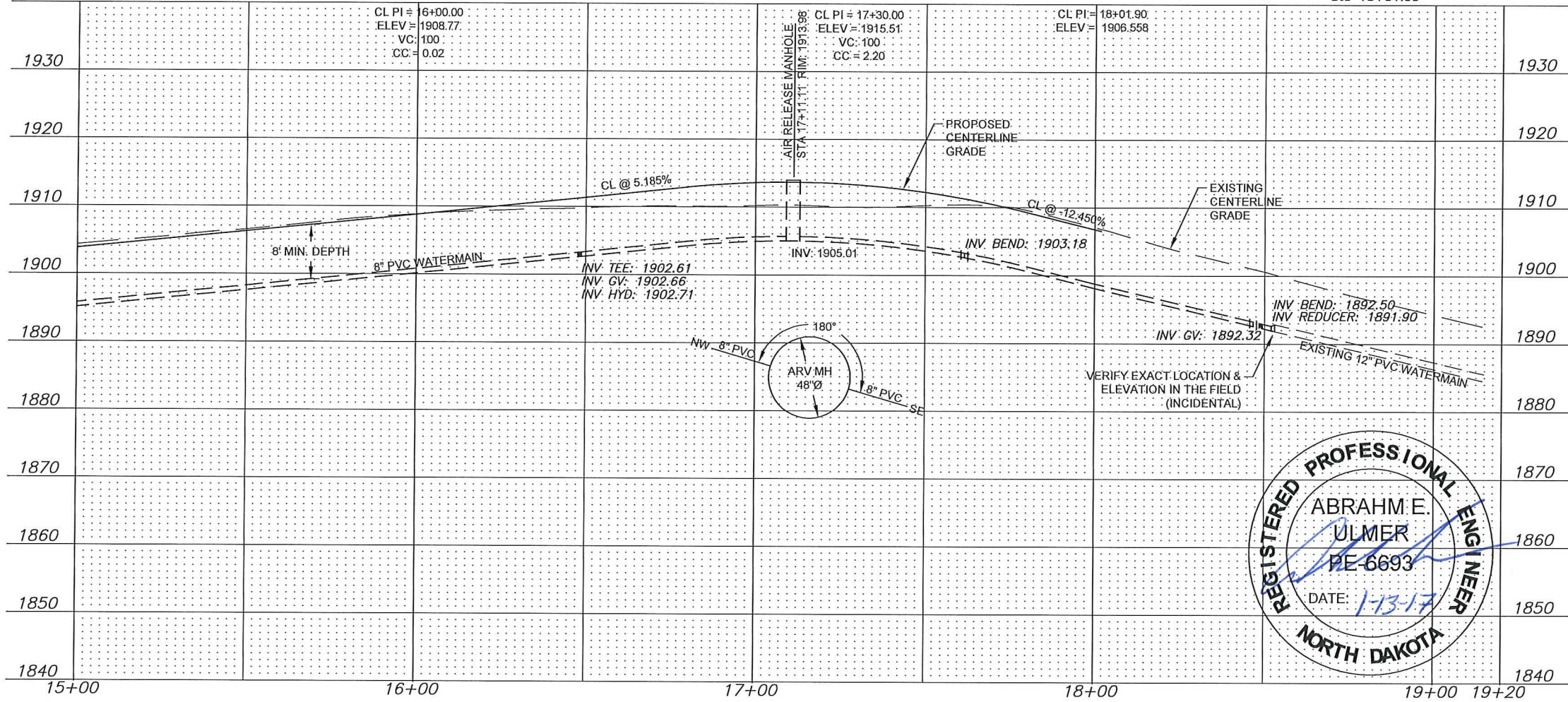
Sta 16+48.24 33' Rt 8"x6" Tee
 10 LF 6" WM
 6" Gate Valve & Box
 6" Hydrant

Sta 17+11.11 23' Rt Air Release Valve

Sta 17+61.46 23' Rt 8" 45° Bend

Sta 18+46.96 30' Rt 8" 22.5° Bend

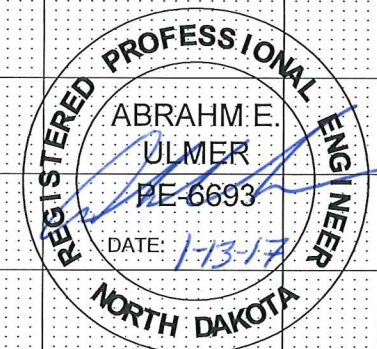
Sta 18+48.96 30.00' Rt 8" Gate Valve
 Sta 18+51.00 30.00' Rt 12"x8" Reducer
 End Watermain
 Quantities
 Sta 18+51.00



WATER MAIN DESIGN REVISED FROM STA 17+65 TO 18+49 ON 6-30-16 DUE TO CONFLICT WITH POWER BOX

AS-BUILT
 DATE: 01/2017

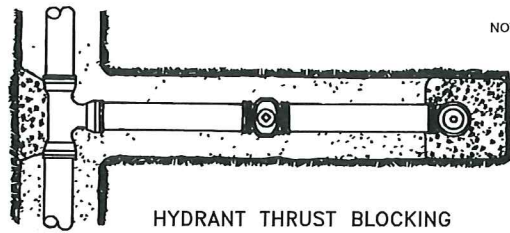
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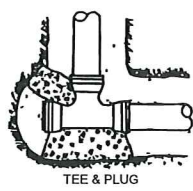
JUDE LANE – ASBUILT
 BIG SKY ESTATES – JUDE LANE
 WATER & SEWER IMPROVEMENTS

CITY PROJECT NO. 2016-10

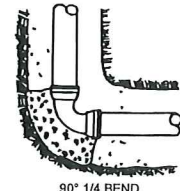


HYDRANT THRUST BLOCKING

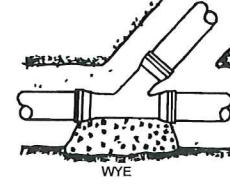
- NOTES:
- (1) PIPE DEFLECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION
 - (2) BEDDING REQUIREMENTS SHALL BE AS INDICATED HEREON UNLESS MODIFIED IN THE SPECIFICATION
 - (3) CONCRETE FOR THRUST BLOCKS SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 P.S.I. AND MAX. SLUMP OF 3 INCHES AT TIME OF PLACEMENT



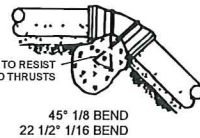
TEE & PLUG



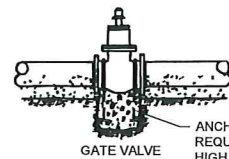
90° 1/4 BEND



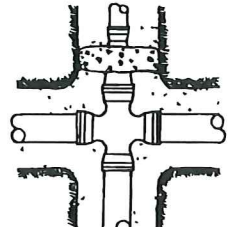
WYE



45° 1/8 BEND
22 1/2° 1/16 BEND



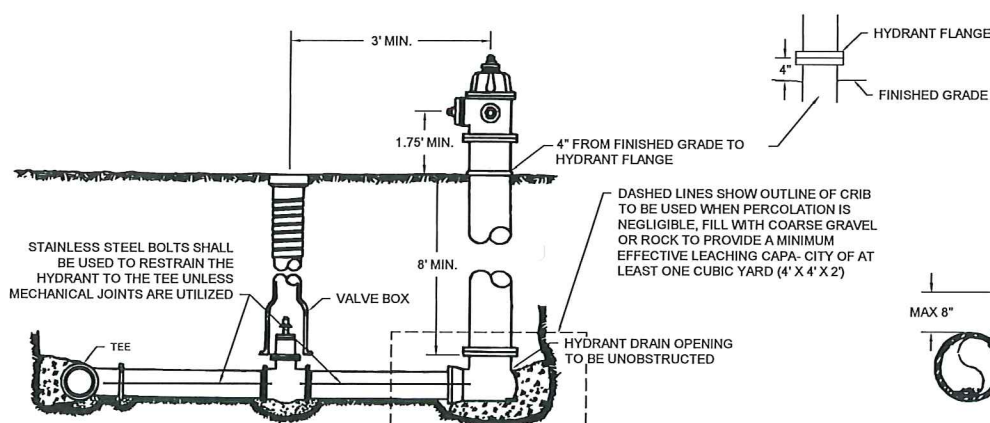
GATE VALVE
ANCHOR RODS REQUIRED FOR HIGH PRESSURE AREAS



CROSS & REDUCER

ANCHOR TO RESIST

THRUST BLOCK DETAILS

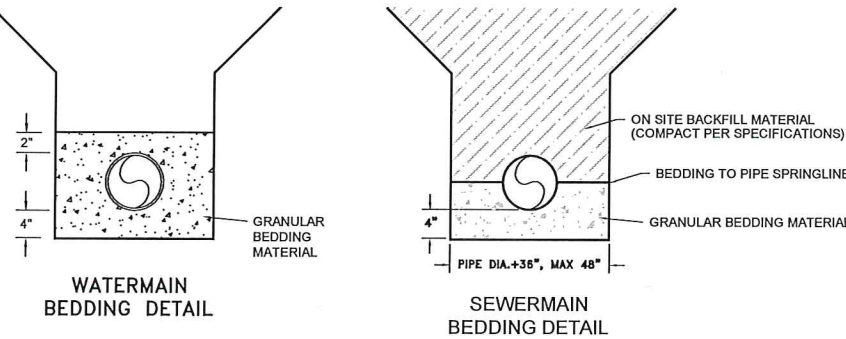


LAYOUT OF FIRE HYDRANT & VALVE

SERVICE LINE CORPORATION COCK DIRECT TAP POSITION

DASHED LINES SHOW OUTLINE OF CRIB TO BE USED WHEN PERCOLATION IS NEGLIGIBLE. FILL WITH COARSE GRAVEL OR ROCK TO PROVIDE A MINIMUM EFFECTIVE LEACHING CAPACITY OF AT LEAST ONE CUBIC YARD (4' X 4' X 2')

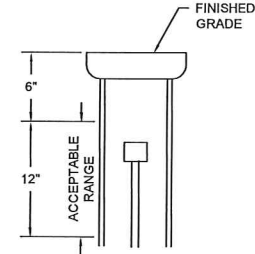
STAINLESS STEEL BOLTS SHALL BE USED TO RESTRAIN THE HYDRANT TO THE TEE UNLESS MECHANICAL JOINTS ARE UTILIZED



WATERMAIN BEDDING DETAIL

SEWERMAIN BEDDING DETAIL

SAND CUSHION BEDDING—SUPPORT ENTIRE LENGTH OF PIPE
SPECIAL COMPACTION REQUIRED TO PIPE SPRING LINE



NOTE: VALVE STEM MUST BE IN RANGE OF 6" - 18" BELOW FINISHED GRADE.

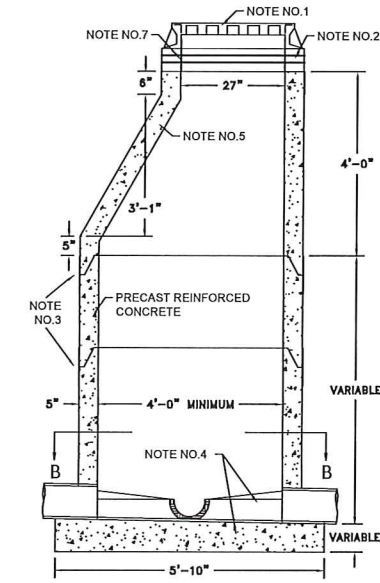
VALVE STEM DETAIL

MAXIMUM SIZE OF OUTLET RECOMMENDED WITH SERVICE CLAMPS (INCHES)

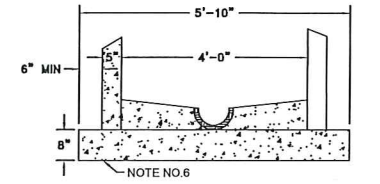
NOMINAL PIPE SIZE	(CLASSES 100-150-200) DOUBLE STRAP
4"	1"
6"	1 1/2"
8"	2"
10"	2"
12"	2"
14"	2"
16"	2"

SADDLES FOR PVC WATERMAIN

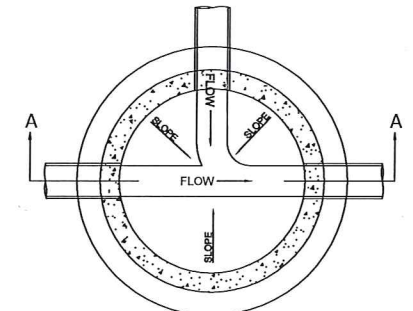
- NOTE NO. 1 - MANHOLE CASTING AND COVER SHALL BE AS DEFINED IN SECTION 1205-2.5.
NOTE NO. 2 - ALLOWANCE FOR ADJUSTMENT - 0" TO 6" - SEE STANDARD DETAIL NO. 1205-1.
NOTE NO. 3 - CRETEX P2 GASKETED JOINT FOR 48" MANHOLES. CRETEX CX-4 JOINT FOR ALL OTHER SIZES OF MANHOLES OR EXTERIOR SEAL BY PRESS-SEAL GASKET CORP., EZ WRAP AND EZ STIK NO. 4 PRIMER, CRETEX SPECIALTY PRODUCTS "MAC WRAP", OR AN APPROVED EQUAL.
NOTE NO. 4 - IF PRECAST MANHOLE BASE IS USED, FLOOR SHALL BE GROUTED AND SLOPED, AS SHOWN, FROM 1/2 THE DIAMETER OF THE PIPE. SEE SECTION 1205-2.3 FOR PRECAST MANHOLE BASE REINFORCEMENT.
NOTE NO. 5 - MANHOLE TOP SECTION SHALL BE ECCENTRIC FOR 48" MANHOLES.
NOTE NO. 6 - CAST IN PLACE MANHOLE BASES SHALL BE DIMENSIONED AS SHOWN UNLESS OTHERWISE INDICATED. BASES SHALL BE REINFORCED WITH NO. 4 REBAR SPACED 15" ON CENTER, BOTH WAYS.
NOTE NO. 7 - 1/2" BARRIER AS MANUFACTURED BY APM PERMAFORM OR AN APPROVED EQUAL.
NOTE NO. 8 - STEPS SHALL NOT BE PLACED IN SANITARY SEWER, STORM SEWER, OR AIR RELEASE MANHOLES OR INLETS, UNLESS SPECIFIED. IF SPECIFIED, THE MANHOLE STEPS SHALL BE DELTA SUREFOOT OR APPROVED EQUAL. STEPS SHALL BE SPACED 16" ON CENTER.



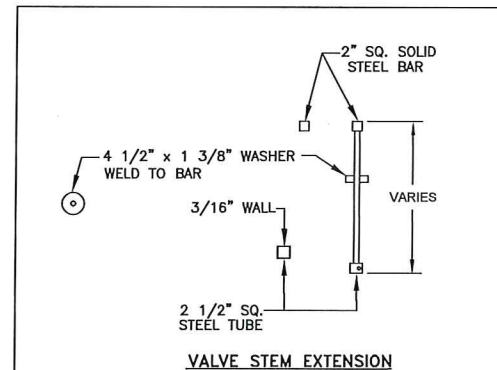
SECTION A-A



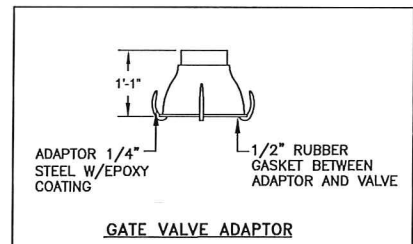
CAST IN PLACE MANHOLE BASE



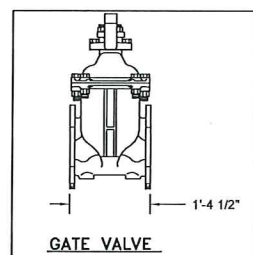
SECTION B-B



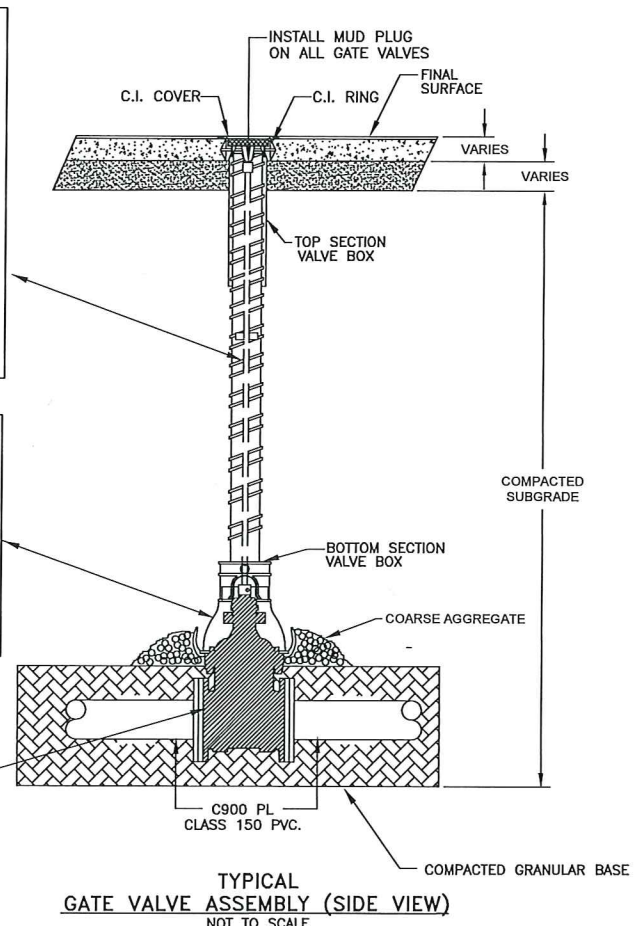
VALVE STEM EXTENSION



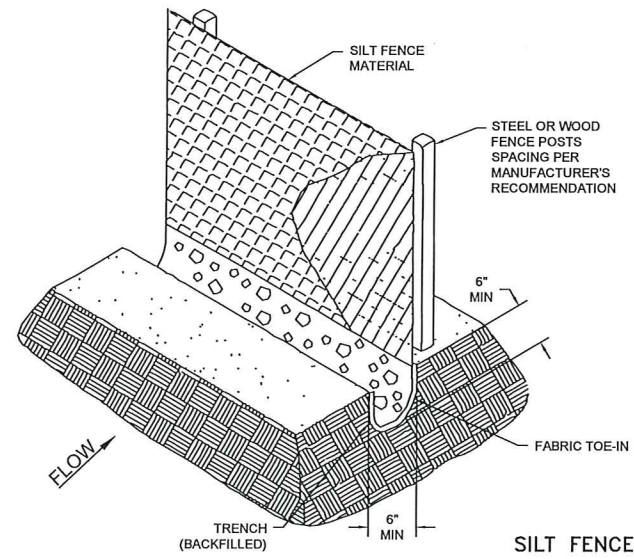
GATE VALVE ADAPTOR



GATE VALVE



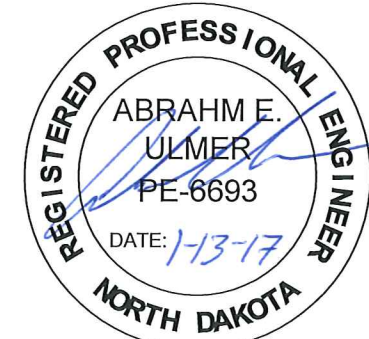
TYPICAL GATE VALVE ASSEMBLY (SIDE VIEW)
NOT TO SCALE



SILT FENCE

- NOTES:
1. SILT FENCE FABRIC SHALL BE ONE OF THE FOLLOWING
A. BURLAP: AASHTO M182
B. POLYPROPYLENE FABRIC: ASTM D4397
C. NYLON NETTING REINFORCED FABRIC
D. PREMANUFACTURED SILT FENCE MEETING EQUAL PROPERTIES OF ABOVE.
 2. SILT FENCE FABRIC SHALL HAVE A MINIMUM BURSTING STRENGTH 150 PSI
 3. SILT FENCE FABRIC SHALL HAVE EDGES TREATED TO PREVENT UNRAVELING.
 4. MINIMUM HEIGHT OF THE SILT FENCE TO BE 2'-6" WITH A MINIMUM OF 6" CLEARANCE BETWEEN THE TOP OF THE SILT FENCE AND THE TOP OF THE POSTS.
 5. INSTALL THE POSTS ON SLIGHT ANGLE TOWARDS THE ANTICIPATED RUNOFF SURFACE.

AS-BUILT
DATE: 01/2017



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WATER & SEWER DETAILS—ASBUILT
BIG SKY ESTATES — JUDE LANE
WATER & SEWER IMPROVEMENTS

CITY PROJECT NO. 2016-10