

# MEADOW RIDGE 1ST & 2ND ADDITION WATER & SEWER IMPROVEMENTS

## CITY PROJECT NO. 2012-05 **ASBUILT**

### MANDAN, NORTH DAKOTA

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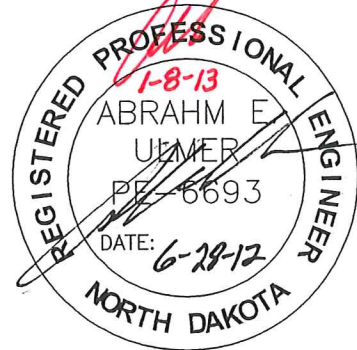
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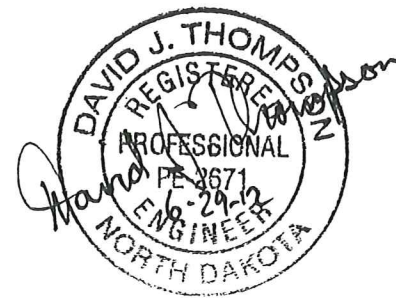
NO SCALE

#### DESIGN ENGINEER'S CERTIFICATE

I, ABRAHM E. ULMER, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NORTH DAKOTA, HEREBY CERTIFY THAT THE PLANS FOR WATER & SANITARY SEWER IMPROVEMENTS, PROJECT NO. 2012-05, MANDAN, NORTH DAKOTA WERE PREPARED UNDER MY SUPERVISION AND ARE COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



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



TITLE SHEET  
 MEADOW RIDGE 1ST & 2ND ADDITIONS  
**As-built**

WATER & SEWER IMPROVEMENTS  
 CITY PROJECT NO. 2012-05  
 SHEET 1 OF 10  
 MANDAN, ND

JUNE, 2012

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

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27TH STREET NW

N  
1" = 100'

F.H. T.N. EL.  
= 1788.19

NOT YET NAMED  
SEE SHEET 3 & 4

MEADOW RIDGE 1ST ADDITION

MEADOW RIDGE 2ND ADDITION

PRIVATE ROAD  
SEE SHEET 7

F.H. T.N. EL.  
= 1802.64

F.H. T.N. EL.  
= 1794.75

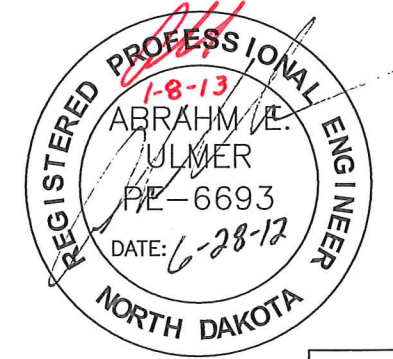
F.H. T.N. EL.  
= 1808.11

SAN. Sewer Extension  
Added Mid-Project  
See sheet #6

F.H. T.N. EL. = 1818.73

PROPOSED 24TH STREET NW  
SEE SHEET 8 & 9

- LEGEND**
- ===== PROPOSED CURB & GUTTER
  - PROPOSED WATERMAIN
  - - - - - PROPOSED WATER SERVICE
  - PROPOSED FIRE HYDRANT
  - ⊕ PROPOSED GATE VALVE
  - PROPOSED SANITARY SEWER
  - - - - - PROPOSED SANITARY SEWER SERVICE
  - PROPOSED SANITARY CLEANOUT
  - PROPOSED SANITARY MANHOLE
  - - - - - PROPOSED STORM SEWER
  - - - - - EXISTING FENCELINE
  - - - - - EXISTING UTILITY EASEMENT
  - - - - - EXISTING WATERMAIN
  - ⊕ EXISTING FIRE HYDRANT
  - ◇ EXISTING CURB STOP
  - ⊕ EXISTING GATE VALVE
  - EXISTING SANITARY MANHOLE
  - - - - - EXISTING SANITARY SEWERMAIN
  - - - - - EXISTING CULVERT
  - EXISTING POWER POLE
  - ⌒ EXISTING GUY WIRE
  - OH - OH - OH - OH - EXISTING OVERHEAD ELECTRIC
  - FO - FO - FO - FO - EXISTING FIBER OPTIC
  - CIV - CIV - CIV - CIV - EXISTING CABLE TV
  - E - E - E - E - EXISTING UNDERGROUND ELECTRIC
  - G - G - G - G - EXISTING GAS LINE



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EXCAVATION

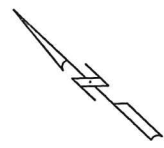
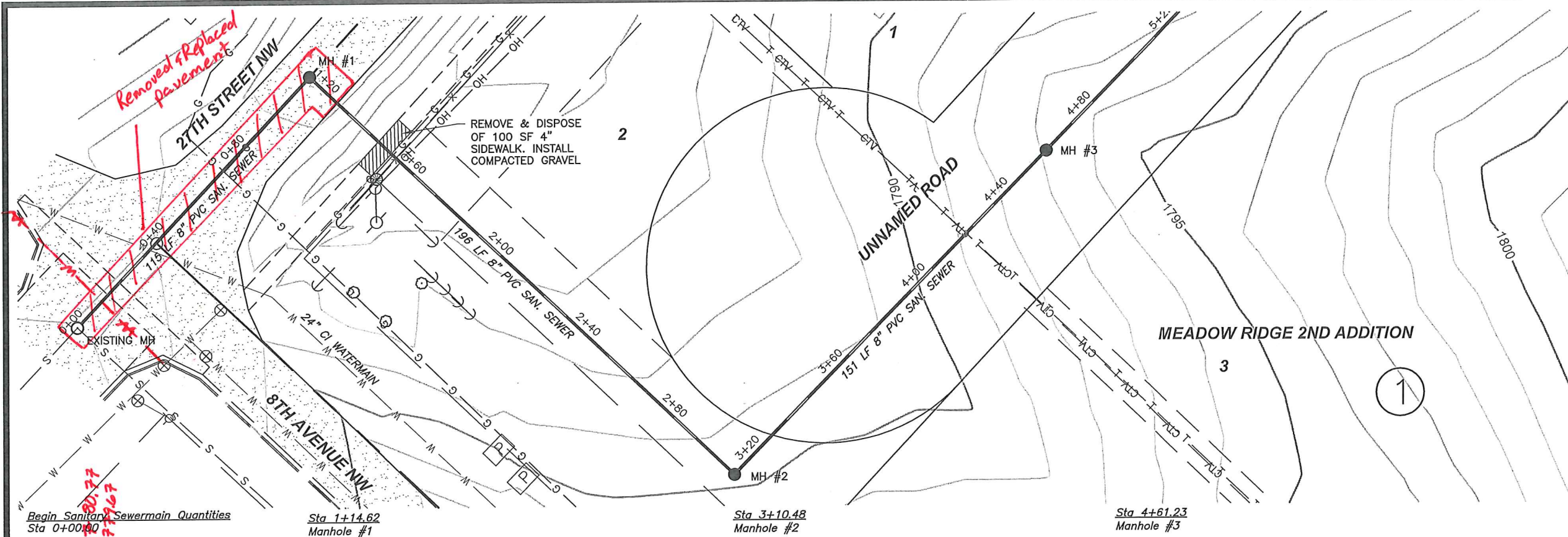


**TOMAN ENGINEERING**  
501 1st Street NW, Mandan, ND 58554  
Phone: 701-663-6483 \* Fax: 701-663-0923

PROJECT LAYOUT  
MEADOW RIDGE 1ST & 2ND ADDITIONS  
*As-built*

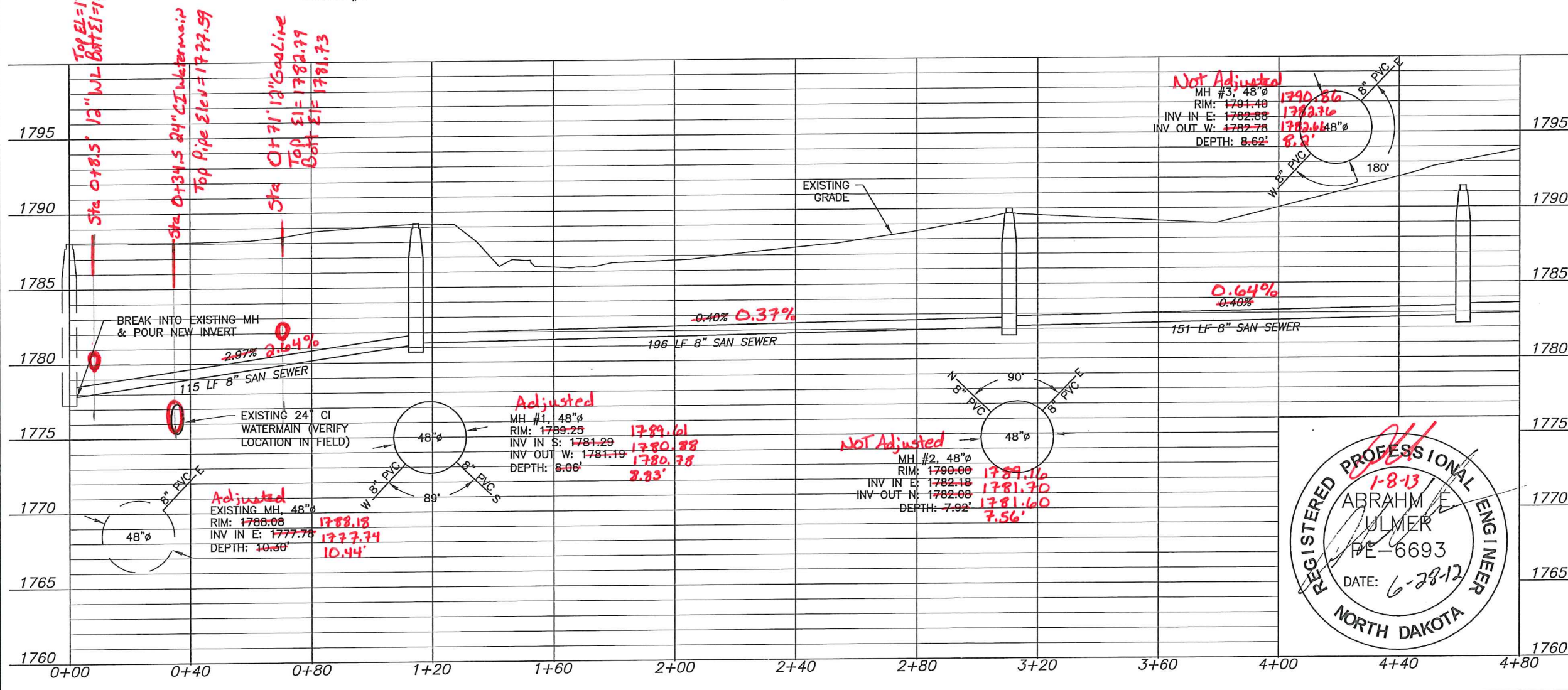
WATER & SEWER IMPROVEMENTS  
CITY PROJECT NO. 2012-05  
SHEET 2 OF 10  
MANDAN, ND  
JUNE, 2012

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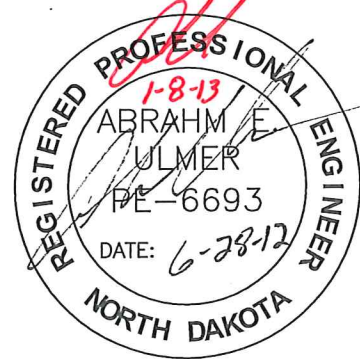


1" = 40'  
NAVD88

**\*CAUTION\***  
UTILITY LOCATIONS ARE APPROXIMATE.  
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EXCAVATION



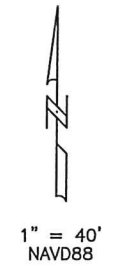
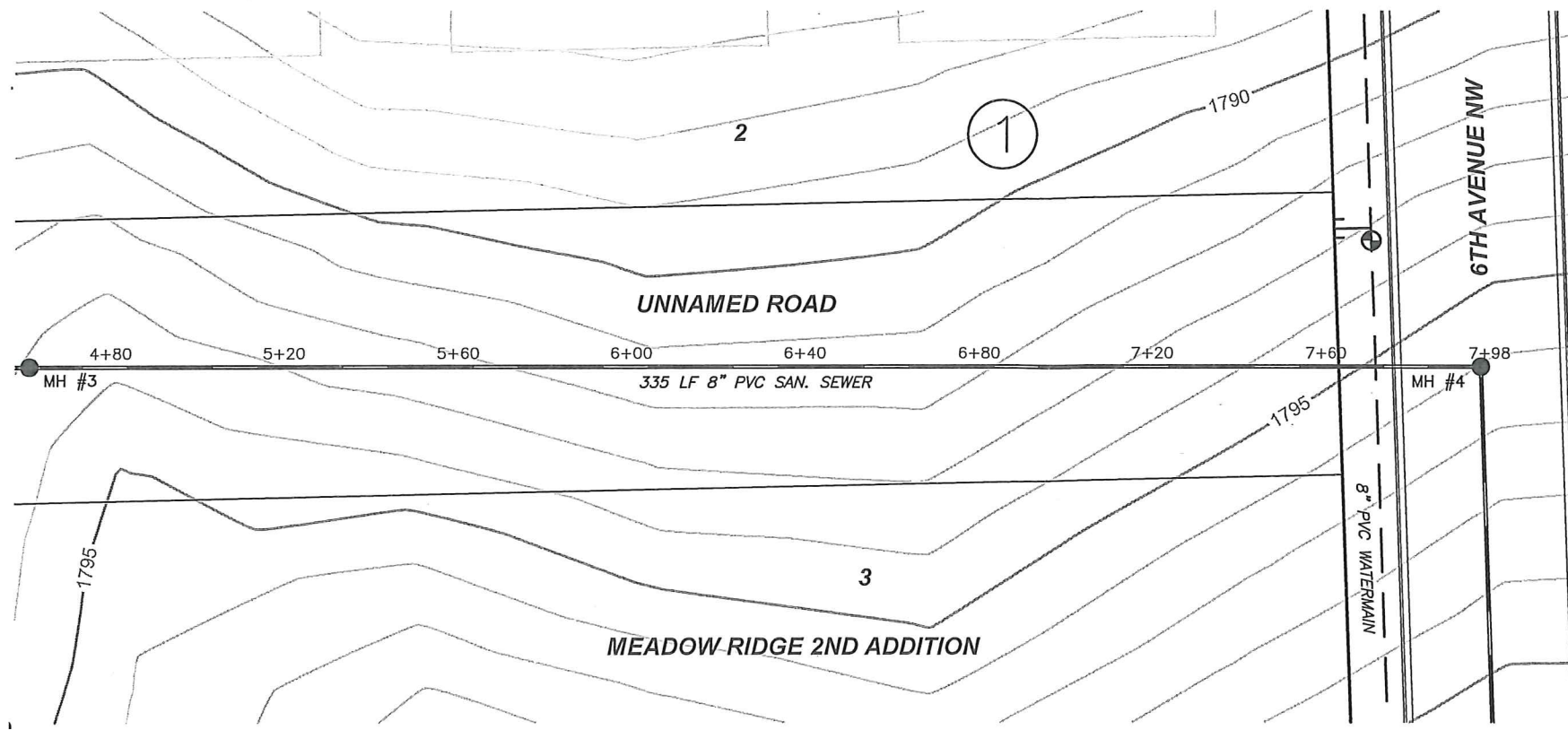
1. Removal & replacement of pavement shall be paid for under respective bid items.
2. Backfill shall be Class "A" as per City of Mandan Specifications.



**SANITARY SEWER**  
MEADOW RIDGE 1ST & 2ND ADDITION  
*As-built*

WATER & SEWER IMPROVEMENTS  
DISTRICT NO. 2012-05  
SHEET 3 OF 10  
MANDAN, ND

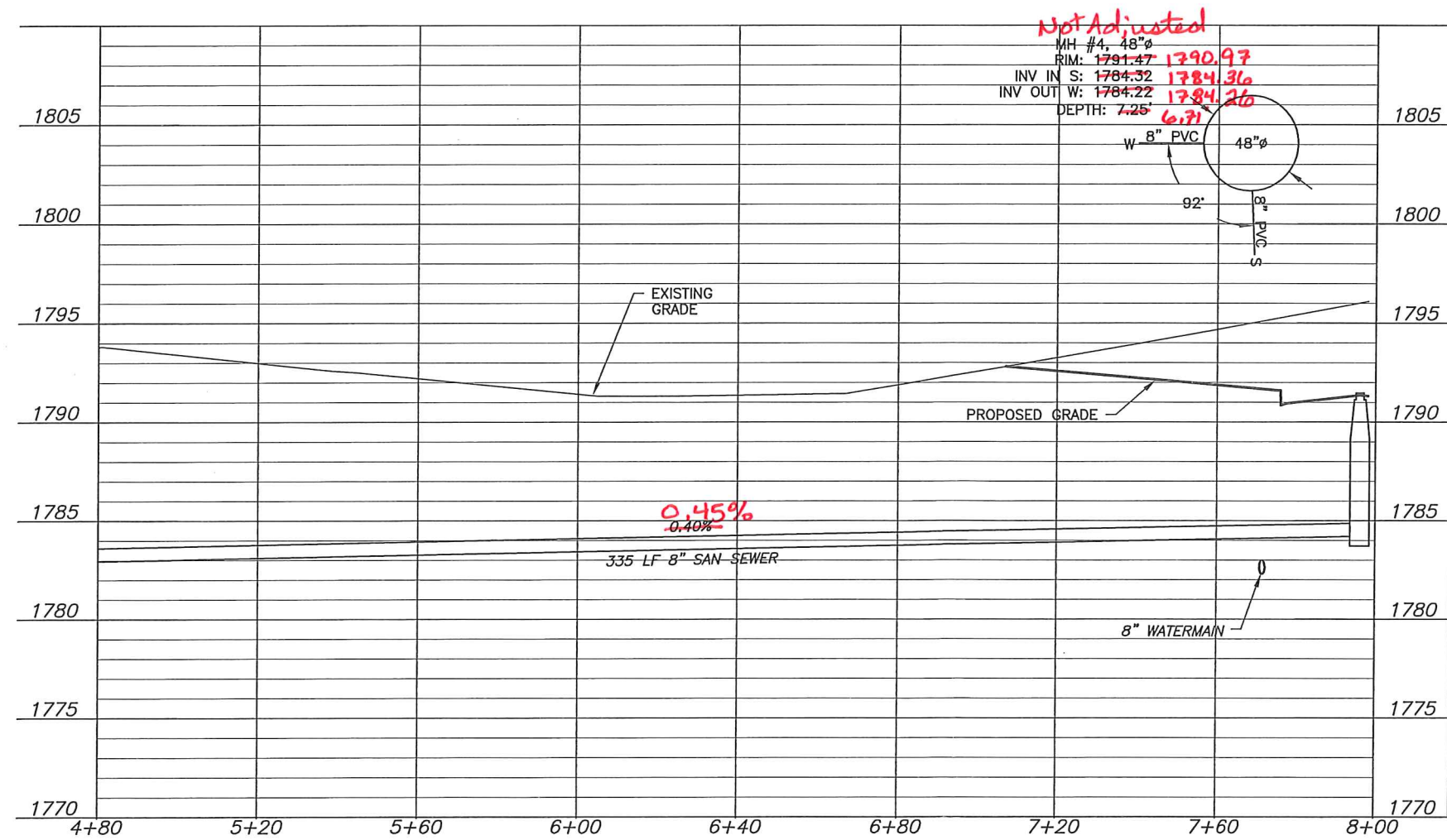
JUNE, 2012



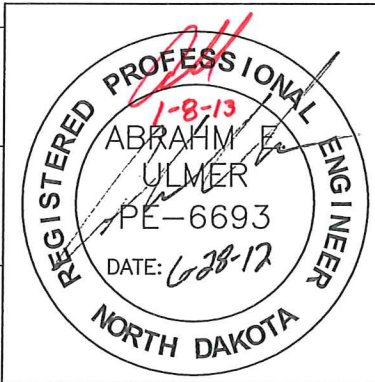
1" = 40'  
NAVD88

Sta 7+96.11  
Manhole #4

**\*CAUTION\***  
UTILITY LOCATIONS ARE APPROXIMATE.  
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EXCAVATION



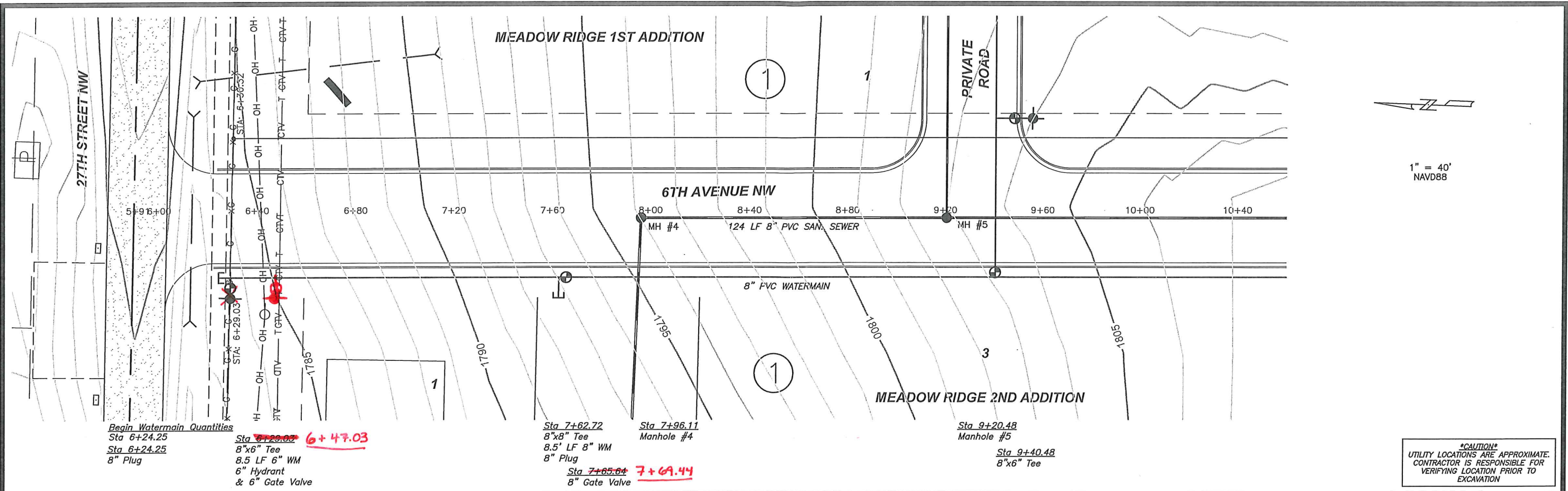
*Not Adjusted*  
MH #4, 48"φ  
RIM: 1791.47  
INV IN S: 1784.32 *1784.36*  
INV OUT W: 1784.22 *1784.26*  
DEPTH: 7.25'  
*6.71'*



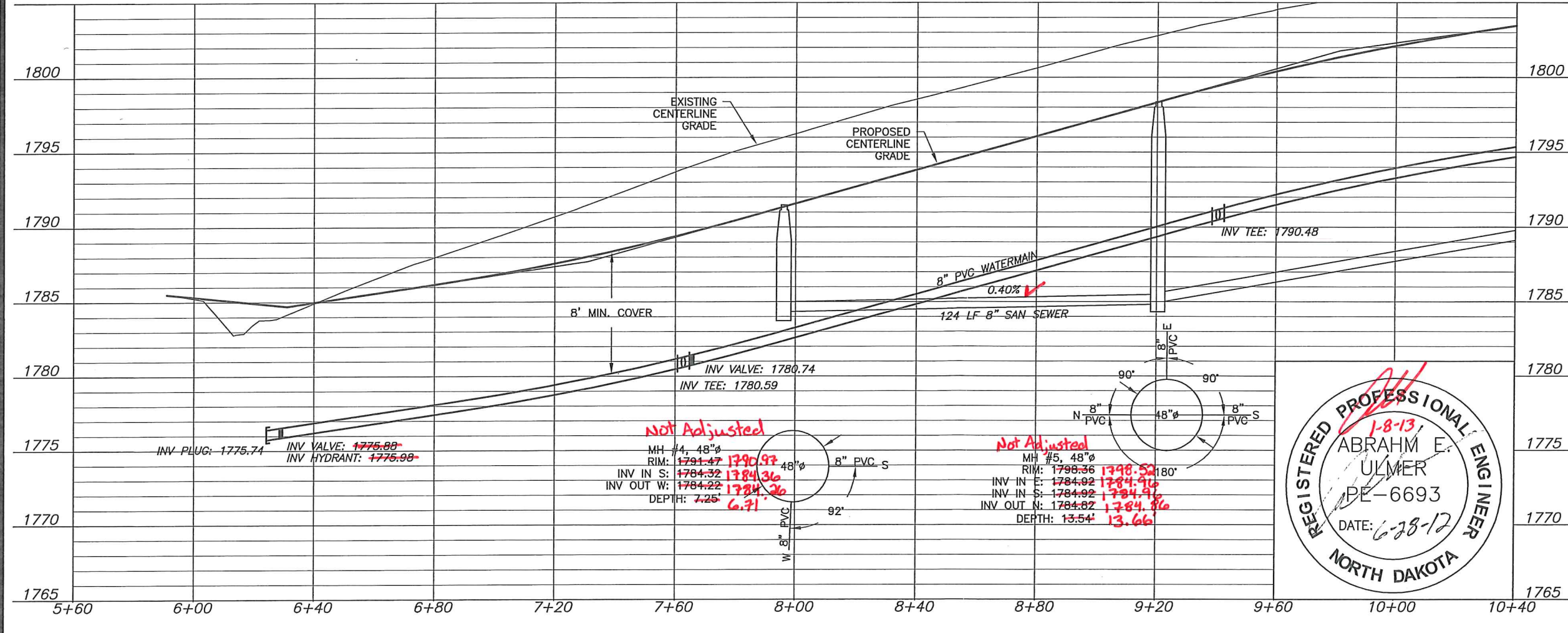
1. Backfill shall be Class "A" as per City of Mandan Specifications.

**TOMAN ENGINEERING**  
1246  
501 1st Street NW, Mandan, ND 58554  
Phone: 701-663-6483 \* Fax: 701-663-0923

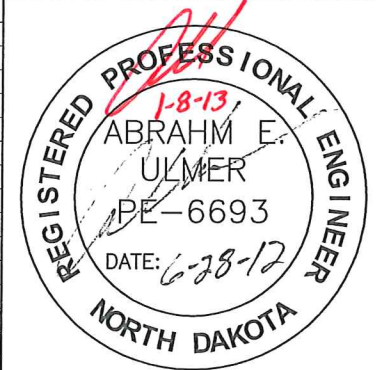
SANITARY SEWER  
MEADOW RIDGE 1ST & 2ND ADDITION *As-built*  
WATER & SEWER IMPROVEMENTS  
DISTRICT NO. 2012-05  
SHEET 4 OF 10  
MANDAN, ND  
JUNE, 2012



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CONTRACTOR IS RESPONSIBLE FOR  
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EXCAVATION



1. Backfill shall be Class "A" as per City of Mandan Specifications.



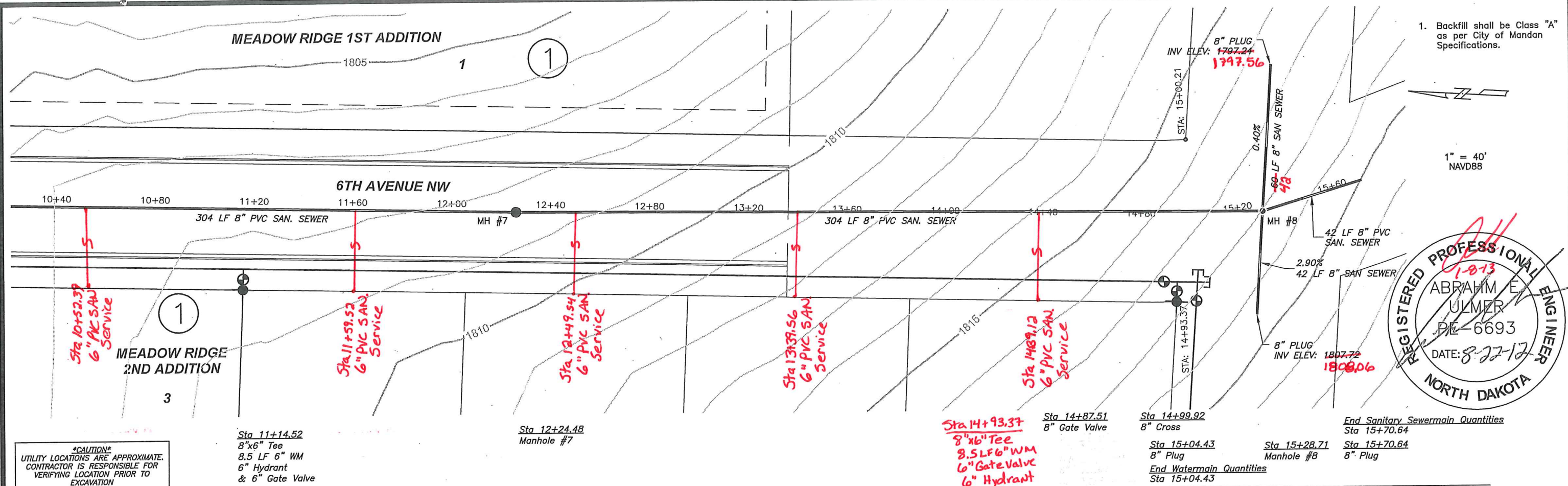
**TOMAN ENGINEERING**  
501 1st Street NW, Mandan, ND 58554  
Phone: 701-663-6483 \* Fax: 701-663-0923

**WATER & SANITARY SEWER**  
ALONG 6TH AVENUE NW  
MEADOW RIDGE 1ST & 2ND ADDITIONS **As-built**

WATER & SEWER IMPROVEMENTS  
DISTRICT NO. 2012-05  
SHEET 5 OF 10  
MANDAN, ND

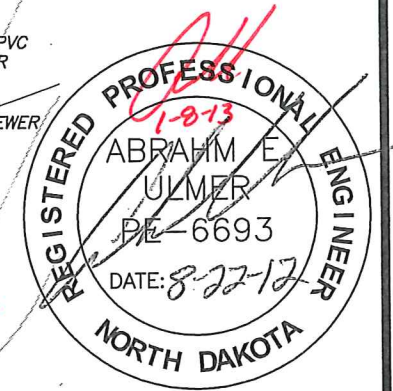
JUNE, 2012

MEADOW RIDGE 1ST ADDITION



1. Backfill shall be Class "A" as per City of Mandan Specifications.

1" = 40'  
NAVD88



**\*CAUTION\***  
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EXCAVATION

Sta 11+14.52  
8"x6" Tee  
8.5 LF 6" WM  
6" Hydrant  
& 6" Gate Valve

Sta 12+24.48  
Manhole #7

Sta 14+93.37  
8"x6" Tee  
8.5 LF 6" WM  
6" Gate Valve  
6" Hydrant

Sta 14+87.51  
8" Gate Valve

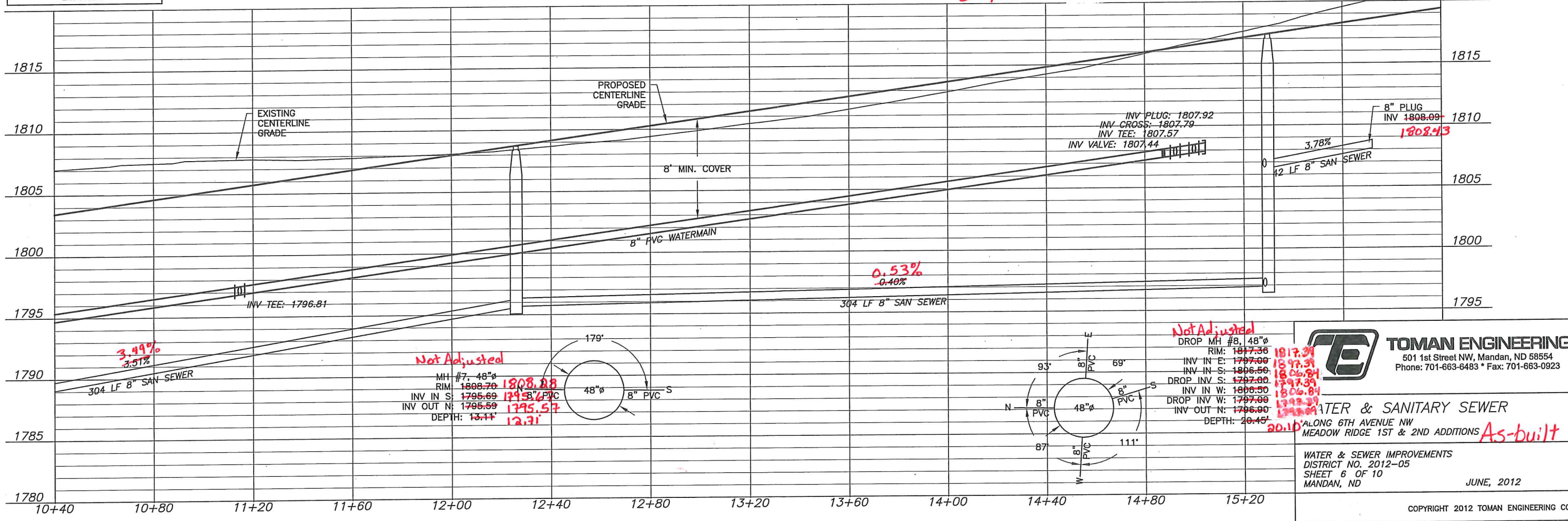
Sta 14+99.92  
8" Cross

Sta 15+04.43  
8" Plug  
End Watermain Quantities  
Sta 15+04.43

Sta 15+28.71  
Manhole #8

End Sanitary Sewermain Quantities  
Sta 15+70.64

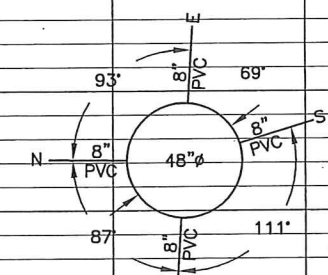
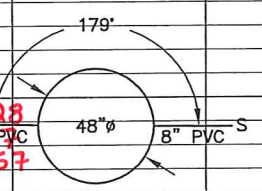
Sta 15+70.64  
8" Plug



Not Adjusted

Not Adjusted

MH #7, 48"ø  
RIM: 1808.70  
INV IN S: 1795.69  
INV OUT N: 1795.59  
DEPTH: 13.11'



DROP MH #8, 48"ø  
RIM: 1817.36  
INV IN E: 1797.00  
INV IN S: 1806.50  
DROP INV S: 1797.00  
INV IN W: 1806.50  
DROP INV W: 1797.00  
INV OUT N: 1796.90  
DEPTH: 20.45'



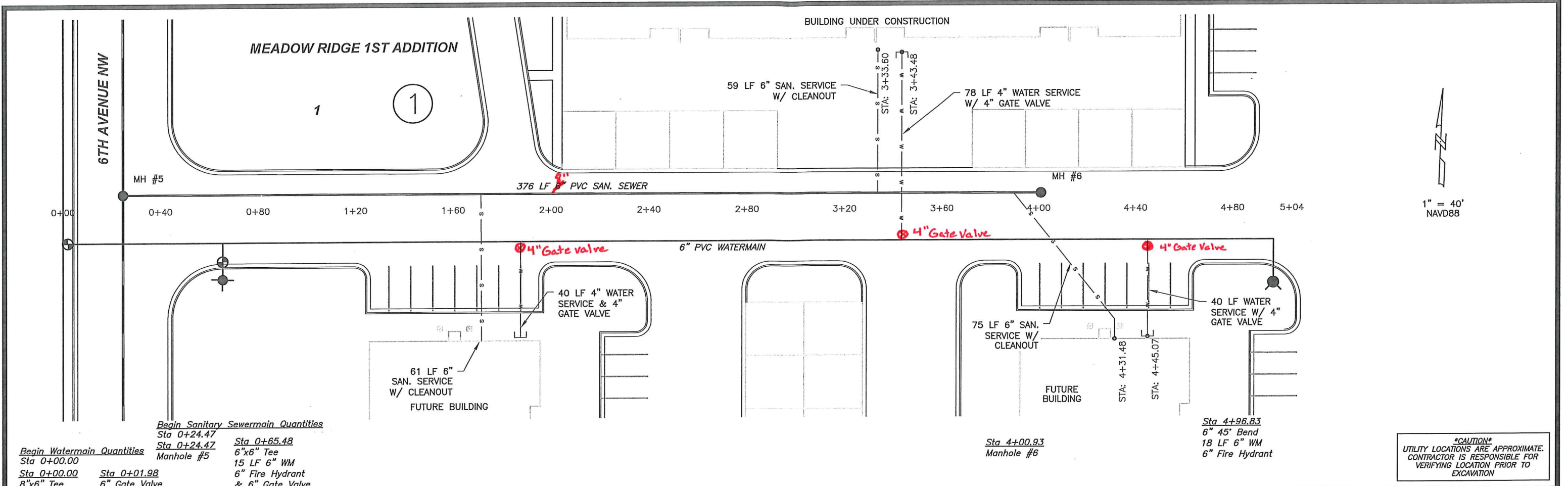
**TOMAN ENGINEERING**  
501 1st Street NW, Mandan, ND 58554  
Phone: 701-663-6483 • Fax: 701-663-0923

WATER & SANITARY SEWER  
ALONG 6TH AVENUE NW  
MEADOW RIDGE 1ST & 2ND ADDITIONS  
**As-built**

WATER & SEWER IMPROVEMENTS  
DISTRICT NO. 2012-05  
SHEET 6 OF 10  
MANDAN, ND

JUNE, 2012

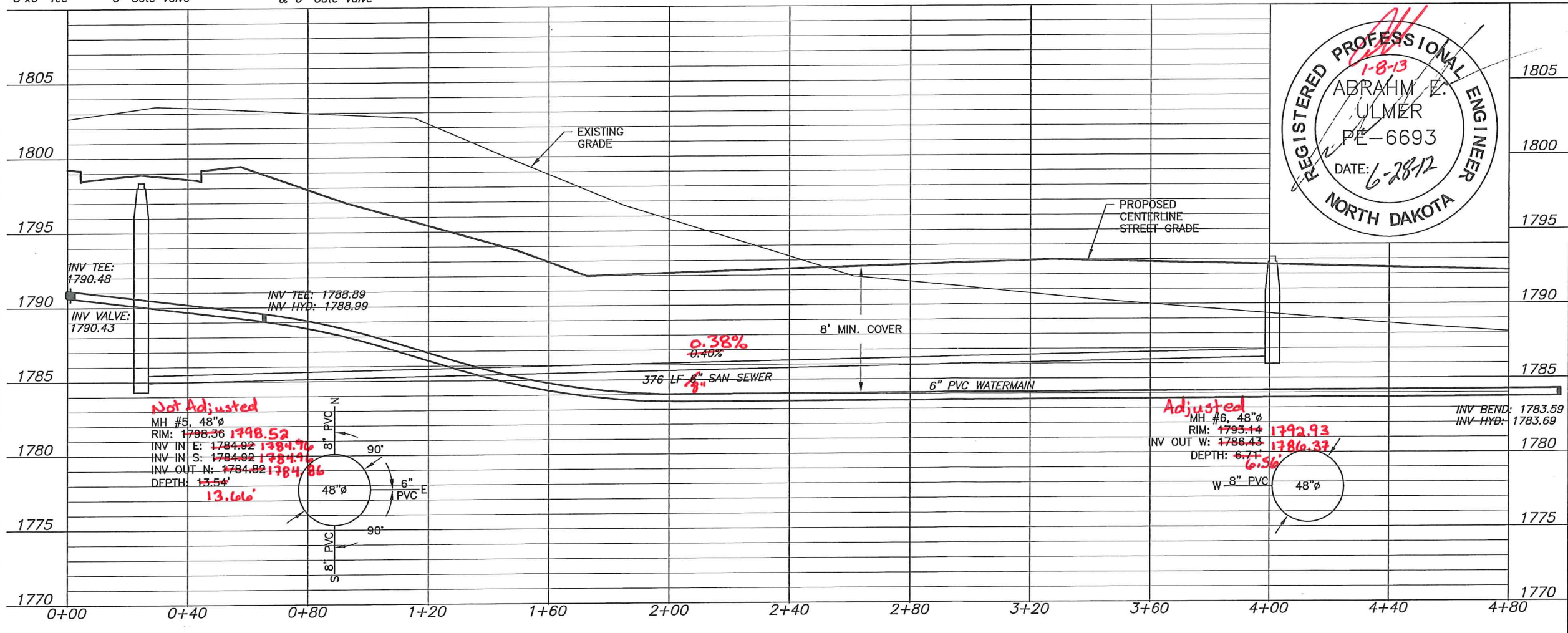
COPYRIGHT 2012 TOMAN ENGINEERING CO.



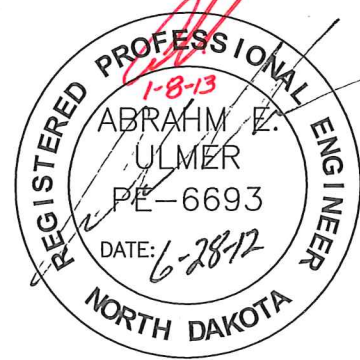
**Begin Sanitary Sewermain Quantities**  
 Sta 0+24.47 Sta 0+65.48  
 Sta 0+24.47 Sta 0+24.47  
 Manhole #5 6"x6" Tee  
 15 LF 6" WM  
 6" Fire Hydrant  
 & 6" Gate Valve

**Begin Watermain Quantities**  
 Sta 0+00.00  
 Sta 0+00.00 Sta 0+01.98  
 8"x6" Tee 6" Gate Valve

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 EXCAVATION

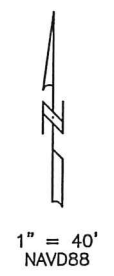
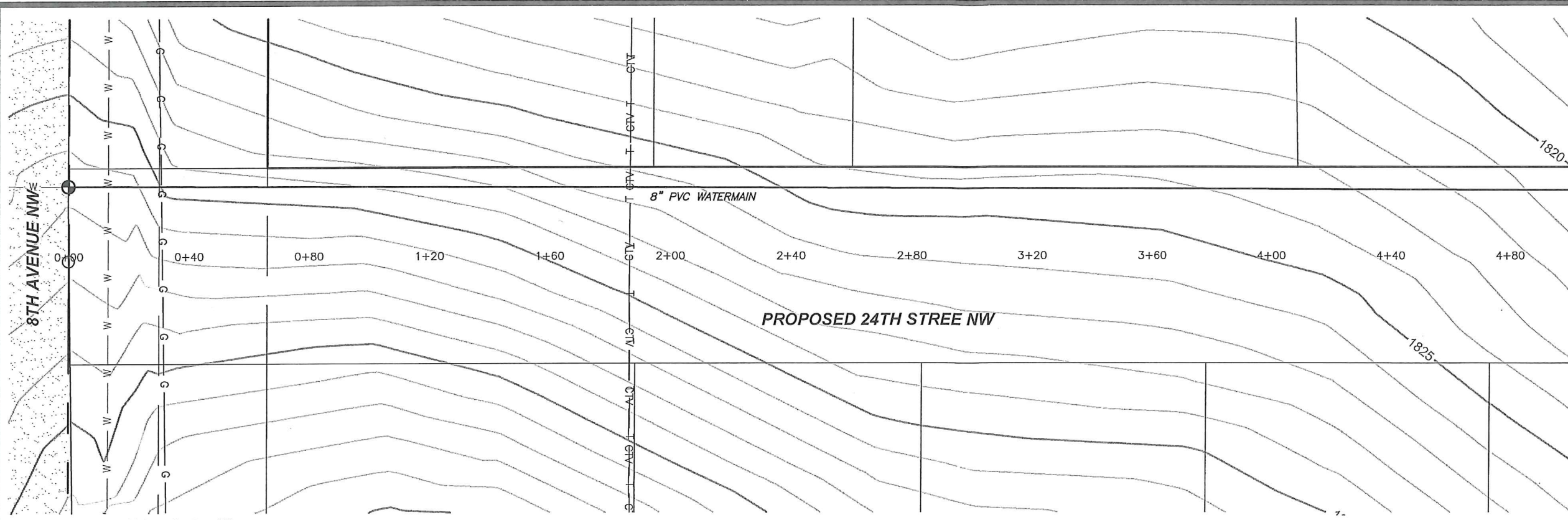


1. Backfill shall be Class "A" as per City of Mandan Specifications.



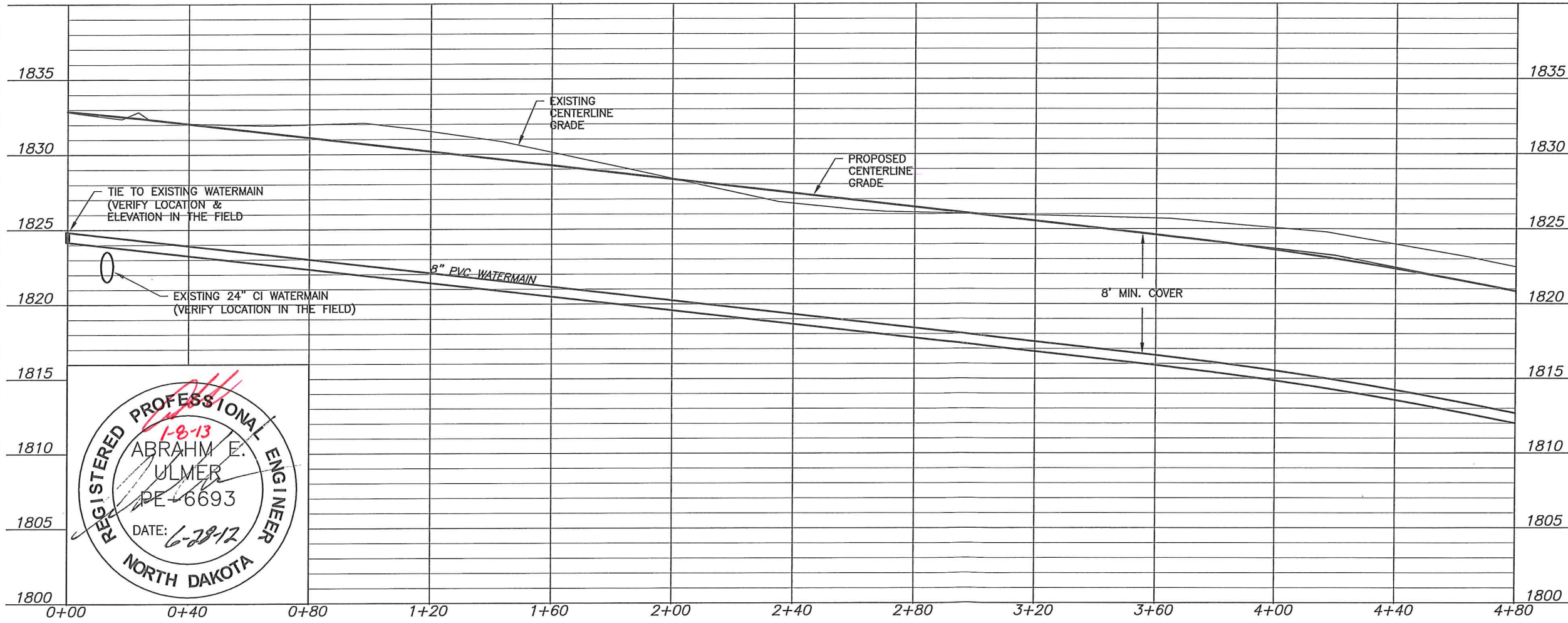

**TOMAN ENGINEERING**  
 501 1st Street NW, Mandan, ND 58554  
 Phone: 701-663-6483 \* Fax: 701-663-0923

PRIVATE STREET  
 WITHIN APARTMENT COMPLEX  
 MEADOW RIDGE 1ST & 2ND ADDITIONS **As-built**  
 WATER & SEWER IMPROVEMENTS  
 DISTRICT NO. 2012-05  
 SHEET 7 OF 10  
 MANDAN, ND

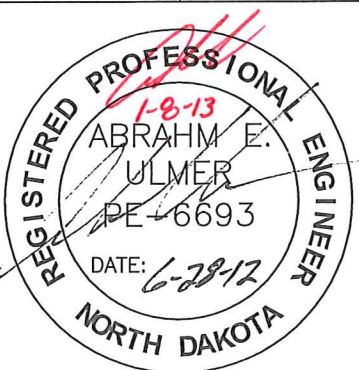


Begin Watermain Quantities  
 Sta 0+00.00 **D+03.66**  
 Sta 0+00.00 **D+03.66**  
 8" Gate Valve

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 EXCAVATION



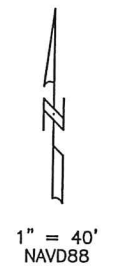
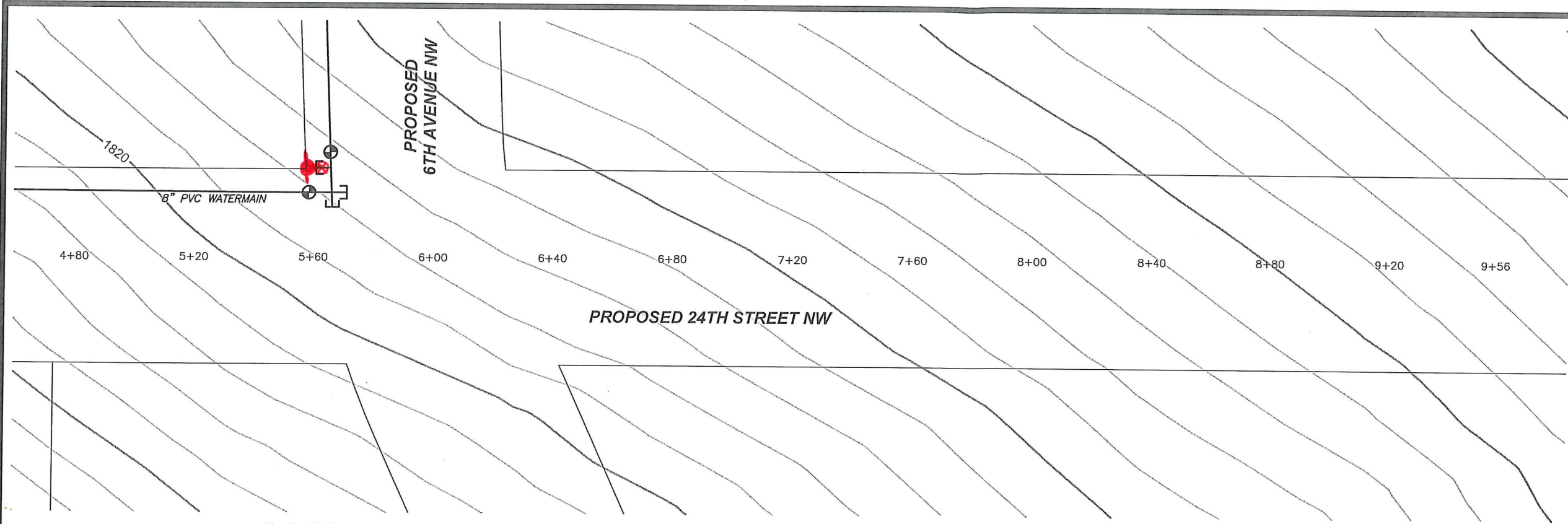
1. Backfill shall be Class "A" as per City of Mandan Specifications.
2. Extra lowering of watermain may be necessary due to existing 24" CI watermain (incidental).



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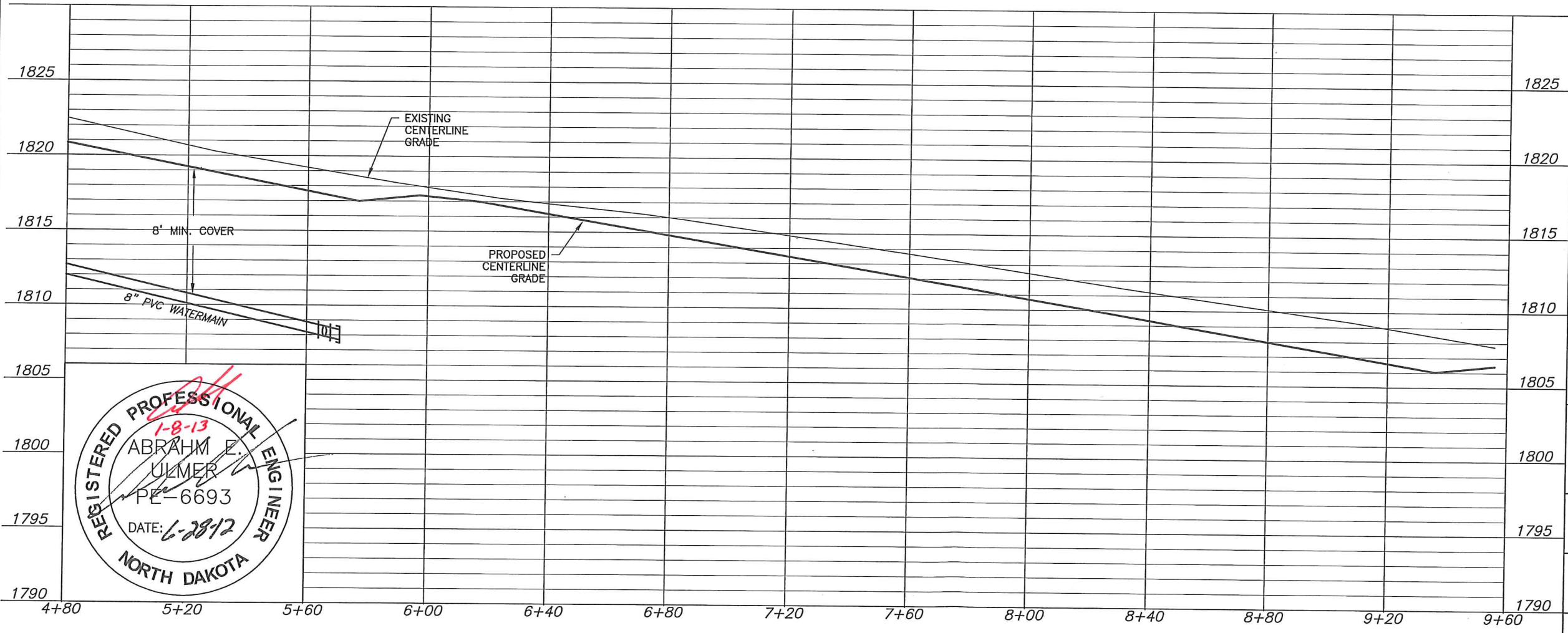
**WATERMAIN**  
 PROPOSED 24TH ST NW  
 MEADOW RIDGE 1ST & 2ND ADDITIONS **As-built**  
 WATER & SEWER IMPROVEMENTS  
 DISTRICT NO. 2012-05  
 SHEET 8 OF 10  
 MANDAN, ND  
 JUNE, 2012



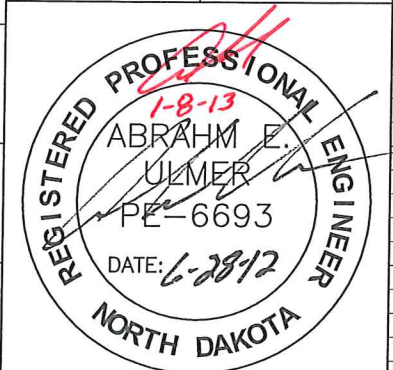


Sta 5+65.97 End Watermain Quantities  
 8"x 8" Cross Sta 5+70.97 **5+68**  
 Sta ~~5+70.97~~ **5+68**  
 8" Plug

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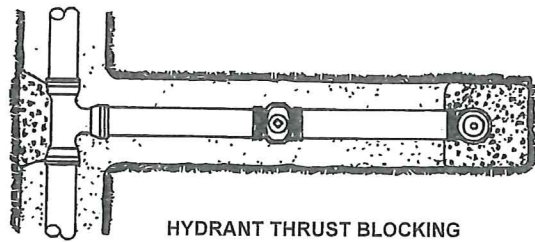


1. Backfill shall be Class "A" as per City of Mandan Specifications.



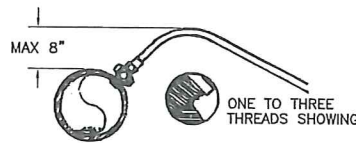
**TOMAN ENGINEERING**  
 501 1st Street NW, Mandan, ND 58554  
 Phone: 701-663-6483 \* Fax: 701-663-0923

**WATERMAIN**  
 PROPOSED 24TH ST NW  
 MEADOW RIDGE 1ST & 2ND ADDITIONS **As-built**  
 WATER & SEWER IMPROVEMENTS  
 DISTRICT NO. 2012-05  
 SHEET 9 OF 10  
 MANDAN, ND  
 JUNE, 2012

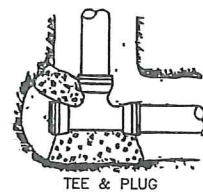


HYDRANT THRUST BLOCKING

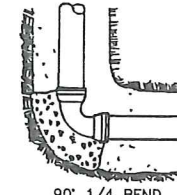
- NOTE: (1) PIPE DEFLECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS BEDDING REQUIREMENTS SHALL BE AS INDICATED HEREON UNLESS MODIFIED IN THE SPECIFICATIONS (3) CONCRETE FOR THRUST BLOCKS SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI, AND MAX. SLUMP OF 3 INCHES AT TIME OF PLACEMENT. (4) ALL DUCTILE IRON FITTINGS SHALL BE WRAPPED WITH 8-MIL PLASTIC



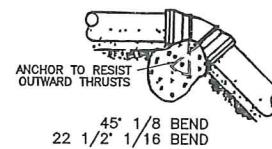
SERVICE LINE CORPORATION COCK DIRECT TAP POSITION



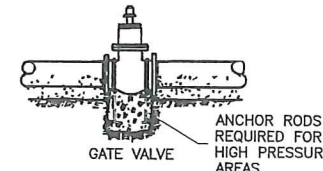
TEE & PLUG



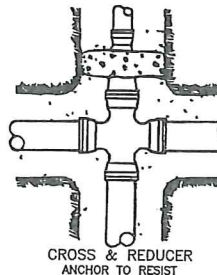
90° 1/4 BEND



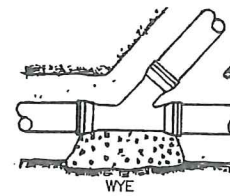
ANCHOR TO RESIST OUTWARD THRUSTS



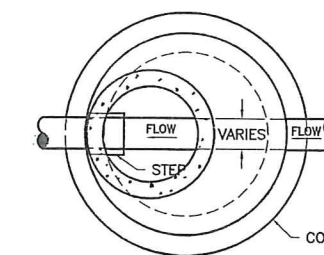
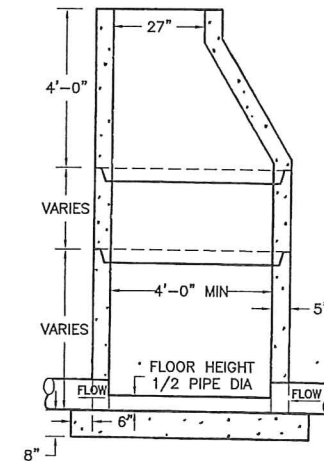
GATE VALVE ANCHOR RODS REQUIRED FOR HIGH PRESSURE AREAS



CROSS & REDUCER ANCHOR TO RESIST

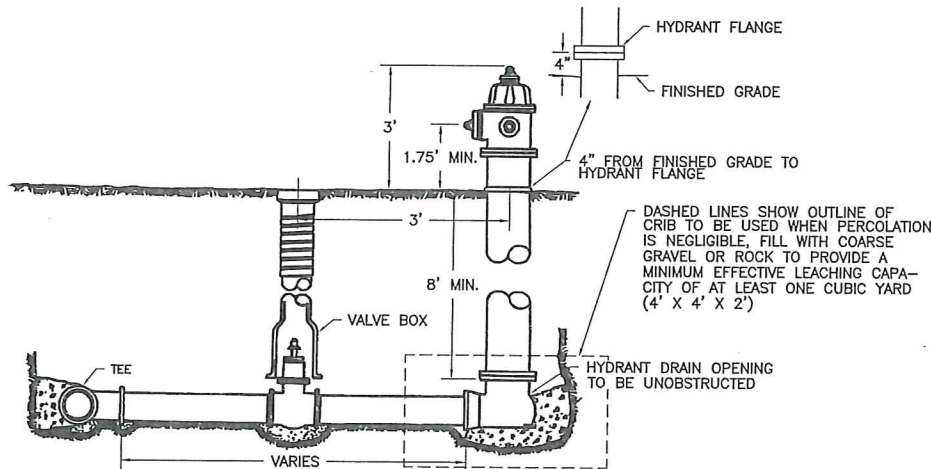


WYE



TYPICAL MANHOLE NON-INTEGRAL

MANHOLES ARE TO BE MANUFACTURED IN ACCORDANCE WITH ASTM SPECIFICATION C-478-73  
 ALL MANHOLES ARE TO HAVE ECCENTRIC CONES  
 ALL MANHOLE SECTION JOINTS TO BE SEALED WITH KENT SEALER  
 MANHOLE FLOORS SHALL SLOPE 1/2" PER FOOT  
 DROP TEE & PIPE: ENCASE PIPE AND ELBOW IN CONCRETE. CONCRETE SHALL NOT BE LESS THAN 6" THICK MEASURED FROM THE OUTSIDE WALL OF THE PIPE.



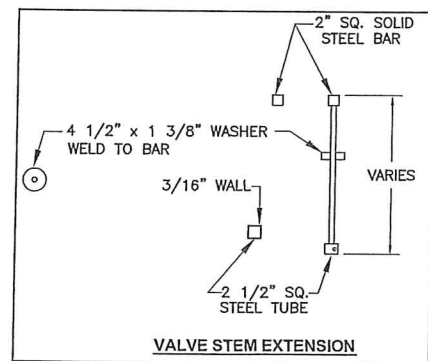
LAYOUT OF FIRE HYDRANT & VALVE

MAXIMUM SIZE OF OUTLET RECOMMENDED WITH SERVICE CLAMPS (INCHES)

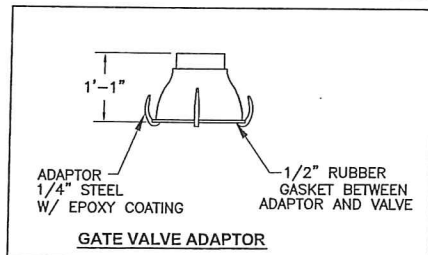
NOMINAL PIPE SIZE	(CLASSES 100-150-200) DOUBLE STRAP
4"	1"
6"	1 1/2"
8"	2"
10"	2"
12"	2"
14"	2"
16"	2"

SADDLES FOR PVC WATERMAIN

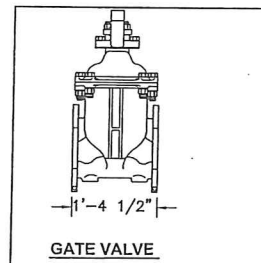
THRUST BLOCK DETAILS



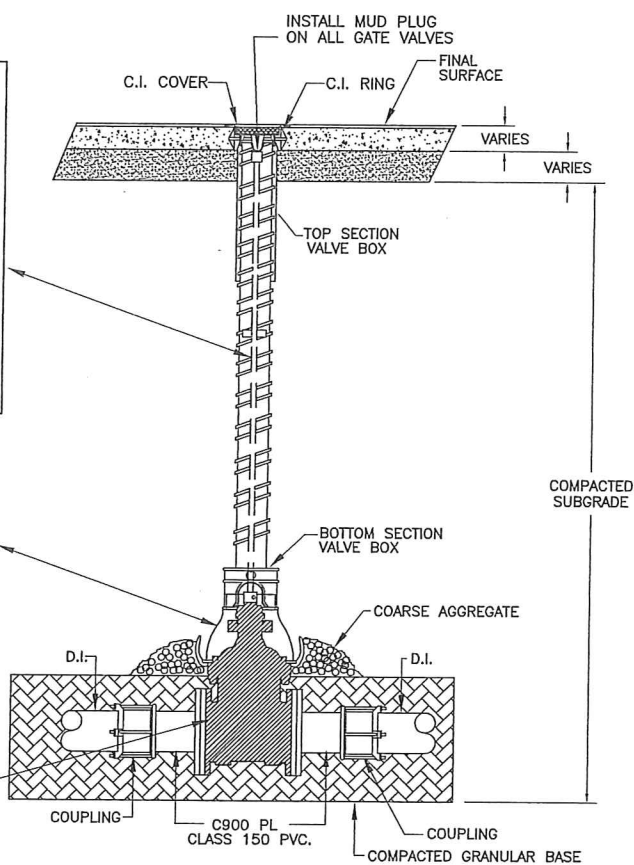
VALVE STEM EXTENSION



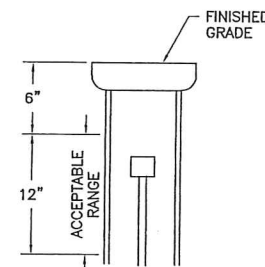
GATE VALVE ADAPTOR



GATE VALVE

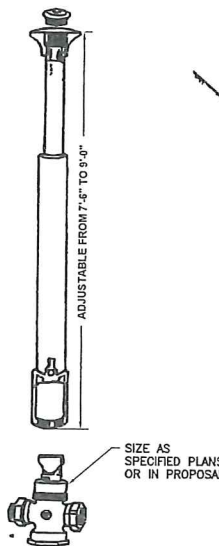


TYPICAL GATE VALVE ASSEMBLY (SIDE VIEW) NOT TO SCALE



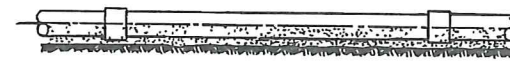
NOTE: VALVE STEM MUST BE IN RANGE OF 6" - 18" BELOW FINISHED GRADE.

VALVE STEM DETAIL

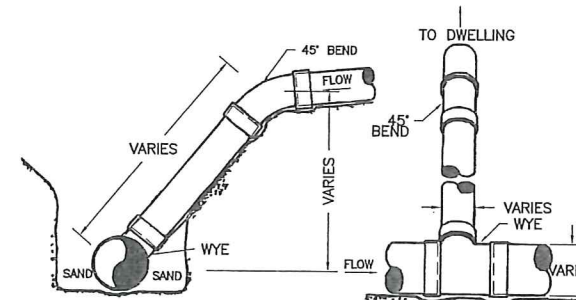


NOTE: 1. CURB STOP SHALL BE PLACED ON 4" X 8" X 2" CONCRETE BLOCK  
 2. AFTER CURB STOP IS PLACED ON CONCRETE BLOCK BACKFILL AROUND CURB STOP WITH WASHED GRAVEL APPROX. 1FT PER BOX

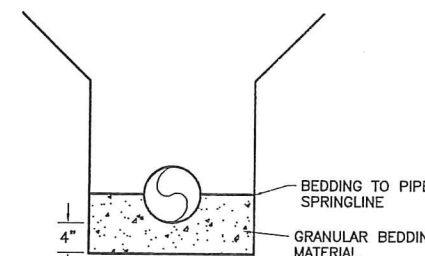
CURB STOP & DRAIN WITH BASE CURB BOX



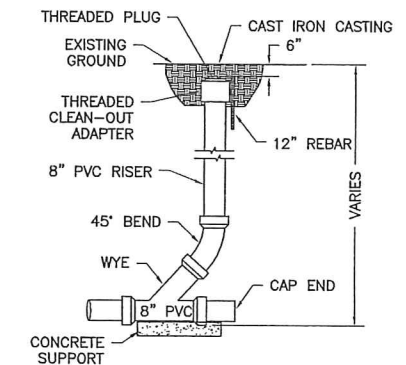
SAND CUSHION BEDDING-SUPPORT ENTIRE LENGTH OF PIPE SPECIAL COMPACTION REQUIRED TO PIPE SPRING LINE



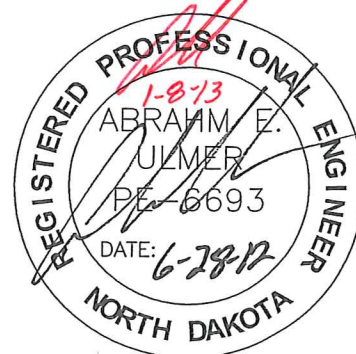
WYE AND RISER DETAILS



WATERMAIN & SEWERMAIN BEDDING DETAIL



CLEANOUT DETAIL



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

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WATER & SEWER DETAILS  
 MEADOW RIDGE 1ST & 2ND ADDITIONS

WATER & SEWER IMPROVEMENTS  
 DISTRICT NO. 2012-05  
 SHEET 10 OF 10  
 MANDAN, ND

JUNE, 2012

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