1044b UIC - EAST POPLAR OIL FIELD ENFORCEMENT CASE
SDWA 1431
Folder ID: 13566 2002 Privileged

East Poplar Oil Field
Enforcement Case

Release in full

Region 8
13566

1044b UIC - EAST POPLAR OIL FIELD ENFORCEMENT CASE
SDWA 1431
Folder ID: 13566 2002 Privileged

East Poplar Oil Field
Enforcement Case
Safe Drinking Water Act §1431
Officer: Nathan Wiser

INTERSTATE ENGINEERING, INC.
P.O. Box 648
SIDNEY, MONTANA 59270

(406) 482-5617

LETTER OF TRANSMITTAL

DATE 8-9-02 JOB NO. 502-44

ATTENTION NATHAN WISER

RE: WATERLINE EXTENSION
EPA ORDER
POPLAR, MONTANA

Region 8
13566

TO EPA
999 18TH ST., SUITE 300
DENVER, CO 80202-2456

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			PLANS
1			SPECIFICATIONS

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS
AS REQUESTED BY DAN MARCH, LAND + WATER CONSULTING

COPY TO FILE

RECYCLED PAPER: Contents: 40% Pre-Consumer • 10% Post-Consumer

SIGNED: Wendy Sundheim

If enclosures are not as noted, kindly notify us at once.

INTERSTATE ENGINEERING, INC.
P.O. Box 648
SIDNEY, MONTANA 59270

(406) 482-5617

LETTER OF TRANSMITTAL

DATE 8-9-02 JOB NO. S02-44

ATTENTION NATHAN WISER

RE: WATERLINE EXTENSION
EPA ORDER
POPLAR, MONTANA

TO EPA
999 18TH St., SUITE 300
DENVER, CO 80202-2456

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

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COPIES	DATE	NO.	DESCRIPTION
1			PLANS
1			SPECIFICATIONS

Misc Box 2
Clip to file folder
From Interstate Engineering, Inc
I E S02-44

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CONSTRUCTION PLANS
FOR
PIPELINE EXTENSION & BOOSTER STATION
POPLAR, MONTANA
JULY 2002

IEI No. S02-44

DRAWN BY: A.M.R.
CHECKED BY: BRM
DATE: JUNE 2002
JOB NO. S02-44
REVISIONS:

APPROVED

_____ 20____

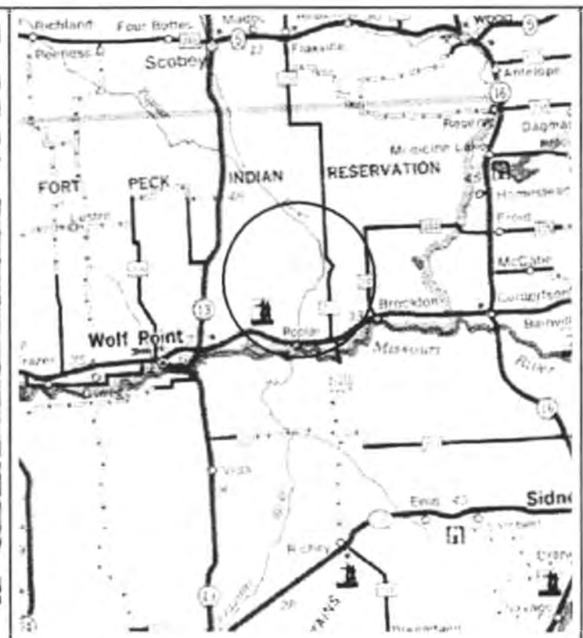
BY : _____
BRIAN R. MILNE, P.E.
AREA MANAGER

APPROVED

_____ 20____

BY : _____
JOHN OSS
PROJECT MANAGER

LOCATION MAP:
N.T.S.



VICINITY MAP:
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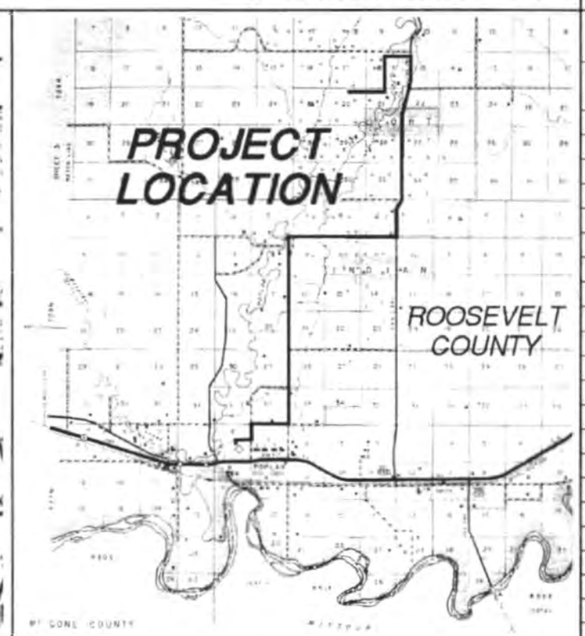

QUADRANGLE MAP:
N.T.S.

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SHEET
1

EXISTING TOPOGRAPHY

- HORZ. CONTROL POINT
- PROPERTY PIN
- POWER POLE (OVERHEAD)
- GUY WIRE
- LIGHT POLE
- STREET SIGN
- DRILL HOLE
- TELEPHONE PEDESTAL
- MAIL BOX
- CURB & GUTTER
- R\W OR PROPERTY LINE
- TREE
- HEDGE
- WIRE FENCE

EXISTING UTILITIES

- FIRE HYDRANT
- VALVE
- TEE
- CROSS
- 90° BENDS
- REDUCER
- MANHOLE
- CURB STOP
- SANITARY SEWER LINE
- NATURAL GAS LINE
- WATER LINE

NEW UTILITIES

- FIRE HYDRANT
- VALVE
- TEE
- CROSS
- 90° BEND
- REDUCER
- MANHOLE
- CURB STOP
- 8"SAS — SANITARY SEWER LINE
- 8"W — WATER LINE
- PROPOSED FENCE
- PROPERTY LINE

DESIGN CRITERIA

GENERAL

CURRENT AVERAGE DAILY FLOW	1.3629/M/HOUSEHOLD
DESIGN POPULATION	20 HOUSEHOLDS
AVERAGE DAILY FLOW	10,000GPD

LAGOON AERATION

ACTUAL OXYGEN TRANSFER RATE	N/A
STANDARD OXYGEN TRANSFER RATE	N/A

DISINFECTION

TYPE	N/A
SODIUM HYPOCHLORITE	N/A
TREATMENT STANDARD	2PPM

BOOSTER STATION

MAIN PUMPS	DUPLEX 279PM @ 200PSI 5 HORSEPOWER 2 PUMPS @ 27 GPM EACH
JOCKEY PUMP	59 PM @ 200PSI

MAXIMUM SYSTEM PRESSURE

200PSI

MINIMUM SYSTEM PRESSURE

35PSI

NOTES

GENERAL NOTES:

1. THE ENGINEER UTILIZED UTILITY INFORMATION AND LOCATES PROVIDED BY THE UTILITY COMPANIES INVOLVED. CONTRACTORS SHALL BE RESPONSIBLE TO CONTACT ALL UTILITY COMPANIES PRIOR TO START OF CONSTRUCTION.
2. EXPLORATION BY CONTRACTOR MAY BE REQUIRED TO AVOID CONFLICTS BETWEEN NEW SEWER LINES AND EXISTING UTILITY LINES. INCIDENTIAL TO WATER MAIN CONSTRUCTION.
3. CONTRACTOR TO FIELD VERIFY EXACT ELEVATION OF UTILITY CROSSINGS BEFORE PLACEMENT OF WATER MAIN AND SERVICE LINES.

ABBREVIATIONS

@	AT
ADDN.	ADDITION
A.M.	AMENDED
ASSY	ASSEMBLY
AVE	AVENUE
BF VALVE	BUTTERFLY VALVE
BM	BENCH MARK
℄	CENTERLINE
C-C	CENTER TO CENTER
CTV	CABLE TELEVISION
C.F.	CUBIC FEET
CONC.	CONCRETE
CPLG	COUPLING
CU	COPPER
DIA	DIAMETER
DR.	DRIVE
E	EAST
EXIST.	EXISTING
HORIZ	HORIZONTAL
HYD	HYDRANT
INV.	INVERT
LT	LEFT
LF	LINEAL FEET
LN	LANE
MAT'L	MATERIAL
MAX.	MAXIMUM
MD	MEASURE DOWN
MH	MANHOLE
IN	MINIMUM
N	NORTH
NE	NORTH EAST
NW	NORTH WEST
GAS	NATURAL GAS
DIP	DUCTILE IRON PIPE
℘	PROPERTY LINE

OHP	OVER HEAD POWER
INV. EL=	INVERT ELEVATION
RIM EL=	RIM ELEVATION
O.D.	OUTSIDE DIAMETER
PVMT	PAVEMENT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVMT	PAVEMENT
R	RADIUS
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RED'R	REDUCER
R.R.	RAILROAD
RT	RIGHT
R/W	RIGHT OF WAY
S	SOUTH
SAN	SANITARY
SAS	SANITARY SEWER
SE	SOUTH EAST
SHT	SHEET
ST	STREET
STL	STEEL
SW	SOUTH WEST
TBM	TEMPORARY BENCH MARK
TYP	TYPICAL
UGT	UNDERGROUND TELEPHONE
UGP	UNDERGROUND POWER
V.P.I.	VERTICAL POINT OF INTERSECTION
VERT	VERTICAL
W	WEST
X-ING	CROSSING
<PT	ANGLE POINT
CIP	CAST IRON PIPE
PVC	POLY VINYL CHLORIDE PIPE

Revision No.	Date	By	Description

LEGEND
WATERMAIN EXTENSION
RURAL ROUTE WATER
ROOSEVELT COUNTY, MONTANA

Drawn By L.A.Y. Project No. 502.44
Checked By B.R.M. Date JULY 2002

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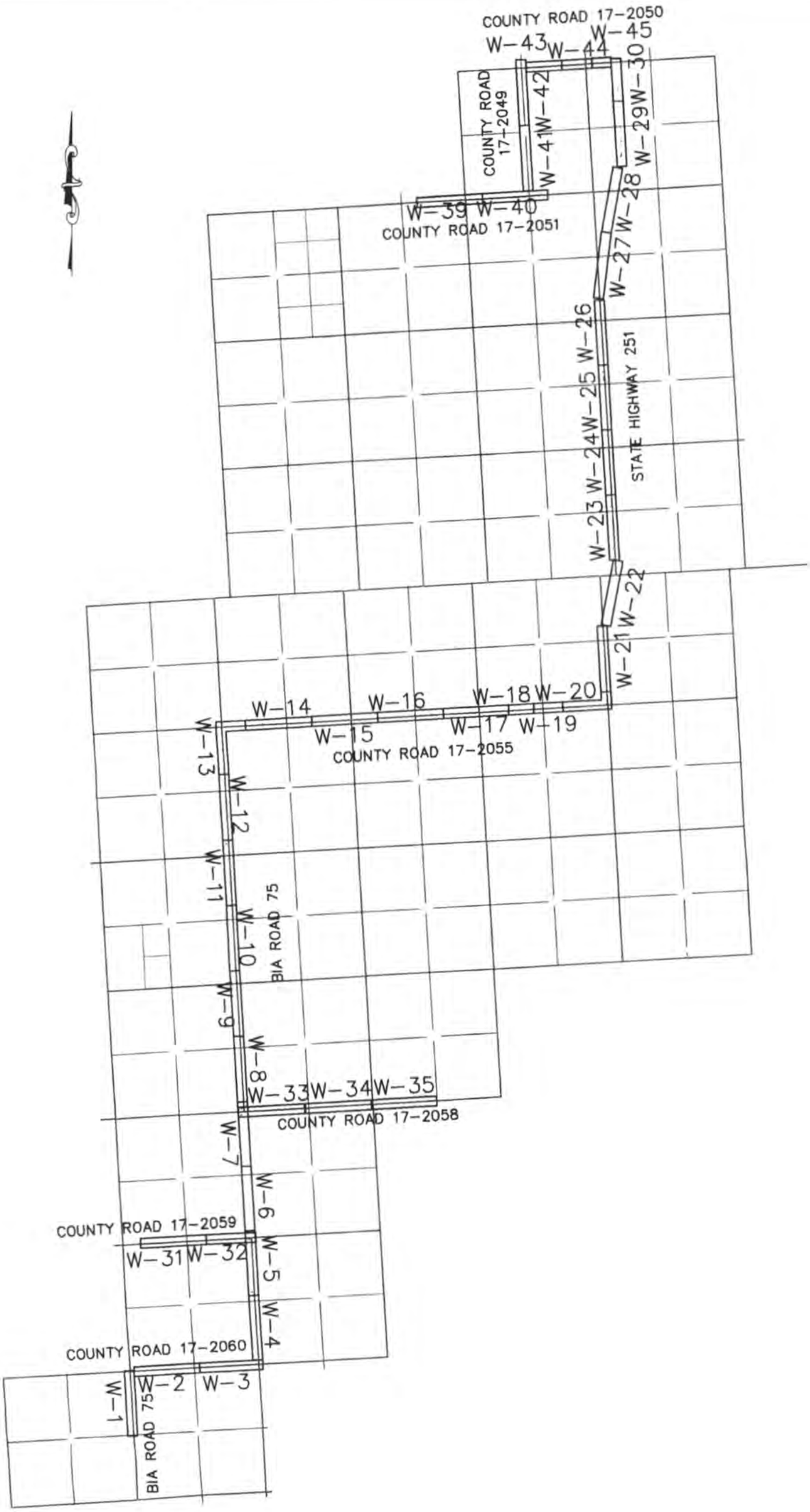
SHEET 2



NOT TO SCALE

SHEET L-1

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POPLAR WATERMAIN EXTENSION
SHEET LAYOUT
ROOSEVELT COUNTY, MONTANA

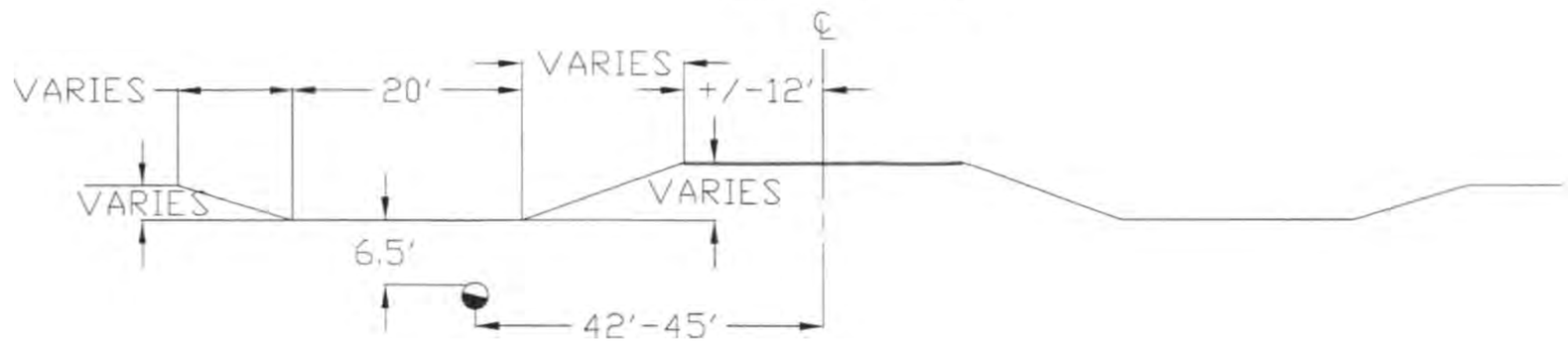
POPLAR, MONTANA

Drawn By D.R.S. | Project No. 502-44

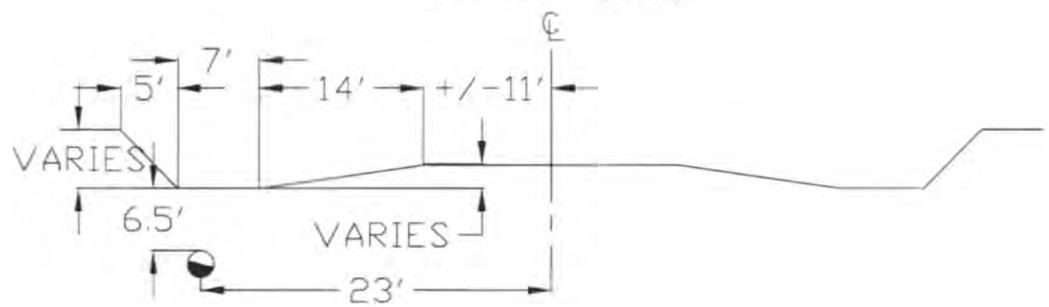
Checked By J.K.D. | Date AUGUST 2002

Revision No.	Date	By	Description

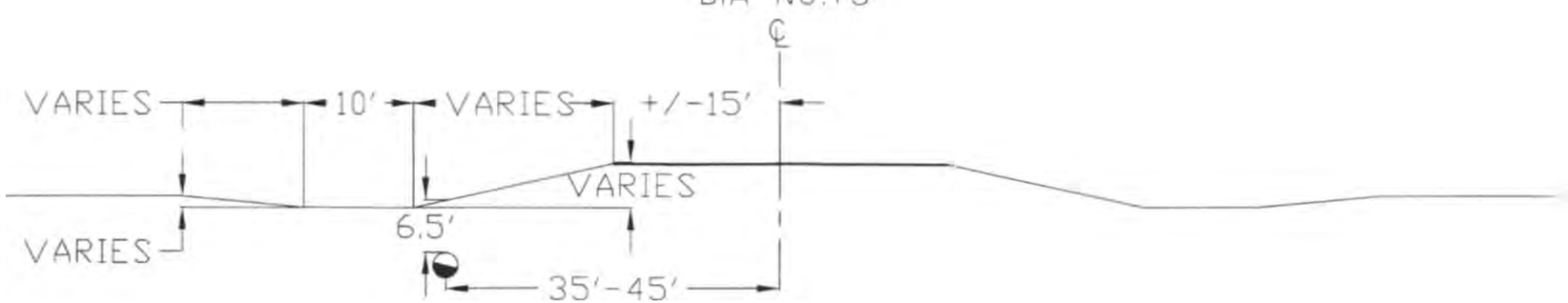
HIGHWAY NO.251



COUNTY ROAD



BIA NO.75



Revision No.	Date	By	Description

TYPICAL CROSS SECTION
POPLAR PIPELINE

POPLAR, MONTANA

Drawn By LAT Project No. 302-44

Checked By JEG Date JULY 2002

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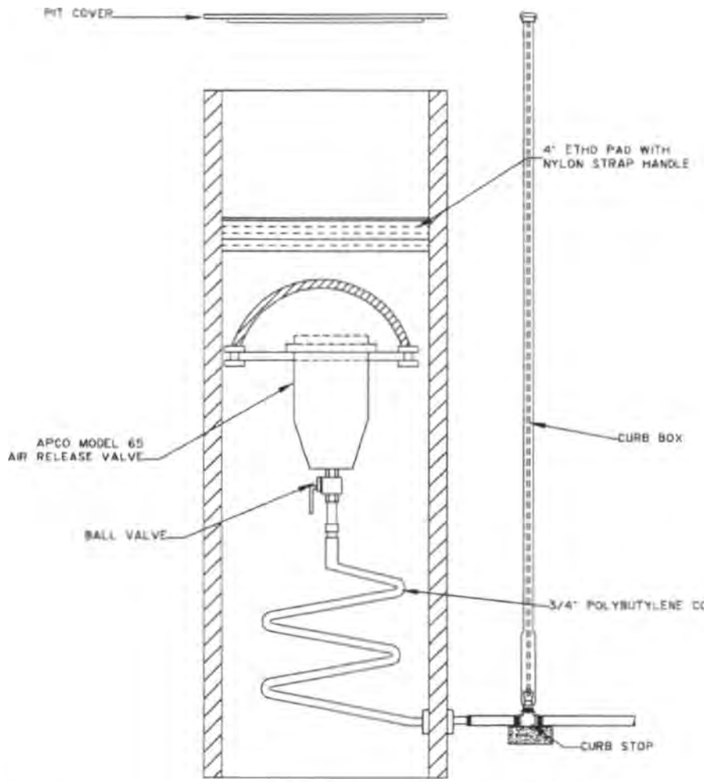
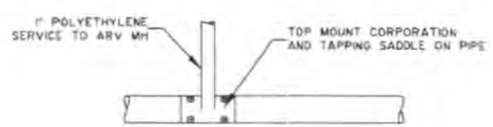
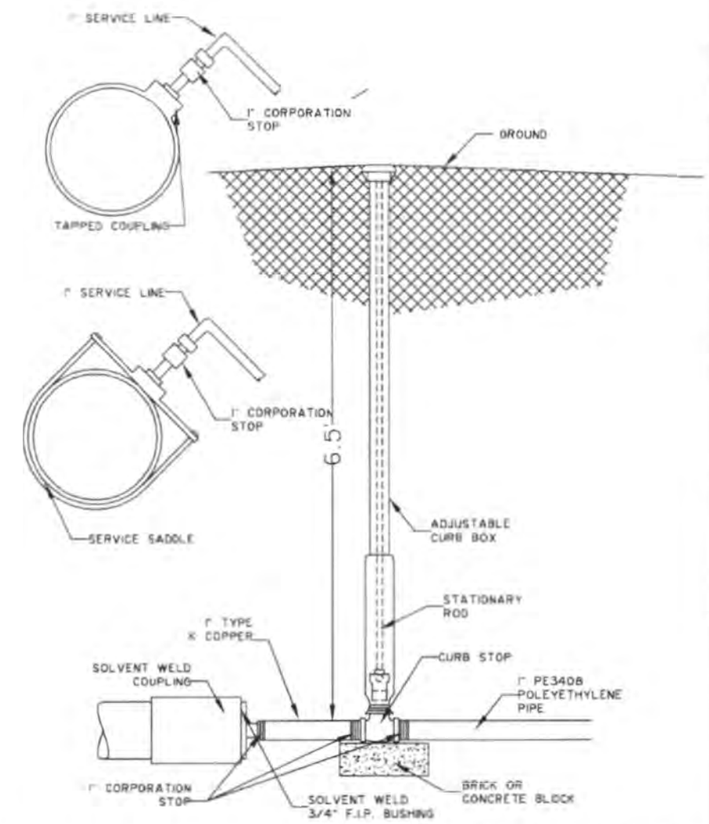
SHEET

WATER METER DETAIL

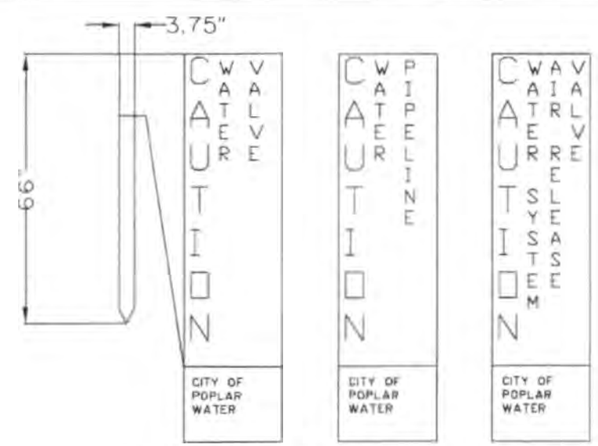


AIR RELEASE VALVE PIT DETAIL





CURB STOP AND CURB BOX SETTING



SIGN DETAIL

Revision No.	Date	By	Description

POPLAR WATER MAIN PIPELINE

POPLAR, MONTANA

Drawn By J.S.V. Project No. 502-44

Checked By J.K.D. Date AUGUST 2002

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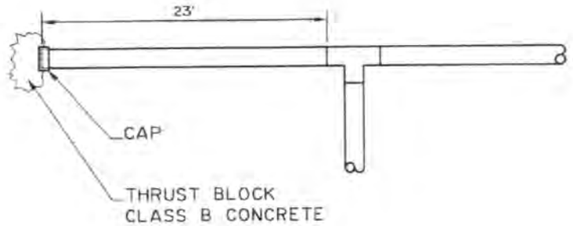
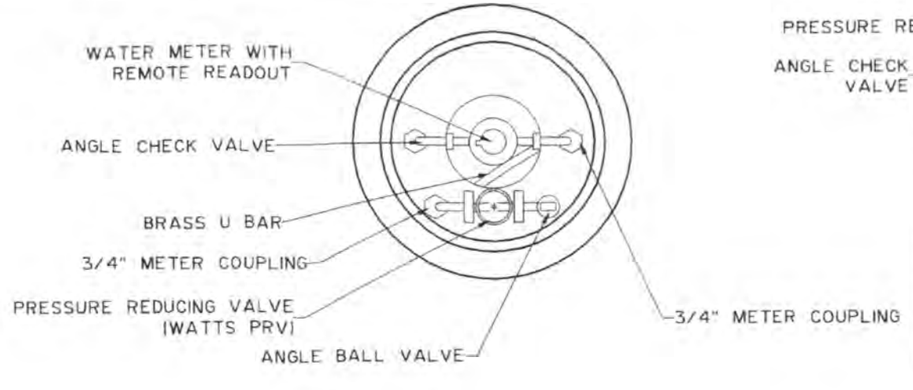
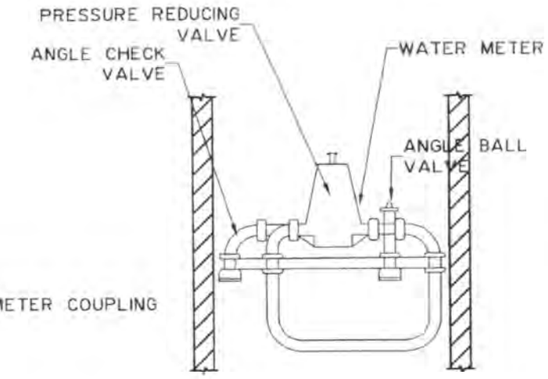
SHEET D-?

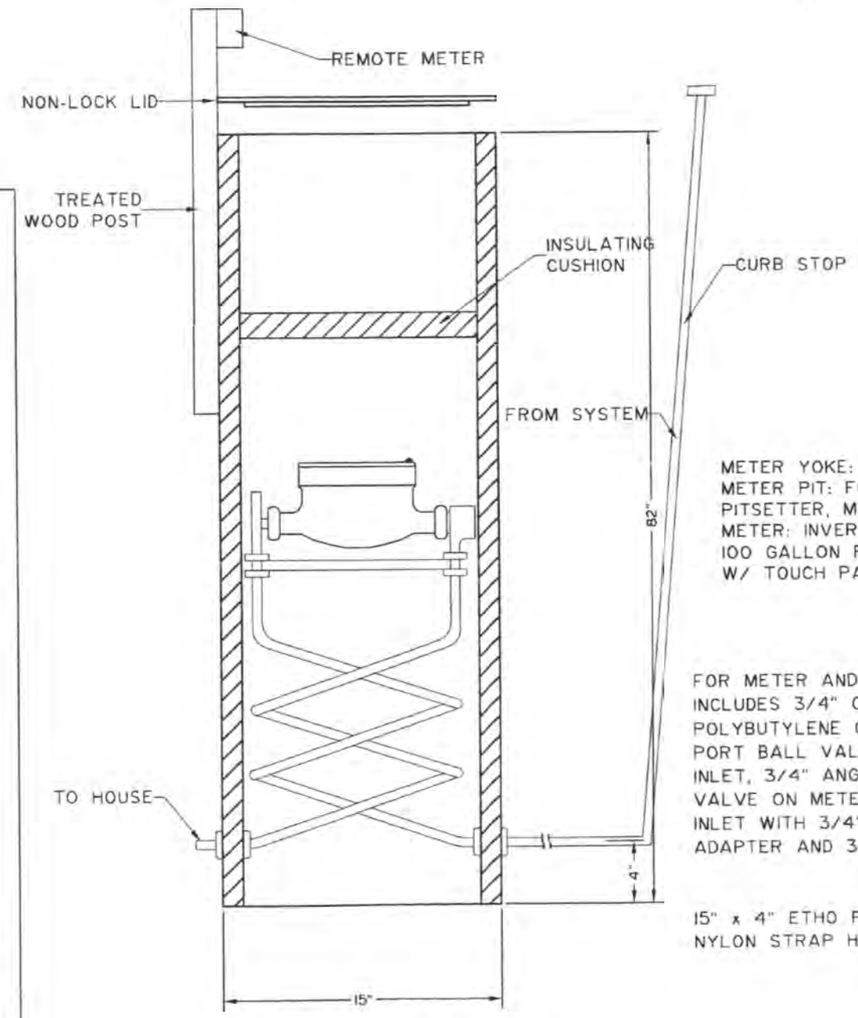


PIPELINE CAPPING

N.T.S.







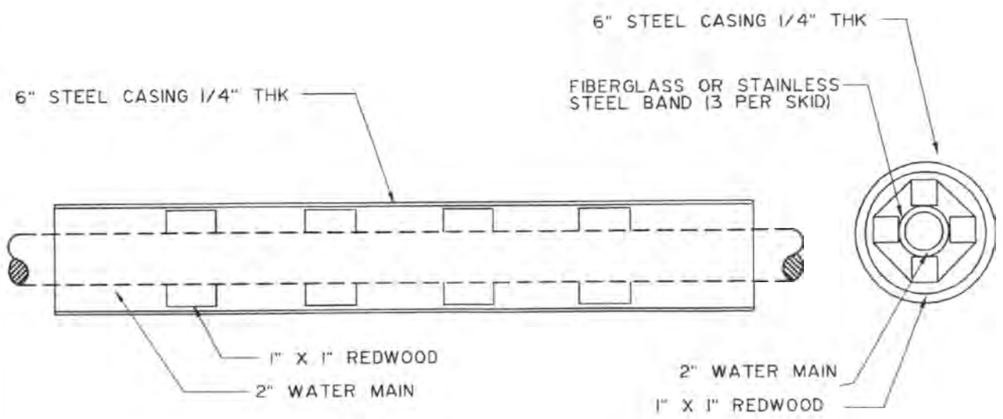
METER YOKE: FORD COPPERHORN
METER PIT: FORD TANDEM
PITSETTER, MODEL PD
METER: INVERSYSIS SR ECR
100 GALLON READING METER
W/ TOUCH PAD

FOR METER AND 3/4" WATTS INCLUDES 3/4" CLASS 250 POLYBUTYLENE COIL, 3/4" FULL PORT BALL VALVE ON METER INLET, 3/4" ANGLE DUAL CHECK VALVE ON METER OUTLET, 3/4" INLET WITH 3/4" x 1-1/2" BRASS ADAPTER AND 3/4" OUTLET.

15" x 4" ETHO PAD WITH NYLON STRAP HANDLE.

METER PIT DETAIL

N.T.S.



TYPICAL CASED PUSH AND BORE

N.T.S.

SECTION

N.T.S.

Revision No.	Date	By	Description

POPLAR WATER MAIN PIPELINE

POPLAR, MONTANA

Drawn By L.A.T. Project No. 502-44

Checked By J.K.O. Date AUGUST 2002

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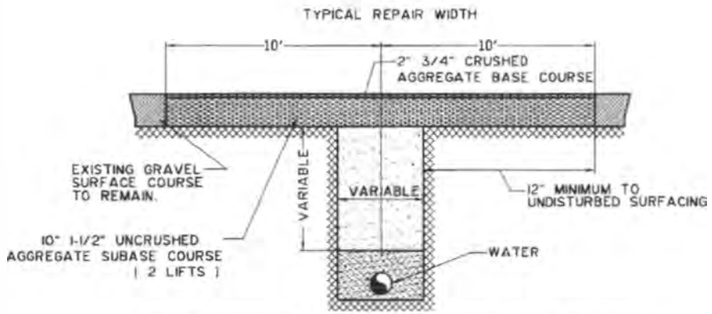
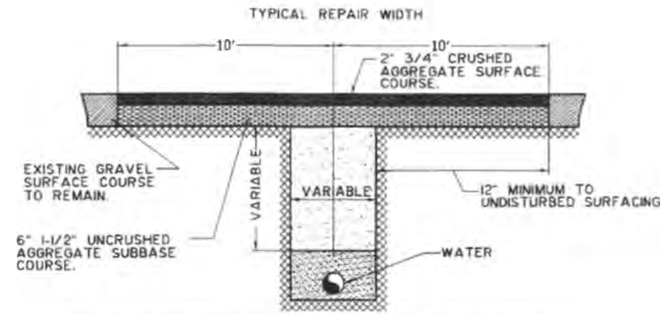
SHEET

D-?



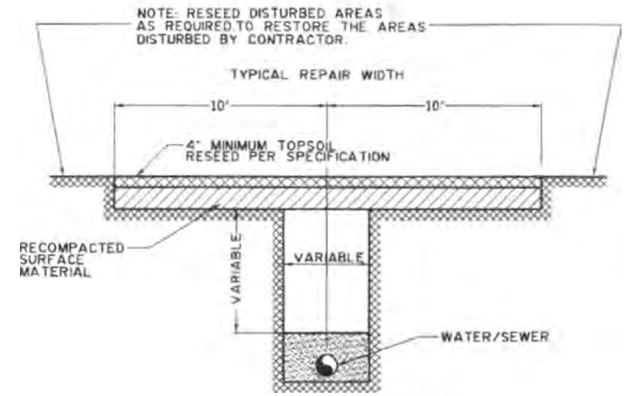
GRAVEL RESTORATION IS INCIDENTAL TO "SITE WORK" PAY ITEM

BIA ROAD GRAVEL SURFACE RESTORATION



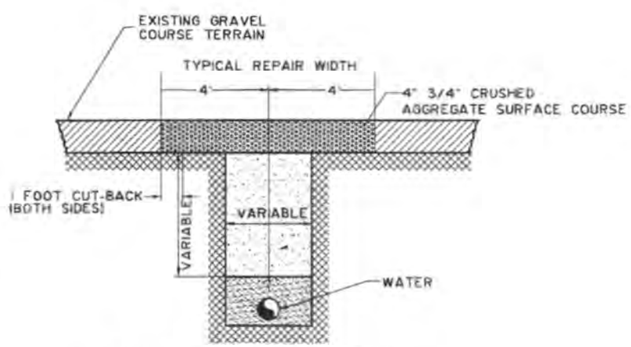
GRAVEL RESTORATION IS INCIDENTAL TO "SITE WORK" PAY ITEM

COUNTY ROAD GRAVEL SURFACE RESTORATION



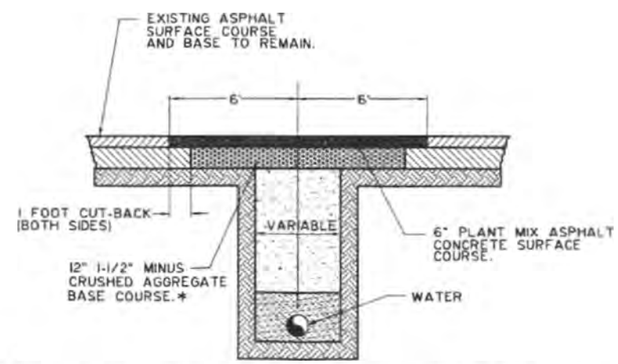
GRASS RESTORATION IS INCIDENTAL TO "SITE WORK" PAY ITEM

GRASS RESTORATION DETAIL



GRAVEL RESTORATION IN DRIVEWAYS IS INCIDENTAL TO "SITE WORK" PAY ITEM.

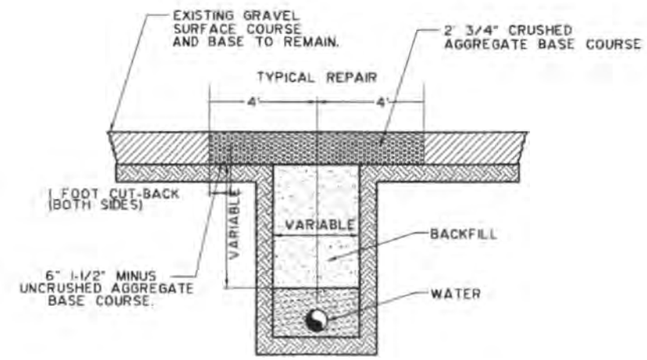
PRIVATE ROAD / DRIVE GRAVEL SURFACE RESTORATION



* WATERLINE CONTRACTOR TO INSTALL 14" OF 1"MINUS CRUSHED BASE COURSE, PAVING SUBCONTRACTOR TO PREPARE THE SUBASE FOR PAVING BY REMOVING, LEVELING AND COMPACTING THE REQUIRED GRAVEL BASE.

NOTE:
WHEN THE EDGE OF THE ASPHALT CUT-BACK IS LESS THAN 2 FEET FROM THE GUTTER AND OUTSIDE THE NORMAL PAY LIMIT, THE ASPHALT SHALL BE REMOVED TO THE GUTTER AND RESTORED. THIS EXTRA SURFACE RESTORATION SHALL BE ADDED IN THE PAY LIMIT.
ASPHALT PAVEMENT RESTORATIONS INCIDENTAL TO "SITE WORK" PAY ITEM

ASPHALT RESTORATION



GRAVEL RESTORATION IN DRIVEWAYS IS INCIDENTAL TO "SITE WORK" PAY ITEM.

BIA AND COUNTY GRAVEL DRIVEWAY / RESTORATION

Revision No.	Date	By	Description

14 MILE POPLAR WATERMAIN
SEC. 33, T23N, R59E
POPLAR, MONTANA
Drawn By JLD Project No. 302-44
Checked By BRM Date JUL 2002

interstate engineering, inc.
Engineering - Surveying - Planning
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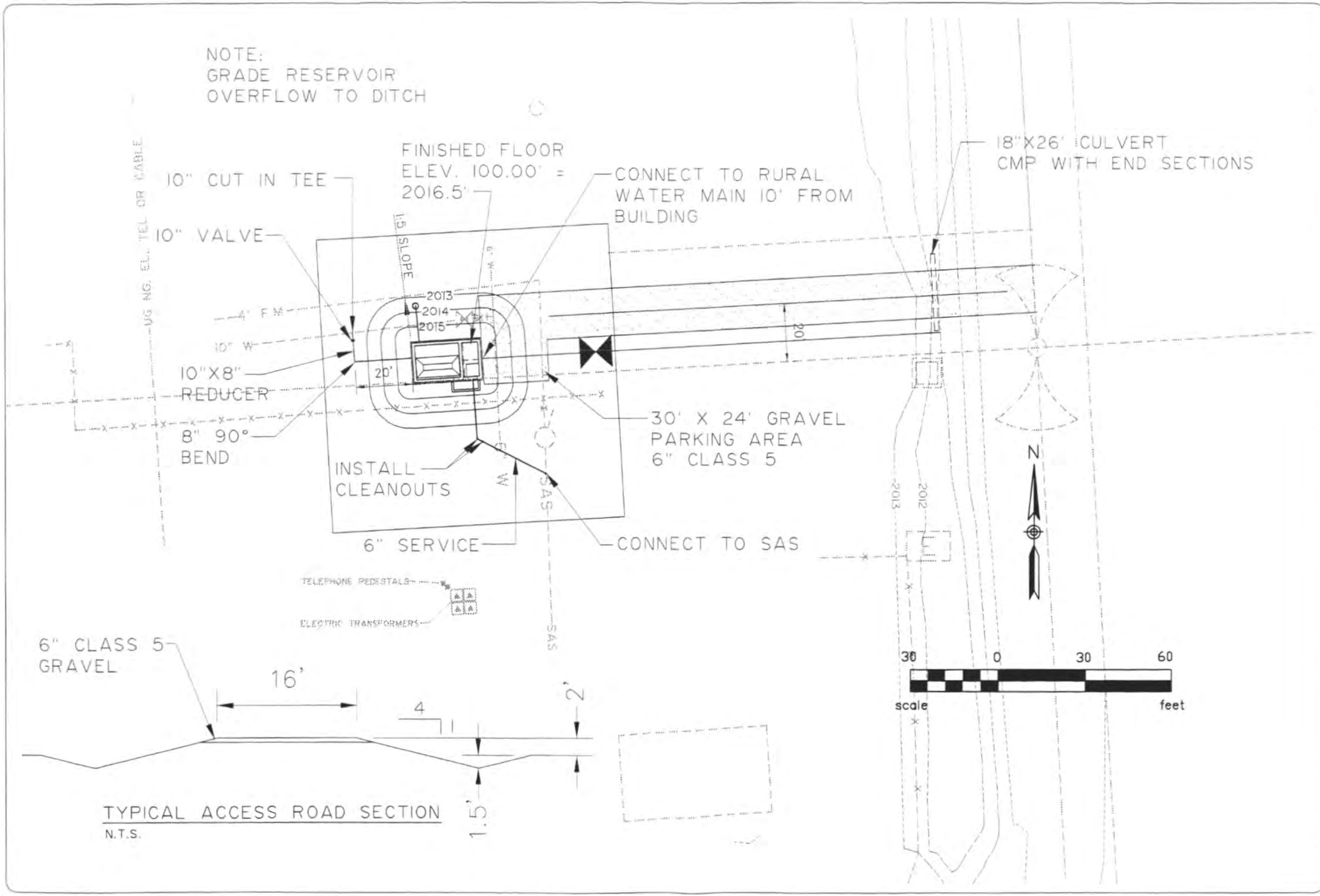
SHEET 1

NOTE:
GRADE RESERVOIR
OVERFLOW TO DITCH



TYPICAL ACCESS ROAD SECTION
N.T.S.

Revision No.	Date	By	Description

BOOSTER STATION
SITE PLAN
POPLAR, MT.
Drawn By T.E.L. Project No. 503-44
Checked By D.R.H./ B.R.M. Date AUGUST 2002

interstate engineering, inc.
Engineering - Surveying - Planning
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SHEET
C1

I. ADDITIONAL SPECIFICATIONS WHICH APPLY

The following specifications shall apply and supplement these Plans and Specifications:

ACI318-95 Building Code Requirements for Reinforced Concrete
ACI318R-95 Building Code Requirements for Reinforced Concrete-Commentary
Recommended Standards For Water Works, Great Lakes Upper Mississippi River Board of State Public Health Environmental Managers.
Uniform Building Code Edition

II. REINFORCING STEEL

A. Minimum concrete cover over reinforcing steel
1. Concrete surface cast against earth — 3 inches
2. All other exposures — 2 inches
3. Column spirals or tie bars — 2 inches

B. All reinforcing steel shall be bent cold. Field bending shall not be performed unless shown on the drawings or permitted by the Engineer.

C. Minimum lap splices (Grade 60 bars, f'c = 4000 PSI)
The following minimum lap splices pertain to bars in walls or slabs with spacings no less than 3db (db = bar diameter) and clear cover with no less than 2db. For columns the lap splices listed below apply if ACI318-95 section 7.10.5 for tie spacing/size requirements are adhered to. For beams these lap splices apply only if the requirements of ACI318-95 sections 11.5.4 and 1.5.5.3 for stirrup spacing/size are adhered to for all cases, the minimum cover requirements noted above shall apply. In the event concrete with a higher compressive stress is specified th elap slice shall remain as shown.

MINIMUM LAP SPLICES (INCHES)

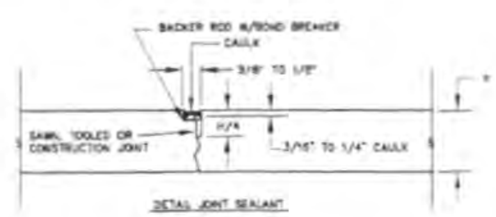
Bar Size	Top Bars	Other
3	18	14
4	24	20
5	30	24
6	36	28
7	42	33
8	50	42
9	64	50
10	82	63
11	100	78

1. Top bars are defined as horizontal bars with 12 inches or more of fresh concrete to be cast below the bar.
2. For lap splices between bars of different sizes the splice length noted for the larger bar shall be used unless noted otherwise.

III WATERSTOP DETAILS AND NOTES

A. BENTONITE ROPE WATERSTOPS

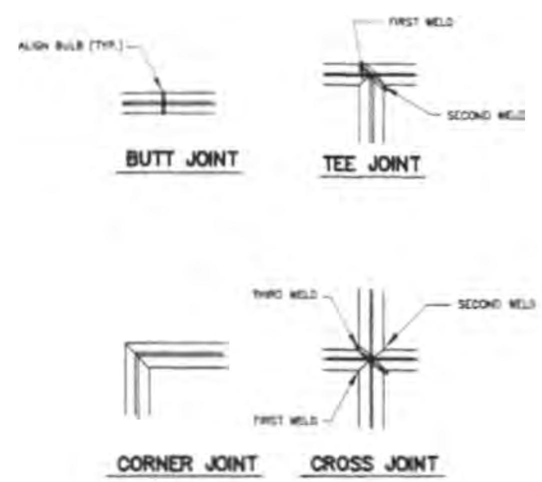
1. Bentonite rope waterstops shall be placed within joints so as to provide no less than 2 inches of cover over the waterstop in the completed joint.
2. Surfaces to which waterstops are to be applied shall be primed with a butyl primer in accordance with the manufacturer's recommendations.
3. Bentonite waterstops shall be secured in place with cut nails driven through the material at intervals not to exceed 12".
4. Joints in bentonite waterstops shall be kneaded together to form a continuous rope.



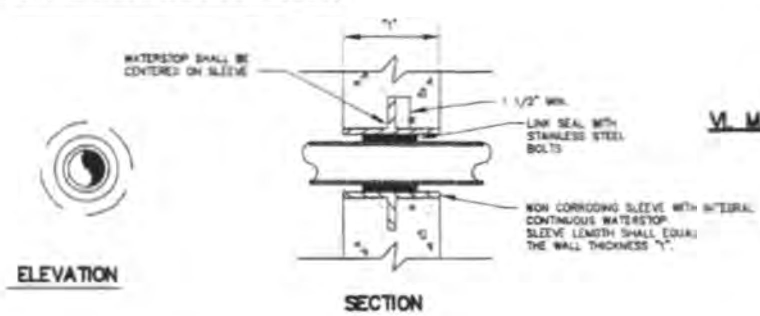
DETAIL JOINT SEALANT

B. PVC WATERSTOPS

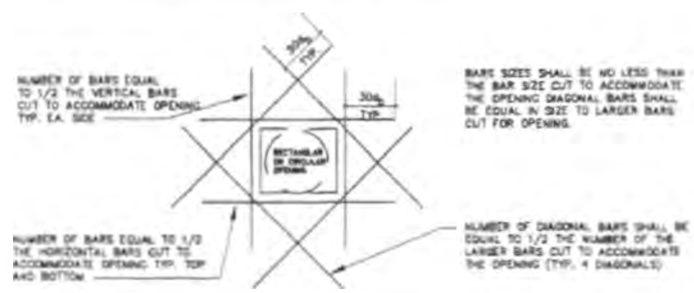
1. PVC waterstops shall be secured in place with tie wires or other means. No wires or nails shall penetrate the waterstop between the second serration from either edge and to middle of the waterstop. When a waterstop is being tied into place, the ties shall be spaced no more than 12 inches.
2. Joints between PVC waterstops shall be made by means of thermal welding. The layout of the joints shall be as detailed below. The iron for welding PVC waterstops shall be capable of maintaining a temperature of 380°F to 410°F. All PVC waterstops which are overheated as indicated by discoloration of the material, shall be discarded.
3. PVC waterstop joints shall not be stressed until they have thoroughly cooled.
4. All welds in PVC waterstops shall be continuous throughout the width and thickness of the waterstop.



IV. PIPE PENETRATION DETAILS



TYPICAL DETAIL FOR REINFORCING STEEL AROUND OPENINGS



NOTES

1. This detail shall apply to all openings which, due to their size, result in the interruption of reinforcing steel or have a diameter or, in the case of rectangular openings, a dimension greater than 6 inches.
2. The detail shown applies to all layers of reinforcing steel in the structural element through which the opening passes.
3. A minimum of 2" clear shall be maintained between the reinforcing steel and the edge of the opening or sleeve.
4. db = bar diameter.
5. The annulus of penetrations which do not require link seals shall be roped and caulked.

V. CONCRETE CONSTRUCTION

A. FORM RELEASE AGENTS

Form release agents which may remain on the surface of concrete within water containment structures shall be nontoxic and shall be odorless and colorless.

B. CONSTRUCTION JOINTS

1. Construction joints shall be located as shown on the plans. Alternate location may be used as approved by the Engineer. Construction joints shown on the plans ARE NOT optional unless noted otherwise.
2. If the Contractor wishes to propose alternate construction joint layouts, details of those layouts shall be submitted to the Engineer for review prior to submittal of shop drawings for the reinforcing steel.
3. In joints constructed where a waterstop is called for PVC waterstops may be substituted for bentonite rope waterstops. The bentonite rope waterstops SHALL NOT be substituted for PVC waterstops unless approved by the Engineer.
4. PVC waterstops shall be furnished for all joints where a waterstop is called for unless noted otherwise.

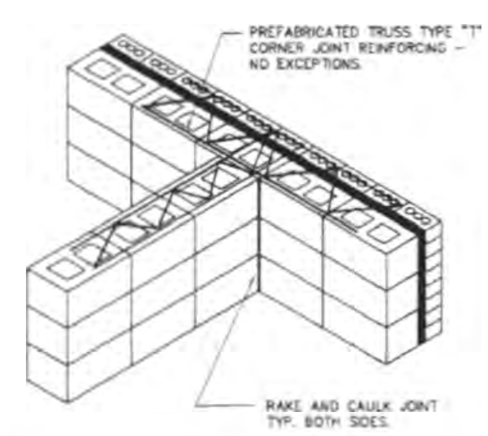
C. PLACEMENT OF REINFORCING STEEL

1. Reinforcing steel which is placed adjacent to a concrete surface which shall be cast against earth shall be supported away from the earth surface with CMU blocks of the appropriate thickness. The CMU blocks shall be wired to the reinforcing bars they support.
2. Reinforcing steel which is placed adjacent to a concrete surface which shall be cast against wood, metal or other removable form work shall be supported away from the formwork with chairs or bolsters. All components of the chairs or bolsters which are in contact with the form shall be noncorroding. Components of the chairs or bolsters which are subject to corrosion shall not be placed within one inch of the formed surface.
3. Bolsters shall be provided between the layers of reinforcing steel within walls and slabs.
4. The spacing of bolsters, chairs and other reinforcing steel supports shall be limited so as to prevent displacement of the reinforcing due to placement of the concrete. In the case of slabs all layers of reinforcing steel shall be supported so as to be capable of carrying the loads of the workers placing the steel and concrete.

D. EMBEDDEMENT

1. All aluminum surfaces to be placed in concrete with concrete shall be coated with bitumastic paint.
2. A minimum of two (2) inches of clear cover shall be provided between all embedements and reinforcing steel and waterstops.

VI. MASONRY



NOTES:
1. For corners - prefabricated truss type corner joint reinforcing shall be used.
2. At corners only the exposed joint shall be raked and caulked.

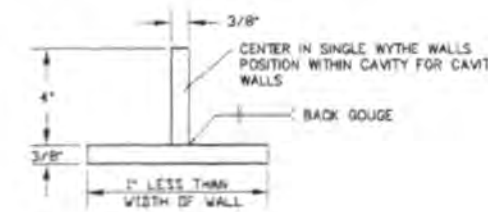
DETAIL - MASONARY WALL INTERSECTIONS

MASONRY

1. Joint reinforcing shall not extend through control joints.
2. Joint reinforcing in mortar bed joints shall be made continuous by overlapping for a distance of no less than 75 wire diameters (12 inches for 9 Ga.).
3. At control joints reinforcing steel shall extend through the joint for a distance of 18 inches. The 18 inch portion of bar shall be greased to prevent bond and shall lap the bars within the bond beam that extend from the joint by no less than 15 inches.
4. Control joints shall be either Michigan - type or tongue-and-grooved type. The mortar in the control joints shall be raked and caulked.
5. All caulk used in masonry joints shall closely match the color of the mortar.
6. The reinforcing in bond beams of intersecting walls shall continue around the corners with bent bars. The minimum lap on bond beam and vertical reinforcing shall be:

BAR SIZE	LAP LENGTH
4	36"
5	45"
6	54"

7. All openings in masonry walls up to 48" wide for doors, windows, mechanical and electrical penetrations in excess of 12 inches of width shall be furnished with a lintel beam as detailed below. The lintel beam shall bear no less than 8 inches on each side of the opening unless noted otherwise. For openings wider than 48" see detail on drawings.



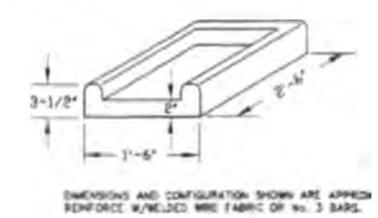
DEATIL - LINTEL BEAM
N.T.S.

VII. BUILDING LOADS

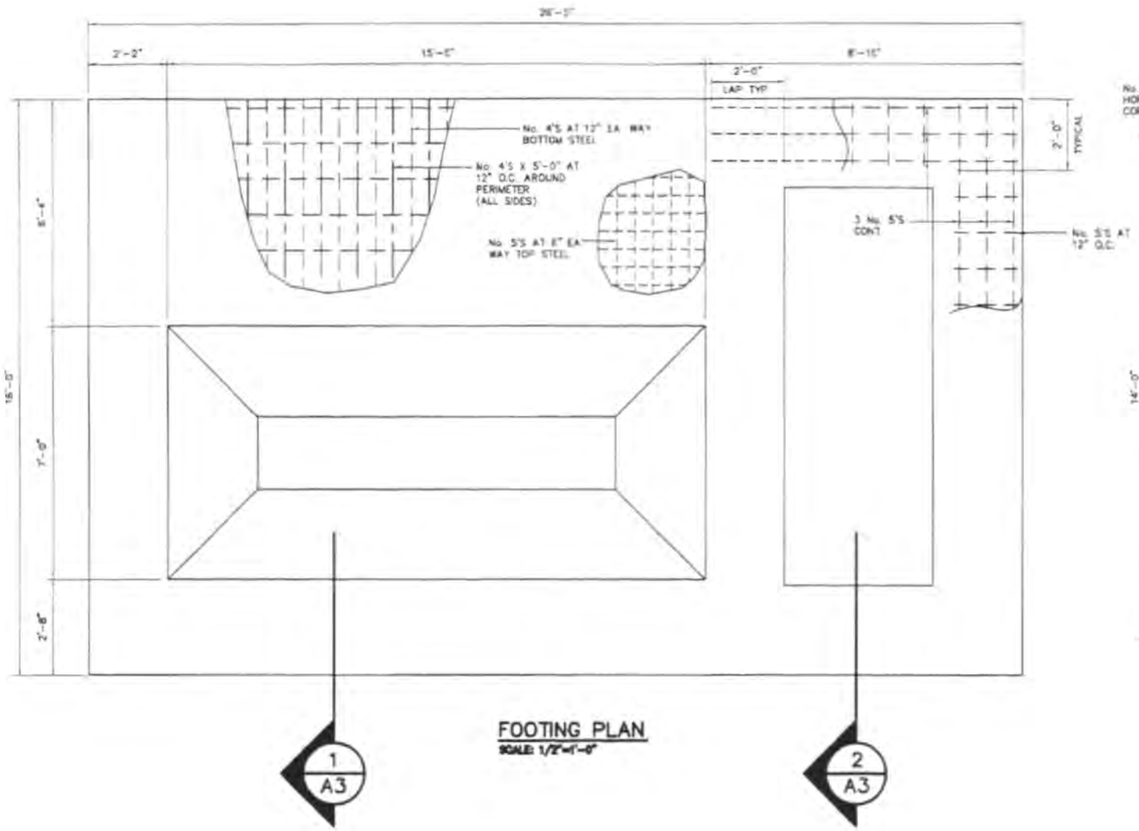
In addition to self weight of structural members and equipment loads, the following live loads shall be supported by various structural components. Sizes of precast concrete shown herein are preliminary in nature. Contractors shall base their bids on component sizes required to support the actual dead and live loads plus impact applied to the structure. Head room and parapets shall be maintained. All revisions to other components of the building and equipment necessary due to the use of different component sizes shall be the responsibility of the Contractor.

LIVE LOAD ON ALL FLOOR AREAS	300 psf
LIVE LOAD ON ROOF (SNOW)	30 psf
WIND LOADS EXPOSURE B	80 mph
MECHANICAL AND ELECTRICAL EQUIPMENT	Actual Weights**
PROCESS EQUIPMENT	Actual Weights**
HOISTS (HOIST + LOAD)	1 1/2 TONS

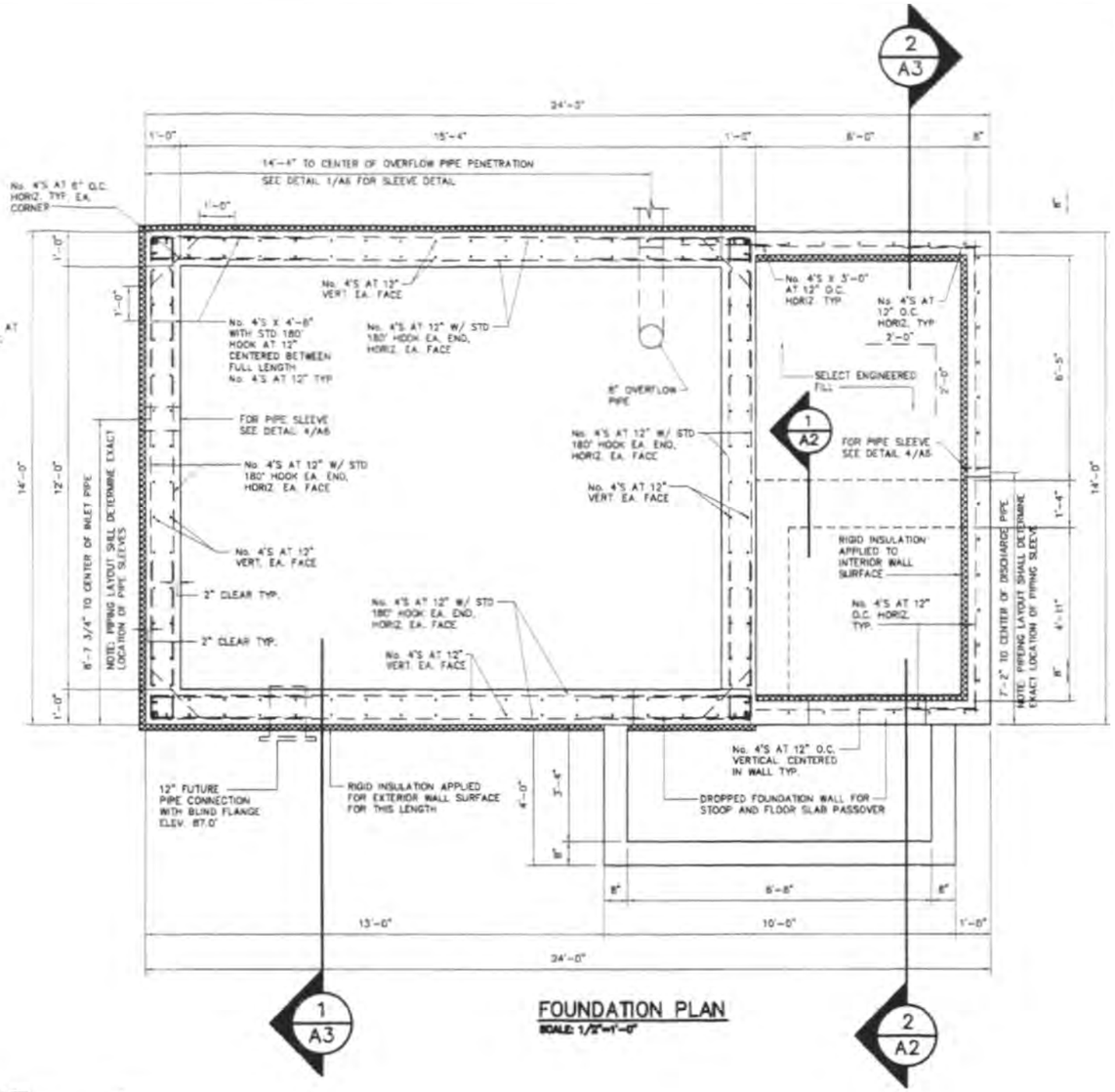
** The design of precast concrete elements shall be based on actual weights of the equipment to be provided by the Contractor.



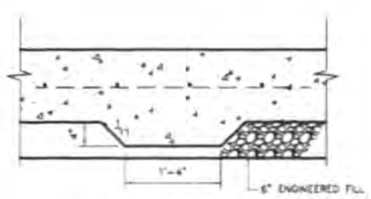
DETAIL - CONCRETE SPLASH BLOCK
N.T.S.



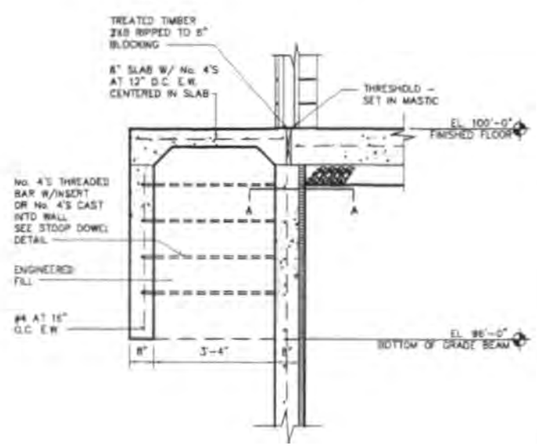
FOOTING PLAN
SCALE: 1/2"=1'-0"



FOUNDATION PLAN
SCALE: 1/2"=1'-0"



1 A2 THICKENED SLAB SECTION
SCALE 1" = 1'-0"



2 A2 STOOP SECTION
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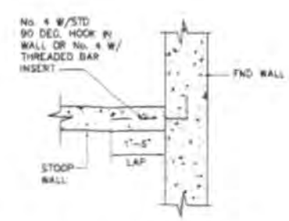

A-A STOOP DOWEL DETAIL

Revision No.	Date	By	Description

BOOSTER STATION
FOOTING AND FOUNDATION PLAN AND DETAILS
POPLAR, MT

Drawn By T.E.L. | Project No. 502-44
Checked By D.R.H./R.R.M. | Date AUGUST 2002

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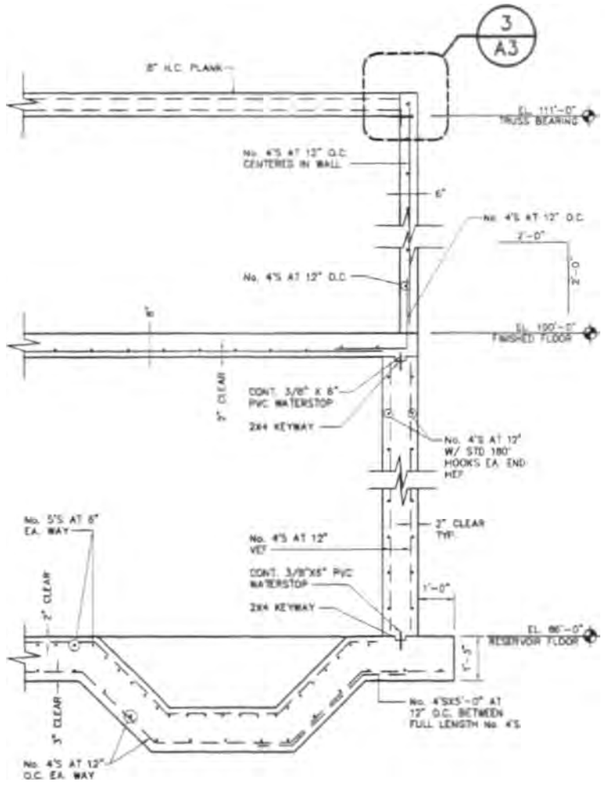
SHEET
A2



1 A3 SECTION
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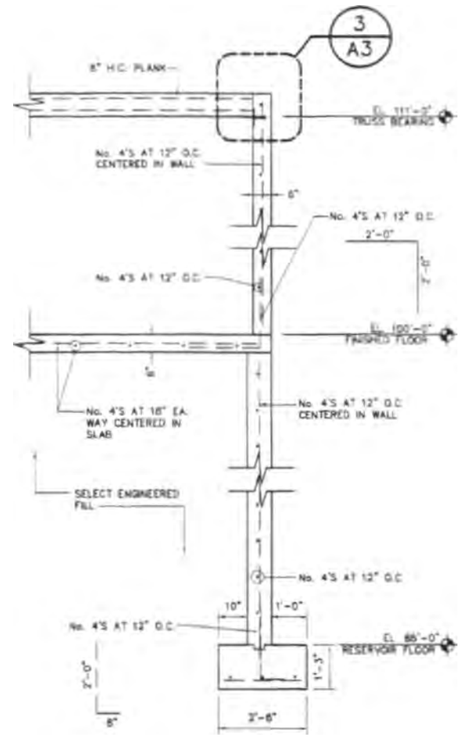

2 A3 SECTION
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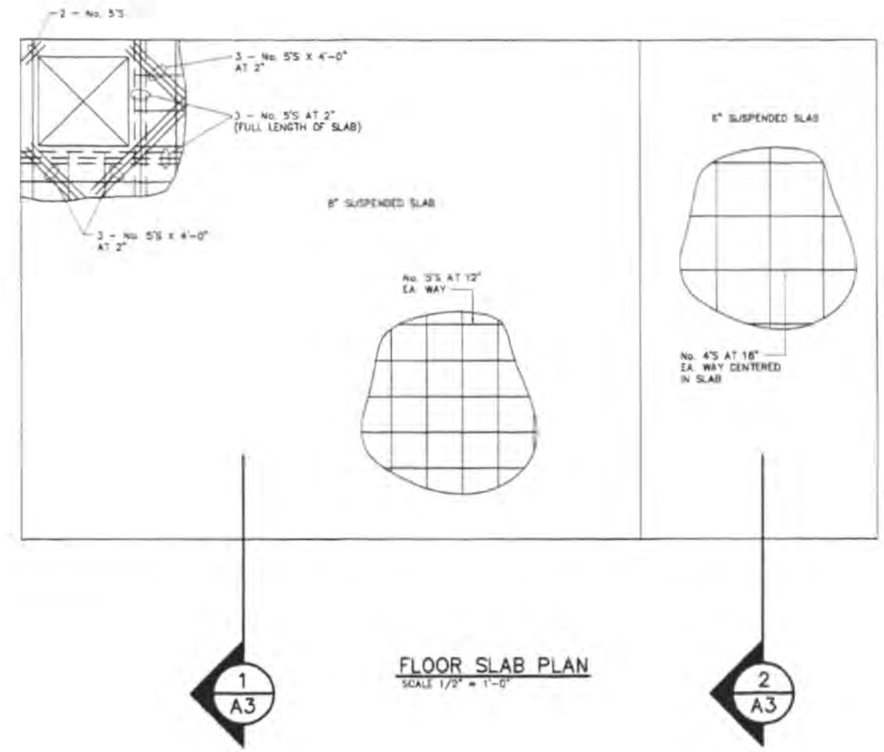
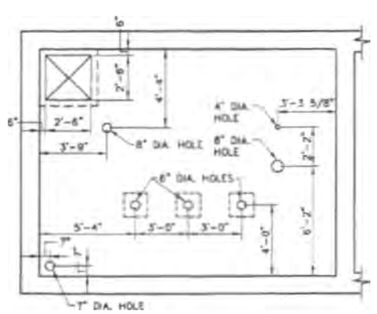
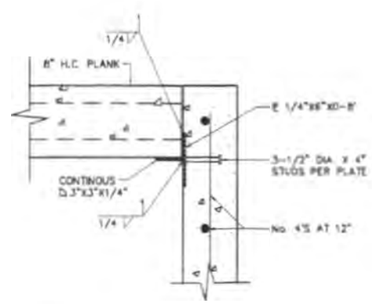


FLOOR SLAB PLAN
SCALE 1/2" = 1'-0"



RESERVOIR ROOF PLAN
SCALE: 1/4"=1'-0"



3 A3 ROOF BEARING
SCALE: 1 1/2 = 1'-0"

Revision No.	Date	By	Description

BOOSTER STATION
REINFORCING PLAN

POPLAR, MT

Drawn By T.E.L. | Project No. 902-44
Checked By D.R.H./B.R.M. | Date AUGUST 2002

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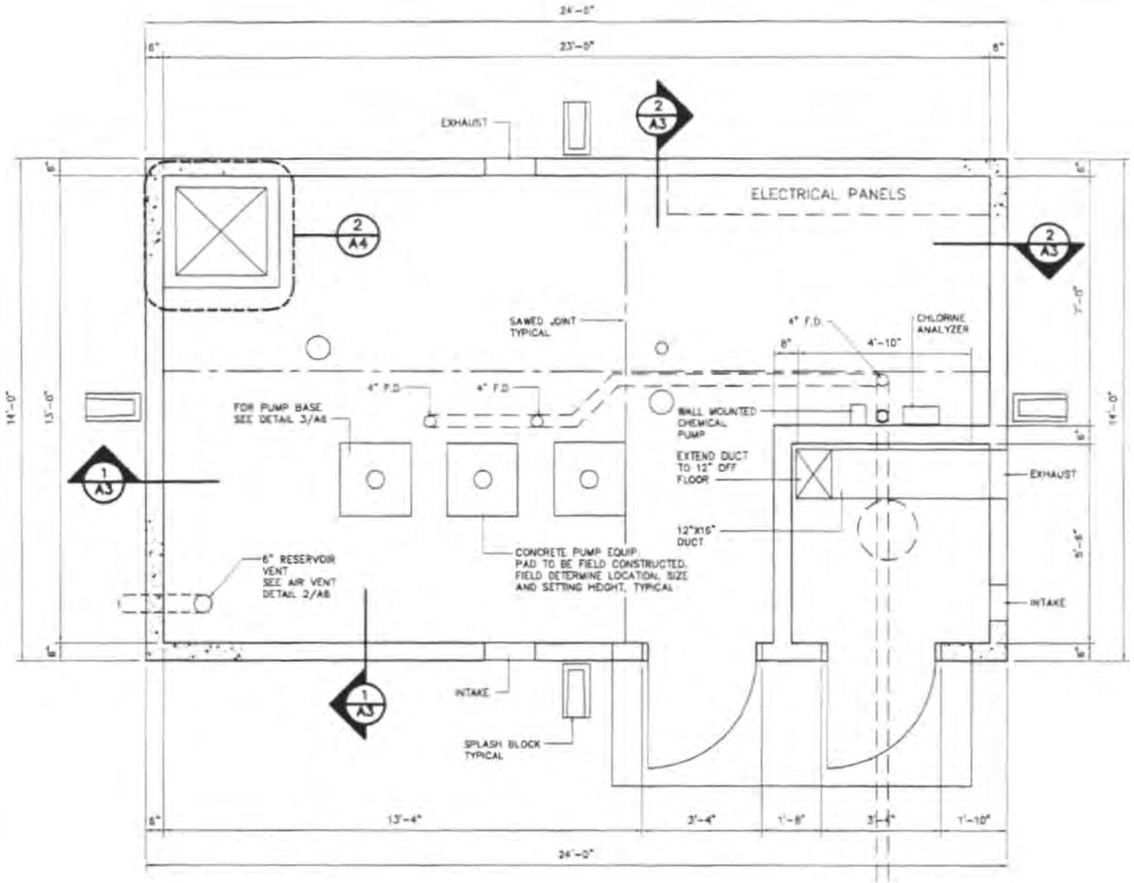
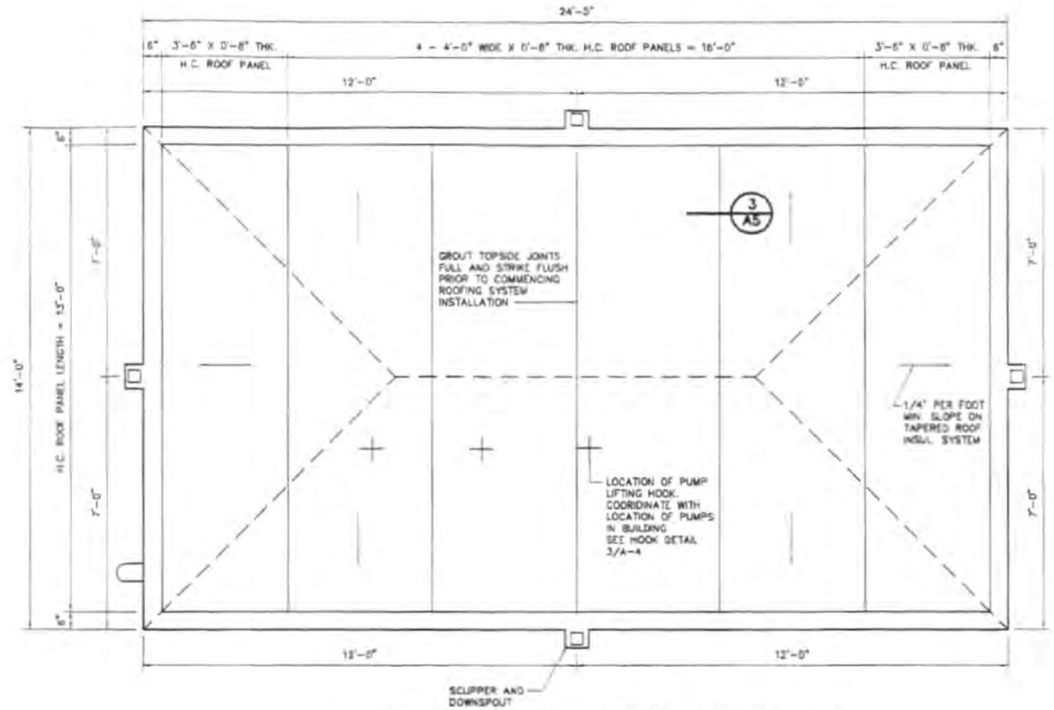
SHEET
A3



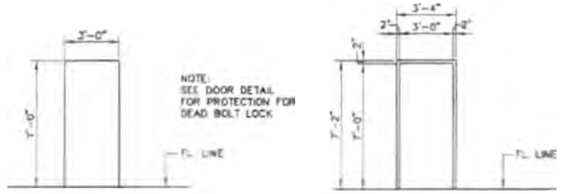
GENERAL NOTE:

CAULK BASE OF ALL WALLS

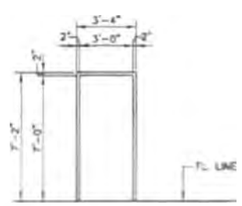
FLOOR PLAN
SCALE: 1/2" = 1'-0"



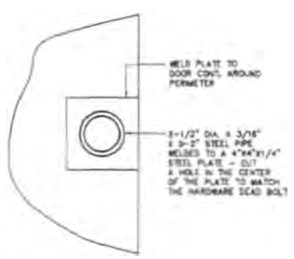
ROOFING PLAN AND H.C. ROOF PANEL PLAN
SCALE: 1/2" = 1'-0"



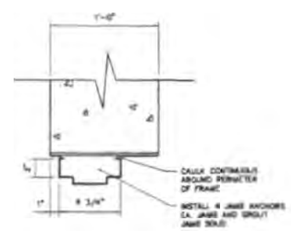
STEEL DOOR ELEVATION
SCALE: 1/4" = 1'-0"



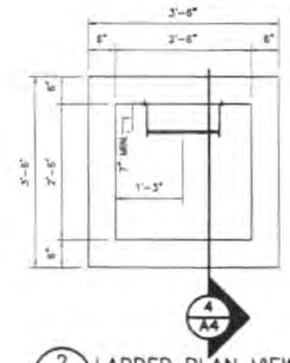
STEEL FRAME ELEVATION
SCALE: 1/4" = 1'-0"



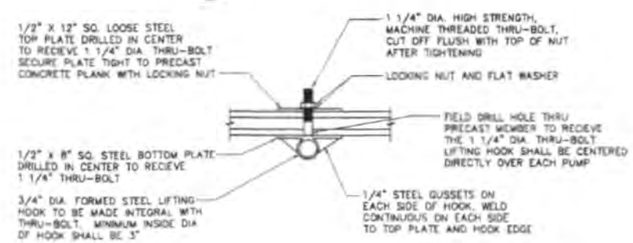
DOOR DETAIL
SCALE



1/A4 HEAD DETAIL
SCALE 1/2" = 1'-0"



2/A4 LADDER PLAN VIEW
SCALE N.T.S.



3/A4 TYPICAL PUMP LIFT HOOK DETAIL
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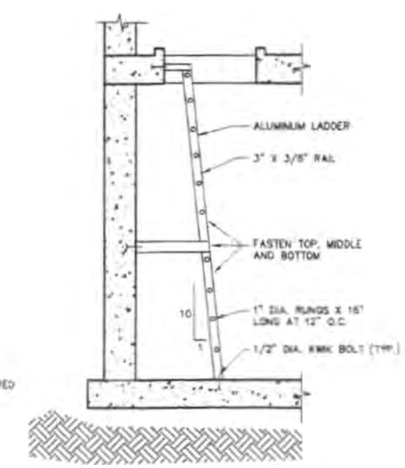

4/A4 RESERVOIR LADDER
SCALE 1/4" = 1'-0"

Revision No.	Date	By	Description

BOOSTER STATION
FLOOR PLAN, ROOF PLAN AND DETAILS
POPLAR, MT

Drawn By I.E.L. Project No. 503-44
Checked By D.R.H./ B.R.M. Date AUGUST 2002

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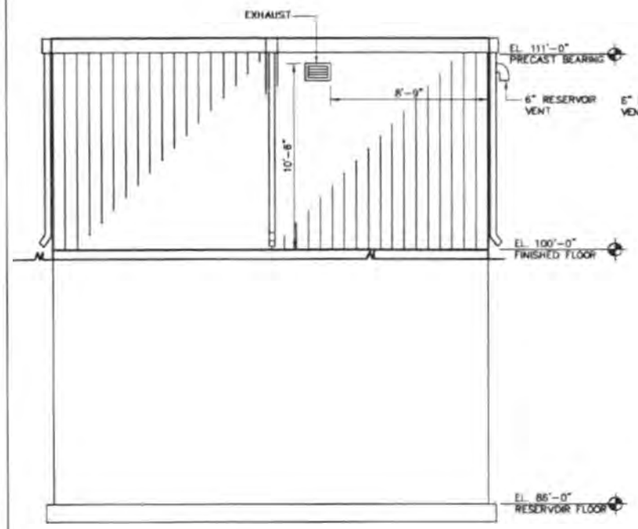
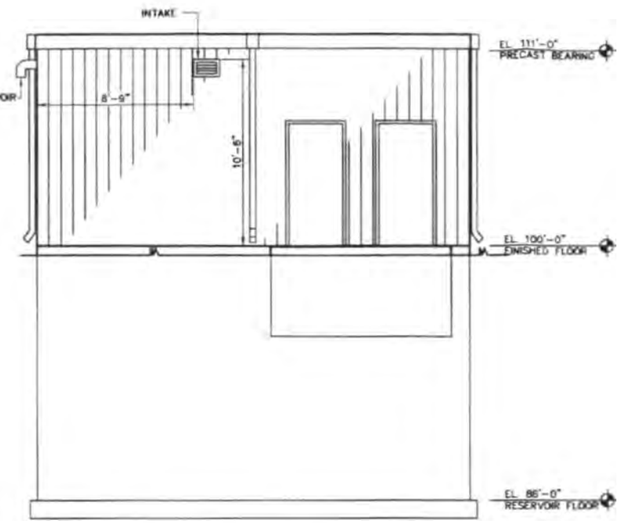
SHEET A4



NORTH ELEVATION
SCALE: 1/4"=1'-0"



SOUTH ELEVATION
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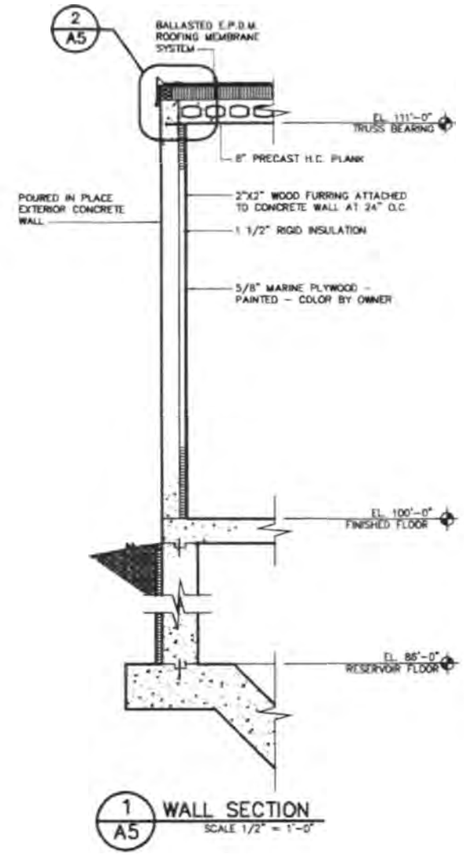
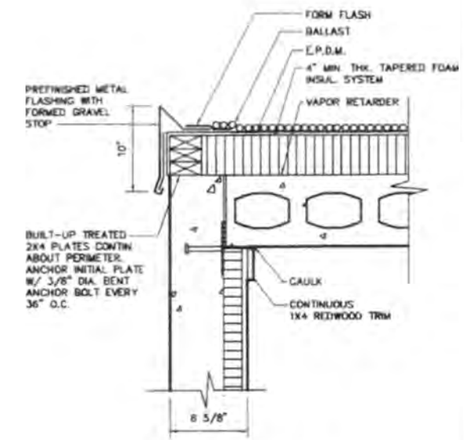
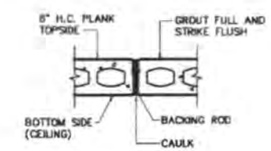


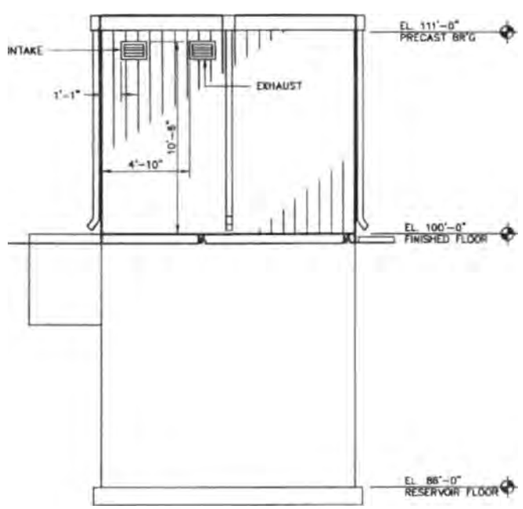
1 A5 WALL SECTION
SCALE 1/2" = 1'-0"



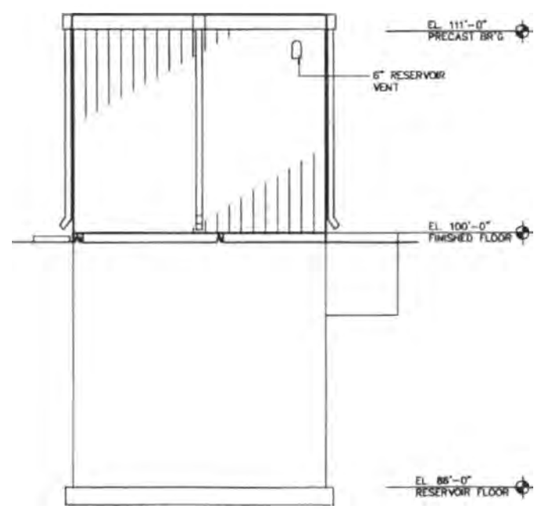
2 A5 WALL DETAIL
SCALE: 1 1/2" = 1'-0"



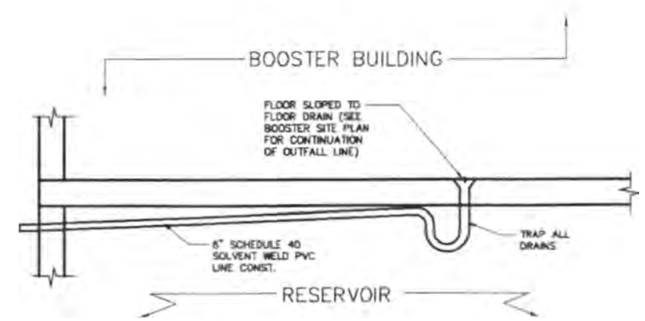
3 A5 DETAIL
SCALE: 3/4" = 1'-0"



EAST ELEVATION
SCALE: 1/4"=1'-0"



WEST ELEVATION
SCALE: 1/4"=1'-0"



BOOSTER BUILDING FLOOR DRAIN SECTION
SCALE: NOT TO SCALE

Revision No.	Date	By	Description

BOOSTER STATION
BUILDING ELEVATIONS, WALL SECTIONS AND DETAILS
POPLAR, MT

Drawn By T.E.L. | Project No. 302-44
Checked By D.R.H./B.R.M. | Date AUGUST 2002

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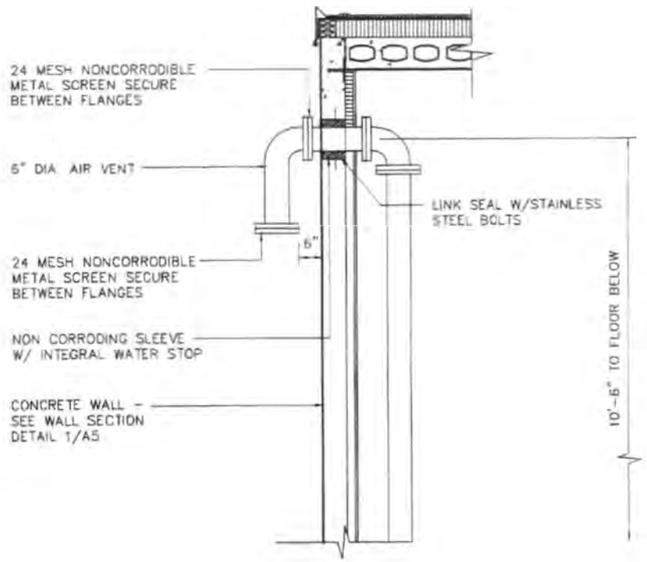
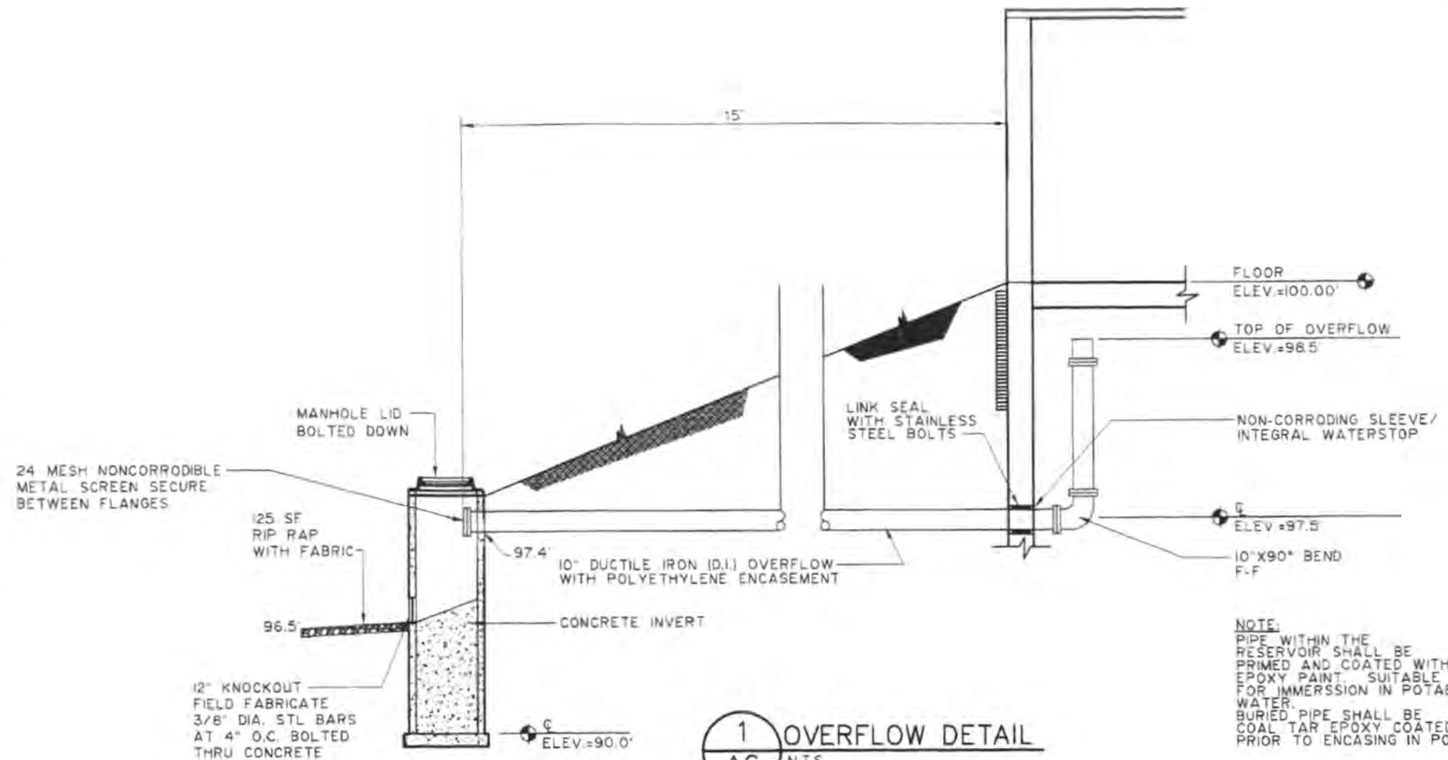
SHEET
A5

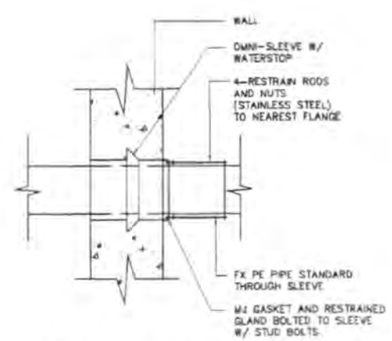


2 / A6 AIR VENT DETAIL
N.T.S.

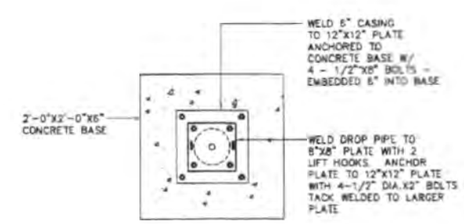


1 / A6 OVERFLOW DETAIL
N.T.S.

NOTE:
PIPE WITHIN THE RESERVOIR SHALL BE PRIMED AND COATED WITH EPOXY PAINT. SUITABLE FOR IMMERSSION IN POTABLE WATER.
BURIED PIPE SHALL BE COAL TAR EPOXY COATED PRIOR TO ENCASING IN POLY.



4 / A6 PIPE PENETRATION DETAIL
N.T.S.



3 / A6 PUMP BASE DETAIL
N.T.S.

Revision No.	Date	By	Description

BOOSTER STATION
MISCELLANEOUS DETAILS
POPLAR, MT
Drawn By T.E.L. Project No. 502-44
Checked By D.R.H./ B.R.M. Date AUGUST 2002

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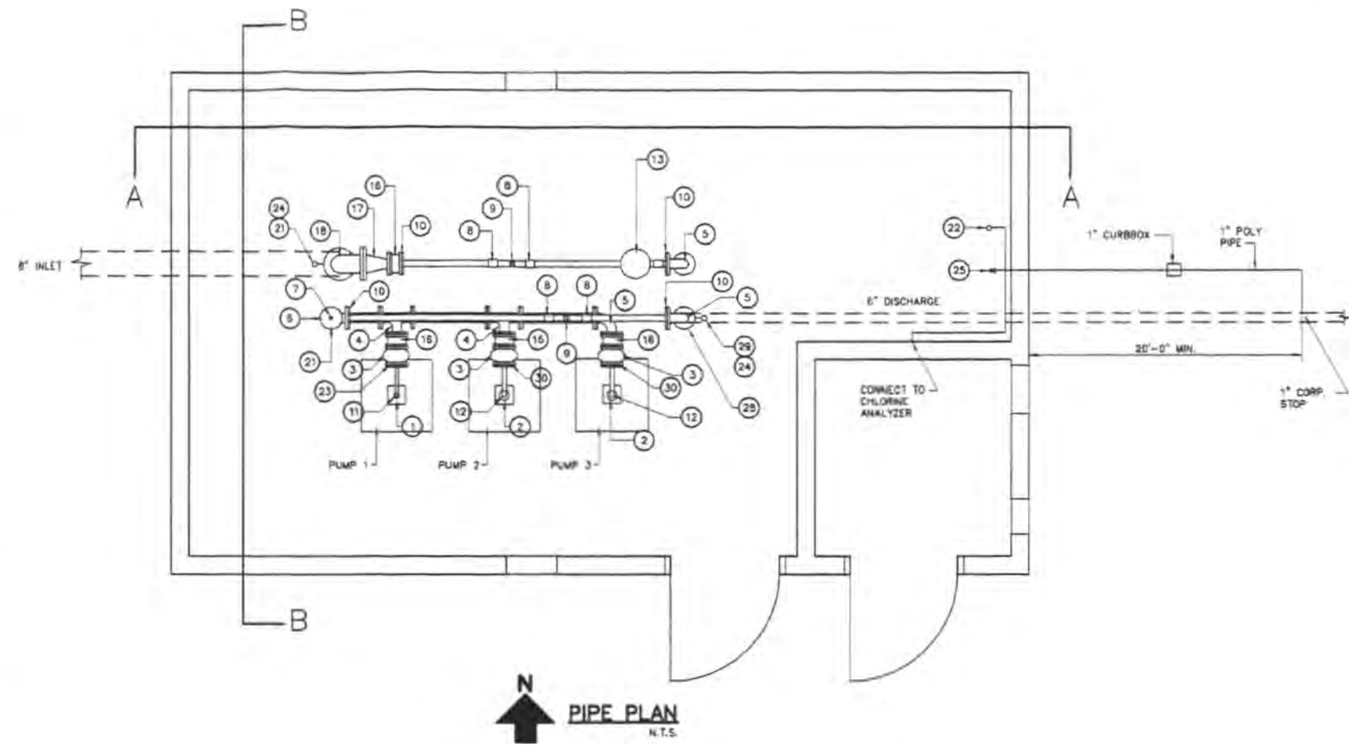
SHEET
A6

PIPE FITTING SCHEDULE

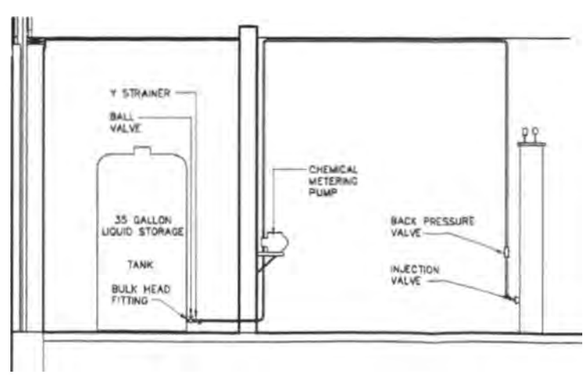
AS INDICATED BY ◯ ON PLANS

No.	ITEM	JOINT	COMMENTS
1	1" EXPANSION JOINT	THREAD COUPLING	
2	1 1/4" EXPANSION JOINT	THREAD COUPLING	
3	3" CHECK VALVE	FLANGE	SILENT CHECK (WAFFLE STYLE)
4	3" TEE	FLANGE	DUCTILE IRON
5	3" 90° BEND	FLANGE	DUCTILE IRON
6	BLIND FLANGE WITH NPT THREAD TO MATCH AIR RELEASE VALVE		FURNISH AS PER SECTION 16900
7	AIR RELEASE VALVE		DUCTILE IRON
8	2" COUPLING	THREADED	WITH BALLVALVE SHUTOFF
9	2" METER	THREADED	GALVANIZE PIPE
10	3"X2" REDUCING FLANGE	THREADED	
11	1" BEND	THREADED	GALVANIZE PIPE
12	1 1/4" 90° BEND	THREADED	GALVANIZE PIPE
13	2" PRESSURE SUSTAINING VALVE WITH SOLENOID (FILL VALVE)	THREADED	FURNISH AS PER SECTION 16900
14	2" METER	THREADED	BY CONTROL SUPPLIER
15	PRESSURE GAUGE	FLANGE	BY CONTROL SUPPLIER
16	3" BUTTERFLY VALVE	FLANGE	DUCTILE IRON
17	6"X3" REDUCER	FLANGE	DUCTILE IRON
18	6" 90° BEND	FLANGE	DUCTILE IRON
19	SUBMERSIBLE PUMP		
20	PRESSURE REDUCING VALVE	THREADED	BY CONTROL SUPPLIER
21	PRESSURE GAUGE		BY CONTROL SUPPLIER
22	3/4" HOSE BIB AND VACUUM BREAKER		
23	3"X1" REDUCING FLANGE	FLANGE	
24	SAMPLE TAP & PETCOCK		
25	1" BALL VALVE		
26	8" 90° BEND	FLANGE	
27	8" X 6" REDUCER	FLANGE	
28	SODIUM HYPOCHLORITE INJECTION ASSEMBLY		
29	PRESSURE GAUGE, BALL VALVE PRESSURE TRANSMITTER		BY CONTROL SUPPLIER
30	3" X 1 1/4" REDUCING FLANGE	FLANGE	



PIPE PLAN

N.T.S.



CHEMICAL FEED DETAIL

N.T.S.

Revision No.	Date	By	Description

BOOSTER STATION PIPING PLAN

POPLAR, MT

Project No. 502-44

Drawn By T.E.L.

Checked By D.R.H./B.R.M.

Date AUGUST 2002

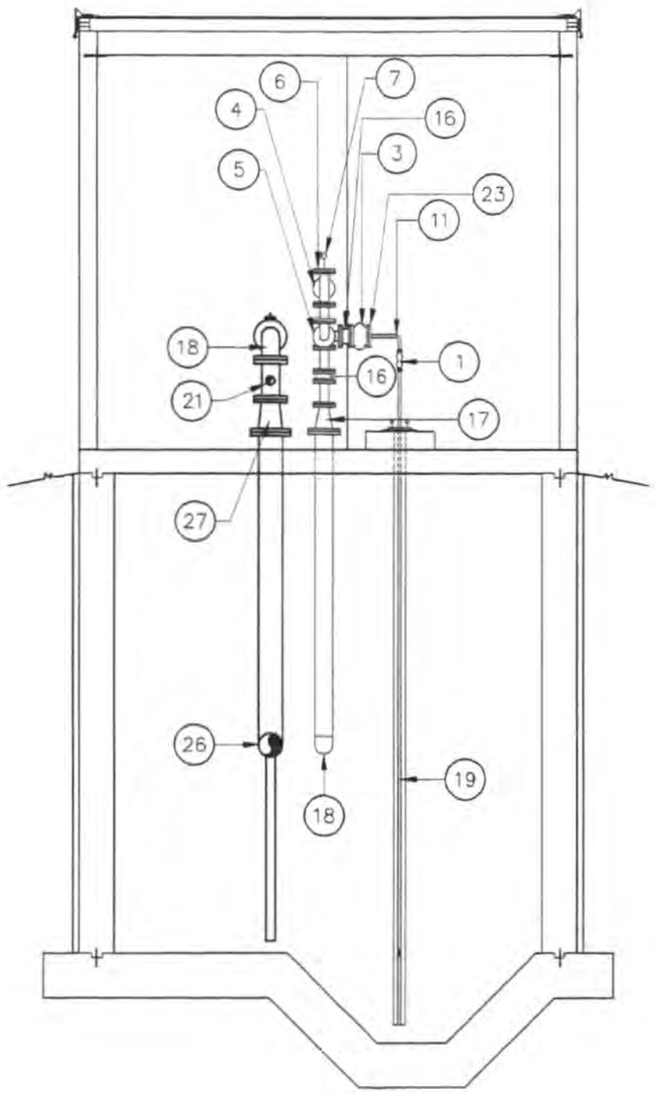
interstate engineering, inc.

Engineering - Surveying - Planning

P.O. Box 648 Sidney, Montana (406)-433-5617 Fax(406)433-5618 interstate@nrinet.com www.iengi.com

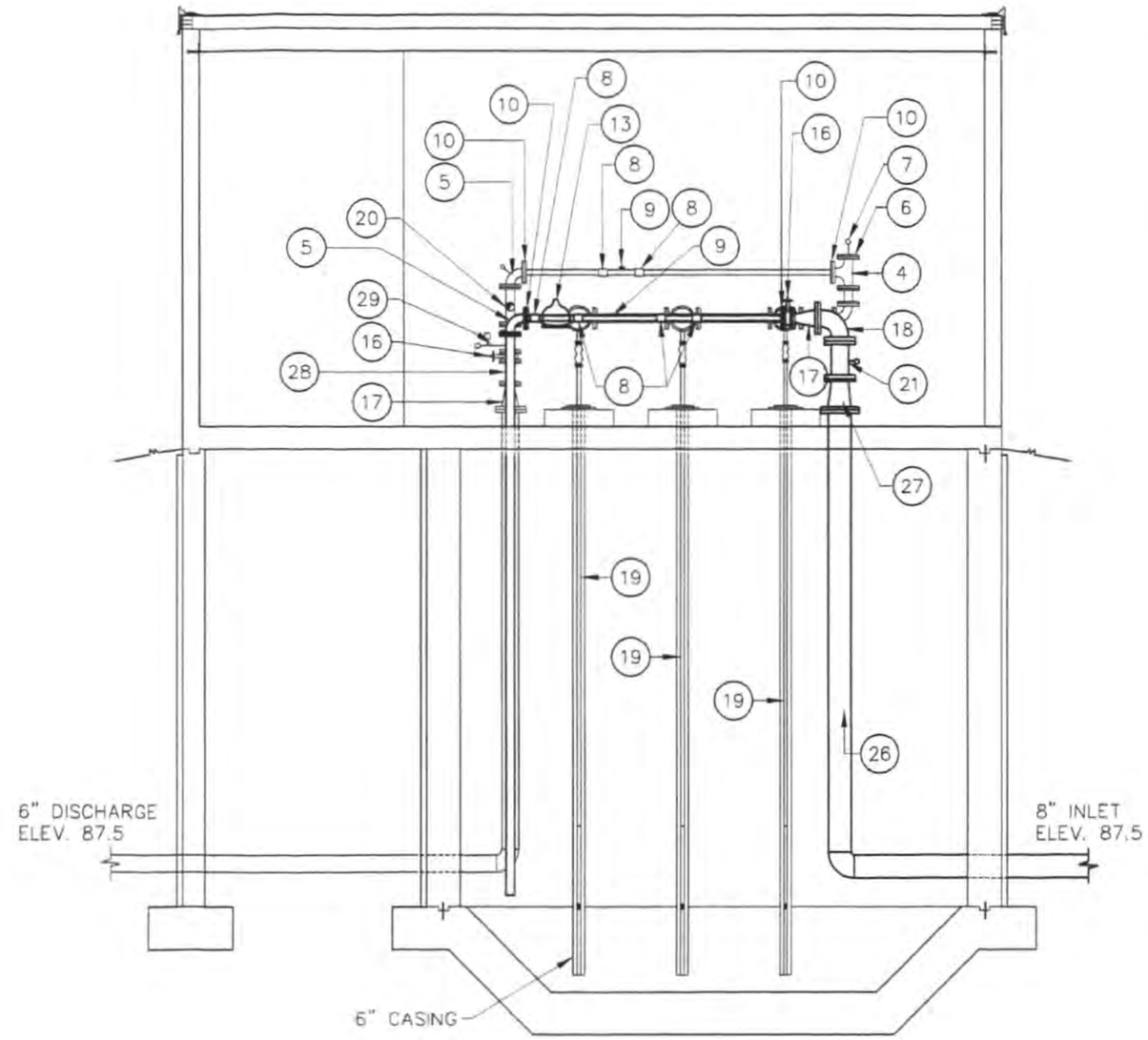
SHEET

A7



PIPE SECTION B–B

SCALE: N.T.S.



PIPE SECTION A–A

SCALE: N.T.S.

Revision No.	Date	By	Description

BOOSTER STATION
PIPING ELEVATIONS

POPLAR, MT

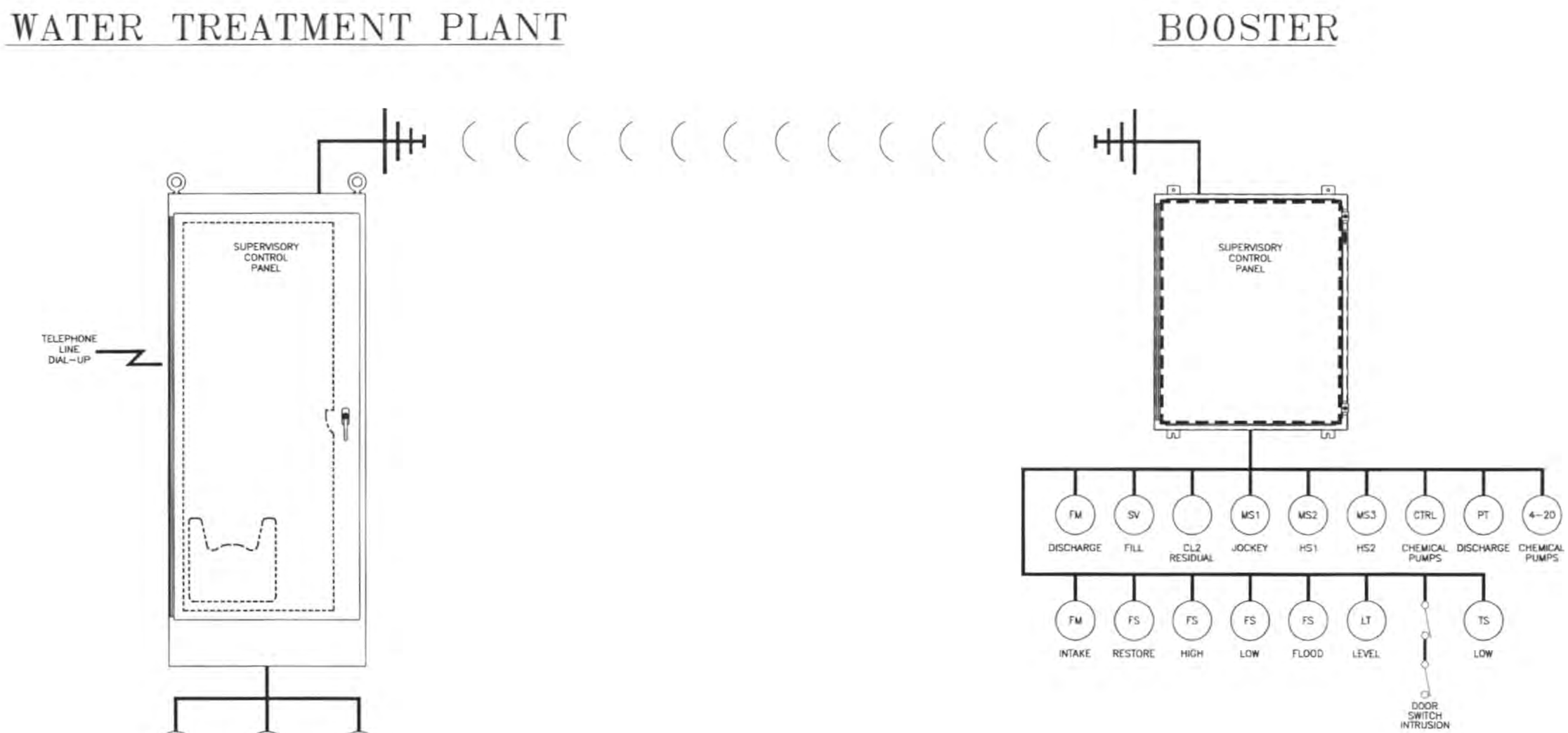
Drawn By T.E.L. Project No. 502-44

Checked By D.R.H. / B.R.M. Date AUGUST 2002

interstate engineering, inc.
Engineering – Surveying – Planning
P.O. Box 648 Sidney, Montana (406)-433-5617 Fax(406)433-5618 isinc@midrivers.com www.isinj.com

SHEET
A8

POPLAR, MT
SITE OVERVIEW



In Control, inc.
10350 Jamestown Street NE
Blaine, MN 55449
(763) 783-9500
www.in-ctrl.com

CUSTOMER NAME AND ADDRESS	MACHINE TYPE OR PROJECT
Poplar, MT	Site Overview

PROJ. ENG.		DRAWN	KAK
SCALE	NONE	CHECKED	JMK

PROJECT NUMBER	DRAWING NUMBER

REV	DESCRIPTION	DATE	BY

interstate engineering, inc.
Engineering - Surveying - Planning
1505 AVENUE D
BILLINGS, MONTANA 59102
P.O. BOX 30215
(406) 256-1920
FAX (406) 256-9178

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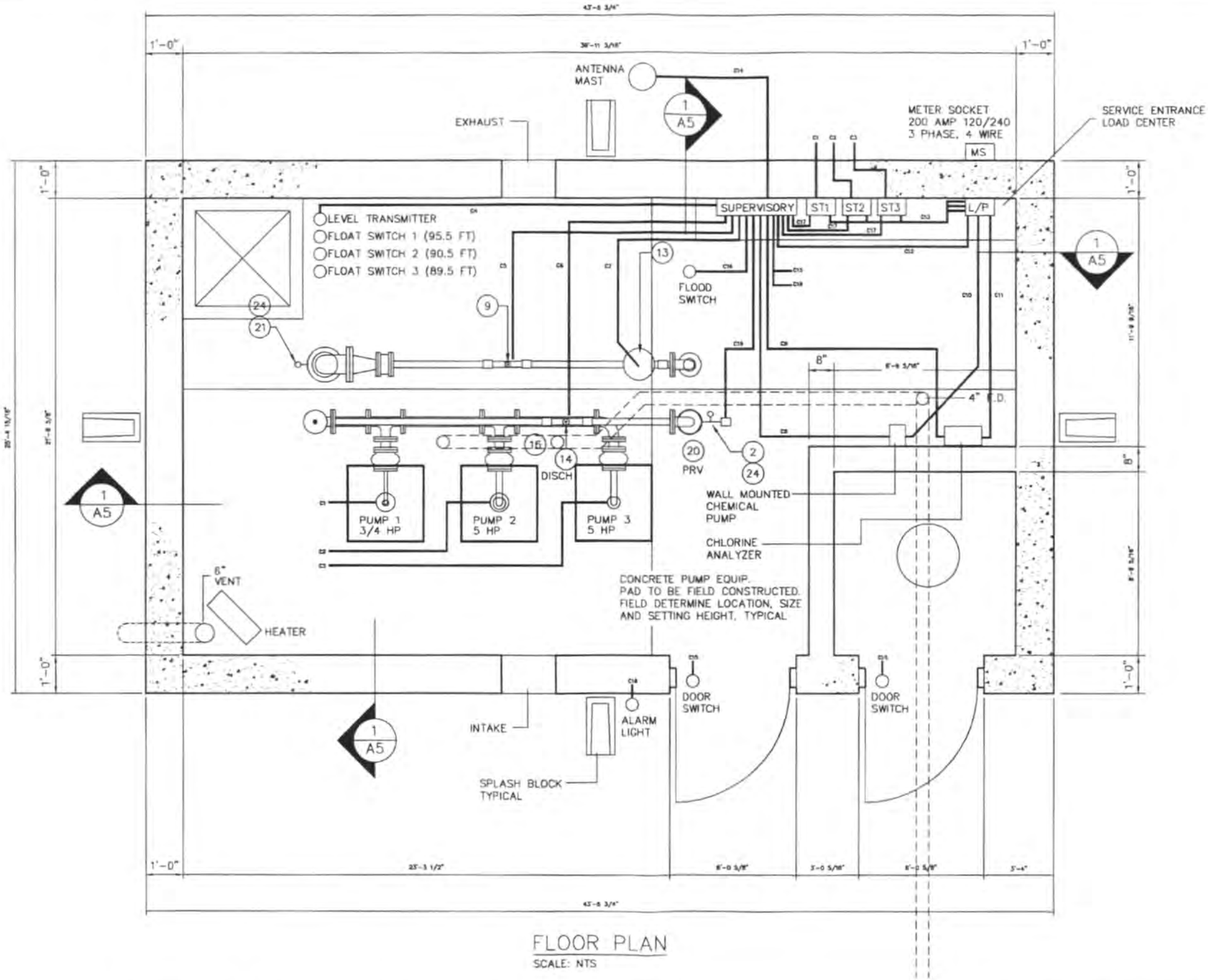

FLOOR PLAN

SCALE: NTS

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Blaine, MN 55449
(763) 783-9500
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CUSTOMER NAME AND ADDRESS	MACHINE TYPE OR PROJECT	REV	DESCRIPTION	DATE	BY
Poplar, MT	Floor and Roof Plan with Conduit				
PROJ. ENG. / DRAWN KAK / SCALE NONE / CHECKED CRH	PROJECT NUMBER / DRAWING NUMBER Poplar MT A-4 Revised				

interstate engineering, inc.
Engineering - Surveying - Planning
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POPLAR, MT
CONDUIT SCHEDULE

CONDUIT NUMBER	CONDUIT SIZE & QUANTITY	VOLTS & PHASE	FROM	TO	REMARKS
C1	4 - 1/C - #10	240V - 3/G	STARTER 1	PUMP 1	3 PHASE POWER
C2	4 - 1/C - #10	240V - 3/G	STARTER 2	PUMP 2	3 PHASE POWER
C3	4 - 1/C - #10	240V - 3/G	STARTER 3	PUMP 3	3 PHASE POWER
C4	4 - 2/C - #16	SIGNAL	SUPERVISORY	LEVEL TRANSMITTER / FLOATS	
C5	1 - 2/C - #16	SIGNAL	SUPERVISORY	INFLUENT FLOWMETER	
C6	1 - 2/C - #16	SIGNAL	SUPERVISORY	DISCHARGE FLOWMETER	
C7	2 - 1/C - #14	CONTROL	SUPERVISORY	FILL SOLENOID	
C8	2 - 1/C - #14	CONTROL	SUPERVISORY	CHEMICAL PUMP	
C9	1 - 2/C - #16	SIGNAL	SUPERVISORY	CL2 RESIDUAL	
C10	3 - 1/C - #12	POWER	LOAD CENTER	CHEMICAL PUMP	
C11	3 - 1/C - #12	POWER	LOAD CENTER	CHLORINE ANALYZER	
C12	3 - 1/C - #12	POWER	LOAD CENTER	SUPERVISORY	
C13	4 - 1/C - #10	240V - 3/G	LOAD CENTER	STARTER 1	3 PHASE POWER
C13	4 - 1/C - #10	240V - 3/G	LOAD CENTER	STARTER 2	3 PHASE POWER
C13	4 - 1/C - #10	240V - 3/G	LOAD CENTER	STARTER 3	3 PHASE POWER
C14	SPECIAL COAX	SIGNAL	SUPERVISORY	ANTENNA	
C15	1 - 2/C - #16	SIGNAL	DOOR SWITCH	SUPERVISORY	
C16	1 - 2/C - #16	SIGNAL	FLOOD SWITCH	SUPERVISORY	
C17	4 - 1/C - #14	CONTROL	SUPERVISORY	STARTER 1	
C17	4 - 1/C - #14	CONTROL	SUPERVISORY	STARTER 2	
C17	4 - 1/C - #14	CONTROL	SUPERVISORY	STARTER 3	
C18	2 - 1/C - #14	CONTROL	SUPERVISORY	ALARM LIGHT	
C19	1 - 2/C - #16	SIGNAL	SUPERVISORY	DISCHARGE PRESSURE TRANSMITTER	

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CUSTOMER NAME AND ADDRESS: Poplar, MT
MACHINE TYPE OR PROJECT: Conduit Schedule
PROJ. ENG. | DRAWN: KAK
SCALE: NONE | CHECKED: MK
PROJECT NUMBER | DRAWING NUMBER

REV	DESCRIPTION	DATE	BY

interstate engineering, inc.
Engineering - Surveying - Planning
1505 AVENUE D
BILLINGS, MONTANA 59102
P.O. BOX 30215
(406) 256-1920
FAX (406) 256-9178
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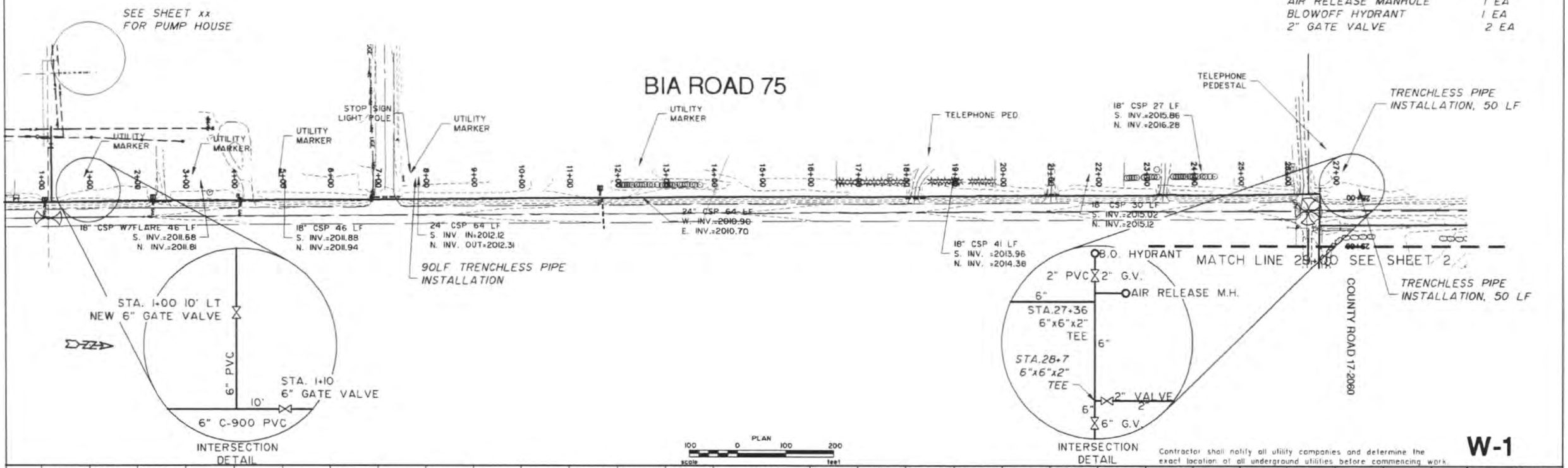
6" PVC WATERMAIN	2800 LF
6" GATE VALVE	3 EA
TRENCH PIPE INSTALLATION	190 LF
AIR RELEASE MANHOLE	1 EA
BLOWOFF HYDRANT	1 EA
2" GATE VALVE	2 EA



PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

2700 LF 6" WATERMAIN

SEE SHEET ____
FOR SITE "A" DETAIL

SITE A

COUNTY ROAD 17-2060

EXISTING FARM
FIELD LINE

DIRT APPROACH

MATCH LINE 29+00 SEE SHEET W-1

MATCH LINE 56+00 SEE SHEET W-3

ION 32

DN 5

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-2

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

APPROXIMATE
EXISTING GROUND

6.5'MIN.

2700 LF 6" C-900 CL 200 PVC WATERMAIN

2040 2035 2030 2025 2020 2015 2010 2005 2000 1995

2020.72 2020.48 2020.13 2019.43 2020.24 2019.88 2019.95 2019.26 2019.28 2018.32 2017.97 2018.14 2021.71 2020.00 2020.06 2020.10 2020.94 2022.43 2023.50 2024.75 2025.54 2025.83 2026.04 2026.34 2026.99 2027.65 2026.24 2026.69 2028.37 2027.57

28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00

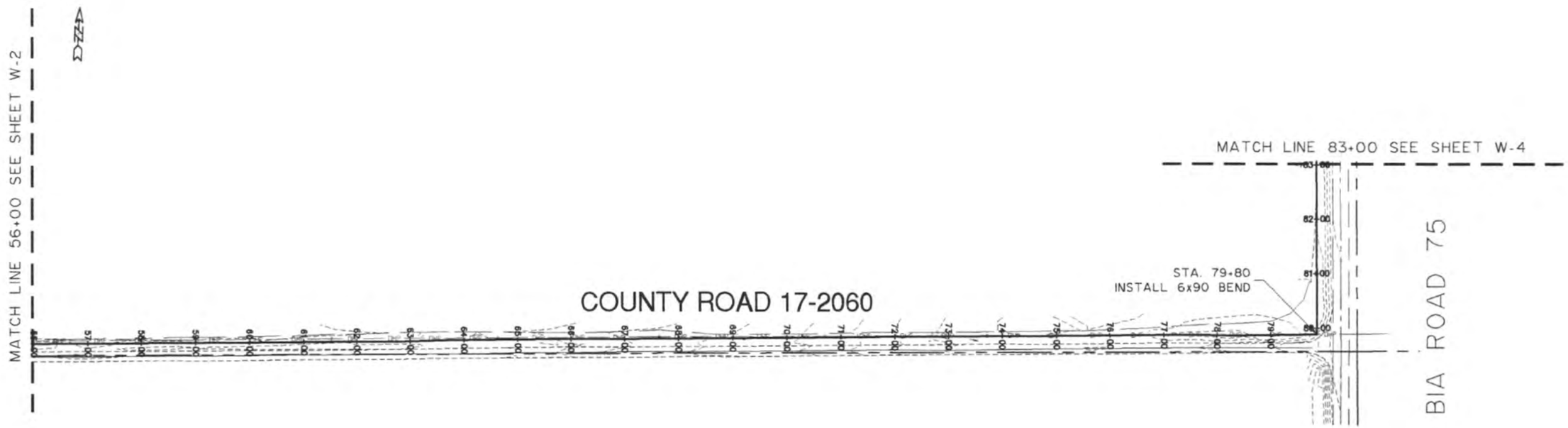
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.D.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

6" WATERMAIN 2700 LF

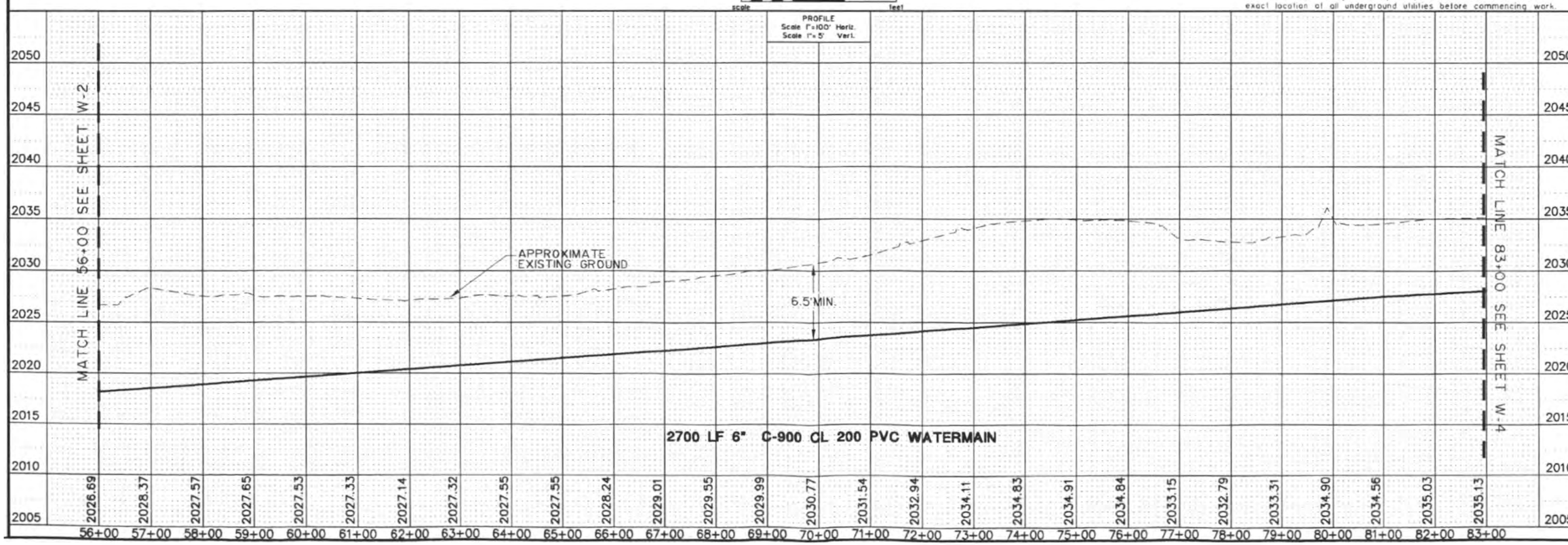


PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-3

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



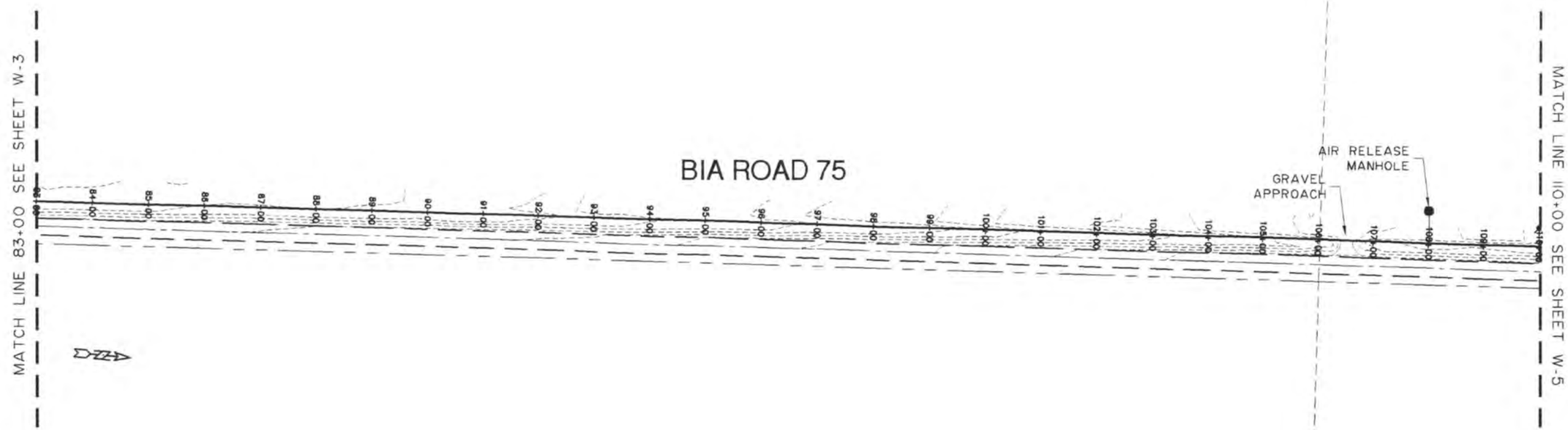
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

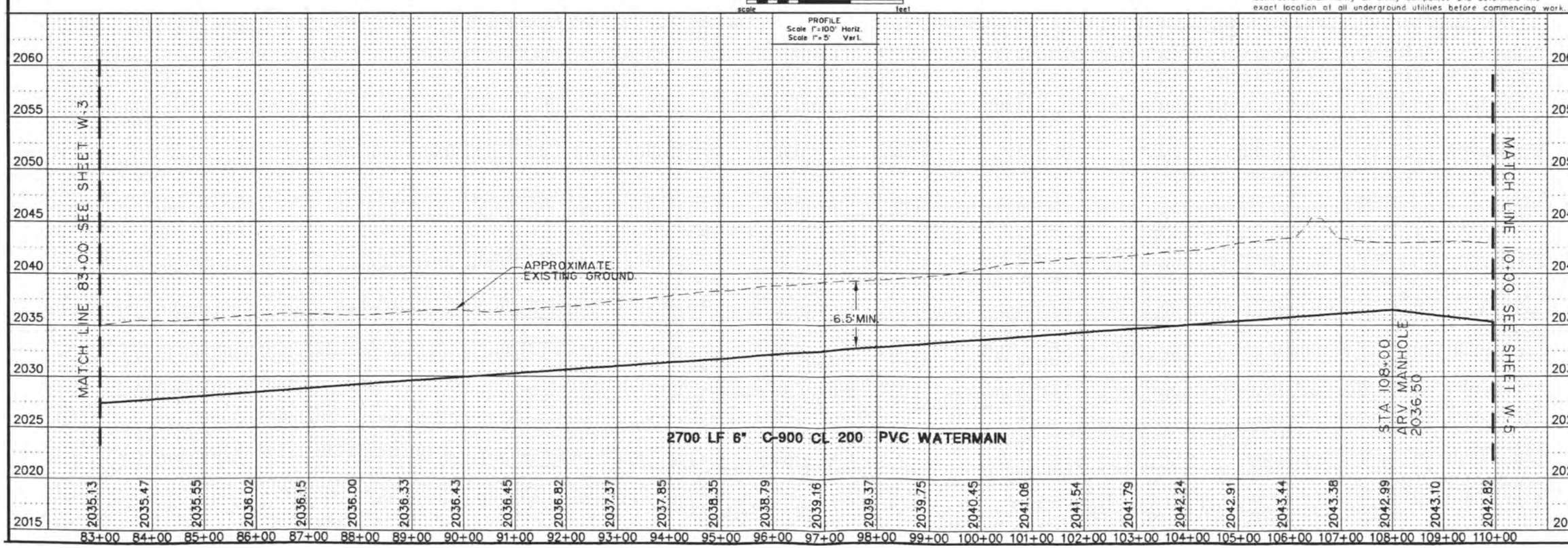
6" WATERMAIN 2700 LF
AIR RELEASE VALVE MANHOLE - 1 EA.



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-4



PROJECT No. S02-44
DRAWN BY D.R.S.
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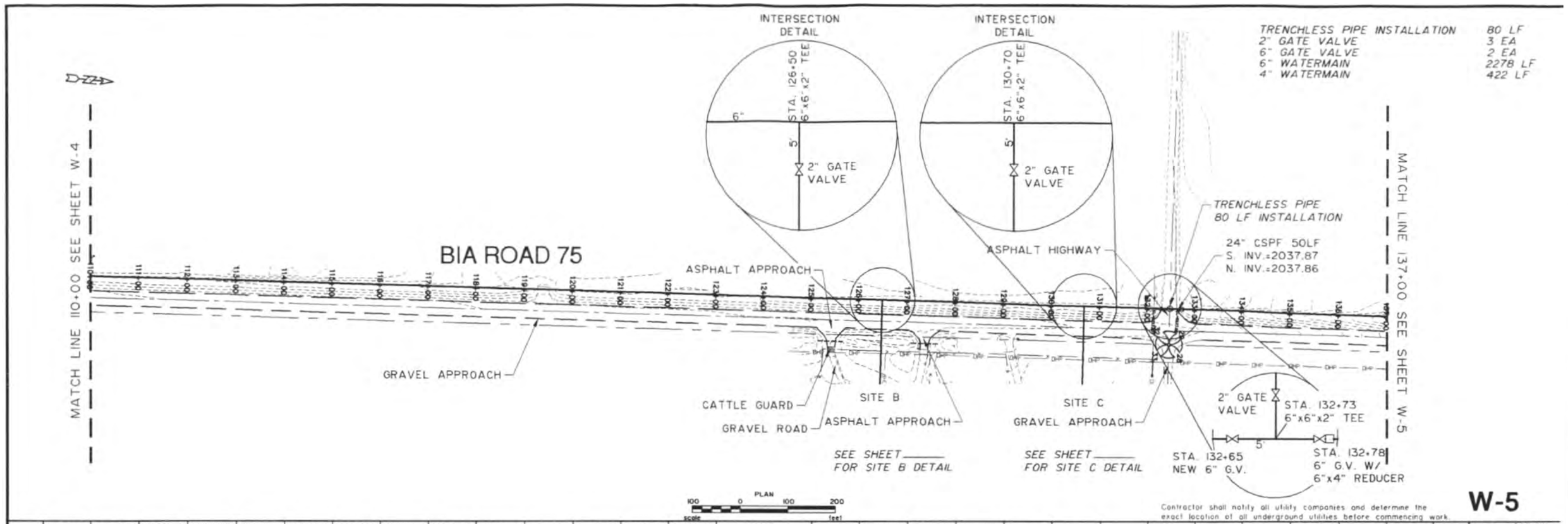
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.


INTERSECTION DETAIL
STA. 126+50 6"x6"x2" TEE
6"
5'
2" GATE VALVE
INTERSECTION DETAIL
STA. 130+70 6"x6"x2" TEE
5'
2" GATE VALVE
TRENCHLESS PIPE INSTALLATION 80 LF
2" GATE VALVE 3 EA
6" GATE VALVE 2 EA
6" WATERMAIN 2278 LF
4" WATERMAIN 422 LF
MATCH LINE 110+00 SEE SHEET W-4
BIA ROAD 75
ASPHALT APPROACH
ASPHALT HIGHWAY
TRENCHLESS PIPE 80 LF INSTALLATION
24" CSPF 50LF
S. INV.=2037.87
N. INV.=2037.86
MATCH LINE 137+00 SEE SHEET W-5
GRAVEL APPROACH
CATTLE GUARD
GRAVEL ROAD
ASPHALT APPROACH
SITE B
SITE C
GRAVEL APPROACH
2" GATE VALVE
STA. 132+73 6"x6"x2" TEE
5'
SEE SHEET ____ FOR SITE B DETAIL
SEE SHEET ____ FOR SITE C DETAIL
STA. 132+65 NEW 6" G.V.
STA. 132+78 6" G.V. W/ 6"x4" REDUCER
PLAN
100 0 100 200
scale feet
Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.
W-5
PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.
APPROXIMATE EXISTING GROUND
MATCH LINE 110+00 SEE SHEET W-4
MATCH LINE 137+00 SEE SHEET W-5
2278 LF 6" C-900 CL 200 PVC WATERMAIN
422 LF 4" C-900 CL 200 PVC WATERMAIN
2050 2045 2040 2035 2030 2025 2020 2015 2010 2005
2042.82 2042.62 2042.56 2042.57 2042.45 2042.11 2041.67 2041.35 2041.20 2040.94 2040.25 2040.08 2040.23 2039.97 2039.96 2039.71 2039.38 2038.97 2038.74 2038.62 2038.73 2038.37 2038.56 2038.59 2037.30 2035.34 2033.57 2031.19 2028.47
110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00 128+00 129+00 130+00 131+00 132+00 133+00 134+00 135+00 136+00 137+00 138+00
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA
REVISION
No. Date By Description
interstate engineering, inc.

TRENCHLESS PIPE INSTALLATION 100 LF
4" WATERMAIN 2700 LF

BIA ROAD 75

MATCH LINE 137+00 SEE SHEET W-5

TRENCHLESS PIPE INSTALLATION 40 LF

24" CSP 75LF
W. INV. - 2019.94
E. INV. - 2023.73

GRAVEL APPROACH

TELEPHONE PEDESTAL

60" CSP 76LF
W. INV. - 1982.06
E. INV. - 1982.64

60 LF TRENCHLESS PIPE INSTALLATION

60" CSP 76LF
W. INV. - 1982.12
E. INV. - 1982.62

60" CSP 76LF
W. INV. - 1981.96
E. INV. - 1982.69

60" CSP 76LF
W. INV. - 1981.98
E. INV. - 1982.62

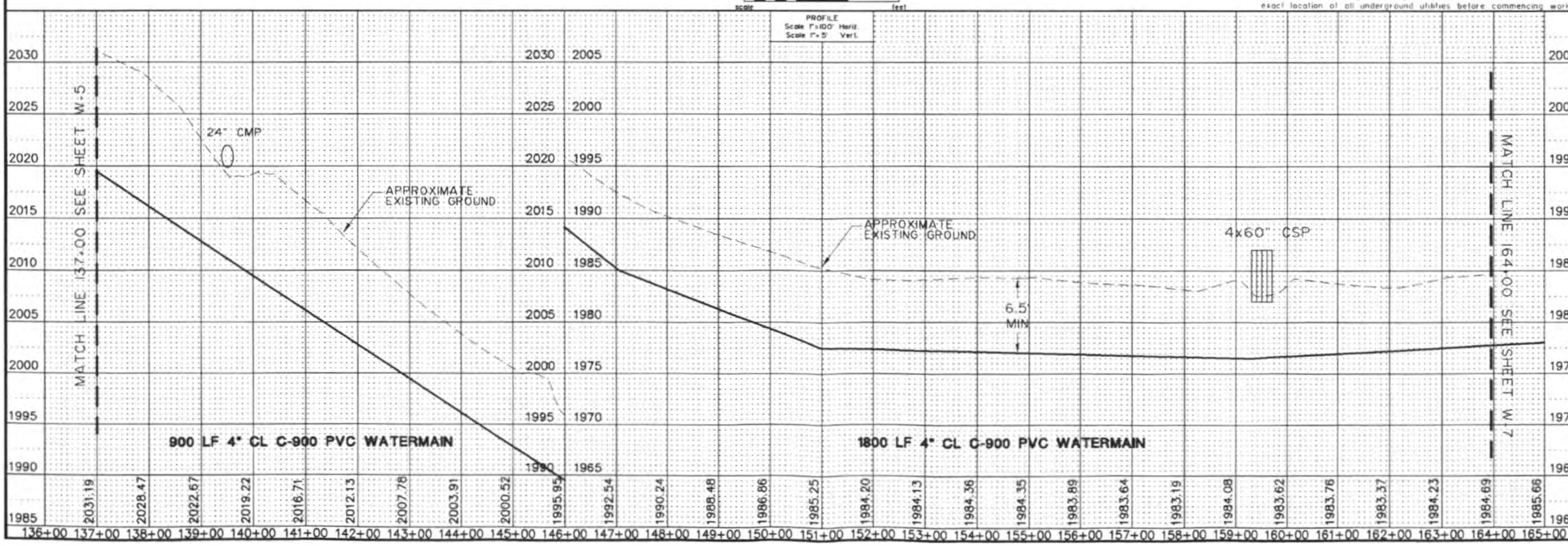
MATCH LINE 164+00 SEE SHEET W-7

PLAN
100 0 100 200
scale feet

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-6



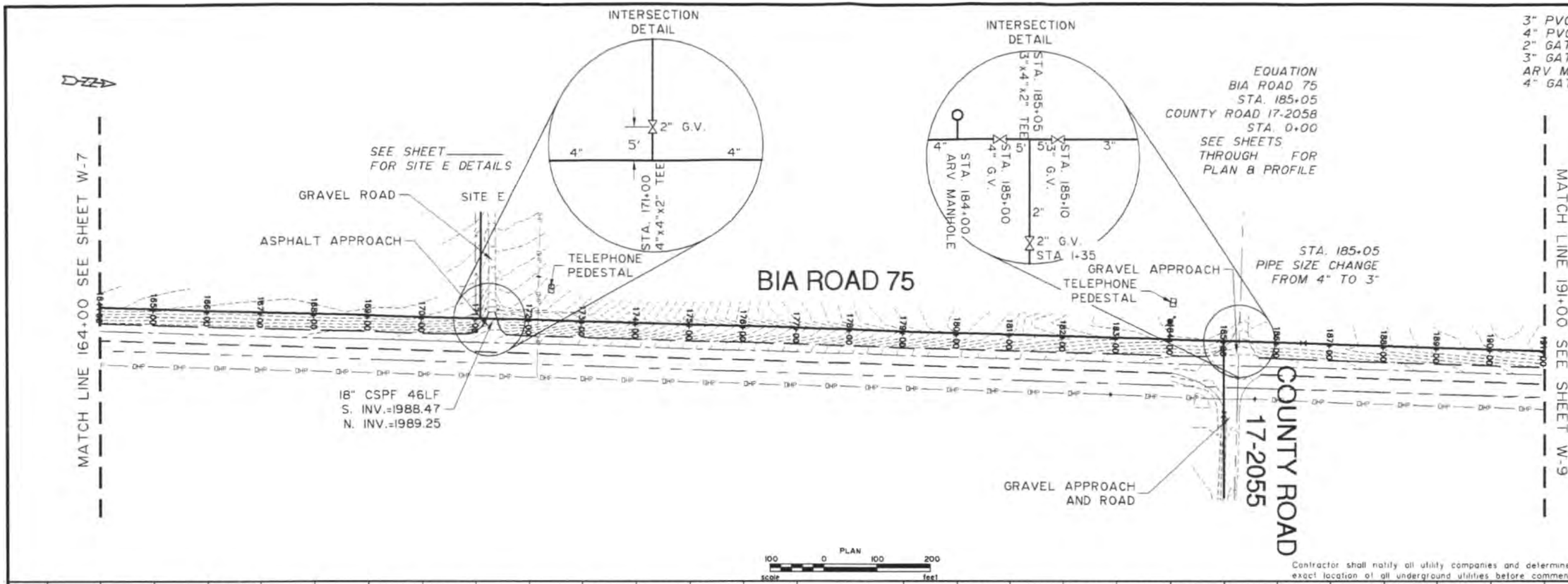
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

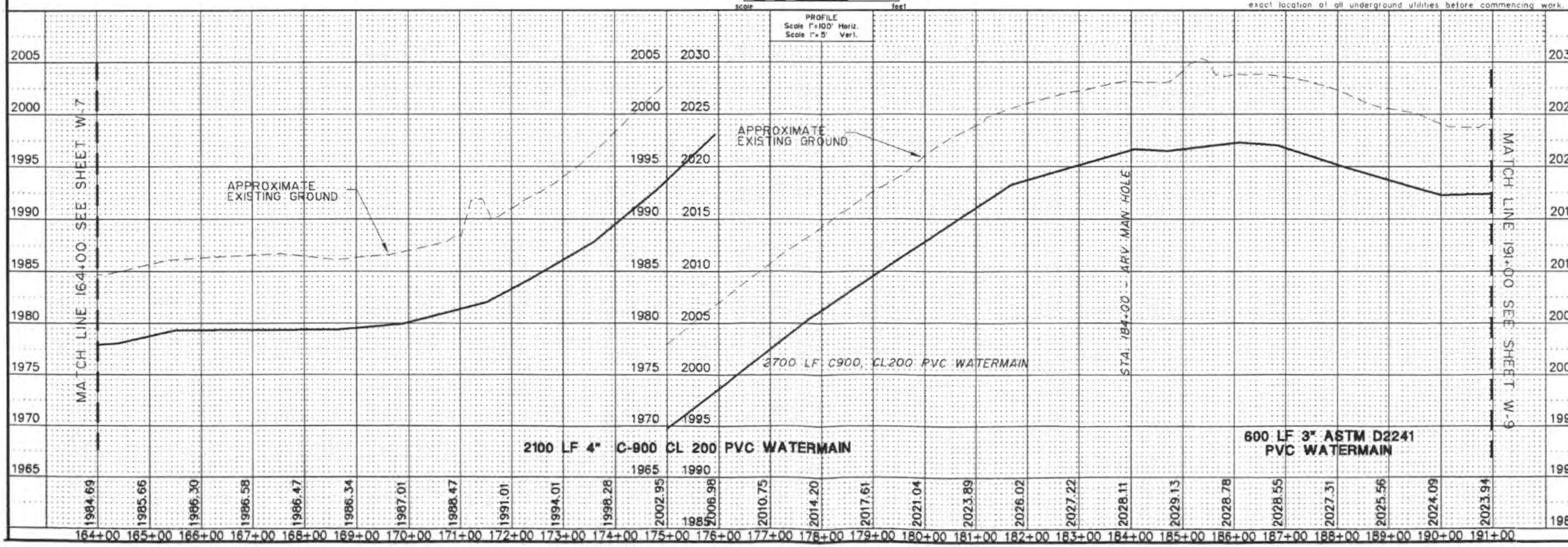
interstate engineering, inc.

3" PVC WATERMAIN	600 LF
4" PVC WATERMAIN	2100 LF
2" GATE VALVE	2 EA.
3" GATE VALVE	1 EA.
ARV MAN HOLE	1 EA.
4" GATE VALVE	1 EA.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-7



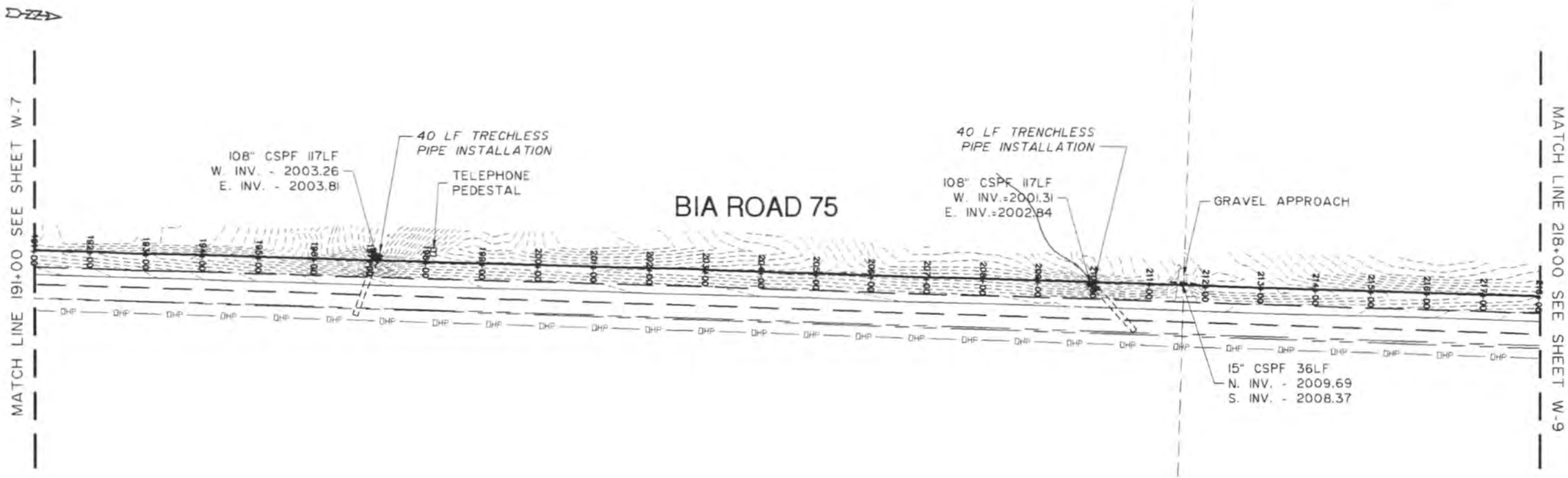
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

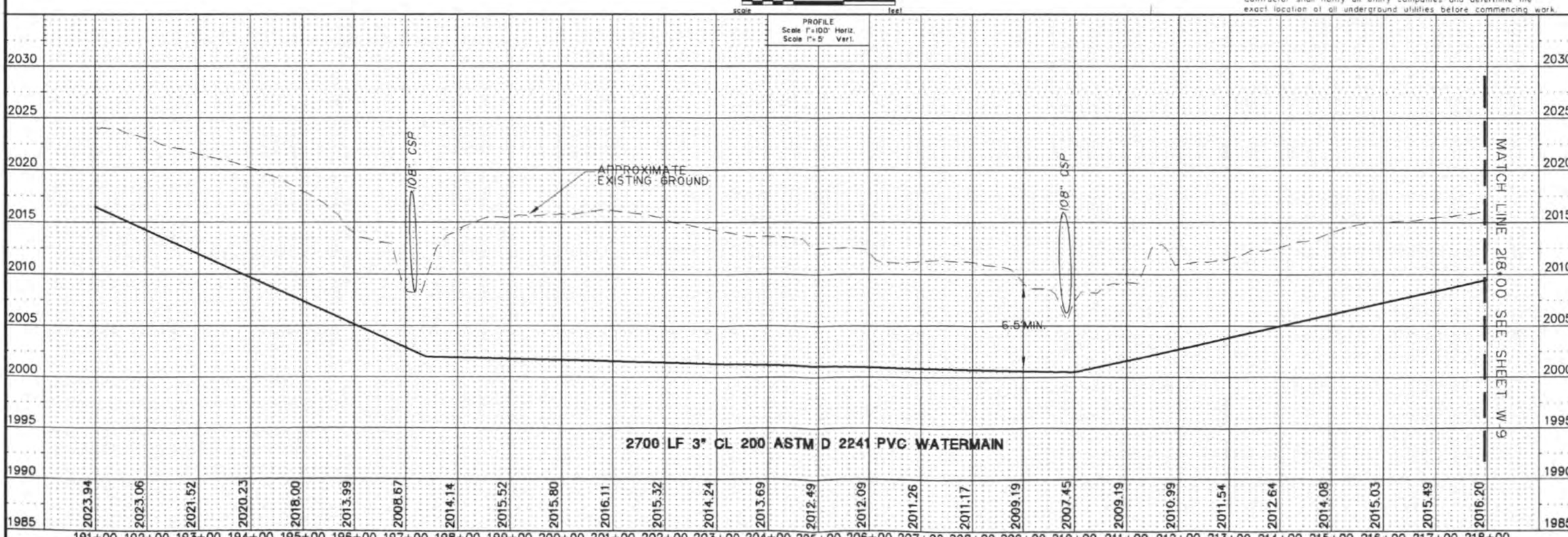
3" PVC WATERMAIN - 2700LF
TRENCHLESS PIPE INSTALLATION 80 LF



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-8



PROJECT No. S02-44
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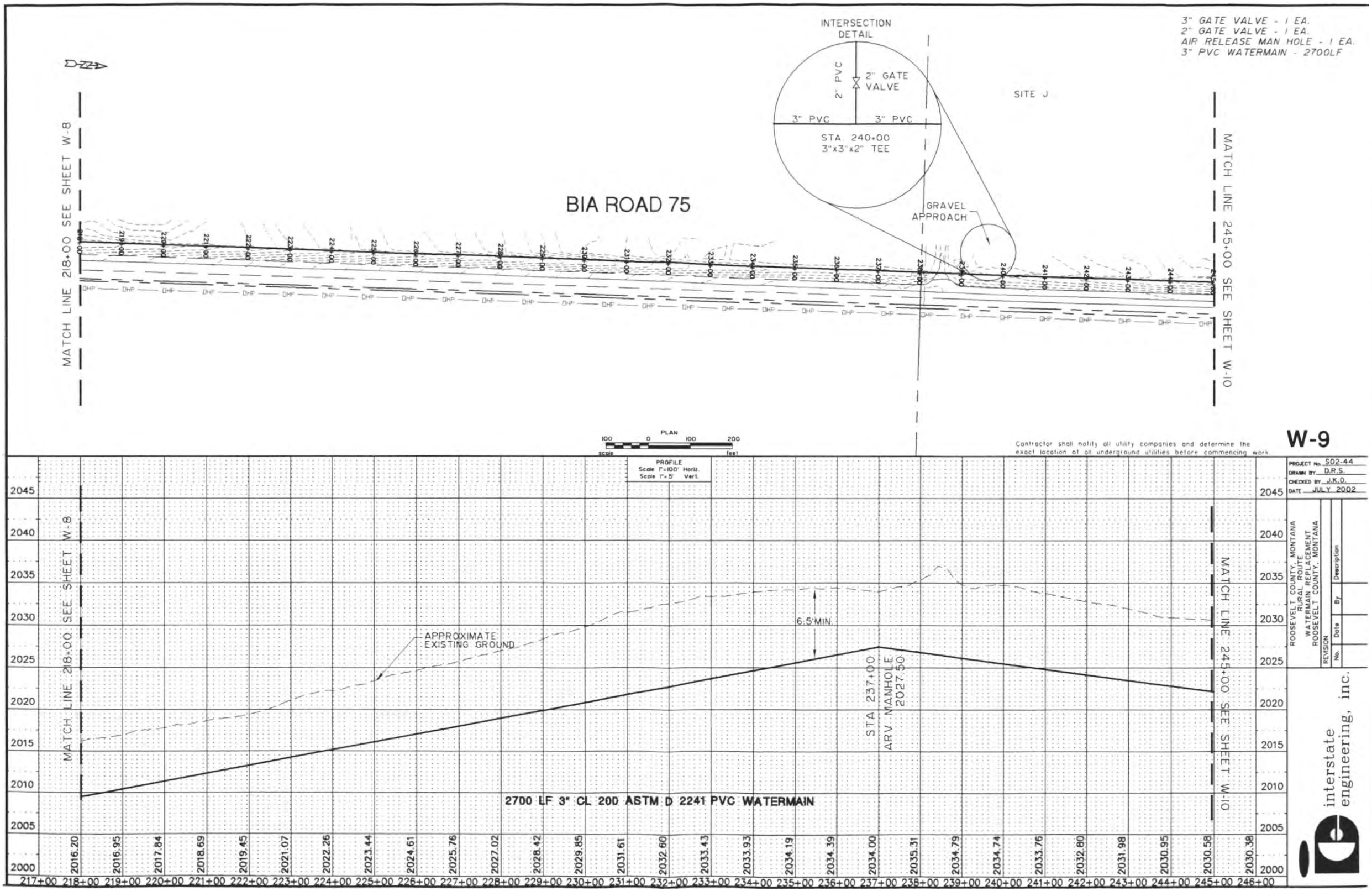
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" GATE VALVE - 1 EA.
2" GATE VALVE - 1 EA.
AIR RELEASE MAN HOLE - 1 EA.
3" PVC WATERMAIN - 2700LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-9

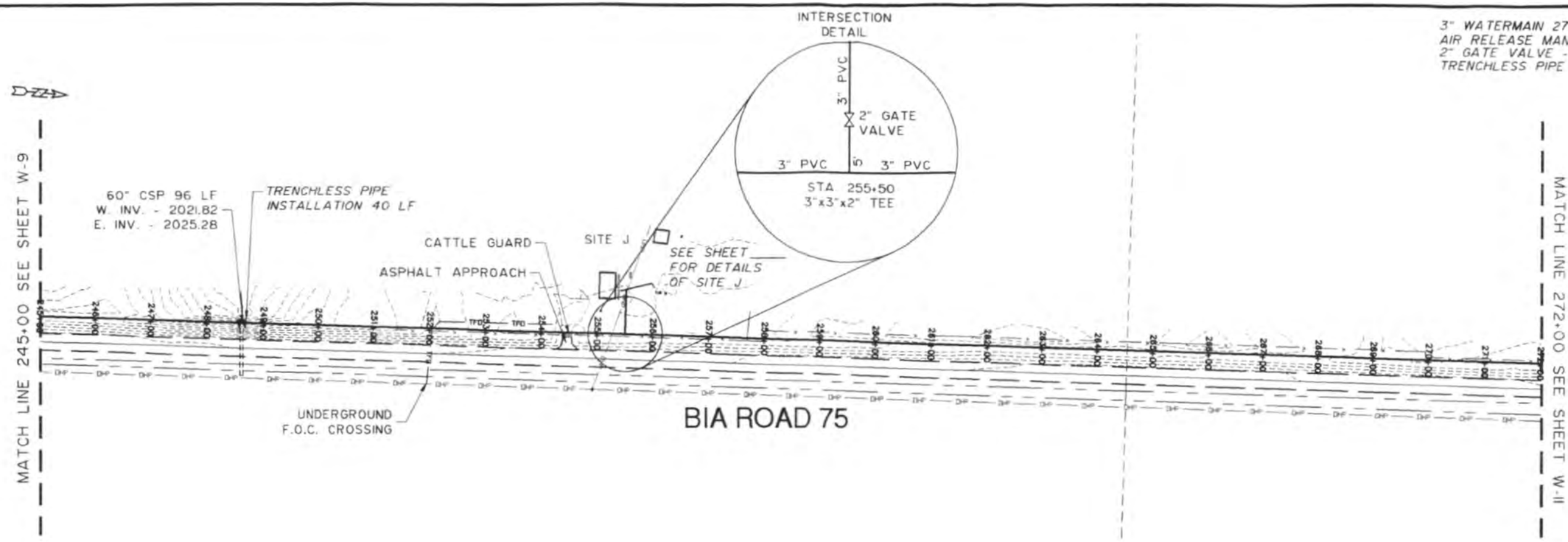
PROJECT No. 502-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

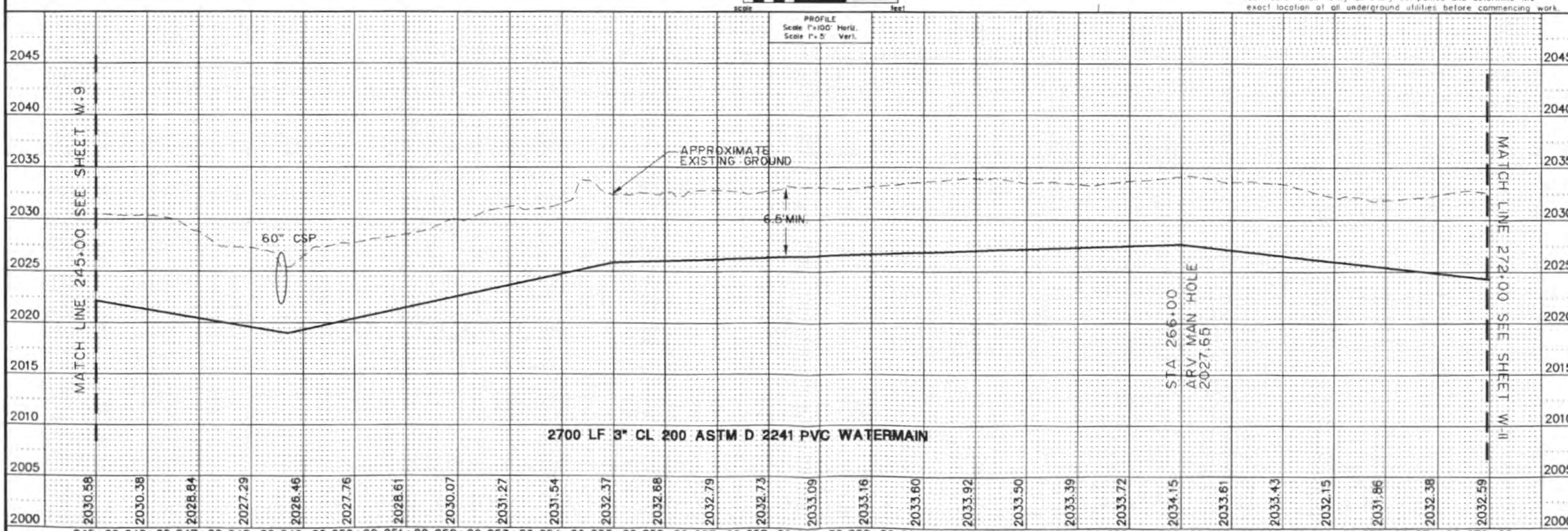
3" WATERMAIN 2700LF
AIR RELEASE MAN HOLE - 1 EA.
2" GATE VALVE - 1 EA.
TRENCHLESS PIPE INSTALLATION 40LF



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-10



PROJECT No. S02-44
DRAWN BY D.R.S.
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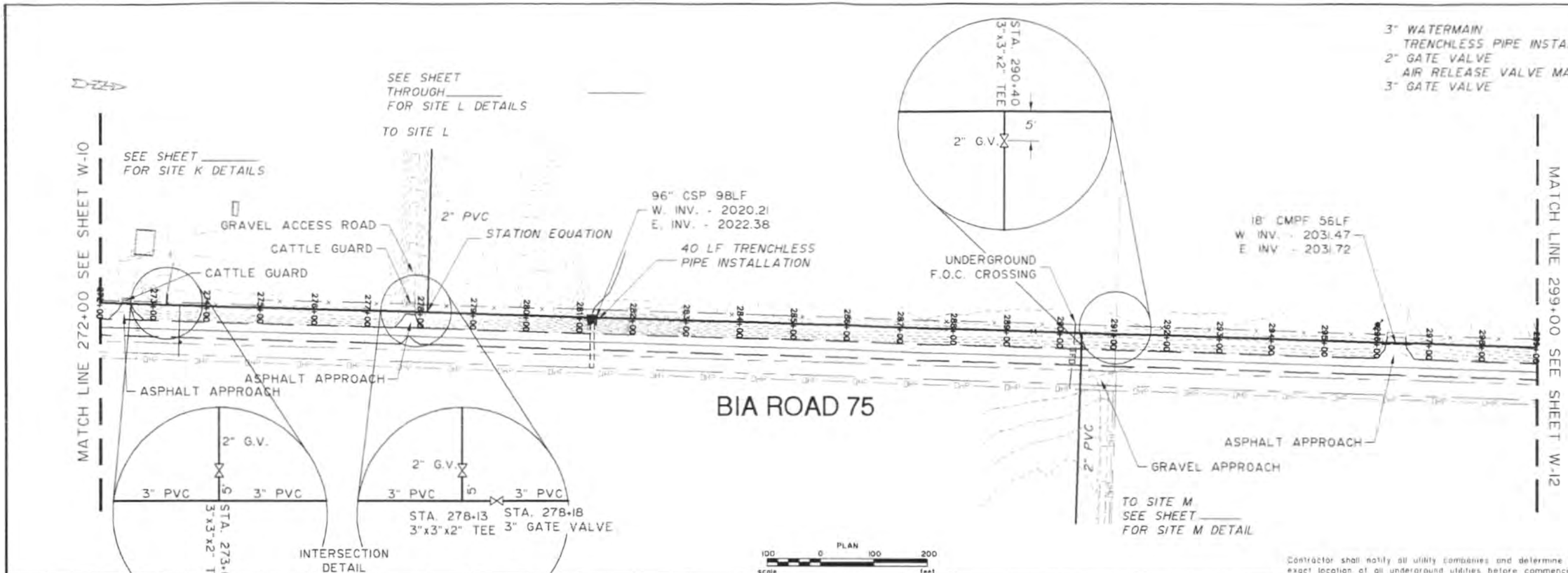
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN	2700 LF
TRENCHLESS PIPE INSTALLATION	40 LF
2" GATE VALVE	3 EA.
AIR RELEASE VALVE MANHOLE	1 EA
3" GATE VALVE	1 EA.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-11

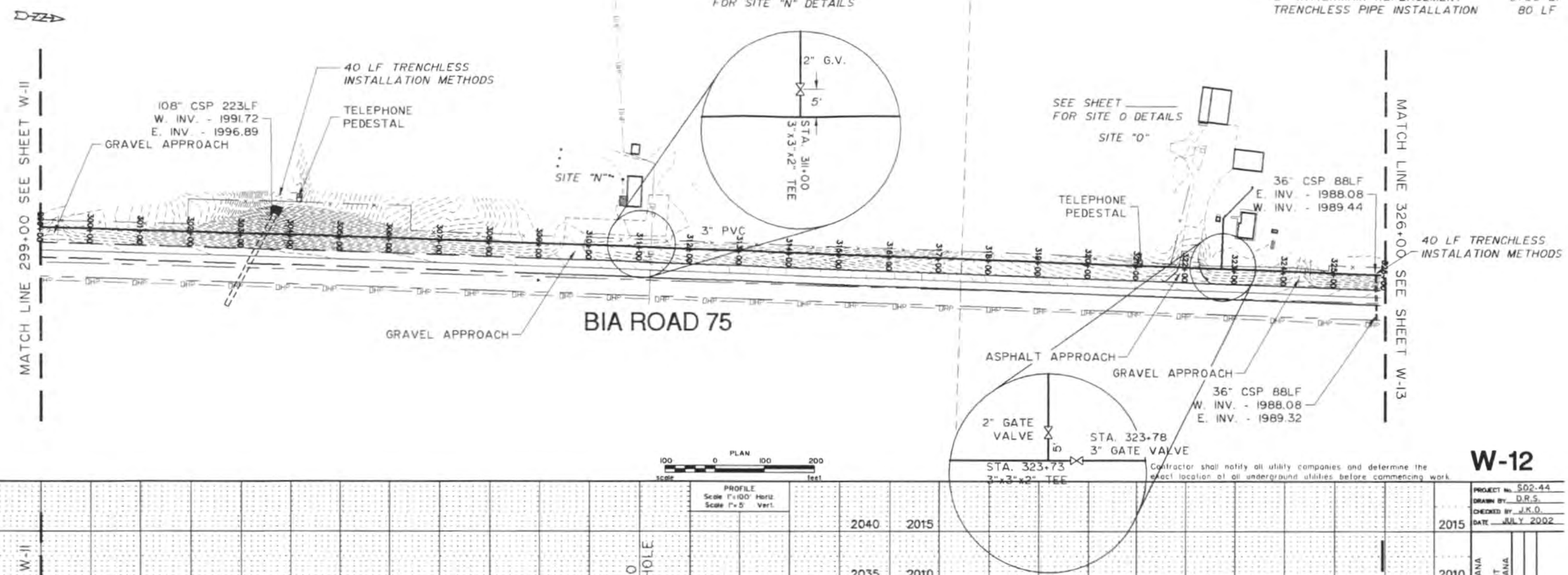
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION No.	Date	By	Description

interstate engineering, inc.

3" GATE VALVE	1 EA.
2" GATE VALVE	2 EA.
3" WATERMAIN REPLACEMENT	2700 LF
TRENCHLESS PIPE INSTALLATION	80 LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-12

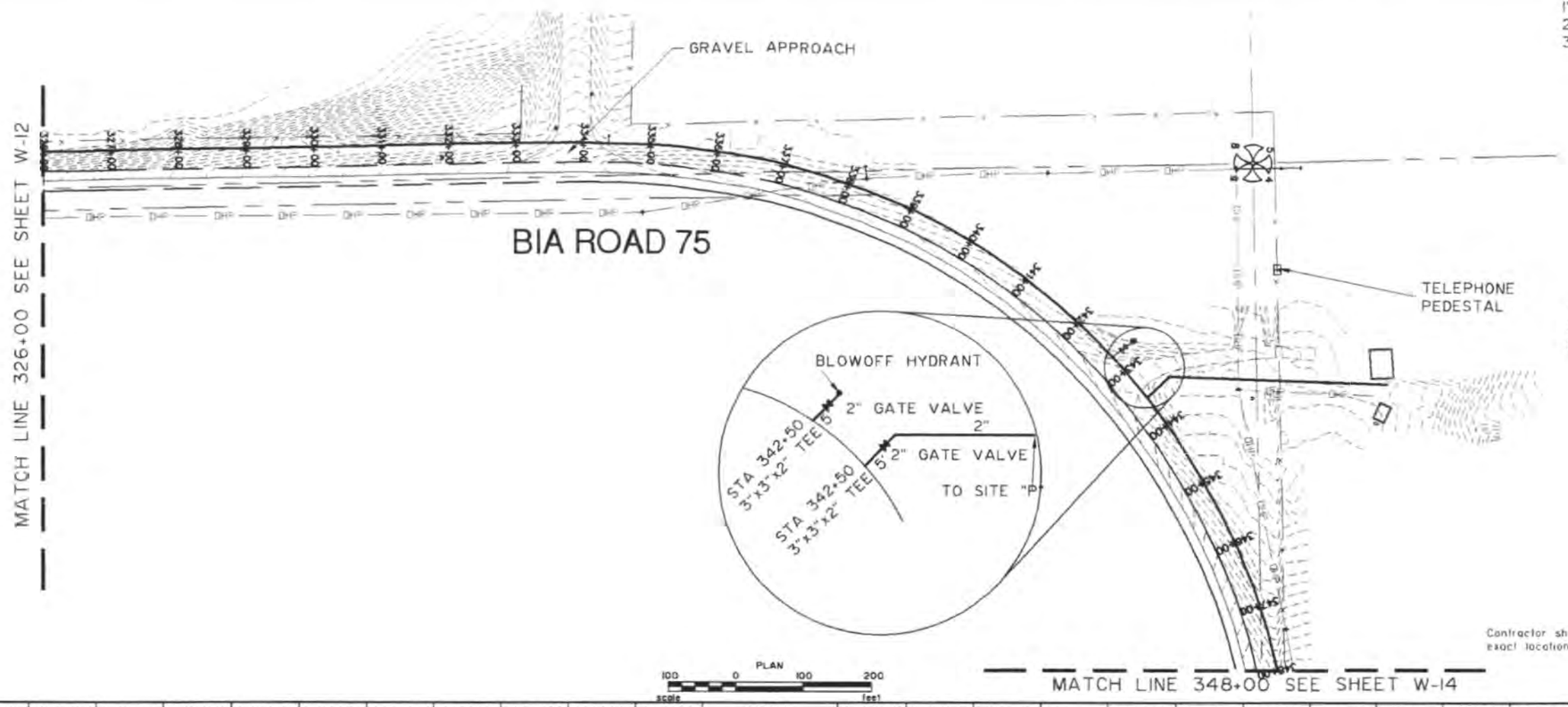
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

1" BLOWOFF HYDRANT 1 EA
2" GATE VALVE 2 EA
3" WATERMAIN 2200LF



TO SITE P
SEE SHEET ??
FOR SITE P DETAIL

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing wor

W-13

PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN 2700LF
ARV MAHOLE 1EA.

MATCH LINE 348+00 SEE SHEET W-13

STA 355+66
END BIA ROAD 75
BEGIN COUNTY ROAD
17-2055

BIA ROAD 75

COUNTY ROAD 17-2055

TELEPHONE
PEDESTAL

MATCH LINE 375+00 SEE SHEET W-15

STA 357+00
ARV VALVE

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-14

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

APPROXIMATE
EXISTING GROUND

6.5' MIN.

MATCH LINE 348+00 SEE SHEET W-13

MATCH LINE 375+00 SEE SHEET W-15

STA 357+00
2028.39

2700 LF 3" CL 200 ASTM D 2241 PVC WATERMAIN

2055 2050 2045 2040 2035 2030 2025 2020 2015 2010

2031.69 2034.71 2036.29 2037.78 2039.03 2039.44 2039.29 2040.17 2040.25 2039.70 2040.88 2041.76 2042.16 2042.20 2041.87 2040.47 2038.25 2036.61 2035.48 2034.89 2035.83 2037.28 2039.47 2041.24 2043.51 2046.23 2047.11 2049.17

348+00 349+00 350+00 351+00 352+00 353+00 354+00 355+00 356+00 357+00 358+00 359+00 360+00 361+00 362+00 363+00 364+00 365+00 366+00 367+00 368+00 369+00 370+00 371+00 372+00 373+00 374+00 375+00

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CHECKED BY J.K.O.
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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN 2700LF

MATCH LINE 375+00 SEE SHEET W-14

GRAVEL APPROACH

COUNTY ROAD 17-2055

PETRO LINE
GAS LINE

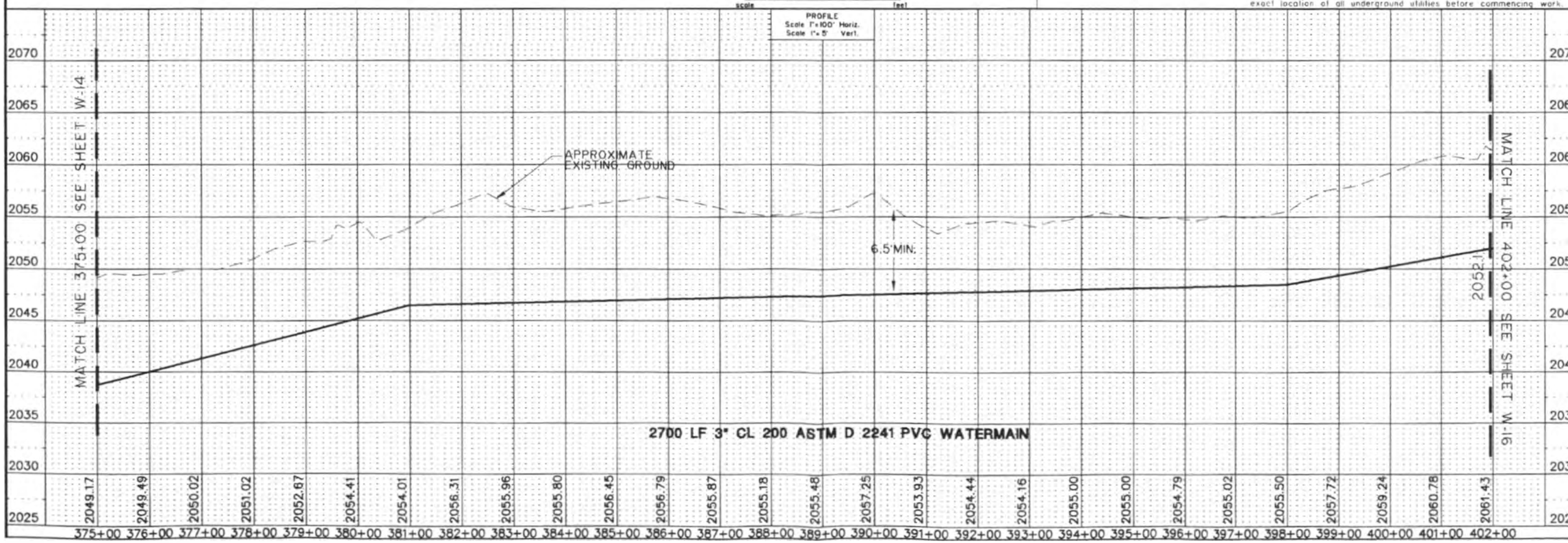
MATCH LINE 402+00 SEE SHEET W-16

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-15

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



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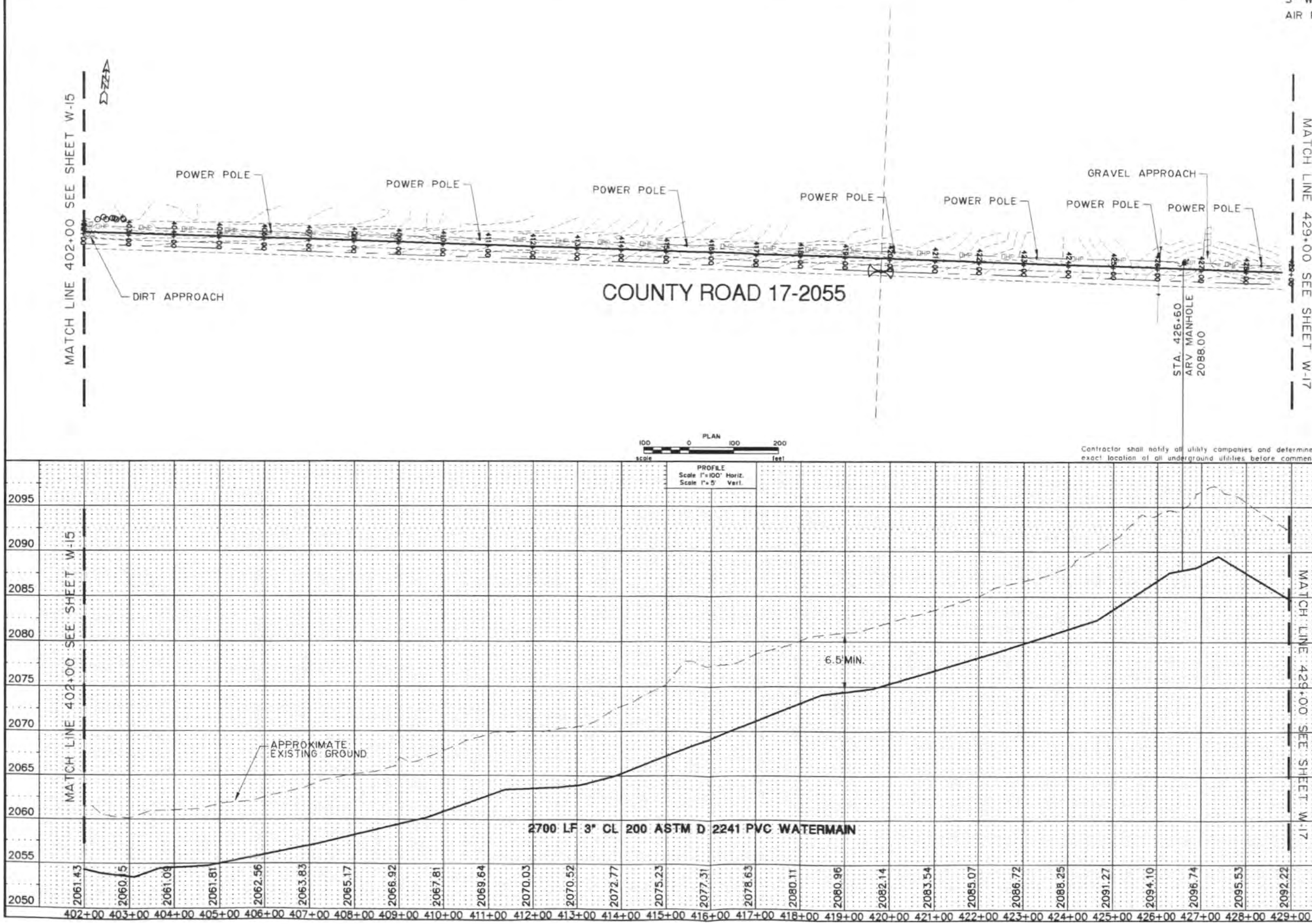
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN 2700LF
AIR RELEASE VALVE - 1 EA.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-16

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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN 2700LF

COUNTY ROAD 17-2055

MATCH LINE 429+00 SEE SHEET W-16

POWER POLE

UNDERGROUND F.O.C. CROSSING

POWER POLE

POWER POLE

POWER POLE

DIRT APPROACH

24" CMP 46 LF
W INV 2085.32
E INV 2086.30

POWER POLE

POWER POLE

TELEPHONE PEDESTAL

GRAVEL APPROACH

POWER POLE

POWER POLE

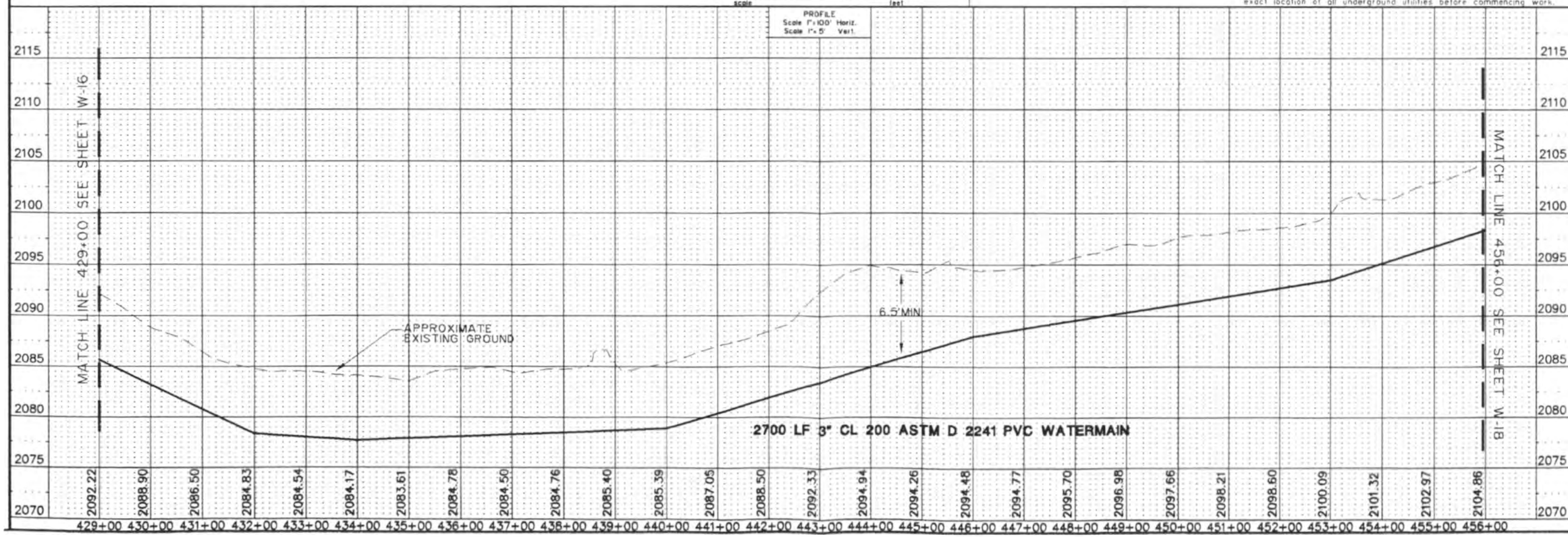
MATCH LINE 456+00 SEE SHEET W-18

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-17

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



PROJECT No. S02-44
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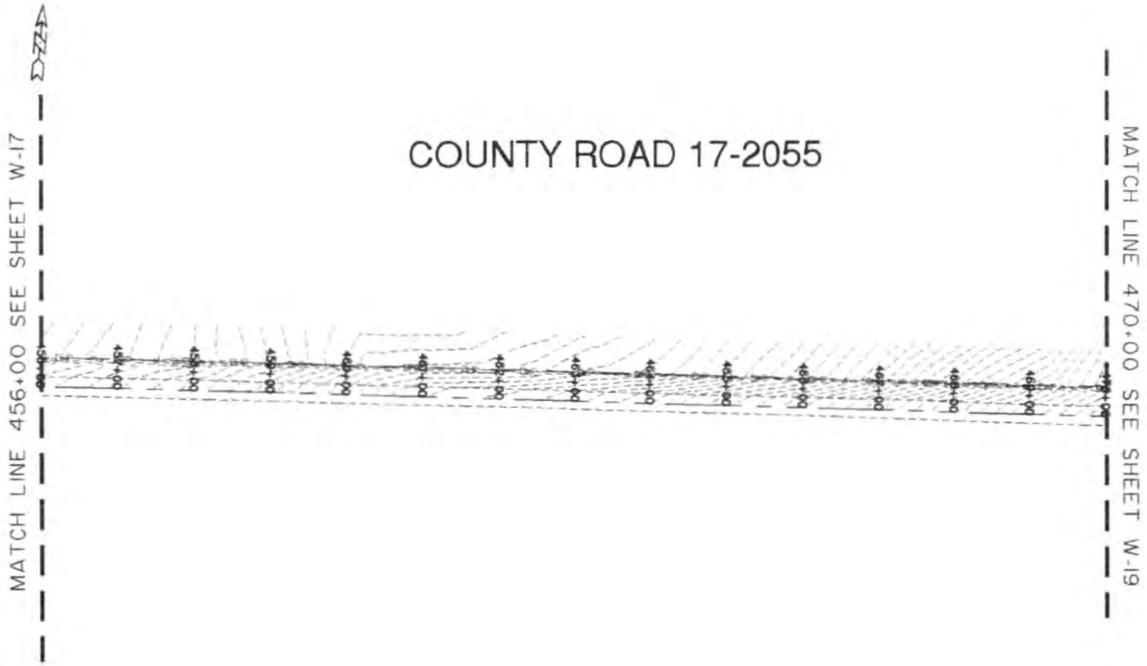
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

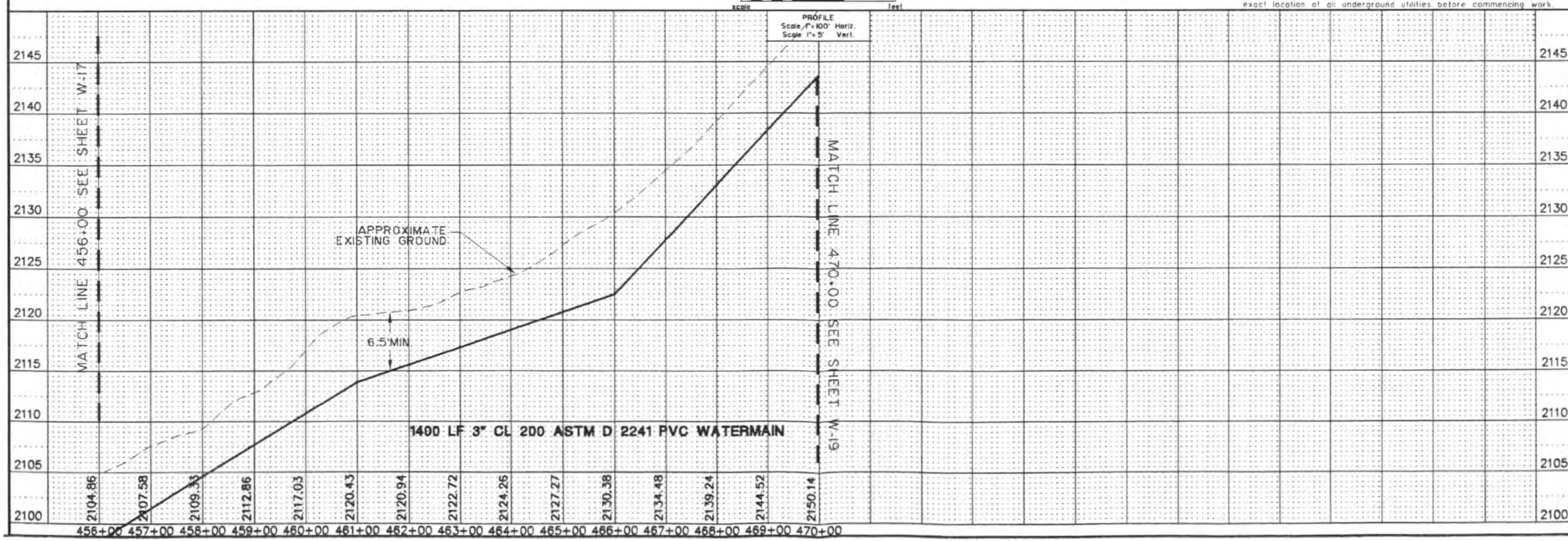
3" WATERMAIN 1400LF



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-18



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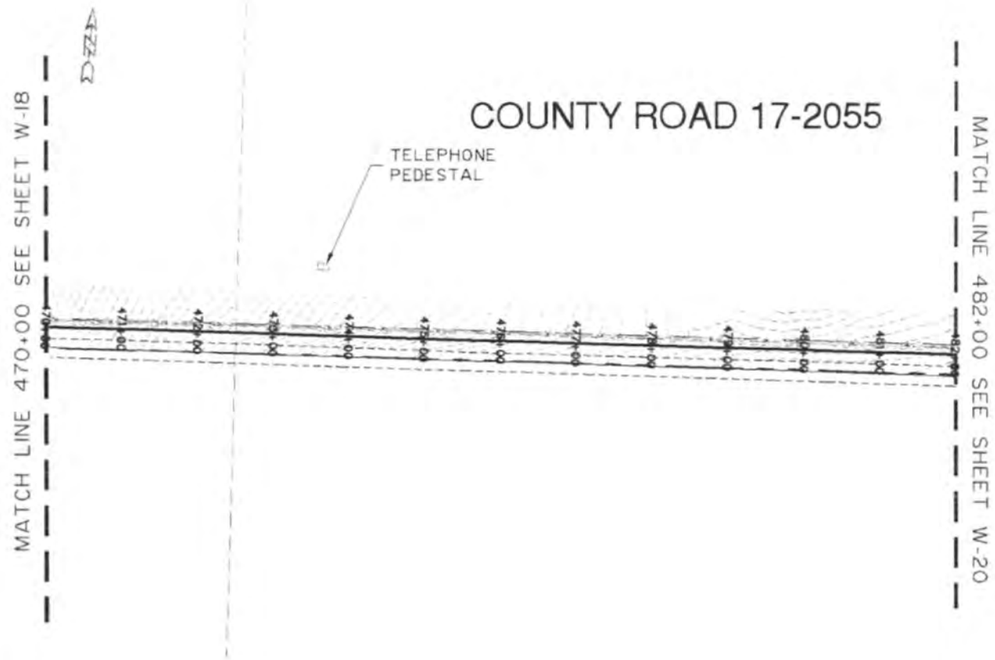
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

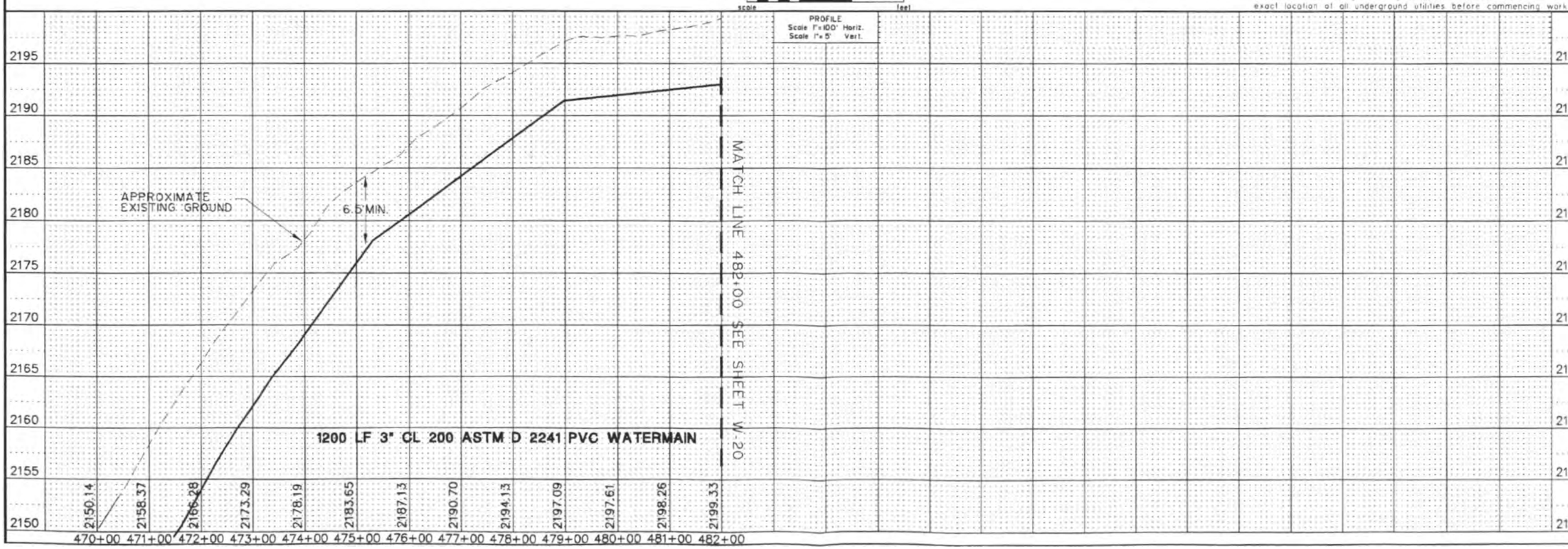
3" WATERMAIN 1200LF



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-19



PROJECT No. S02-44
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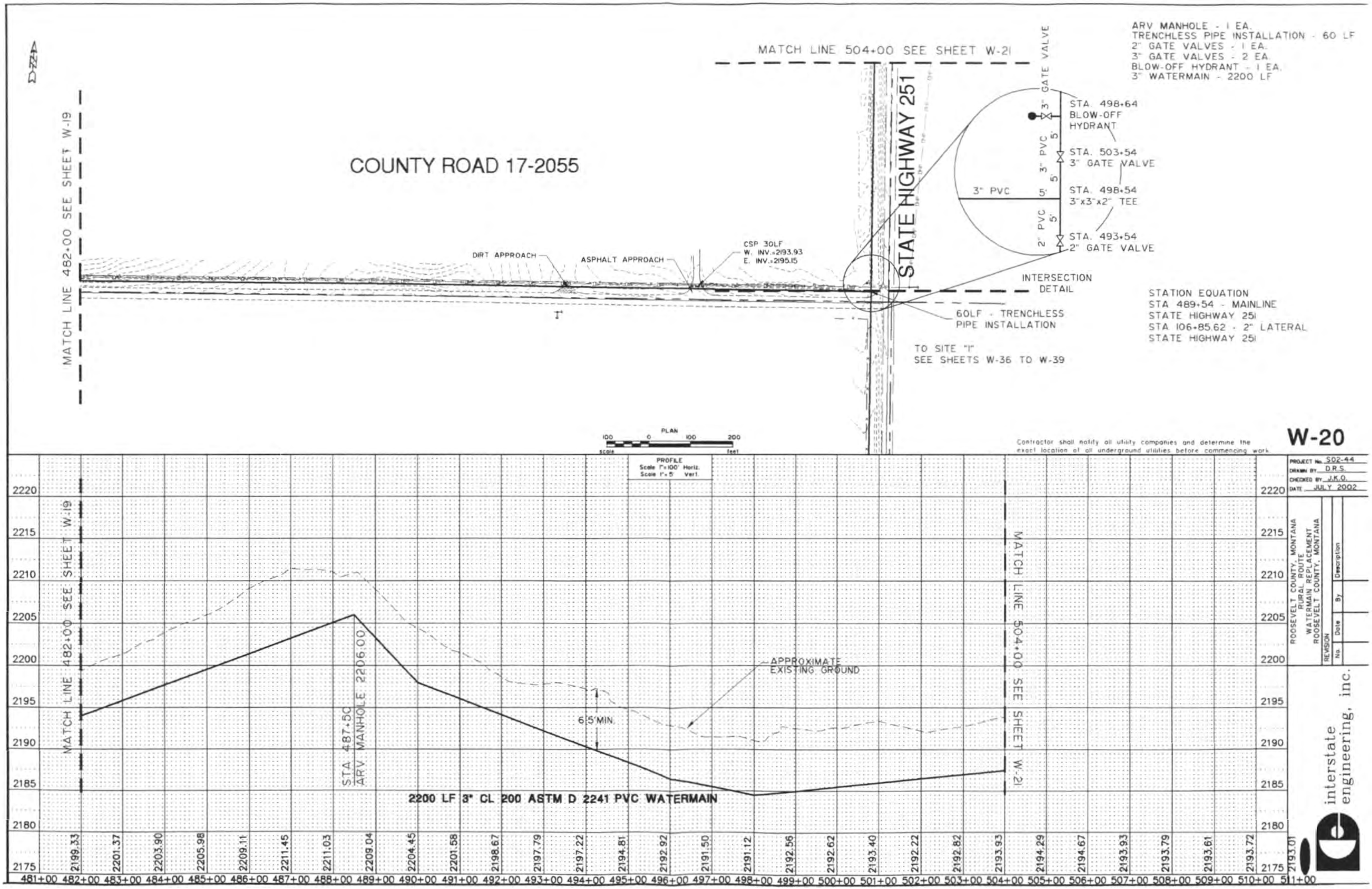
DATE JULY 2002

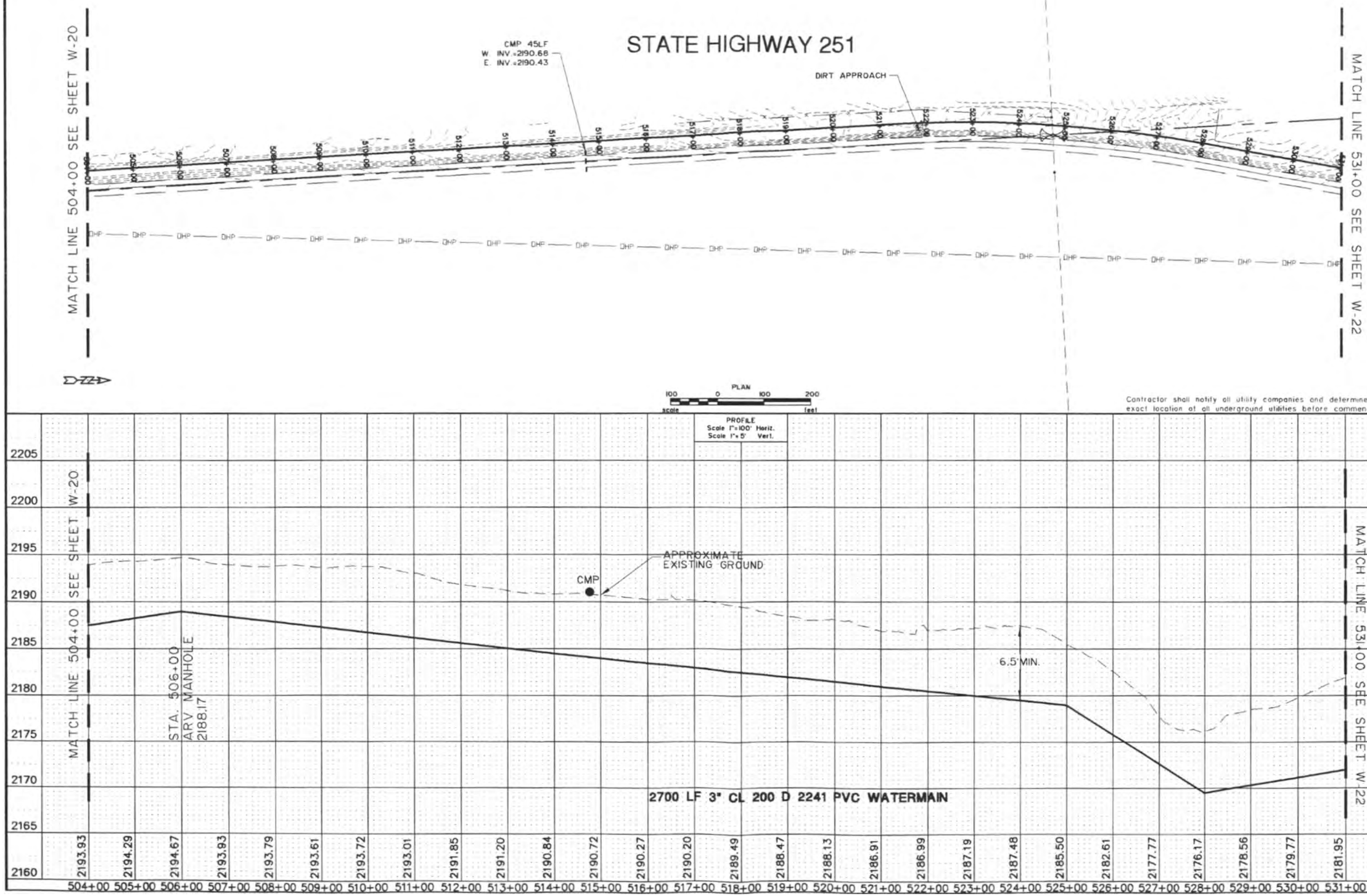
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.


MATCH LINE 504+00 SEE SHEET W-21
MATCH LINE 482+00 SEE SHEET W-19
COUNTY ROAD 17-2055
STATE HIGHWAY 251
DIRT APPROACH
ASPHALT APPROACH
CSP 30LF
W. INV.=2193.93
E. INV.=2195.15
ARV MANHOLE - 1 EA.
TRENCHLESS PIPE INSTALLATION - 60 LF
2" GATE VALVES - 1 EA.
3" GATE VALVES - 2 EA.
BLOW-OFF HYDRANT - 1 EA.
3" WATERMAIN - 2200 LF
3" GATE VALVE
3" PVC
2" PVC
5'
STA. 498+64
BLOW-OFF
HYDRANT
STA. 503+54
3" GATE VALVE
STA. 498+54
3"x3"x2" TEE
STA. 493+54
2" GATE VALVE
INTERSECTION
DETAIL
60LF - TRENCHLESS
PIPE INSTALLATION
TO SITE "1"
SEE SHEETS W-36 TO W-39
STATION EQUATION
STA 489+54 - MAINLINE
STATE HIGHWAY 251
STA 106+85.62 - 2" LATERAL
STATE HIGHWAY 251
PLAN
100 0 100 200
Scale feet
Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work
W-20
PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.
APPROXIMATE
EXISTING GROUND
6.5' MIN.
STA 487+50
ARV MANHOLE 2206.00
2200 LF 3" CL 200 ASTM D 2241 PVC WATERMAIN
2220
2215
2210
2205
2200
2195
2190
2185
2180
2175
2199.33
2201.37
2203.90
2205.98
2209.11
2211.45
2211.03
2209.04
2204.45
2201.58
2198.67
2197.79
2197.22
2194.81
2192.92
2191.50
2191.12
2192.56
2192.62
2193.40
2192.22
2192.82
2193.93
2194.29
2194.67
2193.93
2193.79
2193.61
2193.72
2193.01
481+00 482+00 483+00 484+00 485+00 486+00 487+00 488+00 489+00 490+00 491+00 492+00 493+00 494+00 495+00 496+00 497+00 498+00 499+00 500+00 501+00 502+00 503+00 504+00 505+00 506+00 507+00 508+00 509+00 510+00 511+00
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA
REVISION
No. Date By Description
interstate engineering, inc.

3 " WATERMAIN - 2700LF
ARV MANHOLE 1 EA



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-21

PROJECT No. S02-44
DRAWN BY D.R.S.
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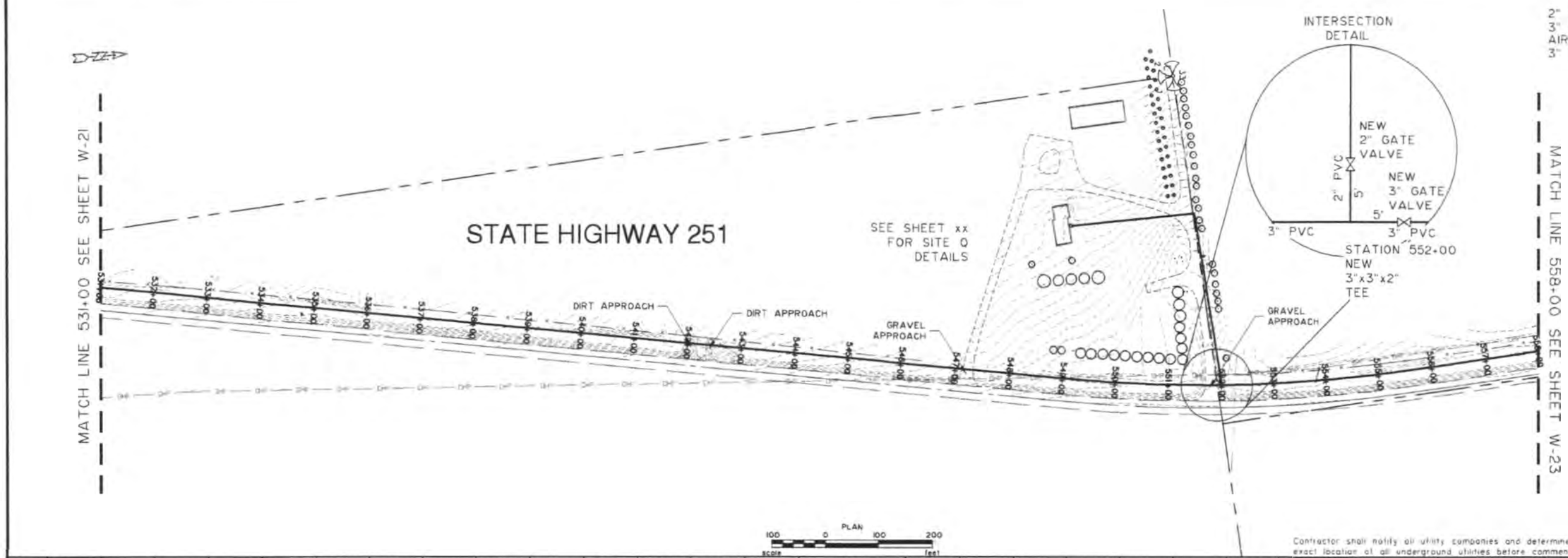
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

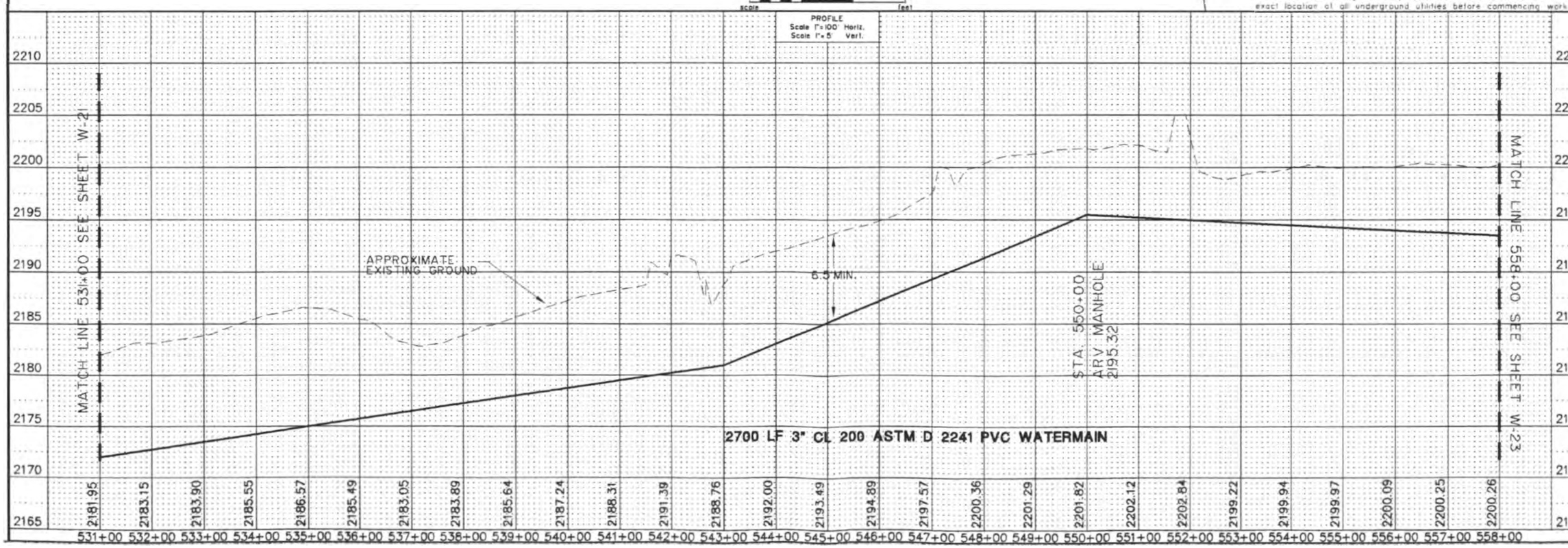
interstate engineering, inc.

2" GATE VALVE - 1
3" GATE VALVE - 1
AIR RELEASE MANHOLE - 1
3" WATERMAIN - 2700LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-22



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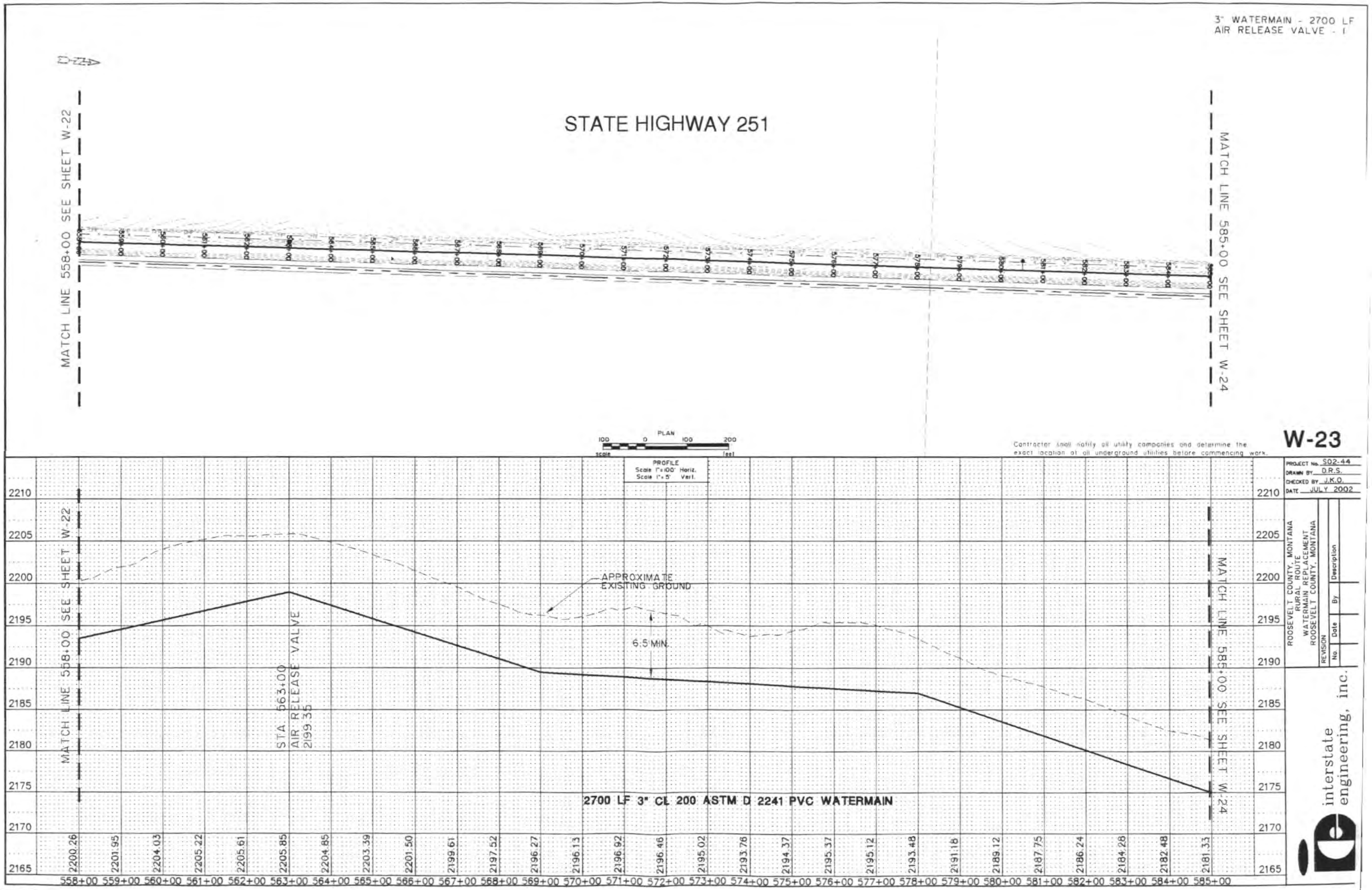
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN - 2700 LF
AIR RELEASE VALVE - 1



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-23

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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

3" PVC WATERMAIN - 2700 LF

STATE HIGHWAY 251

MATCH LINE 585+00 SEE SHEET W-23

MATCH LINE 612+00 SEE SHEET W-25

DIRT APPROACH

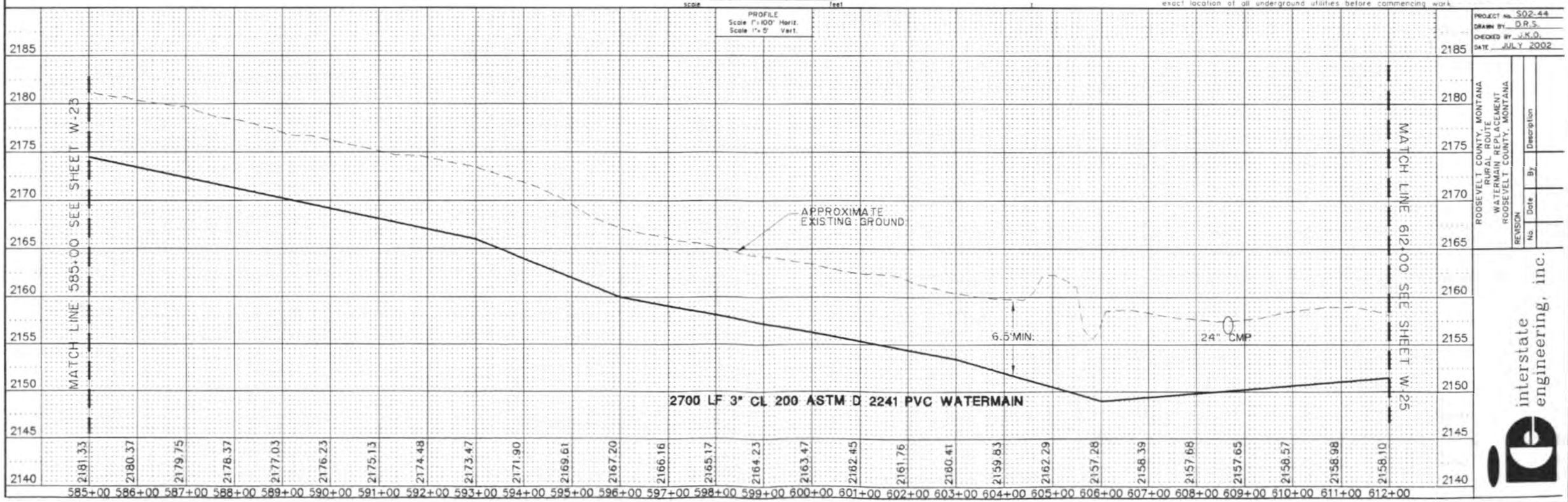
24" CMP 49LF
W. INV=2156.94
E. INV.=2156.94

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-24

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



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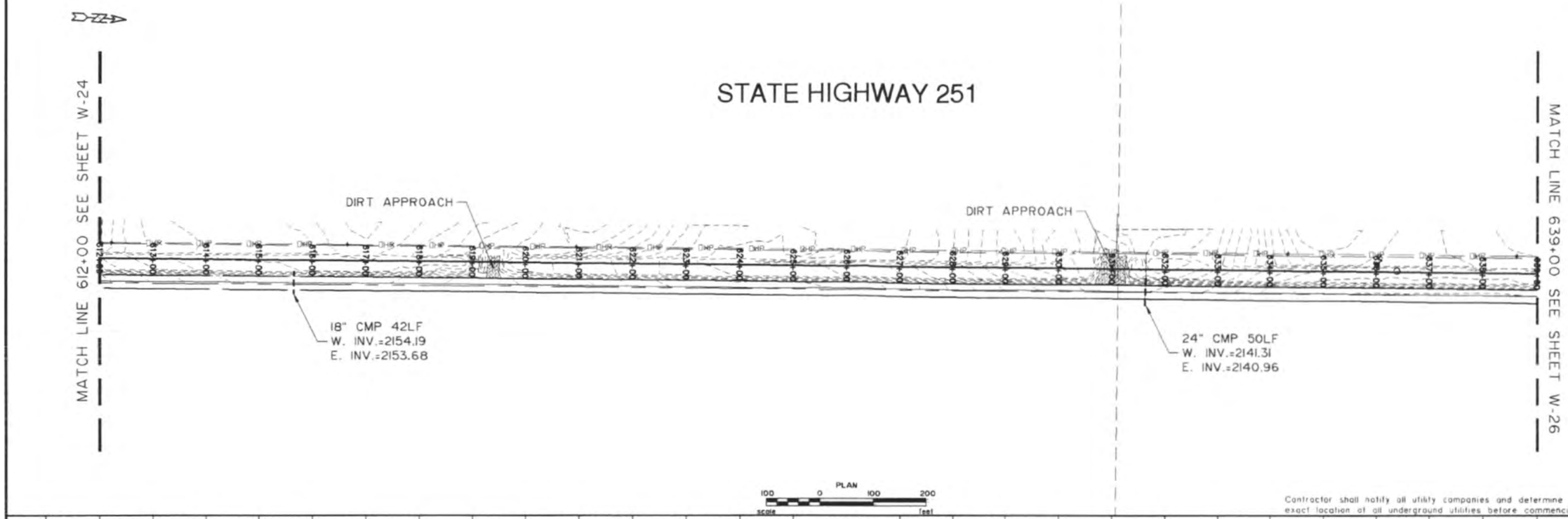
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

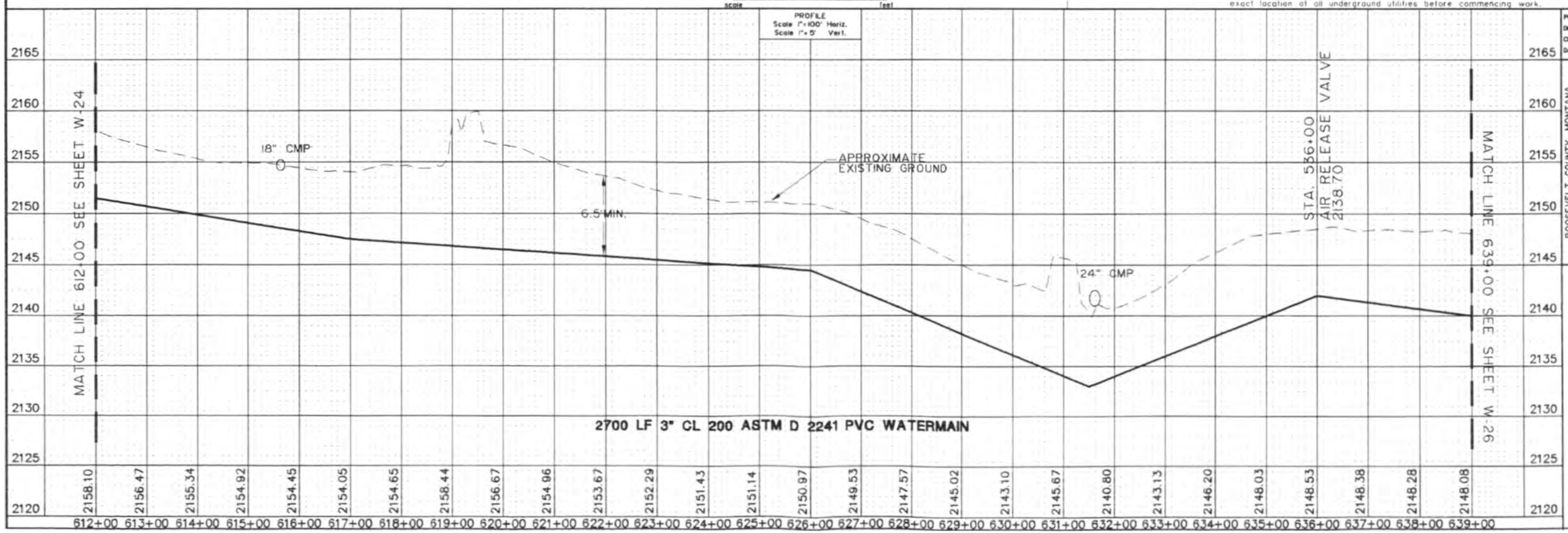
interstate engineering, inc.

3" WATERMAIN - 2700 LF
AIR RELEASE MANHOLE 1 EA



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-25



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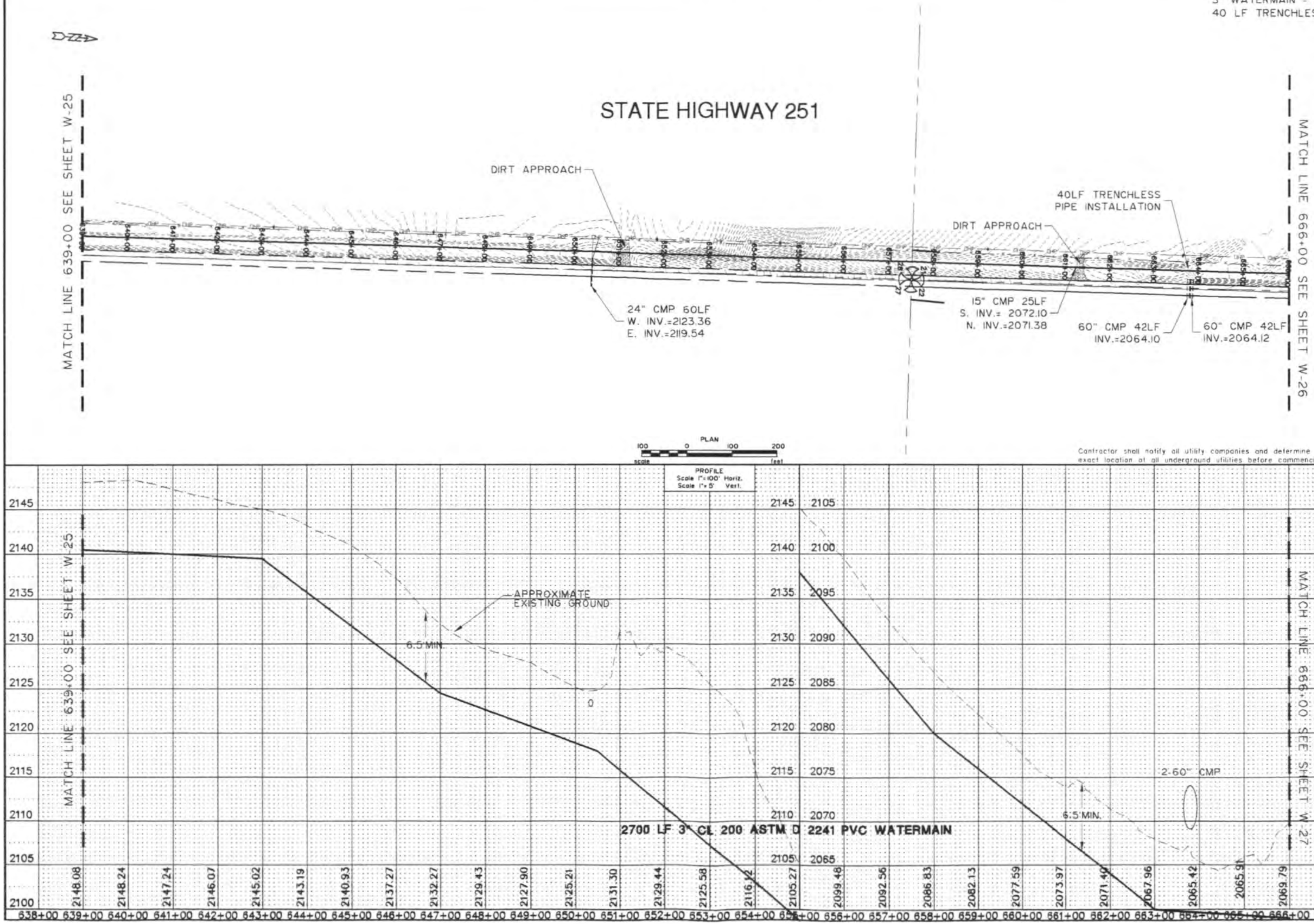
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

3" WATERMAIN - 2700 LF
40 LF TRENCHLESS PIPE INSTALLATION



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-26

PROJECT No. S02-44
DRAWN BY D.R.S.
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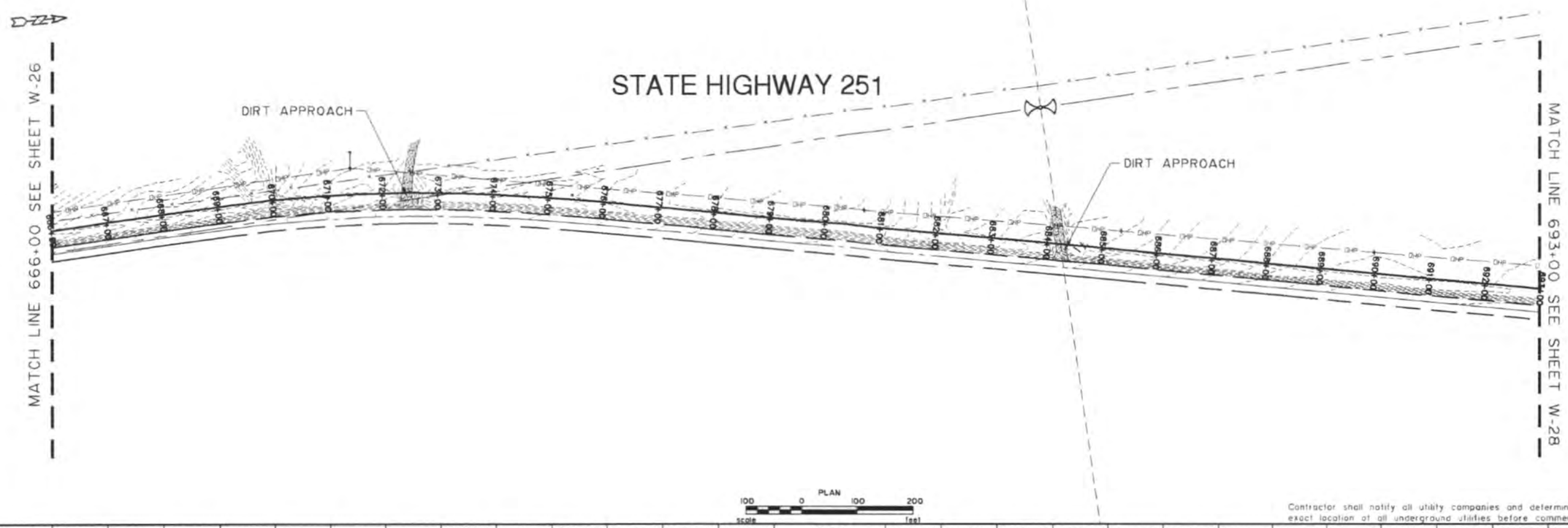
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION No.	Date	By	Description

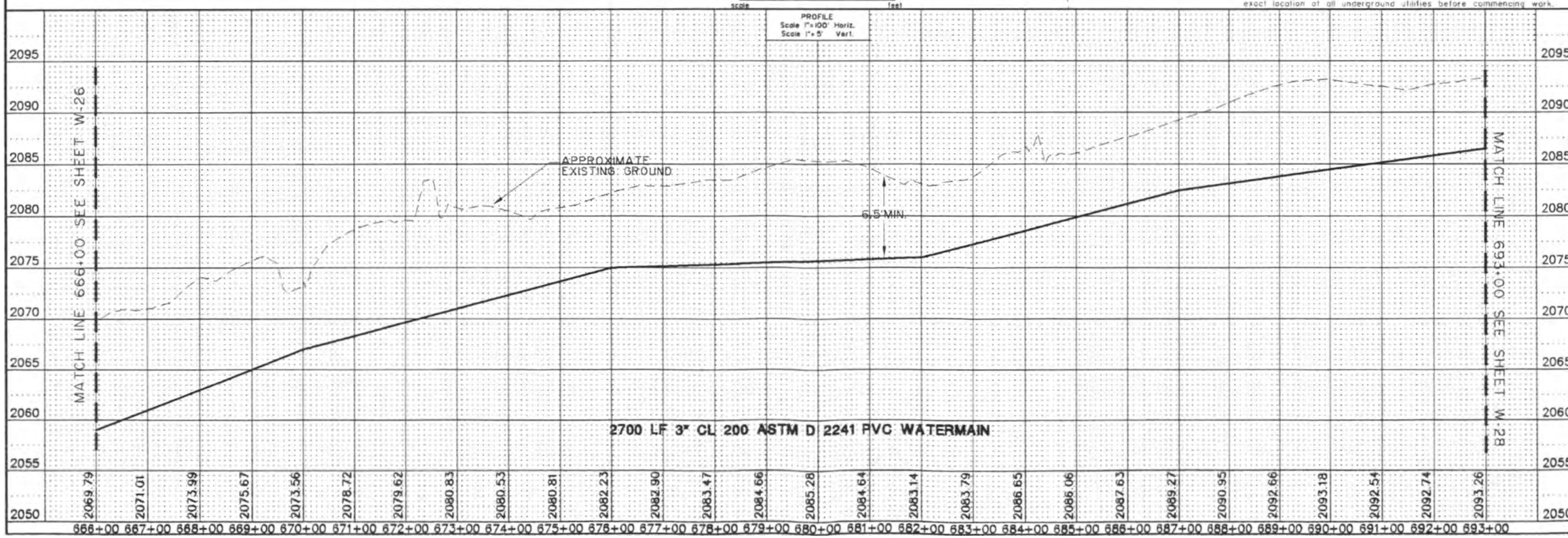
interstate engineering, inc.

3" WATERMAIN 2700LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-27



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
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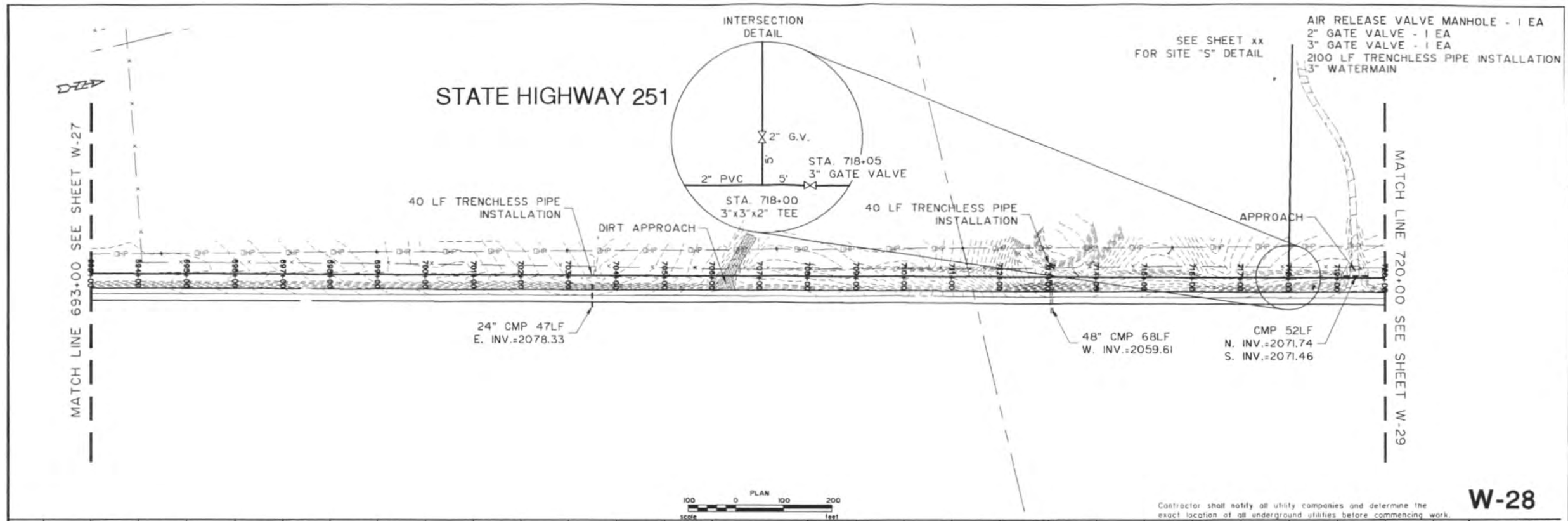
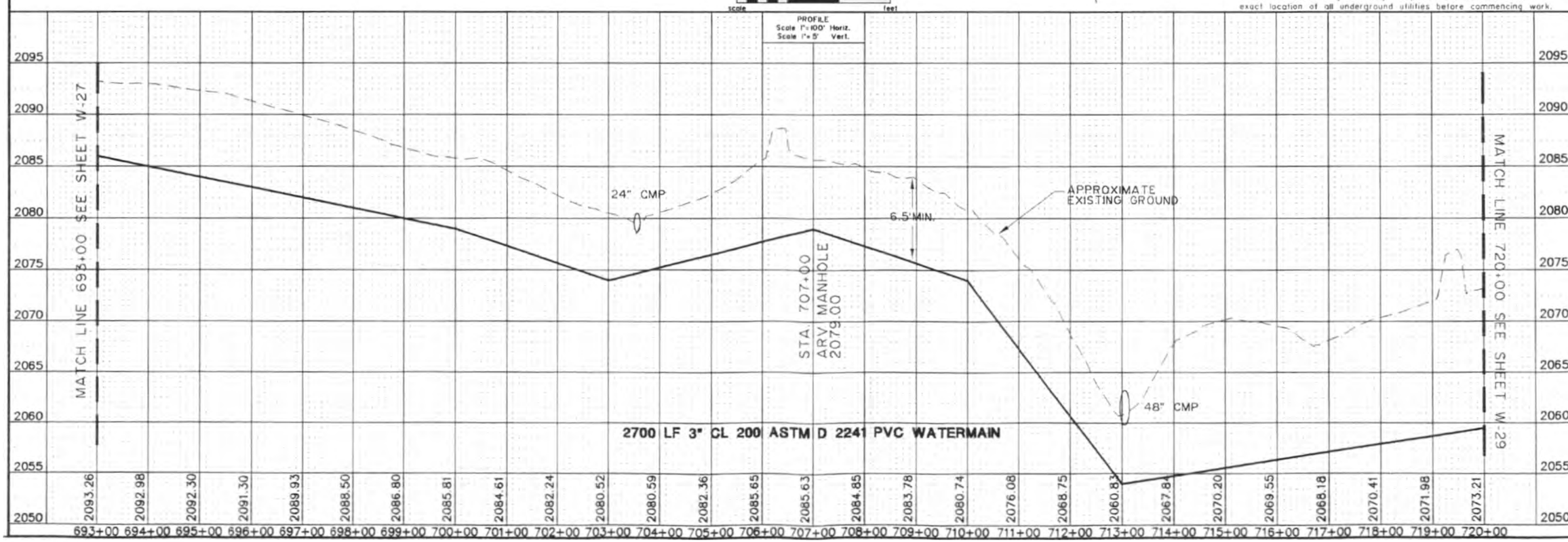
interstate engineering, inc.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-28



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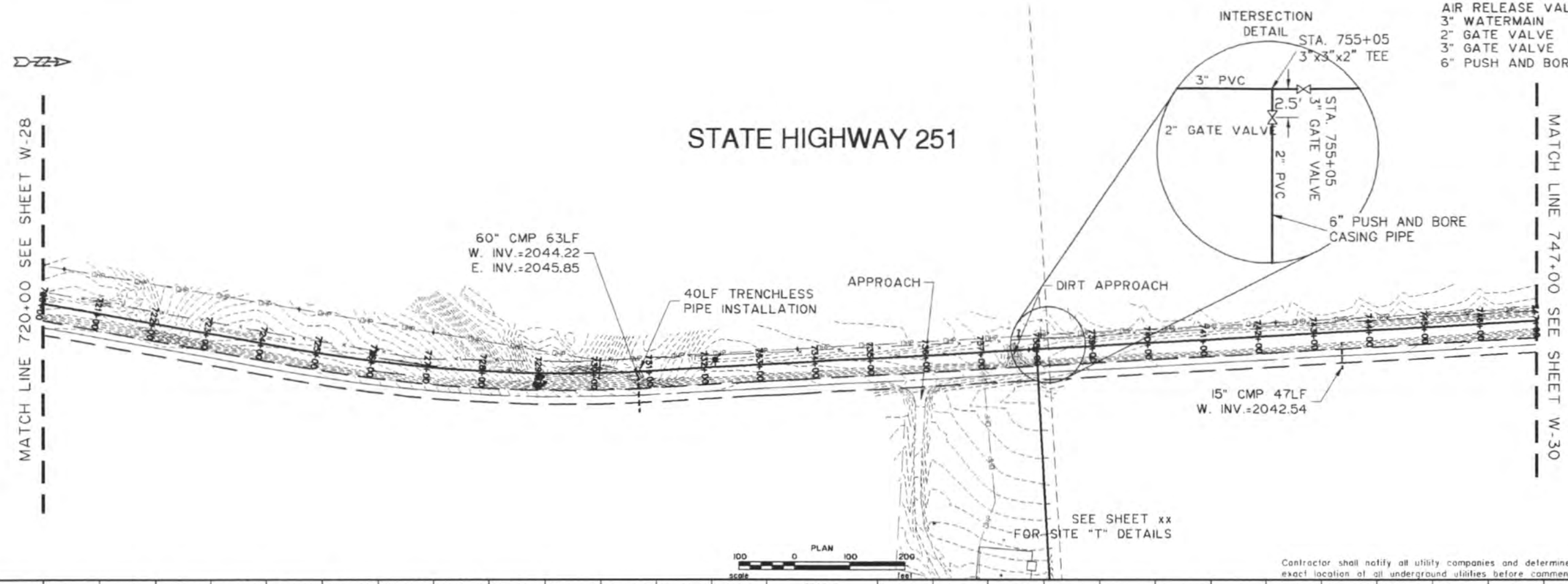
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

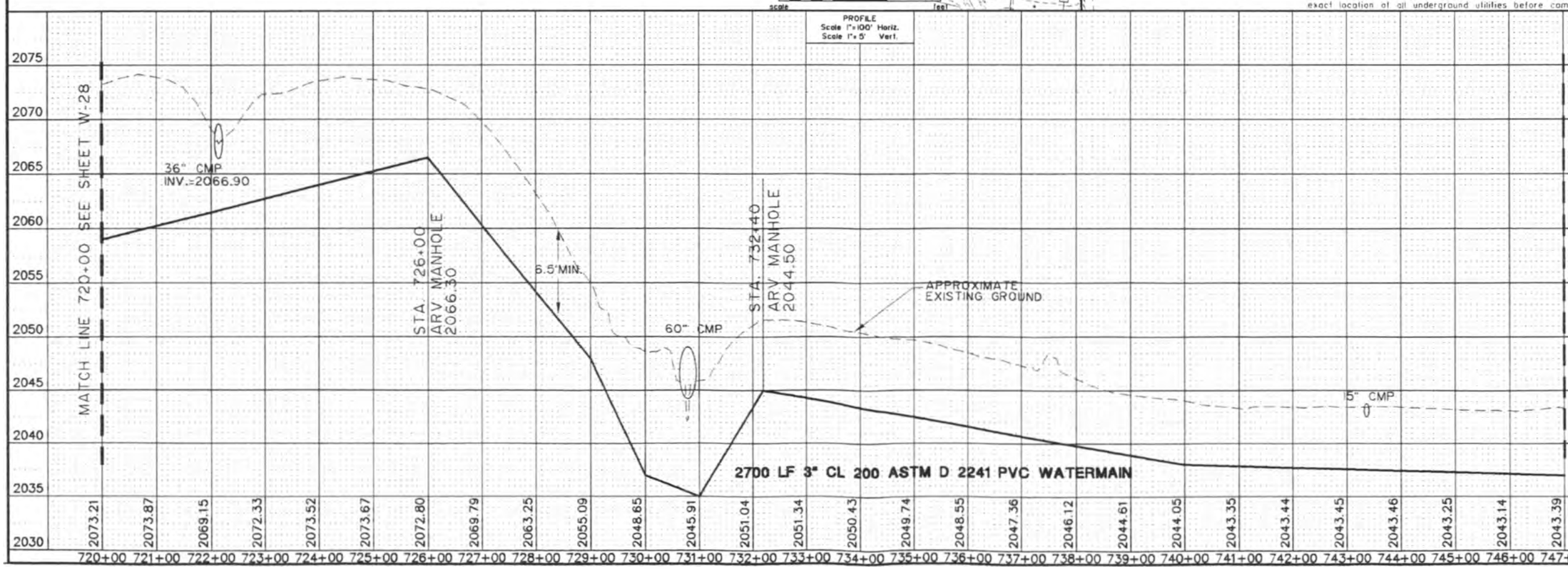
interstate engineering, inc.

TRENCHLESS PIPE INSTALLATION 40 LF
AIR RELEASE VALVE MANHOLE - 1 EA
3" WATERMAIN 2700 LF
2" GATE VALVE 1 EA
3" GATE VALVE 1 EA
6" PUSH AND BORE 80 LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-29



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

AIR RELEASE VALVE MANHOLE - 1
3" WATERMAIN 1830 LF

STATE HIGHWAY 251

COUNTY ROAD 17-2050

MATCH LINE 747+00 SEE SHEET W-29

SEE SHEET 45 FOR INTERSECTION DETAIL

EQUATION STA
STA 764+71 STATE HIGHWAY 251
STA 139+05 COUNTY ROAD 17-2050

48"CMP
W. INV.=2036.74

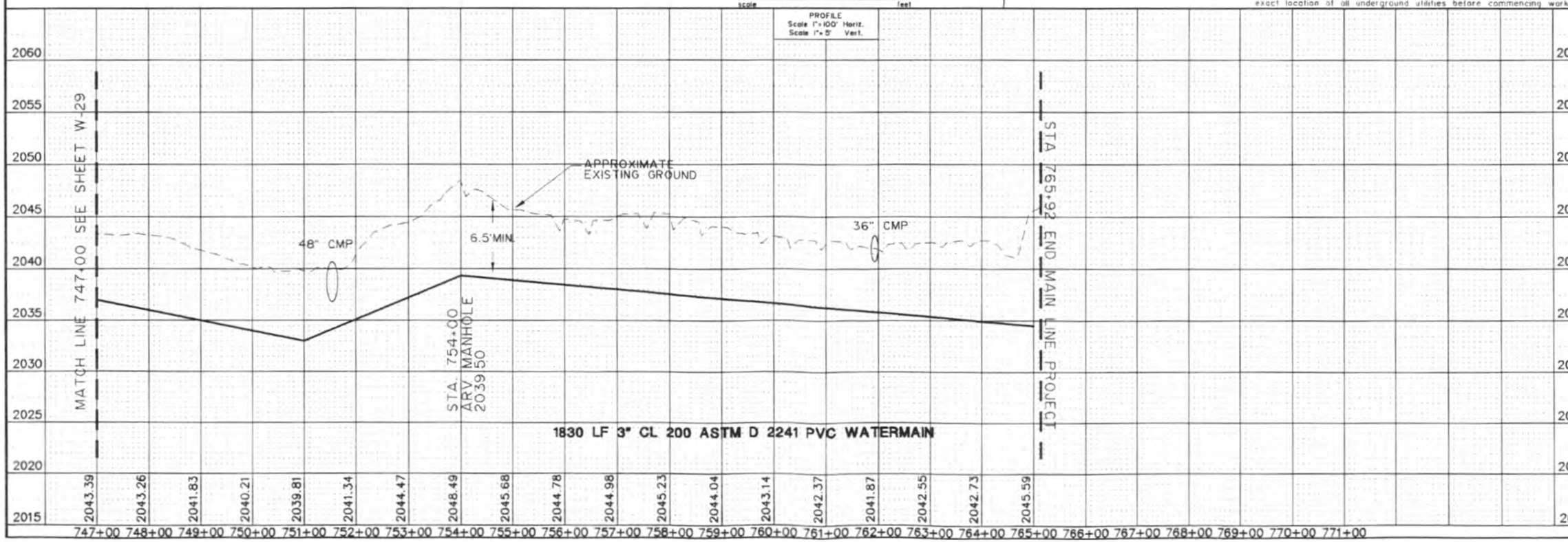
36"CMP 41LF
W. INV.=2040.38
E. INV.=2040.67

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-30

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
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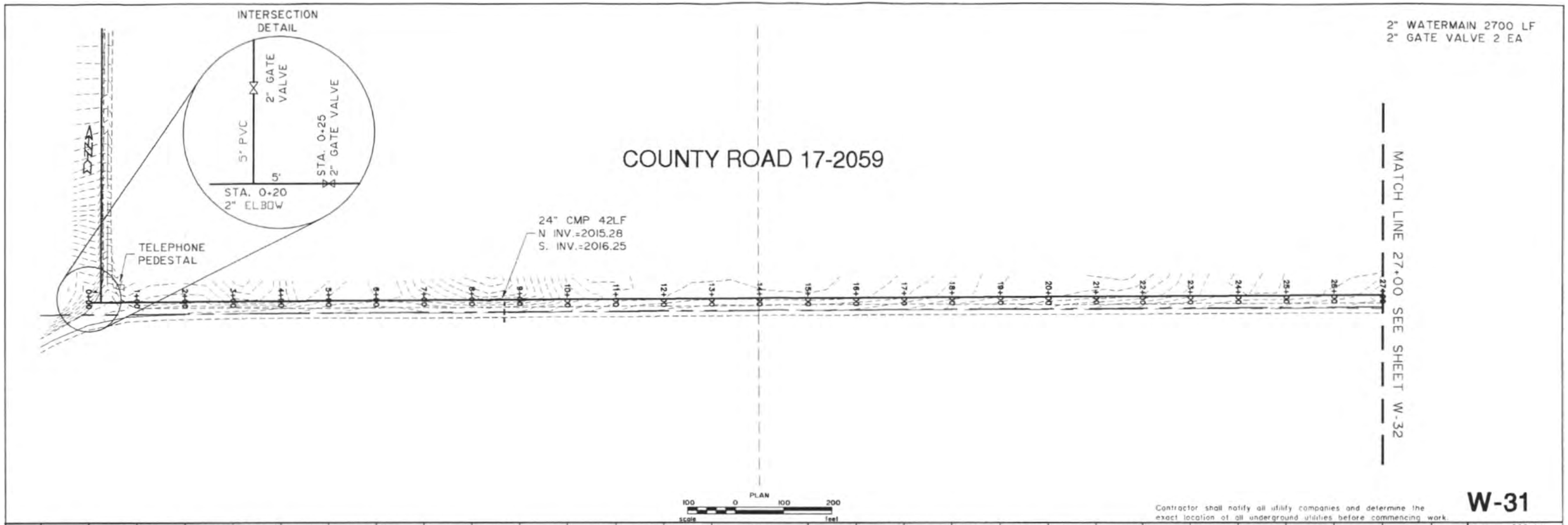
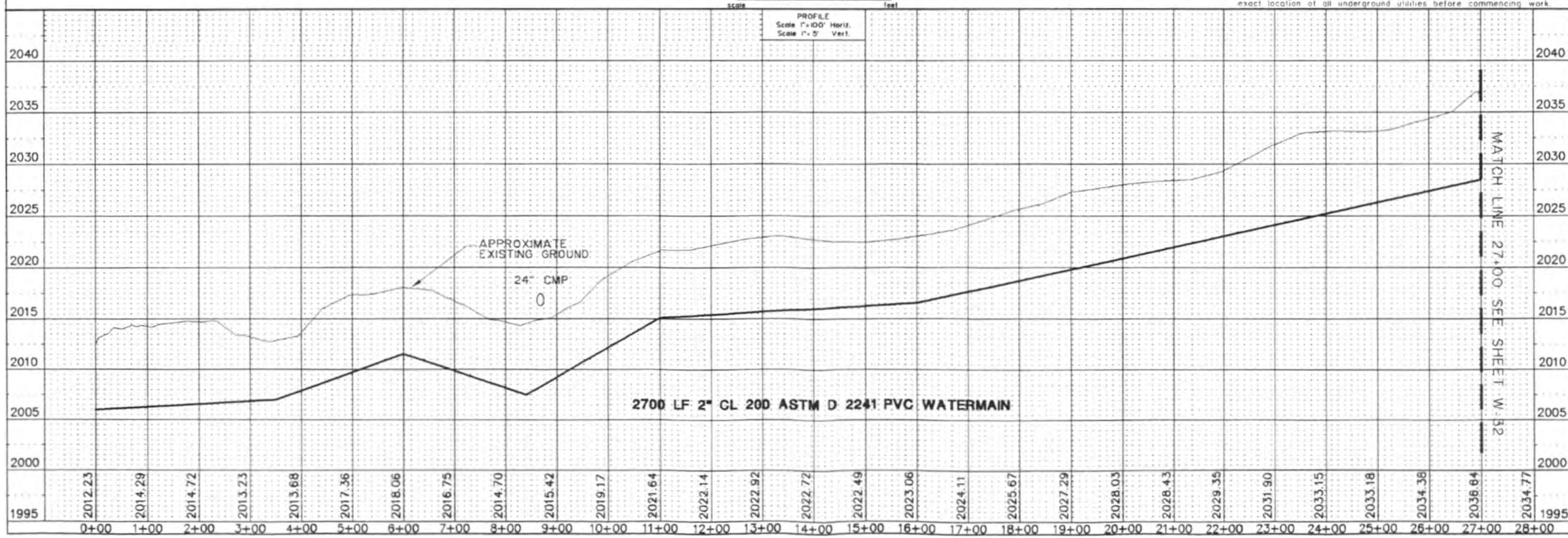
interstate engineering, inc.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-31



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
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REVISION			
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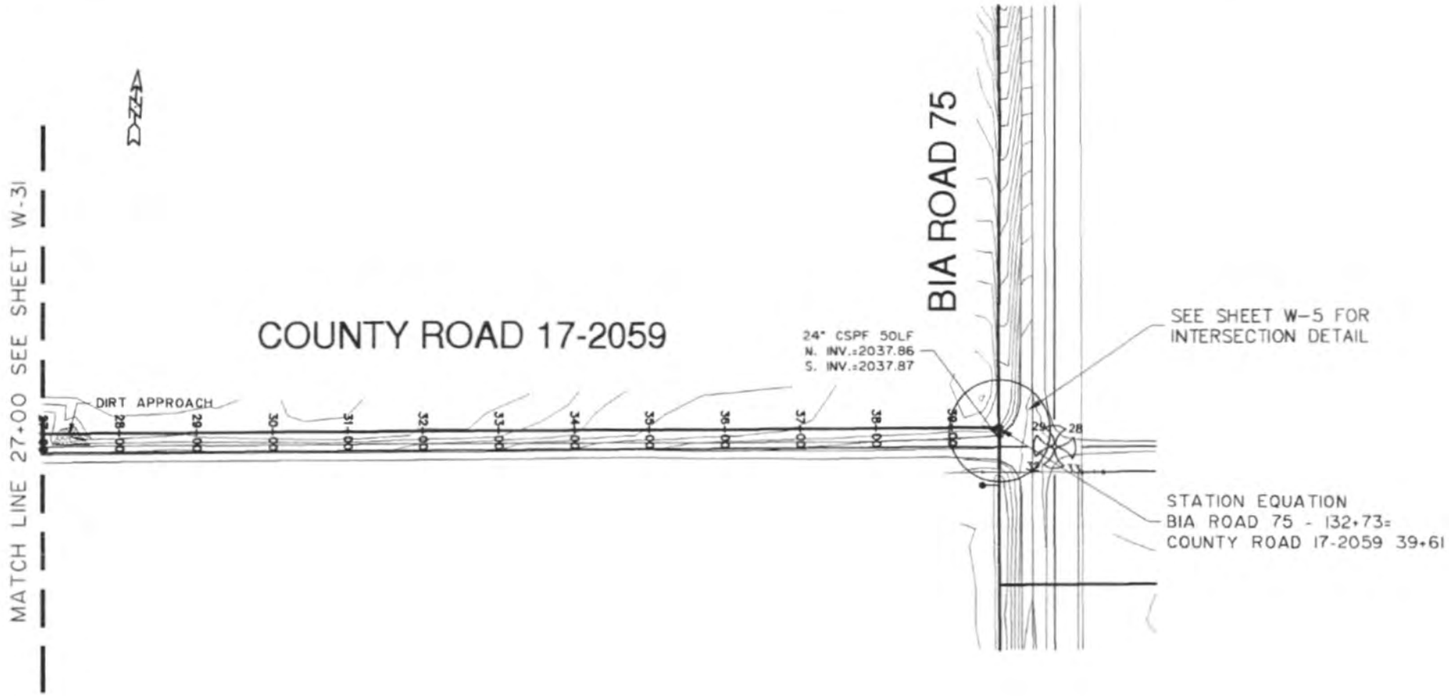
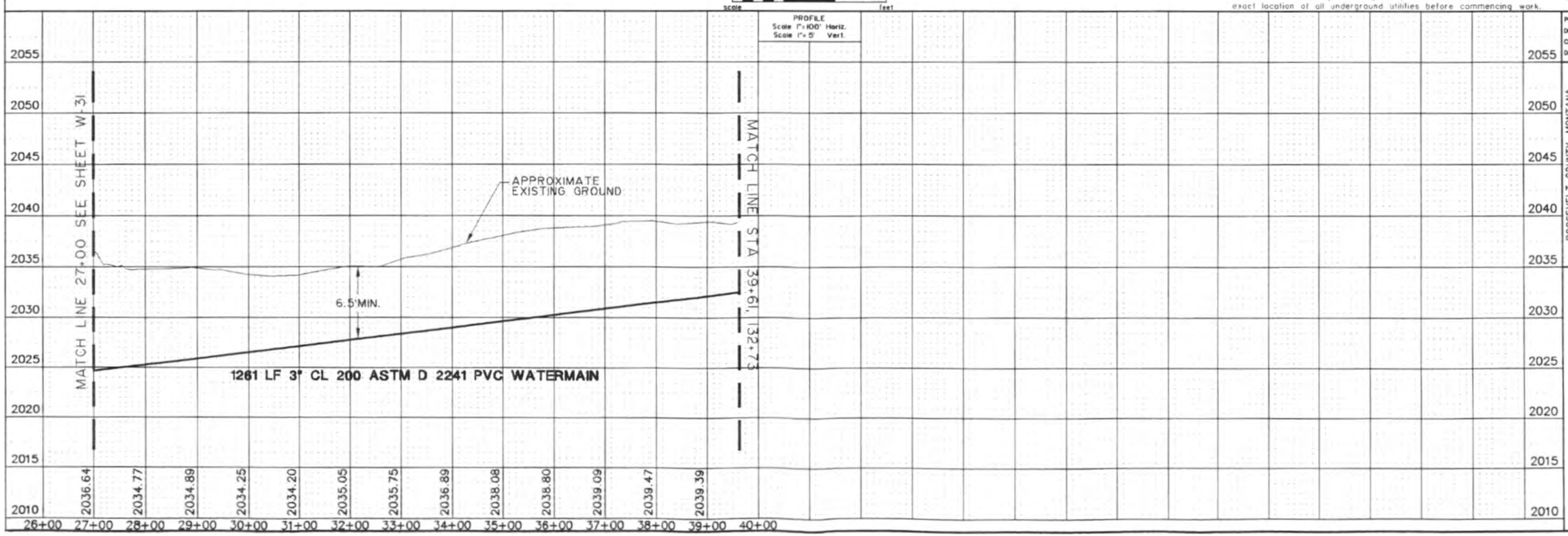
interstate engineering, inc.

2" WATERMAIN 1261 LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-32



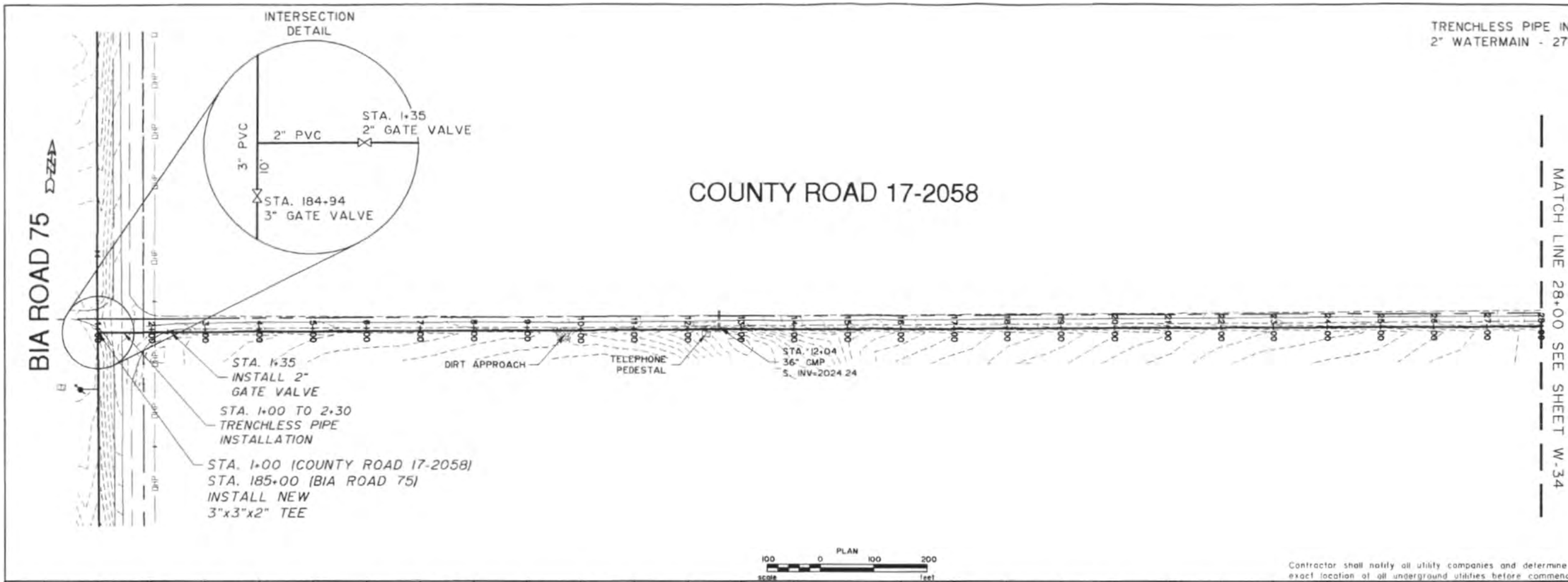
PROJECT No. S02-44
DRAWN BY D.R.S.
CHECKED BY J.K.O.
DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

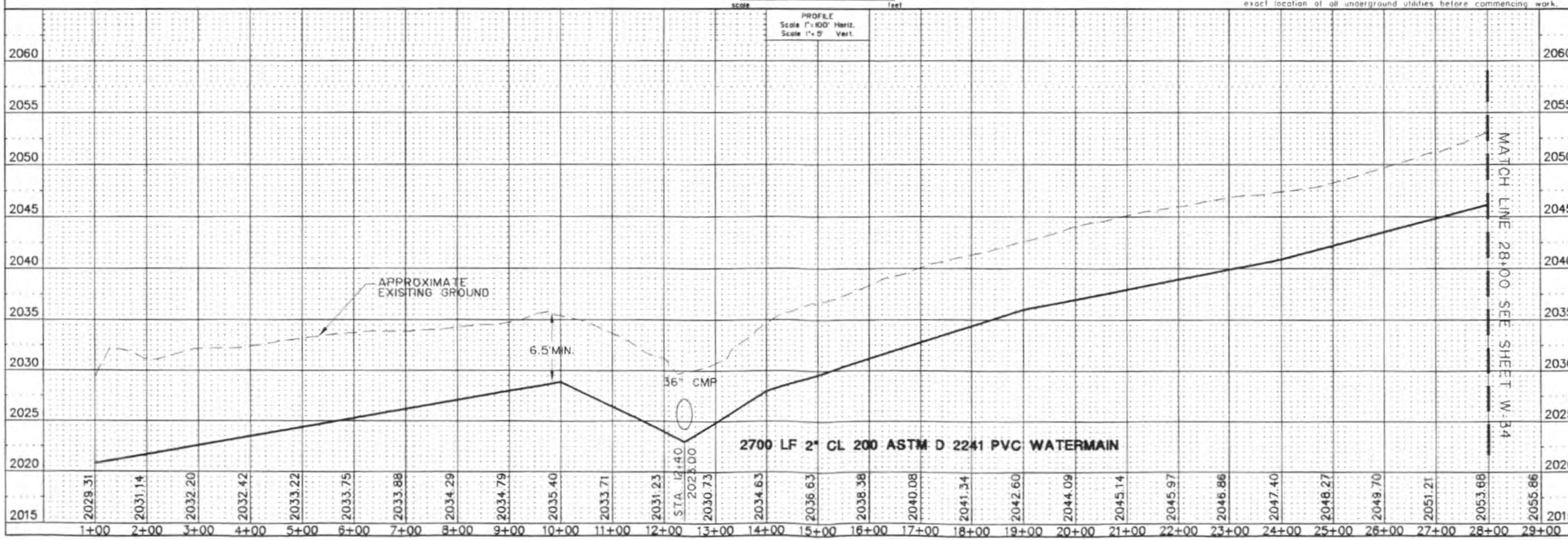
interstate engineering, inc.

TRENCHLESS PIPE INSTALLATION - 130 LF
2" WATERMAIN - 2700 LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-33



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

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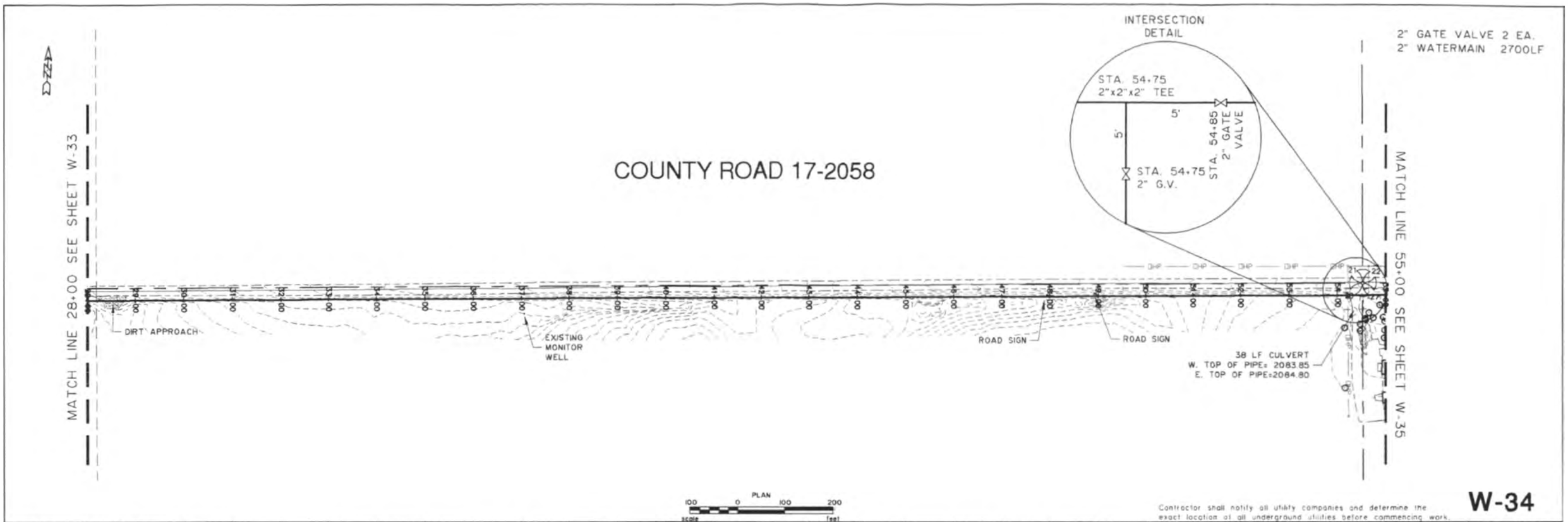
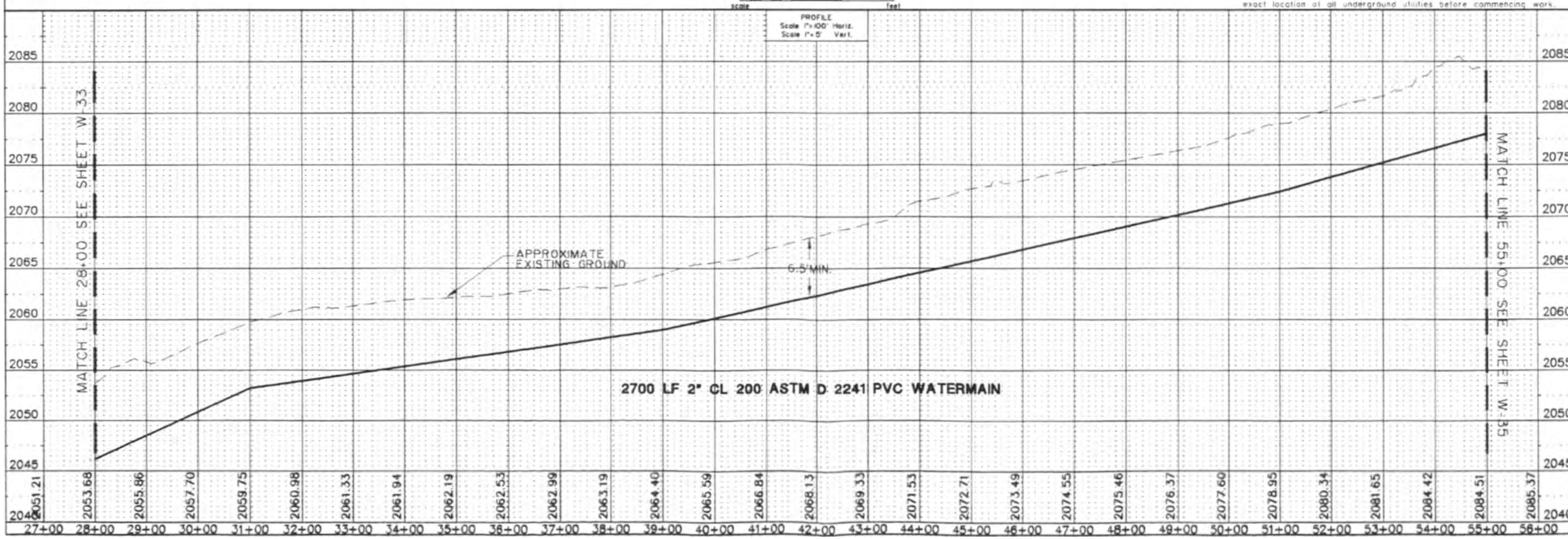
No.	Date	By	Description

interstate engineering, inc.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-34



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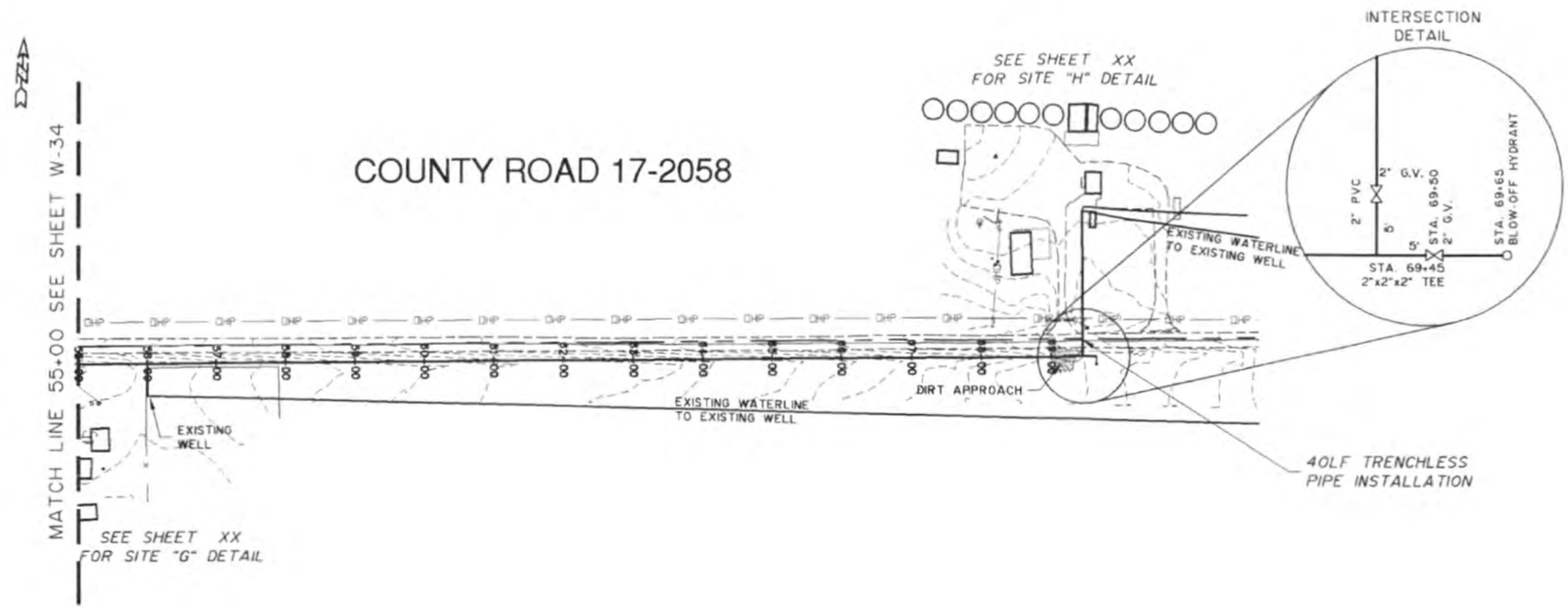
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

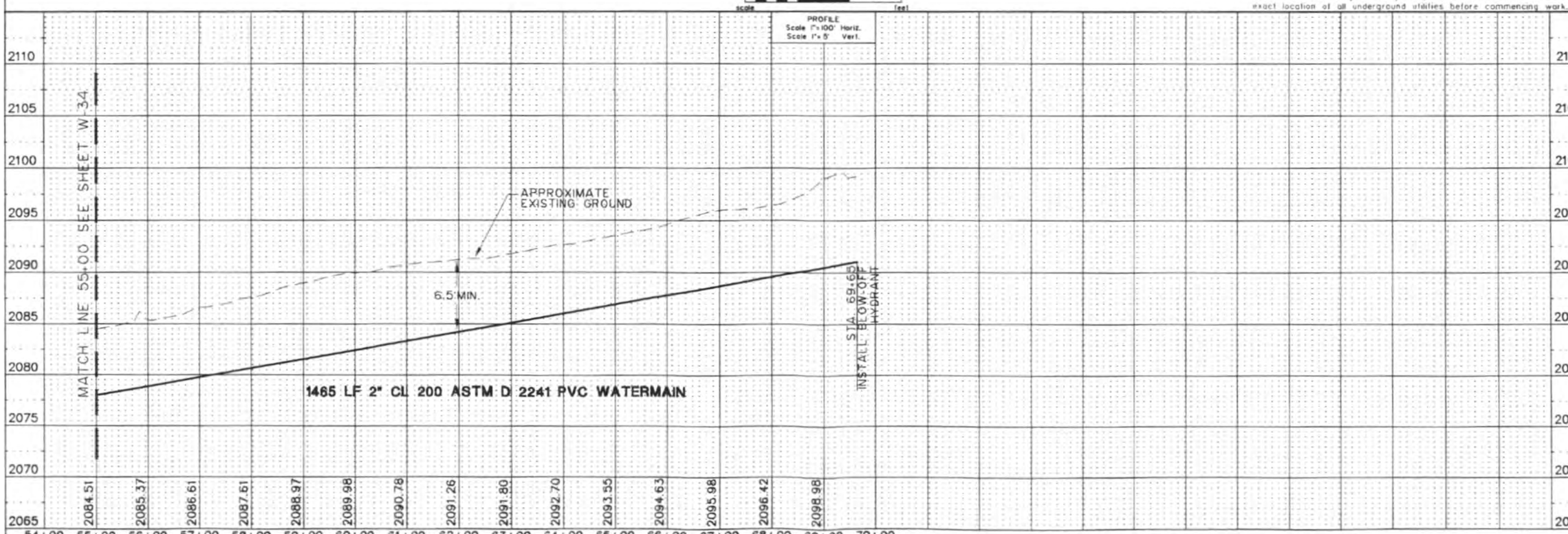
1465 LF 2" PVC WATERMAIN
2 EA. - 2" GATE VALVES
1 EA. - BLOW OFF HYDRANT



PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-35



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ROOSEVELT COUNTY, MONTANA
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WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

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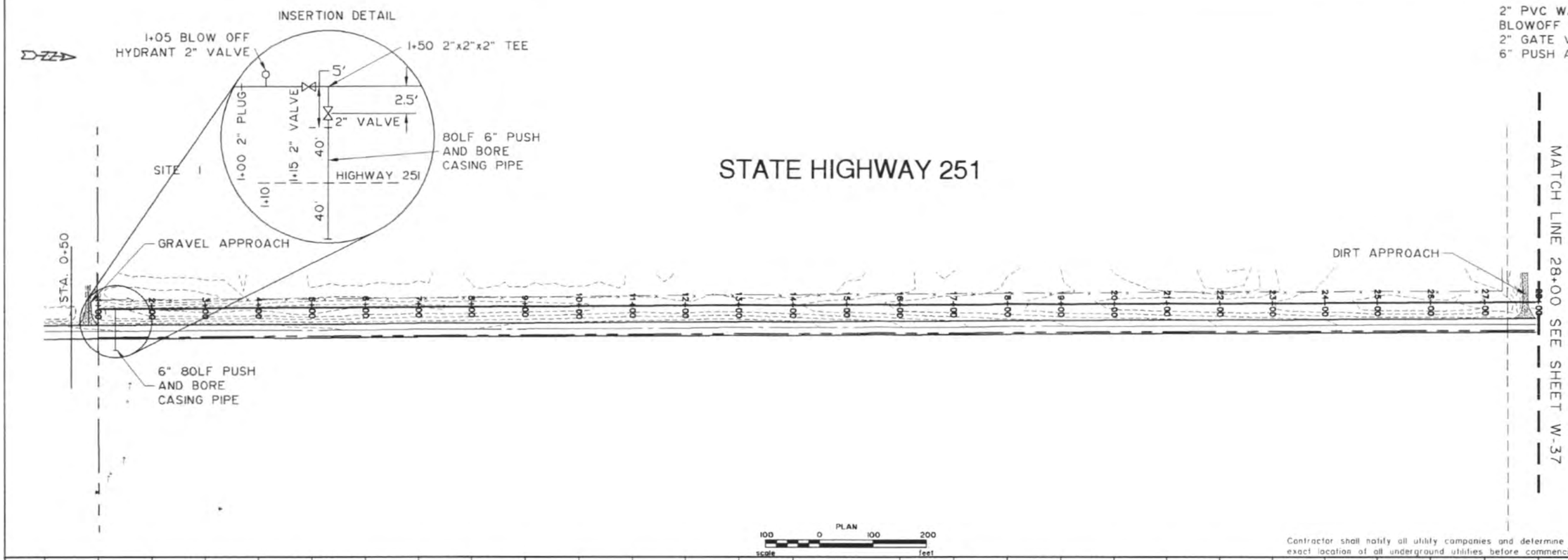
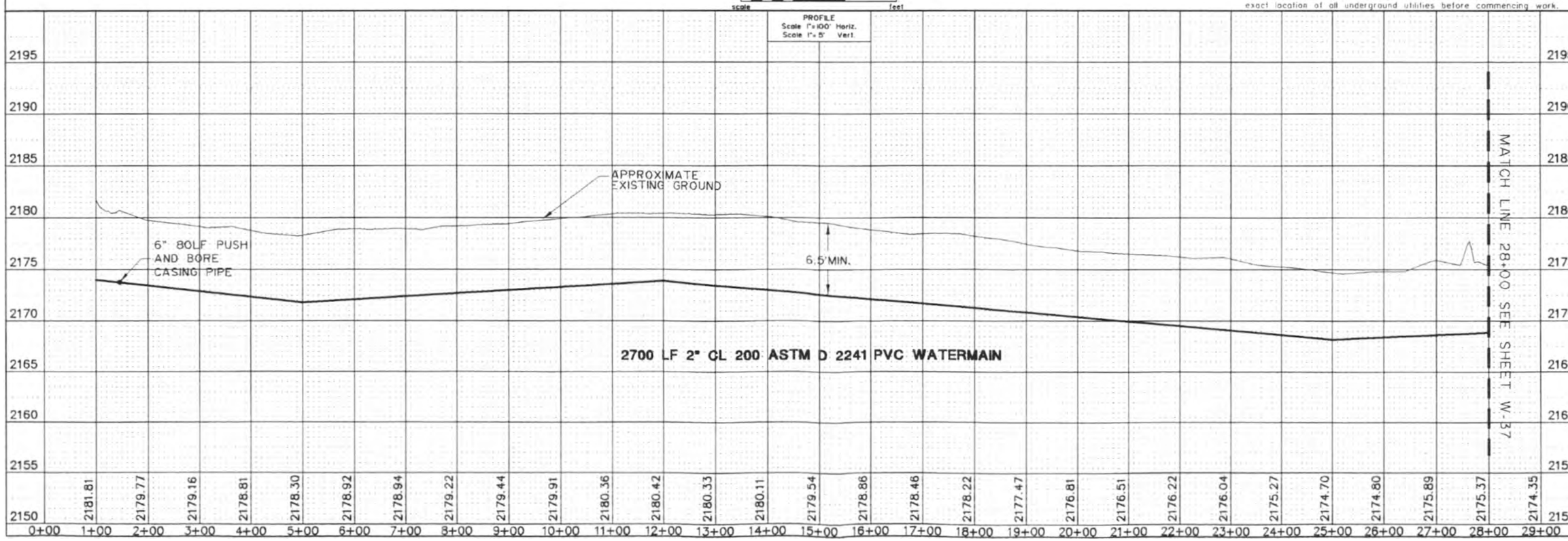
interstate engineering, inc.

2" PVC WATER MAIN - 2700 LF
BLOWOFF HYDRANT - 1 EA.
2" GATE VALVE - 3 EA.
6" PUSH AND BORE - 80 LF.



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-36



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

2" WATERMAIN 2700 LF

D-ZZ-D

MATCH LINE 28+00 SEE SHEET W-36

STATE HIGHWAY 251

DIRT APPROACH

24" CMP 52LF
W INV 2164.83
E INV 2164.03

MATCH LINE 55+00 SEE SHEET W-38

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-37

PROJECT No. S02-44
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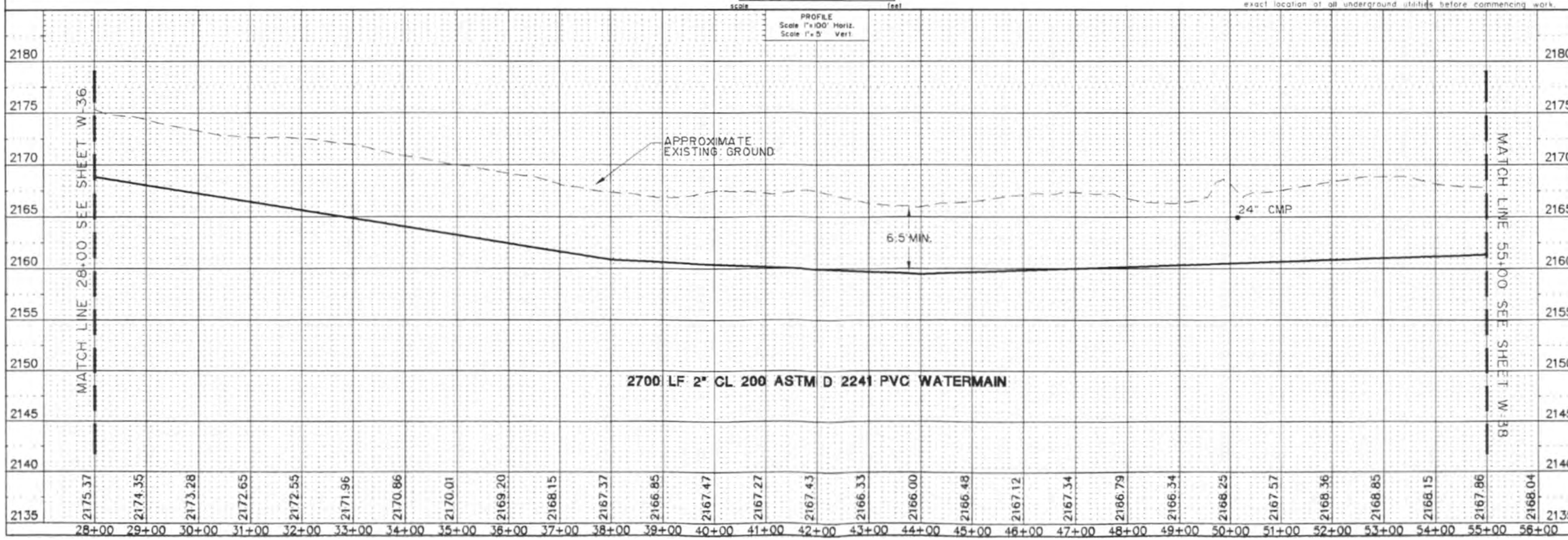
DATE JULY 2002

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

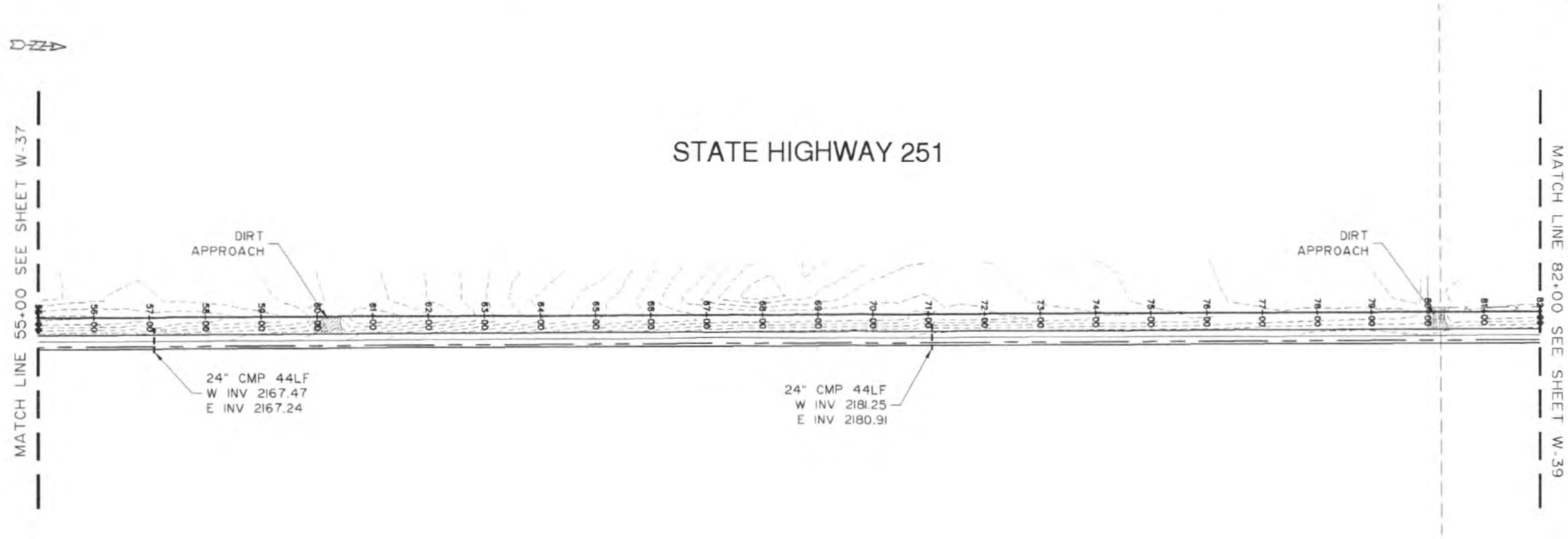


ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

2" WATERMAIN 2700 LF

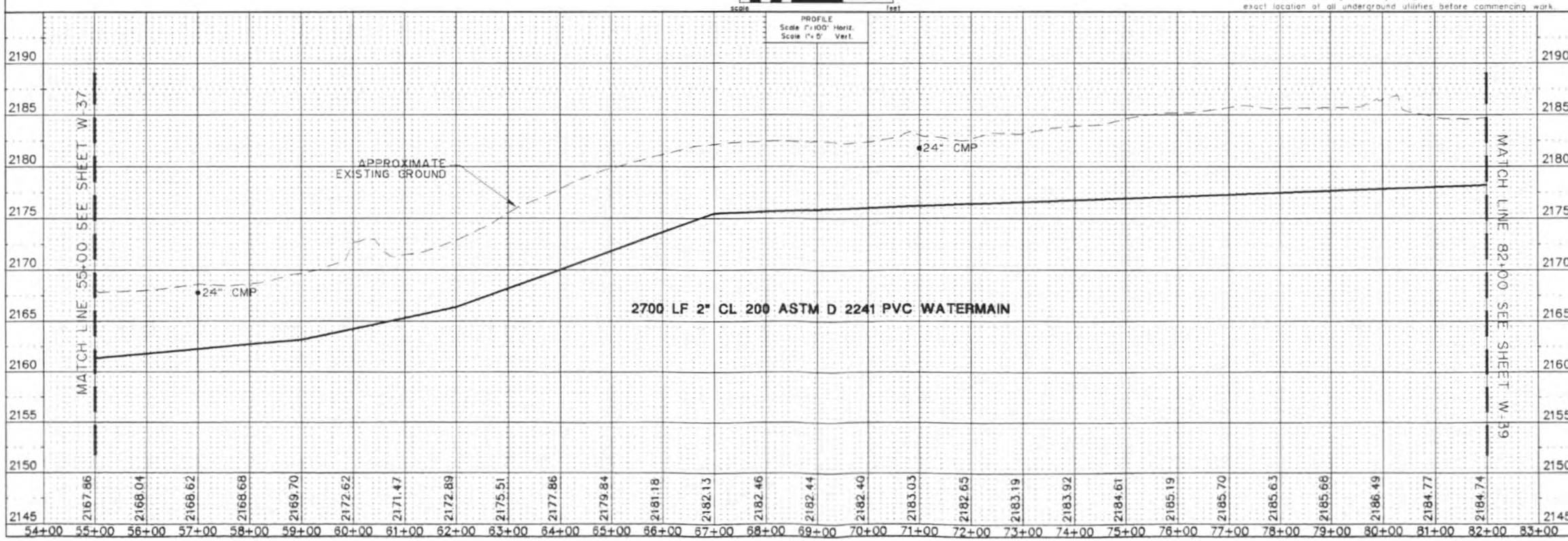


PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-38

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



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DATE JULY 2002

ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

2" WATERMAIN 2462LF

STATE HIGHWAY 251

COUNTY ROAD 17-2055

MATCH LINE 82+00 SEE SHEET W-38

MATCH LINE 106+85.62

NOTE: SEE SHEET W-20 FOR FITTINGS AND VALVE LAYOUT

STATION EQUATION
STA 489+54 - MAINLINE STATE HIGHWAY 251
STA 106+85.62 - 2" LATERAL STATE HIGHWAY 251

PLAN
100 0 100 200
Scale Feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-39

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

MATCH LINE 83+00 SEE SHEET W-38

MATCH LINE 106+85.62

APPROXIMATE EXISTING GROUND

5.5' MIN.

2462 LF 2" CL 200 ASTM D 2241 PVC WATERMAIN

2205 2200 2195 2190 2185 2180 2175 2170 2165 2160

2184.74 2185.33 2186.08 2186.42 2186.45 2186.70 2187.51 2187.40 2187.42 2188.43 2188.77 2189.58 2189.60 2189.20 2188.85 2188.58 2188.81 2189.19 2189.66 2188.93 2188.48 2188.67 2189.15 2189.95 2190.92

81+00 82+00 83+00 84+00 85+00 86+00 87+00 88+00 89+00 90+00 91+00 92+00 93+00 94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00

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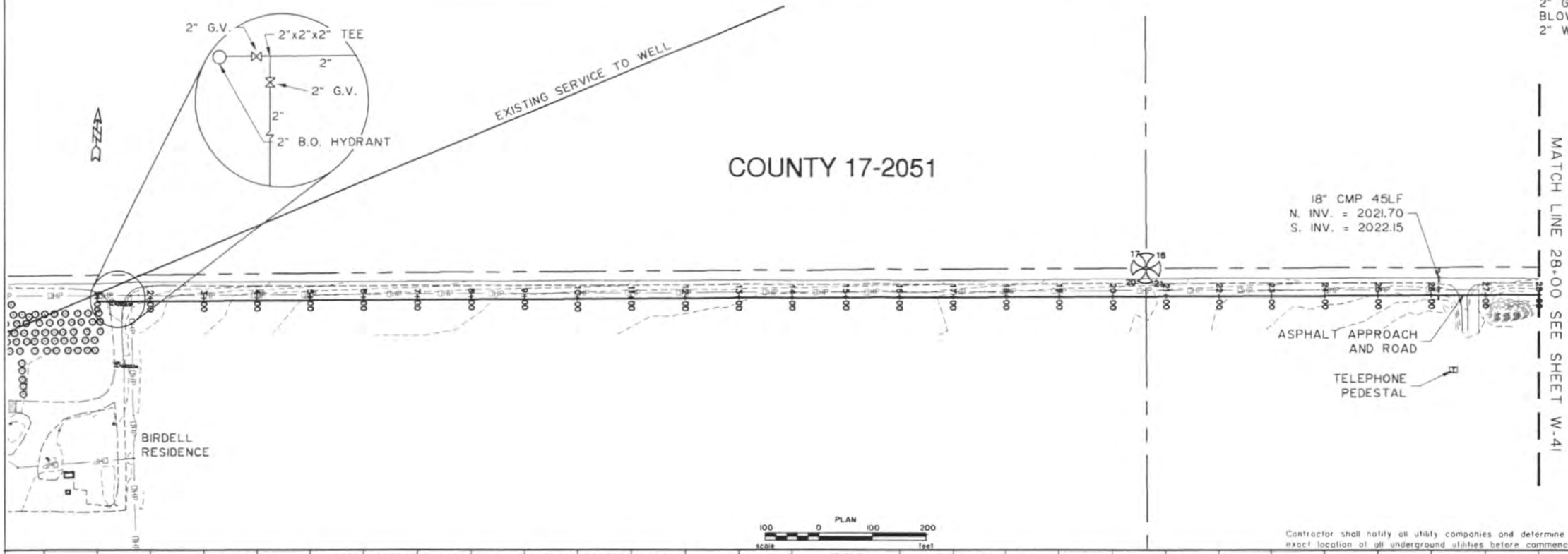
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

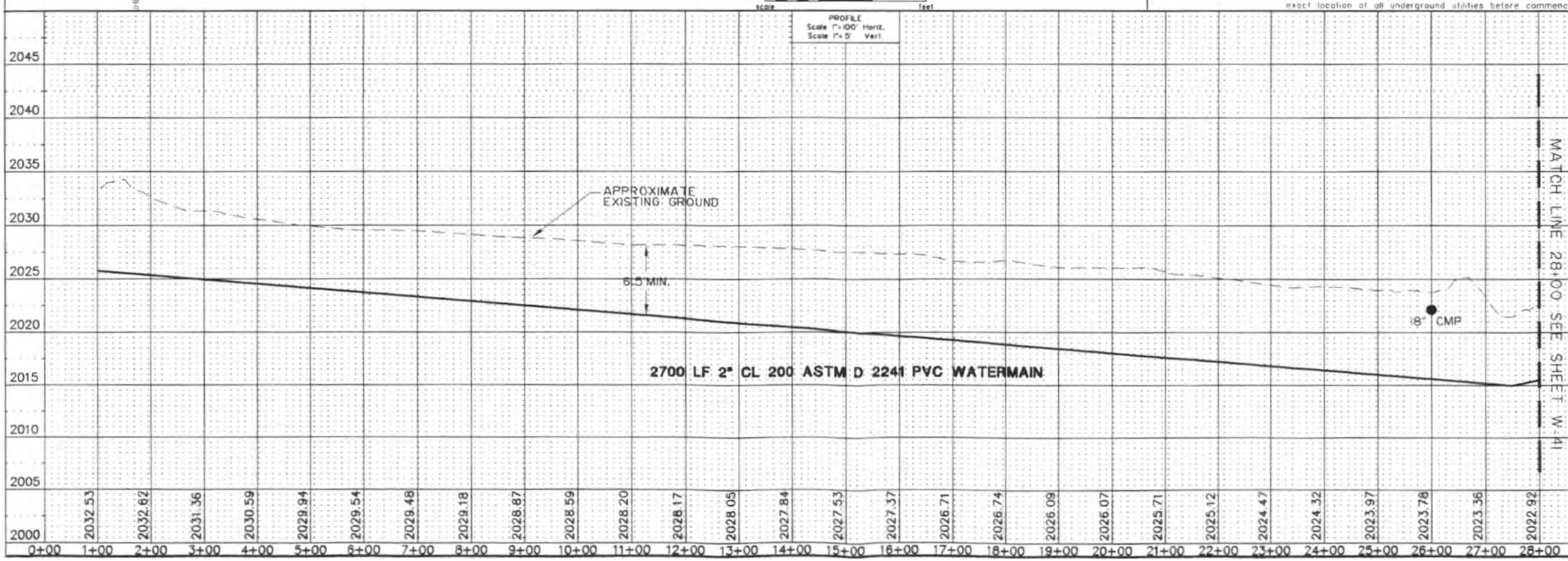
interstate engineering, inc.

2" GATE VALVE - 2 EA.
BLOWOFF HYDRANT - 1 EA.
2" WATERMAIN 2700LF



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-40



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

2" WATERMAIN 2600LF

MATCH LINE 54+00 SEE SHEET W-42

MATCH LINE 28+00 SEE SHEET W-40

COUNTY ROAD 17-2051

COUNTY ROAD 17-1049

24" CMP 62LF
W. INV. = 2019.43
E. INV. = 2018.53

STA. 46+96
INSTALL 2"x90 BEND

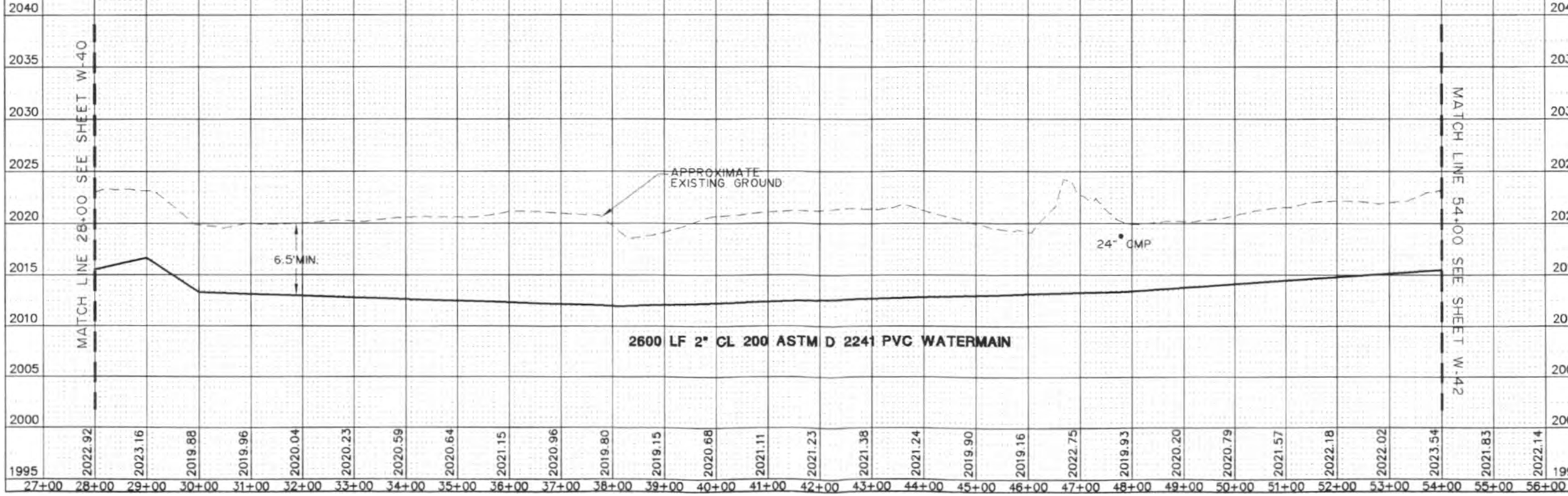
GRAVEL APPROACH

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-41

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.



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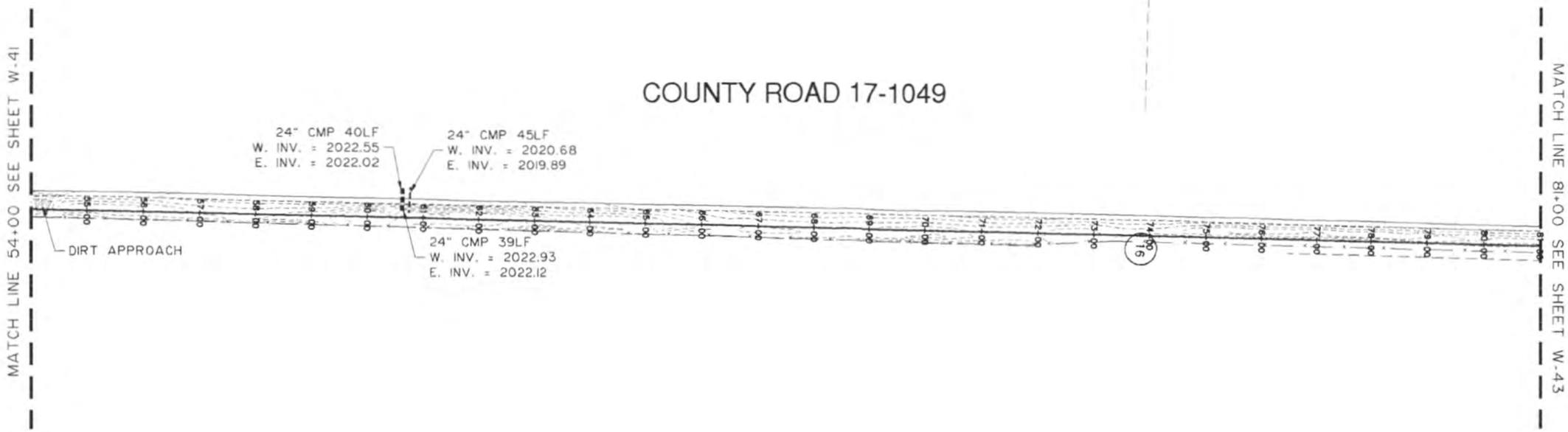
ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

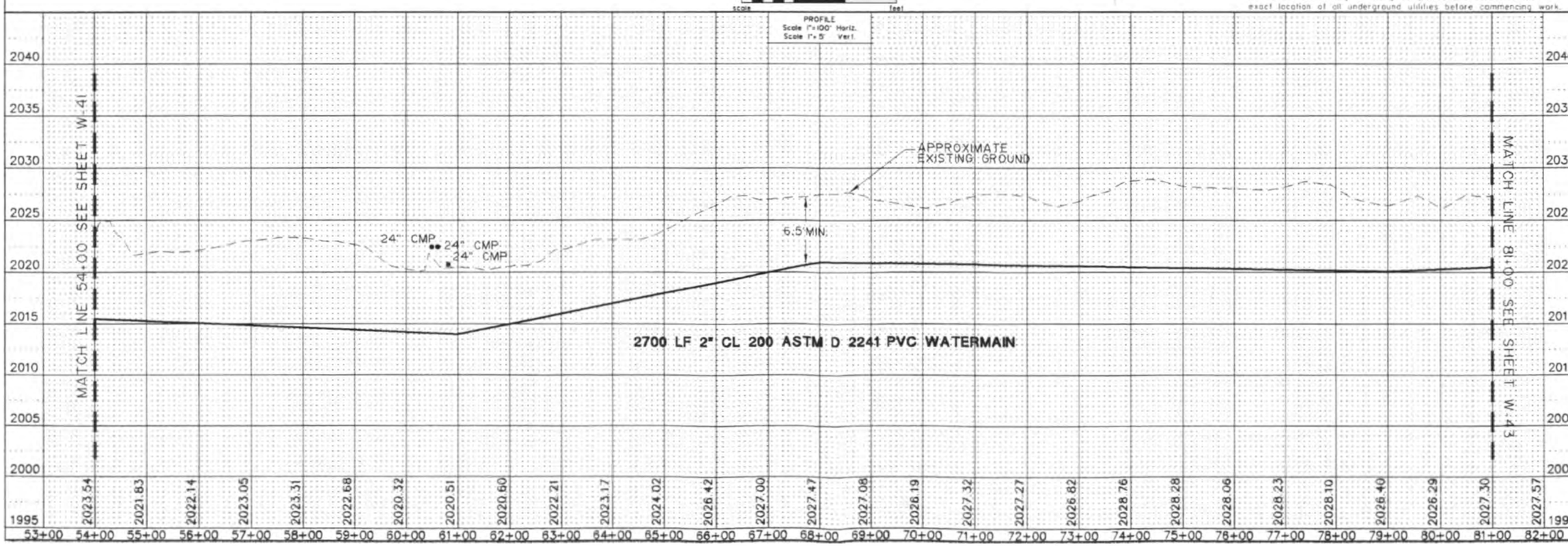
interstate engineering, inc.

2" WATERMAIN 2700LF



W-42

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.



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ROOSEVELT COUNTY, MONTANA
RURAL ROUTE
WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

2" WATERMAIN 2600LF

COUNTY ROAD 17-1049

STA. 99+96
2"x90 BEND

COUNTY ROAD 17-2050

MATCH LINE 81+00 SEE SHEET W-42

MATCH LINE 107+00 SEE SHEET W-44

PLAN
100 0 100 200
scale feet

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-43

PROFILE
Scale 1"=100' Horiz.
Scale 1"=5' Vert.

APPROXIMATE EXISTING GROUND

6.5' MIN.

2600 LF 2" CL 200 ASTM D 2241 PVC WATERMAIN

MATCH LINE 81+00 SEE SHEET W-42

MATCH LINE 107+00 SEE SHEET W-44

2045 2040 2035 2030 2025 2020 2015 2010 2005 2000

2027.30 2027.57 2027.45 2027.29 2027.46 2027.64 2028.09 2028.44 2029.14 2028.88 2028.62 2029.10 2029.22 2029.85 2029.90 2029.91 2030.13 2030.36 2030.46 2031.81 2027.45 2026.73 2026.46 2026.24 2026.16 2026.38 2026.13 2031.06 2025.69

80+00 81+00 82+00 83+00 84+00 85+00 86+00 87+00 88+00 89+00 90+00 91+00 92+00 93+00 94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109+00

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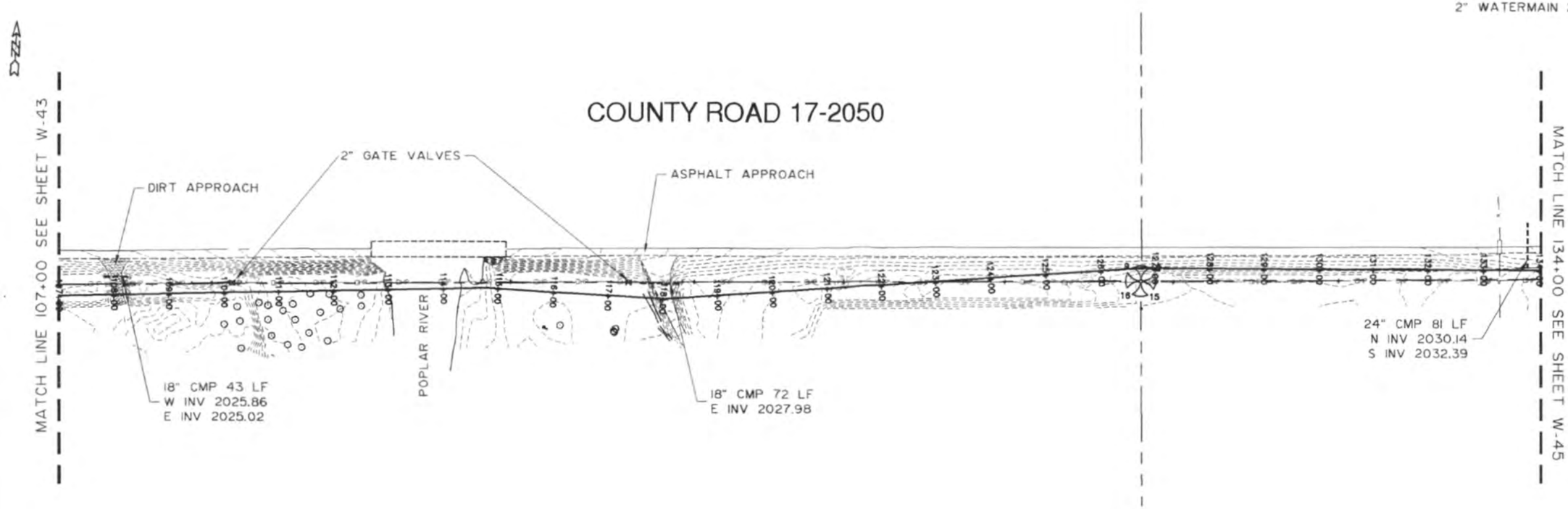
ROOSEVELT COUNTY, MONTANA

REVISION			
No	Date	By	Description

interstate engineering, inc.

2" GATE VALVE - 2 EA.
6" PUSH AND POLE CASING - 450 LF
2" WATERMAIN 2700 LF

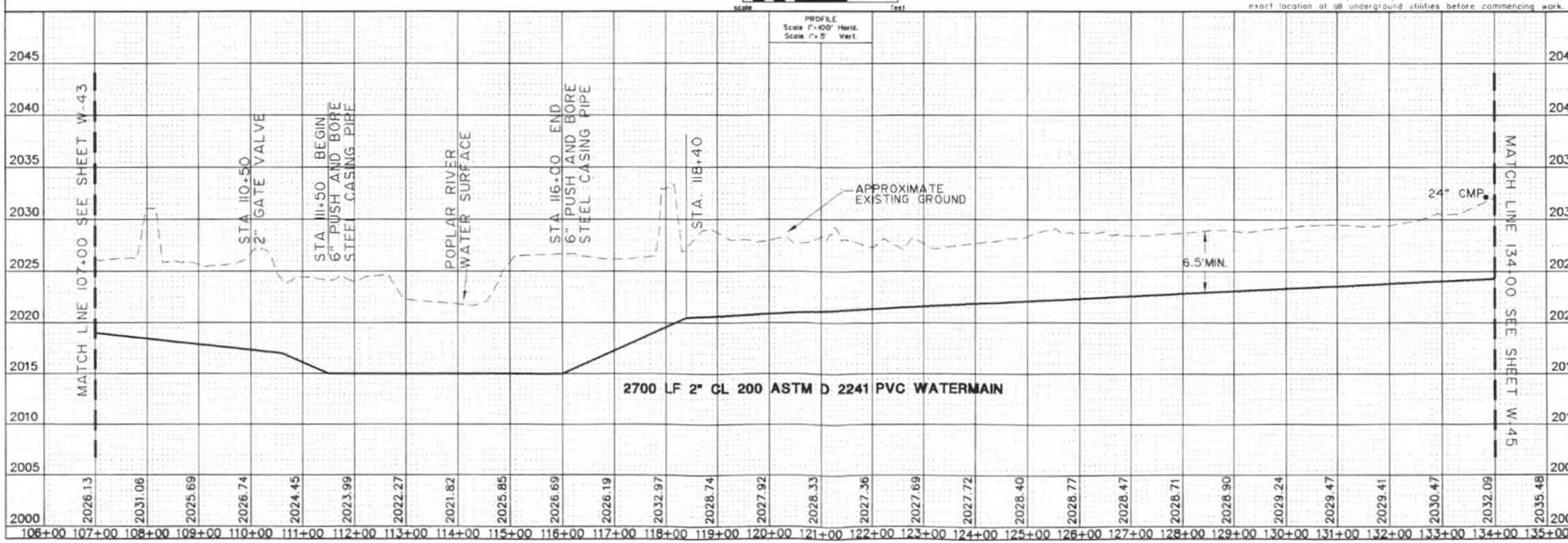
COUNTY ROAD 17-2050



PLAN
100 0 100 200
scale (ft)

Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-44



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RURAL ROUTE
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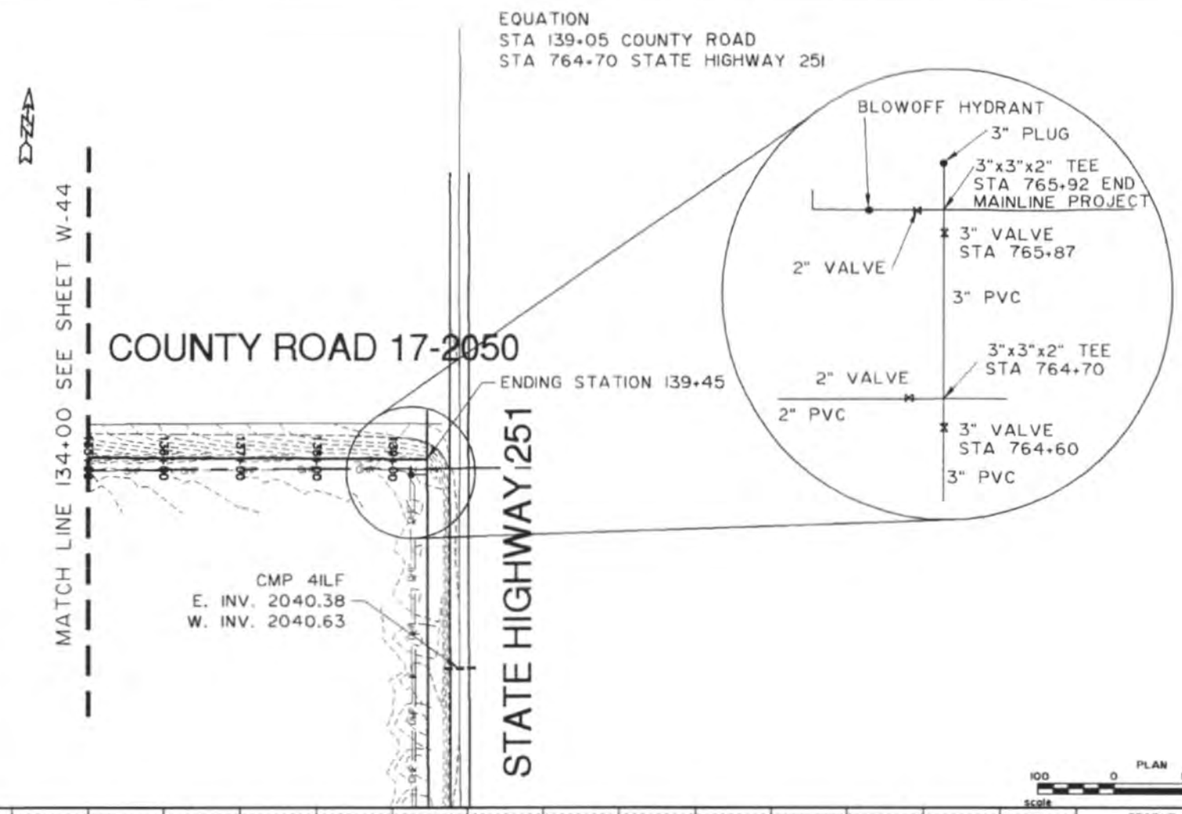
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

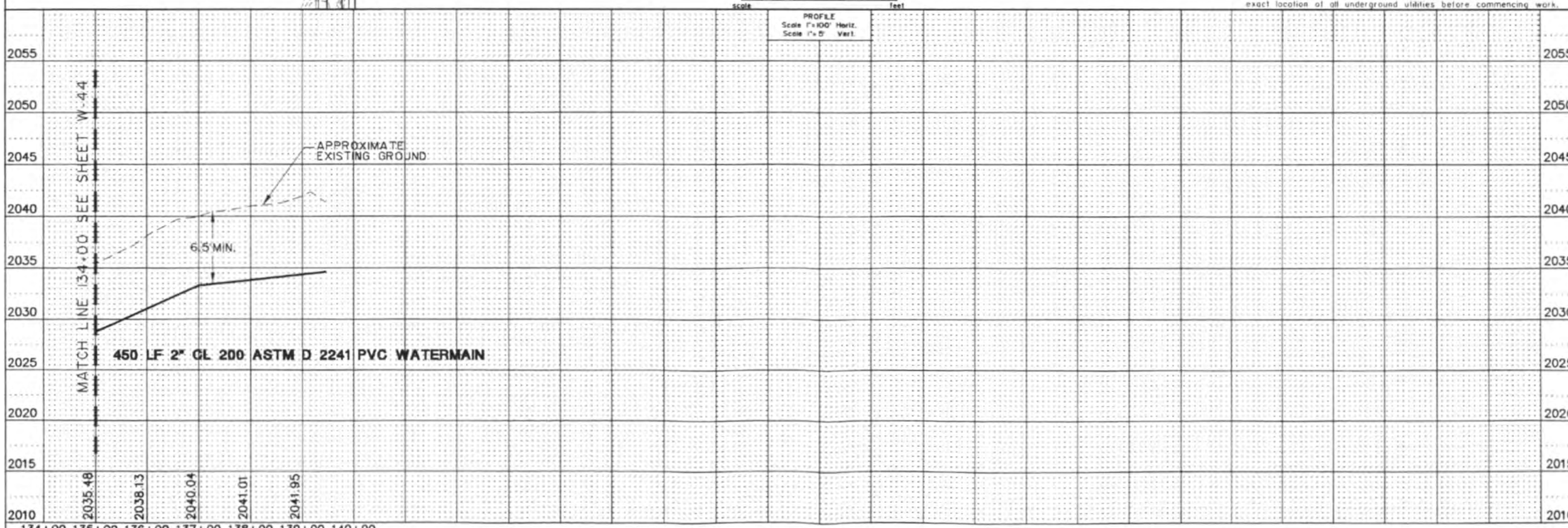
interstate engineering, inc.

BLOWOFFF HYDRANT	1 EA
2" WATER MAIN	450LF
2" GATE VALVE	2 EA
3" GATE VALVE	2 EA



Contractor shall notify all utility companies and determine the exact location of all underground utilities before commencing work.

W-45



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WATERMAIN REPLACEMENT
ROOSEVELT COUNTY, MONTANA

REVISION			
No.	Date	By	Description

interstate engineering, inc.

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