

## Appendix B: Water Pipeline and Water Well Preliminary Engineering Design Drawings

## Basin Electric Deer Creek Station Project

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# CONSTRUCTION PLANS FOR

## BASIN ELECTRIC RAW WATER PIPELINE

**BANNER**

Consulting Engineers & Architects

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Brookings, South Dakota 5700  
605-692-6342  
www.bannerassociates.com

Designing Projects. Building Trust.

CONSULTANTS:

FOR  
REVIEW ONLY  
NOT FOR  
CONSTRUCTION

PROJECT TITLE:

BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

PROJECT LOCATION:

BROOKINGS COUNTY  
SOUTH DAKOTA

REV. DATE DESCRIPTION

REV.	DATE	DESCRIPTION

DRAWN BY: JUL

DESIGNED BY: KLB

CHECKED BY: SDR

JOB NO: 20953-00-02

DATE: NOVEMBER 2009

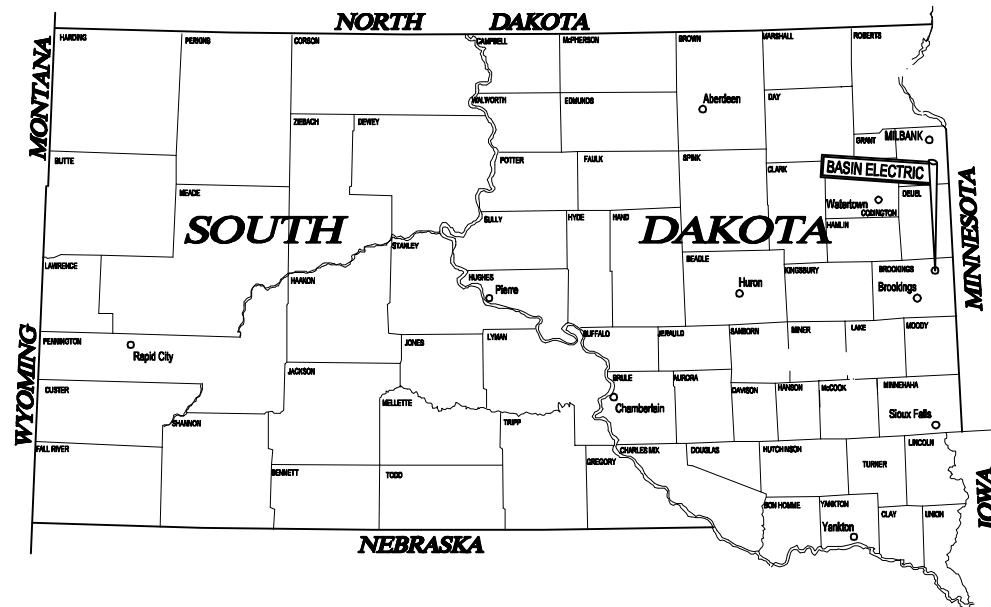
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SHEET TITLE:

TITLE AND  
INDEX OF  
SHEETS

SHEET NO.:

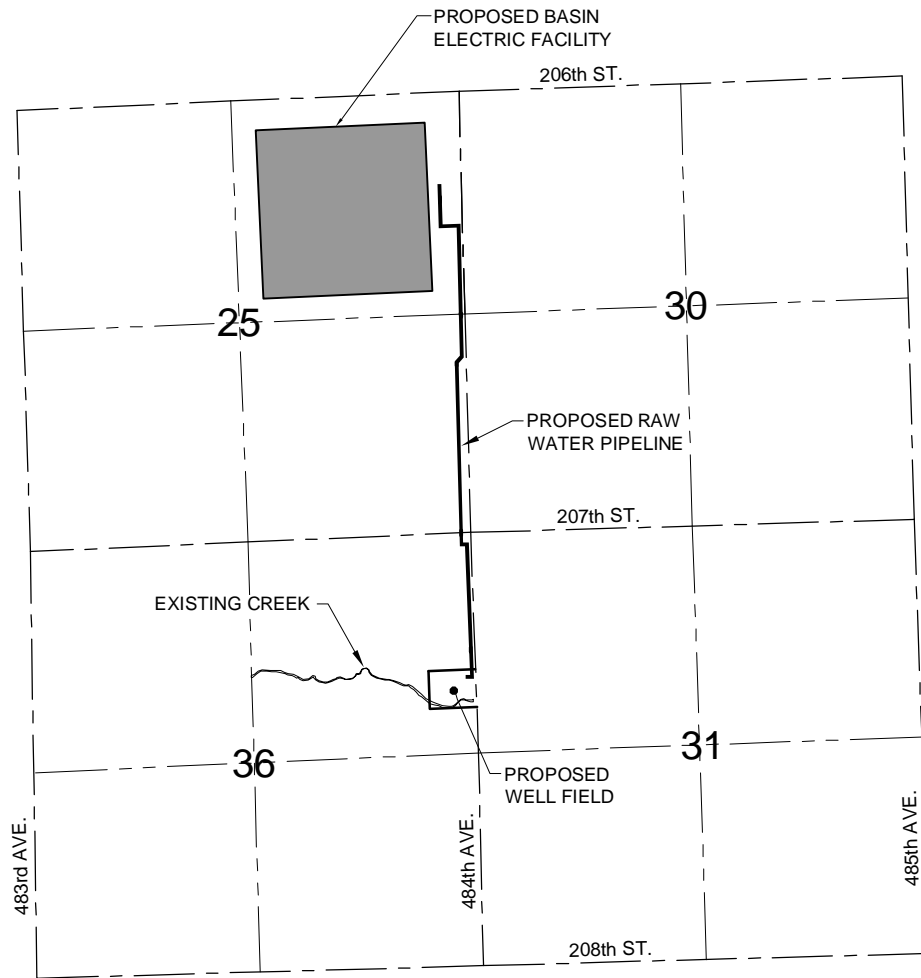
1



PROJECT VICINITY MAP

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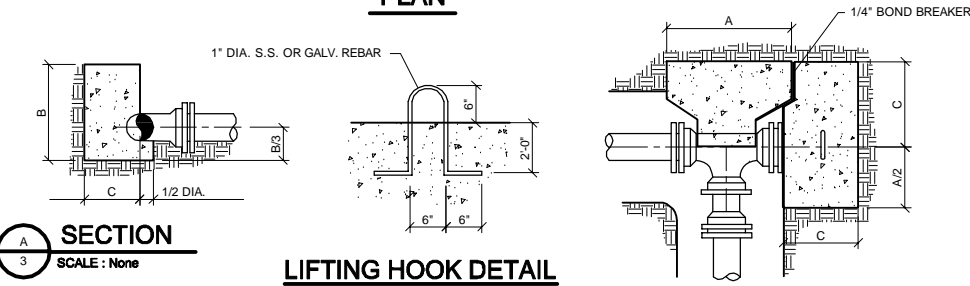
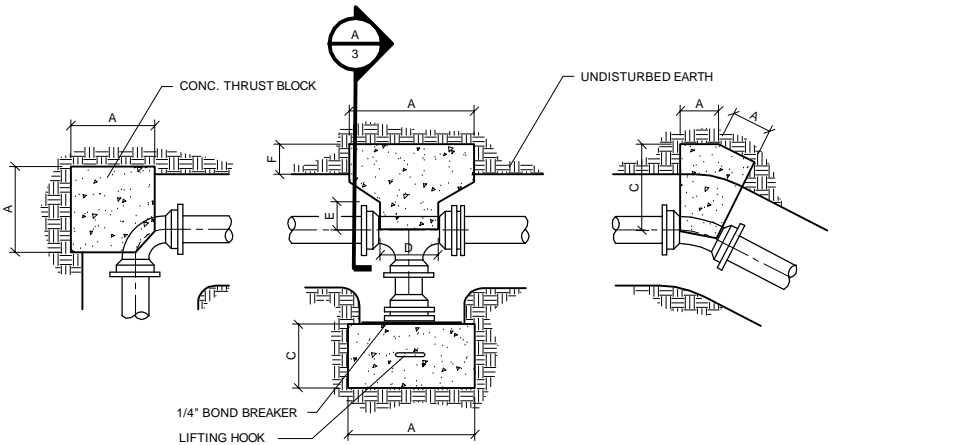


LOCATION MAP

DECEMBER 2009

GENERAL CONSTRUCTION NOTES:

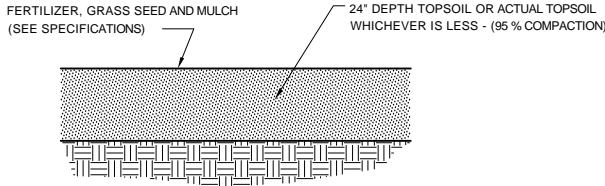
1. LOCATION OF EXISTING UTILITIES SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE RECORDS AND DOES NOT INCLUDE ALL UNDERGROUND UTILITIES SUCH AS ELECTRICAL, GAS, FUEL, UNDERGROUND CABLE TV. PRIOR TO EXCAVATION THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL UTILITIES WHETHER OR NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL PROTECT ALL UTILITIES DURING CONSTRUCTION. ANY DISTURBANCE OR REPLACEMENT OF EXISTING UTILITIES SHALL BE INCIDENTAL TO THE PROJECT. ANY LOSS OF TIME DUE TO LOCATING, RELOCATING, OR ADJUSTING UTILITIES SHALL BE INCIDENTAL TO THE PROJECT.
2. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACTOR HAS CONSIDERED IN THE BID THE PERMANENT AND TEMPORARY UTILITY APPURTENANCES IN THEIR PRESENT OR RELOCATED POSITIONS AS SHOWN ON THE PLANS. ADDITIONAL COMPENSATION WILL NOT BE ALLOWED FOR DELAYS, INCONVENIENCES, OR DAMAGES SUSTAINED DUE TO INTERFERENCE FROM THE UTILITY APPURTENANCES OR THE OPERATION OF MOVING THEM.
3. BARRICADE AND WARNING SIGNS SHALL BE PROVIDED, ERECTED, AND MAINTAINED IN ACCORDANCE WITH SECTION 010000 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS. SIGNS AND BARRICADES THAT ARE PERIODICALLY REQUIRED TO BE MOVED DUE TO CONSTRUCTION OPERATIONS SHALL BE PLACED AT LOCATIONS WHERE THEY GIVE SUFFICIENT WARNING TO MOTORISTS AND PEDESTRIANS OF THE CONDITIONS AHEAD AND SHALL BE RELOCATED AS NEEDED TO KEEP SIGNING CURRENT AT REQUIRED LOCATIONS.
- ALL TRAFFIC CONTROL DEVICES AND METHODS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- THE CONTRACTOR SHALL PROTECT AND RESTRICT ALL PEDESTRIANS FROM WORK AREAS.
- OPEN EXCAVATIONS SHALL BE COVERED OR BARRICADED.
- WHEN PROVIDED, TRUCK CROSSING SIGNS WILL BE USED AT LOCATIONS AS SHOWN ON THE DRAWINGS AND/OR AS DETERMINED IN THE FIELD.
4. ALL EXISTING TREES, SHRUBBERY, ETC. SHALL REMAIN UNDISTURBED, UNLESS REMOVAL HAS BEEN AUTHORIZED BY THE ENGINEER. ALL CLEARING, GRUBBING, AND DISPOSAL AS AUTHORIZED BY THE ENGINEER SHALL BE CONFINED TO THE EASEMENT AREAS AND SHALL BE LIMITED TO GREATEST EXTENT POSSIBLE. ALL DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR AT A SITE PROVIDED BY THE CONTRACTOR.
5. CONTRACTOR SHALL MAINTAIN CONSTRUCTION WORK WITHIN THE EASEMENT LIMITS AS SHOWN ON THE DRAWINGS OR DESIGNATED BY THE ENGINEER IN THE FIELD. ANY DAMAGE OUTSIDE THE CONSTRUCTION LIMITS WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- WHERE THE WORK IS ON PRIVATE PROPERTY, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PROPERTY OWNERS WELL IN ADVANCE OF BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE PROPERTY OWNER REGARDING SCHEDULING AND ACCESS TO THE PROPERTY. THE CONTRACTOR SHALL ALSO DISCUSS AND OBTAIN PERMISSION FOR USE OF ANY ADDITIONAL PROPERTY OUTSIDE OF THE CONSTRUCTION AREA WHICH THE CONTRACTOR DEEMS NECESSARY FOR LOCATION OF PIPE STORAGE, EXCAVATED MATERIAL, AND OTHER MATERIALS OR EQUIPMENT. AN AGREEMENT, SIGNED BY THE PROPERTY OWNER, FOR THE USE OF THE PROPERTY SHALL BE PROVIDED TO BASIN ELECTRIC AND THE ENGINEER PRIOR TO OCCUPYING PROPERTY OUTSIDE OF THE CONSTRUCTION AREA.
- FOLLOWING INSTALLATION OF UTILITIES, ALL DISTURBED AREAS SHALL BE PROPERLY RESTORED TO ITS ORIGINAL CONDITION, AS MUCH AS IS PRACTICAL, AS HEREIN AFTER SPECIFIED AND AS REQUIRED BY THE PROPERTY OWNER. ALL SUCH WORK MUST BE ACCEPTED AND APPROVED BY THE ENGINEER AND PROPERTY OWNERS.
6. THE CONTRACTOR SHALL REMOVE, SALVAGE, AND REINSTALL MAILBOXES, ROAD SIGNS, CULVERTS, ETC. THE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL.
7. ALL DEMOLITION AND REMOVAL OF MATERIAL WITHIN THE CONSTRUCTION LIMITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DISPOSED OF AT A SITE PROVIDED BY THE CONTRACTOR.
11. ALL DUCTILE IRON VALVES, VALVE BOXES AND FITTINGS SHALL BE WRAPPED WITH 8 MIL. POLY TUBES OR WRAPPING. ALL BOLTS SHALL BE COR-BLUE.
12. WATERMAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF 6.0 FEET.
13. AT INTERVALS OF NO MORE THAN 1000 FEET IN AREAS THAT ARE NOT NATIVE CLAY SOIL, THE CONTRACTOR SHALL PROVIDE CLAY FILL DAMS FOR THE FULL DEPTH OF THE TRENCH TO PREVENT THE CONVEYANCE OF WATER THROUGH THE BEDDING MATERIAL. IF THE NORMAL BACKFILL MATERIAL IS NOT SUITABLE FOR CONSTRUCTION OF THESE CLAY DAMS, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN MATERIAL FROM OTHER OUTSIDE SOURCES FOR THIS PURPOSE. CLAY DAMS SHOULD NOT BE CONSTRUCTED AT OR NEAR THE BELL OF THE PIPE BUT SHOULD BE CONSTRUCTED NEAR THE CENTER OF A FULL LENGTH OF PIPE. CLAY DAMS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE COST OF PIPE.
14. DISPOSING OF HEAVILY CHLORINATED UTILITIES: THE ENVIRONMENT TO WHICH THE CHLORINATED WATER FROM DISINFECTION IS TO BE DISCHARGED (INCLUDING POINT OF STORM SEWER DISCHARGE) SHALL BE INSPECTED. IF THERE IS ANY QUESTION THAT THE CHLORINATED DISCHARGE WILL CAUSE DAMAGE TO THE ENVIRONMENT, INCLUDING CREEKS, STREAMS, PONDS OR LAKES THAT SUPPORT AQUATIC LIFE, THEN A REDUCING AGENT SHALL BE APPLIED TO THE WATER TO BE WASTED TO NEUTRALIZE THOROUGHLY THE CHLORINE RESIDUAL REMAINING IN THE WATER. CONTACT THE SURFACE WATER QUALITY PROGRAM AT (605) 773-3351 FOR MORE INFORMATION.
15. IT IS ANTICIPATED THAT EXCAVATION IN AREAS ADJACENT TO AND/OR PARALLEL TO OTHER UNDERGROUND UTILITIES WILL NECESSITATE THE USE OF A TRENCH BOX OR SHORING IN ORDER TO PROTECT SAID UTILITIES.
16. PRIOR TO PERFORMING EXCAVATION AND EMBANKMENT OPERATIONS WITHIN THE PROJECT LIMITS, THE CONTRACTOR SHALL SALVAGE ALL AVAILABLE TOPSOIL AND STOCKPILE IN A LOCATION OF THE CONTRACTOR'S CHOICE ON THE PROJECT SITE. UPON COMPLETION OF ALL GRADING OPERATIONS THE CONTRACTOR SHALL DEPOSIT AND SPREAD THE TOPSOIL TO MATCH THE EXISTING TOPSOIL DEPTH UP TO 2 FEET MAX FOR THE FULL WIDTH OF THE PIPE TRENCH.
17. CONTRACTOR SHALL BE CAREFUL NOT TO DAMAGE WATER VALVE BOXES. DAMAGE TO VALVE BOXES, INCLUDING MISALIGNMENT OF BOXES DUE TO CARELESSNESS OF THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER. ALL CASTINGS SHALL BE SALVAGED AND REMAIN PROPERTY OF THE OWNER. ALL EXCESS MATERIAL THAT IS NOT USED IN CONSTRUCTION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. ALL HAUL IS CONSIDERED INCIDENTAL.
18. THE CONTRACTOR SHALL PROVIDE REASONABLE ACCESS FOR LOCAL RESIDENTS THROUGHOUT CONSTRUCTION. IF THESE AREAS NEED TO BE CLOSED FOR BRIEF PERIODS OF TIME THE CONTRACTOR SHALL COORDINATE THAT CLOSURE TO ENSURE MINIMAL INCONVENIENCE.
19. CONSTRUCTION WILL REQUIRE A CAREFULLY PLANNED SEQUENCE OF CONSTRUCTION IN ORDER TO MINIMIZE INTERRUPTIONS TO THE PROPERTY OWNERS AND TO HANDLE THE STORM RUNOFF. DURING PORTIONS OF THE WORK, IT IS EXPECTED THAT THE DRIVEWAYS WILL BE ENTIRELY CLOSED TO TRAFFIC AND TEMPORARY ACCESS MAY HAVE TO BE PROVIDED ELSEWHERE.
20. THE CONTRACTOR'S CLEANUP AND SURFACE RESTORATION ACTIVITIES SHALL FOLLOW IMMEDIATELY BEHIND UTILITY INSTALLATION. THE CONTRACTOR SHALL BACKFILL AND COMPACT THE TRENCH PROPERLY, CLEAN UP THE AREA, AND DISPOSE OF ALL ROCKS, RUBBLE, EXCESS DIRT, ETC. TO THE SATISFACTION OF THE OWNER / ENGINEER. UPON COMPLETION OF THE PIPE INSTALLATION, ALL DISTURBED ITEMS SUCH AS CULVERTS, UTILITIES, PIPELINES, TOPSOIL, FENCES, ROADWAYS, FIELD APPROACHES, PARKING LOTS, STREAM BEDS, ETC., SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
22. TRENCH SURFACE RESTORATION:  
(a) GRASS AREAS OR FARMED AREAS SHALL HAVE TOPSOIL STRIPPED AND STOCKPILED IN ACCORDANCE WITH THE SPECIFICATIONS AND PLAN DETAILS. REPLACE TOPSOIL AFTER BACKFILL IS COMPLETED. SEED IN ACCORDANCE WITH THE SPECIFICATIONS.  
(b) ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO SAME ELEVATIONS AS PRIOR TO CONSTRUCTION.  
(c) GRAVEL SURFACED AREAS SHALL BE RESURFACED WITH A 6 INCH DEPTH OF GRAVEL IN ACCORDANCE WITH THE SPECIFICATIONS AND PLAN DETAILS.
23. SEDIMENT EROSION CONTROL SHALL BE IN STRICT ACCORDANCE WITH SD DENR RULES AND REGULATIONS REFERENCED IN SECTION 011050 OF THE PROJECT SPECIFICATIONS.
24. BIDDERS ARE EXPECTED TO EXAMINE THE SITE AND ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE CHARACTER AND LOCATIONS OF MATERIALS TO BE ENCOUNTERED. ALL CONTRACTORS DESIRING TO TAKE SOIL BORINGS ON THIS PROJECT MUST OBTAIN PERMISSION FROM THE OWNER AND THE PROPERTY OWNERS IN THE EVENT THE PROPOSED INVESTIGATION IS ON PRIVATE PROPERTY.
- IF GROUNDWATER IS ENCOUNTERED AND DEWATERING IS NECESSARY, ALL COSTS ASSOCIATED WITH THE LABOR, EQUIPMENT, AND MATERIALS FOR DEWATERING THE PROJECT SHALL BE ABSORBED IN THE UNIT PRICE BID FOR PIPE INSTALLATION. ALL PIPE SHALL BE LAID IN A DRY LOCATION. THE CONTRACTOR SHALL DISCHARGE AND DISPOSE OF THE WATER IN AN APPROVED MANNER.



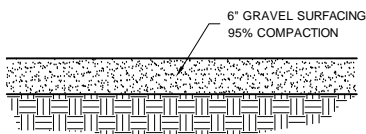
BLOCKING DIMENSIONS																					
PIPE DIA.	TEES						PLUGS			90° BENDS			45° BENDS			22 1/2° BENDS			11 1/4° BENDS		
	A	B	C	D	E	F	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
6"	24	30	16	16	6	6	24	30	12	24	18	16	10	24	12	7	18	12	-	-	-
10"	40	42	23	22	8	6	40	42	24	35	34	24	18	38	27	12	30	27	-	-	-
14"	50	50	29	28	11	6	50	50	24	45	40	32	22	45	36	14	38	32	-	-	-
16"	54	54	32	30	12	6	54	54	24	50	42	36	24	48	40	15	42	34	-	-	-

THRUST BLOCKING NOTES :

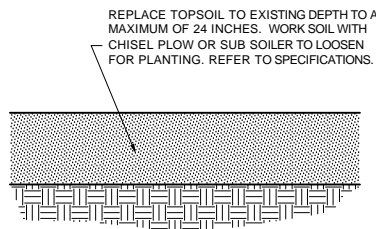
- CAST-IN-PLACE CONCRETE BLOCKS SHALL BE INSTALLED ON ALL BURIED FITTINGS. ALL THRUST BLOCKS SHALL BE CAST-IN-PLACE. PRECAST BLOCKS ARE NOT ACCEPTABLE.
- PLACE DOUBLE LAYER OF PAPER BETWEEN CONCRETE BLOCKING AND PLUG.
- MINIMUM THICKNESS OF CONCRETE BETWEEN FITTING AND UNDISTURBED SOIL SHALL BE 8".
- ALL VALVES AND FITTINGS SHALL BE POLY WRAPPED.
- COMPRESSIVE STRENGTH FOR THRUST BLOCKS SHALL NOT BE LESS THAN 3000 PSI.
- BLOCKING DESIGN FOR 150 PSI AND 1500 PSI SOIL BEARING. BLOCKING FOR REDUCED BRANCH TEE SHALL BE AS LISTED UNDER TEES AND BRANCH DIAMETER. MAINTAIN MINIMUM 1" DIMENSION. ALL DIMENSIONS ARE IN INCHES.



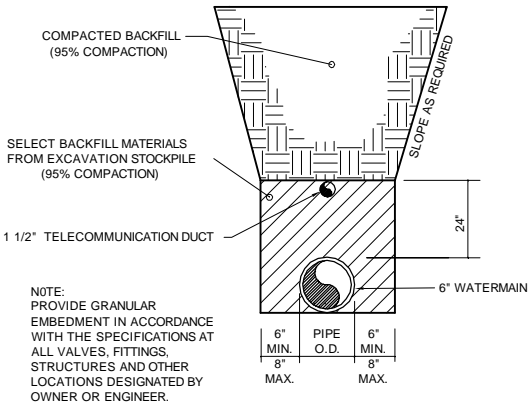
GRASS SURFACE RESTORATION  
(PUBLIC R.O.W. AND PRIVATE EASEMENT AREAS AND CRP/PASTURE AREAS)  
SCALE: NONE



GRAVEL SURFACING RESTORATION  
SCALE: NONE

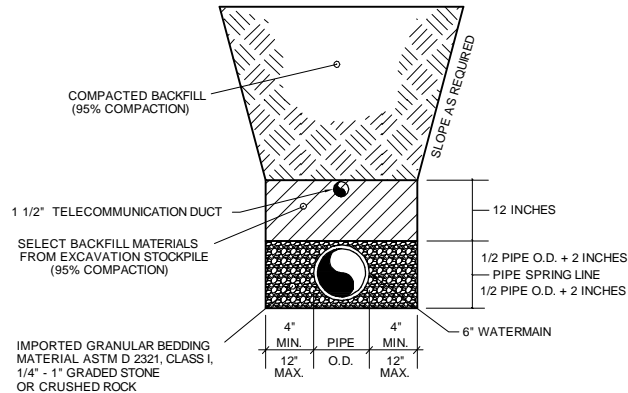


CROP LAND SURFACE RESTORATION  
SCALE: NONE



TYPICAL WATERMAIN BEDDING DETAIL  
SCALE: NONE

- NOTE:
- CONTRACTOR SHALL STRIP AND STOCKPILED TOPSOIL FROM TRENCH. CONTRACTOR TO STRIP AND STOCKPILE SUFFICIENT QUANTITIES OF TOPSOIL TO REPLACE TOPSOIL DEPTH AS SPECIFIED IN GRASS SURFACE AND CROP LAND SURFACE RESTORATION DETAILS.



ALTERNATE WATERMAIN BEDDING DETAIL  
SCALE: NONE

- NOTE:
- GRANULAR BEDDING SHALL BE INSTALLED IN AREAS WHERE ROCK OR UNSATISFACTORY SOILS ARE ENCOUNTERED. GRANULAR BEDDING SHALL BE GRADED AGGREGATE PRODUCT OF WHICH 100 PERCENT PASSES THE 1" SIEVE AND NOT MORE THAN 10 PERCENT WILL PASS THE NO. 200 SIEVE. INSTALLATION OF BEDDING MATERIAL SHALL ONLY BE WHEN AUTHORIZED BY OWNER AND ENGINEER.

CONSULTANTS:

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PROJECT TITLE:

BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

PROJECT LOCATION:

BROOKINGS COUNTY  
SOUTH DAKOTA

REV.	DATE	DESCRIPTION

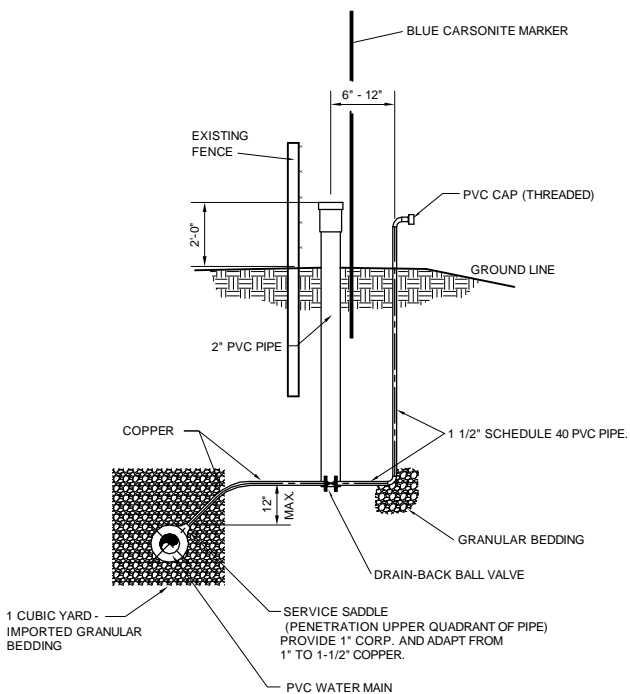
DRAWN BY: JULJ
DESIGNED BY: KLB
CHECKED BY: SDR
JOB NO: 20953-00-02
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GENERAL NOTES  
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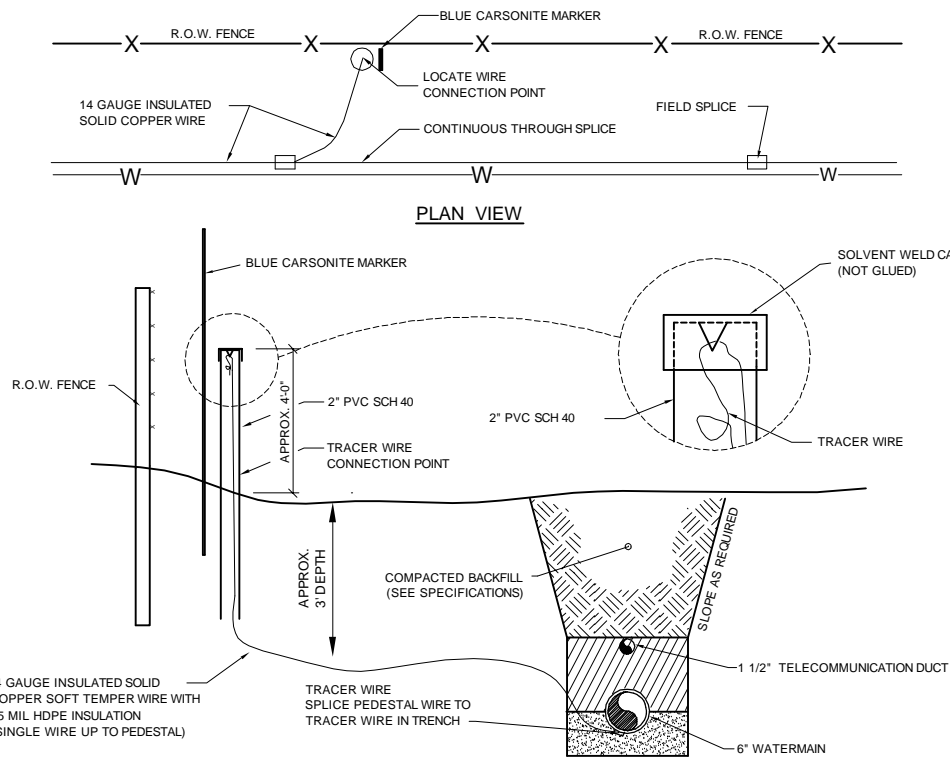
2



**AIR RELEASE DETAIL**

SCALE: NONE

1. VALVE, VALVE BOX AND BLOWOFF SHALL BE LOCATED WITH PRIVATE EASEMENT OR R.O.W. LOCATION SHALL BE COORDINATED WITH OWNER OR ENGINEER PRIOR TO INSTALLTION.

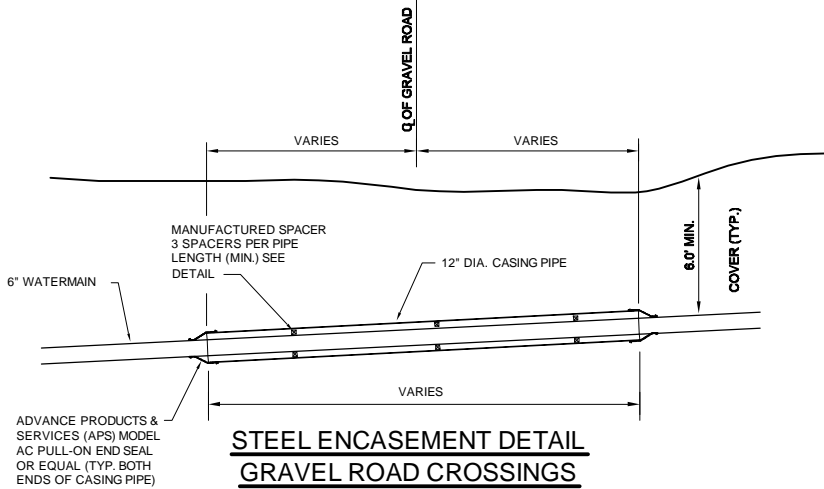


**ELEVATION VIEW**

**TRACER WIRE DETAIL**

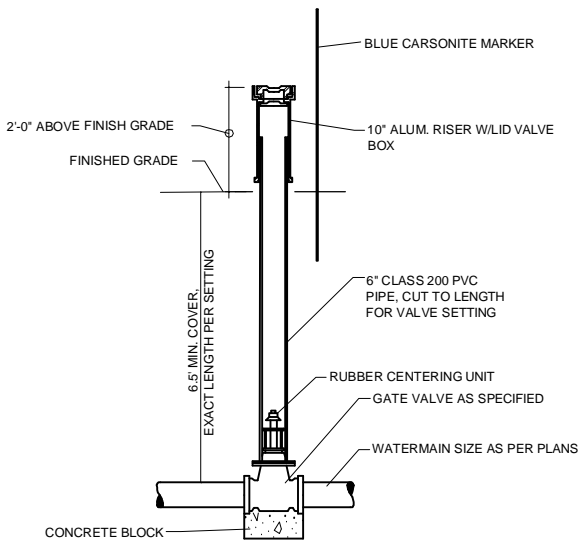
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- NOTES:
1. NOTCH TOP OF CONNECTION POINT PVC PIPE TO HOLD THE LOCATE WIRE.
  2. FIELD SPLICES SHALL BE A WATERPROOF MECHANICALLY CRIMPED CONNECTION OR GEL FILLED WIRE NUT AS MANUFACTURED BY 3M OR EQUAL.



**STEEL ENCASEMENT DETAIL  
GRAVEL ROAD CROSSINGS**

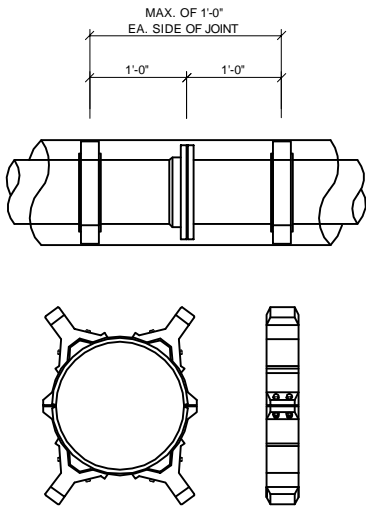
SCALE: NONE



**VALVE BOX DETAIL**

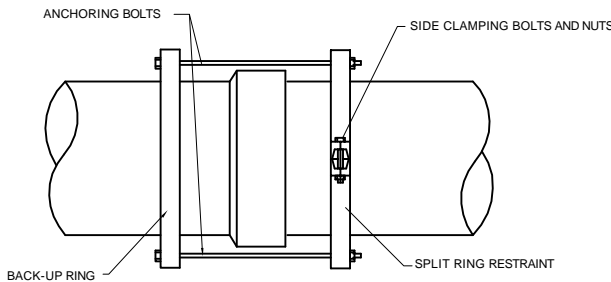
SCALE: NONE

NOTE: ALL VALVES AND FITTINGS SHALL BE POLY WRAPPED.



**ENCASEMENT PIPE SPACERS**

Scale : NONE



**RESTRAINT DETAIL**

SCALE: NONE

F:\20953-00\Design Phase\Acad\Waterline P&P.dwg;12/10/2009 11:21 AM

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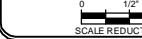
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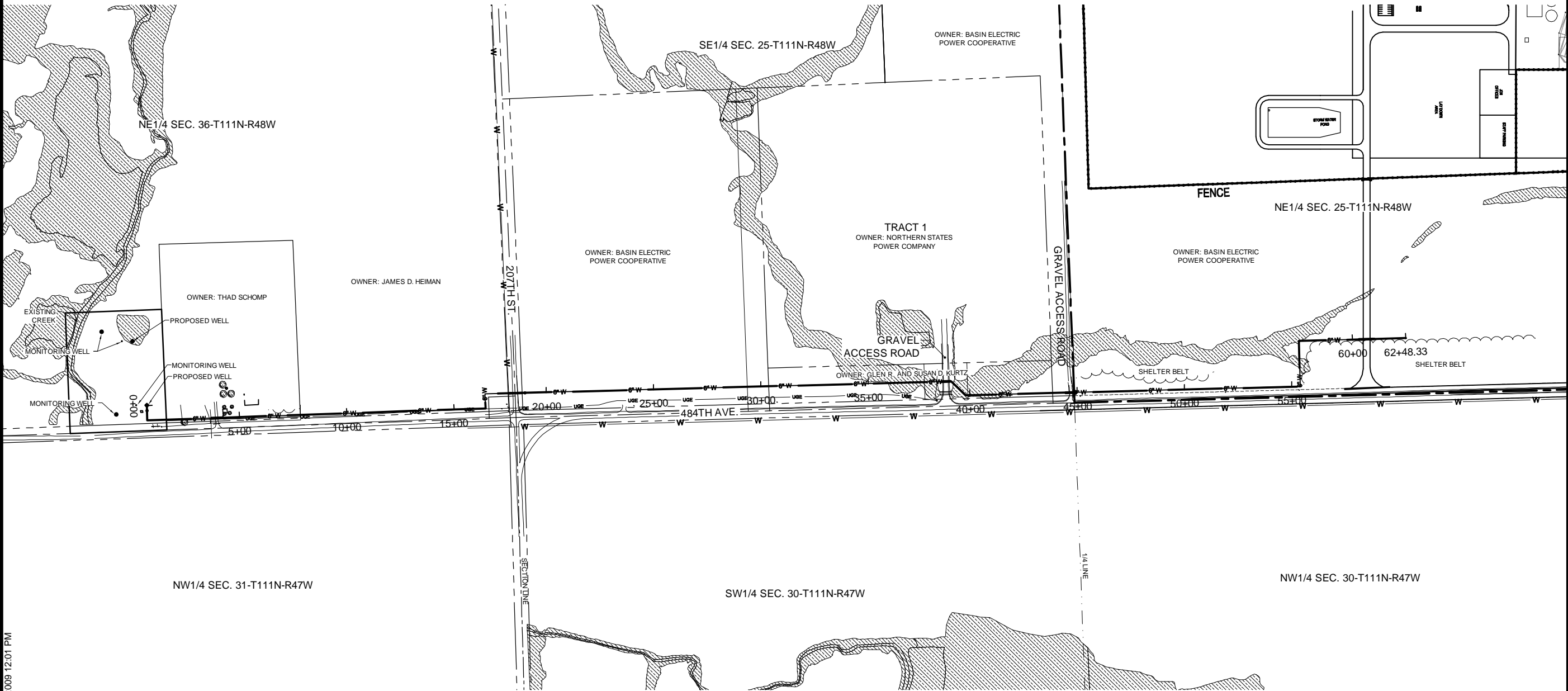
SHEET TITLE :

**GENERAL  
DETAILS**

SHEET NO. :

**3**

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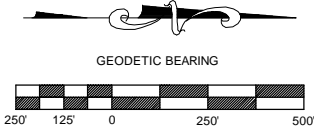


GENERAL WATERMAIN NOTES:

1. CONTRACTOR SHALL INSTALL WATERLINE APPROXIMATELY IN CENTER OF EASEMENT WHEN POSSIBLE. IF EXISTING UTILITIES, TREES, BUILDINGS OR OTHER OBSTRUCTION ARE PRESENT, THEN THE WATERLINE SHALL BE ADJUSTED TOWARD THE HIGHWAY R.O.W. LINE TO AVOID EXISTING OBSTRUCTIONS.
2. CONTRACTOR WILL BE RESPONSIBLE TO HAVE ALL UTILITIES LOCATED PRIOR TO EXCAVATION.
3. WATERLINE SHALL BE LAID WITH A MINIMUM COVER OF SIX FOOT ZERO INCHES (6'-0").
4. INSTALL TRACER WIRE ON ALL WATERLINES. INSTALL CONNECTION POINT AT VALVES.
5. AIR RELEASE VALVES SHALL BE INSTALLED AT THE HIGH POINTS IN THE LINE FINAL LOCATIONS SHALL BE DETERMINED IN THE FIELD.

LEGEND

W	EXISTING WATER LINE
UGE	UNDERGROUND ELECTRIC LINE
UGT	UNDERGROUND TELEPHONE LINE
W	PROPOSED WATER LINE
TRANS	ELECTRIC TRANSFORMER
PP	POWER POLE
TP	TELEPHONE PEDESTAL
DT	DECIDUOUS TREE
WETLANDS	WETLANDS



ALL DIMENSIONS SHOWN ARE IN TERMS OF U.S. SURVEY FEET

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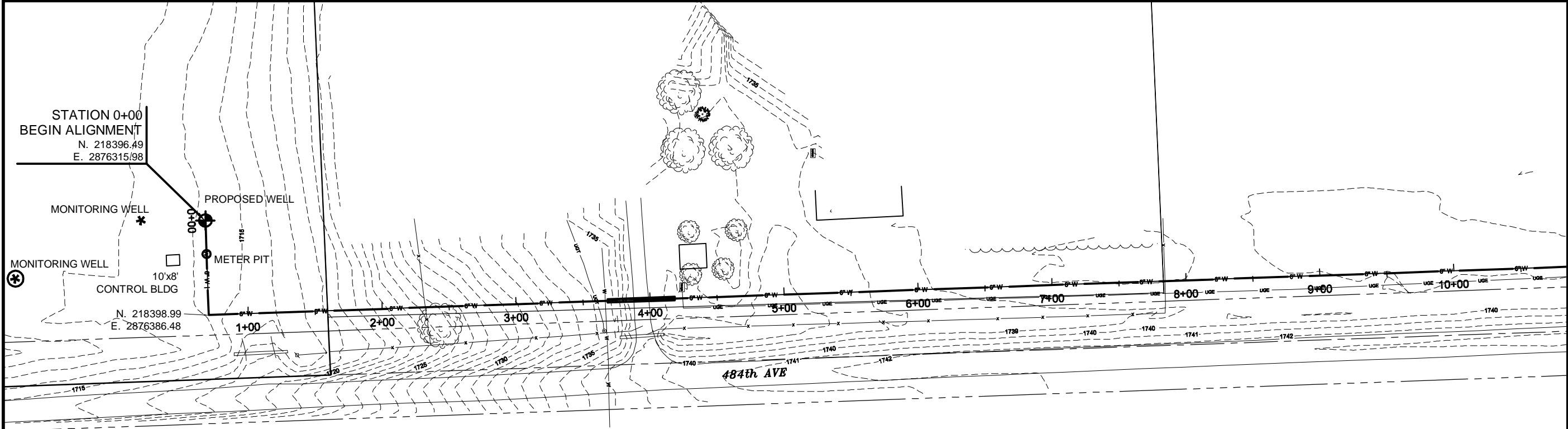
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SCALE REDUCTION BAR

SHEET TITLE:

OVERALL  
SITE

SHEET NO.:

4



**GENERAL WATERMAIN NOTES:**

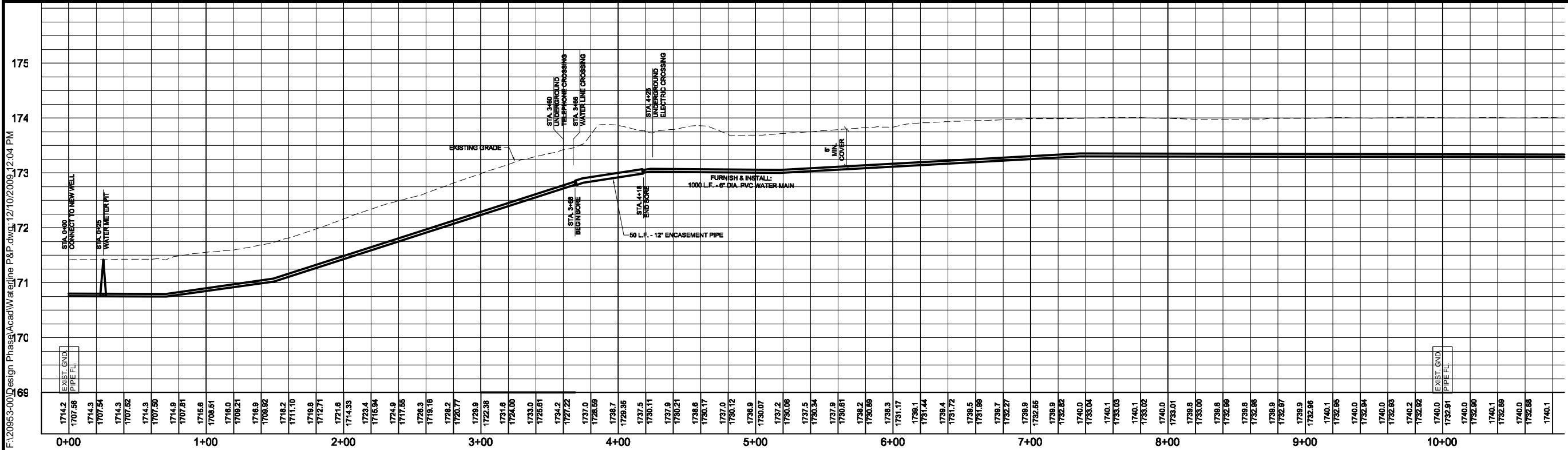
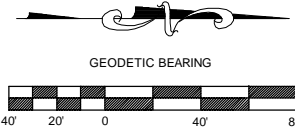
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- PIPING MATERIAL USED FOR ALL ROAD/DRIVEWAY BORINGS SHALL BE FUSIBLE C-900 PVC PIPE OR CERTA-LOK.

UTILITIES:  
STA. 0+00 TO 10+00 - CL  
FURNISH & INSTALL:  
1000 L.F. - 6" DIA. PVC WATER MAIN  
1000 L.F. - 1 1/2" DIA. TELECOMMUNICATIONS DUCT

UTILITIES:  
STA. 0+25 - CL  
FURNISH & INSTALL:  
1 - WATER METER PIT

UTILITIES:  
STA. 0+70.5 - CL  
FURNISH & INSTALL:  
1 - 6" D.I. M.J. 90° BEND W/JOINT RESTRAINTS

UTILITIES:  
STA. 3+68 TO 4+18 - CL  
FURNISH & INSTALL:  
50 L.F. - 12" DIA. ENCASEMENT PIPE



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PLAN AND  
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STA. 0+00  
TO 10+00

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PROJECT LOCATION :

BROOKINGS COUNTY  
SOUTH DAKOTA

[illegible]

DRAWN BY: JLU

DESIGNED BY: KLB

CHECKED BY: SDR

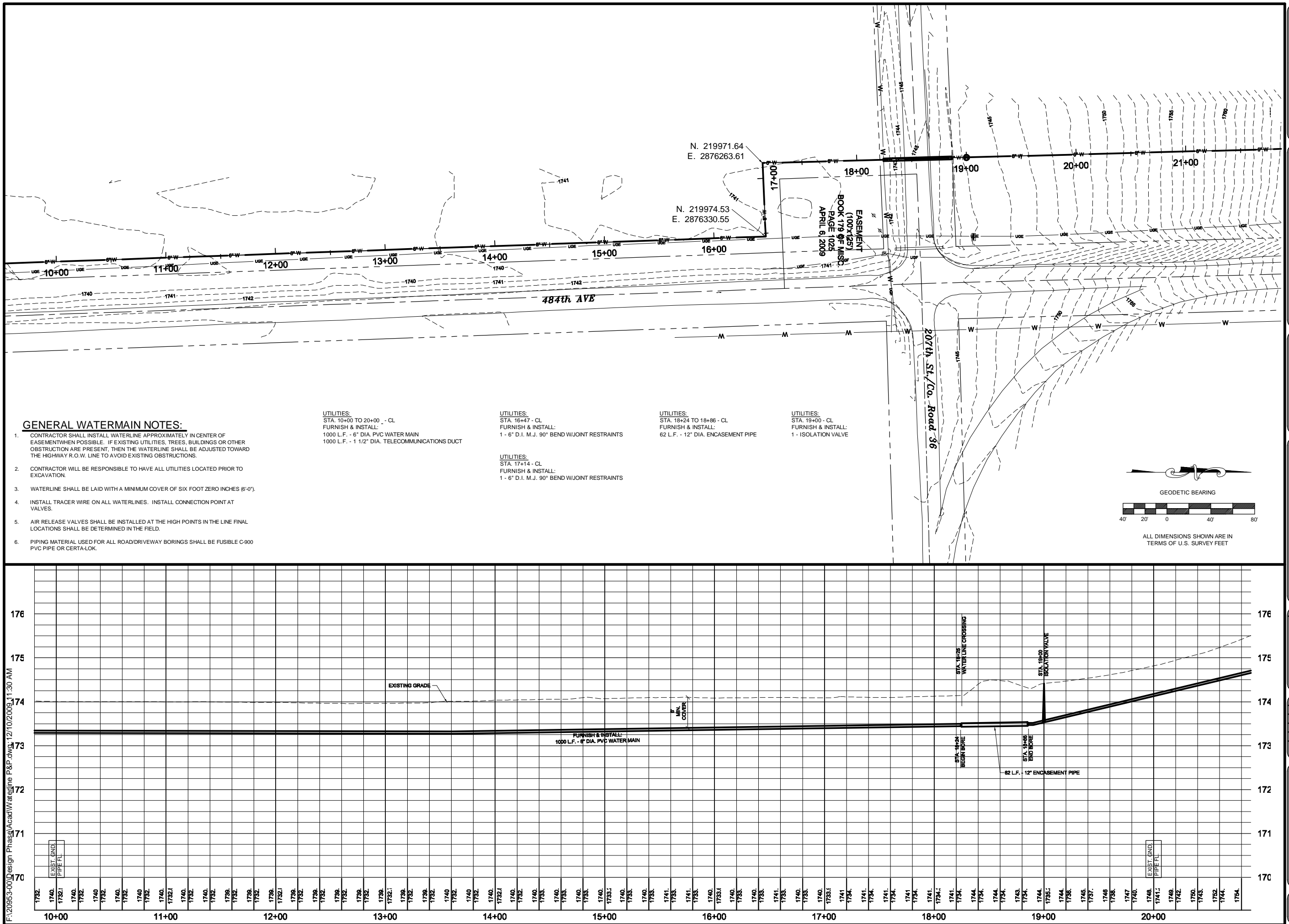
JOB NO : 20953-00-02

DATE: NOVEMBER 2009

SHEET TITLE :

PLAN AND  
PROFILE  
STA. 10+00  
TO 20+00

SHEET NO. :



F:\20953-00\Design Phase\Acad\Waterline P&P.dwg, 12/10/2009, 11:30 AM



## Designing Projects, Building Trust

PROJECT TITLE:

PROJECT LOCATION :  
BROOKINGS COUNTY  
SOUTH DAKOTA

DRAWN BY:	JLU
DESIGNED BY:	KLB
CHECKED BY:	SDR
JOB NO:	20953-00-02
DATE:	NOVEMBER 2009

PLAN AND  
PROFILE  
STA. 20+00  
TO 30+00

7



CONSULTANTS:

FOR  
REVIEW ONLY  
NOT FOR  
CONSTRUCTION

PROJECT TITLE:

BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

PROJECT LOCATION:

BROOKINGS COUNTY  
SOUTH DAKOTA

REV. DATE DESCRIPTION

DRAWN BY: JUL

DESIGNED BY: KLB

CHECKED BY: SDR

JOB NO.: 20953-00-02

DATE: NOVEMBER 2009

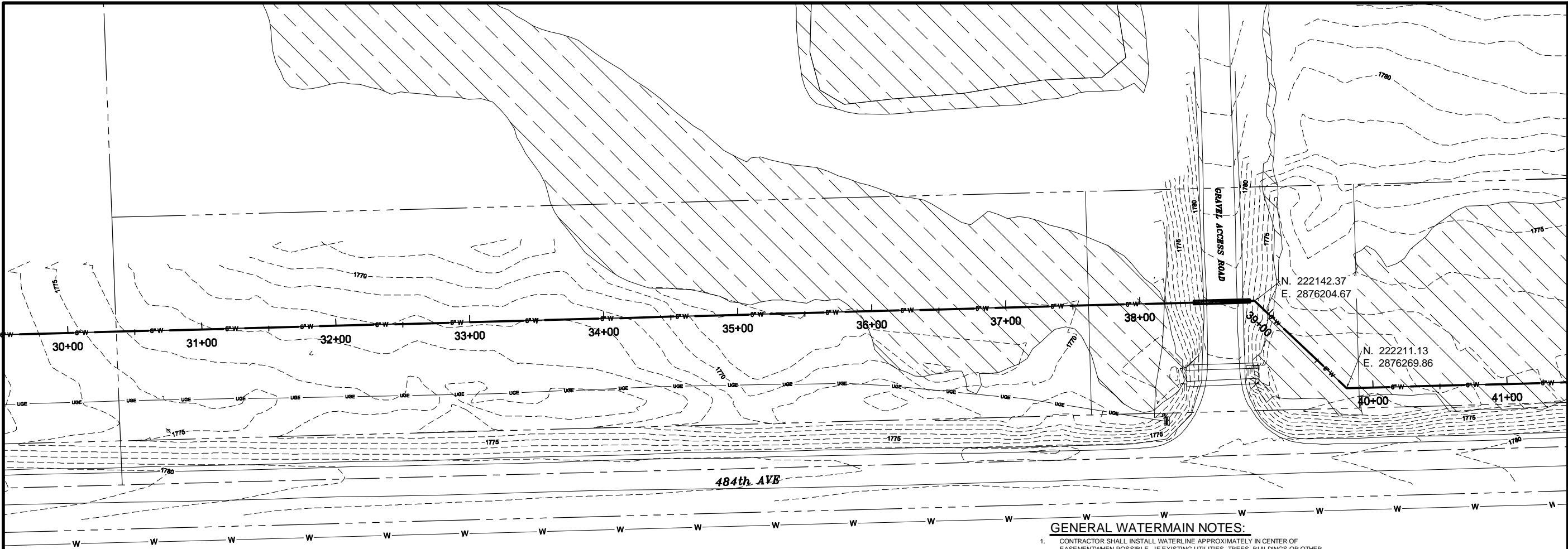
SCALE REDUCTION BAR

SHEET TITLE:

PLAN AND  
PROFILE  
STA. 30+00  
TO 40+00

SHEET NO.:

8



UTILITIES:  
STA. 30+00 TO 40+00 - CL  
FURNISH & INSTALL:  
1000 L.F. - 6\"/>

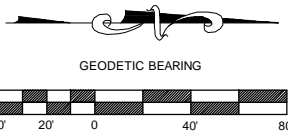
UTILITIES:  
STA. 38+40 TO 38+82 - CL  
FURNISH & INSTALL:  
42 L.F. - 12\"/>

UTILITIES:  
STA. 38+85.6 - CL  
FURNISH & INSTALL:  
1 - 6\"/>

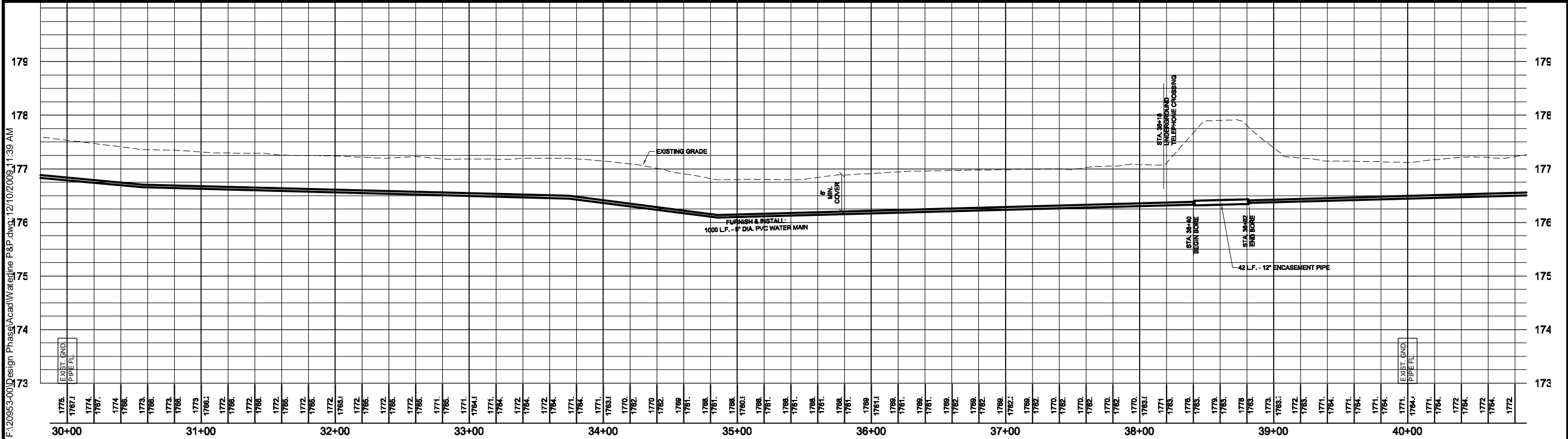
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STA. 39+80.4 - CL  
FURNISH & INSTALL:  
1 - 6\"/>

GENERAL WATERMAIN NOTES:

- CONTRACTOR SHALL INSTALL WATERLINE APPROXIMATELY IN CENTER OF EASEMENT WHEN POSSIBLE. IF EXISTING UTILITIES, TREES, BUILDINGS OR OTHER OBSTRUCTION ARE PRESENT, THEN THE WATERLINE SHALL BE ADJUSTED TOWARD THE HIGHWAY R.O.W. LINE TO AVOID EXISTING OBSTRUCTIONS.
- CONTRACTOR WILL BE RESPONSIBLE TO HAVE ALL UTILITIES LOCATED PRIOR TO EXCAVATION.
- WATERLINE SHALL BE LAID WITH A MINIMUM COVER OF SIX FOOT ZERO INCHES (6'-0").
- INSTALL TRACER WIRE ON ALL WATERLINES. INSTALL CONNECTION POINT AT VALVES.
- AIR RELEASE VALVES SHALL BE INSTALLED AT THE HIGH POINTS IN THE LINE. FINAL LOCATIONS SHALL BE DETERMINED IN THE FIELD.
- PIPING MATERIAL USED FOR ALL ROAD/DRIVEWAY BORINGS SHALL BE FUSIBLE C-900 PVC PIPE OR CERTA-LOK.



ALL DIMENSIONS SHOWN ARE IN  
TERMS OF U.S. SURVEY FEET



FX20953-00-02 Design Phase Acad Waterline P&P.dwg: 12/10/2009 11:39 AM

CONSULTANTS:

FOR  
REVIEW ONLY  
NOT FOR  
CONSTRUCTION

PROJECT TITLE:

BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

PROJECT LOCATION:

BROOKINGS COUNTY  
SOUTH DAKOTA

REV. DATE DESCRIPTION

DRAWN BY: JUL

DESIGNED BY: KLB

CHECKED BY: SDR

JOB NO.: 20953-00-02

DATE: NOVEMBER 2009

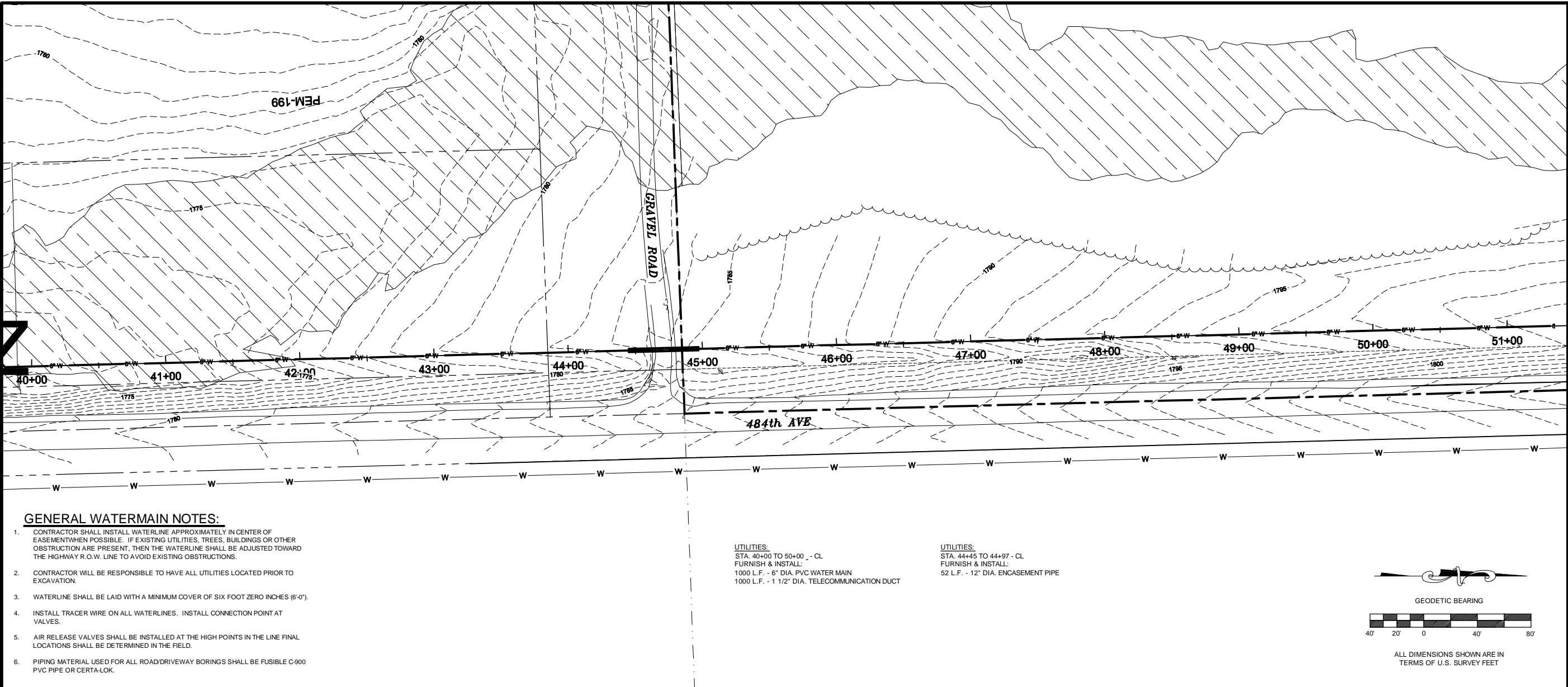
0 1/2" 1"  
SCALE REDUCTION BAR

SHEET TITLE:

PLAN AND  
PROFILE  
STA. 40+00  
TO 50+00

SHEET NO.:

9



GENERAL WATERMAIN NOTES:

- CONTRACTOR SHALL INSTALL WATERLINE APPROXIMATELY IN CENTER OF EASEMENT WHEN POSSIBLE. IF EXISTING UTILITIES, TREES, BUILDINGS OR OTHER OBSTRUCTION ARE PRESENT, THEN THE WATERLINE SHALL BE ADJUSTED TOWARD THE HIGHWAY R.O.W. LINE TO AVOID EXISTING OBSTRUCTIONS.
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UTILITIES:  
STA. 40+00 TO 50+00 - CL  
FURNISH & INSTALL:  
1000 L.F. - 6" DIA. PVC WATER MAIN  
1000 L.F. - 1 1/2" DIA. TELECOMMUNICATION DUCT

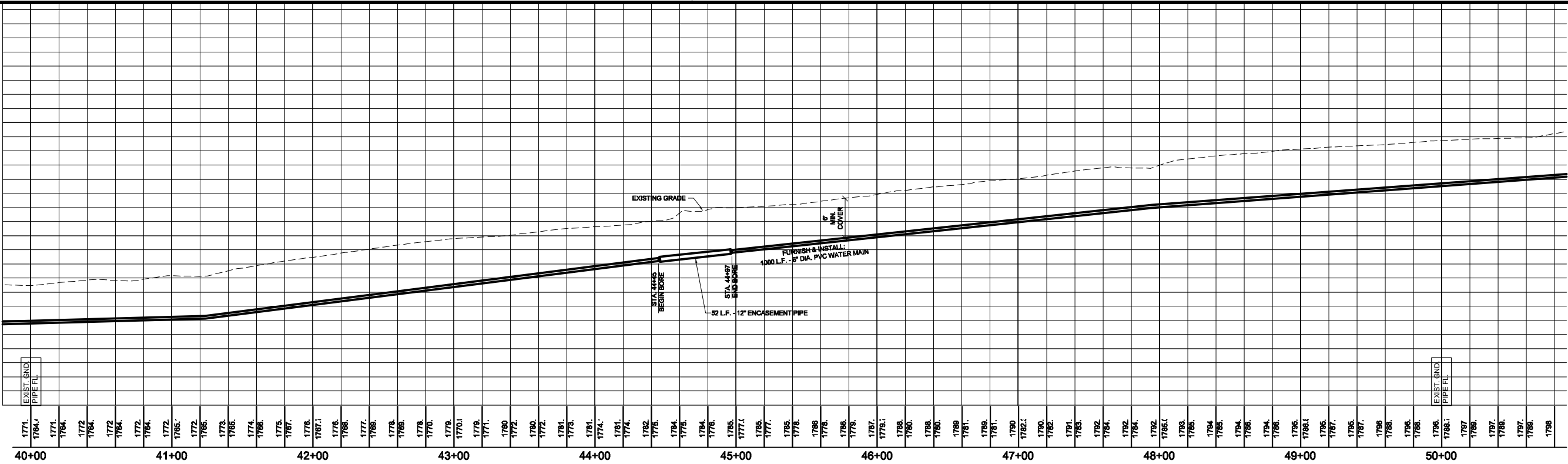
UTILITIES:  
STA. 44+45 TO 44+97 - CL  
FURNISH & INSTALL:  
52 L.F. - 12" DIA. ENCASEMENT PIPE

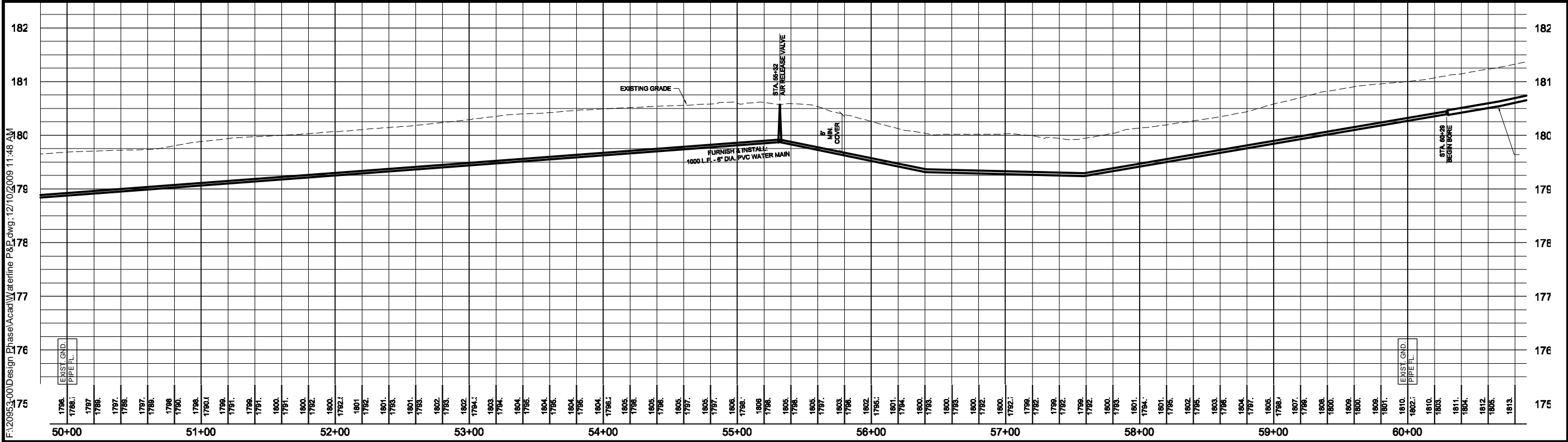
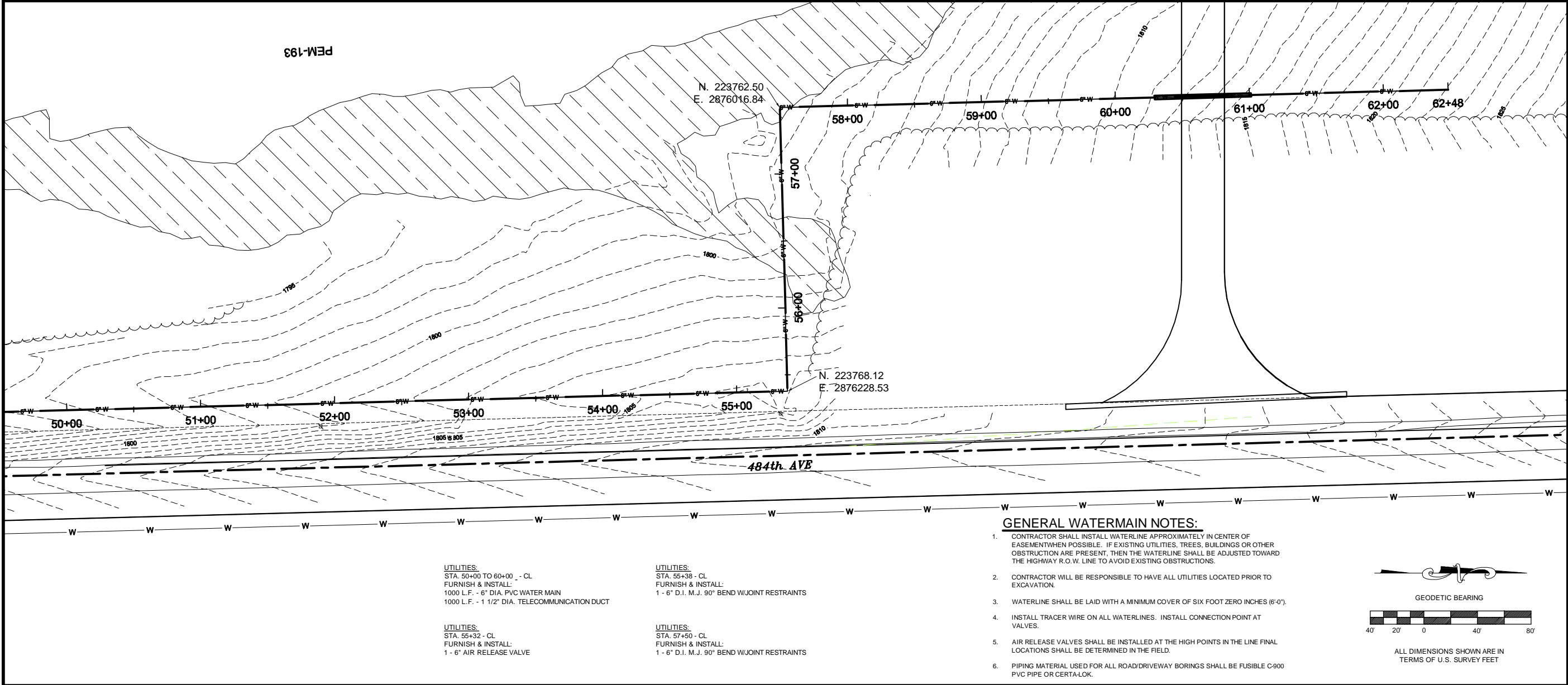


GEODETIC BEARING

ALL DIMENSIONS SHOWN ARE IN  
TERMS OF U.S. SURVEY FEET

F:\20953-00\Design Phase\Acad\Waterline P&P.dwg; 12/10/2009 11:43 AM





**BANNER**  
Consulting Engineers & Architects  
409 22nd Ave. S. P.O. Box 29  
Brookings, South Dakota 5700  
605-692-6342  
www.bannerassociates.com  
Designing Projects. Building Trust.

CONSULTANTS:

FOR REVIEW ONLY  
NOT FOR CONSTRUCTION

PROJECT TITLE:  
  
BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

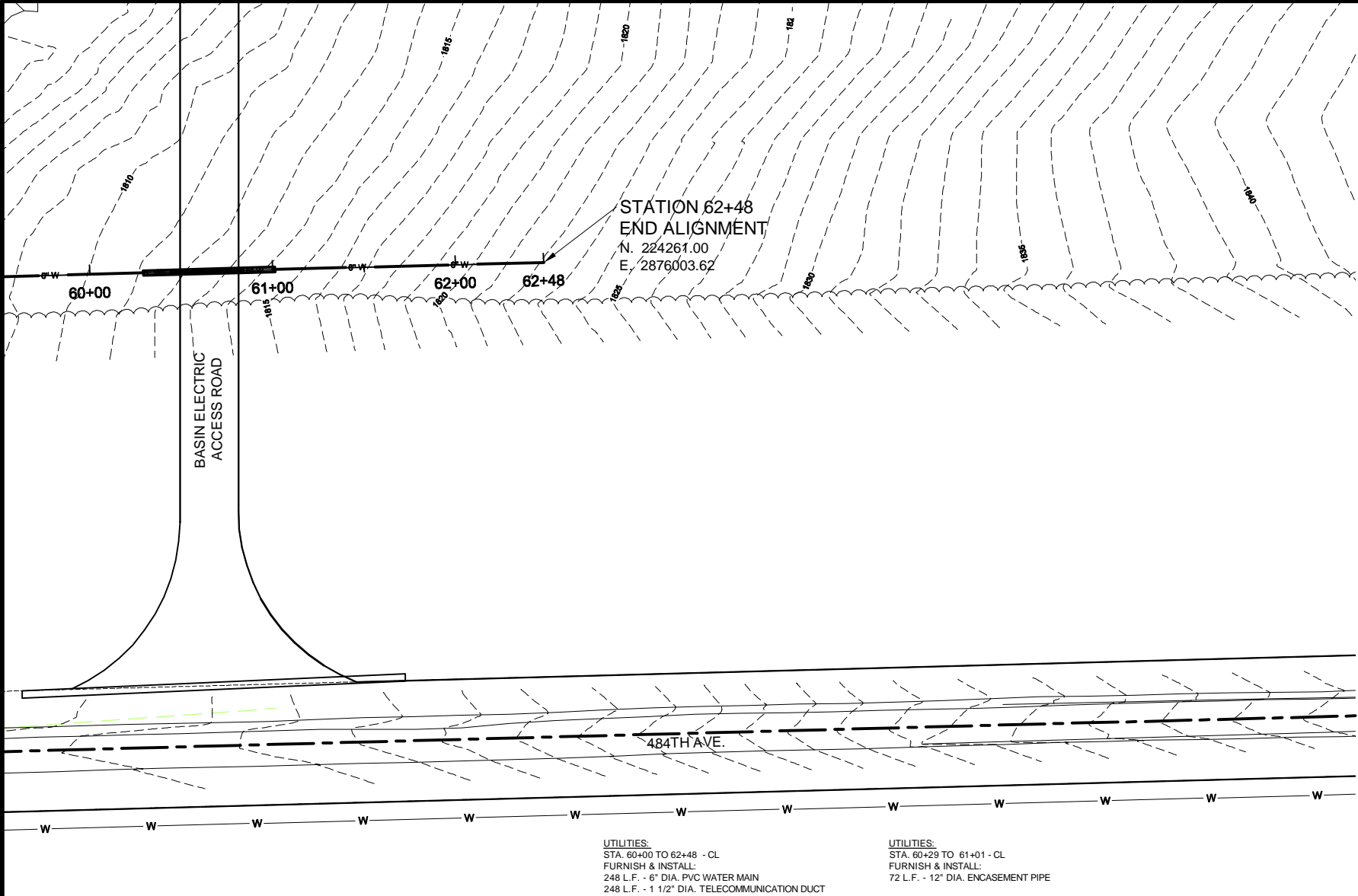
PROJECT LOCATION:  
BROOKINGS COUNTY  
SOUTH DAKOTA

REV.	DATE	DESCRIPTION

DRAWN BY: JUL  
DESIGNED BY: KLB  
CHECKED BY: SDR  
JOB NO.: 20953-00-02  
DATE: NOVEMBER 2009  
SCALE REDUCTION BAR

SHEET TITLE:  
  
PLAN AND  
PROFILE  
STA. 50+00  
TO 60+00

SHEET NO.:  
10

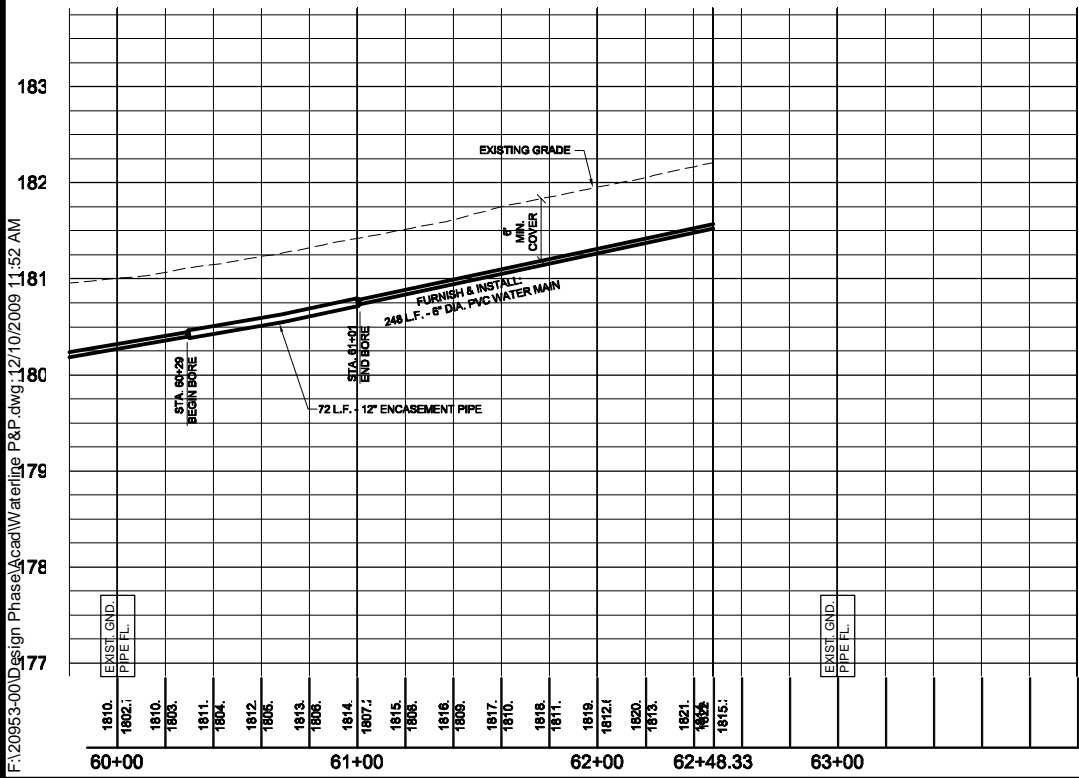
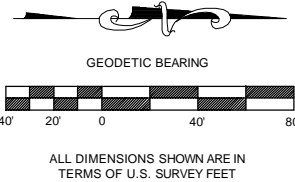


GENERAL WATERMAIN NOTES:

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- 6. PIPING MATERIAL USED FOR ALL ROAD/DRIVEWAY BORINGS SHALL BE FUSIBLE C-900 PVC PIPE OR CERTA-LOK.

UTILITIES:  
STA. 60+00 TO 62+48 - CL  
FURNISH & INSTALL:  
248 L.F. - 6" DIA. PVC WATER MAIN  
248 L.F. - 1 1/2" DIA. TELECOMMUNICATION DUCT

UTILITIES:  
STA. 60+29 TO 61+01 - CL  
FURNISH & INSTALL:  
72 L.F. - 12" DIA. ENCASEMENT PIPE



CONSULTANTS:

FOR  
REVIEW ONLY  
NOT FOR  
CONSTRUCTION

PROJECT TITLE :

BASIN  
ELECTRIC  
RAW WATER  
PIPELINE

PROJECT LOCATION :

BROOKINGS COUNTY  
SOUTH DAKOTA

REV.	DATE	DESCRIPTION

DRAWN BY:	JLU
DESIGNED BY:	KLB
CHECKED BY:	SDR
JOB NO :	20953-00-02
DATE :	NOVEMBER 2009

0 1/2" = 1'  
SCALE REDUCTION BAR

SHEET TITLE :

PLAN AND  
PROFILE  
STA. 60+00  
TO 62+48

SHEET NO. :

