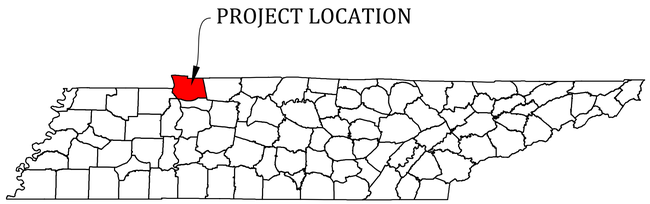
2024 ARPA CUMBERLAND CITY WATER SYSTEM IMPROVEMENTS

CUMBERLAND CITY, TENNESSEE

PHILLIP TAYLOR, HONORABLE MAYOR
LINDA GUNSON, VICE MAYOR
ALEX SHORT, ALDERMAN
ERIC MILLIKEN, ALDERMAN
WANDA GILLIAM, ALDERMAN



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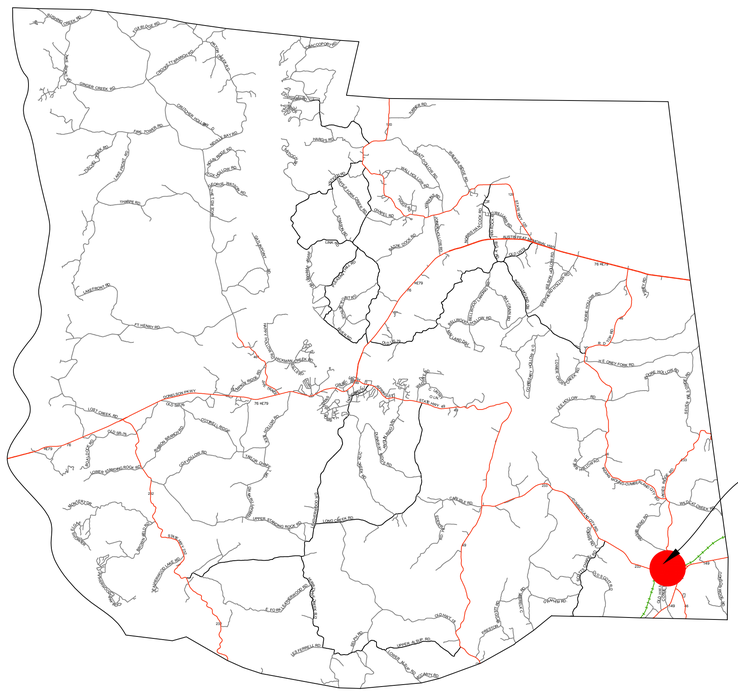
STEWART COUNTY, TENNESSEE



DW20250303R1

APPROVED FOR CONSTRUCTION

THE DOCUMENT BEARING THIS STAMP HAS BEEN RECEIVED AND REVIEWED BY THE

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES

AND IS HEREBY APPROVED FOR CONSTRUCTION BY THE COMMISSIONER

Kaylee Salo
01/08/2026

THIS APPROVAL SHALL NOT BE CONSTRUED AS CREATING A PRESUMPTION OF CORRECT OPERATION OR AS WARRANTING BY THE COMMISSIONER THAT THE APPROVED FACILITIES WILL REACH THE DESIGNED GOALS.

APPROVAL EXPIRES ONE YEAR FROM ABOVE DATE

RYE ENGINEERING PLC
CONSULTING ENGINEERS & SYSTEM OPERATORS
4210 W MAIN STREET, ERIN TN 37061
OFFICE (931) 289-2300 FAX (931) 289-2313

SETH W. RYE
REGISTERED ENGINEER
No. 109814
COMMERCE
STATE OF TENNESSEE

DATE: 12/05/2025

GENERAL NOTES

1. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL PERMITS, AND PAY ALL PERMIT AND TAP FEES PRIOR TO BEGINNING WORK.

2. ALL CONSTRUCTION SHALL BE MADE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND SPECIFICATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE CONSTRUCTION WITH THE TOWN OF CUMBERLAND CITY.

3. THE CONTRACTOR SHALL NOTIFY THE TENNESSEE ONE-CALL SYSTEM, INC., AND ANY NON ONE-CALL UTILITIES INDIVIDUALLY, AT LEAST THREE WORKING DAYS PRIOR TO ANY EXCAVATION AND/OR DEMOLITION.

4. UNDERGROUND STRUCTURES AND UTILITIES SHOWN ARE STRICTLY APPROXIMATE IN LOCATION AND DEPTH, AND MAY NOT BE THE ONLY UTILITIES PRESENT. THE CONTRACTOR SHALL FIELD VERIFY SIZES, LOCATIONS, AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES, PRIOR TO BEGINNING WORK. NOTIFY ENGINEER OF ANY DISCREPANCIES.

5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR ANY DAMAGE TO PROPERTY OR ADJOINING PROPERTIES DURING CONSTRUCTION.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ALL EXISTING DRAINAGE SYSTEMS.

7. THE CONTRACTOR SHALL PROTECT THE PUBLIC FROM WORK AT ALL TIMES. WHEN THE WORK AREA IS IN AN AREA OF DIRECT PUBLIC ACCESS, THE WORK AREA BARRICADED AND ILLUMINATED DARKNESS AND PERIODS OF ACTIVITY.

8. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL FOR ALL WORK IN PUBLIC RIGHT-OF-WAYS. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH FEDERAL AND STATE MANUALS OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) CURRENT EDITION. SEE DETAIL FOR TYPICAL TEMPORARY TRAFFIC CONTROL REQUIREMENTS.

9. CONTRACTOR SHALL ALLOW FULL ACCESS TO PROPERTIES AFFECTED BY UTILITY CONSTRUCTION.

10. CONTRACTOR SHALL PROVIDE SHEETING, SHORING, AND BRACING AS NECESSARY, TO PROTECT WORKMEN AND EXISTING UTILITIES DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A TRENCH SAFETY SYSTEM MEET ALL APPROPRIATE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.

11. THE CONTRACTOR SHALL MAKE A PHYSICAL INSPECTION OF THE SITE BEFORE SUBMITTING A BID FOR THE PROJECT. IT IS ASSUMED THAT THE CONTRACTOR HAS EXAMINED THE, PLANS SPECIFICATIONS AND THE SITE BEFORE SUBMITTING A BID. ANY ITEMS THAT WOULD BE REASONABLY REQUIRED FOR CONSTRUCTION, WHETHER OR NOT SPECIFICALLY DENOTED IN THE PLANS SHALL BE PROVIDED BY THE CONTRACTOR.

12. MAINTAIN ONE SET ONE SET OF AS-BUILT DRAWINGS ON THE JOB SITE FOR DISTRIBUTION TO THE ENGINEER UPON COMPLETION. AS-BUILTS SHALL INCLUDE LOCATIONS AND ELEVATIONS OF WATER MAIN, APPURTENANCES, AND ACCUMULATE ON SITE.

13. THE CONTRACTOR SHALL CONTINUOUSLY CLEAN-UP AND REMOVE DEMOLISHED MATERIALS FROM SITE. DO NOT ALLOW MATERIALS TO ACCUMULATE ON SITE.

14. ALL WATER LINES SHALL BE INSTALLED, AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.

15. BACKFILL UTILITY TRENCHES UNDER PAVEMENT AREAS AND WITH CRUSHED STONE OR FLOWABLE FILL. BACKFILL UTILITY TRENCHES IN LAWN AREAS WITH SATISFACTORY FILL MATERIAL DEVOID OF LARGE ROCKS AND STONES, COMPACTED TO AT LEAST 90% OF MAXIMUM DRY DENSITY PER ASTM D698.

16. WATER LINE DEPTH SHALL BE GREATER AS NECESSARY TO AVOID SEWER, STORM DRAINS, AND OTHER UTILITIES.

17. ROUTE OF NEW UTILITIES IS SHOWN AS APPROXIMATE. ADJUSTMENTS TO ALIGNMENT SHALL BE MADE IN THE FIELD, IF FIELD CONDITIONS VARY FROM THE PLANS. NO CHANGE ORDERS SHALL BE ISSUED FOR MINOR ALIGNMENT CHANGES FOR EXPLORATORY DIGGING.

18. WHERE NO FITTING IS SHOWN, THE CONTRACTOR SHALL FIELD DIRECT PIPE WITHIN THE PIPE MANUFACTURER'S TOLERANCES TO ESTABLISH PROPER ALIGNMENT. IF TOLERANCES CAN'T BE MET, DISCLOSE TO THE ENGINEER.

19. CONTRACTOR SHALL RESTORE ALL EFFECTED STRUCTURES AND PROPERTY AFFECTED DURING CONSTRUCTION, TO A CONDITION THAT IS EQUAL OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS, AND/OR CONDITION THAT IS SATISFACTORY TO THE PROPERTY OWNER AND THE TOWN OF CUMBERLAND CITY.

20. THE CONTRACTOR IS REQUIRED TO PROVIDE AND INSTALL TRACER WIRE AND DETECTOR TAPE.

21. THE CONTRACTOR SHALL LANDSCAPE DISTRIBUTED AREAS IMMEDIATELY AFTER CONSTRUCTION TO WITHIN 0.3 FEET OF EXISTING GRADE.

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CUMBERLAND CITY

SETH W. RYE
REGISTERED ENGINEER
COMMERCE
TENNESSEE
STATE OF TENNESSEE

DATE: 12/05/2025

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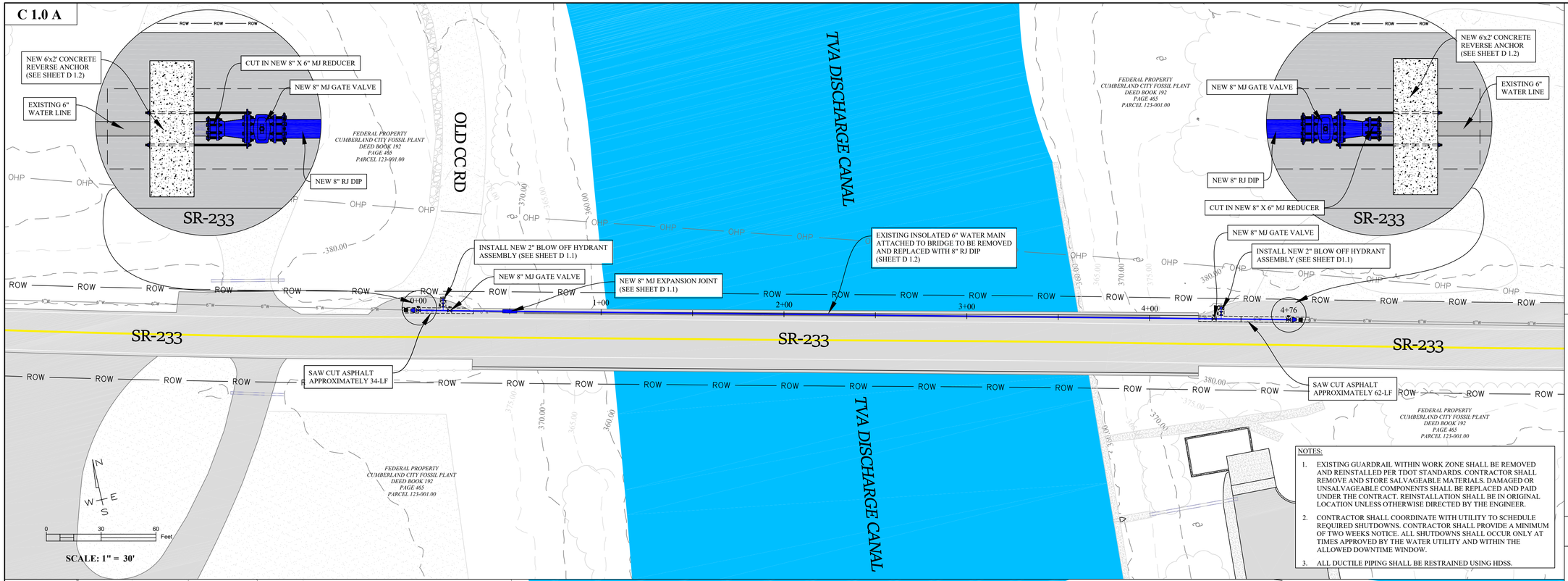
REVISION BLOCK

NO.	REVISION:	DATE:
A	FINAL PLANS	12/05/2025

GENERAL NOTES

G 0.01

C 1.0 A

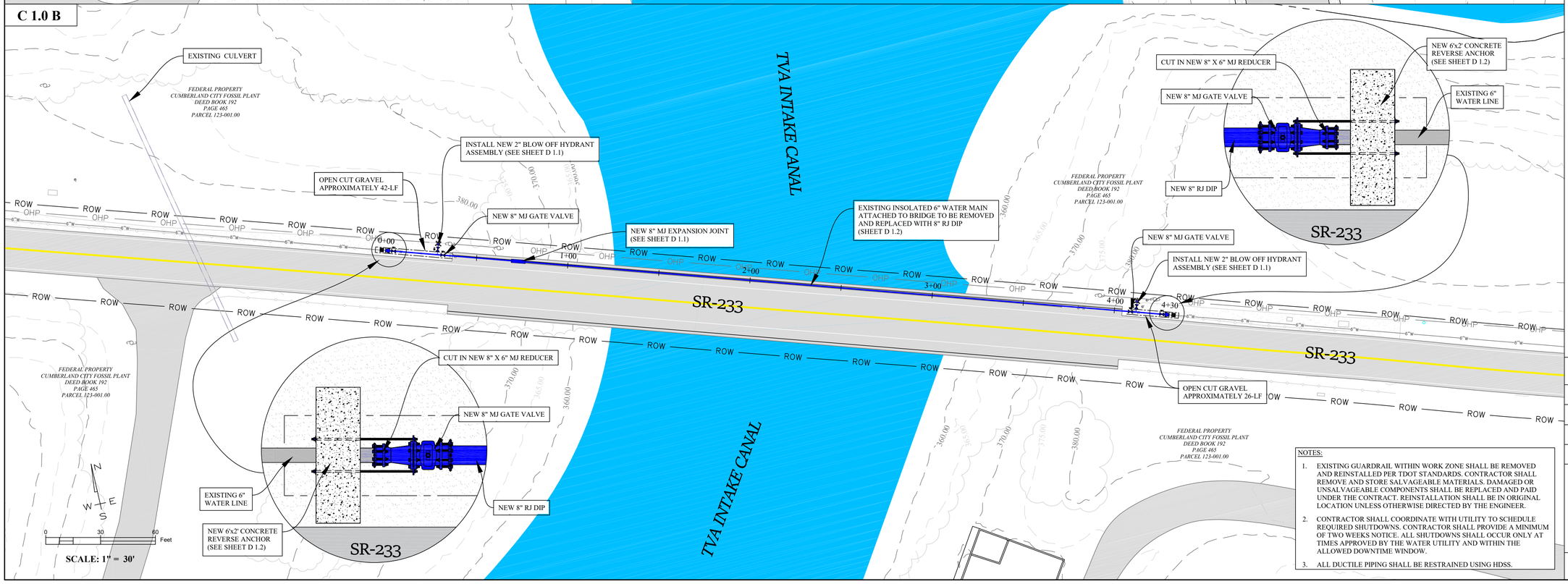


SCALE: 1" = 30'

NOTES:

1. EXISTING GUARDRAIL WITHIN WORK ZONE SHALL BE REMOVED AND REINSTALLED PER TDOT STANDARDS. CONTRACTOR SHALL REMOVE AND STORE SALVAGEABLE MATERIALS. DAMAGED OR UNSALVAGEABLE COMPONENTS SHALL BE REPLACED AND PAID UNDER THE CONTRACT. REINSTALLATION SHALL BE IN ORIGINAL LOCATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. CONTRACTOR SHALL COORDINATE WITH UTILITY TO SCHEDULE REQUIRED SHUTDOWNS. CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE. ALL SHUTDOWNS SHALL OCCUR ONLY AT TIMES APPROVED BY THE WATER UTILITY AND WITHIN THE ALLOWED DOWNTIME WINDOW.
3. ALL DUCTILE PIPING SHALL BE RESTRAINED USING HDSS.

C 1.0 B



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2024 ARPA CUMBERLAND CITY WATER SYSTEM IMPROVEMENTS

CUMBERLAND CITY

SETH W. RYE — REGISTERED ENGINEER — COMMERCE TOSCA — STATE OF TENNESSEE

DATE: 12/05/2025

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT-OF-WAY
- TREE LINE
- EXISTING OVERHEAD POWER
- EXISTING 6" WATER MAIN
- EXISTING GUARDRAIL
- EXISTING POWER POLE
- EXISTING RIP-RAP
- EXISTING CONCRETE
- EXISTING GRAVEL
- NEW 8" RJ DUCTILE IRON PIPE
- SAW CUT
- OPEN CUT
- NEW 8" X 6" MJ REDUCER
- NEW 8" MJ GATE VALVE
- NEW 2" BLOW OFF HYDRANT

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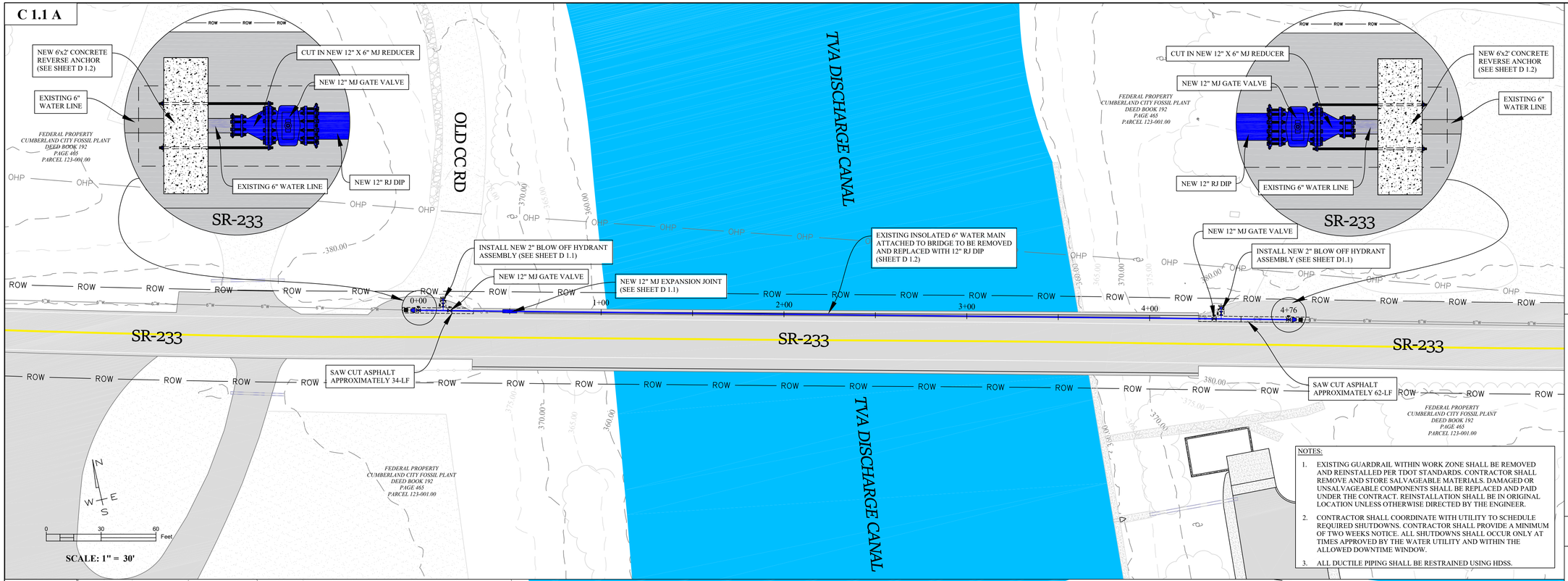
REVISION BLOCK

NO.	REVISION:	DATE:
A	FINAL PLANS	12/05/2025

BRIDGE CROSSING WATER CONSTRUCTION PLAN

C 1.0

C 1.1 A



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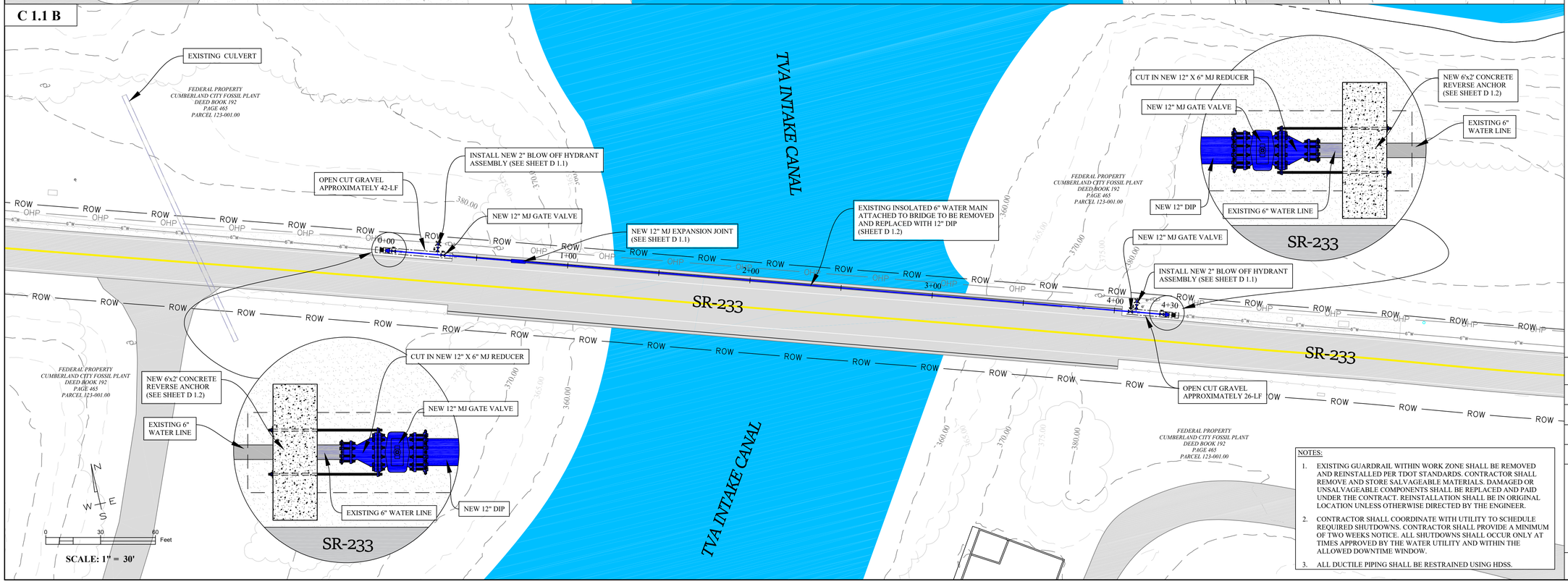
C 1.1 B



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2024 ARPA CUMBERLAND CITY WATER SYSTEM IMPROVEMENTS

CUMBERLAND CITY

SETH W. RYE — REGISTERED ENGINEER — COMMERCE TOBACCO — STATE OF TENNESSEE

DATE: 12/05/2025

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT-OF-WAY
- TREE LINE
- EXISTING OVERHEAD POWER
- EXISTING 6" WATER MAIN
- EXISTING GUARDRAIL
- EXISTING POWER POLE
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- NEW 8" X 6" MJ REDUCER
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REVISION BLOCK

NO.	REVISION:	DATE:
A	FINAL PLANS	12/05/2025

ADDITIVE ALTERNATE
BRIDGE CROSSING WATER CONSTRUCTION PLAN

C 1.1

REDUCER

LENGTH (L) TO BE RESTRAINED

NOMINAL PIPE SIZE	HORIZONTAL BENDS				VERTICAL OFFSETS 45 BENDS (SEE NOTE 4)		VALVES OR DEAD ENDS
	90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	UPPER	LOWER	
4"	21'	9'	5'	3'	17'	3'	47'
6"	30'	13'	6'	3'	23'	4'	66'
8"	38'	16'	8'	4'	30'	6'	86'
10"	45'	19'	9'	5'	36'	7'	103'
12"	53'	23'	11'	6'	43'	8'	121'
14"	61'	26'	13'	6'	50'	9'	140'
16"	66'	28'	14'	7'	55'	10'	154'
18"	73'	30'	15'	8'	60'	11'	170'
20"	79'	33'	16'	8'	66'	12'	186'
24"	79'	33'	16'	8'	77'	15'	204'
30"	93'	39'	19'	10'	97'	17'	222'
36"	106'	39'	21'	11'	107'	20'	257'
42"	117'	49'	24'	12'	120'	24'	289'
48"	144'	53'	26'	13'	133'	26'	321'

NOTE:

1. THIS SCALE SHALL BE USED ON ALL WATER, AND SEWER FORCE MAIN SYSTEMS. ALL FITTINGS SHALL BE RESTRAINED TO THE LENGTHS INDICATED ON THE ABOVE SCHEDULE AT A MINIMUM.

2. ASSUMPTIONS: PVC PIPE, SAFETY FACTOR =1.5, TEST PRESSURE =150PSI, SOIL =GM OR SM, TRENCH TYPE 3, DEPTH OF COVER =30 INCHES FOR 20" AND SMALLER PIPE SIZE OR 36 INCHES FOR 24" AND LARGER PIPE SIZE.

3. BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE.

4. VERTICAL OFFSETS: ARE APPROX. 3 FEET COVER ON TOP AND APPROX. 8 FEET COVER ON BOTTOM. PER THE DETAILS, Lu IS RESTRAINED LENGTH FOR UPPER (TOP) LEVEL. Ll IS THE RESTRAINED LENGTH FOR THE LOWER (DEEPER) LEVEL. ASSUME 45 DEGREE BENDS.

5. TEES: TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE (RUN) SHALL BE A TOTAL DISTANCE OF 30 FEET (MIN). SEE SCHEDULE FOR RESTRAINT LENGTH ON TEE "BRANCH" LINE.

6. HDPE TO PVC TRANSITIONS: THE PVC PIPE SIDE SHALL BE RESTRAINED 35 FT. (MIN).

7. THE INSTALLATION OF BELL HARNESS RESTRAINTS AT PVC JOINTS (DR-18 AND DR-25 PIPE) SHALL BE COMPLETED PER THE MANUFACTURER'S RECOMMENDATION, WHICH INCLUDES NOT OVER TIGHTENING THE PARALLEL RODS/NUTS. THESE NUTS SHOULD ONLY BE SNUG TIGHT. THE HOMEMARKS ON THE PIPE SHOULD ALWAYS BE VISIBLE AFTER THE RESTRAINT IS INSTALLED. OVERHOMMING THE JOINT MAY CAUSE A FAILURE AT THE BELL RESULTING IN A SERVICE OUTAGE.

REDUCERS

SIZE	L
6X4	34'
8X6	36'
8X4	62'
10X8	35'
10X6	63'
12X10	36'
12X8	64'
16X12	66'
16X10	92'
20X18	35'
20X16	66'
20X12	117'
24X20	56'
24X18	80'
24X16	101'
30X24	78'
30X20	121'
36X30	78'
36X24	142'
42X36	75'
42X30	140'
48X42	75'
48X36	139'

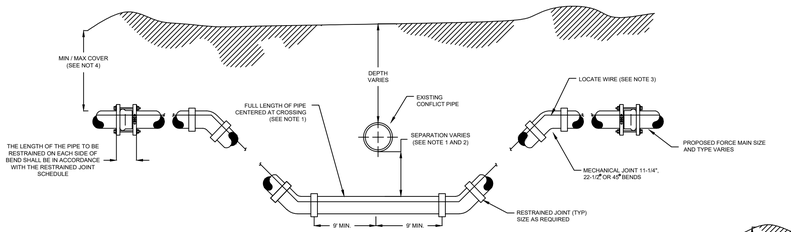
TEES

(SEE NOTE 5)

RUN	BRANCH	L
4"	4"	F.O.
4"	6"	10'
	6">	F.O.
8"	8"	29'
	8">	F.O.
10"	10"	45'
	8"	13'
	8">	F.O.
12"	12"	63'
	10"	32'
	8">	F.O.
16"	16"	94'
	12"	39'
	10"	5'
	10">	F.O.
20"	20"	125'
	16"	76'
	12"	14'
	12">	F.O.
24"	24"	124'
	20"	84'
	16"	36'
	16">	F.O.
30"	30"	159'
	24"	104'
	20"	60'
	16"	5'
	16">	F.O.
36"	36"	192'
	30"	142'
	24"	83'
	20"	33'
	20">	F.O.
42"	42"	223'
	36"	178'
	30"	124'
	24"	59'
	20"	5'
	20">	F.O.
48"	48"	253'
	42"	209'
	36"	162'
	30"	104'
	24"	34'
	24">	F.O.

F.O. = FITTING ONLY

ADJUSTMENT UNDER EXISTING UTILITIES MECHANICAL RESTRAINTS



NOTE:

1. IF EXISTING CONFLICT PIPE IS A WATER MAIN, 18-INCHES OF SEPARATION IS REQUIRED. A FULL LENGTH OF PIPE SHALL BE CENTERED OVER EXISTING UTILITY MAIN TO PROVIDE MAXIMUM JOINT SPACING FOR ALL CROSSINGS.

2. IF EXISTING CONFLICT IS SEWER MAIN A WATERTIGHT CASING SHALL BE REQUIRED.

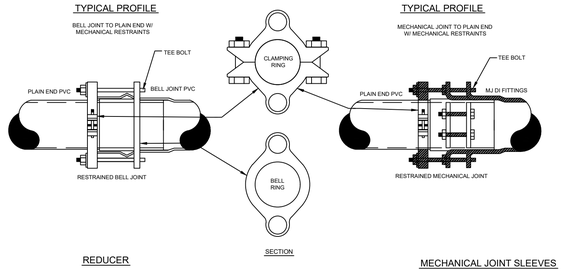
3. LOCATOR WIRE REQUIRED

4. THE COVER FOR PIPING LESS THAN 24" SIZE SHALL BE 30" (MIN) IN UNPAVED AREAS, 36" (MIN) IN PAVED AREAS, AND A MAXIMUM OF 60", UNLESS APPROVED BY OWNER. THE COVER FOR PIPING 24" SIZE AND LARGER SHALL BE 36" (MIN) IN PAVED AND UNPAVED AREAS AND A MAXIMUM COVER OF 84", UNLESS APPROVED BY OWNER.

5. THE SOLIDS BETWEEN THE MAIN AND THE CONFLICT PIPE SHALL BE COMPACTED TO 98% OF THE MAXIMUM DENSITY AS DETERMINED BY THE LABORATORY MODIFIED PROCTOR TEST ASTM D 1557.

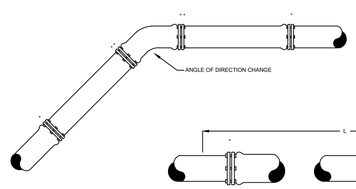
MECHANICAL RESTRAINTS

TYPICAL PROFILE

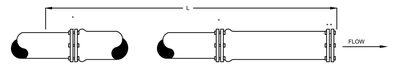


TYPICAL PROFILE

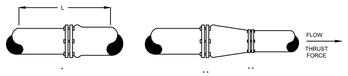
HORIZONTAL BEND



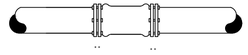
DEAD END



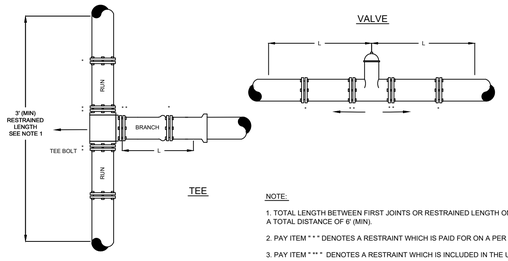
REDUCER



MECHANICAL JOINT SLEEVES

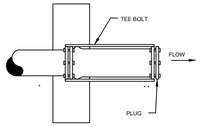


VALVE



TEE

DEAD-END THRUST COLLAR ANCHOR



3" - 8"	DIAMETER OF MAIN = 2 TIE RODS REQUIRED PER JOINT (3/4" ROD)
10" - 12"	DIAMETER OF MAIN = 4 TIE RODS REQUIRED PER JOINT (3/4" ROD)
14" - 16"	DIAMETER OF MAIN = 6 TIE RODS REQUIRED PER JOINT (3/4" ROD)
18" - 20"	DIAMETER OF MAIN = 8 TIE RODS REQUIRED PER JOINT (3/4" ROD)
24"	DIAMETER OF MAIN = 12 TIE RODS REQUIRED PER JOINT (3/4" ROD)
30" - 36"	DIAMETER OF MAIN = 14 TIE RODS REQUIRED PER JOINT (1" ROD)
42" - 48"	DIAMETER OF MAIN = 16 TIE RODS REQUIRED PER JOINT (1-1/4" ROD)
54"	DIAMETER OF MAIN = 18 TIE RODS REQUIRED PER JOINT (1-1/4" ROD)

NOTE:

1. PAY ITEM " " " DENOTES A RESTRAINT WHICH IS PAID FOR ON A PER EACH BASIS.

2. PAY ITEM " "" " DENOTES A RESTRAINT WHICH IS INCLUDED IN THE UNIT PRICE BID FOR FITTINGS OR VALVE.

NOTE:

1. TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE (RUN) SHALL BE A TOTAL DISTANCE OF 6' (MIN).

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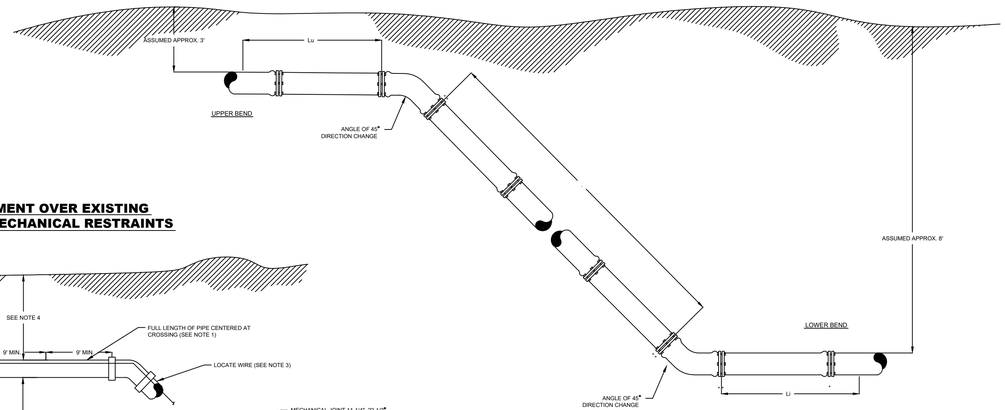
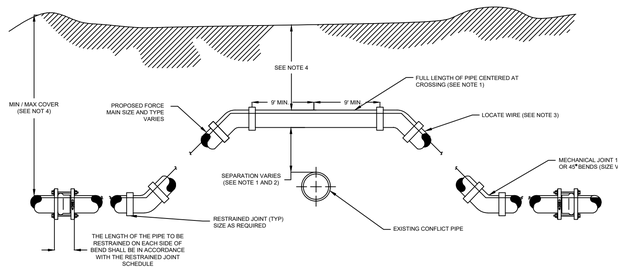
VERTICAL OFFSET PROFILE



ADJUSTMENT OVER EXISTING UTILITIES MECHANICAL RESTRAINTS



NOTE:

1. IF EXISTING CONFLICT PIPE IS A WATER MAIN, 18-INCHES OF SEPARATION. A FULL LENGTH OF PIPE SHALL BE CENTERED OVER EXISTING UTILITY MAIN TO PROVIDE MAXIMUM JOINT SPACING FOR ALL CROSSINGS.

2. IF EXISTING CONFLICT PIPE IS WATER MAIN AND PROPOSED PIPING IS SEWER MAIN A WATERTIGHT CASING SHALL BE REQUIRED.

3. LOCATOR WIRE REQUIRED.

4. THE COVER OF LESS THAN 24" SIZE SHALL BE 30" (MIN) IN PAVED AREAS, 36" MIN. IN PAVED AREAS AND A MAXIMUM COVER OF 60", UNLESS APPROVED BY OWNER. THE COVER FOR PIPING 24" SIZE AND LARGER SHALL BE 36" (MIN) IN PAVED AND UNPAVED AREAS AND A MAXIMUM COVER OF 84", UNLESS APPROVED BY OWNER.

5. THE SOLIDS BETWEEN THE MAIN AND THE CONFLICT PIPE SHALL BE COMPACTED 98% OF THE MAXIMUM DENSITY AS DETERMINED BY THE LABORATORY MODIFY PROCTOR TEST ASTM D 1557.

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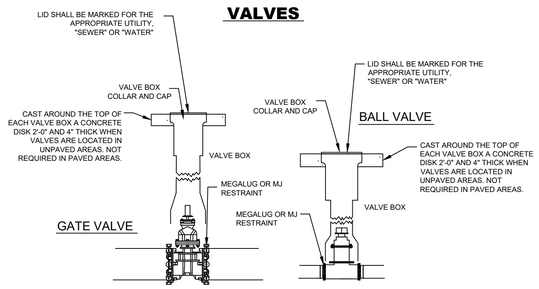
WATER CONSTRUCTION DETAILS

D 1.0

THRUST BLOCKING DETAILS

VALVES



BLOWOFF ASSEMBLY

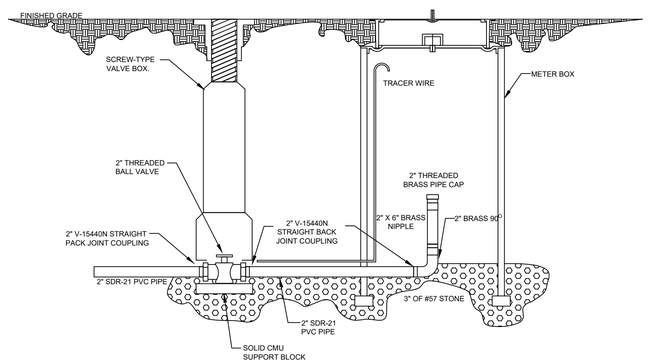


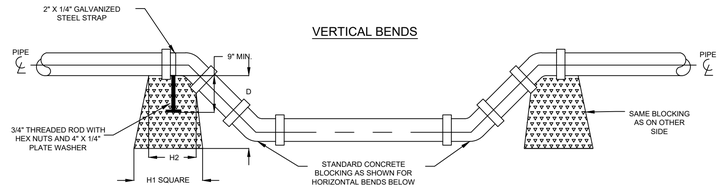
TABLE OF DIMENSIONS FOR CONCRETE THRUST BLOCKS

PIPE SIZE	TEES, CROSSES, PLUGS					90° BENDS					45° BENDS					22-1/2° BENDS					11-1/4° BENDS					PIPE SIZE
	H1	H2	V	D	C.F.	H1	H2	V	D	C.F.	H1	H2	V	D	C.F.	H1	H2	V	D	C.F.	H1	H2	V	D	C.F.	
2",2-1/4"	18"	10"	12"	18"	1.90	18"	10"	12"	18"	1.90	18"	6"	12"	18"	1.50	18"	6"	12"	18"	1.50	18"	6"	12"	18"	1.50	2",2-1/4"
3",4"	24"	12"	12"	18"	2.25	24"	12"	12"	18"	2.25	18"	8"	12"	18"	1.60	18"	8"	12"	18"	1.60	18"	8"	12"	18"	1.60	3",4"
6"	24"	16"	18"	18"	3.50	30"	16"	18"	18"	4.05	24"	10"	16"	18"	3.20	24"	10"	16"	18"	3.20	24"	10"	16"	18"	3.20	6"
8"	36"	18"	18"	18"	5.05	39"	18"	24"	18"	7.30	30"	11"	18"	18"	3.95	30"	11"	18"	18"	3.95	24"	11"	16"	18"	3.40	8"
10"	48"	24"	18"	24"	7.15	54"	32"	24"	24"	10.25	24"	18"	21"	18"	4.60	24"	18"	21"	18"	4.60	24"	18"	21"	18"	4.60	10"
12"	54"	30"	24"	24"	13.40	54"	32"	36"	24"	18.15	42"	18"	24"	24"	9.60	24"	18"	24"	24"	6.60	24"	18"	21"	24"	6.10	12"
14"	60"	32"	30"	24"	17.90	60"	40"	42"	24"	25.00	44"	24"	30"	24"	13.20	30"	24"	24"	24"	9.20	27"	21"	24"	24"	7.90	14"
16"	66"	34"	36"	24"	22.50	69"	48"	48"	24"	29.00	48"	30"	36"	24"	17.00	36"	30"	27"	24"	11.80	27"	24"	27"	24"	9.10	16"
18"	66"	36"	40"	24"	27.50	69"	48"	48"	24"	33.00	48"	30"	36"	24"	17.00	36"	30"	29"	24"	13.00	27"	30"	29"	24"	11.00	18"

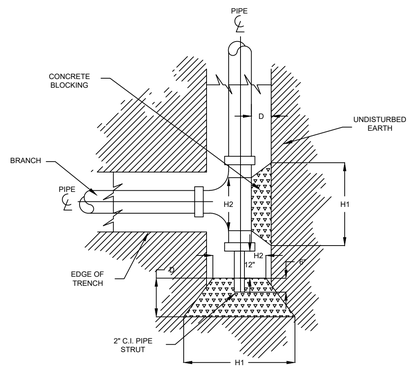
NOTES:

1. DO NOT COVER BELLS OR FLANGES WITH CONCRETE.
2. WRAP ALL FITTINGS WITH POLYETHYLENE PLASTIC SHEETING.
3. BACK ALL TEES ACCORDING TO SIZE OF BRANCH.
4. BACKING FUTURE LINE EXTENSIONS SHALL BE THAT LATER REMOVAL IS POSSIBLE
5. ALL BENDS WHERE FITTINGS ARE USED, BOTH HORIZONTAL AND VERTICAL SHALL BE BACKED.
6. REACTION BACKING TABLE IS BASED ON UTILITY MAIN PRESSURE OF 2,500 LB. / SQ. FT. ADDITIONAL BACKING MAY BE REQUIRED IN SOME AREAS AS DIRECTED BY ENGINEERS.
7. ALL CONCRETE SHALL BE 2500 P.S.I. MINIMUM.
8. 18" AND LARGER REQUIRES ANTI-THRUST DESIGN.
9. ALL 90 DEGREES BENDS ON PVC SERVICE LINES (INCLUDING 1"-2" LINES) SHALL BE BACKED WITH CONCRETE.

VERTICAL BENDS

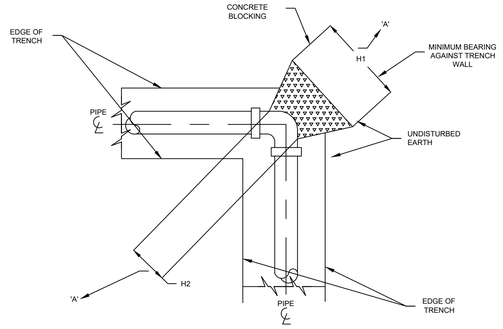


TEES, CROSSES,PLUGS

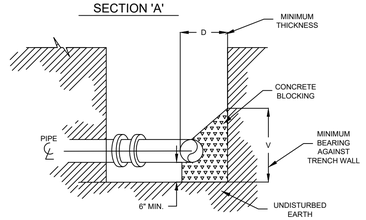


NOTE:
DIMENSIONS ARE CONTROLLED BY DIAMETER OF BRANCH MAIN.

HORIZONTAL BENDS



SECTION 'A'



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B	EXP. JOINT DETAIL	01/06/2026

WATER CONSTRUCTION DETAILS

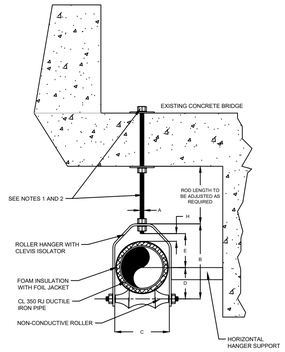
D 1.1

TYPICAL PIPE HANGER AND SUPPORT DETAIL

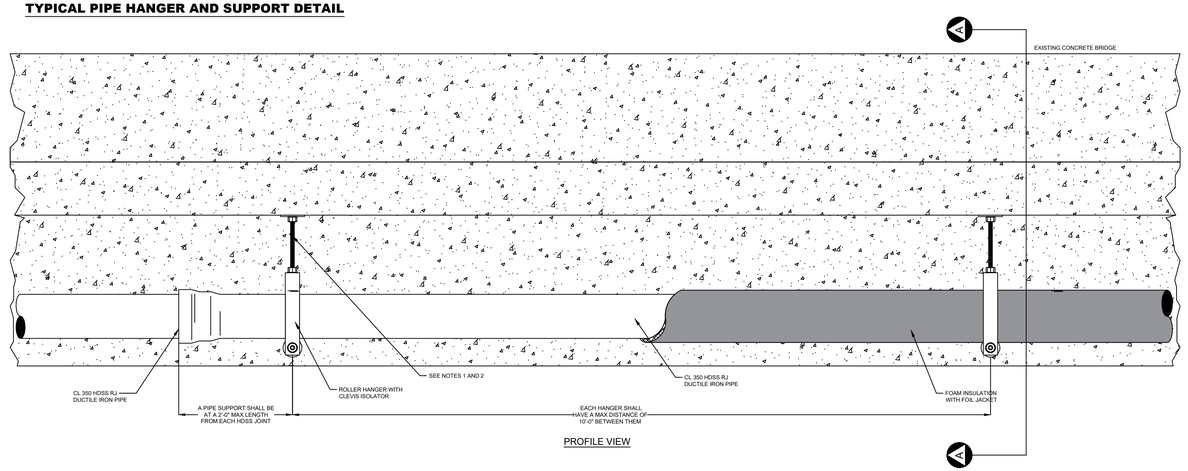
PIPE HANGER AND SUPPORTS									
PIPE SIZE	MAX O.D. OF COVERING	MAX LOAD	WEIGHT	ROD SIZE A	B	C	D	ROD TAKE OUT E	H
2 1/2"	3"	225LBS	1.7LBS	1/2"	5 3/4"	3 1/4"	1 15/16"	2 7/8"	1 11/16"
3"	3 5/8"	310LBS	2.2LBS		6 3/4"	3 7/8"	2 1/4"	3 1/8"	1 5/8"
3 1/2"	4 1/8"	390LBS	2.5LBS		7"	4 3/8"	2 9/16"	3 1/2"	1 11/16"
4"	4 11/16"	475LBS	3.2LBS	5/8"	7 9/16"	4 5/16"	2 13/16"	3 5/8"	1 5/8"
5"	5 3/4"	685LBS	6.3LBS		9 1/8"	6"	3 7/16"	4 1/2"	1 15/16"
6"	6 7/8"	780LBS	9.3LBS	3/4"	10 5/16"	7 1/8"	4"	5"	1 7/8"
8"	9"		14.5LBS		12 11/16"	9 1/4"	5 1/8"	6 1/8"	2"
10"	11"	965LBS	18.8LBS	7/8"	15 1/8"	11 1/4"	6 3/8"	7 1/4"	2 1/16"
12"	13"		27.7LBS		17 7/16"	13 1/4"	7 7/16"	8 3/8"	2 1/4"
14"	14 1/4"	1,200LBS	39.1LBS	1"	18 7/8"	14 1/2"	8 3/8"	8 3/4"	2"
16"	16 1/4"		49.1LBS		20 13/16"	16 1/2"	9 3/8"	9 11/16"	1 15/16"
18"	18 1/4"	1,400LBS	57.8LBS		23 3/4"	18 1/2"	10 7/16"	11 7/16"	2 13/16"
20"	20 1/4"	1,600LBS	75.9LBS	1 1/4"	26"	20 1/2"	11 5/8"	12 1/4"	2 1/2"
24"	24 1/4"	1,800LBS	119.3LBS	1 1/2"	32 5/16"	24 5/8"	13 15/16"	15 3/4"	4 3/8"

NOTES:

1. CORE DRILL THROUGH BRIDGE CONCRETE AS REQUIRED FOR THREADED ROD INSTALLATION AND UTILIZE OR ENLARGE EXISTING CORE HOLES WHERE POSSIBLE TO ACCOMMODATE NEW HANGERS.
2. INSTALL CONTINUOUS THREADED ROD THROUGH BRIDGE CONCRETE AND SECURE WITH NUT AND WASHER AT OPPOSITE END.

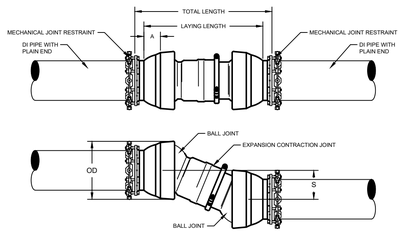


SECTION A-A



PROFILE VIEW

FLEXIBLE EXPANSION JOINT DETAIL

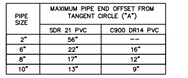


PIPE SIZE	OD	DEFLECTION (DEGREES)	A	EXPANSION	TOTAL LENGTH	LAYING LENGTH	S (OFFSET)	WEIGHT (LBS.)
3"	9.20"	20°	3.88"	4"	35.80"	30.80"	7.75"	176
				8"	51.00"	46.00"	13.28"	221
				12"	66.30"	61.30"	18.84"	265
4"	10.85"	20°	3.59"	4"	34.99"	29.99"	8.49"	152
				8"	50.24"	45.24"	14.39"	203
				12"	64.49"	60.49"	20.29"	248
6"	12.28"	20°	4.20"	4"	37.11"	32.11"	8.79"	213
				8"	51.39"	46.39"	14.36"	274
				12"	65.67"	52.26"	19.93"	335
8"	14.82"	20°	4.91"	4"	41.41"	36.41"	9.78"	311
				8"	58.51"	53.51"	16.31"	404
				12"	75.61"	70.61"	22.84"	497
10"	18.03"	20°	6.18"	4"	45.74"	40.74"	10.39"	475
				8"	61.54"	56.54"	16.48"	612
				12"	77.34"	72.34"	22.57"	750
12"	20.69"	20°	6.84"	4"	48.91"	43.91"	11.03"	587
				8"	64.86"	59.86"	17.17"	735
				12"	80.81"	75.81"	23.31"	882
14"	25.00"	20°	7.00"	8"	65.10"	58.10"	11.79"	12222
				16"	91.50"	84.50"	18.89"	1510
				24"	117.90"	110.90"	25.98"	1798
16"	25.00"	15°	10.30"	8"	74.00"	67.00"	12.41"	1133
				16"	101.50"	94.50"	19.88"	1465
				24"	129.50"	122.50"	27.36"	1797
18"	30.50"	15°	12.60"	8"	71.90"	65.30"	12.62"	1760
				16"	99.20"	92.10"	19.86"	2153
				24"	126.20"	119.20"	27.09"	2546
20"	30.50"	15°	10.40"	8"	73.50"	66.50"	12.30"	1874
				16"	101.00"	94.00"	19.61"	2298
				24"	128.00"	121.00"	26.90"	2721
24"	37.30"	15°	13.80"	8"	87.00"	80.00"	13.99"	3183
				16"	114.00"	107.00"	21.30"	3902
				24"	141.50"	134.00"	28.62"	4555
30"	44.00"	15°	12.30"	8"	98.20"	90.20"	17.50"	4985
				16"	132.50"	124.50"	26.53"	5976
				24"	166.80"	158.80"	35.37"	6856

NOTES:

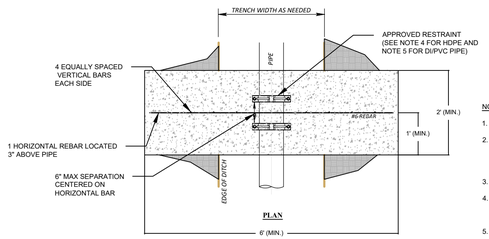
1. FOR PVC PIPING THE SERIES 2000PV MEGALUG MECHANICAL JOINT RESTRAINT SHALL BE USED FOR PIPING CONNECTION.
2. FOR DUCTILE IRON PIPING THE SERIES 1100 MEGALUG MECHANICAL JOINT RESTRAINT SHALL BE USED FOR PIPING CONNECTION.
3. EXPANSION JOINT TO BE INSTALLED IN AN ACCESSIBLE LOCATION FOR FUTURE MAINTENANCE AND PACKING ADJUSTMENT.
4. FITTING IS DESIGNED FOR ANGULAR DEFLECTION AND AXIAL PIPE MOVEMENT.

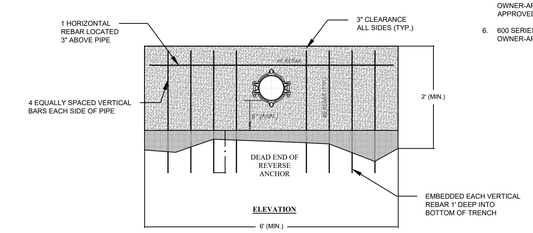
ALLOWABLE LONGITUDINAL PIPE BENDING IN PVC PIPE



PIPE SIZE	MAXIMUM PIPE END OFFSET FROM TANGENT CIRCLE ("A")	
	SDR 21 PVC	C900 DR14 PVC
2"	56"	--
6"	22"	16"
8"	17"	12"
10"	13"	9"

REVERSE CONCRETE ANCHOR





NOTES

1. REFER TO AWWA M-41 AND AWWA M-55 FOR PIPE DESIGN.
2. THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING ASSUMPTIONS BASED ON ACTUAL SITE CONDITIONS. IF SITE CONDITIONS DIFFER FROM ASSUMPTIONS, THE ENGINEER MUST PROVIDE A SITE-SPECIFIC DESIGN THAT COMPLIES WITH AWWA M-41.
3. A SITE-SPECIFIC DESIGN IS REQUIRED FOR:
4. PIPES LARGER THAN 12 INCHES.
   MAXIMUM STATIC PRESSURES GREATER THAN 250 PSI.
   APPROVED RESTRAINT FOR HDPE PIPES INCLUDES:
5. FUSED HDPE WALL ANCHOR.
   ELECTROFUSION FLEX RESTRAINT.
   600 SERIES PIPE JOINT RESTRAINT BY ROMAC (2 REQUIRED).
   OWNER-APPROVED EQUAL RESTRAINT METHODS.
   APPROVED RESTRAINT FOR DI AND PVC PIPES INCLUDES:
6. 600 SERIES PIPE JOINT RESTRAINT BY ROMAC (2 REQUIRED).
   OWNER-APPROVED EQUAL RESTRAINT METHODS.

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WATER CONSTRUCTION DETAILS

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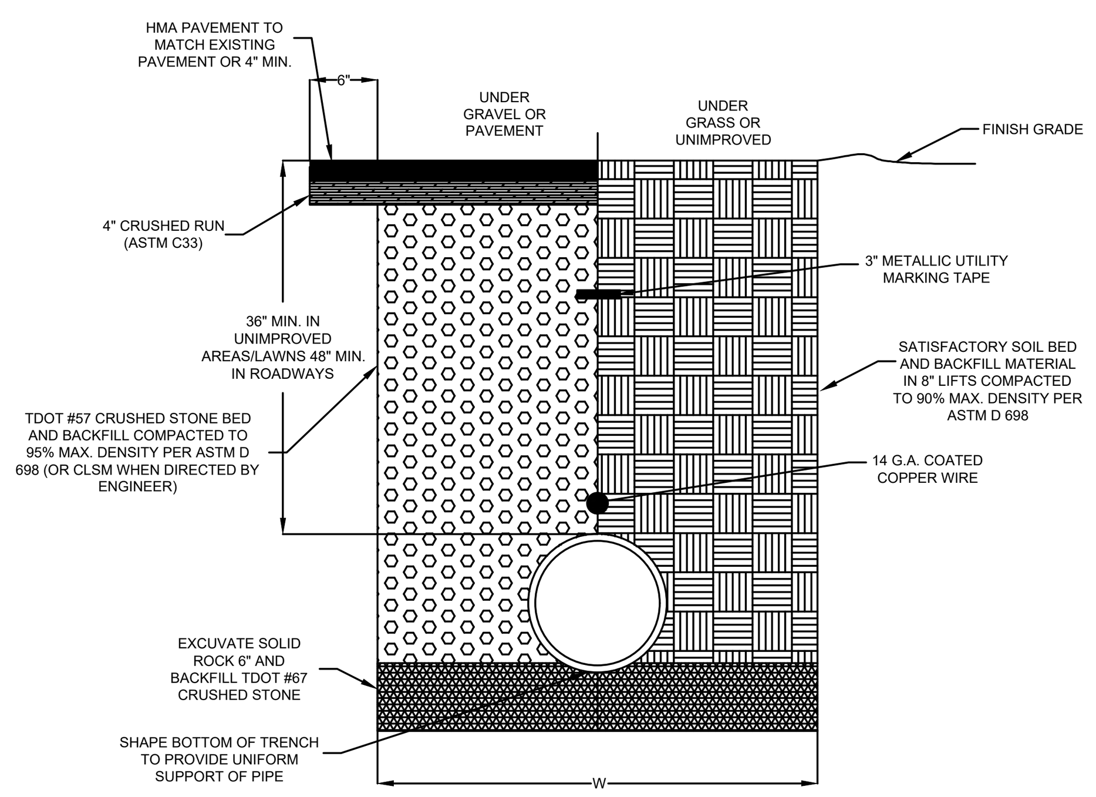
TRENCHING



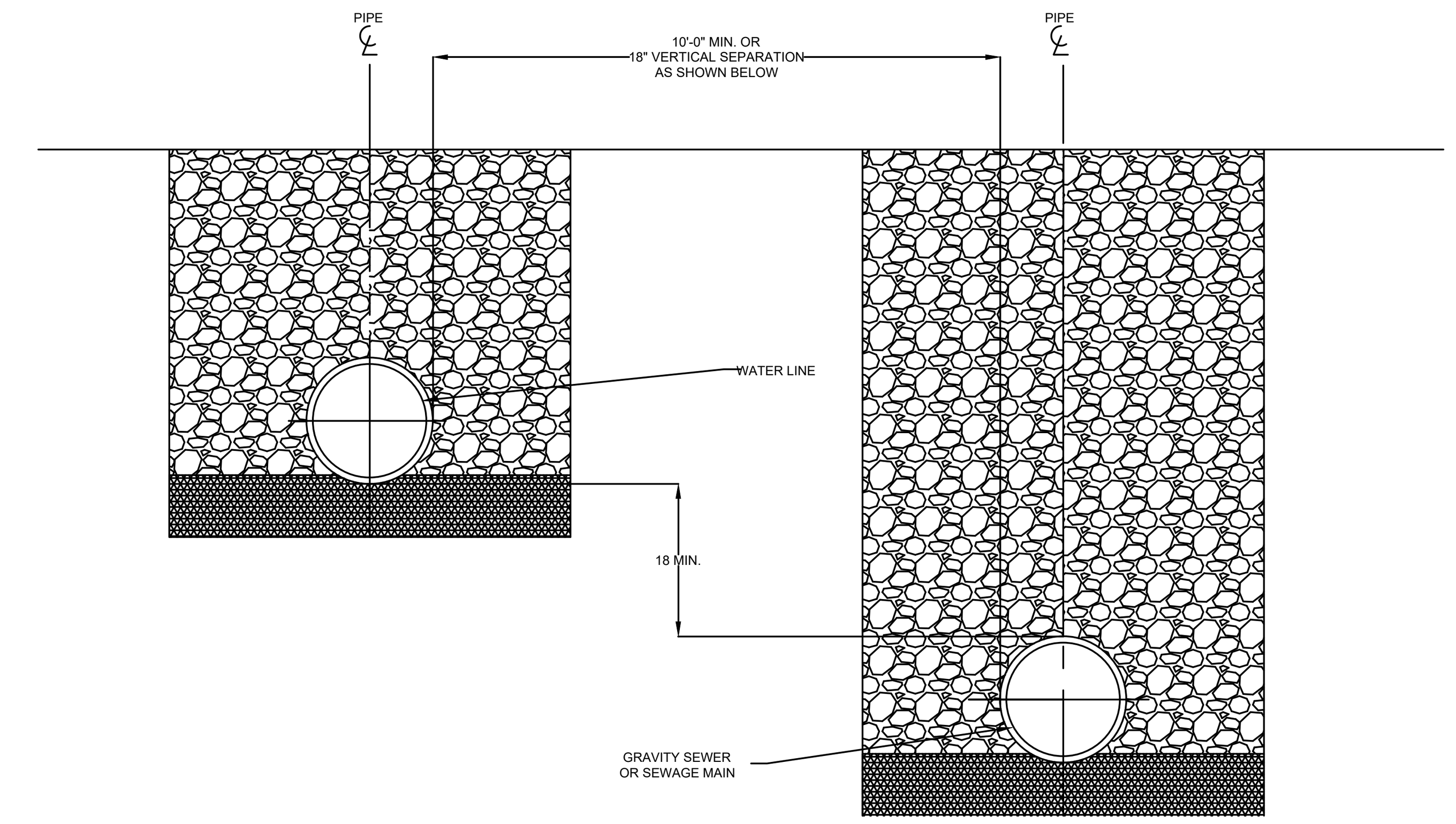
PIPE DIAMETER	TRENCH WIDTH (W) MIN.	TRENCH WIDTH (W) MAX.
4"	4"	48"
6"	6"	48"
8"	8"	48"
10"	10"	48"
12"	12"	48"
16"	16"	48"
18"	18"	54"
24"	24"	60"
30"	30"	74"
36"	36"	80"
42"	42"	86"
48"	48"	92"
54"	54"	98"
60"	60"	104"
72"	72"	116"

W= TRENCH WIDTH AT BOTTOM OF PIPE. TRENCH SIDE SLOPES SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS

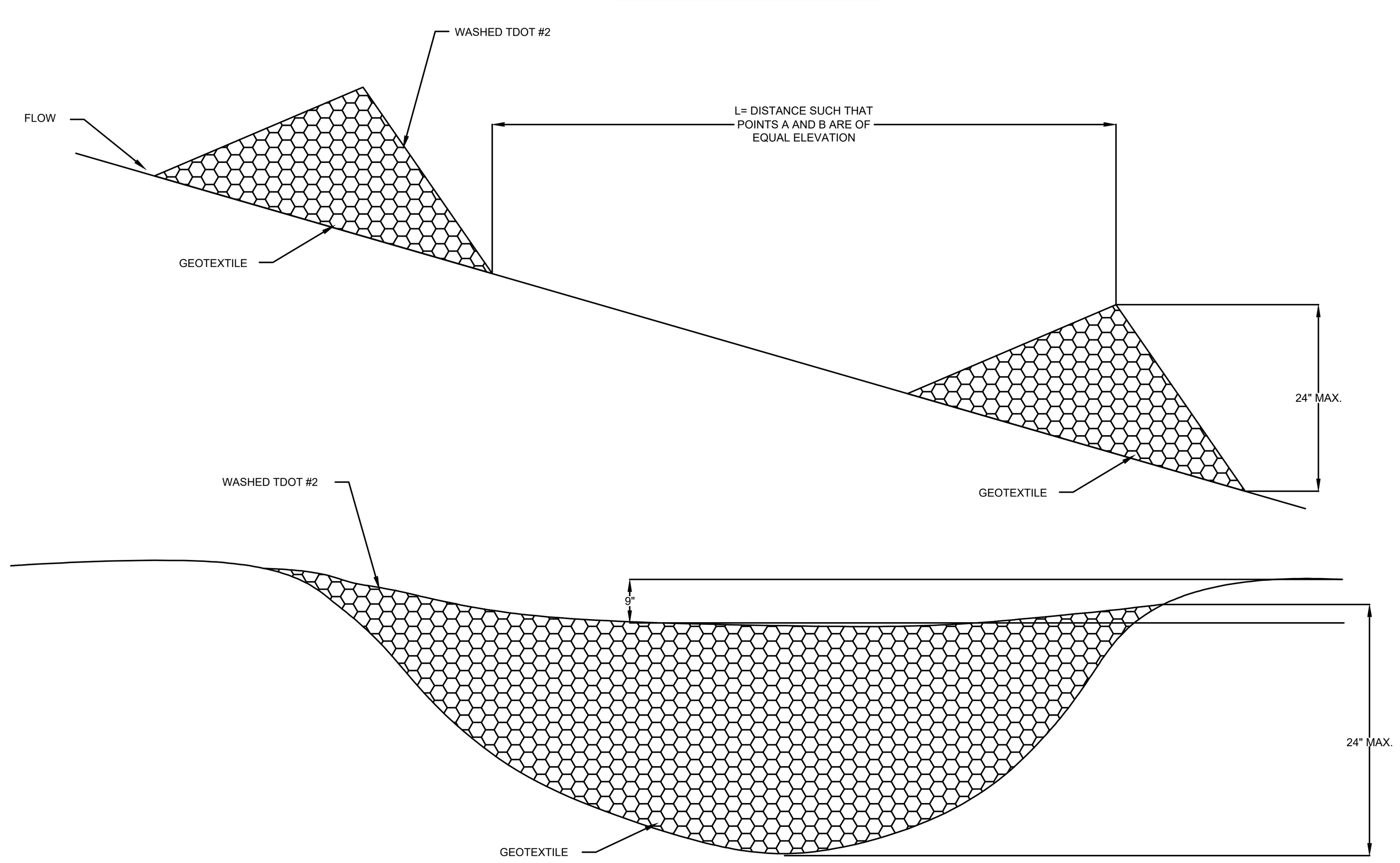
TRENCH NOTES:
COMPACTED BACKFILL SHALL BE LACED TO ONE FOOT MIN. DEPTH OF COVER. THE INITIAL BACKFILL SHALL BE A MATERIAL FREE FROM ROCKS GREATER THAN 1/2" DIA., SOIL CLODS, OR FROZEN MATERIAL. WHEN AUTOMATIC TAMPERS ARE USED, CARE SHALL BE EXERCISED TO AVOID DAMAGE TO THE PIPE.

ALL WATER LINE TRENCHES AND BORE PIT AREAS SHALL BE MECHANICALLY COMPACTED.

UTILITY SEPARATION

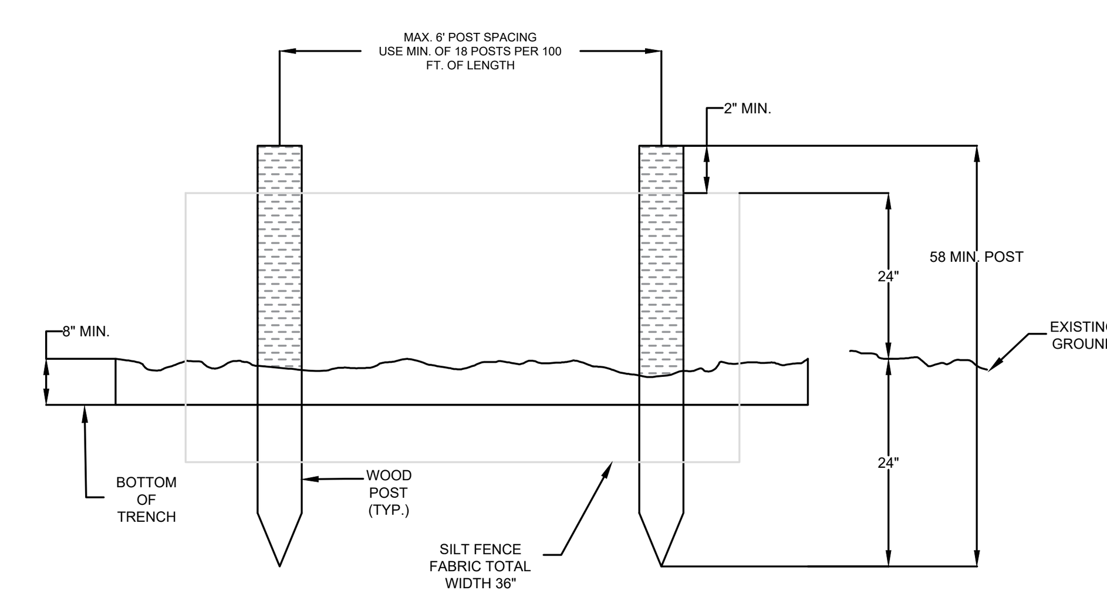


ROCK CHECK DAM

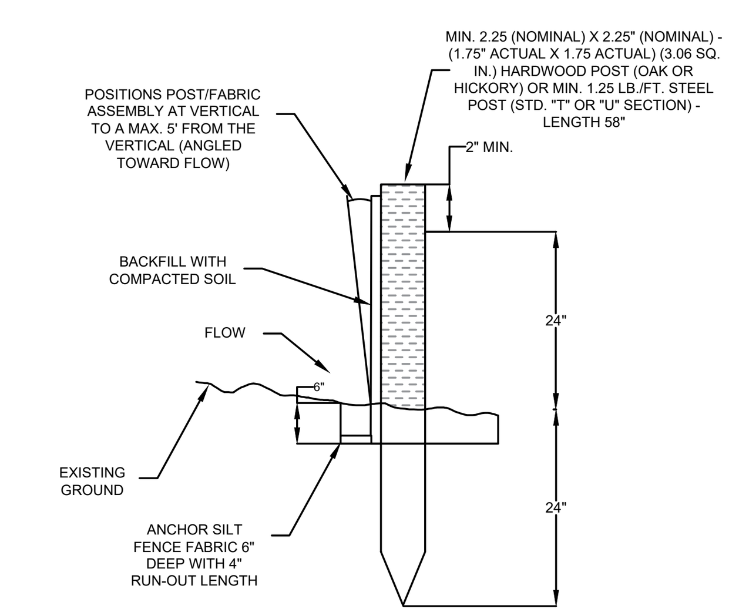


NOTE:
SEDIMENT SHALL BE REMOVED BEFORE IT REACHES THE HEIGHT OF ONE HALF OF THE ORIGINAL DAM. CHECKS DAMS SHALL BE REMOVED ONCE FINAL STABILIZATION OCCURS. AREAS DISTURBED BY THE REMOVAL OF THE DAMS SHALL BE SEEDED AND MULCHED IMMEDIATELY

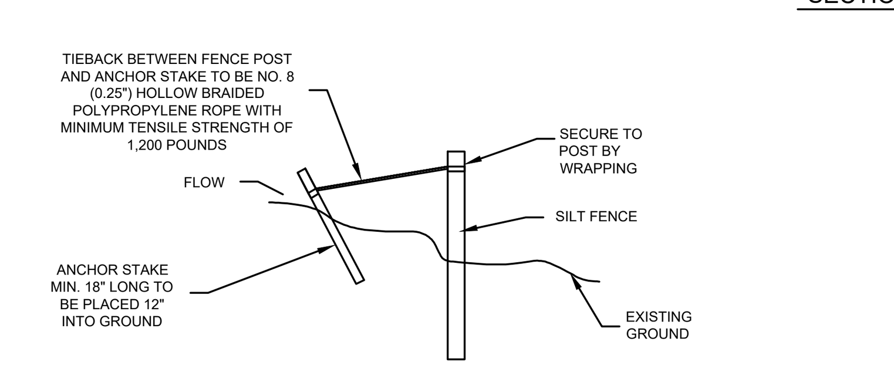
SILT FENCING



ELEVATION VIEW



SECTION VIEW



SILT TIEBACK
FOR STEEL POSTS OR WOOD POSTS

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