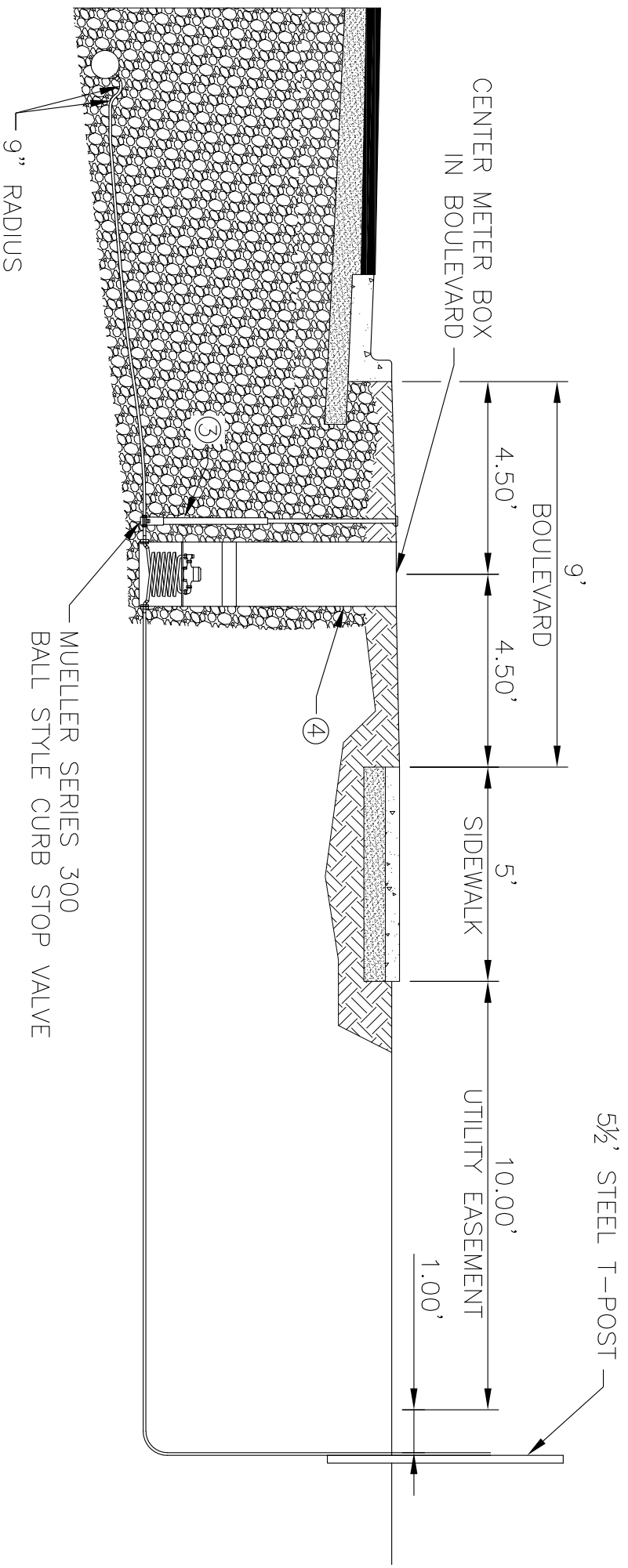


WATER SYSTEM CONSTRUCTION NOTES:

1. THRUST BLOCKING IS REQUIRED AT ALL TEES, BENDS, CAPS, WATER MAIN VALVES, AND FIRE HYDRANTS IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.
2. WATER MAINS SHALL BE INSTALLED WITH 12 GAUGE SOLID CORE COPPER TONING WIRE WITH HDPE OR HMWPE INSULATION APPROVED BY THE MANUFACTURER FOR DIRECT BURY. THE TONER WIRE SHALL BE TAPED TO THE TOP OF THE WATER MAIN AT INTERVALS NO MORE THAN 5 FT. TONER WIRE SHALL BE EXTENDED TO THE SURFACE AT ALL FIRE HYDRANT LOCATIONS. TONER WIRE SHALL BE ROUTED UP BEHIND EACH HYDRANT WITH THE LAST 3 FEET OF THE WIRE BELOW THE SURFACE BEING ENCLOSED IN 1 INCH CONDUIT. TONER WIRE SHALL BE ACCESSIBLE WITH 3 FT OF EXCESS TO CONNECT WITH TONING EQUIPMENT.
3. ALL IRON FITTINGS AND METAL PARTS SHALL BE WRAPPED IN POLYETHYLENE ENCASEMENT.
4. CONCRETE COLLARS SHALL BE INSTALLED AT WATER VALVE BOX RISERS AND MANHOLE RING AND CASTINGS. SEE CITY OF KALISPELL STANDARDS FOR CONSTRUCTION.
5. TEMPORARY WATER SERVICES SHALL BE SUPPLIED DURING CONSTRUCTION WHEN WATER SERVICE WILL BE INTERRUPTED FOR MORE THAN FOUR (4) HOURS. A TEMPORARY WATER SERVICE PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE CITY PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ALL TEMPORARY WATER SERVICES SHALL COMPLY WITH MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY DESIGN CIRCULAR 1.
6. CONTRACTOR SHALL PERFORM HYDROSTATIC LEAK TESTING IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS AS MODIFIED BY CITY SPECIAL PROVISION 02660.
7. ALL NEW, CLEANED OR REPAIRED WATER MAINS SHALL BE FLUSHED AND DISINFECTED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS AS MODIFIED BY CITY SPECIAL PROVISION 02660.
8. THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE ALL BAC-T TESTS UNDER THE SUPERVISION OF CITY STAFF. AFTER SAMPLE COLLECTION THE CITY SHALL TAKE CUSTODY OF SAMPLES AND DELIVER TO A CERTIFIED ENVIRONMENTAL LAB. ALL TESTING SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

W.1

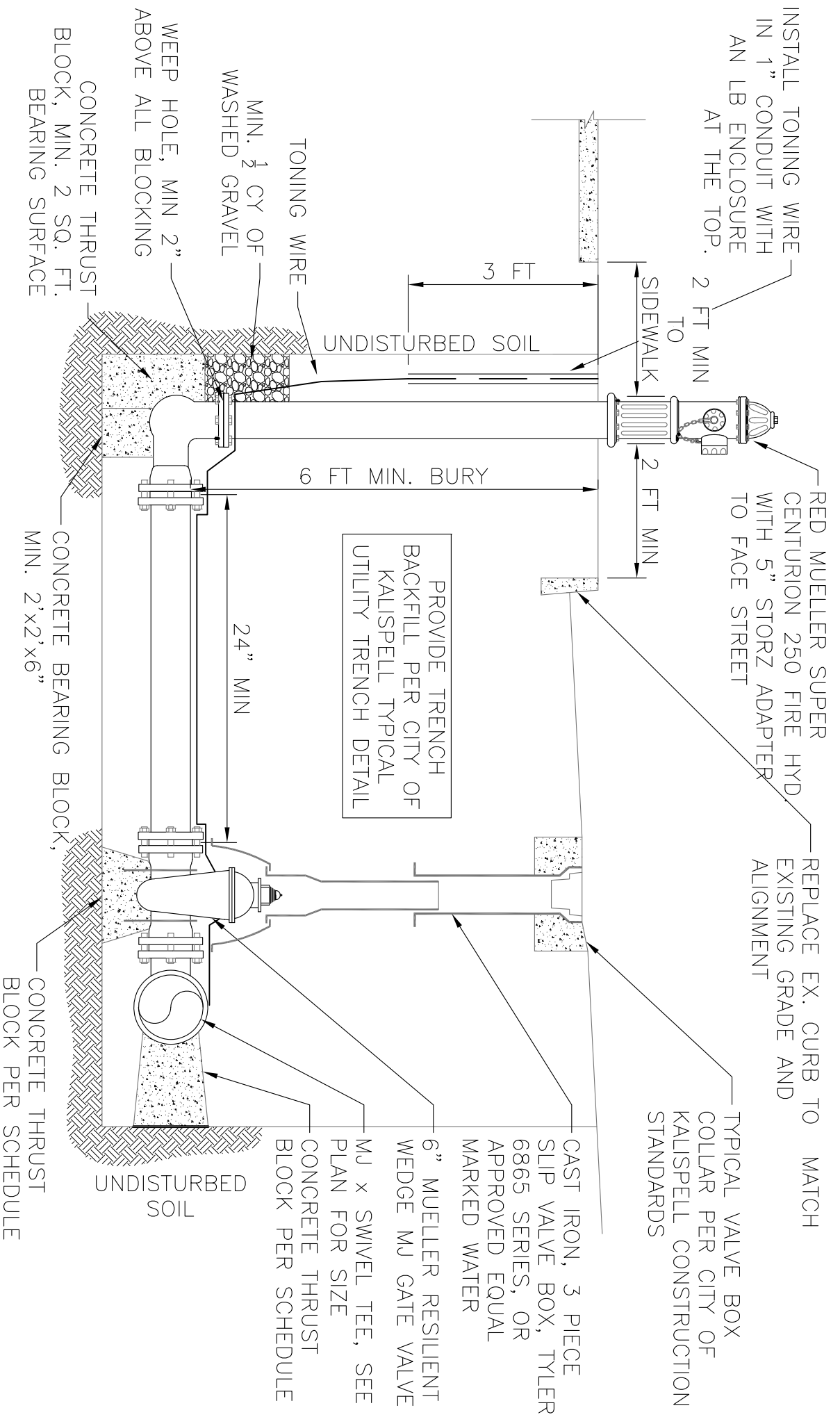
WATER SYSTEM CONSTRUCTION NOTES



- NOTES:
1. $\frac{3}{4}$ " - 2" SERVICES SHALL BE INSTALLED WITH BR2 SERIES SERVICE SADDLES AND PE SERVICE LINE.
 2. 4" AND LARGER SERVICES SHALL BE INSTALLED WITH A ROMAC SSTIII STAINLESS STEEL TAPPING SLEEVE AND CLASS 150 PVC SERVICE LINE.
 3. MUELLER H-10306 ($\frac{3}{4}$ " or 1" SERVICE) OR MUELLER H-10310 (1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ ", OR 2" SERVICES) CAST IRON EXTENSION TYPE WITH ARCH PATTERN BASE, MINIMUM LENGTH 6 $\frac{1}{2}$ ', EQUIPPED WITH A PROPERLY SIZED STATIONARY ROD AND A PENTAGON BRASS PLUG OR APPROVED EQUAL.
 4. MULLER THERMO-COIL METER PITS WITH CENTER LOCKING COMPOSITE LIDS AND INSULATION PADS FOR SERVICES UP TO 1". MULLER EZ VAULT OR APPROVED EQUAL WITH CENTER LOCKING COMPOSITE LIDS AND INSULATION PADS FOR SERVICES LARGER THAN 1"

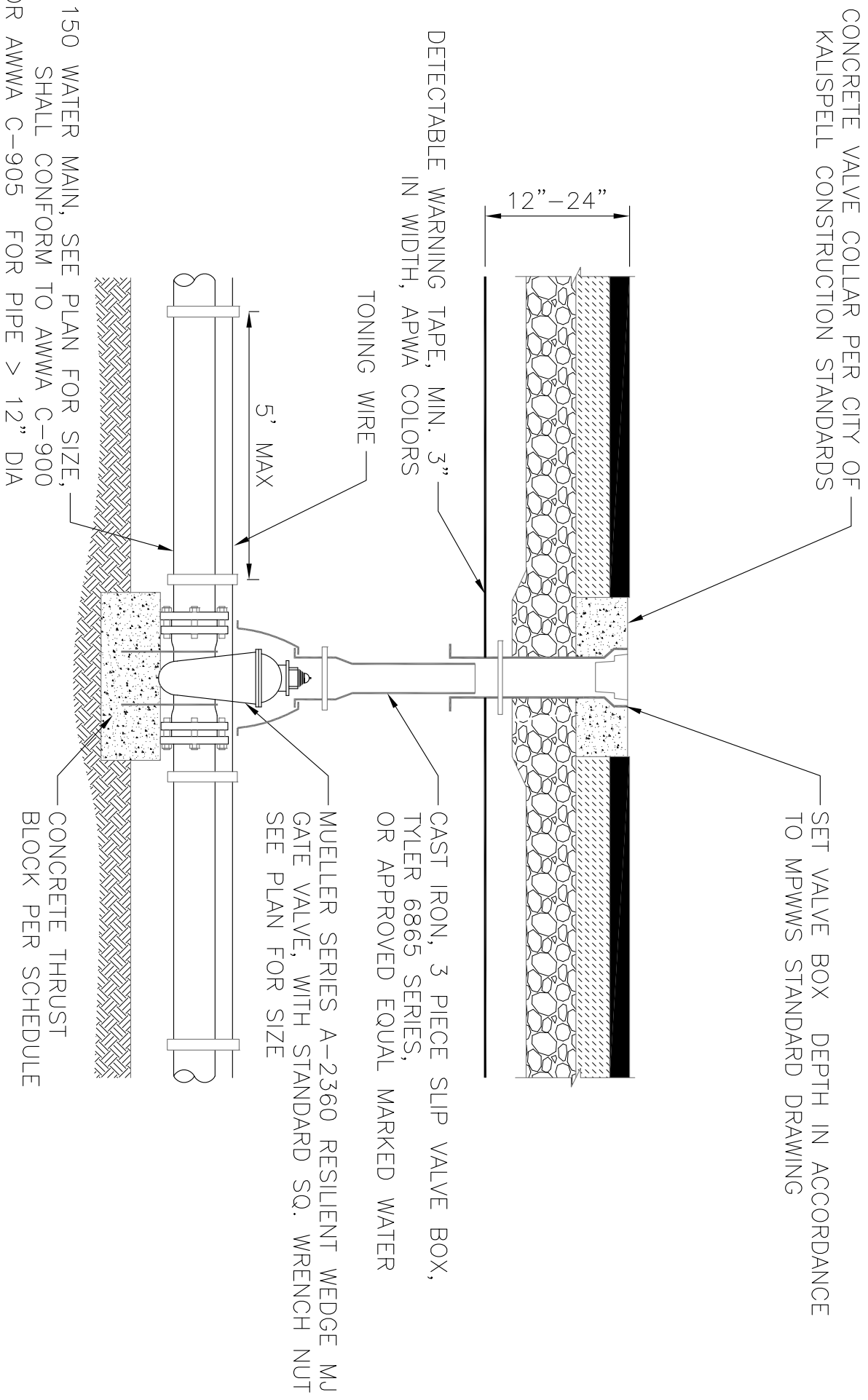
WATER SERVICE CONNECTION DETAIL

W.2



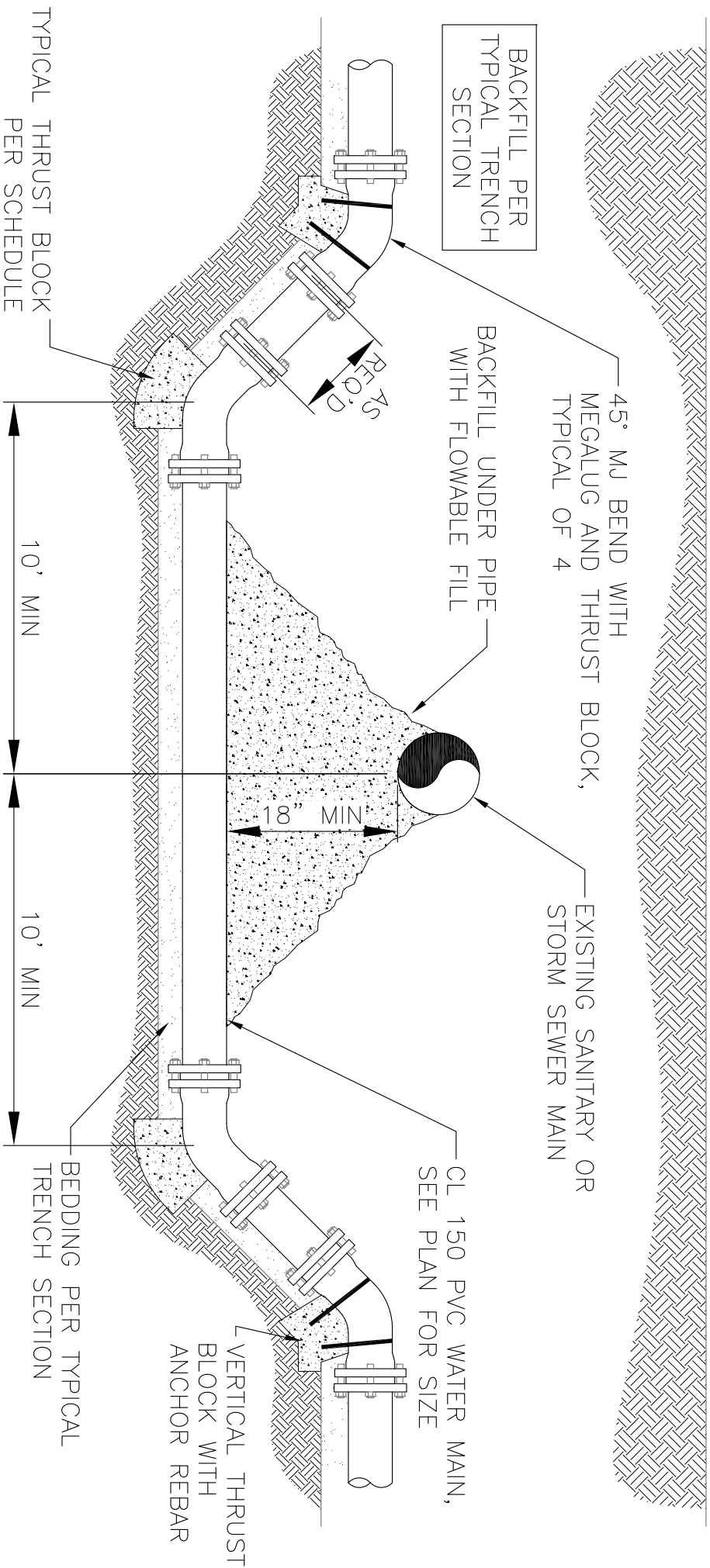
STANDARD FIRE HYDRANT DETAIL

W.3



TYPICAL MJ GATE VALVE SECTION DETAIL

W.4



BACKFILL PER
TYPICAL TRENCH
SECTION

45° MJ BEND WITH
MEGALUG AND THRUST BLOCK,
TYPICAL OF 4

BACKFILL UNDER PIPE
WITH FLOWABLE FILL

EXISTING SANITARY OR
STORM SEWER MAIN

CL 150 PVC WATER MAIN,
SEE PLAN FOR SIZE

VERTICAL THRUST
BLOCK WITH
ANCHOR REBAR

BEDDING PER TYPICAL
TRENCH SECTION

TYPICAL THRUST BLOCK
PER SCHEDULE

10' MIN

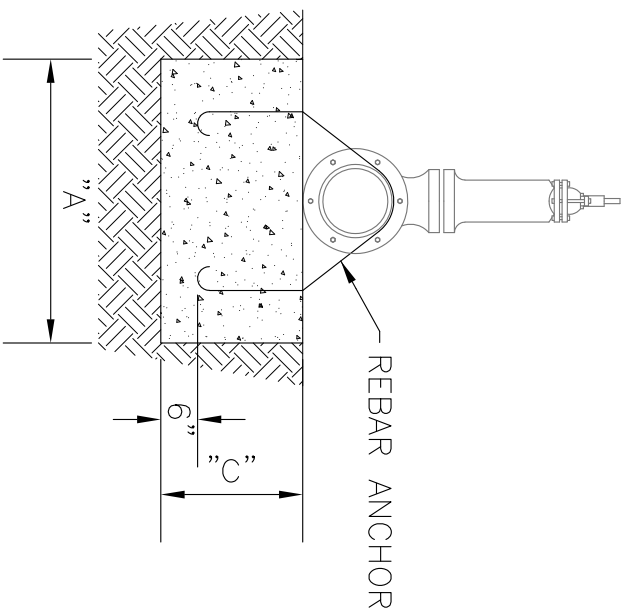
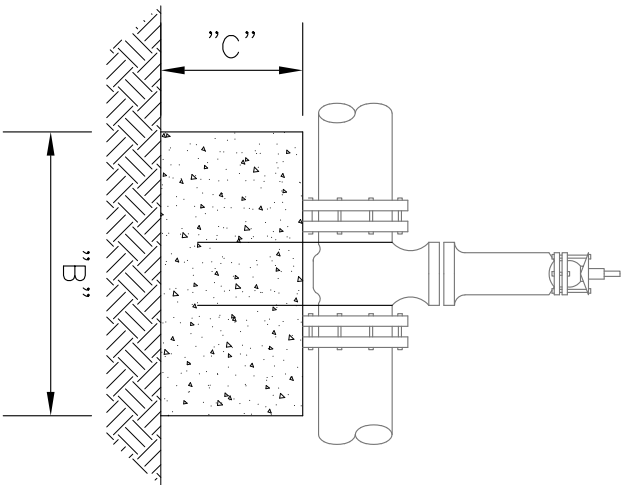
10' MIN

18" MIN

4S
REQ'D

W.5

WATER MAIN LOWERING SECTION DETAIL

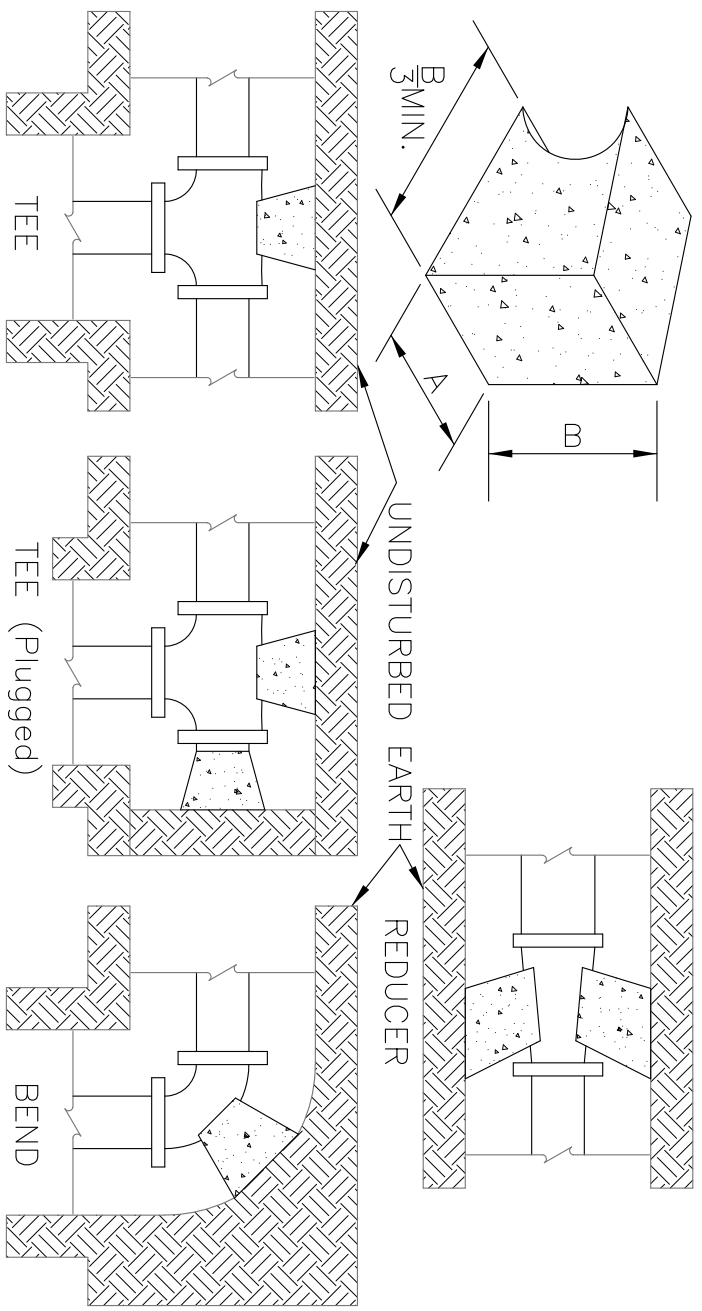


NOTE:
 1. COAT RODS WITH A BITUMASTIC NO. 50 COATING OR EQUAL.
 2. PRESSURES SHOWN ARE MAXIMUM WORKING PRESSURES IN THE SYSTEM

STANDARD THRUST BLOCK DIMENSIONS

ANCHOR ROD SIZE	VALVE SIZE	100 PSI			150 PSI			200 PSI			250 PSI			300 PSI		
		"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"	"C"
3/4"	6" & 8"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-7"
3/4"	10"	2'-0"	2'-0"	2'-0"	2'-6"	2'-6"	2'-0"	2'-9"	2'-6"	2'-6"	3'-0"	3'-0"	3'-0"	3'-7"	3'-0"	3'-0"
3/4"	12"	2'-3"	2'-0"	2'-0"	3'-0"	3'-0"	2'-8"	3'-5"	3'-0"	3'-0"	4'-3"	3'-0"	3'-0"	5'-1"	3'-0"	3'-0"
1"	14"	2'-3"	2'-0"	2'-4"	3'-5"	3'-0"	3'-0"	4'-6"	3'-0"	3'-0"	4'-0"	4'-0"	4'-0"	4'-9"	4'-0"	4'-0"
1 1/8"	16"	3'-0"	3'-0"	2'-11"	4'-4"	3'-0"	3'-0"	4'-1"	4'-0"	4'-0"	5'-1"	4'-0"	4'-0"	6'-1"	4'-0"	4'-0"
1 1/4"	18"	3'-8"	3'-0"	3'-0"	5'-5"	3'-0"	3'-0"	5'-1"	4'-0"	4'-0"	6'-4"	4'-0"	4'-0"	5'-9"	5'-0"	5'-0"
1 3/8"	24"	4'-4"	4'-0"	4'-0"	6'-5"	4'-0"	4'-0"	6'-6"	5'-0"	5'-0"	6'-5"	6'-0"	6'-0"	7'-8"	6'-0"	6'-0"

THRUST BLOCKING FOR WATER MAIN VALVES



NOTES:
 1. THESE TABLES ARE BASED ON 150 PSI MAIN PRESSURE & 2000 PSF SOIL BEARING PRESSURE.
 2. WRAP ALL FITTINGS WITH POLYETHYLENE.

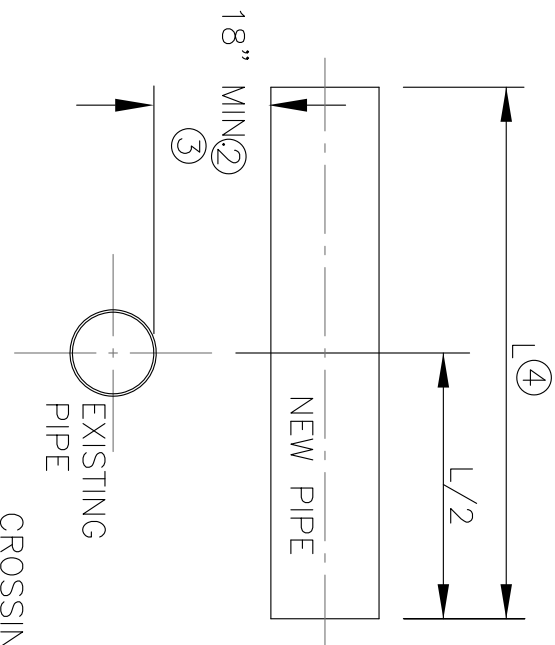
STANDARD DIMENSIONS FOR THRUST BLOCKING

FITTING SIZE	TEES & PLUGS		90° BEND		45° BEND & WYES		REDUCERS & 22° BEND	
	A	B	A	B	A	B	A	B
4"	1'-7"	1'-2"	1'-9"	1'-6"	1'-8"	0'-10"	1'-7"	0'-6"
6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"	1'-9"	0'-10"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"	1'-9"	1'-6"
10"	3'-4"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"	2'-2"	1'-11"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-7"	2'-3"
14"	5'-5"	3'-10"	6'-6"	4'-11"	4'-9"	3'-5"	3'-5"	2'-5"

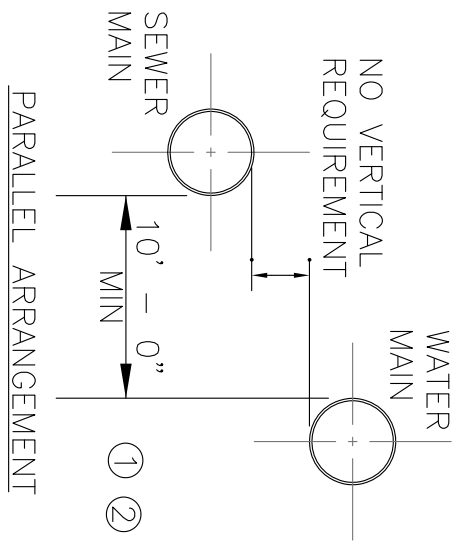
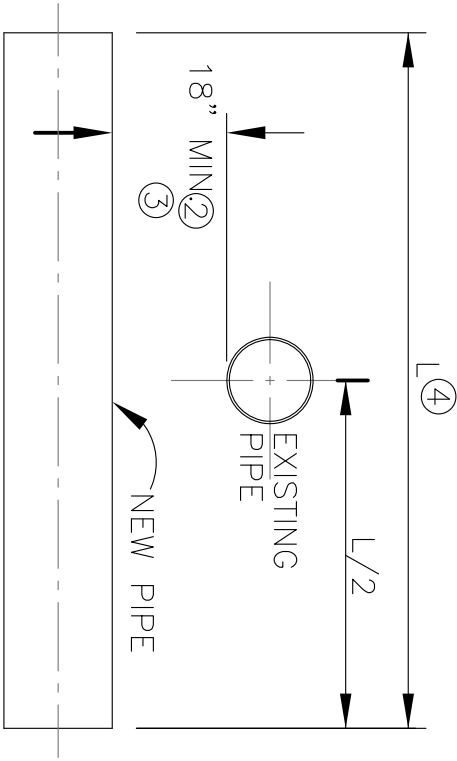
THRUST BLOCKING FOR WATER MAIN FITTINGS

W.7

(MPWSS SD No. 02660-1)



CROSSING
⑤

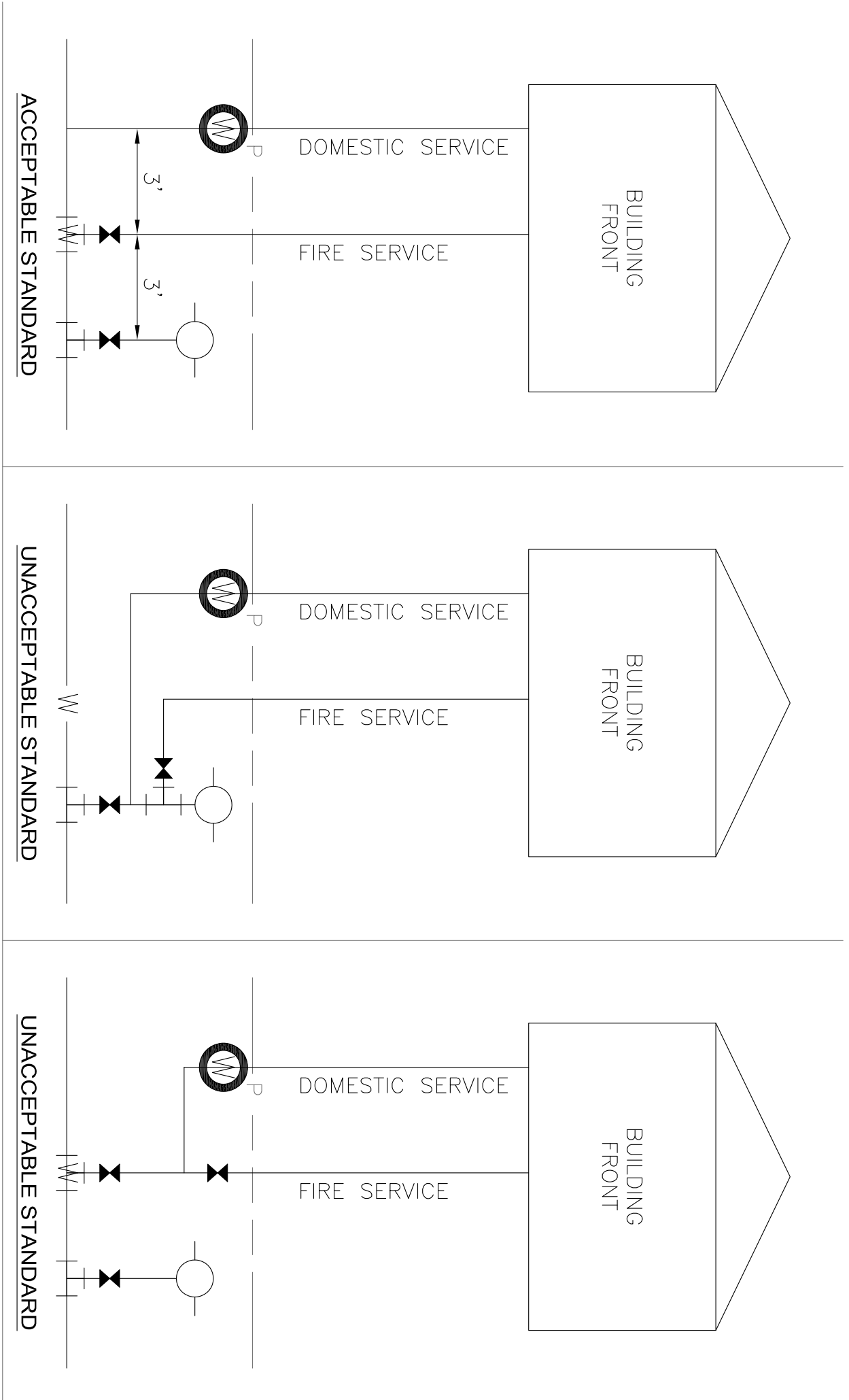


PARALLEL ARRANGEMENT

NOTE:

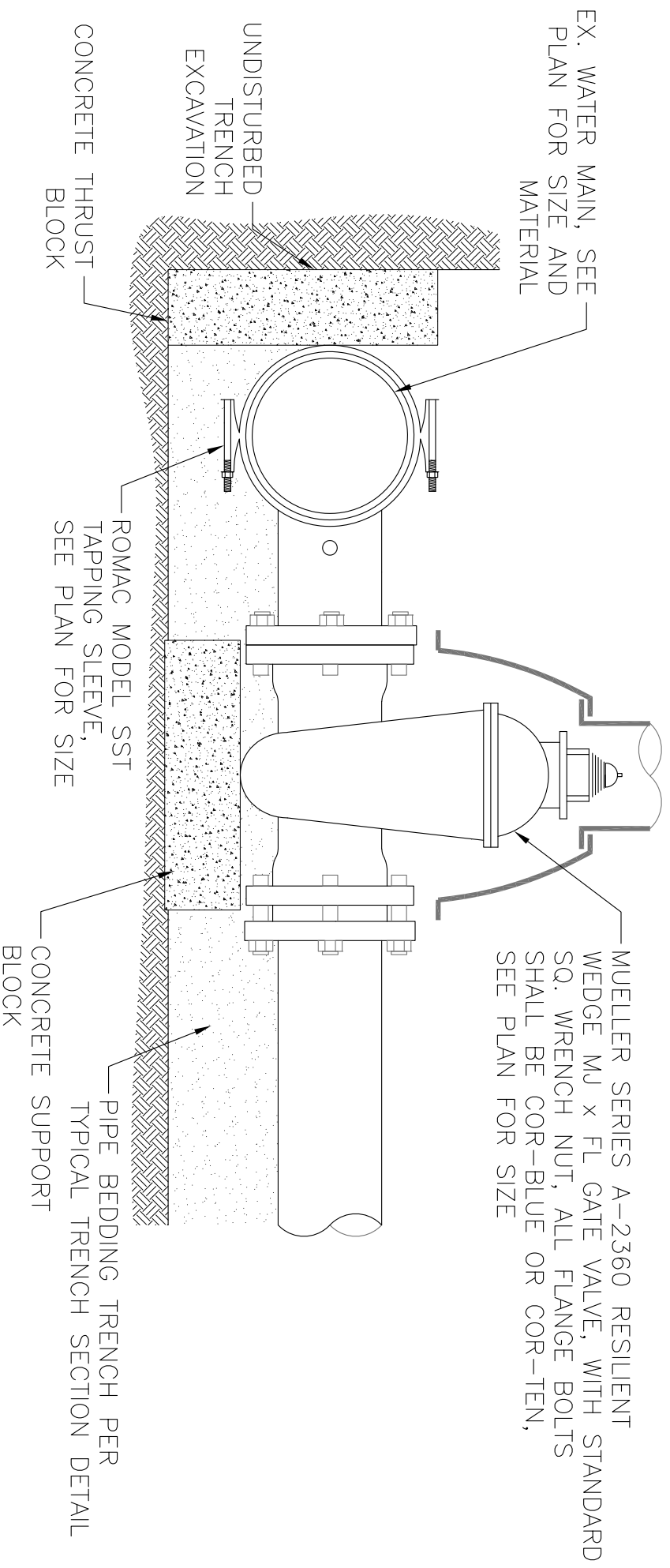
- ① SPECIFIC MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY APPROVAL IS REQUIRED FOR A DISTANCE LESS THAN 10 FEET BETWEEN WATER AND SANITARY SEWER.
- ② NO EXCEPTION TO THE PIPE SEPARATION REQUIREMENT IS PERMITTED WHEN THE SEWAGE PIPE IS A FORCEMAIN. AT CROSSINGS, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE LOCATED SO THAT BOTH JOINTS WILL BE AS FAR FROM THE FORCEMAIN AS POSSIBLE.
- ③ LESS THAN 18" OF SEPARATION IS PERMITTED WHEN THE GRAVITY SEWER AT THE CROSSING IS MADE FROM ONE SINGLE 20 FOOT LENGTH OF AWWA PRESSURE PIPE AND THE CROSSING ANGLE IS APPROXIMATELY 90°. SPECIFIC MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES APPROVAL IS REQUIRED FOR A VERTICAL SEPARATION OF LESS THAN 18" BETWEEN WATER MAIN AND SANITARY SEWER.
- ④ "L" IS A LENGTH OF PIPE AS SUPPLIED BY THE MANUFACTURE.
- ⑤ ADEQUATE STRUCTURE SUPPORT FOR PIPES AT CROSSING SHALL BE PROVIDED.

WATER MAIN AND SEWER MAIN SEPARATION



SERVICE LINE/FIRE SERVICE LINE DETAIL

W.9



WATER MAIN TAPPING SADDLE

W.10