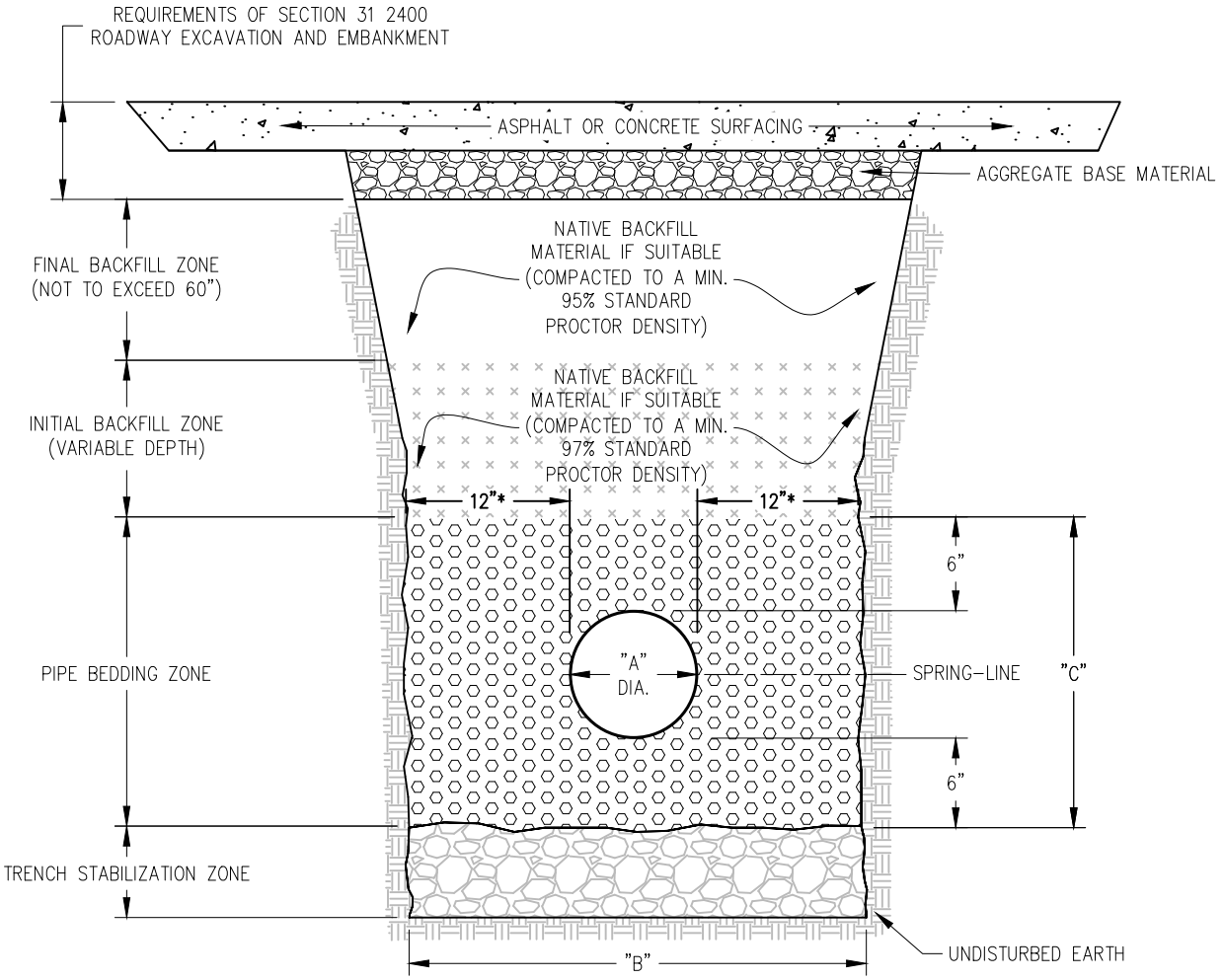

"A" PIPE SIZE DIAMETER	"B" TRENCH WIDTH	"C" TRENCH HEIGHT	TRENCH AREA	PIPE AREA	WATER MAIN BEDDING MAT. AREA	WATER MAIN BEDDING MAT. **TONS/LF
4"	28"	16"	3.11 Sq.Ft.	0.09 Sq.Ft.	3.02 Sq.Ft.	0.18
6"	30"	18"	3.75 Sq.Ft.	0.20 Sq.Ft.	3.55 Sq.Ft.	0.21
8"	32"	20"	4.44 Sq.Ft.	0.35 Sq.Ft.	4.10 Sq.Ft.	0.25
10"	34"	22"	5.19 Sq. Ft.	0.55 Sq.Ft.	4.65 Sq.Ft.	0.28
12"	36"	24"	6.00 Sq.Ft.	0.79 Sq.Ft.	5.22 Sq.Ft.	0.31
16"	40"	28"	7.78 Sq.Ft.	1.40 Sq.Ft.	6.38 Sq.Ft.	0.38
20"	44"	32"	9.78 Sq.Ft.	2.18 Sq.Ft.	7.60 Sq.Ft.	0.46
24"	48"	36"	12.00 Sq.Ft.	3.14 Sq.Ft.	8.86 Sq.Ft.	0.53
30"	60"	42"	17.50 Sq.Ft.	4.91 Sq.Ft.	12.59 Sq.Ft.	0.76

* IF $\geq$30" USE DIA./2 ON EACH SIDE OF WATER MAIN PIPE.

* LENGTH BASED ON ONE (1) FOOT OF WATER PIPE.

** TONS PER LF IS BASED ON (120 LBS/FT^3)

CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

WATER MAIN BEDDING

REVISION DATE
04/01/2026

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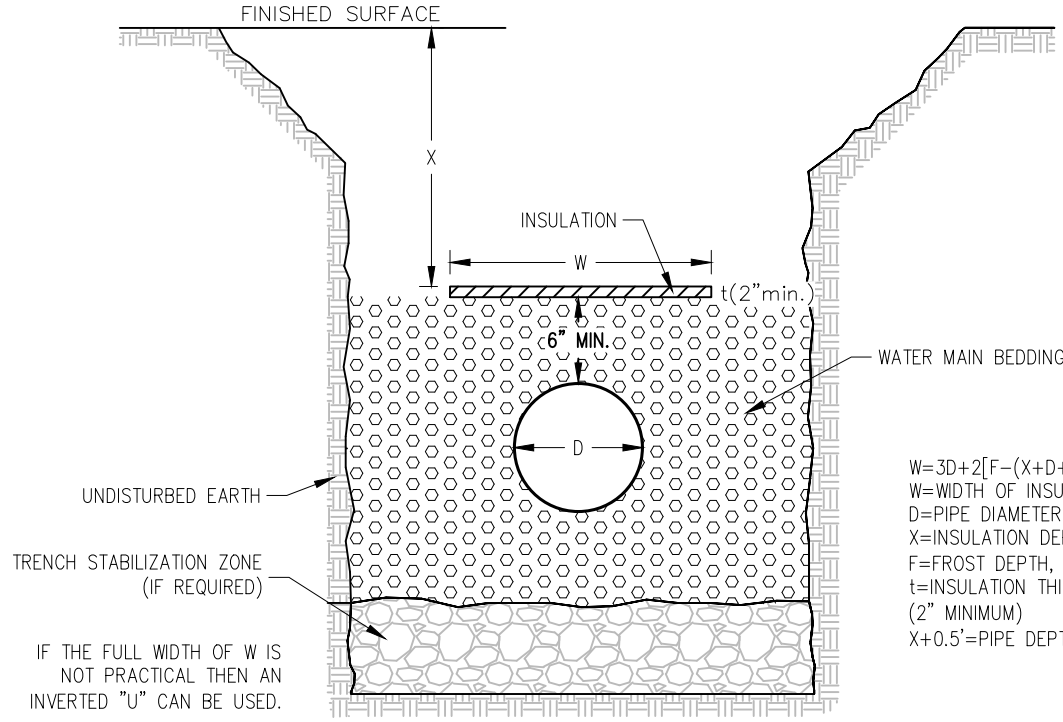
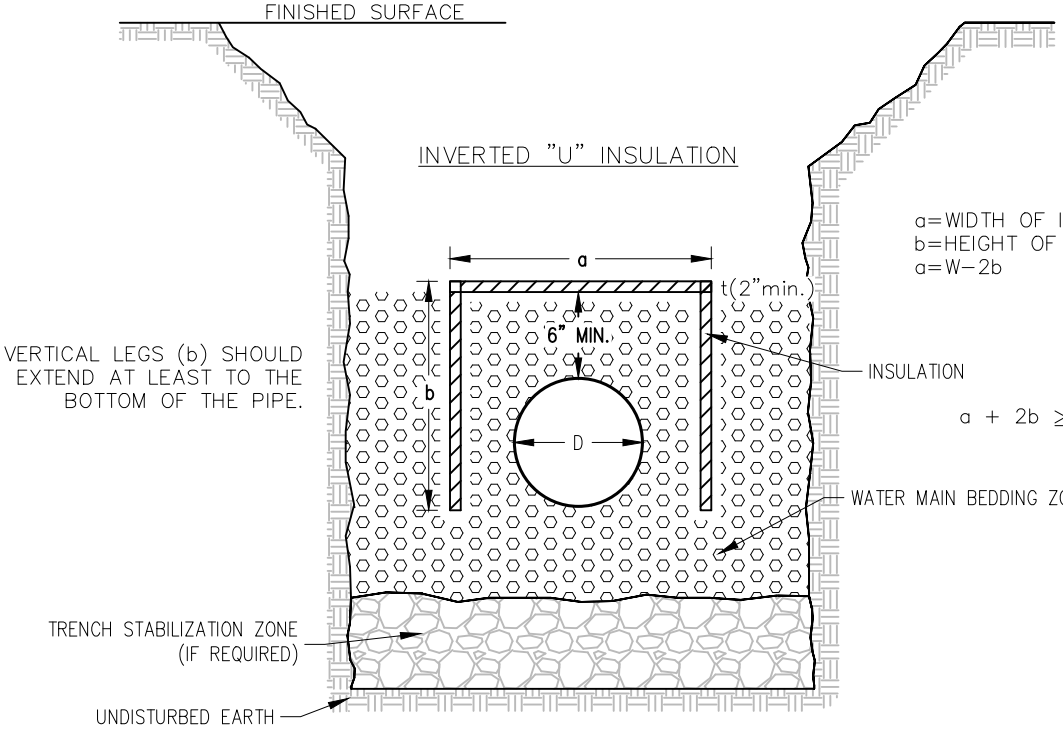
WM-01

HORIZONTAL INSULATION



W=3D+2[F−(X+D+0.5)]
W=WIDTH OF INSULATION, FT.
D=PIPE DIAMETER, FT.
X=INSULATION DEPTH, FT.
F=FROST DEPTH, FT. (USE 6')
t=INSULATION THICKNESS, IN.
(2" MINIMUM)
X+0.5'=PIPE DEPTH

INVERTED "U" INSULATION



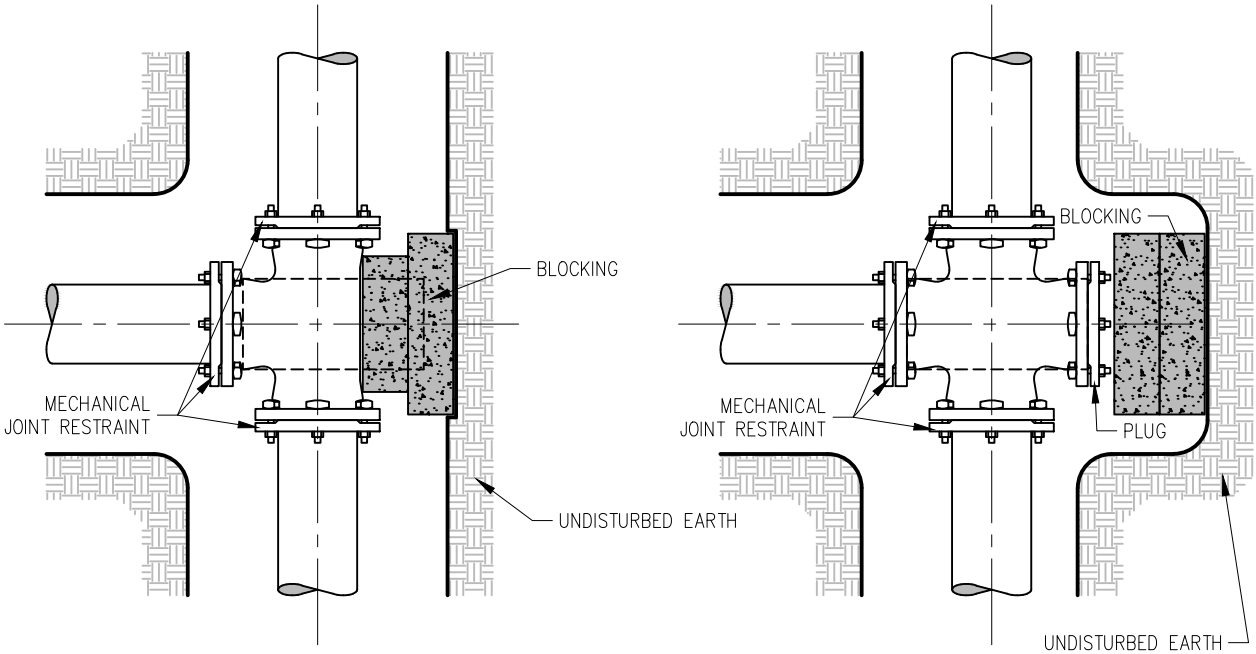
a=WIDTH OF INSULATION, FT
b=HEIGHT OF INSULATION
a=W−2b

VERTICAL LEGS (b) SHOULD
EXTEND AT LEAST TO THE
BOTTOM OF THE PIPE.

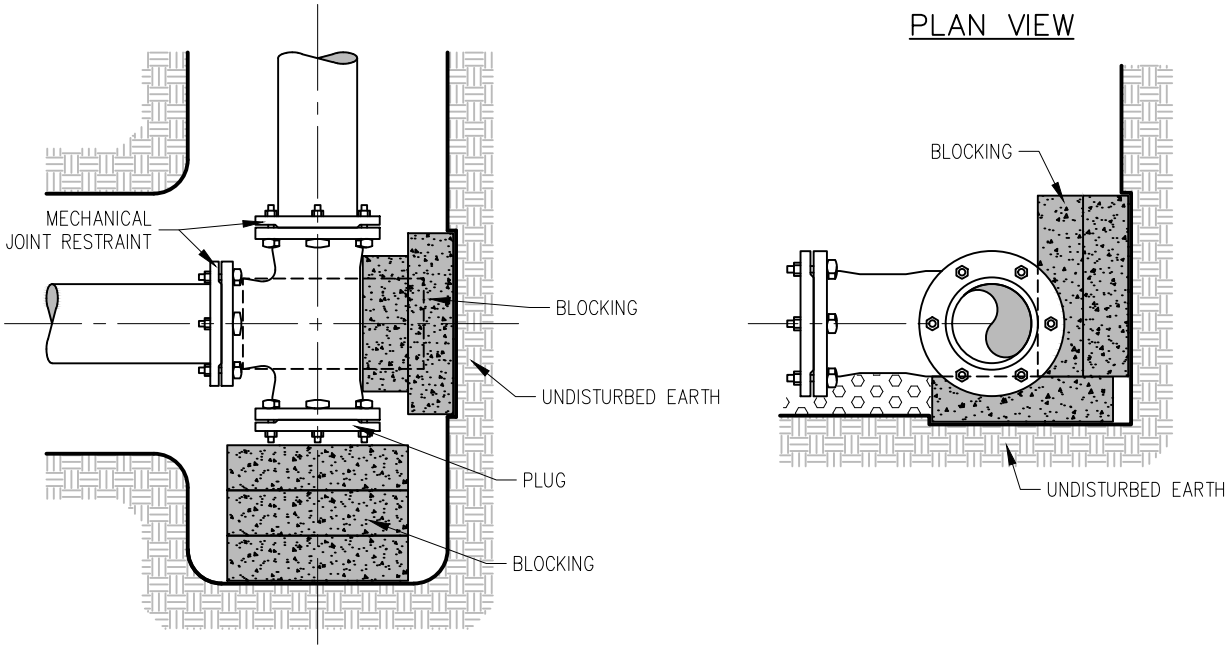
$a + 2b \geq W$

NOTE:
THIS DETAIL IS A GENERAL GUIDELINE. INSULATION OF WATER MAIN WILL BE DETERMINED ON A CASE BY CASE SITUATION DEPENDING ON THE FOLLOWING FACTORS: DEPTH, PIPE DIAMETER, FLOW, AND LOCATION.

CITY OF BROOKINGS BROOKINGS MUNICIPAL UTILITIES **WATER MAIN INSULATION**		REVISION DATE **04/01/2026**	PLATE NUMBER **WM−02**



PLAN VIEW



PLAN VIEW

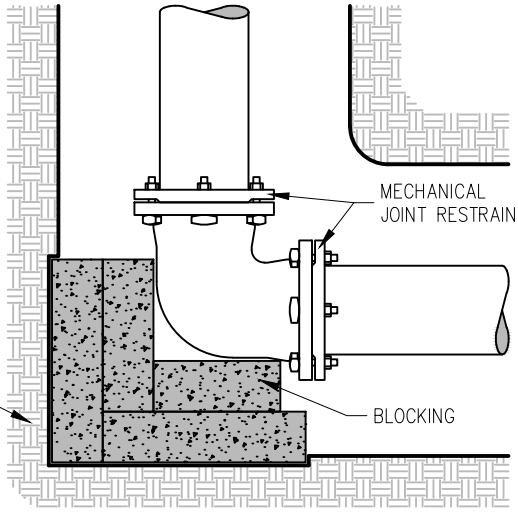
SECTION VIEW

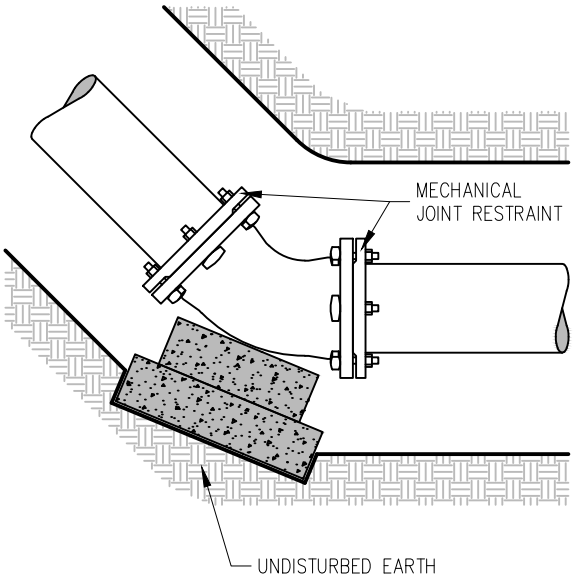
TEE / CROSS

NOTE:
ALL MECHANICAL JOINT FITTINGS SHALL BE INSTALLED WITH MECHANICAL JOINT RESTRAINT (I.E. MEGALUGS) IN ADDITION TO PRECAST CONCRETE BLOCKING.

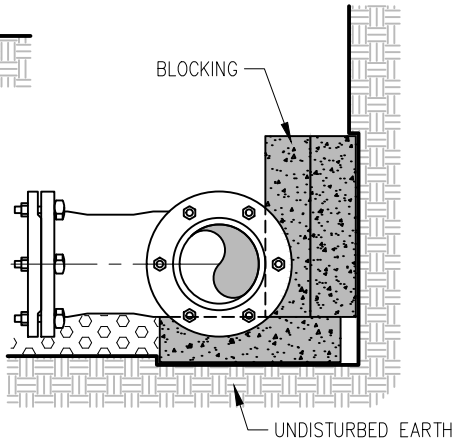
ALL MECHANICAL JOINTS FITTINGS 16 INCH AND LARGER SHALL BE RESTRAINED USING JOINT RESTRAINTS BASED ON CALCULATED RESTRAINT JOINT LENGTH UPSTREAM AND DOWNSTREAM OF FITTING, VALVE, ETC. DESIGN CRITERIA SHALL USE TYPE 5 LAYING CONDITION, APPROPRIATE SOIL DESIGNATION, DESIGN PRESSURE OF 120 PSI AND A SAFETY FACTOR OF 2.0.

CITY OF BROOKINGS BROOKINGS MUNICIPAL UTILITIES **CONCRETE THRUST BLOCK**		REVISION DATE **04/01/2026**	PLATE NUMBER **WM–03**

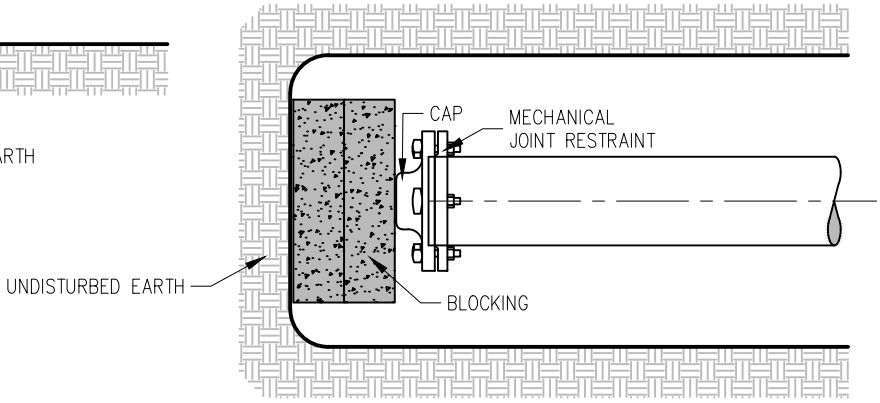




BENDS



SECTION VIEW

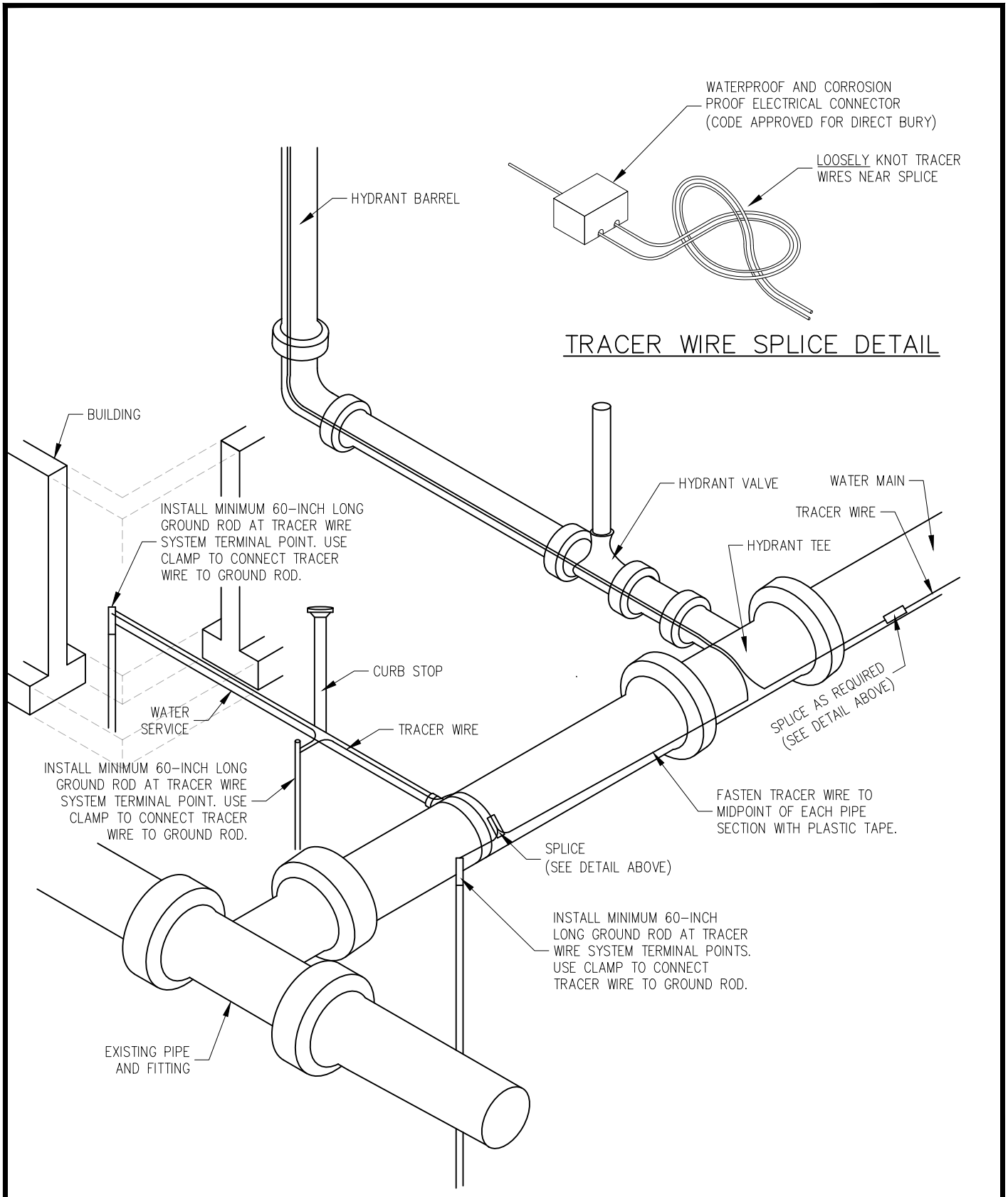


M.J. CAP

NOTE:
ALL MECHANICAL JOINT FITTINGS SHALL BE INSTALLED WITH MECHANICAL JOINT RESTRAINT (I.E. MEGALUGS) IN ADDITION TO PRECAST CONCRETE BLOCKING.

ALL MECHANICAL JOINTS FITTINGS 16 INCH AND LARGER SHALL BE RESTRAINED USING JOINT RESTRAINTS BASED ON CALCULATED RESTRAINT JOINT LENGTH UPSTREAM AND DOWNSTREAM OF FITTING, VALVE, ETC. DESIGN CRITERIA SHALL USE TYPE 5 LAYING CONDITION, APPROPRIATE SOIL DESIGNATION, DESIGN PRESSURE OF 120 PSI AND A SAFETY FACTOR OF 2.0.

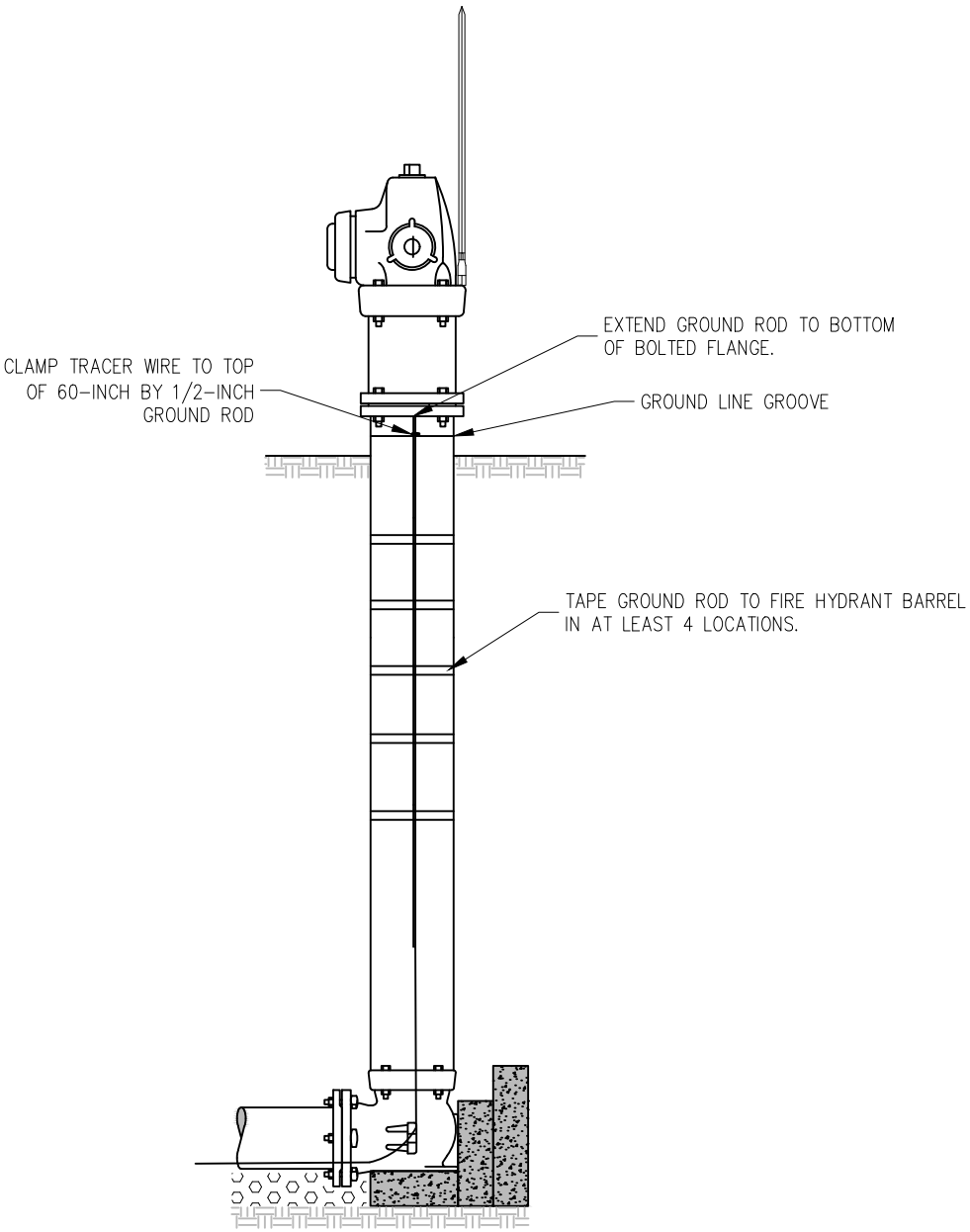
CITY OF BROOKINGS BROOKINGS MUNICIPAL UTILITIES **CONCRETE THRUST BLOCK**		REVISION DATE **04/01/2026**	PLATE NUMBER **WM–04**



CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

TRACER WIRE SYSTEM

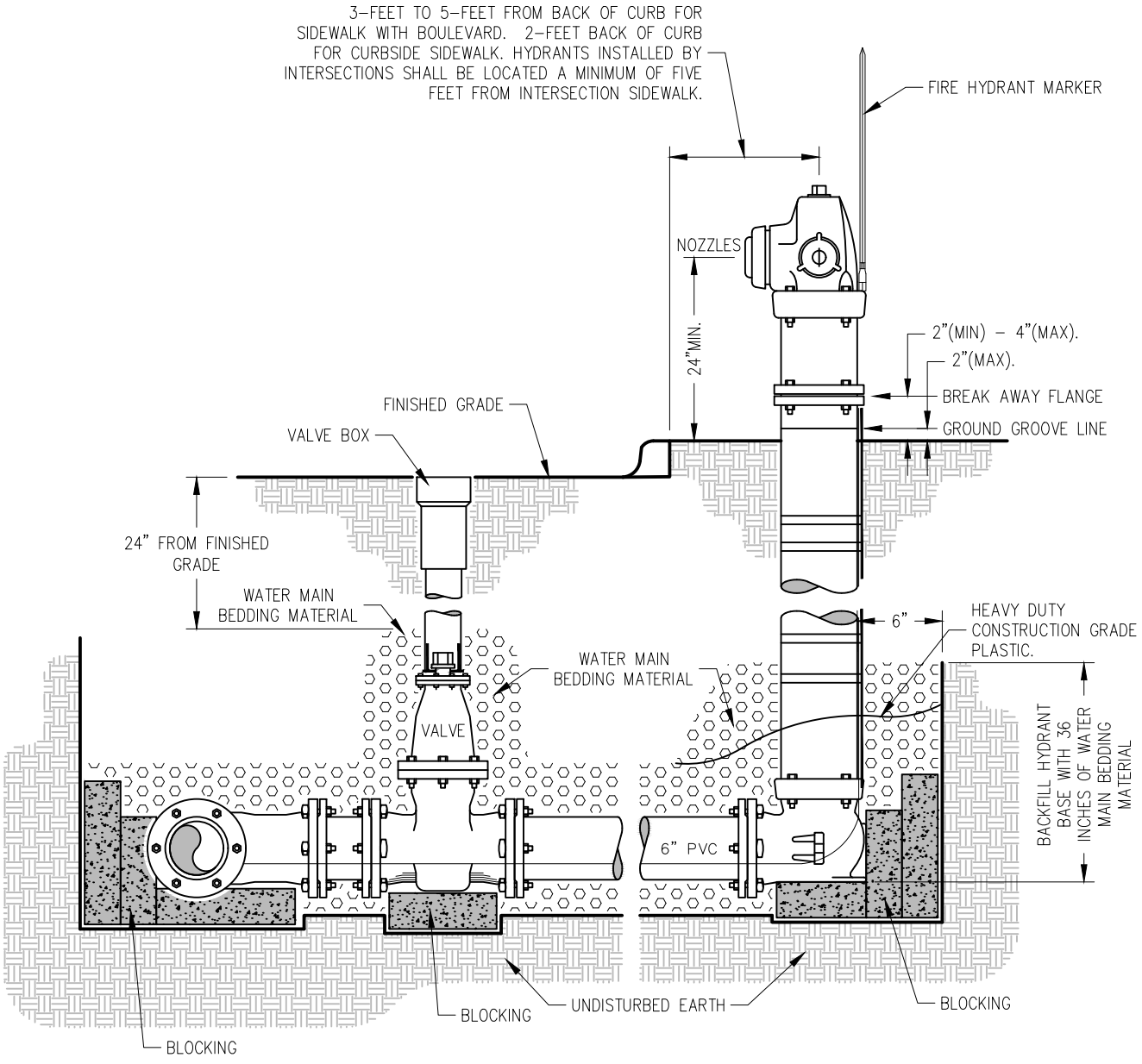
REVISION DATE	PLATE NUMBER
04/01/2026	WM-05



CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

TRACER WIRE SYSTEM AT FIRE HYDRANT

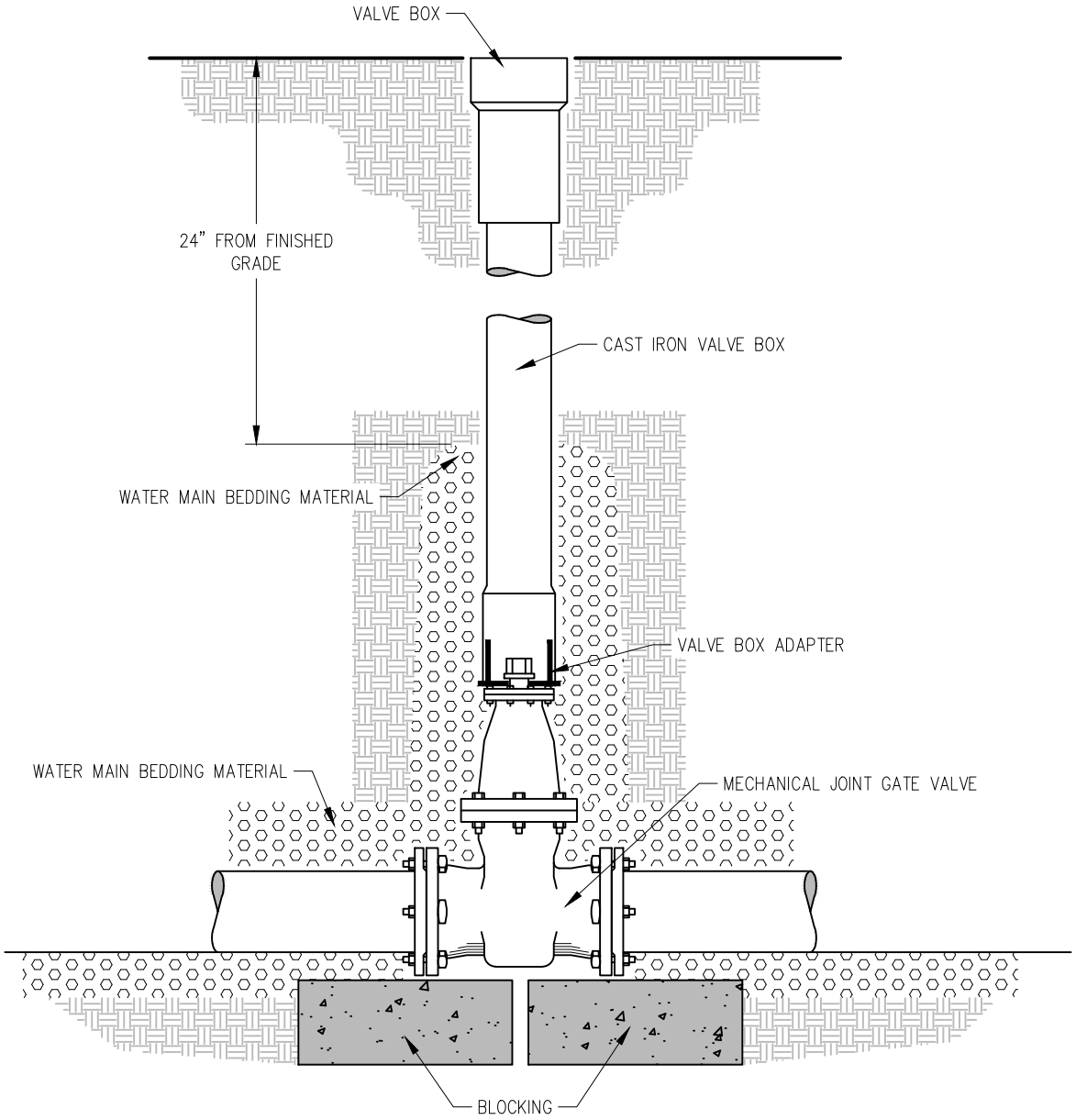
REVISION DATE	PLATE NUMBER
04/01/2026	WM-06



NOTE:
PROVIDE FITTING (IE. FOSTER ADAPTER) OR PIPE PIECE TO ACCOMMODATE APPROPRIATE VALVE PLACEMENT. ISOLATION VALVES LOCATED UNDER CURB AND GUTTER SHALL BE RELOCATED AT NO COST TO BMU.

HYDRANT ELEVATION AND HYDRANT BURY DEPTH SHALL BE DETERMINED BY DESIGN ENGINEER. PROJECT PLANS SHALL INDICATE HYDRANT BURY DEPTH IN 0'–6" INCREMENTS.

CITY OF BROOKINGS BROOKINGS MUNICIPAL UTILITIES **HYDRANT CONNECTION**		REVISION DATE **04/01/2026**	PLATE NUMBER **WM–07**

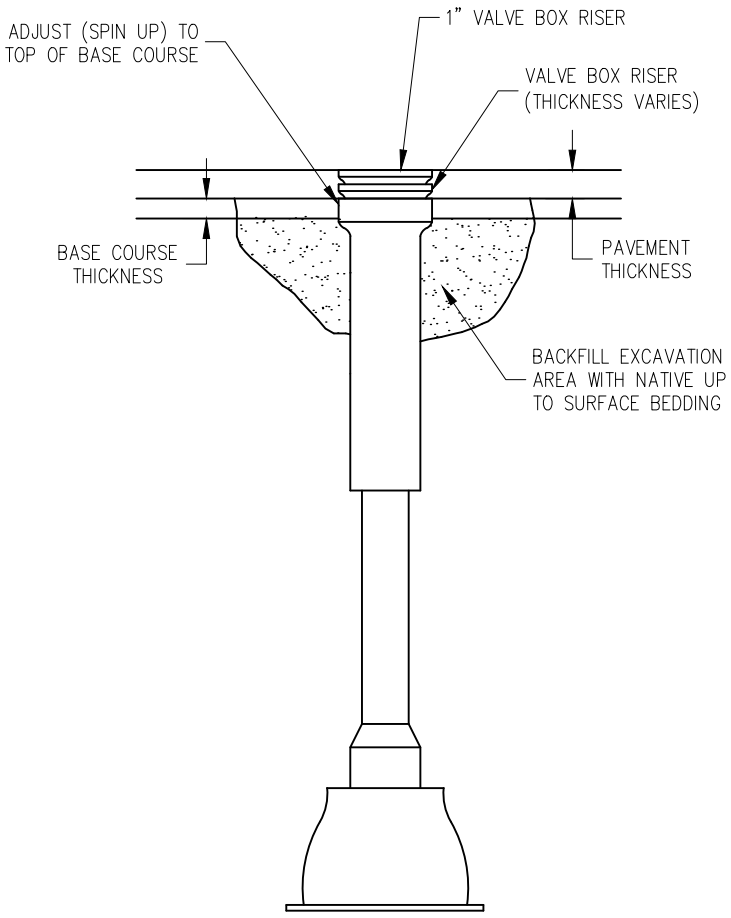


CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

GATE VALVE INSTALLATION

REVISION DATE
04/01/2026

PLATE NUMBER
WM-08



NOTE:

1. ADJUST TOP OF VALVE BOX TO THE TOP OF THE BASE COURSE. TWO (2) RIDE HEIGHTS WILL BE INSTALLED TO BRING THE TOP OF THE VALVE BOX ASSEMBLY TO MATCH THE STREET SURFACE.

2. VALVE BOX SHALL BE ADJUSTED PRIOR TO PLACEMENT OF THE ASPHALT.

3. ALL VALVE BOX ASSEMBLIES SHALL BE ADJUSTED TO BE FLUSH WITH THE PAVEMENT SURFACE WITH TWO (2) RIDE HEIGHTS, THE TOP RIDE HEIGHT WILL BE 1" THICK AND THE BOTTOM ONE WILL BE VARYING THICKNESS TO MAKE THE VALVE BOX ASSEMBLY FLUSH WITH THE ROAD SURFACE.

4. THE ALLOWABLE VERTICAL TOLERANCE BETWEEN THE PAVEMENT SURFACE AND ANY PART OF THE VALVE BOX SHALL BE 0-INCHES TO 1/2-INCH LOW. IN NO CASE SHALL THE VALVE BOX BE ABOVE THE SURFACE OF THE PAVEMENT.

5. IF THE 0-INCHES TO 1/2-INCH TOLERANCE CAN NOT BE MET BY THE "SPIN UP" METHOD ON CONCRETE STREETS, THE REPAIR METHOD WILL BE DETERMINED BY THE ENGINEER. THIS ADDITIONAL WORK SHALL BE INCIDENTAL TO THE "VALVE BOX ADJUSTMENT" BID ITEM.

6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A SYSTEM TO PREVENT MATERIAL FROM ENTERING THE VALVE BOX DURING THE WORK.

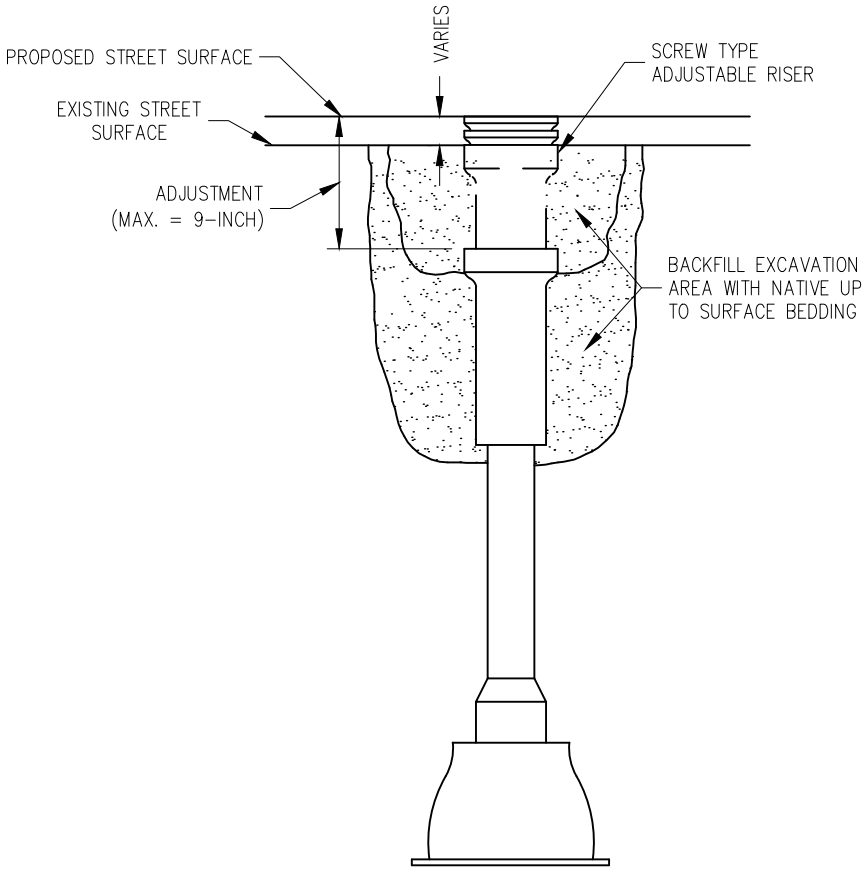
7. ALL ADJUSTMENTS SHALL BE COMPLETED PRIOR TO OPENING UP THE STREET TO TRAFFIC.

8. IF THE VALVE BOX NEEDS MINOR ADJUSTMENT, A MINIMAL AMOUNT OF HEAT CAN BE APPLIED TO BREAK THE BOND BETWEEN THE VALVE BOX AND THE ASPHALT. FULL DEPTH HEATING OF THE ASPHALT WILL NOT BE ALLOWED. IF THE ASPHALT APPEARS TO SHOW SIGNS OF DETERIORATION, IT WILL BE AT THE DISCRETION OF THE ENGINEER TO REQUIRE THE CUT OUT METHOD.

CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

VALVE BOX ASSEMBLY
SPIN UP METHOD

REVISION DATE	PLATE NUMBER
04/01/2026	WM-09



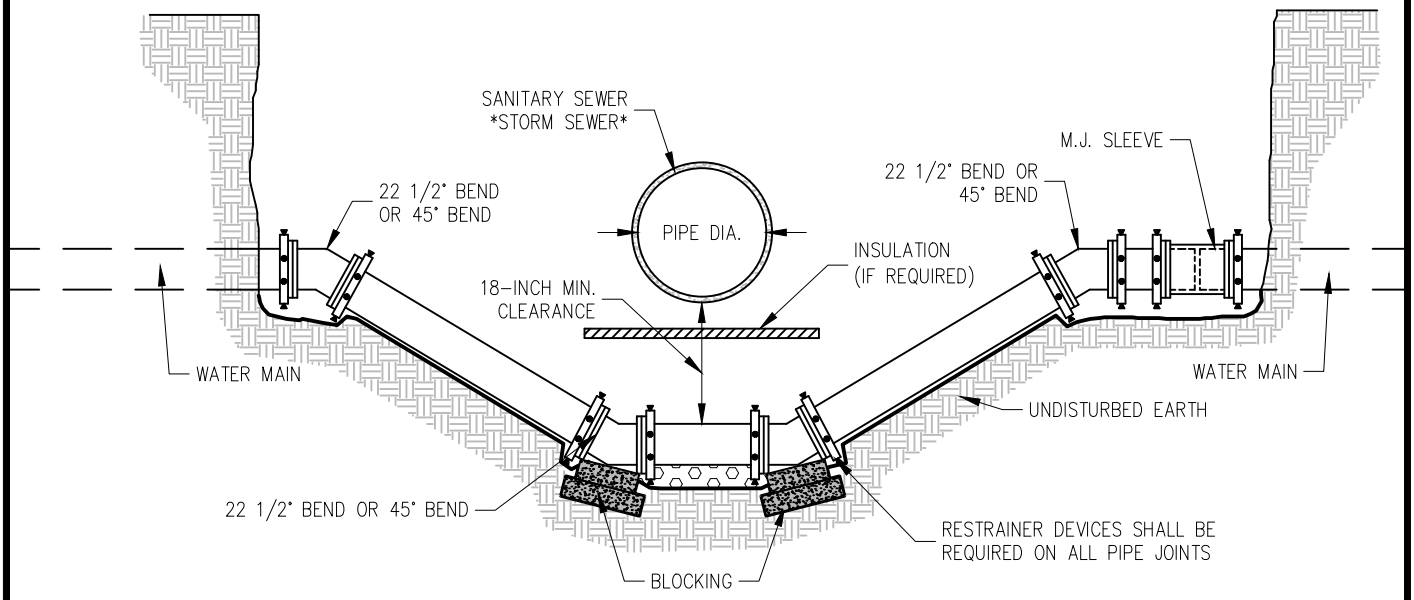
NOTE:

1. USE THIS METHOD IF TOP SECTION OF VALVE BOX CANNOT BE EXTENDED TO MEET PROPOSED GRADE.
2. IF MAXIMUM EXTENSION OF VALVE BOX IS LOWER THAN 9" BELOW PROPOSED STREET SURFACE, REMOVE TOP SECTION SCREW-TYPE CENTER & ADD A SECTION. RE-USE TOP SECTION.
3. ADJUST TOP OF VALVE BOX ASSEMBLY TO MATCH PROPOSED STREET GRADE.
4. IF THE TOP SECTION OF VALVE BOX WILL NOT ACCEPT THE RISER, REPLACE THE TOP & CENTER SECTION AS SHOWN IN DETAIL FOR VALVE BOX REPLACEMENT.

VALVE BOX EXTENSION

(OR REPLACEMENT OF TOP SECTION)

CITY OF BROOKINGS BROOKINGS MUNICIPAL UTILITIES **VALVE BOX ADJUSTMENT EXTENSION**		REVISION DATE **04/01/2026**	PLATE NUMBER **WM-10**



* WATER MAIN TO STORM SEWER CLEARANCES *	
STORM SEWER PIPE DIAMETER	MIN. CLEARANCE (PIPE TO PIPE)
SMALLER THAN 18"	18"
18" TO 24"	24"
27" TO 36"	36"
LARGER THAN 36"	BMU ENGINEER DETERMINED
ALL SIZES OF BOX CULVERTS	BMU ENGINEER DETERMINED

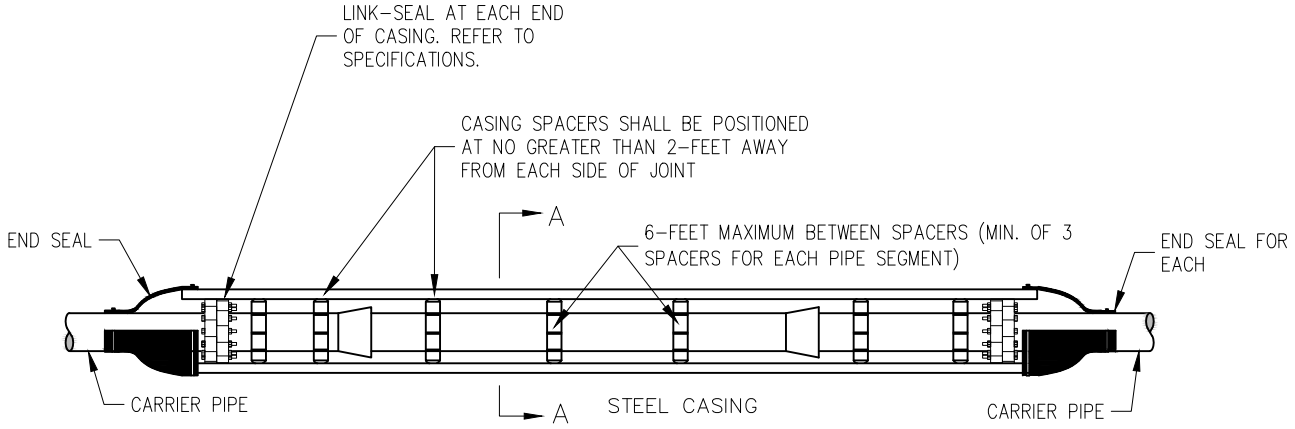
NOTE:
RCP STORM SEWER ABOVE A WATER MAIN REQUIRES JOINT SEALING WITHIN 10.0' ON EACH SIDE OF THE WATER MAIN (SEE BMU WATER MAIN SPECIFICATIONS).

CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES

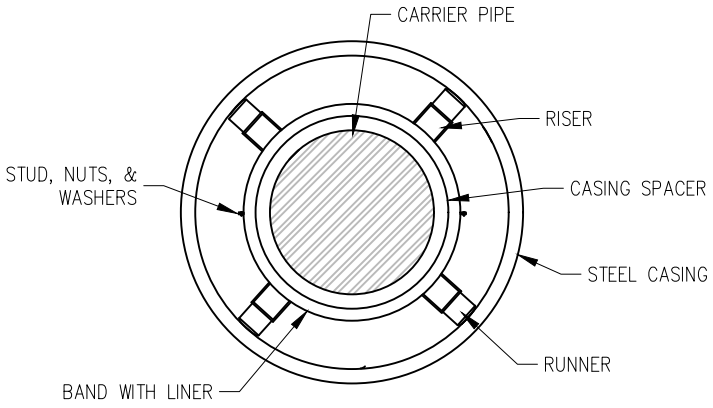
WATER MAIN ADJUSTMENT

REVISION DATE
04/01/2026

PLATE NUMBER
WM–12



ELEVATION VIEW



SECTION A–A

PIPE SIZE	CASING SIZE
4"	10"
6"	12"
8"	16"
10"	18"
12"	20"
16"	24"
20"	30"
24"	36"
30"	42"
>36"	*

* AS RECOMMENDED BY MANUFACTURER

NOTE:
CASING PIPE MUST CONFORM TO AWWA C–200 WITH ASTM GRADE A36 PLATE STEEL MINIMUM YIELD STRENGTH OF 35,000 POUNDS PER SQUARE INCH

GROUTING OF THE ANNULAR SPACE WILL NOT BE REQUIRED UNLESS OTHERWISE NOTED

CITY OF BROOKINGS
BROOKINGS MUNICIPAL UTILITIES
STANDARD CASING/CARRIER FOR WATER PIPE

REVISION DATE
04/01/2026

PLATE NUMBER
WM–13

GENERAL:

1) WATER SERVICE SHALL BE INSTALLED IN ONE CONTINUOUS LENGTH BETWEEN THE CORPORATION AND THE CURB STOP, FREE OF ANY COUPLERS.

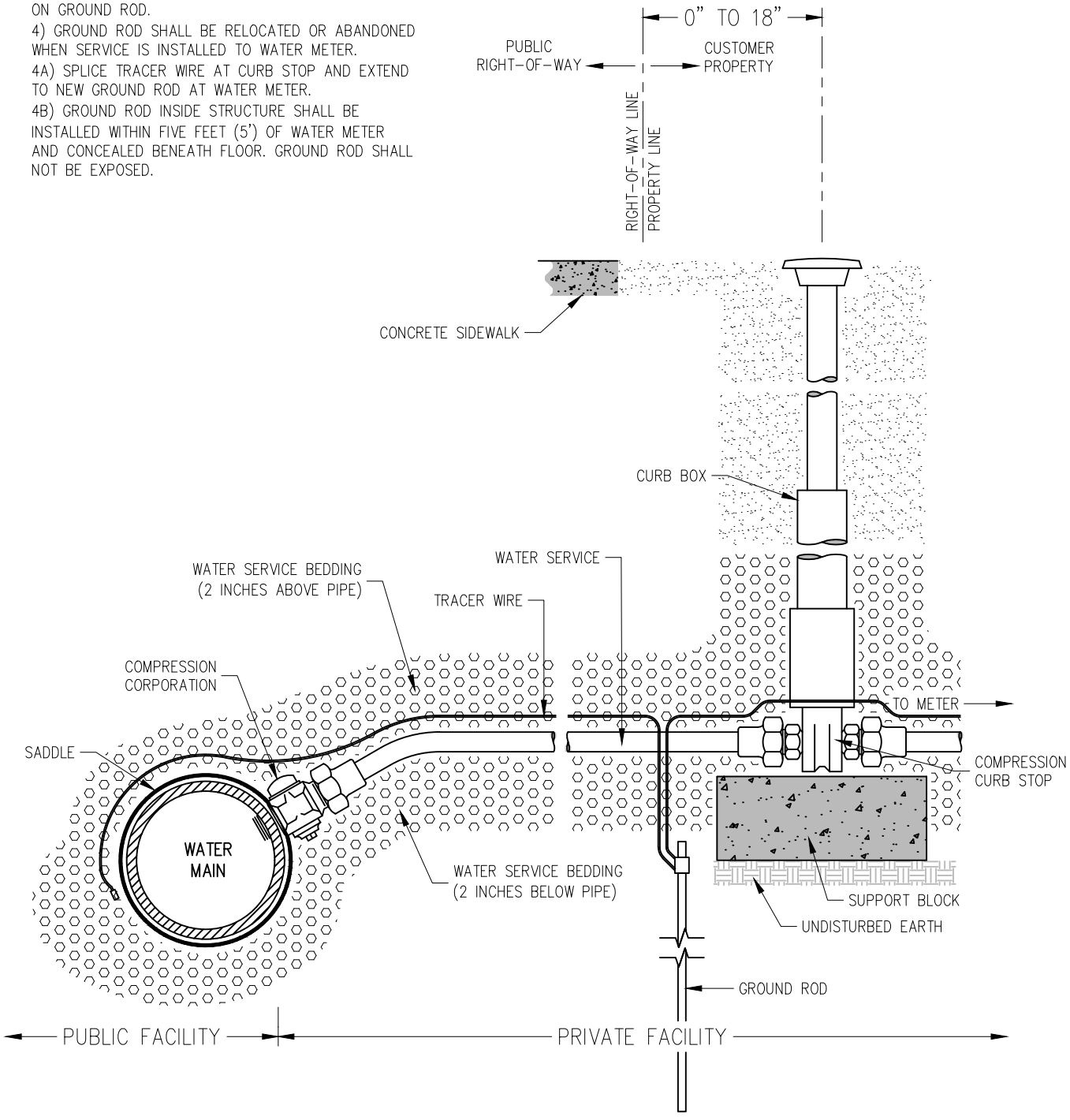
2) BMU PERSONNEL SHALL PERFORM ALL SERVICE TAPS INTO WATER MAIN.

3) GROUND ROD SHALL BE INSTALLED AT CURB STOP WITH WATER SERVICE STUB. TERMINATE TRACER WIRE ON GROUND ROD.

4) GROUND ROD SHALL BE RELOCATED OR ABANDONED WHEN SERVICE IS INSTALLED TO WATER METER.

4A) SPLICE TRACER WIRE AT CURB STOP AND EXTEND TO NEW GROUND ROD AT WATER METER.

4B) GROUND ROD INSIDE STRUCTURE SHALL BE INSTALLED WITHIN FIVE FEET (5') OF WATER METER AND CONCEALED BENEATH FLOOR. GROUND ROD SHALL NOT BE EXPOSED.



CITY OF BROOKINGS
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TYPICAL 1"–2" WATER SERVICE

REVISION DATE	PLATE NUMBER
04/01/2026	WM–14