



2022

RIVERSIDE PUBLIC UTILITIES

STANDARD  
DRAWINGS

FOR THE WATER DIVISION



WATER | ENERGY | LIFE







**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

**TYPICAL PLAN LAYOUT**

PIPE CURVE DATA			
○			
R	△	L	T

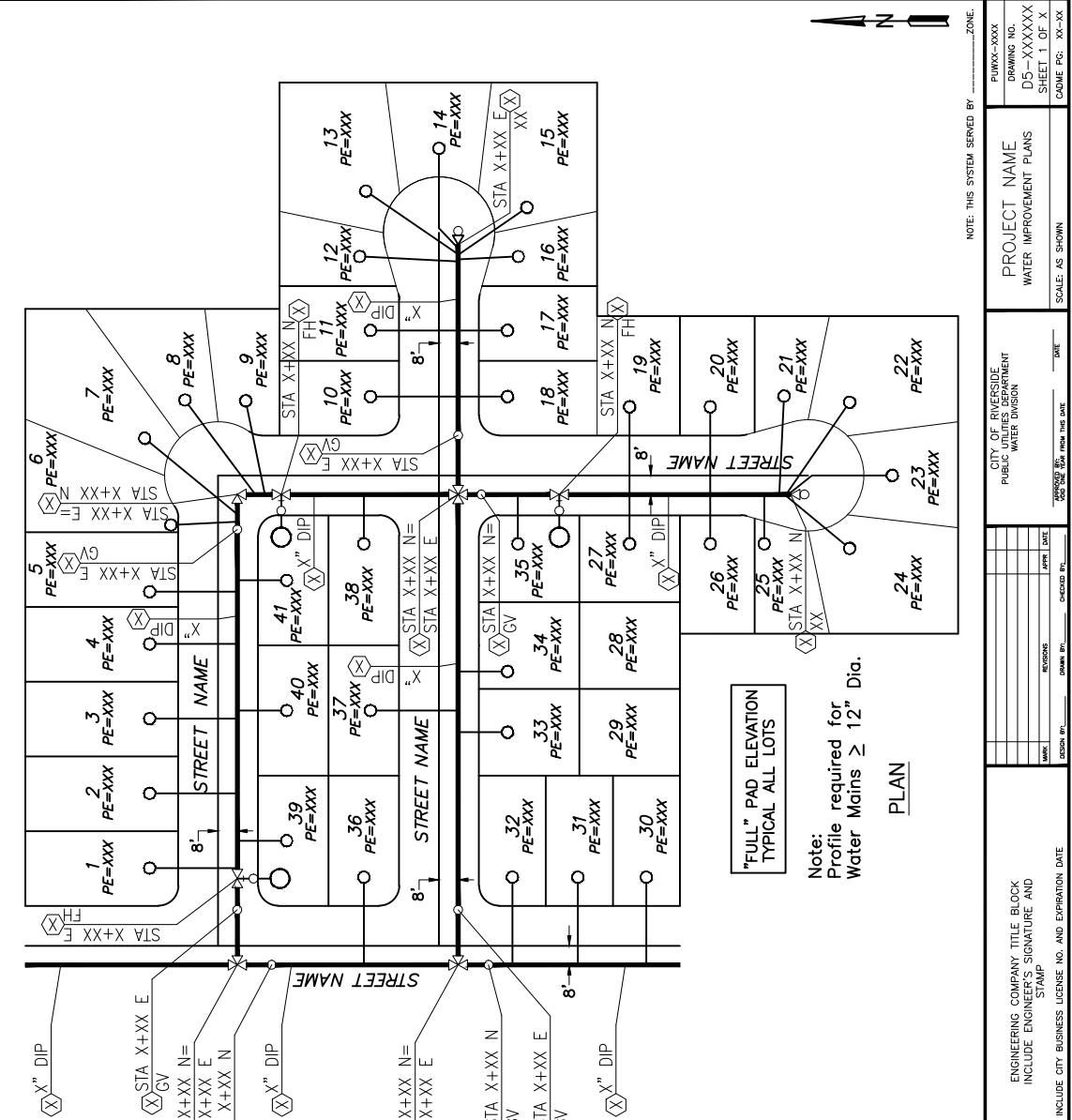
e.g.  
 • Section View of Undercrossing  
 • Section View of Overcrossing  
 • System Connection  
**DETAILS**  
 (as required)

**CONTRACTORS INSTALLATIONS**

ITEM	QUANTITY	STD. DIM. REFERENCE

**CITY FORCES INSTALLATIONS**

ITEM	QUANTITY	STD. DIM. REFERENCE



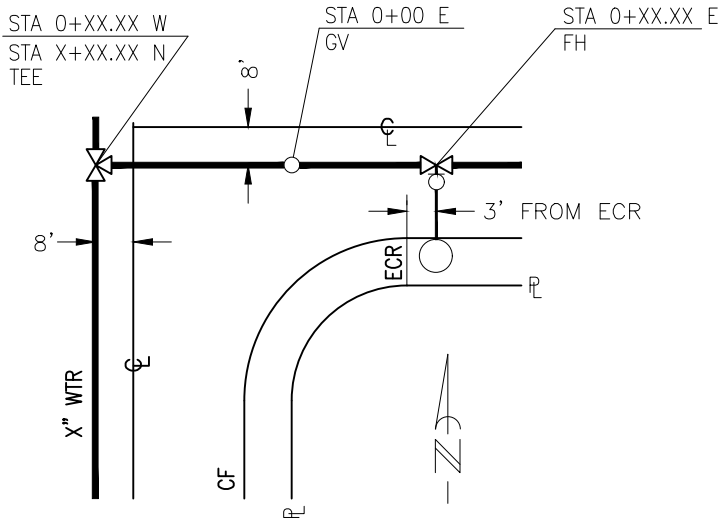
"FULL" PAD ELEVATION  
 TYPICAL ALL LOTS

Note:  
 Profile required for  
 Water Mains ≥ 12" Dia.

**PLAN**

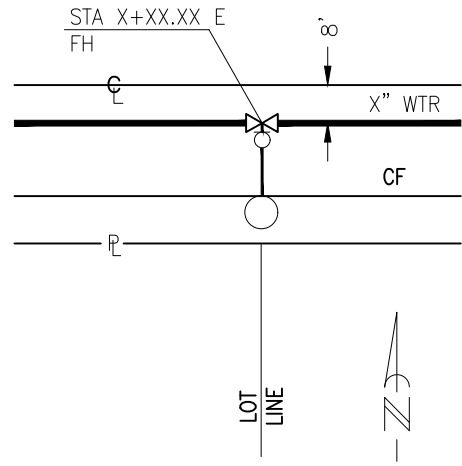
NOTE: THIS SYSTEM SERVED BY \_\_\_\_\_ ZONE.

RIVERSIDE-XXXX DRAWING NO. DS-XXXXXX SHEET 1 OF X	PROJECT NAME WATER IMPROVEMENT PLANS
CITY OF RIVERSIDE PUBLIC UTILITIES DEPARTMENT WATER DIVISION	SCALE: AS SHOWN
UNDERGROUND SERVICE ALERT Insert 811 logo TWO WORKING DAYS BEFORE YOU DIG	APPROVED BY: _____ DATE: _____ CITY OF RIVERSIDE PUBLIC UTILITIES DEPARTMENT OVERHEAD & UNDERGROUND
APPROVED BY: _____ DATE: _____ ENGINEERING COMPANY TITLE BLOCK INCLUDE ENGINEER'S SIGNATURE AND STAMP	CHECKED BY: _____ DATE: _____ DESIGN BY: _____ DATE: _____
INCLUDE CITY BUSINESS LICENSE NO. AND EXPIRATION DATE	APPROVED BY: _____ DATE: _____ ENGINEER'S SIGNATURE AND STAMP

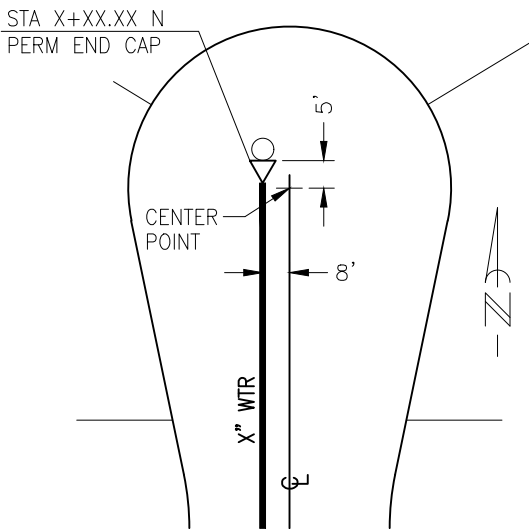


**INTERSECTIONS**

**FIRE HYDRANT LOCATIONS**

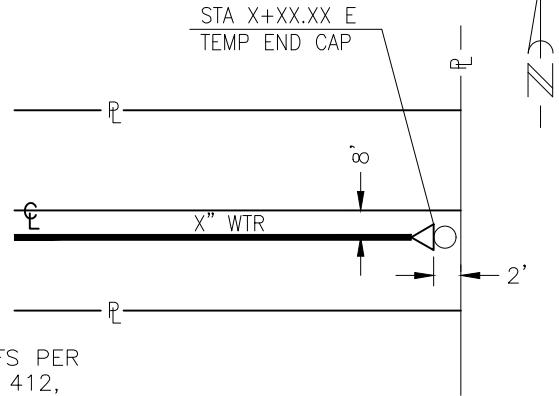


**LOT LINES**



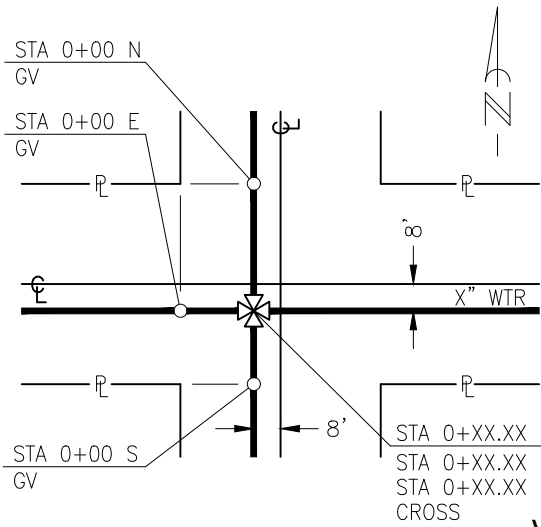
**CUL-DE-SAC**

**END OF MAIN**



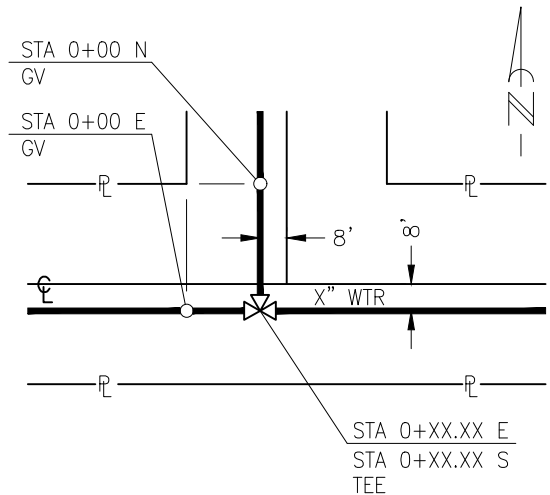
**DEAD-END**

NOTE:  
TYPICAL BLOW-OFFS PER  
CWD-411A, 411B, 412,  
OR 413



**FOUR-WAY**

**VALVE LOCATION**



**THREE-WAY**

NOTE:  
VALVES SHALL BE  
LOCATED ON THE  
EXTENSION OF  
PROPERTY LINES

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL PLAN DETAIL**

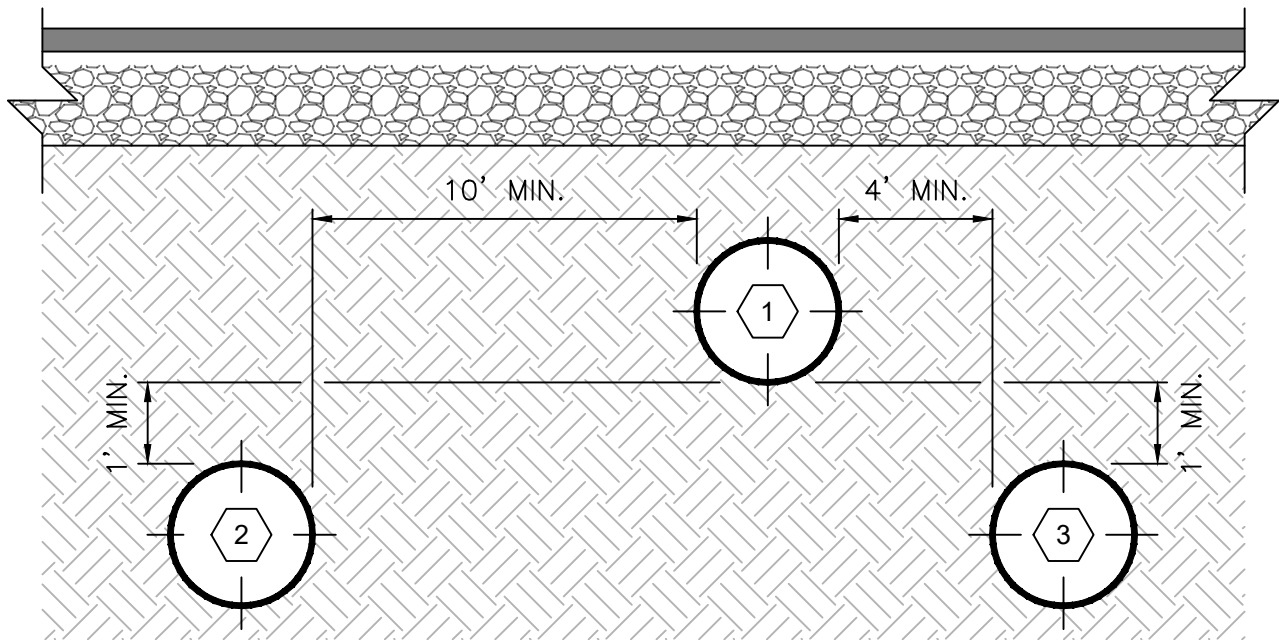


FIGURE 1 - MINIMUM SEPARATION STANDARDS FOR PARALLEL CONSTRUCTION OF NEW WATER PIPES

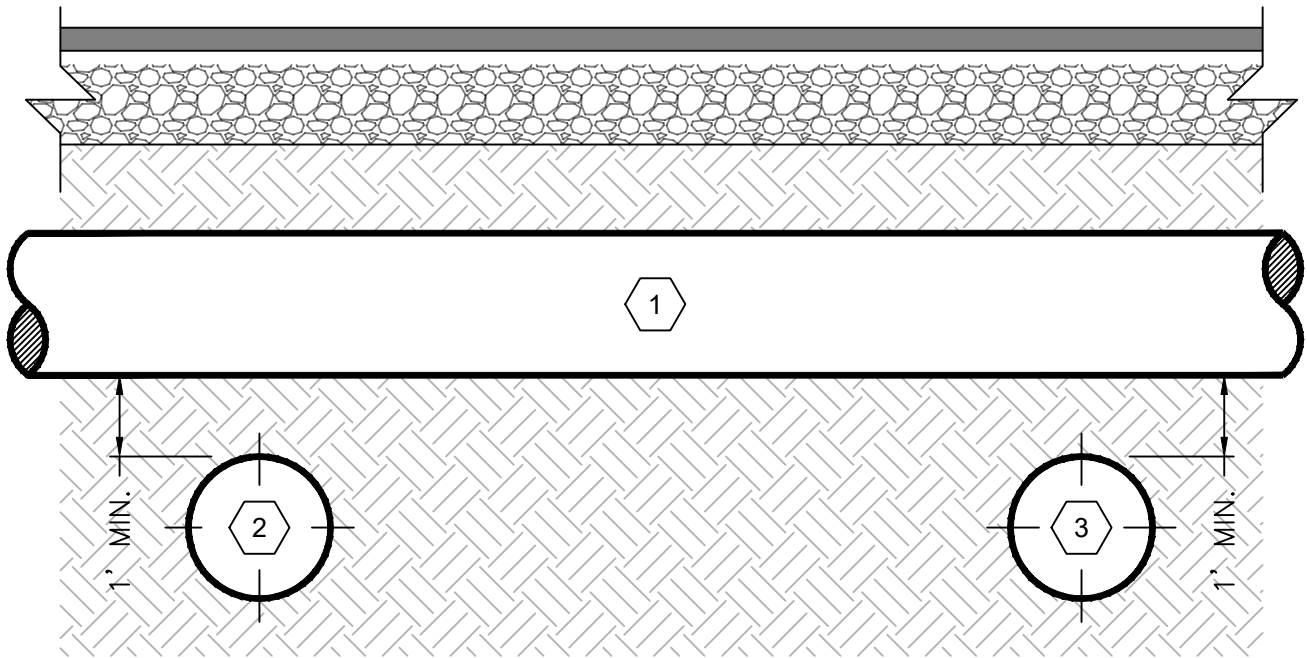


FIGURE 2 - MINIMUM SEPARATION STANDARDS FOR CROSSINGS OF NEW WATER PIPES

- 1 NEW WATER MAIN
- 2 UNTREATED SEWAGE, PRIMARY OR SECONDARY TREATED SEWAGE, DISINFECTED SECONDARY-2.2 RECYCLED WATER, DISINFECTED SECONDARY-2.3 RECYCLED WATER, HAZARDOUS FLUIDS SUCH AS FUELS, INDUSTRIAL WASTES, AND WASTEWATER SLUDGE
- 3 STORM DRAINAGE, DISINFECTED TERTIARY RECYCLED WATER

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WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

WATER MAIN  
SEPARATION STANDARDS

## NOTES

1. THIS CITY STANDARD IS BASED ON THE WATERWORKS STANDARDS IN THE CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 22, CHAPTER 16, SECTION 64572, DATED APRIL 10, 2017.
2. IF THE MINIMUM SEPARATION BETWEEN WATER PIPES AND SEWER/STORM DRAIN LINES AS OUTLINED IN FIGURE 1 AND 2 ON CWD-015-1 CANNOT BE MET, RIVERSIDE PUBLIC UTILITIES (RPU) MUST DEMONSTRATE TO THE DEPARTMENT OF DRINKING WATER (DDW) THAT A PROPOSED ALTERNATIVE WOULD PROVIDE AT LEAST THE SAME LEVEL OF PROTECTION TO THE PUBLIC HEALTH.
3. NEW WATER MAINS AND SERVICES SHALL NOT BE INSTALLED IN THE SAME TRENCH AS EXISTING OR NEW SEWER OR STORM DRAIN LINES.
4. THE MINIMUM SEPARATION DISTANCES SET FORTH IN THIS SECTION SHALL BE MEASURED FROM THE NEAREST OUTSIDE EDGE OF EACH PIPE BARREL.
5. IF CROSSING A SEWER OR STORM DRAIN LINE, A NEW WATER PIPE CROSSING SHALL BE CONSTRUCTED AT NO LESS THAN A 45° ANGLE.
6. THE VERTICAL SEPARATION REQUIREMENT SHOWN IN FIGURE 1 ONLY APPLIES WHEN THE HORIZONTAL DISTANCE BETWEEN A WATER PIPE AND SEWER OR STORM DRAIN LINE IS LESS THAN 10 FEET.
7. RIVERSIDE PUBLIC UTILITIES SHALL BE RESPONSIBLE FOR REQUESTING A WAIVER OF THESE SEPARATION STANDARDS FROM THE DEPARTMENT OF DRINKING WATER FOR ANY INSTANCE WHERE THE STANDARD CANNOT BE MET. THE PROCESS OF REQUESTING AND OBTAINING A WAIVER CAN TAKE SEVERAL WEEKS AND WRITTEN APPROVAL MUST BE RECEIVED PRIOR TO CONSTRUCTION. WHILE RPU CAN RECOMMEND ALTERNATIVES TO ADDRESS SUBSTANDARD SEPARATIONS, DDW WILL ULTIMATELY DECIDE WHAT METHODS ARE ACCEPTABLE.
8. AT CROSSINGS WITH A SEWER LINE, UTILIZE FLEXIBLE CELL-CRETE BACKFILL FOR ADDED PROTECTION WHERE NO JOINTS WITHIN 8 FEET REQUIREMENT CANNOT BE MET.
9. FOR PARALLEL ALIGNMENTS, MAXIMIZE THE HORIZONTAL SEPARATION BETWEEN THE NEW WATER LINE AND EXISTING SEWER LINE, AND INSTALL NEW WATER LINE IN A SEPARATE TRENCH AT LEAST 4 FEET (OUTER EDGE TO OUTER EDGE) FROM EXISTING SEWER LINE.

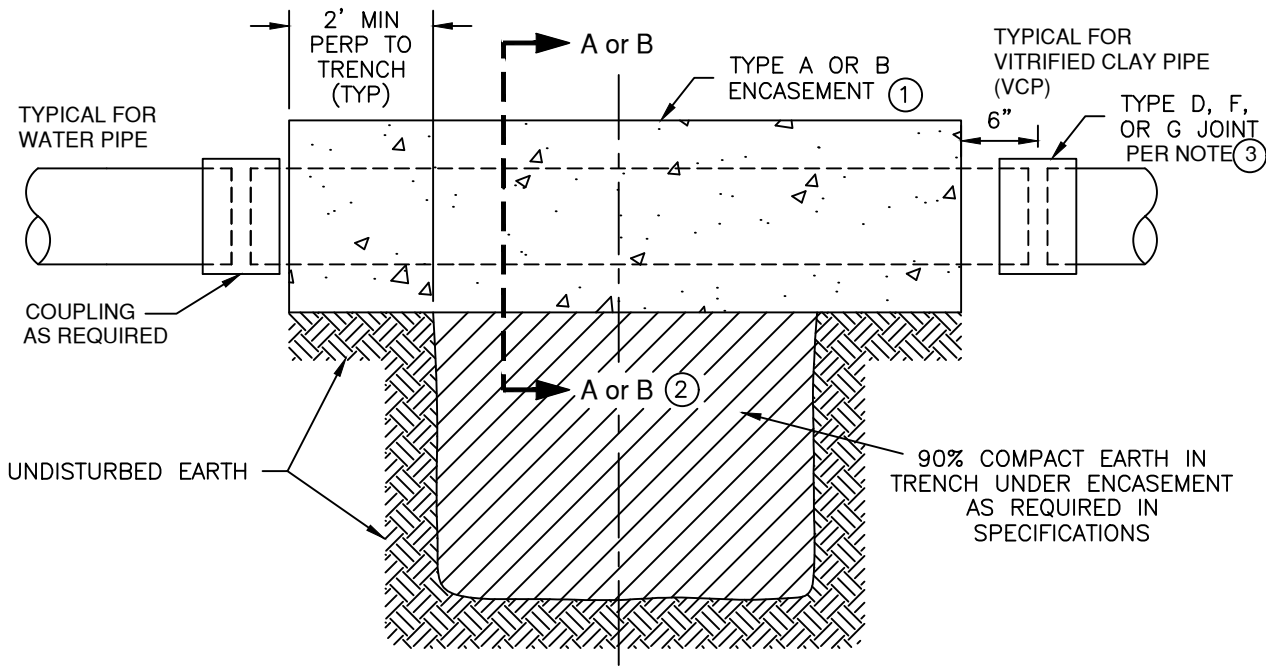
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

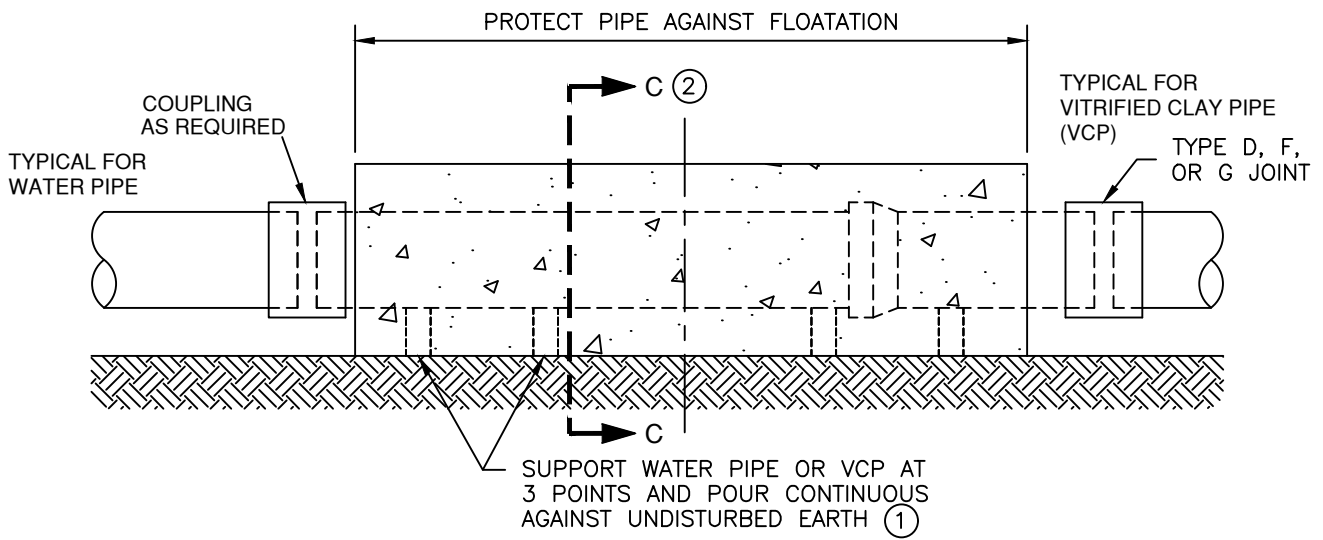
**WATER MAIN  
SEPARTION STANDARDS**



**TYPE A OR B ENCASUREMENT FOR WATER & SEWER**  
 REQUIRED TO SPAN TRENCH, OR WHERE ENCASUREMENT  
 IS NOT POURED ON UNDISTURBED EARTH

NOTE:

- ① EXTEND MACHINED PIPE ENDS BEYOND ENCASUREMENT
- ② SEE CWD-023-2 FOR CROSS-SECTION OF A, B, OR C ENCASUREMENT DETAIL
- ③ PIPE JOINT TYPES AND MATERIALS ARE PER GREEN BOOK SECTION 208



**TYPE C ENCASUREMENT FOR WATER & SEWER**

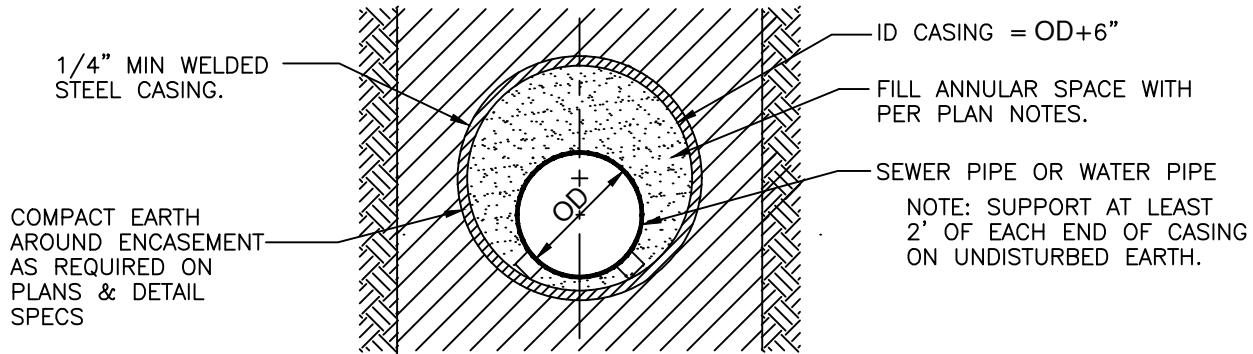
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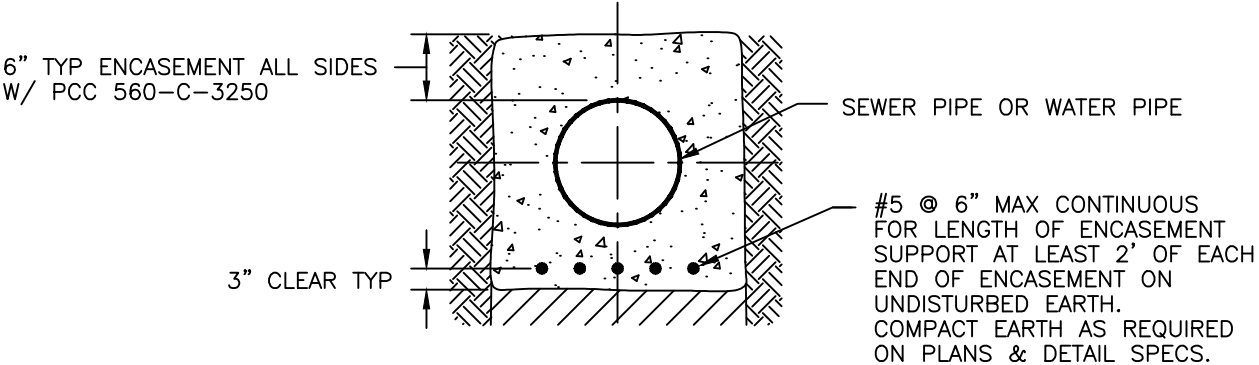
**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

**STRUCTURE INTERFERENCE**  
**TYPE A, B, OR C ENCASUREMENT**

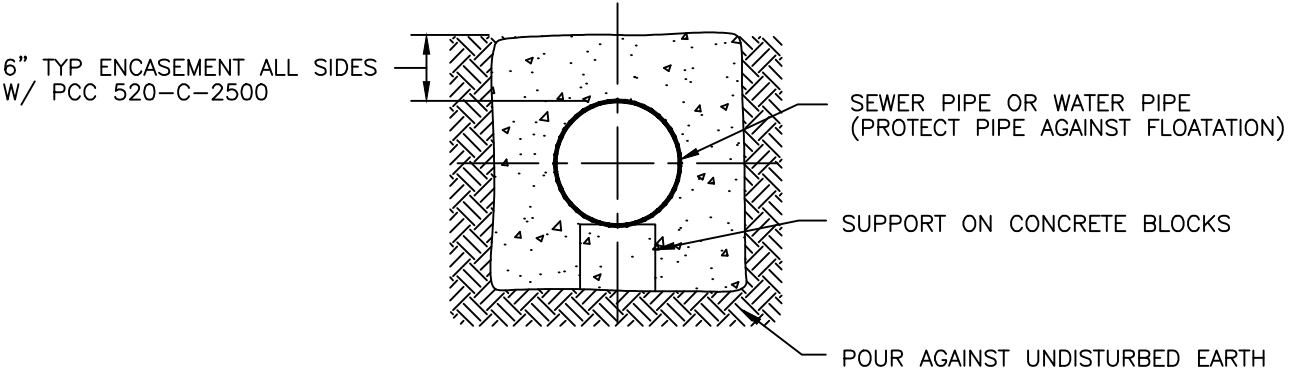
OD = OUTSIDE DIAMETER OF BELL, COLLAR, OR COUPLING.



**TYPE A - PIPE CASING  
SECTION A**



**TYPE B - REINFORCED ENCASEMENT  
SECTION B**



**TYPE C - PLAIN ENCASEMENT  
SECTION C**

**GENERAL NOTES**

- 1.) ALL MATERIALS OF CONSTRUCTION SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION"

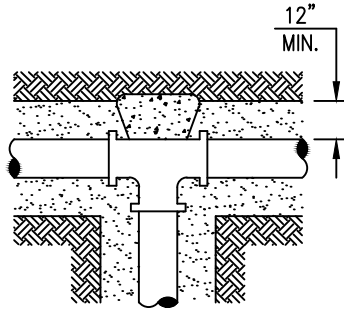
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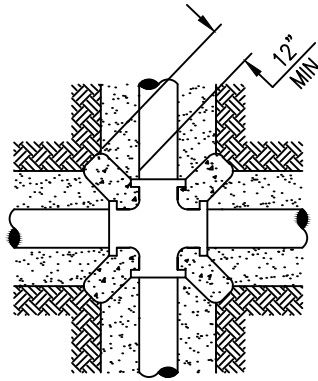
**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**STRUCTURE INTERFERENCE  
ENCASEMENT SECTIONS**

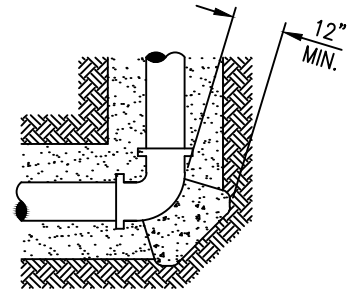




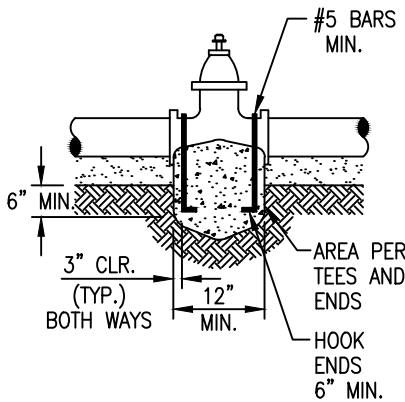
TEE



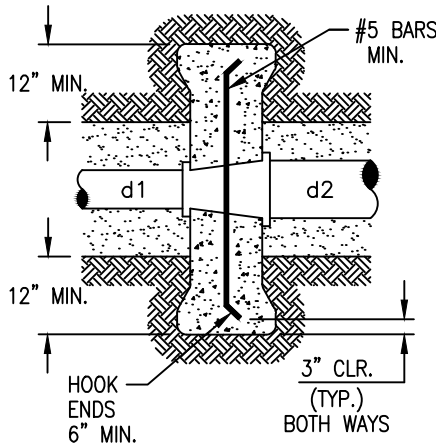
CROSS



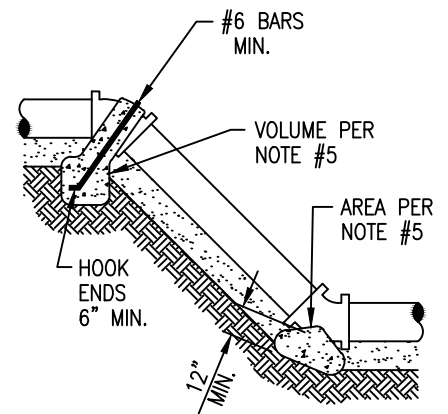
ELL



ANCHORAGE OF VALVE



REDUCER



VERTICAL P.I.

GUIDELINE

NOTES:

- 1.) ALL MATERIALS OF CONSTRUCTION SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
- 2.) THRUST AND ANCHOR BLOCKS FOR D.I.P. AND C.M.L.&C. STEEL PIPE SHALL BE OF PCC 450-C-2000 CONCRETE AND SHALL BE POURED AGAINST UNDISTURBED SOIL. CONCRETE SHALL BE KEPT CLEAR OF THE BELL END OF FITTINGS FOR DUCTILE IRON PIPE.
- 3.) ENGINEERED-APPROVED RESTRAINED JOINTS MAY BE USED IN-LIEU OF THRUST BLOCKS.
- 4.) ANCHOR BLOCK FOR GATE VALVES SHALL BE KEYED A MINIMUM OF 12 INCHES INTO TRENCH WALL AND 6 INCHES INTO BOTTOM OF TRENCH.
- 5.) THE ENGINEER OF RECORD SHALL SIZE ALL THRUST BLOCKS ON THE BASIS OF THE SOIL PASSIVE PRESSURE.

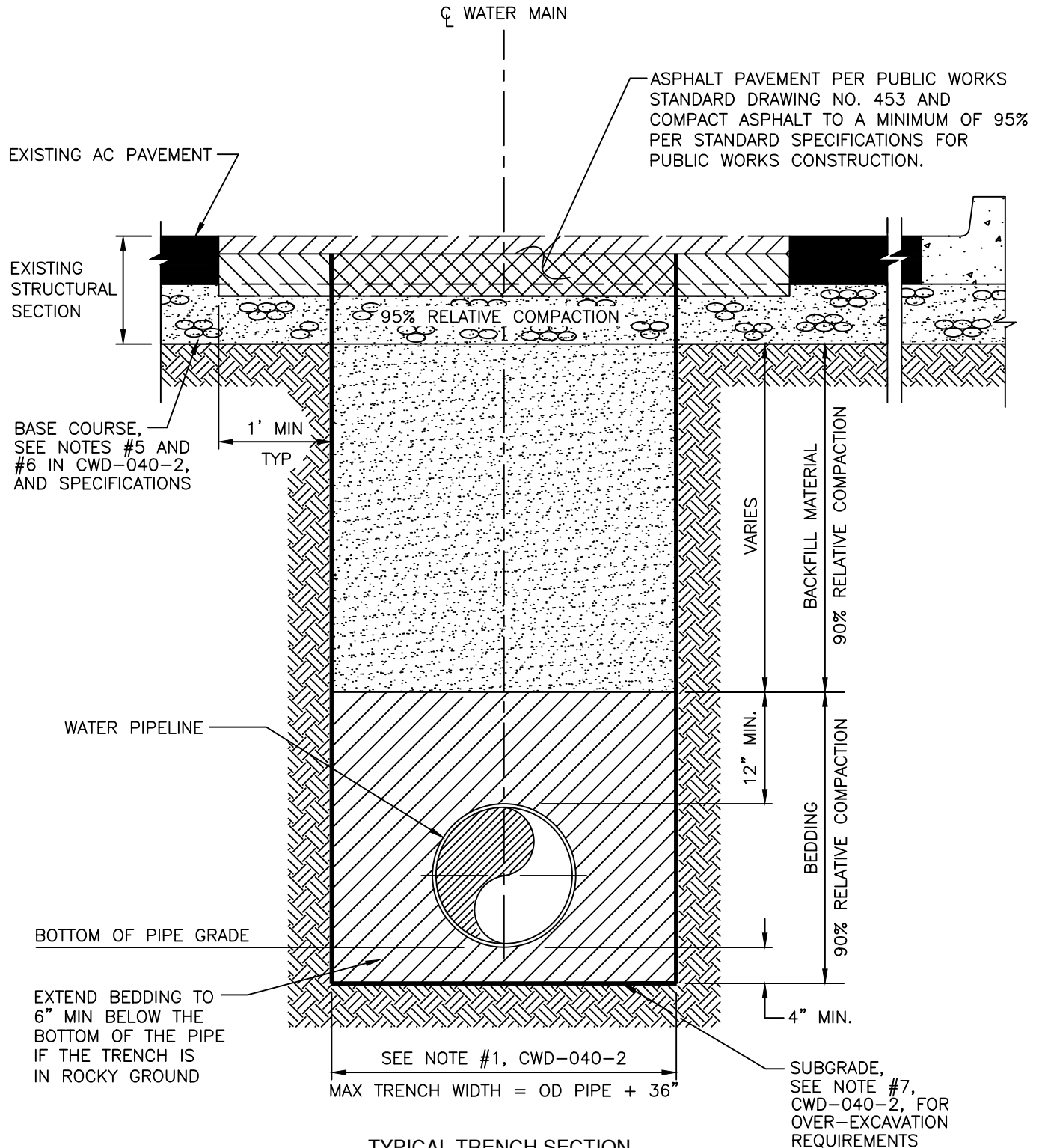
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**THRUST BLOCK DETAILS  
TYPICAL**



**TYPICAL TRENCH SECTION**

SEE CWD-040-2 FOR NOTES

PW STANDARD 453 SUPERCEDES IN CASE OF ANY VARIANCE

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**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

**TYPICAL PIPE TRENCH,**  
**BEDDING, BACKFILL, AND PAVEMENT**  
**REQUIREMENTS**



**GENERAL NOTES:**

1. MINIMUM TRENCH WIDTH = O.D. + 12" FOR 4" TO 12" NOMINAL DIAMETER PIPE AND O.D. + 18" FOR GREATER THAN 12" NOMINAL DIAMETER PIPE.
2. THE MATERIAL FOR BEDDING SHALL BE COHESIONLESS SANDY LOAM, SAND, OR SANDY GRAVEL MATERIAL OBTAINED FROM PROJECT EXCAVATION OR FROM APPROVED BORROW AREAS. THE BEDDING MATERIAL SHALL NOT CONTAIN ANY ROCKS OR OTHER MATERIAL DELETERIOUS TO THE PIPE.
3. SAND BEDDING SHALL BE USED WHEN THE SAND EQUIVALENT OF THE NATIVE MATERIAL IS LESS THAN 30, PER ASTM D2419.
4. FOR PAVED AND UNPAVED AREAS, THE COMPACTION OF BEDDING AND BACKFILL MATERIALS AND PAVEMENT REPLACEMENT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION "GREEN BOOK" LATEST EDITION.
5. COMPACTED BACKFILL MATERIAL IN THE UNPAVED AREAS SHALL COMPLY WITH THE SAME REQUIREMENTS AS THE BACKFILL MATERIAL COMPACTION IN THE STREETS.
6. THE BASE COURSE MATERIAL SHALL BE CRUSHED AGGREGATE BASE MATERIAL AS SPECIFIED IN SECTION 200-2 "UNTREATED BASE MATERIALS" OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION.
7. IF THE ENGINEER DETERMINES THAT THE SOIL UPON WHICH THE PIPE IS TO BE PLACED IS UNSTABLE, THE CONTRACTOR SHALL OVER-EXCAVATE THE BOTTOM OF THE TRENCH TO A DEPTH OF 12" OR AS DIRECTED BY THE ENGINEER AND PLACE A LAYER OF CRUSHED ROCK ON THE TRENCH SUBGRADE COMPACTED TO 90% RELATIVE COMPACTION.

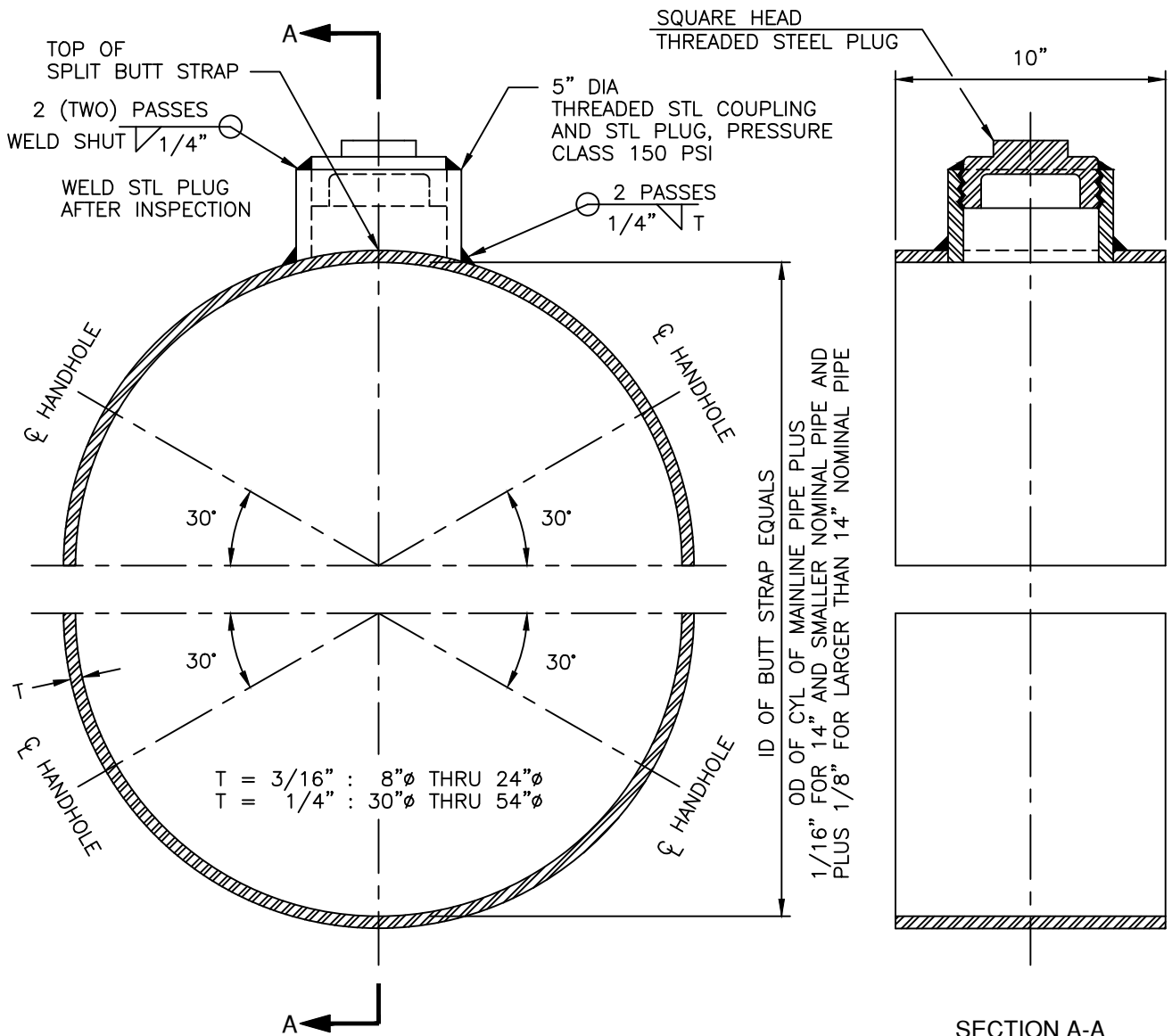
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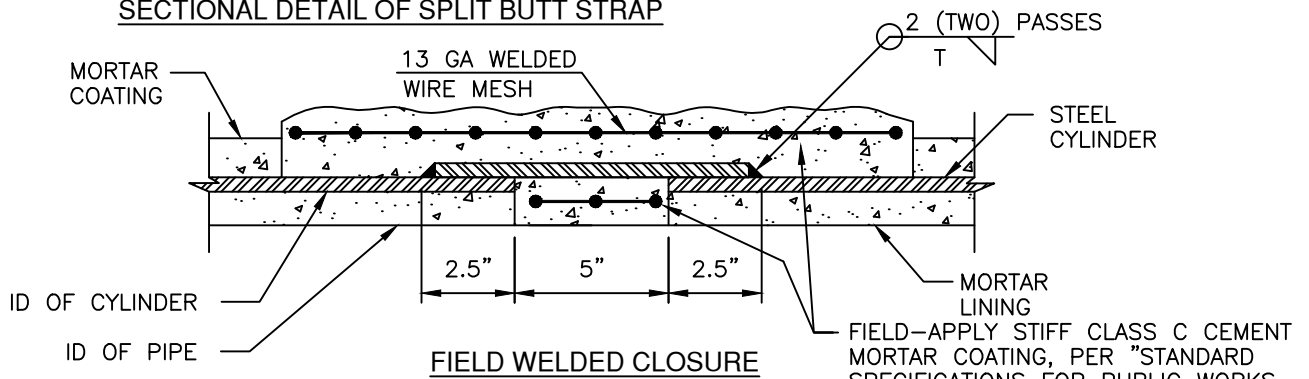
**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL PIPE TRENCH,  
BEDDING, BACKFILL, AND PAVEMENT  
REQUIREMENTS (GENERAL NOTES)**



SECTIONAL DETAIL OF SPLIT BUTT STRAP

SECTION A-A



FIELD WELDED CLOSURE

**NOTES:**

- SHIP IN HALVES AND WELD IN FIELD
- | PIPE SIZE       | HANDHOLES |
|-----------------|-----------|
| 8" THROUGH 12"  | 1         |
| 14" THROUGH 18" | 2         |
| 20" THROUGH 36" | 4         |
| 42" THROUGH 54" | 6         |

- NOTE:**
- AFTER THE ASSEMBLY, ALL BARE METAL TO HAVE SAME COATING APPLIED AS IS ON THE PIPE.
  - ALL WELDS ARE FULL DOUBLE PASS WELDS.

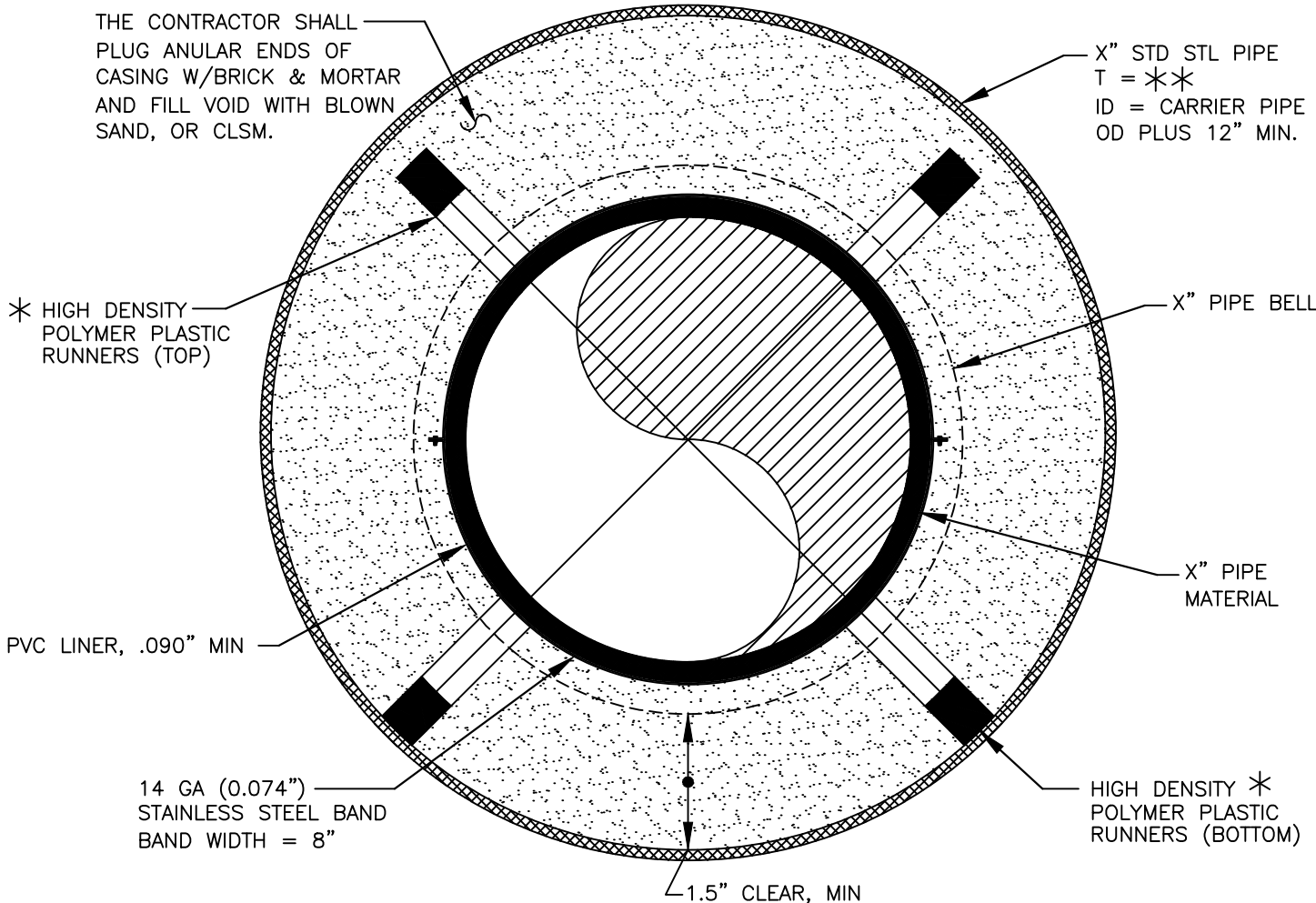
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TYPICAL SPLIT BUTT STRAP  
8" THROUGH 54" DIAMETER  
(150 PSI DESIGN PRESSURE)



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS



NOTES:

- \* 1. CASING SPACERS FOR X" CARRIER PIPE SHALL BE SPECIFIED BY THE ENGINEER IN RESPONSIBLE CHARGE. THEY SHALL BE SPACED 1.5' FROM EACH END OF THE PIPE AND 8' APART MAXIMUM.
- \*\* 2. THE CASING PIPE STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.  
FOR RAILROAD CROSSING, THE STEEL THICKNESS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA), SECTION 5.3 - SPECIFICATIONS FOR PIPELINES CONVEYING NON-FLAMMABLE SUBSTANCES, OR THE PERTINENT RAILWAY COMPANY SPECIFICATIONS, WHICHEVER IS GREATER.  
FOR ROADWAY OR VACANT LAND, THE STEEL THICKNESS SHALL BE ENGINEERED TO SUPPORT AN H-20 LOAD (LIVE LOAD) PLUS THE EARTH LOAD (DEAD LOAD).
- 3. WELDED ALL JOINTS.

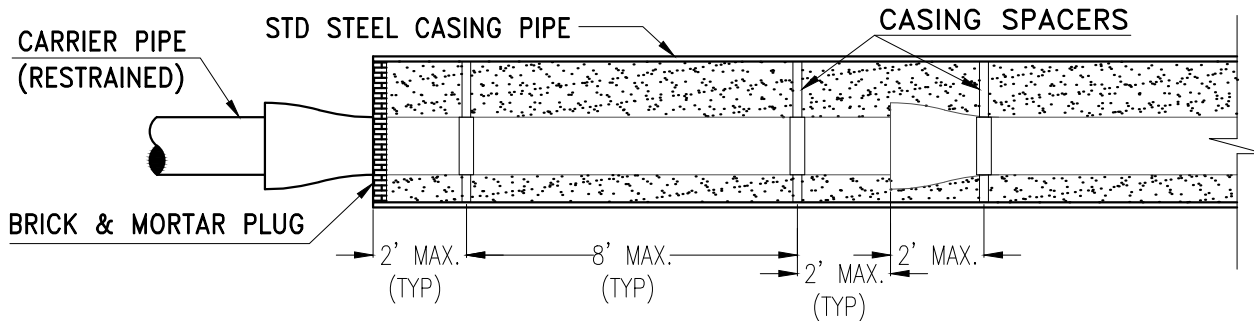
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL CASING PIPE DETAIL FOR  
BORE AND JACK INSTALLATION**

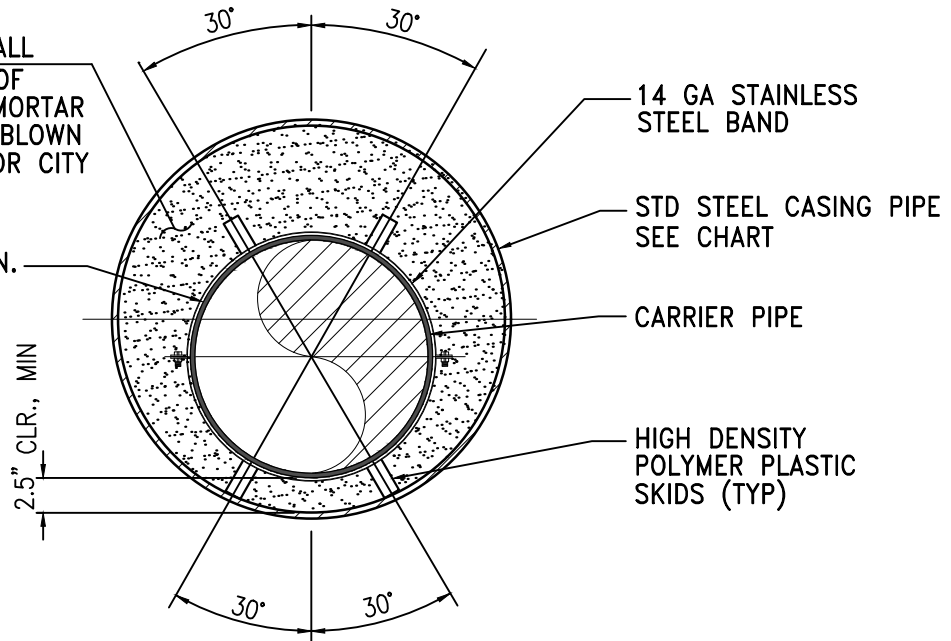


**PROFILE**  
CASING PIPE  
NTS

THE CONTRACTOR SHALL  
PLUG ANULAR ENDS OF  
CASING W/BRICK & MORTAR  
AND FILL VOID WITH BLOWN  
SAND, CELL-CRETE, OR CITY  
APPROVED EQUAL.

PVC LINER, .090" MIN.

WELD ALL STEEL JOINTS.  
RESTRAIN ALL DUCTILE IRON  
JOINTS.



**SECTION**  
CASING PIPE  
NTS

**NOTES:**

1. CASING SPACERS SHALL BE CALPICO INC. MODEL 'M'; OR CASCADE WATERWORKS MFG., CO. OR CITY APPROVED EQUAL. SPACED 8'-0" ON CENTER.
2. WELD ALL STEEL JOINTS. RESTRAIN ALL DUCTILE IRON JOINTS.
3. THE NOMINAL DIAMETER OF THE CASING PIPE SHALL BE 12-INCHES GREATER THAN THE NOMINAL DIAMETER OF THE CARRIER PIPE.
4. THE DIAMETER OF THE BORE HOLE SHALL NOT EXCEED 0.1-FOOT GREATER THAN THE OUTSIDE DIAMETER OF THE CASING PIPE.
5. CASING PIPE SHALL MEET THE REQUIREMENTS OF SECTION 306-2.3 OF THE SPECIFICATION 205.
6. CASING PIPE THICKNESS SHALL BE DETERMINED BY THE CIVIL ENGINEER AND APPROVED BY THE CITY.

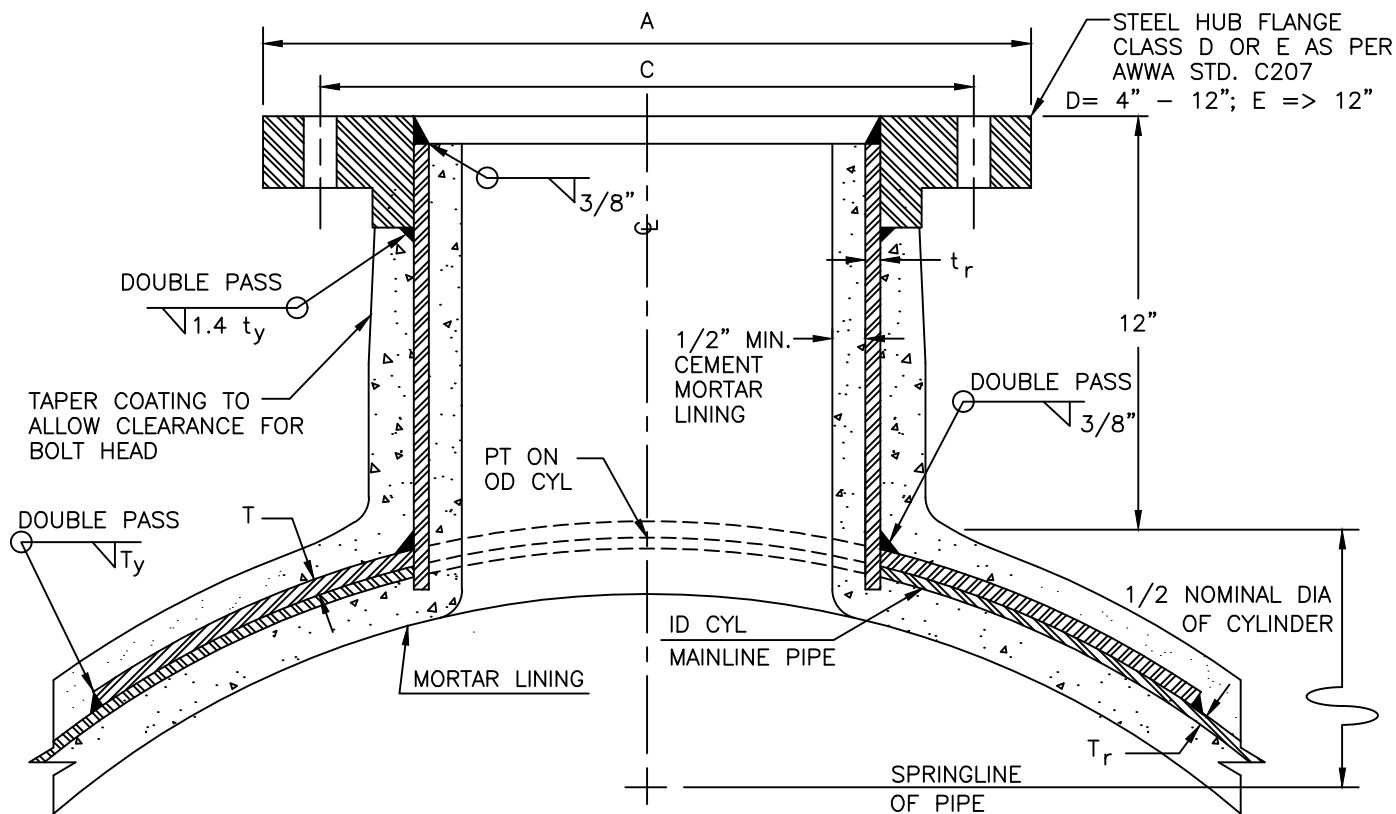
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**WATER**  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

CASING PIPE STANDARD



**SECTIONAL DETAIL OF OUTLET**

NOTE: ALL WELDS ARE FULL DOUBLE PASS WELDS.

NOMINAL OUTLET DIA (in.)	MINIMUM "t <sub>r</sub> " (in.)	HUB FLANGE	
		"C" (in.)	A (in.)
4	0.237	7 1/2	9
6	0.280	9 1/2	11
8	0.322	11 3/4	13 1/2
10	0.366	14 1/4	16
12	0.375	17	19
14	0.375	18 3/4	21
16	0.375	21 1/4	23 1/2
18	0.375	22 3/4	25
20	0.375	25	27 1/2

NOTES:

- 1.) SEE MAINLINE PIPING DRAWING FOR POSITION AND USE OF OUTLET.
- 2.) STEEL HUB FLANGE CLASS D OR E AS PER AWWA STD. C207, SEE ABOVE.
- 3.) SEE MAINLINE PIPE DRAWING FOR MINIMUM DESIGN THICKNESS "t<sub>r</sub>".
- 4.) "w" AND "T", REINFORCEMENT PLATE DIMENSIONS FOR OUTLET JOINTS, TO BE DESIGNED PER AWWA M11, OR EQUAL TO MANUFACTURERS REINFORCING GUIDE.
- 5.) "T<sub>y</sub>" = MAINLINE CYLINDER THICKNESS.
- 6.) "T<sub>r</sub>" = REQUIRED MAINLINE CYLINDER THICKNESS.
- 7.) "t<sub>y</sub>" = BRANCH CYLINDER THICKNESS.
- 8.) "t<sub>r</sub>" = REQUIRED BRANCH CYLINDER THICKNESS.

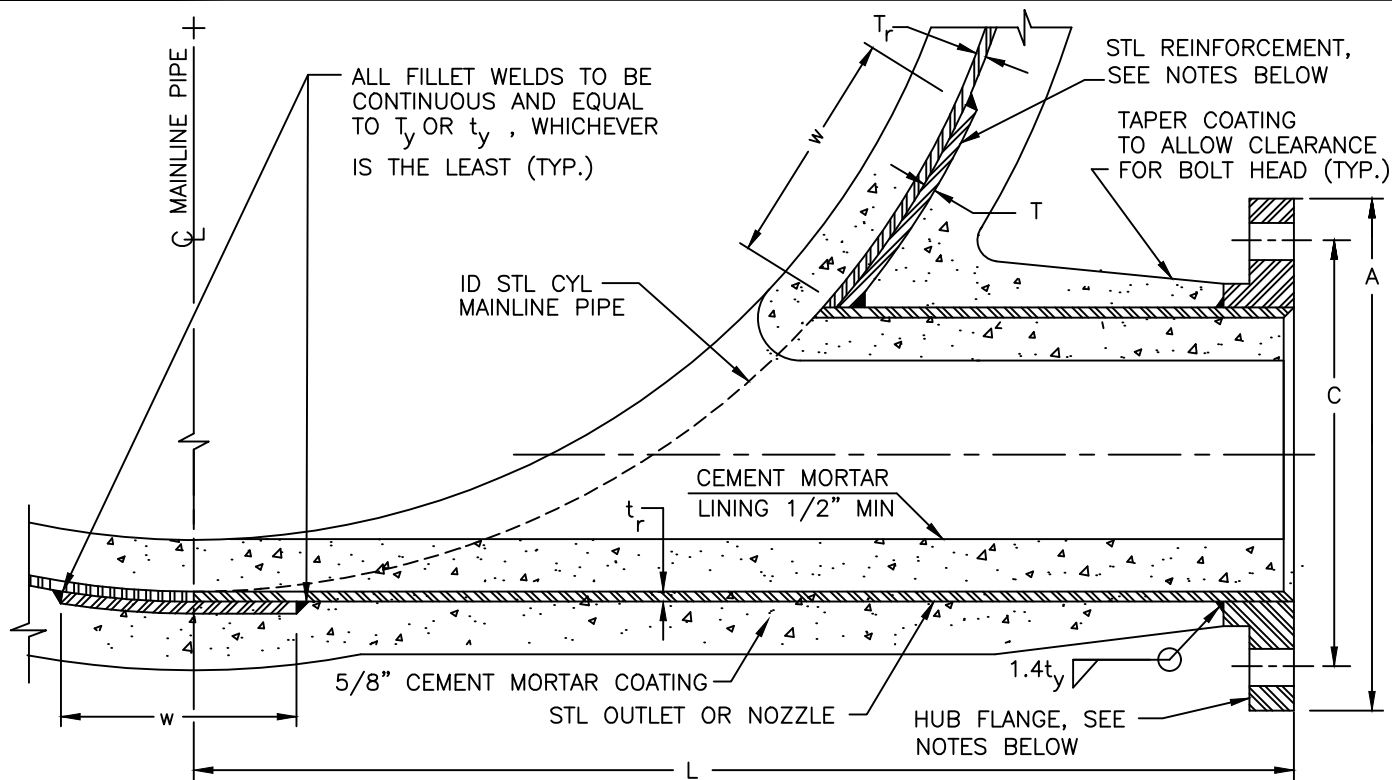
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL FLANGED OUTLET  
4" THROUGH 20"**



**SECTIONAL DETAIL OF OUTLET**

NOMINAL OUTLET DIA (in)	MINIMUM "t <sub>r</sub> " (in)	HUB FLANGE	
		"C" (in)	"A" (in)
4	0.237	7 1/2	9
6	0.280	9 1/2	11
8	0.322	11 3/4	13 1/2
10	0.366	14 1/4	16
12	0.375	17	19

**NOTES:**

- 1.) SEE MAINLINE PIPING DRAWING FOR POSITION AND USE OF OUTLET.
- 2.) STEEL HUB FLANGE CLASS D AS PER AWWA STD. C207.
- 3.) SEE MAINLINE PIPING DRAWING FOR MINIMUM DESIGN THICKNESS "T<sub>r</sub>".
- 4.) "w" AND "T", REINFORCEMENT PLATE DIMENSIONS FOR OUTLET JOINTS, TO BE DESIGNED PER AWWA MII, 13.3-13.6, OR EQUAL TO MANUFACTURERS REINFORCING GUIDE.
- 5.) "T<sub>y</sub>" = MAINLINE CYLINDER THICKNESS.
- 6.) "T<sub>r</sub>" = REQUIRED MAINLINE CYLINDER THICKNESS.
- 7.) "t<sub>y</sub>" = BRANCH CYLINDER THICKNESS.
- 8.) "t<sub>r</sub>" = REQUIRED BRANCH CYLINDER THICKNESS.
- 9.) "L" =  $\frac{\text{NOMINAL DIA}}{2} + 12"$

**APPROVALS**

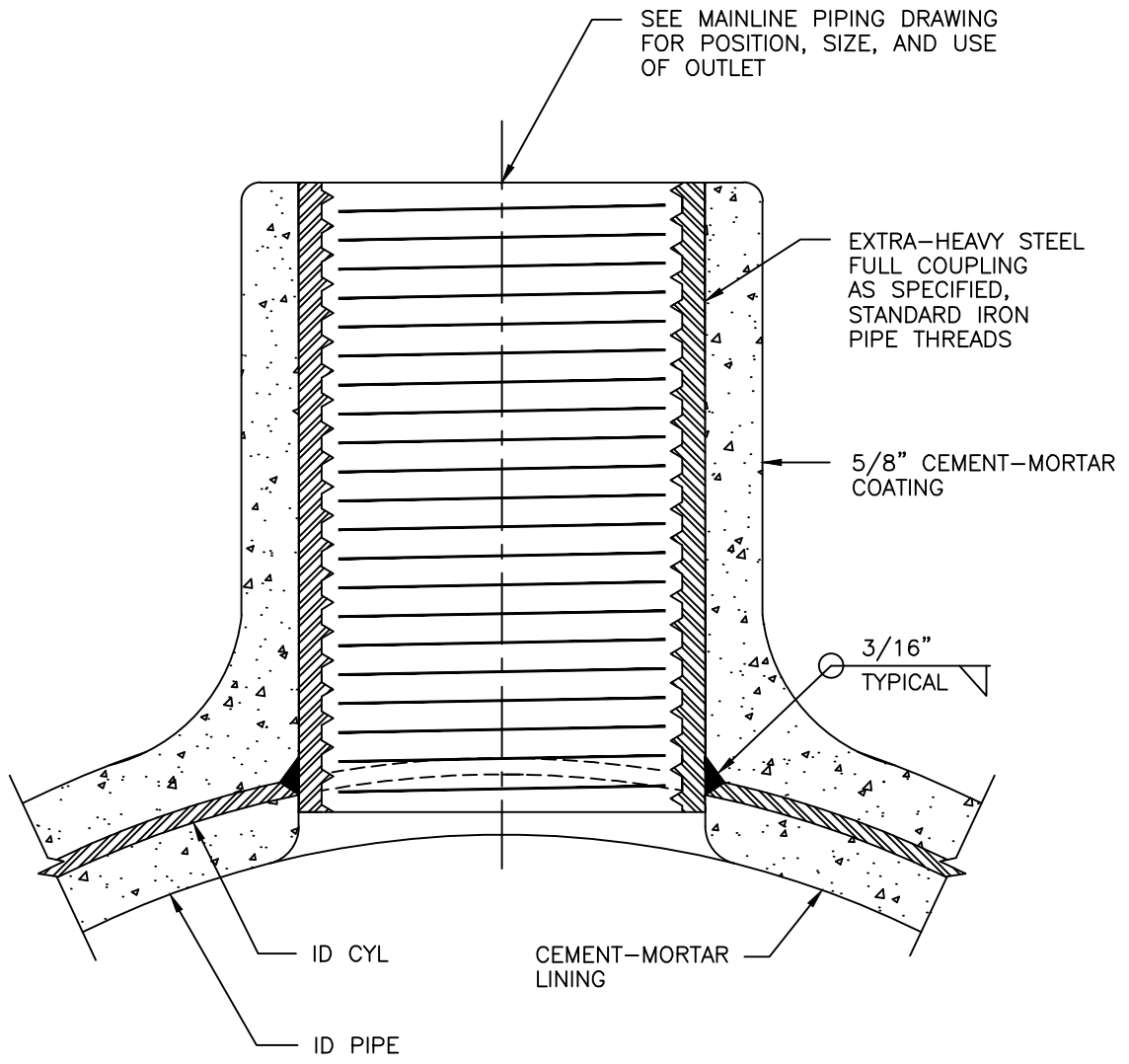
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL FLANGED TANGENT  
OUTLET 40 THROUGH 12" DIAMETER**





CROSS-SECTION OF OUTLET

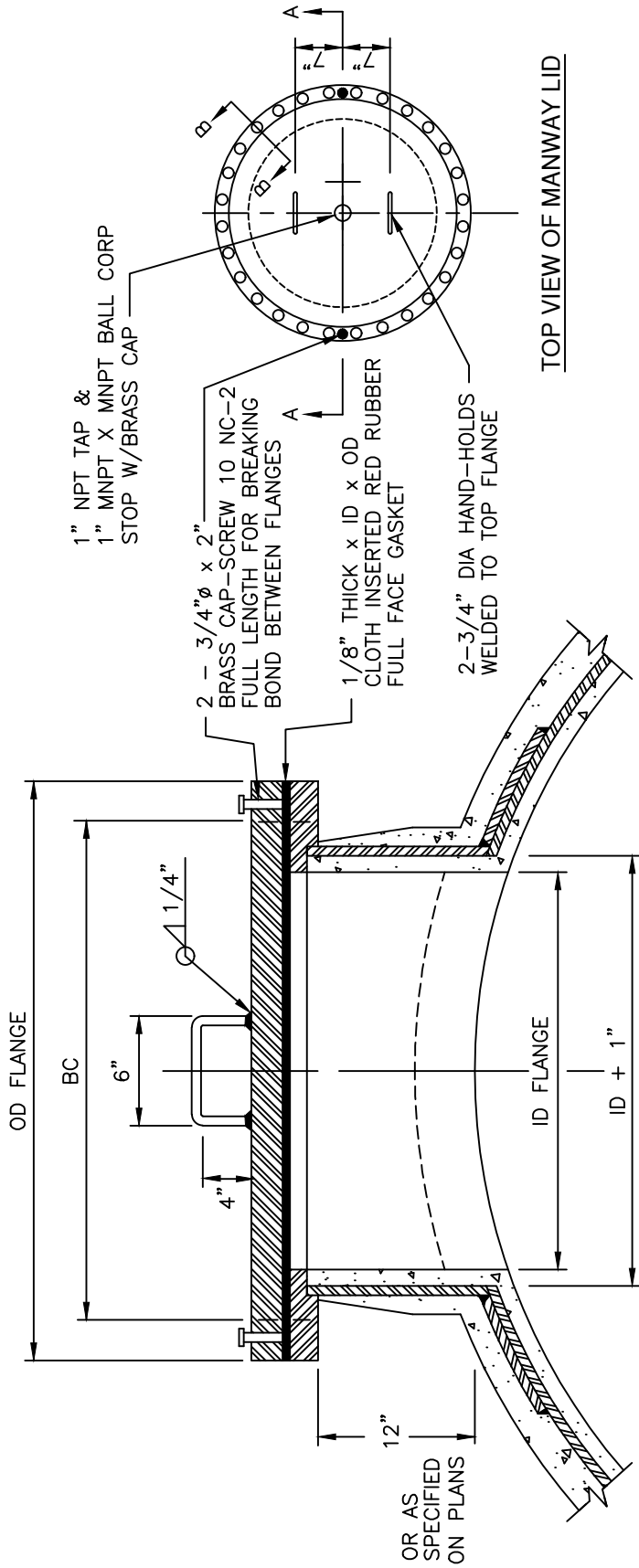
**APPROVALS**

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL THREADED OUTLET  
1" THROUGH 2 1/2" DIAMETER**



1" NPT TAP &  
1" MNPT X MNPT BALL CORP  
STOP W/BRASS CAP

2 - 3/4"  $\phi$  x 2"  
BRASS CAP-SCREW 10 NC-2  
FULL LENGTH FOR BREAKING  
BOND BETWEEN FLANGES

1/8" THICK x ID x OD  
CLOTH INSERTED RED RUBBER  
FULL FACE GASKET

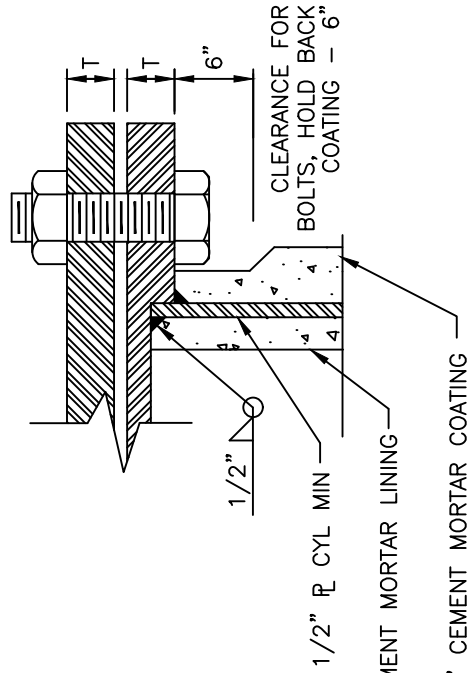
2-3/4" DIA HAND-HOLDS  
WELDED TO TOP FLANGE

TOP VIEW OF MANWAY LID

NOTES:  
CROSS-SECTION OF MANWAY A-A

- 1.) PAINT ALL EXPOSED INTERIOR & EXTERIOR METAL SURFACES OF FLANGES, EXCEPT GASKET SURFACE, PER SPECIFICATIONS.
- 2.) 150 LB. HUB FLANGES SHALL BE USED IF WORKING PRESSURE 175 PSI OR LESS, 300 LB. FLANGES SHALL BE USED IF WORKING PRESSURE OVER 175 PSI.
- 3.) REINFORCE MANWAY IN ACCORDANCE WITH AWWA M11 OR EQUAL, MANUFACTURER'S REINFORCING GUIDE.
- 4.) MANWAY STATIONS MAY BE VARIED IN ORDER TO LOCATE THE 24" DIA OPENING @ MIDPOINT IN INDIVIDUAL PIPE LENGTHS THUS PERMITTING THE MANUFACTURE OF A UNIVERSAL PIPE LENGTH.
- 5.) PAINT UNDERSIDE OF BLIND FLANGE WITH EPOXY PER SPECIFICATIONS.
- 6.) REINFORCEMENT PLATE DIMENSIONS FOR OUTLET JOINTS, TO BE DESIGNED PER AWWA M11, 13.3 - 13.6, OR EQUAL TO MANUFACTURERS R/F GUIDE.

HEX HEAD NUTS AND BOLTS IN ACCORDANCE WITH THE SPECIFICATIONS.



CROSS SECTION OF BOLT ASSEMBLY B-B

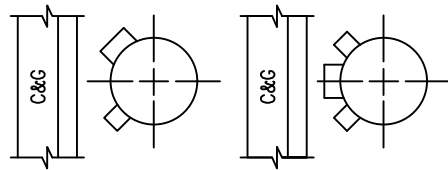
ID	FLANGE OD	BC	T	BOLT DIA	NO. BOLTS	PIPE SIZE
24"	32"	29 1/2"	1 1/4"	1 1/4"	20	24" TO 30"
30"	38 3/4"	36"	1 3/8"	1 1/4"	28	36" & LARGER



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

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OPERATIONS	R. GLENNEY	8/25/22

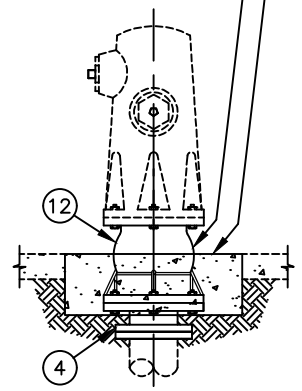
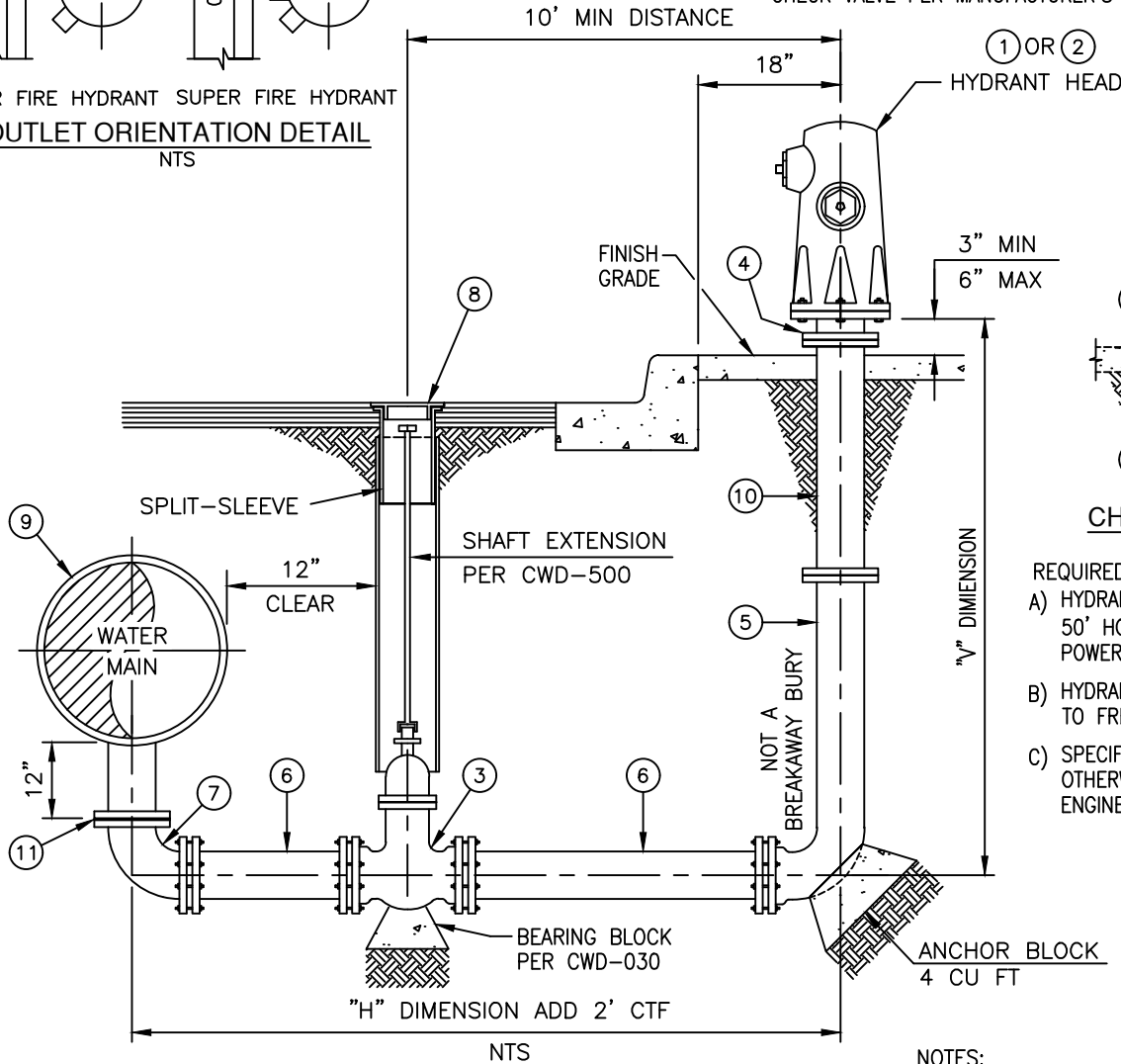
TYPICAL MANWAY FOR  
LARGE PIPELINES



REGULAR FIRE HYDRANT SUPER FIRE HYDRANT  
OUTLET ORIENTATION DETAIL  
NTS

8" THICK CONCRETE COLLAR, 1' FROM FH EDGE TO OUTSIDE EDGE.  
FINISH SURFACE SHALL BE BELOW CONNECTING BOLTS/NUTS.  
INSTALLATION MAY VARY PER MANUFACTURER'S RECOMMENDATIONS.

CHECK VALVE PER MANUFACTURER'S RECOMMENDATIONS.



CHECK VALVE DETAIL

- REQUIRED IF:
- A) HYDRANT HEAD IS LOCATED WITHIN 50' HORIZONTAL OF OVERHEAD POWER LINES;
  - B) HYDRANT HEAD IS ADJACENT TO FREEWAY;
  - C) SPECIFIED ON THE PLANS, OR AS OTHERWISE REQUIRED BY THE ENGINEER.

NOTES:

1. STANDARD OR SUPER HYDRANT PER PLANS AND SPECIFICATIONS.
2. HYDRANT PENTAGON SPANNER NUTS AND NOZZLE CAPS SHALL BE 1 3/4".
3. BREAK-OFF BOLTS REQUIRED BETWEEN HYDRANT AND FLANGE. INSTALL PER SPECIFICATIONS.
4. HYDRANT HEAD OUTLETS SHALL FACE STREET.
5. TOP OF HYDRANT HEAD BLOW-OFF TO BE PAINTED BLUE #315-15 BY FULLER O'BRIEN CO. OR DEPARTMENT APPROVED EQUAL.
6. "H" AND "V" DIMENSION AS SHOWN ON PLAN.
7. BREAKAWAY SPOOLS OR BURY ARE NOT ALLOWED.
8. FIRE HYDRANT VALVE SHALL BE A MINIMUM OF 10 FEET FROM HYDRANT. IF VALVE IS LESS THAN 10 FEET FROM HYDRANT, A CHECK VALVE IS REQUIRED.

BILL OF MATERIALS

ITEM	QUANTITY	REFERENCE
① STANDARD HYDRANT : 1 - 2 1/2", 1 - 4"	1	CWD-700
② SUPER HYDRANT : 2 - 2 1/2", 1 - 4"	1	CWD-700
③ 6" RW GATE VALVE (MJ x MJ)	1	CWD-500
④ 6" FLANGED ADAPTER, 8 HOLE TO 6 HOLE	1	
⑤ 6" x 48" DI BURY (FL x MJ)	1	
⑥ 6" DIP AS REQUIRED (W/ RESTRAINED MJ ADAPTERS)		
⑦ 6" DI 90° ELL (LONG RADIUS) (FL x MJ)	1	
⑧ 8" GATE BOX CAP, GALV SPLIT-SLEEVE, 12 GA STL PIPE	1	CWD-515
⑨ 6" FLANGED TEE OR 6" FLANGED OUTLET	1	
⑩ 6" x VARIABLE, DIP SPOOL, NON BREAKAWAY, (FL x FL)	1	
⑪ 6" FLANGE INSULATION KIT	1	
⑫ AVK FLOWGUARD II BREAK-OFF CHECK VALVE, OR APPROVED EQUAL.	1	

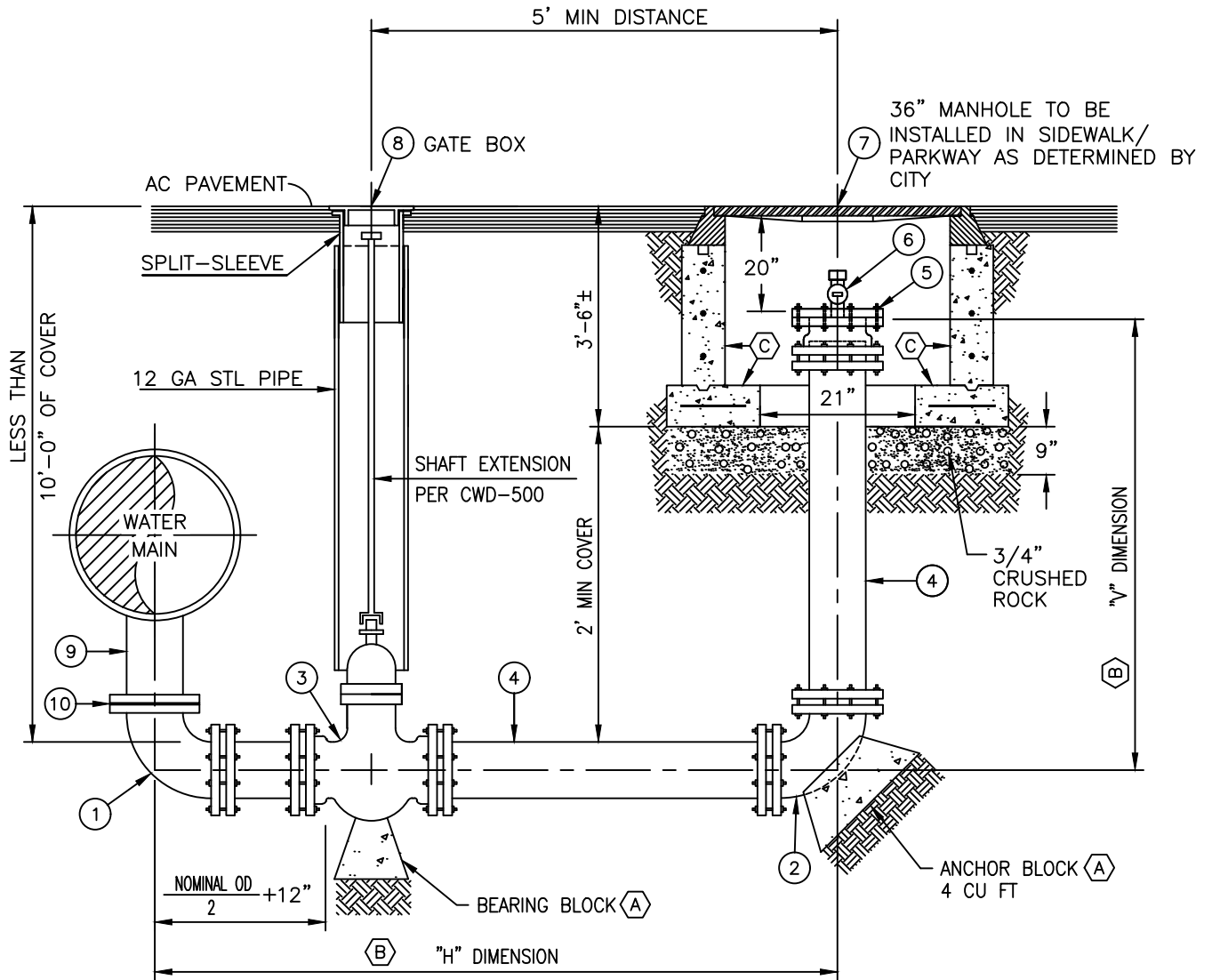
APPROVALS

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6" HYDRANT HEAD BLOW-OFF DI BURY  
24" MAIN AND SMALLER



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS



BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
① 8" DI 90° ELL (LONG RADIUS) (FL x MJ)	2	
② 8" DI 90° ELL (LONG RADIUS) (MJ x MJ)	1	CWD-500
③ 8" RW GATE VALVE (MJ x MJ)		
④ 8" DIP AS REQUIRED (W/ RESTRAINED MJ ADAPTERS)	VARIES	
⑤ 8" FLG x MJ ADARTOR W/ 8" BLIND FLG & 1" TAP, (NPT)	1	
⑥ 1" BALL CORP STOP (MNPT x MNPT) & 1" BRASS CAP		
⑦ 36" MANHOLE COVER & RIM 36" ID CONC MANHOLE SECTION		CWD-811
⑧ 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515
⑨ 8" FLANGED OUTLET		CWD-300
⑩ 8" FLANGE INSULATION KIT	1	

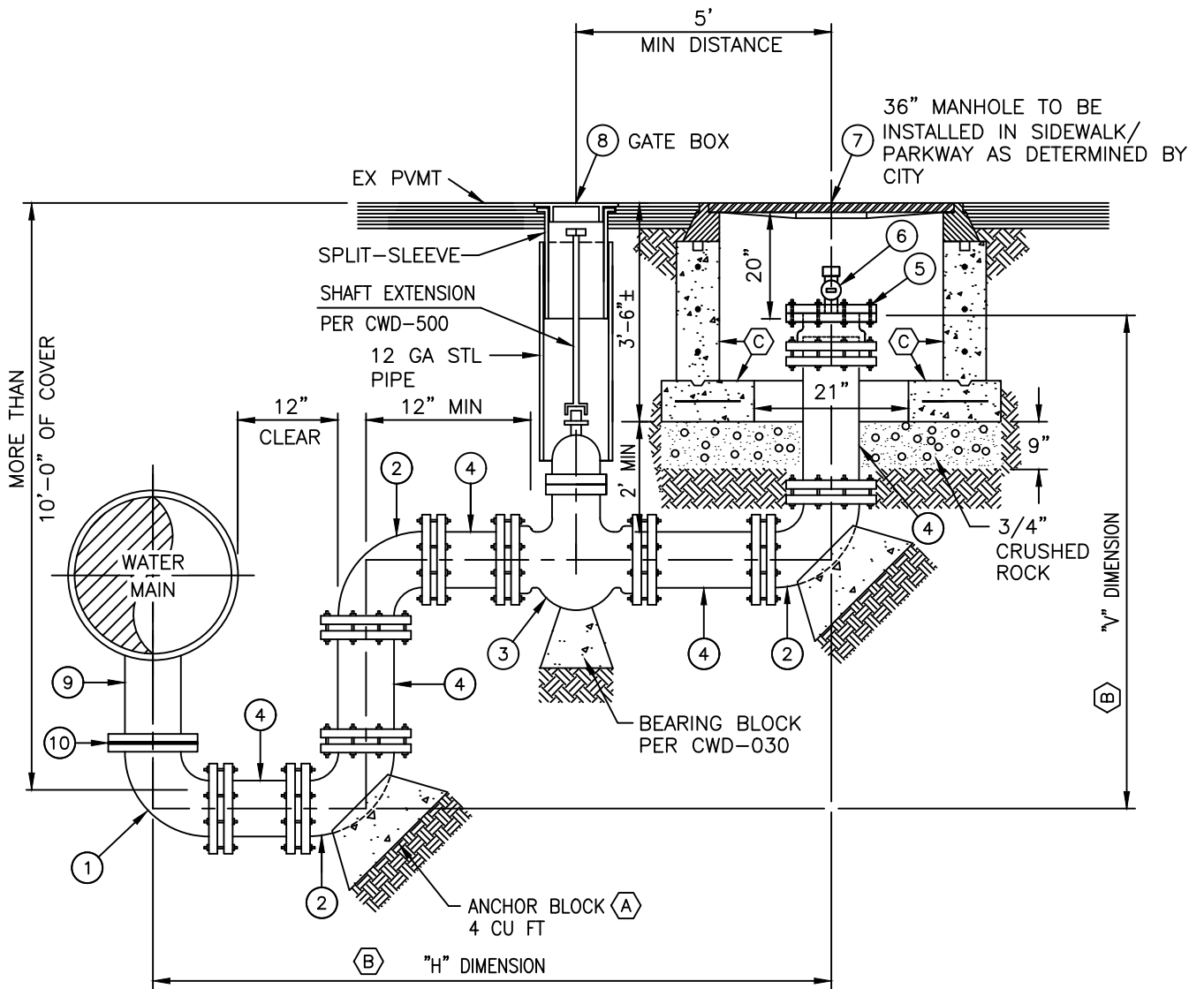
- NOTES:**
- (A) ANCHOR AND BEARING BLOCKS PER CWD-030
  - (B) STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS
  - (C) PRECAST CONCRETE BASE & SHAFT ONLY. GRADE RINGS NOT PERMITTED.

APPROVALS		
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**8" BLOW-OFF / PUMPER OUTLET  
BELOW GRADE  
WITH LESS THAN 10' OF COVER**



BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
① 8" DI 90° ELL (LONG RADIUS) (FL x MJ)	2	
② 8" DI 90° ELL (LONG RADIUS) (MJ x MJ)	1	CWD-500
③ 8" RW GATE VALVE (MJ x MJ)		
④ 8" DIP AS REQUIRED (W/ RESTRAINED MJ ADAPTERS)	VARIABLES	
⑤ 8" FLG x MJ ADARTOR W/ 8" BLIND FLG & 1" TAP, (NPT)	1	
⑥ 1" BALL CORP STOP (MNPT x MNPT) & 1" BRASS CAP		
⑦ 36" MANHOLE COVER & RIM 36" ID CONC MANHOLE SECTION		CWD-811
⑧ 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515
⑨ 8" FLANGED OUTLET		CWD-300
⑩ 8" FLANGE INSULATION KIT		

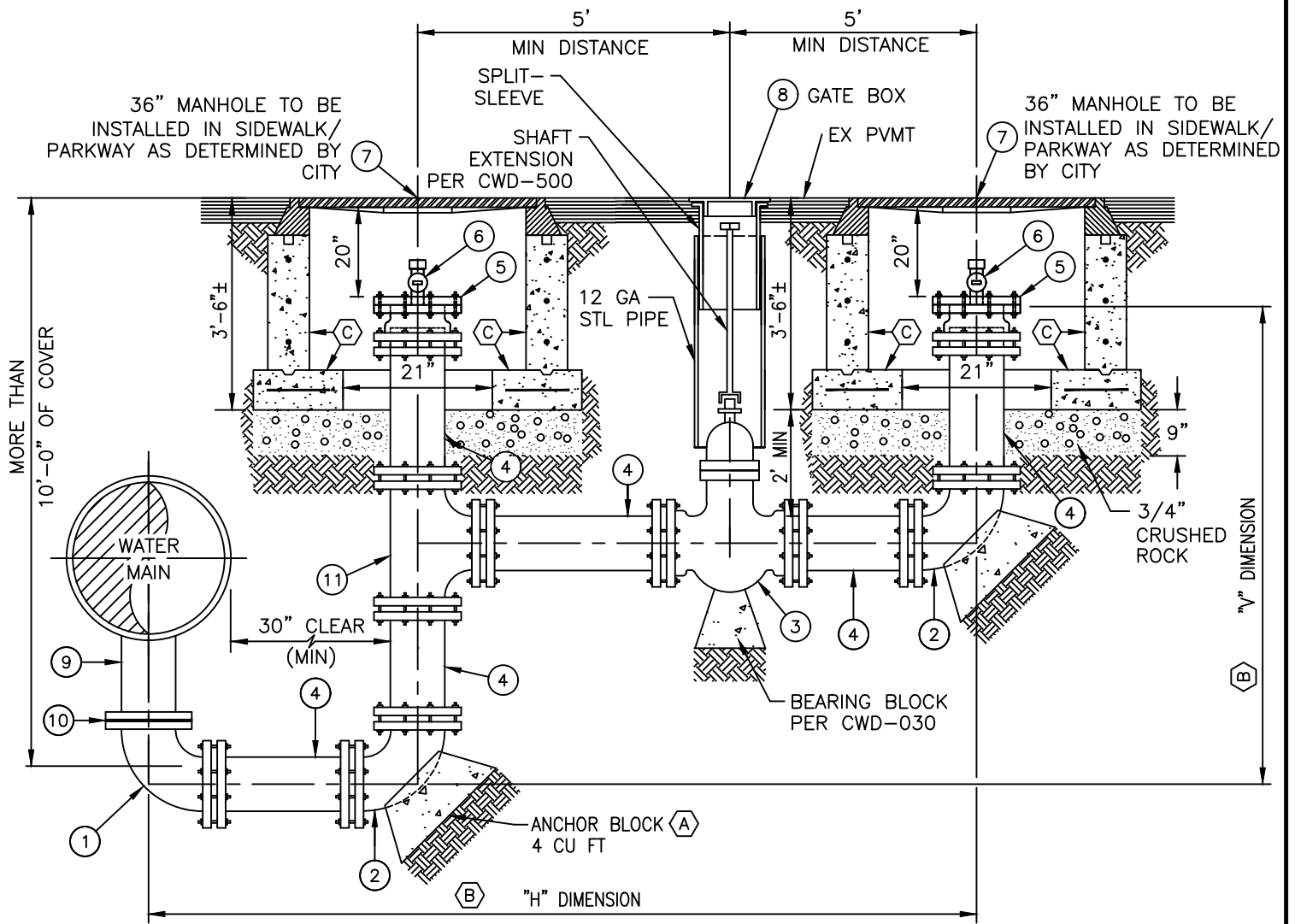
- NOTES:**
- Ⓐ ANCHOR AND BEARING BLOCKS PER CWD-030
  - Ⓑ STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS
  - Ⓒ PRECAST CONCRETE BASE & SHAFT ONLY. GRADE RINGS NOT PERMITTED.

APPROVALS		
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**8" BLOW-OFF BELOW GRADE  
WITH MORE THAN 10' OF COVER**



BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
① 8" DI 90° ELL (LONG RADIUS) (FL x MJ)	1	
② 8" DI 90° ELL (LONG RADIUS) (MJ x MJ)	2	
③ 8" RW GATE VALVE (MJ x MJ)	1	CWD-500
④ 8" DIP AS REQUIRED (W/ RESTRAINED MJ ADAPTERS)	VARIABLES	
⑤ 8" FLG x MJ ADARTOR W/ 8" BLIND FLG & 1" TAP, (NPT)	2	
⑥ 1" BALL CORP STOP (MNPT x MNPT) & 1" BRASS CAP	2	
⑦ 36" MANHOLE COVER & RIM 36" ID CONC MANHOLE SECTION	2	CWD-811
⑧ 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515
⑨ 8" FLANGED OUTLET	1	CWD-300
⑩ 8" FLANGE INSULATION KIT	1	
⑪ 8" DI TEE (MJ x MJ x MJ)	1	

**NOTES:**

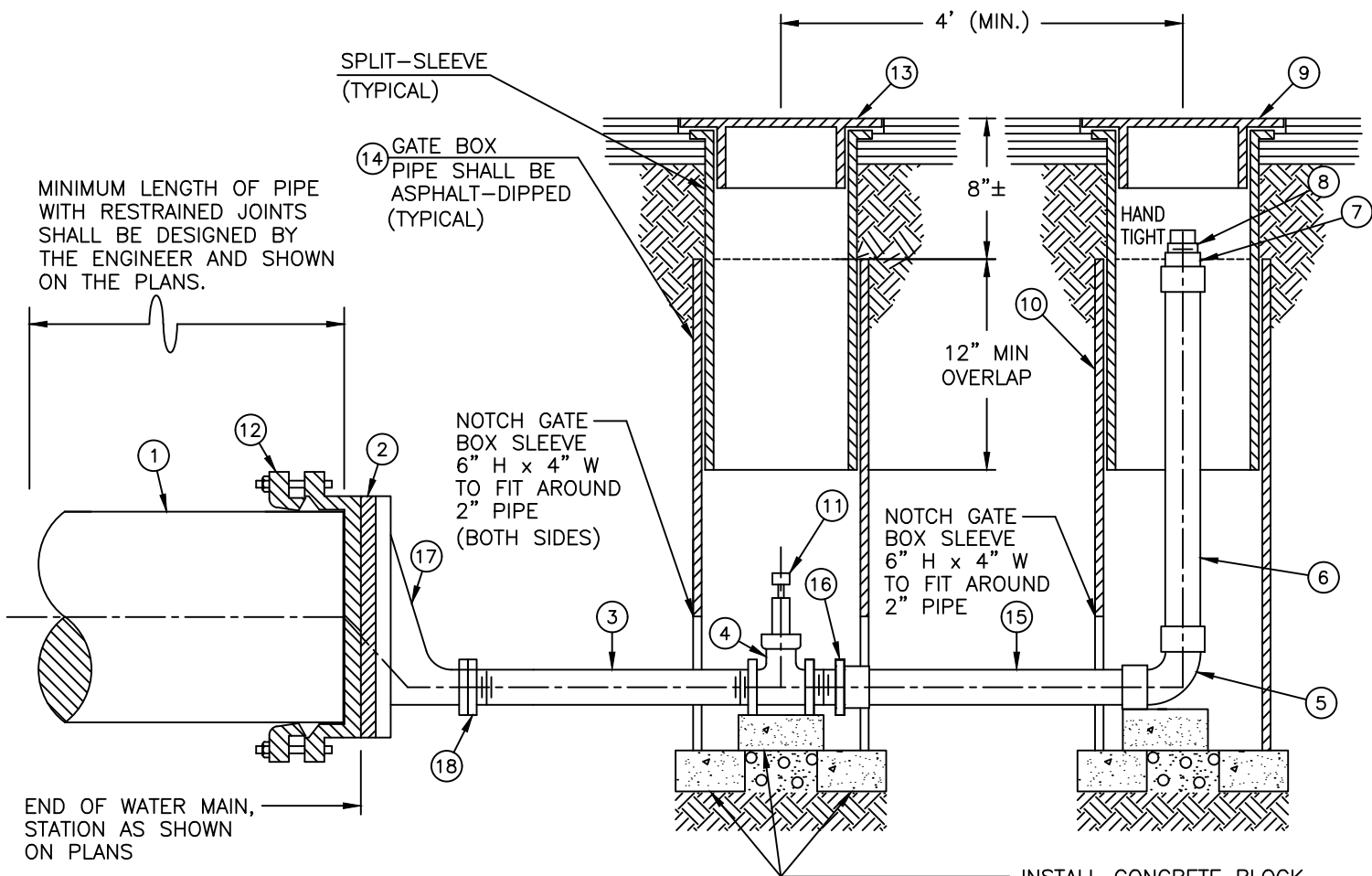
- Ⓐ ANCHOR AND BEARING BLOCKS PER CWD-030
- Ⓑ STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS
- Ⓒ PRECAST CONCRETE BASE & SHAFT ONLY. GRADE RINGS NOT PERMITTED.

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**8" BLOW-OFF / PUMPER OUTLET  
BELOW GRADE  
WITH MORE THAN 10' OF COVER**



MINIMUM LENGTH OF PIPE WITH RESTRAINED JOINTS SHALL BE DESIGNED BY THE ENGINEER AND SHOWN ON THE PLANS.

SPLIT-SLEEVE (TYPICAL)

14 GATE BOX PIPE SHALL BE ASPHALT-DIPPED (TYPICAL)

NOTCH GATE BOX SLEEVE 6" H x 4" W TO FIT AROUND 2" PIPE (BOTH SIDES)

NOTCH GATE BOX SLEEVE 6" H x 4" W TO FIT AROUND 2" PIPE

END OF WATER MAIN, STATION AS SHOWN ON PLANS

INSTALL CONCRETE BLOCK AROUND CIRCUMFERENCE OF GATE BOX PIPE WITH 3/4" CRUSHED ROCK IN CENTER. SUPPORT VALVE WITH CONC BLOCK. (TYPICAL)

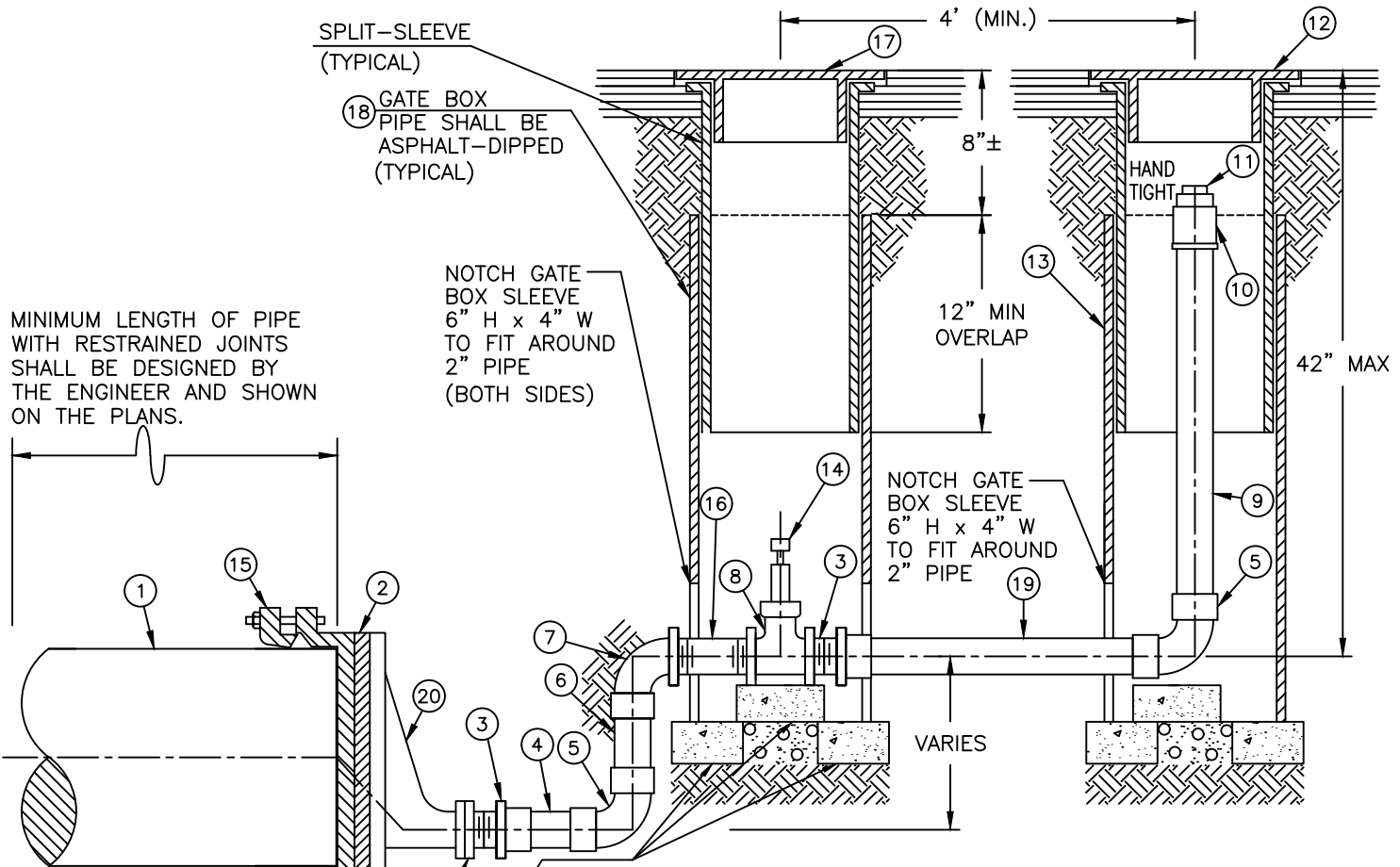
BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
1 4" THROUGH 12" MAIN	1	PER PLAN
2 ADAPTER FLANGE (MJ x FL)	1	PER PLAN
3 2" x 12" BRASS NIPPLE	1	
4 2" RW FULL BODY GATE VALVE, (FNPT)	1	
5 2" 90° ELL (SW x SW)	1	
6 2" x 30"± COPPER PIPE, HARD, NO JOINTS	VARIES	
7 2" ADAPTER (SW x FNPT)	1	
8 2" BRASS PLUG, (MNPT)	1	
9 10" GATE BOX CAP AND SPLIT-SLEEVE	1	CWD-515
10 10" DIA, 12 GA, STEEL PIPE	VARIES	
11 2" SQUARE OPERATOR NUT	1	
12 MAIN SIZE GRIP RING KIT	1	
13 8" GATE BOX CAP AND SPLIT-SLEEVE	1	CWD-515
14 8" DIA, 12 GA, STEEL PIPE	VARIES	
15 2" x 48"± COPPER PIPE, HARD, NO JOINTS	VARIES	
16 2" ADAPTER (SW x MNPT)	1	
17 ECCENTRIC REDUCER (FL x FL)	1	
18 4" x 2" ADAPTER (FL x FNPT)	1	

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WATER DISTRIBUTION & TRANSMISSION PIPELINE CONSTRUCTION METHODS

TYPICAL 2" BLOW-OFF ASSEMBLY FOR MAINS WITH LESS THAN 42" OF COVER



MINIMUM LENGTH OF PIPE WITH RESTRAINED JOINTS SHALL BE DESIGNED BY THE ENGINEER AND SHOWN ON THE PLANS.

SPLIT-SLEEVE (TYPICAL)  
 (18) GATE BOX PIPE SHALL BE ASPHALT-DIPPED (TYPICAL)

NOTCH GATE BOX SLEEVE 6" H x 4" W TO FIT AROUND 2" PIPE (BOTH SIDES)

NOTCH GATE BOX SLEEVE 6" H x 4" W TO FIT AROUND 2" PIPE

END OF WATER MAIN, STATION AS SHOWN.

INSTALL CONCRETE BLOCK AROUND CIRCUMFERENCE OF GATE BOX PIPE WITH 3/4" CRUSHED ROCK IN CENTER. SUPPORT VALVE WITH CONCRETE BLOCK (TYP).

BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
(1) 4" THROUGH 12" MAIN	1	PER PLAN
(2) ADAPTER FLANGE (MJ x FL)	1	PER PLAN
(3) 2" ADAPTER (MNPT x SW)	2	
(4) 2" x 12" COPPER PIPE, SOFT	1	
(5) 2" 90° ELL (SW x SW)	2	
(6) 2" COPPER PIPE, HARD DRAWN	VARIES	
(7) 2" 90° BRASS ELL (MNPT x SW)	1	
(8) 2" RW FULL BODY GATE VALVE, (FNPT)	1	
(9) 2" COPPER PIPE, HARD (NO JOINTS)	VARIES	
(10) 2" ADAPTER (SW x FNPT)	1	
(11) 2" BRASS PLUG (MNPT)	1	
(12) 10" GATE BOX CAP AND SPLIT-SLEEVE	1	CWD-515
(13) 10" DIA STEEL SLEEVE (VARIES)	VARIES	
(14) 2" SQUARE OPERATOR NUT	1	SUPPLIED BY CITY
(15) MAIN SIZE GRIP RING KIT	1	
(16) 2" x 6" BRASS NIPPLE	1	
(17) 8" GATE BOX CAP AND SPLIT-SLEEVE	1	
(18) 8" DIA STEEL SLEEVE (VARIES)	1	
(19) 2" x 48"± COPPER PIPE, HARD, NO JOINTS	VARIES	
(20) ECCENTRIC REDUCER (FL x FL)	1	
(21) 4" x 2" ADAPTER (FL x FNPT)	1	

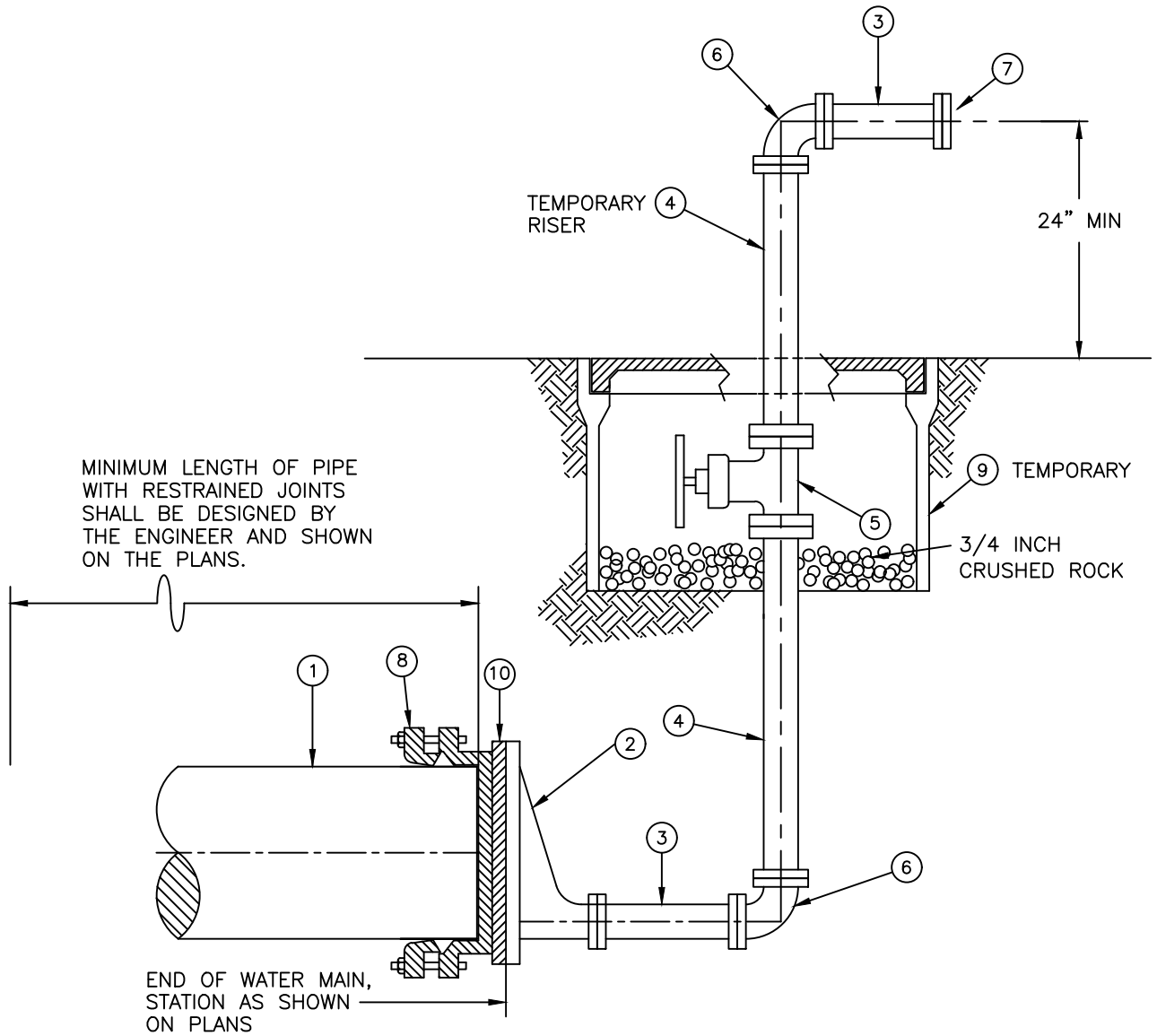
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WATER  
 DISTRIBUTION & TRANSMISSION  
 PIPELINE CONSTRUCTION METHODS

TYPICAL 2" BLOW-OFF ASSEMBLY  
 FOR MAINS WITH MORE THAN  
 42" OF COVER







BILL OF MATERIALS	
ITEM	QUANTITY
① 4" - 10" WATER MAIN	PER PLAN
② ECCENTRIC REDUCER (FL x FL)	1
③ 4" x 12" FLANGED STEEL PIPE	2
④ 4" FLANGED STEEL PIPE	VARIES
⑤ 4" VALVE (FL x FL)	1
⑥ 4" 90° STEEL ELL (FL x FL)	2
⑦ 4" BLIND FLANGE	1
⑧ MAIN SIZE GRIP RING KIT	1
⑨ METER BOX (TRAFFIC RATED BOX & LID)	1
⑩ ADAPTER FLANGE (MJ x FL)	1

**NOTES:**

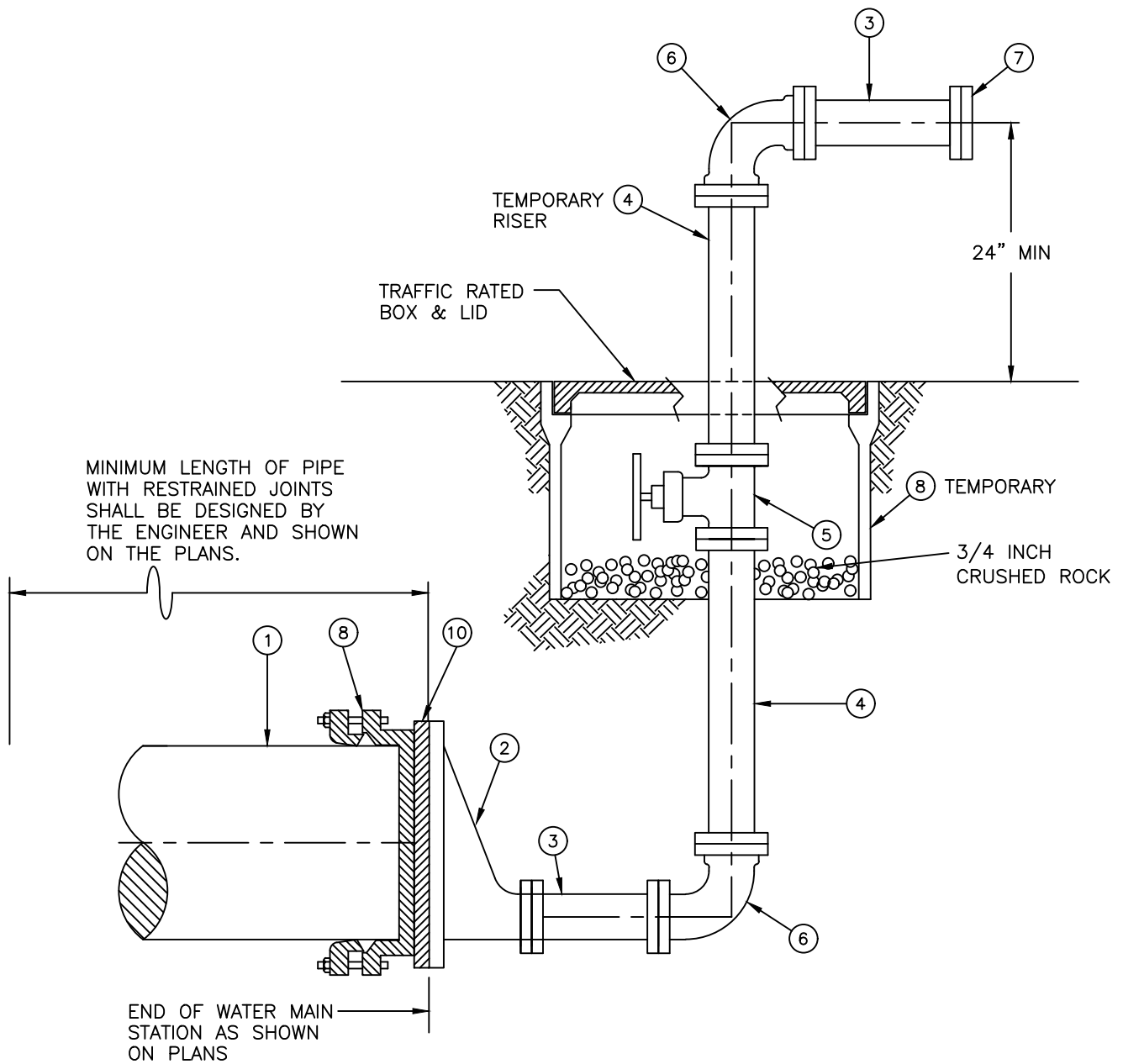
- 1.) CONTRACTOR SHALL LEAVE END CAP IN PLACE UNTIL FINAL CONNECTION BY CITY FORCES

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**4" THROUGH 10" TEMPORARY  
CONSTRUCTION END CAP FOR  
FLUSHING, TESTING, & CHLORINATION**



BILL OF MATERIALS	
ITEM	QUANTITY
① 12" - 20" WATER MAIN	PER PLAN
② ECCENTRIC REDUCER (FL x FL)	1
③ 6" x 12" FLANGED STEEL PIPE	2
④ 6" FLANGED STEEL PIPE	VARIES
⑤ 6" VALVE (FL x FL)	1
⑥ 6" 90° STEEL ELL (FL x FL)	2
⑦ 6" BLIND FLANGE	1
⑧ MAIN SIZE GRIP RING KIT	1
⑨ METER BOX (TRAFFIC RATED BOX & LID)	1
⑩ ADAPTER FLANGE (MJ x FL)	1

**NOTES:**

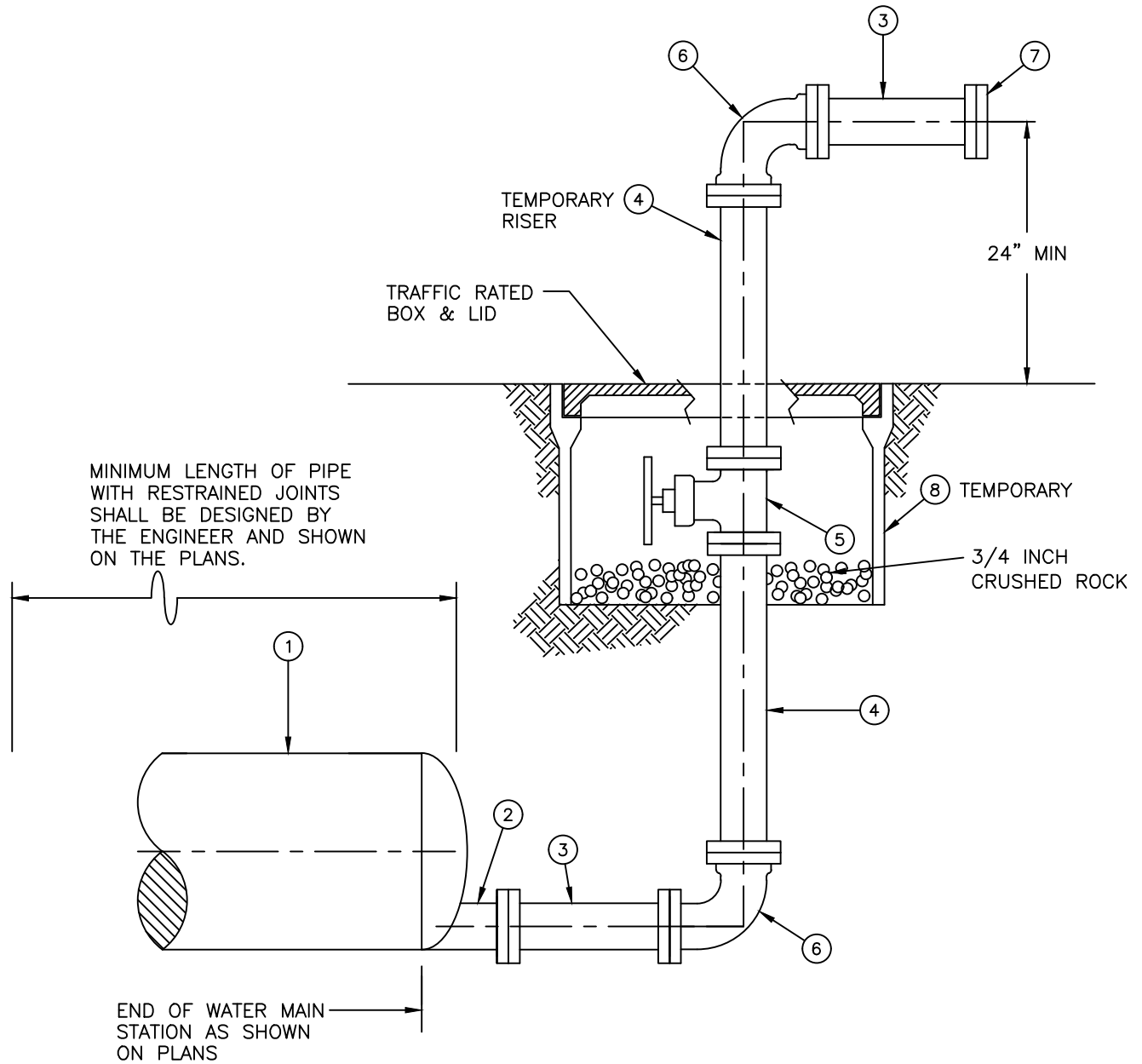
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**12" THROUGH 20" DI TEMPORARY  
CONSTRUCTION END CAP FOR  
FLUSHING, TESTING, & CHLORINATION**



BILL OF MATERIALS	
ITEM	QUANTITY
① 16" - 54" WATER MAIN	PER PLAN
② 6" FLANGED OUTLET PER CWD 300	1
③ 6" x 12" FLANGED STEEL PIPE	2
④ 6" FLANGED STEEL PIPE	VARIES
⑤ 6" VALVE (FL x FL)	1
⑥ 6" 90° STEEL ELL (FL x FL)	2
⑦ 6" BLIND FLANGE	1
⑧ METER BOX (TRAFFIC RATED BOX & LID)	1

**NOTES:**

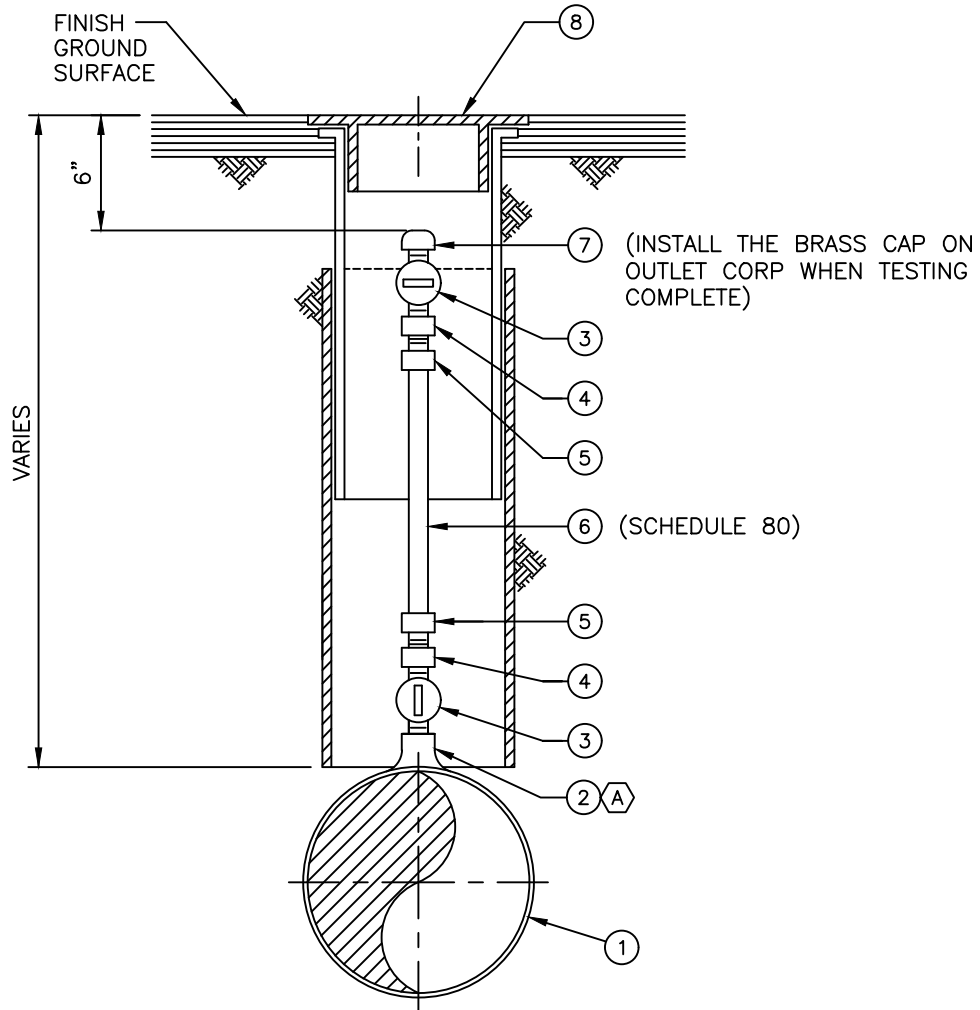
- 1.) CONTRACTOR SHALL LEAVE END CAP IN PLACE UNTIL FINAL CONNECTION BY CITY FORCES

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**16" THROUGH 54" CML&C STEEL  
TEMPORARY CONSTRUCTION END CAP  
FOR FLUSHING, TESTING, & CHLORINATION**



BILL OF MATERIALS		
	QUANTITY	REF
① CML&C STEEL OR DIP WATER MAIN	PER PLAN	
② 1" THREADED OUTLET	1	CWD-340
③ 1" BALL CORP STOP (MNPT x MNPT)	2	
④ 1" GALV STEEL COUPLING	2	
⑤ 1" PVC ADAPTER	2	
⑥ 1" PVC PIPE	VARIES	
⑦ 1" BRASS CAP	1	
⑧ 10" GATE BOX AND SPLIT-SLEEVE	1	CWD-515

**NOTES:**

- 1.) CONTRACTOR SHALL REMOVE VALVE BOX, CLOSE AND CAP 1" BALL CORP STOP AND REMOVE PVC RISER FOLLOWING ACCEPTANCE OF THE TRANSMISSION MAIN.
  - 2.) STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS.
- Ⓐ DOUBLE-STRAP SERVICE SADDLES SHALL BE USED ON ALL DIP CONNECTIONS

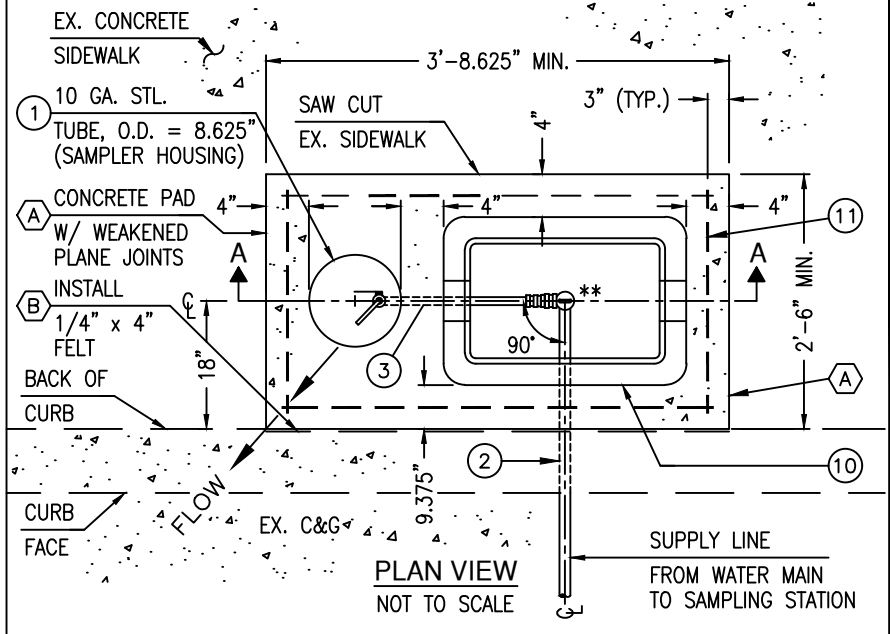
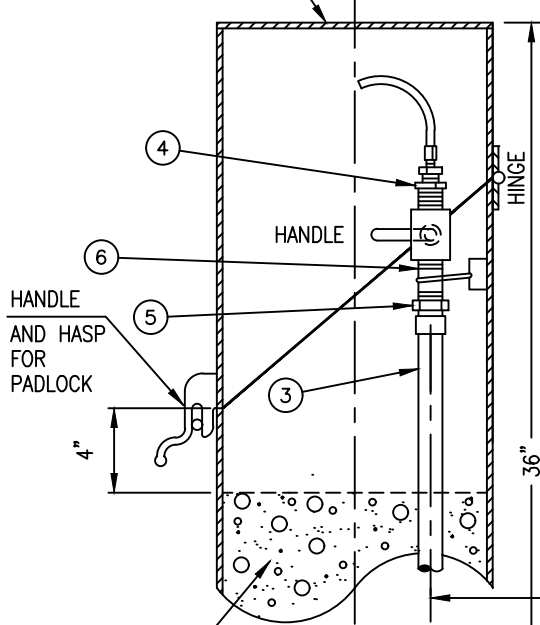
APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TEMPORARY  
WATER SAMPLER**

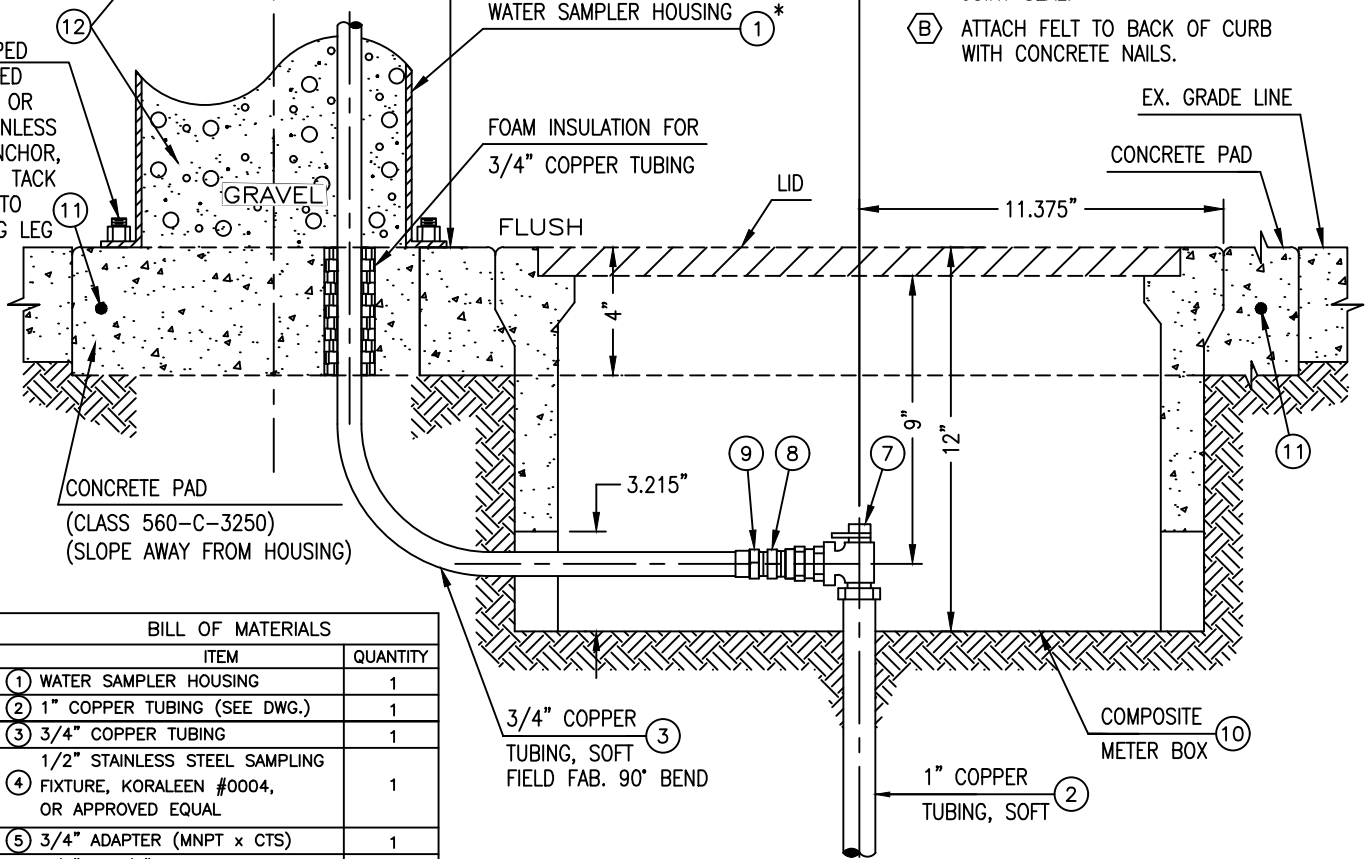
180° OPENING LID



PLAN VIEW  
NOT TO SCALE

- (A) APPLY "CONCRETE GLUE" TO EX. CUT CONCRETE TO PROVIDE ADHESION AND JOINT SEAL.
- (B) ATTACH FELT TO BACK OF CURB WITH CONCRETE NAILS.

HOT DIPPED GALVANIZED WEDGED, OR 316 STAINLESS STEEL ANCHOR, & BOLTS TACK WELDED TO MOUNTING LEG



SECTION A-A  
NOT TO SCALE

- \* SAMPLER HOUSING SHALL BE FUSION EPOXY COLOR COATED "SAFETY BLUE" INSIDE AND OUT.
- \*\* 90° DEFLECTION AT METER STOP REQUIRED ONLY FOR SAMPLERS LOCATED AT CURB FACE OR EDGE OF PAVEMENT.

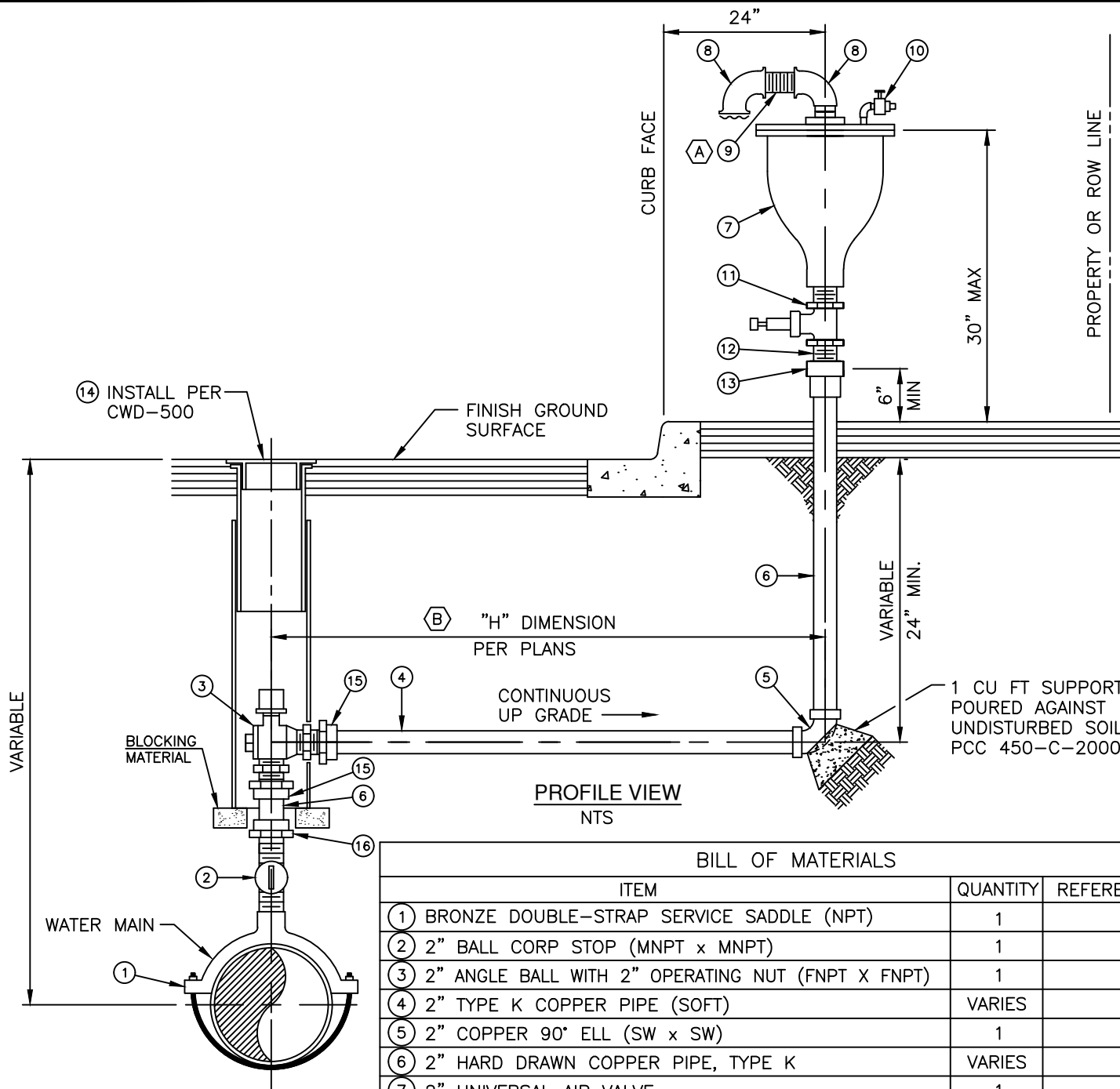
BILL OF MATERIALS	
ITEM	QUANTITY
(1) WATER SAMPLER HOUSING	1
(2) 1" COPPER TUBING (SEE DWG.)	1
(3) 3/4" COPPER TUBING	1
1/2" STAINLESS STEEL SAMPLING FIXTURE, KORALEEN #0004, OR APPROVED EQUAL	1
(5) 3/4" ADAPTER (MNPT x CTS)	1
3/4" x 1/2" BUSHING & 1/2" BRASS NIPPLE	1
(7) 1" ANGLE METER STOP	1
(8) 1" x 3/4" METER ADAPTER	1
(9) 3/4" ADAPTER (MNPT x SW)	1
(10) METER BOX, PER SPECIFICATIONS	1
(11) NO. 3 REBAR	1
(12) 3/4" CRUSHED ROCK	0.75 FT <sup>3</sup>

APPROVALS		
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CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

WATER QUALITY  
SAMPLING STATION



**NOTES:**

- (A) A 1/8" SQ MESH GALVANIZED SCREEN SHALL BE EPOXIED FLAT INTO OPEN ST ELL.
- (B) STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS.
- (C) DOUBLE-STRAP SERVICE SADDLES SHALL BE USED ON ALL DIP CONNECTIONS.

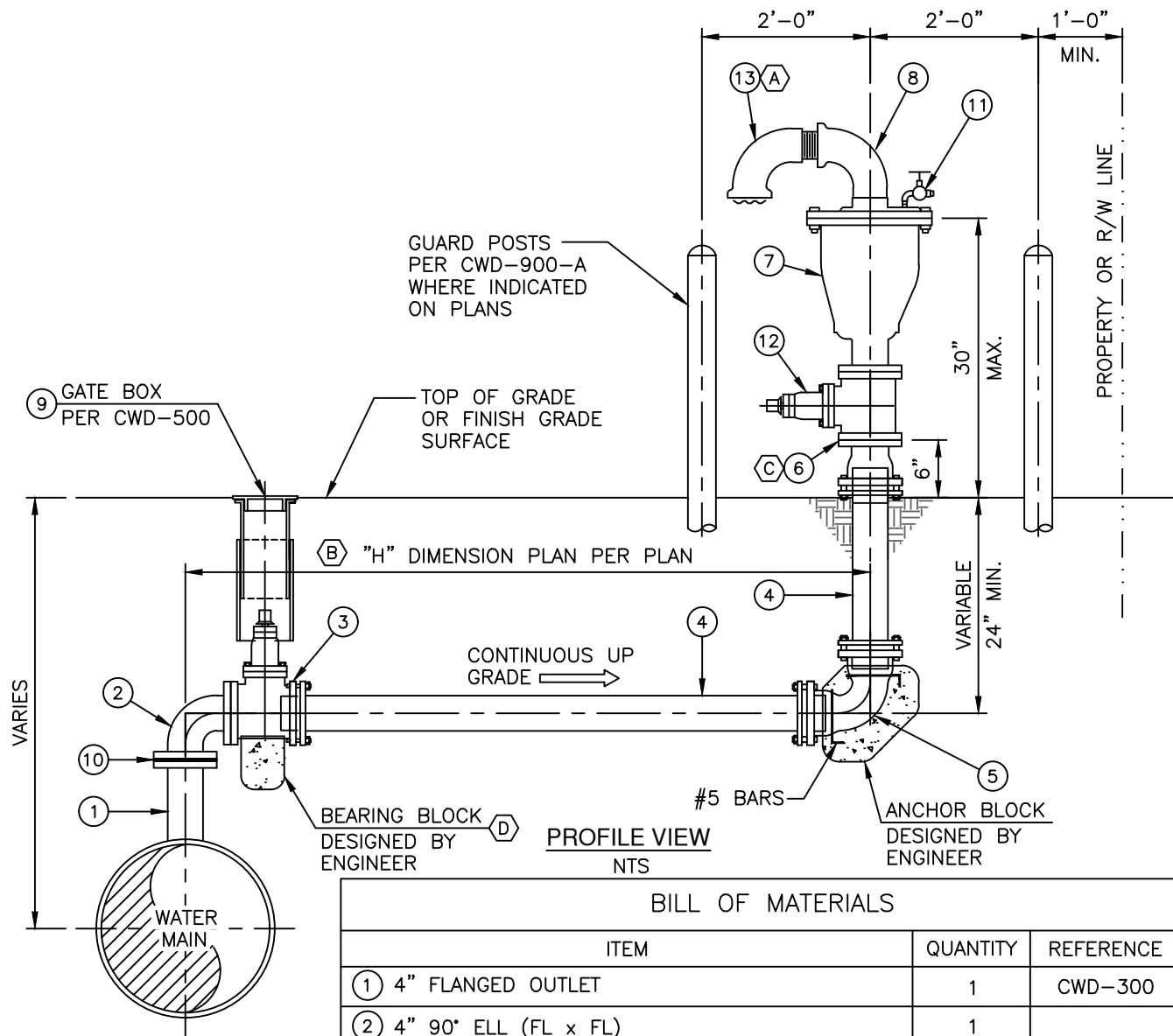
BILL OF MATERIALS			
ITEM	QUANTITY	REFERENCE	
(1) BRONZE DOUBLE-STRAP SERVICE SADDLE (NPT)	1		
(2) 2" BALL CORP STOP (MNPT x MNPT)	1		
(3) 2" ANGLE BALL WITH 2" OPERATING NUT (FNPT x FNPT)	1		
(4) 2" TYPE K COPPER PIPE (SOFT)	VARIES		
(5) 2" COPPER 90° ELL (SW x SW)	1		
(6) 2" HARD DRAWN COPPER PIPE, TYPE K	VARIES		
(7) 2" UNIVERSAL AIR VALVE	1		
(8) 2" GALVANIZED STREET ELL	2		
(9) 2"Ø x 3" CLOSE NIPPLE	1		
(10) 1/4" BRASS GATE VALVE, 1/4" BRASS PLUG, 1/4" x 2" BRASS NIPPLE, 1/4" BRASS STREET ELL	1 EA		
(11) 2" TEMP GATE VALVE & NIPPLE FOR FLUSHING & SAMPLING			
(12) 2"Ø x 6" NIPPLE	1 EA		
(13) 2" BRONZE ADAPTER (SW x IPF)	1 EA		
(14) 8" GATE VALVE CAP, GALV SPLIT SLEEVE, & 12 GA STL PIPE	1 EA	CWD-500	
(15) 2" ADAPTER (MNPT x SW)	2 EA		
(16) 2" ADAPTER (FNPT x SW)	1 EA		

APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL 2" AIR VALVE  
INSTALLATION**



**NOTES:**

- (A) A 1/8" SQ. MESH, GALVANIZED SCREEN SHALL BE EPOXIED INTO OPEN STREET ELL.
- (B) STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS.
- (C) BREAK-OFF BOLTS, CADMIUM-PLATED OR GALVANIZED. INSTALL WITH NUT ON TOP AND COUNTER-BORE, PACKED WITH SILICONE.
- (D) BEARING BLOCK SHALL NOT REST ON MAIN AND SHALL BE NOTCHED ON BOTH SIDES PER CWD-500

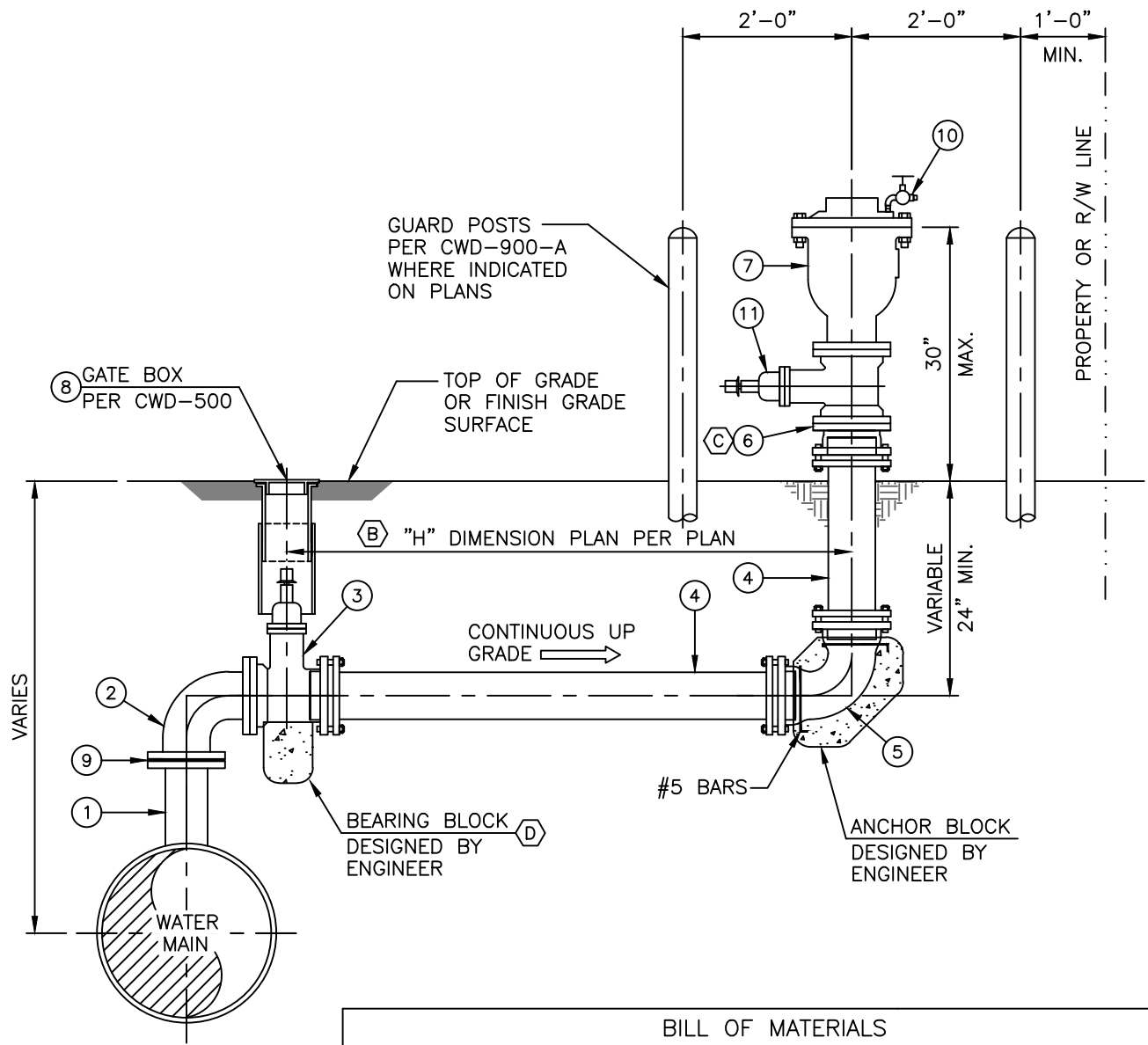
BILL OF MATERIALS			
ITEM	QUANTITY	REFERENCE	
(1) 4" FLANGED OUTLET	1	CWD-300	
(2) 4" 90° ELL (FL x FL)	1		
(3) 4" RW GATE VALVE (FL x MJ)	1		
(4) 4" DUCTILE IRON PIPE, PRESSURE CLASS 350	VARIABLE		
(5) 4" 90° ELL (MJ x MJ)	1		
(6) 4" ADAPTER (FL x MJ)	1		
(7) 4" UNIVERSAL AIR VALVE	1		
(8) 4" 90° GALV STREET ELL	1		
(9) 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-500	
(10) FLANGE INSULATION KIT AS REQUIRED PER SPECIFICATIONS	1		
(11) 1/2" BRASS GV 1/2" x 2" BRASS NIPPLE, 1/2" BRASS STREET ELL, & 1/2" BRASS PLUG	1		
(12) 4" TEMP GATE VALVE AND NIPPLE FOR FLUSHING AND SAMPLING	1		
(13) 4" 90° GALV ELL W/ NIPPLE	1		

APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL 4" AIR VALVE  
INSTALLATION**



**NOTES:**

- (A) A 1/8" SQ. MESH, GALVANIZED SCREEN, SHALL BE EPOXIED INTO OPEN STREET ELL.
- (B) STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS.
- (C) BREAK-OFF BOLTS, CADMIUM-PLATED OR GALVANIZED. INSTALL WITH NUT ON TOP AND COUNTER-BORE, PACKED WITH SILICONE.
- (D) BEARING BLOCK SHALL NOT REST ON MAIN AND SHALL BE NOTCHED ON BOTH SIDES PER CWD-500

BILL OF MATERIALS			
ITEM	QUANTITY	REFERENCE	
(1) 6" FLANGED OUTLET	1	CWD-300	
(2) 6" 90° ELL (FL x FL)	1		
(3) 6" RW GATE VALVE (FL x MJ)	1	CWD-500	
(4) 6" DUCTILE IRON PIPE, PRESSURE CLASS 350	VARIABLE		
(5) 6" 90° ELL (MJ x MJ)	1		
(6) 6" ADAPTER (FL X MJ)	1		
(7) 6" COMBINATION AIR VALVE, PER SPEC	1		
(8) 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515	
(9) FLANGE INSULATION KIT AS REQUIRED PER SPECIFICATIONS	1		
(10) 1/2" BRASS GV, 1/2" x 2" BRASS NIPPLE, 1/2" BRASS STREET ELL, 1/2" BRASS PLUG	1 EA		
(11) 6" TEMP GATE VALVE AND NIPPLE FOR FLUSHING AND SAMPLING	1		

**APPROVALS**

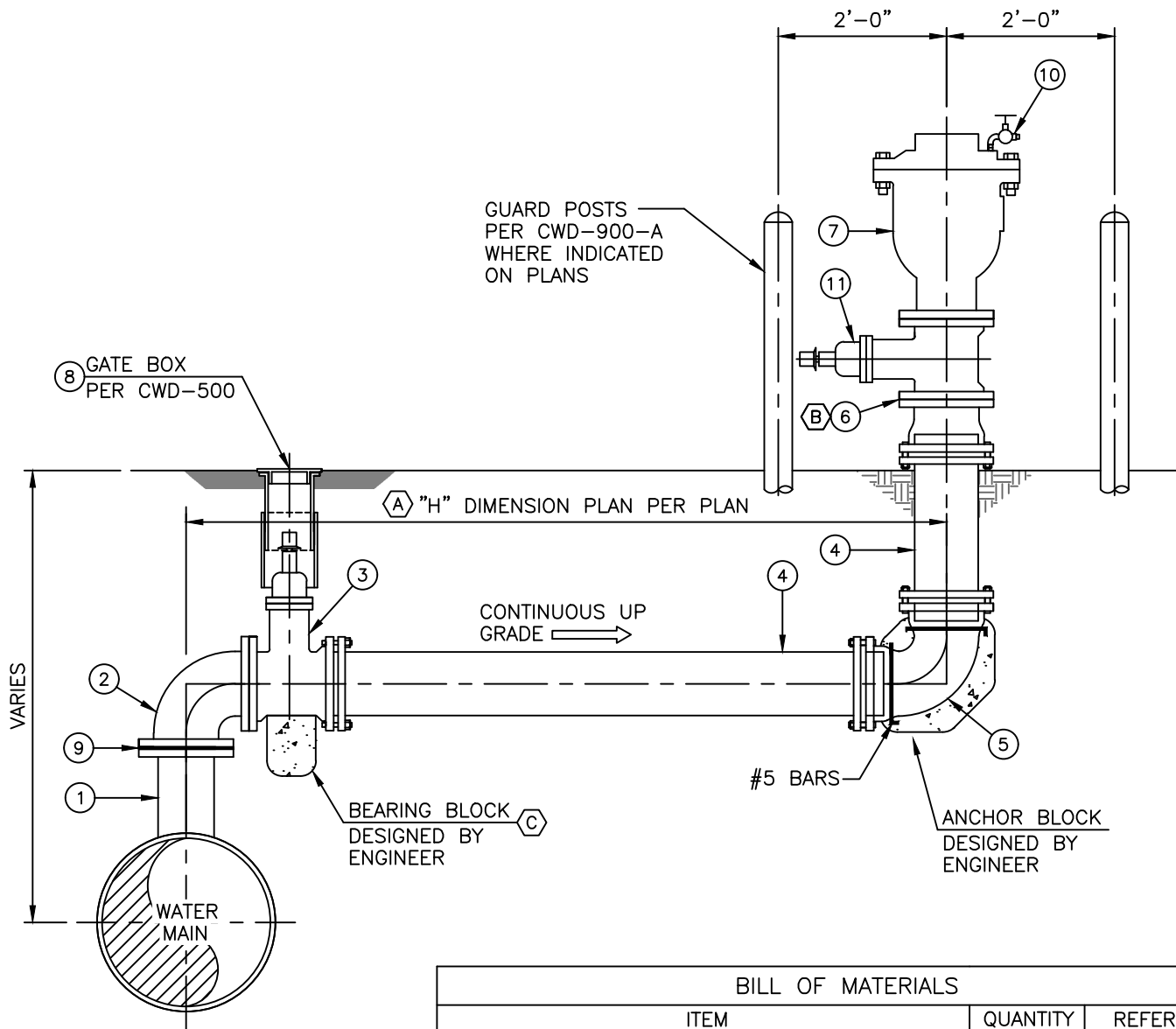
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL 6" AIR VALVE  
INSTALLATION**





GUARD POSTS  
PER CWD-900-A  
WHERE INDICATED  
ON PLANS

8 GATE BOX  
PER CWD-500

A "H" DIMENSION PLAN PER PLAN

CONTINUOUS UP  
GRADE →

VARIABLE

BEARING BLOCK  
DESIGNED BY  
ENGINEER

#5 BARS

ANCHOR BLOCK  
DESIGNED BY  
ENGINEER

WATER  
MAIN

### BILL OF MATERIALS

ITEM	QUANTITY	REFERENCE
1 8" FLANGED OUTLET	1	CWD-300
2 8" 90° ELL (FL x FL)	1	
3 8" RW GATE VALVE (FL x MJ)	1	CWD-500
4 8" DUCTILE IRON PIPE, PRESSURE CLASS 350	VARIABLE	
5 8" 90° ELL (MJ x MJ)	1	
6 8" ADAPTER (FL x MJ)	2	
7 8" COMBINATION AIR VALVE, PER SPEC	1	
8 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515
9 FLANGE INSULATION KIT AS REQUIRED PER SPECIFICATIONS	1	
10 1/2" BRASS GV, 1/2" x 2" BRASS NIPPLE, 1/2" BRASS STREET ELL, 1/2" BRASS PLUG	1 EA	
11 8" TEMP GATE VALVE AND NIPPLE FOR FLUSHING AND SAMPLING	1	

#### NOTES:

- A STATION, LOCATION, AND SPECIAL NOTES PER PLAN AND PROFILE SHEETS.
- B BREAK-OFF BOLTS, CADMIUM-PLATED OR GALVANIZED. INSTALL WITH NUT ON TOP AND COUNTER-BORE, PACKED WITH SILICONE.
- C BEARING BLOCK SHALL NOT REST ON MAIN AND SHALL BE NOTCHED ON BOTH SIDES PER CWD-500

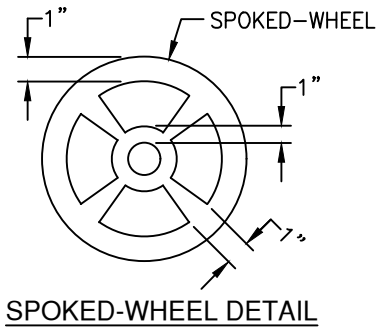
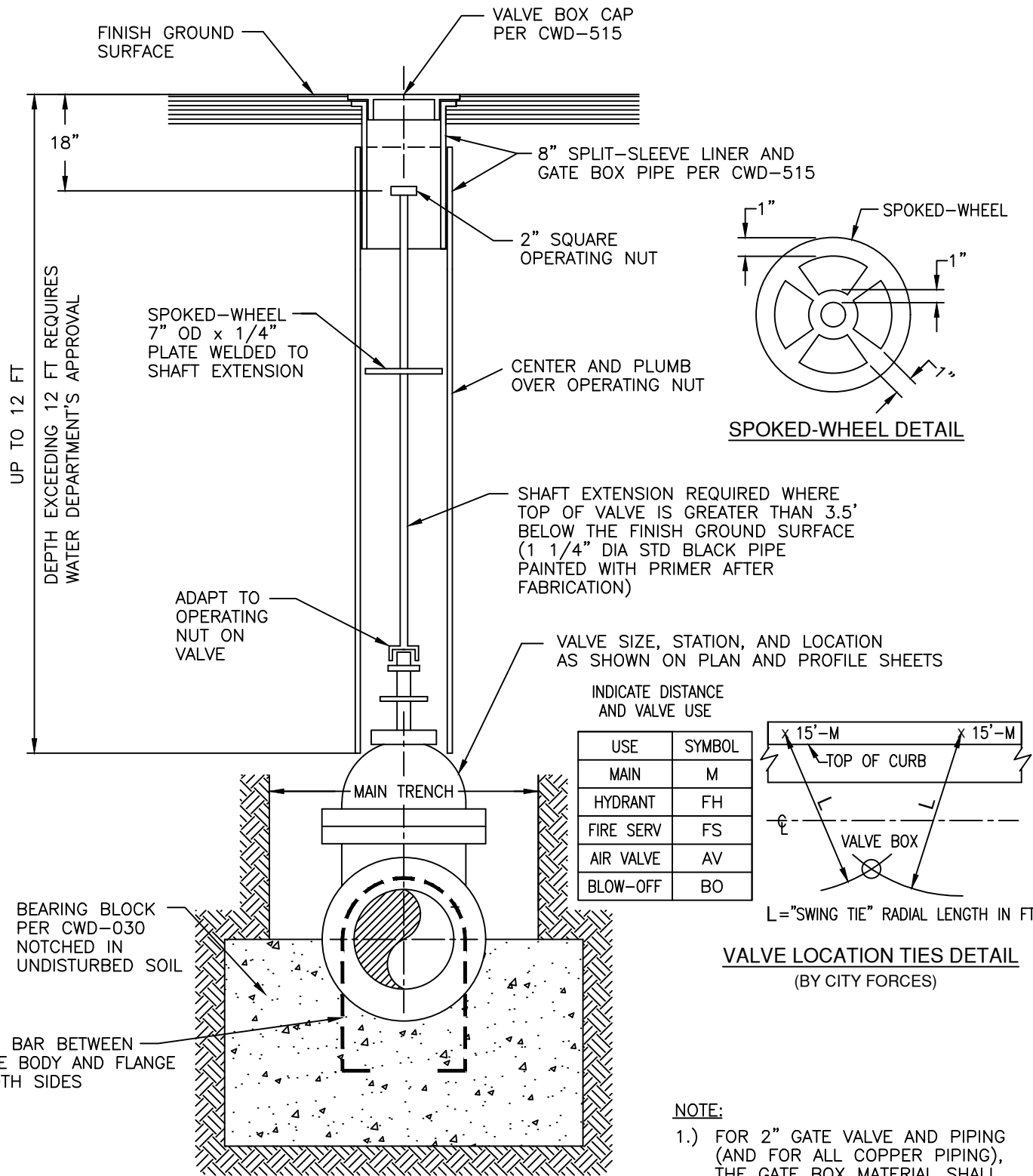
#### APPROVALS

DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

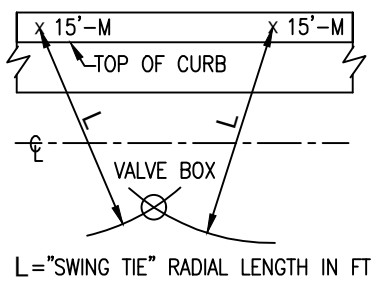
#### TYPICAL 8" AIR VALVE INSTALLATION



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS



USE	SYMBOL
MAIN	M
HYDRANT	FH
FIRE SERV	FS
AIR VALVE	AV
BLOW-OFF	BO



**VALVE BOX SECTIONAL DETAIL**

**VALVE LOCATION TIES DETAIL  
(BY CITY FORCES)**

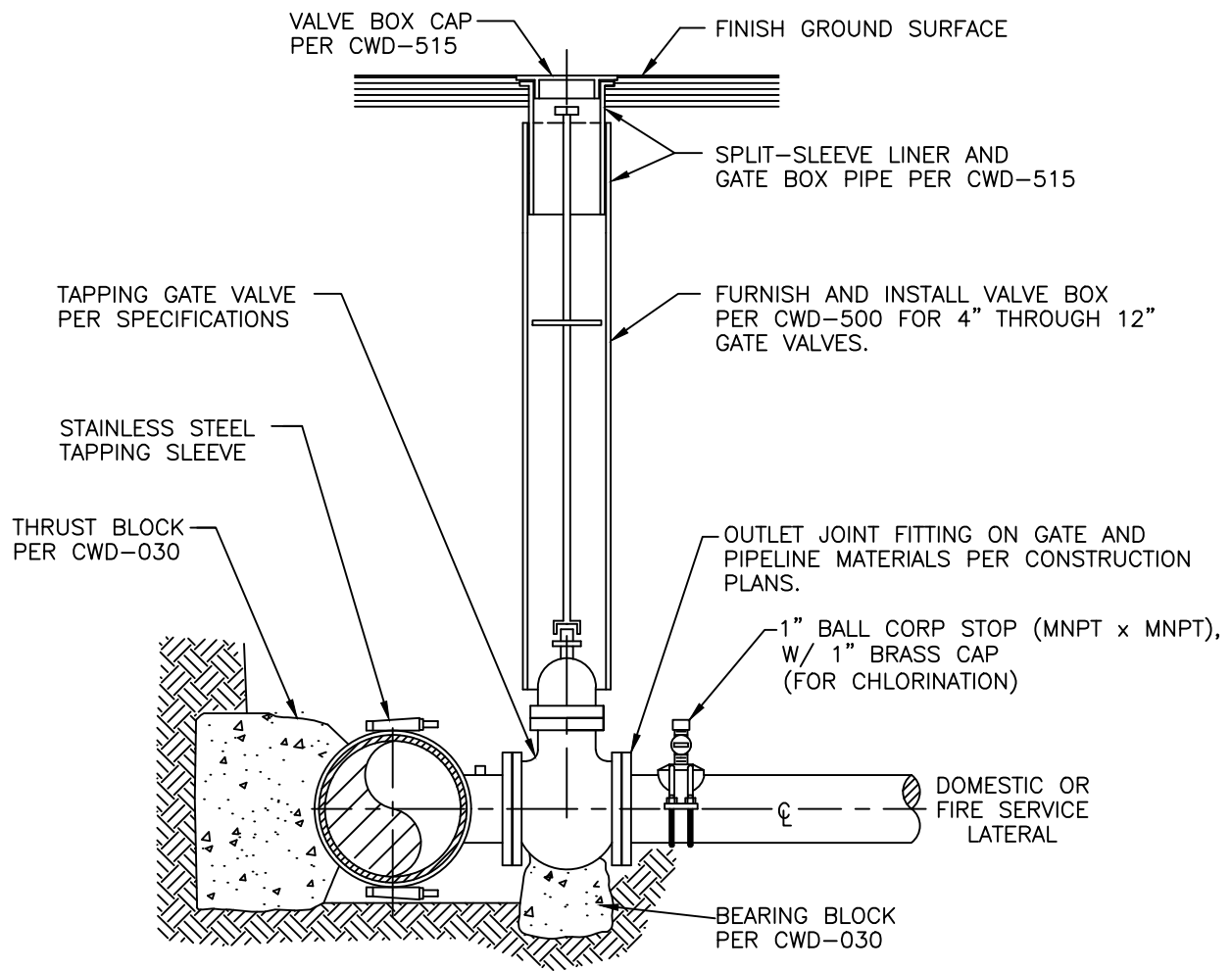
- NOTE:**
- 1.) FOR 2" GATE VALVE AND PIPING (AND FOR ALL COPPER PIPING), THE GATE BOX MATERIAL SHALL BE NOTCHED AND BLOCKED TO CLEAR SAME.
  - 2.) GATE VALVES ARE TO BE INSTALLED IN THE VERTICAL POSITION UNLESS THEY ARE DESIGNED TO OPERATE IN OTHER POSITIONS.

APPROVALS		
DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

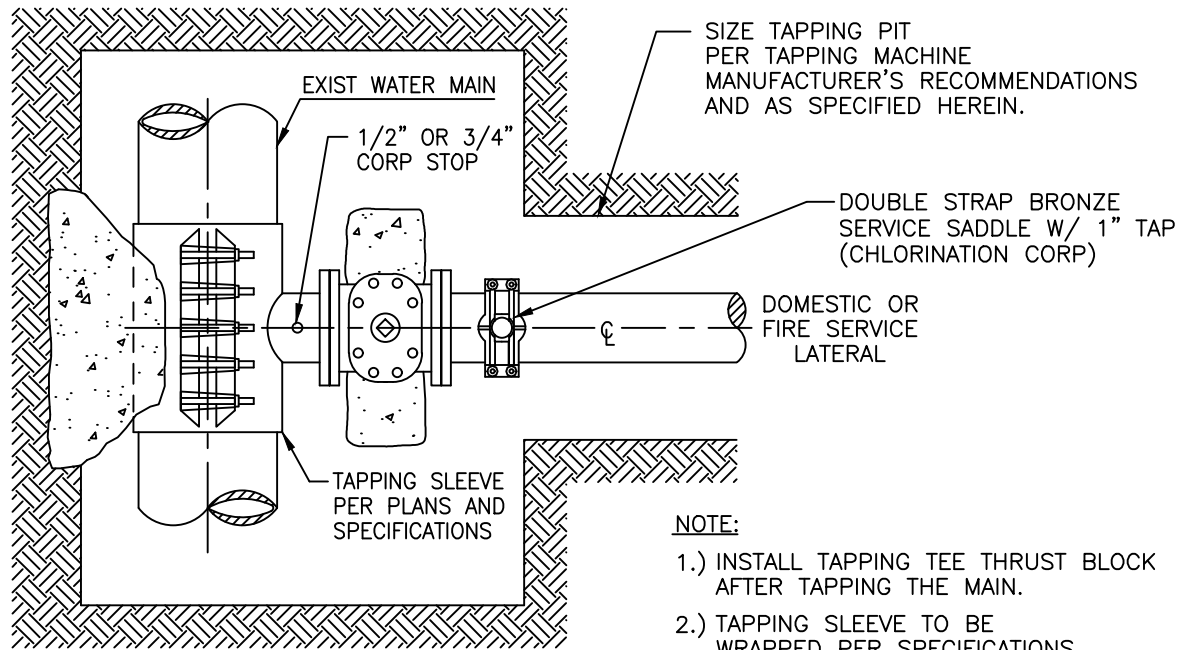


**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL VALVE BOX FOR  
GATE VALVES**



SECTIONAL VIEW



PLAN VIEW

**NOTE:**

- 1.) INSTALL TAPPING TEE THRUST BLOCK AFTER TAPPING THE MAIN.
- 2.) TAPPING SLEEVE TO BE WRAPPED PER SPECIFICATIONS.

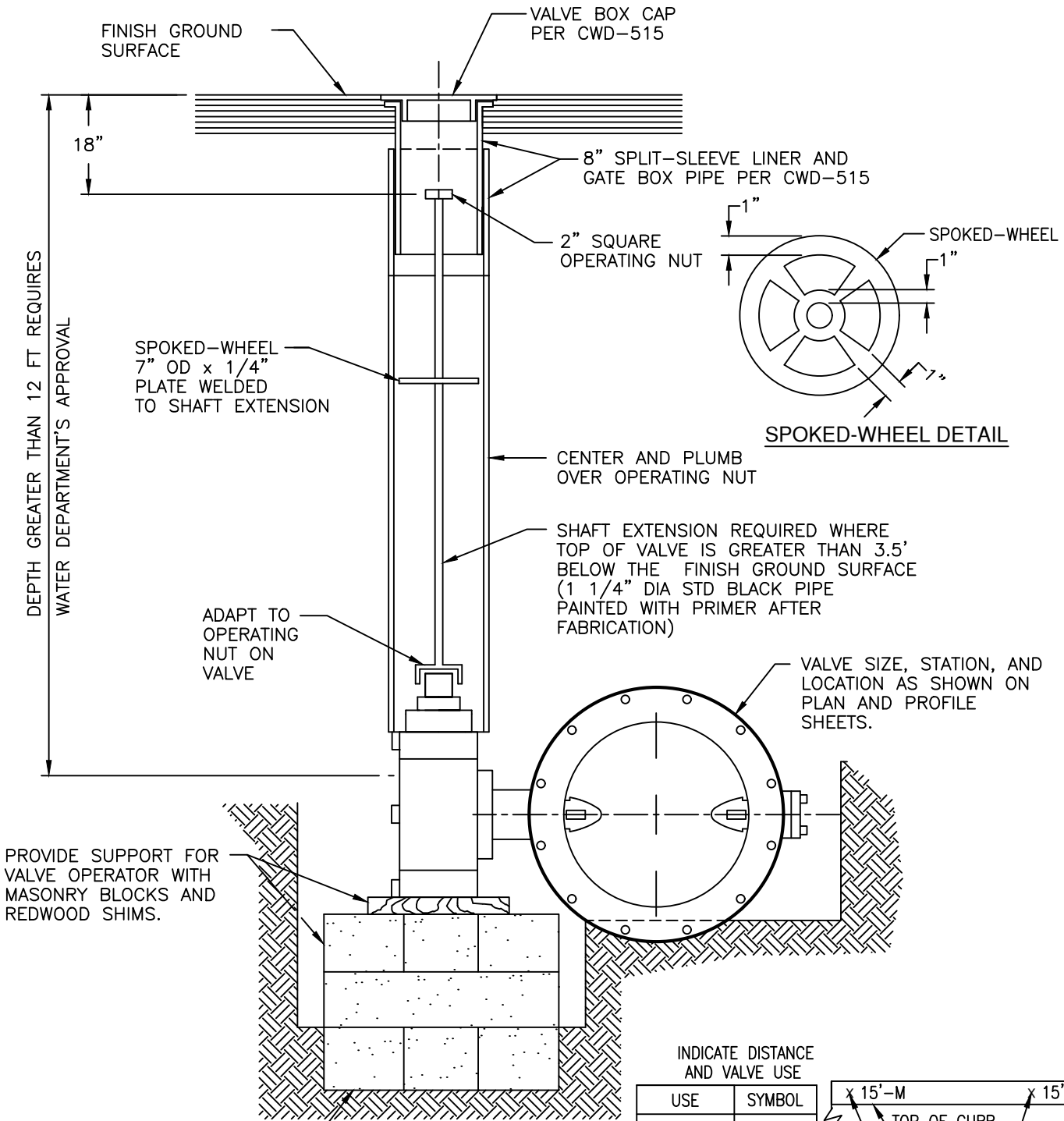
**APPROVALS**

DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

**TAPPING SLEEVE AND**  
**TAPPING VALVE DETAIL FOR**  
**DOMESTIC AND FIRE SERVICES**



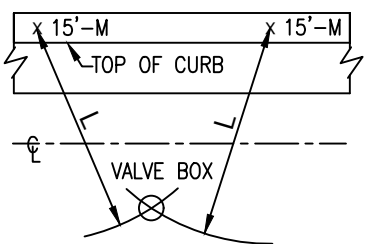


**SPOKED-WHEEL DETAIL**

**SECTIONAL VIEW**

INDICATE DISTANCE AND VALVE USE

USE	SYMBOL
MAIN	M
HYDRANT	FH
FIRE SERV	FS
AIR VALVE	AV
BLOW-OFF	BO



L = "SWING TIE" RADIAL LENGTH IN FT

**VALVE LOCATION TIES DETAIL**  
(BY CITY FORCES)

**APPROVALS**

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PLANNING	B. YAMAMOTO	8/25/22
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**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

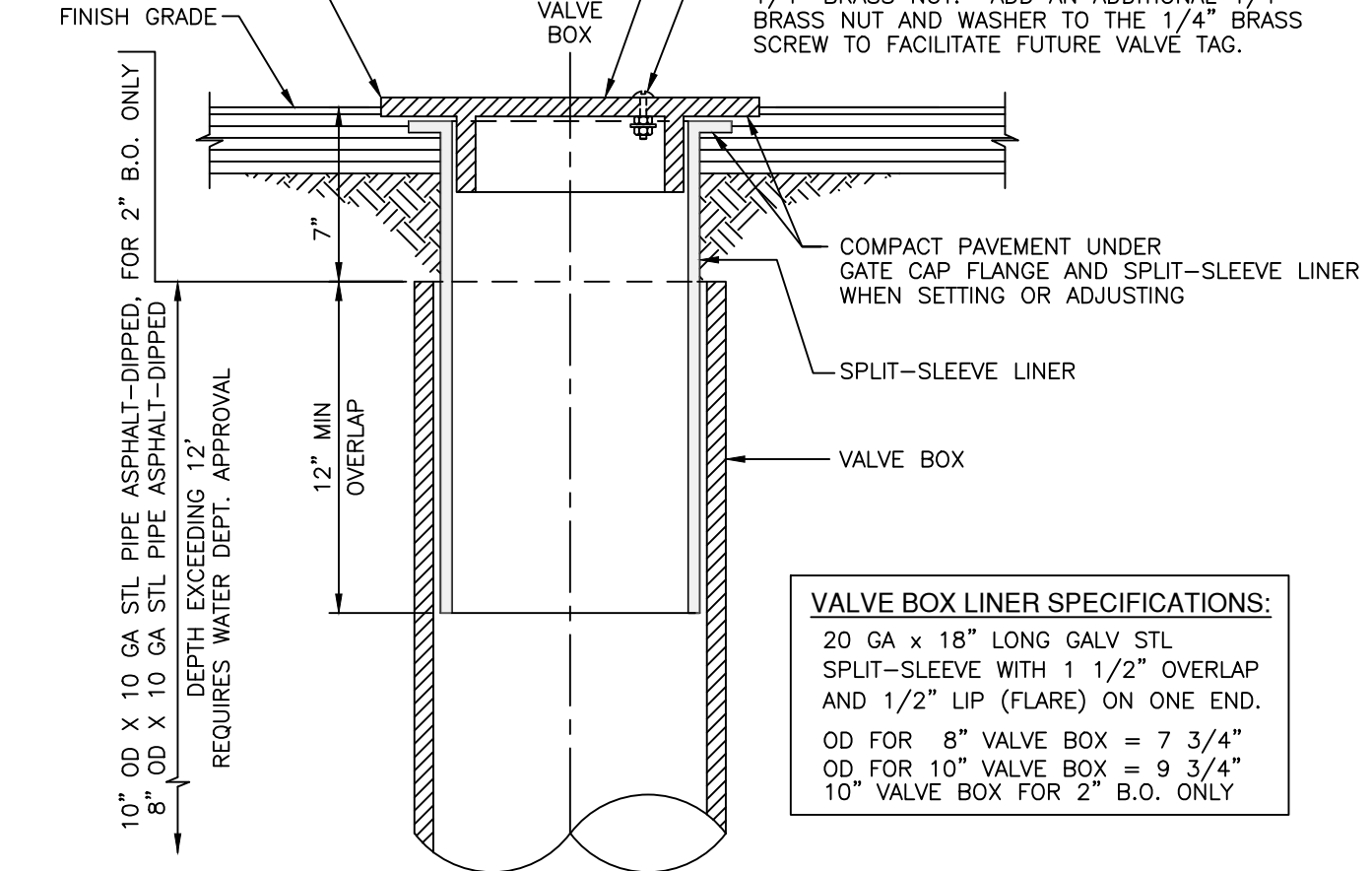
**TYPICAL VALVE BOX**  
**FOR BUTTERFLY VALVES**



8" AND 10" (FOR 2" B.O. ASSEMBLY ONLY)  
CAPS MANUFACTURED BY SOUTH BAY FOUNDRY,  
SAN DIEGO, CA, OR APPROVED EQUAL.  
CAP MARKED "CWD", PAINTED PER SPECIFICATION.

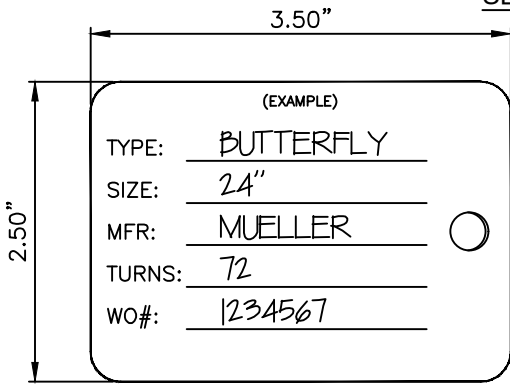
ADJUST CAP FLUSH  
TO 1/4" HIGH ABOVE  
FINISH STREET GRADE

DRILL 1/4" HOLE, 3/8" INSIDE INTERIOR RING  
ON CAP SURFACE. INSTALL 1/4" x 1 1/2"  
BRASS ROUND-HEAD SCREW, SECURE WITH A  
1/4" BRASS NUT. ADD AN ADDITIONAL 1/4"  
BRASS NUT AND WASHER TO THE 1/4" BRASS  
SCREW TO FACILITATE FUTURE VALVE TAG.

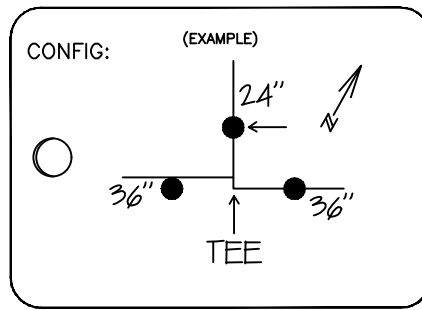


**VALVE BOX LINER SPECIFICATIONS:**  
20 GA x 18" LONG GALV STL  
SPLIT-SLEEVE WITH 1 1/2" OVERLAP  
AND 1/2" LIP (FLARE) ON ONE END.  
OD FOR 8" VALVE BOX = 7 3/4"  
OD FOR 10" VALVE BOX = 9 3/4"  
10" VALVE BOX FOR 2" B.O. ONLY

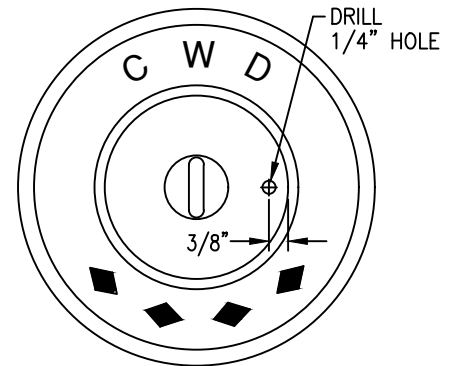
SECTIONAL DETAIL



FRONT OF TAG  
TEMPORARY VALVE TAG ON NEW VALVES



BACK OF TAG



TYPICAL VALVE BOX CAP

**NOTES:**

- 1.) TAG MATERIAL SHALL BE WHITE, HEAVY-DUTY 20 MIL THICK VINYL.
- 2.) TEMPORARY VALVE TAG SHALL BE ATTACHED TO SCREW ON BOTTOM OF VALVE BOX CAP USING WIRE TIES.
- 3.) ALL VALVE INFORMATION SHALL BE WRITTEN WITH INDELIBLE MARKER.

**NOTES:**

- 1.) THIS STANDARD IS TO BE USED IN CONJUNCTION WITH STANDARD DRAWINGS CWD-500, CWD-504, AND CWD-510.

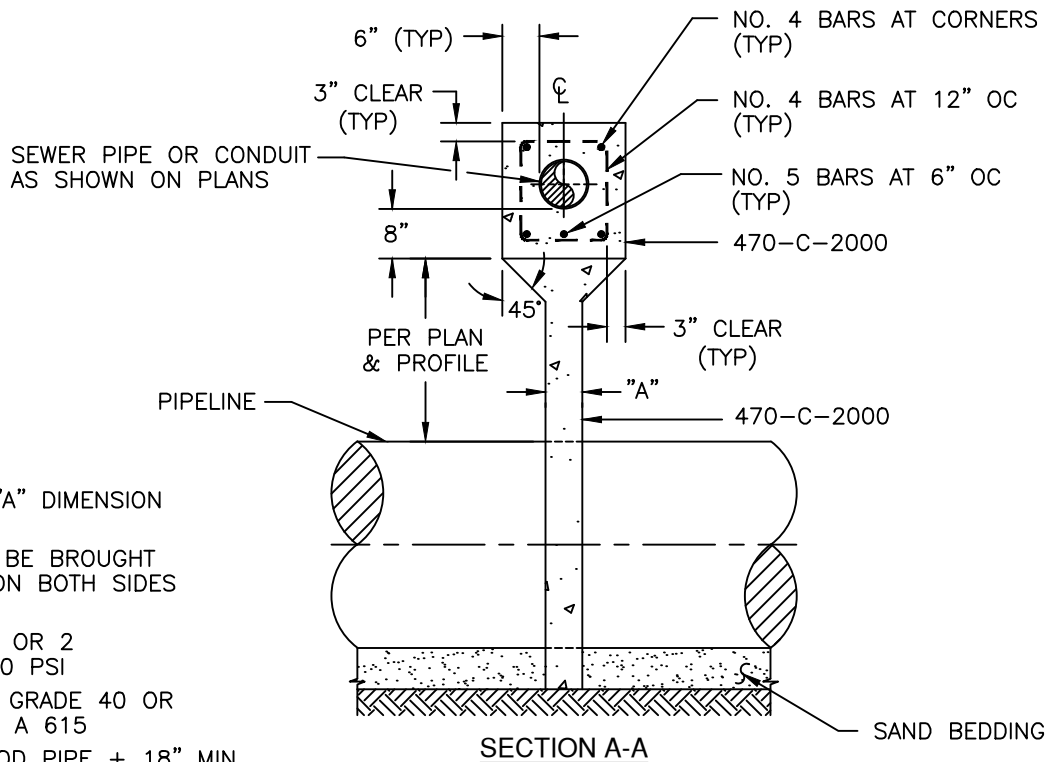
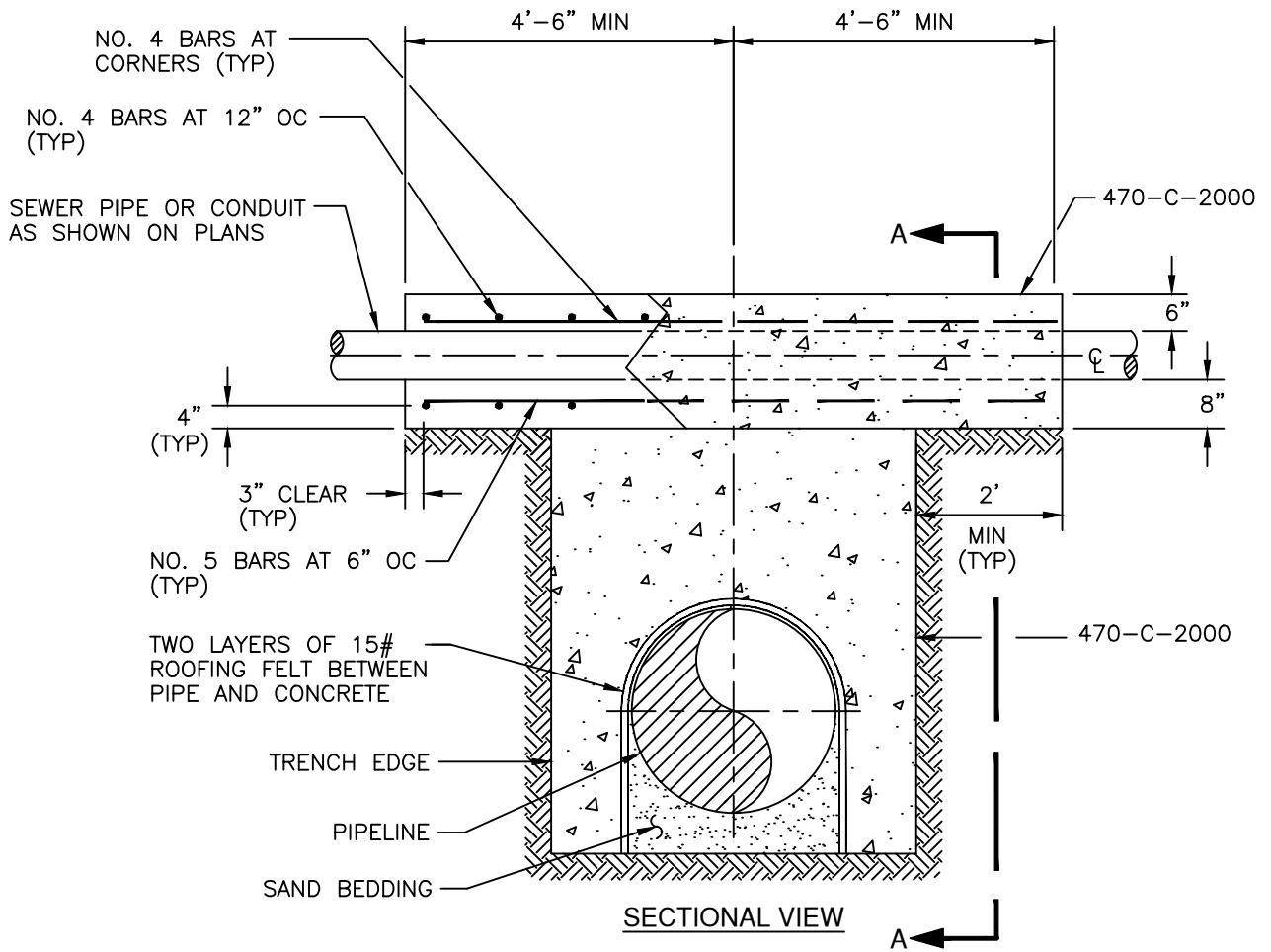
**APPROVALS**

DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
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**WATER**  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

TYPICAL SPLIT-SLEEVE LINER AND  
CAP FOR 8" AND 10" VALVE BOX



**NOTES**

- 1.) SEE PLAN FOR "A" DIMENSION (8" MIN)
- 2.) BACKFILL SHALL BE BROUGHT UP UNIFORMLY ON BOTH SIDES OF WALL.
- 3.) CEMENT: TYPE 1 OR 2  
ASTM 5150, 2000 PSI
- 4.) REINFORCEMENT: GRADE 40 OR GRADE 60, ASTM A 615
- 5.) TRENCH WIDTH: OD PIPE + 18" MIN

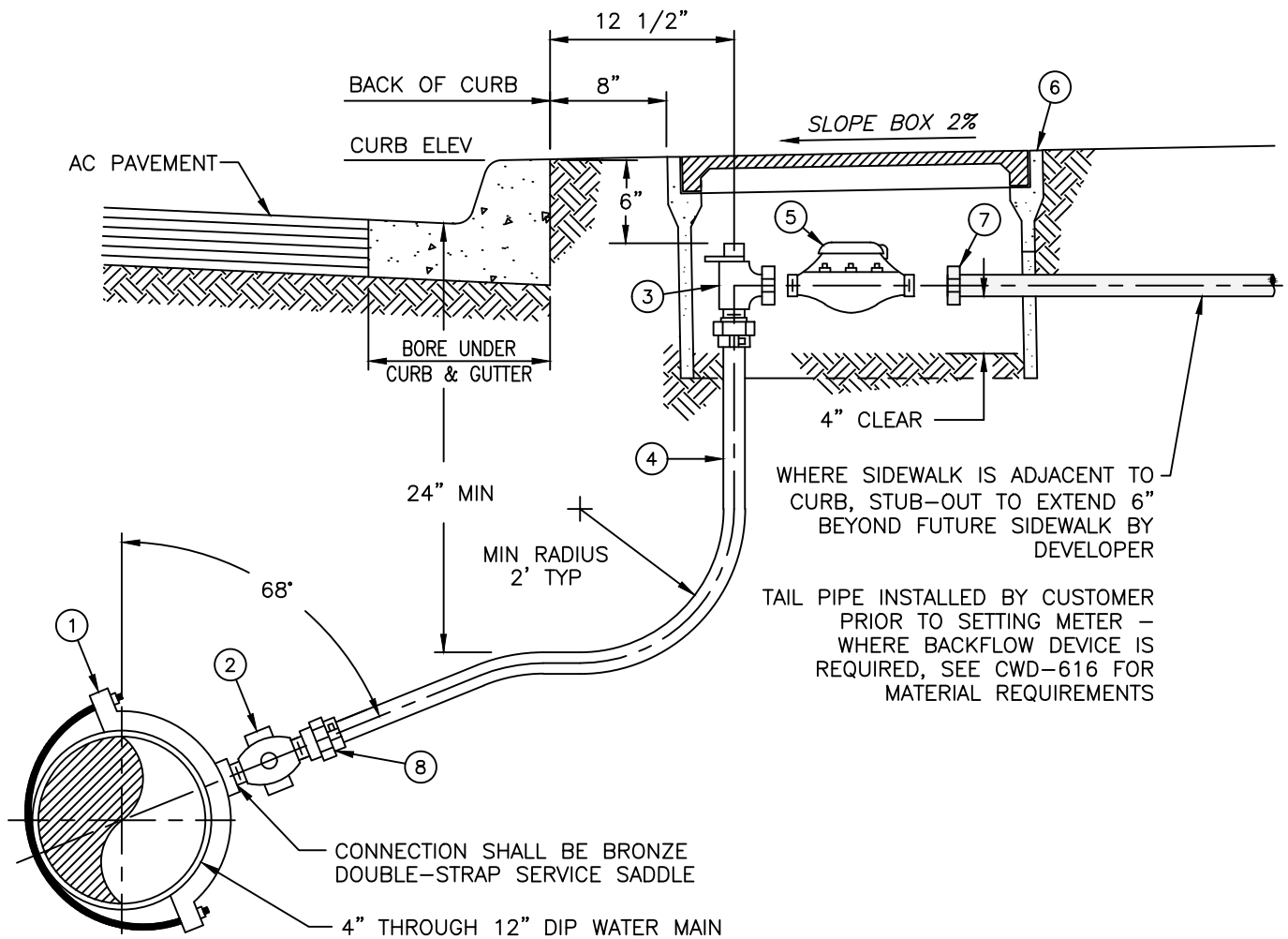
**APPROVALS**

DIVISION	INITIAL	DATE
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OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TYPICAL CONDUIT SUPPORT**



### TYPICAL STREET INSTALLATION

BILL OF MATERIALS	
ITEM	QUANTITY
① BRONZE DOUBLE-STRAP SERVICE SADDLE (NPT)	1
② 1" BRONZE BALL CORP STOP (MNPT x MNPT)	1
③ 1" ANGLE BALL METER STOP (COMP x METER COUPLING) (WITH 1" x 3/4" ADAPTER FOR 3/4" METER) PER SPECIFICATIONS	1
④ 1" TUBING, SOFT COPPER, TYPE K	VARIES
⑤ METER INSTALLED BY CITY FORCES	1
⑥ METER BOX PER SPECIFICATIONS AND/OR PLANS	1
⑦ 1" OR 3/4" COUPLINGS	1
⑧ 1" ADAPTER (FNPT x COMP)	1

#### NOTES:

- 1.) METER BOX COVER TO BE CAST IRON WHERE BOX IS IN ALLEY OR DRIVEWAY.
- 2.) CONTRACTOR SHALL INSTALL METER BOXES WITH READING HOLE AT TIME ANGLE METER STOPS ARE INSTALLED.
- 3.) CITY WILL FURNISH A TEMPORARY SERVICE METER JUMPER, PRIOR TO INSTALLING METER, UPON PAYMENT OF FEES.
- 4.) METER BOX TO BE CLEANED BEFORE NEW METER CAN BE INSTALLED BY CITY FORCES.

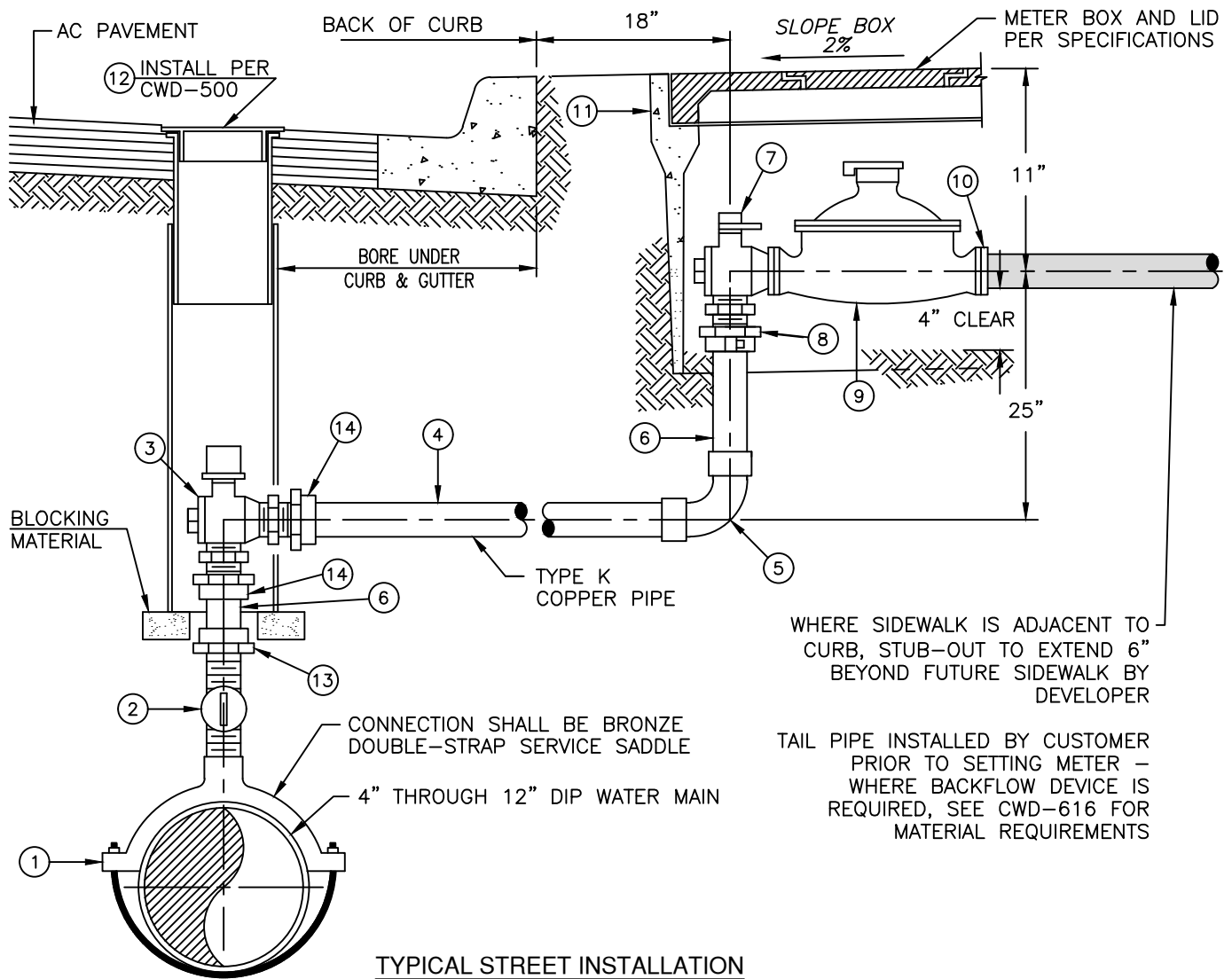
#### APPROVALS

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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

1-INCH WATER SERVICE



TYPICAL STREET INSTALLATION

BILL OF MATERIALS	
ITEM	QUANTITY
(1) BRONZE DOUBLE-STRAP SERVICE SADDLE (NPT)	1
(2) 2" BALL CORP STOP (MNPT x MNPT)	1
(3) 2" ANGLE BALL WITH 2" OPERATING NUT (FNPT x FNPT)	1
(4) 2" SOFT COPPER PIPE, TYPE K	VARIES
(5) 2" COPPER 90° ELL (SW/SW)	1
(6) 2" HARD DRAWN COPPER (RISER PIPE)	VARIES
(7) 2" ANGLE BALL METER STOP (IPF x METER FLG)	1
(8) 2" COUPLING (COMP x MNPT)	1
(9) 1 1/2" OR 2" METER (INSTALLED BY CITY)	1
(10) 1 1/2" OR 2" METER FLANGE (INSTALLED BY CITY)	1
(11) METER BOX: CONCRETE COVER 2 PC OR STEEL COVER 2 PC	1
(12) 8" GATE VALVE CAP, GALV SPLIT SLEEVE, & 12 GA STL PIPE - PER CWD-500	1
(13) 2" ADAPTER (FNPT x SW)	1
(14) 2" ADAPTER (MNPT x SW)	2

NOTES:

- 1.) A STEEL METER BOX LID IS REQUIRED IN ALLEY OR DRIVEWAY.
- 2.) DOUBLE GASKETS SHALL BE USED ON EACH SIDE OF METER SPACER (JUMPER) UNTIL METER IS INSTALLED BY CITY.
- 3.) INSTALL BLOCKING MATERIAL SO AS TO NOT IMPEDE ACCESS TO THE CORP STOP.
- 4.) USE HARD DRAWN RISER PIPE AND SWEAT FITTINGS AS NEEDED BETWEEN THE CORP STOP AND ANGLE BALL.

APPROVALS

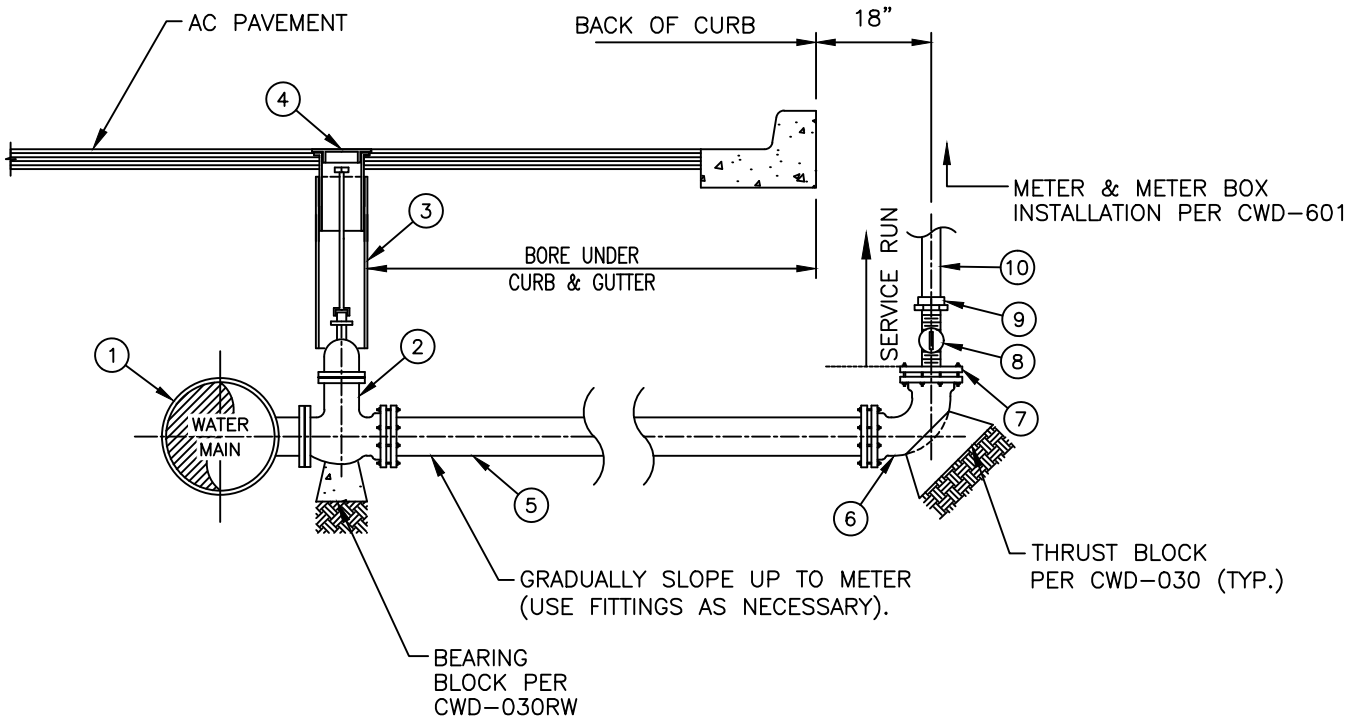
DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



WATER  
 DISTRIBUTION & TRANSMISSION  
 PIPELINE CONSTRUCTION METHODS

2-INCH WATER SERVICE





**BILL OF MATERIALS**

ITEM	QUANTITY
① 4" TEE	1
② RW GATE VALVE, FLxMJ (CWD-500)	1
③ SPLIT-SLEEVE (CWD-515)	1
④ VALVE BOX (CWD-500)	1
⑤ 4" SERVICE LATERAL	VARIES
⑥ 4"-90°-DUCTILE IRON MJxMJ BEND	1
⑦ 4" PLUG W/ 2" TAP	1
⑧ 2" ALL CORP STOP (MNPTxMNPT)	1
⑨ 2" ADAPTER (FNPTxSW)	1
⑩ 2" HARD DRAWN COPPER	1

**NOTES:**

1. USE HARD DRAWN RISER PIPE AND SWEAT FITTINGS AS NEEDED BETWEEN THE CORP STOP AND ANGLE BALL.
2. REFER TO CWD-616 FOR BACKFLOW INSTALLATION WHERE REQUIRED.

**APPROVALS**

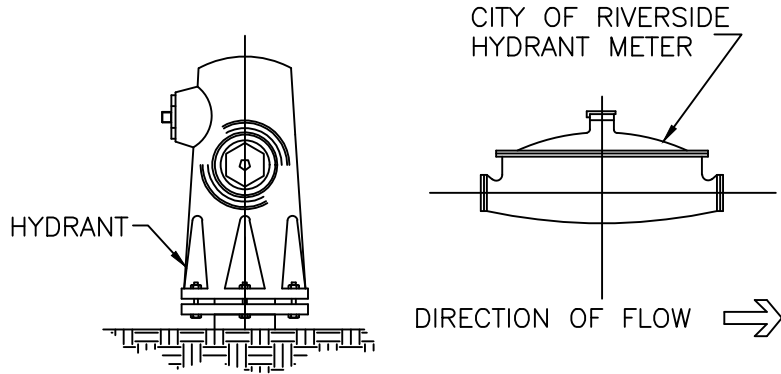
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



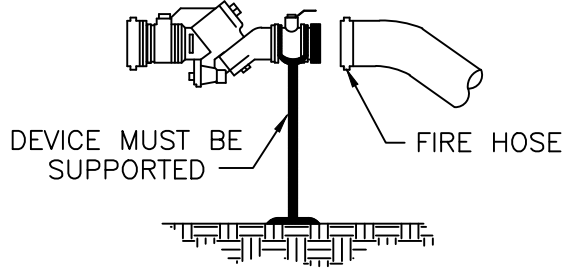
**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**2-INCH WATER SERVICE  
WITH 4" LATERAL**

WATER SERVICE CONNECTION, NOT LIMITED TO HYDRANT CONNECTIONS.



REDUCED PRESSURE BACKFLOW  
DEVICE FOR DIRECT CONNECTIONS



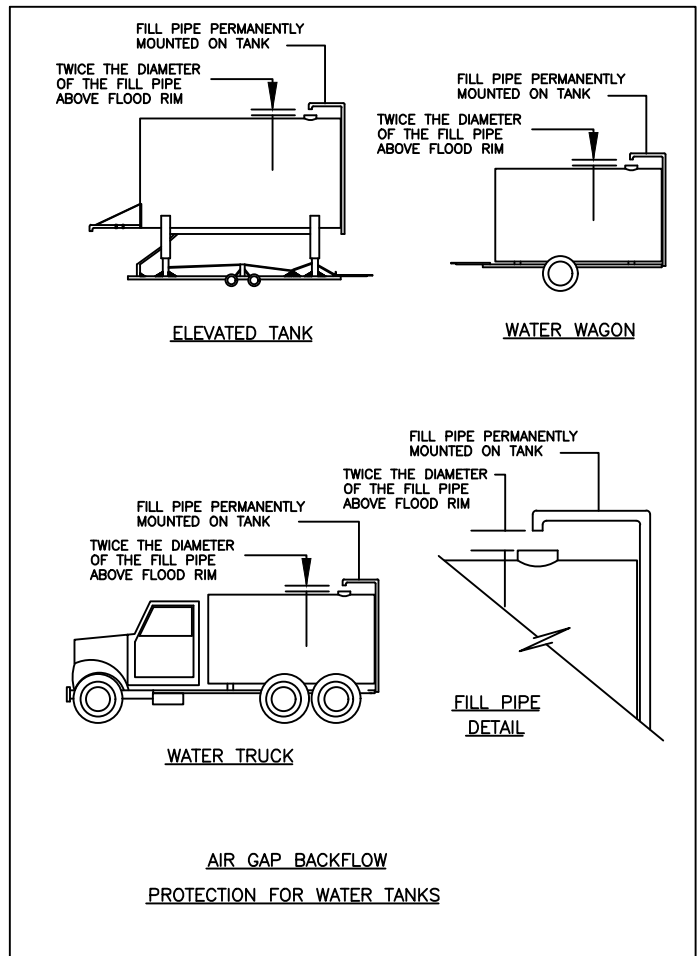
GUIDELINES:

1. AN AIR GAP IS REQUIRED AT SERVICE CONNECTION WHEN:
  - a) A REDUCED PRESSURE BACKFLOW DEVICE (RP) IS NOT AVAILABLE.
  - b) THE POTABLE WATER SUPPLY IS USED TO SUPPLEMENT A NON-POTABLE OR RECYCLED WATER SUPPLY.
2. A REDUCED PRESSURE BACKFLOW DEVICE (RP) IS REQUIRED WHEN:
  - a) AN AIR GAP IS NOT PRACTICAL.
  - b) CUSTOMER'S LENGTH OF HOSE EXCEEDS 50'.
  - c) WATER IS APPLIED DIRECTLY VIA HOSE.
  - d) THERE IS ANY PROCESS OR EQUIPMENT DIRECTLY SUPPLIED VIA CONNECTION.
  - e) THERE IS ANY RIDGED PIPING OR VALVE DOWNSTREAM OF CONNECTION.

CONNECTION IS SUBJECT TO APPROVAL OF THE PROGRAM SPECIALIST. CONNECTION AND BACKFLOW DEVICE MUST BE INSPECTED IMMEDIATELY AFTER INSTALLATION. TO SCHEDULE AN APPOINTMENT, CALL (951) 351-6320 OR (951) 351-6282.

TEMPORARY CONNECTION METER CONTACTS

- TELEPHONE NUMBERS:
- (951) 826-5285 - WATER ENGINEERING
  - (951) 351-6320 - WATER OPERATIONS/BACKFLOW
  - (951) 351-6350 - WATER MAINTENANCE/METER SHOP
  - (951) 782-0330 - CUSTOMER SERVICE

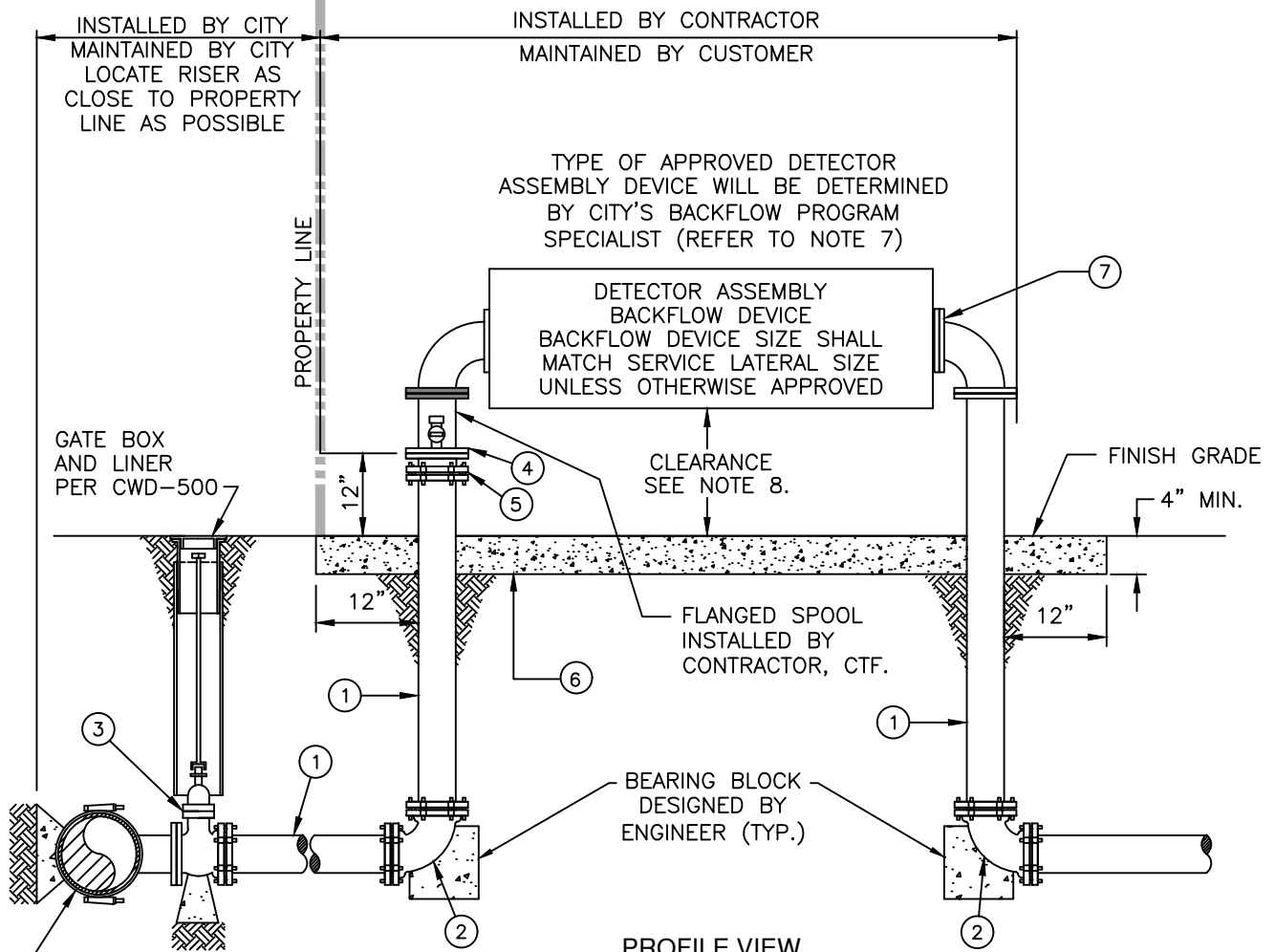


APPROVALS		
DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**TEMPORARY, EMERGENCY, OR  
CONSTRUCTION WATER SERVICE  
/ BACKFLOW PROTECTION**



PROFILE VIEW

NOTES

1. PRIME AND WRAP BURIED PIPE TO 6" ABOVE GRADE WITH POLYKEN #927 AND #900, OR APPROVED EQUAL.
2. CITY FORCES WILL BLIND FLANGE CONNECTION POINT. WATER INSPECTOR IS TO BE PRESENT WHEN BLIND FLANGE IS REMOVED AND DETECTOR ASSEMBLY IS INSTALLED.
3. FACILITIES TO BE DISINFECTED PER RPU SPECIFICATION 205, PART 7.
4. CONTRACTOR TO SWAB CONNECTING VALVES WITH 600 PPM CHLORINE WHEN MAKING CONNECTION.
5. CONTRACTOR TO PAINT ALL ABOVE GRADE PIPING AND DETECTOR ASSEMBLY.
6. FOR 10" DETECTOR ASSEMBLY INSTALL 12" LATERAL AND PIPING. CUSTOMER TO SUPPLY 12" X 10" FLANGED REDUCERS ON BOTH SIDES OF DETECTOR ASSEMBLY.
7. THE DETECTOR ASSEMBLY SPECIFICATION SHALL BE DETERMINED AFTER SURVEY OR PLAN REVIEW OF THE FIRE SYSTEM BY THE BACKFLOW PROGRAM SPECIALIST. BACKFLOW PROGRAM SPECIALIST CAN BE REACHED AT (951) 351-6282 OR (951) 351-6167.
8. FOR DETECTOR ASSEMBLY CLEARANCE REQUIREMENTS REFER TO CWD-616-1 AND CWD-617.
9. RESTRAIN ALL JOINTS WITH APPROVED RESTRAINT ASSEMBLY.
10. FIRE SERVICE BACKFLOWS SHALL BE EQUIPPED WITH RESILIENT SEATED OS&Y GATE VALVES.
11. BACTERIOLOGICAL TESTING OF PIPING BETWEEN BACKFLOW DEVICE AND SERVICE VALVE SHALL CONFORM TO CITY OF RIVERSIDE WATER RULE NO. 11.

MATERIALS	
ITEM	
①	DUCTILE IRON PIPE (CLASS 350)
②	90° ELL (MJ X MJ, RESTRAINED).
③	GATE VALVE (FLG X MJ).
④	TEMPORARY BLIND FLANGE WITH 1" NPT TAP AND 1" BALL CORPORATION STOP FOR SAMPLE (BY CITY FORCES).
⑤	FLANGE X MECHANICAL JOINT ADAPTER, AS REQUIRED.
⑥	4" MIN. CONCRETE SLAB-NECESSARY FOR EROSION PREVENTION
⑦	TEST PLATE REQUIRED FOR PRESSURE TEST.

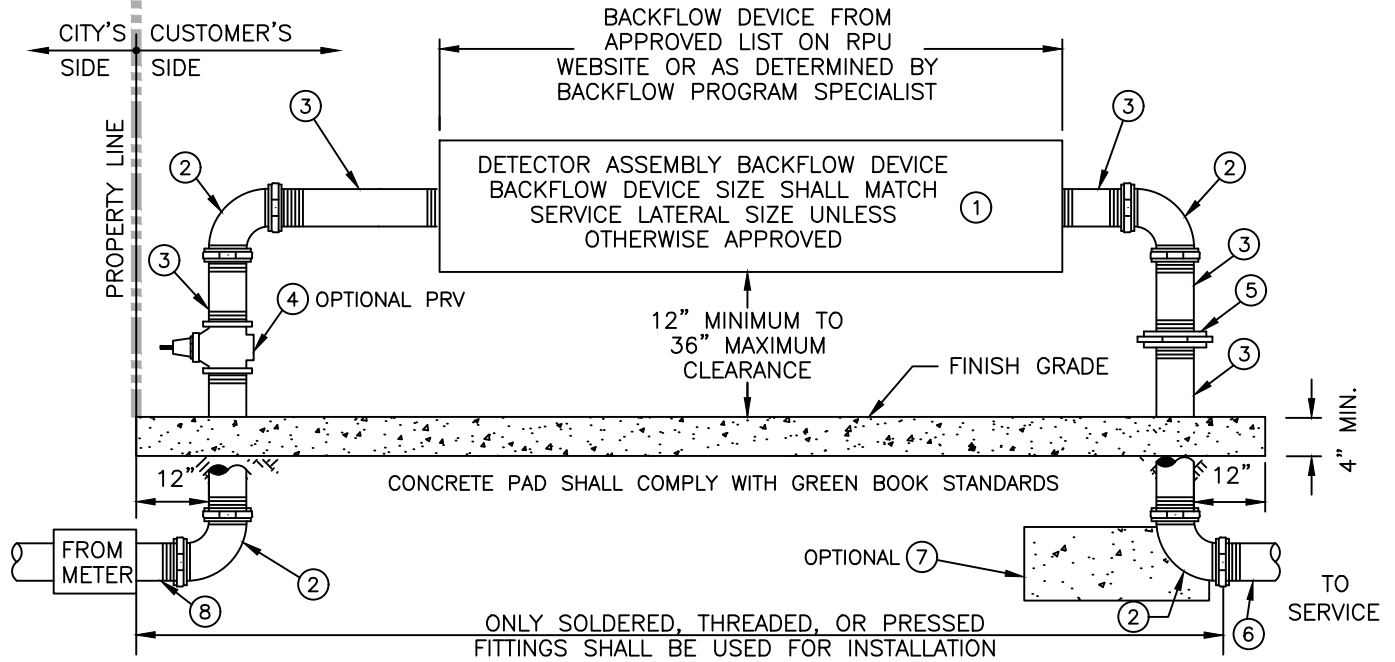
APPROVALS		
DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

4" THROUGH 12" ABOVE GROUND  
FIRE SERVICE

## TYPICAL BACKFLOW DEVICE CONFIGURATION



NOTES: APPLIES TO BOTH NEW AND EXISTING SERVICES.

1. PRIOR TO INSTALLATION, LOCATION OF THE BACKFLOW DEVICE SHALL BE SUBJECT TO APPROVAL OF THE BACKFLOW PROGRAM SPECIALIST (951) 351-6282/6167. DEVICE SHALL BE LOCATED AS CLOSE TO THE METER AS PRACTICAL (MIN. 18", MAX. 24" BACK OF PROPERTY LINE.)
2. ANY DEVIATION FROM NOTE #1 IS SUBJECT TO CONDITIONS AS DESCRIBED WITHIN CWD-616-2.
3. INSPECTION OF THE PLUMBING AND TESTING OF THE BACKFLOW DEVICE IS REQUIRED PRIOR TO BACKFILLING, POURING CONCRETE, AND SERVICE ACTIVATION. CALL (951) 351-6282 OR (951) 351-6167 TO SCHEDULE APPOINTMENT.
4. THE BACKFLOW ASSEMBLY INSTALLATION, INCLUDING ALL APPURTENANCES AND MATERIALS, SHALL BE LEAD-FREE AND IN COMPLIANCE WITH THE APPROVED MATERIALS SPECIFIED BELOW.
5. NO OUTLETS, TEES, OR CONNECTIONS SHALL BE ALLOWED BETWEEN THE METER AND THE BACKFLOW DEVICE.

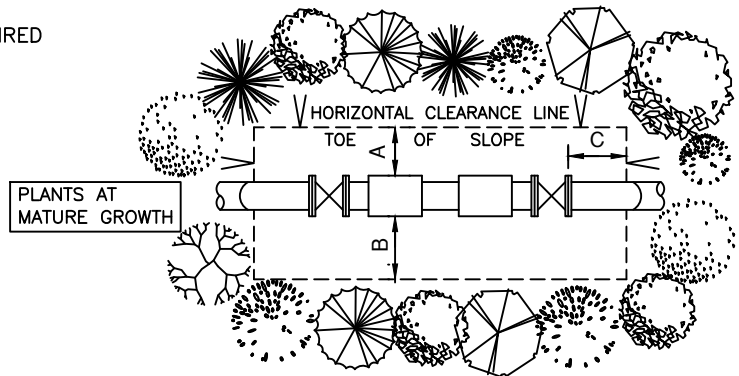
ITEM	EACH	DESCRIPTION
①	1	LEAD-FREE REDUCED PRESSURE PRINCIPLE BACKFLOW DEVICE
②	4	90 DEGREE ELBOW, BRASS OR HARD DRAWN COPPER**
③	4	RISER & NIPPLES, BRASS OR HARD DRAWN COPPER**
④	1	PRV VALVE (FOR PRESSURE IN EXCESS OF 80 PSI)**

ITEM	EACH	DESCRIPTION
⑤	1	BRASS OR COPPER UNION* **
⑥	1	SCH 80 PVC NIPPLE CUT TO LENGTH WITH SLIP x SLIP COUPLER
⑦	1	CONCRETE THRUST BLOCK (OPTIONAL)
⑧	1	SERVICE LINE, BRASS OR HARD DRAWN COPPER**

\*A SECOND UNION ON OPPOSITE RISER MAY BE REQUIRED IF CLEARANCE REQUIREMENTS ARE NOT MAINTAINED.  
 \*\*BRASS OR COPPER MAY BE SUBSTITUTED WITH STAINLESS STEEL PER DISCRETION OF CITY BACKFLOW PROGRAM SPECIALIST.

ADEQUATE AND SAFE CLEARANCE MUST BE PROVIDED TO PERMIT TESTING AND REPAIR WORK

MINIMUM CLEARANCE SCHEDULE			
SIZE	A	B	C
3/4" THROUGH 2 1/2"	12"	18"	12"



OVERHEAD VIEW OF CLEARANCE REQUIREMENTS

### APPROVALS

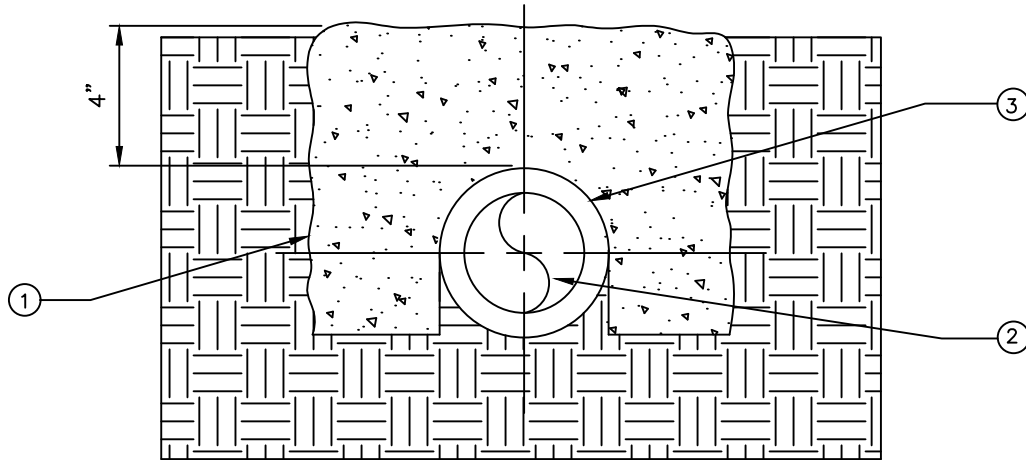
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

**BACKFLOW PREVENTION  
 ASSEMBLY 3/4" - 2 1/2" ABOVE  
 GROUND INSTALLATION**



**WATER  
 DISTRIBUTION & TRANSMISSION  
 PIPELINE CONSTRUCTION METHODS**

PRIVATE SERVICE LINE ENCASEMENT



ITEM	DESCRIPTION
①	4" CONCRETE ENCASEMENT ALL SIDES*
②	BRASS OR COPPER WATER SERVICE LINE
③	CORROSION BARRIER

\*ENCASEMENT AND/OR SLEEVING MAY BE REQUIRED BY CITY BACKFLOW PROGRAM SPECIALIST FROM METER BOX TO BACKFLOW ASSEMBLY.

IF DETERMINED BY PUBLIC UTILITIES THAT A BACKFLOW DEVICE IS UNABLE TO BE INSTALLED IN ACCORDANCE WITH CWD-616-1, NOTE 1, AN ALTERNATIVE LOCATION MAY BE APPROVED AND THE FOLLOWING CONDITIONS SHALL APPLY.

CONDITIONS:

1. A DRAWING DEPICTING THE PROPOSED PATH OF PIPING FROM THE WATER METER TO THE BACKFLOW DEVICE AND THE FINAL LOCATION OF DEVICE MUST BE SUBMITTED TO PUBLIC UTILITIES FOR APPROVAL.
2. ONCE APPROVED, INSTALLER MUST COORDINATE WITH THE BACKFLOW PROGRAM SPECIALIST TO OVERSEE, INSPECT, AND DOCUMENT THE INSTALLATION. CORROSION BARRIER TO BE INSPECTED PRIOR TO POURING OF CONCRETE.
3. MATERIALS SHALL REMAIN IN COMPLIANCE AS SPECIFIED WITHIN CWD-616-1.
4. MATERIALS SHALL BE IN COMPLIANCE WITH THE APPROVED MATERIALS SPECIFIED ON THE TABLE ABOVE.

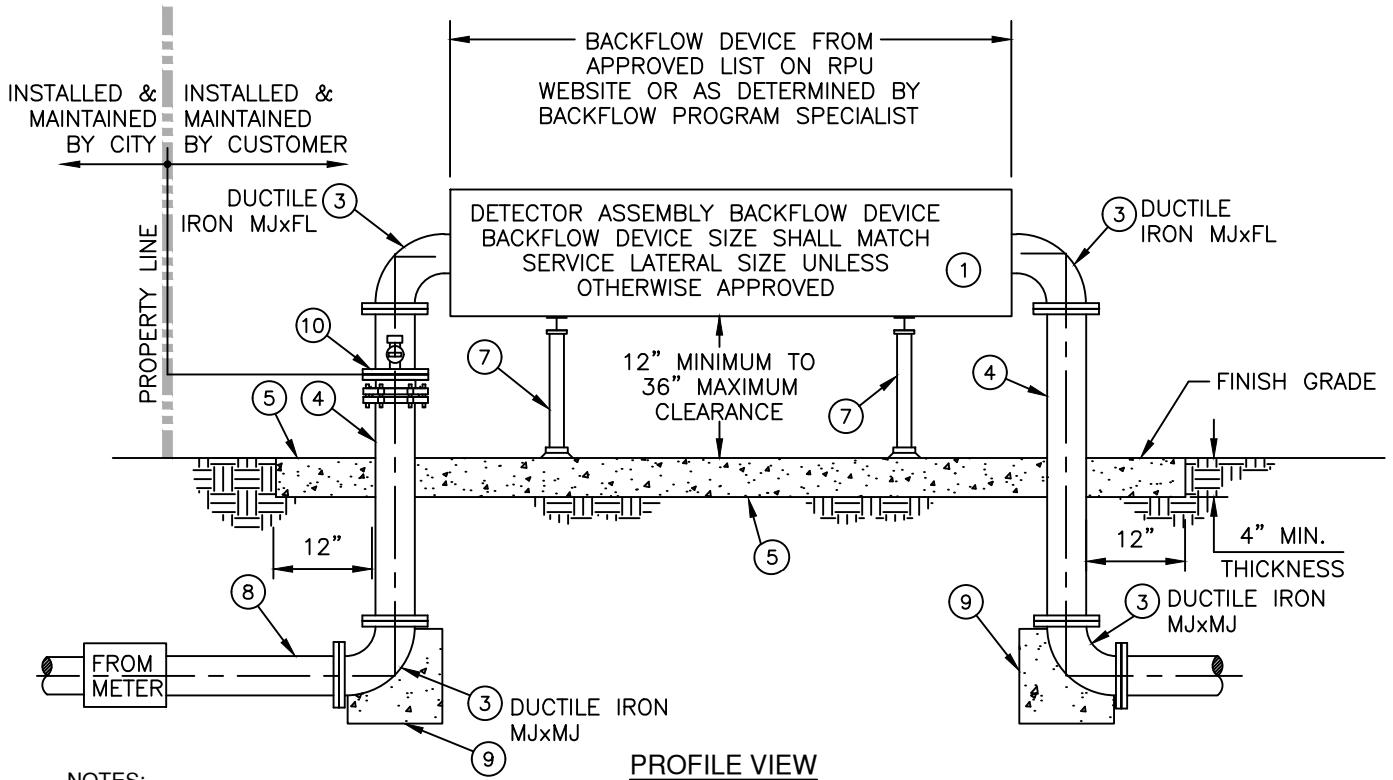
**APPROVALS**

DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22

**BACKFLOW PREVENTION  
ASSEMBLY ALTERNATIVE  
LOCATION INSTALLATION**



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**



**NOTES:**

1. PRIOR TO INSTALLATION, LOCATION OF THE BACKFLOW DEVICE SHALL BE SUBJECT TO THE APPROVAL OF THE BACKFLOW PROGRAM SPECIALIST (951) 351-6282/6167. DEVICE SHALL BE LOCATED AS CLOSE TO METER AS PRACTICAL (MIN. 18", MAX. 24" BACK OF PROPERTY LINE)
2. PLACE BOTTOM OF DEVICE A MINIMUM OF 12 INCHES AND NOT MORE THAN 36 INCHES ABOVE FINISH GRADE.
3. INSPECTION OF THE PLUMBING AND TESTING OF THE BACKFLOW DEVICE IS REQUIRED PRIOR BACKFILLING, POURING CONCRETE, AND SERVICE ACTIVATION. CALL (951) 351-6282 OR (951) 351-6167 TO SCHEDULE APPOINTMENT.
4. THE BACKFLOW ASSEMBLY INSTALLATION, INCLUDING ALL APPURTENANCES AND MATERIALS, SHALL BE LEAD-FREE AND IN COMPLIANCE WITH THE APPROVED MATERIALS SPECIFIED BELOW.
5. BACTERIOLOGICAL TESTING OF PIPING BETWEEN BACKFLOW DEVICE AND METER SHALL CONFORM TO CITY OF RIVERSIDE WATER RULE NO. 11.

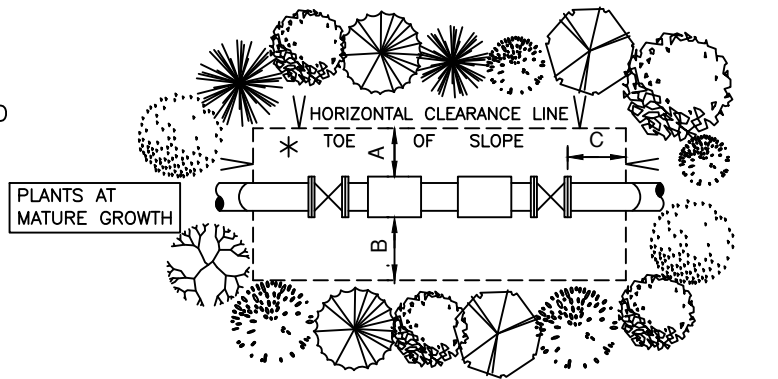
ITEM	EACH	DESCRIPTION
①	1	LEAD-FREE REDUCED PRESSURE PRINCIPLE BACKFLOW DEVICE
③	4	90 DEGREE ELBOW
④	2	FLANGED RISER PIPE
⑤		CONCRETE PAD (NECESSARY TO PREVENT CORROSION)

ITEM	EACH	DESCRIPTION
⑦	2	PIPE SUPPORT
⑧	1	SERVICE LINE (NO PVC)
⑨	2	CONCRETE THRUST BLOCK
⑩	1	TEMPORARY BLIND FLANGE WITH 1" NPT TAP AND 1" BALL CORPORATION STOP FOR SAMPLE (BY CITY FORCES).

ADEQUATE AND SAFE CLEARANCE MUST BE PROVIDED TO PERMIT TESTING AND REPAIR WORK

MINIMUM CLEARANCE SCHEDULE			
SIZE	* A	B	C
3" AND UP	24"	24"	12"

\*REFERENCE TO INCLINE AND DECLINE SLOPES



APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
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OPERATIONS	R. GLENNEY	8/25/22

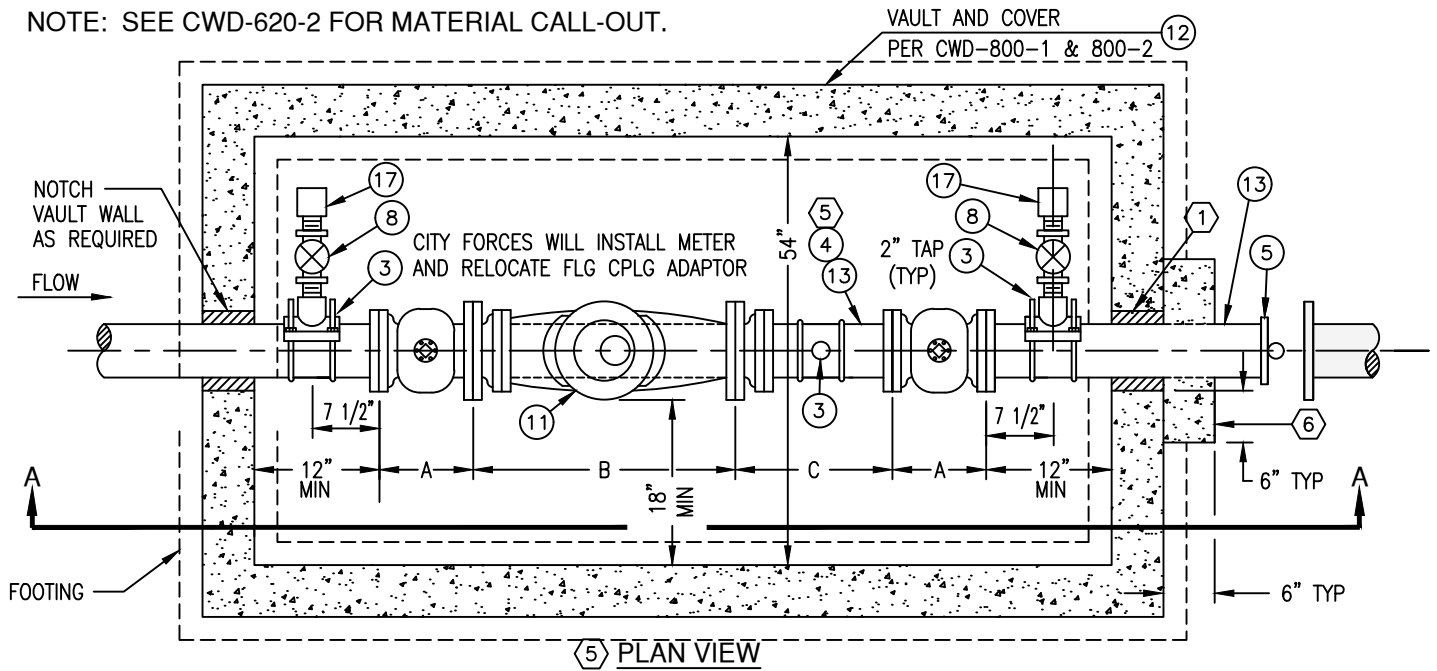
OVERHEAD VIEW OF CLEARANCE REQUIREMENTS



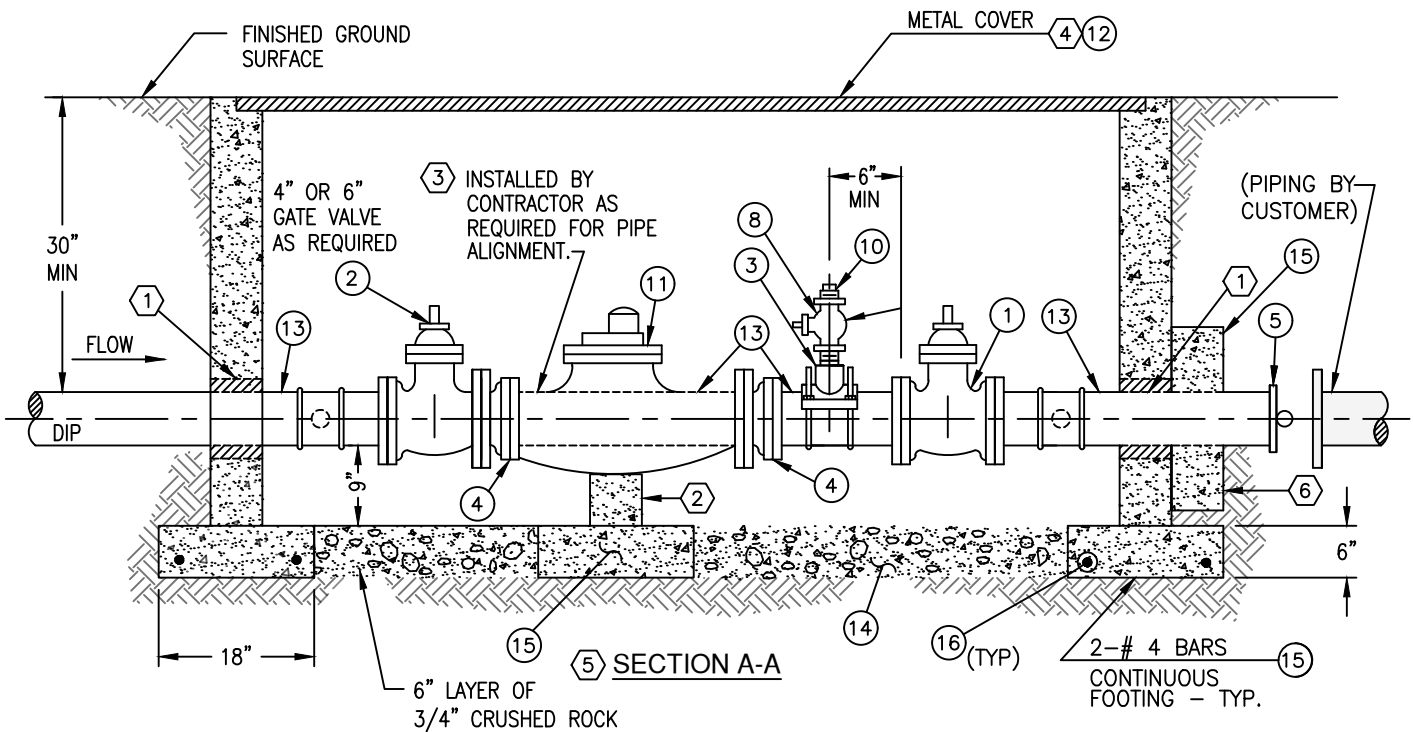
**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**BACKFLOW PREVENTION  
ASSEMBLY 3" & LARGER ABOVE  
GROUND INSTALLATION**

NOTE: SEE CWD-620-2 FOR MATERIAL CALL-OUT.



5 PLAN VIEW



5 SECTION A-A

**CONSTRUCTION NOTES:**

- 1 DRY-PACK PIPE OPENINGS.
- 2 SUPPORT COMPOUND METER ON CONCRETE PAD WITH CONCRETE BLOCK.
- 3 CONTRACTOR SHALL INSTALL ALL PIPE, FITTINGS, AND MATERIALS BETWEEN THE TAPPING GATE AND "PIPING BY CUSTOMER", INCLUDING TEMPORARY CONNECTION AT INFLUENT VALVE.
- 4 ADJUST VAULT AND COVER TO MEET SIDEWALK AND CURB GRADE. PAINT PER SECTION 310.
- 5 PROVIDE JOINT RESTRAINTS PER CONSTRUCTION SPECIFICATIONS.
- 6 POUR PCC 560-C-3250 CONCRETE THRUST COLLAR AGAINST WALL OF VAULT.

TYPICAL DIMENSIONS			
SERVICE SIZE	A	B	C
3 IN.	9"	24"	29"±
4 IN.	9"	24"	24±
6 IN.	10 1/2"	36 1/2"	13"±

APPROVALS		
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OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**3", 4", AND 6" METER  
WATER SERVICE**

BILL OF MATERIALS				
ITEM	QUANTITIES			REFERENCE
	3" METER	4" METER	6" METER	
① DIA RESILIENT WEDGE GATE VALVE (MJ X MJ)	1-(4" DIA)	1	1	
② DIA RESILIENT WEDGE GATE VALVE (MJ X FL)	1-(4" DIA)	1	1	
③ DIA x 2" BRONZE SERVICE SADDLE	3-(4" DIA)	3	3	
④ DIA FLANGE X MJ ADAPTER	1	1	1	
⑤ DIA 2" TEMPORARY CONSTRUCTION END CAP	1	1	1	CWD-412
⑥ 4" x 3" BRASS BUSHING	2	NA	NA	
⑦ 3" x 6" BRASS NIPPLE	1	NA	NA	
⑧ 2" CORP STOP (MNPT X MNPT)	3	3	3	
⑨ 4" SCREW FLANGE	2-(4" DIA)	NA	NA	
⑩ 2" BRASS CAP	1	1	1	
⑪ COMPOUND METER, DIA x FL x FL	1	1	1	PER REQ
⑫ VAULT AND COVER	1	1	1	CWD-800-1,2
⑬ DIA DUCTILE IRON PIPE, PRESSURE CLASS 350	VARIABLE			
⑭ 3/4" CRUSHED ROCK	16 CU FT			
⑮ CONCRETE PCC 560-C-3250	24 CU FT			
⑯ NO. 4 REBAR	48 LINEAR FT±			
⑰ 2" END CAP	2	2	2	

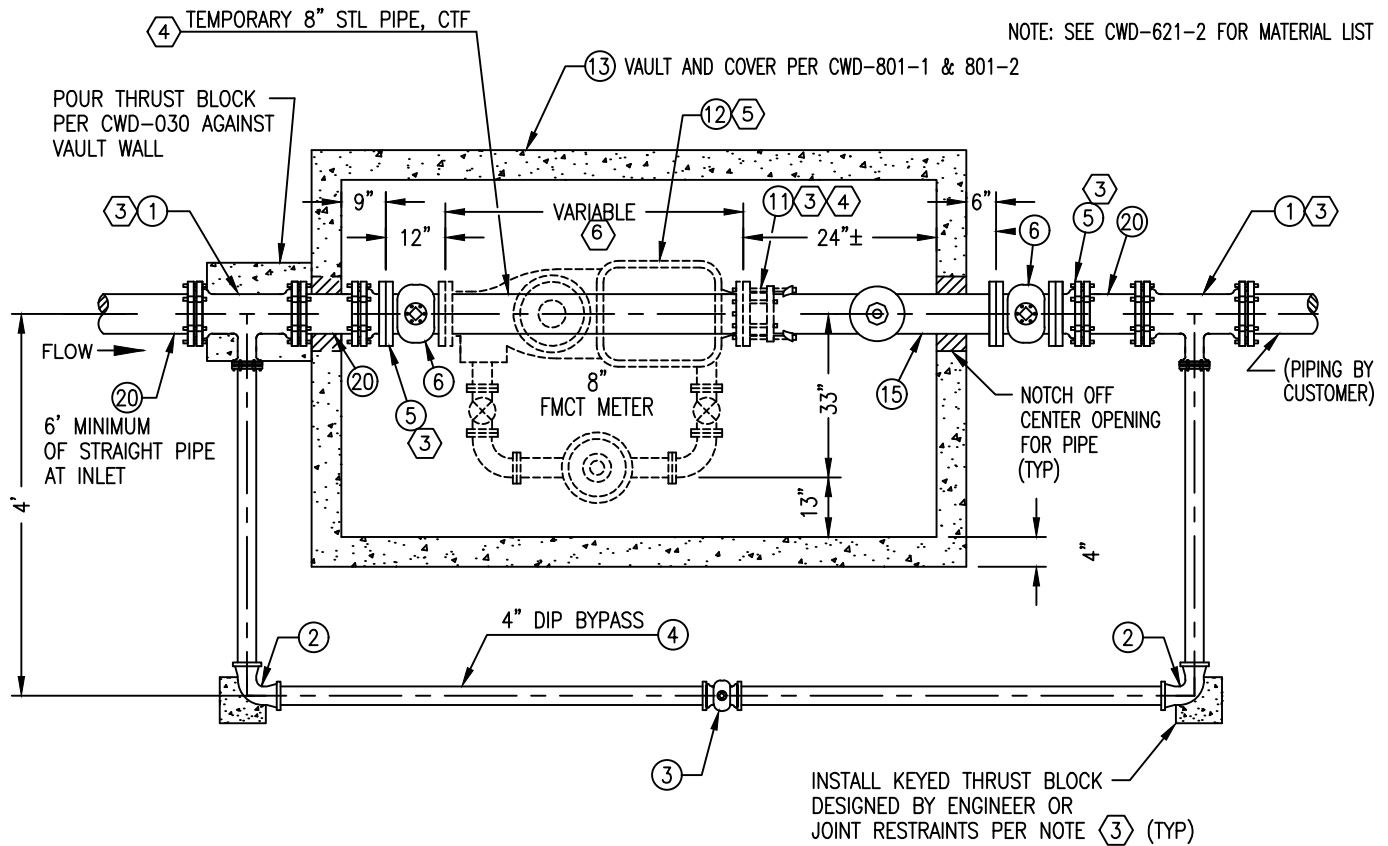
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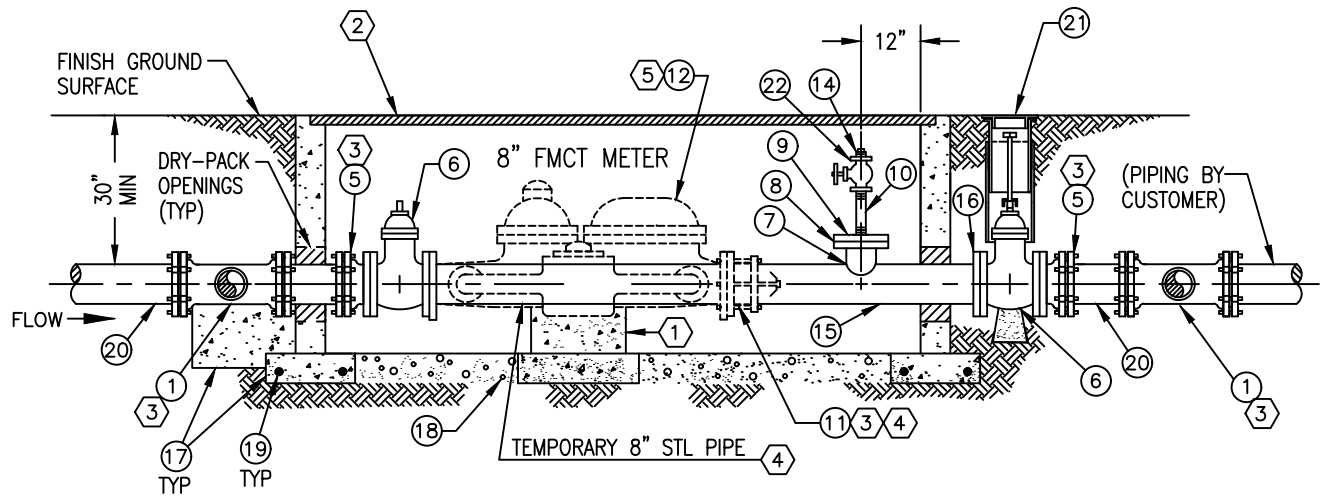
WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

BILL OF MATERIALS FOR  
3", 4", AND 6" METER  
WATER SERVICE





PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

- ① SUPPORT METER ON CONCRETE PAD AND CONCRETE BLOCK.
- ② ADJUST VAULT AND COVER TO MEET SIDEWALK AND CURB GRADE. PAINT PER CONSTRUCTION SPECIFICATION SECTION 310.
- ③ RESTRAIN ALL MECHANICAL JOINTS PER CONSTRUCTION SPECIFICATIONS.
- ④ CONTRACTOR SHALL INSTALL ALL PIPE, FITTINGS, AND MATERIALS BETWEEN THE TAPPING GATE AND "PIPING BY CUSTOMER", INCLUDING TEMPORARY FLANGE COUPLING CONNECTION AT THE INFLUENT VALVE LOCATION.
- ⑤ CITY FORCES WILL FURNISH AND INSTALL 8" FMCT METER AND FAB METER READING LID.
- ⑥ VARIABLE LENGTH IS PER MANUFACTURER'S REQUIREMENTS.

APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
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OPERATIONS	R. GLENNEY	8/25/22



WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

8" FMCT WATER SERVICE

BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
① 8" x 4" TEE (MJ X MJ)	2	
② 4" - 90° ELL (MJ X MJ)	2	
③ 4" RW GATE VALVE (MJ X MJ)	1	
④ 4" DI PIPE	23 FT±	
⑤ 8" FL X MJ ADAPTER W/ 8" FL INSULATION KIT	2	
⑥ 8" GATE VALVE (FL X FL)	2	
⑦ 6" MORTAR LINED STEEL PIPE (FL X PE)	1 FT	
⑧ 6" WELD FLANGE	1	
⑨ 6" BLIND FLANGE W/ 2" NPT TAP	1	
⑩ 2" X 12" GALV NIPPLE	1	
⑪ 8" FLANGED COUPLING ADAPTER	1	
⑫ 8" COMPOUND METER	1	
⑬ VAULT AND COVER	1	CWD-801-1,2
⑭ 2" GALVANIZED PLUG	1	
⑮ 8" STL PIPE (SCHEDULE 40)	7 FT±	
⑯ 8" WELD FLANGE	1	
⑰ CONCRETE PCC 480-C-2000	20 CU FT±	
⑱ 3/4" CRUSHED ROCK (6" DEEP LAYER)	28 CU FT	
⑲ NO 4 REBAR	64 FT±	
⑳ 8" DI PIPE	VARIABLE	
㉑ 8" GATE BOX MATERIAL	1	CWD-500
㉒ 2" RW GATE VALVE W/ 2" NUT	1	

**APPROVALS**

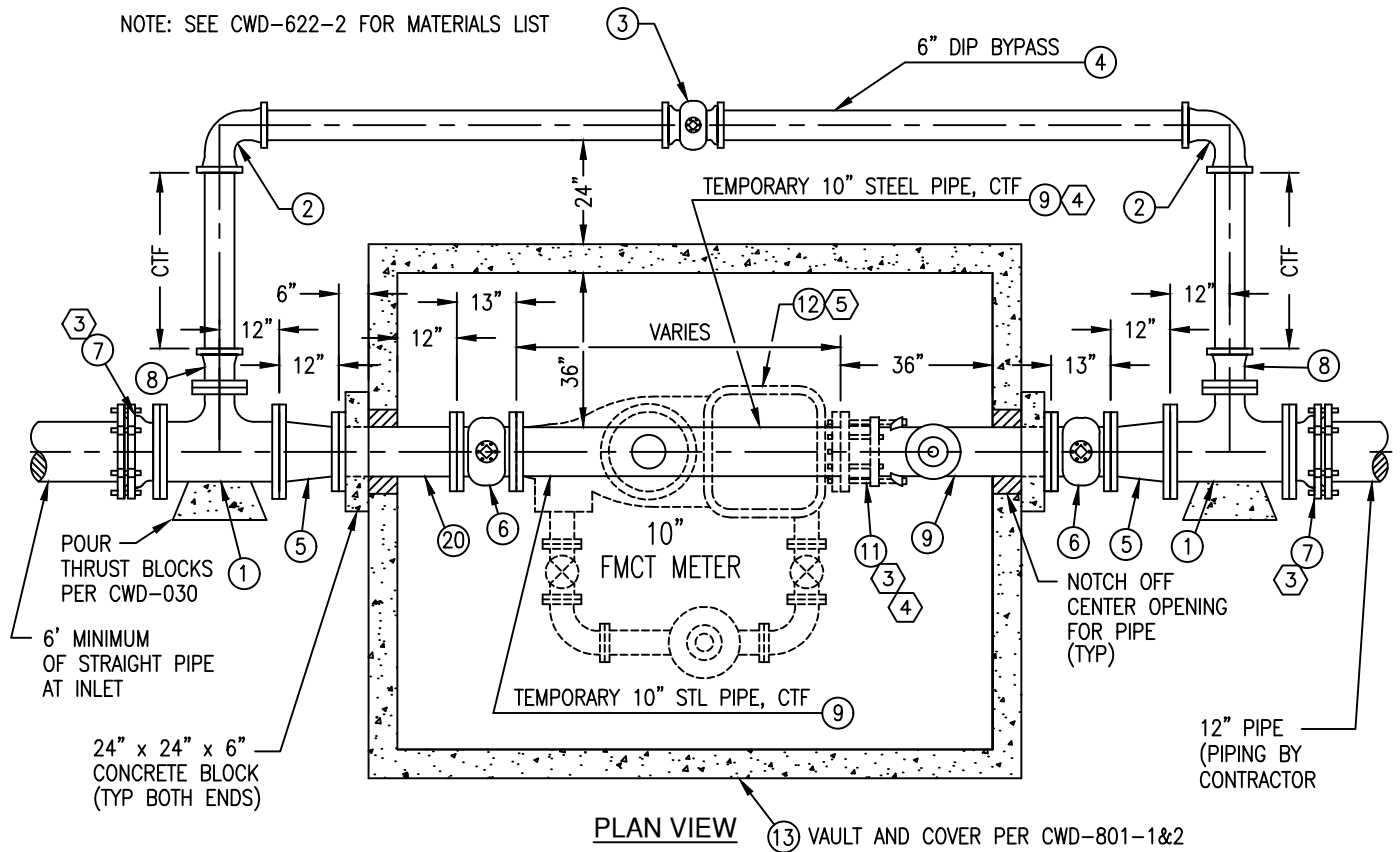
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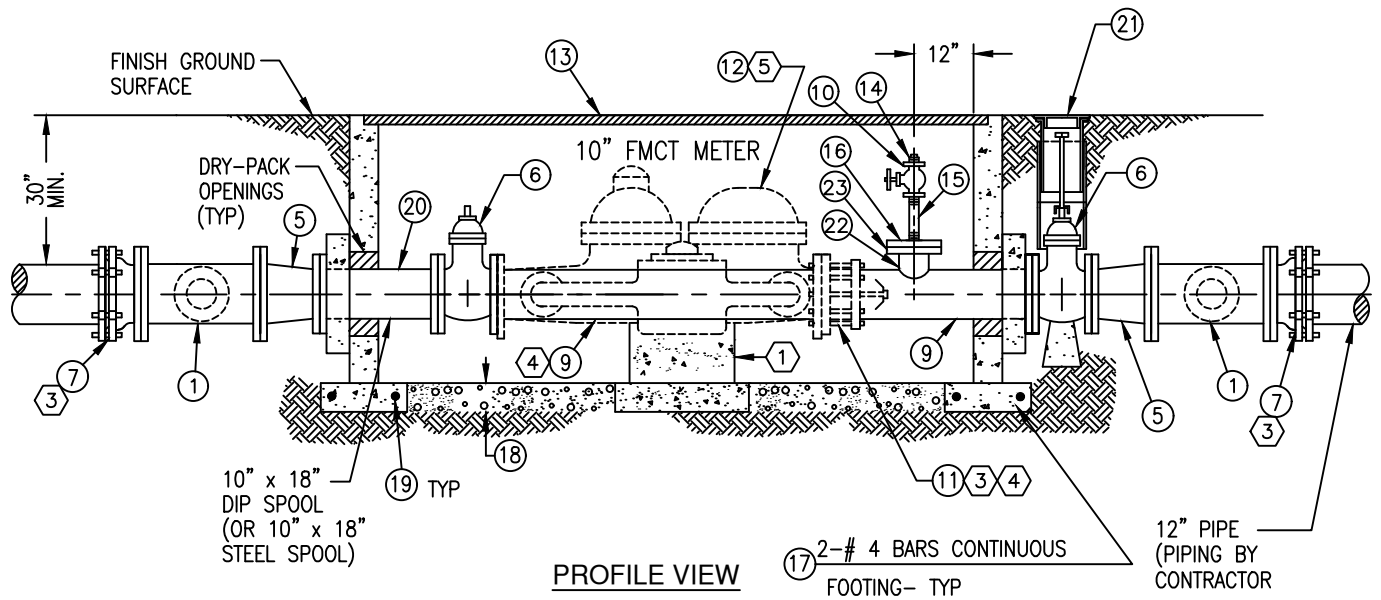
**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**BILL OF MATERIALS FOR  
8" FMCT WATER SERVICE**

NOTE: SEE CWD-622-2 FOR MATERIALS LIST



PLAN VIEW (13) VAULT AND COVER PER CWD-801-1&2



PROFILE VIEW (17) 2-# 4 BARS CONTINUOUS FOOTING- TYP

**GENERAL NOTES:**

- (1) SUPPORT METER ON CONCRETE PAD AND CONCRETE BLOCK.
- (2) ADJUST VAULT AND COVER TO MEET SIDEWALK AND CURB GRADE. PAINT PER CONSTRUCTION SPECIFICATION, SECTION 310.
- (3) RESTRAIN ALL MECHANICAL JOINTS PER CONSTRUCTION SPECIFICATIONS.
- (4) CONTRACTOR SHALL INSTALL ALL PIPE, FITTINGS, AND MATERIALS BETWEEN THE TAPPING GATE AND "PIPING BY CONTRACTOR", INCLUDING TEMPORARY FLANGE COUPLING CONNECTION AT INFLUENT VALVE.
- (5) CITY FORCES WILL FURNISH AND INSTALL 10" COMPOUND METER AND FAB. METER READING LID.

**APPROVALS**

DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
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OPERATIONS	R. GLENNEY	8/25/22

10" DOMESTIC WATER SERVICE



**WATER DISTRIBUTION & TRANSMISSION PIPELINE CONSTRUCTION METHODS**

BILL OF MATERIALS		
ITEM	QUANTITY	REFERENCE
① 12" x 6" TEE (FL X FL) *	2	
② 6" 90° ELL (MJ X MJ)	2	
③ 6" RW GATE VALVE (MJ X MJ)	1	
④ 6" DI PIPE	20 FT±	
⑤ 12" x 10" REDUCER (FL X FL)	2	
⑥ 10" GATE VALVE (FL X FL)	2	
⑦ 12" FL X MJ ADAPTER W/ 12" FLANGE INSULATION KIT	2	
⑧ 6" FL X MJ ADAPTER W/ 6" FLANGE INSULATION KIT	2	
⑨ 10" MORTAR LINED STL PIPE (FL X PE)	10 FT±	
⑩ 2" RW GATE VALVE W/ 2" NUT	1	
⑪ 10" FLANGE COUPLING ADAPTER	1	
⑫ 10" COMPOUND METER	1	
⑬ VAULT AND COVER	1	CWD-802-1/2
⑭ 2" GALVANIZED PLUG	1	
⑮ 2" X 12" GALV NIPPLE	1	
⑯ 6" BLIND FLANGE W/ 2" NPT TAP	1	
⑰ CONCRETE PCC 480-6-2000	40 CU FT	
⑱ 3/4" CRUSHED ROCK (6" DEEP LAYER)	40 CU FT	
⑲ NO 4 REBAR	64 FT±	
⑳ 10" x 18" DIP SPOOL, (FL X FL)	ALTERNATE FOR STEEL	
㉑ 8" GATE BOX MATERIAL	1	
㉒ 6" MORTAR LINED STL PIPE (FL X PE)	1 FT	
㉓ 6" WELD FLANGE	1	

\* 12" x 12" TEE (FL X FL) WITH 12" x 6" REDUCER  
MAY BE USED INSTEAD OF 12" x 12" x 6" TEE.

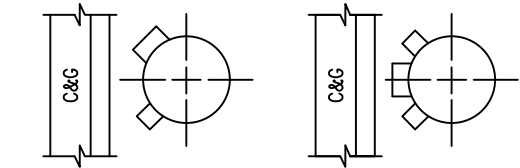
APPROVALS		
DIVISION	INITIAL	DATE
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DESIGN	J. FARLEY	8/25/22
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**WATER**  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

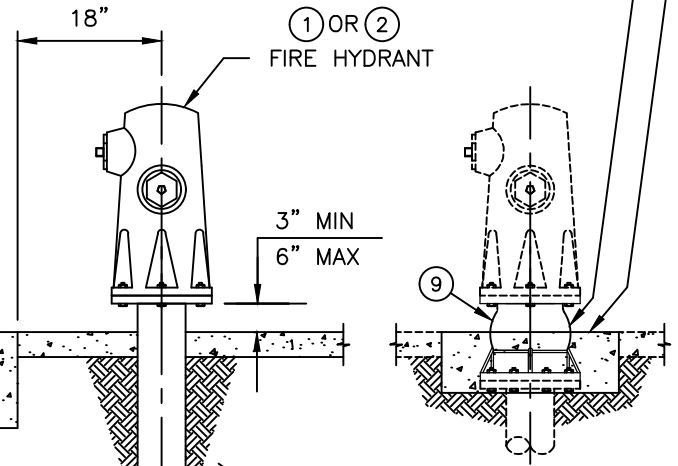
BILL OF MATERIALS FOR  
10" DOMESTIC WATER SERVICE

8" THICK CONCRETE COLLAR, 1' FROM FH EDGE TO OUTSIDE EDGE.  
 FINISH SURFACE SHALL BE BELOW CONNECTING BOLTS/NUTS.  
 INSTALLATION MAY VARY PER MANUFACTURER'S RECOMMENDATIONS.

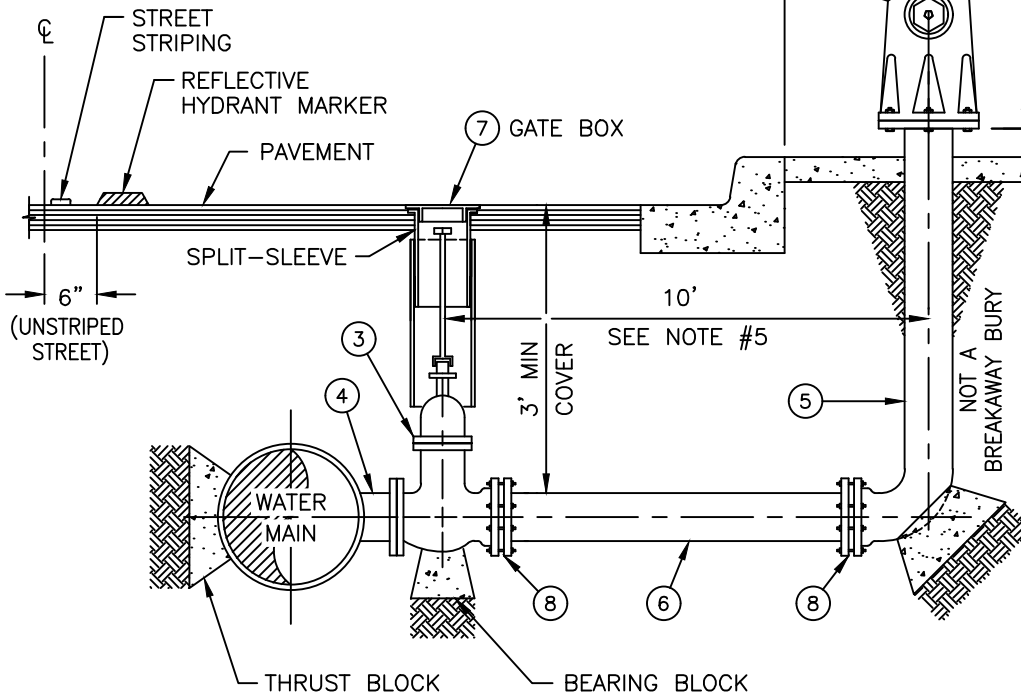


REGULAR FIRE HYDRANT SUPER FIRE HYDRANT  
**OUTLET ORIENTATION DETAIL**  
 NTS

CHECK VALVE PER MANUFACTURER'S RECOMMENDATIONS.



**CHECK VALVE DETAIL**



- REQUIRED IF:
- A) FIRE HYDRANT IS LOCATED WITHIN 50' HORIZONTAL OF OVERHEAD POWER LINES;
  - B) FIRE HYDRANT IS NEAR FREEWAY, AS DIRECTED BY THE ENGINEER;
  - C) FIRE HYDRANT VALVE IS LESS THAN 10' FROM FIRE HYDRANT;
  - D) SPECIFIED ON THE PLANS, OR AS OTHERWISE REQUIRED BY THE ENGINEER.

**NOTES**

1. REGULAR OR SUPER HYDRANT IN ACCORDANCE WITH PLAN AND SPECIFICATIONS.
2. HYDRANT PENTAGON SPANNER NUTS AND NOZZLE CAPS SHALL BE 1 3/4".
3. BREAK-OFF BOLTS REQUIRED BETWEEN FIRE HYDRANT AND FLANGE IN ACCORDANCE WITH SPECIFICATIONS. INSTALL WITH NUT ON TOP.
4. DI BURY AND FIRE HYDRANT FLANGE SHALL BE 6-HOLE.
5. FIRE HYDRANT OUTLETS SHALL FACE STREET.
6. FIRE HYDRANT VALVE SHALL BE A MINIMUM OF 10 FEET FROM HYDRANT.
7. THRUST AND BEARING BLOCKS PER CWD-030
8. FURNISH AND INSTALL A STIMSONITE MODEL 88AB TWO-WAY BLUE REFLECTIVE FIRE HYDRANT MARKER DIRECTLY OPPOSITE HYDRANT, LOCATE MARKER ON HYDRANT SIDE OF STREET CENTERLINE IN ACCORDANCE WITH THE ABOVE DETAIL, WITH REFLECTIVE SIDE FACING ONCOMING TRAFFIC, PROVIDE 2 - MARKERS FOR HYDRANTS INSTALLED AT INTERSECTIONS.
9. ALL PIPE TO BE POLYETHENE-ENCASED PER SPECIFICATION SECTION 306.
10. IF MAIN LINE MUST BE WET TAPPED, SEE CWD-504.

BILL OF MATERIALS			
ITEM	QUANTITY	REFERENCE	
① REGULAR FIRE HYDRANT OUTLETS: 1 - 2 1/2", 1 - 4"	1		
② SUPER FIRE HYDRANT OUTLETS: 2 - 2 1/2", 1 - 4"			
③ 6" RW GATE VALVE, (FL x MJ)	1	CWD-500	
④ 6" FLANGED TEE	1		
⑤ 6" DI BURY, (FL x MJ) BREAKAWAY BURY IS NOT PERMITTED	1		
⑥ 6" DI PIPE	1		
⑦ 8" GATE BOX CAP, GALV SPLIT-SLEEVE, AND 12 GA STL PIPE	1	CWD-515	
⑧ APPROVED RESTRAINT SYSTEM	2		
⑨ AVK FLOWGUARD II BREAK-OFF CHECK VALVE, OR APPROVED EQUAL.	1		

APPROVALS		
DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER**  
 DISTRIBUTION & TRANSMISSION  
 PIPELINE CONSTRUCTION METHODS

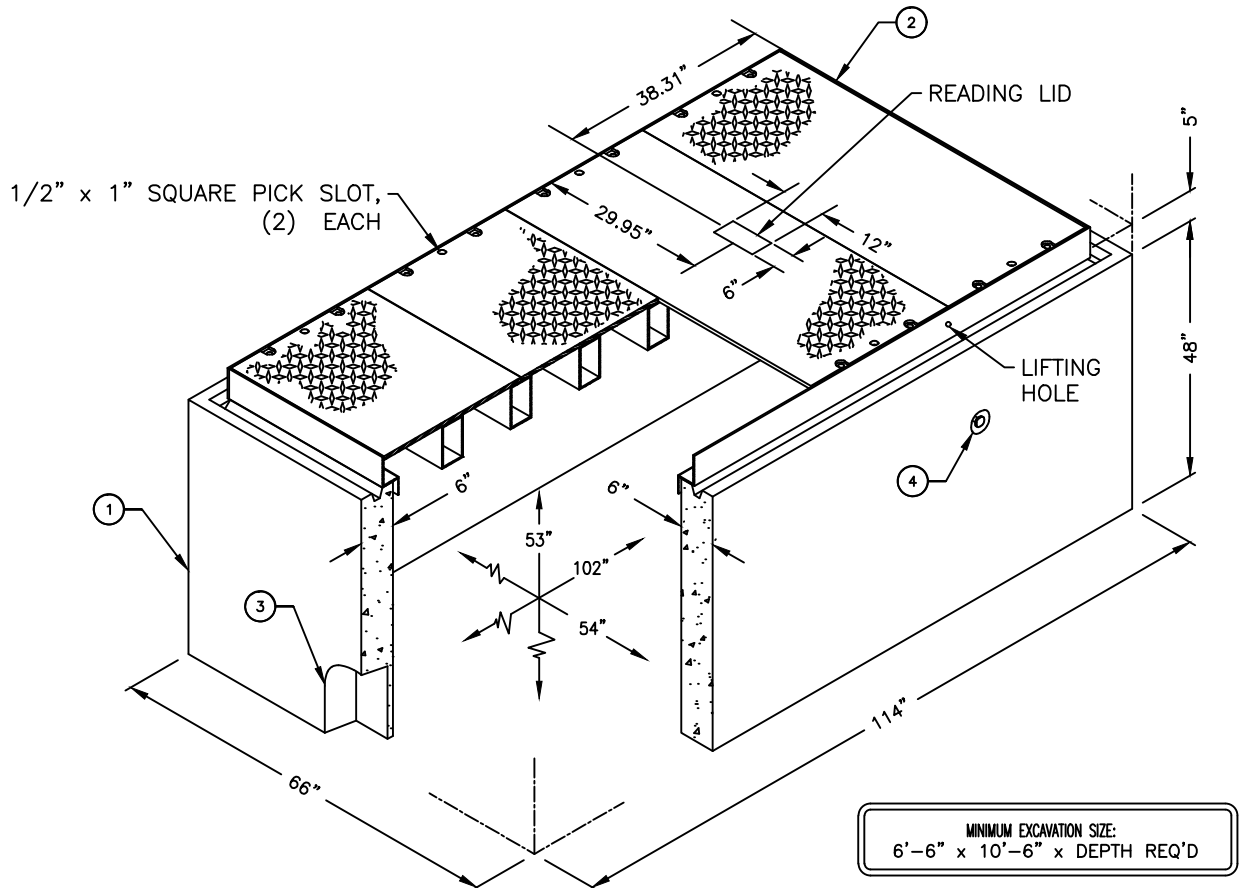
**REGULAR AND SUPER FIRE  
 HYDRANT DETAIL**

# 4' - 6" x 8' - 6" TRAFFIC VAULT X 53" DEEP

## GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO H-20-44 TRAFFIC BRIDGE LOADING USING 5,500 PSI [37.92MPa] COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI [413.2MPa] YIELD STRENGTH ASTM A-706 STEEL REINFORCEMENT.
2. COVER DESIGNED FOR H-20-44 TRAFFIC LOADING FOR USE IN OFF STREET LOCATIONS.
3. HANDHOLE TO BE PLACED ON A 6" [15cm] BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
4. MINIMUM SOIL BEARING CAPACITY IS HEREBY ASSUMED TO BE 2,000 PSF.
5. INSTALLATION OF MANHOLES, VAULTS, HANDHOLES.
6. ALL PERMISSIBLE TOLERANCES SHALL BE MET PER THE REQUIREMENTS OF THE MANUFACTURER.
7. CONTRACTOR SHALL CUT-IN A 12"x6" WINDOW FOR METER READING AS DIRECTED BY THE CITY WATER INSPECTOR.

BILL OF MATERIALS	
SYMBOL	DESCRIPTION
①	48" LOWER SECTION
②	TRAFFIC METALTECH GREY PAINTED ASSEMBLY, (32) 1/2" PLATED SHAKEPROOF WASHER, (16) 1/2" x 1-1/2" H.H.S.S. BOLTS, (16) 1/2" UNISTRUT SPRING NUTS, <u>WITH SPECIAL PICK HOLES &amp; READING LID</u>
③	12"W x 24"H MOUSE HOLE. LOCATE AS FOLLOWS: LOWER SECTION, (2) SHELL MTD.
④	4 TON x 4 3/4" GALVANIZED RISS ANCHOR FOR HANDLING, LOCATE AS FOLLOWS: LOWER SECTION, (4) SHELL MTD.



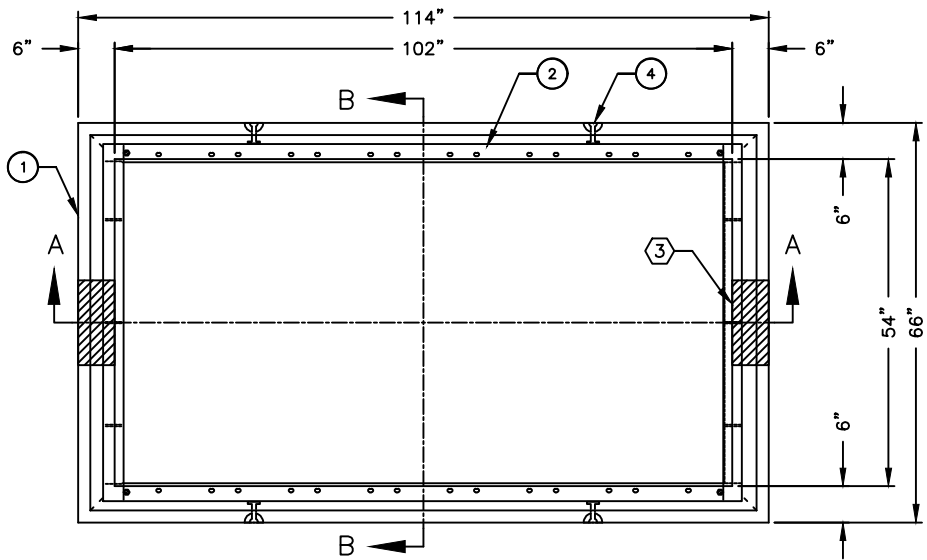
MINIMUM EXCAVATION SIZE:  
 6'-6" x 10'-6" x DEPTH REQ'D

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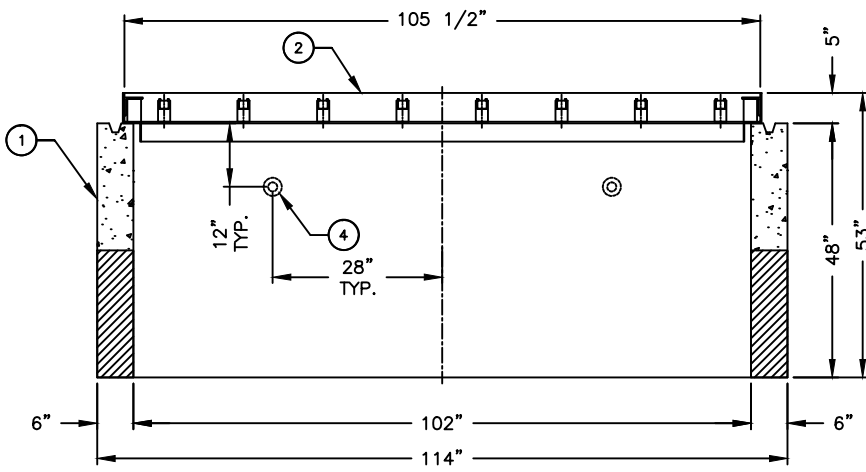


**WATER**  
 DISTRIBUTION & TRANSMISSION  
 PIPELINE CONSTRUCTION METHODS

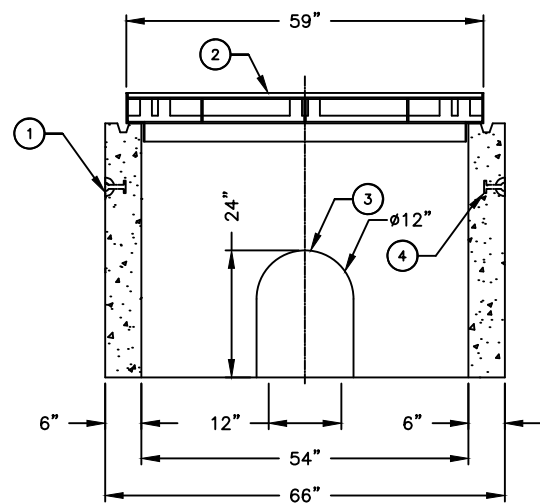
TRAFFIC RATED VAULT FOR  
 3" THROUGH 12" METERS



PLAN VIEW



SECTION A-A



SECTION B-B

BILL OF MATERIALS

SYMBOL	DESCRIPTION
①	48" LOWER SECTION
②	TRAFFIC METALTECH GREY PAINTED ASSEMBLY, (32) 1/2" PLATED SHAKEPROOF WASHER, (16) 1/2" x 1-1/2" H.H.S.S. BOLTS, (16) 1/2" UNISTRUT SPRING NUTS, WITH SPECIAL PICK HOLES & READING LID
③	12"W x 24"H MOUSE HOLE. LOCATE AS FOLLOWS: LOWER SECTION, (2) SHELL MTD.
④	4 TON x 4 3/4" GALVANIZED RISS ANCHOR FOR HANDLING, LOCATE AS FOLLOWS: LOWER SECTION, (4) SHELL MTD.

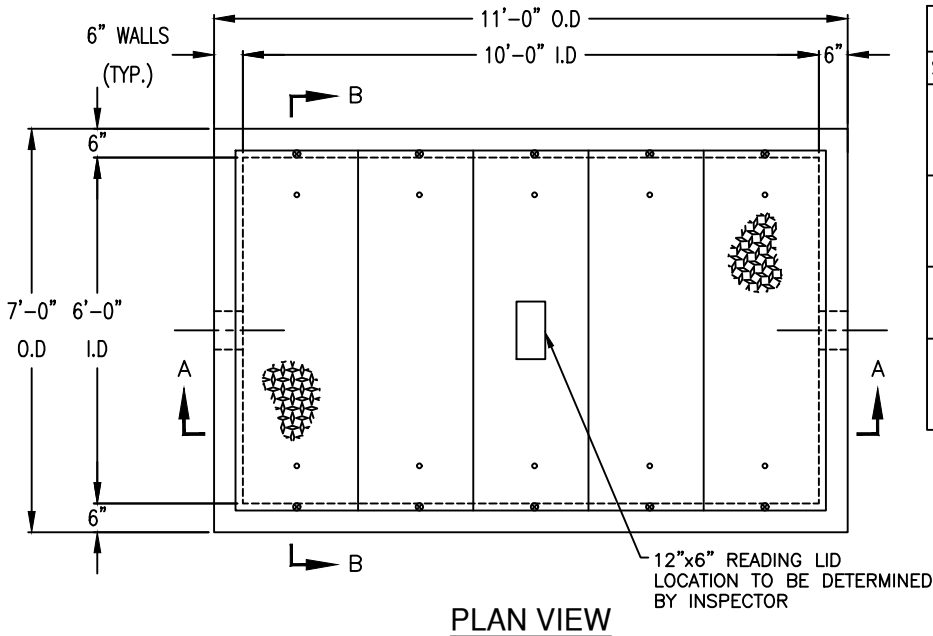
APPROVALS

DIVISION	INITIAL	DATE
PLANNING	B. YAMAMOTO	8/25/22
DESIGN	J. FARLEY	8/25/22
CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



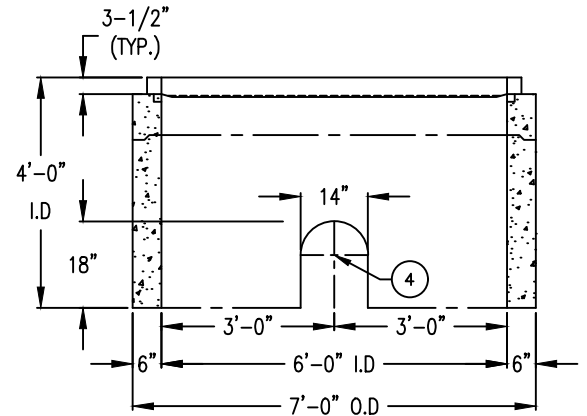
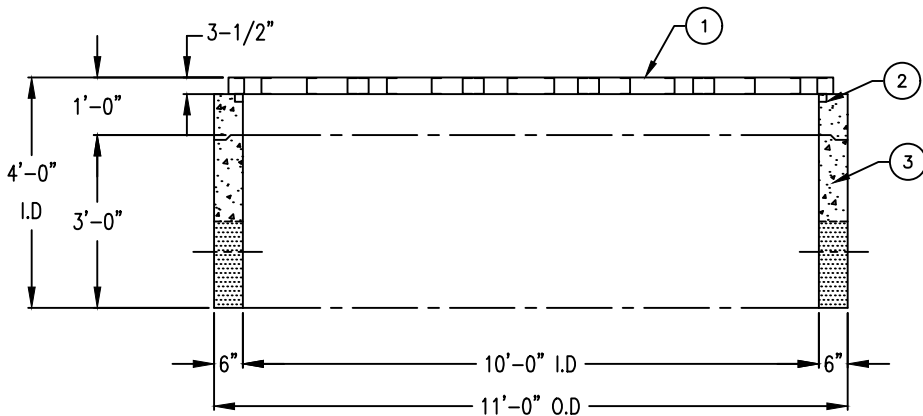
WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

TRAFFIC RATED VAULT FOR  
3" THROUGH 12" METERS



BILL OF MATERIALS		
SYMBOL	QTY.	DESCRIPTION
①	1	5-PIECE BOLTDOWN GALVANIZED STEEL DIAMOND PLATE H-20 TRAFFIC COVER
②	1	6'-0" x 10'-0" x 1'-0" TOP SECTION WITH GALVANIZED ANGLE EXPOSED CAST-IN FRAME
③	1	6'-0" x 10'-0" x 3'-0" LOWER SECTION
④	2	14" WIDE x 18" HIGH SLOTTED PIPE OPENINGS ONE ON EACH 6' END WALL

\*VERIFY AND APPROVE ALL OPENINGS AND DIMENSIONS BEFORE PRODUCTION.



**GENERAL NOTES:**

1. VAULT DESIGNED IN ACCORDANCE WITH AASHTO H-20-44 TRAFFIC BRIDGE LOADING USING 5,500 PSI [37.92MPa] COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI [413.2MPa] YIELD STRENGTH ASTM A-706 STEEL REINFORCEMENT PER CALC.
2. COVER IS DESIGNED FOR AASHTO H-20 WHEEL LOADING.
3. PRIOR TO SETTING, A MINIMUM OF SIX (6) INCHES OF CRUSHED ROCK SHALL BE PROVIDED AS A BASE TO RECEIVE STRUCTURE. THE BASE MATERIAL SHALL BE COMPACTED AND GRADED LEVEL AT THE PROPER ELEVATION.
4. MINIMUM SOIL BEARING CAPACITY ASSUMED TO BE 2,000 PSF.
5. INSTALLATION OF VAULT WILL BE PER THE MANUFACTURER'S REQUIREMENTS AND PROCEDURES.
6. ALL TOLERANCES MUST MEET THE MANUFACTURER'S REQUIREMENTS.
7. JOINTS ARE TO BE SEALED WITH A BUTYL FLEXIBLE MASTIC SEALANT.

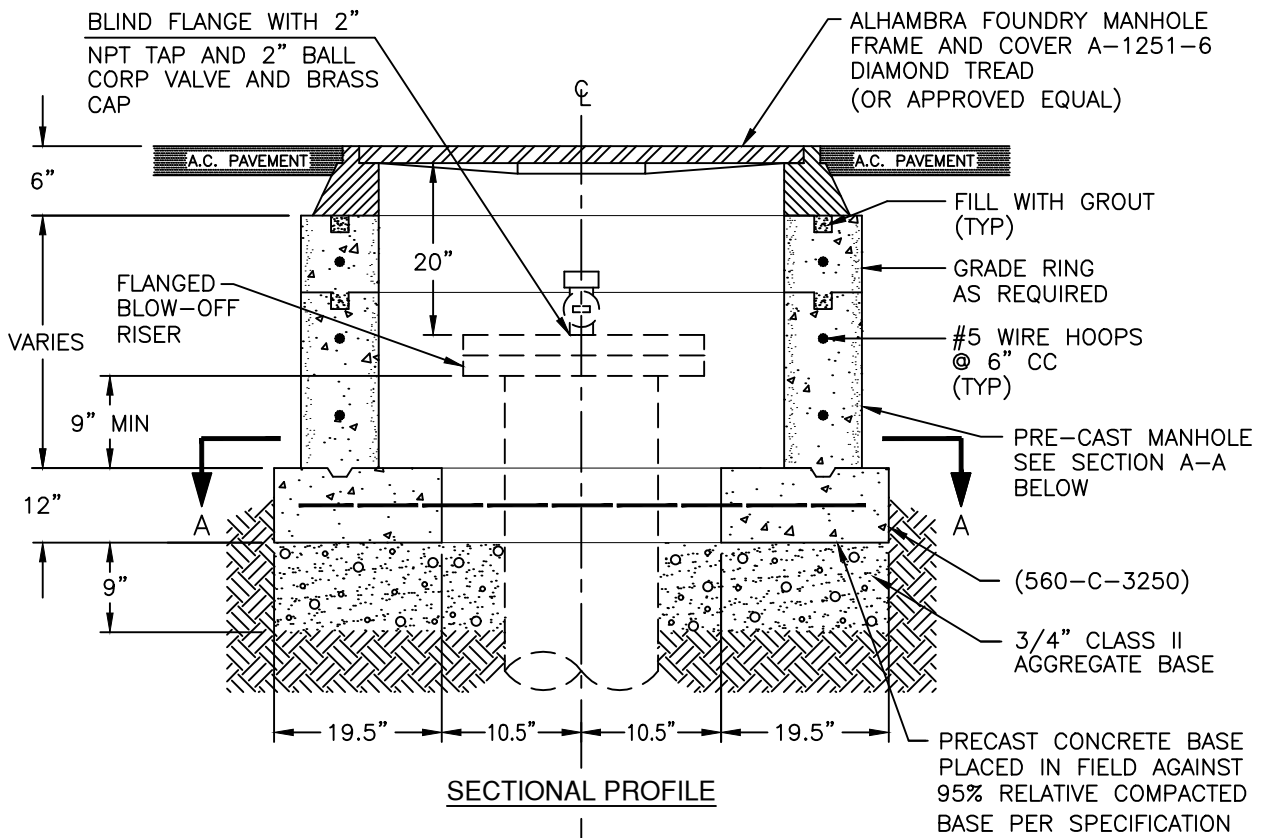
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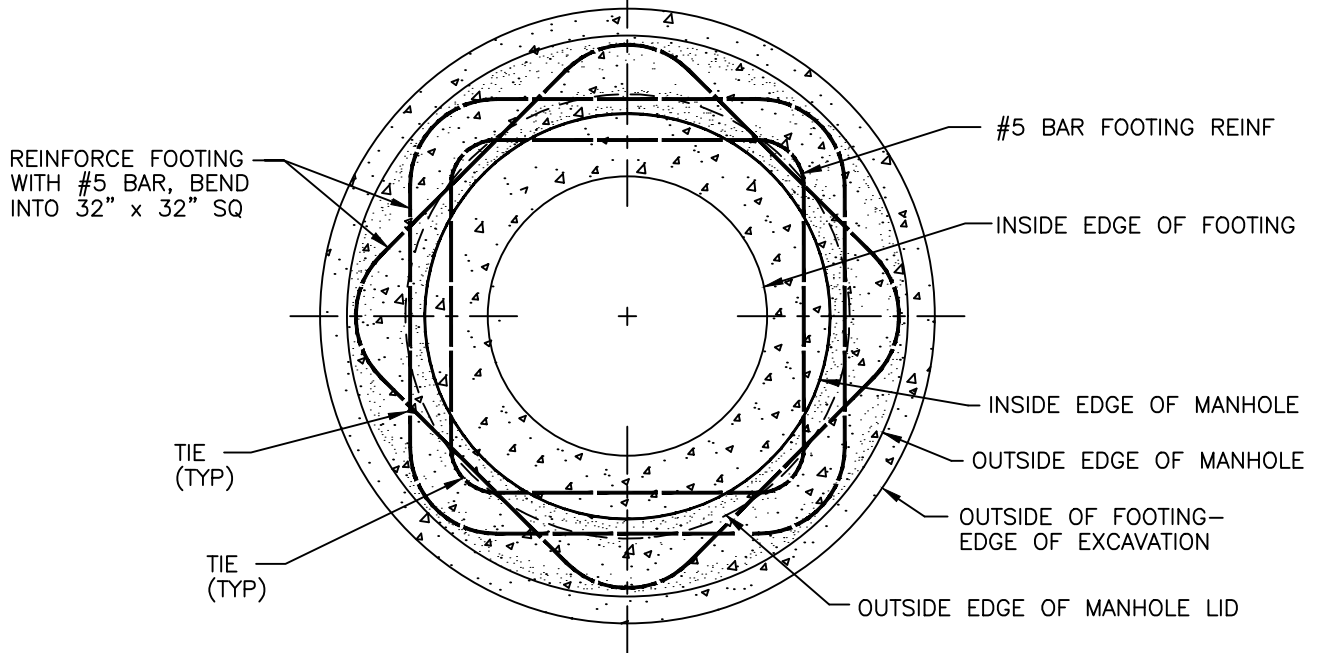
WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

MISCELLANEOUS LARGE  
METER VAULT





SECTIONAL PROFILE



SECTION A-A

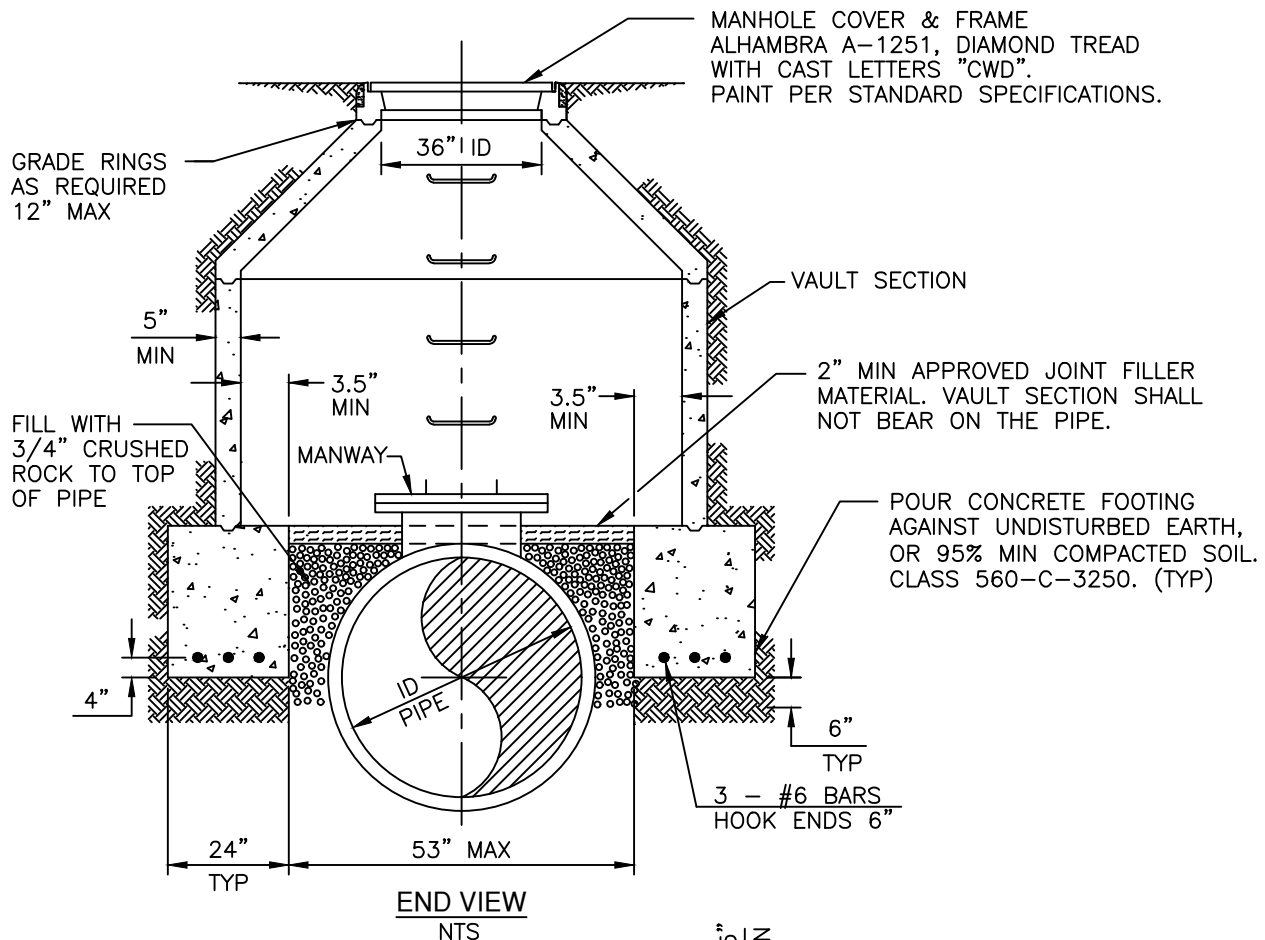
- PRE-CAST MANHOLE SECTION SPECIFICATIONS:**
- 1) DESIGN LOADING H = 20 - S 16
  - 2) CEMENT: TYPE II, ASTM C150, 3250 PSI
  - 3) REINFORCEMENT: GRADE 40 OR GRADE 60 ASTM A615
  - 4) COVER TO BE DIAMOND-TREAD FINISH, LETTERED "CWD"

APPROVALS		
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OPERATIONS	R. GLENNEY	8/25/22

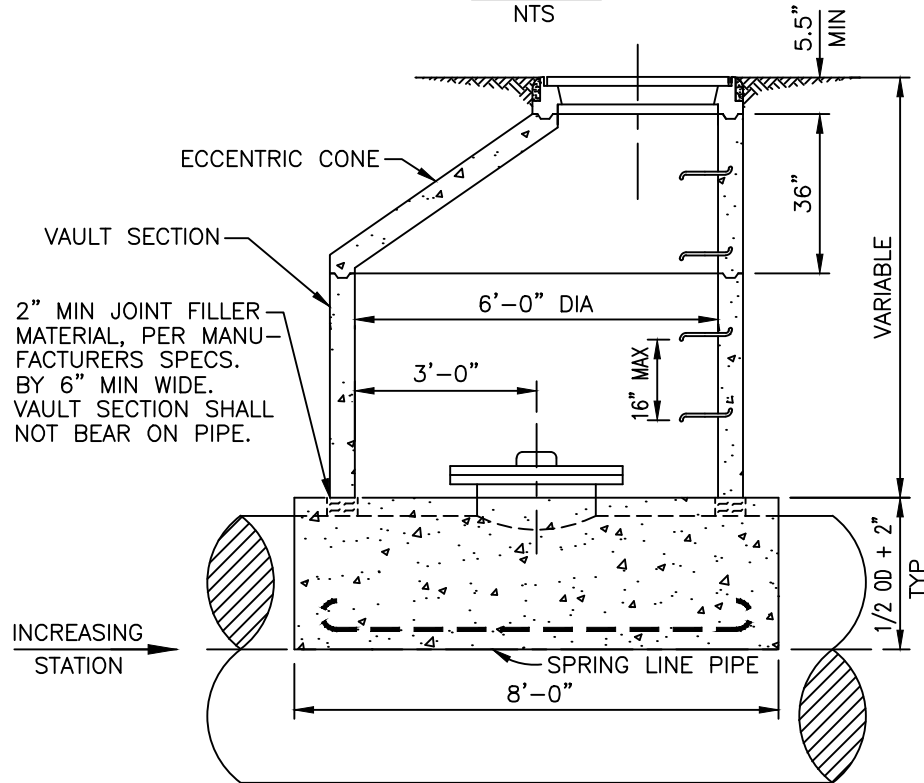


**WATER**  
**DISTRIBUTION & TRANSMISSION**  
**PIPELINE CONSTRUCTION METHODS**

**BLOW-OFF MANHOLE**  
**INSTALLATION**



END VIEW  
NTS



SIDE VIEW  
NTS

NOTES:

- 1.) STEPS SHALL BE 16" WIDE STIRRUP TYPE SAFETY STEPS CAST IN-PLACE AT TIME OF MANUFACTURE. STEPS SHALL BE PLACED AT A MAX. OF 16" CENTER TO CENTER. MATERIAL FOR STEPS SHALL BE 3/4" GALV. STEEL, ASTM A-124, OR 1/2" GRADE 60 STEEL REINFORCED NON-SLIP COPOLYMER POLYPROPYLENE PLASTIC.
- 2.) WHEN MANHOLE IS IN PAVED AREA, MANHOLE FRAME SHALL BE SET AFTER ADJACENT PAVEMENT HAS BEEN PLACED. TOP SHALL BE FLUSH WITH PAVEMENT.
- 3.) ALL JOINTS SHALL BE SEALED WITH AN APPROVED JOINT SEALANT.
- 4.) VAULT SHALL BE DESIGNED FOR H-20, S-16 LOADING.
- 5.) LOCATION FOR MANHOLES OVER MANWAYS AS SHOWN ON THE PLAN AND PROFILE SHEETS.

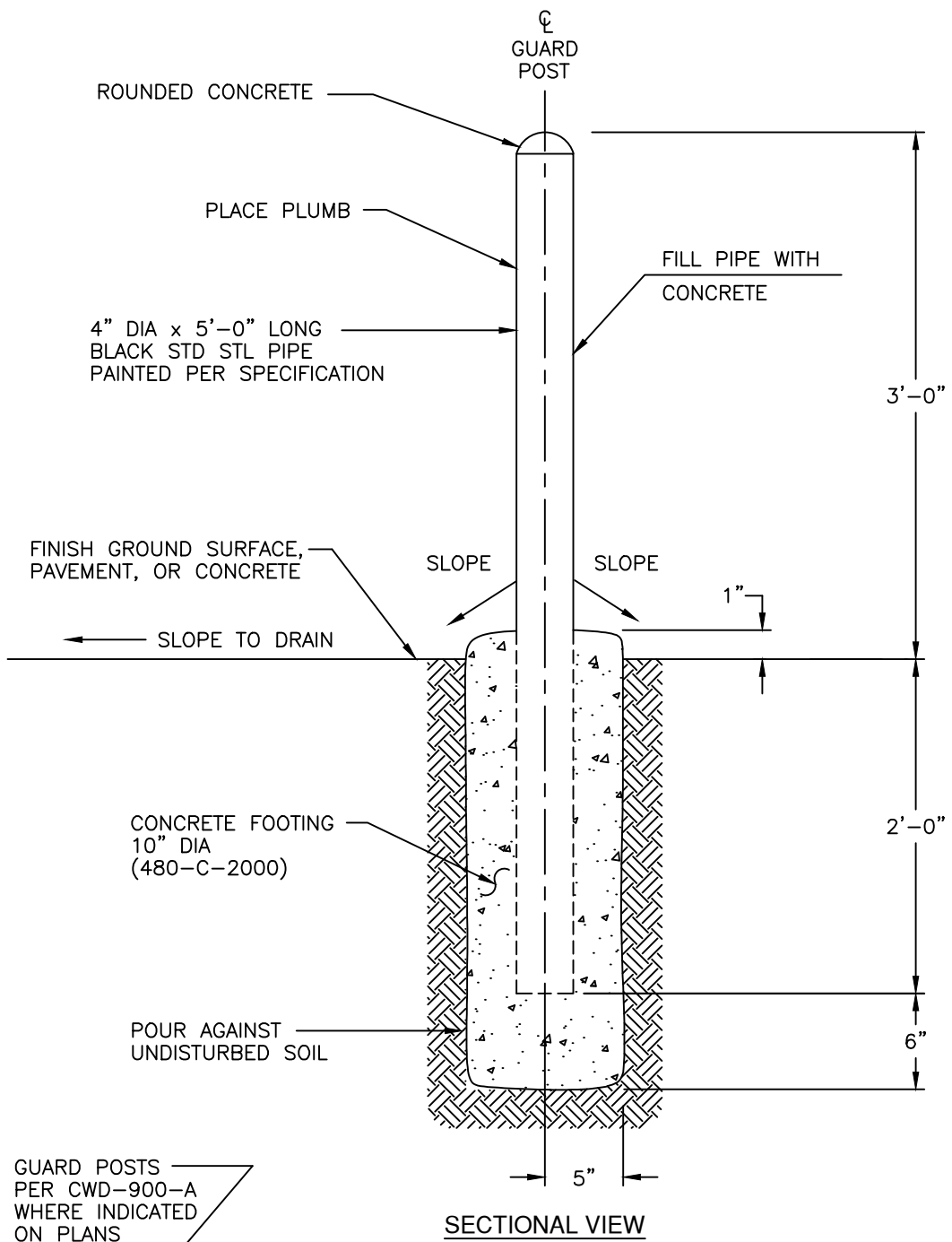
APPROVALS

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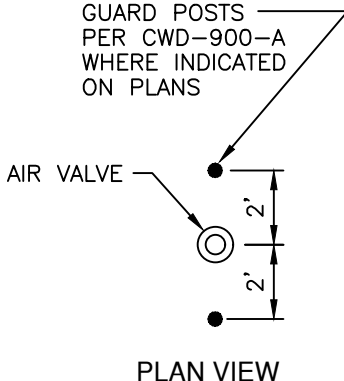


WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

MANHOLE DETAIL  
48" MAX ID PIPE



**SECTIONAL VIEW**



**PLAN VIEW**

**NOTES:**

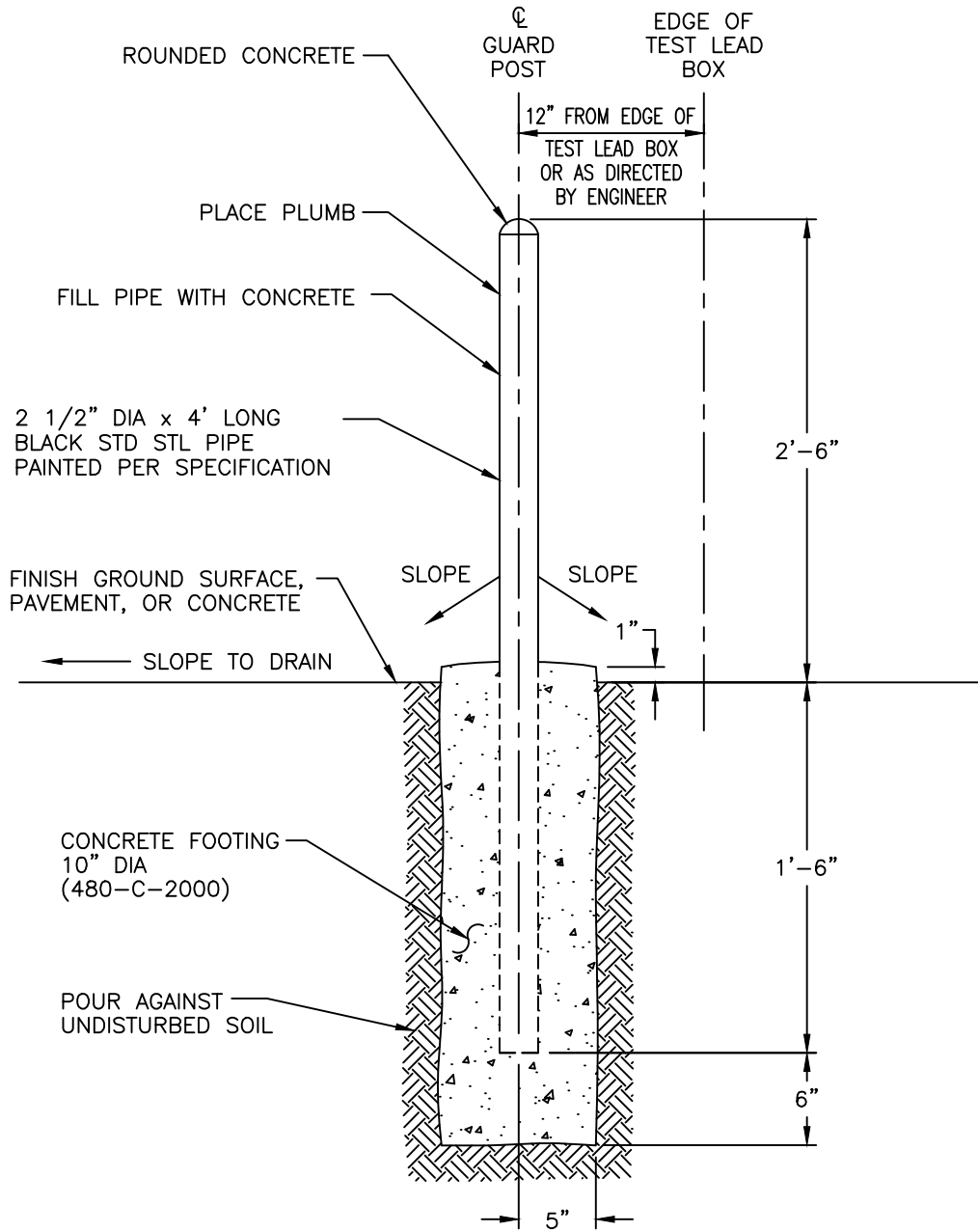
- 1.) NUMBER AND POSITION OF GUARD POSTS AS SPECIFIED ON PLANS.
- 2.) REFER TO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEC. 210 AND SEC. 310.

APPROVALS		
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**4" DIAMETER GUARD POST  
INSTALLATION**



**SECTIONAL VIEW**

**NOTES:**

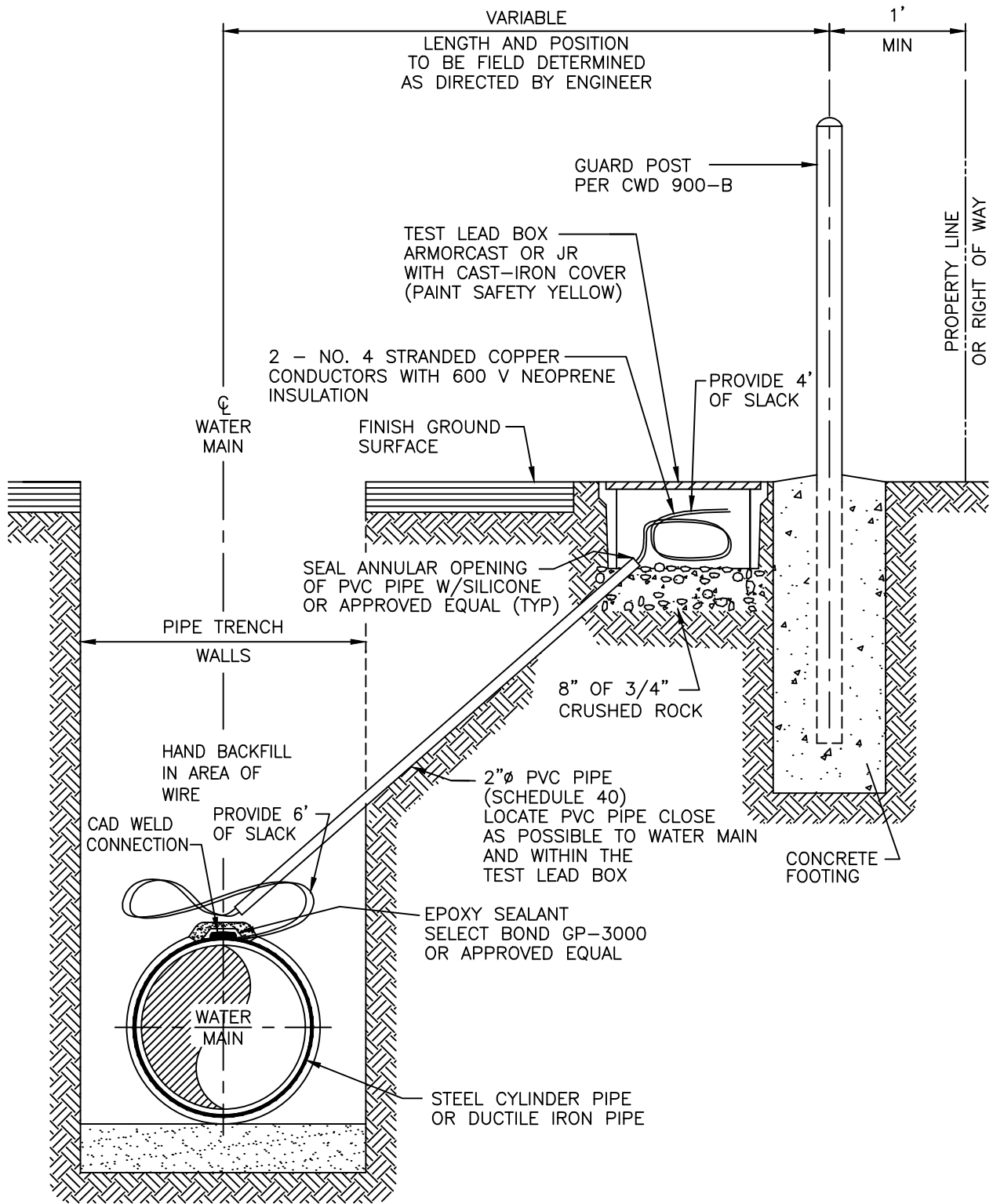
- 1.) NUMBER AND POSITION OF GUARD POSTS AS SPECIFIED ON PLANS.
- 2.) REFER TO "STANDARD SPECIFICATIONS PUBLIC WORKS CONSTRUCTION", SEC 210 AND 310.

APPROVALS		
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CONTRACT ADMIN.	E. ESCOBAR	8/25/22
OPERATIONS	R. GLENNEY	8/25/22



**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**2.5" DIAMETER GUARD POST  
INSTALLATION**



PROFILE VIEW

NOTES

- 1.) "CADWELD" TYPE HA-3 CONNECTION, CAH AA-IL, WITH F33 STANDARD CHARGE (STEEL PIPE); TYPE HB CONNECTION, CA HBA-16, XF-19 CHARGE (DUCTILE IRON PIPE); OR CITY APPROVED EQUAL.
- 2.) PREPARATION OF CONDUCTOR AND PIPE SURFACES SHALL BE MADE PER THE PUBLISHED INSTRUCTIONS OF THE CONNECTOR MANUFACTURER.
- 3.) SEE DRAWINGS FOR STATION AND LOCATION OF TEST LEAD CONNECTIONS.
- 4.) EPOXY SEALANT: MIX AND FIRMLY APPLY EPOXY PUTTY TO PROVIDE A WATER-TIGHT SEAL AT LEAST 1/4 INCH THICK OVER WELD AND BARE WIRE. OVERLAY WIRE INSULATION BY 1/2 INCH.

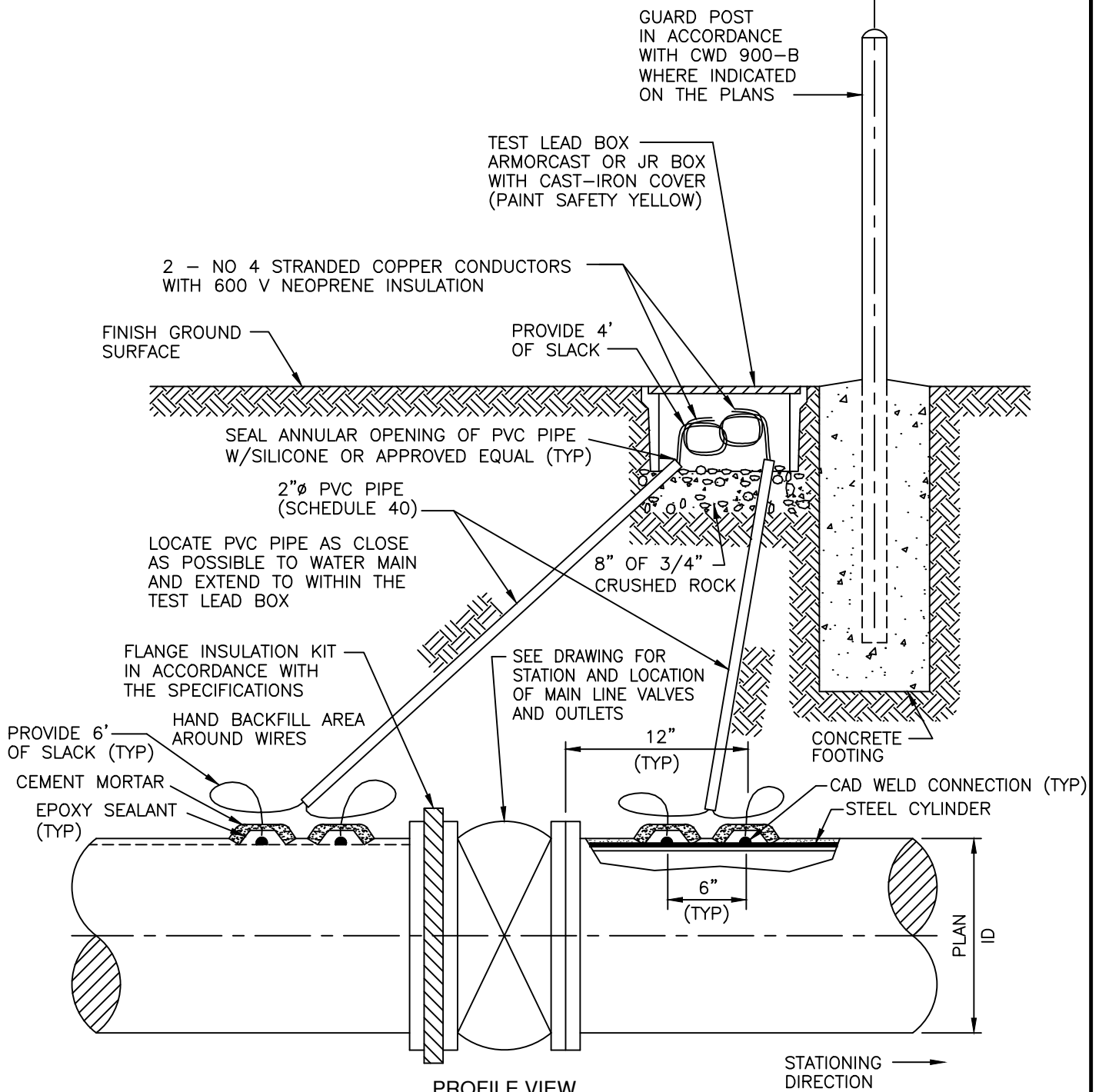
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WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

TEST LEAD INSTALLATION



**NOTES**

- 1.) FLANGE INSULATION GASKETS SHALL BE FULL-FACED, NEOPRENE-COATED FABRIC-REINFORCED PHENOLIC, 1/8 INCH THICK. A ONE-PIECE SLEEVE AND WASHER, SEPARATE PHENOLIC WASHER, AND TWO CADMIUM-PLATED STEEL WASHERS SHALL BE USED FOR EACH BOLT OR CAP SCREW.
- 2.) FLANGE KITS SHALL BE FURNISHED IN ACCORDANCE WITH THE SPECIFICATIONS.
- 3.) TEST LEAD CONNECTIONS AND LOCATIONS IN ACCORDANCE WITH CWD-922.
- 4.) TEST LEADS SHALL BE TAGGED AND/OR COLOR-CODED EAST/WEST OR NORTH/SOUTH OF VALVE.
- 5.) TEST LEAD INSULATION KIT SHALL BE STRIPPED BACK ONE INCH FROM ENDS.
- 6.) WHEN FLANGE KITS ARE SPECIFIED: SIZE \_\_\_\_\_ - 150# - TYPE EN-DW.

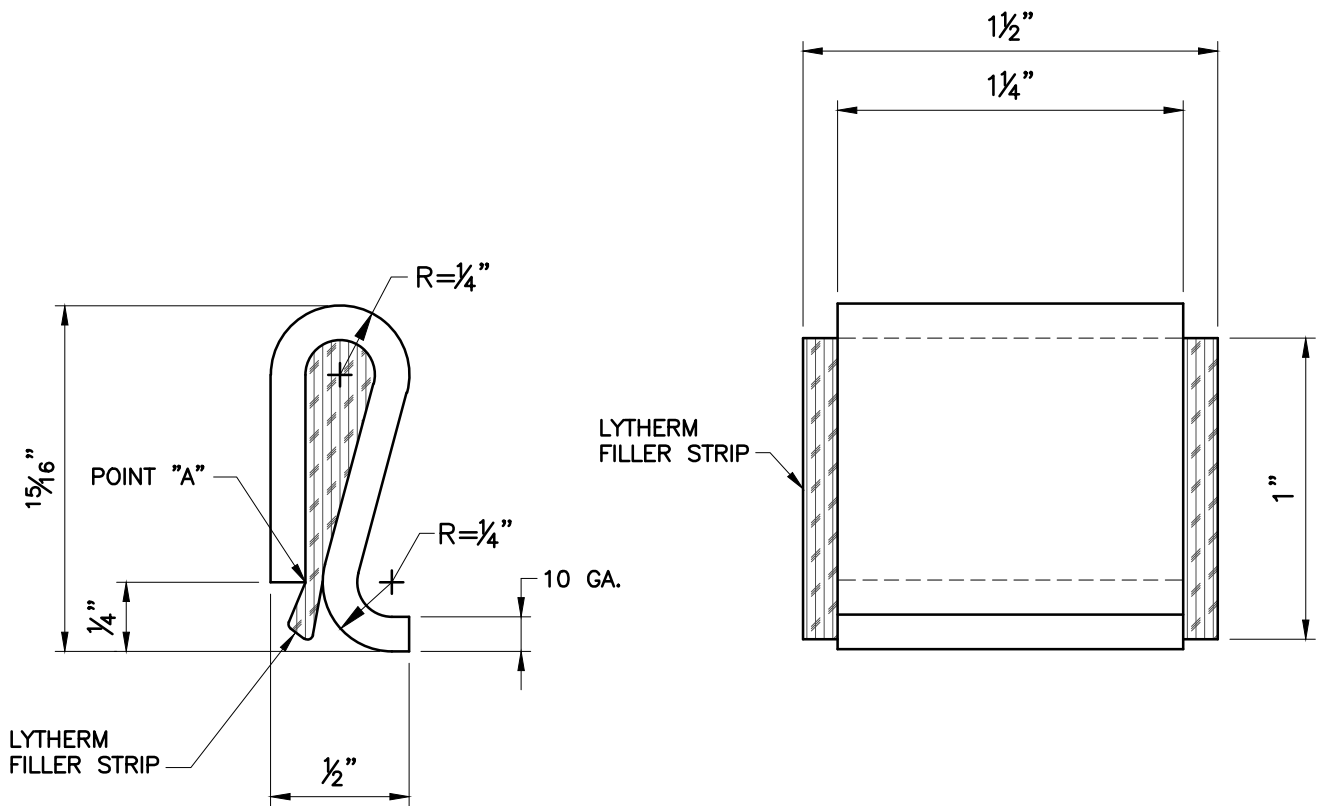
**APPROVALS**

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**FLANGE INSULATION  
AND TEST LEAD INSTALLATION**





**NOTES:**

1. STEEL BONDING CLIP SPECIFICATIONS:  
MATERIAL SPECIFICATION ASTM A356 COMMERCIAL QUALITY  
CUT LENGTH =  $2\frac{1}{2}'' + \frac{1}{6}''$ , WIDTH =  $1\frac{1}{4}'' + \frac{1}{6}''$ .
2. LYTHERM FILLER STRIP DIMENSIONS TO BE  $1'' \times 1\frac{1}{2}''$   
IN ORDER TO OVERLAP SIDES OF CLIP.
3. CRIMP BONDING CLIP OVER FILLER AT POINT "A" TO  
COMPRESS FILLER.

**PERFORMANCE NOTE:**

THE ADDED FLEXIBILITY OF THE BONDING CLIP ( $\frac{3}{4}''$  + MOVEMENT TOLERANCE) SIGNIFICANTLY REDUCES THE CHANCES OF WELDS BREAKING, AS OPPOSED TO THE RIGID "S"-BAR.

PIPE SIZE	JUMPERS/JOINT
16" THROUGH 24"	2
30" THROUGH 42"	3
46" THROUGH 54"	4

**MILD STEEL JOINT BOND**

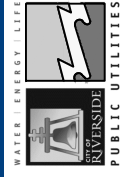
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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**JOINT BOND  
DETAILS**

# RIVERSIDE RENAISSANCE



• Project Name:

## PROJECT NAME / WATER MAIN

• Streets Impacted:

• Project Duration:

• Contractor:

• Phone No.:

WARD PROJECT

COUNCIL MEMBER

MAYOR

CITY COUNCIL MEMBERS

CITY MANAGER

[www.RiversideCa.gov](http://www.RiversideCa.gov)

**RIVERSIDE PUBLIC UTILITIES: (951) 826-5311**

[www.riversidepublicutilities.com](http://www.riversidepublicutilities.com)

NOTIFICATION SIGN NOTES:

- 1). SIGN DIMENSIONS ARE TO BE 48"X60" WIDE.
- 2). SIGN SHALL BE BLUE LETTERS ON WHITE BACKGROUND WITH RPU LOGO CAN BE DOWNLOADED AT [WWW.RIVERSIDEPUBLICUTILITIES.COM](http://WWW.RIVERSIDEPUBLICUTILITIES.COM).
- 3). CITY SIGN TEMPLATE CAN BE DOWNLOADED AT [WWW.RIVERSIDECA.GOV](http://WWW.RIVERSIDECA.GOV)
- 4). SIGNS SHALL BE POSTED A MINIMUM OF ONE WEEK PRIOR TO CONSTRUCTION.
- 5). SIGN SHALL BE POSTED AT EACH END OF THE PROJECT AND LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO ERECTING THE SIGNS.
- 6). SEE CWD-960-2 FOR CONSTRUCTION OF SIGN.



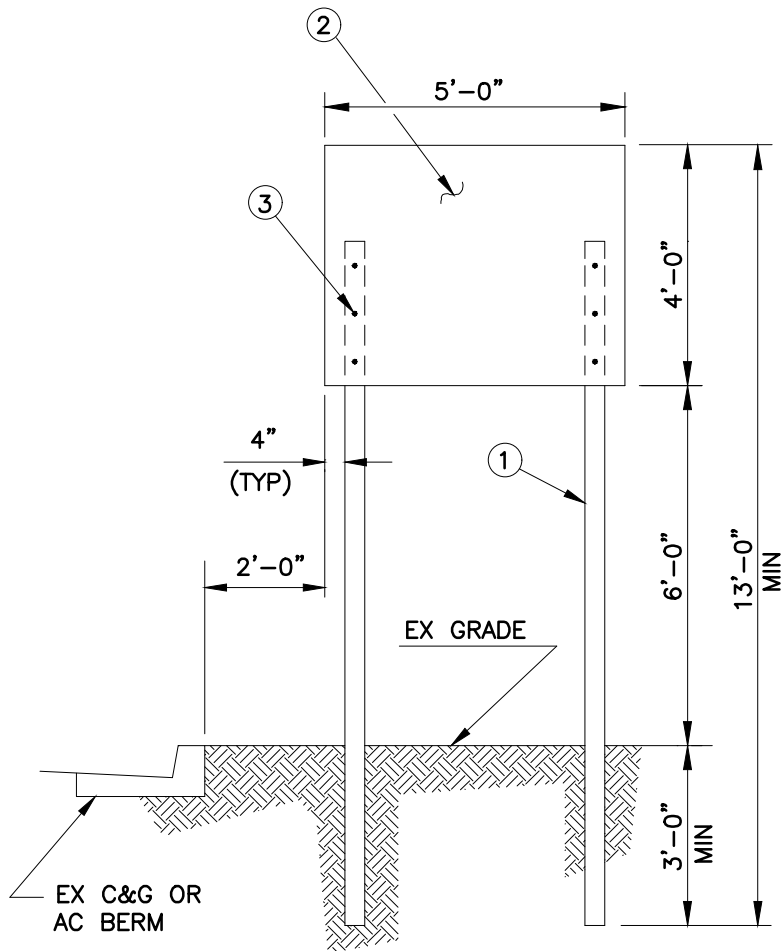
WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS

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NOTIFICATION SIGN





**CONSTRUCTION NOTES:**

- ① 2 – DOUGLAS FIR CONSTRUCTION GRADE 4" X 4" POST.
- ② 3/4" THICK PLYWOOD.
- ③ FASTEN PLYWOOD SIGN TO POST W/ 6 – 5"± CARRIAGE BOLTS W/NUTS, FLAT WASHERS, AND JAM NUTS.

**NOTES:**

- 1) EXACT LOCATION OF SIGN TO BE DETERMINED BY ENGINEER WITH APPROVAL BY CITY PUBLIC UTILITIES DEPARTMENT.

**APPROVALS**

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**WATER  
DISTRIBUTION & TRANSMISSION  
PIPELINE CONSTRUCTION METHODS**

**NOTIFICATION SIGN**