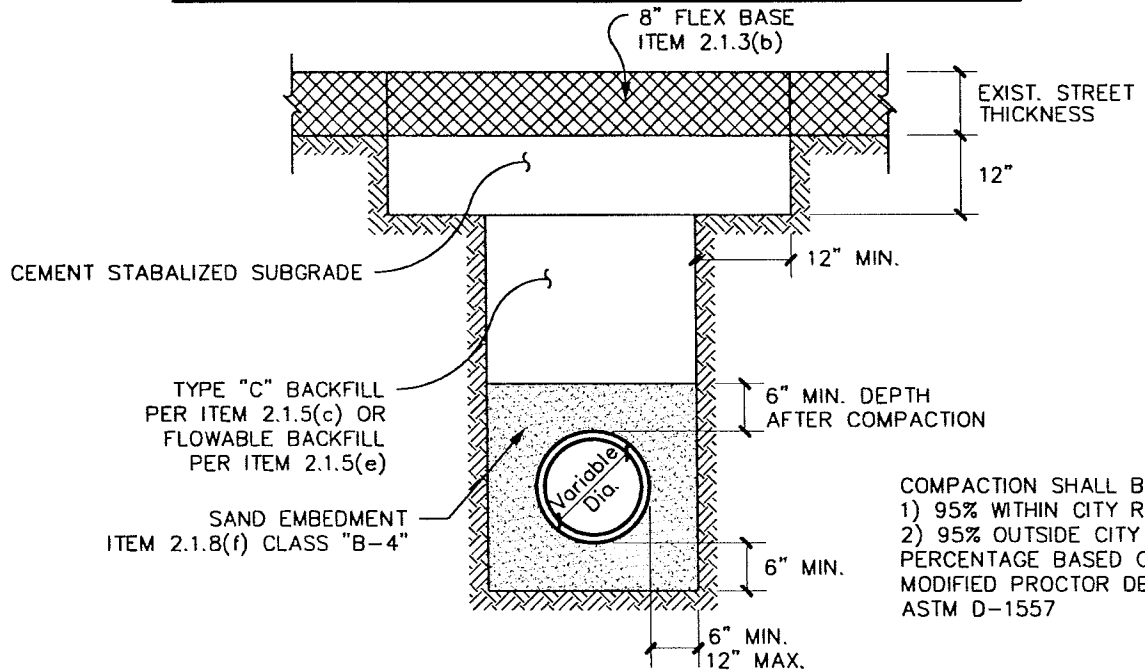


UNPAVED AND FUTURE PAVED AREAS



COMPACTION SHALL BE:
 1) 95% WITHIN CITY R.O.W.
 2) 95% OUTSIDE CITY R.O.W.
 PERCENTAGE BASED ON 95%
 MODIFIED PROCTOR DENSITY
 ASTM D-1557

NOTES:

EXISTING FLEXBASE SURFACE

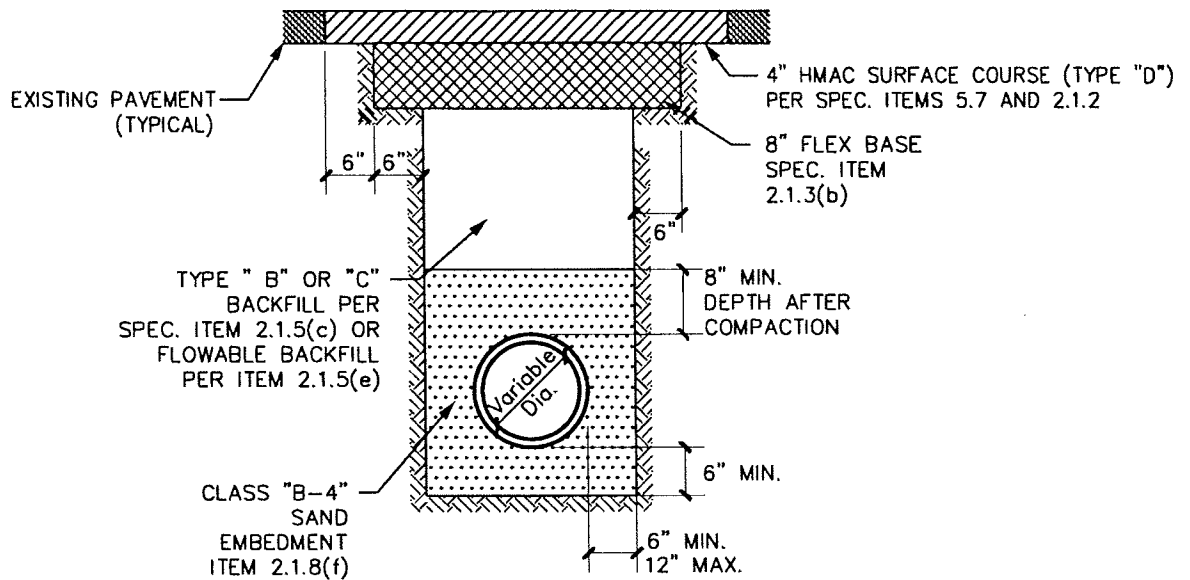
1. AT THE END OF EACH WORK DAY ALL SPOILS SHALL BE REMOVED FROM THE CITY AND TxDOT ROW UNLESS PRIOR WRITTEN PERMISSION IS OBTAINED FROM THE OWNER TO STORE SPOILS IN DESIGNATED SPOIL STORAGE AREAS THAT DO NOT OBSTRUCT AUTOMOBILE OR PEDESTRIAN TRAFFIC.
2. ALL BACKFILL SHALL BE PER SPEC ITEM 6.2 AND SHALL BE COMPACTED PER SPEC ITEM 6.2.9(b). ROCKS GREATER THAN 4" IN DIAMETER SHALL BE REMOVED FROM ANY NATIVE MATERIAL USED AS BACKFILL.
3. ALL PAVEMENT SHALL BE REMOVED ALONG NEAT SAW-CUT LINES PER SPEC ITEM 8.8.
4. COATED TRACER WIRE SHALL BE INSTALLED IN THE EMBEDMENT MATERIAL ABOVE THE PVC PIPE WITH THE TRACER WIRE TERMINATING IN IN-LINE GATE VALVE BOXES ACCESSIBLE BY CITY STAFF. BLUE UNDERGROUND WATER LINE WARNING TAPE OF MIN. 4" WIDTH SHALL BE INSTALLED ABOVE THE EMBEDMENT MATERIAL.
5. A MAXIMUM OF 300 FT OF OPEN TRENCH WILL BE ALLOWED AT ANY TIME, UNLESS APPROVED BY THE CITY ENGINEER.
6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAWS CONCERNING EXCAVATION, TRENCHING AND SHORING.



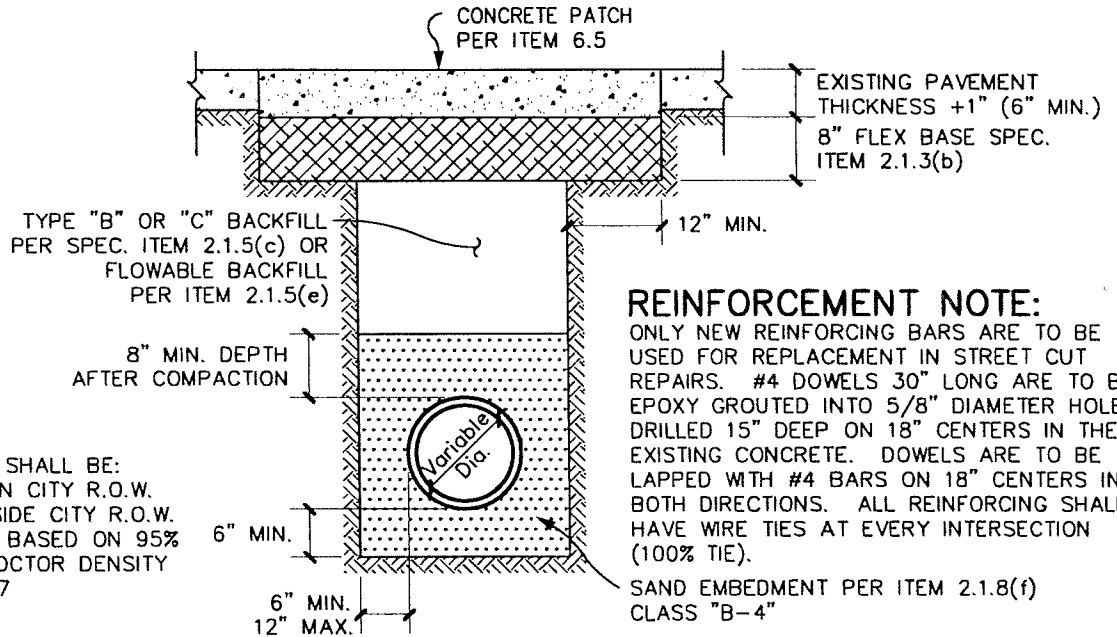
WATER SYSTEM CONSTRUCTION DETAILS STANDARD WATER LINE EMBEDMENT AND BACKFILL

REVISION DATE:
 APRIL 14, 2000

SHEET: **W-1A**



EXISTING ASPHALT PAVEMENT



COMPACTION SHALL BE:
 1) 95% WITHIN CITY R.O.W.
 2) 95% OUTSIDE CITY R.O.W.
 PERCENTAGE BASED ON 95% MODIFIED PROCTOR DENSITY ASTM D-1557

NOTES:

EXISTING CONCRETE PAVEMENT

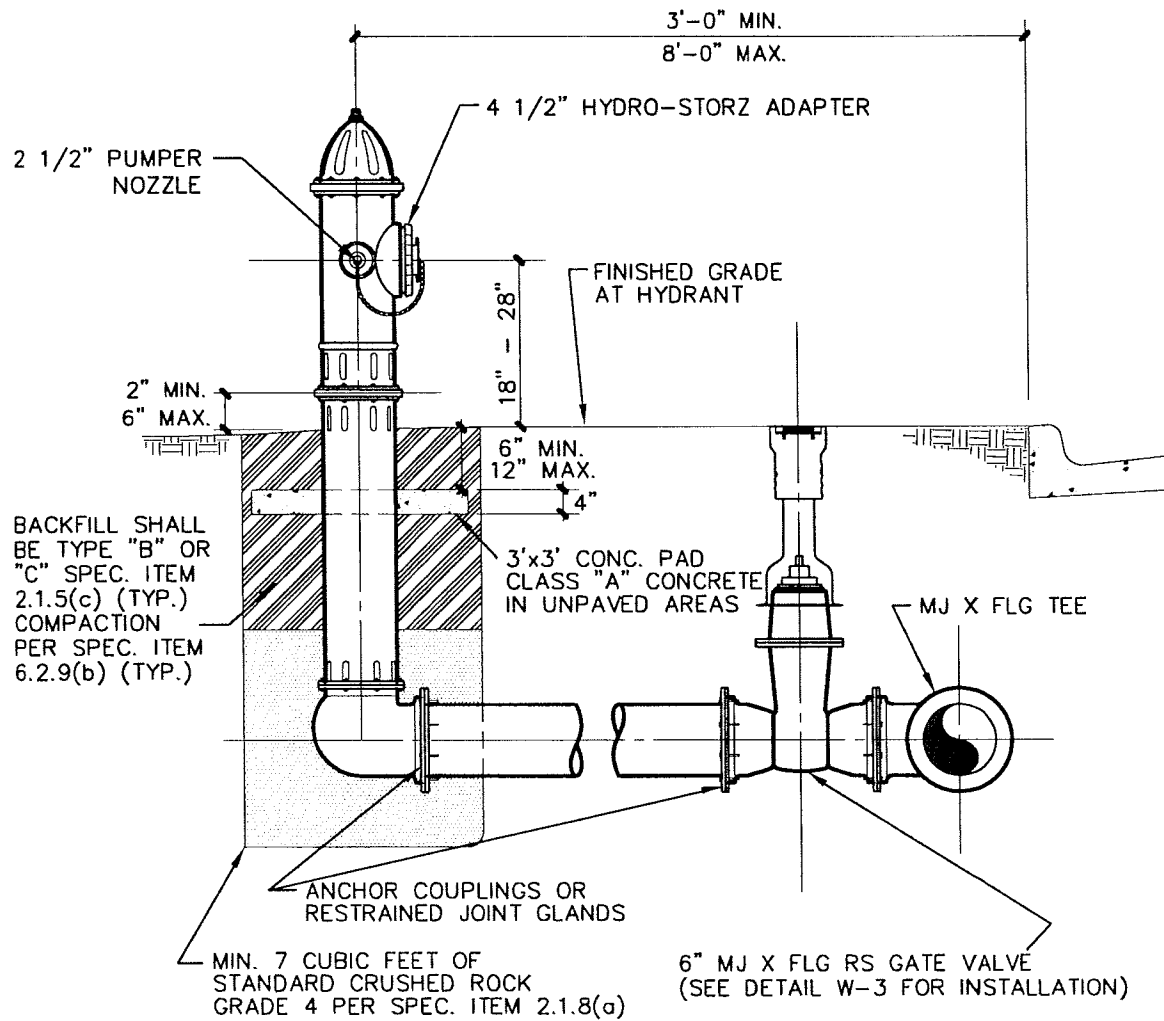
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6. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAWS CONCERNING EXCAVATION, TRENCHING AND SHORING.



WATER SYSTEM CONSTRUCTION DETAILS STANDARD WATER LINE EMBEDMENT AND BACKFILL

REVISION DATE:
 APRIL 14, 2000

SHEET: **W-1B**



NOTES:

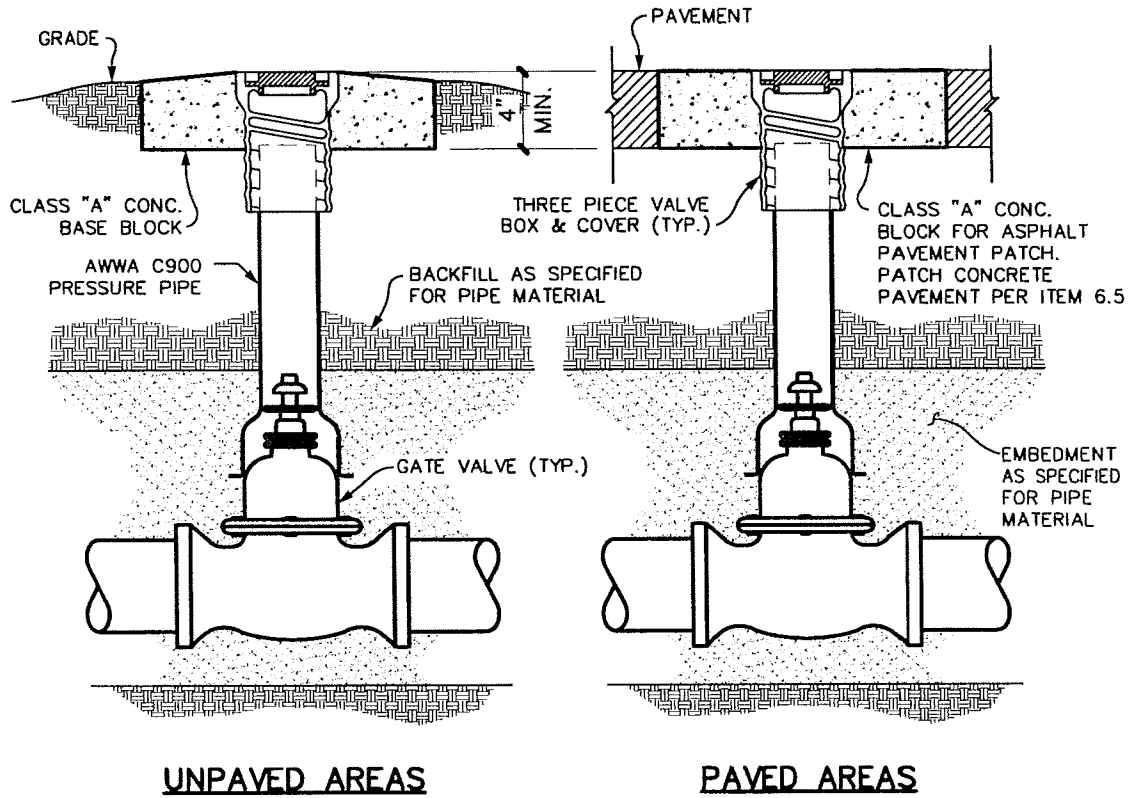
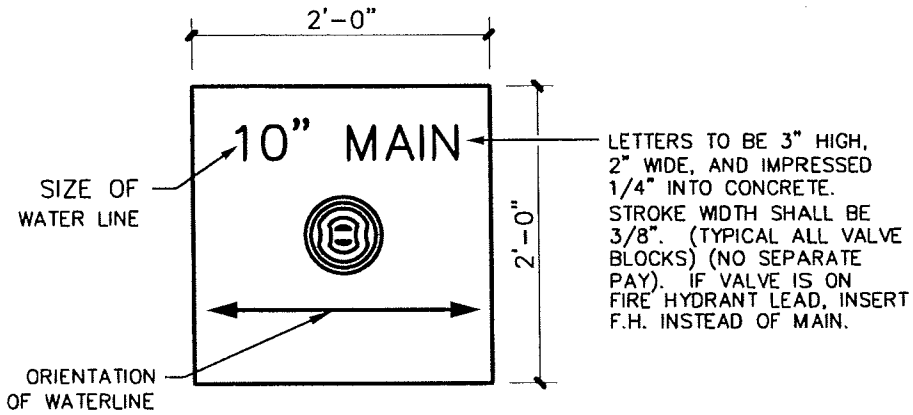
1. ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS, C-502. FIRE HYDRANTS SHALL HAVE A 5 1/4" MIN VALVE OPENING AND AN INSIDE BARREL DIAMETER OF APPROXIMATELY 7". ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE.
2. ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
3. FIRE HYDRANT NO CLOSER THAN 18" TO EXISTING OR PROPOSED SIDEWALKS. (TYPICAL)
4. BURY DEPTH SHALL NOT EXCEED 7- FEET.
5. FIRE HYDRANT SHALL BE PLACED ON THE EXTENDED LOT LINE WHEN POSSIBLE.
6. ALL BELOW GROUND IRON ASSEMBLES SHALL BE WRAPPED IN POLYETHYLENE ACCORDING TO AWWA C105.
7. FIRE HYDRANT SHALL BE LOCATED A MINIMUM OF 1 FOOT OUTSIDE OF THE AREA BETWEEN THE P.C.'S OF THE CORNER TURNING RADIUS AT THE INTERSECTIONS.
8. FIRE HYDRANT SHALL BE AT LEAST 42-INCHES FROM ANY ABOVE GROUND OBSTRUCTIONS, SUCH AS GUARDRAILS, RETAINING WALLS, BOLLARDS, ETC.
9. FIRE HYDRANTS SHALL BE MANUFACTURED BY MUELLER (CENTURION MUELLER A-423), WATROUS (PACER-100) OR CLOW.
10. ALL HYDRANTS SHALL OPEN BY TURNING THE OPERATING-STEM NUT TO THE LEFT (CCW) W/PENTAGONAL NUT. A CLEARLY VISIBLE CURVED ARROW AND THE WORD "OPEN" SHALL BE CAST IN RELIEF ON TOP OF THE HYDRANT TO INDICATE THE DIRECTION OF OPENING.
11. HYDRO-STORZ ADAPTER SHALL BE INSTALLED ON THE MAIN NOZZLE FOR ALL FIRE HYDRANTS.



WATER SYSTEM CONSTRUCTION DETAILS
**FIRE HYDRANT
INSTALLATION**

REVISION DATE:
APRIL 14, 2000

SHEET: **W-2**



NOTES:

1. THE VALVE AND JOINT ASSEMBLIES SHALL BE WRAPPED IN POLYETHYLENE ACCORDING TO AWWA C105.
2. THE JOINT TYPE SHALL BE MECHANICAL JOINT UNLESS OTHERWISE SPECIFIED IN THE PLANS.
3. VALVE BOX SHALL BE TYLER PIPE 6850 SERIES OR APPROVED EQUAL.
4. GATE VALVE SHALL BE RESILIENT SEAT TYPE WITH A NON RISING STEM AND A 2-INCH SQUARE OPERATOR. RESILIENT SEAT GATE VALVE SHALL CONFORM TO AWWA C509.
5. A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE WITH AN OPERATING NUT LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE SUFFICIENT LENGTH TO ENSURE THAT ITS TOP IS WITHIN 4 FEET OF VALVE BOX LID.
6. 16" AND LARGER GATE VALVES REQUIRE CONCRETE BLOCK UNDER THE VALVE BODY.
7. ALL VALVE COVERS SHALL BE PAINTED BLUE.
8. A "V" SHALL BE SAW CUT IN THE CURB AT ALL VALVE LOCATIONS.
9. ALL GATE VALVES SHALL BE MANUFACTURED BY MUELLER, WATEROUS OR CLOW.
10. ALL VALVES SHALL OPEN LEFT.

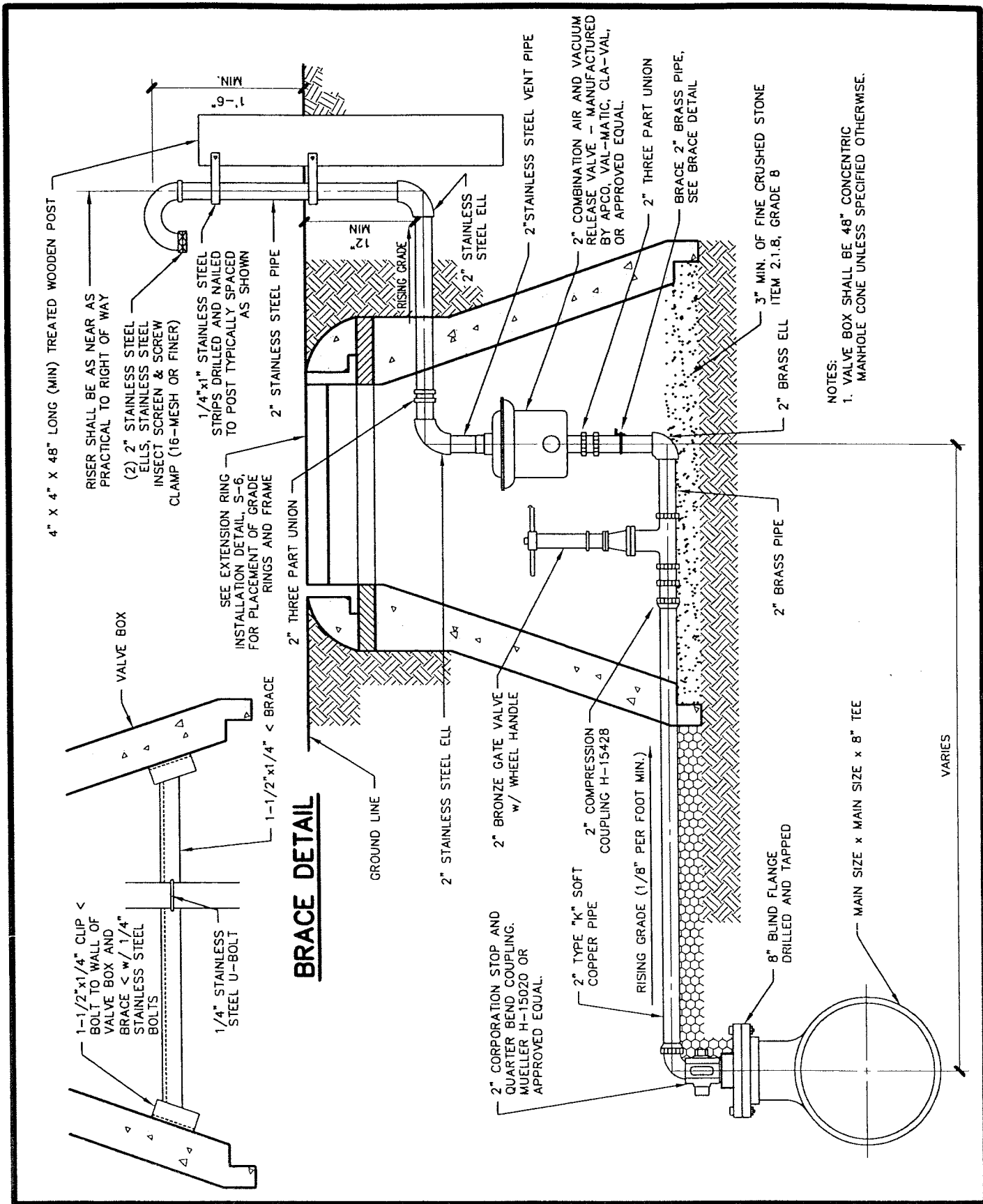


WATER SYSTEM CONSTRUCTION DETAILS

GATE VALVE INSTALLATION

REVISION DATE:
APRIL 14, 2000

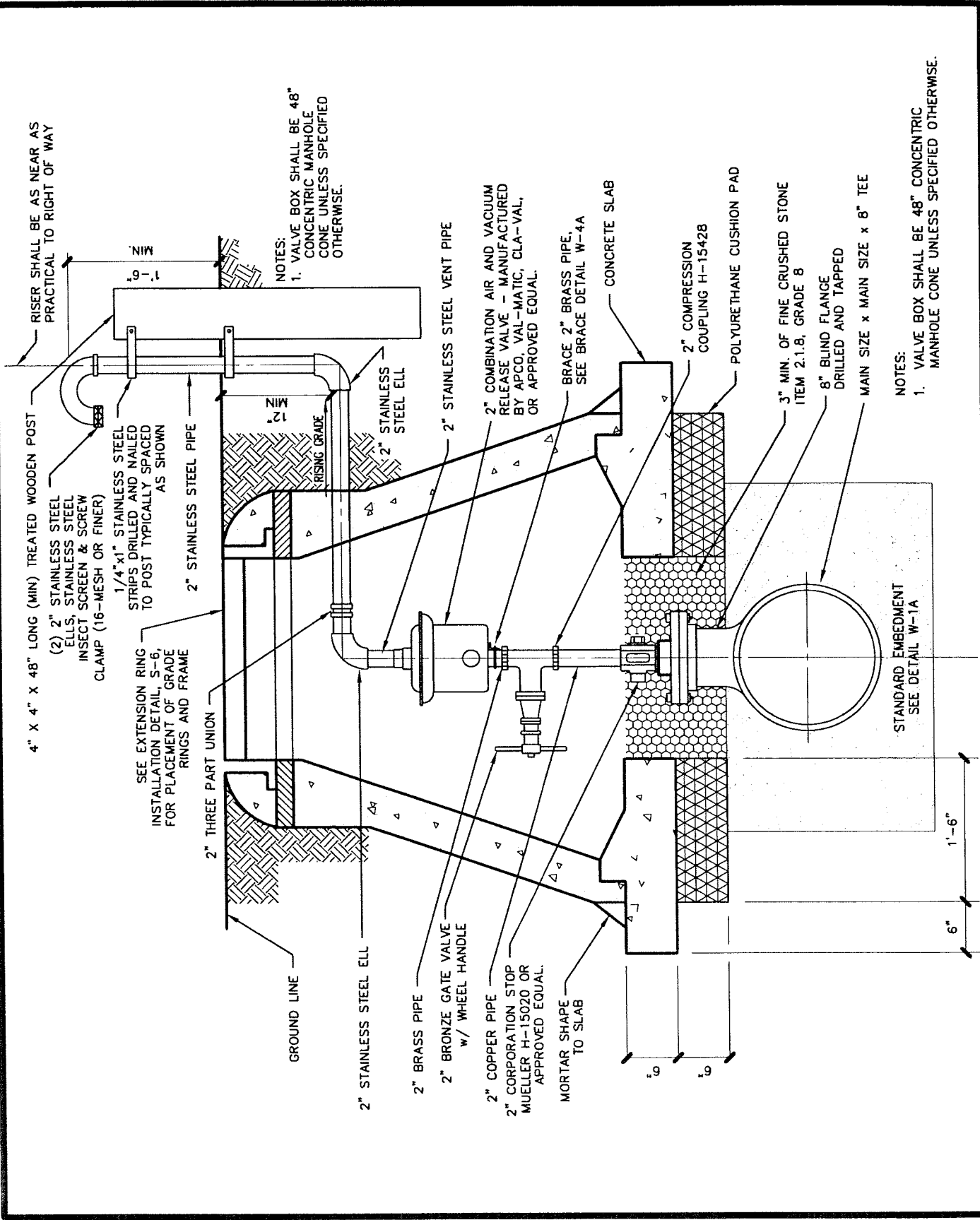
SHEET: **W-3**



WATER SYSTEM CONSTRUCTION DETAILS
AIR RELEASE VALVE ASSEMBLY
TYPE 1

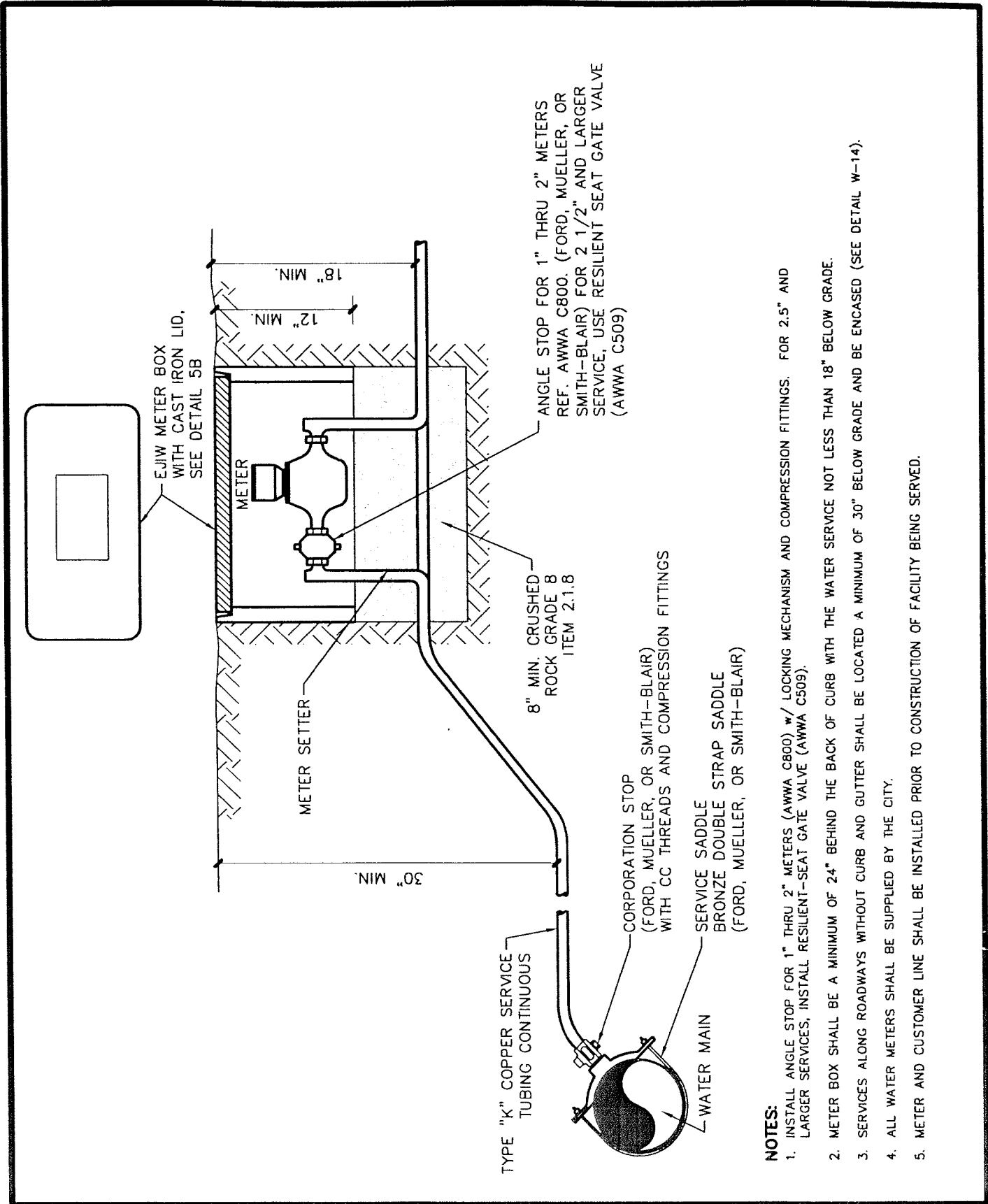
REVISION DATE:
 APRIL 14, 2000

SHEET: **W-4A**



WATER SYSTEM CONSTRUCTION DETAILS
 AIR RELEASE VALVE ASSEMBLY
 TYPE 2

REVISION DATE:
 APRIL 14, 2000
 SHEET: **W-4B**



EJIW METER BOX WITH CAST IRON LID. SEE DETAIL 5B

METER

METER SETTER

18" MIN.

12" MIN.

8" MIN. CRUSHED ROCK GRADE 8 ITEM 2.1.8

ANGLE STOP FOR 1" THRU 2" METERS REF. AWWA C800. (FORD, MUELLER, OR SMITH-BLAIR) FOR 2 1/2" AND LARGER SERVICE, USE RESILIENT SEAT GATE VALVE (AWWA C509)

30" MIN.

TYPE "K" COPPER SERVICE TUBING CONTINUOUS

CORPORATION STOP (FORD, MUELLER, OR SMITH-BLAIR) WITH CC THREADS AND COMPRESSION FITTINGS

SERVICE SADDLE BRONZE DOUBLE STRAP SADDLE (FORD, MUELLER, OR SMITH-BLAIR)

WATER MAIN

- NOTES:**
1. INSTALL ANGLE STOP FOR 1" THRU 2" METERS (AWWA C800) w/ LOCKING MECHANISM AND COMPRESSION FITTINGS. FOR 2.5" AND LARGER SERVICES, INSTALL RESILIENT-SEAT GATE VALVE (AWWA C509).
 2. METER BOX SHALL BE A MINIMUM OF 24" BEHIND THE BACK OF CURB WITH THE WATER SERVICE NOT LESS THAN 18" BELOW GRADE.
 3. SERVICES ALONG ROADWAYS WITHOUT CURB AND GUTTER SHALL BE LOCATED A MINIMUM OF 30" BELOW GRADE AND BE ENCASED (SEE DETAIL W-14).
 4. ALL WATER METERS SHALL BE SUPPLIED BY THE CITY.
 5. METER AND CUSTOMER LINE SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF FACILITY BEING SERVED.



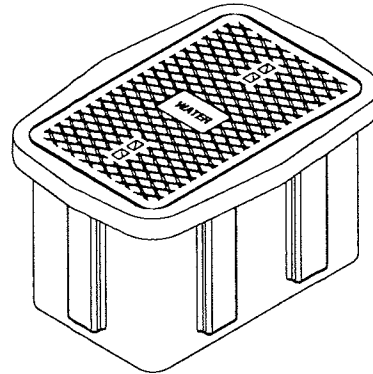
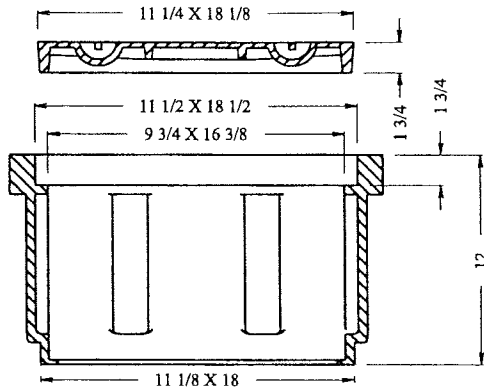
WATER SYSTEM CONSTRUCTION DETAILS

WATER SERVICE ASSEMBLY

REVISION DATE:
APRIL 14, 2000

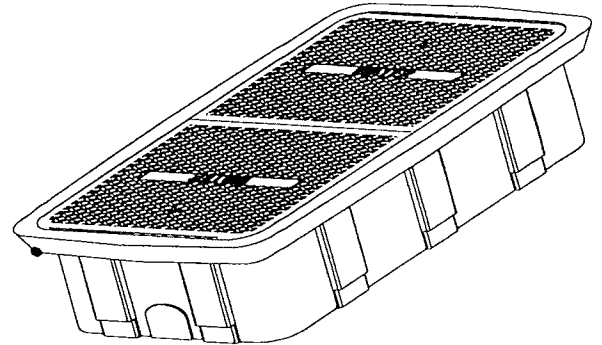
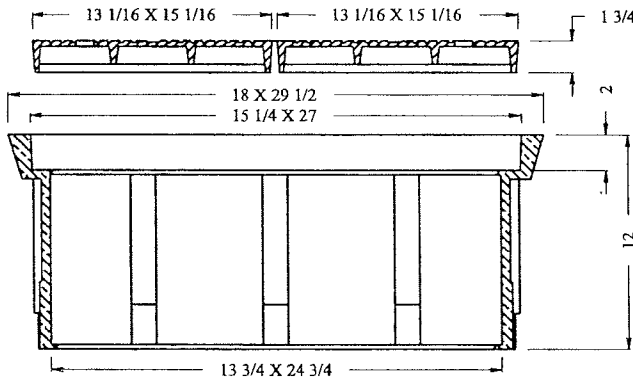
SHEET: **W-5A**

EAST JORDAN IRON WORKS #37-S PLASTIC BOX WITH CAST IRON LID
 PRODUCT NO. - 32513702



SINGLE (1") METER BOX

EAST JORDAN IRON WORKS 15 X 27 PLASTIC BOX WITH 2 65T DUAL LIDS
 PRODUCT NO. - 32513801



DOUBLE (1.5"-2") METER BOX

NOTES:

1. ALL DIMENSIONS IN INCHES.



WATER SYSTEM CONSTRUCTION DETAILS

METER BOXES

REVISION DATE:
 APRIL 14, 2000

SHEET: **W-5B**

CURB STOP FOR 3/4" THRU 2" METERS
 REF. AWWA C800. (FORD B41-233H OR EQUAL)
 FOR 2 1/2" AND LARGER SERVICE, USE
 RESILIENT SEAT GATE VALVE (AWWA C509)

12" MIN.
 8"

STANDARD 36 SERIES
 METER BOX BY BROOKS
 OR APPROVED EQUAL

8" MIN. CRUSHED ROCK
 ITEM 2.1.8 GRADE 8

30" MIN.

TYPE "K" COPPER SERVICE
 TUBING CONTINUOUS

CORPORATION STOP
 (FORD F-1000 OR EQUAL)
 WITH CC THREADS AND COMPRESSION FITTINGS

SERVICE SADDLE
 BRONZE DOUBLE STRAP SADDLE
 (FORD F-202B SERIES OR EQUAL)

WATER MAIN

NOTES:

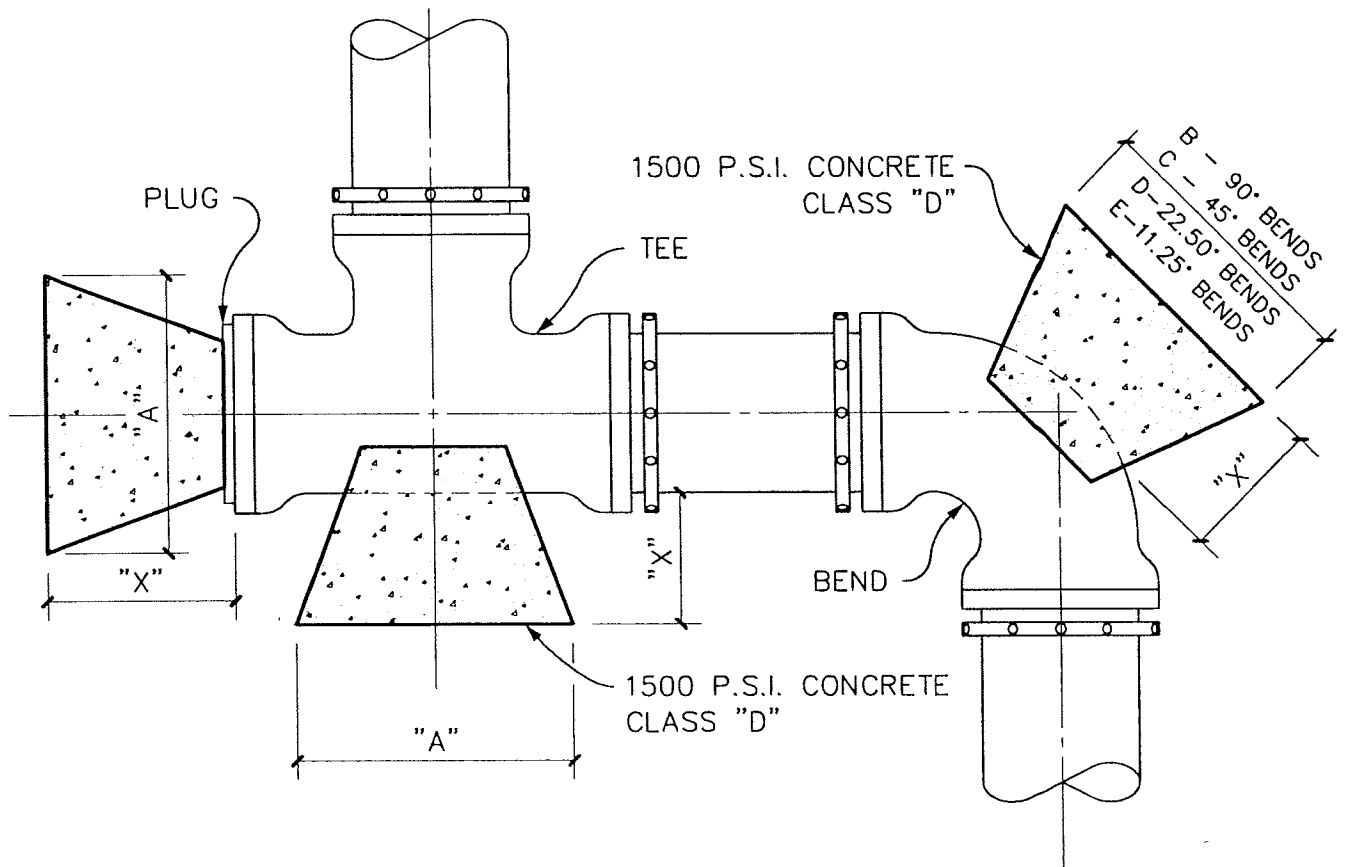
1. SERVICE SADDLE AND CORPORATION STOP SHALL BE PER WATER SERVICE ASSEMBLY.



WATER SYSTEM CONSTRUCTION DETAILS
**FLUSHING VALVE
 INSTALLATION**

REVISION DATE:
 APRIL 14, 2000

SHEET: **W-6**



HORIZONTAL BLOCKING TABLE

DIMENSION "X" TO BE A MINIMUM OF (1) FOOT, BUT IS TO BE INCREASED WHERE NECESSARY TO PROVIDE BEARING AGAINST UNDISTURBED TRENCH WALL.

PIPE SIZE	"X" DIM.	PLUGS & TEES		90° BENDS		45° BENDS		22.50° BENDS		11.25° BENDS	
		"A"	MIN. AREA sf	"B"	MIN. AREA sf	"C"	MIN. AREA sf	"D"	MIN. AREA sf	"E"	MIN. AREA sf
6"	1'-6"	1'-0"	1.06	1'-2"	1.50	1'-0"	.83	1'-0"	.83	1'-0"	.83
8"	1'-6"	1'-3"	1.89	1'-6"	2.66	1'-3"	1.44	1'-0"	.83	1'-0"	.83
10"	1'-6"	1'-9"	2.95	2'-0"	4.17	1'-6"	2.26	1'-3"	1.15	1'-0"	.83
12"	1'-6"	2'-0"	4.25	2'-3"	6.00	1'-9"	3.25	1'-3"	1.65	1'-0"	.83
16"	2'-0"	2'-7"	7.54	3'-0"	10.65	2'-3"	5.76	1'-8"	2.94	1'-2"	1.48

NOTES:

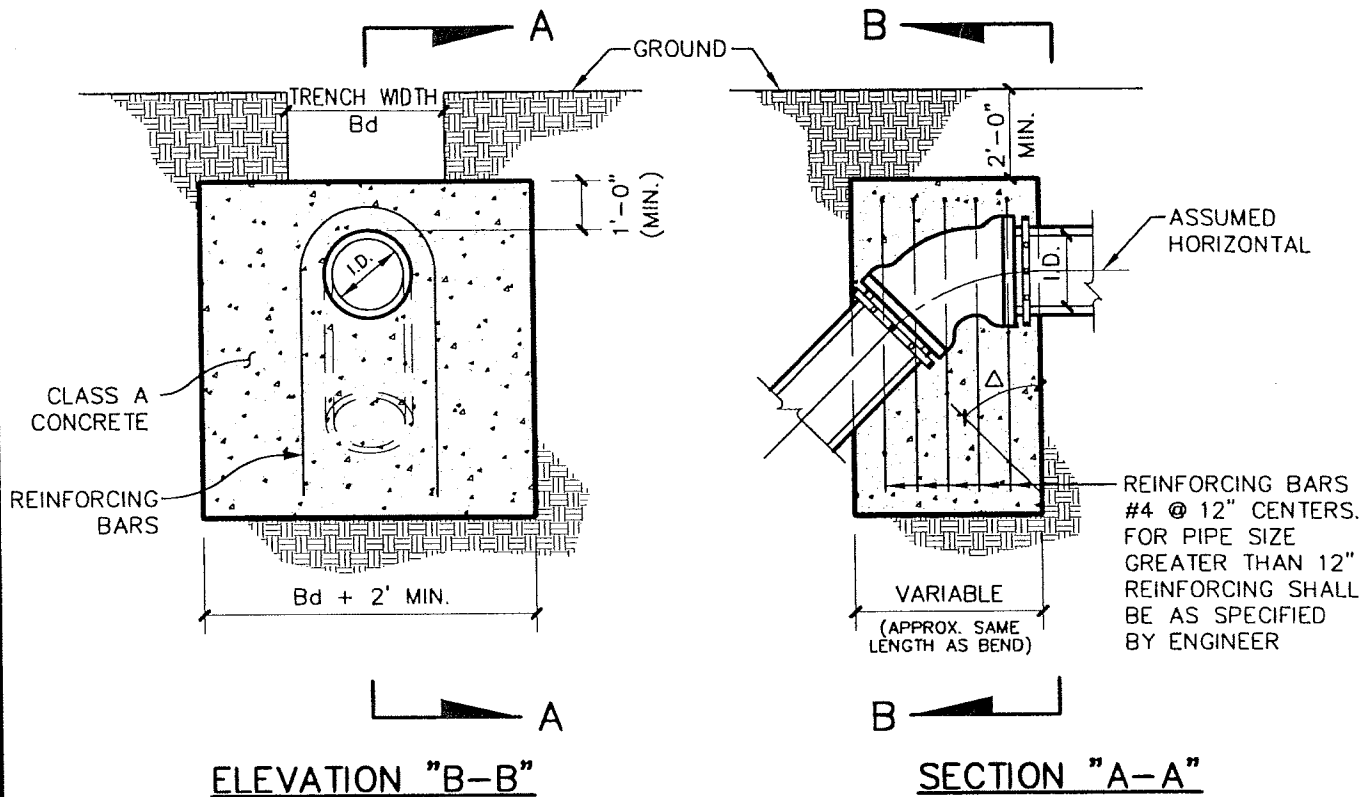
1. BEARING AREAS SHOWN ARE BASED ON 150 PSI TEST PRESSURE AND 3000 PSF ALLOWABLE SOIL BEARING PRESSURE.
2. WRAP ALL BELOW GROUND IRON ASSEMBLIES IN POLYETHYLENE ACCORDING TO AWWA C105.
3. ALL TEES, BENDS, PLUGS, ETC. SHALL BE MECHANICALLY RESTRAINED BY MEGALUG OR APPROVED EQUAL.



WATER SYSTEM CONSTRUCTION DETAILS
HORIZONTAL BLOCKING

REVISION DATE:
APRIL 14, 2000

SHEET: **W-7**



VERTICAL THRUST BLOCK TABLE

△ →	11.25'		22.50'		30.00'		45.00'		67.50'		90.00'		← △
I.D. (IN.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	I.D. (IN.)
4,6,8	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5	4,6,8
10,12	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7	10,12

NOTES:

1. WRAP ALL BELOW GROUND IRON ASSEMBLIES IN POLYETHYLENE ACCORDING TO AWWA C105.
2. ALL TEES, BENDS, PLUGS, ETC. SHALL BE MECHANICALLY RESTRAINED BY MEGALUG OR APPROVED EQUAL.

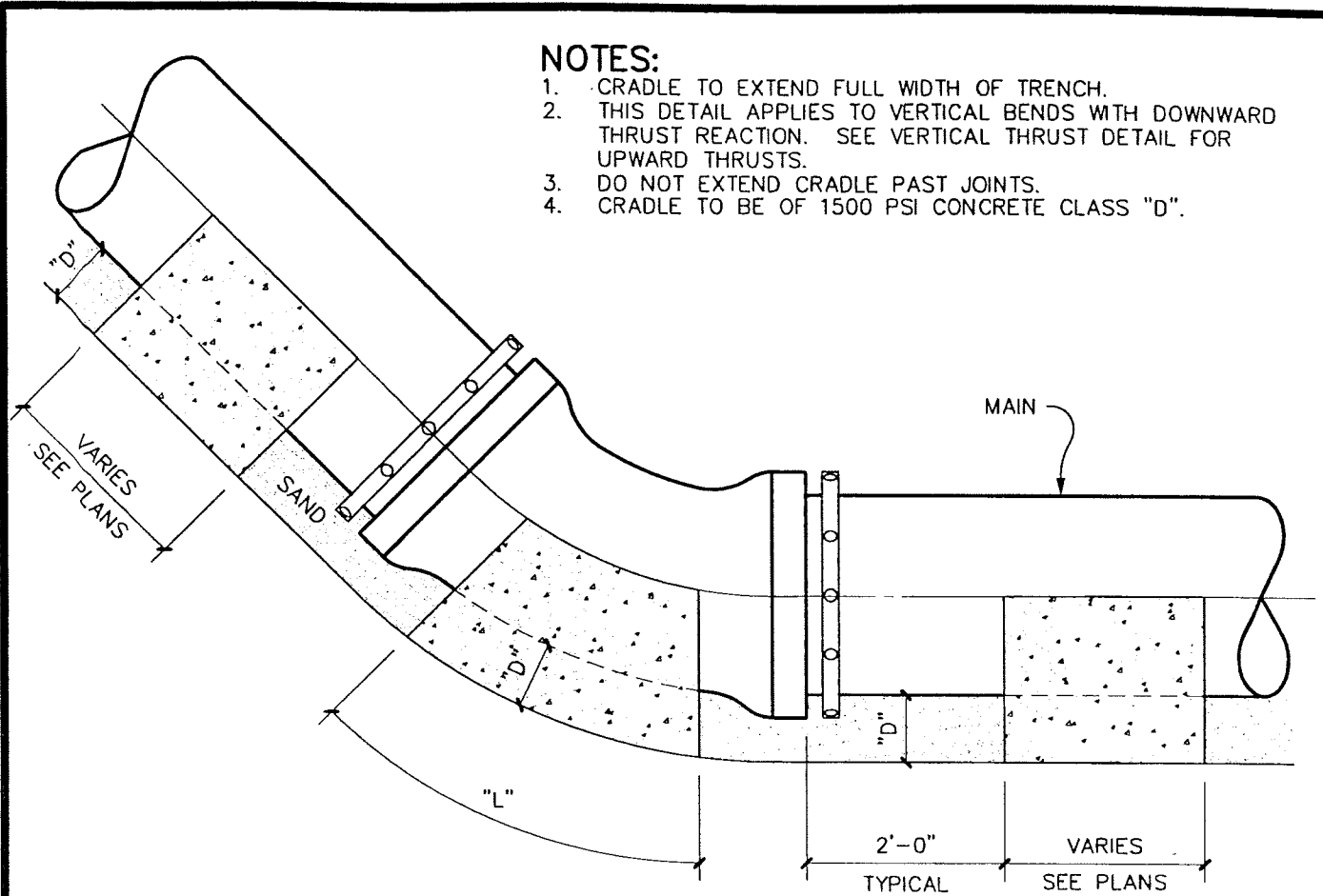


WATER SYSTEM CONSTRUCTION DETAILS

VERTICAL THRUST BLOCK

REVISION DATE:
APRIL 14, 2000

SHEET: **W-8**



NOTES:

1. CRADLE TO EXTEND FULL WIDTH OF TRENCH.
2. THIS DETAIL APPLIES TO VERTICAL BENDS WITH DOWNWARD THRUST REACTION. SEE VERTICAL THRUST DETAIL FOR UPWARD THRUSTS.
3. DO NOT EXTEND CRADLE PAST JOINTS.
4. CRADLE TO BE OF 1500 PSI CONCRETE CLASS "D".

"D" = 6" MINIMUM OR TO UNDISTURBED SOIL

CONCRETE CRADLE TABLE

PIPE SIZE	90° BENDS		45° BENDS		22.50° BENDS		11.25° BENDS	
	"L"	MIN. AREA sf	"L"	MIN. AREA sf	"L"	MIN. AREA sf	"L"	MIN. AREA sf
6"	6"	1.50	1'-0"	.83	1'-0"	.83	1'-0"	.83
8"	1'-6"	2.66	1'-3"	1.44	1'-0"	.83	1'-0"	.83
10"	2'-0"	4.17	1'-6"	2.26	1'-3"	1.15	1'-0"	.83
12"	2'-3"	6.00	1'-9"	3.25	1'-3"	1.65	1'-0"	.83
16"	3'-0"	10.65	2'-3"	5.76	1'-8"	2.94	1'-2"	1.48

NOTES:

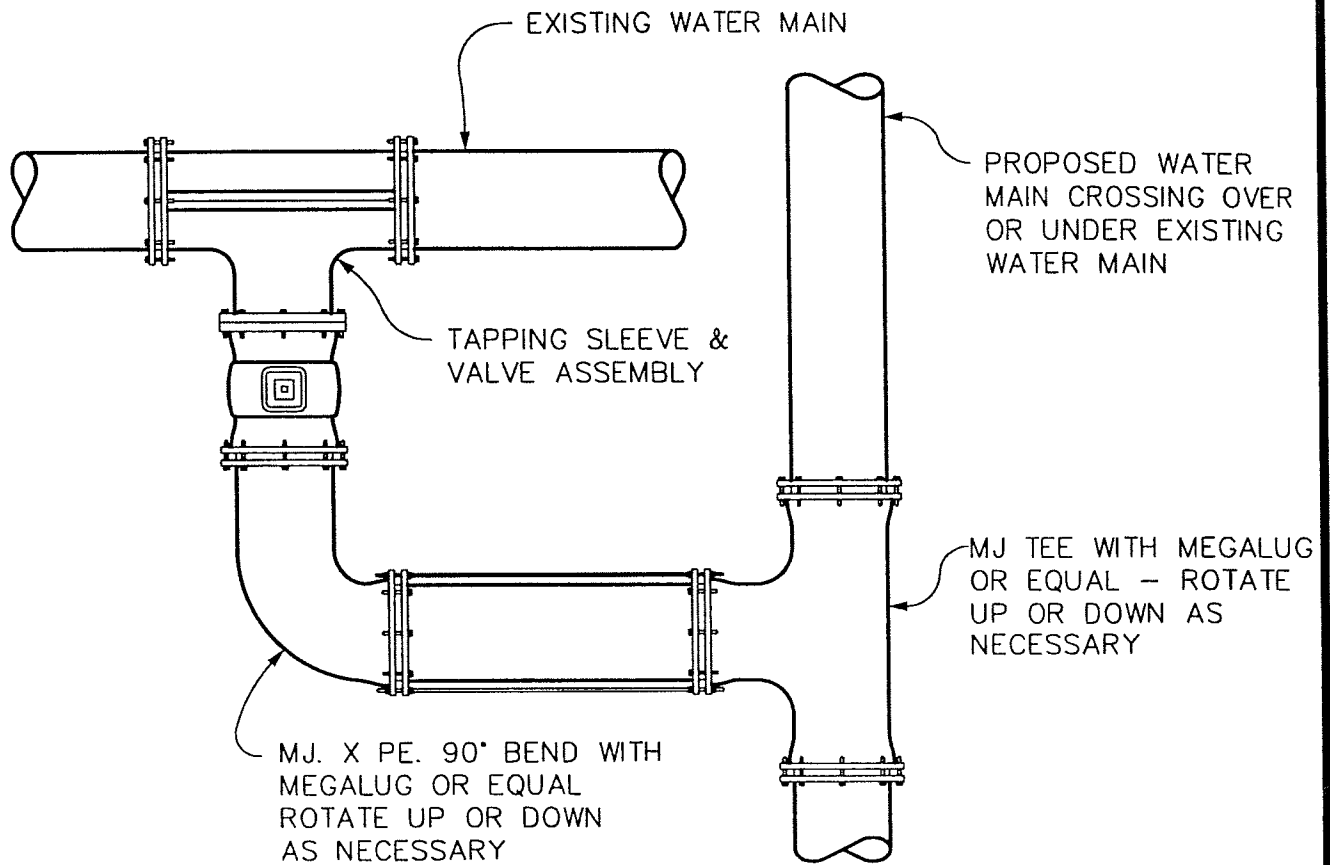
1. BEARING AREAS SHOWN ARE BASED ON 150 PSI TEST PRESSURE AND 3000 PSF ALLOWABLE SOIL BEARING PRESSURE.
2. WRAP ALL BELOW GROUND IRON ASSEMBLIES IN POLYETHYLENE ACCORDING TO AWWA C105.
3. ALL TEES, BENDS, PLUGS, ETC. SHALL BE MECHANICALLY RESTRAINED BY MEGALUG OR APPROVED EQUAL.



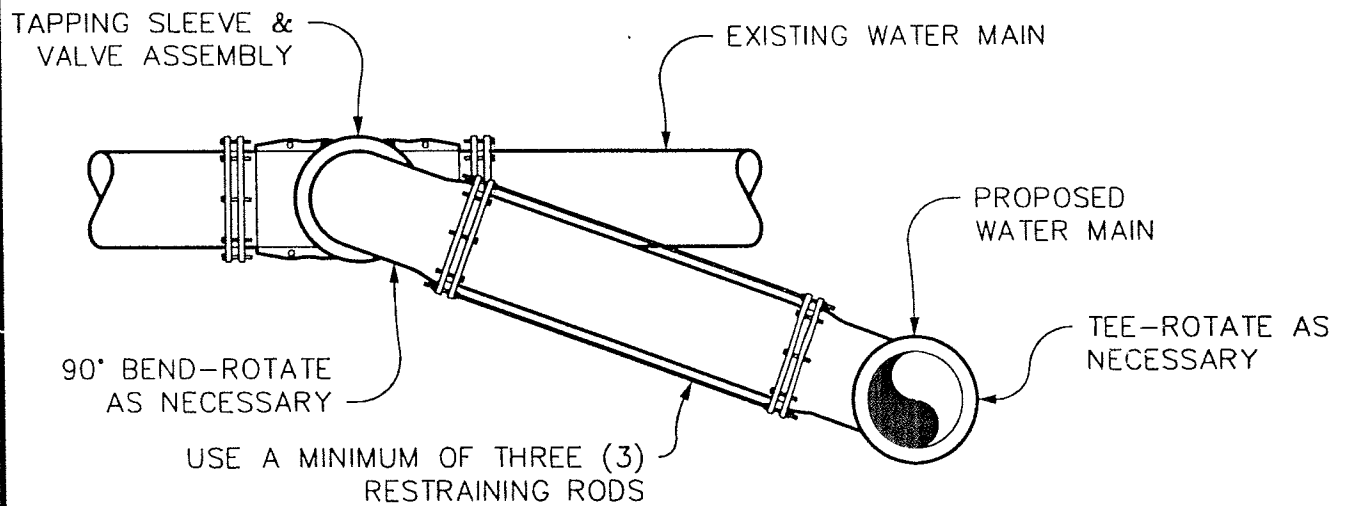
WATER SYSTEM CONSTRUCTION DETAILS
CONCRETE CRADLE AT VERTICAL BENDS

REVISION DATE:
 APRIL 14, 2000

SHEET: **W-9**



PLAN



SECTION

NOTES:

1. WRAP ALL BELOW GROUND ASSEMBLIES IN POLYETHYLENE ACCORDING TO AWWA C105.

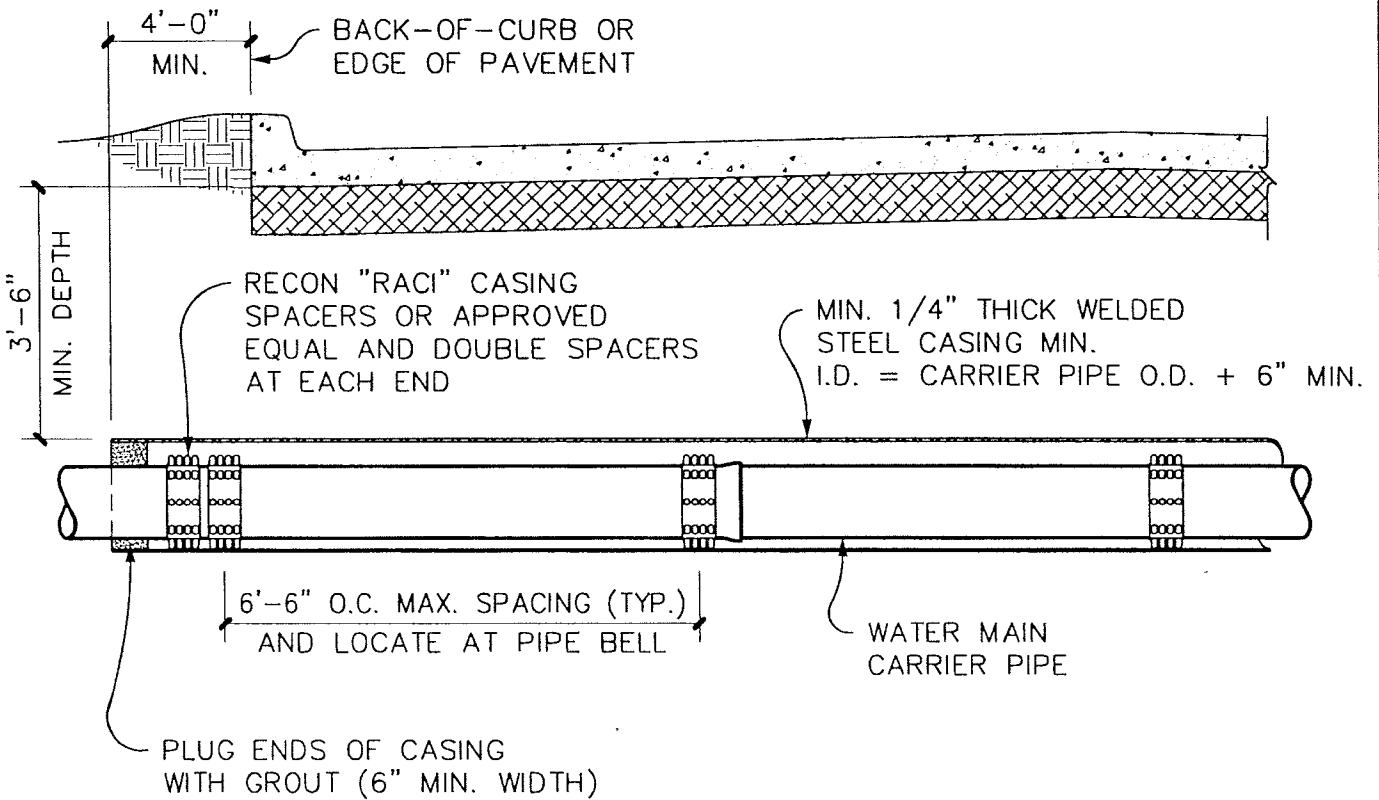


WATER SYSTEM CONSTRUCTION DETAILS

TYPICAL RING CONNECTION

REVISION DATE:
APRIL 14, 2000

SHEET: **W-10**



NOTES:

1. WHERE A BORE PIT EXCEEDS 5 FEET IN DEPTH THE CONTRACTOR SHALL INSTALL SHORING OF THE PIT WALLS AS REQUIRED BY OSHA.
2. WHERE A BORE IS TO BE PARTIALLY OR COMPLETELY ABANDONED, SAID BORE SHALL BE COMPLETELY FILLED WITH HYDRAULICALLY PLACED CEMENT GROUT.
3. CASING SHALL BE EXTENDED TO THE RIGHT-OF-WAY LINE FOR STATE HIGHWAY AND RAILROAD CROSSINGS.
4. THE EDGE OF BORE PIT SHALL BE A MINIMUM OF 4' BEHIND THE BACK OF CURB OR EDGE OF PAVEMENT.



WATER SYSTEM CONSTRUCTION DETAILS
WATER LINE INSTALLATION
BORE DETAIL

REVISION DATE:
 APRIL 14, 2000

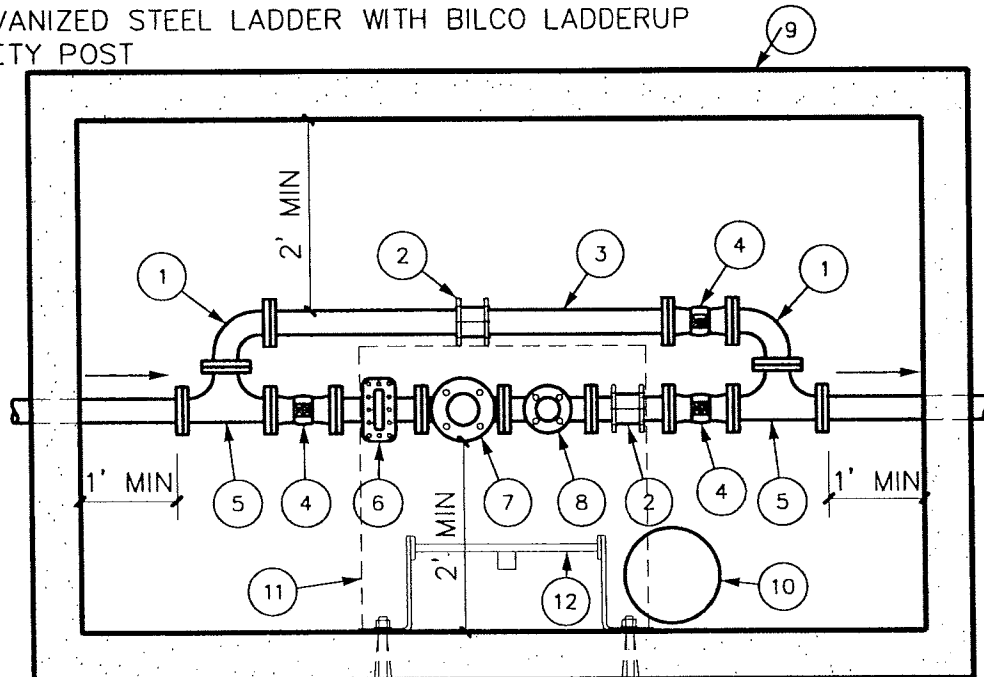
SHEET: **W-11**

MATERIALS LIST:

- 1 - D.I. 90° BEND FLG. x FLG.
- 2 - RESTRAINED COUPLING OR EXPANSION JOINT
- 3 - BYPASS LINE
- 4 - GATE VALVE OS&Y W/ CHAIN & LOCK FLG. X FLG.
- 5 - D.I. TEE FLG. X FLG.
- 6 - STRAINER
- 7 - COMPOUND OR TURBINE METER
- 8 - TESTING TEE FLG. X FLG. WITH 2" GATE VALVE AND FLG. X THREADED END DISCHARGE PIPE
- 9 - PRECAST METEER VAULT
- 10 - 12" SUMP x 24" DEEP (12" R.C.P. OR EQUAL)
- 11 - ACCESS DOOR
- 12 - GALVANIZED STEEL LADDER WITH BILCO LADDERUP SAFETY POST

MINIMUM VAULT SIZE

METER	VAULT
3 INCH	6'X8'
4 INCH	6'X8'
6 INCH	8'X10'



NOTES:

1. A J-4AL BILCO DOOR (3'x3') SHALL BE SPECIFIED FOR 3" AND 4" METER VAULTS. A JD-2AL BILCO DOOR (4'x4') SHALL BE SPECIFIED FOR 6" AND 8" METER VAULTS OR APPROVED EQUAL. DOOR SHALL BE DESIGNED FOR AASHTO H-20 WHERE APPLICABLE.
2. ALL VAULTS SHALL BE BROOKS, AMERICAN OR APPROVED EQUAL AND DESIGNED FOR AASHTO H-20 OR H-20-44 LIVE LOADS.
3. DOOR DRAIN SHALL BE PLUMBED TO OUTSIDE OF VAULT.
4. ALL WALL PENETRATIONS SHALL BE SEALED WITH LINK SEAL OR APPROVED EQUAL.
5. PIPE AND FITTINGS SHALL BE CONSTRUCTED A MIN. OF 1' ABOVE THE VAULT FLOOR. A CONCRETE PEDESTAL SHALL BE INSTALLED AT THE MID POINT OF THE PIPING ASSEMBLY FOR HORIZONTAL SUPPORT.
6. BYPASS LINE SHALL BE SAME SIZE AS MAIN LINE.
7. METERS SHALL BE CITY SPECIFIED



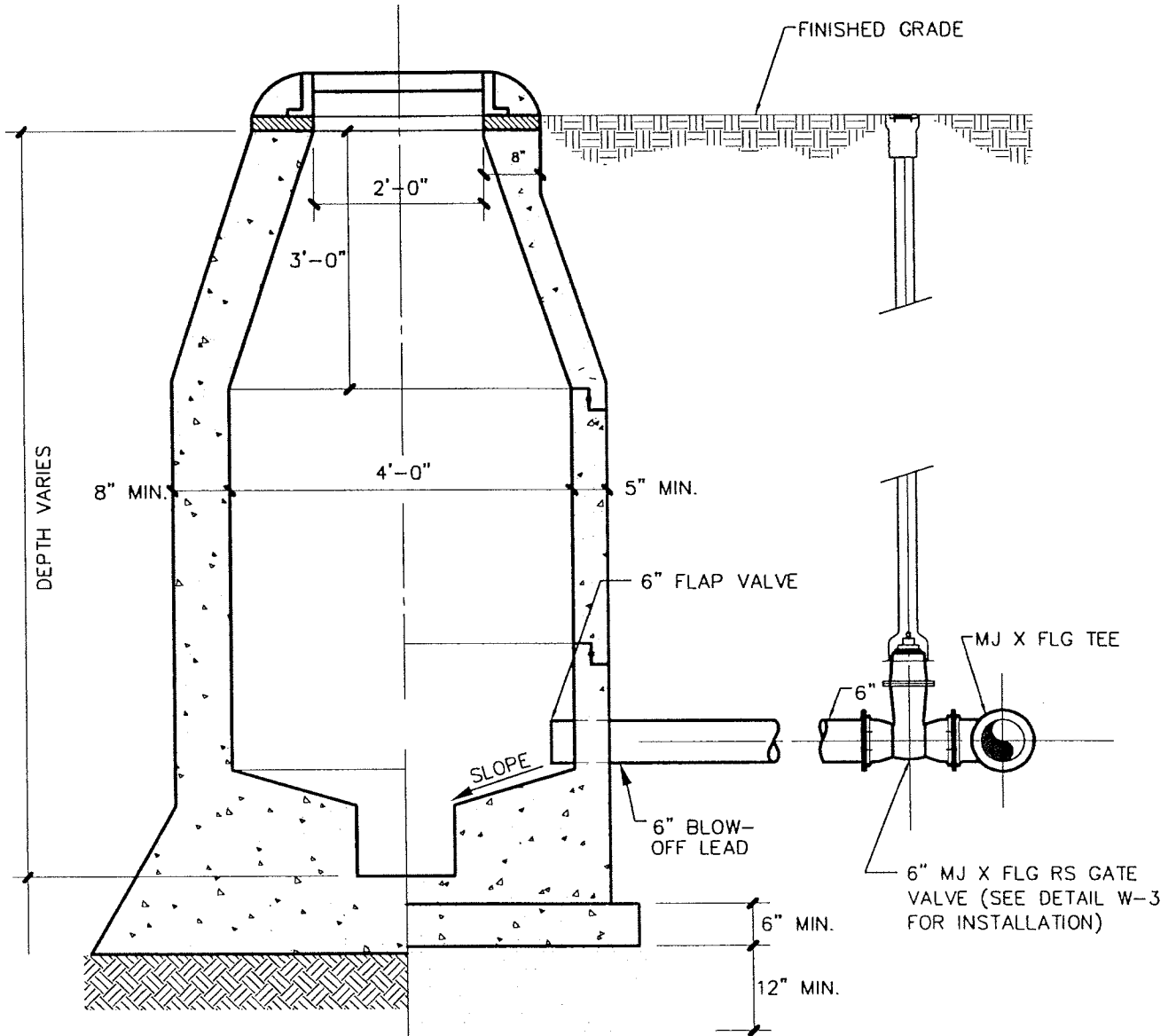
WATER SYSTEM CONSTRUCTION DETAILS

3" AND LARGER METER VAULT

REVISION DATE:
APRIL 14, 2000

SHEET: W-12

MANHOLE MAY BE EITHER CAST-IN-PLACE OR PRECAST



CAST-IN-PLACE

1/2 SECTION

SEE DETAIL S-3, CAST-IN-PLACE
SANITARY SEWER MANHOLE

PRECAST

1/2 SECTION

SEE DETAIL S-2, PRECAST
SANITARY SEWER MANHOLE

NOTES:

1. LOCATE THE BLOW-OFF SUMP MANHOLE NEAR PROPERTY LINE WITHOUT DISRUPTION TO SERVICE LINES.
2. ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF THE WATER MAIN.
3. WATER STOP GASKETS SHALL BE PLACED ON ALL PENETRATIONS OF CONCRETE.

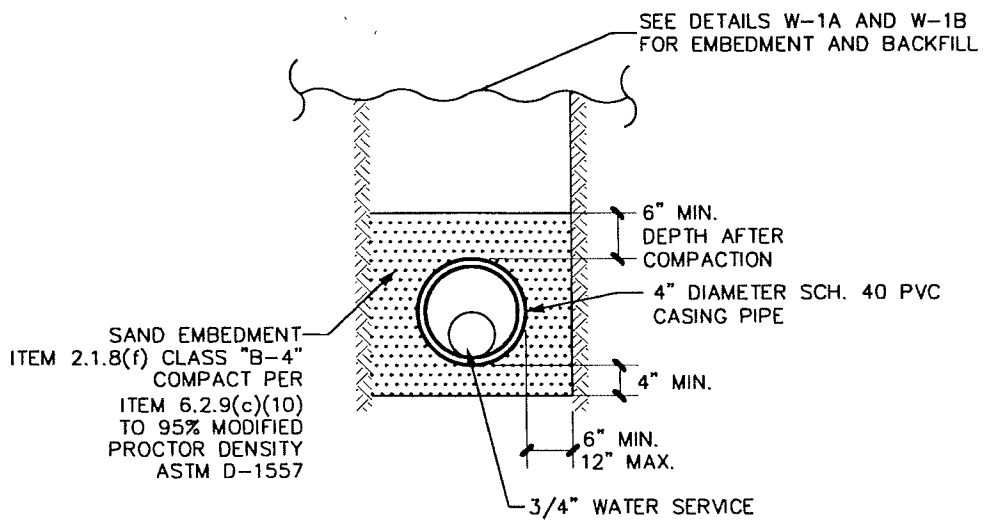


WATER SYSTEM CONSTRUCTION DETAILS

BLOW-OFF INSTALLATION

REVISION DATE:
APRIL 14, 2000

SHEET: **W-13**



WATER SYSTEM CONSTRUCTION DETAILS

SERVICE LINE ENCASEMENT

REVISION DATE:
APRIL 14, 2000

SHEET: **W-14**