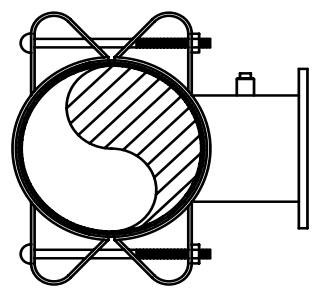
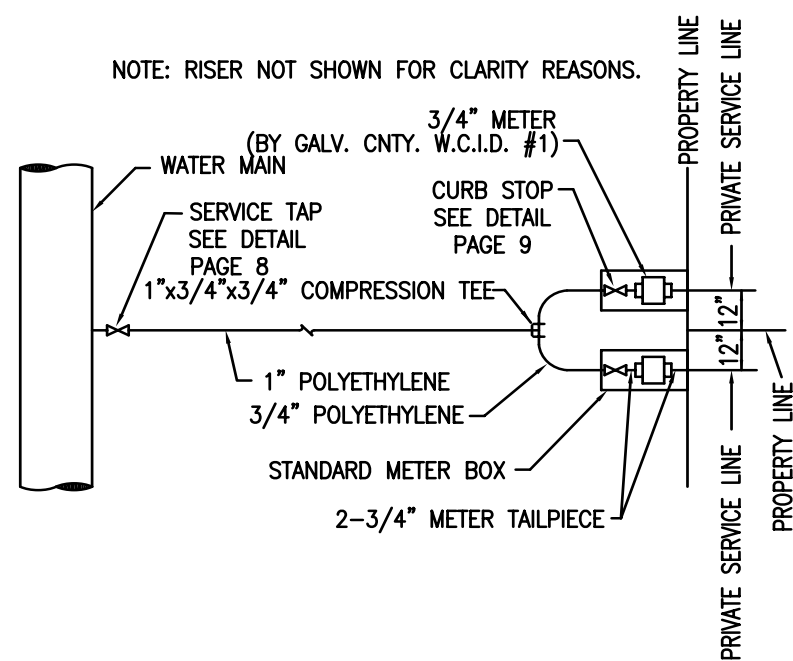


BELOW GROUND  
AIR RELEASE VALVE DETAIL  
DATE: APRIL 2003



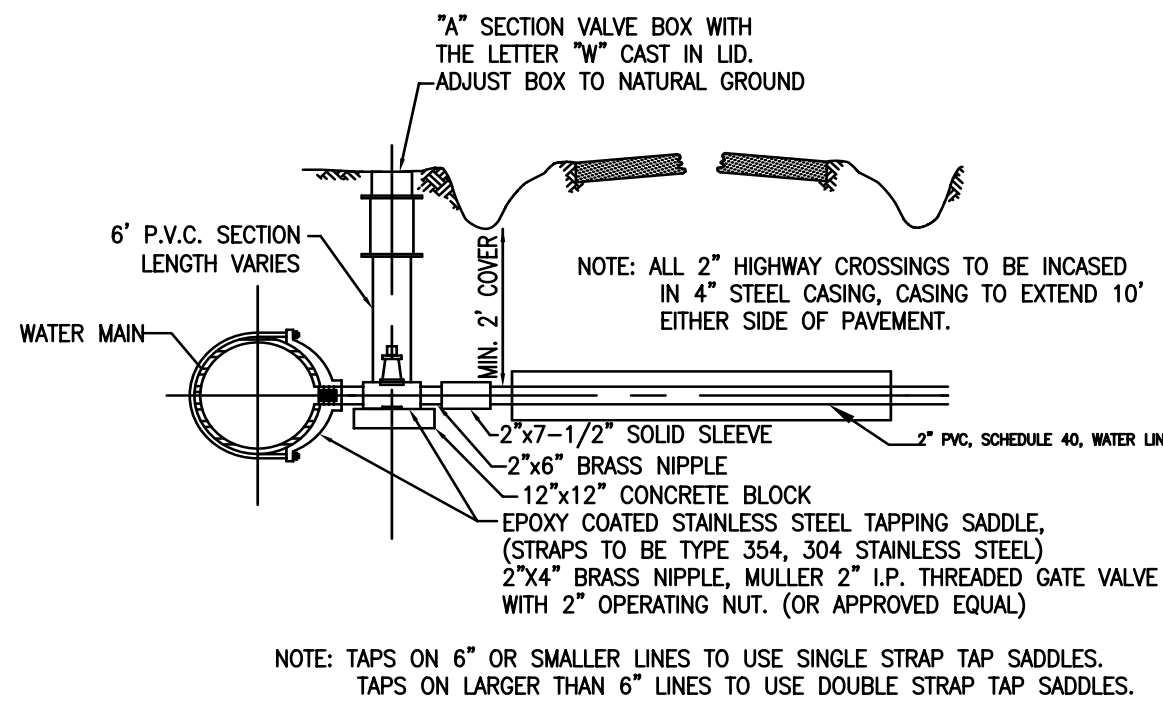
FULL CIRCLE  
TAPPING SLEEVE DETAIL  
DATE: APRIL 2003

JCM 432 ALL STAINLESS STEEL TAPPING SLEEVE OR APPROVED  
EQUAL TO BE USED ON ALL SIZE TAPS OR WHERE  
DESIGNATED BY WATER DISTRICT.

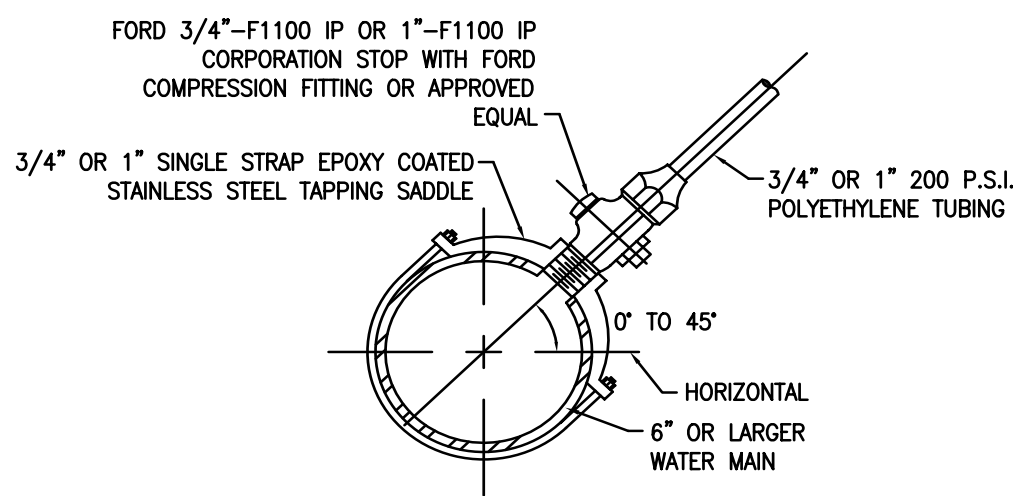


- NOTES
1. LOCATION OF METER BOX ON SINGLE SERVICE LEADS SHALL BE THE SAME AS SHOWN FOR DOUBLE SERVICE LEADS.
  2. TOP OF METER BOX TO BE SET LEVEL WITH TOP OF NATURAL GROUND.
  3. SET METER BOX ON 8" LAYER OF PEA GRAVEL.
  4. METER RISERS SHALL BE PLACED AT ALL RESIDENTIAL SERVICE CONNECTIONS.

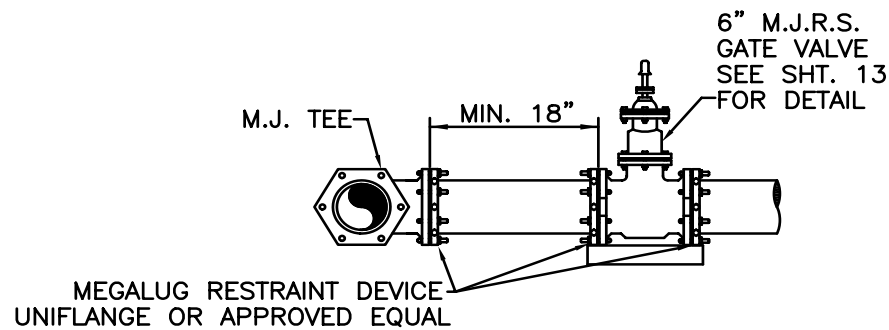
RESIDENTIAL  
DOUBLE SERVICE LEAD DETAIL  
DATE: APRIL 2003



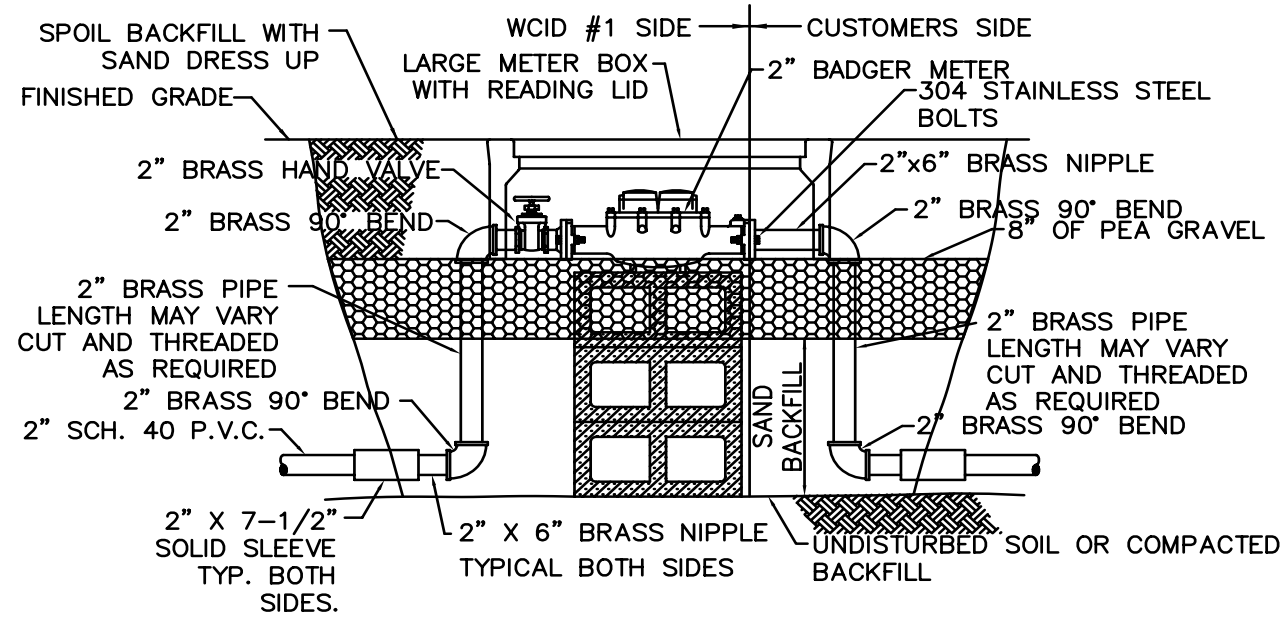
TYPICAL 2" LONGSIDE  
CONNECTION TO LARGER MAINS  
DATE: APRIL 2003



3/4" OR 1" TAP DETAIL  
DATE: APRIL 2003

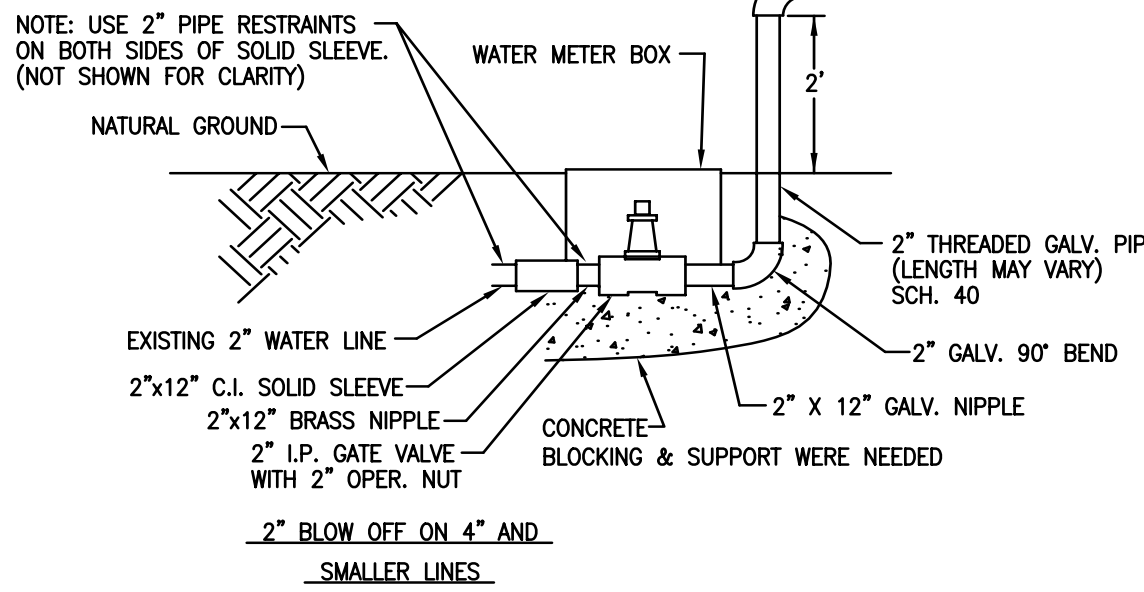
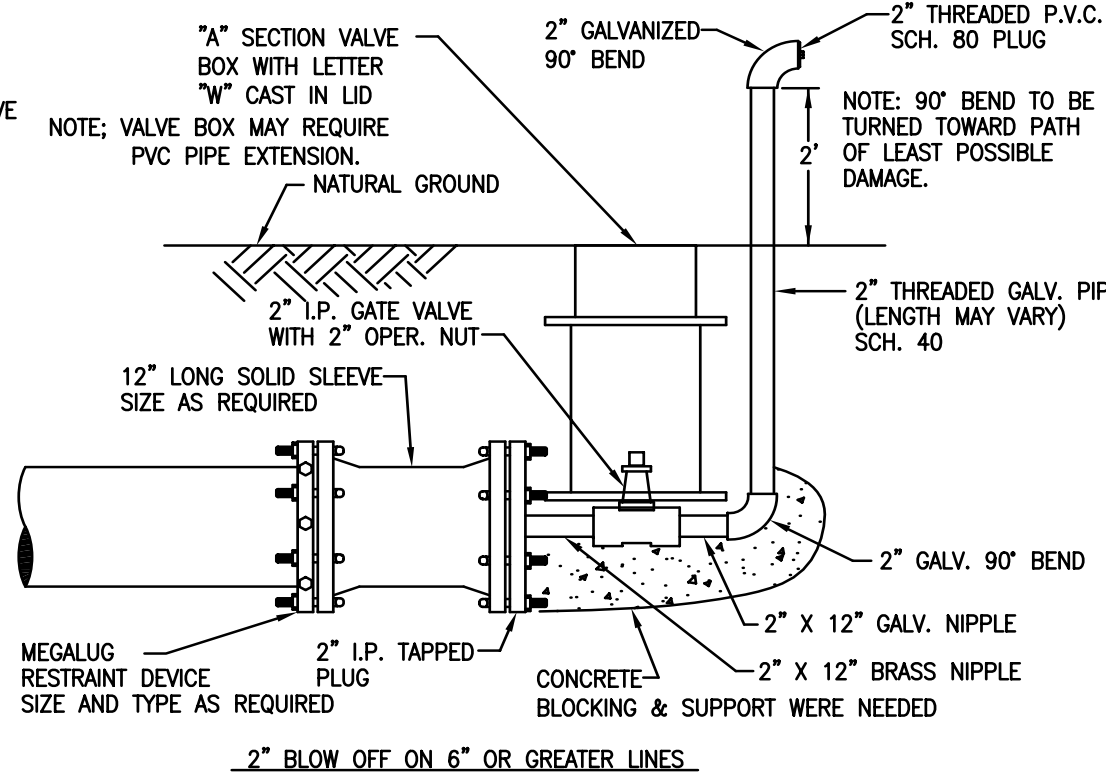


MECHANICAL JOINT DETAIL



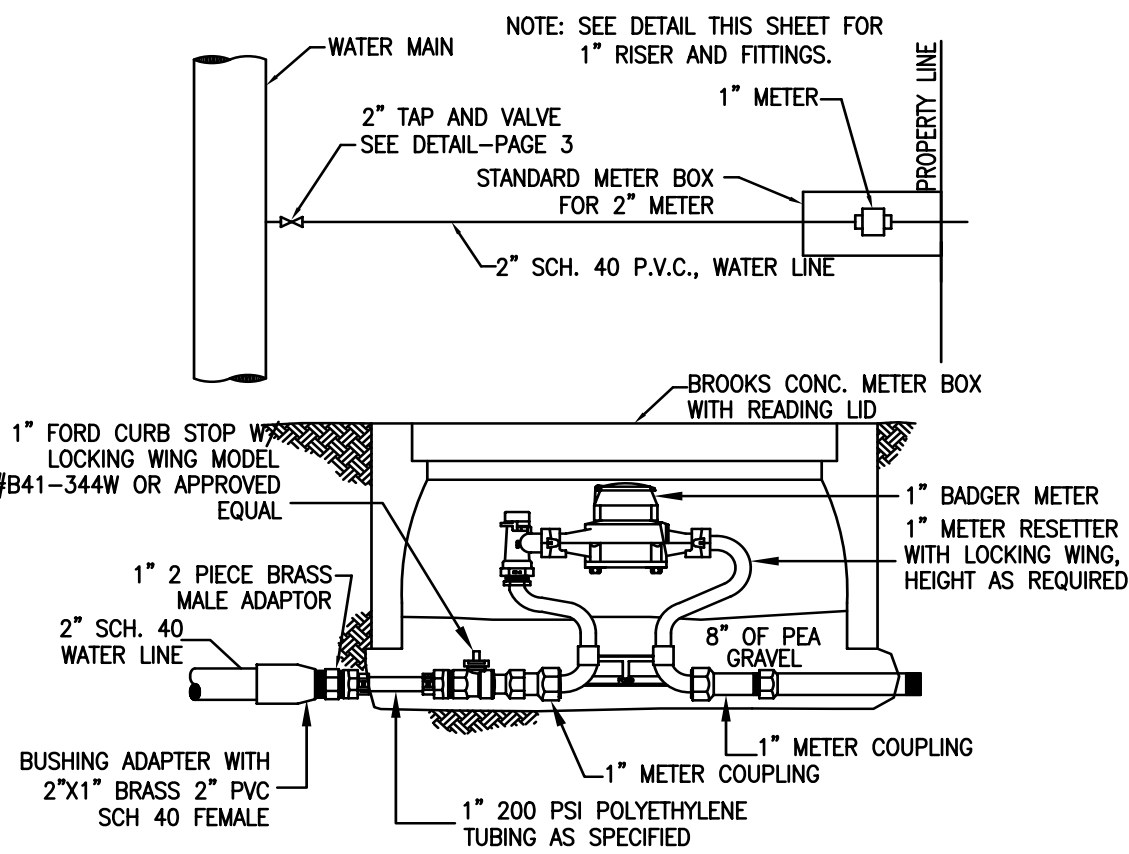
- NOTES:
1. SAND BEDDING TO BE WATER COMPACTED, DEPTH OF SAND WILL VARY WITH EACH INSTALLATION.
  2. BLOCKING SUPPORT TO BE USED UNDER ALL 1-1/2" AND LARGER METERS. NOT TO EXCEED A MAXIMUM OF 3 CINDER BLOCKS. BLOCKING TO BE PLACED ON LEVEL COMPACTED OR UNDISTURBED SOIL.
  3. GROSS CONNECTION DEVICE REQUIRED ON ALL COMMERCIAL CONNECTIONS INSTALLED BY LICENSED PLUMBER PER STATE CODES.
  4. BY PASS PIPING REQUIRED ON ALL 3" AND LARGER INSTALLATIONS.

1-1/2" AND LARGER  
METER DETAIL  
DATE: APRIL 2003



GENERAL NOTE  
2" WIDE VINYL TAPE TO BE WRAPPED AROUND  
ALL GALV. PIPE AND GALV. FITTINGS TO 6" ABOVE  
GROUND.

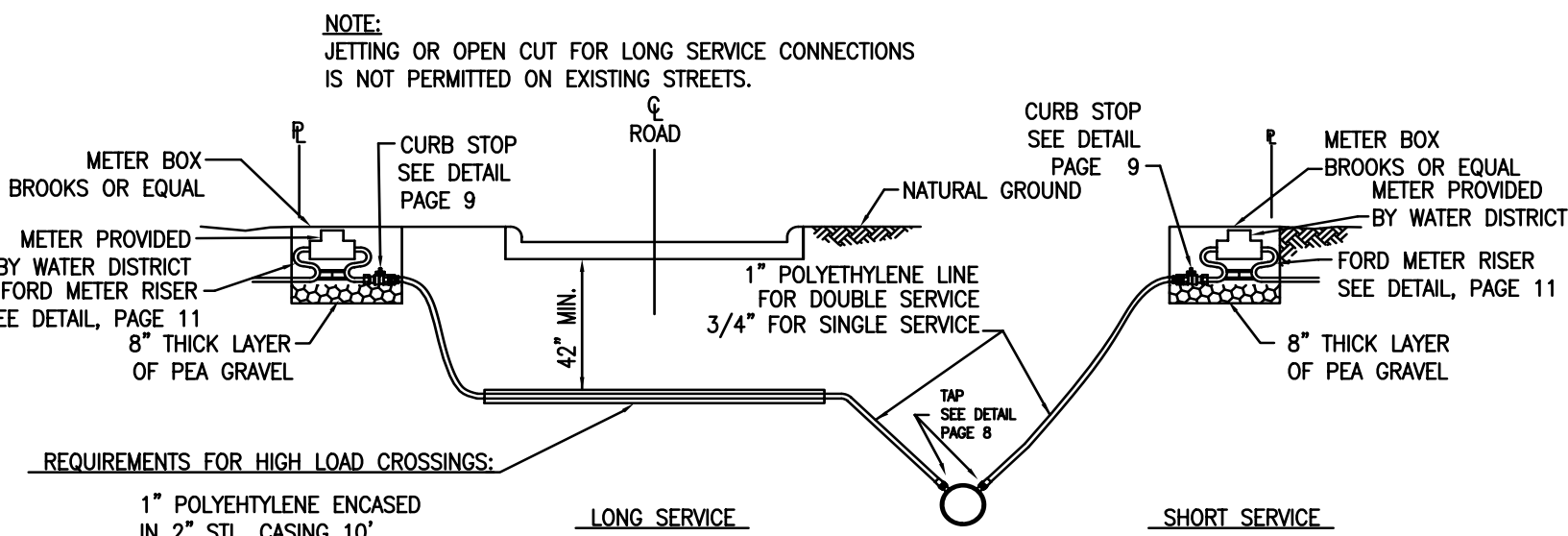
BLOW OFF DETAIL  
DATE: APRIL 2003



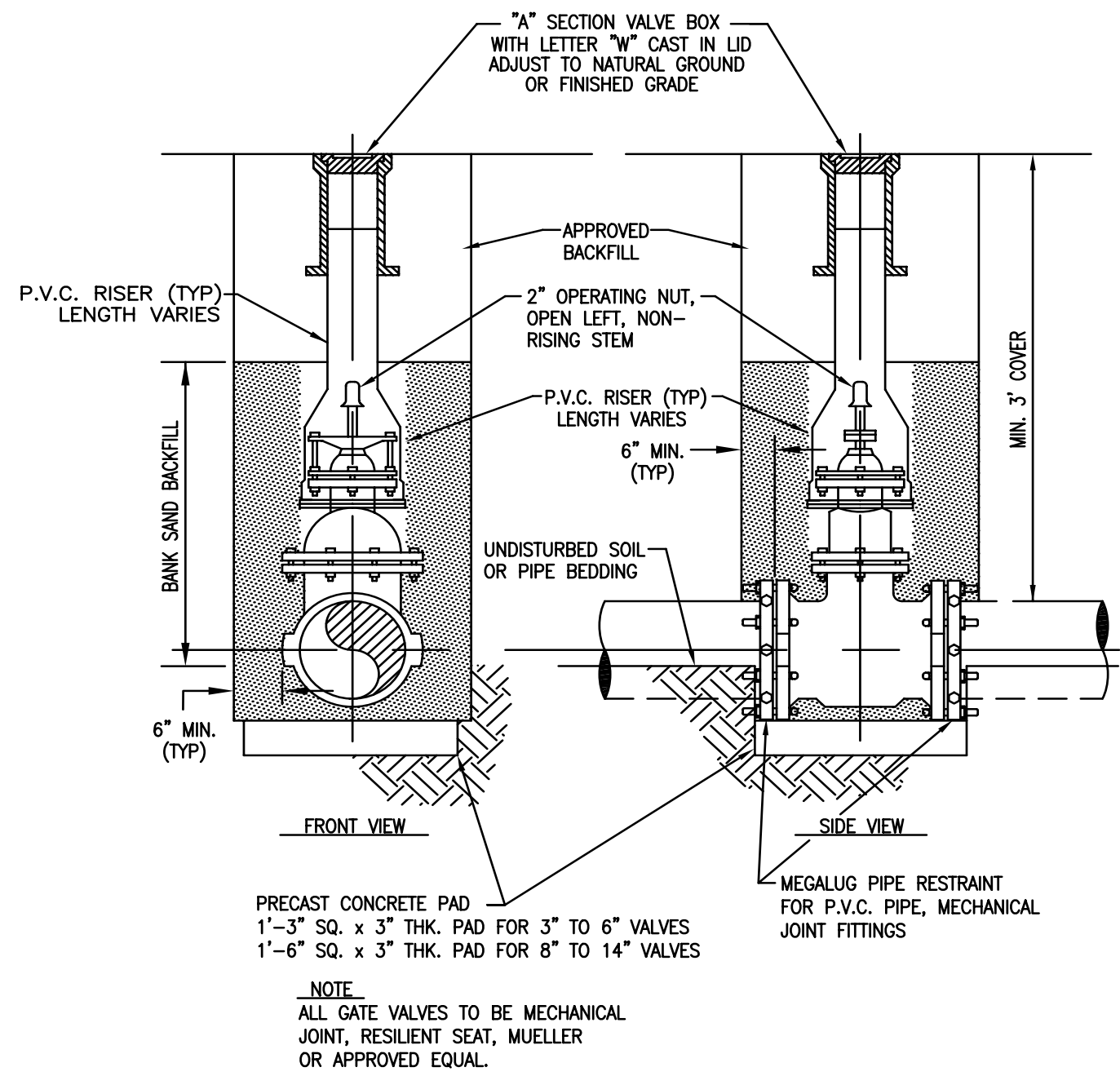
SPECIAL NOTE: CUSTOMER/TENANT IS RESPONSIBLE FOR INSTALLATION OF  
APPROVED TESTABLE BACK FLOW PREVENTION DEVICE TO BE INSTALLED BY  
A LICENSED PLUMBER PER STATE PLUMBING CODE. CUSTOMER/TENANT  
WILL ALSO PROVIDE TEST RESULTS ANNUALLY TO THE WATER DISTRICT.

- NOTES
1. TOP OF METER BOX TO BE SET LEVEL WITH TOP OF NATURAL GROUND.
  2. SET METER BOX ON 8" LAYER OF PEA GRAVEL.
  3. METER RISERS TO BE PLACED AT ALL 3/4" TO 1" METER SET UPS.

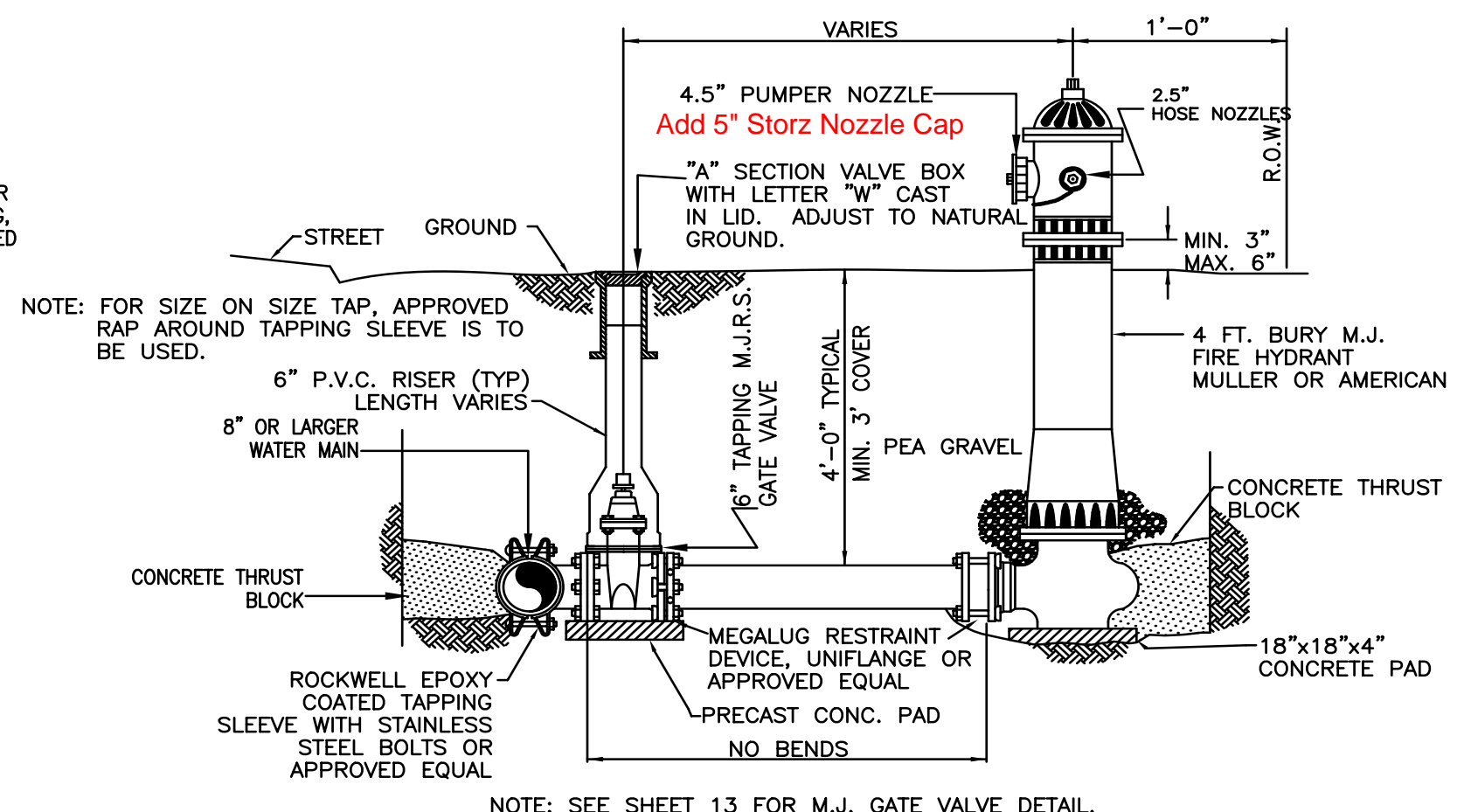
COMMERCIAL  
2" SERVICE CONNECTION  
WITH 1" METER DETAIL  
DATE: APRIL 2003



RESIDENTIAL SERVICE  
CONNECTION DETAIL  
DATE: APRIL 2003



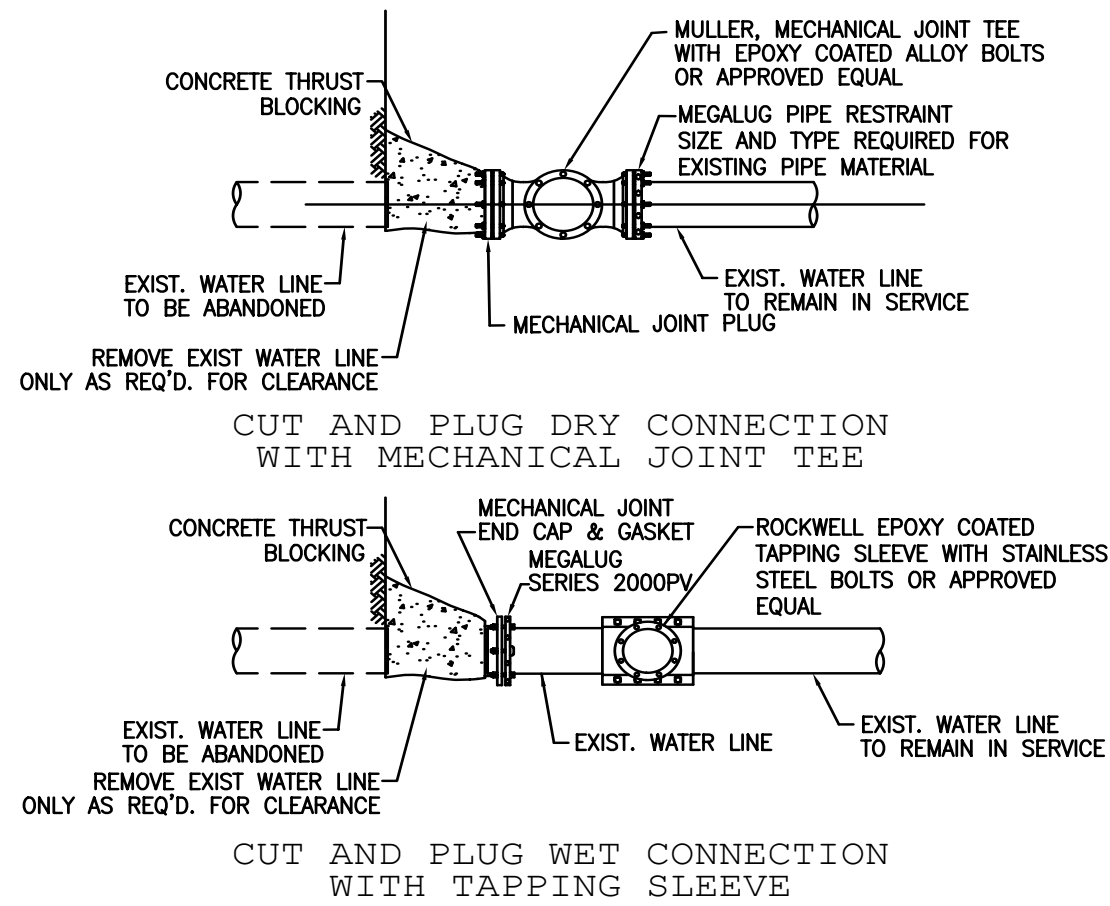
RESILIENT SEAT GATE VALVE  
INSTALLATION DETAIL  
DATE: APRIL 2003



NOTE: SEE SHEET 13 FOR M.J. GATE VALVE DETAIL.

FIRE HYDRANT  
& TAPPING VALVE DETAIL  
DATE: JAN. 2004

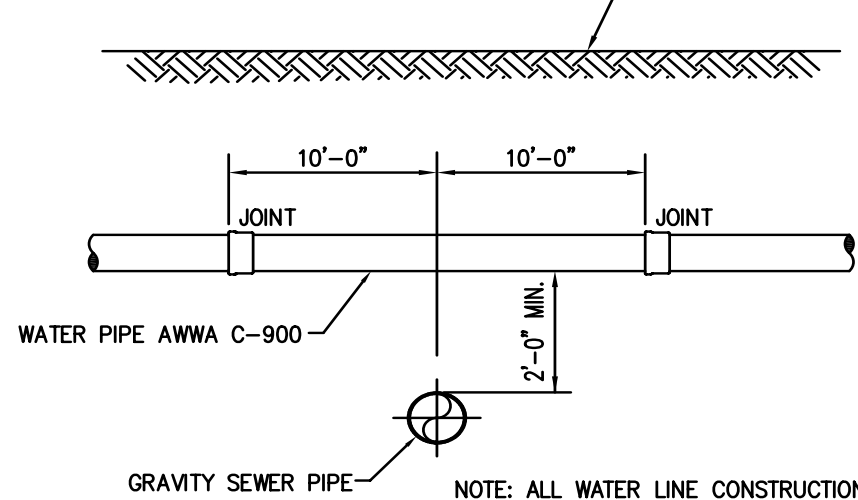
DATE	JULY 14, 2003
REVISION	JAN. 02, 2004
SCALE	(H) - (V)
DRAWING NUMBER	WATER-DETAIL



NOTES:  
SEE PAGE 1 FOR VALVE CONNECTIONS TO TEES  
AND TAPPING SLEEVES.  
FOR SIZE ON SIZE TAPPING, SEE PAGE 1 FOR SPEC. INFO  
ON FULL CIRCLE TAPPING SLEEVE.

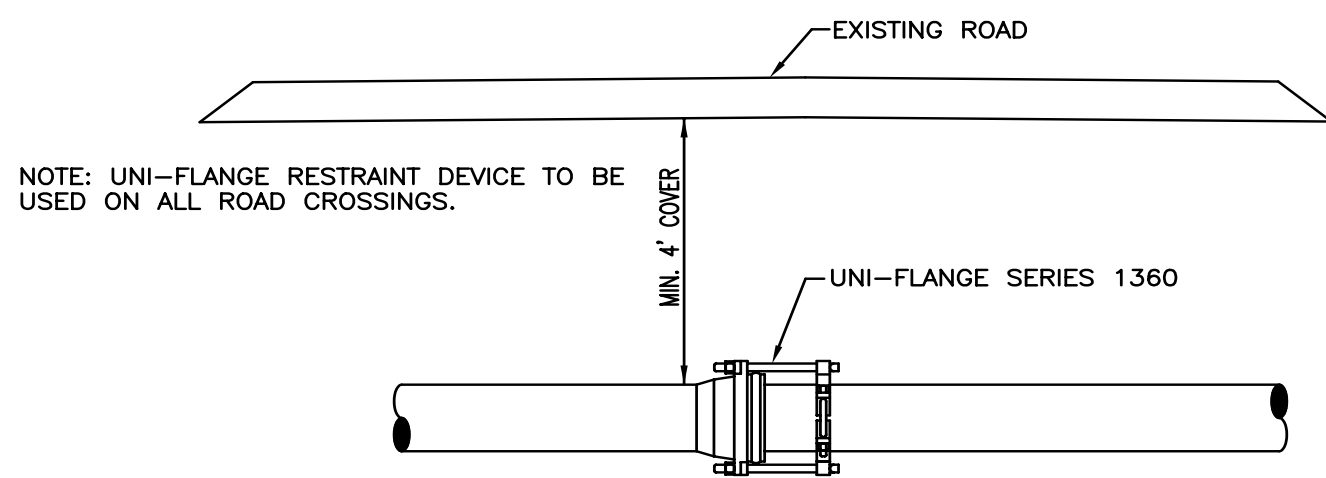
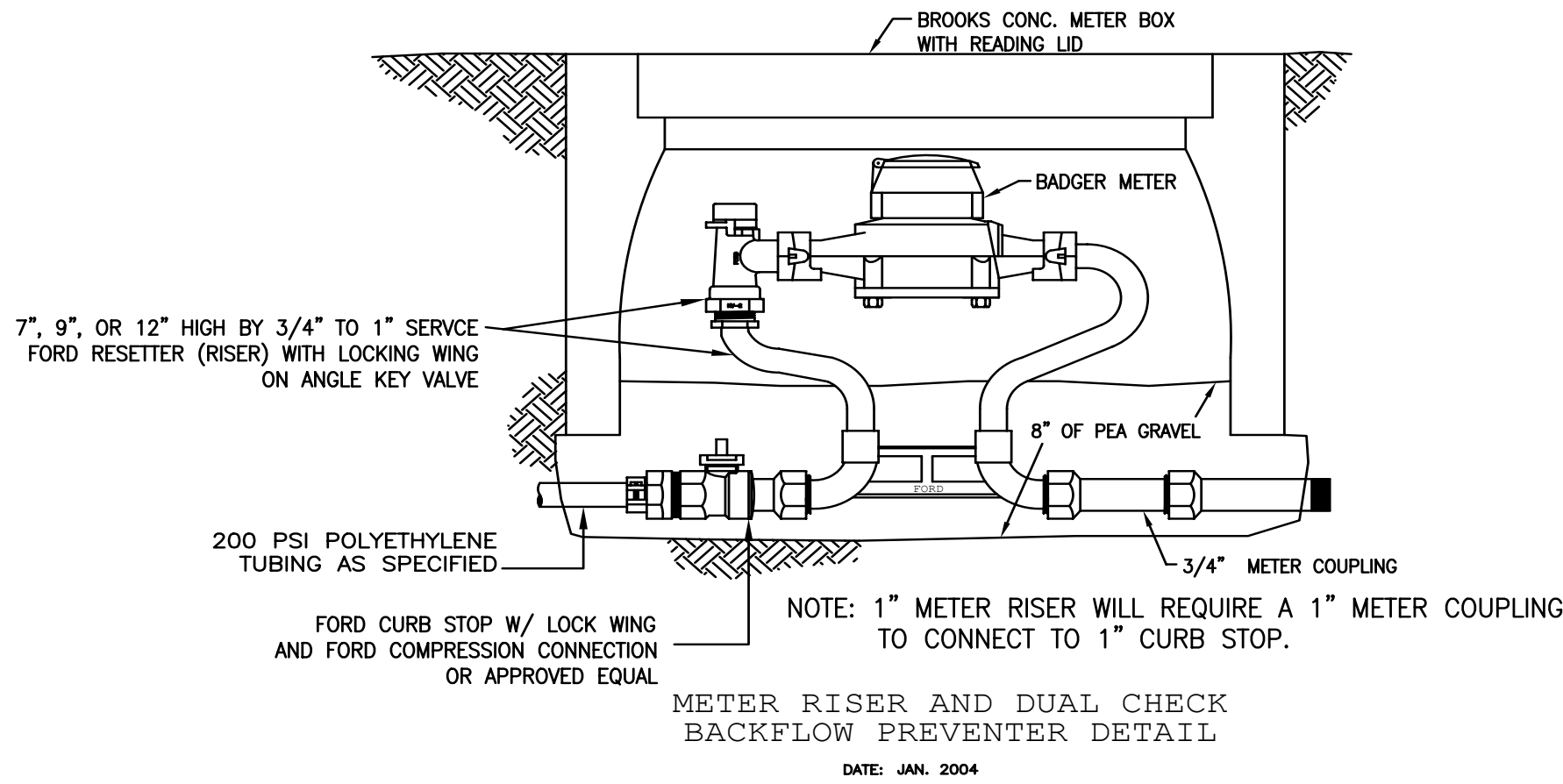
CUT & PLUG CONNECTIONS  
FOR MECHANICAL JOINT TEE  
& TAPPING SLEEVE

DATE: APRIL 2003



SPECIAL WATER LINE  
CONSTRUCTION AT SEWER LINE  
CROSSING

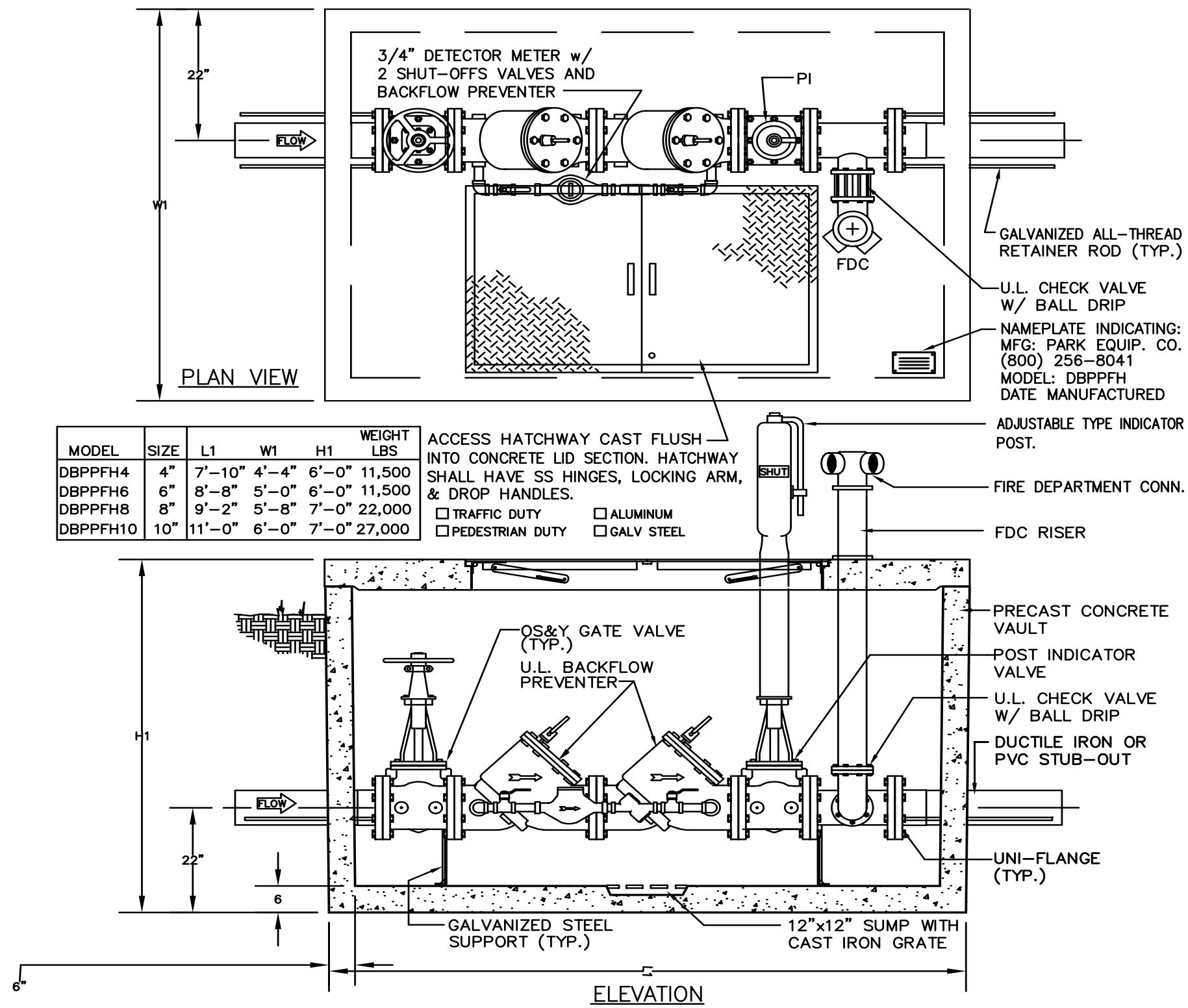
DATE: APRIL 2003



- SPECIFICATIONS:
1. RESTRAINT DEVICES FOR P.V.C. (AWWA C-900) AND P.V.C. PRESSURE FITTINGS (AWWA C-907) SHALL CONSIST OF A SPLIT RING INSTALLED ON THE PIPE SPIGOT, CONNECTED TO A SPLIT BACK-UP RING SEATED BEHIND THE FITTING BELL.
  2. THE SPLIT RESTRAINT RING SHALL INCORPORATE A SERIES OF MACHINED SERRATIONS (NOT "AS CAST") ON THE INSIDE DIAMETER TO PROVIDE POSITIVE RESTRAINT, EXACT FIT, AND 360° CONTACT AND SUPPORT OF THE PIPE WALL.
  3. THE TWO HALVES OF THE SPLIT BACK UP RING SHALL INTER-LOCK WITHOUT THE NEED FOR ADDITIONAL BOLTS AND SHALL FORM A BEVELED LEADING EDGE TO ASSURE EXACT FIT BEHIND THE FITTING BELL.
  4. RESTRAINT DEVICES SHALL BE OF DUCTILE IRON, ASTM A536, GRADE 65-45-12 AND CONNECTING BOLTS SHALL BE OF HIGH STRENGTH, LOW ALLOY MATERIAL IN ACCORDANCE WITH ANSI/AWWA C111/21.11
  5. RESTRAINT DEVICES SHALL BE UNI-FLANGE SERIES 1360 OR APPROVED EQUAL.

UNI-FLANGE RESTRAINT  
ROAD CROSSING DETAIL

DATE: APRIL 2003



#### Specifications

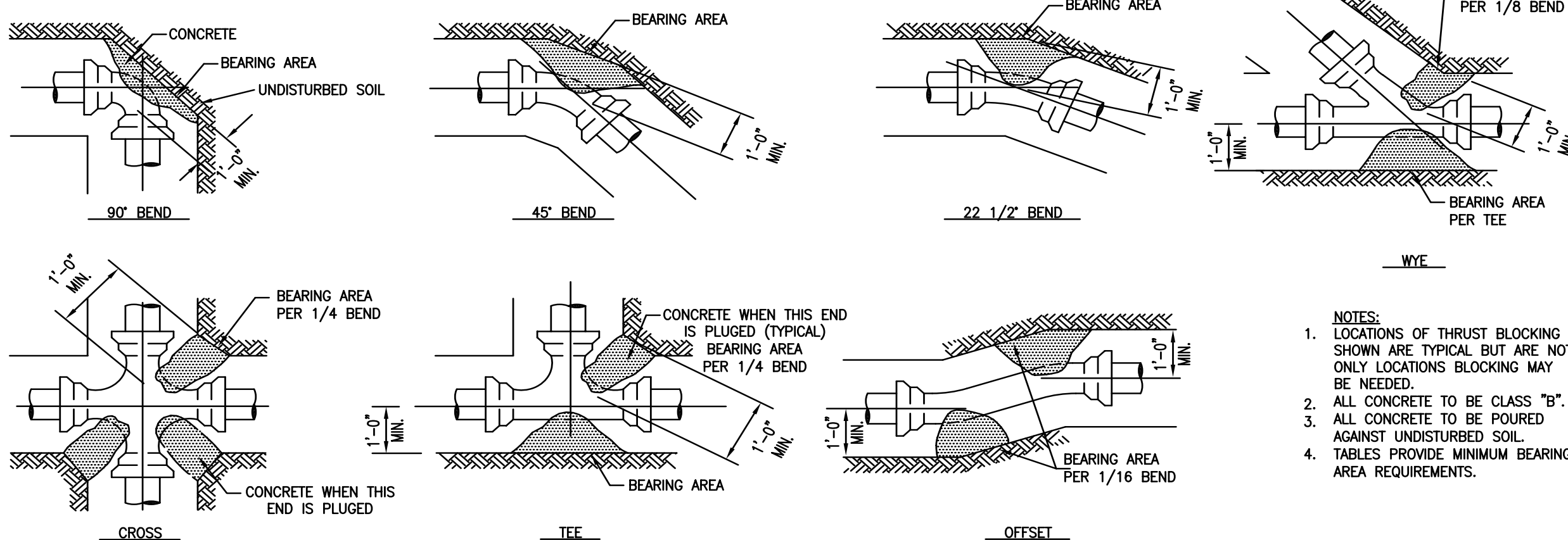
- CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.
- REINFORCEMENT : Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.
- HATCHWAY : 1/4" skid-resistant floor plate with structural members as required. Frame shall be angle type with concrete embeds. Hatch shall be hinged and have locking arm and drop handles.

FIREWATER BACKFLOW  
PREVENTER VAULT DETAIL

DATE: APRIL 2003

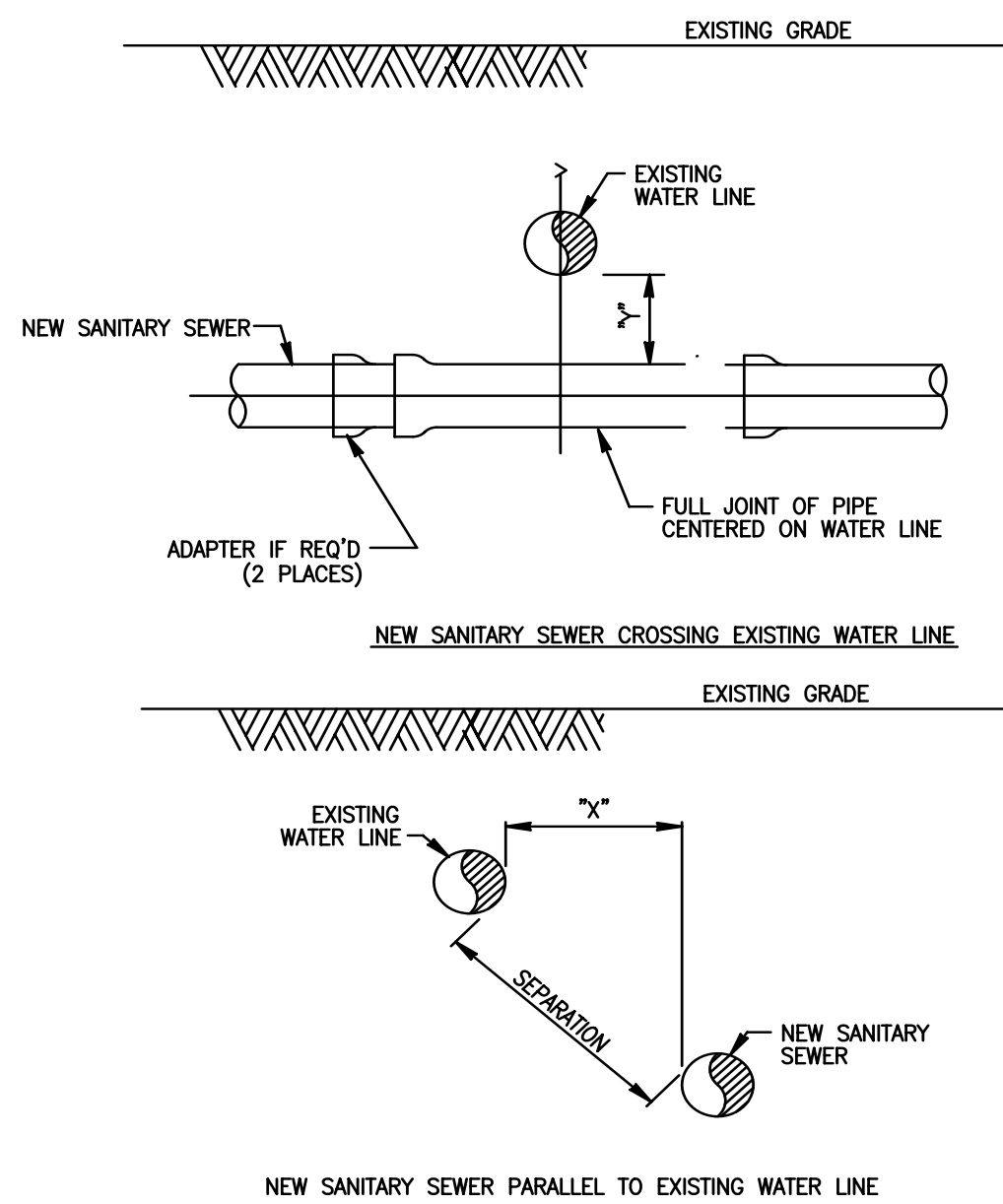
1/16 BEND (22 1/2°)		1/8 BEND (45°)		1/4 BEND (90°)		TEE	
PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA
4"	1 S.F.	4"	1 S.F.	4"	3 S.F.	4"	2 S.F.
6"	2 S.F.	6"	3 S.F.	6"	6 S.F.	6"	4 S.F.
8"	3 S.F.	8"	5 S.F.	8"	10 S.F.	8"	7 S.F.
10"	4 S.F.	10"	8 S.F.	10"	16 S.F.	10"	11 S.F.
12"	6 S.F.	12"	12 S.F.	12"	22 S.F.	12"	15 S.F.
14"	8 S.F.	14"	14 S.F.	14"	33 S.F.	14"	21 S.F.
16"	10 S.F.	16"	16 S.F.	16"	44 S.F.	16"	28 S.F.
18"	12 S.F.	18"	18 S.F.	18"	55 S.F.	18"	35 S.F.
20"	14 S.F.	20"	20 S.F.	20"	66 S.F.	20"	42 S.F.
24"	18 S.F.	24"	24 S.F.	24"	87 S.F.	24"	54 S.F.

WATER PIPE RESTRAINT NOTE: DISTRICT REQUIRES MEGALUG RESTRAINT FLANGES ON ALL WATER FITTING INSTALLATIONS AND PIPE RESTRAINTS WITHIN 60 LINER FEET OF ALL IN GROUND FITTINGS. DISTRICT WILL ACCEPT CONCRETE THRUST BLOCKING ON AN AS NEEDED BASES, APPROVED BY DISTRICT.



THRUST BLOCK DETAILS

DATE: APRIL 2003



- INSTALLATION REQUIREMENTS
1. IF "Y" IS GREATER THAN 6" AND "Y" IS LESS THAN 2', USE MINIMUM 18 FT JOINT OF PRESSURE-RATED PIPE PER COH STANDARD DRAWING.
  2. IF "Y" IS GREATER THAN 2' AND "Y" IS LESS THAN 9', USE GRAVITY SEWER PIPE IN CEMENT-STABILIZED SAND EMBEDMENT.
  3. IF "Y" IS GREATER THAN 9', USE STANDARD EMBEDMENT AND NORMAL JOINT SPACING.

- INSTALLATION REQUIREMENTS
1. IF "X" IS LESS THAN 9" AND SEPARATION IS LESS THAN 9', USE PRESSURE-RATED PIPE MH TO MH. "X" MUST BE AT LEAST 4 FT.
  2. IF "X" IS GREATER THAN OR EQUAL TO 4' AND SEPARATION IS 9' OR GREATER, USE STANDARD PIPE AND EMBEDMENT.

SANITARY SEWER  
INSTALLING SANITARY SEWERS  
CROSSING OR PARALLEL TO WATER LINES  
(NOT TO SCALE)

- NOTES:
1. SANITARY SEWER MUST BE BELOW WATER LINE WHEREVER POSSIBLE. WHEN WATERLINE IS BELOW THE SANITARY SEWER, PROVIDE MINIMUM 2 FT SEPARATION AND INSTALL PIPE SAME AS FOR SEWER BELOW WATER.
  2. WHEN PRESSURE-RATED PIPE IS REQUIRED, PROVIDE PIPE WITH MINIMUM 150 PSI PRESSURE RATING.
  3. ADAPTERS MUST BE FACTORY MOULDED OR FABRICATED, WITH RING STIFFENERS AT LEAST EQUAL TO THE ADJOINING SANITARY SEWER PIPE, AND USING RESILIENT GASKET OR SEAL MATERIAL. FLEXIBLE RUBBER "BOOT" TYPE ADAPTERS WILL NOT BE ACCEPTED.
  4. INSTALL FORCE MAINS SAME AS FOR GRAVITY SEWER, USING SPECIFIED PRESSURE PIPE.
  5. "Y" MUST ALWAYS BE GREATER THAN OR EQUAL 6".
  6. "X" MUST BE GREATER THAN OR EQUAL TO 4 FT.
  7. ALTERNATIVES MAY BE SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
  8. SEPARATION REQUIREMENTS SHOWN HERE DO NOT APPLY TO SERVICE CONNECTIONS - REFER TO PLUMBING CODE FOR APPLICABLE REQUIREMENTS.

TABLE 02730-04 SEWER LINE CROSSING BELOW WATER LINE WITHIN 2 FT SEPARATION		
GRAVITY SANITARY SEWER PIPE SIZE	PRESSURE-RATED PIPE SIZE & TYPE (NOTE 2)	ADAPTERS REQUIRED
6" TO 12" (ASTM D3034)	SAME SIZE ASTM D2241, SDR 26	ASTM D3034 TO D2665 (SEWER TO D.W.V.) ADAPTER COUPLING
15" (ASTM D3034)	14" LINED DUCTILE IRON OR AWWA C905, DR25	NONE REQUIRED
18" AND 24"	SAME SIZE AWWA C905, PRESSURE-RATED FRP, OR LINED DUCTILE IRON, MANHOLE TO MANHOLE	NONE REQUIRED
21" AND 27"	PRESSURE PIPE NOT AVAILABLE. SEE CASING ALTERNATIVE	NOT APPLICABLE
30" AND LARGER	SAME SIZE PRESSURE- RATED FRP OR LINED DUCTILE IRON, MANHOLE TO MANHOLE	NOT APPLICABLE
CASING ALTERNATIVE:	INSTALL AS CASING PIPE MIN 18 FT JOINT OF PRESSURE PIPE AT LEAST 2 NOMINAL SIZES LARGER THAN SAN. SEWER CARRIER PIPE. GROUT ANNUAL SPACE WITH TUNNEL GROUT	NOT APPLICABLE
ANY SIZE AND TYPE		

GALVESTON COUNTY W.C.I.D. #1  
STANDARD CONSTRUCTION DETAILS  
CITY OF DICKINSON, TEXAS

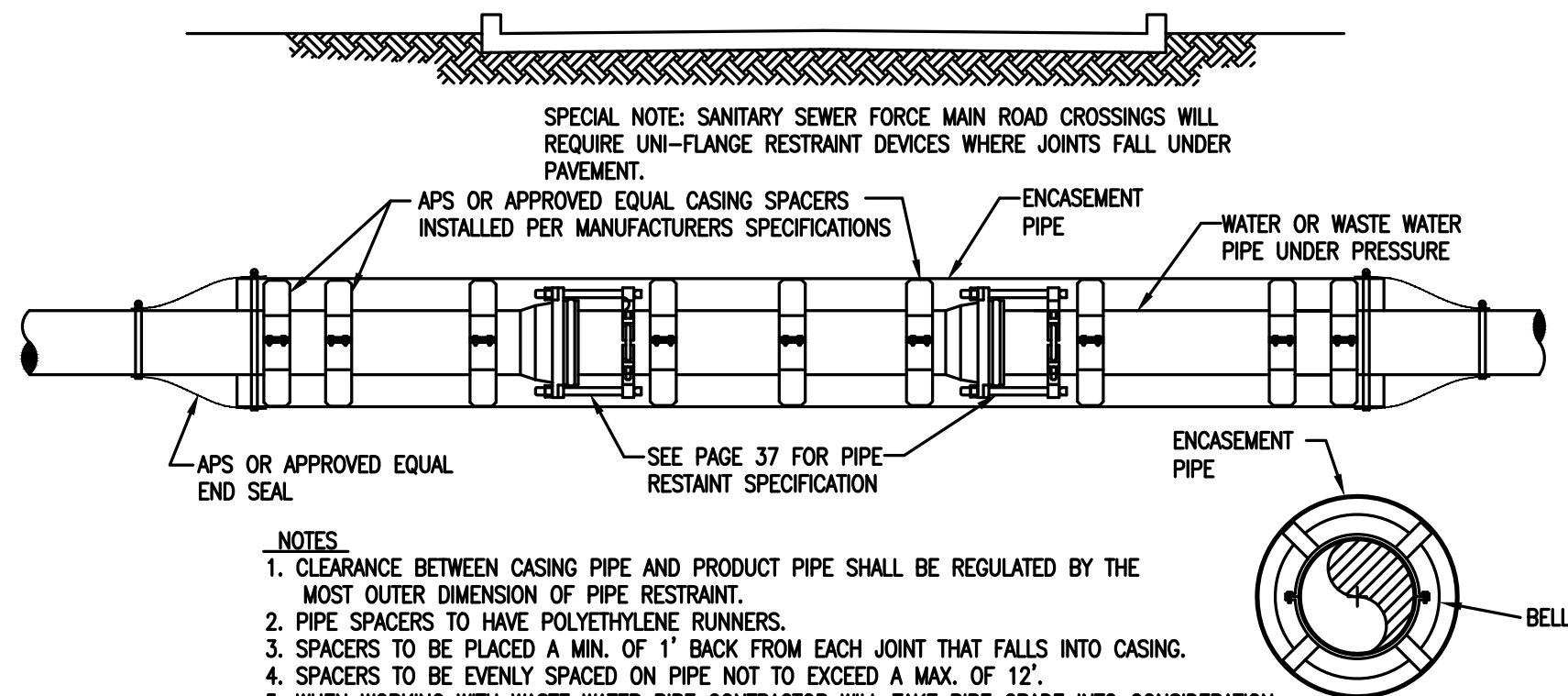
STANDARD  
WATER  
DETAILS

GALVESTON COUNTY  
W.C.I.D. #1

DATE	REVISION	DATE	REVISION	DATE	REVISION
JULY 14, 2003		JAN 02, 2004			
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)
SALE	(H)	SALE	(H)	SALE	(H)

SHEET 2 OF 3





- NOTES:**
- CLEARANCE BETWEEN CASING PIPE AND PRODUCT PIPE SHALL BE REGULATED BY THE MOST OUTER DIMENSION OF PIPE RESTRAINT.
  - PIPE SPACERS TO HAVE POLYETHYLENE RUNNERS.
  - SPACERS TO BE PLACED A MIN. OF 1' BACK FROM EACH JOINT THAT FALLS INTO CASING.
  - SPACERS TO BE EVENLY SPACED ON PIPE NOT TO EXCEED A MAX. OF 12'.
  - WHEN WORKING WITH WASTE WATER PIPE CONTRACTOR WILL TAKE PIPE GRADE INTO CONSIDERATION SO THAT THE PROPER FALL IS MAINTAINED.
  - WHERE USING DUCTILE IRON FOR HIGHWAY CROSSINGS, CASING PIPE IS NOT REQUIRED.
  - JOINT RESTRAINTS ARE REQUIRED ON ALL JOINTS THAT FALL UNDER OR WITHIN 10' OF HIGHWAYS REGARDLESS OF PIPE MATERIAL, CASED OR NOT.
  - PIPE SHALL BE CENTERED WITHIN CASING WITH USE OF SPACERS; A MAX. TOLERANCE OF 1/2" TO BE MAINTAINED BETWEEN INSIDE WALL OF CASING PIPE AND RUNNER ON SPACER.
  - END CAPS TO BE USED ON ALL CASING PROJECTS.

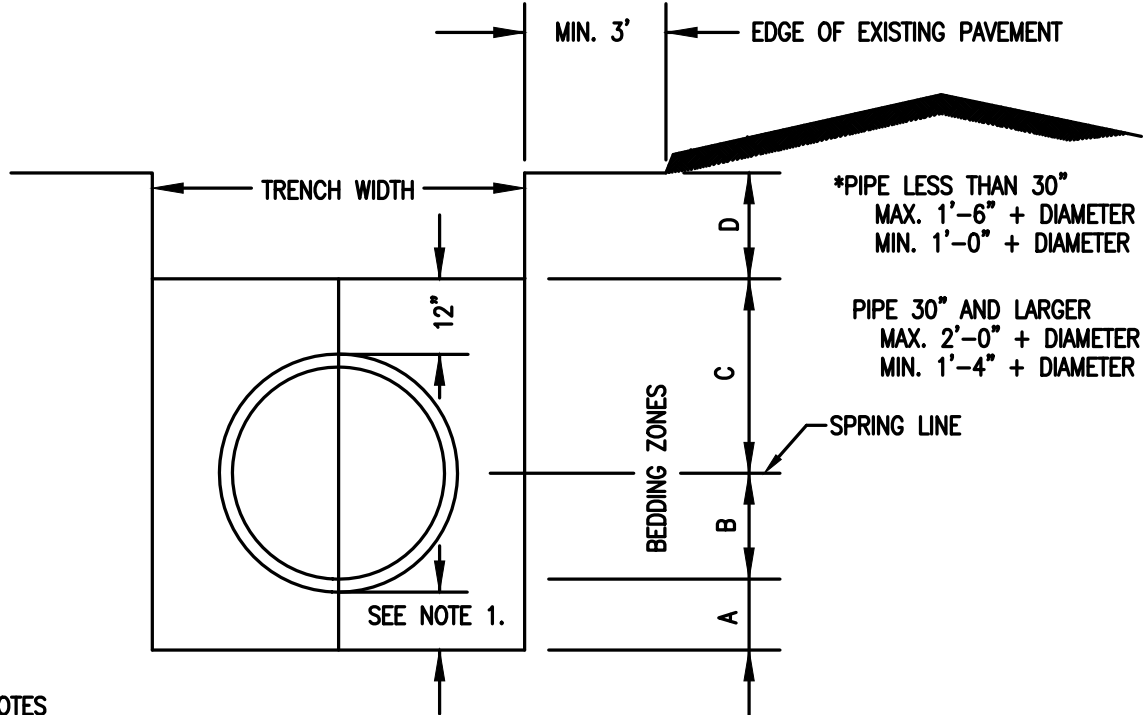
SPECIAL NOTE: IN LIEU OF USING CASING ON SANITARY SEWER HIGHWAY CROSSINGS AND DITCH CROSSING CONTRACTOR MAY USE GRIFFIN-20, AMSTD, H2SEWER SAFE, DUCTILE IRON SEWER PIPE, WITH SEWPER COAT LINING.

### ENCASED CONSTRUCTION FOR HIGHWAY CROSSINGS

DATE: APRIL 2003

PIPE MATERIAL	BEDDING ZONES			
	A	B	C	D
PVC (PRESSURE PIPE)	BS	BS	BS	EF
PVC (GRAVITY PIPE)	BS	BS	BS	EF

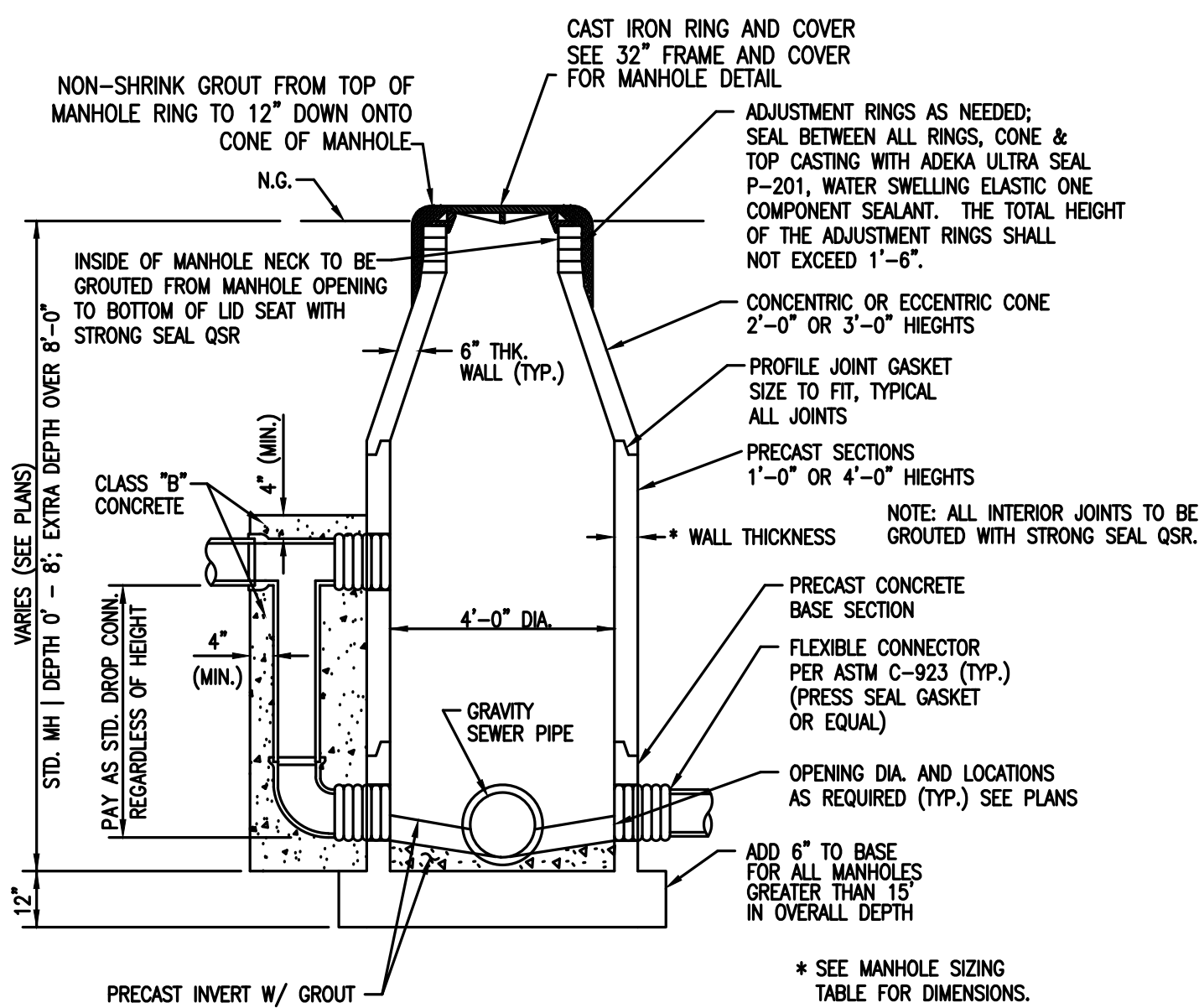
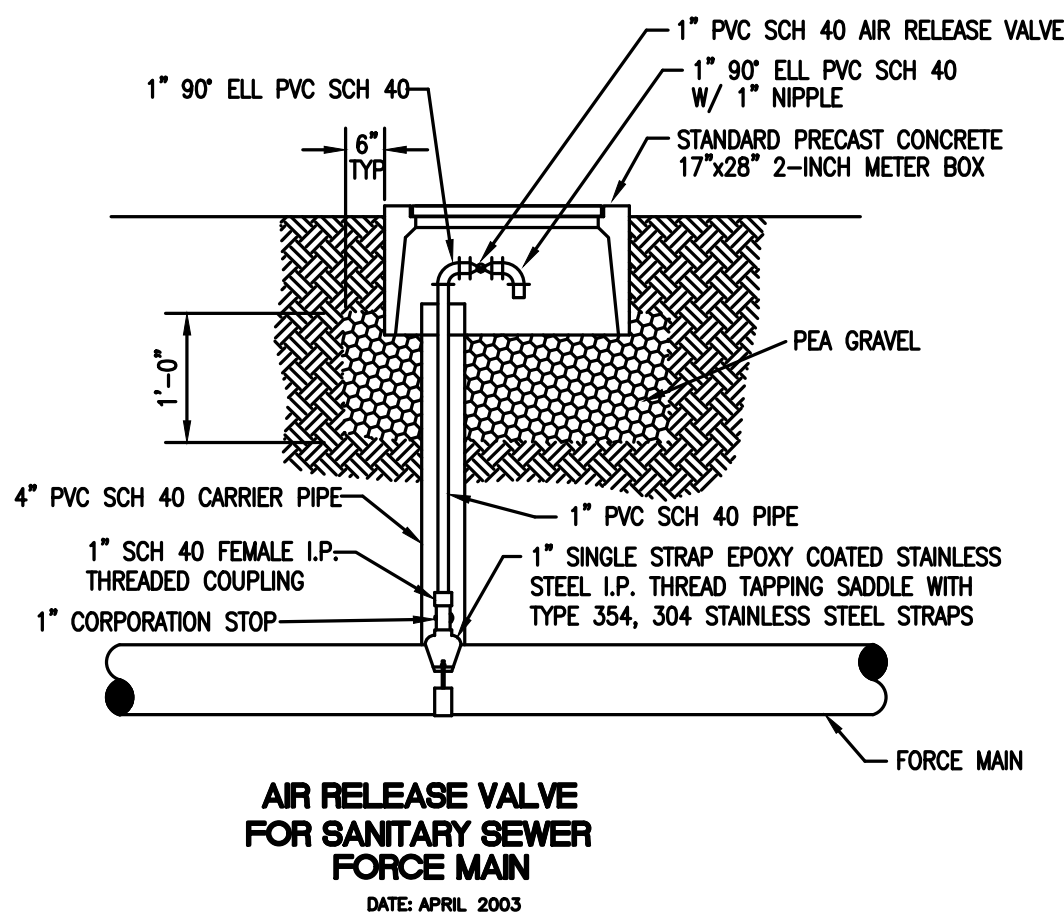
BS- BANKSAND.  
AB- AGGREGATE BEDDING.  
ES- SELECT EARTH FILL PLACED SAME DAY AS PIPE IS LAID.  
EF- EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID.  
CS- CEMENT STABILIZED SAND.



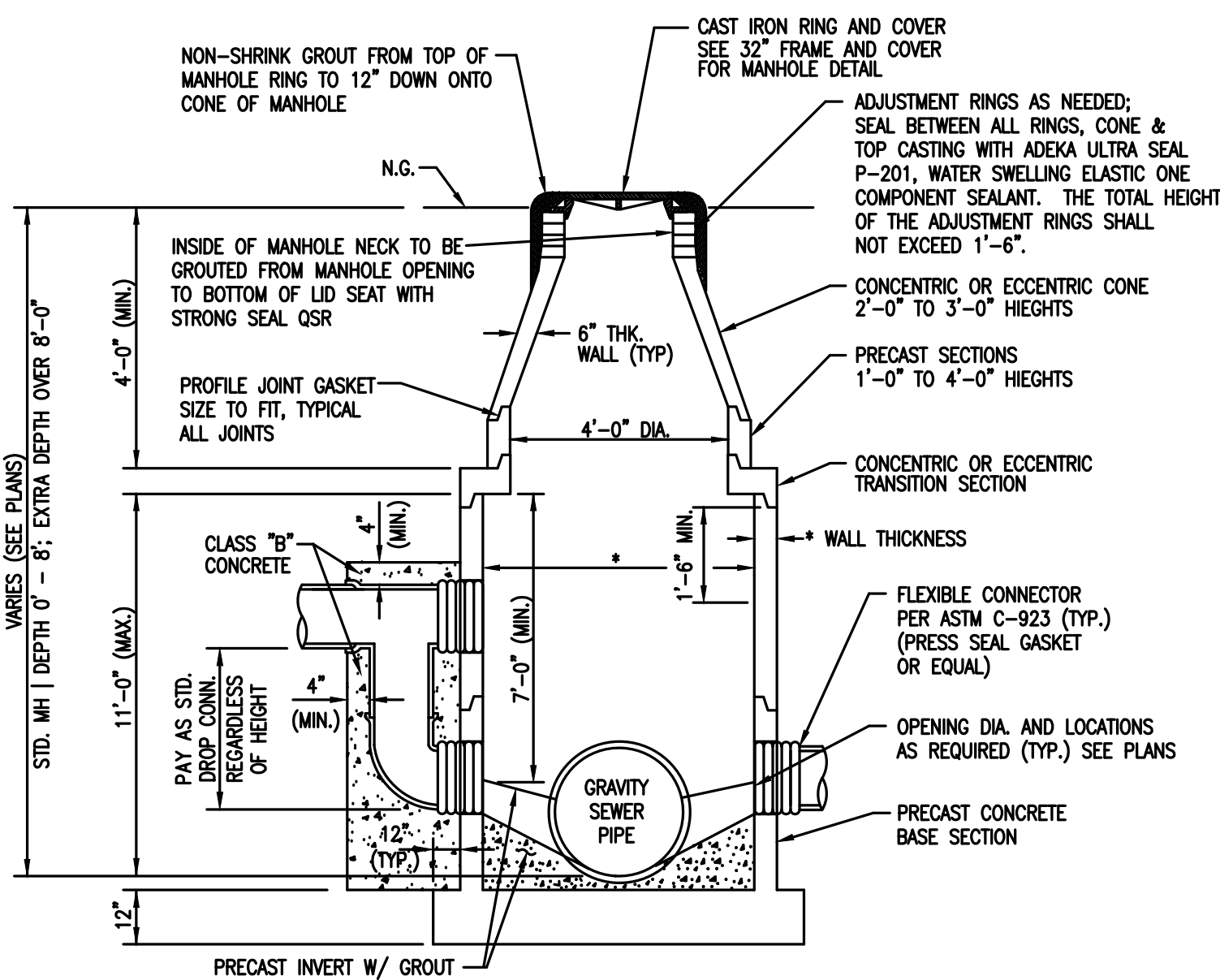
- NOTES:**
- BEDDING TO BE 1/4 OF PIPE DIAMETER OR 4", WHICHEVER IS GREATERST.
  - ANY EXCAVATION WITHIN 3' OR LESS OF HIGHWAY PAVEMENT TO BE 2 SACK STABILIZED MATERIAL; EXCAVATION WITHIN 3' OR LESS OF ANY CITY STREET SHALL BE 2 SACK STABILIZED SAND IN ZONE D. ALL STABILIZED SAND TO BE COMPACTED IN 12" LIFTS WITH VIBRATORY PLATE.

### ORDINARY TRENCH EMBEDMENT + BACKFILL DETAIL

DATE: APRIL 2003



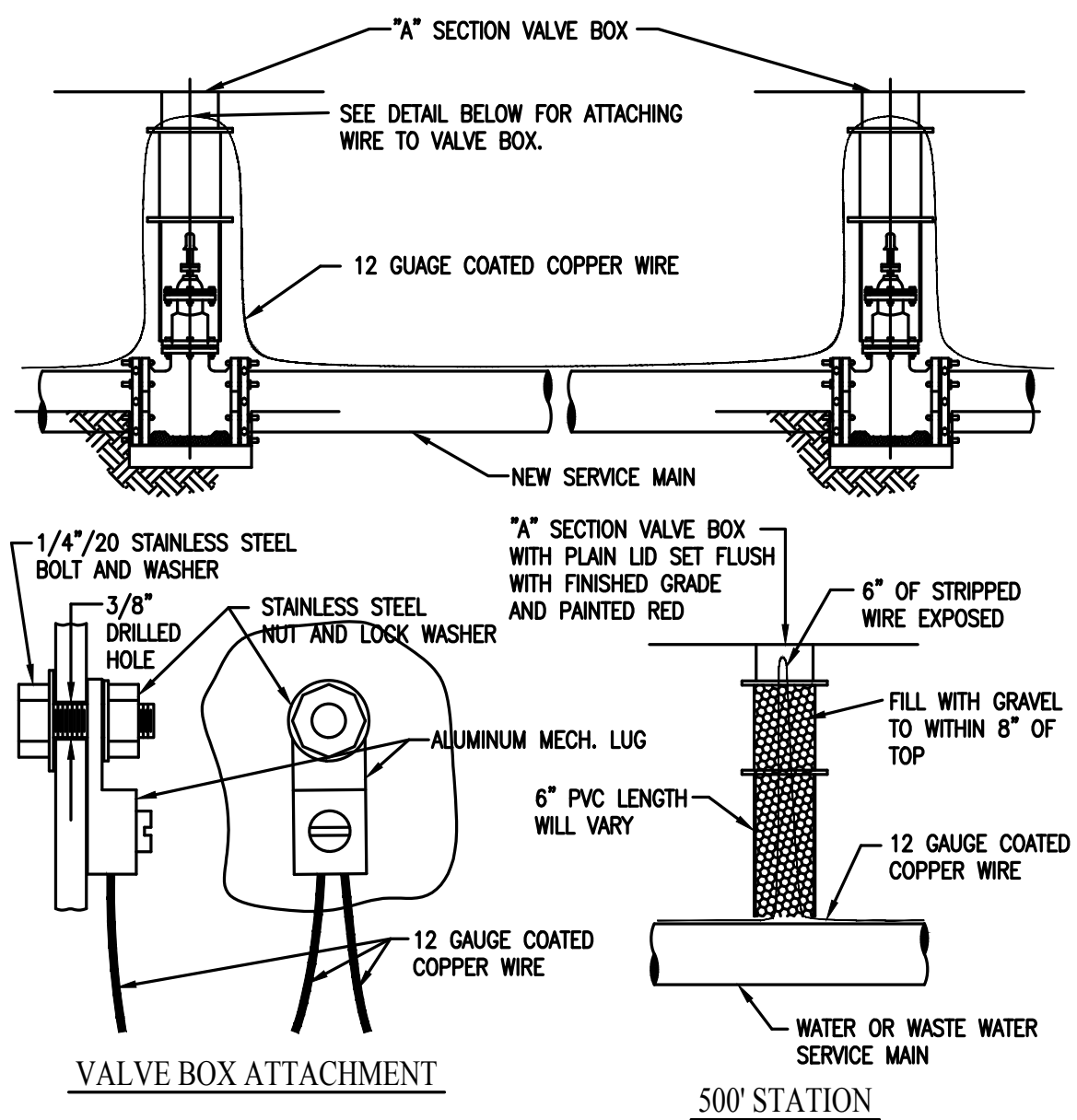
### STANDARD PRECAST 4'-0" DIA. MANHOLE



### STANDARD PRECAST 5'-0" TO 8'-0" DIA. MANHOLE

### DROP MANHOLE DETAIL

DATE: APRIL 2003

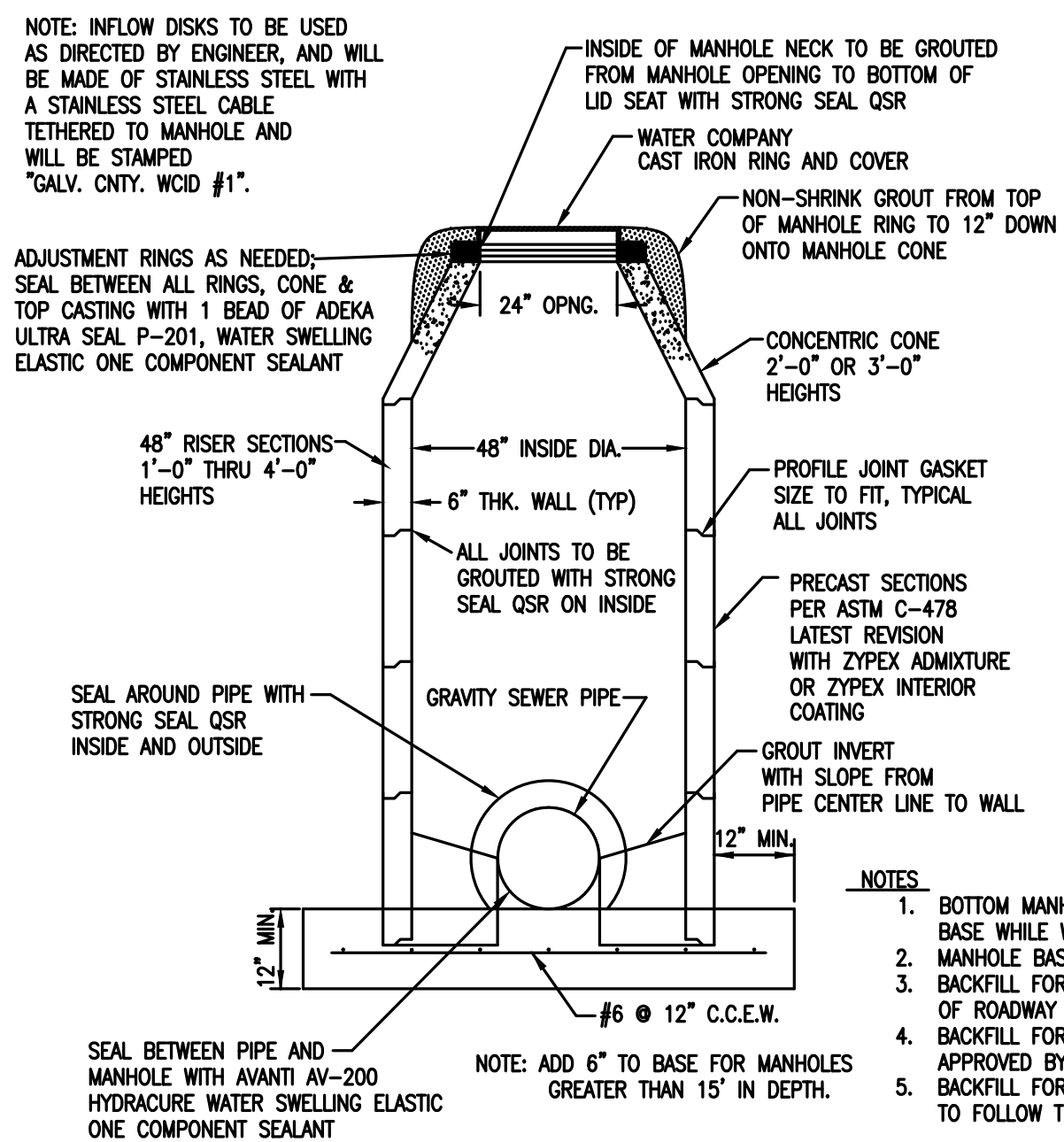


- NOTES:**
- TRACER WIRE TO BE PLACED ON TOP OF ALL NEWLY CONSTRUCTED WATER AND WASTE WATER FORCE MAINS. WIRE MAY BE DUCT TAPED TO PIPE UNTIL BACKFILL IS COMPLETED.
  - END OF TRACER WIRE TO BE ATTACHED TO VALVE BOX. (SEE DETAIL ABOVE).
  - TRACER WIRE ON WASTE WATER FORCE MAINS OR WHERE VALVE BOXES ARE OVER 500' APART, A TRACER WIRE RISER STATION WILL BE CONSTRUCTED.
  - TRACER WIRE TO BE 12 GAUGE COATED COPPER WIRE.
  - NO SPLICES BETWEEN TERMINAL RISERS OR VALVE BOXES.

**SPECIAL NOTE:**  
REPAIRS TO TRACER WIRE TO BE MADE WITH AN ALUMINUM KERNY DESIGNED FOR 12 GAUGE WIRE.

### PRESSURE PIPE TRACER WIRE DETAIL

DATE: APRIL 2003



- NOTES:**
- BOTTOM MANHOLE SECTION TO BE SET 6" INTO CONCRETE BASE WHILE WET. BASE TO BE CLASS "A" CONCRETE.
  - MANHOLE BASE TO BE SET IN UNDISTURBED SOIL.
  - BACKFILL FOR MANHOLES SET IN ROADWAY OR WITHIN 3' OF ROADWAY TO BE 2 SACKS OF STABILIZED SAND.
  - BACKFILL FOR MANHOLES SET ELSEWHERE TO BE APPROVED BY DISTRICT.
  - BACKFILL FOR MANHOLES SET NEAR OR IN HIGHWAYS TO FOLLOW TxDOT SPECIFICATIONS.

### STANDARD PRECAST CONCRETE MANHOLE

DATE: APRIL 2003

DATE:	REVISION:	SCALE:	REVISION:
JULY 14, 2003	AUGUST 5, 2004	(H) -	(V) -

REVISION NUMBER: SANITARY-DETAIL

