LVWD GENERAL DETAILS	
Detail No.	**Description**
100	Cover Sheet for 24" X 36" Size Sheet
101	Location for Utility Lines
102	Separation Distance Sanitary Sewer and Potable Water (Special Conditions)
102A	Proposed Pipeline Crossing Existing LVWD Utility Lines
103	Trench Cross-Section Terminology
104	Embedment Class E1 for Rigid Pipe and Flexible Pipe
105	Embedment Class E2 and E3 for Flexible Pipe
106	Embedment Class F for Flexible Pipe
107	Typical Pipe Trench, Embedment and Backfill
108	Pipe Casing Details
109	Pipe Casing Details (TXDOT Right-of-Way)
110	Pipe Casing Details (Private Ditch Crossing)
111	Pipe Casing Detail (Bore Crossing)
112	Vent Details (Goose Neck)
112A	Vent Details (Level with Ground)
113	Break-A-Way Coupling
114	Water Line Lowering by Contractor
115	Concrete Cap (Paved Condition)
116	Concrete Cap (Unpaved Condition)
117	Typical Trench Backfill & Pavement Restoration for Proposed or Existing Paved Street
118	Site Sign - No Trespassing
119	Sign Pole
120	Concrete Collar Installation in Paved Areas
121	Concrete Apron Installation in Non Paved Areas

WATER DETAILS	
Detail No.	**Description**
200	Cover for Water Mains
201	Typical Valve Locations
202	Resilient Wedge Gate Valve Installation
203	Gate Valve Installation - Valve Anchor
204	Tapping Sleeve and Valve
205	Butterfly Valve Manhole (20" Lines and Smaller)
206	Butterfly Valve in Manhole Installation Details (24" and Larger)
207	Pressure Test Outlet
208	Biological Test Outlet Detail
209	Extension Stem Guide
210	Blowoff Assembly
211	Blowoff Assembly in TxDOT Right-of-Way
212	Air Release Valve Installation
213	Combination Air Release Valve Installation - Paved or Unpaved Condition 16" and Smaller (No Curb)
214	Combination Air Release Valve for 16" and Smaller Beneath Paving Installation with Curb
215	Combination Air Release Valve for Lines 20" and Larger Behind Curb Installation
216	Air Release Piping
217	Pressure Reducing Valve (in-Line) Behind Curb Installation
218	Pressure Relief Valve
219	Bonnet Box
220	Bonnet Box Cover (Flip Resistant)
221	Concrete Thrust Blocking
222	Side Outlet Connection
223	Standard Fire Hydrant Installation
224	Fire Hydrant Installation (12" Main or Larger)
225	Fire Hydrant Locations
226	Fire Hydrant Construction Meter
227	Fire Line
228	Service Line 3/4" & 1" Installation
229	Typical 2" Service Line Installation
230	Typical 4" and Larger Service Line Installation
231	3/4" - 2" Reduced Pressure Backflow Preventor
232	Water Sampling Station
233	Service Connection Location
234	Service Connection Location Within TxDOT Right-of-Way
235	Service Connection Within Commercial Site
236	Service Connection Within Commercial Site TxDOT
237	Meter Box Type "A" for 3/4" Service Installation
238	Meter Box Type "B" for 1" Service Installation
239	Meter Box Cover
240	Meter Box Frame
241	Meter Box Type "C" for 2" Service Installation
242	Meter Box Type "D"
243	Frame and Cover Type "C" & "D" Meter Box
244	Meter Box Type 96"X72"X60"-3" and Larger Service Installation
245	Bollard Detail

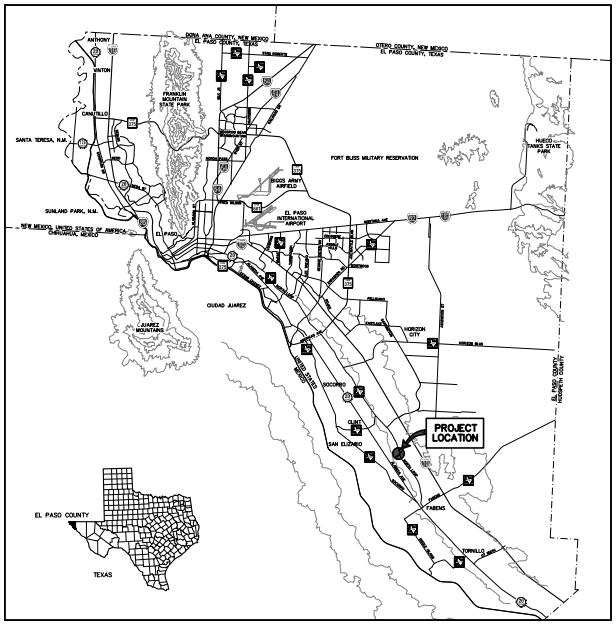
SANITARY SEWER DETAILS	
Detail No.	**Description**
301	Standard Cover for Sewer Mains
310	Standard Manhole Type "A"
311	Standard Manhole Type "A1"
312	Standard Manhole Type "A2"
313	Standard Manhole Type "A3" - Cast in Place
320	Standard Manhole Type "B"
321	Standard Manhole Type "B1"
330	Pipe Connection to Manhole
331	Internal Drop Connection Manhole
332	External Drop Connection Manhole
340	Manhole Cover
341	Manhole Ring
342	Concrete Manhole Cover for 72" I.D.
350	Typical Manhole Invert Plans
360	Sewer Service Riser & Service Line Connection
370	End of Sewer Line Cleanout
380	15' Water or Sanitary Sewer Easement
381	30' Water or Sanitary Sewer Easement
382	30' Water or Sanitary Sewer Easement 8'-12' Depth
390	Grease and Sewer Trap Detail

Lift Station Details	
Detail No.	**Description**
410	Typical Lift Station Site Plan
411	Lift Station General Layout
412	Clean-out Hatch and Flushing Detail
413	Lift Station General Section - Below Grade
414	Sump Pump Detail
415	Typical Pump Power & Control Box Mounting Stand
416	Double Hatch Access Cover
417	Typical Control Building
418	Typical Monorail System
419	Exterior Hose Rack with Hose Bib Detail

STANDARD 24" X 36" SHEET

COVER SHEET BORDER

OFFSET
1.5" FOR
BINDING



VICINITY MAP
APPROXIMATE SCALE:
1" = 4 MILES

Lower Valley WATER DISTRICT

PROJECT NAME

LVWD BID # _____

PRESIDENT
FIRST NAME AND LAST NAME

BOARD MEMBERS
FIRST NAME AND LAST NAME
FIRST NAME AND LAST NAME
FIRST NAME AND LAST NAME
FIRST NAME AND LAST NAME

GENERAL MANAGER
FIRST NAME AND LAST NAME

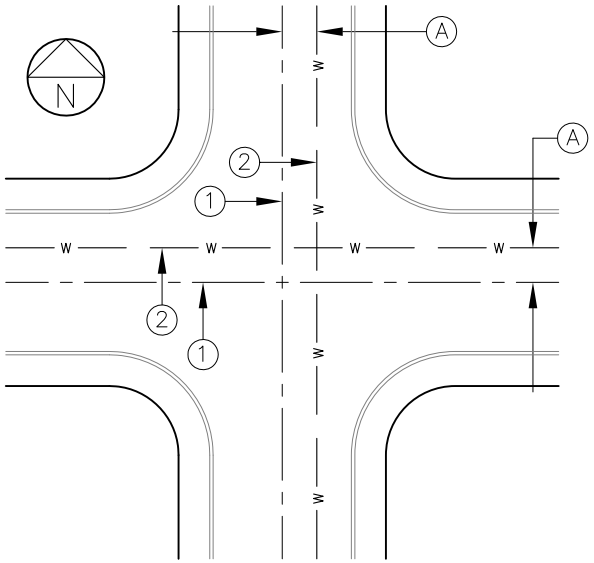
CONSULTING ENGINEER

CONSULTANT LOGO

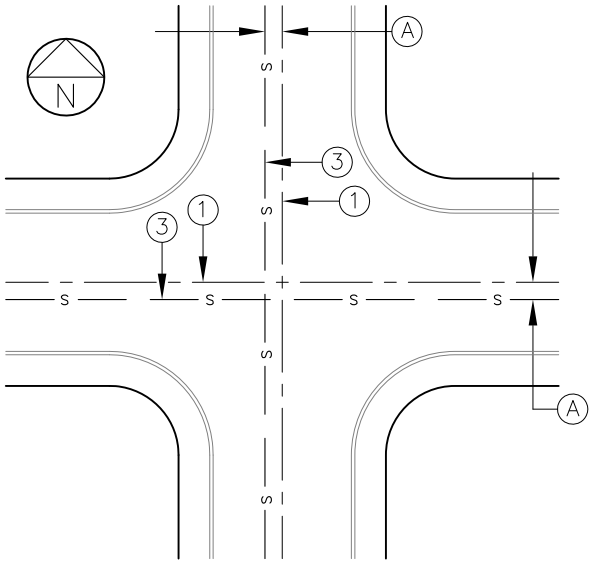
CONSULTANT SEAL AND SIGNATURE

DATE (MONTH, YEAR)

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	COVER SHEET FOR 24" X 36" SIZE SHEET SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 100



WATER LOCATIONS



SANITARY SEWER LOCATIONS

GENERAL NOTES:

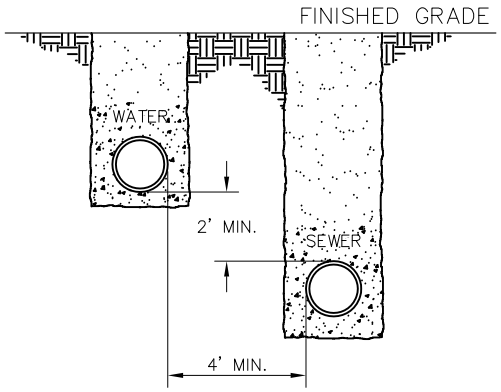
1. REFERENCE CENTERLINE SHALL BE CENTERLINE OF RIGHT OF WAY PROVIDED IT COINCIDES WITH STREET CENTERLINE. WHERE THESE CENTERLINES DO NOT COINCIDE, THEN REFERENCE SHALL BE STREET CENTERLINE.
2. WATER EXTENSIONS SHALL BE LOCATED ON NORTH OR EAST SIDES OF DEDICATED STREETS OR ALLEYS.
3. SEWER EXTENSIONS SHALL BE LOCATED ON SOUTH OR WEST SIDES OF DEDICATED STREETS OR ALLEYS.
4. STORM SEWER MAINS SHALL BE LOCATED ON THE CENTER LINE

CONSTRUCTION KEY NOTES:

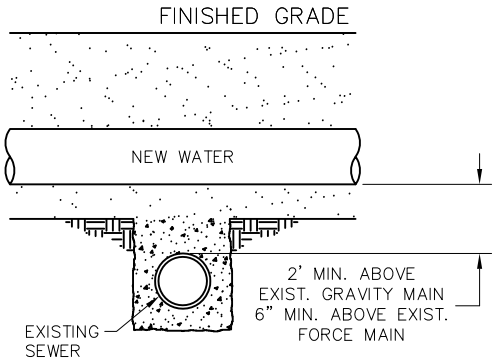
A. DISTANCES FROM CENTERLINE VARIES AND SHALL BE ACCORDING TO THE FOLLOWING:

PIPELINE LOCATION WITHIN NEW RIGHT-OF-WAY		
RIGHT-OF-WAY WIDTH	DISTANCE "A" FROM CENTERLINE	
	WATER	SEWER
46 FT.	8 FT.	5 FT.
50 FT.	7 FT.	5 FT.
52 FT.	8 FT.	5 FT.
56 FT.	10 FT.	5 FT.
60 FT.	10 FT.	5 FT.
70 FT.	10 FT.	5 FT.
90 FT.	20 FT.	5 FT.
120 FT.	25 FT.	5 FT.

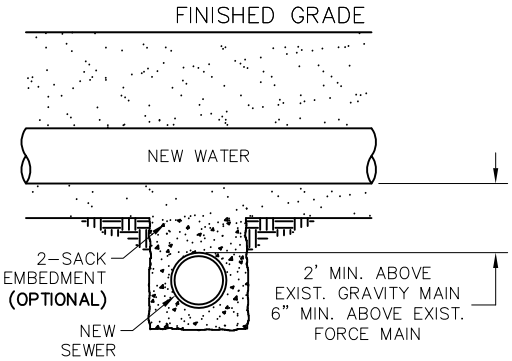
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	LOCATION FOR UTILITY LINES SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 101



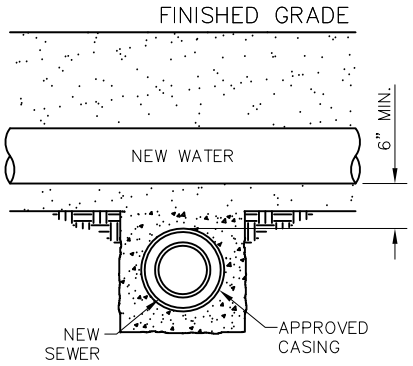
CASE 1



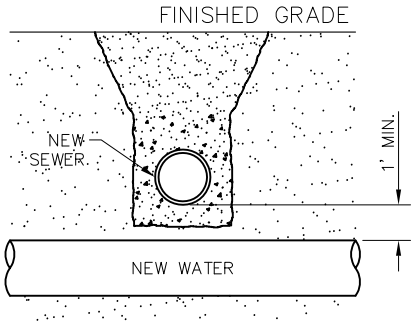
CASE 2



CASE 3



CASE 4



CASE 5

GENERAL NOTES:

1. NEW OR EXISTING POTABLE WATER AND SANITARY SEWER MAINS.
2. SEPARATION DISTANCES SHALL FOLLOW TEXAS COMMISSION ON ENVIRONMENTAL QUALITY STANDARD REQUIREMENTS.

CONSTRUCTION KEY NOTES

WHEN STANDARD NINE (9) FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, SEPARATION SHALL BE DETERMINED ACCORDING TO THE FOLLOWING CONDITIONS:

CASE 1. GRAVITY SANITARY SEWER MAIN OR FORCE MAIN PARALLEL TO POTABLE WATER MAIN (PER TCEQ §290.44(e)(4)(A)).

- LOCATION: WATER ABOVE SEWER OR FORCE MAIN.
- SEWER MATERIALS: EXISTING GRAVITY MAIN (PVC SDR35 OR CLAY) OR FORCE MAIN TO REMAIN IF NOT LEAKING–IF LEAKING, MUST BE REPLACED WITH PVC (150 PSI) OR DI. NEW GRAVITY MAIN OR FORCE MAIN REQUIRES PVC (150 PSI) OR DI.
- SEPARATE TRENCHES SHALL BE USED.

CASE 2. NEW POTABLE WATER MAIN CROSSING EXISTING GRAVITY SANITARY SEWER MAIN OR EXISTING FORCE MAIN (PER TCEQ §290.44(e)(4)(B)(i) AND §290.44(e)(4)(B)(ii).

- LOCATION: WATER ABOVE SEWER OR FORCE MAIN.
- SEWER MATERIALS: EXISTING GRAVITY MAIN (PVC SDR35 OR CLAY) OR FORCE MAIN TO REMAIN IF NOT LEAKING–IF LEAKING, REPLACE ONE PIPE SEGMENT PER CASE 3 REQUIREMENTS.
- CENTER ONE SEGMENT OF WATER PIPE OVER SEWER MAIN OR FORCE MAIN.
- MINIMUM PIPE SEGMENT LENGTH FOR WATER PIPE SHALL BE 18 FEET LONG.

CASE 3. NEW POTABLE WATER MAIN CROSSING NEW GRAVITY SANITARY SEWER MAIN OR NEW FORCE MAIN (PER TCEQ §290.44(e)(4)(B)(iii), §290.44(e)(4)(B)(v) AND §290.44(e)(4)(B)(iv)(I).

- LOCATION: WATER ABOVE SEWER OR FORCE MAIN.
- SEWER MATERIALS: NEW GRAVITY MAIN – PVC (150 PSI) or DI REQUIRED, CENTER UNDER WATER MAIN. NEW FORCE MAIN – PVC (150PSI) OR DI REQUIRED. FORCE MAIN TO BE EMBEDDED IN CEMENT STABILIZED BACKFILL THE TOTAL LENGTH OF ONE PIPE PLUS 12" BEYOND THE JOINT AT EACH END.
- CENTER ONE SEGMENT OF WATER PIPE OVER SEWER PIPE OR FORCE MAIN.
- MINIMUM PIPE SEGMENT LENGTH FOR WATER AND SEWER SHALL BE 18 FEET LONG.
- FOR NEW GRAVITY SEWER ONLY, IN LIEU OF PVC (150PSI) OR DI, INSTALL ONE PIPE SEGMENT OF SDR35; SEWER MAIN MUST BE EMBEDDED IN CEMENT STABILIZED BACKFILL THE TOTAL LENGTH OF ONE PIPE PLUS 12" BEYOND THE JOINT AT EACH END.

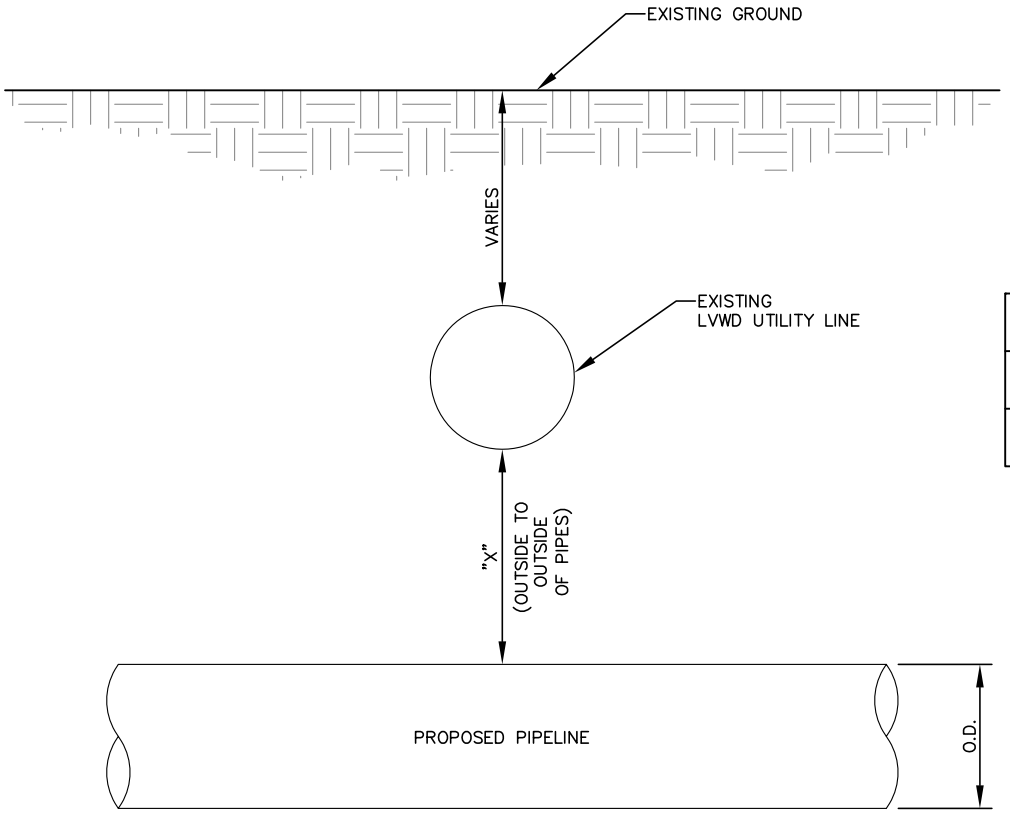
CASE 4. NEW POTABLE WATER MAIN CROSSING NEW GRAVITY SANITARY SEWER MAIN OR NEW FORCE MAIN (PER TCEQ §290.44(e)(4)(B)(iv)(II)).

- LOCATION: WATER ABOVE SEWER OR FORCE MAIN.
- SEWER MATERIALS: NEW GRAVITY MAIN – SDR35 ACCEPTABLE, NEW FORCE MAIN – PVC (150PSI) OR DI REQUIRED. IN ADDITION, SEWER MAIN OR FORCE MAIN MUST BE ENCASED IN DI OR STEEL, TWO NOMINAL SIZES LARGER THAN MAIN AND AT LEAST 18 FEET LONG.
- CENTER CASING PIPE ON WATER MAIN.

CASE 5. NEW GRAVITY SANITARY SEWER MAIN OR NEW FORCE MAIN CROSSING NEW POTABLE WATER MAIN (PER TCEQ §290.44(e)(4)(B)(iv)(III)).

- LOCATION: SEWER OR FORCE MAIN ABOVE WATER.
- NEW GRAVITY MAIN OR FORCE MAIN REQUIRES ONE PIPE SEGMENT OF PVC (150 PSI) OR DI. IN ADDITION, WATER MUST BE DI OR STEEL OR ENCASED IN DI OR STEEL, TWO NOMINAL SIZES LARGER THAN MAIN AND AT LEAST 18 FEET LONG.
- CENTER ONE SEGMENT OF SEWER PIPE ON WATER MAIN.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SEPARATION DISTANCE SANITARY SEWER AND POTABLE WATER (SPECIAL CONDITIONS) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 102



O.D. OF PROPOSED PIPELINE	"X"
24" & SMALLER	24"
LARGER THAN 24"	O.D. OF PROPOSED PIPELINE

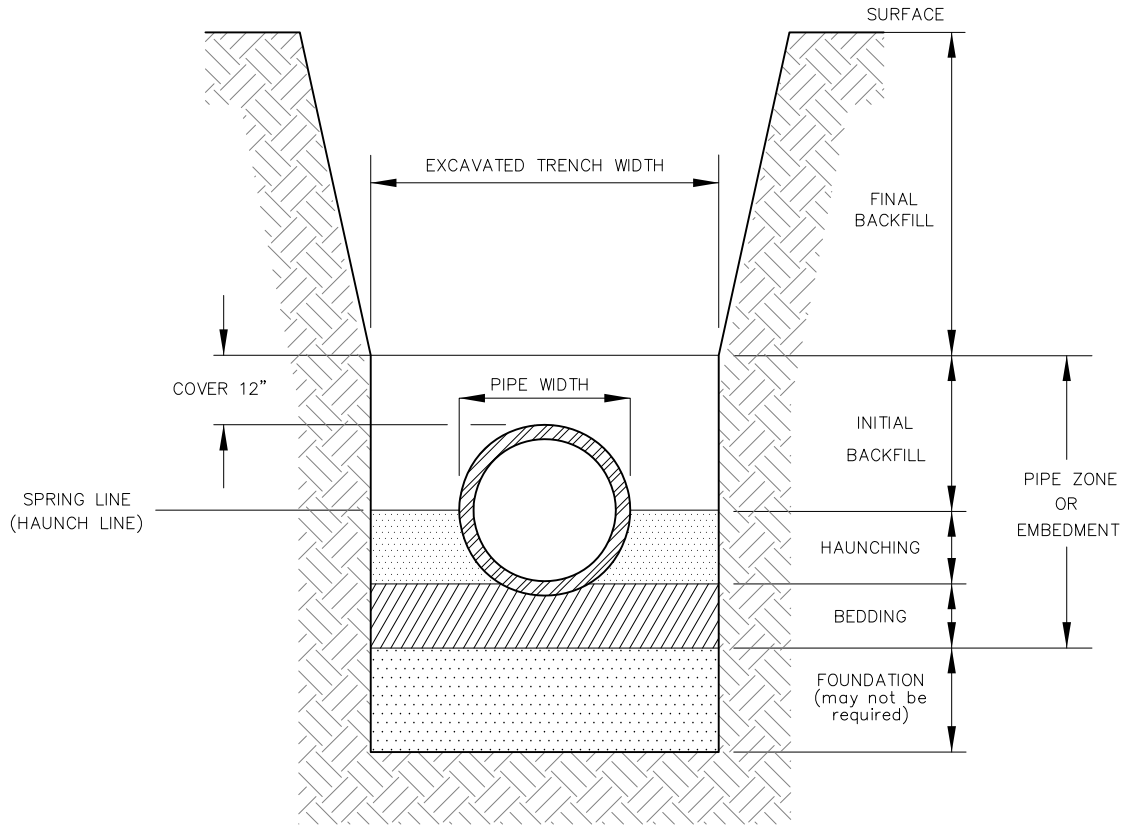
NOTE:

IF PROPOSED PIPELINE IS SANITARY SEWER, OR SEWER FORCE MAIN, SEPARATION DISTANCES SHALL FOLLOW DETAIL 102.

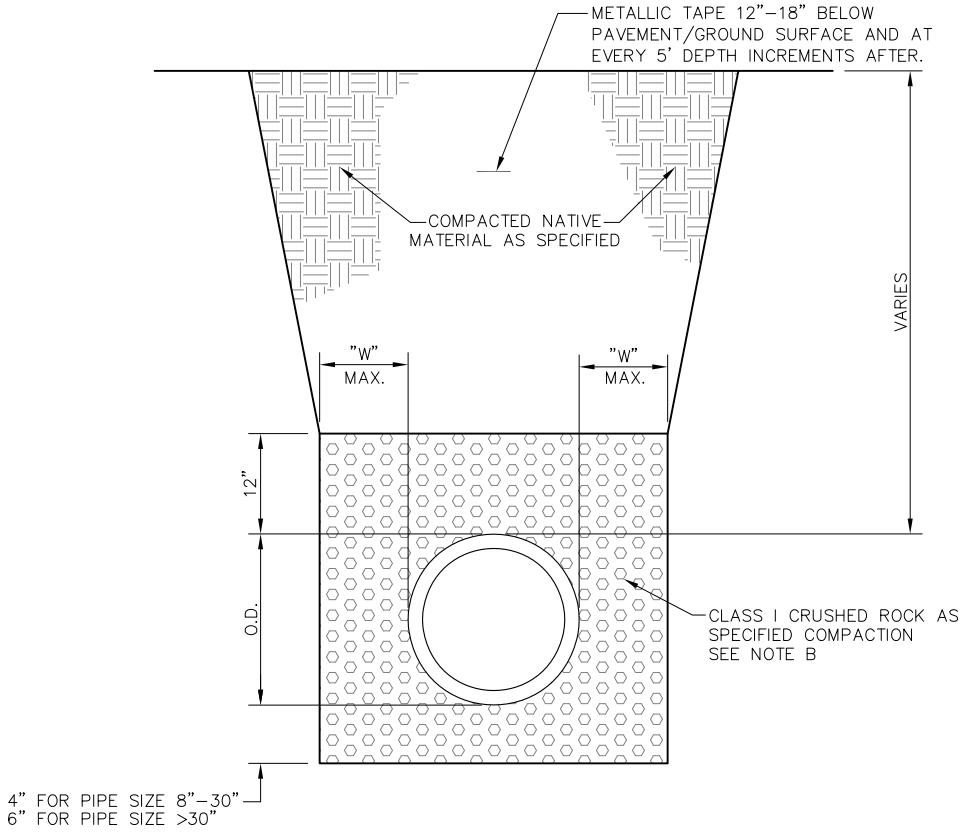
STANDARD DETAIL	DATE: AUG. 2016 REV: APR. 2017	PROPOSED PIPELINE CROSSING EXISTING LVWD UTILITY LINE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 102A

GENERAL NOTES:

1. DETAIL DRAWING TERMINOLOGY IS IN ACCORDANCE WITH ASTM D-2321
2. UNLESS OTHERWISE PERMITTED BY THE ENGINEER. ALL MATERIAL IN THE EMBEDMENT ZONE SHALL BE HOMOGENEOUS.



STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TRENCH CROSS-SECTION TERMINOLOGY SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 103



CONSTRUCTION KEY NOTES:

A. USE CLASS I CRUSHED ROCK MAXIMUM 1 1/2 INCH SIZE PER ASTM D–2321.

B. NO COMPACTION REQUIRED. USE MINIMAL TAMPING, RODDING OR HAUNCH SLICING CAREFULLY IN THE EMBEDMENT ZONE. IF REQUIRED BY THE ENGINEER, TEST PER ASTM D–4254 PERCENT OF RELATIVE DENSITY.

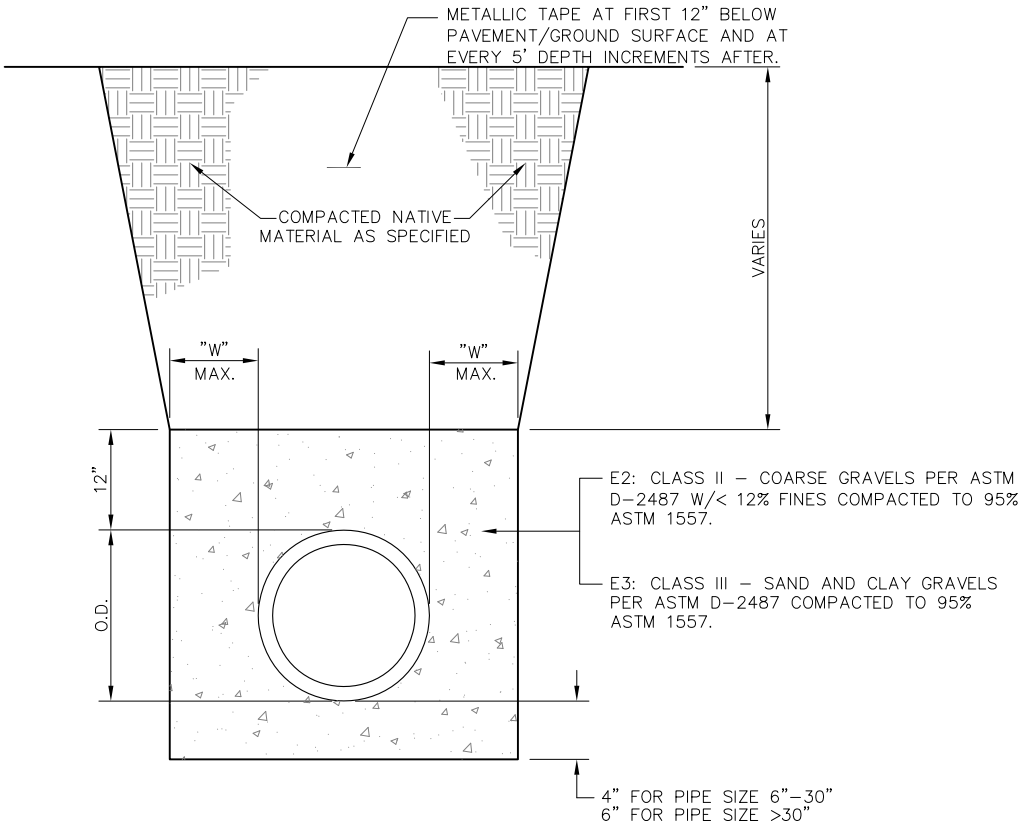
C. TRENCH DIMENSION "W" AS FOLLOWS FOR FLEXIBLE PIPE.

PIPE DIAMETER	"W" AS FOLLOWS
LESS THAN 24"	9"
24" – 48"	12"
GREATER THAN 48"	O.D./4

D. TRENCH DIMENSION "W" AS FOLLOWS FOR RIGID PIPE:

PIPE DIAMETER	"W" AS FOLLOWS
LESS THAN 18"	16"
18" – 24"	19"
27" – 39"	22"
42" & LARGER	1/2 PIPE O.D.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	EMBEDMENT CLASS E1 FOR RIGID PIPE & FLEXIBLE PIPE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 104



GENERAL NOTES:

1. NATIVE MATERIAL MAY BE USED PROVIDED IT MEETS THE SPECIFICATIONS FOR CLASS II OR III MATERIALS.
2. EMBEDMENT CONDITIONS SHOWN FOR DRY TRENCH.

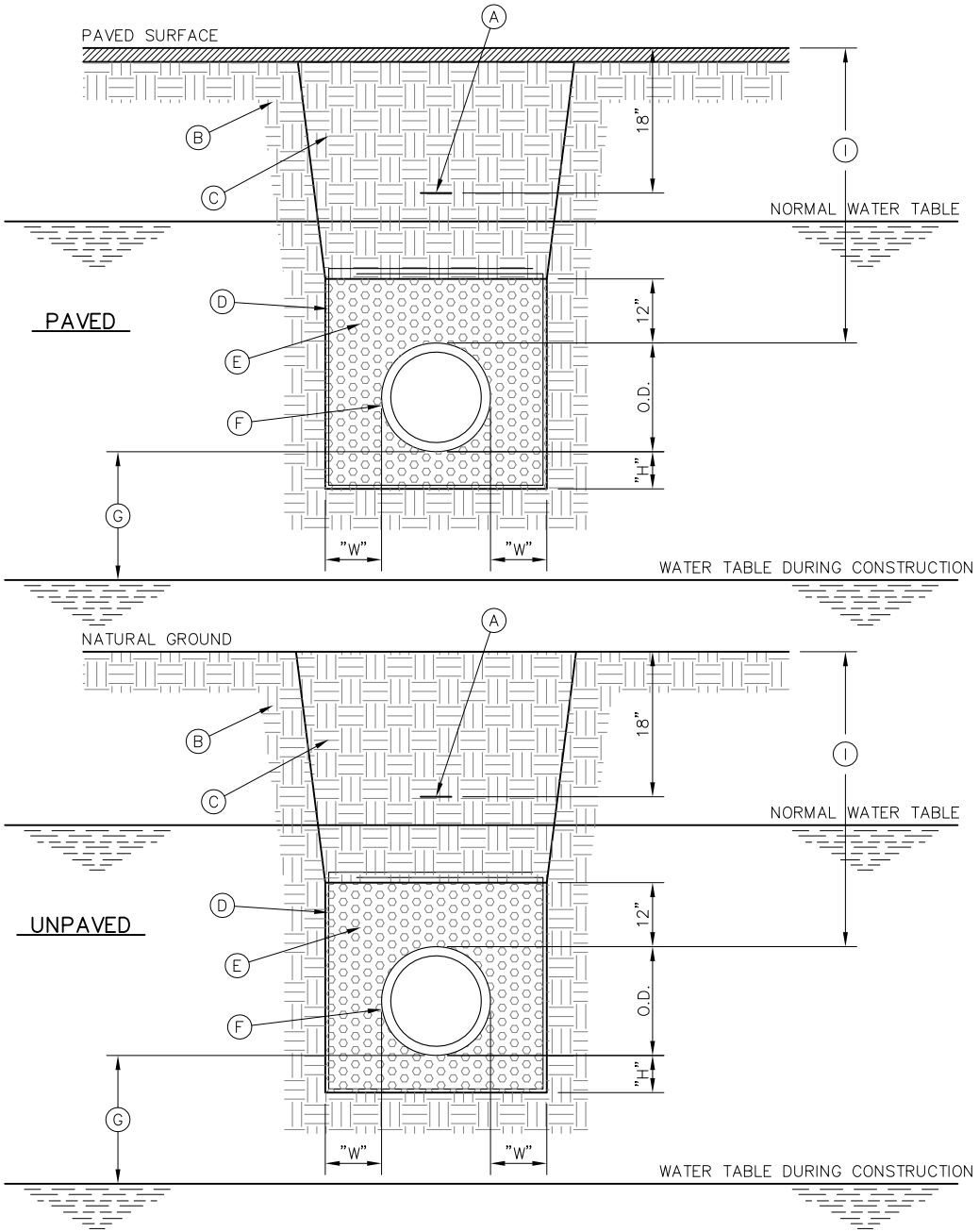
CONSTRUCTION KEY NOTES:

A. PLACE EMBEDMENT MATERIAL IN 8" LIFTS AND COMPACT AS SPECIFIED.

B. TRENCH DIMENSION "W" AS FOLLOWS:

PIPE DIAMETER	"W" AS FOLLOWS
LESS THAN 24"	9"
24" – 48"	12"
GREATER THAN 48"	O.D./4

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	EMBEDMENT CLASS E2 & E3 FOR FLEXIBLE PIPE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 105



GENERAL NOTES:

1. BEDDING FOR PRESSURE PIPE IN WET CONDITIONS.
2. PROVIDE TRENCH SAFETY SYSTEM FOR TRENCH DEPTHS GREATER THAN 5 FEET.
3. A DRY TRENCH MUST BE MAINTAINED WHILE PLACING BEDDING AND GEOTECHNICAL FABRIC.
4. IF THE NATIVE MATERIAL EXCAVATED FROM THE TRENCH IS UNSUITABLE AS BACKFILL MATERIAL, OR THE REQUIRED COMPACTION IS UNATTAINABLE, THE CONTRACTOR SHALL, AT HIS EXPENSE, IMPORT SELECT MATERIAL TO BE MIXED WITH OR USED IN PLACE OF THE NATIVE MATERIAL. SELECT MATERIAL MUST BE APPROVED BY LVWD. SUBSTITUTE SOIL CEMENT SLURRY (1–SACK) IF REQUIRED IN SPECS.

CONSTRUCTION KEY NOTES:

A. METALLIC TAPE AT FIRST 12" BELOW/GROUND SURFACE AND AT EVERY 5' DEPTH INCREMENTS AFTER.

B. UNDISTURBED STABLE MATERIAL.

C. NATIVE MATERIAL BACKFILL.
PAVED CONDITION: COMPACT TO 90% DENSITY PER ASTM D–1557 MODIFIED PROCTOR.
UNPAVED CONDITION: COMPACT TO 85% DENSITY PER ASTM D–1557 MODIFIED PROCTOR.
(*R.O.W. OWNER REQUIREMENTS MAY BE STRICTER. CONTRACTOR TO FOLLOW MORE STRINGENT REQUIREMENTS.)

D. APPROVED GEOTECHNICAL FABRIC WITH A STANDARD OVERLAP THAT IS 2 FEET EXCEPT WHERE TRENCH WIDTH EXCEEDS 3 FEET, THE OVERLAP AT TOP SHALL BE 3 FEET.

E. USE CLASS I GRAVEL PER ASTM D–2321 AND D–2487. NO COMPACTION REQUIRED. USE MINIMAL TAMPING, RODDING OR HAUNCH SLICING CAREFULLY IN THE EMBEDMENT ZONE. IF REQUIRED BY THE ENGINEER, TEST PER ASTM D–4254 PERCENT OF RELATIVE DENSITY.

F. APPROVED PIPE.

G. 18" MINIMUM UNLESS OTHERWISE SPECIFIED.

H. TRENCH DIMENSIONS AS FOLLOWS:

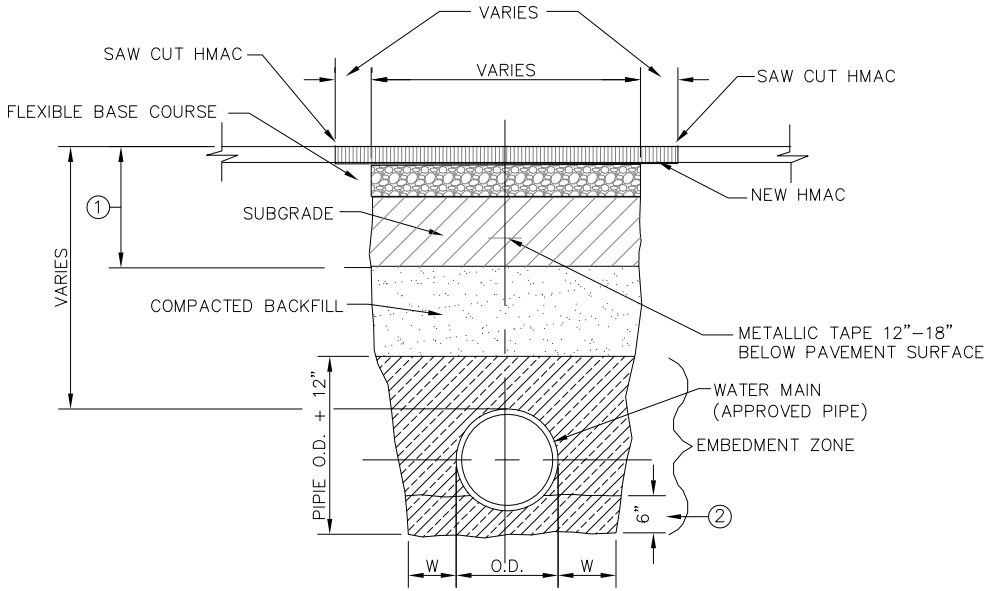
PIPE DIAMETER	"W" AS FOLLOWS
LESS THAN 24"	9"
24" – 48"	12"
GREATER THAN 48"	O.D./4

PIPE DIAMETER	"H" AS FOLLOWS
6" – 30"	4"
GREATER THAN 30"	12"

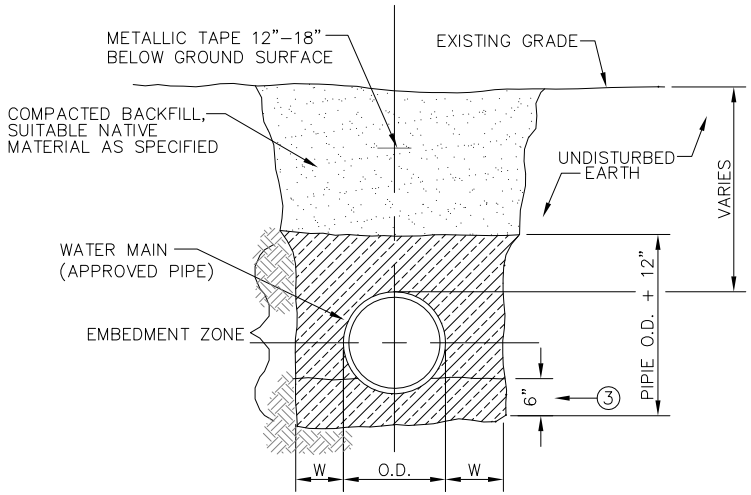
I. STANDARD COVER FOR WATER MAINS:

	CONDITION	DIAMETER = 6–INCH AND 8–INCH	DIAMETER = 12–INCH AND LARGER
A	NORMAL LINE INSTALLATION, STREET AND DRAINAGE PROJECTS, WATER LINE RELOCATION	MINIMUM COVER SHALL BE 4–FT FROM TOP OF PIPE TO FINISHED GRADE	MINIMUM COVER SHALL BE 5–FT FROM TOP OF PIPE TO FINISHED GRADE
B	NEW SUBDIVISIONS OR NON–PAVED AREAS	MINIMUM COVER SHALL BE 6–FT FROM TOP OF PIPE TO FINISHED GRADE	MINIMUM COVER SHALL BE 7–FT FROM TOP OF PIPE TO FINISHED GRADE

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	EMBEDMENT CLASS F FOR FLEXIBLE WATER PIPE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 106



PAVEMENT REPAIR AND BACKFILL DETAIL



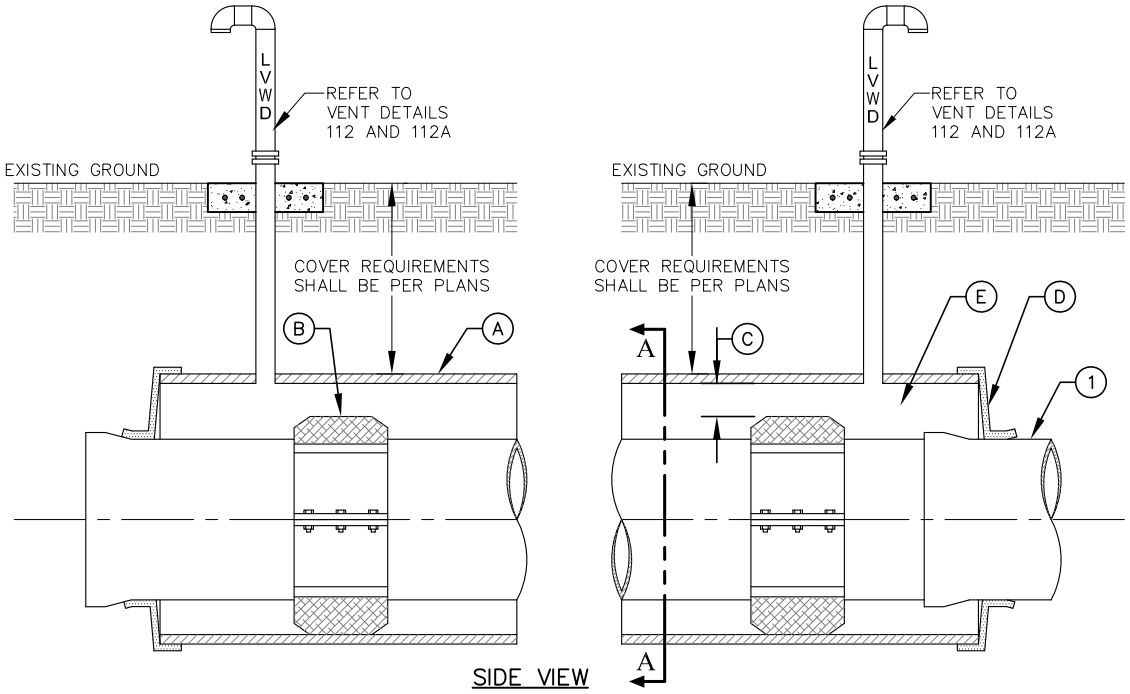
PIPE TRENCH AND BACKFILL DETAIL

GENERAL NOTES:

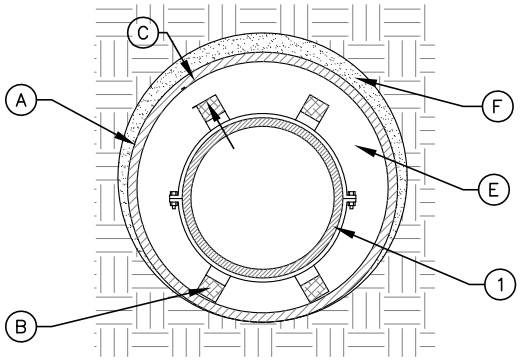
1. THE PAVEMENT REPLACEMENT SYSTEM (HMAC, BASE, SUBGRADE) SHOWN ARE GENERAL REQUIREMENTS AND WILL WORK IN GOOD TO MODERATE SOIL CONDITIONS. REFER TO SITE SPECIFIC GEOTECHNICAL STUDY FOR PAVEMENT RECOMMENDATIONS IN AREAS OF BAD SOIL CONDITIONS AND FOR NEW SUBDIVISIONS.
2. PAVEMENT STRUCTURE INCLUDING HMAC, FLEXIBLE BASE COURSE, SUBGRADE SHALL COMPLY WITH THE REQUIREMENTS OF THE R.O.W. JURISDICTIONAL AGENCY.
3. UNIFORM TRENCH BOTTOM – PIPE SHALL GENERALLY BE LAID ON UNIFORM, EVENLY GRADED TRENCH BOTTOM. TRENCH BOTTOM SHALL BE SHAPED AT EVERY BELL TO PROVIDE UNIFORM BEARING OF PIPE BARREL.
4. NON–UNIFORM TRENCH BOTTOM – WHEN A UNIFORM TRENCH BOTTOM IS UNATTAINABLE (ie ROCKY OR UNEVENLY GRADED) A 6" SAND BEDDING SHALL BE REQUIRED.
5. EMBEDMENT BACKFILL – USE CLASS II COARSE GRAVELS PER ASTM D–2487 W/<12% FINES & MAX SIZE 1–1/2". NATIVE MATERIAL OR IMPORTED SELECT MATERIAL, MEETING OR EXCEEDING CLASS II REQUIREMENTS, MAY BE USED. CLASS I MATERIAL (MAXIMUM 1–1/2" SIZE) IS ACCEPTABLE AT THE DISCRETION OF THE CONTRACTOR.
6. FINAL BACKFILL – SUITABLE COMPACTED NATIVE MATERIAL, MINIMUM 3" SIZE IS ACCEPTABLE.
7. SHORING (TRENCH SAFETY) SHALL BE AS PER O.S.H.A. REQUIREMENTS. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM R.O.W. OWNER TO PERFORM "ANGLE OF REPOSE" ON TRENCH WALLS.

NOMINAL PIPE DIAMETER	W MAX.
LESS THAN 24"	9"
24" – 48"	12"
GREATER THAN 48"	O.D./4

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL PIPE TRENCH, EMBEDMENT AND BACKFILL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 107



SIDE VIEW



A SECTION

NOTES:

1. INSTALLATION FOR APPROVED CARRIER PIPE.
2. CASING SHALL BE INSTALLED USING EITHER JACKING, BORING OR TUNNELING METHODS FROM THE END WHICH CREATES A MINIMUM OF ACCESS AND RELOCATION PROBLEMS.
3. INSULATED SPACERS SHALL BE USED WHEN SPECIFIED, TO PROVIDE CORROSION PROTECTION.
4. VENTS SHALL BE INSTALLED AT BOTH ENDS OF STEEL CASING.
5. A CERTIFIED WELDER MUST PERFORM ALL WELDS.

KEY NOTES:

A. STEEL CASING MINIMUM YIELD 36,000 P.S.I. SIZE AND LENGTH AS SPECIFIED.

B. CASING INSULATORS, SPACING AND LOCATION PER MANUFACTURES RECOMMENDATIONS. INSULATORS SHALL FIT SNUG OVER THE CARRIER PIPE.

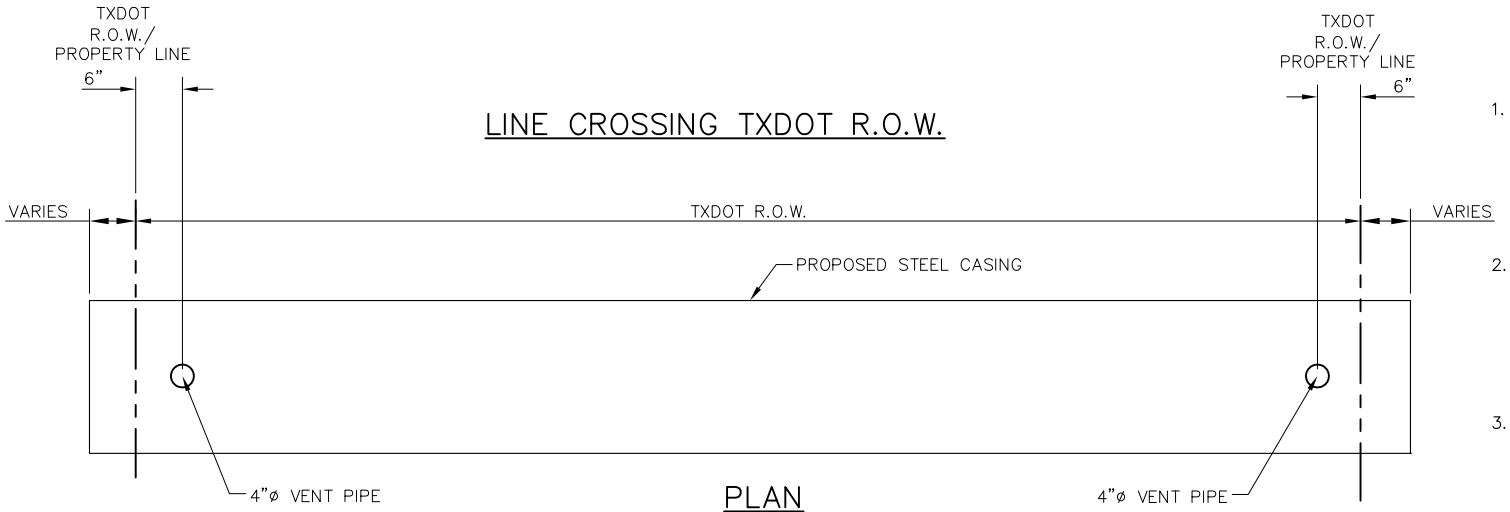
C. POSITION CARRIER PIPE APPROXIMATELY IN CENTER OF CASING. MINIMUM SPACING BETWEEN INSULATOR AND CARRIER PIPE SHALL BE 1", MAXIMUM SPACING SHALL BE 2".

D. END SHALL BE SEALED WITH BRICK AND MORTAR, BULKHEAD AND GROUT, OR WITH SYNTHETIC RUBBER SEAL, AS SPECIFIED.

E. ANNULAR SPACE SHALL BE LEFT OPEN FOR CATHODICALLY PROTECTED SYSTEM WHERE BOTH CASING AND CARRIER PIPE ARE METALLIC MATERIAL, OR AS OTHERWISE SPECIFIED.

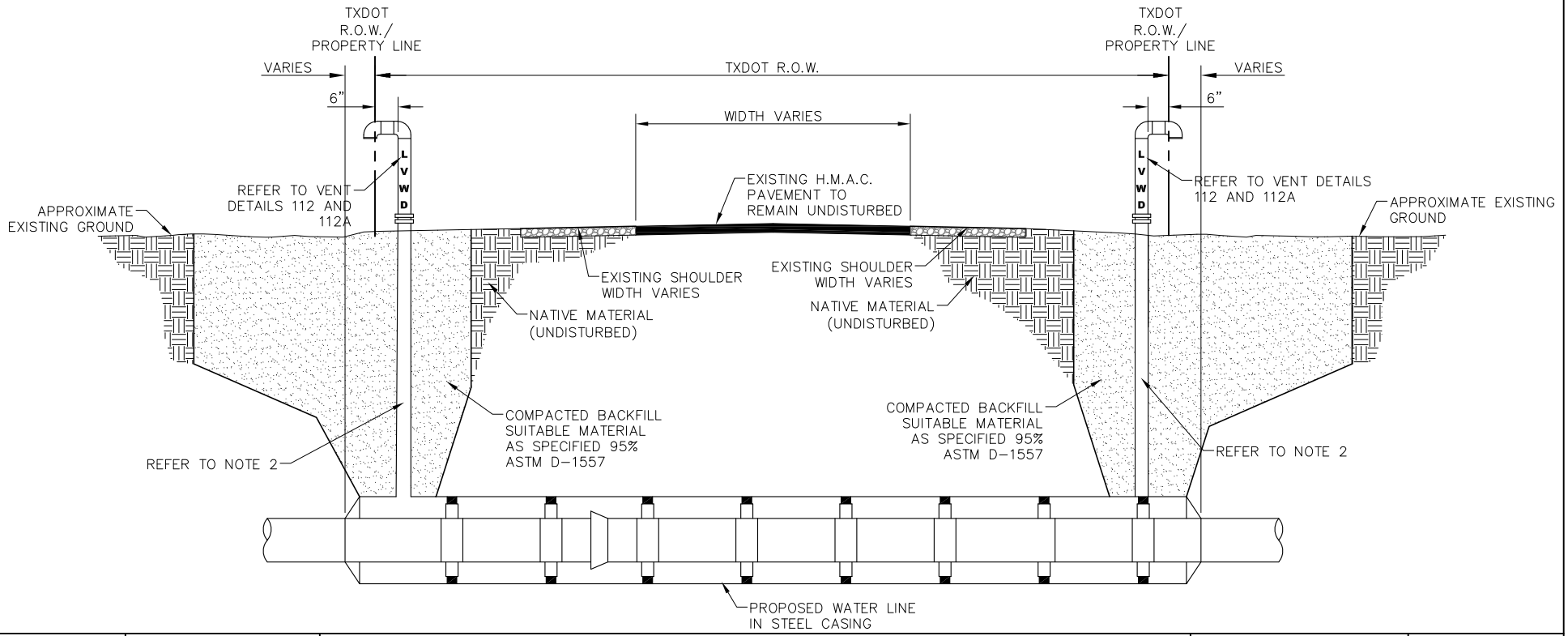
F. PRESSURE GROUT ANNULAR SPACE OUTSIDE CASING AFTER CASING IS INSTALLED.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PIPE CASING DETAILS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 108

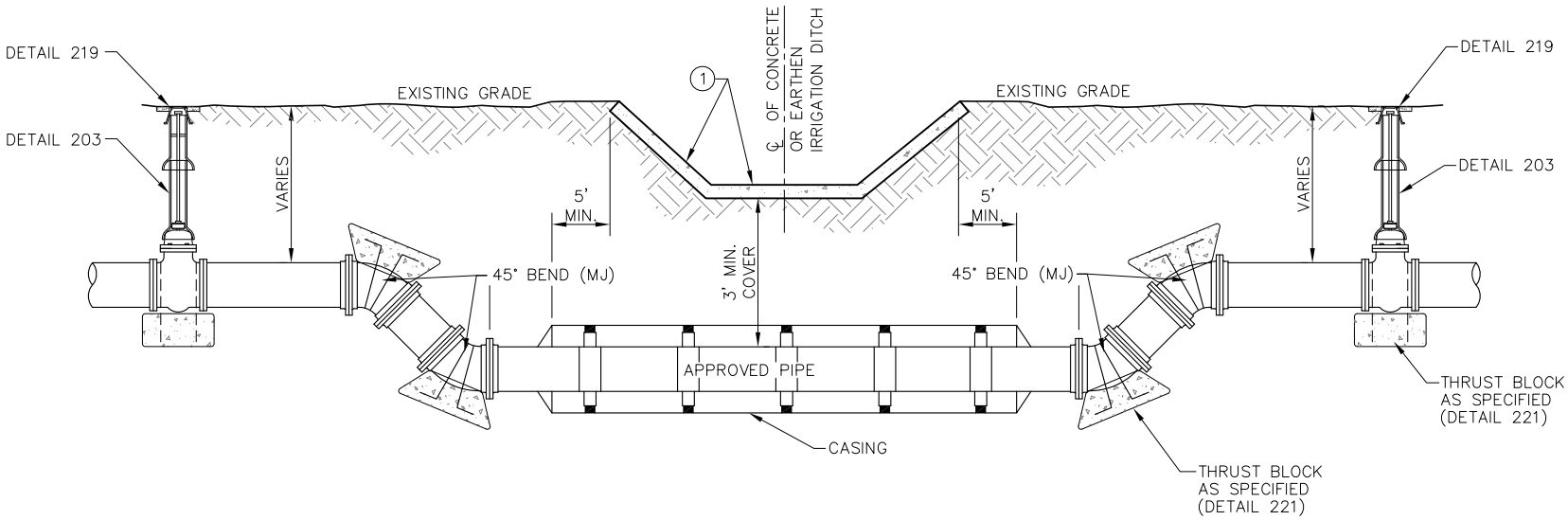


GENERAL NOTES:

1. PIPING TO BE 4" DIA. SCHEDULE TO WELDED STEEL WITH FORGED STEEL WELD FITTINGS. BURIED VENT PIPING SHALL HAVE 2 COATS OF EPOXY POLYAMITE COATING AND ABOVE GROUND PIPING SHALL BE PRIMERED AND PAINTED WITH SEMI-GLOSS ENAMEL, WHITE LETTERS ON BLUE PIPE.
2. VENT PIPE AS REQUIRED BY TXDOT/L.V.W.D. AND FOR WATER LINES ONLY. LOCATION TO BE COORDINATED WITH TXDOT/L.V.W.D. REPRESENTATIVE. AT R.O.W. OWNER'S REQUEST, INSTALL BONNET BOX AT FINISH GRADE. INSTALLATION SHALL BE DONE AS PER REQUIREMENTS.
3. CONTRACTOR SHALL ADHERE TO MOST CURRENT TXDOT GUIDELINES FOR CROSSINGS.



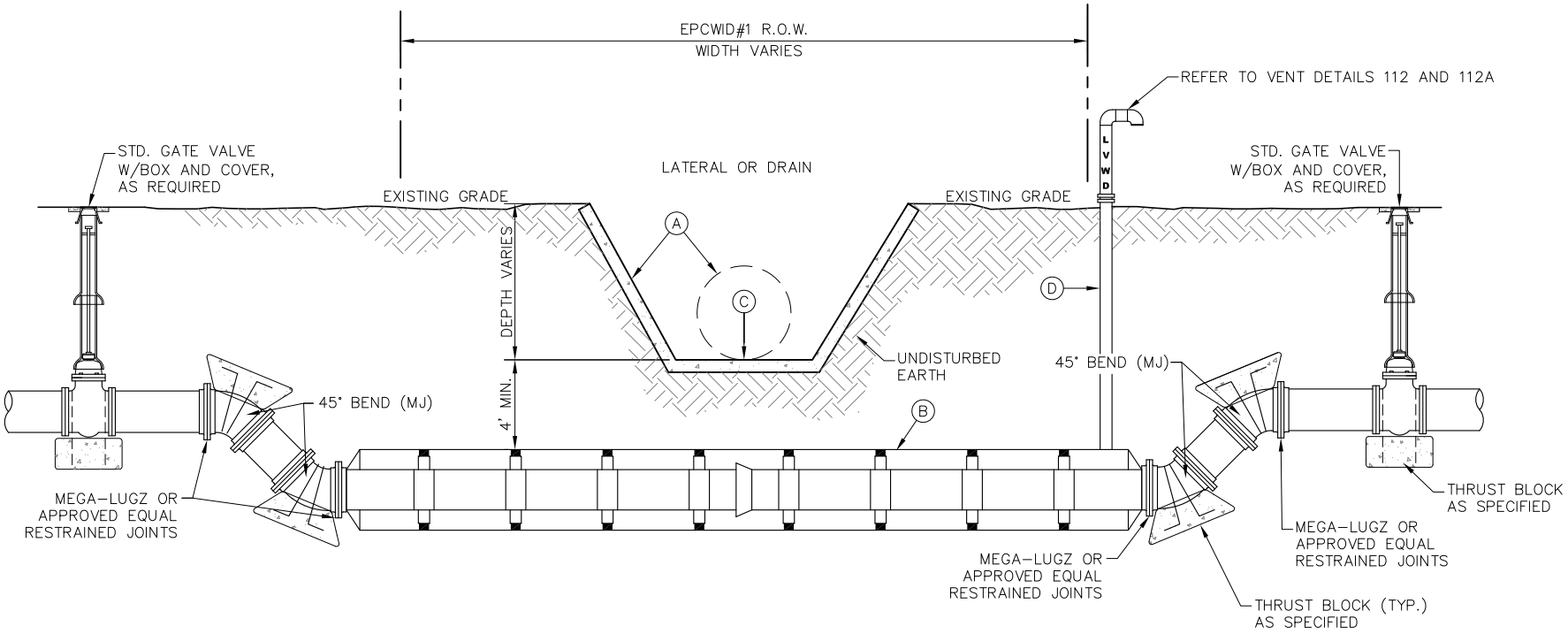
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PIPE CASING DETAILS (TXDOT RIGHT-OF-WAY) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 109



KEYED NOTES:

1. SAW CUT, REMOVE AND REPLACE ±10' SECTION OF EXISTING CONCRETE IRRIGATION DITCH. MATCH EXISTING DITCH SECTION.
2. ALL BENDS/FITTINGS SHALL BE RESTRAINED WITH MECHANICAL RESTRAINTS "MEGA–LUGS" OR APPROVED EQUAL.
3. NO PIPE JOINTS SHALL BE LOCATED UNDER THE IRRIGATION DITCH.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PIPE CASING DETAILS (PRIVATE DITCH CROSSING) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 110



GENERAL NOTES:

1. NO WORK SHALL BE CONDUCTED WITHIN E.P.C.W.I.D.#1 WITHOUT AN APPROVED PERMIT. IT IS THE RESPONSIBILITY OF L.V.W.D. TO OBTAIN AND COVER THE COST OF THE APPROVED PERMITS.
2. COORDINATE BORING ACTIVITY WITH E.P.C.W.I.D.#1 AND L.V.W.D. AT LEAST FIVE (5) WORKING DAYS PRIOR TO CONSTRUCTION. E.P.C.W.I.D.#1 AND L.V.W.D. MUST BE NOTIFIED 72 HOURS PRIOR TO COMMENCING ANY WORK IN AREAS WITHIN THEIR JURISDICTION.
3. REFER TO GENERAL NOTES FOR OTHER REQUIREMENTS.
4. CONSULTANT SHALL COORDINATE WITH E.P.C.W.I.D.#1 DURING THE DESIGN OF THE CROSSING.
5. AIR VENT PIPING SHALL BE LOCATED CLEAR OF PAVED ROADWAY.

CONSTRUCTION KEY NOTES:

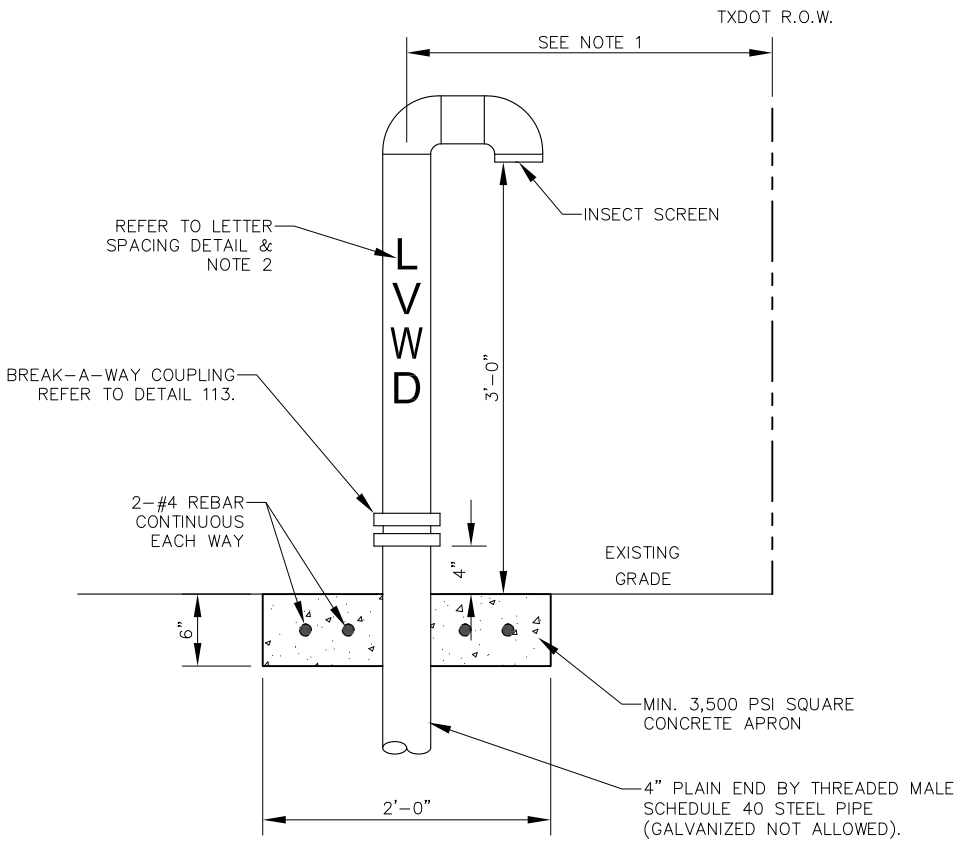
A. EXISTING CONCRETE LINED CHANNEL, NATURALLY GRADED DITCH OR UNDERGROUND CULVERT OR PIPE TO REMAIN UNDISTURBED.

B. ALL CROSSINGS THROUGH EL PASO COUNTY WATER IMPROVEMENT DISTRICT #1 (E.P.C.W.I.D.#1) RIGHT-OF-WAY SHALL BE INSTALLED WITH STEEL CASING BY BORING METHODS. STEEL CASING TO COVER ENTIRE R.O.W. WIDTH OF E.P.C.W.I.D.#1 RIGHT-OF-WAY. REFER TO PIPE CASING DETAILS FOR OTHER REQUIREMENTS.

C. MINIMUM COVER IS FOUR (4') FEET BELOW DESIGN INVERT OF DRAIN, CANAL, LATERAL, ETC., AS PER E.P.C.W.I.D.#1 STANDARDS, UNLESS OTHERWISE SHOWN ON PLANS.

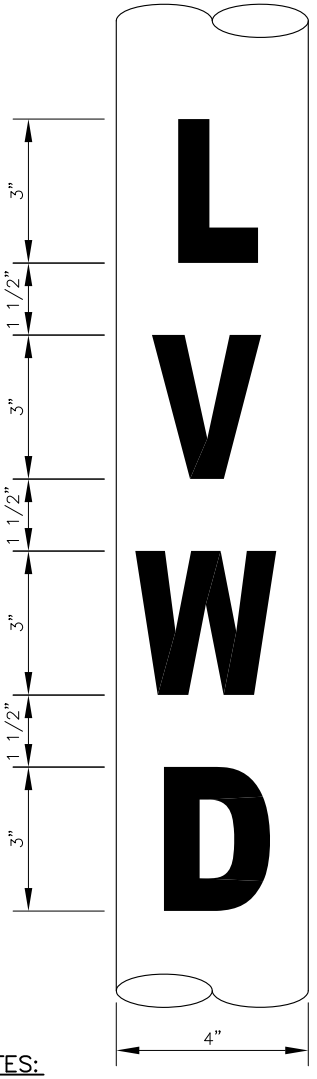
D. AIR VENT PIPING TO BE 4" DIA. SCHEDULE 40 WELDED STEEL WITH FORGED STEEL WELD FITTINGS. BURIED VENT PIPING SHALL HAVE 2 COATS OF EPOXY POLYAMITE COATING.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PIPE CASING DETAILS (BORE CROSSING) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 111



NOTES:

1. WHEN INSTALLATION IS WITHIN TXDOT R.O.W., VENT PIPE SHALL BE LOCATED 6" FROM TXDOT R.O.W. VENT PIPE SHALL NOT BE PLACED IN SIDEWALK AREA.
2. AIR VENT PIPING TO BE 4" DIA. SCHEDULE 40 WELDED STEEL WITH FORGED STEEL WELD FITTINGS. BURIED VENT PIPING SHALL HAVE 2 COATS OF EPOXY POLYAMIDE COATING. ABOVE GROUND PIPING TO BE PRIMED AND PAINTED BLUE WITH A SEMI-GLOSS ENAMEL AND LABELED "LVWD" WITH 3-INCH HIGH WHITE LETTERS.
3. AIR VENT PIPING SHALL BE LOCATED CLEAR OF PAVED ROADWAY. VENT PIPE OPENING SHALL FACE AWAY FROM PAVED ROADWAYS.
4. INSECT SCREEN SHALL BE STAINLESS STEEL, #12 MAX.

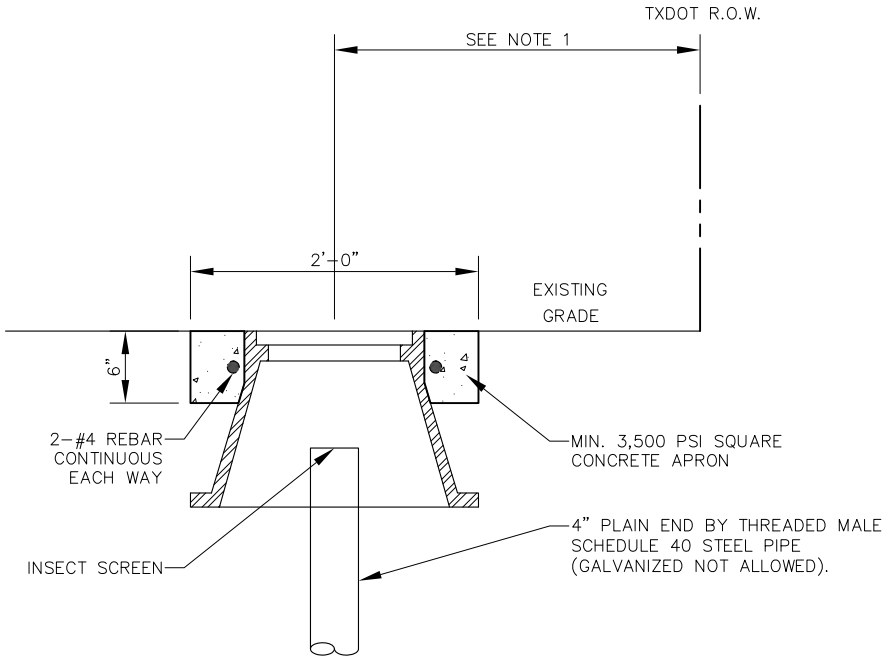


NOTES:

1. COLORS:
   LETTERS – WHITE
   BACKGROUND – BLUE

LETTERING SPACING

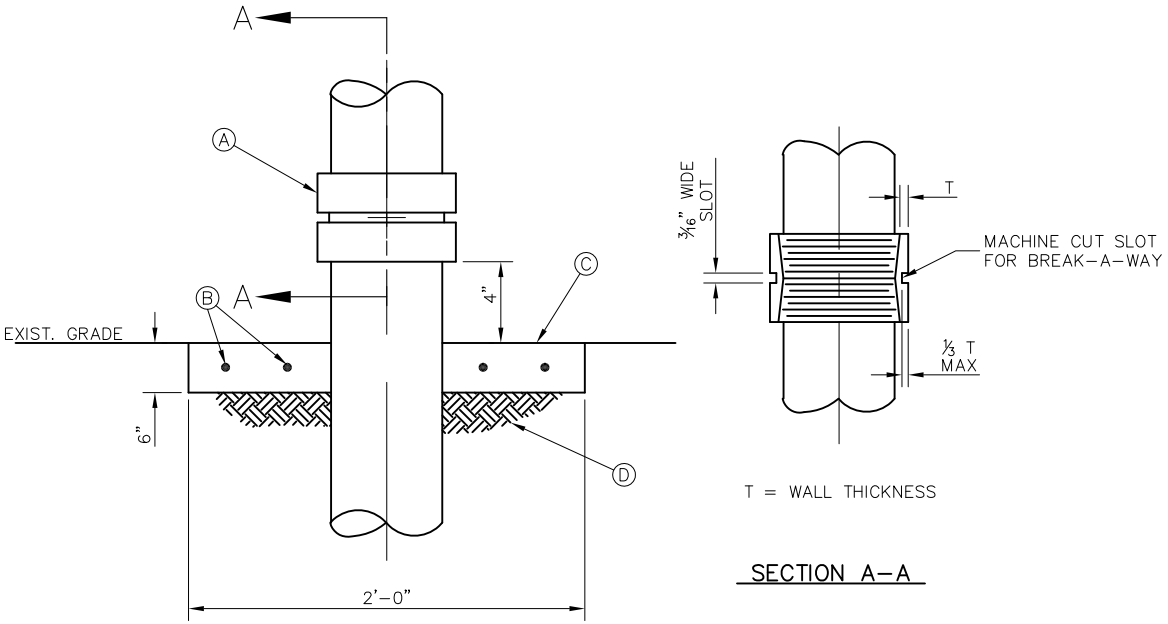
STANDARD DETAIL	DATE: XXXX REV: APR. 2017	VENT DETAILS (GOOSE NECK) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 112



NOTES:

1. WHEN INSTALLATION IS WITHIN TXDOT R.O.W., VENT PIPE SHALL BE LOCATED 6" FROM TXDOT R.O.W. VENT PIPE SHALL NOT BE PLACED IN SIDEWALK AREA.
2. AIR VENT PIPING TO BE 4" DIA. SCHEDULE 40 WELDED STEEL WITH FORGED STEEL WELD FITTINGS. BURIED VENT PIPING SHALL HAVE 2 COATS OF EPOXY POLYAMIDE COATING.
3. AIR VENT PIPING SHALL BE LOCATED CLEAR OF PAVED ROADWAY. VENT PIPE OPENING SHALL FACE AWAY FROM PAVED ROADWAYS.
4. INSECT SCREEN SHALL BE STAINLESS STEEL, #12 MAX.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	VENT DETAILS (LEVEL WITH GROUND) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 112A

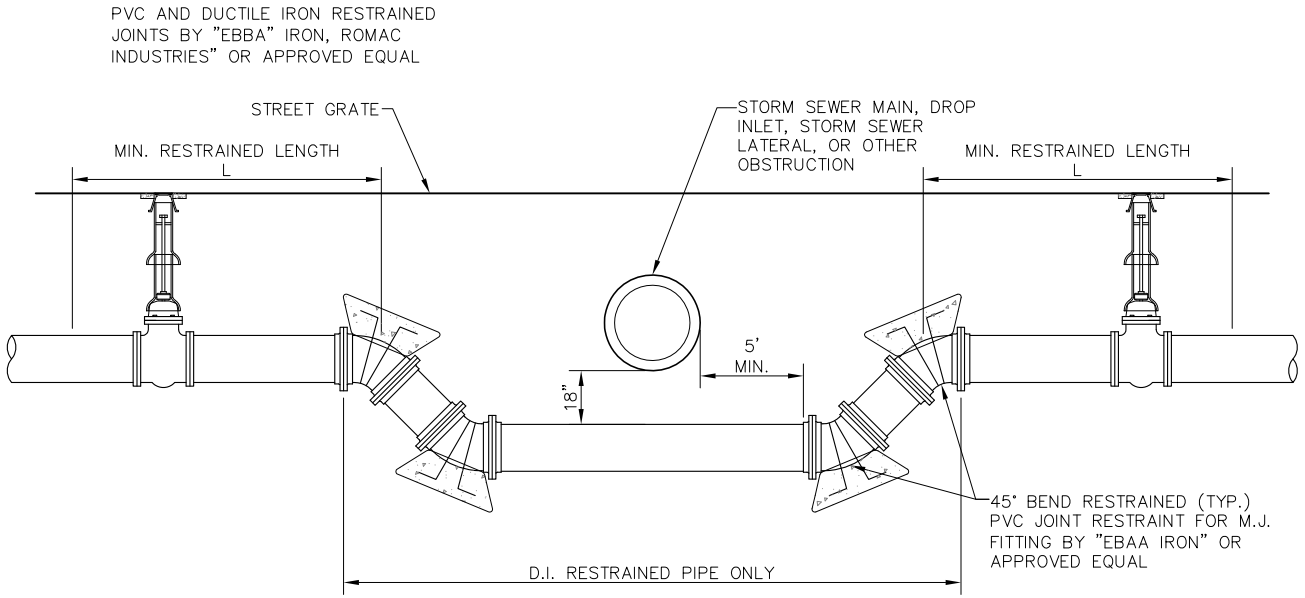


SECTION A-A

CONSTRUCTION KEY NOTES:

A. SCHEDULE 40 THREADED STEEL COUPLING
B. 2 – NO. 4 REBAR CONTINUOUS, EACH WAY.
C. MINIMUM 3500PSI CONCRETE 2'X2' SQUARE COLLAR.
D. 12" SUBGRADE @ 95% PER ASTM D-1557.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	BREAK-A-WAY COUPLING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 113



RESTRAINED LENGTH (L) IN FEET

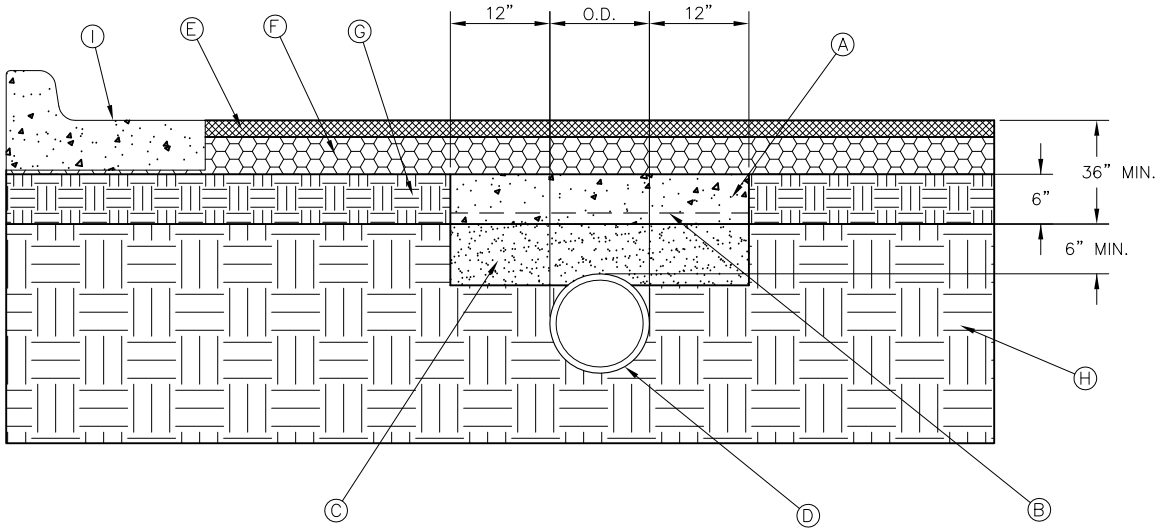
PIPE SIZE	D.I.	PVC
4"	12'	22'
6"	17'	30'
8"	22'	40'
10"	26'	48'
12"	30'	56'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

GENERAL NOTES:

1. THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER DESIGN RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETER OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
2. RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR
3. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	WATER LINE LOWERING (BY CONTRACTOR) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 114



CONCRETE CAP

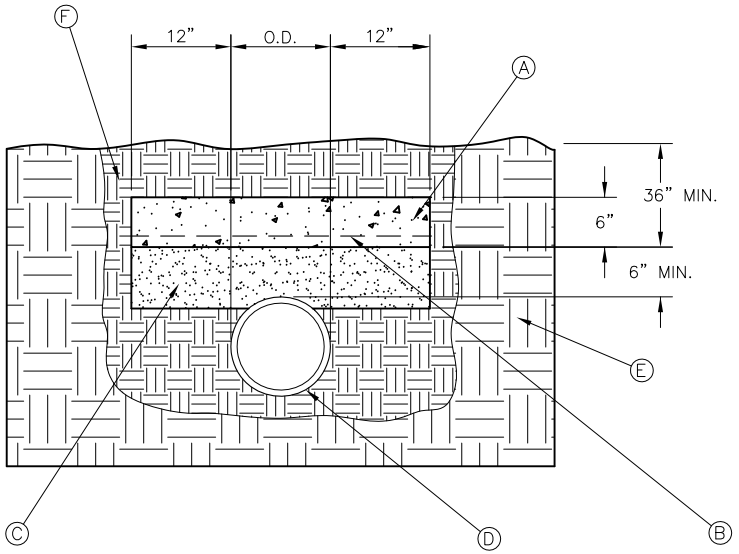
GENERAL NOTES:

1. IF APPROVED BY LVWD, DETAIL USED WHEN STANDARD COVER CANNOT MET.
2. NEW PAVEMENT ELEVATION, HMAC THICKNESS, BASE THICKNESS, AND SUB–BASE THICKNESS IS TO BE PROPOSED BY OTHERS.

CONSTRUCTION KEY NOTES:

A. CONCRETE CAP 3,000 P.S.I. CLASS "A"
B. (6/6–10 WWF) WIRE MESH
C. SAND CUSHION
D. PROPOSED OR EXISTING PIPE
E. HMAC
F. BASE
G. SUB–BASE
H. COMPACTED BACKFILL
I. CONCRETE CURB

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	CONCRETE CAP (PAVED CONDITION) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 115



CONCRETE CAP

GENERAL NOTES:

1. IF APPROVED BY LVWD, DETAIL USED WHEN STANDARD COVER CANNOT MET.

CONSTRUCTION KEY NOTES:

A. CONCRETE CAP 3,000 P.S.I. CLASS "A"

B. (6/6–10 WWF) WIRE MESH

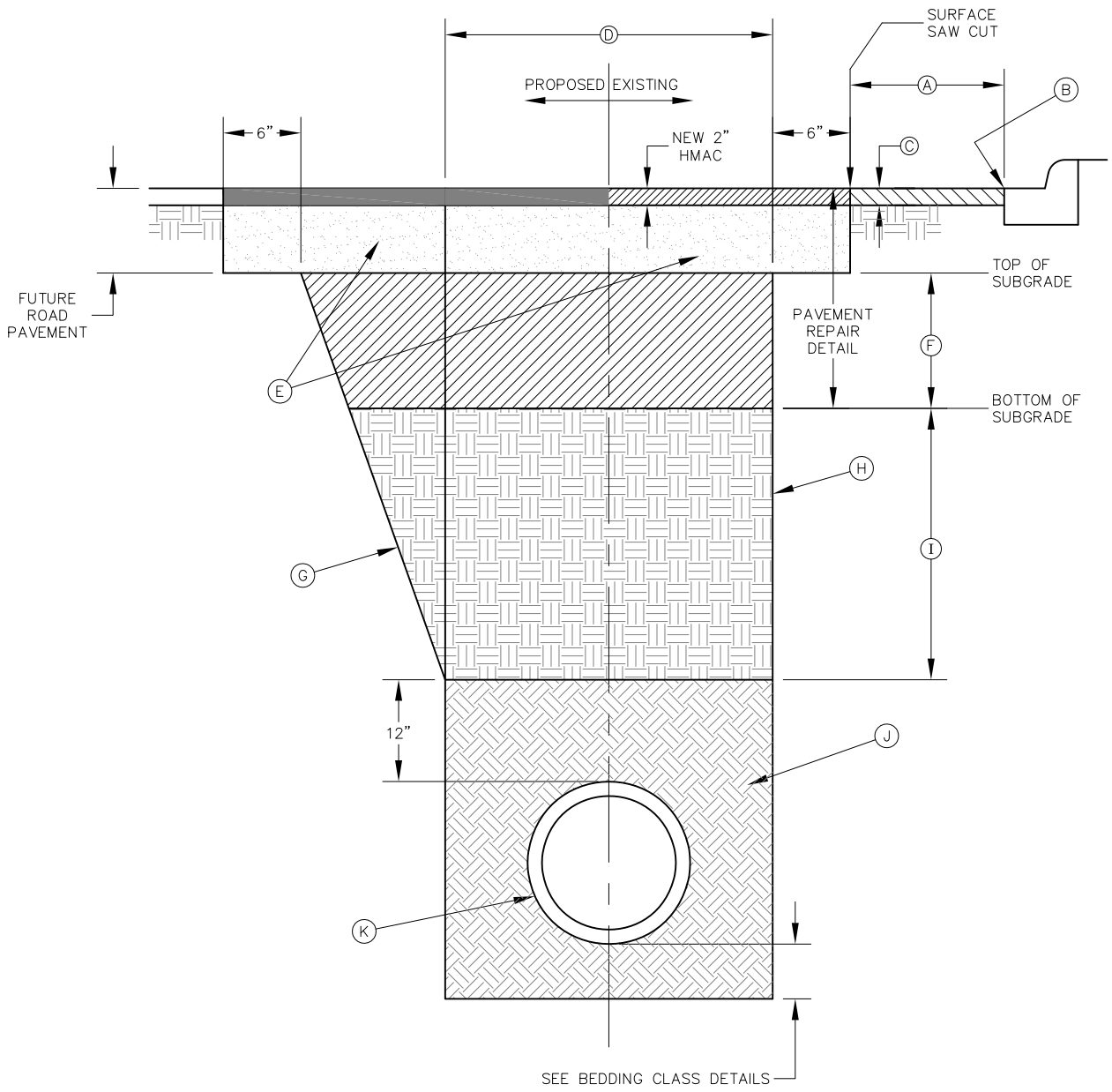
C. SAND CUSHION

D. PROPOSED OR EXISTING PIPE

E. EXISTING GROUND

F. COMPACTED BACKFILL

STANDARD DETAIL	DATE: XXX REV: APR. 2017	CONCRETE CAP (UNPAVED CONDITION) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 116



CONSTRUCTION KEY NOTES:

A. DIMENSION VARIES. WHERE GUTTER FACE, ETC. IS WITHIN 3'–0" OF SAW CUT EDGE, CONTRACTOR SHALL REMOVE & REPLACE EXISTING H.M.A.C. IN THIS AREA.

B. EXISTING GUTTER FACE EDGE OF PAVEMENT OR BEGINNING OF SHOULDER.

C. EXISTING HMAC THICKNESS MAY VARY.

D. REFER TO SPECS FOR LIMIT OF PAVING WIDTH.

E. BASE COURSE: THICKNESS 8" STANDARD UNLESS OTHERWISE SPECIFIED. COMPACT TO 100% A.S.T.M. D–1557.

F. SUBGRADE LAYER THICKNESS 18" UNLESS OTHERWISE SPECIFIED. COMPACT TO A.S.T.M. D–1557: 90% IF COHESIVE SOIL, 95% IF NONCOHESIVE OR AS R.O.W. AGENCY/OWNER REQUIRES.

G. SLOPED TRENCH CONDITION.

H. VERTICAL TRENCH CONDITION.

I. DEPTH VARIES. MATERIAL AS SPECIFIED, COMPACT TO 85% PER A.S.T.M. D–1557 OR AS R.O.W. AGENCY/OWNER REQUIRES.

J. EMBEDMENT AS SPECIFIED.

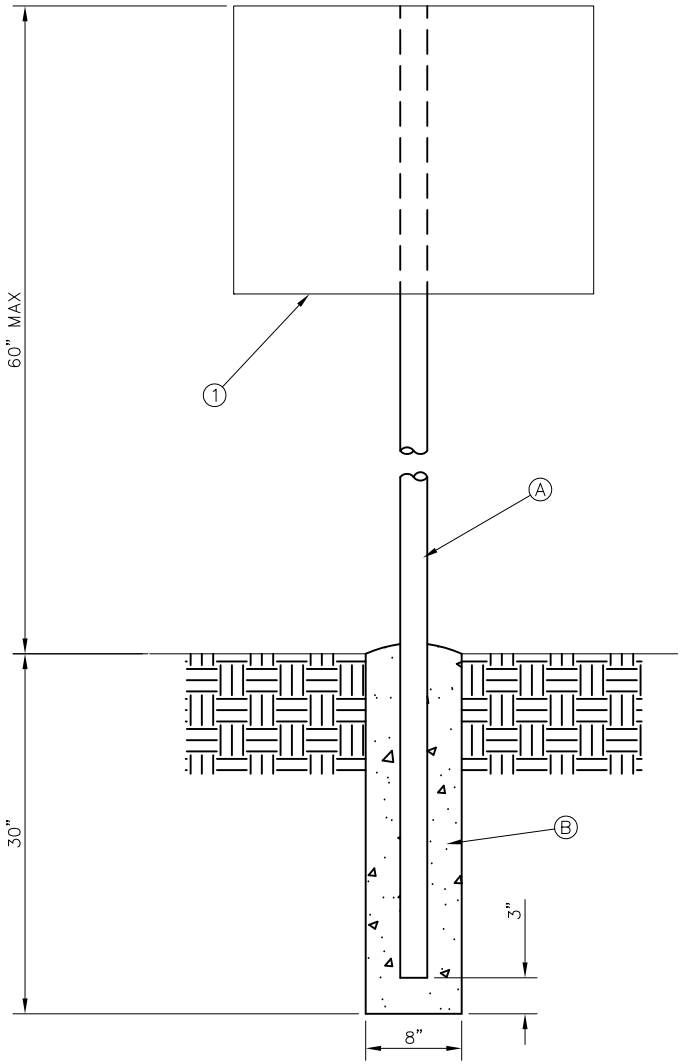
K. APPROVED PIPE.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL TRENCH BACKFILL & PAVEMENT RESTORATION FOR PROPOSED OR EXISTING PAVED STREET SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 117

GENERAL NOTES:

1. SIGN MATERIAL TO BE 16 GAUGE GALVANIZED SHEET METAL.
2. TOP PART OF SIGN SHALL SHOW BLACK LETTERS ON A WHITE BACKGROUND.
3. BOTTOM PART OF SIGN SHALL SHOW WHITE LETTERS ON A BLACK BACKGROUND.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	SITE SIGN – NO TRESPASSING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 118



GENERAL NOTES:

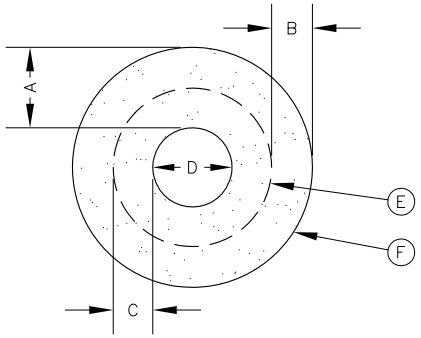
1. SIGN MATERIAL TO BE 16 GAUGE GALVANIZED SHEET METAL.
2. SIGN SHALL BE SECURELY FASTENED TO POLE IN A FASHION AS TO WITHSTAND SEVERE WEATHER AND VANDALISM.
3. SIGN SHALL BE PLACED INSIDE THE FACILITY FENCE, 10' FROM THE GATE SWING ARM AND 5' FROM FENCE.

CONSTRUCTION KEY NOTES:

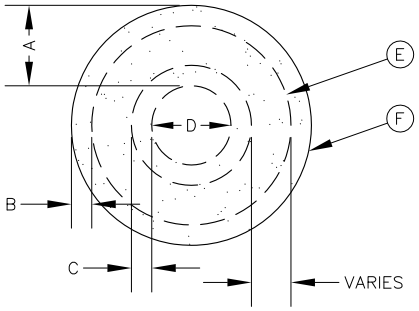
A. 2¼" O.D. GALVANIZED STEEL POLE.

B. 2,000 PSI CONCRETE FILL.

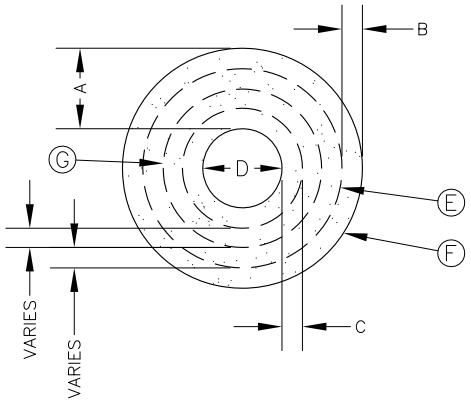
STANDARD DETAIL	DATE: 8/28/2006 REV: APR. 2017	SIGN POLE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 119



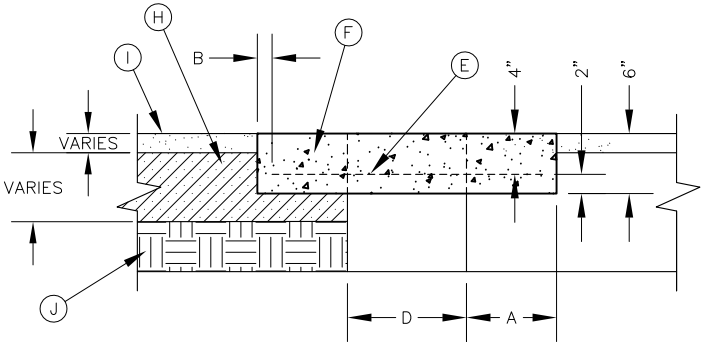
PLAN VIEW – SINGLE REBAR



PLAN VIEW – TWO REBARS



PLAN VIEW – THREE REBARS



SECTION VIEW – ASPHALT JUNCTURE

GENERAL NOTES:

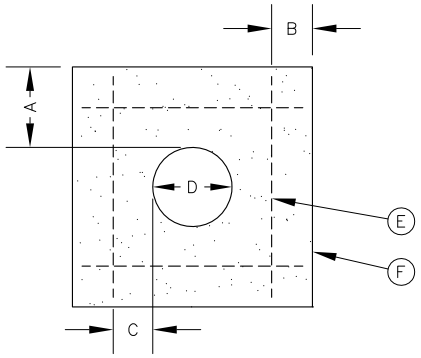
1. THE CONCRETE COLLAR SHOULD BE CAST IN-PLACE CONCRETE. (MINIMUM 28 DAY COMPRESSIVE STRENGTH 4,000 PSI. HIGH EARLY CONCRETE IS REQUIRED)
2. TOPS OF CONCRETE COLLAR SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
3. ANY DISTURBED SUBGRADE UNDER THE CONCRETE COLLAR SHALL BE COMPACTED TO 95% DENSITY ± 3% OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-1557.
4. ANY DISTURBED BASE COARSE UNDER THE CONCRETE COLLAR SHALL BE COMPACTED TO 100% DENSITY ± 2% OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-1557.
5. PROVIDE A MINIMUM OF 1 1/2" OF CONCRETE COVER FOR ALL REINFORCEMENT STEEL.
6. REINFORCING SHALL MEET ASTM C-478 AND TRAFFIC LOADING (HS-20).
7. NO. 3 REINFORCING STEEL HOOPS SHALL BE SPACED EQUALLY.

CONSTRUCTION KEY NOTES:

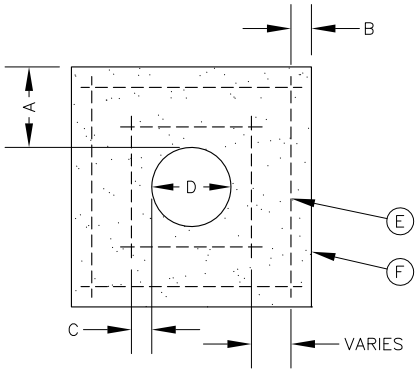
E. #3 REINFORCING STEEL TYP.
F. CONCRETE COLLAR.
G. #3 REINFORCING STEEL EQUALLY SPACED.
H. COMPACTED BASE COARSE.
I. PAVEMENT.
J. COMPACTED SUBGRADE.

"D" DIAMETER OF PENETRATION	NUMBER OF #3 REINFORCING STEEL BARS	"A" MINIMUM CONCRETE HORIZONTAL DIMENSION FROM PENETRATION	"B" MINIMUM CLEARANCE FROM EDGE OF CONCRETE COLLAR TO CENTER OF NEAREST REBAR	"C" MINIMUM CLEARANCE FROM PENETRATION EDGE TO CENTER OF NEAREST REBAR
0" TO 6"	1	6"	1½"	4½"
6.1" TO 18"	2	6"	1½"	1½"
18.1" AND OVER	3	9"	1½"	1½"

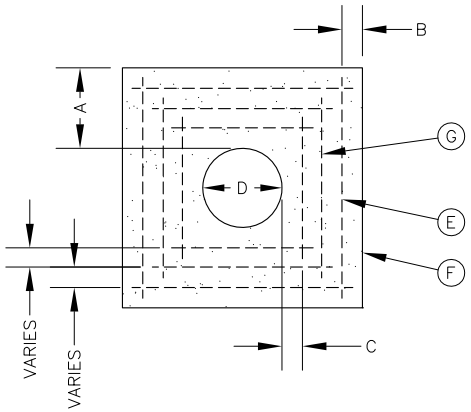
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	CONCRETE COLLAR INSTALLATION IN PAVED AREAS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 120



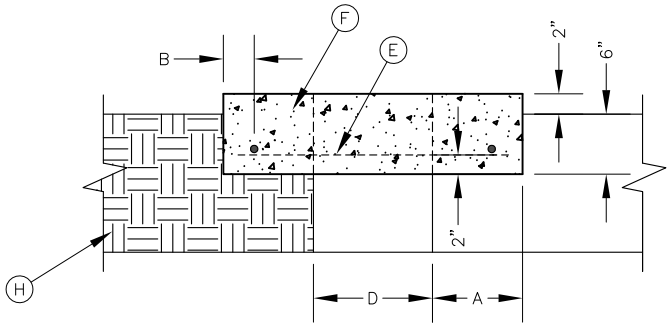
PLAN VIEW – SINGLE REBAR



PLAN VIEW – TWO REBARS



PLAN VIEW – THREE REBARS



SECTION VIEW

GENERAL NOTES:

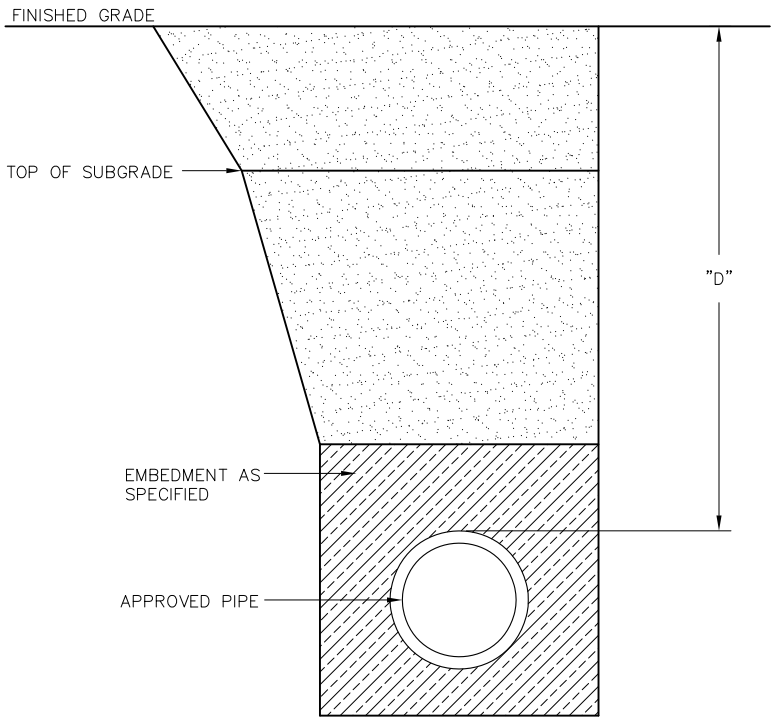
1. THE CONCRETE APRON SHOULD BE CAST IN–PLACE CONCRETE. (MINIMUM 28 DAY COMPRESSIVE STRENGTH 4,000 PSI. HIGH EARLY CONCRETE IS REQUIRED)
2. TOPS OF CONCRETE APRON SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
3. PROVIDE A MINIMUM OF 1 1/2" OF CONCRETE COVER FOR ALL REINFORCEMENT STEEL.
4. REINFORCING SHALL MEET ASTM C–478 AND TRAFFIC LOADING (HS–20).
5. NO. 3 REBARS SPACED EQUALLY MAY BE LAP TIED OR SQUARE HOOPS.

CONSTRUCTION KEY NOTES:

E. #3 REINFORCING STEEL TYP.
F. CONCRETE APRON.
G. #3 REINFORCING STEEL EQUALLY SPACED.
H. COMPACTED BACKFILL.

"D" DIAMETER OF PENETRATION	NUMBER OF #3 REINFORCING STEEL BARS	"A" MINIMUM CONCRETE HORIZONTAL DIMENSION FROM PENETRATION	"B" MINIMUM CLEARANCE FROM EDGE OF CONCRETE APRON TO CENTER OF NEAREST REBAR	"C" MINIMUM CLEARANCE FROM PENETRATION EDGE TO CENTER OF NEAREST REBAR
0" TO 6"	1	4"	1½"	4½"
6.1" TO 18"	2	6"	1½"	1½"
18.1" AND OVER	3	8"	1½"	1½"

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	CONCRETE APRON INSTALLATION IN NON PAVED AREAS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 121



GENERAL NOTES:

1. REFER TO UTILITY STANDARD DETAIL FOR PAVEMENT REPLACEMENT AND BACKFILL REQUIREMENTS.
2. TRENCH SAFETY SYSTEMS SHALL BE USED WHEN TRENCH DEPTH EXCEEDS 5 FEET OR WHEN EXISTING SOIL CONDITIONS DICTATE.

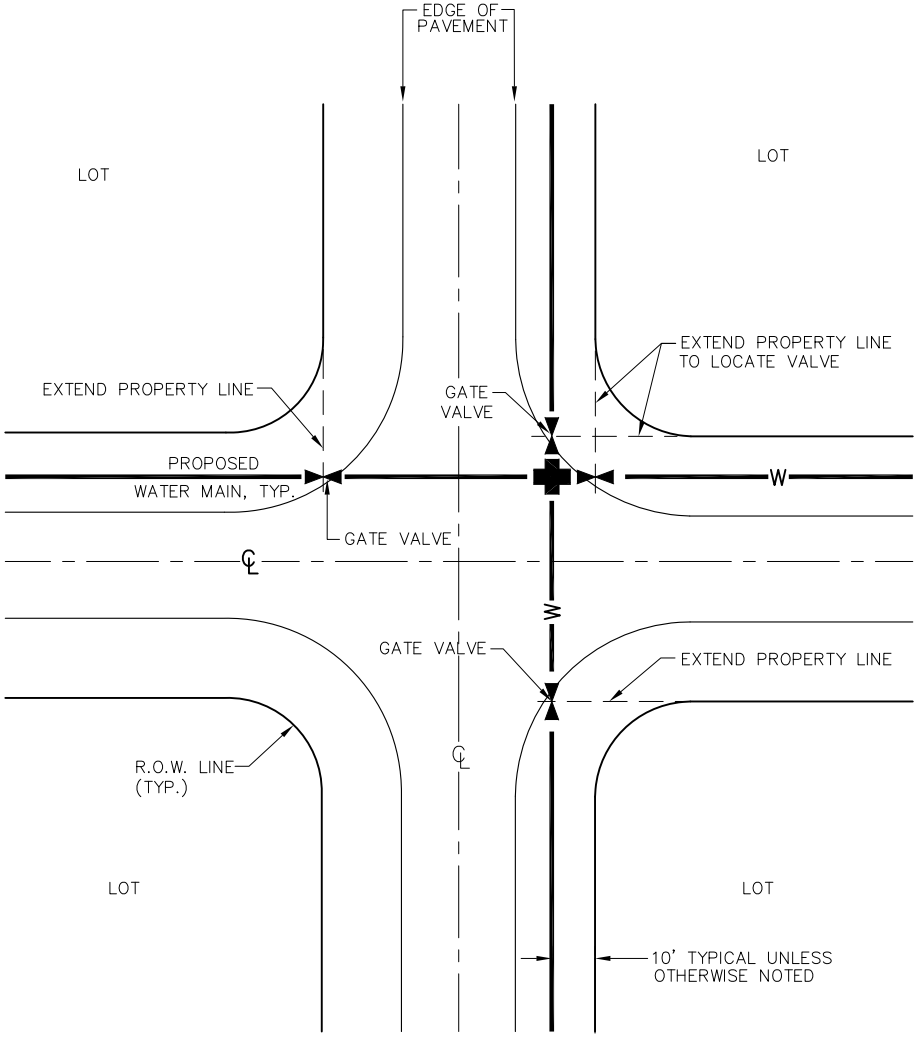
CONSTRUCTION KEY NOTES:

A. STANDARD COVER FOR WATER MAINS SHALL DEPEND ON THE PIPE SIZE AND THE FOLLOWING INSTALLATION CONDITIONS,

AND SHALL BE AS FOLLOWS.

CONDITION		DIAMETER: 6–INCH TO 12–INCH	DIAMETER: 15–INCH AND LARGER
A	NORMAL LINE INSTALLATION, STREET AND DRAINAGE PROJECTS, WATER LINE RELOCATION WITHIN AN EXISTING STREET.	MINIMUM COVER SHALL BE 4–FT FROM TOP OF PIPE TO FINISHED GRADE	MINIMUM COVER SHALL BE 5–FT FROM TOP OF PIPE TO FINISHED GRADE
B	NEW SUBDIVISION OR NON–PAVED AREAS	MINIMUM COVER SHALL BE 6–FT FROM TOP OF PIPE TO PROPOSED FINISHED GRADE	MINIMUM COVER SHALL BE 7–FT FROM TOP OF PIPE TO PROPOSED FINISHED GRADE

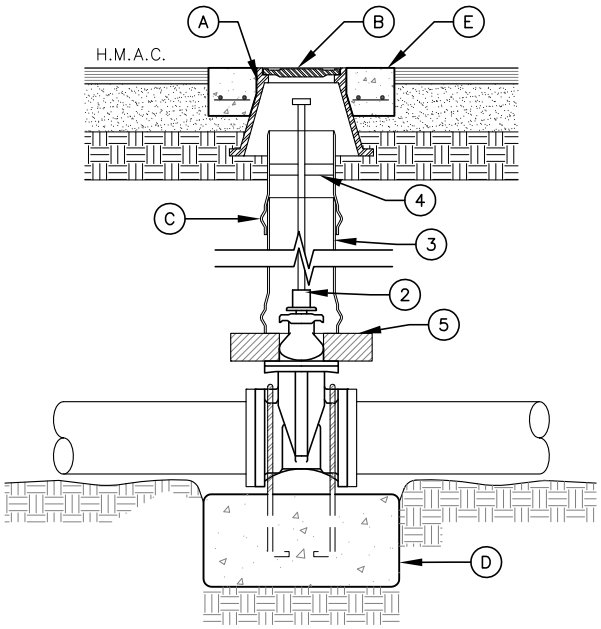
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD COVER FOR WATER MAINS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 200



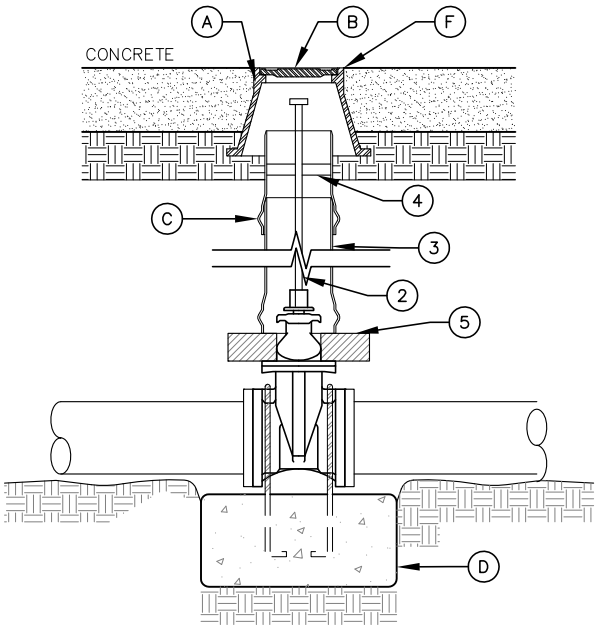
GENERAL NOTES:

1. SEE PLANS FOR SIZE AND LOCATION OF WATER MAIN AND LOTS TO BE SERVICED.
2. THE NUMBER OF VALVES INSTALLED AT THE INTERSECTION MUST EQUAL TO THE NUMBER OF INTERSECTING STREETS.

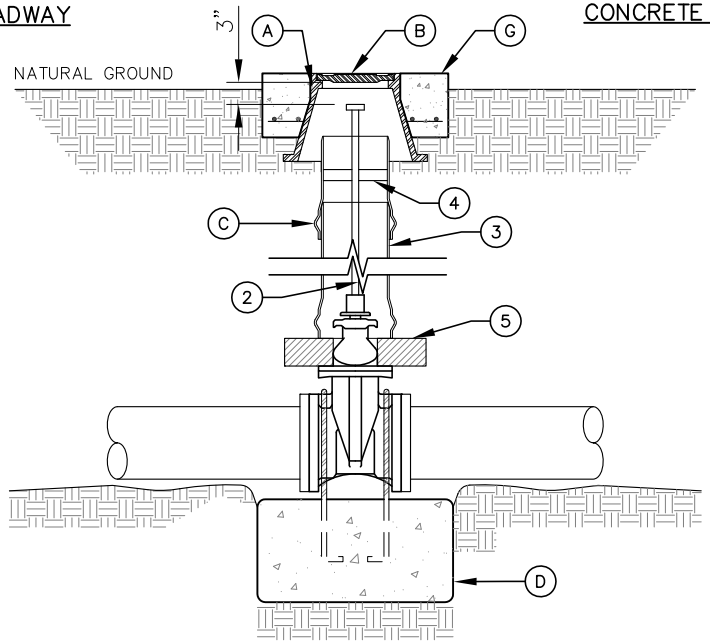
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL VALVE LOCATIONS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 201



ASPHALT ROADWAY



CONCRETE ROADWAY



UNPAVED AREAS

NOTES:

1. RESILIENT WEDGE GATE VALVE AND VALVE ENDS SHALL BE KENNEDY, MUELLER OR APPROVED EQUAL.
2. ALL BURIED VALVES 5' AND DEEPER SHALL BE PROVIDED WITH SOLID STEEL EXTENSION STEM OPERATOR WITH 2" SQUARE AWWA NUT WITHIN 36" OF VALVE BOX COVER. NUT IS TO INDICATE DIRECTION OF ROTATION TO OPEN VALVE.
3. 8" DIA. MINIMUM SDR 35 P.V.C. PIPE. PIPE SHALL NOT REST ON VALVE BODY.
4. ¼" THICK STEEL TRASH RING VALVE BOX INSIDE DIAMETER MINUS ⅛".
5. MINIMUM 2 ½" CONCRETE OR BRICK ALL AROUND.
6. CLEAN BONNET BOX OF ALL DEBRIS AND SOIL.
7. COAT BURIED PIPE AND BONNET BOX PER SPECIFICATIONS, VALUE SHALL BE WRAPPED IN POLYETHYLENE IN ACCORDANCE WITH SPECIFICATIONS.
8. GREASE ALL NUTS AND BOLTS AND WRAP VALVE IN POLYETHYLENE PER SPECIFICATIONS.

CONSTRUCTION KEY NOTES:

A. BONNET BOX

B. BONNET BOX COVER

C. FINAL EXTENSION TO SUBGRADE WITH BELL END (SRD 35 P.V.C. SPOOL) OUT TO BOTTOM OF BONNET BOX. SPOOL TO BE VERTICAL AND CENTERED WITH STEEL EXTENSION STEM & BONNET BOX.

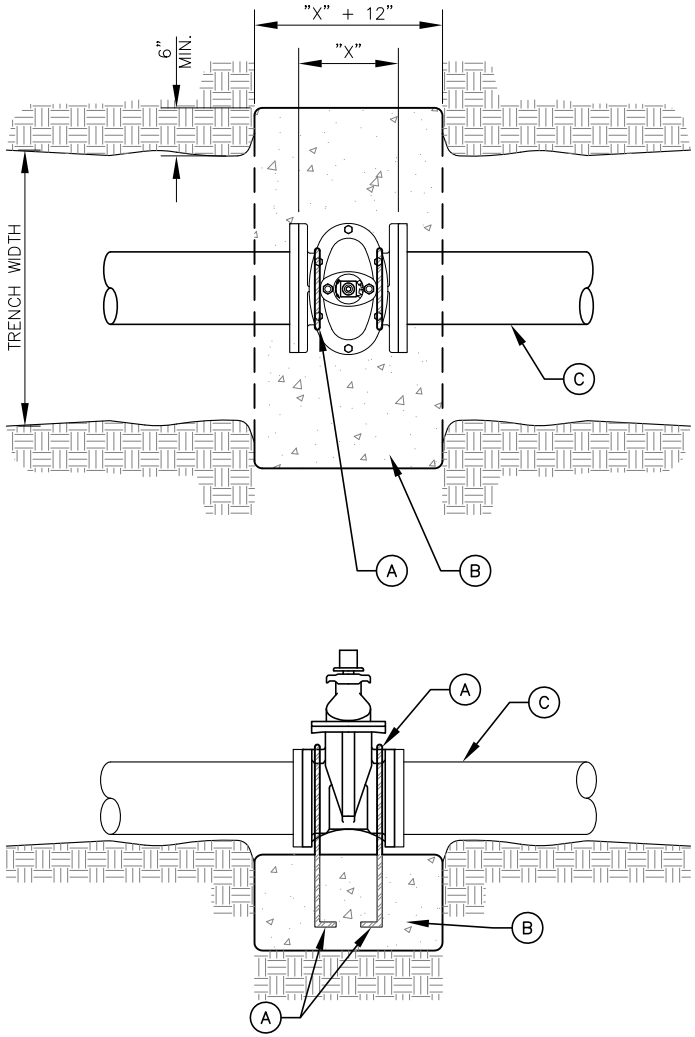
D. REFER TO DETAIL 203.

E. CONCRETE COLLAR FLUSH WITH TOP OF H.M.A.C.

F. BONNET BOX FLUSH WITH TOP OF CONCRETE, CONCRETE COLLAR NOT NEEDED.

G. CONCRETE APRON FLUSH WITH BONNET BOX AND 2" ABOVE NATURAL GROUND.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	RESILIENT WEDGE GATE VALVE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 202



GENERAL NOTES:

1. COMPLY WITH REQUIREMENTS OF AWWA C-550, PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES.

CONSTRUCTION KEY NOTES:

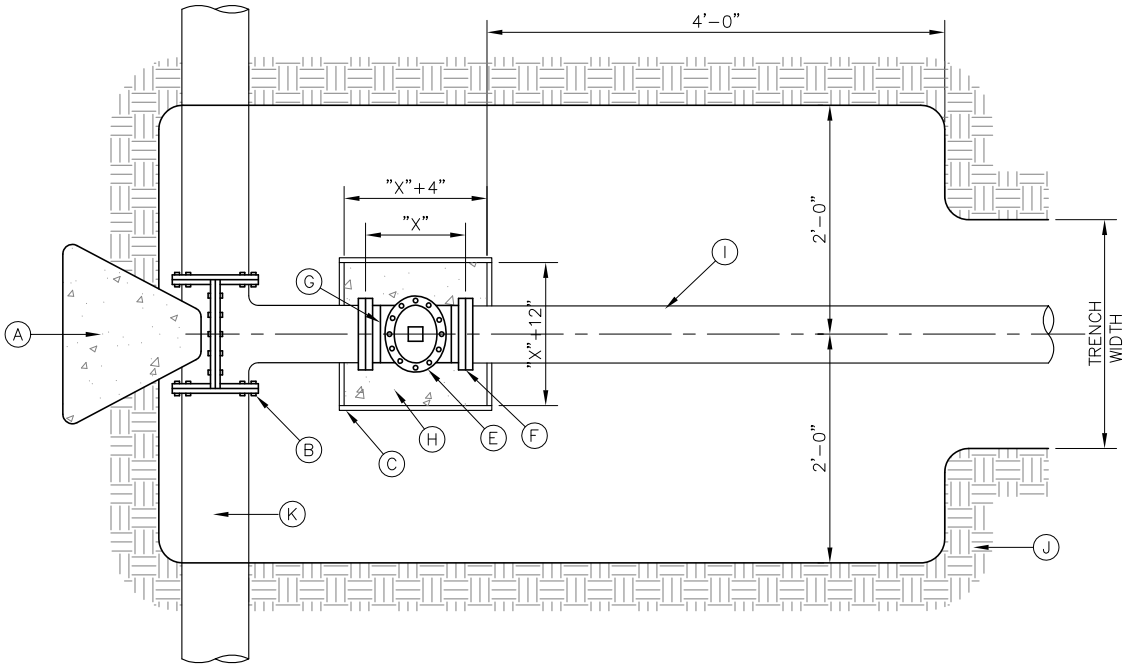
A. TWO No.5 REBAR HAIR PINS. PAINT UNEMBEDDED PORTION OF REBARS WITH TWO COATS OF COAL TAR EPOXY. REBAR SHALL HAVE THE "L" EMBEDDED.

B. CONCRETE VALVE SUPPORT, 2,500 PSI. CONCRETE MINIMUM.

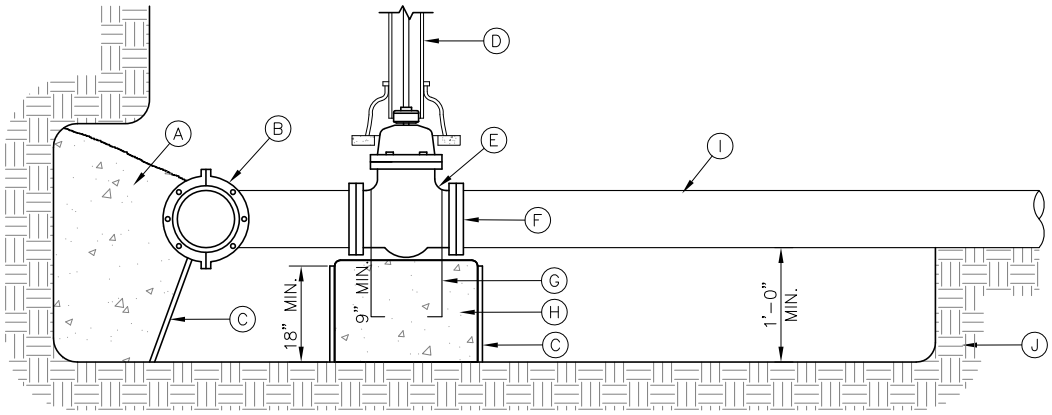
C. APPROVED PIPE

D. RESILIENT WEDGE GATE VALVE. KENNEDY, MUELLER MODELS OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	GATE VALVE INSTALLATION – VALVE ANCHOR SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 203



PLAN



SECTION

GENERAL NOTES:

1. TRUST BLOCKING SHALL EXTEND TO UNDISTURBED EARTH.
2. TAPPING SLEEVE SHALL BE 18" MINIMUM FROM ANY BELL, COUPLING, VALVE OR FITTING.
3. REPLACE EXCAVATED MATERIAL WITH CEMENT STABILIZED BACKFILL PRIOR TO PAVING.
4. JOINTS AND BOLTS SHALL BE CLEAR OF CONCRETE.
5. INSTALL PERMANENT THRUST BLOCKING UNDER VALVE BEFORE TAP IS MADE. JOINTS AND BOLTS TO BE CLEAR OF CONCRETE.
6. TAPPING SLEEVE AND VALVE SHALL BE MECHANICALLY RESTRAINED.

CONSTRUCTION KEY NOTES:

A. CONCRETE THRUST BLOCKING, PER L.V.W.D. STANDARD DETAILS.

B. TAPPING SLEEVE

C. FORMS

D. PVC PIPE, PER LVWD STANDARD DETAIL 202.

E. TAPPING VALVE

F. VALVE ENDS FOR TYPE OF PIPE INSTALLED

G. 2–#5 REBAR HAIRPINS, PAINT UNEMEDDED PORTION OF BARS WITH 2–COATS OF COAL TAR EPOXY, THEN COVER WITH 2" MINIMUM OF CEMENT MORTAR.

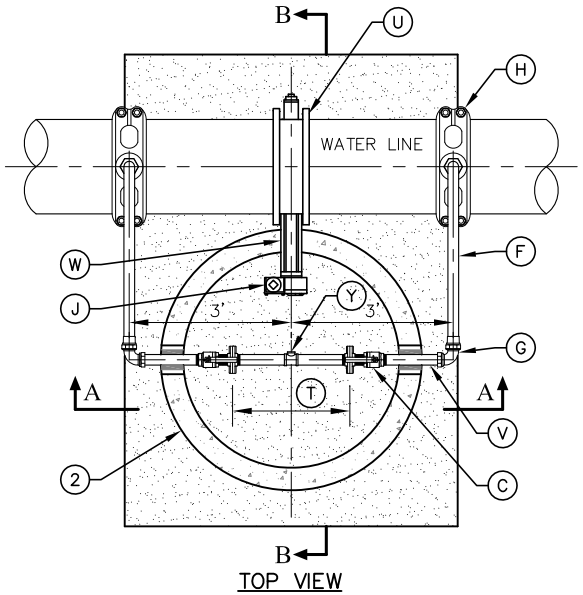
H. CONCRETE VALVE SUPPORT.

I. NEW WATER LINE TO BE CONSTRUCTED.

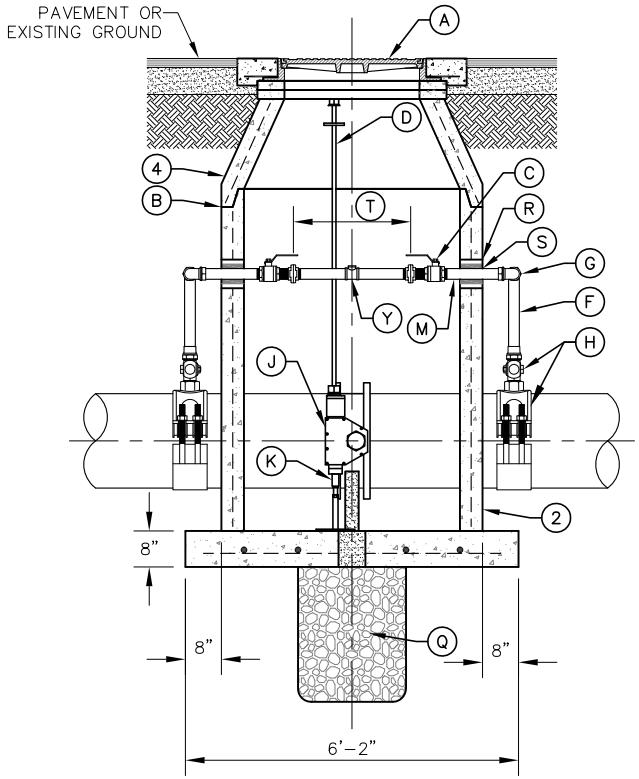
J. UNDISTURBED EARTH

K. EXISTING WATER MAIN TO BE TAPPED

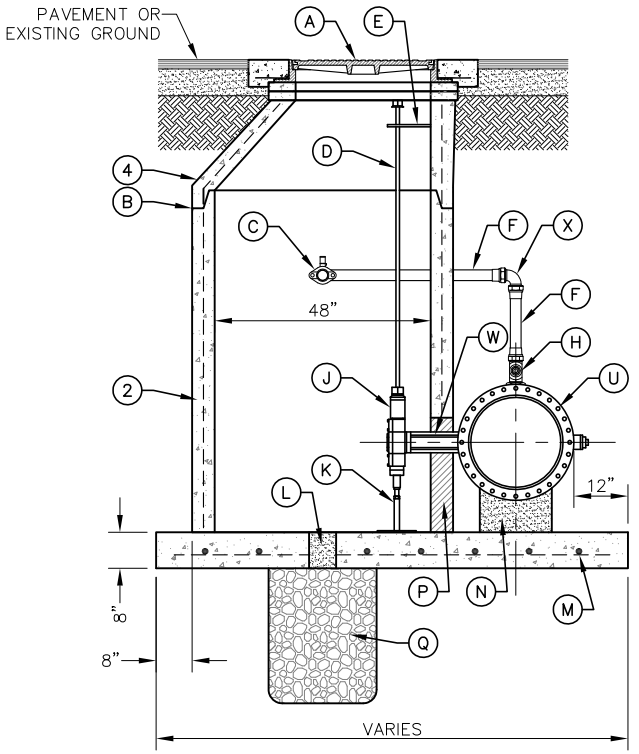
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TAPPING SLEEVE AND VALVE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 204



TOP VIEW



A SECTION



B SECTION

KEYED NOTES:

A. MANHOLE RING AND COVER AS PER DETAILS 340 AND 341. SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.

B. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR APPROVED EQUAL.

C. 2" BALL VALVE (NORMALLY CLOSED).

D. 1¼" DIAMETER SOLID STEEL EXTENSION STEM WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT AND 2" SQUARE OPERATOR NUT ON TOP.

E. ADJUSTABLE EXTENSION STEM GUIDE @ 6' MAX. INTERVALS AS PER DETAIL 209.

F. 2" COPPER PIPE (TYPE-K).

G. THREADED END TO FLARED END 90° ELBOW (TYP.).

H. 16"x2" DOUBLE STRAP SADDLE TAP WITH 2" CORPORATION STOP TO BE CC X COMPRESSION.

J. BUTTERFLY VALVE OPERATOR.

K. ADJUSTABLE SUPPORT OR APPROVED EQUAL.

L. 6" DIAMETER DRAIN HOLE FILLED WITH GRAVEL.

M. #5 @ 12" O.C.E.W.

N. CONCRETE SUPPORT.

P. NOTCH MANHOLE SECTION FOR VALVE OPERATOR. FILL WITH BRICK AND MORTAR AFTER VALVE INSTALLATION.

Q. 24" DIAMETER BY 2'-6" DEEP GRAVEL SUMP.

R. CEMENT GROUT.

S. 1" PREMOULDED ASPHALT EXPANSION JOINT.

T. INSTALL A 2" DIA. BRASS SPOOL PIECE WITH FLANGED ENDS. ONE SPOOL PIECE TO BE PROVIDED FOR EACH BUTTERFLY VALVE LOCATION. PROVIDE A 1" THREADED OUTLET WITH PLUG ON SPOOL PIECE. ALL SPOOL PIECES TO BE PROVIDED WITH FULL FACE GASKETS.

U. BUTTERFLY VALVE.

V. 2" BRASS NIPPLE PIECE (TYP.).

W. VALVE OPERATOR EXTENSION – 12" LONG.

X. FLARED END TO FLARED END 90° ELBOW (TYP.).

Y. 2"X1" BRONZE TEE WITH 1" TO ¾" ADAPTER & ¾" TEST OUTLET WITH CORPORATION STOP. SEE DETAIL 208 FOR BIOLOGICAL TEST OUTLET.

NOTES:

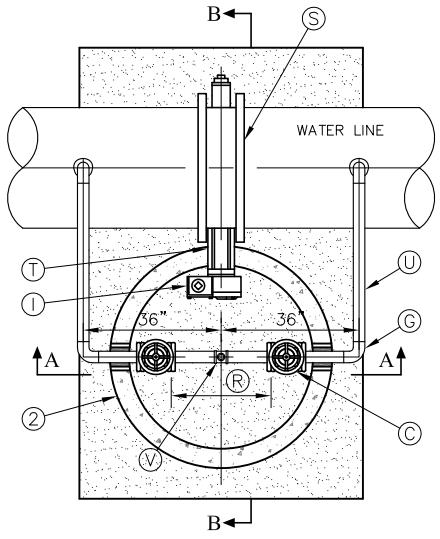
1. INSTALLATION APPLICABLE TO P.V.C. & DUCTILE IRON WATER MAINS ONLY. INSTALLATION FOR OTHER PIPE MATERIALS REQUIRE L.V.W.D. APPROVAL.

2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C-478 AND SHALL MEET HS-20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.

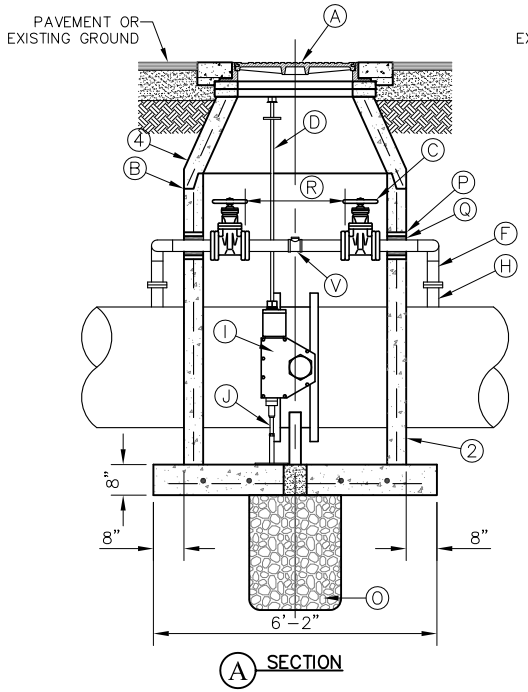
3. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

4. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C-478.

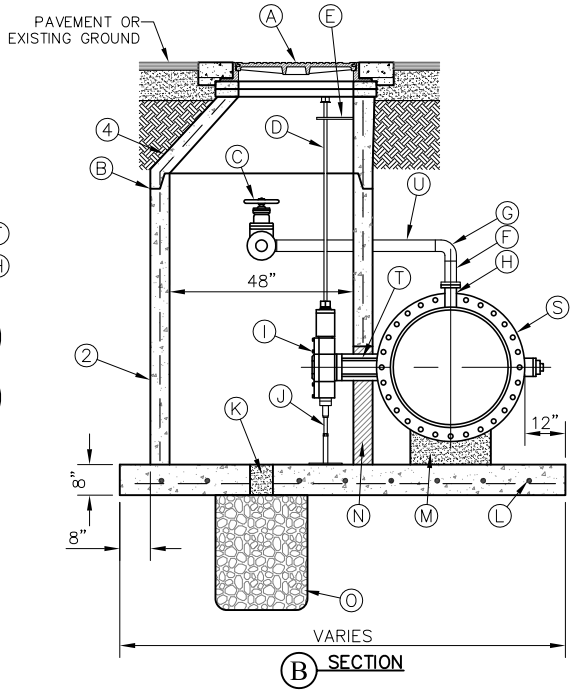
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	BUTTERFLY VALVE MANHOLE (FOR 20" LINES AND SMALLER) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 205



TOP VIEW



A SECTION



B SECTION

GENERAL NOTES:

1. INSTALLATION APPLICABLE TO S.C.C.P. & STEEL WATER MAINS ONLY. INSTALLATION FOR OTHER PIPE MATERIALS REQUIRE L.V.W.D. APPROVAL.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C-478 AND SHALL MEET HS-20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.
3. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
4. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C-478.

CONSTRUCTION KEY NOTES:

A. MANHOLE RING AND COVER AS PER EPWU DETAILS 340 AND 341. SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.

B. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR APPROVED EQUAL.

C. 3" FLANGED GATE VALVE (NORMALLY CLOSED) WITH REMOVABLE HAND-WHEEL.

D. 1¼" DIAMETER SOLID STEEL EXTENSION STEM WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT AND 2" SQUARE OPERATOR NUT ON TOP.

E. ADJUSTABLE EXTENSION STEM GUIDE @ 6' MAX. INTERVALS AS PER L.V.W.D. DETAIL 209.

F. 3" SCH. 40 STEEL PIPE (FLxPE) WRAPPED WITH APPROVED POLYKEN TAPE (MIN. 80 MILS) COATING.

G. 3"-90° WELDED (PExPE) ELBOW (TYP.).

H. 3" WELDED FLANGE OUTLET (INSTALLED BY PIPE MANUFACTURER).

I. BUTTERFLY VALVE OPERATOR.

J. ADJUSTABLE SUPPORT OR APPROVED EQUAL.

K. 6" DIAMETER DRAIN HOLE FILLED WITH GRAVEL.

L. #5 @ 12" O.C.E.W.

M. CONCRETE SUPPORT.

N. NOTCH MANHOLE SECTION FOR VALVE OPERATOR. FILL WITH BRICK AND MORTAR AFTER VALVE INSTALLATION.

O. 24" DIAMETER BY 2'-6" DEEP GRAVEL SUMP.

P. CEMENT GROUT.

Q. 1" PREMOULDED ASPHALT EXPANSION JOINT.

R. INSTALL A 3" DIA. DUCTILE IRON SPOOL PIECE WITH FLANGED ENDS. UNI-FLANGE NOT ACCEPTABLE. ONE SPOOL PIECE TO BE PROVIDED FOR EACH BUTTERFLY VALVE LOCATION. PROVIDE A 1" THREADED OUTLET WITH PLUG ON SPOOL PIECE. ALL SPOOL PIECES TO BE PROVIDED WITH FULL FACE GASKETS.

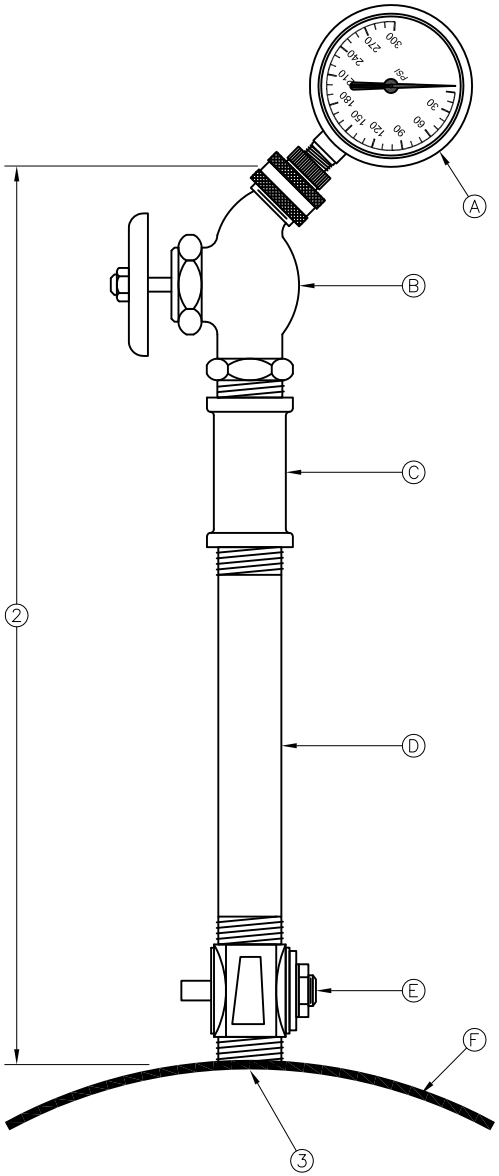
S. BUTTERFLY VALVE.

T. VALVE OPERATOR EXTENSION – 12" LONG.

U. 3" SCH. 40 STEEL PIPE (PExPE) WRAPPED WITH APPROVED POLYKEN TAPE (MIN. 80 MILS) COATING.

V. 3"x1" BRONZE TEE WITH 1" TO ¾" ADAPTER & ¾" TEST OUTLET WITH CORPORATION STOP. SEE DETAIL 208 FOR BIOLOGICAL TEST OUTLET.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	BUTTERFLY VALVE IN MANHOLE INSTALLATION DETAILS (24" AND LARGER) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 206



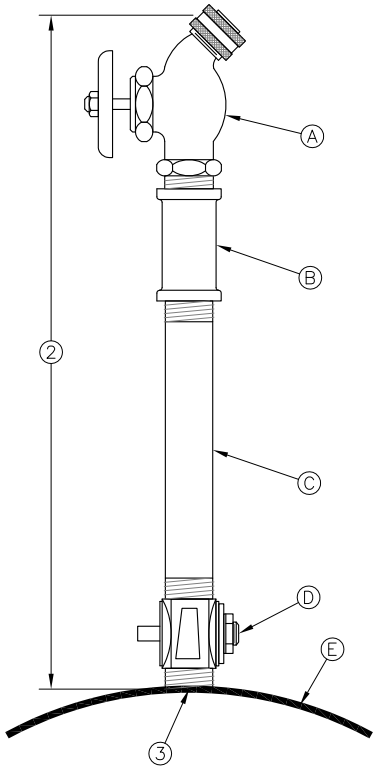
GENERAL NOTES:

1. TEST OUTLET ASSEMBLY GENERALLY USED ON PRESSURE REDUCING VALVE INSTALLATIONS FOR THE ADJUSTMENT & MONITORING OF PRESSURE RELIEF VALVES.
2. ADJUST HEIGHT AS NECESSARY.
3. ACTUAL TYPE OF CONNECTION TO PRESSURE PIPE VARIES (SUCH AS THREADED TEE OR TAPPING SADDLE).

CONSTRUCTION KEY NOTES:

A. REMOVABLE PRESSURE GAUGE
B. ¾" BRASS HOSE BIB
C. ¾" BRASS UNION/ADAPTER
D. ¾" COPPER PIPE
E. ¾" COROPORATION STOP
F. PRESSURE PIPE

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	PRESSURE TEST OUTLET SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 207



GENERAL NOTES:

1. TEST OUTLET ASSEMBLY GENERALLY USED ON BUTTERFLY VALVE INSTALLATIONS FOR THE MONITORING OF WATER QUALITY.
2. ADJUST HEIGHT AS NECESSARY.
3. ACTUAL TYPE OF CONNECTION TO PRESSURE PIPE VARIES (SUCH AS THREADED TEE OR TAPPING SADDLE).

CONSTRUCTION KEY NOTES:

A. ¾" BRASS HOSE BIB

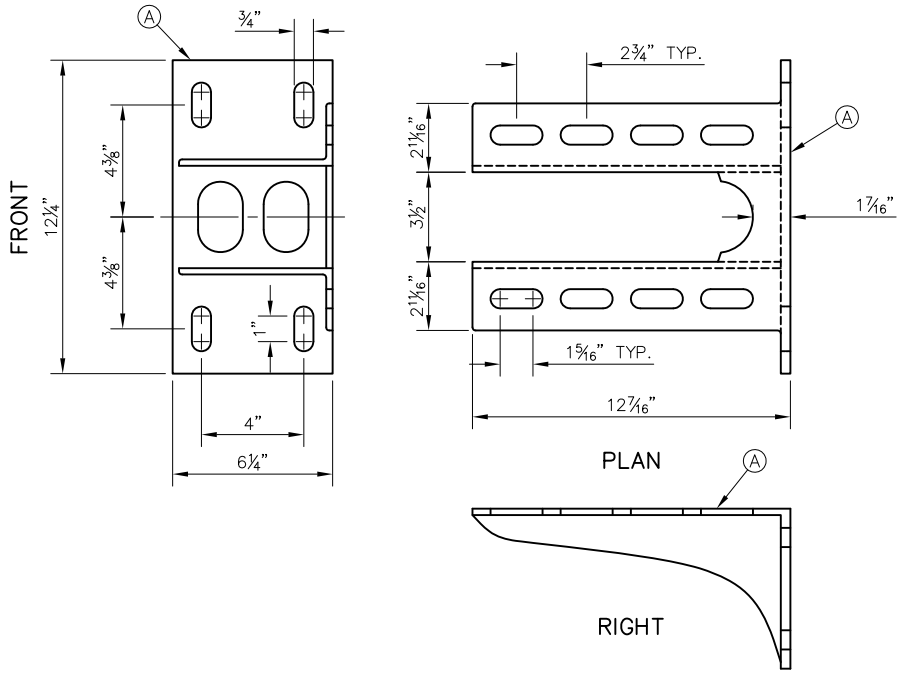
B. ¾" BRASS UNION/ADAPTER

C. ¾" COPPER PIPE

D. ¾" COROPORATION STOP

E. PRESSURE PIPE

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	BIOLOGICAL TEST OUTLET DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 208



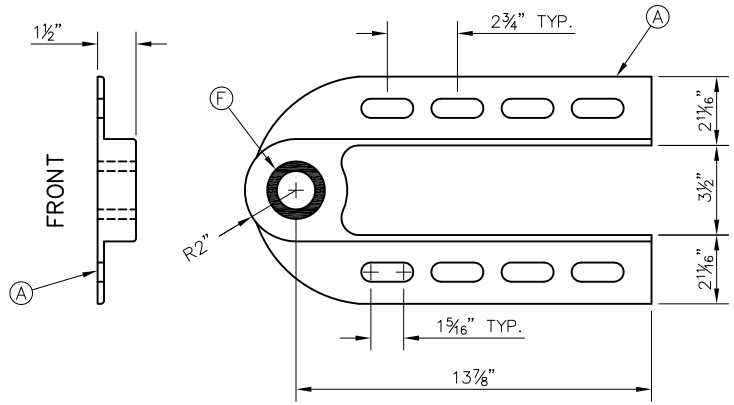
EXTENSION STEM GUIDE BRACKET

GENERAL NOTES:

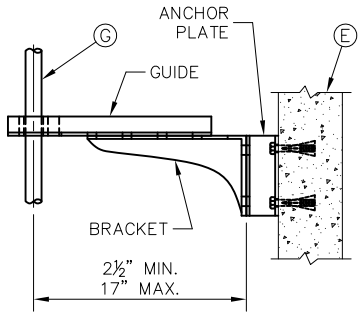
1. EXTENSION STEM GUIDE TO BE INSTALLED VERTICALLY ALONG MANHOLE WALL TO SUPPORT EXTENSION STEM.
2. EXTENSION STEM GUIDE TO BE FULLY ADJUSTABLE
3. INSTALL @ 6' MAX. INTERVALS VERTICAL TO THE INSIDE OF MANHOLE WALL.

CONSTRUCTION KEY NOTES:

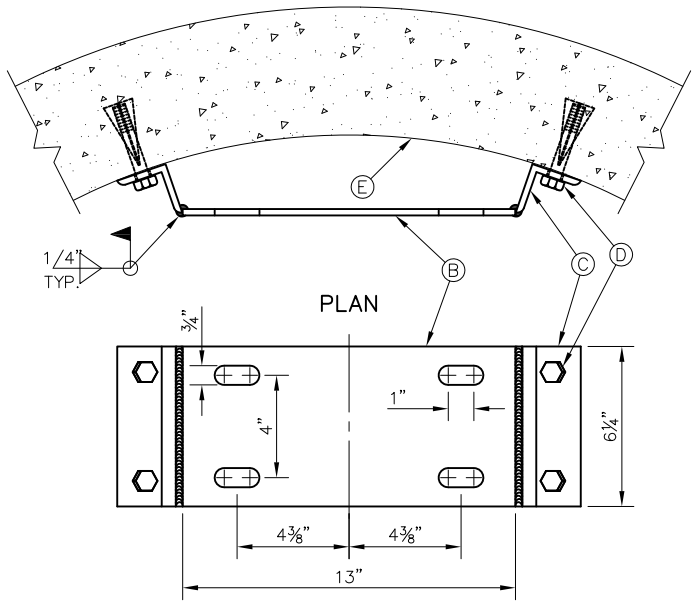
A. DUCTILE IRON 65.45.12 MIN.
B. 6¼"X13"X¼" THK. STL. PLATE.
C. 2"X2"X¼" ANGLE 6¼" LONG TYP.
D. ½" DIA. X 3" EXP. BOLT TYP.
E. MANHOLE WALL.
F. BRONZE BUSHING.
G. 1¼" DIA. VALVE EXTENSION STEM.



EXTENSION STEM GUIDE

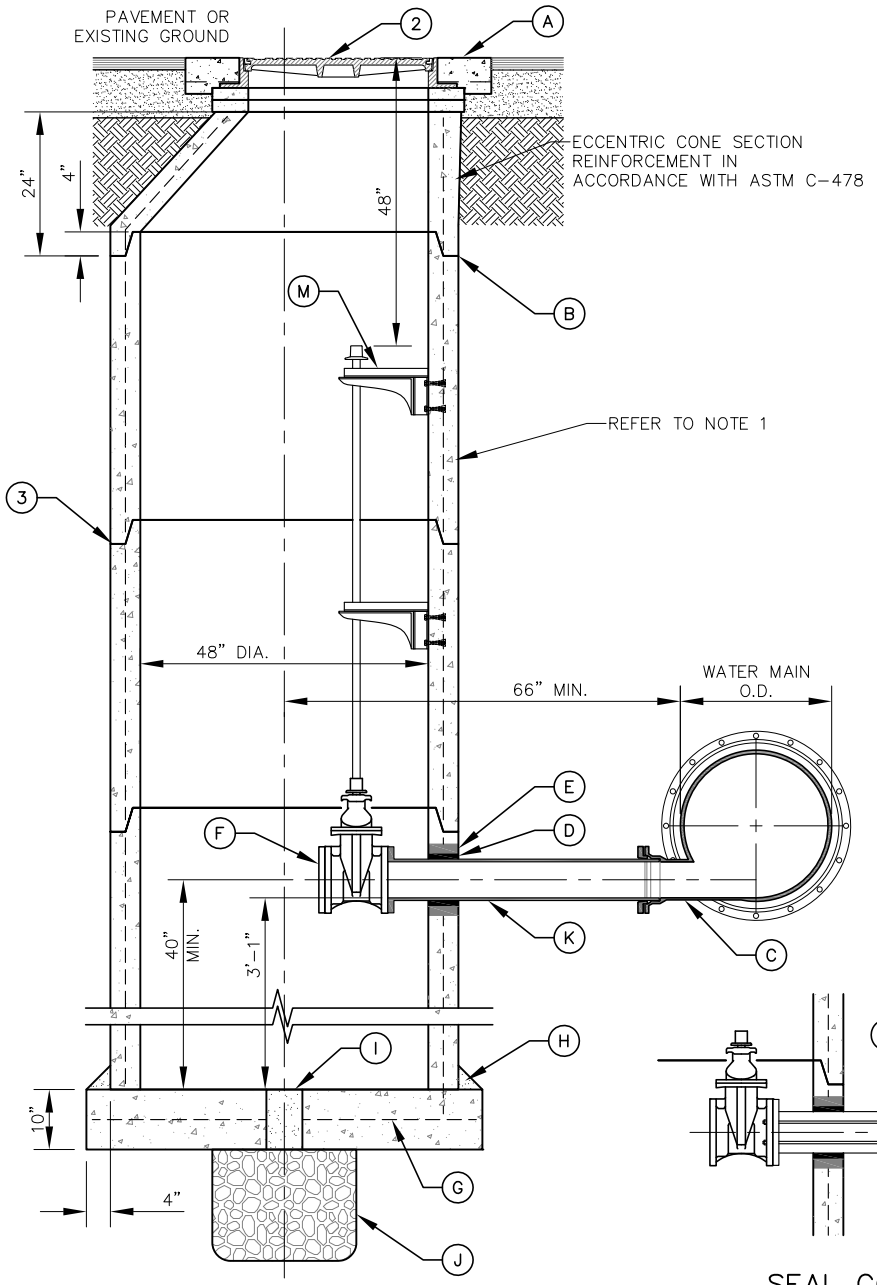


COMPLETED ASSEMBLY

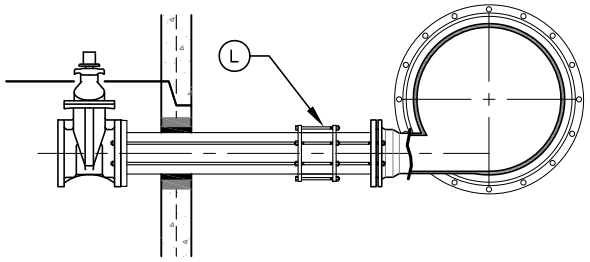


EXTENSION STEM GUIDE
MANHOLE ANCHOR PLATE

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	EXTENSION STEM GUIDE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 209



SECTION



SEAL COUPLING ALTERNATE

KEYED NOTES:

A. 12"X6" THICK 3,000 PSI CONCRETE COLLAR OVER BACKFILL COMPACTER TO SPECIFIED DENSITY.

B. 1 ¼" DIAMETER SOLID STEEL EXTENSION STEM WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT AND 2" SQUARE OPERATOR NUT ON TOP.

C. 6" BOTTOM TANGENT OUTLET. USE BOTTOM OUTLET DIP.

D. 1" SPONGE RUBBER.

E. NON-SHRINK GROUT

F. 6"FLANGED GATE VALVE

G. NO. 5 REBAR AT 12" ON CENTER BOTH WAYS.

H. 4"X4" GROUT ALL AROUND

I. 6" DIAMETER HOLE FILL WITH GRAVEL.

J. 24" DIAMETER BY 2'-6" DEEP GRAVEL SUMP.

K. PROVIDE SPOOL PIECE WITH BOLTED FLANGES BOTH ENDS.

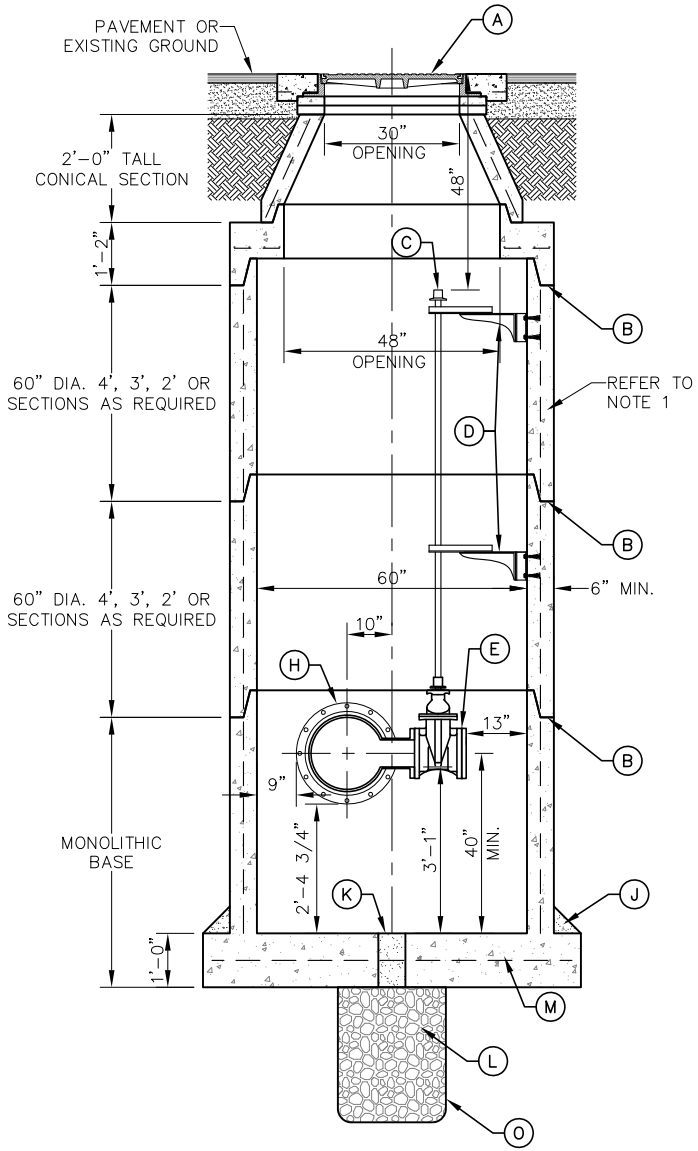
L. IF SEAL COUPLING IS USED, MUST INSTALL ¾" STAINLESS STEEL HARNESS RODS WELDED OR BOLTED TO BOTH END FLANGES FOR PROPER RESTRAINT. COAT RODS WITH NON-CORROSIVE INHIBITIVE PAINT. WRAP ENTIRE COUPLING & ROD ASSEMBLY WITH POLYETHYLENE WRAP.

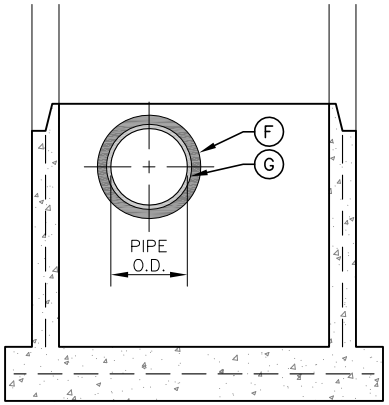
M. EXTENSION STEM GUIDE DETAIL 209.

NOTES:

1. MANHOLE DETAIL 310.
2. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C-478. WITH STANDARD MANHOLE RING AND COVER PER L.V.W.D. STANDARD DETAILS.
3. ALL JOINTS TO BE TONGUE AND GROOVE AND SEALED WITH RAM-NEK OR EQUAL.
4. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	BLOWOFF ASSEMBLY SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 210





NOTES:

1. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C-478 AND SHALL MEET HS-20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.
2. CEMENT SHALL BE TYPE I-II, PER ASTM C-150, AND MUST CONTAIN A MINIMUM OF 4% FLY ASH OF THE TOTAL MANHOLE WEIGHT.
3. THE BASE & RISER SHALL BE INTEGRALLY CAST. CONCRETE SHALL BE MIN. 28 DAY COMPRESSIVE STRENGTH 4,000 PSI.
4. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
5. THE SUBGRADE UNDER THE BASE SHALL BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.
6. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY AND INTERNALLY COATED WITH BITUMINOUS COATING.
7. DEPTHS OVER 14' SHALL HAVE STRENGTHENED WALLS (REFER TO CONTRACT DRAWINGS OR SPECIFICATIONS).

KEYED NOTES:

A. MANHOLE RING AND COVER AS PER DETAILS 340 AND 341. SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.

B. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR APPROVED EQUAL.

C. 1¼" DIAMETER SOLID STEEL EXTENSION STEM WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT AND 2" SQUARE OPERATOR NUT ON TOP.

D. ADJUSTABLE EXTENSION STEM GUIDE @ 6' MAX. INTERVALS AS PER DETAIL 209.

E. 6" FLANGED GATE VALVE (NORMALLY CLOSED). A BLIND FLANGE IS TO BE ATTACHED WHEN MANHOLE IS INSTALLED BELOW WATER TABLE.

F. NON-SHRINK GROUT

G. 1" SPONGE RUBBER

H. 16"x6" TEE (F.E.xF.E.).

I. 4"X4" GROUT ALL AROUND.

J. 6" DIAMETER DRAIN HOLE FILLED WITH GRAVEL.

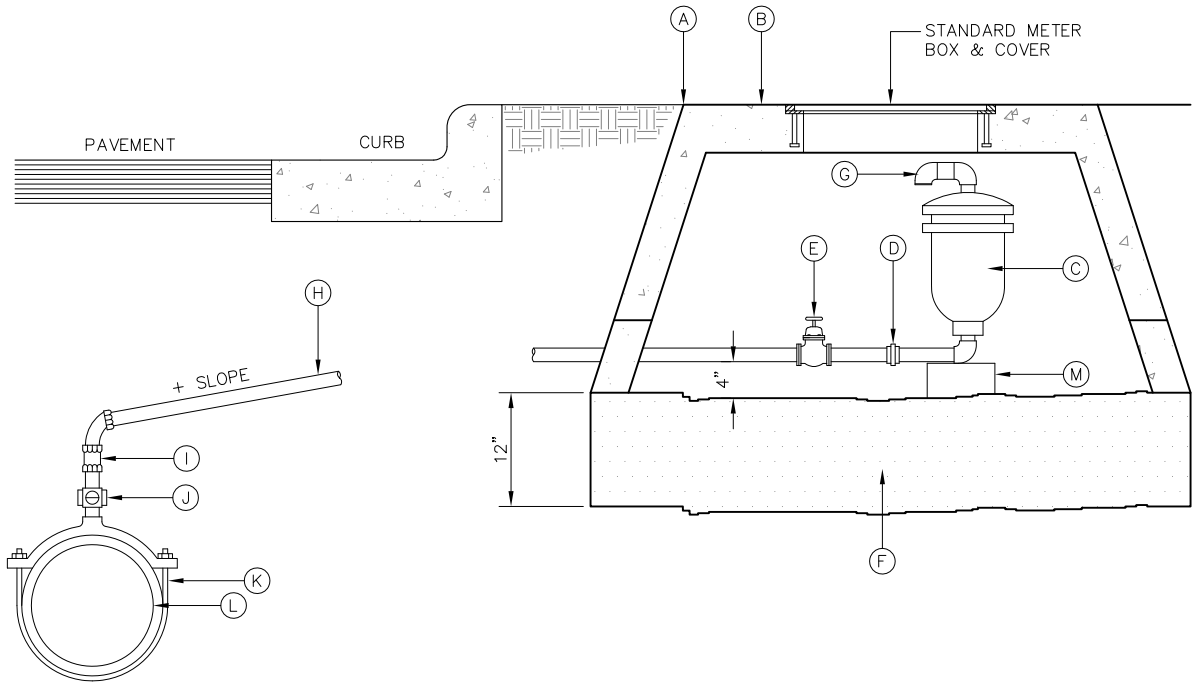
K. 24" DIAMETER BY 2'-6" DEEP GRAVEL SUMP.

L. #5 @ 12" O.C.E.W.

M. IF SEAL COUPLING IS USED, MUST INSTALL ¾" STAINLESS STEEL HARNESS RODS WELDED OR BOLTED TO BOTH END FLANGES FOR PROPER RESTRAINT. COAT RODS WITH NON-CORROSIVE INHIBITIVE PAINT. WRAP ENTIRE COUPLING & ROD ASSEMBLY WITH POLYETHYLENE WRAP.

N. FILTER FABRIC

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	BLOWOFF ASSEMBLY IN TXDOT RIGHT-OF-WAY SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 211



GENERAL NOTES:

1. INSTALLATION SHALL GENERALLY BE USED FOR 2" AND SMALLER AIR RELEASE VALVES.
2. VALVE AND PIPE SIZES SHALL BE AS SPECIFIED.
3. VALVE SHALL GENERALLY BE INSTALLED BEHIND THE CURB.

CONSTRUCTION KEY NOTES:

A. SET TOP OF METER BOX AT SURROUNDING GROUND OR AT CURB LEVEL.

B. L.V.W.D. STANDARD METER BOX TYPE "C" FOR INSTALLATION BEHIND CURB, L.V.W.D. STANDARD BONNET BOX FOR INSTALLATION IN ROADWAYS.

C. AIR RELEASE VALVE OR SINGLE BODY COMBINATION AIR VALVE, AS SPECIFIED

D. UNION

E. GATE VALVE WITH HAND WHEEL OPERATOR

F. GRAVEL WITH FILLER FABRIC

G. RETURN BEND

H. COPPER PIPE TO AIR RELEASE VALVE

I. FLARED TUBE CONNECTIONS

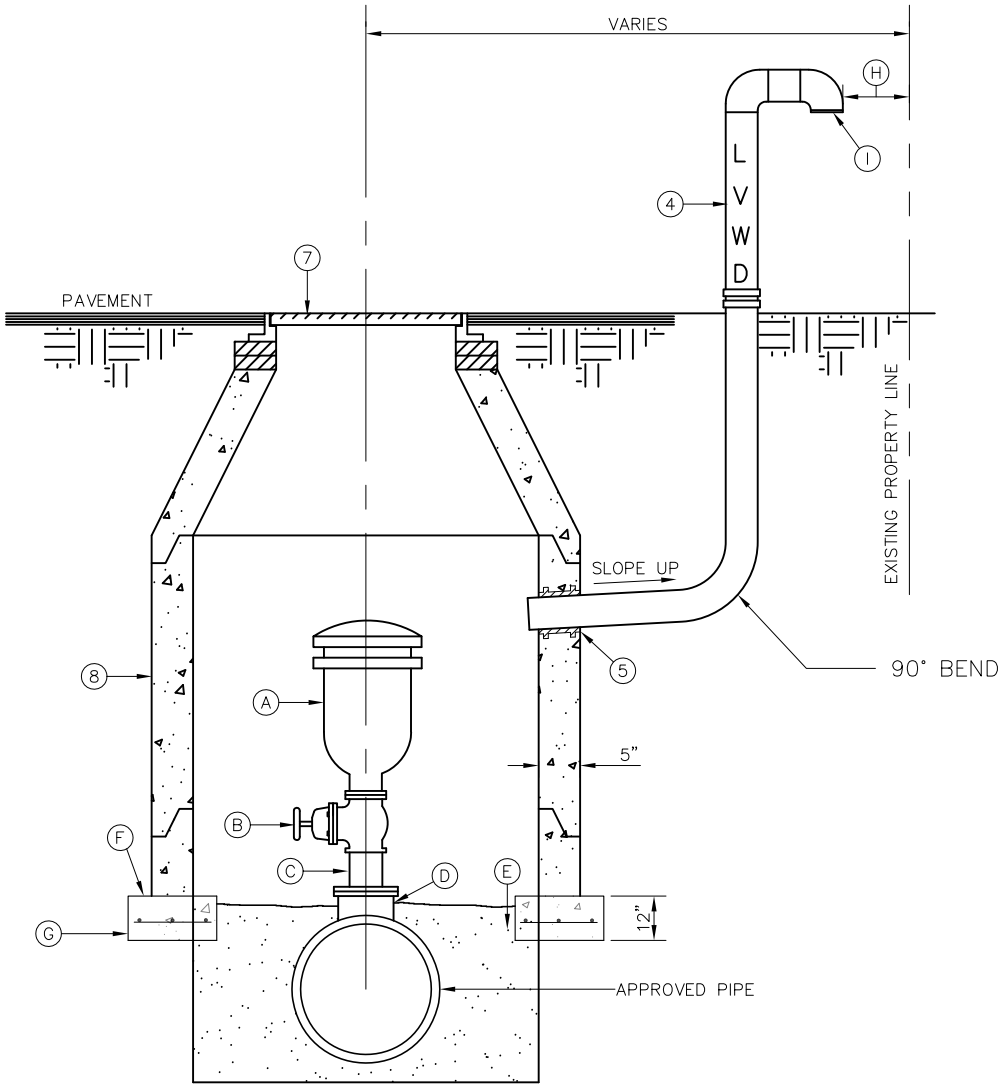
J. TAP WITH CORPORATION STOP

K. SERVICE SADDLE

L. WATER MAIN

M. CONCRETE SUPPORT (2,500 PSI)

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	AIR RELEASE VALVE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 212



GENERAL NOTES:

1. INSTALLATION SHALL GENERALLY BE USED FOR WATER MAINS 16" AND SMALLER UNDER PAVED CONDITIONS.
2. VALVE AND PIPE SIZES SHALL BE AS SPECIFIED.
3. AIR VENTS SHALL BE LOCATED CLEAR OF PAVED ROADWAY. DIMENSIONS TO BE DETERMINED IN THE FIELD. AIR VENT PIPING AND SLEEVE SIZE SHALL EQUAL AIR VALVE SIZE.
4. REFER TO VENT DETAILS 112 AND 112A.
5. PIPE WALL SLEEVE SHALL HAVE LINK SEAL OR EQUAL.
6. WHERE TOP OUTLET FITTING IS NOT PROVIDED BY MANUFACTURER, PROVIDE TAPPING SLEEVE WITH VERTICAL FLANGE TO SIZE OF AIR VALVE. CONTRACTOR TO DRY TAP MAIN LINE.
7. MANHOLE COVER & RING DETAILS 340 AND 341.
8. MANHOLE DETAIL 310.
9. PIPE OPENINGS IN MANHOLES RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (ASTM–923) "KOR–N–SEL" OR EQUAL.

CONSTRUCTION KEY NOTES:

A. FLANGED COMBINATION AIR AND VACUUM VALVE

B. FLANGED OR THREADED GATE VALVE

C. BLIND FLANGE AND WELDED, BRASS THREADED NIPPLE SAME SIZE AS AIR VALVE.

D. FLANGED OUTLET SAME SIZE AS AIR VALVE

E. GRAVEL BEDDING 12" DEEP

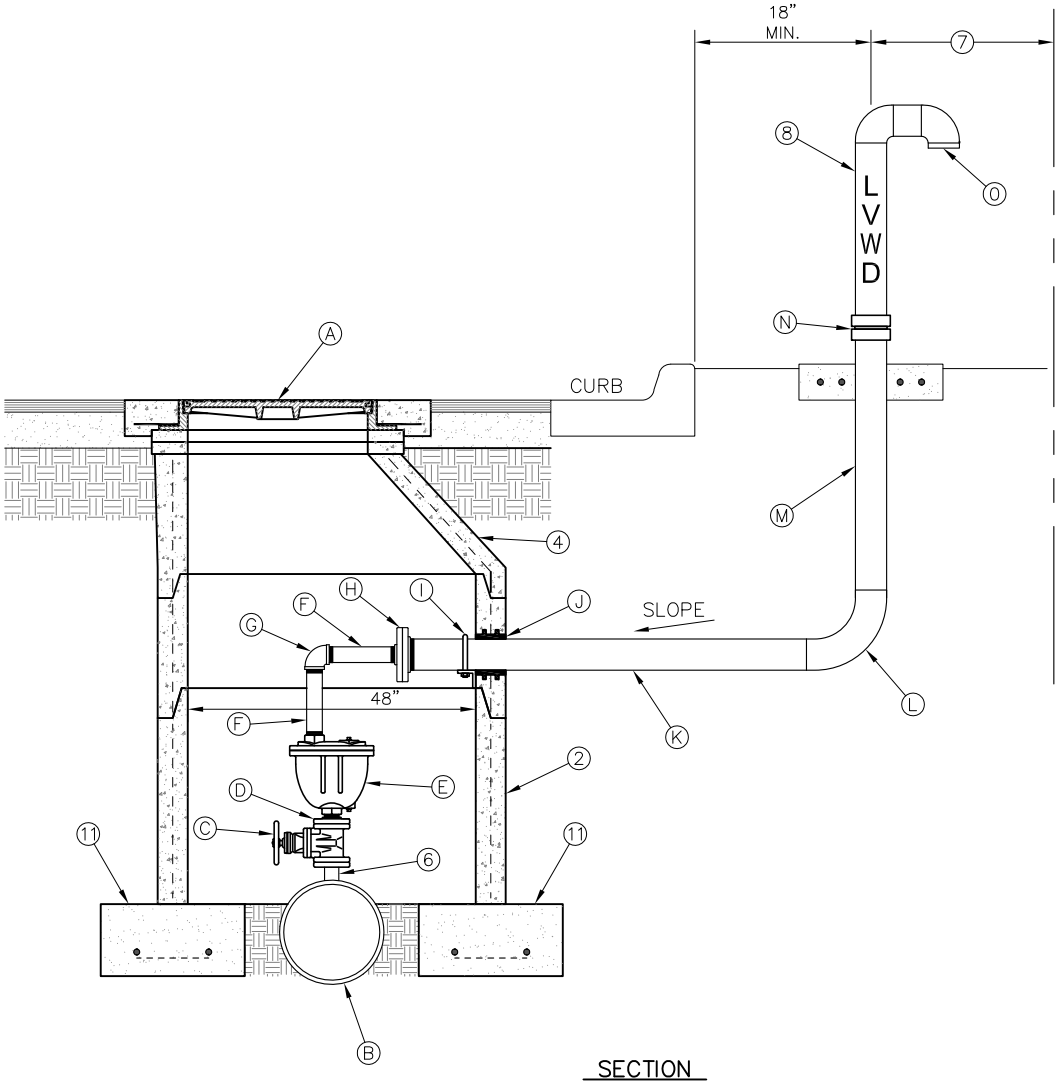
F. No. 5 AT 12" EACH WAY

G. CONCRETE FOOTING CLASS "A" CONCRETE MINIMUM 3,500 PSI.

H. WHEN INSTALLATION IS WITH IN TXDOT RIGHT–OF–WAY, VENT PIPE SHALL BE LOCATED 6" FROM EXISTING TXDOT RIGHT–OF–WAY.

I. INSECT SCREEN SHALL BE STAINLESS STEEL, #12 MAX.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	COMBINATION AIR RELEASE VALVE INSTALLATION – PAVED OR UNPAVED CONDITION 16" AND SMALLER (NO CURB) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 213



SECTION

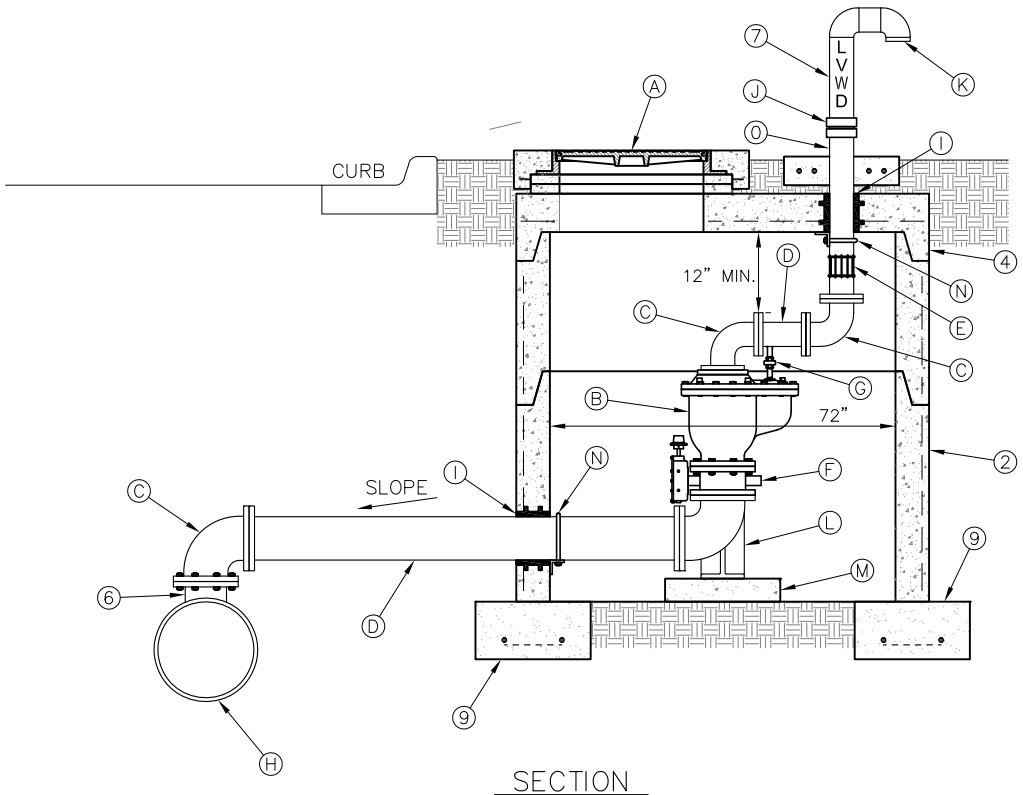
GENERAL NOTES:

1. INSTALLATION SHALL GENERALLY BE FOR A MAIN–LINE 16" AND SMALLER (2" COMBINATION AIR VALVE SHOWN). INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
2. PRE–CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C–478 AND SHALL MEET HS–20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.
3. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
4. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C–478.
5. VALVE AND PIPE SIZES AS SPECIFIED.
6. WHERE TOP OUTLET FITTING IS NOT PROVIDED BY MANUFACTURER, PROVIDE TAPPING SLEEVE (DRY TAP MAIN LINE) WITH VERTICAL FLANGE TO SIZE OF AIR VALVE.
7. WHEN INSTALLATION IS WITHIN TXDOT R.O.W., VENT PIPE SHALL BE LOCATED 6" FROM TXDOT R.O.W. VENT PIPE SHALL NOT BE PLACED IN SIDEWALK AREA.
8. AIR VENT PIPING (SEE DETAILS 112 AND 112A)
9. AIR VENT PIPING SHALL BE LOCATED CLEAR OF PAVED ROADWAY.
10. PRE–CAST MANHOLE SHALL NOT REST ON PIPE.
11. 12"X24" FOOTING WITH NO.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.

CONSTRUCTION KEY NOTES:

A. MANHOLE RING AND COVER (SEE DETAILS 340 & 341). SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.
B. MAINLINE, SIZE AS SPECIFIED.
C. 2" FLANGED GATE VALVE.
D. 2" CAST IRON COMPANION FLANGE
E. COMBINATION AIR VALVE, SIZE AS SPECIFIED
F. 2" MALE THREADED BRASS NIPPLE.
G. 2" FEMALE THREADED BRONZE 90° ELBOW.
H. 4"X2" CAST IRON REDUCING COMPANION FLANGE.
I. ANCHOR PIPING TO VALVE VAULT WITH 3"X3"X¼" ANGLE & ⅜"ø STRAP.
J. PIPE WALL SLEEVE (LINK SEAL OR EQUAL).
K. 4" FLANGED BY PLAIN END SCHEDULE 40 STEEL PIPE (GALVANIZED NOT ALLOWED).
L. 4" STEEL 90° BEND WELDED
M. 4" PLAIN END BY THREADED MALE SCHEDULE 40 STEEL PIPE (GALVANIZED NOT ALLOWED).
N. BREAK–A–WAY COUPLING, SEE DETAIL 113.
O. INSECT SCREEN SHALL BE STAINLESS STEEL, #12 MAX.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	COMBINATION AIR RELEASE VALVE FOR 16" AND SMALLER BENEATH PAVING INSTALLATION WITH CURB SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 214



SECTION

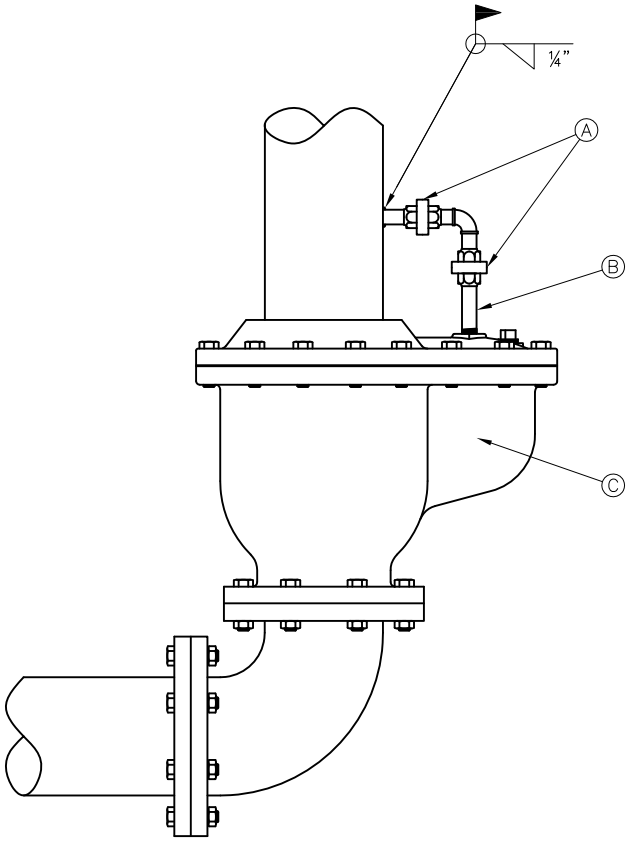
GENERAL NOTES:

1. INSTALLATION SHALL GENERALLY BE FOR A MAIN–LINE 20" AND LARGER (6" COMBINATION AIR VALVE SHOWN). INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
2. PRE–CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C–478 AND SHALL MEET HS–20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.
3. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
4. ECCENTRIC/CONCENTRIC LID (ECCENTRIC SHOWN), 8" THICK (SEE DETAIL 342).
5. VALVE AND PIPE SIZES AS SPECIFIED.
6. WHERE TOP OUTLET FITTING IS NOT PROVIDED BY MANUFACTURER, PROVIDE TAPPING SLEEVE (DRY TAP MAIN LINE) WITH VERTICAL FLANGE TO SIZE OF AIR VALVE.
7. AIR VENT PIPING SEE DETAILS 112 AND 112A.
8. AIR VENT PIPING SHALL BE LOCATED CLEAR OF PAVED ROADWAY.
9. 12"X24" FOOTING WITH NO.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.

CONSTRUCTION KEY NOTES:

A. MANHOLE RING AND COVER (SEE DETAILS 340 & 341). SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.
B. COMBINATION AIR VALVE, SIZE AS SPECIFIED.
C. 6" FLANGED 90° BEND.
D. 6" FLANGED SPOOL.
E. 6" DRESSER COUPLING (ROMAC 501 OR APPROVED EQUAL).
F. 6" FLANGED BUTTERFLY VALVE WITH VERTICAL OPERATING NUT.
G. AIR RELEASE PIPING, SEE DETAIL 216.
H. MAINLINE, SIZE AS SPECIFIED.
I. PIPE WALL SLEEVE (LINK SEAL OR EQUAL).
J. BREAK–A–WAY COUPLING, SEE DETAIL 113.
K. INSECT SCREEN SHALL BE STAINLESS STEEL, #12 MAX.
L. 6" FLANGED 90° BEND WITH INTEGRATED CAST BASE, BOLTED TO CONCRETE SUPPORT.
M. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
N. ANCHOR PIPING TO VALVE VAULT WITH 3"X3"X¼" ANGLE & ⅜"ø STRAP.
O. 4" PLAIN END BY THREADED MALE SCHEDULE 40 STEEL PIPE (GALVANIZED NOT ALLOWED).

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	COMBINATION AIR RELEASE VALVE FOR LINES 20" AND LARGER BEHIND CURB INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 215



CONSTRUCTION KEY NOTES:

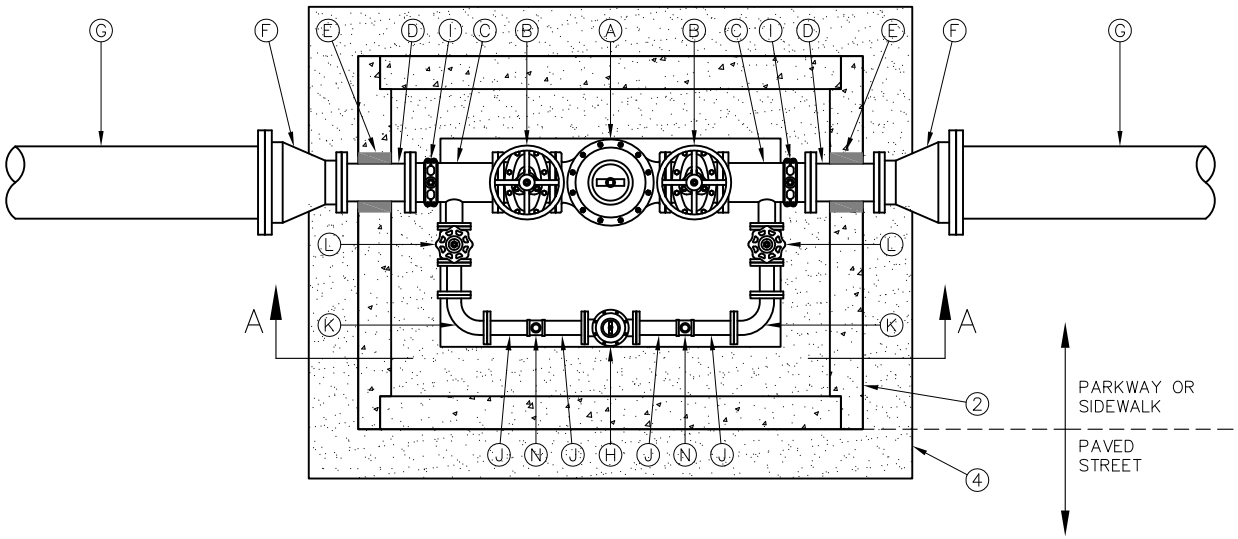
A. UNION SIZED FOR OUTLET PIPING (WHERE APPLICABLE).

B. STEEL AIR RELEASE OUTLET PIPING ROUTED INTO LARGER STEEL VACUUM PIPING.

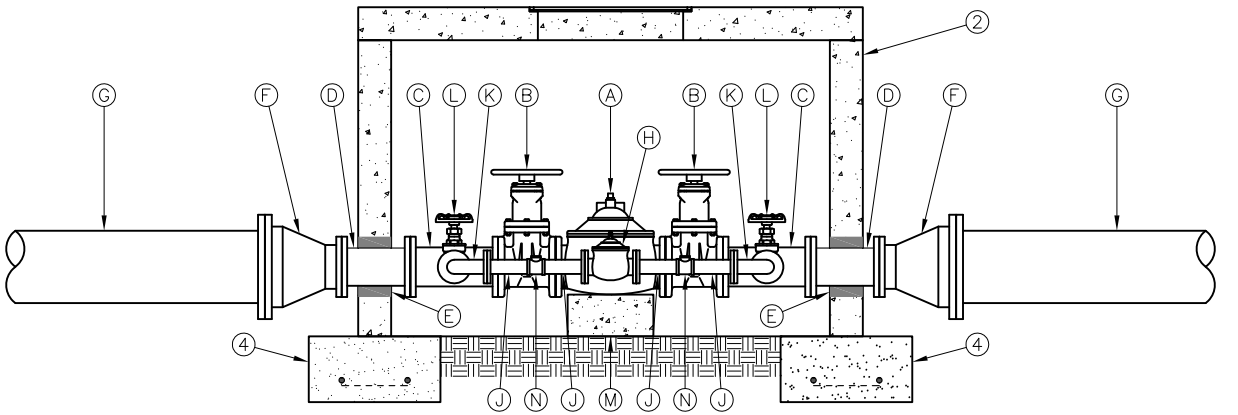
C. SINGLE BODY COMBINATION AIR RELEASE AIR VACUUM VALVE.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	AIR RELEASE PIPING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 216

TOP VIEW



SECTION A–A



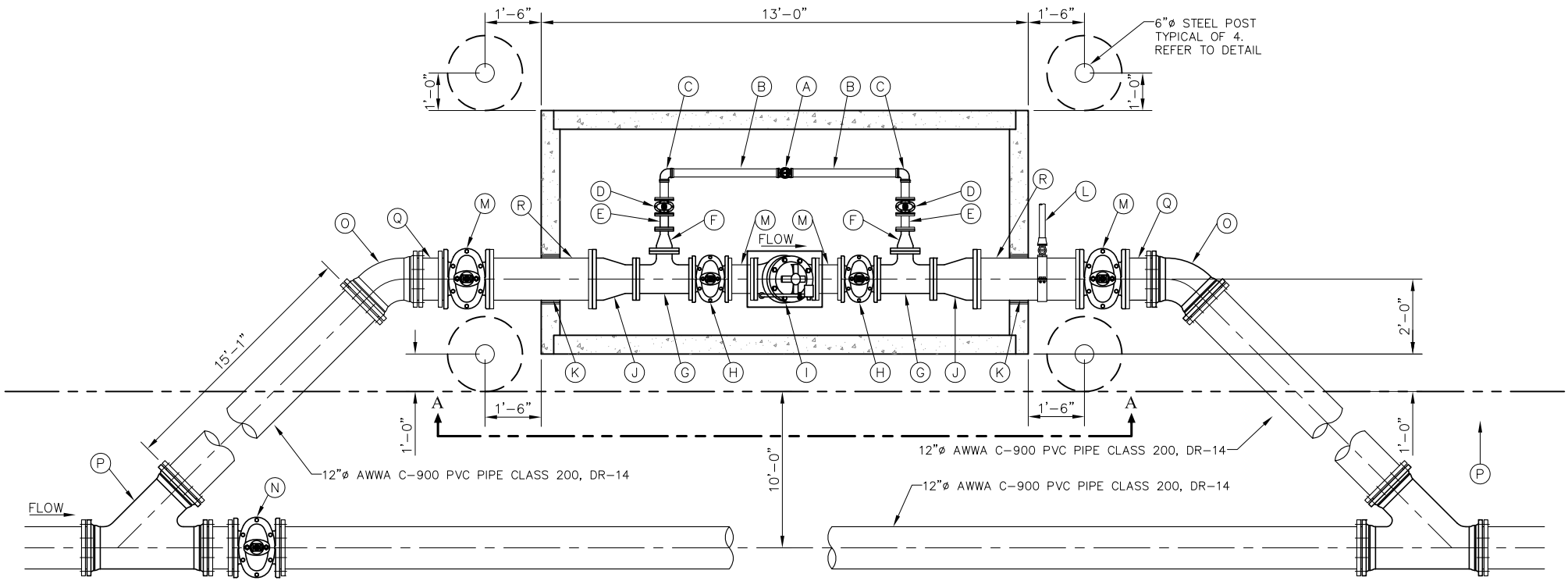
GENERAL NOTES:

1. INSTALLATION SHALL GENERALLY BE FOR A MAIN–LINE 12" AND SMALLER. INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
2. VALVE VAULT SHALL BE TYPE "E", SEE DETAIL 295–1. FOR PRESSURE REDUCING VALVES LARGER THAN 6", VAULT SIZE SHALL BE INCREASED TO ACCOMMODATE LARGER APPURTENANCES. LARGER VAULT DIMENSIONS MUST BE APPROVED BY THE EPWU.
3. PRESSURE RELIEF VALVE MAY BE LOCATED EITHER UPSTREAM OR DOWNSTREAM OF PRESSURE REDUCING VALVE DEPENDING ON A SUITABLE DISCHARGE LOCATION. WHEN RELIEF VALVE IS LOCATED DOWNSTREAM REDUCING VALVE SHALL BE EQUIPPED WITH A PRESSURE RELIEF PILOT AS NOTED IN A AND N. RELIEF VALVE SIZE IS GENERALLY ONE OR TWO SIZES SMALLER THAN THE SIZE OF THE MAINLINE.
4. 12"X24" FOOTING WITH NO.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.
5. TEST OUTLETS TO BE PLACED BEFORE AND AFTER PRESSURE REDUCERS. SEE DETAIL 264–5 FOR TEST OUTLET DETAIL.

CONSTRUCTION KEY NOTES:

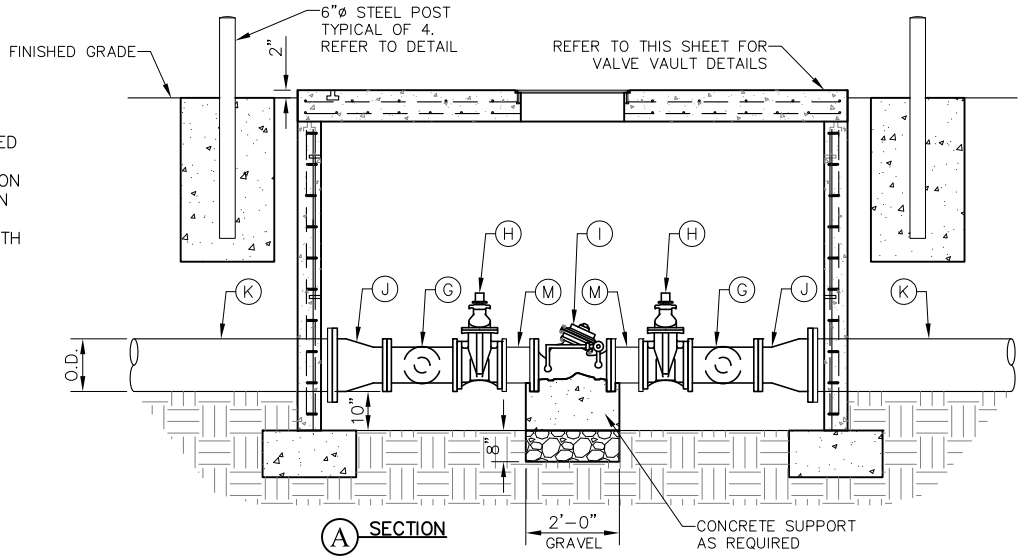
A. 6" FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR HIGH FLOWS.
B. 6" FLANGED GATE VALVE WITH HANDWHEEL.
C. 6"X2" FLANGED TEE.
D. 6" DUCTILE IRON FLANGED SPOOL.
E. WALL SLEEVES AND/OR GROUT.
F. FLANGED REDUCER (6" X MAINLINE SIZE AS SPECIFIED).
G. MAINLINE, SIZE AS SPECIFIED.
H. 2" FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR LOW FLOWS.
I. 6"X¾" TAPPING SADDLE & ¾" TEST OUTLET WITH CORPORATION STOP.
J. 2" FLANGED BRASS OR DUCTILE IRON SPOOL.
K. 2" FLANGED 90° BEND.
L. 2" GATE VALVE WITH HANDWHEEL.
M. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
N. 2"X1" BRONZE TEE WITH 1" TO ¾" ADAPTER & ¾" TEST OUTLET WITH CORPORATION STOP.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	PRESSURE REDUCING VALVE (IN–LINE) BEHIND CURB INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 217



GENERAL NOTES:

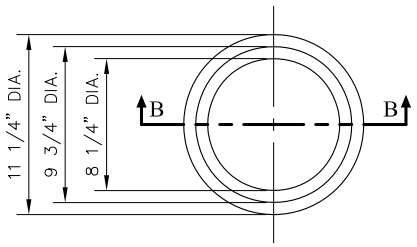
1. VALVE VAULT AND COVER SHALL BE IN ACCORDANCE WITH LVWD DETAILS.
2. PRESSURE RELIEF VALVE MAY BE LOCATED EITHER UPSTREAM OR DOWNSTREAM OF PRESSURE REDUCING VALVE DEPENDING ON A SUITABLE DISCHARGE LOCATION. WHEN RELIEF VALVE IS LOCATED DOWNSTREAM REDUCING VALVE SHALL BE EQUIPPED WITH A PRESSURE RELIEF PILOT AS NOTED IN "A" AND "I".
3. FOOTING REQUIRED WHEN PLACED NEAR TO TXDOT RIGHT-OF-WAY.



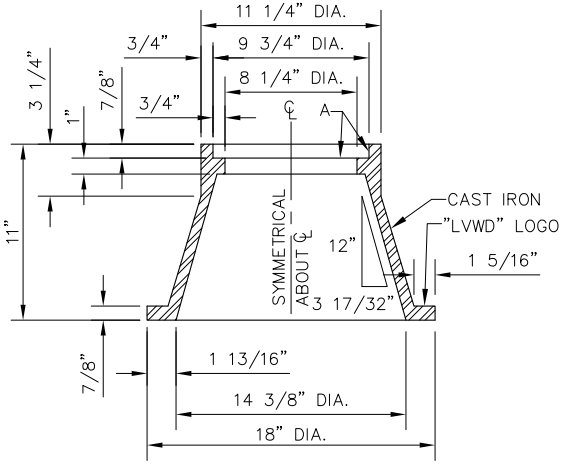
CONSTRUCTION KEY NOTES:

A. 2" PRESSURE REDUCING VALVE (FE X FE), WITH SURGE RELIEF PILOT, FOR LOW FLOWS
B. 2" DIAMETER BRASS SPOOL (FE X FE)
C. 2" 90° BRASS ELBOW (COMPRESSION X FE)
D. 2" GATE VALVE (FE X FE)
E. 2" DIAMETER BRASS NIPPLE (FE X FE)
F. 4" X 2" REDUCER (FE X FE)
G. 8" X 4" TEE (FE X FE)
H. 8" GATE VALVE (FE X FE)
I. 8" FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR HIGH FLOWS, AS MANUFACTURED BY BERMAD INC., OR APPROVED EQUAL.
J. 12" X 8" REDUCER (FE X FE)
K. 12" DUCTILE IRON SPOOL (FE X FE)
L. TO PRESSURE RELIEF, VALVE SIZE IS GENERALLY ONE OR TWO SIZES SMALLER THAN THE SIZE OF THE MAINLINE.
M. 12" GATE VALVE (FE X MJ)
N. 12" GATE VALVE (MJ X MJ)
O. 12" 45° ELBOW (MJ X MJ)
P. 12" WYE (MJ X MJ)
Q. 12" AWWA C900 PVC PIPE CLASS 200, DR-14
R. WALL SLEEVES, SEAL ALL VOIDS WITH CAULKING, (SONNEBORN NP1)

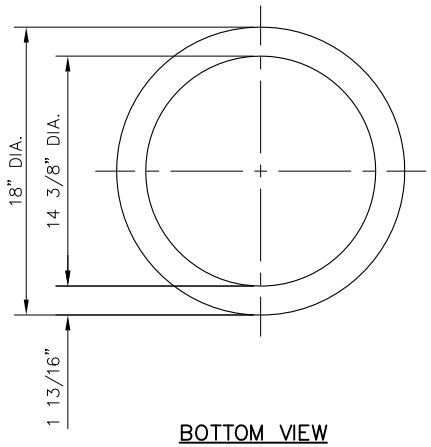
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PRESSURE RELIEF VALVE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 218



TOP VIEW



B SECTION



BOTTOM VIEW

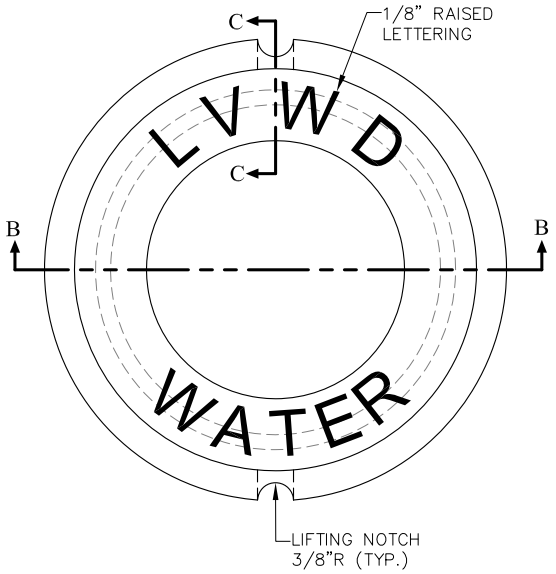
NOTES:

1. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.
2. WEIGHT OF BONNET BOX IS 95 POUNDS.

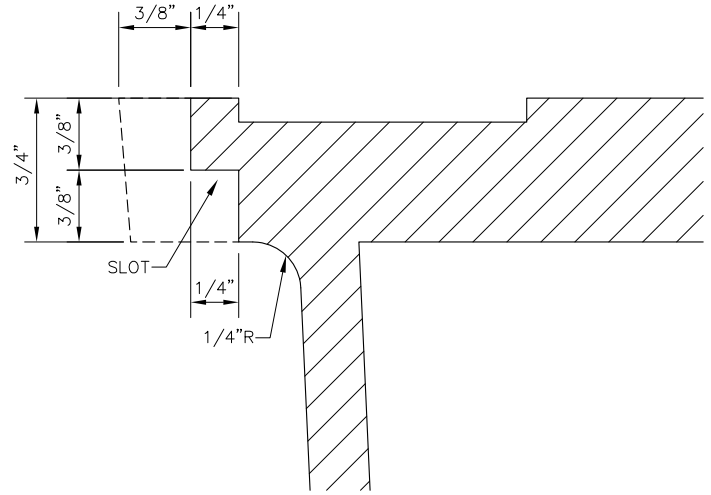
KEYED NOTES:

A. TO BE ROUGH GROUND OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.

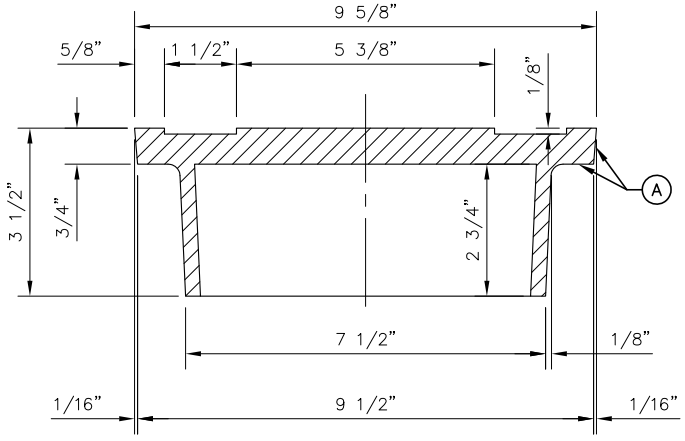
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	BONNET BOX SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 219



TOP VIEW



C SECTION



B SECTION

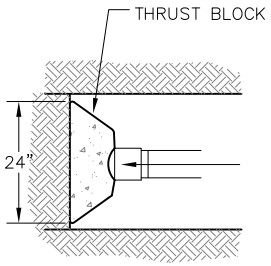
NOTES:

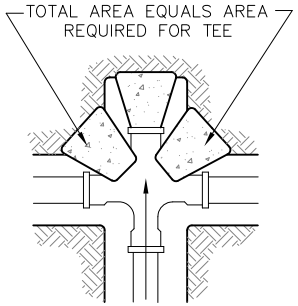
1. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.
2. WEIGHT OF COVER IS 18 POUNDS.

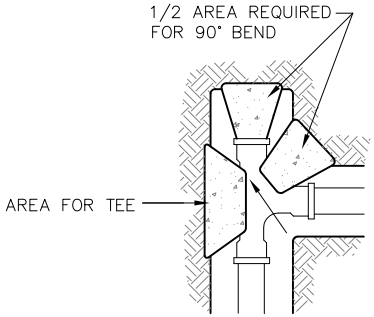
KEYED NOTES:

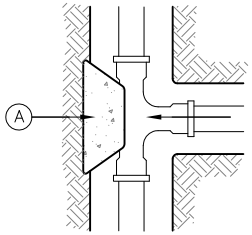
A. TO BE ROUGH GROUND OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.

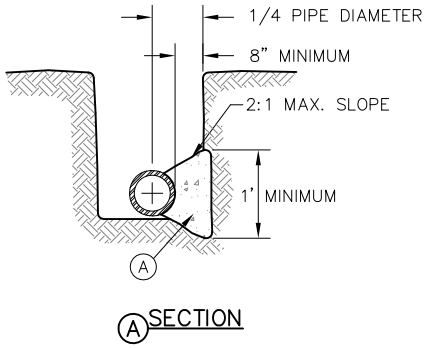
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	BONNET BOX COVER (FLIP RESISTANT) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 220



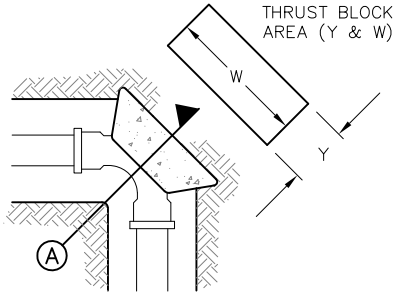








Ⓐ SECTION



GENERAL NOTES:

1. TABLE IS BASED ON 2,000#/SQ. FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPE LARGER THAN 18" SHALL BE CALCULATED.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSION STRENGTH OF 2,500 PSI.
4. THRUST BLOCK IS TO EXTEND TO UNDISTURBED SOIL.
5. SIZE MAY BE DECREASED FOR LESSER DEGREE BENDS AS DETERMINED BY ENGINEER.
6. KEEP CONCRETE CLEAR OF M.J. OR BELL AND SPIGOT JOINTS.
7. BLOCK IN A SIMILAR MANNER AT TEES, HYDRANTS, PLUG OR OTHER LOCATIONS AS REQUIRED.
8. IF CONCRETE BLOCKS CANNOT BE POURED, THEN USE TIE–RODS OR OTHER APPROVED METHOD TO RESTRAIN THRUST.

CONSTRUCTION KEY NOTES:

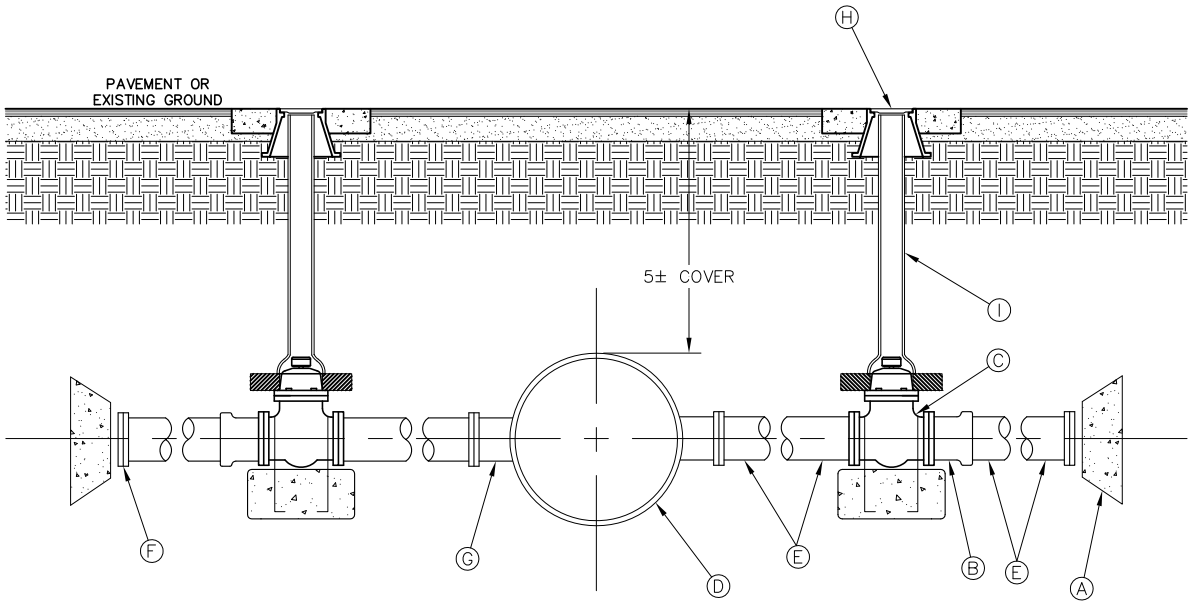
A. LENGTH "Y & W" AS REQUIRED TO OBTAIN BEARING AREA AGAINST UNDISTURBED SOIL.

B. ADDITIONAL EXCAVATION IF NECESSARY TO OBTAIN REQUIRED BEARING AREA.

C. MINIMUM THRUST BLOCK AREA REQUIREMENTS FOR (Y & W) AS FOLLOWS:

PIPE SIZE	WATER PIPE	
	TEE, DEAD END 90° BEND	45° AND 22 1/2° BENDS
4" & LESS	3 SQ. FEET	3 SQ. FEET
6"	4 SQ. FEET	3 SQ. FEET
8"	6 SQ. FEET	3 SQ. FEET
10"	9 SQ. FEET	5 SQ. FEET
12"	13 SQ. FEET	7 SQ. FEET
16"	23 SQ. FEET	12 SQ. FEET
18"	29 SQ. FEET	15 SQ. FEET

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	CONCRETE THRUST BLOCKING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 221



SIDE OUTLET CONNECTION

GENERAL NOTES:

1. INSTALLATION SHOWN TYPICAL FOR 24" PIPE OR LARGER FOR FUTURE WATER CONNECTION.
2. BONNET BOX, PIPE RISER, & VALVE INSTALLATION AS PER DETAILS 219 AND 202.

CONSTRUCTION KEY NOTES:

A. PROVIDE ADEQUATE CONCRETE THRUST BLOCKING.

B. FLANGE TO P.V.C. ADAPTER.

C. FLANGED GATE VALVE WITH CONCRETE ANCHOR (SEE DETAIL 203.)

D. MAIN WATER LINE PIPE.

E. ONE (1) JOINT OF AWWA C900 P.V.C. PIPE CLASS 235.

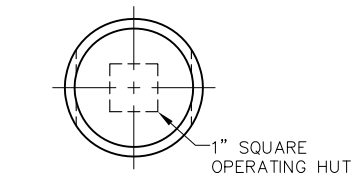
F. CAP OR F.H. CONNECTION.

G. FLANGED SIDE OUTLET (INSTALLED BY PIPE MANUFACTURER).

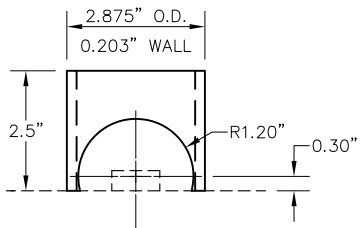
H. BONNET BOX AND COVER (SEE DETAILS 219 & 220) SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.

I. 8" PIPE RISER. (P.V.C. S.D.R.–35)

STANDARD DETAIL	DATE: XXX REV: APR. 2017	SIDE OUTLET CONNECTION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 222



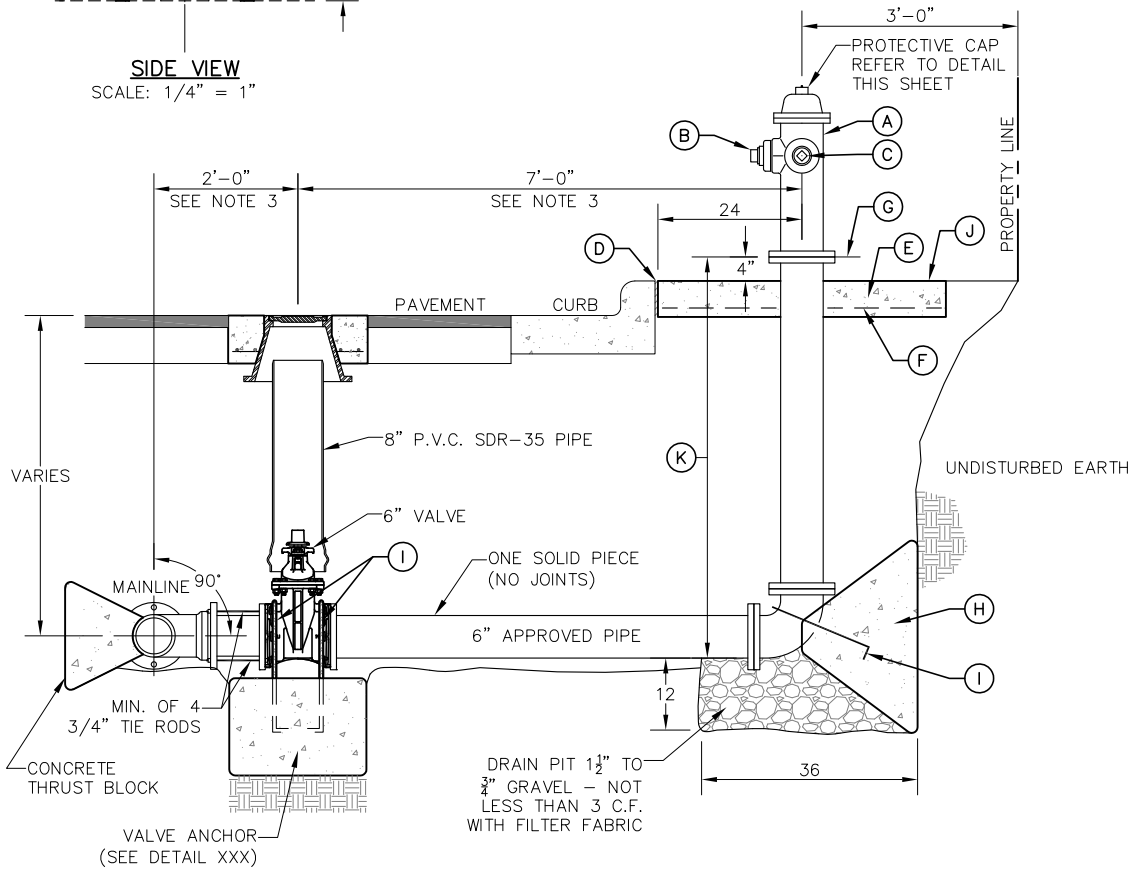
TOP VIEW
SCALE: 1/4" = 1"



SIDE VIEW
SCALE: 1/4" = 1"

CAP NOTES:

1. STEEL CAPS TO BE MACHINED FROM STEEL PIPE:
   NOMINAL SIZE = 2 1/2" DIA.
   OUTSIDE DIA. = 2.875"
   WALL THICKNESS = 0.203
   LBS/FT. = 5.79
2. CAPS ARE TO BE TACK WELDED OR BRAZED ON FIRE HYDRANT BONNET OR WEATHER CAP.
3. THE CAPS OVER THE OPERATING NUT WILL PREVENT ACCESS TO THE UNAUTHORIZED USE OF HYDRANT WATER.



NOTES:

1. NO OBSTRUCTIONS WILL BE PERMITTED WITHIN THREE (3') FEET. IN ALL DIRECTIONS OF FIRE HYDRANT. FIRE HYDRANT SHALL NOT BE PLACED IN WHEEL CHAIR RAMP OR DRIVEWAY.
2. FIRE HYDRANT SHALL BE LOCATED AT THE BEGINNING OF CURB RETURN OR AT THE PROPERTY LINE COMMON TO ADJOINING LOTS, UNLESS OTHERWISE SHOWN ON PLANS. REFER TO DETAIL NO. 225 FOR SPECIAL CASES.
3. WHERE DISTANCE IS LESS THAN SEVEN (7') FEET, HYDRANT SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL NO. 225.
4. VALVE MAY BE CONNECTED TO TEE AT MAIN LINE. USE FLANGED MECHANICAL JOINT ENDS. WHERE SPOOL IS REQUIRED BETWEEN TEE AND VALVE, USE FLANGED MECHANICAL ENDS WITH 3/4" DIAMETER TIE RODS.
5. COMPLY WITH REQUIREMENTS OF AWWA C-502, DRY BARREL FIRE HYDRANTS AND AWWA C-550, PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.
6. ALL JOINTS TO BE RESTRAINED WITH "MEGA-LUG" OR APPROVED EQUAL.
7. BOLLARDS WILL BE REQUIRED TO PROTECT FIRE HYDRANT IN AREAS OF HIGH TRAFFIC. COORDINATE WITH L.V.W.D.

KEYED NOTES:

A. FIRE HYDRANT TO BE MUELLER, KENNEDY MODEL OR APPROVED EQUAL.

B. PUMPER NOZZLE 4" TO BE FACING THE TRAVELED WAY, UNLESS OTHERWISE NOTED IN THE PLANS.

C. HOSE NOZZLE 2 1/2".

D. 1/2" PREMOLDED EXPANSION JOINT WITH 1" TOP FILLER.

E. 2'x2'x6" CONC. SQ. PAD, TO BE CONSTRUCTED AROUND FIRE HYDRANT'S CENTER LINE WHEN NOT LOCATED WITHIN SIDEWALK OR CONC. AREA.

F. REINFORCE CONCRETE WITH 6x6-W1.4xW1.4 WELDED WIRE FABRIC.

G. CONTROLLED ELEVATION LINE, LEVEL IN ALL DIRECTIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING TOP FLANGE OF THE HYDRANT TO CONTROLLED ELEVATION.

H. CONC. THRUST BLOCK, APPROX. 2'x2'x3' TO BE POURED AGAINST UNDISTURBED EARTH, F.H. WEEP HOLE MUST BE UNOBSTRUCTED.

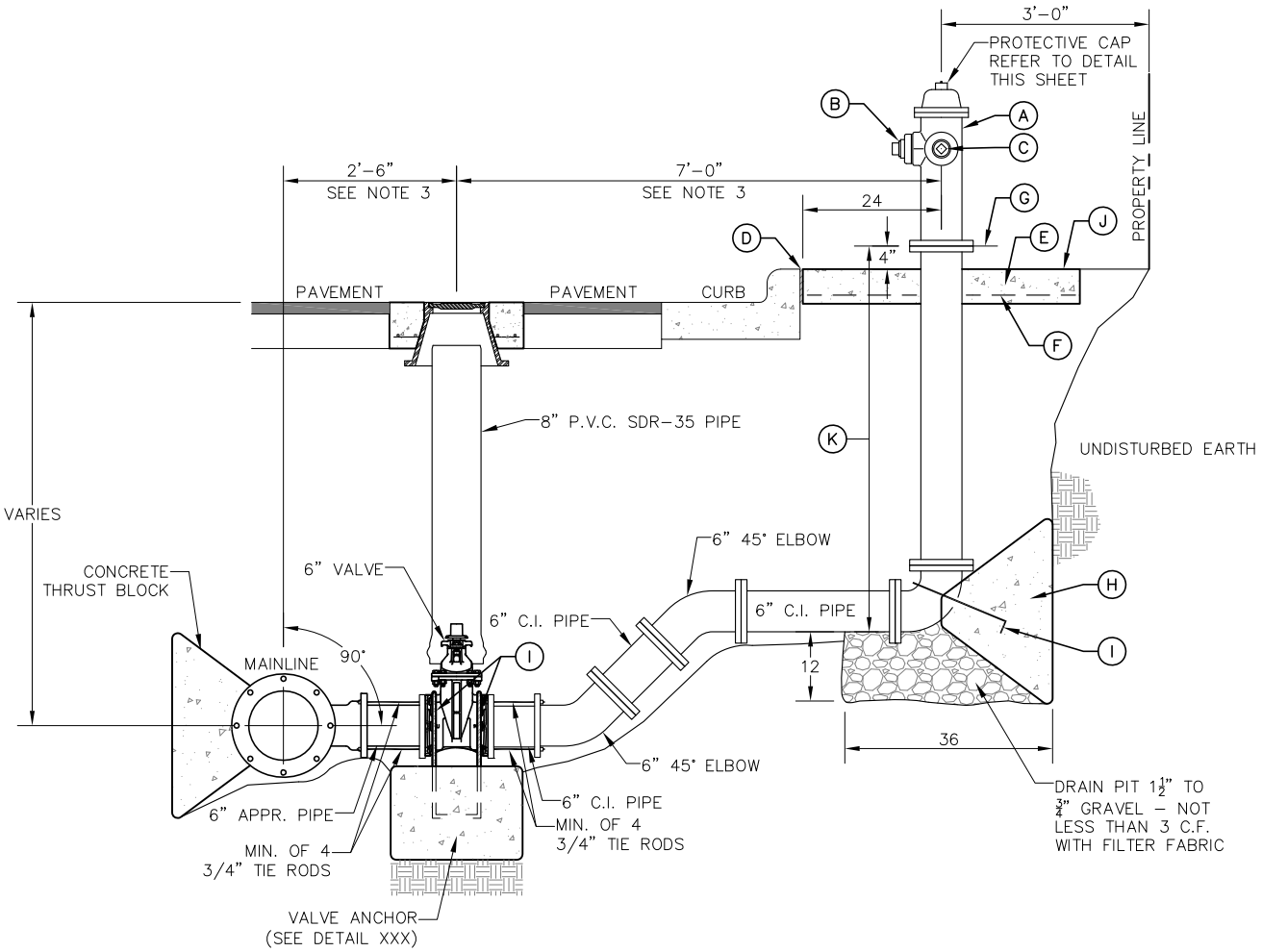
I. NO. 5 REBAR ANCHOR PINS.

J. TOP OF SLAB SHALL BE AT CURB LEVEL 4" BELOW THE BREAK LINE OF THE HYDRANT. UNDER SPECIAL CONDITIONS THE ENGINEER MAY ALLOW VARIATIONS TO THIS CONSTRUCTION.

K. CONTRACTOR IS TO PROVIDE ADDITIONAL SPOOLS IF NEEDED TO MAINTAIN THE 4' MIN. CLEARANCE FROM THE CONTROLLED ELEV. LINE TO TOP OF SLAB.

L. GREASE ALL NUTS AND BOLTS PRIOR TO WRAPPING WITH POLYETHYLENE.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD FIRE HYDRANT INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 223



NOTES:

1. NO OBSTRUCTIONS WILL BE PERMITTED WITHIN THREE (3') FEET. IN ALL DIRECTIONS OF FIRE HYDRANT. FIRE HYDRANT SHALL NOT BE PLACED IN WHEEL CHAIR RAMP OR DRIVEWAY.
2. FIRE HYDRANT SHALL BE LOCATED AT THE BEGINNING OF CURB RETURN OR AT THE PROPERTY LINE COMMON TO ADJOINING LOTS, UNLESS OTHERWISE SHOWN ON PLANS. REFER TO DETAIL NO. 225 FOR SPECIAL CASES.
3. WHERE DISTANCE IS LESS THAN SEVEN (7') FEET, HYDRANT SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL NO. 225.
4. VALVE MAY BE CONNECTED TO TEE AT MAIN LINE. USE FLANGED MECHANICAL JOINT ENDS. WHERE SPOOL IS REQUIRED BETWEEN TEE AND VALVE, USE FLANGED MECHANICAL ENDS WITH 3/4" DIAMETER TIE RODS.
5. COMPLY WITH REQUIREMENTS OF AWWA C-502, DRY BARREL FIRE HYDRANTS AND AWWA C-550, PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.
6. ALL JOINTS TO BE RESTRAINED WITH "MEGA-LUG" OR APPROVED EQUAL.
7. BOLLARDS WILL BE REQUIRED TO PROTECT FIRE HYDRANT IN AREAS OF HIGH TRAFFIC. COORDINATE WITH L.V.W.D.

KEYED NOTES:

A. FIRE HYDRANT TO BE MUELLER, KENNEDY MODEL OR APPROVED EQUAL.

B. PUMPER NOZZLE 4" TO BE FACING THE TRAVELED WAY, UNLESS OTHERWISE NOTED IN THE PLANS.

C. HOSE NOZZLE 2 1/2".

D. 1/2" PREMOLDED EXPANSION JOINT WITH 1" TOP FILLER.

E. 2'x2'x6" CONC. SQ. PAD, TO BE CONSTRUCTED AROUND FIRE HYDRANT'S CENTER LINE WHEN NOT LOCATED WITHIN SIDEWALK OR CONC. AREA.

F. REINFORCE CONCRETE WITH 6x6-W1.4xW1.4 WELDED WIRE FABRIC.

G. CONTROLLED ELEVATION LINE, LEVEL IN ALL DIRECTIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING TOP FLANGE OF THE HYDRANT TO CONTROLLED ELEVATION.

H. CONC. THRUST BLOCK, APPROX. 2'x2'x3' TO BE POURED AGAINST UNDISTURBED EARTH, F.H. WEEP HOLE MUST BE UNOBSTRUCTED.

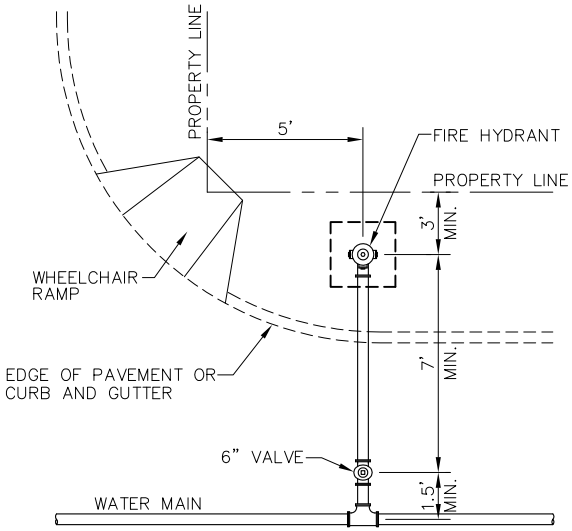
I. NO. 5 REBAR ANCHOR PINS.

J. TOP OF SLAB SHALL BE AT CURB LEVEL 4" BELOW THE BREAK LINE OF THE HYDRANT. UNDER SPECIAL CONDITIONS THE ENGINEER MAY ALLOW VARIATIONS TO THIS CONSTRUCTION.

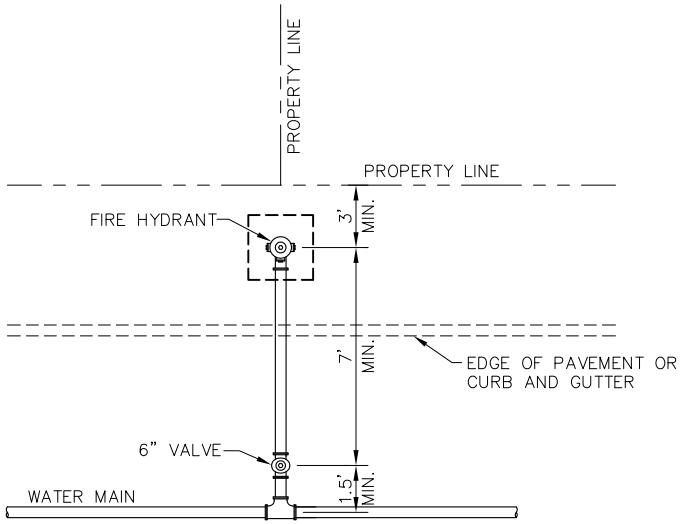
K. CONTRACTOR IS TO PROVIDE ADDITIONAL SPOOLS IF NEEDED TO MAINTAIN THE 4' MIN. CLEARANCE FROM THE CONTROLLED ELEV. LINE TO TOP OF SLAB.

L. GREASE ALL NUTS AND BOLTS PRIOR TO WRAPPING WITH POLYETHYLENE.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	FIRE HYDRANT INSTALLATION (12" MAIN OR LARGER) SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 224



CASE I

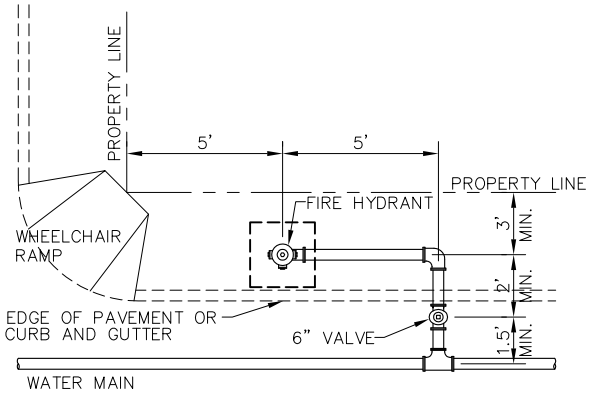


CASE II

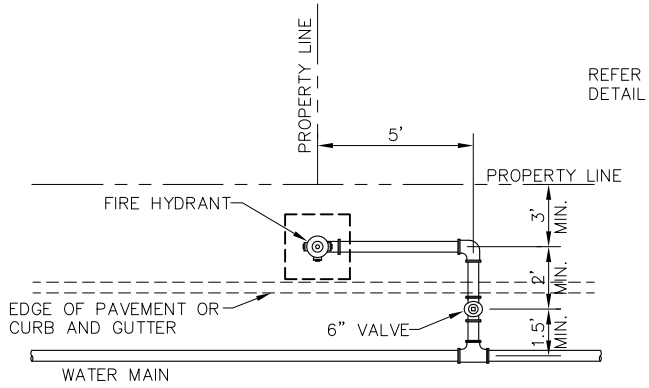
STANDARD LOCATIONS

GENERAL NOTES:

1. FOR CASE I FIRE HYDRANT SHALL BE LOCATED AT A DISTANCE OF 5 FT. MINIMUM FROM THE PROPERTY LINE OR AT THE BEGINNING OF CURB RETURN.
2. FOR CASE II FIRE HYDRANT SHALL BE LOCATED AT THE PROPERTY LINE COMMON TO ADJOINING LOTS.
3. FOR CASE III AND IV WHERE THE DISTANCE BETWEEN THE VALVE AND THE HYDRANT IS LESS THAN 7 FT. PLACE HYDRANT AS SHOWN.
4. FOR INSTALLATION OF FIRE HYDRANT SEE DETAILS 223 AND 224 THIS MANUAL.
5. A MINIMUM CLEARANCE OF 3 FT. WILL BE PROVIDED BETWEEN A FIRE HYDRANT AND PROPERTY LINE OR A PERMANENT OBSTRUCTION (UTILITY POLE, LIGHT STANDARD, TRAFFIC SIGNAL, WHEEL CHAIR RAMP, FENCE PROTECTIVE POSTS, ETC.)
6. LOCATION OF FIRE HYDRANT WITHIN SIDEWALK AND/OR PARKWAY SHALL CONSIDER ALL A.D.A. REQUIREMENTS.
7. NO JOINTS ALLOWED BETWEEN VALVE AND FIRE HYDRANT.

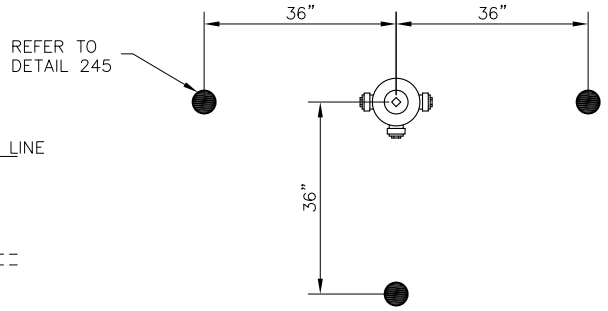


CASE III



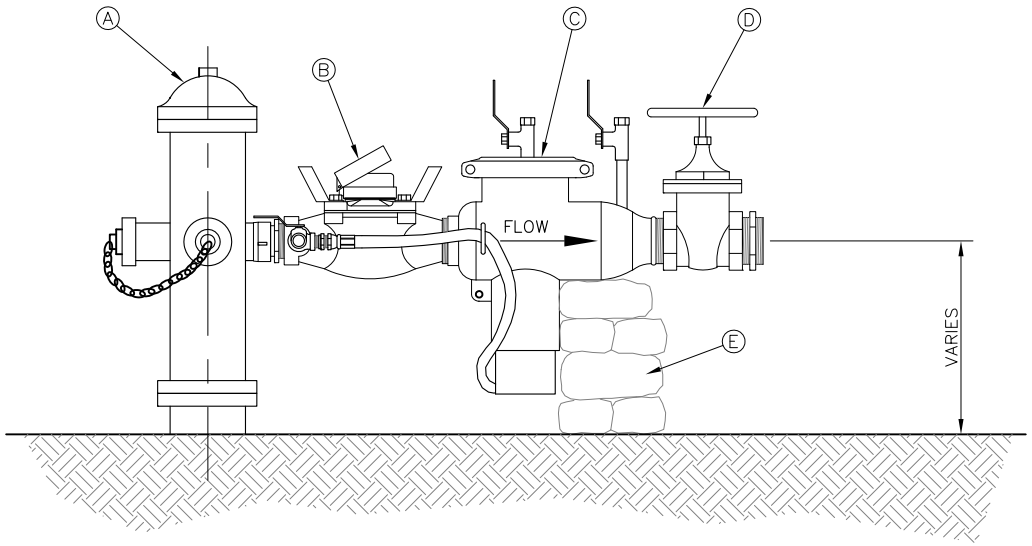
CASE IV

SPECIAL LOCATIONS



(FIRE HYDRANT BOLLARDS AS NEEDED.)

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	FIRE HYDRANT LOCATIONS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 225



FIRE METER INSTALLATION

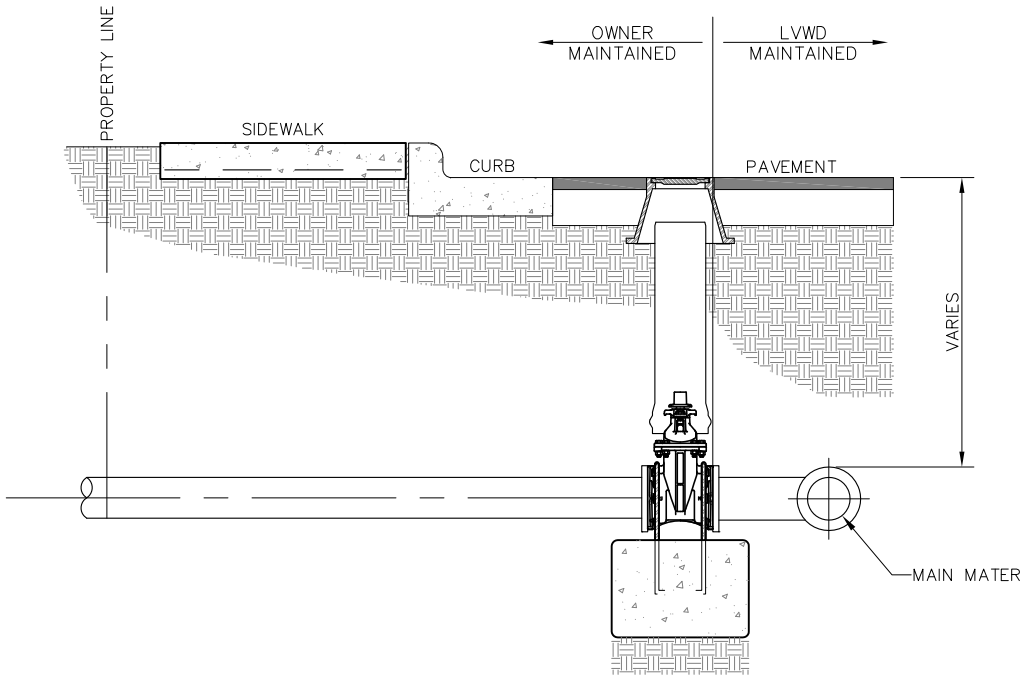
GENERAL NOTES:

1. USE OF HYDRANT REQUIRES VALID HYDRANT USE PERMIT. CONTACT LVWD ENGINEERING DEVELOPER SERVICES SECTION FOR APPLICATION.
2. METER AND BACKFLOW DEVICE SHALL BE FULLY SUPPORTED WHEN CONNECTED TO FIRE HYDRANT.
3. METER AND BACKFLOW DEVICE SHALL BE APPROVED BY LVWD. (MS–30) METER MUST BE INSPECTED AND NUMBERED BY LVWD BEFORE BEING PLACED IN SERVICE.
4. METER SHALL BE TESTED ANNUALLY BY LVWD.
5. BACKFLOW DEVICE SHALL BE TESTED ANNUALLY AND COPY OF TEST SHALL BE SENT TO LVWD, BEFORE USAGE WILL BE ALLOWED.
6. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO FIRE HYDRANT DURING USE.

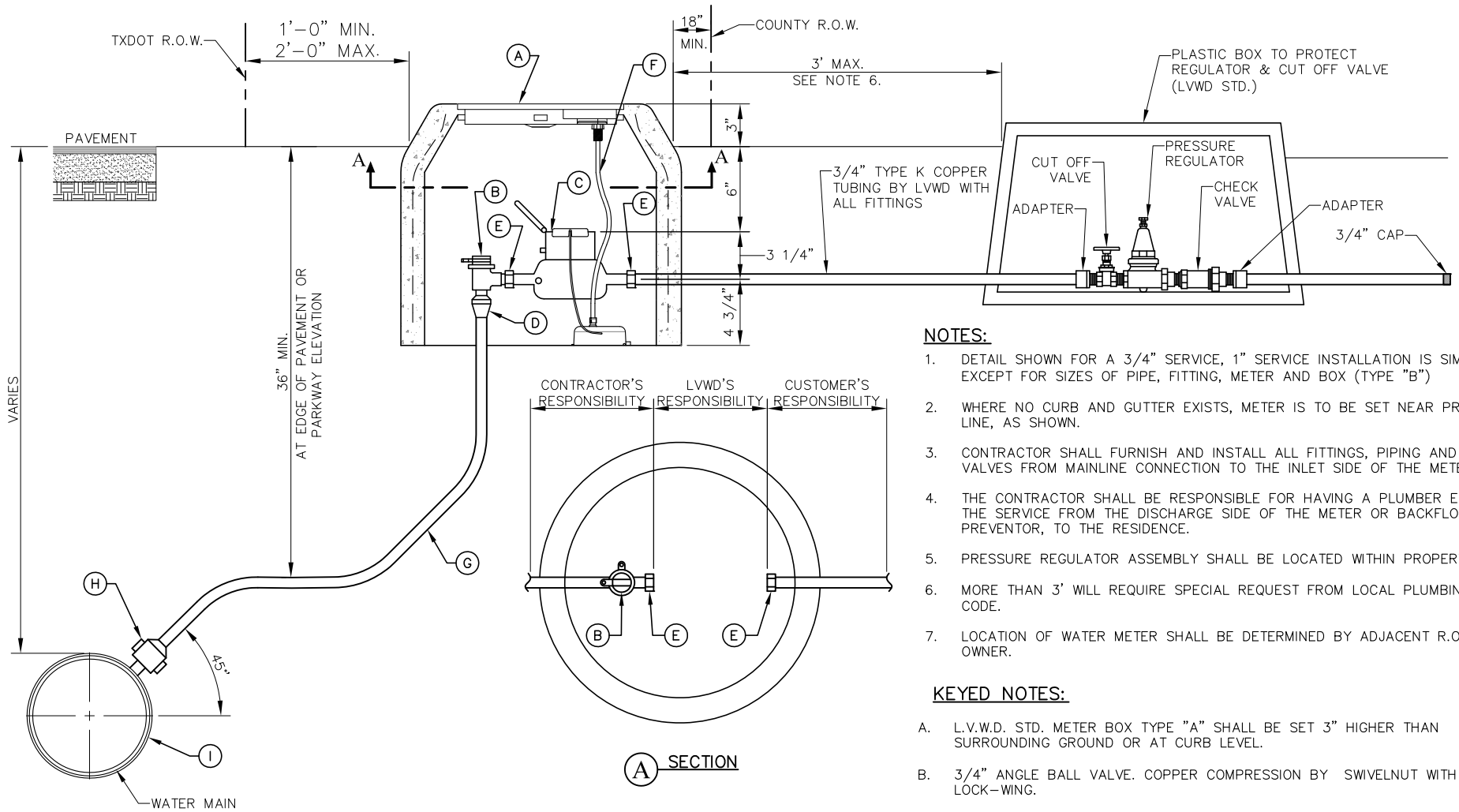
CONSTRUCTION KEY NOTES:

A. EXISTING FIRE HYDRANT
B. FIRE HYDRANT METER
C. BACKFLOW PREVENTER
D. 3" GATE VALVE WITH HANDWHEEL
E. SANDBAGS OR EQUAL FOR SUPPORT

STANDARD DETAIL	DATE: XXX REV: APR. 2017	FIRE HYDRANT CONSTRUCTION METER SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 226



STANDARD DETAIL	DATE: XXX REV: APR. 2017	FIRE LINE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 227



NOTES:

1. DETAIL SHOWN FOR A 3/4" SERVICE, 1" SERVICE INSTALLATION IS SIMILAR EXCEPT FOR SIZES OF PIPE, FITTING, METER AND BOX (TYPE "B")
2. WHERE NO CURB AND GUTTER EXISTS, METER IS TO BE SET NEAR PROPERTY LINE, AS SHOWN.
3. CONTRACTOR SHALL FURNISH AND INSTALL ALL FITTINGS, PIPING AND VALVES FROM MAINLINE CONNECTION TO THE INLET SIDE OF THE METER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A PLUMBER EXTEND THE SERVICE FROM THE DISCHARGE SIDE OF THE METER OR BACKFLOW PREVENTOR, TO THE RESIDENCE.
5. PRESSURE REGULATOR ASSEMBLY SHALL BE LOCATED WITHIN PROPERTY.
6. MORE THAN 3' WILL REQUIRE SPECIAL REQUEST FROM LOCAL PLUMBING CODE.
7. LOCATION OF WATER METER SHALL BE DETERMINED BY ADJACENT R.O.W. OWNER.

KEYED NOTES:

A. L.V.W.D. STD. METER BOX TYPE "A" SHALL BE SET 3" HIGHER THAN SURROUNDING GROUND OR AT CURB LEVEL.

B. 3/4" ANGLE BALL VALVE. COPPER COMPRESSION BY SWIVELNUT WITH LOCK-WING.

C. WATER METER TO BE INSTALLED BY LVWD. AN 8" GAP SHALL BE LEFT FOR METER INSTALLATION.

D. COMPRESSION FITTING OF SERVICE LINE.

E. INLET AND OUTLET COUPLING; CONTRACTOR'S AND CUSTOMER'S RESPONSIBILITY.

F. NEPTUNE R9000 TRANSPONDER.

G. 3/4" (TYPE K) COPPER TUBING WITH COMPRESSION FITTINGS.

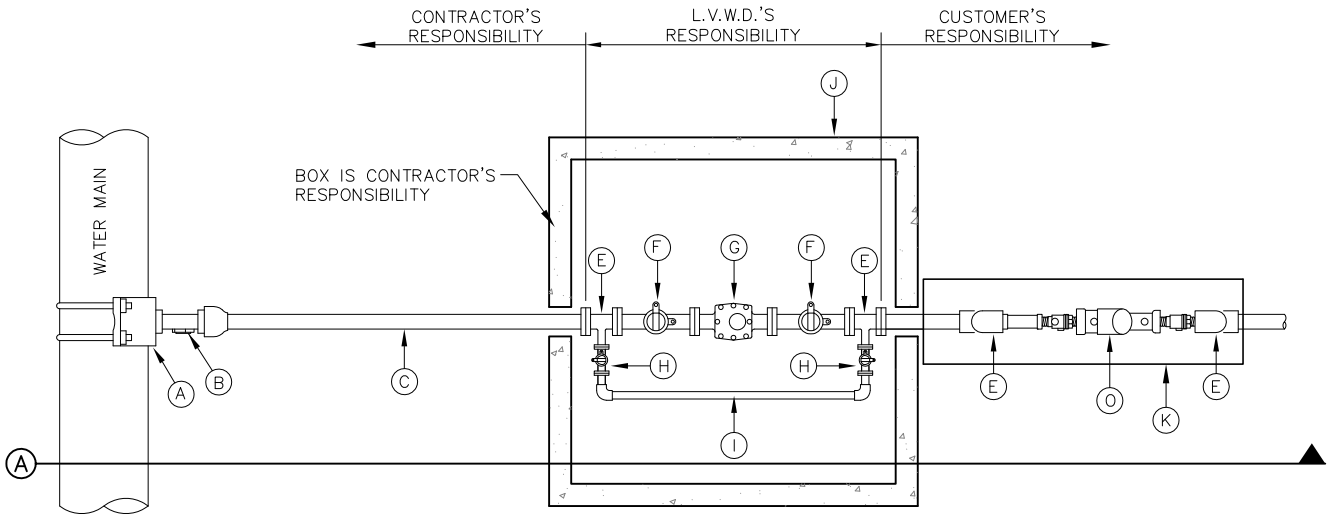
H. 3/4" CORPORATION STOP, COMPRESSION X COMPRESSION.

I. DOUBLE STRAP SERVICE SADDLE.

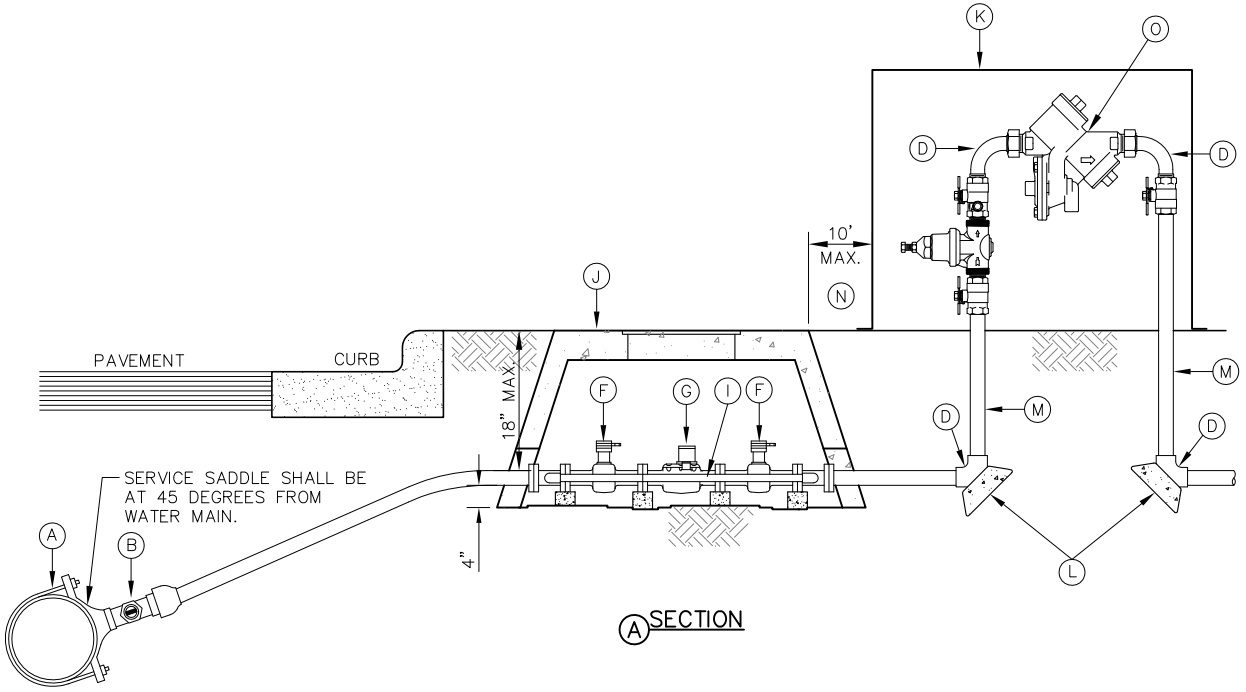
THERMAL EXPANSION NOTES:

1. THE INSTALLATION OF "NON-RETURN DEVICES" SUCH AS BACKFLOW PREVENTION ASSEMBLIES, CHECK VALVES, DUAL CHECK VALVES, PRESSURE REDUCING OR PRESSURE REGULATING VALVES, AND WATER SOFTENERS BETWEEN THE WATER SERVICE CONNECTION AND THE DOMESTIC WATER HEATER MAY CREATE A "CLOSED DOMESTIC POTABLE WATER SYSTEM" PREVENTING PRESSURE RELIEF THROUGH THE BUILDING SUPPLY.
2. A UPC LISTED THERMAL EXPANSION TANK SHALL BE INSTALLED BETWEEN THE "NON-RETURN DEVICE" AND THE WATER STORAGE TANK HEATED BY INDIRECT MEANS AND HEAT INPUT LIMITED TO 200,000 BTU/HR, WATER TEMPERATURE LIMITED TO 210°F, AND WATER CAPACITY THAT DOES NOT EXCEED 120 GALLONS.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SERVICE LINE ¾" & 1" INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 228



PLAN



A SECTION

GENERAL NOTES:

1. 2" SERVICE SHALL HAVE A 1" BY-PASS METER.
2. WHERE NO CURB EXISTS, METER IS TO BE SET NEAR PROPERTY LINE AND AT DESIGNATED LOCATION. CONTRACTOR/CUSTOMER TO COORDINATE LOCATION WITH L.V.W.D.
3. THE L.V.W.D. WILL FURNISH AND INSTALL THE METER IT SHALL BE THE RESPONSIBILITY OF THE PRIVATE OWNER TO HAVE PLUMBER EXTEND SERVICE LINE ON DISCHARGE SIDE OF METER, AS REQUIRED.
4. CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING SYSTEM FOR NO LESS THAN 1-YEAR AFTER DEDICATION/CONSTRUCTION.

CONSTRUCTION KEY NOTES:

A. DOUBLE STRAP SERVICE SADDLE

B. 2" TAP WITH CORPORATION STOP

C. 2" HDPE PIPE CTS 200 PSI. FOR 2" SERVICE INSTALLATIONS, ALL PIPING SHALL BE COPPER AND ALL FITTINGS SHALL BE BRONZE UNLESS OTHERWISE SPECIFIED.

D. BEND 90°

E. TEE

F. 2" BALL VALVE FLANGE x FIP

G. 2" COMPOUND METER (L.V.W.D.'S RESPONSIBILITY). (THE NEED OF A COMPOUND METER WILL BE DICTATED AT TIME OF APPLICATION.)

H. CURB VALVE

I. 1" BY-PASS LINE

J. STANDARD METER BOX TYPE "D"; 3" ABOVE GRADE OR FLUSH WITH CONCRETE. (DETAIL 242)

K. BACKFLOW ENCLOSURE ASSEMBLY AS REQUIRED. BY L.V.W.D. REFER TO L.V.W.D. STANDARD IN THIS MANUAL.

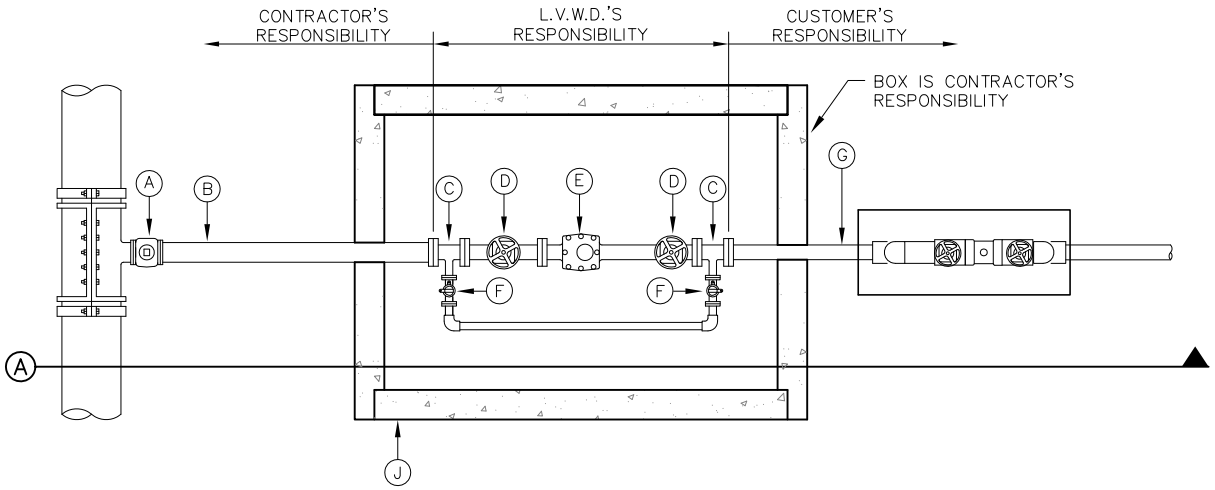
L. THRUST BLOCKING OR RESTRAINED JOINTS AS REQUIRED.

M. 2" BRASS PIPE-LENGTH AS REQUIRED

N. MORE THAN 10' NEED SPECIAL APPROVAL

O. BACKFLOW DETAIL 231.

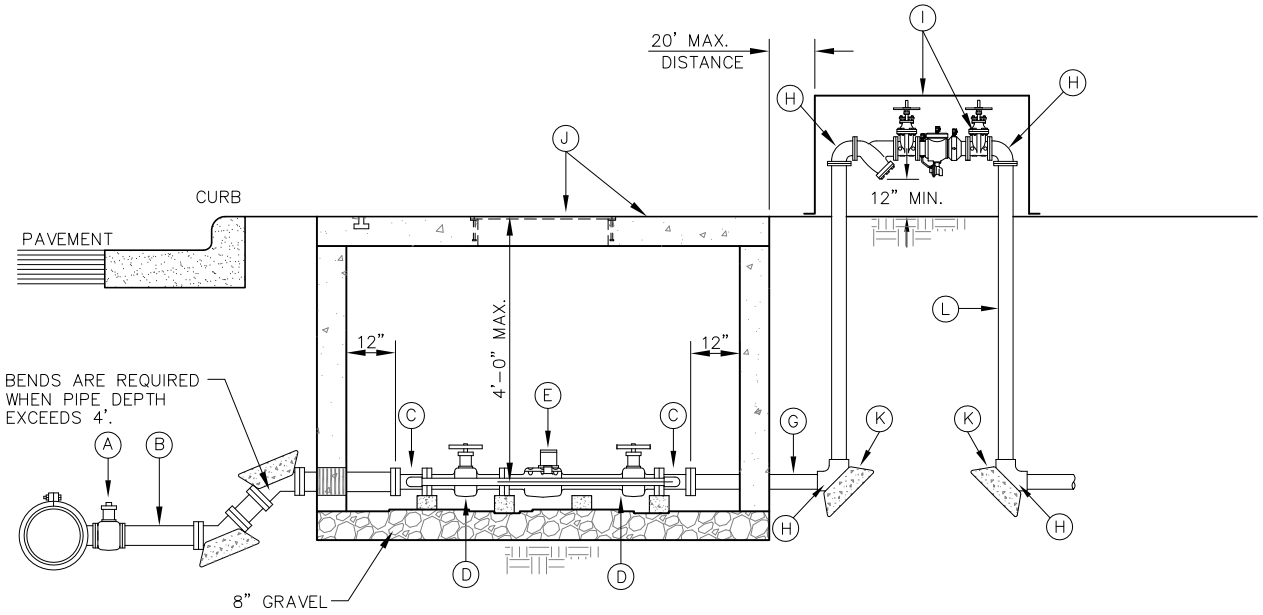
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL 2" SERVICE LINE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 229



PLAN

GENERAL NOTES:

1. DETAIL SHOWN FOR 4" SERVICE: INSTALLATION SIMILAR FOR LARGER SERVICES EXCEPT FOR SIZE OF PIPE, FITTINGS AND METER. NO 3" SERVICES WILL BE ALLOWED.
2. WHERE NO CURB EXISTS, METER IS TO BE SET NEAR PROPERTY LINE OR AT DESIGNATED LOCATION. CONTRACTOR/CUSTOMER TO COORDINATE LOCATION WITH L.V.W.D.
3. THE L.V.W.D. WILL FURNISH AND INSTALL THE METER. IT SHALL BE THE RESPONSIBLITY OF THE PRIVATE OWNER TO HAVE PLUMBER EXTEND SERVICE LINE ON DISCHARGE SIDE OF METER, AS REQUIRED.
4. 1 YR WARRANTY PERIOD, IF INSTALLED BY OTHERS.
5. ALL FITTING SHALL BE FLANGED & MECHANICALLY RESTRAINED.



A SECTION

CONSTRUCTION KEY NOTES:

A. 4" TAPPING SLEEVE VALVE AND RESILIENT WEDGE GATE VALVE. REFER TO OTHER REQUIREMENTS IN THIS MANUAL. (DETAIL 202 AND 204)

B. 4" P.V.C. (C-900)

C. 4"x2" TEE

D. 4" RESILIENT WEDGE GATE VALVE

E. 4" METER

F. 2" BALL VALVE WITH LOCK WING

G. 4" SPOOL (PVC C-900) DR 180

H. 4" BEND 90°

I. 4" BACKFLOW PREVENTER AND ENCLOSURE ASSEMBLY AS REQUIRED BY L.V.W.D. REFER TO DETAIL IN THIS MANUAL. (DETAIL 231)

J. STANDARD METER BOX TYPE "D" WITH 8x6X5 HATCH.

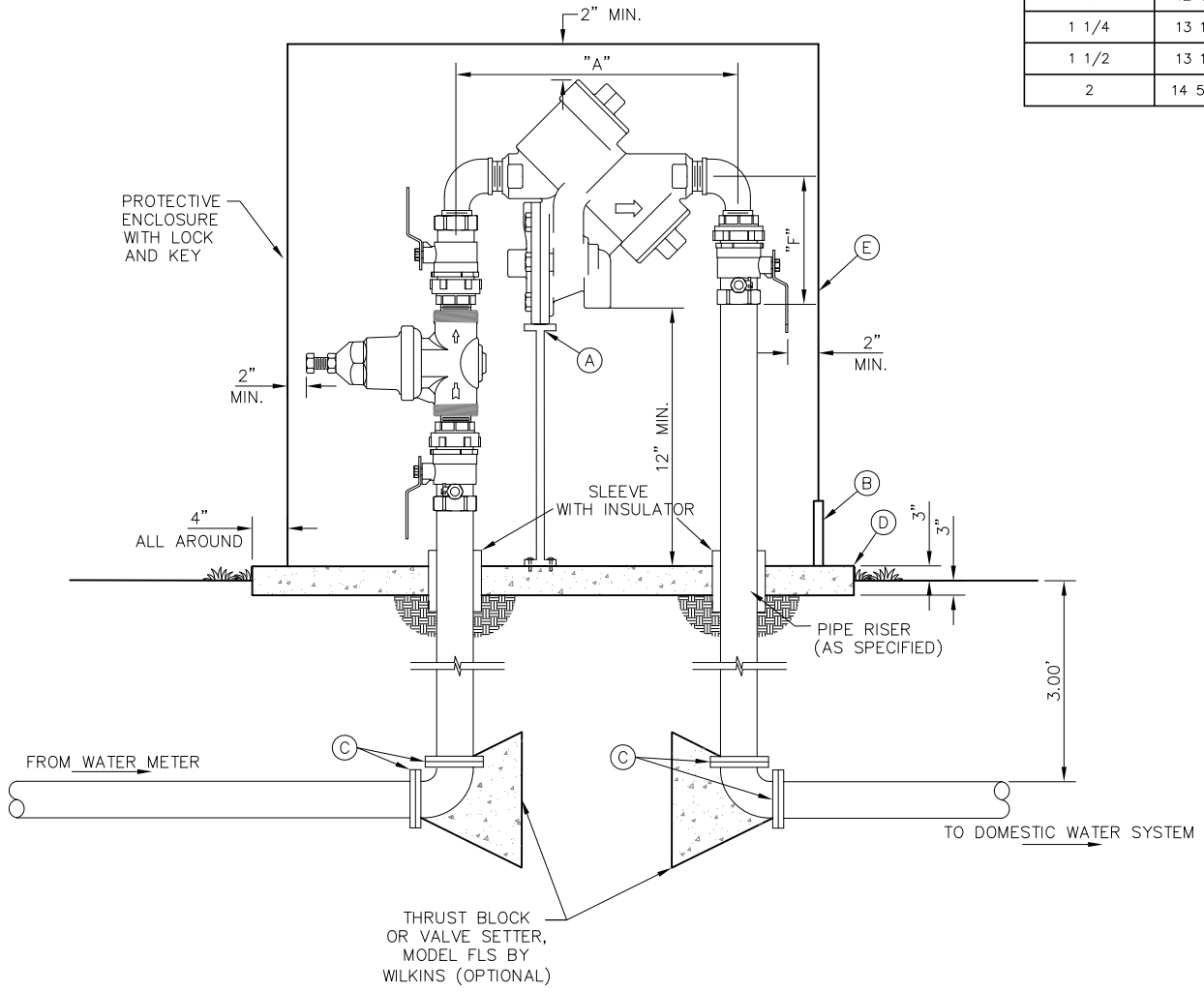
K. THRUST BLOCKING AS REQUIRED

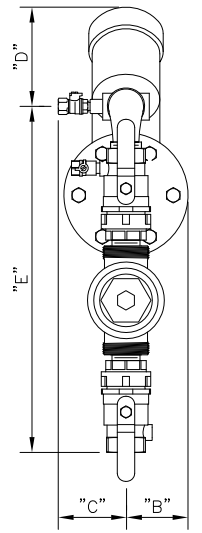
L. 4" FLANGED (PVC C-900) DR 180 – LENGTH AS REQUIRED

M. 4" BEND 45°

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL 4" AND LARGER SERVICE LINE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 230

WILKINS 975XL–VCR PRE–SET	DIMENSIONS IN INCHES (APPROXIMATE)						WEIGHT LBS.
	A	B	C	D	E	F	
3/4	12 1/4	2 1/8	3	3 1/2	11 3/4	5	18
1	12 1/4	2 1/8	3	3 1/2	13	5 1/4	22
1 1/4	13 1/2	2 3/4	3 1/2	5	14 7/8	5 3/8	41
1 1/2	13 1/2	2 3/4	3 1/2	5	16 3/4	6 1/4	46
2	14 5/16	2 3/4	3 1/2	5	19	7 11/16	58





GENERAL NOTES:

1. PROTECTIVE ENCLOSURE & THERMAL EXPANSION REQUIREMENTS WITH LOCK AND KEY.
2. WILKINS MODEL OR APPROVED EQUAL .

CONSTRUCTION KEY NOTES:

A. PIPE SUPPORTS BOLTED TO FLANGE.

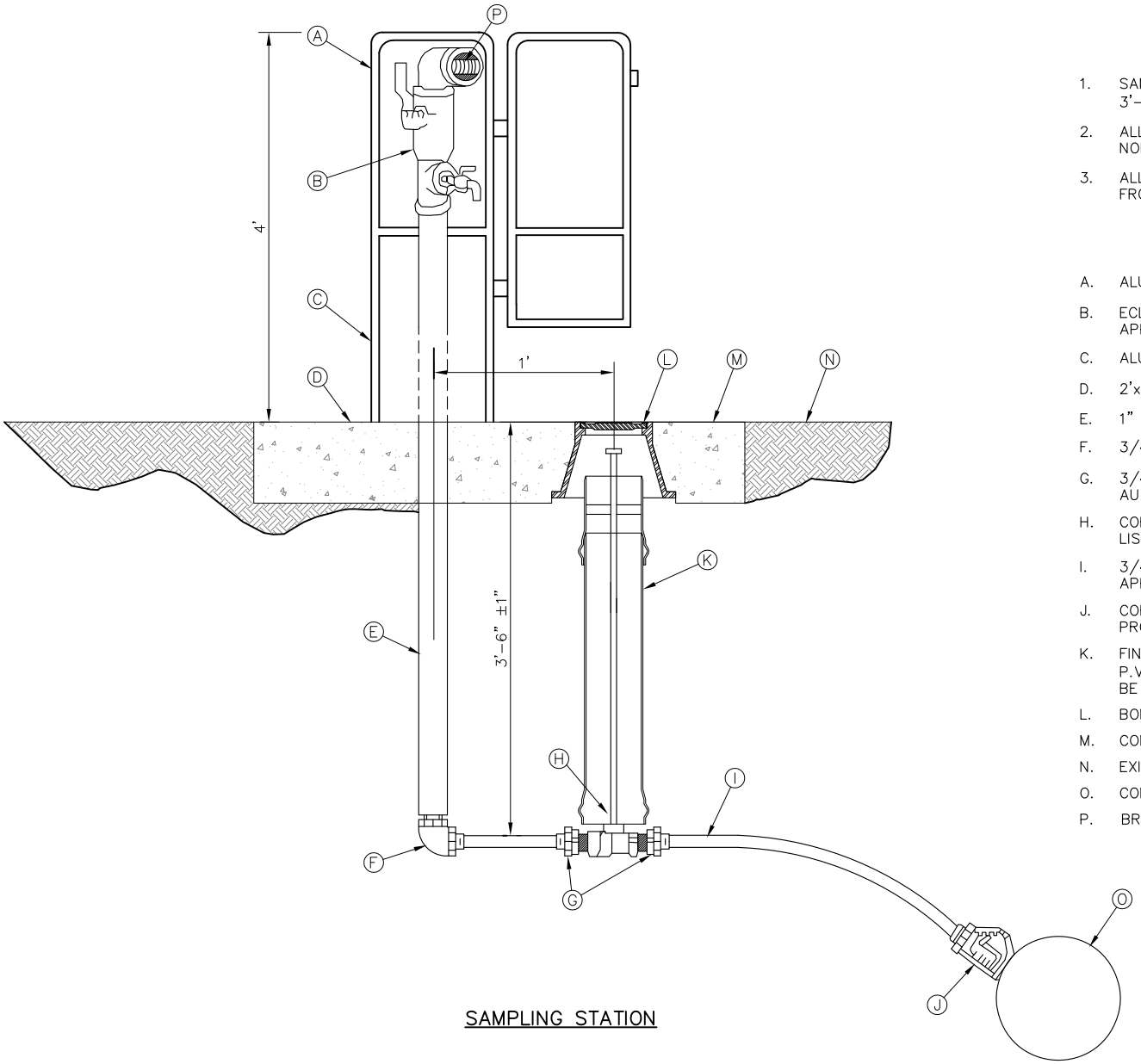
B. DRAIN OPENING SIZED PER MANUFACTURER'S RECOMMENDATIONS.

C. RESTRAINED JOINT.

D. 6" CONCRETE PAD (3,000 P.S.I., REINFORCED WITH 6x6x6 WIRE MESH)

E. LVWD SHALL PROVIDE HOUSING UNIT.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	3/4" – 2" REDUCED PRESSURE BACKFLOW PREVENTOR SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 231



SAMPLING STATION

GENERAL NOTES:

1. SAMPLING STATIONS SHALL BE BURIED TO A DEPTH OF 3'-6" ±1", WITH A 1" MIP INLET, AND A 1" FIP DISCHARGE.
2. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NON-REMOVABLE, ALUMINUM-CAST HOUSING.
3. ALL WORKING PARTS SHALL BE BRASS AND BE REMOVABLE FROM ABOVE GROUND WITH NO DIGGING.

CONSTRUCTION KEY NOTES:

A. ALUMINUM HOUSING (SHOWN OPEN)

B. ECLIPSE 88 SAMPLING STATION, OR WATER AUTHORITY APPROVED EQUAL.

C. ALUMINUM BASE

D. 2'x2'x6" CONCRETE PAD. f'c = 3,000 PSI

E. 1" BRASS STANDPIPE

F. 3/4" COPPER x 1" FIP ELBOW

G. 3/4" MIPT x COPPER FLARE FORD C28-33, OR WATER AUTHORITY APPROVED EQUAL.

H. CORPSTOP PER WATER AUTHORITY APPROVED PRODUCTS LIST.

I. 3/4" DOMESTIC COPPER K-TYPE, OR WATER AUTHORITY APPROVED EQUAL.

J. CORPORATION STOP PER WATER AUTHORITY APPROVED PRODUCTS LIST.

K. FINAL EXTENSION TO SUBGRADE WITH BELL END (S.D.R. 35 P.V.C. SPOOL) OUT TO BOTTOM OF BONNET BOX. SPOOL TO BE VERTICAL AND CENTERED WITH CORP STOP.

L. BONNET BOX WITH COVER DETAILS 219 AND 220.

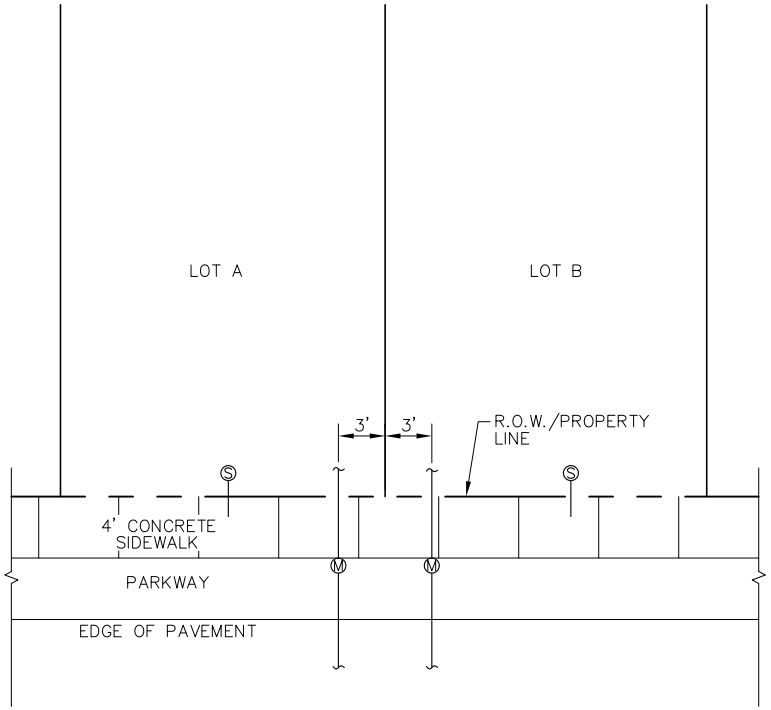
M. CONCRETE COLLAR PER STANDARD DRAWING 120 AND 121.

N. EXISTING GROUND

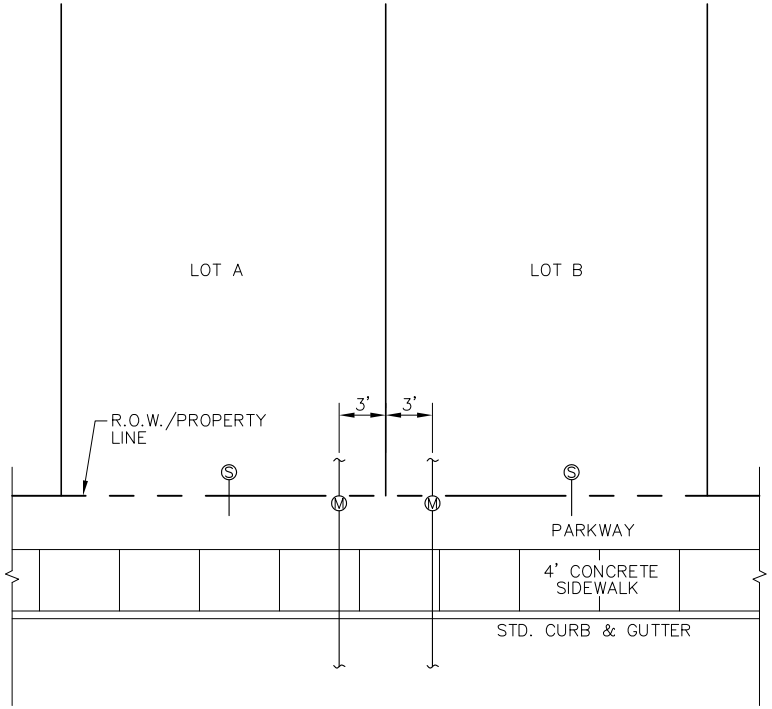
O. CONNECT TO MAIN

P. BRASS PLUG

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	WATER SAMPLING STATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 232



PLAN

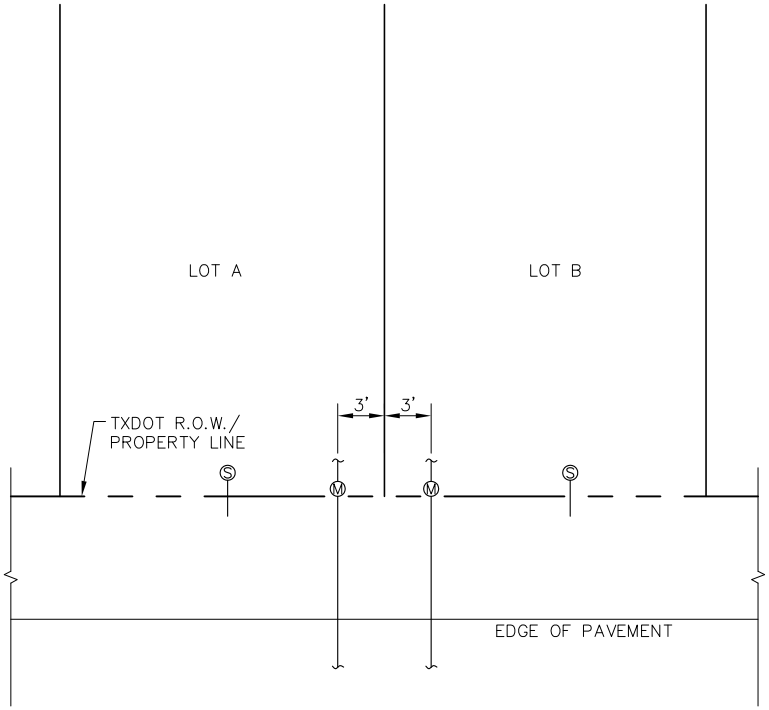


PLAN

GENERAL NOTES:

1. METER BOXES TO BE PLACED BACK TO BACK AS SHOWN.
2. SEWER SERVICE SHALL BE LOCATED AT CENTER OF LOTS, AS SHOWN.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SERVICE CONNECTION LOCATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 233

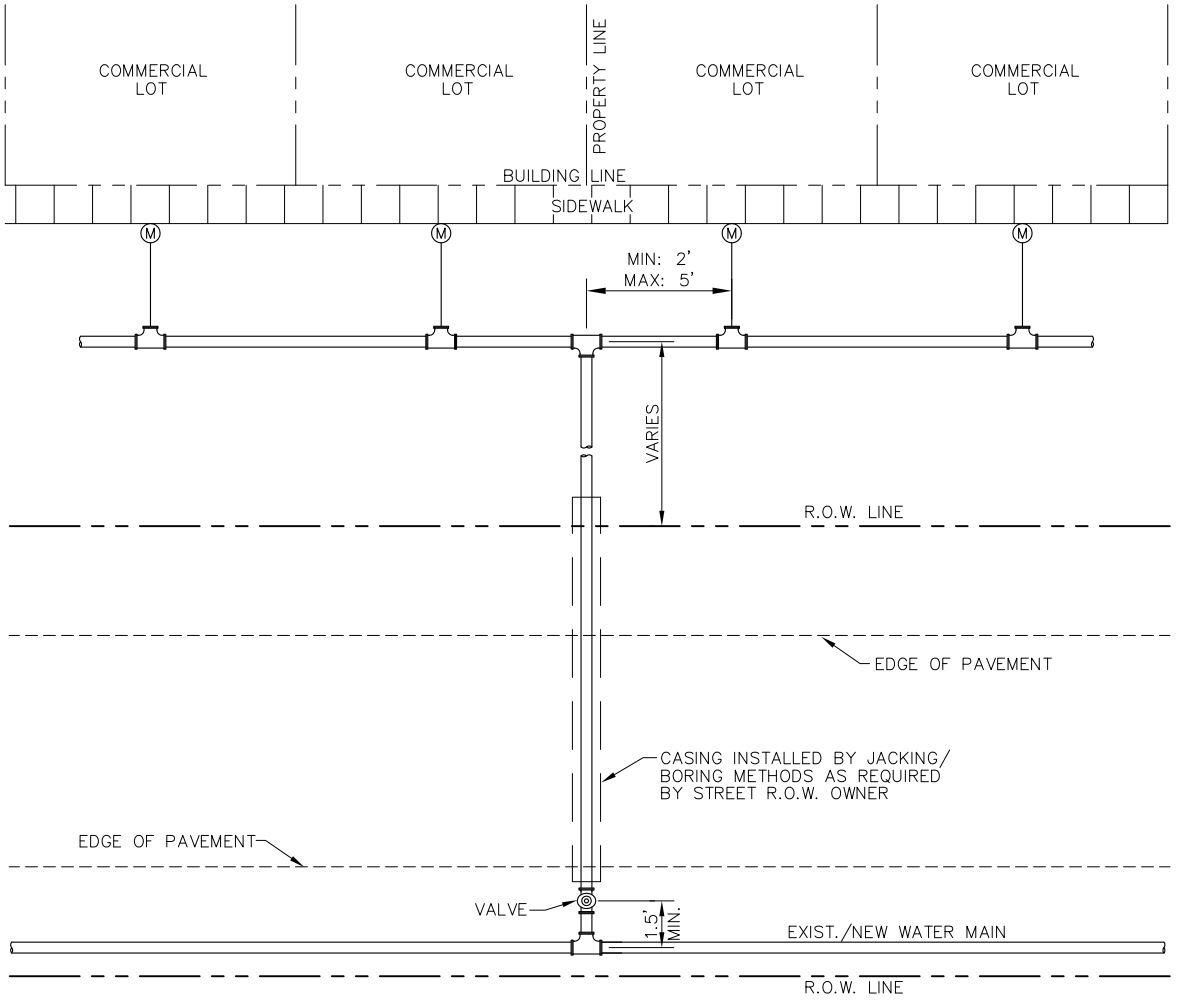


PLAN

GENERAL NOTES:

1. METER BOXES TO BE PLACED BACK TO BACK AS SHOWN.
2. SEWER SERVICE SHALL BE LOCATED AT CENTER OF LOTS, AS SHOWN.

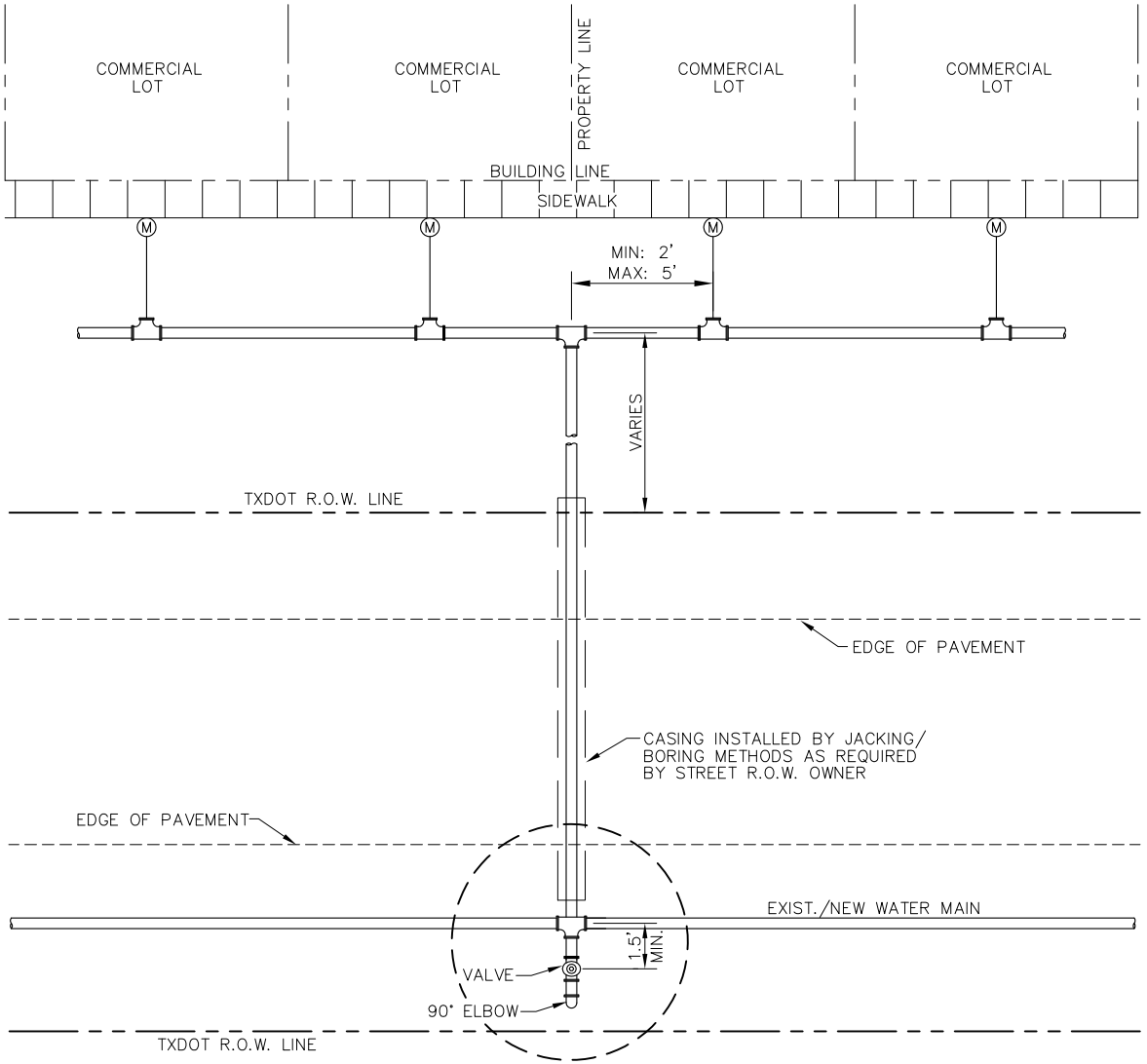
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SERVICE CONNECTION LOCATION WITHIN TXDOT RIGHT-OF-WAY SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 234



GENERAL NOTES:

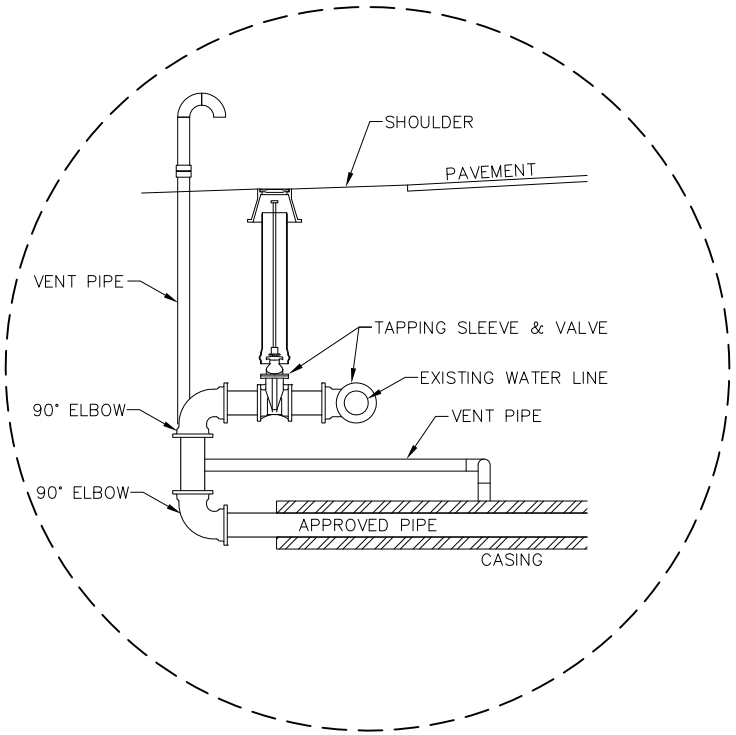
1. PURPOSE OF THIS DETAIL IS TO SERVE COMMERICAL/ INDUSTRIAL CUSTOMERS BY EXECUTING ONE STREET CROSSING AND SERVING NUMEROUS CUSTOMERS.
2. SIZE OF LINES WILL BE AS DETERMINED BY L.V.W.D. AND TCEQ REQUIREMENTS.
3. REQUIRED PRESSURE AT THE METER (ACCORDING TO TCEQ STANDARDS) SHALL BE AT LEAST 35 P.S.I.
4. A MAXIMUM OF 20 SERVICES SHALL BE CONNECTED IN SERIES. A PRESSURE DROP OF APPROXIMATELY 15–20 P.S.I., AT PEAK USAGE TIME (e.g. NOON), SHALL BE TAKEN INTO ACCOUNT FOR THE MAXIMUM AMOUNT OF SERVICES INSTALLED. PRESSURE DROP COULD VARY DUE TO SPECIFICATIONS ON THE DESIGN.
5. COMMERCIAL PROPERTY OWNER IS RESPONSIBLE FOR COMMERCIAL SERVICE FROM TAPPING SLEEVE VALVE TO PROPERTY.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SERVICE CONNECTION WITHIN COMMERCIAL SITE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 235

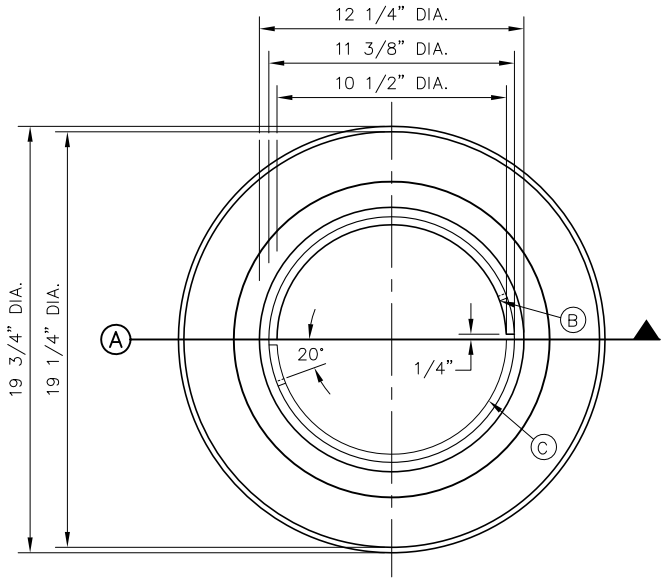


GENERAL NOTES:

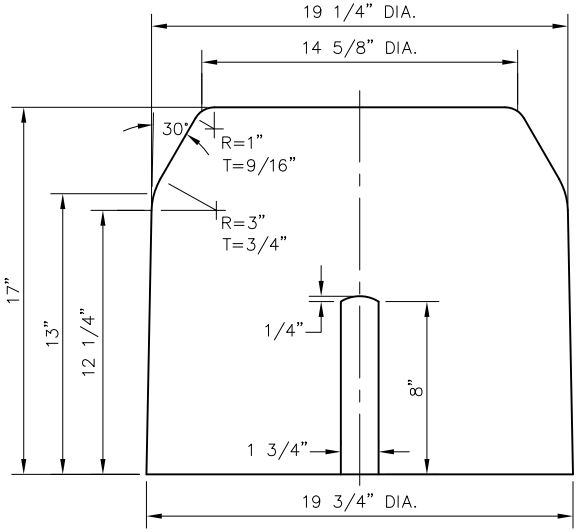
1. PURPOSE OF THIS DETAIL IS TO SERVE COMMERICAL/ INDUSTRIAL CUSTOMERS BY EXECUTING ONE STREET CROSSING AND SERVING NUMEROUS CUSTOMERS.
2. SIZE OF LINES WILL BE AS DETERMINED BY L.V.W.D. AND TCEQ REQUIREMENTS.
3. REQUIRED PRESSURE AT THE METER (ACCORDING TO TCEQ STANDARDS) SHALL BE AT LEAST 35 P.S.I.
4. A MAXIMUM OF 20 SERVICES SHALL BE CONNECTED IN SERIES. A PRESSURE DROP OF APPROXIMATELY 15–20 P.S.I., AT PEAK USAGE TIME (e.g. NOON), SHALL BE TAKEN INTO ACCOUNT FOR THE MAXIMUM AMOUNT OF SERVICES INSTALLED. PRESSURE DROP COULD VARY DUE TO SPECIFICATIONS ON THE DESIGN.

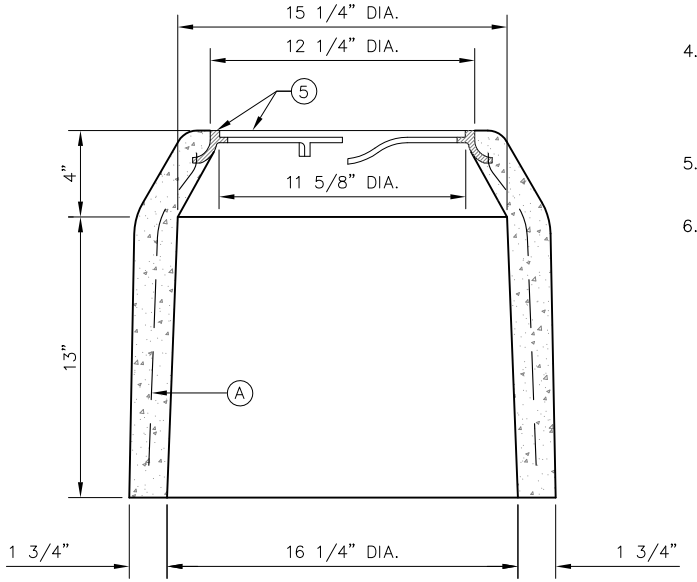


STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SERVICE CONNECTION WITHIN COMMERCIAL SITE TXDOT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 236



TOP VIEW





(A) SECTION

GENERAL NOTES:

1. INSTALL TO GRADE MATCHING TOP OF CURB, OR AS SPECIFIED.
2. ANGLE VALVE SHALL BE IN LINE WITH THE INLET/OUTLET PORTS OF THE METER BOX.
3. METER BOXES SHALL NOT BE INSTALLED UNDER SIDEWALKS, DRIVEWAYS, OR PROPOSED ABOVE GROUND STRUCTURES. REFER TO DETAIL 233 FOR METER BOX LOCATION.
4. WHERE NO CURBING EXIST, INSTALL BOXES IN ACCESSIBLE LOCATIONS BEYOND LIMITS OF STREET SURFACING, WALKS AND DRIVEWAYS. REFER TO DETAIL 233 FOR METER BOX LOCATIONS.
5. STANDARD METER BOX FRAME AND COVER PER LVWD STANDARD DETAILS 239 AND 240.
6. WHERE IT IS NECESSARY TO INSTALL A TYPE "A" BOX FOR 3/4" METER UNDER ROADWAYS OF TRAFFIC BEARING SURFACES, BOX SHALL BE ENCASED IN 12" CONCRETE, 3,000 PSI. MINIMUM.

CONSTRUCTION KEY NOTES:

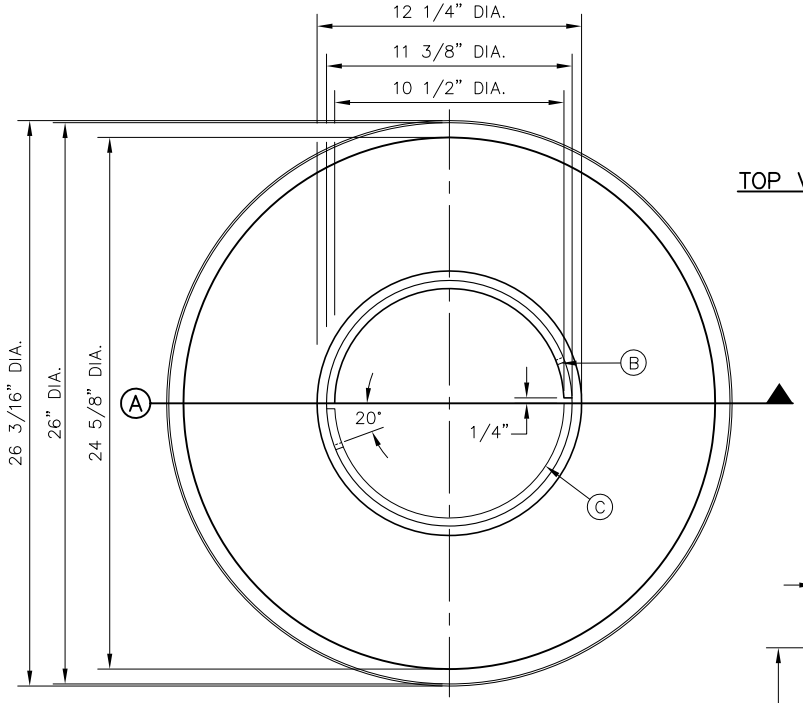
A. 3/16", 9 GAUGE BLACK ANNEALED WIRE

B. LUG–STOP

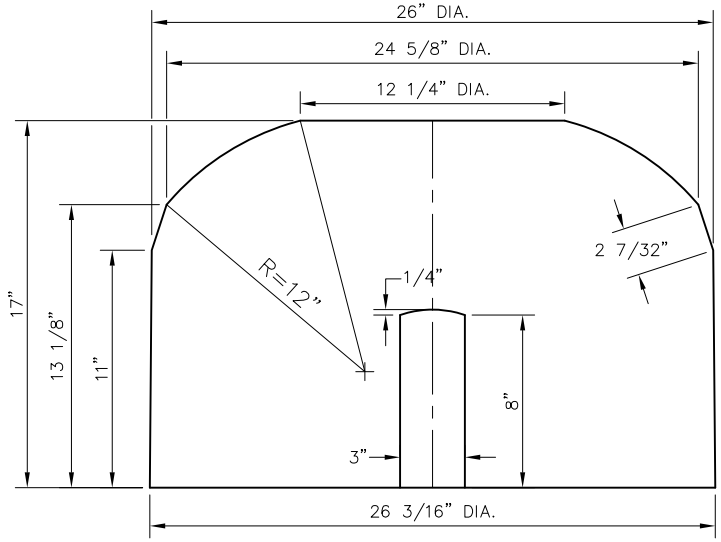
C. STANDARD CAST IRON RING

D. SINGLE UNIT

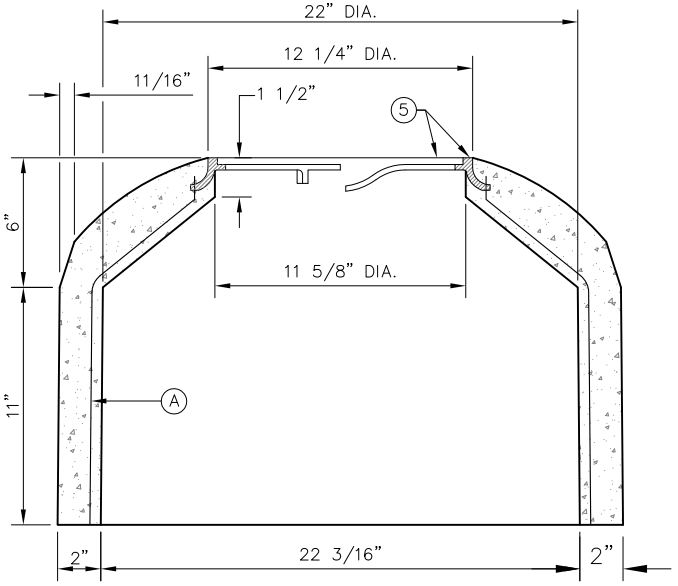
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX TYPE "A" FOR 3/4" SERVICE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 237



TOP VIEW



SIDE VIEW



A SECTION

GENERAL NOTES:

1. INSTALL TO GRADE MATCHING TOP OF CURB.
2. ANGLE VALVE SHALL BE IN LINE WITH THE INLET/OUTLET PORTS OF THE METER BOX.
3. METER BOXES SHALL NOT BE INSTALLED UNDER SIDEWALKS, DRIVEWAYS, OR PROPOSED ABOVE GROUND STRUCTURES. REFER TO DETAIL 233 FOR METER BOX LOCATION.
4. WHERE NO CURBING EXIST, INSTALL BOXES IN ACCESSIBLE LOCATIONS BEYOND LIMITS OF STREET SURFACING, WALKS AND DRIVEWAYS. REFER TO DETAIL 233 FOR METER BOX LOCATION.
5. STANDARD METER BOX FRAME AND COVER PER L.V.W.D. STANDARD DETAILS 239 AND 240.
6. WHERE IT IS NECESSARY TO INSTALL A TYPE "B" BOX FOR 1" METER UNDER ROADWAYS OF TRAFFIC BEARING SURFACES, BOX SHALL BE ENCASED IN 12" CONCRETE, 3,000 PSI MINIMUM.

CONSTRUCTION KEY NOTES:

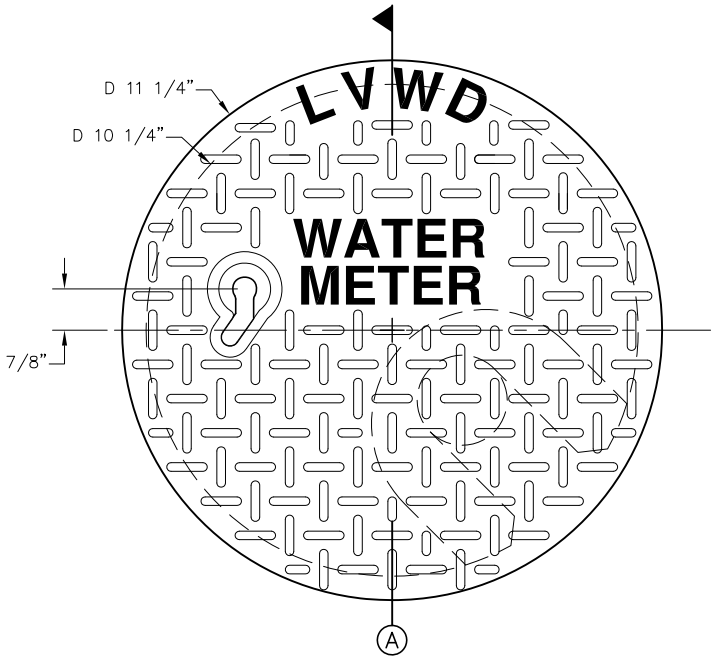
A. 3/16", 9 GAUGE BLACK ANNEALED WIRE

B. LUG–STOP

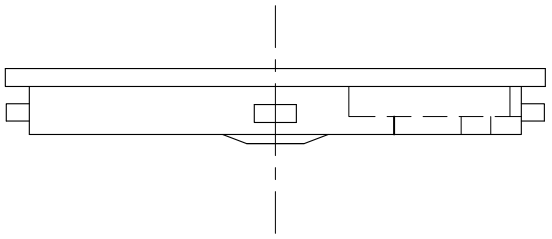
C. STANDARD CAST IRON RING

D. SINGLE UNIT

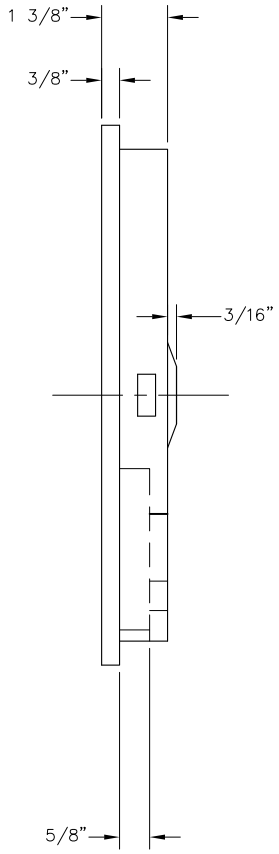
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX TYPE "B" FOR 1" SERVICE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 238



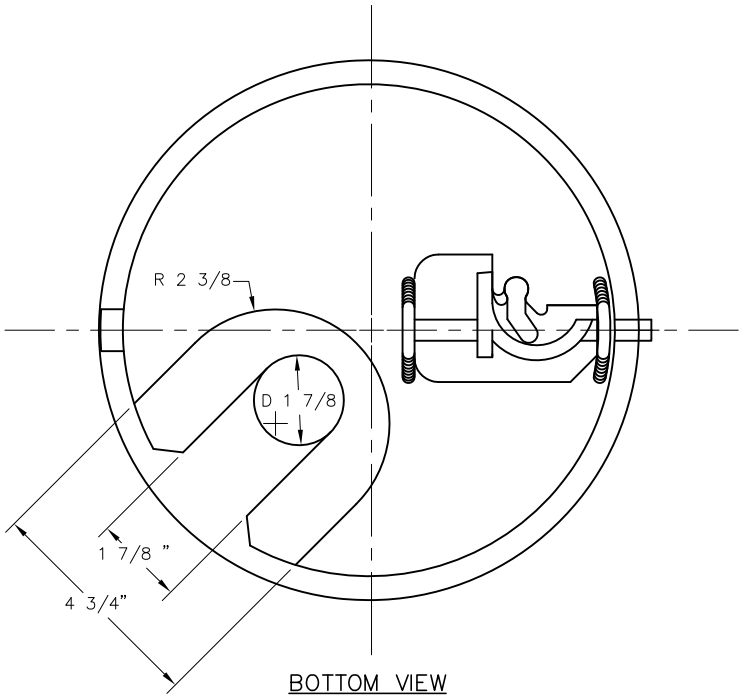
TOP VIEW



SIDE VIEW



TOP VIEW

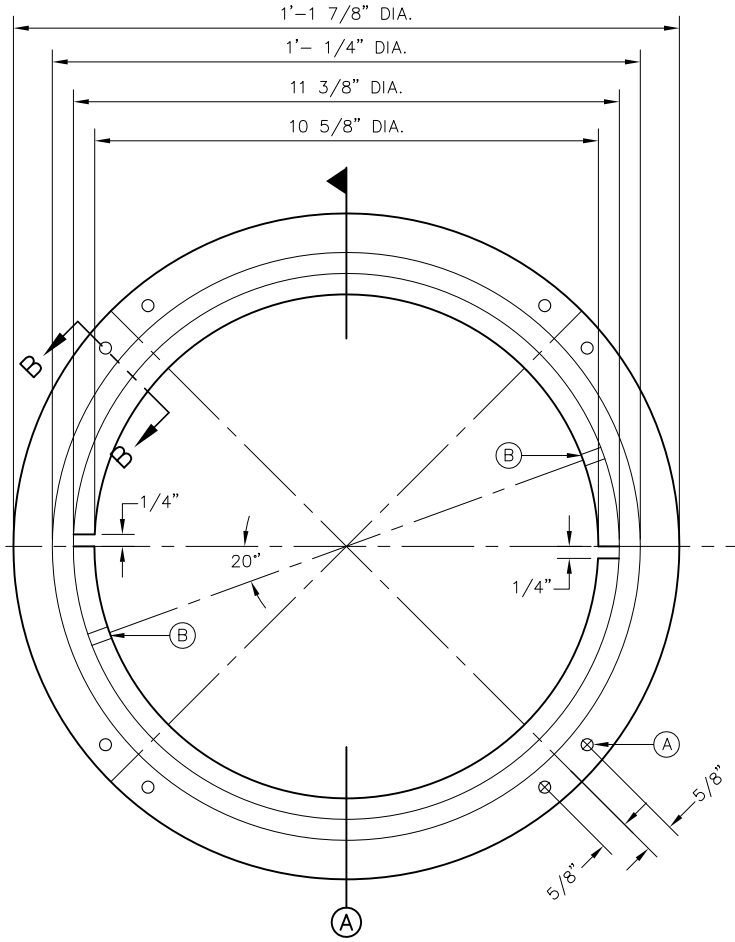


BOTTOM VIEW

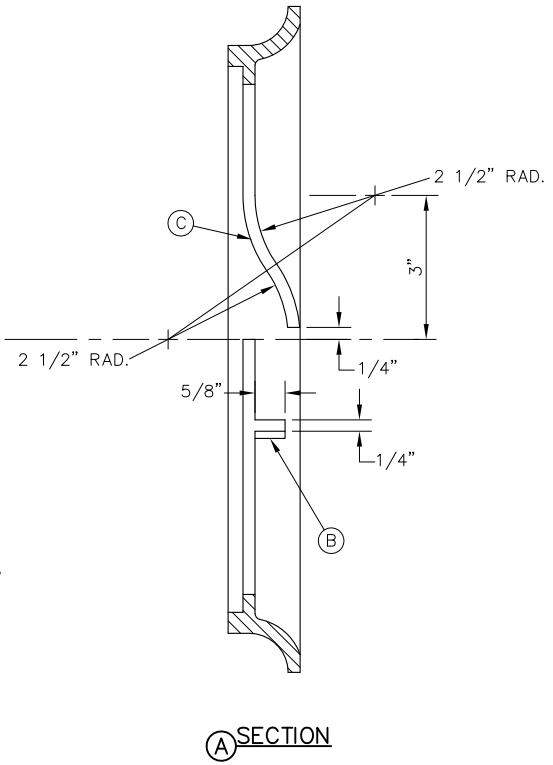
PLASTIC LID

1) THE LID SHALL BE BLACK
2) THE LID SHALL HAVE A LOGO MOLDED ON ITS SURFACE
3) THE SHALL HAVE THE WORDING "WATER METER" MOLDED ON ITS SURFACE
4) THE LID SHALL HAVE A DIAMOND PATTERN FOR SKID RESISTANCE
5) THE LID SHALL BE SOLID AND WEIGH A MINIMUM OF 4LBS.
6) THE LID SHALL HAVE A MOLDED ERT POCKET ON ITS BOTTOM SIDE THAT WILL ACCOMIDATE AN "NEPTUNE R9000 TRANSPONDER"
7) THE LID SHALL HAVE A PLASTIC LOOKING MECHANISM STAINLESS STEEL COIL SPRING THAT CAN BE OPENED AND CLOSED USING A STANDARD BRASS KEY
8) THE LID DIMENSIONS SHALL BE APROXIMATELY: 11 1/4 DIA X 1 3/8 INCHES

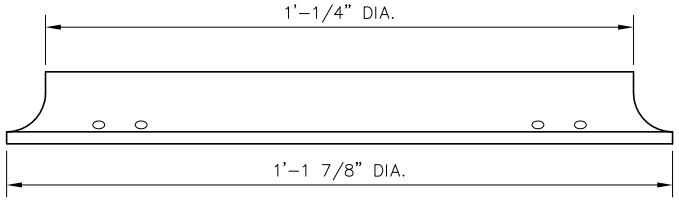
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX COVER SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 239



TOP VIEW



A SECTION



SIDE VIEW

GENERAL NOTES:

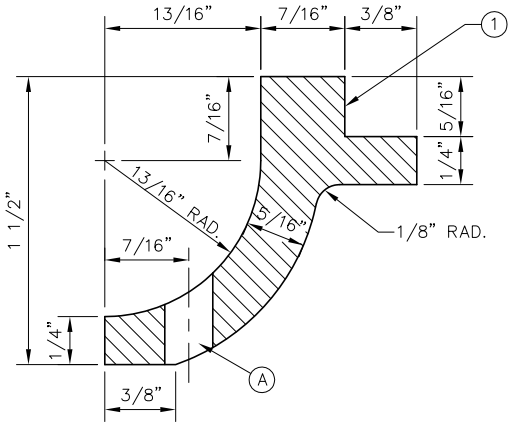
1. MATCHING SURFACES TO BE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.
3. METER BOX RING WEIGHT = 7 LBS.
4. METER BOX RING MADE OF CAST IRON.

CONSTRUCTION KEY NOTES:

A. 1/4" DIAMETER HOLES FOR ANCHORING RING TO CONCRETE METER BOX.

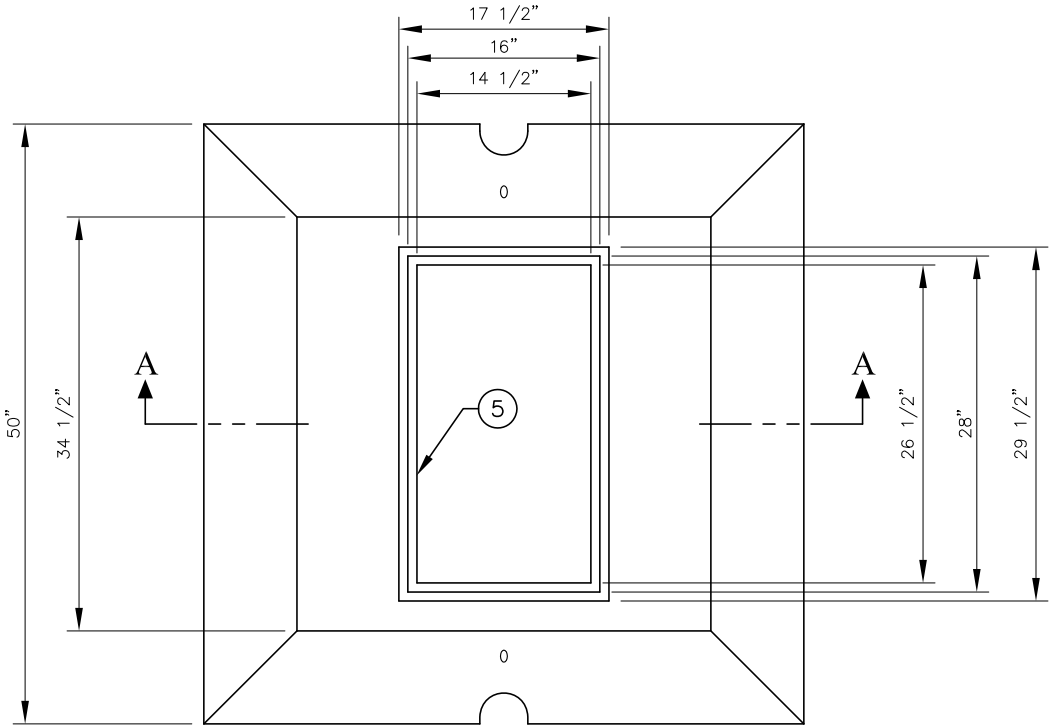
B. LUG STOP

C. LOCKING LUG SLIDE



B SECTION

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX FRAME SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 240



TOP VIEW

NOTES:

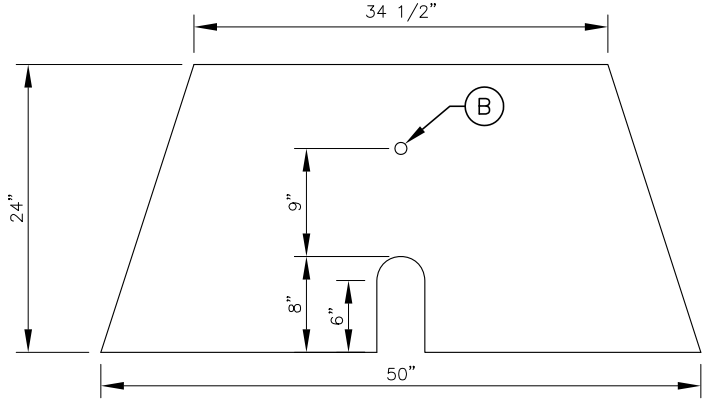
1. INSTALL TO GRADE MATCHING TOP OF CURB.
2. ANGLE VALVE SHALL BE IN LINE WITH THE INLET/OUTLET PORTS OF THE METER BOX.
3. METER BOXES SHALL NOT BE INSTALLED UNDER SIDEWALKS, DRIVEWAYS, OR PROPOSED ABOVE GROUND STRUCTURES.
4. WHERE NO CURBING EXIST, INSTALL BOXES IN ACCESSIBLE LOCATIONS BEYOND LIMITS OF STREET SURFACING, WALKS AND DRIVEWAYS.
5. STANDARD METER BOX FRAME AND COVER PER DETAIL 239 AND 240.

KEYED NOTES:

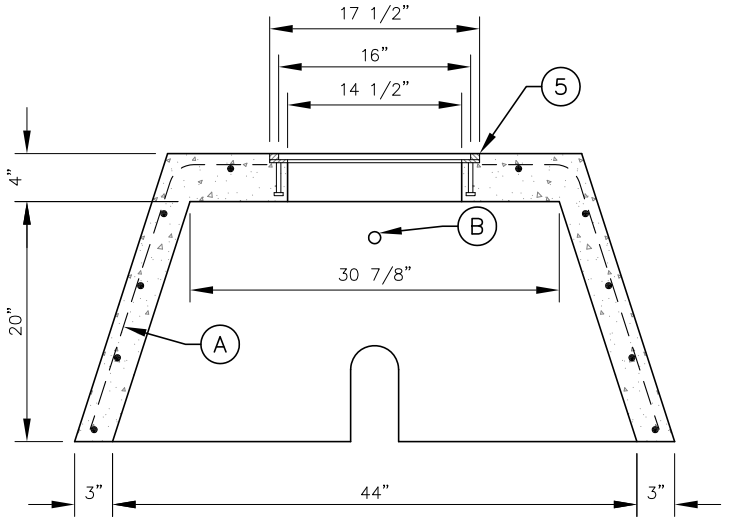
A. No. 4 REBAR AT 6" ON CENTER, EACH WAY

B. 1" DIAMETER HOLE

C. SINGLE UNIT

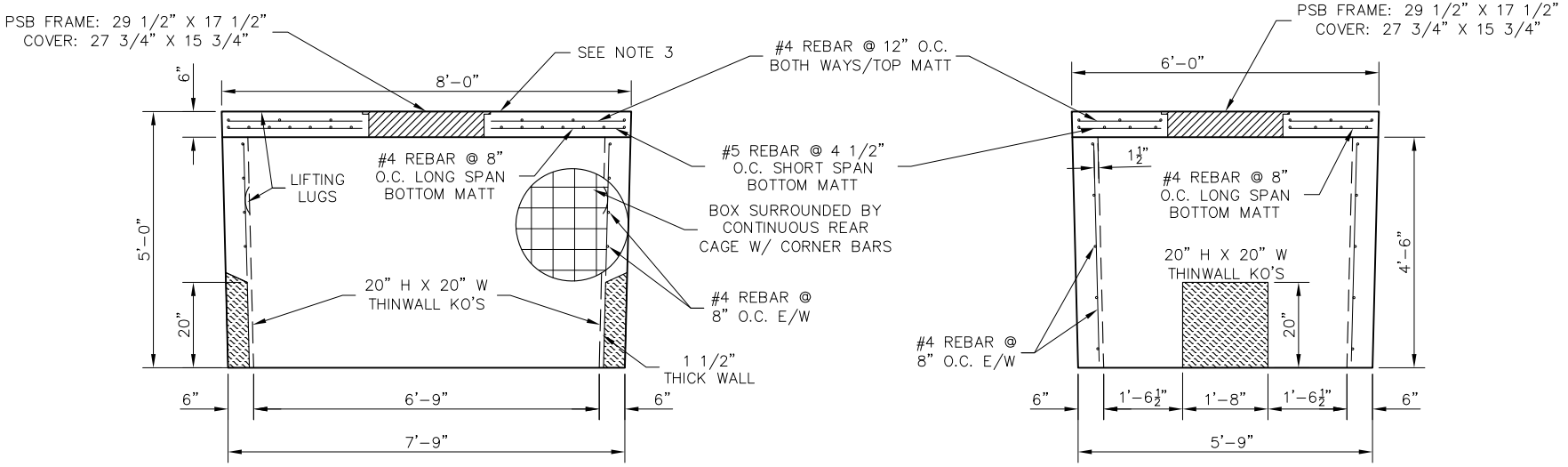


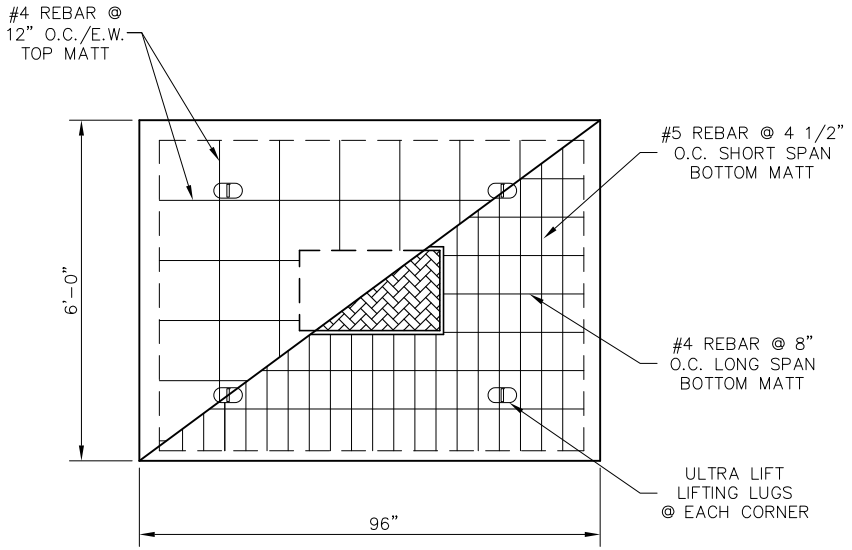
FRONT VIEW



A SECTION

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	METER BOX TYPE C FOR 2" SERVICE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 241

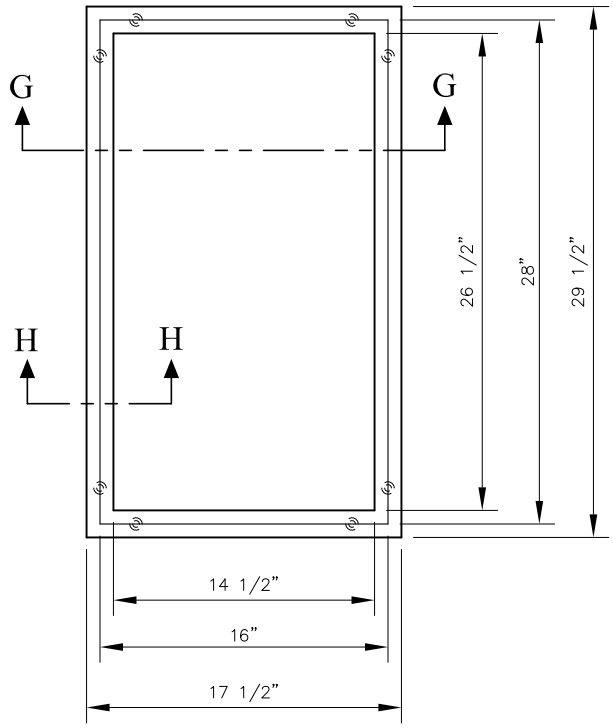




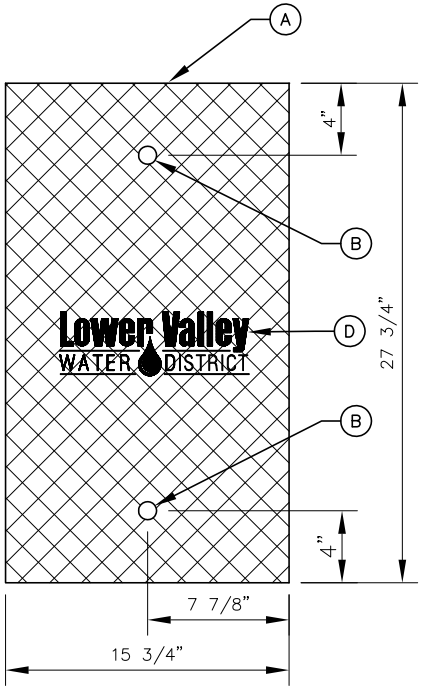
GENERAL NOTES:

1. ALL REINFORCEMENT SHALL COMPLY WITH ASTM A615 GRADE 60 STEEL = 60,000 PSI.
2. CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4,000 PSI.
3. LID IS SEPARATED FROM MAIN BOX.

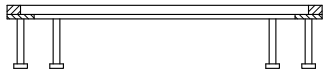
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX TYPE "D" SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 242



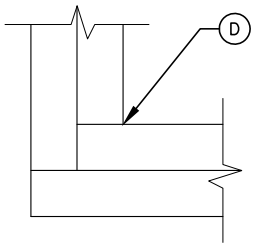
TOP VIEW



STEEL COVER



G SECTION



CORNER DETAIL

KEYED NOTES:

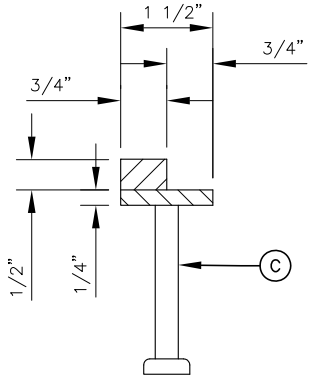
A. MATERIAL 3/8" DIAMOND PLATE

B. 2 – 1" DIAMETER HOLES

C. 8 – 3/4"x2 1/2" NELSON STUDS

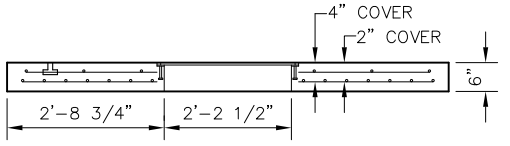
D. BUTT CORNERS AND TACKWELD GRIND SMOOTH

E. MOLDED LOGO

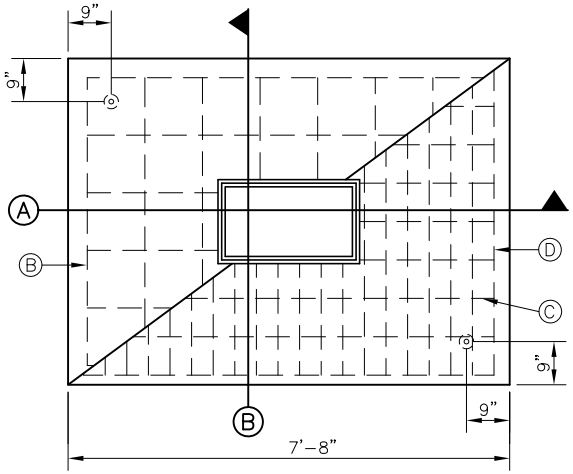


H SECTION

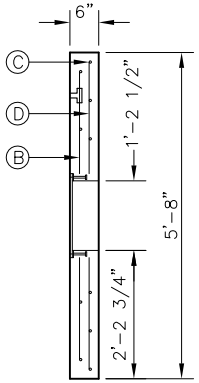
STANDARD DETAIL	DATE: XXXX REV: APR. 2017	FRAME & COVER FOR TYPE C & D METER BOX SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 243



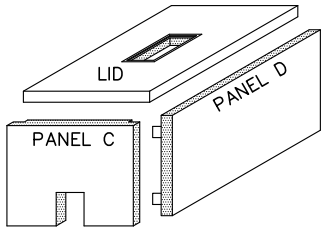
A SECTION



LID



B SECTION

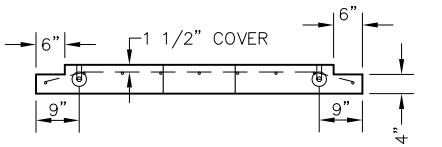


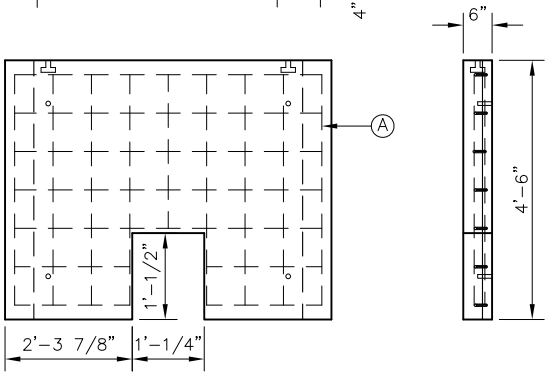
GENERAL NOTES:

1. WATER CEMENT RATIO 0.5 OR LESS BY WEIGHT OR NOT MORE THAN 5.5 GALLONS PER SACK.
2. REINFORCING SHALL COMPLY WITH ASTM A615 GRADE 60 STEEL FY=60,000 PSI.
3. BAR BENDING AND PLACEMENT TO COMPLY WITH LATEST ACI STANDARDS.
4. LIFTERS FOR HANDLING SHALL BE INSTALLED PER MANUFACTURER'S REQUIREMENTS AND RATED TO HANDLE THE WEIGHT.
5. CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4,000 PSI.
6. STANDARD METER BOX FRAME AND COVER PER L.V.W.D. STANDARD DETAILS 239 AND 240.

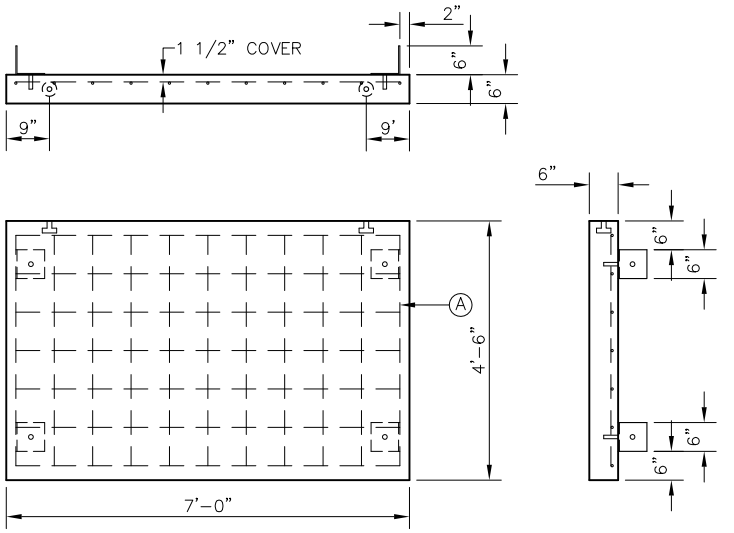
CONSTRUCTION KEY NOTES:

A. No. 4 REBAR AT 8" ON CENTER, BOTH WAYS.
B. No. 4 REBAR AT 12" ON CENTER, BOTH WAYS (TOP LAYER).
C. No. 4 REBAR AT 8" ON CENTER, LONG SPAN (BOTTOM LAYER).
D. No. 5 REBAR AT 4 1/2" ON CENTER, SHORT SPAN (BOTTOM LAYER).
E. MODULAR





PANEL C



PANEL D

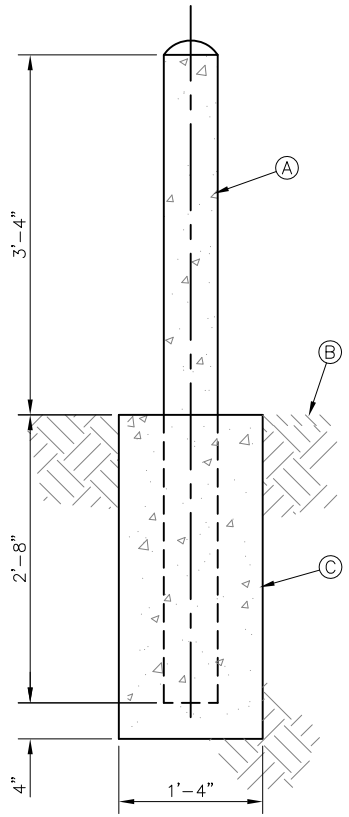
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	METER BOX TYPE 96"X72"X60"-3" AND LARGER SERVICE INSTALLATION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 244

CONSTRUCTION KEY NOTES:

A. 6"ø SCHEDULE 40 GALVANIZED STEEL PIPE. 6' LONG, FILLED WITH CONCRETE. EXPOSED STEEL SHALL BE PAINTED WITH AN OIL BASE ALKYD PRIMER AND AN OIL BASE ALKYD ENAMEL TOP COAT. COLOR SHALL BE "SAFETY YELLOW".

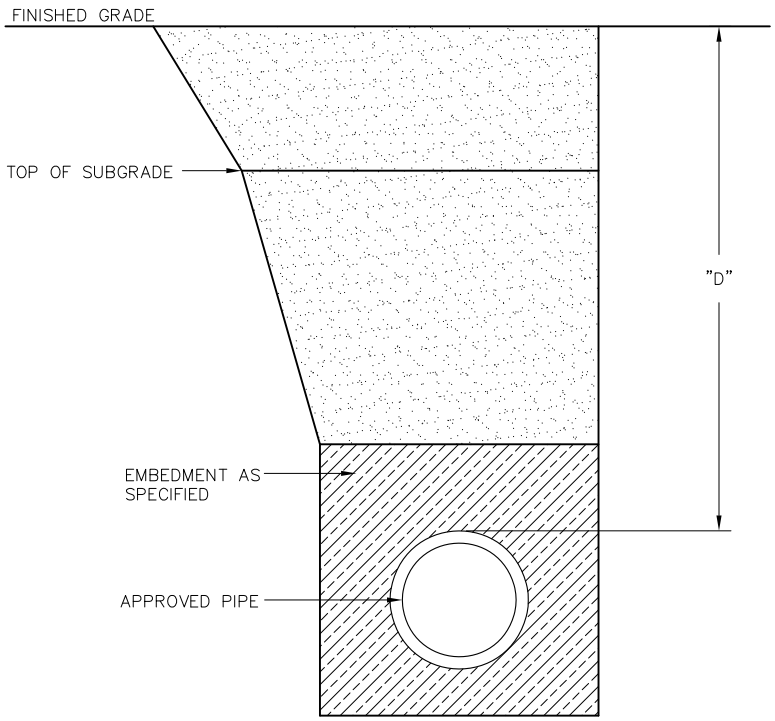
B. PAVEMENT, OR FINISHED GRADE.

C. 16"ø CONCRETE FOOTING, 3,000 PSI AT 28 DAYS, WITH SMOOTH OR BROOM FINISH WHEN ADJACENT TO PAVEMENT.



SECTION

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	BOLLARD DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 245



GENERAL NOTES:

1. REFER TO UTILITY STANDARD DETAIL FOR PAVEMENT REPLACEMENT AND BACKFILL REQUIREMENTS.
2. TRENCH SAFETY SYSTEMS SHALL BE USED WHEN TRENCH DEPTH EXCEEDS 5 FEET OR WHEN EXISTING SOIL CONDITIONS DICTATE.

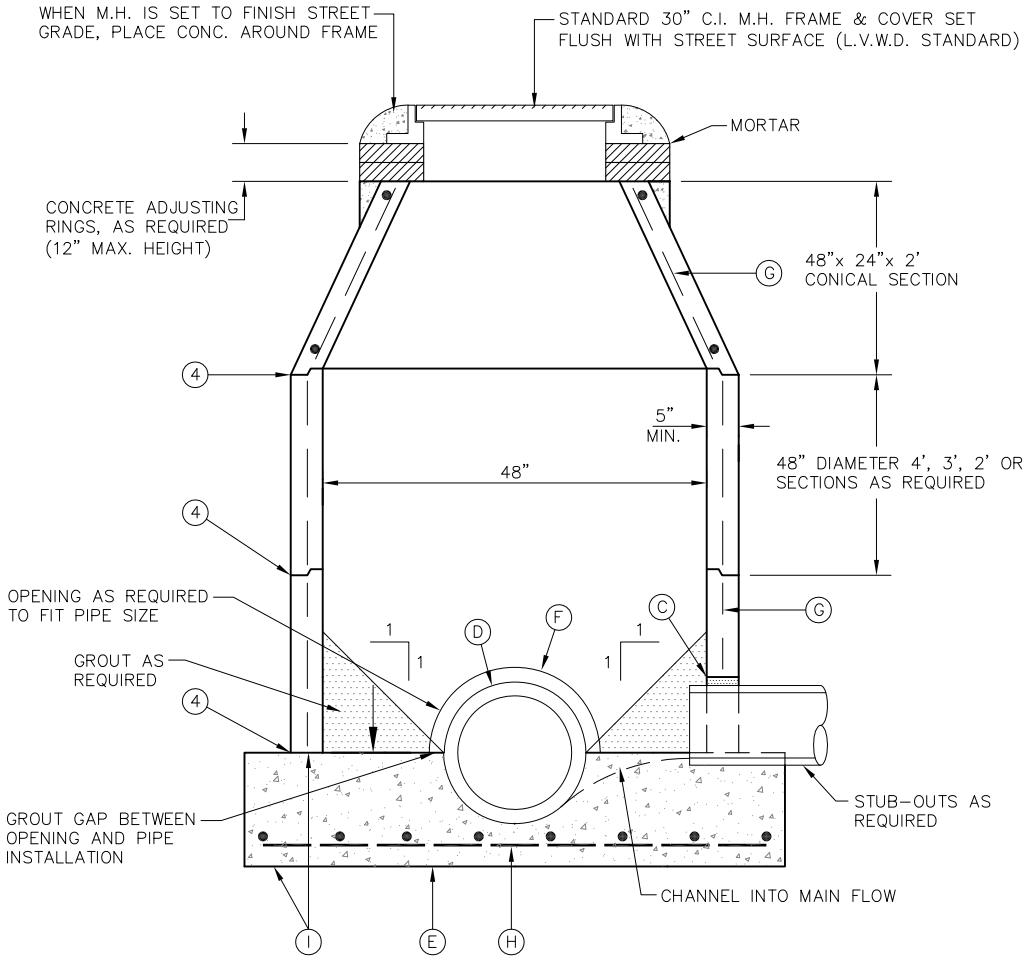
CONSTRUCTION KEY NOTES:

A. STANDARD COVER FOR WATER MAINS SHALL DEPEND ON THE PIPE SIZE AND THE FOLLOWING INSTALLATION CONDITIONS,

AND SHALL BE AS FOLLOWS.

CONDITION		DEPTH (D)
A	NORMAL LINE INSTALLATION, STREET AND DRAINAGE PROJECTS, WATER LINE RELOCATION WITHIN AN EXISTING STREET.	MINIMUM COVER SHALL BE 5–FT FROM TOP OF PIPE TO FINISHED GRADE
B	NEW SUBDIVISION OR NON–PAVED AREAS	MINIMUM COVER SHALL BE 6–FT FROM TOP OF PIPE TO PROPOSED FINISHED GRADE

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD COVER FOR SEWER MAINS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 301



GENERAL NOTES:

1. STANDARD MANHOLE TYPE "A" SHALL BE USED FOR LINES 24" AND SMALLER.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM SPECIFICATION C 478. CEMENT SHALL BE TYPE V (SULPHATE RESISTING).
3. THE BASE SHALL BE PRECAST CONCRETE. (MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.)
4. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR EQUAL.
5. TOPS OF MANHOLES SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
6. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

CONSTRUCTION KEY NOTES:

A. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY COATED WITH BITUMINOUS COATING.

B. THE SUBGRADE UNDER THE BASESHALL BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.

C. PIPE OPENINGS IN MANHOLES RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (ASTM-923) "KOR-N-SEAL" OR EQUAL.

D. ON MAINLINE M.H.'S PIPE IS TO BE LAID THRU AND UPPER 1/2 CUT OUT.

E. CONCRETE BASE 6" + 1/2 OUTER DIAMETER OF THE PIPE.

F. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS.

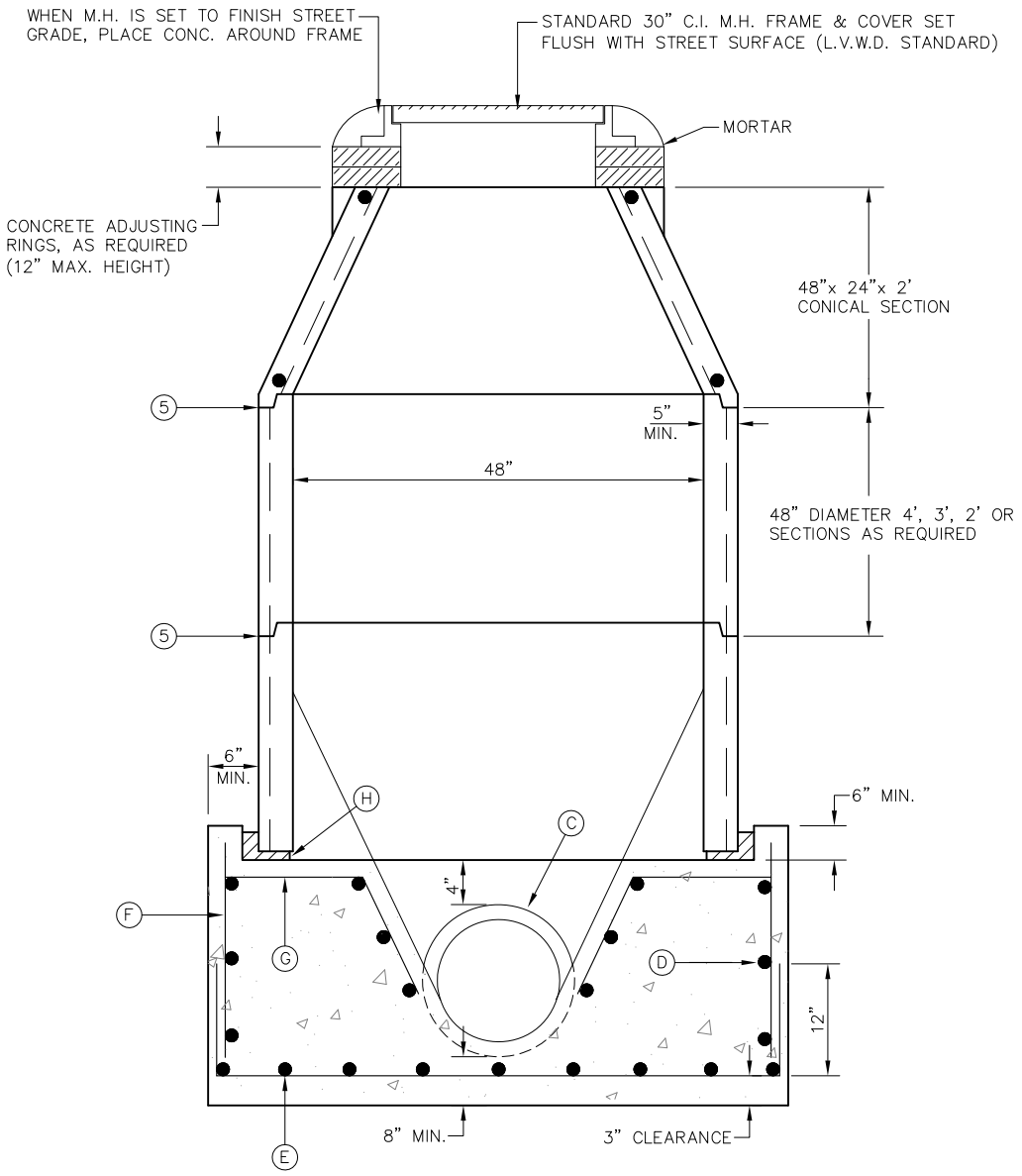
G. REINFORCING SHALL MEET ASTM C-478 AND TRAFFIC LOADING (HS-20).

H. No. 4 REBARS 8" ON CENTER, BOTH WAYS.

I. MAY BE POURED MONOLITH WITH BASE.

J. ALL MANHOLES TO BE EPOXY COATED INSIDE WITH DURA-PLATE 5800 BY SHERWIN WILLIAMS OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD MANHOLE TYPE "A" SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 310



GENERAL NOTES:

1. SPECIAL MANHOLE TYPE "A2" SHALL BE USED FOR LINES 24" AND SMALLER, WHEN SPECIAL SOIL CONDITIONS REQUIRE FOUNDATION TO BE STABILIZED.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM SPECIFICATION C 478. CEMENT SHALL BE TYPE V (SULPHATE RESISTING).
3. THE BASE SHALL BE CONCRETE (MINIMUM 28 DAY COMPRESSIVE STRENGTH 4,000 PSI.) POURED ON UNDISTURBED OR THOROUGHLY COMPACTED SUB-BASE.
4. DEPTHS OVER 14' SHALL HAVE STRENGTHENED WALLS REFER TO CONTRACT DRAWINGS OR SPECIFICATIONS.
5. ALL JOINTS TO BE TONGUE, GROOVE AND SEAL WITH RAM-NEK OR EQUAL.
6. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

CONSTRUCTION KEY NOTES:

A. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY COATED WITH BITUMINOUS COATING.

B. SUBGRADE UNDER PRECAST MANHOLE BASES TO BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.

C. ON MAINLINE MANHOLE"S PIPE IS TO BE LAID THRU AND UPPER 1/2 CUT OUT.

D. No. 4 AT 12" ON CENTER CIRCUMFERENTIAL BAR, LAP END 12".

E. No. 4 AT 12" ON CENTER EACH WAY, TYPICAL.

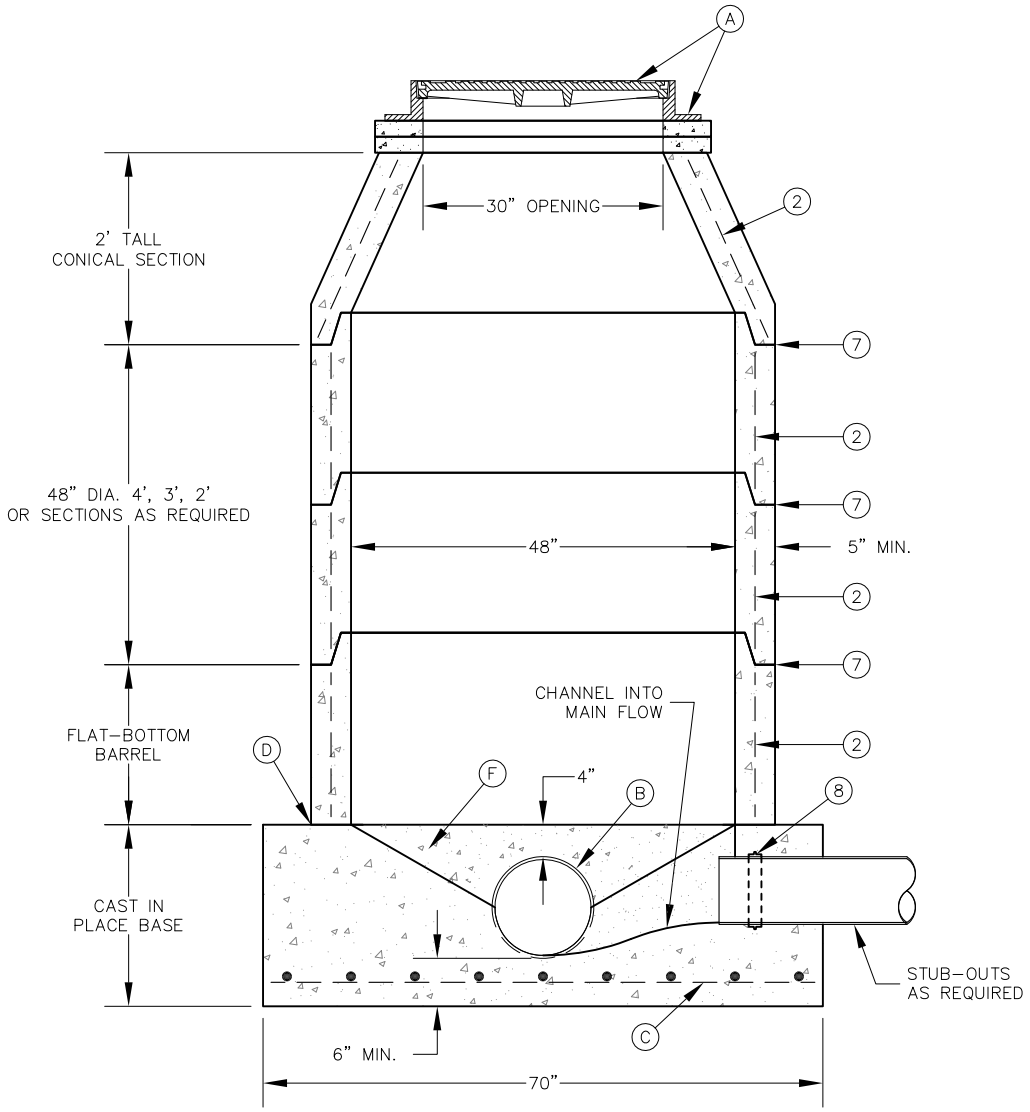
F. No. 4 AT 2" ON CENTER VERTICAL.

G. No. 4 AT 12" ON CENTER.

H. 1" TO 2" GROUT SPACING.

I. ALL MANHOLES TO BE EPOXY COATED INSIDE WITH. DUE-PLATE 5800 BY SHERWIN WILLIAMS OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD MANHOLE TYPE "A2" SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 312



SECTION

GENERAL NOTES:

1. MANHOLE TYPE "A3" SHALL BE USED FOR LINES 24" AND SMALLER.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C-478 AND SHALL MEET HS-20 LOADING.
3. CEMENT SHALL BE TYPE V (SULFATE RESISTING)
4. THE BASE SHALL BE CAST IN PLACE CONCRETE (MINIMUM 28 DAY COMPRESSIVE STRENGTH 4,000 PSI.) POURED ON UNDISTURBED OR THOROUGHLY COMPACTED SUB-BASE.
5. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
6. THE SUBGRADE UNDER THE BASE SHALL BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.
7. ALL JOINTS TO BE TONGUE, GROOVE, SEALED WITH RAM-NEK OR APPROVED EQUAL.
8. PIPE GASKET.

CONSTRUCTION KEY NOTES:

A. MANHOLE RING AND COVER (SEE DETAILS 340 & 341). SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.

B. ON MAINLINE, PIPE IS TO BE LAID THRU AND UPPER HALF CUT OUT.

C. NO. 4 REBARS 8" ON CENTER, BOTH WAYS

D. SEAL ALL AROUND WITH RAM-NEK OR APPROVED EQUAL.

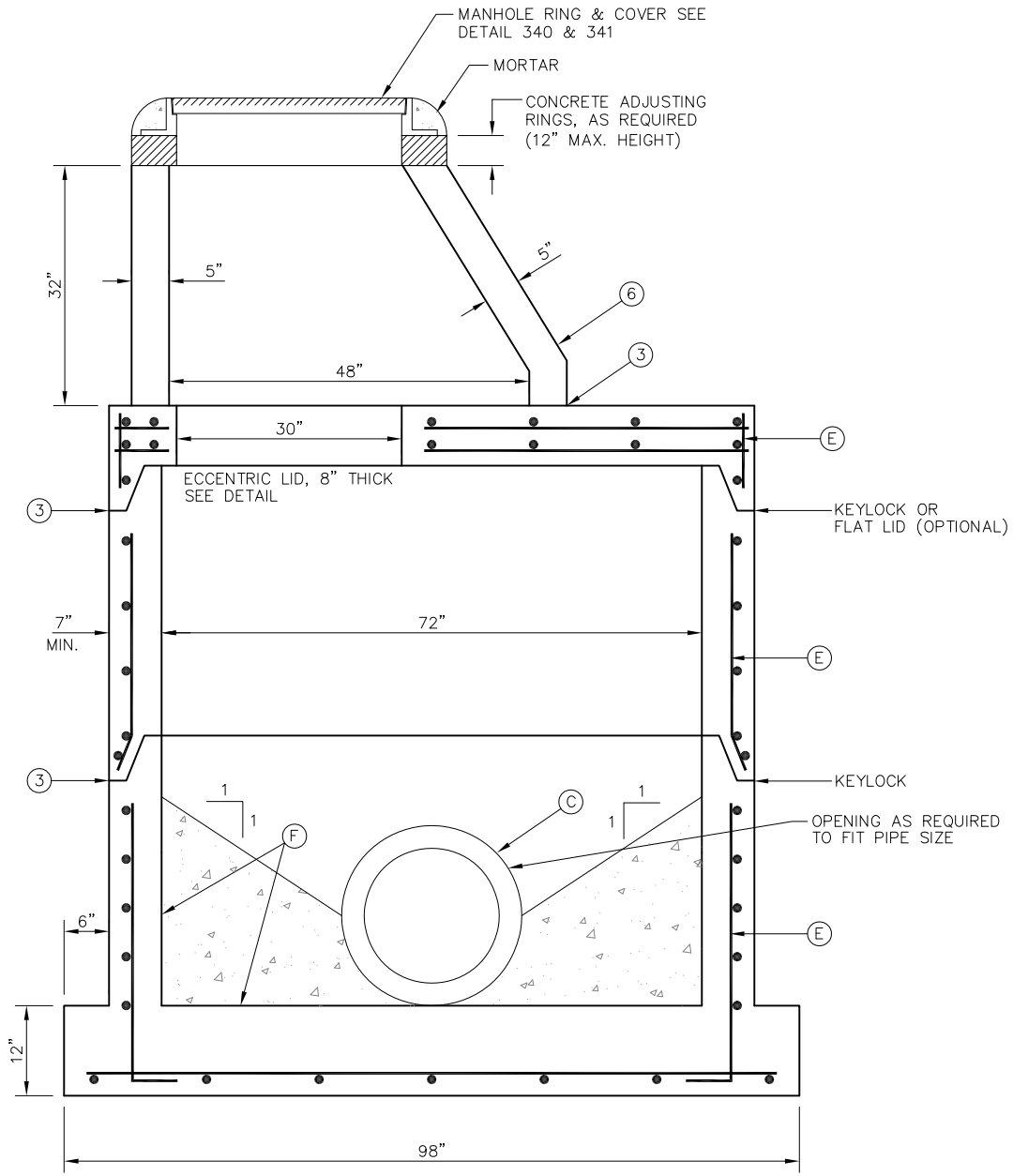
E. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY COATED WITH BITUMINOUS COATING.

F. PIPE OPENINGS IN MANHOLE RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (ASTM-923) "KOR-N-SEAL" OR EQUAL.

G. CONCRETE BASE SHALL BE 8" FOR MH'S 0 – 12' AND 12" FOR DEPTHS GREATER THAN 12'.

H. ALL MANHOLES TO BE EPOXY COATED INSIDE.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD MANHOLE TYPE "A3" – CAST IN PLACE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 313



GENERAL NOTES:

1. STANDARD MANHOLE TYPE "B" SHALL BE USED FOR LINES 27" AND LARGER OR WHEN SEWER MONITORING EQUIPMENT IS REQUIRED.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM SPECIFICATION C 478. CEMENT SHALL BE TYPE V (SULPHATE RESISTING).
3. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR EQUAL.
4. TOPS OF MANHOLES SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
5. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
6. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C-478.

CONSTRUCTION KEY NOTES:

A. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY COATED WITH BITUMINOUS COATING.

B. SUBGRADE UNDER PRECAST MANHOLE BASES TO BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.

C. PIPE OPENINGS IN MANHOLES RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (ASTM-923) "KOR-N-SEAL" OR EQUAL.

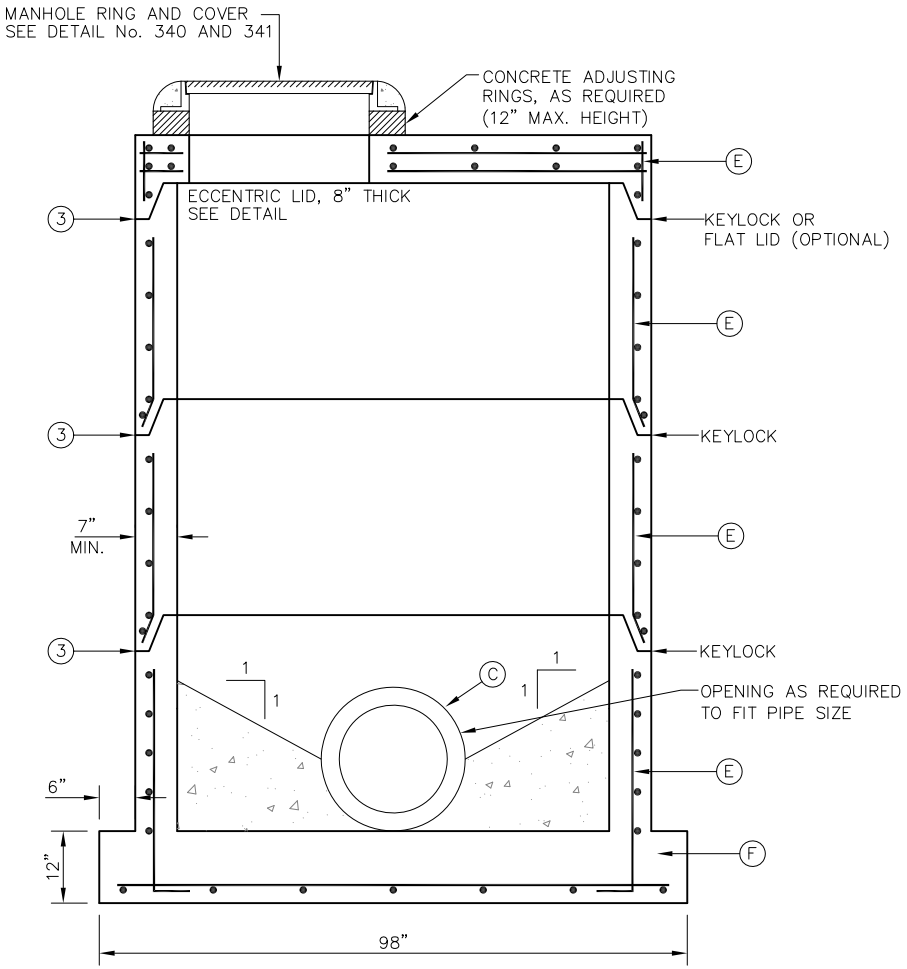
D. 4,000 P.S.I. CONCRETE 28 DAYS.

E. REINFORCING SHALL MEET ASTM C478 AND TRAFFIC LOADING (HS-20).

F. BOTTOM RISER SECTION PRECAST INTEGRALLY WITH BASE SLAB.

G. ALL MANHOLES TO BE EPOXY COATED INSIDE WITH DURA-PLATE 5800 BY SHERWIN WILLIAMS OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD MANHOLE TYPE "B" SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 320



GENERAL NOTES:

1. STANDARD MANHOLE TYPE "B1" SHALL BE USED FOR LINES 27" AND LARGER AND SPECIAL LOADING CONDITIONS. GENERALLY GREATER THAN H-20 OR WHEN REQUIRED BY OTHER GOVERNING AGENCIES.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM SPECIFICATION C 478. CEMENT SHALL BE TYPE V (SULPHATE RESISTING).
3. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR EQUAL.
4. TOPS OF MANHOLES SHALL BE FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
5. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

CONSTRUCTION KEY NOTES:

A. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY COATED WITH BITUMINOUS COATING.

B. SUBGRADE UNDER PRECAST MANHOLE BASES TO BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.

C. PIPE OPENINGS IN MANHOLES RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (ASTM-923) "KOR-N-SEAL" OR EQUAL.

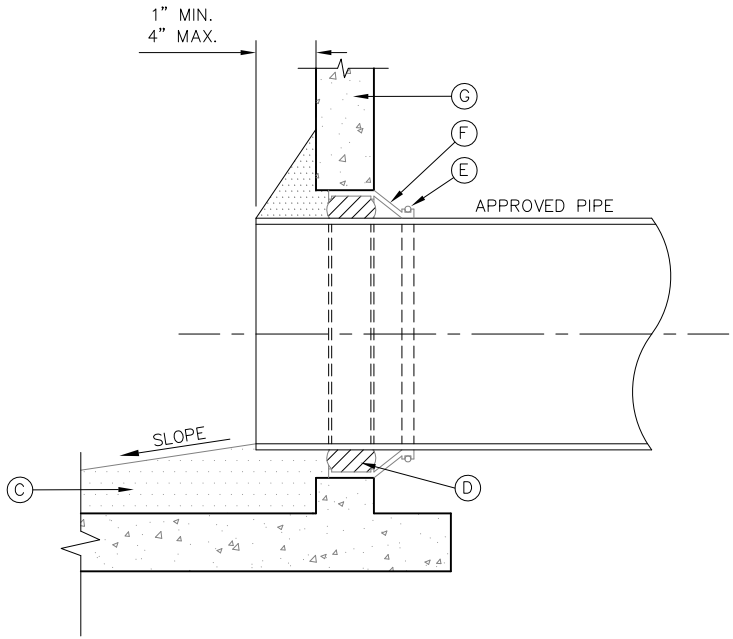
D. 4,000 P.S.I. CONCRETE 28 DAYS.

E. REINFORCING SHALL MEET ASTM C478 AND TRAFFIC LOADING (HS-20).

F. BOTTOM RISER SECTION PRECAST INTEGRALLY WITH BASE SLAB.

G. ALL MANHOLES TO BE EPOXY COATED INSIDE WITH DURA-PLATE 5800 BY SHERWIN WILLIAMS OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	STANDARD MANHOLE TYPE "B1" SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 321



GENERAL NOTES:

1. MANHOLE CONNECTOR SHALL BE KOR-N-SEAL OR EQUAL MEETING THE REQUIREMENTS OF ASTM C-923. CONNECTOR SHALL BE FURNISHED BY CONTRACTOR.

CONSTRUCTION KEY NOTES:

A. AN EPOXY COATING SHALL BE APPLIED TO THE MANHOLE INTERIOR WHEN SPECIFIED.

B. ON MAINLINE MANHOLES PIPE IS TO BE LAID THRU AND UPPER 1/2 CUT OUT.

C. NON SHRINK GROUT AS REQUIRED TO FORM SMOOTH CHANNEL TO MANHOLE INVERT.

D. KOR-N-SEAL, CAVITY-O-RING OR EQUAL

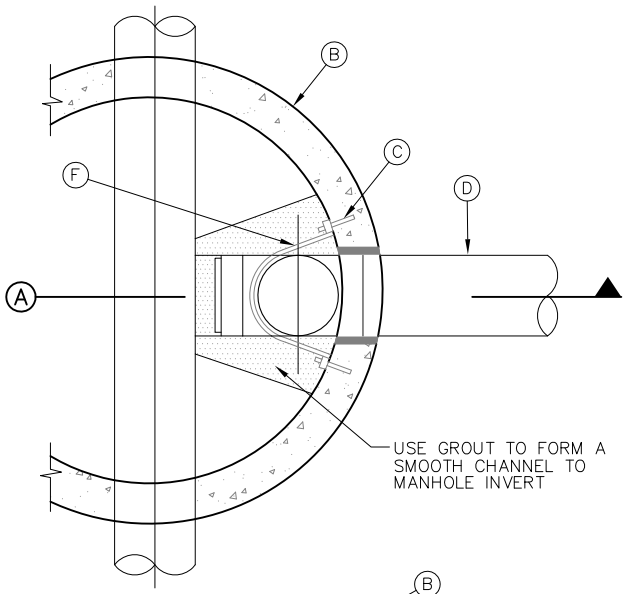
E. PIPE CLAMP SS 316

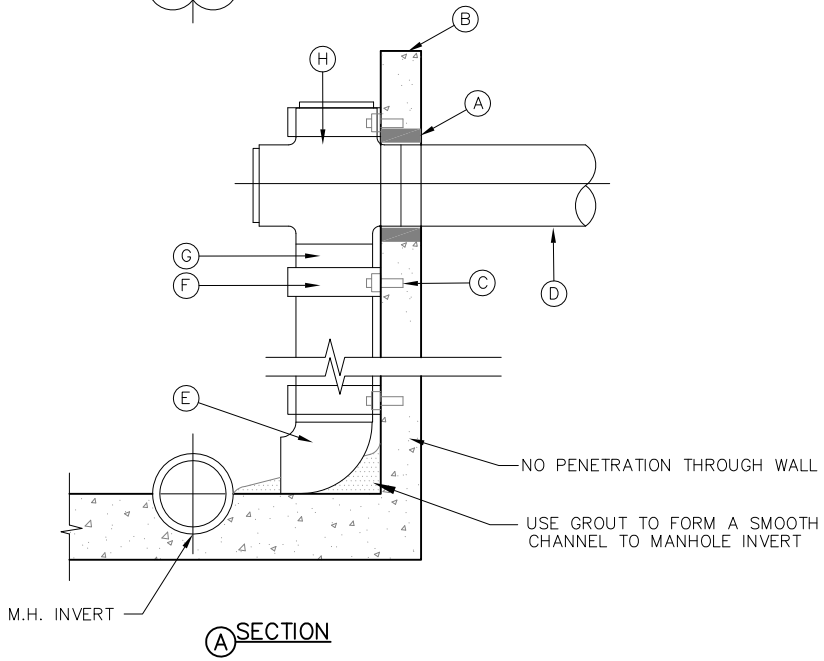
F. FLEXIBLE CONNECTOR

G. PRECAST MANHOLE

H. NON SHRINK GROUT.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	PIPE CONNECTION TO MANHOLE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 330





A SECTION

GENERAL NOTES:

1. ANCHOR STRAPS & BOLTS, SHALL HAVE ONE HEAVY COAT OF POLYAMIDE CURED COAL TAR EPOXY TO PREVENT CORROSION.
2. DROP CONNECTIONS SHOWN HERE ARE LIMITED TO INCOMING COLLECTOR LINES 12" OR LESS DIAMETER, UNLESS OTHERWISE SHOWN IN THE PROJECT DRAWINGS.
3. FOR USE IN 60" AND 72" DIAMETER

CONSTRUCTION KEY NOTES:

A. PIPE OPENINGS IN MANHOLE RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (A.S.T.M.– C923) "KOR–N–SEAL" OR EQUAL.

B. MANHOLE WALL

C. 1/2" EXPANSION BOLT (STAINLESS STEEL) TO HAVE 2" MIN. ANCHORAGE INTO MANHOLE EVERY 2'.

D. APPROVED SEWER PIPE.

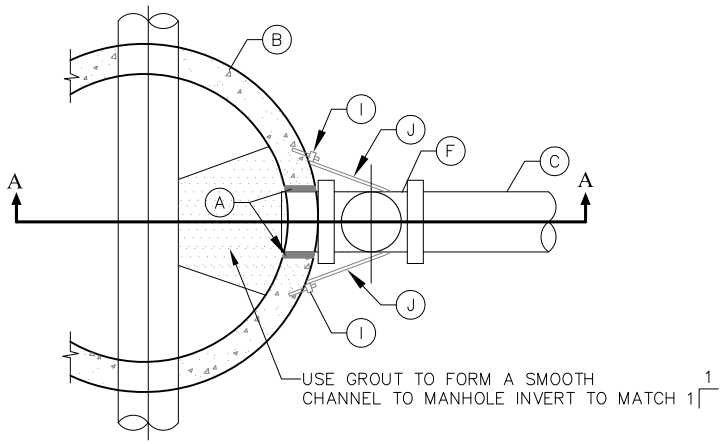
E. 90° BEND (P.V.C.)

F. 2" WIDE X 3/16" THICK STAINLESS STEEL STRAP @ 4' O.C. (AS REQUIRED)

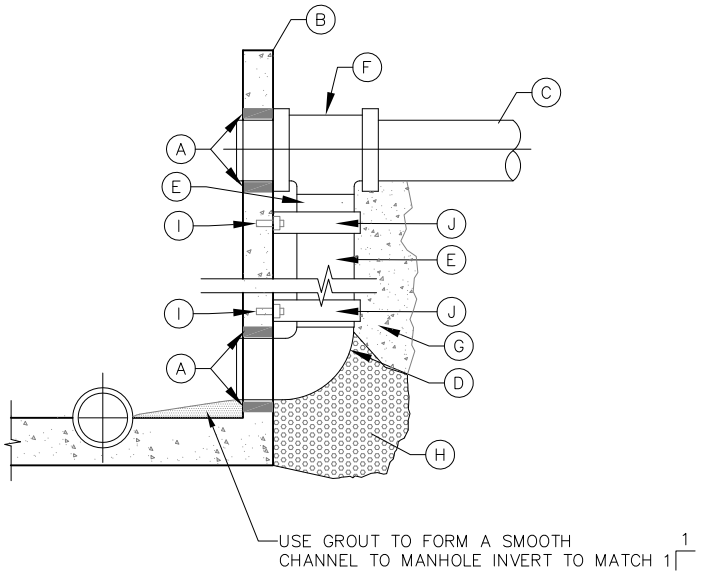
G. P.V.C. PIPE

H. CROSS

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	INTERNAL DROP CONNECTION MANHOLE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 331



TOP VIEW



Ⓐ SECTION

NOTES:

1. ANCHOR STRAPS & BOLTS SHALL HAVE ONE HEAVY COAT OF POLYAMIDE CURED COAL TAR EPOXY TO PREVENT CORROSION.
2. DROP CONNECTION SHOWN MAY BE USED ON ALL MANHOLE TYPES (NOT RECOMMENDED IN GROUND WATER CONDITIONS).
3. DROP CONNECTIONS SHOWN HERE ARE LIMITED TO INCOMING COLLECTOR LINES 8" OR LESS IN DIAMETER, UNLESS OTHERWISE SHOWN IN THE PROJECT DRAWINGS.
4. DROP CONNECTION SHALL BE CONSTRUCTED WHEN INVERT ELEVATION OF INFLUENT PIPE IS 3 FEET (OR GREATER) ABOVE THE MANHOLE INVERT.

KEYED NOTES:

A. PIPE OPENINGS IN MANHOLE RISERS SHALL HAVE COMPRESSION TYPE FLEXIBLE PIPE TO MANHOLE CONNECTORS (A.S.T.M. – C923) "KOR–N–SEAL" OR APPROVED EQUAL.

B. MANHOLE WALL

C. INFLUENT SEWER PIPE

D. 90° ELBOW (P.V.C.)

E. P.V.C. PIPE

F. P.V.C. TEE

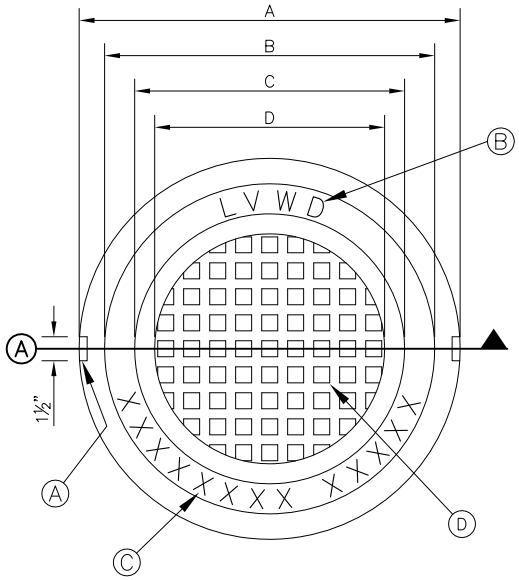
G. CONCRETE FLOWABLE FILL (80–150 P.S.I.)

H. GRAVEL WITH FILTER FABRIC

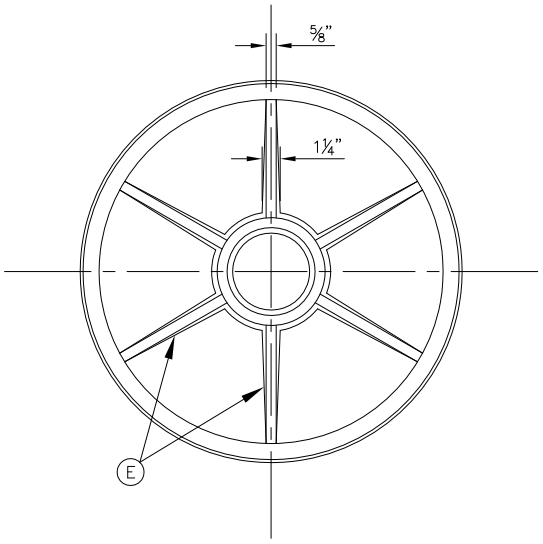
I. 1/2" EXPANSION BOLT TO HAVE 2" MIN. ANCHORAGE INTO MANHOLE EVERY 2'.

J. 2" WIDE X 3/16" THICK STAINLESS STEEL STRAP @ 4' O.C. (AS REQUIRED).

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	EXTERNAL DROP CONNECTION MANHOLE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 332



MANHOLE COVER (TOP VIEW)



MANHOLE COVER (BOTTOM VIEW)

GENERAL NOTES:

1. MATCHING SURFACES MARKED "MF" TO BE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH & VOID OF AIR HOLES.
3. CASTING MUST MEET REQUIREMENTS OF AASHTO M306-07
4. AS-CAST DIMENSIONS MAY VARY 1/16"± / PER FOOT (AASHTO M306-07)
5. WEIGHT MAY VARY 5%± (AASHTO M306-07)

CONSTRUCTION KEY NOTES:

A. LIFTING NOTCH.

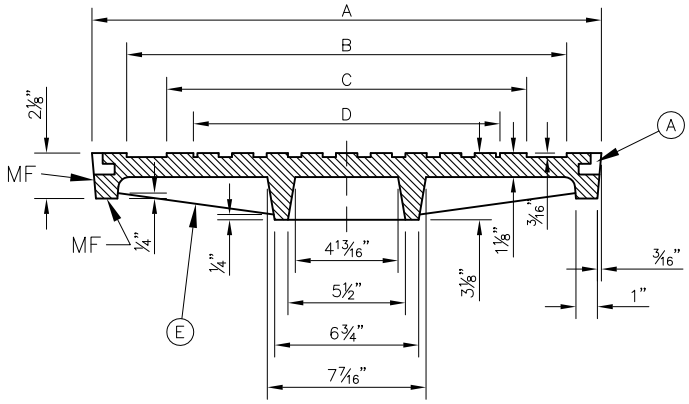
B. 3/16" RAISED LETTERING "LVWD."

C. 3/16" RAISED LETTERING "WATER" OR "SANITARY SEWER."

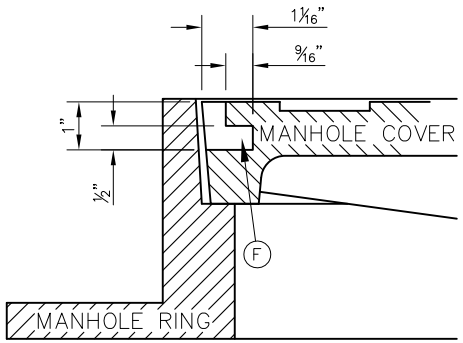
D. 1" SQUARES (3/16" TALL) WITH 5/8" SPACE BETWEEN.

E. REINFORCING RIBS.

F. SLOT.



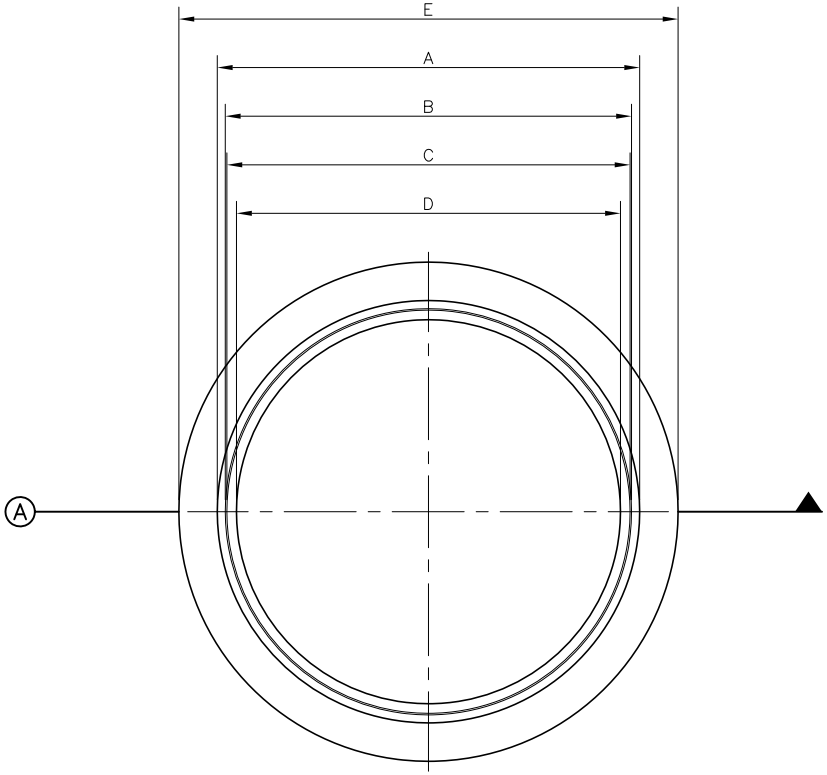
A SECTION



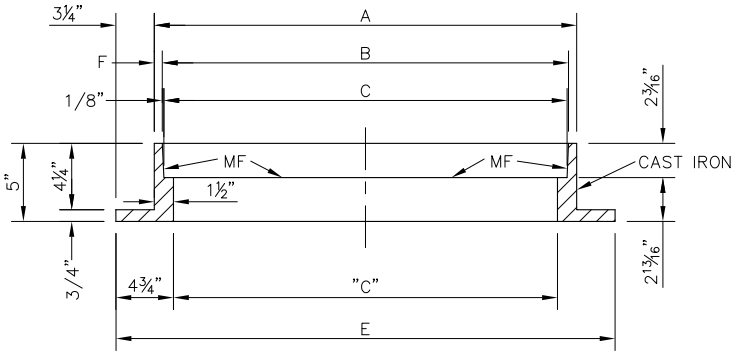
LIFTING NOTCH

MANHOLE COVER	MANHOLE – ALL TYPES
A	31⅜"
B	28⅛"
C	24⅜"
D	21⅞"
WEIGHT	200 LBS.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	MANHOLE COVER SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 340



TOP VIEW



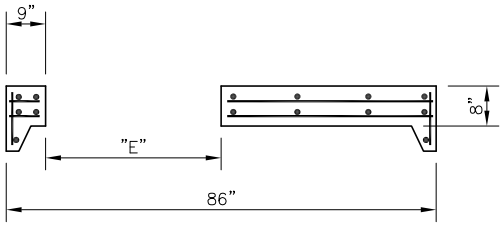
Ⓐ SECTION

GENERAL NOTES:

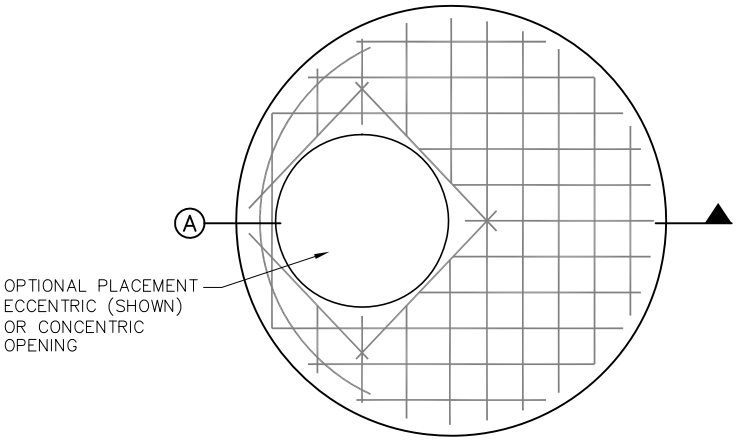
1. MATCHING SURFACES MARKED "MF" TO BE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH & VOID OF AIR HOLES.
3. CASTING MUST MEET REQUIREMENTS OF AASHTO M306–07
4. AS–CAST DIMENSIONS MAY VARY 1/16"±/ PER FOOT (AASHTO M306–07)
5. WEIGHT MAY VARY 5%± (AASHTO M306–07)

MANHOLE RING	MANHOLE – ALL TYPES
A	33"
B	31¾"
C	31½"
D	30"
E	39½"
F	⅝"
WEIGHT	205 LBS.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	MANHOLE RING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 341



Ⓐ SECTION



GENERAL NOTES:

1. ALL JOINTS TO BE TONGUE & GROOVE AND SEALED WITH RAM–NEK OR EQUAL.
2. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.

CONSTRUCTION KEY NOTES:

A. 4,000 P.S.I. CONCRETE 28 DAYS.

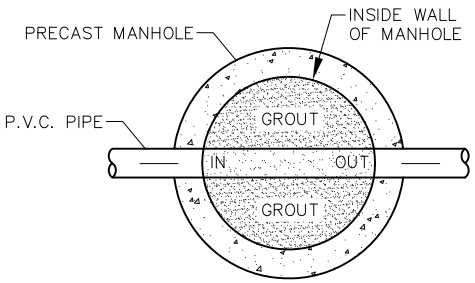
B. KEYLOCK ADDS 8" TO VERTICAL HEIGHT.

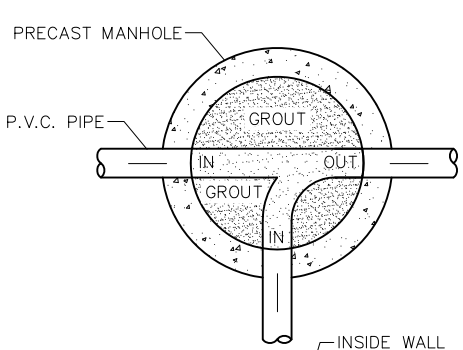
C. RING & COVER OR SPECIAL LIDS TO MEET REQUIREMENTS, MAY BE CAST IN PLACE.

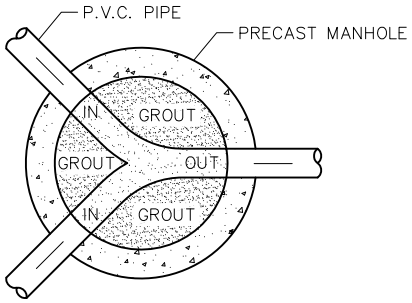
D. REINFORCING SHALL MEET A.S.T.M. C478–87 AND TRAFFIC LOADING (HS–20).

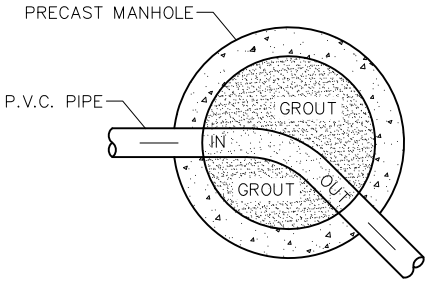
E. SIZE TO ACCOMMODATE TYPE B & B1 MANHOLE RING, SEE DETAIL.

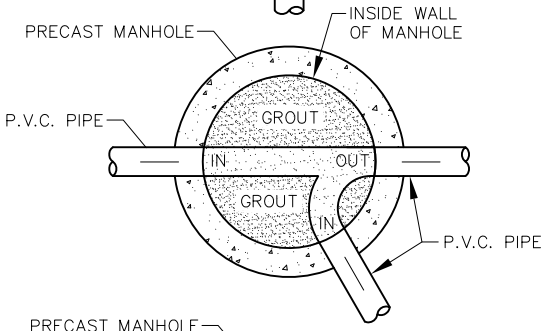
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	CONCRETE MANHOLE COVER FOR 72" I.D. SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 342

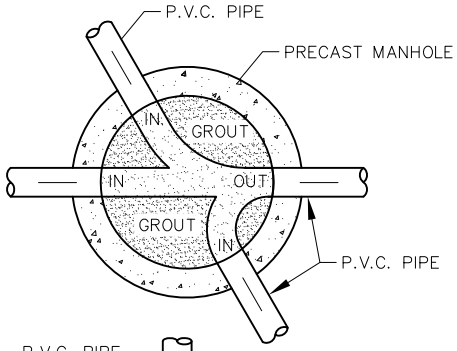


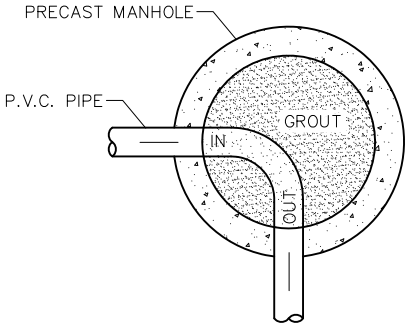


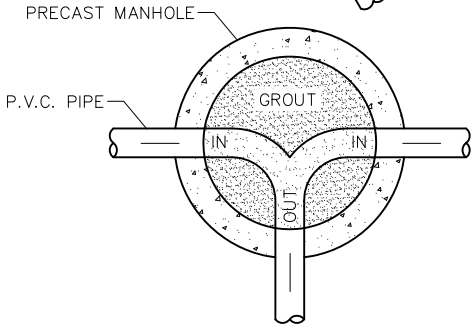


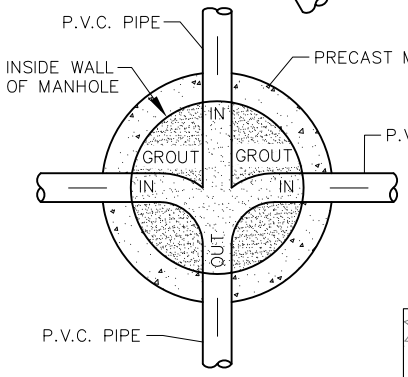






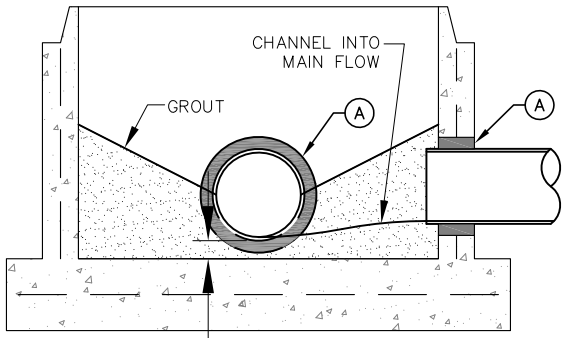






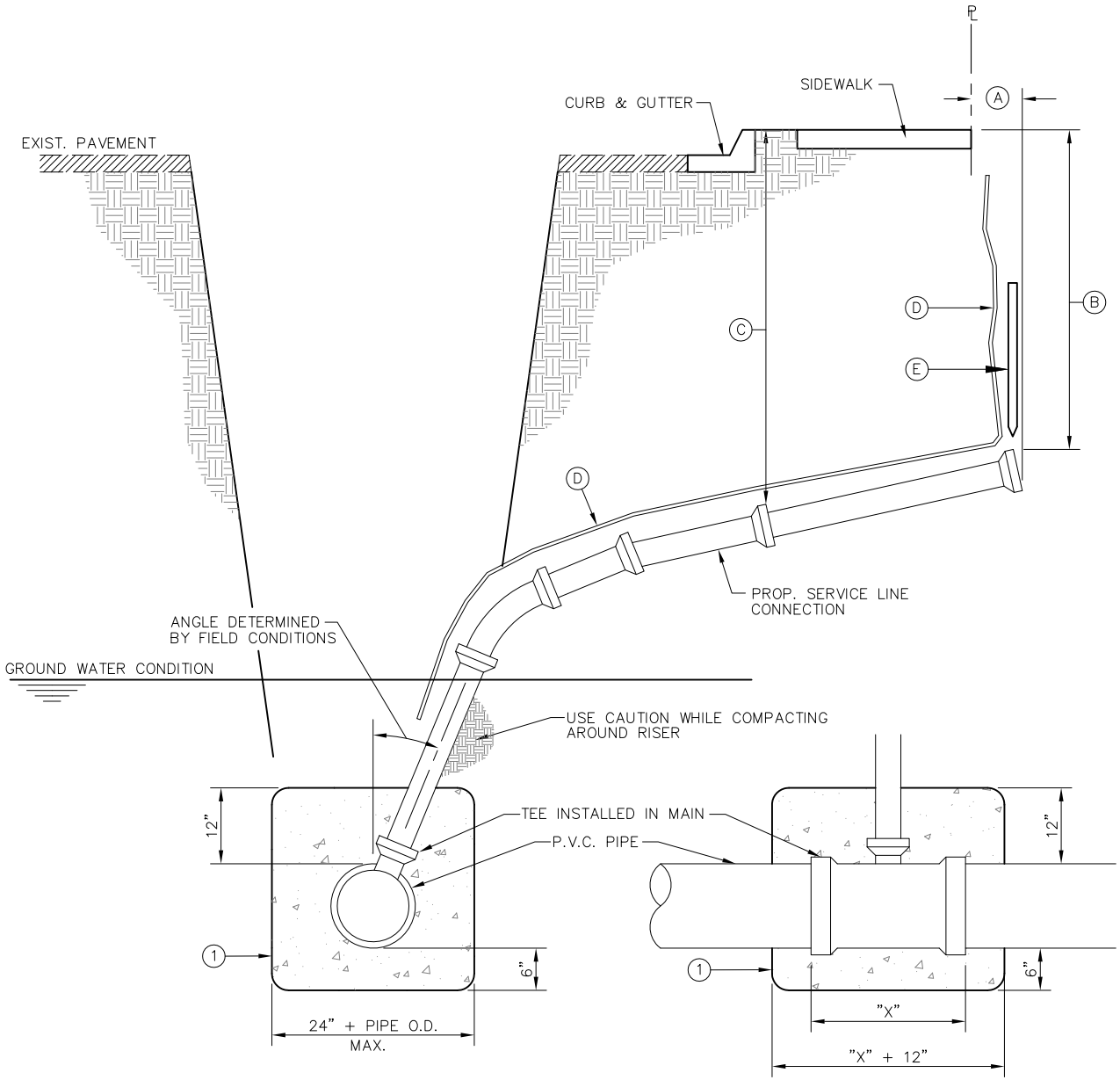
GENERAL NOTES:

1. CONTRACTOR TO FORM SMOOTH CHANNEL WITH GROUT TO CONTINUE PIPE SLOPE IN THE DIRECTION OF FLOW.
2. WIDTH OF CHANNEL TO MATCH INSIDE DIAMETER OF PIPE
3. WHEN DIFFERENT SIZES OF PIPE ARE CONNECTING TO MANHOLE, TAPER WIDTH OF CHANNEL TO TOTAL LENGTH OF INSIDE DIAMETER OF MANHOLE.
4. GROUT TO BE USED FOR BOTH MANHOLES AND DROP MANHOLES. NO P.V.C. PIPE SHALL BE INSTALLED IN MANHOLE.
5. ALL MANHOLES TO BE EPOXY COATED INSIDE WITH DURA-PLATE 5800 BY SHERWIN WILLIAMS OR APPROVED EQUAL.



SECTION

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	TYPICAL MANHOLE INVERT PLANS SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 350



GENERAL NOTES:

1. IN GROUNDWATER CONDITIONS ONLY, P.V.C. SADDLES OR TEES ARE TO BE ENCASED WITH CLASS B CONCRETE.
2. UNDER CERTAIN CONDITIONS FIELD INVESTIGATIONS WILL BE REQUIRED TO DETERMINE THE ADEQUACY OF THE DEPTH ON THE LATERAL.
3. WHEN GROUND WATER IS ENCOUNTERED SERVICE RISER SHALL BE EXTENDED ABOVE ANTICIPATED WATER TABLE LEVEL.

CONSTRUCTION KEY NOTES:

A. CONTRACTOR TO INSTALL SEWER SERVICE LINE FROM THE MAIN TO A LOCATION 6" BEHIND THE CURB OR 18" BEYOND THE EDGE OF PAVEMENT, UNLESS CONDITIONS REQUIRE OTHERWISE

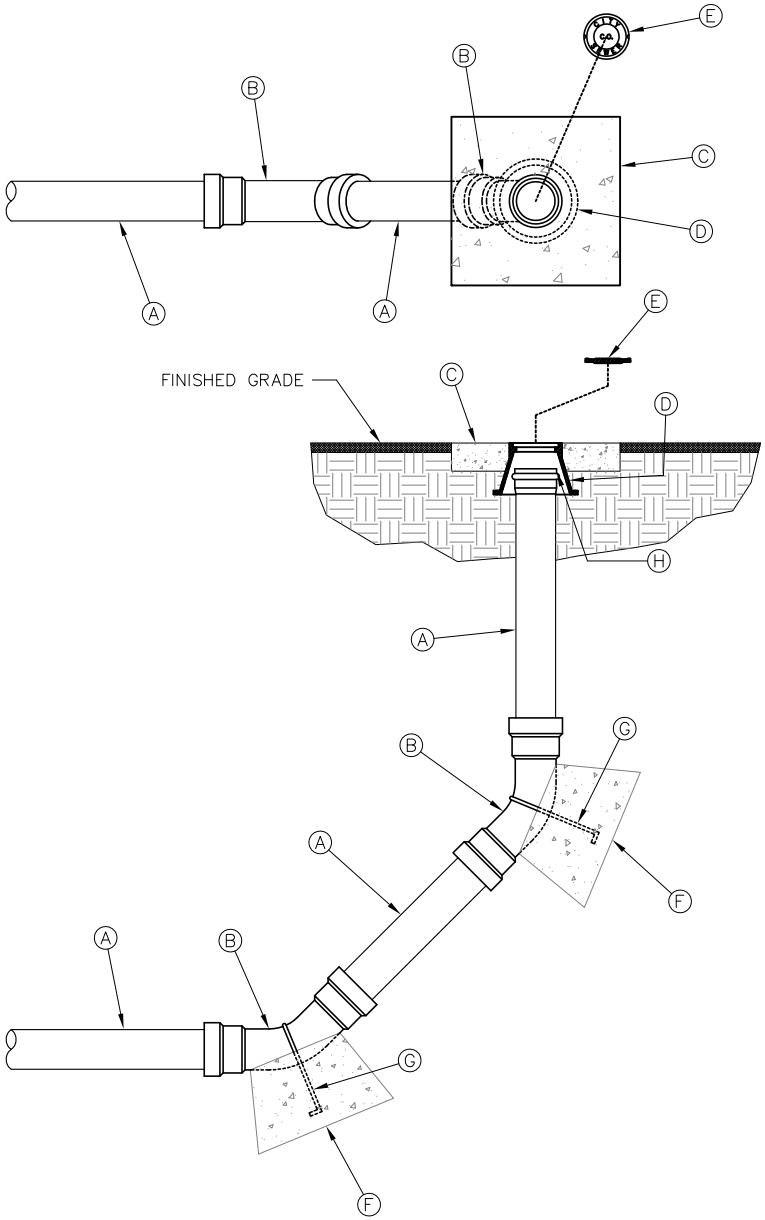
B. 42" FOR STANDARD SUBDIVISION, 42" FOR SUBDIVISIONS WITH ON-SITE PONDING OR FLAT TERRAIN.

C. RISERS OR LATERALS EXTENDING BEYOND EXISTING PAVING SHALL BE INSTALLED TO 3.5"MINIMUM TOP OF GROUP OR PAVEMENT, UNLESS CONDITIONS REQUIRE OTHERWISE.

D. PLASTIC METALLIC MARKING TAPE RISING TO WITHIN 6" OF GROUND SURFACE OR METALLIC DISK.

E. WOODEN STAKE (1"x2"x36") VERTICALLY PLACED AT PLUGGED END OF PROPOSED SERVICE LINE.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SEWER SERVICE RISER & SERVICE LINE CONNECTION SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 360



CLEANOUT

GENERAL NOTES:

1. CLEANOUT TO BE USED AT END OF LINES & AT CUL–DE–SACS (AS SPECIFIED ON PLANS).
2. DOUBLE WYES TO BE USED AS NECESSARY ON CUL–DE–SACS.
3. SPOOL LENGTHS AND DEPTHS WILL VARY.
4. BONNET BOX & CONCRETE COLLAR TO BE FLUSH WITH FINISHED GRADE.
5. CLEANOUT NOT TO BE USED MORE THAN 300' AWAY FROM LAST MANHOLE IN LINE.

CONSTRUCTION KEY NOTES:

A. 8" P.V.C. SDR 35 (LENGTHS VARY)

B. 8" LONG SWEEP BEND 45°

C. CONCRETE COLLAR DETAIL 120

D. BONNET BOX (SEE DETAIL 219)

E. BONNET BOX COVER (SEE DETAIL 220)

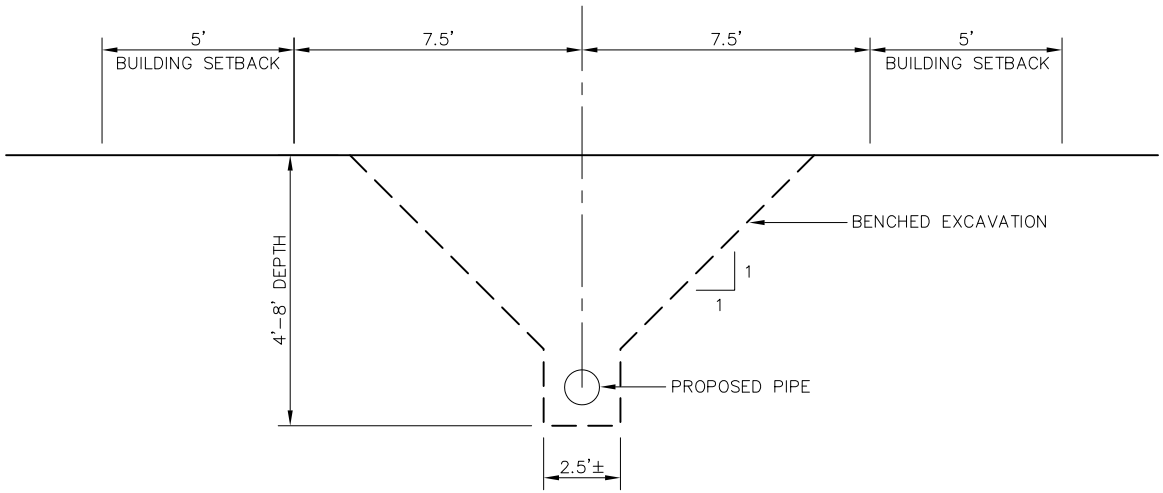
F. 2,500 PSI CONCRETE THRUST BLOCKING

G. NO. 5 REBAR HAIR PIN. PAINT UNEMBEDDED PORTION OF REBAR WITH TWO COATS OF COAL TAR EPOXY.

H. P.V.C. BELL END

I. PIPE BELL END TO FIT SNUGLY AGAINST INTERIOR OF BONNET BOX.

STANDARD DETAIL	DATE: XXXX REV: APR. 2017	END OF SEWER LINE CLEANOUT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 370

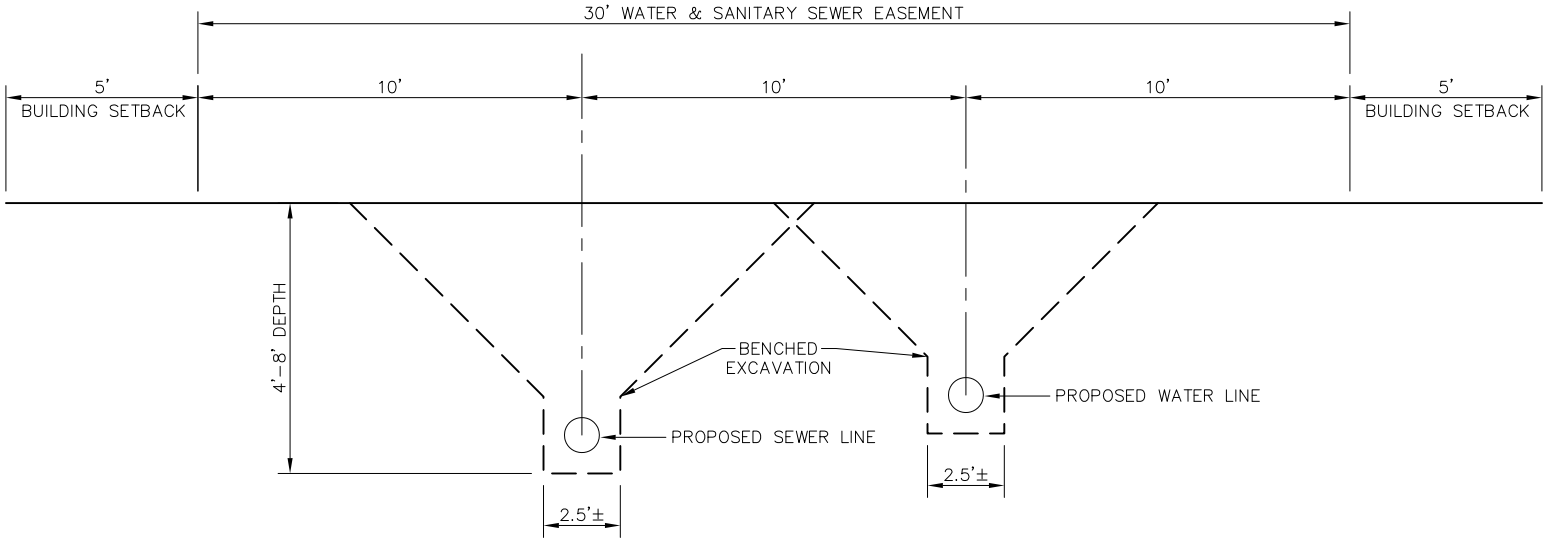


SINGLE UTILITY (4'–8' DEPTH)

GENERAL NOTES:

1. FOR LINES GREATER THAN 16" IN DIAMETER ADDITIONAL CONDITIONS ARE NEEDED.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	15' WATER OR SANITARY SEWER EASEMENT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 380



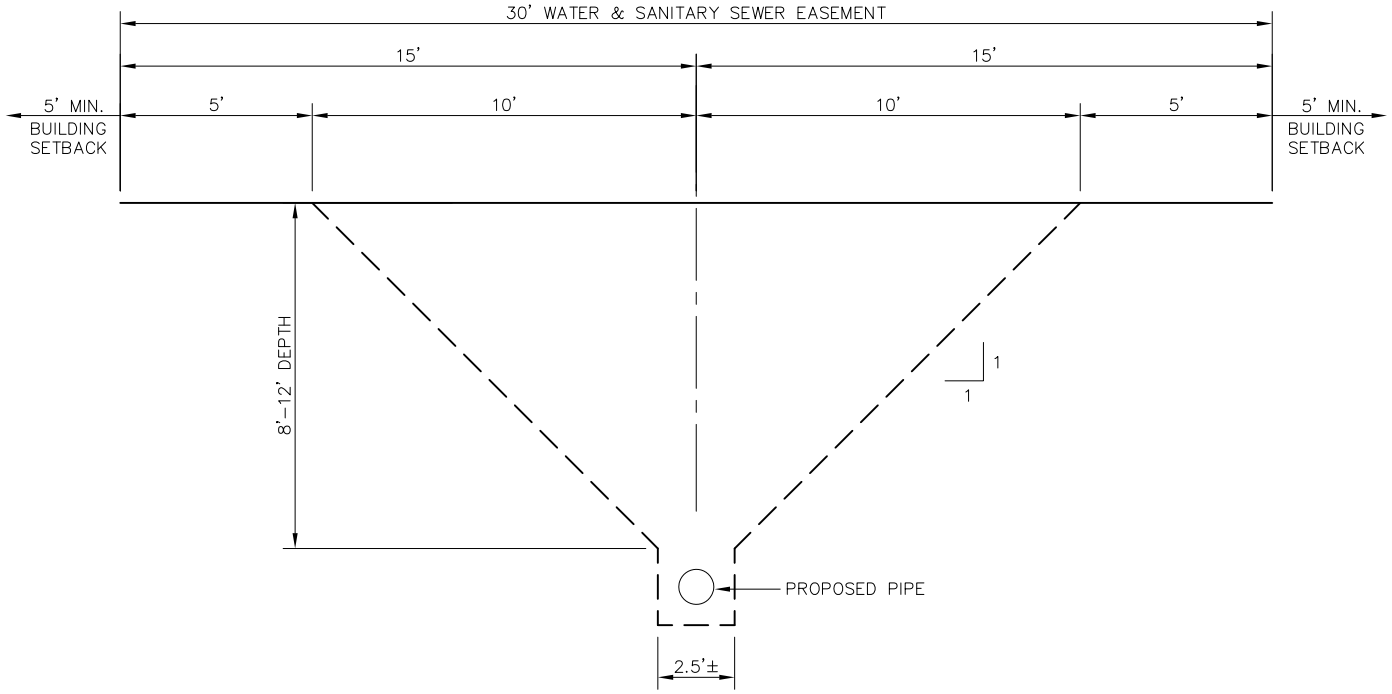
COMBINED WATER & SEWER UTILITIES

EXCAVATION 4'–8' DEPTH

GENERAL NOTES:

1. FOR LINES GREATER THAN 16" IN DIAMETER ADDITIONAL CONDITIONS ARE NEEDED.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	30' WATER OR SANITARY SEWER EASEMENT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 381

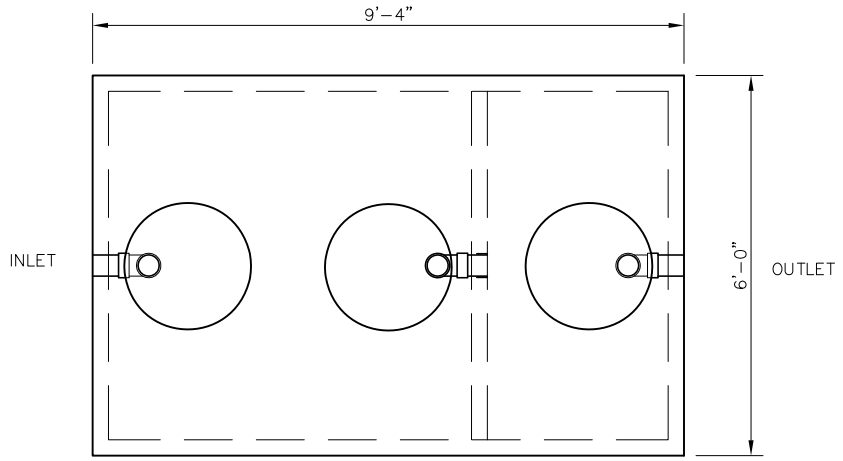


EXCAVATION 8'–12' DEPTH

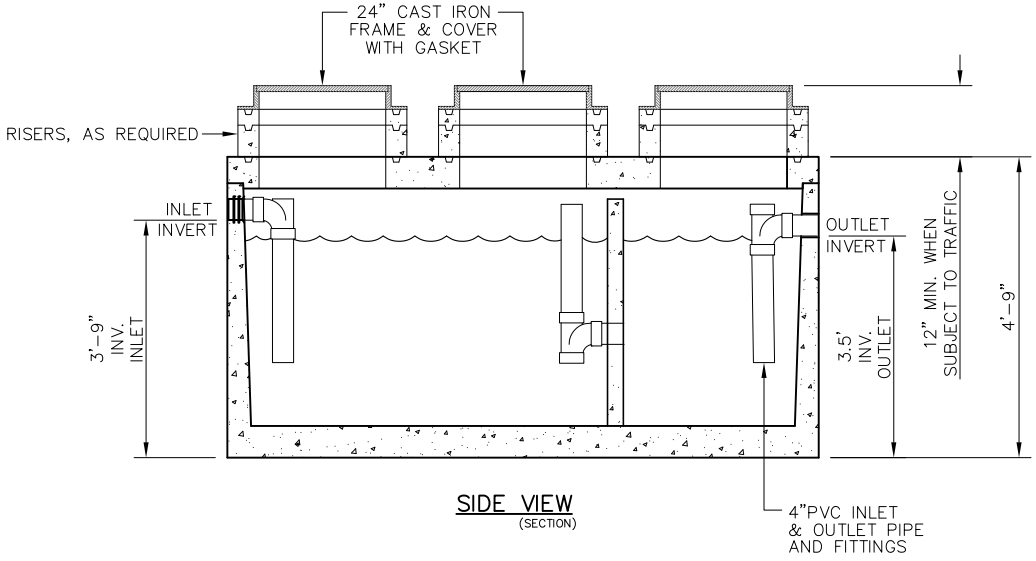
GENERAL NOTES:

1. FOR DEPTHS GREATER THAN 12" DEEP OR LINES GREATER THAN 16" IN DIAMETER ADDITIONAL CONDITIONS ARE NEEDED.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	30' WATER OR SANITARY SEWER EASEMENT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 382



TOP VIEW
(COVERS & RISERS REMOVED)



SIDE VIEW
(SECTION)

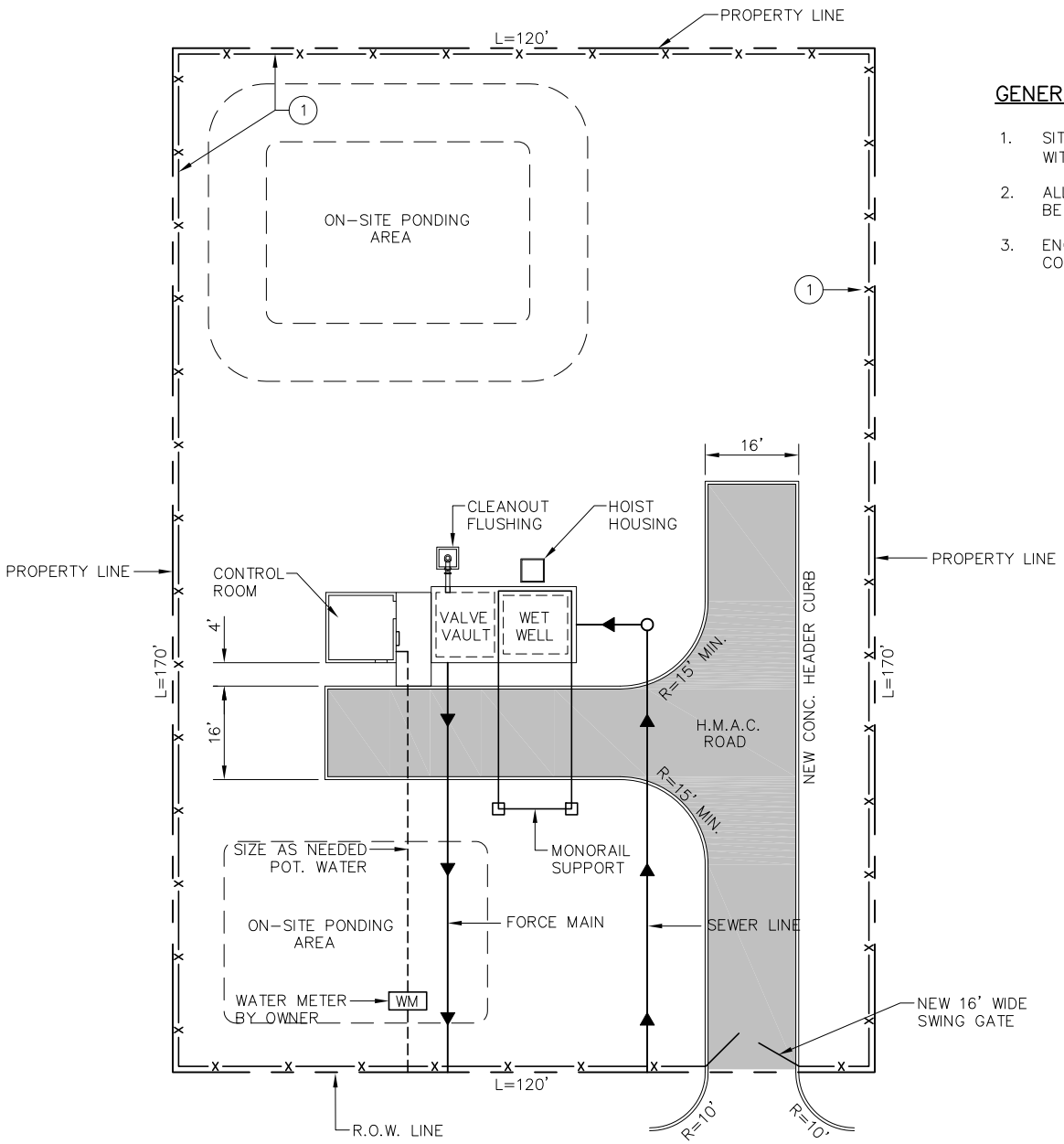
GENERAL NOTES:

1. LIQUID CAPACITY: DIMENSIONS SHOWN FOR 1,000 GALLONS.
2. TANK DESIGNED FOR H–20 TRAFFIC WHEEL LOAD WITH 1' TO 6' MAX. EARTH COVER AND WATER TABLE AT ONE FOOT BELOW GRADE.
3. SUITABLE NATIVE SOIL OR GRANULAR SUB–BASE SHALL BE COMPACTED AND LEVELED TO HANDLE ANTICIPATED LOADS. SEE INSTALLATION PROCEDURES SHEET FOR ADDITIONAL INFO.
4. EXTERIOR AND INTERIOR CONCRETE SURFACES TO BE COATED WITH AN APPROVED BITUMINOUS MATERIAL.
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION CONTACT WESTERN PRE–CAST.
6. REFER TO EPWU STANDARDS TO DETERMINE SIZE OF TRAP.

WEIGHTS IN LBS.

TOP SLAB	3,700
BODY	10,400
TOTAL TANK	14,100

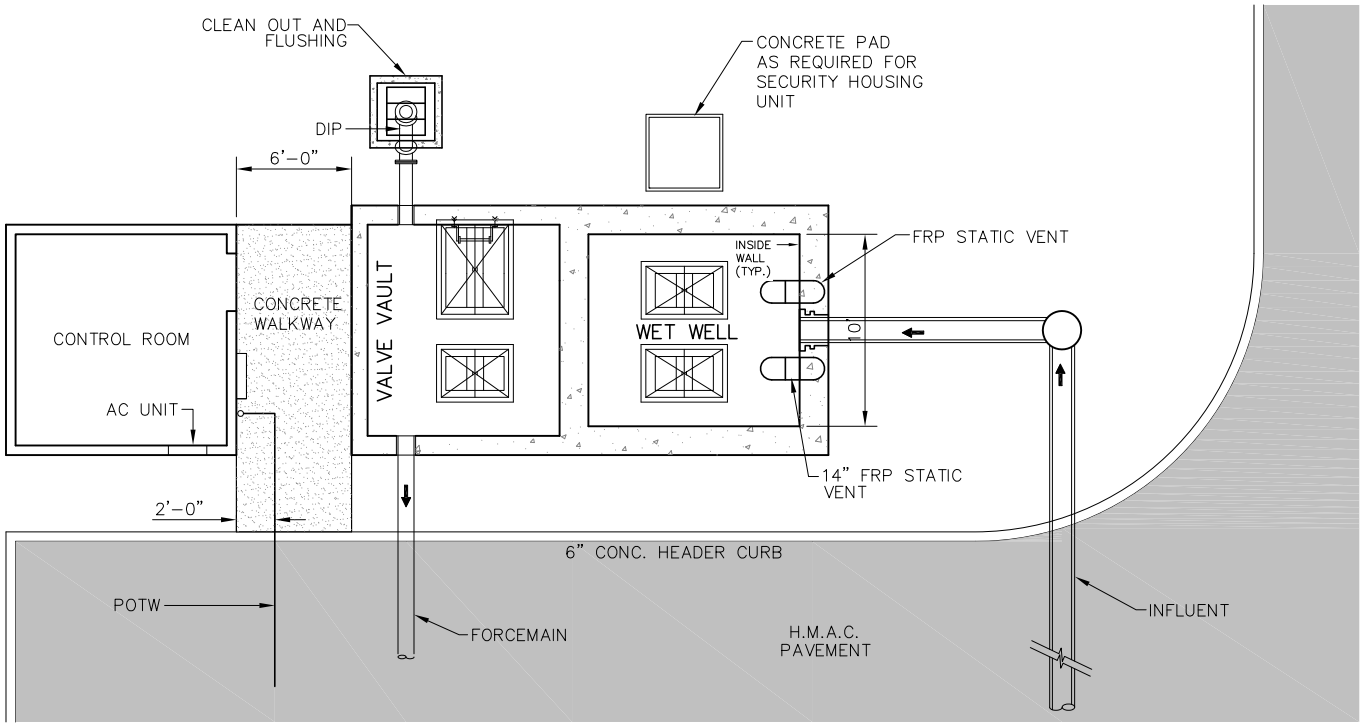
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	GREASE AND SEWER TRAP DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 390



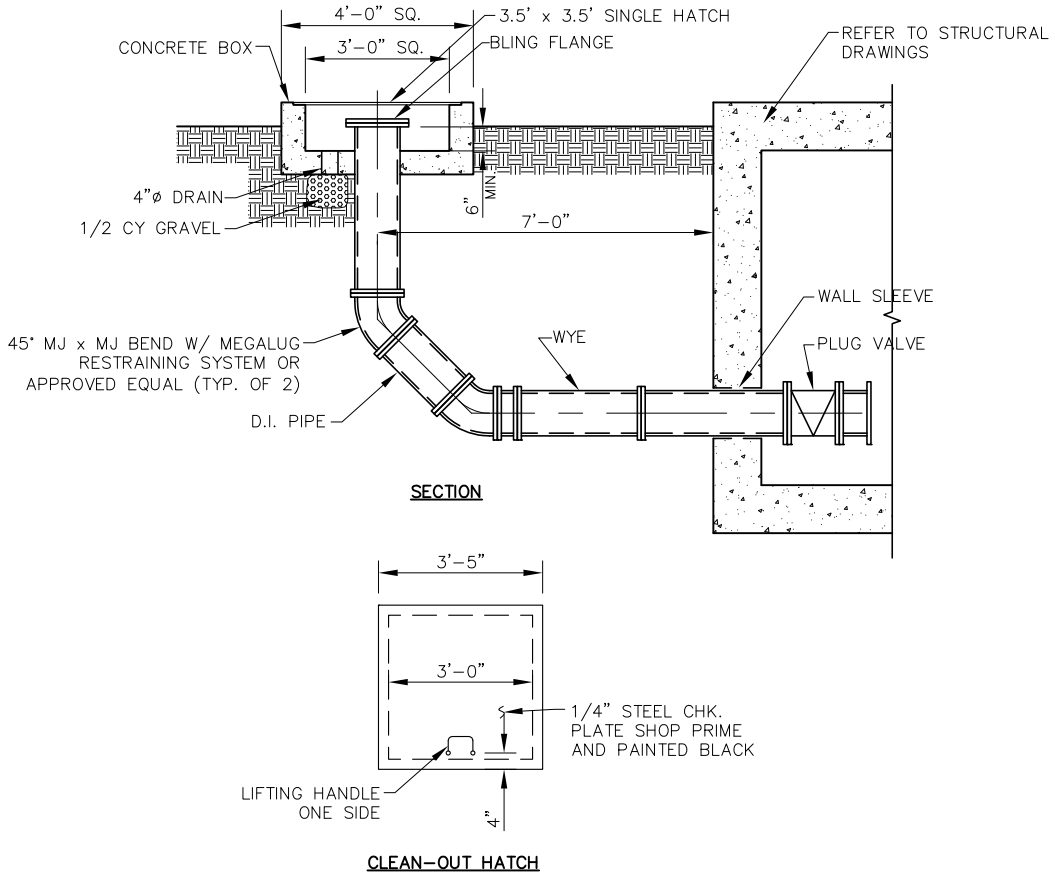
GENERAL NOTES:

1. SITE SHOULD HAVE 6' ROCKWALL FENCE WITH 1' RAZOR WIRE.
2. ALL LIFT STATION DIMENSIONS SHOULD BE DESIGNED BY ENGINEER.
3. ENGINEER SHALL DETERMINE THE FINAL CONFIGURATION.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL LIFT STATION SITE PLAN SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 410



STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	LIFT STATION GENERAL LAYOUT SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 411

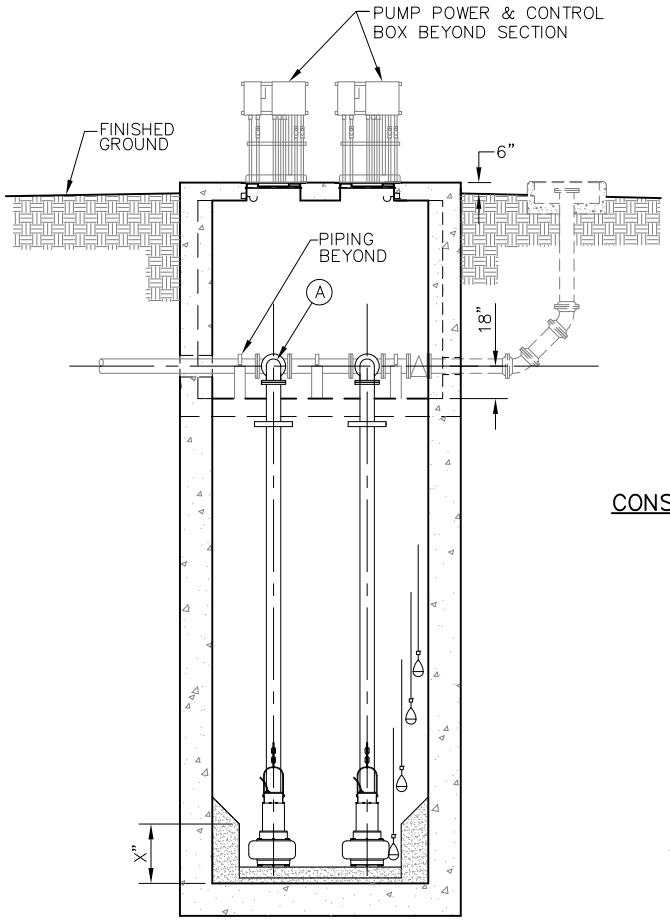


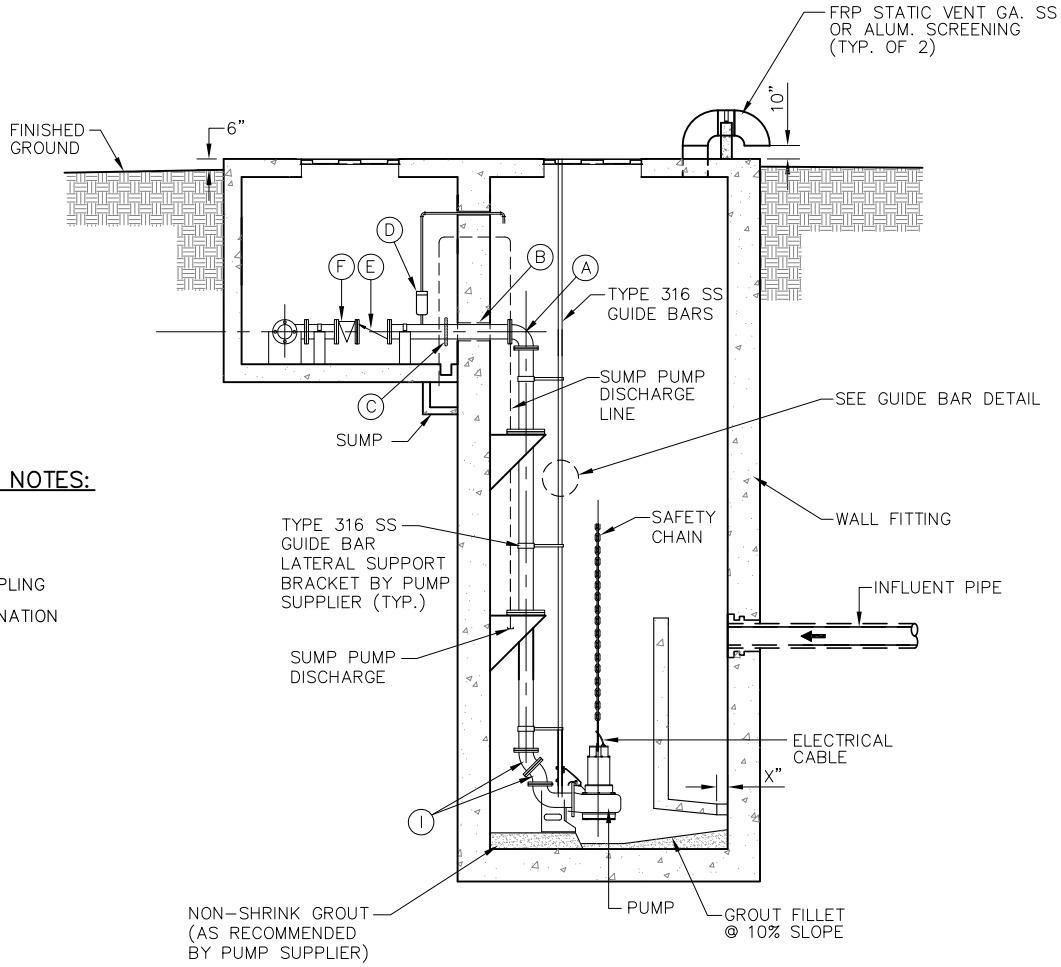
GENERAL NOTES:

1. SIZE OF PIPING TO BE DETERMINED BY ENGINEER.
2. CONCRETE BOX TO BE SIZED ACCORDINGLY.

CLEANOUT / FLUSHING DETAIL

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	CLEAN-OUT HATCH AND FLUSHING DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 412





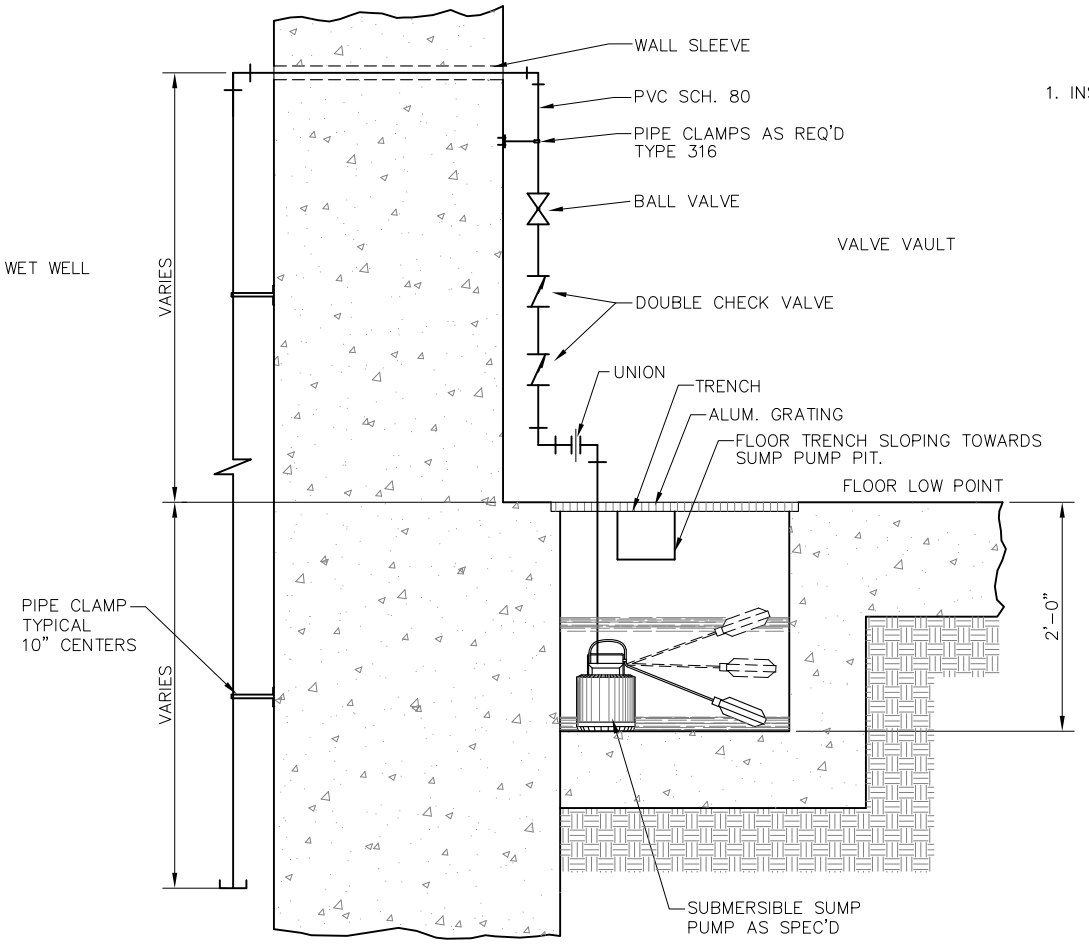
CONSTRUCTION KEY NOTES:

A. 90° BEND
B. WALL SLEEVE
C. VICTAULIC COUPLING
D. SEWAGE COMBINATION AIR VALVE
E. CHECK VALVE
F. PLUG VALVE
G. TEE
H. WALL SLEEVE
I. 45° BEND
J. PLUG VALVE

NOTES:

1. ELEVATIONS FOR PUMP CONTROLS SHALL BE PROVDIED FOR THE BOTTOM OF EACH FLOAT.
2. ACCESSORIES, INCLUDING STEEL CHAINS, GUIDE BARS, BRACKETS AND SUPPORTS SHALL BE MADE OF STAINLESS OF APPROPRIATE GAGE.

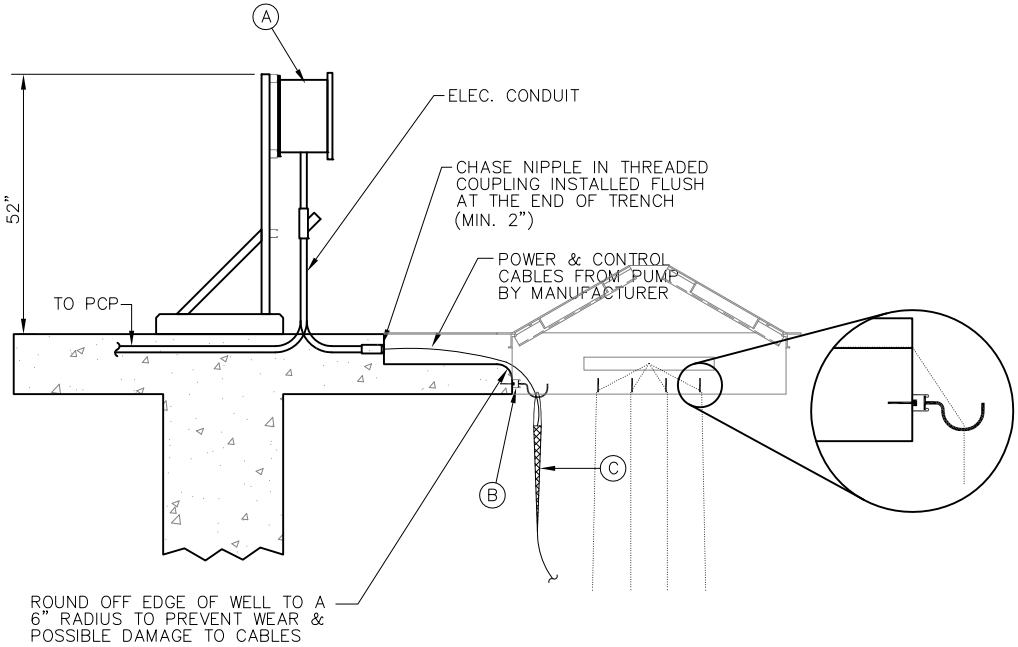
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	LIFT STATION GENERAL SECTION – BELOW GRADE SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 413



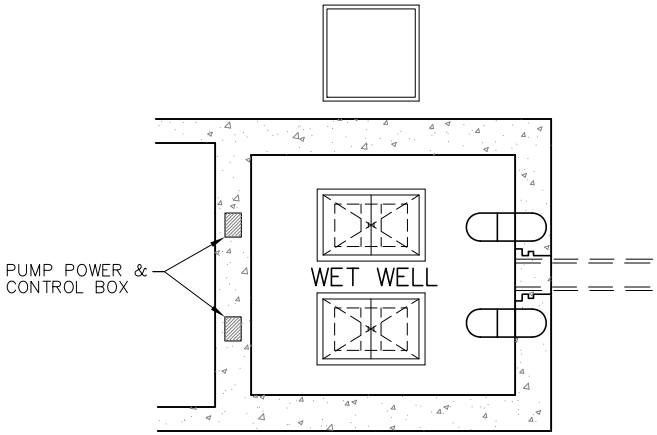
GENERAL NOTES:

1. INSTALL BY-PASS SWITCH FOR MANUAL/MAINTENANCE USE.

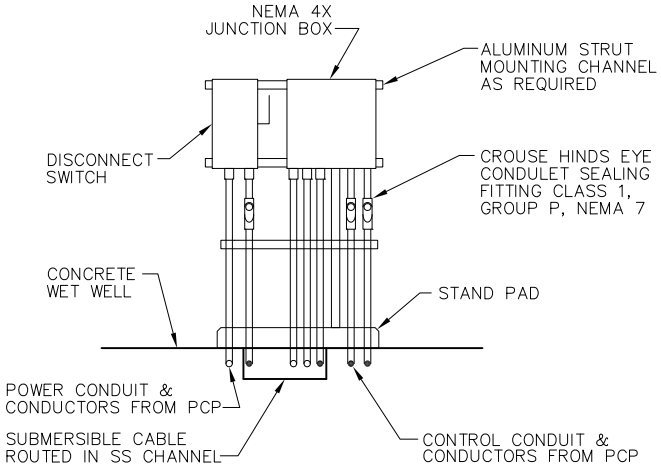
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	SUMP PUMP DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 414



DETAIL



PLAN



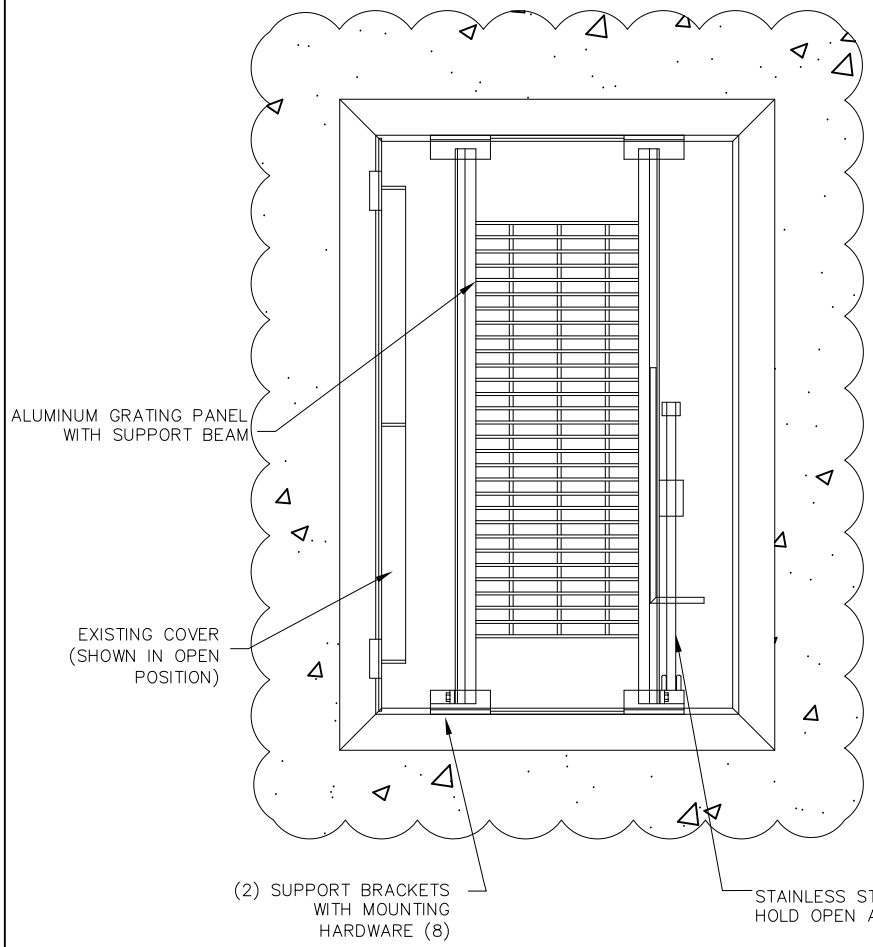
PUMP CONTROL STAND NOTES:

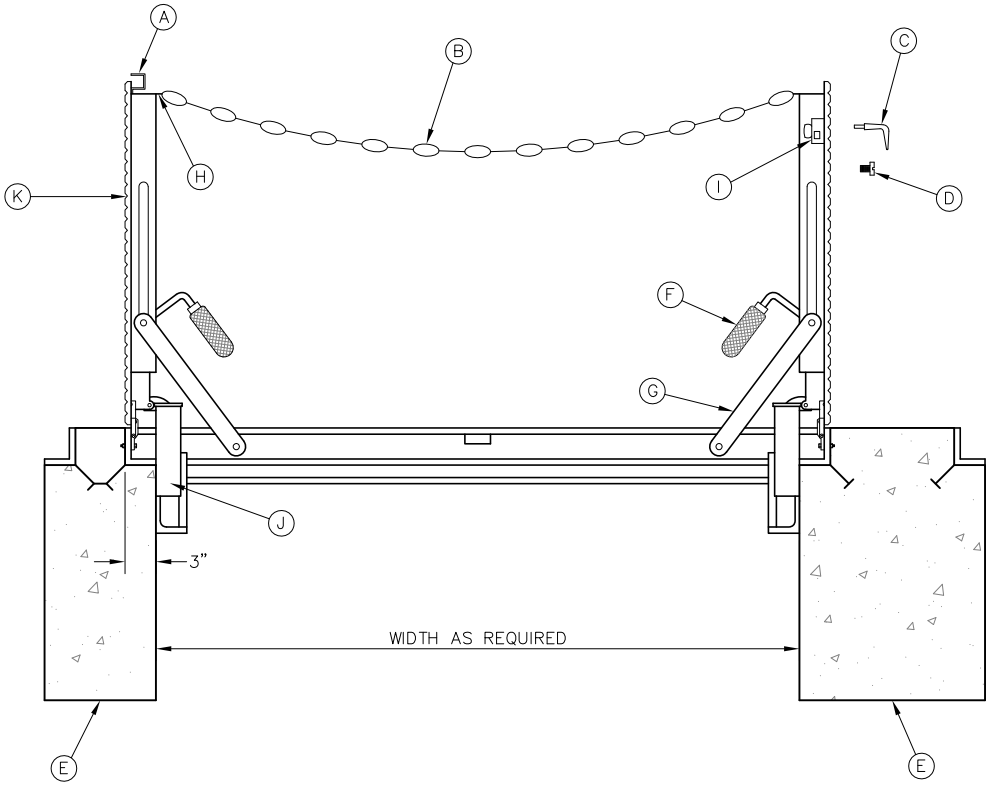
(A) CROUSE HINDS NEMA 4X STAINLESS STEEL JUNCTION BOX OR APPROVED EQUAL, WITH (1) 3–POLE AND (1) 1–POLE POWER BLOCKS, ALLEN–BRADLEY CAT. NO. 1492–PDM3111 AND 492–50Y RESPECTIVLY. ALSO PROVIDE (7) 1–POLE PANEL MOUNT BLOCKS, ALLEN–BRADLEY CAT. NO. 1492–15T FOR CONTROL CABLING.

(B) 2'–0" STAINLESS STEEL UNISTRUT CHANNEL WITH (1) 1/2" DIAMETER STAINLESS STEEL HOOK FOR EACH CABLE TO BE SUPPORTED. ALL HARDWARE REQUIRED FOR THIS INSTALLATION SHALL BE STAINLESS STEEL.

(C) STAINLESS STEEL HEAVY DUTY, SINGLE EYE, CLOSED MESH KELLUM GRIPS. FOR THE POWER CABLE THE CONTRACTOR SHALL PROVIDE A HUBBELL CAT. NO. 02206012 OR APPROVED EQUAL. FOR THE CONTROLS CABLE THE CONTRACTOR SHALL SELECT THE APPROPRIATE SUPPORT FROM THE HUBBELL CAT. NO. 022170xx SERIES, OR APPROVED EQUAL.

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL PUMP POWER & CONTROL BOX MOUNTING STAND SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 415





GENERAL NOTES:

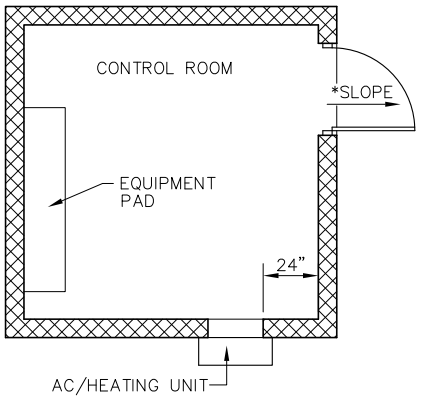
1. HATCH TO BE SUPPLIED BY PUMP SUPPLIER.

CONSTRUCTION KEY NOTES:

A. CENTER DRIP CHANNEL CUT INTO MAIN CHANNEL FRAME AT EACH END.
B. SS SAFETY CHAIN AT EACH END
C. REMOVABLE KEY WRENCH
D. REMOVABLE PLUG
E. CONCRETE BEAM
F. VINYL GRIP
G. AUTOMATIC HOLD–OPEN ARM
H. DOOR REINFORCING
I. SLAM LOCK
J. LIFTING MECHANISM HOUSING
K. 1/4" DIAMOND PLATE COVERS

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	DOUBLE HATCH ACCESS COVER SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 416

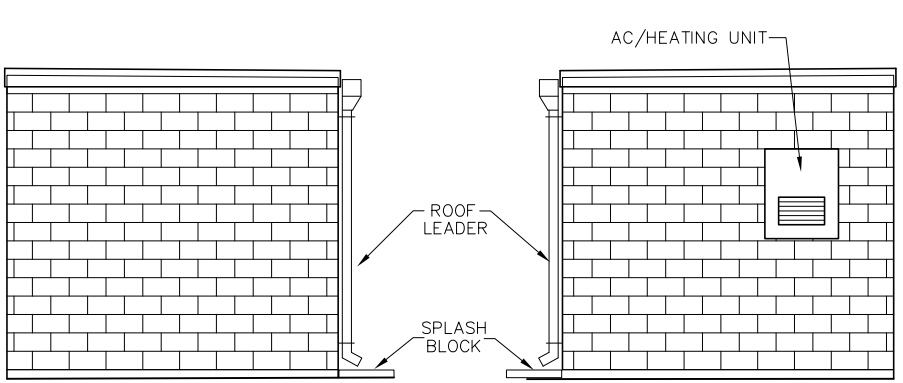
*SLOPE: 1/4" PER FEET.



GENERAL NOTES:

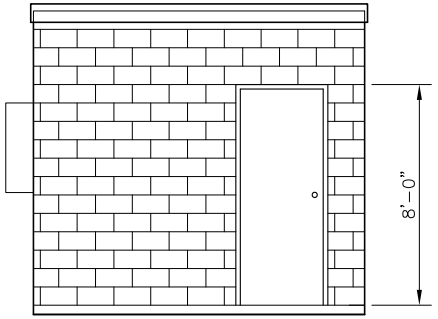
1. CMU SHALL BE TEXTURE AND COLORED. COLORS TO BE SELECTED BY OWNER.
2. SIZE OF CONTROL BUILDING BY ENGINEER.

PLAN

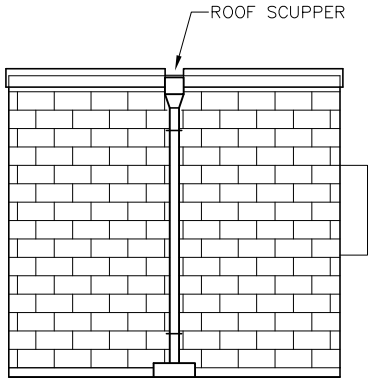


RIGHT SIDE ELEVATION

LEFT SIDE ELEVATION

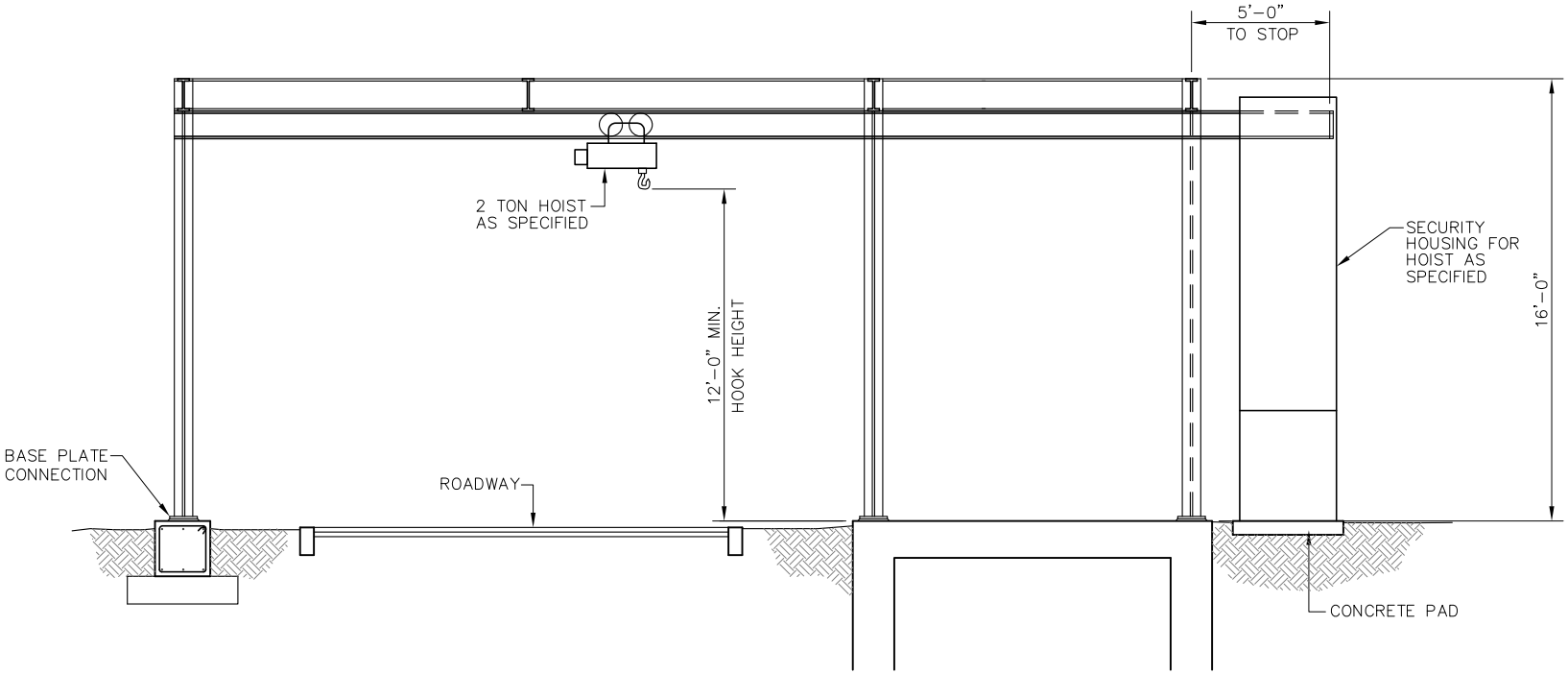


FRONT ELEVATION



REAR ELEVATION

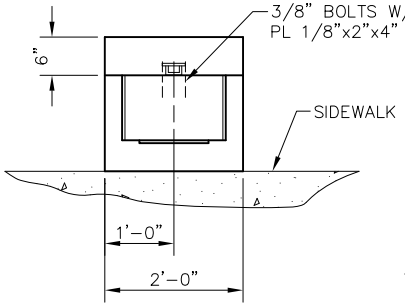
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL CONTROL BUILDING SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 417



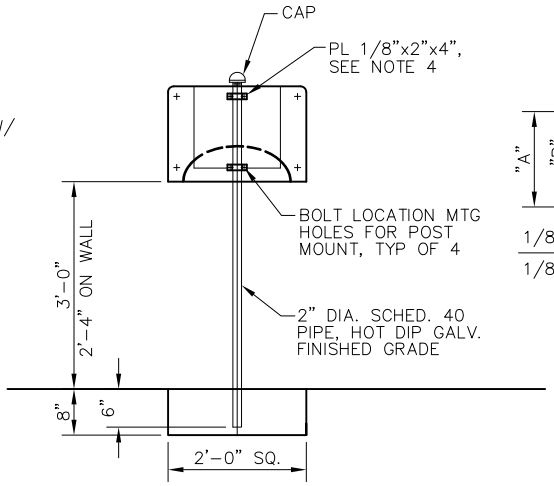
GENERAL NOTES

1. ALL COLUMNS, BEAMS, AND CONCRETE SHALL BE SIZED BY ENGINEER.

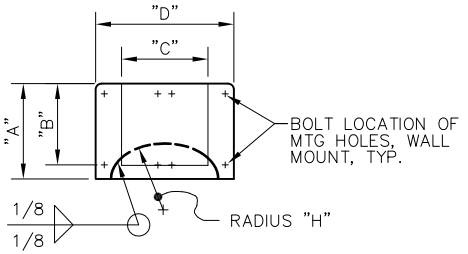
STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	TYPICAL MONORAIL SYSTEM SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 418



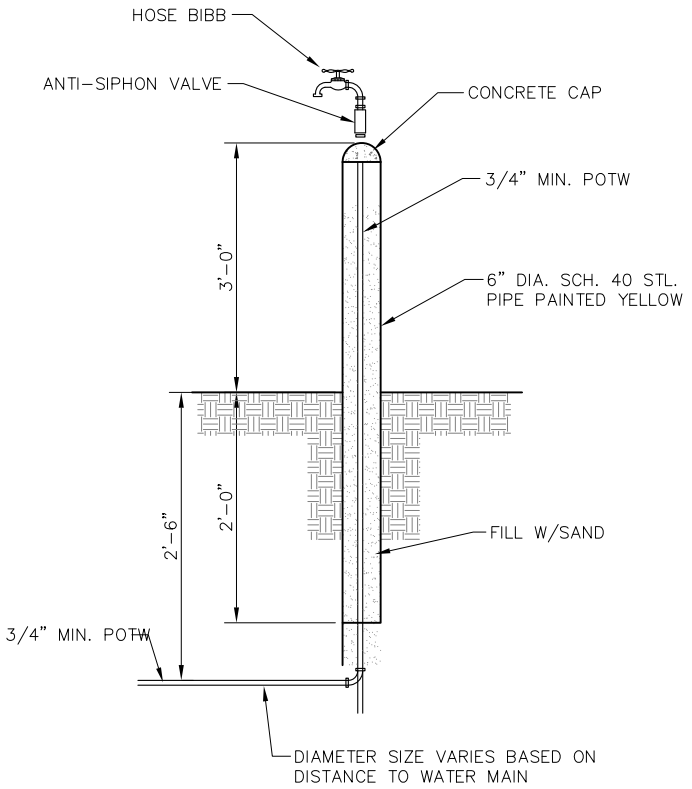
PLAN



SECTION



WALL MOUNTED



POST MOUNTED

GENERAL NOTES:

1. EXTERIOR UNITS SHALL BE FABRICATED FROM 3/16" 6061-T6 ALUMINUM ALLOY PLATE
2. ATTACH TO CONCRETE WALL WITH (4)-1/4" STAINLESS STEEL STUD TYPE WEDGE ANCHORS.
3. ATTACH TO INDIVIDUAL POST WITH PLATES AND (4)-1/4" STAINLESS STEEL BOLTS.
4. ATTACH TO STEEL COLUMN WITH (4)-1/4" ROUND HEAD BOLTS, ONE IN EACH CORNER. INSERT DOUBLE SPACER NUTS BETWEEN COLUMN AND HOSE RACK.
5. HOSE RACK MAY BE MOUNTED ON EITHER POST OR WALL AS DIRECTED BY THE ENGINEER.

RACK TYPE	DIMENSIONS IN INCHES								
	A	B	C	D	E	F	G	H	I
TYPE A-3/4" HOSE	10-1/2	9	9	18	3	6	7-1/2	9-3/4	1-1/2

STANDARD DETAIL	DATE: APR. 2005 REV: APR. 2017	EXTERIOR HOSE RACK WITH HOSE BIB DETAIL SCALE: N.T.S.	Lower Valley WATER DISTRICT	DETAIL NO. 419