

## WATERLINE CONSTRUCTION NOTES

1. ALL WATERLINE CONSTRUCTION TO BE ACCOMPLISHED IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS AS CODIFIED UNDER TITLE 30 TEXAS ADMINISTRATIVE CODE (30 TAC), CHAPTER 290.
2. ALL WATERLINES TO BE LOCATED INSIDE PUBLIC ROAD RIGHTS-OF-WAYS AND PUBLIC EASEMENTS. CITY REPRESENTATIVE TO INSPECT & APPROVE PRIOR TO BACKFILL.
3. ALL WATER MAINS 4" TO 16" SHALL BE C-909 (DR-18) AND ALL WATER MAINS 20" TO 24" SHALL BE C-900 (DR-18).
4. TWELVE (12) INCH OR SMALLER WATERMAINS TO HAVE A MINIMUM COVER OF FOUR (4) FEET. VARY FLOW LINE UNIFORMLY FROM DEPTH AND LOCATION SHOWN IN PLANS.
5. WATERLINE FITTINGS TO BE CAST OR DUCTILE IRON WITH POLYETHYLENE WRAP AS SPECIFIED UNLESS OTHERWISE NOTED.
6. MAINTAIN 12-INCH MINIMUM CLEARANCE AT CROSSINGS BETWEEN ALL WATERLINES AND ALL UTILITIES INCLUDING STORM SEWERS AND CULVERTS UNLESS OTHERWISE NOTED.
7. WATERLINES SHALL BE BEDDED AS SHOWN IN THE CITY OF HUNTSVILLE DETAILS. ALL WATER LINES TO BE INSPECTED BY CITY OF HUNTSVILLE PRIOR TO BACKFILL.
8. WATERLINE TRENCHES UNDER OR WITHIN THREE (3) FEET OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED PER THE CITY OF HUNTSVILLE DETAILS.
9. ALL 2" THRU 12" GATE VALVES FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH AWWA C509 AND BE MANUFACTURED BY MUELLER, AMERICAN-DARLING, OR APPROVED EQUAL RESILIENT SEAT GATE VALVES AND SHALL OPEN IN A COUNTER CLOCKWISE DIRECTION ONLY. VALVES ON ALL TAPPING SLEEVES ARE TO BE OF THE SAME TYPE.
10. VALVES TO BE LOCATED OPPOSITE PROPERTY CORNER WHERE APPROPRIATE.
11. ALL VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE AFTER PAVING IS COMPLETE.
12. ALL FIRE HYDRANTS SHALL BE MANUFACTURED BY MUELLER OR AMERICAN-DARLING. EQUIP EACH FIRE HYDRANT WITH TWO (2) TWO AND ONE-HALF (2 ½) INCH NOMINAL INSIDE DIAMETER HOSE NOZZLES AND ONE (1) FOUR AND ONE-HALF (4 ½) INCH NOMINAL INSIDE DIAMETER PUMPER NOZZLE WITH NATIONAL STANDARD THREADS ON EACH NOZZLE.
13. CONTRACTOR SHALL PROVIDE ADEQUATE THRUST BLOCKING TO WITHSTAND TEST PRESSURES SPECIFIED BY THE TCEQ AND THE CITY OF HUNTSVILLE STANDARD DETAILS.
14. ALL WATERLINE TESTING SHALL BE WITNESSED AND APPROVED BY THE CITY OF HUNTSVILLE.
15. 12-GAUGE LOCATOR WIRE TO BE INSTALLED ON ALL WATER LINES & FORCE MAINS, TO BE ACCESSIBLE AT VALVE STACKS.
16. ALL TS&VS SHALL BE FULL BODY - STAINLESS STEEL.
17. 1 WATER SAMPLE PER 1000 FEET SHALL BE SUBMITTED TO A TEXAS DEPARTMENT OF HEALTH APPROVED LABORATORY AND SHALL BE FREE OF ANY CONTAMINATES, PRIOR TO BEING PUT IN SERVICE.
18. DISINFECTION OF NEW AND REPAIRED WATER MAINS SHALL BE IN CONFORMANCE WITH AWWA C651. ALL NEW WATER MAINS SHALL BE DISINFECTED BEFORE THEY ARE PLACED IN SERVICE. ALL WATER MAINS TAKEN OUT OF SERVICE FOR INSPECTING, REPAIRING OR OTHER ACTIVITY, WHICH MIGHT LEAD TO CONTAMINATION OF WATER, SHALL BE DISINFECTED BEFORE THEY ARE RETURNED TO SERVICE. (NO SEPARATE PAY)
19. CONTRACTOR TO INSTALL RAY-O-LITE OR EQUAL 4" X 4" BLUE REFLECTORIZED PAVEMENT MARKERS 6" OFF CENTER OF ROADWAY ON FIRE HYDRANT SIDE OF STREET.
20. WATERLINE 8" OR GREATER SHALL BE CONSTRUCTED SUCH THAT ALL CROSSINGS WITH SANITARY SEWER OR SANITARY SEWER LEADS SHALL CENTER ONE FULL SECTION OF WATERLINE AT THE SANITARY SEWER CROSSING. WATERLINE SHALL BE AT LEAST 2 FEET ABOVE SANITARY LINE. WHERE WATERLINE CROSSES UNDER SANITARY SEWER LINES. WATERLINE SEGMENT SHALL BE ENCASED IN PIPE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN WATERLINE AND MAINTAIN 1-FOOT VERTICAL CLEARANCE FROM SANITARY LINE.
21. WHERE WATERLINE CROSSES UNDER SANITARY SEWER LINE, BOTH SEGMENTS MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED BY TCEQ UNDER 30 TAC, CHAPTER 290 AND IN AWWA C600 STANDARDS.
22. ALL VALVE BOXES SHALL BE ERECTED PLUMBED & BE FREE OF DEBRIS.

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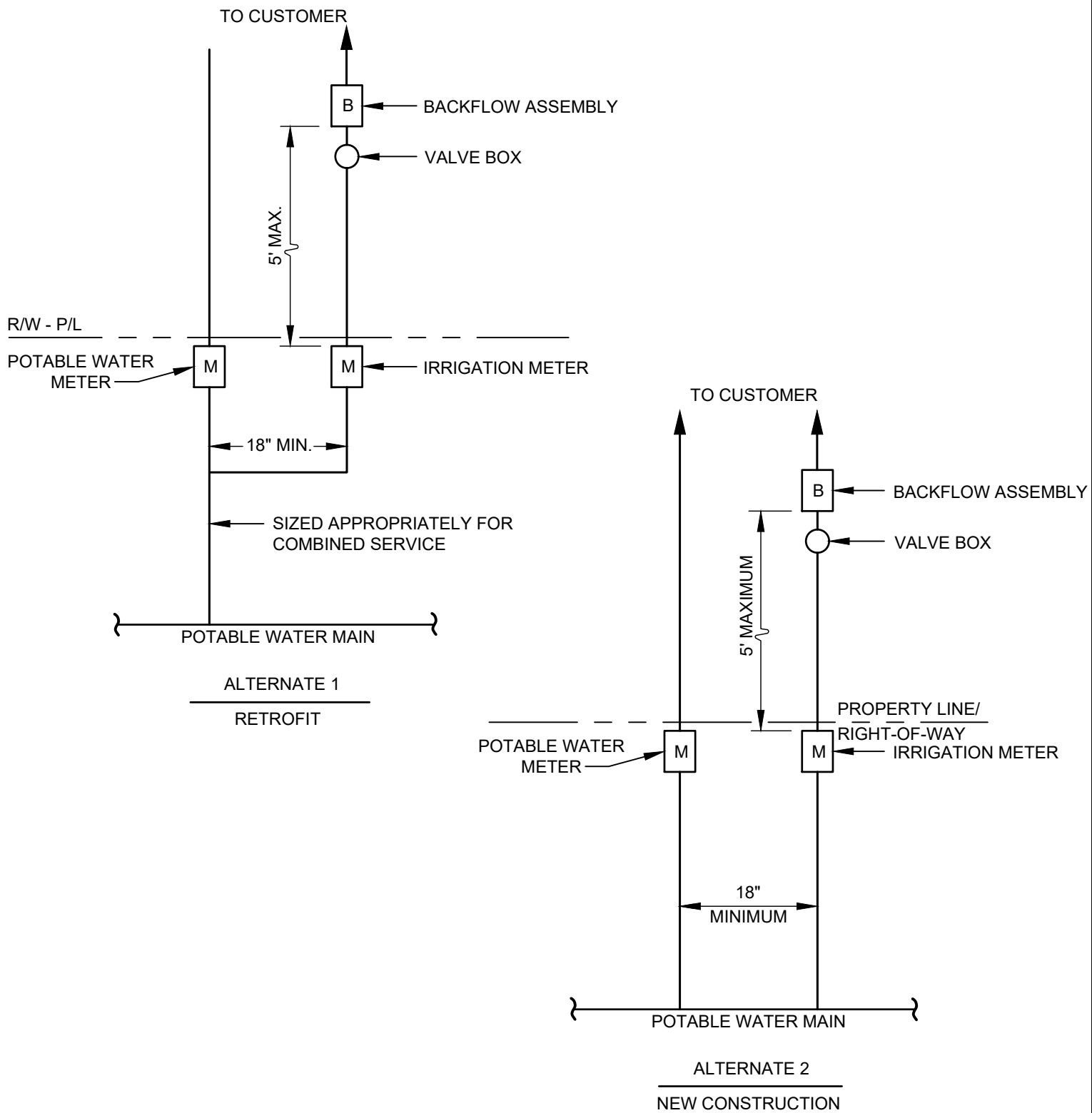


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### CITY OF HUNTSVILLE STANDARD DETAILS WATERLINE CONSTRUCTION NOTES

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1  W-01
0	MAM	07/31/2018	RAM	
1	MAM	10/1/2019	RAM	

NAME: WL CONSTRUCTION NOTES  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



NOTES:  
1. NONE.

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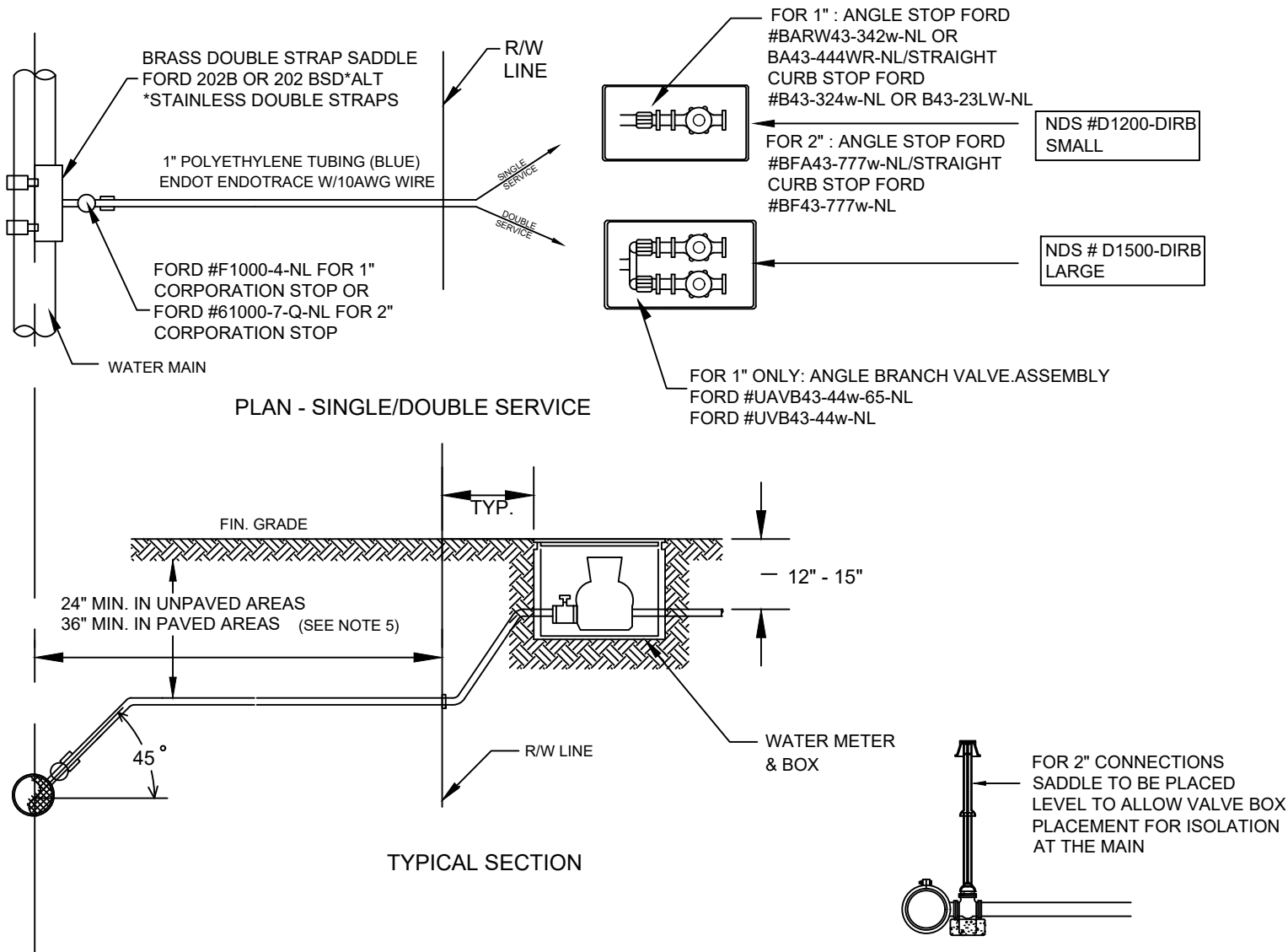


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CITY OF HUNTSVILLE STANDARD DETAILS  
IRRIGATION SERVICE CONNECTIONS

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-02

NAME: IRRIGATION SERVICE CXN.  
CATEGORY: WATER  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### NOTES:

1. CUSTOMER POINT OF SERVICE IS TYPICALLY AT THE LOCATION WHERE CUSTOMER PLUMBING IS ATTACHED TO THE YOKE NUT.
2.  $\frac{3}{4}$ " COPPER TUBING FOR  $\frac{3}{4}$ " X  $\frac{5}{8}$ " METER INSTALLATION. 1" COPPER TUBING FOR 1" METER INSTALLATION.
3. HDPE SHALL BE 200 PSI, NSF APPROVED, SDR 9, MEETING ASTM D1248. TUBING SHALL BE ENDOT ENDOTRACE (OR APPROVED EQUAL).
4. REDUCED PRESSURE BACKFLOW PREVENTERS ARE REQUIRED FOR ALL COMMERCIAL SERVICES AND SHALL BE INSTALLED BY A CERTIFIED TECHNICIAN AT OWNERS EXPENSE.
5. ALL SERVICE TAPS SHALL BE NO CLOSER THAN 2'-0" STAGGERED INTERVAL OR WITHIN 2'-0" OF BELL OR SPIGOT ENDS.
6. IN AREAS TO BE PAVED PROVIDE A 2" MIN. PVC SCHEDULE 40 SLEEVE FOR PE-TUBING. SLEEVE SHALL EXTEND A MIN. OF 2' BEHIND BACK OF CURB AT EACH SIDE OF ROAD.
7. WATER METERS INSTALLED IN AREAS SERVED BY RECLAIMED WATER SHALL BE EQUIPPED WITH A DUAL CHECK BACKFLOW PREVENTER.
8. WATER METERS IN AREA SERVED WITH AN ALTERNATE IRRIGATION SUPPLY SHALL BE EQUIPPED WITH BACKFLOW PREVENTION TO BE APPROVED FOR USE BY CITY OF HUNTSVILLE.
9. THE CITY OF HUNTSVILLE WILL MAKE ALL STANDARD RESIDENTIAL WATER SERVICE CONNECTIONS, UNLESS WRITTEN APPROVAL TO DO OTHERWISE HAS BEEN GRANTED BY THE CITY.

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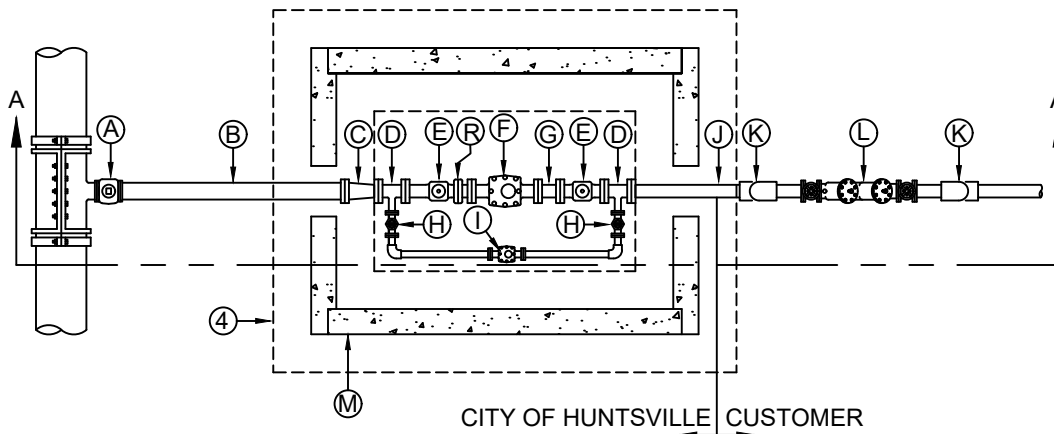


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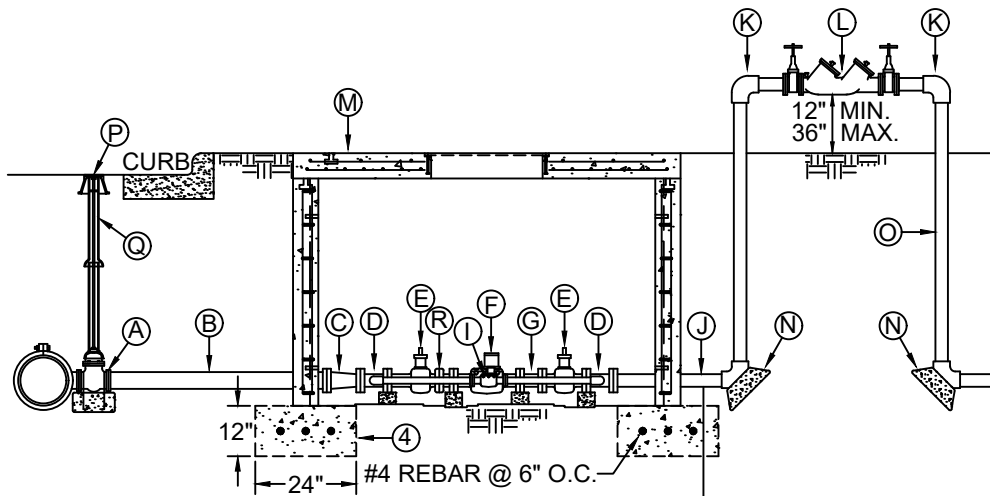
#### CITY OF HUNTSVILLE STANDARD DETAILS WATER SERVICE CONNECTION 5/8", 3/4", 1-1/2", AND 2" METERS

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
1	MAM	1/23/2025		W-03

NAME: WATER SERVICE CONNECTION  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



PLAN VIEW



SECTION A-A

# CONSTRUCTION KEY NOTES:

- A. 4" TAPPING SLEEVE AND VALVE.
- B. 4" P.V.C.
- C. 4"x3" REDUCER.
- D. 3"x2" TEE.
- E. 3" GATE VALVE.
- F. 3" METER.
- G. 3" TEST PLUG D.I.P.
- H. 2" GATE VALVE.
- I. 2" BY-PASS METER.
- J. 3" SPOOL D.I.P.
- K. 3" BEND 90°
- L. 3" BACKFLOW PREVENTER.
- M. METER BOX TYPE "E".
- N. THRUST BLOCKING AS REQUIRED
- O. 3" FLANGED D.I.P. - LENGTH AS REQUIRED.
- P. BONNET BOX AND COVER. SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.
- Q. 8" PIPE RISER.
- R. D.I. FLANGED COUPLING ADAPTER PER REQUIRED METER SIZE ON INFLOW SIDE OF METER.

## NOTES:

1. DETAIL SHOWN FOR 3" SERVICE WITH A TAPPING SLEEVE & VALVE CONNECTION TO AN EXISTING LINE (CONNECTION TO A NEW MAINLINE USUALLY WITH GATE VALVE & TEE). INSTALLATION IS SIMILAR FOR LARGER SERVICES EXCEPT FOR SIZE OF PIPE, FITTINGS AND METER.
2. WHERE NO CURB EXISTS, METER IS TO BE SET NEAR PROPERTY LINE OR AT DESIGNATED LOCATION.
3. FOR GREATER THAN 2" WATER SERVICE CONNECTION, THE OWNER/CONTRACTOR WILL FURNISH AND INSTALL ALL NECESSARY PIPE, FITTINGS, METER BOXES, AND METER REQUIRED. IT SHALL BE THE RESPONSIBILITY OF THE PRIVATE OWNER TO HAVE A CERTIFIED PLUMBER INSTALL A BACKFLOW PREVENTER AND EXTEND SERVICE LINE ON DISCHARGE SIDE OF METER.
4. FOOTING REQUIRED.
5. TYPICAL WATER METER SERVICE. 2" OR LARGER METER INSTALLATION WILL REQUIRE CONCRETE VAULT AND A BY-PASS ASSEMBLY.

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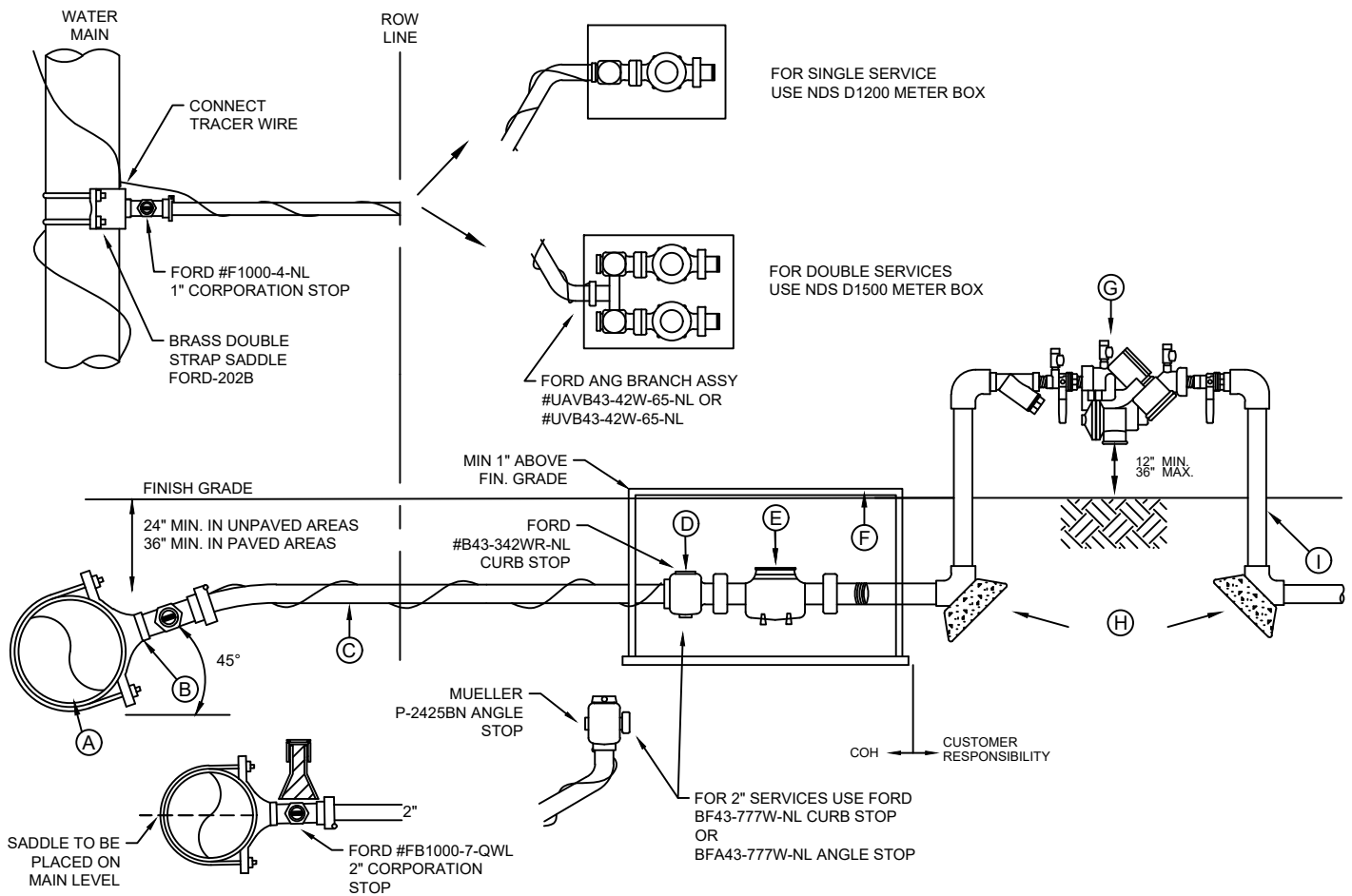


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## CITY OF HUNTSVILLE STANDARD DETAILS WATER SERVICE CONNECTION 3" AND LARGER

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
1	MAM	04/02/2019		W-04

NAME: WATER SERVICE CONNECTION  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



**CONSTRUCTION KEY NOTES:**

- A. SERVICE SADDLE
- B. 2" TAP WITH CORPORATION STOP
- C. 2" COPPER PIPE. FOR 2" SERVICE INSTALLATIONS, ALL PIPING SHALL BE COPPER OR ENDOTRACE POLY AND ALL FITTINGS SHALL BE BRONZE UNLESS OTHERWISE SPECIFIED.
- D. 2" FLANGED BY FEMALE THREADED BALL VALVE
- E. 2" TURBINE METER
- F. METER BOX TYPE "C".
- G. 2" BACKFLOW PREVENTER WHEN REQUIRED BY CITY OF HUNTSVILLE. COORDINATE BACKFLOW ASSEMBLY DESIGN WITH CENTRAL INSPECTIONS.
- H. THRUST BLOCKING AS REQUIRED
- I. 2" BRASS PIPE-LENGTH AS REQUIRED
- J. 2" THREADED NIPPLE

**NOTES:**

1. DETAIL SHOWN FOR 1½" YARD METER; INSTALLATION SIMILAR FOR 2" YARD METER EXCEPT FOR SIZES OF PIPE, FITTINGS AND METER.
2. WHERE NO CURB EXISTS, METER IS TO BE SET NEAR PROPERTY LINE OR AT DESIGNATED LOCATION.
3. THE CITY OF HUNTSVILLE WILL FURNISH AND INSTALL ALL NECESSARY PIPE, FITTINGS, METER BOXES, AND METERS REQUIRED. IT SHALL BE THE RESPONSIBILITY OF THE PRIVATE OWNER TO HAVE A CERTIFIED PLUMBER INSTALL A BACKFLOW PREVENTER AND EXTEND SERVICE LINE ON DISCHARGE SIDE OF METER.

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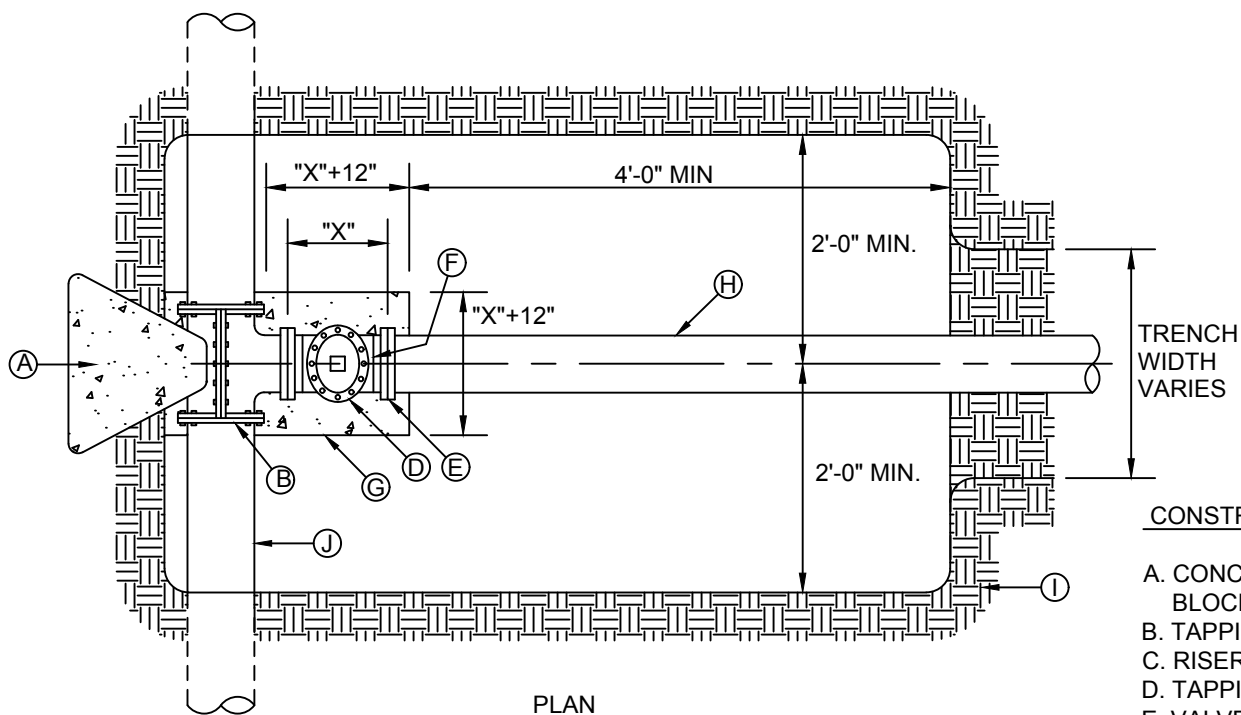


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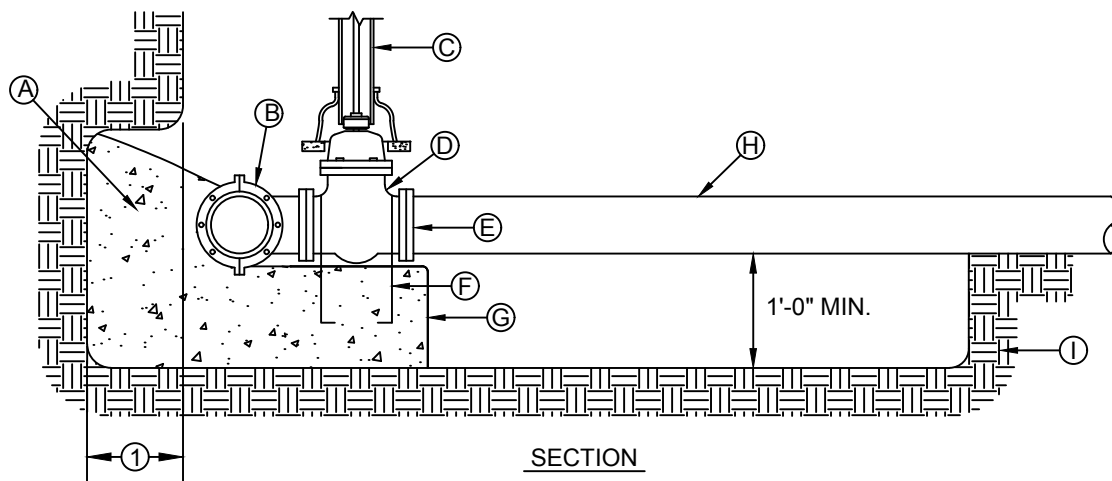
CITY OF HUNTSVILLE STANDARD DETAILS  
YARD METER LINE  
2" INSTALLATION

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
1	KSJB	06/28/2022	KSJB	W-05

NAME: YARD METER  
CATEGORY: WATER  
DRAWN DATE: 06/28/2022  
DRAWN BY: DAC  
SCALE: N.T.S.  
APPROVED BY: YSR



PLAN



SECTION

CONSTRUCTION KEY NOTES:

- A. CONCRETE THRUST BLOCKING.
- B. TAPPING SLEEVE.
- C. RISER INSTALLATION.
- D. TAPPING VALVE.
- E. VALVE ENDS FOR TYPE OF PIPE INSTALLED.
- F. 2-#5 REBAR HAIRPINS, PAINT UNEMBEDDED PORTION OF BARS WITH 2-COATS OF COAL TAR EPOXY, THEN COVER WITH 2" MINIMUM OF CEMENT MORTAR.
- G. CONCRETE VALVE SUPPORT.
- H. NEW WATER LINE TO BE INSTALLED.
- I. UNDISTURBED EARTH.
- J. EXISTING WATER MAIN TO BE TAPPED.

NOTES:

1. THRUST BLOCKING SHALL EXTEND TO UNDISTURBED EARTH.
2. TAPPING SLEEVE SHALL BE 18" MINIMUM FROM ANY BELL, COUPLING, VALVE OR FITTING LOCATED ALONG EXISTING WATER LINE TO BE TAPPED.
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. 3" TAPS AND LARGER SHALL BE SMITH-BLAIR STAINLESS STEEL TAPPING SLEEVE AND BOLTS.

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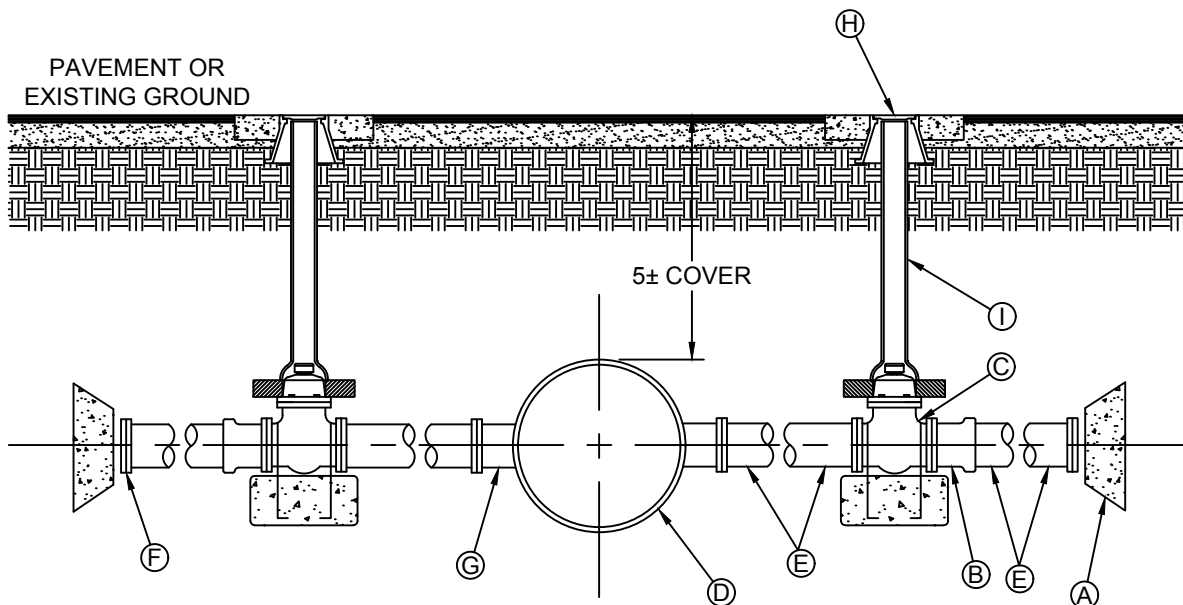
NAME: TAPPING SLEEVE AND VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



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CITY OF HUNTSVILLE STANDARD DETAILS  
TAPPING SLEEVE AND  
VALVE INSTALLTION

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-06



SIDE OUTLET CONNECTION

CONSTRUCTION KEY NOTES:

- A. PROVIDE ADEQUATE CONCRETE THRUST BLOCKING.
- B. FLANGE TO P.V.C. ADAPTER.
- C. FLANGED GATE VALVE WITH CONCRETE ANCHOR.
- 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 SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.
- I. 8" PIPE RISER.

NOTES:

1. INSTALLATION SHOWN TYPICAL FOR 24" PIPE OR LARGER FOR FUTURE WATER CONNECTION.
2. BONNET BOX, PIPE RISER, & VALVE INSTALLATION.

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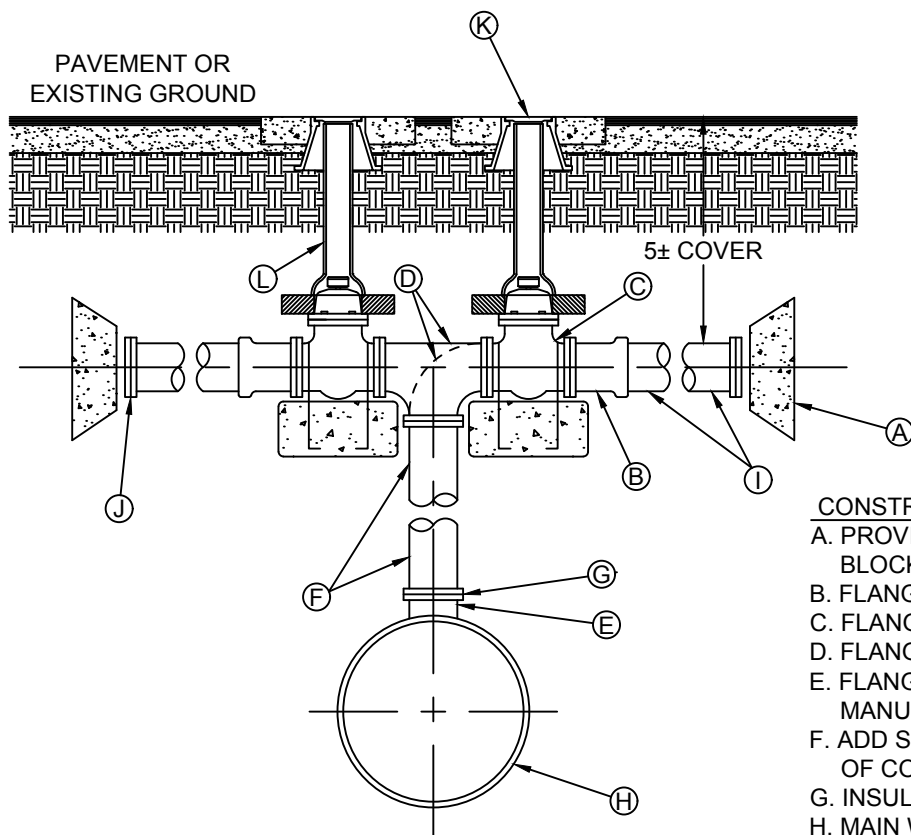
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CITY OF HUNTSVILLE STANDARD DETAILS  
SIDE OUTLET CONNECTION

NAME: SIDE OUTLET CONNECTION  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				W-07





TOP OUTLET CONNECTION

CONSTRUCTION KEY NOTES:

- A. PROVIDE ADEQUATE CONCRETE THRUST BLOCKING.
- B. FLANGE TO P.V.C. ADAPTER.
- C. FLANGED GATE VALVE WITH CONCRETE ANCHOR .
- D. FLANGED TEE OR FLANGED 90° BEND.
- E. FLANGED TOP OUTLET (INSTALLED BY PIPE MANUFACTURER).
- F. ADD SPOOL PIECE TO PROVIDE APPROXIMATELY 5ft. OF COVER.
- G. INSULATING FLANGE KIT.
- H. MAIN WATER LINE PIPE.
- I. ONE (1) JOINT OF AWWA C900 P.V.C. PIPE CLASS 235.
- J. CAP OR F.H. CONNECTION.
- K. BONNET BOX AND COVER, SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE.
- L. 8" PIPE RISER.

NOTES:

1. INSTALLATION SHOWN TYPICAL FOR 24" PIPE OR LARGER FOR FUTURE WATER CONNECTION.
2. BONNET BOX, PIPE RISER, & VALVE INSTALLATION.

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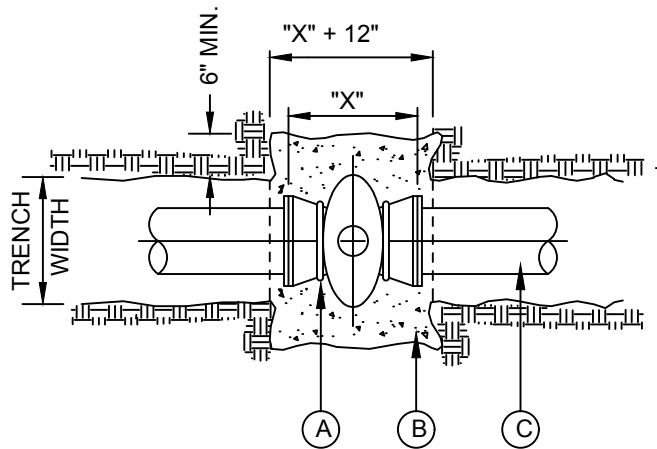
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CITY OF HUNTSVILLE STANDARD DETAILS  
TOP OUTLET CONNECTION

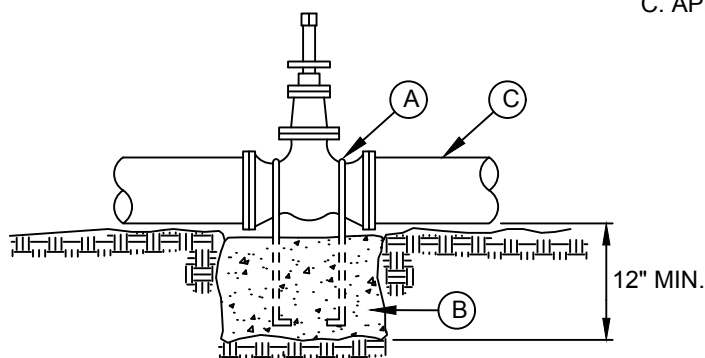
REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
				W-08

NAME: TOP OUTLET CONNECTION  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR





PLAN



SECTION

CONSTRUCTION KEY NOTES:

- A. TWO No. 5 REBAR HAIR PINS. PAINT UNEMBEDDED PORTION OF REBARS WITH TWO COATS OF COAL TAR EPOXY.
- B. CONCRETE VALVE SUPPORT, 2500 PSI. CONCRETE.
- C. APPROVED PIPE.

NOTES:

- 1. THE ENGINEER SHALL PROVIDE DESIGN FOR ALL VALVES GREATER THAN 12\".
- 2. COMPLY WITH CITY OF HUNTSVILLE REQUIREMENTS.
- 3. PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES.

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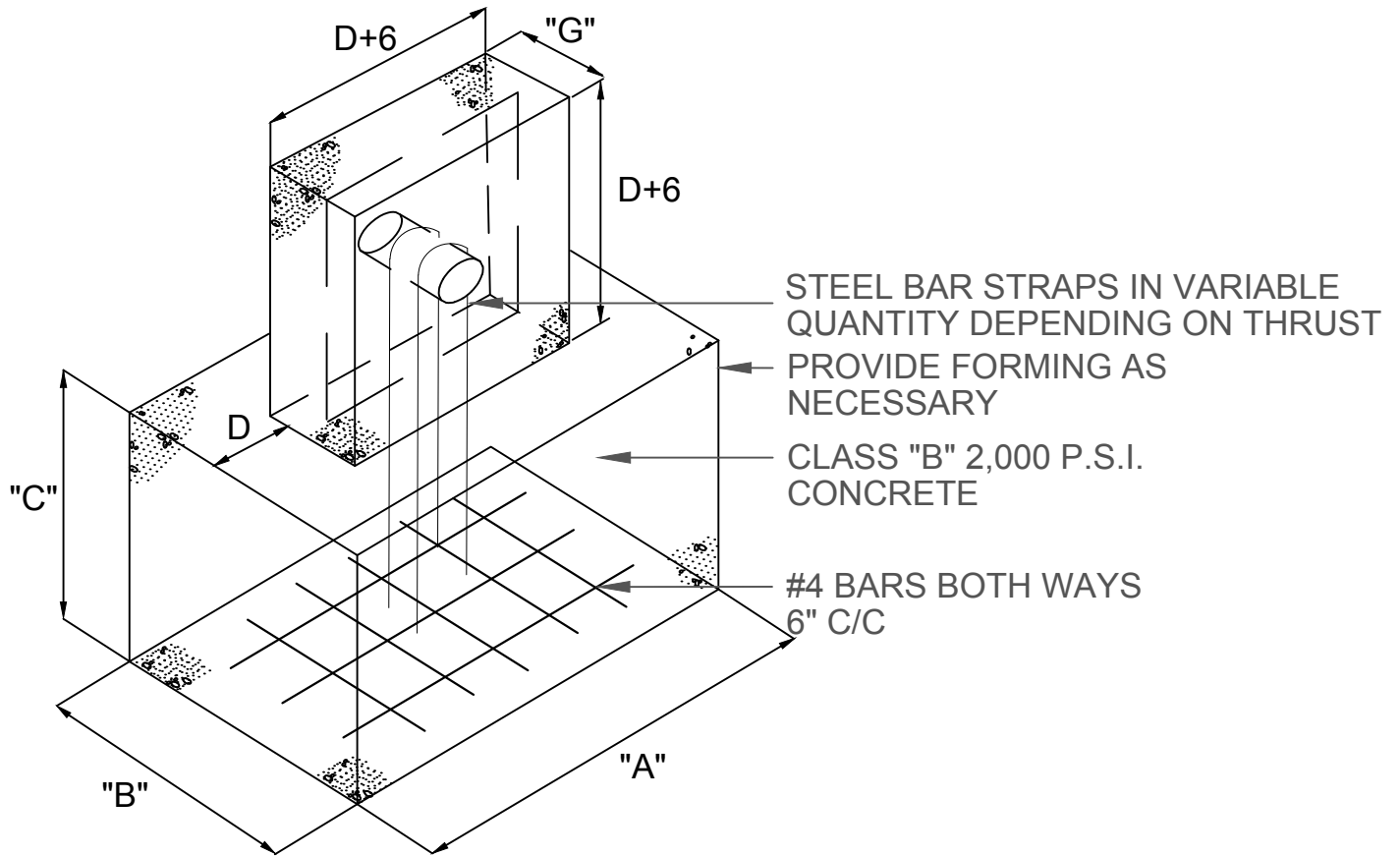


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CITY OF HUNTSVILLE STANDARD DETAILS  
VALVE ANCHOR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-09

NAME: VALVE ANCHOR  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



NOTES:

1. DIMENSIONS "A", "B", AND "C" WILL BE SPECIFIED ON DETAIL PLANS OR AS DIRECTED BY THE CITY ENGINEER.
2. D = PIPE OUTSIDE DIAMETER.

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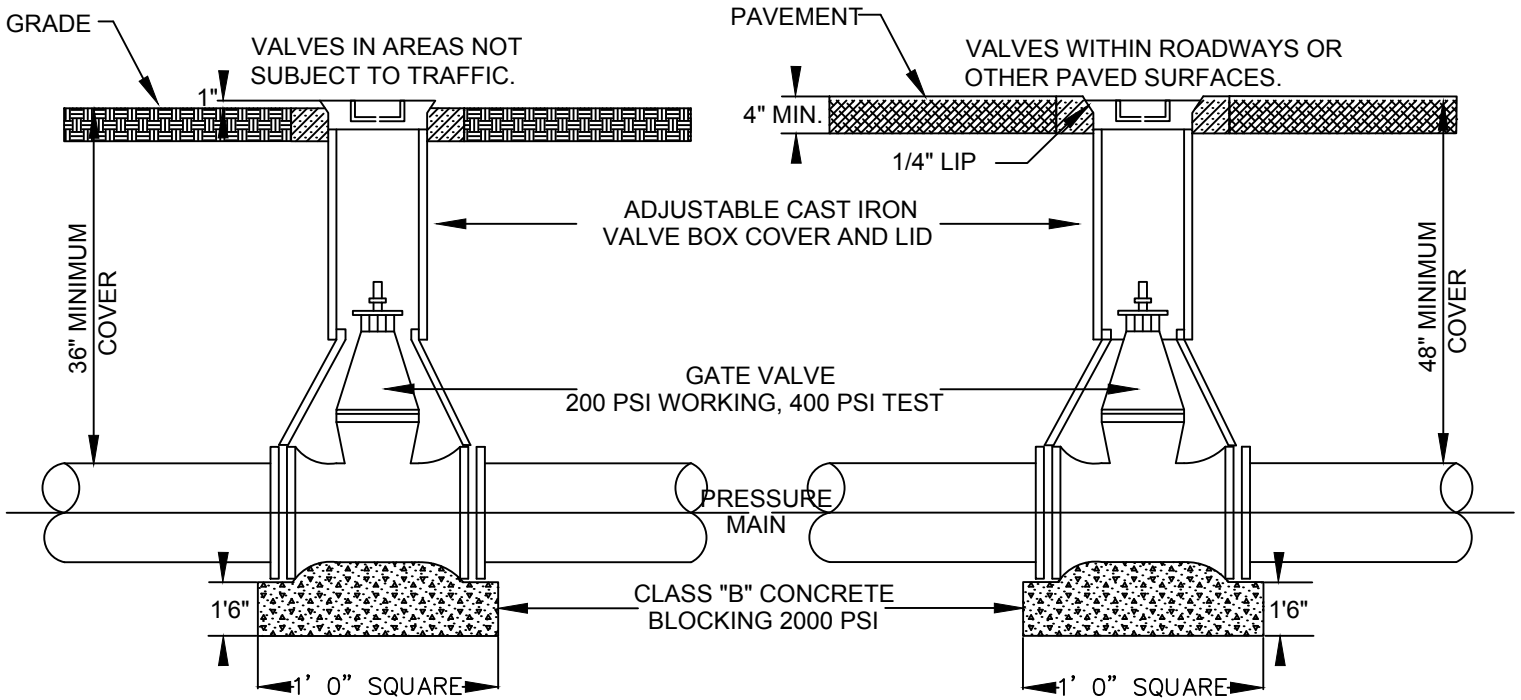
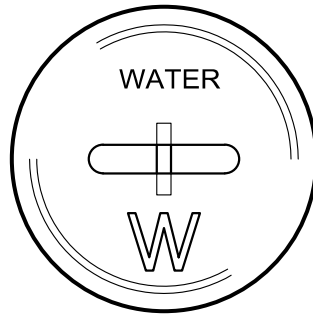


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CITY OF HUNTSVILLE STANDARD DETAILS  
VERTICAL TIE-DOWN BLOCKING

NAME: VERTICAL TIE-DOWN BLOCKING  
CATEGORY: WATER  
DRAWN DATE: 10/25/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 of 1
0	MAM	07/31/2018		
				W-10



**NOTES:**

1. All water systems must be designed and constructed in accordance with the City's Standards, Specifications, and Design Criteria and applicable design criteria of the Texas Commission on Environmental Quality.
2. Block Gate Valves with Compression Joint Fittings on 8" and larger lines.
3. Place 1/2" expansion joint material around water pipe where it passes through concrete vault,
4. Valves 18" or larger shall have spur gearing with grease case.
5. Larger diameter R.C.P. may be required dependent upon manufacturer's standard size for gate valve.
6. Provide corporation with copper riser and curb stop at a maximum of 12" from each end of gave valve. Corporation and curb stop sizes shall be 1". Extend riser to within 24" of top of manhole.
7. Valves, bypass, corporation stop and piping shall be designed to operate at the maximum pressures as described in the specifications.
8. The developer shall install valves at the intersections of all main waterlines and shall install inline valves at approximately one thousand (1,000) foot intervals.

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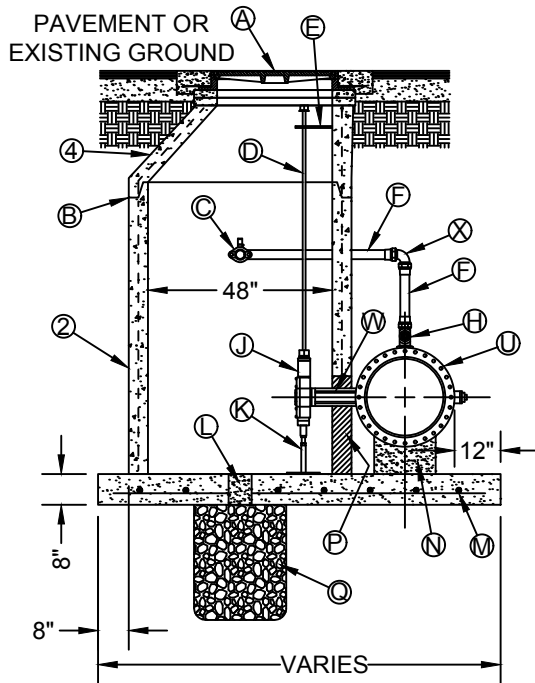
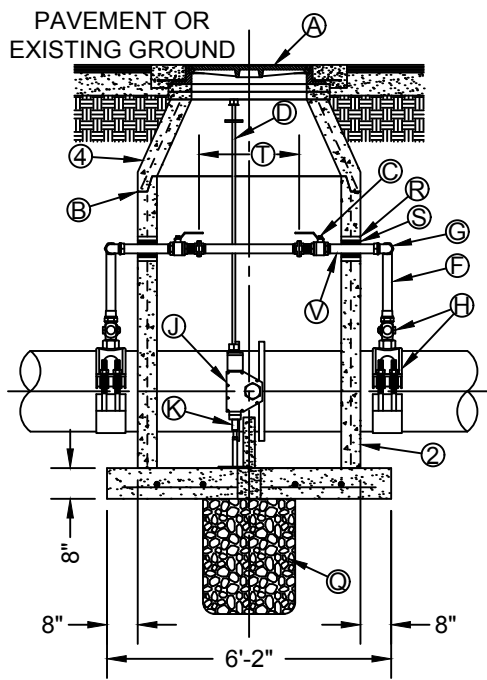


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CITY OF HUNTSVILLE STANDARD DETAILS  
GATE VALVE AND VAULT INSTALLATION  
14 INCH AND SMALLER

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				W-11

NAME: GATE VALVE & VAULT  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



### CONSTRUCTION KEY NOTES:

- A. MANHOLE RING AND COVER. 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. 1/4" 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.
- F. 2" COPPER PIPE (TYPE-K).
- G. THREADED END TO FLARED END 90° ELBOW (TYP.).
- H. 20"x2" OR 16"x2" SADDLE TAP WITH 2" CORPORATION STOP.
- 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 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.
- S. BUTTERFLY VALVE.
- T. 2" BRASS NIPPLE PIECE (TYP.).
- U. VALVE OPERATOR EXTENSION - 12" LONG.
- V. FLARED END TO FLARED END 90° ELBOW (TYP.).

### NOTES:

1. INSTALLATION APPLICABLE TO P.V.C. & DUCTILE IRON WATER MAINS ONLY. INSTALLATION FOR OTHER PIPE MATERIALS REQUIRE CITY OF HUNTSVILLE 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.

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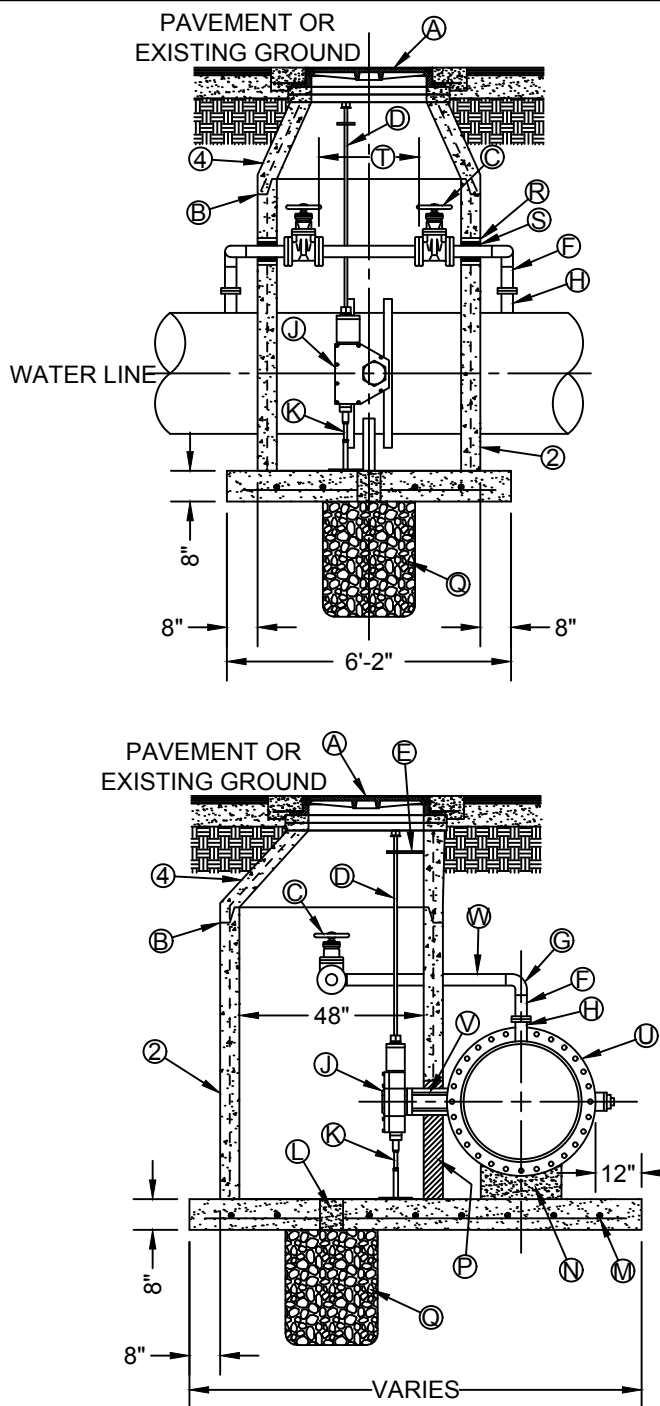


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### CITY OF HUNTSVILLE STANDARD DETAILS BUTTERFLY VALVE IN MANHOLE INSTALLATION 16" AND 20" WATER LINES

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				W-12

NAME: BUTTERFLY VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



### CONSTRUCTION KEY NOTES:

- A. MANHOLE RING AND COVER. 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. 1 1/4" 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.
- 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).
- 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 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.
- U. BUTTERFLY VALVE.
- V. VALVE OPERATOR EXTENSION - 12" LONG.
- W. 3" SCH. 40 STEEL PIPE (PExPE) WRAPPED WITH APPROVED POLYKEN TAPE (MIN. 80 MILS) COATING.

### NOTES:

1. INSTALLATION APPLICABLE TO STEEL CYLINDER CONCRETE PIPE & STEEL WATER MAINS ONLY. INSTALLATION FOR OTHER PIPE MATERIALS REQUIRE CITY OF HUNTSVILLE 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.

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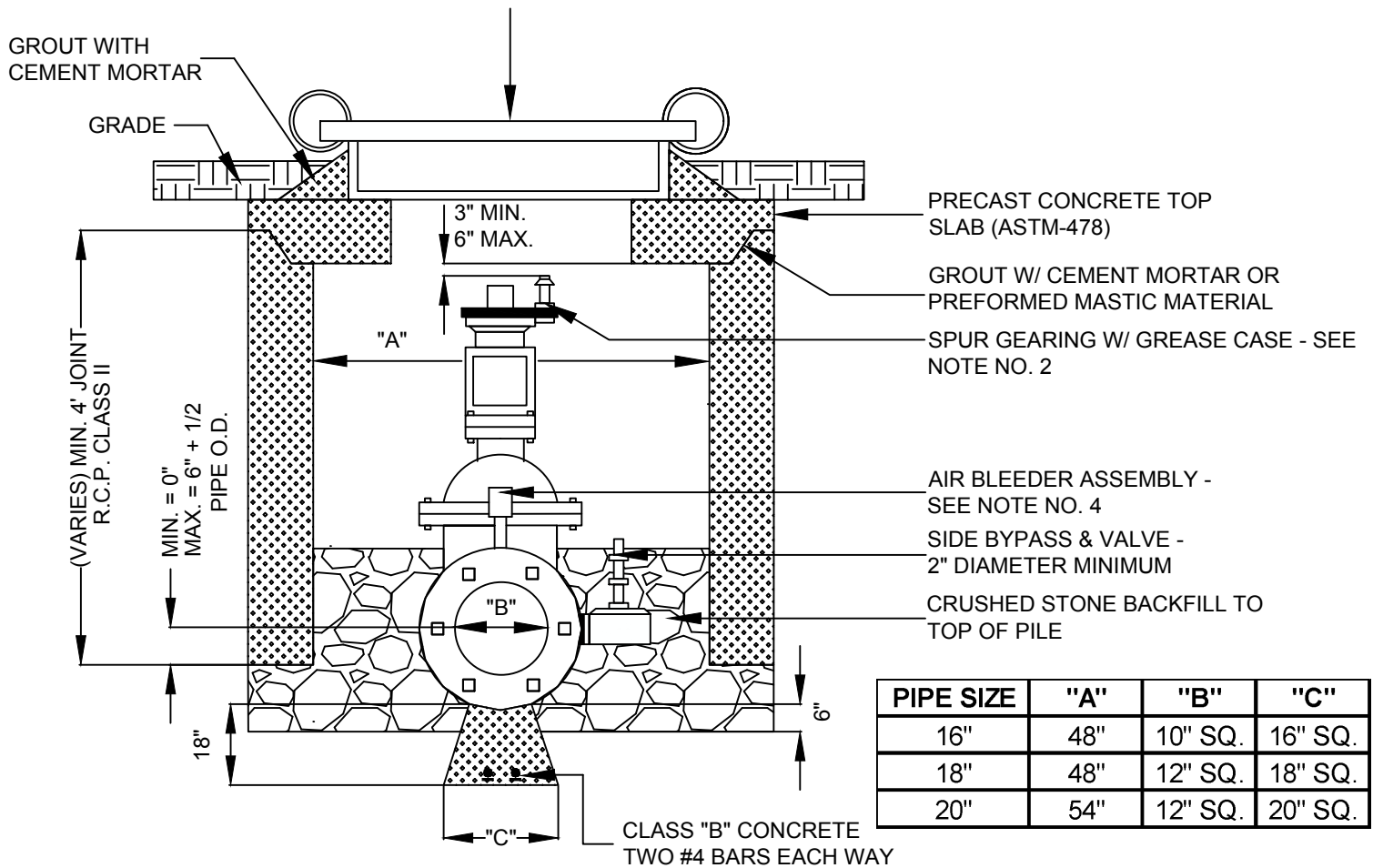
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### CITY OF HUNTSVILLE STANDARD DETAILS BUTTERFLY VALVE IN MANHOLE INSTALLATION 24" AND LARGER WATER LINES

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
				W-13

NAME: BUTTERFLY VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

24" C.I. MANHOLE RING & COVER NEENAH TYPE "B" NO. 1782  
(OR EQUIVALENT) W/ LOCKING DEVICE AND LOCK



#### NOTES:

1. All water systems must be designed and constructed in accordance with the City's Standards, Specifications, and Design Criteria and applicable design criteria of the Texas Commission on Environmental Quality.
2. Block Gate Valves with Compression Joint Fittings on 8" and larger lines.
3. Place 1/2" expansion joint material around water pipe where it passes through concrete vault,
4. Valves 18" or larger shall have spur gearing with grease case.
5. Larger diameter R.C.P. may be required dependent upon manufacturer's standard size for gate valve.
6. Provide corporation with copper riser and curb stop at a maximum of 12" from each end of gate valve. Corporation and curb stop sizes shall be 1". Extend riser to within 24" of top of manhole.
7. Valves, bypass, corporation stop and piping shall be designed to operate at the maximum pressures as described in the specifications.
8. The developer shall install valves at the intersections of all main waterlines and shall install inline valves at approximately one thousand (1,000) foot intervals.

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#### CITY OF HUNTSVILLE STANDARD DETAILS GATE VALVE AND VAULT INSTALLATION 16 INCH AND LARGER

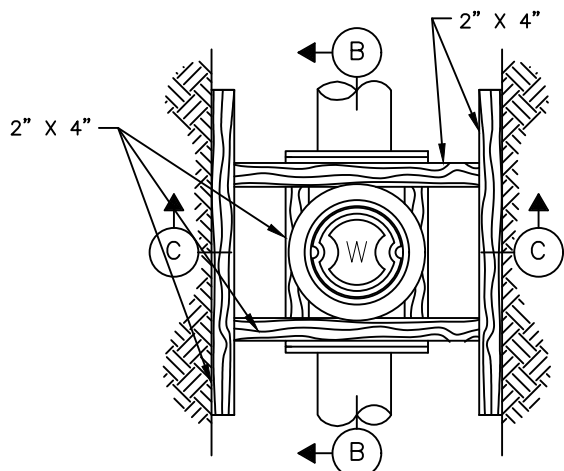
REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-14

NAME: GATE VALVE & VAULT  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR





PLAN OF  
COVER



## PLAN

LETTER "W"  
RAISED  $\frac{1}{8}$ "

$\frac{1}{2}$ "

$\frac{1}{8}$ "

$\frac{3}{8}$ "  $\frac{3}{8}$ "

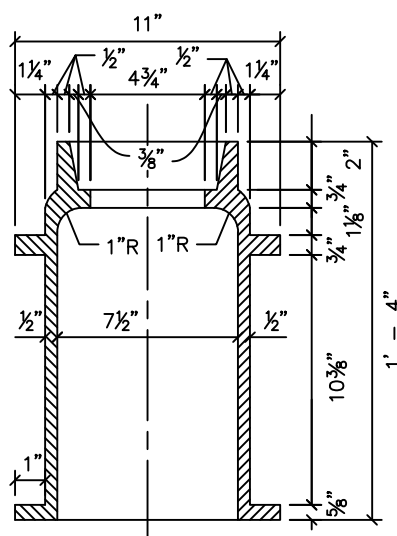
$\frac{1}{4}$ "  $\frac{1}{4}$ "

$5\frac{9}{16}$ "

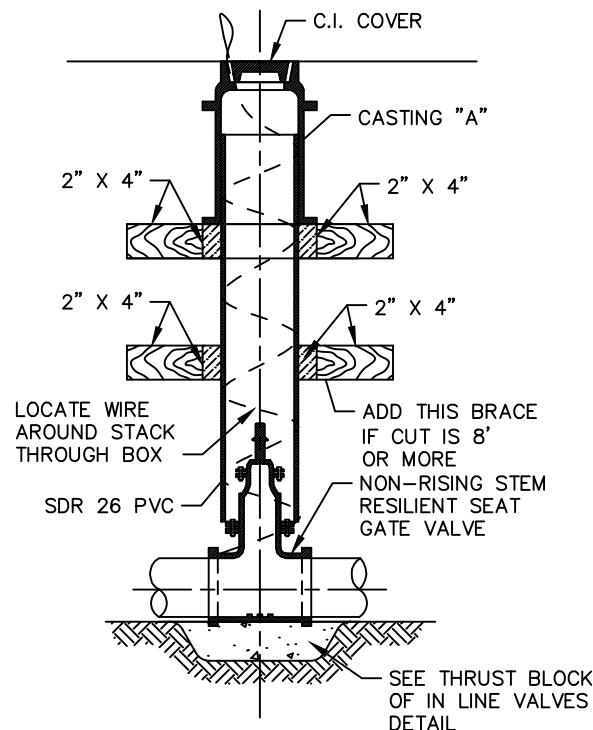
$\frac{1}{2}$ "

$\frac{1}{8}$ "

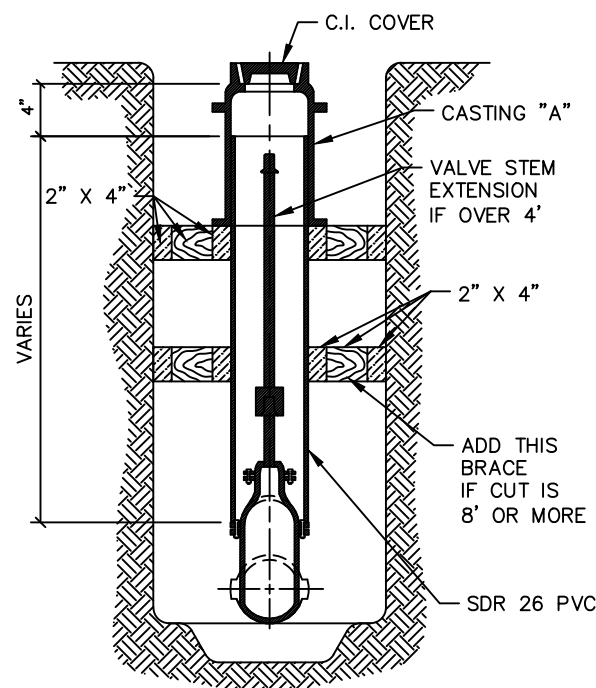
SECTION A-A



SECTION THRU  
CASTING "A"



SECTION B-B



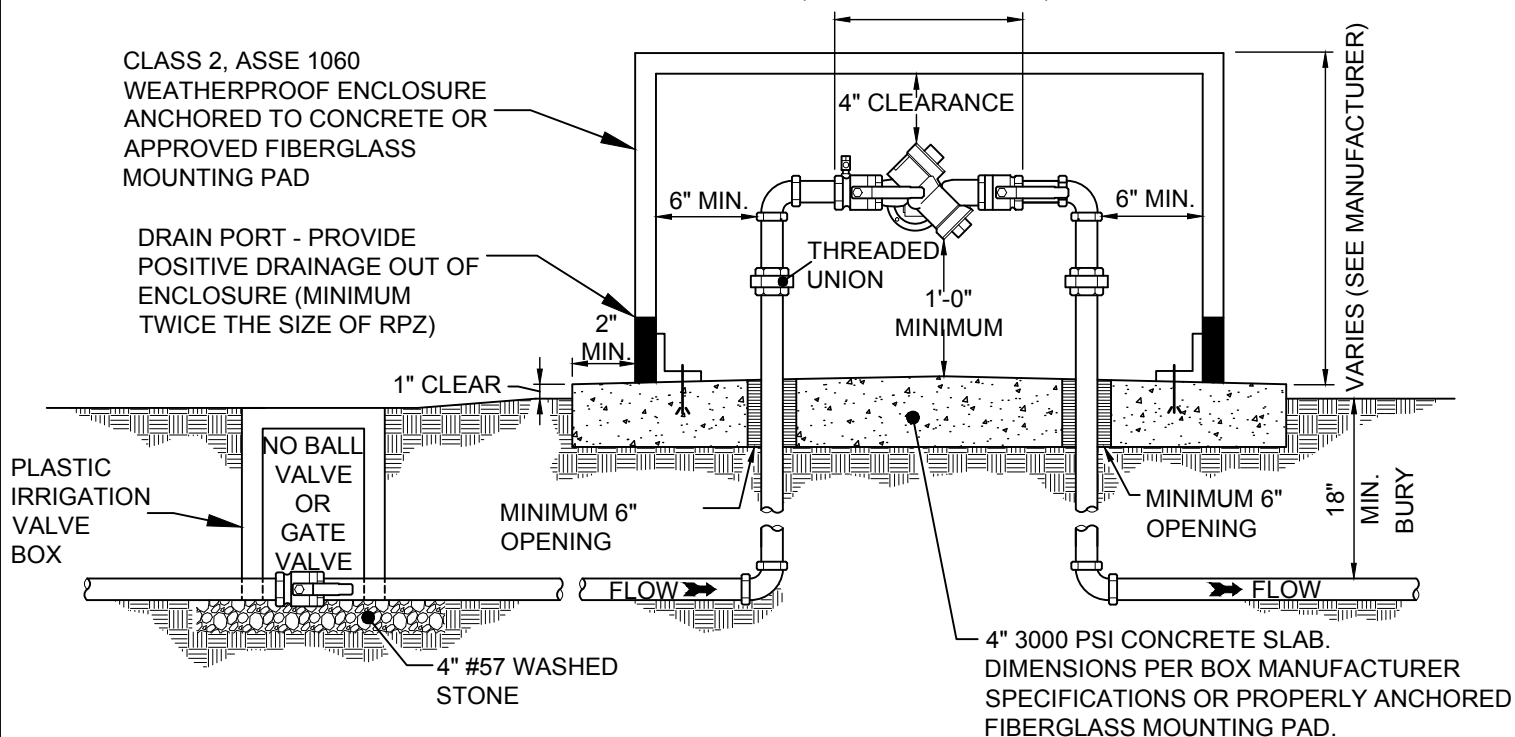
SECTION C-C

### VALVE BOX DETAIL

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-15



**NO LEAD REDUCED PRESSURE PRINCIPLE BACKFLOW  
PREVENTION ASSEMBLY  
VARIES  
(SEE MANUFACTURER)**



**NOTES:**

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED WITHIN 5-FT OF THE IRRIGATION METER.
3. BACKFLOW ASSEMBLY SHALL BE CENTERED ON CONCRETE OR OTHER APPROVED MOUNTING PAD AND CENTERED WITHIN ENCLOSURE.
4. MINIMUM NON-HEATED, INSULATED CLASS II, ASSE 1060 WEATHERPROOF ENCLOSURE REQUIRED.
5. PIPE MATERIAL SHALL BE PVC (SCH. 80 OR BETTER), COPPER (TYPE K), OR 'NO LEAD' BRASS (UNS C89833 PER ASTM B584).
6. IRRIGATION ASSEMBLIES TO BE DRAINED DURING WINTER MONTHS BY PROPERTY OWNER.
7. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CITY ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE LOCAL PLUMBING CODE.
8. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW PREVENTION ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
9. ALL BRASS COMPONENTS SHALL BE 'NO LEAD' BRASS MEETING UNS C89833 AS PER ASTM B584.

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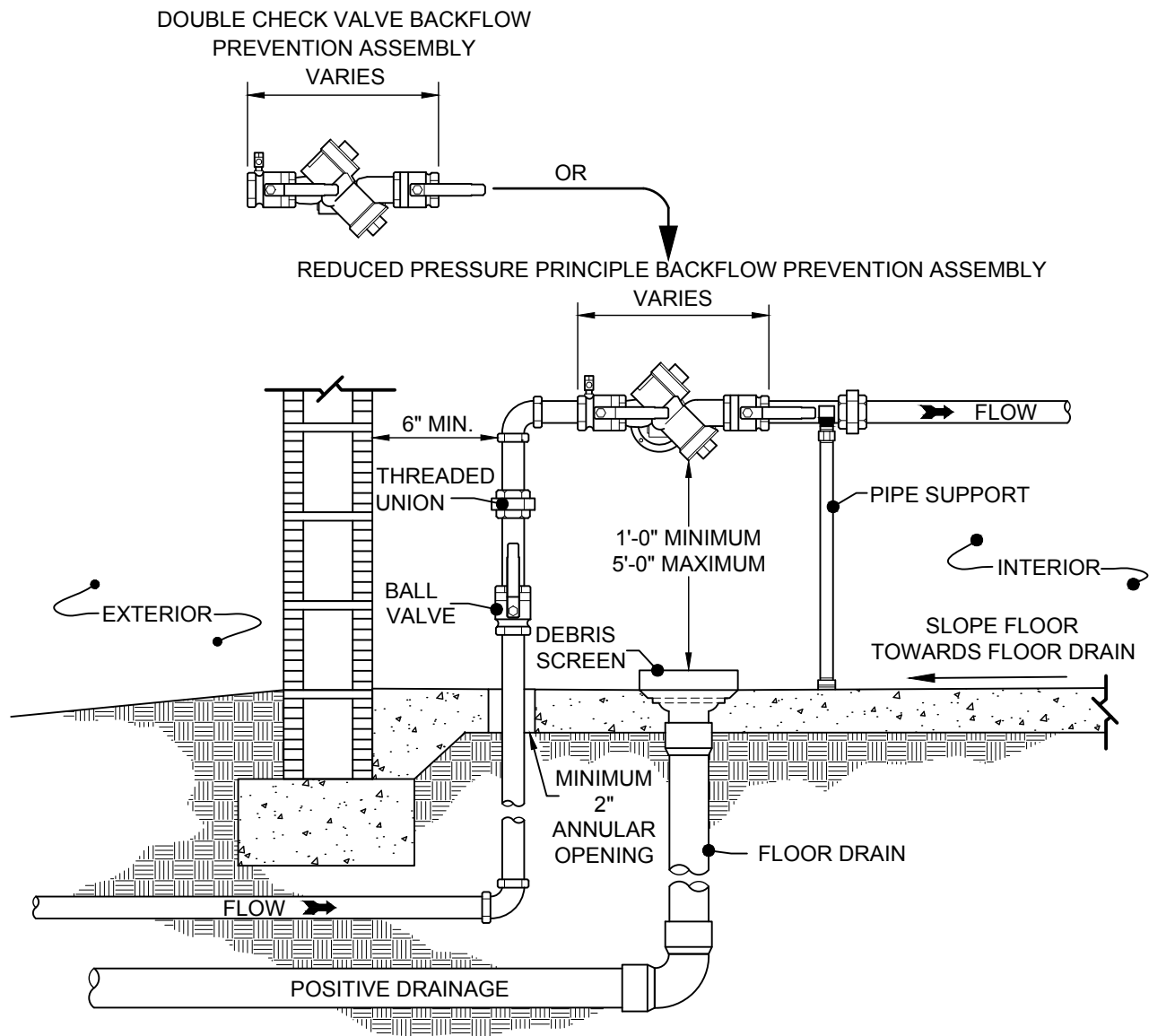


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**CITY OF HUNTSVILLE STANDARD DETAILS  
1" RESIDENTIAL IRRIGATION BACKFLOW ASSEMBLY**

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				<b>W-16</b>

NAME: 1" RESIDENTIAL IRRIGATION  
CATEGORY: CROSS CXN. CONTROL  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



**NOTES:**

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1015 & AWWA C510.
3. BACKFLOW PREVENTION ASSEMBLY SHALL MAINTAIN MINIMUM CLEARANCES FROM WALLS AND FLOOR AS SPECIFIED.
4. EXTERIOR ACCESS DOOR TO BACKFLOW ASSEMBLY IS REQUIRED.
5. PIPE MATERIAL SHALL BE COPPER (TYPE K) OR BRASS (ASTM B43).
6. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CITY ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE CITY OF HUNTSVILLE PLUMBING CODE.
7. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.

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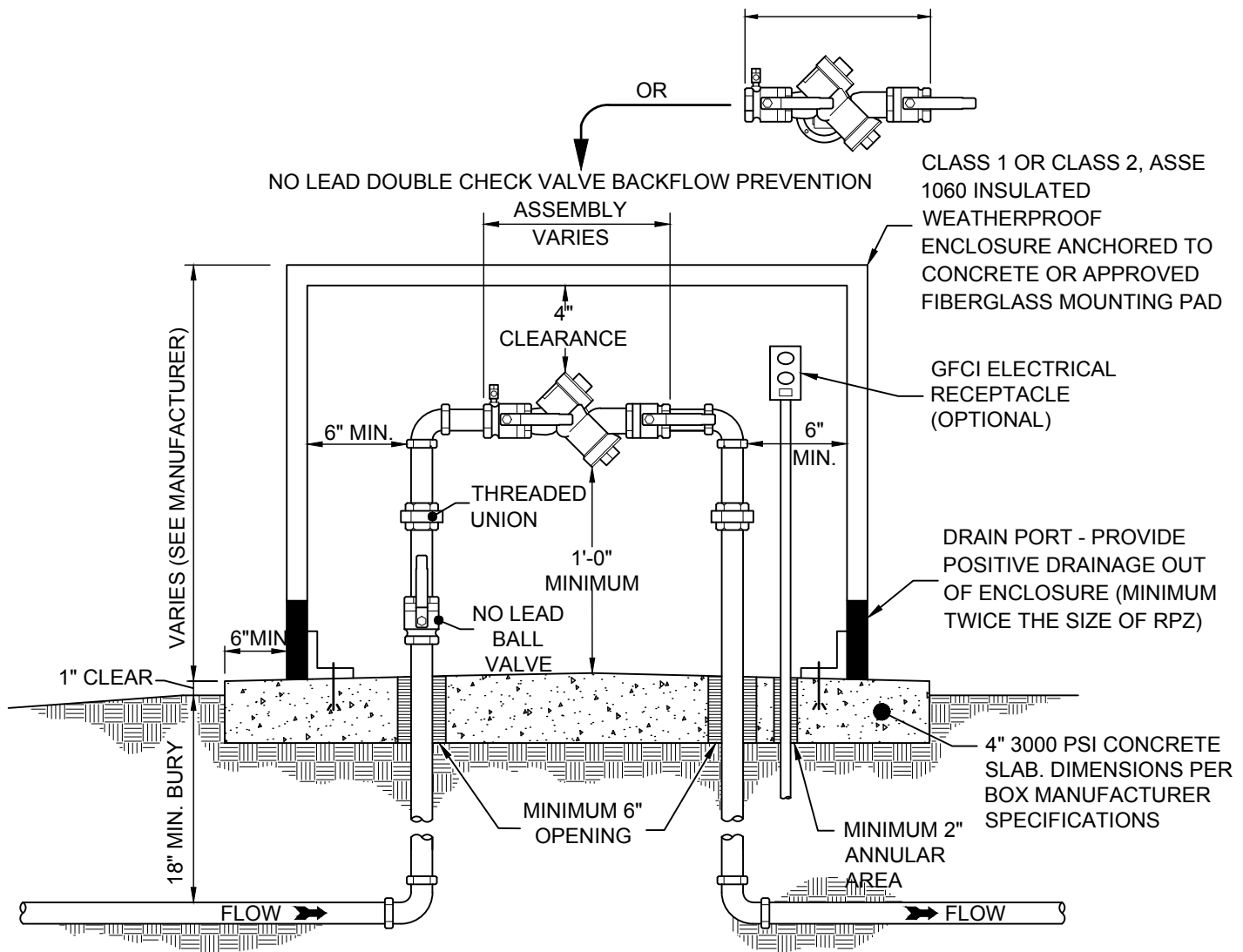
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CITY OF HUNTSVILLE STANDARD DETAILS  
1" TO 2.5" COMMERCIAL INDOOR  
BACKFLOW ASSEMBLY

NAME: CML. INDOOR BACKFLOW  
CATEGORY: CROSS CXN. CONTROL  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-17

# NO LEAD REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY VARIES



## NOTES:

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1015 & AWWA C510.
3. BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED WITHIN 5-FT OF THE METER BOX.
4. BACKFLOW PREVENTION ASSEMBLY SHALL BE CENTERED ON CONCRETE OR APPROVED FIBERGLASS MOUNTING PAD AND CENTERED WITHIN ENCLOSURE.
5. MINIMUM INSULATED CLASS I OR CLASS II, ASSE 1060 WEATHERPROOF ENCLOSURE REQUIRED (HEATING OPTIONAL).
6. OPTIONAL 120V GFCI ELECTRICAL RECEPTACLE TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE FOR OUTDOOR OPERATION.
7. PIPE MATERIAL SHALL BE PVC (SCH. 80 OR BETTER), COPPER (TYPE K), OR 'NO LEAD' BRASS (UNS C89833 PER ASTM B584).
8. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CITY ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE LOCAL PLUMBING CODE.
9. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
10. ALL BRASS COMPONENTS SHALL BE 'NO LEAD' BRASS MEETING UNS C89833 AS PER ASTM B584.

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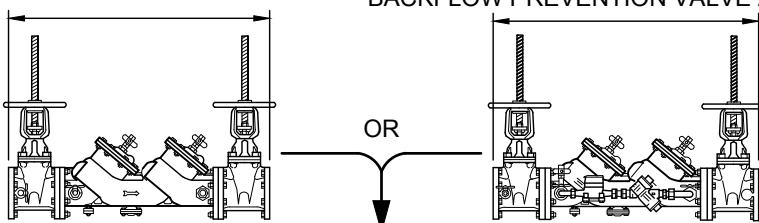
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## CITY OF HUNTSVILLE STANDARD DETAILS 1" TO 2.5" COMMERCIAL OUTDOOR BACKFLOW ASSEMBLY

NAME: CML OUTDOOR BACKFLOW  
CATEGORY: CROSS CXN. CONTROL  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

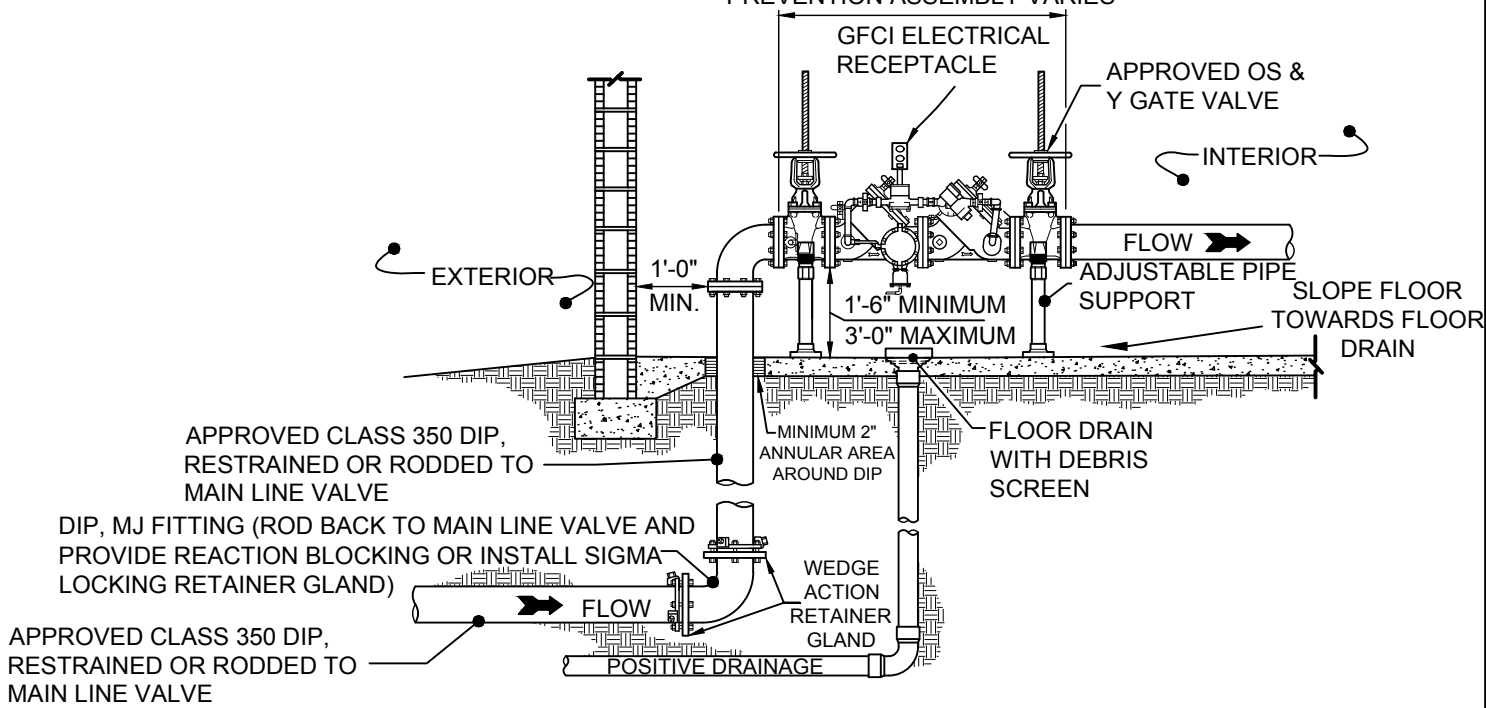
REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-18

NO LEAD DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY      NO LEAD DOUBLE CHECK DETECTOR BACKFLOW PREVENTION VALVE ASSEMBLY



OR

NO LEAD REDUCED PRESSURE DETECTOR BACKFLOW PREVENTION ASSEMBLY VARIES



NOTES:

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. REDUCED PRESSURE DETECTOR BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1047.
3. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1015 & AWWA C510.
4. DOUBLE CHECK DETECTOR BACKFLOW PREVENTION VALVE ASSEMBLY SHALL COMPLY WITH ASSE 1048.
5. BACKFLOW ASSEMBLY SHALL MAINTAIN MINIMUM CLEARANCES FROM WALLS AND FLOOR AS SPECIFIED.
6. EXTERIOR ACCESS DOOR TO BACKFLOW ASSEMBLY IS REQUIRED.
7. PIPE MATERIAL SHALL BE CLASS 350 DIP APPROVED BY THE TOWN.
8. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE TOWN ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE CITY OF HUNTSVILLE PLUMBING CODE.
9. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
10. ALL 'NO LEAD' BRASS COMPONENTS SHALL MEET UNS C89833 AS PER ASTM B584.

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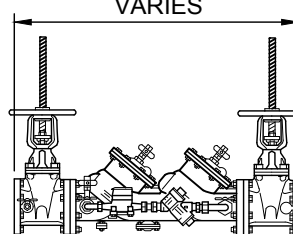
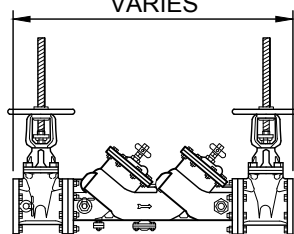
CITY OF HUNTSVILLE STANDARD DETAILS  
3" DIAMETER AND LARGER COMMERCIAL  
INDOOR BACKFLOW ASSEMBLY

NAME: CML. INDOOR BACKFLOW 3"  
CATEGORY: WATER  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-19

NO LEAD DOUBLE CHECK VALVE  
BACKFLOW PREVENTION ASSEMBLY  
VARIES

NO LEAD DOUBLE CHECK DETECTOR  
BACKFLOW PREVENTION ASSEMBLY  
VARIES



OR

NO LEAD REDUCED PRESSURE DETECTOR BACKFLOW  
PREVENTION ASSEMBLY VARIES

CLASS 1, ASSE 1060 HEATED & INSULATED WEATHERPROOF ENCLOSURE ANCHORED TO CONCRETE PAD

IF RPZ, PROVIDE DRAIN PORT FOR POSITIVE DRAINAGE OUT OF ENCLOSURE (MINIMUM TWICE THE SIZE OF RPZ)

6" 3000 PSI CONCRETE SLAB. DIMENSIONS PER ENCLOSURE MANUFACTURER SPECIFICATION

DIP, MJ FITTING (ROD BACK TO MAIN LINE VALVE AND PROVIDE REACTION BLOCKING OR INSTALL LOCKING RETAINER GLAND)

APPROVED CLASS 350 DIP, RESTRAINED OR RODDED TO MAIN LINE VALVE

CLASS 350 DIP FLANGED FITTING

2'-0" CLEAR

1'-6" MIN.

2'-0" CLEAR

6" MIN.

1" CLEAR

36" MIN. BURY

MAINTAIN 2" ANNULAR AREA AROUND DIP AND ELECTRICAL CONDUIT

APPROVED CLASS 350 DIP RESTRAINED OR RODDED WEDGE ACTION RETAINER GLAND

COMPACTED SUBGRADE

ADJUSTABLE PIPE SUPPORT

GFCI ELECTRICAL RECEPTACLE

APV. OS & Y GATE VALVE

VALVE OPEN VARIES (SEE MANUFACTURER)

4" MIN. CLEARANCE WITH VALVE OPEN

FLOW

FLOW

#### NOTES:

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. REDUCED PRESSURE DETECTOR BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1047.
3. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1015 & AWWA C510.
4. DOUBLE CHECK DETECTOR BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1048.
5. BACKFLOW ASSEMBLY SHALL BE CENTERED ON CONCRETE PAD AND CENTERED WITHIN ENCLOSURE.
6. CLASS I, ASSE 1060 HEATED AND INSULATED WEATHERPROOF ENCLOSURE REQUIRED.
7. STANDARD 120V GFCI ELECTRICAL RECEPTACLE TO BE INSTALLED IN ACCORDANCE WITH THE CITY OF HUNTSVILLE ELECTRICAL CODE FOR OUTDOOR OPERATION.
8. PIPE MATERIAL SHALL BE CLASS 350 DIP APPROVED BY THE TOWN.
9. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE TOWN ORDINANCES AND SPECIFICATIONS IN ADDITION TO THE CITY OF HUNTSVILLE PLUMBING CODE.
10. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
11. ALL 'NO LEAD' BRASS COMPONENTS SHALL MEET UNS C89833 AS PER ASTM B584.

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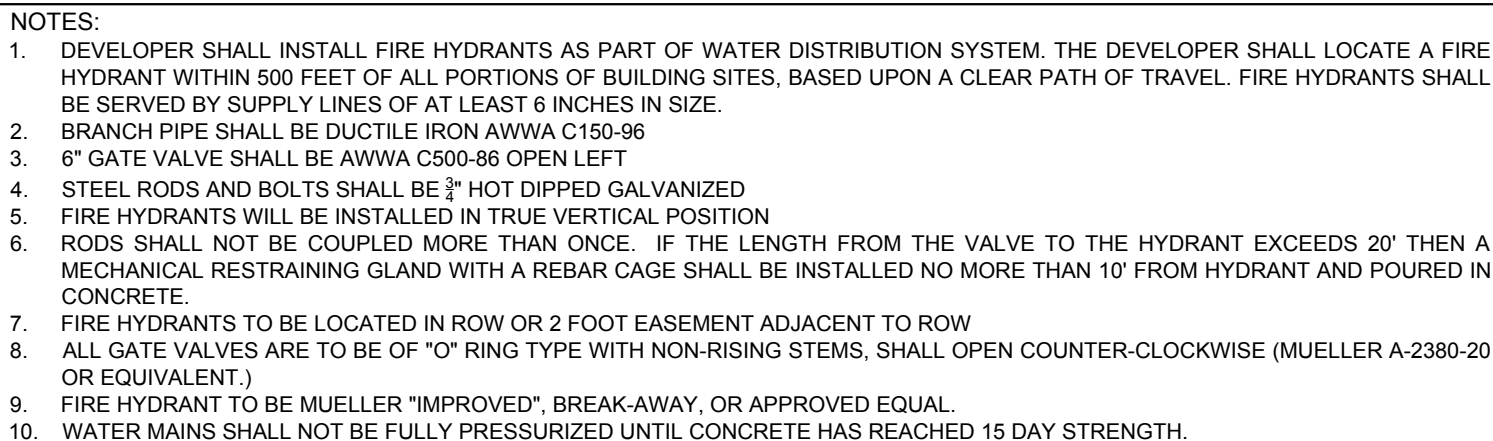
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#### CITY OF HUNTSVILLE STANDARD DETAILS 3" DIAMETER AND LARGER COMMERCIAL OUTDOOR BACKFLOW ASSEMBLY

REV#	ISSUER	DATE	APPROVER	SHEET
0	MAM	07/31/2018		1 OF 1

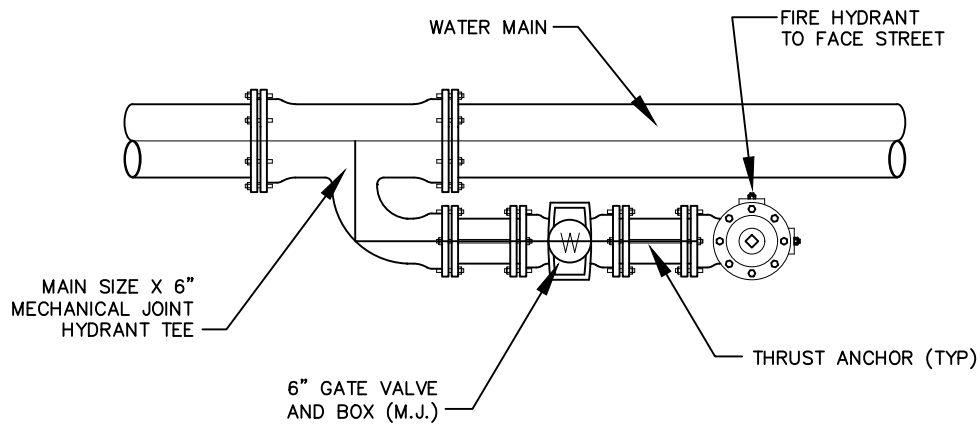
W-20

NAME: CML. OUTDOOR BACKFLOW 3" A  
CATEGORY: WATER  
DRAWN DATE: 11/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

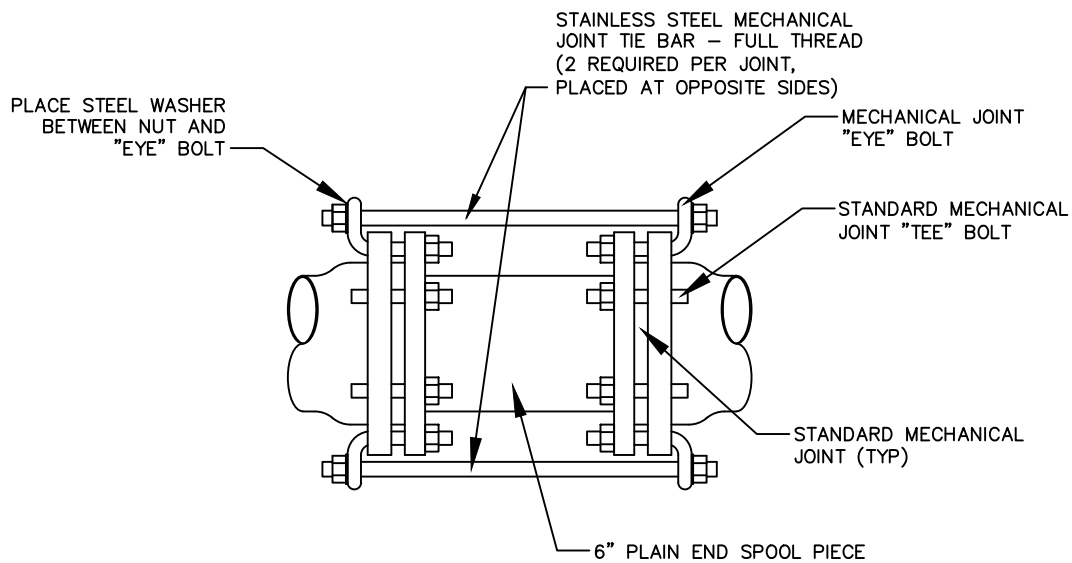


REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 4
0	MAM	07/31/2018		
				W-21





ALTERNATE FIRE HYDRANT PLAN



THRUST ANCHOR DETAIL

DEPARTMENT OF ENGINEERING &  
MAPPING/ENGINEERING  
DIVISION  
CITY OF  
HUNTSVILLE, TEXAS



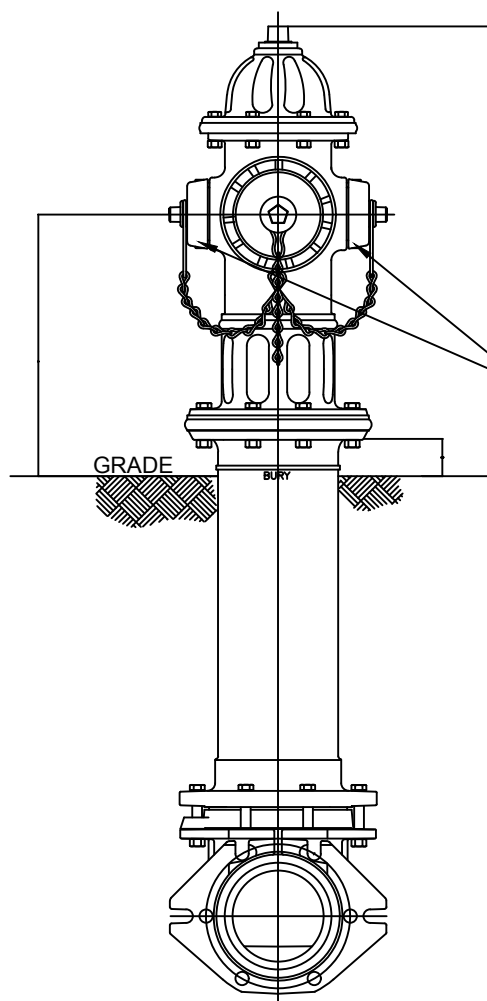
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CITY OF HUNTSVILLE STANDARD DETAILS  
ALTERNATE HYDRANT PLAN

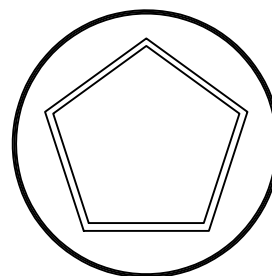
NAME: FIRE HYDRANT  
CATEGORY: WATER  
DRAWN DATE: 10/24/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 4
0	MAM	07/31/2018		
				W-22

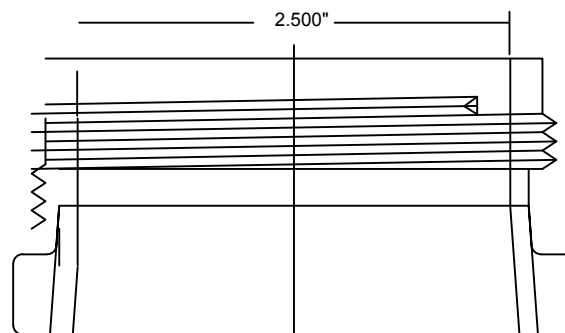
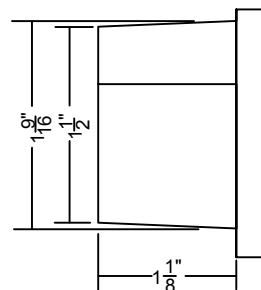




2 1/2" NOZZLES  
W/ NATIONAL  
STANDARD  
THREADS



1 9/16" OPERATION NUT



2 1/2" NATIONAL STANDARD  
OUTLET THREADS

#### NOTES:

1. DEVELOPER SHALL INSTALL FIRE HYDRANTS AS PART OF WATER DISTRIBUTION SYSTEM. THE DEVELOPER SHALL LOCATE A FIRE HYDRANT WITHIN 500 FEET OF ALL PORTIONS OF BUILDING SITES, BASED UPON A CLEAR PATH OF TRAVEL. FIRE HYDRANTS SHALL BE SERVED BY SUPPLY LINES OF AT LEAST 6 INCHES IN SIZE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
6. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
7. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW
8. ALL GATE VALVES ARE TO BE OF "O" RING TYPE WITH NON-RISING STEMS, SHALL OPEN COUNTER-CLOCKWISE (MUELLER A-2380-20 OR EQUIVALENT.)
9. FIRE HYDRANT TO BE MUELLER "IMPROVED", BREAK-AWAY, OR APPROVED EQUAL.
10. WATER MAINS SHALL NOT BE FULLY PRESSURIZED UNTIL CONCRETE HAS REACHED 15 DAY STRENGTH.

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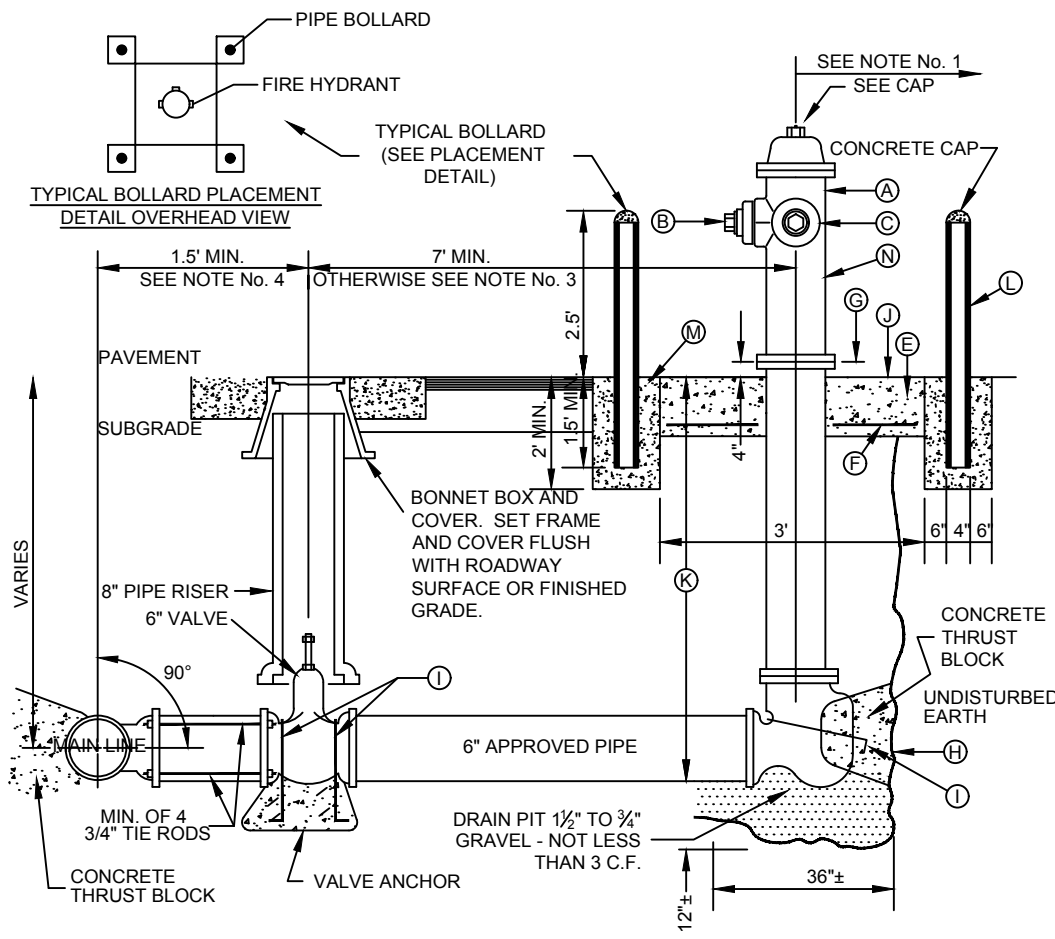


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#### CITY OF HUNTSVILLE STANDARD DETAILS FIRE HYDRANT INSTALLATION HYDRANT OPERATION NUT & THREADS

REV#	ISSUER	DATE	APPROVER	SHEET 3 OF 4
0	MAM	07/31/2018		
				W-23

NAME: FIRE HYDRANT  
CATEGORY: WATER  
DRAWN DATE: 10/24/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



- CONSTRUCTION KEY NOTES:**
- FIRE HYDRANT PER SPEC'S.
  - PUMPER NOZZLE 4" TO BE FACING THE TRAVELED WAY, UNLESS OTHERWISE NOTED IN THE PLANS.
  - HOSE NOZZLE 2 1/2".
  - 1/2" PREMOLDED EXPANSION JOINT WITH 1" TOP FILLER.
  - 3'x3'x6" CONC. SQ. PAD, TO BE CONSTRUCTED AROUND FIRE HYDRANT'S CENTER LINE WHEN NOT LOCATED WITHIN SIDEWALK OR CONC. AREA.
  - #10; 6/6 WWF.
  - CONTROLLED ELEVATION LINE, LEVEL IN ALL DIRECTIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING TOP FLANGE OF THE HYDRANT TO CONTROLLED ELEVATION.
  - CONC. THRUST BLOCK, APPROX. 2'x2'x3' TO BE POURED AGAINST UNDISTURBED EARTH, F.H. WEEP HOLE MUST BE UNOBSTRUCTED.
  - 2"x1/4" STEEL ANCHOR PINS.
  - TOP OF SLAB SHALL BE AT FINISHED GRADE 4" BELOW THE BREAK LINE OF THE HYDRANT. UNDER SPECIAL CONDITIONS THE ENGINEER MAY ALLOW VARIATIONS TO THIS CONSTRUCTION.
  - MAXIMUM OF ONE (1) SPOOL EXTENSION ALLOWED TO MAINTAIN THE CONTROLLED ELEVATION LINE TO TOP OF SLAB. ADDITIONAL ADJUSTMENT MUST BE MADE WITH OFFSETS & FITTINGS AS NEEDED.
  - 4" OUTSIDE DIAMETER STEEL PIPE (PAINTED SAFETY YELLOW) FILLED SOLID WITH CONCRETE.
  - 3000 P.S.I. CONCRETE
  - REQUIRED** - DAVIDSON ANTI TERRORISM CORROSION RESISTANT VALVE KIT (DATV).

**NOTES:**

- NO OBSTRUCTIONS WILL BE PERMITTED WITHIN 5 FT. IN ALL DIRECTIONS OF FIRE HYDRANT. FIRE HYDRANT SHALL NOT BE PLACED IN WHEEL CHAIR RAMP OR DRIVEWAY.
- 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.
- WHERE DISTANCE IS LESS THAN 7', HYDRANT SHALL BE INSTALLED IN ACCORDANCE CITY OF HUNTSVILLE.
- 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.
- COMPLY WITH REQUIREMENTS OF AWWA C-502, DRY BARREL FIRE HYDRANTS AND AWWA C-550, PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.

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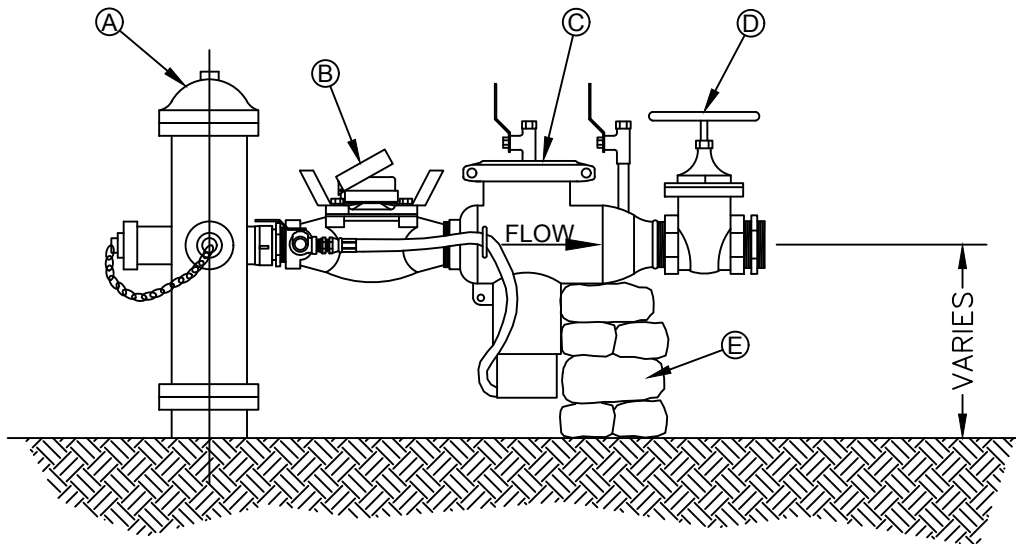


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**CITY OF HUNTSVILLE STANDARD DETAILS**  
**FIRE HYDRANT INSTALLATION**  
**INSIDE PARKING LOT**

REV#	ISSUER	DATE	APPROVER	SHEET 4 OF 4
0	MAM	07/31/2018		
				<b>W-24</b>

NAME: FIRE HYDRANT INSTALLATION  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



### FIRE METER INSTALLATION

#### 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

#### NOTES:

1. USE OF HYDRANT REQUIRES VALID HYDRANT USE PERMIT. CONTACT THE CITY OF HUNTSVILLE 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 THE CITY OF HUNTSVILLE. METER MUST BE INSPECTED AND NUMBERED BY THE CITY OF HUNTSVILLE BEFORE BEING PLACED IN SERVICE.
4. METER SHALL BE TESTED ANNUALLY BY THE CITY OF HUNTSVILLE.
5. BACKFLOW DEVICE SHALL BE TESTED ANNUALLY AND COPY OF TEST SHALL BE SENT TO THE CITY OF HUNTSVILLE, BEFORE USAGE WILL BE ALLOWED.
6. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO FIRE HYDRANT DURING USE.

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### CITY OF HUNTSVILLE STANDARD DETAILS FIRE HYDRANT CONSTRUCTION METER

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-25

NAME: FIRE HYDRANT METER  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

## NOTES:

### POLYETHELENE WRAP FOR IRON PIPE

NOTE:

1. POLYETHYLENE FILM SHALL BE USED AS A WRAP TO PROTECT CAST IRON AND OTHER METALS IN A CORROSIVE SOIL ENVIRONMENT.
2. AN 8 MIL POLYETHYLENE FILM WRAP SHALL BE REQUIRED AROUND ALL METAL PIPE AND APPURTENANCES (EXCEPT FIRE HYDRANTS).
3. POLYETHYLENE FILM SHALL BE FURNISHED AND INSTALLED EITHER IN TUBULAR FORM PRIOR TO LOWERING THE PIPE IN TRENCH OR IN SHEET FORM.
4. POLYETHYLENE TUBE ENCASEMENT, IF REQUIRED, SHALL CONFORM WITH THE MINIMUM REQUIREMENTS OF "POLYETHYLENE ENCASEMENT FOR GRAY AND DUCTILE CAST-IRON PIPING FOR WATER AND OTHER LIQUIDS", ANSI/AWWA C105, CURRENT REVISION. SOILS WITHIN A PROJECT SHALL BE TESTED IN ACCORDANCE WITH APPENDIX A OF ANSI/AWWA C105 TO ADEQUATELY DETERMINE THE REQUIREMENTS FOR ENCASEMENT.

### BENDS, TEES & PLUGS FOR PIPE OF VARIOUS SIZES

SIZE	90° BEND		45° BEND		22½° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	A	B
2½"	12"	7"	6"	7"	6"	6"	7"	8"	8"	14"
6"	16"	10"	9"	10"	6"	12"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

## CONSTRUCTION NOTES:

1. ALL WATER MAIN LINES 4" TO 16" SHALL BE C-909 (DR-13). ALL WATER MAIN LINES 20" THROUGH 24" SHALL BE C-900 (DR-18).
2. ALL FLUSHING VALVES AND GATE VALVES TO BE AMERICAN WATER WORKS ASSOC. (AWWA) STANDARD COUNTERCLOCKWISE OPENING WITH NON-RISING STEM DESIGN.
3. THE MAXIMUM ALLOWABLE SIZE OF A TAPPING SLEEVE AND VALVE ON AN EXISTING PIPE IS ONE SIZE SMALLER THEN THE PIPE DIAMETER OF THE MAIN TO BE TAPPED.
4. ALL DUCTILE IRON PIPE SHALL BE CLASS 50 MORTAR LINED. NO A.C. PIPE WILL BE ALLOWED AND ALL DUCTILE IRON FITTINGS SHALL BE MORTAR LINED PUSHON OR MECHANICAL JOINTS.
5. ALL BACKFILL WITHIN THE R.O.W. SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.

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NAME: POLYETHYLENE WRAP  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

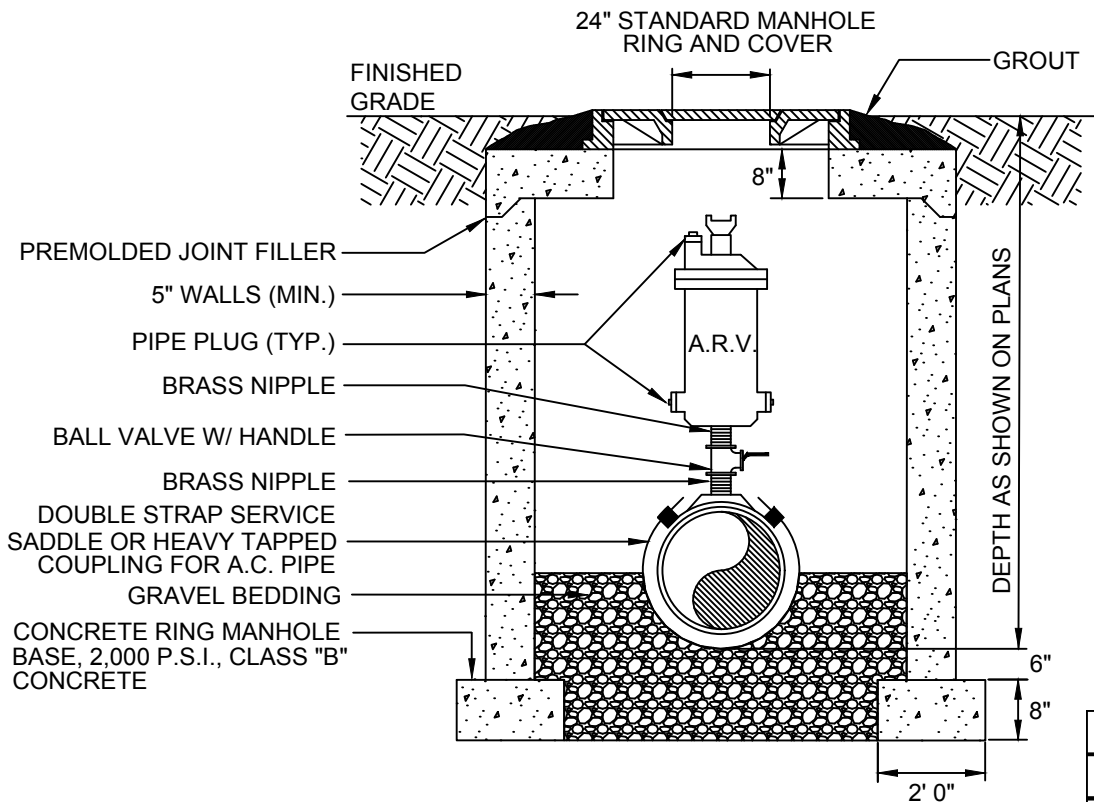


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### CITY OF HUNTSVILLE STANDARD DETAILS POLYETHYLENE WRAP DETAIL & TABLE FOR BENDS, TEES, AND PLUGS

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-26

DIRECTLY SET ON THE WATERMAIN



Sizing Installation	
Main Size	Valve Size
1" to 4"	1/2"
6" to 10"	1"
12" to 18"	2"
20" to 24"	3"
26" to 30"	4"

**NOTES:**

1. ANY GRADE RINGS REQUIRED SHALL BE SET AS SHOWN ON STANDARD SANITARY SEWER MANHOLE DRAWING.
2. CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES TO BE DETERMINED BY THE ENGINEER AND APPROVED BY THE CITY OF HUNTSVILLE PRIOR TO INSTALLATION.
3. IF OFFSET IS GREATER THAN 6', 2" PE TUBING MUST BE USED. IF OFFSET IS LESS THAN 6' BRASS PIPE MUST BE USED (NO COUPLINGS).

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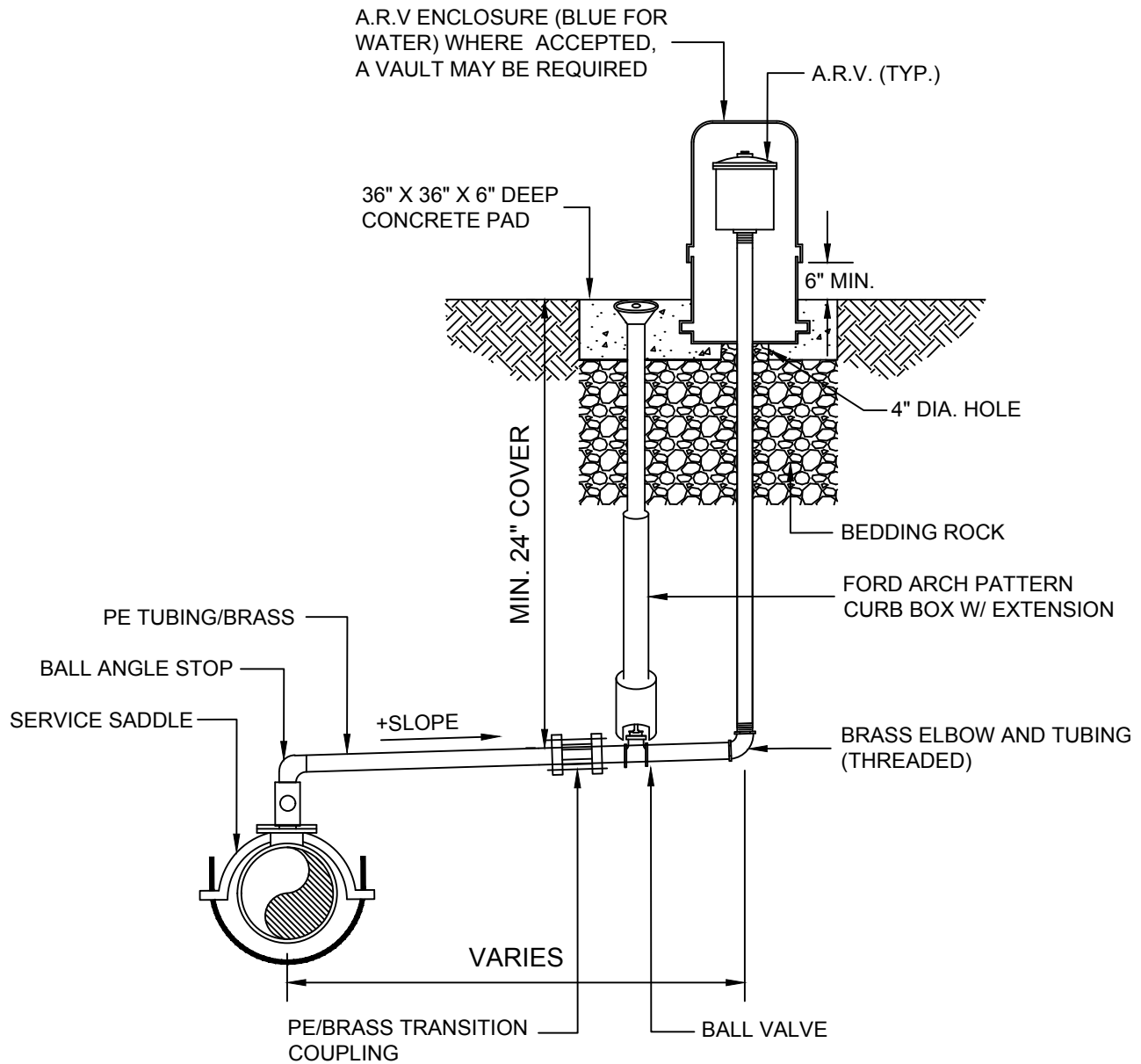
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CITY OF HUNTSVILLE STANDARD DETAILS  
AIR/VACUUM RELEASE VALVE  
SET ON WATER MAIN

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				<b>W-27</b>

NAME: AIR/VACUUM RELEASE VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

# OFFSET FROM THE WATERMAIN



## NOTES:

1. CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES TO BE DETERMINED BY THE ENGINEER AND APPROVED BY THE CITY OF HUNTSVILLE PRIOR TO INSTALLATION.
2. IF OFFSET IS GREATER THAN 6', 2" PE TUBING MUST BE USED. IF OFFSET IS LESS THAN 6' BRASS PIPE MUST BE USED (NO COUPLINGS).

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CITY OF  
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NAME: AIR/VACUUM RELEASE VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



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## CITY OF HUNTSVILLE STANDARD DETAILS AIR/VACUUM RELEASE VALVE OFFSET FROM WATER MAIN

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
				W-28

2"-90° S.E.  
BRASS ELBOW

2"-90° BRASS ELBOW

ABOVE 2 YEAR  
FLOOD PLAIN  
MIN 2' ABOVE  
FINISHED GRADE

16 MESH BRONZE  
OR STAINLESS  
STEEL SCREEN  
TO BE CRIMPED  
OVER OPENING  
& FASTENED  
WITH STAINLESS  
STEEL CLAMPS

2" BRASS NIPPLE

32" COVER

VARIED DEPTH

2" TAPPING SADDLE

WATER MAIN

MANHOLE

2" APCO COMBINATION  
AIR & VACCUM RELEASE  
VALVE W/2" ORIFICE DIA.  
NO. 145-C OR APPROVED EQUAL

2" NIPPLE (RED BRASS)

2" BRASS GATE VALVE,  
HANDWHEEL OPERATED

2" NIPPLE (RED BRASS)

PEA GRAVEL

### AIR RELEASE VALVE DETAIL

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DIVISION  
CITY OF  
HUNTSVILLE, TEXAS



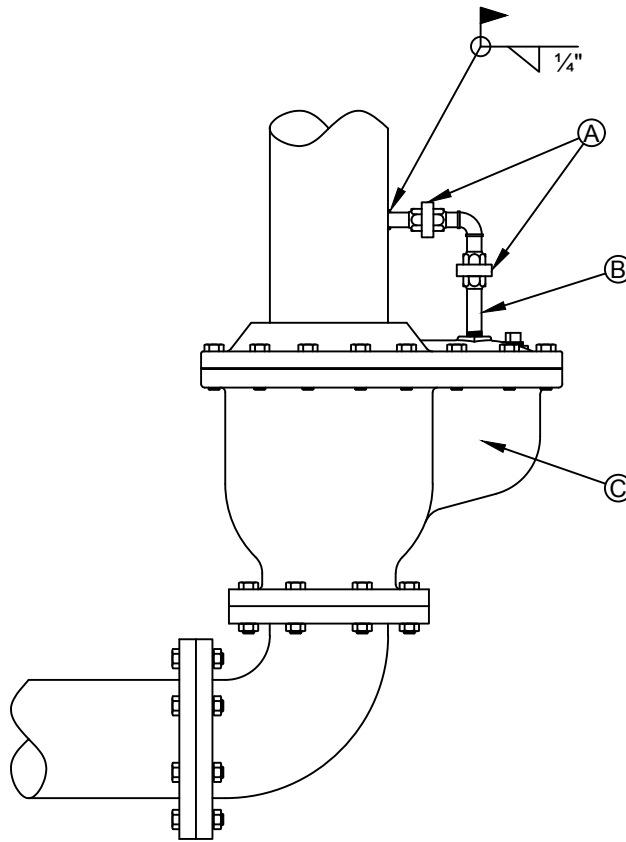
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### CITY OF HUNTSVILLE STANDARD DETAILS AIR RELEASE VALVE BOX

NAME: AIR RELEASE VALVE BOX  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-29





- 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.

NOTES:  
1. NONE.

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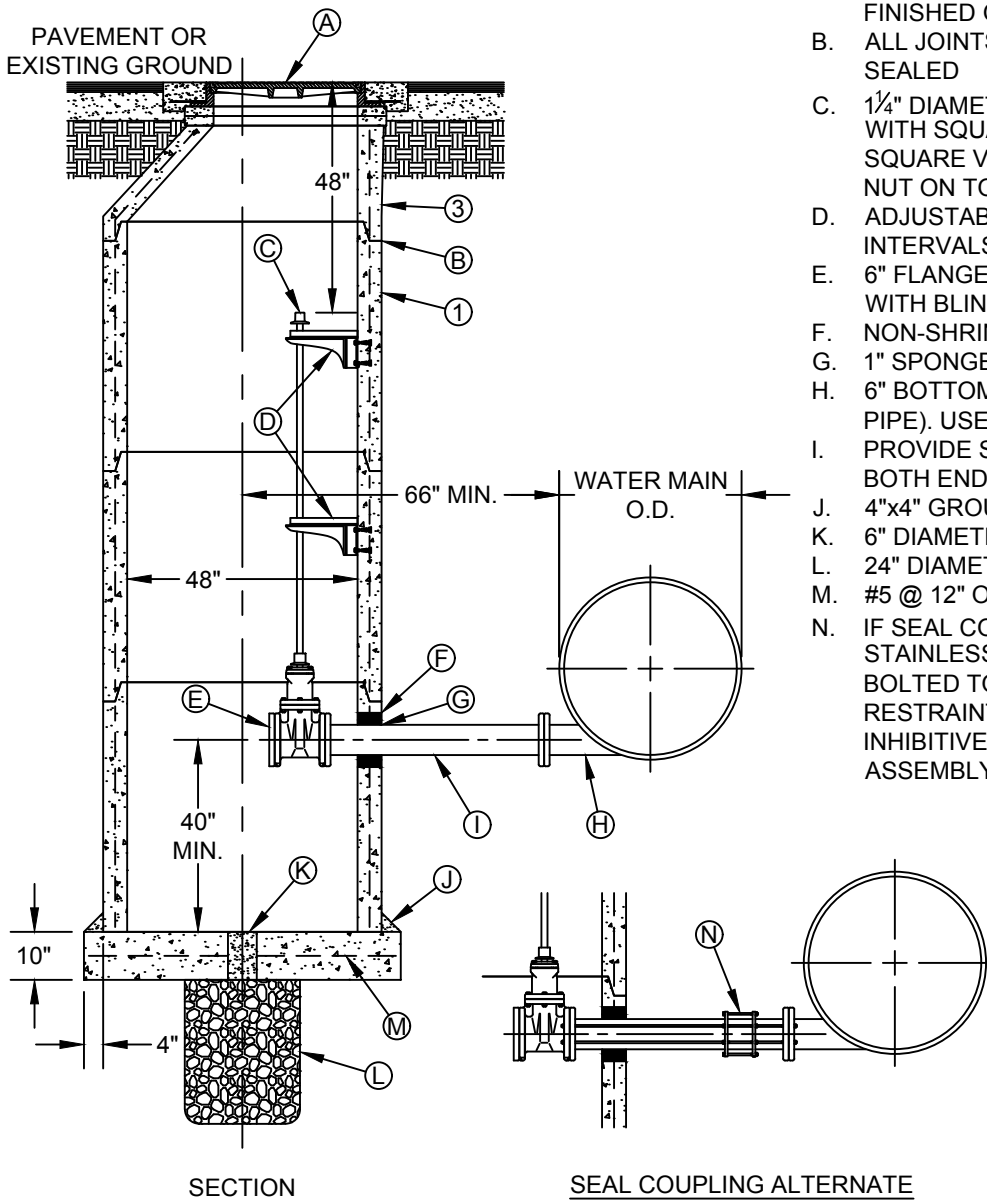
CITY OF HUNTSVILLE STANDARD DETAILS  
AIR RELEASE PIPING

NAME: AIR RELEASE PIPING  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-30

# CONSTRUCTION KEY NOTES:

- A. MANHOLE RING AND COVER. SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE (MIN. 30" OPENING).
- B. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR APPROVED EQUAL.
- C. 1 1/4" 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.
- E. 6" FLANGED GATE VALVE (NORMALLY CLOSED) WITH BLIND FLANGE.
- F. NON-SHRINK GROUT.
- G. 1" SPONGE RUBBER.
- H. 6" BOTTOM TANGENT OUTLET (SCCP OR STEEL PIPE). USE BOTTOM OUTLET FOR DIP.
- I. PROVIDE SPOOL PIECE WITH BOLTED FLANGES BOTH ENDS.
- J. 4"x4" GROUT ALL AROUND.
- K. 6" DIAMETER DRAIN HOLE FILLED WITH GRAVEL.
- L. 24" DIAMETER BY 2'-6" DEEP GRAVEL SUMP.
- M. #5 @ 12" O.C.E.W.
- N. IF SEAL COUPLING IS USED, MUST INSTALL 3/4" 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.



## 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. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
3. ECCENTRIC CONE SECTION REINFORCEMENT IN ACCORDANCE WITH ASTM C-478.

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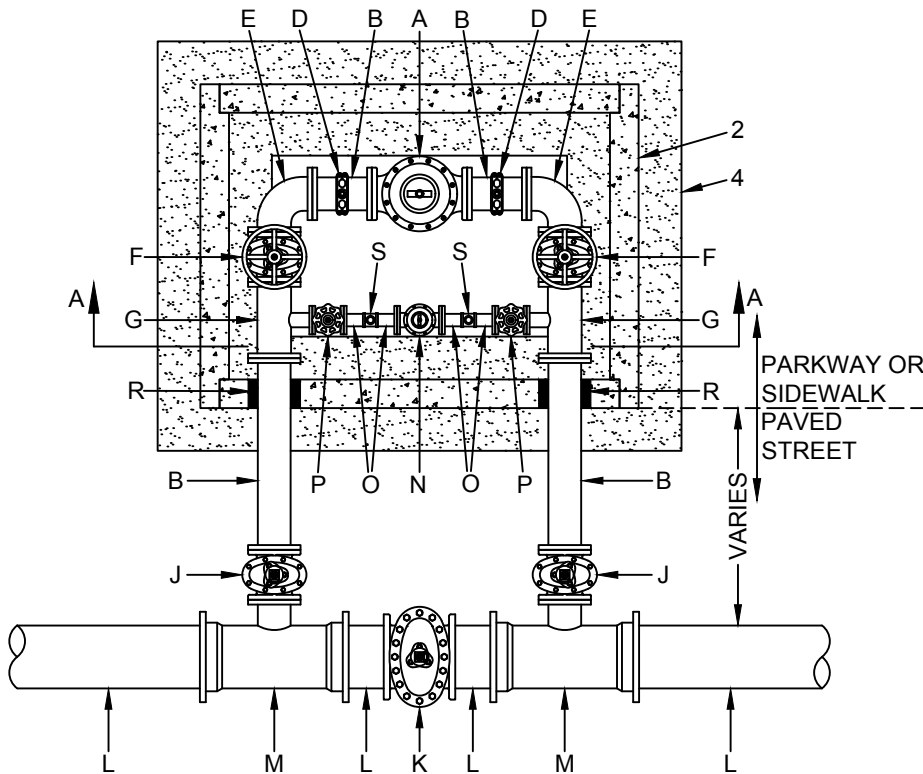
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## CITY OF HUNTSVILLE STANDARD DETAILS BLOWOFF VALVE ASSEMBLY

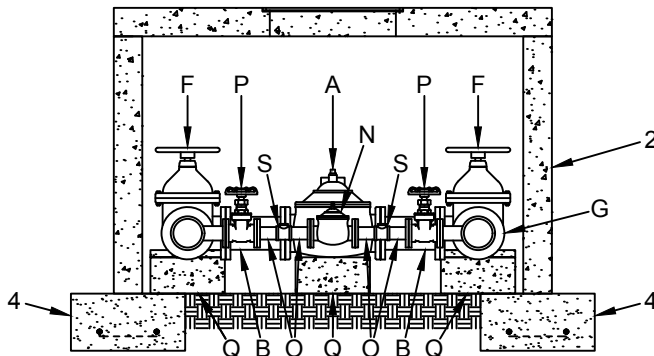
NAME: BLOW OFF VALVE ASSEMBLY  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-31

# TOP VIEW



# SECTION A-A



## CONSTRUCTION KEY NOTES:

- A. FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR HIGH FLOWS.
- B. FLANGED DUCTILE IRON SPOOL.
- C. TAPPING SADDLE & TEST OUTLET WITH CORPORATION STOP.
- D. FLANGED 90° BEND.
- E. FLANGED GATE VALVE WITH HANDWHEEL.
- F. FLANGED TEE.
- G. FLANGED GATE VALVE WITH VALVE BONNET BOX AND COVER.
- H. GATE VALVE (CLOSED) SIZE AS SPECIFIED, WITH VALVE BONNET BOX AND COVER.
- I. MAINLINE, SIZE AS SPECIFIED.
- J. MECHANICAL JOINT TEE WITH FLANGED BRANCH, MAINLINE SIZE AS SPECIFIED.
- K. FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR LOW FLOWS.
- L. FLANGED BRASS OR DUCTILE IRON SPOOL.
- M. FLANGED GATE VALVE WITH HANDWHEEL.
- N. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
- O. WALL SLEEVES AND/OR GROUT.
- P. BRONZE TEE WITH ADAPTER & TEST OUTLET WITH CORPORATION STOP.

## 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". FOR PRESSURE REDUCING VALVES LARGER THAN 6", VAULT SIZE SHALL BE INCREASED TO ACCOMMODATE LARGER APPURTENANCES. LARGER VAULT DIMENSIONS MUST BE APPROVED BY THE CITY OF HUNTSVILLE.
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. 12"x24" FOOTING WITH NO.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.
4. 12"x24" FOOTING AT 12" ON CENTER. TEST OUTLETS TO BE PLACED BEFORE AND AFTER PRESSURE REDUCERS.

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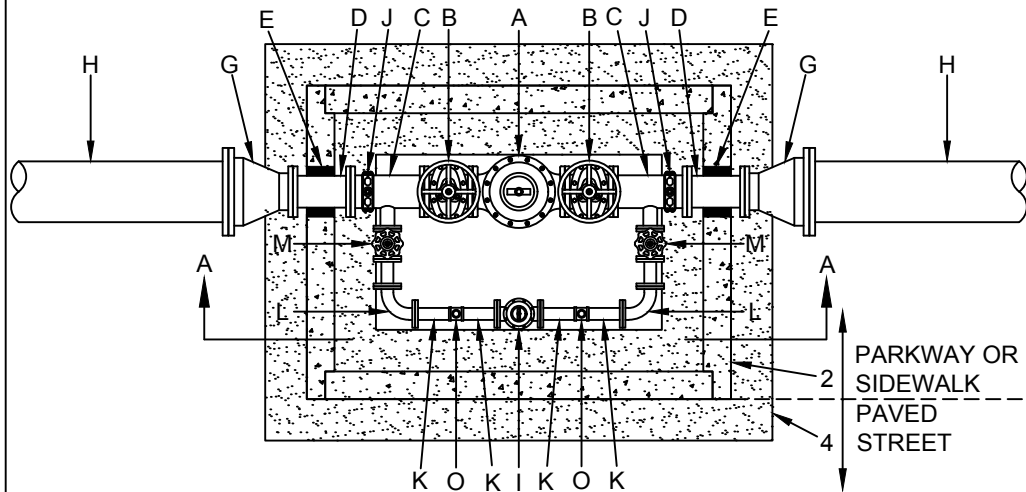
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CITY OF HUNTSVILLE STANDARD DETAILS  
PRESSURE REDUCING VALVE  
BY-PASSED - BEHIND CURB INSTALLATION

NAME: PRESSURE REDUCING VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				W-32

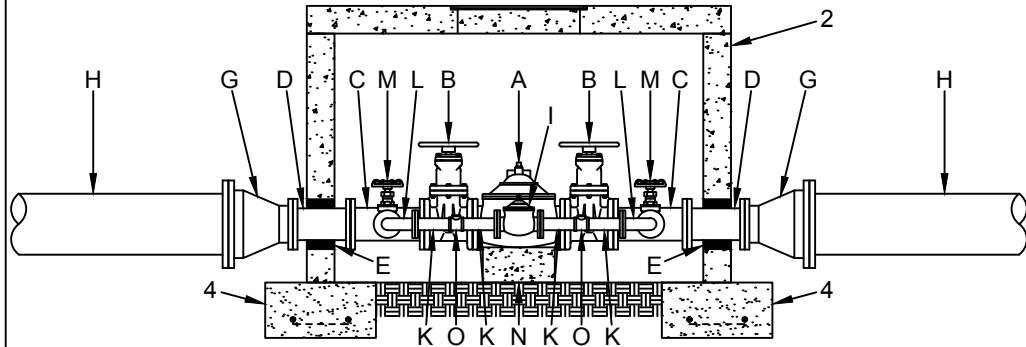
# TOP VIEW



## CONSTRUCTION KEY NOTES:

- A. FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR HIGH FLOWS.
- B. FLANGED GATE VALVE WITH HANDWHEEL.
- C. FLANGED TEE.
- D. 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. FLANGED PRESSURE REDUCING VALVE, WITH SURGE RELIEF PILOT, FOR LOW FLOWS.
- I. TAPPING SADDLE & TEST OUTLET WITH CORPORATION STOP.
- J. FLANGED BRASS OR DUCTILE IRON SPOOL.
- K. FLANGED 90° BEND.
- L. GATE VALVE WITH HANDWHEEL.
- M. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
- N. BRONZE TEE WITH ADAPTER & TEST OUTLET WITH CORPORATION STOP.

# SECTION A-A



## 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". FOR PRESSURE REDUCING VALVES LARGER THAN 6", VAULT SIZE SHALL BE INCREASED TO ACCOMMODATE LARGER APPURTENANCES. LARGER VAULT DIMENSIONS MUST BE APPROVED BY THE CITY OF HUNTSVILLE.
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. 12"x24" FOOTING WITH No.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.
4. 12"x24" FOOTING AT 12" ON CENTER. TEST OUTLETS TO BE PLACED BEFORE AND AFTER.

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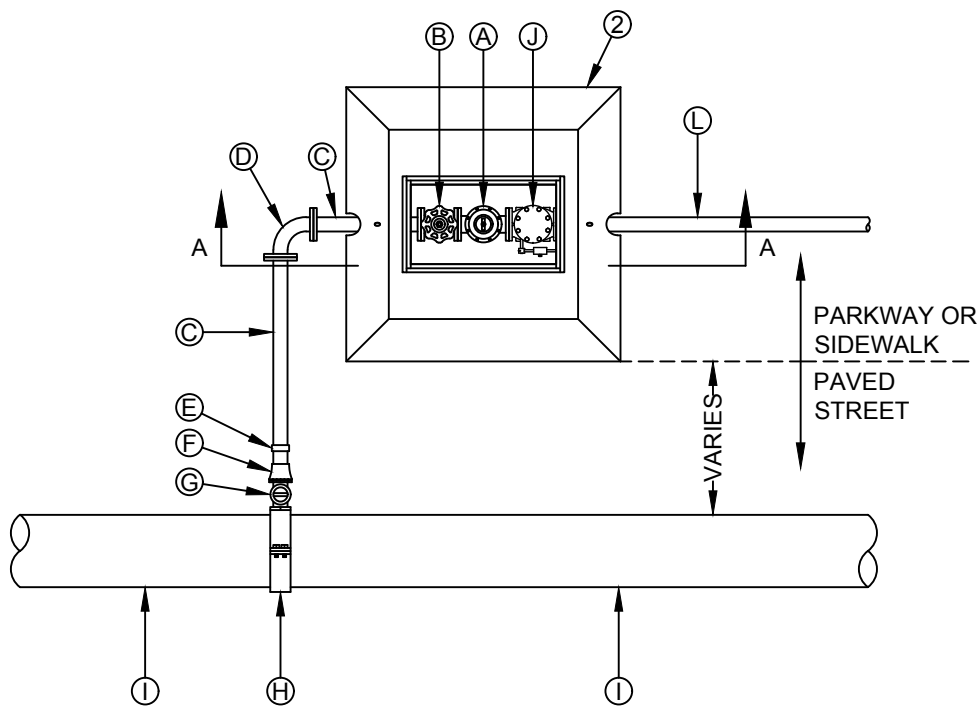


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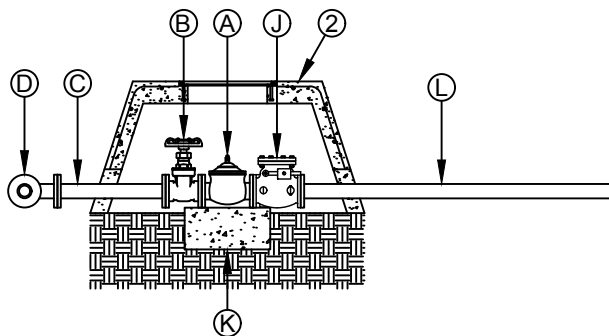
## CITY OF HUNTSVILLE STANDARD DETAILS PRESSURE REDUCING VALVE IN-LINE BEHIND CURB INSTALLATION

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
				W-33

NAME: PRESSURE REDUCING VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



TOP VIEW



SECTION A-A

**CONSTRUCTION KEY NOTES:**

- A. 2" FLANGED PRESSURE RELIEF VALVE.
- B. 2" FLANGED GATE VALVE WITH HANDWHEEL
- C. 2" FLANGED BRASS SPOOL.
- D. 2" FLANGED BRASS 90° BEND.
- E. 2" COUPLING BRASS.
- F. 2" NIPPLE BRASS.
- G. 2" CORPORATION STOP.
- H. 2" SERVICE SADDLE.
- I. MAINLINE, SIZE AS SPECIFIED.
- J. 2" CHECK VALVE.
- K. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
- L. 2" P.V.C. SCH. 40 DISCHARGE TO ATMOSPHERE (SEE NOTE 3).

**NOTES:**

1. INSTALLATION SHOWN FOR A 2" VALVE. INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
2. VALVE VAULT SHALL BE TYPE "D".
3. DISCHARGE TO AN OPEN ATMOSPHERE INCLUDES BUT IS NOT LIMITED TO STORM DRAINS, CULVERTS, AND PONDING AREAS OR ANY APPROVED STRUCTURE/LOCATION.

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DIVISION  
CITY OF  
HUNTSVILLE, TEXAS

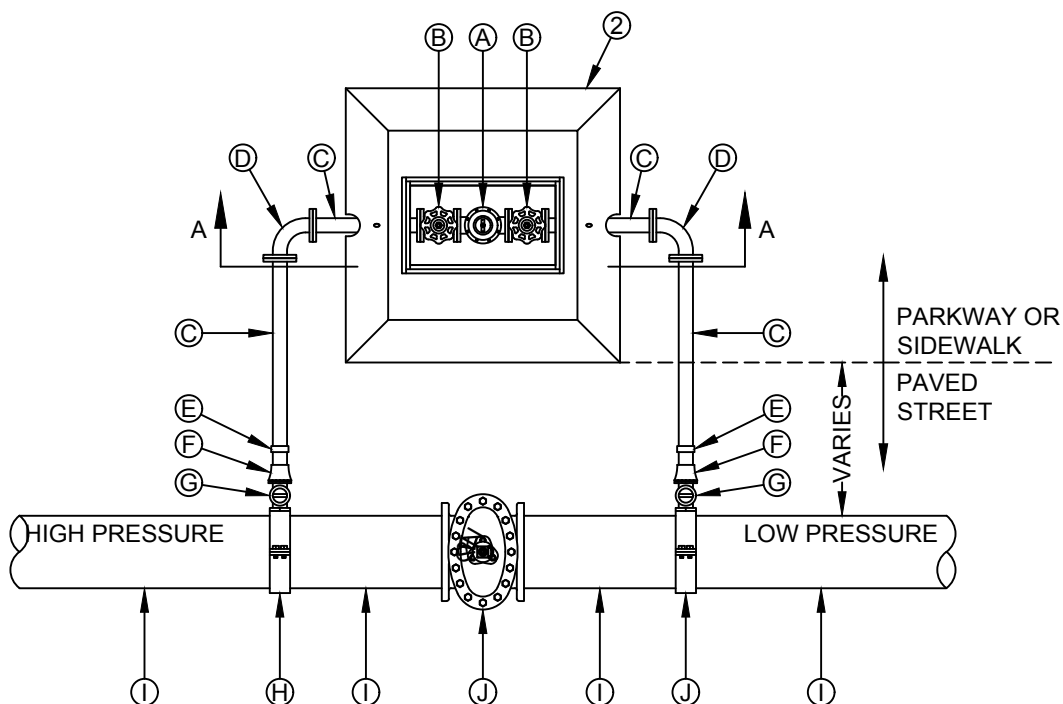


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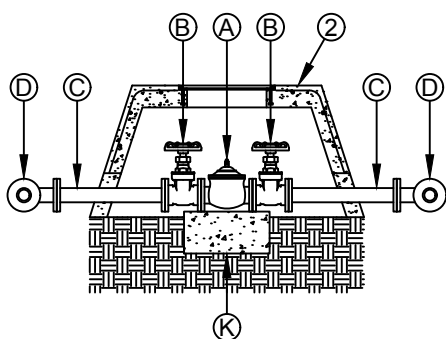
CITY OF HUNTSVILLE STANDARD DETAILS  
1" AND 2" PRESSURE RELIEF VALVE  
DISCHARGE TO ATMOSPHERE - BEHIND CURB INSTALLATION

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 4
0	MAM	07/31/2018		
				W-34

NAME: PRESSURE RELIEF VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



TOP VIEW



SECTION A-A

CONSTRUCTION KEY NOTES:

- A. 2" FLANGED PRESSURE RELIEF VALVE.
- B. 2" FLANGED GATE VALVE WITH HANDWHEEL
- C. 2" FLANGED BRASS SPOOL.
- D. 2" FLANGED BRASS 90° BEND.
- E. 2" COUPLING BRASS.
- F. 2" NIPPLE BRASS.
- G. 2" CORPORATION STOP.
- H. 2" SERVICE SADDLE.
- I. MAINLINE, SIZE AS SPECIFIED.
- J. GATE VALVE (NORMALLY CLOSED) AND BONNET BOX, SIZE AS SPECIFIED.
- K. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.

NOTES:

- 1. INSTALLATION SHOWN FOR A 2" VALVE. INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
- 2. VALVE VAULT SHALL BE TYPE "D".

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CITY OF  
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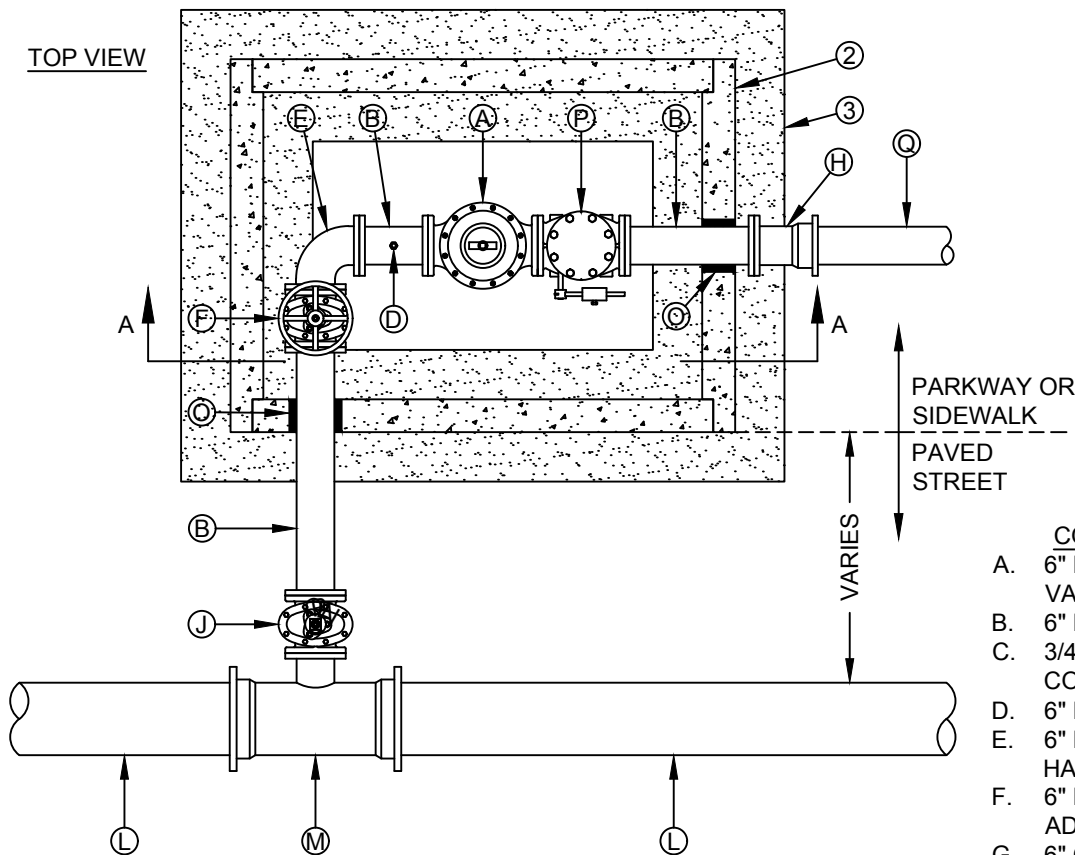
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448 State Highway 75  
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CITY OF HUNTSVILLE STANDARD DETAILS  
1" AND 2" PRESSURE RELIEF VALVE  
BACK DISCHARGE TO LOW SIDE - BEHIND CURB INSTALLATION

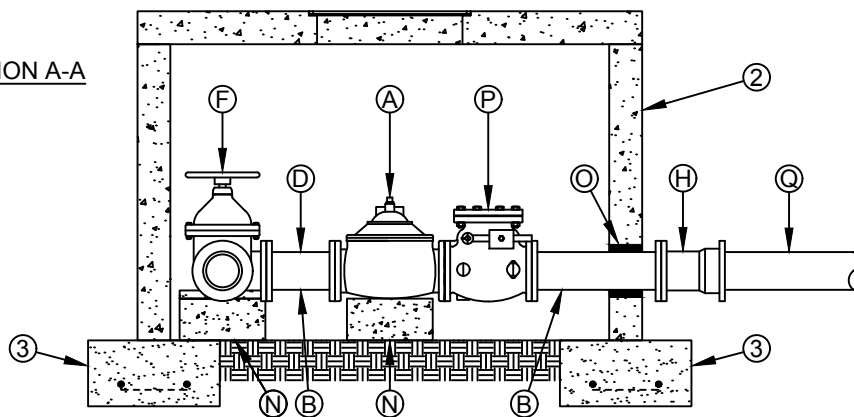
REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 4
0	MAM	07/31/2018		
				W-35

NAME: PRESSURE RELIEF VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

# TOP VIEW



## SECTION A-A



- CONSTRUCTION KEY NOTES:**
- A. 6" FLANGED PRESSURE RELIEF VALVE.
  - B. 6" FLANGED DUCTILE IRON SPOOL.
  - C. 3/4" TEST OUTLET WITH CORPORATION STOP
  - D. 6" FLANGED 90° BEND.
  - E. 6" FLANGED GATE VALVE WITH HANDWHEEL
  - F. 6" FLANGED TO MECHANICAL JOINT ADAPTER
  - G. 6" GATE VALVE WITH VALVE BONNET BOX AND COVER.
  - H. MAINLINE, SIZE AS SPECIFIED.
  - I. MECHANICAL JOINT TEE WITH A 6" FLANGED BRANCH, MAINLINE SIZE AS SPECIFIED.
  - J. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
  - K. WALL SLEEVES AND/OR GROUT.
  - L. 6" CHECK VALVE.
  - M. 6" P.V.C. DISCHARGE TO ATMOSPHERE (SEE NOTE 5).

- NOTES:**
1. INSTALLATION SHOWN FOR A 6" VALVE. INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
  2. VALVE VAULT SHALL BE TYPE "E". FOR PRESSURE RELIEF VALVES LARGER THAN 6", VAULT SIZE SHALL BE INCREASED TO ACCOMMODATE LARGER APPURTENANCES. LARGER VAULT DIMENSIONS MUST BE APPROVED BY THE CITY OF HUNTSVILLE.
  3. 12"x24" FOOTING WITH No.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.
  4. TEST OUTLET TO BE PLACED BEFORE PRESSURE RELIEF.
  5. DISCHARGE TO AN OPEN ATMOSPHERE INCLUDES BUT IS NOT LIMITED TO STORM DRAINS, CULVERTS, AND PONDING AREAS OR ANY APPROVED STRUCTURE/LOCATION.

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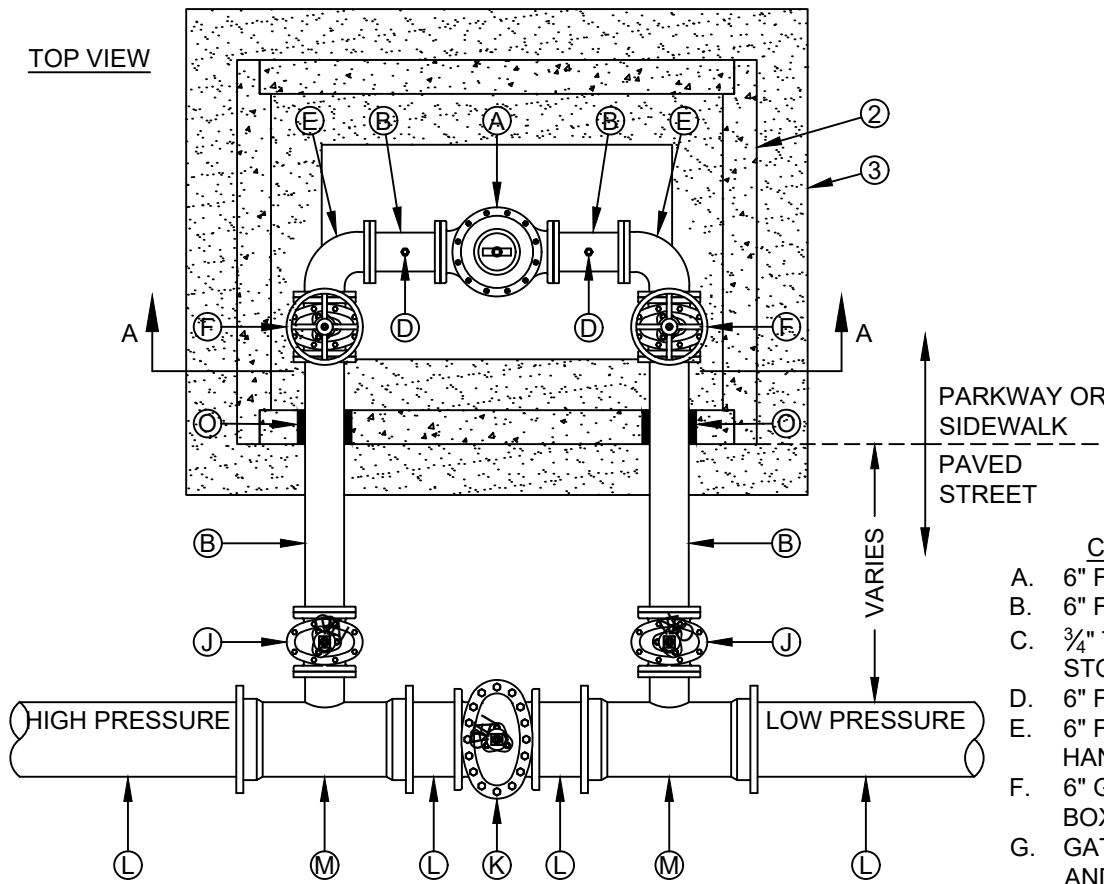
CITY OF HUNTSVILLE STANDARD DETAILS  
3" AND LARGER PRESSURE RELIEF VALVE  
DISCHARGE TO ATMOSPHERE - BEHIND CURB INSTALLTION

REV#	ISSUER	DATE	APPROVER	SHEET 3 OF 4
0	MAM	07/31/2018		
				W-36

NAME: PRESSURE RELIEF VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



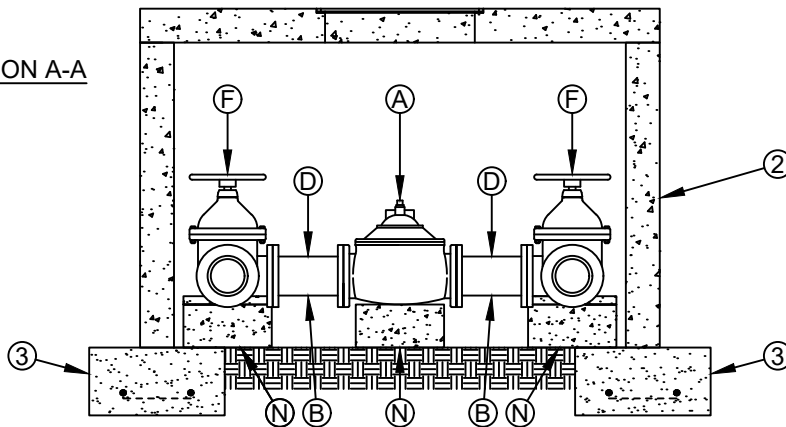
TOP VIEW



CONSTRUCTION KEY NOTES:

- A. 6" FLANGED PRESSURE RELIEF VALVE.
- B. 6" FLANGED DUCTILE IRON SPOOL.
- C.  $\frac{3}{4}$ " TEST OUTLET WITH CORPORATION STOP
- D. 6" FLANGED 90° BEND.
- E. 6" FLANGED GATE VALVE WITH HANDWHEEL
- F. 6" GATE VALVE WITH VALVE BONNET BOX AND COVER.
- G. GATE VALVE (NORMALLY CLOSED) AND BONNET BOX, SIZE AS SPECIFIED.
- H. MAINLINE, SIZE AS SPECIFIED.
- I. MECHANICAL JOINT TEE WITH A 6" FLANGED BRANCH, MAINLINE SIZE AS SPECIFIED.
- J. VALVES INSTALLED ON NATURAL GROUND WITH CONCRETE SUPPORTS AS REQUIRED.
- K. WALL SLEEVES AND/OR GROUT.

SECTION A-A



NOTES:

1. INSTALLATION SHOWN FOR A 6" VALVE. INSTALLATION OF OTHER SIZED VALVES IS SIMILAR.
2. VALVE VAULT SHALL BE TYPE "E". FOR PRESSURE RELIEF VALVES LARGER THAN 6", VAULT SIZE SHALL BE INCREASED TO ACCOMMODATE LARGER APPURTENANCES. LARGER VAULT DIMENSIONS MUST BE APPROVED BY THE CITY OF HUNTSVILLE.
3. 12"x24" FOOTING WITH No.5 REBAR AT 12" ON CENTER EACH WAY IS REQUIRED.
4. TEST OUTLETS TO BE PLACED BEFORE AND AFTER PRESSURE RELIEF.

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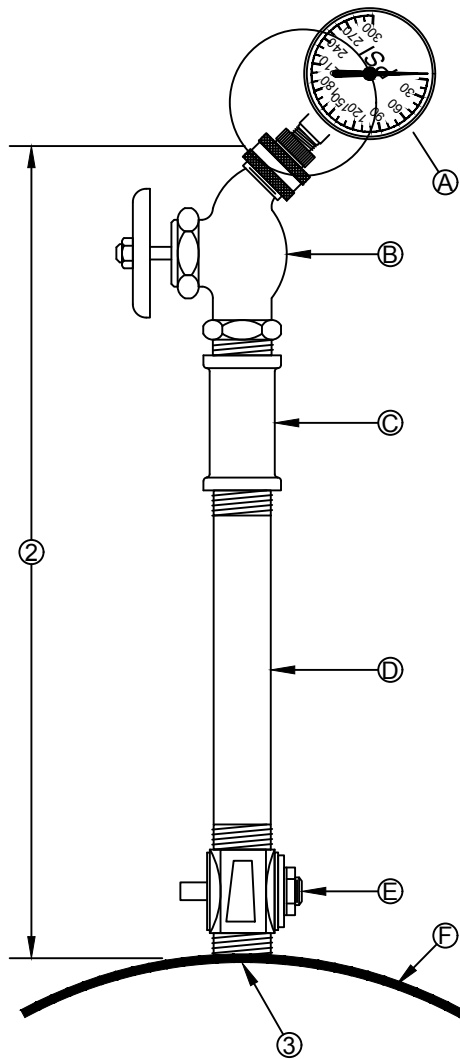


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CITY OF HUNTSVILLE STANDARD DETAILS  
3" OR LARGER PRESSURE RELIEF VALVE  
BACK DISCHARGE TO LOW SIDE - BEHIND CURB INSTALLATION

NAME: PRESSURE RELIEF VALVE  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 4 OF 4
0	MAM	07/31/2018		
				W-37



CONSTRUCTION KEY NOTES:  
 A. REMOVABLE PRESSURE GAUGE  
 B. BRASS HOSE BIB  
 C. BRASS UNION/ADAPTER  
 D. COPPER PIPE  
 E. COROPORATION STOP  
 F. PRESSURE PIPE

**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).

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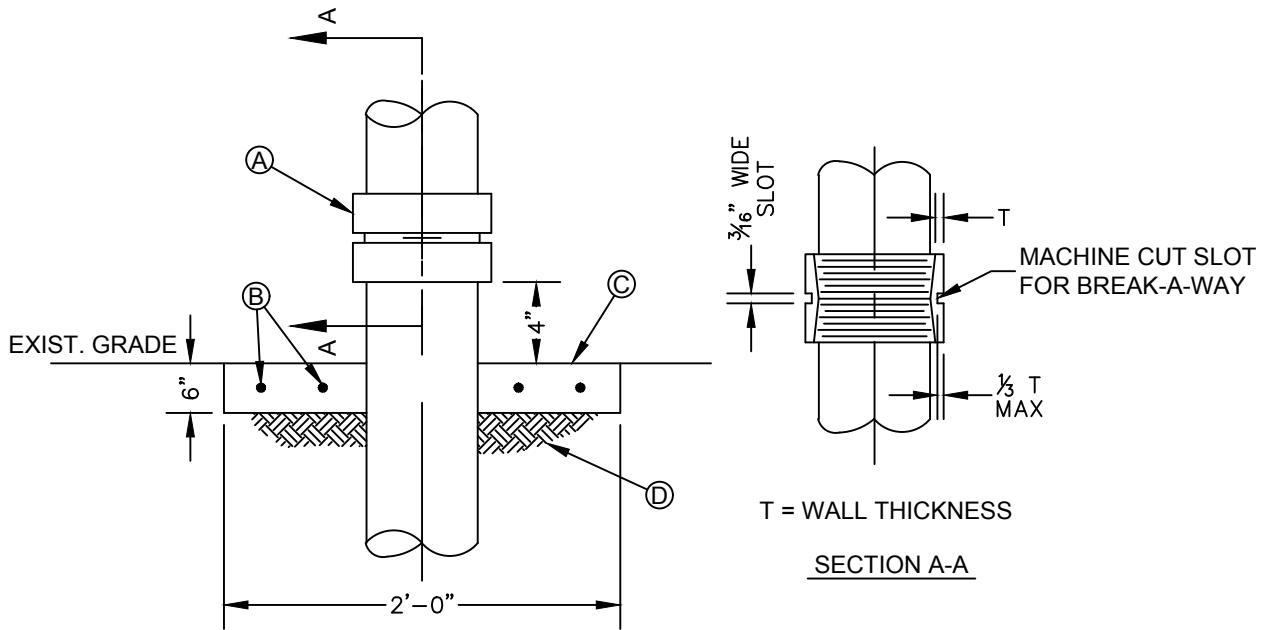


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CITY OF HUNTSVILLE STANDARD DETAILS  
 PRESSURE TEST OUTLET

NAME: PRESSURE TEST OUTLET  
 CATEGORY: WATER  
 DRAWN DATE: 10/31/2016  
 DRAWN BY: WLSIII  
 SCALE: N.T.S.  
 APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-38



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.

NOTES:

- 1. NONE.

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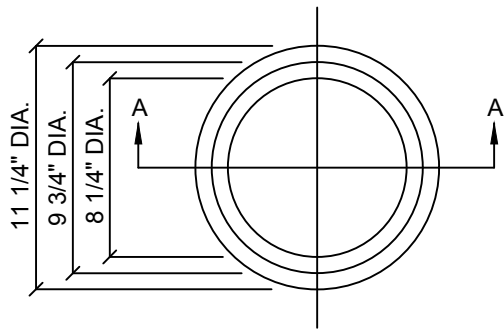


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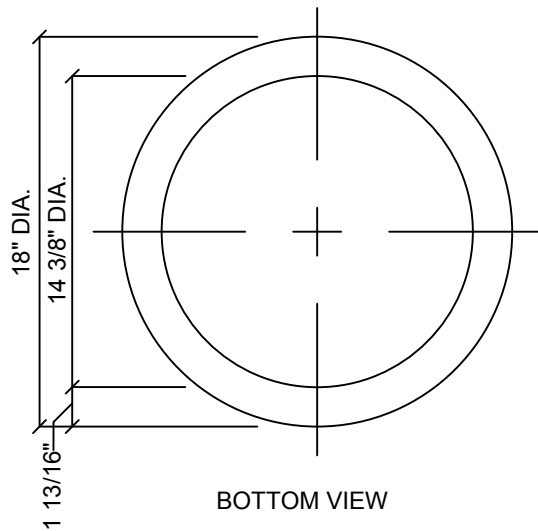
CITY OF HUNTSVILLE STANDARD DETAILS  
BREAK-A-WAY COUPLING

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-39

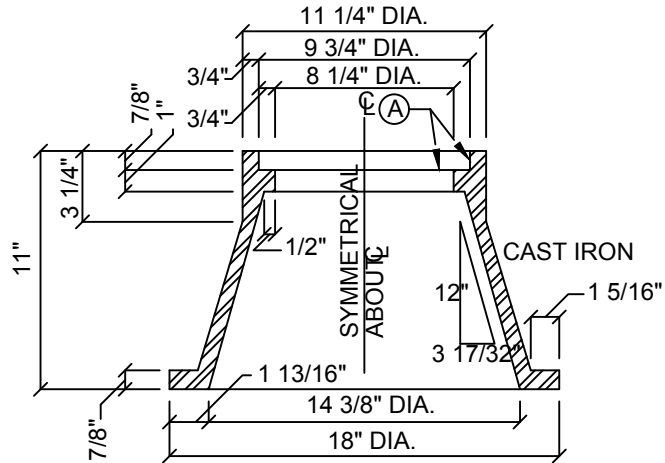
NAME: COUPLING  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



TOP VIEW



BOTTOM VIEW



SECTION A-A

CONSTRUCTION KEY NOTES:

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

NOTES:

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

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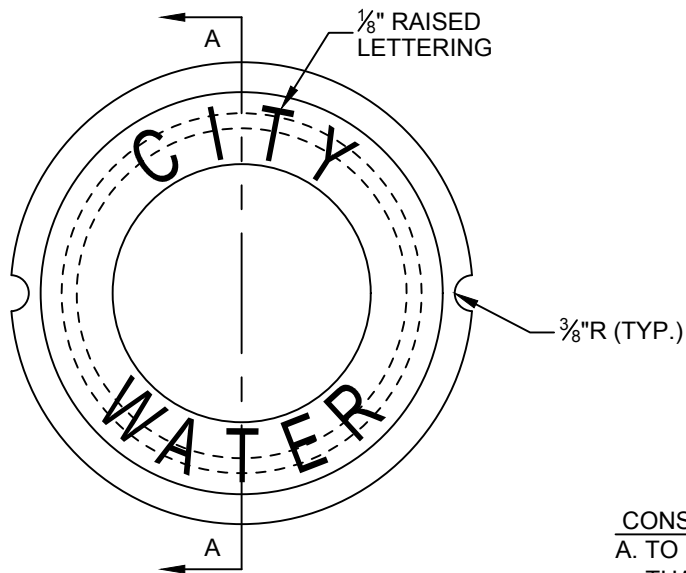


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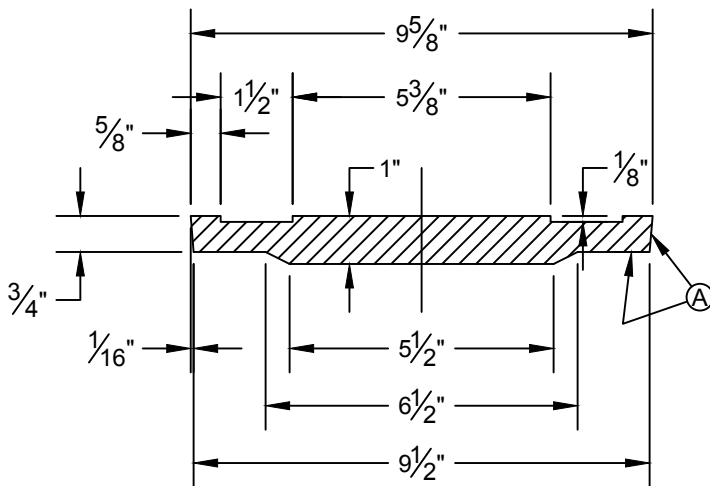
CITY OF HUNTSVILLE STANDARD DETAILS  
BONNET BOX

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 3
0	MAM	07/31/2018		
				W-40

NAME: BONNET BOX  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



CONSTRUCTION KEY NOTES:  
 A. TO BE ROUGH GROUND OF ANY IRREGULARITIES  
 THAT WOULD PREVENT A SNUG FIT.



SECTION A-A

NOTES:

1. CASTINGS TO SMOOTH AND VOID OF AIR HOLES.
2. WEIGHT OF COVER IS 10 POUNDS.

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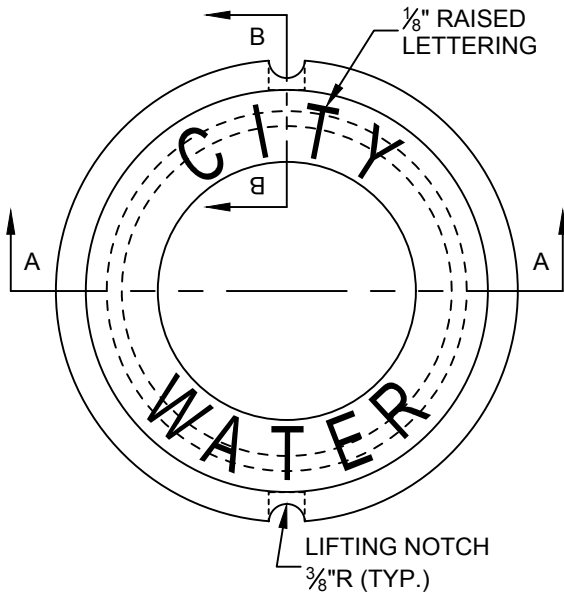


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CITY OF HUNTSVILLE STANDARD DETAILS  
 BONNET BOX COVER

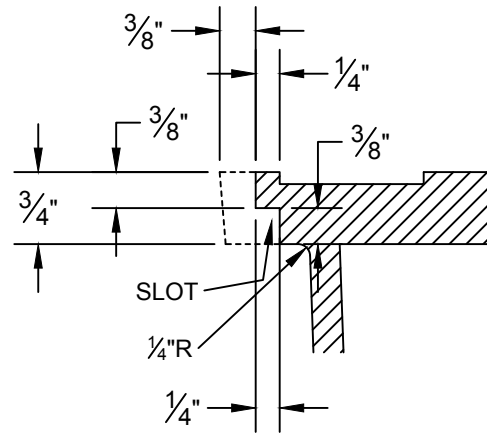
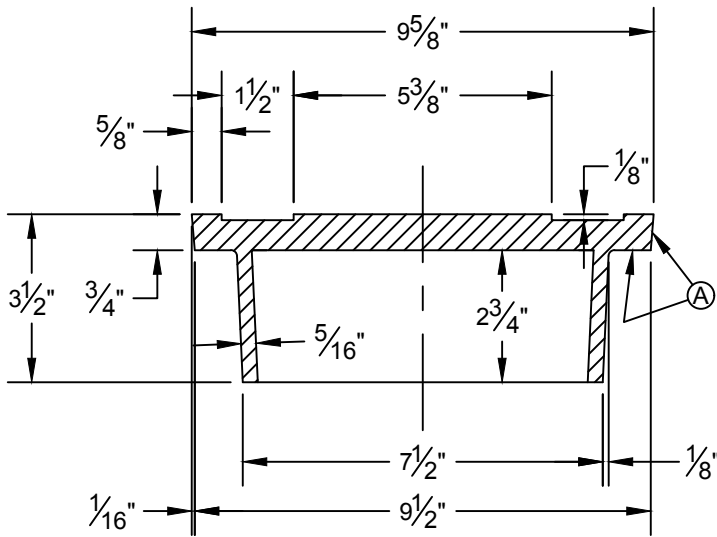
REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 3
0	MAM	07/31/2018		
				W-41

NAME: BONNET BOX COVER  
 CATEGORY: WATER  
 DRAWN DATE: 10/31/2016  
 DRAWN BY: WLSIII  
 SCALE: N.T.S.  
 APPROVED BY: YSR



**CONSTRUCTION KEY NOTES:**

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



**NOTES:**

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

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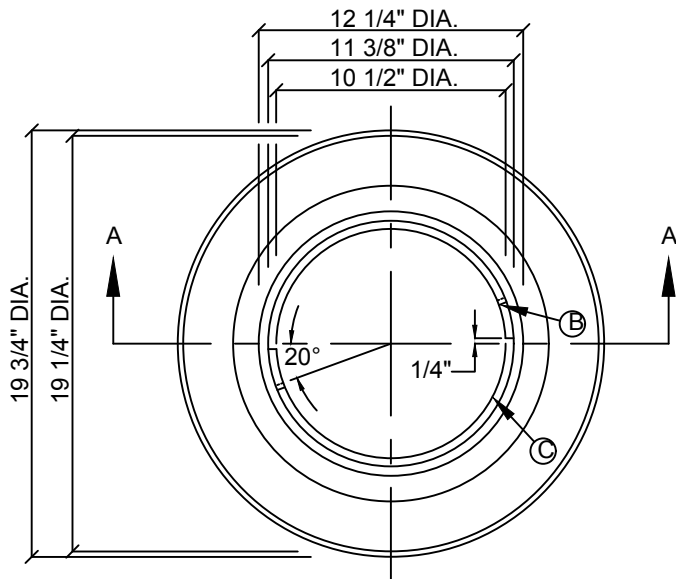


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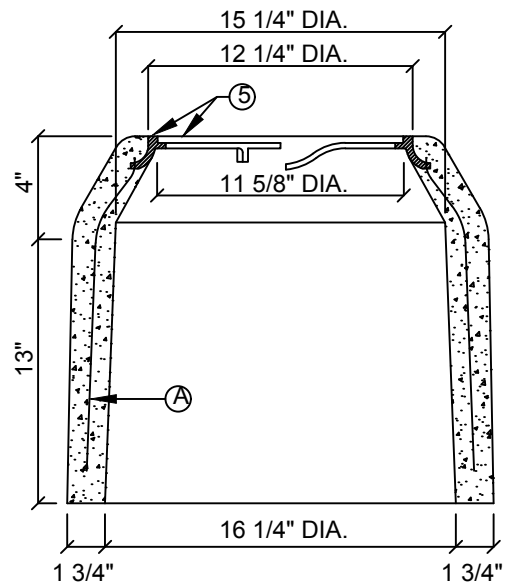
**CITY OF HUNTSVILLE STANDARD DETAILS**  
**BONNET BOX COVER**  
**FLIP RESISTANT**

REV#	ISSUER	DATE	APPROVER	SHEET 3 OF 3
0	MAM	07/31/2018		
				W-42

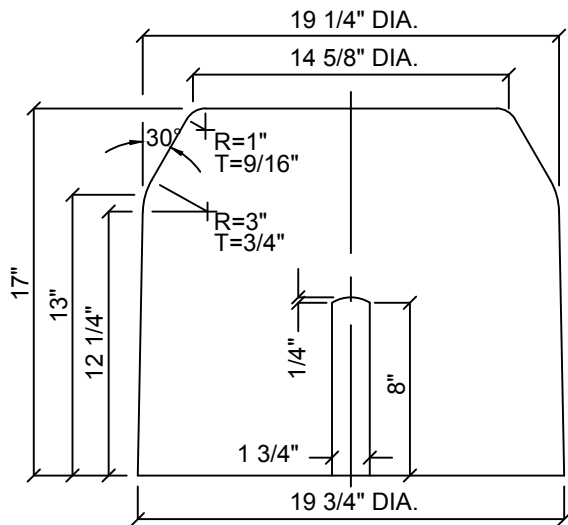
NAME: BONNET BOX COVER (FR)  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



TOP VIEW



SECTION A-A



SIDE VIEW

CONSTRUCTION KEY NOTES:

- A. 3/16", 9 GAUGE BLACK ANNEALED WIRE  
B. LUG-STOP C. CAST IRON RING

**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. METER BOX RING AND COVER PER CITY OF HUNTSVILLE.
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, 3000 PSI. MINIMUM.
7. METER BOX SHALL BE SINGLE UNIT CONSTRUCTION; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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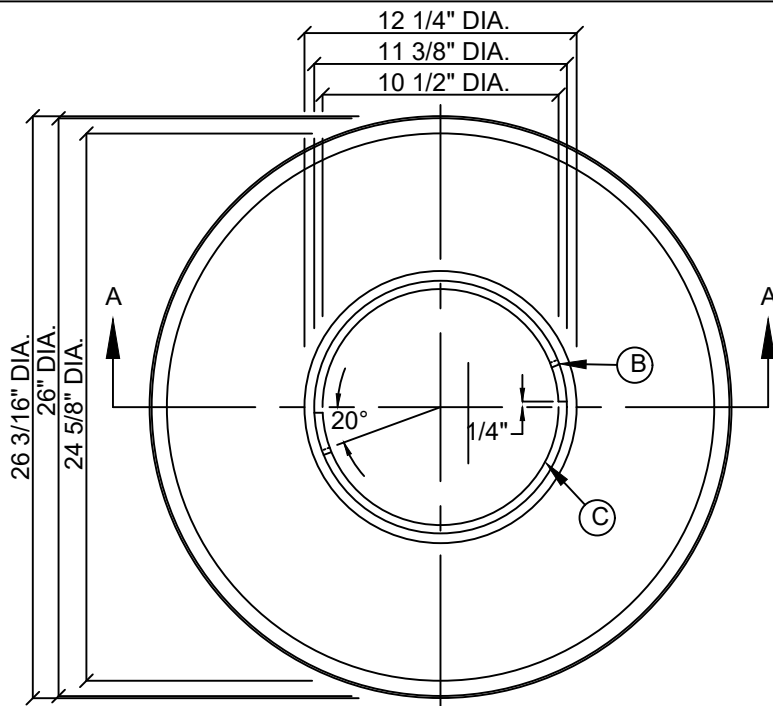
CITY OF HUNTSVILLE STANDARD DETAILS

METER BOX TYPE "A"  
3/4" SERVICE INSTALLATION

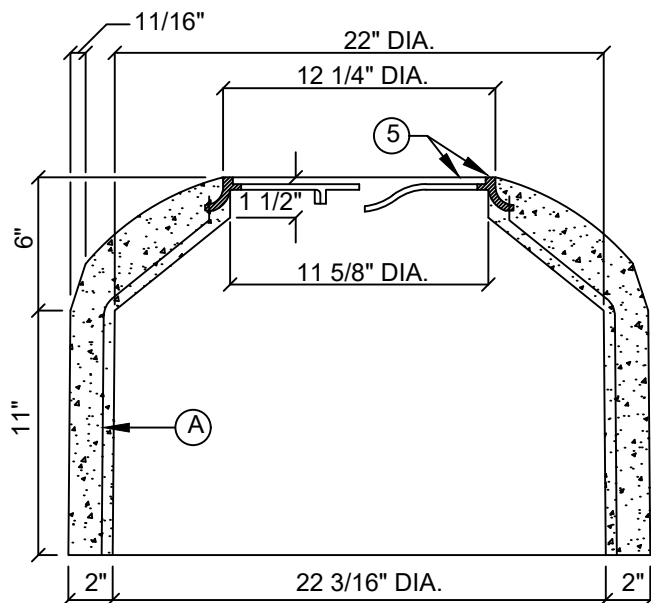
NAME: METER BOX TYPE "A"  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-43

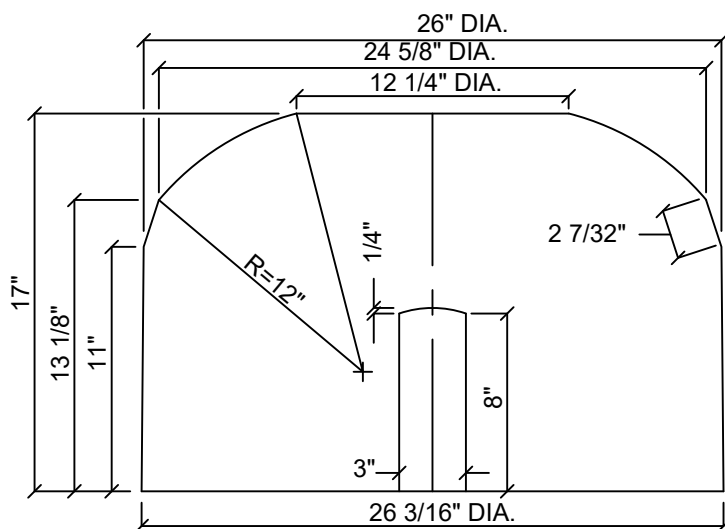




TOP VIEW



SECTION A-A



SIDE VIEW

**CONSTRUCTION KEY NOTES:**

- A. 3/16", 9 GAUGE BLACK ANNEALED WIRE
- B. LUG-STOP
- C. CAST IRON RING

**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. METER BOX RING AND COVER PER CITY OF HUNTSVILLE.
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, 3000 PSI. MINIMUM.
7. METER BOX SHALL BE SINGLE UNIT CONSTRUCTION; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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CITY OF  
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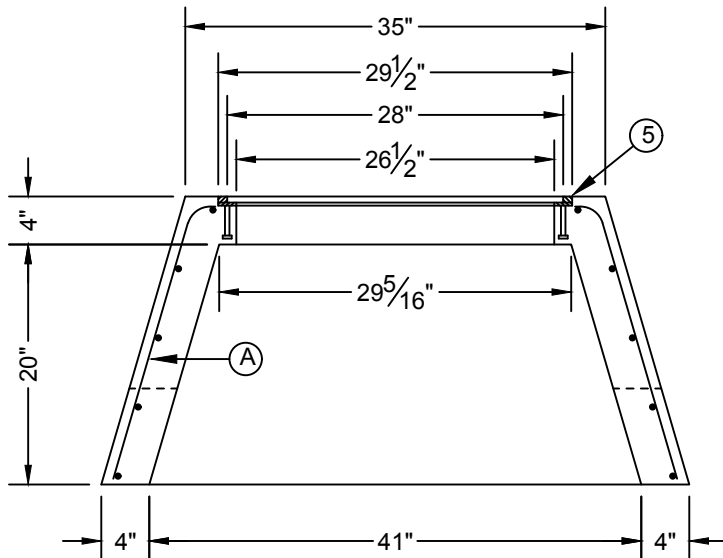
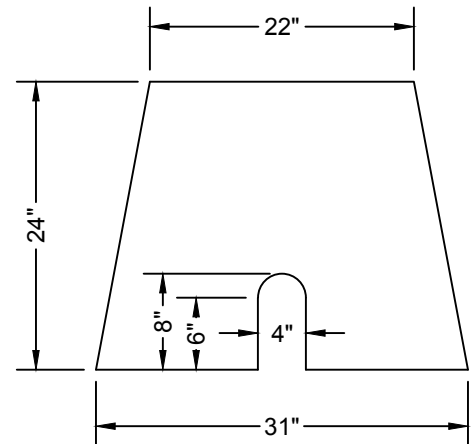
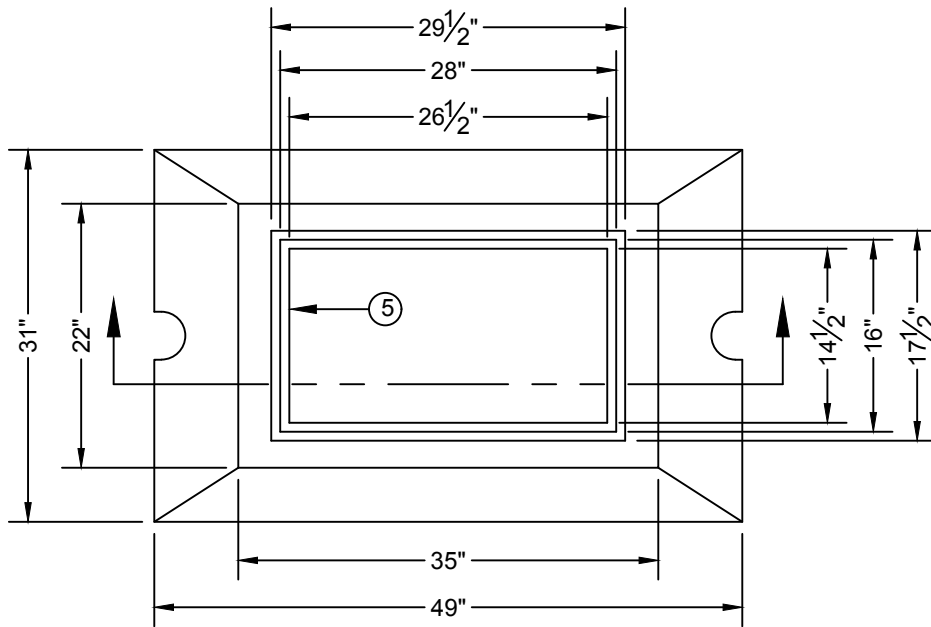


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**CITY OF HUNTSVILLE STANDARD DETAILS**  
**METER BOX TYPE "B"**  
**FOR 1" SERVICE INSTALLATION**

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				<b>W-44</b>

NAME: METER BOX TYPE "B"  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



CONSTRUCTION KEY NOTES:  
A. No. 4 REBAR AT 6" ON CENTER, EACH WAY

**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. METER BOX FRAME AND COVER PER CITY OF HUNTSVILLE.
6. METER BOX SHALL BE SINGLE UNIT CONSTRUCTION; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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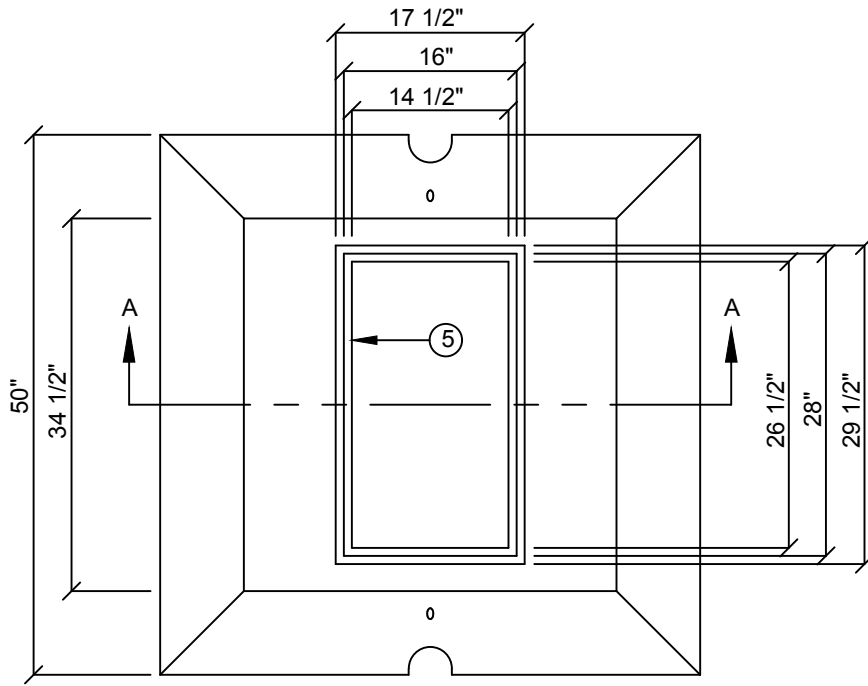


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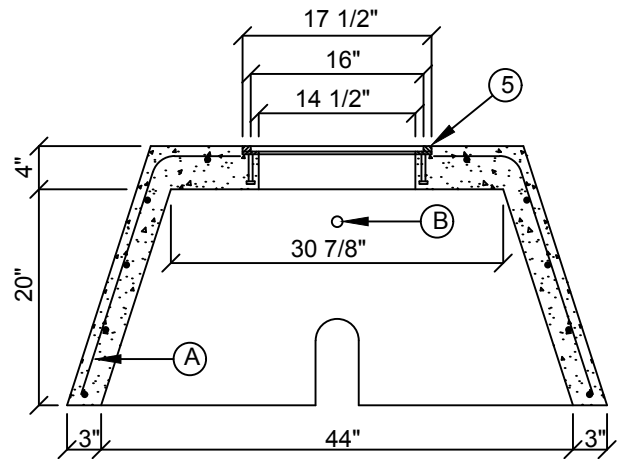
CITY OF HUNTSVILLE STANDARD DETAILS  
METER BOX TYPE "C"  
FOR 1-1/2" SERVICE INSTALLATION

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-45

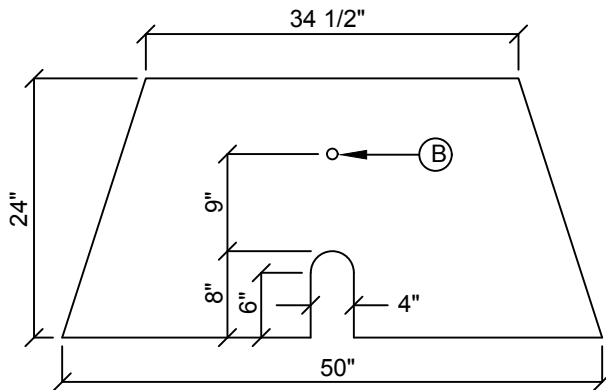
NAME: METER BOX TYPE "C"  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



TOP VIEW



SECTION A-A



FRONT VIEW

**CONSTRUCTION KEY NOTES:**

- A. No. 4 REBAR AT 6" ON CENTER, EACH WAY
- B. 1" DIAMETER HOLE

**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. METER BOX FRAME AND COVER PER CITY OF HUNTSVILLE.
6. METER BOX SHALL BE SINGLE UNIT CONSTRUCTION; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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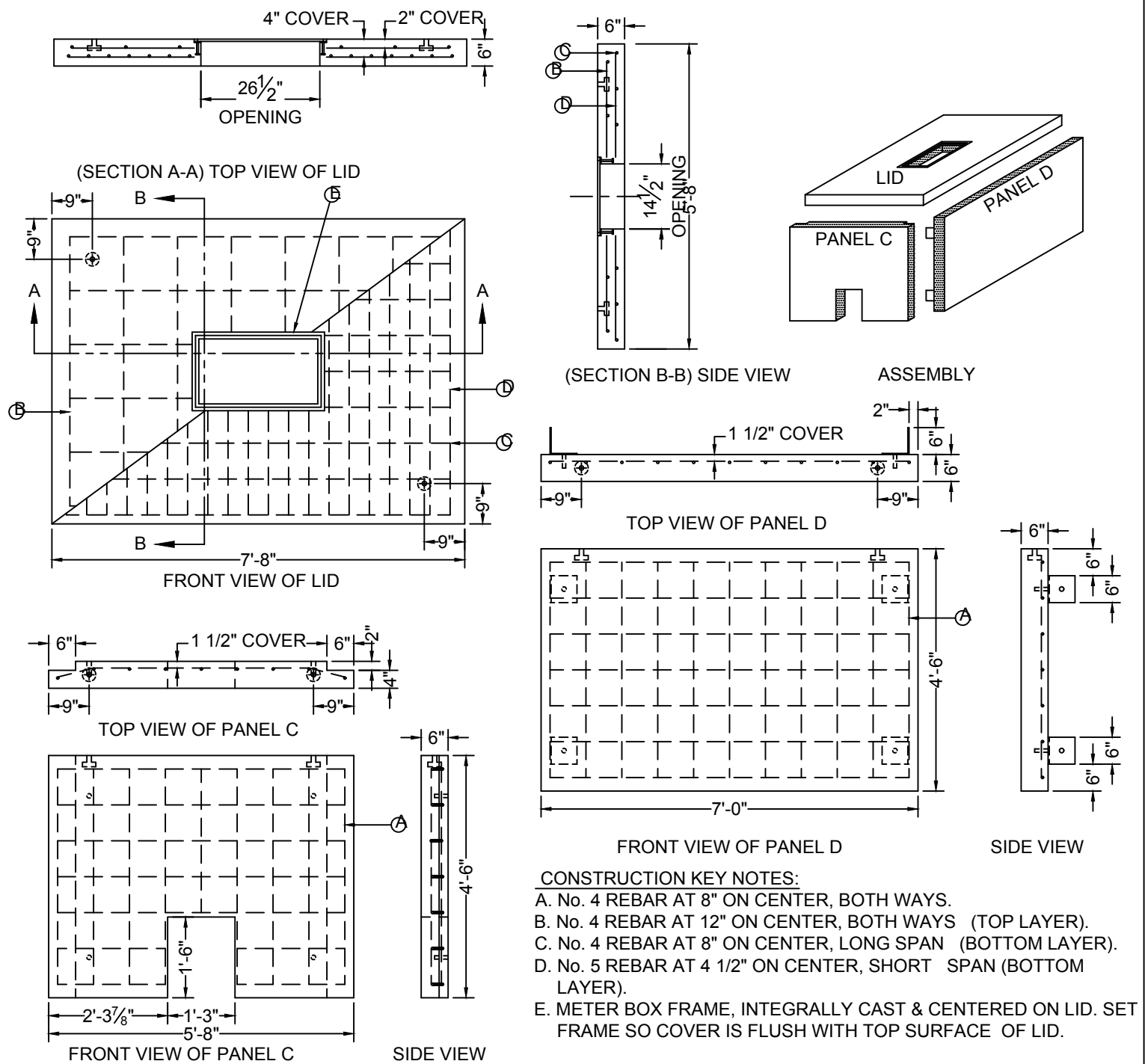


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**CITY OF HUNTSVILLE STANDARD DETAILS**  
**METER BOX TYPE "D"**  
**FOR 2" SERVICE INSTALLATION**

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-46

NAME: METER BOX TYPE "D"  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### 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=60000 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. METER BOX SHALL BE MODULAR; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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 CITY OF  
 HUNTSVILLE, TEXAS

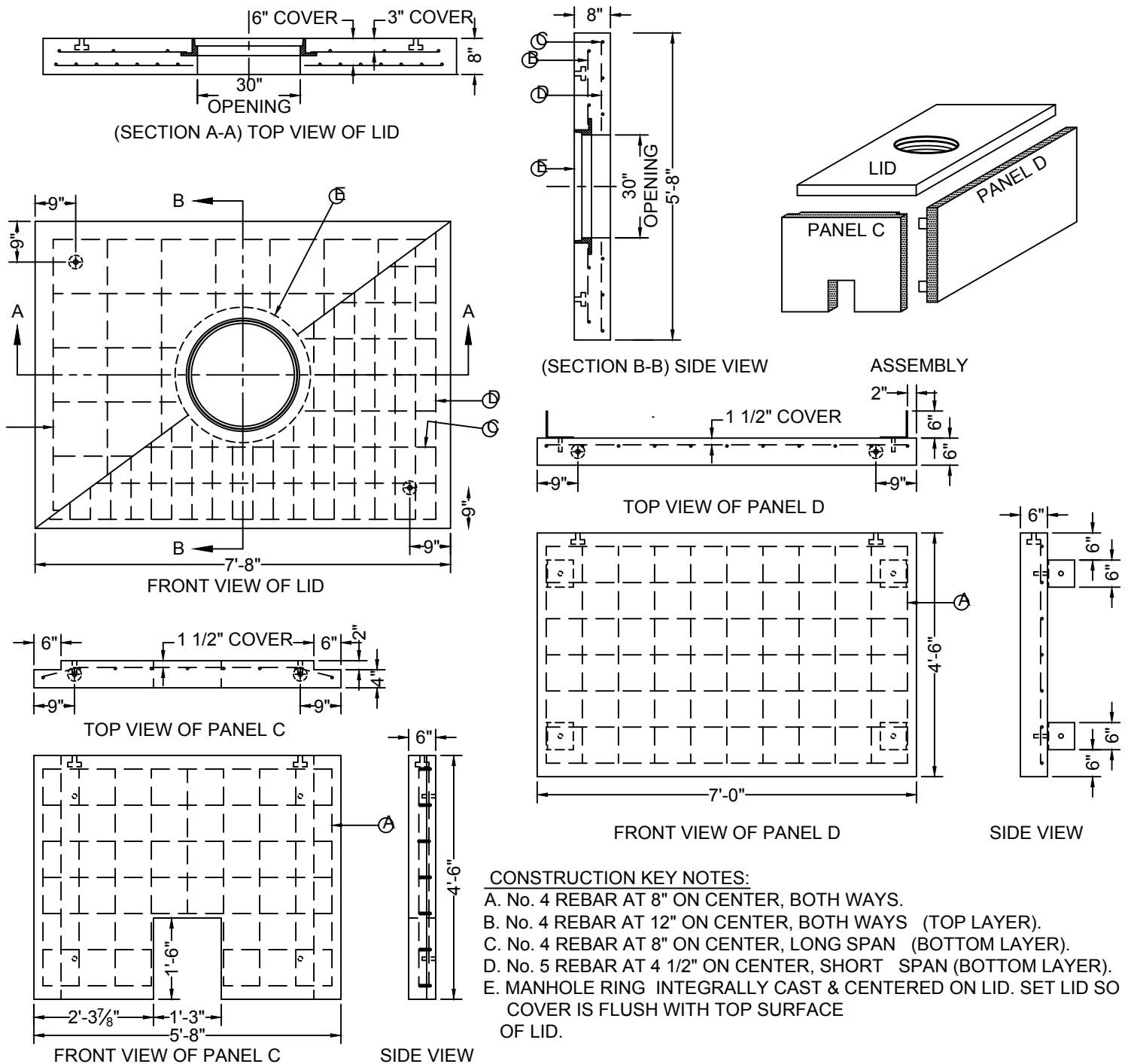


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#### CITY OF HUNTSVILLE STANDARD DETAILS METER BOX TYPE "E" FOR 3" AND LARGER SERVICE INSTALLATION

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-47

NAME: METER BOX TYPE "E"  
 CATEGORY: WATER  
 DRAWN DATE: 11/01/2016  
 DRAWN BY: WLSIII  
 SCALE: N.T.S.  
 APPROVED BY: YSR



#### 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  $F_y=60000$  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. METER BOX SHALL BE MODULAR; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

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CITY OF  
HUNTSVILLE, TEXAS

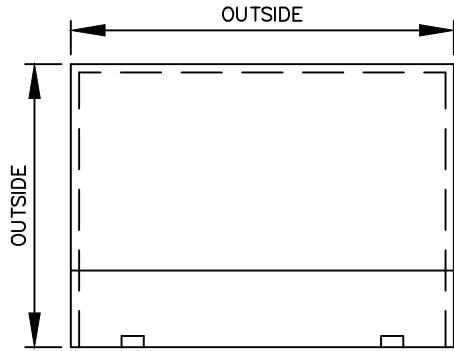


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CITY OF HUNTSVILLE STANDARD DETAILS  
METER BOX TYPE "F"  
FOR 3" AND LARGER SERVICE INSTALLATION (H2O LOADING)

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-48

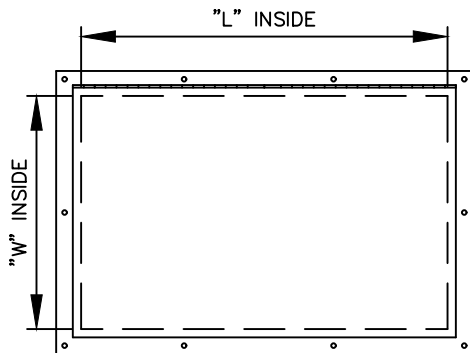
NAME: METER BOX TYPE "F"  
CATEGORY: WATER  
DRAWN DATE: 11/01/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



INSULATED ENCLOSURE, TWO PIECE BOX  
W/PAD—LOCKABLE HINGED LID, DRAINAGE &  
GROUND ANCHOR CAPABILITY, (COLOR: BEIGE).  
N.E. FLORIDA ENTERPRISES, INC. HOT BOX MODEL  
#1.5 OR APPROVED EQUAL.

CONTINUOUS HINGE  
ON REAR AT SEAM

2" X 1" DRAIN HOLE ON FAR  
SIDE (TYP.) 2 — REQUIRED



KEY LOCKING CAM  
W/FINGER LIFT TAB

LID SEAM (TYP.)

ATTACH FIBERGLASS ENCLOSURE  
TO CONCRETE PAD USING (8) 1/4"Ø  
X 2 LG. T-316 S.S. KWIK BOLTS

## DETAIL OF BACKFLOW PREVENTOR ENCLOSURE

MODEL #	PIPE SIZE	INSIDE L	INSIDE W	INSIDE H	WEIGHT	PAD SIZE
LB1.5	3/4"—1 1/2"	33"	21"	24"	65#	44"X32"
LB2	1 1/4"—2"	39"	13"	28"	75#	50"X24"

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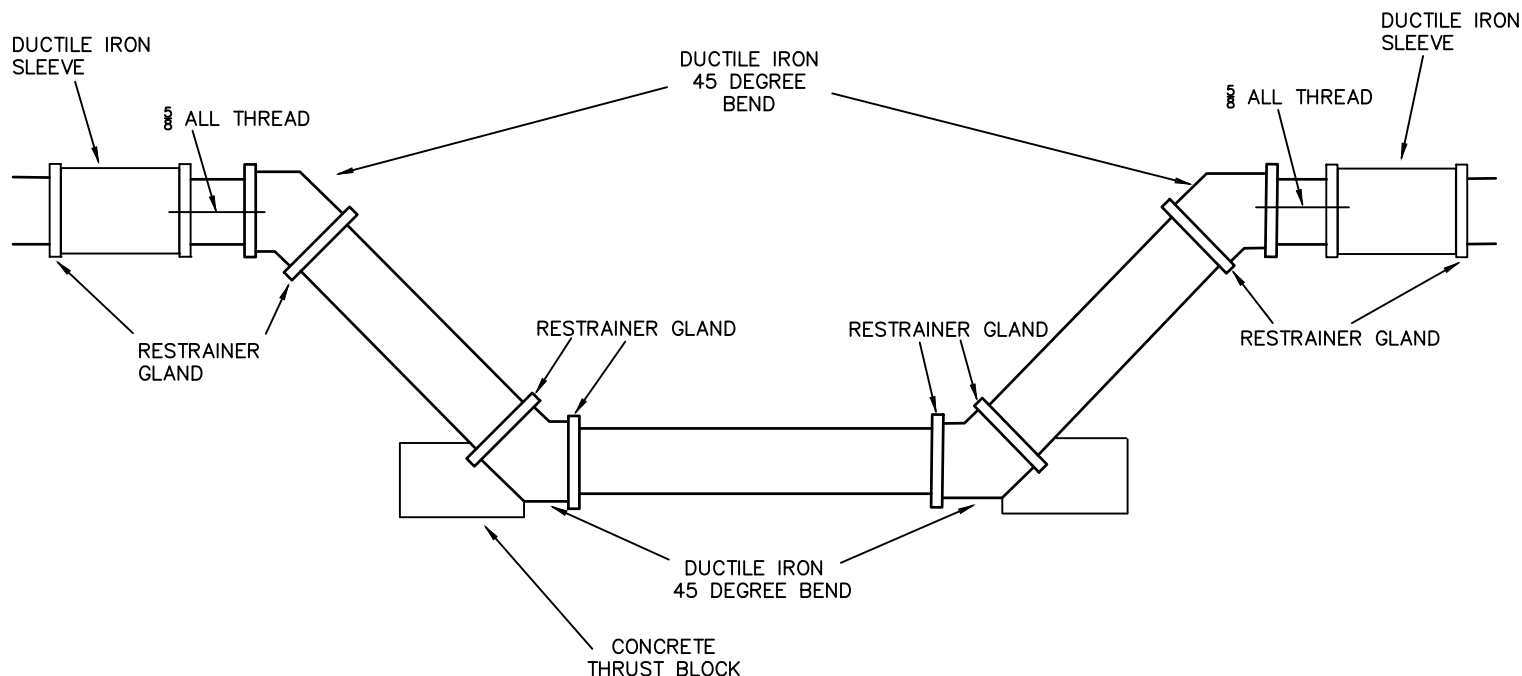


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## CITY OF HUNTSVILLE STANDARD DETAILS HOT BOX ENCLOSURES

NAME: HOT BOX ENCLOSURES  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-49



MIN. PIPE WALL THICKNESS	
4"	— 0.250"
6"	— 0.280"
8"	— 0.322"
12" AND LARGER	— 0.375"

FOR A LINE TO PASS OVER AN OBSTRUCTION RATHER THAN UNDER, IT MUST HAVE ADEQUATE COVER AND BE APPROVED BY ENGINEERING & PLANNING DEPARTMENT.

### C-900 WATER LINE OFFSET ASSEMBLY

#### NOTES:

1. ALL MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH ENGINEERING & PLANNING DEPARTMENT SPECIFICATIONS
2. OFFSET SECTIONS SHALL BE THRUST-BLOCKED IN ACCORDANCE WITH DWG NO COT-WA-07, IF NECESSARY ALL THREAD RODS SHALL BE USED TO RESTRAIN THE JOINTS.
3. ALL WATER MAINS LESS THAN OR EQUAL TO 12" DIAMETER SHALL BE PVC C-900 (DR-18). ALL PROPOSED WATER MAINS GREATER THAN OR EQUAL TO 14" DIAMETER SHALL BE PVC C-905 (DR-18).
4. DUCTILE IRON FITTING SHALL BE FULL BODY PER AWWA C110.

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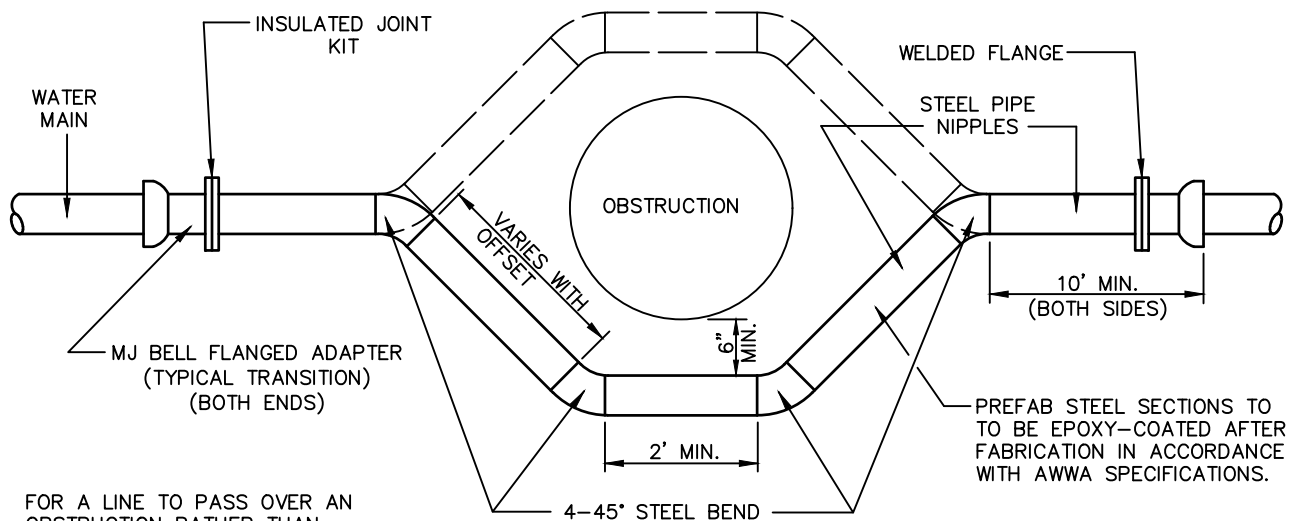
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#### CITY OF HUNTSVILLE STANDARD DETAILS PVC WATER LINE OFFSET ASSEMBLY

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-50

NAME: PVC WL OFFSET ASSEMBLY  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR





FOR A LINE TO PASS OVER AN OBSTRUCTION RATHER THAN UNDER, IT MUST HAVE ADEQUATE COVER AND BE APPROVED BY ENGINEERING & PLANNING DEPARTMENT.

### STEEL WATER PIPE OFFSET ASSEMBLY

MIN. PIPE WALL THICKNESS		
4"	–	0.250"
6"	–	0.280"
8"	–	0.322"
12" AND LARGER	–	0.375"

**NOTES:**

1. ALL MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH DEPARTMENT OF ENGINEERING & PLANING SPECIFICATIONS
2. INSULATED JOINT TO BE MADE UP USING INSULATING GASKETS, PLASTIC BOLT SLEEVES AND WASHERS OF INSULATING GASKET MATERIAL BACKED WITH ZINC-PLATED WASHERS, OR OTHER METHODS APPROVED SPECIFICALLY BY THE ENGINEERING & PLANNING DEPARTMENT.
3. NO FIELD FABRICATION OR INTERIOR COATING OF STEEL WATER PIPE OFFSETS ALLOWED.
4. OFFSET SECTIONS SHALL BE THRUST-BLOCKED IN ACCORDANCE WITH DWG NO COT-WA-07, IF NECESSARY ALL THREAD RODS SHALL BE USED TO RESTRAIN THE JOINTS.
5. PROPOSED WATER LINE CROSSING OF WASTEWATER MAINS AND LATERALS SHALL BE PER NOTE 21 OF THE WATER LINE CONSTRUCTION NOTES.

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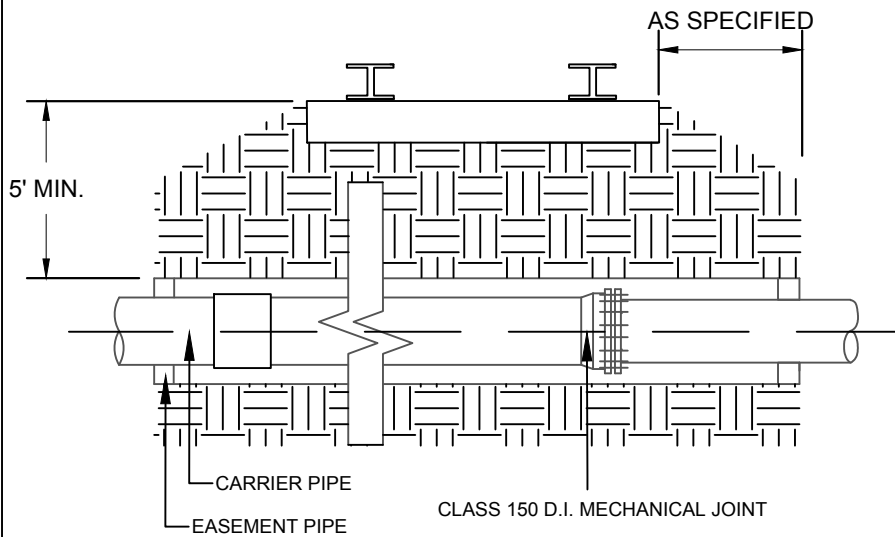


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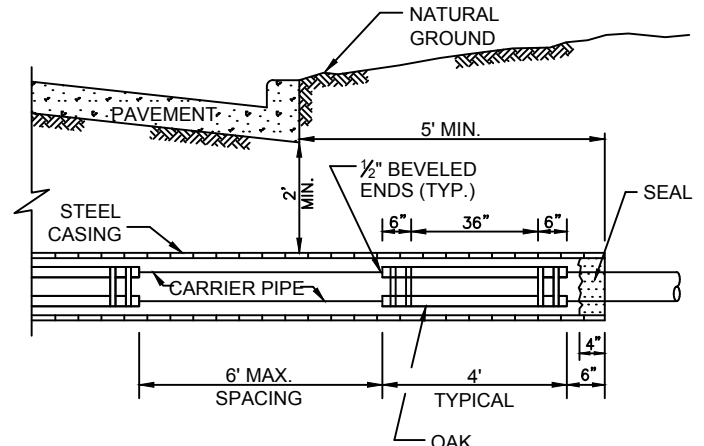
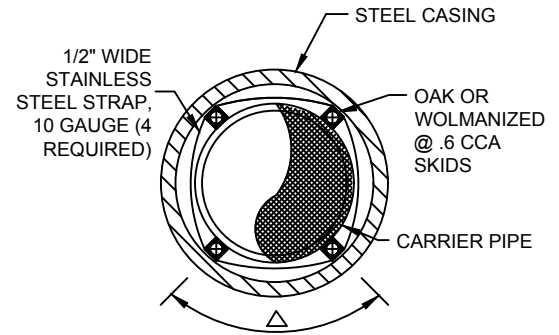
#### CITY OF HUNTSVILLE STANDARD DETAILS STEEL WATER LINE OFFSET ASSEMBLY

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-51

NAME: STEEL WL OFFSET ASSEMBLY  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



SINGLE TRACK CROSSING  
N.T.S.



ELEVATION

**NOTES:**

1. SPACING BETWEEN TIMBERS:  
= 90° FOR 12" AND UNDER,  
= 60° FOR PIPE OVER 12".
2. CASING SIZE AND THICKNESS SHALL CONFORM TO THE MINIMUM REQUIREMENTS AS SHOWN ON CASING SCHEDULE, OTHER PERMITS AS REQUIRED.
3. MAINTAIN  $\frac{1}{2}$ " MINIMUM CLEARANCE BETWEEN THE MAXIMUM OUTSIDE DIAMETER OF CARRIER PIPE AND CASING AT ALL LOCATIONS.
4. DIMENSIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL INSTALL ADEQUATELY SIZED CASING TO ACCOMMODATE THE CARRIER PIPE.

Carrier Size	Minimum Encasement		
	Corrugated Pipe	Concrete Pipe	Steel Pipe
4" C.I.	15" - 14GA	12" Class 5	10" - .250 Wall
6" C.I.	15" - 14GA	15" Class 5	14" - .250 Wall
8" C.I.	18" - 14GA	15" Class 5	16" - .250 Wall
10" C.I.	21" - 14GA	18" Class 5	18" - .250 Wall
12" C.I.	24" - 14GA	21" Class 5	20" - .250 Wall
14" C.I.	30" - 14GA	24" Class 5	24" - .250 Wall
16" C.I.	30" - 14GA	27" Class 5	26" - .250 Wall
18" C.I.	30" - 14GA	30" Class 5	30" - .250 Wall
20" C.I.	36" - 14GA	33" Class 5	36" - .375 Wall
24" C.I.	36" - 14GA	36" Class 5	42" - .375 Wall

**NOTES:**

1. STEEL CASING SHALL HAVE COMPLETE WELDED JOINTS.
2. STEEL CASING SHALL BE USED IN ALL BOXES.
3. CORRUGATED METAL PIPE (C.M.P.) SHALL BE USED ONLY AS CASING WHEN BORING DRIVEWAYS AND WHEN LAID IN OPEN-CUT TRENCH INSTALLATION.

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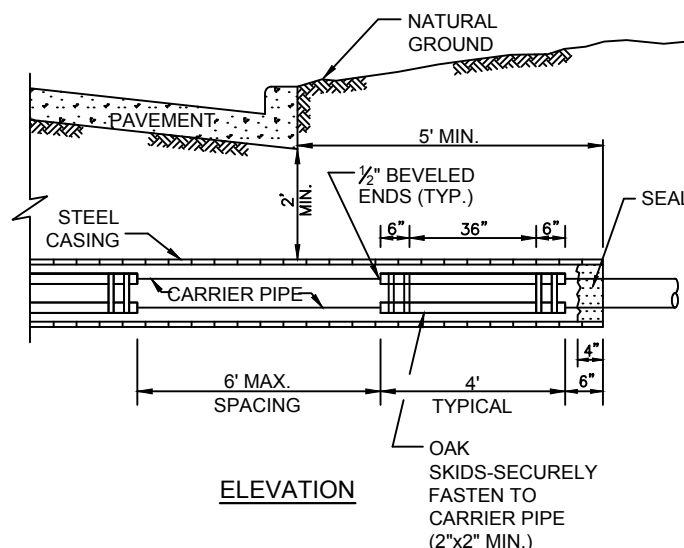
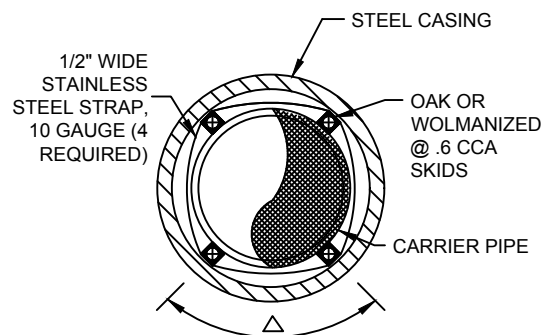
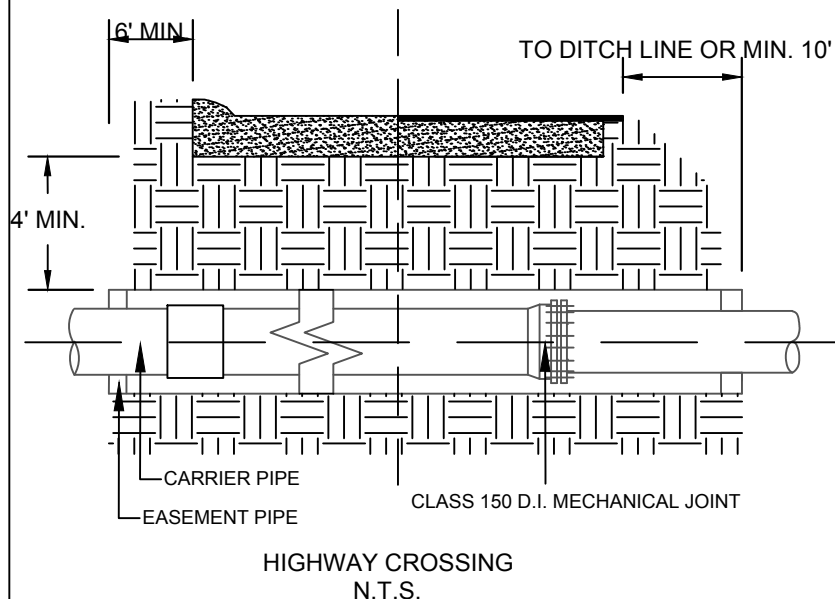


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CITY OF HUNTSVILLE STANDARD DETAILS  
STANDARD BORE CROSSING  
SINGLE TRACK

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
				W-52

NAME: STANDARD BORE CROSSING  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### NOTES:

1. SPACING BETWEEN TIMBERS:  
= 90° FOR 12" AND UNDER,  
= 60° FOR PIPE OVER 12".
2. CASING SIZE AND THICKNESS SHALL CONFORM TO THE MINIMUM REQUIREMENTS AS SHOWN ON CASING SCHEDULE, OTHER PERMITS AS REQUIRED.
3. MAINTAIN 1/2" MINIMUM CLEARANCE BETWEEN THE MAXIMUM OUTSIDE DIAMETER OF CARRIER PIPE AND CASING AT ALL LOCATIONS.
4. DIMENSIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL INSTALL ADEQUATELY SIZED CASING TO ACCOMMODATE THE CARRIER PIPE.

Carrier Size	Minimum Encasement		
	Corrugated Pipe	Concrete Pipe	Steel Pipe
4" C.I.	12" - 14GA	12" Class 3	10" - .250 Wall
6" C.I.	15" - 14GA	15" Class 3	14" - .250 Wall
8" C.I.	18" - 14GA	18" Class 3	16" - .250 Wall
10" C.I.	21" - 14GA	18" Class 3	18" - .250 Wall
12" C.I.	24" - 14GA	21" Class 3	20" - .250 Wall
14" C.I.	24" - 14GA	24" Class 3	24" - .250 Wall
16" C.I.	27" - 14GA	27" Class 3	26" - .250 Wall
18" C.I.	30" - 14GA	30" Class 3	30" - .250 Wall
20" C.I.	33" - 14GA	33" Class 3	36" - .375 Wall
24" C.I.	36" - 14GA	36" Class 3	42" - .375 Wall

#### NOTES:

1. STEEL CASING SHALL HAVE COMPLETE WELDED JOINTS.
2. STEEL CASING SHALL BE USED IN ALL BOXES.
3. CORRUGATED METAL PIPE (C.M.P.) SHALL BE USED ONLY AS CASING WHEN BORING DRIVEWAYS AND WHEN LAID IN OPEN-CUT TRENCH INSTALLATION.

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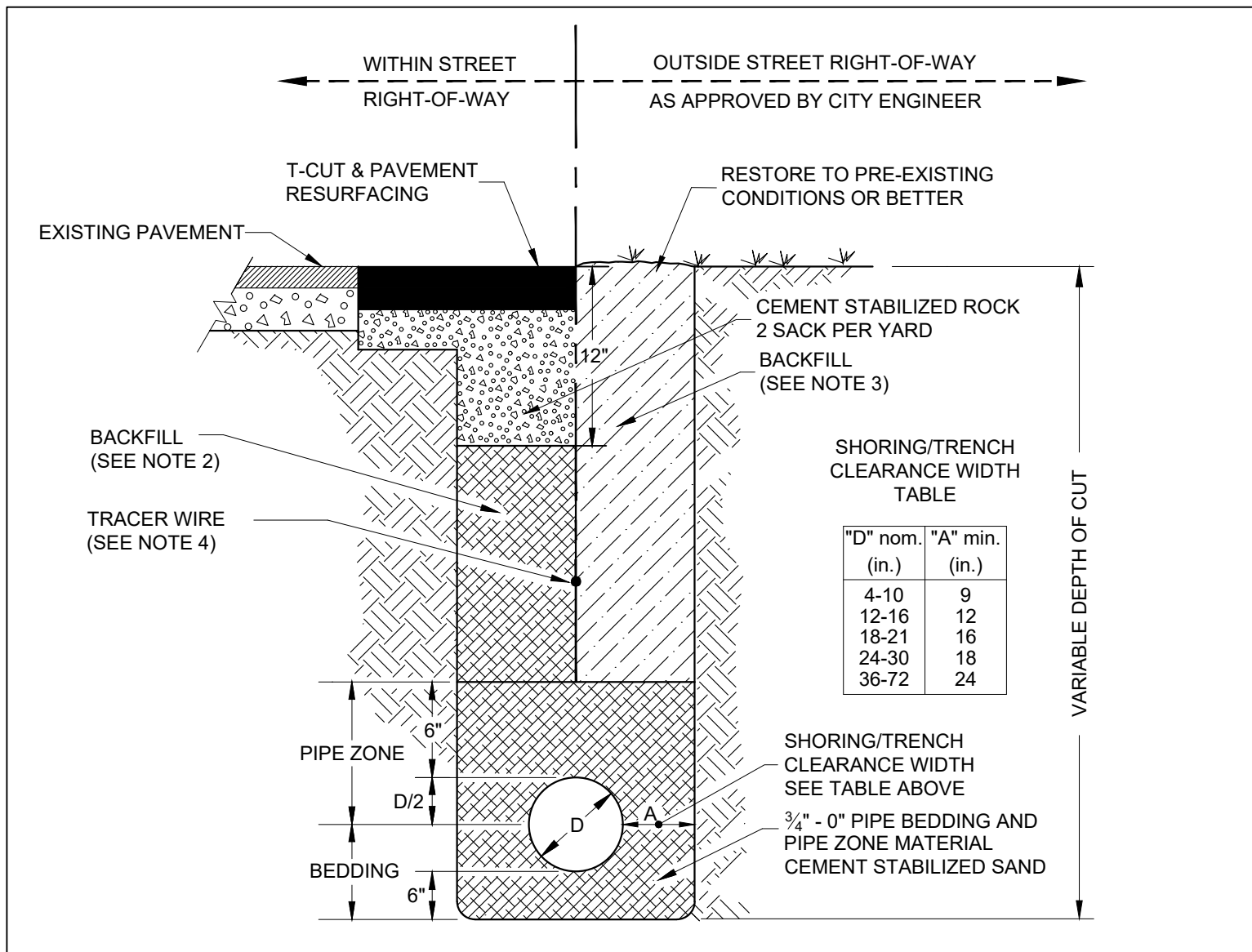


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#### CITY OF HUNTSVILLE STANDARD DETAILS STANDARD BORE CROSSING HIGHWAY

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
				W-53

NAME: STANDARD BORE CROSSING  
CATEGORY: WATER  
DRAWN DATE: 10/21/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



# NOTES:

1. THESE TRENCH BACKFILL REQUIREMENTS APPLY TO ALL PUBLIC UTILITY PIPES.
2. FOR TRENCHES 12" WIDE OR LESS IN STREETS WITH CLASSIFICATIONS HIGHER THAN RESIDENTIAL, USE SELECT FILL. FOR ALL OTHER TRENCHES, USE 3/4" - 0" AGGREGATE COMPACTED TO 95% OF MAX DENSITY.
3. USE SELECT BACKFILL COMPACTED TO 90% OF MAX DENSITY.
4. TRACER WIRE SHALL BE PLACED ABOVE NON-METALLIC PIPE AND 2 FEET BELOW FINISHED GRADE.
5. RESTORE TO ORIGINAL CONDITIONS OR BETTER.

ENGINEERING DEPARTMENT

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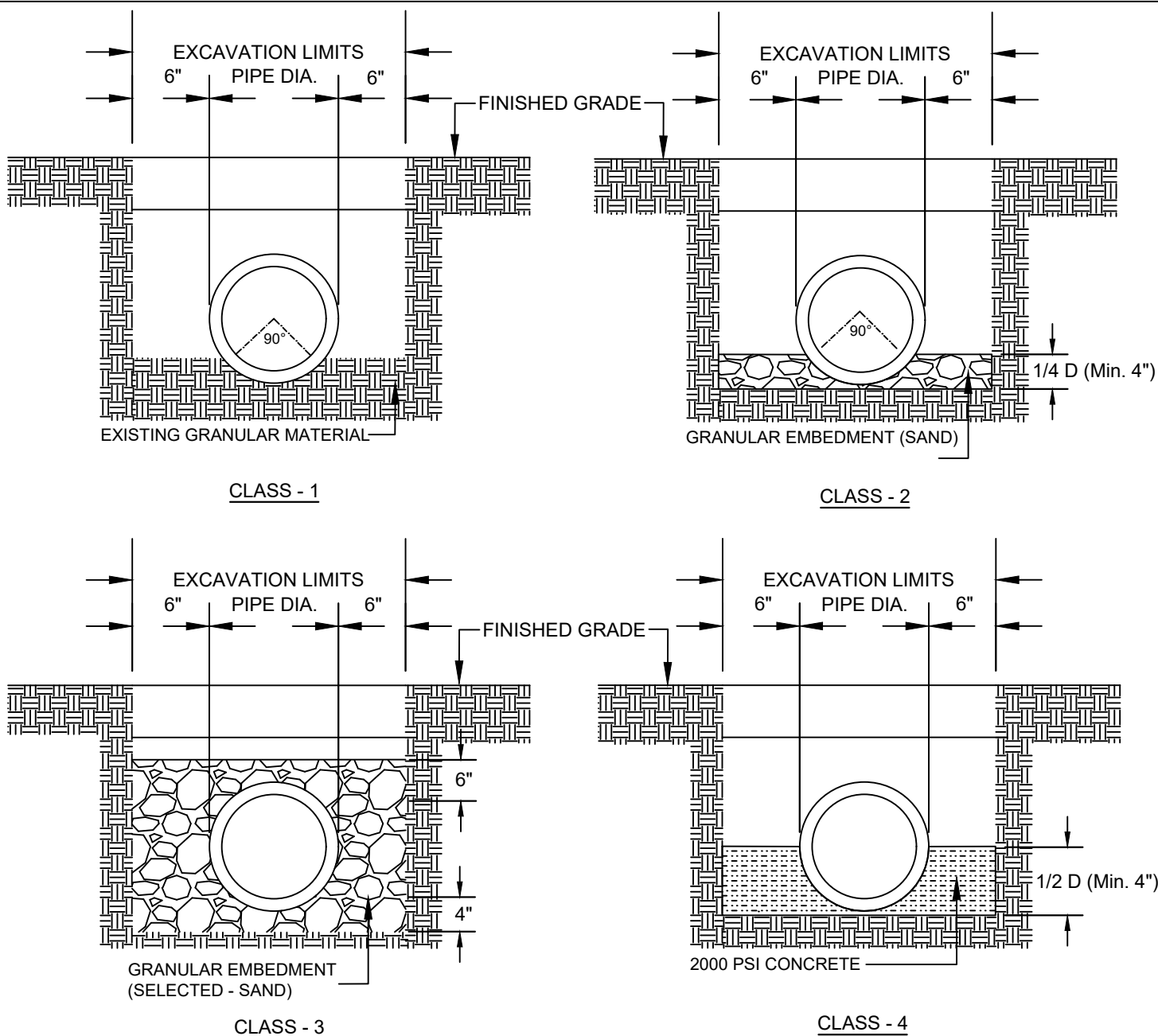


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## CITY OF HUNTSVILLE STANDARD DETAILS PIPE TRENCH BACKFILL

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
1	MAM	10/16/2019	RAM	W-54

NAME: PIPE TRENCH BACKFILL  
CATEGORY: WATER  
DRAWN DATE: 10/26/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### NOTES:

1. CLASS OF BEDDING REQUIRED SHALL BE BASED ON THE TYPE OF SOIL ENCOUNTERED IN EXCAVATION.
2. MINIMUM TRENCH WIDTH SHALL BE PIPE OUTSIDE DIAMETER (O.D.) + 12 INCHES.
3. BACKFILL ABOVE THE BEDDING SHALL CONFORM TO, "UTILITY TRENCH REPAIR" STANDARD DRAWING, SHEET 2 OF 2.
4. REFER TO STANDARD SPECIFICATION ITEMS FOR MATERIAL AND CONSTRUCTION REQUIREMENTS.
5. ALL TRENCHES WITHIN 3 FEET OF EXISTING CURB MUST BE BACKFILLED WITH 2 SACK PER CUBIC YARD CEMENT STABILIZED SAND.

ENGINEERING DEPARTMENT

CITY OF  
HUNTSVILLE, TEXAS

NAME: PIPE BEDDING  
CATEGORY: UTILITIES-WATER/SEWER  
DRAWN DATE: 10/18/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

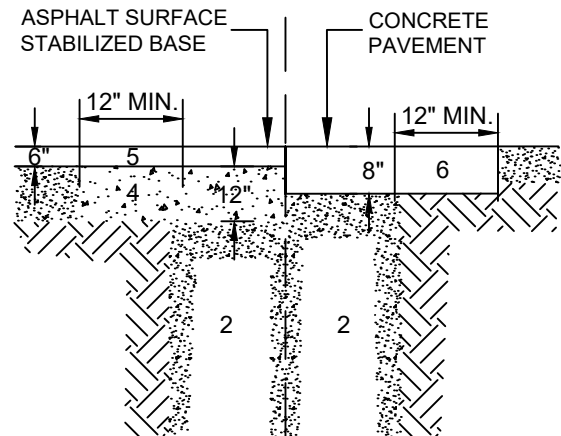
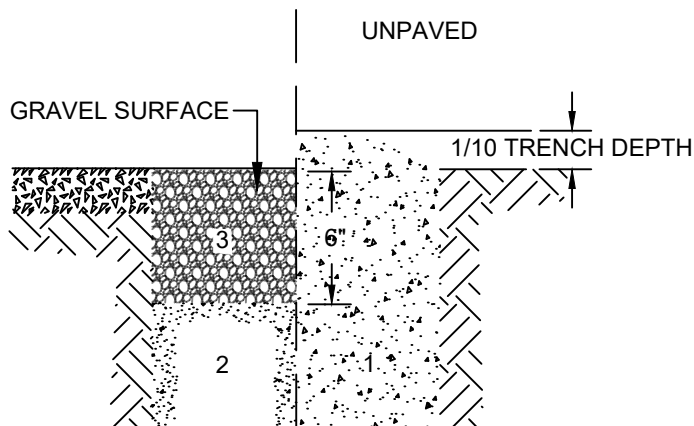


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CITY OF HUNTSVILLE STANDARD DETAILS

PIPE BEDDING  
CLASSES I - IV

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 2
0	MAM	07/31/2018		
1	MAM	10/21/2019	RAM	W-55



1. SELECT MATERIAL \*
2. 2-SACK CEMENT STABILIZED SAND \*
3. CRUSHED ROCK, IRON ORE BASE MATERIAL \*\*
4. 2-SACK CEMENT STABILIZED SAND \*\*
5. H.M.A.C. PAVEMENT
6. CLASS "A" CONCRETE PAVEMENT, REINFORCED TO MATCH EXISTING PAVEMENT

\* COMPACTION BY TAMPING, VIBRATION OR JETTING AS APPROPRIATE.

\*\* TAMPED PNEUMATICALLY OR MECHANICALLY TO 95% MODIFIED PROCTOR DENSITY.

#### NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO CITY OF HUNTSVILLE STANDARD SPECIFICATIONS.
2. STABILIZED SAND BACKFILL REQUIREMENTS TO EXTEND 3 FEET BEHIND ANY CURB AND GUTTER OR OTHER CONCRETE STRUCTURE AND TO DITCH FLOW LINE ON NON-CURB AND GUTTER STREETS.
3. WHERE 50% OR MORE OF THE SURFACE ARE OF PAVEMENT HAS BEEN REMOVED OR DAMAGED, CALCULATED AT INTERVALS OF ONE BLOCK OR 350 LINEAR FEET (WHICH EVER IS LESS), FULL WIDTH RESTORATION SHALL BE REQUIRED. ANY STRIP OF REMAINING PAVEMENT LESS THAN 2 FEET IN WIDTH ALONG CURB AND GUTTER OR PAVEMENT EDGE, SHALL BE REMOVED AND REPLACED.
4. UTILITY CROSSINGS OF CITY STREETS MUST BE BORED, UNLESS PERMISSION FOR A STREET CUT HAS BEEN GIVEN IN WRITING BY THE CITY ENGINEER. STREET CUTS PARALLEL TO CENTERLINE MUST BE APPROVED BY THE CITY ENGINEER AND WILL REQUIRE RESURFACING BY A PAVING MACHINE.
5. STREET SURFACING SHALL BE TRIMMED TO NEAT STRAIGHT LINE WITH EDGES FREE OF DUST, MOISTURE OR LOOSE MATERIAL.
6. ALL COLD JOINT SURFACES SHALL BE TACKED WITH EMULSION WHICH SHALL HAVE "BROKEN" PRIOR TO PATCHING.
7. COMPLETED PATCH SHALL NOT DEVIATE FROM EXISTING SURFACE MORE THAN .03 FEET/10 FEET IN PROFILE OR .05 FEET/10 FEET IN CROSS-SECTION WHEN MEASURED WITH A 10 FEET STRAIGHT EDGE.
8. COMPLETE PATCH SHALL NOT POND WATER IN EXCESS OF .01 FOOT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF STREET REPAIR FOR ONE YEAR AFTER INSTALLATION.
10. ALL TRENCHES 4 FEET DEEP OR DEEPER MUST BE SHORED.

ENGINEERING DEPARTMENT

CITY OF  
HUNTSVILLE, TEXAS



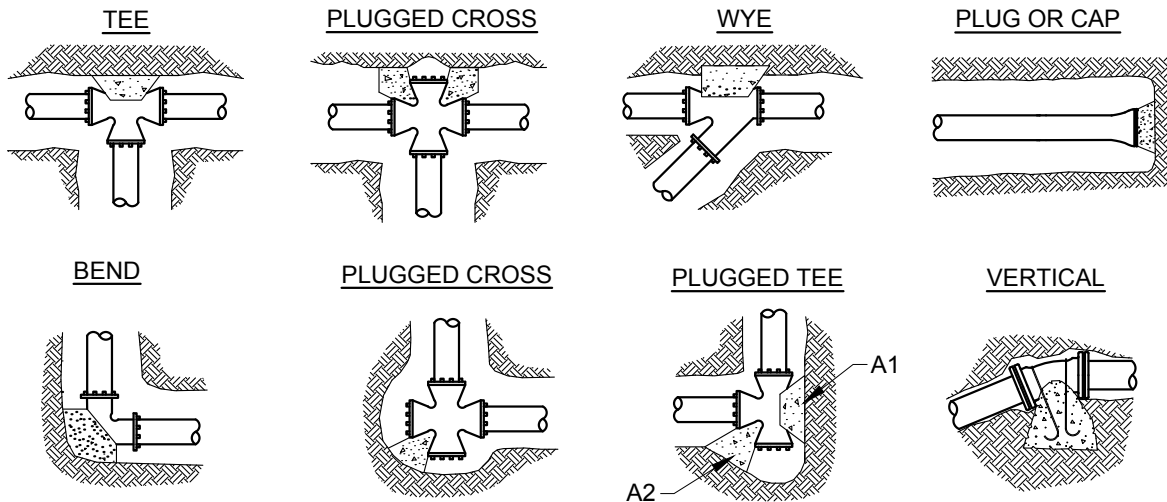
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#### CITY OF HUNTSVILLE STANDARD DETAILS UTILITY TRENCH REPAIR

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 2
0	MAM	07/31/2018		
1	MAM	10/21/2019	RAM	W-56

NAME: UTILITY TRENCH REPAIR  
CATEGORY: UTILITIES-WATER/SEWER  
DRAWN DATE: 10/18/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR





**CONCRETE THRUST BLOCK SCHEDULE**  
(BEARING AREA OF THRUST BLOCKS IN SQUARE FEET)

FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND OR PLUGGED CROSS	TEE PLUGGED ON RUN BEND		45° BEND	22 1/2° BEND	11 1/4° BEND	VERTICAL VOLUME OF THRUST BLOCK IN CUBIC YARDS			
			A1	A2				FITTING SIZE	45° BEND	22 1/2° BEND	11 1/4° BEND
04	1.3	1.9	2.5	1.9	1.3	1.3	1.3	4"	1.1	0.4	0.2
06	2.8	4.0	5.7	4.0	2.1	1.3	1.3	6"	2.7	1.0	0.4
08	5.1	7.1	10.1	7.1	3.9	2.0	1.3	8"	4.0	1.5	0.6
10	7.9	11.2	15.7	11.2	6.1	3.2	1.6	12"	8.5	3.2	1.3
12	11.3	16.0	22.7	16.0	8.8	4.5	2.3	16"	14.8	5.6	2.3
14	15.3	21.7	30.7	21.7	11.9	6.1	3.1	VERTICAL BEND			
16	20.0	28.4	40.0	28.4	15.5	8.0	4.0	FITTING SIZE	ROD SIZE	EMBEDMENT BEND	
18	25.3	36.0	50.7	36.0	19.5	10.1	5.1	4" - 12"	#6	30	
20	31.3	44.4	62.7	44.4	24.1	12.5	6.3	14" - 16"	#8	36	
24	45.3	64.0	90.7	64.0	34.9	18.1	9.1				

Above bearing areas based on test pressure of 150 psi and an allowable soil bearing strength of 1,500 pounds per square foot. To compute bearing areas for different test pressures and soil bearing stresses, use the following equation:

$$\text{BEARING AREA} = (\text{TEST PRESSURE} / 150) \times (1,500 / \text{SOIL BEARING STRESS}) \times (\text{TABLE VALUE})$$

**NOTES:**

1. Concrete thrust blocking to be poured against undisturbed earth. (Min. strength of concrete 3000 psi)
2. Keep concrete clear of joint and accessories. Install 12 mil total thickness polyethylene sheet around fitting. Secure sheet ends to prevent infiltration of dirt between sheet and pipe fitting prior to pouring thrust blocking. Protect mechanical joint followers and bolts from concrete with temporary forms and 12 mil polyethylene sheeting.
3. The required thrust bearing areas for special connections are shown.
4. If not shown on plans, required bearing areas at fitting shall be as indicated above, adjust if necessary, to conform to the test pressure(s) and allowable soil bearing stress(es) stated in the *Special Specifications*.
5. Bearing areas and special blocking details shown on plans take precedence over bearing areas and blocking details shown on this *Standard Dwg*. Bearing area of thrust blocks is in square feet.
6. Vertical changes in direction require specific designs for thrust blocks.

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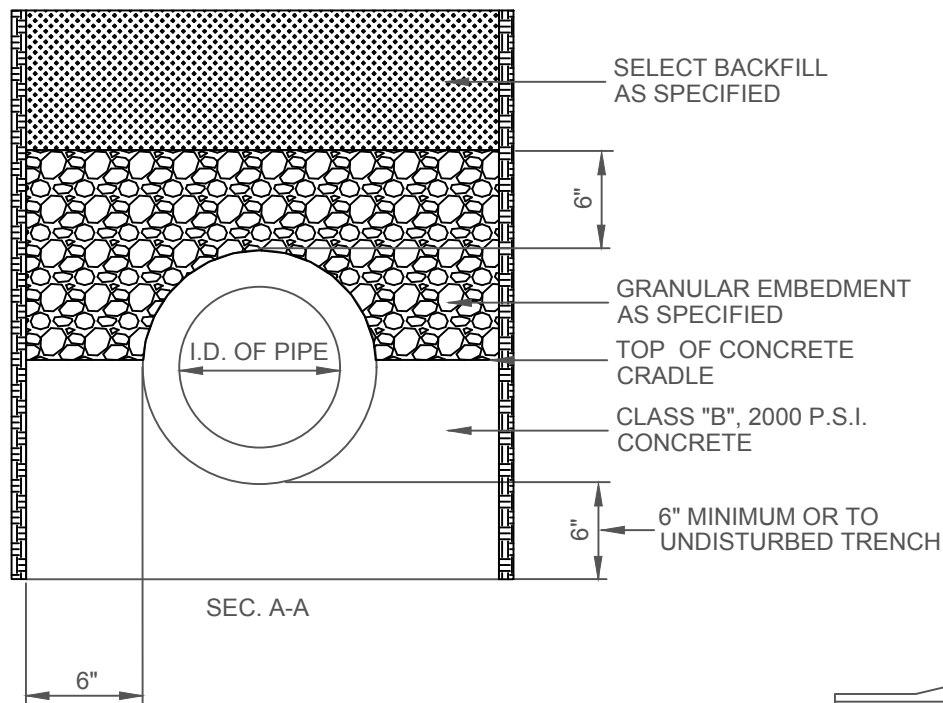
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CITY OF HUNTSVILLE STANDARD DETAILS  
HORIZONTAL BLOCKING  
CONCRETE CRADLE VERTICAL BENDS

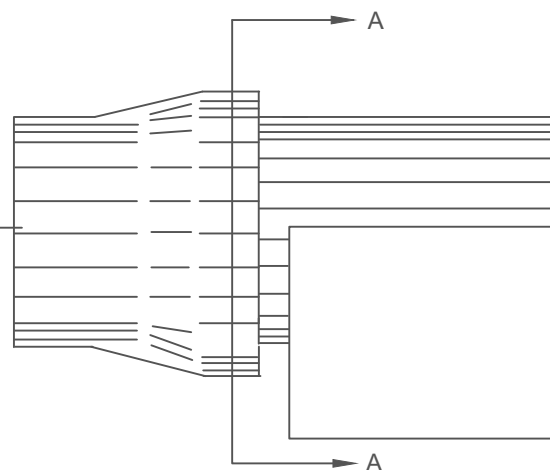
NAME: HORIZONTAL/VERT. BLOCKING  
CATEGORY: WATER  
DRAWN DATE: 10/25/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 3
0	MAM	07/31/2018		
				<b>W-57</b>





C.L. OF  
PIPE



NOTES:

1. FOR USE ONLY WHERE INDICATED ON PLANS
2. THE CONCRETE SHALL BE 2000 PSI CONCRETE.
3. THE MINIMUM THICKNESS, ON THE SIDES AND BOTTOM SHALL BE 6". THE TOP OF THE CONCRETE SHALL BE AT LEAST TO THE CENTER OF THE PIPE.
4. EXTEND TO EDGE OF TRENCH - SEE STANDARD TRENCH DETAILS AND CONCRETE CRADLE AT VERTICAL BEND

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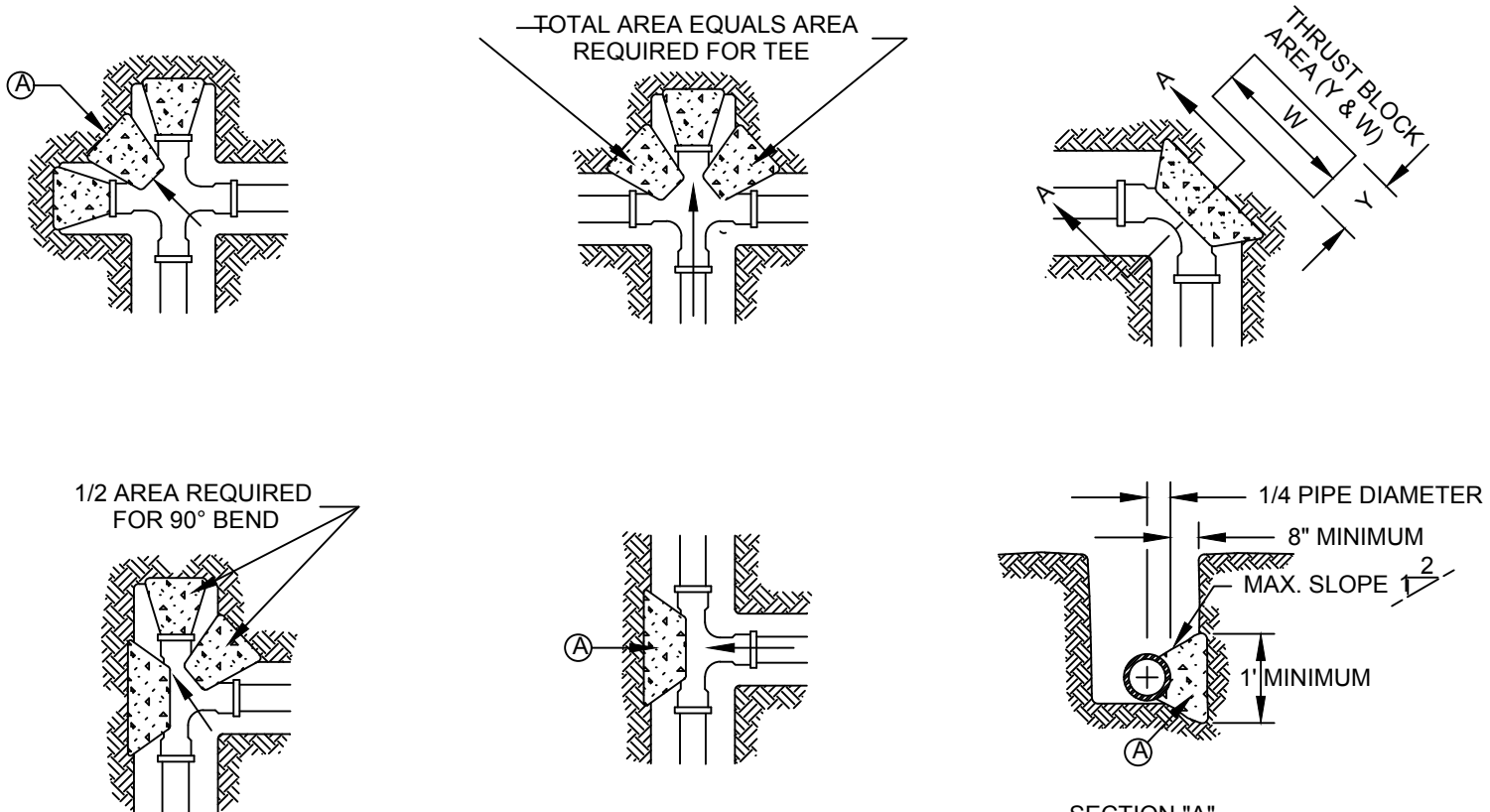


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CITY OF HUNTSVILLE STANDARD DETAILS  
CONCRETE CRADLE

REV#	ISSUER	DATE	APPROVER	SHEET 2 OF 3
0	MAM	07/31/2018		
				W-58

NAME: CONCRETE CRADLE  
CATEGORY: WATER  
DRAWN DATE: 10/25/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### 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

#### NOTES:

1. TABLE IS BASED ON 2000#/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 2500 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. WHEN NECESSARY ADDITIONAL THRUST RESTRAINT METHODS MAY BE USED, SUCH AS MECHANICAL JOINT RESTRAINTS, TIE-RODS (INSTALLED PER MANUFACTURERS' RECOMMENDATIONS) OR OTHER APPROVED METHODS.

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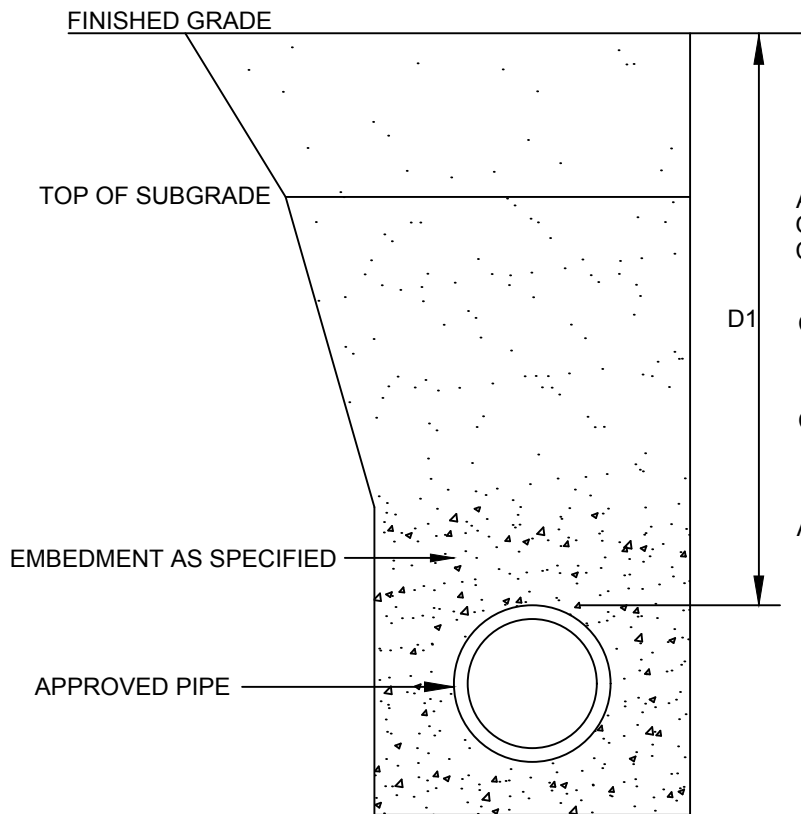


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#### CITY OF HUNTSVILLE STANDARD DETAILS CONCRETE THRUST BLOCKING

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-59

NAME: CONCRETE THRUST BLOCKING  
CATEGORY: WATER  
DRAWN DATE: 10/31/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



CONSTRUCTION KEY NOTES:

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

CONDITION A - NORMAL LINE INSTALLATION, STREET AND DRAINAGE PROJECTS, WATERLINE RELOCATION

CONDITION B - NEW SUBDIVISIONS, NON-PAVED AREA

AND SHALL BE AS FOLLOWS:

PIPE SIZE	CONDITION	DIMENSION
6", 8"	A	D1 = 4'
6", 8"	B	D1 = 4'
12" & LARGER	A OR B	D1 = 5'

NOTES:

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

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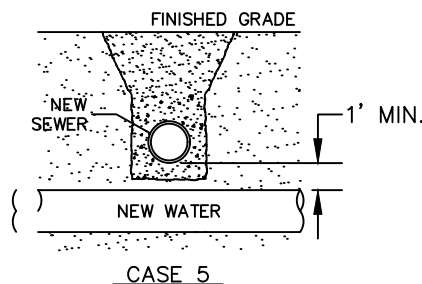
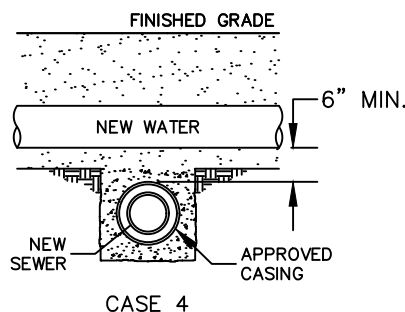
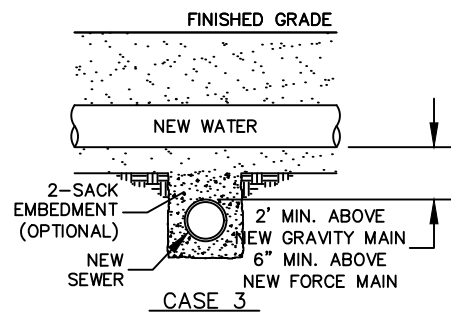
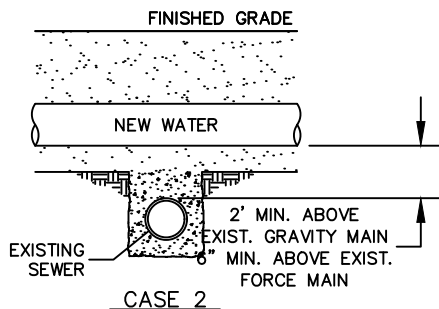
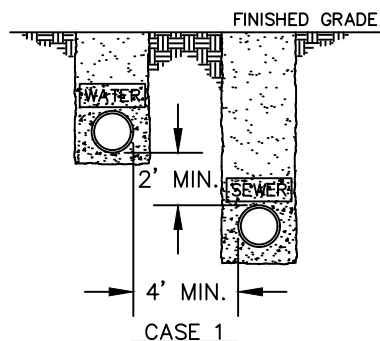


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CITY OF HUNTSVILLE STANDARD DETAILS  
COVER FOR WATER MAINS

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-60

NAME: COVER FOR WATER MAINS  
CATEGORY: WATER  
DRAWN DATE: 10/16/2016  
DRAWN BY: WLSIII  
SCALE: N.T.S.  
APPROVED BY: YSR



#### 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.

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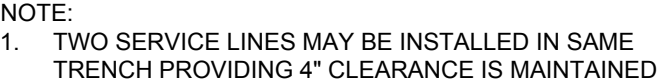
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#### CITY OF HUNTSVILLE STANDARD DETAILS

##### SEPARATION DISTANCE SANITARY SEWER AND POTABLE WATER

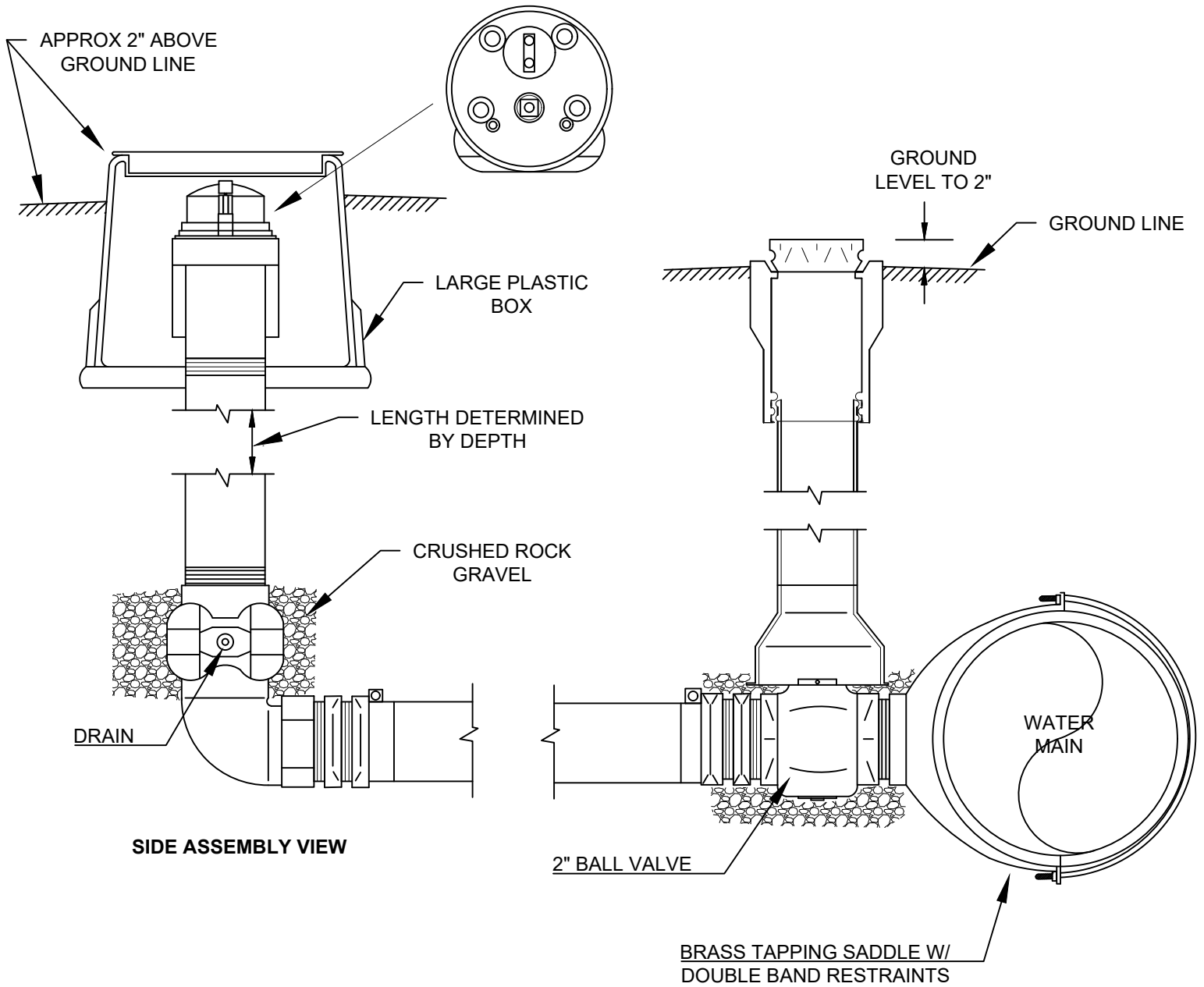
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0	MAM	07/31/2018		
				W-61

NAME: SEPARATION DISTANCE  
CATEGORY: WATER  
DRAWN DATE: 06/08/2018  
DRAWN BY: DAC  
SCALE: N.T.S.  
APPROVED BY: MMC



REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	07/31/2018		
				W-62

# TOP HEADSTOCK VIEW



## NOTES:

1. INCLUDE SIGNAGE MARKER LABELING AS "BLOWOFF APPROVED BY CITY".
2. BLOWOFF NOT ALLOWED IN ROADSIDE DITCHES OR BACKSLOPE.

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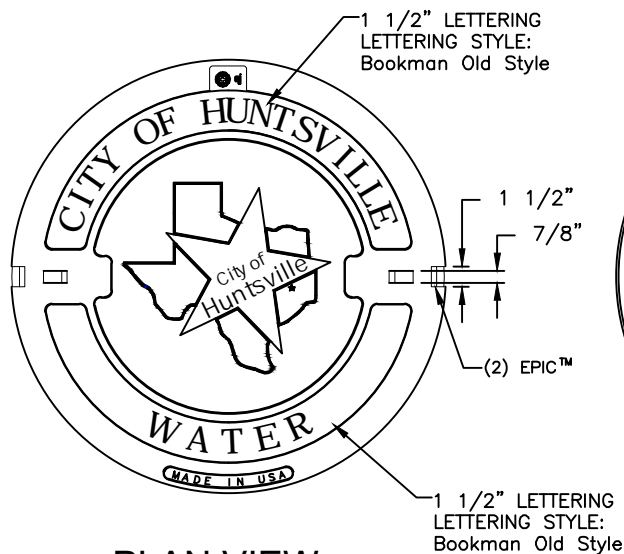
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## CITY OF HUNTSVILLE STANDARD DETAILS 2" BLOWOFF

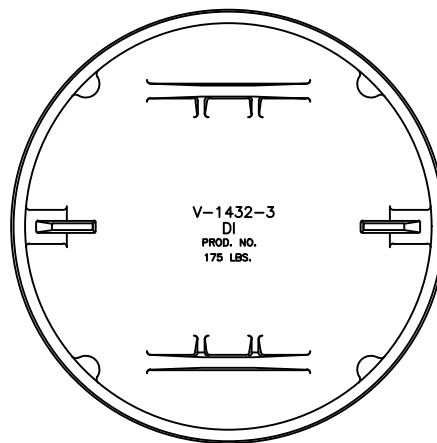
REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	04/02/19		
				W-63

NAME: 2" BLOWOFF  
CATEGORY: WATER  
DRAWN DATE: 3/11/2019  
DRAWN BY: DAC  
SCALE: N.T.S.  
APPROVED BY: MAM

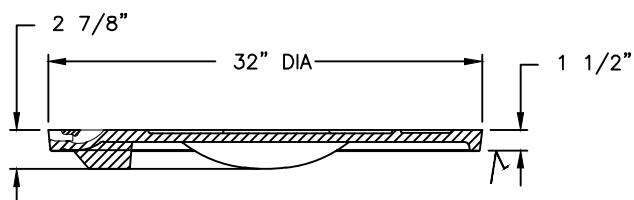
## V1432-3DI Cover



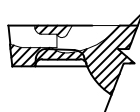
PLAN VIEW



BOTTOM VIEW



CROSS SECTION



EPIC PICKBAR

Product Number  
41432146

### Design Features

- Materials: Ductile Iron (70-50-05)
- Design Load: Heavy Duty
- Open Area: n/a
- Coating: Undipped
- √ Designates Machined Surface

### Certification

- ASTM A536
- Country of Origin:

### Drawing Revision

07/09/2009 Designer: GAD  
07/31/2013 Revised By: DVD

### Disclaimer

Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

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PATENT PENDING

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### CITY OF HUNTSVILLE STANDARD DETAILS AIR RELEASE MANHOLE COVER

REV#	ISSUER	DATE	APPROVER	SHEET 1 OF 1
0	MAM	04/21/2020	RAM	
				W-64

NAME: WL CONSTRUCTION NOTES  
CATEGORY: WATER  
DRAWN DATE:  
DRAWN BY:  
SCALE: N.T.S.  
APPROVED BY: YSR