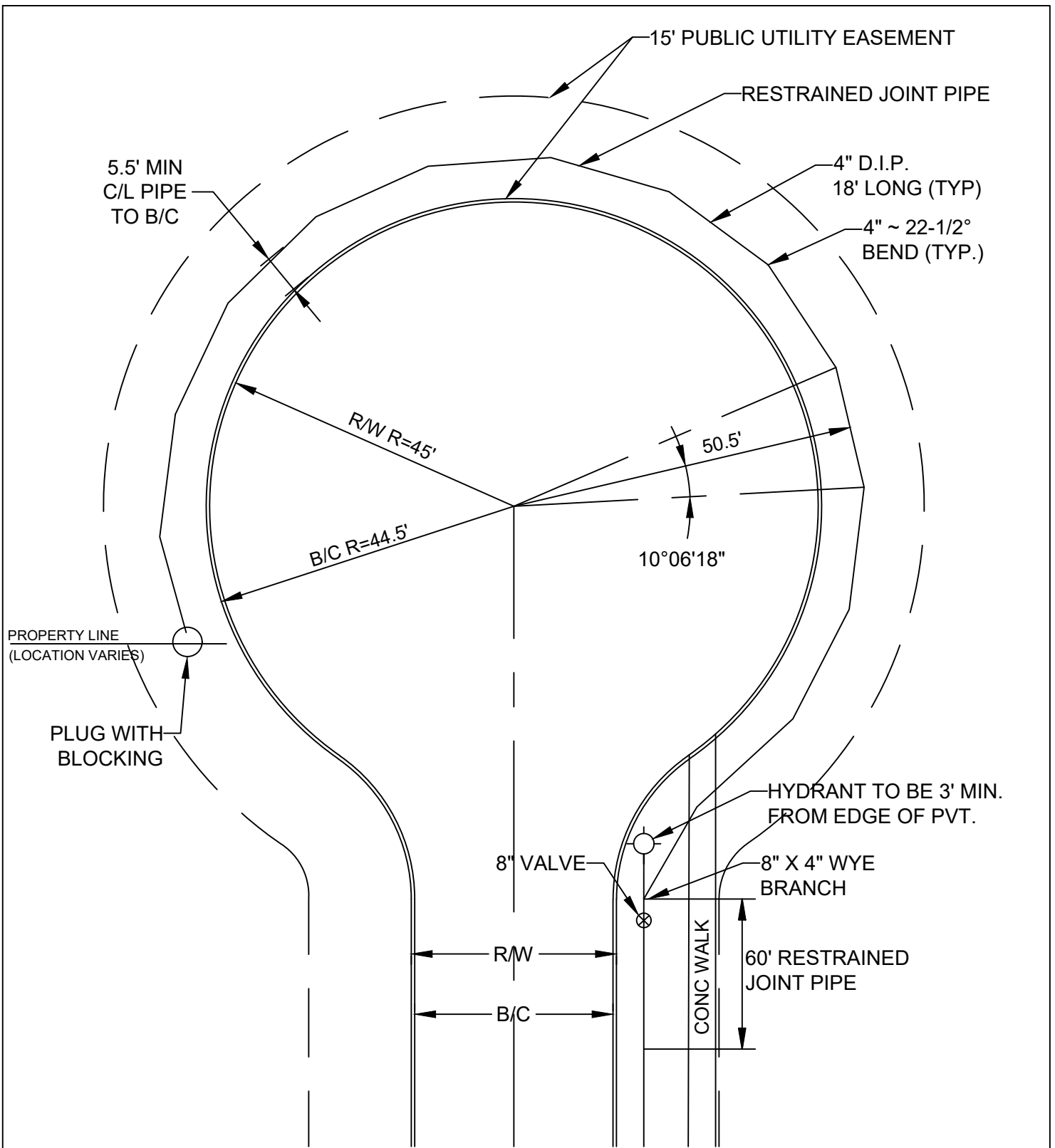


# WATER DETAILS

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W-2	WATERMAIN TRENCH DETAIL
W-3	THRUST BLOCK DETAILS
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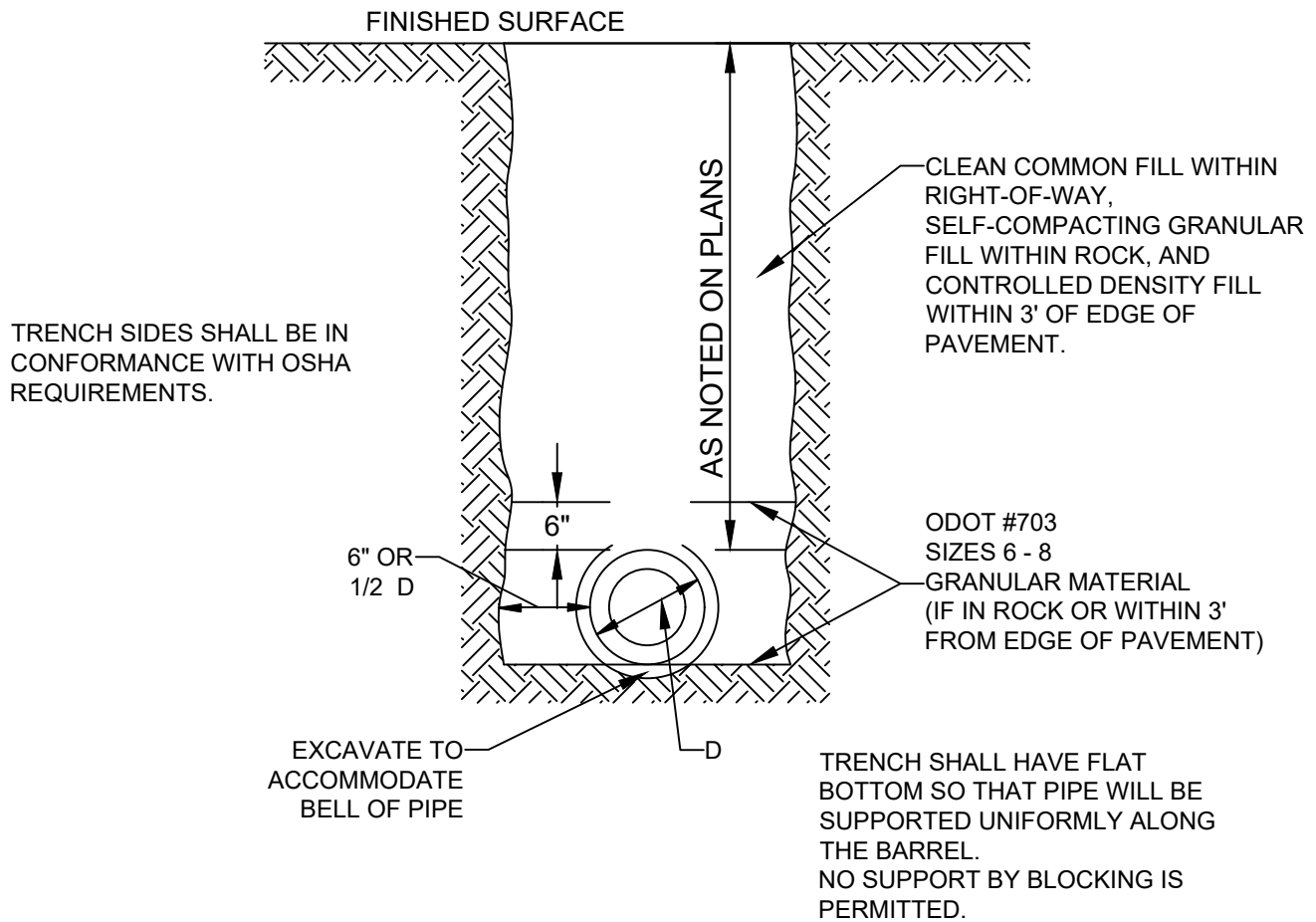
ALL BENDS SHALL BE LABELED WITH STATIONING.

## WATERMAIN LAYOUT AT CUL-DE-SAC

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <h1 style="font-size: 2em; margin: 0;">W-1</h1>
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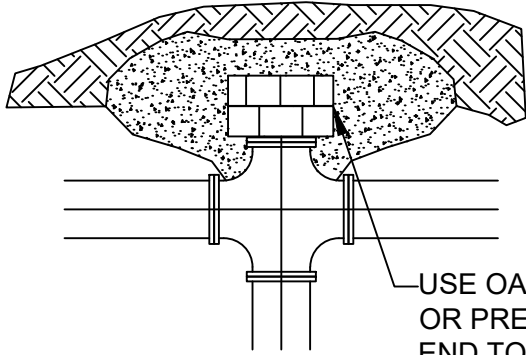
WATERMAIN SHALL BE INSTALLED IN A SEPARATE TRENCH FROM THE SANITARY SEWER AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM THE SANITARY SEWER.

BACKFILL AND RESTORATION OF PAVEMENT MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATION(S).



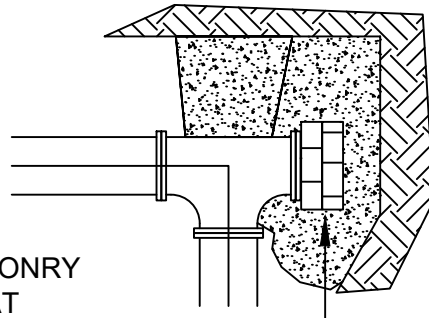
## WATERMAIN TRENCH DETAIL

APPROVED/REVISED  JUNE, 2012	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b style="font-size: 2em;">W-2</b>
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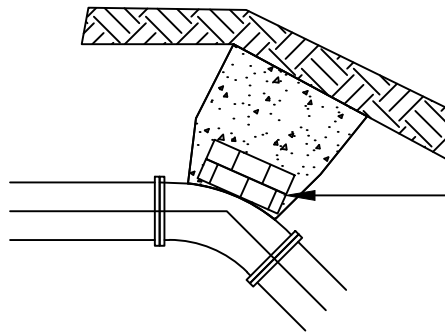
CROSS

USE OAK, CEMENT MASONRY OR PRECAST BLOCKS AT END TO BE PLUGGED (TYP.)



TEE

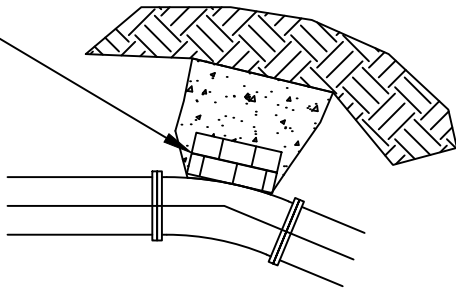
USE OAK, CEMENT MASONRY OR PRECAST BLOCKS AT END TO BE PLUGGED (TYP.)



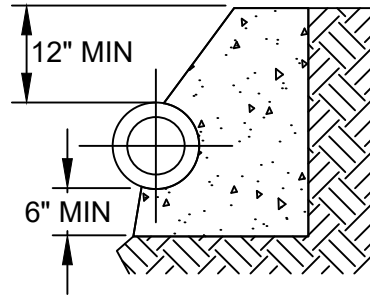
45° BEND

USE OAK, CEMENT MASONRY OR PRECAST BLOCKS AT BACK OF BEND (TYP.)

USE OAK, CEMENT MASONRY OR PRECAST BLOCKS AT BACK OF BEND (TYP.)



22.5° BEND



SECTIONAL VIEW

12" MIN  
6" MIN

NOTE:

BEARING AREA TO BE DETERMINED BASED ON SOIL TYPE & WORKING PRESSURE.  
 THRUST BLOCKS TO BE USED AT ALL BENDS 22.5° OR GREATER.  
 THRUST BLOCKS TO BE POURED AGAINST FIRM UNDISTURBED SOIL.  
 USE CLASS "C" CONCRETE.  
 90° BENDS SHALL NOT BE PERMITTED.

## THRUST BLOCK DETAILS

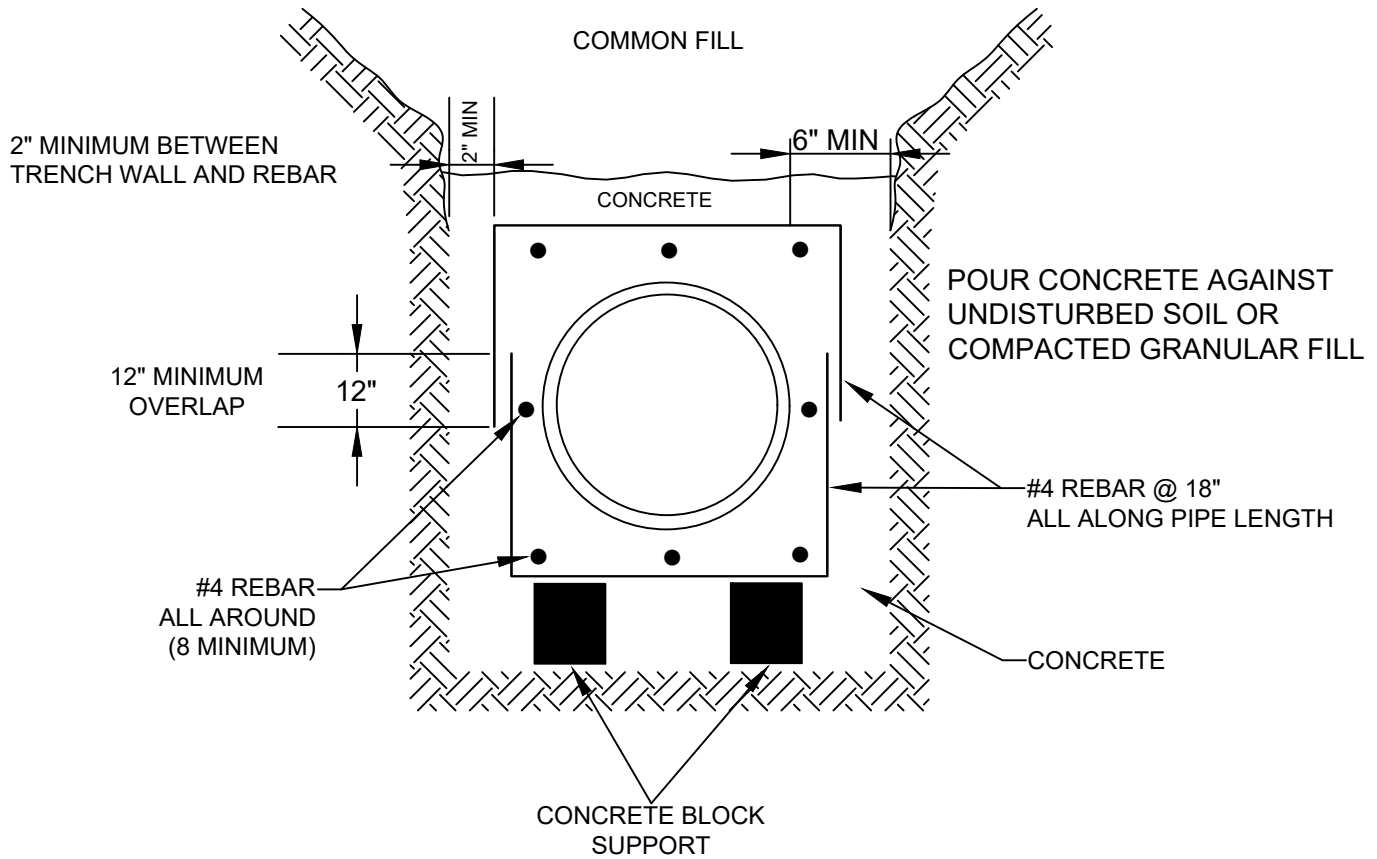
APPROVED/REVISED

MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-3**



NOTES:

- 1) CONCRETE SHALL BE 3000 P.S.I. MINIMUM 28 DAYS STRENGTH (4" SLUMP).
- 2) SUPPORT PIPE AND REBAR CAGE ON CONCRETE BRICKS DURING CONCRETE PLACEMENT.
- 3) CONCRETE ENCASMENT SHALL BE TERMINATED AT PIPE JOINTS ONLY.

## FULL CONCRETE ENCASEMENT

APPROVED/REVISED

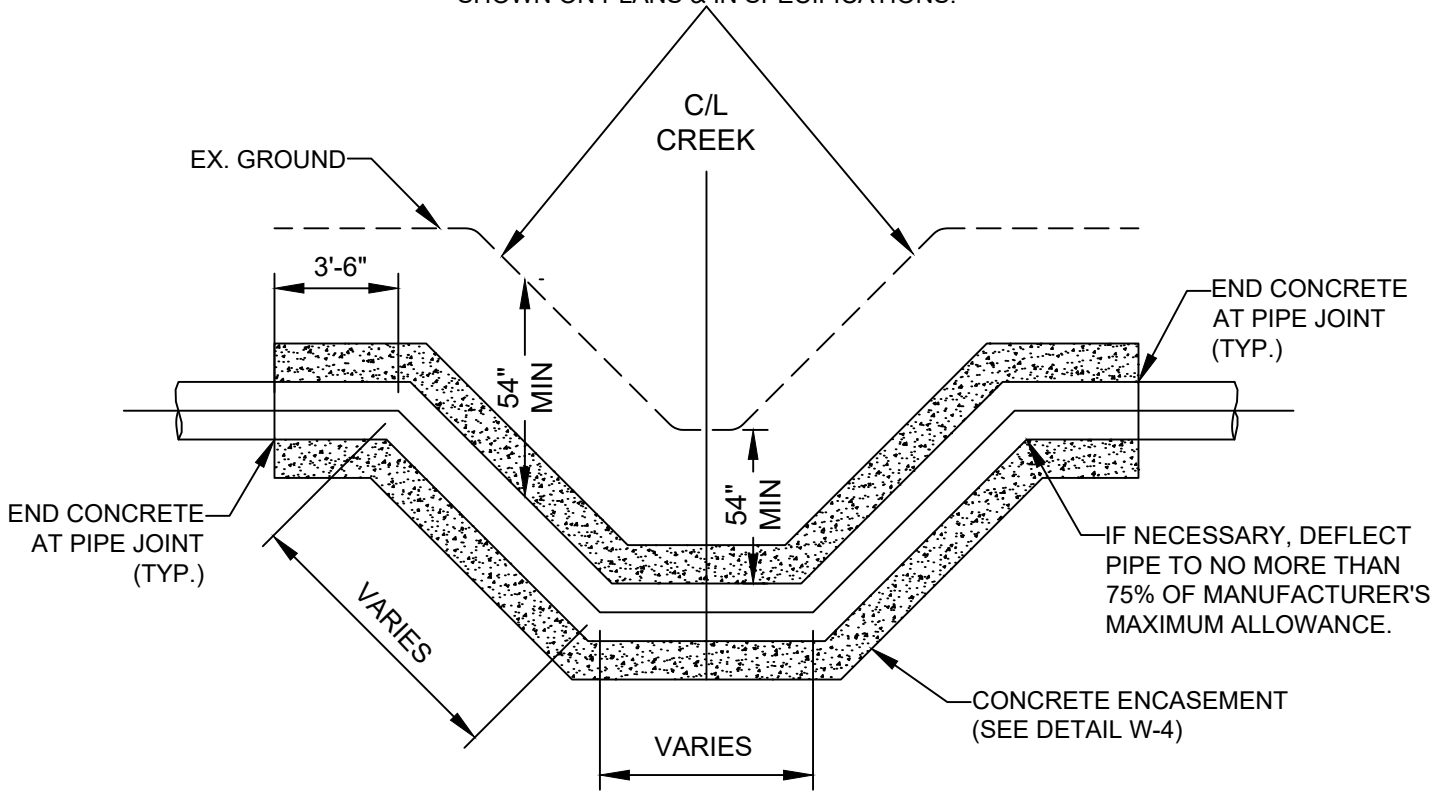
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# W-4

ROCK CHANNEL PROTECTION AS SHOWN ON PLANS & IN SPECIFICATIONS.



NOTES:

- 1) ALL PIPE IN CREEK CROSSINGS TO BE RESTRAINED JOINT, PER STANDARD NUMBER W-18.
- 2) WATERMAIN ENCASEMENT TO BE USED ONLY WHEN SPECIFIED ON PLANS.

## WATERMAIN ENCASEMENT AT CREEK CROSSING

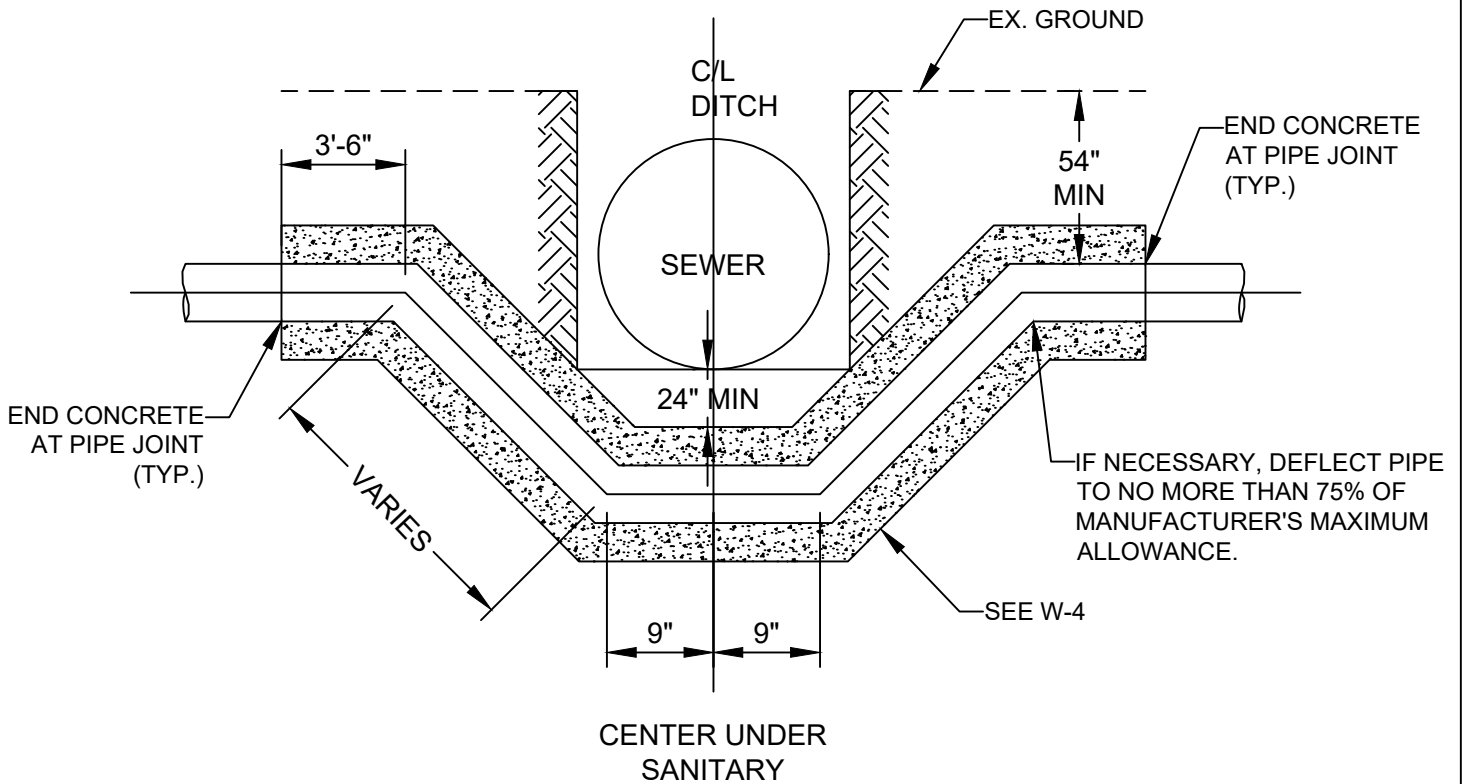
APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# W-5



NOTE:  
 WATERMAIN ENCASEMENT TO BE USED ONLY WHEN SPECIFIED ON PLANS.

ALL PIPE IN SEWER CROSSINGS TO BE RESTRAINED JOINT, PER STANDARD NUMBER W-18

## WATERMAIN ENCASEMENT AT SEWER CROSSING

APPROVED/REVISED

MAY, 2023

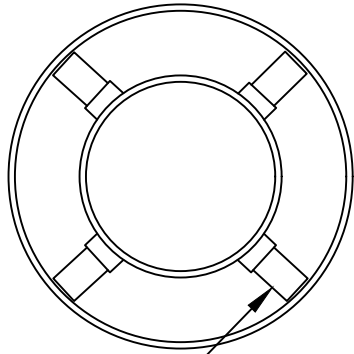
WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-6**

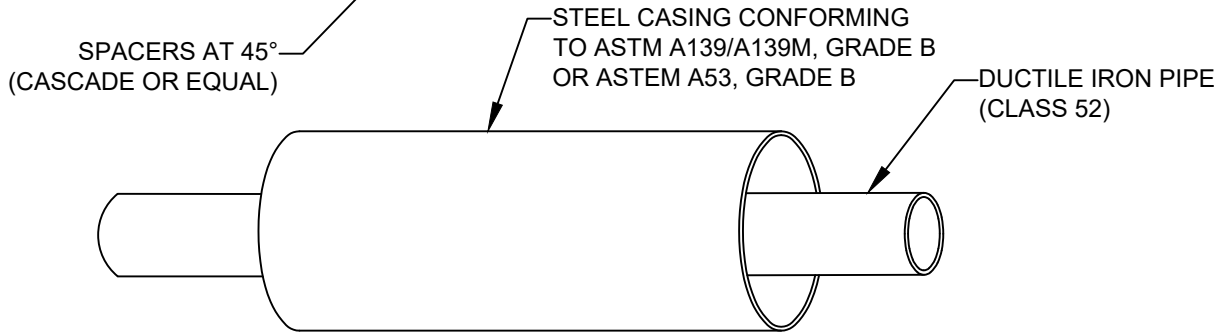
WATER PIPE SIZE - CARRIER PIPE SIZE (O.D.)-THICKNESS

4"	10"	1/4"
6"	12"	3/8"
8"	18"	3/8"
10"	20"	3/8"
12"	24"	1/2"
16"	24"	1/2"
20"	30"	1/2"
24"	36"	1/2"



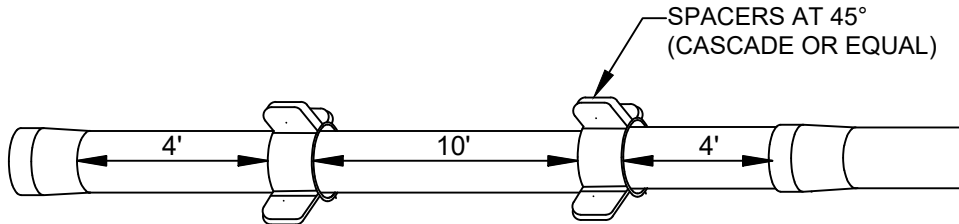
SO THAT PIPE WILL BE CENTERED IN CARRIER PIPE, THE FOLLOWING INFORMATION IS NEEDED:

1. TYPE & O.D. OF PIPE
2. TYPE OF JOINT/RESTRAINT
3. TYPE & I.D. OF CASING
4. 2 SPACER PER LENGTH OF PIPE (18")  
(SEE STANDARD PLACEMENT BELOW)



NOTE:

1. RESTRAINED JOINT TO BE USED WITHIN LIMITS OF CASING
2. PACK END OF CASING WITH CONCRETE OR GRAVEL
3. CASING SPACER TO BE USED THRU CARRIER PIPE



RECOMMENDED STANDARD PLACEMENT

## WATERMAIN IN CASING

APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

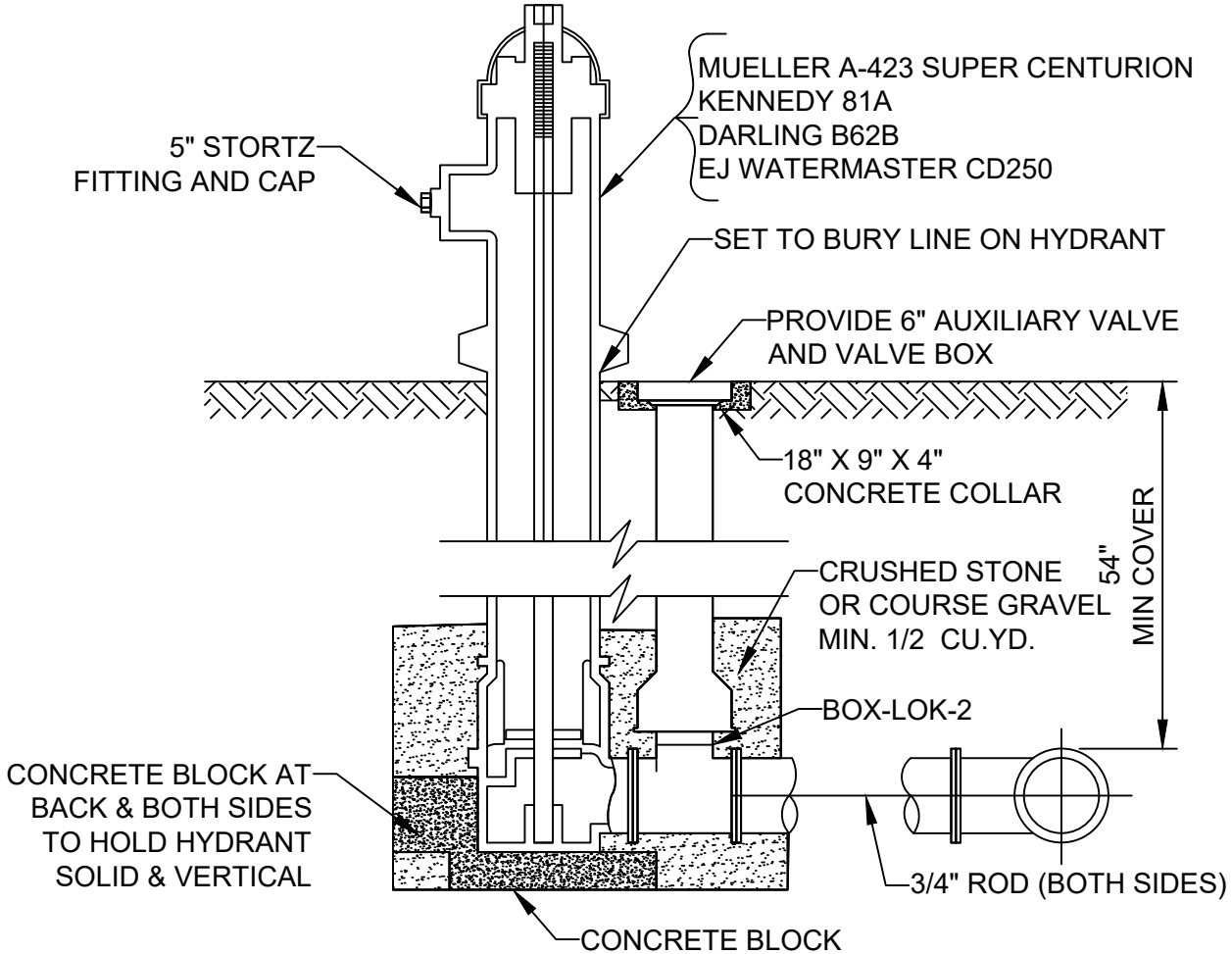
**W-7**



W.M.	F.H. BURIAL DEPTH
6"	5'-0"
8"	5'-0"
10"	5'-0"
12"	5'-0"
16"	5'-6"
18"	5'-6"
20"	5'-6"

ALL FIRE HYDRANTS AND HYDRANT VALVES MUST OPEN LEFT.

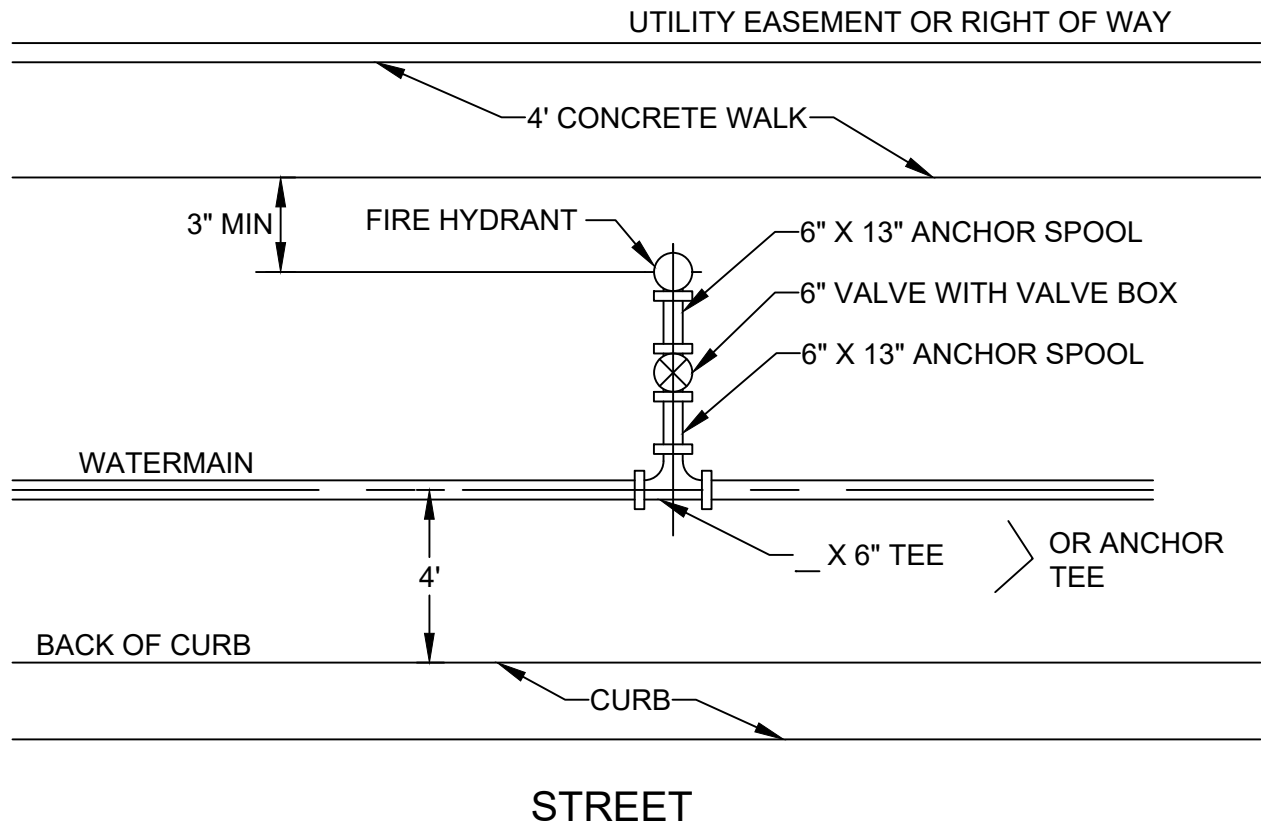
ALL HYDRANTS TO BE 5 1/4" BRONZE TO BRONZE SEAT



1. ALL VALVES MUST BE RESILIENT SEATED.
2. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
3. RODDING SHALL NOT BE REQUIRED IF ANCHOR FLANGES (SPOOLS) ARE USED.
4. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.

## HYDRANT SETTING

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS	STANDARD NUMBER
MAY, 2023	DEPARTMENT OF WATER & SEWER	<b>W-8</b>



**NOTES:**

1. HYDRANT, VALVE, BEND & TEE TO BE CLOSE COUPLED (USE RESTRAINED JOINTS).
2. HYDRANT AND VALVE MUST BE A MINIMUM OF 3' FROM ANY PAVED SURFACE.
3. ALL VALVES MUST BE RESILIENT SEATED.
4. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
5. RODDING SHALL NOT BE REQ'D IF ANCHOR FLANGES (SPOOLS) ARE USED.
6. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.

## FIRE HYDRANT ARRANGEMENT

APPROVED/REVISED

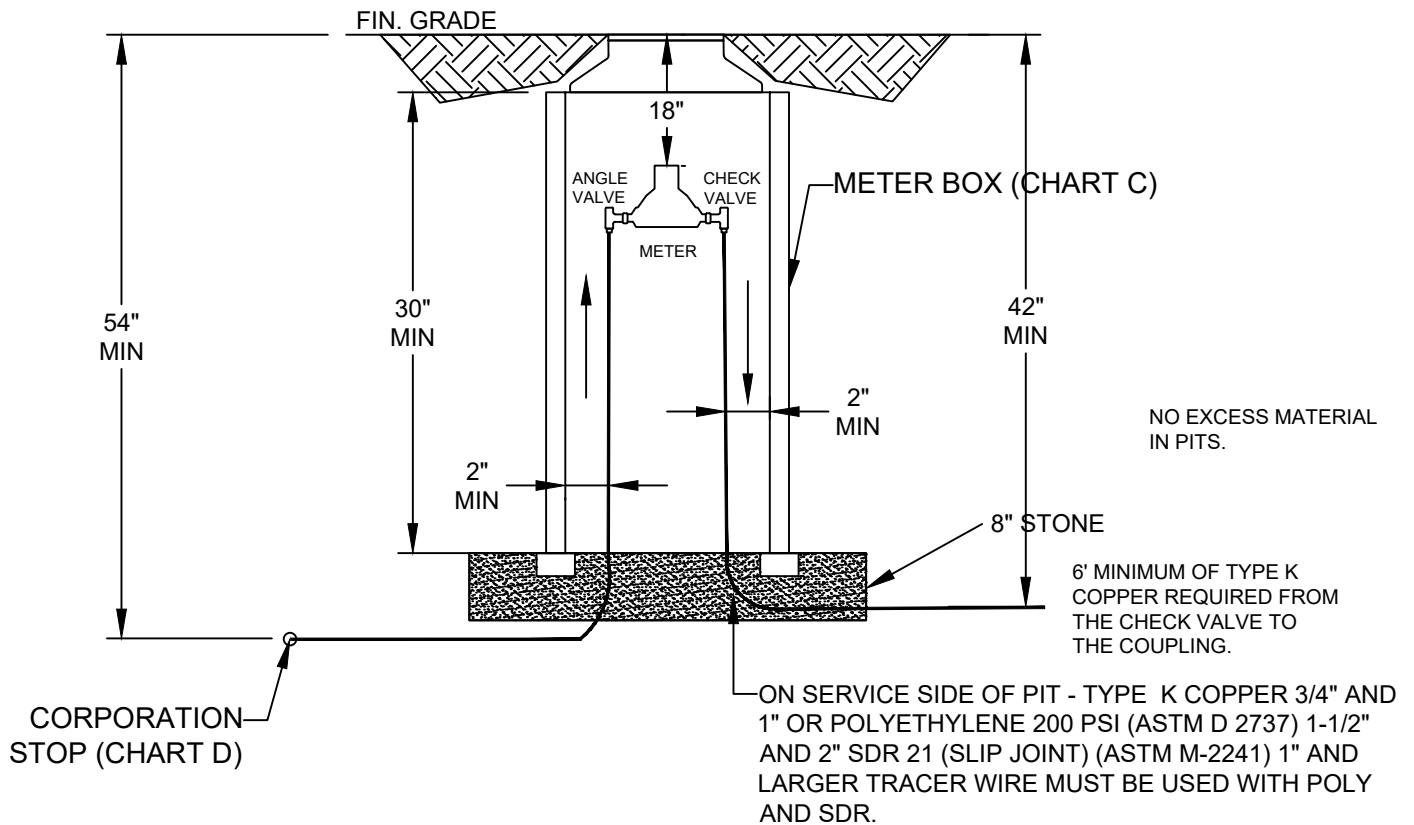
JUNE, 2012

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# W-9

METER SIZE	CHART A ANGLE VALVE	CHART B CHECK VALVE	CHART C METER PIT & COVER	CHART D CORP STOP	CHART E COUPLINGS
3/4" - 5/8"	MUELLER P24258-1 FORD BA43-332W MCDONALD 4602 B-22	MUELLER P 14269 FORD HA34 323 MCDONALD 02-342	<u>METER PIT</u> 20'X30" SIGMA #2030-SW-W ROUND STRAIGHT WALL <u>COVER</u> FORD C-3T OR EQUAL	MUELLER P 15008 FORD FB1000 MCDONALD MAC-PAK COMPRESSION	FORD C44-33 MUELLER P 15403 MCDONALD 4758-22
1 "	FORD BA43-444W	FORD HA34-444	<u>METER PIT</u> 20'X30" SIGMA #2030-SW-W ROUND STRAIGHT WALL <u>COVER</u> FORD C-3T OR EQUAL	FORD FB1000	FORD C44-44 MUELLER P 15403 MCDONALD 4758-22
DOUBLE 3/4"	FORD UVB43-32W	FORD HA34-323	<u>METER PIT</u> 20'X30" SIGMA #2030-SW-W ROUND STRAIGHT WALL <u>COVER</u> FORD C-3T OR EQUAL	FORD FB1000	FORD C44-33 MUELLER P 15403 MCDONALD 4758-22



NOTE:

1. BACK FLOW PREVENTER TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN METER PIT.

## METER BOX DETAIL FOR 3/4" AND 1" METERS

APPROVED/REVISED

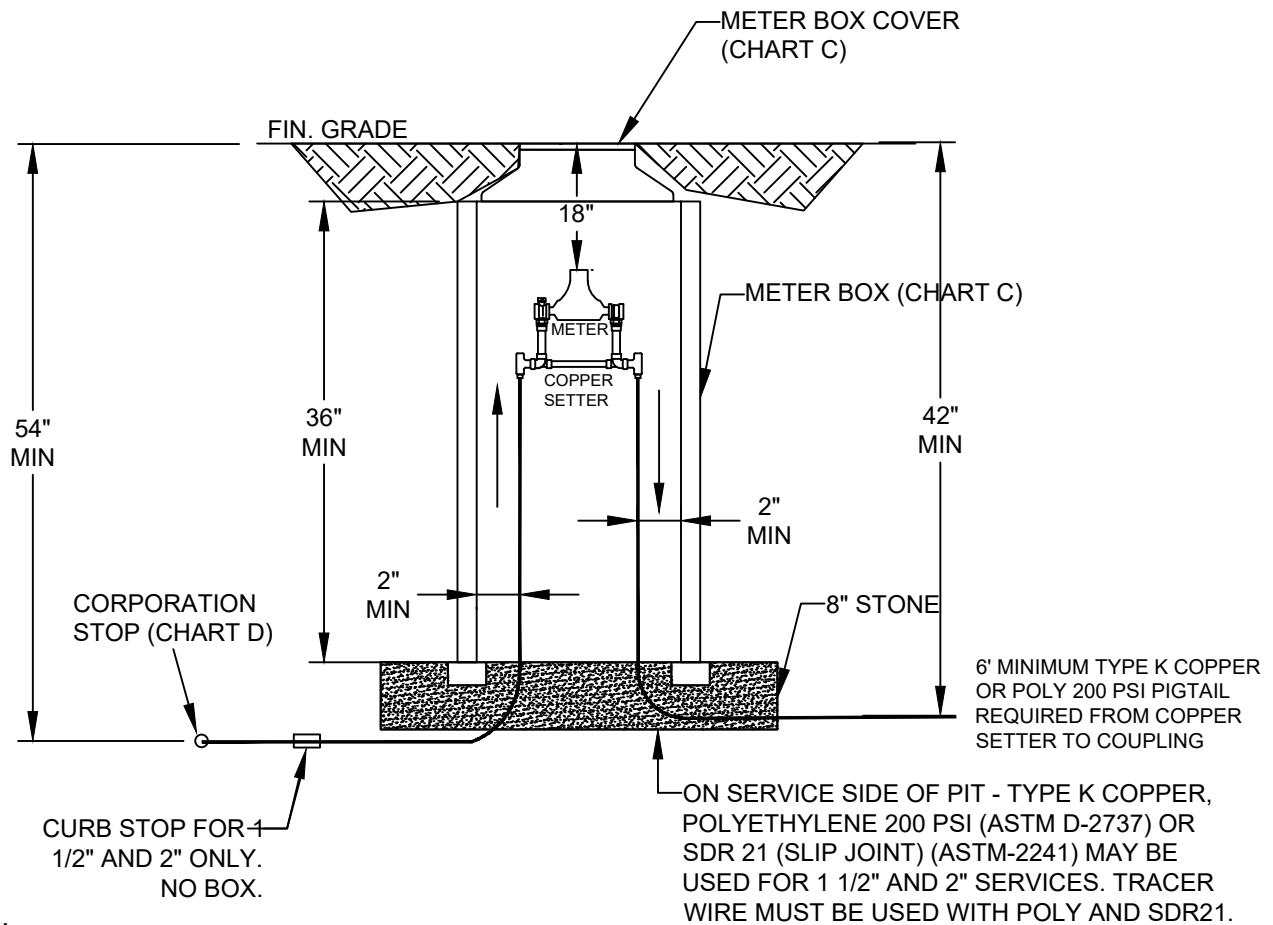
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-10A**

METER SIZE	CHART A ANGLE VALVE	CHART B CHECK VALVE	CHART C METER PIT & COVER	CHART D CORP STOP	CHART E COUPLINGS
1 1/2"	FORD VBH76-15-44-66 OR EQUAL	FORD B44-666 OR EQUAL	<u>METER PIT</u> 36"X36" CARSON STRAIGHT WALL METER PIT  <u>COVER</u> FORD C-3T OR EQUAL	FORD F1000-6 FORD FB1000-6	FORD C44-66 MUELLER P 15403 MCDONALD 4758-22
2"	FORD VBH77-15B-44-77 OR EQUAL	FORD B44-777 OR EQUAL	<u>METER PIT</u> 36"X36" CARSON STRAIGHT WALL METER PIT  <u>COVER</u> FORD C-3T OR EQUAL	FORD F1000-7 FORD FB1000-7	FORD C44-77 MUELLER P 15403 MCDONALD 4758-22



**NOTE:**

- BACK FLOW PREVENTER TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN METER PIT.

## METER BOX DETAIL FOR 1 1/2" AND 2" METERS

APPROVED/REVISED

MARCH, 2018

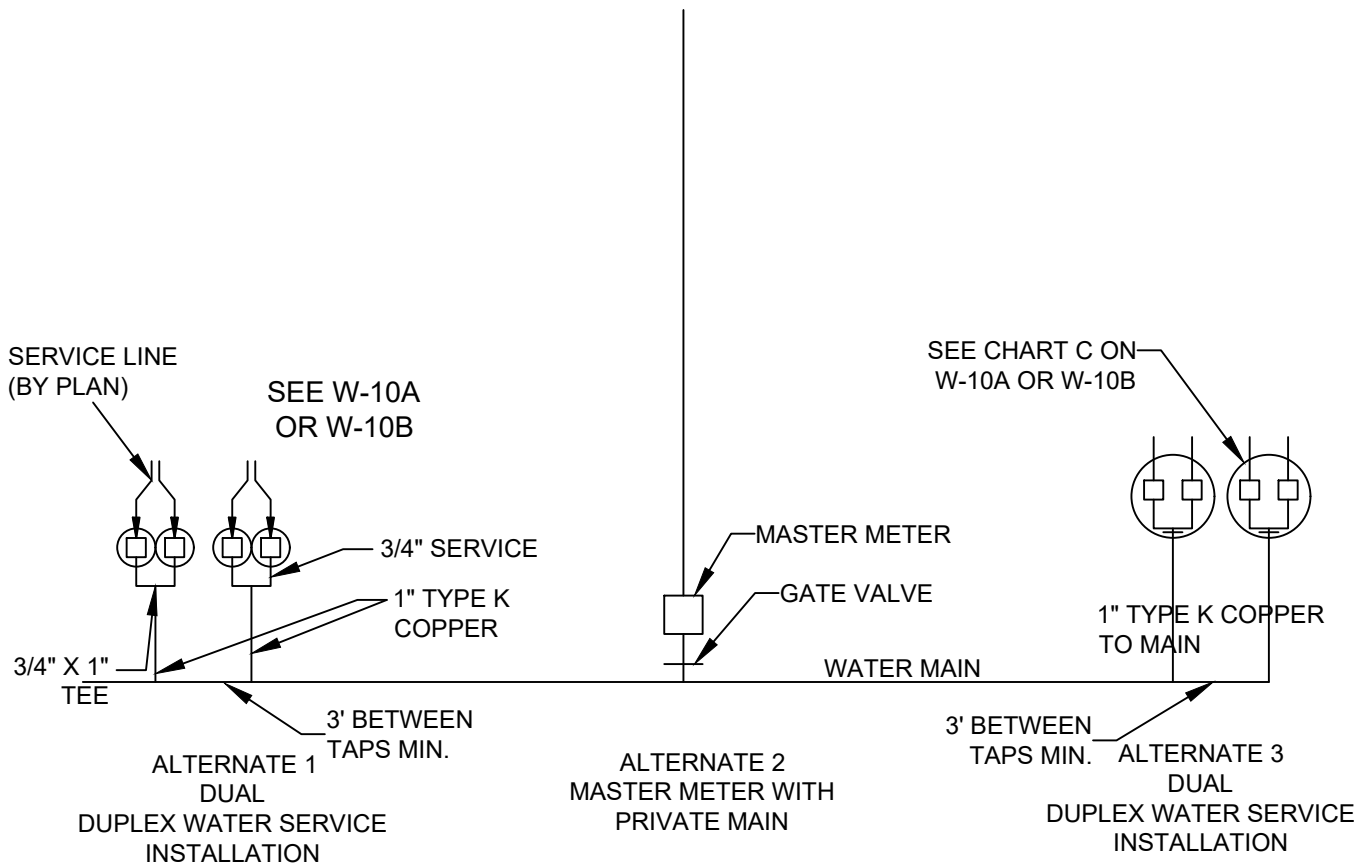
WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-10B**

NOTES:

1. PRIVATE MAIN APPLICATION MUST BE ACCOMPANIED BY MAINTENANCE AGREEMENT IN PROPER FORM.
2. MULTIPLE SERVICES LINES ON SINGLE TAPS SHALL BE APPROVED BY THE COUNTY ON A CASE-BY-CASE BASIS.



(TYPICAL LAYOUT)  
 WATER METER SEE W-10A, W-10B, W-14, W-15A AND W-15B

## MULTIPLE WATER SERVICE CONNECTIONS

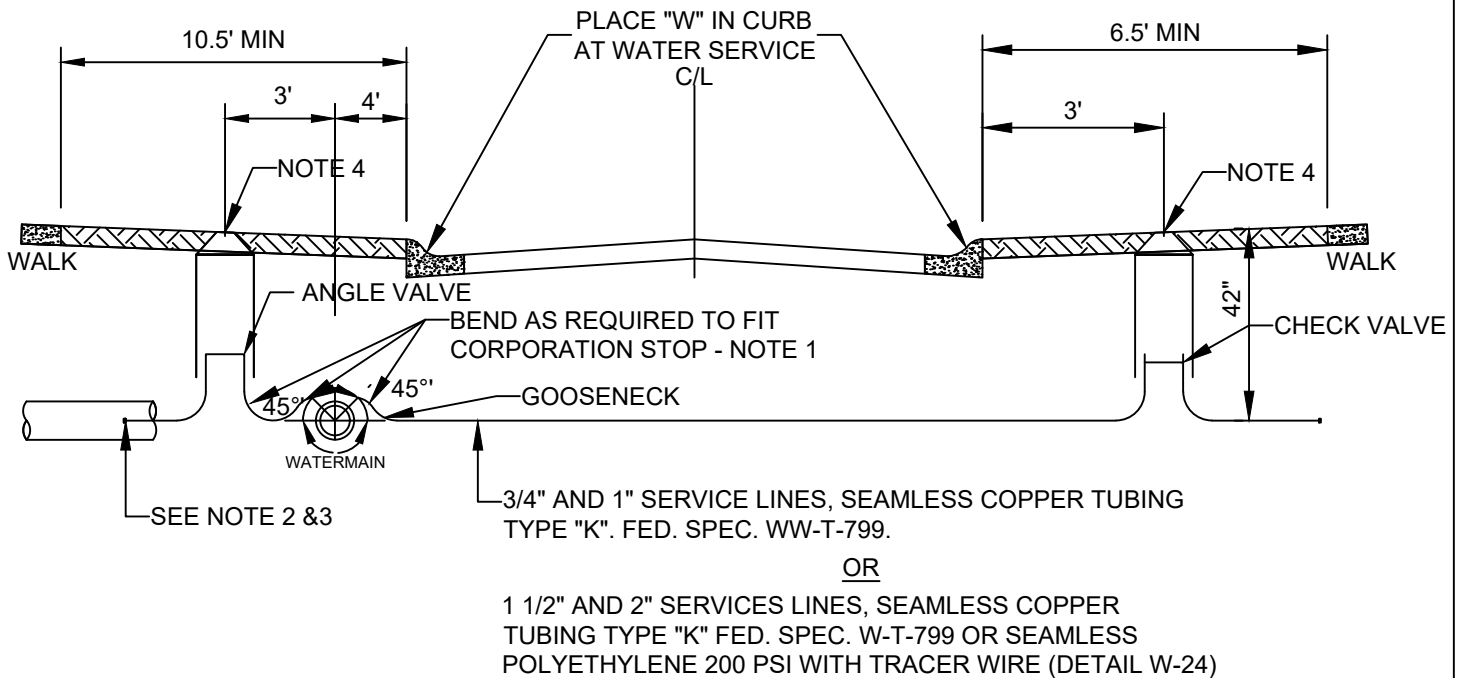
APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-11**



**NOTES:**

- 1) CORPORATION STOP TO BE CAST BRASS OR BRONZE. SEE W-10A OR W-10B.
- 2) ON THE SIDE OF THE ROAD WITH THE WATER MAIN, PLASTIC TUBING SHALL BE 20' +/- LONG AND EXTEND 23' BEHIND CURB TO CLEAR TELEPHONE AND ELECTRIC EASEMENTS.
- 3) CONTRACTOR SHALL PLACE 2"X4" OR LARGER POSTS, PAINTED BLUE AT BOTH ENDS OF PLASTIC CONDUIT.
- 4) CONTRACTOR SHALL INSTALL A REBAR 5' LONG VERTICALLY AT ANGLE VALVES.
- 5) WATER MAIN WITHIN 3' OF BACK OF CURB MUST HAVE CDF BACKFILL.

**TYPICAL WATER SYSTEM DETAIL**

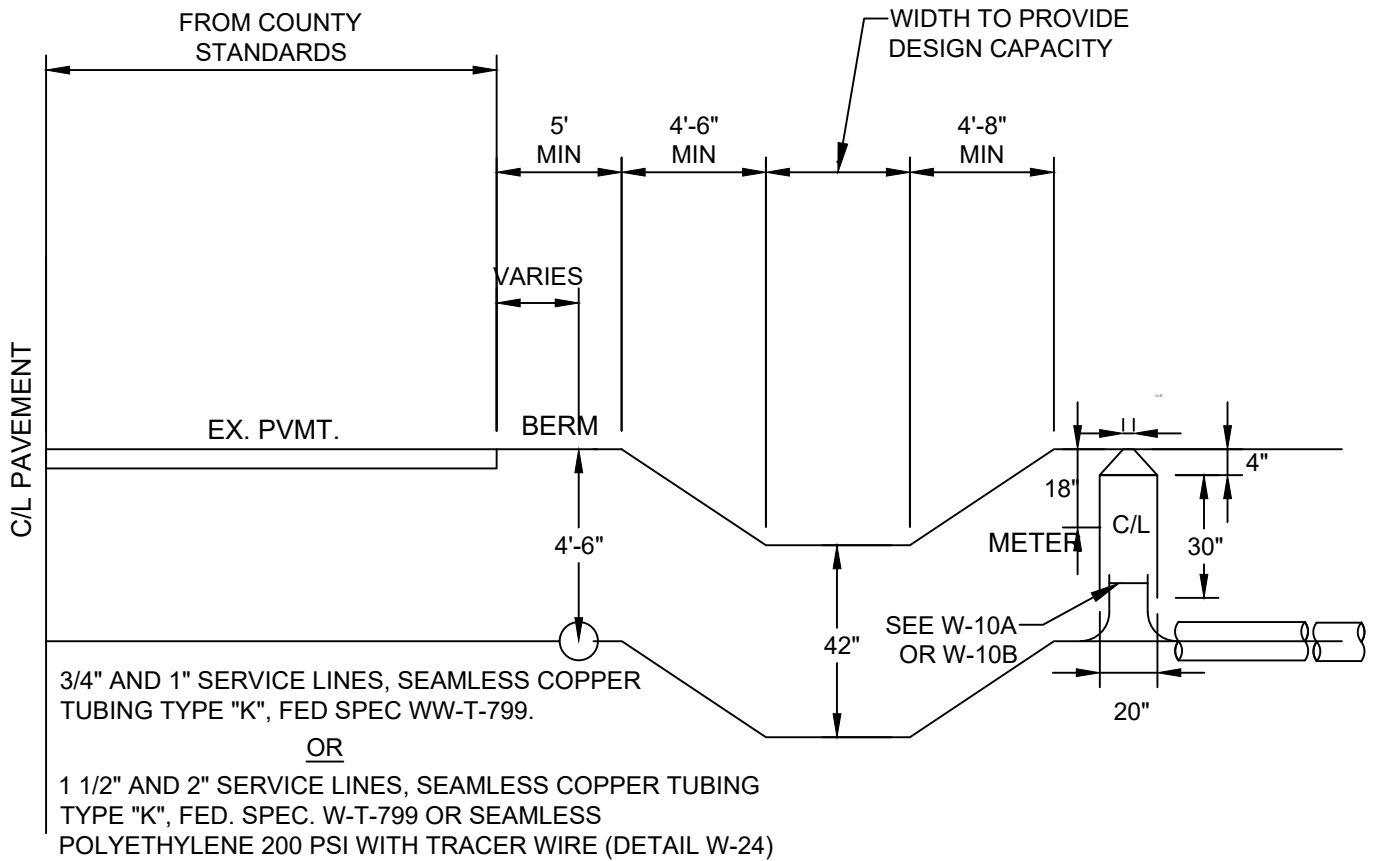
APPROVED/REVISED

MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-12**



**NOTES:**

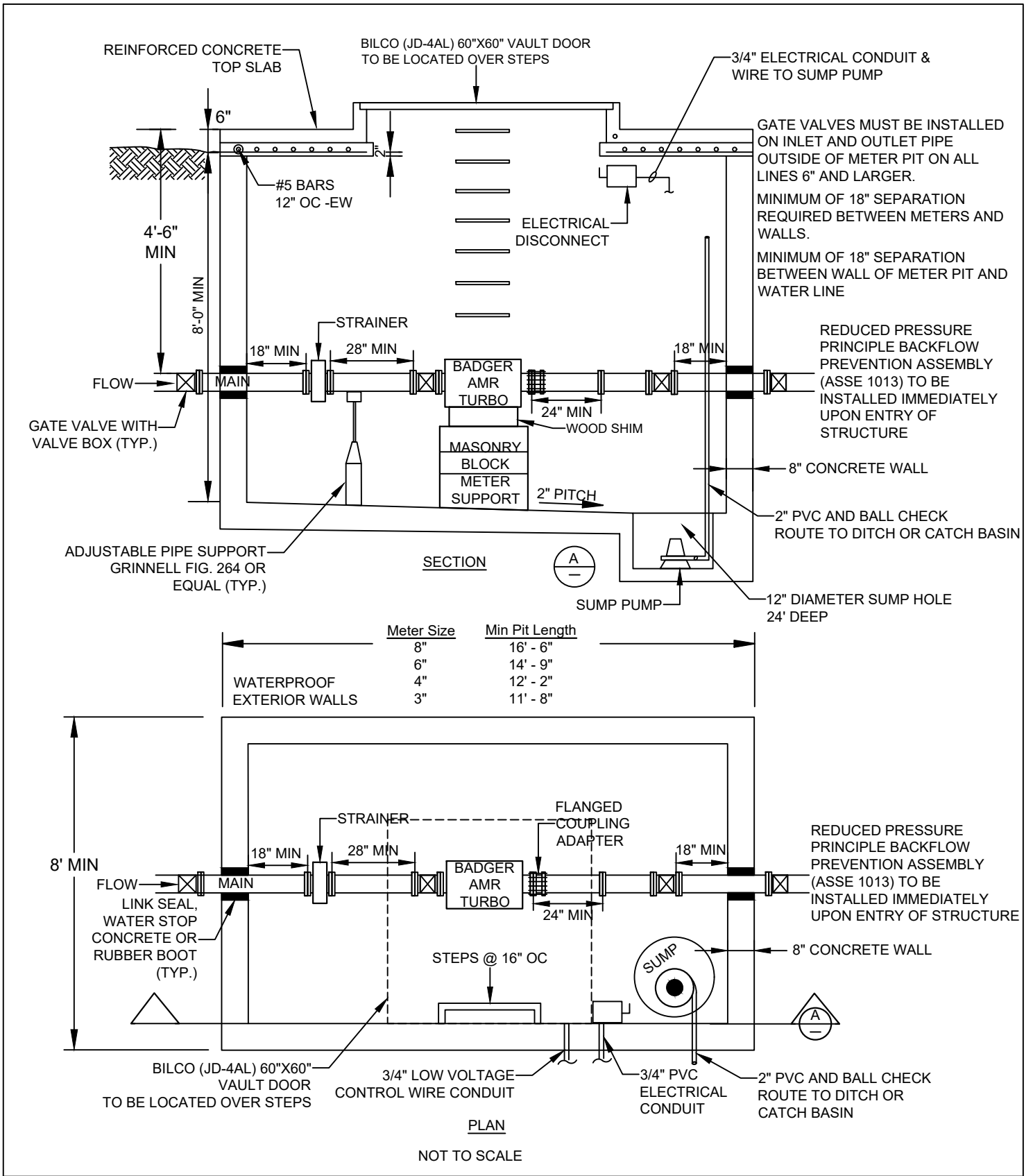
- 1) CORPORATION STOP TO BE CAST BRASS OR BRONZE. SEE W-10A OR W-10B.
- 2) PLASTIC CONDUIT (2" ID) SHALL BE 20' +/- LONG AND EXTEND A MINIMUM OF 2' INTO THE LOTS TO CLEAR UTILITY EASEMENTS.
- 3) CONTRACTOR SHALL PLACE 2"X4" OR LARGER POSTS, PAINTED BLUE AT BOTH ENDS OF PLASTIC CONDUIT.
- 4) CONTRACTOR SHALL INSTALL A REBAR 5' LONG VERTICALLY AT ANGLE VALVES.
- 5) WATER MAIN WITHIN 3' OF BACK OF CURB MUST HAVE CDF BACKFILL.

## DITCH AND METER LOCATION

APPROVED/REVISED  
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**W-13**



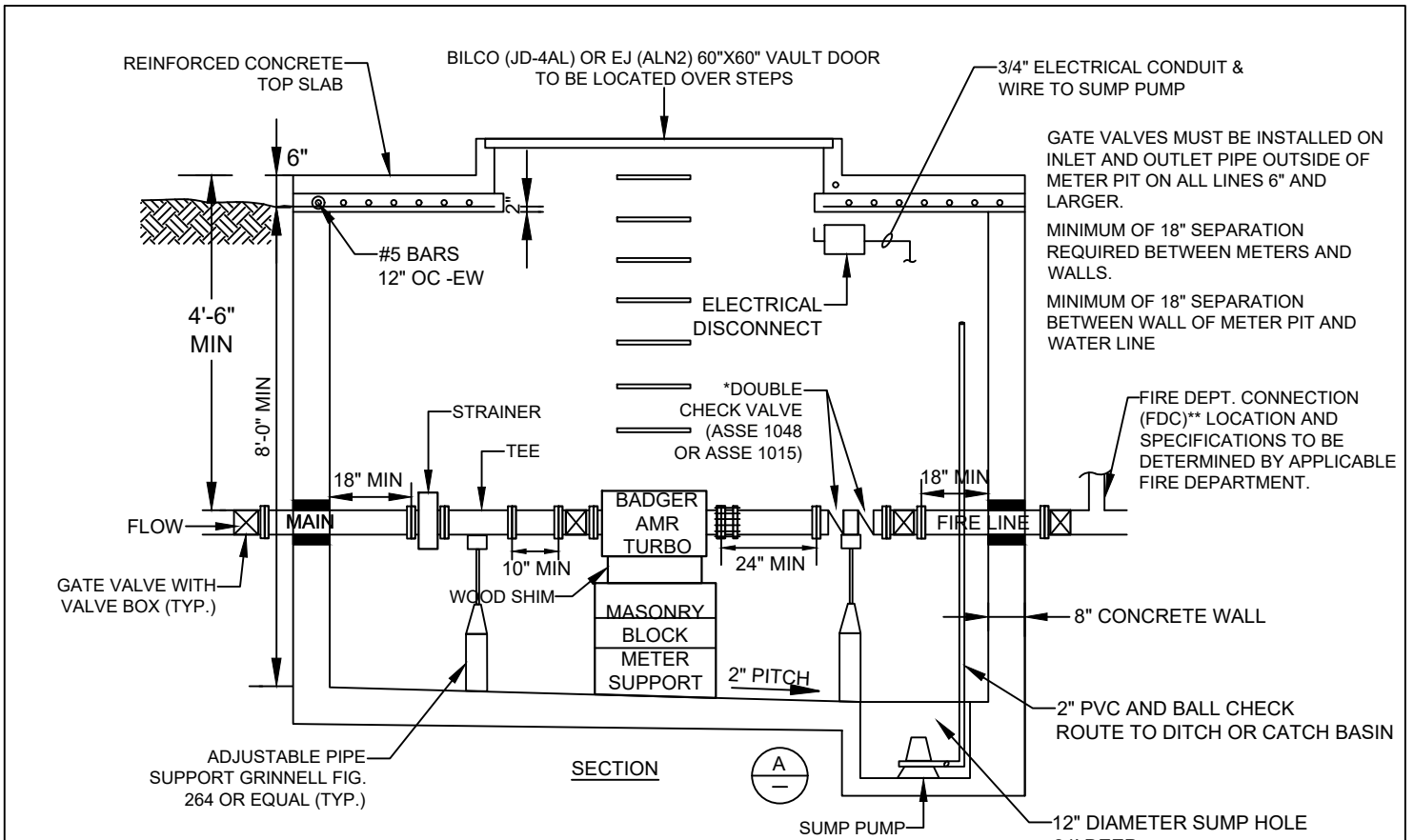
# LARGE DOMESTIC WATER METER PIT

APPROVED/REVISED  
 MAY, 2023

WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**W-14**





GATE VALVES MUST BE INSTALLED ON INLET AND OUTLET PIPE OUTSIDE OF METER PIT ON ALL LINES 6" AND LARGER.

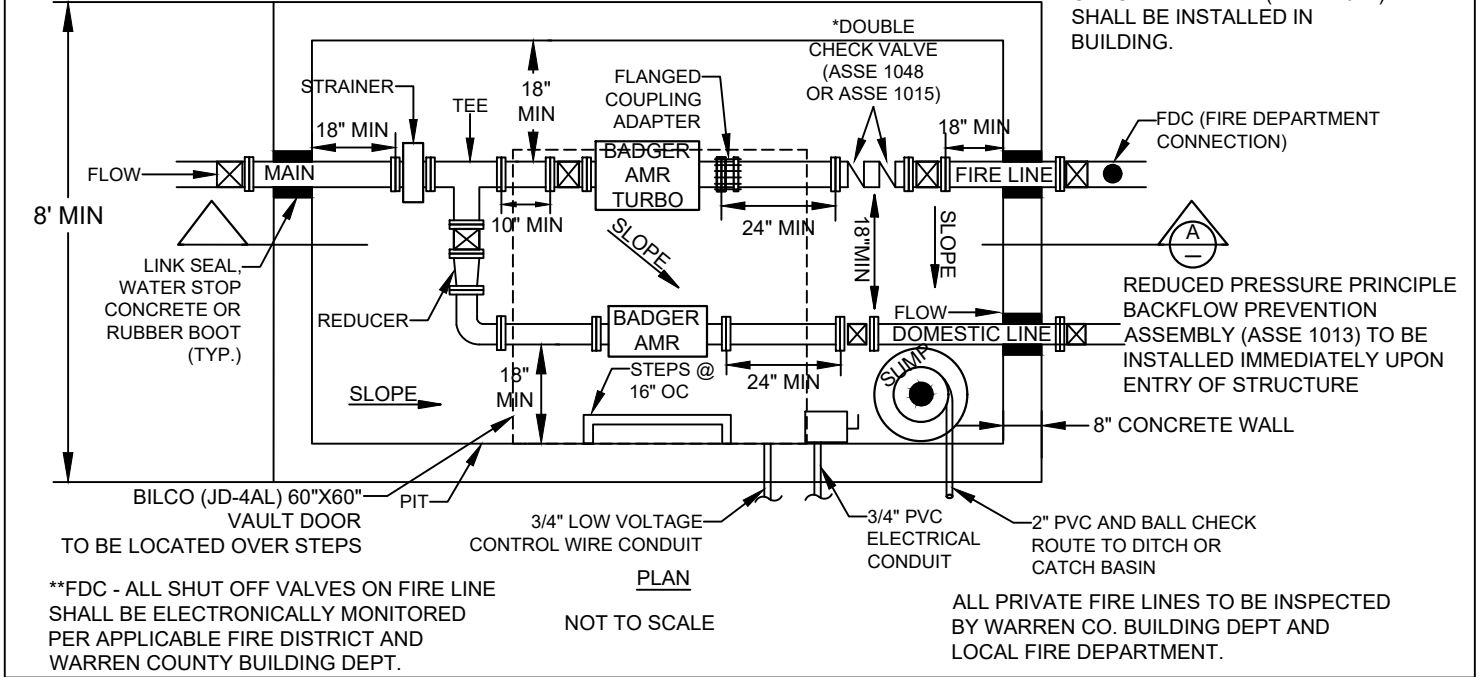
MINIMUM OF 18" SEPARATION REQUIRED BETWEEN METERS AND WALLS.

MINIMUM OF 18" SEPARATION BETWEEN WALL OF METER PIT AND WATER LINE

FIRE DEPT. CONNECTION (FDC)\*\* LOCATION AND SPECIFICATIONS TO BE DETERMINED BY APPLICABLE FIRE DEPARTMENT.

	Meter Size	Min Pit Length
WATERPROOF EXTERIOR WALLS	8"	16' - 6"
	6"	14' - 9"
	4"	12' - 2"
	3"	11' - 8"

\*IF FIRE PROTECTION SYSTEM CONTAINS ADDITIVES, REDUCED PRESSURE PRINCIPAL DETECTOR CHECK ASSEMBLY (ASSE 1047) SHALL BE INSTALLED IN BUILDING.



REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (ASSE 1013) TO BE INSTALLED IMMEDIATELY UPON ENTRY OF STRUCTURE

\*\*FDC - ALL SHUT OFF VALVES ON FIRE LINE SHALL BE ELECTRONICALLY MONITORED PER APPLICABLE FIRE DISTRICT AND WARREN COUNTY BUILDING DEPT.

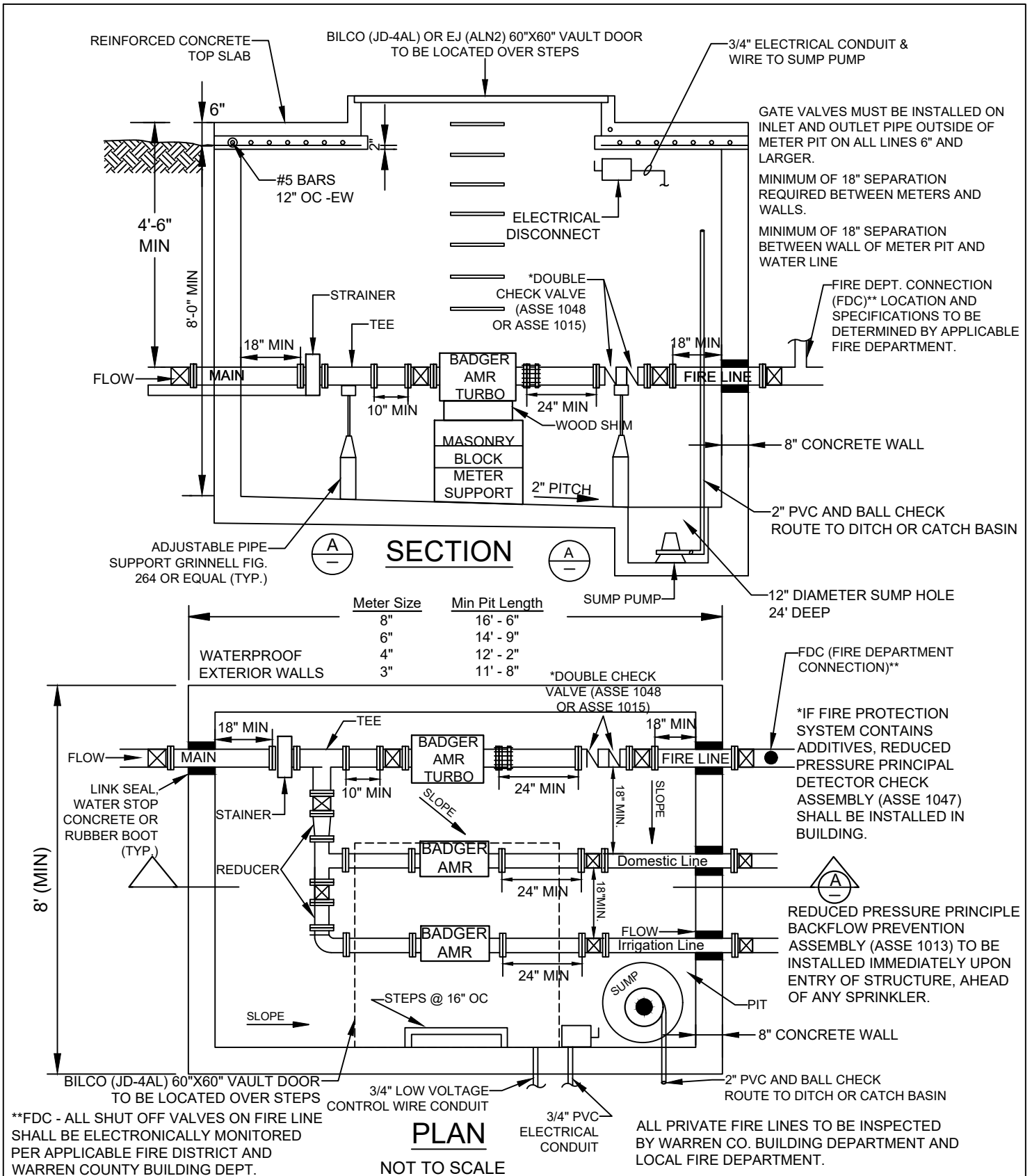
ALL PRIVATE FIRE LINES TO BE INSPECTED BY WARREN CO. BUILDING DEPT AND LOCAL FIRE DEPARTMENT.

## LARGE WATER METER PIT W/ FIRE LINE W/ FDC & DOMESTIC LINE

APPROVED/REVISED  
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**W-15A**



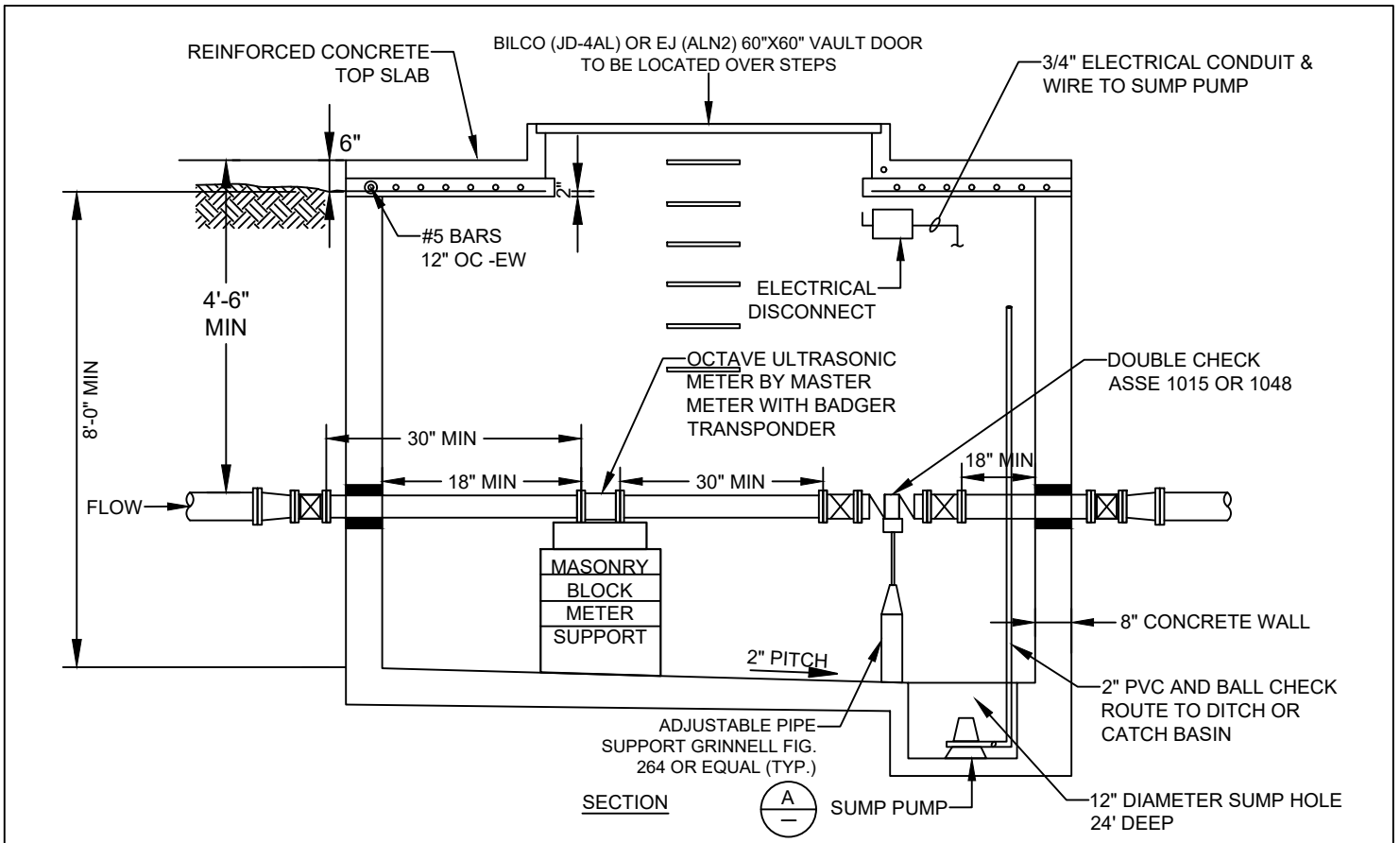
## LARGE WATER METER PIT W/ FIRE LINE, DOMESTIC LINE & IRRIGATION LINE

APPROVED/REVISED  
MAY, 2023

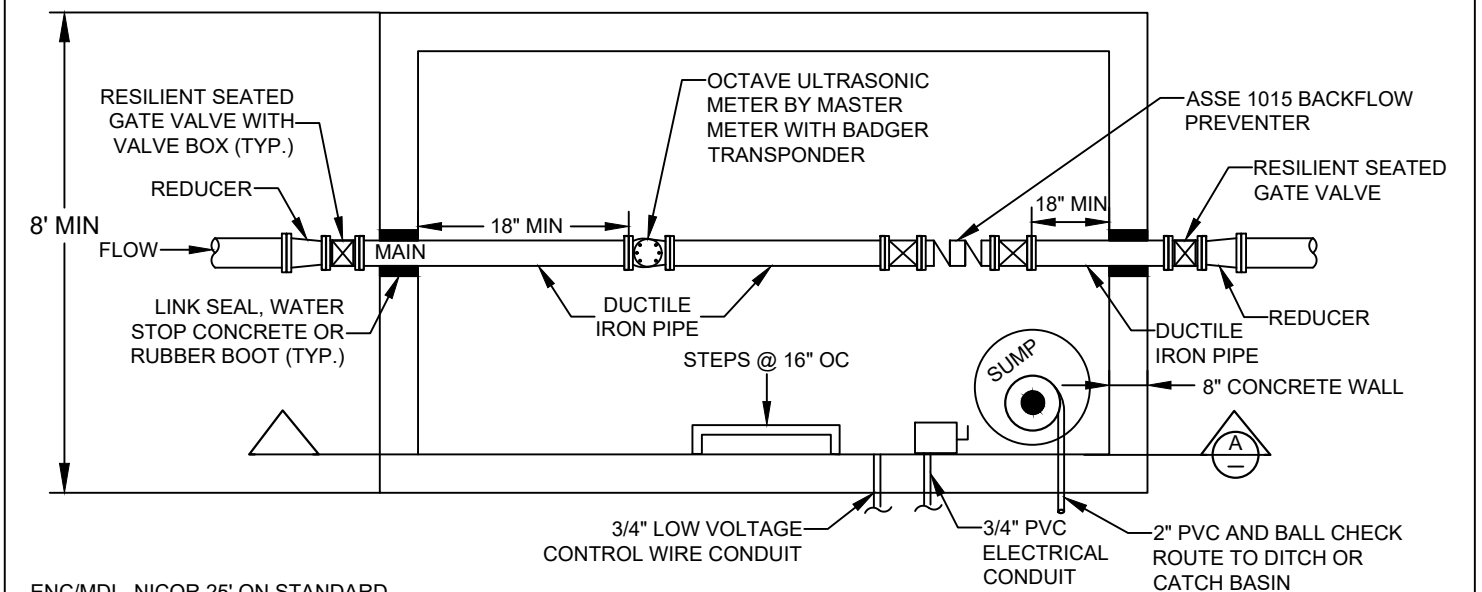
WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

W-15B



	Meter Size	Min Pit Length
WATERPROOF EXTERIOR WALLS	8"	12' - 6"
	6"	12' - 0"



ENC/MDL, NICOR 25' ON STANDARD TO BE PROVIDED AND INSTALLED.

NOT TO SCALE

# COMBINATION FIRE/DOMESTIC METER PIT

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER <b>W-15C</b>
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GATE VALVES - AWWA RESILIENT SEATED WITH CAST IRON BODY, BRONZE MOUNTED, FLANGED CONNECTIONS, NONRISING STEM, FUSION EPOXY COATING, 400 PSI HYDROSTATIC RATED.

FLANGED COUPLING

ADAPTORS - FLANGED ADAPTOR CONNECTIONS FOR PLAIN END PIPE AT FITTINGS AND VALVES SHALL BE DRESSER STYLE 127 OR 128, OR EQUAL.

VAULT DOOR - 60" X 60" DOUBLE LEAF ALUMINUM DIAMOND PLATE WITH HOLD OPEN ARM LOCKS. GREEN SPACE AREA HATCHES RATED FOR 300 PSF. TRAFFIC AREAS SHALL BE AASHTO H-20. DOORS SHALL BE JD-4AL, JD-4AL H20 BY BILCO, EJ ALN2, OR EQUAL.

STRAINER - STRAINERS 6" OR SMALLER MUST BE BADGER BRONZE PLATE STRAINERS OR EQUAL. SCREENS MUST BE MADE OF NON-CORROSIVE 316 STAINLESS STEEL WITH 3/16" OR 1/4" PERFORATIONS. STRAINERS 8" OR LARGER MUST BE BADGER MODEL ML-MS PLATE STRAINERS OR EQUAL. SCREENS MUST BE MADE OF NON-CORROSIVE STAINLESS STEEL.

SUMP PUMP - SUBMERSIBLE PUMP WITH AUTOMATIC LEVEL CONTROL, 115V SINGLE PHASE, DISCHARGE 25 - 30 GPM AT 10 FT TDH. SUMP PUMP OPERATION AND MAINTENANCE IS THE RESPONSIBILITY OF THE OWNER.

PIPING - ALL PIPING 3" AND LARGER SHALL BE CLASS 52 DUCTILE IRON WITH FLANGED FITTINGS. PIPING SMALLER THAN 3" SHALL BE THREADED STEEL. DOMESTIC AND SPRINKLER LINES SHALL BE TYPE K COPPER THROUGH THE VAULT.

BACKFLOW

PREVENTER - FIRE: ASSE 1048 DOUBLE CHECK DETECTOR OR ASSE 1015 DOUBLE CHECK VALVE. ASSE 1047 REDUCED PRESSURE PRINCIPLE DETECTOR IF ADDITIVES IN SYSTEM. ASSE 1047 TO BE INSTALLED IN THE BUILDING.

1. ASSE 1015 & 1048 AND NSF/ANSI 61 APPROVED MODELS:
  - A. ZURN WILKINS, MODEL 350, 350A, 250AST, 250DA, 250ADA, 350ASTDA, 450, OR 450 DA.
  - B. WATTS, SERIES 757, 757N, LF709, 774, LF757DCDA, LF757NDCDA, OR 774DCDA.
2. ASSE 1047 AND NSF/ANSI 61 APPROVED MODELS:
  - A. ZURN WILKINS MODEL 375DA, 375ADA, 374ASTDA, 475DA, OR 475 DAN.
  - WATTS, SERIES 909RPDA, 994RPDA, OR LF957RPDA.

DOMESTIC: ASSE 1013 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLED IMMEDIATELY UPON ENTRY OF STRUCTURE.

IRRIGATION: ASSE 1013 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY INSTALLED IMMEDIATELY UPON ENTRY OF STRUCTURE AND BEFORE ANY SPRINKLERS.

THE OPERATION AND MAINTENANCE OF ALL BACKFLOW PREVENTERS IS THE RESPONSIBILITY OF THE PROPERTY OWNER.

## LARGE WATER METER PIT EQUIPMENT SCHEDULE

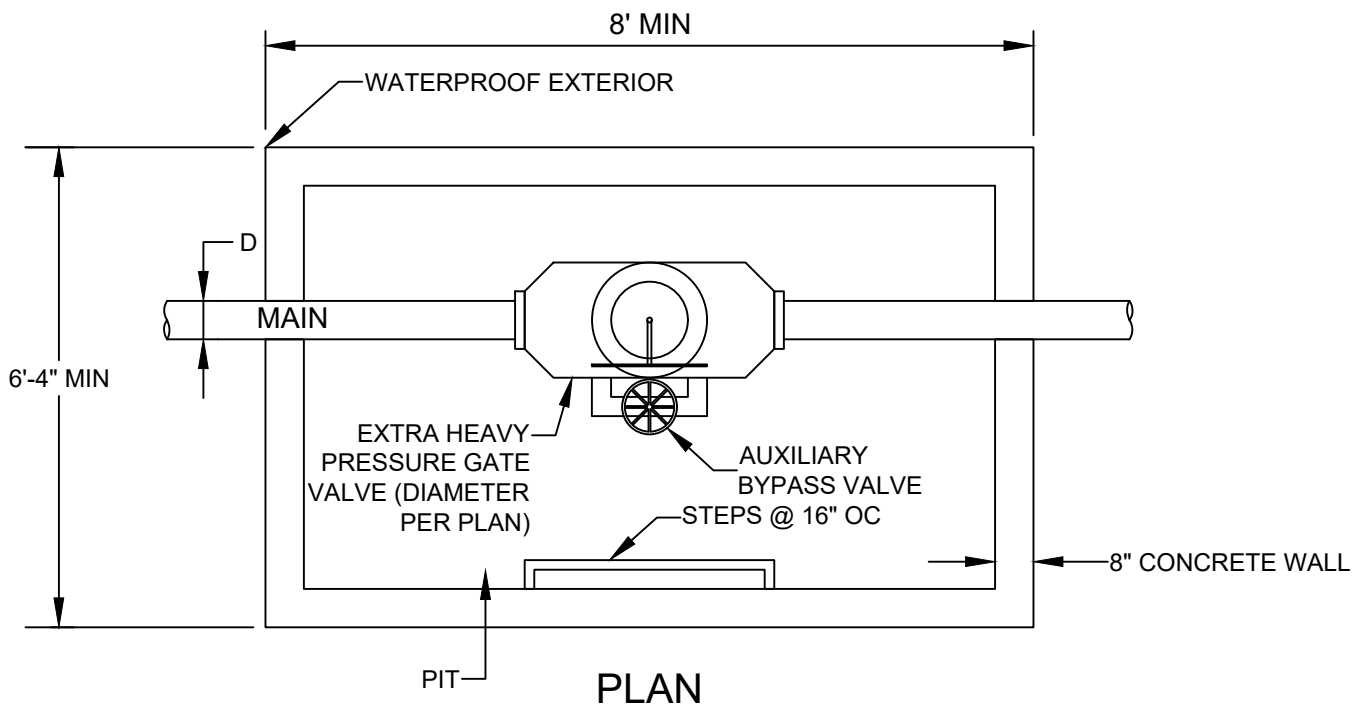
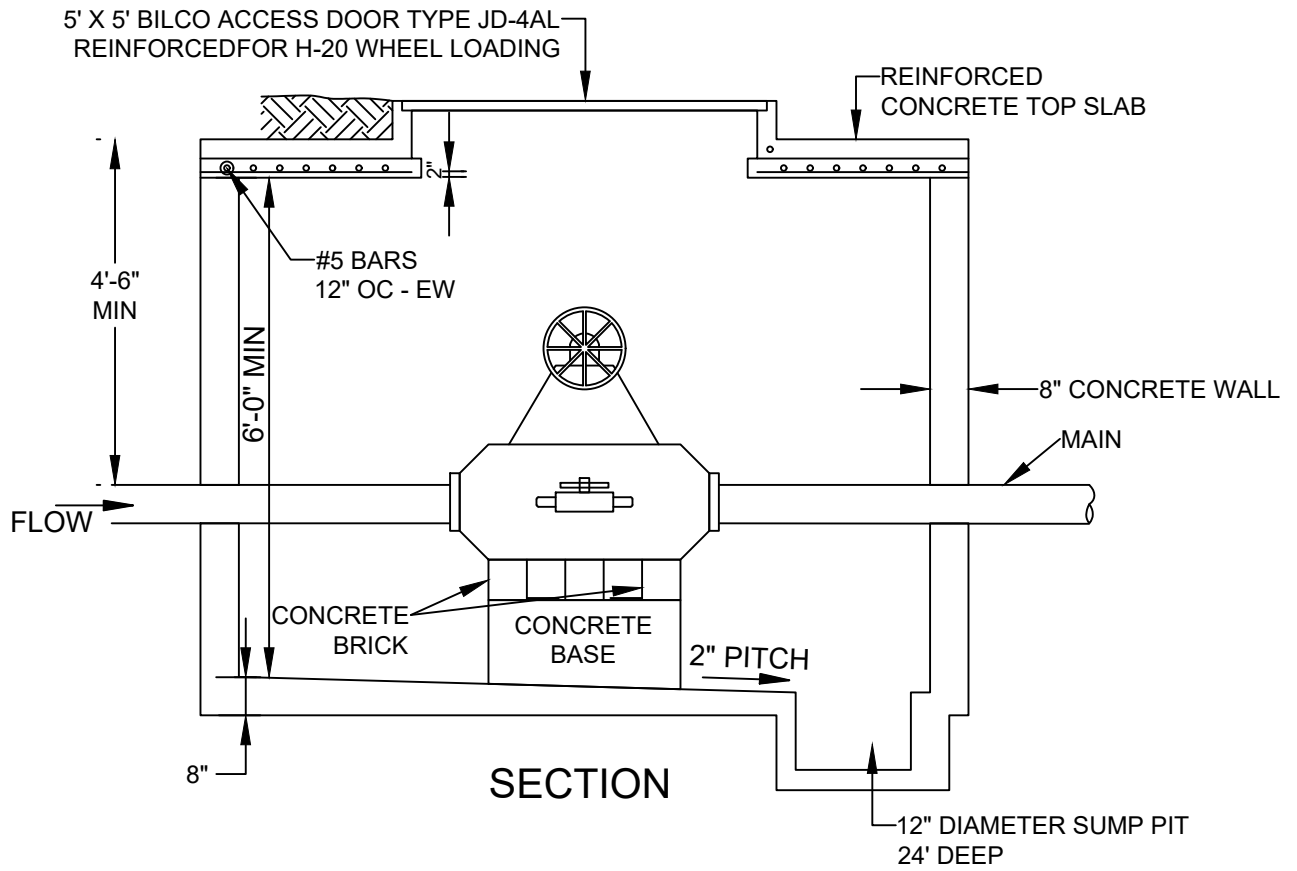
APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-15D**

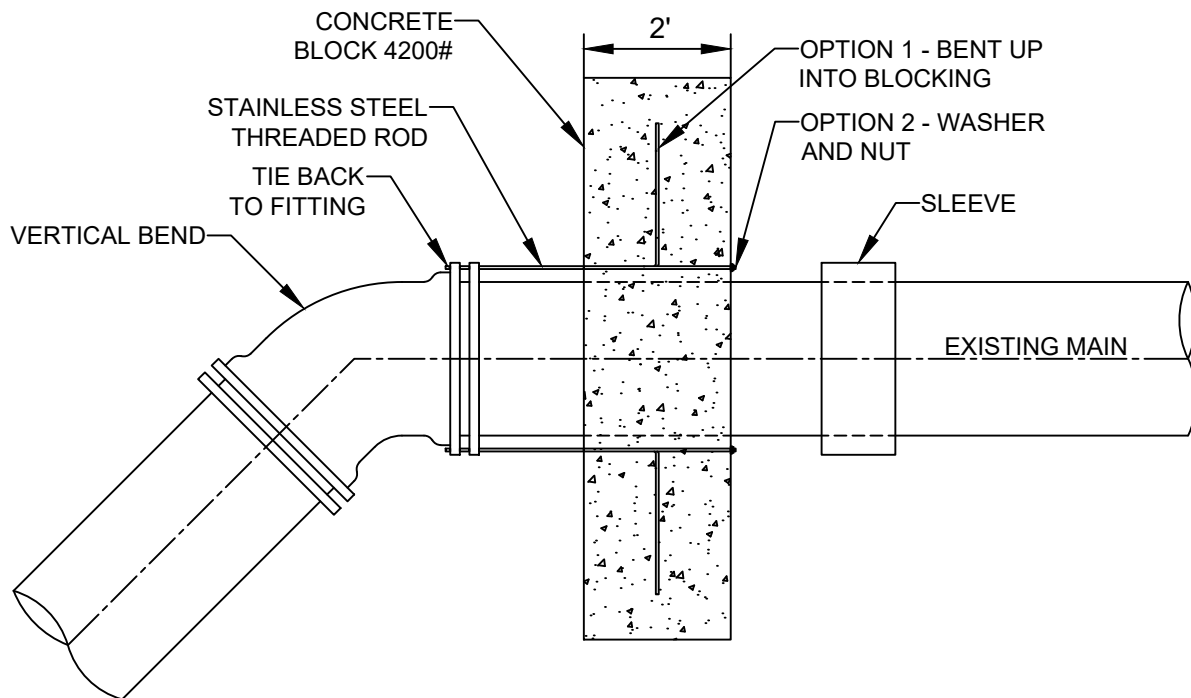


## VALVE PIT

APPROVED/REVISED  
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**W-16**



## VERTICAL BEND RESTRAINT - BLOCK DETAIL

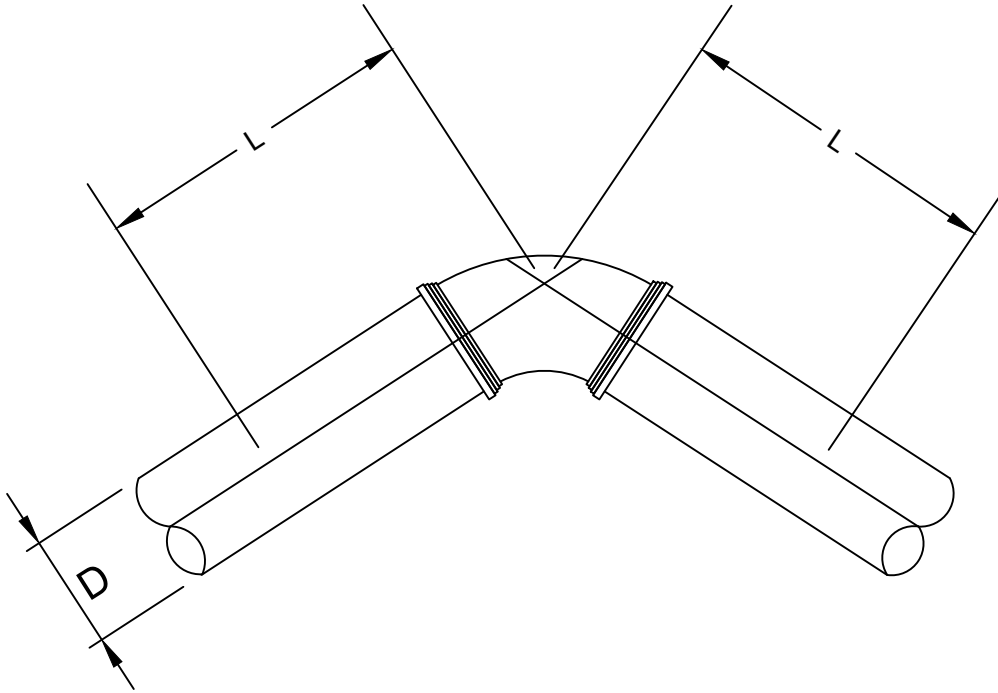
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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-17**



MINIMUM 60' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL HORIZONTAL AND VERTICAL BENDS. REFER TO TABLE BELOW.

**RESTRAINT OPTIONS:**

- MECHANICAL JOINT W/MEGALUGS ~ ALL SIZES OF PIPE
- US TR FLEX OR AMERICAN FLEX RING ~ ALL SIZES OF PIPE
- MJ FIELD LOCKS ~ < 24" PIPE

TABLE  
 REQUIRED LENGTH OF RESTRAINED JOINTS  
 D - DIAMETER OF PIPE  
 L - LENGTH OF PIPE

D	4"	6"	8"	10"	12"	16"	20"	24"
L	60'	60'	60'	60'	66'	98'	125'	145'

**NOTES:**

1. ALL HORIZONTAL AND VERTICAL BENDS SHALL BE LABELED WITH STATIONING.
2. LABEL LIMITS OF REQUIRED RESTRAINED JOINTS WITH STATIONING.

## REQUIRED RESTRAINED JOINTS FOR BENDS

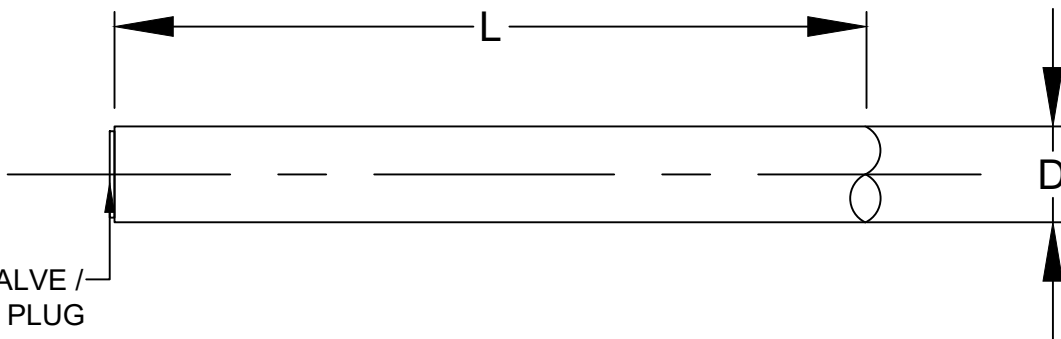
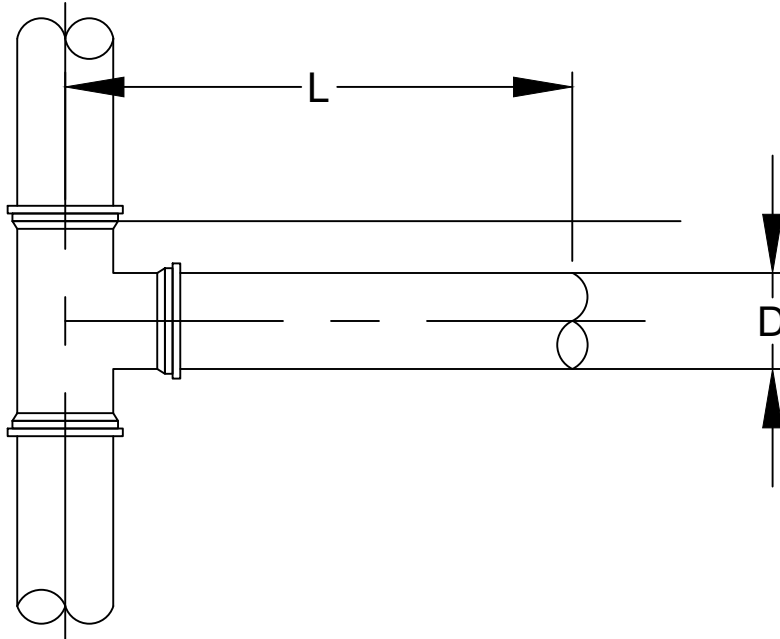
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MAY, 2023

WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# W-18



DEAD END VALVE /  
CAP / PLUG

MINIMUM 60' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL HORIZONTAL AND VERTICAL BENDS. REFER TO TABLE BELOW.

**RESTRAINT OPTIONS:**

- MECHANICAL JOINT W/MEGALUGS ~ ALL SIZES OF PIPE
- US TR FLEX OR AMERICAN FLEX RING ~ ALL SIZES OF PIPE
- MJ FIELD LOCKS ~ < 24" PIPE

TABLE  
REQUIRED LENGTH OF RESTRAINED JOINTS  
D - DIAMETER OF PIPE  
L - LENGTH OF PIPE

D	4"	6"	8"	10"	12"	16"	20"	24"
L	60'	60'	60'	60'	66'	98'	125'	145'

**NOTES:**

1. ALL DEAD END VALVES, PLUGS, CAPS AND TEES SHALL BE LABELED WITH STATIONING.
2. LABEL LIMITS OF REQUIRED RESTRAINED JOINTS WITH STATIONING.

**REQUIRED RESTRAINED JOINTS - DEAD END VALVES  
PLUGS, CAPS & TEES**

APPROVED/REVISED

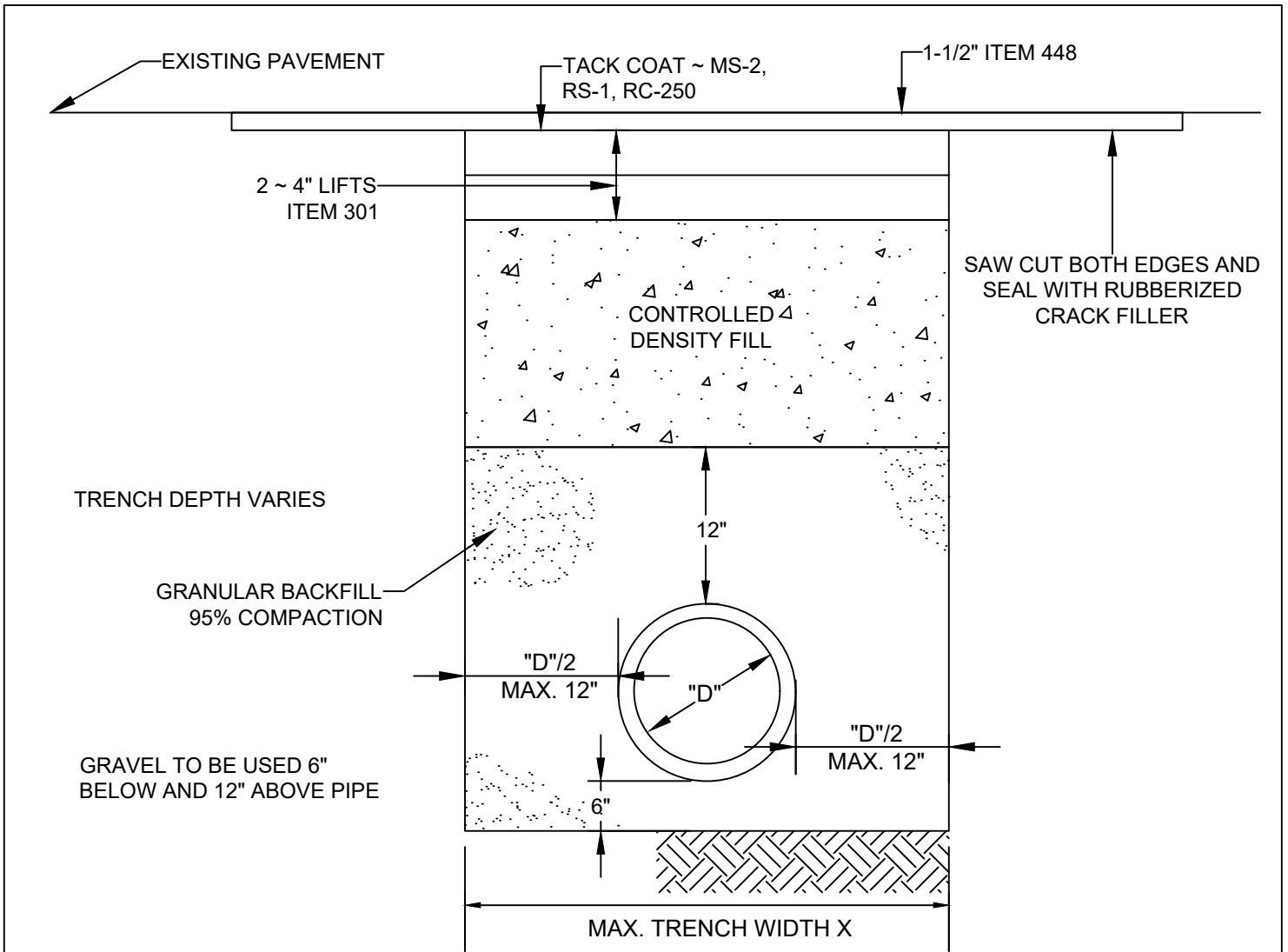
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-19**



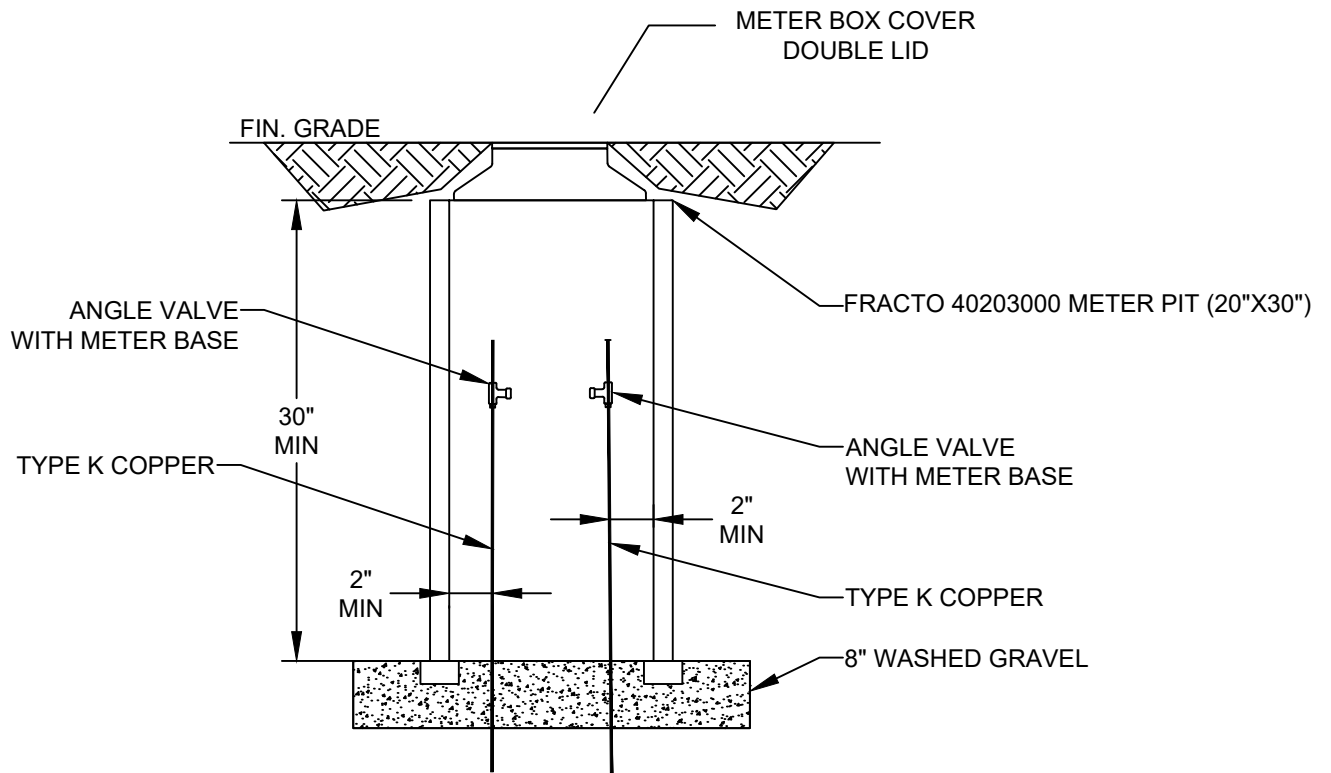


**NOTES:**

1. ALL DIMENSIONS ARE MINIMUM - ACTUAL TO BE PER COUNTY ENGINEER OR ODOT INSTRUCTIONS & PERMIT.
2. TRAFFIC MUST BE MAINTAINED AT ALL TIMES; LIGHTS, SIGNS, BARRICADES AND IF NECESSARY, FLAGMAN AN WATCHMEN TO BE ON JOB FOR PROTECTION OF THE PUBLIC. STREET PLATES MUST CONFORM TO COUNTY ENGINEER OR ODOT REQUIREMENTS.
3. FLASHFILL OR CONTROLLED DENSITY FILL TO A MINIMUM DISTANCE OF 5 FEET BEYOND THE EDGE OF PAVEMENT. TRENCH BACKFILL AND PAVEMENT RESTORATION MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATIONS.
4. EXISTING PAVEMENT AND EDGES SHALL BE NEATLY AND SQUARELY TRIMMED AND/OR MILLED. PAVEMENT MUST MATCH EXISTING ROAD THICKNESS OR AS SPECIFIED BY COUNTY ENGINEER OR ODOT.

**ROAD PAVEMENT CUT AND RESTORATION AT  
ROADWAY CROSSING**

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
MARCH, 2018		<b>W-20</b>



**NOTE:**

CONNECT ON BOTH SIDES OF MAIN LINE GATE VALVE WITH 3/4" TYPE K COPPER CORP STOPS. INSTALL METER PIT & LID WITH 3/4" TYPE K COPPER LINES A MINIMUM OF 18" BELOW METER LID. ONE (1) ANGLE VALVE WITH METER BASE SHALL BE INSTALLED ON BOTH LINES.

## METER TEST PIT AT CREEK CROSSING

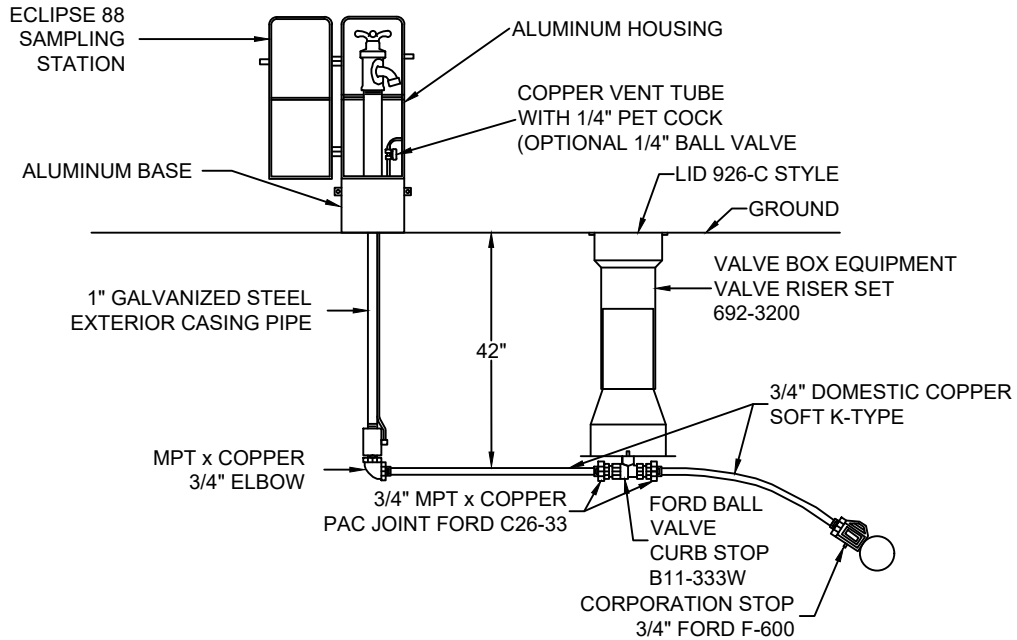
APPROVED/REVISED

MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-21**



SAMPLING STATION TO BE REQUIRED ON EVERY NEW PLATTED SUBDIVISION.

SAMPLING STATIONS SHALL BE BURIED 42", WITH A 3/4" FIP INLET AND A (3/4" HOSE OR UNTHREADED) NOZZLE.

ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE, ALUMINUM CAST HOUSING.

WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY.

ALL WORKING PARTS WILL ALSO BE OF BRASS AND BE REMOVABLE FROM ABOVE GROUND WITH NO DIGGING. EXTERIOR PIPING SHALL BE BRASS OR GALVANIZED.

A COPPER VENT TUBE WILL ENABLE EACH STATION TO BE PUMPED FREE OF STANDING WATER TO PREVENT FREEZING AND TO MINIMIZE BACTERIA GROWTH.

ECLIPSE NO. #88 SAMPLING STATION SHALL BE MAUFACTURED BY KUPFERIA FOUNDRY, ST LOUIS, MO 63102.

## SAMPLING STATION

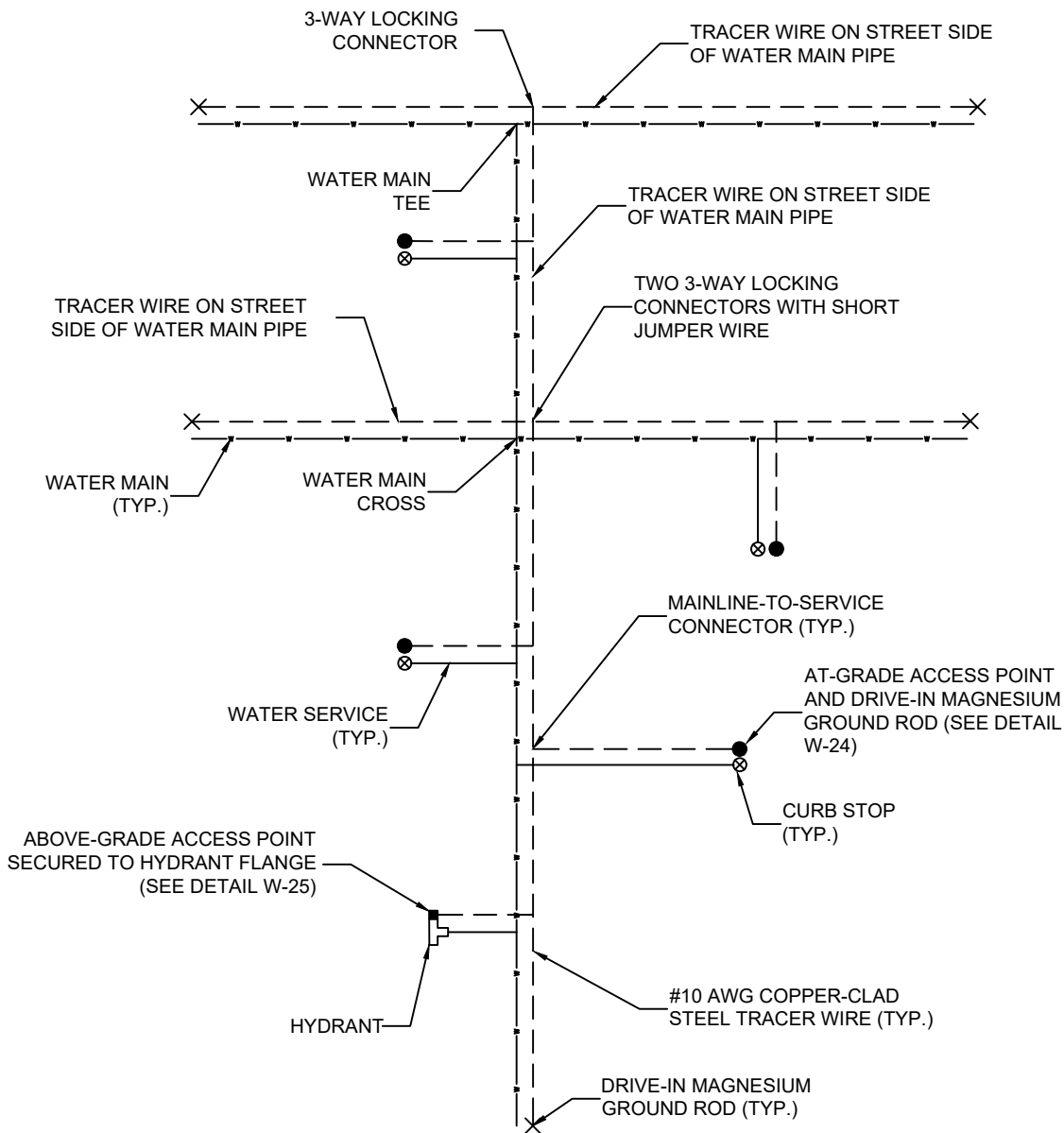
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MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-22**



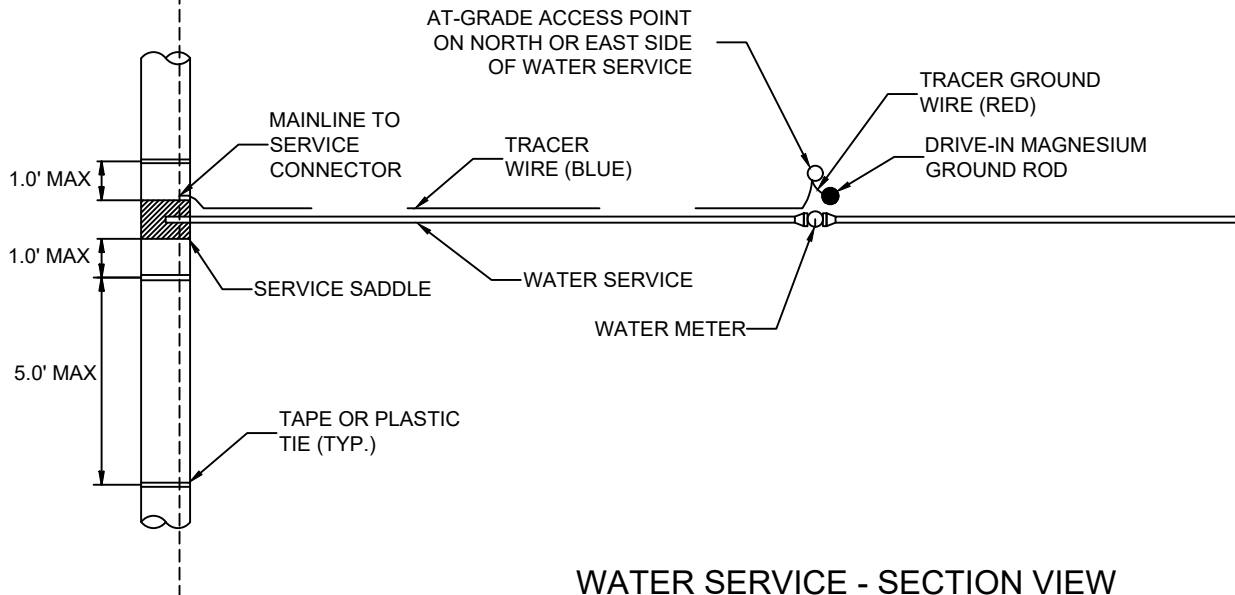
**NOTES:**

1. WIRE SHOWN AWAY FROM PIPE FOR CLARITY.
2. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE BELOW THE SPRING LING.
3. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 5' INTERVALS.
4. TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES, PART NO. 1030B-HS, OR EQUAL.
5. AT-GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. RB14B2T-SW, OR EQUAL.
6. ABOVE GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. T2-B-FLPKG, OR EQUAL.
7. 3-WAY LOCKING CONNECTORS SHALL BE COPPERHEAD INDUSTRIES, PART NO. LSC1030C, OR EQUAL.
8. MAINLINE TO SERVICE CONNECTOR SHALL BE COPPERHEAD INDUSTRIES, PART NO. 3WB-01, OR EQUAL.

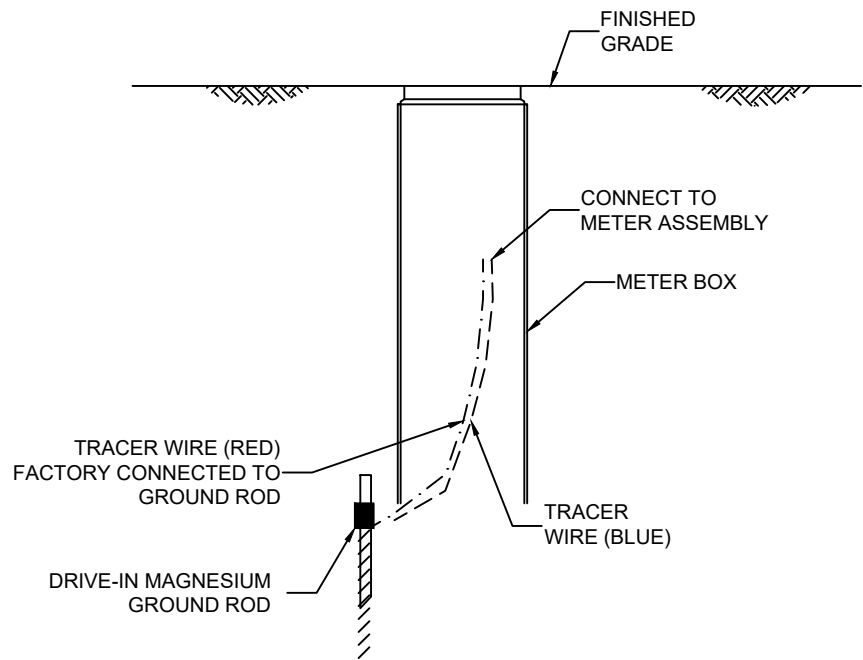
## TRACER WIRE - PLAN

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <h1 style="font-size: 2em; margin: 0;">W-23</h1>
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## WATER SERVICE - PLAN VIEW



## WATER SERVICE - SECTION VIEW



### NOTES:

1. WIRE SHOWN AWAY FROM PIPE FOR CLARITY.
2. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE BELOW THE SPRING LING.
3. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 5' INTERVALS.
4. TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES, PART NO. 1030B-HS, OR EQUAL.
5. AT-GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. RB14B2T-SW, OR EQUAL.
6. ABOVE GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. T2-B-FLPKG, OR EQUAL.
7. 3-WAY LOCKING CONNECTORS SHALL BE COPPERHEAD INDUSTRIES, PART NO. LSC1030C, OR EQUAL.
8. MAINLINE TO SERVICE CONNECTOR SHALL BE COPPERHEAD INDUSTRIES, PART NO. 3WB-01, OR EQUAL.
9. GROUND ROD AND TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES, PART NO. ANO-12, OR EQUAL.

## TRACER WIRE - WATER SERVICE PLAN

APPROVED/REVISED

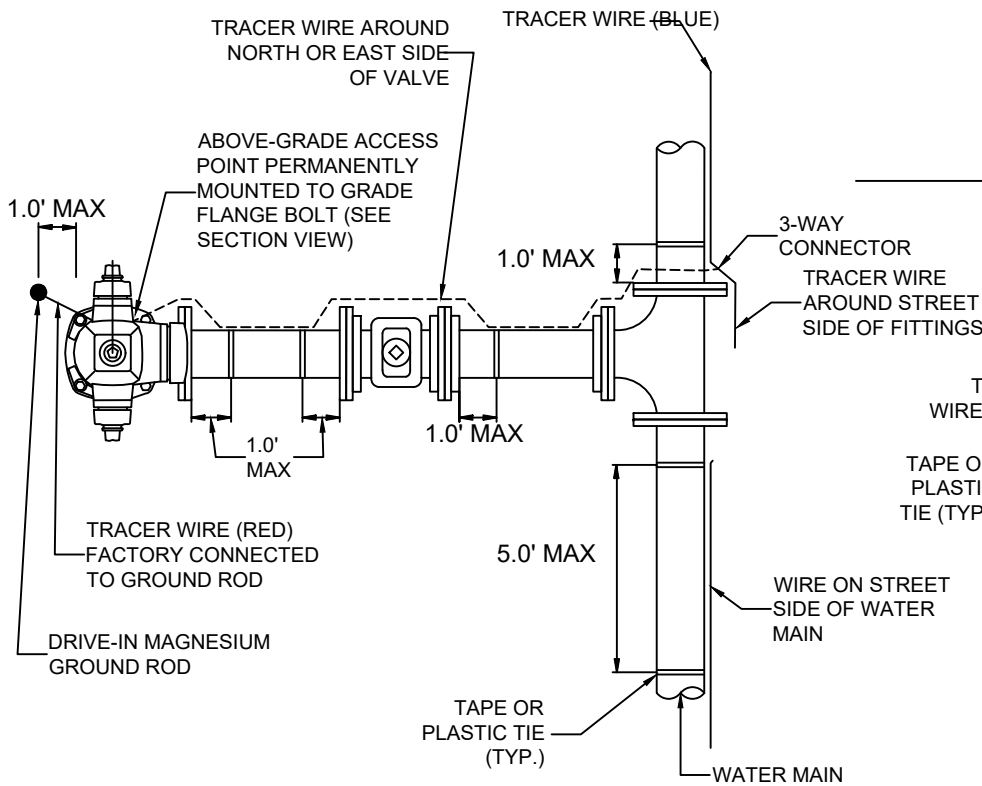
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

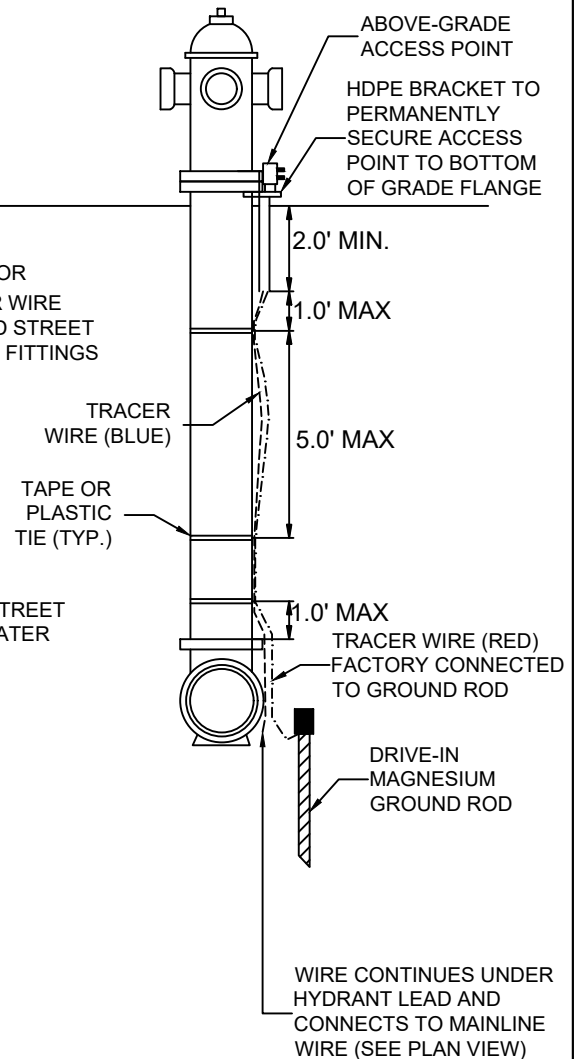
STANDARD NUMBER

# W-24

## HYDRANT - PLAN VIEW



## HYDRANT - SECTION VIEW



### NOTES:

1. WIRE SHOWN AWAY FROM PIPE FOR CLARITY.
2. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE BELOW THE SPRING LING.
3. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 5' INTERVALS.
4. TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES, PART NO. 1030B-HS, OR EQUAL.
5. AT-GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. RB14B2T-SW, OR EQUAL.
6. ABOVE GRADE ACCESS POINT SHALL BE COPPERHEAD INDUSTRIES, PART NO. T2-B-FLPKG, OR EQUAL.
7. 3-WAY LOCKING CONNECTORS SHALL BE COPPERHEAD INDUSTRIES, PART NO. LSC1030C, OR EQUAL.
8. MAINLINE TO SERVICE CONNECTOR SHALL BE COPPERHEAD INDUSTRIES, PART NO. 3WB-01, OR EQUAL.
9. GROUND ROD AND TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES, PART NO. ANO-12, OR EQUAL.
10. FOR HYDRANT SETTING AND HYDRANT ARRANGEMENT SEE DETAILS W-8 AND W-9.

## TRACER WIRE - FIRE HYDRANT PLAN

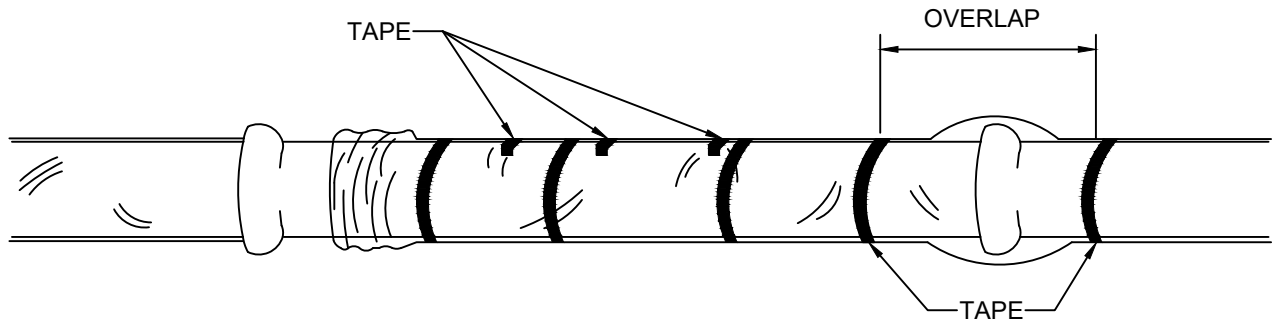
APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-25**



TUBE SIZE REQUIRED							
PIPE DIAMETER	4"	6"	8"	10"	12"	16"	20"
MIN. FLAT TUBE WIDTH	14"	16"	20"	24"	27"	34"	41"

**MATERIALS:**

1. POLYETHYLENE ENCASEMENT: IN ACCORDANCE WITH ASTM D-1248 TYPE 1, CLASS A OR C, GRADE E-1.  
 FLOW RATE = 0.4 MAX, DIELECTRIC STRENGTH  
 VOLUME RESISTIVELY MIN. OHM-CM<sup>3</sup> = 10<sup>6</sup>  
 POLYETHYLENE FILE THICKNESS = 8 MILS  
 INTERIOR VOLATILE CORROSION INHIBITOR AND ANTI-MICROBIAL ADDITIVE = 1.5 MILS  
 TENSILE STRENGTH = 1200 P.S.I MIN.  
 ELONGATION = 300% MIN.  
 DIELECTRIC STRENGTH = 800 VOLTS/MIL
2. TAPE: POLYETHYLENE TAPE 1-1/2" WIDE AS RECOMMENDED BY THE FILM MANUFACTURER.

**PROCEDURE FOR APPLYING POLYETHYLENE ENCASEMENT**

1. REMOVE ALL LUMPS OF CLAY, MUD, CINDERS, OR OTHER MATERIAL THAT MIGHT HAVE ACCUMULATED ON THE PIPE SURFACE.
2. CUT POLYETHYLENE TUBE TO A LENGTH APPROXIMATELY TWO FEET LONGER THAN THE LENGTH OF THE PIPE SECTION. SLIP THE TUBE AROUND THE PIPE, STARTING AT THE SPIGOT END. BUNCH THE TUBE ACCORDION FASHION ON THE END OF THE PIPE. PULL BACK THE OVERHANGING END OF THE TUBE AND CIRCUMFERENTIALLY TAPE IT TO THE BARREL OF THE PIPE JUST BEHIND THE INSERTION LINE. AFTER ASSEMBLY OF THE JOINT, THE TAPE SHOULD BE AS CLOSE TO THE FACE OF THE BELL AS POSSIBLE BUT NOT SO CLOSE TO THE SPIGOT END THAT IT INTERFERES WITH THE GASKET.
3. TAKE UP THE SLACK IN THE TUB ALONG THE BARREL OF THE PIPE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD THE EXCESS POLYETHYLENE BACK OVER THE TOP OF THE PIPE AND USE PIECES OF TAP ACROSS THE FOLD TO SECURELY HOLD IT.
4. DIG A SHALLOW BELL HOLE IN THE TRENCH BOTTOM AT THE JOINT LOCATION TO FACILITATE INSTALLATION OF THE POLYETHYLENE TUBE. LOWER THE PIPE INTO THE TRENCH AND MAKE THE PIPE JOINT WITH THE PRECEDING SECTION OF PIPE.
5. SLIDE THE TUBE OVER THE REMAINING BARREL OF THE PIPE. SNUGLY FOLD OVER THE EXCESS WRAP USING TAPE TO HOLD IT IN PLACE. MAKE SURE NO DIRT OR OTHER BEDDING BECOMES TRAPPED BETWEEN THE WRAP AND PIPE. SECURE THE POLYETHYLENE WITH A CIRCUMFERENTIAL WRAP OF TAPE EVER FIVE (5') FEET.
6. SECURE THE POLYETHYLENE IN PLACE BEHIND THE PROCEEDING BELL USING A CIRCUMFERENTIAL WRAP OF TAP. MAKE THE OVERLAP OF THE POLYETHYLENE TUBE BY PULING BACK THE BUNCHED POLYETHYLENE FROM THE PRECEDING LENGTH OF PIPE AND ENSURE THERE IS AT LEAST A 12-INCH OVERLAP. PLACE ANOTHER CIRCUMFERENTIAL WRAP OF TAPE ON THE OVERLAPPING POLYETHYLENE, SECURING IT TO THE SPIGOT SIDE OF THE JOINT.

**POLYETHYLENE ENCASEMENT - DUCTILE IRON PIPE**

APPROVED/REVISED

MARCH, 2024

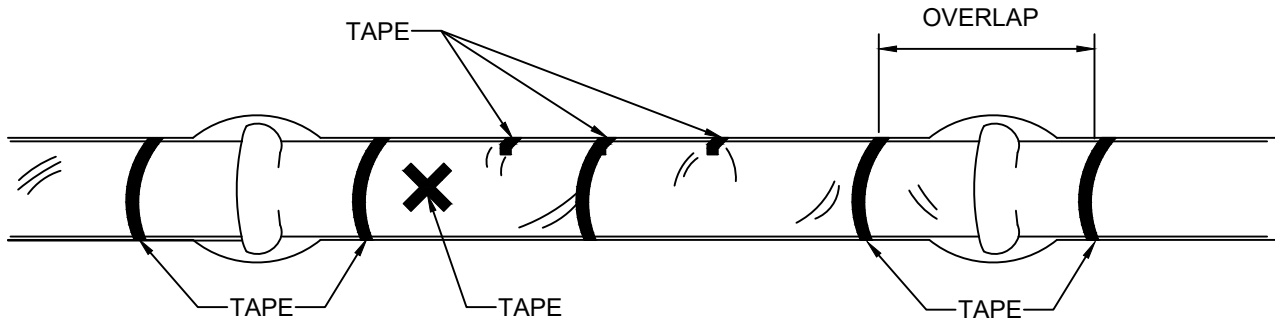
WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-26A**

REPAIR DAMAGED SECTION OF POLYETHYLENE ENCASEMENT:

1. REPAIR ALL SMALL RIPS, TEARS OR OTHER TUBE DAMAGE WITH TWO PIECES OF ADHESIVE TAPE. PLACE THE TAPE OVER THE DAMAGED SECTION IN THE SHAPE OF AN X. IF THE POLYETHYLENE IS BADLY DAMAGED, REPAIR THE DAMAGED AREA WITH A SHEET OF POLYETHYLENE AND SEAL THE EDGES OF THE REPAIR WITH ADHESIVE TAPE.



PIPE SHAPED APPURTENANCES:

BENDS, REDUCERS, OFFSETS AND OTHER PIPE-SHAPED APPURTENANCES SHALL BE COVERED WITH POLYETHYLENE IN THE SAME MANNER AS THE PIPE.

JUNCTIONS BETWEEN WRAPPED AND UNWRAPPED PIPE:

WHERE POLYETHYLENE WRAPPED PIPE JOINTS A PIPE WHICH IS NOT WRAPPED, EXTEND THE POLYETHYLENE TUBE TO COVER THE UNWRAPPED PIPE A DISTANCE OF AT LEAST TWO FEET. SECURE THE END WITH CIRCUMFERENTIAL TURNS OF TAPE.

ODD SHAPED APPURTENANCES

VALVES, TEES, CROSSES AND OTHER ODD-SHAPED PIECES WHICH CANNOT BE WRAPPED PRACTICALLY IN A TUBE SHALL BE WRAPPED WITH A FLAT SHEET OR SPLIT LENGTH OF POLYETHYLENE TUBE. THE SHEET SHALL BE PASSED UNDER THE APPURTENANCE AND BROUGHT UP AROUND THE BODY. SEAMS SHALL BE MADE BY BRINGING THE EDGES TOGETHER, FOLDING OVER TWICE AND TAPPING DOWN. SLACK WIDTH AND OVERLAPS AT JOINTS SHALL BE HANDLED AS DESCRIBED ABOVE. TAPE POLYETHYLENE SECURELY IN PLACE AT VALVE STEM AND OTHER PENETRATIONS.

BACKFILL FOR POLYETHYLENE WRAPPED PIPE

BACKFILL MATERIAL SHALL BE AS SHOWN IN STANDARD DETAIL W-2. SPECIAL CARE SHOULD BE TAKEN TO PREVENT DAMAGE TO THE POLYETHYLENE WRAPPING WHEN PLACING BACKFILL. BACKFILL MATERIAL SHOULD BE FREE FROM CINDERS, REFUSE, BOULDERS, ROCKS, STONES OR OTHER MATERIAL THAT COULD DAMAGE THE POLYETHYLENE.

**POLYETHYLENE ENCASEMENT - DUCTILE IRON PIPE CONT.**

APPROVED/REVISED

MARCH, 2024

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

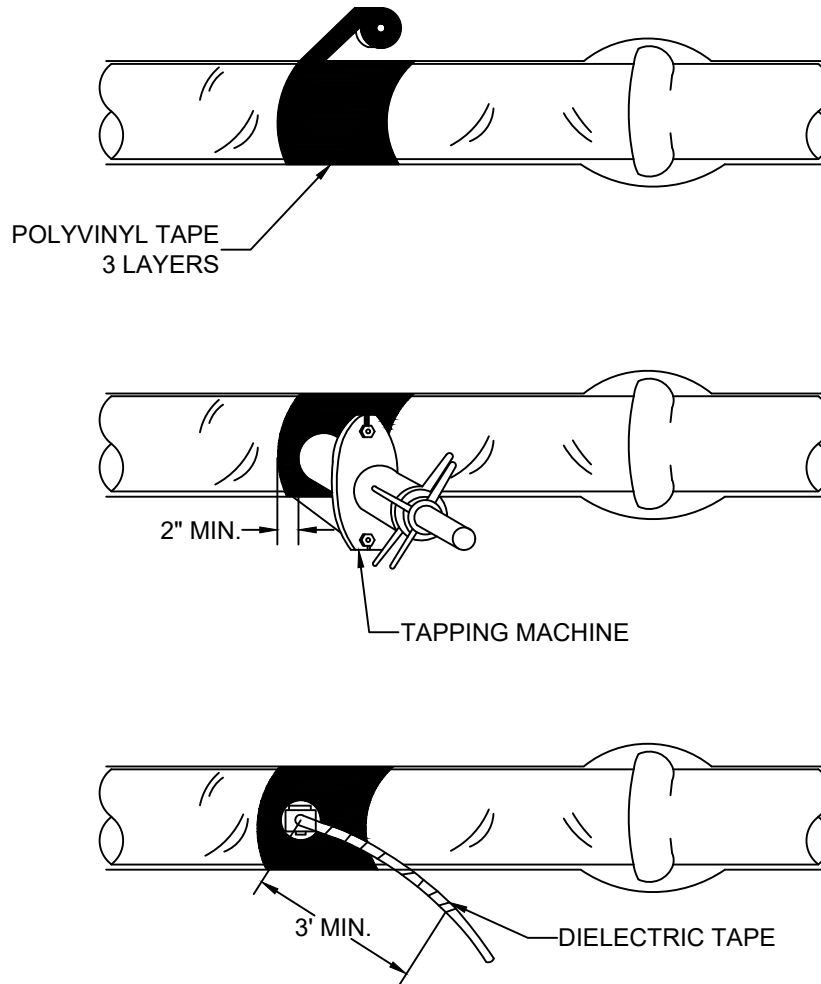
STANDARD NUMBER

**W-26B**



PROCEDURE FOR MAKING OPENINGS FOR BRANCHES, SERVICE TAPS, BLOW-OFFS, AIR VALVES, AND SIMILAR APPURTENANCES

1. WRAPPING THREE (3) LAYERS OF POLYVINYL - COMPATIBLE ADHESIVE TAP COMPLETELY AROUND THE PIPE TO COVER THE AREA WHERE THE TAPPING MACHINE AND CHAIN WILL BE MOUNTED, EXTENDING A MINIMUM OF 2" BEYOND THE MOUNTING SURFACE.
2. MOUNT THE TAPPING MACHINE ON THE PIPE AREA COVERED BY THE TAPE AND MAKE THE TAP AND INSTALL THE FERRULE DIRECTLY THROUGH THE TAPE AND POLYETHYLENE.
3. INSPECT THE ENTIRE CIRCUMFERENTIAL AREA FOR DAMAGE AND MAKE ANY NECESSARY REPAIRS WITH TAPE.
4. ON HOUSE SERVICES TO MINIMIZE THE POSSIBILITY OF DISSIMILAR METAL CORROSION AT SERVICE CONNECTIONS, WRAP THE FERRULE AND A MINIMUM CLEAR DISTANCE OF THREE (3) FEET OF THE COPPER SERVICE WITH POLYETHYLENE OR A SUITABLE DIELECTRIC TAPE.



## TAPPING POLYETHYLENE ENCASED PIPE

APPROVED/REVISED

MARCH, 2024

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**W-27**

## GENERAL NOTES - WATER

1. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 4'-6".
  - A. ALL WATER SERVICE LATERALS SHALL HAVE A MINIMUM COVER OF 42".
2. ALL WATER MAINS SHALL BE DUCTILE IRON CONFORMING WITH AWWA SPEC. C-151 CLASS 52 IN SIZES 4"-16" AND PSI CLASS 350 FOR 20" AND ABOVE.
3. ALL WATER MAINS SHALL BE INSTALLED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH STANDARD DETAILS W-26A, W-26B AND W-27.
4. COMPACT FITTINGS ARE PERMITTED.
5. ALL WATER VALVES MUST OPEN LEFT. ALL VALVE BOX LIDS MUST BE CAST/ STAMPED "WCWD" IN 1 1/2" LETTERS AND BE NEENAH NF-19130002 OR EQUAL. ALL VALVE EXTENSIONS TO HAVE SET SCREWS. ALL VALVES TO BE EQUIPPED WITH BOX-LOX-2.
6. A CONCRETE SLAB MUST BE PROVIDED AT FINAL GRADE AROUND ALL MAIN VALVE BOXES. THE SLABS MUST BE EIGHTEEN INCHES (18") SQUARE/CIRCLE AND NINE INCHES (9") THICK. PRE-FABRICATED CONCRETE RINGS ARE ACCEPTABLE.
7. WATER AND SEWER LINES SHALL HAVE A MINIMUM OF TEN FEET (10') HORIZONTAL SEPARATION AND/OR TWO FEET (2') VERTICAL SEPARATION.
8. NO GATE VALVE, METER PIT, BLOW OFF OR CORPORATION STOP SHALL BE LOCATED UNDER OR WITHIN THREE FEET (3') OF DRIVEWAYS, ROADWAYS OR SIDEWALKS.
9. NO DRIVEWAY SHALL BE INSTALLED WITHIN FIVE FEET (5') OF A FIRE HYDRANT.
10. A MINIMUM OF THREE FEET (3') IS REQUIRED BETWEEN CORPORATION STOPS. NO TAP SHALL BE MADE WITHIN THREE (3') OF A BELL.
11. THE LOCATION OF WATER SERVICE LATERALS MUST BE STAMPED IN THE CURB AT THE TIME THE CURB IS PLACED TO PERMANENTLY INDICATE THE LOCATION OF SAID LATERALS.
12. THE LOCATION OF ALL WATER SERVICE LATERALS, BENDS, TEES, ETC. MUST BE PROVIDED ON THE AS-BUILT PLANS. ALL OF THESE APPURTENANCES SHOULD BE SURVEYED IN STATE PLANE COORDINATES AND ELECTRONICALLY DELIVERED WITH AS-BUILTS.
13. CONTRACTOR SHALL SUBMIT AS-BUILT PLANS OF SANITARY AND WATER LATERALS TO THE OWNER.
14. ALL WATER MAINS CROSSING UNDER STORM DRAINS SHALL BE BACK-FILLED WITH GRANULAR MATERIAL, O.D.O.T. ITEM 310.02, BETWEEN MAINS AND DRAINS.
15. ALL NEW WATER MAINS SHALL BE PRESSURE TESTED FOR 2 HOURS AT 200 PSI. ALLOWABLE LEAKAGE SHALL BE PER TABLE 6A OF AWWA C-600.
16. WHERE PVC IS USED IN RURAL WATER SERVICE AREAS, DETECTABLE WATER TAPE, PRESCO #PSD3105B52, SHOULD BE PLACED 1' ABOVE WATER MAIN.

APPROVED/REVISED

MARCH, 2024

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**WG-1A**

## GENERAL NOTES - WATER (CONTINUED)

16. EACH SERVICE LATERAL MUST BE A CONTINUOUS PIECE OF PIPE FROM THE CORP STOP TO THE METER. COUPLINGS SHALL NOT BE ALLOWED. TYPE K COPPER SHALL BE USED FOR 3/4" AND 1" SERVICES. POLYETHYLENE 200 PSI (COPPER TUBE SIZE) MAY BE USED FOR 1 1/2" AND 2" SERVICES. TRACER WIRE MUST BE USED WITH POLY AND SDR 21.
17. SERVICE LINES 1" AND LARGER MUST BE EITHER TYPE K COPPER, POLY 200 PSI (ASTM D-2737) OR SDR 21 (SLIP JOINT) (ASTM-2241). TRACER WIRE MUST BE TAPED EVENLY EVERY 3' ON POLY AND SDR 21 FROM THE METER PIT INTO THE STRUCTURE BEING SERVED (A 3' LEAD IS REQUIRED INSIDE THE PIT).
18. 1 1/2" AND 2" SERVICE LINES FROM THE CORP STOP TO THE METER PIT MUST BE TYPE K COPPER OR POLYETHYLENE 200 PSI. POLY MUST HAVE A TRACER WIRE. SEE W-10B.
19. FIRE HYDRANTS MUST BE PROVIDED AT THE ENTRANCE TO ALL SUBDIVISIONS AND AT ALL STREET INTERSECTIONS.
20. AN APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED ON ALL WATER SERVICE LATERALS BY THE PROPERTY OWNER PRIOR TO ANY POINT OF CONNECTION OR USAGE. THE FOLLOWING DEVICES AND LOCATIONS ARE REQUIRED.
  - A) RESIDENTIAL DWELLING UNITS (3 FAMILY OR LESS): LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE. DUEL CHECK VALVE A.S.S.E. 1024.
  - B) LANDSCAPE IRRIGATION SYSTEMS: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013. LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.
  - C) FIRE PROTECTION SYSTEMS: DOUBLE CHECK DETECTOR CHECK ASSEMBLY A.S.S.E. 1048 OR REDUCED PRESSURE PRINCIPLE DETECTOR CHECK A.S.S.E. 1047 IF SYSTEM CONTAINS ADDITIVES; A.S.S.E. 1048 LOCATED IN VAULT AND A.S.S.E. 1047 LOCATED IN BUILDING.
  - D) NON-RESIDENTIAL SERVICES: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013, LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.
21. BACKFLOW PREVENTION DEVICE THAT COMPLIES WITH A.S.S.E. 1013 IS TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN THE METER PIT.
22. NEW BACKFLOW PREVENTION DEVICES BEING INSTALLED ON EXISTING SERVICES SHALL BE INSTALLED EITHER IMMEDIATELY UPON ENTRY TO THE BUILDING, BEFORE ANY CONNECTIONS, OR IN A PIT OR ABOVE GROUND HEATED INCLOSURE (IN ACCORDANCE WITH DEVICE INSTALLATION REQUIREMENTS) A MINIMUM OF 4 FEET AWAY FROM THE EXISTING METER PIT OR VAULT.
23. SWAB PIPE WITH 50 PPM CHLORINE SOLUTION BEFORE INSTALLATION.
24. DEDUCT METERS SHALL NOT BE ALLOWED.
25. NO IRRIGATION CONNECTIONS SHALL BE ALLOWED IN THE METER PIT.
26. ALL MATERIALS USED SHALL BE DOMESTIC, MADE IN THE UNITED STATES OF AMERICA.

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b>WG-1B</b>
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## PROCEDURE FOR CONNECTION TO EXISTING WATER SYSTEM

1. MUST NOTIFY WARREN COUNTY WATER DEPARTMENT THREE (3) DAYS IN ADVANCE OF ANY SHUT DOWN. WARREN COUNTY WILL ISSUE THE SHUT DOWN NOTIFICATION AND/OR BOIL ADVISORY TO AFFECTED CUSTOMERS PER OHIO EPA REQUIREMENTS IF DETERMINED NECESSARY BY WARREN COUNTY.
2. EXPOSE EXISTING MAIN AT PROPOSED CONNECTION POINT. NO WET TAP SHALL BE MADE WITHIN THREE (3) FEET OF A BELL OR PIPE CONNECTION.
3. COUNTY PERSONNEL TO OPERATE CLOSING OF APPROPRIATE VALVES TO ISOLATE LINE TO BE TAPPED.
4. INSTALL PROPER TAPPING SLEEVE AND TAPPING VALVE. THE TAPPING SLEEVE AND VALVE SHALL BE TESTED AT 200 PSI FOR A PERIOD OF AT LEAST 5 MINUTES. THE PIPE SLUG MUST BE REMOVED AND INSPECTED BY COUNTY PERSONNEL.
5. IF THE TAPPING SLEEVE AND VALVE WILL BE UNDER FUTURE PAVEMENT, THE BURIED VALVE MUST BE LEFT OPEN AND A NEW VALVE SET OUT OF PAVEMENT.
6. FIELD CUT EXISTING MAIN AS NECESSARY TO ACCOMMODATE TEE AND CLOSE COUPLED VALVES AT EACH END OF TEE. CARE IS TO BE TAKEN SO AS NOT TO GET DIRT IN EXISTING MAIN.
7. THOROUGHLY CLEAN AND DISINFECT PIPE AND APPURTENANCES TO BE INSTALLED.
8. INSTALL TEE AND VALVES - DRESSER COUPLINGS CAN BE USED IF NECESSARY. PROPOSED MAIN VALVE IS TO BE CAPPED AND SHUT OFF. EXISTING MAIN IS THEN TO BE RETURNED TO SERVICE BY COUNTY PERSONNEL.
9. CONSTRUCTION OF PROPOSED MAIN IS TO BE COMPLETED WITHIN A JOINT OF CONNECTION TO TEE AND VALVES INSTALLED ABOVE.
10. ENTIRE LINE IS TO BE PRESSURE TESTED AND DISINFECTED TO COUNTY STANDARDS.
11. ENTIRE LENGTH OF PIPE IS TO BE THOROUGHLY CLEANED AND DISINFECTED PRIOR TO INSTALLATION. PERMATEX CHLORINE TABLETS TO BE USED FOR DISINFECTION. DOSAGE SHALL BE PER MANUFACTURER'S SPECIFICATIONS BASED ON PIPE MATERIAL.
12. NEW MAIN IS TO BE PUT INTO SERVICE BY COUNTY PERSONNEL.
13. TAPPING SLEEVES/SADDLES TO BE TWO-PIECE CAST IRON OR DUCTILE IRON (MUELLER H615). JCM412 OR FORD FTSS TAPPING SLEEVES PERMITTED ON C-900. SIZE ON SIZE TAPPING SLEEVES ARE NOT PERMITTED.

APPROVED/REVISED  MARCH, 2018	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b>WG-2</b>
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**PROCEDURE FOR RELOCATING OR LOWERING SERVICE LATERAL  
AND RELOCATING OR BRINGING TO GRADE METER PITS**

1. ALL AFFECTED USERS MUST BE NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE AS TO THE TIME AND DURATION OF THE SHUTOFF. ANY DISCONTINUANCE OF SERVICE MUST BE COORDINATED THROUGH WARREN COUNTY PRIOR TO ANY SHUT DOWN.
2. ALL WORK MUST BE PERFORMED ACCORDING TO ALL WARREN COUNTY SPECIFICATIONS, PARTICULARLY W-10A, W-10B, AND W-12.
3. EACH SERVICE LATERAL MUST BE A CONTINUOUS PIECE OF PIPE FROM THE CORP STOP TO THE METER. COUPLINGS SHALL NOT BE PERMITTED. TYPE K COPPER SHALL BE USED FOR 3/4" AND 1" SERVICES. POLYETHYLENE 200 PSI MAY BE USED FOR 1 1/2" AND 2" SERVICES.
4. METER PITS MUST BE ADJUSTED TO GRADE USING RING RISERS OR PIT RISERS. METERS MUST BE ADJUSTED WITH METER RESETTERS (FORD V42).
5. ALL PROCEDURES MUST BE DISCUSSED AT A PRECONSTRUCTION MEETING PRIOR TO THE INITIATION OF CONSTRUCTION.

APPROVED/REVISED  MARCH, 2018	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b>WG-3</b>
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## SEWER DETAILS

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S-2	PRECAST MANHOLE INSIDE DROP CONNECTION
S-3	VENTED MANHOLE
S-4	MANHOLE CHANNELS
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## TABLE OF CONTENTS - SANITARY SEWER DETAILS

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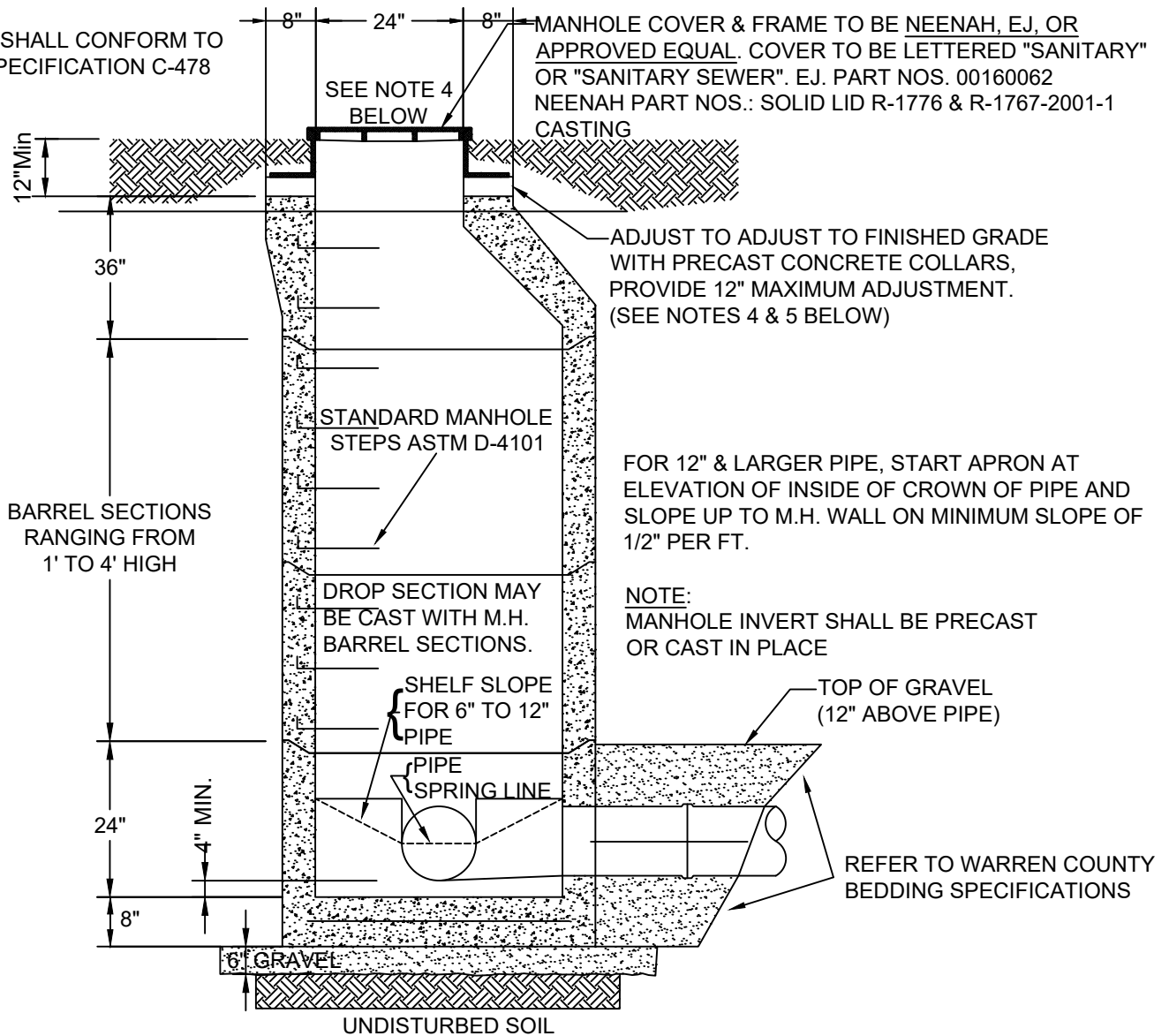
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**TOC**

MANHOLE SHALL CONFORM TO A.S.T.M. SPECIFICATION C-478



**NOTES:**

1. MINIMUM WALL THICKNESS AND STEEL REINFORCING TO CONFORM WITH A.S.T.M. DESIGNATION C-478. STEEL SHALL BE COLD DRAWING WIRE IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-82.
2. WATER TIGHT GASKETS ARE REQUIRED AT ALL JOINTS (C-443 FOR RUBBER TYPE JOINTS).
3. EXCEPT AS OTHERWISE NOTED ON THE SEWER STAKING PLAN, WHERE PIPE SIZES CHANGE AT THE MANHOLE, THE INSIDE TOPS OF PIPES ARE TO BE SET AT THE SAME ELEVATION.
4. TOP OF CASTING SHALL BE EVEN WITH FINISHED GRADE AT PAVE LOCATIONS (ROADWAYS AND PARKING LOTS) AND AT DEVELOPED LOTS. IN UNDEVELOPED LOTS, TOP OF CASTING TO BE A MINIMUM OF 12" ABOVE FINISHED GRADE OR AS OTHERWISE SHOWN ON PLAN.
5. WITHIN A NEW SUBDIVISION, TEMPORARY ADJUSTING COLLAR MUST BE PROVIDED 1 FOOT ABOVE ROUGH/FINISHED GRADE. RISERS (12" MAXIMUM) ARE PERMITTED. MANHOLES SHALL BE LOWERED TO FINISHED GRADE WHEN SUBDIVISION IMPROVEMENTS ARE COMPLETED AND THE LOTS IS BUILT ON.
6. NO MANHOLE, OR ANY PORTION OF MANHOLE, SHALL BE LOCATED UNDER A SIDEWALK OR DRIVEWAY. MANHOLES SHALL ONLY BE ALLOWED IN ROADWAY PAVEMENT UPON PERMISSION BY THE COUNTY SANITARY ENGINEER.
7. A MINIMUM DROP OF 0.20' MUST BE MAINTAINED BETWEEN INLET AND OUTLET INVERTS IN MANHOLES.

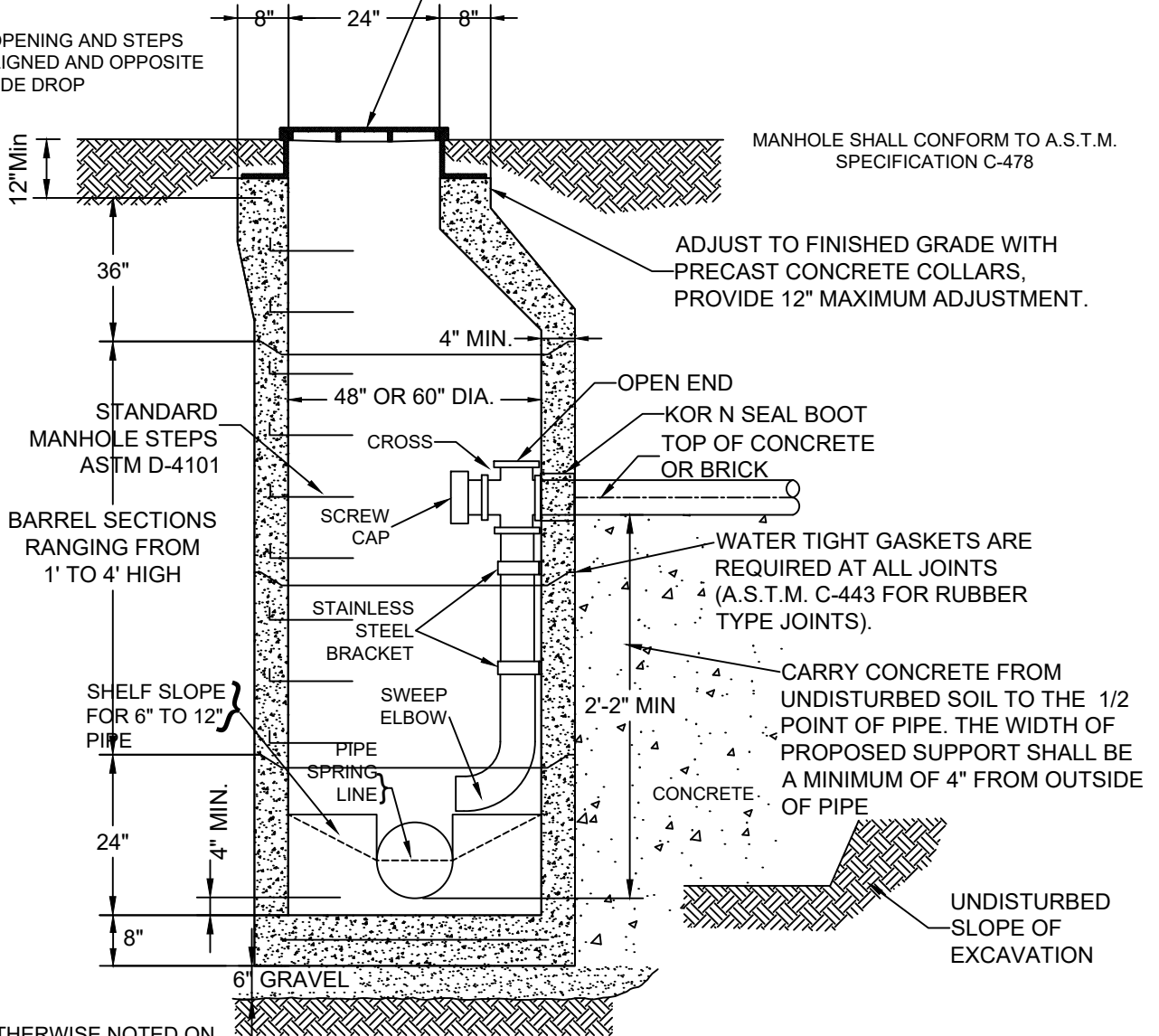
## PRECAST MANHOLE

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <h1 style="font-size: 2em; margin: 0;">S-1</h1>
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**NOTE:** TOP OF CASTING SHALL BE AT FINISHED GRADE AT PAVED LOCATIONS (ROADWAYS AND PARKING LOTS) AND AT DEVELOPED LOTS. IN UNDEVELOPED LOTS, TOP OF CASTING TO BE A MINIMUM OF 12" ABOVE FINISHED GRADE OR AS SHOWN ON PLAN.

MANHOLE COVER & FRAME TO BE NEENAH, EJ, OR APPROVED EQUAL. COVER TO BE LETTERED "SANITARY" OR "SANITARY SEWER". EJ. PART NOS. 00160062 NEENAH PART NOS.: SOLID LID R-1776 & R-1767-2001-1 CASTING

MANHOLE OPENING AND STEPS MUST BE ALIGNED AND OPPOSITE OF THE INSIDE DROP



MANHOLE SHALL CONFORM TO A.S.T.M. SPECIFICATION C-478

ADJUST TO FINISHED GRADE WITH PRECAST CONCRETE COLLARS, PROVIDE 12" MAXIMUM ADJUSTMENT.

WATER TIGHT GASKETS ARE REQUIRED AT ALL JOINTS (A.S.T.M. C-443 FOR RUBBER TYPE JOINTS).

CARRY CONCRETE FROM UNDISTURBED SOIL TO THE 1/2 POINT OF PIPE. THE WIDTH OF PROPOSED SUPPORT SHALL BE A MINIMUM OF 4" FROM OUTSIDE OF PIPE

UNDISTURBED SLOPE OF EXCAVATION

**NOTE:**

EXCEPT AS OTHERWISE NOTED ON THE SEWER STAKING PLAN, WHERE PIPE SIZES CHANGE AT THE MH, THE INSIDE TOPS OF PIPES ARE TO BE AT THE SAME ELEVATION.

MINIMUM WALL THICKNESS AND STEEL REINFORCING TO CONFORM WITH ASTM DESIGNATION C-478. STEEL SHALL BE COLD DRAWN WIRE IN ACCORDANCE WITH ASTM DESIGNATION A-82.

NO MANHOLE, OR ANY PORTION OF A MANHOLE, SHALL BE LOCATED UNDER A SIDEWALK OR DRIVEWAY. MANHOLE SHALL ONLY BE ALLOWED IN ROADWAY PAVEMENT UPON PERMISSION BY THE COUNTY SANITARY ENGINEER.

WITHIN A NEW SUBDIVISION, TEMPORARY ADJUSTING COLLAR MUST BE PROVIDED 1 FOOT ABOVE ROUGH/FINISHED GRADE. RISERS (12" MAXIMUM) ARE PERMITTED. MANHOLES SHALL BE LOWERED TO FINISHED GRADE WHEN SUBDIVISION IMPROVEMENTS ARE COMPLETED AND THE LOT IS BUILT ON .

# PRECAST MANHOLE INSIDE DROP CONNECTION

APPROVED/REVISED

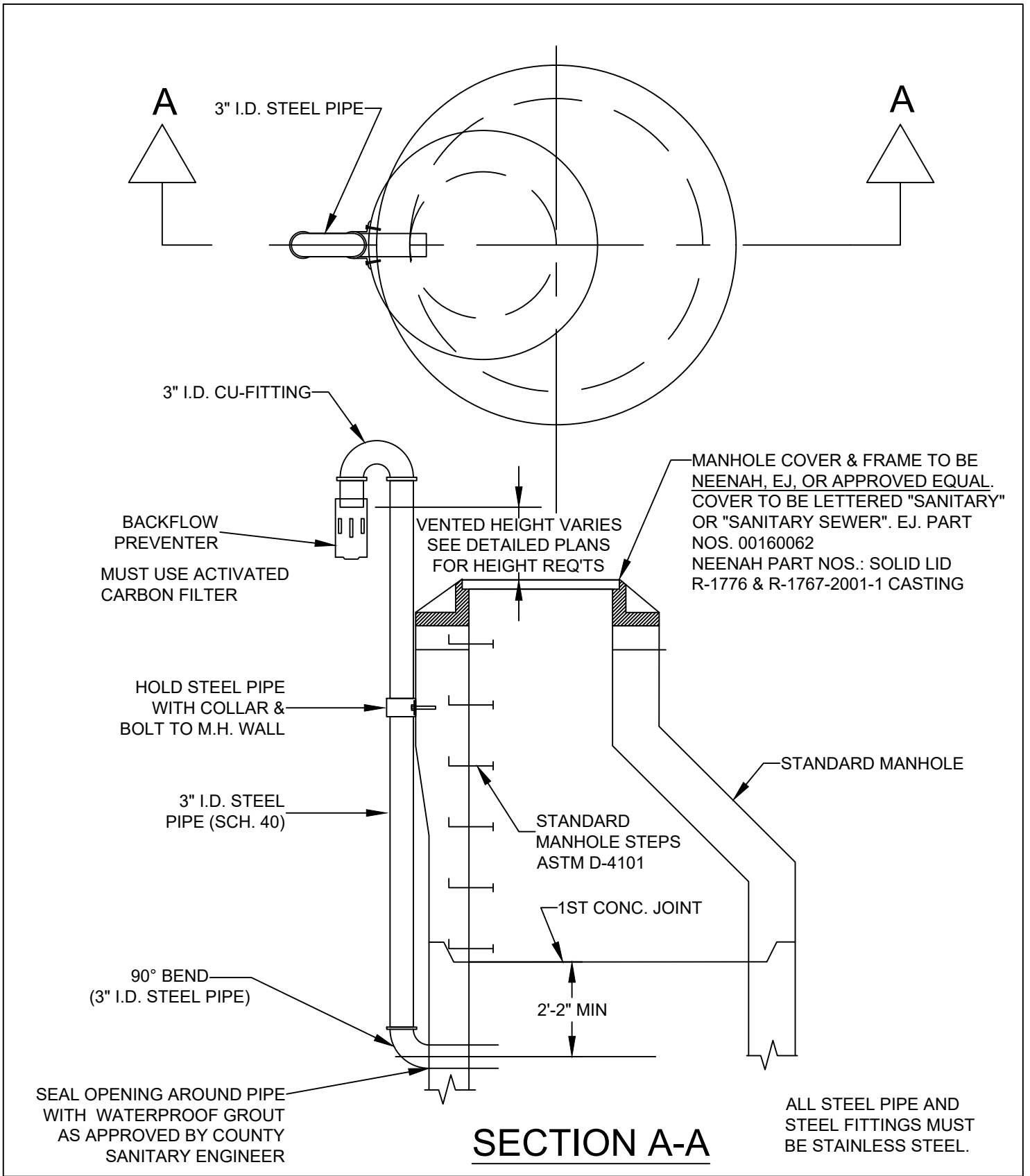
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
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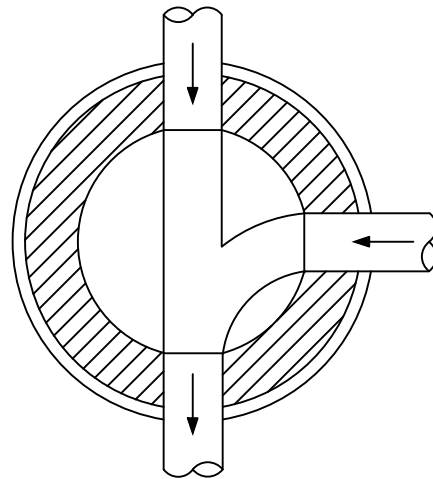
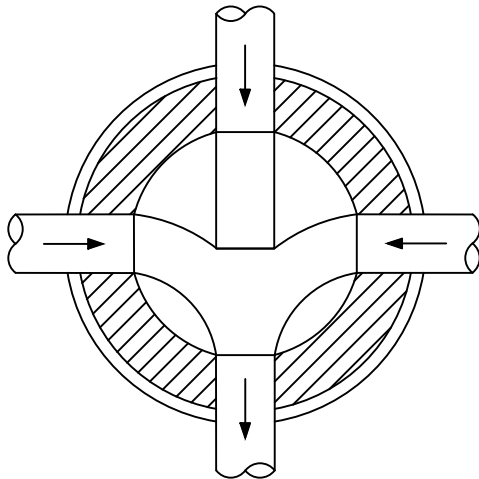
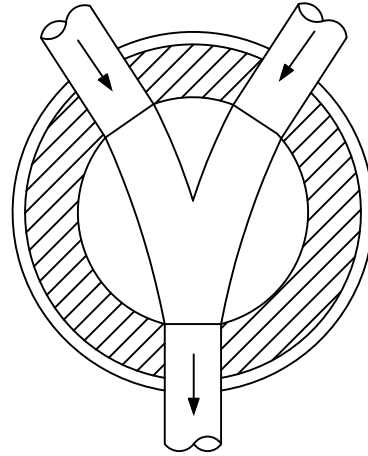
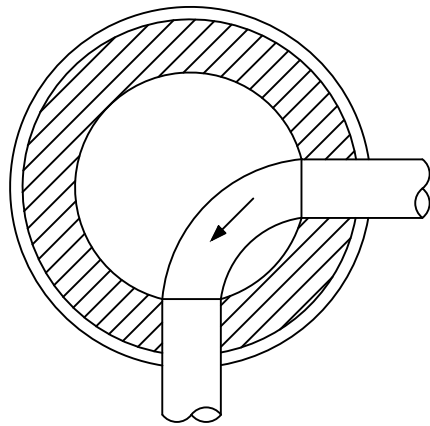
# S-2





## VENTED MANHOLE

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NOTE:

1. MODIFY MANHOLE CHANNEL ENTRANCE CONDITIONS TO SUIT ENTRANCE NEEDS OF INDIVIDUAL CASES, MAINTAINING CHANNEL CONCEPT.
2. CHANNELS MUST BE SUITABLE FOR INSTALLATION & REMOVAL OF EXPANSION PLUG USED FOR FLUSHING.
3. ALL CONSTRUCTION DETAILS & DIMENSION ARE TO CONFORM TO THOSE SHOWN FOR STANDARD MANHOLES.
4. ALL CHANNELS MUST BE SMOOTH AND UNIFORM. TRANSITION MUST NOT CREATE OBSTRUCTION TO FLOW.
5. SLOPE CHANNELS UNIFORMLY TO MAINTAIN A MINIMUM DROP OF 0.20' BETWEEN INLET AND OUTLET INVERTS.

## MANHOLE CHANNELS

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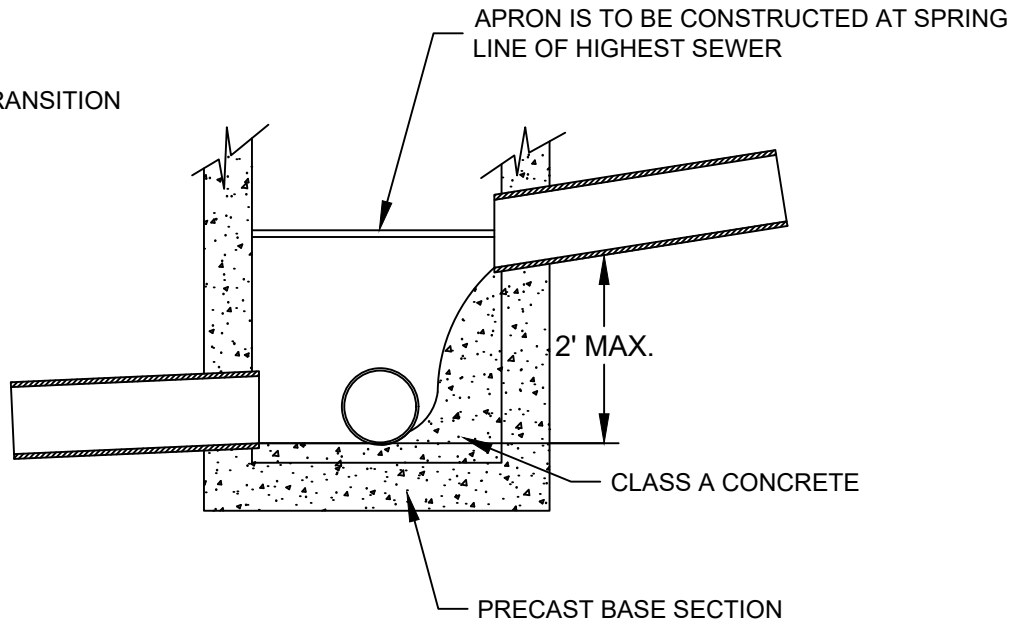
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

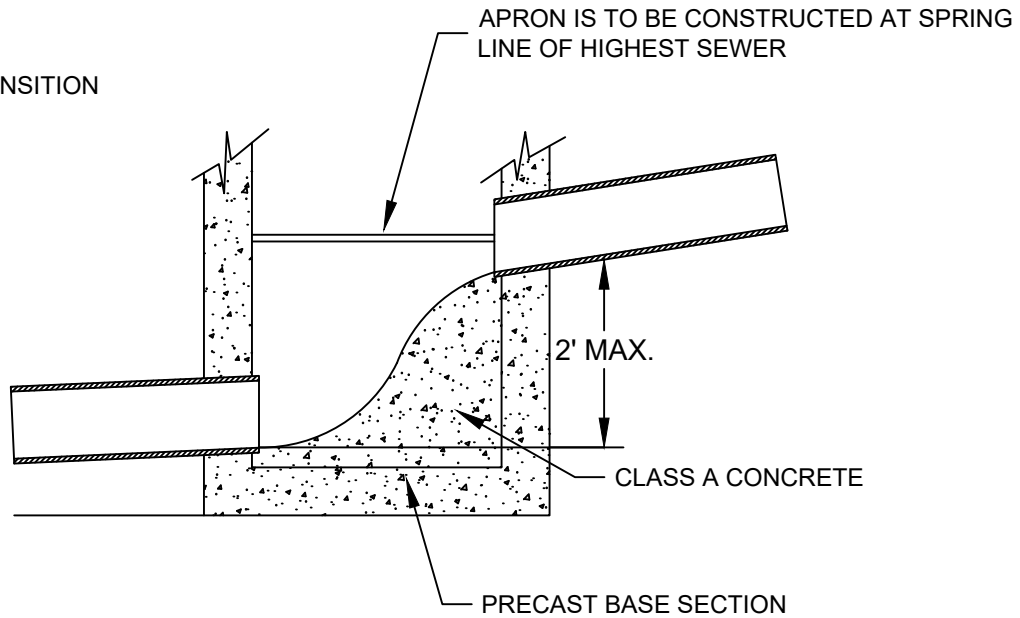
STANDARD NUMBER

# S-4

THREE PIPE TRANSITION



TWO PIPE TRANSITION



**NOTE:**  
 DROP MANHOLES ARE TO BE USED WHEN THE SEWER ENTERING THE MANHOLE IS TWO (2) FEET OR GREATER ABOVE THE MANHOLE INVERT.

## SANITARY M.H. INVERT TRANSITION BASE SECTIONS

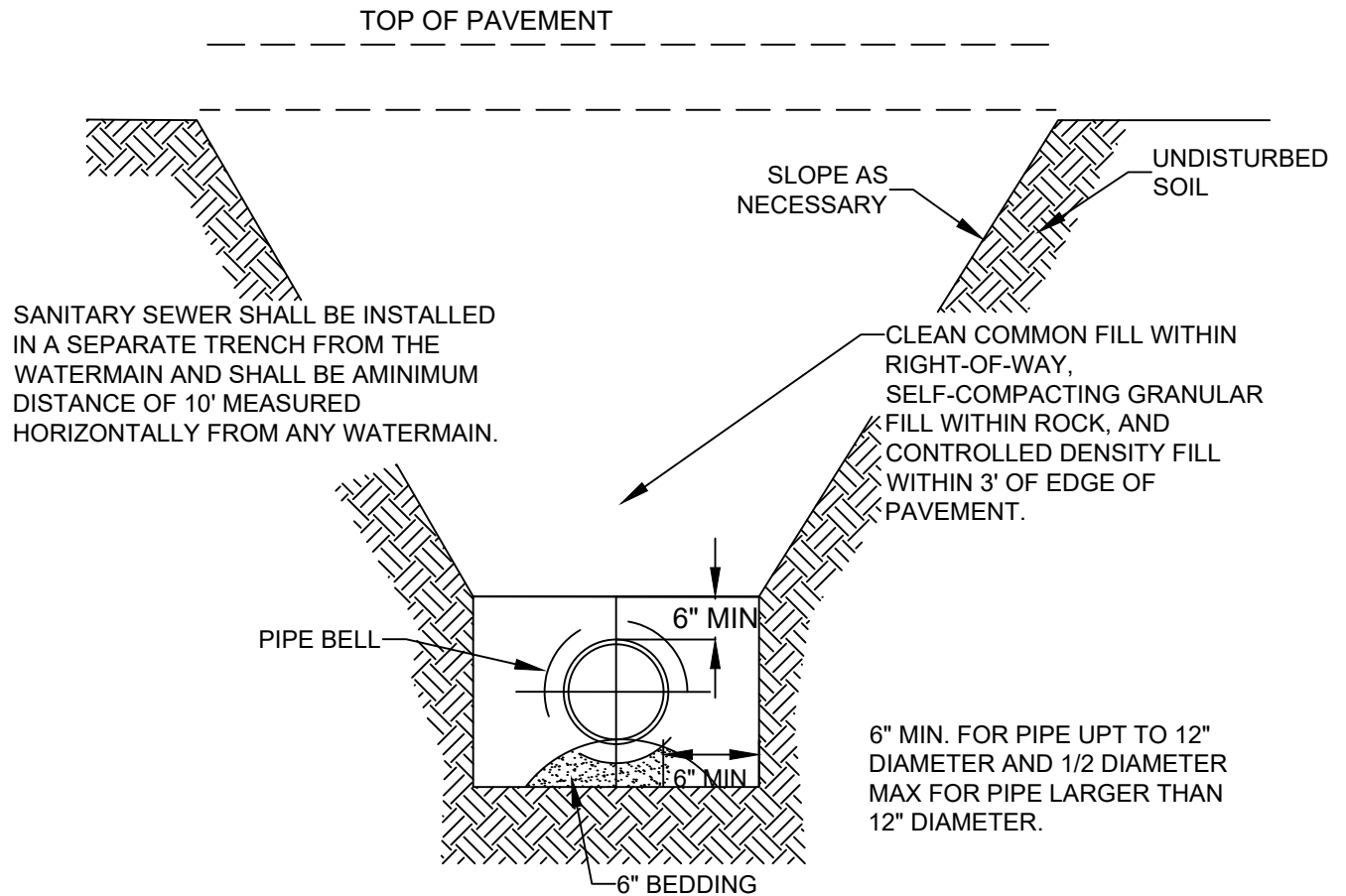
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MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**S-5**



SANITARY SEWER SHALL BE INSTALLED IN A SEPARATE TRENCH FROM THE WATERMAIN AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM ANY WATERMAIN.

REFER TO WARREN COUNTY BEDDING REQUIREMENTS PER STANDARD DETAILS SG-1.

**NOTES:**

1. TRENCH SIDES SHALL MEET OSHA REQUIREMENTS.
2. TRENCH SHALL HAVE FLAT BOTTOM SO THAT PIPE WILL BE SUPPORTED UNIFORMLY ALONG THE BARREL.
3. NO SUPPORT BY BLOCKING IS PERMITTED.

## SANITARY GRAVITY SEWER TRENCH DETIAL

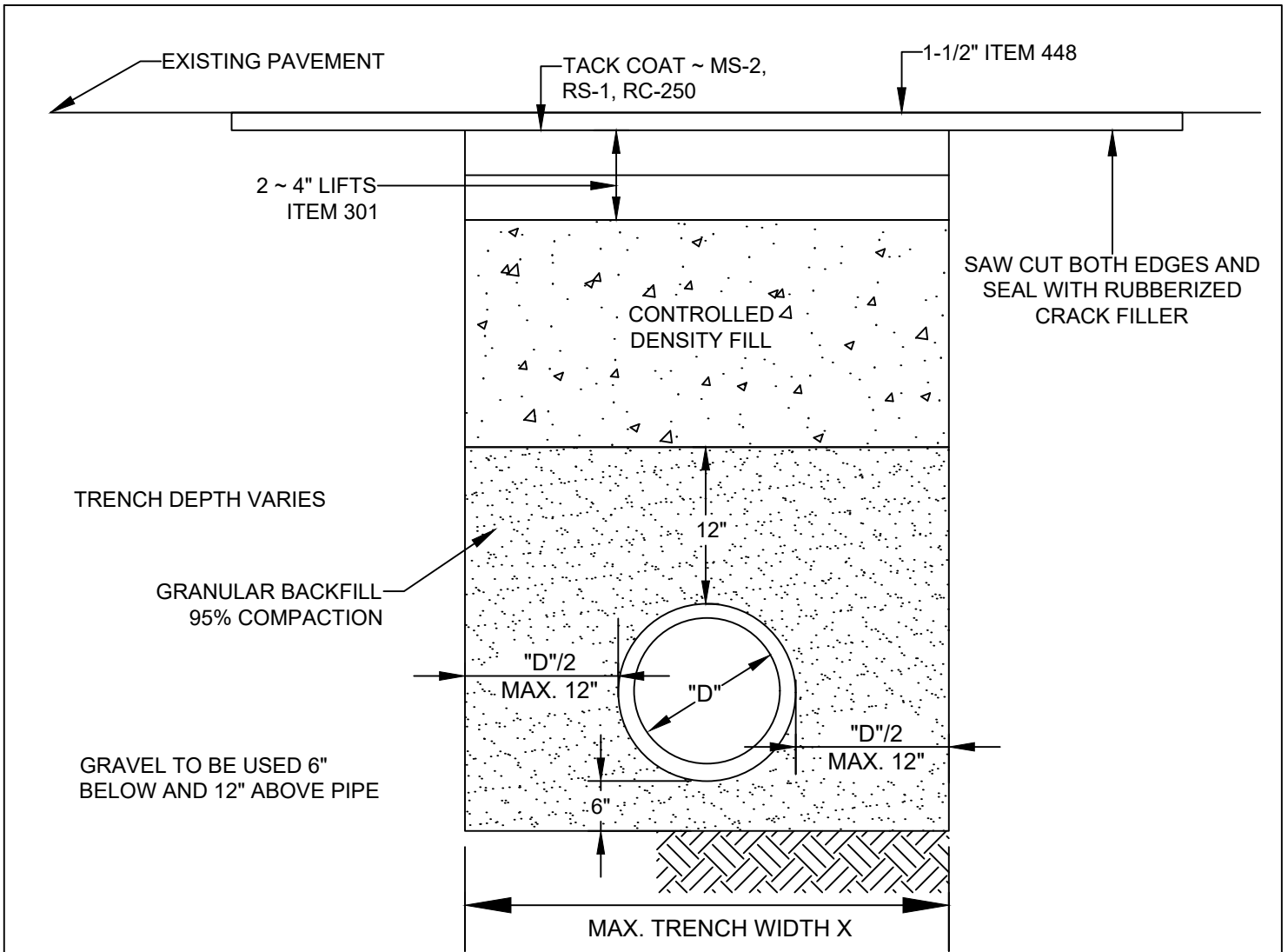
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MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-6



**NOTES:**

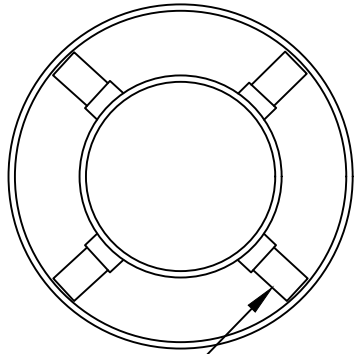
1. ALL DIMENSIONS ARE MINIMUM - ACTUAL TO BE PER COUNTY ENGINEER OR ODOT INSTRUCTIONS & PERMIT.
2. TRAFFIC MUST BE MAINTAINED AT ALL TIMES; LIGHTS, SIGNS, BARRICADES AND IF NECESSARY, FLAGMAN AN WATCHMEN TO BE ON JOB FOR PROTECTION OF THE PUBLIC. STREET PLATES MUST CONFORM TO COUNTY ENGINEER OR ODOT REQUIREMENTS.
3. FLASHFILL OR CONTROLLED DENSITY FILL TO A MINIMUM DISTANCE OF 5 FEET BEYOND THE EDGE OF PAVEMENT. TRENCH BACKFILL AND PAVEMENT RESTORATION MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATIONS.
4. EXISTING PAVEMENT AND EDGES SHALL BE NEATLY AND SQUARELY TRIMMED AND/OR MILLED. PAVEMENT MUST MATCH EXISTING ROAD THICKNESS OR AS SPECIFIED BY COUNTY ENGINEER OR ODOT.

**ROAD PAVEMENT CUT AND RESTORATION  
AT ROADWAY CROSSING**

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
MARCH, 2018		<b>S-7</b>

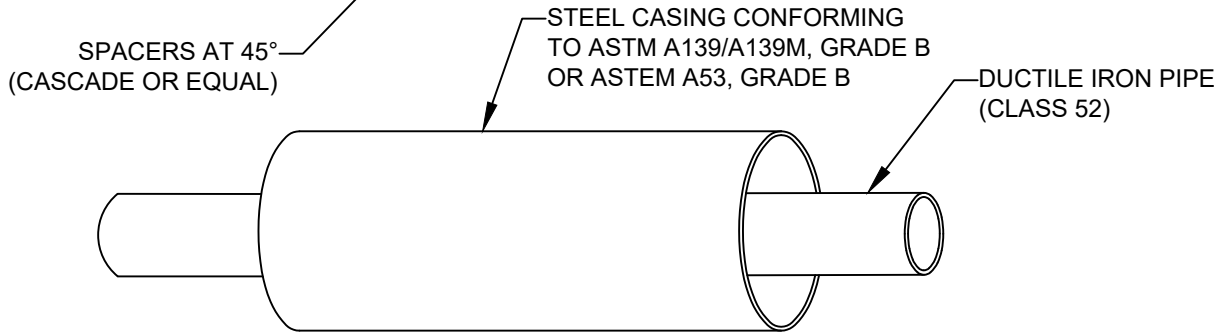
WATER PIPE SIZE - CARRIER PIPE SIZE (O.D.)-THICKNESS

4"	10"	1/4"
6"	12"	3/8"
8"	18"	3/8"
10"	20"	3/8"
12"	24"	1/2"
16"	24"	1/2"
20"	30"	1/2"
24"	36"	1/2"



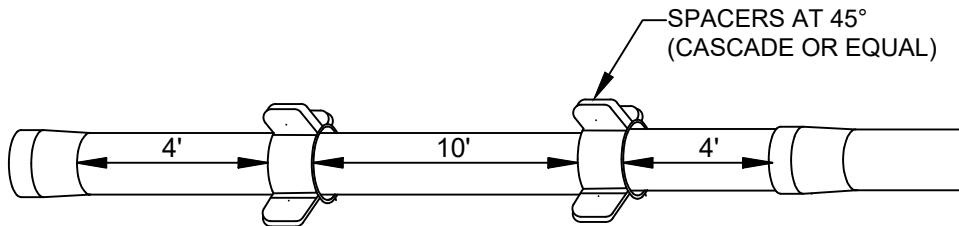
SO THAT PIPE WILL BE CENTERED IN CARRIER PIPE, THE FOLLOWING INFORMATION IS NEEDED:

1. TYPE & O.D. OF PIPE
2. TYPE OF JOINT/RESTRAINT
3. TYPE & I.D. OF CASING
4. 2 SPACER PER LENGTH OF PIPE (18")  
(SEE STANDARD PLACEMENT BELOW)



NOTE:

1. RESTRAINED JOINT TO BE USED WITHIN LIMITS OF CASING
2. PACK END OF CASING WITH CONCRETE OR GRAVEL
3. CASING SPACER TO BE USED THRU CARRIER PIPE



RECOMMENDED STANDARD PLACEMENT

## SEWER IN CASING

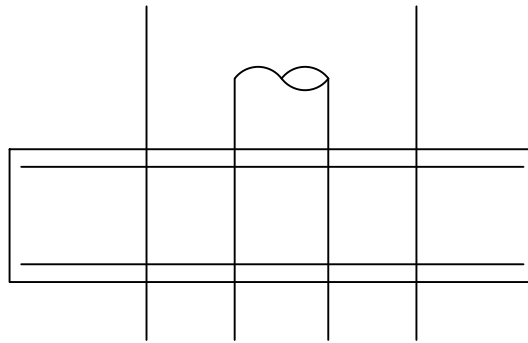
APPROVED/REVISED

MARCH, 2018

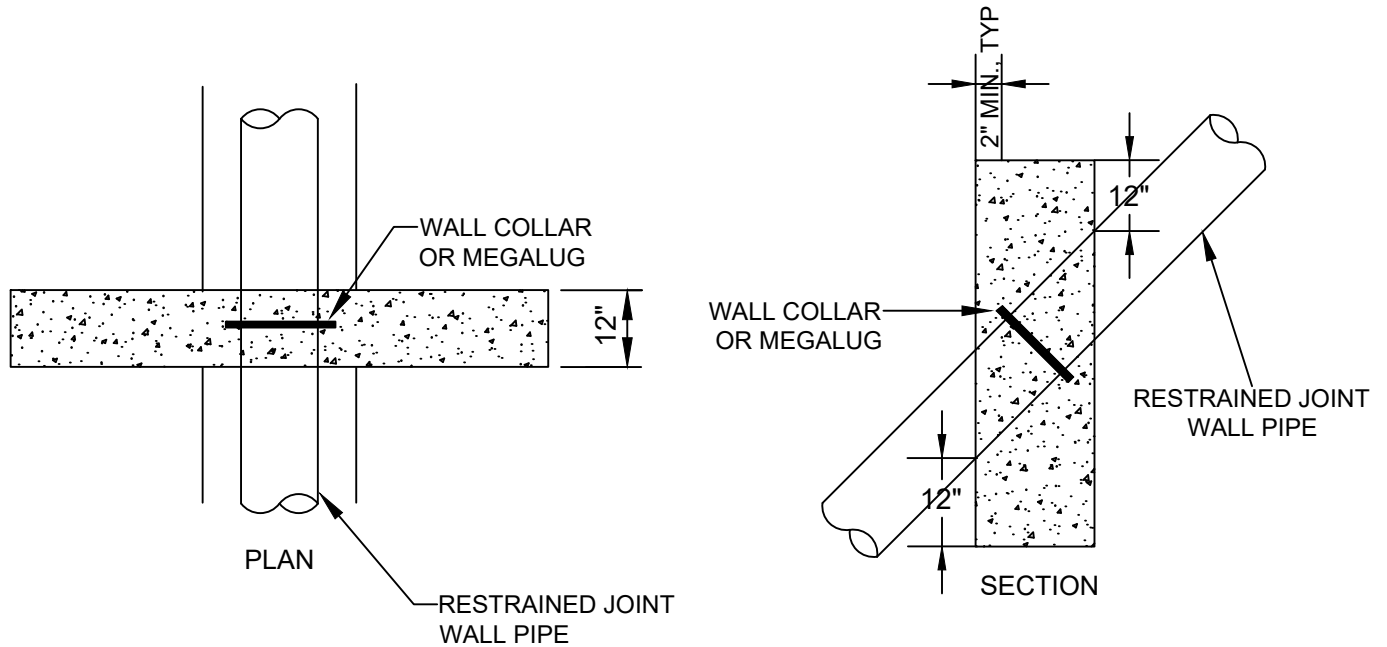
WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**S-8**



4000 PSI CONCRETE



SEWERS ON 20 PERCENT SLOPE OR GREATER SHALL BE CASS 53 RESTRAINED JOINT DUCTILE IRON ANCHORED WITH CONCRETE ANCHORS SPACED AS FOLLOWS:

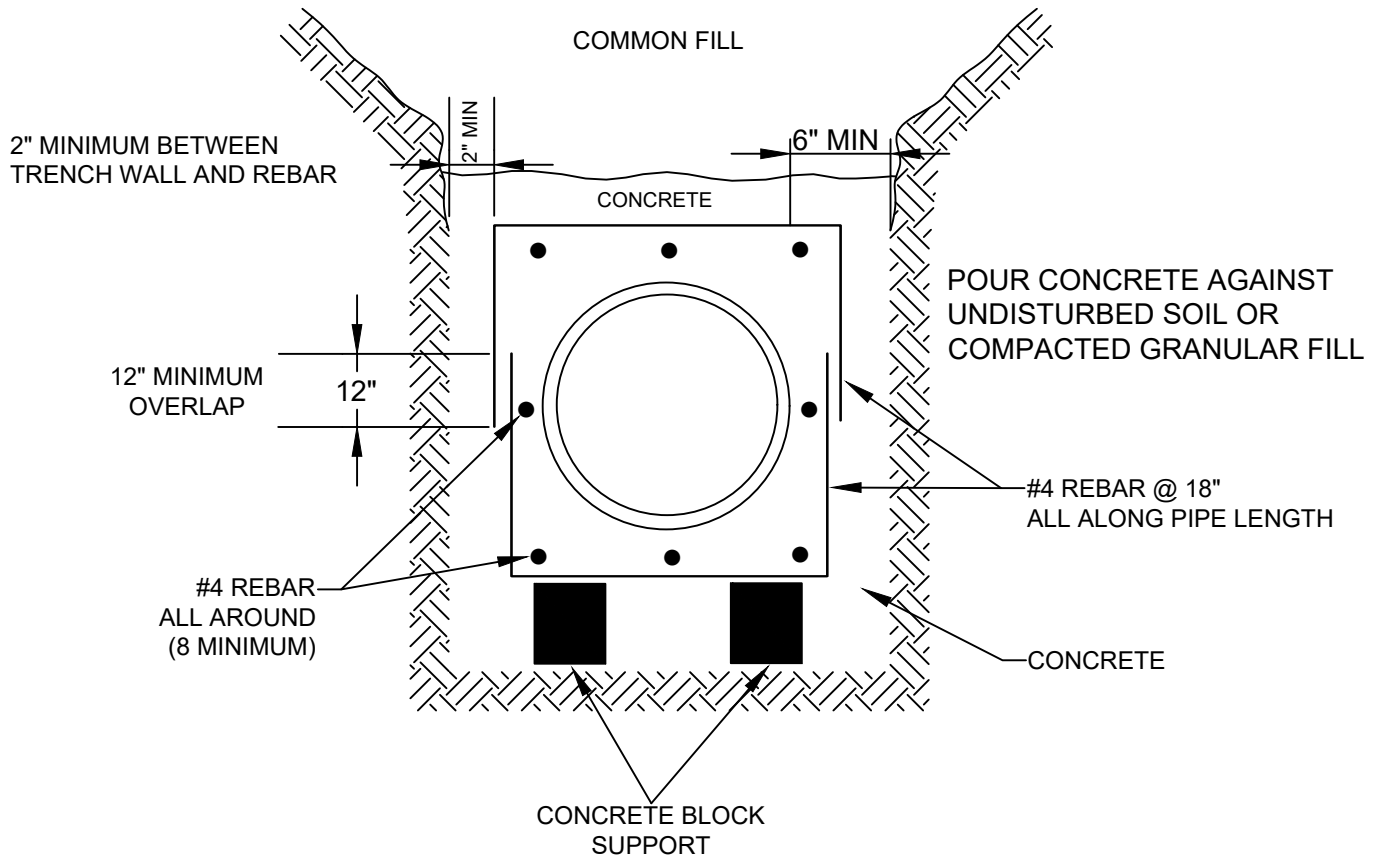
1. NOT OVER 36 FEET CENTER TO CENTER ON GRADES 20 PERCENT TO 35 PERCENT.
2. NOT OVER 24 FEET CENTER TO CENTER ON GRADES 35 PERCENT TO 50 PERCENT.
3. NOT OVER 16 FEET CENTER TO CENTER ON GRADES 50 PERCENT AND OVER.

## CONCRETE ANCHOR

APPROVED/REVISED  
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**S-9**



NOTES:

- 1) CONCRETE SHALL BE 3000 P.S.I. MINIMUM 28 DAYS STRENGTH (4" SLUMP).
- 2) SUPPORT PIPE AND REBAR CAGE ON CONCRETE BRICKS DURING CONCRETE PLACEMENT.
- 3) CONCRETE ENCASEMENT SHALL BE TERMINATED AT PIPE JOINTS ONLY.

## FULL CONCRETE ENCASEMENT

APPROVED/REVISED

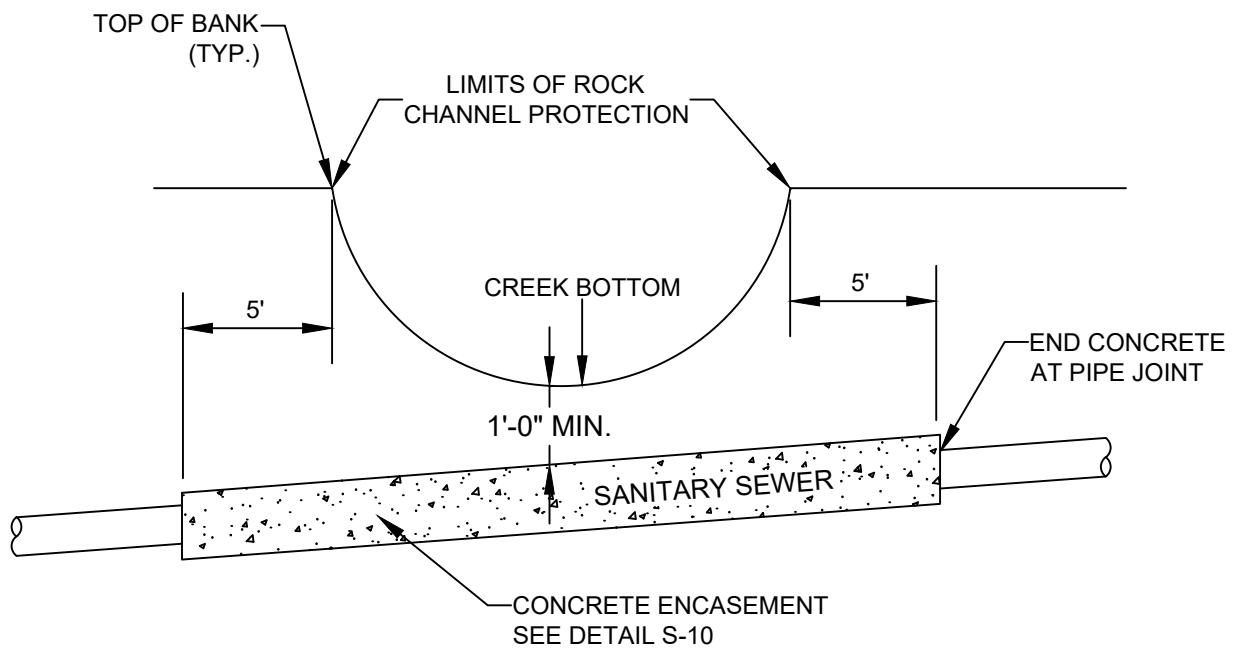
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-10





## SANITARY SEWER CREEK CROSSING

APPROVED/REVISED

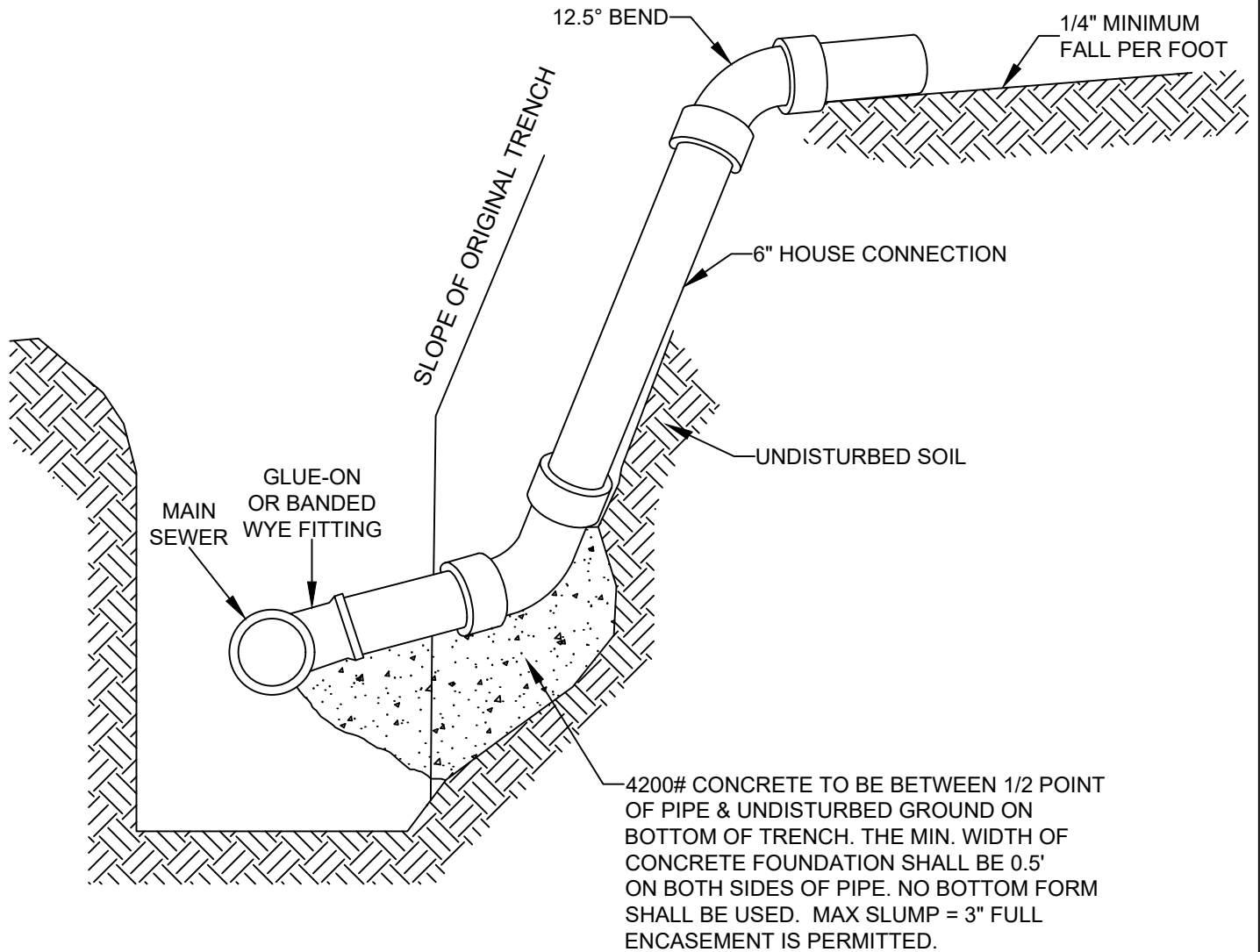
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-11





**NOTES:**

1. ALL JOINTS SHALL BE WATER TIGHT.
2. PIPE TO BE BEDDED SO THAT PIPE LOADS ARE NOT IMPOSED ON EXISTING WYES OR SADDLES.
3. EXCAVATION CLOSER THAN TWO FEET (2') FROM PIPE, WYES OR SADDLES SHALL BE DONE BY HAND.
4. DEEP HOUSE CONNECTION TO BE USED WHEN HOUSE CONNECTION IS MADE TO A SEWER DEEPER THAN 12'.

## DEEP HOUSE CONNECTIONS

APPROVED/REVISED

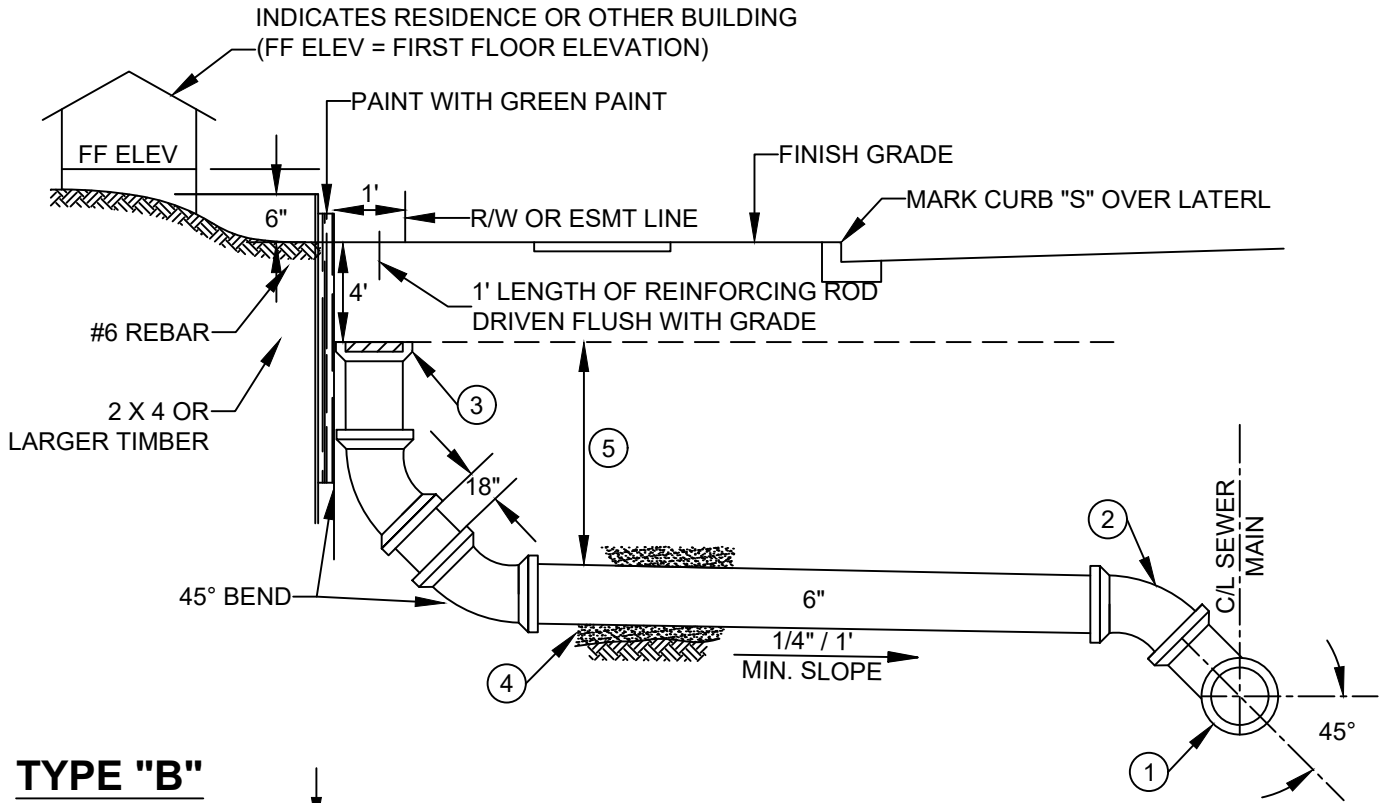
MARCH, 2018

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

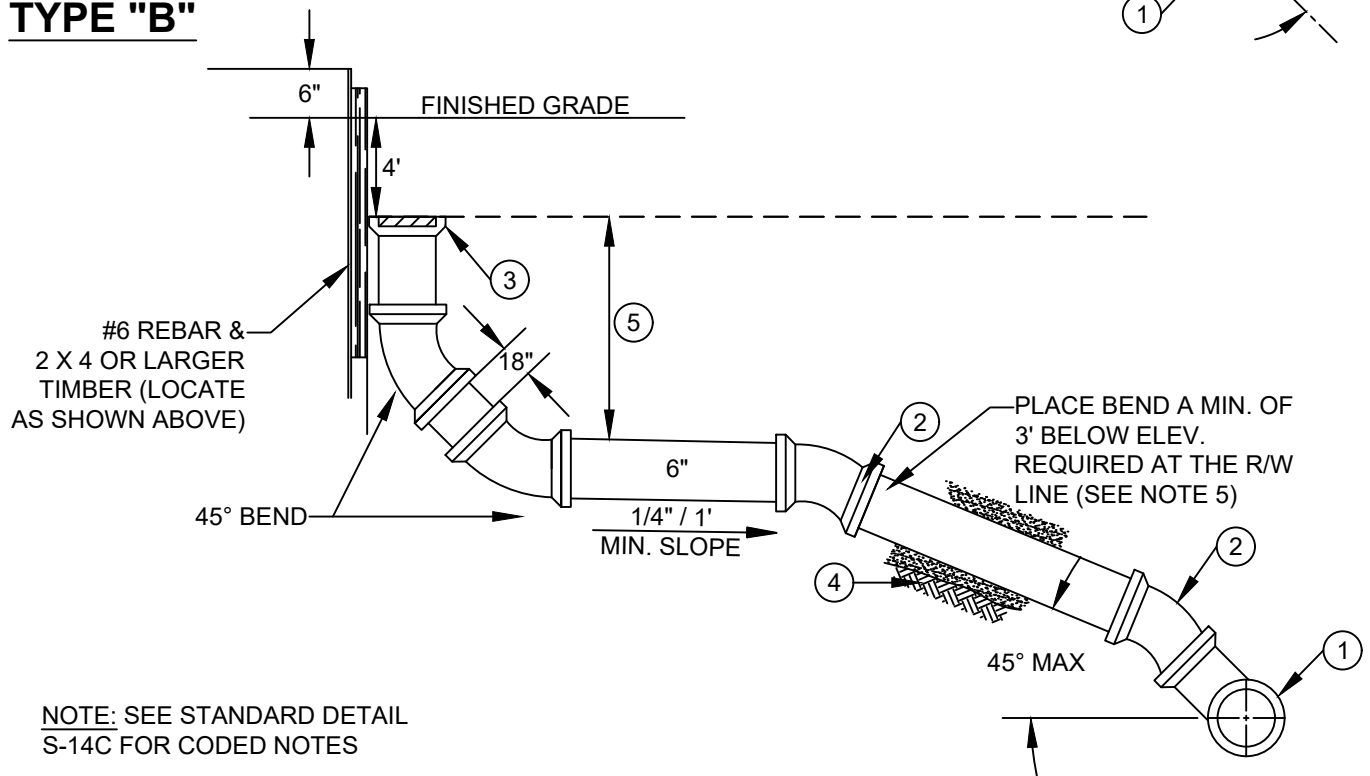
STANDARD NUMBER

# S-13

# TYPE "A"



# TYPE "B"



NOTE: SEE STANDARD DETAIL S-14C FOR CODED NOTES

## HOUSE CONNECTIONS

SHT 1 OF 3

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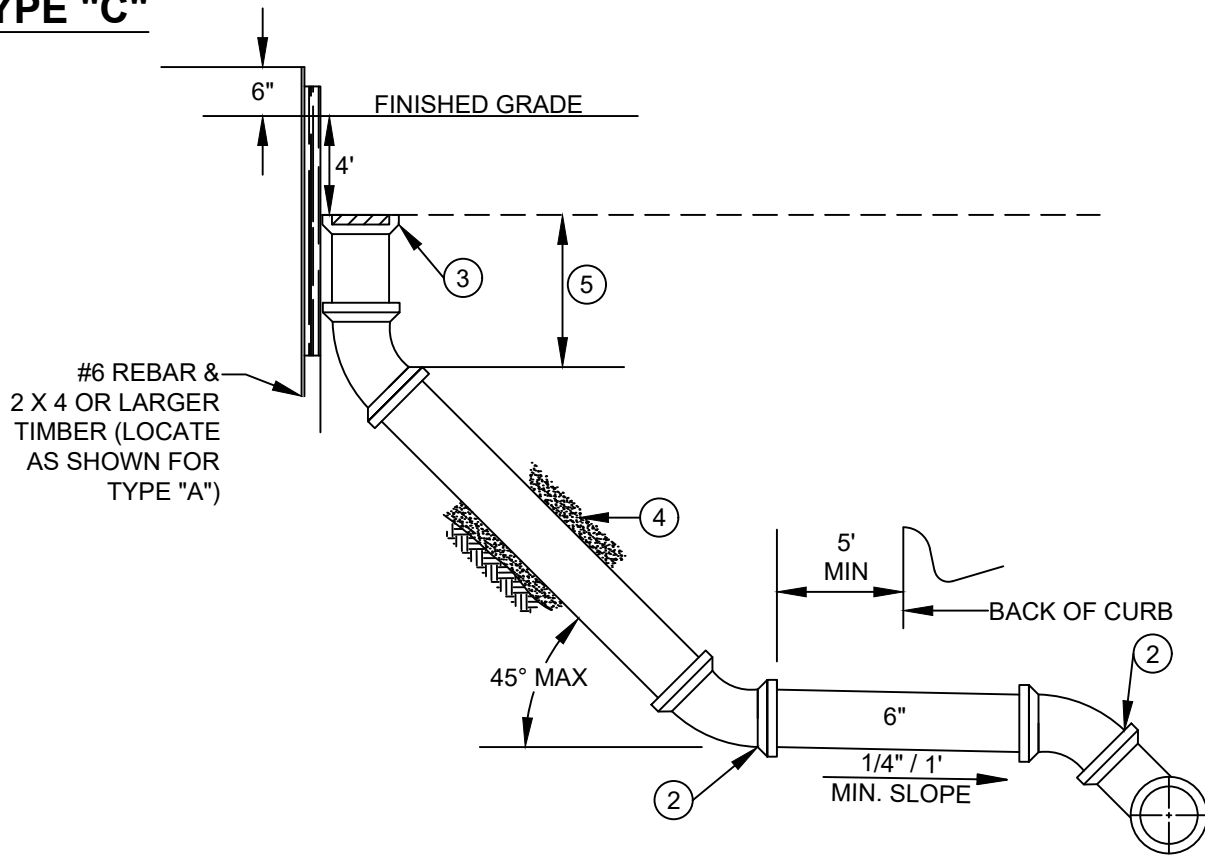
MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-14A

# TYPE "C"



NOTE: SEE STANDARD DETAIL S-14C FOR CODED NOTES

## HOUSE CONNECTIONS

SHT 2 OF 3

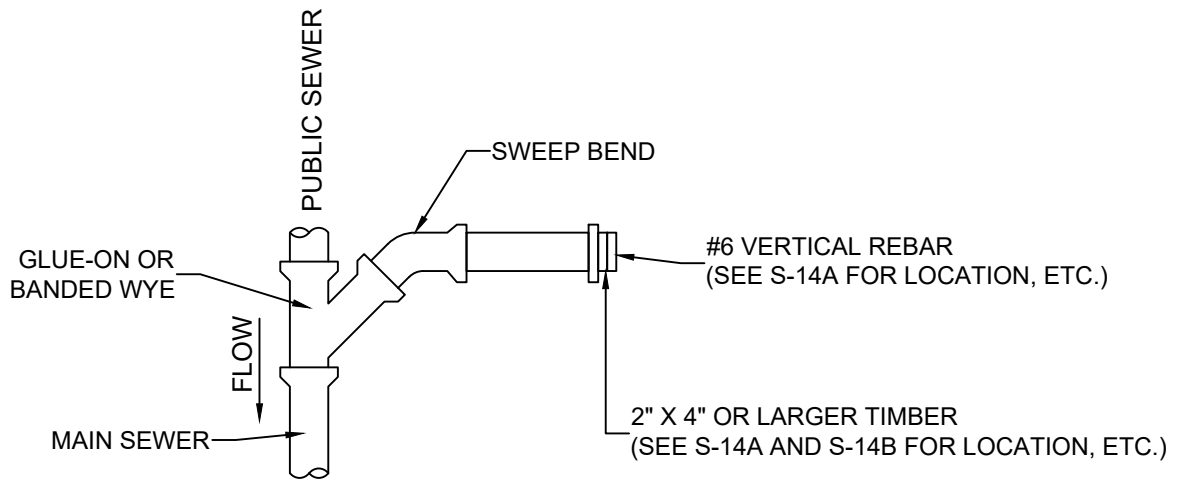
APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-14B



- ① 6" TEE OR WY - ROTATE 45° FROM HORIZONTAL WHEN ⑤ DIMENSION IS ATTAINABLE.
- ② 6" 1/8 BEND OR 1/16 BEND AS NEEDED.
- ③ CAP UNLESS JOINING EXISTING HOUSE LOCATION.
- ④ BED WITH 4" GRANULAR MATERIAL AND BACKFILL WITH GRANULAR MATERIAL TO 4" ABOVE PIPE.
- ⑤ 6' FOR HOUSES ON SLAB.  
8' FOR HOUSES WITH CRAWL SPACE.  
10' FOR HOUSES WITH BASEMENT.

**NOTE:**

- A. USE TYPE "B" WHEN SEWER INVERT ELEVATION IS 5' TO 10' BELOW THE ELEVATION REQUIRED AT R/W LINE.
- B. USE DEEP HOUSE CONNECTION (S-13) WHEN SEWER INVERT ELEVATION IS 10' OR MORE BELOW THE ELEVATION REQUIRED AT R/W LINE.
- C. IN ALL OTHER CASES USE TYPE "A" OR TYPE "C".

## HOUSE CONNECTIONS

SHT 3 OF 3

APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

# S-14C

NOTE: TOP OF CASTING SHALL BE AT FINISHED GRADE AT PAVED LOCATIONS (ROADWAYS AND PARKING LOTS) AND AT DEVELOPED LOTS. IN UNDEVELOPED LOTS, TOP OF CASTING TO BE A MINIMUM OF 12" ABOVE FINISHED GRADE OR AS SHOWN ON PLAN.

MANHOLE COVER & FRAME TO BE NEENAH, E.J. OR APPROVED EQUAL. COVER TO BE LETTERED "SANITARY" OR "SANITARY SEWER". E.J. PART NOS. 00160041B01 SOLID LID R-1776 & R-1767-2001-1 CASTING

FINISHED GRADE

MANHOLE COVER & FRAME TO BE NEENAH, E.J. OR APPROVED EQUAL. COVER TO BE LETTERED "SANITARY" OR "SANITARY SEWER". E.J. PART NOS. 00160041B01 SOLID LID R-1776 & R-1767-2001-1 CASTING

ADJUST TO FINISHED GRADE WITH PRECAST CONCRETE COLLARS, PROVIDE 12" MAXIMUM ADJUSTMENT.

MANHOLE SHALL CONFORM TO ASTM SPECIFICATION C-478

STANDARD MANHOLE STEPS ASTM D-4101

WATERTIGHT GASKETS ARE REQUIRED AT ALL JOINTS (ASTM C-443 FOR RUBBER TYPE GASKET JOINTS.)

5' DIA.

CAULK WITH EXPANDING GROUT (TYP.)

2" HOSE CONNECTOR  
2" PLUG VALVE  
2" NIPPLE  
PLUG VALVES

FORCE MAIN

STRAIGHT COUPLING

FLANGED CROSS - RUN TO MATCH FORCEMAIN DIAMETER BRANCHES TO BE 4"

2'-6"

COMPANION FLANGE WITH 4" PLUG

SLOPE

1'

CLASS "A" CONCRETE

## FORCEMAIN CLEANOUT

APPROVED/REVISED

MAY, 2023

WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

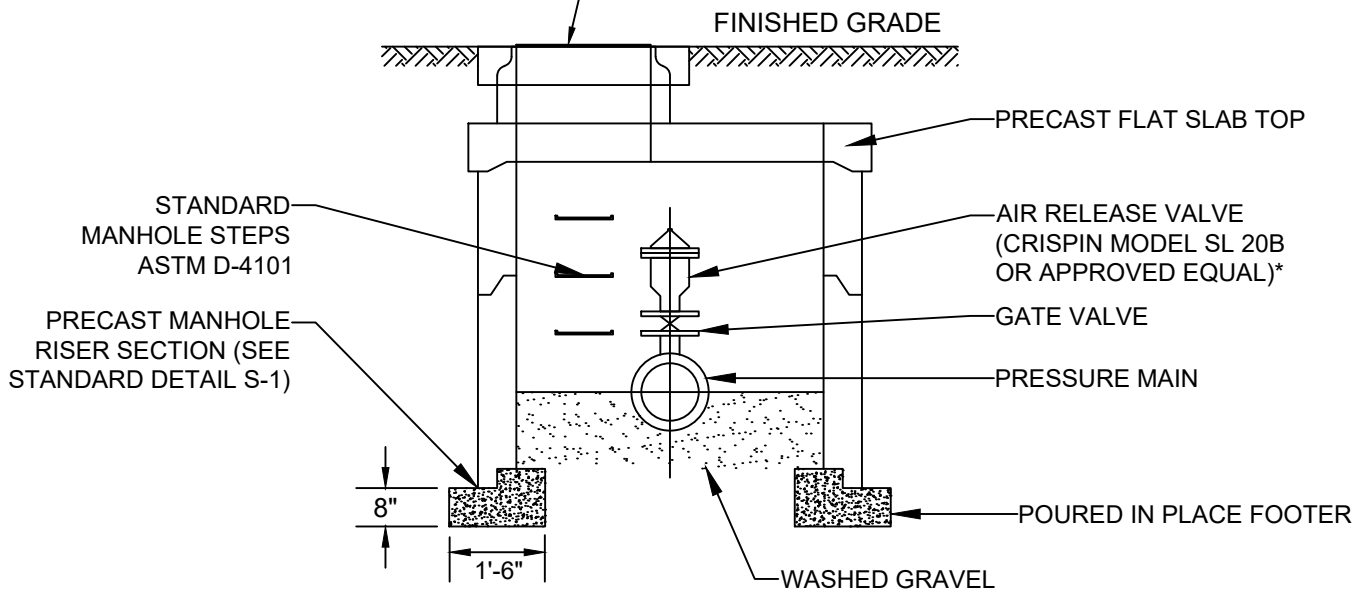
STANDARD NUMBER

**S-15**

**NOTE:** TOP OF CASTING SHALL BE AT FINISHED GRADE AT PAVED LOCATIONS (ROADWAYS AND PARKING LOTS) AND AT DEVELOPED LOTS. IN UNDEVELOPED LOTS, TOP OF CASTING TO BE A MINIMUM OF 12" ABOVE FINISHED GRADE OR AS SHOWN ON PLAN.

MANHOLE SHALL CONFORM TO ASTM SPECIFICATION C-478

MANHOLE COVER & FRAME TO BE NEENAH, E.J. OR APPROVED EQUAL. COVER TO BE LETTERED "SANITARY" OR "SANITARY SEWER". E.J. PART NOS. 00160041B01 SOLID LID R-1776 & R-1767-2001-1 CASTING



**NOTE:** IN WET AREAS SEAL BOTTOM WITH POURED CONCRETE BASE OR PRECAST MANHOLE BASE.

ADJUST TO FINISH GRADE WITH PRECAST CONCRETE COLLARS - 12" MAX ADJUSTMENT.

\* MODEL NUMBER MAY VARY DEPENDING ON APPLICATION

WATERTIGHT GASKETS ARE REQUIRED AT ALL JOINTS (ASTM C-443 FOR RUBBER TYPE GASKET JOINTS).

## AIR RELEASE VALVE ASSEMBLY

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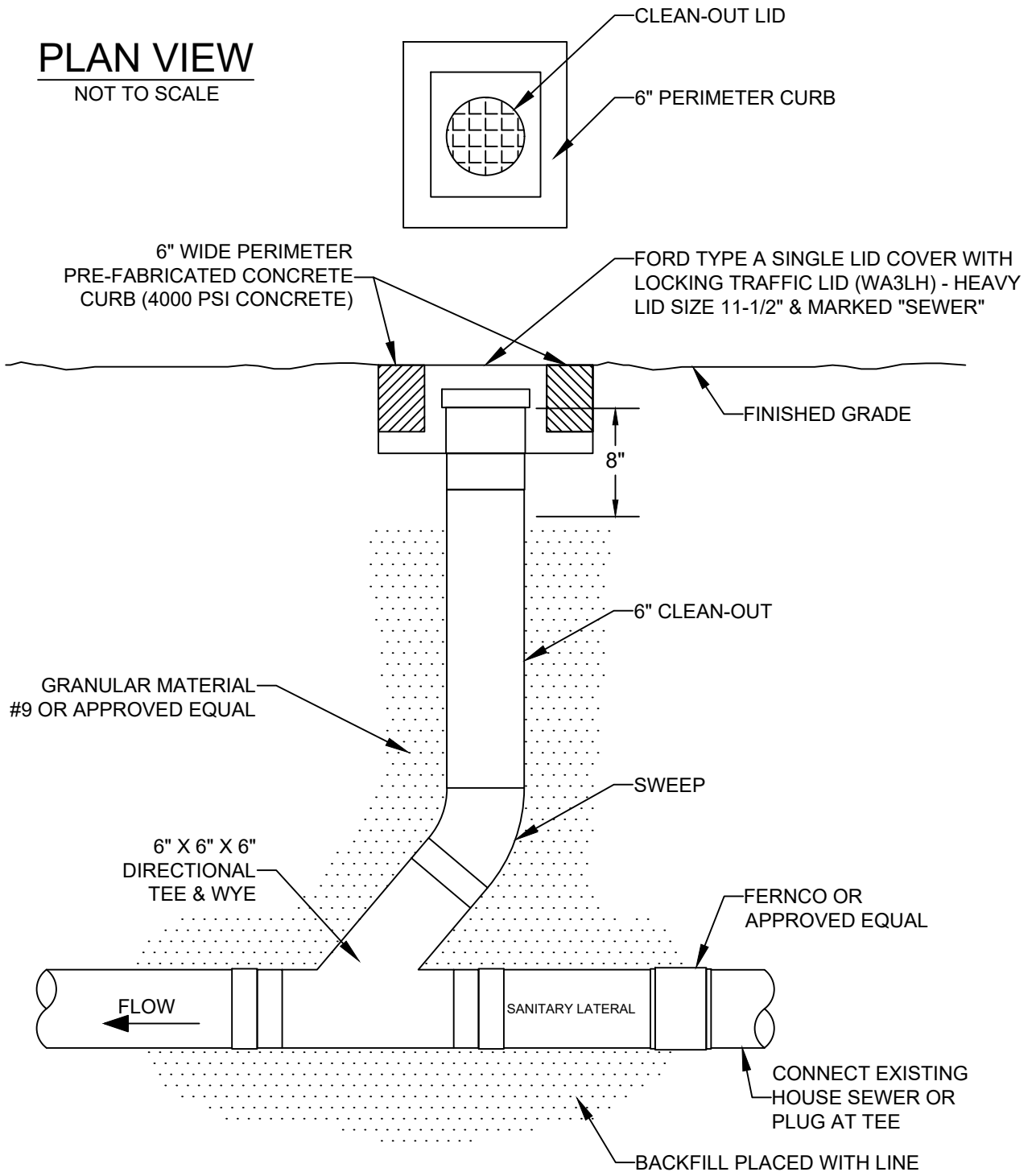
STANDARD NUMBER

**S-16**



# PLAN VIEW

NOT TO SCALE



**NOTES:**

CLEANOUTS SHALL BE INSTALLED AT ALL 45° BENDS.

ALL STRUCTURES MUST HAVE A CLEANOUT THAT IS ACCESSIBLE WITHIN TWO FEET (2') FROM THE POINT OF ENTRY INTO THE STRUCTURES.

## SANITARY CLEANOUT

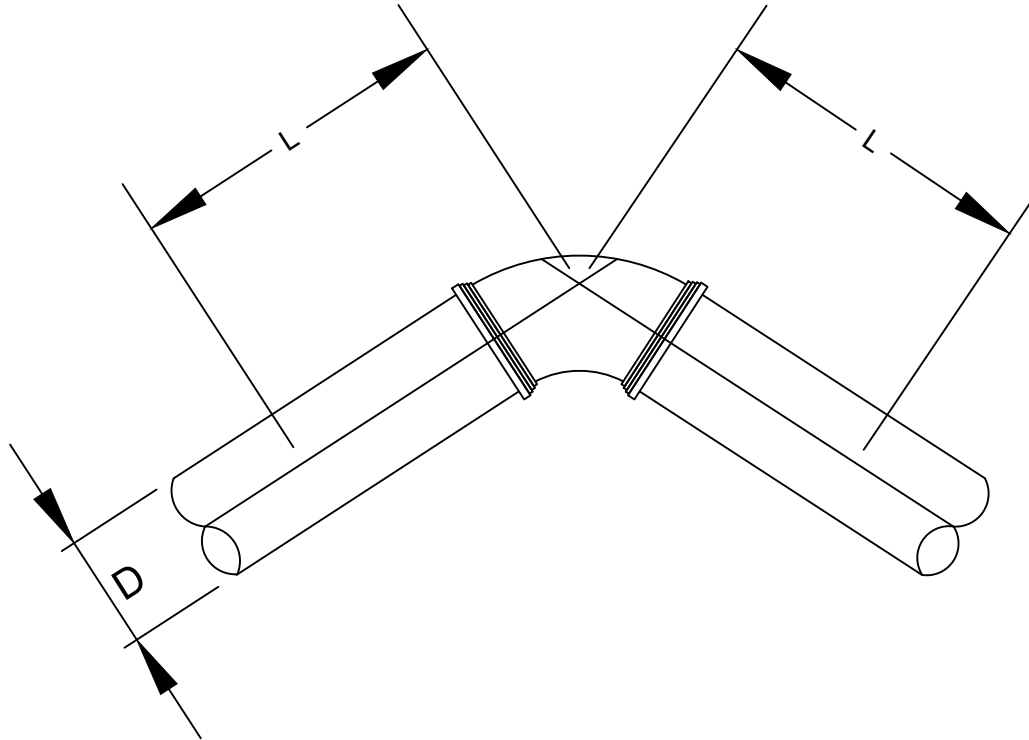
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**S-17**



MINIMUM 60' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL HORIZONTAL AND VERTICAL BENDS. REFER TO TABLE BELOW.

RESTRAINT OPTIONS:  
 MECHANICAL JOINT W/MEGALUGS ~ ALL SIZES OF PIPE  
 MJ FIELD LOCKS ~ < 24" PIPE

TABLE  
 REQUIRED LENGTH OF RESTRAINED JOINTS  
 D - DIAMETER OF PIPE  
 L - LENGTH OF PIPE

D	4"	6"	8"	10"	12"	16"	20"	24"
L	60'	60'	60'	60'	66'	98'	125'	145'

**NOTES:**

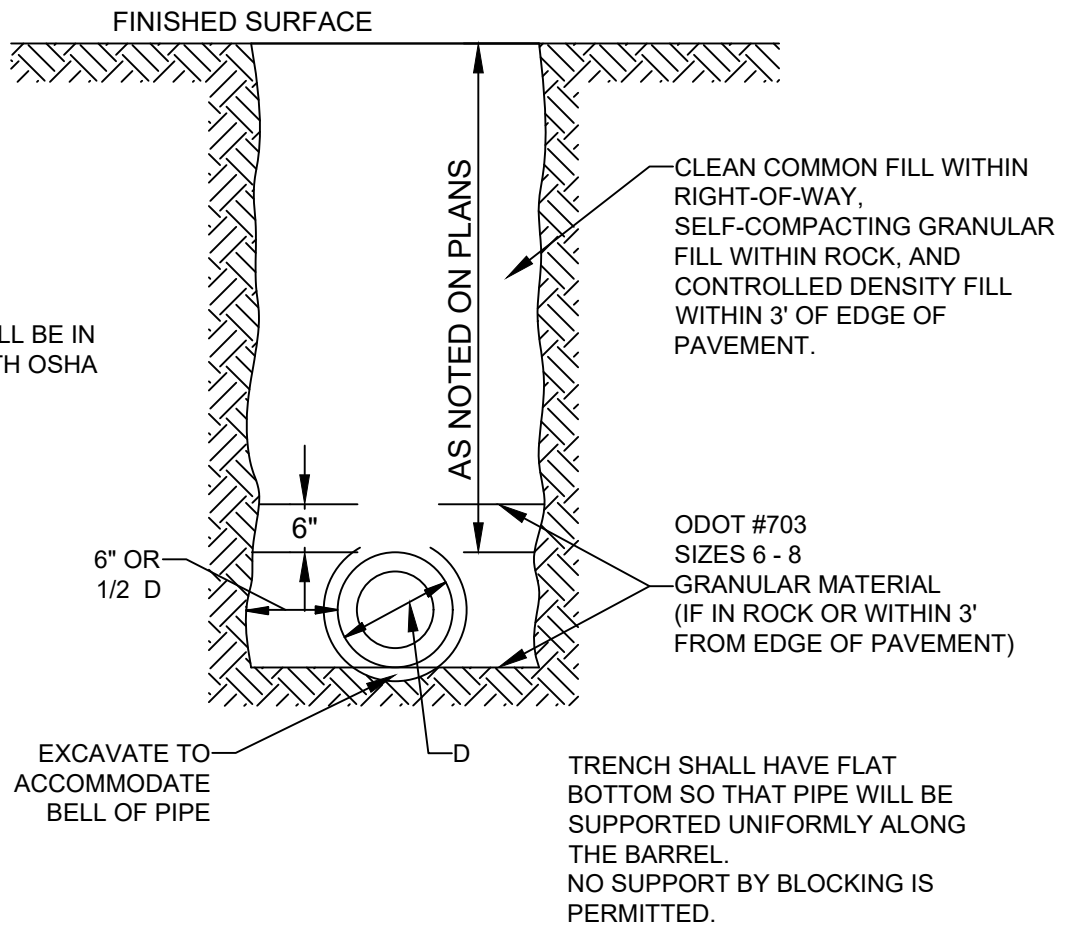
1. ALL HORIZONTAL AND VERTICAL BENDS SHALL BE LABELED WITH STATIONING.
2. LABEL LIMITS OF REQUIRED RESTRAINED JOINTS WITH STATIONING.

**REQUIRED RESTRAINED JOINTS FOR FORCEMAIN BENDS**

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WARREN COUNTY STANDARD DETAILS  
 DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**S-18**



## FORCEMAIN TRENCH DETAIL

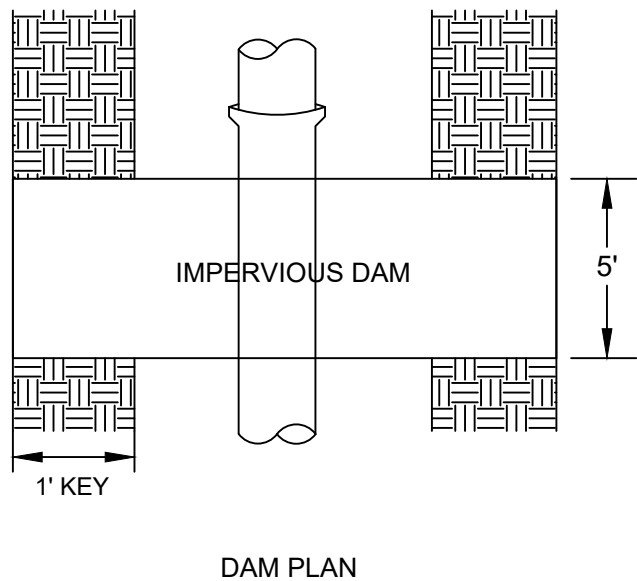
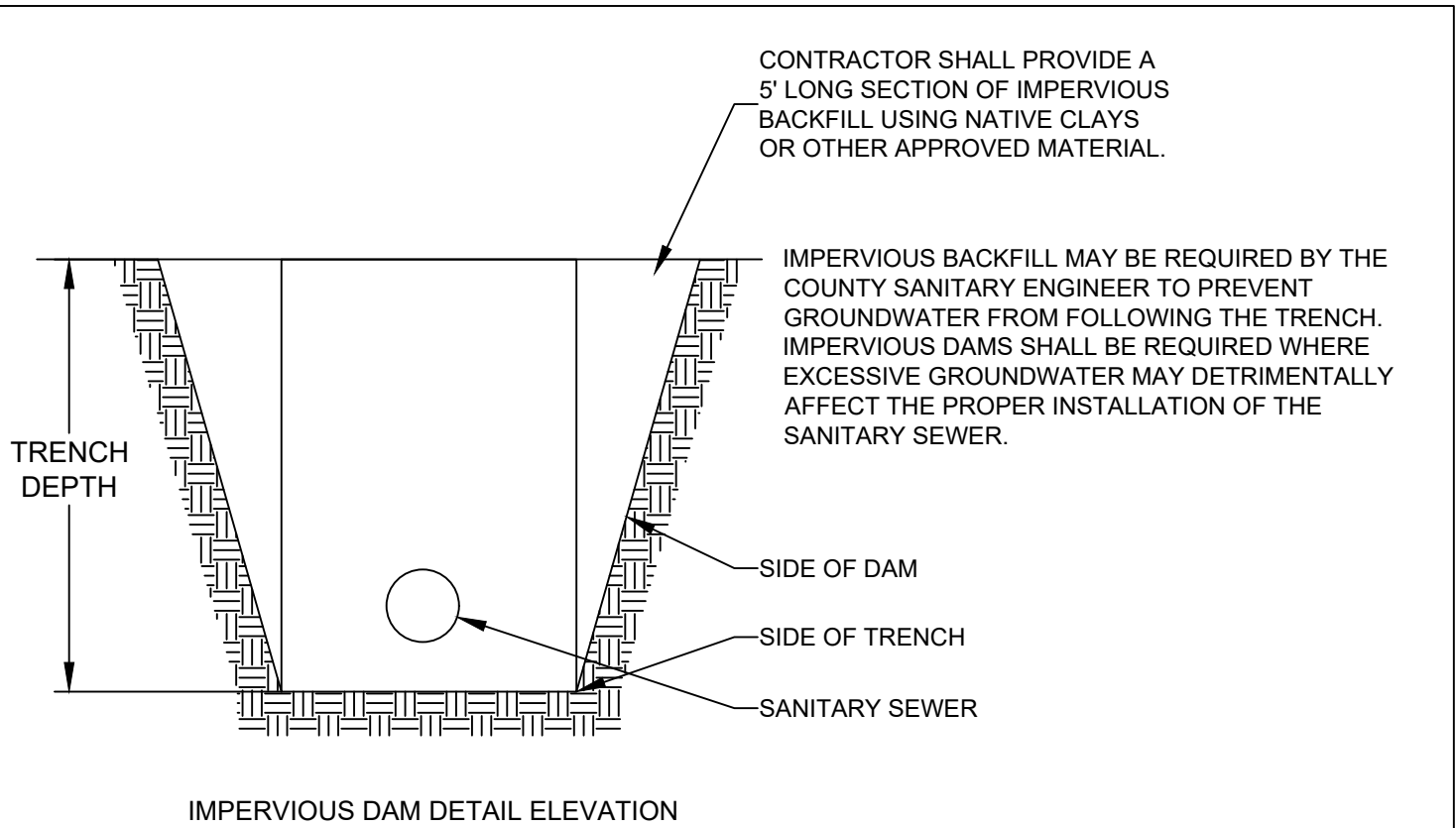
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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**S-19**

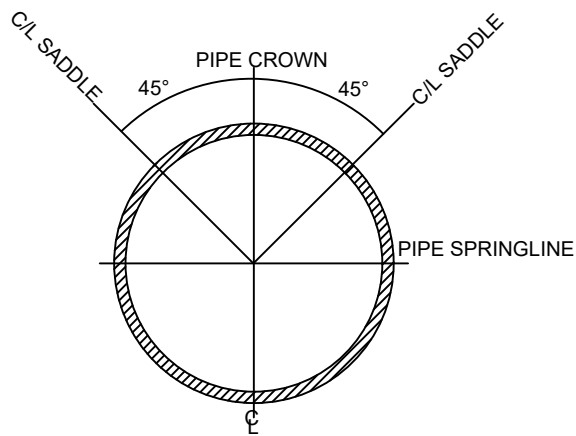
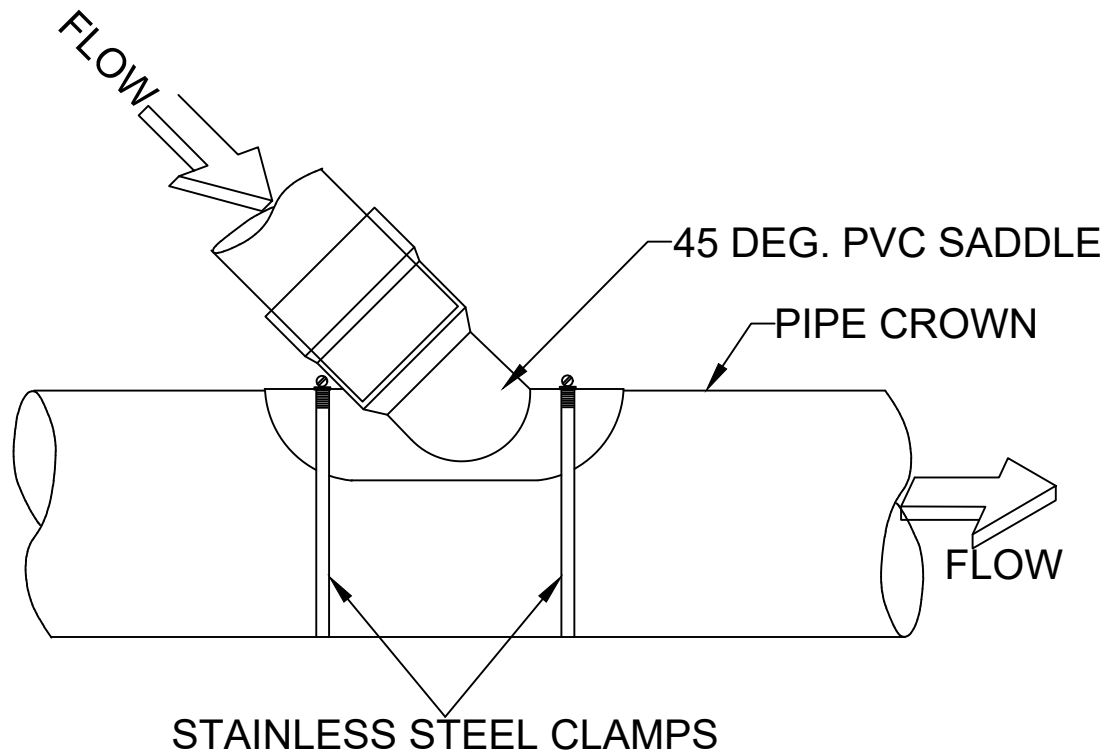


THE CONTRACTOR SHALL PLACE CUTOFF TRENCH DAMS OF NATIVE CLAY OR IMPERVIOUS SOIL ACROSS AND ALONG THE TRENCH AS SPECIFIED BY THE COUNTY SANITARY ENGINEER.

THE TRENCH DAMS SHALL BE CAREFULLY COMPACTED AND SHALL BE 5 FEET IN LENGTH (MEASURED ALONG THE TRENCH CENTERLINE) AND SHALL BE BENCHED INTO THE UNDISTURBED TRENCH SIDES.

## IMPERVIOUS DAM DETAIL

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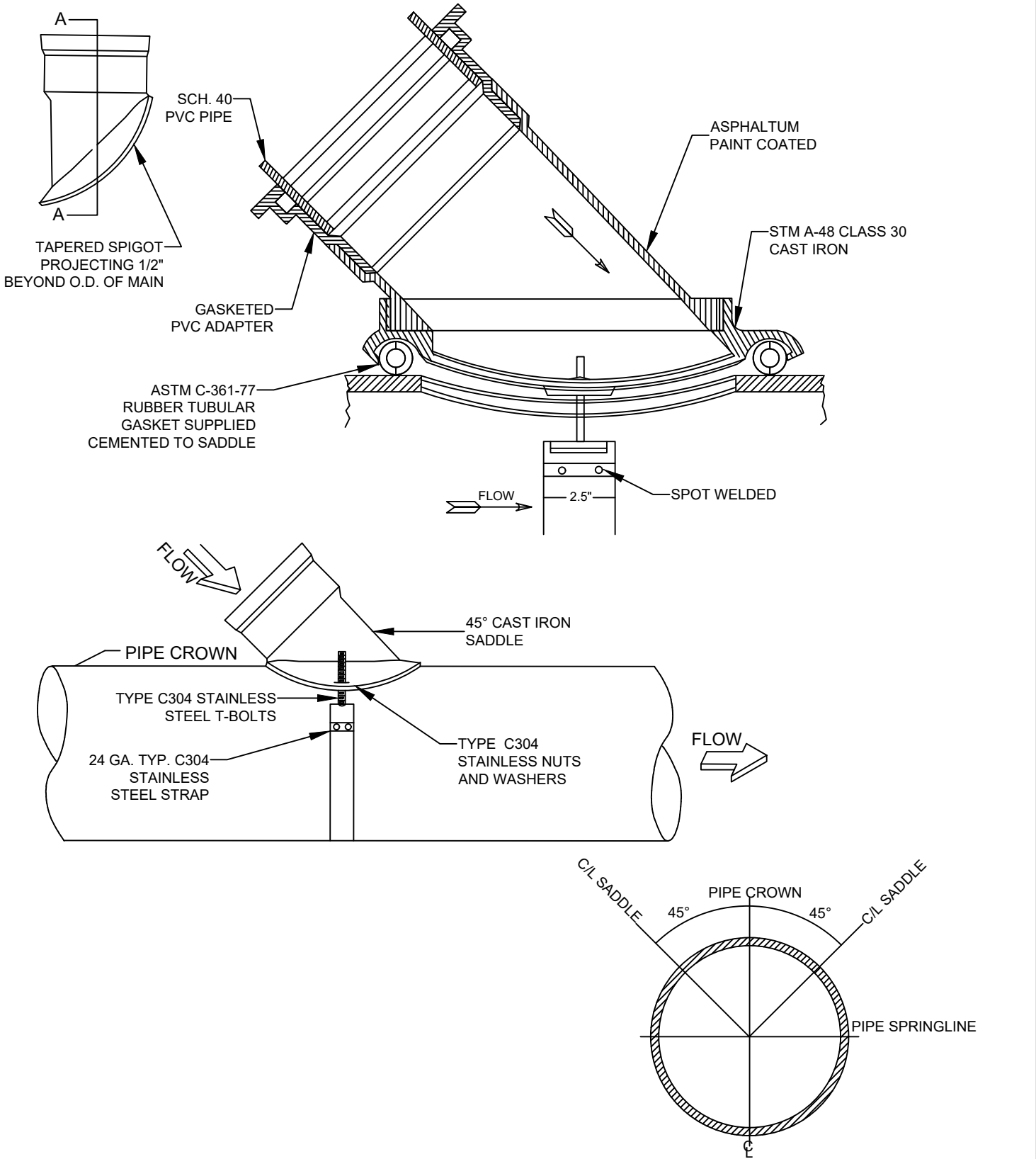


## LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE

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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

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**S-21**



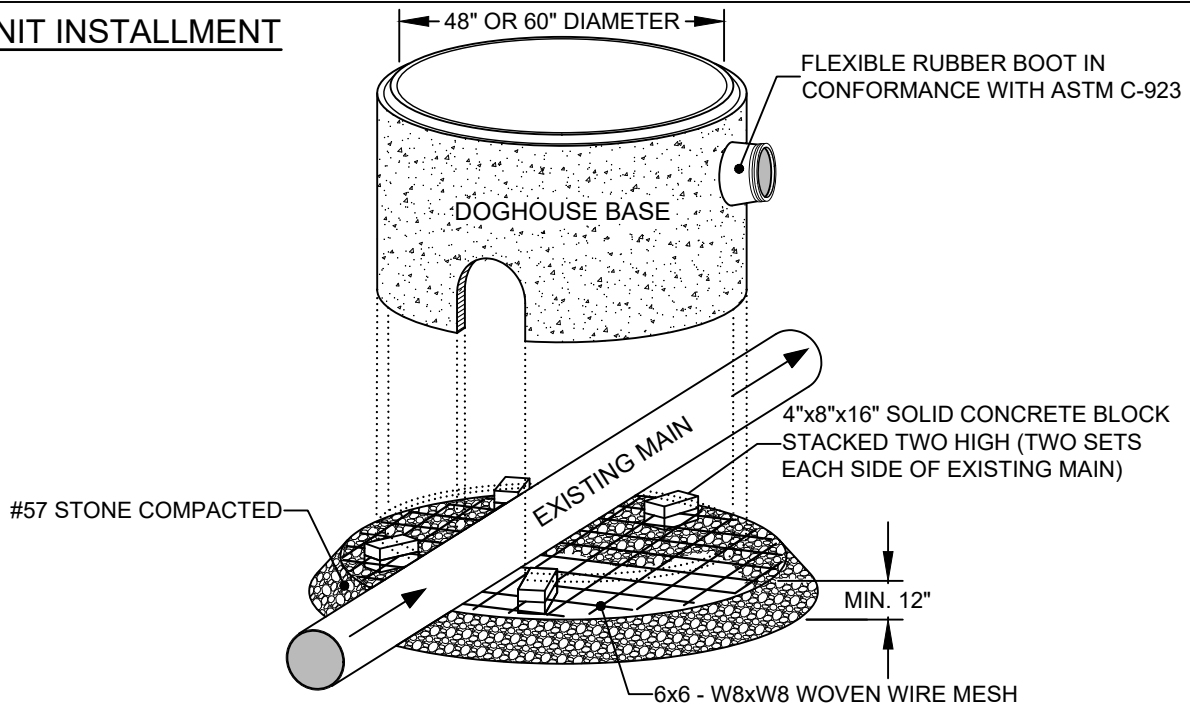
## LATERAL SADDLE INSTALLATION FOR VCP & DUCTILE IRON PIPE

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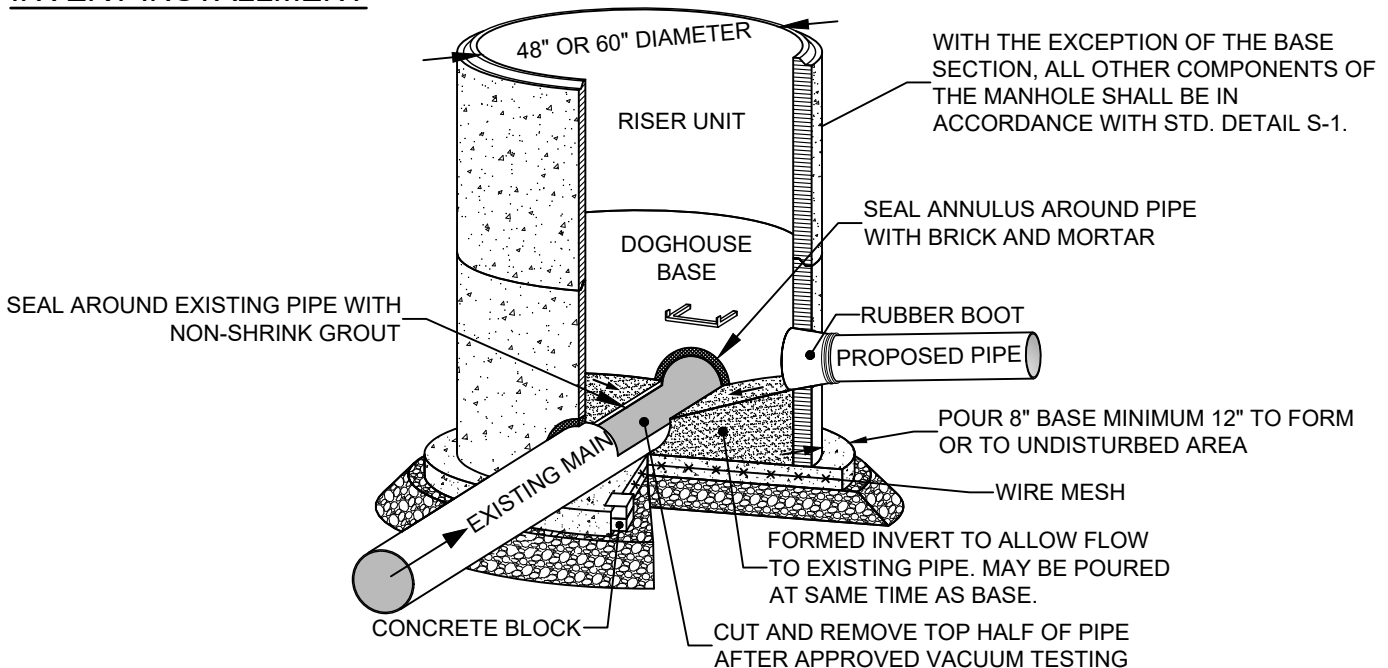
WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER  
**S-22**

## BASE UNIT INSTALLMENT



## INVERT INSTALLMENT



### NOTES:

1. DOGHOUSE OPENINGS IN PRECAST UNITS SHALL HAVE A RADIUS OF 4 TO 8 INCHES LARGER THAN THE EXISTING PIPE DIAMETER.
2. CAST-IN-PLACE CONCRETE SHALL BE 4000 PSI, PER ASTM C-94.
3. ALL PRECAST MANHOLE COMPONENTS SHALL MEET ASTM C-478.
4. BENCH SHALL SLOPE UPWARD FROM THE SPRINGLINE TO THE PROJECTED LEVEL OF THE PIPE CROWN OR 8 INCHES ABOVE THE SPRINGLINE, WHICHEVER IS LESS.

# STANDARD PRECAST CONCRETE DOGHOUSE MANHOLE

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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**S-23**

## DETAILED PROCEDURES FOR SANITARY SEWER

### PROCEDURES FOR MAKING SEWER LATERAL CONNECTIONS TO EXISTING SEWER:

- A. IF ABS COMPOSITE
  1. EXCAVATE TO POINT OF LATERAL ON MAIN.
  2. CLEAN EXISTING PIPE.
  3. ALIGN SADDLE TO PROPER POSITION AND MARK AREA TO BE CUT.
  4. CUT HOLE IN PIPE AS REQUIRED MAKING SURE THE CUT OUT DOESN'T ENTER THE MAIN.
  5. ATTACH AND SEAL SADDLE WITH STAINLESS STEEL STRAPS AND MASTIC SEALER BETWEEN SADDLE AND PIPE. INSERTA TEES ARE NOT PERMITTED.
- B. IF CLAY OR CONCRETE
  1. EXCAVATE TO POINT OF LATERAL ON MAIN.
  2. PLUG OUTLET PIPE AT UPSTREAM MANHOLE - PUMP TO DOWNSTREAM MANHOLE IF NECESSARY. REMOVE CLOSEST LENGTH OF PIPE AND REPLACE WITH TEE LATERAL SECTION OF PIPE OR CORE EXISTING MAIN.

### PROCEDURE FOR MAKING SEWER EXTENSIONS FROM EXISTING MANHOLES:

- A. CONSTRUCT LINE TO WITHIN ONE JOINT OF EXISTING MANHOLE.
- B. AFTER LINE PASSES LEAKAGE TEST AND WARREN COUNTY SANITARY ENGINEER GIVES GO AHEAD - CONNECTION IS TO BE MADE.
- C. PLUG OUTLET PIPE AT UPSTREAM MANHOLE - PUMP TO DOWNSTREAM MANHOLE IF NECESSARY.
- D. A HOLE IS CUT AT THE PROPOSED INLET POINT AND THE LAST JOINT IS LAID.
- E. EXISTING BENCH AND CHANNEL OF MANHOLE IS REBUILT AND SHAPED AS REQUIRED.
- F. NEW CONNECTION IS TO BE SEALED AS REQUIRED.

### PROCEDURE FOR MAKING NEW MANHOLES ON EXISTING SEWER MAINS:

- A. EXCAVATE AND EXPOSE EXISTING SEWER AT POINT OF NEW MANHOLE.
- B. BUILD MANHOLE OVER EXISTING LINE WILL NOT DISTURBING EXISTING LINE.
- C. BUILD NEW LINE(S) FROM NEW MANHOLE.
- D. AFTER NEW LINE(S) PASS(ES) LEAKAGE TEST AND WARREN COUNTY SANITARY ENGINEER GIVE GO AHEAD - PLUG OUTLET PIPE AT EXISTING UPSTREAM MANHOLE (PUMP TO EXISTING DOWNSTREAM MANHOLE IF NECESSARY).
- E. BREAKOUT TOP OF EXISTING SEWER AS REQUIRED AND FORM A BENCH AND CHANNEL AS REQUIRED.

### STORM WATER AND EXTRANEIOUS FLOWS:

- A. STORM WATER AND EXTRANEIOUS FLOWS ARE PROHIBITED FROM ENTERING THE EXISTING SYSTEM DURING CONSTRUCTION.
- B. NO OPEN CUT TRENCHES WILL BE ALLOWED TO REMAIN OPEN OVERNIGHT.
- C. STORM DRAINS, DIVERSION DITCHES, PUMPS, ETC., SHALL BE USED AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE SYSTEM AT ALL TIMES.

### SANITARY SEWER BEDDING:

- A. ALL SANITARY SEWER PIPE MUST BE BEDDED WITH NUMBER 57 STONE EXTENDING FROM A POINT NOT LESS THAN 6" BELOW THE BOTTOM OF THE PIPE TO THE SPRINGLINE OF THE PIPE.
- B. BACKFILL WITH NUMBER 9 GRITS FROM THE SPRINGLINE TO A POINT NOT LESS THAN 12" ABOVE THE CROWN OF THE PIPE.
- C. BEDDING SHALL PROVIDE A UNIFORM SUPPORT ALONG THE ENTIRE PIPE BARREL, WITHOUT LOAD CONCENTRATION AT JOINT COLLARS OR BELLS.
- D. BEDDING DISTURBED BY PIPE MOVEMENT OR BY REMOVAL OF SHORING OR MOVEMENT OF THE TRENCH SHIELD OR BOXY SHALL BE RECONSOLIDATED PRIOR TO BACKFILL.
- E. BEDDING TO BE COMPACTED TO 95% PROCTOR.

APPROVED/REVISED  MAY, 2023	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b>SG-1</b>
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## GENERAL NOTES - SANITARY SEWER

1. ALL SANITARY PIPE SHALL CONFORM TO THE FOLLOWING:
  - A. ASTM D-2680 FOR ABS/PVC GASKETED COMPOSITE PIPE (TRUSS)
  - B. ASTM D-3034 FOR SDR 26 GASKETED 4" - 15" DIAMETER
  - C. ASTM F-679 FOR SDR 26 GASKETED 18" - 30" DIAMETER
  - D. PIPE LARGER THAN 15" SHALL CONFORM TO ASTM F-9494 (A2000) OR ASTM F-1803.
2. CERAMIC COATED CLASS 53 DUCTILE IRON PIPE OR EQUAL MUST BE USED WHERE SPECIFIED BY THE COUNTY SANITARY ENGINEER.
3. JOINTS FOR PVC GRAVITY SEWER SHALL BE PUSH-ON TYPES WITH RUBBER GASKETS. PIPE ENDS SHALL NOT BE BEVELED. PIPE ENDS MUST BE SEALED.
4. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER STORM WATER CONNECTIONS TO THE SANITARY SYSTEM ARE PROHIBITED.
5. NO MANHOLE OR ANY PORTION OF THE MANHOLE, SHALL BE LOCATED UNDER A SIDEWALK OR DRIVEWAY.
6. SANITARY SEWER LATERALS SHALL BE CONSTRUCTED OF THE FOLLOWING MATERIALS.
  - A. ABS PIPE - ASTM d-2751 WITH SDR 23.5 (6" GLUE JOINT)
  - B. PVC PIPE - ASTM D-3034 WITH 23.5 (6" GLUE OR GASKET JOINT)  
ASTM D-2665 SCHEDULE 40  
ASTM D-3034 WITH SDR 35 (6" ONLY)
  - C. DUCTILE IRON - CLASS 53 (6")
7. SEWER LATERAL LOCATION :
  - A. SEWER LATERALS MUST BE EXTENDED TO THE HOUSE SIDE OF UTILITY EASEMENTS.
  - B. SEWER LATERALS SHALL BE MARKED BY TWO INCHES BY FOUR INCHES (2" X 4") OR LARGER POSTS. POSTS SHALL BE PAINTED GREEN.
  - C. A SIX FOOT (6') LENGTH OF #6 REINFORCED BAR SHALL BE INSTALLED AGAINST THE POST.
  - D. END OF SEWER LATERAL SHALL NOT EXCEED 4' IN DEPTH UNLESS APPROVED BY THE COUNTY SANITARY ENGINEER.
  - E. SEE DETAILS S-14A , S-14B, AND S-14C.
8. ONLY SANITARY WYES WITH 45° BENDS SHALL BE USED FOR SANITARY LATERAL INSTALLATION. ALL WYES TO BE GLUE JOINTS ON TRUSS AND COMPOSITE PIPE. ALL SANITARY LATERALS MUST BE SIX INCHES (6") IN DIAMETER WITHIN THE RIGHT-OF-WAY. NO CONNECTION SHALL BE MADE TO THE CROWN OF THE SEWER MAIN.
9. ALL LATERALS TO BE NOT LESS THAN SIX INCHES (6") INSIDE DIAMETER.
10. THE LOCATION OF SEWER LATERALS MUST BE STAMPED IN THE CURB AT THE TIME THE CURB IS PLACED TO PERMANENTLY INDICATE THE LOCATION OF SAID LATERALS.
11. THE LOCATION OF ALL SEWER LATERALS MUST BE PROVIDED ON THE AS-BUILT PLANS.
12. MANHOLE LATERALS SHALL HAVE AN INVERT TWO INCHES (2") ABOVE MAIN-LINE INVERTS.
13. EXISTING MANHOLE CASTING ARE TO BE RAISED BY EITHER A MANHOLE ADJUSTING RING OR A BARREL SECTION ADDED. IF THE HEIGHT OF NECESSARY ADJUSTMENT IS OVER ONE FOOT (1') OR THERE IS ALREADY AN EXISTING ADJUSTMENT RING BEING USED, THE CONTRACTOR IS TO USE A NEW BARREL SECTION ONLY. EXTRA CARE IS TO BE TAKEN TO INSURE A PROPER AND TIGHT SEAL AT ALL NEW JOINTS.

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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

SG-2A

## GENERAL NOTES - SANITARY SEWER (CONTINUED)

14. THE CONTRACTOR MUST INSTALL MECHANICAL PLUG(S) AT THE POINT(S) OF CONNECTION TO EXISTING SEWER PRIOR TO INITIATING ANY CONSTRUCTION. THE MECHANICAL PLUG(S) SHALL REMAIN IN PLACE UNTIL THE NEW MAINS HAVE BEEN FLUSHED, CLEANED, TESTED, TELEVISED, AND APPROVED FOR USE BY WARREN COUNTY SANITARY ENGINEER. THE MECHANICAL PLUG(S) CAN ONLY BE REMOVED IN THE PRESENCE OF A WARREN COUNTY SEWER INSPECTOR.
15. TRENCH SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR MUST INSURE THAT ALL APPLICABLE OSHA OPEN TRENCH SAFETY REQUIREMENTS ARE FOLLOWED. IT IS NOT WARREN COUNTY'S RESPONSIBILITY TO INSPECT EACH SITE FOR COMPLIANCE.
16. HDPE PIPE MAY ONLY BE USED FOR DIRECTIONAL BORING OF FORCE MAINS WITH APPROVAL FROM THE COUNTY SANITARY ENGINEER. ALL DIRECTIONAL BORING SHOULD BE ACCOMPANIED BY DRILLING LOGS AT 25' STATION INCREMENTS, PVC PIPE SHALL BE PERMITTED FOR FORCE MAINS SIX INCHES (6") OR SMALLER IN DIAMETER. FORCE MAINS EIGHT INCHES (8") OR LARGER MUST BE CLASS 53 DUCTILE IRON WITH AN INTERIOR LINING OF EPOXY OR CERAMIC. PVC SHALL CONFORM TO AWWA C900 REQUIREMENTS AND HAVE AN EQUIVALENT OUTSIDE DIAMETER OF DR 14.
17. MINIMUM SLOPE SHALL BE AS FOLLOWS:

<u>PIPE SIZE</u>	<u>MINIMUM SLOPE (%)</u>
6"	2.00
8"	.50
10"	.35
12"	.28
15"	.19
18"	.15

18. ALL MATERIALS USED SHALL BE DOMESTIC, MADE IN THE UNITED STATES OF AMERICA.

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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**SG-2B**

## PIPE CONNECTIONS INTO MANHOLES

SEWER PIPE TO MANHOLE CONNECTIONS ON ALL SANITARY SEWERS SHALL BE FLEXIBLE AND WATERTIGHT. SEWER PIPE SHALL BE SEALED IN THE MANHOLE SECTION PIPE OPENINGS WITH A RESILIENT CONNECTOR MEETING THE REQUIREMENTS OF ASTM C923. THE CONNECTION MAY BE ANY OF THE FOLLOWING TYPES:

1. RUBBER SLEEVE WITH STAINLESS STEEL BANDING
  - A. KOR-N-SEAL AS MANUFACTURED BY POLLUTION CONTROL SYSTEMS, INC.
  - B. LOCK JOINT FLEXIBLE MANHOLE SLEEVE AS MANUFACTURED BY INTERSPACE CORPORATION.
  - C. OR EQUAL.
  
2. RUBBER GASKET COMPRESSION
  - A. PRESS WEDGE II AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION.
  - B. DURA-SEAL AS MANUFACTURED BY DURA TECH, INC.
  - C. OR EQUAL.

RESILIENT CONNECTOR SHALL BE CAST INTEGRALLY INTO THE WALL OF THE MANHOLE SECTION AT TIME OF MANUFACTURE OR SHALL BE INSTALLED BY MECHANICAL MEANS IN OPENING CUT INTO MAHOLE WALL PER ASTM C923.

ANY CONNECTION TO AN EXISTING MANHOLE MUST BE MADE BY CORING THE MANHOLE. ANY CORE TO A MANHOLE MUST BE CENTERED IN THE BARREL SECTION. NO CORE SHALL BE MADE ALONG THE SEAM OF THE BARREL SECTION(S).

APPROVED/REVISED  MARCH, 2018	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER  <b>SG-3</b>
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## SEWER TESTING

1. THE CONTRACTOR MUST INSTALL MECHANICAL PLUG(S) AT THE POINT(S) OF CONNECTION TO THE EXISTING SEWER PRIOR TO INITIATING ANY CONSTRUCTION. THE MECHANICAL PLUG(S) SHALL REMAIN IN PLACE UNTIL THE NEW MAINS HAVE BEEN FLUSHED, CLEANED, TESTED, TELEVISED, AND APPROVED FOR USE BY THE WARREN COUNTY SANITARY ENGINEER. THE MECHANICAL PLUG(S) CAN ONLY BE REMOVED IN THE PRESENCE OF A WARREN COUNTY SEWER INSPECTOR.
2. ALL NEW MANHOLES SHALL BE VACUUM TESTED. A VACUUM OF 10" OF MERCURY SHALL BE DRAWN ON THE MANHOLE. FOR A 4' MANHOLE LESS THAN 20' DEEP, MANHOLE SHALL HOLD 9" OF MERCURY FOR AT LEAST ONE (1) MINUTE.
3. ALL SANITARY SEWER MAINS MUST BE AIR TESTED. THE STANDARD TEST IS AN AIR PRESSURE TEST OF 5.0 PSI FOR A FIVE (5) MINUTE PERIOD WITH A MAXIMUM OF 1.0 PSI LOSS.
4. ALL NON-TRUSS PIPE SHALL BE TESTED FOR DEFLECTION AFTER BACKFILLING IS COMPLETED (30 DAY MINIMUM REQUIRED). A DEFLECTION TEST WITH A NINE POINT MANDREL WILL BE REQUIRED. NO MECHANICAL PULLING DEVICE SHALL BE USED. A VERTICAL RING DEFLECTION GREATER THAN FIVE PERCENT (5%) WILL NOT BE ALLOWED. THIS DEFLECTION IS DEFINED AS A FIVE PERCENT REDUCTION IN THE VERTICAL BASE OR AVERAGE INSIDE DIAMETER.
5. AT THE TIME THE SANITARY SEWER IS TESTED, THE SEWER MUST BE CLEANED AND TELEVISED WITH VIDEO DOCUMENTATION PROVIDED TO WARREN COUNTY ON A FLASH DRIVE OR THROUGH A FILE TRANSFER PROTOCOL (FTP) SITE. THE VIDEO MUST INCLUDE AUDIO IDENTIFICATION OF THE PIPE SPANS FROM MANHOLE TO MANHOLE, FLOW DIRECTION, TILT AND PAN OF ALL LATERALS AND CALL OUT ANY SUSPECT PROBLEMS IN THE SYSTEM. ALL PROBLEMS MUST BE IDENTIFIED BY THE CONTRACTOR. THE NECESSARY REPAIRS MUST BE MADE AND THE SEWER MUST THEN BE RE-CLEANED, RE-TESTED, AND RE-TELEVISED.
6. A SECOND VIDEO INSPECTION IS REQUIRED ONE YEAR AFTER INSTALLATION AND/OR PRIOR TO THE RELEASE OF THE MAINTENANCE BOND. IF A DEFICIENCY IS IDENTIFIED DURING THIS TELEVISED INSPECTION, THE FAILED SEWER PIPE MUST BE TESTED AND REPAIRED TO THE SATISFACTION OF THE COUNTY SANITARY ENGINEER.
7. THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE TELEVISING, TESTING, AND REPAIRS OF THE SANITARY SEWER.

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WARREN COUNTY STANDARD DETAILS  
DEPARTMENT OF WATER & SEWER

STANDARD NUMBER

**SG-4**