

# **SOUTHWEST LICKING COMMUNITY WATER & SEWER DISTRICT**

## **WATER AND SANITARY SEWER STANDARD DRAWINGS**



Revision Date:  
February 2023

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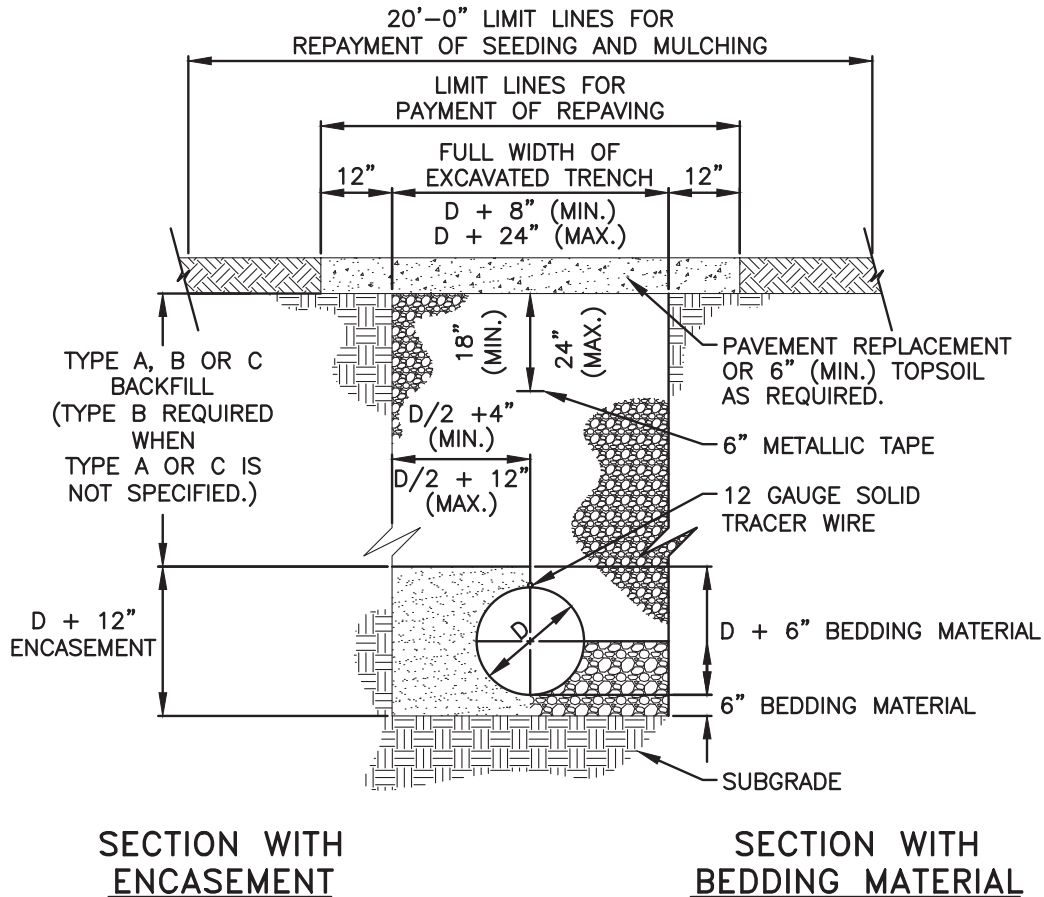
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NOTES:

1. ITEM NUMBERS REFER TO THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.
2. AGGREGATE FOR BEDDING SHALL BE WASHED GRAVEL AND BE NO. 57 PER CMS 304.02.
3. TYPE A BACKFILL SHALL BE GRANULAR MATERIAL AS SPECIFIED IN ITEM 703.11, GRANULAR MATERIAL, TYPE 2. TYPE A BACKFILL SHALL BE USED WHEN THE TRENCH IS 5' OR LESS FROM ANY PAVED OR GRAVEL SURFACE OR BENEATH THE PAVEMENT OR GRAVEL. COMPACTION SHALL MEET THE REQUIREMENTS OF ITEM 203.
4. TYPE B BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, TOPSOIL, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 95% OF ITS MAXIMUM LABORATORY DRY WEIGHT.
5. TYPE C BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 6" ACROSS THEIR GREATEST DIMENSION, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 90% OF ITS MAXIMUM LABORATORY DRY WEIGHT. WHEN APPROVED BY THE CONTRACT ADMINISTRATOR, STONES NO LARGER THAN ONE CUBIC FOOT MAY BE DEPOSITED AT LEAST 3' ABOVE THE TOP OF THE PIPE.
6. THE EXCAVATED TRENCH WIDTH 12" ABOVE THE CONDUIT MAY BE INCREASED WITHOUT ADDITIONAL COMPENSATION.
7. RIGID PIPE SHALL INCLUDE DUCTILE IRON.
8. ENCASEMENT SHALL BE CLASS C CONCRETE.
9. SECTIONS ARE SYMMETRICAL ABOUT THE CENTERLINE.



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# TYPICAL TRENCH FOR RIGID PIPE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

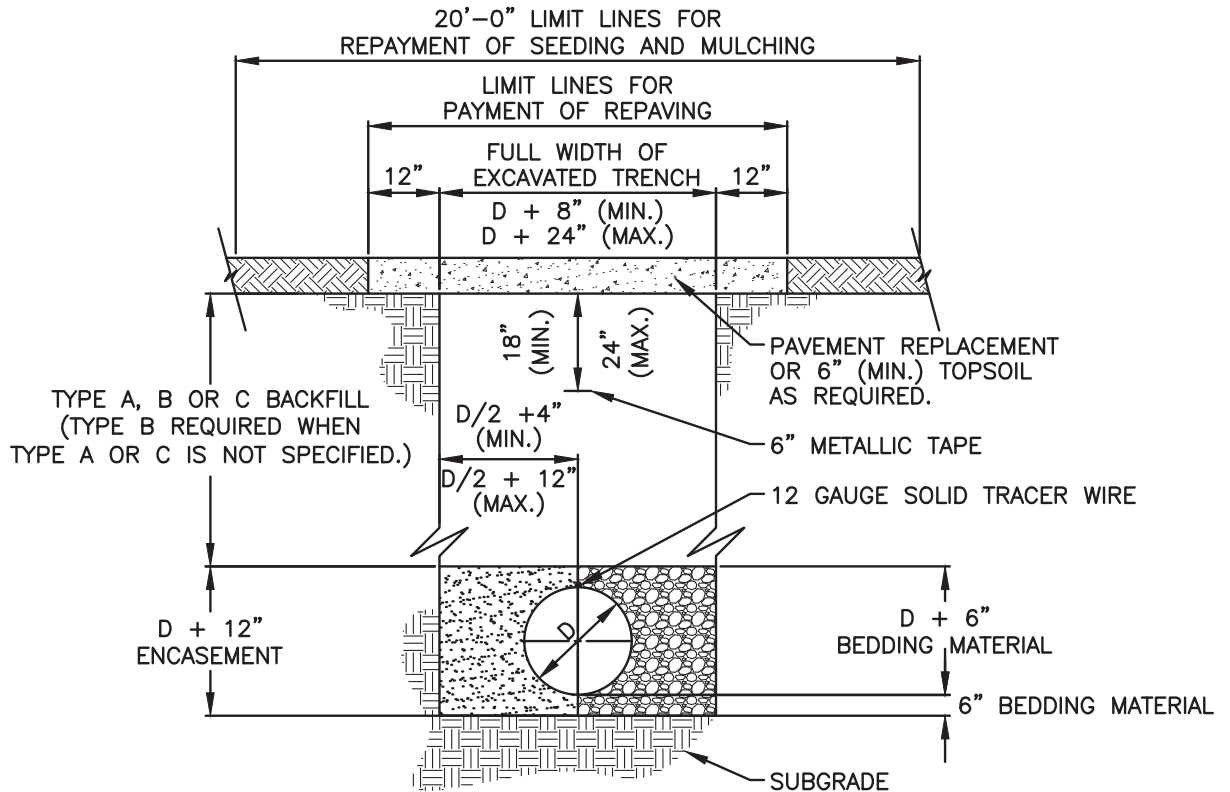
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-1A  
1 OF 2

NOTES:

1. ITEM NUMBERS REFER TO THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.
2. AGGREGATE FOR BEDDING SHALL BE WASHED GRAVEL AND BE NO. 57 PER CMS 304.02.
3. TYPE A BACKFILL SHALL BE GRANULAR MATERIAL AS SPECIFIED IN ITEM 703.11, GRANULAR MATERIAL, TYPE 2. TYPE A BACKFILL SHALL BE USED WHEN THE TRENCH IS 5' OR LESS FROM ANY PAVED OR GRAVEL SURFACE OR BENEATH THE PAVEMENT OR GRAVEL. COMPACTION SHALL MEET THE REQUIREMENTS OF ITEM 203.
4. TYPE B BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, TOPSOIL, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 95% OF ITS MAXIMUM LABORATORY DRY WEIGHT.
5. TYPE C BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 6" ACROSS THEIR GREATEST DIMENSION, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 90% OF ITS MAXIMUM LABORATORY DRY WEIGHT. WHEN APPROVED BY THE CONTRACT ADMINISTRATOR, STONES NO LARGER THAN ONE CUBIC FOOT MAY BE DEPOSITED AT LEAST 3' ABOVE THE TOP OF THE PIPE.
6. THE EXCAVATED TRENCH WIDTH 12" ABOVE THE CONDUIT MAY BE INCREASED WITHOUT ADDITIONAL COMPENSATION.
7. FLEXIBLE PIPE SHALL INCLUDE PVC AND POLYETHYLENE.
8. ENCASEMENT SHALL BE CLASS C CONCRETE.



SECTION WITH ENCASEMENT

SECTION WITH BEDDING MATERIAL

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# TYPICAL TRENCH FOR FLEXIBLE PIPE

SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

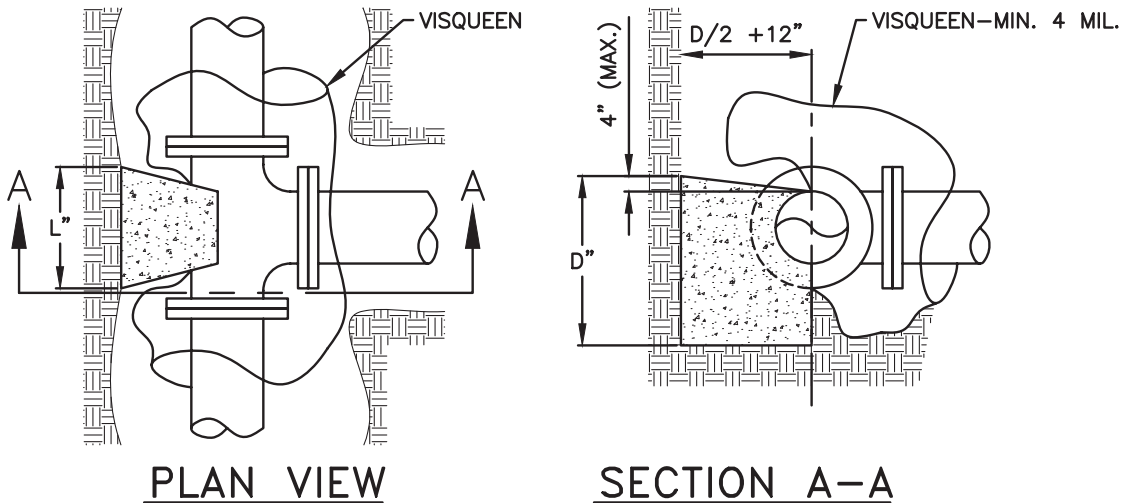
REVISED:  
02/2023

DRAWING NO.  
W-1B  
2 OF 2

RUN	BRANCH											
	3"			4"			6"			8"		
	L	D	V	L	D	V	L	D	V	L	D	V
3"	12	5	0.5									
4"	10	6	0.5	11	8	0.8						
6"	9	7	0.5	11	8	0.8	18	12	1.9			
8"	8	8	0.5	10	9	0.7	18	12	1.9	23	16	3.5
12"	6	12	0.6	8	12	0.8	18	12	1.9	23	16	3.5
16"	6	16	0.8	6	16	0.8	14	16	2.0	20	18	3.3
20"	6	20	1.0	6	20	1.0	11	20	1.9	18	20	3.3
24"	6	24	1.2	6	24	1.2	9	24	1.9	15	24	3.3

RUN	BRANCH											
	12"			16"			20"			24"		
	L	D	V	L	D	V	L	D	V	L	D	V
3"												
4"												
6"												
8"												
12"	38	22	8.7									
16"	36	23	8.7	49	30	13.6						
20"	35	24	8.7	46	32	13.6	60	38	26.5			
24"	30	28	8.7	42	36	14.0	54	42	26.3	68	48	45.4

V = VOLUME OF CONCRETE IN CUBIC FEET



NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE ENGINEER
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
6. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.

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DATE

*Scott Campbell*  
REGISTERED ENGINEER

# BACKING FOR TEES

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

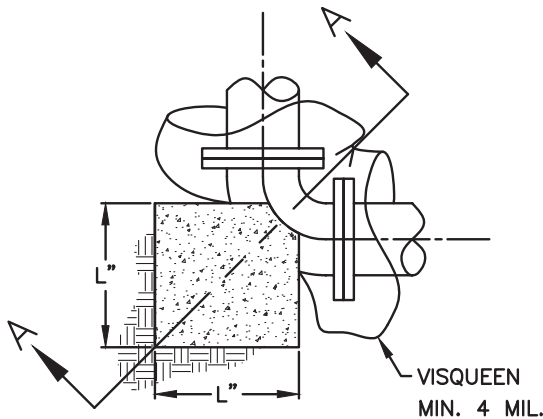
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

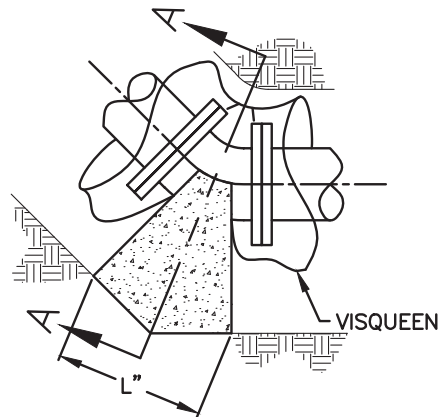
DRAWING NO.  
W-3

PIPE SIZE	DEGREE OF BEND											
	11 1/4°			22 1/2°			45°			90°		
	L	D	V	L	D	V	L	D	V	L	D	V
3"	4	3	0.1	6	4	0.2	10	4	0.3	10	4	0.3
4"	5	4	0.2	9	5	0.4	14	5	0.6	14	5	0.6
6"	8	6	0.5	12	7	0.7	20	8	1.4	18	9	1.7
8"	9	8	0.7	16	9	1.4	24	12	2.7	25	11	4.0
12"	14	12	1.8	24	14	3.6	36	18	6.8	32	18	10.7
16"	18	16	3.4	32	18	6.7	36	32	13.4	41	26	25.4
20"	25	20	6.4	30	30	11.5	49	36	20.5	50	32	46.5
24"	27	24	9.0	39	34	18.4	60	42	35.0	58	40	77.7

V = VOLUME OF CONCRETE IN CUBIC FEET



90° BENDS

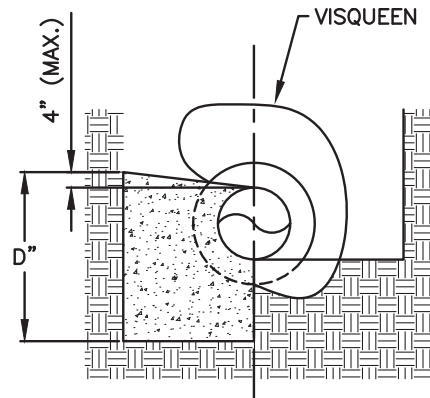


BENDS LESS THAN 90°

PLAN VIEWS

NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE ENGINEER.
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
6. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.



SECTION A-A

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

**BACKING  
FOR  
BENDS**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

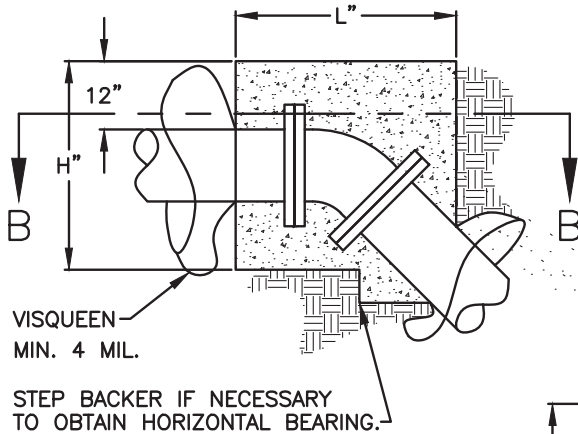
DRAWING NO.  
W-4

PIPE SIZE	DEGREE OF BEND															
	11 1/4°				22 1/2°				45°				90°			
	L	W	H	V	L	W	H	V	L	W	H	V	L	W	H	V
3"	12	18	12	1.5	13	25	16	3.0	18	30	19	5.9	25	30	24	10.4
4"	12	24	16	2.6	16	30	18	5.0	22	36	24	11.0	27	48	25	18.7
6"	12	48	18	6.0	15	43	36	13.4	30	55	24	22.9	37	54	36	41.6
8"	12	63	24	10.5	18	57	34	20.2	36	57	33	39.2	47	60	46	75.0
12"	20	54	36	22.6	37	62	37	49.0	48	62	51	87.9	66	66	66	166.4
16"	31	65	38	44.3	60	65	39	88.1	65	65	65	159.2	72	96	72	288.0
20"	45	70	40	72.8	56	70	60	136.2	72	76	78	247.0	86	108	84	451.8
24"	41	72	54	92.3	67	74	69	198.0	88	84	84	359.1	96	120	96	640.0

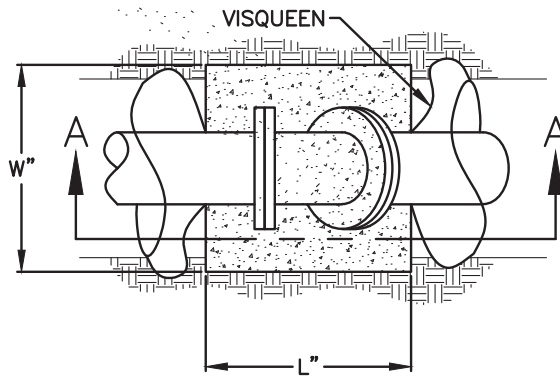
V = VOLUME OF CONCRETE IN CUBIC FEET

NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE ENGINEER.
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. BACKING SHALL BE CENTERED HORIZONTALLY ON BEND.
6. ANY PIPE WHICH COMES IN CONTACT WITH THE CONCRETE ENCASEMENT SHALL BE DUCTILE IRON.
7. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
8. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.



SECTION A-A



SECTION B-B

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

**BACKING FOR  
VERTICAL BENDS  
(OVER BENDS ONLY)**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-5

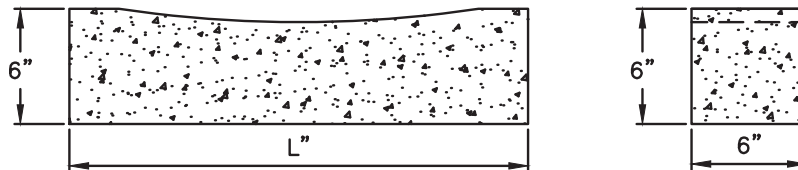


	SIZE	L	V
GATE VALVES	3"	15	0.31
	4"	16	0.33
	6"	17	0.36
	8"	20	0.42
	12"	24	0.50
	16"	30	0.63
BUTTERFLY VALVES	20"	36	0.75
	24"	42	0.88
	30"	48	1.00

V = VOLUME OF CONCRETE IN CUBIC FEET

NOTES:

1. CONCRETE FOR SUPPORTS SHALL BE CLASS C.
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
4. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
5. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BACKING DOES NOT HAVE DIRECT CONTACT WITH VALVE.



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

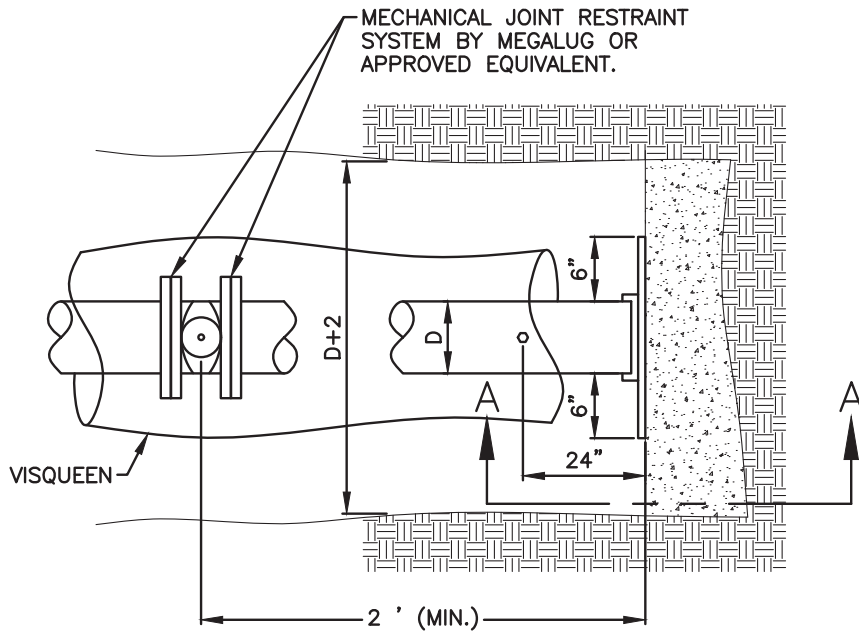
# CONCRETE VALVE SUPPORTS

SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

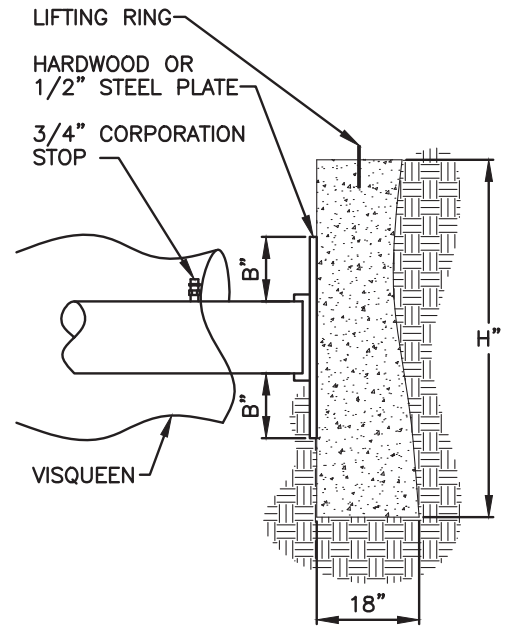
STANDARD CONSTRUCTION DWG.

REVISED:  
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DRAWING NO.  
W-6



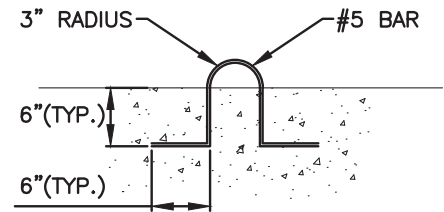
**PLAN VIEW**



**SECTION A-A**

**NOTES:**

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
4. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
5. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.
6. END OF PIPE SHALL BE CAPPED OR PLUGGED.
7. STEEL PLATE SHALL BE GREASED WHERE IN CONTACT WITH CONCRETE BACKING.
8. PLUG POLES SHALL BE INSTALLED AT ALL END-OF-LINE STUBS AT THE THRUST BLOCK.



**LIFTING RING DETAIL**

SIZE OF PIPE	H	B	L (PVC)	L (DIP)	V
6"	8	1	20	18	2.52
8"	12	1	20	18	4.00
12"	23	3	20	18	8.64
16"	37	3	20	18	15.39

V = VOLUME OF CONCRETE IN CUBIC FEET.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

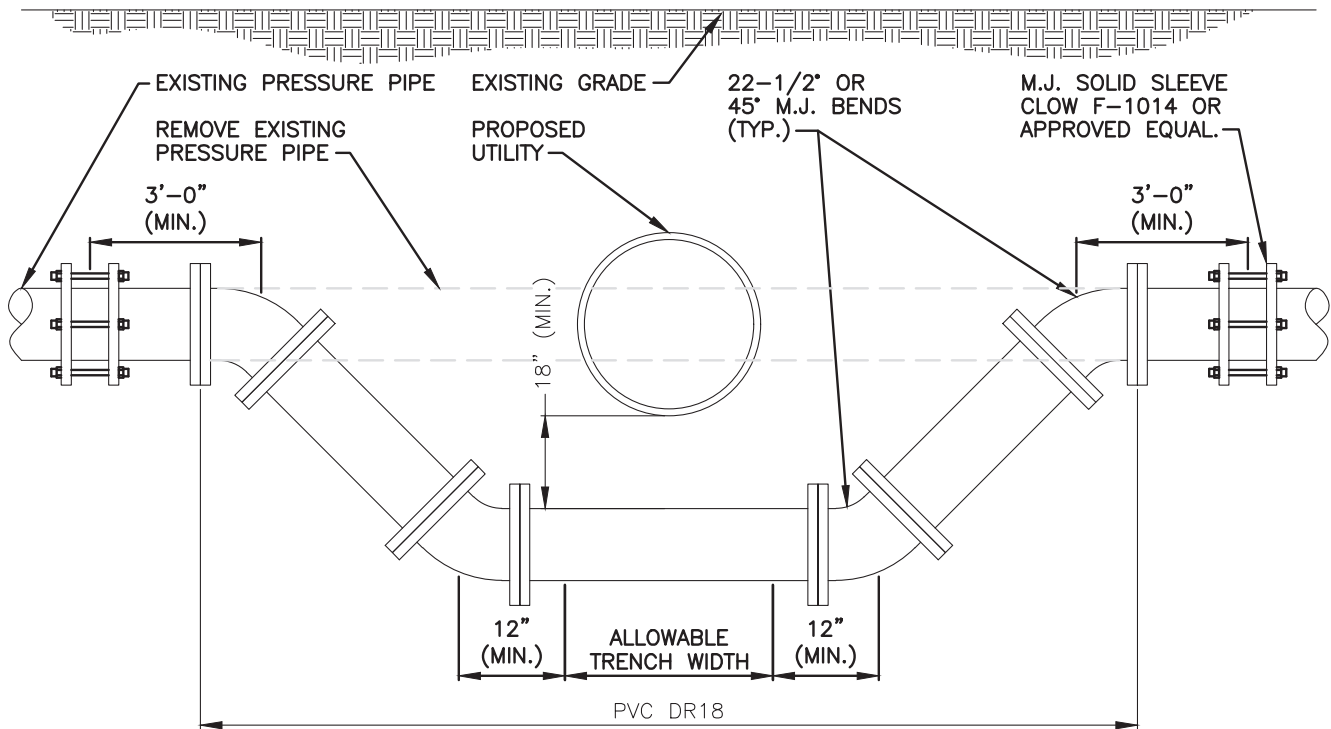
**THRUST  
BLOCK  
DETAIL**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-7



NOTES:

1. TIME AND DURATION OF SHUTDOWN SHALL BE DETERMINED OR APPROVED BY THE DISTRICT.
2. THE CONTRACTOR SHALL NOTIFY ANY CUSTOMERS AFFECTED BY THE PROPOSED WORK AT LEAST 48 HOURS IN ADVANCE OF SHUTDOWN.
3. ALL SLEEVES AND BENDS SHALL BE SECURED BY RESTRAINING GLANDS, RODDING OR OTHER METHODS AS APPROVED BY THE ENGINEER TO RESTORE MAIN SERVICE AS SOON AS POSSIBLE.
4. THE RELOCATED LINES SHALL BE LAID TO THE NEW LINE AND GRADE, TESTED AND DISINFECTED AS REQUIRED PRIOR TO THE SHUTDOWN OF EXISTING MAIN AND CONNECTION OF THE RELOCATED LINES TO THE EXISTING MAIN.
5. ALL WATER LINES SHALL BE DISINFECTED BY A SWABBING WITH A 5% HYPOCHLORITE SOLUTION IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF AWWA C651.

APPROVED: \_\_\_\_\_  
 DATE: 02/22/2023

*Scott Campbell*  
 REGISTERED ENGINEER

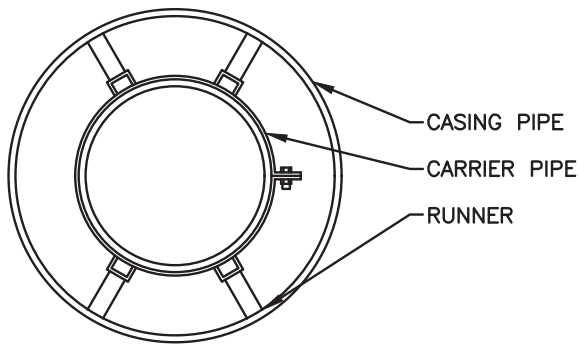
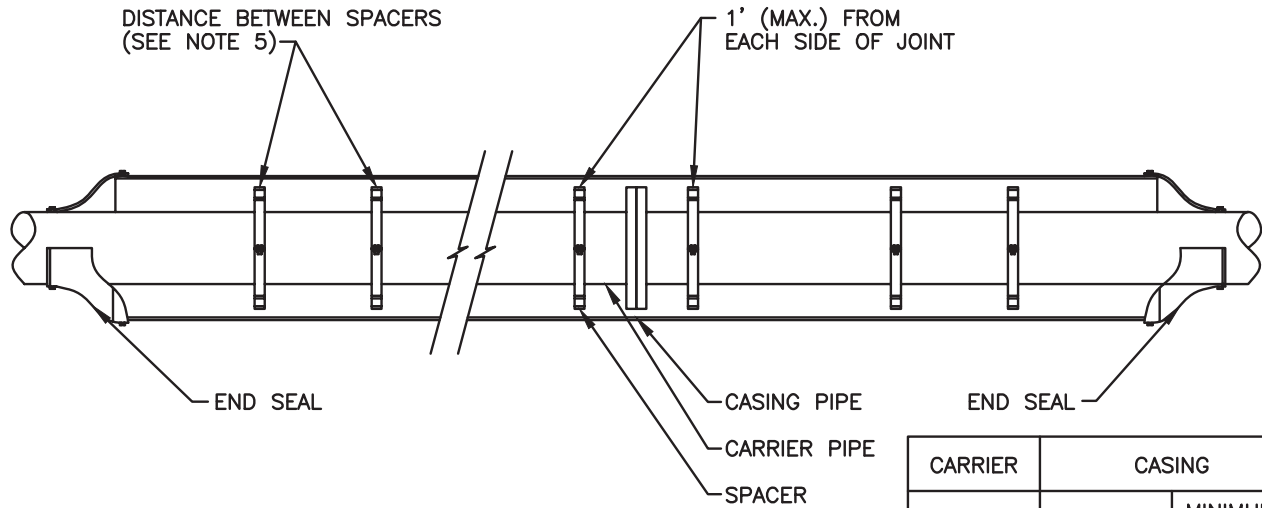
# TYPICAL PRESSURE PIPE LOWERING

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

DRAWING NO.  
 W-10



CARRIER INSIDE DIAMETER	CASING	
	MINIMUM DIAMETER	MINIMUM WALL THICKNESS
2"	8"	0.188"
3"	10"	0.188"
4"	10"	0.188"
6"	14"	0.219"
8"	16"	0.219"
10"	18"	0.250"
12"	20"	0.281"
15"	24"	0.344"
16"	24"	0.344"
18"	28"	0.406"
20"	28"	0.406"
24"	36"	0.469"
27"	42"	0.500"
30"	42"	0.500"
36"	48"	0.675"

NOTES:

- CARRIER PIPE SHALL BE CERTA-LOK C900 (DR18) OR HPDE (DR11)
- CASING PIPE SHALL BE INSTALLED BY JACKING OR DIRECTIONAL DRILL WITH A MINIMUM WALL THICKNESS AS SHOWN IN THE TABLE OR MEETING THE REQUIREMENTS OF THE RECEIVING AUTHORITY.
- CASING SPACERS AND END SEALS SHALL BE ADVANCE PRODUCTS & SYSTEMS, INC. OR APPROVED EQUIVALENT.
- WHEN HDPE PIPE IS USED, THE PIPE SHALL BE DR11 WITH AN INTERNAL DIAMETER EQUAL TO OR GREATER THAN THAT OF THE OPEN CUT EXCAVATION MATERIAL IN WHICH THE CONNECTION WAS MADE.
- DIMENSIONS BETWEEN SPACERS FOR PVC PIPE SHALL BE 6 FEET MAXIMUM.
- THE QUANTITY OF RUNNERS IS IN ACCORDANCE WITH THE SIZE OF THE CARRIER PIPE AS FOLLOWS:  
 TO 14" DIA. - 4 RUNNERS 16"  
 TO 36" DIA. - 6 RUNNERS 38"  
 TO 48" DIA. - 8 RUNNERS
- WITH HPDE, MECH. RESTRAINTS MUST BE USED 3 JOINTS FROM BOTH ENDS OF THE BORE.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# CASING PIPE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

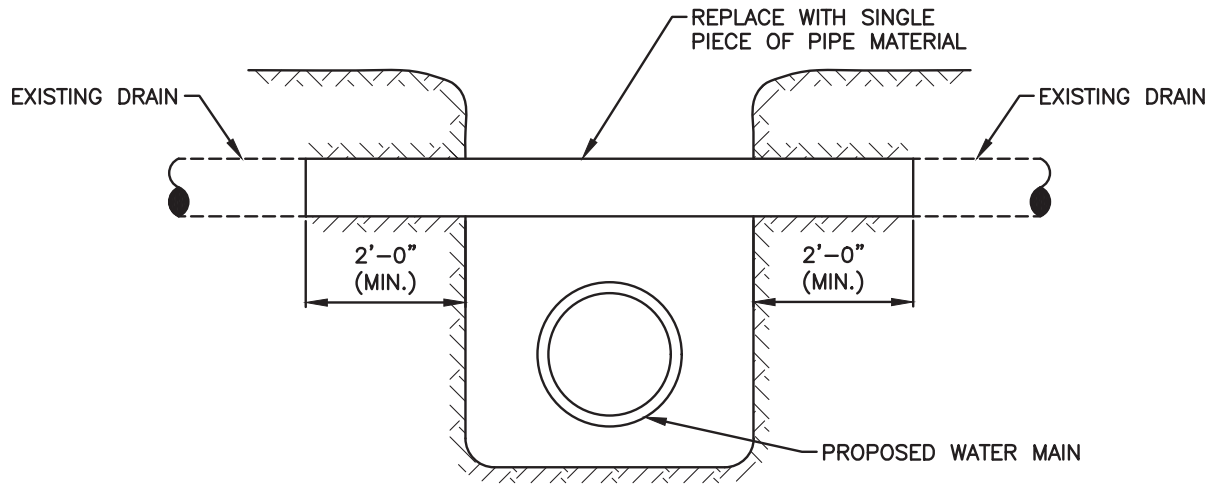
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-11

MINIMUM ROAD AND CURB UNDERDRAIN  
 REPLACEMENT MATERIAL SHALL BE:  
 PERFORATED CONCRETE: ITEM 706.06 (ODOTCMS)  
 CONCRETE DRAIN TILE: ITEM 706.07 (ODOTCMS)  
 PERFORATED PVC: ITEM 707.41 (ODOTCMS)  
 HEAVY DUTY CORRUGATED POLYETHYLENE  
 SLOTTED DRAIN: ITEM 707.32 (ODOTCMS)

MINIMUM DRAIN TILE REPLACEMENT MATERIAL SHALL  
 BE:  
 PVC: C900 DR18  
 CONCRETE: ITEM 706.02 (ODOTCMS)  
 POLYETHYLENE: ITEM 707.33 (ODOTCMS)



NOTE:

1. INSIDE DIAMETER OF REPLACEMENT PIPE SHALL BE EQUAL TO OR GREATER THAN INSIDE DIAMETER OF EXISTING TILE OR UNDERDRAIN.
2. REPLACEMENT MATERIAL USED SHALL BE EQUAL TO OR BETTER THAN THE EXISTING TILE OR UNDERDRAIN AS DIRECTED BY THE ENGINEER.
3. PROVIDE FERNCO FITTING OR APPROVED EQUIVALENT WHERE EXISTING TILE OR UNDERDRAIN HAS WATERTIGHT JOINTS. PROVIDE 30# FELT OR CONCRETE MORTAR OVER THE UPPER HALF OF THE JOINT WHERE OPEN JOINTS ARE ENCOUNTERED.
4. BACKFILL BETWEEN WATER MAIN AND REPLACEMENT TILE OR UNDERDRAIN SHALL BE PER SWLCWSD CMS SECTION 304.02.

APPROVED: \_\_\_\_\_  
 DATE: 02/22/2023

*Scott Campbell*  
 REGISTERED ENGINEER

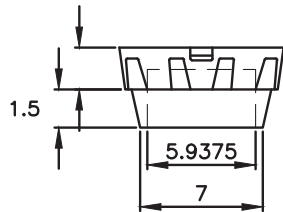
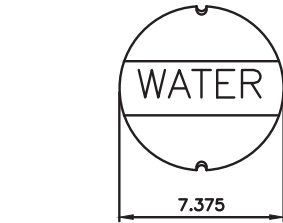
# DRAIN TILE AND UNDERDRAIN REPLACEMENT

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

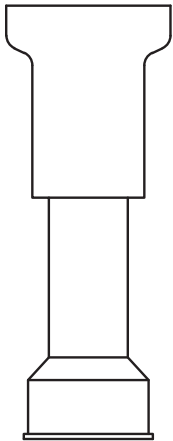
STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

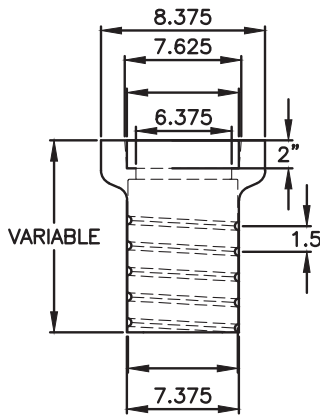
DRAWING NO.  
 W-12



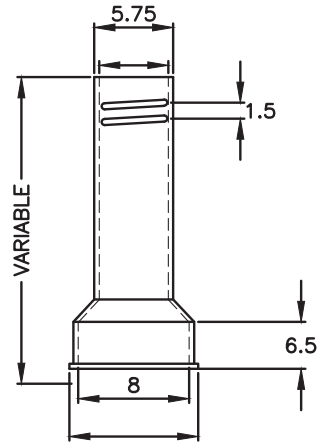
LID



BOX COMPLETE



TOP



BOTTOM

NOTE:  
 VALVE BOX TO BE STAR ITEM NO VB664A,  
 BINGHAM & TAYLOR NO. 8000 CIP 22  
 OR DISTRICT APPROVED EQUAL.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
 REGISTERED ENGINEER

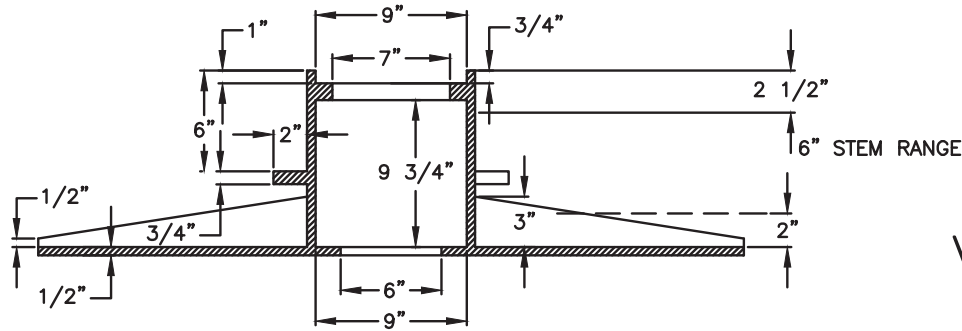
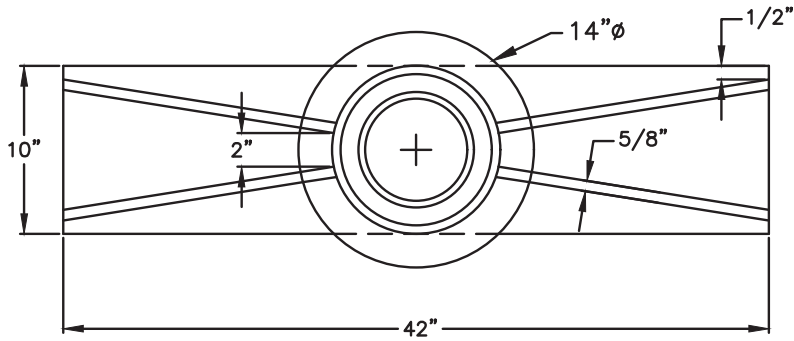
# STANDARD VALVE BOX

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

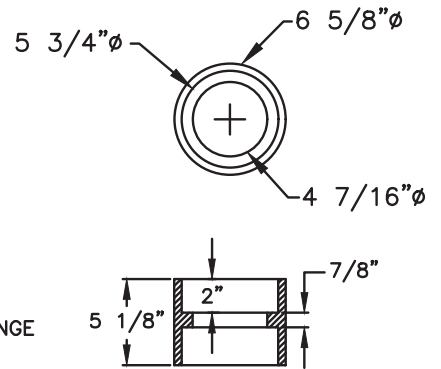
STANDARD  
 CONSTRUCTION DWG.

REVISED:  
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DRAWING NO.  
 W-14

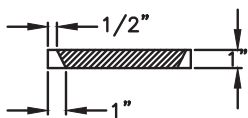
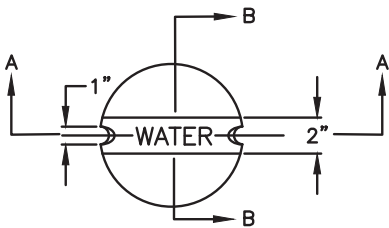


**VALVE BOX**  
133 LBS.

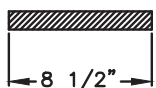


**VALVE STEM SLEEVE**  
14 LBS.

NOTE:  
AVERAGE WEIGHTS ARE TO THE NEAREST  
EVEN POUND CALCULATED USING  
0.26 LBS. PER CUBIC INCH.

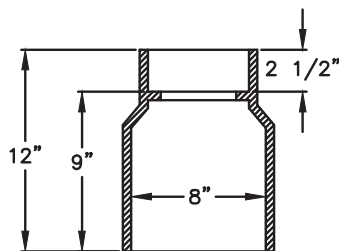
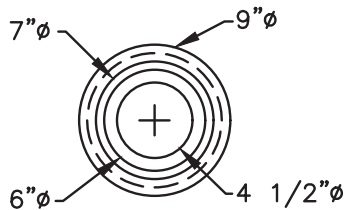


SECTION AA

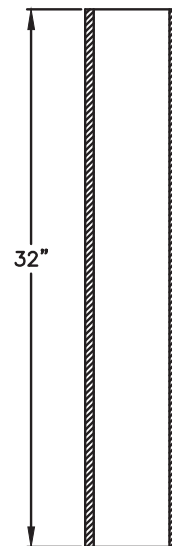
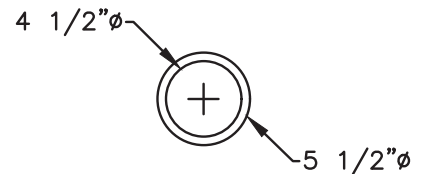


SECTION BB

**VALVE BOX LID**  
15 LBS.



**VALVE BOX BASE**  
41 LBS.



**VALVE STEM**  
65 LBS.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

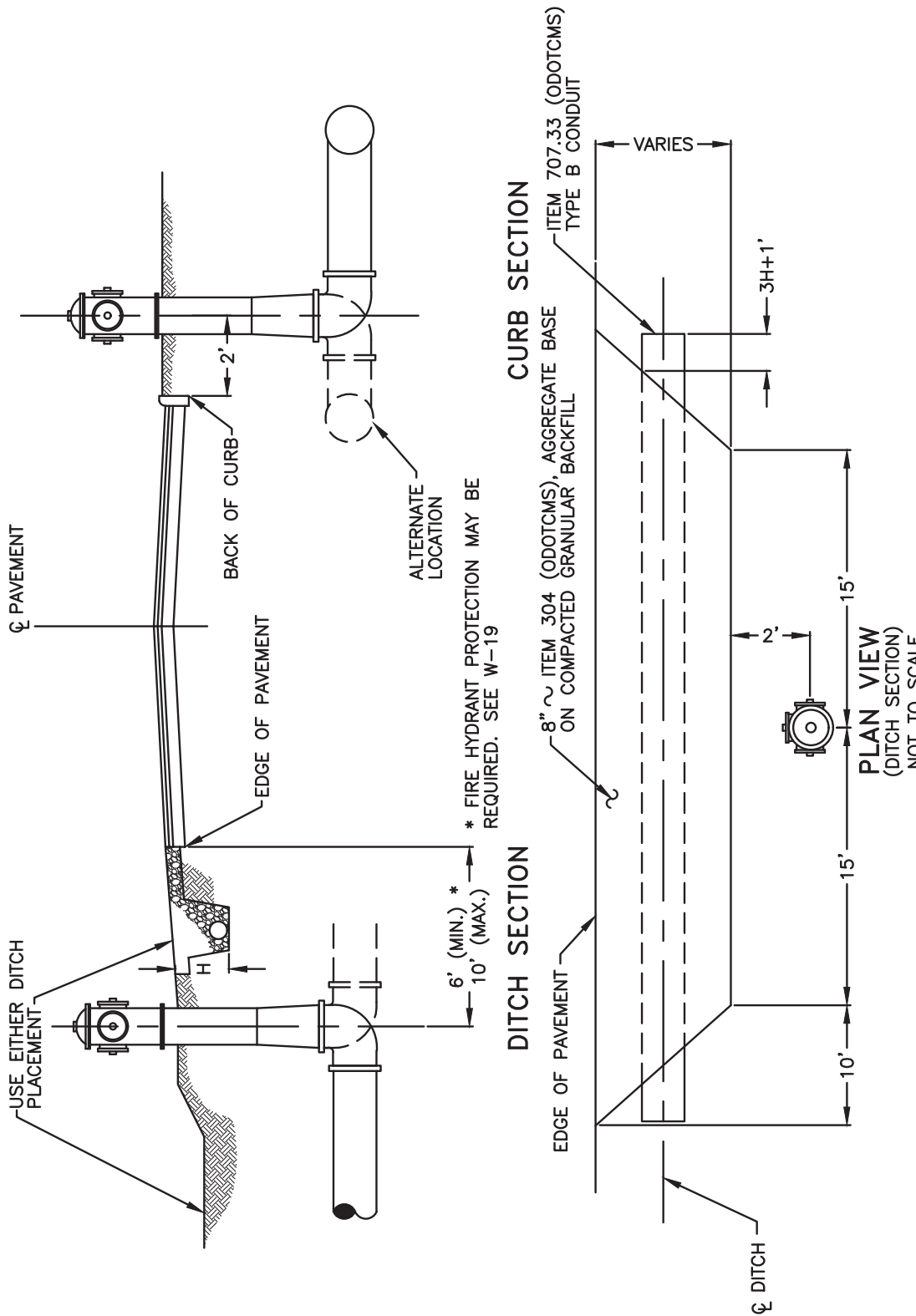
# HEAVY DUTY VALVE BOX (TRAFFIC TYPE)

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-15



**NOTES:**

1. THIS DETAIL IS TO BE USED IN CONJUNCTION WITH THE FOLLOWING SWLWSD STANDARD DRAWINGS AS APPLICABLE: W-20 STANDARD FIRE HYDRANT DETAIL, W-21 TYPICAL HYDRANT SETTING (TYPE A), W-22 TYPICAL HYDRANT SETTING (TYPE A MODIFIED), AND W-23 TYPICAL HYDRANT SETTING (TYPE B AND TYPE B MODIFIED).
2. NO FIRE HYDRANT SHALL BE LOCATED WITHIN SIX (6) FEET OF THE EDGE OF ANY RESIDENTIAL DRIVE APPROACH NOR SHALL ANY HYDRANT BE LOCATED WITHIN EIGHT (8) FEET OF ANY ALLEY, COMMERCIAL DRIVE, OR ACCESS ROAD.

APPROVED: \_\_\_\_\_ DATE 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

# FIRE HYDRANT LOCATION DETAIL

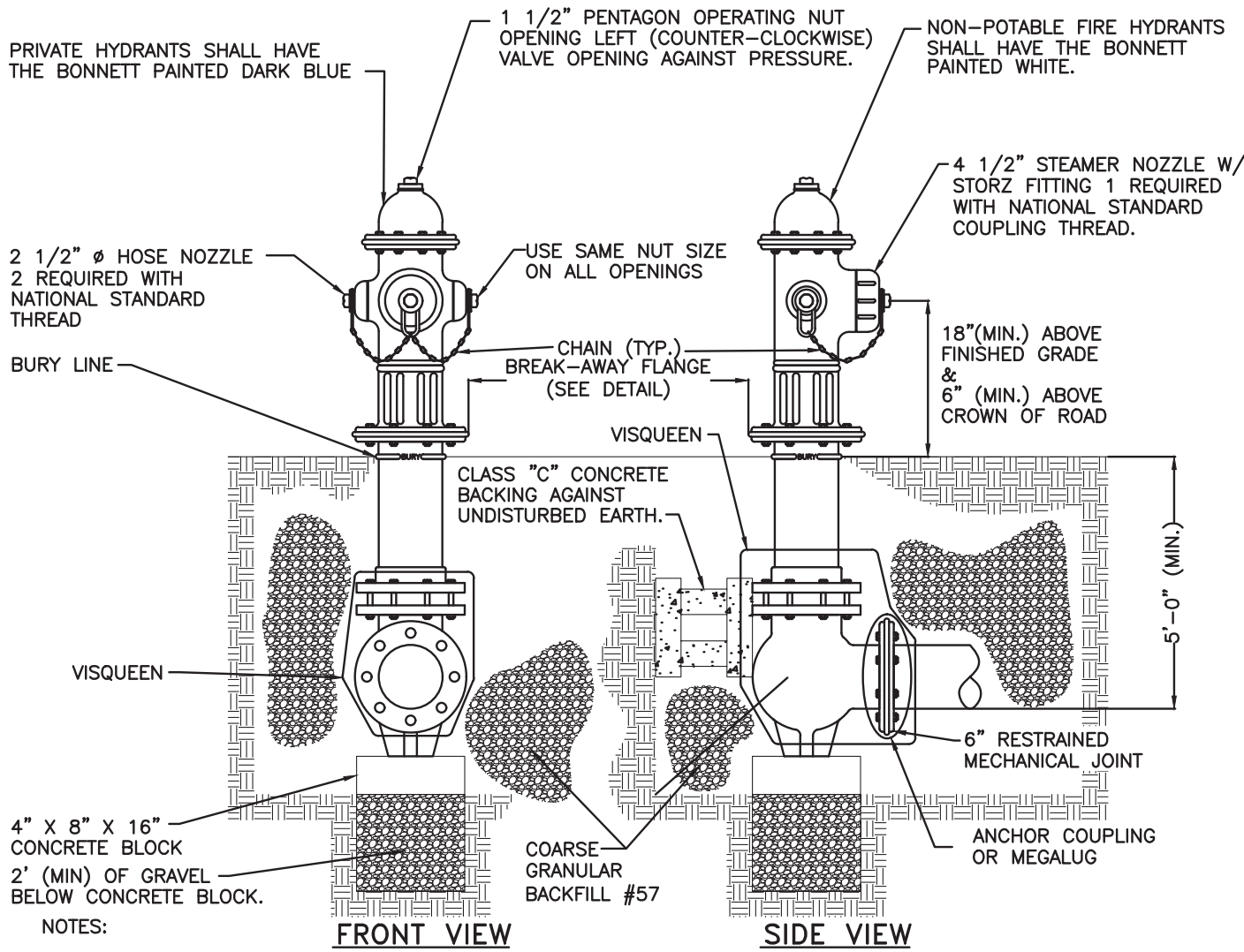
SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

REVISED: 02/2023

DRAWING NO. W-18



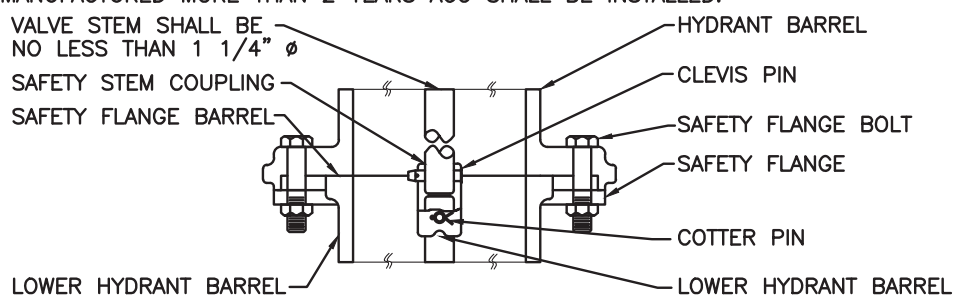


**FRONT VIEW**

**SIDE VIEW**


**NOTES:**

1. BACKFILL SHALL EXTEND FROM THE BOTTOM OF THE PIT TO 12" ABOVE THE HYDRANT SHOE. COST OF FURNISHING AND PLACING BACKFILL SHALL BE INCLUDED IN THE PRICE BID FOR EACH FIRE HYDRANT.
2. ALL FIRE HYDRANTS SHALL BE INSTALLED WITH CLASS "C" CONCRETE BACKING AGAINST UNDISTURBED EARTH.
3. ALL FIRE HYDRANTS SHALL BE OF THE DRY-BARREL TYPE.
4. ALL FIRE HYDRANTS SHALL HAVE A STORZ FITTING, HARRINGTON HIHS OR EQUAL.
5. NO FIRE HYDRANTS MANUFACTURED MORE THAN 2 YEARS AGO SHALL BE INSTALLED.



**BREAK-AWAY FLANGE & SAFETY COUPLING SECTION**

APPROVED: 02/22/2023  
DATE



REGISTERED ENGINEER

# STANDARD FIRE HYDRANT DETAIL

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED: 02/2023	DRAWING NO. W-20A 1 OF 3
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## FIRE HYDRANT NOTES

**TYPE OF HYDRANT:** THE HYDRANT SHALL BE THE POST TYPE TRAFFIC MODEL MADE OF CAST IRON AS SHOWN HEREON, AMERICAN FLOW CONTROL MK 73-5 CLOW MEDALLION, MUELLER SUPER CENTURION 250 MODEL A-421. IT SHALL HAVE A BREAKING CONNECTION THAT PREVENTS LOSS OF WATER WHEN THE UPPER AND LOWER SECTIONS ARE SEPARATED BY A SMASHING IMPACT. THE HYDRANT SHALL BE OF THE COMPRESSION TYPE WITH THE VALVE OPENING IN A COUNTERCLOCKWISE DIRECTION AGAINST THE PRESSURE AND CLOSING WITH THE PRESSURE. THE VALVE END OF THE STEM OR VALVE ROD SHALL BE SO CONSTRUCTED AS TO ELIMINATE CONTACT OF DISSIMILAR METALS IN THE PRESENCE OF MOISTURE.

THE STEM OR VALVE ROD SHALL BE CONSTRUCTED IN ONE CONTINUOUS LENGTH FROM THE VALVE TO THE BREAKING COUPLING OR TO THE BOTTOM OF THE EXTENSION PIECE WHERE EXTENSIONS ARE REQUIRED. THE STEM OR VALVE ROD BETWEEN THE VALVE AND OPERATING NUT SHALL BE MADE OF STEEL STOCK AND HAVE A 1 1/4 INCH MINIMUM DIAMETER AFTER MACHINING. THE BREAKING COUPLING SHALL FIT OVER THE VALVE ROD AND BE LOCATED AT THE PROPER POINT TO CONFORM TO THE BREAKING CONNECTION IN THE STANDPIPE.

THE BARREL SHALL HAVE AN AREA OF NOT LESS THAN 120 PERCENT OF THE VALVE OPENING. THE TYPE OF VALVE SEAL SHALL BE RUBBER WITH THE DIAMETER OF THE PORT IN THE SEAL RING BEING A MINIMUM OF 4 1/4 INCH.

ALL INTERIOR WORKING PARTS OF THE HYDRANT INCLUDING THE VALVE AND VALVE SEAT SHALL BE SUCH THAT THEY CAN BE REMOVED THROUGH THE TOP OF THE STANDPIPE WITHOUT EXCAVATION. THE UPPER SECTION OF THE STANDPIPE ABOVE THE GROUND LINE SHALL BE ADJUSTABLE SO THAT THE NOZZLES CAN BE ROTATED TO ANY DESIRED POSITION.

**REFERENCE SPECIFICATIONS:** ALL FIRE HYDRANTS SHALL CONFORM TO THE LATEST AMERICAN WATER WORKS ASSOCIATION SPECIFICATIONS C502, THE REQUIREMENTS OF THE DISTRICT AND APPLICABLE LOCAL FIRE DEPARTMENT. ALL SPECIFICATIONS SHALL BE THE LATEST EDITION IN EFFECT ON THE DATE THE CONSTRUCTION DRAWINGS ARE APPROVED (SIGNED) BY THE DISTRICT, UNLESS OTHERWISE NOTED.

**APPROVALS AND CERTIFICATION:** THE SUPPLIER OR MANUFACTURER SHALL SUBMIT TO THE DISTRICT SIX (6) COPIES OF THE RESULTS OF CERTIFIED FLOW TESTS RUN BY AN INDEPENDENT TESTING LABORATORY AND SHOP DRAWINGS WITH DIMENSIONS, MATERIALS AND NOMENCLATURE OF PARTS FOR EACH TYPE OR MODEL OF HYDRANT PROPOSED FOR USE IN THE PROJECT AREA.

UPON APPROVAL OF THE ABOVE INFORMATION BY THE DISTRICT, IT SHALL REMAIN ON FILE WITH THE DISTRICT. SUBMISSION OF THE ABOVE MATERIALS WITH EACH ORDER OF FIRE HYDRANTS IS NOT NECESSARY IF APPROVED MATERIAL IS ALREADY ON FILE. SUBMISSION OF NEW MATERIAL IS REQUIRED WHEN A DEVIATION IN THE PRODUCT, ITS MANUFACTURER, OR THE STANDARDS IS REQUESTED.

ANY FIRE HYDRANTS DELIVERED TO A PROJECT WHICH FAIL TO CONFORM TO THE APPROVED INFORMATION ON FILE WITH THE DISTRICT SHALL BE REJECTED.

WITH EACH DELIVERY SHIPMENT OF FIRE HYDRANTS, THE HYDRANT MANUFACTURER SHALL CERTIFY THAT THE HYDRANTS CONFORM TO THE INFORMATION APPROVED AND ON FILE WITH THE DISTRICT. THIS CERTIFICATE SHALL INCLUDE THE MODEL OR IDENTIFICATION NUMBERS OF THE HYDRANTS BEING DELIVERED AND THE APPROVAL DATE OF THE INFORMATION ON FILE WITH THE DISTRICT. THIS DOCUMENTATION DOES NOT CONSTITUTE APPROVAL OF FINAL ACCEPTANCE OF THE SPECIFIC HYDRANTS DELIVERED.

APPROVED: 02/22/2023  
DATE

  
REGISTERED ENGINEER

# STANDARD FIRE HYDRANT DETAIL

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-20B  
2 OF 3

## FIRE HYDRANT NOTES (CONTINUED)

**INSPECTION:** PRIOR TO INSTALLATION, ALL FIRE HYDRANTS SHALL BE INSPECTED BY THE DISTRICT AND BY THE CHIEF OF THE APPLICABLE FIRE DEPARTMENT OR HIS REPRESENTATIVE. THE HYDRANTS SHALL RECEIVE EITHER A CONDITIONAL ACCEPTANCE OR A REJECTION. CONDITIONAL ACCEPTANCE SHALL MEAN THAT THE HYDRANTS MAY BE INSTALLED.

UPON INSTALLATION, EACH HYDRANT SHALL BE TESTED FOR OPERATION AND LEAKS WITH A MEMBER OF THE APPLICABLE FIRE DEPARTMENT PRESENT DURING THE TEST AND SHALL RECEIVE EITHER OPERATIONAL ACCEPTANCE OR A REJECTION.

THE DISTRICT RESERVES THE RIGHT TO REJECT ANY AND ALL FIRE HYDRANTS FOUND TO BE IN NON-COMPLIANCE WITH ANY OF THE REQUIREMENTS STATED HEREIN AT ANY TIME DURING THE ACCEPTANCE OR ABOVE DESCRIBED APPROVAL PROCESS. ANY HYDRANTS WHICH ARE REJECTED AND WHICH CANNOT BE BROUGHT INTO COMPLIANCE WITH THE REQUIREMENTS AS STATED HEREIN SHALL BE REMOVED FROM THE PROJECT SITE, STORAGE SITE OR THE WORK SITE AT NO EXPENSE TO THE DISTRICT.

THE FINAL FIELD ACCEPTANCE SHALL GOVERN OVER ANY DOCUMENT APPROVAL AND SHALL BE BASED ON ALL WORK BEING COMPLETED INCLUDING INSTALLATION, TESTING, OPERATION, PAINTING AND LUBRICATION.

**INSTALLATION:** THE FIRE HYDRANTS SHALL BE INSTALLED AS SPECIFIED HEREIN AND IN ACCORDANCE WITH STANDARD DRAWING W-20, STANDARD FIRE HYDRANT DETAIL, W-21, TYPICAL HYDRANT SETTING (TYPE "A"); W-22, TYPICAL HYDRANT SETTING (TYPE "A" MODIFIED); W-23, TYPICAL HYDRANT SETTING (TYPES "B" AND "B" MODIFIED); W-24, 6"~90° HYDRANT BEND OR AS SPECIFIED BY THE DISTRICT.

THE BASE SECTION OF ALL FIRE HYDRANTS SHALL BE SET TO AN ELEVATION WHICH WILL BE CORRECT FOR THE PROPOSED GRADE OF THE STREET. THE ELEVATION OF THE TOP BARREL SECTION SHALL BE SET SO THAT THE GRADE LINE OF THE HYDRANT IS AT THE ESTABLISHED OR PROPOSED FINISHED GRADE AS INDICATED ON THE CONSTRUCTION DRAWINGS, THROUGH THE INSTALLATION OF HYDRANT EXTENSION SECTIONS AS NEEDED.

PRIOR TO OPERATIONAL ACCEPTANCE, THE HYDRANT NOZZLES SHALL BE TURNED AWAY FROM THE STREET. UPON RECEIVING OPERATIONAL ACCEPTANCE, THE HYDRANT SHALL BE TURNED WITH THE STEAMER NOZZLE FACING THE ROAD OR STREET AND THE HYDRANT EXERCISED TO CHECK THE OPERATION AND FOR LEAKS.

**PAINTING:** FINAL PAINT COLOR SHALL BE FIRE PROTECTION RED ENAMEL FROM THE MANUFACTURE. PRIOR TO PAINTING, SAMPLES SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. AFTER OPERATIONAL ACCEPTANCE, ALL HYDRANT SURFACES ABOVE THE GROUND LINE SHALL BE CLEANED, WASHED AND WIRE BRUSHED. ALL SURFACES OR SPOTS THAT REQUIRE TOUCHING UP SHALL HAVE TWO (2) COATS OF ZINC CHROMATE PRIMER. WHEN ALL THE SURFACES HAVE BEEN PRIMED AND ARE DRY, ALL HYDRANT SURFACES SHALL RECEIVE ONE (1) COAT OF THE APPROVED ENAMEL.

**MATERIALS AND WORKMANSHIP:** ALL MACHINED PARTS SHALL BE TRUE TO GAUGE SO THAT THEY WILL BE INTERCHANGEABLE BETWEEN HYDRANTS OF THE SAME MAKE AND SIZE. WHEN REQUIRED, NON-ADJUSTABLE HYDRANT WRENCHES, PROPERLY SIZED TO THE SPECIFIED OPERATING NUT DIMENSIONS AND FABRICATED BY THE HYDRANT MANUFACTURER, SHALL BE SUPPLIED.

**LUBRICATION:** ALL HYDRANT NOZZLE THREADS SHALL BE LUBRICATED WITH A FDA APPROVED FOOD GRADE LUBRICANT (PERMATEx SUPER LUBE OR EQUAL).

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DATE

02/22/2023

  
REGISTERED ENGINEER

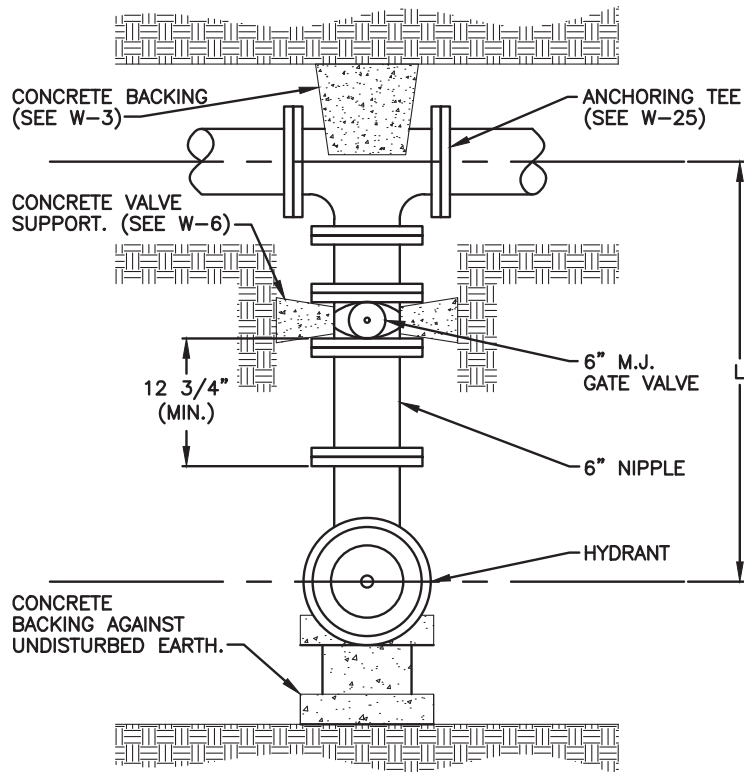
# STANDARD FIRE HYDRANT DETAIL

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-20C  
3 OF 3



SIZE OF PIPE	MINIMUM L
6"	35"
8"	36"
12"	39"
16"	42"

PLAN VIEW

NOTES:

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DATE

*Scott Campbell*  
REGISTERED ENGINEER

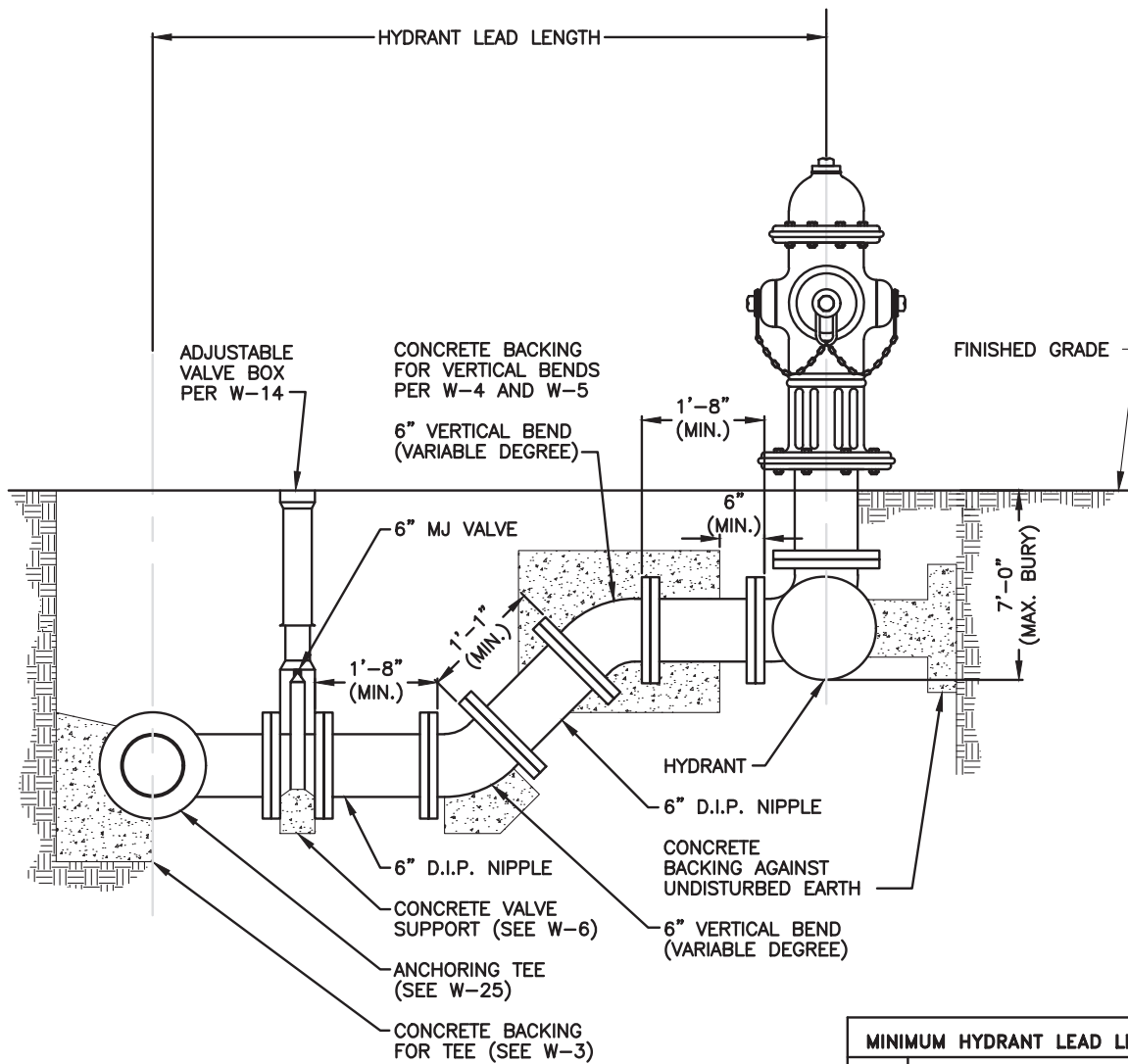
**TYPICAL  
HYDRANT SETTING  
(TYPE "A")**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-21



**SECTION VIEW**

MINIMUM HYDRANT LEAD LENGTH			
SIZE OF MAIN	VERTICAL BENDS		
	11-1/4'	22-1/2'	45'
6"	8'-2"	8'-1"	7'-8"
8"	8'-3"	8'-2"	7'-9"
10"	8'-4"	8'-3"	8'-0"
12"	8'-6"	8'-5"	8'-0"
16"	8'-9"	8'-8"	8'-3"

**NOTES:**

1. VERTICAL BENDS SHALL NOT EXCEED 45°.
2. WHERE APPLICABLE AND APPROVED BY THE ENGINEER, A COMMERCIAL OFFSET MAY (CLOW F-982 OR APPROVED EQUIVALENT) BE USED IN LIEU OF THE TWO VERTICAL BENDS AND THE INCLINED NIPPLE.
3. CONCRETE BACKING FOR VERTICAL BENDS SHALL BE PROVIDED PER W-4 AND W-5.
4. ALL JOINTS TO BE RESTRAINED WITH MEGALUG RESTRAINED JOINT FITTINGS.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

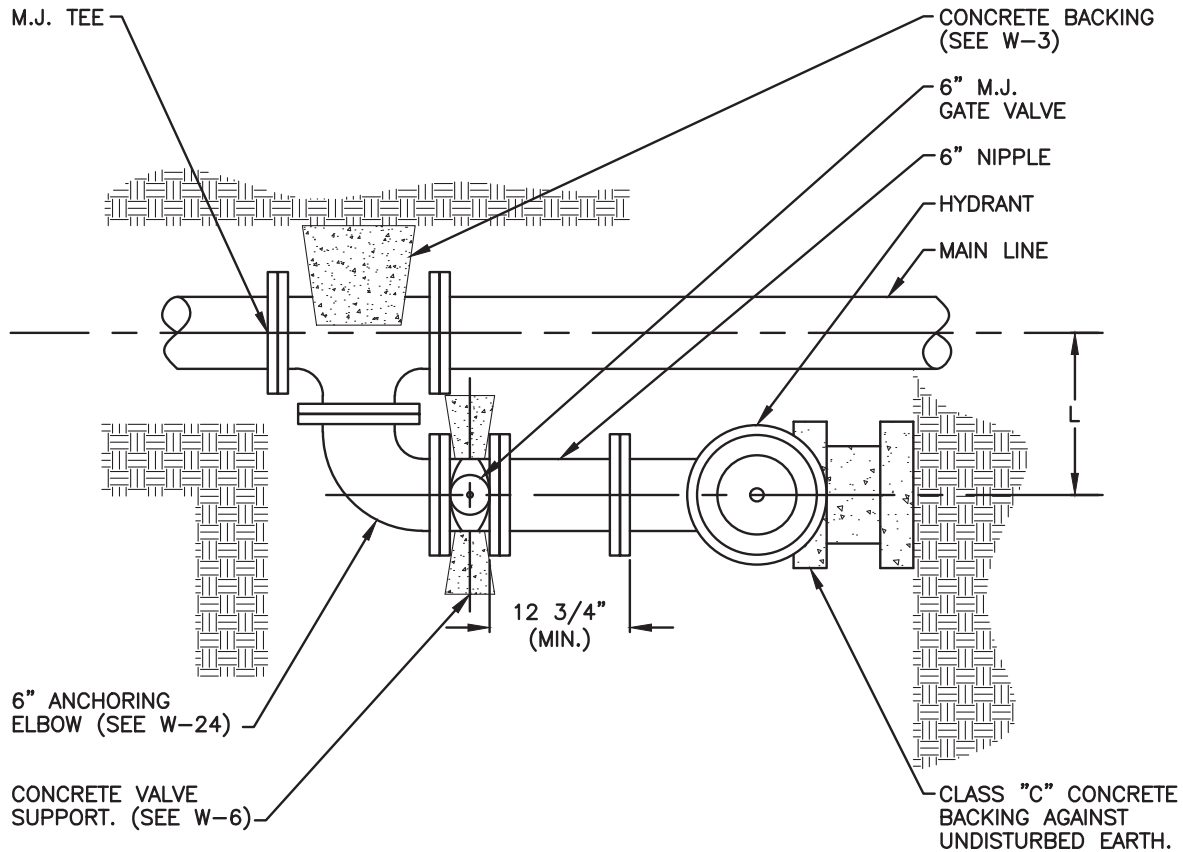
**TYPICAL  
HYDRANT SETTING  
(TYPE "A" MODIFIED)**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-22



MAIN LINE	MINIMUM L	
	TYPE B	TYPE B MODIFIED
6"	24"	19"
8"	25"	20"
10"	26"	21"
12"	28"	23"
16"	31"	26"

NOTES:

1. TYPE B: LONG SIDE OF BEND TO TEE. TYPE B MODIFIED: SHORT SIDE OF BEND TO TEE.
2. FIRE HYDRANTS SHALL HAVE A MAXIMUM BURY OF 7'-0". MODIFICATION OF THE HYDRANT LEAD TO MEET THIS REQUIREMENT SHALL BE IN THE SECTION FROM THE VALVE TO THE HYDRANT PER W-22.
3. ALL JOINTS TO BE RESTRAINED WITH MEGALUG RESTRAINED JOINT FITTINGS.

APPROVED: \_\_\_\_\_  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

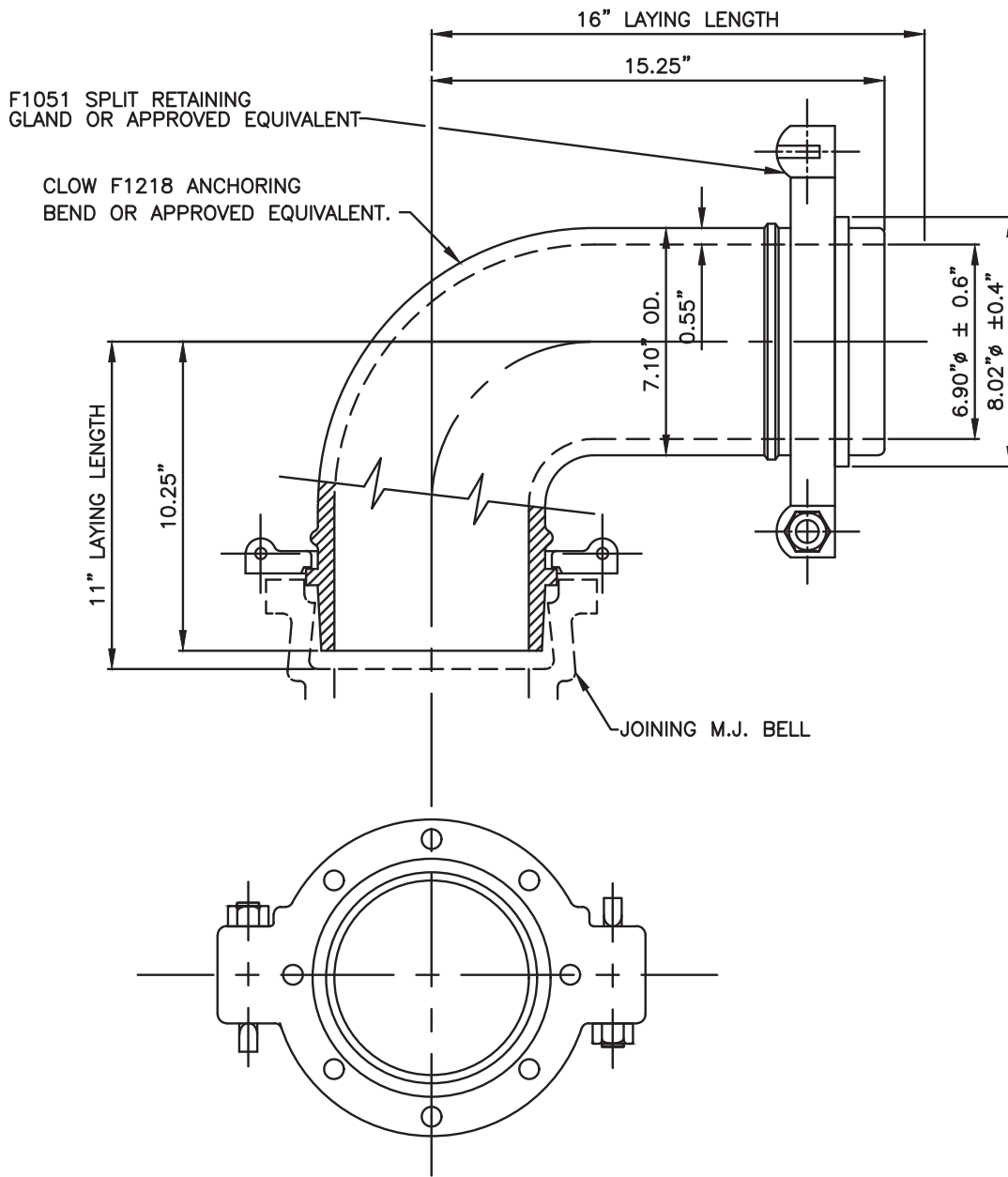
# TYPICAL HYDRANT SETTING (TYPES "B" AND "B" MODIFIED)

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

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02/2023

DRAWING NO.  
W-23



THIS BEND IS TO BE USED WITH TYPE B AND TYPE B MODIFIED FIRE HYDRANT INSTALLATIONS. SEE W-23.

APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

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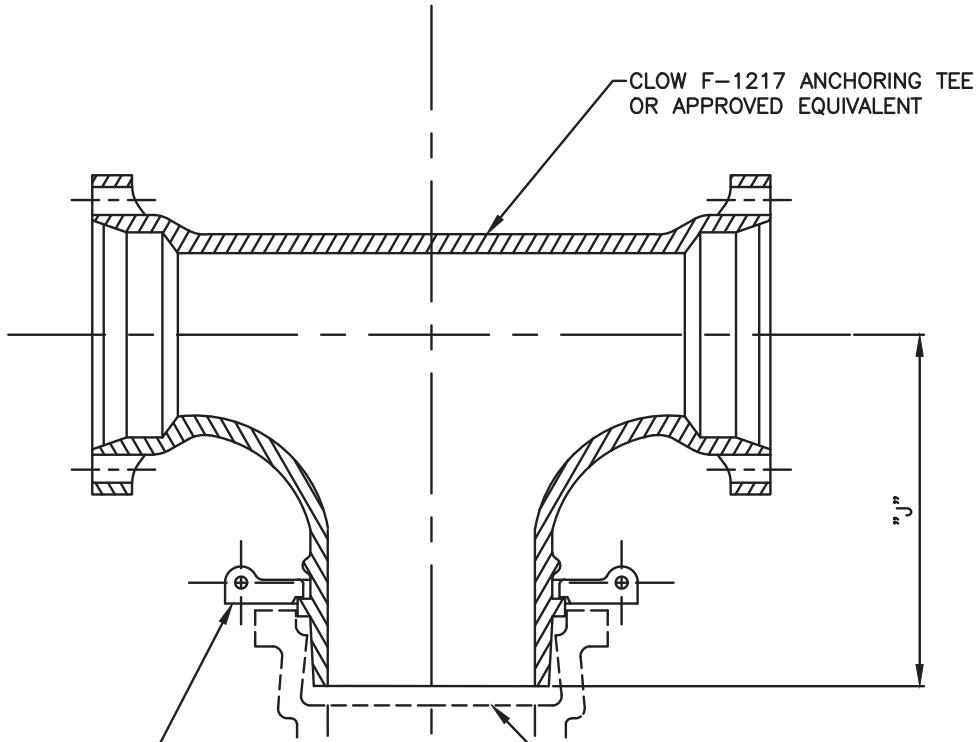
# 6"~90° HYDRANT BEND

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

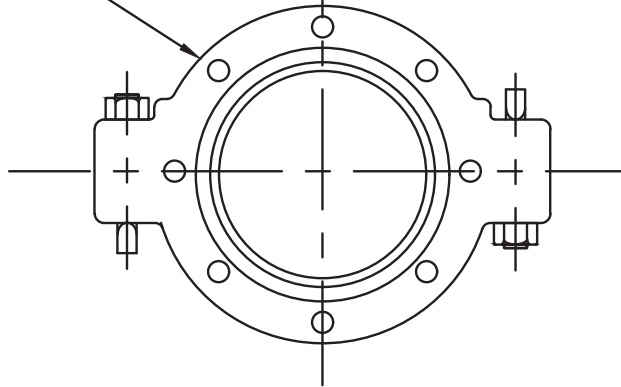
DRAWING NO.  
W-24



CLOW F-1051 SPLIT RETAINING GLAND OR APPROVED EQUIVALENT

SEAT OF JOINING BELL

RUN	BRANCH	
	6"	8"
	J"	J"
6"	10 1/2"	
8"	11 1/2"	11"
10"	13 1/2"	13"
12"	14 1/2"	14"
16"	17"	17"



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# ANCHORING TEE

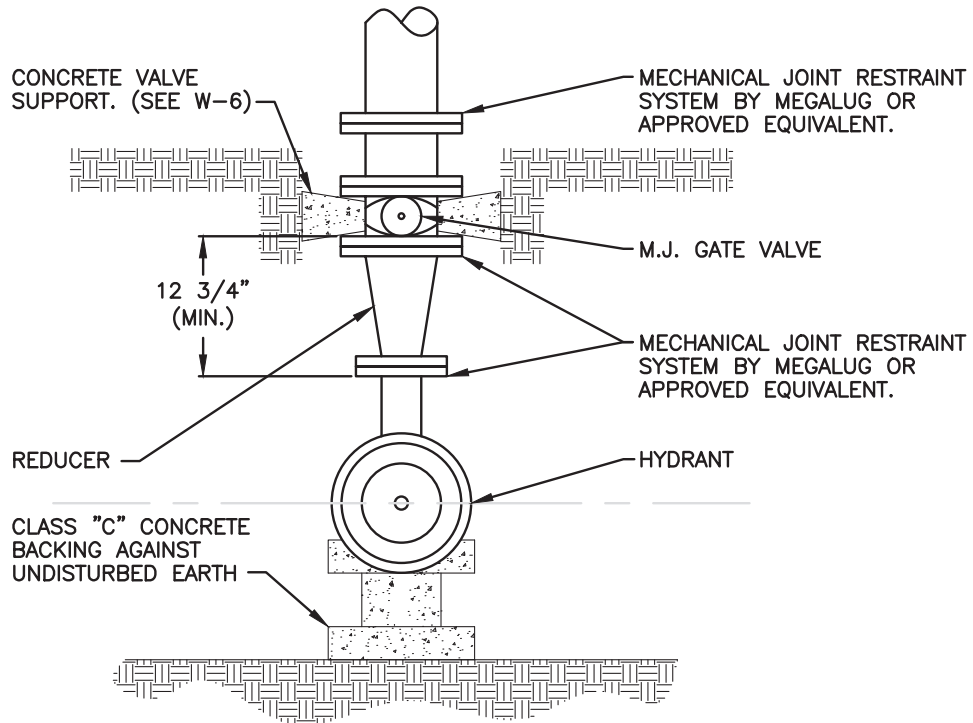
SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-25





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DATE

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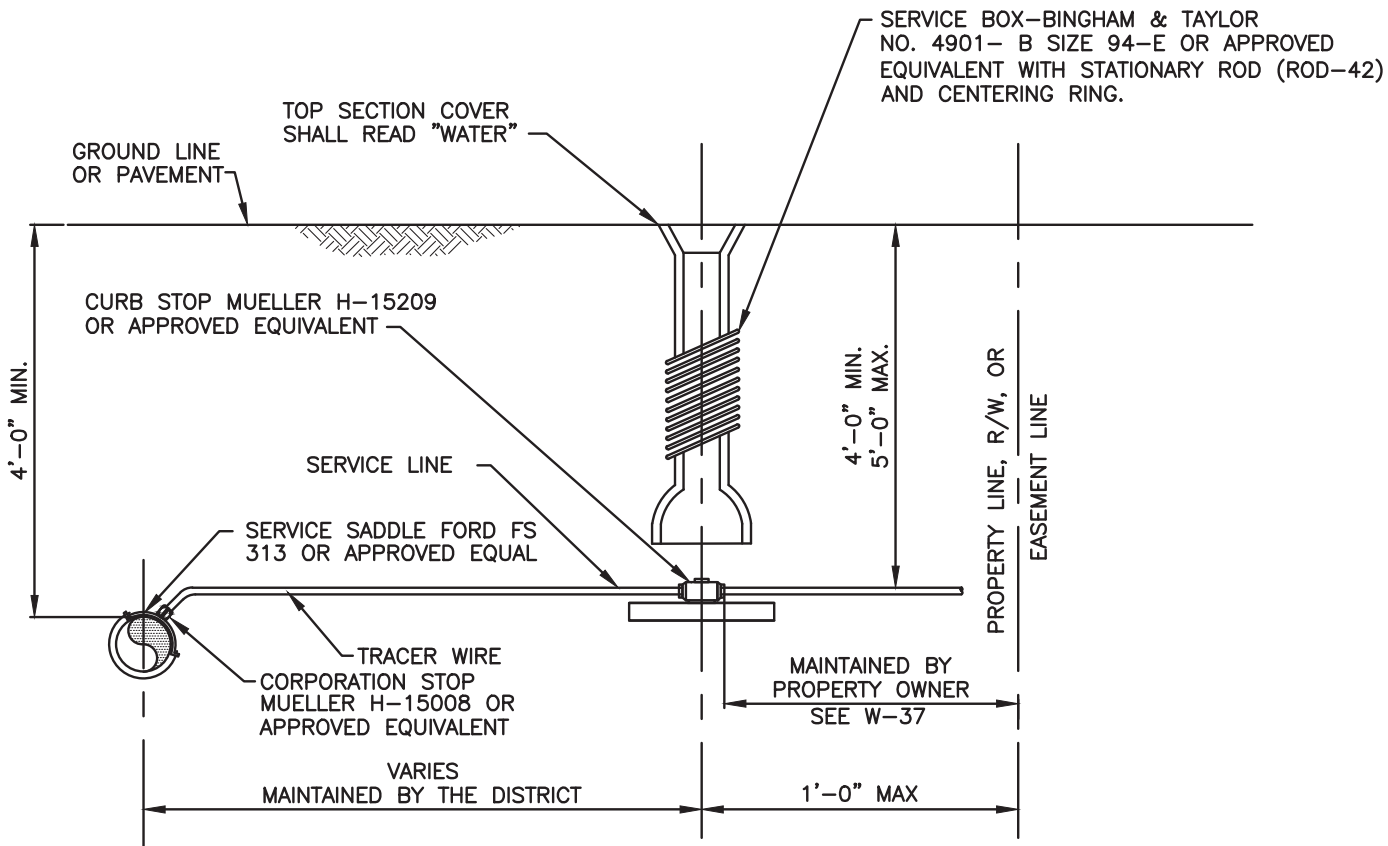
# TYPICAL HYDRANT SETTING (TYPE "C")

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-26



NOTES:

1. THE WATER SERVICE LINE SHALL BE A SINGLE PIECE OF PIPE WITHOUT JOINTS, COUPLING OR UNIONS BETWEEN:
  - A. THE CORPORATION STOP AND CURB STOP.
  - B. THE CURB STOP AND THE METER SETTINGS.
2. SERVICE LINE MATERIAL SHALL BE:
  - A. AWWA C901, PE4710, COPPER TUBE SIZE OD ASTM D2737 SDR 9.
- TRACER WIRE
  - A. TRACER WIRE IN ACCORDANCE WITH CMS SECTION 212.01(C) SHALL BE INSTALLED ON ALL SERVICE LINES FROM THE WATER MAIN TO THE SERVICE BOX.
1. FOR HDPE MAIN  
THE SERVICE SADDLE SHALL BE FORD FSP 313 OR APPROVED EQUAL

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

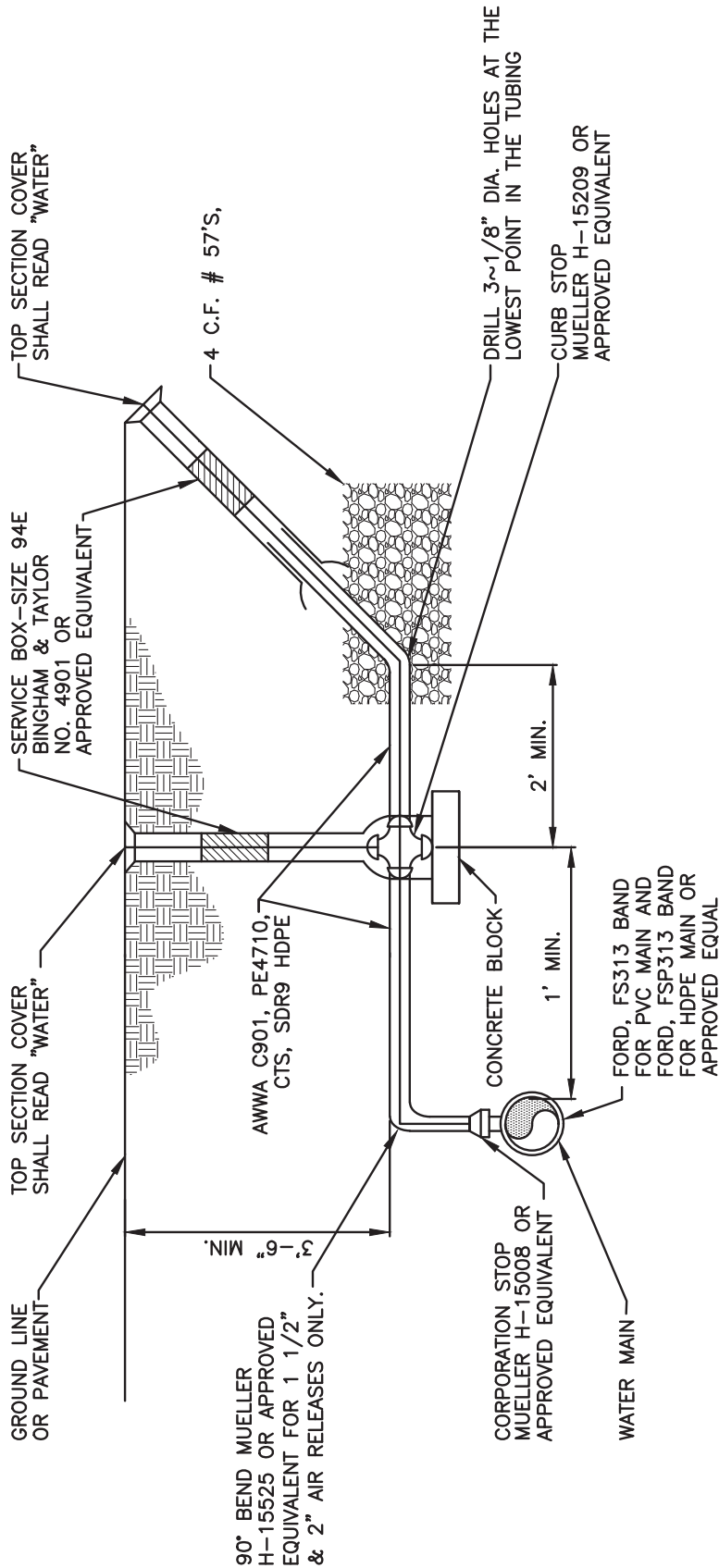
# STANDARD WATER SERVICE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-30



NOTES:

1. BLOW OFF TO BE REMOVED AFTER PROJECT COMPLETION AND ACCEPTANCE.
2. CORP STOP TO BE REPLACED W/ SOLID BRASS PLUG.

APPROVED: \_\_\_\_\_ 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# TYPICAL AIR RELEASE

(3/4" TO 2")

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

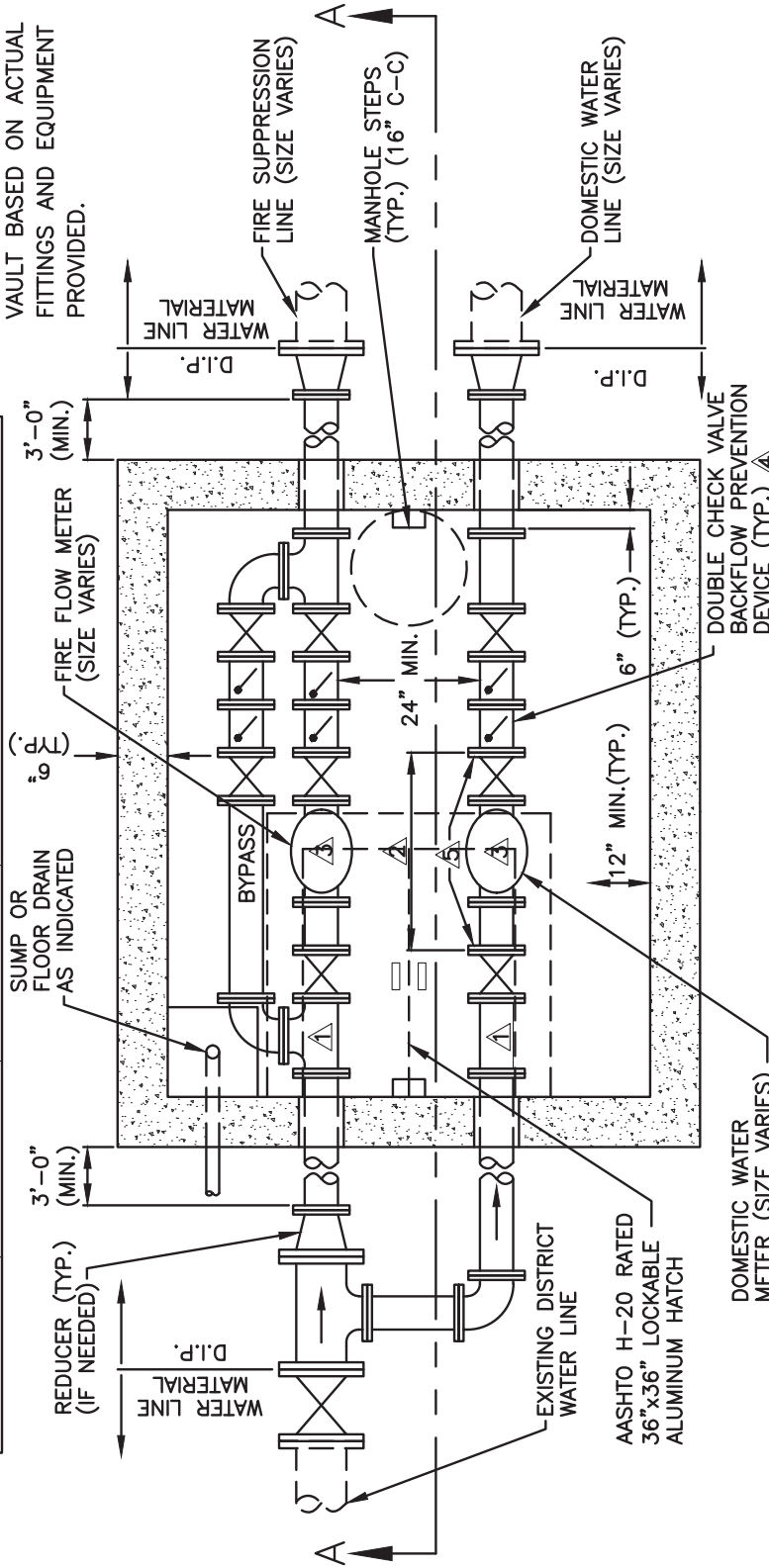
REVISED:  
02/2023

DRAWING NO.  
W-31

### MINIMUM VAULT DIMENSIONS \*

METER SIZE	LENGTH	WIDTH	WIDTH WITH SPRINKLER LINE
4"	11'	7'-6"	9'
6"	13'	8'	10'
8"	16'	9'	11'

\* SIZES SHOWN TO PROVIDE MINIMUM VAULT SIZE REQUIREMENT AND DOES NOT RELIEVE DEVELOPER, SUPPLIER, OR ENGINEER OF THE RESPONSIBILITY TO ADEQUATELY SIZE THE VAULT BASED ON ACTUAL FITTINGS AND EQUIPMENT PROVIDED.



- △ PIPING ON EACH LINE SHALL MATCH METER SIZE, FITTINGS, AND DEVICES UNLESS OTHERWISE APPROVED BY THE DISTRICT.
- △ DISTANCE BETWEEN GATE VALVES SHALL BE AS NECESSARY FOR PROPER OPERATION OF FLOW METERS AND IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
- △ METER SHALL BE A NEPTUNE COMPOUND METER WITH LOW FLOW BYPASS METER, APPROPRIATE STRAINER, ENCODER REGISTER AND RADIO READ SYSTEM COMPATIBLE WITH DISTRICT'S AUTOMATIC READ SYSTEM. RADIO READ SHALL BE INSTALLED IN A FASHION TO BE READ BY THE DISTRICT'S RADIO READ SYSTEM WITHOUT ENTERING THE VAULT.
- △ DOUBLE CHECK VALVE SHALL BE AN AMES 2000SS SERIES OR APPROVED EQUAL. INSTALLED ON ALL SERVICE LINES AND BYPASS LINES.
- △ PIPE FLANGES SHALL BE CAPABLE OF BEING LOOSENED AND SLID BACK TO FACILITATE METER REMOVAL.

#### NOTES:

1. ALL VALVES SHALL BE LOCKABLE.
2. THE DISTRICT RESERVES THE RIGHT TO REQUIRE A BYPASS LINE.
3. DI CLASS 52 MUST BE USED WITHIN 4FT OF THE VAULT EXTERIOR.
4. PSX DIRECT DRIVE BOOT OR LINK-SEALS WITH 316SS HARDWARE SHALL BE USED WHEN SEALING VAULT PIPE PENETRATIONS

APPROVED: \_\_\_\_\_ DATE: 02/22/2023

*Jason Campbell*  
REGISTERED ENGINEER

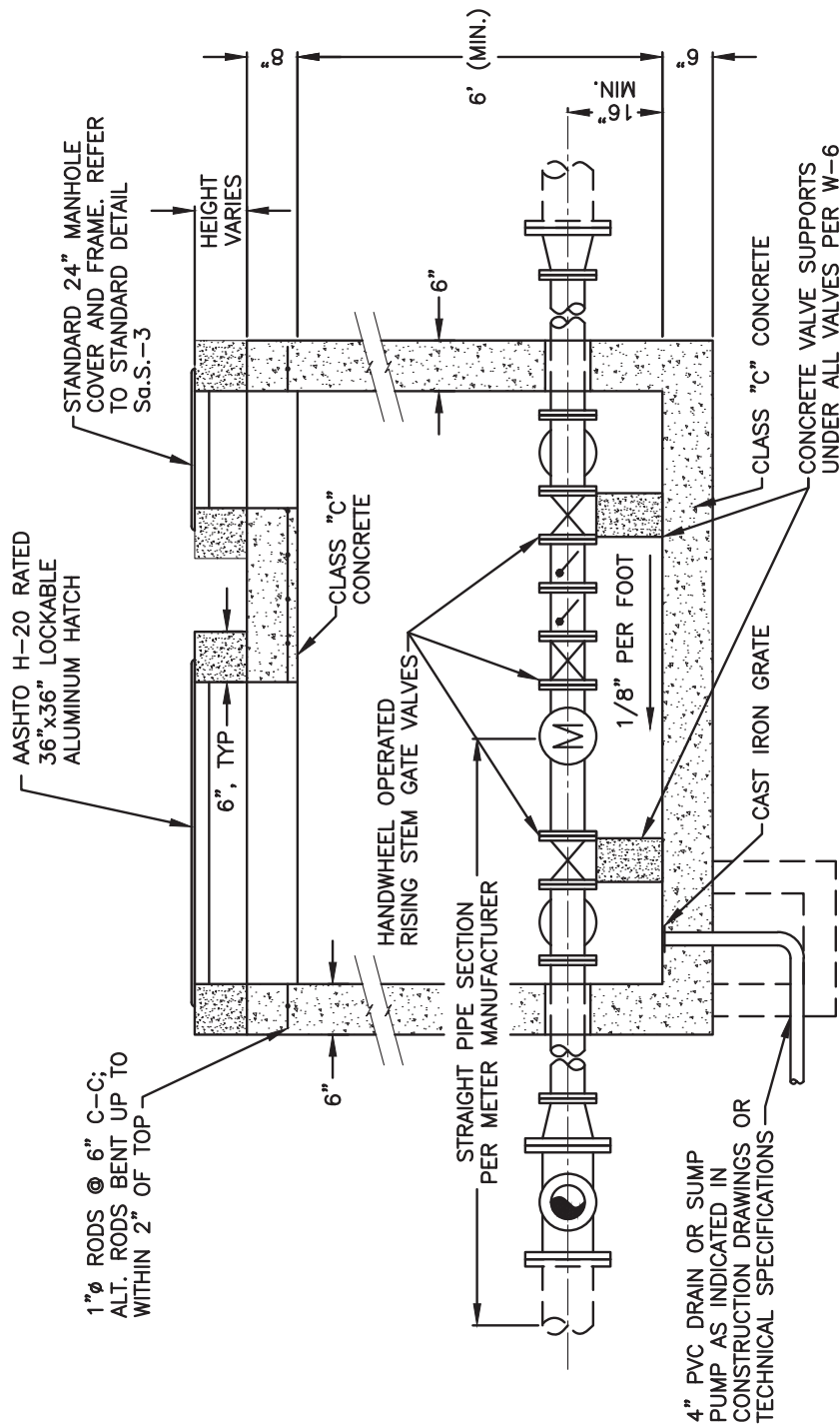
# STANDARD METER PIT

SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

REVISED: 02/2023

DRAWING NO. W-35A  
1 OF 2




**SECTION A-A**

**NOTES:**

1. METER PIT WITH SUMPS SHALL BE EQUIPPED WITH SUMP PUMPS.
2. ALL METER PITS SHALL HAVE A WATERPROOF 110V, 20AMP OUTLET ADJACENT TO THE PIT.
3. CONCRETE VALVE SUPPORTS REQUIRED FOR ALL VALVES.
4. CASTINGS SHALL BE PLACED 6" ABOVE FINISHED GRADE.
5. DI CLASS 52 MUST BE USED WITHIN 4 FT OF THE VAULT EXTERIOR.
6. INTERIOR PIPE TO BE DI CLASS 52 (3 IN OR GREATER), SMALLER PIPE SHALL BE COPPER (TYPE M) OR BRASS.

APPROVED: \_\_\_\_\_  
 02/22/2023  
 DATE



REGISTERED ENGINEER

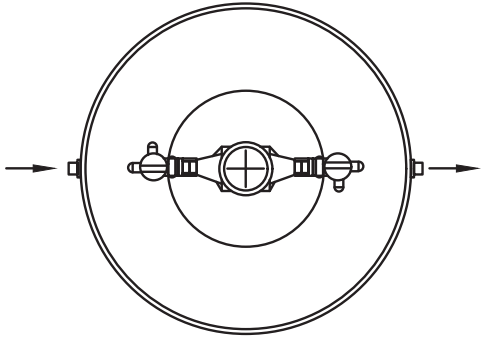
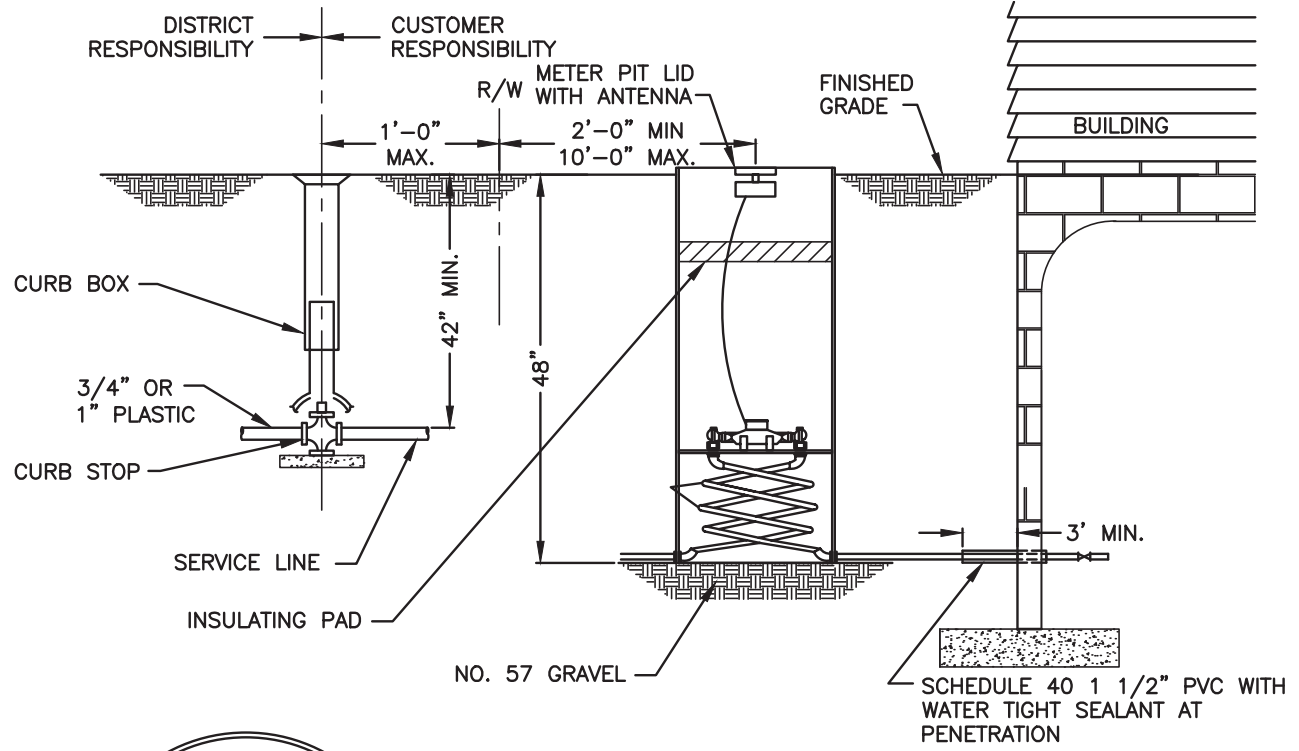
**STANDARD  
 METER  
 PIT**

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

DRAWING NO.  
 W-35B  
 2 OF 2



PLAN VIEW

NOTES:

1. RESIDENCES LOCATED IN EXCESS OF 300 FT FROM MAINLINE OR WITH CONCRETE SLAB ON GRADE/CRAWL SPACE SHALL REQUIRE A METER PIT.

1. THE METER PIT SHALL BE A MUELLER THERMAL-COIL METER BOX OR APPROVED EQUAL.
  - A. 5/8" X 3/4" MODEL NUMBER- 203 CS 15 42 FFBSN
  - B. 1" MODEL NUMBER- 330 CS 18 42 FFBSN
2. THE METER PIT LID SHALL BE MUELLER OR APPROVED EQUAL.
  - A. 5/8" X 3/4" MODEL NUMBER- 780112
  - B. 1" MODEL NUMBER- 780113

APPROVED: \_\_\_\_\_  
 DATE: 02/22/2023  
 \_\_\_\_\_  
 REGISTERED ENGINEER

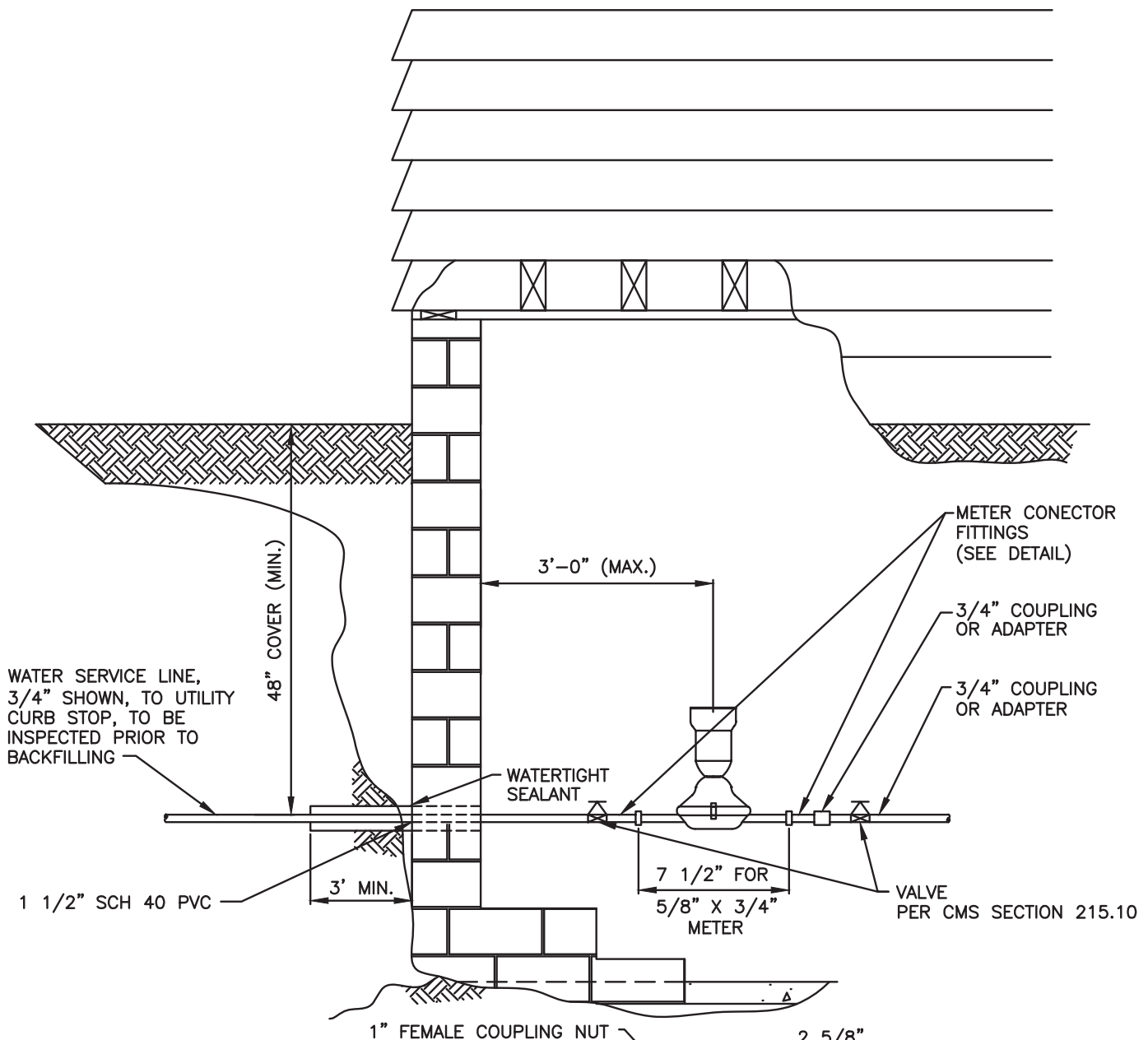
# EXTERIOR METER PIT (5/8" TO 1" METERS)

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

DRAWING NO.  
 W-36



**NOTES**

1. COMPLETE REGISTER INSTALLATION SHALL BE INSPECTED AND APPROVED BY THE DISTRICT.
2. NO METER BYPASSES ARE PERMITTED.
3. EXTERIOR METER SHALL BE INSTALLED ON THE FRONT OF THE HOUSE FACING THE STREET OR WITHIN 1'-0" OF A CORNER FACING THE STREET.
4. ALL CONDUIT AND PIPING SHALL BE PROPERLY SUPPORTED.
5. PRESSURES GREATER THAN 80PSI SHALL INSTALL A WATTS LF25AUB PRV WITH A WATTS PLT5 EXPANSION TANK.

**METER CONECTOR FITTINGS  
(5/8" X 3/4" METER)**

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

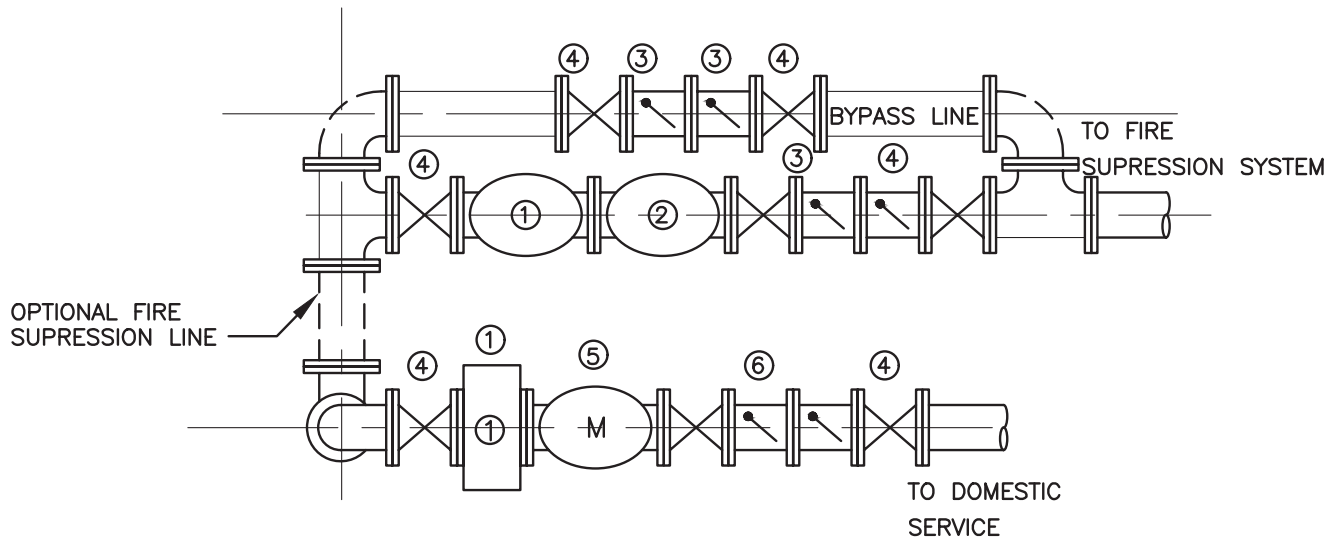
**TYPICAL  
WATER METER  
( 5/8" TO 1")**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

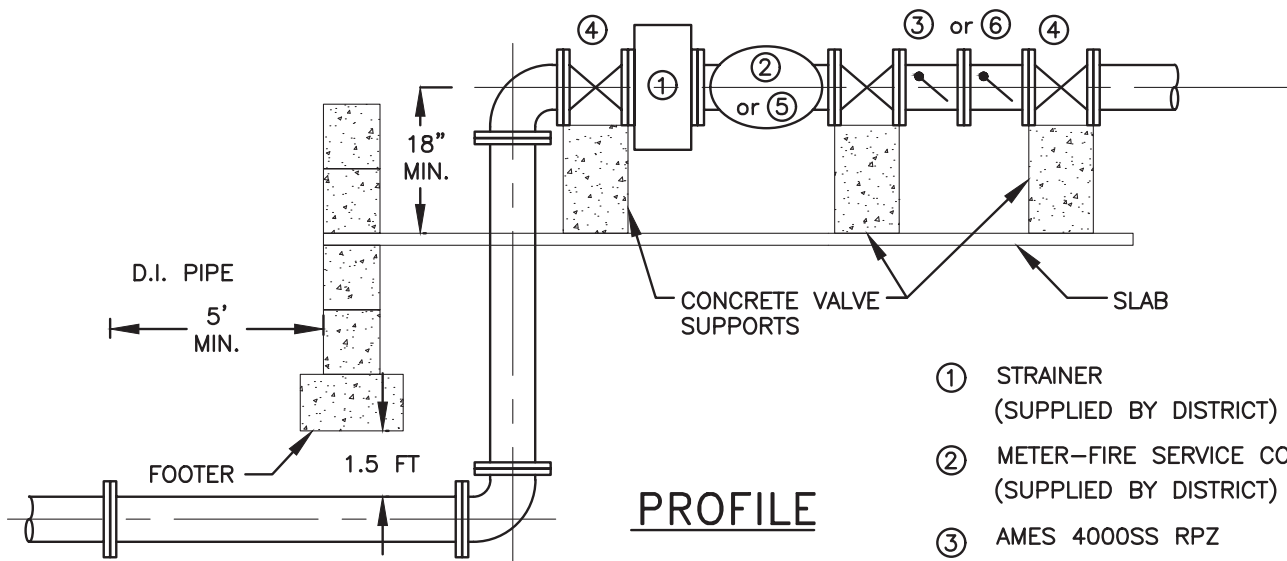
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
W-37



PLAN



PROFILE

- ① STRAINER  
(SUPPLIED BY DISTRICT)
- ② METER—FIRE SERVICE COMPOUND  
(SUPPLIED BY DISTRICT)
- ③ AMES 4000SS RPZ  
OR APPROVED EQUAL
- ④ O.S & Y VALVE
- ⑤ METER—COMPOUND  
(SUPPLIED BY DISTRICT)
- ⑥ AMES 4000 SS RPZ  
OR APPROVED EQUAL

NOTES:

1. THE DISTRICT RESERVES THE RIGHT TO REQUIRE A BYPASS LINE.
2. ALL VALVES SHALL BE LOCKABLE.

APPROVED: \_\_\_\_\_ 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

**TYPICAL WATER  
METER  
(1 1/2" - 12")**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

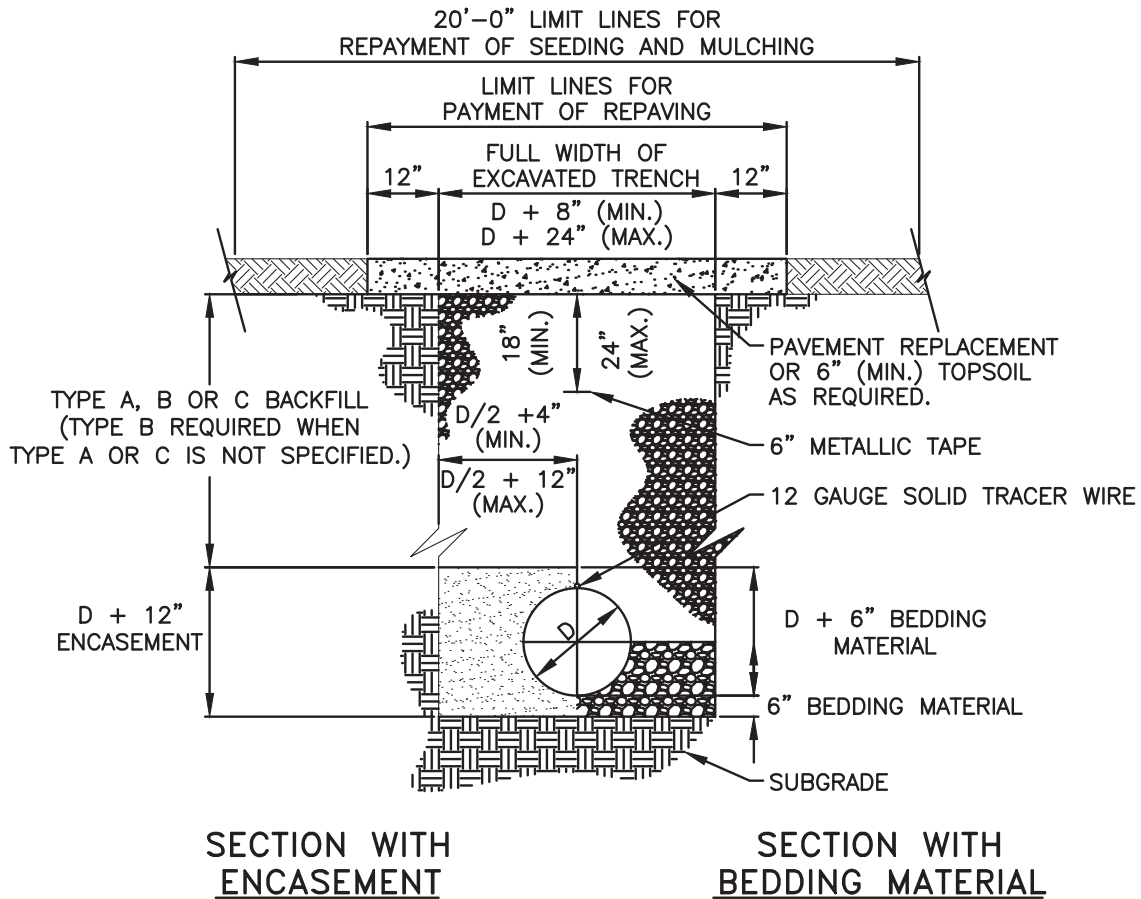
REVISED:  
02/2023

DRAWING NO.  
W-38



NOTES:

1. ITEM NUMBERS REFER TO THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.
2. AGGREGATE FOR BEDDING SHALL BE WASHED GRAVEL AND BE NO. 57 PER CMS 304.02. TYPE A BACKFILL SHALL BE GRANULAR MATERIAL AS SPECIFIED IN ITEM 703.11,
3. GRANULAR MATERIAL, TYPE 2. TYPE A BACKFILL SHALL BE USED WHEN THE TRENCH IS 5' OR LESS FROM ANY PAVED OR GRAVEL SURFACE OR BENEATH THE PAVEMENT OR GRAVEL. COMPACTION SHALL MEET THE REQUIREMENTS OF ITEM 203.
4. TYPE B BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, TOPSOIL, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 95% OF ITS MAXIMUM LABORATORY DRY WEIGHT.
5. TYPE C BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 90% OF ITS MAXIMUM LABORATORY DRY WEIGHT. APPROVED BY THE CONTRACT ADMINISTRATOR, STONES NO LARGER THAN ONE CUBIC FOOT MAY BE DEPOSITED AT LEAST 3' ABOVE THE TOP OF THE PIPE.
6. THE EXCAVATED TRENCH WIDTH 12" ABOVE THE CONDUIT MAY BE INCREASED WITHOUT ADDITIONAL COMPENSATION.
7. RIGID PIPE SHALL INCLUDE DUCTILE IRON.
8. ENCASEMENT SHALL BE CLASS C CONCRETE.
9. SECTIONS ARE SYMMETRIC ABOUT THE CENTERLINE.



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# TYPICAL TRENCH FOR RIGID PIPE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

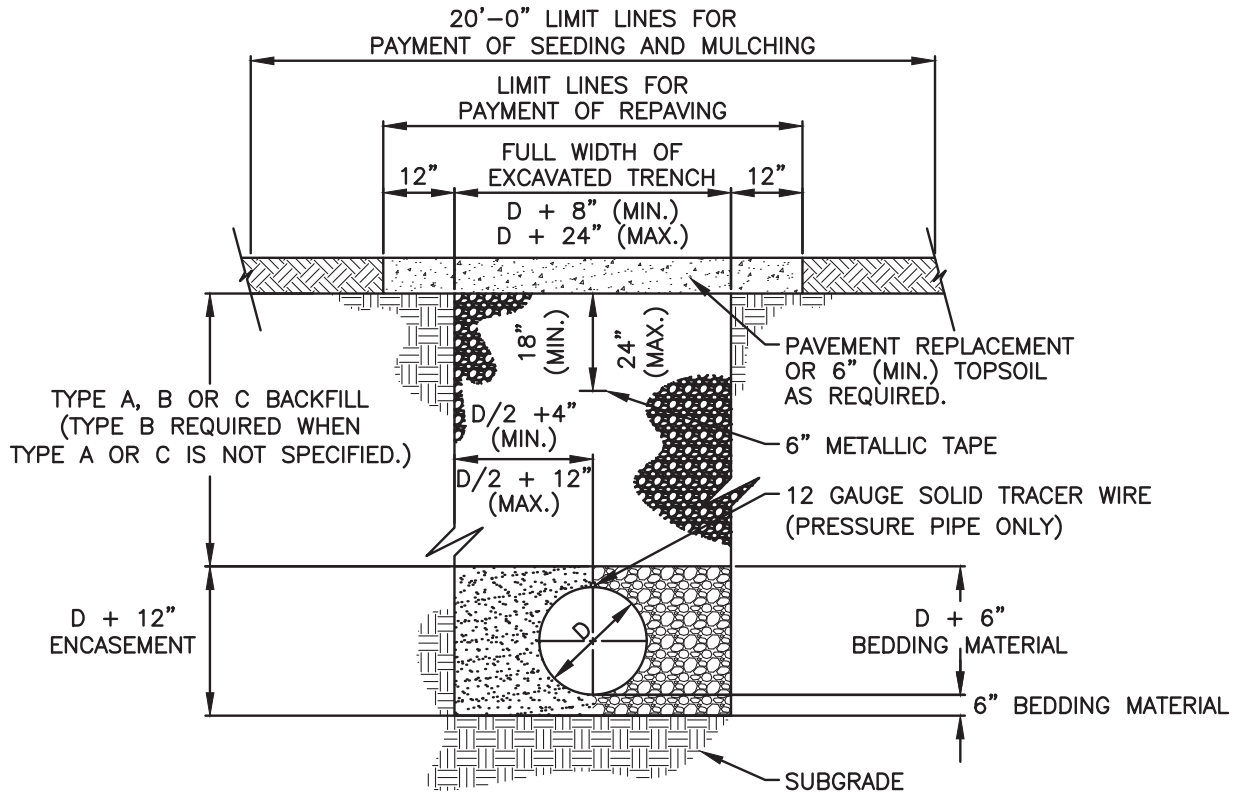
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S-1A  
1 OF 2

NOTES:

1. ITEM NUMBERS REFER TO THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.
2. AGGREGATE FOR BEDDING SHALL BE WASHED GRAVEL AND BE NO. 57 PER CMS 304.02. TYPE A BACKFILL SHALL BE GRANULAR MATERIAL AS SPECIFIED IN ITEM 703.11,
3. GRANULAR MATERIAL, TYPE 2. TYPE A BACKFILL SHALL BE USED WHEN THE TRENCH IS 5' OR LESS FROM ANY PAVED OR GRAVEL SURFACE OR BENEATH THE PAVEMENT OR GRAVEL. COMPACTION SHALL MEET THE REQUIREMENTS OF ITEM 203.
4. TYPE B BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, TOPSOIL, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 95% OF ITS MAXIMUM LABORATORY DRY WEIGHT.
5. TYPE C BACKFILL SHALL BE NATURAL SOIL FREE FROM STONES LARGER THAN 2" ACROSS THEIR GREATEST DIMENSION, VEGETATION, DEBRIS, RUBBISH OR FROZEN MATERIAL, COMPACTED TO 90% OF ITS MAXIMUM LABORATORY DRY WEIGHT. APPROVED BY THE CONTRACT ADMINISTRATOR, STONES NO LARGER THAN ONE CUBIC FOOT MAY BE DEPOSITED AT LEAST 3' ABOVE THE TOP OF THE PIPE.
6. THE EXCAVATED TRENCH WIDTH 12" ABOVE THE CONDUIT MAY BE INCREASED WITHOUT ADDITIONAL COMPENSATION.
7. FLEXIBLE PIPE SHALL INCLUDE PVC AND HDPE.
8. ENCASEMENT SHALL BE CLASS C CONCRETE.



**SECTION WITH  
ENCASEMENT**

**SECTION WITH  
BEDDING MATERIAL**

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

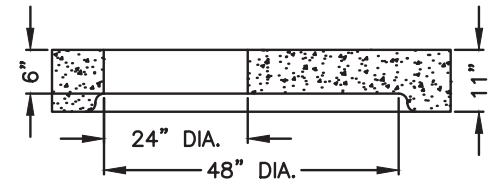
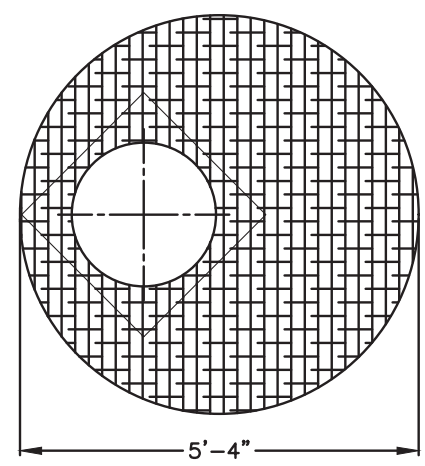
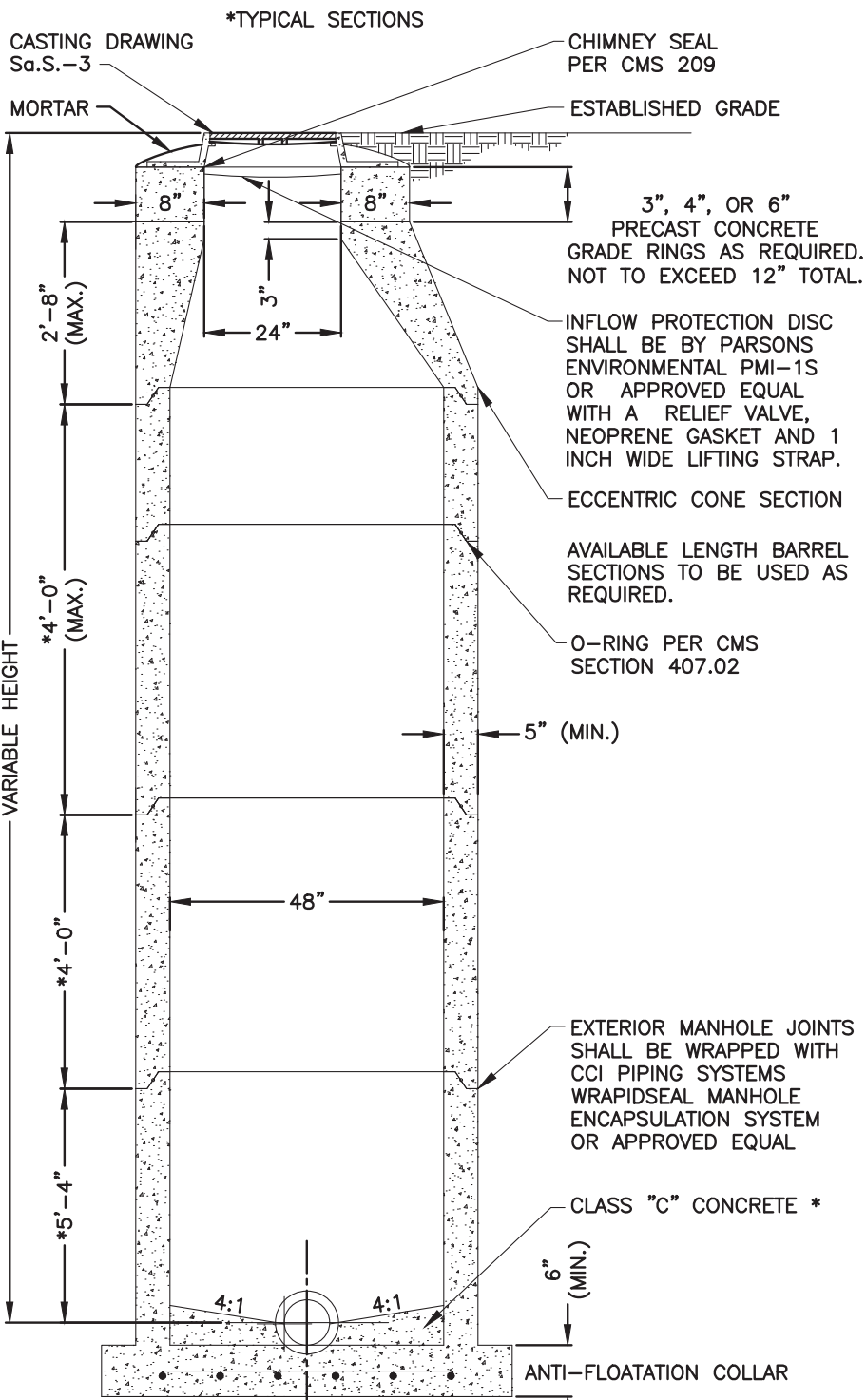
# TYPICAL TRENCH FOR FLEXIBLE PIPE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

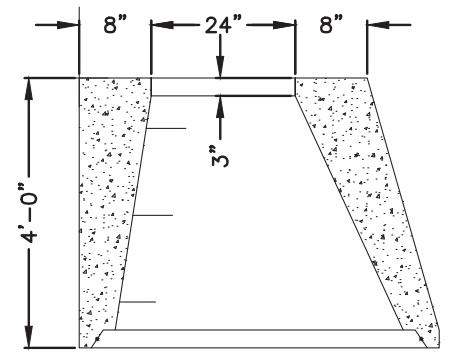
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S-1B  
2 OF 2



**ALTERNATE TOP SLAB**  
SEE NOTE #1



**ALTERNATE ECCENTRIC  
CONE SECTION**

- NOTES:
1. WHEN SHOWN IN TRAFFIC AREAS, THE ALTERNATE TOP SLAB SHALL BE DESIGNED FOR TRAFFIC LOADING.
  2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO ASTM C478-70 UNLESS OTHERWISE SHOWN.
  3. ALL CORE DRILLED OPENINGS SHALL BE DONE ONLY AS APPROVED AND DIRECTED BY THE ENGINEER.
  4. PRECAST CONCRETE GRADE RINGS, SEALED WITH CONSEAL, SHALL BE USED BETWEEN THE SLAB OR CONE TOP AND THE ACCESS FRAME CASTING AND COVER. NO MANHOLE BRICK SHALL BE PERMITTED FOR USE.
  5. SEWER PIPE SHALL BE SECURED THROUGH THE MANHOLE WALL BY PSX DIRECT DRIVE BOOT OR APPROVED EQUIVALENT.

APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

**PRECAST CONCRETE  
MANHOLE  
(24" PIPE AND SMALLER)**

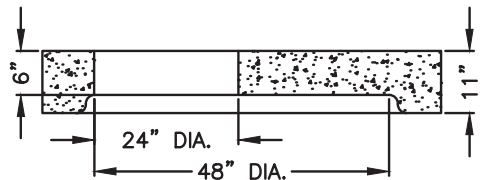
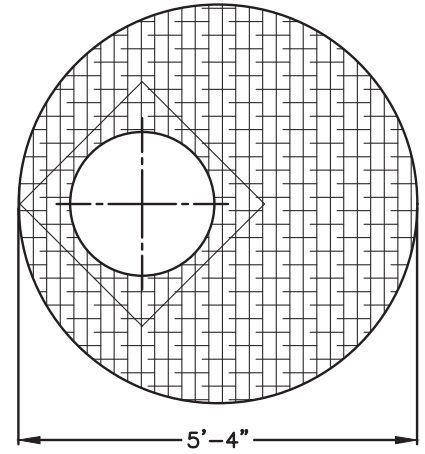
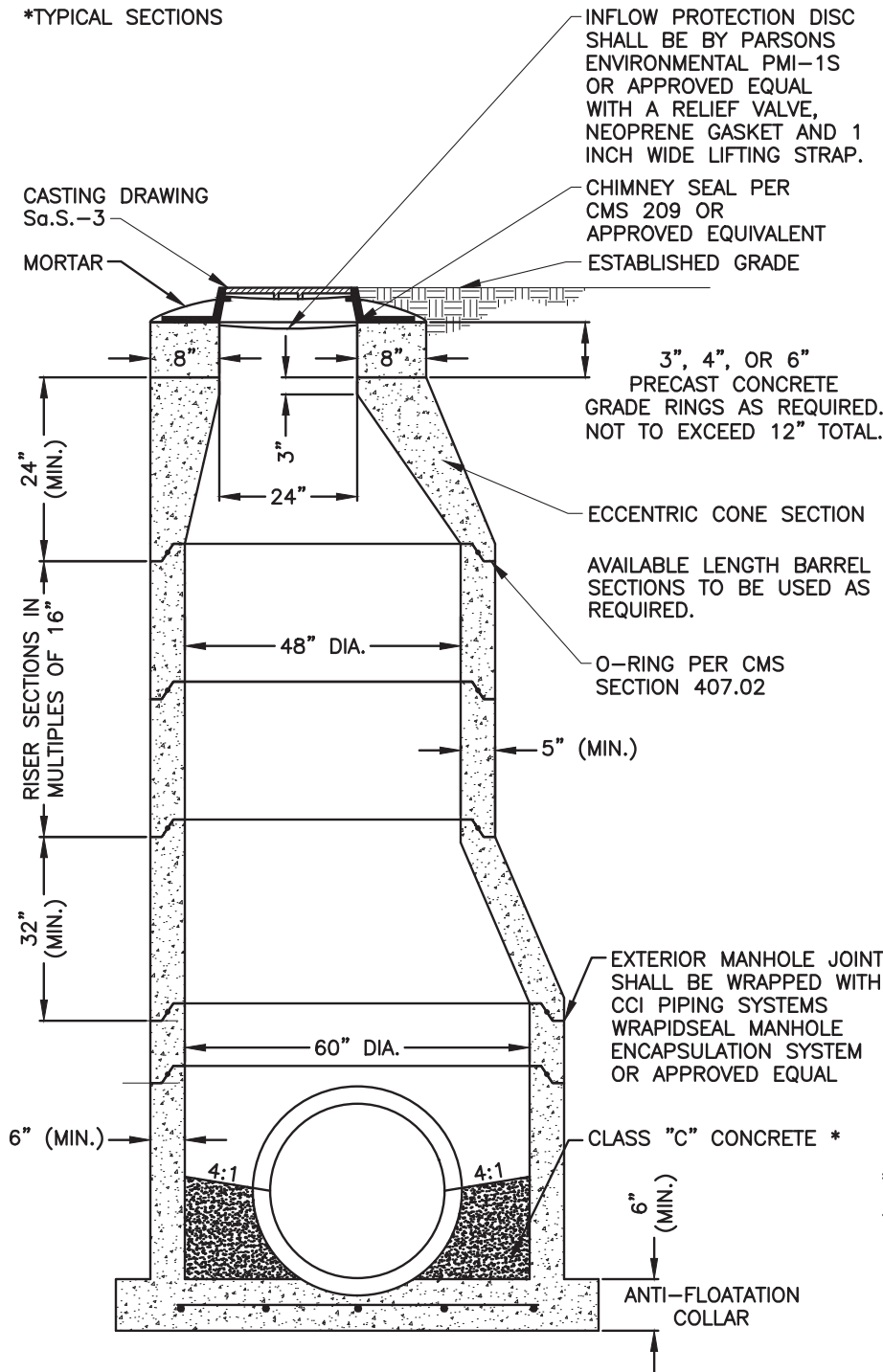
SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

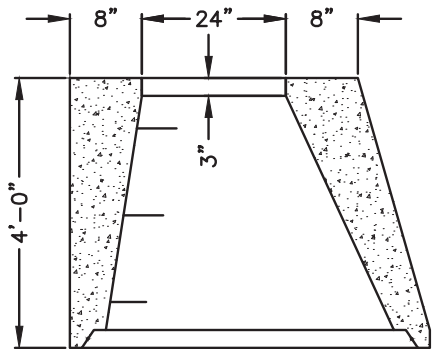
REVISED:  
02/2023

DRAWING NO.  
Sa.S.-2A  
1 OF 2

**\*TYPICAL SECTIONS**



**ALTERNATE TOP SLAB**  
SEE NOTE #1



**ALTERNATE ECCENTRIC CONE SECTION**

- NOTES:**
1. WHEN SHOWN IN TRAFFIC AREAS, THE ALTERNATE TOP SLAB SHALL BE DESIGNED FOR TRAFFIC LOADING.
  2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO ASTM C478-70 UNLESS OTHERWISE SHOWN.
  3. ALL CORE DRILLED OPENINGS SHALL BE DONE ONLY AS APPROVED AND DIRECTED BY THE ENGINEER.
  4. PRECAST CONCRETE GRADE RINGS, SEALED WITH CONSEAL, SHALL BE USED BETWEEN THE SLAB OR CONE TOP AND THE ACCESS FRAME CASTING AND COVER. NO MANHOLE BRICK SHALL BE PERMITTED FOR USE.
  5. SEWER PIPE SHALL BE SECURED THROUGH THE MANHOLE WALL BY PSX DIRECT DRIVE BOOT OR APPROVED EQUIVALENT.

APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

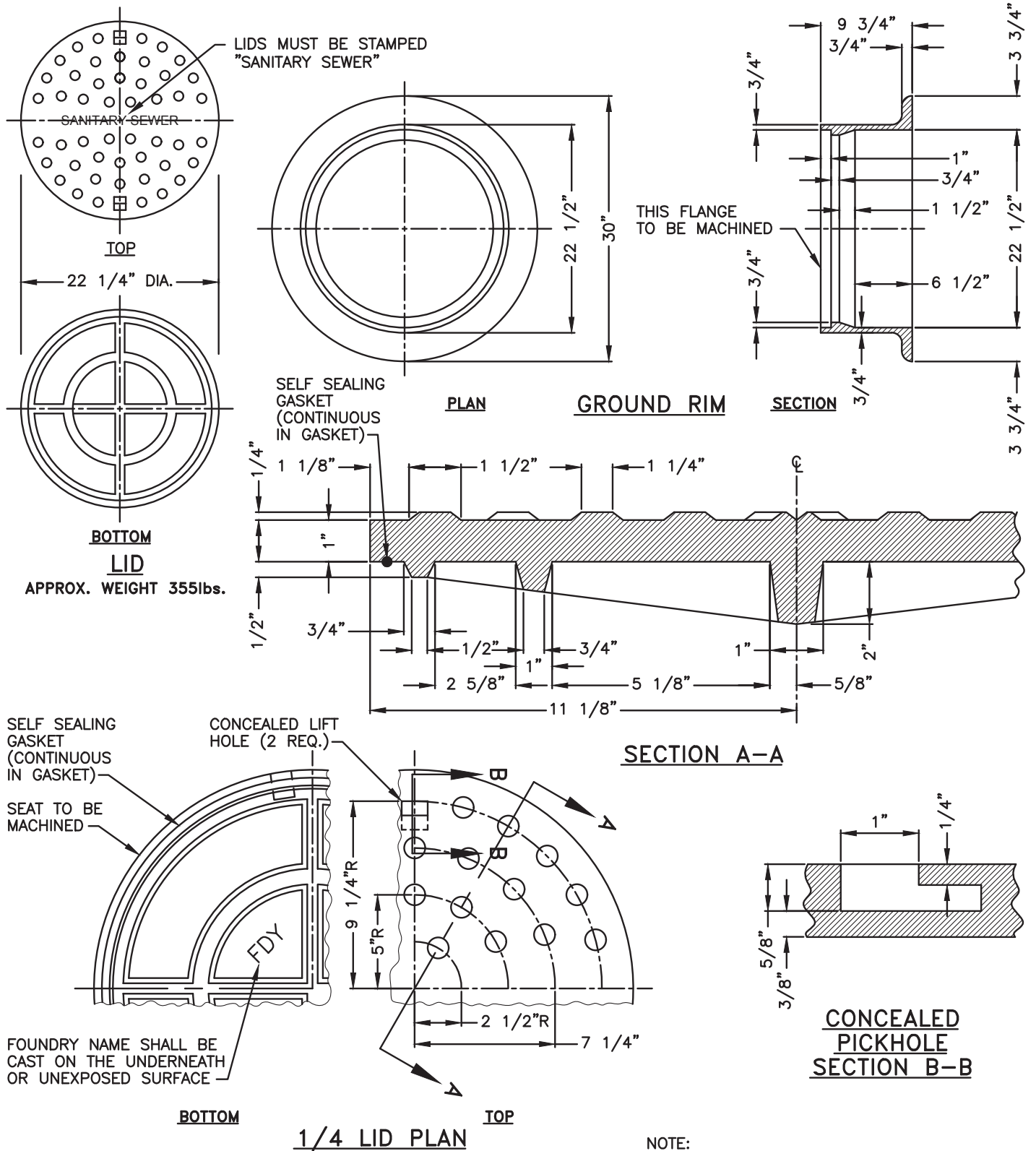
**PRECAST CONCRETE  
MANHOLE  
(27"-42" PIPE)**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED: 02/2023

DRAWING NO. Sa.S.-2B  
2 OF 2



**STANDARD DIMENSIONS FOR SANITARY  
SEWER MANHOLE FRAME AND COVER**  
NOT TO SCALE

NOTE:  
1. LID SHALL BE EAST JORDAN MODEL #1660A2GS  
AND FRAME SHALL BE AN EAST JORDAN  
MODEL #1661Z1 OR APPROVED EQUIVALENT.

APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

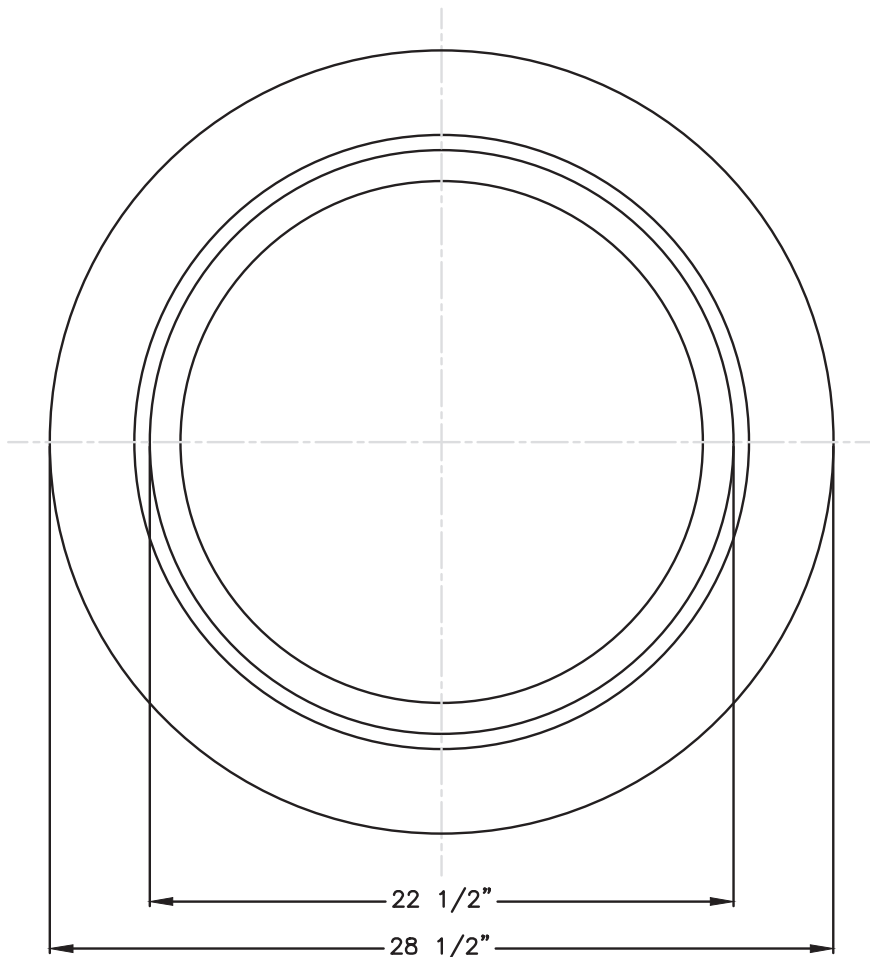
*Scott Campbell*  
REGISTERED ENGINEER

# 24" MANHOLE FRAME & COVER CASTINGS

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

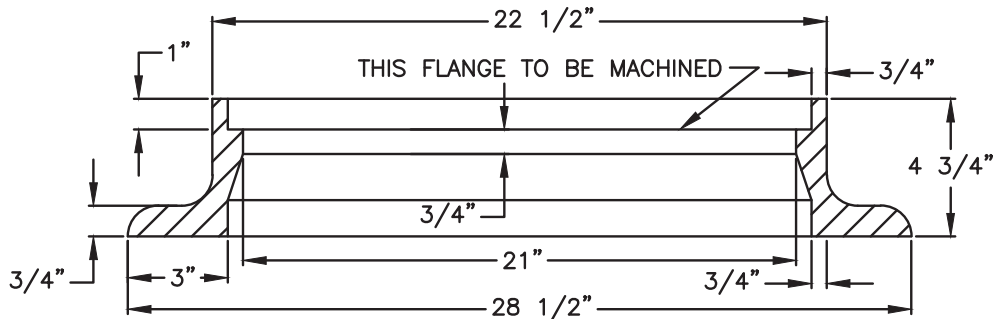
STANDARD  
CONSTRUCTION DWG.

REVISED: 02/2023      DRAWING NO. Sa.S.-3



APPROXIMATE WEIGHT 125 lbs.

PLAN VIEW



SECTION

NOTE:

1. FOR COVER DETAILS, SEE Sa.S.-3
2. CASTING TO BE EAST JORDAN MODEL #16607 FRAME AND EAST JORDAN MODEL # 1660A2GS LID.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

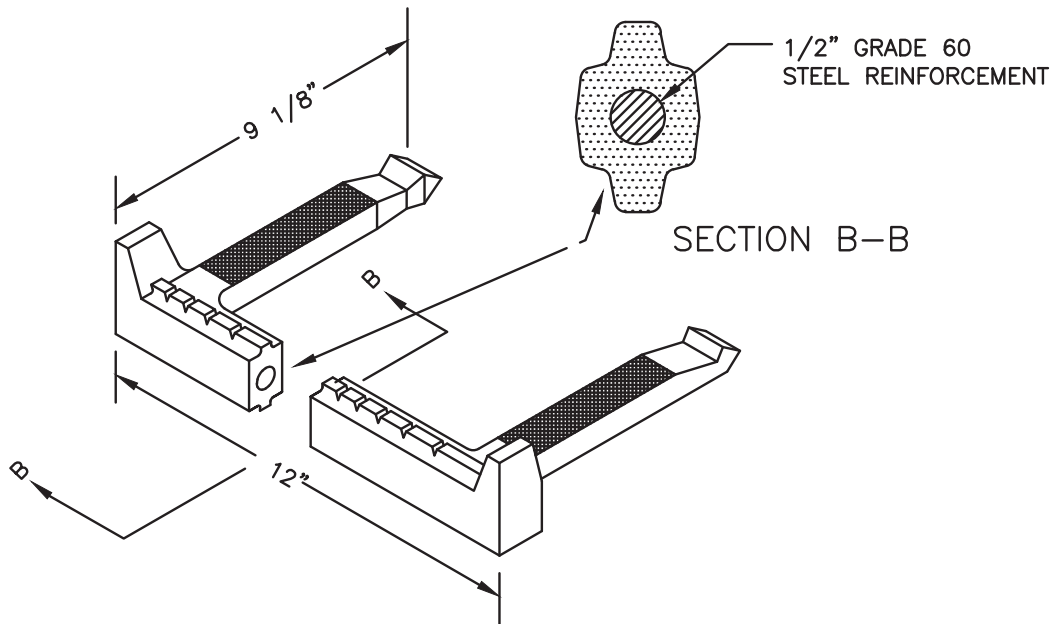
**LOW  
PROFILE  
CASTING**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S-4



POLYPROPYLENE STEP

NOTES

1. STEPS SHALL BE CAREFULLY DRIVEN INTO THE STRUCTURE BY PRESSURE OR VIBRATION BEFORE INITIAL SET OCCURS. CAST IN PLACE OR MORTARED WITH A NON-SHRINKING GROUT.
2. STEPS SHALL BE INSTALLED 16" C/C.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

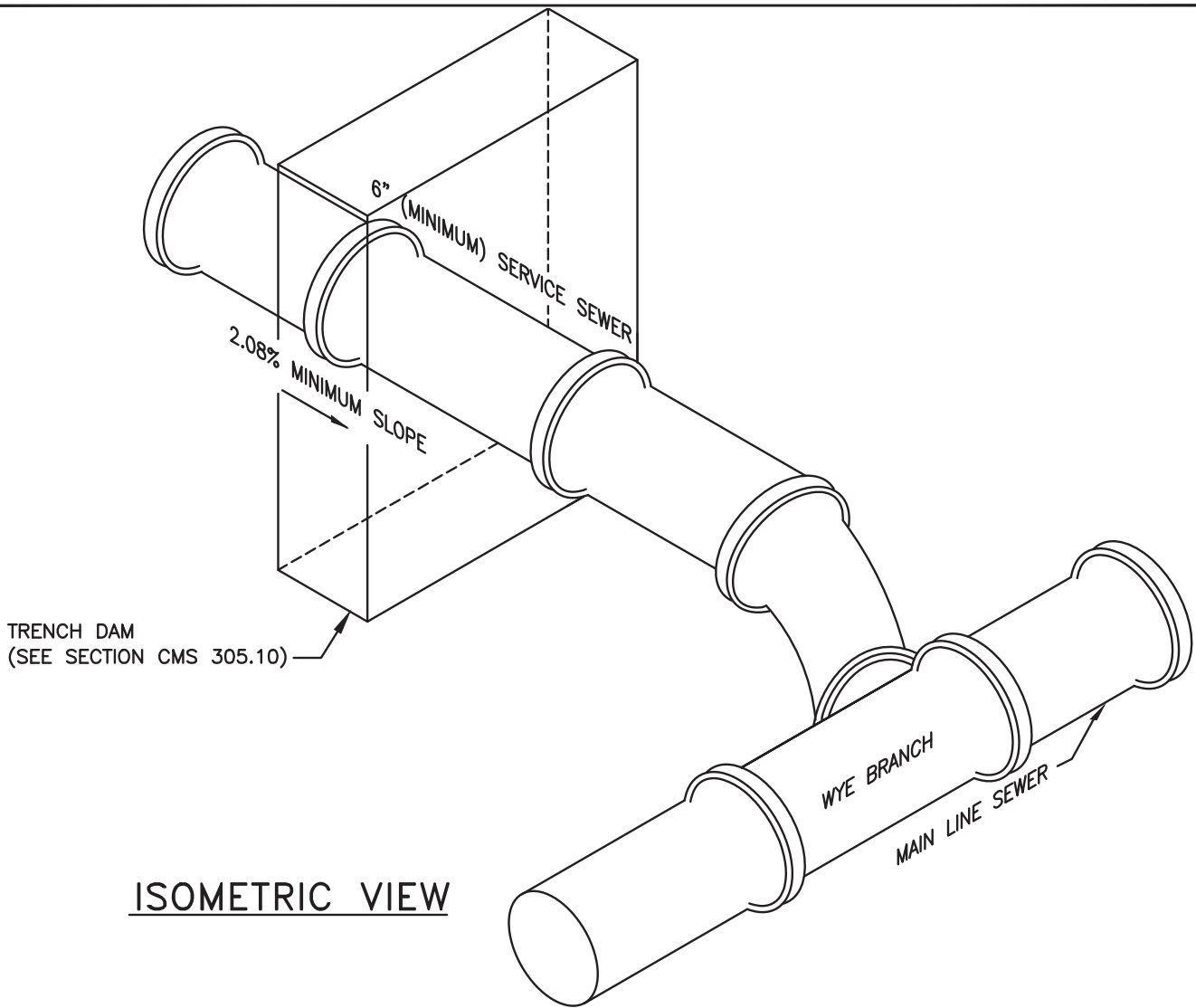
**METER / VALVE VAULT  
MANHOLE STEPS**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

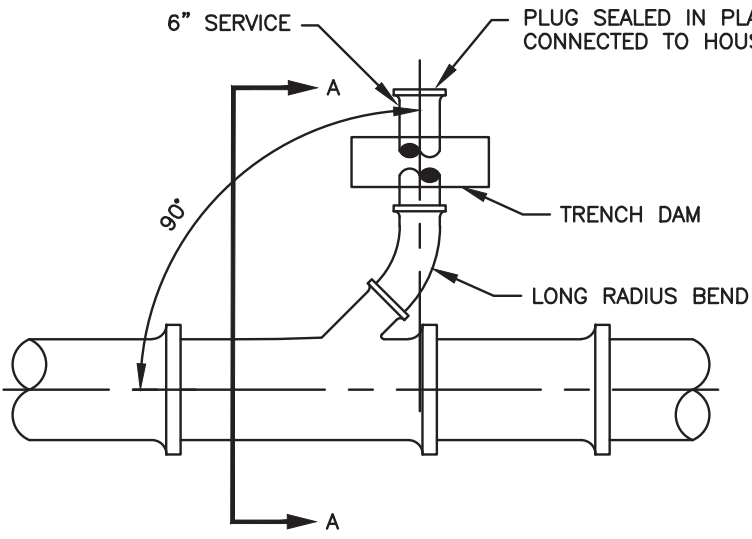
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

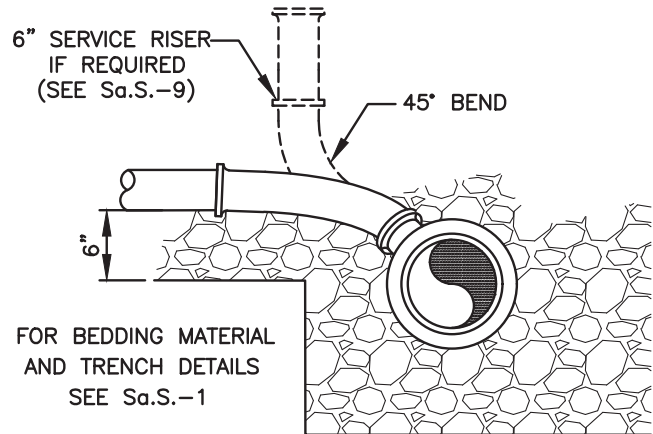
DRAWING NO.  
Sa.S.-5



ISOMETRIC VIEW



PLAN VIEW



SECTION A-A

APPROVED: 02/22/2023  
DATE

*SpaB Cankel*  
REGISTERED ENGINEER

**6 SANITARY  
SEWER SERVICE  
(MAIN LINE TO R/W)**

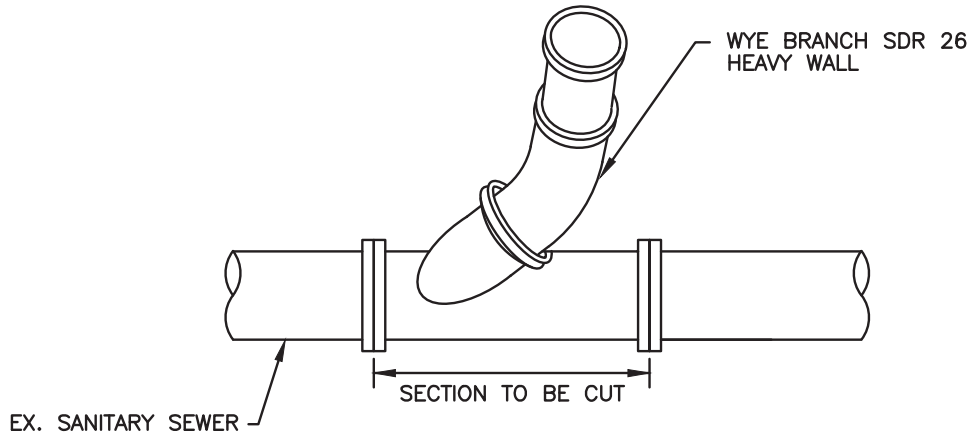
SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-7





1. BYPASS PUMP OR PLUG UPSTREAM INVERT;  
CONDITIONS VARY AND APPROVAL BY DISTRICT REQUIRED.
2. CUT OUT PIPE SECTION; INSTALL SDR 26 HEAVY WALL WYE  
BRANCH; BEVEAL EDGES ON EXISTING PIPE; SDR 26 GASKETED  
HARD COUPLERS ARE REQUIRED FOR CONNECTION OF THE WYE  
TO THE MAIN LINE;
3. BEDDING AROUND CONNECTION SHALL BE CDF TO SPRING LINE  
AND WASHED NO. 57 GRAVEL.

APPROVED: 02/22/2023  
DATE

*Scott A. Cankel*  
REGISTERED ENGINEER

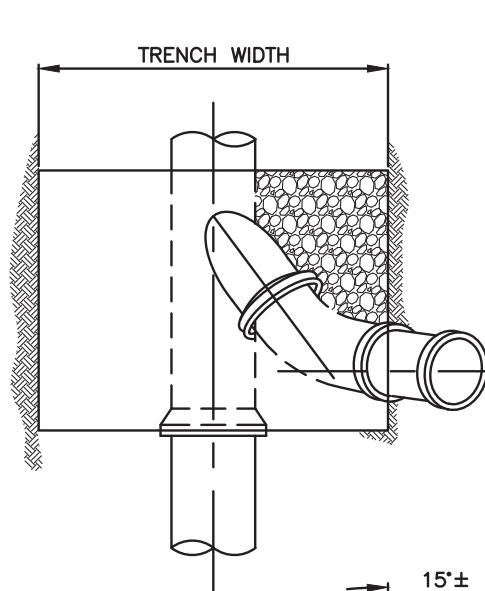
# SERVICE CONNECTION FOR EXISTING SANITARY SEWER PIPE

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

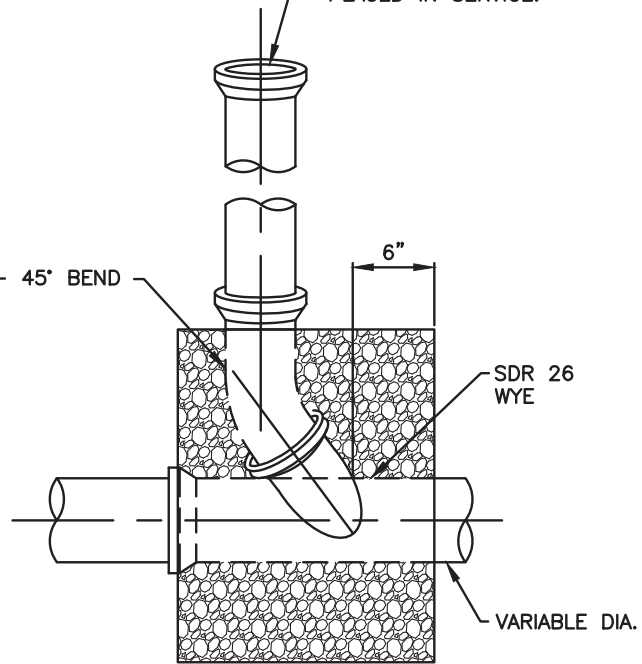
DRAWING NO.  
Sa.S.-8



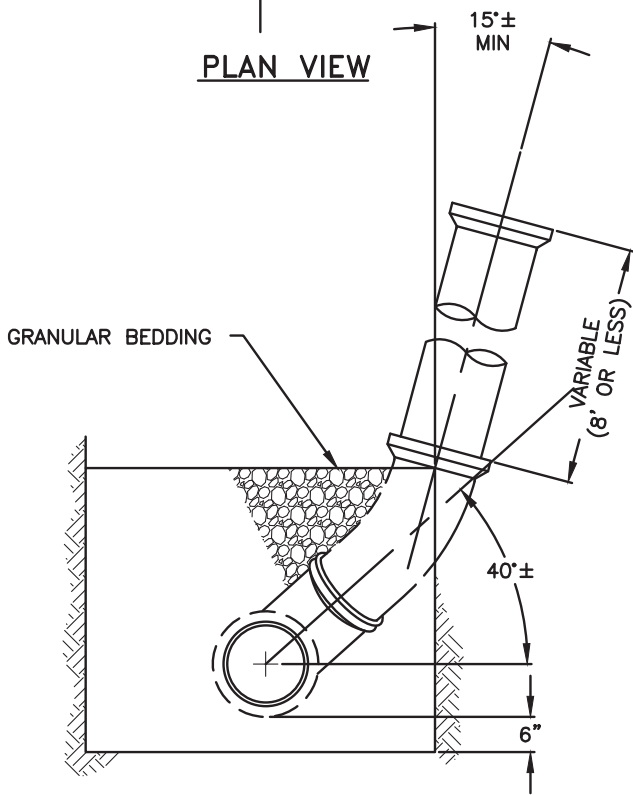
PLAN VIEW

6" - 45° BEND

SDR 26 COMPRESSION-TYPE GASKET PLUG OR CAP SHALL BE INSTALLED IF NOT IMMEDIATELY PLACED IN SERVICE.



SIDE VIEW



END VIEW

NOTES:

1. FOR WYE BRANCH INSTALLATION, SEE Sa.S-7

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

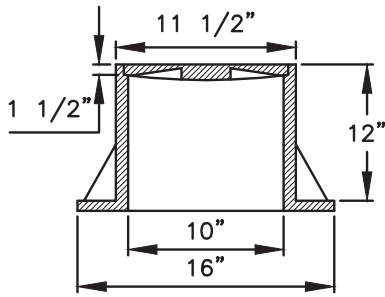
# TYPICAL RISER

SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

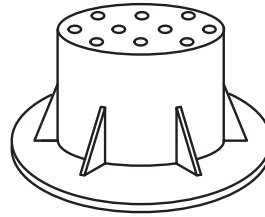
REVISED:  
02/2023

DRAWING NO.  
Sa.S-9



DIMENSIONS MAY VARY

SECTION VIEW



AXONOMETRIC VIEW

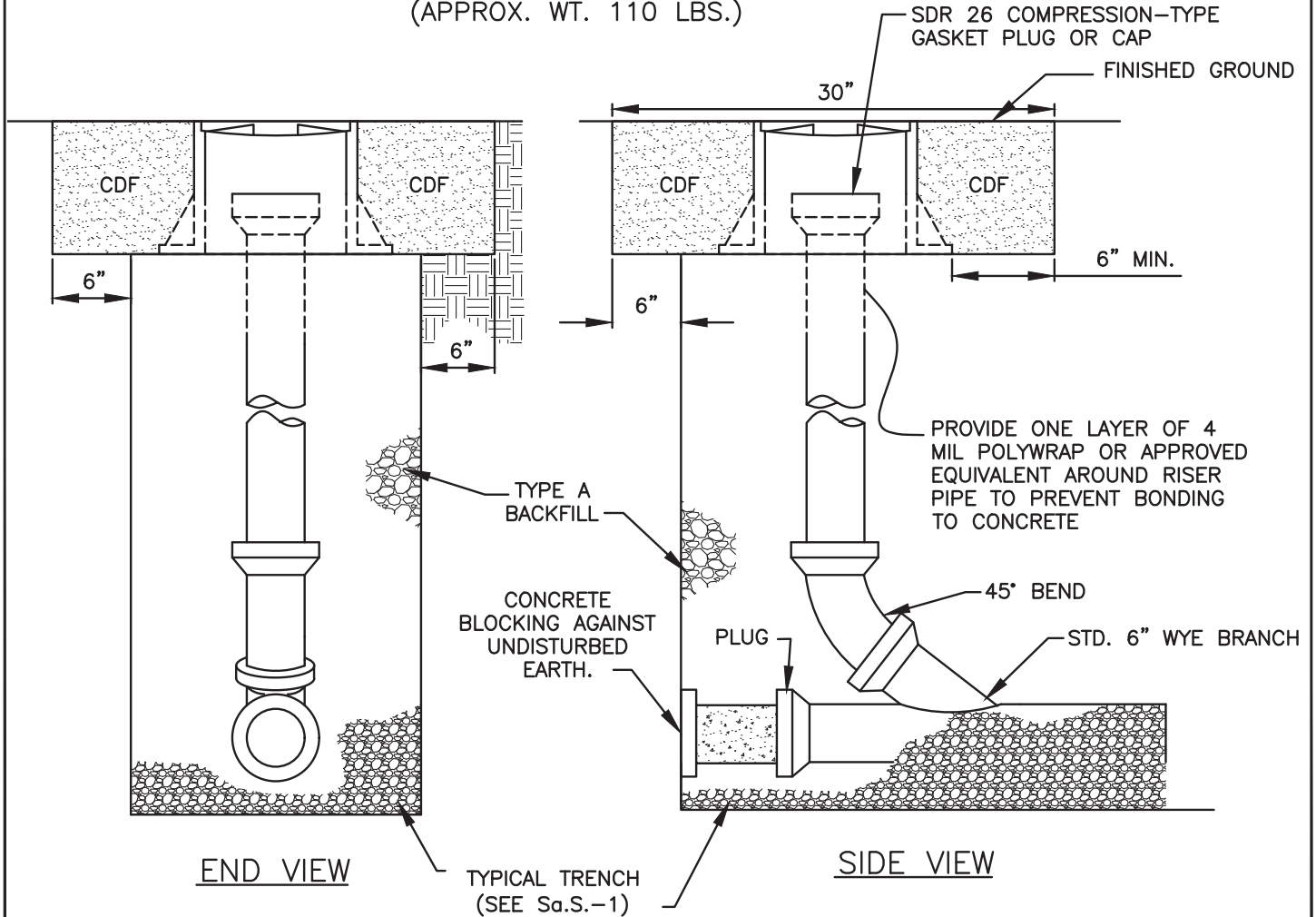
NOTES

1. CLEANOUT FRAME AND LID SHALL BE NEENAH R-1977 SERIES OR APPROVED EQUIVALENT.

2. CLEANOUT TOP OF CASTING SHALL BE SET FLUSH WITH FINISHED GRADE.

CLEANOUT FRAME AND LID

(APPROX. WT. 110 LBS.)



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

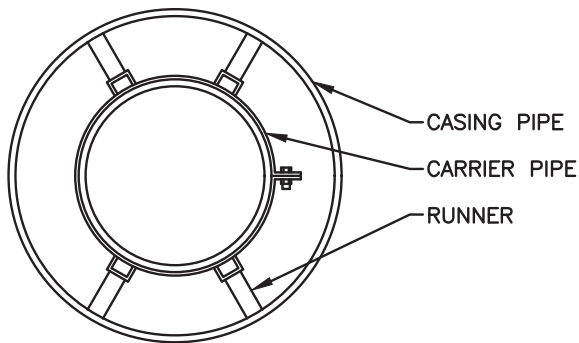
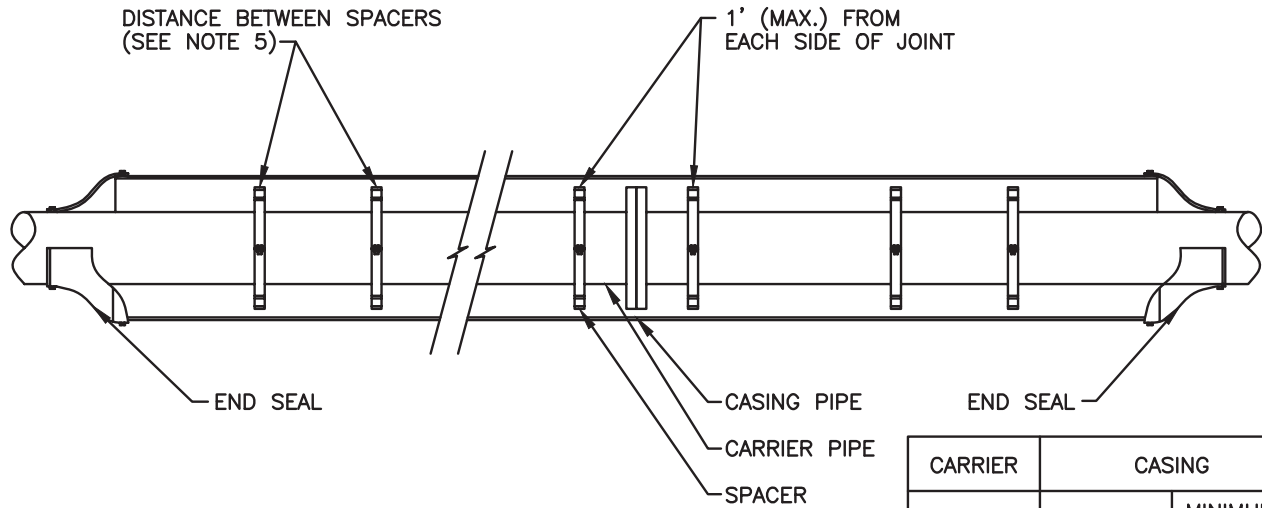
**TYPICAL  
CLEANOUT  
DETAIL**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-10



**SECTION**

CARRIER INSIDE DIAMETER	CASING	
	MINIMUM DIAMETER	MINIMUM WALL THICKNESS
2"	8"	0.188"
3"	10"	0.188"
4"	10"	0.188"
6"	14"	0.219"
8"	16"	0.219"
10"	18"	0.250"
12"	20"	0.281"
15"	24"	0.344"
16"	24"	0.344"
18"	28"	0.406"
20"	28"	0.406"
24"	36"	0.469"
27"	42"	0.500"
30"	42"	0.500"
36"	48"	0.675"

**NOTES:**

- CARRIER PIPE SHALL BE YELOMINE SDR21, CERTALOK C900 DR18 OR HDPE DR11 FOR FORCEMAINS AND YELOMINE SDR26, CERTALOK C900 DR 18 FOR GRAVITY SEWERS
- CASING PIPE SHALL BE INSTALLED BY JACKING OR DIRECTIONAL DRILL WITH A MINIMUM WALL THICKNESS AS SHOWN IN THE TABLE OR MEETING THE REQUIREMENTS OF THE RECEIVING AUTHORITY.
- CASING SPACERS AND END SEALS SHALL BE ADVANCE PRODUCTS & SYSTEMS, INC. OR APPROVED EQUIVALENT.
- WHEN HDPE PIPE IS USED, THE PIPE SHALL BE DR11 WITH AN INTERNAL DIAMETER EQUAL TO OR GREATER THAN THAT OF THE OPEN CUT EXCAVATION MATERIAL IN WHICH THE CONNECTION WAS MADE.
- DIMENSIONS BETWEEN SPACERS FOR PVC PIPE SHALL BE 6 FEET MAXIMUM.
- THE QUANTITY OF RUNNERS IS IN ACCORDANCE WITH THE SIZE OF THE CARRIER PIPE AS FOLLOWS:  
 TO 14" DIA. - 4 RUNNERS  
 TO 16" DIA. - 4 RUNNERS  
 TO 18" DIA. - 4 RUNNERS  
 TO 20" DIA. - 4 RUNNERS  
 TO 24" DIA. - 6 RUNNERS  
 TO 30" DIA. - 6 RUNNERS  
 TO 36" DIA. - 6 RUNNERS  
 TO 42" DIA. - 8 RUNNERS  
 TO 48" DIA. - 8 RUNNERS
- WITH HPDE, MECH. RESTRAINTS MUST BE USED 3 JOINTS FROM BOTH ENDS OF THE BORE.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# CASING PIPE

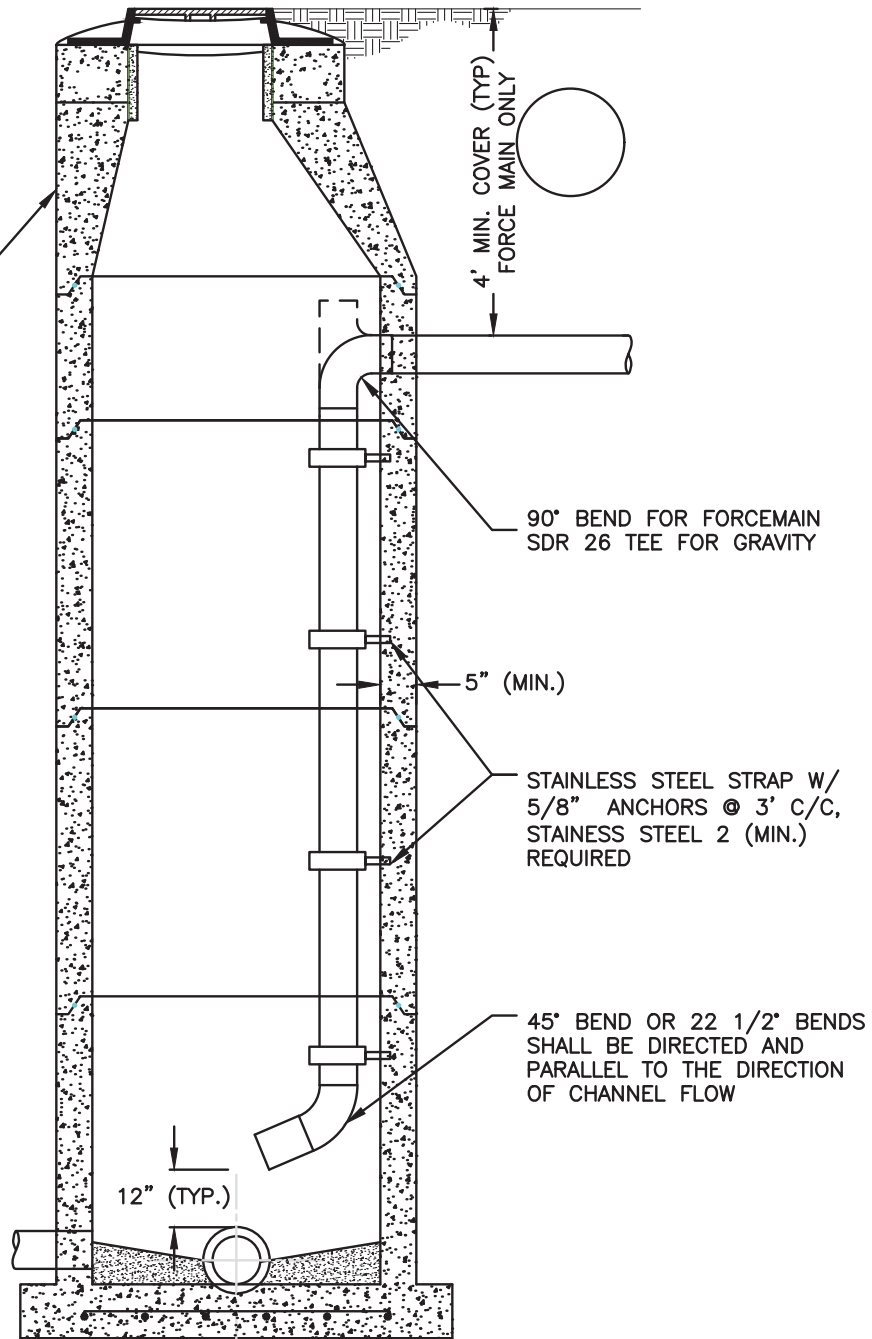
SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-11

STD MANHOLE SECTION  
(TYP.)



NOTES

1. FORCE MAIN OR SERVICE DROP PIPE SHALL IN NO WAY INTERFERE WITH THE STEPS OR OTHER ACCESS TO THE BOTTOM OF THE STRUCTURE.
2. THE VERTICAL SECTION OF PIPE SHALL BE ONE CONTINUOUS LENGTH.
3. PIPE SHALL BE PVC (ASTM 2241 SDR21) FOR FORCEMAIN WITH UNIFLANGE OR APPROVED EQUIVALENT AT ALL INTERIOR OR VERTICAL JOINTS OR PVC SDR35 D3034 FOR SERVICE LINE.
4. STRUCTURE PENETRATIONS SHALL BE WATERTIGHT WITH FLEXIBLE CONNECTION MEETING ASTM C 923.
5. WHEN CONNECTING FORCE MAIN OR SERVICE LINE TO AN EXISTING MANHOLE, THE WALL PENETRATION SHALL BE A PSX DIRECT DRIVE BOOT.
6. A INSIDE DROP ON SERVICE LINES IS ONLY REQUIRED IF THE PROPOSED CONNECTION IS 2 FEET OR GREATER ABOVE THE CHANNEL.
7. CONTRACTOR TO USE EPOXY COATING IN ACCORDANCE WITH CMS SECTION 209.
8. FOR LINES GREATER THAN 10" AND LARGER, INCREASE MANHOLE TO 60" DIAMETER.

APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

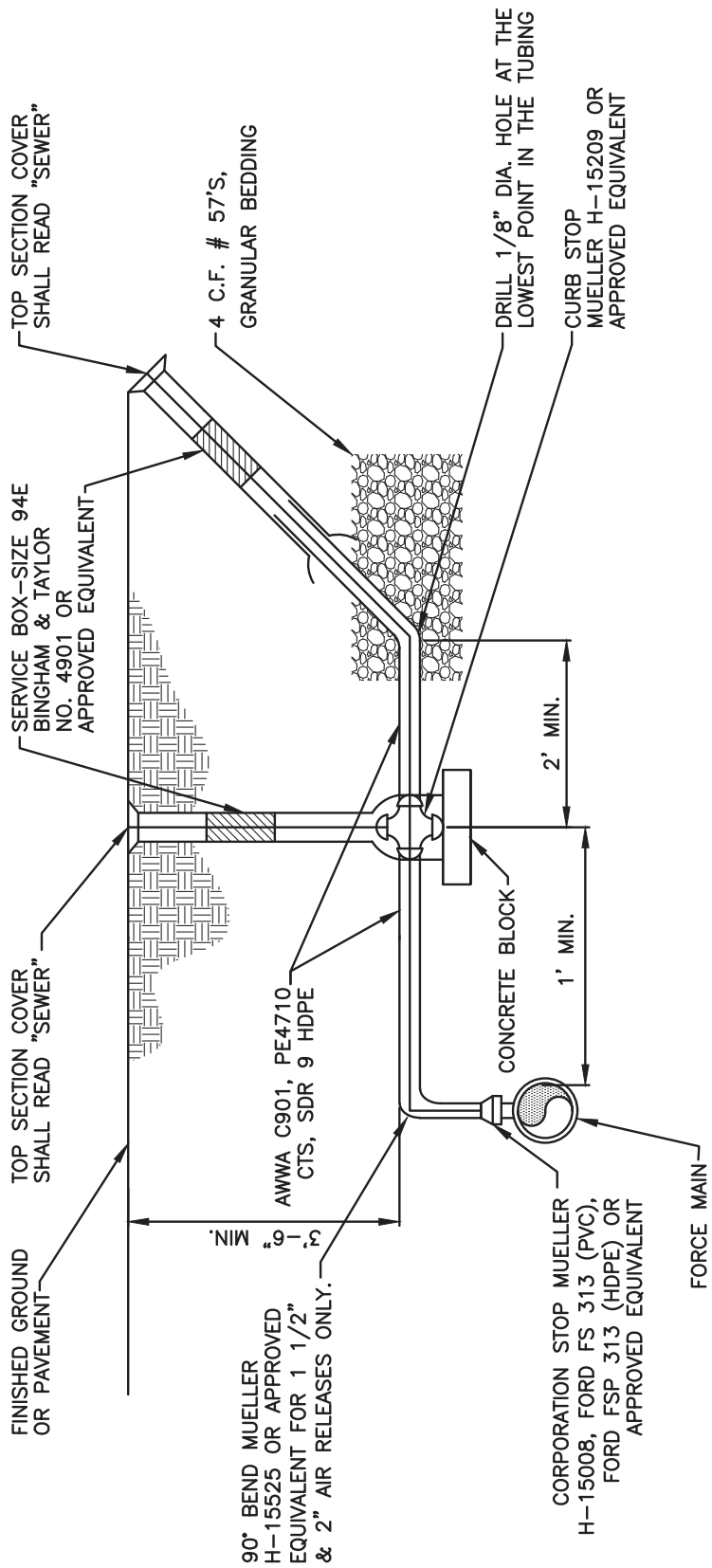
# F/M & 8" OR LESS GRAVITY LINE DROP PIPE DETAIL

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S-12



APPROVED: \_\_\_\_\_ 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# TYPICAL AIR RELEASE

(3/4" TO 2")

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

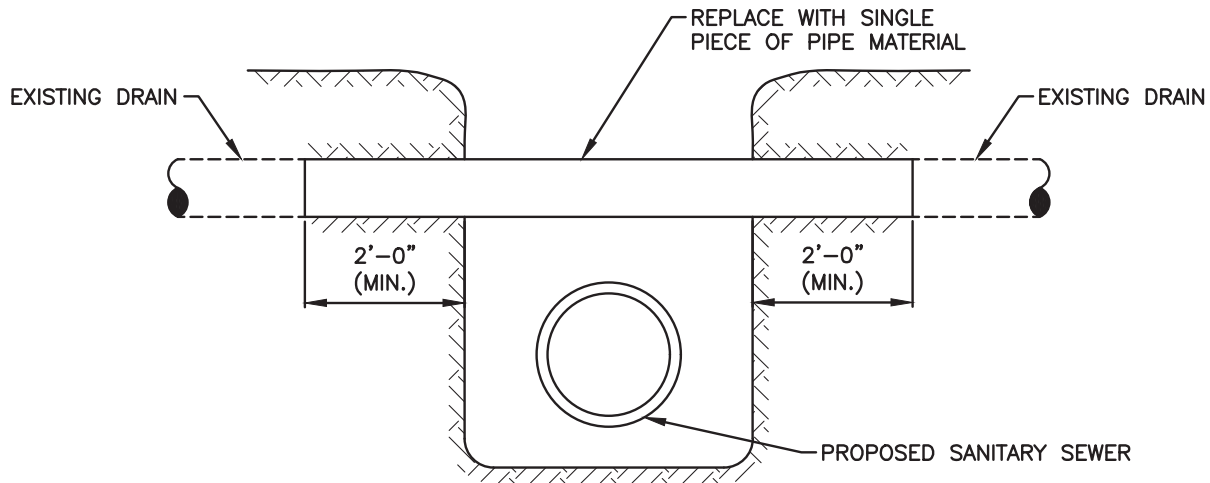
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-13

MINIMUM ROAD AND CURB UNDERDRAIN  
 REPLACEMENT MATERIAL SHALL BE:  
 PERFORATED CONCRETE: ITEM 706.06 (ODOTCMS)  
 CONCRETE DRAIN TILE: ITEM 706.07 (ODOTCMS)  
 PERFORATED PVC: ITEM 707.41 (ODOTCMS)  
 HEAVY DUTY CORRUGATED POLYETHYLENE  
 SLOTTED DRAIN: ITEM 707.32 (ODOTCMS)

MINIMUM DRAIN TILE REPLACEMENT MATERIAL SHALL  
 BE:  
 PVC: ASTM 2241, SDR 21 OR SDR 35 D3034.  
 CONCRETE: ITEM 706.02 (ODOTCMS)  
 POLYETHYLENE: ITEM 707.33 (ODOTCMS)



NOTE:

1. INSIDE DIAMETER OF REPLACEMENT PIPE SHALL BE EQUAL TO OR GREATER THAN INSIDE DIAMETER OF EXISTING TILE OR UNDERDRAIN.
2. REPLACEMENT MATERIAL USED SHALL BE EQUAL TO OR BETTER THAN THE EXISTING TILE OR UNDERDRAIN AS DIRECTED BY THE ENGINEER.
3. PROVIDE FERNCO FITTING OR APPROVED EQUIVALENT WHERE EXISTING TILE OR UNDERDRAIN HAS WATERTIGHT JOINTS. PROVIDE 30# FELT OR CONCRETE MORTAR OVER THE UPPER HALF OF THE JOINT WHERE OPEN JOINTS ARE ENCOUNTERED.
4. BACKFILL BETWEEN SANITARY SEWER PIPE AND REPLACEMENT TILE OR UNDERDRAIN SHALL BE GRANULAR BACKFILL.
5. SANITARY SEWER SHALL BE INSTALLED IN ACCORDANCE Sa.S.-1.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
 REGISTERED ENGINEER

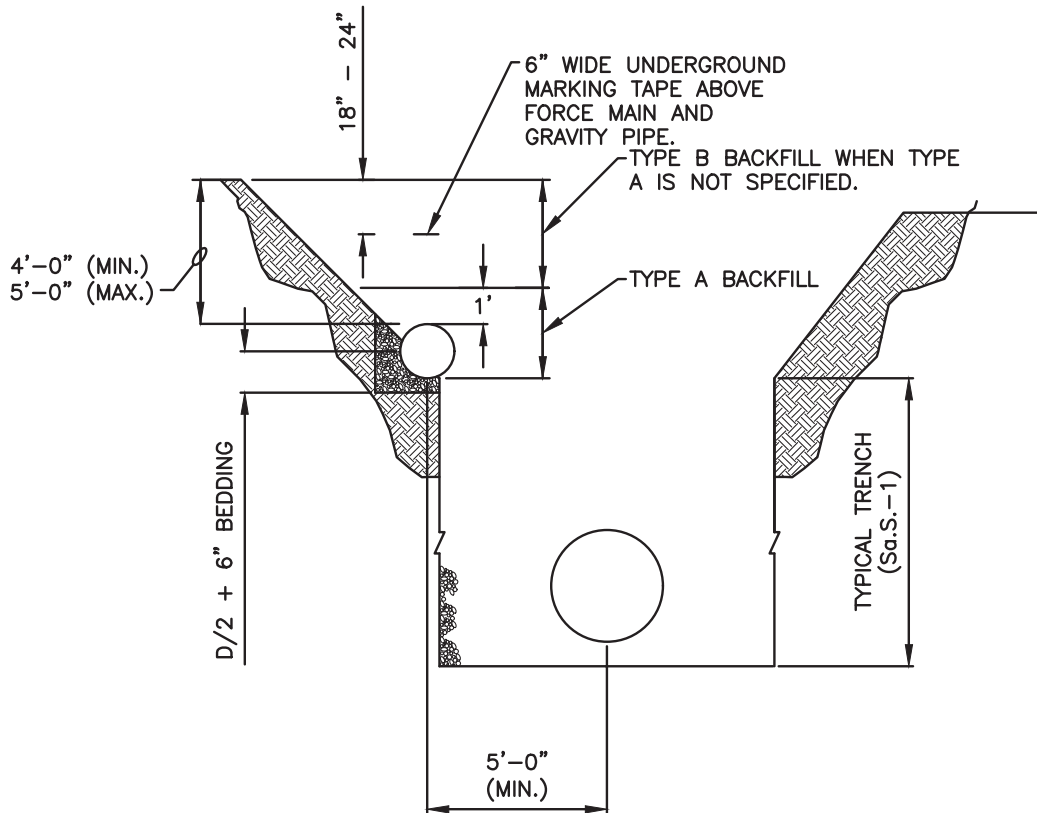
# DRAIN TILE AND UNDERDRAIN REPLACEMENT

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

DRAWING NO.  
 Sa.S.-14



APPROVED: \_\_\_\_\_  
DATE: 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

# FORCE MAIN AND SANITARY SEWER TRENCH

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-16

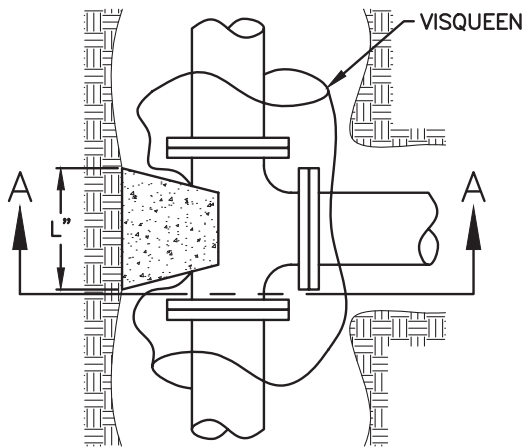




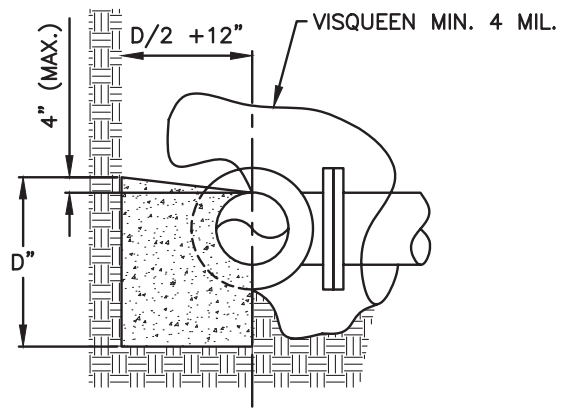
RUN	BRANCH											
	3"			4"			6"			8"		
	L	D	V	L	D	V	L	D	V	L	D	V
3"	12	5	0.5									
4"	10	6	0.5	11	8	0.8						
6"	9	7	0.5	11	8	0.8	18	12	1.9			
8"	8	8	0.5	10	9	0.7	18	12	1.9	23	16	3.5
12"	6	12	0.6	8	12	0.8	18	12	1.9	23	16	3.5
16"	6	16	0.8	6	16	0.8	14	16	2.0	20	18	3.3
20"	6	20	1.0	6	20	1.0	11	20	1.9	18	20	3.3
24"	6	24	1.2	6	24	1.2	9	24	1.9	15	24	3.3

RUN	BRANCH											
	12"			16"			20"			24"		
	L	D	V	L	D	V	L	D	V	L	D	V
3"												
4"												
6"												
8"												
12"	38	22	8.7									
16"	36	23	8.7	49	30	13.6						
20"	35	24	8.7	46	32	13.6	60	38	26.5			
24"	30	28	8.7	42	36	14.0	54	42	26.3	68	48	45.4

V = VOLUME OF CONCRETE IN CUBIC FEET



PLAN VIEW



SECTION A-A

NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE DISTRICT
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
6. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.

APPROVED: \_\_\_\_\_  
DATE

02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

# BACKING FOR TEES

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

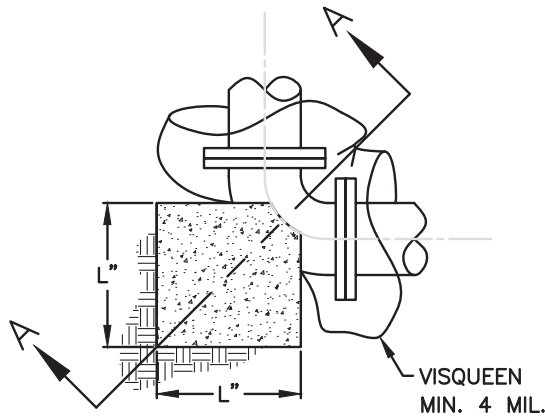
STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

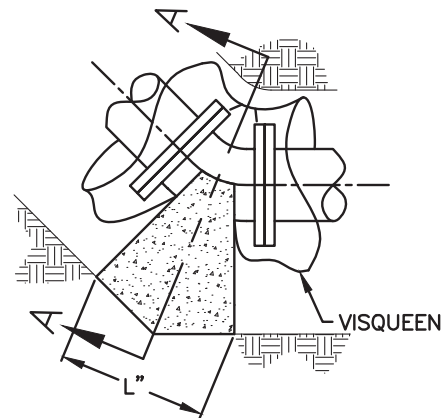
DRAWING NO.  
Sa.S.-20

PIPE SIZE	DEGREE OF BEND											
	11 1/4°			22 1/2°			45°			90°		
	L	D	V	L	D	V	L	D	V	L	D	V
3"	4	3	0.1	6	4	0.2	10	4	0.3	10	4	0.3
4"	5	4	0.2	9	5	0.4	14	5	0.6	14	5	0.6
6"	8	6	0.5	12	7	0.7	20	8	1.4	18	9	1.7
8"	9	8	0.7	16	9	1.4	24	12	2.7	25	11	4.0
12"	14	12	1.8	24	14	3.6	36	18	6.8	32	18	10.7
16"	18	16	3.4	32	18	6.7	36	32	13.4	41	26	25.4
20"	25	20	6.4	30	30	11.5	49	36	20.5	50	32	46.5
24"	27	24	9.0	39	34	18.4	60	42	35.0	58	40	77.7

V = VOLUME OF CONCRETE IN CUBIC FEET



90° BENDS

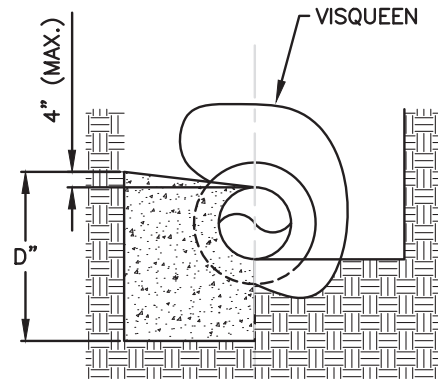


BENDS LESS THAN 90°

PLAN VIEWS

NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE DISTRICT
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
6. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.



SECTION A-A

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

**BACKING  
FOR  
BENDS**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

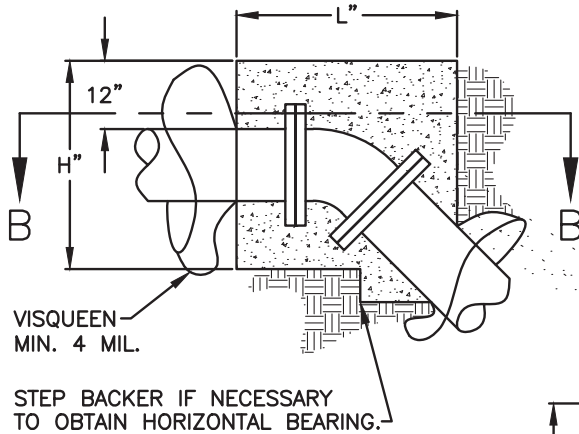
DRAWING NO.  
Sa.S.-21

PIPE SIZE	DEGREE OF BEND															
	11 1/4°				22 1/2°				45°				90°			
	L	W	H	V	L	W	H	V	L	W	H	V	L	W	H	V
3"	12	18	12	1.5	13	25	16	3.0	18	30	19	5.9	25	30	24	10.4
4"	12	24	16	2.6	16	30	18	5.0	22	36	24	11.0	27	48	25	18.7
6"	12	48	18	6.0	15	43	36	13.4	30	55	24	22.9	37	54	36	41.6
8"	12	63	24	10.5	18	57	34	20.2	36	57	33	39.2	47	60	46	75.0
12"	20	54	36	22.6	37	62	37	49.0	48	62	51	87.9	66	66	66	166.4
16"	31	65	38	44.3	60	65	39	88.1	65	65	65	159.2	72	96	72	288.0
20"	45	70	40	72.8	56	70	60	136.2	72	76	78	247.0	86	108	84	451.8
24"	41	72	54	92.3	67	74	69	198.0	88	84	84	359.1	96	120	96	640.0

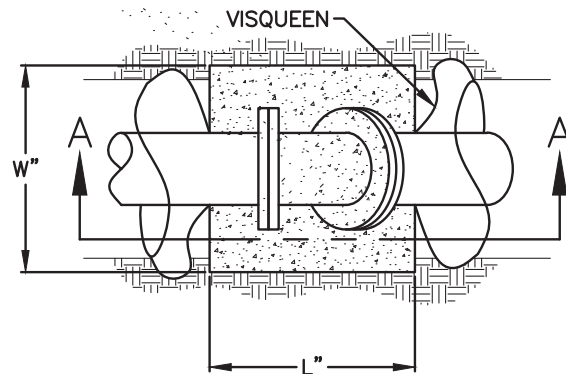
V = VOLUME OF CONCRETE IN CUBIC FEET

NOTES:

1. CONCRETE FOR BACKING SHALL BE CLASS "C".
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. REINFORCING STEEL SHALL BE USED AS DIRECTED BY THE DISTRICT.
4. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
5. BACKING SHALL BE CENTERED HORIZONTALLY ON BEND.
6. ANY PIPE WHICH COMES IN CONTACT WITH THE CONCRETE ENCASEMENT SHALL BE DUCTILE IRON.
7. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
8. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BLOCKING DOES NOT HAVE DIRECT CONTACT WITH TEE AND OR FITTINGS.



SECTION A-A



SECTION B-B

APPROVED: \_\_\_\_\_ DATE 02/22/2023

*Scott Campbell*  
REGISTERED ENGINEER

**BACKING FOR  
VERTICAL BENDS  
(OVER BENDS ONLY)**

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

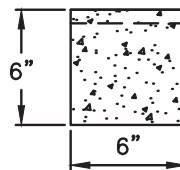
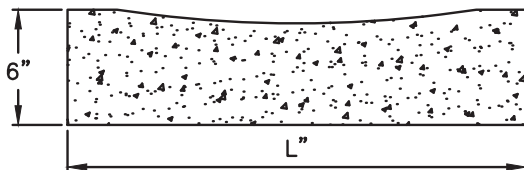
DRAWING NO.  
Sa.S.-22

	SIZE	L	V
GATE VALVES	3"	15	0.31
	4"	16	0.33
	6"	17	0.36
	8"	20	0.42
	12"	24	0.50
	16"	30	0.63
BUTTERFLY VALVES	20"	36	0.75
	24"	42	0.88
	30"	48	1.00

V = VOLUME OF CONCRETE IN CUBIC FEET

NOTES:

1. CONCRETE FOR SUPPORTS SHALL BE CLASS C.
2. BACKING SHALL BE DESIGNED FOR 3000 PSF SOIL BEARING.
3. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH.
4. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
5. VISQUEEN SHALL BE PLACED IN A MANNER SUCH THAT CONCRETE BACKING DOES NOT HAVE DIRECT CONTACT WITH VALVE.



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

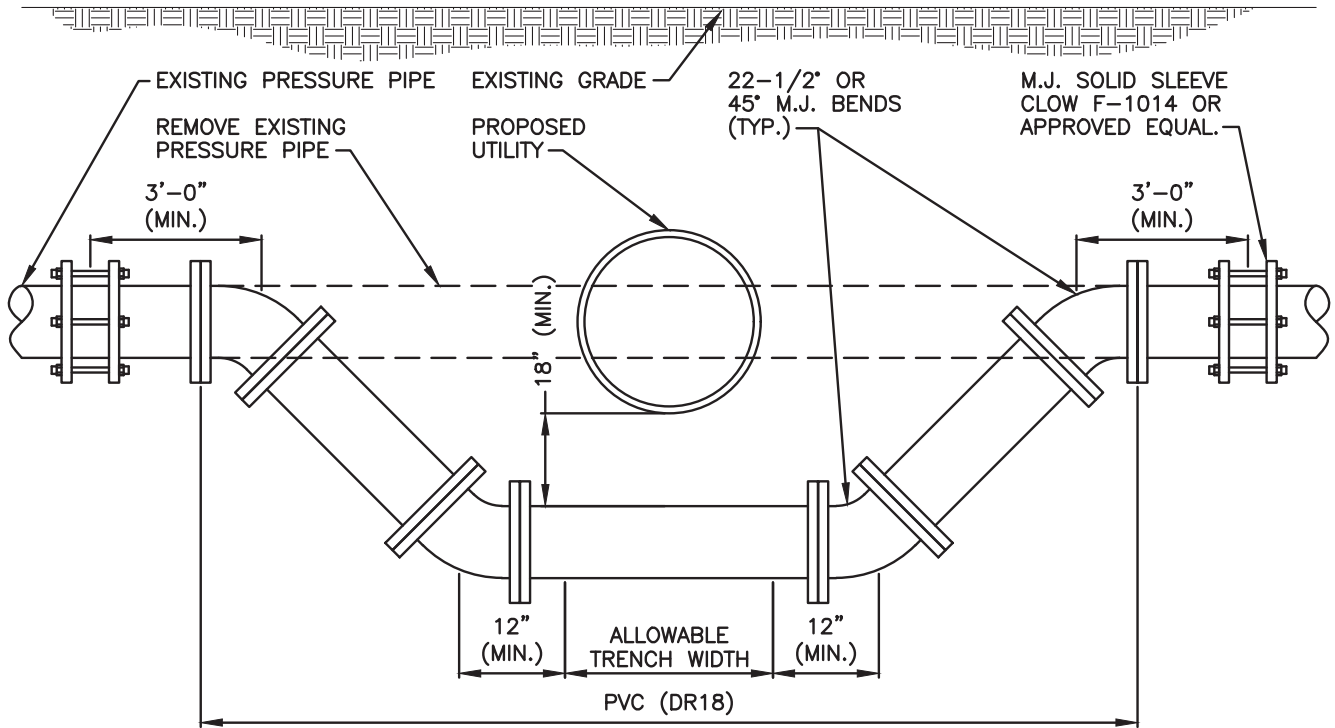
# CONCRETE VALVE SUPPORTS

SOUTHWEST LICKING COMMUNITY WATER AND SEWER DISTRICT

STANDARD CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-23



NOTES:

1. TIME AND DURATION OF SHUTDOWN SHALL BE DETERMINED OR APPROVED BY THE DISTRICT.
2. THE CONTRACTOR SHALL NOTIFY ANY CUSTOMERS AFFECTED BY THE PROPOSED WORK AT LEAST 48 HOURS IN ADVANCE OF SHUTDOWN.
3. ALL SLEEVES AND BENDS SHALL BE SECURED BY RESTRAINING GLANDS OR OTHER METHODS AS APPROVED BY THE ENGINEER TO RESTORE MAIN SERVICE AS SOON AS POSSIBLE.
4. THE RELOCATED LINES SHALL BE LAID TO THE NEW LINE AND GRADE, TESTED AND DISINFECTED AS REQUIRED PRIOR TO THE SHUTDOWN OF EXISTING MAIN AND CONNECTION OF THE RELOCATED LINES TO THE EXISTING MAIN.

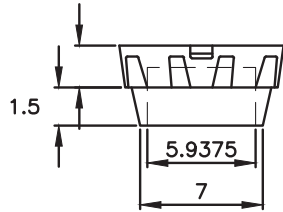
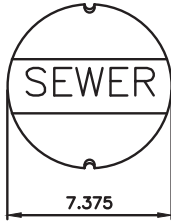
APPROVED: \_\_\_\_\_  
 DATE: 02/22/2023  
 \_\_\_\_\_  
 REGISTERED ENGINEER

# TYPICAL PRESSURE PIPE LOWERING

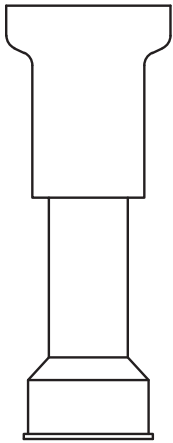
SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

STANDARD  
 CONSTRUCTION DWG.

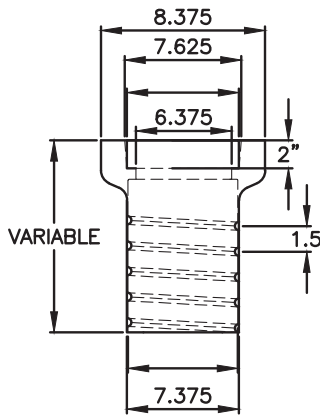
REVISED: 02/2023  
 DRAWING NO. Sa.S.-24



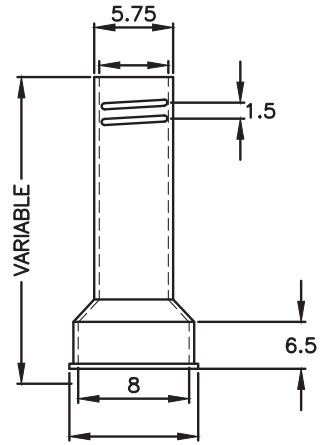
LID



BOX COMPLETE



TOP



BOTTOM

NOTE:  
 VALVE BOX TO BE STAR ITEM NO VB664A,  
 BINGHAM & TAYLOR NO. 8000 CIP 22  
 OR DISTRICT APPROVED EQUAL.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
 REGISTERED ENGINEER

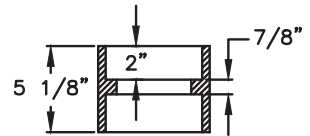
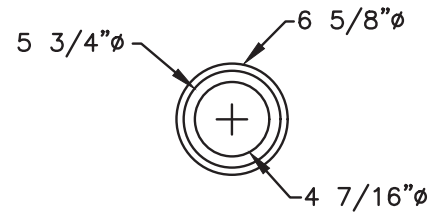
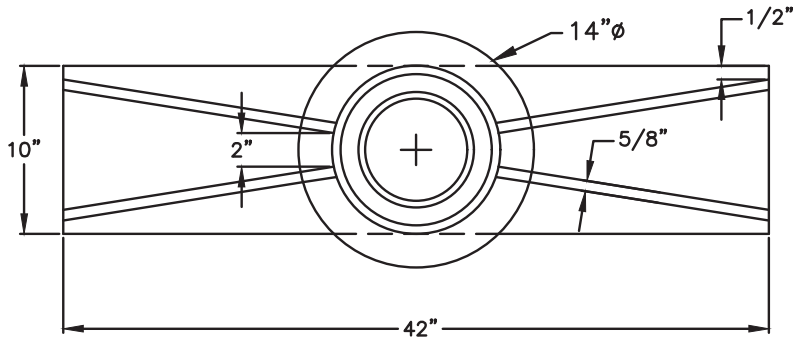
# STANDARD VALVE BOX

SOUTHWEST LICKING COMMUNITY  
 WATER AND SEWER DISTRICT

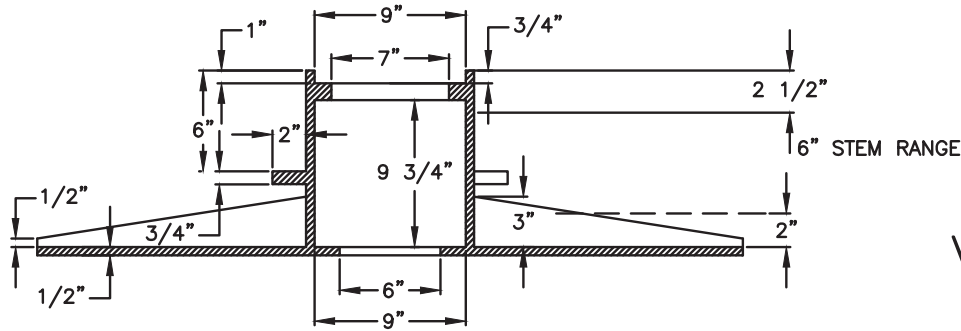
STANDARD  
 CONSTRUCTION DWG.

REVISED:  
 02/2023

DRAWING NO.  
 Sa.S.-25

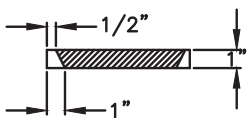
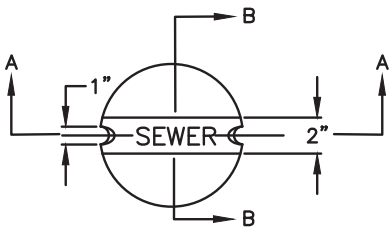
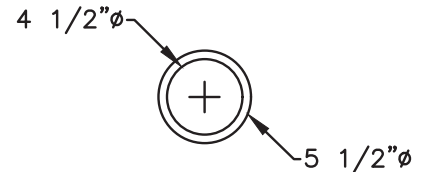


**VALVE STEM SLEEVE**  
14 LBS.

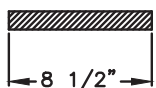


**VALVE BOX**  
133 LBS.

NOTE:  
AVERAGE WEIGHTS ARE TO THE NEAREST  
EVEN POUND CALCULATED USING  
0.26 LBS. PER CUBIC INCH.

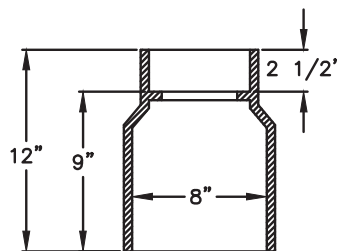
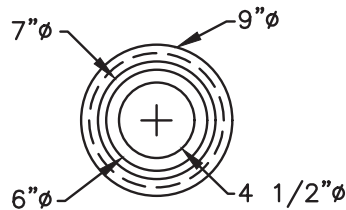


SECTION AA

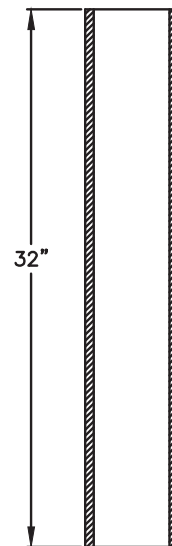


SECTION BB

**VALVE BOX LID**  
15 LBS.



**VALVE BOX BASE**  
41 LBS.



**VALVE STEM**  
65 LBS.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# HEAVY DUTY VALVE BOX (TRAFFIC TYPE)

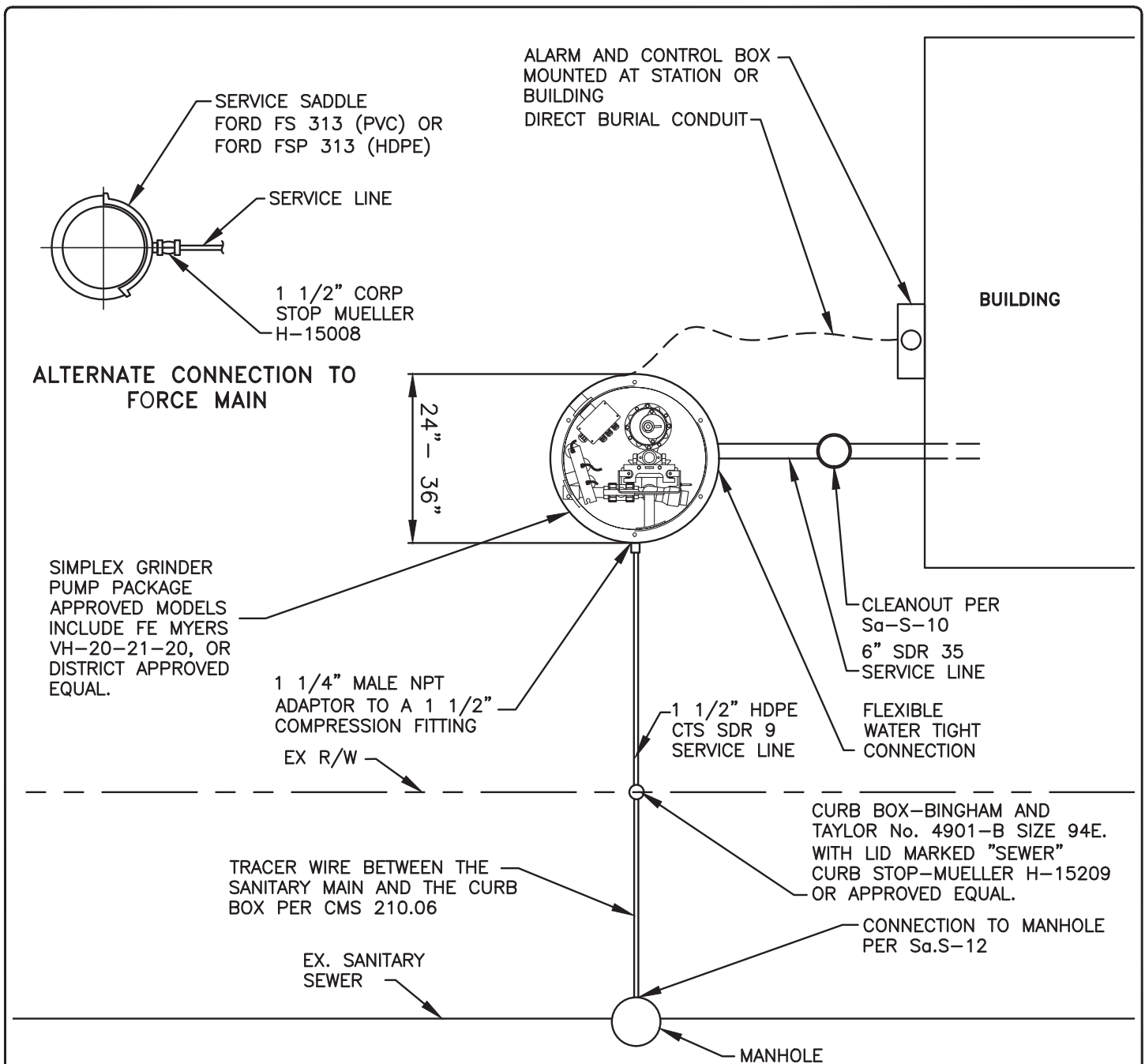
SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-26





**NOTES:**

1. POWER SUPPLY OF 240V, SINGLE PHASE, 60 Hz PROVIDED TO THE ALARM AND CONTROL BOX BY PROPERTY OWNER.
2. DUPLEX GRINDER UNIT MAY BE REQUIRED FOR COMMERCIAL INSTALLATION OR AT HOMEOWNER'S DISCRETION.
3. OPERATION AND MAINTENANCE INCLUDING ELECTRICAL COSTS ARE RESPONSIBILITY OF THE PROPERTY OWNER.
4. ALARM AND CONTROL BOX SHALL CONTAIN AT A MINIMUM AN AUDIBLE AND VISUAL ALARM.
5. EACH INSTALLATION SHALL BE REVIEWED AND APPROVED BY THE DISTRICT.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

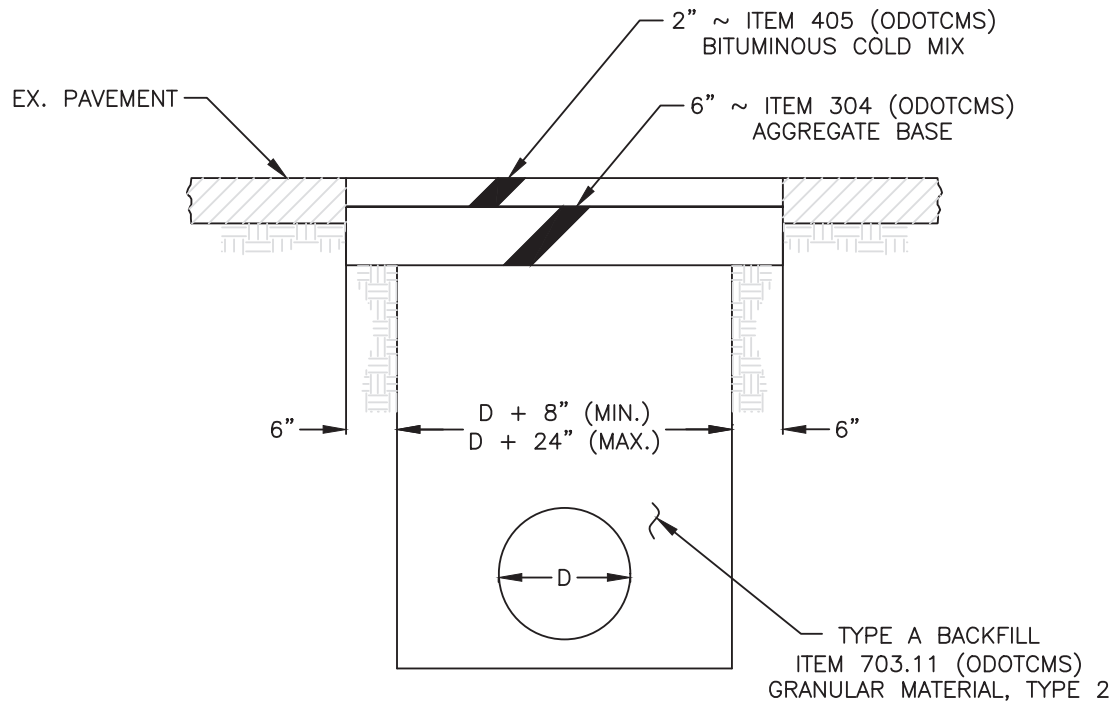
# GRINDER PUMP INSTALLATION

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
Sa.S.-27



NOTE:  
UNLESS OTHERWISE APPROVED BY THE ENGINEER TEMPORARY  
PAVEMENT IS TO BE PLACED ON THE SAME DAY THE EXISTING  
PAVEMENT IS REMOVED.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

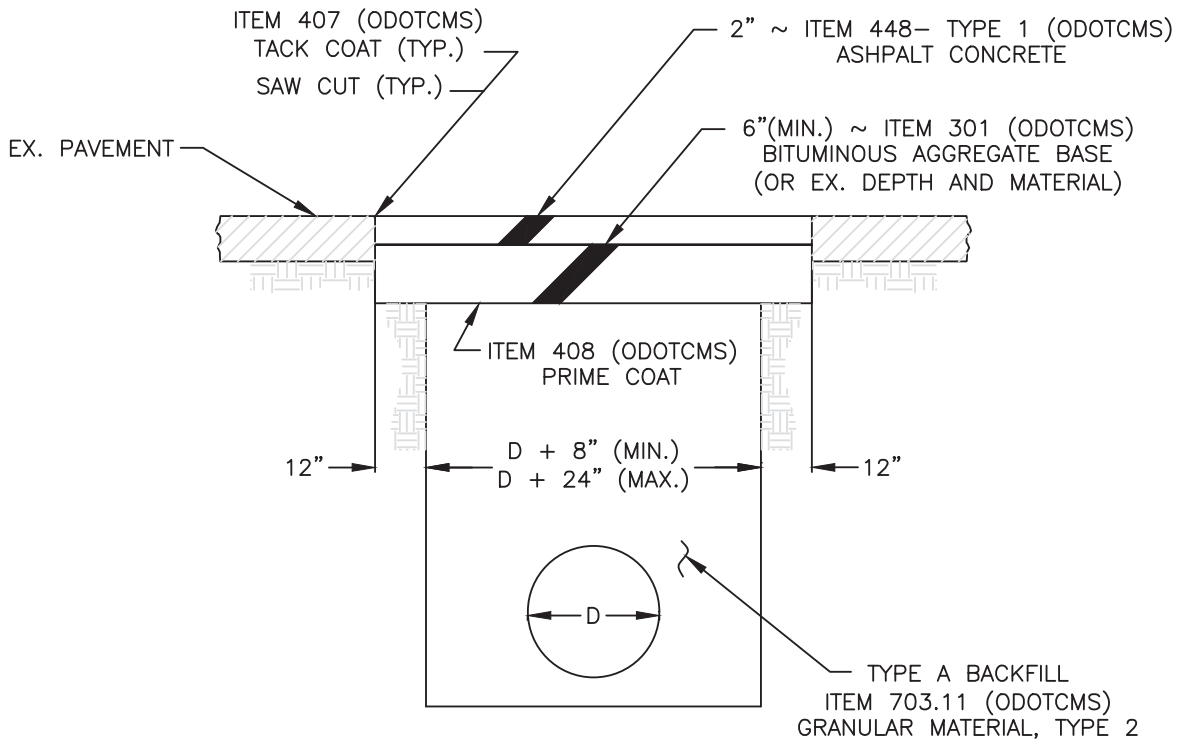
# TEMPORARY PAVEMENT REPLACEMENT

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
P-1



APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# PERMANENT PAVEMENT REPLACEMENT

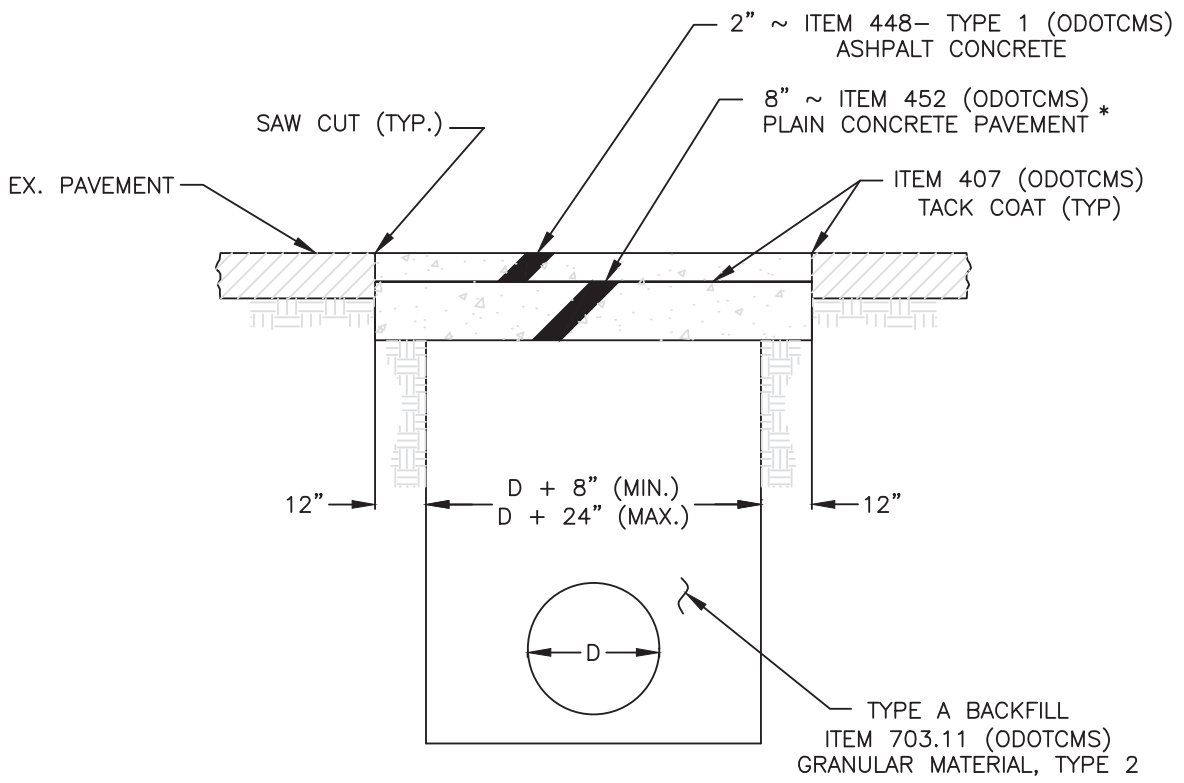
SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
P-2





\* CLASS FS CONCRETE MAY BE USED  
APPROVAL PRIOR TO USE IS REQUIRED.

APPROVED: 02/22/2023  
DATE

*Scott Campbell*  
REGISTERED ENGINEER

# COUNTY ROAD PAVEMENT REPLACEMENT

SOUTHWEST LICKING COMMUNITY  
WATER AND SEWER DISTRICT

STANDARD  
CONSTRUCTION DWG.

REVISED:  
02/2023

DRAWING NO.  
P-4