

Grand Water & Sewer Service Agency



Construction Standards



Grand Water & Sewer Service Agency

CONSTRUCTION SPECIFICATIONS

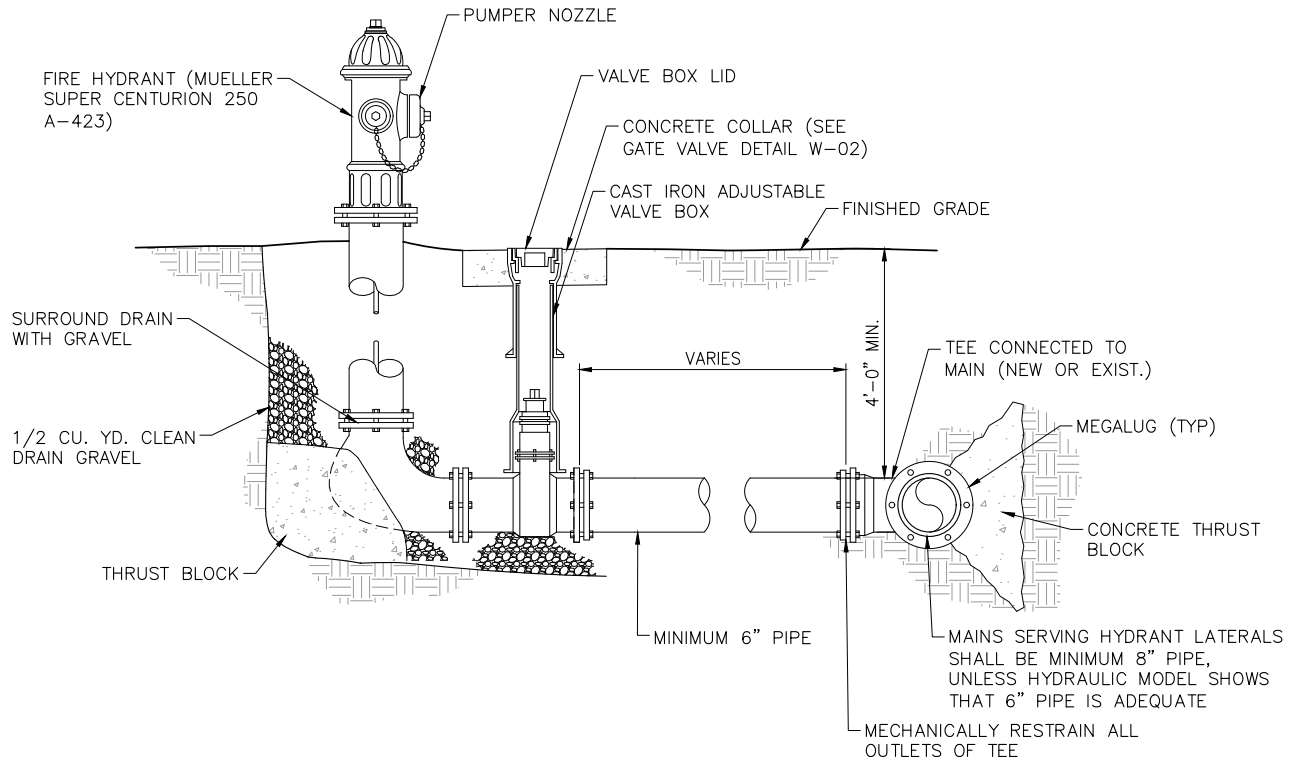
All water system construction for Transmission and Distribution Pipelines under the jurisdiction of the GWSSA must be in accordance with Utah Division of Drinking Water Rule R309-550 (Transmission and Distribution Pipelines) with inclusion of the associated ANSI/NSF, AWWA, ASTM and Utah-adopted plumbing code standards listed in R309-550 by reference.

All sewer system construction for wastewater collection pipelines and lift stations under the jurisdiction of GWSSA must be in accordance with the Utah Division of Water Quality Rule R317-3 (Design Requirements for Wastewater Collection, Treatment and Disposal Systems) with inclusion of the associated ANSI/NSF, AWWA, ASTM and Utah-adopted plumbing code standards listed in R317-3 by reference.

CONSTRUCTION STANDARDS

The Construction Standards, as prepared by Sunrise Engineering and originally adopted by Grand Water & Sewer Service Agency in Resolution 2017-08-17a, hereby incorporate the above Construction Specification language as of January 18, 2018. The standards and specifications are subject to review and amendment from time to time by the Agency Board of Directors.

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NOTES:

1. FIRE HYDRANT BREAKAWAY FLANGE SHALL BE NO GREATER THAN 5in. ABOVE FINISHED GRADE OR 1in. BELOW FINISHED GRADE
2. PIPE, JOINTS, FITTINGS, VALVES, AND FIRE HYDRANTS SHALL CONFORM TO ANSI/NSF STANDARD 61 AND APPLICABLE SECTIONS OF AWWA STANDARDS C104-AZ14-08 THROUGH C550-05 AND C900-07 THROUGH C950-07. BLOCKING OR MECHANICAL RESTRAINT SHALL BE PROVIDED PER DETAILS W-06 AND W-07.
3. HYDRANT DRAINS SHALL NOT BE LOCATED WITHIN 10 FEET OF SANITARY SEWERS.

DETAIL - FIRE HYDRANT

N.T.S.

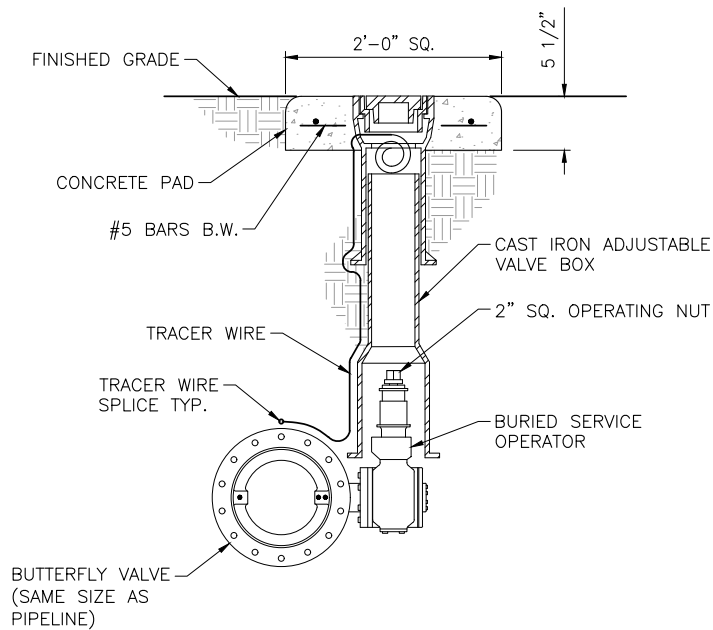
REV NO.	COMMENT	DATE

SUNRISE ENGINEERING

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FILLMORE, UTAH 84631
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www.sunrise-eng.com

Grand Water & Sewer Service Agency					
STANDARD DETAILS					
WATER - FIRE HYDRANT					
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	DJS	TRB	RWW		W-01

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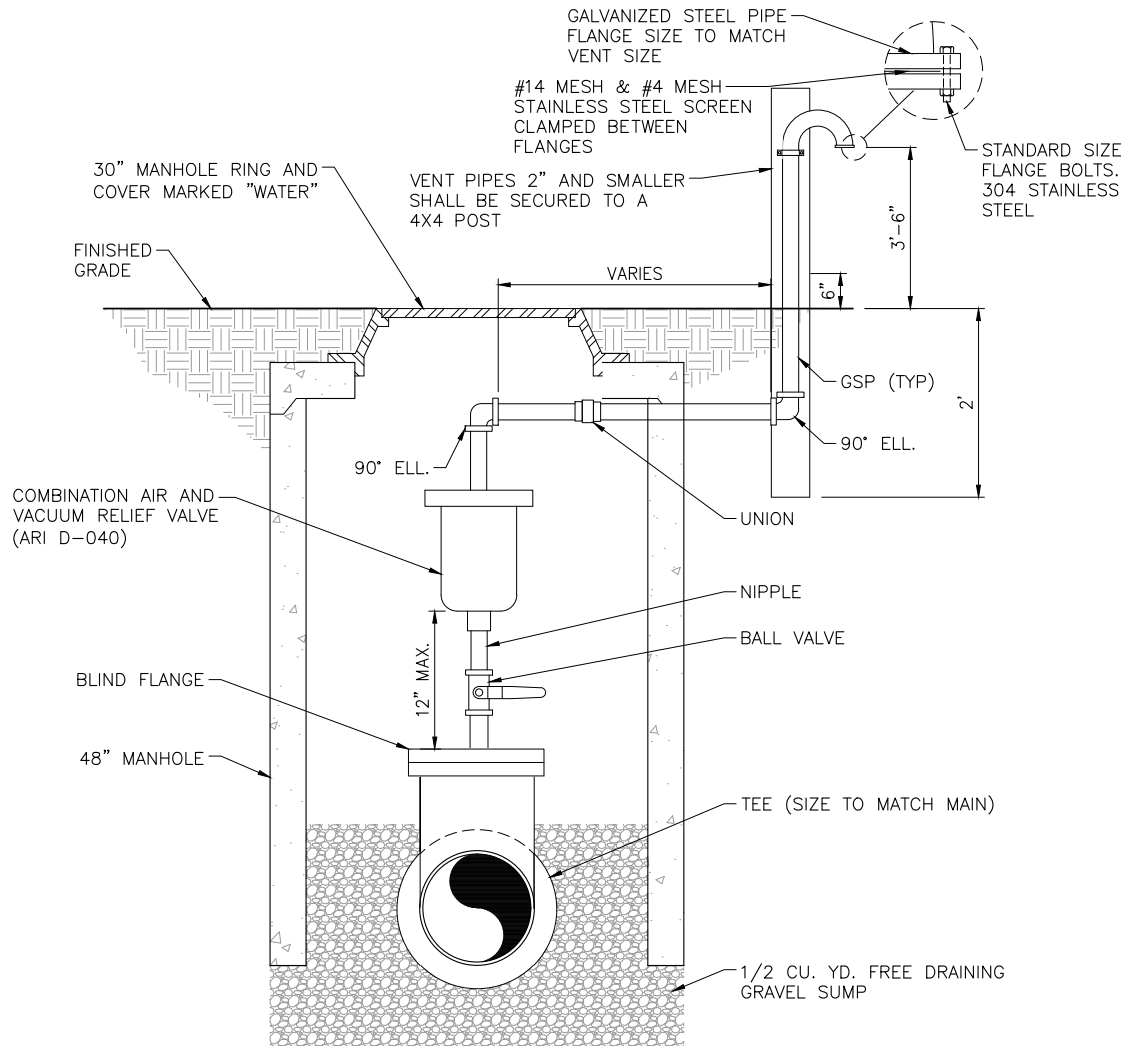
NOTES:

1. ALL VALVES SHALL BE RESTRAINED ACCORDING TO DETAILS W-06 AND W-07 AND SHALL BE TREATED AS A DEAD END IN BOTH DIRECTIONS.
2. PIPE, JOINTS, FITTINGS, VALVES, AND FIRE HYDRANTS SHALL CONFORM TO ANSI/NSF STANDARD 61 AND APPLICABLE SECTIONS OF AWWA STANDARDS C104-AZ14-08 THROUGH C550-05 AND C900-07 THROUGH C950-07. BLOCKING OR MECHANICAL RESTRAINT SHALL BE PROVIDED PER DETAILS W-06 AND W-07.
3. FOR VALVES OVER 48" DEEP ADD VALVE STEM AND VALVE BOX EXTENSIONS AS NECESSARY FOR NORMAL OPERATION OF VALVE KEY.
4. TRACER WIRE SHALL BE BROUGHT INTO THE VALVE BOX THROUGH HOLE AT BELL. COIL 12" OF TRACER WIRE INSIDE VALVE BOX BELL SECTION.
5. VALVES SMALLER THAN 16" SHALL BE GATE VALVES. MAINLINE VALVES 16" AND LARGER SHALL BE SHORT-BODY BUTTERFLY VALVES.

DETAIL - BURIED BUTTERFLY VALVE
N.T.S.

REV NO.	COMMENT	DATE	SUNRISE ENGINEERING 25 EAST 500 NORTH FILLMORE, UTAH 84631 TEL 435.743.6151 • FAX 435.743.7900 www.sunrise-eng.com					Grand Water & Sewer Service Agency				
								STANDARD DETAILS				
								WATER - BUTTERFLY VALVE				
								SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
								DJS	TRB	RWW		W-03

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NOTES:

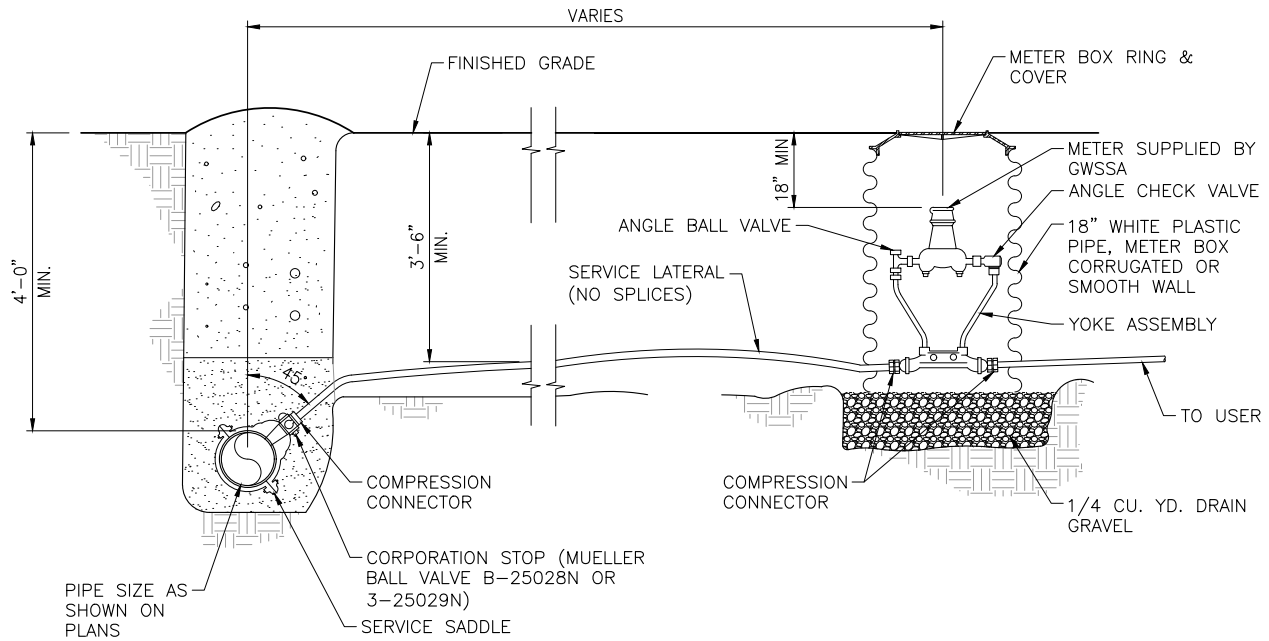
1. COMBINATION AIR VALVES SHALL BE NO LESS THAN 1/8" THE SIZE OF THE MAIN.
2. PIPE, JOINTS, FITTINGS, VALVES, AND FIRE HYDRANTS SHALL CONFORM TO ANSI/NSF STANDARD 61 AND APPLICABLE SECTIONS OF AWWA STANDARDS C104-AZ14-08 THROUGH C550-05 AND C900-07 THROUGH C950-07. BLOCKING OR MECHANICAL RESTRAINT SHALL BE PROVIDED PER DETAILS W-06 AND W-07.
3. ALL PIPE FITTINGS SHALL BE GALVANIZED STEEL 300lb. CLASS THREADED.
4. ALL AIR VALVE COMPONENT CONNECTING NIPPLES SHALL BE GSP SCHEDULE 40.
5. ALL PIPE PENETRATIONS SHALL BE SEALED WITH PORTLAND CEMENT GROUT.
6. PIPE NIPPLES, FITTINGS, GOOSENECK, & BALL VALVE SHALL BE SIZED TO MATCH SIZE OF AIR VALVE.

DETAIL - COMBINATION AIR VALVE

N.T.S.

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				STANDARD DETAILS					
				WATER - COMBINATION AIR VALVE					
				SEI NO.	DESIGNED DJS	DRAWN TRB	CHECKED RWW	SHEET NO.	W-04

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NOTES:

1. LOCATION OF WATER SERVICE SHALL GENERALLY BE ON THE HIGH SIDE OF THE PROPERTY 5 FEET FROM THE LOT CENTERLINE AND SHALL NOT BE INSTALLED IN DRIVE APPROACH.
2. ALL NEW SERVICE CONNECTIONS SHALL INCLUDE DUAL CHECK VALVE SETTER ASSEMBLIES.
3. SERVICE LATERALS UP TO 2" MAY BE EITHER TYPE K COPPER OR POLYETHYLENE PIPE (IPS) WITH COMPRESSION FITTINGS. SERVICE LINES LARGER THAN 2 INCH SHALL BE TYPE K COPPER.
4. PIPE, JOINTS, FITTINGS, VALVES, AND FIRE HYDRANTS SHALL CONFORM TO ANSI/NSF STANDARD 61 AND APPLICABLE SECTIONS OF AWWA STANDARDS C104-AZ14-08 THROUGH C550-05 AND C900-07 THROUGH C950-07.
5. SERVICE LINES SHALL BE CAPPED UNTIL CONNECTED FOR SERVICE.

DETAIL - NEW WATER SERVICE CONNECTION

N.T.S.

REV NO.	COMMENT	DATE

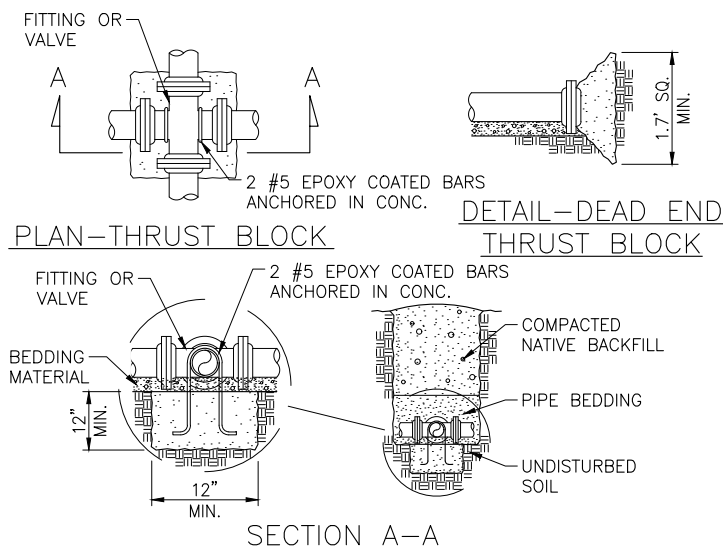
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Grand Water & Sewer Service Agency					
STANDARD DETAILS					
WATER - NEW WATER SERVICE CONNECTION					
SEI NO.	DESIGNED DJS	DRAWN TRB	CHECKED RWW	SHEET NO. .	W-05

CONCRETE THRUST BLOCK RESTRAINING SYSTEM DETAILS

NOTE:
CONTRACTOR SHALL USE EITHER MECHANICAL
RESTRAINTS OR CONCRETE THRUST RESTRAINING
SYSTEM FOR WATERLINE INSTALLATION.



THRUST BLOCK BEARING AREA IN SQ. FT.										
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND	
4	2.4	1.7	1.7	1.7	—	2.4	1.3	1.0	1.0	
6	5.4	3.8	3.8	3.8	—	5.4	2.9	1.5	1.0	
8	9.6	6.8	6.8	6.8	—	9.6	5.2	2.7	1.4	
10	15.0	10.6	10.6	10.6	—	15.0	8.1	4.2	2.1	
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0	
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1	
16	38.2	27.0	27.0	27.0	27.0	38.2	20.7	10.6	5.3	
18	48.4	34.2	34.2	34.2	34.2	48.4	26.2	13.4	6.7	
20	59.7	42.2	42.2	42.2	42.2	59.7	32.3	16.5	8.3	
24	85.9	60.8	60.8	60.8	60.8	85.9	46.5	23.7	11.9	
REDUCER										
D2 \ D1	6	8	10	12	14	16	18	20	24	
4	2.1	5.1	8.8	13.4	—	—	—	—	—	
6	—	3.0	6.7	11.3	16.8	23.1	—	—	—	
8	—	—	3.8	8.4	13.8	20.1	27.2	—	—	
10	—	—	—	4.6	10.1	16.3	23.5	31.4	—	
12	—	—	—	—	5.5	11.7	18.8	26.8	45.2	
14	—	—	—	—	—	6.3	13.4	21.3	39.8	
16	—	—	—	—	—	—	7.1	15.1	33.5	
18	—	—	—	—	—	—	—	8.0	26.3	
20	—	—	—	—	—	—	—	—	18.4	

NOTES:

1. ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
2. SQUARE ALL EDGES TO RECEIVE CONCRETE.
3. CONCRETE SHALL BE CLASS C.
4. CALCULATED ON 200 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
5. IN POORER SOILS SPECIAL DESIGN IS REQUIRED.
6. ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO EPOXY COATED #5 REBAR. ONLY ONE REQ'D FOR REDUCER
7. CENTER ALL FITTINGS OVER THRUST BLOCKS.

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STANDARD DETAILS					
WATER - CONCRETE THRUST BLOCKS					
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
DJS	TRB	RWW	.	W-06	

MECHANICAL THRUST RESTRAINING SYSTEM DETAILS

* CALCULATIONS DERIVED FROM EBAA IRON SALES

PVC VERTICAL BEND RESTRAINED LENGTHS IN FT. (L ₁ —BEFORE CONNECTION/L ₂ , AFTER CONNECTION)										
BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	4/1	5/2	7/2	9/3	10/3	12/4	13/4	15/5	16/5	19/6
22.5	8/3	11/4	15/5	17/6	21/7	24/8	27/9	30/9	33/10	38/12
45	16/5	23/8	30/10	36/12	43/14	49/16	56/18	62/20	68/21	79/25

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.
FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L₁ ON BOTH SIDES OF FITTING.

PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.										
BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	1	2	2	3	3	4	4	5	5	6
22.5	3	4	5	6	7	8	9	9	10	12
45	5	8	10	12	14	16	18	20	21	25
90	13	18	24	29	34	38	43	47	52	60

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PVC TEE RESTRAINED LENGTHS L, IN FT.										
BRANCH SIZE DIA.	RUN SIZE DIAMETER									
	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	—	*	*	*	*	*	*	*	*	*
8	—	—	*	*	*	*	*	*	*	*
10	—	—	—	*	*	*	*	*	*	*
12	—	—	—	—	*	*	*	*	*	*
14	—	—	—	—	—	*	*	*	*	*
16	—	—	—	—	—	—	7	*	*	*
18	—	—	—	—	—	—	—	20	4	*
20	—	—	—	—	—	—	—	—	34	3
24	—	—	—	—	—	—	—	—	—	60

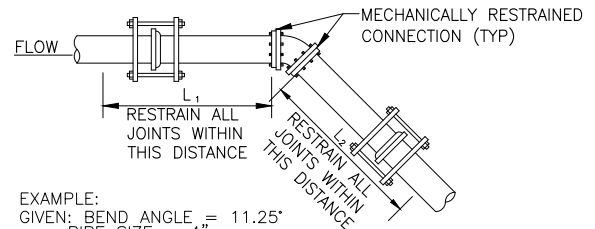
* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE
NOTES:

- RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
- ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

PVC REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)									
D1 \ D2	6	8	10	12	14	16	18	20	24
4	42/29	100/52	171/71	258/90	—	—	—	—	—
6	—	40/31	88/54	147/75	217/95	297/113	—	—	—
8	—	—	37/29	82/55	135/77	197/98	266/117	—	—
10	—	—	—	36/30	79/56	128/80	183/100	244/120	—
12	—	—	—	—	36/30	77/57	123/80	174/102	293/142
14	—	—	—	—	—	35/30	74/57	118/81	219/124
16	—	—	—	—	—	—	34/30	73/57	161/104
18	—	—	—	—	—	—	—	34/30	111/82
20	—	—	—	—	—	—	—	—	70/57

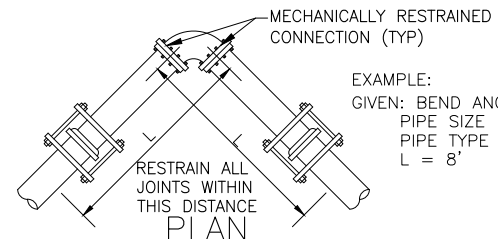
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

BASED ON:
TEST PRESSURE 200 PSI
SOIL TYPE: GM - SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
BURIAL DEPTH: 4 FT.
TRENCH TYPE: 5 - PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO THE CENTER LINE OF PIPE, 4" MIN. UNDER PIPE. COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE. (APPROX. 90% STANDARD PROCTOR, AASHTO T-99)
SAFETY FACTOR: 1.5



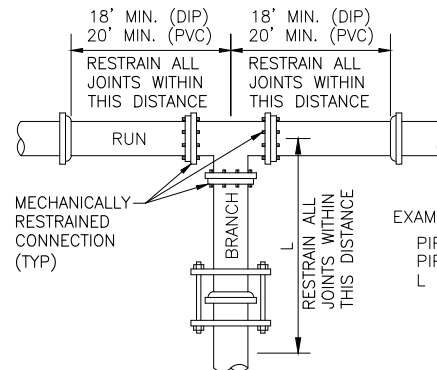
EXAMPLE:
GIVEN: BEND ANGLE = 11.25°
PIPE SIZE = 4"
PIPE TYPE = PVC
L₁ = 4'
L₂ = 4'

ELEVATION



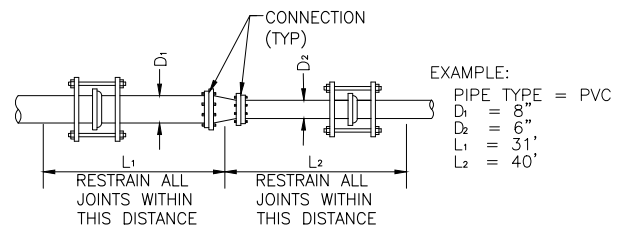
EXAMPLE:
GIVEN: BEND ANGLE = 45°
PIPE SIZE = 6"
PIPE TYPE = PVC
L = 8'

PLAN



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 16"
L = 12'

PLAN



EXAMPLE:
PIPE TYPE = PVC
D₁ = 8"
D₂ = 6"
L₁ = 31'
L₂ = 40'

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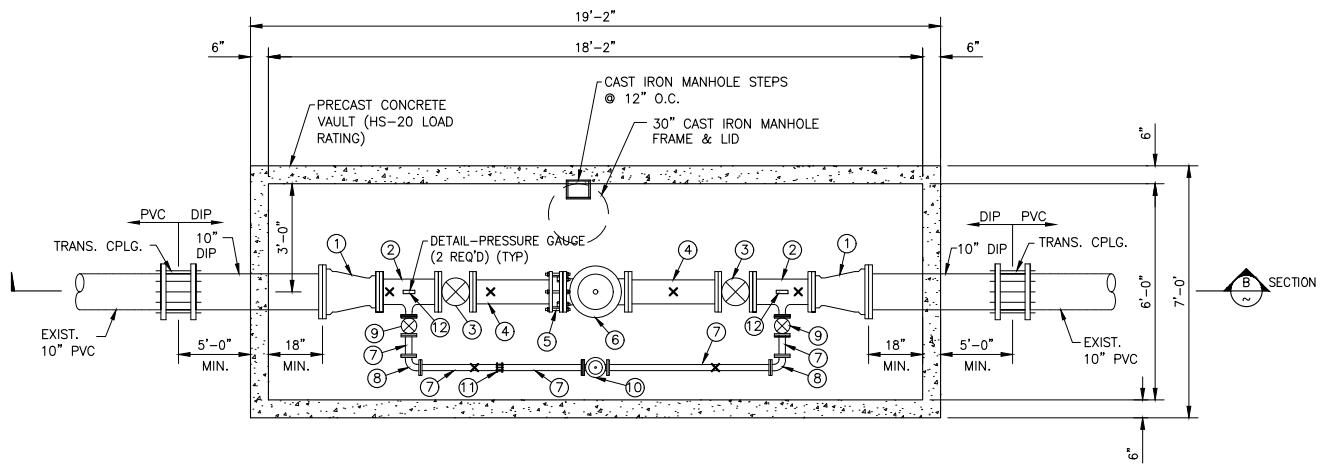
Grand Water & Sewer Service Agency

STANDARD DETAILS

WATER - MECHANICAL RESTRAINING SYSTEM (PVC PIPE)

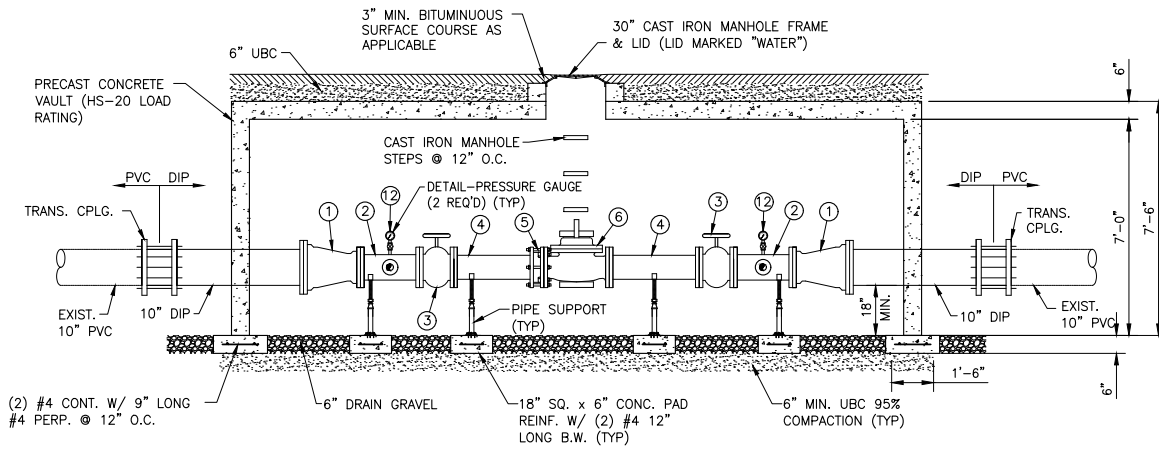
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DJS	TRB	RWW	.	W-07

Version 1, Approved 8/17/2017



NOTE:
ALL PIPING PENETRATIONS SHALL BE
SEALED WITH PORTLAND CEMENT GROUT.

A PLAN - 10" PRV STATION
1/4" = 1'-0"



NOTE:
ALL PIPING PENETRATIONS SHALL BE SEALED
WITH PORTLAND CEMENT GROUT.

B SECTION - 10" PRV STATION
1/4" = 1'-0"

EQUIPMENT SCHEDULE

NUMBER	DESCRIPTION	SIZE	REMARKS
1	10"x 8" REDUCER	-	
2	8"x 8"x 3" TEE	-	
3	GATE VALVE	8"	
4	SPOOL	8"	LENGTH AS REQ'D (2 REQ'D)
5	FLNG. CPLG. ADAPTER	8"	
6	PRESSURE REDUCING VALVE	8"	CLA-VAL 150# FLANGE MODEL 90-01YBCKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
7	SPOOL	3"	(GSP) LENGTH AS REQ'D
8	90° ELL.	3"	
9	GATE VALVE	3"	
10	PRESSURE REDUCING VALVE	3"	CLA-VAL 150# FLANGE MODEL 90-01YBCKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
11	COUPLING	3"	
12	PRESSURE GAUGE	-	2 REQ'D. LIQUID FILLED (1 UPSTREAM RANGE 0-150 PSI) (1 DOWNSTREAM RANGE 0-60 PSI)
X	LOCATION OF PIPE SUPPORT	-	SEE DETAIL C/D4 (6 REQ'D)

REV NO.	COMMENT	DATE

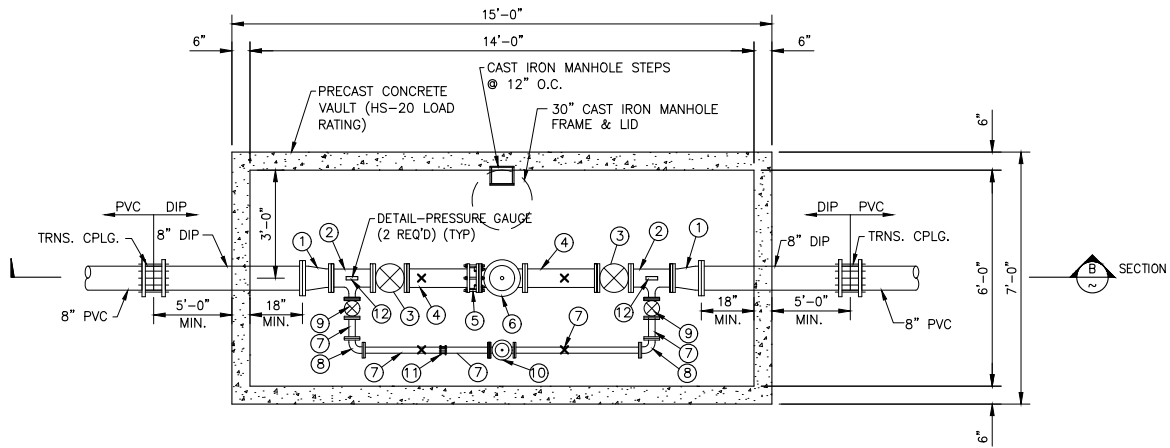


Grand Water & Sewer Service Agency

STANDARD DETAILS

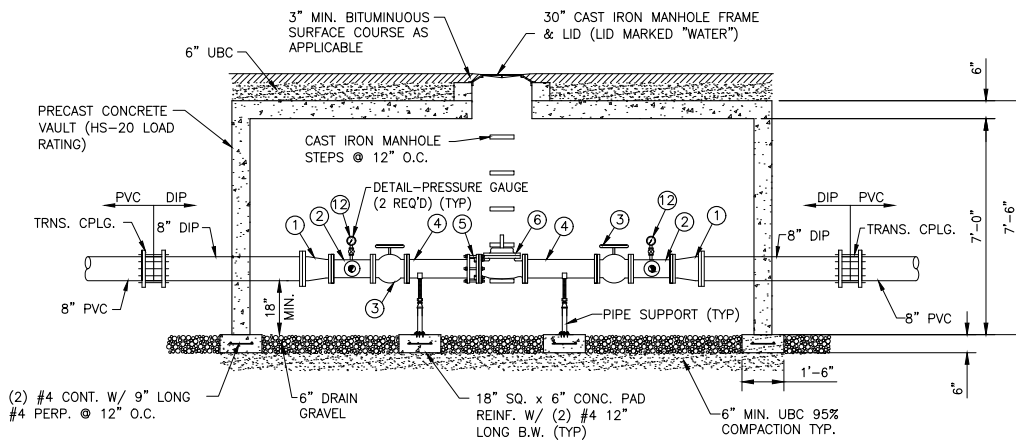
WATER- 10" PRV STATION

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	W-08
DJS	TRB	RWW	.		



NOTE:
ALL PIPING PENETRATIONS SHALL BE
SEALED WITH PORTLAND CEMENT GROUT.

(A) PLAN - 8" PRV STATION
1/4" = 1'-0"



NOTE:
ALL PIPING PENETRATIONS SHALL BE SEALED
WITH PORTLAND CEMENT GROUT.

(B) SECTION - 8" PRV STATION
1/4" = 1'-0"

EQUIPMENT SCHEDULE

NUMBER	DESCRIPTION	SIZE	REMARKS
1	8"x6" REDUCER		
2	6"x6"x2" TEE		
3	GATE VALVE	6"	
4	SPOOL	6"	LENGTH AS REQ'D (2 REQ'D)
5	FLNG. CPLG. ADAPTER	6"	
6	PRESSURE REDUCING VALVE	6"	CLA-VAL 150# FLANGE MODEL 90-01YBCSKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
7	SPOOL	2"	(GSP) LENGTH AS REQ'D
8	90° ELL.	2"	
9	GATE VALVE	2"	
10	PRESSURE REDUCING VALVE	2"	CLA-VAL 150# FLANGE MODEL 90-01YBKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
11	COUPLING	2"	
12	PRESSURE GAUGE		2 REQ'D. LIQUID FILLED (1 UPSTREAM RANGE 0-150 PSI) (1 DOWNSTREAM RANGE 0-60 PSI)
X	LOCATION OF PIPE SUPPORT		SEE DETAIL C/D4 (4 REQ'D)

REV NO.	COMMENT	DATE

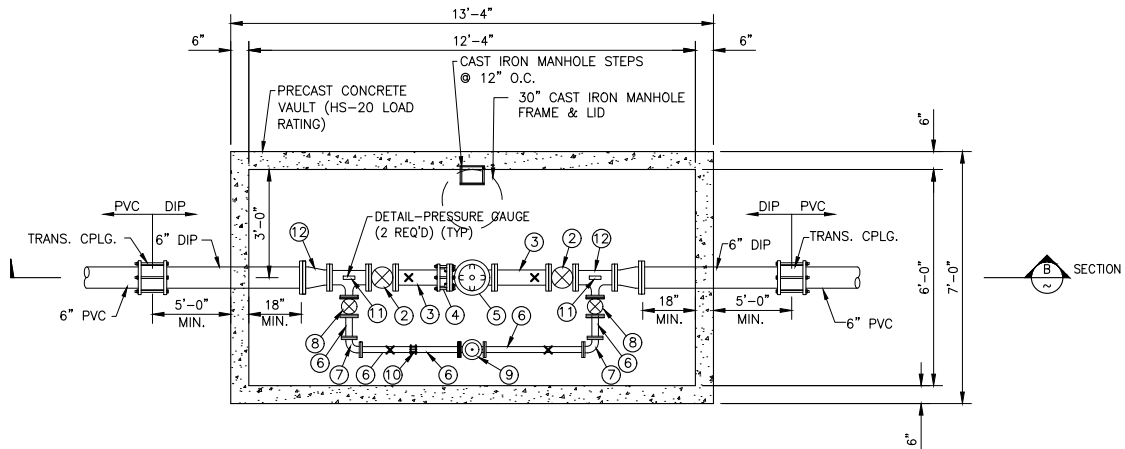


Grand Water & Sewer Service Agency

STANDARD DETAILS

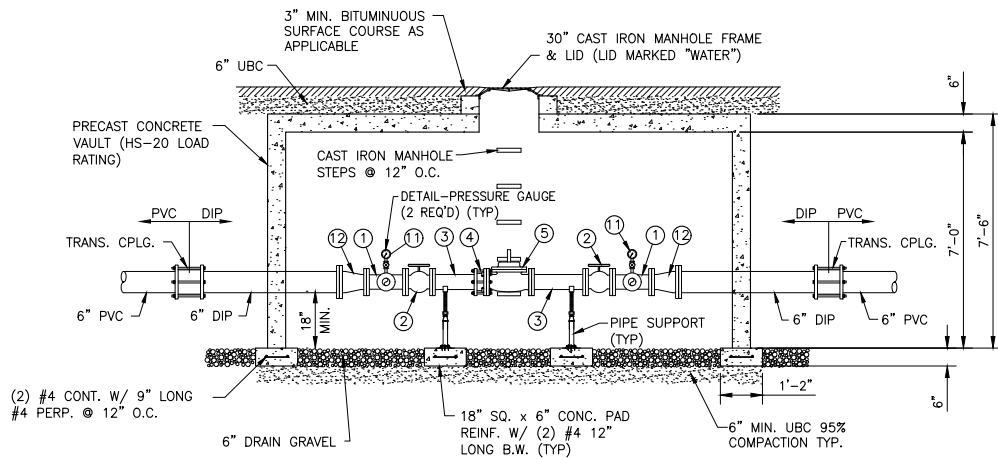
WATER- 8" PRV STATION

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
DJS	TRB	RWW		W-09	



NOTE:
ALL PIPING PENETRATIONS SHALL BE
SEALED WITH PORTLAND CEMENT GROUT.

(A) PLAN - 6" PRV STATION
1/4" = 1'-0"



NOTE:
ALL PIPING PENETRATIONS SHALL BE SEALED
WITH PORTLAND CEMENT GROUT.

(B) SECTION - 6" PRV STATION
1/4" = 1'-0"

EQUIPMENT SCHEDULE

NUMBER	DESCRIPTION	SIZE	REMARKS
1	TEE	4"x 2"	
2	GATE VALVE	4"	
3	SPOOL	4"	2 REQ'D. 2' LONG (1 CUT INTO TWO PIECES)
4	FLNG. CPLG. ADAPTER	4"	
5	PRESSURE REDUCING VALVE	4"	CLA-VAL 150# FLANGE MODEL 90-01YBCSKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
6	SPOOL	2"	2 REQ'D. LENGTH AS REQ'D. (1 CUT INTO TWO PIECES)
7	90° ELL.	2"	
8	GATE VALVE	2"	
9	PRESSURE REDUCING VALVE	2"	CLA-VAL 150# FLANGE MODEL 90-01YBKC OR APPD. EQ., S.S. TUBING, FITTINGS, & TRIM, 15-75 PSI SPRING RANGE REQ'D
10	COUPLING	2"	
11	PRESSURE GAUGE		2 REQ'D. LIQUID FILLED (1 UPSTREAM RANGE 0-150 PSI) (1 DOWNSTREAM RANGE 0-60 PSI)
12	REDUCER	6"x 4"	
x	LOCATION OF PIPE SUPPORT		SEE DETAIL C/D4

REV NO.	COMMENT	DATE

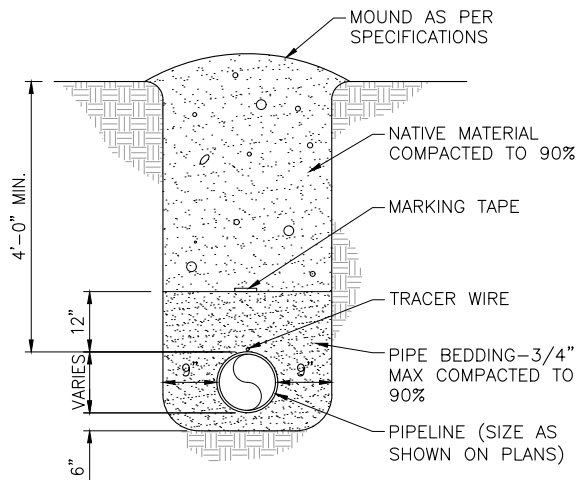


Grand Water & Sewer Service Agency

STANDARD DETAILS

WATER- 6" PRV STATION

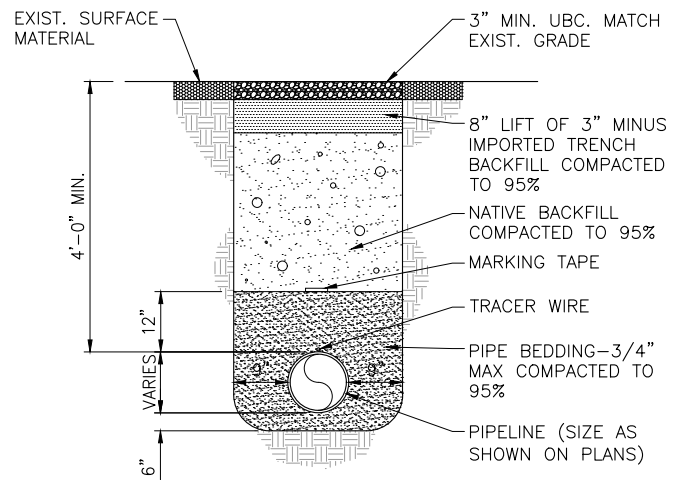
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	W-10
DJS	TRB	RWW			



NOTE:
TRENCH DETAIL OUTSIDE OF TRAVELED ROADWAY
OR DESIGNATED ROAD RIGHT-OF-WAY.

DETAIL - TYPICAL TRENCH

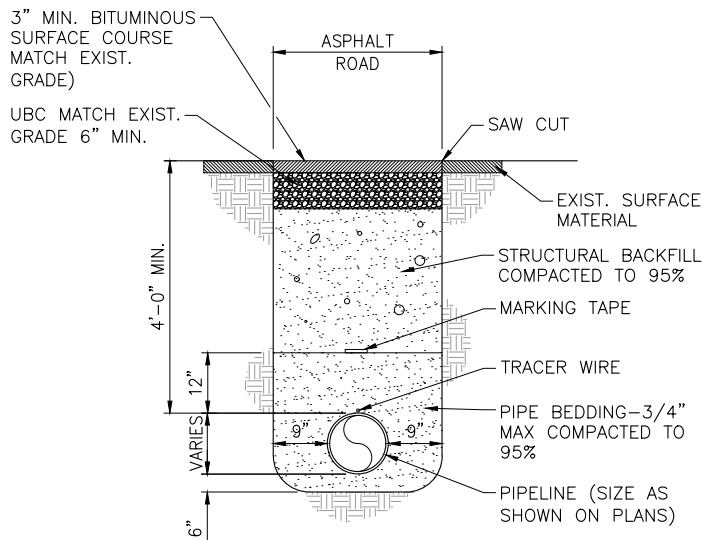
N.T.S.



NOTE:
TRENCH DETAIL INSIDE OF GRAVEL ROADWAYS.

DETAIL - UNPAVED ROADWAY TRENCH

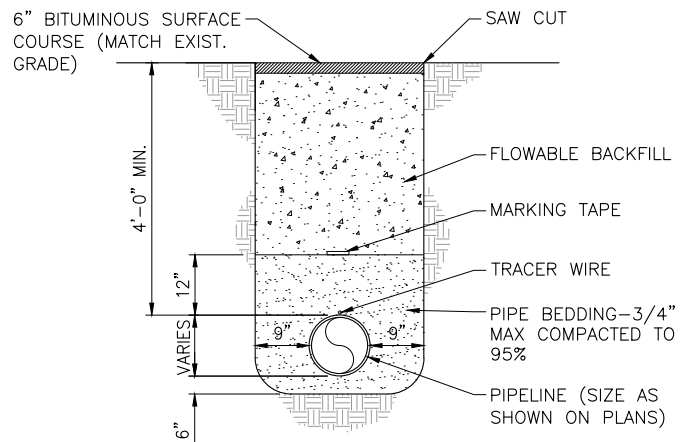
N.T.S.



NOTES:
1. TRENCH DETAILS INSIDE OF ROADWAYS
ASPHALT/GRAVEL ROADS.
2. ASPHALT ROADS SHALL BE SAW CUT.
3. MAX PAY WIDTH SHALL BE 5'-0".

DETAIL - PAVED ROADWAY TRENCH

N.T.S.



NOTE:
THIS SHALL BE USED ON ALL COUNTY AND STATE HIGHWAY CROSSINGS
AND WHERE SPECIFICALLY CALLED FOR. CONTRACTOR SHALL OBTAIN
PERMIT FROM UDOT OR COUNTY PRIOR TO CONSTRUCTION

DETAIL - TRENCH W/ FLOWABLE BACKFILL

N.T.S.

REV NO.	COMMENT	DATE



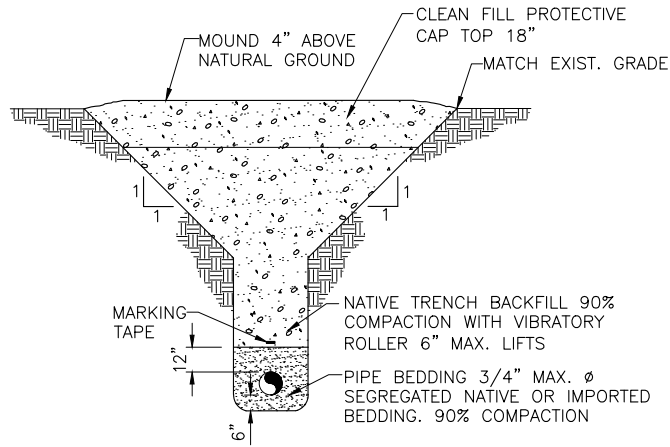
Grand Water & Sewer Service Agency

STANDARD DETAILS

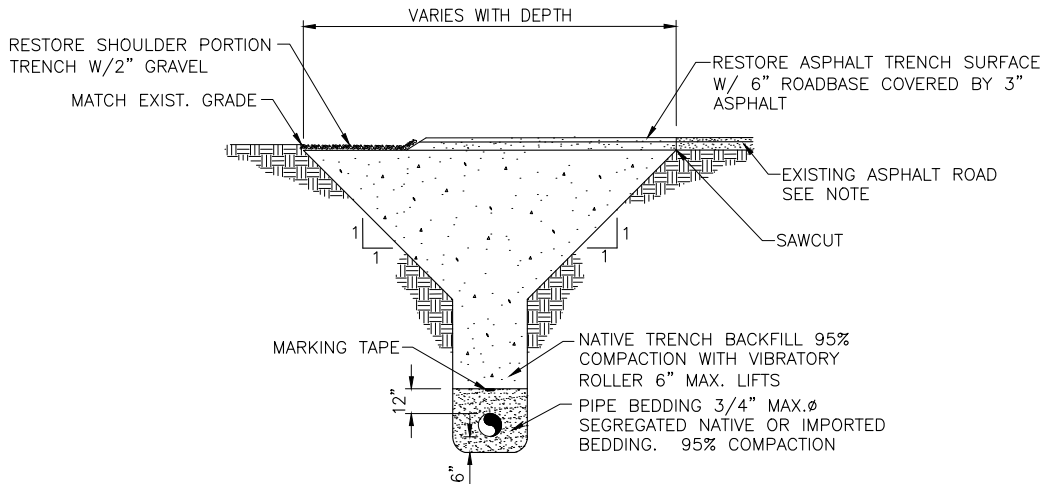
ROADWAY - TRENCH DETAILS

SEI NO.	DESIGNED DJS	DRAWN TRB	CHECKED RWW	SHEET NO.	R-01
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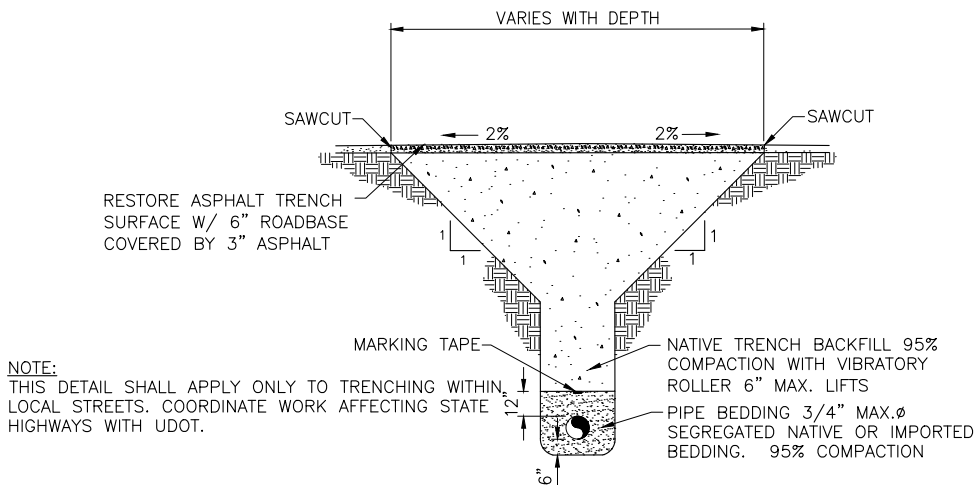
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(A)
TYP **DETAIL - TRENCH CONDITION 'A'**
TRENCH OUTSIDE OF ROADWAYS



(B)
TYP **DETAIL - TRENCH CONDITION 'B'**
TRENCH WITHIN SHOULDER



NOTE:
THIS DETAIL SHALL APPLY ONLY TO TRENCHING WITHIN
LOCAL STREETS. COORDINATE WORK AFFECTING STATE
HIGHWAYS WITH UDOT.

(C)
TYP **DETAIL - TRENCH CONDITION 'C'**
TRENCH WITHIN ASPHALT ROADWAY -
LOCAL STREETS

REV NO.	COMMENT	DATE



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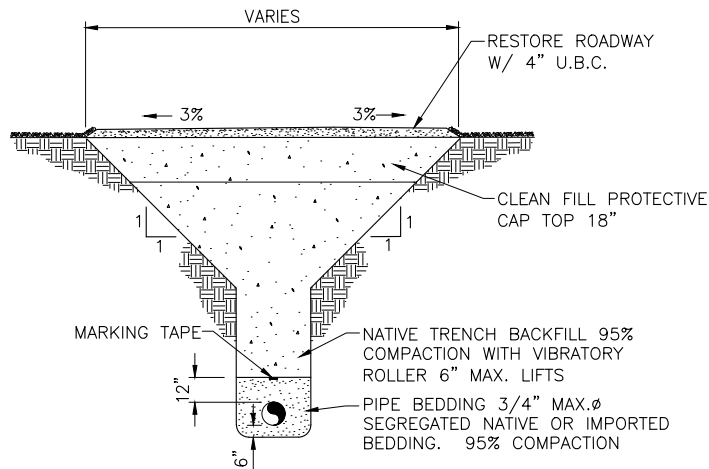
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STANDARD DETAILS

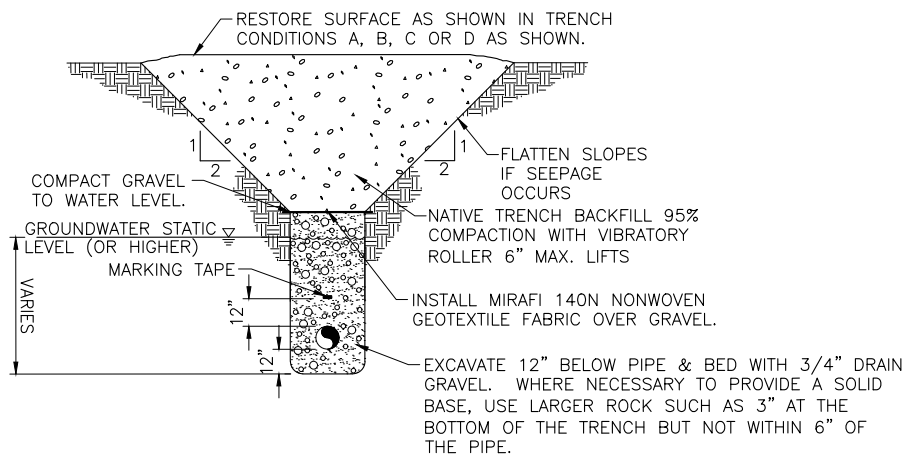
ROADWAY - TRENCH DETAILS

SEI NO.	DESIGNED DJS	DRAWN TRB	CHECKED RWW	SHEET NO.	R-02
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D DETAIL - TRENCH CONDITION 'D'
TYP TRENCH WITHIN GRAVEL ROADWAY



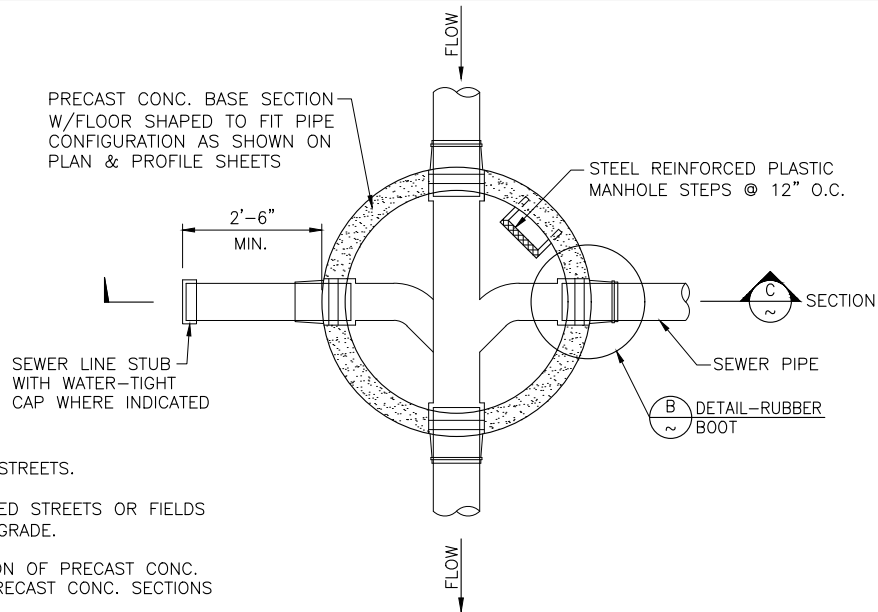
E DETAIL - TRENCH CONDITION 'E'
TYP WET TRENCHING

NOTES:

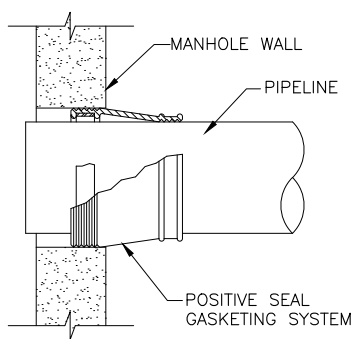
1. CONSTRUCTION AS SHOWN IS REQUIRED WHEN GROUNDWATER STATIC LEVEL IS EQUAL TO OR ABOVE SEWER INVERT ELEVATION OR AS DIRECTED BY THE ENGINEER.
2. CLAY CUT-OFF WALLS REQUIRED IN WET TRENCHING OR AS DIRECTED BY THE ENGINEER.
3. DEWATERING EFFORTS REQUIRED.
4. PLACE BACKFILL UP TO WATER LEVEL DURING CONSTRUCTION BEFORE DISCONTINUING THE DEWATERING.
5. DEWATERING OF EXCAVATIONS SHOULD BE FROM OUTSIDE THE EXCAVATED AREA TO MAINTAIN STABILITY.
6. THE FREE WATER LEVEL SHALL BE MAINTAINED AT LEAST 2ft. BELOW THE BASE OF THE EXCAVATION DURING CONSTRUCTION.

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				STANDARD DETAILS					
				ROADWAY - TRENCH DETAILS					
				DESIGNED	DRAWN	CHECKED	SHEET NO.	R-03	
				DJS	TRB	RWW	.		

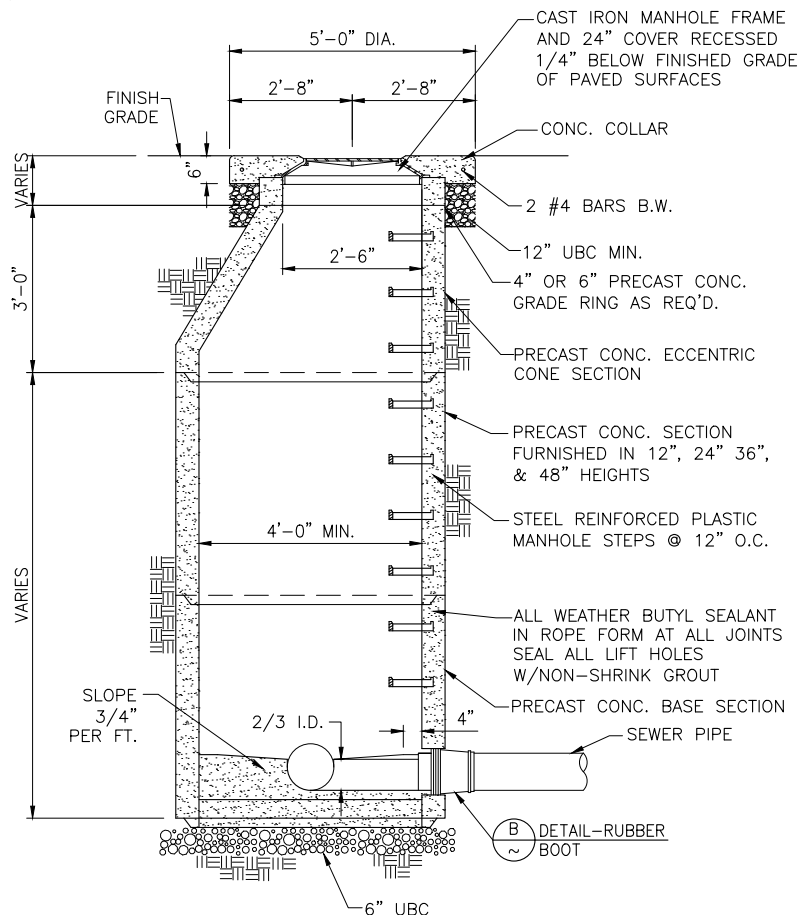
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A
TYP **PLAN - MANHOLE**
N.T.S.



B
TYP **PLAN - RUBBER BOOT**
N.T.S.



C
TYP **SECTION - MANHOLE**
N.T.S.

REV NO.	COMMENT	DATE



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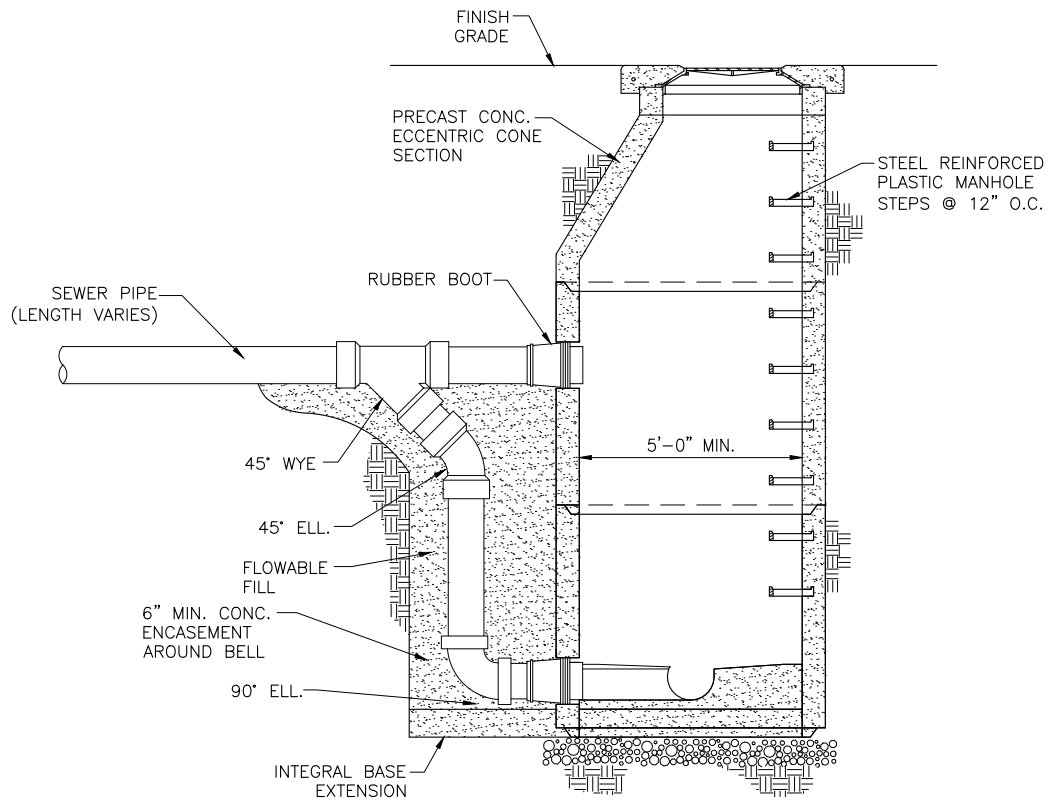
Grand Water & Sewer Service Agency

STANDARD DETAILS

SANITARY SEWER- STANDARD MANHOLE

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
DJS	TRB	RWW	.	S-01

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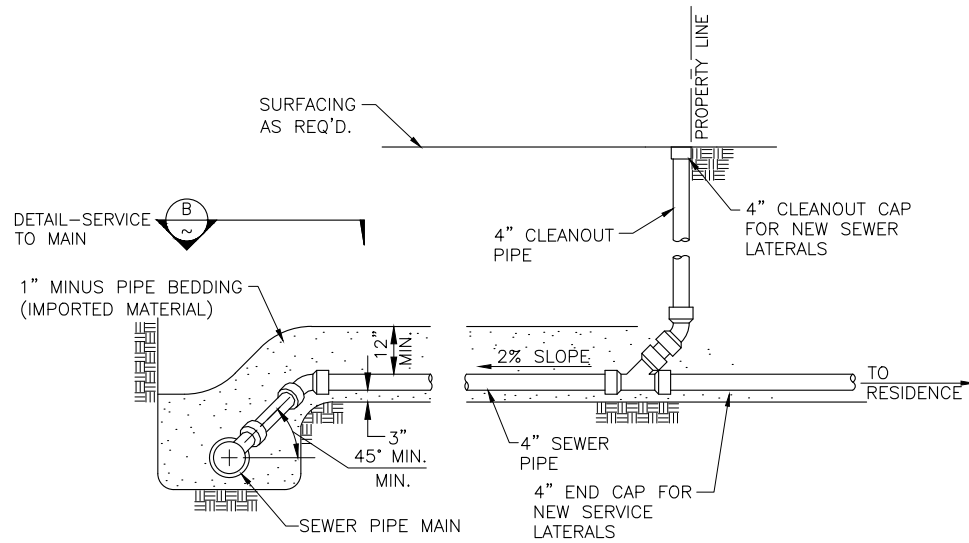
SECTION - DROP MANHOLE

N.T.S.

NOTE:
FOR DROP DISTANCES LESS THAN 24" NO DROP MANHOLE SHALL BE USED. THE CONTRACTOR SHALL SLOPE THE TROUGHS IN THE BASE OF THE MANHOLE TO ACCOMMODATE THE DROP DISTANCES.

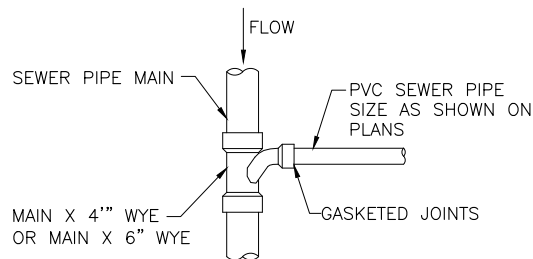
REV NO.	COMMENT	DATE	 SUNRISE ENGINEERING 25 EAST 500 NORTH FILLMORE, UTAH 84631 TEL 435.743.6151 • FAX 435.743.7900 www.sunrise-eng.com	Grand Water & Sewer Service Agency				
				STANDARD DETAILS				
				SANITARY SEWER- STANDARD DROP MANHOLE				
				SEI NO.	DESIGNED DJS	DRAWN TRB	CHECKED RWW	SHEET NO. .
								S-02

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NOTE:
SEWER LATERALS ARE GENERALLY LOCATED ON THE LOW SIDE
OF THE PROPERTY 5 FEET FROM THE LOT CENTERLINE.

A
TYP DETAIL - SEWER SERVICE LATERAL
N.T.S.



B
TYP DETAIL - SERVICE TO MAIN
N.T.S.

REV NO.	COMMENT	DATE



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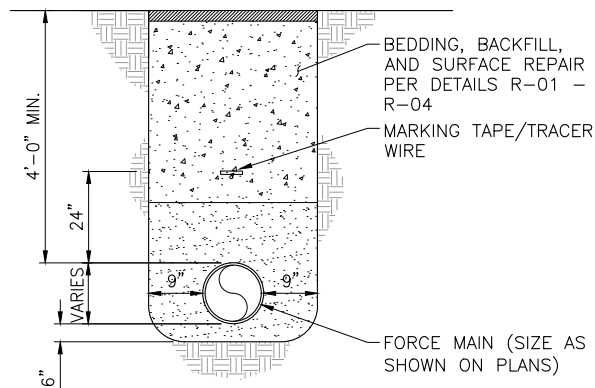
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STANDARD DETAILS

SANITARY SEWER- STANDARD SERVICE CONNECTION

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
DJS	TRB	RWW	.	S-03	

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NOTES:

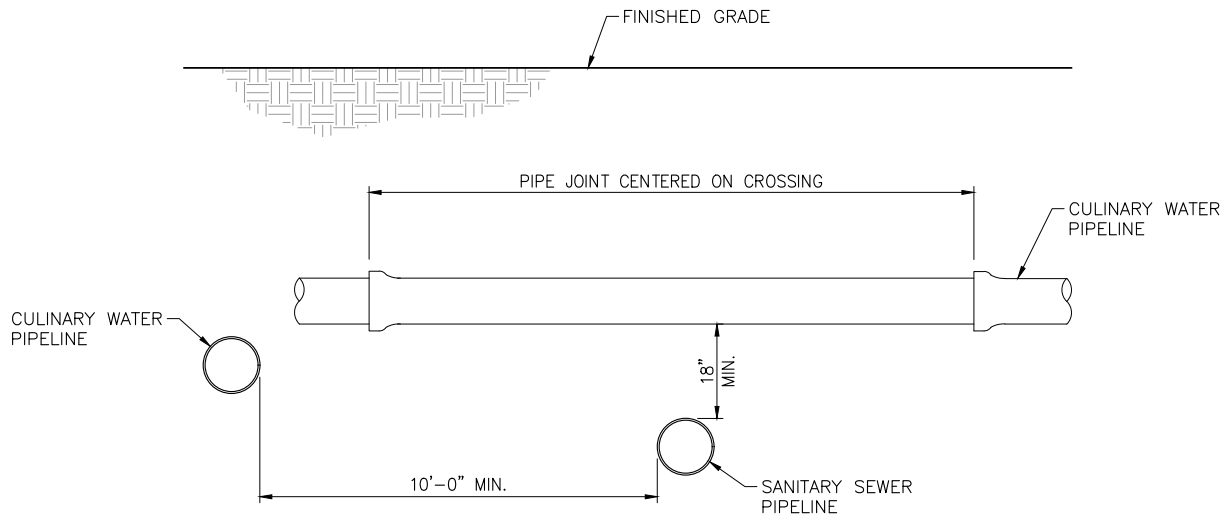
1. UNLESS GRINDER PUMPS ARE UTILIZED, FORCE MAINS SHALL BE A MINIMUM 4" HDPE.
2. FORCE MAINS SHALL ENTER THE GRAVITY SEWER SYSTEM AT A POINT NOT MORE THAN 24" ABOVE THE FLOWLINE OF THE RECEIVING MANHOLE.
3. AUTOMATIC AIR RELIEF VALVES SHALL BE PLACED AT HIGH POINTS IN THE FORCE MAIN TO PREVENT AIR LOCKING.
4. JOINT RESTRAINT MUST BE PROVIDED PER DETAILS W-06 AND W-07. JOINTS MAY ALSO BE FUSED.

DETAIL - FORCE MAIN CONSTRUCTION

N.T.S.

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				STANDARD DETAILS					
				SANITARY SEWER - FORCE MAIN CONSTRUCTION					
				SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	S-04
				DJS	BN	RWW	.		

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NOTES:

1. IF THE MINIMUM SEPARATION SHOWN HERE CANNOT BE MET, ADDITIONAL COORDINATION WITH GWSSA AND DIVISION OF DRINKING WATER APPROVAL ARE REQUIRED.
2. WATER TRANSMISSION LINES THAT MAY BECOME UNPRESSURIZED SHALL NOT BE INSTALLED WITHIN 20 FEET OF SEWER LINES.
3. WHEN A NEW SEWER FORCE MAIN CROSSES UNDER AN EXISTING WATER MAIN, ALL PORTIONS OF THE SEWER FORCE MAIN WITHIN 10 FEET (HORIZONTALLY) OF THE WATER MAIN SHALL BE ENCLOSED IN A CONTINUOUS SLEEVE.
4. WHEN A NEW WATER MAIN CROSSES OVER AN EXISTING SEWER FORCE MAIN, THE WATER MAIN SHALL BE CONSTRUCTED OF PIPE MATERIALS WITH A MINIMUM RATED WORKING PRESSURE OF 200 PSI OR EQUIVALENT PRESSURE RATING.
5. THE SEPARATION STANDARDS SHOWN ALSO APPLY TO SERVICE LATERALS.

DETAIL - WATER AND SEWER SEPARATION

N.T.S.

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				STANDARD DETAILS					
				WATER - WATER AND SEWER SEPARATION					
				SEI NO.	DESIGNED DJS	DRAWN BN	CHECKED RWW	SHEET NO.	M-01