

1:4/2/2019 - Sanderson Road (03) Design (06-CEN) 4230B (rev) 7/10/2023 12:35:32 PM, 6.0

**PLAN AND ELEVATION PLUGS**

**SECTION X-X**

**SECTION Y-Y**

**NOTES**

- FOR VERT. BEND DOWN IN EXCESS OF 11 1/4" BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
- FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
- GLANDS & BELLS SHALL BE PROTECTED FROM CONC. WITH PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
- ALL THRUST BLOCK & SUPPORT CONCRETE SHALL BE 3000 PSI READY MIX CONCRETE.
- THRUST BLOCKS WITH 10" DIMENSION GREATER THAN 12" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4" OF COVER. REFER TO MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTH DETAIL FOR WHEN THRUST BLOCKS ARE REQUIRED TO BE USED.
- WHEN THRUST BLOCK IS REQUIRED BUT NOT FEASIBLE TO CONSTRUCT, THRUST COLLAR DETAIL SHALL BE USED. SEE THRUST COLLAR DETAIL.

**WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL**

**THRUST BLOCK REQUIREMENTS**

02/10/15 W-18

PIPE SIZE	PIPE MATL.	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG	REDUCER	1/2" VERT. WELD	2 1/2" VERT. WELD	
6"	D.I.	28	21	8	3	60	20	20	21	10	5
8"	D.I.	36	21	8	4	60	41	27	27	12	7
10"	D.I.	43	21	8	5	77	53	30	30	16	8
12"	D.I.	51	21	10	5	91	67	27	30	18	8
6"	PVC	28	21	8	3	70	20	40	32	10	8
8"	PVC	33	21	8	4	102	49	43	43	21	10
10"	PVC	44	21	8	5	122	68	41	57	25	12
12"	PVC	57	21	11	6	143	98	42	69	29	15

**FACTOR OF SAFETY = 1.5**

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING AND DOCUMENTED BY THE INSPECTOR FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.

2. RESTRAINED LENGTH SHOWN REFERS TO ANY DESIGNED OR POTENTIAL LINE STOP, INCLUDING ALL GATE VALVES.

3. RESTRAINED LENGTH SHOWN REFERS TO THE BRANCH LINE ONLY. THE CONTINUOUS PIPE LENGTH OF THE MAIN RUN SHALL BE A MINIMUM OF 10' ON EACH SIDE OF THE TEE.

4. RESTRAINED LENGTH SHOWN IS BASED ON REDUCING PIPE DIAMETER TO ONE SIZE SMALLER THAN PIPE LISTED. ANY OTHER DIAMETER REDUCTION WILL REQUIRE ADDITIONAL CALCULATIONS BEFORE INSTALLATION. RESTRAINED LENGTH SHOWN IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.

5. 12" AND SMALLER DIAMETER: IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINTS ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCKS AND RESTRAINED JOINTS SHALL BE USED. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINTS ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCKS AND RESTRAINED JOINTS SHALL BE USED UNLESS OTHERWISE APPROVED BY THE PARTICIPATING UTILITY.

6. FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING & J. PVC AND D.I. PIPE MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONSTRUCTION MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND D.I. BELL AND SPIGOT DIMENSIONS.

**WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL**

**MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS**

02/10/15 W-19

**INSTALLATION OF DUCTILE IRON WATER MAINS**

**TABLE 4 WATER CROSS-SECTION**

Maximum Joint Deflection Full Length of Pipe - Push on Type Joint

Maximum Offset - 5" (inches)

Approximate Radius of Curve - 40' (feet)

Prohibited by Succession of Joints

Normal Pipe Size (inches)	Deflection Angle - 8 (degrees)	Joint Length 18'-feet	Joint Length 20'-feet	Joint Length 18'-feet	Joint Length 20'-feet
3	5°	19	21	205	230
4	5°	19	21	205	230
6	5°	19	21	205	230
8	5°	19	21	205	230
9	5°	19	21	205	230
10	5°	19	21	205	230
12	5°	19	21	205	230
14	5°	11	12	340	380
16	5°	11	12	340	380
18	5°	11	12	340	380
20	5°	11	12	340	380
24	5°	11	12	340	380
30	5°	11	12	340	380

**INSTALLATION OF DUCTILE IRON WATER MAINS**

**TABLE 4 WATER CROSS-SECTION**

Maximum Joint Deflection Full Length of Pipe - Mechanical Joint Pipe

Maximum Offset - 5" (inches)

Approximate Radius of Curve - 40' (feet)

Prohibited by Succession of Joints

**Asphalt Pavement Restoration Detail for Open Cut Utility Installations**

**NOTES:**

\* Asphalt Concrete Surface Material: SM-9.5A for ADT < 10,000 SM-9.5D for ADT > 10,000

The district administrator's designee shall determine the restoration requirements for other pavement types.

\*\* Trench width and pipe bedding shall be in accordance with VDOT Std. PB-1

\*\*\* 12 inches minimum beyond the edge of the trench on longitudinal open cuts, or 25 feet minimum beyond the trench centerline on perpendicular open cuts, or as determined by the district administrator's designee.

**Date: August 27, 2014**

**PAVEMENT RESTORATION**

ALL OPEN CUTS OF PAVEMENT WITHIN VDOT RIGHTS-OF-WAY SHALL BE MAINTAINED FOR NORMAL VEHICULAR USE AT ALL TIMES. ALL PAVEMENT DISTURBANCE WITHIN VDOT RIGHTS-OF-WAY SHALL BE RESTORED IN ACCORDANCE WITH THE "VDOT LUP-OC DETAIL" AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MILL & REPLACE PAVEMENT FULL LINE WIDTHS AS SHOWN ON PLAN SHEETS (5-11). MILL & REPLACE SHALL BE 6" WIDTHS WHERE POSSIBLE. UNLESS SHOWN OTHERWISE, MILL & REPLACE SHALL EXTEND TO INSIDE EDGE OF EDGELINE PAVEMENT MARKING. THE YELLOW ROAD CENTRLINE PAVEMENT MARKING SHALL REMAIN UNDISTURBED. THE WHITE EDGELINE PAVEMENT MARKING SHALL REMAIN UNDISTURBED WHERE POSSIBLE. PRIOR TO FINAL PAVEMENT RESTORATION, ALL OPEN CUTS SHALL BE TEMPORARILY PATCHED IN ACCORDANCE WITH THE "TEMPORARY PAVEMENT RESTORATION DETAIL" AS SHOWN ON THIS SHEET. PRIOR TO TEMPORARY PAVEMENT RESTORATION OR FINAL PAVEMENT RESTORATION, THE CONTRACTOR SHALL PROVIDE AN ADEQUATELY COMPACTED STONE SURFACE IN ALL AREAS AT THE END OF EACH DAY OR PRIOR TO REMOVING TEMPORARY TRAFFIC CONTROL MEASURES DURING THE WORK DAY. THE CONTRACTOR SHALL MAINTAIN THE COMPACTED STONE SURFACE AS AN ADEQUATE DRIVING SURFACE (FREE OF POT HOLES, RILLS, DEPRESSIONS, HUMPS, ETC.) AT ALL TIMES. THE CONTRACTOR SHALL FOLLOW THE RESTORATION REQUIREMENTS OF VDOT LAMP USE PERMIT LUP-OC DETAIL ON THIS SHEET. SEE THE SUGGESTED SEQUENCE OF CONSTRUCTION ON SHEET 16.

**TEMPORARY PAVEMENT RESTORATION DETAIL**

**N.T.S.**



Date:	Issue Date:	July 10, 2023
Revisions:	Drawn By:	M.C.
	Designed By:	BNK
	Checked By:	BNK
	Date:	07/10/23

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**SAUNDERSON DRIVE WATERLINE**

**DETAILS**

**BOTETOWN COUNTY, VIRGINIA**

Vertical Scale:	N/A
Horizontal Scale:	N/A
Commission Number:	4230B

Sheet No.:	13
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