

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
SINGLE RESIDENTIAL WATER SERVICE (REPLACEMENT OF EXISTING SERVICE)	
	02/10/15

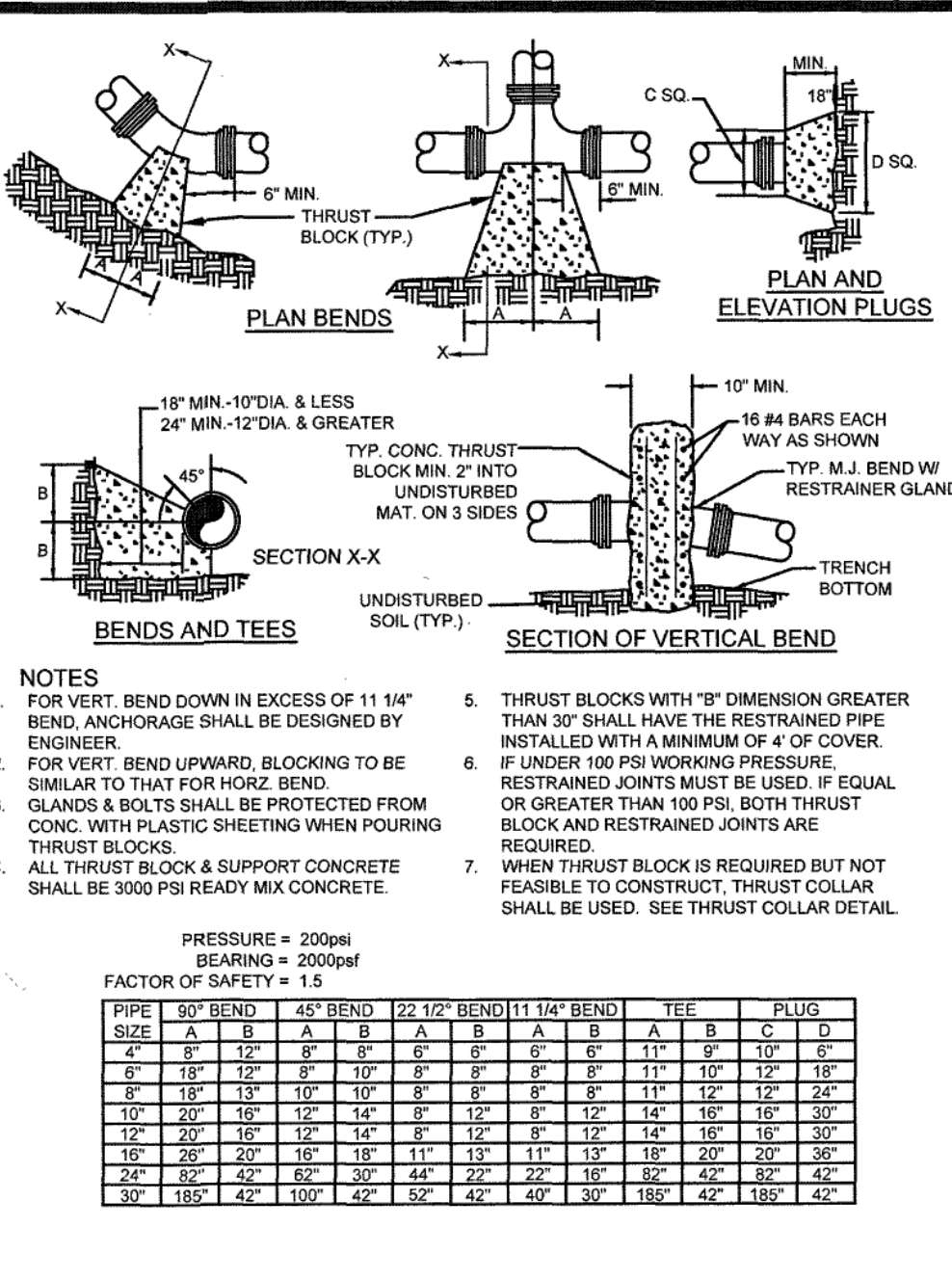
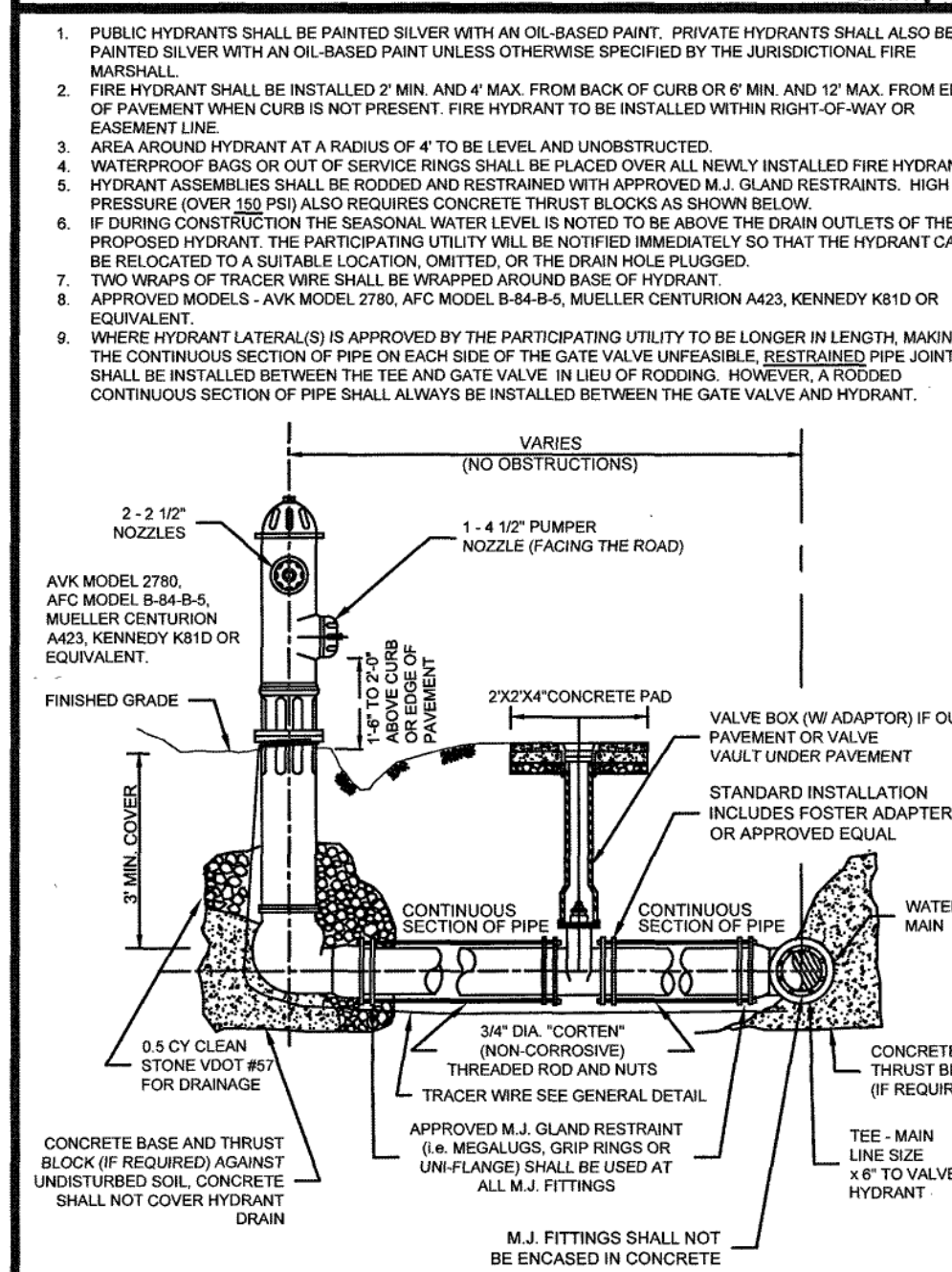
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
SINGLE RESIDENTIAL WATER SERVICE FOR HIGH PRESSURE (LINE PRESSURE OVER 120 PSI)	W- 02/10/15

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
WATER LINE VALVE & VAULT	W- 01/01/14

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

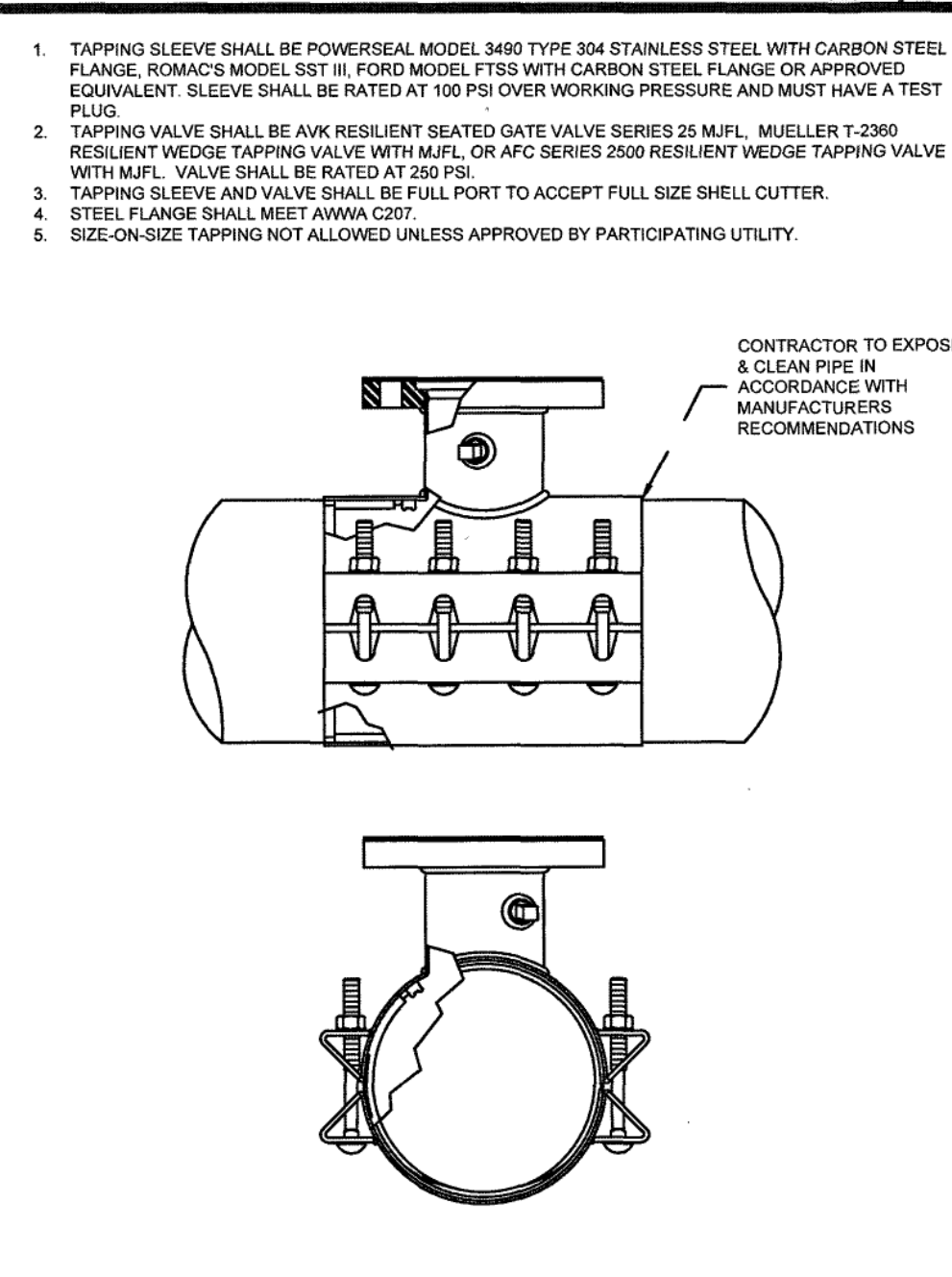
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
COMBINATION AIR VALVE ASSEMBLY	W- 02/10/15

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		
DEEP VALVE VAULT (MANHOLE)		W-
		01/01/14



FACTOR OF SAFETY = 1.5											
PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	1 1/2 BEND	VALVE / FLUE	TEE / BRANCH (NOTE 3)	REDUCER (NOTE 4)	45° VERT.	22 1/2° VERT.	1 1/2° VERT.
6"	D.I.	28'	21'	6'	3'	50'	26'	26'	21'	10'	5'
8"	D.I.	36'	21'	8'	4'	65'	41'	27'	27'	13'	7'
10"	D.I.	43'	21'	9'	5'	77'	33'	26'	32'	16'	8'
12"	D.I.	51'	31'	10'	5'	91'	37'	37'	38'	18'	9'
6"	PVC	29'	21'	6'	3'	78'	25'	49'	32'	16'	8'
8"	PVC	37'	21'	8'	4'	102'	49'	43'	42'	21'	10'
10"	PVC	44'	21'	9'	5'	122'	68'	41'	51'	25'	12'
12"	PVC	51'	21'	11'	6'	143'	89'	42'	60'	29'	15'

- ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING AND DOCUMENTED BY THE INSPECTOR FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.
- RESTRAINED LENGTH SHOWN REFERS TO ANY DESIGNED OR POTENTIAL LINE STOP, INCLUDING ALL GATE VALVES.
- 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.
- 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.
- 12" AND SMALLER DIAMETER: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCK(S) AND RESTRAINED JOINT(S) ARE TO BE USED.
- LARGER THAN 12" DIAMETER: IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCK(S) AND RESTRAINED JOINT(S) ARE TO BE USED (UNLESS OTHERWISE APPROVED BY THE PARTICIPATING UTILITY).
- FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING R, PVC AND R, DIP MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONTRACTOR MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND DIP BELL AND SPOUT DIMENSIONS.



INSTALLATION OF DUCTILE IRON WATER MAINS

TABLE 3 AWWA C600-05

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

Nominal Pipe Size (inches)	Deflection Angle - θ (degrees)	Maximum Offset - S* (inches)		Approximate Radius of Curve - R* Produced by Succession of Joints		
		Joint Length 18'-EFT	Joint Length 20'-EFT	Joint Length 18'-EFT	Joint Length 20'-EFT	Joint Length 23'-EFT
3	5°	19	21	205	230	230
4	5°	19	21	205	230	230
6	5°	19	21	205	230	230
8	5°	19	21	205	230	230
10	5°	19	21	205	230	230
12	5°	19	21	205	230	230
14	3°	11	12	340	380	380
16	3°	11	12	340	380	380
18	3°	11	12	340	380	380
20	3°	11	12	340	380	380
24	3°	11	12	340	380	380
30	3°	11	12	340	380	380

* SEE FIGURE 4.

For 14-inch and larger push-on joints, maximum deflection angle may be larger than shown above. Consult the manufacturer.

INSTALLATION OF DUCTILE IRON WATER MAINS

TABLE 4 AWWA C600-05

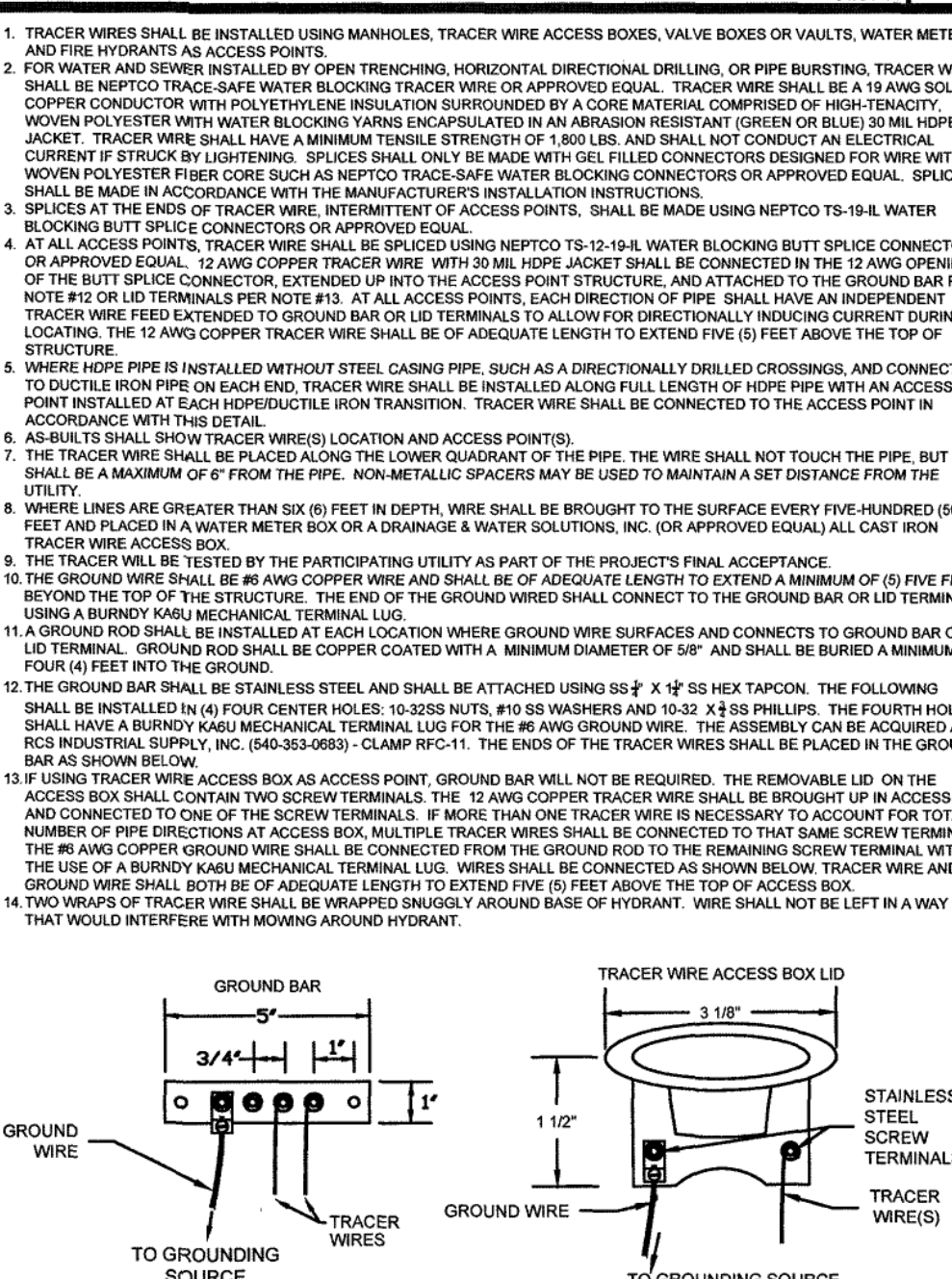
Maximum Joint Deflection Full Length of Pipe - Mechanical Joint Pipe

Nominal Pipe Size (inches)	Deflection Angle - θ (degrees)	Maximum Offset - S* (inches)		Approximate Radius of Curve - R* Produced by Succession of Joints		
		Joint Length 18'-EFT	Joint Length 20'-EFT	Joint Length 18'-EFT	Joint Length 20'-EFT	Joint Length 23'-EFT
3	8°-18°	31	35	125	140	140
4	8°-18°	31	35	125	140	140
6	7°-07°	27	30	145	160	160
8	5°-21°	20	22	195	220	220
10	5°-21°	20	22	195	220	220
12	5°-21°	20	22	195	220	220
14	3°-35°	13.5	16	285	320	320
16	3°-35°	13.5	16	285	320	320
18	3°-00°	11	12	340	380	380
20	3°-00°	11	12	340	380	380
24	2°-23°	9	10	450	500	500

θ = DEFLECTION ANGLE
S = JOINT DEFLECTION OFFSET
L = LAYING LENGTH
R = RADIUS OF CURVE
 $R = L^2/(8\theta)$

FIGURE 4

* SEE FIGURE 4.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
FIRE HYDRANT ASSEMBLY	V 02/10/15

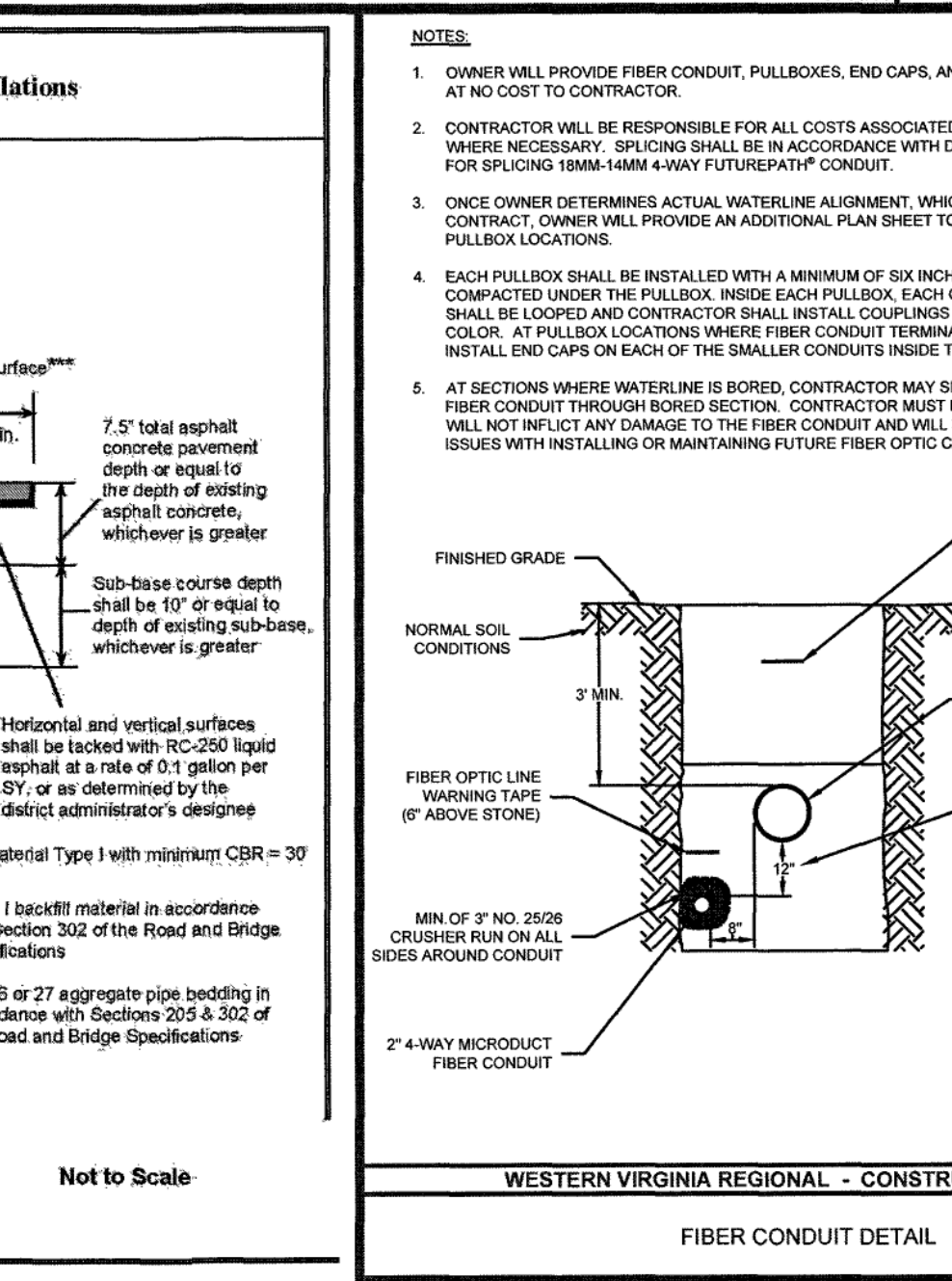
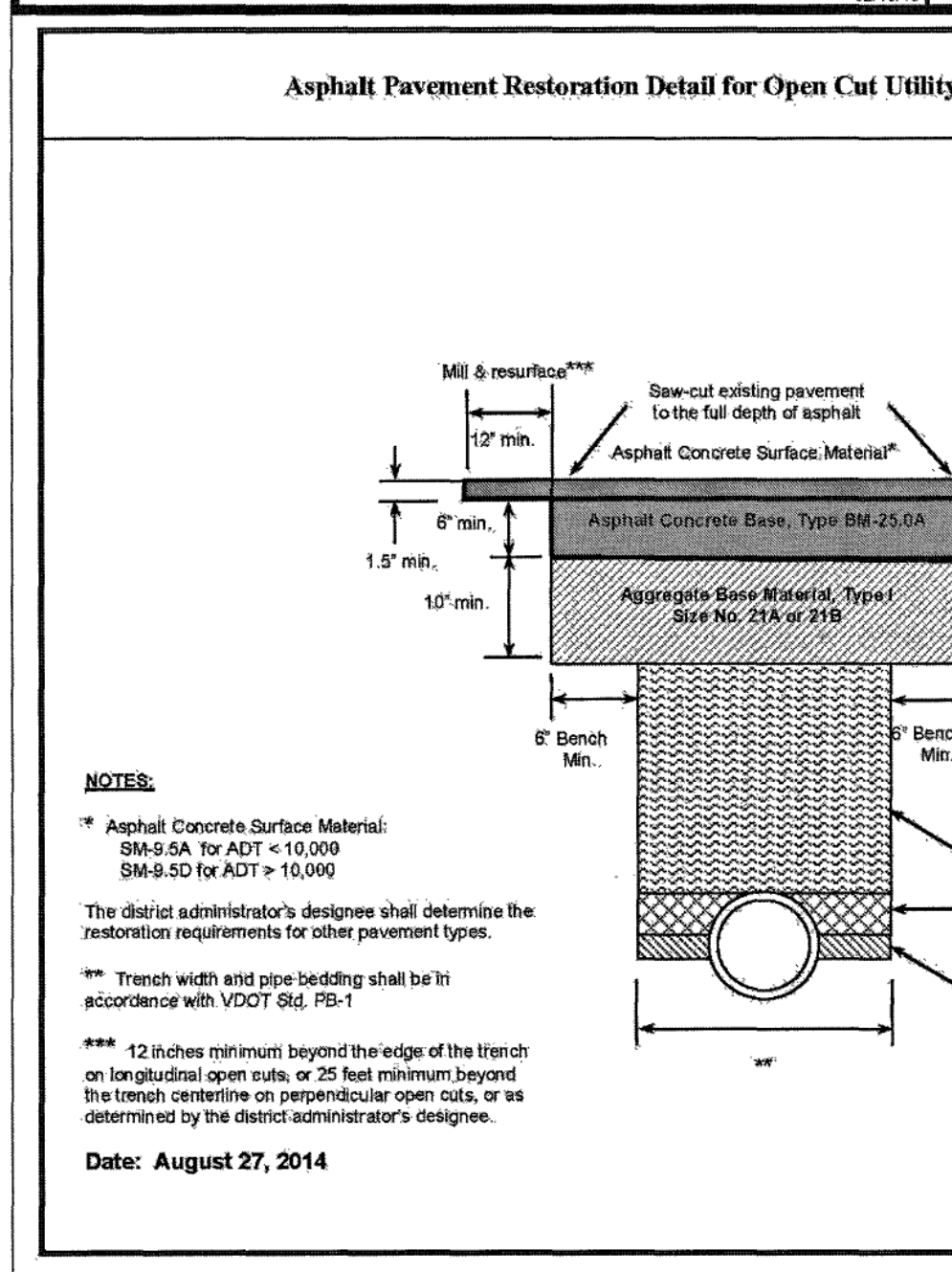
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		
THRUST BLOCK REQUIREMENTS		W-1
		01/01/14

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		
MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS		W-1
		02/10/15

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
TAPPING SLEEVE AND VALVE	W-2

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
DUCTILE IRON PIPE DEFLECTION ALLOWANCE TABLES	W-

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL TRACER WIRE FOR NON-METALLIC PRESSURE PIPE		01/01/14
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1. A 1" DRAIN WILL BE REQUIRED ON THE LOWER END OF THE CASING PIPE.

2. SPACERS SHALL BE RATCH HOPE SPACERS OR EQUIVALENT. STAINLESS STEEL IS REQUIRED IF IN COMPLIANCE WITH THE FOLLOWING CRITERIA:

- INTERIOR SURFACES OF THE CIRCULAR STAINLESS STEEL SHALL BE SMOOTH OR NEARLY SMOOTH.
- ABRASION RESISTANT RUNNERS/SKIDS SHALL BE POLYMER MATERIAL BEVELLED TO FACILITATE EASY OF INSTALLATION INTO CASING PIPE.

3. SPACERS SHALL BE SPACED 6 1/2" ON SEWER PIPE.

4. CARRIER PIPE SHALL BE IDENTIFIED HOPE IN ACCORDANCE WITH REGIONAL.

5. IF HOPE CARRIER PIPE IS USED AND PROPOSED GRADES ARE NOT REQUIRED THE SPACERS MAY BE OMITTED.

6. CASING PIPE TO BE STEEL IN ACCORDANCE WITH VDOT STANDARD DETAIL E, SPECIFIED IN THE STANDARDS IF APPROVED BY THE PARTICIPATING UTILITY.

7. CORRODED CASING PIPE WILL NOT BE ALLOWED.

8. DIAMETER OF CASING PIPE SHALL BE AS SHOWN IN THE TABLE BELOW UNLESS OTHERWISE SPECIFIED BY THE PARTICIPATING UTILITY. WHERE SPACERS ARE NOT REQUIRED, THERE SHALL BE MINIMUM DIAMETER TO ADEQUATELY INSTALL AND PASS CARRIER PIPE. MINIMIZE VOID SPACE BETWEEN CARRIER AND CASING PIPES.

CASING PIPE SIZE CHART	
CARRIER PIPE (NOMINAL DIAMETER)	CASING PIPE (DIAMETER)
6" 12"	8" 16"
8" 12"	10" 24"
10" 24"	12" 24"
12" 24"	14" 24"
14" 30"	16" 30"
16" 30"	18" 42"
18" 42"	20" 42"
20" 42"	24" 42"

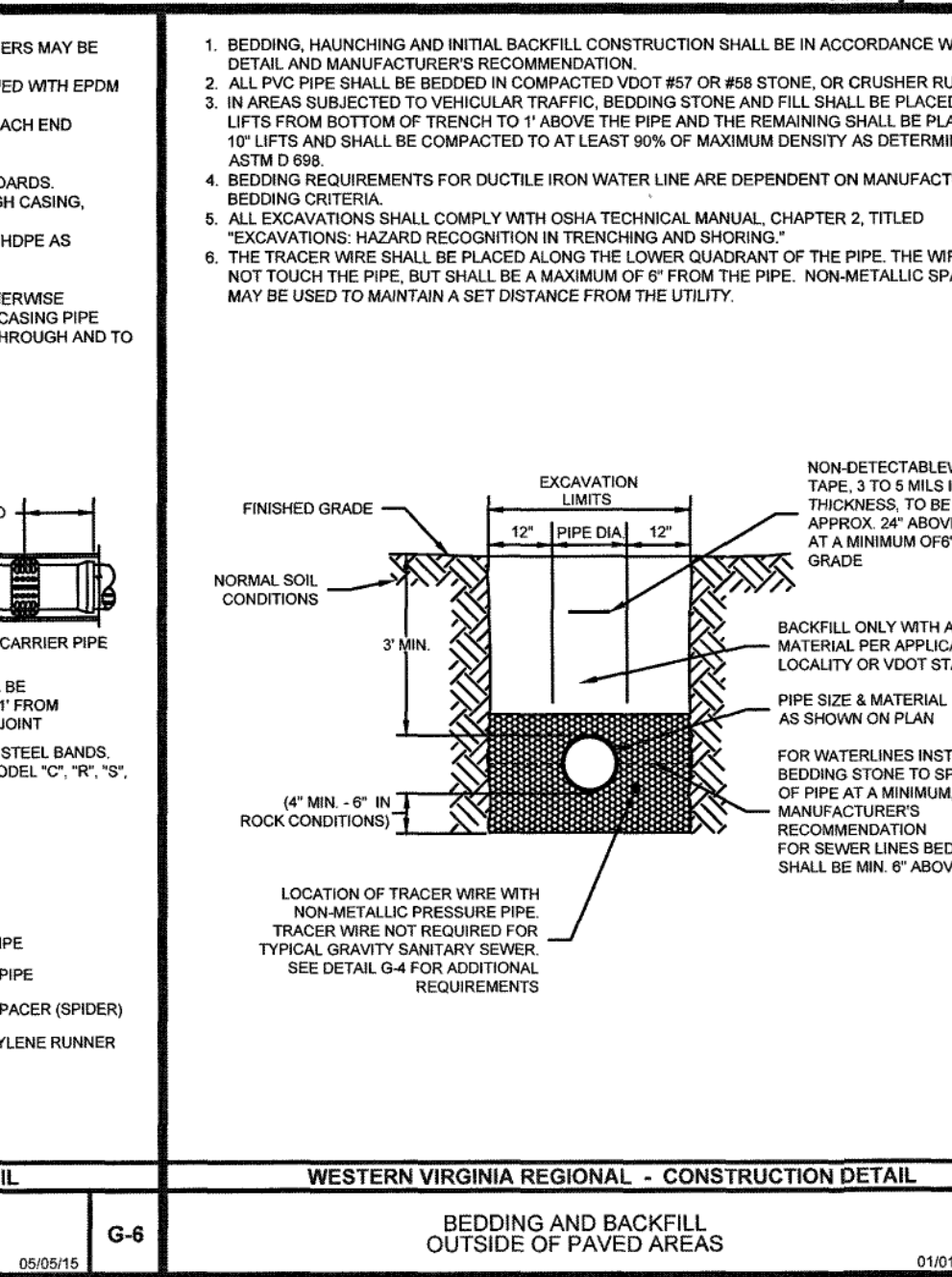
TWO SPACERS PLACED AT EACH CARRIER (TYP)

* ADDITIONAL SPACING ALLOWED AS RECOMMENDED BY PIPE MANUFACTURER

CASING PIPE SIZE CHART	
CARRIER PIPE (NOMINAL DIAMETER)	CASING PIPE (DIAMETER)
6" 12"	8" 16"
8" 12"	10" 24"
10" 24"	12" 24"
12" 24"	14" 24"
14" 30"	16" 30"
16" 30"	18" 42"
18" 42"	20" 42"
20" 42"	24" 42"

TWO SPACERS PLACED AT EACH CARRIER (TYP)

* ADDITIONAL SPACING ALLOWED AS RECOMMENDED BY PIPE MANUFACTURER



1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.

2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #67 OR #88 STONE.

3. IN VIOLENT ROAD, THE CONTRACTOR SHALL REPLACE THE PAVEMENT AS REQUIRED AND SPECIFIED BY VDOT IN INLANDER CITY. CONTRACTOR SHALL REPLACE PAVEMENT AS REQUIRED BY CITY OF INLANDER CITY. IN VIOLENT ROAD, THE CONTRACTOR SHALL REPLACE THE PAVEMENT AS REQUIRED AND SPECIFIED BY VDOT IN INLANDER CITY.

4. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED BY VDOT OR APPLICABLE LOCALITY.

5. PRIOR TO CONSTRUCTION, CONTRACTOR IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS FROM VDOT AND/OR APPLICABLE LOCALITY.

6. IN AREAS SUBJECTED TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO AT LEAST 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 998.

7. ALL SEWER LINE PIPE SHALL BE BEDDED IN COMPACTED GRANULAR MATERIAL. BEDDING REQUIREMENTS FOR DUCTILE-IRON PIPE ARE DEFINED IN MANUFACTURER'S BEDDING CRITICAL BENCH CUT ON EACH SIDE OF PAVEMENT SHALL BE IN ACCORDANCE WITH VDOT OR APPLICABLE LOCALITY'S SPECIFICATIONS.

8. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: RECORDATION IN TRENCHING AND SHORING".

9. THE TRACER WIRE SHALL BE PLACED ALONG THE LOWER QUADRANT OF THE PIPE. THE WIRE SHALL NOT TOUCH THE PIPE, BUT SHALL BE A MAXIMUM OF 6" FROM THE PIPE. NON-METALLIC SPANNERS SEVERE TO MAINTAIN A SET DISTANCE FROM THE UTILITY.

EXISTING PAVEMENT SECTION

LIMITS OF OPEN CUT

SURFACE MIX ASPHALT
BASE MIX ASPHALT
SUBBASE

BACKFILL ONLY WITH APPROVED MATERIAL PER APPLICABLE LOCALITY OR VDOT STANDARDS

PIPE SIZE & MATERIAL AS SHOWN ON PLAN

SEE BEDDING NOTE BELOW

6" IN ROCK CONDITIONS

NON-DETECTABLE WARNING LAMP, 1/2" IN THICKNESS, TO BE INSTALLED APPROX. 24" ABOVE AND AT A MINIMUM OF 6" BELOW GRADE (ALL PIPE)

DEPTH VARIES

LOCATION OF TRACER WIRE WITH NON-METALLIC PRESSURE PIPE
TRACER WIRE NOT REQUIRED FOR TYPICAL GRAVITY SPANNERS SEVERE
SEE DETAIL G-4

WIDTH OF TRENCH EXCAVATION
PIPE DIA. + 6" EACH SIDE (MINIMUM)

BEDDING: FOR WATERLINES, INITIAL BEDDING STONE TO SPRING LINE OF PIPE AT A MINIMUM OR PER MANUFACTURER'S RECOMMENDATION. FOR SEWER LINES, BEDDING SHALL BE MINIMUM 6" ABOVE PIPE.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL
UNDER PAVEMENT AND IN RIGHT-OF-WAY

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