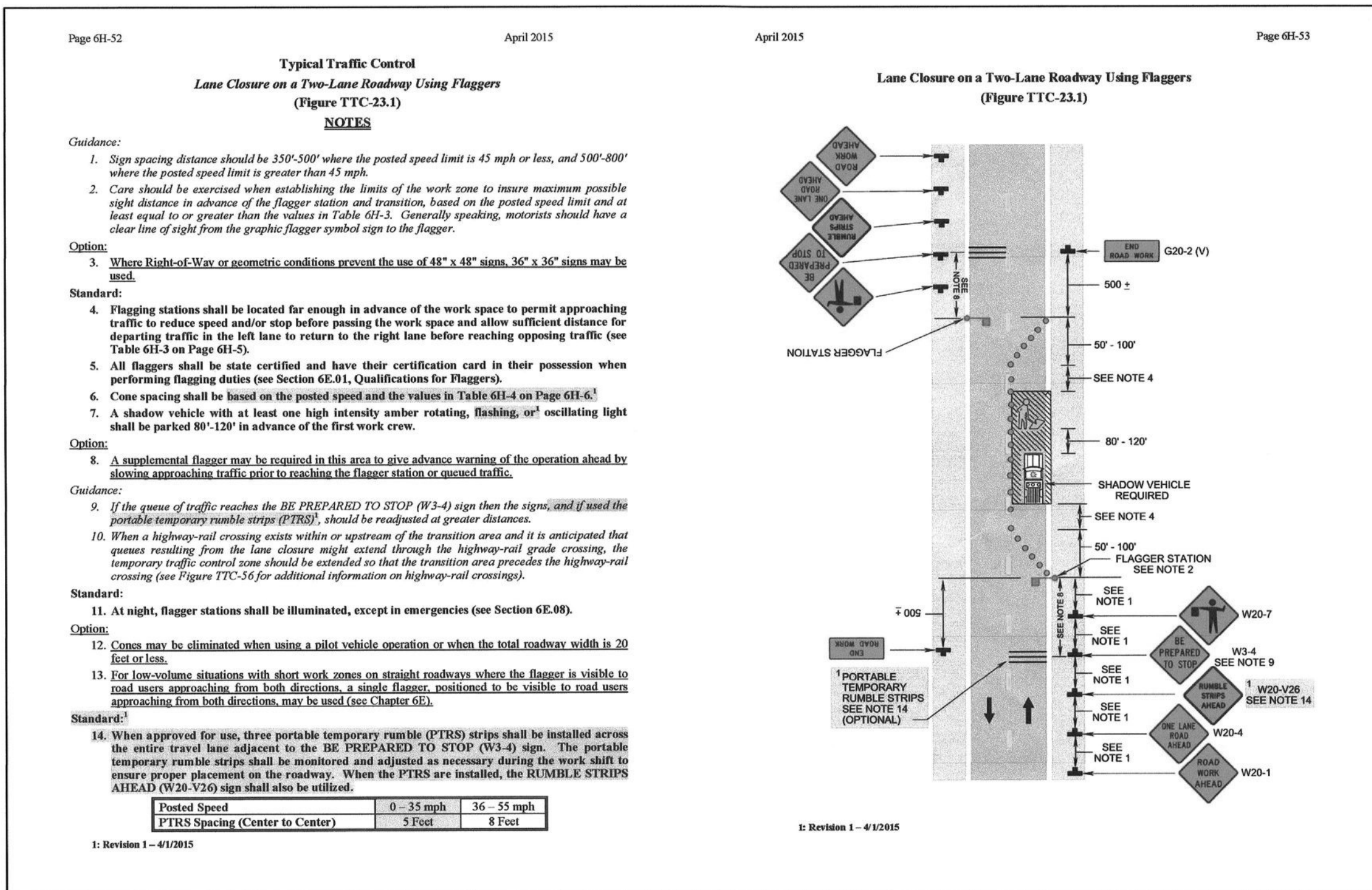
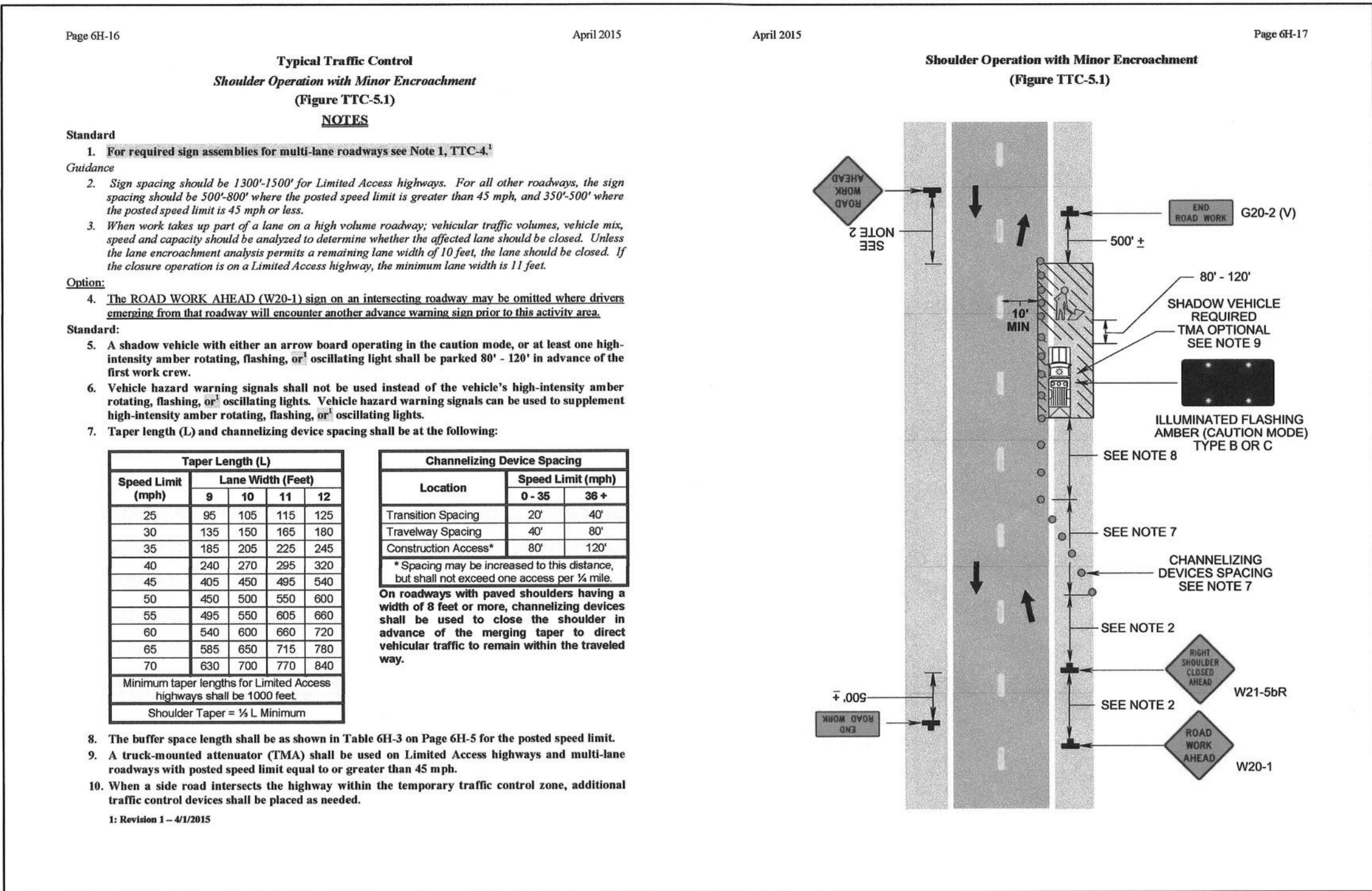


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WESTERN VIRGINIA WATER AUTHORITY

REVISIONS	
DATE	SHEETS
COMMISSION NO: 19-034	
SHEET 1 OF 12	

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**TYPICAL APPLICATIONS OF TEMPORARY TRAFFIC CONTROL
AS GIVEN IN THE VIRGINIA WORK AREA PROTECTION MANUAL**

MAINTENANCE OF TRAFFIC NOTES

1. DURING CONSTRUCTION, CONTRACTOR SHALL LIMIT DISRUPTION TO RESIDENTIAL ACCESS DRIVEWAYS, COORDINATE CONSTRUCTION ACTIVITIES THAT MAY AFFECT DRIVEWAYS WITH THE PROPERTY OWNER, AND PROVIDE OWNER WITH ACCESS BY END OF WORK DAY OR SOONER AS POSSIBLE.
2. ALL STANDARDS AND GUIDELINES OF THE VIRGINIA WORK AREA PROTECTION MANUAL (VWAPM) SHALL APPLY TO ANY TRAFFIC CONTROL MEASURES INCLUDING, BUT NOT LIMITED TO, ALL DEVICES, METHODS, AND DIMENSIONS.
3. CONTRACTOR SHALL PROVIDE WARNING SIGNS, AND APPROVED PORTABLE SIGN STANDS AND INSURE AN UNRESTRICTED VIEW OF ADVANCE WARNING SIGN MESSAGES FOR SAFETY OF TRAFFIC AND IN ACCORDANCE WITH THE VWAPM.
4. ALL WORK WITHIN THE RIGHT-OF-WAY SHALL BE APPROPRIATELY SIGNED REGARDLESS OF WHETHER A LANE OR SHOULDER CLOSURE IS NEEDED.
5. DURING LANE CLOSURES, CONTRACTOR SHALL USE AT LEAST 2 FLAGMEN AT ALL TIMES AND IN ACCORDANCE WITH THE VWAPM.
6. CONES MAY BE USED IN AREAS WHERE PERSONNEL WILL BE PRESENT TO INSURE THEIR PROPER ALIGNMENT; GROUP II DRUMS SHALL BE REQUIRED WHEN THE WORK ZONE IS UNMANNED. ALL CONES SHALL BE A MINIMUM OF 36" IN HEIGHT AND PLACED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE VWAPM.
7. ALL TRAFFIC CONTROL EQUIPMENT AND OBJECTS SHALL MEET NCHRP 350 CRASH TESTING CRITERIA.
8. THESE NOTES ARE PROVIDED AS GUIDELINES ONLY. THE CONTRACTOR SHALL PREPARE A SPECIFIC TRAFFIC CONTROL PLAN THAT MATCHES HIS PLANNED OPERATIONS AND PROJECT SEQUENCING.

COMMUNICATION NOTES

1. THE CONTRACTOR SHALL ADVISE THE CITY OF ROANOKE TRANSPORTATION DEPARTMENT OF PLANNED LANE CLOSURES A MINIMUM OF 72 HOURS IN ADVANCE OF PLANNED LANE CLOSURE.
2. THE CONTRACTOR SHOULD IMMEDIATELY NOTIFY 911 FOR ANY EMERGENCY.
3. IF AN EMERGENCY IS TRAFFIC RELATED, THE CITY OF ROANOKE TRANSPORTATION DEPARTMENT, OR HIS DESIGNEE SHOULD BE NOTIFIED IMMEDIATELY AFTER CALLING 911.

TABLE: PRESSURE AND METER TYPE FOR SERVICE

TAX MAP NUMBER	PROPERTY ADDRESS	APPROX. METER PRESSURE (psd)	METER TYPE
5480401	4210 Griffin Road, S.W.	112	S
5470201	4247 Griffin Road, S.W.	103	S
5470202	4237 Griffin Road, S.W.	86	S
5470203	4263 Griffin Road, S.W.	83	S
5470204	4305 Griffin Road, S.W.	78	S
5470205	4313 Griffin Road, S.W.	75	S
5470206	4323 Griffin Road, S.W.	73	S
5470504	0 Griffin Road, S.W.	88	D
5470505	0 Griffin Road, S.W.	88	D
5470415	0 Griffin Road, S.W.	78	S
5470414	4320 Griffin Road, S.W.	68	S
5470413	0 Griffin Road, S.W.	66	S
5470412	4334 Griffin Road, S.W.	63	S
5470411	0 Griffin Road, S.W.	59	S
5470410	4350 Griffin Road, S.W.	52	D
5470409	0 Griffin Road, S.W.	52	D
5470408	4372 Griffin Road, S.W.	49	S
5470401	4320 Bristol Road, S.W.	63	S
5470402	4322 Bristol Road, S.W.	50	S
5470404	4351 Bristol Road, S.W.	34	S
5470405	4367 Bristol Road, S.W.	31	S
5470406	0 Bristol Road, S.W.	28	D
5470407	0 Bristol Road, S.W.	28	D
5470506	4318 Bristol Road, S.W.	74	S
5470526	0 Bristol Road, S.W.	60	S
5470525	4332 Bristol Road, S.W.	54	S
5470524	0 Bristol Road, S.W.	41	D
5470523	0 Bristol Road, S.W.	41	D
5470522	0 Bristol Road, S.W.	30	S
5470521	4364 Bristol Road, S.W.	28	D
5470520	4372 Bristol Road, S.W.	28	D
5470507	0 Joplin Road, S.W.	65	S
5470508	4233 Joplin Road, S.W.	65	S
5470509	4243 Joplin Road, S.W.	65	S
5470510	4251 Joplin Road, S.W.	66	S
5470511	4259 Joplin Road, S.W.	61	D
5470512	4267 Joplin Road, S.W.	61	D
5470513	4297 Joplin Road, S.W.	72	S
5470601	4228 Joplin Road, S.W.	68	S
5470602	4244 Joplin Road, S.W.	68	S
5470603	4252 Joplin Road, S.W.	65	S
5470604	4260 Joplin Road, S.W.	65	S
5470605	4268 Joplin Road, S.W.	70	S
5470712	4404 Van Winkle Road, S.W.	47	S
5470711	4384 Van Winkle Road, S.W.	41	S
5470710	4374 Van Winkle Road, S.W.	36	S
5470709	4366 Van Winkle Road, S.W.	36	S
5470708	4356 Van Winkle Road, S.W.	38	S
5470707	4350 Van Winkle Road, S.W.	40	S
5470705	4336 Van Winkle Road, S.W.	45	S
5470703	4306 Van Winkle Road, S.W.	69	S
5470702	0 Van Winkle Road, S.W.	76	S
5470701	0 Van Winkle Road, S.W.	81	S
5470519	0 Van Winkle Road, S.W.	37	D
5470518	0 Van Winkle Road, S.W.	37	D
5470517	0 Van Winkle Road, S.W.	41	S
5470516	4339 Van Winkle Road, S.W.	48	S
5470515	0 Van Winkle Road, S.W.	53	S
5470514	4305 Van Winkle Road, S.W.	71	S
5480340	4215 Roy Drive, S.W.	74	S
5480339	0 Roy Drive, S.W.	72	S
5480338	4233 Roy Drive, S.W.	65	S
5480337	0 Roy Drive, S.W.	62	S
5480121	0 Griffin Road, S.W.	72	S
5480122	4220 Roy Drive, S.W.	70	S
5480107	0 Roy Drive, S.W.	60	S
5480106	4236 Roy Drive, S.W.	55	S

ABOVE PRESSURES ARE STATIC BASED ON HGL AT ELEVATION 1410
S - DENOTES SINGLE METER SETTER, D - DENOTES DOUBLE METER SETTER

#	STRUCTURE	RIM	GRATE	INV.OUT	INV.IN
D-1	DMH	1144.38'			
D-2	Curb Inlet	1148.70'			
D-2a	Curb Inlet	1148.62'			
D-2b	Drop Inlet		1148.71'		
D-2c	Drop Inlet		1147.30'		
D-3	15" RCP			1189.17' (15" RCP)	1192.26' (15" RCP)
D-4	15" CMP			1207.11' (15" CMP)	1208.79' (15" CMP)
D-5	12" RCP			1218.00' (12" RCP)	1222.99' (12" RCP)
D-6	15" STL			1220.08' (15" STL)	1223.73' (15" STL)
D-7	12" RCP			1240.40' (12" RCP)	1242.06' (12" RCP)
D-8	12" RCP			1243.27' (12" RCP)	1244.61' (12" RCP)
D-9	12" RCP			1257.90' (12" RCP)	1258.44' (12" RCP)
D-10	12" CMP			1259.46' (12" CMP)	1260.30' (12" CMP)
D-11	12" RCP			1283.00' (12" RCP)	1283.32' (12" RCP)
D-12	18" RCP			1281.40' (18" RCP)	1282.78' (18" RCP)
D-13	18" RCP			1242.60' (18" RCP)	1245.58' (18" RCP)
D-14	18" RCP			1289.48' (18" RCP)	1291.26' (18" RCP)
D-15	12" RCP			1246.62' (12" RCP)	1248.68' (12" RCP)
D-16	15" RCP			1241.92' (15" RCP)	1243.32' (15" RCP)
D-17	24" CMP			1235.95' (24" CMP)	1237.92' (24" CMP)
D-18	15" CMP			1233.94' (15" CMP)	1235.31' (15" CMP)
D-19	36" RCP			1220.07' (36" RCP)	1221.77' (36" RCP)
D-20	15" CMP			1241.40' (15" CMP)	1243.22' (15" CMP)
D-21	12" CMP			1248.78' (12" CMP)	1252.21' (12" CMP)
D-22	Drop Inlet		1212.16'		
D-23	15" RCP				1221.33' (15" RCP)
D-24	15" RCP			1232.25' (15" RCP)	unknown
D-25	15" CMP			1236.38' (15" CMP)	1236.96' (15" CMP)
D-26	15" CPP			1241.79' (15" CPP)	1243.17' (15" CPP)

SITE AND ZONING TABULATIONS

CURRENT ZONING: ALL LOTS ARE R-7 EXCEPT FOR TAX MAP #5480401.
#5480401 IS RA(c): RESIDENTIAL-AGRICULTURAL ORD. #30467
PROPOSED USE: SAME RESIDENTIAL USE WITH WATERLINE BETTERMENT.
SITE ACREAGE: LOT SIZE VARIES.
PROPOSED NUMBER OF LOTS: NO CHANGE IN NUMBER OF LOTS.

GENERAL NOTES

1. THE PROPERTIES SHOWN ON THESE PLANS ARE LOCATED AT ROANOKE CITY TAX ASSESSMENT MAP NUMBERS AS LISTED IN CHART AT LEFT.
2. OWNER/DEVELOPER: WESTERN VIRGINIA WATER AUTHORITY
(ATTN: WILL BULLOSS, P.E.)
601 SOUTH JEFFERSON STREET, SUITE 300
ROANOKE, VA 24011 (540) 283-2939
3. NO PORTION OF THIS PROJECT IS LOCATED WITHIN THE LIMITS OF A 100 YEAR FLOOD BOUNDARY AS DESIGNATED BY FEMA. THIS OPINION IS BASED ON AN INSPECTION OF THE FLOOD INSURANCE RATE MAP #51161C0252G, DATED SEPTEMBER 28, 2007.
4. THE PROPERTY LINES AND RIGHT OF WAY SHOWN ARE THE RESULT OF REPRODUCING RECORDED SUBDIVISION PLATS FOR THE LOTS INVOLVED AND JUSTIFYING THESE WITH PROPERTY CORNERS AS LOCATED BY FIELD SURVEY PERFORMED BY LUMSDEN ASSOCIATES, P.C. IN 2019.
5. TOPOGRAPHIC DATA IS BASED ON A FIELD SURVEY PERFORMED BY LUMSDEN ASSOCIATES, P.C. IN 2019 AND SUPPLEMENTED BY ROANOKE CITY GIS MAPPING. THE LOCATION OF THE NEAR SIDE CURBS, OR EDGE OF PAVEMENT, AND PROFILE ELEVATIONS ARE TAKEN DIRECTLY FROM THE FIELD SURVEY.
6. A TITLE REPORT WAS NOT FURNISHED FOR THESE PROPERTIES.
7. THE PROPERTIES SHOWN ON THESE PLANS ARE CURRENTLY SERVED BY WESTERN VIRGINIA WATER AUTHORITY FOR WATER SUPPLY.
8. THE PROPERTIES SHOWN ON THESE PLANS ARE ACCESSED BY PUBLIC ROADS.
9. AN APPROVED SET OF PLANS SHALL BE KEPT ON SITE AT ALL TIMES.

Lumsden Associates, P.C.
ENGINEERS | SURVEYORS | PLANNERS

4664 BRAMBLETON AVENUE
P.O. BOX 20669
ROANOKE, VIRGINIA 24018

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WWW.LUMSDENPC.COM

NOTES & DETAILS

**GRIFFIN / VAN WINKLE
WATERLINE REPLACEMENTS**
PREPARED FOR
WESTERN VIRGINIA WATER AUTHORITY
SITUATED IN
THE CITY OF ROANOKE, VIRGINIA

REVISIONS	NO.	DATE	DESCRIPTION
	1		
	2		
	3		
	4		
	5		

DATE: December 18, 2019
SCALE: NONE
COMMISSION NO: 19-034
SHEET 2 OF 12

GENERAL UTILITY NOTES

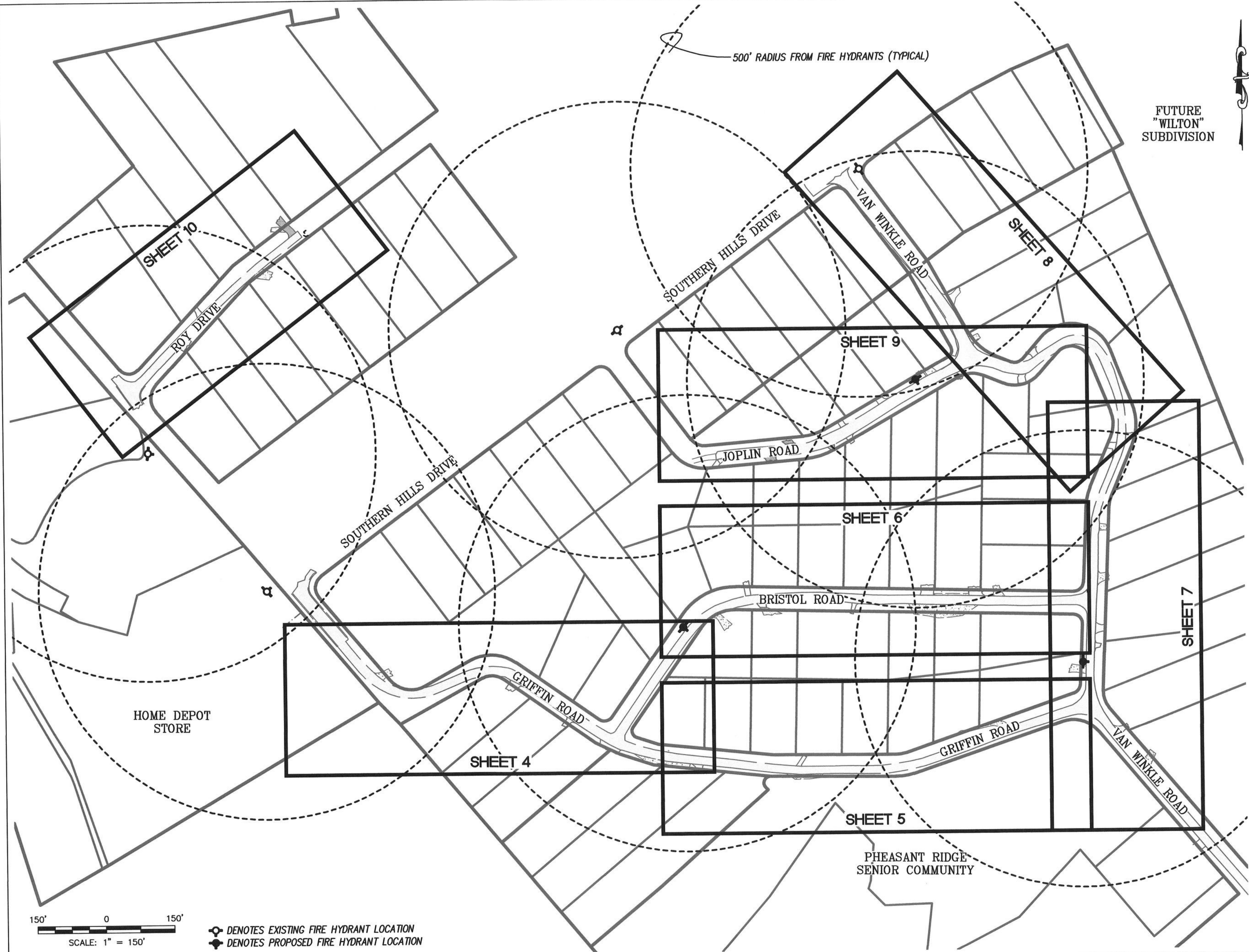
- ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE WESTERN VIRGINIA REGIONAL DESIGN AND CONSTRUCTION STANDARDS AVAILABLE AT WWW.WESTERNVAVATER.ORG OR BY CONTACTING THE AUTHORITY AT 540-853-5700. THE PROJECT SHALL ALSO COMPLY WITH THE GOVERNING JURISDICTION'S STANDARDS AND OTHER AGENCY STANDARDS (E.G., VDOT, DEQ, DCR, VDH, ETC.) WHERE APPLICABLE.
- THE AUTHORITY WILL INSTALL ALL NEW WATER METERS AND REMOVE ALL EXISTING WATER METERS. THE CONTRACTOR SHALL INSTALL COMPLETE NEW WATER SERVICES INCLUDING THE METER SETTER AND BOX. FOLLOWING METER REPLACEMENT BY THE AUTHORITY, THE CONTRACTOR SHALL DEMOLISH THE EXISTING WATER METER SETTER AND BOX. THE CONTRACTOR SHALL COORDINATE EXISTING METER REMOVAL AND NEW METER INSTALLATION DIRECTLY WITH THE AUTHORITY. THE CONTRACTOR SHALL PROVIDE AT LEAST THREE (3) BUSINESS DAYS ADVANCE NOTICE TO THE AUTHORITY PRIOR TO NEEDING METER INSTALLATIONS. THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITY TO PROVIDE A SERIES OF AT LEAST TEN (10) SERVICES THAT ARE READY TO RECEIVE NEW METERS BEFORE CONTACTING THE AUTHORITY FOR WATER METER REPLACEMENT.
- ALL CONNECTIONS TO EXISTING WATERLINES SHALL BE PERFORMED BY THE AUTHORITY. THE CONTRACTOR SHALL PROVIDE FULL STAINLESS STEEL TAPPING SLEEVE(S) AND VALVE(S). THE CONTRACTOR SHALL EXCAVATE TO THE EXISTING WATERLINE, SHORE THE TRENCH PER OSHA REQUIREMENTS, CLEAN THE EXISTING WATERLINE, AND INSTALL THE TAPPING SLEEVE AND VALVE PRIOR TO THE AUTHORITY PERFORMING THE TAP. THE CONTRACTOR SHALL NOTIFY THE AUTHORITY'S UTILITY LINE SERVICES DIVISION AT 540-853-2792 AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO REQUIRING THE CONNECTION.
- ALL CONNECTIONS TO EXISTING SEWERLINES SHALL BE PERFORMED BY THE AUTHORITY. THE CONTRACTOR SHALL EXCAVATE TO THE EXISTING SEWERLINE, SHORE THE TRENCH PER OSHA REQUIREMENTS, AND CLEAN THE EXISTING SEWERLINE PRIOR TO THE AUTHORITY PERFORMING THE TAP. THE CONTRACTOR SHALL NOTIFY THE AUTHORITY'S UTILITY LINE SERVICES DIVISION AT 540-853-2792 AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO REQUIRING THE CONNECTION.
- THE CONTRACTOR SHALL PERFORM ALL MANHOLE CONNECTIONS. THE CORING AND BOOT INSTALLATION SHALL BE INSPECTED AND APPROVED BY AN AUTHORITY CONSTRUCTION INSPECTOR PRIOR TO ACTIVATING SEWER SERVICE. THE CONTRACTOR SHALL CONTACT THE AUTHORITY'S CONSTRUCTION INSPECTOR RESPONSIBLE FOR THE PROJECT AT LEAST ONE (1) DAY PRIOR TO INITIATING THE MANHOLE CONNECTION.
- PRIOR TO CONSTRUCTION IN THE RIGHT-OF-WAY, ALL APPLICABLE PERMIT(S) FROM THE GOVERNING JURISDICTION AND/OR AGENCY MUST BE OBTAINED AND A COPY KEPT ON THE PROJECT SITE.
- FOR PROJECTS REQUIRING TRAFFIC CONTROL IN THE CITY OF ROANOKE, NOTIFY MANAGER OF TRANSPORTATION, MARK JAMISON, AT 540-853-5471 AT LEAST TWO WEEKS IN ADVANCE OF REQUIRING TRAFFIC CONTROL. FOR A LANE CLOSURE PERMIT IN THE CITY OF ROANOKE, CONTACT THE TRAFFIC ENGINEER, HONG LIU, AT 540-853-2686. IN ROANOKE OR FRANKLIN COUNTIES, TRAFFIC CONTROL REQUIREMENTS SHALL BE DETERMINED ONCE THE VDOT LAND USE PERMIT HAS BEEN ISSUED. PLEASE CONTACT THE LOCAL VDOT OFFICE. TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE MOST RECENT MUTCD MANUAL AND THE VDOT WORK AREA PROTECTION MANUAL UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL NOTIFY THE AUTHORITY'S ENGINEERING COORDINATOR, MARK SINK, AT 540-537-3480 AT LEAST THREE (3) DAYS PRIOR TO CONSTRUCTION.
- A PRE-CONSTRUCTION CONFERENCE SHALL BE SCHEDULED AT LEAST ONE (1) DAY PRIOR TO ANY CONSTRUCTION.
- THE CONTRACTOR SHALL HAVE A VALID MISS UTILITY TICKET PRIOR TO EXCAVATION. CONTACT MISS UTILITY AT 1-800-552-7001.
- ALL EXISTING UTILITIES MAY NOT BE SHOWN OR MAY NOT BE SHOWN IN THEIR EXACT LOCATION. CONTRACTOR SHALL LOCATE ALL UTILITIES AND DETERMINE ALL INVERTS PRIOR TO CONSTRUCTION TO ALLOW FOR ADJUSTMENTS DUE TO CONFLICTS WITH OTHER UTILITIES. THE CONTRACTOR SHALL COMPLY WITH THE VIRGINIA STATE WATER WORKS REGULATIONS, SECTION 12VAC5-590-1150, AND THE VIRGINIA STATE SEWAGE COLLECTION AND TREATMENT REGULATIONS WHERE LINES CROSS.
- AN APPROVED SET OF PLANS AND PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES.
- CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED IN ACCORDANCE WITH THE VIRGINIA LITTER CONTROL ACT.
- PRIOR TO COMMENCING WORK, THE CONTRACTOR'S CERTIFIED RESPONSIBLE LAND DISTURBER SHALL OBTAIN AN EROSION AND SEDIMENT CONTROL PERMIT FOR THE PROJECT FROM THE LOCAL GOVERNING JURISDICTION AND DEQ (IF REQUIRED). ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE INSTALLED PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING ALL VEHICLES AND EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE STREETS ARE KEPT IN A CLEAN, MUD- AND DUST-FREE CONDITION AT ALL TIMES.
- FIELD CHANGES SHALL BE APPROVED BY THE AUTHORITY'S ENGINEERING DIVISION PRIOR TO SUCH CONSTRUCTION.
- THE CONTRACTOR SHALL MAKE PROVISIONS TO PROVIDE ACCESS TO ALL PROPERTIES DURING CONSTRUCTION AND SHALL MAINTAIN SAFE ACCESSIBILITY TO FIRE HYDRANTS AT ALL TIMES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND UNCOVERING ALL MANHOLES AFTER PAVING. MANHOLE RIMS SHALL BE INSTALLED TO GRADE AND FLUSH WITH THE FINAL PAVEMENT.
- UNREPAIRED ROADWAYS OPENED TO TRAFFIC SHALL HAVE, AT A MINIMUM, COMPACTED AGGREGATE MATERIAL VDOT 21A OR 21B FLUSH WITH THE ADJACENT ROADWAY SURFACE AND SHALL BE INSPECTED AND REPAIRED ON A DAILY BASIS. SOME AREAS WILL REQUIRE A TEMPORARY PATCH UNTIL FINAL PAVING CAN BE COMPLETED.
- THE CONTRACTOR SHALL NOT EXCAVATE MORE TRENCH LENGTH THAN CAN BE RESTORED WITHIN THE SAME WORK DAY. ALL TRENCHES SHALL BE BACKFILLED OR PLATED AT THE END OF EACH WORK DAY OR WHEN THE CONTRACTOR IS NOT ON SITE.
- THE CONTRACTOR SHALL SUPPLY THE AUTHORITY WITH CORRECT AS-BUILT PLANS BEFORE SUBSTANTIAL COMPLETION WILL BE GRANTED.
- THE REPLACEMENT PAVEMENT SECTION SHALL BE AS SET FORTH IN SECTION 5.1 OF THE CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS. SEE UTILITY TRENCH REPAIR DETAIL (UTR-1) IN SAME STANDARDS.

WATERLINE NOTES

- INSTALL WATERLINE AND APPURTENANCES IN ACCORDANCE WITH THE DETAILS SHOWN ON THESE DRAWINGS AND ALL OTHER AUTHORITY REGULATIONS.
- A TYPICAL MINIMUM COVER OF THREE (3) FEET IS REQUIRED OVER PROPOSED WATERLINES UNLESS OTHERWISE INDICATED ON PLANS.
- WATER MAINS SHALL BE A MINIMUM CLASS 350 DUCTILE IRON PER AWWA C151, UNLESS OTHERWISE INDICATED ON PLANS.
- ALL WATERLINES SHALL BE INSTALLED ACCORDING TO THE PROFILES INCLUDED WITH THESE PLANS AND WITHOUT ANY ADDITIONAL HIGH POINTS OTHER THAN THOSE INDICATED ON PROFILES. SHOULD THE CONTRACTOR CONSTRUCT WATERLINE WITH HIGH POINTS NOT SHOWN ON PROFILES, THE CONTRACTOR SHALL INSTALL ADDITIONAL AIR RELEASE VALVES AT SUCH HIGH POINTS AND IN-LINE BLOW-OFFS AT ADJACENT LOW POINTS WITH NO ADDITIONAL COST TO THE AUTHORITY.
- ALL SERVICE LATERALS CROSSING ROADWAYS SHOULD BE BORED ACROSS TO A POINT PAST OPPOSITE EDGE OF PAVEMENT WITH MINIMAL ADDITIONAL DAMAGE TO ROAD SURFACE.
- THE TOPS OF ALL VALVE BOXES, VALVE VAULTS, AND ACCESS MANHOLES SHALL BE INSTALLED TO GRADE AND FLUSH WITH PAVED SURFACES.
- ALL WATERLINES SHALL BE PROPERLY RESTRAINED WITH THRUST BLOCKS OR JOINT RESTRAINTS AS SHOWN ON AUTHORITY'S DETAILS.
- WHERE WATERLINE MUST CROSS UNDER STORM DRAINS, PIPES SHALL HAVE A MINIMUM OF 18" OF SEPARATION, OR THE STORM PIPE SHALL BE SUPPORTED IN ACCORDANCE WITH THE AUTHORITY'S STANDARDS.
- ALL WATERLINES AND SERVICE LATERALS SHALL BE PRESSURE TESTED, AFTER BACKFILLING, TO A HYDROSTATIC PRESSURE OF NOT LESS THAN 100psi ABOVE THE DESIGN WATER PRESSURE FOR THE SYSTEM OR 200psi, WHICHEVER IS GREATER. TESTING PROCEDURE AND ALLOWABLE LEAKAGE SHALL BE ACCORDING TO AUTHORITY STANDARDS.

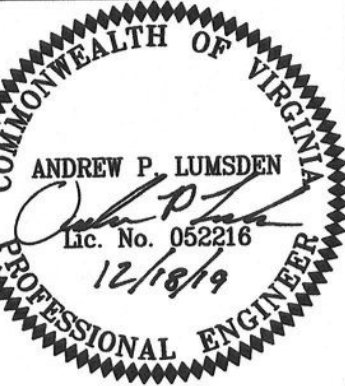
LEGEND		
ITEM	EXISTING	PROPOSED
Pavement	----	----
Curb and Gutter	----	----
Curb	----	----
Pavement Replacement	----	----
Storm Drain Line	24" RCP	----
Sanitary Sewer Manhole	SS	SS
Sanitary Sewer Line	8" SS	8" W
Waterline	16" W	8" W HP
High Pressure Waterline	----	----
Single Water Service	----	----
Double Water Service	----	----
Hydrant	RT	RT
Gate Valve	GV	GV
Underground Electric Line	UE	UE
Overhead Electric Line	OHE	OHE
Underground Telephone Line	UGT	UGT
Underground Gas Line	GAS	GAS
Utility Pole	UP	UP
Fence	X	X
Contours	1216	1216
Spot Elevation	1214.8	X
Treeline	----	----

ABBREVIATIONS	
D.E.	DRAINAGE EASEMENT
W.E.	WATER LINE EASEMENT
S.S.E.	SANITARY SEWER EASEMENT
P.U.E.	PUBLIC UTILITY EASEMENT
ESMT.	EASEMENT
M.B.L.	MINIMUM BUILDING LINE
R/W	RIGHT OF WAY
VAR.	VARIABLE
EX.	EXISTING
D.B.	DEED BOOK
P.B.	PLAT BOOK
PG.	PAGE
No.	NUMBER
TYP.	TYPICAL
STA	STATION
L.T.	LEFT
R.T.	RIGHT
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SSMH	SANITARY SEWER MANHOLE
W	WATER LINE

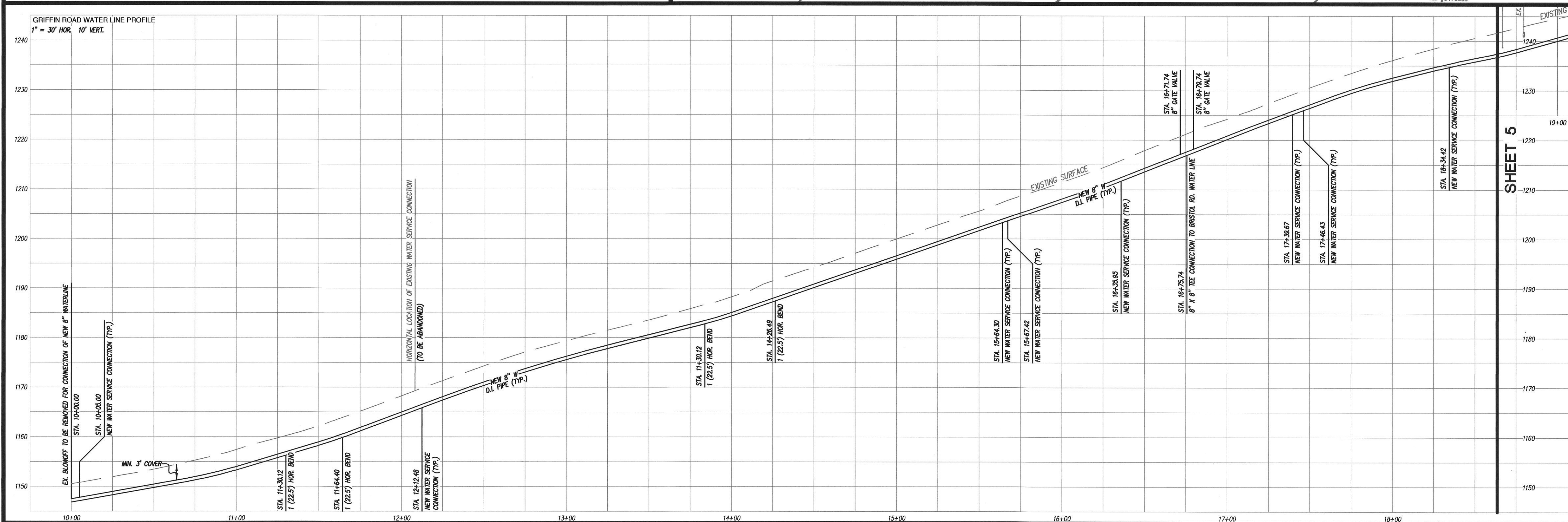
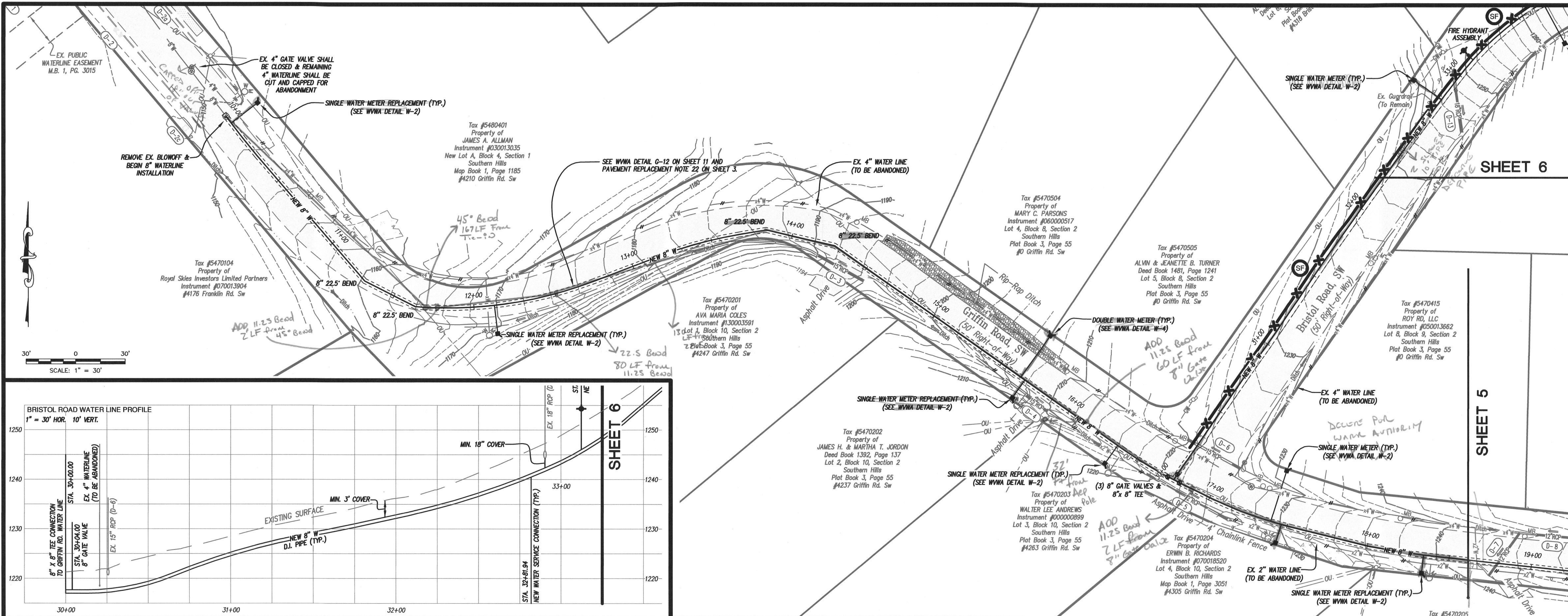


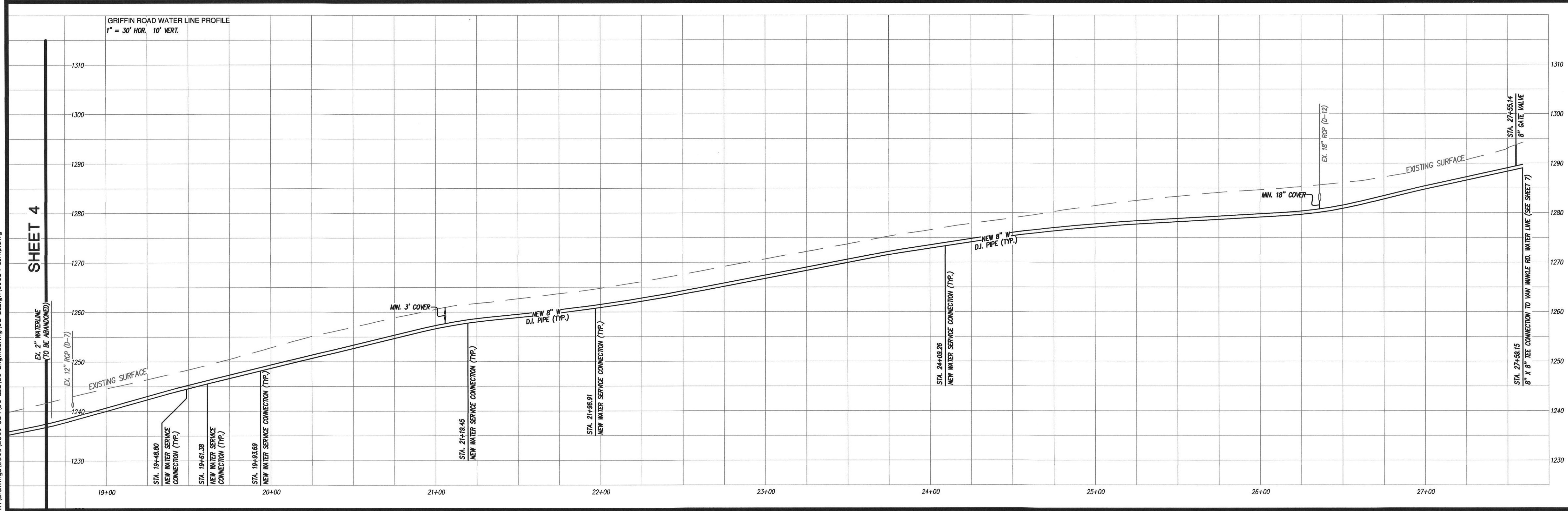
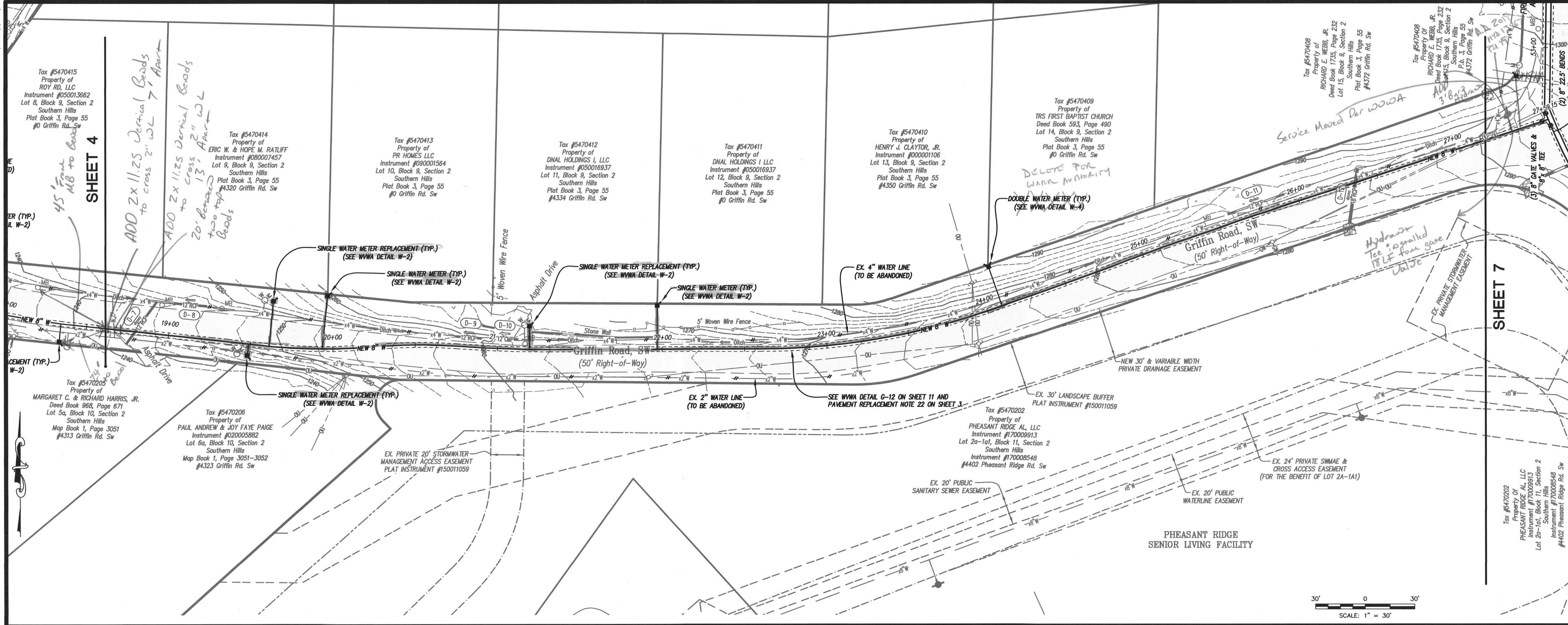
SHEET LAYOUT AND FIRE HYDRANT LOCATION

1" = 150'



REVISIONS		DATE	DESCRIPTION
NO.	1		
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	3		
	4		
	5		
DATE:		December 18, 2019	
SCALE:		AS SHOWN	
COMMISSION NO:		19-034	
SHEET		3 OF 12	





Lumsden Associates, P.C.
ENGINEERS | SURVEYORS | PLANNERS

COMMONWEALTH OF VIRGINIA
ANDREW P. LUMSDEN
Lic. No. 052218
12/18/19
PROFESSIONAL ENGINEER

PLAN & PROFILE
WESTERN GRIFFIN ROAD

GRIFFIN / VAN WINKLE
WATERLINE REPLACEMENTS
PREPARED FOR
WESTERN VIRGINIA WATER AUTHORITY
SITUATED IN
THE CITY OF ROANOKE, VIRGINIA

REVISIONS	
NO.	DESCRIPTION
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2	
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5	

DATE:
December 18, 2019

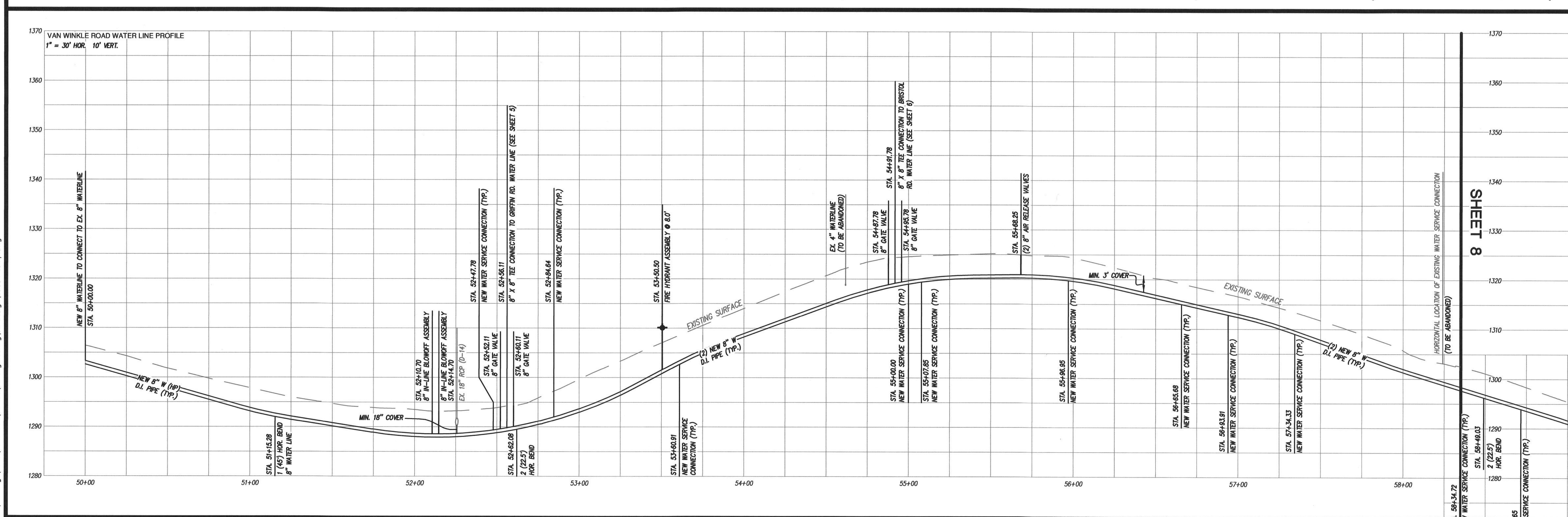
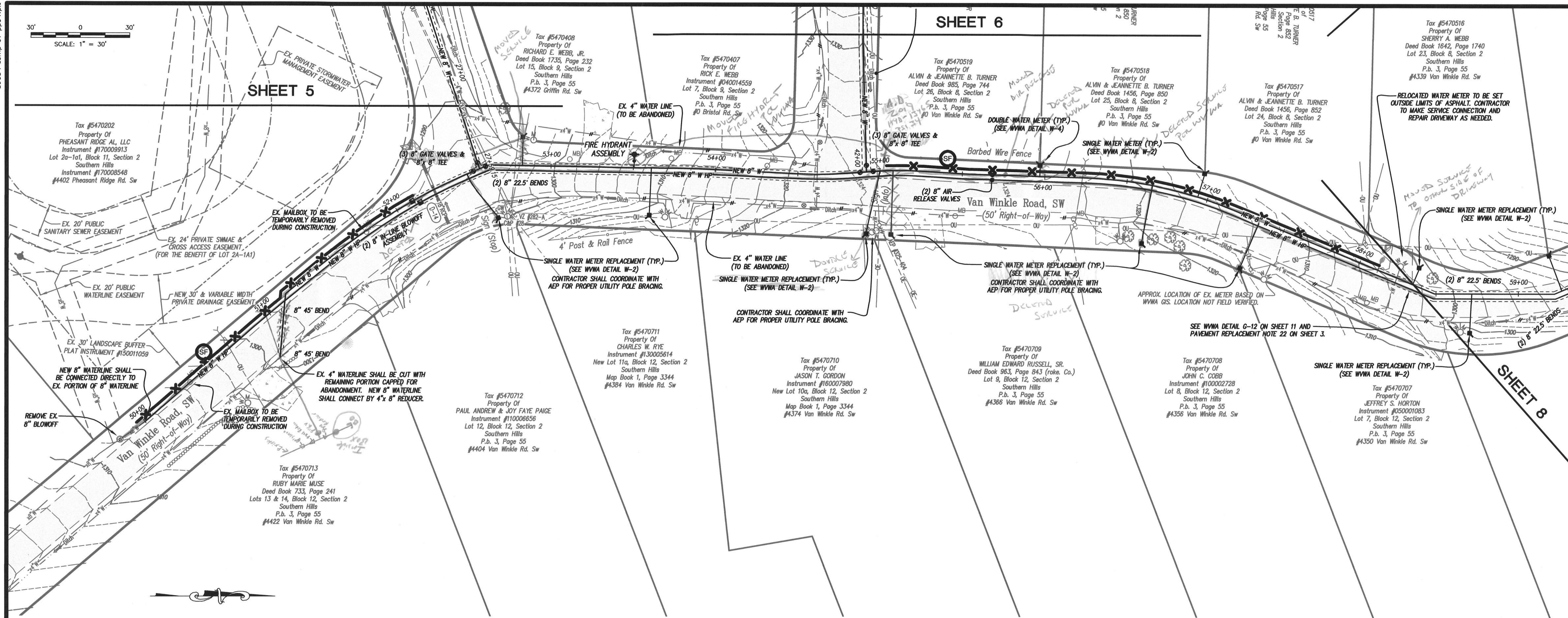
SCALE:
1" = 30'

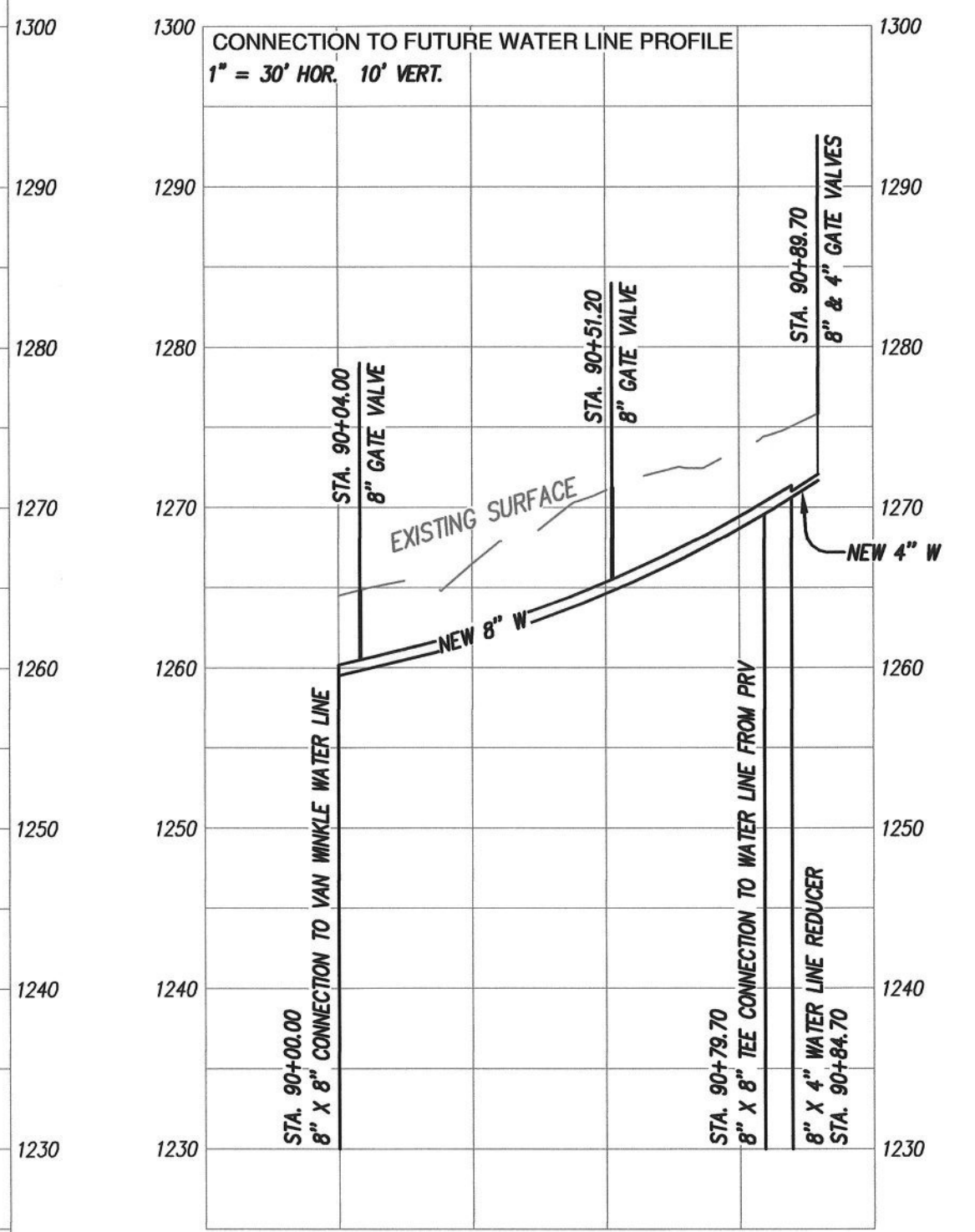
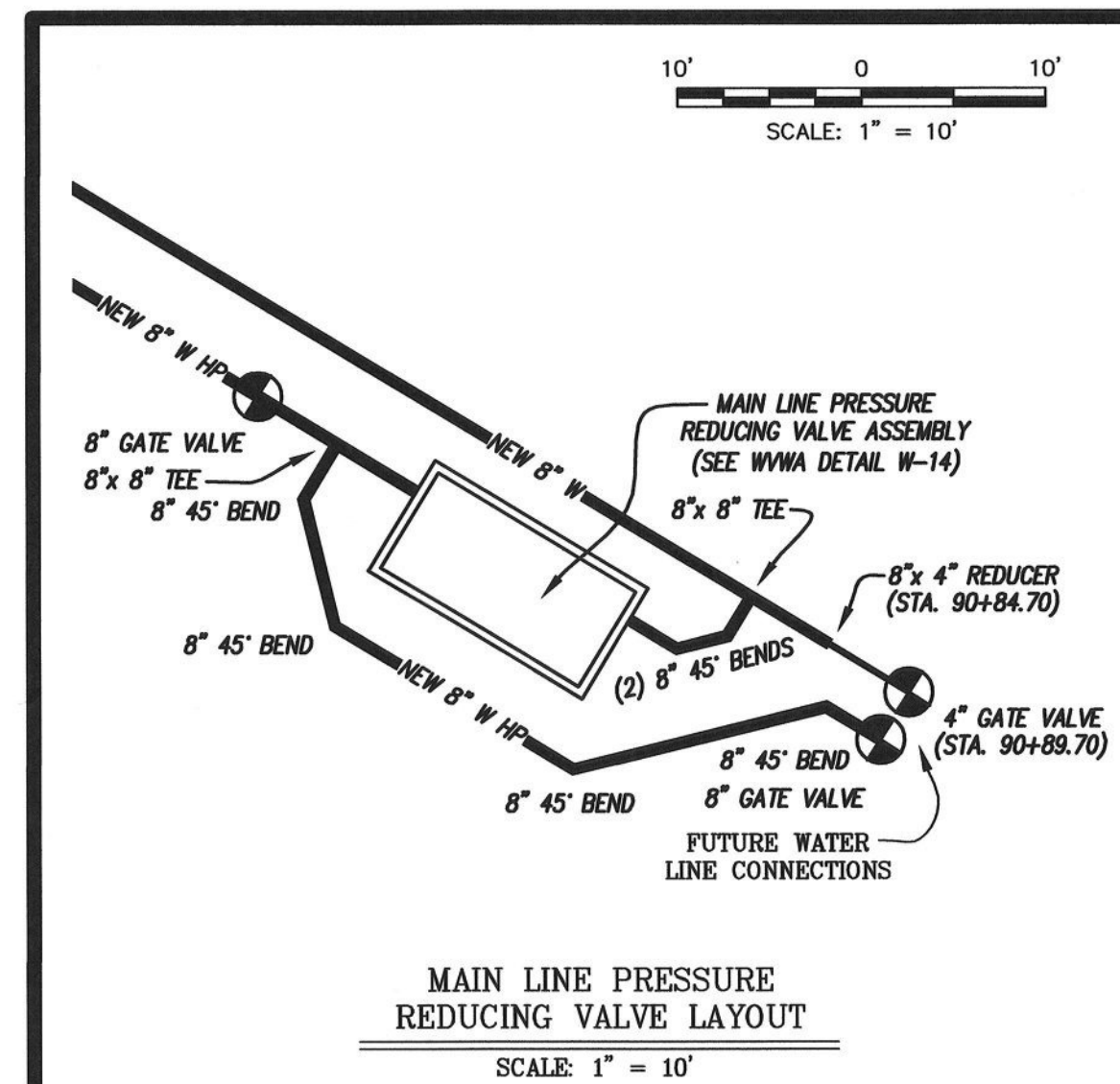
COMMISSION NO:
19-034

SHEET 5 OF 12

PHONE: (540) 774-4411
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4664 BRAMBLETON AVENUE
P.O. BOX 20689
ROANOKE, VIRGINIA 24018

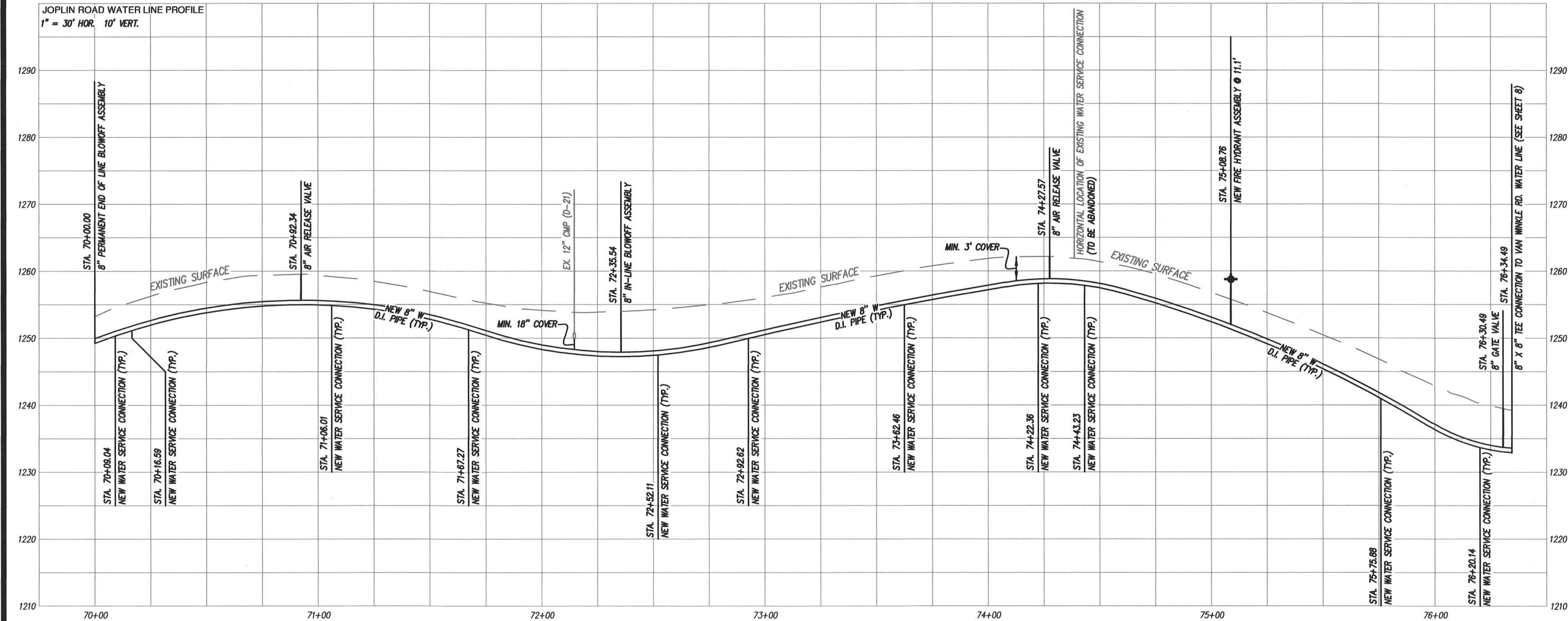
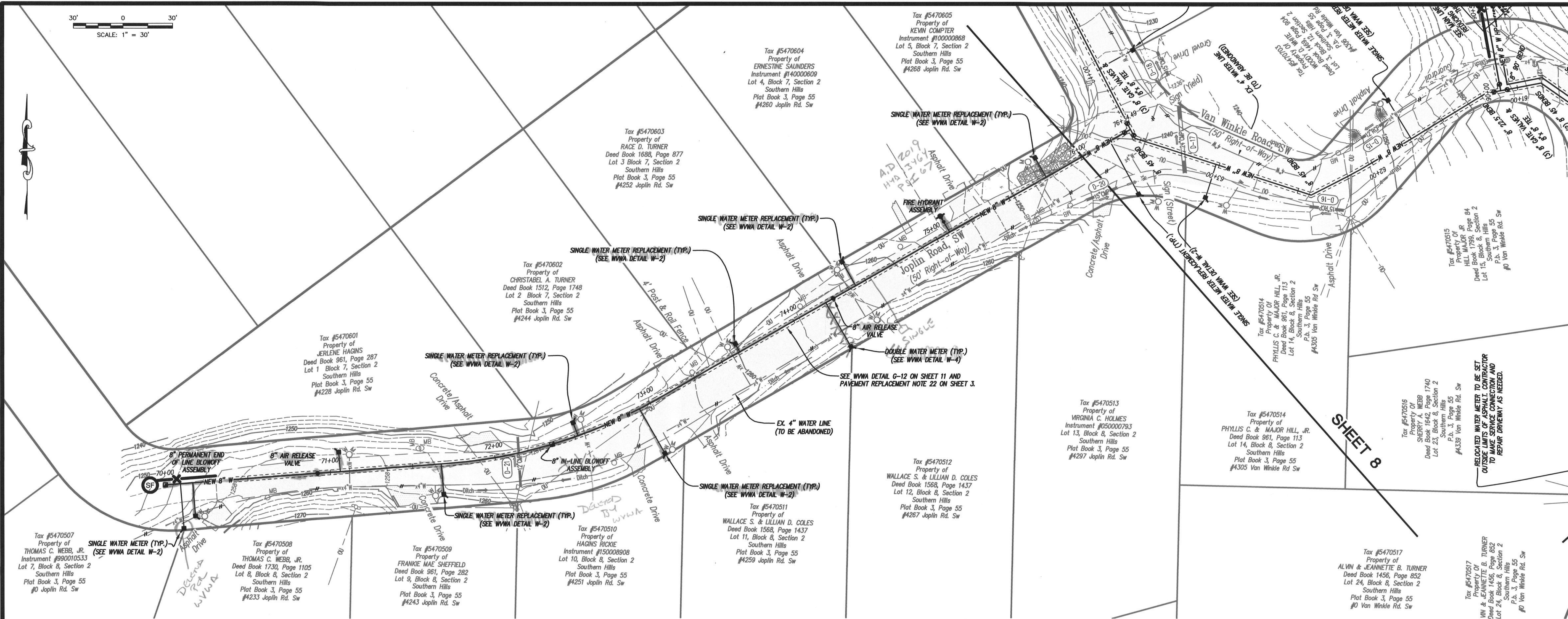




REVIEWS		
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DATE:	December 18, 2019
SCALE:	1" = 30'
COMMISSION NO:	19-034
SHEET 8 OF 12	

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Lumsden Associates, P.C.
ENGINEERS | SURVEYORS | PLANNERS

4664 BRAMBLETON AVENUE
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ROANOKE, VIRGINIA 24018
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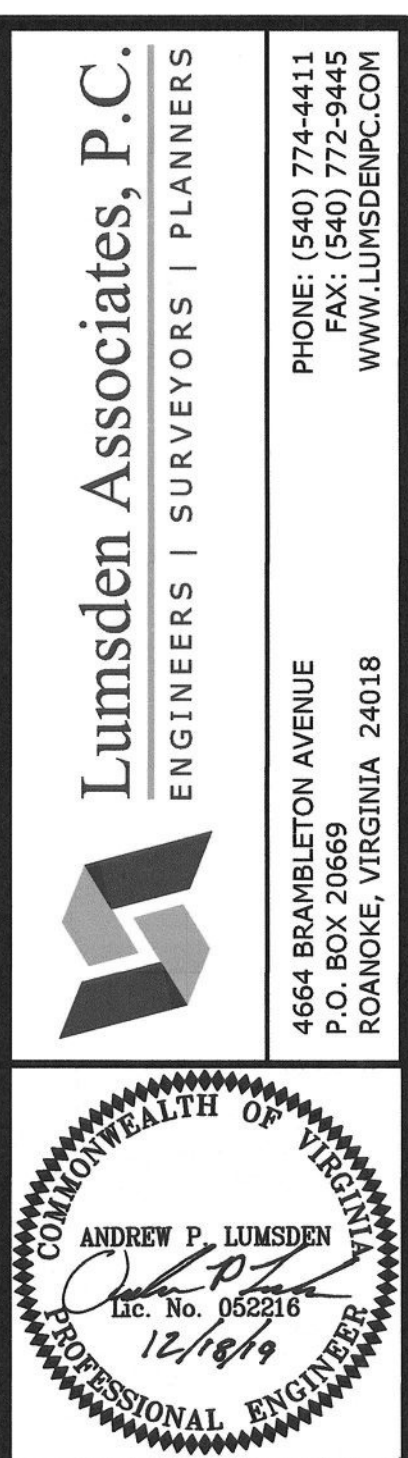
COMMONWEALTH OF VIRGINIA
ANDREW P. LUMSDEN
Lic. No. 052216
12/16/19
PROFESSIONAL ENGINEER

PLAN & PROFILE
JOPLIN ROAD

GRIFFIN / VAN WINKLE
WATERLINE REPLACEMENTS
PREPARED FOR
WESTERN VIRGINIA WATER AUTHORITY
SITUATED IN
THE CITY OF ROANOKE, VIRGINIA

REVISIONS	
NO.	DESCRIPTION
1	
2	
3	
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DATE: December 18, 2019
SCALE: 1" = 30'
COMMISSION NO: 19-034
SHEET 9 OF 12



**PLAN & PROFILE
ROY DRIVE**

**GRIFFIN / VAN WINKLE
WATERLINE REPLACEMENTS
PREPARED FOR
WESTERN VIRGINIA WATER AUTHORITY
SITUATED IN
THE CITY OF ROANOKE, VIRGINIA**

REVISIONS	
NO.	DESCRIPTION
1	
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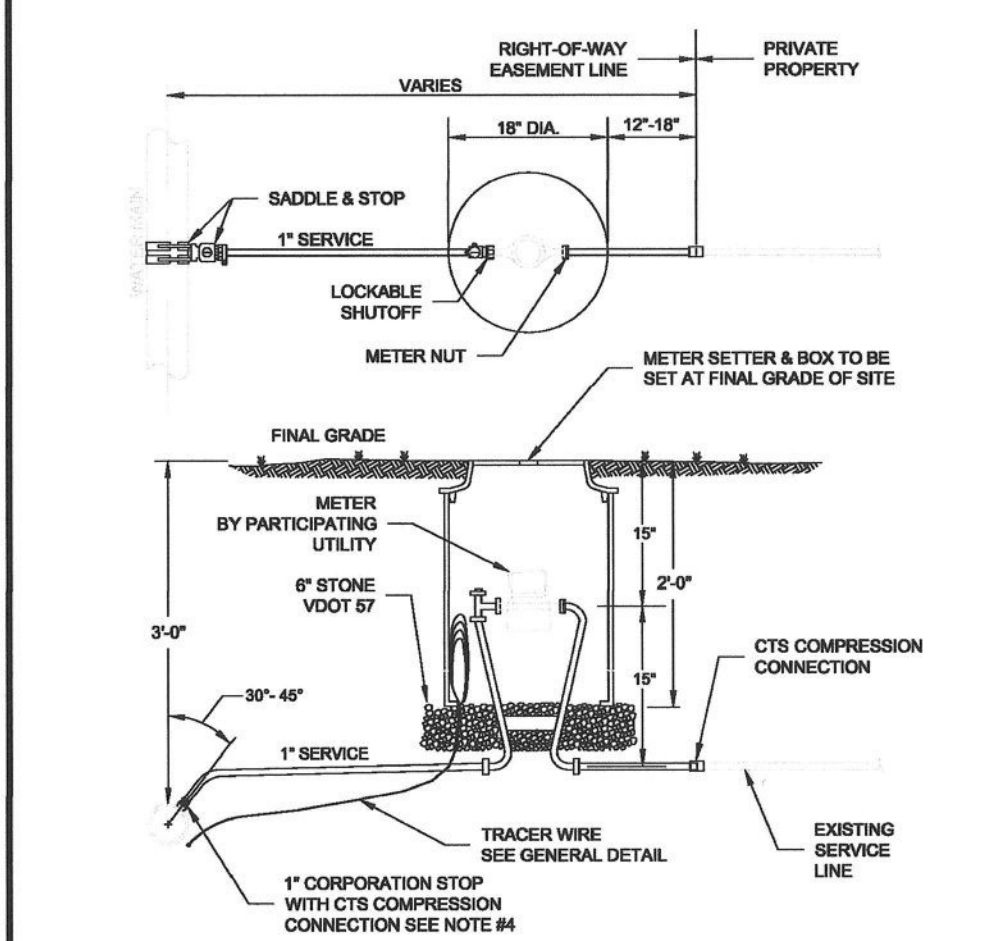
DATE: December 18, 1991

SCALE: 1" = 30'

COMMISSION NO: 19-034

SHEET 10 OF 12

1. SETTER TO BE A.Y. McDONALD 720-219W0033, FORD 1972-19W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3419AS, ROMAC 200, OR 300, OR FORD METER F8002 OR F8003. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER F8002.
3. METER BOX SHALL BE CAPSOMMA DESIGN, INC. PLASTIC BOX WITH FORD "M" DOMESTIC SERIES FRAME WITH A NICO DOMESTIC 12.25 CK LID WITH SENSUS RECESS AND WYMA LOGO, ADS CORRUGATED HOPE BOX WITH FORD "M" DOMESTIC SERIES FRAME WITH A NICO DOMESTIC 12.25 CK LID WITH SENSUS RECESS AND WYMA LOGO OR APPROVED EQUAL. METER BOX SHALL NOT BE PLACED IN AREAS SUBJECT TO VEHICULAR TRAFFIC. IF TRAFFIC BEARING BOX IS REQUIRED, DESIGN ENGINEER SHALL CONSULT WITH PARTICIPATING UTILITY TO DETERMINE SITE SPECIFIC REQUIREMENTS.
4. CORPORATION STOP SHALL BE FORD F81004-4-NL, MUELLER 9-2500B OR APPROVED EQUAL.
5. SERVICE SHALL BE "C" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, 300R (200 psi).
6. WHENEVER SIDEWALK EXIST OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.

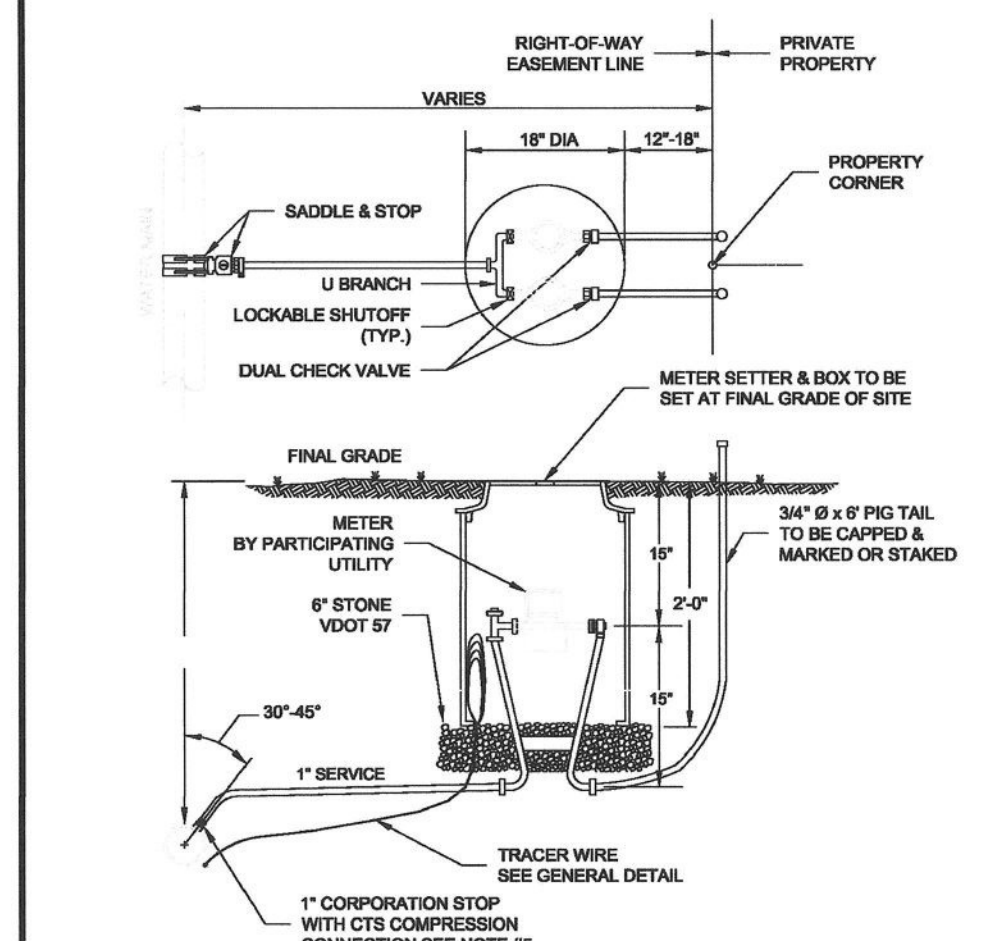


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SINGLE RESIDENTIAL WATER SERVICE
(REPLACEMENT OF EXISTING SERVICE)

W-2

1. SETTER TO BE A.Y. McDONALD 720-219W0033, FORD 1972-19W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3419AS, ROMAC 200, OR 300, OR FORD METER F8002 OR F8003. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER F8002.
3. METER BOX SHALL BE CAPSOMMA DESIGN, INC. PLASTIC BOX WITH FORD "M" DOMESTIC SERIES FRAME WITH A NICO DOMESTIC 12.25 CK LID WITH SENSUS RECESS AND WYMA LOGO, ADS CORRUGATED HOPE BOX WITH FORD "M" DOMESTIC SERIES FRAME WITH A NICO DOMESTIC 12.25 CK LID WITH SENSUS RECESS AND WYMA LOGO OR APPROVED EQUAL. METER BOX SHALL NOT BE PLACED IN AREAS SUBJECT TO VEHICULAR TRAFFIC. IF TRAFFIC BEARING BOX IS REQUIRED, DESIGN ENGINEER SHALL CONSULT WITH PARTICIPATING UTILITY TO DETERMINE SITE SPECIFIC REQUIREMENTS.
4. CORPORATION STOP SHALL BE FORD F81004-4-NL, MUELLER 9-2500B OR APPROVED EQUAL.
5. SERVICE SHALL BE "C" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, 300R (200 psi).
6. WHENEVER SIDEWALK EXIST OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.

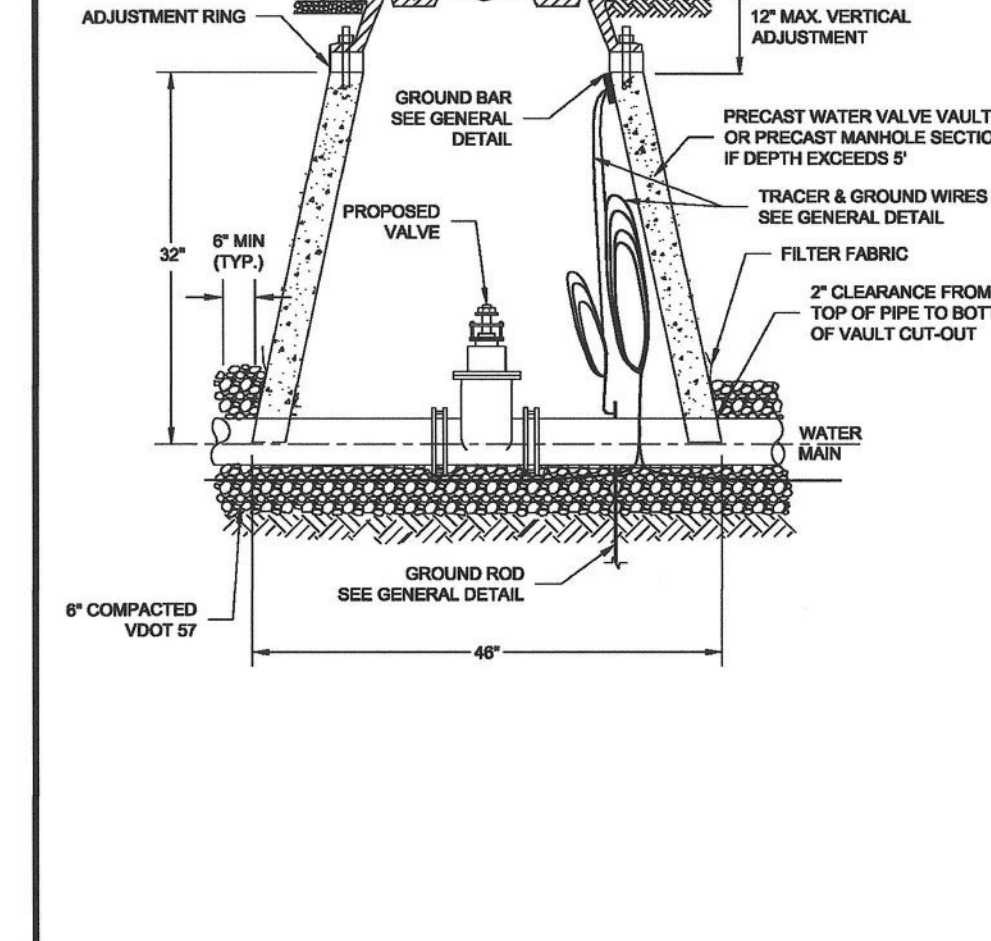


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DOUBLE RESIDENTIAL WATER SERVICE
(LINE PRESSURE UNDER 150 PSI)

W-4

1. FILTER FABRIC TO BE INSTALLED BETWEEN BOTTOM OF PIPE AND STONE BEDDING. FABRIC TO EXTEND VERTICALLY A MINIMUM OF 6" FROM BOTTOM OF VAULT (FULL CIRCUMFERENCE).

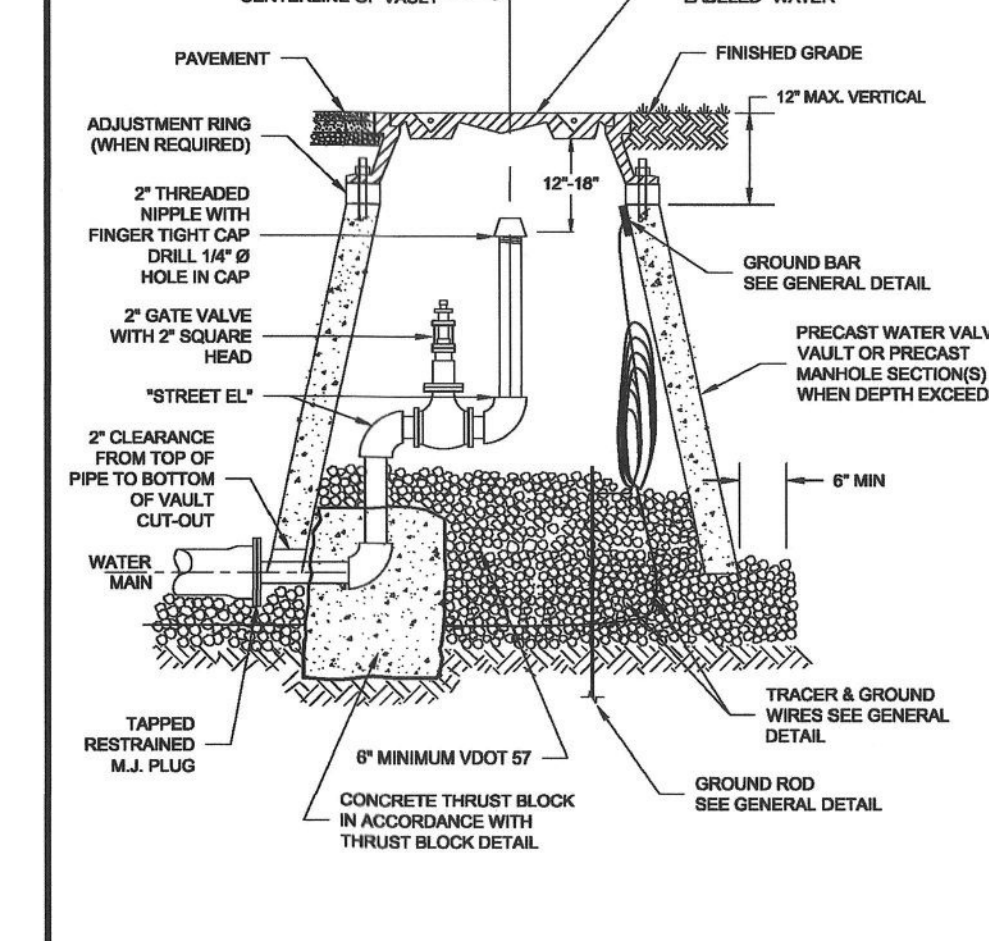


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

WATER LINE VALVE & VAULT

W-9

1. WHEN APPROVED BY PARTICIPATING UTILITY, FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE WATER SYSTEM DESIGN STANDARDS FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE CURB & GUTTER.
4. THE PIPING AND "STREET ELB" BETWEEN THE MAIN LINE AND 2" GATE VALVE SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
5. RESTRAINED JOINTS SHALL BE INSTALLED BEFORE M.J. PLUG FOR DISCHARGE SHOWN IN THE MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTH DETAIL FOR VALVE PLUS AND CORRESPONDING PIPE JOINT DETAIL.

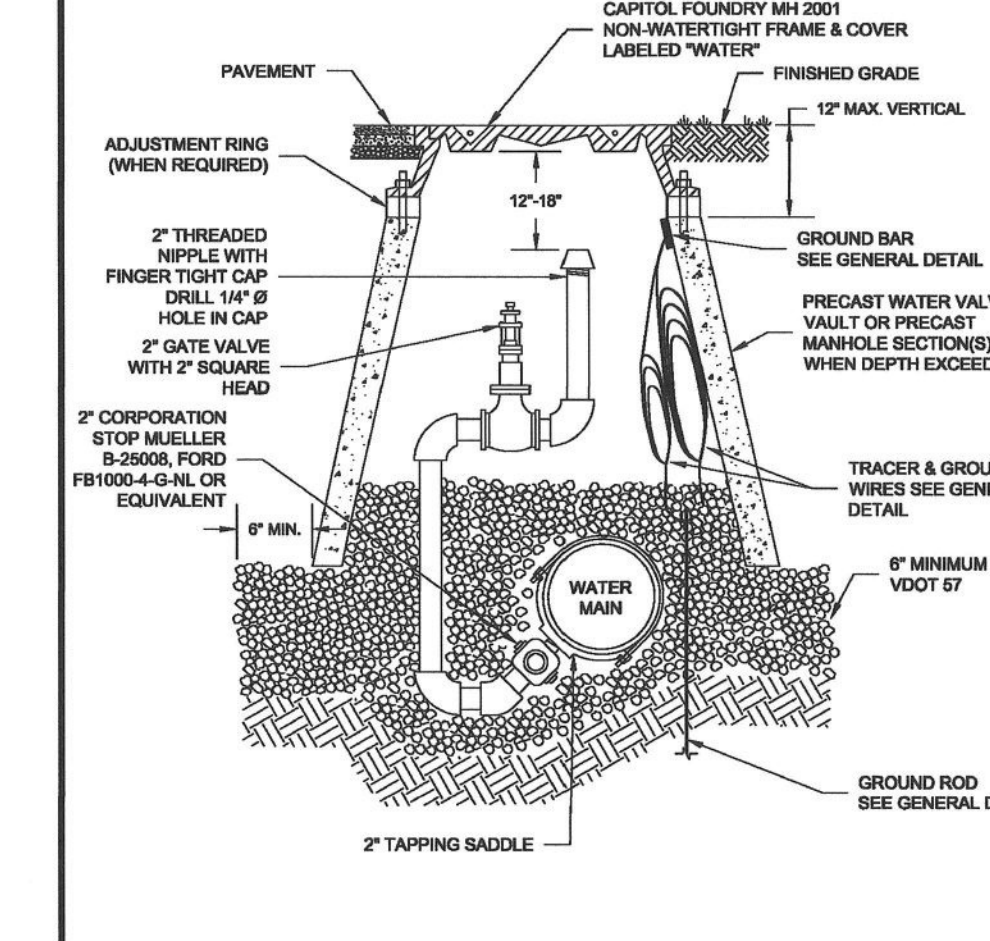


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PERMANENT END OF LINE BLOW-OFF ASSEMBLY

W-10

1. FIRE HYDRANTS MAY BE USED AT LOW POINTS IN PLACE OF BLOW-OFFS.
2. THE PIPING AND "STREET ELB" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
3. THE POINT OF CONNECTION TO THE WATER MAIN SHALL BE LOCATED NEAR THE BOTTOM OF THE MAIN (AS SHOWN) TO FACILITATE REMOVAL OF ACCUMULATED SEDIMENT.
4. SADDLES FOR PLASTIC PIPE SHALL BE PER RESIDENTIAL WATER SERVICE DETAIL.

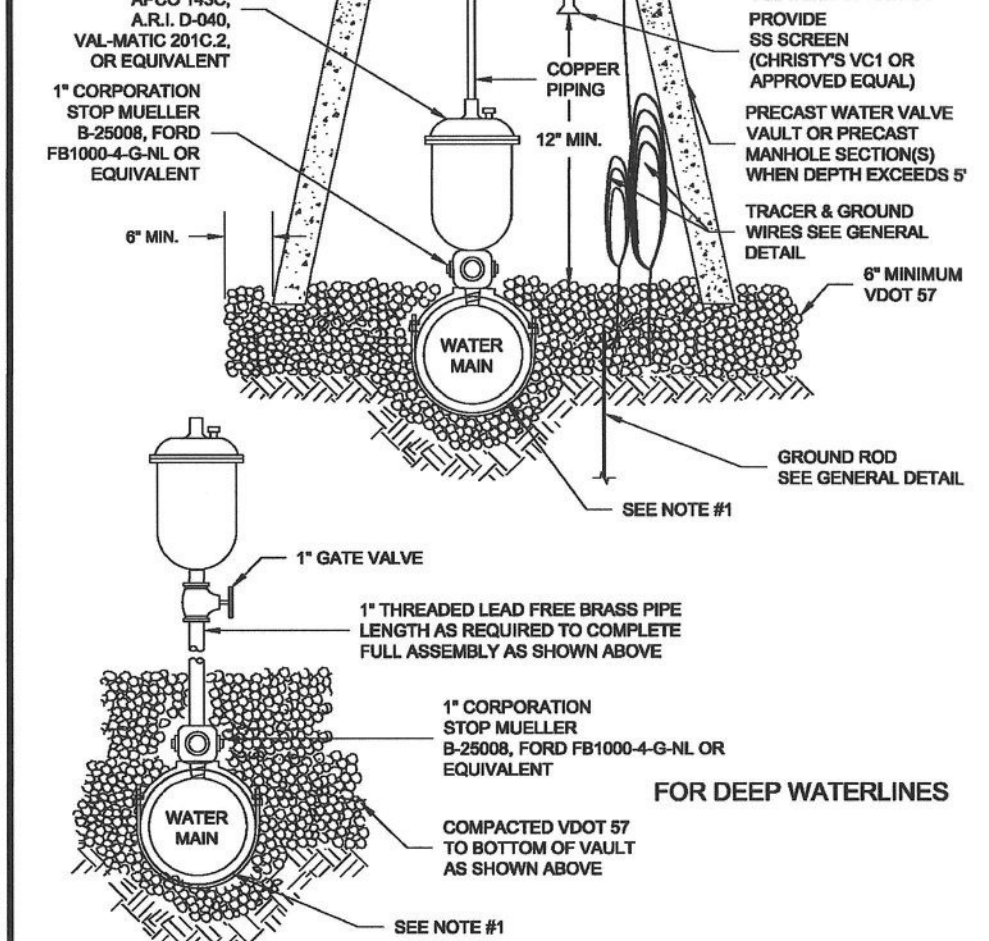


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

IN-LINE BLOW-OFF ASSEMBLY

W-12

1. SEE RESIDENTIAL WATER SERVICE DETAIL FOR SADDLE REQUIREMENTS.
2. LARGER COMBINATION VALVE MAY BE REQUIRED DEPENDING ON APPLICATION.

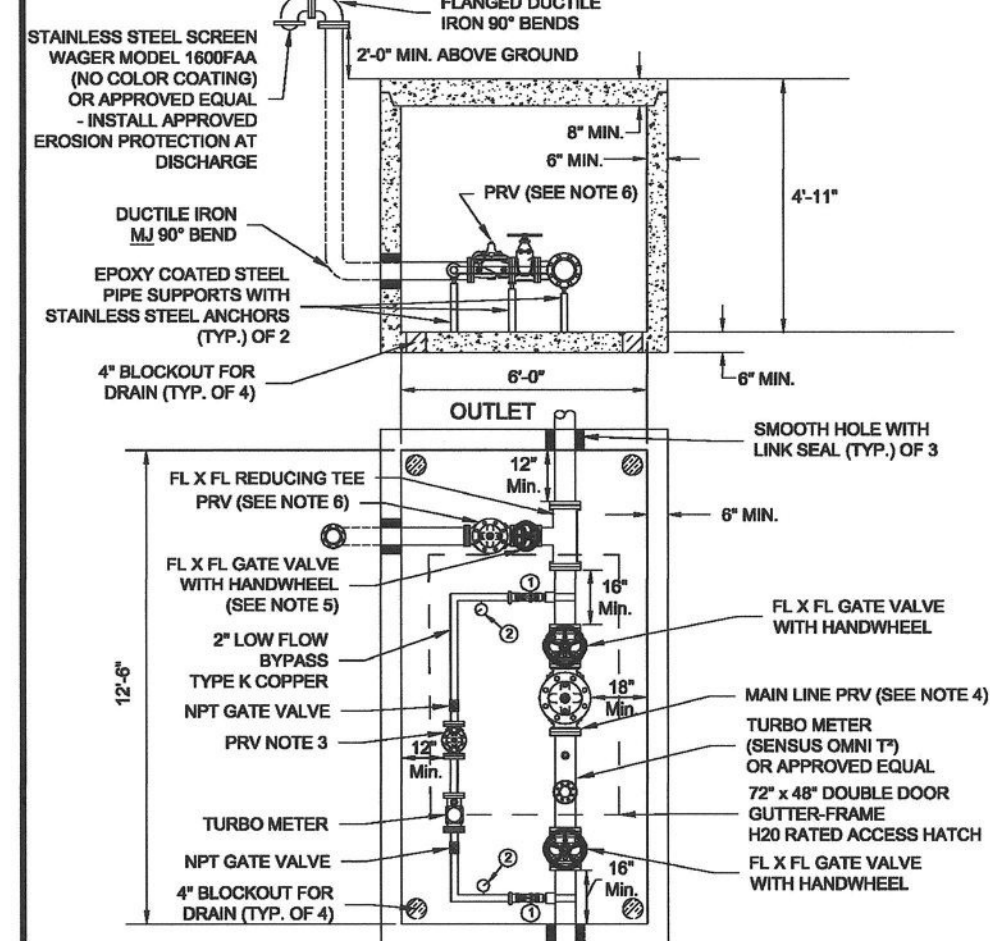


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

COMBINATION AIR VALVE ASSEMBLY

W-13

1. 2" CORPORATION STOP: MUELLER 9-2500B, FORD F81004-4-NL OR EQUIVALENT.
2. LIQUID FILLED PRESSURE GAUGE.
3. 2" FLANGED PRESSURE REGULATING VALVE (CL-AVAL MODEL 80-01 OR APPROVED EQUAL) SET AT WORKING PRESSURE.
4. FLANGE: FLANGE MAIN LINE PRESSURE REGULATING VALVE (CL-AVAL MODEL 80-01 OR APPROVED EQUAL) SET AT 1/2" LESS THAN 6". (CL-AVAL 80-01 OR APPROVED EQUAL) MAY BE ALLOWED IN SOME INSTALLATIONS, CONFORM WITH PARTICIPATING UTILITY.
5. FLANGE: FLANGE GATE VALVE, WITH HAND WHEEL, ONE SIZE LESS THAN MAIN LINE.
6. FLANGE: FLANGE PRESSURE RELIEF VALVE, ONE SIZE LESS THAN MAIN LINE (CL-AVAL MODEL 80-01 OR APPROVED EQUAL) SET AT 1/2" GREATER THAN MAIN LINE.
7. VAULT SHALL BE PRE-CAST 5000 PSI REINFORCED CONCRETE.
8. MAIN LINE INLET, OUTLET, AND INTERIOR PIPING SHALL BE FLANGED - FLANGE END, OR PLAIN END DUCTILE IRON PIPE WITH APPROVED FLANGE ADAPTER, MIN. PRESSURE CLASS 300 OR THICKNESS CLASS 50.
9. VAULT TO BE INSTALLED ON M.J. 6" COMPACTED VDOT 87 STONE WITH FILTER FABRIC PLACED BETWEEN BOTTOM OF VAULT AND STONE BEDDING. FILTER FABRIC TO EXTEND VERTICALLY A MINIMUM OF 6" ON ALL FOUR SIDES OF VAULT.

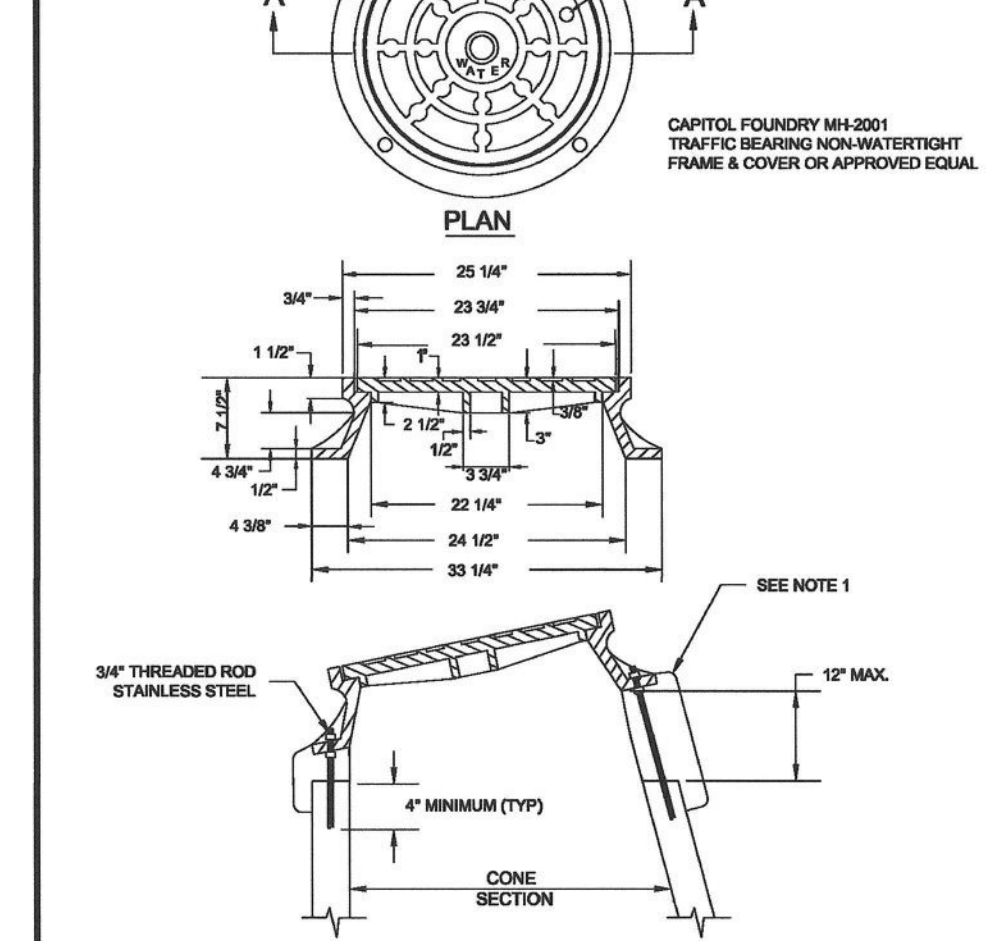


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MAIN LINE - PRESSURE REDUCING VALVE ASSEMBLY

W-14

1. USE MODERATELY STIFF MIX OF NON-SHRINK GROUT, SAND, AND 1/2" LESS DIAMETER GRAVEL WITH 28 DAYS STRENGTH AT MINIMUM 3,000 P.S.I.
2. MIX IS TO BE FORCED INTO ALL JOINTS AND UNDER FLANGE OF FRAME AND LEFT AT OR ABOVE TOP OF FLANGE.
3. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CONCRETE IS PLACED. THE USE OF HIGH EARLY STRENGTH GROUT WOULD REDUCE TIME TO GRAH.
4. RESTRICT TRAFFIC LOAD FOR A MINIMUM OF 24 HOURS.

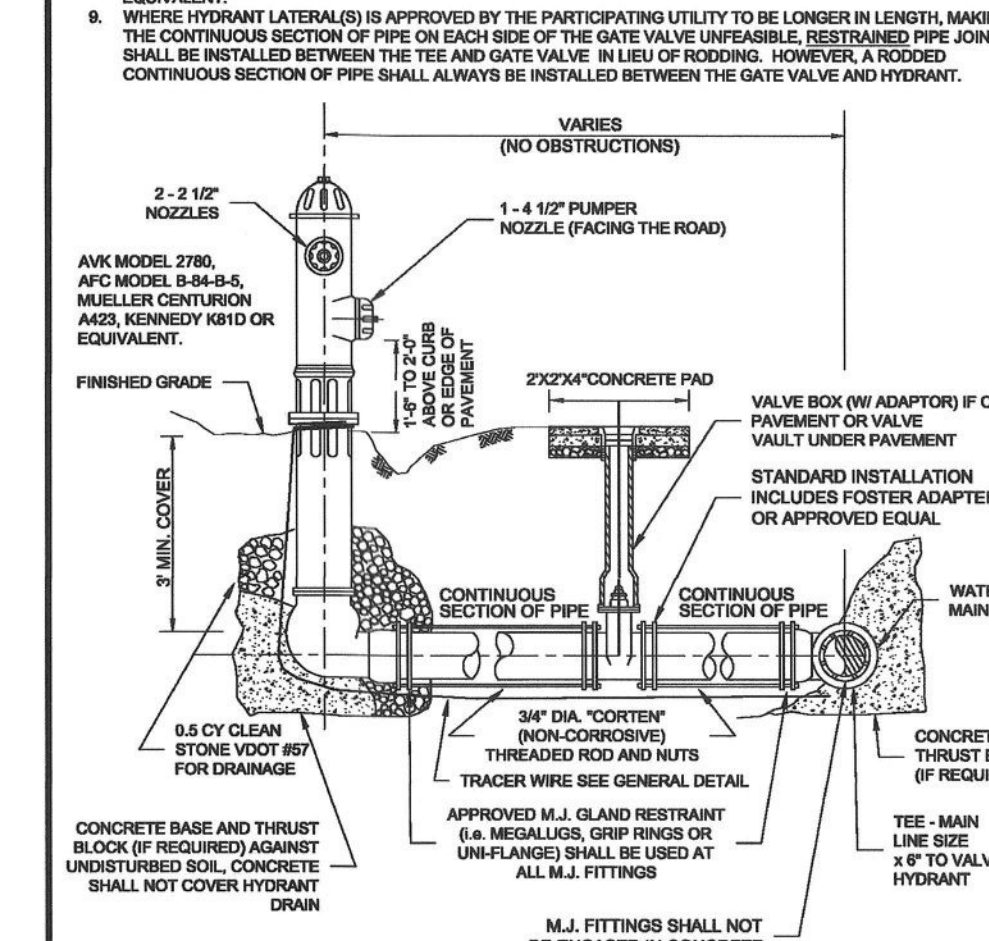


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

VAULT FRAME AND COVER

W-16

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT. PRIVATE HYDRANTS SHALL ALSO BE PAINTED SILVER WITH AN OIL-BASED PAINT UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL FIRE MARSHAL.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE WATER SYSTEM DESIGN STANDARDS FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE CURB & GUTTER.
4. THE PIPING AND "STREET ELB" BETWEEN THE MAIN LINE AND 2" GATE VALVE SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
5. RESTRAINED JOINTS SHALL BE INSTALLED BEFORE M.J. PLUG FOR DISCHARGE SHOWN IN THE MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTH DETAIL FOR VALVE PLUS AND CORRESPONDING PIPE JOINT DETAIL.

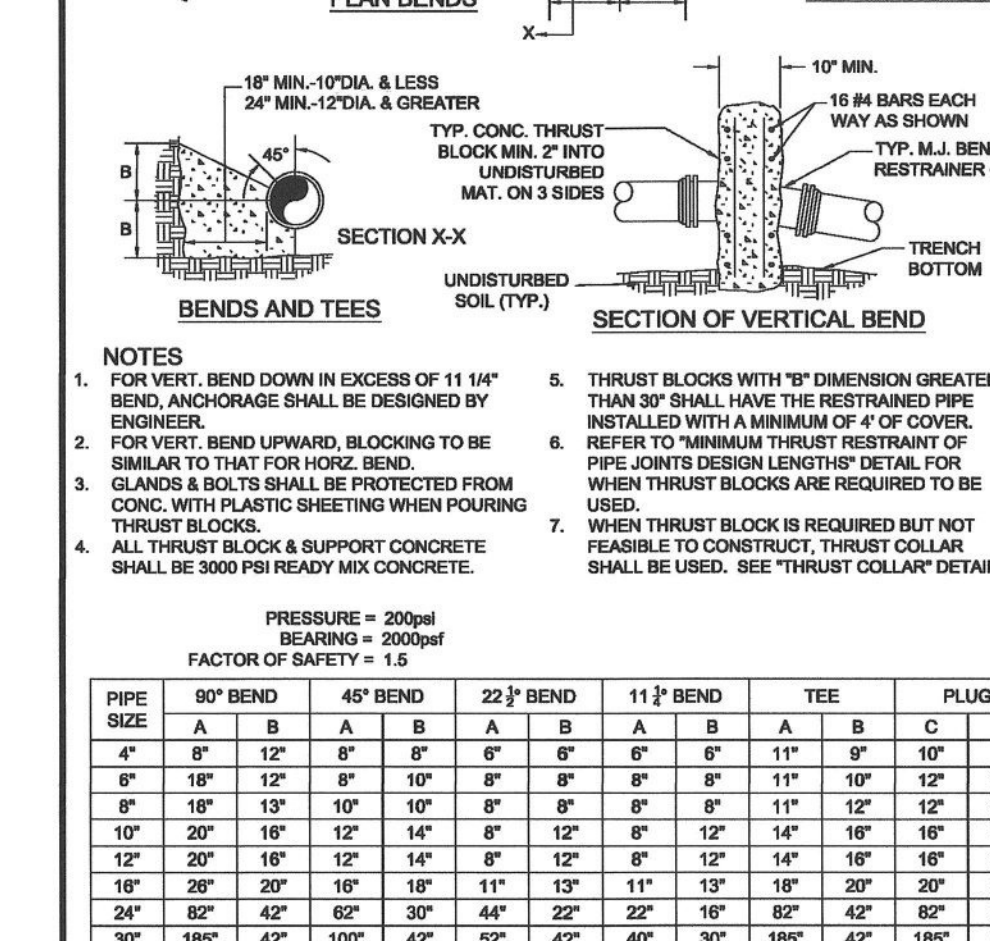


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

FIRE HYDRANT ASSEMBLY

W-17

1. FOR VERTICAL BEND DOWN IN EXCESS OF 11 1/4" BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
2. FOR VERTICAL BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZONTAL BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM WHEN THRUST BLOCKS ARE REQUIRED TO BE USED.
4. ALL THRUST BLOCK & SUPPORT CONCRETE SHALL BE 3000 PSI READY MIX CONCRETE.
5. THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINED PIPE INVERTED WITH A MINIMUM OF 4" OF COVER.
6. REFER TO MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTH DETAIL FOR WHEN THRUST BLOCKS ARE REQUIRED TO BE USED.
7. 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

W-18

PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG	REDUCER (NOTES 4, 5)	45° VERT.	22 1/2° VERT.	11 1/4° VERT.
6"	D.I.	28'	21'	16'	12'	3'	3'	28'	21'	16'	12'
8"	D.I.	36'	28'	21'	16'	4'	4'	36'	28'	21'	16'
10"	D.I.	43'	34'	25'	19'	5'	5'	43'	34'	25'	19'
12"	D.I.	51'	41'	30'	22'	6'	6'	51'	41'	30'	22'
6"	PVC	29'	21'	16'	12'	3'	3'	29'	21'	16'	12'
8"	PVC	37'	28'	21'	16'	4'	4'	37'	28'	21'	16'
10"	PVC	44'	34'	25'	19'	5'	5'	44'	34'	25'	19'
12"	PVC	51'	41'	30'	22'	6'	6'	51'	41'	30'	22'

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 DIAMETERS: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINTS ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCKS AND RESTRAINED JOINTS SHALL BE USED.
6. LARGER THAN 12" DIAMETERS: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINTS ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCKS AND RESTRAINED JOINTS SHALL BE USED (UNLESS OTHERWISE APPROVED BY THE PARTICIPATING UTILITY).
7. FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING R.J. PVC AND R.J. DIP MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONTRACTOR MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND DIP BELL AND SPOOT DIMENSIONS.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS

W-19

Nominal Pipe Size (Inches)	Deflection Angle - θ (Degrees)	Maximum Offset - S (Inches)		Approximate Radius of Curve - R (Feet)	
		Joint Length 15-Feet	Joint Length 20-Feet	Joint Length 15-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
10"	5°	19	21	205	230
12"	5°	19	21	205	230
14"	3°	11	12	340	380
16"	3°	11	12	340	380
18"	3°	11	12	340	380
20"	3°	11	12	340	380
24"	3°	11	12	340	380
30"	3°	11	12	340	380

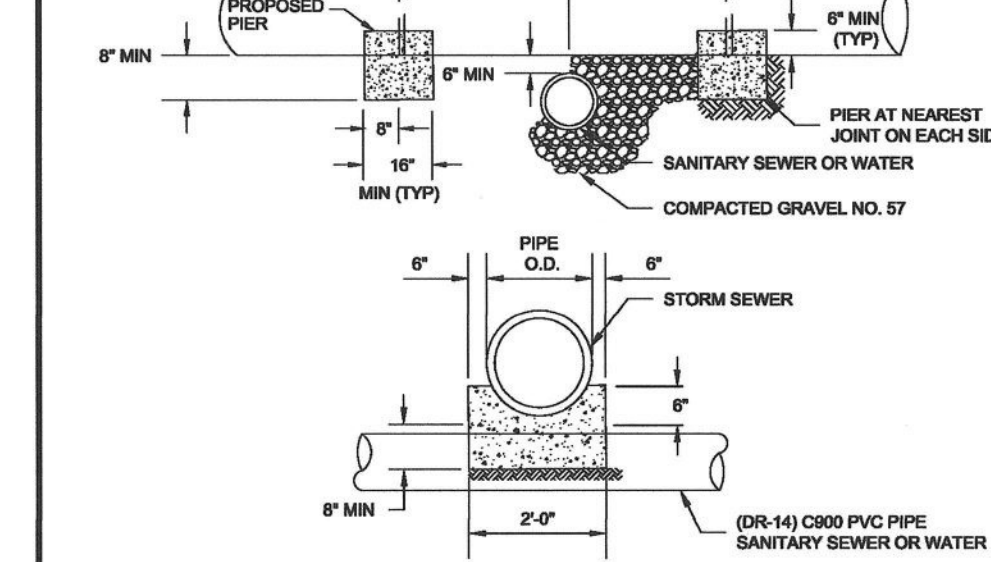
Nominal Pipe Size (Inches)	Deflection Angle - θ (Degrees)	Maximum Offset - S (Inches)		Approximate Radius of Curve - R (Feet)	
		Joint Length 15-Feet	Joint Length 20-Feet	Joint Length 15-Feet	Joint Length 20-Feet
3"	5°	19	21	205	230
4"	5°	19	21	205	230
6"	5°	19	21	205	230
8"	5°	19	21	205	230
10"	5°	19	21	205	230
12"	5°	19	21	205	230
14"	3°	11	12	340	380
16"	3°	11	12	340	380
18"	3°	11	12	340	380
20"	3°	11	12	340	380
24"	3°	11	12	340	380
30"	3°	11	12	340	380

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DUCTILE IRON PIPE DEFLECTION ALLOWANCE TABLES

W-22

1. PIER REQUIRED WHEN STORM DRAIN OR OTHER PIPES CROSSES OVER THE OTHER UTILITY WITH A VERTICAL CLEARANCE OF LESS THAN 18".
2. PIER TO BE BUILT ON UNDISTURBED EARTH.
3. CONCRETE TO BE READY MIX, CLASS AS.

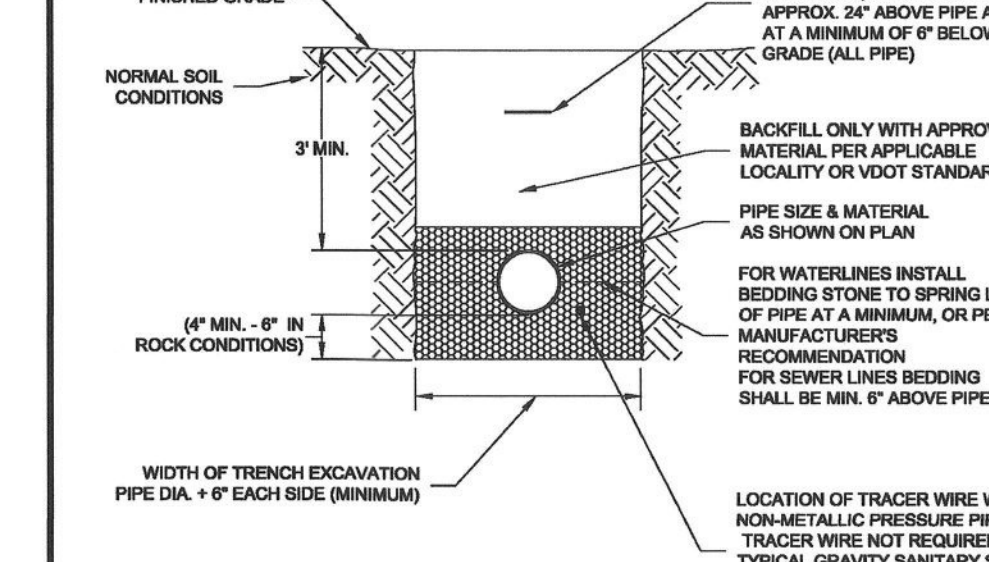


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

CONCRETE PIER

W-22

1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURERS RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT 87 OR R88 STONE, OR CRUSHER RUN.
3. IN AREAS SUBJECT TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS FROM BOTTOM OF TRENCH TO 1" ABOVE THE PIPE AND THE REMAINING SHALL BE PLACED IN 10" LIFTS AND SHALL BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
4. BEDDING REQUIREMENTS FOR DUCTILE IRON WATER LINE ARE DEPENDENT ON MANUFACTURERS BEDDING CRITERIA.
5. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING".
6. 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 SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.

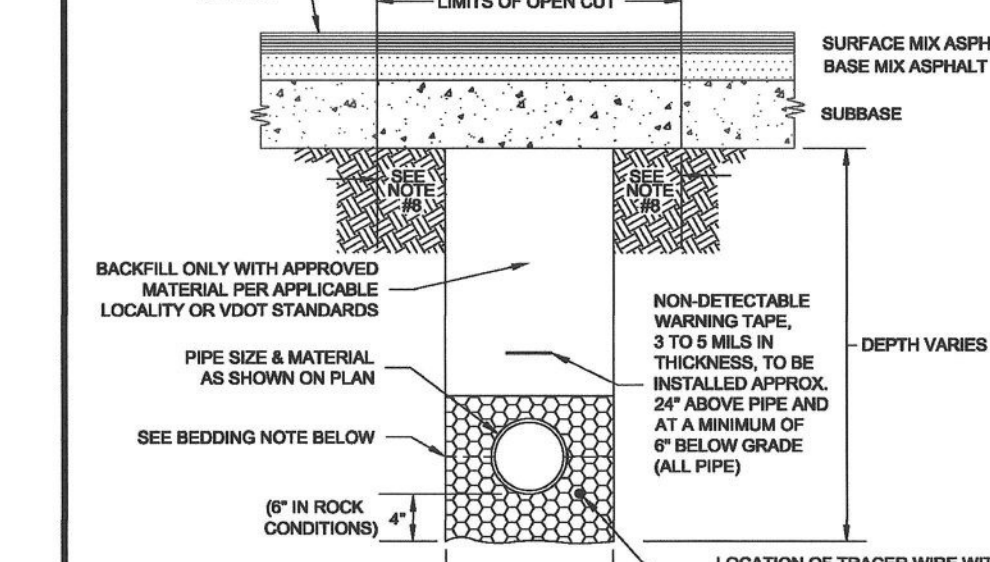


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL UNDER PAVED AREAS

W-22

1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURERS RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT 87 OR R88 STONE, OR CRUSHER RUN.
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WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL UNDER PAVED AREAS

W-22

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EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION
THE PURPOSE OF THE PROJECT IS TO REPLACE EXISTING WATERLINES AND INSTALL A HIGH PRESSURE WATERLINE THAT WILL BE A PART OF A FUTURE WATER LINE EXTENSION. THE LENGTH OF WATERLINE TO BE INSTALLED IS APPROXIMATELY 7,000 FEET. THE INSTALLATION WILL TAKE PLACE INSIDE EXISTING RIGHT-OF-WAY AND WATERLINE EASEMENTS. THIS PROJECT IS LOCATED IN THE CITY OF ROANOKE. TOTAL DISTURBED AREA IS APPROXIMATELY 0.39 ACRES.

EXISTING SITE CONDITIONS
THE EXISTING SITE WITHIN THE CITY OF ROANOKE INCLUDES AREAS ALONG VAN WINKLE ROAD SW, GRIFFIN ROAD SW, BRISTOL ROAD SW, JORDAN ROAD SW, AND ROY DRIVE SW. THE ROADS ARE ASPHALT PAVED. WATERLINE IS TO BE INSTALLED IN PAVED AND UNPAVED AREAS.

ADJACENT AREAS
THE PROJECT IS SURROUNDED BY RESIDENTIAL DEVELOPMENT AND UNDEVELOPED PROPERTIES.

OFFSITE AREAS
IT IS NOT ANTICIPATED THAT ANY LAND DISTURBING ACTIVITIES WILL OCCUR OFFSITE. THE CITY OF ROANOKE WILL BE NOTIFIED OF ANY OFFSITE LAND DISTURBING ACTIVITY ASSOCIATED WITH THIS PROJECT. ALL OFFSITE AREAS SHALL HAVE THEIR OWN INDIVIDUAL EROSION CONTROL PLAN.

SOILS
REFER TO THE SOILS MAP INCLUDED ON THIS SHEET. ALL OF THE PROPOSED WORK IS INSIDE AREAS THAT HAVE BEEN PREVIOUSLY DEVELOPED.

SOILS
REFER TO THE SOILS MAP INCLUDED ON THIS SHEET. ALL OF THE PROPOSED WORK IS INSIDE AREAS THAT HAVE BEEN PREVIOUSLY DEVELOPED.

SOILS SYMBOL

SYMBOL	SOIL TYPE
13A	DERROC COBBLY SANDY LOAM, 0% TO 4% SLOPES
15D	EDGEMONT CHANNERY SANDY LOAM, 15% TO 35% SLOPES
15E	EDGEMONT CHANNERY SANDY LOAM, 35% TO 60% SLOPES

DERROC COBBLY SANDY LOAM SOIL PROPERTIES:
COMPOSITION: 0 to 4 INCHES, COBBLY SANDY LOAM; 4 to 31 INCHES, VERY COBBLY SANDY LOAM; 31 to 65 INCHES, EXTREMELY COBBLY LOAMY SAND.
PERMEABILITY: WELL DRAINED
AVAILABLE WATER CAPACITY: HIGH TO VERY HIGH
DEPTH TO RESTRICTIVE FEATURE: MORE THAN 80 INCHES
DEPTH TO WATER TABLE: MORE THAN 80 INCHES

EDGEMONT CHANNERY SANDY LOAM SOIL PROPERTIES:
COMPOSITION: 0 to 6 INCHES, CHANNERY SANDY LOAM; 6 to 38 INCHES, CLAY LOAM; 38 to 62 INCHES, LOAM
PERMEABILITY: WELL DRAINED
AVAILABLE WATER CAPACITY: MODERATELY HIGH TO HIGH
DEPTH TO RESTRICTIVE FEATURE: MORE THAN 80 INCHES
DEPTH TO WATER TABLE: MORE THAN 80 INCHES

CRITICAL AREAS
THE CONTRACTOR SHALL TAKE SPECIAL CARE TO MINIMIZE THE POTENTIAL FOR ANY SEDIMENT LEAVING THE SITE ONTO ADJACENT PROPERTY.

MINIMUM STANDARDS
REFER TO DEQ MINIMUM STANDARDS.

EROSION AND SEDIMENT CONTROL MEASURES
CONSTRUCTION ENTRANCE (3.02) – A STONE CONSTRUCTION ENTRANCE WILL BE INSTALLED TO MINIMIZE THE AMOUNT OF MUD TRANSPORTED INTO EXISTING ROADS.
SILT FENCE (3.05) – SILT FENCE WILL BE INSTALLED AT THE LOWER ENDS OF THE PROJECT SITE TO INTERCEPT SEDIMENT LOADED RUN-OFF PRIOR TO EXITING THE SITE.
TEMPORARY SEEDING (3.31) – TEMPORARY SEEDING SHALL BE APPLIED TO TEMPORARY DIVERSION DIKES, TOPSOIL STOCKPILES, AND ALL AREAS TO BE ROUGH GRADED, BUT NOT FINISHED GRADED DURING THE INITIAL PHASE OF CONSTRUCTION. TEMPORARY SEEDING SHALL BE FAST GERMINATING, TEMPORARY VEGETATION AND INSTALLED IMMEDIATELY FOLLOWING GRADING, OR INSTALLATION IF A TEMPORARY MEASURE. SEE ALSO MINIMUM STANDARDS.
PERMANENT SEEDING (3.32) – PERMANENT SEEDING SHALL BE INSTALLED ON ALL DISTURBED AREAS OF THE SITE NOT OTHERWISE STABILIZED.
MULCHING (3.33) – ALL DISTURBED AREAS SHALL BE MULCHED AFTER SEEDING. STRAW MULCH SHALL BE APPLIED AT A RATE OF TWO TONS PER ACRE AND ANCHORED WITH 750 LBS PER ACRE OF FIBER MULCH OVER THE SEEDED AREA.
PERMANENT STABILIZATION
AREAS NOT COVERED BY LANDSCAPING OR OTHER PERMANENT HARD SURFACE SHALL BE STABILIZED WITH PERMANENT SEEDING. THE CONTRACTOR SHALL ENSURE THAT A STRONG STAND OF GRASS IS ESTABLISHED BEFORE THE REMOVAL OF EROSION CONTROL MEASURES.
MAINTENANCE
ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BI-WEEKLY AND AFTER EVERY RUNOFF PRODUCING RAINFALL. A LOG OF DATES AND INSPECTIONS SHALL BE KEPT. ANY DEFICIENCIES THAT ARE FOUND SHALL BE CORRECTED IMMEDIATELY. ACCUMULATED SEDIMENT AT TRAPPING MEASURES SHALL BE ROUTINELY REMOVED. THE CONTRACTOR AND RLD SHALL PAY PARTICULAR ATTENTION TO THE FOLLOWING:
ALL DITCHES, SWALES, AND NATURAL WATERCOURSES DOWNSTREAM OF THIS PROJECT SHALL BE FIELD INSPECTED DURING AND AFTER CONSTRUCTION BY THE RLD TO ENSURE COMPLIANCE WITH DEQ'S MS-19. IF EROSION OR SCOUR IS OCCURRING THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL CORRECTIVE MEASURES.
EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL AFTER ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED AND THEN TEMPORARY MEASURES PROPERLY REMOVED.
ALL SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND OF GRASS IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEED AS REQUIRED TO ACHIEVE A GOOD STAND OF GRASS.
STORMWATER MANAGEMENT CONSIDERATION:
THE PROPOSED PROJECT IS A LINEAR DEVELOPMENT AND IS THEREFORE EXEMPT FROM STORMWATER MANAGEMENT REQUIREMENTS.

CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THE FOLLOWING MINIMUM STANDARDS:

- Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year. **APPLY SEEDING MIXTURES IN ACCORDANCE WITH SPECIFICATIONS 3.31 AND 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCCH) TO ALL AREAS THAT DO NOT HAVE A NON-ERODIBLE SURFACE AS SHOWN ON THIS PLAN.**
- During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site. **NO ONSITE STOCKPILE IS CURRENTLY PLANNED FOR THIS PROJECT.**
- A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion. **SEE MINIMUM STANDARD 1.**
- Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place. **INSTALL EROSION CONTROL MEASURES AS OUTLINED IN THE CONSTRUCTION SEQUENCE.**
- Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation. **NO EARTHER STRUCTURES ARE PROPOSED WITH THIS PLAN.**
- Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.
 - The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
 - Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.**NO SEDIMENT TRAPS OR BASINS ARE PROPOSED WITH THIS PLAN.**
- Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be protected with additional slope stabilizing measures until the problem is corrected. **RESERVE ANY AREAS THAT DO NOT HAVE AN ESTABLISHMENT OF A GOOD STAND OF GRASS AFTER INITIAL APPLICATION OF PERMANENT SEEDING. ADDITIONAL SLOPE STABILIZATION MEASURES ARE TO BE CONSIDERED AS CONDITIONS DICTATE.**
- Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure. **NO CONCENTRATED RUNOFF SHALL FLOW DOWN CUT OR FILL SLOPES AND SHALL BE DIVERTED AS NECESSARY.**
- Whenever water seeps from a slope face, adequate drainage or other protection shall be provided. **THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY UPON THE DISCOVERY OF ANY WATER SEEPS.**
- All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment. **NO INLET PROTECTION IS PROPOSED WITH THIS PLAN.**
- Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel. **NO OUTLET PROTECTION IS PROPOSED WITH THIS PLAN.**
- When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials. **NO WORK WITHIN LIVE WATERCOURSES IS PROPOSED FOR THIS PROJECT.**
- When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided. **NO WORK WITHIN LIVE WATERCOURSES IS PROPOSED FOR THIS PROJECT.**
- All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met. **NO WORK WITHIN LIVE WATERCOURSES IS PROPOSED FOR THIS PROJECT.**
- The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed. **NO WORK WITHIN LIVE WATERCOURSES IS PROPOSED FOR THIS PROJECT.**
- Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:
 - No more than 500 linear feet of trench may be opened at one time.
 - Excavated material shall be placed on the uphill side of trenches.
 - Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
 - Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
 - Restabilization shall be accomplished in accordance with these regulations.
 - Applicable safety regulations shall be complied with.**UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS ABOVE.**
- Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities. **ADAPTABLE MEANS SHALL BE PROVIDED FOR THE CLEANING OF MUD AND SEDIMENT FROM CONSTRUCTION VEHICLES PRIOR TO ENTERING PUBLIC STREETS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY MUD AND SEDIMENT TRANSPORTED FROM THIS SITE ONTO THE PUBLIC STREETS.**
- All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local government authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation. **EROSION & SEDIMENT CONTROL MEASURES SHALL NOT BE REMOVED WITHOUT ROANOKE CITY PERMISSION AND SHALL BE IN ACCORDANCE WITH ABOVE REQUIREMENTS.**

MINIMUM STANDARDS CONTINUED:

- Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:
 - Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
 - Adequacy of all channels and pipes shall be verified in the following manner:
 - The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or
 - Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.
 - All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
 - Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.
 - If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:
 - Improve the channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to channel bed or banks; or
 - Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances;
 - Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outfalls into a man-made channel; or
 - Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCCH authority to prevent downstream erosion.
 - The applicant shall provide evidence of permission to make the improvements.
 - All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development of the subject project.
 - If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCCH of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
 - Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipater shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.
 - All on-site channels must be verified to be adequate.
 - Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.
 - In applying these stormwater runoff criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.
 - All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.
 - Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural and man-made channels if the practices are designed to
 - detain the water quality volumes and release it over 48 hours;
 - detain and release over 24-hour period the expected rainfall resulting from the one year, 24-hour storm and;
 - reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to 62.1-44.15:54 or 62.1-44.15:65 of the Act.
 - For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9VAC25-870-46 of the Virginia Stormwater Management Program (VSMF) Permit Regulations.
 - Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSMF) Permit Regulations shall be deemed to satisfy the requirements of Minimum Standard 19. **SINCE THE PROJECT DOES NOT PROPOSE ANY NEW IMPERVIOUS SURFACES, THE PRAK FLOW CONDITIONS SHOULD NOT INCREASE. BECAUSE OF THIS, MS-19 IS SATISFIED BY COMPLIANCE WITH MS-19 SECTION c(9).**

GENERAL EROSION AND SEDIMENT CONTROL NOTES, ROANOKE CITY, VIRGINIA

ES-1- UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 9V 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.

ES-2- THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

ES-3- ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.

ES-4- A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE, AS WELL AS A COPY OF THE LAND DISTURBING PERMIT, SHALL BE MAINTAINED ON THE SITE AT ALL TIMES. THE EROSION AND SEDIMENT CONTROL ADMINISTRATOR WILL DELIVER THESE MATERIALS AT THE ONSITE PRECONSTRUCTION CONFERENCE.

ES-5- PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

ES-6- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

ES-7- ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING THE LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES-8- DURING DEWATERING OPERATION, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.

ES-9- PRIOR TO THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

TEMPORARY STABILIZATION

TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

TS TEMPORARY SEEDING MIXTURE

PLANTING DATES	SPECIES	RATE (LBS./ACRE)
SEPT. 1 – FEB. 15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50 – 100
FEB. 16 – APR. 30	ANNUAL RYEGRASS (LOLIUM MULTI-FLORUM)	60 – 100
MAY. 1 – AUG. 31	GERMAN MILLET (SETARIA ITALICA)	50
LIME:	90 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE	
FERTILIZER:	10-10-10 @ 10 LB / 1000 SF	

PERMANENT STABILIZATION

ALL AREAS DISTURBED BY CONSTRUCTION WILL BE STABILIZED WITH PERMANENT SEEDING WITHIN 7 DAYS OR IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING WILL BE DONE ACCORDING TO STANDARD AND SPECIFICATION 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. PERMANENTLY SEEDER AREAS SHALL BE PROTECTED DURING ESTABLISHMENT WITH STRAW MULCH.

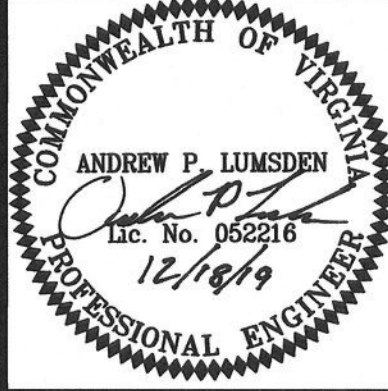
PS PERMANENT SEEDING MIXTURE

SEEDING AREA:	SEEDING RATE:
GENERAL TURF	200 lbs/Ac
(Optional) PERENNIAL RYEGRASS	20 lbs/Ac
GENERAL SLOPE (3:1 or less)	
K-31 FESCUE	128 lbs/Ac
RED TOP GRASS	2 lbs/Ac
SEASONAL NURSE CROP	20 lbs/Ac
STEEP SLOPE (Greater than 3:1)	
K-31 FESCUE	108 lbs/Ac
RED TOP GRASS	2 lbs/Ac
SEASONAL NURSE CROP	20 lbs/Ac
CROWN VETCH	20 lbs/Ac
SEASONAL NURSE CROP SCHEDULE:	
March, April – May 15th	ANNUAL RYE
May 16th – August 15th	FORKAL MILLET
August 16th – September, October	ANNUAL RYE
November – February	WINTER RYE
LIME:	90 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE
FERTILIZER:	10-20-10 @ 12 LB / 1000 SF
MULCH:	IF REQUIRED, SHALL BE USED OVER ALL SEEDER AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
SOIL CONDITIONS:	INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.
SEED APPLICATION:	APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CLOUTPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

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GRIFFIN / VAN WINKLE
WATERLINE REPLACEMENTS
PREPARED FOR
WESTERN VIRGINIA WATER AUTHORITY
SITUATED IN
THE CITY OF ROANOKE, VIRGINIA

EROSION & SEDIMENT
CONTROL NOTES
AND DETAILS

REVISIONS	NO.	DATE	DESCRIPTION
	1		
	2		
	3		
	4		
	5		

DATE: December 18, 2019
SCALE: AS SHOWN
COMMISSION NO.: 19-034
SHEET 12 OF 12

