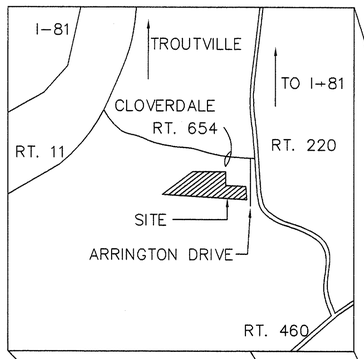
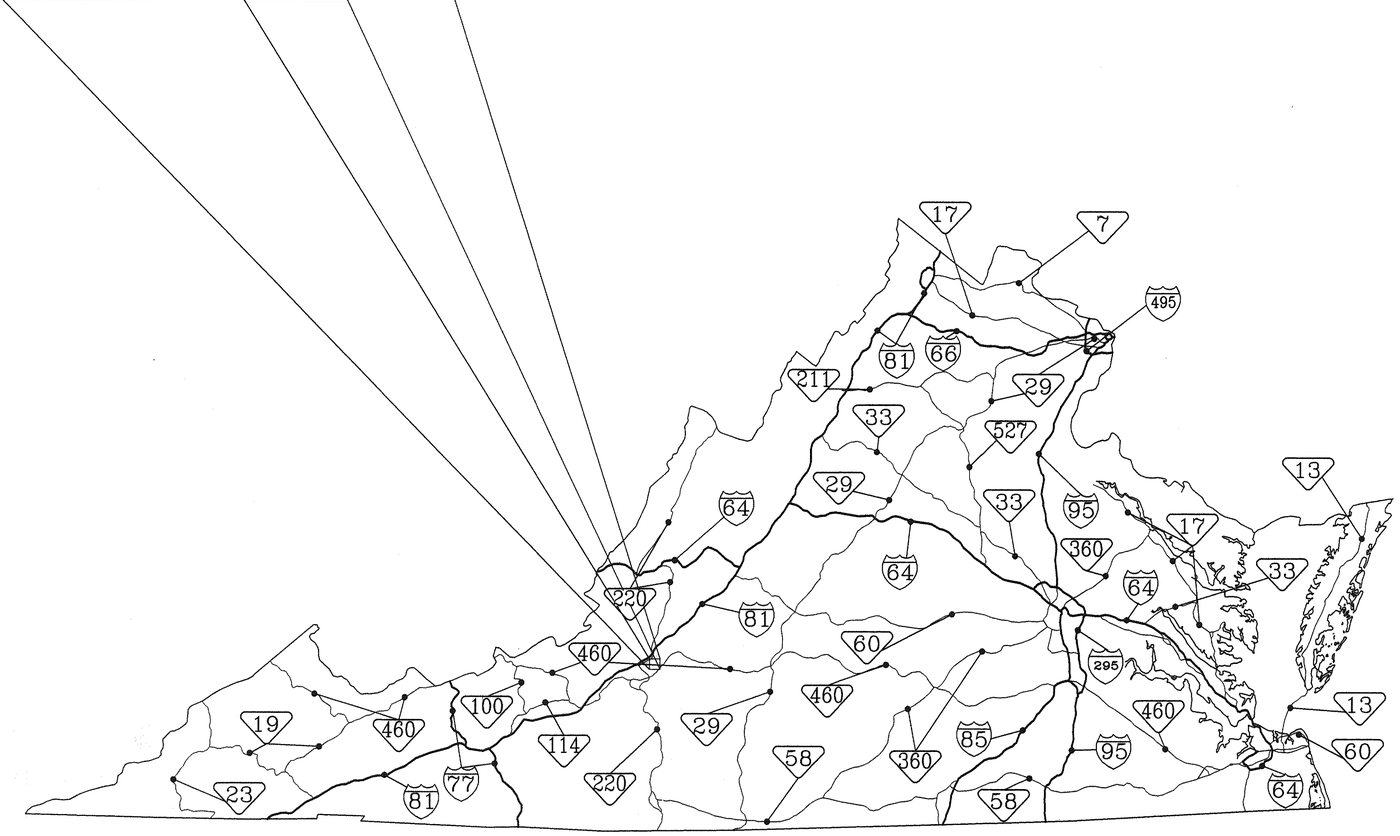
MOUNTAIN CREST

BOTETOURT COUNTY, VIRGINIA

FRED HANCOCK
P.O. BOX 6
DALEVILLE, VIRGINIA 24083
PHONE #: 992-2384

VICINITY MAP
NO SCALE





LOCATION MAP
NO SCALE

INDEX OF DRAWINGS

PROJECT NAME: ?AB Mountain Crest
DATE: 10-18-99
TYPE: Subdivision
LOCATION: Hollins Dist Botetourt Co
TOTAL # SHEETS: 15
A/E FIRM: LMW
OF SETS: 1

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

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MOUNTAIN CREST SITE PLAN

COMM. NO. 1809

DATE: 05/26/99 REVISED: 10/18/99

SET NO.

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ABBREVIATIONS

ABAN	ABANDON, ABANDONED
ABUT	ABUTMENT
ADJ	ADJACENT
AGGR	AGGREGATE
ANC	ANCHOR
APPROX	APPROXIMATE
BIT	BITUMINOUS
BJ	BELL JOINT
BL	BASE LINE
BEG	BEGIN, BEGINNING
BLDG	BUILDING
BM	BENCH MARK
BSP	BLACK STEEL PIPE
BV	BUTTERFLY VALVE
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
C & G	CURB AND GUTTER
CI	CAST IRON
CL	CENTER LINE
CONST	CONSTRUCTION
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNITS
CND	CONDUIT
CO	CLEANOUT
COMB	COMBINATION
CONC	CONCRETE (PORTLAND CEMENT)
CONN	CONNECT, CONNECTION
CONTR	CONTRACTOR
CONV	CONVEYOR
COR	CORNER
CR STONE	CRUSHED STONE
CTR	CENTER
CULV	CULVERT
D	DEPTH OR DEGREE OF CURVE
DE	DRAINAGE EASEMENT
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DMH	DROP MANHOLE
DN	DOWN
DTL	DETAIL
DW, D/W	DRIVEWAY
DWL	DWELLING
DWG	DRAWING
EA	EACH
E.B.L.	EASTBOUND LANE
EL. ELEV	ELEVATION
ELEC	ELECTRICAL
ENGR	ENGINEER
ENTR	ENTRANCE
EOL	END OF LINE
EP	EDGE OF PAVEMENT
EQ	EQUAL
EQPT	EQUIPMENT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EW	EACH WAY, ENDWALL
EXIST	EXISTING
FES	FLARED END SECTION
FF	FINISH FLOOR
FFE	FINISHED FLOOR ELEVATION
FIG	FIGURE
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE
FT	FOOT
FTG	FOOTING
FUT	FUTURE
GAL	GALLON
GALV	GALVANIZED
GAR	GARAGE
GND	GROUND
GR	GRAVEL
GOVT	GOVERNMENT
GPM	GALLONS PER MINUTE
GRTG	GRATING
GV	GATE VALVE
H&T	HUB AND TAC
HORIZ	HORIZONTAL
HPT	HIGH POINT
HYD	HYDRANT
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
INV	INVERT
IP	IRON PIN (FOUND OR SET NOTED)
L	LENGTH, LONG
LF	LINEAL FOOT
LG	LONG
LP	LIGHT POLE
LR	LONG RADIUS
LT	LEFT
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MAIL BOX
MBL	MINIMUM BUILDING LINE
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MON	MONUMENT
MTL	METAL
N & C	NAIL AND CAP
NIC	NOT IN CONTRACT
NO	NUMBER
NPW	NON POTABLE WATER
NTS	NOT TO SCALE
OC	ON CENTERS
OD	OUTSIDE DIAMETER
PVMT	PAVEMENT
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PER	PERIMETER
PERF	PERFORATED
PERP	PERPENDICULAR
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE
POL	POINT ON LINE
PT	POINT OF TANGENCY
POT	POINT ON TANGENT
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PUE	PUBLIC UTILITY EASEMENT
R	RADIUS, RISER
RR	RAILROAD
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDCR	REDUCER
REINF	REINFORCE, REINFORCEMENT
REF	REFERENCE
REL	RELOCATED
REQD	REQUIRED
REV	REVISION
RTE	ROUTE
RT	RIGHT
R/W	RIGHT OF WAY
SS	SANITARY SEWER
SAN	SANITARY
S/W	SIDEWALK
SD	STORM DRAIN
SE	SLOPE EASEMENT
SECT	SECTION
SER	SERVICE
SH	SHEET
SPEC	SPECIFICATION
SPECS	SPECIFICATIONS
SQ	SQUARE
SSTL	STAINLESS STEEL
STR	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUR	SURVEY
T & B	TOP AND BOTTOM
TELE	TELEPHONE
TEMP	TEMPORARY
THK	THICK
TP	TELEPHONE POLE
TRTD	TREATED
TV	TELEVISION
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
U.S.C.&G.S	UNITED STATES COAST AND GEODETIC SURVEY
V. VAL	VALVE, VENT
VAR	VARIABLE
VC	VERTICAL CURVE
VERT	VERTICAL
VESCR	VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS
VOL	VOLUME
VDOT	VIRGINIA DEPARTMENT OF TRANSPORTATION
V.S.D.	VERTICAL SIGHT DISTANCE
W.B.L.	WESTBOUND LANE
W	WIDE FLANGE, WIDE, WASTE, WATER
W/	WITH
WL	WATER LINE
W/O	WITHOUT
WS	WATER SURFACE
WT	WATERTIGHT, WEIGHT
WVDH	WEST VIRGINIA DEPARTMENT OF HIGHWAYS
HDPE	HIGH DENSITY POLYETHYLENE

LEGEND / SYMBOLS

EXISTING	NEW	DESCRIPTION
		BUILDING WITH PORCH OR STOOP
		FOUNDATION ONLY
35	35	CONTOUR, CONTOUR WITH ELEVATION
20.0 E OR +1025.00 E	20.0 E OR X 1025	SPOT ELEVATION
		CONCRETE CURB
		CONCRETE CURB & GUTTER
		CONCRETE WALK OR SLAB
		PAVEMENT
		UNPAVED OR GRAVEL ROAD
		CONSTRUCTION EASEMENT
		PERMANENT EASEMENT
		TREE LINE
OR	OR	TREE OR SHRUB
X X	X X	FENCE (EXISTING OR PROPOSED NOTED)
		CENTERLINE CREEK, SWALE, DITCH
P	P	PROPERTY LINE
℄ ℬ	℄ ℬ	CENTERLINE OR BASELINE
△	△	FIELD SURVEY TRAVERSE POINT
○	○	P.C. OR P.T.
⊕	◒	GEOLOGIC BORE HOLE
⊕	◒	BENCH MARK (EXISTING OR SET NOTED)
SD	SD	STORM DRAIN AND ENDWALL
SS	SS	SANITARY SEWER
FM	FM	FORCE MAIN
G	G	GAS MAIN OR SERVICE LINE
W	W	WATER MAIN OR SERVICE LINE
OE	OE	OVERHEAD ELECTRICAL LINE
OT	OT	OVERHEAD TELEPHONE LINE
UE	UE	UNDERGROUND ELECTRICAL LINE
UT	UT	UNDERGROUND TELEPHONE LINE
		PIPE FITTINGS
		FIRE HYDRANT
		GATE VALVE
CO	CO	CLEANOUT
S	S	MANHOLE
		DROP INLET (CURB AND GRATING TYPES)
		WM – WATER METER DWM – DOUBLE WATER METER
		TELEPHONE POLE, GUY AND ANCHOR
		POWER POLE, GUY AND ANCHOR
		LIGHT POLE
T	T	TELEPHONE PEDESTAL
T	T	BURIED TELEPHONE VAULT
		PAVED DITCH
		STORM PIPE (SIZE / TYPE NOTED)
		CULVERT WITH FLARED END SECTION
PROFILE PLAN	PROFILE PLAN	AIR RELEASE VALVE / VAULT ASSEMBLY
PROFILE PLAN	PROFILE PLAN	BLOW OFF VALVE / VAULT ASSEMBLY
		STEEL ENCASEMENT
		CONCRETE ENCASEMENT
		ABANDON OR REMOVE
		LIMITS OF CONSTRUCTION

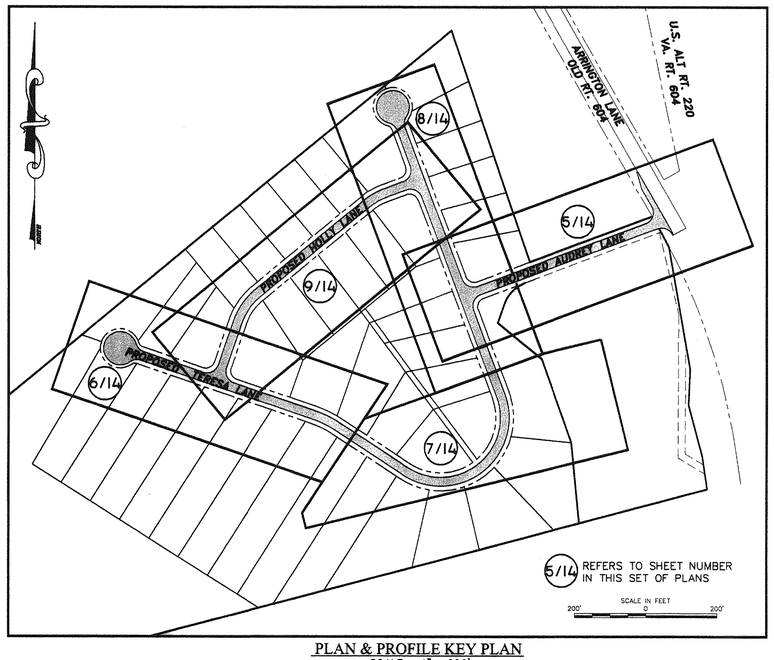
GENERAL NOTES

THE LOCATION OF EXISTING UTILITIES, INCLUDING UNDERGROUND UTILITIES, IS INDICATED ON THE DRAWINGS IN SO FAR AS THEIR EXISTENCE AND LOCATION WERE KNOWN AT THE TIME OF PREPARATION OF THESE DRAWINGS, HOWEVER, NOTHING IN THESE CONTRACT DOCUMENTS SHALL BE CONSTRUED AS A GUARANTEE THAT SUCH UTILITIES ARE IN THE LOCATION INDICATED OR THAT THEY ACTUALLY EXIST OR THAT OTHER UTILITIES ARE NOT WITHIN THE AREA OF OPERATIONS. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO DETERMINE THE EXISTENCE AND LOCATIONS OF SUCH UTILITIES. THE CONTRACTOR SHALL PAY FOR ANY DAMAGE TO AND FOR MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES.

EXISTING WATER LINE LOCATIONS BOTH HORIZONTAL AND VERTICAL ARE APPROXIMATE. THE LOCATION IS NOT THE RESULT OF A FIELD SURVEY.

THE CONTRACTOR IS DIRECTED TO DIG AND LOCATE ALL UTILITIES IN ADVANCE OF PIPELAYING TO ALLOW FOR ADJUSTMENTS DUE TO CONFLICTS WITH EXISTING UTILITIES. SHOULD A CONFLICT ARISE THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY.

THE CONTRACTOR IS REQUIRED TO NOTIFY "MISS UTILITY" AT 1-800-552-7001 AT LEAST TWO, BUT NOT MORE THAN TEN, WORKING DAYS IN ADVANCE OF CONSTRUCTION.



PLAN & PROFILE KEY PLAN
SCALE: 1"= 200'

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MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

No.	DATE	DESCRIPTION	BY
	8/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

ABBREVIATIONS, LEGEND, GENERAL NOTES & PLAN & PROFILE KEY PLAN

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
8.27.99
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	1809ABBR.
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	2 of 14

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VIRGINIA DEPARTMENT OF TRANSPORTATION NOTES:

1. QUALITY CONTROL

STREETS TO BE GRADED, PAVED AND ALL STRUCTURAL COMPONENTS ERECTED IN ACCORDANCE WITH CURRENT VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS AND ROAD DESIGN STANDARDS, VIRGINIA DEPARTMENT OF TRANSPORTATION, VIRGINIA DESIGN STANDARDS AND SPECIFICATIONS. ALL MATERIALS USED SHALL BE TESTED IN ACCORDANCE WITH STANDARD POLICIES. THE DEVELOPER MUST CONTACT THE OFFICE OF THE RESIDENT ENGINEER PRIOR TO BEGINNING ANY CONSTRUCTION AT WHICH TIME AN INSPECTION AND TESTING PROCEDURE POLICY WILL BE DRAWN. THE DEVELOPER WILL PRODUCE TEXT REPORTS FROM APPROVED INDEPENDENT LABORATORIES AT THE DEVELOPER'S EXPENSE.

THE PAVEMENT DESIGNS SHOWN ARE BASED ON A SUBGRADE CBR VALUE OF 10 OR GREATER. THE SUBGRADE SOIL IS TO BE TESTED BY AN INDEPENDENT LABORATORY AND THE RESULTS SUBMITTED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION PRIOR TO BASE CONSTRUCTION. SHOULD THE SUBGRADE CBR VALUES BE LESS THAN 10, THEN ADDITIONAL BASE MATERIAL WILL BE REQUIRED IN ACCORDANCE WITH DEPARTMENTAL SPECIFICATIONS.

THE SUBGRADE MUST BE APPROVED BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION PRIOR TO PLACEMENT OF THE BASE. BASE MUST BE APPROVED BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION FOR DEPTH, TEMPLATE AND COMPACTION BEFORE SURFACE IS APPLIED.

2. UTILITIES

ALL NECESSARY UTILITY LATERALS ALONG WITH PROVISIONS FOR CONDUITS (I.E. WATER, SEWER, STORM, GAS, AND TELEPHONE) WILL BE CONSTRUCTED PRIOR TO PLACEMENT OF BASE MATERIAL.

GAS OR PETROLEUM TRANSMISSION LINES WILL NOT BE PERMITTED WITHIN THE PAVEMENT OR SHOULDER ELEMENT (BACK OF CURB TO BACK OF CURB) OF THIS DEVELOPMENT. SERVICE LATERALS CROSSING AND PIPE LINES LOCATED OUTSIDE THE PAVEMENT, BUT INSIDE THE RIGHT OF WAY, WILL BE CONSTRUCTED IN CONFORMITY WITH ASA B 31.8 SPECIFICATIONS AND SAFETY REGULATIONS. DISTRIBUTION LINES WITH PRESSURES LESS THAN 120 LBS. ARE UNAFFECTED BY THE ABOVE.

PERMITS WILL BE REQUIRED FOR ALL UTILITIES WITHIN STREET RIGHT OF WAY PRIOR TO ACCEPTANCE INTO THE SECONDARY HIGHWAY SYSTEM.

ANY EASEMENTS GRANTED TO A UTILITY COMPANY FOR PLACEMENT OF POWER, TELEPHONE, ETC. MUST BE RELEASED PRIOR TO ACCEPTANCE.

3. PRIVATE ENTRANCES

DRIVEWAYS CONNECTING TO ROADS WITHOUT CURB & GUTTER SHALL CONFORM TO THE PAVEMENT, SHOULDER & SLOPE.

PERMITS WILL BE REQUIRED FOR ALL PRIVATE ENTRANCES CONSTRUCTED ON STREET RIGHTS-OF-WAY AFTER ACCEPTANCE INTO THE SECONDARY HIGHWAY SYSTEM.

4. EROSION CONTROL AND LANDSCAPING

CARE MUST BE TAKEN DURING CONSTRUCTION TO PREVENT EROSION, DUST AND MUD FROM DAMAGING ADJACENT PROPERTY, CLOGGING DITCHES, STREAKING PUBLIC STREETS AND OTHERWISE CREATING A PUBLIC OR PRIVATE NUISANCE TO SURROUNDING AREAS.

THE ENTIRE CONSTRUCTION AREA INCLUDING DITCHES, CHANNELS, BACK OF CURBS AND OR PAVEMENT ARE TO BE BACKFILLED AND SEEDED WITHIN 7 DAYS AFTER COMPLETING FINAL GRADING.

DRAINAGE EASEMENTS MUST BE DEFINED BY EXCAVATED DITCHES OR CHANNELS FOR THEIR FULL LENGTH TO WELL DEFINED EXISTING NATURAL WATERCOURSES.

THE ROAD WILL BE REVIEWED DURING CONSTRUCTION FOR THE NEED OF PAVED DITCHES. IF EROSION IS ENCOUNTERED IN ANY DRAINAGE EASEMENT, IT WILL BE THE RESPONSIBILITY OF THE DEVELOPER TO SOD, RIP RAP, GROUT, PAVE, OR TO DO WHATEVER IS NECESSARY TO CORRECT THE PROBLEM.

ALL VEGETATION AND OVERBURDEN TO BE REMOVED FROM SHOULDER TO SHOULDER PRIOR TO THE CONDITIONING (CUTTING AND/OR PREPARATION) OF THE SUBGRADE.

5. INTERSECTION PAVEMENT RADIUS

MINIMUM PAVEMENT RADIUS OF 35 FEET IS REQUIRED AT ALL STREET INTERSECTIONS.

6. CONNECTIONS TO STATE-MAINTAINED ROADS

WHILE THESE PLANS HAVE BEEN APPROVED, SUCH APPROVAL DOES NOT EXEMPT CONNECTIONS WITH EXISTING STATE-MAINTAINED ROADS FROM CRITICAL REVIEW AT THE TIME PERMIT APPLICATIONS ARE MADE. THIS IS NECESSARY IN ORDER THAT THE PREVAILING CONDITIONS BE TAKEN INTO CONSIDERATION REGARDING SAFETY ACCOMPANIMENTS SUCH AS TURNING LANES.

7. GUARDRAILS

STANDARD GUARDRAIL WITH SAFETY END SECTIONS MAY BE REQUIRED ON FILLS AS DEEMED NECESSARY BY THE RESIDENT ENGINEER. AFTER COMPLETION OF ROUGH GRADING OPERATIONS, THE OFFICE OF THE RESIDENT ENGINEER SHALL BE NOTIFIED SO THAT A FIELD REVIEW MAY BE MADE OF THE PROPOSED LOCATIONS.

WHERE GUARDRAILS ARE TO BE INSTALLED, THE SHOULDER WIDTH SHALL BE INCREASED IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS.

8. ENTRANCE PERMIT

CONTRACTOR SHALL OBTAIN ENTRANCE PERMIT TO THE EXISTING VIRGINIA DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY FROM RESIDENT ENGINEER PRIOR TO ROAD CONSTRUCTION.

9. INSPECTION

AN INSPECTOR WILL NOT BE FURNISHED EXCEPT FOR PERIODIC PROGRESS INSPECTION, THE ABOVE MENTIONED FIELD REVIEWS AND CHECKING FOR REQUIRED STONE DEPTHS. THE DEVELOPER WILL BE REQUIRED TO POST A SURETY TO GUARANTEE THE ROAD FREE OF DEFECTS FOR ONE YEAR AFTER ACCEPTANCE BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION.

10. STREET MAINTENANCE

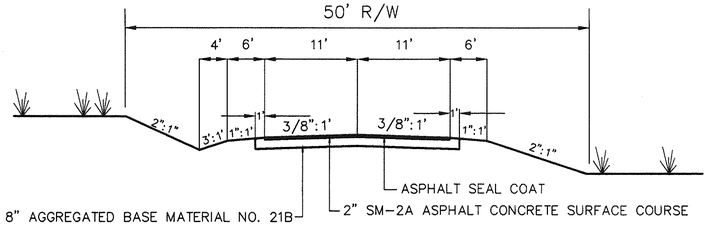
THE STREETS MUST BE PROPERLY MAINTAINED UNTIL ACCEPTANCE. AT SUCH TIME AS ALL REQUIREMENTS HAVE BEEN MET FOR ACCEPTANCE, ANOTHER INSPECTION WILL BE MADE TO DETERMINE THAT THE STREET HAS BEEN PROPERLY MAINTAINED.

11. UNDERGROUND UTILITIES

CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES SHOWN ON THE PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK BY CONTACTING MISS UTILITY. CONTACT CONSULTING ENGINEER IMMEDIATELY IF LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS. IF THERE APPEARS TO BE A CONFLICT AND UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THIS PLAN, CALL "MISS UTILITY" OF CENTRAL VIRGINIA AT 1-800-552-7001.

12. REVISIONS OF SPECIFICATIONS AND STANDARDS

APPROVAL OF THESE PLANS WILL BE BASED ON SPECIFICATIONS AND STANDARDS IN EFFECT AT THE TIME OF APPROVAL AND WILL BE SUBJECT, UNTIL COMPLETION OF THE ROADWAY AND ACCEPTANCE BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION, TO FUTURE REVISIONS OF THE SPECIFICATIONS AND STANDARDS.



AUDREY LANE, TERESA LANE & HOLLY LANE

TYPICAL PAVEMENT SECTION
NO SCALE

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MOUNTAIN CREST SUBDIVISION

LOCATED IN

BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY
1	8/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

TRANSPORTATION NOTES
PAVEMENT SECTIONS

COMMONWEALTH OF VIRGINIA
DOUGLAS R. JOHNSON
C. MEREDITH, JR.
No. 22942
8-27-99
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB/JDC
Checked By	RCW
Approved By	RCW
Submitted By	RCW
Drawing	1809TRAN.DWG
Date	05/26/99
Scale	NONE
Commission No.	1809
Sheet	3 of 14

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SPECIAL CONDITIONS

1. A MINIMUM COVER OF THREE AND ONE HALF (3.5) FEET OVER THE PROPOSED LINES IS REQUIRED.

1A. A PRECONSTRUCTION CONFERENCE SHALL BE SCHEDULED WITH BOTETOURT COUNTY PRIOR TO COMMENCING WITH CONSTRUCTION.

2. NO WORK SHALL BEGIN WITHOUT NOTIFYING BOTETOURT COUNTY 24 HOURS IN ADVANCE. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY AND ALL NECESSARY PERMITS.

3. NO WORK SHALL BEGIN WITHOUT WRITTEN APPROVAL OF CONSTRUCTION PLANS.

4. WORK SHALL BE SUBJECT TO INSPECTION BY THE COUNTY INSPECTORS AND DESIGN ENGINEER. SANITARY SEWER CUT SHEETS SHALL BE SUBMITTED TO THE BOTETOURT COUNTY ENGINEER.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND UNCOVERING ALL VALVE BOXES TO FINAL GRADE TREATMENT OF ROADS AND ADJUSTING BOXES TO FINAL ROAD GRADES, IF NECESSARY.

6. ALL EXISTING UTILITIES MAY BE SHOWN OR MAY NOT BE SHOWN IN THE EXACT LOCATION. THE CONTRACTOR SHALL COMPLY WITH THE STATE WATER WORKS REGULATIONS, SECTION 12.05.03 WHERE LINES CROSS.

7. THE CONTRACTOR SHALL NOTIFY THE COUNTY AND OBTAIN COUNTY APPROVAL OF ANY FIELD CORRECTION TO THE APPROVED PLANS PRIOR TO SUCH CONSTRUCTION.

8. ALL TRENCHES WITHIN THE EXISTING OR FUTURE VIRGINIA STATE DEPARTMENT OF HIGHWAYS AND TRANSPORTATION RIGHT-OF-WAY MUST BE COMPACTED IN SIX INCH LAYERS.

9. ALL LINES TO BE STAKED PRIOR TO CONSTRUCTION.

10. CONTRACTOR TO COORDINATE WITH THE ENGINEER TO PROVIDE AS-BUILT PLANS CONTRACTOR SHALL MAINTAIN A SET OF RED-LINE PLANS SHOWING AS-BUILT LOCATION OF ALL STRUCTURES. AS-BUILT INFORMATION TO BE SUBMITTED TO DESIGN ENGINEER FOR PREPARATION OF RECORD AS-BUILT PLANS. SUCH AS-BUILT PLANS SHALL BE SUBMITTED TO BOTETOURT COUNTY PRIOR TO COUNTY ACCEPTANCE.

11. ALL CONSTRUCTION SHALL BE IN ACCORDANCE TO APPROVED CONSTRUCTION PRACTICES OF THE APPLICABLE TRADES.

12. UNLESS NOTED OTHERWISE HEREIN ALL CONSTRUCTION SHALL BE IN ACCORDANCE TO THE LATEST EDITION OF AWWA STANDARDS.

EXCAVATION, STABILIZATION AND BEDDING

A. TRENCHING

1. EXCAVATION FOR TRENCHES SHALL INCLUDE THE REMOVAL OF ALL MATERIAL ENCOUNTERED REGARDLESS OF CLASSIFICATION IN ACCORDANCE WITH THE ELEVATIONS AND GRADES AT THE LOCATIONS AND STATIONS INDICATED ON THE PLANS OR SPECIFIED HEREIN.

2. EXCAVATION, UNLESS OTHERWISE SPECIFIED, SHALL BE OPEN CUT. THE CONTRACTOR SHALL OPEN NO MORE THAN TWO HUNDRED (200) FEET OF TRENCH AT ONE TIME FOLLOWING THE LAYING OF PIPE, UNLESS APPROVED BY THE ENGINEER.

3. TRENCHES SHALL BE EXCAVATED IN STRAIGHT LINES AND SHALL BE ACCURATELY GRADED IN ORDER TO ESTABLISH A TRUE ELEVATION FOR THE INVERT OF THE PIPE.

4. THE WIDTH OF TRENCHES, FROM EXISTING GRADE TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE OF SUFFICIENT WIDTH TO PERMIT THE PROPER INSTALLATION OF BRACING, SHORING OR SHEETING.

5. THE SIDES OF THE TRENCHES SHALL BE AS VERTICAL AS PRACTICAL.

6. EXCAVATION FOR STRUCTURES SHALL ALLOW A MINIMUM OF TWELVE (12) INCHES CLEAR BETWEEN THE STRUCTURE AND THE SIDES OF THE TRENCH OR ANY REQUIRED BRACING, SHORING OR SHEETING.

7. EXCAVATED MATERIALS SUITABLE FOR BACKFILL SHALL BE STOCKPILED IN AN ORDERLY MANNER AT A SUFFICIENT DISTANCE FROM THE SIDES OF THE TRENCH IN ORDER TO AVOID OVERLOADING THE BANKS OF THE TRENCH AND TO PREVENT SLIDES OR CAVE-INS.

8. EXCAVATED MATERIALS WHICH ARE NOT REQUIRED OR APPROVED FOR BACKFILL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR, AT HIS EXPENSE.

9. CONTRACTOR TO ADHERE TO ALL LOCAL, STATE AND FEDERAL CONSTRUCTION LAWS, INCLUDING OSHA TRENCH SAFETY REGULATIONS.

B. TRENCH STABILIZATION

1. TRENCH STABILIZATION MATERIAL SHALL BE COARSE AGGREGATE SIZE NUMBER 2 AND SHALL CONFORM WITH VDOT SECTION 203 AND/OR ASTM C 33.

2. WHENEVER EXCESSIVELY WET OR UNSTABLE MATERIAL IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, WHICH IN THE OPINION OF THE ENGINEER IS INCAPABLE OF PROPERLY SUPPORTING THE PIPE OR STRUCTURES, SUCH MATERIAL SHALL BE REMOVED AND BACKFILLED WITH TRENCH STABILIZATION MATERIAL AND SHALL BE GRADED TO ALLOW FOR THE COMPACTED BEDDING MATERIAL.

3. ALL UNAUTHORIZED OVERDEPTHS OF EXCAVATION SHALL BE BACKFILLED, AT THE CONTRACTOR'S EXPENSE, WITH TRENCH STABILIZATION MATERIAL AND SHALL BE GRADED TO ALLOW FOR THE COMPACTED BEDDING MATERIAL.

C. COMPACTED BEDDING MATERIAL

1. BEDDING MATERIAL SHALL BE COARSE AGGREGATE SIZE NUMBER 57 AND SHALL CONFORM WITH VDOT SECTION 203 AND/OR ASTM C 33.

2. THE BOTTOM OF THE PIPE TRENCH SHALL BE EXCAVATED TO A MINIMUM OVERDEPTH OF SIX (6) INCHES BELOW THE BOTTOM OF THE PIPE, TO PROVIDE FOR THE COMPACTED BEDDING MATERIAL. BEDDING MATERIAL SHALL BE PLACED, SHAPED AND COMPACTED.

3. BELL HOLES AND DEPRESSIONS REQUIRED FOR THE JOINTING OF THE PIPE SHALL BE DUG AFTER THE COMPACTED BEDDING MATERIAL HAS BEEN GRADED AND SHAPED AND SHALL BE ONLY OF THE LENGTH, DEPTH AND WIDTH REQUIRED TO MAKE THE JOINT PROPERLY.

PIPE, JOINTS AND FITTINGS

A. SCOPE OF WORK

1. ALL MATERIALS AND APPURTENANCES REQUIRED FOR THE WORK SHALL BE NEW, OR FIRST CLASS QUALITY AND SHALL BE FURNISHED, DELIVERED, ERECTED CONNECTED AND FINISHED IN EVERY DETAIL AS SPECIFIED OR INDICATED. ALL MATERIALS FOUND DEFECTIVE, REGARDLESS OF THE CIRCUMSTANCES, SHALL BE REPLACED WITH NEW MATERIAL AT THE EXPENSE OF THE CONTRACTOR.

2. THE MATERIALS SPECIFIED FOR THE CONSTRUCTION SHALL COMPLY WITH THE LATEST REVISIONS OF THE APPLICABLE AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) AND/OR THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) STANDARDS.

B. OPTIONAL PIPE SELECTIONS

1. THE CONTRACTOR SHALL INSTALL ONLY ONE (1) TYPE OF PIPE BETWEEN STRUCTURES EXCEPT WHERE DUCTILE IRON PIPE IS SPECIFIED OR INDICATED. WHERE EXISTING PIPE IS TO BE REPLACED OR EXTENDED THE SAME TYPE OF PIPE SHALL BE INSTALLED, UNLESS SPECIFIED OR INDICATED OTHERWISE

2. WATER LINE SHALL BE EITHER PVC OR DUCTILE IRON.

3. SANITARY SEWERS WITH AN INSIDE DIAMETER LESS THAN OR EQUAL TO TWELVE (12) INCHES SHALL BE EITHER POLYVINYL CHLORIDE OR DUCTILE IRON PIPE, AT THE CONTRACTOR'S OPTION, UNLESS SPECIFIED OR INDICATED OTHERWISE. CONTRACTOR SHALL OBTAIN APPROVAL OF PIPE MATERIAL BY BOTETOURT COUNTY ENGINEER PRIOR TO BEGINNING CONSTRUCTION.

4. SERVICE LATERALS SHALL BE SCHEDULE 40 POLYVINYL CHLORIDE.

C. TYPES OF PIPE

1. POLYVINYL CHLORIDE (PVC) WATER PIPE SHALL BE AWWA C900 DR 18 MINIMUM, UNLESS SPECIFIED OR INDICATED OTHERWISE.

2. DUCTILE IRON PIPE SHALL CONFORM WITH AWWA C 151/ANSI 21.51 AND FITTINGS SHALL CONFORM WITH AWWA C 110/ANSI 21.10. THE PIPE AND FITTINGS SHALL BE FACTORY APPLIED COATED AND CEMENT LINED IN ACCORDANCE WITH AWWA C 104/ANSI 21.40. THE PIPE THICKNESS SHALL CONFORM WITH AWWA C 150/ANSI 21.50 AND SHALL BE CLASS 50, AS A MINIMUM, UNLESS SPECIFIED OR INDICATED OTHERWISE.

3. PVC SEWER PIPE AND FITTINGS SHALL BE SDR 35 (ASTM D 3034).

D. JOINTS COUPLINGS AND APPURTENANCES

1. PVC PIPE AND ;FITTINGS SHALL BE BELL AND SPIGOT TYPE JOINTS. THE BELL AND SPIGOT JOINT SHALL BE SEALED WITH ELASTOMERIC GASKETS CONFORMING TO ASTM D 3212. THE JOINTS SHALL BE MADE IN STRICT ACCORDANCE WITH THE RECOMMENDATION OF THE PIPE MANUFACTURER.

2. DUCTILE IRON PIPE AND FITTINGS SHALL BE EITHER MECHANICAL OR BELL AND SPIGOT TYPE JOINTS AS SPECIFIED OR INDICATED. JOINTS SHALL BE MADE WITH A SINGLE WATERTIGHT RUBBER GASKET MANUFACTURED IN ACCORDANCE WITH AWWA C 111/ANSI 21.11. THE JOINTS SHALL BE MADE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPE MANUFACTURER.

3. GATE VALVES SHALL BE IRON-BODY, BRONZE-MOUNTED, DOUBLE-DISC, PARALLEL-SEAL, O-RING SEALED, INSIDE-SCREW, NON-RISING STEM, FITTING WITH 2 INCH SQUARE OPERATING NUT FOR VALVE VAULT SERVICE, ALL IN ACCORDANCE WITH AWVA STANDARD C500 (LATEST REVISION). CONNECTIONS SHALL BE SUITABLE FOR THE PIPE WITH WHICH IT IS USED. THE VALVES SHALL BE SUITABLE FOR 200 P.S.I. WATER WORKING PRESSURE AND SHALL BE TESTED AT TWICE THE RATED WORKING PRESSURE. ALL GATE VALVES SHALL BE INSTALLED IN VALVE VAULTS AND EQUIPPED WITH A 2-INCH SQUARE OPERATING NUT. THE NUT SHALL BE MARKED WITH AN ARROW AND THE WORD "OPEN" AND SHALL OPEN BY TURNING TO THE RIGHT (CLOCKWISE).

4. ALL OTHER MATERIALS AND APPURTENCES TO BE IN ACCORDANCE WITH DETAILS SHOWN ON PLANS.

PIPE INSTALLATION

A. GENERAL

1. THE CONTRACTOR SHALL NOT LAY PIPE OR PLACE MANHOLES UNTIL ALL WATER HAS BEEN REMOVED FROM THE TRENCH OR WHEN IN THE OPINION OF THE ENGINEER, THE TRENCH OR THE WEATHER CONDITIONS ARE UNSUITABLE FOR WORK.

2. PIPE THAT MAY REQUIRE FIELD CUTTING SHALL BE DONE SO IN A NEAT AND WORKMANLIKE MANNER, SO AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE. CARE SHALL BE TAKEN TO AVOID DAMAGING THE PIPE AND ANY COATINGS OR LININGS. DUCTILE IRON PIPE SHALL NOT BE CUT WITH AN OXYACETYLENE TORCH.

3. THE MATERIALS SHALL BE VISUALLY INSPECTED FOR DEFECTS BEFORE LOWERING THE PIPE OR PLACING THE MANHOLES INTO THE TRENCH. DURING THE LAYING OPERATION NO TOOLS, CLOTHING OR OTHER MATERIAL SHALL BE PLACED IN THE PIPE OR MANHOLE. THE INTERIOR OF THE PIPE SHALL BE CLEAR OF ALL SOIL, DEBRIS AND SUPERFLUOUS MATERIALS PRIOR TO AND DURING THE INSTALLATION.

4. THE CONTRACTOR SHALL EXERCISE EVERY PRECAUTION TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE WHIL IT IS BEING PLACED IN THE TRENCH. FAILURE BY THE CONTRACTOR TO TAKE SUCH PRECAUTIONS MAY RESULT IN THE ENGINEER REQUIRING A HEAVY, TIGHTLY WOVEN CANVAS BAG OF SUITABLE SIZE BE PLACED OVER EACH END OF THE PIPE AND REMOVED ONLY WHEN THE JOINT CAN BE MADE PROPERLY.

5. THE PIPE AND MANHOLES SHALL BE LOWERED CAREFULLY INTO THE TRENCH BY SUITABLE MEANS AND HANDLED WITH CARE AT ALL TIMES TO AVOID DAMAGE. UNDER NO CIRCUMSTANCES SHALL THE MATERIALS BE DROPPED OR DUMPED INTO THE TRENCHES.

6. WHEN WORK IS NOT IN PROGRESS, THE CONTRACTOR SHALL PLUG THE OPEN ENDS OF THE PIPE TO PREVENT TRENCH WATER OR OTHER SUBSTANCES FROM ENTERING THE PIPE. THE PLUG SHALL BE WATERTIGHT AND SHALL REMAIN IN PLACE UNTIL ANY REQUIRED DEWATERING HAS BEEN COMPLETED.

7. PARALLEL INSTALLATION - WATER LINES SHALL BE LAID AT LEAST TEN FEET HORIZONTALLY FROM A SEWER OR SEWER MANHOLE WHENEVER POSSIBLE. WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF TEN FEET, THE WATER LINE MAY BE LAID CLOSER TO A SEWER OR SEWER MANHOLE PROVIDED THAT:

   I. THE INVERT OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES ABOVE THE CROWN OF THE SEWER.

   II. WHERE THIS VERTICAL SEPARATION CANNOT BE OBTAINED, THE SEWER SHALL BE CONSTRUCTED OF AWWA APPROVED WATER PIPE, PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING.

   III. THE SEWER MANHOLE SHALL BE OF WATER-TIGHT CONSTRUCTION AND TESTED IN PLACE.

   CROSSING - WATER LINES CROSSING SEWERS SHALL BE LAID TO PROVIDE A SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER WHENEVER POSSIBLE. WHEN LOCAL CONDITIONS PREVENT THIS VERTICAL SEPARATION, THE FOLLOWING CONSTRUCTION SHALL BE USED:

   I. SEWERS PASSING OVER OR UNDER WATER LINES SHALL BE CONSTRUCTED OF AWWA APPROVED WATER PIPE, PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING.

   II. WATER LINES PASSING UNDER SEWERS SHALL, IN ADDITION, BE PROTECTED BY PROVIDING:

   (A) A VERTICAL SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE SEWER AND THE TOP OF THE WATER LINE,

   (B) ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF THE JOINTS AND THE SETTLING ON AND BREAKING OF THE WATERLINE, AND

   (C) THAT THE LENGTH OF THE WATER LINE BE CENTERED AT THE POINT OF THE CROSSING SO THAT JOINTS SHALL BE EQUAL DISTANCE AND AS FAR AS POSSIBLE FROM THE SEWER.

NO WATER PIPES SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SANITARY SEWER MANHOLE. ALL SANITARY SEWER MANHOLES SHALL BE PLACED A MINIMUM OF 10 FEET HORIZONTALLY FROM ALL WATER MAINS WHENEVER POSSIBLE. WHERE THIS HORIZONTAL SEPERATION CAN NOT BE MAINTAINED, THE MANHOLE SHALL BE OF WATERTIGHT CONSTRUCTION AND TESTED IN PLACE.

8. BEFORE JOINTS ARE MADE THE PIPE SHALL BE WELL BEDDED ON A FIRM FOUNDATION AND NO PIPE SHALL BE BROUGHT INTO POSITION UNTIL THE PRECEDING LENGTH HAS BEEN THOROUGHLY EMBEDDED AND SECURED IN PLACE. ANY DEFECTS DUE TO SETTLEMENT SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE. BELL HOLES SHALL BE DUG SUFFICIENTLY LARGE TO INSURE THE MAKING OF PROPER JOINTS.

9. PIPE SHALL BE JOINTED IN FULL ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PUSH-ON JOINTS SHALL BE THOUROUGHLY CLEANED, THE RUBBER GASKET INSERTED IN THE BELL SOCKET, A THIN FILM OF APPROVED GASKET LUBRICANT APPLIED, THE SPIGOT END OF THE PIPE CENTERED INTO THE SOCKET AND THE JOINT COMPLETED BY FORCING THE SPIGOT END TO THE BOTTOM OF THE SOCKET BY A JACK-TYPE TOOL OR OTHER DEVICE APPROVED BY THE ENGINEER. MECHANICAL JOINTS SHALL BE THOROUGHLY CLEANED, THE GLAND SLIPPED OVER THE SPIGOT END OF THE PIPE, THE RUBBER GASKET PAINTED WITH SOAP SOLUTION AND PLACED ON THE SPIGOT END, THE SPIGOT END OF THE PIPE SEATED IN THE BELL, THE GASKET PRESSED INTO PLACE WITHIN THE BELL. THE GASKET PRESSED INTO PLACE WITHIN THE BELL, THE GLAND MOVED INTO POSITION, AND BOLTS AND NUTS ASSEMBLED BY HAND AND TIGHTENED WITH AN APPROVED TORQUE-LIMITING WRENCH.

B. INSTALLING WATER MAINS

1. THE WATER MAIN SHALL BE LAID AND MAINTAINED AT THE REQUIRED LINES AND GRADES WITH FITTINGS AND VALVES AT THE REQUIRED LOCATIONS.

2. DEFLECTION OF THE LINE OF PIPE, IN EITHER, THE VERTICAL OR HORIZONTAL PLANE TO AVOID OBSTRUCTIONS, OR IN LOCATIONS WHERE LONG-RADIUS CURVES ARE REQUIRED, THE AMOUNT OF DEFLECTION SHALL NOT EXCEED APPROVED AWWA STANDARDS. ALIGNMENT THAT REQUIRES DEFLECTIONS IN EXCESS OF THE RECOMMENDED LIMITATIONS, SPECIAL BENDS, OR A SUFFICIENT NUMBER OF SHORT LENGTHS OF PIPE TO PROVIDE THE ANGULAR DEFLECTIONS WITHIN THE LIMITS AS SET FORTH, SHALL BE APPROVED BY THE ENGINEER.

3. ALL PLUGS, EXCEPT MECHANICAL JOINT PLUGS AT CONNECTIONS FOR FUTURE LINES, AND TEMPORARY END BENDS IN WATER MAINS UNDER PRESSURE SHALL BE PROVIDED WITH REACTION BACKING CONSISTING OF CONCRETE THRUST BLOCKS. VALVES FOR CONNECTIONS TO FUTURE LINES AND FIRE HYDRANTS SHALL BE ANCHORED TO THE WATER MAIN WITH THE RODS.

4. DETECTION TAPE TO BE INSTALLED 12"-18" ABOVE ALL NEW PVC WATER LINES.

C. DISINFECTION OF WATER MAINS

1. ALL PIPE SHALL BE DISINFECTED, TESTED AND FLUSHED IN ACCORDANCE WITH AWWA STANDARD C601 (LATEST REVISION).

2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, NECESSARY TAPS AND PERSONNEL AND PROCEDURE FOR THE STERILIZATION, TESTING AND FLUSHING OF THE WATER MAIN.

3. NO TESTED SECTION OF WATER LINE SHALL BE APPROVED TO DELIVER WATER SERVICE UNTIL A FAVORABLE LABORATORY REPORT HAS BEEN RECEIVED. ANY TESTED SECTION OF WATER LINE FAILING TO MEET THE REQUIREMENTS SPECIFIED SHALL BE REQUIRED BY THE CONTRACTOR AND RETESTED UNTIL THE RESULTS ARE WITHIN THE LIMITS SPECIFIED.

4. THE WATER MAIN OR VALVED OFF SECTION THAT HAS BEEN COMPLETED SHALL BE FILLED, TESTED AND FLUSHED. TEST LOCATIONS SHALL BE SUBJECT TO THE DISCRETION OF THE ENGINEER AND AS VALVES AND BLOW-OFFS PERMIT.

5. AFTER TESTING AND BEFORE FINAL INSPECTION OF THE COMPLETED SYSTEMS, WATER MAINS AND SERVICE LATERALS SHALL BE FLUSHED AND DISINFECTED IN ACCORDANCE WITH AWWA SPECIFICATIONS C601(LATEST REVISION). FLUSHING SHALL BE ACCOMPLISHED AT A FLOW VELOCITY OF NOT LESS THAN 2.5 FEET PER SECOND.

   DISINFECTION AS DESCRIBED IN AWWA C651 - "PLACING OF CALCIUM HYPOCHLORITE TABLETS" SHALL BE USED. 5 GRAM CALCIUM HYPOCHLORITE TABLETS WITH 3.25 GRAM AVAILABLE CHLORINE PER TABLET SHALL BE ATTACHED AT THE INSIDE TOP OF THE PIPE BY AN ADHESIVE SUCH AS PERMATEX NO. 2 OR EQUAL. THE FOLLOWING NUMBER OF TABLETS PER THE GIVEN PIPE SIZE SHALL BE USED FOR AN INITIAL DOSE OF 25 MG/1 (PPM) CHLORINE:

PIPE DIAMETER	NUMBER TABLETS PER 18-20 FT. PIPE SECTION
6"	1
8"	2
10"	3
12"	4
16"	7

   OR THE NUMBER OF TABLETS EQUAL TO 0.0012D2L ROUNDED TO THE NEXT HIGHER INTEGER, WHERE D IS THE INSIDE DIAMETER, IN INCHES AND L IS THE LENGTH OF THE PIPE SECTION, IN FEET. USE OF THE CONTINUOUS FEED OR SLUG METHOD OF DISINFECTING MAY ONLY BE USED TO RE-CHLORINATE A WATER PIPE AFTER THE INITIAL DISINFECTION OR IN OTHER SPECIFIC CASES APPROVED BY THE DESIGN ENGINEER. WHEN FILLING THE PIPELINE FOR DISINFECTION, THE RATE OF FILLING MUST RESULT IN A VELOCITY OF LESS THAN 1 FT./SEC.

   THE DISINFECTION SOLUTION SHALL REMAIN IN THE PIPE LINE FOR NOT LESS THAN TWENTY-FOUR (24) HOURS, AFTER WHICH TIME A CHLORINE RESIDUAL OF 10 PPM AT ALL PARTS OF THE LINE SHALL BE REQUIRED.

   FOLLOWING CHLORINATION, THE PIPING SHALL BE THOROUGHLY FLUSHED. THE VIRGINIA WATERWORKS REGULATIONS REQUIRE AT LEAST TWO CONSECUTIVE SATISFACTORY BACTERIOLOGICAL SAMPLES AT 24 HOUR INTERVALS FROM THE DISTRIBUTION SYSTEM AT MAXIMUM SPACING OF 2000 FEET BEFORE THE SYSTEM CAN BE PLACED IN SERVICE. IF THE INITIAL TESTING IS NOT SATISFACTORY THE NEW LINES WILL BE RETESTED UNTIL SATISFACTORY RESULTS ARE ACHIEVED. THE CONTRACTOR SHALL PAY ALL COSTS ASSOCIATED WITH DISINFECTION AND TESTING OF INSTALLED FACILITIES INCLUDING ANY BACTERIOLOGICAL SAMPLES AND RETESTING IF REQUIRED. SAMPLES WILL BE COLLECTED IN ACCORDANCE WITH THE VIRGINIA WATERWORKS REGULATIONS.

D. INSTALLING SEWER PIPE & MANHOLES

1. THE INSTALLATION OF THE SANITARY SEWER SYSTEM SHALL BEGIN AT THE DOWNSTREAM MANHOLE AND PROCEED UPSTREAM. THE DOWNSTREAM SECTIONS SHALL BE COMPLETED, TESTED, AND APPROVED PRIOR TO ALLOWING SANITARY SEWAGE TO ENTER THE SYSTEM.

2. THE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER. THE PIPE SHALL BE LAID IN TRUE STRAIGHT LINES WITH THE BELL ENDS UPSTREAM AND WITH THE INVERT OF THE PIPE BEING THE TRUE ELEVATION AND GRADE OF THE SYSTEM.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING THE HORIZONTAL ALIGNMENT AND VERTICAL ELEVATION AND GRADE OF THE SYSTEM IN ACCORDANCE WITH THE SURVEY INFORMATION INDICATED ON THE PLANS.

4. THE HORIZONTAL ALIGNMENT OF THE PIPE SHALL BE MAINTAINED BY A TRANSIT OR THEODOLITE PLUMBED OVER THE CENTER OF THE DOWNSTREAM MANHOLE. THE VERTICAL ELEVATION AND GRADE SHALL BE MAINTAINED BY NOT LESS THAN THREE (3) BATTER BOARDS PLACED BETWEEN MANHOLES OR BY AN ADJUSTABLE LASER LEVEL MOUNTED AT THE INVERT OF THE DOWNSTREAM MANHOLE WITH TARGET(S) PLACED IN THE BELL END OF THE PIPE BEING LAID.

5. SEWER PIPE SHALL BE INSTALLED IN 4 INCH GRAVEL BEDDING EXTENDING TO THE SPRINGLINE OF PIPE AND IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

6. THE SANITARY SEWER SYSTEM SHALL BE LAID AND JOINED COMPLETE-IN-PLACE DUE TO THAT EACH LENGTH AND SECTION OF PIPE BETWEEN THE MANHOLES SHALL HAVE A SMOOTH AND UNIFORM INVERT.

7. THE PIPE SHALL BE CONNECTED TO MANHOLES THROUGH PRECAST OPENINGS AND JOINED WITH EITHER A FLEXIBLE BOOT ADAPTER OR A PIPE SEAL GASKET.

8. DETECTION TAPE TO BE INSTALLED 12" TO 18" ABOVE ALL NEW SEWER PIPE MAINS AND SEWER SERVICE LATERALS.

E. CONNECTION TO EXISTING SYSTEMS

1. THE NEW PIPE CONNECTION TO BE MADE TO AN EXISTING MANHOLE WHERE NO STUB OR OPENING EXISTS, SHALL BE MADE THROUGH AN OPENING OF MAXIMUM DIAMETER CUT INTO THE MANHOLE WALL AT THE REQUIRED LOCATION AND ELEVATION.

2. THE EXISTING INVERT CHANNELS AND BENCHES SHALL BE REWORKED AS REQUIRED TO FORM A NEW FLOW CHANNEL FROM THE NEW CONNECTION TO THE EXISTING FLOW CHANNEL.

3. THE NEW PIPE CONNECTED TO AN EXISTING MANHOLE SHALL BE SECURED IN POSITION AND THE REMAINING OPENING SHALL BE FILLED AND SEALED WITH BRICK AND MORTAR. THE OUTER SURFACE OF THE CONNECTION SHALL BE GIVEN A COAT OF HEAVY BITUMASTIC WATERPROOFING COMPOUND.

F. SERVICE CONNECTIONS

1. THE CONTRACTOR SHALL MAKE ALL SERVICE CONNECTIONS TO THE SEWER PIPE AND FROM MANHOLES WHERE SHOWN ON THE PLANS AND/OR WHERE LOCATED IN THE FIELD. THE SERVICE CONNECTIONS TO THE SEWER PIPE SHALL BE MADE WITH A WYE OR TEE WYE BRANCH FITTING.

2. THE WYE AND TEE WYE BRANCH FITTINGS FOR SERVICE CONNECTIONS SHALL BE COMMERCIALLY MANUFACTURED AND INSTALLED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPE MANUFACTURER.

3. THE SEWER PIPE SHALL NOT BE CUT OR TAPPED FOR SERVICE CONNECTONS EXCEPT WHEN AND WHERE PERMITTED BY THE ENGINEER.

4. ALL SERVICE CONNECTIONS SHALL BE MADE WITH FOUR (4) INCH PIPE AS A MINIMUM, UNLESS THE SIZE OF AN EXISTING SERVICE CONNECTION DICTATES OTHERWISE, AND SHALL BE INSTALLED ON A MINIMUM GRADE OF TWO (2) PERCENT AND EXTEND ONE (1) FOOT FROM THE SEWER PIPE OR MANHOLE TO THE PROPERTY OR EASEMENT LINE.

5. FUTURE SERVICE CONNECTIONS SHALL EXTEND TO THE PROPERTY OR EASEMENT LINE WITH CLEANOUT AND BE PROPERLY CAPPED WITH A WATERTIGHT FITTING TO PREVENT INFILTRATION INTO THE SEWERAGE SYSTEM. THE FITTING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPE MANUFACTURER.

6. FUTURE SERVICE CONNECTIONS SHALL BE FIELD MARKED BY A TREATED, SOLID WOODEN (2 X 4) MARKER THREE (3) FEET LONG SET VERTICALLY PLUMB WITH THE END OF THE CAPPED EXTENSION. THE TOPS OF THE MARKERS SHALL BE PAINTED YELLOW AND SET 24" ABOVE THE FINISHED GRADE. THE LOCATION AND INVERT DEPTH OF THE SERVICE CONNECTION SHALL BE SHOWN ON THE AS-BUILT PLANS.

BACKFILLING

A. JOB CONDITIONS

1. PRIOR TO PLACING BACKFILL ALL ORGANIC, RUBBISH, DEBRIS, OR OTHER UNSUITABLE OR OBJECTIONABLE MATERIAL WITHIN THE TRENCH SHALL BE REMOVED. ALL CONCRETE FORMS SHALL BE REMOVED. ALL SHORING OR SHEETING SHALL BE REMOVED OR CUT OFF AT THE DEPTH STIPULATED BY THE ENGINEER.

2. PRIOR TO PLACING BACKFILL, THE TRENCH BOX SHALL BE REMOVED. ALL CONCRETE FORMS SHALL BE REMOVED. ALL SHORING OR SHEETING SHALL BE REMOVED OR CUT OFF AT THE DEPTH STIPULATED BY THE ENGINEER.

3. BACKFILL MATERIAL SHALL BE PLACED IN UNIFORM HORIZONTAL LAYERS AND THOUGHLY COMPACTED WITH PROPER MECHANICAL OR HAND OPERATED TAMPERS OR OTHER EQUIPMENT AS APPROVED BY THE ENGINEER TO PERFORM SUCH WORK.

4. BACKFILL MATERIAL SHALL BE PLACED AND COMPACTED SO AS TO NOT UNEVENLY SUPPORT, DAMAGE OR DISPLACE THE ALIGNMENT OF THE PIPE OR STRUCTURES.

5. BACKFILL SHALL NOT BE PLACED OR COMPACTED AGAINST CAST IN PLACE CONCRETE UNTIL IT HAS OBTAINED SUFFICIENT STRENGTH TO WITHSTAND THE BACKFILLED PRESSURE PLACED UPON IT.

6. UPON THE COMPLETION OF BACKFILLING, ALL EXCESS SOIL, STONES AND DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR.

B. BACKFILL MATERIAL

1. MATERIALS FOR BACKFILL SHALL BE APPROVED EXCAVATED MATERIAL OR APPROVED SUITABLE MATERIAL OBTAINED FROM OTHER SOURCES. ALL MATERIAL SHALL BE APPROVED BY A SOILS ENGINEER.

2. MATERIAL SHALL CONSIST OF DURABLE NATURAL GRANULAR MATERIAL OR GRANULAR AGGREGATES FREE OF ORGANIC MATERIAL, LOAM, DEBRIS, OR OTHER OBJECTIONABLE MATERIAL WHICH CANNOT BE THOROUGHLY COMPACTED.

3. MATERIAL SHALL NOT CONTAIN STONES LARGER IN DIAMETER THAN THOSE SPECIFIED HEREIN, GRANITE, BROKEN CONCRETE, MASONRY RUBBLE OR OTHER MATERIAL WHICH IN THE OPINION OF THE ENGINEER IS UNSUITABLE FOR BACKFILL.

4. EXCESSIVELY WET EXCAVATED MATERIAL SHALL NOT BE USED AS BACKFILL. FROZEN MATERIAL SHALL NOT BE PLACED IN THE TRENCH, NOR SHALL APPROVED BACKFILL BE PLACED UPON FROZEN MATERIAL. HOWEVER, BACKFILLING MAY BE ALLOWED IN FREEZING WEATHER WITH PRIOR APPROVAL OF THE ENGINEER.

C. BACKFILL BELOW UNPAVED AREAS

1. BACKFILL FROM THE TOP OF THE PIPE BEDDING OR BOTTOM OF THE PIPE TRENCH TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE FREE OF STONES LARGER THAN ONE (1) INCH IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED SIX (6) INCHES AND COMPACTED WITH HAND OPERATED TAMPERS.

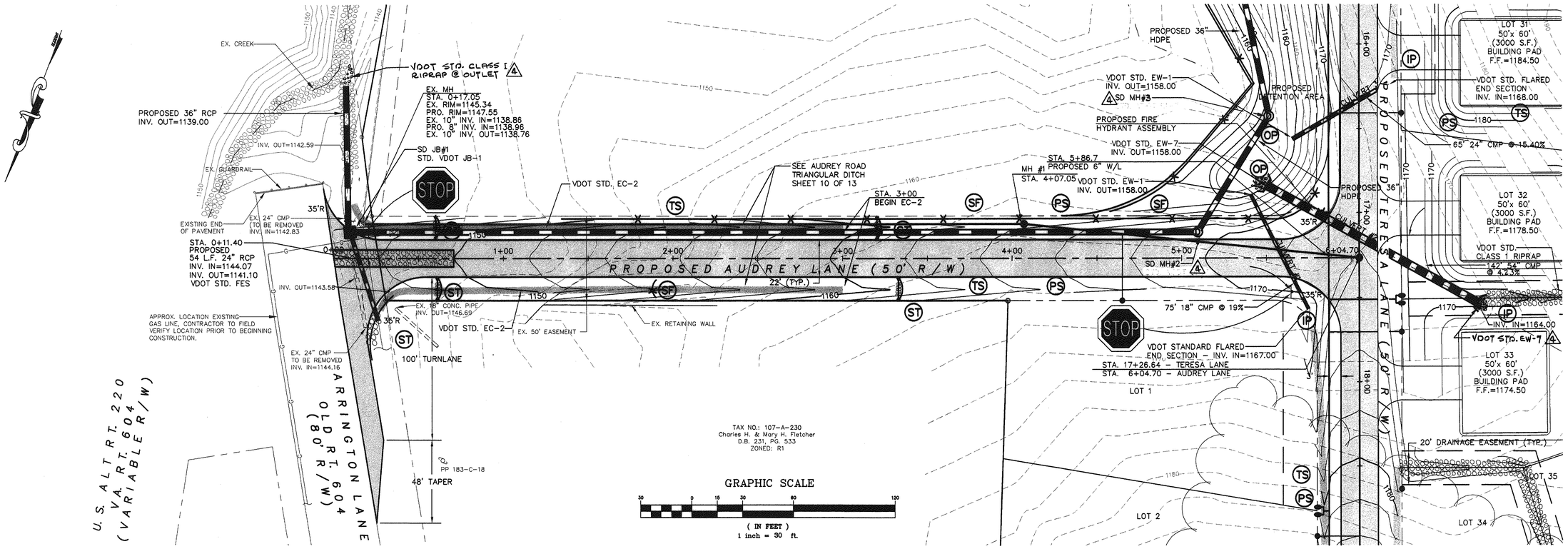
2. BACKFILL FROM ONE (1) FOOT ABOVE THE TOP OF THE PIPE TO THE TOPSOIL SUBGRADE SHALL BE FREE OF STONES LARGER THAN FIVE (5) INCHES IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED TWELVE (12) INCHES AND COMPACTED WITH MECHANICAL TAMPERS.

3. DRAINAGE CHANNELS TO BE CONSTRUCTED OF FILL MATERIAL SHALL BE COMPACTED FROM THE TOPSOIL SUBGRADE A NEGATIVE MATERIAL FREE OF STONES LARGER THAN FOUR (4) INCHES IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED EIGHT (8) INCHES AND COMPACTED WITH MECHANICAL TAMPERS.

D. BACKFILL BELOW EXISTING OR NEW PAVED AREAS AND SIDEWALKS

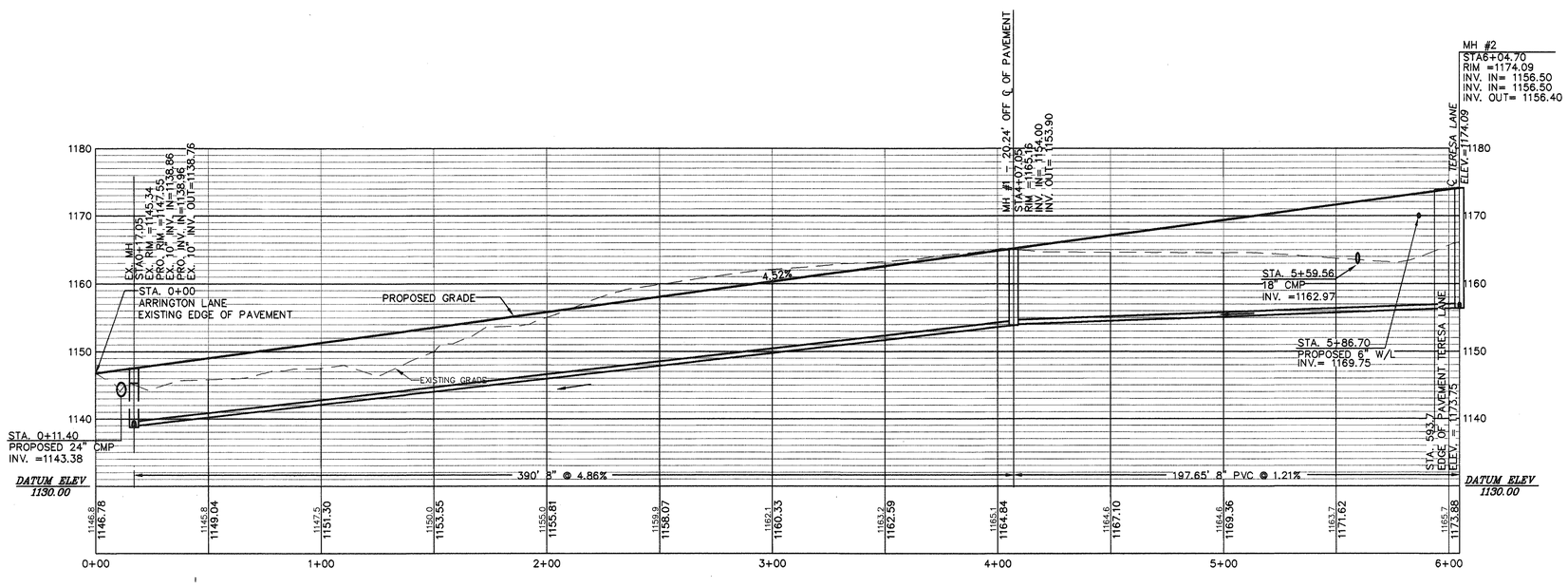
1. BACKFILL FROM THE TOP OF THE PIPE BEDDING OR BOTTOM OF THE PIPE TRENCH TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE FREE OF STONES LARGER THAN ONE (1) INCH IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED SIX (6) INCHES AND COMPACTED WITH HAND TAMPERS.

2. BACKFILL FROM ONE (1) FOOT ABOVE THE TOP OF THE PIPE TO THE PAVEMENT SUBGRADE SHALL BE FREE OF STONES LAR



PROPOSED AUDREY LANE - PLAN VIEW

NOTE:
REFER TO SHEET NO. 10 OF 14 FOR ROADSIDE DITCH TYPICAL SECTIONS



SCALE
HORZ: 1"= 30'
VERT: 1"= 10'

PROPOSED AUDREY LANE - PROFILE

LMW P.C.
ENGINEERING · ARCHITECTURE · SURVEYING
102 ALBEMARLE AVE., S.E.
ROANOKE, VIRGINIA 24013
(540) 345-0675
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

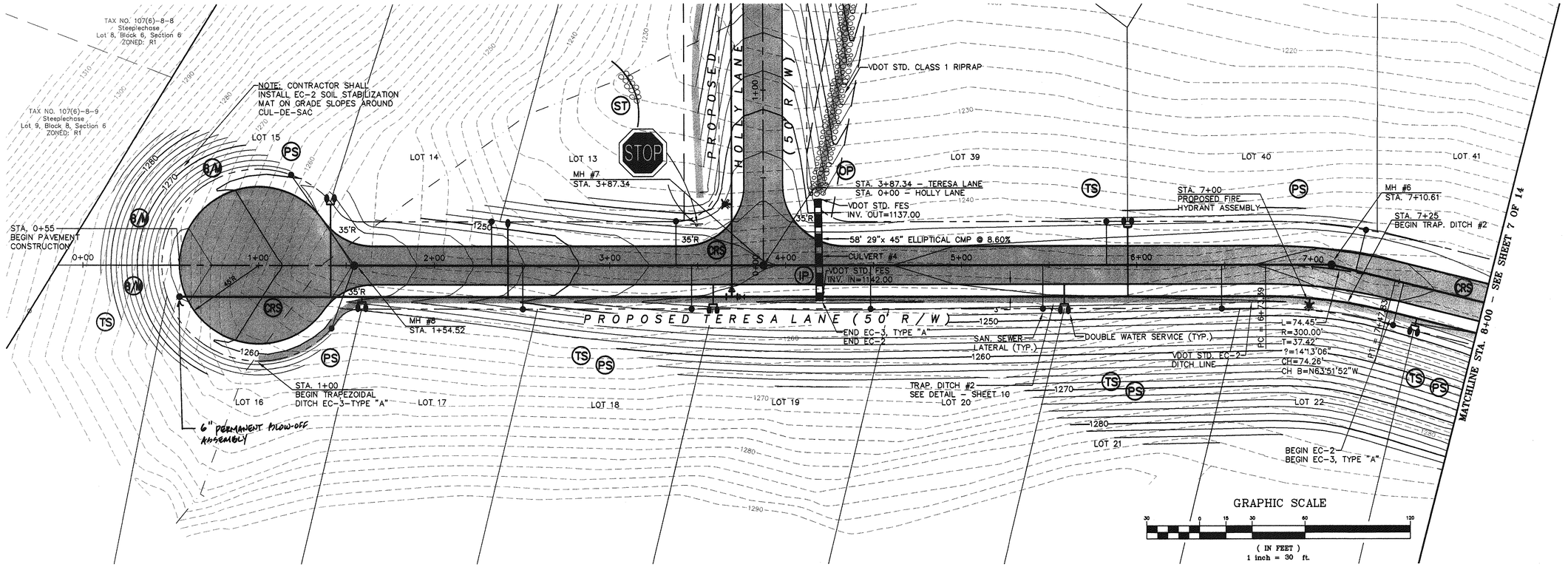
11/18/99 VDOT COMMENTS DME

NO.	DATE	DESCRIPTION	BY
3	10/18/99	BOTETOURT CTY. COMMENTS	DDW
2	9/27/99	VDOT & BOTETOURT CTY. COMMENTS	DDW
1	8/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

PROPOSED AUDREY LANE
PLAN & PROFILE

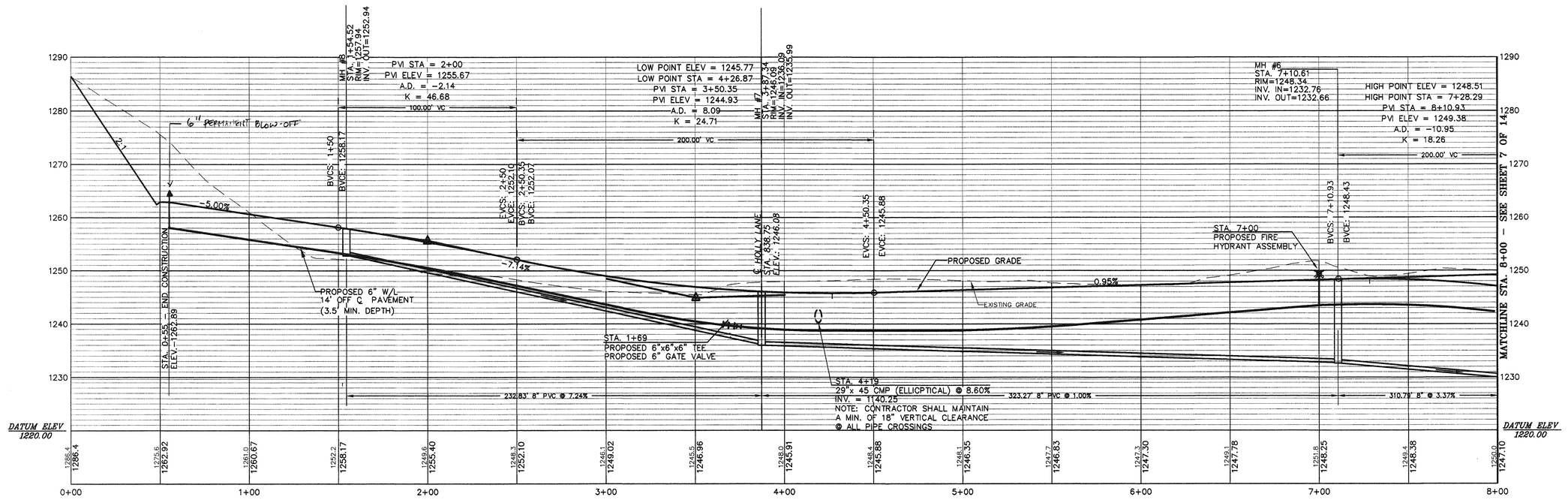
COMMONWEALTH OF VIRGINIA
DOUGLAS C. MEREDITH, JR.
No. 22942
10-19-99
PROFESSIONAL ENGINEER

Designed By	DDW/RCW
Drawn By	DDW
Checked By	RCW
Approved By	RCW
Submitted By	RCW
Drawing	1809DESIGN
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	5 of 14



PROPOSED TERESA LANE STA. 0+00 TO 8+00 - PLAN VIEW

NOTE:
REFER TO SHEET NO. 10 OF 14 FOR ROADSIDE DITCH TYPICAL SECTIONS



PROPOSED TERESA LANE STA. 0+00 TO 8+00 - PROFILE

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102 ALBEMARLE AVE., S.E.
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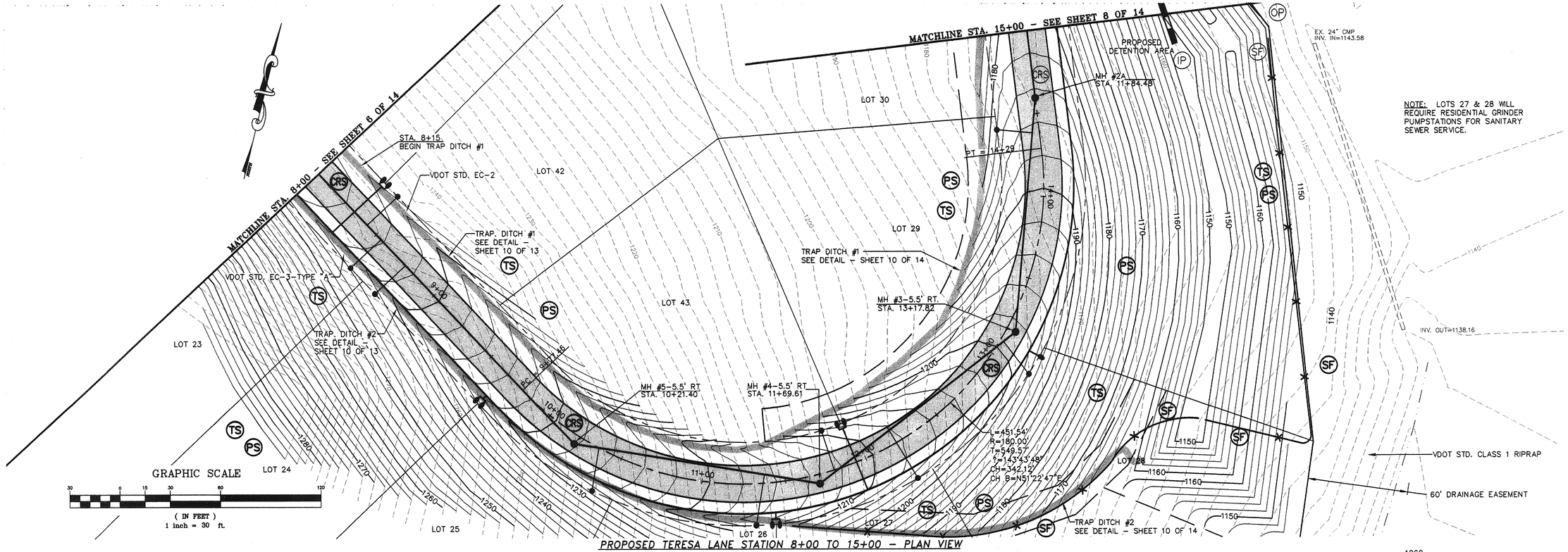
MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY
3	10/18/99	BOTETOURT CTY. COMMENTS	DDW
2	9/27/99	VDOT & BOTETOURT CTY. COMMENTS	DDW
1	8/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

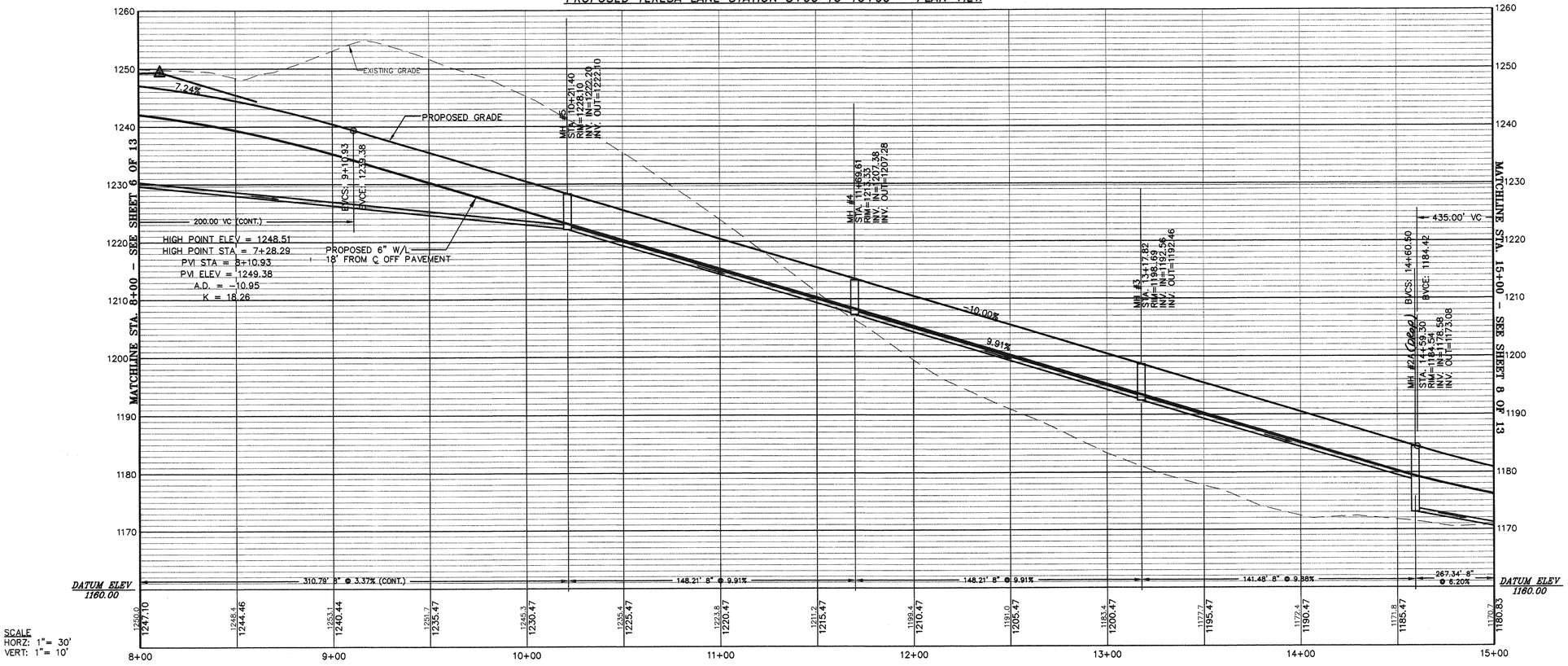
PROPOSED TERESA DRIVE
STATION 0+00 TO 8+00
PLAN & PROFILE

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

Designed By	DDW/RCW
Drawn By	DDW
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	1809DESIGN
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	6 of 14



PROPOSED TERESA LANE STATION 8+00 TO 15+00 - PLAN VIEW



PROPOSED TERESA LANE STATION 8+00 TO 15+00 - PROFILE

SCALE
HORZ: 1"= 30'
VERT: 1"= 10'

LMW P.C.
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ROANOKE, VIRGINIA 24013
(540) 345-0675
FAX (540) 342-4456

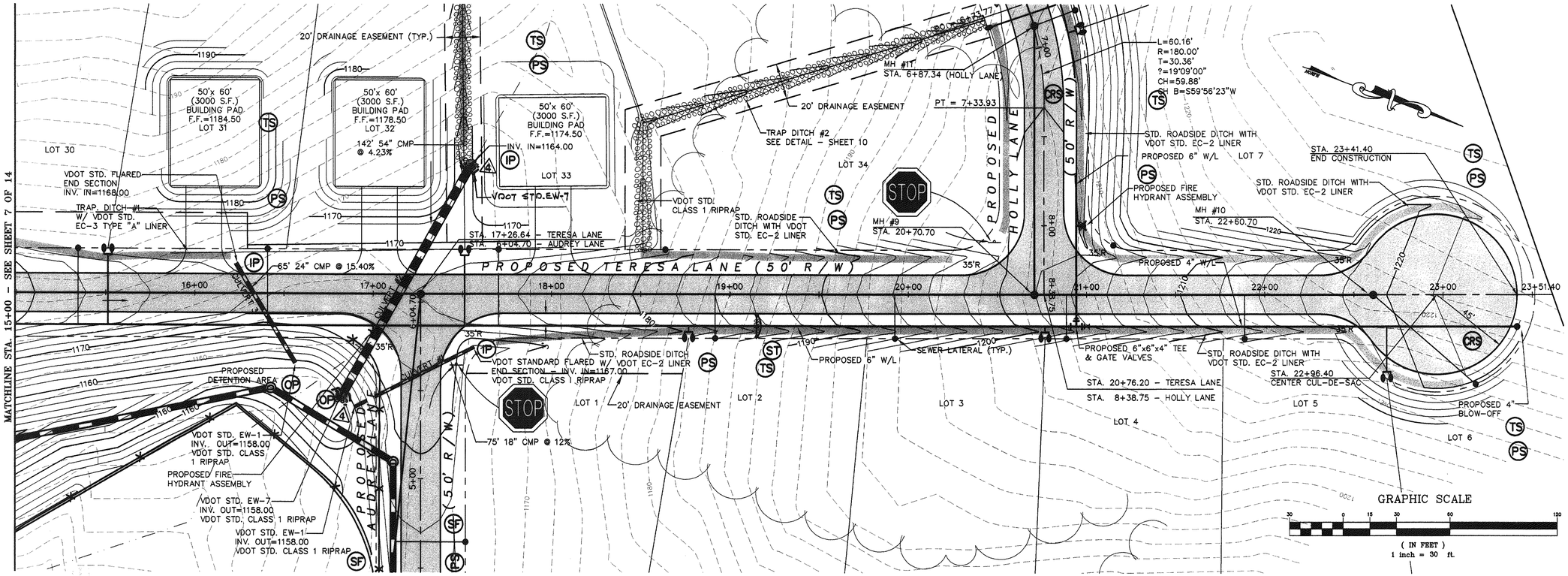
MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY
2	10/18/99	BOTETOURT CTY. COMMENTS	DDW
1	9/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

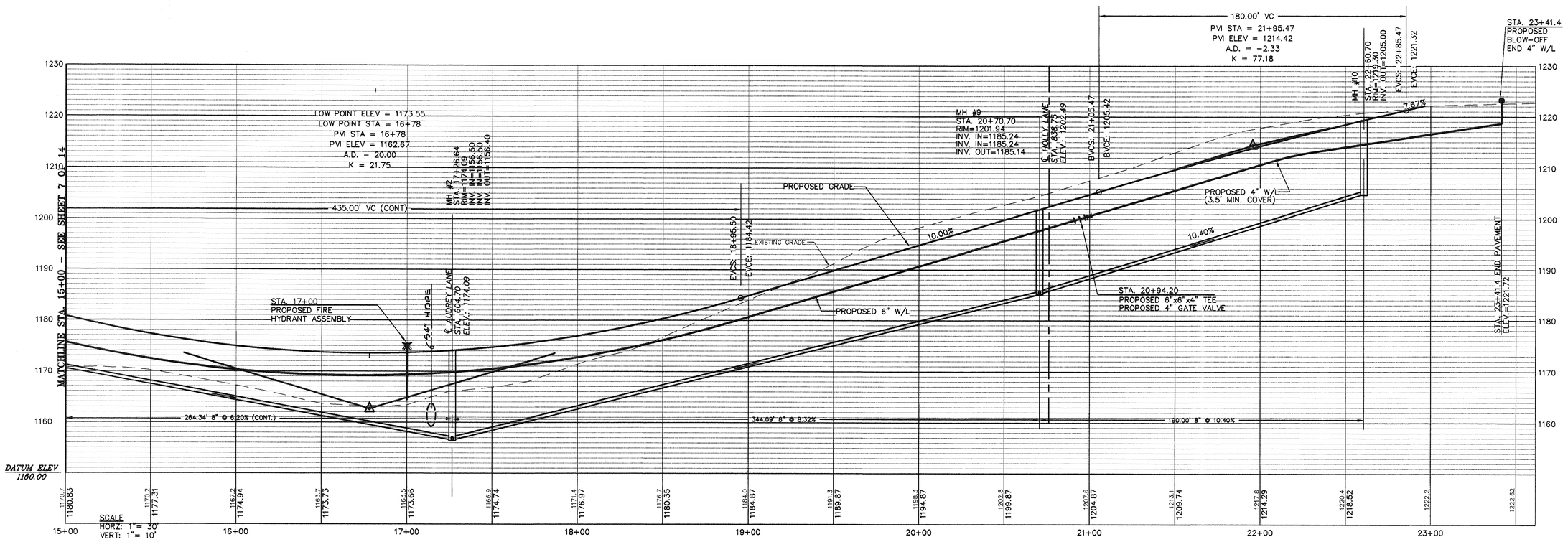
PROPOSED TERESA LANE
STATION 8+00 TO 15+00
PLAN & PROFILE

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

Designed By	DDW/RCW
Drawn By	DDW
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	1809DESIGN
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	7 of 14



PROPOSED TERESA LANE STATION 15+00 TO 23+51.40 - PLAN VIEW



PROPOSED TERESA LANE STATION 15+00 TO 23+51.40 - PROFILE

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MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

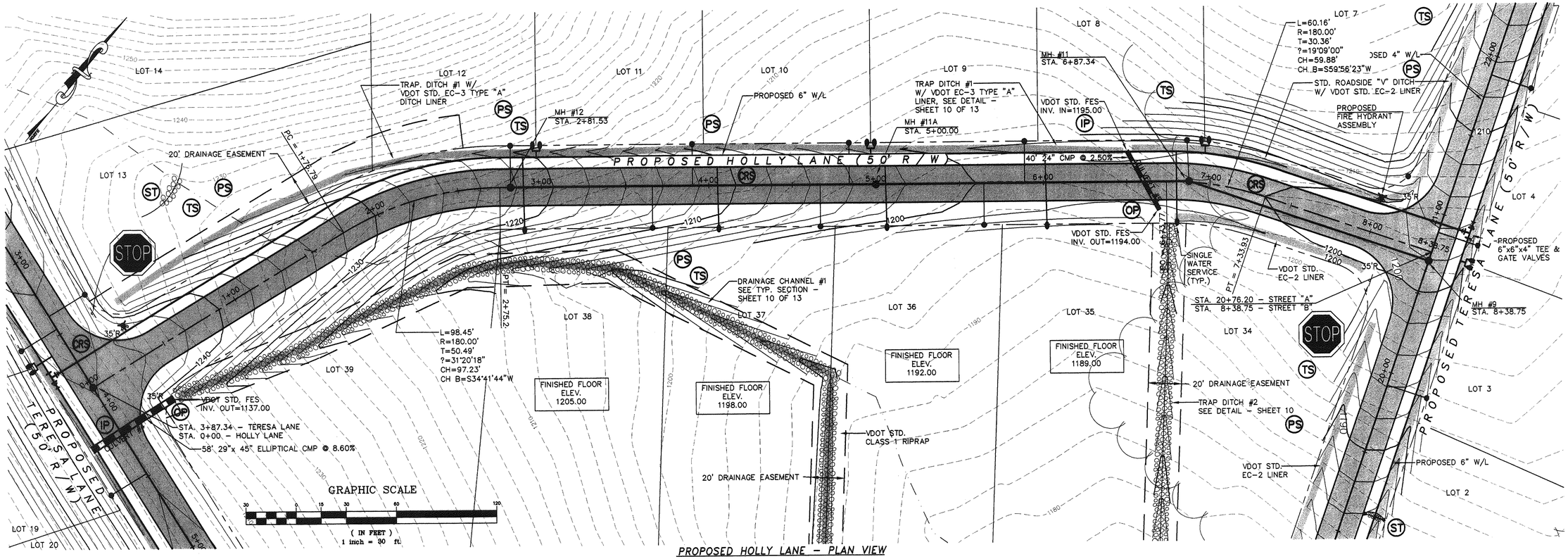
11/16/99 VDOT COMMENTS DME

NO.	DATE	DESCRIPTION	BY
3	10/18/99	BOTETOURT CTY. COMMENTS	DDW
2	9/27/99	VDOT & BOTETOURT CTY. COMMENTS	DDW
1	8/25/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

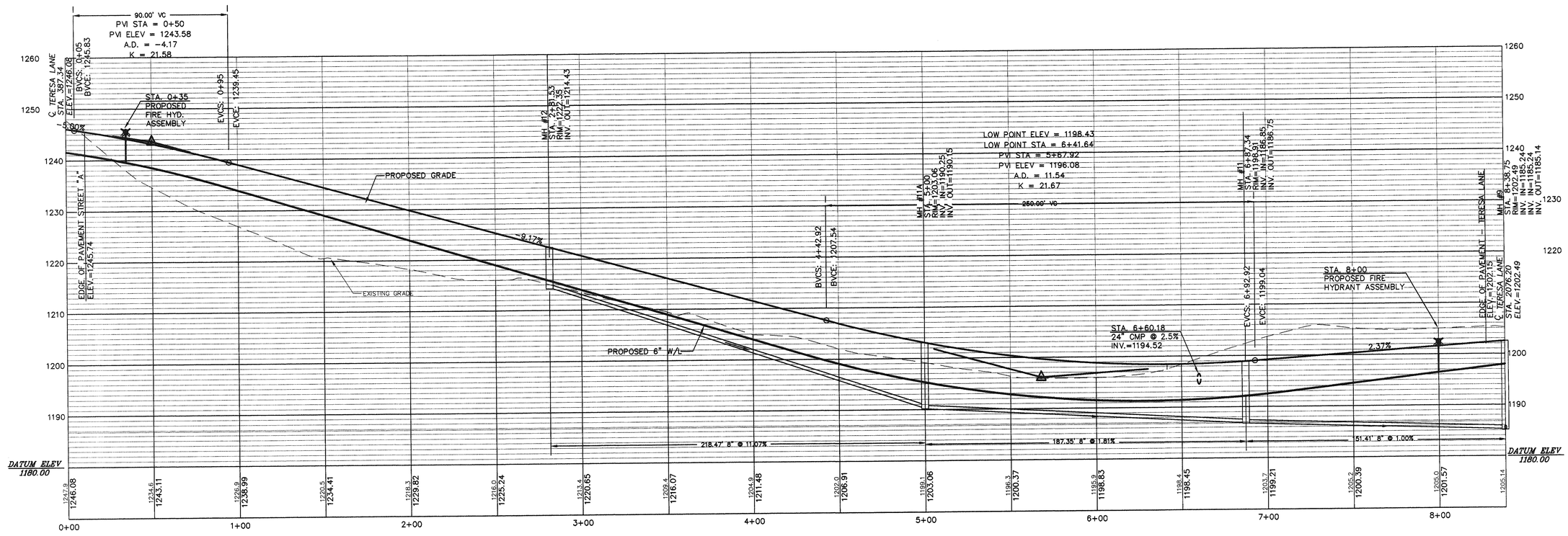
PROPOSED TERESA LANE
STATION 15+00 TO 23+51.40
PLAN & PROFILE

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

Designed By	DDW/RCW
Drawn By	DDW
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	1809DESIGN
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	8 of 14



PROPOSED HOLLY LANE - PLAN VIEW



PROPOSED HOLLY LANE - PROFILE

SCALE
HORZ: 1"= 30'
VERT: 1"= 10'

LMW P.C.
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MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

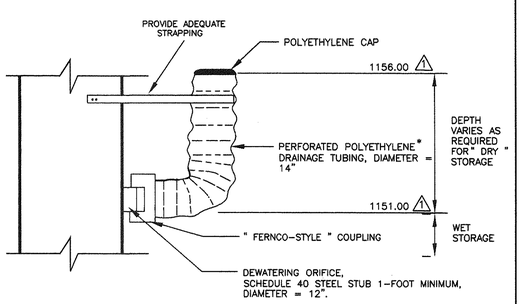
NO.	DATE	DESCRIPTION	BY
2	10/18/99	BOTETOURT CTY. COMMENTS	DDW
1	6/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

PROPOSED HOLLY LANE
PLAN & PROFILE

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

Designed By	DDW/RCW
Drawn By	DDW
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	1809DESIGN
Date	05/26/99
Scale	AS NOTED
Commission No.	1809
Sheet	9 of 14

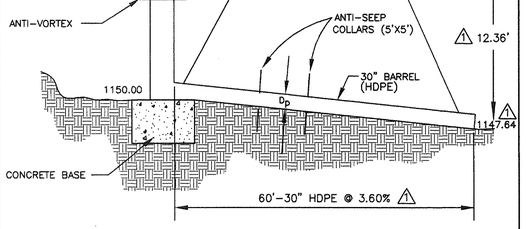
RECOMMENDED DEWATERING SYSTEM FOR SEDIMENT BASINS



NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

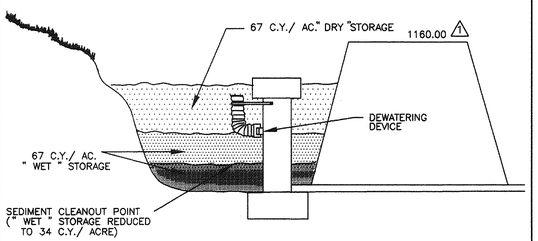
*DRAINAGE TUBING SHALL COMPLY WITH ASTM F667 AND AASHTO M294

PRINCIPAL SPILLWAY DESIGN

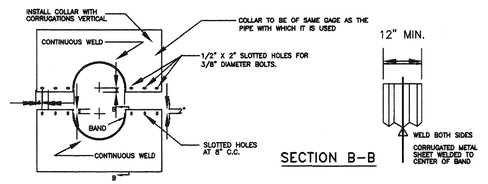


H = HEAD ON PIPE THROUGH EMBANKMENT
h = HEAD OVER RISER CREST
L = LENGTH OF PIPE THROUGH EMBANKMENT
D_p = DIAMETER OF PIPE THROUGH EMBANKMENT
D = DIAMETER OF RISER

MINIMUM STORAGE VOLUME AND SEDIMENT STORAGE



DETAILS OF CORRUGATED METAL ANTI-SEEP COLLAR



ELEVATION OF UNASSEMBLED COLLAR

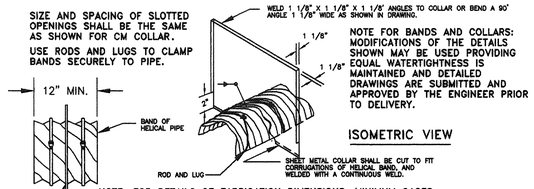
NOTES FOR COLLARS:

1. ALL MATERIALS TO BE IN ACCORDANCE WITH CONSTRUCTION AND CONSTRUCTION MATERIAL SPECIFICATIONS.
2. WHEN SPECIFIED ON THE PLANS, COATING OF COLLARS SHALL BE IN ACCORDANCE WITH CONSTRUCTION AND CONSTRUCTION MATERIAL SPECIFICATIONS.
3. UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.
4. THE LAP BETWEEN THE TWO HALF SECTIONS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAULKED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.
5. EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2" DIAMETER RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.

DETAIL OF HELICAL PIPE ANTI-SEEP COLLAR

SIZE AND SPACING OF SLOTTED OPENINGS SHALL BE THE SAME AS SHOWN FOR CM COLLAR.

USE RODS AND LUGS TO CLAMP BANDS SECURELY TO PIPE.



NOTE FOR BANDS AND COLLARS: MODIFICATIONS OF THE DETAILS SHOWN MAY BE USED PROVIDING EQUAL WATERTIGHTNESS IS MAINTAINED AND DETAILED DRAWINGS ARE SUBMITTED AND APPROVED BY THE ENGINEER PRIOR TO DELIVERY.

NOTE: FOR DETAILS OF FABRICATION DIMENSIONS, MINIMUM GAGES, SLOTTED HOLES, AND NOTES, SEE DETAIL ABOVE.

NOTE: TWO OTHER TYPES OF ANTI-SEEP COLLARS ARE:

1. CORRUGATED METAL, SIMILAR TO UPPER, EXCEPT SHOP WELDED TO A SHORT (4FT.) SECTION OF THE PIPE AND CONNECTED WITH CONNECTING BANDS TO THE PIPE.
2. CONCRETE, SIX INCHES THICK FORMED AROUND THE PIPE WITH #3 REBAR SPACED 15" HORIZONTALLY AND VERTICALLY.

REF: ENGR. FIELD MANUAL

SOURCE: USDA-SCS PLATE. 3.14-13

****
NORTH AMERICAN GREEN CHANNEL PROTECTION MATERIAL SPECIFICATIONS
****

C350 Specification

North American Green C350 permanent erosion control/turf reinforcement mat is constructed of 100% coconut fiber stitch bonded between a heavy duty UV stabilized bottom net, and a heavy duty UV stabilized cuspated (crimped) middle netting overlaid with a heavy duty UV stabilized top net. The cuspated netting forms prominent closely spaced ridges across the entire width of the mat. The three nettings are stitched together on 1.5 in (3.8 cm) centers with UV stabilized polypropylene thread to form a permanent three dimensional structure. The following list contains further physical properties of the C350 Erosion Control/Turf Reinforcement Mat.

Property	Test Method	Value	Unit
Ground Cover	Image Analysis	93	%
Thickness	ASTM D1777	.63 (1.6)	in (cm)
Mass Per Unit Area	ASTM D3776	.92 (.50)	lb/sy (kg/m^2)
Tensile Strength	ASTM D5035	480 (714)	lb/ft (kg/m)
Elongation	ASTM D5035	49	%
Tensile Strength	ASTM D5035	960 (1429)	lb/ft (kg/m)
Elongation	ASTM D5035	31	%
Tensile Strength	ASTM D1682	177 (80)	lbs (kg)
Elongation	ASTM D1682	22	%
Resiliency	ASTM D1777	>80	%
UV Stability*	ASTM D4355	151 (68)	lbs (kg)
		86	%
Color(permanent net)		UV Black	
Porosity(permanent net)	Calculated	>95	%
Minimum Filament Diameter (permanent net)	Measured	.03 (.08)	in (cm)

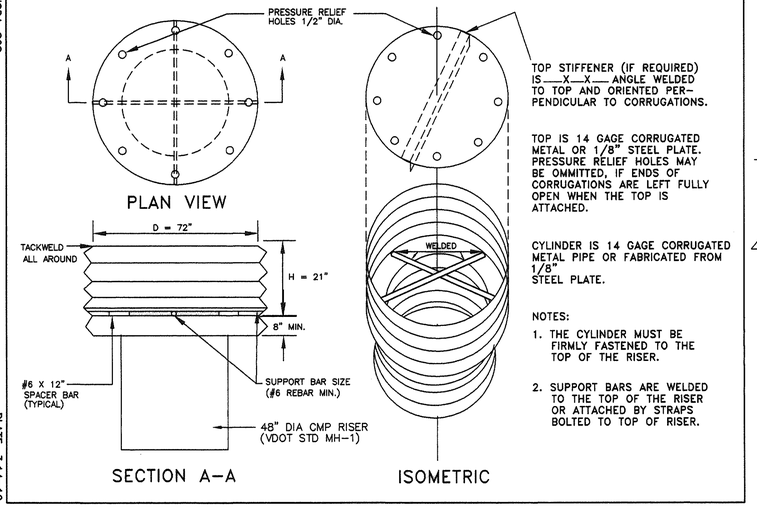
*ASTM D1682 Tensile Strength and % Strength Retention of material after 1000 hours of exposure in Xenon-Arc Weatherometer

Physical Specifications (Roll)

Width	6.5 feet (2 m)
Length	55.5 feet (16.9 m)
Weight	37 lbs +/- 10% (16.8kg)
Area	40 yd^2 (33.4 m^2)

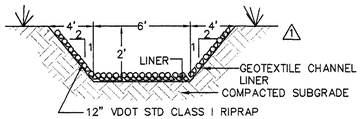
SOURCE: USDA-SCS PLATE. 3.14-10

ANTI- VORTEX DEVICE DESIGN

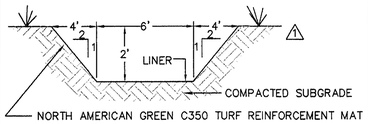


NOTES:

1. THE CYLINDER MUST BE FIRMLY FASTENED TO THE TOP OF THE RISER.
2. SUPPORT BARS ARE WELDED TO THE TOP OF THE RISER OR ATTACHED BY STRAPS BOLTED TO TOP OF RISER.

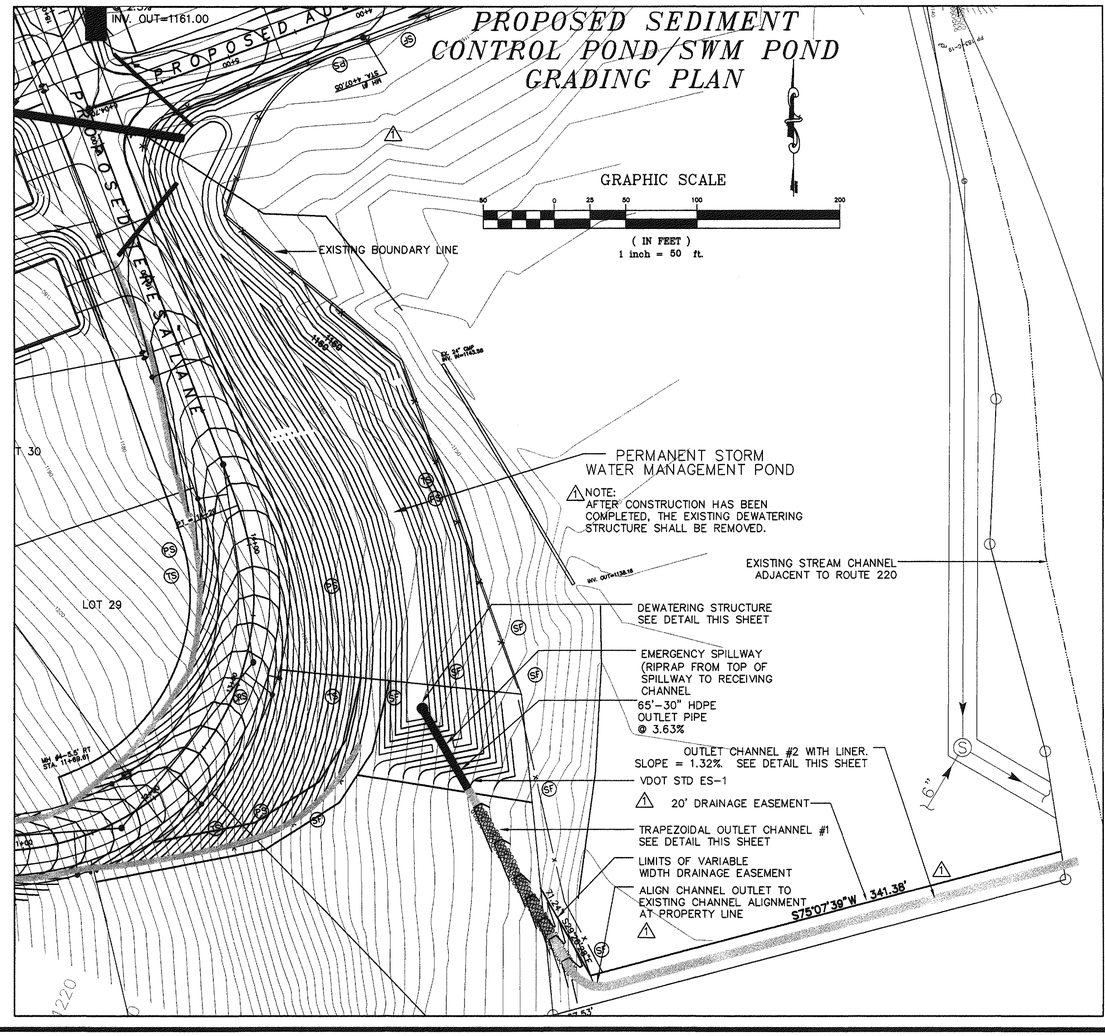


POND OUTLET CHANNEL #1 DETAIL



POND OUTLET CHANNEL #2 DETAIL

PROPOSED SEDIMENT CONTROL POND/SWM POND GRADING PLAN



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(540) 345-0875
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

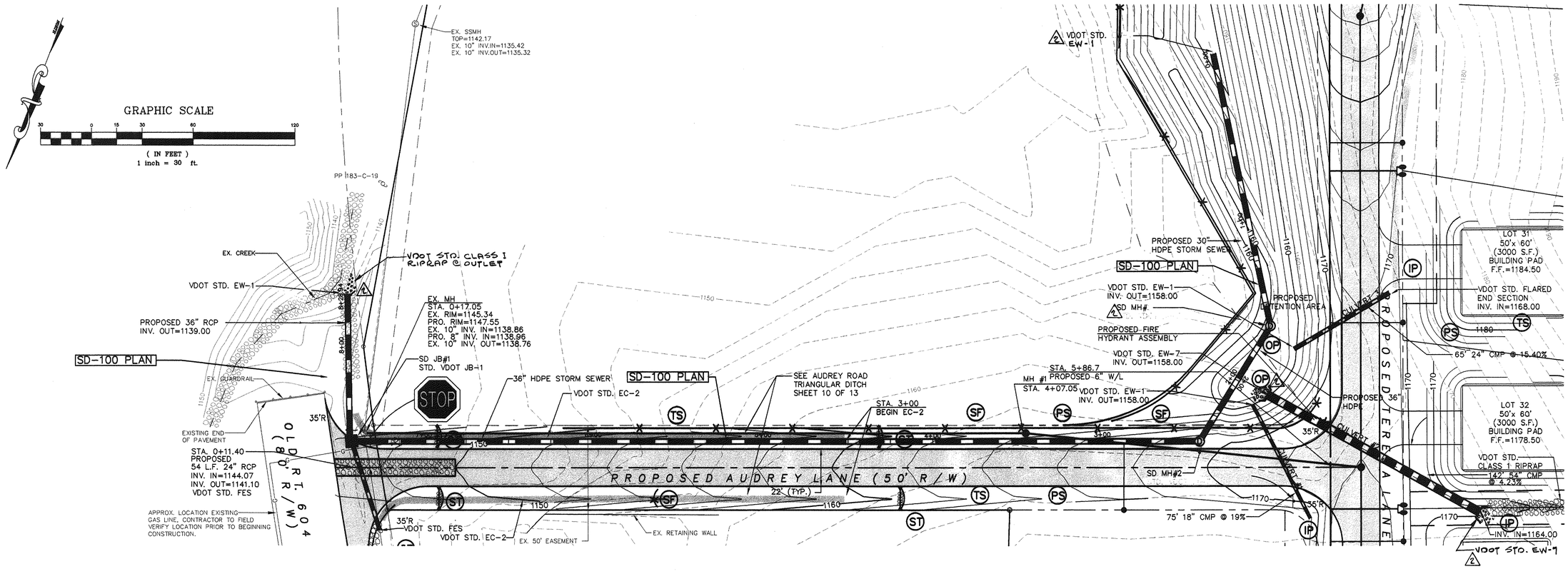
NO.	DATE	DESCRIPTION	BY
1	5/2/00	REVISE POND PER F. HANCOCK	DME

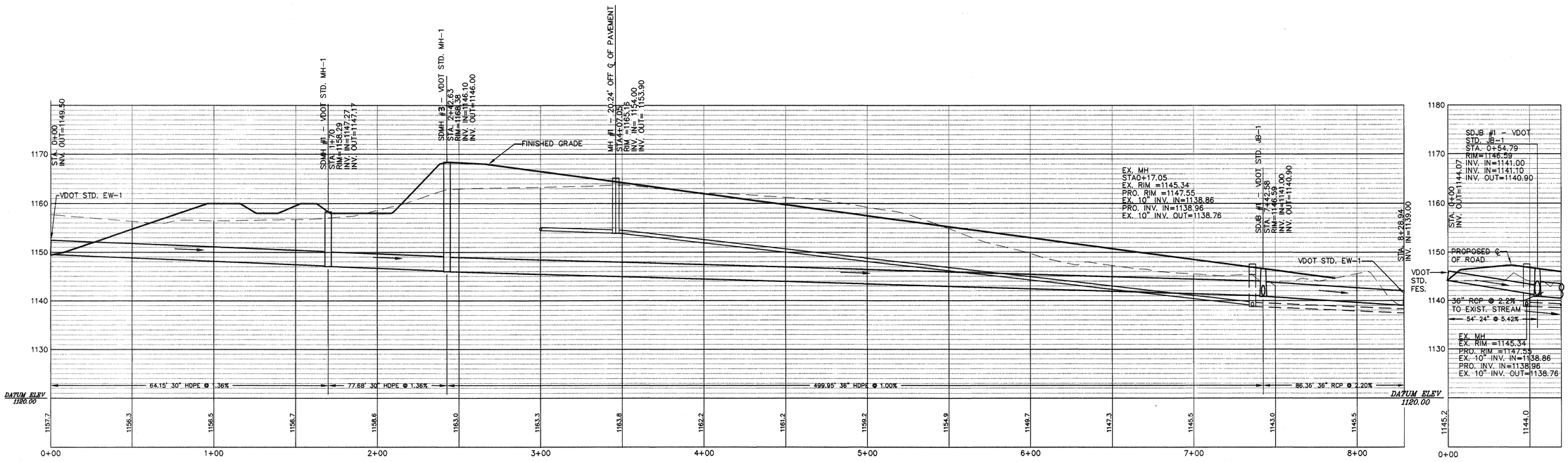
SEDIMENT POND OUTLET STRUCTURE DETAILS

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
7/25/00
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB
Checked By	DME
Approved By	DRM
Submitted By	DRM
Drawing	1809 POND
Date	7/25/00
Scale	AS NOTED
Commission No.	1809
Sheet	10 of 13

C:\MKS\1809\dwg\1809_pond.dwg Fri Aug 04 10:58:25 2000





SD-100 - PROFILE

LMW P.C.
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(540) 345-0675
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	COMMENTS	BY
1	10/18/99	BOTETOURT CTY. COMMENTS	DDW
1	11/1/99	VDOT Comments	DME

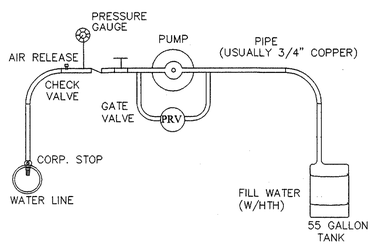
STORM SEWER
PLAN & PROFILES

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

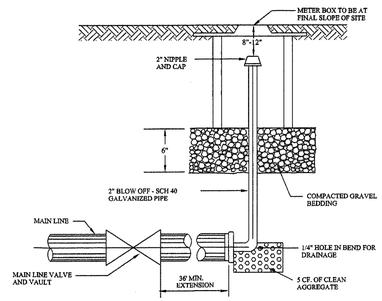
Designed By	DDW/DRM
Drawn By	DDW
Checked By	DRM
Approved By	DEM
Submitted By	DEM
Drawing	1809DESIGN
Date	09/27/99
Scale	1"=30
Commission No.	1809
Sheet	10A of 14

Pipe Diameter (in.)	Min. Time (min: sec)	Length for Min. Time (ft)	Time for Longer Length (sec)	Specified Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

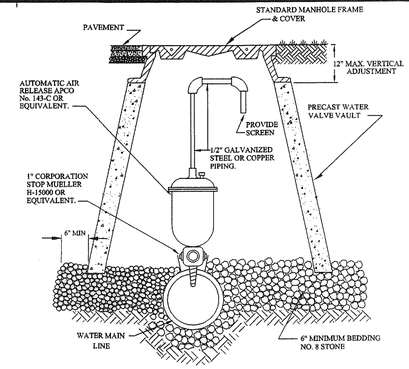
MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015



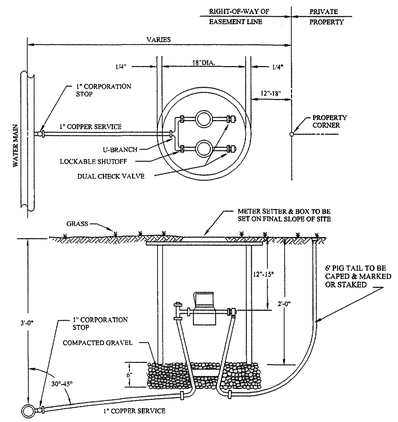
TYPICAL WATER PRESSURE TEST RIG



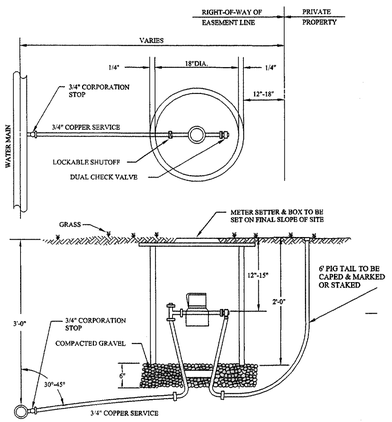
BLOW OFF ASSEMBLY FOR MAIN LINE



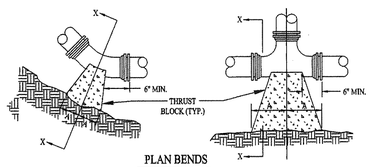
AUTOMATIC AIR RELEASE ASSEMBLY



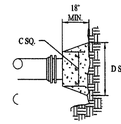
DOUBLE RESIDENTIAL WATER SYSTEM



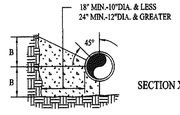
SINGLE RESIDENTIAL WATER SERVICE



PLAN BENDS



PLAN AND ELEVATION PLUGS

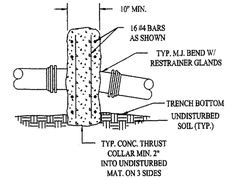


BENDS AND TEES

PIPE SIZE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
	8"	12"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
	18"	12"	8"	10"	8"	8"	8"	8"	11"	10"	12"	18"
4"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
6"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
8"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
16"	26"	20"	16"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	82"	42"	62"	30"	44"	22"	22"	16"	82"	42"	82"	42"
30"	185"	42"	100"	42"	52"	42"	40"	30"	185"	42"	185"	42"

THRUST BLOCK CONSTRUCTION

NO SCALE



SECTION OF VERTICAL BEND

NOTES:

1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4° BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
4. ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
5. THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4' OF COVER.

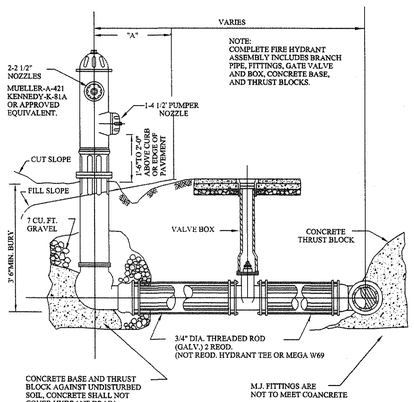
PRESSURE = 200 psi
BEARING = 2000 psf
FACTOR OF SAFETY = 1.5

NOTES:
(1) MAIN BODY OF HYDRANT MUST BE SILVER AND HAVE RED CAPS AND BONNET.

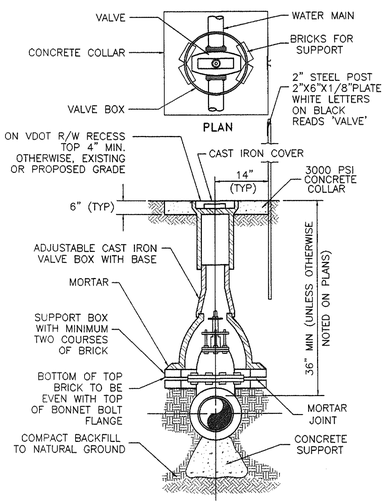
(2) DISTANCE "A" WITH CURB AND GUTTER, 2' MIN., 4' MAX. FROM BACK OF CURB.

(3) DISTANCE "A" WITHOUT CURB AND CUTTER, 6' MIN., 12' MAX. FROM EDGE OF PAVEMENT.

(4) AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE APPROXIMATELY LEVEL AND UNOBSTRUCTED.

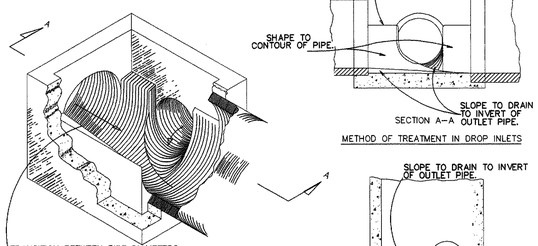


FIRE HYDRANT ASSEMBLY



TYPICAL VALVE SETTING DETAIL

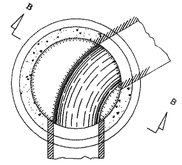
NTS



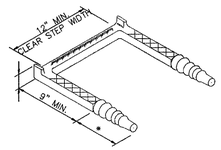
NOTES:
SHAPING OF MANHOLE AND INLET INVERTS IN ACCORDANCE WITH THIS DRAWING IS TO APPLY TO THOSE STRUCTURES SPECIFIED ON PLANS OR WHERE INVERT OF PIPE IS ABOVE INVERT OF STRUCTURE.

MANHOLE OR DROP INLET IS TO BE FORMED AND CONSTRUCTED IN ACCORDANCE WITH APPLICABLE STANDARD OR SPECIAL DRAWING. THE INVERT SHAPING AS DETAILED HEREON IS TO CONSIST OF A PORTLAND CEMENT CONCRETE MIX CONFORMING TO CLASS 20 OR CLASS 10, EXCEPT THAT 25% OF COARSE AGGREGATE MAY BE UP TO 4 INCHES IN DIAMETER AND CONSIST OF STONE, BROKEN BRICK, BROKEN CONCRETE OR BROKEN CONCRETE BLOCK. THE SURFACE SHALL BE LEFT SMOOTH BY MEANS OF HAND TROWELLING. NONE OF THE COARSE AGGREGATE SHALL REMAIN EXPOSED.

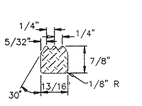
DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE OR DROP INLET IS TO BE SHAPED INDIVIDUALLY TO BEST FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.



METHOD OF SHAPING MANHOLE AND INLET INVERTS

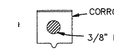


ENCAPSULATED STEEL STEP

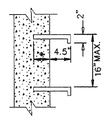


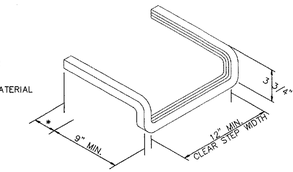
TYPICAL SECTION
(DIMENSIONS MAY VARY WITH MANUFACTURER'S DESIGN)

NOTES: 13, GRADE 400, REINFORCING ROD ENCASED IN A CORROSION RESISTANT RUBBER OR OTHER MATERIAL APPROVED BY THE ENGINEER.



TYPICAL SECTION
(DIMENSIONS MAY VARY WITH MANUFACTURER'S DESIGN)





ALUMINUM STEP

NOTES: (ALUMINUM STEP)
STEPS SHALL BE FABRICATED IN ACCORDANCE WITH ASTM B221M, ALLOY 6005-T5.
THAT PORTION OF THE STEP ENCASED IN MASONRY SHALL BE UNIFORMLY COATED WITH BITUMINOUS, SOLVENT TYPE.
ASBESTOS FILLED ALUMINUM PIGMENTED COATING CONFORMING TO FEDERAL SPECIFICATION TC-C-00498A.

NOTES:
1. STEPS WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH OF 48" OR GREATER UNLESS OTHERWISE NOTED ON THE PLANS.
2. ALL STEPS SHALL PROTRUDE 4.5" FROM INSIDE FACE OF STRUCTURE WALL. MAXIMUM STEP SPACING TO BE 16" C-C.
3. STEPS SHALL WITHSTAND A MINIMUM FORCE OF 1335 NEWTONS WHEN EXTENDED 4.5" FROM THE FACE OF THE SUPPORT.
4. STEPS ARE TO VERTICALLY ALIGNED AND UNIFORMLY SPACED FOR THE ENTIRE DEPTH OF ANY STRUCTURE.
5. IN PRECAST UNITS STEPS MAY BE CAST IN PLACE, MORTARED INTO HOLES PROVIDED BY THE FABRICATOR, OR DRIVEN
6. STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THEY MEET THE MINIMUM REQUIREMENTS SHOWN HEREON AND THE CONTRACTOR HAS FURNISHED THE SUBSTITUTE AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.
7. ALL STEPS INSTALLED SHALL BE PROVIDED WITH SLIP-RESISTANT SURFACES SUCH AS, BUT NOT LIMITED TO, CORRUGATED KNURLED, OR DIMPLED SURFACES.

* MINIMUM OF 3" EMBEDMENT

MANHOLE STEP

LMW P.C.
ENGINEERING-ARCHITECTURE-SURVEYING
102 ALBEMARLE AVE., S.E.
ROANOKE, VIRGINIA 24013
(540) 345-0675
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY

WATER DETAILS

COMMONWEALTH OF VIRGINIA
JOHN D. CRAIG
No. 020021
6-15-00
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB/JDC
Checked By	RCW
Approved By	RCW
Submitted By	RCW
Drawing	DETAILS
Date	6/15/00
Scale	NONE
Commission No.	1809
Sheet	11 of 14

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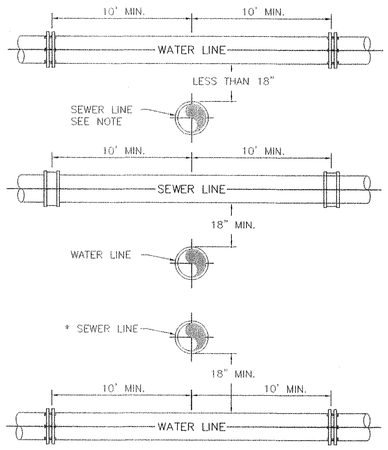
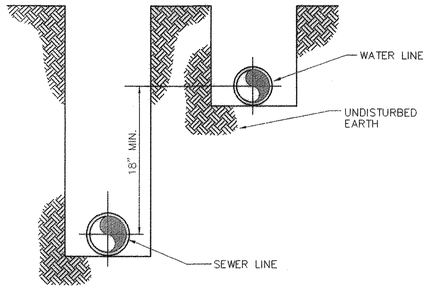


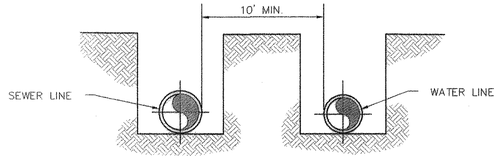
NOTE:
* SEWER LINE ABOVE WATERLINE TO BE CONSTRUCTED OF AWWA WATER LINE MATERIAL & PRESSURE TESTED (SEE SPEC.) AT NO ADDITIONAL COST (SEE SEWER LINE COUPLING DETAIL).

WATER and SEWER CROSSING DETAIL

NTS



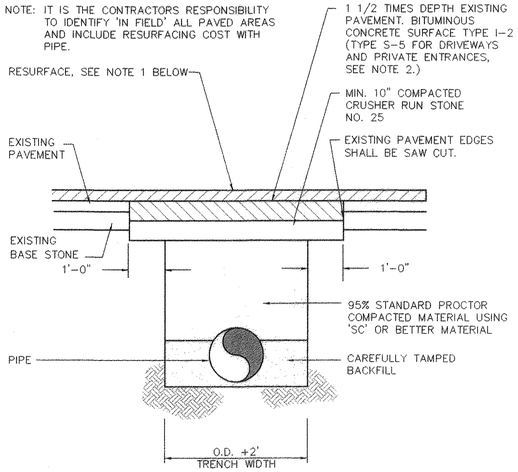
VERTICAL SEPARTION



HORIZONTAL SEPARATION

WATER and SEWER SEPARATION DETAIL

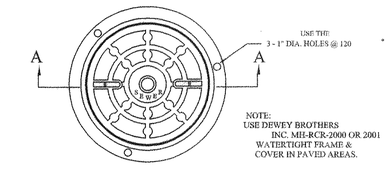
NTS



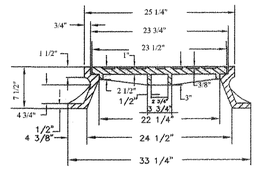
OPEN CUT ROAD and CROSSING DETAIL

NTS

NOTES:
1) ALLPAVED SURFACES OWNED BY THE STATE SHALL BE RESURFACED 25' EACH SIDE OF CUT, AS PER V.D.O.T. SPECIFICATIONS.
2) THIS DETAIL ALSO APPLIES TO ALL PAVED DRIVEWAYS AND ENTRANCES- EXCLUDING 25' RESURFACING EACH WAY.
3) WHERE EXISTING SURFACE IS GRAVEL, REPLACEMENT SURFACE TO BE CRUSHER RUN STONE NO. 25.



PLAN



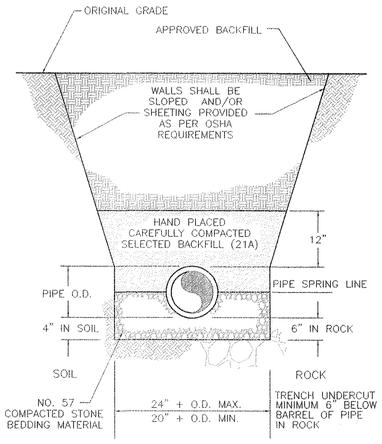
SECTION A-A

MANHOLE FRAME AND COVER

PAVED 2001EC
UNPAVED 2001(ABOVE)

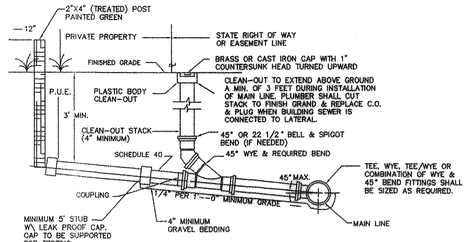
LMW P.C.
ENGINEERING • ARCHITECTURE • SURVEYING
102 ALBEMARLE AVE., S.E.
ROANOKE, VIRGINIA 24013
(540) 345-0675
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA



PIPE LAYING CONDITION for GRAVITY SEWER

NTS

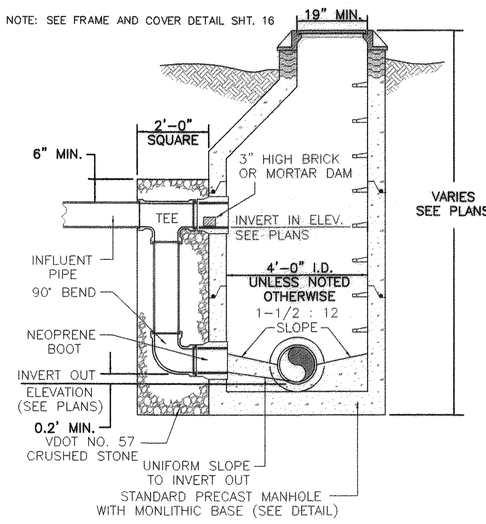


SANITARY SEWER LATERAL

GENERAL NOTES:

1. TRAFFIC BEARING BOX REQUIRED IN TRAFFIC AREAS.
2. ALL PIPE AND FITTINGS SHALL BE OF SIMILAR MATERIAL.
3. ALL PIPE SHALL BE OF SAME SIZE.
4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE. (EXCEPT AS NOTED)
5. ALL MAIN LINE TAPS ON ACTIVE MAINS WILL BE PERFORMED BY ROANOKE COUNTY UTILITY DEPT.
6. PIPING BEHIND CLEANOUT TO BE INSTALLED PER BOCA CODE.
7. MINIMUM LATERAL SIZE: 4" FOR RESIDENTIAL SERVICE 6" FOR NON-RESIDENTIAL SERVICE
8. MINIMUM COVER FOR ALL SEWER LATERALS SHALL BE THREE (3') FEET

1809 Sewer Det



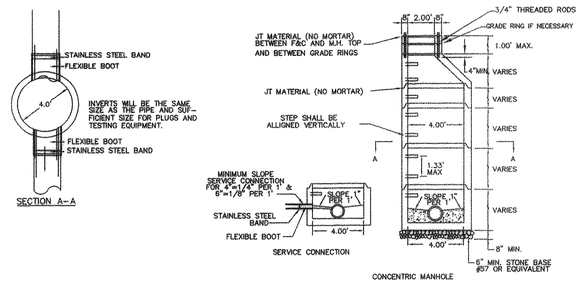
TYPICAL OUTSIDE DROP MANHOLE

NTS

1. MANHOLE UNIT JOINTS SHALL BE MADE WITH EITHER FLEXIBLE BUTYL SEALANTS OR GASKETS, AT THE CONTRACTOR'S OPTION. FLEXIBLE BUTYL SEALANTS SHALL BE MANUFACTURED BY CONCRETE SEALANTS, INC. (CS-302) OR EQUAL AND FLEXIBLE BUTYL GASKETS SHALL BE MANUFACTURED BY CONCRETE PRODUCTS SUPPLY COMPANY (E-Z STICK) OR EQUAL. THE GASKETS OR SEALANTS SHALL BE INSTALLED AND THE JOINT MADE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER(S).

2. ALL MANHOLES DEEPER THAN 10' SHALL BE PROVIDED WITH A SAFETY SLAB.

3. TEE, BEND, AND ALL PIPING SHALL BE SAME SIZE AS INFLUENT PIPE (SEE PLANS)



4' STANDARD MANHOLE FOR PIPE 15" OR SMALLER

NOTES:

1. ALL MANHOLE FRAMES AND COVERS SHALL BE DEWEY BROTHERS, INC. MH-RCR-3000W IN NON-PAVED AREAS REQUIRING WATERTIGHT FRAME & COVERS AND MH-RCR-3000EC-WT IN PAVED AREAS, OR APPROVED EQUAL.
2. STEPS TO BE VERTICALLY ALIGNED.
3. THE FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE.
4. MANHOLE UNIT JOINTS SHALL BE MADE WITH EITHER FLEXIBLE BUTYL SEALANTS OR GASKETS, AT THE CONTRACTOR'S OPTION. FLEXIBLE BUTYL SEALANTS SHALL BE MANUFACTURED BY CONCRETE SEALANTS, INC. (CS-302) OR EQUAL AND FLEXIBLE BUTYL GASKETS SHALL BE MANUFACTURED BY CONCRETE PRODUCTS SUPPLY COMPANY (E-Z STICK) OR EQUAL. THE GASKETS OR SEALANTS SHALL BE INSTALLED AND THE JOINT MADE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER(S).
5. ALL MANHOLES DEEPER THAN 10' SHALL BE PROVIDED WITH A SAFETY SLAB.

SEWER DETAILS

NO.	DATE	DESCRIPTION	BY

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
8-27-99
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB/JDC
Checked By	RCW
Approved By	DRM
Submitted By	DRM
Drawing	DETAILS
Date	05/26/99
Scale	NONE
Commission No	1809
Sheet	12 of 14

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EROSION & SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

The purpose of this project is to construct a single family subdivision. This project will include 50 lots, with a minimum lot size of 20,000 SF. There will be approximately 6000 LF of new roadway having a typical pavement width of width of 22 feet. The total acreage of this project is approximately 50 acres.

EXISTING SITE CONDITIONS

The proposed development is located along Route 849, Arrington Rd., in the Blue Ridge District of Botetourt County. The existing site is wooded at this time and is not being used at this time.

ADJACENT AREAS

The site is bordered on the east by Route 849, the north and west by Steeplechase subdivision and to the south by private property.

SOILS

Soils found at this site are common to the area. None of these soils have high erosion tendencies.

CRITICAL EROSION AREAS

The potential critical erosion areas are:
1. Steep roadside ditch slopes along proposed roads.
2. The outlet of all culverts.

EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the handbook. The minimum standards of the VESCR shall be adhered to unless otherwise waived or approved by a variance.

STRUCTURAL PRACTICES

1. Temporary Construction Entrance (Section 3.02)
   One temporary construction entrance will be installed. Should tracking occur the road will be immediately cleaned.
2. Silt Fence (Section 3.05)
   Temporary silt fences will be installed as indicated on the site plan.
3. Straw Bale Barrier (Section 3.04)
   ⚠ Temporary straw bale barriers will be placed and entrenched and anchored as indicated on the site plan.
4. Outlet Protection (Section 3.18)
   Outlet protection will be placed at all discharge points from controlled flow to open flow. All outlet protection will be permanently designed and installed.
5. Surface Roughening (Section 3.29)
   Surface roughening will be employed on all slopes exceeding 2:1.
6. Temporary Seeding (Section 3.31)
   Temporary seeding will be placed on all disturbed areas that will not be brought to final grade within 30 days. Temporary seeding will aid in the reduction of dust and sediment. Temporary seeding will be Annual Ryegrass (100 #/ac), Feb 16 – April 30, German Millet (60 #/ac), May 1 – Aug. 31.
7. ⚠ Permanent Seeding (Section 3.32)
   Within 7 days after final grading permanent, seeding will be employed to reduce erosion and sediment yield.

   Seeding Specifications:

   Permanent seeding will be Kentucky Bluegrass, blended to contain 4 or more varieties, with no one variety exceeding 30%. The seeding will be applied at 140 lb. per acre. On slopes 2:1 or greater a mixture of Crown Vetch (50%), Perennial Ryegrass (40%), and Redtop (10%) will be used.

   All seeding, with required associated practices, will be in accordance with all applicable sections of the Virginia Erosion and Sediment Control
8. Dust Control (Section 3.39)
   If arid conditions prevail dust control practices will be employed as required.
9. Construction Road Stabilization (Section 3.03)
   All roads and parking areas on the site shall be stabilized with gravel immediately after grading.
10. Temporary Sediment Basin (Section 3.14)
11. Riprap (Section 3.19)
    Riprap shall be placed at the outlet of all pipes in accordance with VDOT standard EC–2 as indicated on the plans. Riprap along the ditches shall be VDOT Class 1 riprap installed over a six inch filter consisting of #57 stone.
12. Check Dams (Section 3.20)

MANAGEMENT

1. Construction should be sequenced so that grading operations can begin and end as quickly as possible.
2. Erosion and Sediment control devices shall be installed as the first step of construction.
3. Areas which are not to be disturbed shall be clearly marked by flags, signs, etc.
4. The grading contractor shall be responsible for the installation and maintenance of all erosion and sediment control practices. Inspections are to be made periodically and after every significant rainfall.
5. After achieving adequate stabilization, the temporary E&S controls will be cleaned up and removed, and the sediment basins will be cleaned out and converted to permanent stormwater management basins. Removal must be approved by Botetourt County. ⚠

PERMANENT STABILIZATION

All areas disturbed by construction shall be stabilized with permanent seeding within 7 days following finish grading. Seeding shall be done with Kentucky 31 Tall Fescue according to Std. & Spec. 3.32, PERMANENT SEEDING, of the handbook. Erosion control blankets will be installed over fill slopes which have been brought to final grade and have been seeded to protect the slopes from rill and gully erosion and to allow seed to germinate properly. Mulch (straw or fiber) will be used on relatively flat areas. In all seeding operations, seed, fertilizer and lime will be applied prior to mulching.

MAINTENANCE OF DETENTION FACILITIES

The applicant shall obtain approval from the locality 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.

STORMWATER MANAGEMENT

Calculation of runoff before and after development indicates that there will be a net increase in peak runoff as a result of project development. Consequently, stormwater management basins have been designed to detain and release the runoff at the 2–year pre–developed rate. (See attached calculations)

MAINTENANCE

In general, all erosion and sediment control measures will be checked daily and after each significant rainfall. Any items not found in accordance with the Virginia Erosion and Sediment Control Handbook will be immediately replaced and/or repaired. The following items will be checked in particular:

1. The sediment basin will be cleaned out when the level of sediment buildup reaches the cleanout point indicated on the riser pipe.
2. The gravel outlets will be checked regularly for sediment buildup which will prevent drainage. If the gravel is clogged by sediment, it shall be removed and cleaned or replaced.
3. The silt fence barrier will be checked regularly for undermining or deterioration of the fabric. Sediment shall be removed when the level of sediment deposition reaches half way to the top of the barrier.
4. The seeded areas will be checked regularly to ensure that a good stand is maintained. Areas should be fertilized and re–seeded as needed.

GENERAL

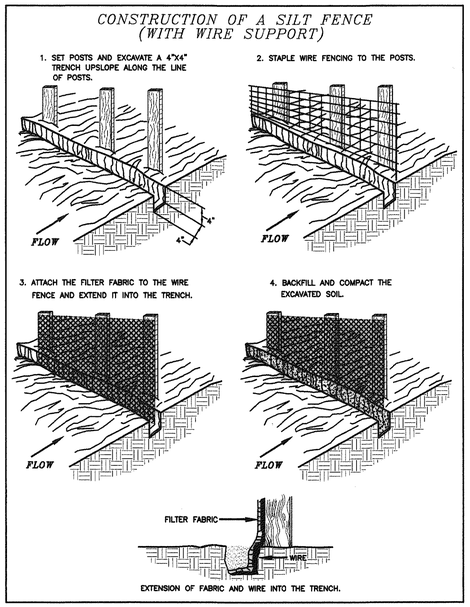
The erosion and sediment control measures shown on the construction plans are the minimum measures required. The owner, through his contractor, will employ whatever measures which may be required to assure that sediment laden runoff does not leave the site.

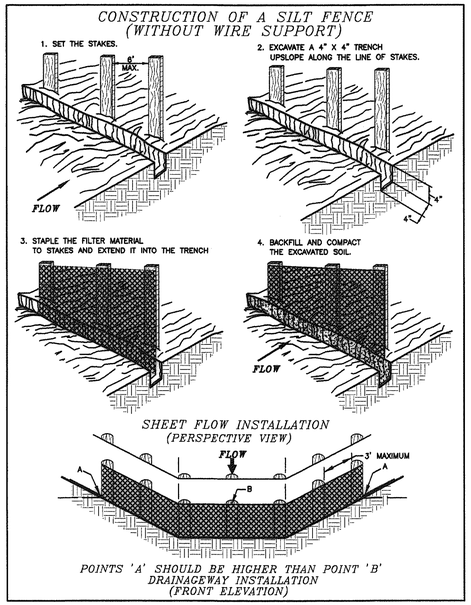
All materials and measures employed for erosion and sediment control will be in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition.

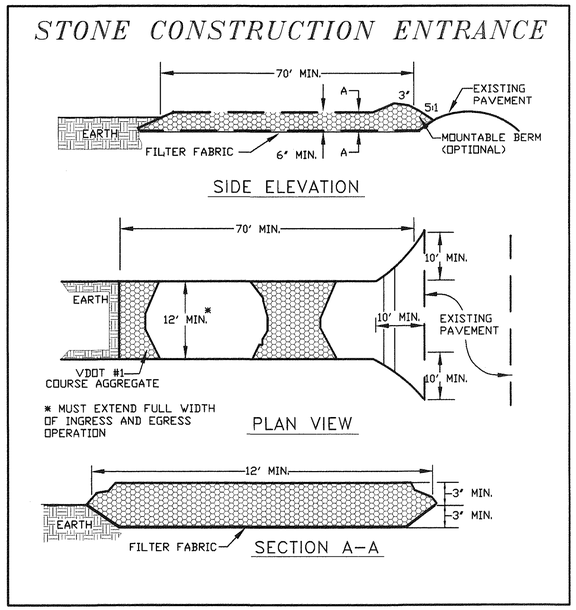
If, during construction, additional Erosion and Sediment Control measures are deemed necessary, they shall be installed as directed by the Owner, Engineer or County agent.

This project is to be constructed consistent with the 1992 Virginia Erosion And Sediment Control Regulations.

⚠ Construction traffic shall not enter streams or swales without first installing a temporary stream crossing.







LMW P.C.
ENGINEERING • ARCHITECTURE • SURVEYING
102 ALBEMARLE AVE., S.E.
ROANOKE, VIRGINIA 24013
☎ (540) 345-0675
FAX (540) 342-4456

MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY
2	10/18/99	BOTETOURT CTY. COMMENTS	DDW
1	8/26/99	VDOT & BOTETOURT CTY. COMMENTS	DDW

EROSION AND SEDIMENT CONTROL NARRATIVE

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
10-18-99
PROFESSIONAL ENGINEER

Designed By	RCW
Drawn By	DJB/JDC
Checked By	RCW
Approved By	RCW
Submitted By	RCW
Drawing	1809EROS.DWG
Date	05/26/99
Scale	NONE
Commission No.	1809
Sheet	13 of 14

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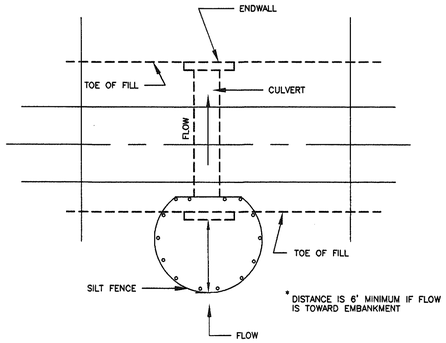
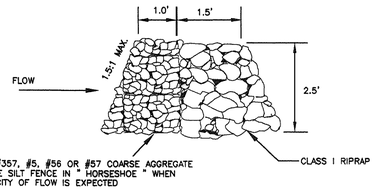
SILT FENCE CULVERT INLET PROTECTION



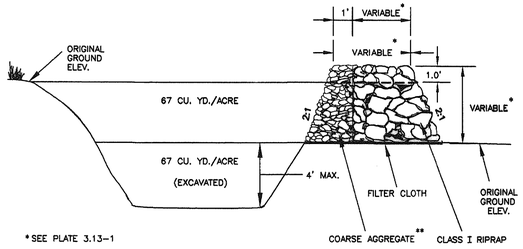
*OPTIONAL STONE COMBINATION



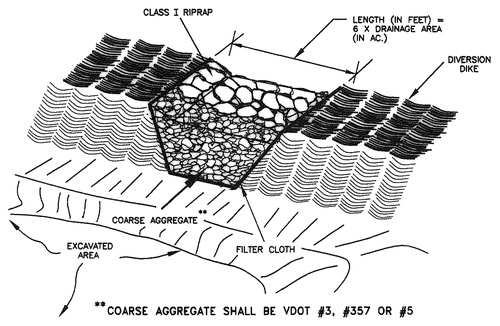
*VDOT #3, #357, #5, #56 OR #57 COARSE AGGREGATE TO REPLACE SILT FENCE IN " HORSESHOE " WHEN HIGH VELOCITY OF FLOW IS EXPECTED

SOURCE: ADAPTED from VDOT Standard Sheets and Va. DSWC — PLATE. 3.08-1

TEMPORARY SEDIMENT TRAP



CROSS SECTION OF OUTLET

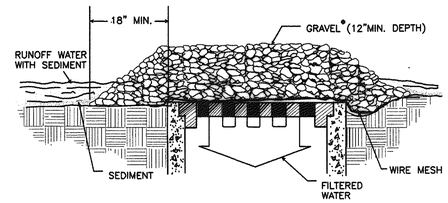


**COARSE AGGREGATE SHALL BE VDOT #3, #357 OR #5

OUTLET (PERSPECTIVE VIEW)

SOURCE: VA. DSWC — PLATE. 3.13-2

GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER



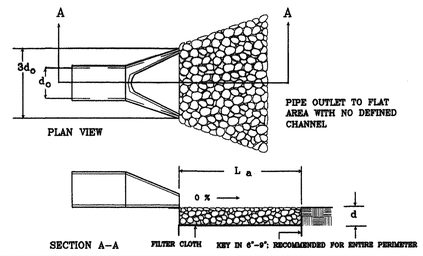
SPECIFIC APPLICATION

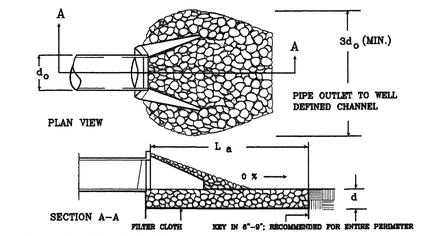
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

SOURCE: VA. DSWC — PLATE. 3.07-2

PIPE OUTLET CONDITIONS





NOTES: 1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18-3 AND 3.18-4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

Source: Va. DSWC — Plate 3.18-1

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MOUNTAIN CREST
LOCATED IN
BOTETOURT COUNTY, VIRGINIA

NO.	DATE	DESCRIPTION	BY

EROSION & SEDIMENT CONTROL
ADDITIONAL DETAILS

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
No. 22942
9-29-99
PROFESSIONAL ENGINEER

Designed By	DDW/DME
Drawn By	DDW
Checked By	DME
Approved By	DRM
Submitted By	DRM
Drawing	1809ADDET
Date	09/27/99
Scale	NONE
Commission No.	1809
Sheet	14 of 14

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