

QUANTITY & COST ESTIMATE

ITEM	QUANTITY	UNIT COST	TOTAL
Roadway Excavation	3250 CY	x \$2.50 CY	\$8,125.00
Cat I Pavement	3376 SY	x \$10.00 SY	\$33,760.00
Curb & Gutter	1352 LF	x \$12.00 LF	\$16,224.00
Driveway Aprons	26 EA	x \$1000.00 EA	\$26,000.00
Curb Inlets - Std. 36"	4 EA	x \$1,500.00 EA	\$6,000.00
Curb Inlets - Std. 30"	2 EA	x \$1,500.00 EA	\$3,000.00
Std. Manholes	2 EA	x \$1,500.00 EA	\$3,000.00
15" Conc. Pipe	852 LF	x \$19.50 LF	\$16,614.00
18" Conc. Pipe	18 LF	x \$25.00 LF	\$450.00
18" Conc. End Section	1 EA	x \$500.00 EA	\$500.00
Rip-Rap	4 CY	x \$75.00 CY	\$300.00
Anchor Blocks	3 EA	x \$150.00 EA	\$450.00
8" S.S. Pipe	1432 LF	x \$20.00 LF	\$28,640.00
Std. S.S. Manholes	10 EA	x \$1,500.00 EA	\$15,000.00
4" Laterals/Cleanouts	26 EA	x \$300.00 EA	\$7,800.00
8" Waterline Pipe	295 LF	x \$22.50 LF	\$6,640.00
Fire Hydrant Assembly	1 EA	x \$1,500.00 EA	\$1,500.00
Single Meter Setters	4 EA	x \$250.00 EA	\$1,000.00
Double Meter Setters	11 EA	x \$350.00 EA	\$3,850.00
Air Release Valve	1 EA	x \$1,500.00 EA	\$1,500.00
Relocate End-of-Line Blowoff	1 EA	x \$500.00 EA	\$500.00
Sub-Total			\$180,853.00
10% Contingency			\$18,085.30
ESTIMATED TOTAL			\$198,938.30

SEPARATION OF WATER LINES AND SANITARY SEWER LINES

- PARALLEL INSTALLATION
- A. Normal Conditions - water lines shall be laid at least ten feet (10') horizontally from a sewer line whenever possible, the distance shall be measured edge-to-edge unless determined by the W.V.W.A. to be an unusual condition.
- B. Unusual Conditions - when local conditions prevent a horizontal separation described above, the following construction shall be used:
- The bottom (invert) of the water main shall be at least eighteen inches (18") above the top (crown) of the sewer.
 - Whenever 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. Pressure test shall be 30 psi.
- CROSSINGS
- A. Normal conditions - water lines crossing over sewers shall be laid to provide separation of at least eighteen inches (18") between the bottom of the water line and the top of the sewer whenever possible.
- B. Unusual conditions - when local conditions prevent a vertical separation as described above, the following construction shall be used:
- Sewers passing over or under waterlines shall be constructed of AWWA approved water pipe, pressure tested in place without leakage prior to backfill. Pressure test shall be 30 psi.
 - Water lines passing under sewers shall, in addition, be protected by providing:
 - A vertical separation of at least eighteen inches (18") between the bottom of the sewer and the top of the waterline. Sewer line shall be encased along its length where it is within ten feet (10') of the waterline.
 - Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline
 - The length of the waterline to be centered at the point of the crossing so that the waterline pipe joints shall be equidistant and as far as possible from the sewer.

WESTERN VIRGINIA WATER AUTHORITY NOTES

GENERAL NOTES:
A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED WITH THE WESTERN VIRGINIA WATER AUTHORITY TO BE HELD AT LEAST ONE (1) DAY PRIOR TO ANY CONSTRUCTION OF THE APPROVED WATER AND SANITARY SEWER FACILITIES.

A MINIMUM COVER OF THREE (3) FEET IS REQUIRED OVER PROPOSED LINES.

ALL SANITARY SEWER AND WATER CONNECTIONS TO EXISTING LINES SHALL BE COORDINATED WITH AND PERFORMED BY THE WESTERN VIRGINIA WATER AUTHORITY.

CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND UNCOVERING VALVE VAULTS, MANHOLES, ETC. AFTER PAVING AND ADJUSTING TO FINAL GRADE IF NECESSARY.

ALL EXISTING UTILITIES MAY NOT 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.

ALL TRENCHES IN EXISTING OR FUTURE HIGHWAY RIGHT-OF-WAYS SHALL BE COMPACTED ACCORDING TO CITY OF ROANOKE STANDARDS.

LINES SHALL BE STAKED PRIOR TO CONSTRUCTION.

CONTRACTOR SHALL REFER TO THE WESTERN VIRGINIA WATER AUTHORITY STANDARD WATER AND SEWER REGULATIONS FOR CONSTRUCTION DETAILS AND INSTALLATION METHODS AS REQUIRED TO COMPLETE THE PROPOSED UTILITY FACILITIES AS INDICATED BY THESE DRAWINGS.

THE CONTRACTOR SHALL PROVIDE THE WESTERN VIRGINIA WATER AUTHORITY WITH CORRECT AS-BUILT PLANS PRIOR TO SUBSTANTIAL COMPLETION OF ANY NEW PUBLIC EXTENSIONS.

WATER MAINS SHALL BE MINIMUM CLASS 52 DUCTILE IRON IN ACCORDANCE TO AWWA C151 OR DR-14 PVC IN ACCORDANCE WITH AWWA C-900.

WATER LATERALS FROM THE METER TO THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE.

THE CONSTRUCTION OF THE PROPOSED PUBLIC WATER MAIN AND ALL RESIDENTIAL SERVICES SHALL BE IN COMPLIANCE WITH THE CURRENT WESTERN VIRGINIA WATER AUTHORITY REGULATIONS. REFER TO THESE REGULATIONS FOR COMPLETE DETAILS AND INSTALLATION METHODS.

SEWER NOTES:
HOUSE CONNECTIONS ARE TO BE MADE WITH 4" PIPE INSTALLED AT A MINIMUM GRADE OF 1/4" INCH TO 1 FOOT IN R/W.

LATERALS FROM MANHOLES SHALL BE PVC OR DUCTILE IRON OF SUFFICIENT LENGTH TO PROVIDE TWO (2) FEET OF BEARING ON NATURAL GROUND.

THE LATERALS AND REQUIRED FITTINGS LOCATED WITHIN A VDOT RIGHT-OF-WAY OR PUBLIC EASEMENT SHALL BE OF THE SAME TYPE OF MATERIAL AS THE MAINLINE SEWER PIPELINE.

THE CONSTRUCTION OF THE PROPOSED PUBLIC SEWER MAIN AND ALL RESIDENTIAL SERVICES SHALL BE IN COMPLIANCE WITH THE CURRENT WESTERN VIRGINIA WATER AUTHORITY REGULATIONS. REFER TO THESE REGULATIONS FOR COMPLETE DETAILS AND INSTALLATION METHODS.

ALL SANITARY SEWER PIPING SHALL BE PVC (POLYVINYL CHLORIDE) MANUFACTURED IN ACCORDANCE WITH ASTM DESIGNATION 3034-77 (SDR 35) UNLESS OTHERWISE NOTED ON THE PROFILES.

ALL MANHOLE FRAMES AND COVERS SHALL BE WATERTIGHT AND ALL COVERS SHALL BE BOLT-DOWN MANHOLE COVERS (SEE DETAIL S-05 AND S-06) WHERE APPLICABLE.

SANITARY SEWER MANHOLE AND CLEANOUT INFORMATION

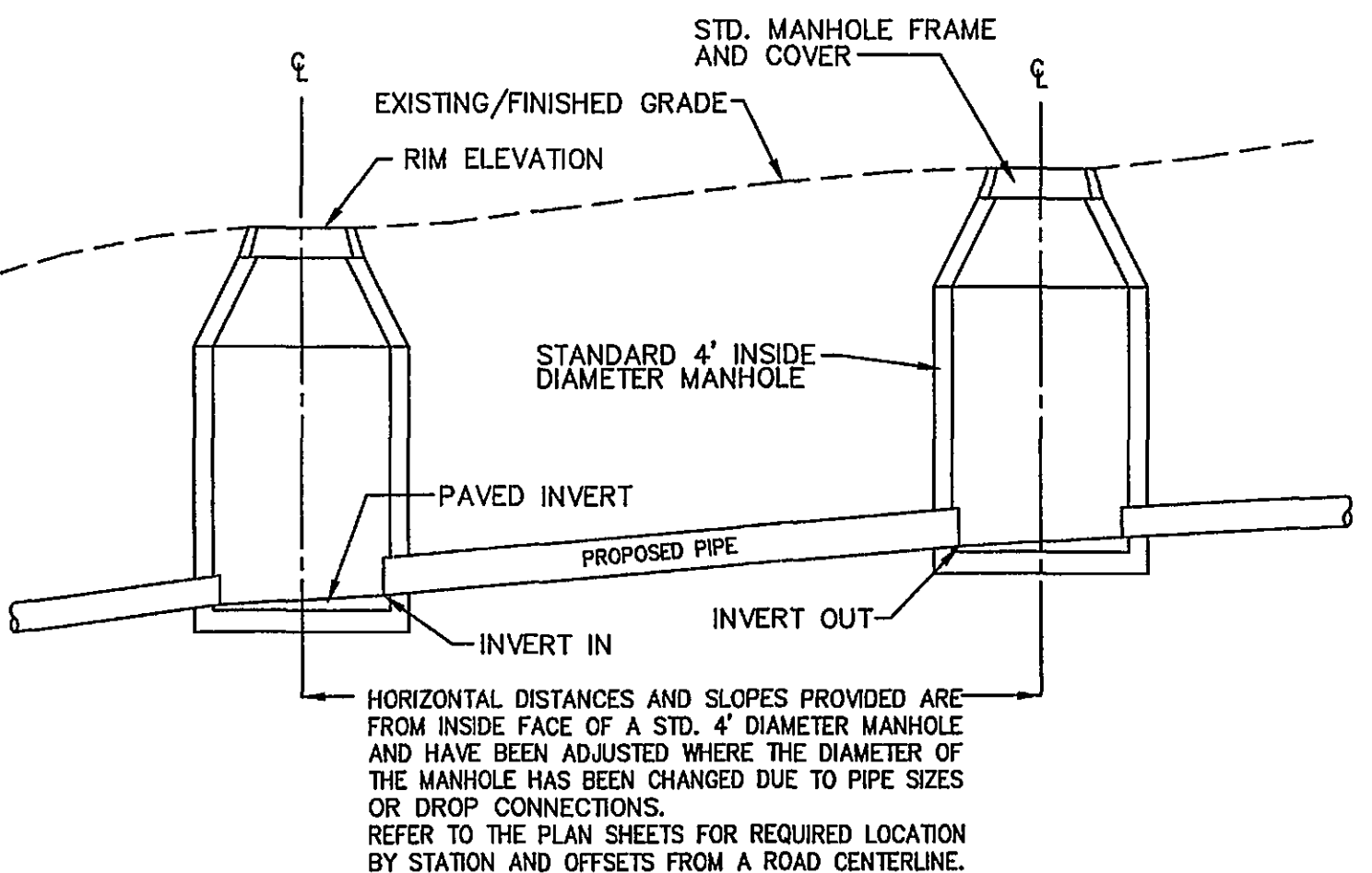
LINE	BEARING	DISTANCE
#101 to #102	S. 18°47'20" E.	51.98'
#102 to #103	S. 18°47'20" E.	126.81'
#103 to #104	N. 79°07'29" E.	119.86'
#104 to #105	S. 54°22'15" E.	179.88'
#105 to #106	S. 03°35'57" W.	198.61'
#106 to #107	S. 45°33'37" W.	83.22'
#107 to #108	S. 67°09'27" W.	125.10'
#108 to #109	S. 71°04'43" W.	330.00'
#109 to #110	S. 71°04'43" W.	250.00'

LOT	MH - STA/OS	C.O. Inv.	MIN. FLOOR ELEV.
19	'110' - 36.0' STUB from MH.	1209.95	1212.0
20	'109' - 1+63.0 / 36.0' Lt.	1209.05	1211.1
21	'109' - 0+81.0 / 36.0' Lt.	1208.25	1210.3
22	'108' - 3+13.0 / 36.0' Lt.	1205.90	1207.9
23	'108' - 2+23.0 / 36.0' Lt.	1199.00	1201.0
24	'108' - 1+33.0 / 36.0' Lt.	1192.20	1194.2
25	'108' - 0+43.0 / 36.0' Lt.	1185.40	1187.4
26	'107' - 0+80.7 / 39.1' Lt.	1181.80	1183.8
27	'107' - 35.6' STUB from MH.	1180.90	1182.9
28	'106' - 0+34.7 / 33.3' Lt.	1180.30	1182.3
29	'105' - 1+43.6 / 35.3' Lt.	1179.60	1181.6
30	'105' - 0+60.3 / 35.5' Lt.	1179.10	1181.0
31	'105' - 0+32.3 / 52.4' Lt.	1179.30	1181.3
32	'105' - 54.0' STUB from MH.	1179.15	1181.2
33	'104' - 0+72.0' / 12.0' Rt.	1177.50	1179.5
34	'104' - 0+70.0 / 12.0' Rt.	1177.50	1179.5
35	'105' - 0+73.8 / 13.5' Rt.	1178.70	1179.7
36	'107' - 0+21.2 / 10.3' Rt.	1180.60	1182.6
37	'107' - 0+82.7 / 10.6' Rt.	1181.20	1183.2
38	'108' - 0+41.0 / 14.0' Rt.	1184.90	1186.9
39	'108' - 1+31.0 / 14.0' Rt.	1191.60	1193.6
40	'108' - 2+21.0 / 14.0' Rt.	1198.40	1200.4
41	'108' - 3+11.0 / 14.0' Rt.	1205.30	1207.3
42	'109' - 0+71.0 / 14.0' Rt.	1207.70	1209.7
43	'109' - 1+61.0 / 14.0' Rt.	1208.60	1210.6
44	'110' - 14.0' STUB from MH.	1209.40	1211.4

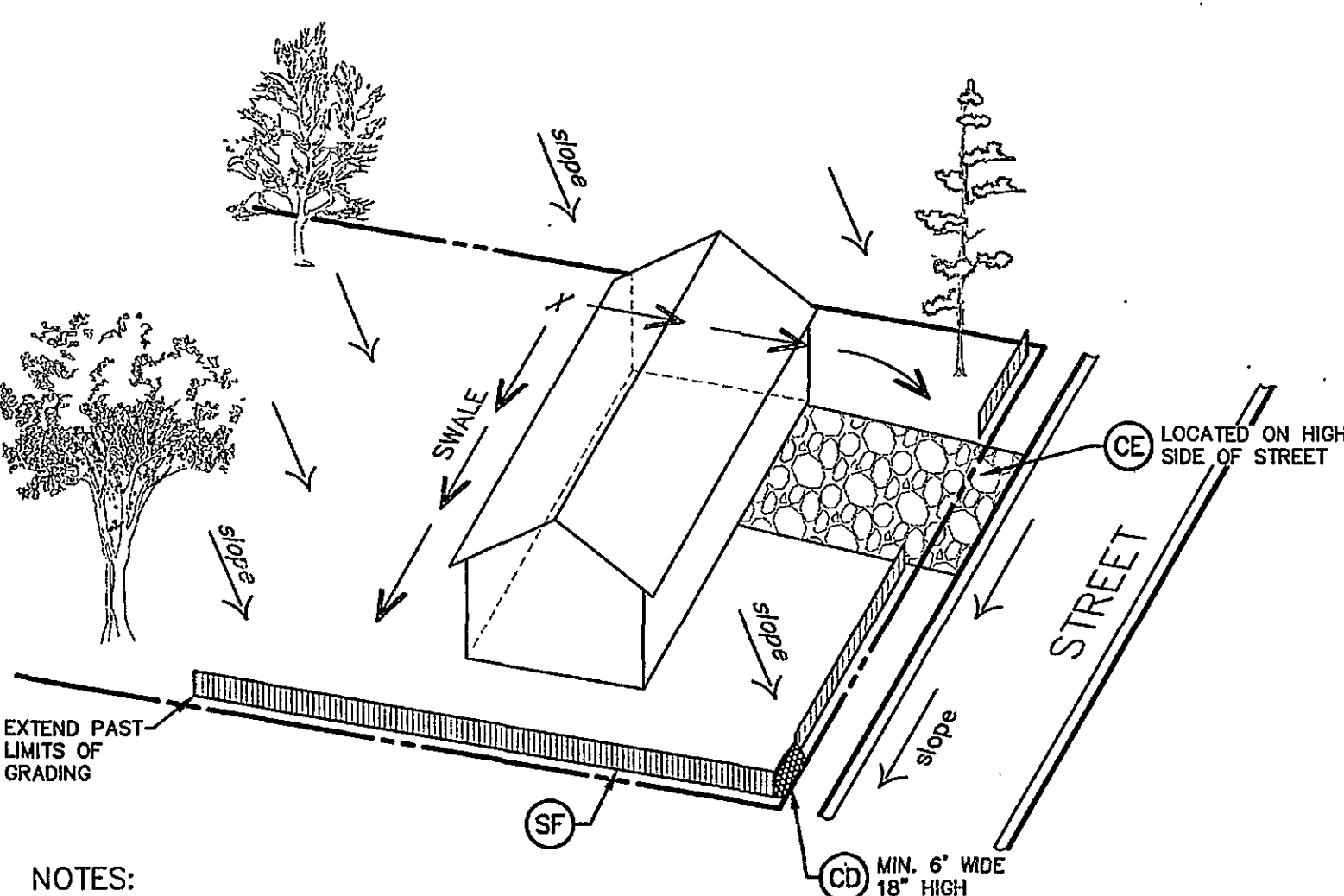
STATIONS AND OFFSETS ARE MEASURED ALONG A BASELINE FROM CENTER OF MANHOLE TO CENTER OF MANHOLE WITH 0+00.0 BEING THE BEGINNING AT THE LOWER MANHOLE.

CLEANOUT ELEVATIONS ARE BASED ON A MINIMUM SLOPE OF 2.08% WITHIN THE RIGHT-OF-WAY OR EASEMENTS AND MAY BE INCREASED AS DICTATED BY THE SURROUNDING TOPOGRAPHY.

THE MIN. FLOOR ELEVATION IS BASED ON SEC. 200.02-S-A-8 OF THE W.V.W.A. WATER & SEWER REGULATIONS. LOT OWNERS REQUESTING A LOWER SERVICE ELEVATION WILL REQUIRE THE USE OF A PRIVATE SEWAGE PUMP FACILITY, INSTALLED AND MAINTAINED BY THE HOMEOWNER.



MANHOLE CONSTRUCTION INFORMATION
NO SCALE



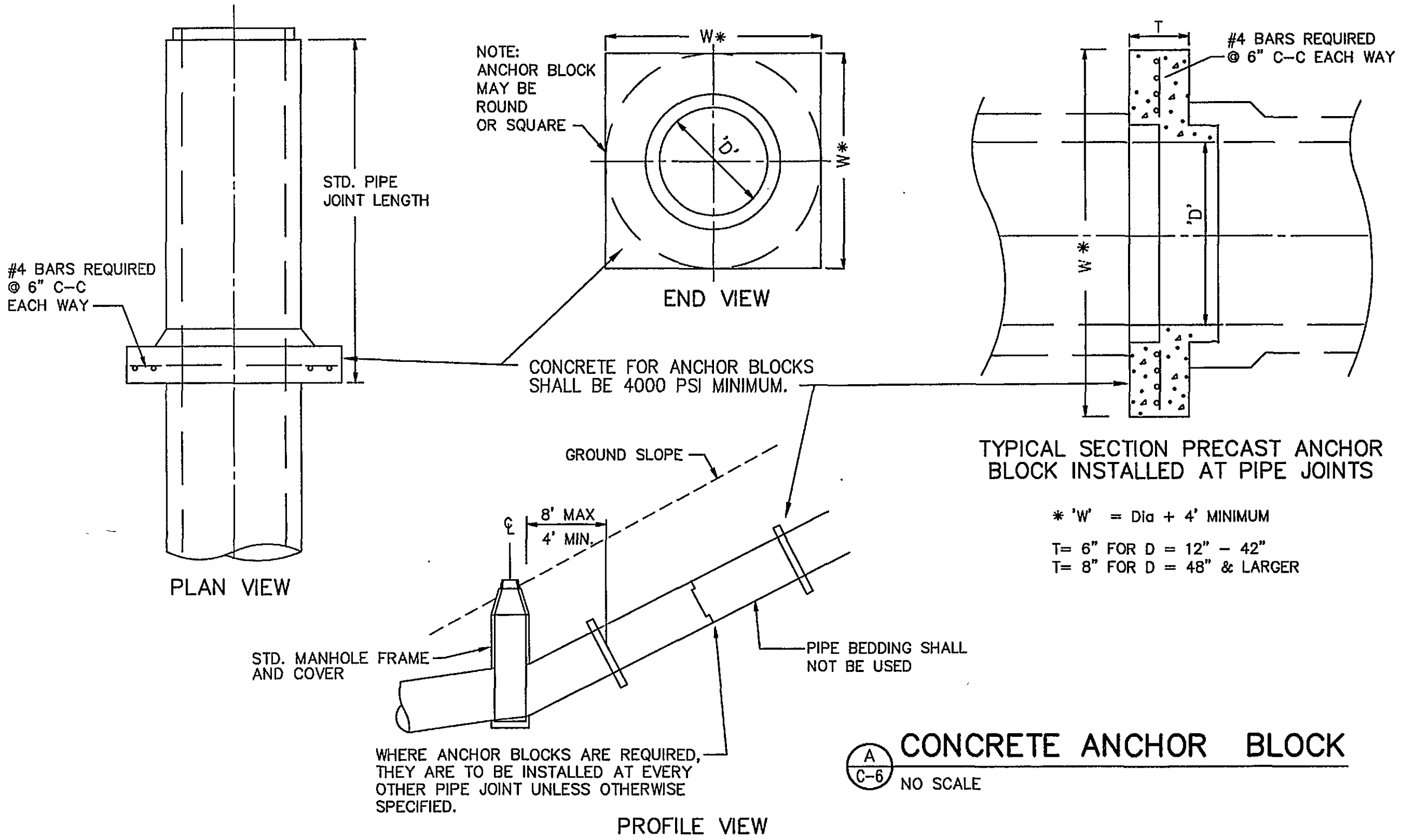
NOTES:
1. REFER TO VESCH FOR DETAILS OF PROPOSED SOIL EROSION MEASURES
2. LAYOUT IS FOR SCHEMATIC PURPOSES ONLY, G.C. SHALL ADJUST LOCATION OF SILT FENCING AND CHECK DAM TO INTERCEPT ALL DISTURBED AREAS.
3. ADDITIONAL ITEMS OR MODIFICATIONS MAY BE REQUIRED AS DIRECTED BY ROANOKE COUNTY INSPECTORS.
4. POSITIVE DRAINAGE SHALL BE PROVIDED ALONG THE LONGITUDINAL SLOPE OF THE SILT FENCING TO THE PROPOSED CHECK DAM.

TYPICAL ESC PLAN FOR A SINGLE DWELLING
NO SCALE

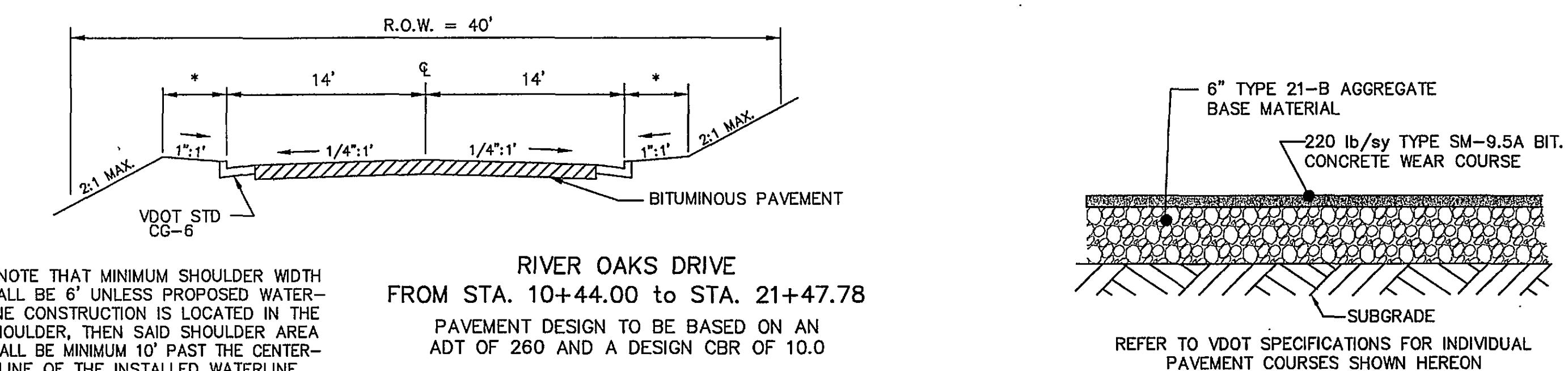
CONSTRUCTION DETAILS & NOTES
FOXFIELD at
RUSSLER FARMS
SECTION 2
CATAWBA MAGISTERIAL DISTRICT
ROANOKE COUNTY, VIRGINIA

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
Post Office Box 6280
ROANOKE, VIRGINIA 24017
Telephone: (844) 888-3400 Fax: (844) 368-8702
EMAIL: CWA@ROANOKE.AOL.COM

Designed: J.V. Judy
Drawn: J.V. Judy
Checked: F.B. Caldwell
Revised: Jan. 21, 2005
Scale: AS SHOWN
Tax Parcel: 56.03-2-43
W.O. # 01-0090



CONCRETE ANCHOR BLOCK
NO SCALE



* NOTE THAT MINIMUM SHOULDER WIDTH SHALL BE 6' UNLESS PROPOSED WATER-LINE CONSTRUCTION IS LOCATED IN THE SHOULDER, THEN SAID SHOULDER AREA SHALL BE MINIMUM 10' PAST THE CENTER-LINE OF THE INSTALLED WATERLINE.

RIVER OAKS DRIVE
FROM STA. 10+44.00 TO STA. 21+47.78
PAVEMENT DESIGN TO BE BASED ON AN ADT OF 260 AND A DESIGN CBR OF 10.0
CBR TESTS AND FINAL PAVEMENT SPECIFICATIONS TO BE PROVIDED TO VDOT RESIDENCY FOR APPROVAL PRIOR TO INSTALLATION

TYPICAL ROADWAY SECTION
NO SCALE