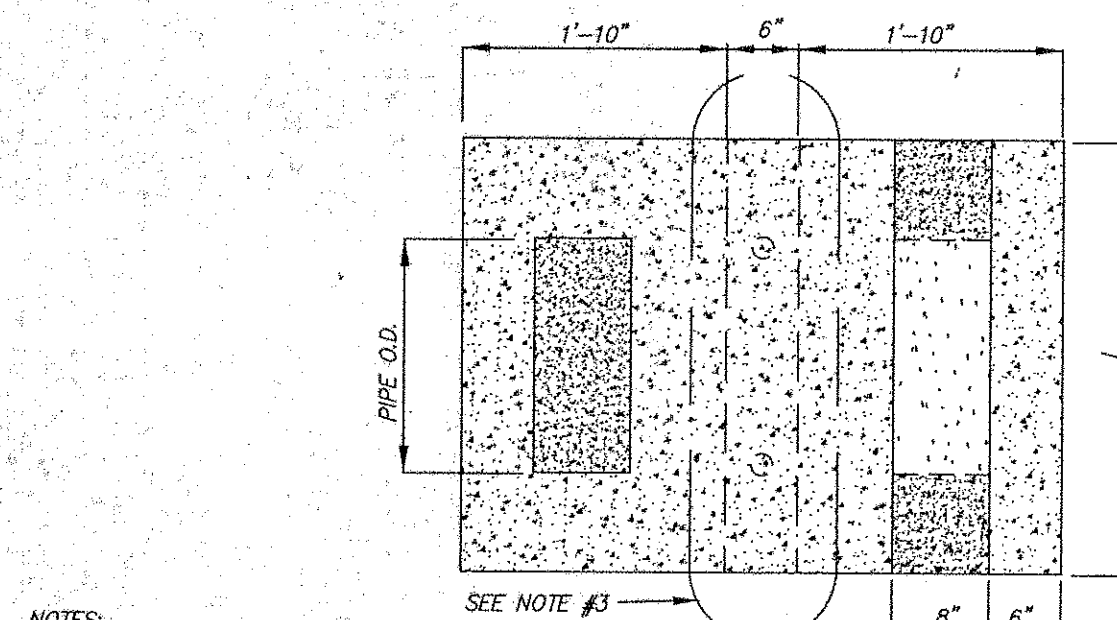
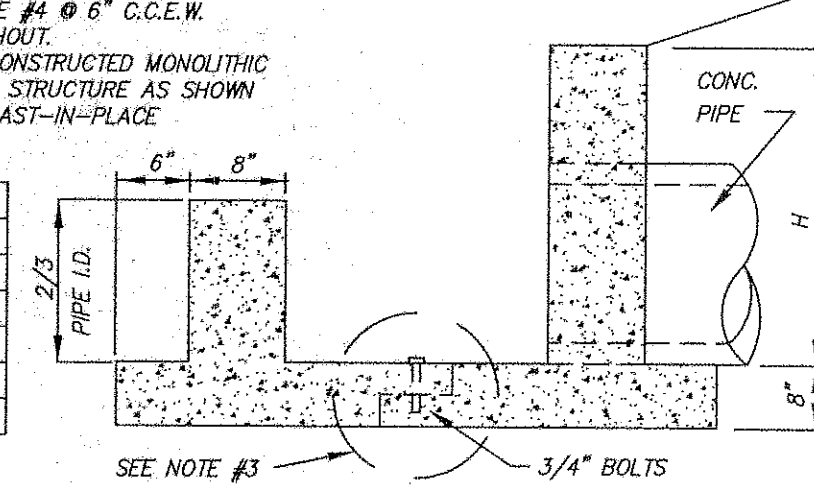


MANHOLE CONSTRUCTION INFORMATION



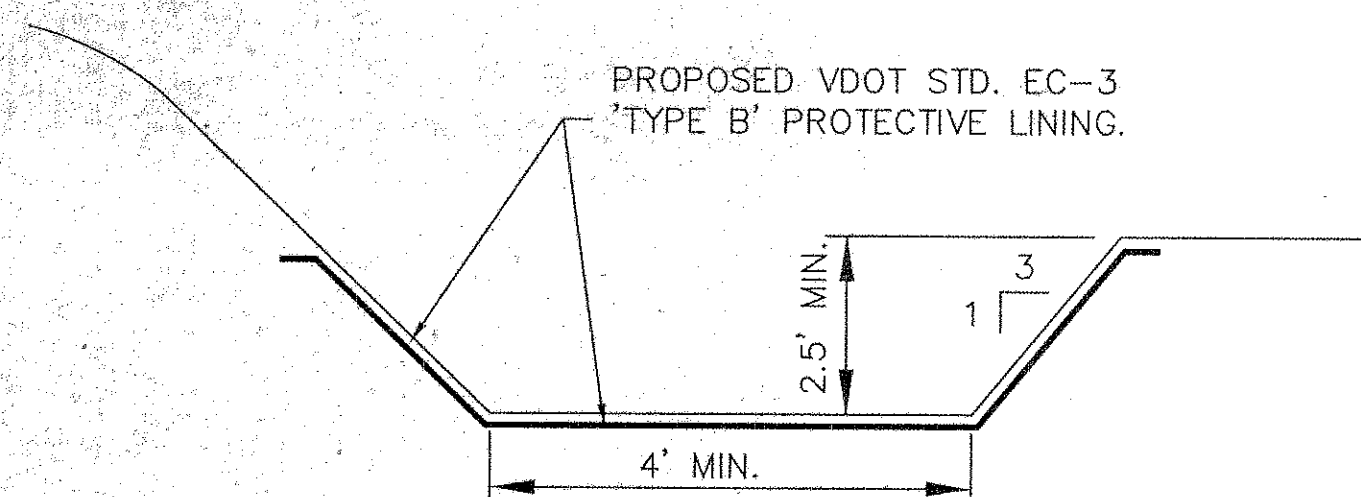
- NOTES:
1. CONCRETE SHALL BE 4000 PSI
 2. REINFORCING SHALL BE #4 @ 6" C.C.E.W. DOUBLE ROW THROUGHOUT.
 3. DISSIPATOR MAY BE CONSTRUCTED MONOLITHIC OR AS A TWO-PIECE STRUCTURE AS SHOWN
 4. DISSIPATOR MAY BE CAST-IN-PLACE OR PRECAST

PIPE	H	L
12"	2.00'	4.0'
15"	2.25'	5.0'
18"	2.50'	6.0'
24"	3.17'	8.0'
30"	3.83'	10.0'
36"	4.50'	12.0'



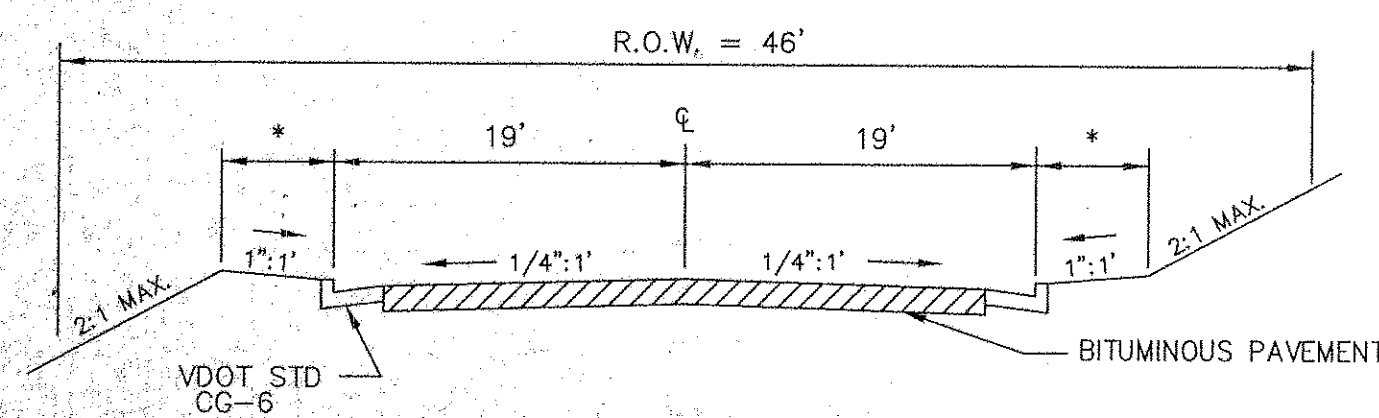
1 PIPE ENERGY DISSIPATOR

C9 NO SCALE



2 OFF-SITE DITCH

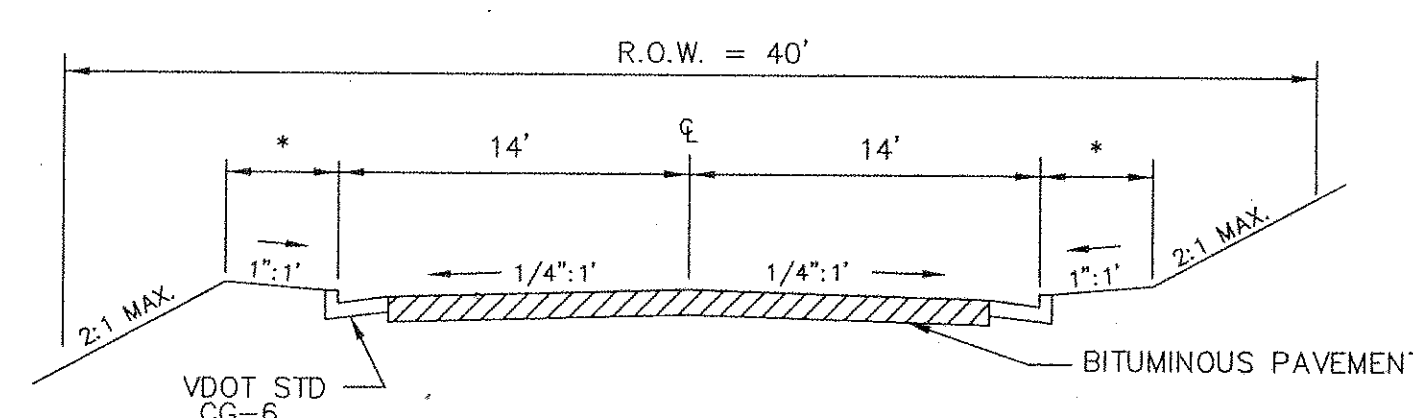
C9 NO SCALE



MILLWOOD DRIVE
STA. 16+12.8 TO STA. 20+67.1

PAVEMENT DESIGN TO BE BASED ON AN ADT OF 2850 AND A DESIGN CBR OF 10.0
CBR TESTS AND FINAL PAVEMENT SPECIFICATIONS TO BE PROVIDED TO VDOT RESIDENCY FOR APPROVAL PRIOR TO INSTALLATION

* 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.



FOXFIELD CIRCLE & HIGH GATE LANE
FROM STA. 16+27 TO STA. 23+90.52

PAVEMENT DESIGN TO BE BASED ON AN ADT OF 230 AND A DESIGN CBR OF 10.0
CBR TESTS AND FINAL PAVEMENT SPECIFICATIONS TO BE PROVIDED TO VDOT RESIDENCY FOR APPROVAL PRIOR TO INSTALLATION

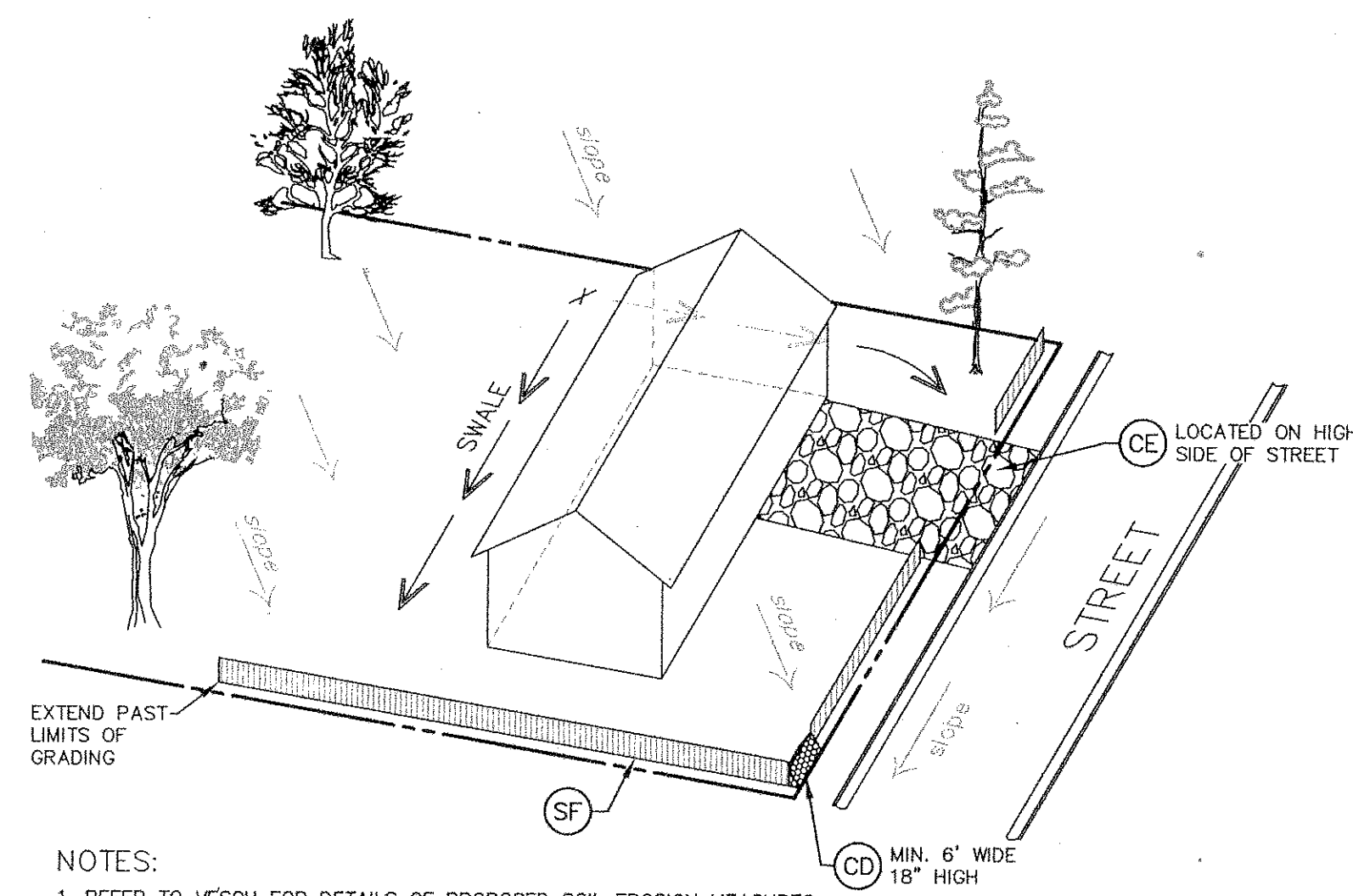
TYPICAL ROADWAY SECTIONS

NO SCALE

QUANTITY & COST ESTIMATE

ITEM	QUANTITY	UNIT	COST	TOTAL
Roadway Excavation	5950 CY	x	\$2.50 CY	\$14,900.00
Demolition	300 Tons	x	\$20.00 Ton	\$6,000.00
Cat I Pavement	3067 SY	x	\$10.00 SY	\$30,370.00
Cat IV Pavement	1716 SY	x	\$16.00 SY	\$27,640.00
Curb & Gutter	2865 LF	x	\$12.00 LF	\$34,380.00
Driveway Aprons	23 EA	x	\$250.00 EA	\$5,750.00
Curb Inlets - Std. 38's	6 EA	x	\$1,500.00 EA	\$9,000.00
Curb Inlets - Std. 30's	1 EA	x	\$1,200.00 EA	\$1,200.00
Std. Manholes	1 EA	x	\$1,200.00 EA	\$1,200.00
15" Conc. Pipe	560 LF	x	\$19.50 LF	\$10,920.00
18" Conc. Pipe	88 LF	x	\$25.00 LF	\$2,200.00
Energy Dissipator	2 EA	x	\$1,000.00 EA	\$2,000.00
Rip-Rap	4 CY	x	\$75.00 CY	\$300.00
8" S.S. Pipe	1580 LF	x	\$20.00 LF	\$31,600.00
Std. S.S. Manholes	6 EA	x	\$1,200.00 EA	\$7,200.00
Outside Drop Manhole	1 EA	x	\$3,000.00 EA	\$3,000.00
4" Laterals/Cleanouts	32 EA	x	\$300.00 EA	\$9,600.00
8" Waterline Pipe	1653 LF	x	\$22.50 LF	\$37,190.00
Fire Hydrant Assembly	2 EA	x	\$1,500.00 EA	\$3,000.00
Single Meter Setters	4 EA	x	\$250.00 EA	\$1,000.00
Double Meter Setters	9 EA	x	\$350.00 EA	\$3,150.00
8" Gate Valves	6 EA	x	\$500.00 EA	\$3,000.00
Air Release Valve	1 EA	x	\$1500.00 EA	\$1,500.00
Temporary Blow-offs	1 EA	x	\$500.00 EA	\$500.00
Permanent End Assembly	1 EA	x	\$1000.00 EA	\$1,000.00
1" Corp Stops & Laterals	6 EA	x	\$200.00 EA	\$1,200.00

Sub-Total \$248,600.00
10% Contingency \$24,900.00
ESTIMATED TOTAL \$273,500.00



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

WATER NOTES

A minimum cover of three (3) feet is required over proposed lines.

Contractor shall be responsible for locating and uncovering valve vaults after paving and adjustment 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 V.D.O.T. standards.

Lines shall be staked prior to construction.

Water main shall be minimum Class 52 Ductile Iron in accordance to AWWA C151 or DR-14 PVC in accordance with AWWA C-900.

The construction of the proposed public water main and all residential services shall be in compliance with the current Roanoke County Water and Sanitary Sewer Regulations. Refer to these regulations for complete details and installation methods.

5/8" water meters are to be installed unless otherwise requested by the applicant for the actual Building Permit.

Availability number 02-88

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 Utility Director to be an unusual condition.
- B. Unusual Conditions - when local conditions prevent a horizontal separation described above, the following construction shall be used:
 1. The bottom (invert) of the water main shall be at least eighteen inches (18") above the top (crown) of the sewer.
 2. 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.
 3. The sewer manhole shall be installed using 100% water-tight construction and tested in place by filling with water to top of manhole cover frame.

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:
 1. 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.
 2. Water lines passing under sewers shall, in addition, be protected by providing:
 - a. 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.
 - b. Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline
 - c. The length of the waterline to be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer.

SEWER NOTES

A minimum cover of three (3) feet is required over proposed lines.

Contractor shall be responsible for locating and uncovering all manholes after paving. Manhole tops shall be adjusted to grade if necessary.

All existing utilities may not be shown or may not be shown in the exact location. The contractor shall comply with State Water Works Regulations, Section 12.05.03, where lines cross.

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 transition from ductile iron to asbestos cement or concrete pipe shall be made with an adapter coupling in R/W.

All trenches in existing or future rights-of-way shall be compacted according to V.D.O.T. standards.

Lines shall be staked prior to construction.

The construction of the proposed sanitary sewer mains and all residential services shall be in compliance with the current Roanoke County Water and Sanitary Sewer Regulations. Refer to these regulations for complete details and installation methods.

Availability number 02-88

SANITARY SEWER MANHOLE AND CLEANOUT INFORMATION

LINE	BEARING	DISTANCE
exist. to #103	S. 30°38'58" W.	285.89'
#103 to #104	S. 30°38'58" W.	382.11'
#104 to #301	S. 59°21'02" E.	199.36'
#301 to #302	S. 81°52'14" E.	111.84'
#302 to #303	S. 75°36'35" W.	120.09'
#303 to #304	S. 76°30'56" W.	202.94'
#303 to #305	N. 10°03'03" W.	295.03'

LOT	MH - STA/OS	C.O. Inv.	MIN. FLOOR ELEV.
18	exist '102' - 1+34.0 / 26.0' Lt.	1152.7	1154.7
19	exist '102' - 2+19.0 / 26.0' Lt.	1153.1	1155.1
20	'103' - 0+18.1 / 26.0' Lt.	1153.6	1155.6
21	'103' - 1+09.1 / 26.0' Lt.	1154.3	1156.3
22	'103' - 1+89.1 / 26.0' Lt.	1154.8	1156.8
23	'103' - 2+74.1 / 26.0' Lt.	1155.4	1157.4
24	'104' - 1+44.0 / 25.5' Lt.	1170.2	1172.2
25	'301' - 0+90.4 / 19.4' Lt.	1180.2	1182.2
26	'303' - 1+43.8' / 13.5' Lt.	1188.5	1190.5
27	'305' - 4.4' STUB from MH	1189.8	1191.8
28	'303' - 2+31.1 / 35.5' Rt.	1189.9	1191.9
29	'303' - 1+56.1 / 35.5' Rt.	1189.1	1191.1
30	'303' - 0+54.6 / 26.4' Lt.	1189.7	1191.7
31	'303' - 1+55.4 / 27.7' Lt.	1194.2	1196.2
32	'304' - 18.9' STUB from MH	1196.3	1198.3
33	'303' - 1+41.8 / 21.3' Rt.	1193.5	1195.5
34	'303' - 0+60.2 / 22.5' Rt.	1189.9	1191.9
35	'302' - 0+98.5 / 23.5' Rt.	1186.1	1189.5
36	'302' - 0+17.0 / 23.5' Rt.	1182.4	1185.1
37	'301' - 0+72.4 / 33.8' Rt.	1179.3	1181.3
38	'301' - 22.6' STUB from MH	1174.3	1176.3
39	'104' - 1+24.5 / 23.5' Rt.	1168.7	1170.7
40	'104' - 0+51.5 / 23.5' Rt.	1163.3	1165.3
E	exist '102' - 0+72.0 / 33.0' Rt.	1152.5	1154.5
F	exist '102' - 0+92.0 / 33.0' Rt.	1152.6	1154.6
G	exist '102' - 1+64.5 / 33.0' Rt.	1153.0	1155.0
H	exist '102' - 2+37.0 / 33.0' Rt.	1153.3	1155.3
I	'103' - 0+23.6 / 33.0' Rt.	1153.8	1155.8
J	'103' - 1+01.1 / 33.0' Rt.	1154.4	1156.4
K	'103' - 1+68.6 / 33.0' Rt.	1154.8	1156.8
L	'103' - 2+41.1 / 33.0' Rt.	1155.3	1157.3
M	'103' - 3+39.4 / 33.0' Rt.	1156.0	1158.0
N	'104' - 0+51.5 / 23.5' Rt.	1163.3	1165.3

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.

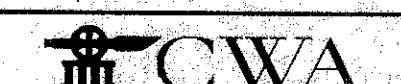
THE MIN. FLOOR ELEVATION IS BASED ON SEC. 200.02-5-A-8 OF THE ROANOKE CO. WATER & SEWER REGULATIONS. LOT OWNERS REQUESTING A LOWER SERVICE ELEVATION WILL REQUIRE THE USE OF A PRIVATE SEWAGE PUMP FACILITY, INSTALLED AND MAINTAINED BY THE HOMEOWNER.

CONSTRUCTION DETAILS & NOTES

FOXFIELD at RUSSELL FARMS

SECTION 2

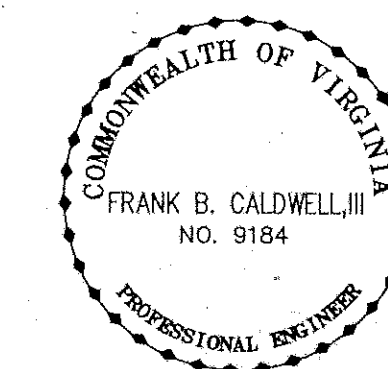
CATAWBA MAGISTERIAL DISTRICT
ROANOKE COUNTY, VIRGINIA



CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS

4203 MELROSE AVENUE, N.W.
Post Office Box 6260
ROANOKE, VIRGINIA 24017
Telephone: (540) 356-3400 Fax: (540) 356-8708
EMAIL: CWA@ROANOKE.AOL.COM

Designed: J.V. Judy
Drawn: J.V. Judy
Checked: F.B. Caldwell
Date: Aug. 29, 2002
Scale: AS SHOWN
Tax Parcel: 56.03-2-43
N.O. # 01-0080



REVISED: 10/24/03 per ROANOKE CO 2nd REVIEW
REVISED: 7/16/03 per ROANOKE CO. & VDOT 1st REVIEW