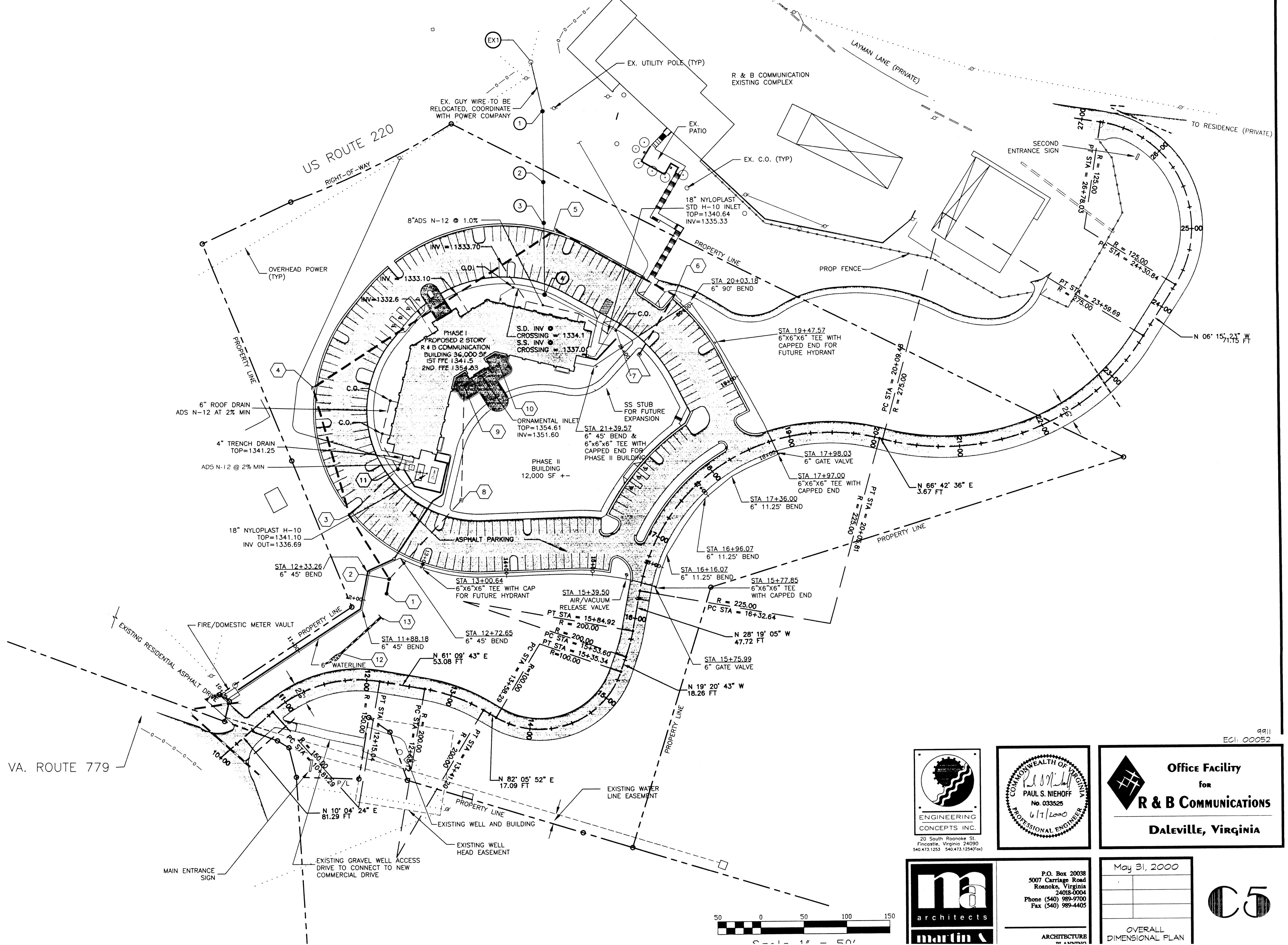
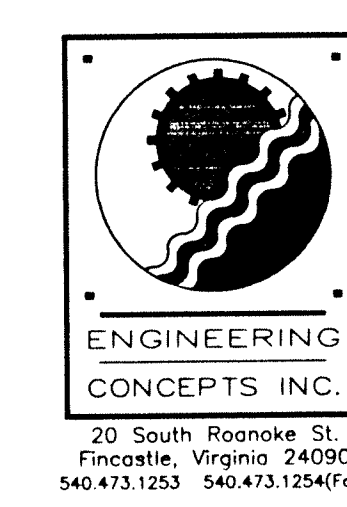
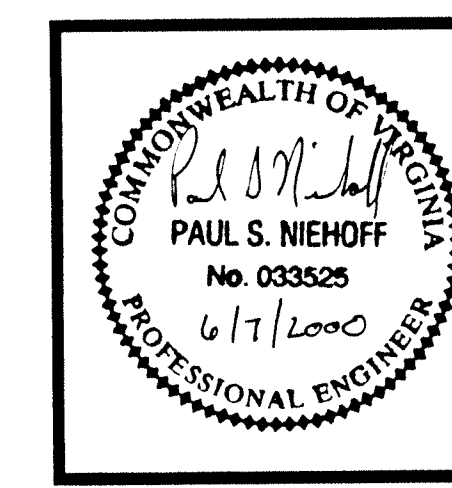




9911
ECI: 00052



20 South Roanoke St.
Fincastle, Virginia 24090
540.473.1253 540.473.1254(Fax)



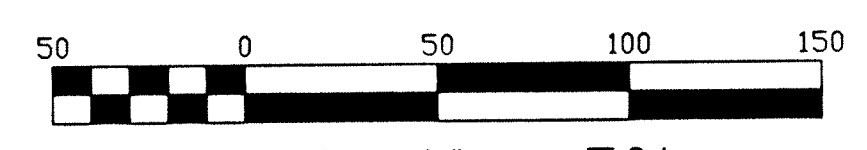
Office Facility
for
R & B Communications
Daleville, Virginia

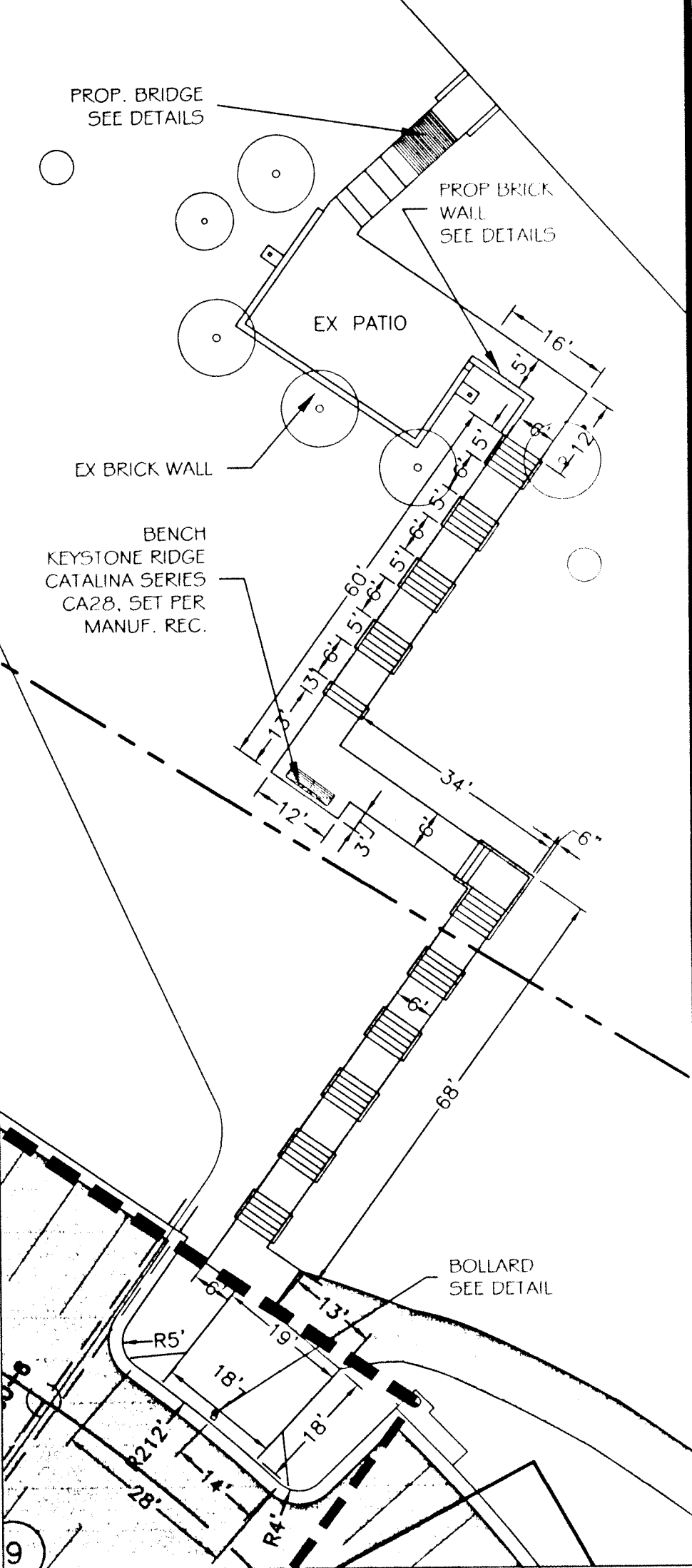
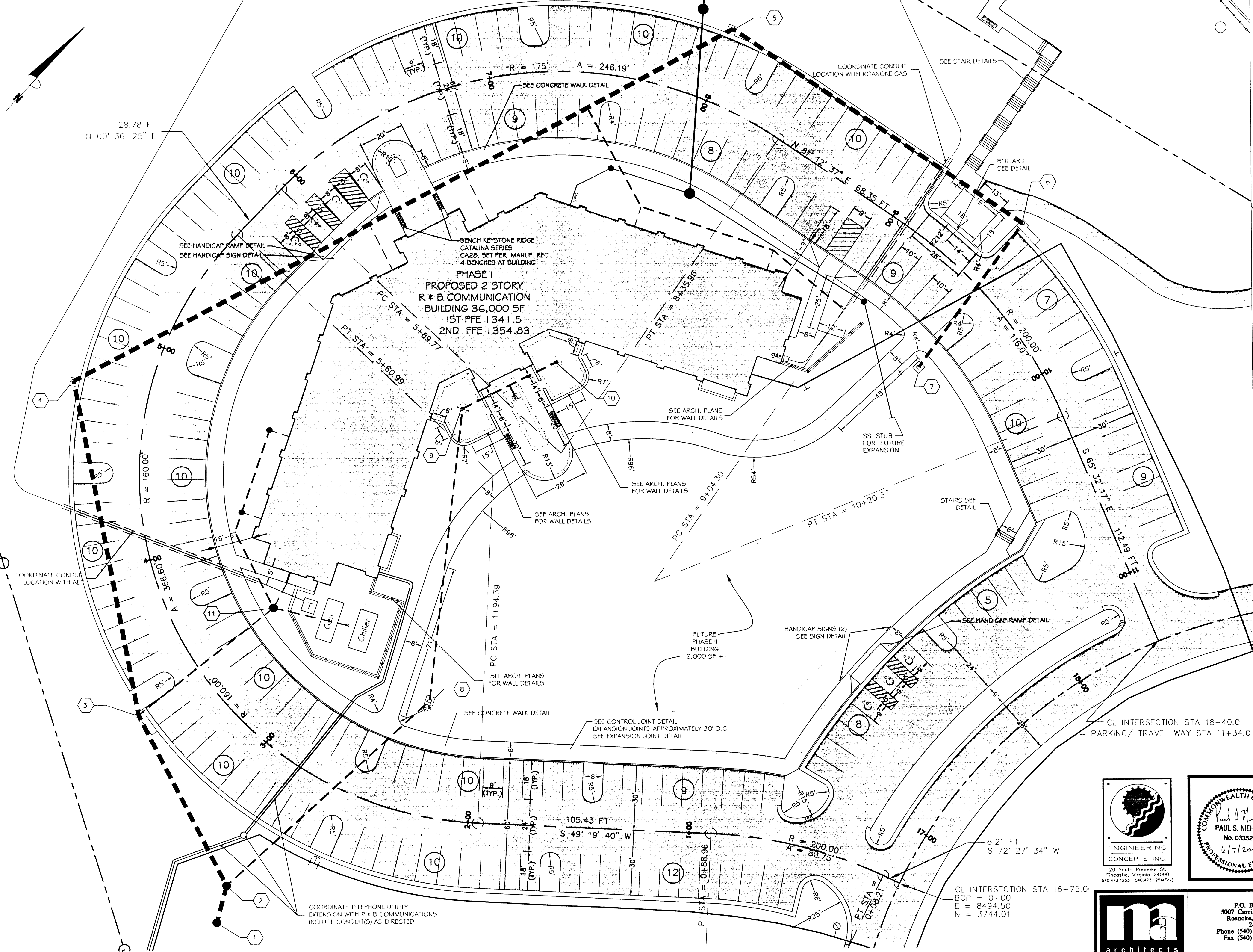


P.O. Box 20038
5007 Carriage Road
Roanoke, Virginia
24018-0004
Phone (540) 989-9700
Fax (540) 989-4405

May 31, 2000

OVERALL
DIMENSIONAL PLAN

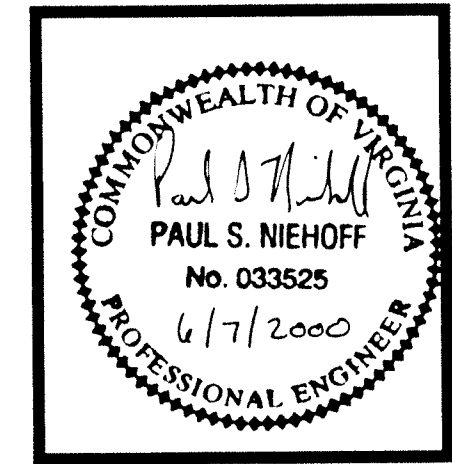
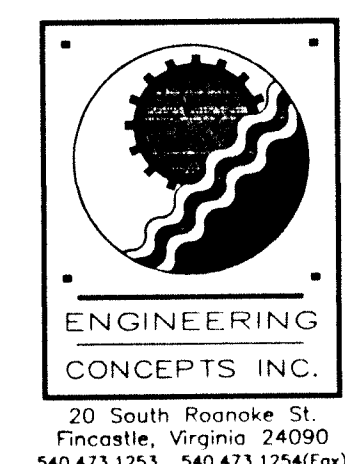




STAIRS AREA DIMENSIONAL DETAIL

- Notes:
1. SEE SHEET C9 FOR UTILITY PROFILES
 2. ALL CURB & GUTTER SHALL BE STAKED PRIOR TO INSTALLATION.
 3. ALL SITE UTILITY SHALL BE STAKED PRIOR TO INSTALLATION.
 4. ACCESS ROAD & PARKING TRAVELWAY SHALL BE STAKED FOR CONSTRUCTION.
 5. ALL PARKING STALL PAINT SHALL BE DURABLE AND COMPATIBLE WITH EXTERIOR APPLICATION - APPLY PAINT WITH MECHANICAL EQUIPMENT AND TEMPLATES TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY AT MANUFACTURER'S DRY FILM THICKNESS OF 15 MILS. PAINTED LINES SHALL HAVE A MINIMUM 4" WIDTH.

9411
ECI: 00052



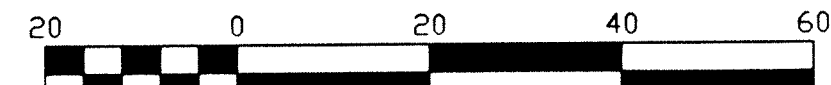
Office Facility
for
R & B Communications
Daleville, Virginia

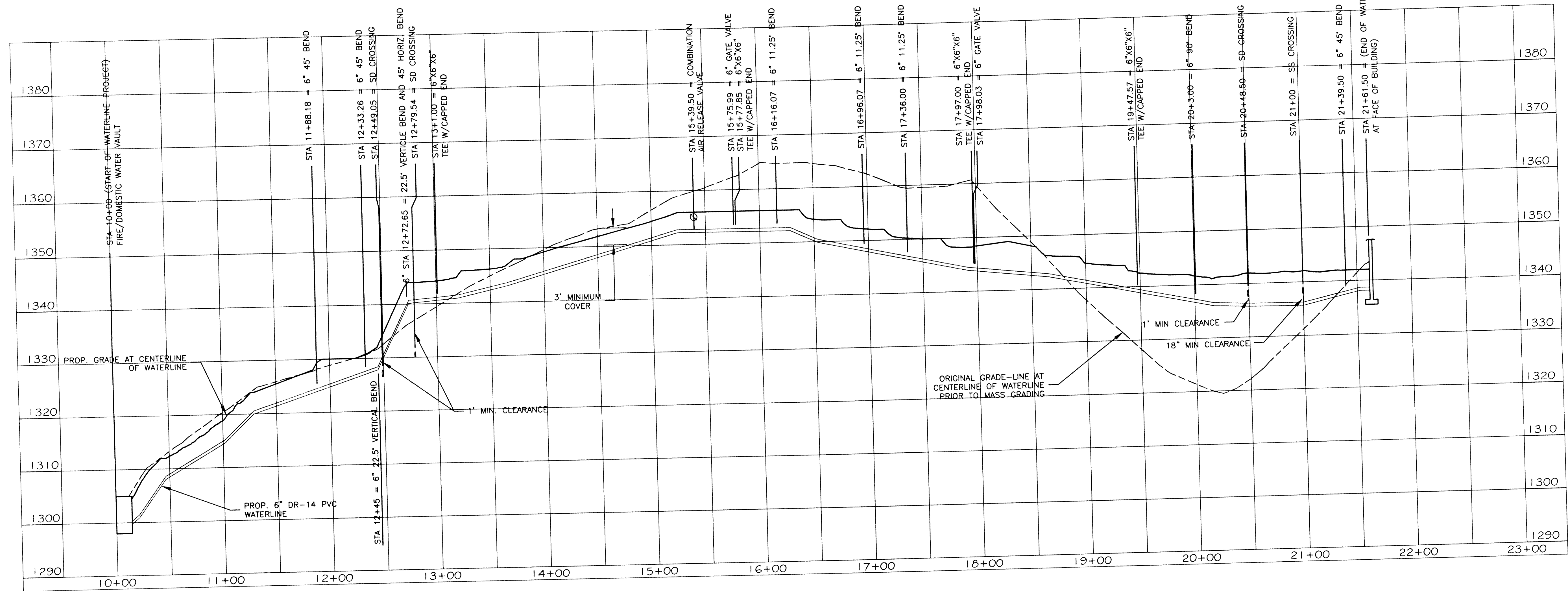


P.O. Box 20038
5007 Carriage Road
Roanoke, Virginia
24018-6004
Phone (540) 989-9700
Fax (540) 989-4405

May 31, 2000

DIMENSIONAL DETAIL
PI AN

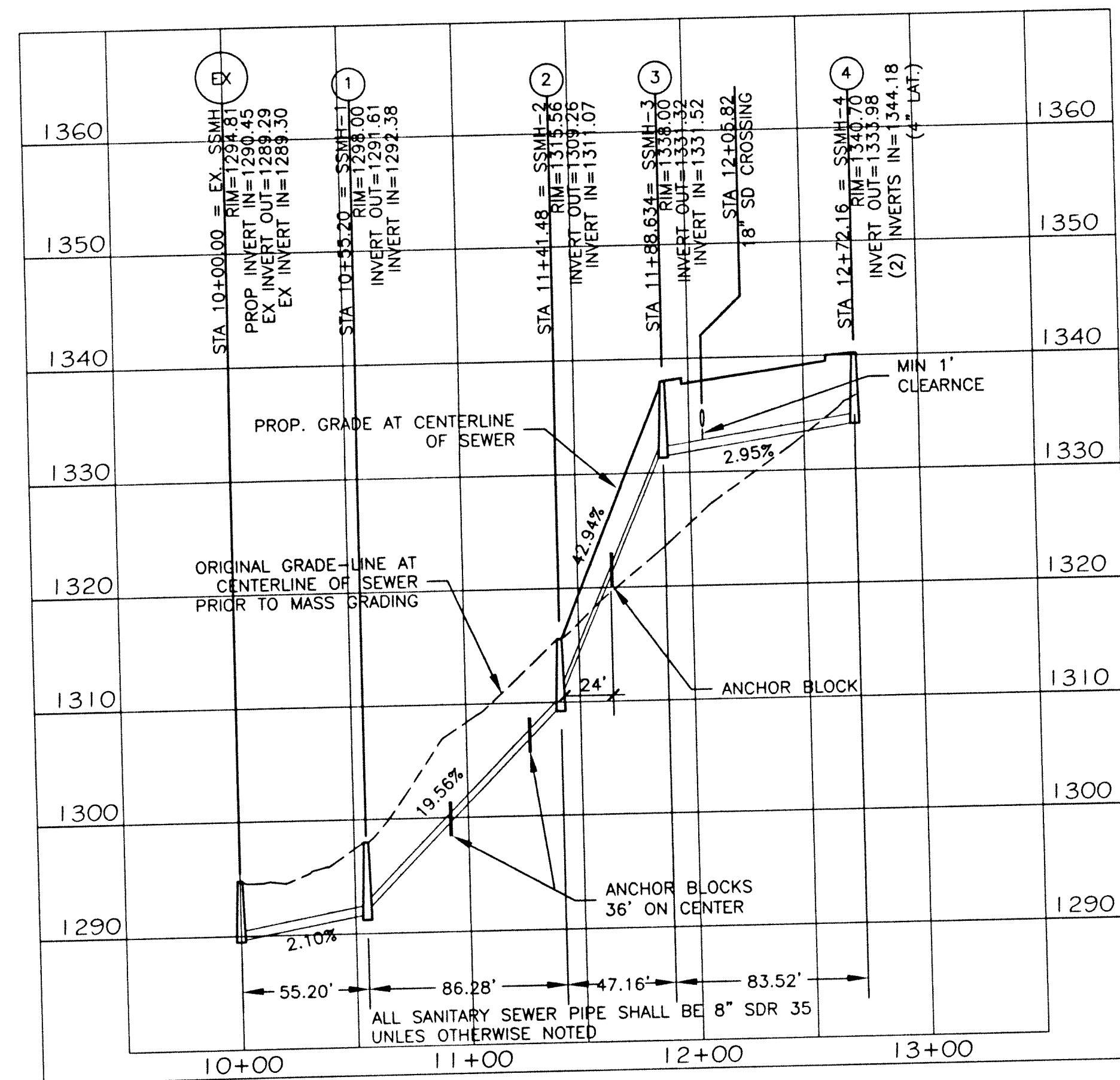




WATERLINE PROFILE

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

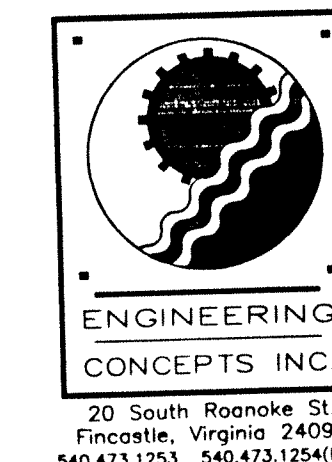
NOTE: EX. GRADE AT CENTERLINE
PROFILES APPROXIMATELY
12" FROM PROPOSED GRADE
SHOWN



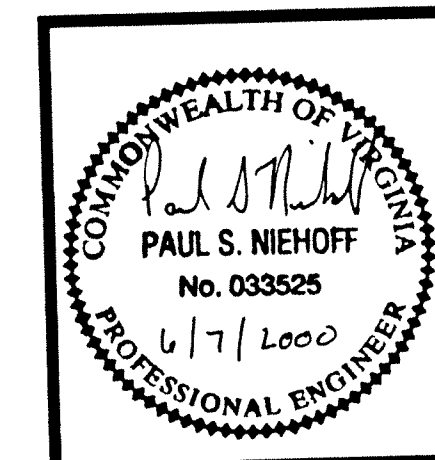
SANITARY SEWER PROFILE

HORIZONTAL SCALE: 1" = 50'

CONTRACTOR SHALL USE VERTICAL
BENDS AT FACE OF MANHOLE TO



ENGINEERING
CONCEPTS, INC.
20 South Roanoke St.
Fincastle, Virginia 24090
540.473.1253 540.473.1254 (fax)



Office Facility
for
R & B Communications
Daleville, Virginia



P.O. Box 20038
5007 Carriage Road
Roanoke, Virginia
24018-0038
Phone (540) 989-9700
Fax (540) 989-4405

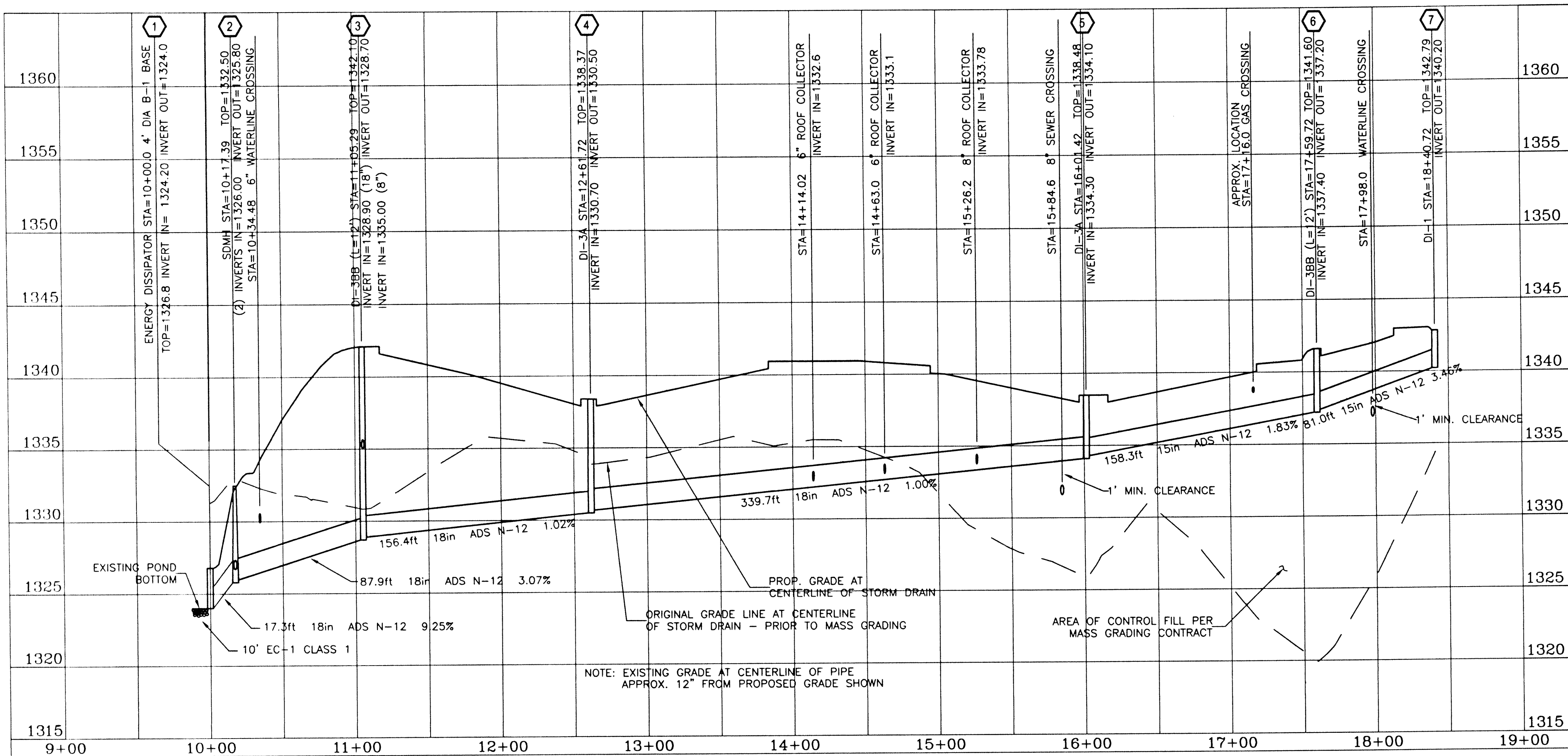
ARCHITECTURE
PLANNING

MAY 31, 2000	

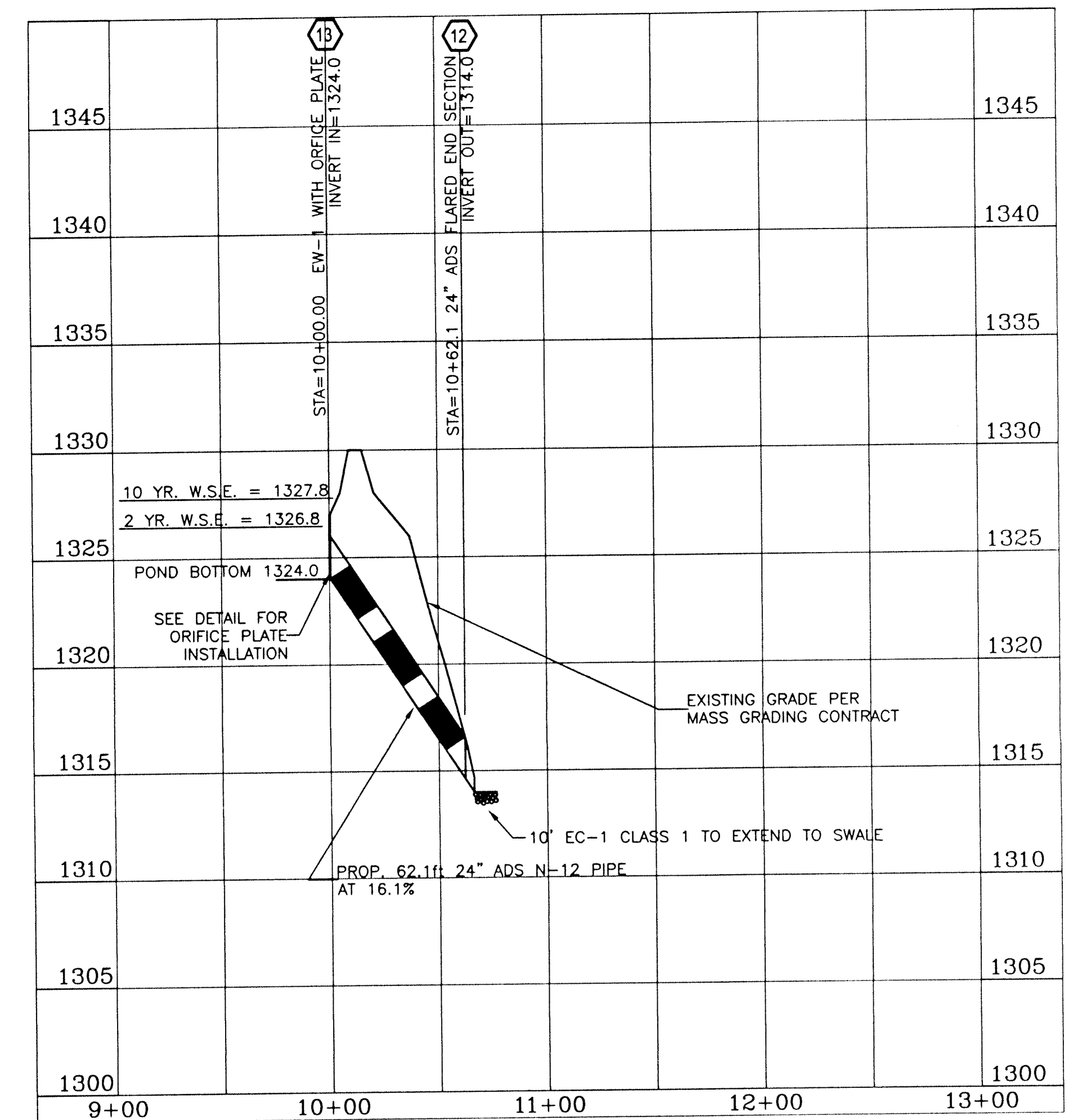
SEWER AND WATER
PROFILES



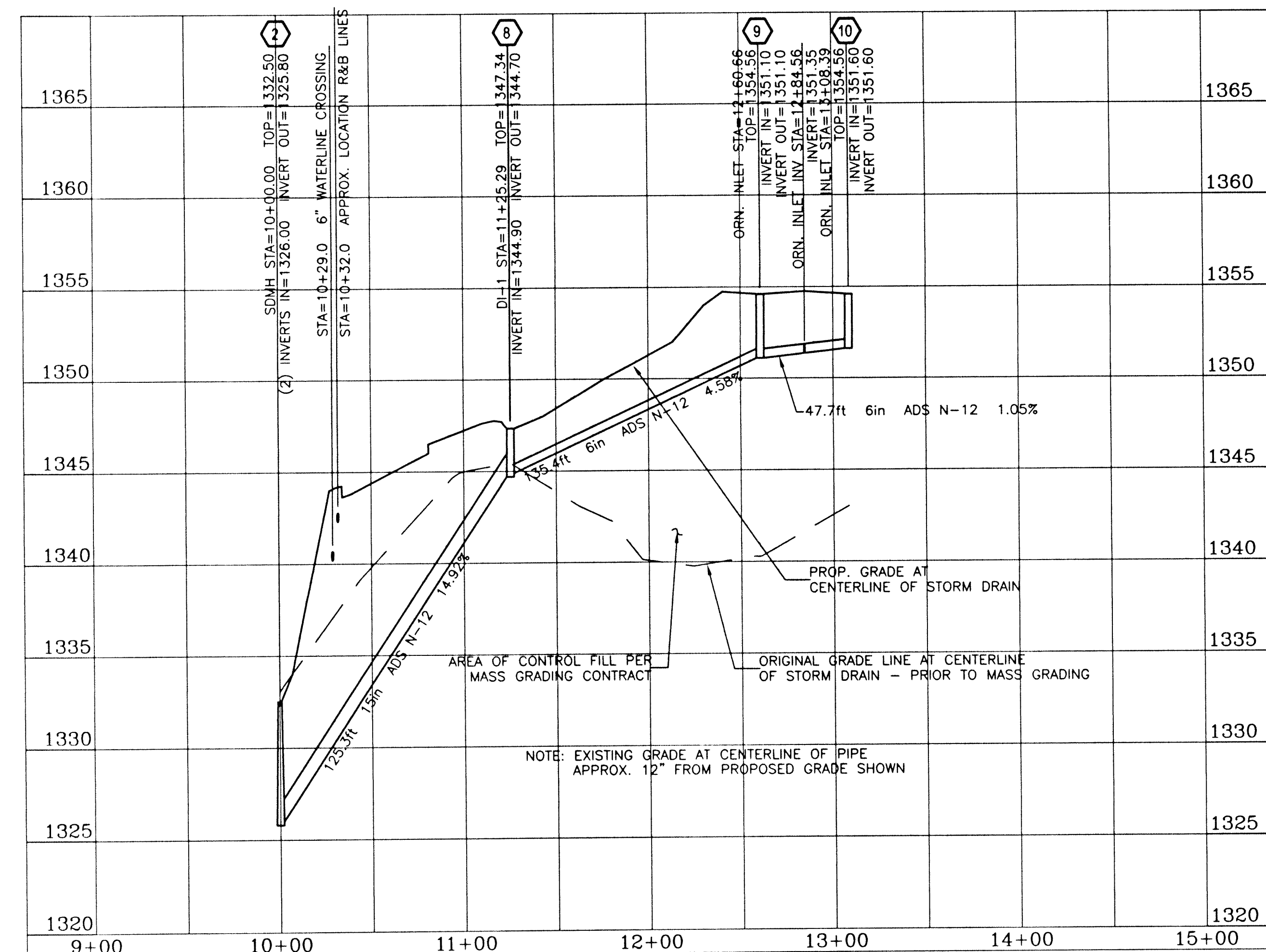
9911
ECI: 00052



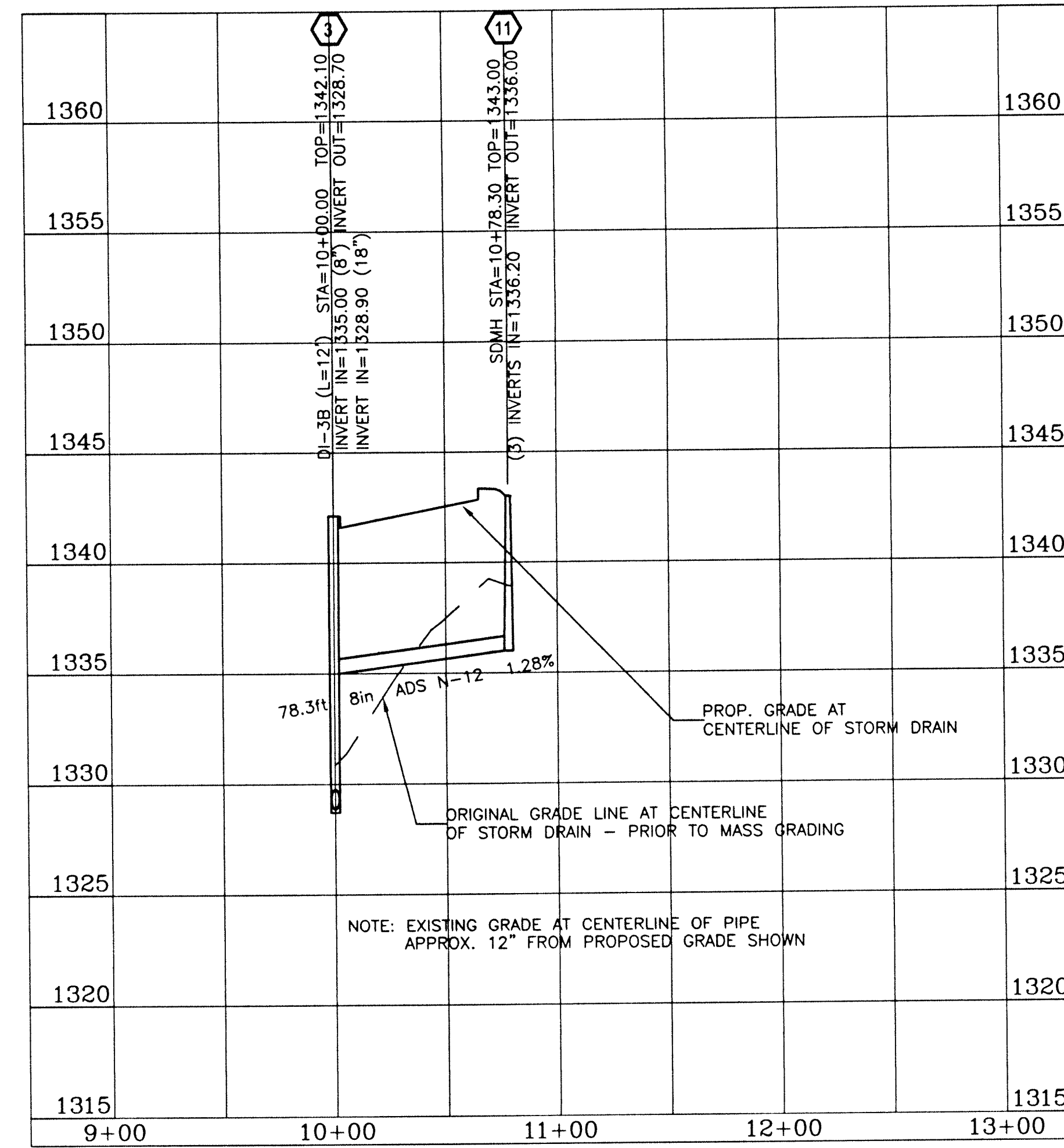
1 STORM DRAIN PROFILES 7
SCALE: HOR.-1"=50'
VER.-1"=5'



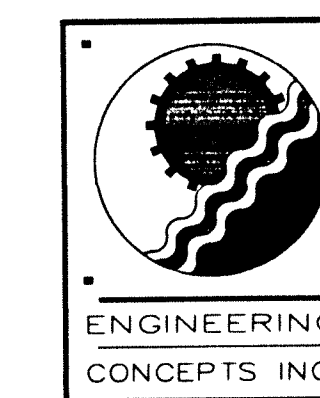
12 STORMWATER MANAGEMENT OUTFALL DRAIN PROFILE 13
SCALE: HOR.-1"=50'
VER.-1"=5'



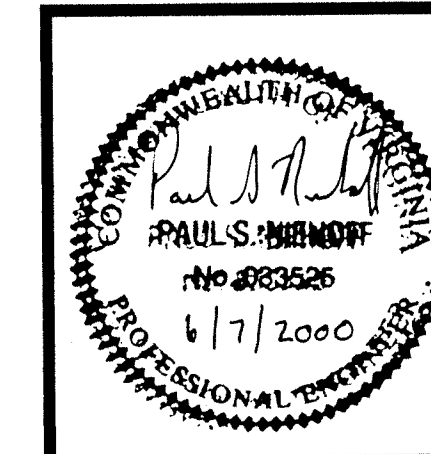
2 STORM DRAIN PROFILES 2



4 STORM DRAIN PROFILES 41



20 South Roanoke St.
Fincastle, Virginia 24090
540.473.1253 540.473.1254(fax)



P.O. Box 20038
5007 Carriage Road
Roanoke, Virginia
24018-0004
Phone (540) 989-9700
Fax (540) 989-4405

ARCHITECTURE
BY ASSOCIATES

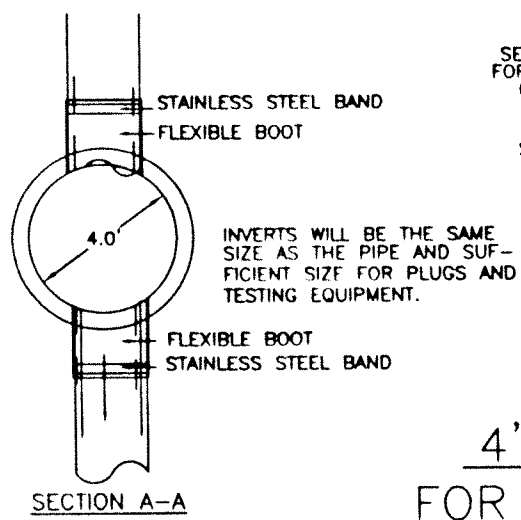
MAY 31, 2000

STORM DRAIN
PROFILES

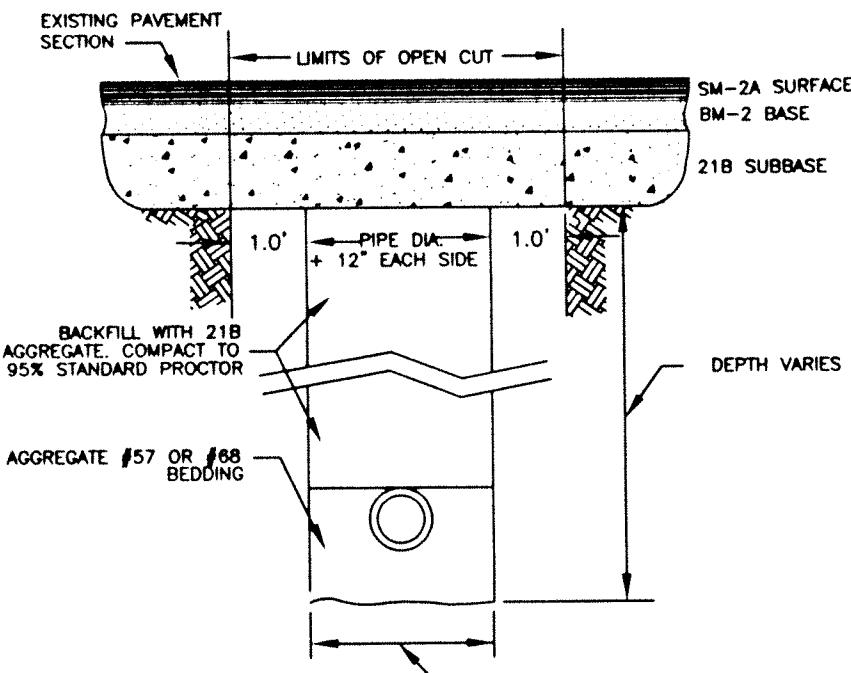
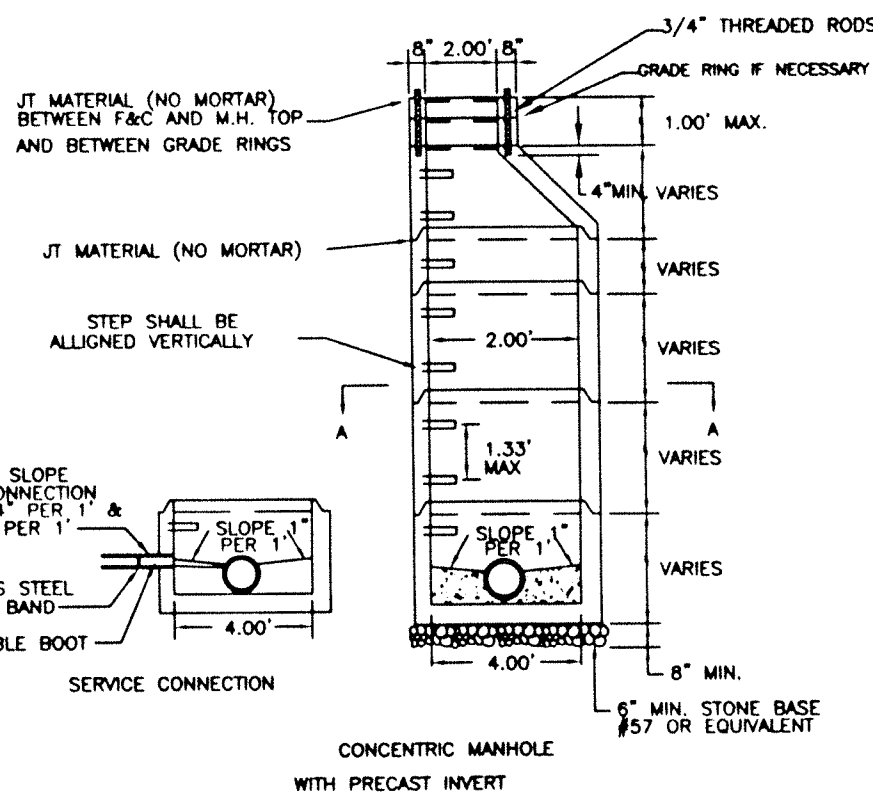


9911
EC1: 00052

- NOTES
1. ALL MANHOLE FRAMES AND COVERS SHALL BE DEWEY BROTHERS, INC. MH-RCR-3000W IN NON-PAVED AREAS, REQUIRING WATER TIGHT FRAME & COVERS AND MH-RCR-3000E-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. ALL SAMPLING MANHOLES SHALL BE CONSTRUCTED AS PER MANHOLE DETAILS. WHEN NECESSARY, THE FLAT TOP MANHOLE MAY BE SUBSTITUTED WITH ECCENTRIC OPENING AT STEPS.
 5. JOINT MATERIAL SHALL CONSIST OF TWO (2) ROLLS OF MASTIC PER JOINT. MASTIC SHALL BE PLACED AT THE TOP & BOTTOM OF EACH JOINT.

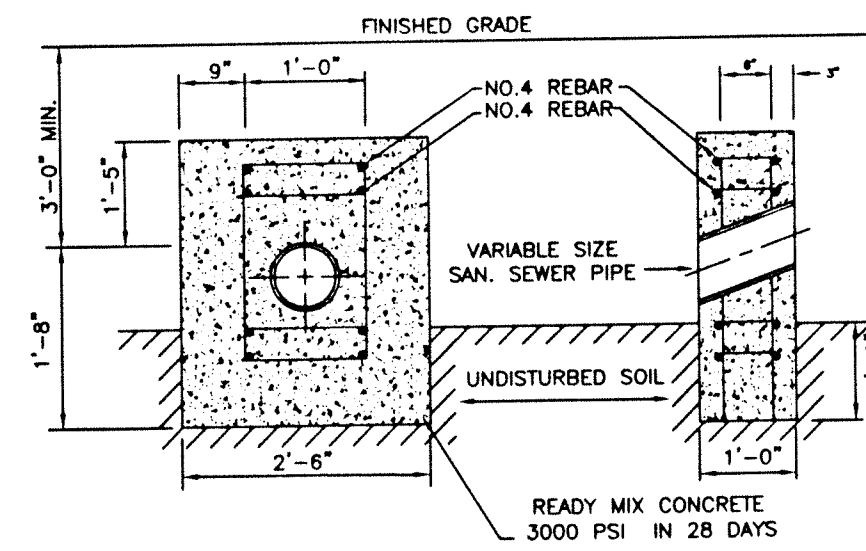


4' STANDARD MANHOLE
FOR PIPE 15" OR SMALLER



- A. THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE, 2" VDOT SM-2A, BASE COURSE, 3" VDOT BM-2, AND SUBBASE, 6" VDOT 21B, OR AS REQUIRED BY VDOT.
- B. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED OR AS REQUIRED BY VDOT.
- C. ALL EXPOSED EDGES OF EXISTING BITUMINOUS SURFACE COURSE SHALL BE PRIMED WITH A MATERIAL SATISFACTORY TO VDOT BEFORE THE BITUMINOUS MIXTURES ARE REPLACED. EDGES OF TRENCH SHALL BE CUT TO A STRAIGHT LINE PRIOR TO PAVING.
- D. THE BACKFILL IN THE TRENCH SHALL BE SUITABLE AND THOROUGHLY COMPACTED IN 8-INCH LAYERS BY TAMPING OR BY OTHER APPROVED METHOD BEFORE THE OPENING IS PAVED. NO EXCAVATIONS UNDER THE EXISTING PAVEMENT WILL BE PERMITTED. SHEETING OR SHORING SHALL BE USED WHEN REQUIRED BY THE DEPTH OF THE TRENCH OR TYPE OF MATERIAL IN ACCORDANCE WITH VIRGINIA O.S.H.A. STANDARDS.

PAVEMENT REPLACEMENT
OPEN CUT ROADWAY



- GRADES 20% TO 35% -- 36 FT ON CENTER
* GRADES 35% TO 50% -- 24 FT ON CENTER
* GRADES 50% TO 60% -- 16 FT ON CENTER
* WITH WRITTEN APPROVAL OF UTILITY DIRECTOR

ANCHOR BLOCK

SANITARY SEWER NOTES & SPECIFICATIONS

1. **PIPE & FITTINGS:** ALL SANITARY SEWER PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC), SDR 35 (SCH.40 FOR LATERALS ONLY), AND SHALL CONFORM WITH ASTM D-3034.

2. **INSTALLATION:** THE SANITARY SEWER PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS. 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. THE PIPE SHALL BE VISUALLY INSPECTED FOR DEFECTS BEFORE LOWERING THE PIPE IN THE TRENCH. FIELD CUTTING OF THE PIPE 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. METAL DETECTION TAPE WITH MIN. 12 GA. WIRE SHALL BE INSTALLED WITH PIPE.

3. **TRENCH EXCAVATION:** TRENCHES SHALL BE EXCAVATED IN STRAIGHT LINES AND SHALL BE OF SUFFICIENT WIDTH TO PERMIT THE PROPER INSTALLATION OF BRACING, SHORING OR SHEETING. TRENCH WIDTH SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION. THE BOTTOM OF THE PIPE TRENCH SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF FOUR (4) INCHES BELOW THE BOTTOM OF THE PIPE, TO PROVIDE FOR THE COMPACTED BEDDING MATERIAL.

4. **BEDDING:** BEDDING MATERIAL SHALL BE COARSE AGGREGATE SIZE NUMBER 57 AND SHALL CONFORM WITH VDOT SECTION 203 AND/OR ASTM C33. BEDDING MATERIAL SHALL BE PLACED AND COMPACTED IN FOUR (4) INCHES BELOW THE PIPE AND AS A MINIMUM UP TO THE TOP OF THE PIPE. CARE SHALL BE TAKEN TO ENSURE THE BEDDING MATERIAL FULLY SUPPORTS THE SIDE AND BOTTOM OF THE PIPE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

5. **BACK FILL:** BACK FILL MATERIAL SHALL BE EITHER APPROVED EXCAVATED MATERIAL OR APPROVED SUITABLE MATERIAL FROM OTHER SOURCES THAT IS FREE OF ORGANIC MATERIAL, LOAM, DEBRIS, OR MINIMUM ONE (1) FOOT ABOVE THE TOP OF PIPE SHALL BE FREE OF STONES LARGER THAN ONE (1) INCH AND SHALL BE PLACED IN SIX (6) INCH LAYERS AND COMPACTED WITH HAND TAMPERS. BACK FILL FROM THIS POINT TO TOP OF TRENCH SHALL BE FREE OF STONES LARGER THAN FOUR (4) INCHES AND SHALL BE PLACED IN LAYERS NOT TO EXCEED EIGHT (8) INCHES AND COMPACTED WITH MECHANICAL TAMPERS. BACK FILL BELOW UNPAVED AREAS SHALL BE COMPACTED TO 90%. BACK FILL BELOW PAVED AREAS SHALL BE COMPACTED TO 95%. BACK FILL COMPACTION TESTING SHALL BE IN ACCORDANCE WITH ASTM D-1557.

6. **TESTING OF SANITARY SEWER:** ALL SEWER LINES SHALL BE PRESSURE TESTED IN ACCORDANCE WITH BOTETOURT COUNTY STANDARDS. COORDINATE WITH THE ENGINEER FOR INSPECTION.

7. A MINIMUM COVER OF THREE (3) FEET IS REQUIRED OVER PROPOSED LINES ALONG GRADES LESS THAN 40%. A MINIMUM COVER OF FOUR (4) FEET IS REQUIRED OVER PROPOSED LINES ALONG GRADES GREATER THAN 40%.

8. 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.

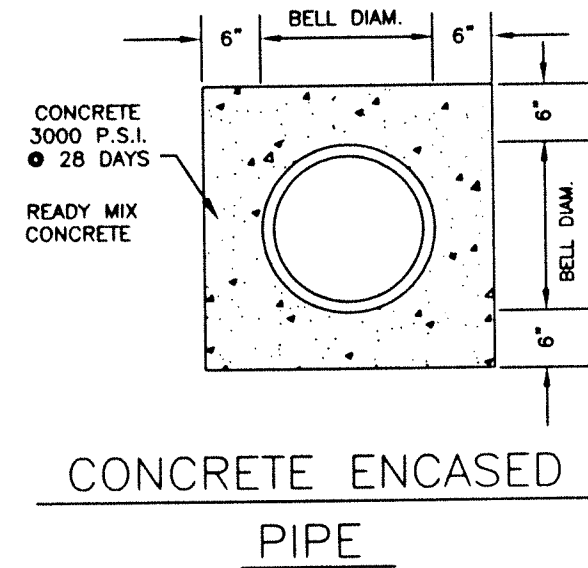
9. BUILDING CONNECTIONS ARE TO BE MADE WITH 4" PIPE INSTALLED AT A MINIMUM GRADE OF 1/4 INCH TO 1 FOOT, UNLESS NOTED OTHERWISE ON DRAWING.

10. LINES SHALL BE STAKED PRIOR TO CONSTRUCTION.

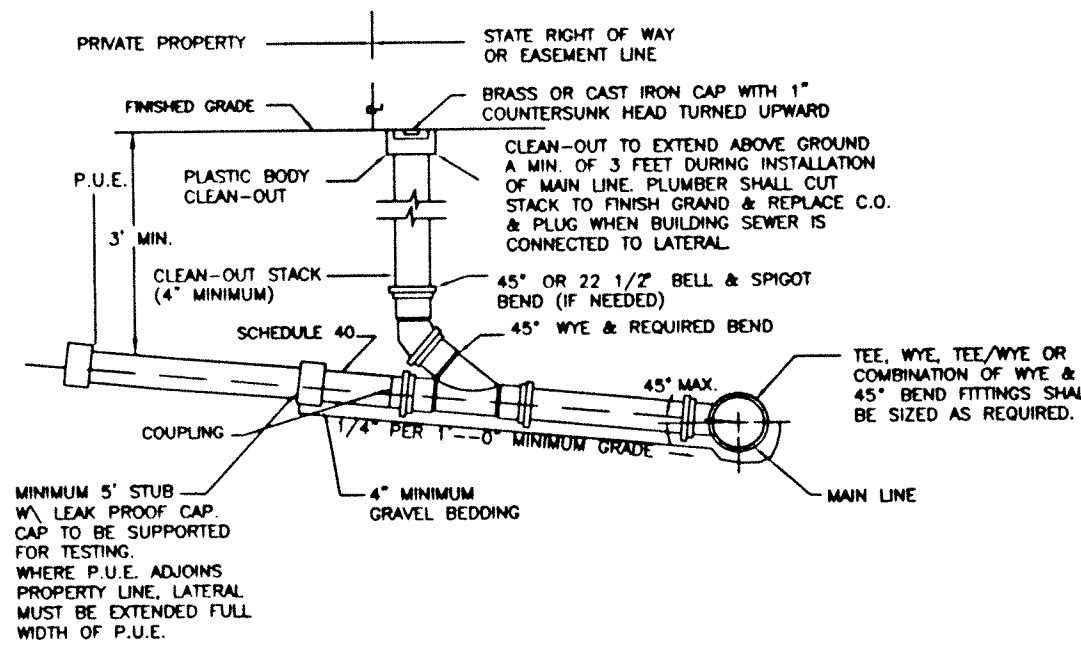
11. CONTRACTOR SHALL USE THE PROPPER FITTINGS TO CONNECT SEWERLINE TO MANHOLE WHERE NECESSARY

Pipe Diameter (in.)	Min. Time (min.)	Length for Min. Time (ft.)	Time for Longer Length (min.)	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	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:28	239	2.374 L	9:28	9:28	9:28	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	25:36	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	28:10	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	21.368 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



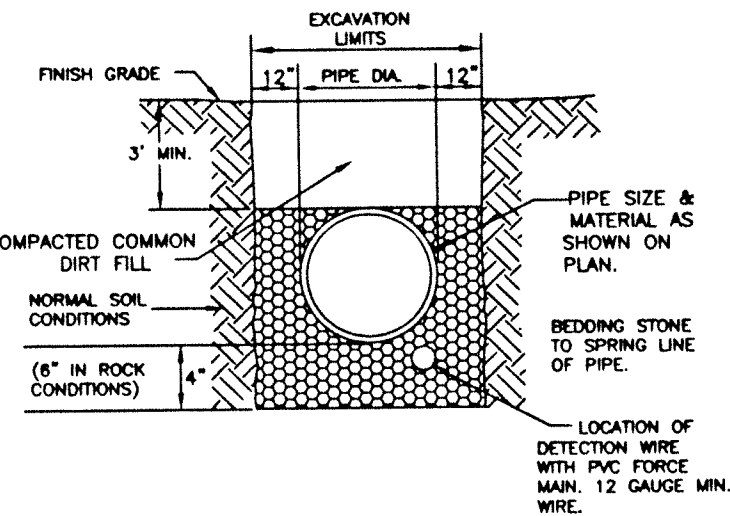
CONCRETE ENCASED
PIPE



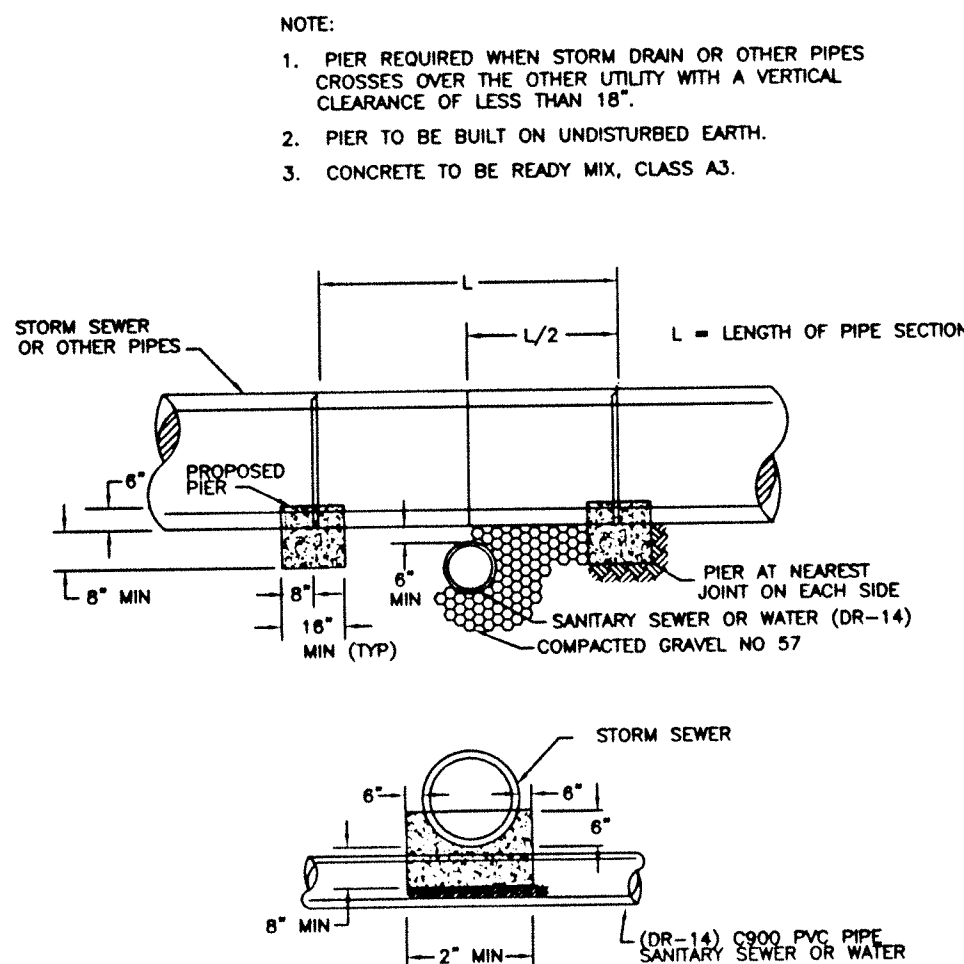
SANITARY SEWER LATERAL

GENERAL NOTES:

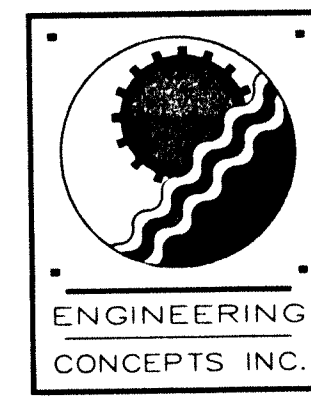
1. TRAFFIC BEARING BOX REQUIRED IN TRAFFIC AREAS.
2. ALL PIPE AND FITTINGS SHALL BE OF SIMILAR MATERIAL.
3. ALL PIPE SHALL BE OF SAME SIZE.
4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE (EXCEPT AS NOTED).
5. ALL MAIN LINE TAPS ON ACTIVE MAINS WILL BE PERFORMED BY ROANOKE 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.



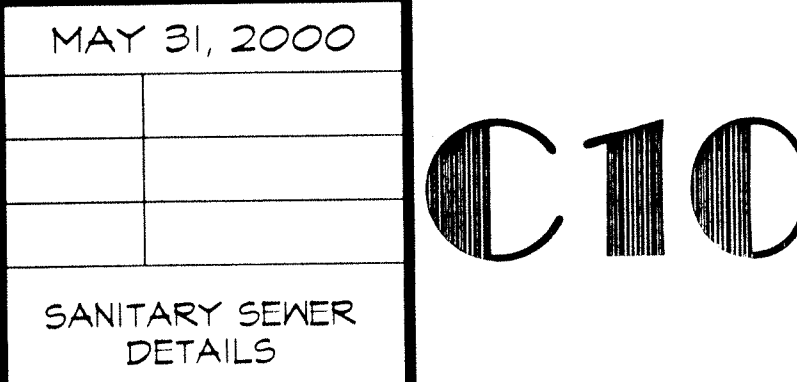
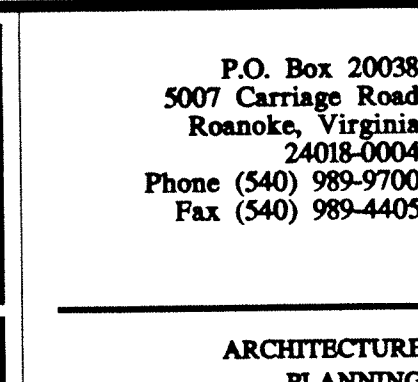
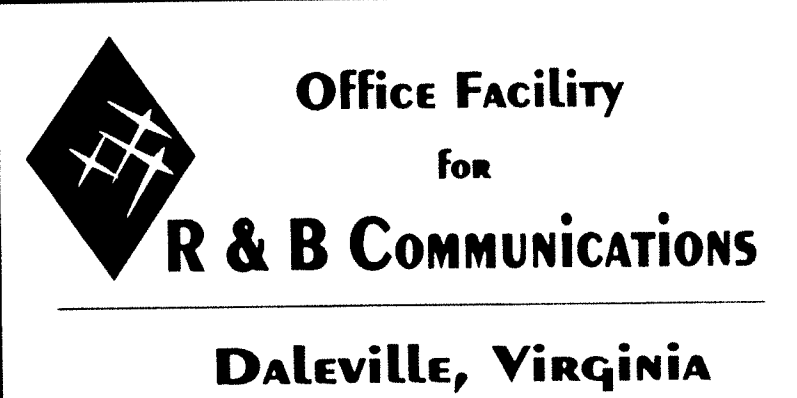
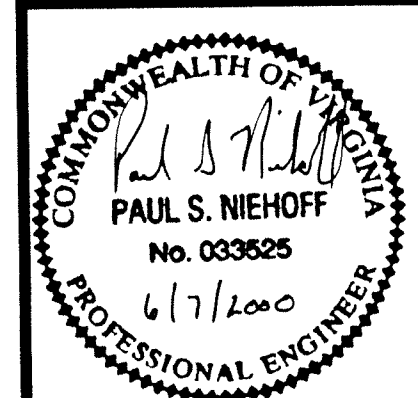
STONE BEDDING



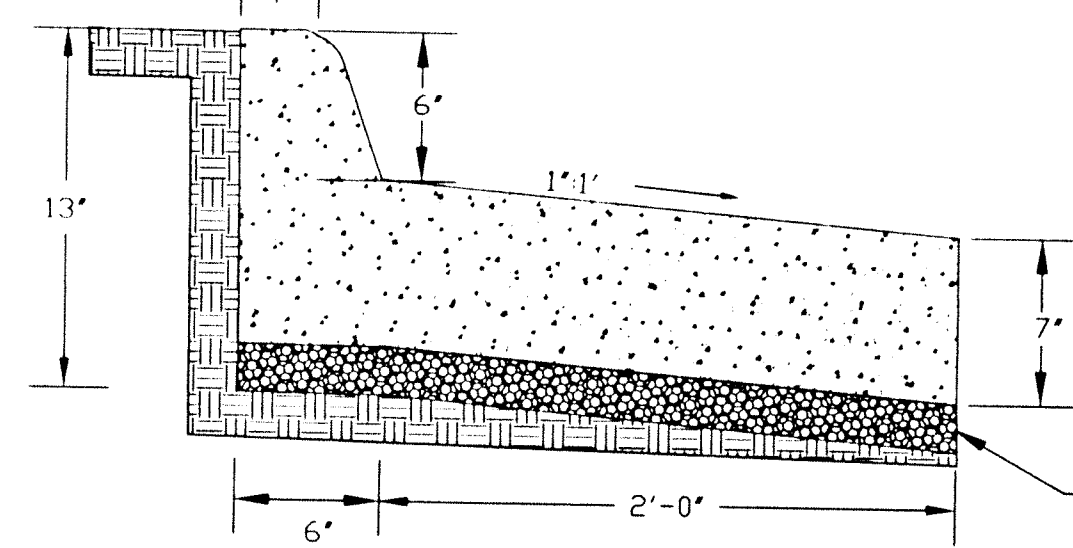
CONCRETE PIER



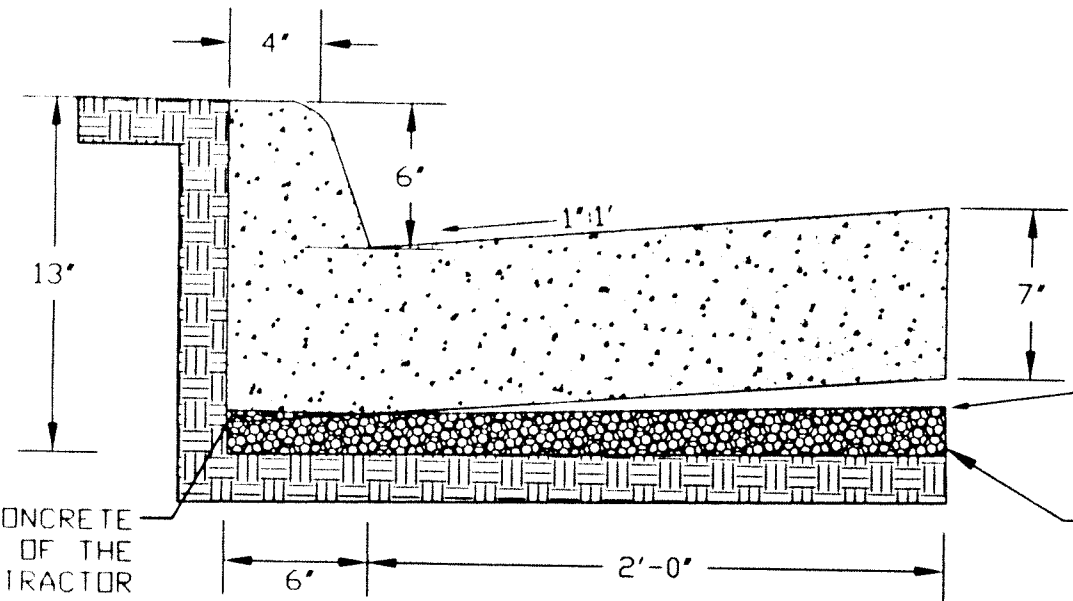
20 South Roanoke St.
Fincastle, Virginia 24090
540.473.1253 540.473.1254 (fax)



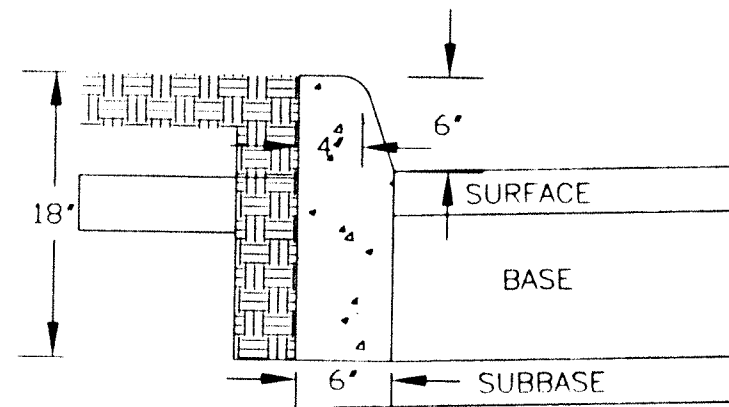
THESE CURBS ARE TO BE USED WHEN DESIGN SPEED IS 40 MPH OR LESS ON RURAL HIGHWAYS AND 45 MPH OR LESS IN DEVELOPED URBAN & SUBURBAN AREAS



CG-6R CURB & GUTTER
NOT TO SCALE



CG-6 CURB & GUTTER
NOT TO SCALE



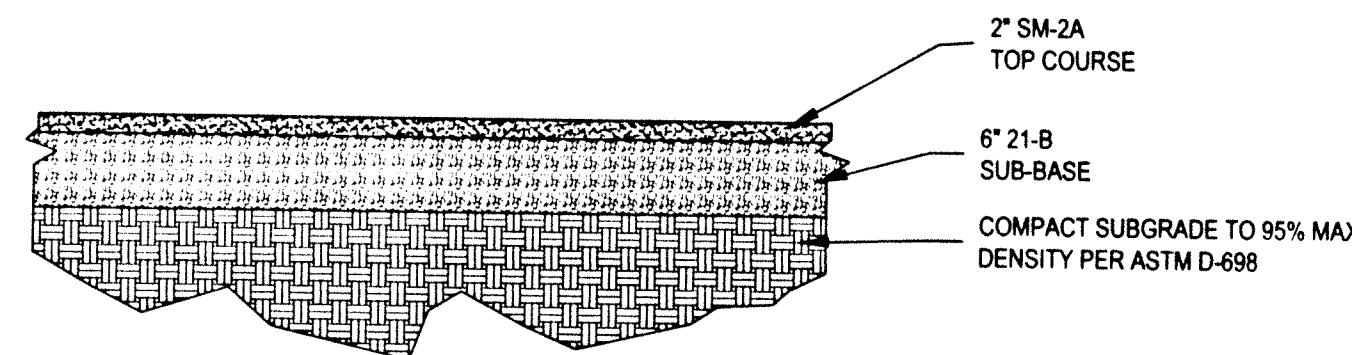
CG-2 CURB & GUTTER
NOT TO SCALE

NOTE: CURB HAVING A RADIUS OF 300 FT. OF LESS (ALONG FACE OF CURB) WILL BE PAID FOR AS RADIAL CURB.

THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (15" DEPTH) OR INCREASED AS MUCH AS 3" (21" DEPTH) IN ORDER THAT THE BOTTOM OF CURB WILL COINCIDE WITH THE TOP OF A COURSE OF THE PAVEMENT SUBSTRUCTURE. OTHERWISE, THE DEPTH IS TO BE 18" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR INCREASE IN DEPTH.

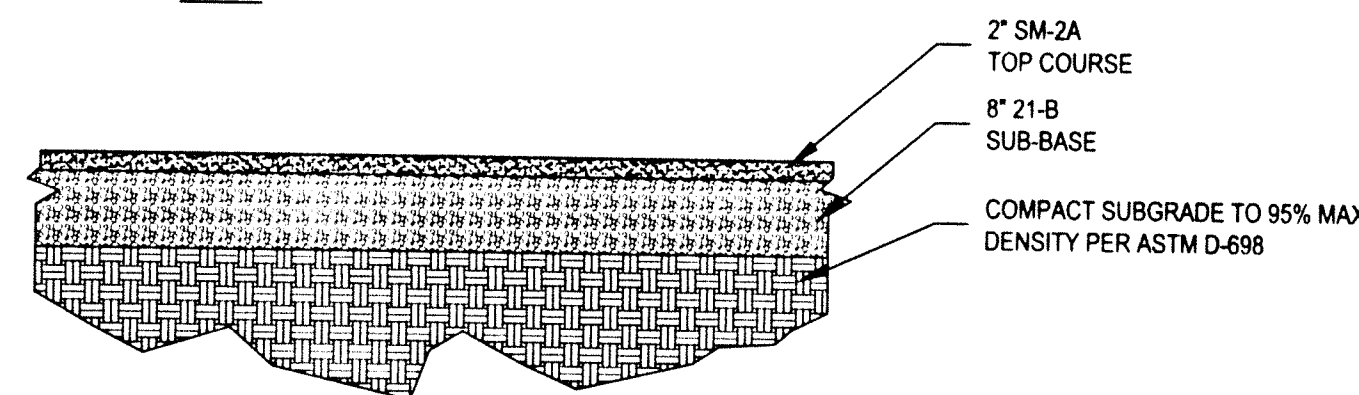
THIS CURB IS TO BE USED WHEN DESIGN SPEED IS 40 MPH OR LESS ON RURAL HIGHWAYS AND 45 MPH OR LESS IN DEVELOPED URBAN AND SUBURBAN AREAS.

THIS ITEM MAY BE PRECAST OR CAST IN PLACE. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.



NOT TO SCALE

TYPICAL RESIDENTIAL/CART
PATH PAVEMENT SECTION
A-A



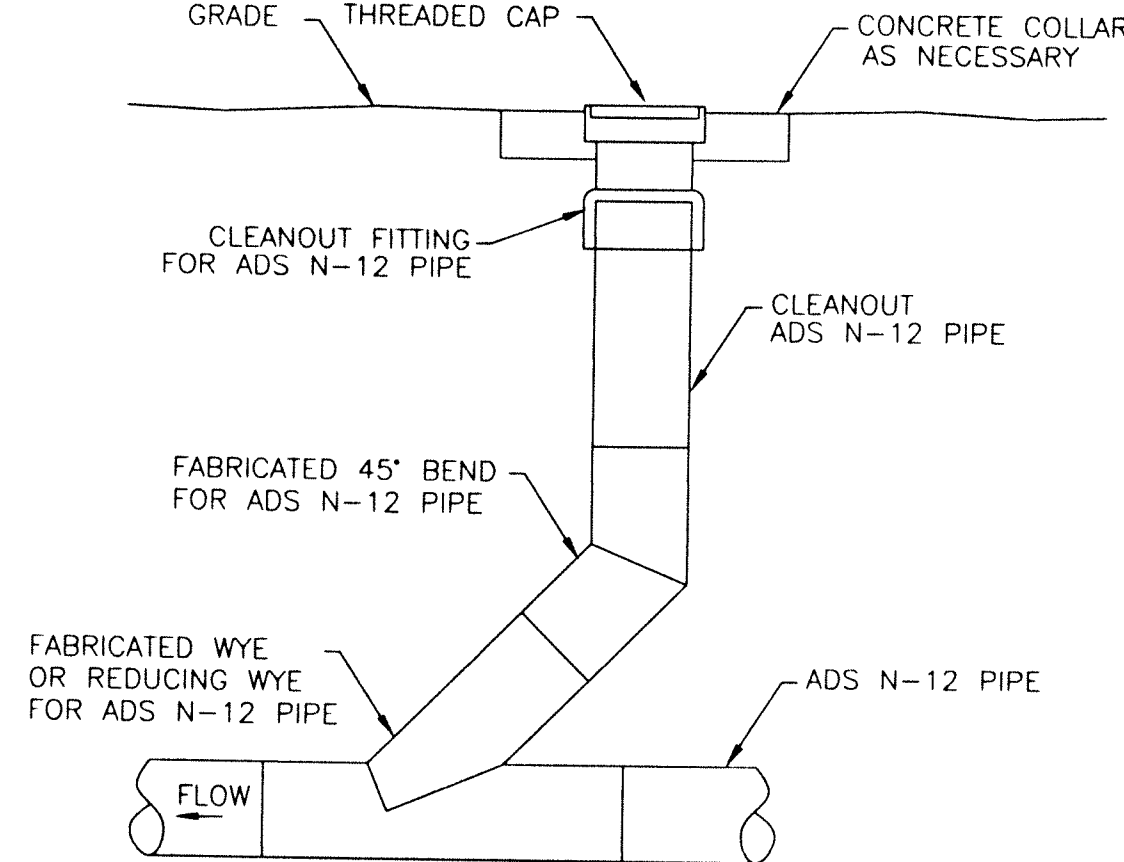
NOT TO SCALE

TYPICAL COMMERCIAL DRIVE
PAVEMENT SECTION B-B

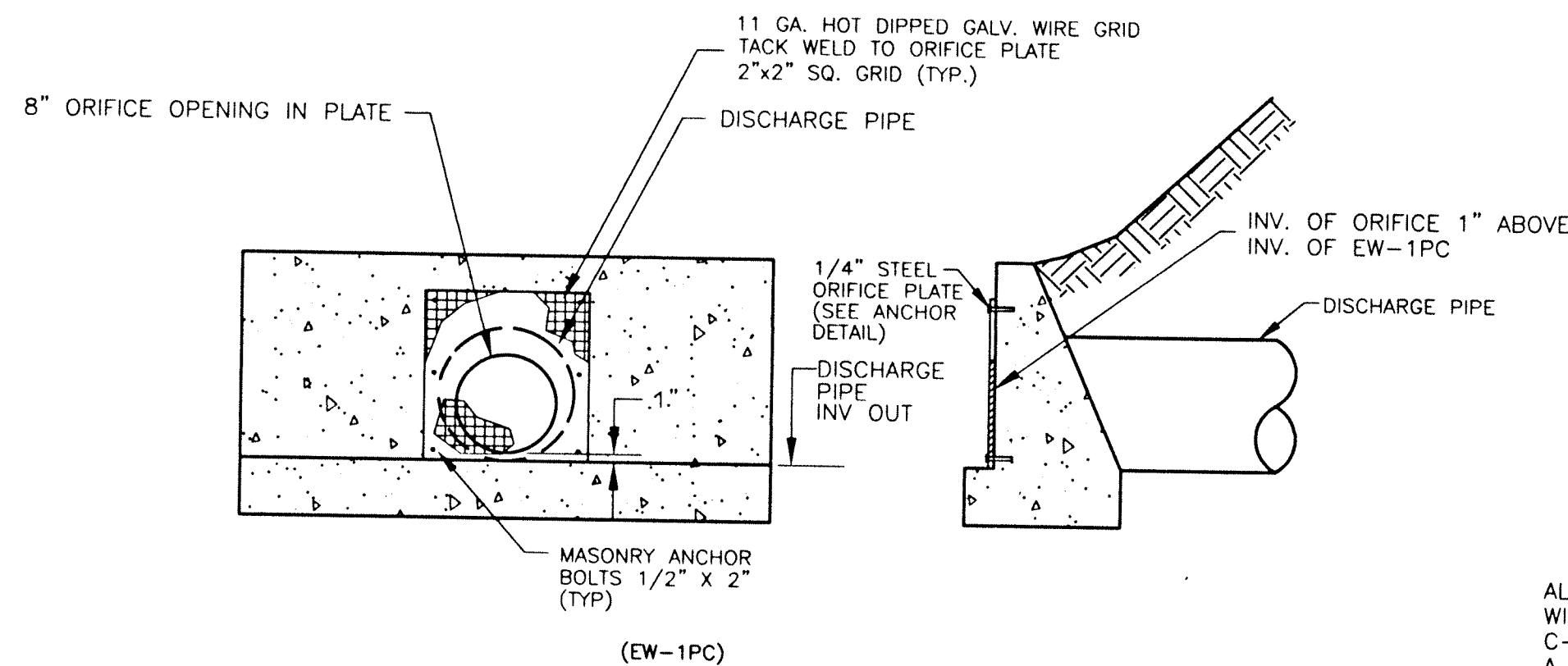
NOTE: COMB. CURB & GUTTER HAVING A RADIUS OF 300' OR LESS (ALONG FACE OF CURB SHALL BE PAID FOR AS RADIAL COMBINATION CURB & GUTTER

THIS ITEM MAY BE PRECAST OR CAST IN PLACE

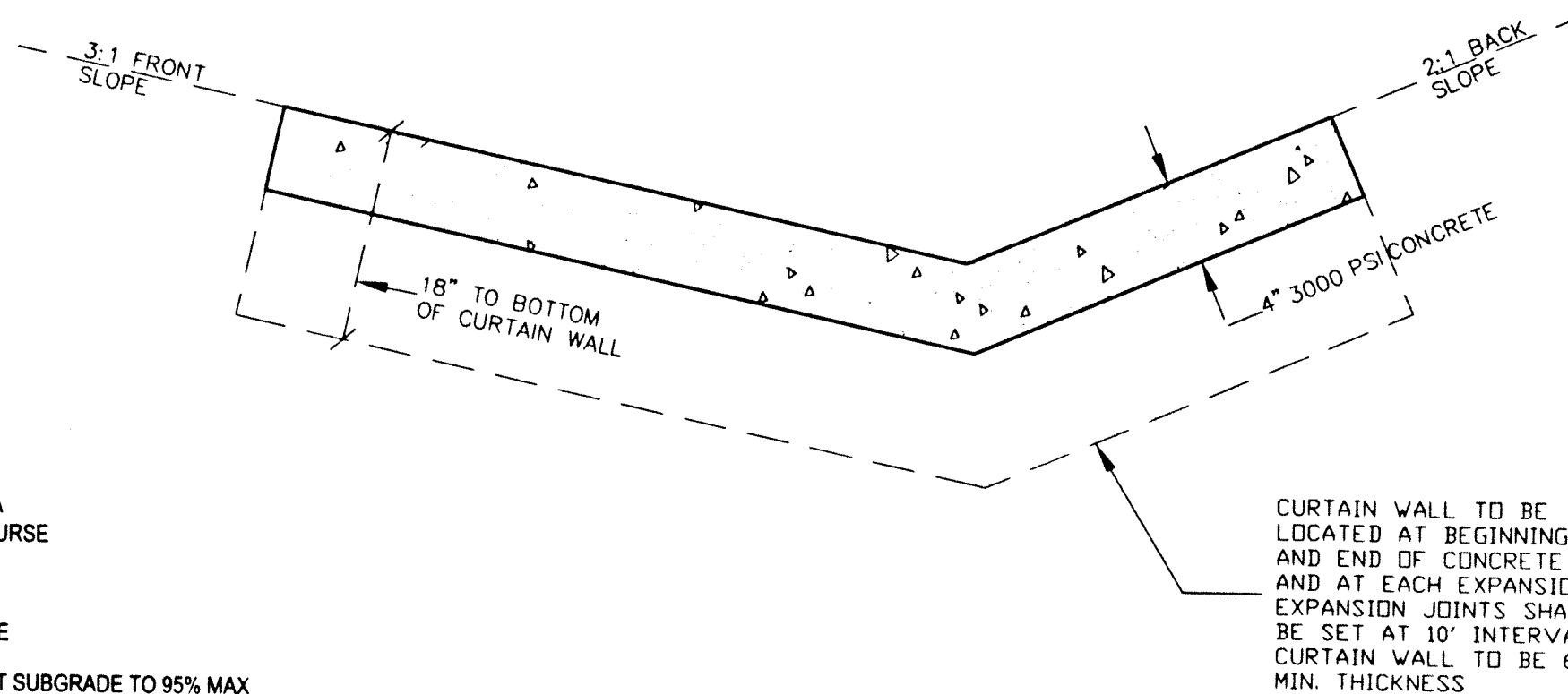
CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.



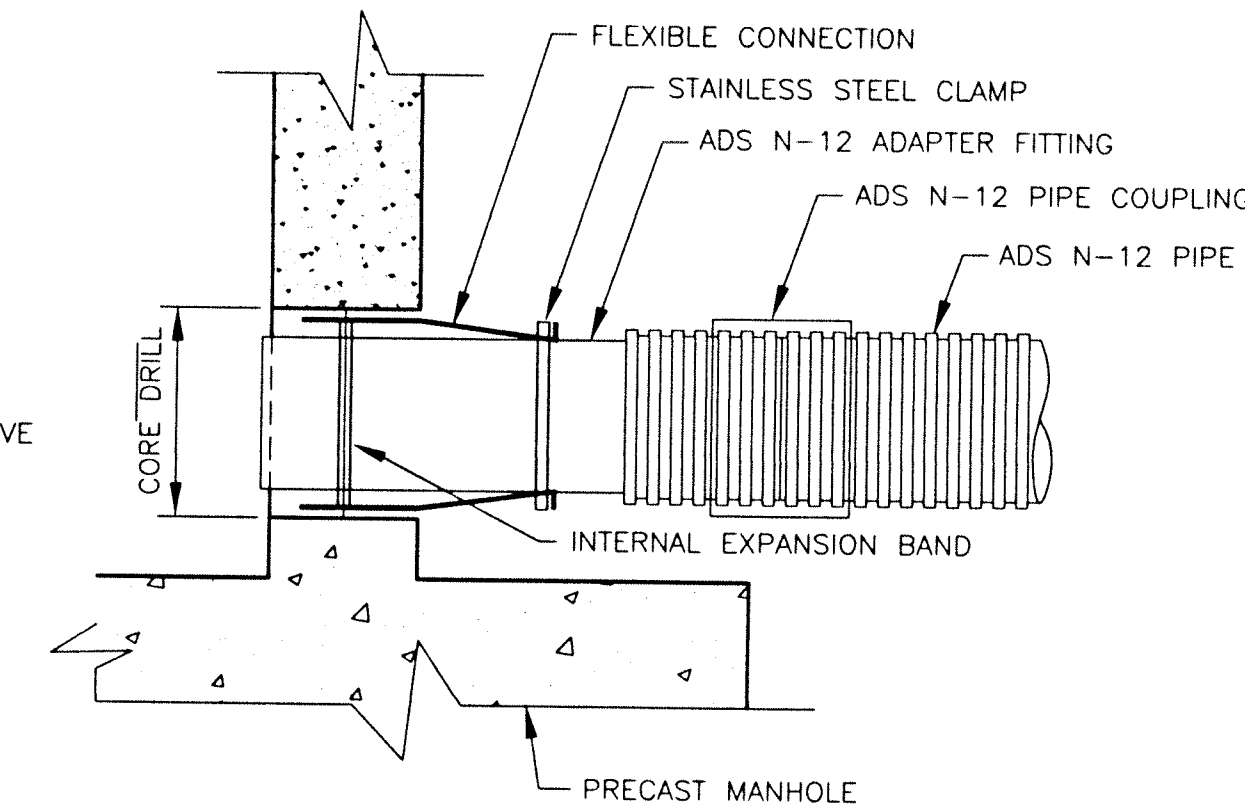
IN-LINE STORM DRAIN CLEANOUT DETAIL
NOT TO SCALE



ORIFICE PLATE DETAIL
NOT TO SCALE



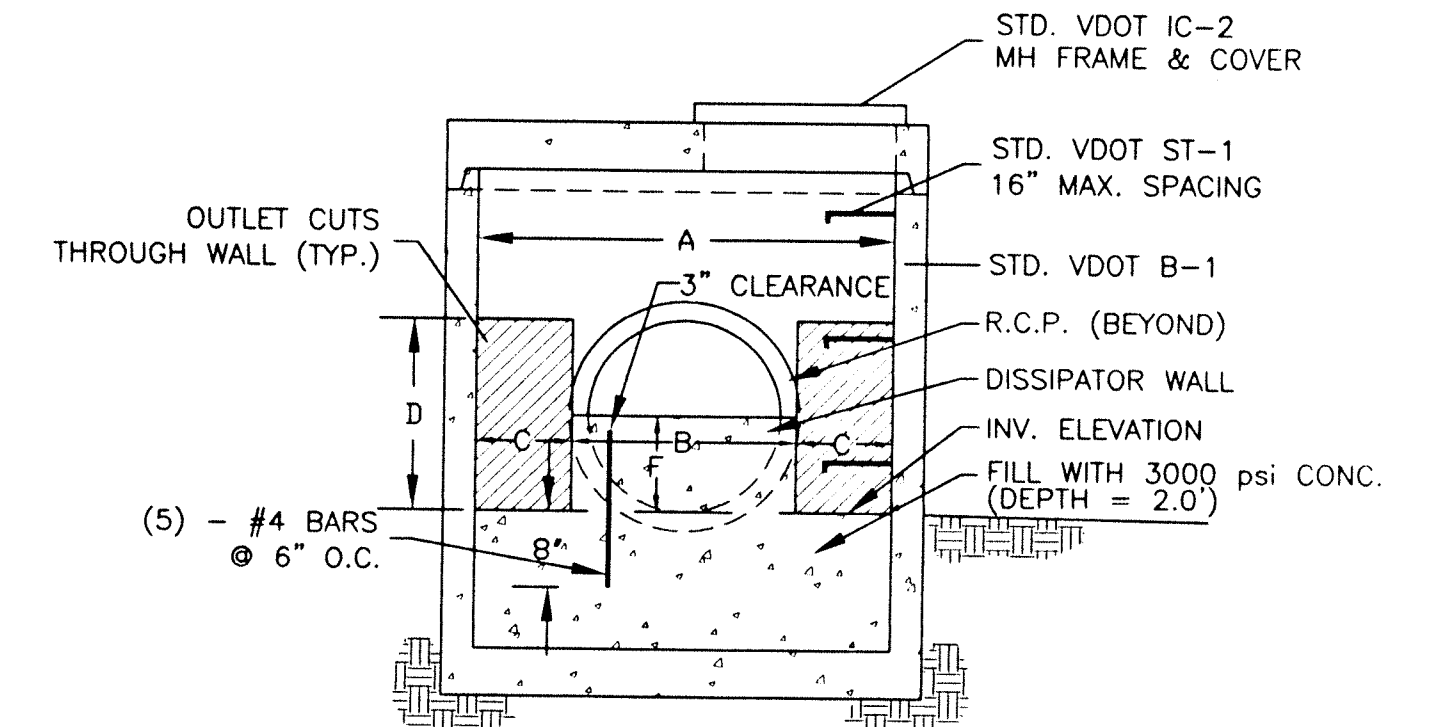
CONCRETE DITCH DETAIL
NOT TO SCALE



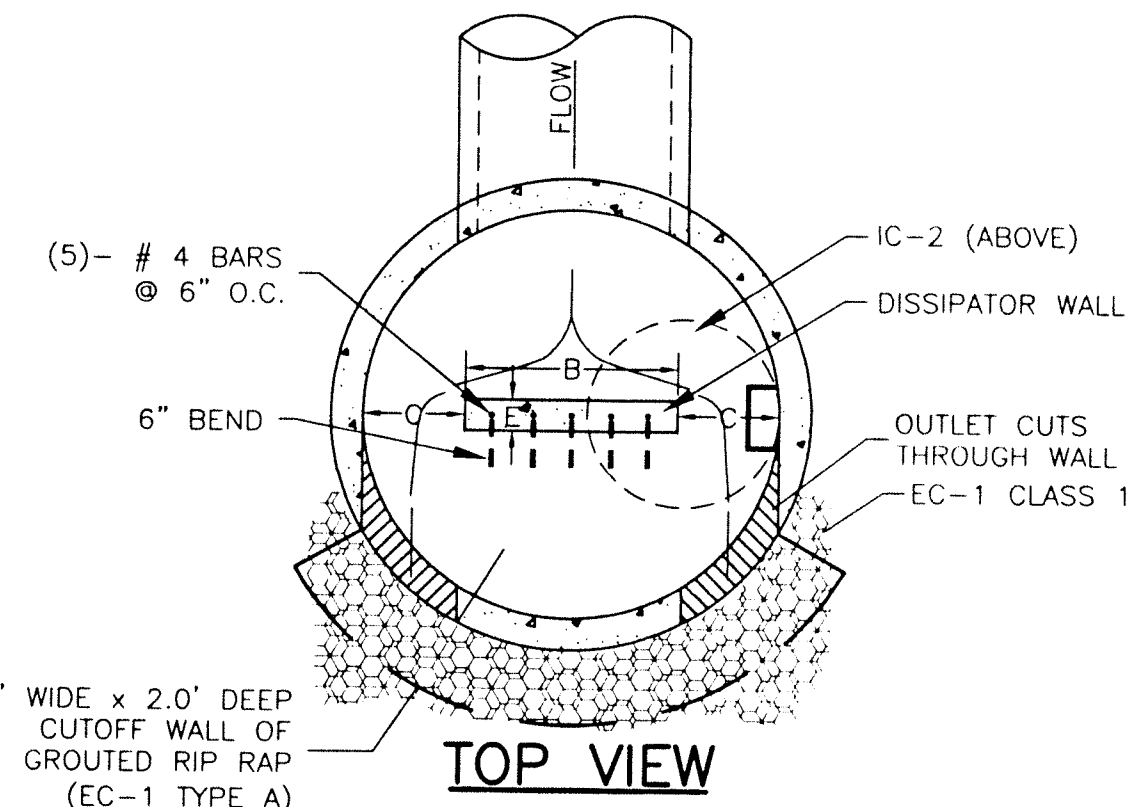
STORMWATER FLEXIBLE
CONNECTION DETAIL

ALL ADS PIPE CONNECTIONS TO PRECAST MANHOLES SHALL BE MADE WITH A FLEXIBLE BOOT. THE BOOT SHALL MEET ASTM SPECIFICATION C-923. BOOT SHALL BE MADE FROM NEOPRENE RUBBER AND HAVE A 3/8" MINIMUM WALL THICKNESS THROUGHOUT. THE INTERNAL EXPANSION BAND TO SECURE THE BOOT IN PLACE SHALL CONFORM TO ALUMINUM MATERIAL SPECIFICATION 6061-T6. THE EXTERNAL BAND TO CLAMP AND SEAL THE BOOT TO THE PIPE SHALL BE STAINLESS STEEL-CORROSION RESISTANT CONFORMING TO ASTM SPECIFICATION A-167. THE PORT TO RECEIVE THE BOOT SHALL BE CORE DRILLED AND SHALL ALLOW FOR LATERAL AND VERTICAL ANGULAR ADJUSTMENT THRU 20 DEGREES IN ALL DIRECTIONS. ALL FIELD INSTALLATION OF PIPE THRU FLEXIBLE CONNECTION SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.

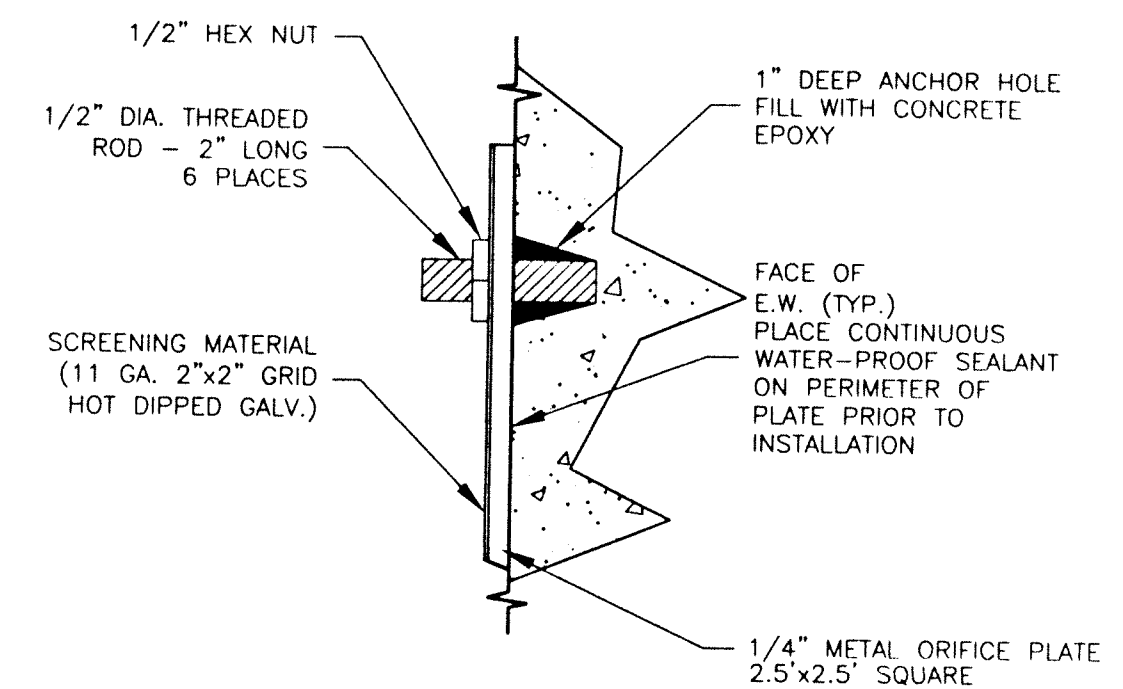
DIMENSIONS						
STR #	A	B	C	D	E	F
1	4.0'	2.0'	1.0'	2.0'	0.5'	1.5'



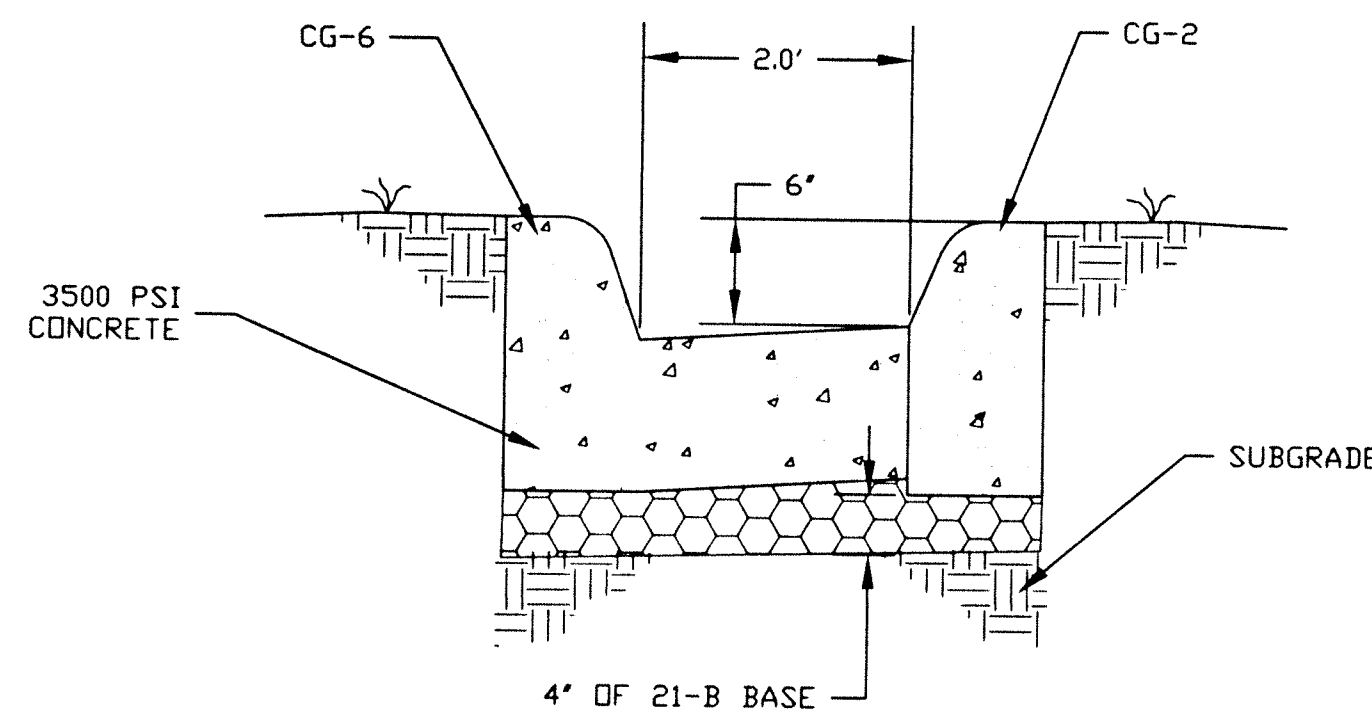
FRONT VIEW



TOP VIEW
ENERGY DISSIPATOR DETAIL
NOT TO SCALE



ORIFICE PLATE ANCHOR DETAIL
NOT TO SCALE



CURB-CUT DETAIL

