

# ROADWAYS, STORM DRAINAGE AND STORMWATER MANAGEMENT ARBOR WOODS 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD PLAN
3	ROAD PROFILES AND TYPICAL SECTIONS
4	GRADING AND SEDIMENT CONTROL PLAN
5	SEDIMENT CONTROL NOTES AND DETAILS
6	DRAINAGE AREA MAP
7	STORMDRAIN PROFILES
8	STORMWATER MANAGEMENT NOTES AND DETAILS
9	STORMWATER MANAGEMENT/SEDIMENT CONTROL NOTES AND DETAILS
10	LANDSCAPE PLAN NOTES AND DETAILS
11	FOREST CONSERVATION PLAN
12	FOREST CONSERVATION NOTES AND DETAILS

### STORMWATER MANAGEMENT FACILITY OPERATIONS AND MAINTENANCE SCHEDULE

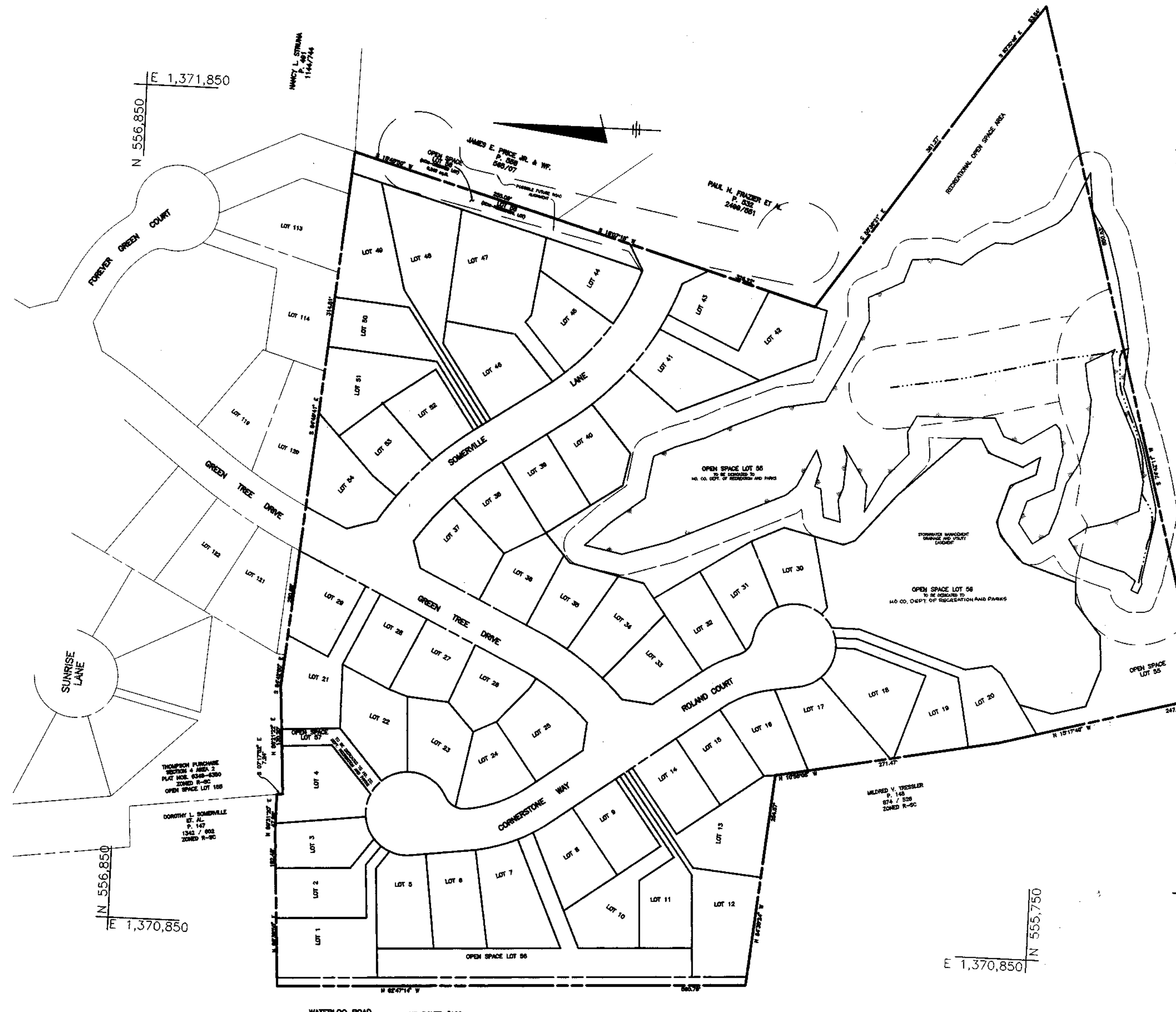
#### ROUTINE MAINTENANCE

- Facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is functioning properly.
- Top and side slopes of the embankment shall be mowed a minimum of two (2) times a year, once in June and once in September. Other side of slopes and maintenance access should be mowed as needed.
- Debris and litter shall be removed during regular mowing operations and as needed.
- Visible signs of erosion in the pond as well as riprap outlet area shall be repaired as soon as it is noticed.

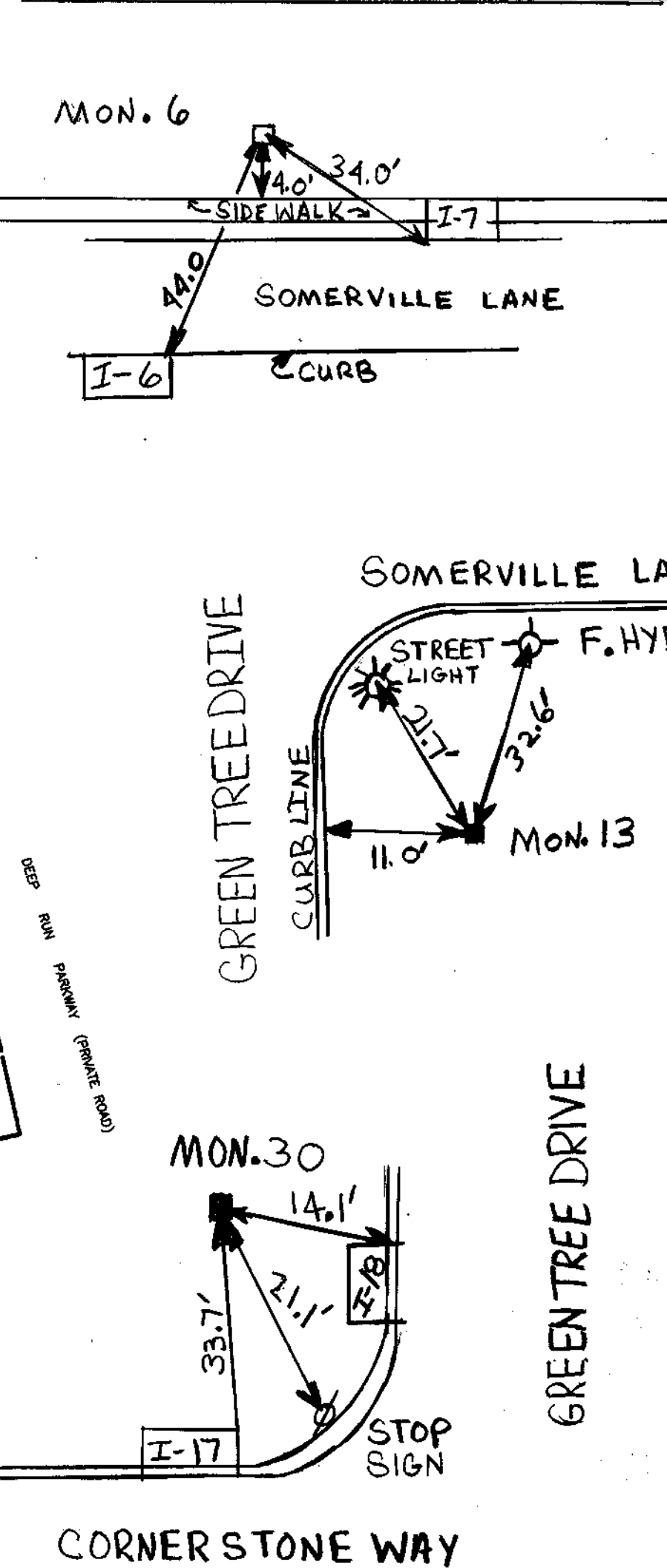
#### NON-ROUTINE MAINTENANCE

- Structural components of the pond such as the dam, the riser, and the pipes shall be repaired upon the detection of any damage. The components should be inspected during routine maintenance operations.
- Sediment should be removed from the pond no later than when the capacity of the pond is half full of sediment, when deemed necessary for aesthetic reasons, or when deemed necessary by the Howard County's Department of Public Works.

RIGHT OF WAY ELEVATION CHART (NAD 27)					
R/W P.L. NO.	DESCRIPTION	ELEV.	R/W P.L. NO.	DESCRIPTION	ELEV.
			11	REBAR & CAP	330.50
			12	REBAR & CAP	340.58
			13	CONC. MON.	339.78
			14	MARK IN CONC. DRIVEWAY	330.99
			15	REBAR & CAP	328.58
			16	REBAR & CAP	327.90
			17	REBAR & CAP	325.61
			18	REBAR & CAP	324.89
			19	"X"- MARK IN CONC.	323.93
			20	"X"- MARK IN CONC.	323.62
			21	REBAR & CAP	324.76
			22	REBAR & CAP	326.38
			23	"X"- MARK IN CONC.	334.07
			24	REBAR & CAP	340.07
			25	"X"- MARK IN CONC.	343.80
1	REBAR & CAP	342.54	26	REBAR & CAP	341.85
2	REBAR & CAP	342.84	27	REBAR & CAP	339.50
3	REBAR & CAP	342.24	28	REBAR & CAP	334.13
4	REBAR & CAP	340.63	29	REBAR & CAP	330.18
5	P-KNAIL IN DRIVEWAY	329.14	30	CONC. MON.	328.76
6	CONC. MON.	325.17	31	REBAR & CAP	331.67
7	MARK IN ASPHALT TURNAROUND	321.15	32	REBAR & CAP	343.18
7A	REBAR & CAP	329.01			
8	REBAR & CAP	319.59			
9	MARK IN ASPHALT TURNAROUND	320.41			
10	MARK IN CONC. DRIVEWAY	324.70			



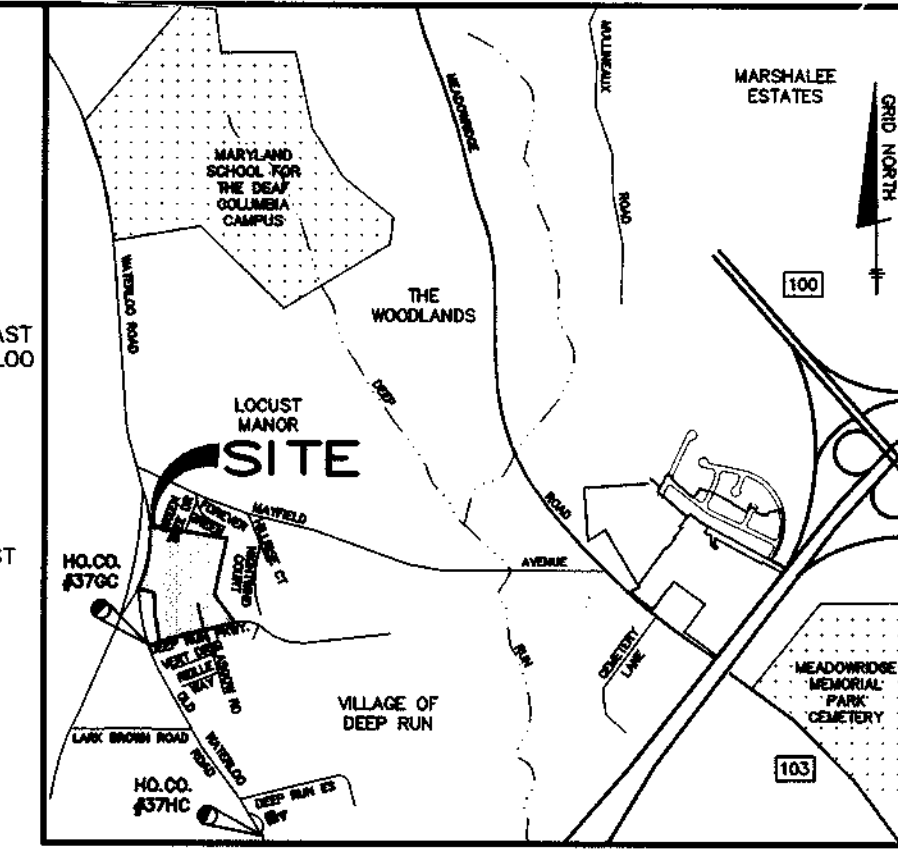
### MONUMENT RECOVERY SKETCH



**BENCH MARKS (NAD 83)**  
 H.O. CO. #3725  
 3/4" REBAR AND ALUMINUM CAP 38.0' SOUTH OF THE EDGE OF PAVEMENT ON WATERLOO ROAD, 120' ± EAST OF THE GATEWAY TO WATERLOO COMMUNITY PARK.  
 N 552854.2141(FT) E 1372639.499(FT)  
 N 168510.3015(M) E 418381.3561(M)

H.O. CO. #3726  
 3/4" REBAR AND ALUMINUM CAP 13.8' WEST OF THE EDGE OF PAVEMENT ON WATERLOO ROAD, 0.15 MILES EAST OF THE INTERSECTION BETWEEN ROUTE 108 AND WATERLOO ROAD.  
 N 565250.7923(FT) E 1370946.362(FT)  
 N 169240.7860(M) E 417865.2694(M)

**BENCH MARKS (NAD 27)**  
 H.O. CO. #2444001-R ELEV. 346.728'  
 CONC. MONUMENT SET FLUSH WITH SURFACE, 34.07' EAST OF THE EDGE OF PAVEMENT ALONG N.B. ROUTE 108  
 N 495673.696 E 858372.166



VICINITY MAP  
SCALE: 1"=2000'

### GENERAL NOTES

- All construction shall be in accordance with the latest standards and specifications of Howard County, plus MSHA standards and specifications, if applicable.
- The contractor shall notify the Department of Public Works Construction Inspection Division at (410) 313-1880 at least (five) 5 working days prior to the start of work.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work.
- Project Background:  
 Location: Tax Map 37 - Parcels 149, 405, 493 & 594  
 Zoning: R-SC  
 Total Tract Area: 18.936 Ac.  
 Number of Proposed Lots: 54 SFD, 4 OPEN SPACE, 1 NON-CREDITED  
 Date Preliminary Plan Approved: November 13, 1996  
 DPZ Reference #: S-94-36, P-97-01, WP-97-03
- Traffic control devices, markings and signing shall be in accordance with the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
- Topography taken from field run survey performed by TSA Group Inc., dated September 1994, supplemented by 200' scale county topographic maps. Contour interval is 2 feet.
- Howard County Geodetic control station 2444001-R (NAD 27) was used for vertical datum and geodetic control station 370C and 37HC (NAD 83) was used for horizontal datum on this plan.
- Water and Sewer for this subdivision is provided by Potomac. Contract No. 14-3588-D.
- Stormwater Management (Quantity and Quality) for this subdivision is provided by a retention facility. Hazard classification for the structure shall be class "A". Vegetative buffers shall provide water quality treatment for unmanaged areas.
- No Floodplain exist on this site.
- Forest Conservation Plan prepared by ECO-SCIENCE PROFESSIONAL, INC. dated September 4, 1993. 0.4 acres of reforestation required, provided on site, February, 1994.
- Traffic Study compiled by Lee Cunningham & Associates, Inc. February, 1994.
- Geotechnical Report compiled by Hillis-Carnes Engineering Associates, Inc. February 10, 1995.
- Existing utilities were located by record drawings and field run survey by TSA Group, Inc.
- Unless noted as "private" all easements are public.
- The Forest Conservation Easement has been established to fulfill the requirements of Section 16.1200 of the Howard County Code: Forest Conservation Act. No clearing, grading or construction is permitted within the Forest Conservation easement; Forest management practices as defined in the deed of Forest Conservation easement are allowed.
- The stormwater facility shown on these plans will be owned and maintained by the homeowners association.
- The existing water and sewer lines reflect information obtained from as built drawings. It shall be the contractor's responsibility to verify the locations and elevations of the existing lines.
- WP-97-03 on August 15, 1996 the Planning Board Director denied the request to waive section 16.116(a)(1) to allow grading or removal of vegetation within 25 feet of wetland.
- Street light placement and type of fixture and pole selected shall be in accordance with the Howard County Design manual, Volume III (1993) and as modified by the "Guidelines for Street Lights in Residential Developments (June 1993)", which determined lateral and longitudinal placement.
- All road fills shall be compacted to 95% as determined by AASHTC T-180.
- All sidewalks and sidewalk ramps shall be in conformance with current ADA criteria.
- Wetland delineation compiled by Environmental Resources Services, Inc. January, 1994
- No clearing, grading or construction is permitted within wetlands, wetland buffers, stream buffers or forest conservation areas except for work associated with utility crossings as presented on these plans.
- Noise study was performed by TSA Group, Inc. February, 1996.
- Wetland permit tracking number: 199761513  
 Non-tidal wetland number: 97-NT-0038

CENTERLINE CONTROL DATA - GREEN TREE DRIVE			
STATION	NORTH	EAST	
LIMIT OF SUBMISSION STA. 5+57.58 POC	556639.0414	1371326.5643	
PT STA. 5+66.89	556630.6744	1371322.4817	
STA. 4+50.88 GREEN TREE DR=STA. 0+00 SOMERVILLE LN.	556553.1434	1371285.2668	
PC STA. 8+63.89	556553.1434	1371285.2668	
PT STA. 10+20.27	556243.6951	1371095.1839	
STA. 10+32.27 GREEN TREE DR =	556236.5810	1371085.5201	
STA. 0+00 CORNERSTONE WAY			

CENTERLINE CONTROL DATA - CORNERSTONE WAY SOUTH			
STATION	NORTH	EAST	
STA. 0+00 CORNERSTONE WAY =			
STA. 10+32.27 GREEN TREE CT.	556236.5810	1371085.5201	
PC STA. 1+18.84	556140.8805	1371155.9715	
PRC. STA. 1+69.07	556096.2356	1371178.4889	
PT STA. 2+19.75	556065.5725	1371204.8254	
END CL STA. 2+32.21	556044.3496	1371213.8205	

CENTERLINE CONTROL DATA-CORNERSTONE WAY NORTH			
STATION	NORTH	EAST	
STA. 0+00 CORNERSTONE WAY			
STA. 10+32.27 GREEN TREE CT.	556236.5810	1371085.5201	
PC STA. 1+30	556341.2720	1371008.4501	
PCC STA. 2+20.08	556423.9101	1370975.0250	
PT STA. 2+51.33	556492.3143	1370987.6824	
END CL STA. 2+32.41	556498.1625	1370990.5968	

CENTERLINE CONTROL DATA-SOMERVILLE LANE			
STATION	NORTH	EAST	
PC STA. 0+00	556553.1434	1371285.2668	
PT STA. 1+96	556427.0018	1371432.3643	
PC STA. 2+96	556344.5026	1371488.8788	
STA. 5+24.58 = LIMIT OF SUBMISSION	556215.6669	1371672.2723	

PLAN  
SCALE: 1"=100'



CURVE TABLE	
CURVE	DELTA
C1	723.49° 9.31'
C2	320.00° 156.38'
C3	375.00° 196.00'
C4	320.00° 228.98'
C5	180.00° 91.00'
C6	111.76° 70.36'
C7	150.00° 50.24'
C8	100.00° 50.68'

- NOTE:**
- ALL CURB RADII ARE TO BE 5' UNLESS OTHERWISE NOTED.
  - ANY POWER POLE RELOCATION, MANHOLE, FIRE HYDRANT OR SIGN ADJUSTMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR (TO BE COORDINATED WITH THE APPLICABLE UTILITY COMPANY).

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 6-10-97

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Candy Hamilton*  
 DIVISION OF LAND DEVELOPMENT  
 DATE: 6/12/97

APPROVED: *[Signature]*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK  
 DATE: 6/12/97

NO.	DATE	REVISION

**TSA GROUP, INC.**  
 planning • architecture • engineering  
 6480 Baltimore National Pike • Ellicott City, Maryland 21048 • (410) 406-0105

**OWNER:**  
 ROSE MARIE SEARS  
 8122 FOREVER GREEN CT.  
 ELKCRIDGE, MD 21227

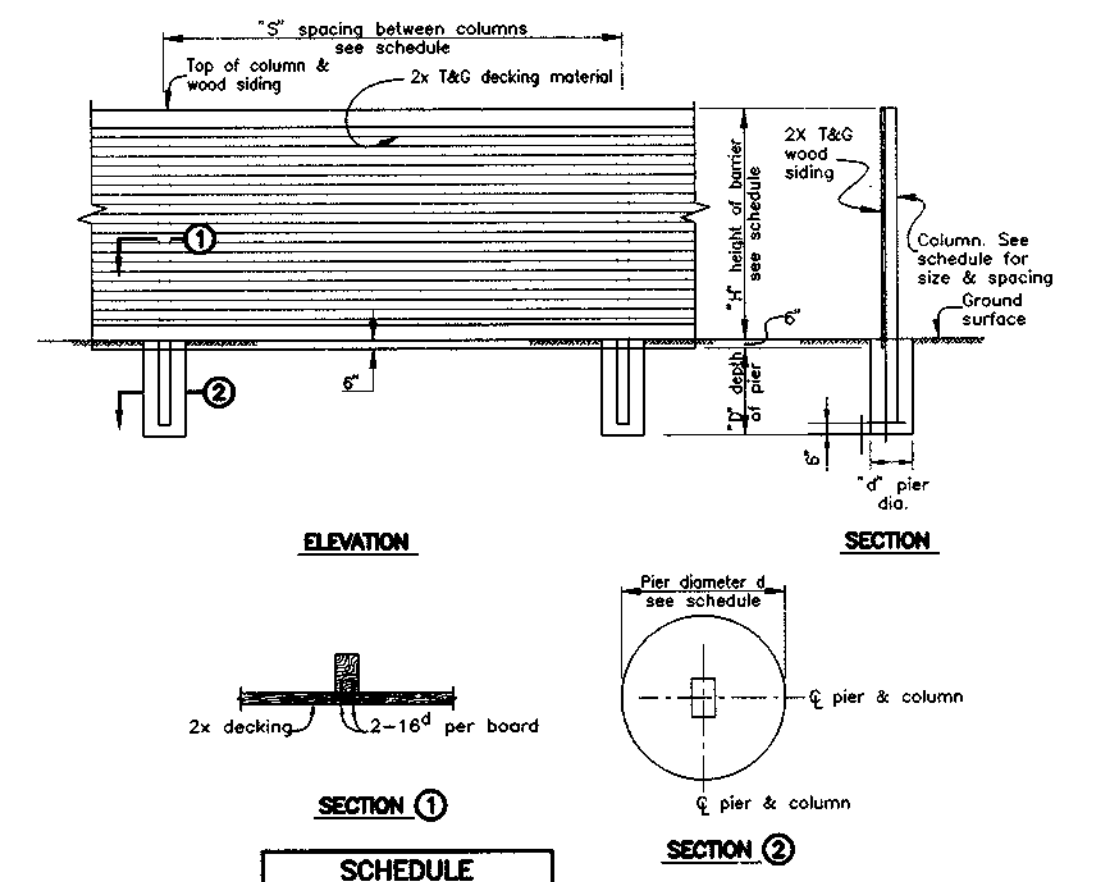
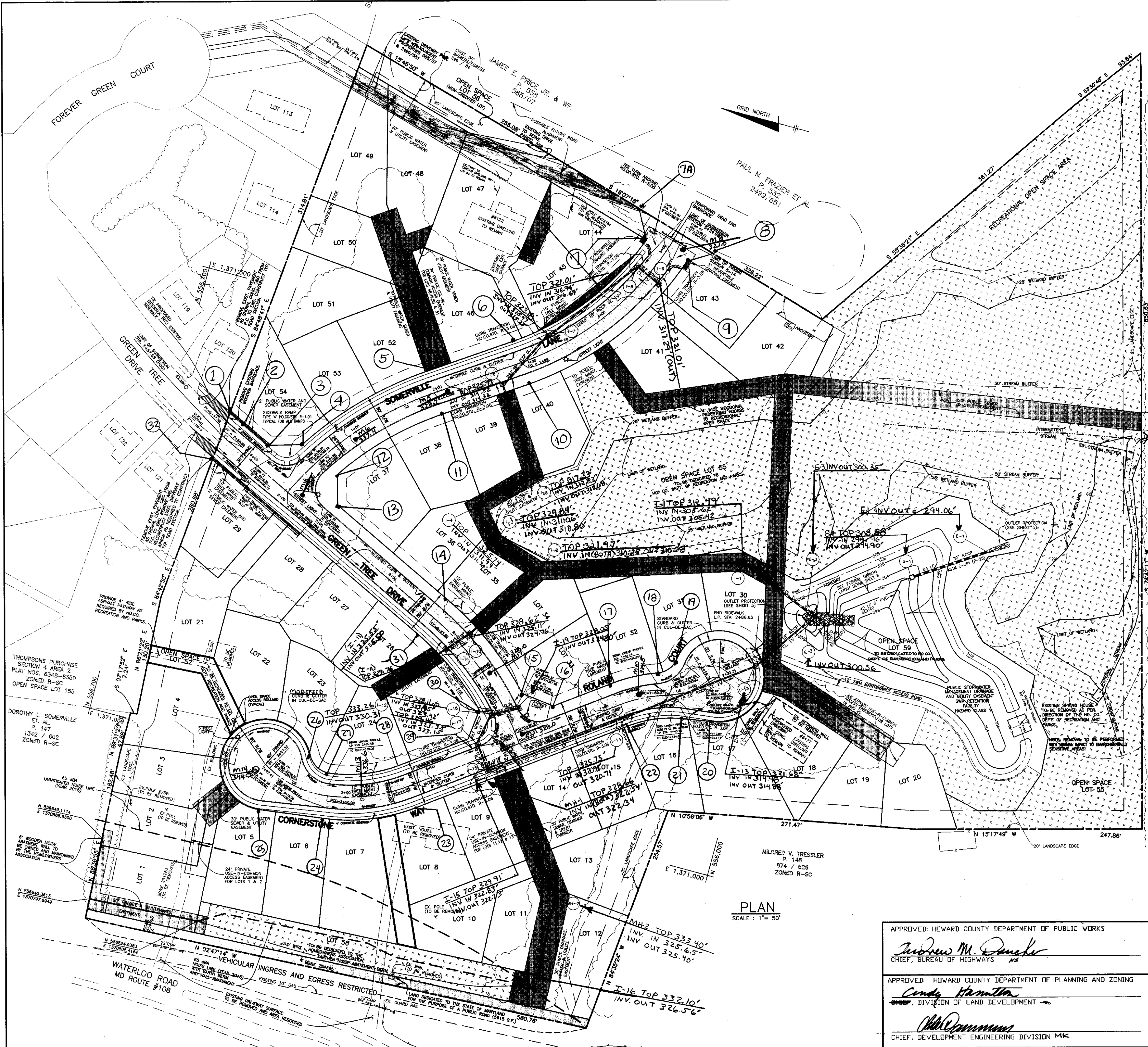
**DEVELOPER:**  
 CORNERSTONE HOLDINGS, L.L.C.  
 7405 BUCKS HAVEN LANE  
 HIGHLAND, MARYLAND 20777

**PROJECT:**  
**ARBOR WOODS**  
 LOTS 1-59

**LOCATION:**  
 TAX MAP 37 - PARCELS 149, 405, 493 & 594  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

**TITLE SHEET**  
 S-94-36, P-97-01, WP-97-03  
 DATE: January 8, 1997  
 MAY 23, 1997  
 PROJECT NO. 0675  
 SCALE: AS SHOWN  
 DRAWING 1 OF 12

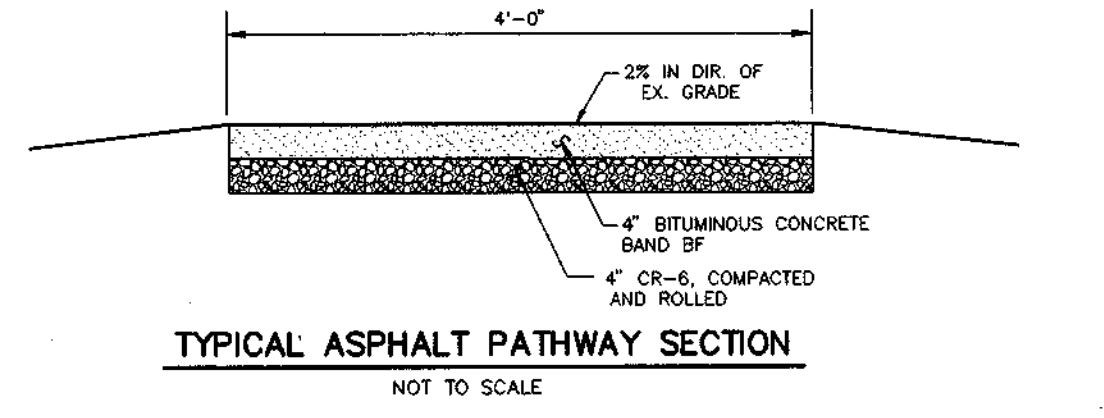




**NOTES:**

- GENERAL
  - Height of barrier shall be based on acoustic requirements.
- SIDING
  - 2x wood decking material shall be utilized to span horizontally between posts. Design criteria is based on an allowable bending stress of 1400 lbs. per sq. in. and a 33% increase in stress for wind loads as considered appropriate. Decking shall be MC15.
  - Siding in contact with the ground and for a distance of 6' above grade shall be treated with wood preservative.
- POSTS
  - Wood post shall be utilized at the spacing indicated on the schedule. Design criteria is based on an allowable bending stress of 1400 lbs. per sq. in. and a 33% increase for wind loadings.
  - Post embedded in concrete shall be treated with a wood preservative in the area of embedment and 12" above grade.
- CONCRETE
  - Concrete in the piers shall have a 28 day compressive strength of 2500 lbs. per sq. in.
  - Concrete shall be placed in drilled piers utilizing the earth as the forms.
- FOUNDATIONS
  - The drilled piers have been designed utilizing an allowable passive pressure of 300 lbs. per sq. ft. and the following formula:  
 $D = \frac{1.45M}{\phi}$   
 $M =$  Moment at top of drilled pier (ft./lbs.)  
 $\phi =$  Allowable passive pressure (300 lbs. per sq. ft.)  
 $d =$  Diameter of pier (ft.)
- PRESERVATIVE TREATMENT: Material used for basic wood structure shall conform to ANSI standards.

DESIGN BASED ON FEDERAL HIGHWAY ADMINISTRATION  
NOISE BARRIER DESIGN HANDBOOK (FHWA-RD-76-58)  
PAGE A-14



**NOTES:**

- FOR @ CURVE DATA SEE SHEET NO. 1
- EXISTING DWELLING LOCATED ON LOT 47 TO BE SERVED BY EXISTING WATER HOUSE CONNECTION, WITH PROPOSED SEWER HOUSE CONNECTION PROVIDED. EXISTING DWELLING ON LOT 18 TO BE SERVED BY PROPOSED WATER HOUSE CONNECTION AND SEWER HOUSE CONNECTION. DOCUMENTATION FOR ABANDONMENT OF EXISTING SEWERAGE SYSTEMS AND WATER HOUSE CONNECTIONS FOR EXISTING DWELLINGS TO BE REMOVED WILL BE PROVIDED PRIOR TO PLAT RECORDATION.
- REPRESENT FOREST CONSERVATION EASEMENT AREA

STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	TYPE
☆	STA. 6+80, 20' LT., STA. 10+07, 19' LT., (GREEN TREE DRIVE)	100 WATT HPS VAPOR TRADITIONAL POST TOP FIXTURE MOUNTED ON 14' BLACK FIBERGLASS POLE.
☆	STA. 34+42, 16' RT., (SOMERVILLE LANE)	100 WATT HPS VAPOR TRADITIONAL POST TOP FIXTURE MOUNTED ON 14' BLACK FIBERGLASS POLE.
	LINEAR PROFILE STA. 34+52, 3' RT., (CORNERSTONE WAY)	

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
AS-BUILT 8/17/00

NO.	DATE	REVISION

**TSA GROUP, INC.**  
planning • architecture • engineering  
8400 Baltimore National Pike • Ellicott City, Maryland 21043 • (410) 465-8106



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
CHIEF, BUREAU OF HIGHWAYS  
DATE: 6-10-97

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cindy Hamilton*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 6/17/97

APPROVED: *John Dammann*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK  
DATE: 6/12/97

OWNER:  
ROSE MARIE SEARS  
8122 FOREVER GREEN CT.  
ELKRIDGE, MD 21227

DEVELOPER:  
CORNERSTONE HOLDINGS, L.L.C.  
7405 BUCKS HAVEN LANE  
HIGHLAND, MARYLAND 20777  
Phone: (410) 988-9146

PROJECT:  
**ARBOR WOODS**  
LOTS 1-59

LOCATION:  
TAX MAP 37 - PARCELS 149,405,493 & 594  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

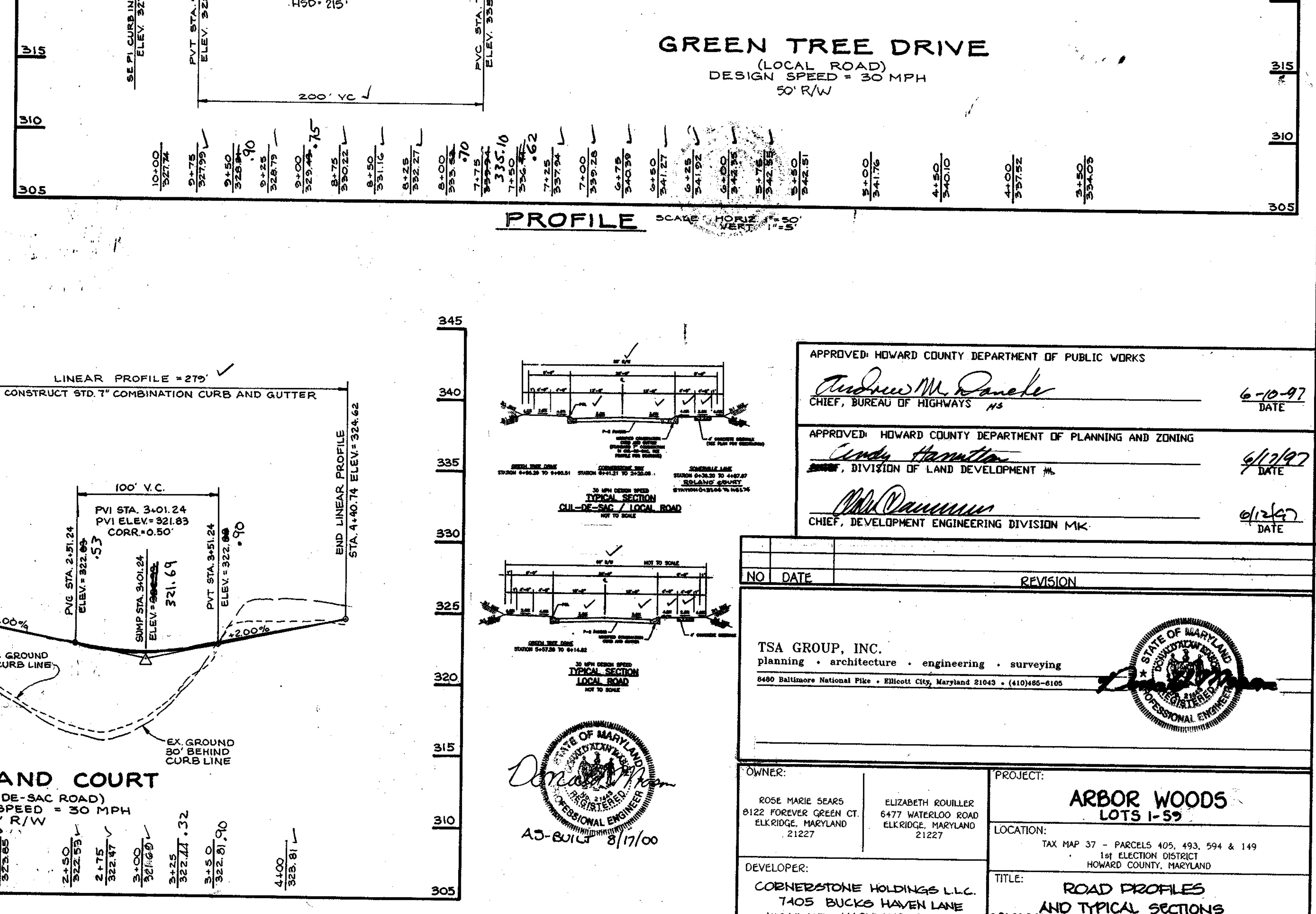
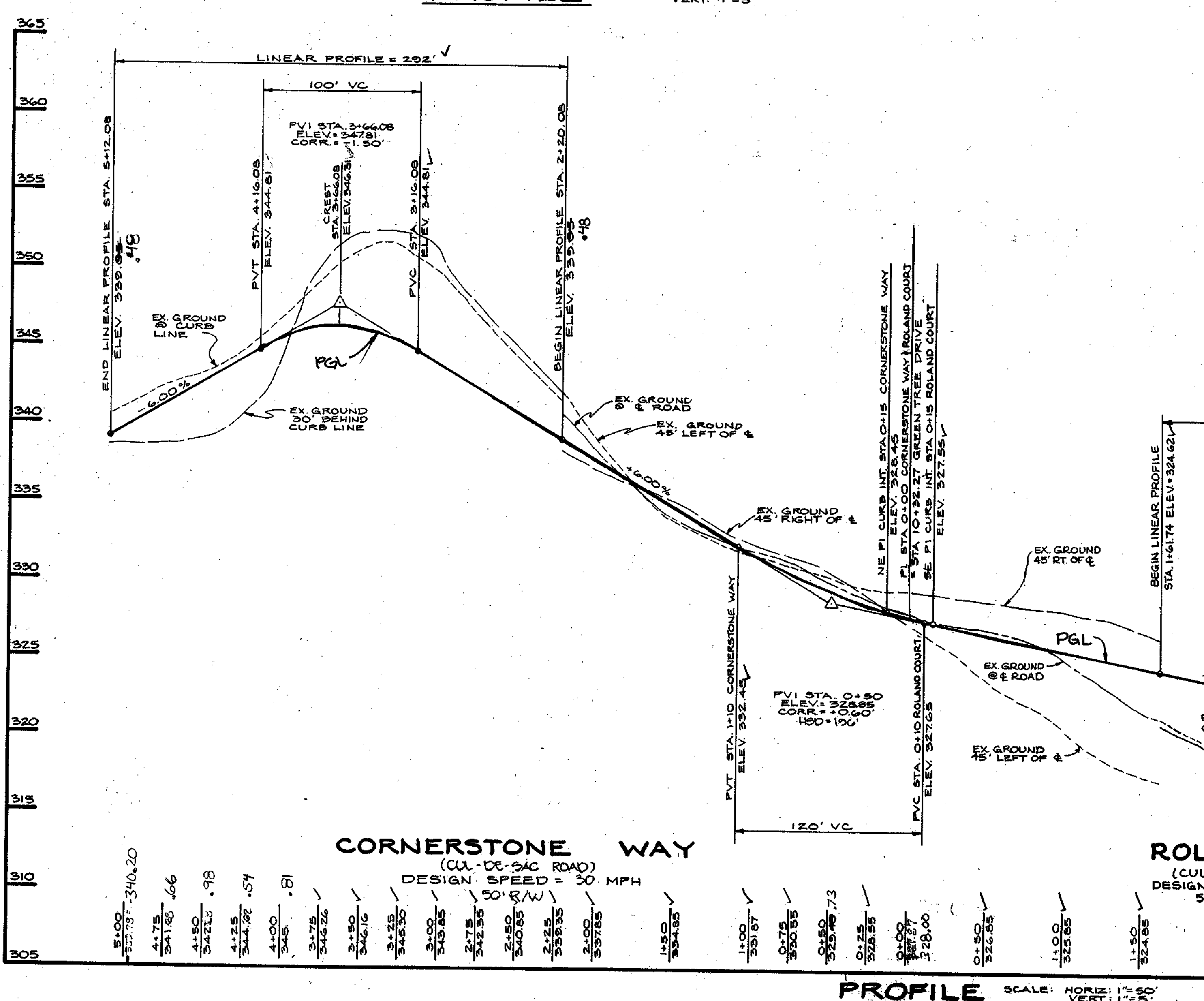
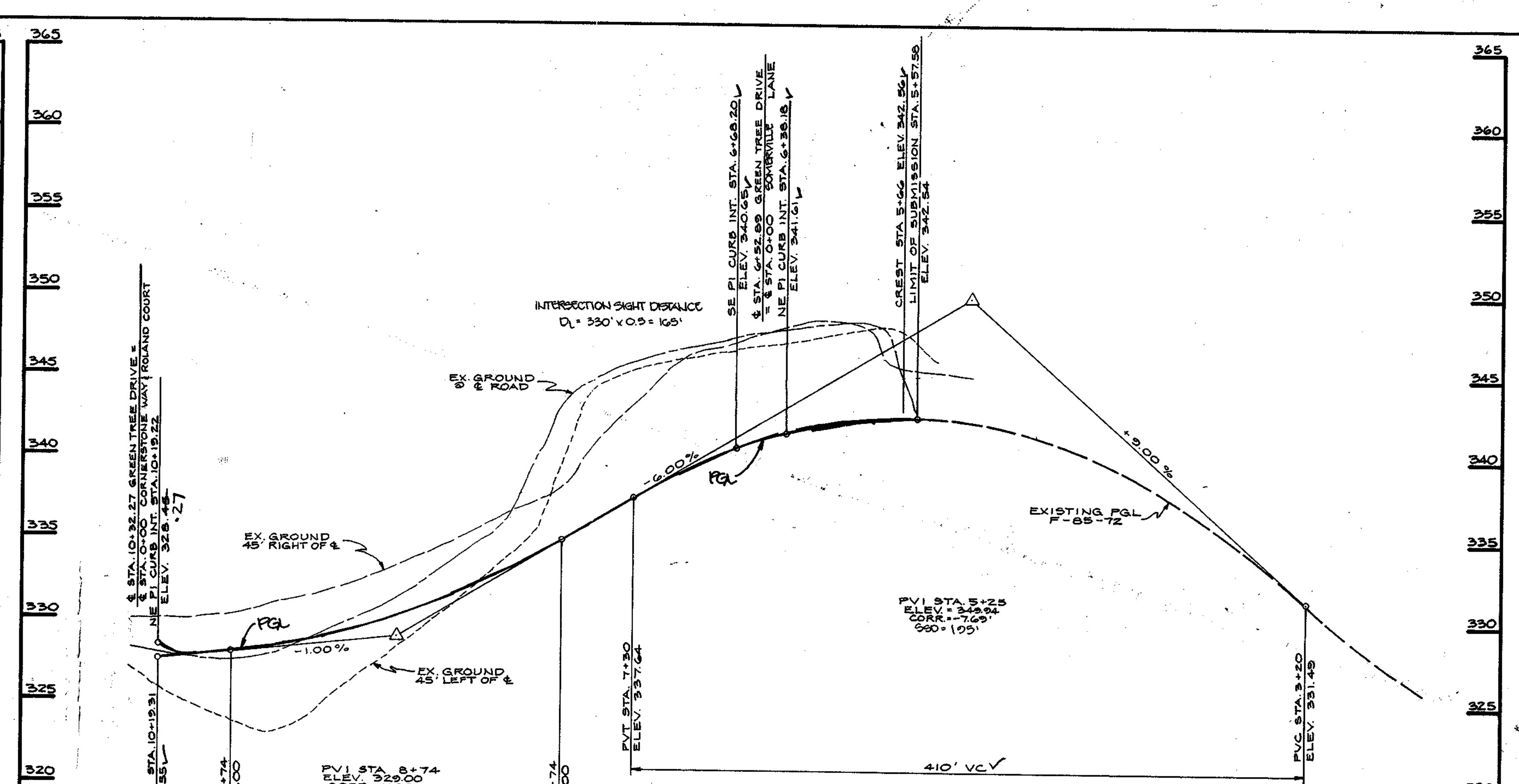
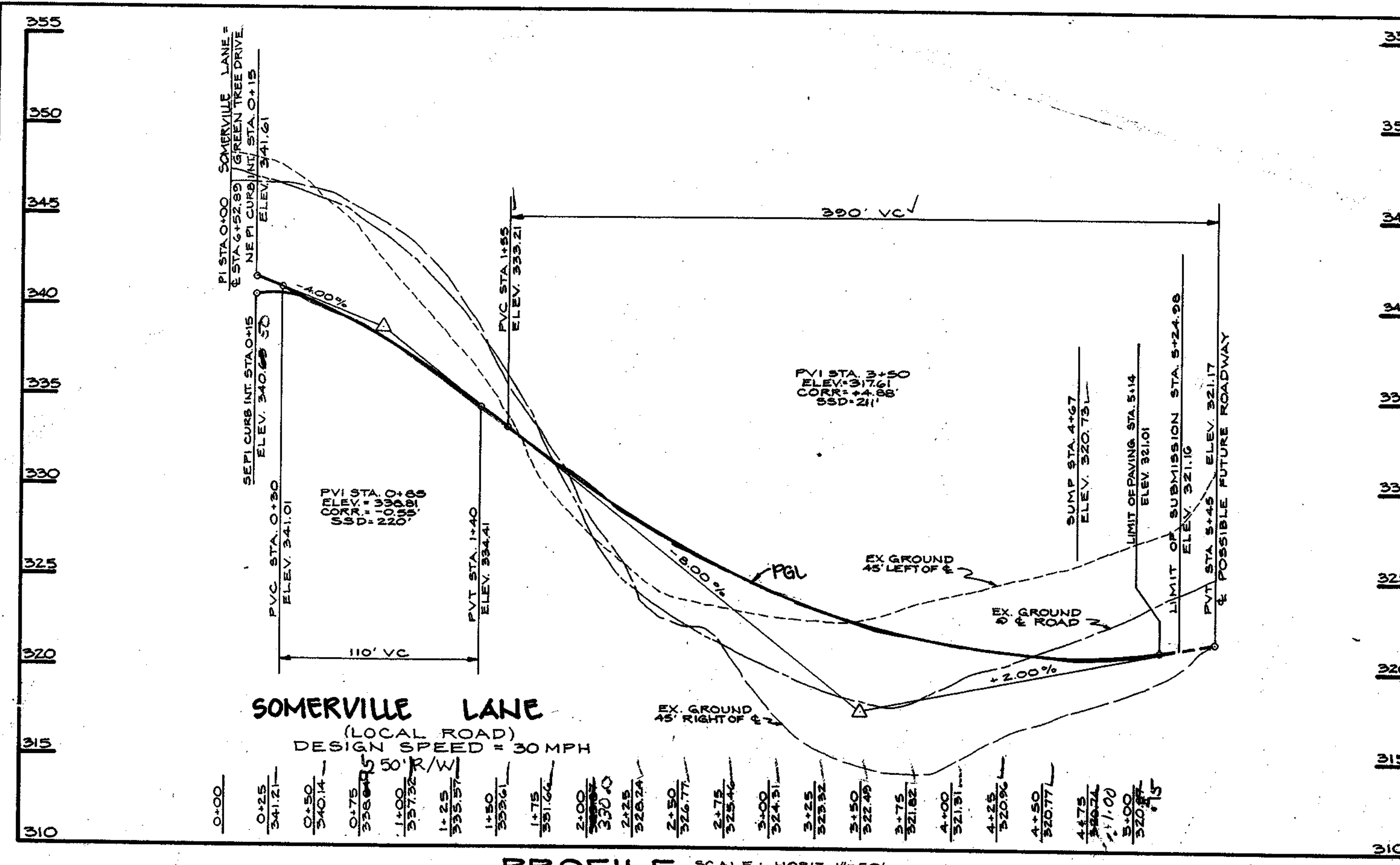
TITLE:  
**ROAD PLAN**

S-94-36, P-97-01, WP-97-03  
DATE: January 8, 1997  
MAY 23, 1997

PROJECT NO. 0675  
DRAWING NO. OF 12

Design: GWF Draft: JR  
SCALE: 1"=50'





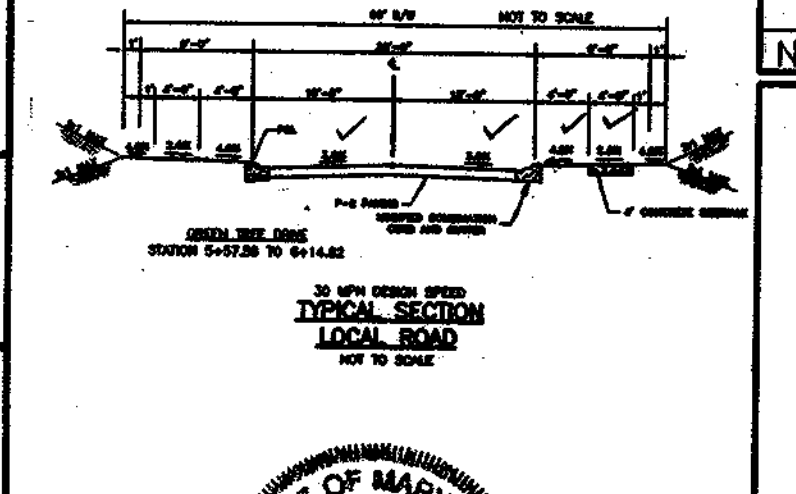
**PROFILE** SCALE: HORIZ. 1"=50' VERT. 1"=5'

**APPROVED:** HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
 CHIEF, BUREAU OF HIGHWAYS *MS* 6-10-97 DATE

**APPROVED:** HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Andy Hamilton*  
 DIVISION OF LAND DEVELOPMENT *JM* 6/1/97 DATE

**APPROVED:** *Mr. [Signature]*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION *MK* 6/12/97 DATE

NO.	DATE	REVISION



*Demetrius [Signature]*  
 PROFESSIONAL ENGINEER  
 15-8013 8/17/00

**TSA GROUP, INC.**  
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 8480 Baltimore National Pike • Ellicott City, Maryland 21043 • (410)465-6105

**OWNER:** ROSE MARIE SEARS, 8122 FOREVER GREEN CT, ELK RIDGE, MARYLAND 21227

**ELIZABETH ROULLIER**, 6477 WATERLOO ROAD, ELK RIDGE, MARYLAND 21227

**PROJECT:** ARBOR WOODS LOTS 1-59

**LOCATION:** TAX MAP 37 - PARCELS 405, 493, 594 & 149, 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

**DEVELOPER:** CORNERSTONE HOLDINGS L.L.C., 7405 BUCKS HAVEN LANE, HIGHLAND, MARYLAND 20777

**TITLE:** ROAD PROFILES AND TYPICAL SECTIONS

**DATE:** JANUARY 6, 1997 / MAY 23, 1997

**PROJECT NO.:** 0675

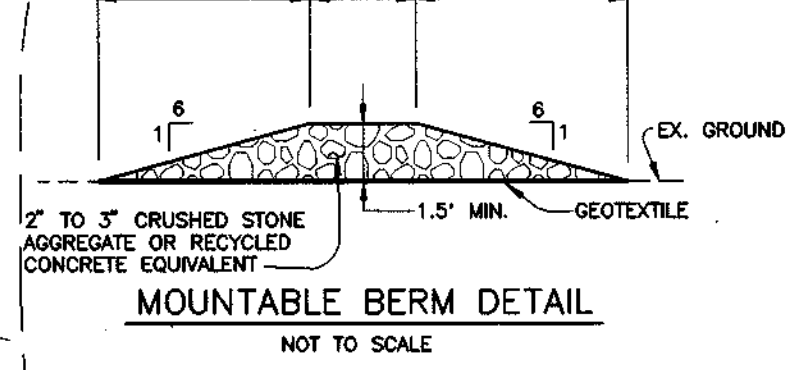
**SCALE:** AS SHOWN

**DRAWING:** 3 OF 12



**SEQUENCE OF CONSTRUCTION**

- DAY 1: OBTAIN GRADING PERMIT.  
 DAY 2-20: INSTALL STABILIZED CONSTRUCTION ENTRANCE, CONSTRUCT EARTHDIKE, SEDIMENT TRAP, INSTALL SILT FENCE. CLEAR AS REQUIRED TO CONSTRUCT SEDIMENT TRAP. CONSTRUCT BASIN AND RIPRAP INFLOW PROTECTION FOR TEMPORARY STORMWATER MANAGEMENT. NOTE: NO GRABBING OF SITE IS TO BE CONSIDERED TO SEDIMENT BASIN CONSTRUCTION AND CONSTRUCTION OF STORM DRAIN FROM E TO S. (SEE SPECIFICATIONS AND 3).  
 DAY 21-31: CLEAR AS REQUIRED AND CONSTRUCT STORM DRAIN LINE FROM E TO S. GRADE AS NEEDED TO CONVEY RUNOFF TO INLET 2-6 THRU 2-5.  
 DAY 32-47: WITH THE APPROVAL OF THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCT STORM DRAIN SYSTEM. INSPECTOR, GRAB SITE AND PREPARE WASH OPERATIONS. SLOPES.  
 DAY 48-76: STABILIZE SITE. FINISH CONSTRUCTION OF STORM DRAIN SYSTEM. INSTALL UTILITIES. GRADE ROADWAY AREAS TO SUBGRADE. CONSTRUCT CURB AND GUTTER AND INSTALL PAVEMENT SUB-BASE.



SWM FACILITY SUMMARY TABLE			
DRAINAGE AREA TO FACILITY	14.69 Ac.		
UNROUTED DRAINAGE AREA	13.93 Ac.		
YEAR STORM	2	10	100
ALLOWABLE RELEASE RATE	0.6	18.1	52.6
INFLOW INTO FACILITY	19.1	44.0	73.9
UNROUTED AREA DISCHARGE	0.1	8.5	17.1
DISCHARGE FROM FACILITY	0.5	16.2	55.4
DISCHARGE FROM SITE	0.6	18.1	71.1
ELEVATION IN FACILITY	306.0	307.1	307.8
STORAGE VOLUME IN FACILITY	0.96 Ac/ft	1.43 Ac/ft	1.80 Ac/ft

**SOILS CLASSIFICATION**

EVG - Evesboro loamy sand, 1 to 5 percent slopes, 'A' soil.  
 EVC - Evesboro loamy sand, 5 to 15 percent slopes, 'A' soil.  
 Fa - Fallingington loam, 'HYDRIC' soil.  
 SIB2 - Sassafras loam, 1 to 5 percent slopes, 'B' soil.  
 SIC2 - Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.  
 SIB2 - Sassafras gravelly sandy loam, 1 to 5 percent slopes, moderately eroded 'B' soil.  
 SIC2 - Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.  
 Howard County Soils map no. 25

- NOTES:**
- SWM FACILITY 3 1/4" ORIFICE TO BE FITTED WITH VERTICAL BLOCKING DEVICE DURING GRADING OPERATIONS. SEE DETAIL SHEET NO.5.
  - ALL DISTURBED WETLAND AREAS TO BE SEEDED WITH WETLAND SEED MIX. SEE SHEET NO.5 FOR DETAILS.
  - UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA AND WITH APPROVAL OF SEDIMENT CONTROL INSPECTOR REMOVE CONTROLS INDICATED AND INSTALL SILT FENCE WHERE INDICATED.

**SEDIMENT BASIN DATA**

DRAINAGE AREA	11.8 Ac.
WET STORAGE REQUIRED	21,240 cf
WET STORAGE PROVIDED	28,750 cf
BOTTOM ELEVATION	295.0
EMBANKMENT ELEVATION	309.2
RISER WEIR CREST ELEV.	307.5
CLEAN OUT ELEV.	299.8
EMERGENCY SPILLWAY CREST	307.5
DRAIN DOWN ORIFICE INVERT	302.7
DISTANCE FROM TOP OF RISER TO CLEANOUT ELEV.	8.9'

NOTE: REFER TO SWM/SEDIMENT CONTROL NOTES AND DETAILS FOR ADDITIONAL INFORMATION.

**SEDIMENT TRAP #1 DATA**

DRAINAGE AREA	2.0 Ac.
STORAGE REQUIRED	7200 cf
STORAGE PROVIDED	7200 cf
BOTTOM DIMENSIONS	69'x34'
DEPTH BELOW WEIR CREST	2.5'
SIDE SLOPES	2:1
BOTTOM ELEVATION	304.0
EMBANKMENT ELEVATION	307.5
CREST ELEVATION	306.5
CLEAN OUT ELEVATION	305.3
WEIR LENGTH	96.0'
WEIR SPACING	8.0'
DEPTH BELOW OUTLET	2.0'

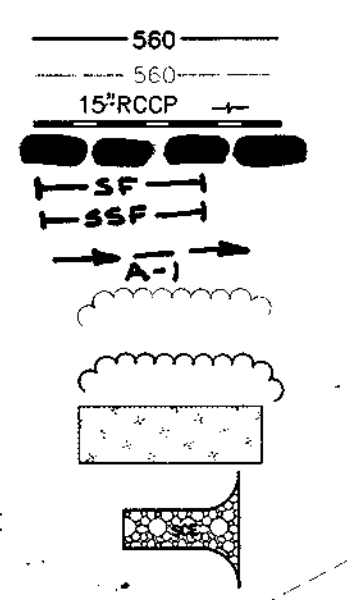
**SEDIMENT TRAP #2 DATA**

DRAINAGE AREA	1.8 Ac.
STORAGE REQUIRED	6480 cf
STORAGE PROVIDED	6480 cf
BOTTOM DIMENSIONS	69'x32'
DEPTH BELOW WEIR CREST	2.5'
SIDE SLOPES	2:1
BOTTOM ELEVATION	325.5
EMBANKMENT ELEVATION	329.0
CREST ELEVATION	328.0
CLEAN OUT ELEVATION	326.8
WEIR LENGTH	72'
WEIR SPACING	2.0'
DEPTH BELOW OUTLET	2.0'

NO.	DATE	REVISION

**TSA GROUP, INC.**  
 planning • architecture • engineering  
 8480 Baltimore National Pike • Ellicott City, Maryland 21045 • (410) 466-8106

- LEGEND**
- PROPOSED CONTOUR
  - EXISTING GRADE
  - PROPOSED STORM DRAIN
  - LIMIT OF DISTURBANCE
  - SILT FENCE
  - SUPER SILT FENCE
  - EARTH DIKE
  - EXISTING TREE LINE
  - PROPOSED TREE LINE
  - FOREST CONSERVATION EASEMENT
  - STABILIZED CONSTRUCTION ENTRANCE



**PLAN**  
SCALE: 1" = 50'

**THIS PLAN TO BE USED FOR GRADING AND SEDIMENT CONTROL ONLY**

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels* 6/10/97  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Chris Hamilton* 6/10/97  
 DIVISION OF LAND DEVELOPMENT

APPROVED: *William Dammann* 6/12/97  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK

OWNER:  
 ROSE MARIE SEARS 8122 FOREVER GREEN CT ELKRDGE, MD 21227  
 ELIZABETH ROULLER 6477 WATERLOO RD ELKRDGE, MD 21227

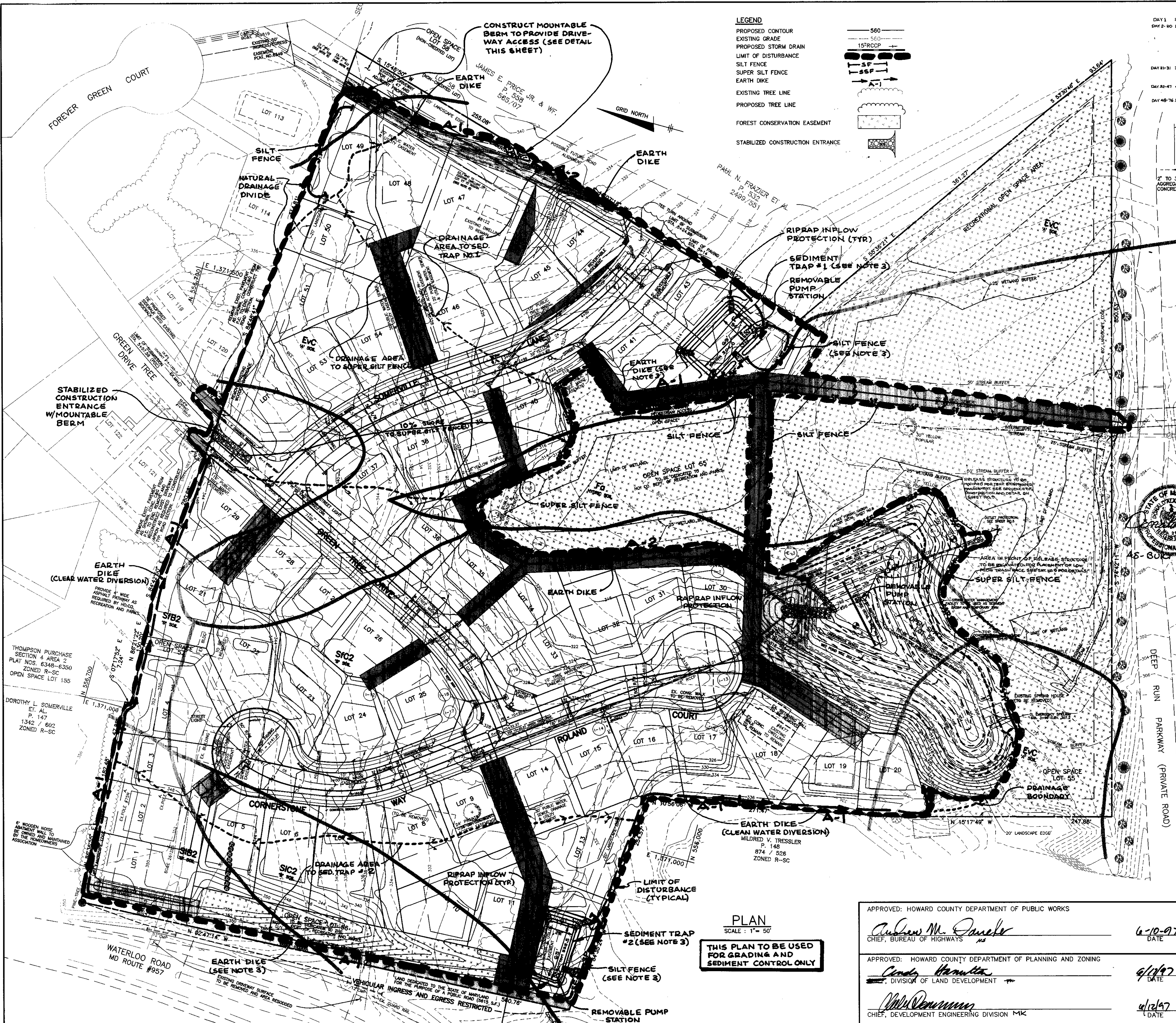
DEVELOPER:  
 CORNERSTONE HOLDINGS, L.L.C.  
 7405 BUCKS HAVEN LANE HIGHLAND, MARYLAND 20777

PROJECT:  
**ARBOR WOODS**  
 LOTS 1-59

LOCATION:  
 TAX MAP 37 - PARCELS 149,405,493 & 594  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE:  
**GRADING & SEDIMENT CONTROL PLAN**  
 S-94-36-P-97-01, WP-97-03  
 DATE: JANUARY 8, 1997  
 MAY 23, 1997  
 PROJECT NO. 0675  
 DRAWING 4 OF 12

Design: GWF Draft: JR SCALE: 1"=50'









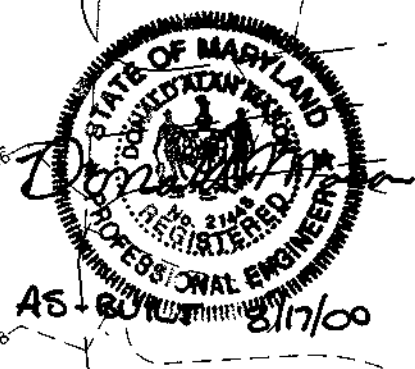


STORMWATER RUNOFF TOTAL									
STRUCTURE	D.A.(ACRES)	C	% IMP.	T.C.(MIN)	10 <sup>2</sup> /hr	10 <sup>1</sup> /hr	Q <sub>2</sub> /hr	Q <sub>10</sub> /hr	Q <sub>100</sub> /hr
I-1	0.45	0.28	56	10.0	4.5	6.6	0.59	0.86	
I-2	0.12	0.30	65	10.0	4.5	6.6	0.18	0.26	
I-3	0.05	0.31	65	10.0	4.5	6.6	0.09	0.13	
I-4	0.32	0.30	65	10.0	4.5	6.6	0.45	0.66	
I-5	0.10	0.30	65	10.0	4.5	6.6	0.14	0.20	
I-6	0.34	0.55	50	10.0	4.5	6.6	0.86	1.25	
I-7	0.94	0.33	63	10.0	4.5	6.6	1.40	2.05	
I-8 (SUMP)	1.81	0.27	51	10.0	---	6.6	---	3.23	
I-9 (SUMP)	0.33	0.47	48	10.0	---	6.6	---	1.06	
I-10	0.29	0.53	64	10.0	4.5	6.6	0.68	0.99	
I-11	0.86	0.37	65	10.0	4.5	6.6	1.44	2.11	
I-12	0.76	0.30	65	10.0	4.5	6.6	1.03	1.52	
I-13 (SUMP)	1.53	0.39	70	10.0	---	6.6	---	3.96	
I-14	0.98	0.32	61	10.0	4.5	6.6	1.48	2.05	
I-15	1.20	0.35	62	10.0	4.5	6.6	1.89	2.77	
I-16	0.98	0.26	47	10.0	4.5	6.6	1.17	1.72	
I-17	0.75	0.37	58	10.0	4.5	6.6	1.26	1.85	
I-18	0.14	0.40	68	10.0	4.5	6.6	0.27	0.40	
I-19	0.15	0.40	68	10.0	4.5	6.6	0.28	0.40	

STRUCTURE SCHEDULE									
STRUCTURE	LOCATION	INV. (N)	INV. (OUT)	TOP ELEV	TYPE	HO.COST.			
I-1	N 556052.3138 E 1371341.7198	18' 305.62	18' 305.42	311.24	TYPE 'D'	STD SD-4.39			
I-2	N 556264.4874 E 1371274.2459	18' 310.28	18' 310.08	311.24	TYPE 'D'	STD SD-4.39			
I-3	N 556319.9759 E 1371291.114	18' 311.06	18' 310.86	311.24	TYPE 'D'	STD SD-4.39			
I-4	N 556349.4156 E 1371323.9756	18' 311.94	18' 311.74	311.24	TYPE 'D'	STD SD-4.39			
I-5	N 556299.3805 E 1371374.6717	18' 312.82	18' 312.62	311.24	TYPE 'D'	STD SD-4.39			
I-6	SOMERVILLE STA. 2+70 13.43' RT	18' 314.52	18' 314.32	325.99	TYPE 'A-10'	STD SD-4.02			
I-7	SOMERVILLE STA. 3+37 13.43' LT	18' 315.47	18' 315.27	325.99	TYPE 'A-10'	STD SD-4.02			
I-8	SOMERVILLE STA. 4+67 13.43' LT	15' 316.94	18' 316.69	321.01	TYPE 'A-5'	STD SD-4.01			
I-9	SOMERVILLE STA. 4+67 13.43' RT	---	15' 317.29	321.01	TYPE 'A-5'	STD SD-4.01			
I-10	GREEN TREE STA. 9+03 13.43' LT	18' 325.44	18' 325.24	329.62	TYPE 'A-5'	STD SD-4.01			
I-11	GREEN TREE STA. 8+98 13.43' RT	15' 325.99	18' 325.79	329.62	TYPE 'A-10'	STD SD-4.02			
I-12	N 556395.1873 E 1371105.32	---	15' 330.29	333.57	TYPE 'D'	STD SD-4.39			
I-13	CORNERSTONE (hd) LP STA 3+01.24	18' 315.50	18' 315.30	321.01	TYPE 'A-5'	STD SD-4.01			
I-14	CORNERSTONE (hd) STA 1+884 13.43' RT	18' 320.91	18' 320.71	325.75	TYPE 'A-10'	STD SD-4.02			
I-15	CORNERSTONE (hd) STA 0+43 13.43' LT	18' 322.83	18' 322.73	329.41	TYPE 'A-10'	STD SD-4.02			
I-16	N 556150.2591 E 1370842.8842	---	15' 326.56	336.57	TYPE 'D'	STD SD-4.39			
I-17	CORNERSTONE (hd) STA 0+43 13.43' RT	18' 323.35	18' 323.15	329.46	TYPE 'A-10'	STD SD-4.02			
I-18	GREEN TREE STA. 9+91 13.43' RT	15' 323.95	18' 323.75	328.11	TYPE 'A-5'	STD SD-4.01			
I-19	GREEN TREE STA. 9+97.5 13.43' LT	---	15' 324.30	328.05	TYPE 'A-5'	STD SD-4.01			
MH-1	CORNERSTONE (hd) STA 0+245 16' RT	18' 322.54	18' 322.34	328.66	STD MH	STD G-5.12			
MH-2	N 556154.6601 E 1370933.2821	15' 325.65	18' 325.40	333.40	STD MH	STD G-5.12			
E-1	N 555797.8459 E 1371422.8657	---	30' 294.06	---	30' END SECTION	STD G-5.21			
E-2	N 555989.3604 E 1371293.1245	---	18' 300.34	---	18' END SECTION	STD G-5.21			
E-3	N 555971.3307 E 1371308.3124	---	18' 300.34	---	18' END SECTION	STD G-5.21			
S-1	N 555869.7226 E 1371374.2611	6' 294.96	30' 294.90	308.27	SEE RELEASE STRUCTURE DETAIL				

NOTES:  
 1. PRECAST STRUCTURES MEETING MS-25 LOADING MAY BE USED  
 2. FOR A-5 & A-10 INLETS LOCATION AND ELEVATIONS GIVEN TO CENTER OF STRUCTURE  
 3. FOR TYPE 'D' INLETS, MANHOLES AND SWM RELEASE STRUCTURE LOCATION AND ELEVATIONS GIVEN TO CENTER OF STRUCTURE

NOTE: GRADES SHOWN ON THIS PLAN REFLECT ULTIMATE GRADING WITH BUILDINGS PRESENT. DRAINAGE AREAS REFLECT THIS ULTIMATE GRADING CONDITION.



LEGEND	
SOIL TYPE DELINEATION	PROPOSED CONTOUR
EXISTING TREE LINE	EXISTING GRADE
PROPOSED TREE LINE	PROPOSED STORM DRAIN
DRAINAGE DIVIDE	EARTH DIKE
	SOIL TYPE

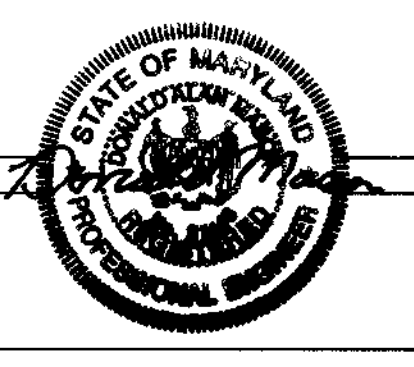
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
 CHIEF, BUREAU OF HIGHWAYS 16 6-10-97 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cathy Hamilton*  
 DIVISION OF LAND DEVELOPMENT 6/12/97 DATE

*Mark Drumm*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 6/12/97 DATE

NO.	DATE	REVISION

TSA GROUP, INC.  
 planning • architecture • engineering  
 8480 Baltimore National Pike • Elliott City, Maryland 21603 • (410) 468-6106



OWNER: ROSE MARIE SEARS 8122 FOREVER GREEN CT, ELK RIDGE, MD 21227  
 ELIZABETH ROULLER 6477 WATERLOO RD, ELK RIDGE, MD 21227

PROJECT: ARBOR WOODS LOTS 1-59  
 LOCATION: TAX MAP 37 - PARCELS 149,405,493 & 594 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DEVELOPER: CORNERSTONE HOLDINGS, L.L.C. 7405 BUCKS HAVEN LANE HIGHLAND, MARYLAND 20777 Phone: (410) 988-9146

TITLE: DRAINAGE AREA MAP  
 S-94-36, P-97-01, WP-97-03  
 DATE: JANUARY 8, 1996  
 MAY 23, 1997

PROJECT NO. 0675  
 SCALE: 1"=50'  
 DRAWING 6 OF 12

**SOILS CLASSIFICATION**

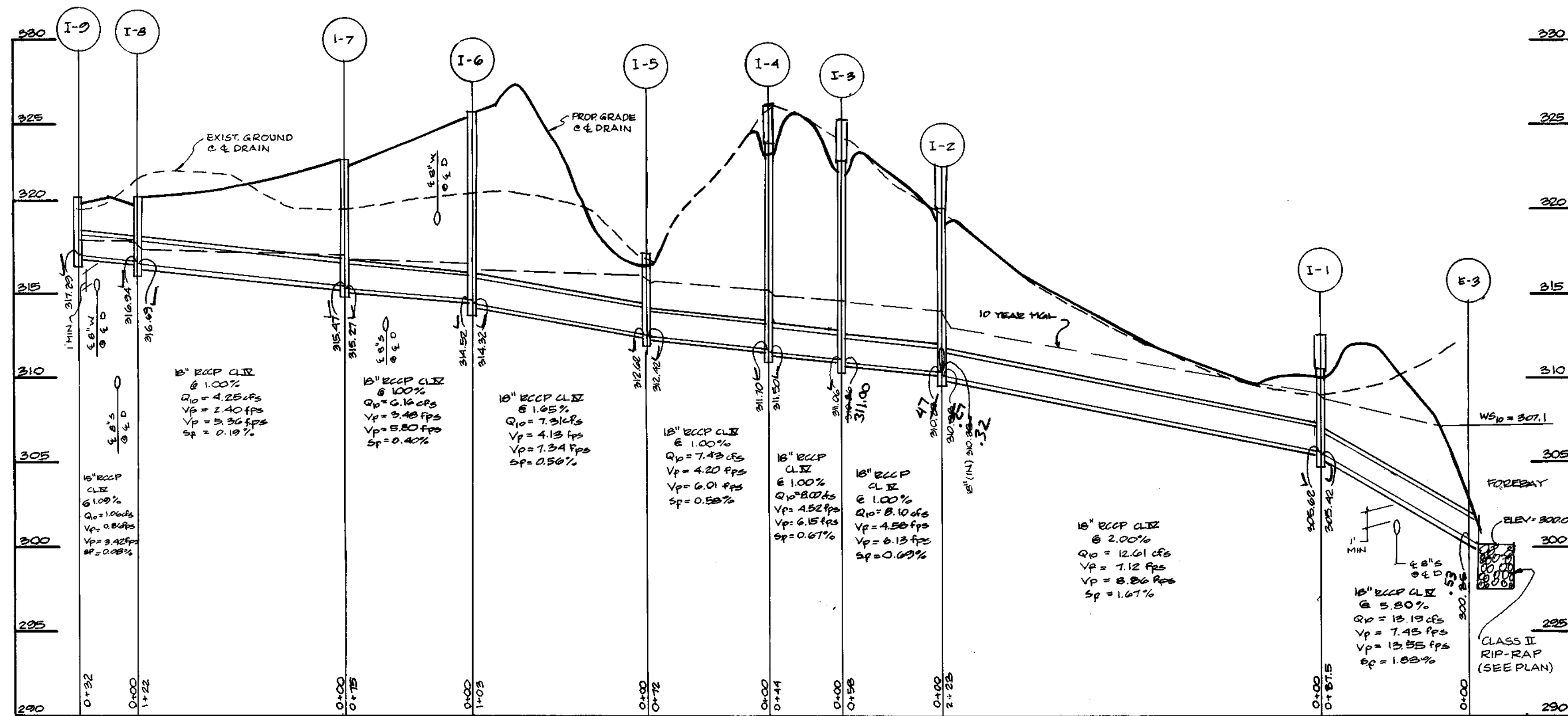
EvB - Evesboro loamy sand, 1 to 5 percent slopes, 'A' soil.  
 EvC - Evesboro loamy sand, 5 to 15 percent slopes, 'A' soil.  
 Fa - Fallsington loam, 'HYDRIC' soil.  
 SIB2 - Sassafras loam, 1 to 5 percent slopes, 'B' soil.  
 SIC2 - Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.  
 SIB2 - Sassafras gravelly sandy loam, 1 to 5 percent slopes, moderately eroded 'B' soil.  
 SFC2 - Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.

Howard County Soils map no. 25

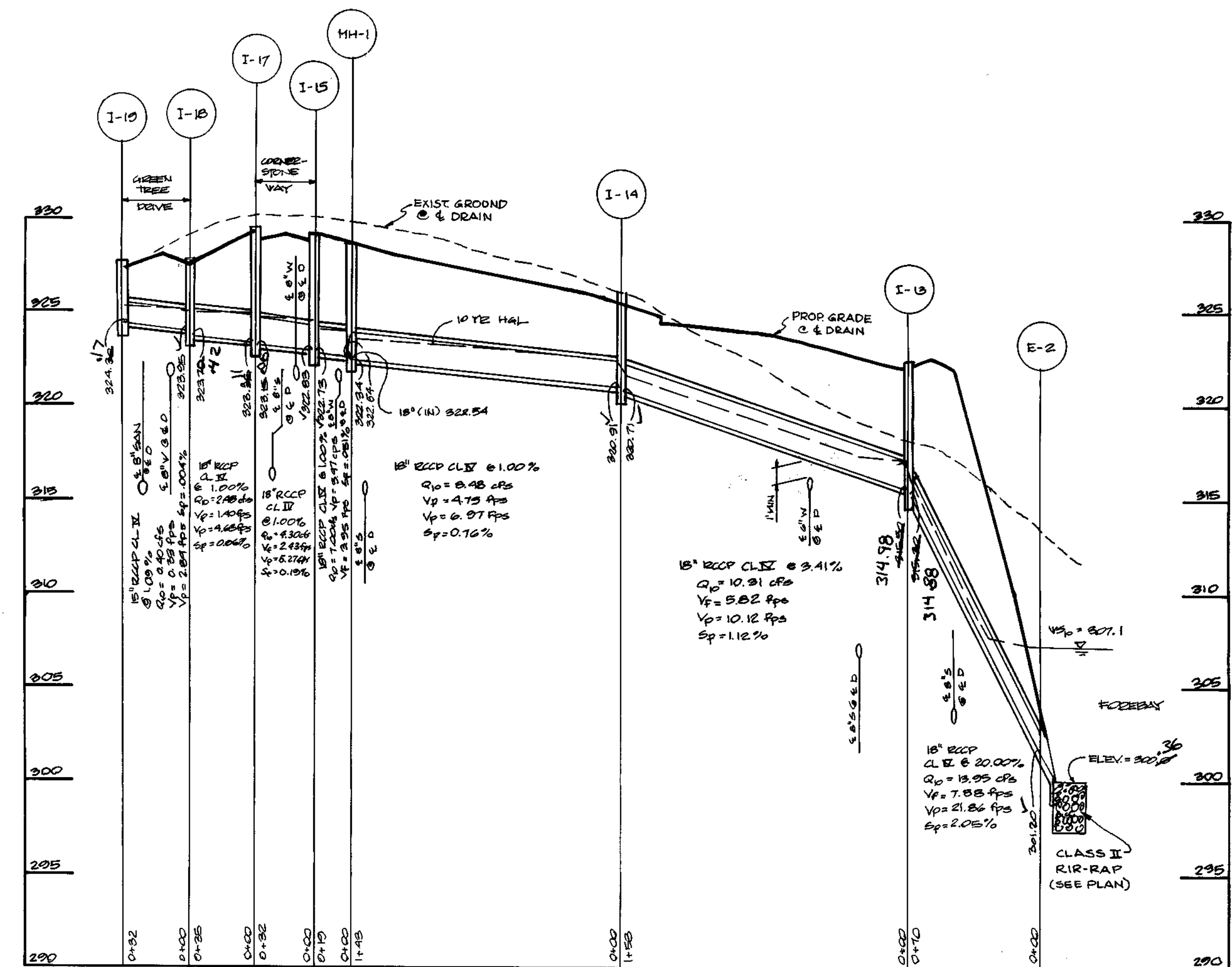
THIS PLAN NOT TO BE USED FOR CONSTRUCTION

PLAN SCALE: 1" = 50'

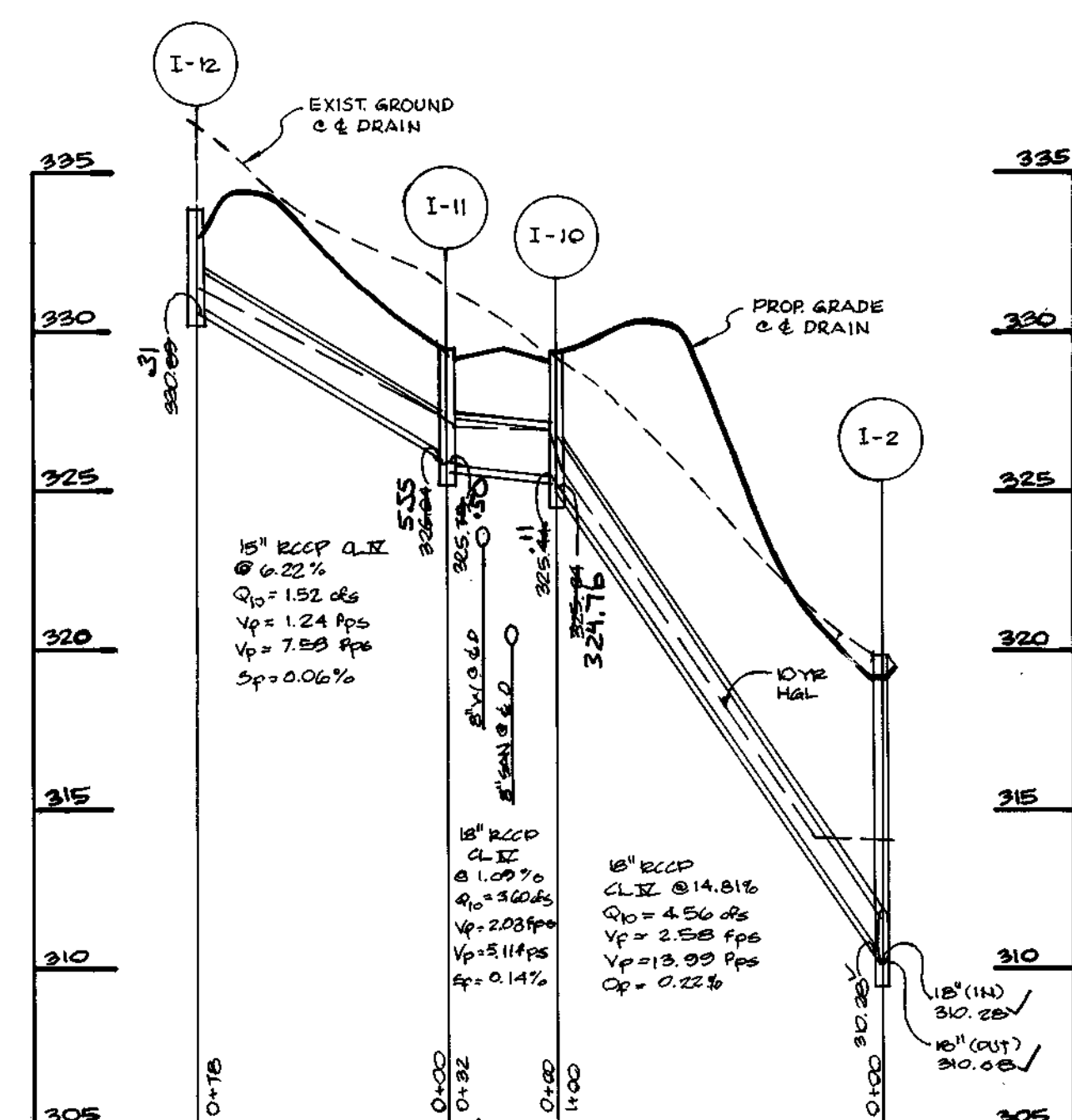




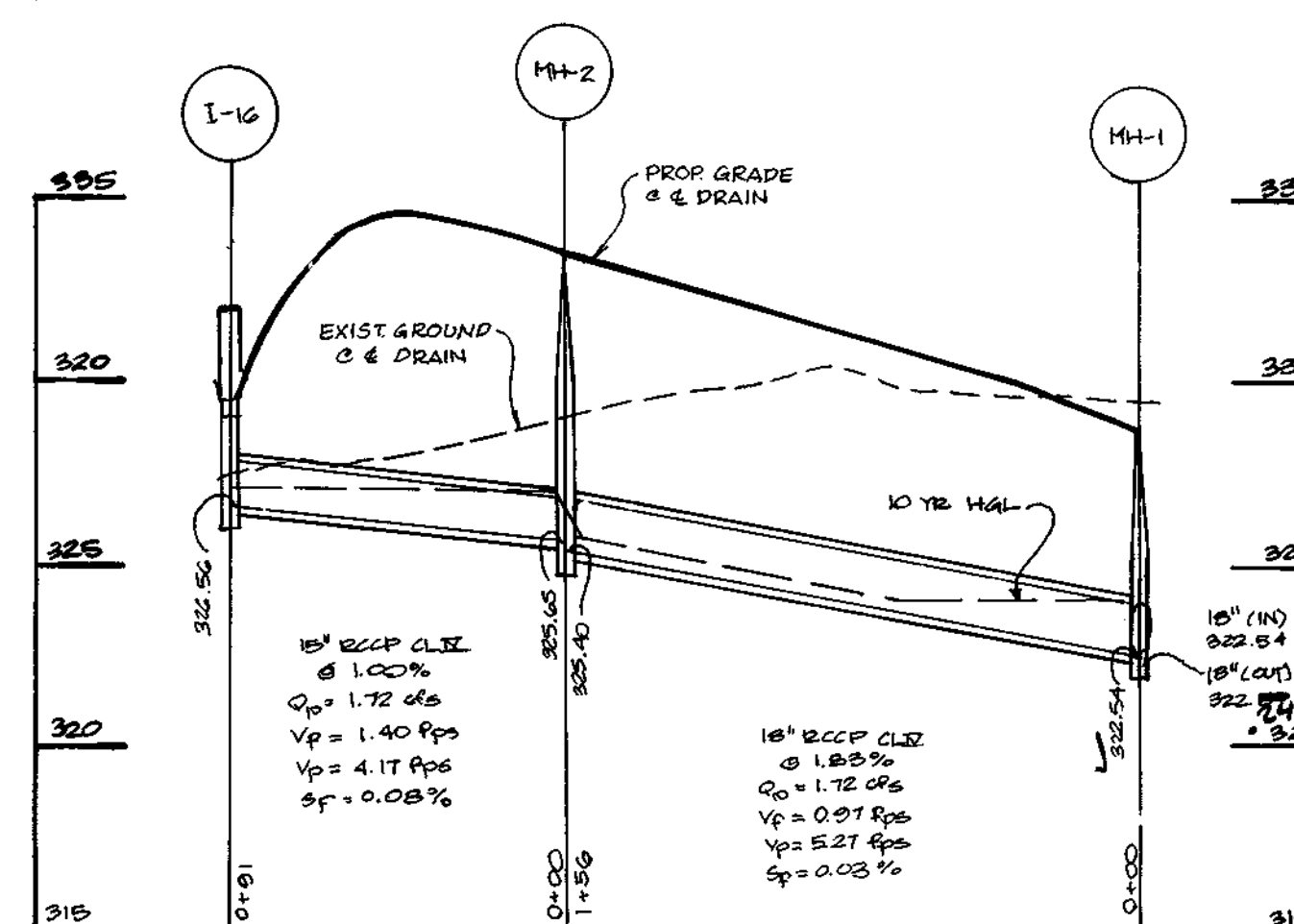
STORM DRAIN PROFILE



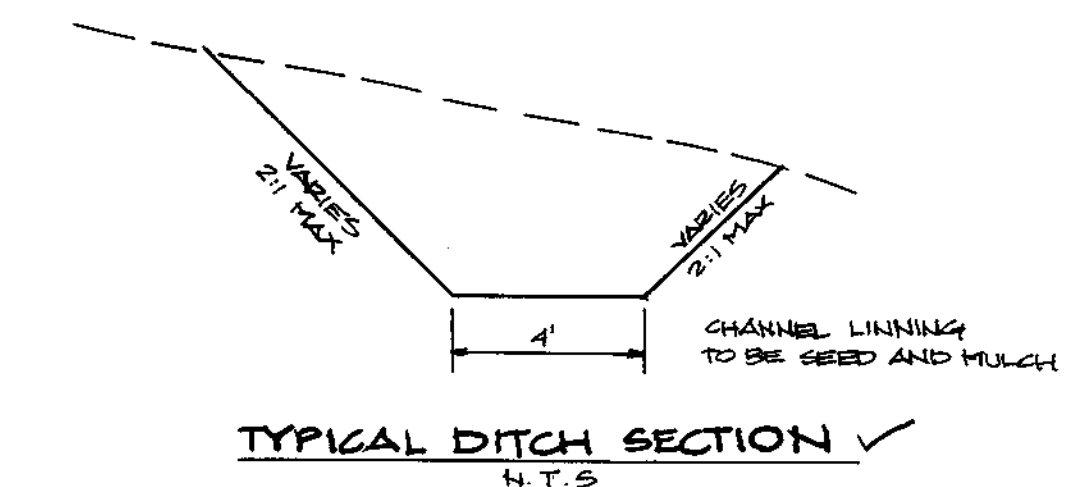
STORM DRAIN PROFILE



STORM DRAIN PROFILE

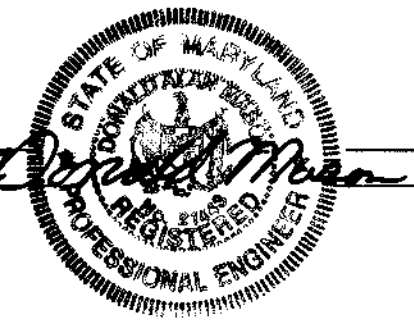


STORM DRAIN PROFILE



NO.	DATE	REVISION

**TSA GROUP, INC.**  
 planning • architecture • engineering  
 8480 Baltimore National Pike • Ellicott City, Maryland 21043 • (410) 485-8106



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS <i>Andrew M. Daniels</i> CHIEF, BUREAU OF HIGHWAYS DATE: 6-10-97	OWNER: ROSE MARIE SEARS 8122 FOREVER GREEN CT ELKCRIDGE, MD 21227	ELIZABETH ROULLER 8477 WATERLOO RD. ELKCRIDGE, MD 21227	PROJECT: <b>ARBOR WOODS</b> LOTS 1-59
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING <i>Candy Hamilton</i> CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 6/17/97	DEVELOPER: CORNERSTONE HOLDINGS, L.L.C. 7405 BUCKS HAVEN LANE HIGHLAND, MARYLAND 20777	LOCATION: TAX MAP 37 - PARCELS 149,405,493 & 594 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND	TITLE: <b>STORM DRAIN PROFILES</b> S-94-36, P-97-01, WP-97-03 DATE: JANUARY 8, 1997 MAY 23, 1997 HORIZ: 1"=50' SCALE: VERT: 1"=5'
APPROVED: <i>Bill Dammann</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE: 6/12/97	Design: GWF Draft: KSW	PROJECT NO. 0675 DRAWING 7 OF 12	Design: GWF Draft: KSW

**POND CONSTRUCTION SPECIFICATIONS**

**Site Preparation**

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 50 foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

After stripping operations have been completed, the exposed subgrade materials should be profiled with a loaded dump truck or similar equipment in the presence of a geotechnical engineer or his representative. For areas that are not accessible to a dump truck, the exposed materials should be observed and tested by a geotechnical engineer or his representative utilizing a Dynamic Cone Penetrometer. Any excessively soft or loose materials identified by profiling or penetrometer testing should be excavated to suitable firm soil, and then grades re-established by backfilling with suitable soil.

**Earth Fill**

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6" frozen or other objectionable materials. Fill material for the center of the embankment and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL. These soil materials were identified in the soil borings. Consideration may be given to the use of other materials in the embankment if design and construction are supervised by a geotechnical engineer. In addition to the soil materials described above a fine grained soil, including Silt (ML) with a plasticity index of 10 or more can be utilized for the embankment and core trench. Exploration with test pits and additional laboratory testing can be conducted prior to construction to identify and quantify potential borrow areas. All fill materials must be placed and compacted in accordance with MD SCS 378 specifications.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment. A representative of the geotechnical engineer should be present to monitor placement and compaction of fill for the embankment and cut off trench.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of the equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble yet not so wet that water can be squeezed out.

Where a minimum required density is specified, it shall not be less than 95% of maximum dry density with a moisture content within +/- 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99.

Out Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

**Structure Backfill**

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material tends to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

**Pipe Conduits**

All pipes shall be circular in cross section.

**Corrugated Metal Pipe** - All of the following criteria shall apply for corrugated metal pipe:

- Materials - (Steel Pipe) - This pipe and its appurtenances shall be galvanized and fully bituminous coated and shall conform to the requirements of AASHTO Specification M-190 Type A with watertight coupling bands. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. The following coatings or an approved equal may be used: Nexon, Plastico-Cote, Biac-Klad, and Beth-Cu-Loy. Coated corrugated steel pipe shall meet the requirements of AASHTO M-245 and M-246.
- Materials - (Aluminum Coated Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound.
- Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-198 or M-211 with watertight coupling bands or flanges. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

**Coupling bands, anti-seep collars, and sections, etc., must be composed of the same material as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.**

**Connections** - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the band width. The following type connections are acceptable for pipes less than 48" in diameter: flanges on both ends of the pipe, a 12" wide standard lap type band with 12" wide by 3/8" thick closed cell circular neoprene gasket; and a 12" wide huggie type band with O-ring gaskets having a minimum diameter of 1/2" greater than the corrugation depth. Pipes 48" in diameter and larger shall be connected by a 24" long annular corrugated band using rods and lugs. A 12" wide by 3/8" thick closed cell circular neoprene gasket will be installed on the end of each pipe for a total of 24". Helically corrugated pipe shall have either continuously welded seams or have lock seams.

**Bedding** - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

**Backfilling** shall conform to "Structure Backfill."

**Other details** (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

- Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM Designation C-361. An approved equivalent is AWWA Specification C-302.
- Bedding - All reinforced concrete pipe conduits shall be laid in a concrete bedding for their entire length. This bedding shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 10% of its outside diameter with a minimum thickness of 3 inches, or as shown on the drawings.

- Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 2 feet from the riser.

- Backfilling shall conform to "Structure Backfill."
- Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

**Polyvinyl Chloride (PVC) Pipe** - All of the following criteria shall apply for polyvinyl chloride (PVC) pipe:

- Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241.
- Joints and connections to anti-seep collars shall be completely watertight.
- Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
- Backfilling shall conform to "Structure Backfill."
- Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

**Concrete**

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 608, Mix No. 3.

**Rock Riprap**

All rock shall be dense, sound, and free from cracks, seams, and other defects conducive to accelerated weathering. The rock fragments shall be angular to subrounded in shape. The least dimension of an individual rock fragment shall be not less than one third the greatest dimension of the fragment.

The rock shall have the following properties:

- Bulk specific gravity (saturated surface-dry basis) not less than 2.5.
- Absorption not more than three percent.
- Soundness: Weight loss in five cycles not more than 20 percent when sodium sulfate is used.

Bulk specific gravity and absorption shall be determined according to ASTM C 127. The test for soundness shall be performed according to ASTM C 88.

The riprap shall be placed to the required thickness in one operation. The rock shall be delivered and placed in a manner that will insure the riprap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks filling the voids between the larger rocks. Filter cloth shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 919.12.

**Care of Water during Construction**

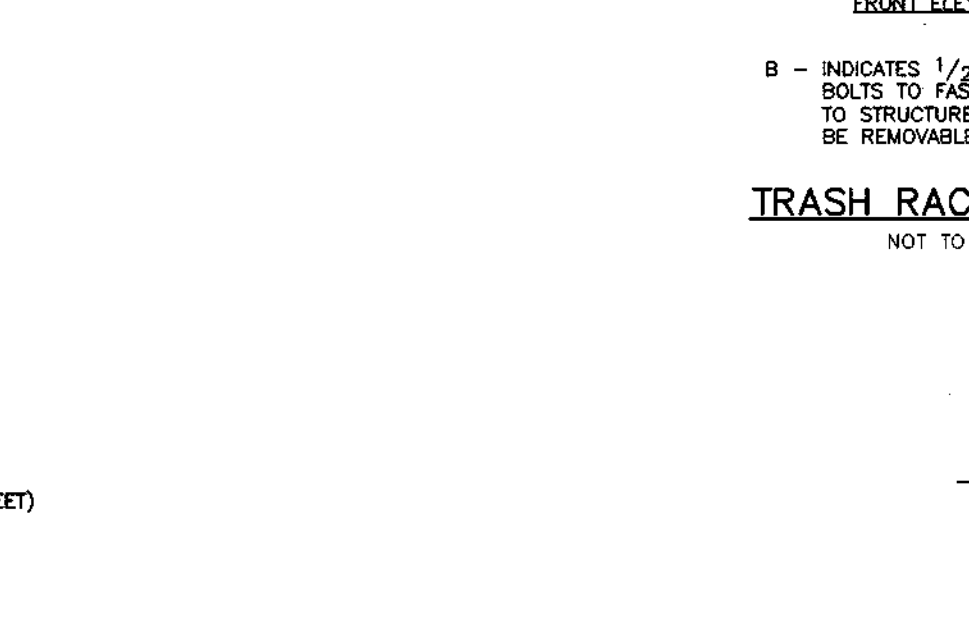
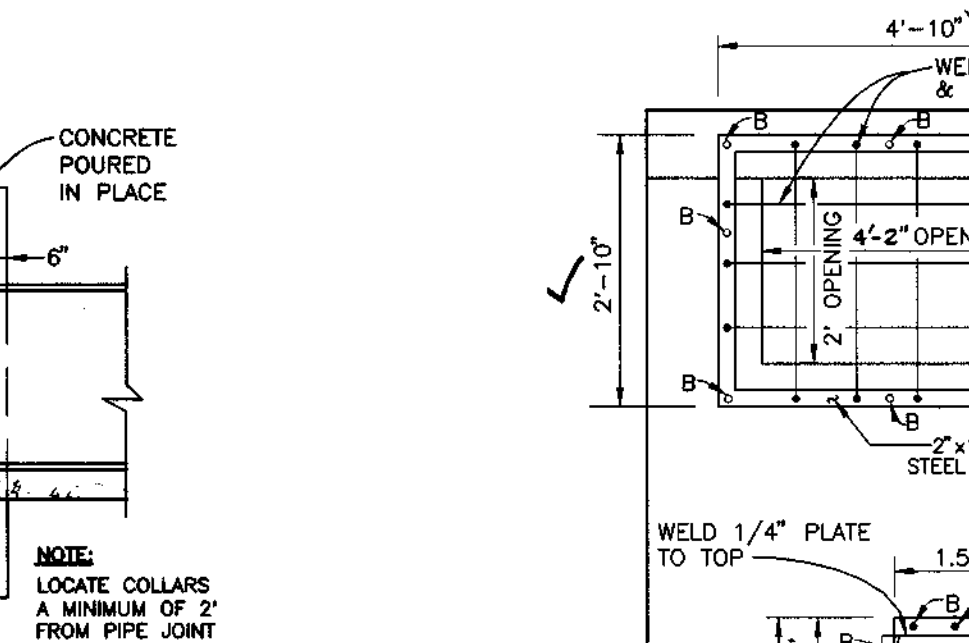
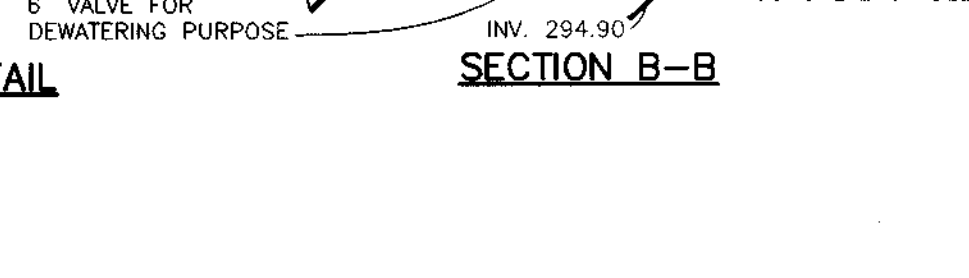
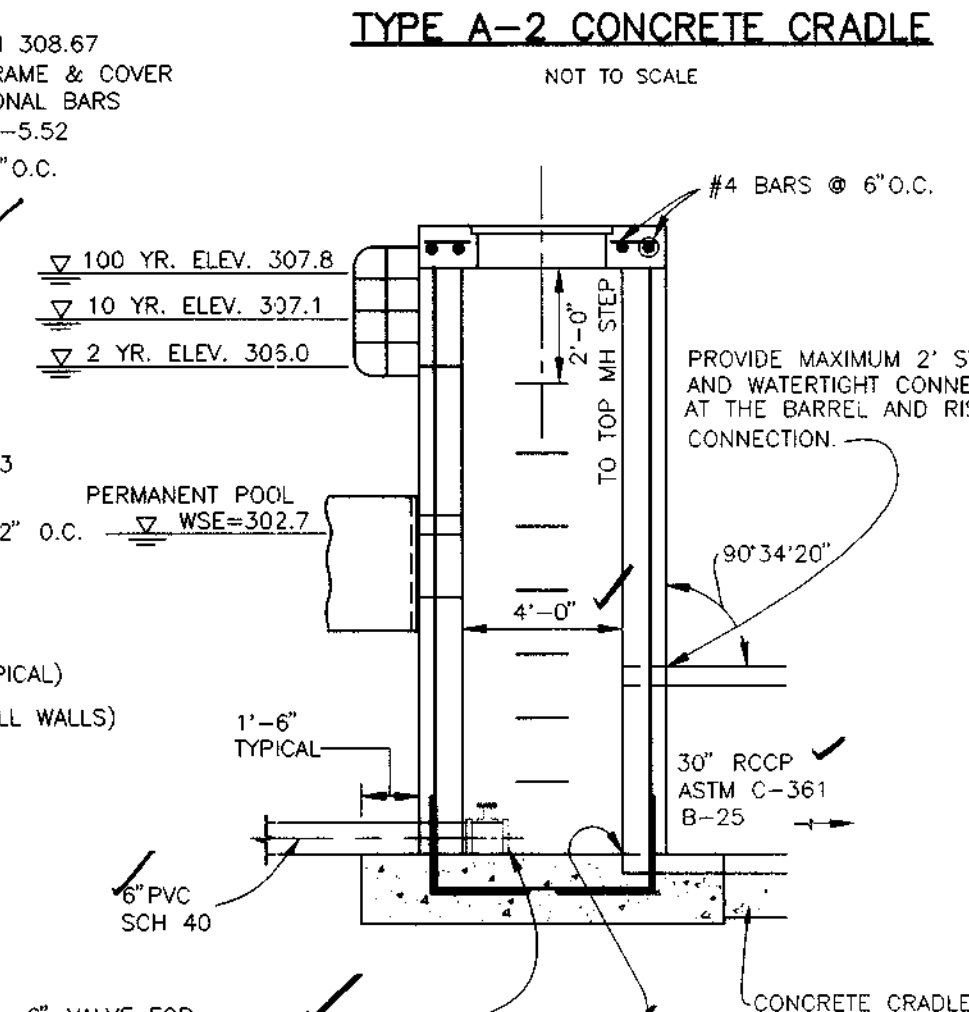
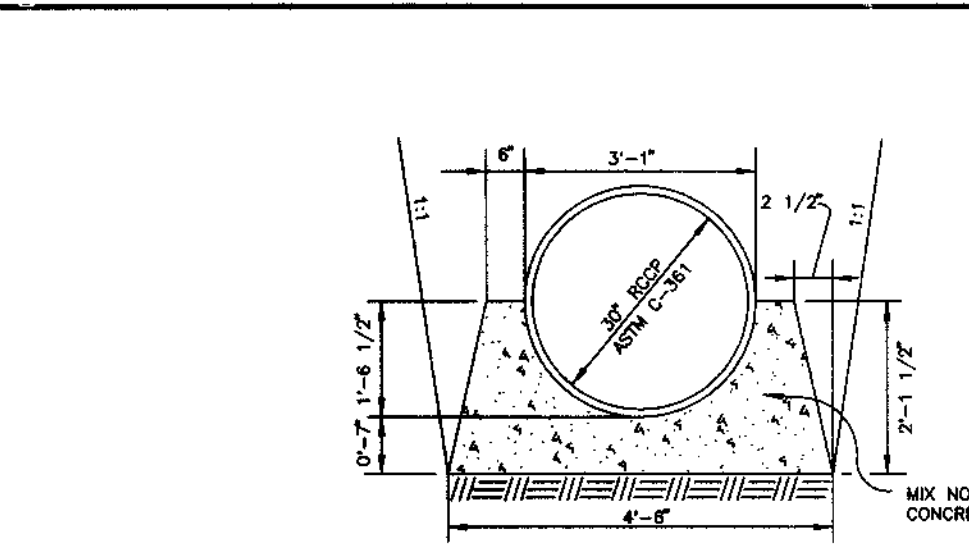
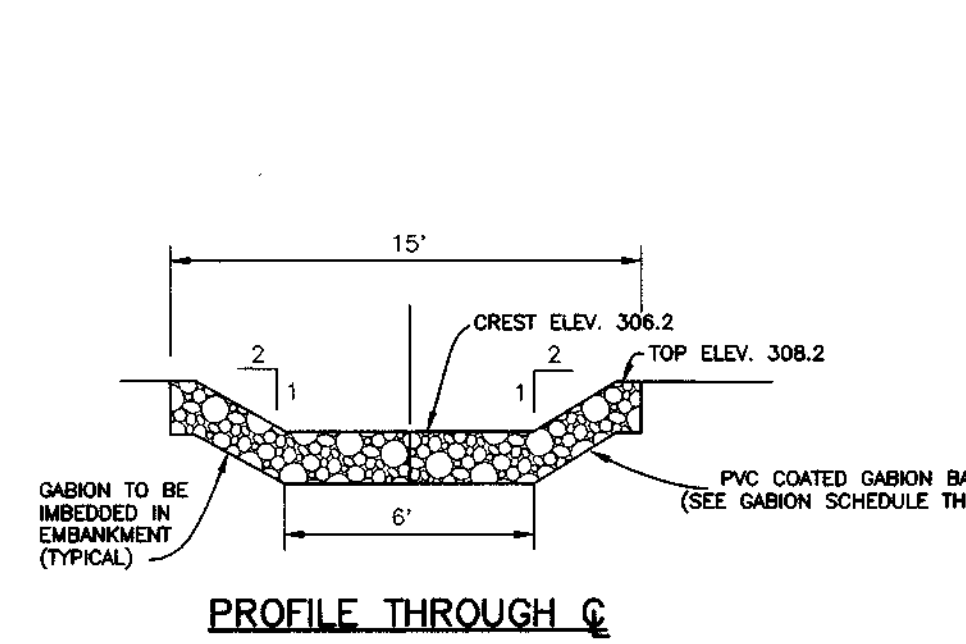
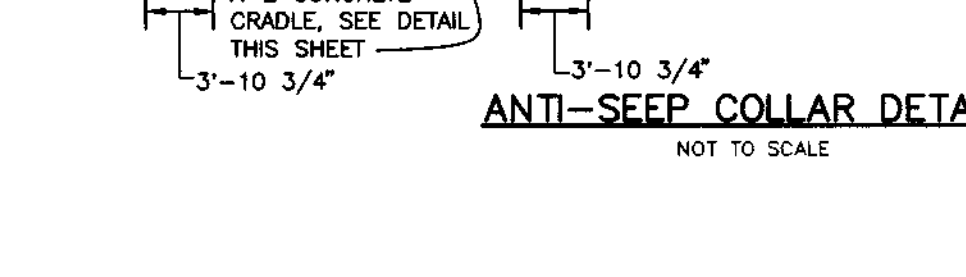
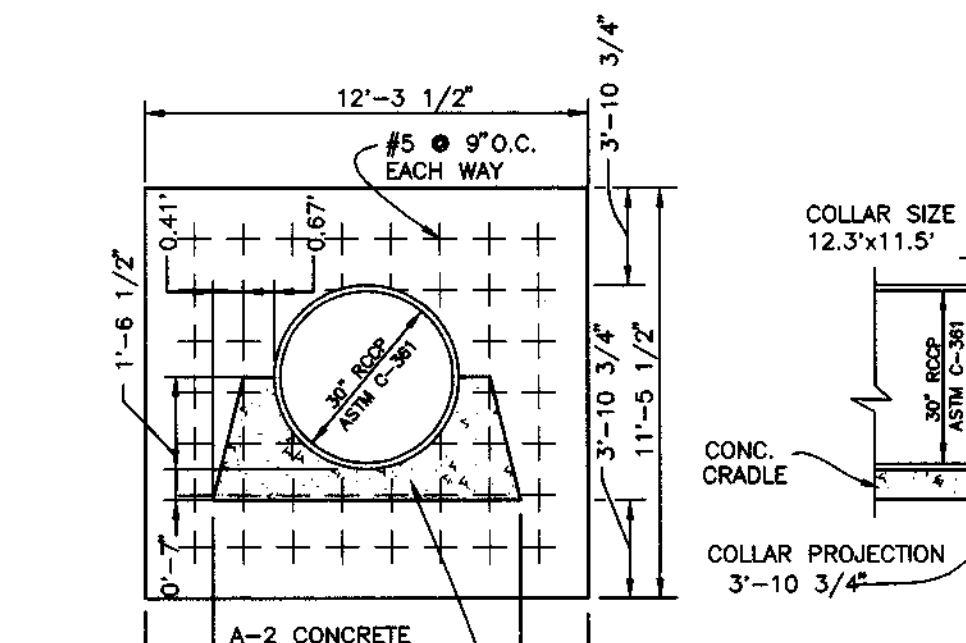
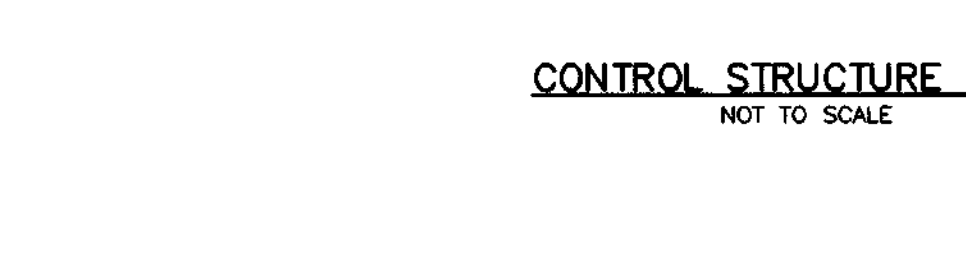
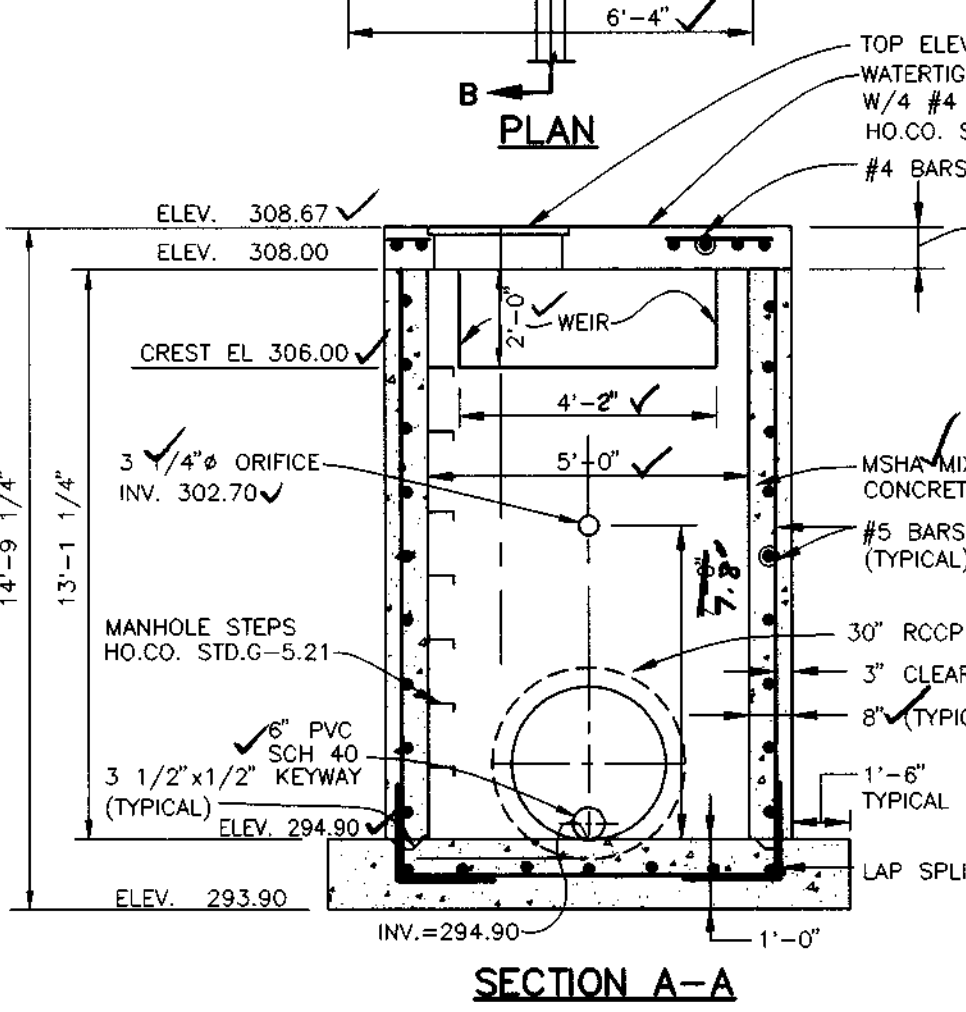
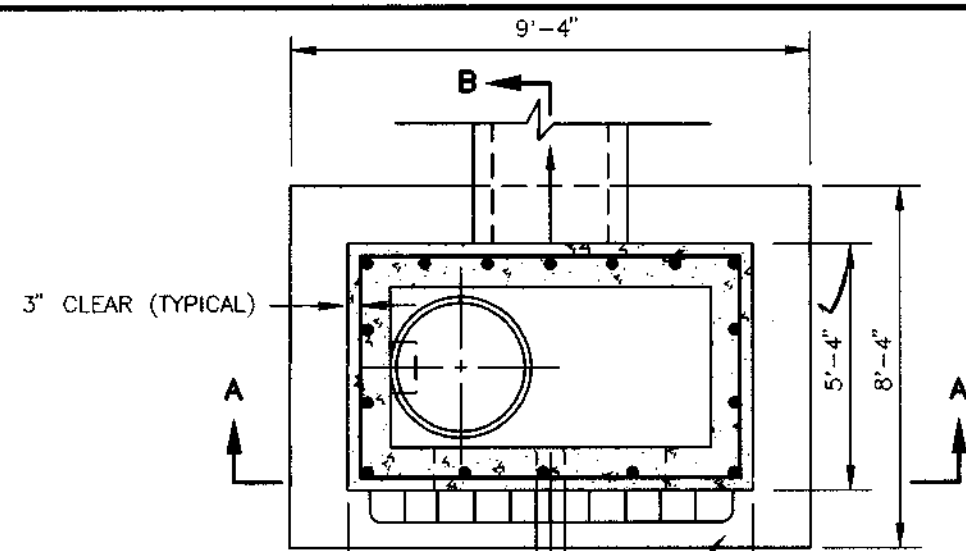
All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from the various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structures. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom of required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water to sumps from which the water shall be pumped.

**Stabilization**

All borrow areas shall be graded to provide proper drainage and left in a slightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Maryland Soil Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

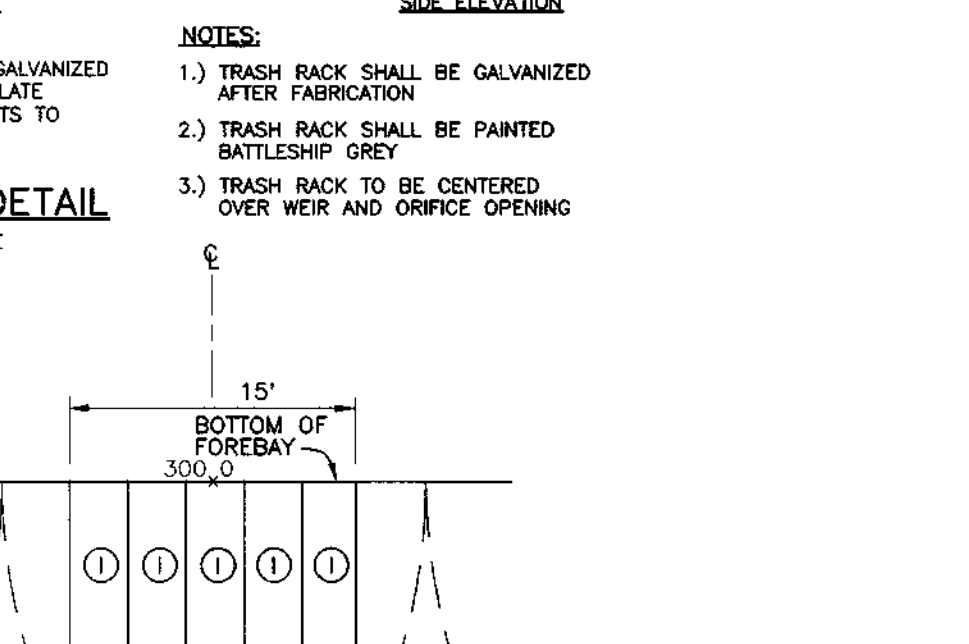
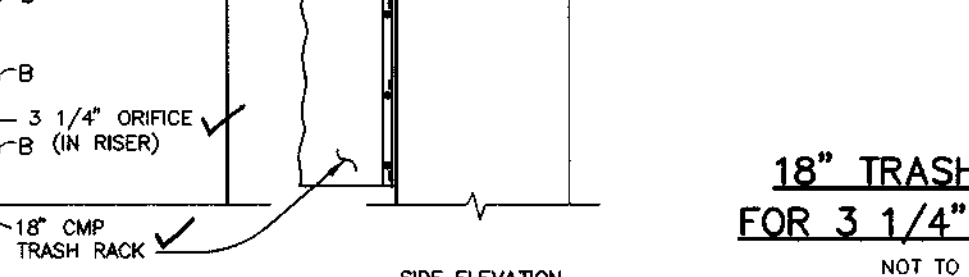
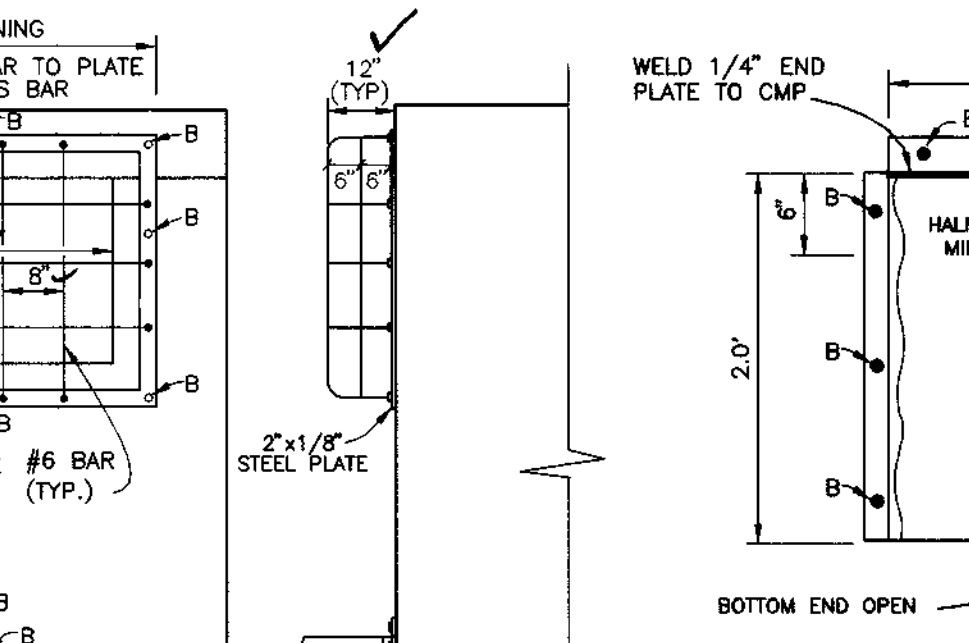
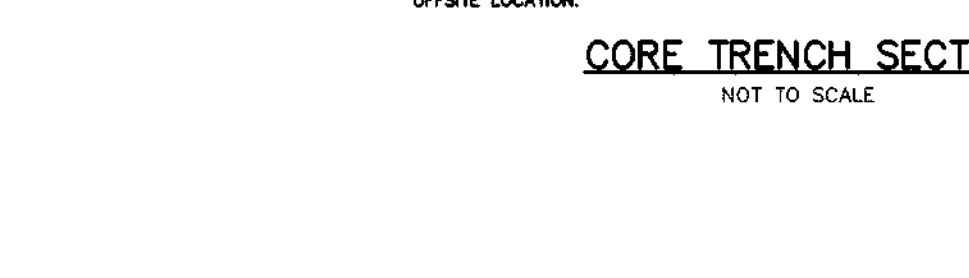
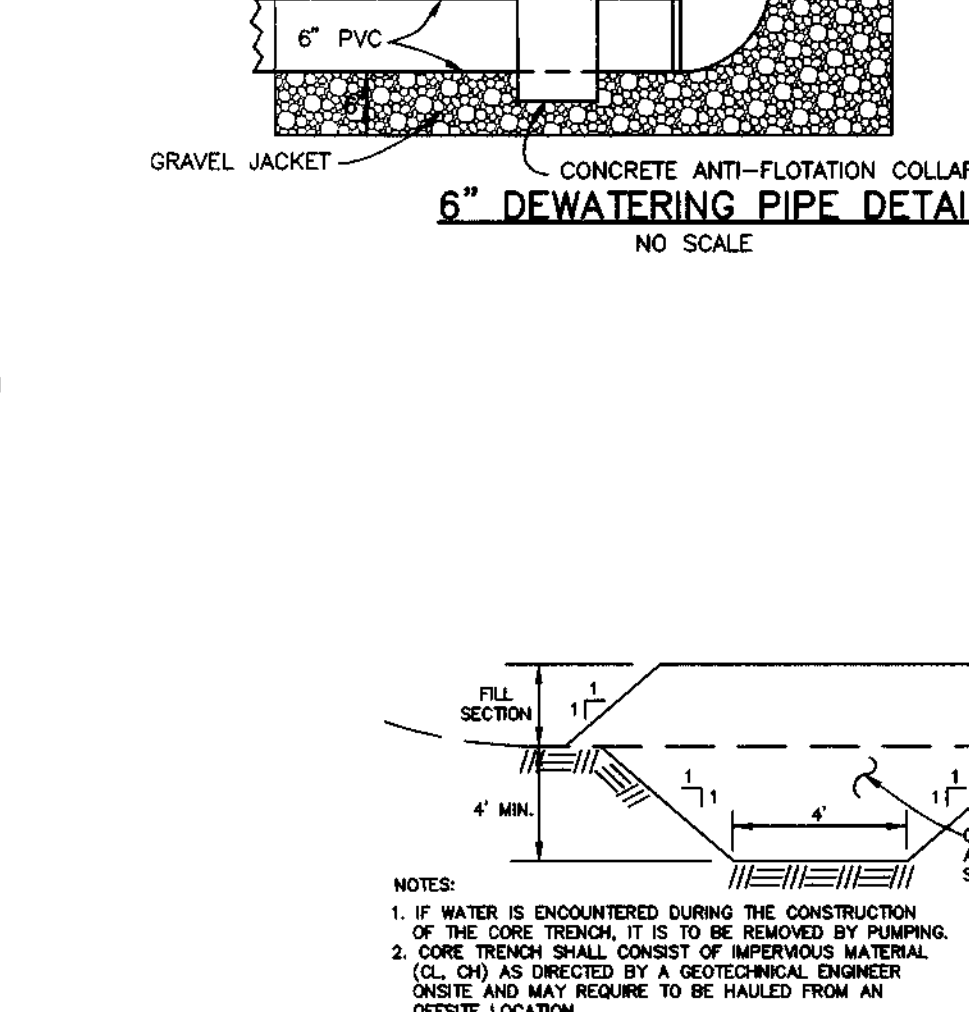
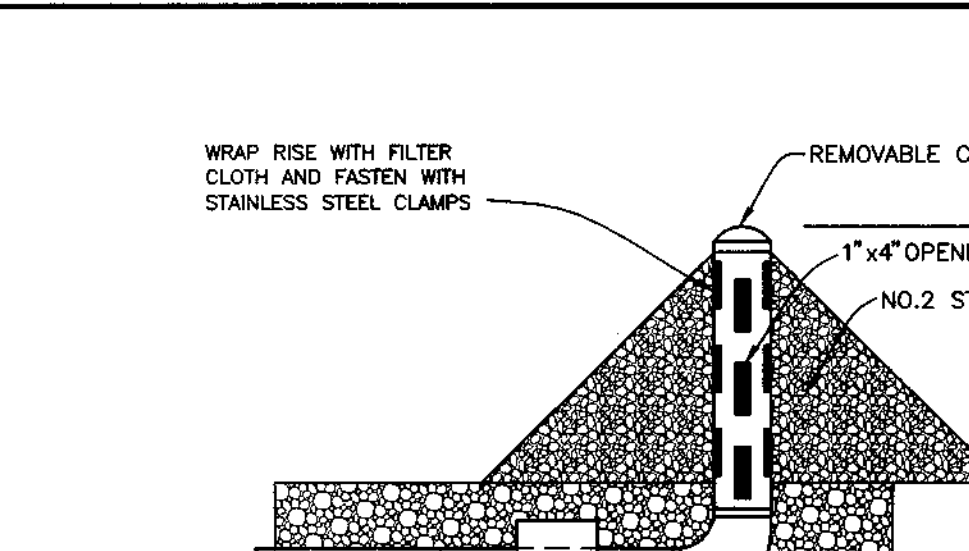
**Erosion and Sediment Control**

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures to be employed during the construction process.



GABION SCHEDULE				
LETTER CODE	LENGTH	WIDTH	THICKNESS	NO. REQUIRED
(1)	12'	3'	1'	13
(2)	6'	3'	1'	7

\* - AS PER MANUFACTURER



**OPERATION MAINTENANCE AND INSPECTION NOTE**

INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS STANDARDS AND SPECIFICATIONS FOR POND(S) (MS-378). THE POND OWNER(S) AND HIS SUCCESSORS, OR ASSIGNEES SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

I hereby certify that the facility shown on this plan was constructed as shown on the "AS-BUILT" plans and meets the approved plans and specifications.

*Donald Maan* 8/17/00  
DONALD A. MASON Date

Certify means to state or declare a professional opinion based on onsite inspections and materials tests which are conducted during construction. The onsite inspections and materials tests are those inspections and tests deemed sufficient and appropriate by commonly accepted engineering standards. Certify does not mean or imply a guarantee by the Engineer nor does an Engineer's certification relieve any other party from meeting requirements imposed by contract, employment or other means including meeting commonly accepted industry practices.

By the Developer:  
I/We certify that all development and/or construction will be done according to these plans, and that any responsible personnel involved in the construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District.

*D. Bay* 4/14/97  
DEVELOPER: Date

By the Engineer:  
I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.

*Donald Maan* 4/14/97  
DONALD A. MASON, P.E.#21443 Date  
ENGINEER:

These plans have been reviewed for the Howard Soil Conservation District and meet the technical requirements for small pond construction, soil erosion and sediment control.

*Cheryl K. Semmes* 06-2-97  
Natural Resource Conservation Service Date

These plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.

*Robert W. Zick* 10/6/97  
Howard Soil Conservation District Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*Andrew M. Daniels*  
CHIEF, BUREAU OF HIGHWAYS 6-10-97  
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Carole Hamilton*  
DIVISION OF LAND DEVELOPMENT 6/10/97  
DATE

*Mike Damman*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 6/12/97  
DATE

NO.	DATE	REVISION

**TSA GROUP, INC.**  
planning • architecture • engineering  
8480 Baltimore National Pike • Elkridge City, Maryland 21045 • (410) 485-8106

**OWNER:**  
ROSE MARIE SEARS  
8122 FOREVER GREEN CT.  
ELK RIDGE, MD 21227

**ELIZABETH ROULLER**  
8477 WATERLOO RD.  
ELK RIDGE, MD 21227

**PROJECT:**  
**ARBOR WOODS**  
LOTS 1-59

**LOCATION:**  
TAX MAP 37 - PARCELS 149,405,493 & 594  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

**DEVELOPER:**  
CORNERSTONE HOLDINGS, L.L.C.  
7405 BUCKS HAVEN LANE  
HIGHLAND, MARYLAND 20777  
Phone: (410) 988-9146

**TITLE:**  
STORMWATER MANAGEMENT NOTES AND DETAILS  
S-94-36, P-97-01, WP-97-03

**DATE:**  
January 8, 1997  
MAY 23, 1997

**PROJECT NO.:** 0675

**SCALE:** AS SHOWN

**DRAWING:** 8 OF 12

**Design:** GWF **Draft:** JR



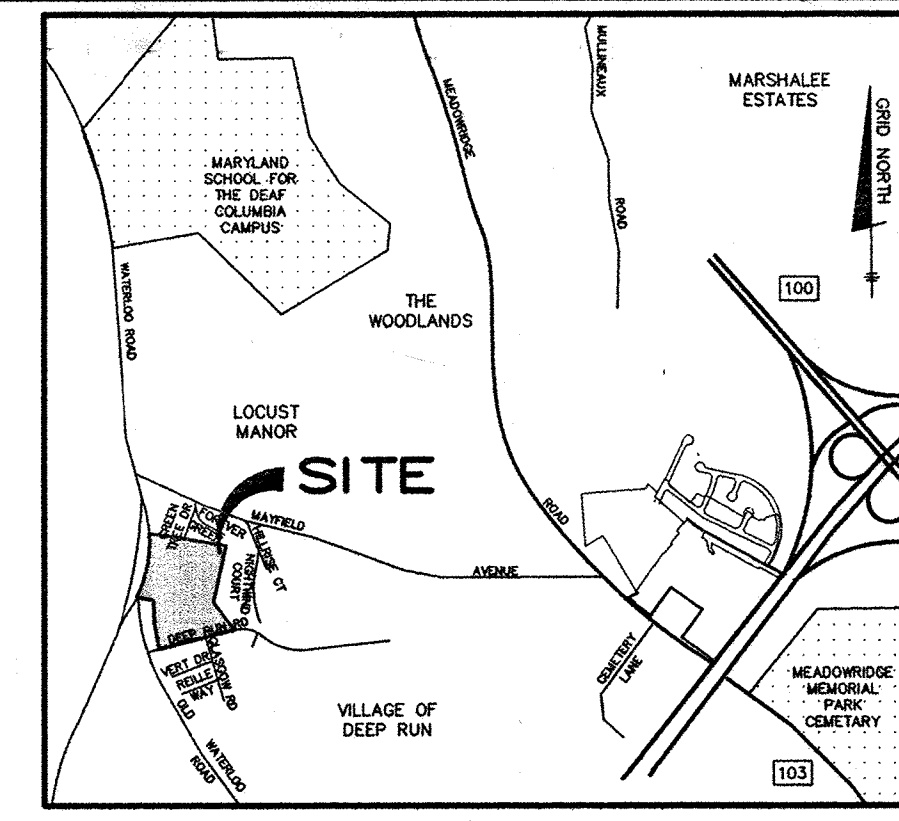








**SOILS CLASSIFICATION**  
 EvB - Evesboro loamy sand, 1 to 5 percent slopes, 'A' soil.  
 EvC - Evesboro loamy sand, 5 to 15 percent slopes, 'A' soil.  
 Fa - Fallsington loam, 'HYDRIC' soil.  
 SIB2 - Sassafras loam, 1 to 5 percent slopes, 'B' soil.  
 SIC2 - Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.  
 SIB2 - Sassafras gravelly sandy loam, 1 to 5 percent slopes, moderately eroded 'B' soil.  
 SIC2 - Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded 'B' soil.  
 Howard County Soils map no. 25



**VICINITY MAP**  
 SCALE: 1"=2000'

**SITE DATA TABULATION**

1.) ZONED.....	R-SC
2.) TOTAL AREA OF SITE.....	18.936 AC.
3.) TOTAL AREA OF FLOODPLAIN.....	N/A
4.) TOTAL AREA OF 25% OR GREATER SLOPES.....	N/A
3.) APPROXIMATE AREA OF DISTURBANCE.....	13.81 ± AC.
4.) NET AREA OF SITE.....	18.936 AC.

NOTE: SEE SHEET NO 12 FOR FCP NOTES, PLANTING SCHEDULE, SPECIFICATIONS AND DETAILS.

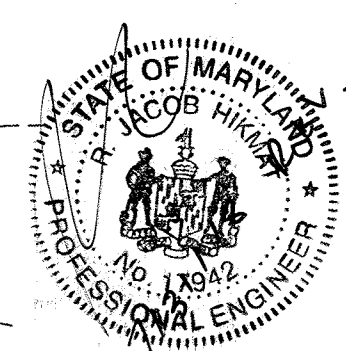
**THIS PLAN TO BE USED FOR FOREST CONSERVATION PURPOSES ONLY**

**FCP LEGEND**

- X — X — LIMIT OF FOREST CONSERVATION EASEMENT
- X — X — TEMPORARY PROTECTIVE FENCING/LOD (SEE FCP NOTE 6 ON SHEET 12)
- FCE** PERMANENT PROTECTIVE SIGNAGE

**LEGEND**

- EXISTING TREE LINE
- PROPOSED TREE LINE
- PROPOSED CONTOUR
- EXISTING GRADE
- SOILS DELINEATION
- SOILS TYPE
- SLOPES 15% TO 24.99%
- FOREST CONSERVATION AREA
- LIMIT OF DISTURBANCE



- PUBLIC SEWER AND UTILITY EASEMENT
- AREA OF MITIGATION FOR CONSTRUCTION OF PUBLIC SEWER MAIN

NO.	DATE	REVISION
1	07/2018	ADDED 20' PUBLIC SEWER UTILITY EASEMENT OVER OPEN SPACE LOT 55

**TSA GROUP, INC.**  
 planning • architecture • engineering  
 6480 Baltimore National Pike • Ellicott City, Maryland 21045 • (410) 466-6100

<b>OWNER:</b> ROSE MARIE SEARS 8122 FOREVER GREEN CT. ELKRIDGE, MD 21227	<b>ELIZABETH ROULLER</b> 8477 WATERLOO RD. ELKRIDGE, MD 21227	<b>PROJECT:</b> <b>ARBOR WOODS</b> LOTS 1-59
<b>DEVELOPER:</b> CORNERSTONE HOLDINGS, L.L.C. 7405 BUCKS HAVEN LANE HIGHLAND, MARYLAND 20777 Phone: (410)988-9146		<b>LOCATION:</b> TAX MAP 37 - PARCELS 149,405,493 & 594 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND
<b>TITLE:</b> FOREST CONSERVATION PLAN		<b>DATE:</b> January 8, 1997 MAY 23, 1997
<b>Design:</b> DAM/GWF	<b>Draft:</b> JR	<b>PROJECT NO.</b> 0675 <b>DRAWING</b> 11 OF 12

**PLAN**  
 SCALE: 1"=50'

MD DNS: Qualified Professional  
 TRUSCOK Wetland Delimitator  
 Certification # 03029330061004482  
*John P. Cassel*

**Eco-Science Professionals, Inc.**  
 CONSULTING ECOLOGISTS

P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
 CHIEF, BUREAU OF HIGHWAYS  
 6-10-97 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cindy Hamilton*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 6/17/97 DATE

*Alfred Dammann*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK  
 6/16/97 DATE



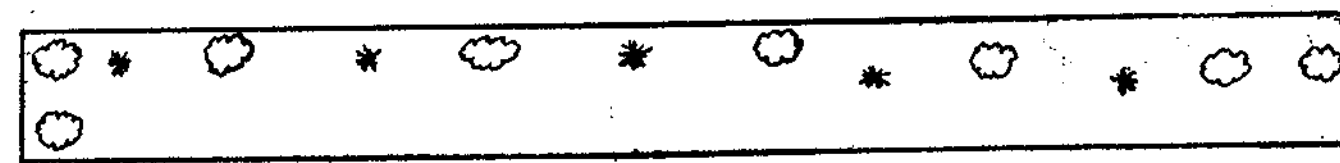
# Planting Schedule

## Forest Conservation Easement (0.4 acres) -

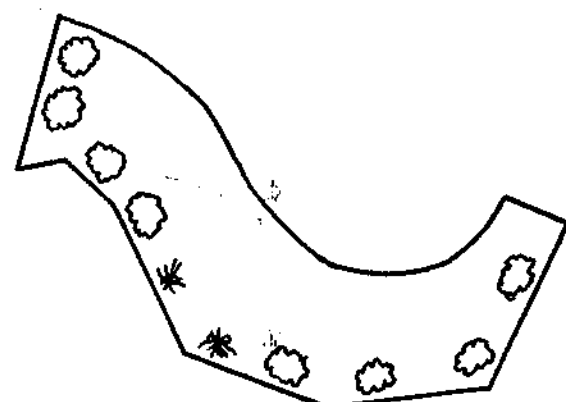
Qty.	Species	Size	Spacing
8	Liriodendron tulipifera - Poplar	1" cal.	"
7	Pinus strobus - White pine	5-6" cont.	as shown - *
8	Quercus rubra - Red oak	1" cal.	"
20	Acer rubrum - Red maple	2-3" whip	**
15	Cornus florida - Flowering dogwood	2-3" whip	**
20	Liriodendron tulipifera - Poplar	2-3" whip	**
20	Quercus rubra - Red oak	2-3" whip	**
10	Viburnum acerifolium - Blackhaw	18-24" h.t.	**
15	Viburnum prunifolium - Blackhaw	18-24" h.t.	**

- \* - Planting sites for 1" caliper stock is shown on FCE as
- Species selection for each individual planting site should be made randomly.
- \*\* - plants shall be spaced randomly eleven feet on center, not in a grid pattern
- h.t. - branched transplant; cal. - caliper; BR - bare root

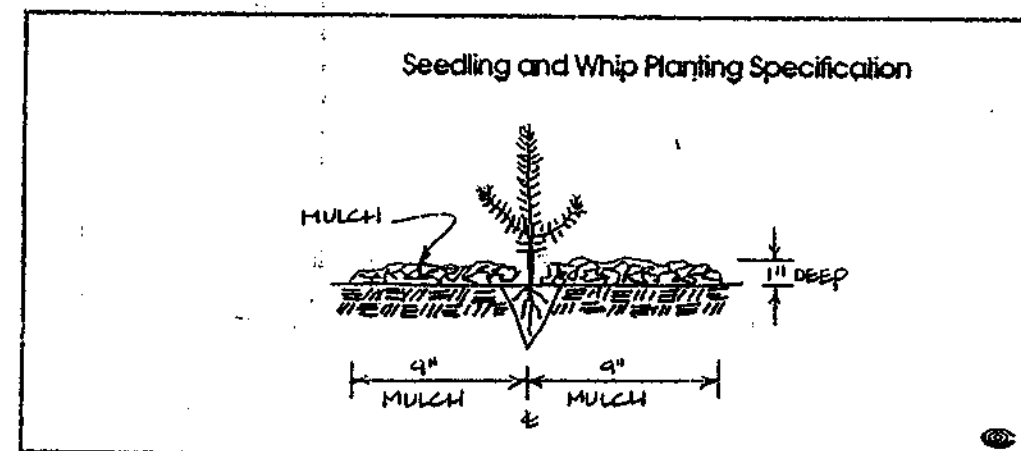
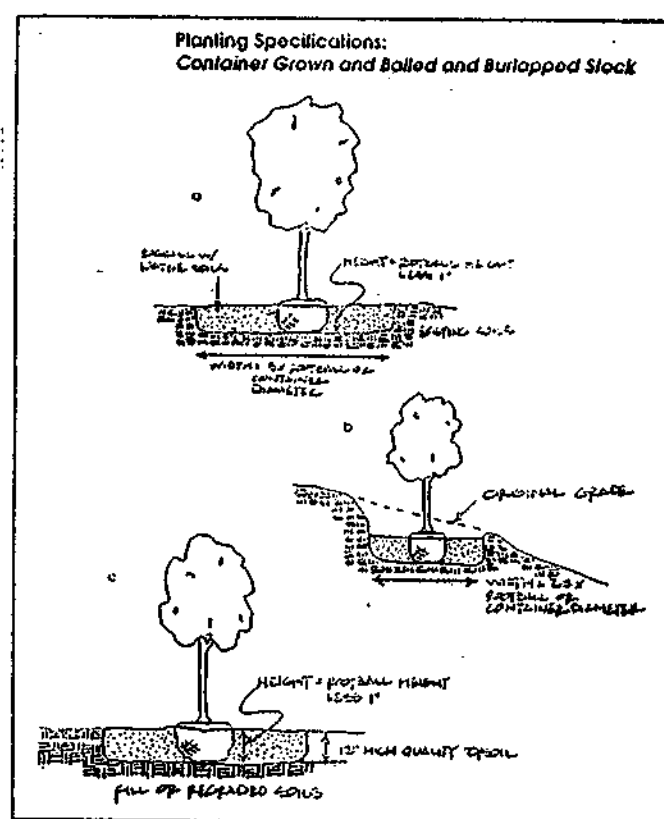
### Planting Plan Scale 1"=50'



EASEMENT NO. 4

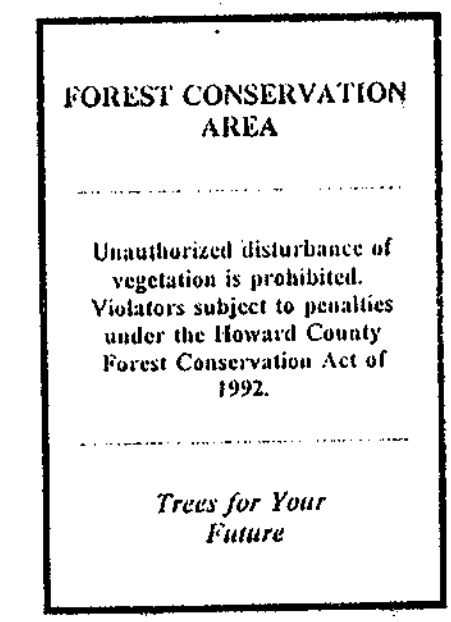


EASEMENT NO. 5

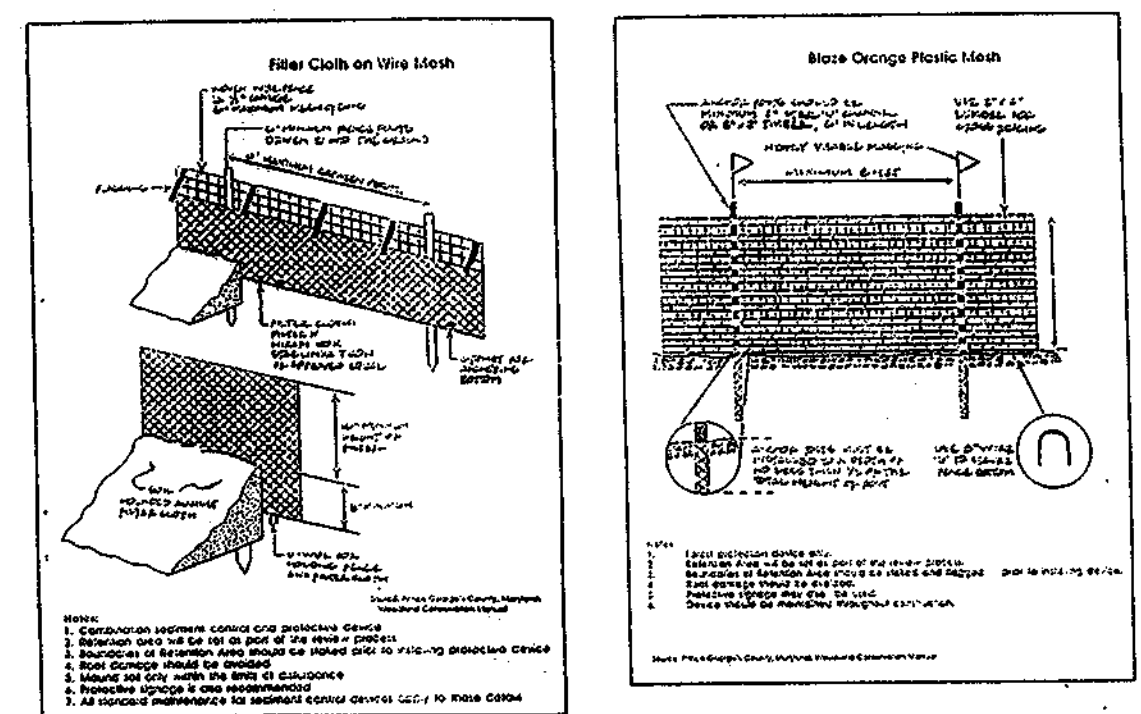


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### Permanent Protective Signage



### Temporary Protective Fencing



### Planting/Soil Specifications

- Planting of nursery stock shall take place between March 15th and April 30th.
- A twelve (12) inch layer of topsoil shall be spread over all afforestation areas impacted by site grading to assure a suitable planting area. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
- All bare-root planting stock shall have their root systems dipped into an anti-desiccant gel prior to planting.
- Plants shall be installed so that the top of root mass is level with the top of existing grade. Backfill in the planting pit shall consist of 3 parts existing soil to 1 part pine fines or equivalent.
- Fertilizer shall consist of Agriform 22-8-2, or equivalent, applied as per manufacturer's specifications.
- A two (2) inch layer of hardwood mulch shall be placed over the root area of all plantings.
- Plant material shall be transported to the site in a tarped or covered truck. Plants shall be kept moist prior to planting.
- All inorganic debris associated with the planting operation shall be removed from the site by the contractor.

### Sequence of Construction

- Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
- Upon completion of the planting, signage shall be installed as per the Forest Retention Area Protection Devices shown on Sheet 2 of the Forest Conservation Plan.
- Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

### Maintenance of Plantings

- Maintenance of plantings shall last for a period of 24 months.
- All plant material shall be watered twice a month during the 1st growing season. Watering may be more or less frequent depending on weather conditions. During second growing season, once a month during May-September, if needed.
- Invasive exotic and noxious weeds will be removed from reforestation areas. Old field successional species will be retained.
- Plants will be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
- Dead branches will be pruned from plantings.

### Guarantee Requirements

- A 75 percent survival rate of reforestation plantings will be required at the end of the 24 month maintenance period. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season. After one growing season, plant material shall be maintained at 90% survival threshold.
- The contractor will not be liable for plant loss due to theft or vandalism.

### Surety for Reforestation

- The developer shall post a surety (bond, letter of credit) to ensure that reforestation plantings are completed. Upon acceptance of the plantings by the County, the bond shall be released.

### FCP NOTES

- Any Forest Conservation Easement (FCE) area shown hereon is subject to protective covenants which may be found in the Land Records of Howard County which restrict the disturbance and use of these areas.
- Forested areas occurring outside of the FCE shall not be considered part of the FCE and shall not be subject to protective land covenants.
- Limits of disturbance shall be restricted to areas outside the limit of temporary fencing or the FCE boundary, whichever is greater.
- There shall be no clearing, grading, construction or disturbance of vegetation in the Forest Conservation Easement, except as permitted by Howard County DPZ.
- No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Conservation Easements.
- Temporary fencing shall be used to protect forest resources during construction. The fencing shall be placed along all FCE boundaries which occur within 10 feet of the proposed limits of disturbance.
- Permanent signage shall be placed 50-100' apart along the boundaries of all areas included in Forest Conservation Easements.
- Lot 47 is being created for an existing home and has been deducted from the gross site acreage.

FOREST DATA	
Gross Area:	19.9
Lots Created for Ex. Houses:	10.5
Net Tract Area (NTA):	18.4
Existing Forest (NTA):	12.1
Afforestation Threshold:	2.8
Reforestation Threshold:	3.7
Forest to be Cleared (NTA):	7.0
Forest to be Retained (NTA):	5.1
Forest to be Retained Within FCE (NTA):	5.1
Reforestation Required:	0.4
Reforestation Proposed:	0.4

NO.	DATE	REVISION

TSA GROUP, INC.  
planning • architecture • engineering  
8680 Baltimore National Pike • Ellicott City, Maryland 21043 • (410) 466-8106

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daniels*  
CHIEF, BUREAU OF HIGHWAYS  
6-10-97  
DATE

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6477 WATERLOO RD.  
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PROJECT: ARBOR WOODS  
LOTS 1-59

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Carol Hamilton*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
8/17/97  
DATE  
*Mike Demaree*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK  
4/12/97  
DATE

DEVELOPER:  
CORNERSTONE HOLDINGS L.L.C.  
7405 BUCKS HAVEN LANE  
HIGHLAND, MARYLAND 20777  
LOCATION: TAX MAP 37 - PARCELS 149,405,493 & 594  
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TITLE: FOREST CONSERVATION PLAN  
S-94-36, P. 97-01, WP-97-03  
DATE: JANUARY 6, 1997  
MAY 23, 1997  
PROJECT NO. 0675  
DRAWING 12 OF 12  
Design: DAM/GWF Draft: JR SCALE: 1"=50'

Eco-Science Professionals, Inc. CONSULTING ECOLOGISTS

P.O. Box 5006 Glen Artn, MD 21057 (410) 592-6752  
Plotted: May 22, 1998  
Acad Dwg: 301456