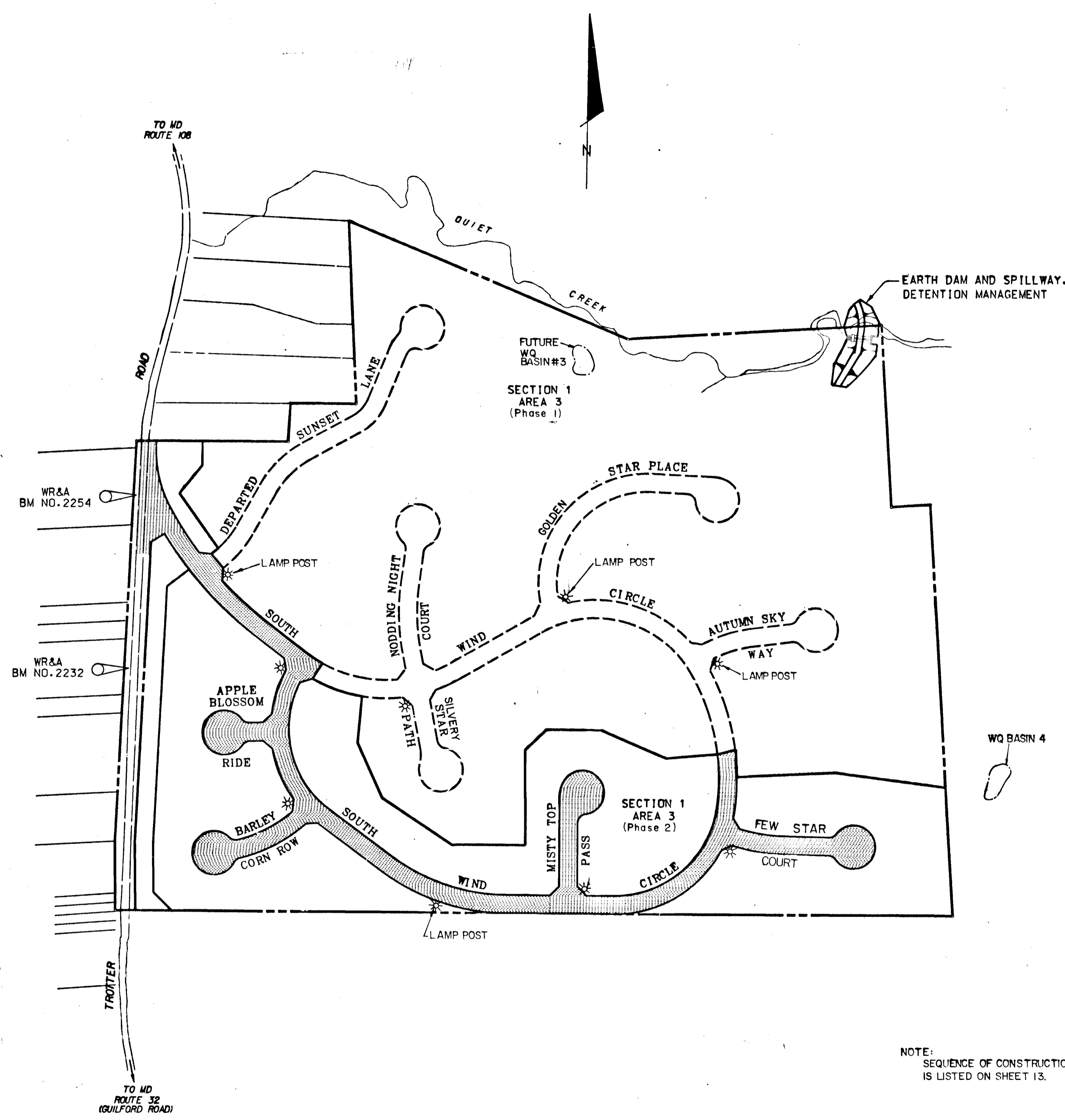


VICINITY MAP
SCALE: 1" = 2000'

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH HOWARD COUNTY STANDARDS, SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
- ALL UTILITY COMPANIES SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF CONSTRUCTION.
- ALL INLETS SHALL BE HOWARD COUNTY STANDARD UNLESS OTHERWISE SHOWN.
- ALL STREET CURB RETURNS SHALL HAVE A 30.0 RADII UNLESS OTHERWISE NOTED.
- STORM DRAIN TRENCHES WITHIN ROAD RIGHT-OF-WAY SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL, VOLUME IX.
- APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL TEST PIT EXISTING UTILITIES WHERE DIRECTED BY THE ENGINEER A MINIMUM OF TWO WEEKS IN ADVANCE OF ANY CONSTRUCTION.
- TEMPORARY COMPACTED 18" HIGH EARTH FILL DIVERSION DIKES SHALL BE CONSTRUCTED ABOVE THE LIPS OF FILL SLOPES ON THE R.O.W. CONCURRENTLY WITH THE INITIAL GRADING AND DIRECTED TO UNDISTURBED SOIL AREAS AT THE END OF EACH DAY.
- CONTRACTOR TO NOTIFY THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS AT LEAST 3 DAYS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS. TELEPHONE NO. 313-2436.
- ALL DISTURBED SLOPE AREAS TO BE STABILIZED AS SOON AS GRADING IS COMPLETED.
- ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM OF 28 DAYS STRENGTH OF 3500 P.S.I. UNLESS OTHERWISE NOTED.
- ALL SWALES AND SLOPES SHALL BE PERMANENTLY SEED. SEE THE SEED SPECIFICATIONS ON SHEET.
- TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 1988 REVISED EDITION.
- STABLENKA (FILTER CLOTH T-100) OR EQUAL SHALL BE PLACED UNDER ALL STONE RIP-RAP (FULL WIDTH AND LENGTH OF STONE).
- STONE FOR RIP-RAP SHALL BE AS SPECIFIED ON THE DRAWINGS. ALL RIP-RAP SHALL BE UNPAVED.
- LAMP POST - 100 WATT HIGH PRESSURE SODIUM VAPOR PENDANTS MOUNTED AT 14' HEIGHT ON FIBRE GLASS BRONZE POLES NO LESS THAN 3' BEHIND FACE OF CURB.
- REINFORCING STEEL SPECIFICATIONS: FY=60,000 P.S.I.

SHEET INDEX	
1	TITLE SHEET
2	PLAN AND PROFILE, SOUTH WIND CIRCLE
3	PLAN AND PROFILE, SOUTH WIND CIRCLE
4	PLAN AND PROFILE, SOUTH WIND CIRCLE AND FEW STAR COURT
5	PLAN AND PROFILE, APPLE BLOSSOM RIDE AND BARLEY CORN ROW
6	PLAN AND PROFILE, MISTY TOP PASS
7	ROADWAY DETAILS
8	ROADWAY DETAILS
9	ROADWAY DETAILS
10	STORM DRAIN PROFILES
11	STORM DRAIN PROFILES
12	STORM DRAIN DRAINAGE AREA MAP
13	SEDIMENT CONTROL DRAINAGE AREA MAP
14	GRADING - SEDIMENT CONTROL
15	GRADING - SEDIMENT CONTROL
16	GRADING - SEDIMENT CONTROL
17	SEDIMENT CONTROL DETAILS
18	EARTH DAM AND SPILLWAY, PLAN, PROFILE
19	EARTH DAM AND SPILLWAY, DETAILS
20	WQ BASIN 4
21	WQ BASIN 4
22	BORINGS
23	SWM SPECIFICATIONS
24	SWM AND WQ STAKEOUT PLANS



LOCATION MAP
SCALE: 1" = 200'

NOTE: SEQUENCE OF CONSTRUCTION IS LISTED ON SHEET 13.

STREET TREES

THE LOCATIONS AND TYPE OF TREES SHOWN ON THESE PLANS ARE TENTATIVE AND ARE USED FOR BOND PURPOSES ONLY. THE FINAL LOCATION AND VARIETY OF TREES MAY VARY TO ACCOMMODATE FIELD CONDITIONS AND BUILDERS LANDSCAPE PROGRAM. BOND RELEASE IS CONTINGENT UPON SECTION 16.131 OF THE HOWARD COUNTY SUBDIVISION REGULATIONS, AS APPROVED BY THE DEPARTMENT OF PLANNING AND ZONING.

BENCH MARKS

- WR&A BM NO. M2254 - CAP AND REBAR AT WEST SIDE EDGE OF TROTTER ROAD APPROXIMATELY 175 FEET SOUTH OF EXISTING DRIVEWAY (RHODES PROPERTY). ELEV. 409.00
- WR&A BM NO. M2232 - CAP AND REBAR AT WEST SIDE EDGE OF TROTTER ROAD APPROXIMATELY 28 FEET FROM GAS & ELECTRIC POWER POLE NO. 170221. ELEV. 430.43

DATE	NO.	REVISION
June 10, 1991	1	REMOVED DETENTION BASIN 6

COLUMBIA VILLAGE OF RIVER HILL

SECTION I AREA 3 PHASE 2

ROAD CONSTRUCTION PLANS

OWNER AND DEVELOPER
THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

COLUMBIA, MARYLAND
5TH ELECTION DISTRICT OF
HOWARD COUNTY, MARYLAND

DATE: 4/1/91 SCALE: AS SHOWN

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Oliver M. Dungan 4/17/91
CHIEF, LAND DEVELOPMENT DIVISION

Lawrence W. Williams 4/19/91
CHIEF, BUREAU OF HIGHWAYS

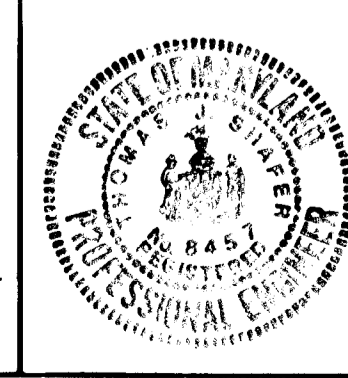
William S. King 4-17-91
CHIEF, BUREAU OF ENGINEERING

DEPARTMENT OF PLANNING AND ZONING

Thomas J. Shafer 4/23/91
CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT

WHITMAN, REQUARDT AND ASSOCIATES
ENGINEERS
2315 SAINT PAUL STREET
BALTIMORE, MARYLAND 21218

Thomas J. Shafer
THOMAS J. SHAFER
REGISTERED ENGINEER NO. 8457



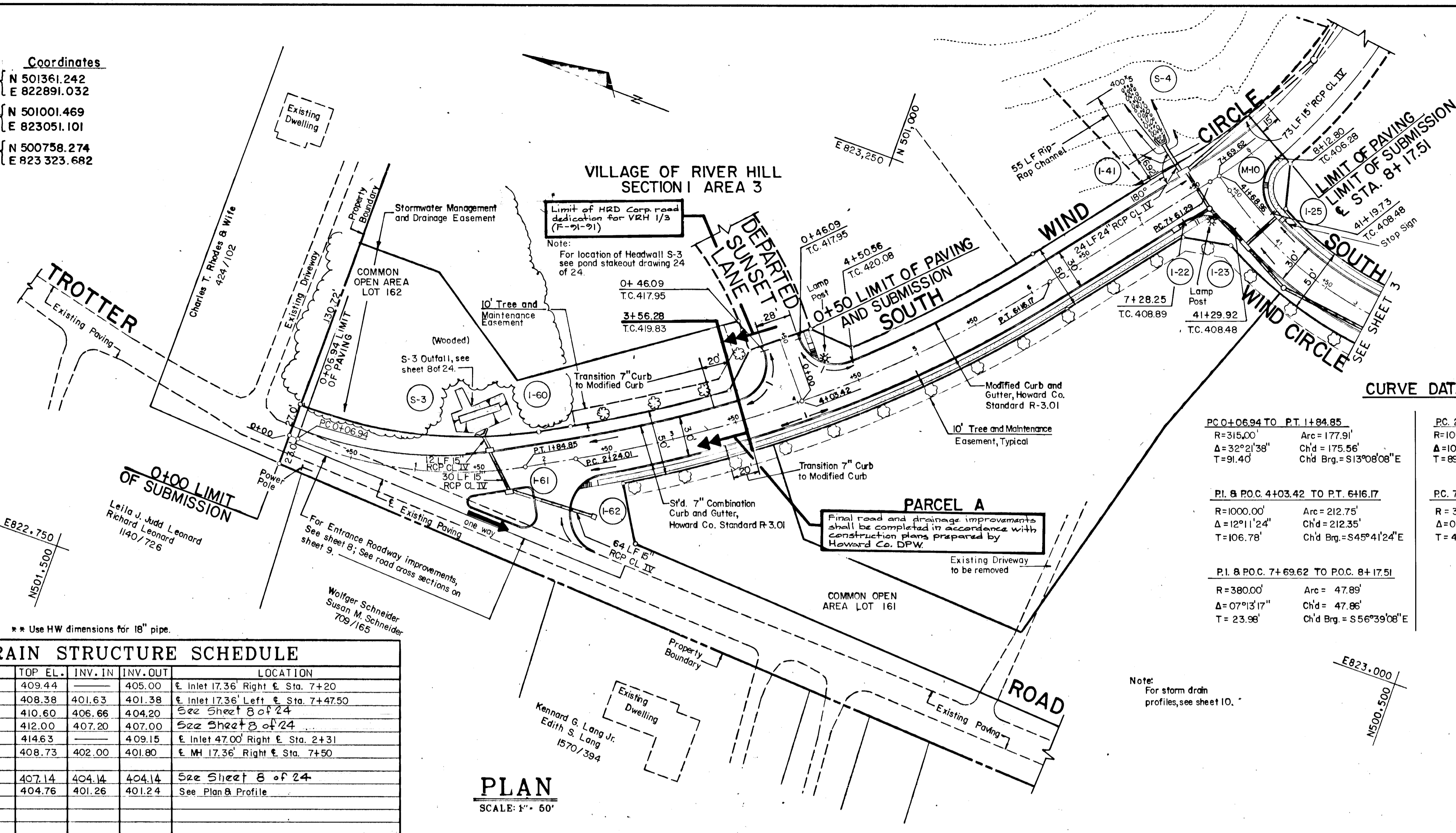
OWNER AND DEVELOPER

THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION
COLUMBIA, MARYLAND

487

John M. Langston 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE
Lawrence W. Weiland 4/19/91
 CHIEF, BUREAU OF HIGHWAYS DATE
Debra J. Brey 4-17-91
 CHIEF, BUREAU OF ENGINEERING DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Thomas J. Shafer 4/23/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE

Station	Coordinates
0+00 South Wind Circle	N 501361.242 E 822891.032
4+03.42 South Wind Circle	N 501001.469 E 823051.101
7+69.62 South Wind Circle	N 500758.274 E 823323.682



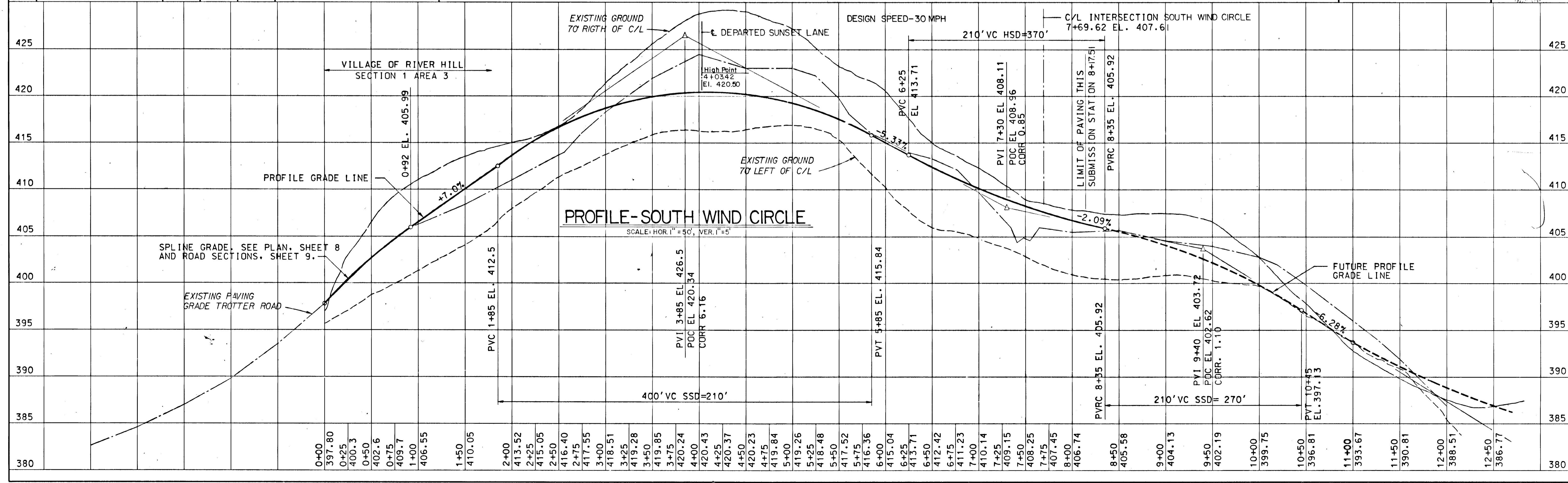
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R=315.00' Arc=177.91'	R=1000.00' Arc=179.41'
Δ=32°21'38" Ch'd=175.56'	Δ=10°16'45" Ch'd=179.17'
T=91.40' Ch'd Brg.=S13°08'08"E	T=89.94' Ch'd Brg.=S34°27'20"E
PI=8 POC=4+03.42 TO PT=616.17	PC=7+61.29 TO PT=7+69.62
R=1000.00' Arc=212.75'	R=380.00' Arc=8.33'
Δ=12°11'24" Ch'd=212.35'	Δ=0°15'24" Ch'd=8.33'
T=106.78' Ch'd Brg.=S45°41'24"E	T=4.17' Ch'd Brg.=S52°24'57"E
PI=8 POC=7+69.62 TO POC=8+17.51	
R=380.00' Arc=47.69'	
Δ=07°13'17" Ch'd=47.86'	
T=23.98' Ch'd Brg.=S56°39'08"E	

STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	TOP EL.	INV. IN	INV. OUT	LOCATION
I-22	A-5 Inlet Width 2.5' (S.D. 4.01)	409.44		405.00	£ Inlet 17.36' Right £ Sta. 7+20
I-41	A-10 Inlet Width 2.5' (S.D. 4.02)	408.38	401.63	401.38	£ Inlet 17.36' Left £ Sta. 7+47.50
I-60	A-5 Inlet Width 2.5' (S.D. 4.01)	410.60	406.66	404.20	See Sheet 8 of 24
I-61	A-5 Inlet Width 2.5' (S.D. 4.01)	412.00	407.20	407.00	See Sheet 8 of 24
I-62	Type D Inlet (S.D. 4.11)	414.63		409.15	£ Inlet 47.00' Right £ Sta. 2+31
M-10	Standard Manhole (6 5.01)	408.73	402.00	401.80	£ MH 17.36' Right £ Sta. 7+50
S-3	Type "A" Headwall (S.D. 5.41)	407.14	404.14	404.14	See Sheet 8 of 24
S-4	Type "A" Headwall (S.D. 5.11)	404.76	401.26	401.24	See Plan & Profile

PLAN
SCALE: 1" = 50'



PROFILE-SOUTH WIND CIRCLE
SCALE: HOR. 1" = 50', VER. 1" = 5'

REV. DATE	REV. NO.	REVISION DESCRIPTION
June 12, 1991	1	Removed Basin 6, Revised Outfall S-3
		Revised R/W Line Trotter Rd./South Wind Circle

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND
 OWNER AND DEVELOPER
 THE HOWARD RESEARCH
 AND DEVELOPMENT CORPORATION
 PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION 1 AREA 3 PHASE 2
 PROJECT TITLE:
 PLAN AND PROFILE
 SOUTH WIND CIRCLE
 SCALE: AS SHOWN DATE: 4/1/91
 WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218
Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457

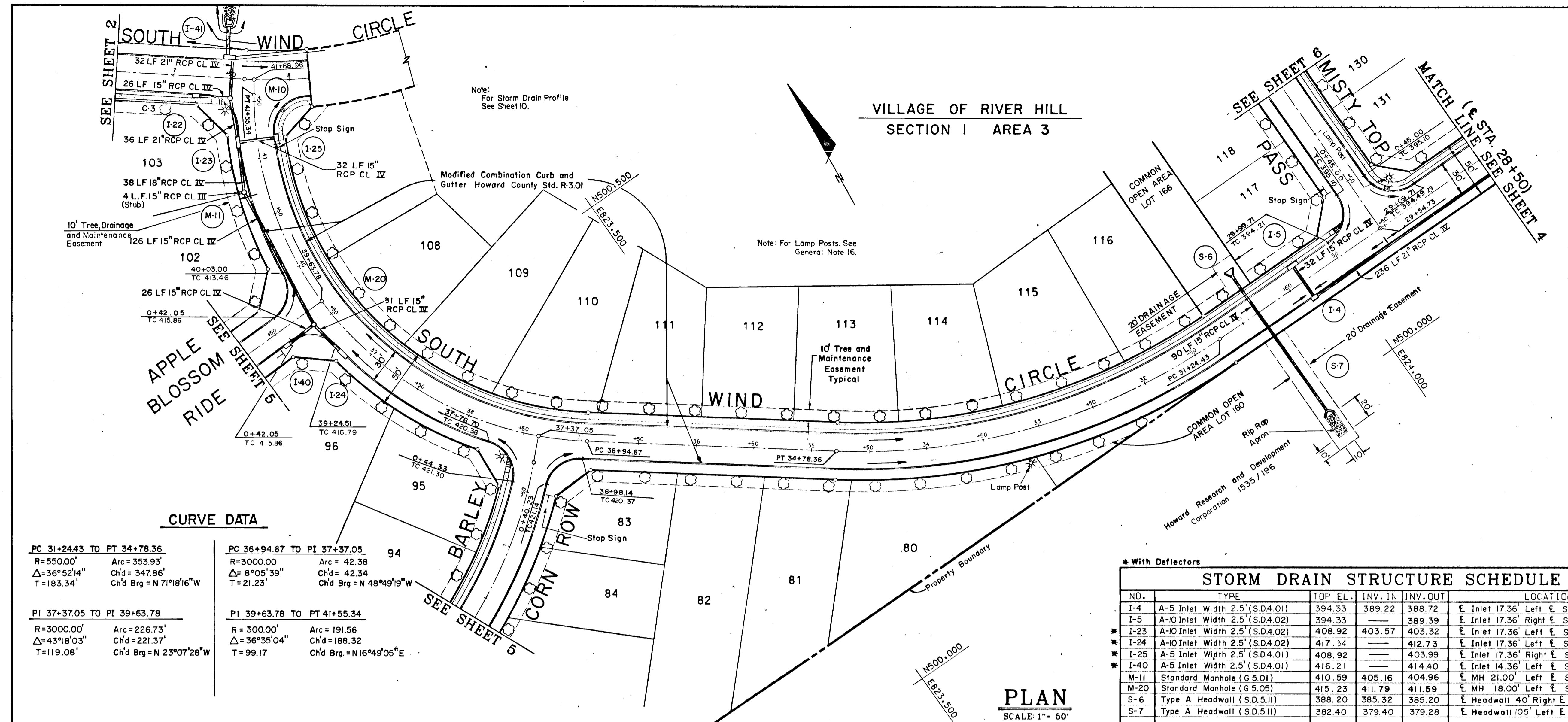
1-787

Thomas J. Shafer 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE
Arwelle W. Weiland 4/19/91
 CHIEF, BUREAU OF HIGHWAYS DATE
Robert B. S. S. 4-17-91
 CHIEF, BUREAU OF ENGINEERING DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark J. Taylor 3/21/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE

Station	Coordinates
39+63.78 South Wind Circle	N 500 566.870 E 823 261.363
37+37.05 South Wind Circle	N 500 363.230 E 823 348.300
29+54.73 South Wind Circle	N 500 092.566 E 824 051.824

Nov. 7, 1991	1	Revised 15" RCP, S-7 to S-6
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA		
5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2		
PROJECT TITLE: PLAN AND PROFILE SOUTH WIND CIRCLE		
SCALE: AS SHOWN		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

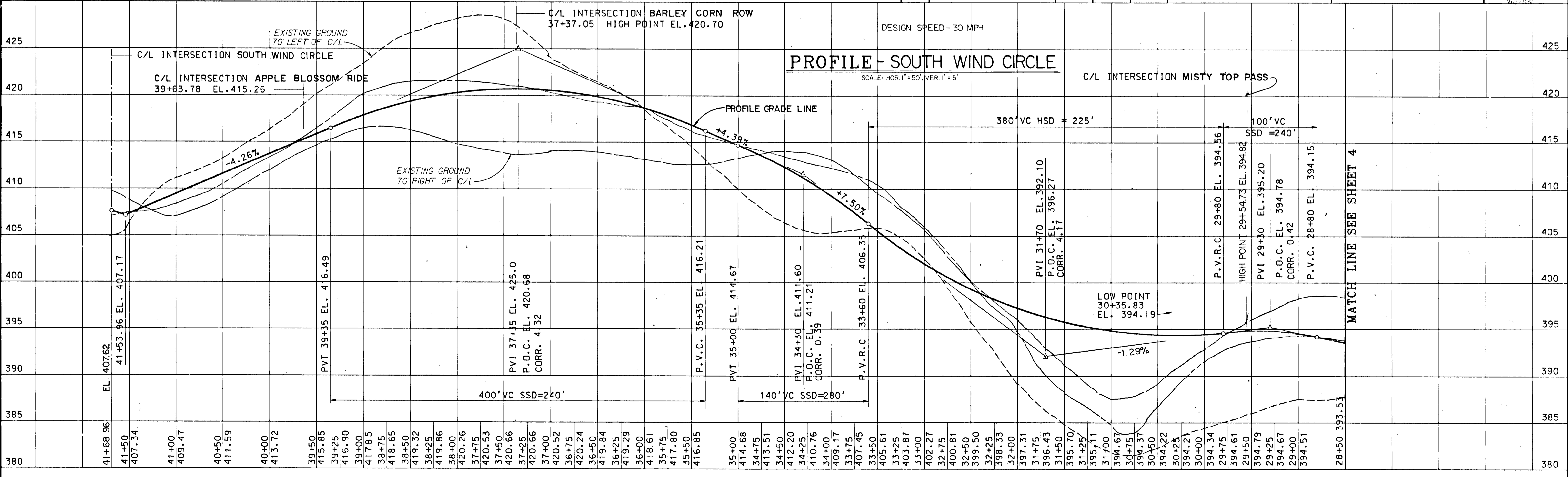


CURVE DATA

PC 31+24.43 TO PT 34+78.36 R=550.00' Arc=353.93' Δ=36°52'14" Ch'd=347.86' T=183.34' Ch'd Brg=N 71°0'16"W	PC 36+94.67 TO PT 37+37.05 R=3000.00 Arc=42.38' Δ=8°05'39" Ch'd=42.34' T=21.23' Ch'd Brg=N 48°49'19"W
PI 37+37.05 TO PI 39+63.78 R=3000.00' Arc=226.73' Δ=43°18'03" Ch'd=221.37' T=119.08' Ch'd Brg=N 23°07'28"W	PI 39+63.78 TO PT 41+55.34 R=300.00' Arc=191.56' Δ=36°35'04" Ch'd=188.32' T=99.17' Ch'd Brg=N 16°49'05"E

STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	TOP EL.	INV. IN	INV. OUT	LOCATION
I-4	A-5 Inlet Width 2.5' (S.D.4.01)	394.33	389.22	388.72	€ Inlet 17.36' Left € Sta. 30+35.83
I-5	A-10 Inlet Width 2.5' (S.D.4.02)	394.33	—	389.39	€ Inlet 17.36' Right € Sta. 30+35.83
I-23	A-10 Inlet Width 2.5' (S.D.4.02)	408.92	403.57	403.32	€ Inlet 17.36' Left € Sta. 41+16.
I-24	A-10 Inlet Width 2.5' (S.D.4.02)	417.34	—	412.73	€ Inlet 17.36' Left € Sta. 39+18
I-25	A-5 Inlet Width 2.5' (S.D.4.01)	408.92	—	403.99	€ Inlet 17.36' Right € Sta. 41+16
I-40	A-5 Inlet Width 2.5' (S.D.4.01)	416.21	—	414.40	€ Inlet 14.36' Left € Sta. 0+47
M-11	Standard Manhole (G.S.01)	410.59	405.16	404.96	€ MH 21.00' Left € Sta. 40+75
M-20	Standard Manhole (G.S.05)	415.23	411.79	411.59	€ MH 18.00' Left € Sta. 39+52
S-6	Type A Headwall (S.D.5.11)	388.20	385.32	385.20	€ Headwall 40' Right € Sta. 30+84
S-7	Type A Headwall (S.D.5.11)	382.40	379.40	379.28	€ Headwall 105' Left € Sta. 30+84



1487

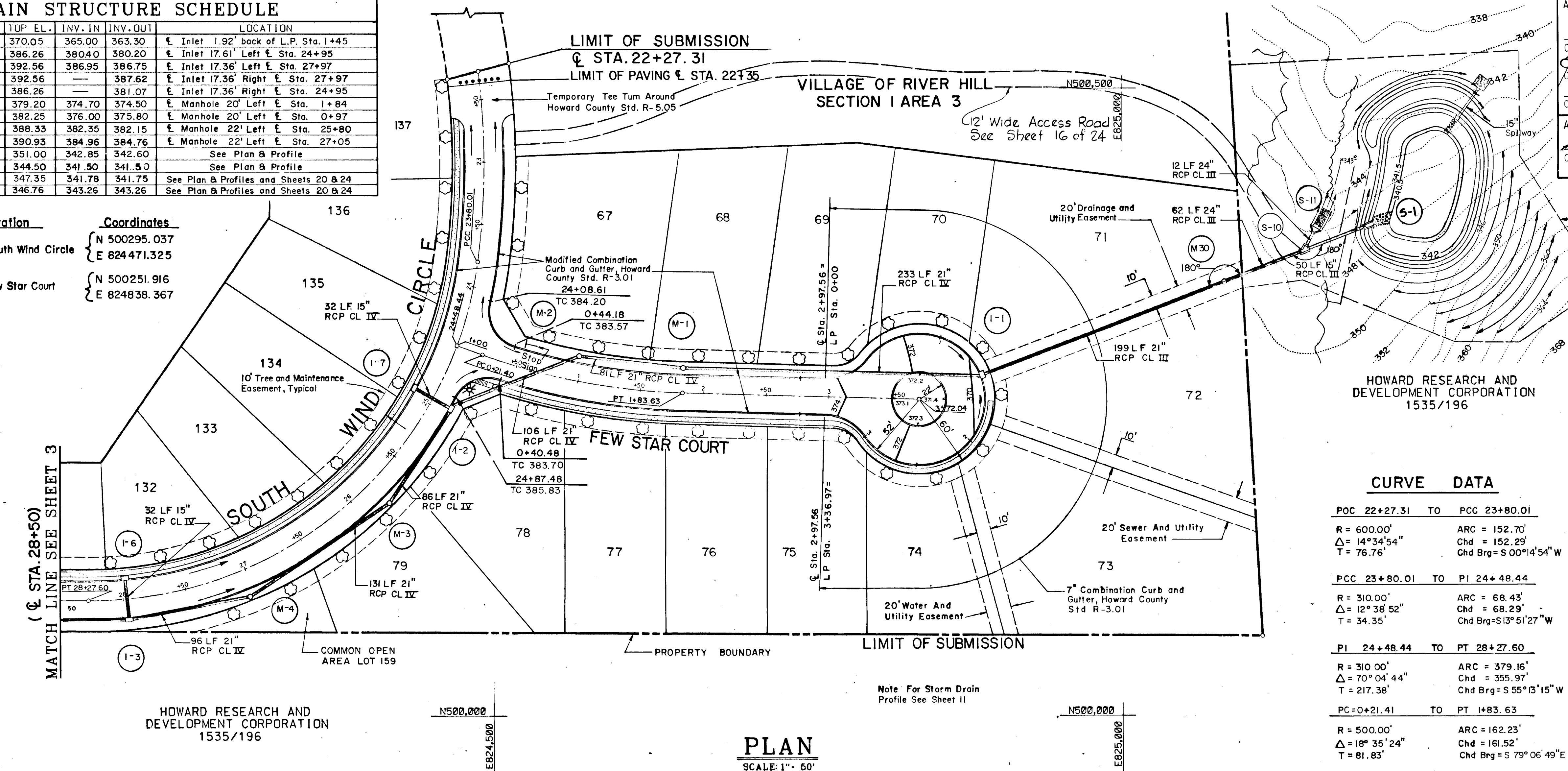
STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	TOP EL.	INV. IN	INV. OUT	LOCATION
I-1	A-5 Inlet Width 2.5' (S.D.4.01)	370.05	365.00	363.30	€ Inlet 1.92' back of L.P. Sta. 1+45
I-2	A-5 Inlet Width 3.0' (S.D.4.01)	386.26	380.40	380.20	€ Inlet 17.61' Left € Sta. 24+95
I-3	A-5 Inlet Width 2.5' (S.D.4.01)	392.56	386.95	386.75	€ Inlet 17.36' Left € Sta. 27+97
I-6*	A-5 Inlet Width 2.5' (S.D.4.01)	392.56	—	387.62	€ Inlet 17.36' Right € Sta. 27+97
I-7*	A-5 Inlet Width 2.5' (S.D.4.01)	386.26	—	381.07	€ Inlet 17.36' Right € Sta. 24+95
M-1	Standard Manhole (G5.05)	379.20	374.70	374.50	€ Manhole 20' Left € Sta. 1+84
M-2	Standard Manhole (G5.01)	382.25	376.00	375.80	€ Manhole 20' Left € Sta. 0+97
M-3	Standard Manhole (G5.01)	388.33	382.35	382.15	€ Manhole 22' Left € Sta. 25+80
M-4	Standard Manhole (G5.01)	390.93	384.96	384.76	€ Manhole 22' Left € Sta. 27+05
M-30	Standard Manhole (G5.41)	351.00	342.85	342.60	See Plan & Profile
S-1	Type "O" Headwall (S.D.4.41)	344.50	341.50	341.50	See Plan & Profile
S-10	Special Structure, See Sheet 8	347.35	341.78	341.75	See Plan & Profiles and Sheets 20 & 24
S-11	Standard "A" Headwall (S.D.5.11)	346.76	343.26	343.26	See Plan & Profiles and Sheets 20 & 24

* INLETS WITH DEFLECTORS

Station	Coordinates
24+48.44 South Wind Circle	N 500295.037 E 824471.325
3+72.04 Few Star Court	N 500251.916 E 824838.367

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, Land Development Division
 Draville W. Welwood
 Chief, Bureau of Highways
 Approved: DEPARTMENT OF PLANNING AND ZONING
 Chief, Division of Community Planning and Land Development
 Date: 4/1/91



CURVE DATA

PCC 22+27.31 TO PCC 23+80.01	ARC = 152.70'
R = 600.00'	Chd = 152.29'
Δ = 14°34'54"	Chd Brg = S 00°14'54" W
T = 76.76'	
PCC 23+80.01 TO PI 24+48.44	ARC = 68.43'
R = 310.00'	Chd = 68.29'
Δ = 12°38'52"	Chd Brg = S 13°51'27" W
T = 34.35'	
PI 24+48.44 TO PT 28+27.60	ARC = 379.16'
R = 310.00'	Chd = 355.97'
Δ = 70°04'44"	Chd Brg = S 55°13'15" W
T = 217.38'	
PC=0+21.41 TO PT 1+83.63	ARC = 162.25'
R = 500.00'	Chd = 161.52'
Δ = 18°35'24"	Chd Brg = S 79°06'49" E
T = 81.83'	

REV. DATE	REV. NO.	REVISION DESCRIPTION

COLUMBIA
5TH ELECTION DISTRICT
HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

PROJECT AREA:
VILLAGE OF RIVER HILL
SECTION I AREA 3 PHASE 2

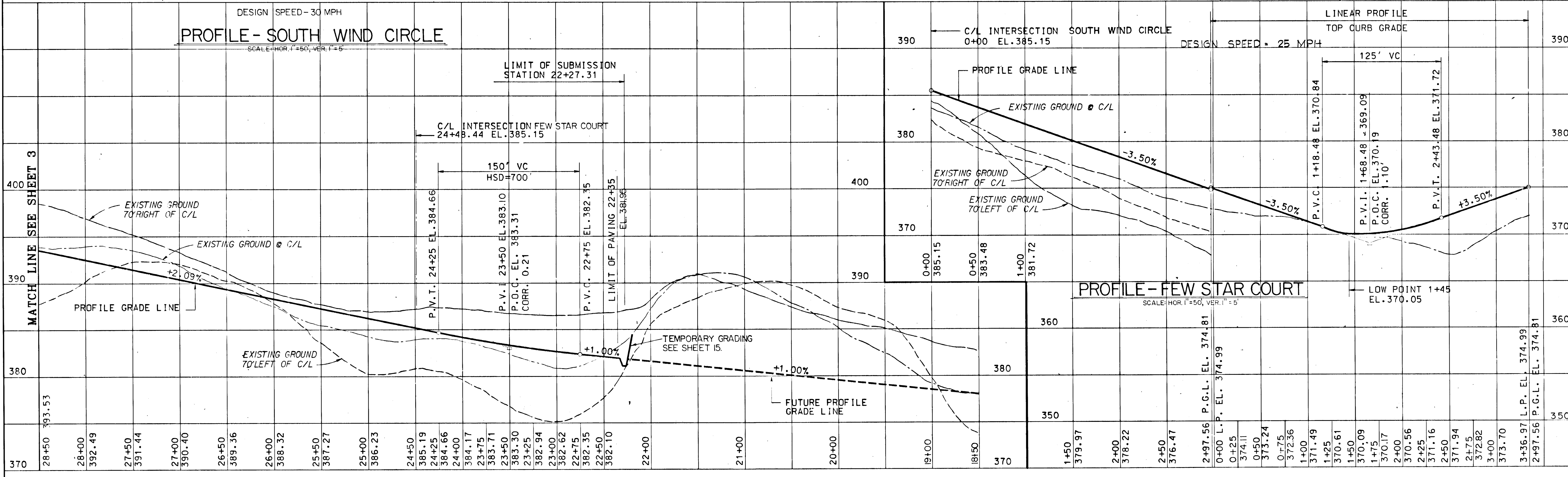
PROJECT TITLE:
PLAN AND PROFILE
SOUTH WIND CIRCLE, FEW STAR COURT

SCALE: AS SHOWN DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
ENGINEERS
BALTIMORE, MARYLAND 21218

Thomas J. Shafer
THOMAS J. SHAFER
REGISTERED ENGINEER
NO. 8457

PROFILE - SOUTH WIND CIRCLE
SCALE: HOR. 1" = 50', VER. 1" = 5'

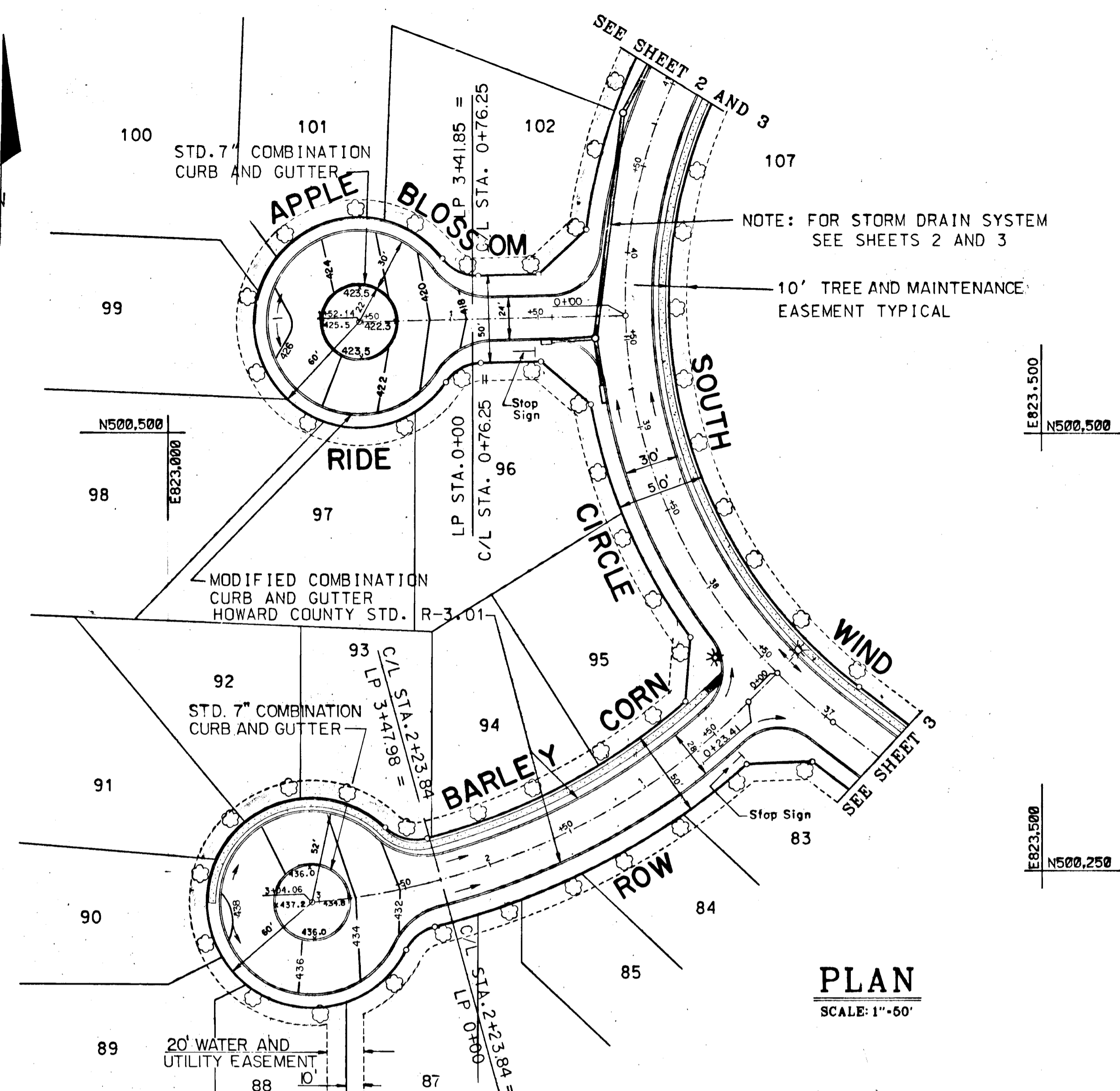


PROFILE - FEW STAR COURT
SCALE: HOR. 1" = 50', VER. 1" = 5'

1487

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
John M. Pongan 4/1/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE
Lawrence W. Wilbeard 4/9/91
 CHIEF, BUREAU OF HIGHWAYS DATE
Kenneth E. Ryan 4-17-91
 CHIEF, BUREAU OF ENGINEERING SH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Paul J. Taylor 4/22/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE

± Road Station Coordinates
 1+52.14 Apple Blossom Ride N 500562.956
 E 823109.273
 3+04.06 Barley Corn Row N 500232.030
 E 823081.855



CURVE DATA

PC 0+23.41	TO 3+04.06
R= 400.00'	ARC= 280.65
R= 40° 12' 03"	CHD= 274.93
T= 146.38'	CHD. BRG. S65° 19' 31" W

PLAN
 SCALE: 1"=50'

REV. DATE	REV. NO.	REVISION DESCRIPTION
June 10, 91	1	Revised Linear Profiles

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

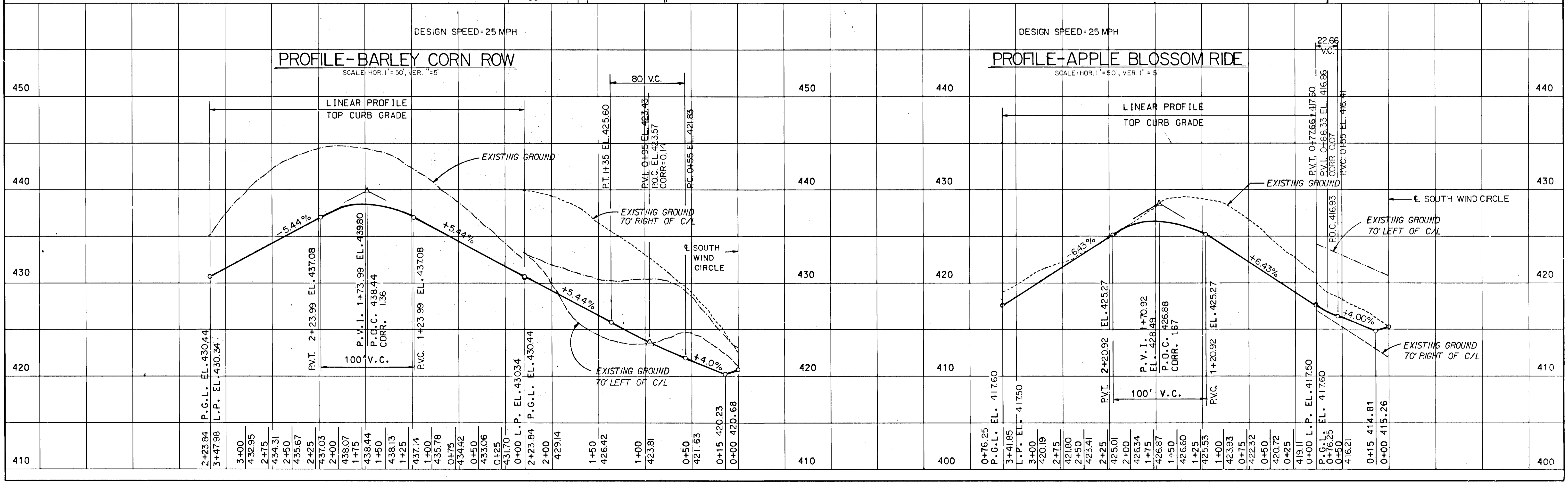
PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION 1 AREA 3 PHASE 2

PROJECT TITLE:
 PLAN AND PROFILE
 BARLEY CORN ROW
 APPLE BLOSSOM RIDE

SCALE: AS SHOWN DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

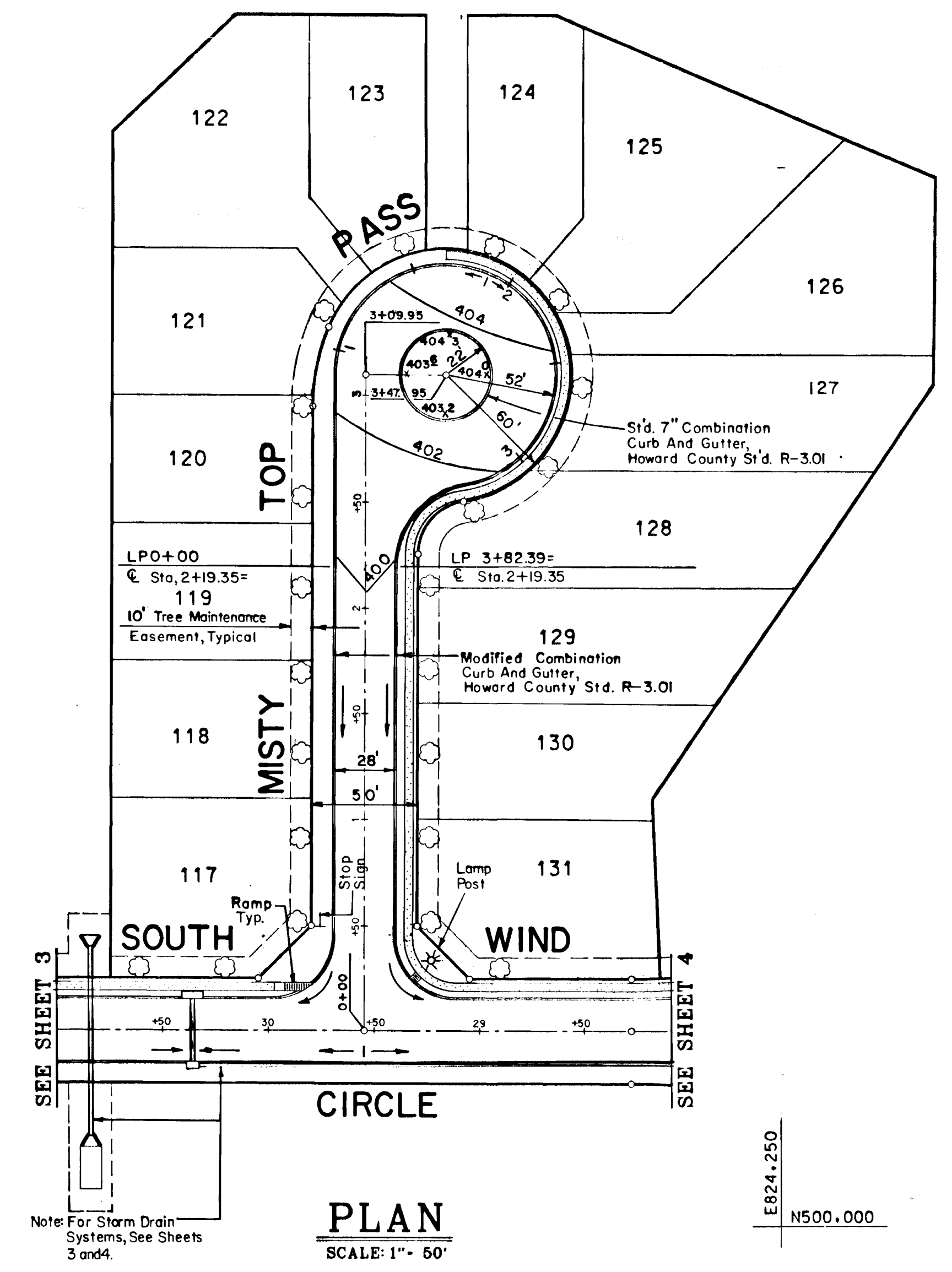
Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457



1487

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, LAND DEVELOPMENT DIVISION *Alan M. Ferguson* 4/17/91
 Chief, BUREAU OF HIGHWAYS *Donna W. Wehlauf* 4/19/91
 Chief, BUREAU OF ENGINEERING *John S. H.* 4-17-91
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT *Wm* 4/23/91

⚡ Road Station Coordinates
 3+09.95 Misty Top Pass N 500402.515
 E 824053.232



E823.750
 N500.500

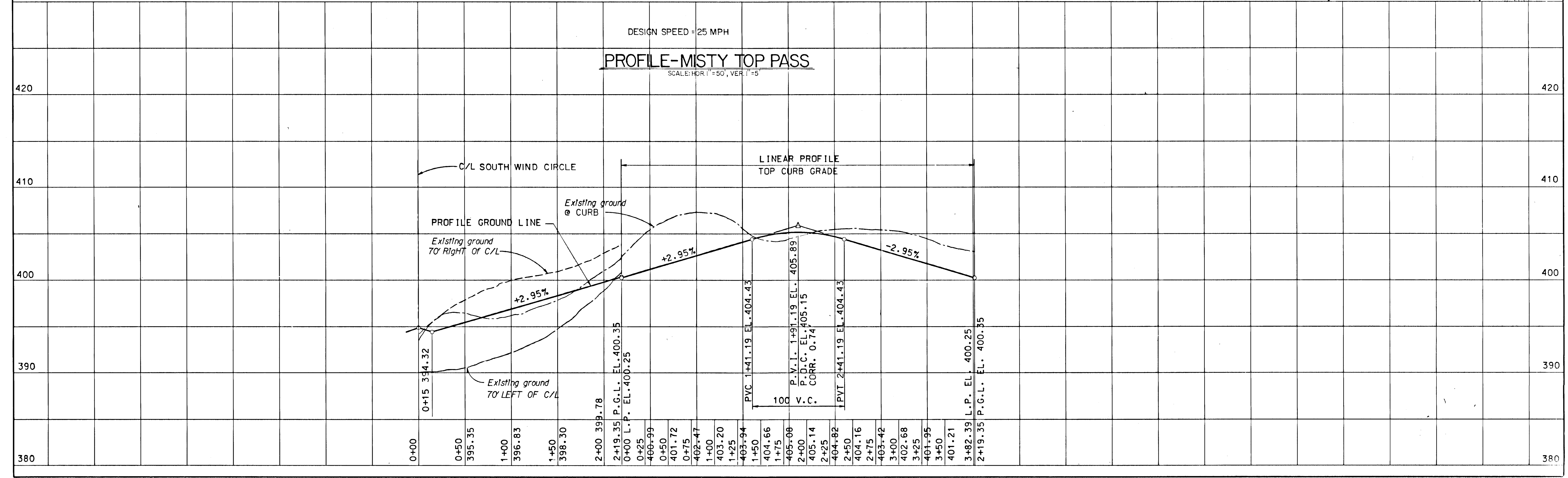
E823.750
 N500.000

E824.250
 N500.000

REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2 PROJECT TITLE: PLAN AND PROFILE MISTY TOP PASS SCALE: AS SHOWN DATE: 4/1/91 WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218 <i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

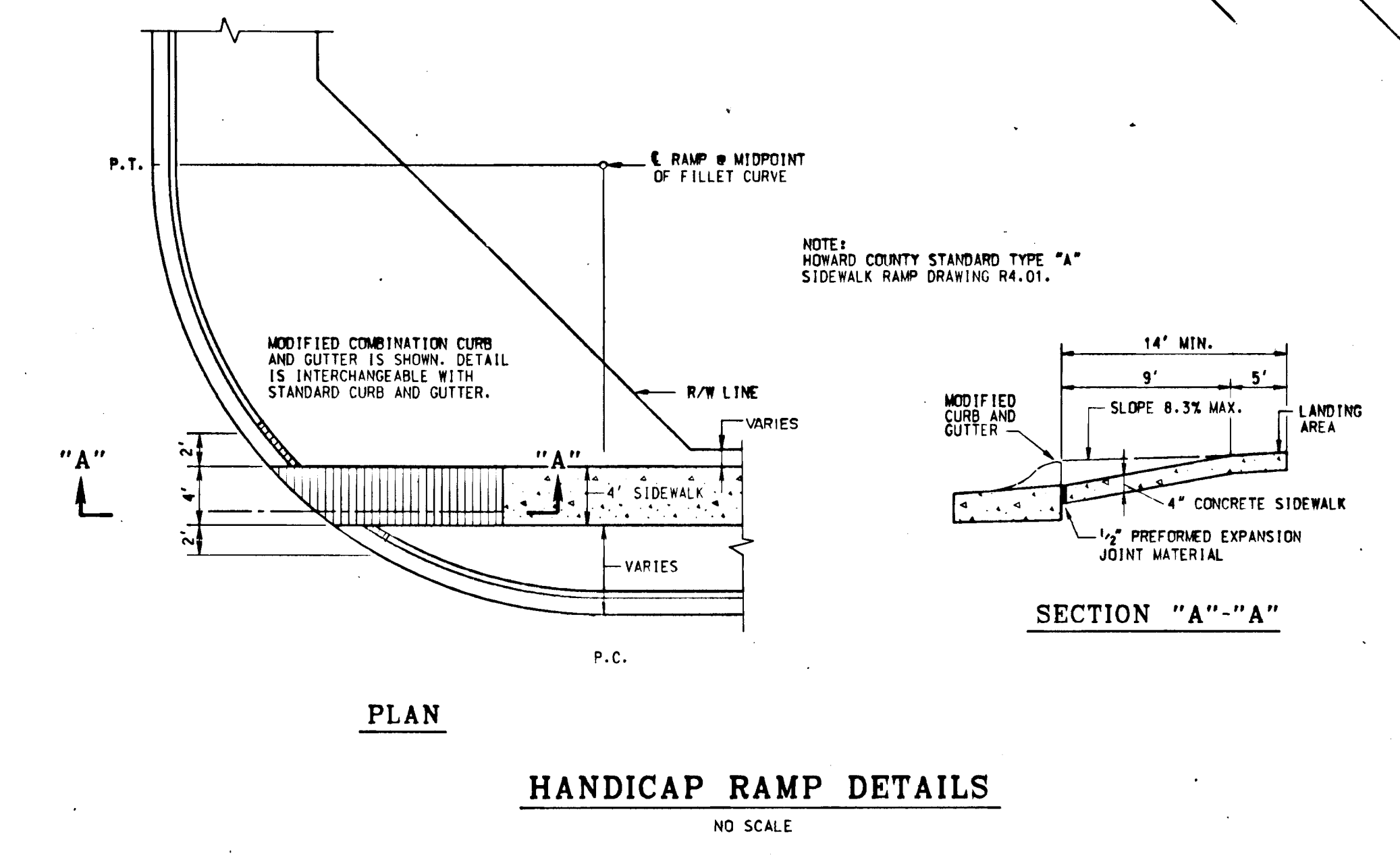
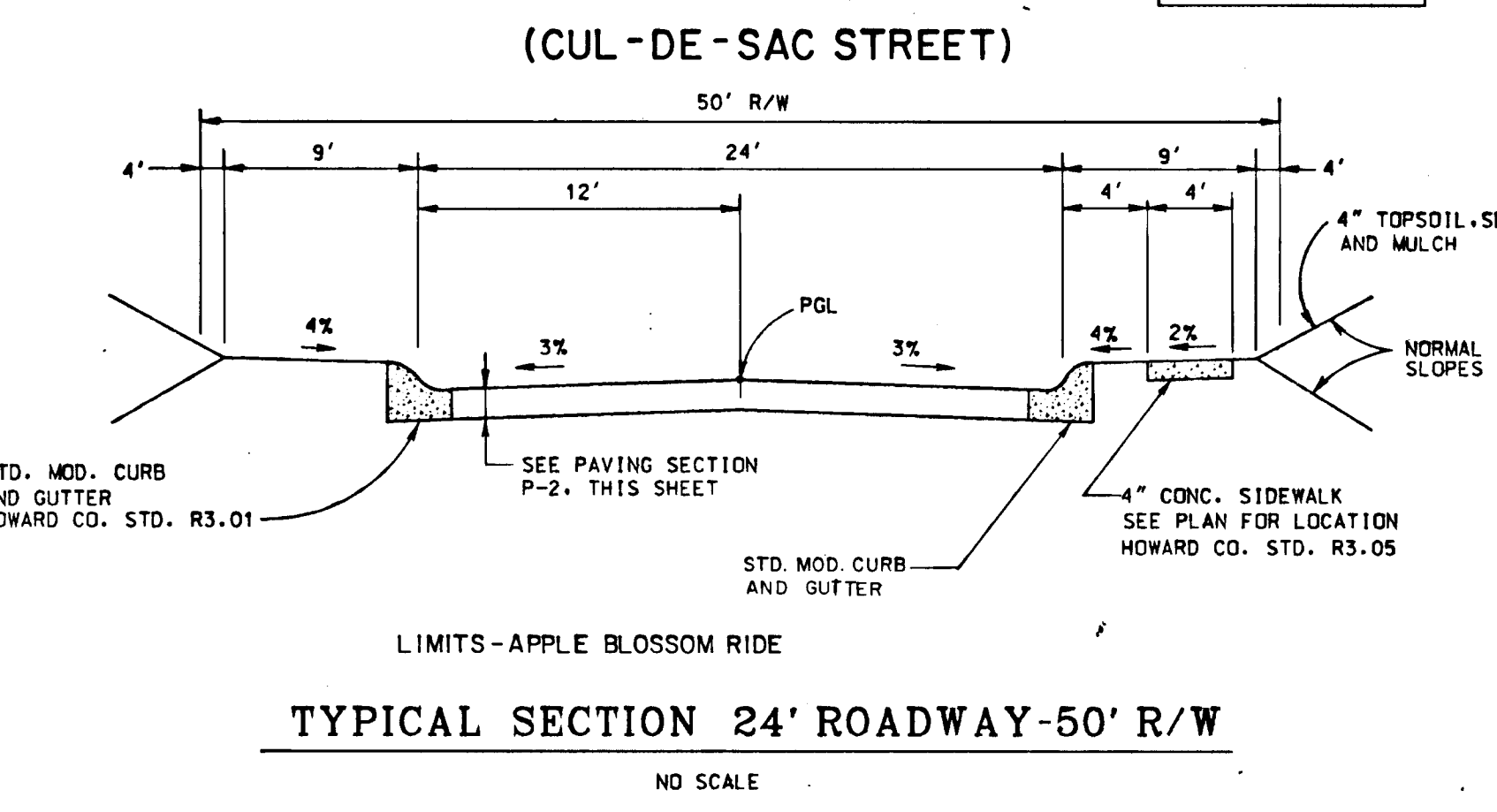
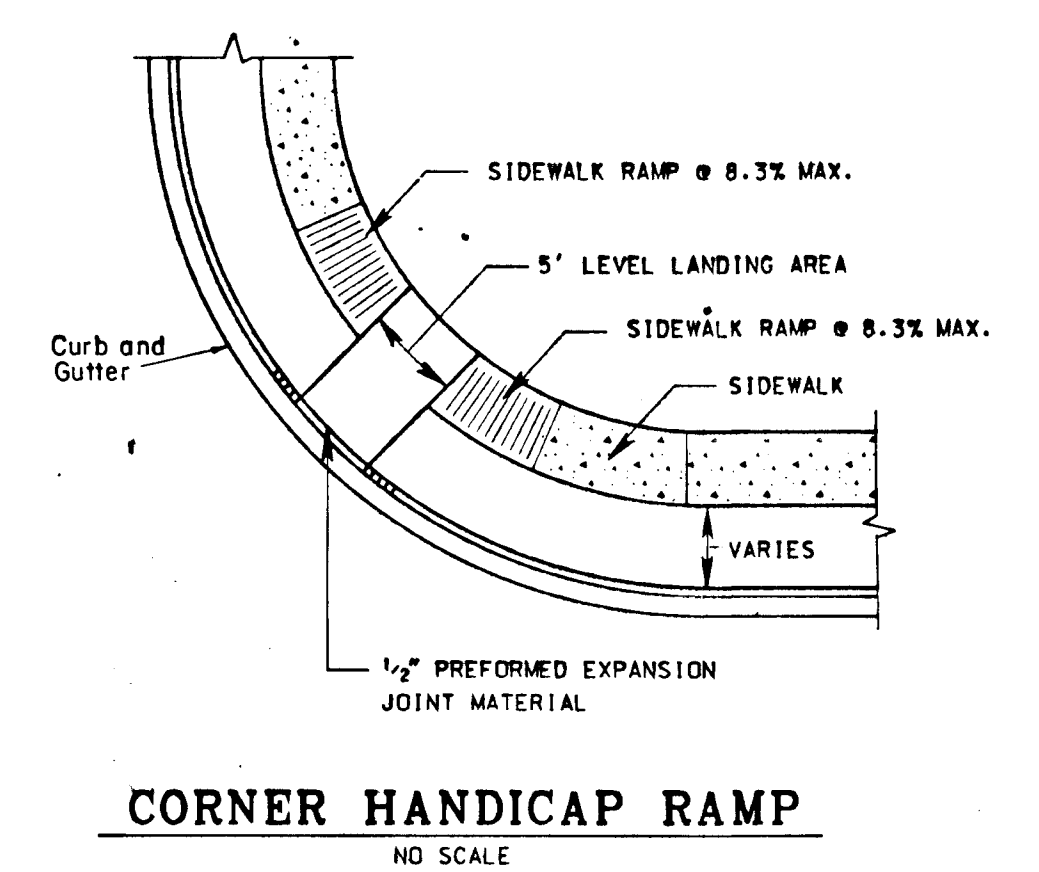
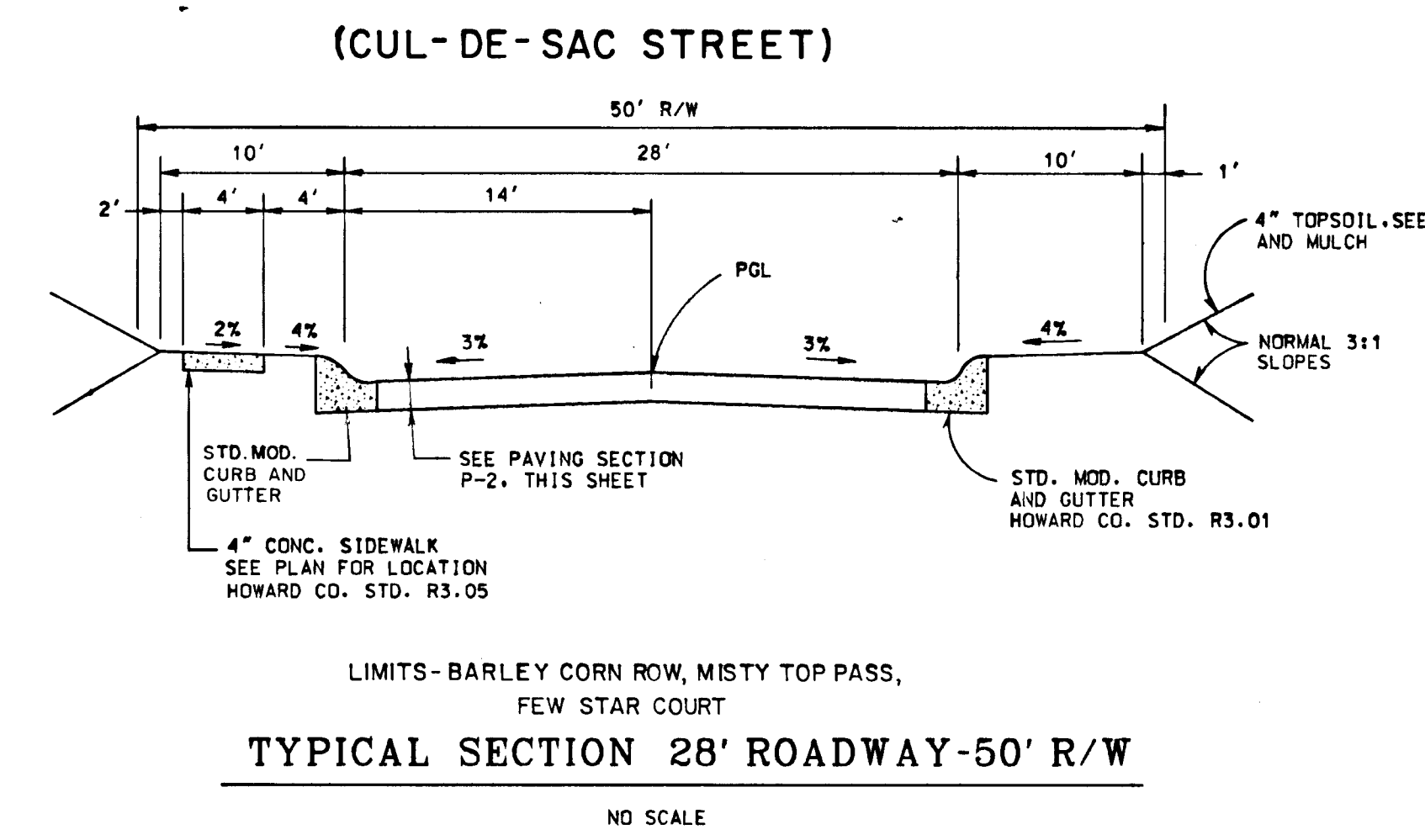
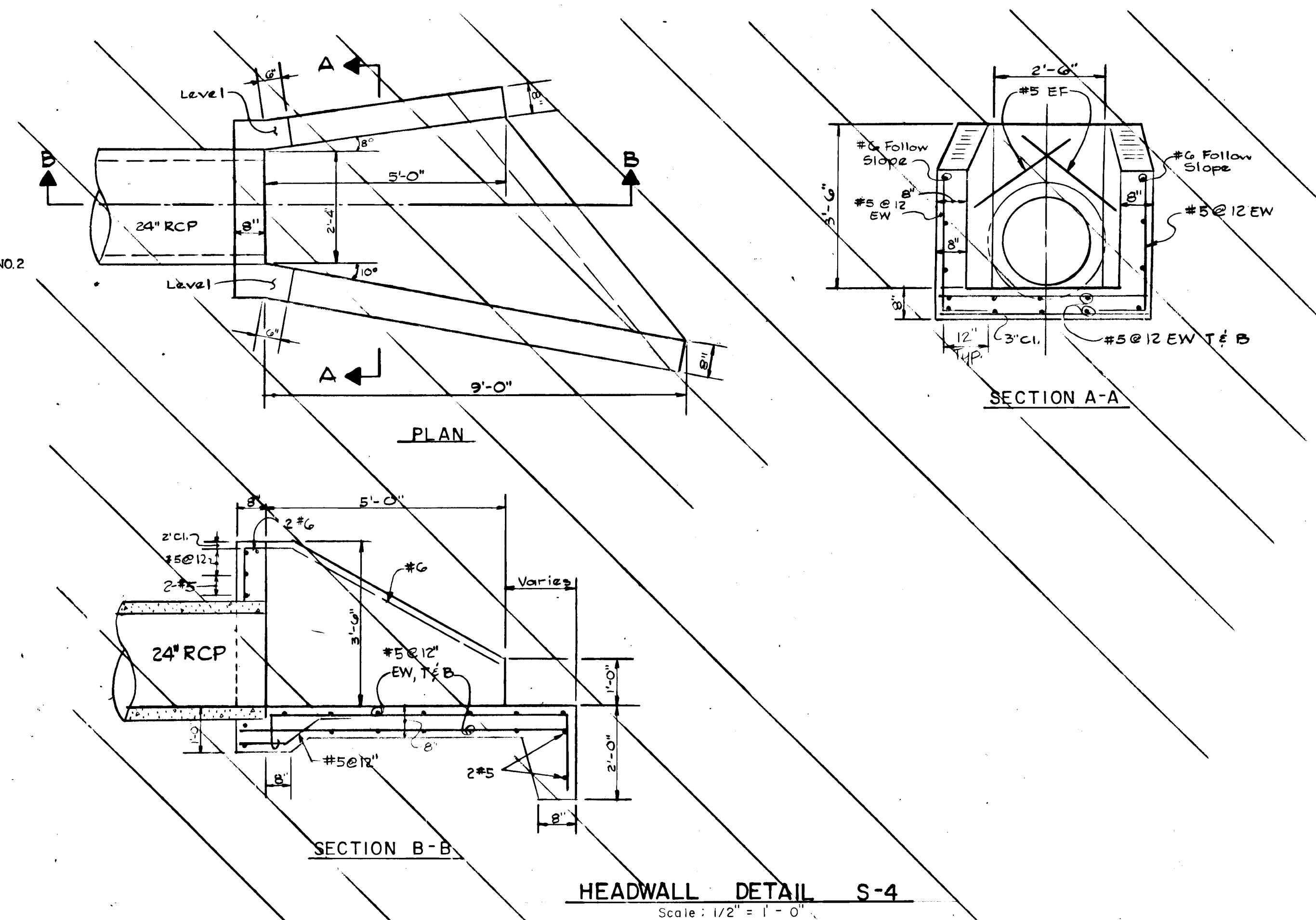
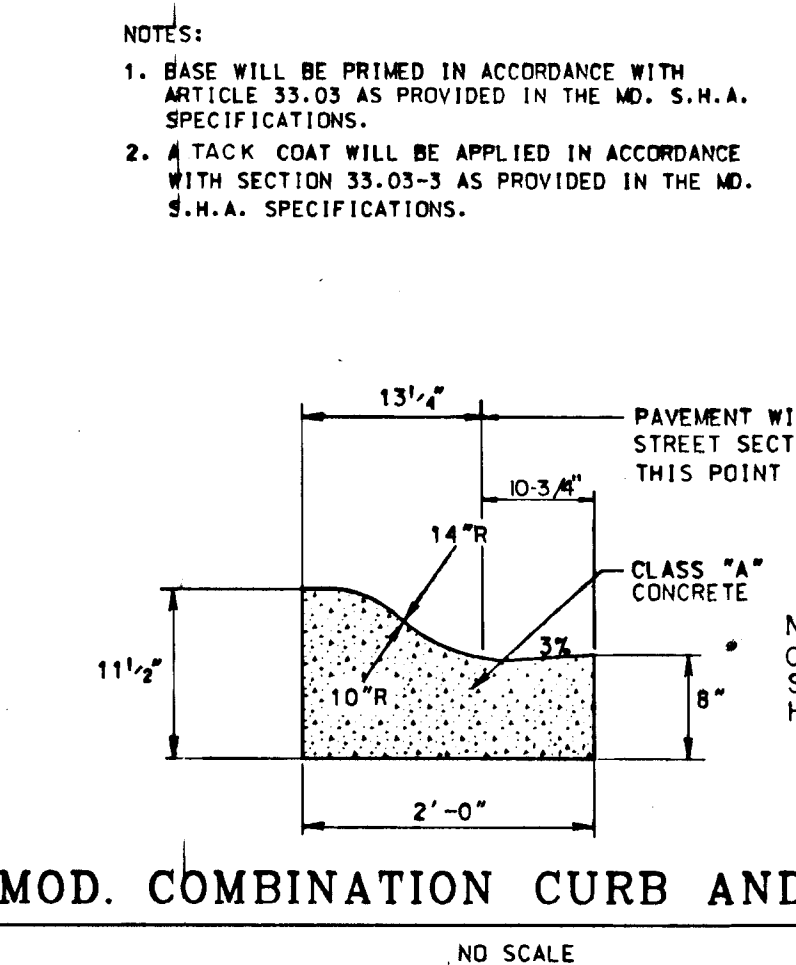
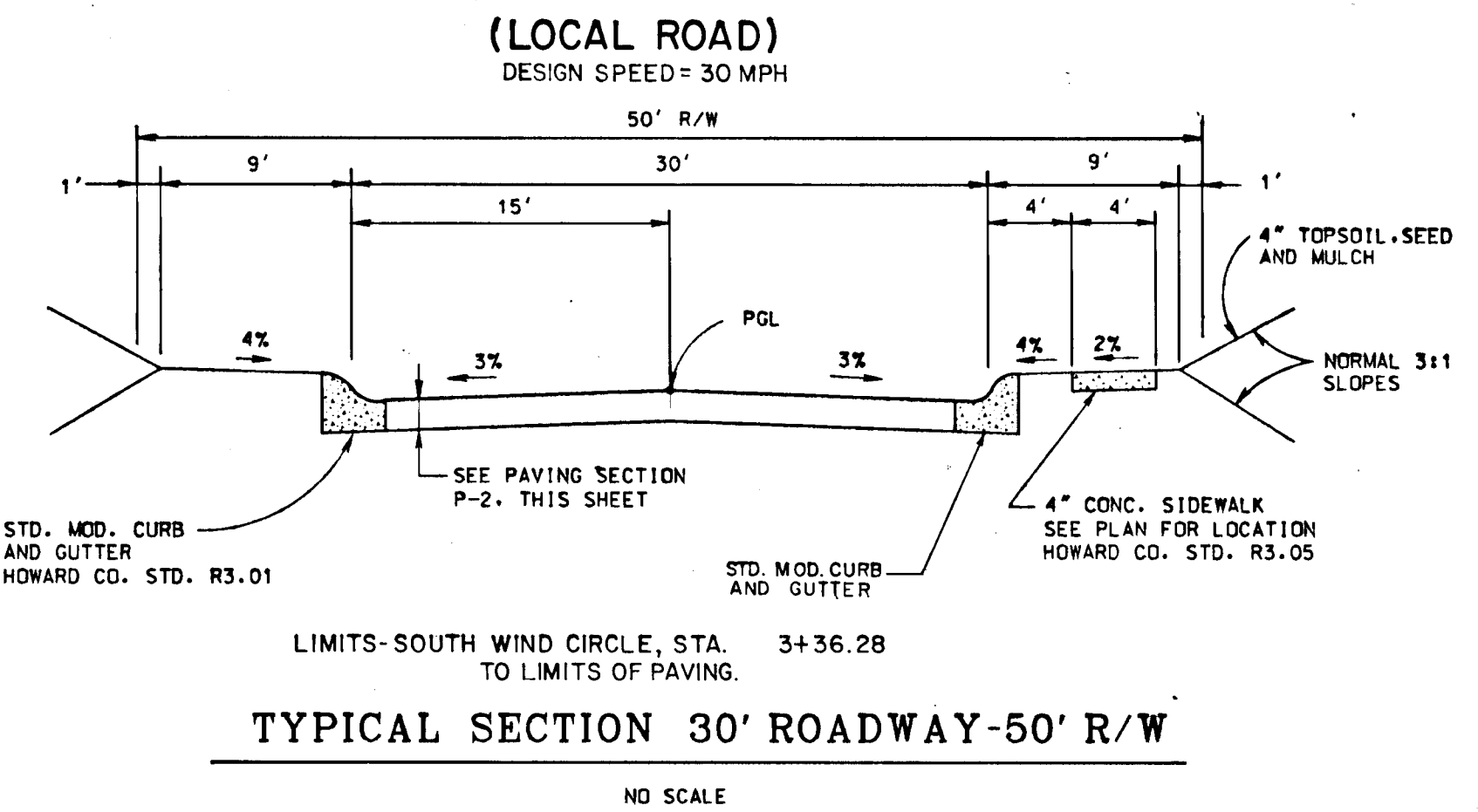
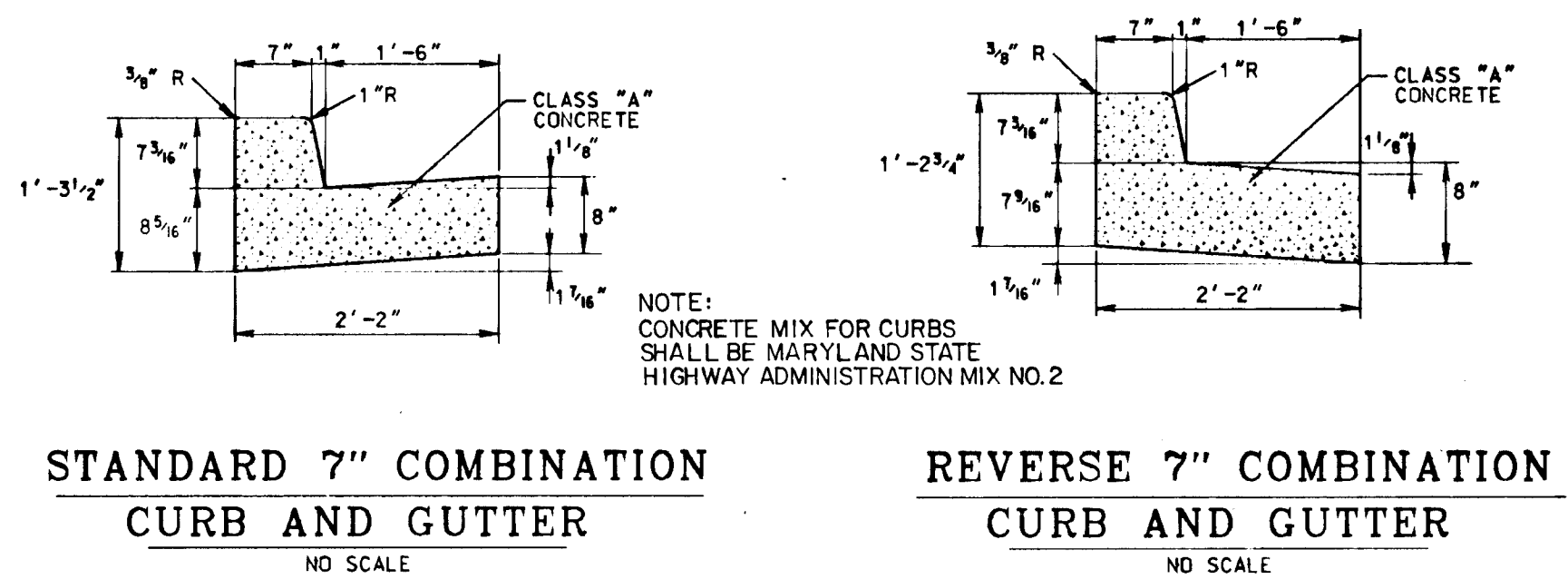
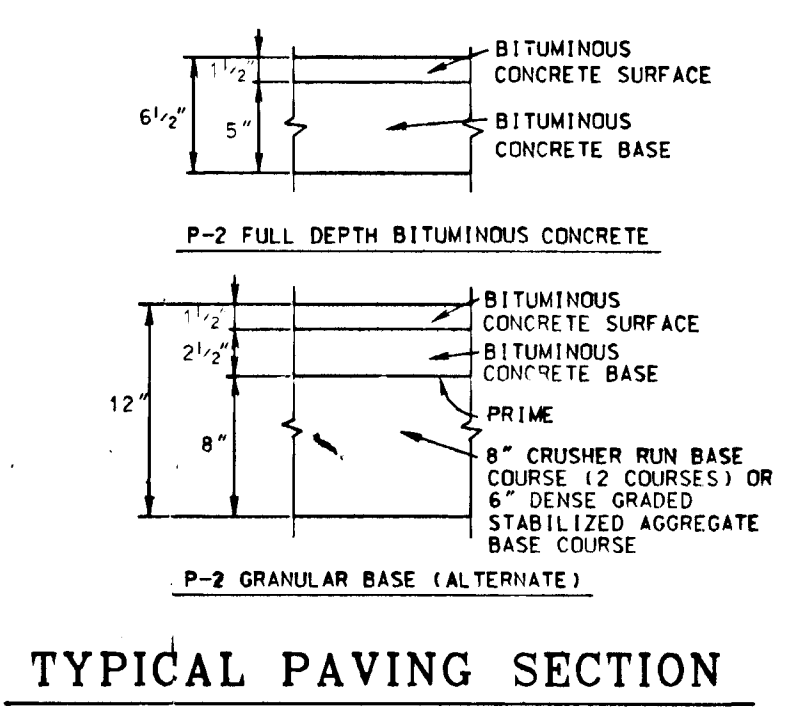
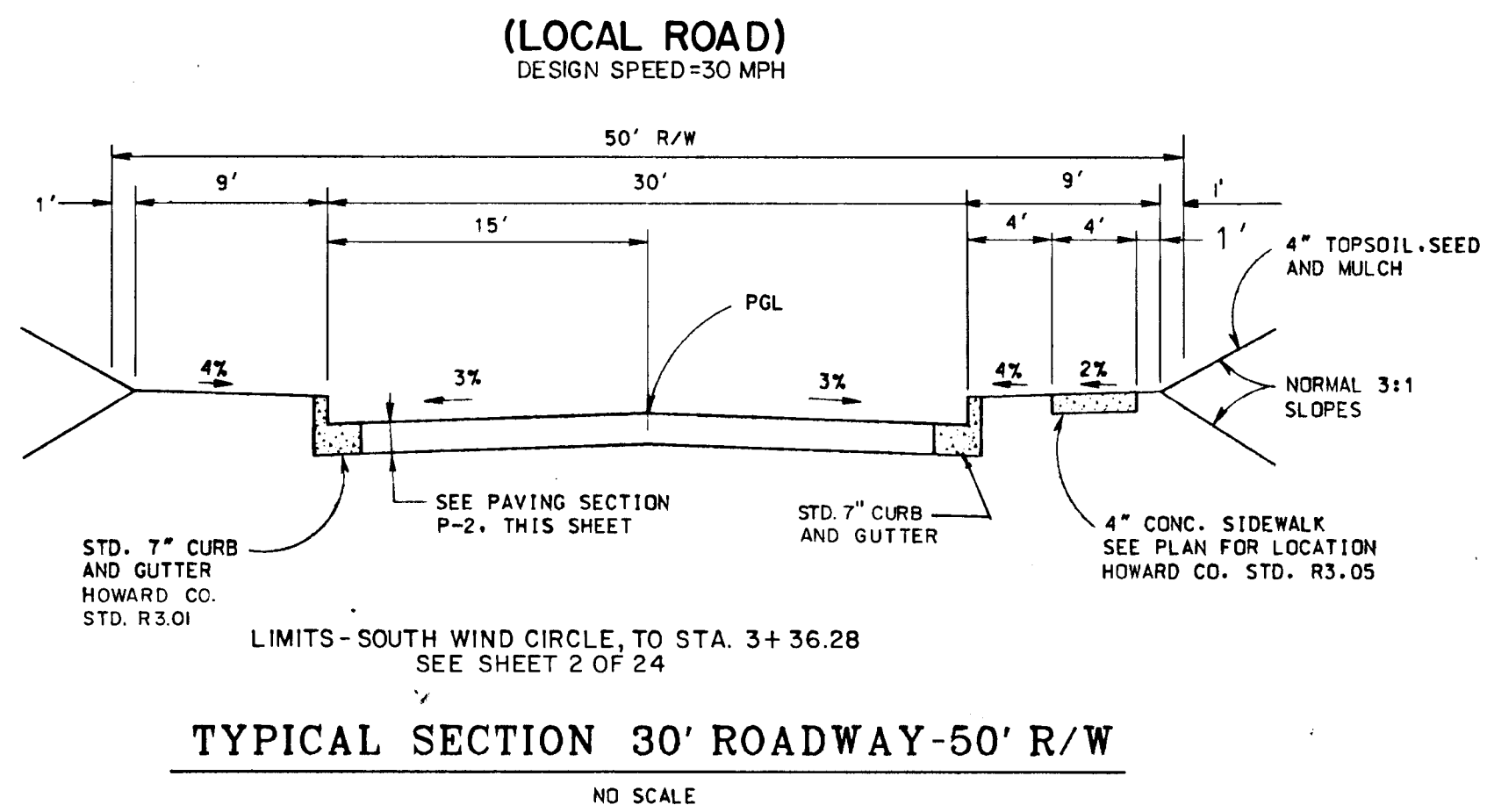
DESIGN SPEED = 25 MPH

PROFILE-MISTY TOP PASS
 SCALE: HOR. 1"=50', VER. 1"=5'



1487

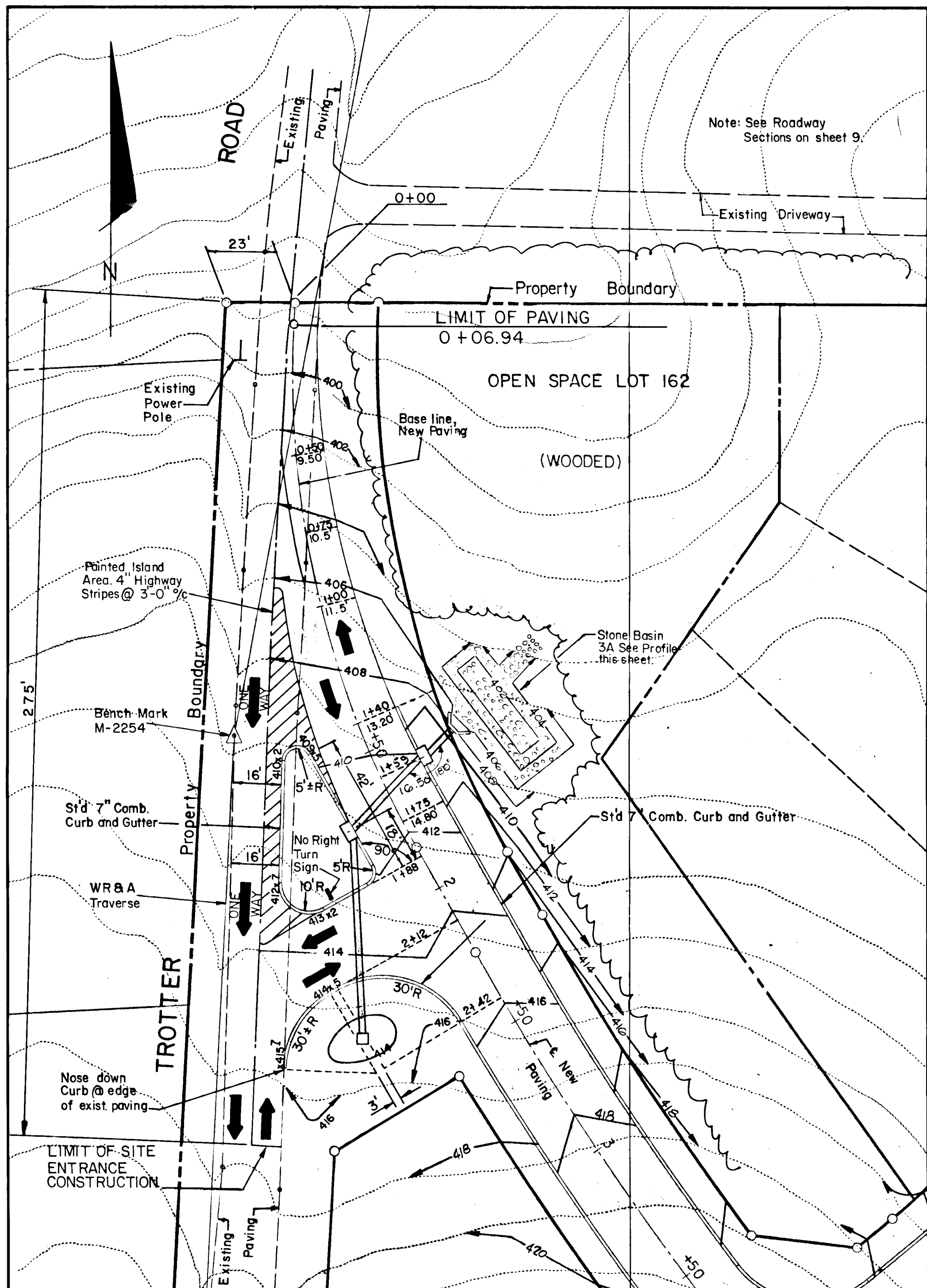
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 4/17/91
 DATE
 CHIEF, LAND DEVELOPMENT DIVISION
 Crumville W. Wehland
 CHIEF, BUREAU OF HIGHWAYS
 DATE
 4-17-91
 CHIEF, BUREAU OF ENGINEERING
 SH
 DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 4/20/91
 DATE
 CHIEF, DIVISION OF COMMUNITY PLANNING
 AND LAND DEVELOPMENT
 Com
 DATE



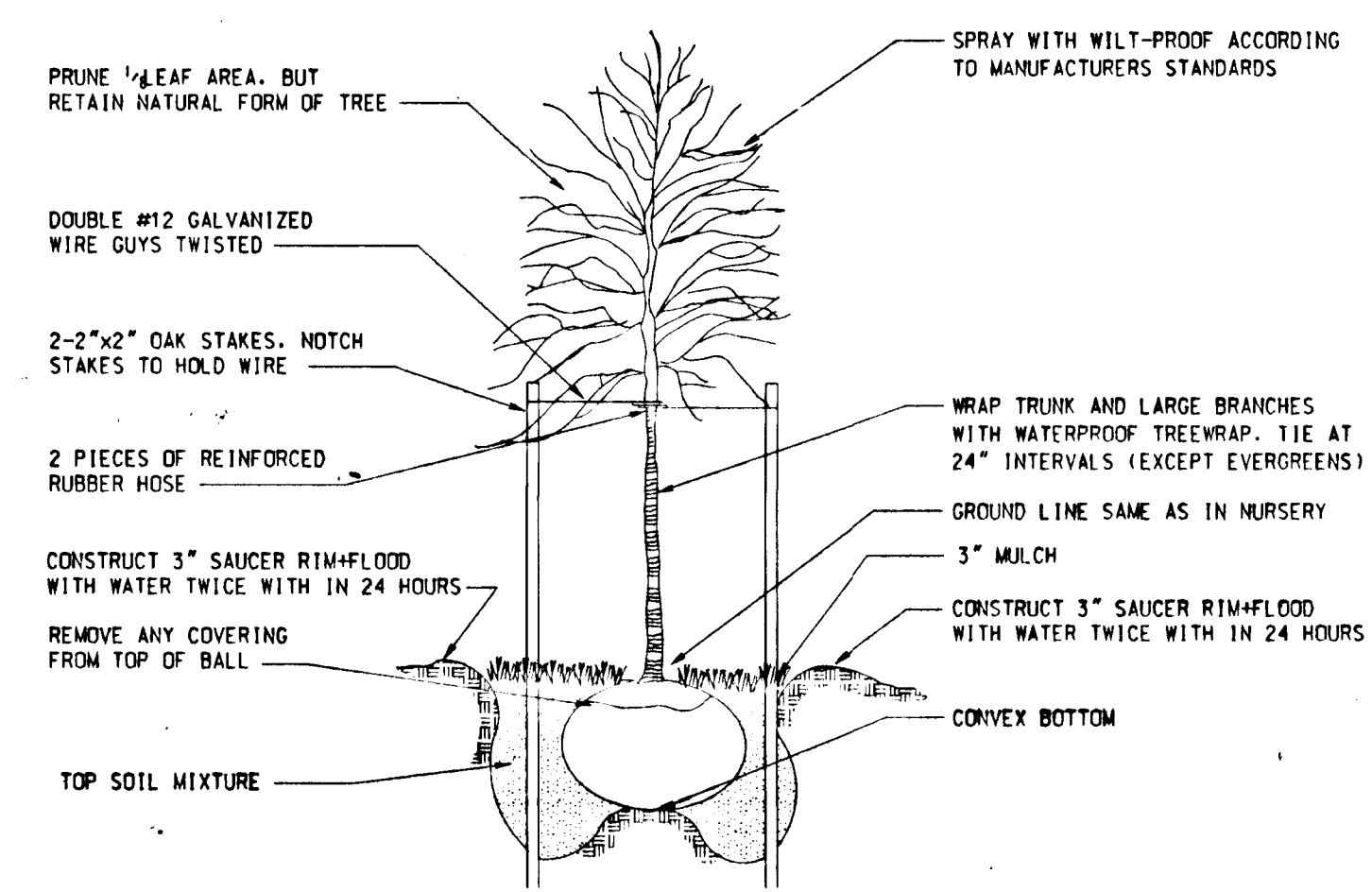
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2 PROJECT TITLE: ROADWAY DETAILS SCALE: AS SHOWN DATE: 4/1/91 WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218 Thomas J. Shafer THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

1489

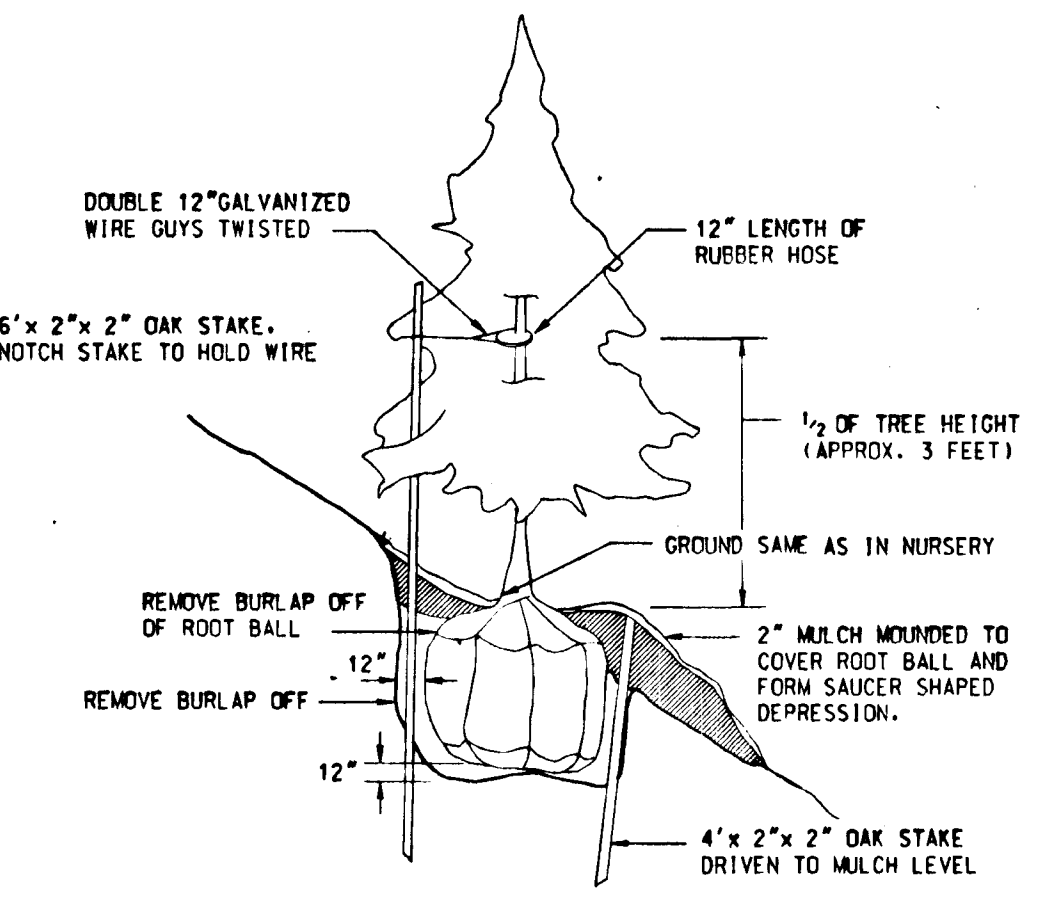
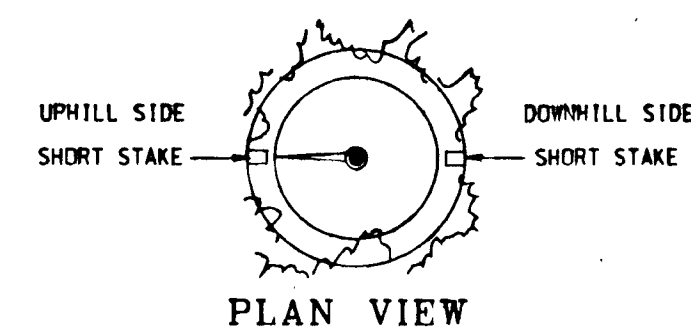
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
John M. [Signature] 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION
Lawrence W. Debeaud 4/9/91
 CHIEF, BUREAU OF HIGHWAYS
William B. [Signature] 4-17-91
 CHIEF, BUREAU OF ENGINEERING SH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 4/23/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT con DATE



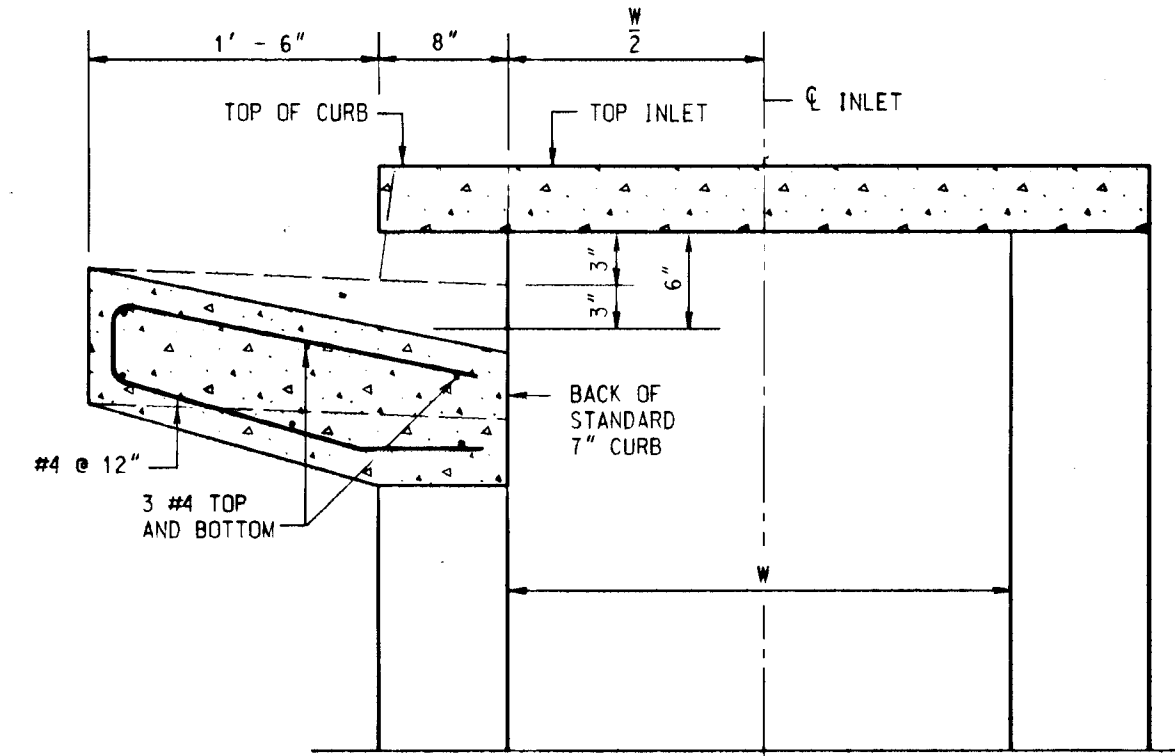
SITE ENTRANCE
 SCALE: 1" = 30'



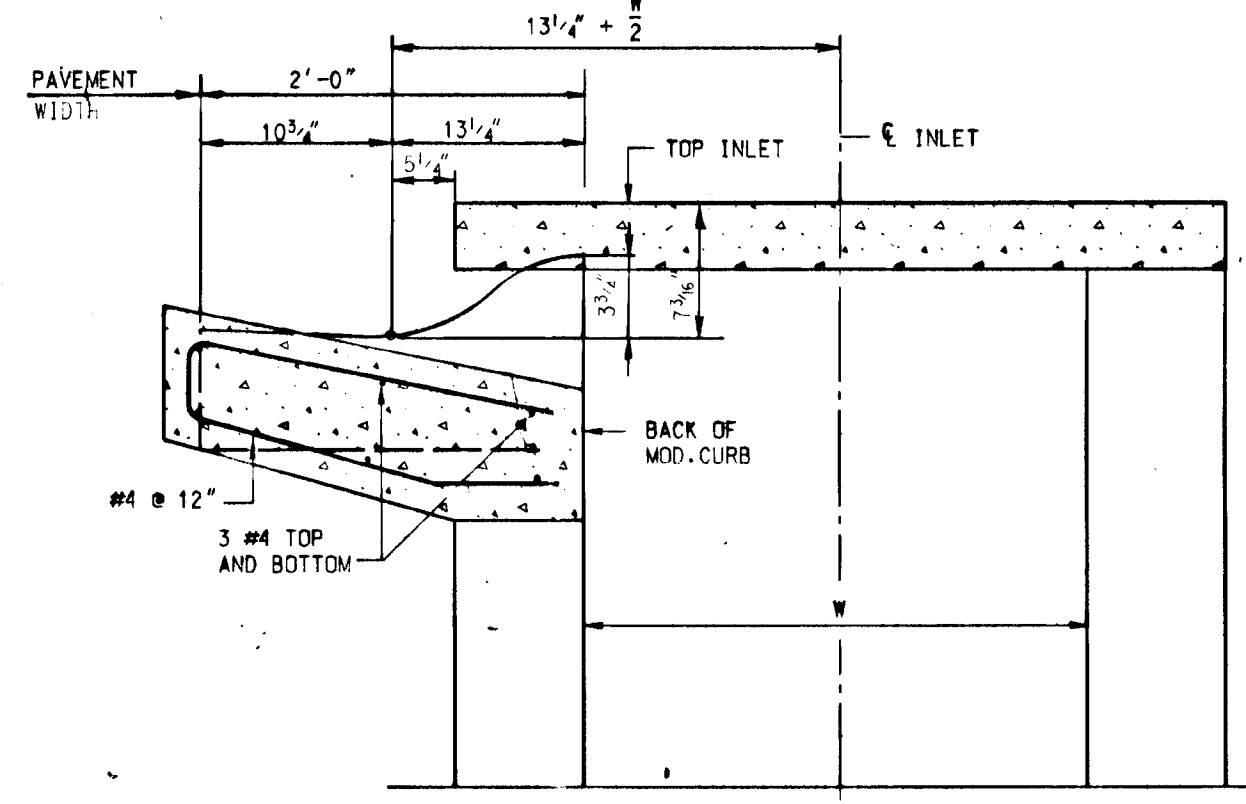
TREE PLANTING DETAIL
 NO SCALE



PLANTING DETAIL FOR STEEP SLOPE
 NO SCALE

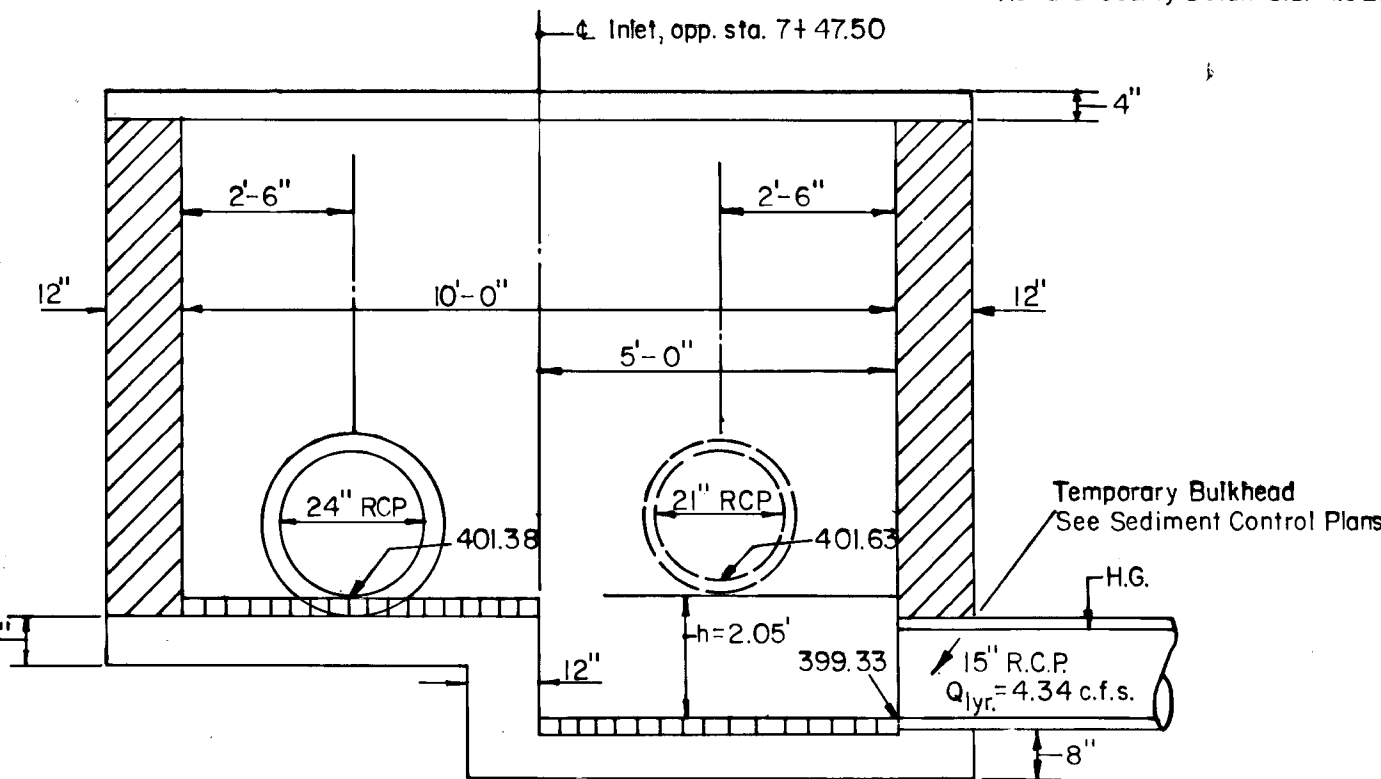


SECTION "A"- "A"
"A" INLET - STANDARD CURB
 NO SCALE



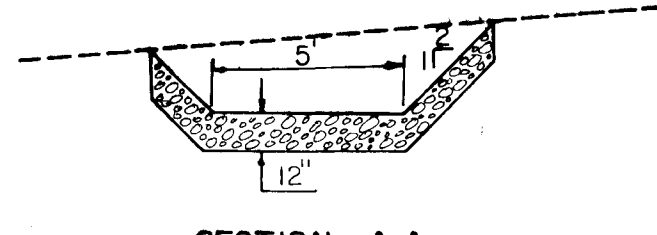
SECTION "B"- "B"
"A" INLET MODIFIED CURB
 NO SCALE

Note: For additional dimensions and for size of steel in top & bottom slabs, see Howard County Detail S.D. 402.

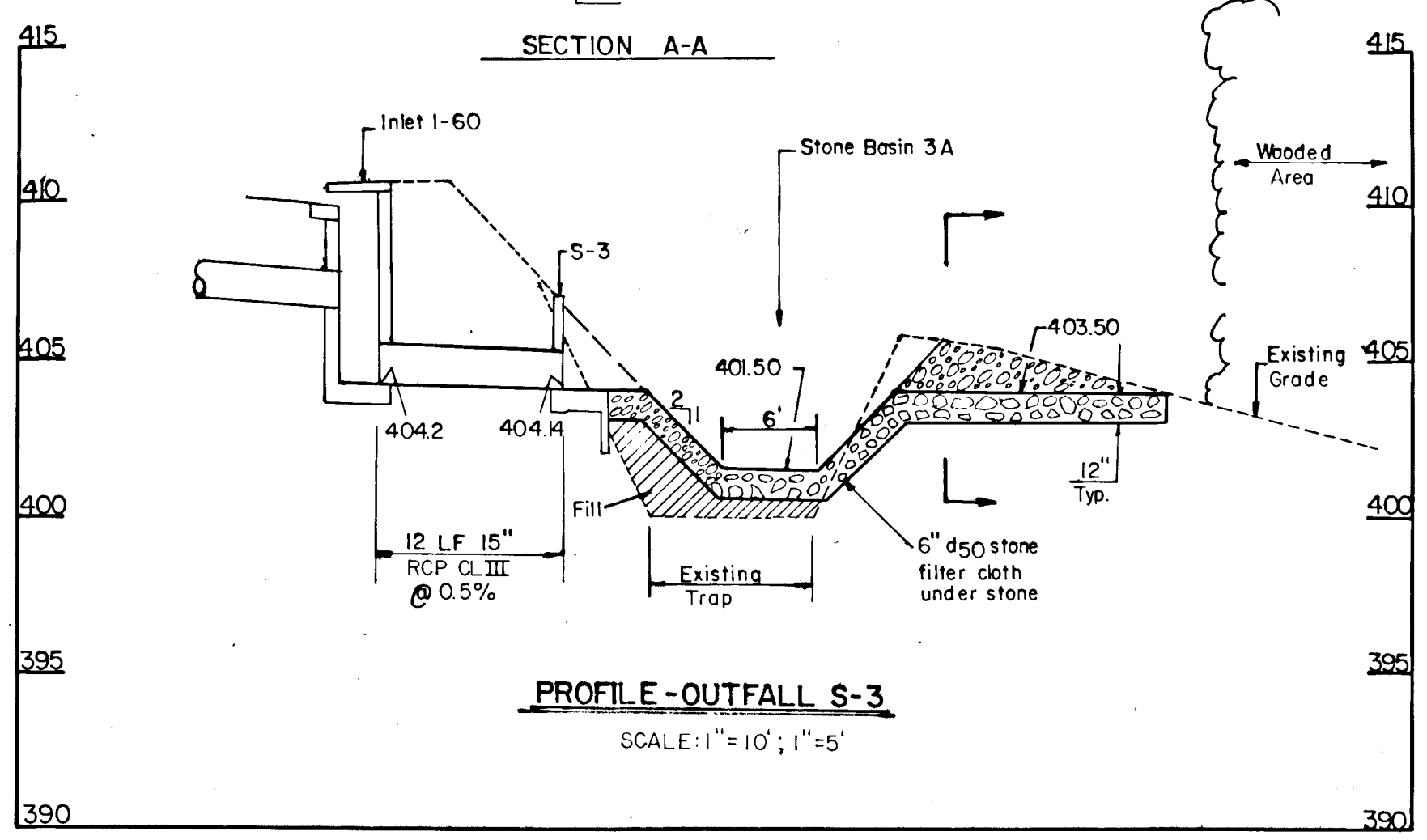


DETAIL INLET I-41
 NO SCALE

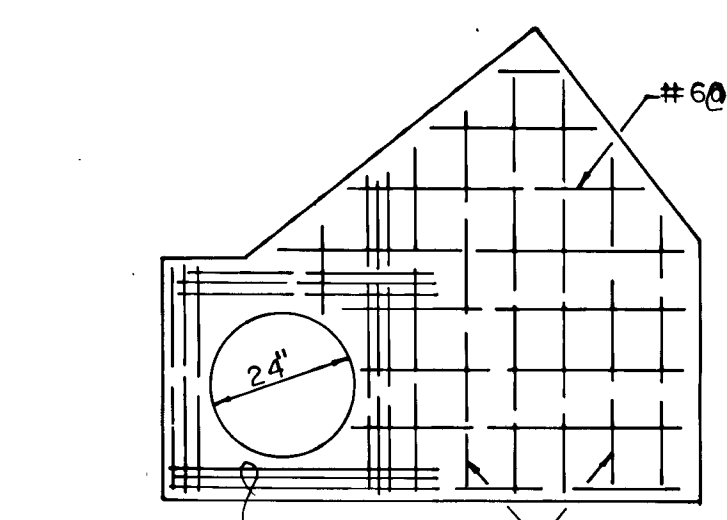
QUANTITY OF TREES	COMMON NAME	BOTANICAL NAME	HEIGHT
172	PIN OAK	QUERCUS PALUSTRIS	10'



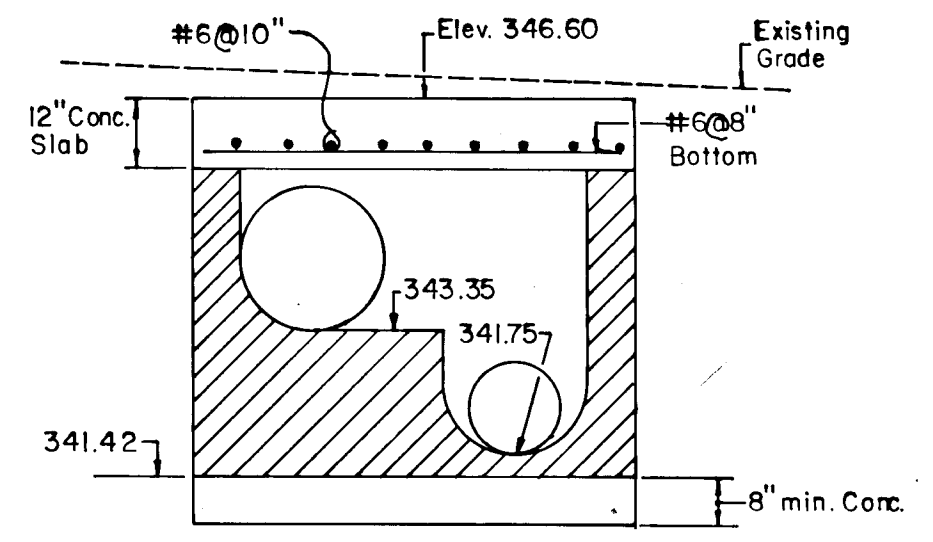
SECTION A-A



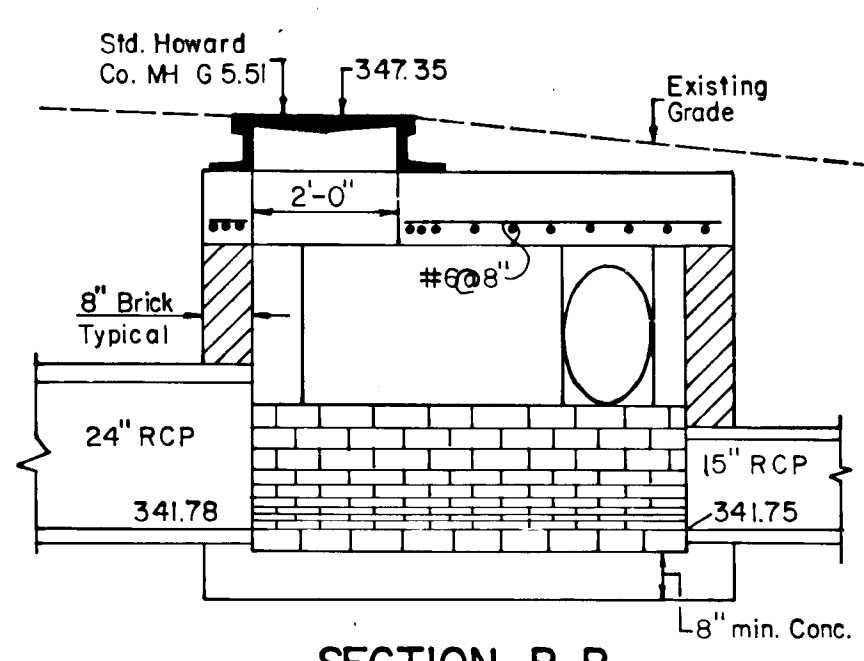
PROFILE-OUTFALL S-3
 SCALE: 1" = 10'; 1" = 5'



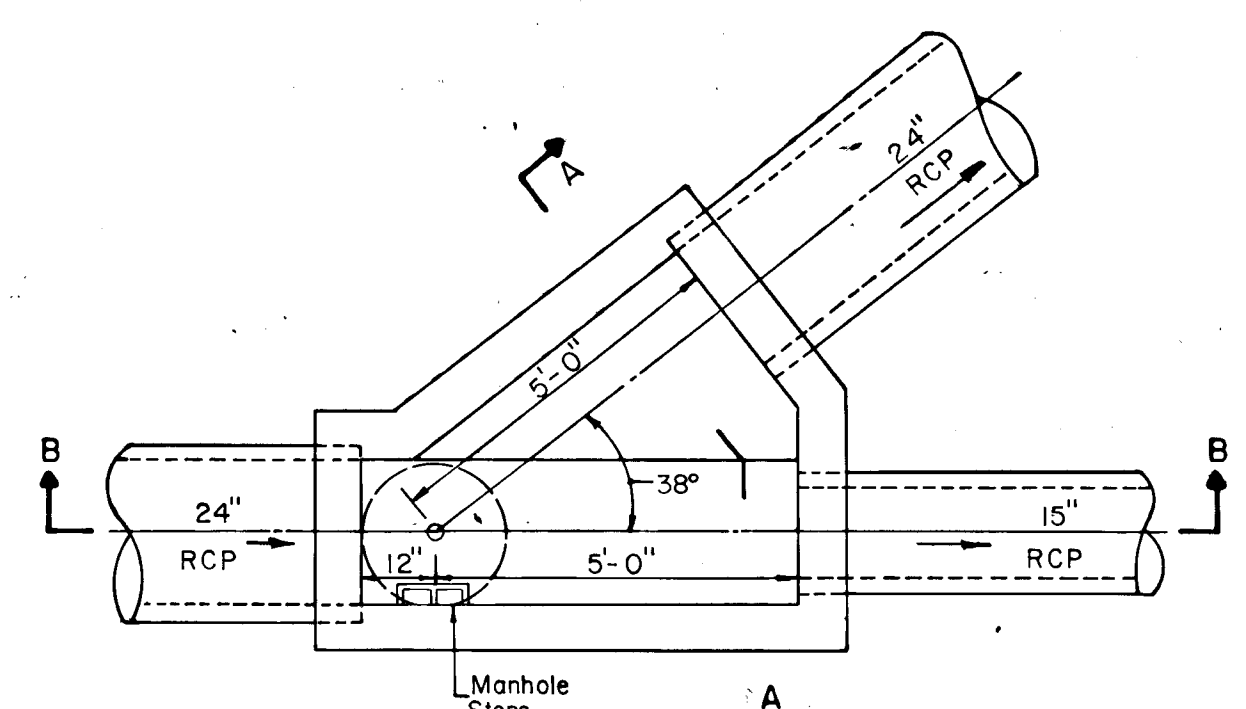
PLAN TOP SLAB



SECTION A-A



SECTION B-B



PLAN

DETAIL S-10
 SCALE: 3/8" = 1'-0"

REV. DATE	REV. NO.	REVISION DESCRIPTION
June 12, 1991	1	Revised Basin 6, Revised R/W line
		Revised S-3 Outfall

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH
 AND DEVELOPMENT CORPORATION

PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION 1 AREA 3 PHASE 2

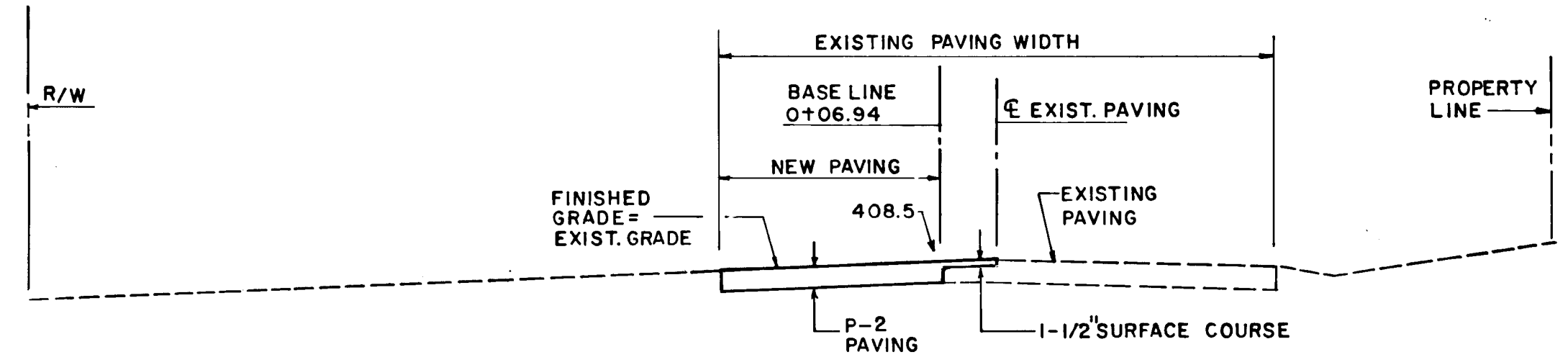
PROJECT TITLE:
 ROAD - STORM DRAIN AND
 TREE PLANTING DETAILS

SCALE: AS SHOWN DATE: 4/11/91

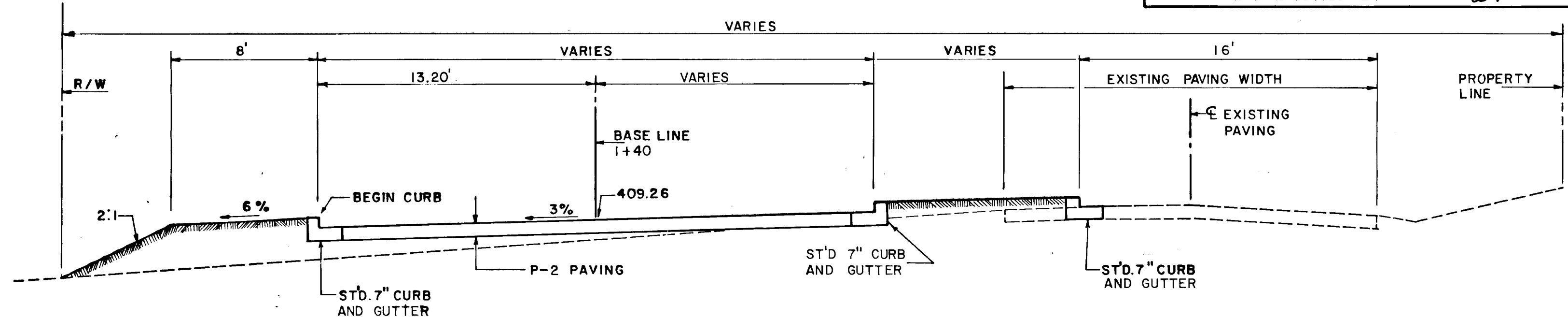
WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457

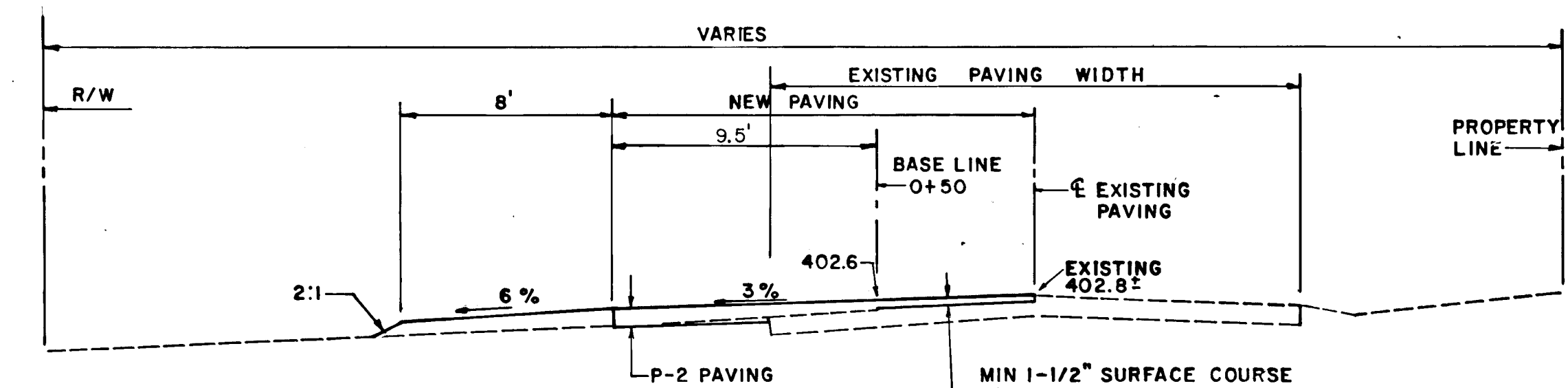
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
John M. Long 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE
Lawrence W. Weiland 4/19/91
 CHIEF, BUREAU OF HIGHWAYS DATE
William E. Ray 4-17-91
 CHIEF, BUREAU OF ENGINEERING SH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark J. ... 4/23/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE



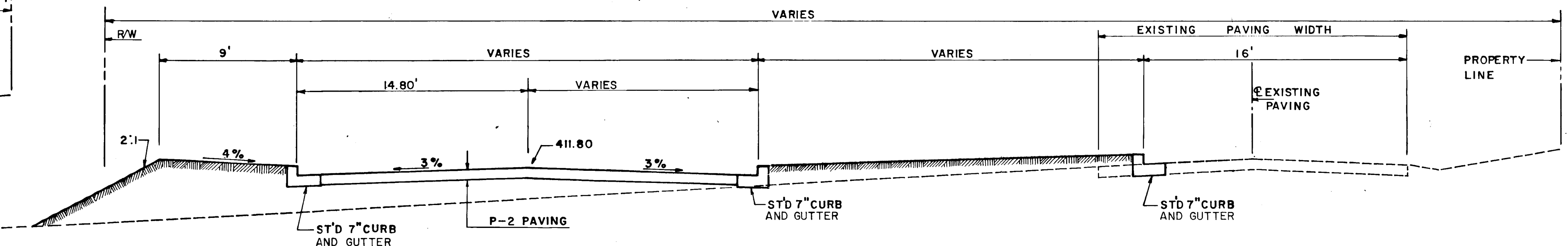
STATION 0+06.94 BEGIN PAVING



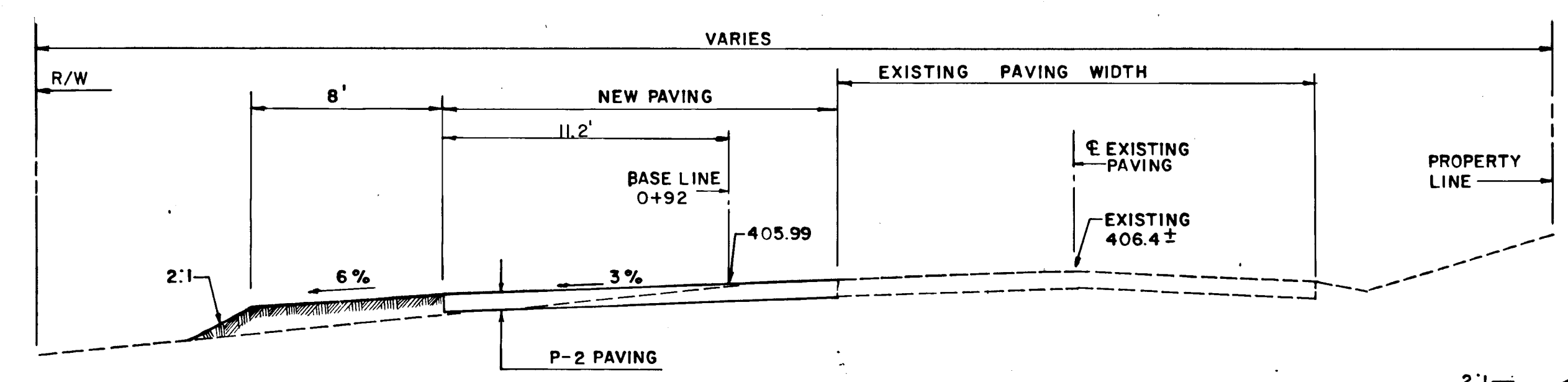
STATION 1+40



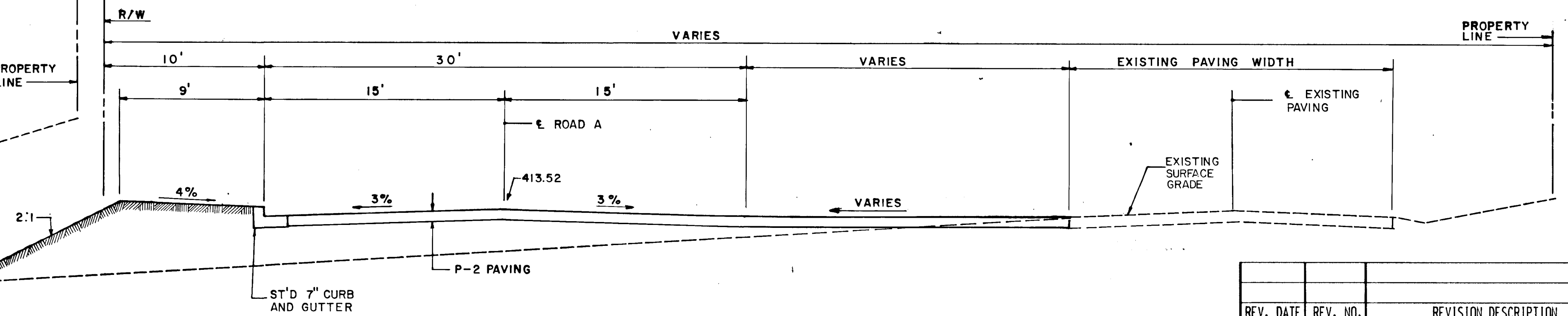
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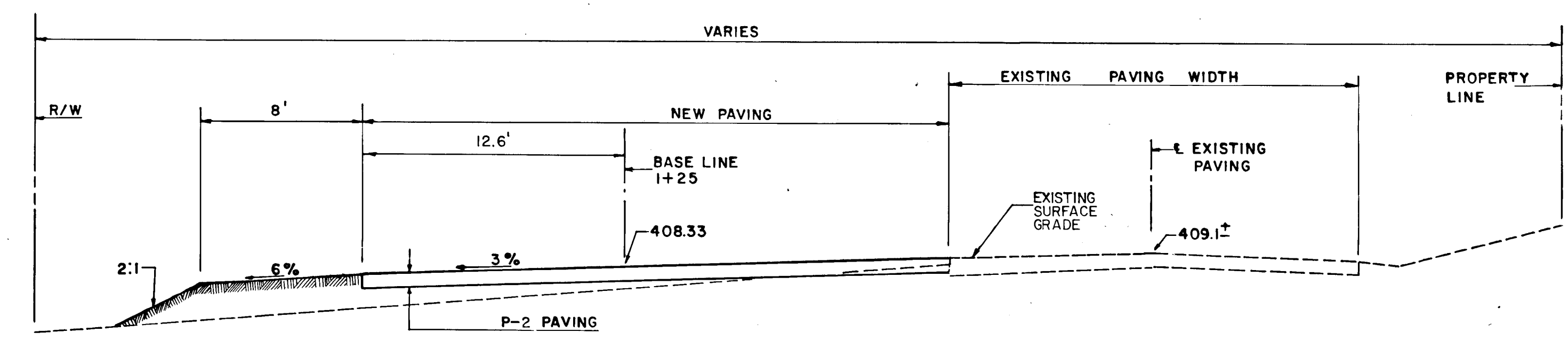
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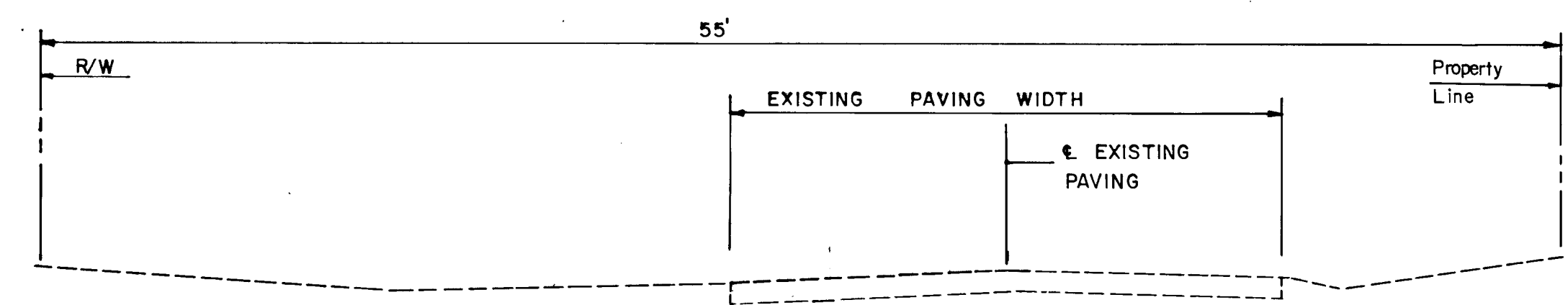
STATION 0+92



STATION 2+00



STATION 1+25



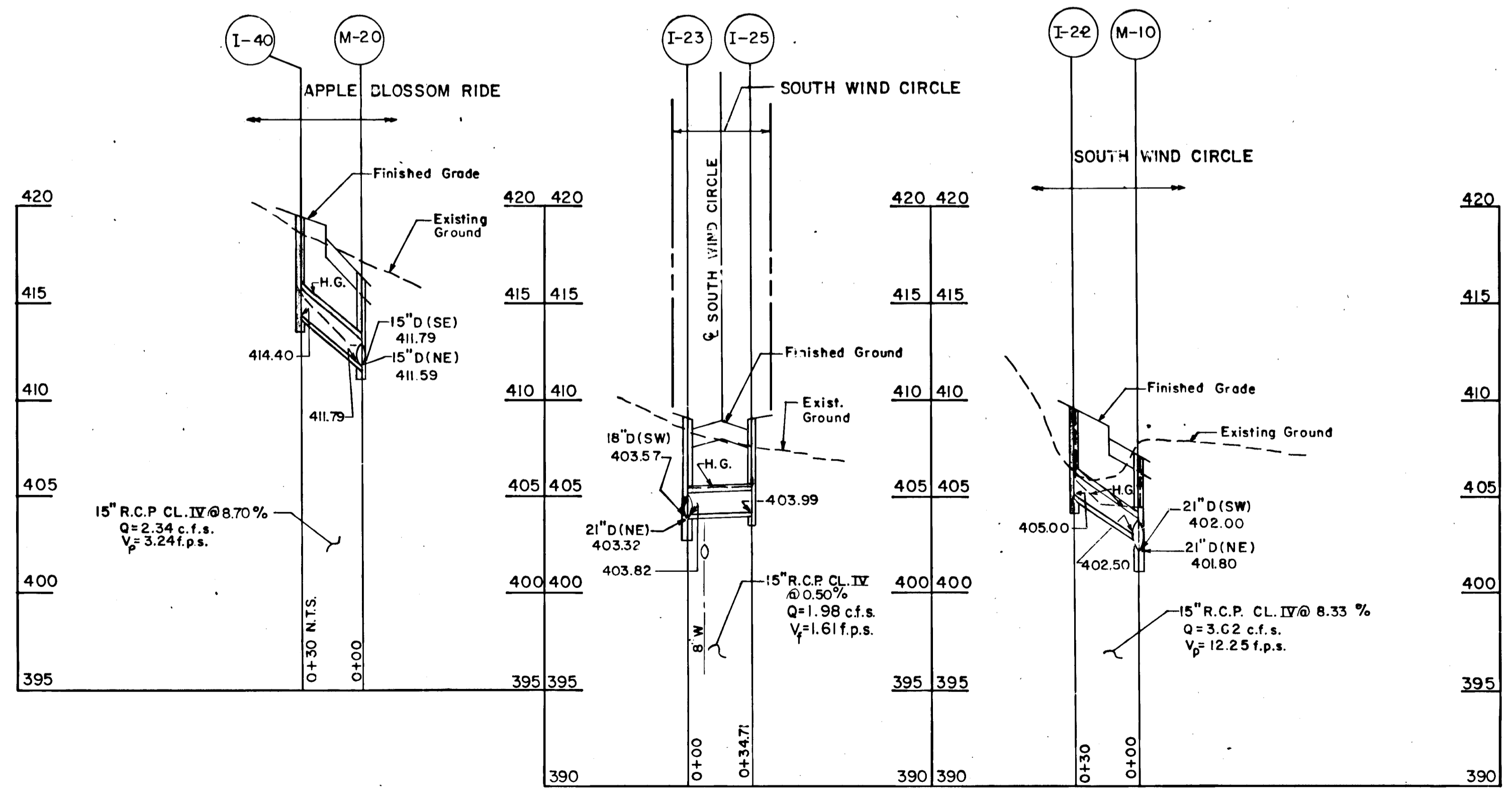
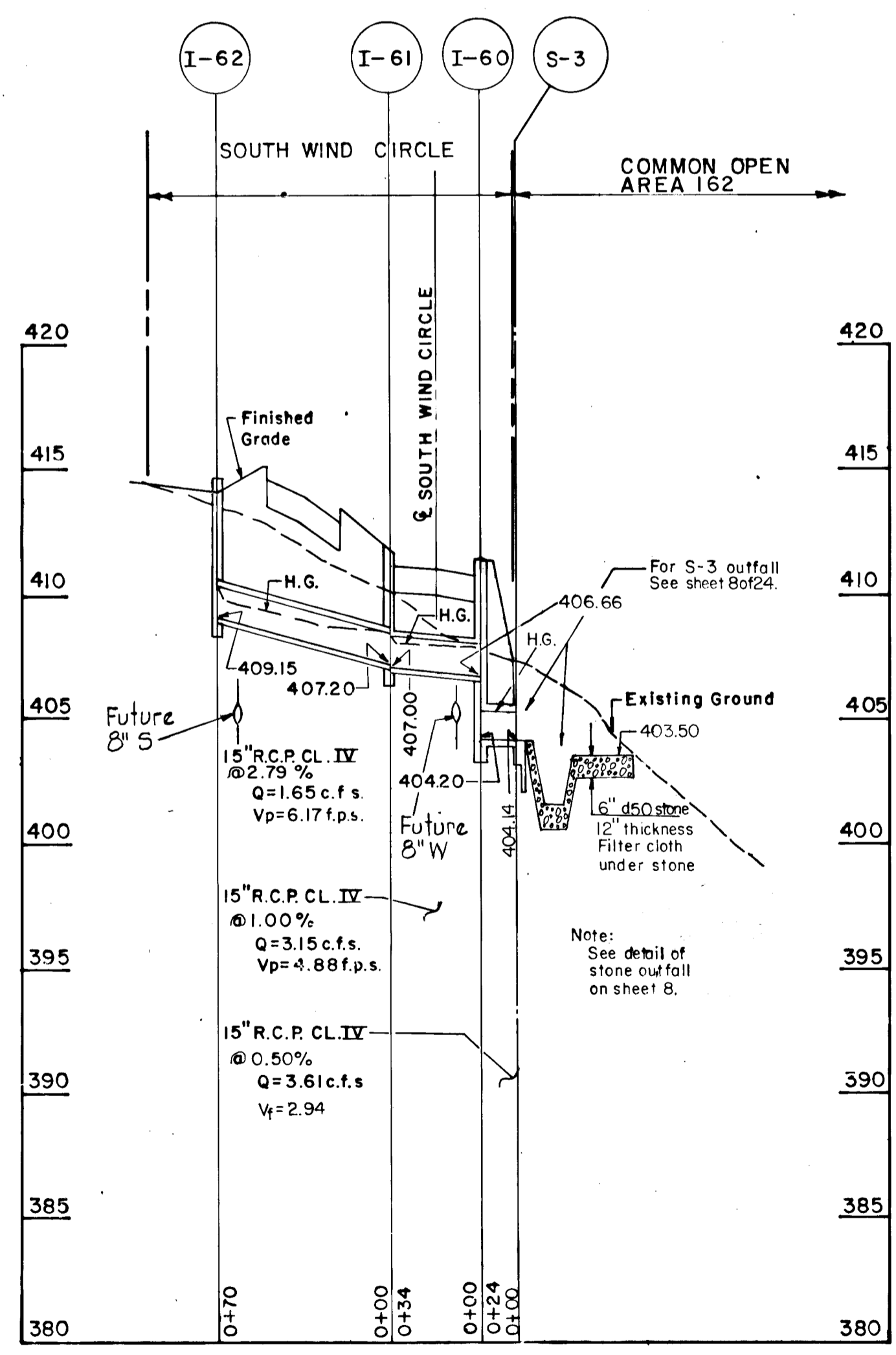
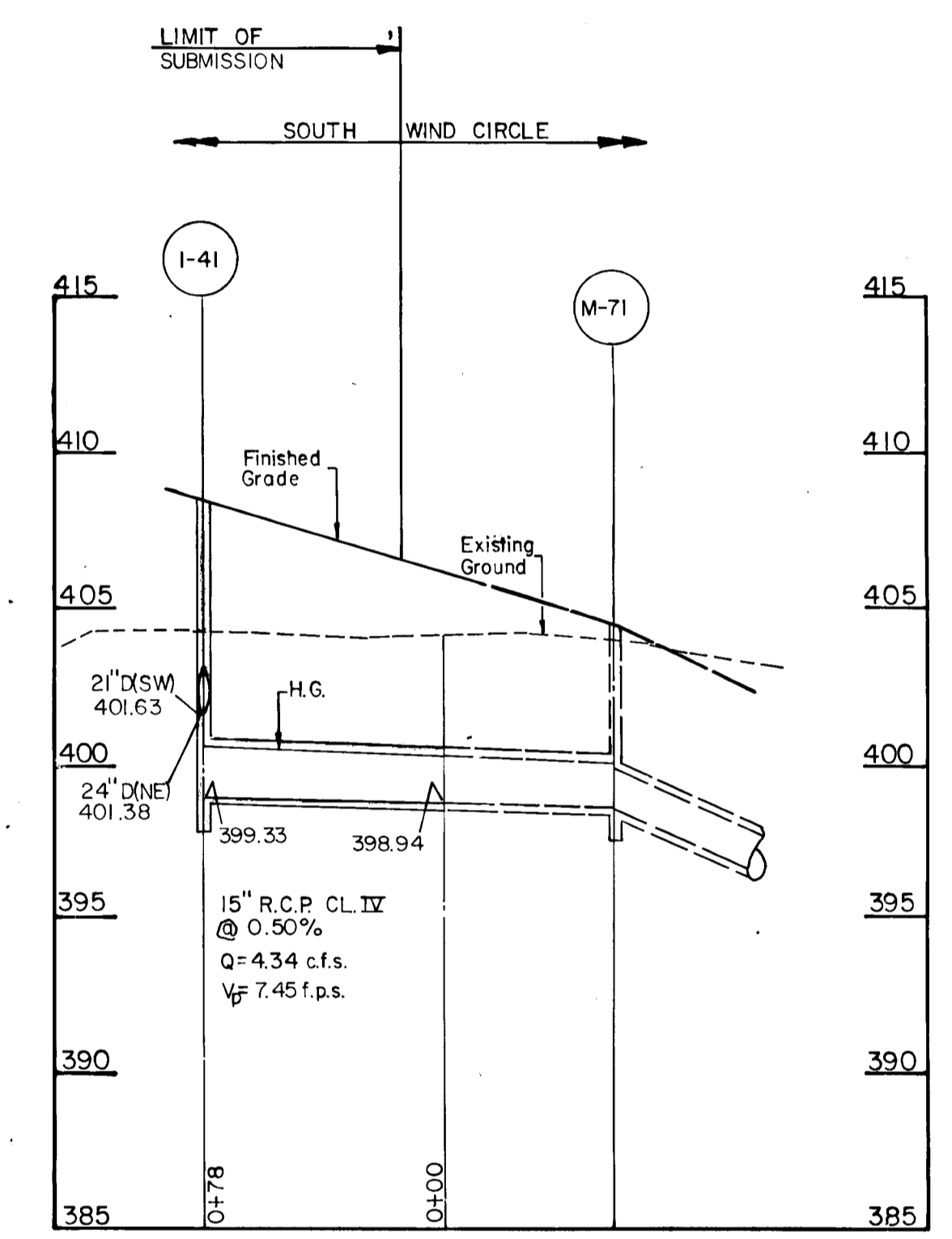
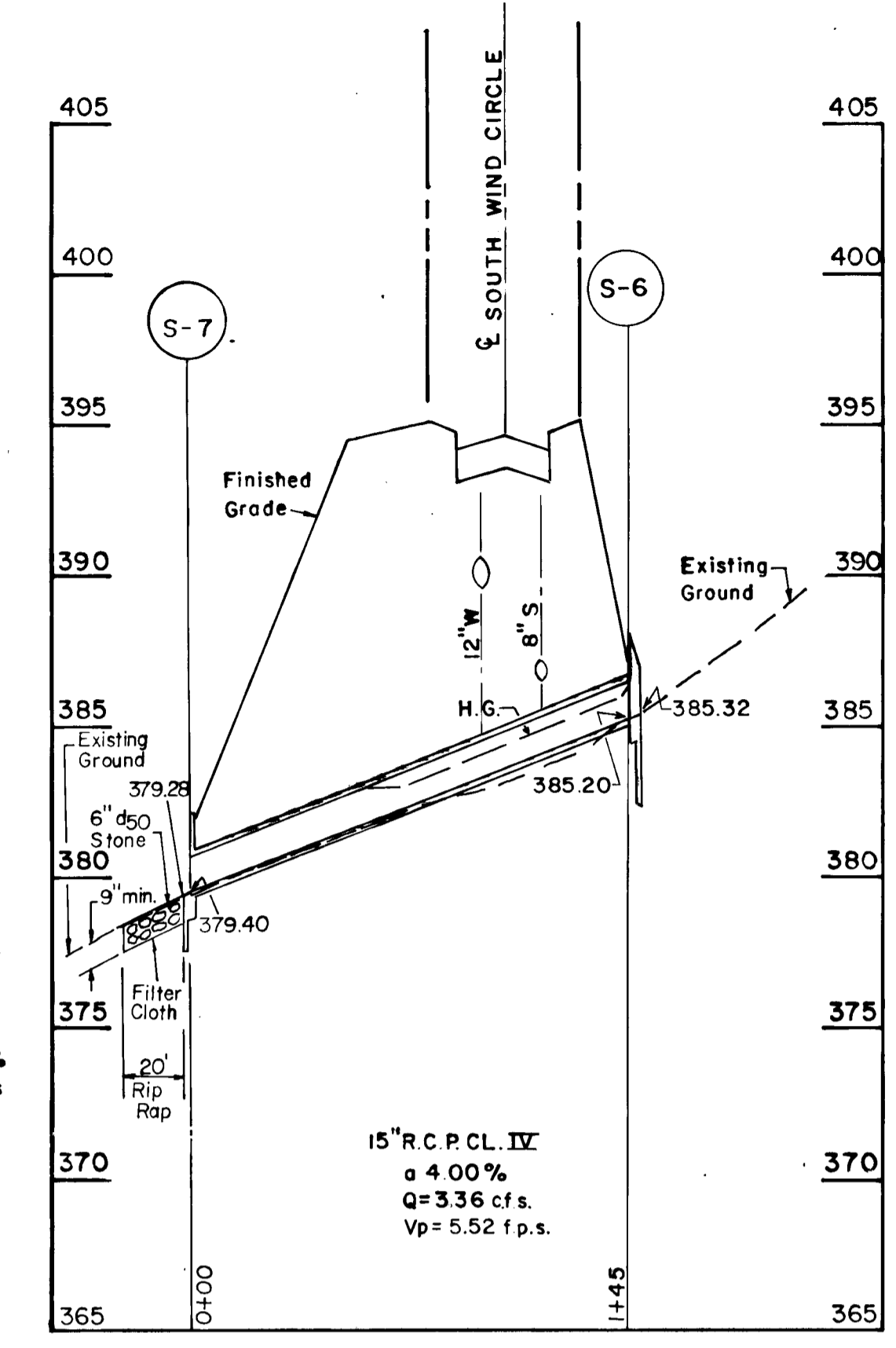
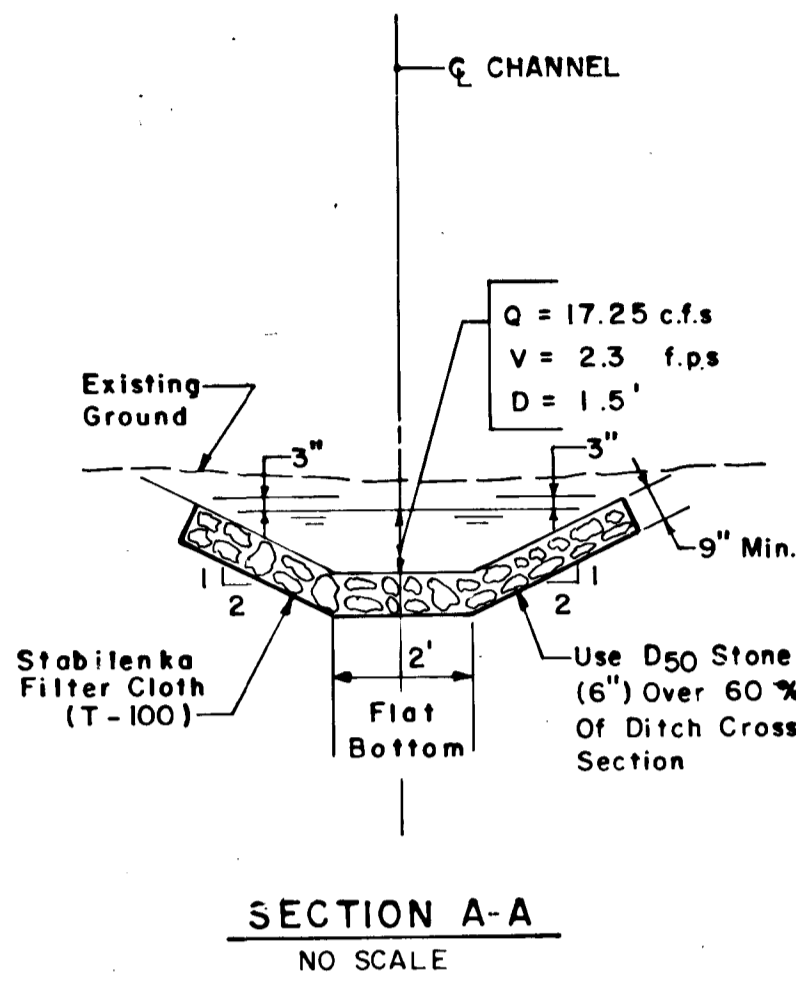
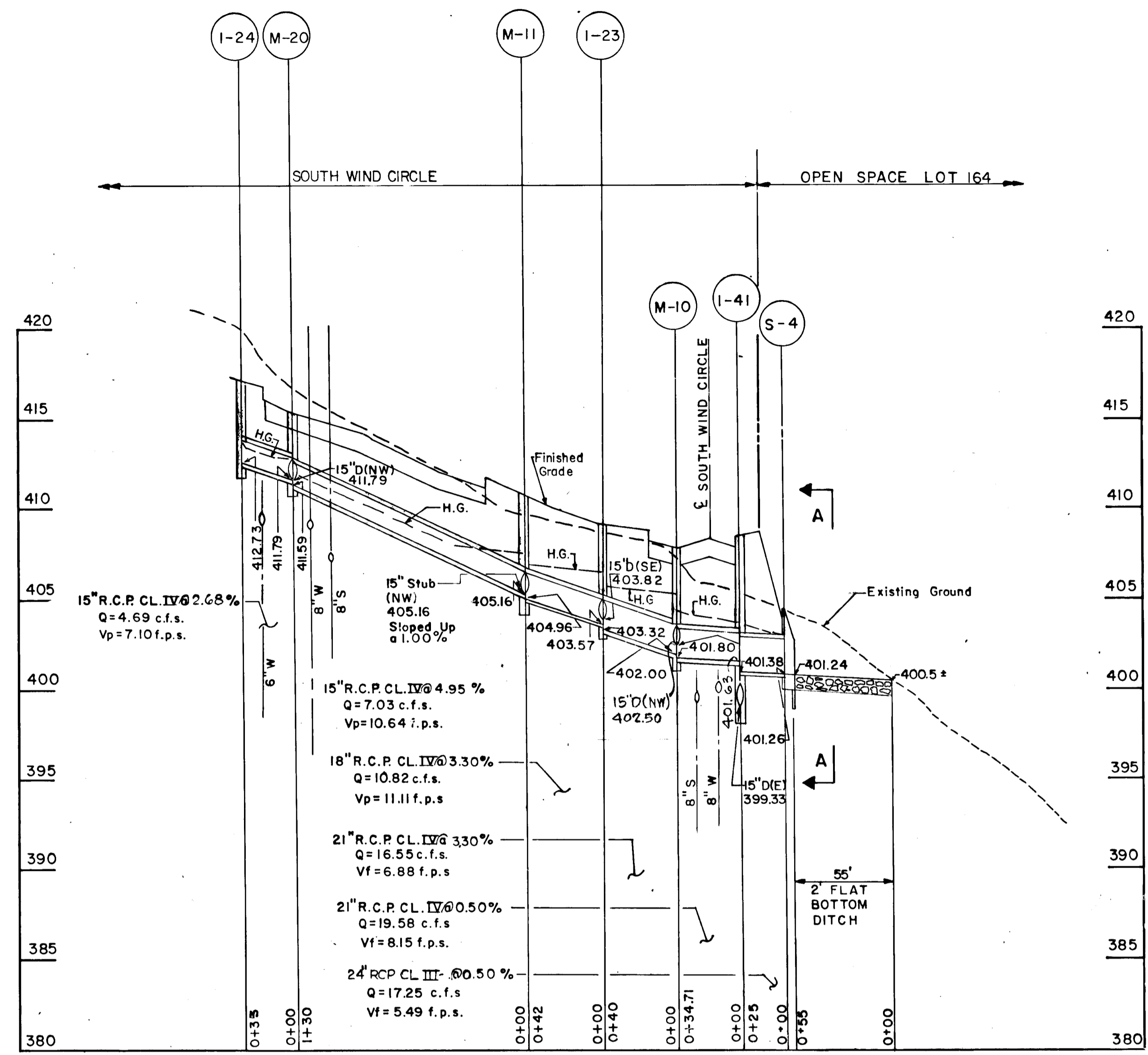
END SITE ENTRANCE CONSTRUCTION SEE PLAN SHEET 8

REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2 PROJECT TITLE: ROADWAY DETAILS SCALE: 1" = 5' DATE: 4/1/91 WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218 <i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

1487

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Ch. M. Perry 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE
Drayville W. Welles 4/19/91
 CHIEF, BUREAU OF HIGHWAYS DATE
James S. Z... 4-17-91
 CHIEF, BUREAU OF ENGINEERING JH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark E. ... 4/20/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE

NOTE:
 THE TYPE OF BEDDING USED FOR STORM DRAIN PIPE SHALL BE CLASS C, SHAPED SUBGRADE. IF ROCK IS ENCOUNTERED, THE TRENCH INVERT SHOULD BE OVER EXCAVATED 6" AND THE OVER EXCAVATION OF 6" REFILLED WITH GRANULAR MATERIAL.



REV. DATE	REV. NO.	REVISION DESCRIPTION
Nov 7/91	2	Revised Storm Drain Profile S-7
June 12, 1991	1	Revised Storm Drain Profile S-3, Stone Basin Outfall

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION I AREA 3 PHASE 2

PROJECT TITLE:
 STORM DRAIN PROFILES

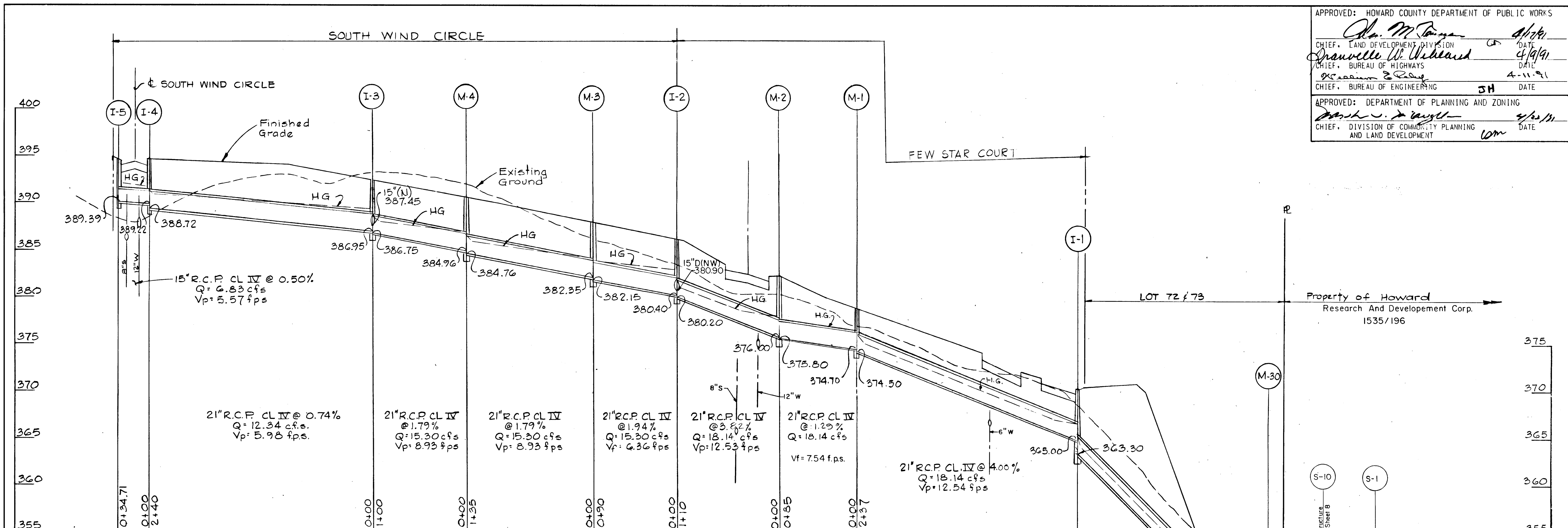
SCALE: Hor. 1"=50', Ver. 1"=5' DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

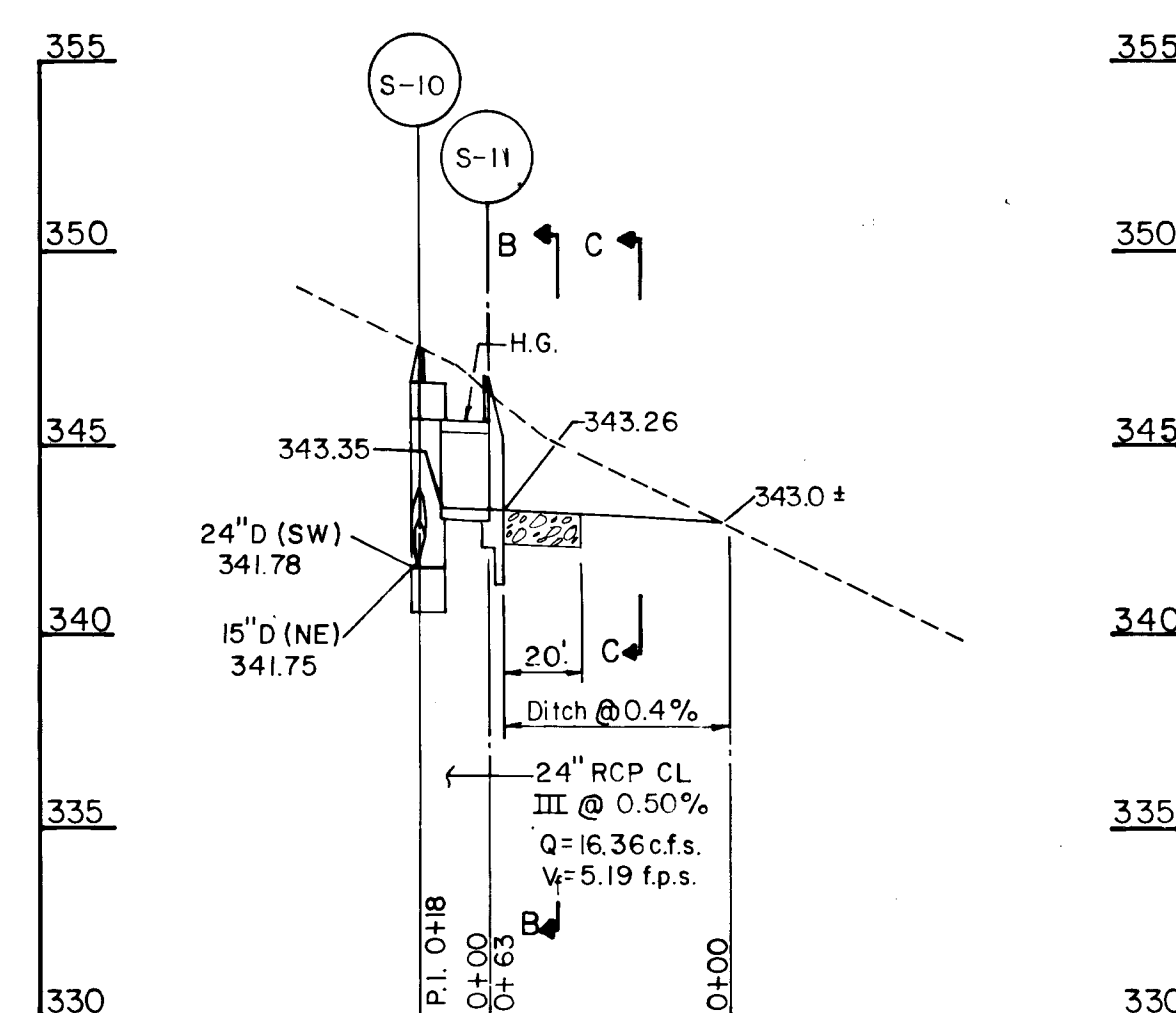
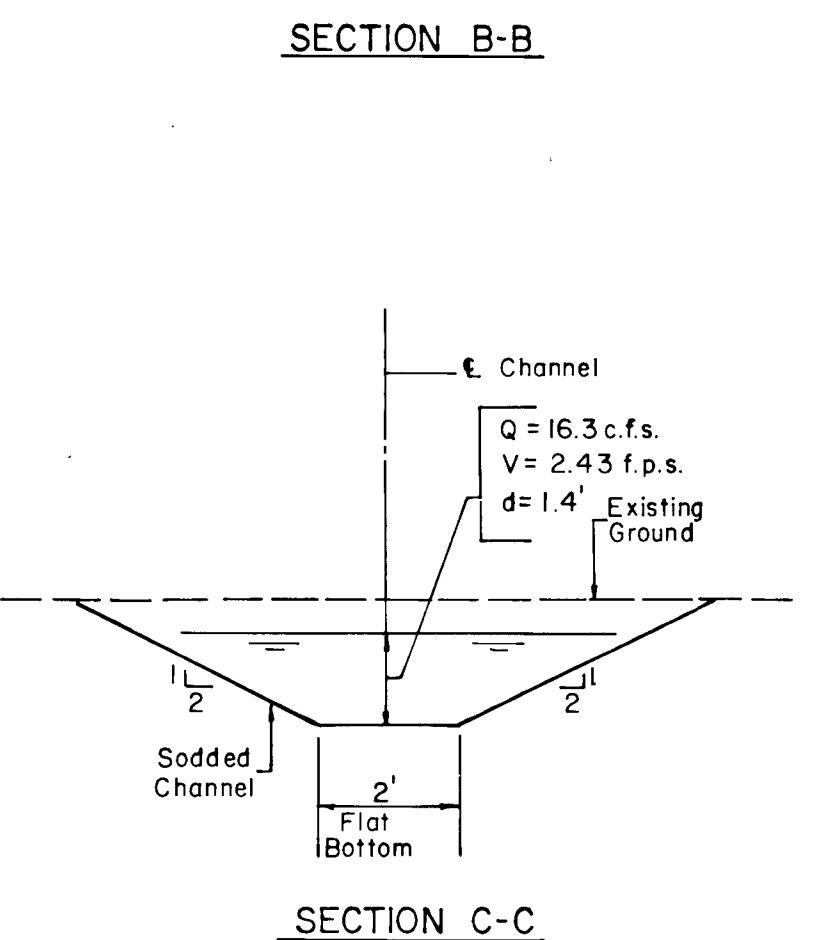
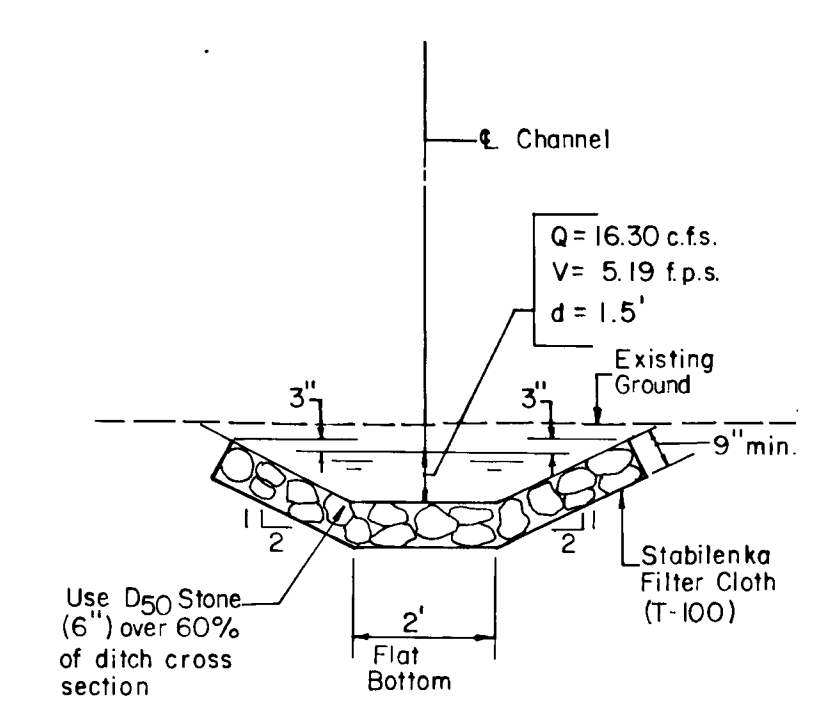
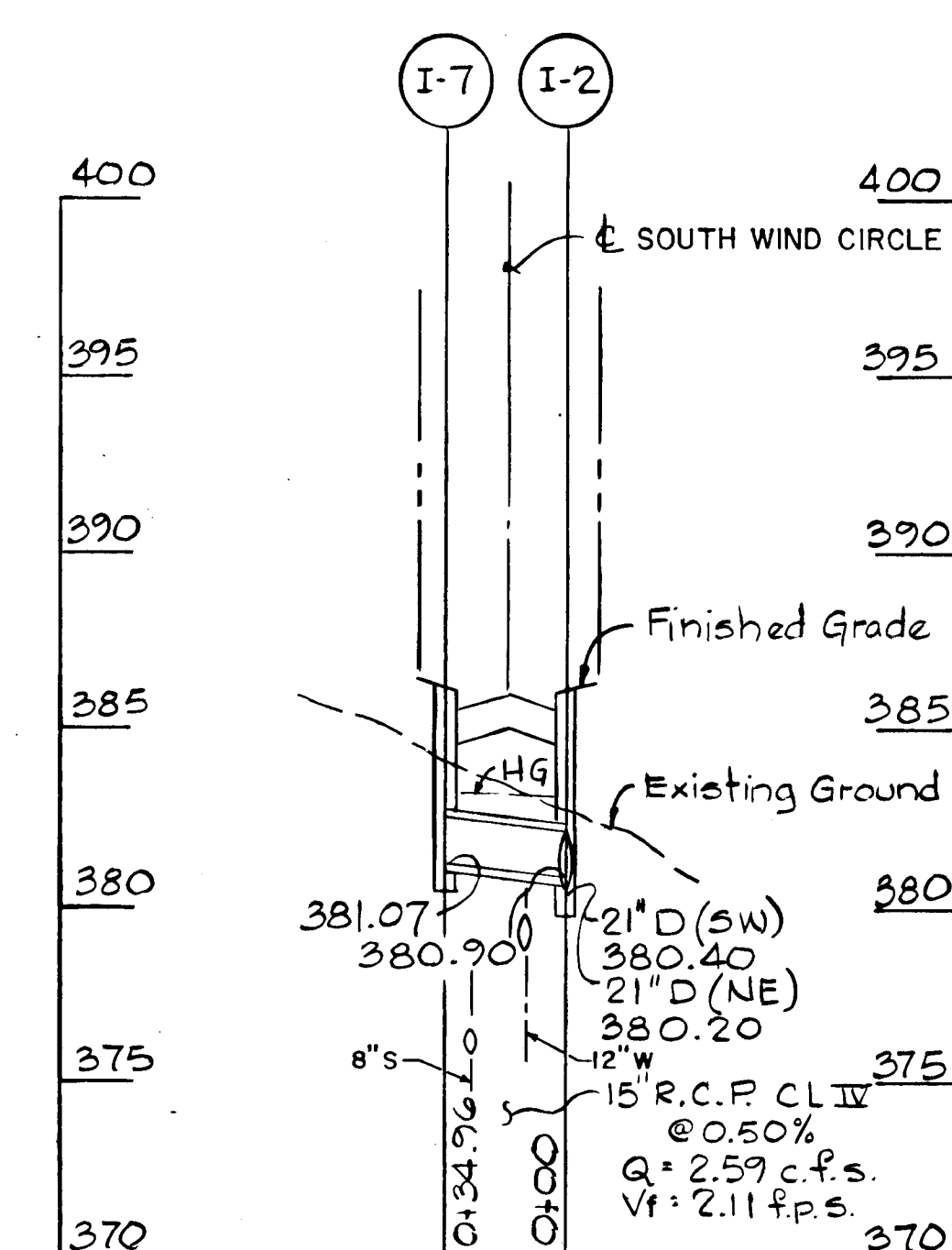
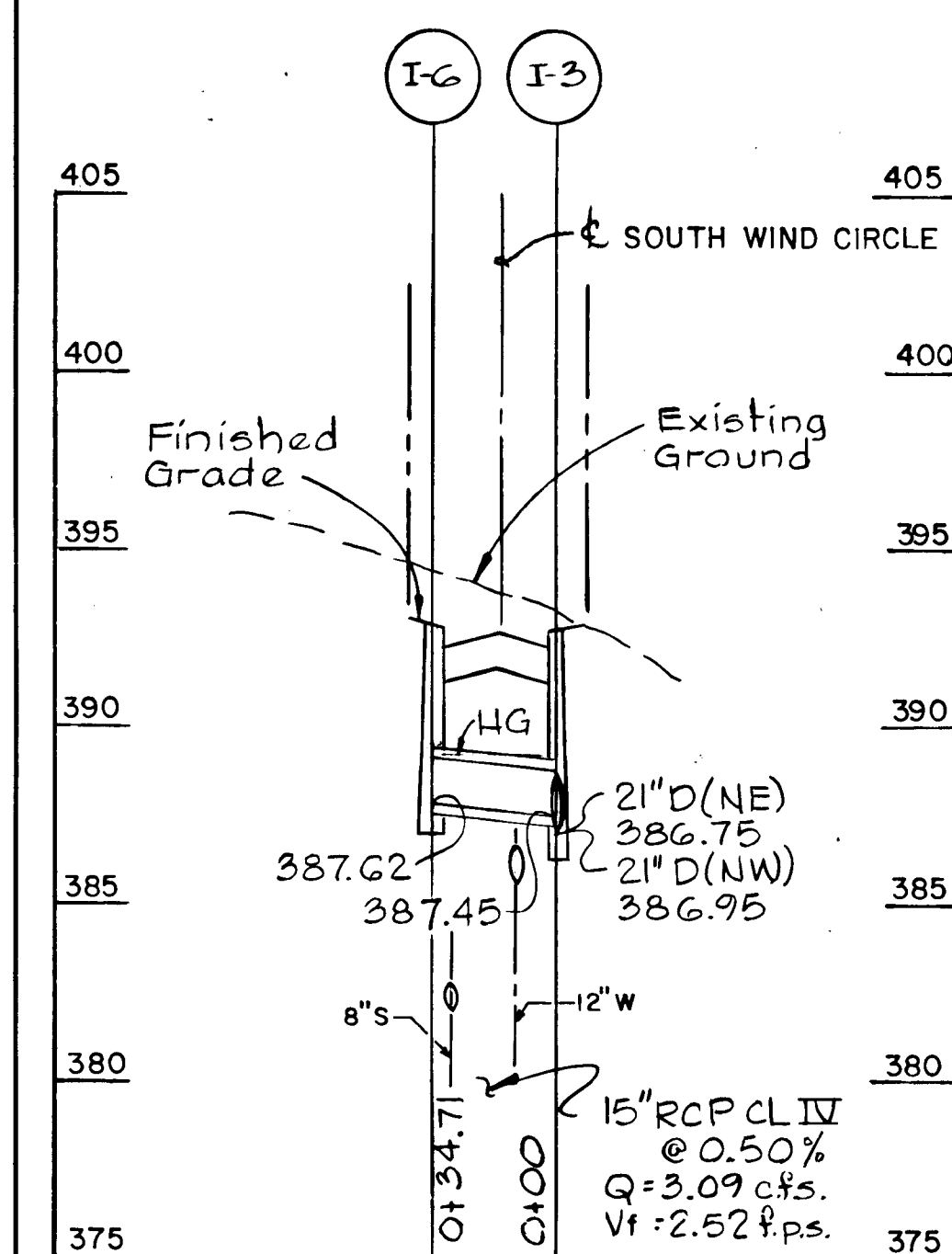
Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457

1487

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Ch. M. Taylor 4/1/91
 CHIEF, LAND DEVELOPMENT DIVISION
Orville W. Weiland 4/1/91
 CHIEF, BUREAU OF HIGHWAYS
William S. Ray 4-11-91
 CHIEF, BUREAU OF ENGINEERING
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark J. Taylor 4/2/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT



NOTE:
 THE TYPE OF BEDDING USED FOR STORM DRAIN PIPE SHALL BE CLASS C, SHAPED SUBGRADE. IF ROCK IS ENCOUNTERED, THE TRENCH INVERT SHOULD BE OVER EXCAVATED 6" AND THE OVER EXCAVATION OF 6" REFILLED WITH GRANULAR MATERIAL.



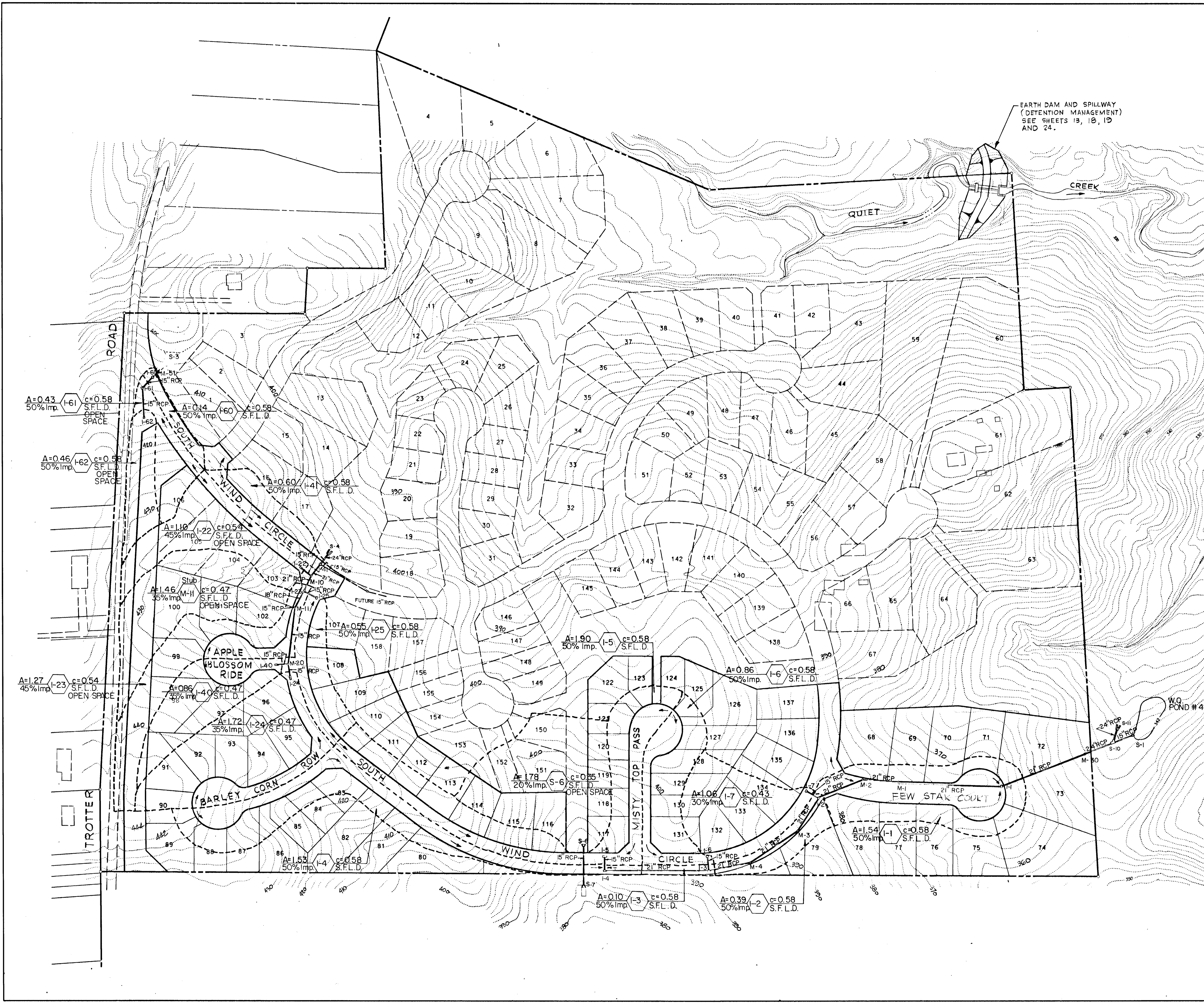
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2 PROJECT TITLE: STORM DRAIN PROFILES SCALE: Hor. 1"=50', Ver. 1"=5' DATE: 4/1/91 WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218 <i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

1871

Dr. M. D. ...
 CHIEF, LAND DEVELOPMENT DIVISION DATE 4/17/91
Dr. W. W. ...
 CHIEF, BUREAU OF HIGHWAYS DATE 4/19/91
W. ...
 CHIEF, BUREAU OF ENGINEERING DATE 4-17-91

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Paul ...
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE 4/17/91

EARTH DAM AND SPILLWAY
(DETENTION MANAGEMENT)
SEE SHEETS 13, 18, 19
AND 24.



June 10, 1991	1	Removed Basin No. G
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE: DRAINAGE AREA MAP		
SCALE: 1" = 100'		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

1541

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Alan M. Sanger 4/7/91
 CHIEF, LAND DEVELOPMENT DIVISION DATE

Lawrence W. Weiland 4/9/91
 CHIEF, BUREAU OF HIGHWAYS DATE

James D. Ray 4-17-91
 CHIEF, BUREAU OF ENGINEERING JH DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Mark J. Sanger 4/22/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT DATE

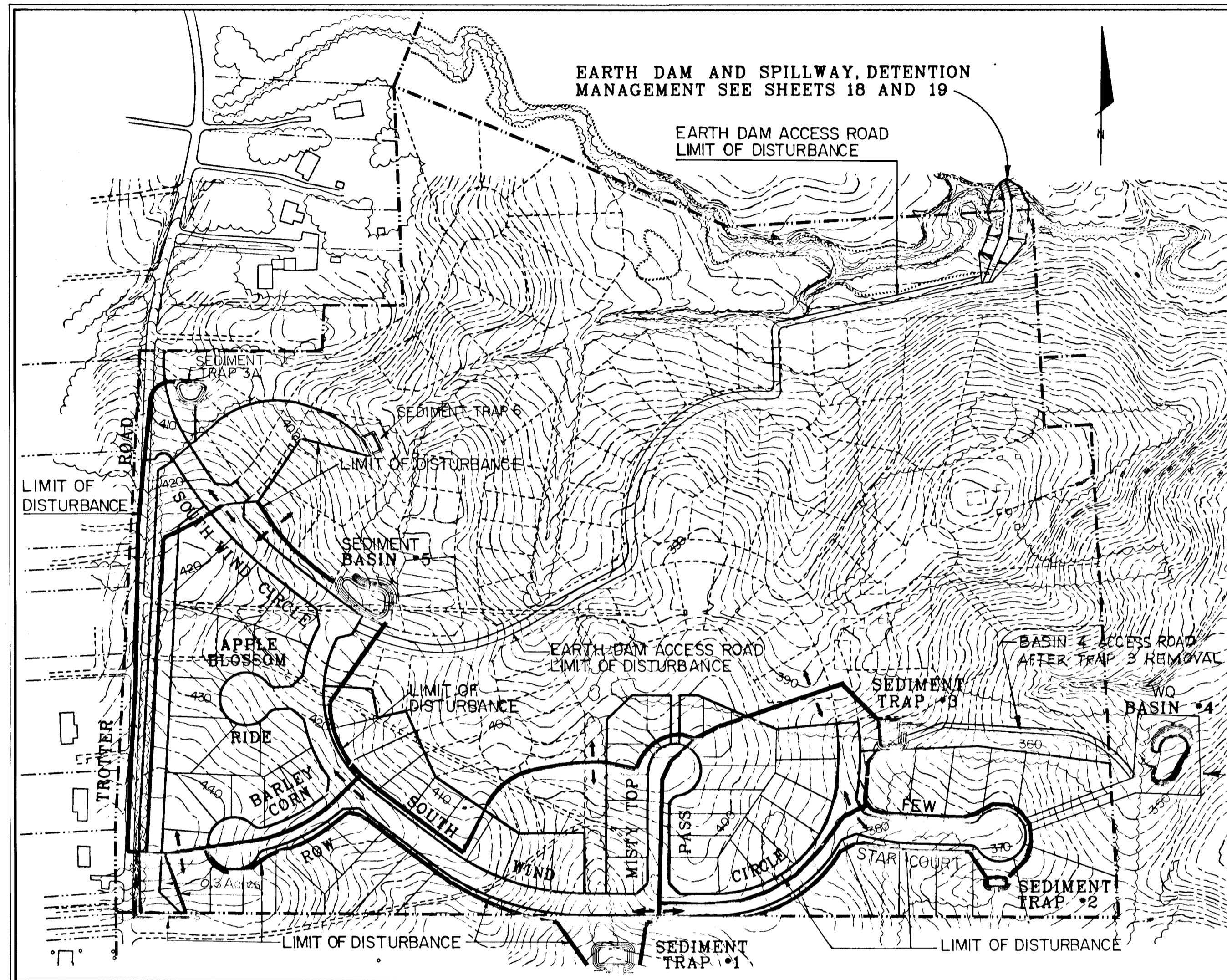
SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- PLACE STABILIZED CONSTRUCTION ENTRANCE.
- CLEAR AND GRUB AREAS FOR DAM ACCESS ROAD, EARTH DAM, WQ BASIN SEDIMENT CONTROL FACILITIES ONLY.
- INSTALL DIKES, SILT FENCE AND SEDIMENT TRAPS. CONSTRUCT EARTH DAM AND WQ BASINS 4.
- STRIP AND GRADE THE SITE AS SHOWN ON SHEETS 14, 15, AND 16.
- INSTALL STORM DRAINS AND UTILITIES, EXCEPT S-3 TO I-60.
- COMPLETE ROAD CONSTRUCTION AND STABILIZE ALL DISTURBED AREAS.
- CONSTRUCT DRAIN S-3 TO I-60 WHEN TRAP 3A IS CONVERTED TO STONE BASIN OUTFALL.
- AFTER APPROVAL BY THE SEDIMENT CONTROL INSPECTOR, SEDIMENTS TRAPS 1 AND 2 MAY BE REMOVED.
- AFTER TRAP NO. 1 IS REMOVED, PLACE SILT FENCE AND FILL EMBANKMENT AND MITIGATION AREA AND STABILIZE. AFTER APPROVAL BY THE SEDIMENT CONTROL INSPECTOR, SILT FENCE MAY BE REMOVED.

SEDIMENT CONTROL NOTES

- A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTION AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION. (S-3-2.4.1)
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (1) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES GREATER THAN 5:1; (2) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52) TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:

TOTAL AREA OF SITE	30 ACRES
AREA DISTURBED	13 ACRES
AREA TO BE ROOFED OR PAVED	3.0 ACRES
AREA TO BE VEGETATIVELY STABILIZED	10.0 ACRES
TOTAL CUT	23,000 CU. YDS.
TOTAL FILL	23,000 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY HOWARD COUNTY DPW SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.



SEDIMENT CONTROL DRAINAGE AREA MAP

SCALE: 1" = 200'

SEDIMENT DESIGN DATA
WQ BASINS AND TRAPS

SEDIMENT BASIN #5

DRAINAGE AREA = 7.0 AC.
 STORAGE REQUIRED = 0.29 A.F.
 STORAGE PROVIDED = 0.30 A.F.
 RISER CREST = 400.00
 EMERGENCY SPILLWAY = 401.0
 TOP BERM ELEV. = 403.0
 SEDIMENT ELEV. = 400.0
 BOTTOM ELEV. = 396.5
 DEPTH = 6.5'

SEDIMENT TRAP 3A

TRAP TYPE = RIP RAP OUTLET
 DRAINAGE AREA = 0.30 AC.
 STORAGE REQUIRED = 0.01 A.F.
 STORAGE PROVIDED = 0.02 A.F.
 OUTLET LENGTH = 4'
 WEIR CREST ELEV. = 403.5
 TOP BERM ELEV. = 404.5
 SEDIMENT ELEV. = 402.5
 BOTTOM ELEV. = 400.0
 DEPTH = 2.5'

SEDIMENT TRAP #1

TRAP TYPE = RIP RAP OUTLET
 DRAINAGE AREA = 4.6 AC.
 STORAGE REQUIRED = 0.19 A.F.
 STORAGE PROVIDED = 0.26 A.F.
 OUTLET LENGTH = 20'
 WEIR CREST ELEV. = 376.0
 TOP BERM ELEV. = 378.0
 SEDIMENT ELEV. = 375.0
 BOTTOM ELEV. = 371.0
 DEPTH = 5.0'

SEDIMENT TRAP #2

TRAP TYPE = RIP RAP OUTLET
 DRAINAGE AREA = 1.1 AC.
 STORAGE REQUIRED = 0.05 A.F.
 STORAGE PROVIDED = 0.06 A.F.
 OUTLET LENGTH = 8'
 WEIR CREST ELEV. = 362.0
 TOP BERM ELEV. = 364.0
 SEDIMENT ELEV. = 361.0
 BOTTOM ELEV. = 358.0
 DEPTH = 4.0'

SEDIMENT TRAP #3

TRAP TYPE = RIP RAP OUTLET
 DRAINAGE AREA = 3.6 AC.
 STORAGE REQUIRED = 0.15 A.F.
 STORAGE PROVIDED = 0.18 A.F.
 OUTLET LENGTH = 15'
 WEIR CREST ELEV. = 374.0
 TOP BERM ELEV. = 376.0
 SEDIMENT ELEV. = 373.0
 BOTTOM ELEV. = 370.0
 DEPTH = 4.0'

SEDIMENT TRAP #6

TRAP TYPE = RIP RAP OUTLET
 DRAINAGE AREA = 2.5 ACRES
 STORAGE REQUIRED = 0.10 AF
 STORAGE PROVIDED = 0.10 AF
 OUTLET LENGTH = 12'
 WEIR CREST ELEV. = 383.0
 TOP BERM ELEV. = 384.5
 SEDIMENT ELEV. = 382.0
 BOTTOM ELEV. = 377.0
 DEPTH = 5.0'

REV. DATE	REV. NO.	REVISION DESCRIPTION
Nov. 7, 1991	3	Revised 15' RCP S-7 to 50
Oct. 10, 1991	2	Added Note 10 - See question 10
Nov. 7, 1991	1	Revised 15' RCP S-7 to 50

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH
 AND DEVELOPMENT CORPORATION

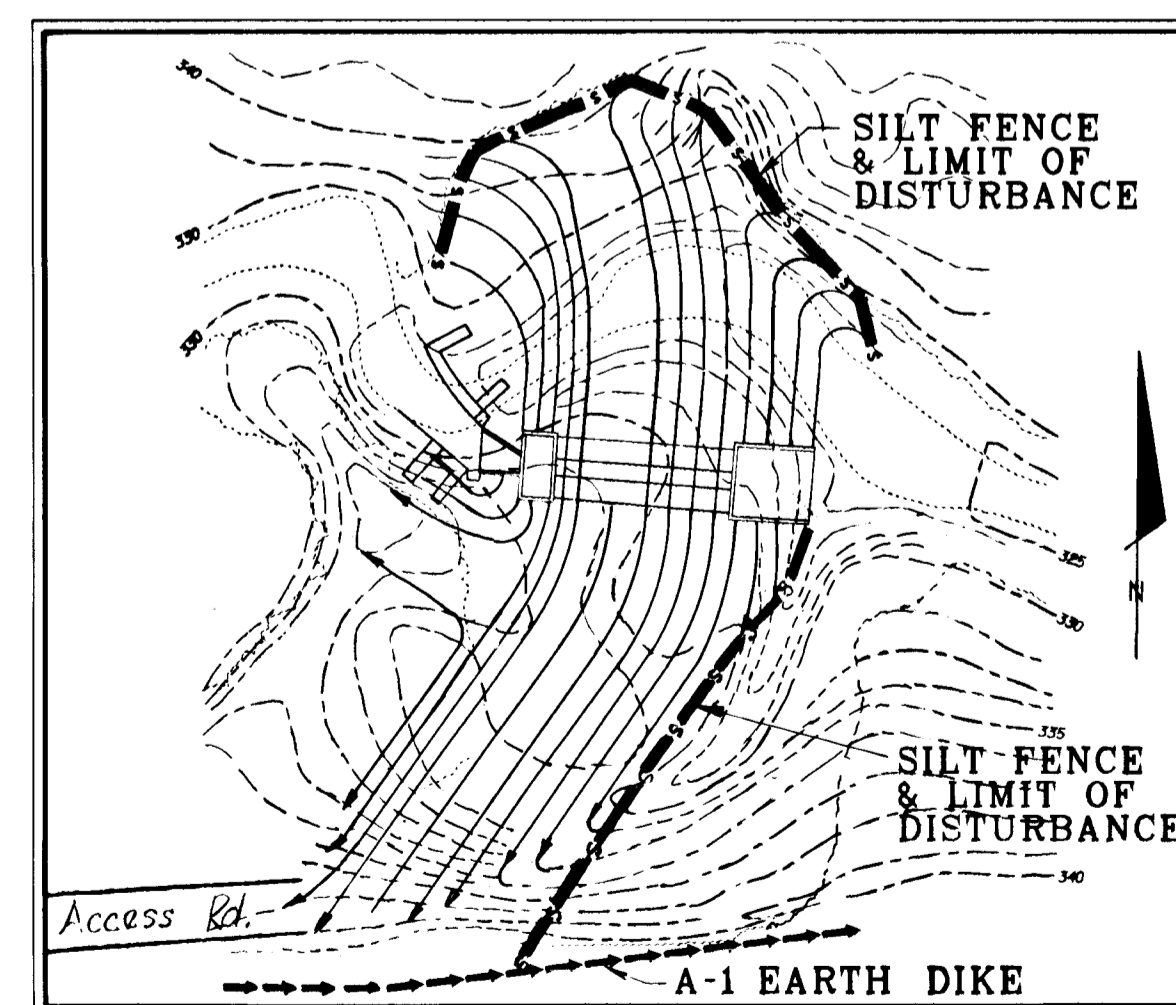
PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION 1 AREA 3 PHASE 2

PROJECT TITLE:
 SEDIMENT CONTROL
 DRAINAGE AREA MAP

SCALE: AS SHOWN DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457



EARTH DAM SEDIMENT CONTROL PLAN

SCALE: 1" = 50'

REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.

James M. Helm 4/4/91
 S.S. SOIL CONSERVATION SERVICE

BY THE DEVELOPER:
 "I CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT".

BY THE ENGINEER:
 "I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT".

Thomas J. Shafer 12/3/90
 THOMAS J. SHAFER P.E. NO. 8457

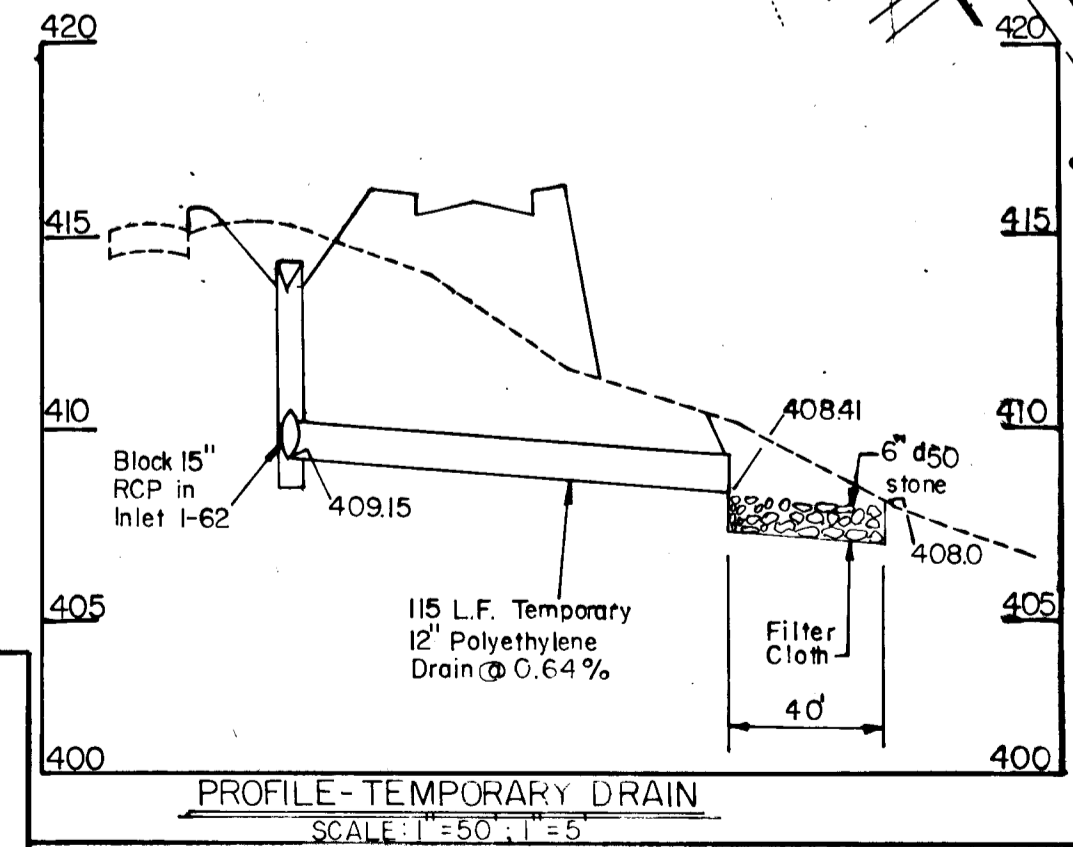
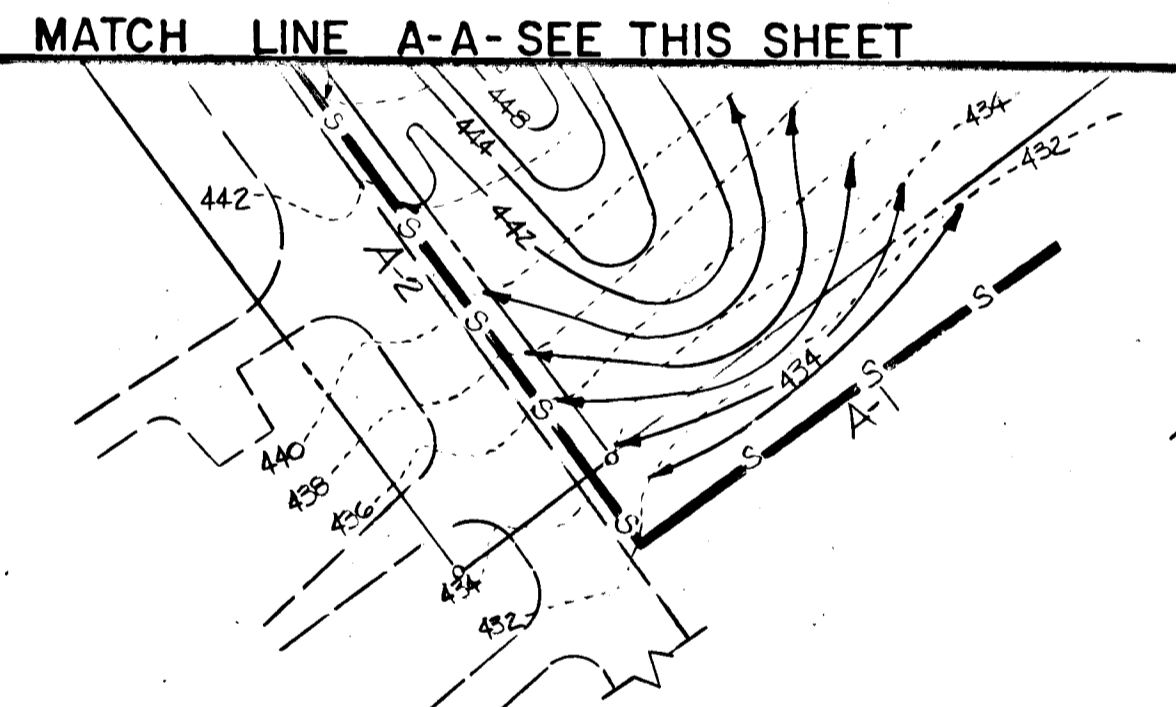
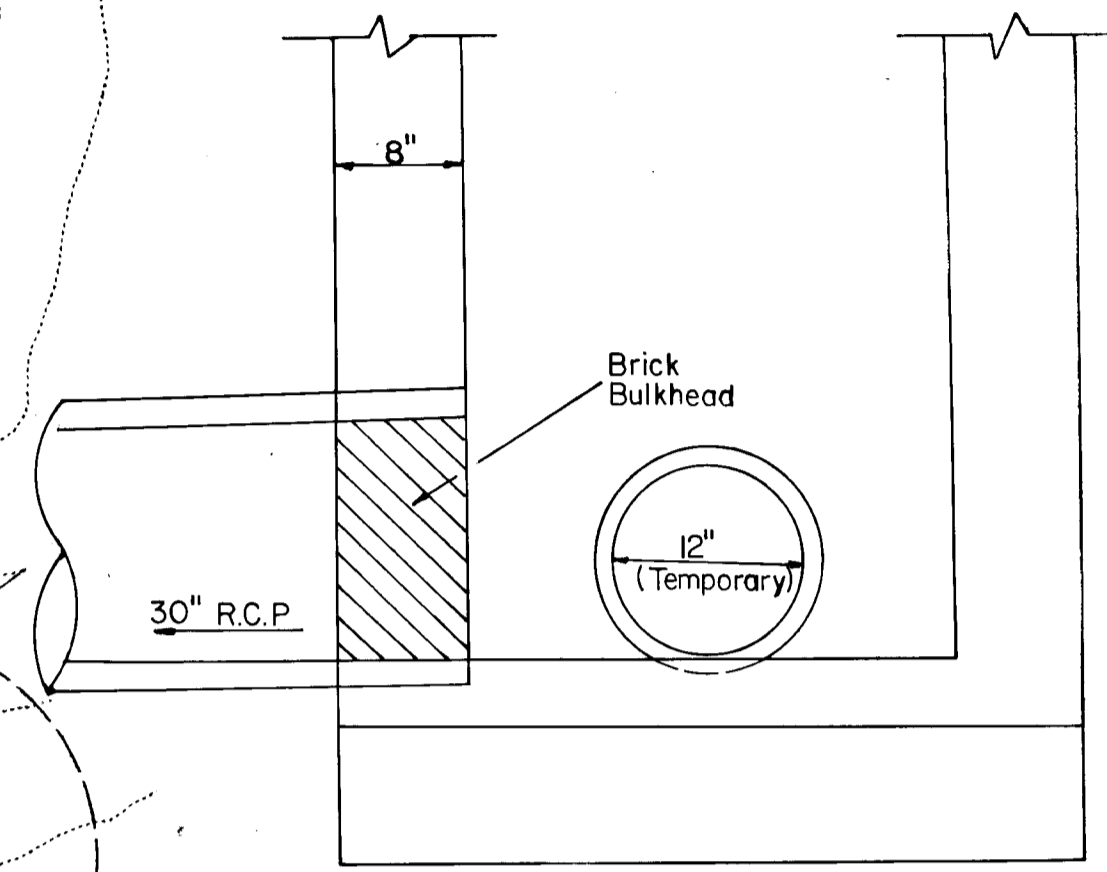
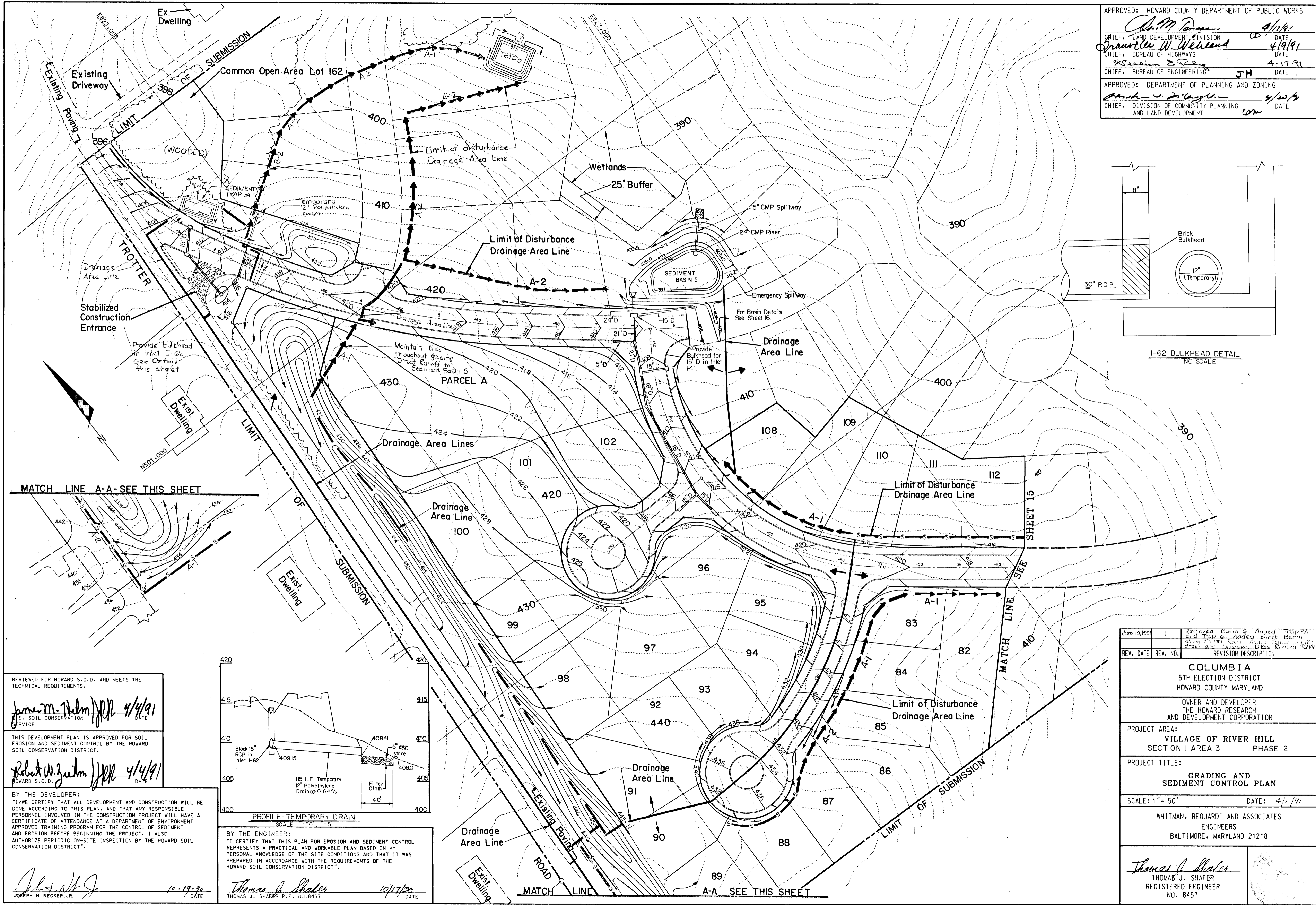
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Robert W. Ziehm 4/4/91
 HOWARD S.C.D.

Joseph H. Necker, Jr.
 JOSEPH H. NECKER, JR.
 12-5-90

6371

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
John M. ... 4/1/91 DATE
 CHIEF, LAND DEVELOPMENT DIVISION
Frankie W. ... 4/19/91 DATE
 CHIEF, BUREAU OF HIGHWAYS
William ... 4-17-91 DATE
 CHIEF, BUREAU OF ENGINEERING JH
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
... 4/22/91 DATE
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT com



REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.
John M. Helm JPH 4/4/91 DATE
 S.O. SOIL CONSERVATION SERVICE
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Robert W. Zuch RZ 4/4/91 DATE
 HOWARD S.C.D.
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Joseph H. Necker, Jr. JHN 10-19-90 DATE
 JOSEPH H. NECKER, JR.

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Thomas J. Shafer TJS 10/17/90 DATE
 THOMAS J. SHAFER P.E. NO. 8457

REV. DATE	REV. NO.	REVISION DESCRIPTION
June 10, 1991	1	Removed Basin 6 and Added Trap A and Trap 6. Added Earth Berm along Troter Road. Added Temporary Drain and Ditches. Dikes Revised. JTW

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION I AREA 3 PHASE 2

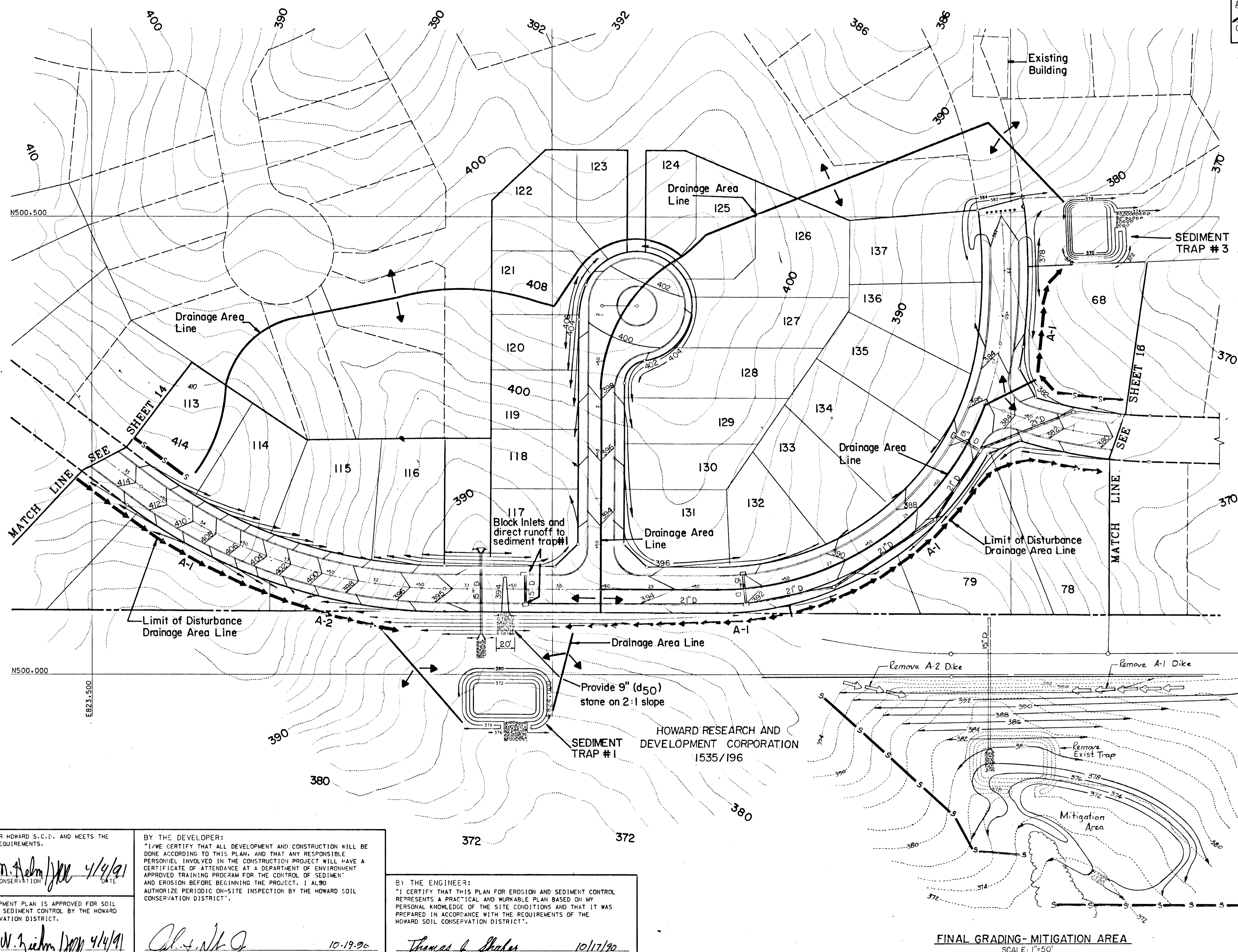
PROJECT TITLE:
 GRADING AND SEDIMENT CONTROL PLAN

SCALE: 1" = 50' DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

Thomas J. Shafer
 THOMAS J. SHAFER
 REGISTERED ENGINEER
 NO. 8457

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, LAND DEVELOPMENT DIVISION *4/17/91*
Dravelle W. Wallace DATE 4/19/91
 Chief, BUREAU OF HIGHWAYS
K. ... DATE 4-17-91
 Chief, BUREAU OF ENGINEERING *JH* DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark J. ... DATE 4/23/91
 Chief, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT *cm* DATE



Nov. 7, 91	2	Revised 15" RCP S-7 to S-6
Oct. 10, 1991	1	Added Detail - Mitigation Area
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE: GRADING AND SEDIMENT CONTROL PLAN		
SCALE: 1" = 50'		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

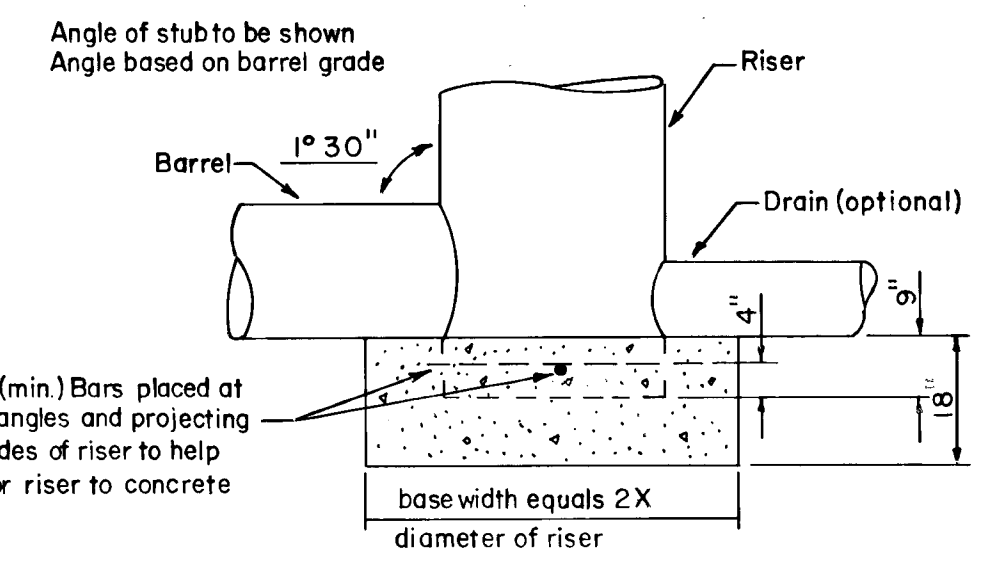
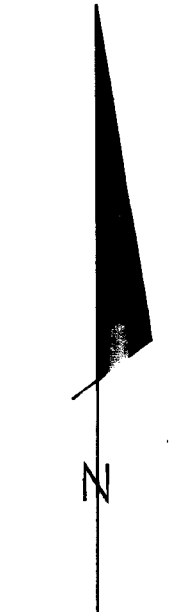
REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.
James M. Helm / *JMH* 4/4/91
 HOWARD S.C.D. SERVICE

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Joseph H. Necker, Jr. 10-19-90
 JOSEPH H. NECKER, JR. DATE

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Thomas J. Shafer 10/17/90
 THOMAS J. SHAFER, P.E. NO. 8457 DATE

14571

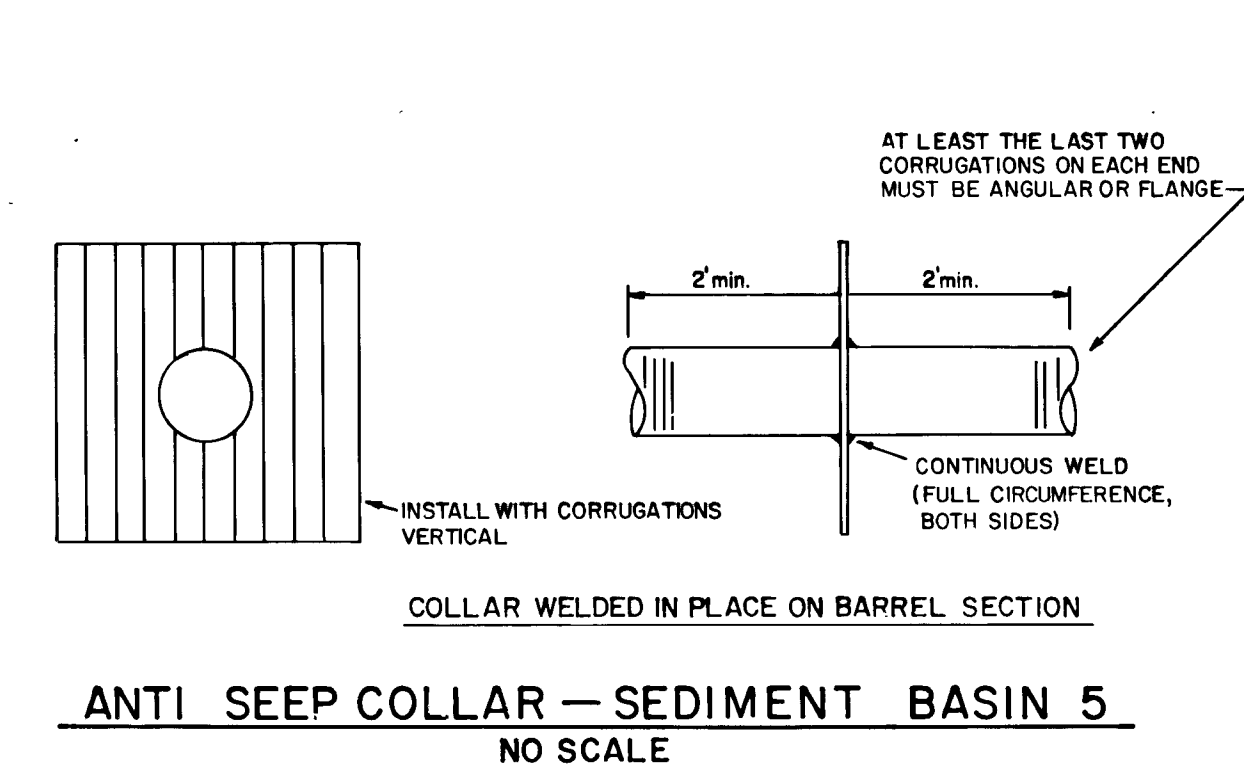
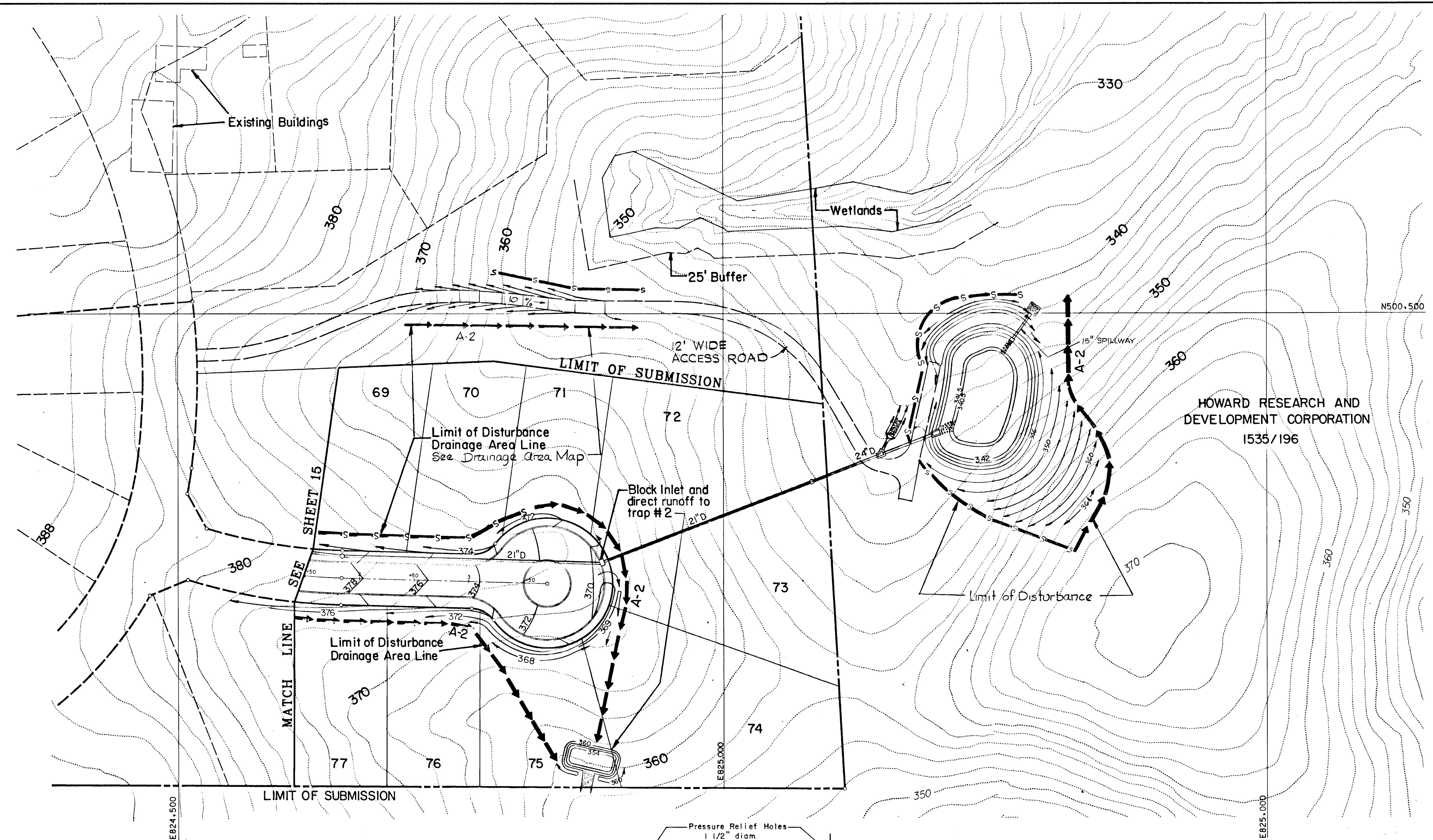
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHIEF, LAND DEVELOPMENT DIVISION *4/17/91* DATE
Lawrence W. Welwood 4/19/91
 CHIEF, BUREAU OF HIGHWAYS DATE
James Z. Rose 4-17-91
 CHIEF, BUREAU OF ENGINEERING *JH* DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Joseph H. Necker 4/20/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT *cm* DATE



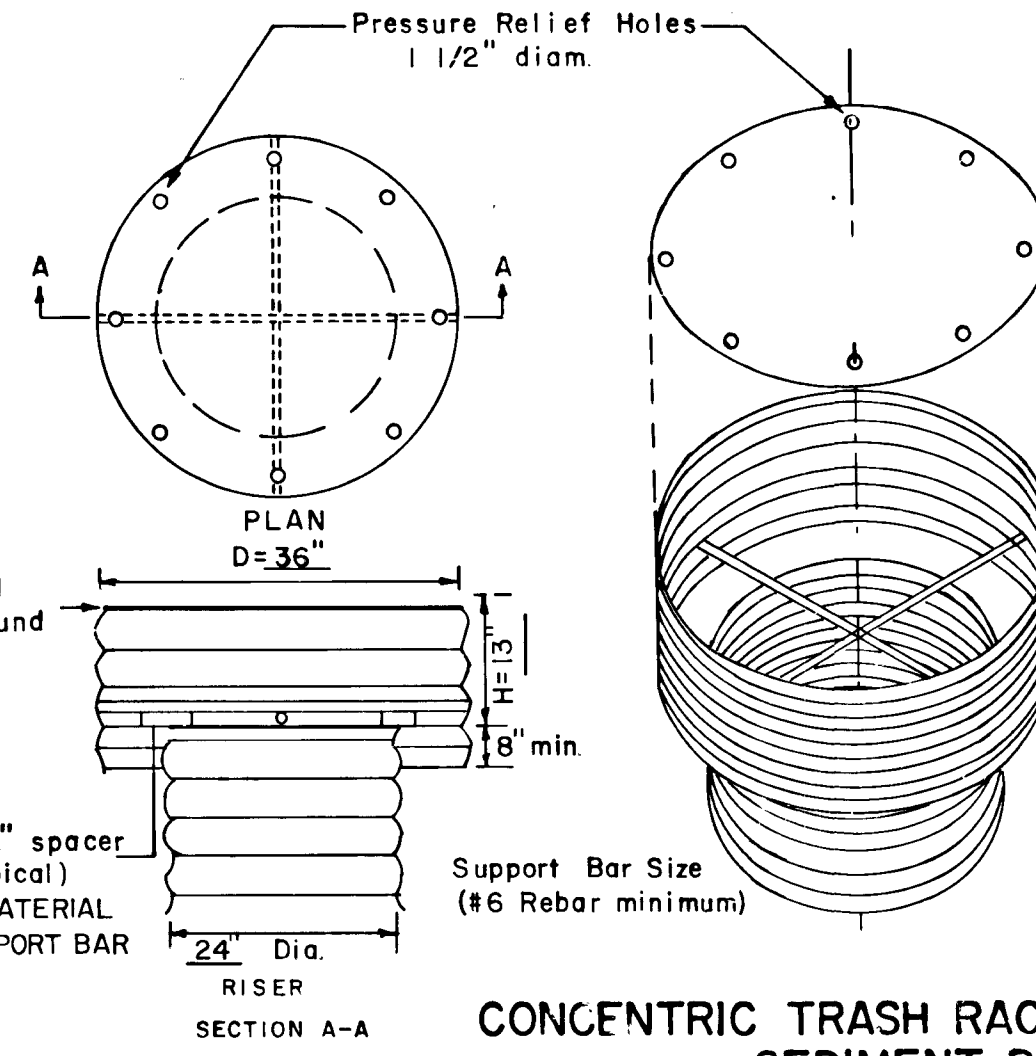
- NOTES:
1. The concrete base shall be poured in such a manner to insure that the concrete fills the bottom of the riser to the invert of the outlet pipe to prevent the riser from breaking away from the base.
 2. With aluminum or aluminized pipe, the embedded section must be painted with zinc chromate or equivalent.
 3. Riser base may be sized as computed using floatation with a factor of safety of 1.2.

RISER BASE DETAIL - SEDIMENT BASIN 5
NO SCALE

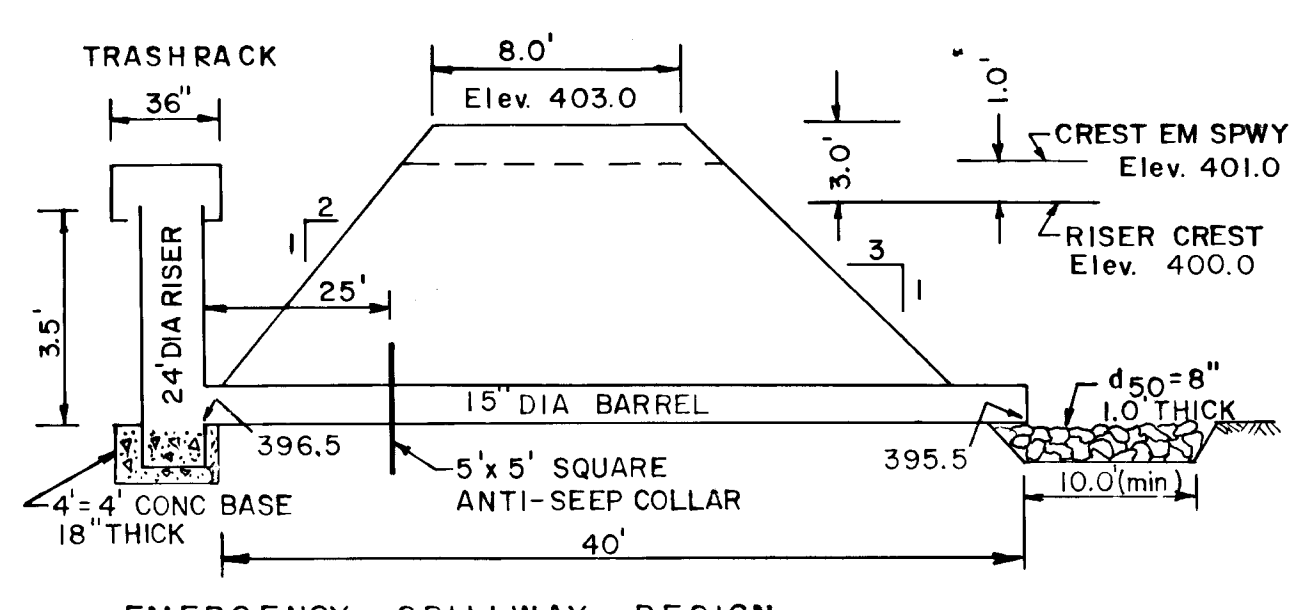
REV. DATE	REV. NO.	REVISION DESCRIPTION
		COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND
		OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION
		PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2
		PROJECT TITLE: GRADING AND SEDIMENT CONTROL PLAN
		SCALE: 1" = 50' DATE: 4/1/91
		WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218
		<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457



HOWARD RESEARCH AND DEVELOPMENT CORPORATION
1535/196



Top is 1/4 gage corrugated metal or 1/8" steel plate. Pressure relief holes may be omitted, if ends of corrugations are left fully open when corrugated top is welded to cylinder.
 Cylinder is 1/4 gage corrugated metal pipe or fabricated from 1/8" steel plate.
 NOTES:
 1) The cylinder must be firmly fastened to the top of the riser.
 2) Support bars are welded to the top of the riser or attached by straps bolted to top of riser.



EMERGENCY SPILLWAY DESIGN
 $QES = QPEAK - QPIPE = 29.4 - 8.3 = 21.1 \text{ CFS}$
 SIZE: WIDTH 10 FT. ; $H_p = 0.9 \text{ FT.}$
 ENTRANCE SLOPE - POSITIVE
 EXIT SLOPE - 3.0% ; $V = 3.7 \text{ fps}$

REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.
James M. Helm 4/14/91
 S.O.S. SOIL CONSERVATION DISTRICT DATE

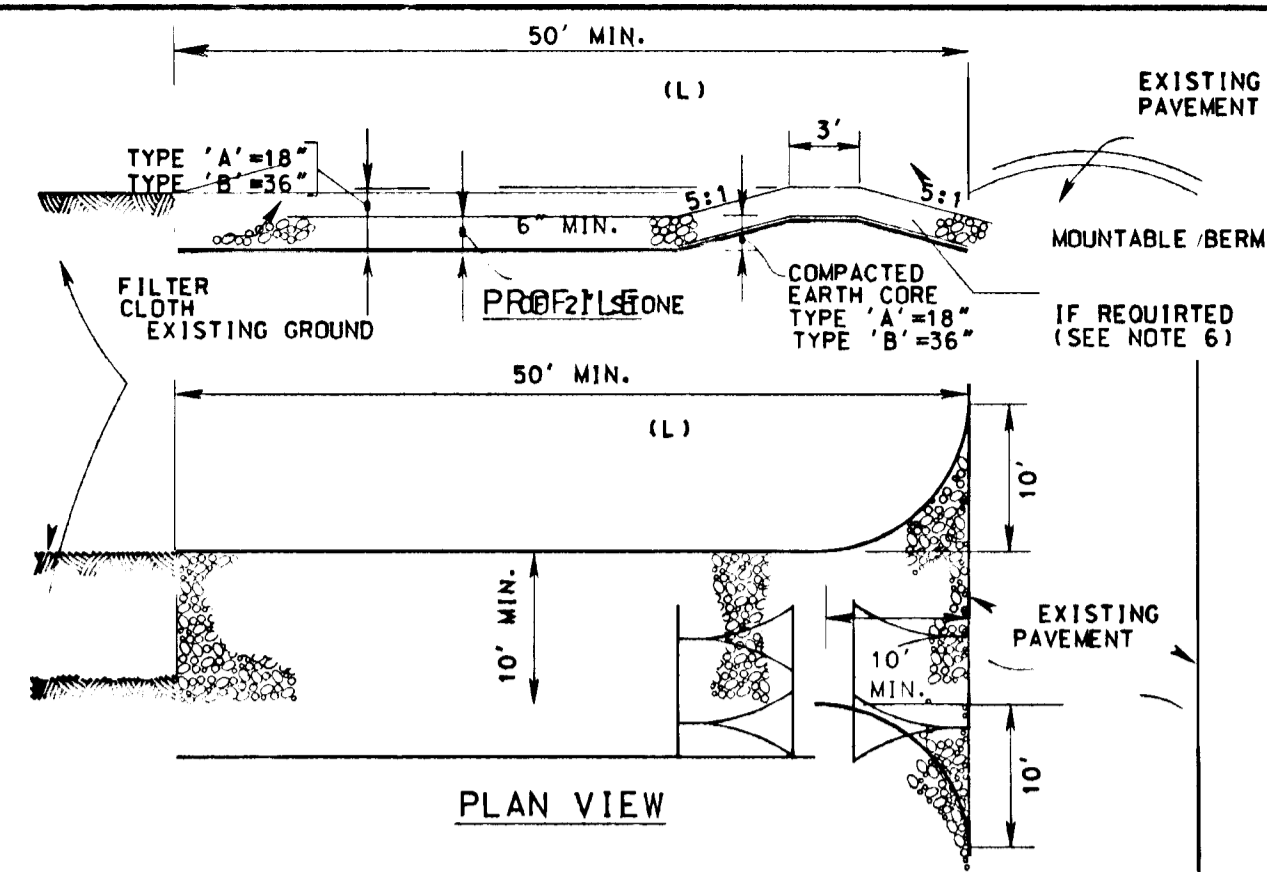
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Robert W. Zichem 4/14/91
 HOWARD S.C.D. DATE

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Joseph H. Necker, Jr. 10-19-90
 JOSEPH H. NECKER, JR. DATE

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Thomas J. Shafer 10/17/90
 THOMAS J. SHAFER P.E. NO. 8457 DATE

1489

Howard W. DeWald
 CHIEF, BUREAU OF HIGHWAYS
 DATE: 4/9/91
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Thomas J. Shafer
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT
 DATE: 4/17/91

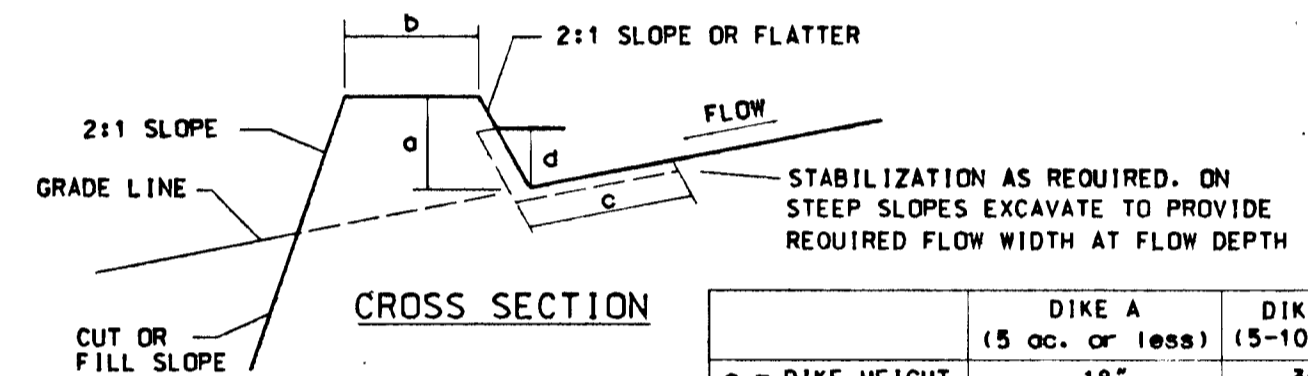


CONSTRUCTION SPECIFICATIONS

- STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
- LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
- THICKNESS - NOT LESS THAN SIX (6) INCHES.
- WIDTH - TEN (10) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
- FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
- SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
- MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
- WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO A APPROVED SEDIMENT TRAPPING DEVICE.
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

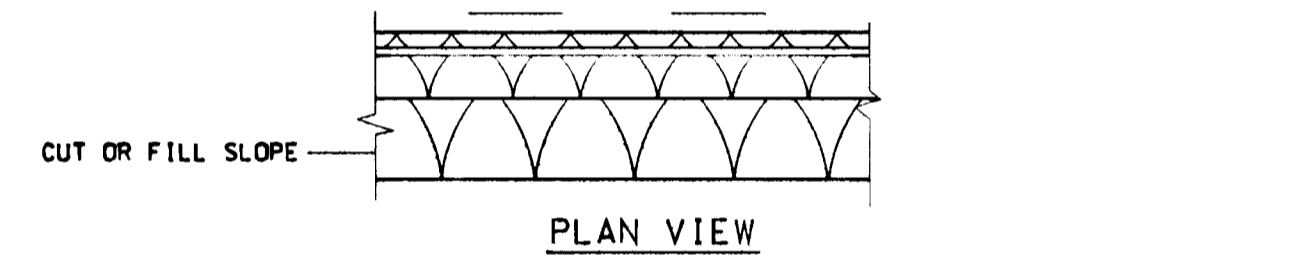
STANDARD SYMBOL: S.C.E.

STABILIZED CONSTRUCTION ENTRANCE



	DIKE A (5' OC. OR 10' OC.)	DIKE B (5'-10' OC.)
a = DIKE HEIGHT	18"	36"
b = DIKE WIDTH	24"	36"
c = FLOW WIDTH	4'	6'
d = FLOW DEPTH	8"	15"

POSITIVE DRAINAGE-GRADE SUFFICIENT TO DRAIN



CONSTRUCTION SPECIFICATIONS

- ALL DIKES SHALL BE COMPACTED BY EARTH-MOVING EQUIPMENT.
- ALL DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
- TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER IF DESIRED TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.
- FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO UTILIZE A STABILIZED SAFE OUTLET.
- EARTH DIKES SHALL HAVE AN OUTLET THAT FUNCTIONS WITH A MINIMUM OF EROSION. RUNOFF SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE SUCH AS A SEDIMENT TRAP OR SEDIMENT BASIN WHERE EITHER THE DIKE CHANNEL OR THE DRAINAGE AREA ABOVE THE DIKE ARE NOT ADEQUATELY STABILIZED.
- STABILIZATION SHALL BE: (A) IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR SEED AND STRAW MULCH OR STRAW MULCH IF NOT IN SEEDING SEASON. (B) FLOW CHANNEL AS PER THE CHART BELOW.

TYPE OF TREATMENT	CHANNEL GRADE	DIKE A	DIKE B
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE, OR EXCELSIOR, SOD, 2" STONE
3	3.1-5.0%	SEED WITH JUTE, OR SOD, 2" STONE	LINED RIP-RAP 4-8"
4	8.1-20%	LINED RIP-RAP 4-8"	ENGINEERING DESIGN

- STONE TO BE 2 INCH STONE OR RECYCLED CONCRETE EQUIVALENT, IN A LAYER AT LEAST 3 INCHES IN THICKNESS AND BE PRESSED INTO THE SOIL WITH CONSTRUCTION EQUIPMENT.
- RIP-RAP TO BE 4-8 INCHES IN A LAYER AT LEAST 8 INCHES THICKNESS AND PRESSED INTO THE SOIL.
- APPROVED EQUIVALENTS CAN BE SUBSTITUTED FOR ANY OF THE ABOVE MATERIALS.

- PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

STANDARD SYMBOL: A-2 / B-3

EARTH DIKE

REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.

Robert W. Ziehm / *JJM* 4/9/91
U.S. SOIL CONSERVATION SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Robert W. Ziehm / *JJM* 4/9/91
HOWARD S.C.D. DATE

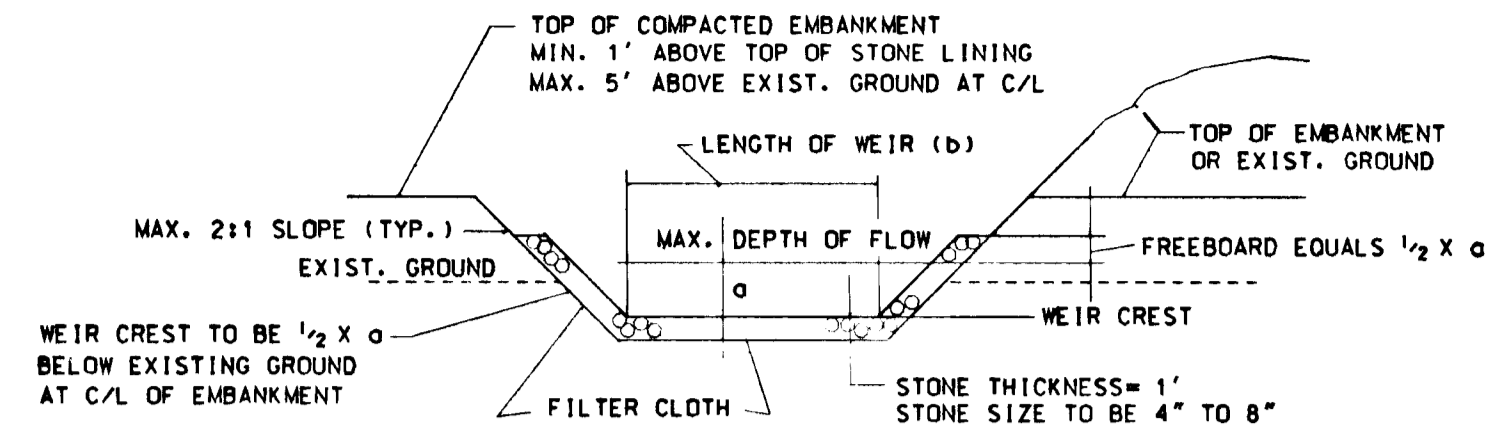
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Joseph H. Necker, Jr. 10.19.90
JOSEPH H. NECKER, JR. DATE

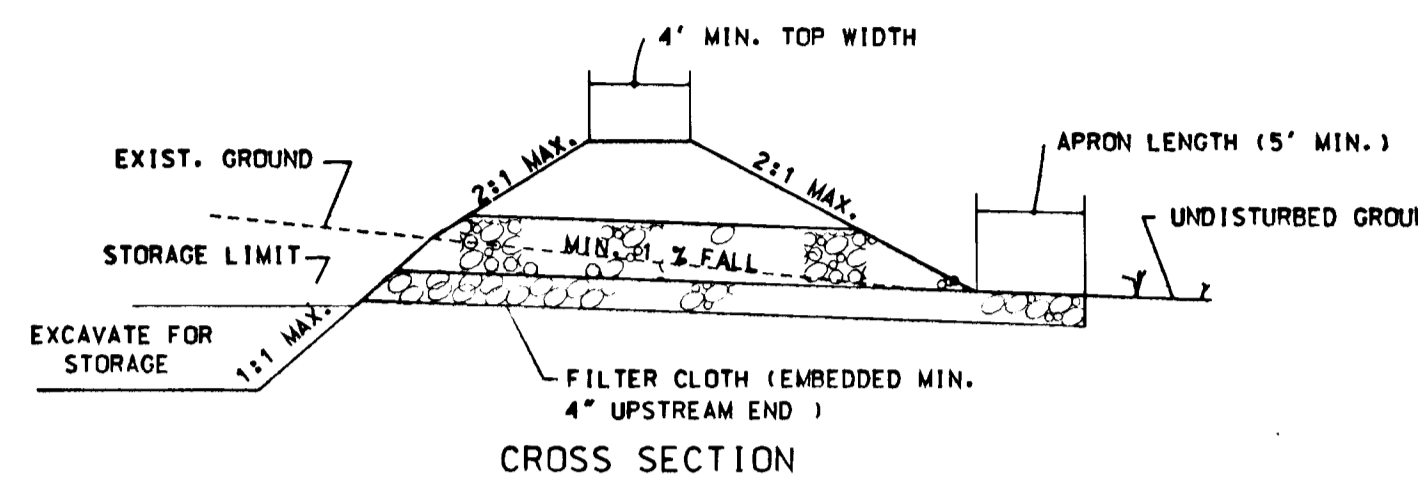
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Thomas J. Shafer 10/17/90
THOMAS J. SHAFER P.E. NO. 8487 DATE

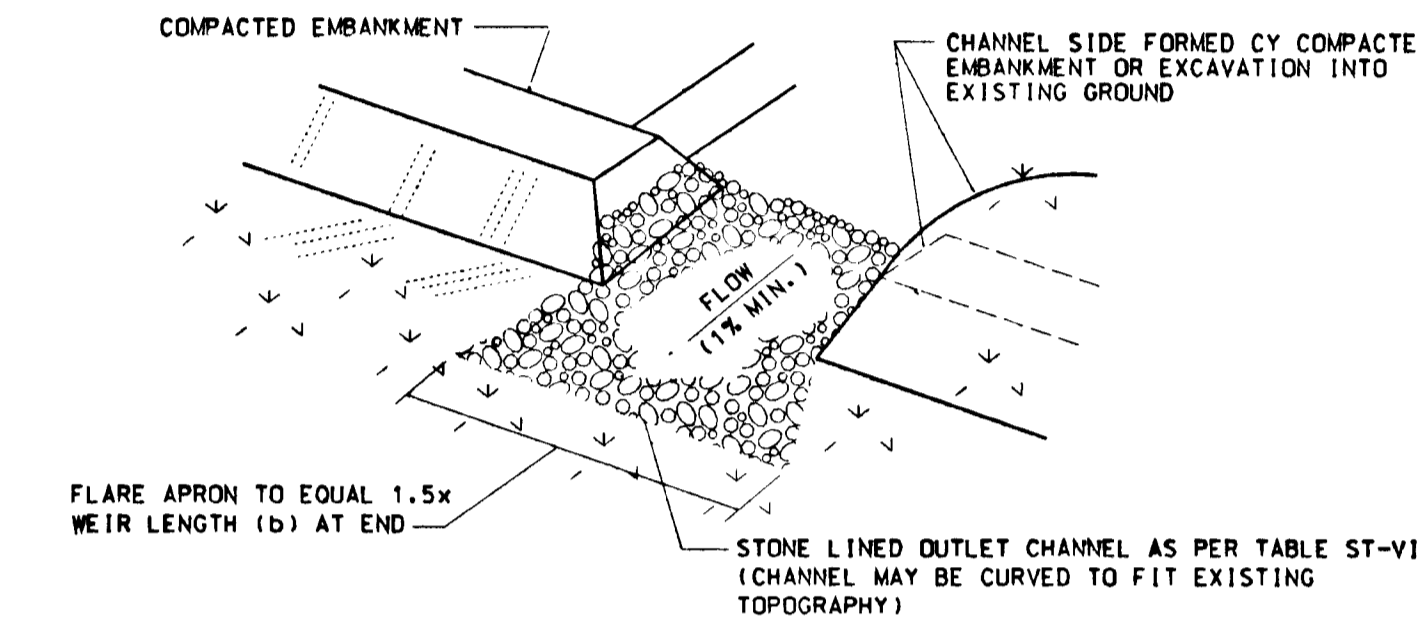
RIPRAP OUTLET SEDIMENT TRAP ST-V1



PROFILE



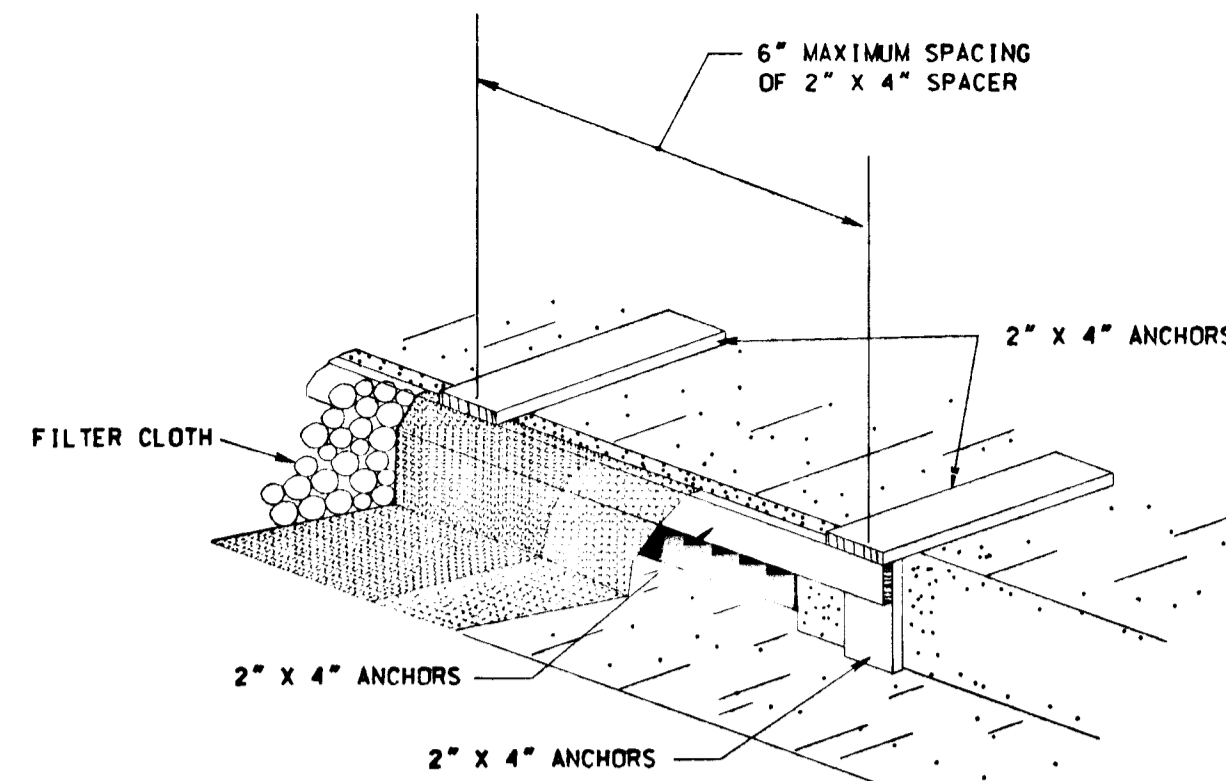
CROSS SECTION



PERSPECTIVE VIEW

CONSTRUCTION SPECIFICATIONS FOR ST-V1

- THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
- THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVELING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF EMBANKMENT SHALL BE FIVE (5) FEET, MEASURED AT CENTERLINE OF EMBANKMENT.
- ALL FILL SLOPES SHALL BE 2:1 OR FLATTER; CUT SLOPES 1:1 OR FLATTER.
- ELEVATION OF THE TOP OF ANY DIKE DIRECTING WATER INTO TRAP MUST EQUAL OR EXCEED THE HEIGHT OF EMBANKMENT.
- STORAGE AREA PROVIDED SHALL BE FIGURED BY COMPUTING THE VOLUME AVAILABLE BEHIND THE OUTLET CHANNEL UP TO AN ELEVATION OF ONE (1) FOOT BELOW THE LEVEL WEIR CREST.
- FILTER CLOTH SHALL BE PLACED OVER THE BOTTOM AND SIDES OF THE OUTLET CHANNEL PRIOR TO PLACEMENT OF STONE. SECTIONS OF FABRIC MUST OVERLAP AT LEAST ONE (1) FOOT WITH SECTION NEAREST THE ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
- STONE USED IN THE OUTLET CHANNEL SHALL BE FOUR (4) TO EIGHT (8) INCHES (RIPRAP), TO PROVIDE A FILTERING EFFECT. A LAYER OF FILTER CLOTH SHALL BE EMBEDDED ONE (1) FOOT BACK INTO THE UPSTREAM FACE OF THE OUTLET STONE OR A ONE (1) FOOT THICK LAYER OF TWO (2) INCH OR FINER AGGREGATE SHALL BE PLACED ON THE UPSTREAM FACE OF THE OUTLET.
- SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
- THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRED AS NEEDED.
- CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
- THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
- DRAINAGE AREA FOR THIS PRACTICE IS LIMITED TO 15 ACRES OR LESS.

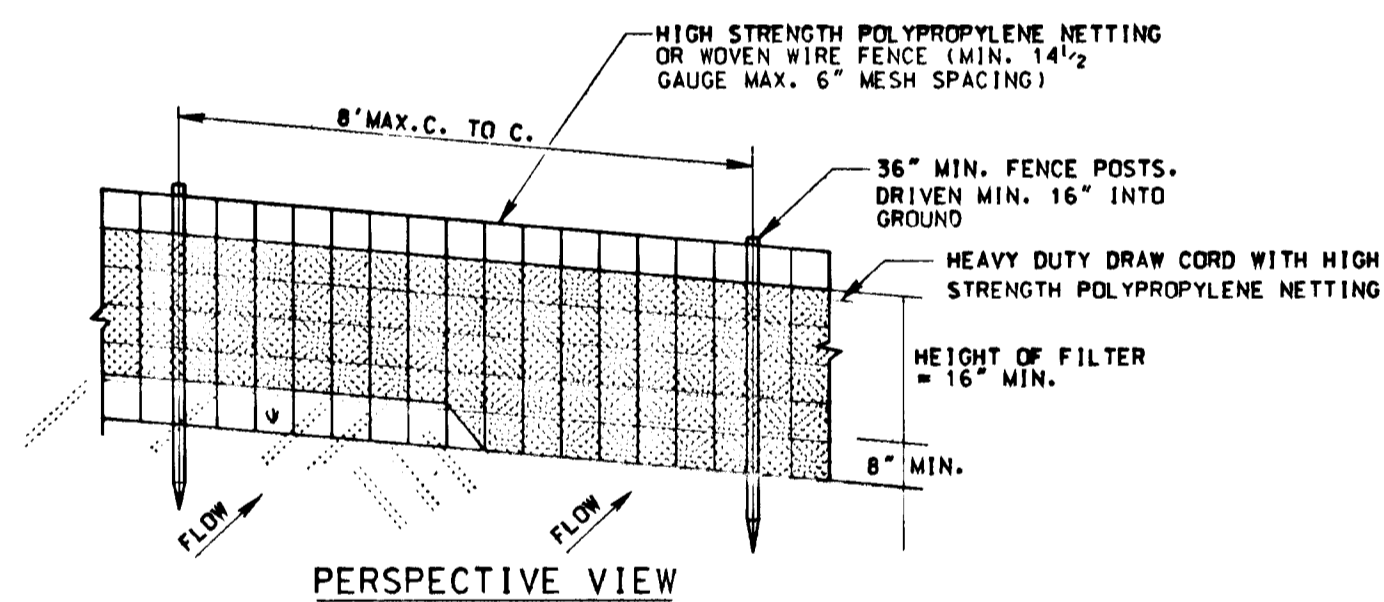


PERSPECTIVE VIEW

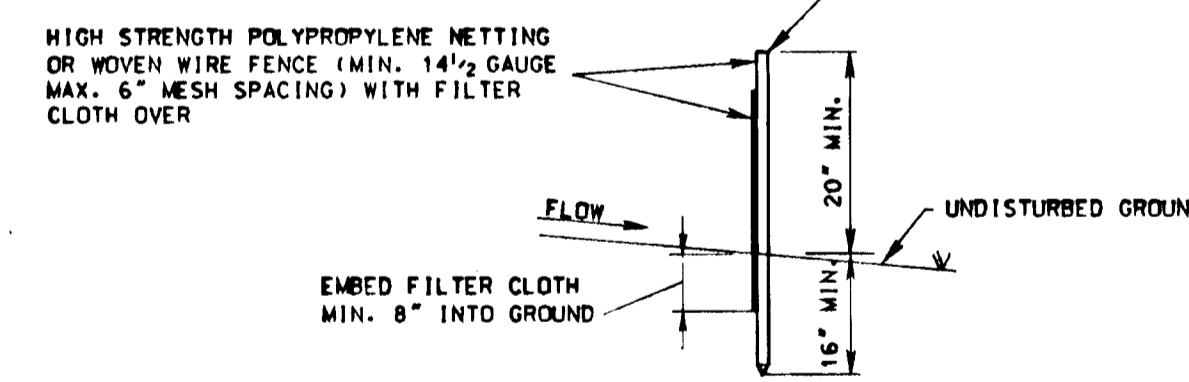
CURB INLET PROTECTION

- ATTACH A CONTINUOUS PIECE OF WIRE MESH (30" MIN. WIDTH BY THROAT LENGTH PLUS 4") TO THE 2" x 4" WEIR (MEASURING THROAT LENGTH PLUS 2") AS SHOWN ON THE STANDARD DRAWING.
- PLACE A PIECE OF APPROVED FILTER CLOTH (40-85 SIEVE) OF THE SAME DIMENSIONS AS THE WIRE MESH OVER THE WIRE MESH AND SECURELY ATTACH TO THE 2" x 4" WEIR.
- SECURELY NAIL THE 2" x 4" WEIR TO 9" LONG VERTICAL SPACERS TO BE LOCATED BETWEEN THE WEIR AND INLET FACE (MAX. 6" APART).
- PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL (MINIMUM 2" LENGTHS OF 20 x 4 TO THE TOP OF THE WEIR AT SPACER LOCATIONS, THESE 2" x 4" ANCHORS SHALL EXTEND ACROSS THE INLET TOP AND BE HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHT.
- THE ASSEMBLY SHALL BE PLACED SO THAT THE END SPACERS ARE A MINIMUM 1' BEYOND BOTH ENDS OF THE THROAT OPENING.
- FORM THE WIRE MESH AND FILTER CLOTH TO THE CONCRETE GUTTER AND AGAINST THE FACE OF CURB ON BOTH SIDES OF THE INLET. PLACE CLEAN 2" STONE OVER THE WIRE MESH AND FILTER FABRIC IN SUCH A MANNER AS TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE FILTER CLOTH.
- THIS TYPE OF PROTECTION MUST BE INSPECTED FREQUENTLY AND THE FILTER CLOTH AND STONE REPLACED WHEN CLOGGED WITH SEDIMENT.
- ASSURE THAT STORM FLOW DOES NOT BYPASS INLET BY INSTALLING TEMPORARY EARTH OR ASPHALT DIKES DIRECTING FLOW INTO INLET.

CURB INLET PROTECTION



PERSPECTIVE VIEW



SECTION

CONSTRUCTION SPECIFICATIONS

- HIGH STRENGTH POLYPROPYLENE NETTING OR WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
- FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

STANDARD SYMBOL: S S

SILT FENCE

PERMANENT SEEDING

APPLIES TO GRADED OR CLEARED AREA NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT, LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING. IF NOT PREVIOUSLY LOOSENEED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

- PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SO FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SO FT.) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0 UREA-FORM FERTILIZER (9 LBS/1000 SO FT.).
- ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SO FT.) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SO FT.) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 THRU APRIL 30 AND AUGUST 1 THRU OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SO FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS KENTUCKY TALL FESCUE PER ACRE AND 2 LBS PER ACRE (0.05 LBS/1000 SO FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SO FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SO FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SO FT.) FOR ANCHORING.

MAINTENANCE - INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING

APPLIES TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE (3) INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING. IF NOT PREVIOUSLY LOOSENEED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER. (14 LBS/1000 SO FT.) AND ONE TON PER ACRE OR 46 LBS/1000 SO FT OF DOLOMITIC LIMESTONE.

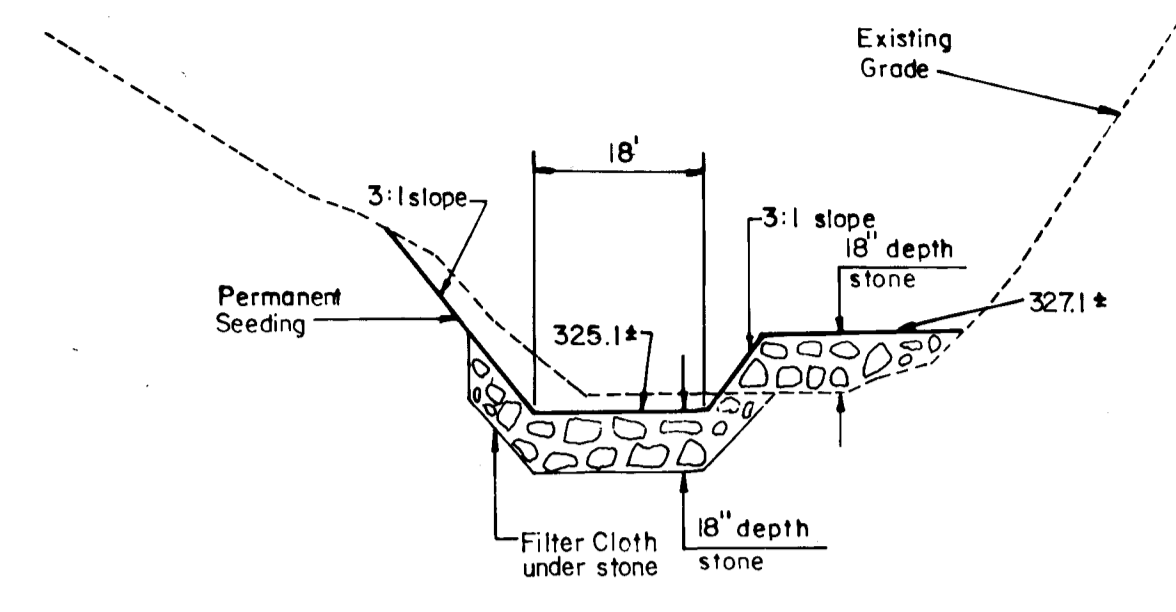
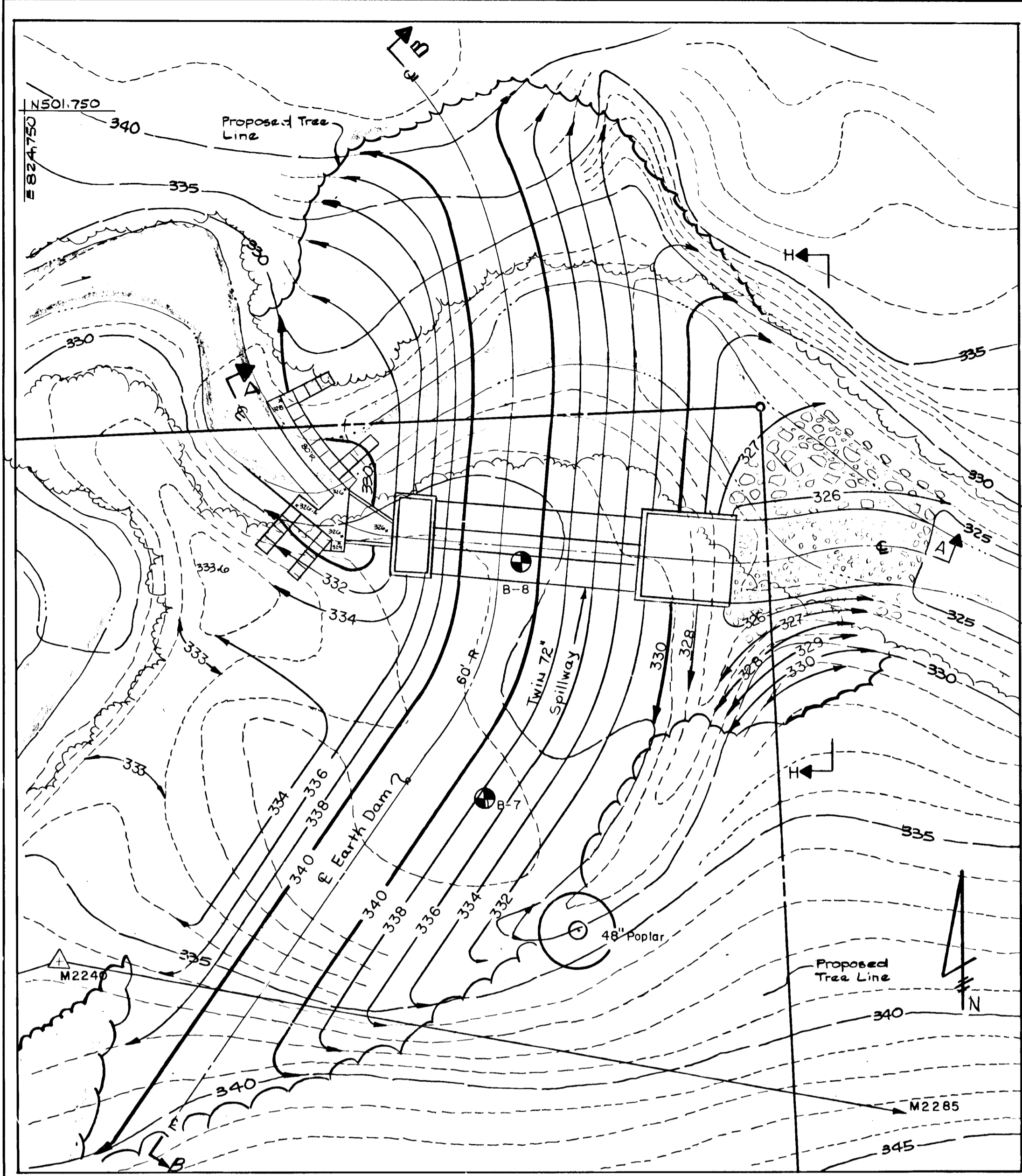
SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU NOVEMBER 15, SEED WITH 2 1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SO FT.). FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (0.07 LBS/1000 SO FT.). FOR THE PERIOD NOVEMBER 16 THRU FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SO FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL PER ACRE (5 GAL/1000 SO FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES 8 FT OR HIGHER, USE 348 GAL PER ACRE (8 GAL/1000 SO FT.) FOR ANCHORING.

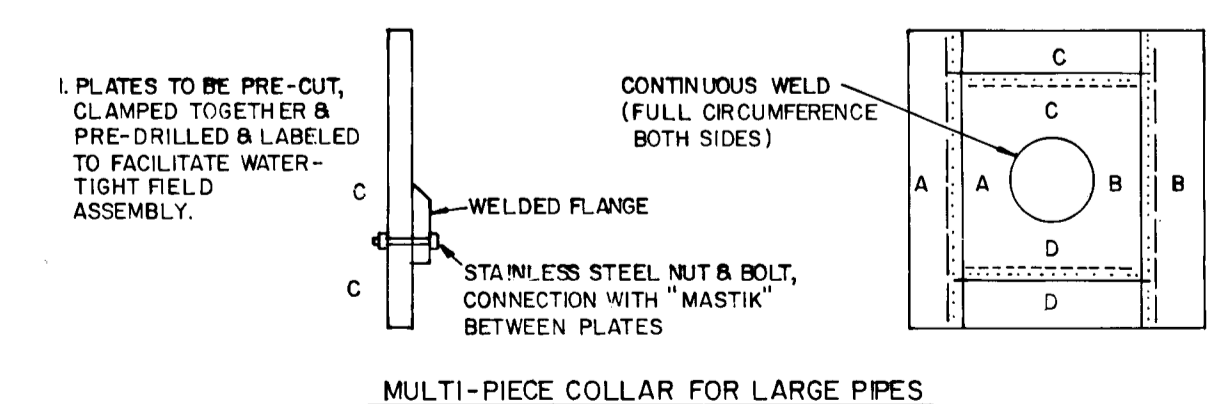
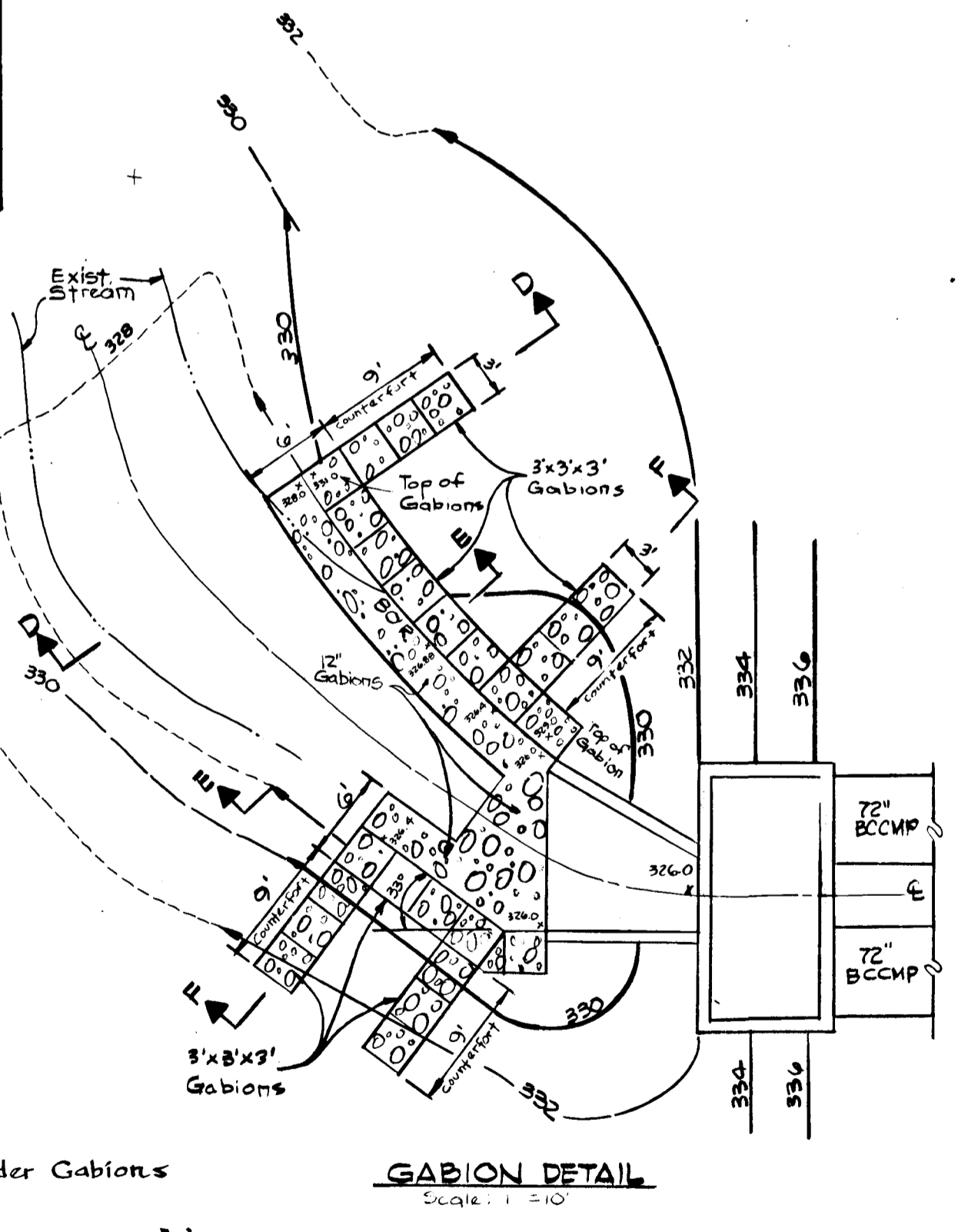
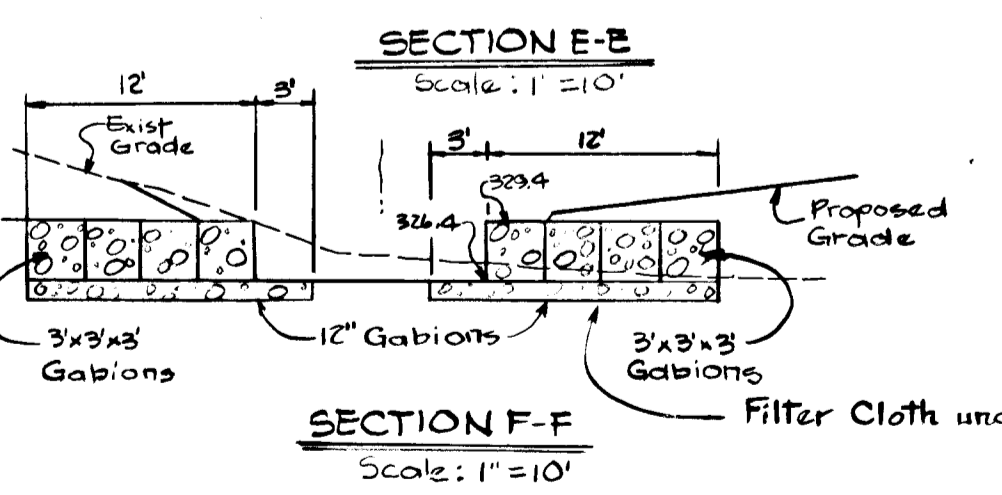
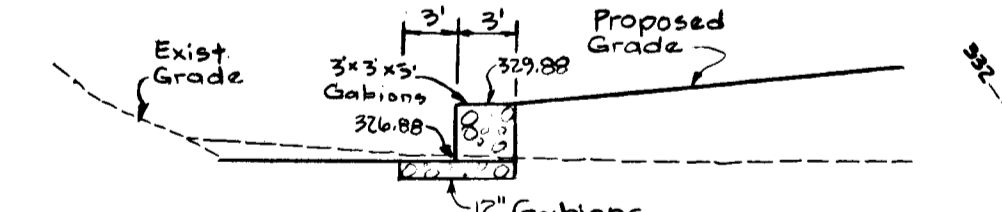
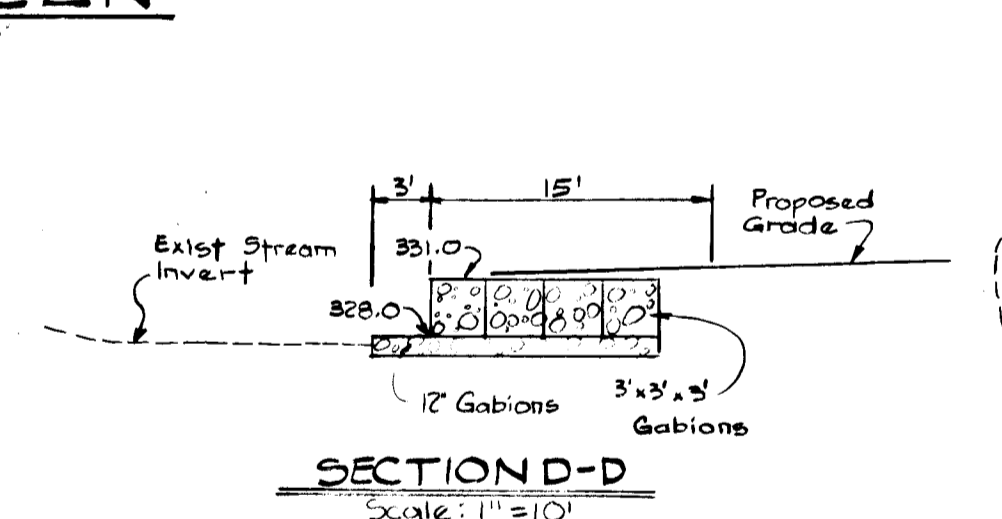
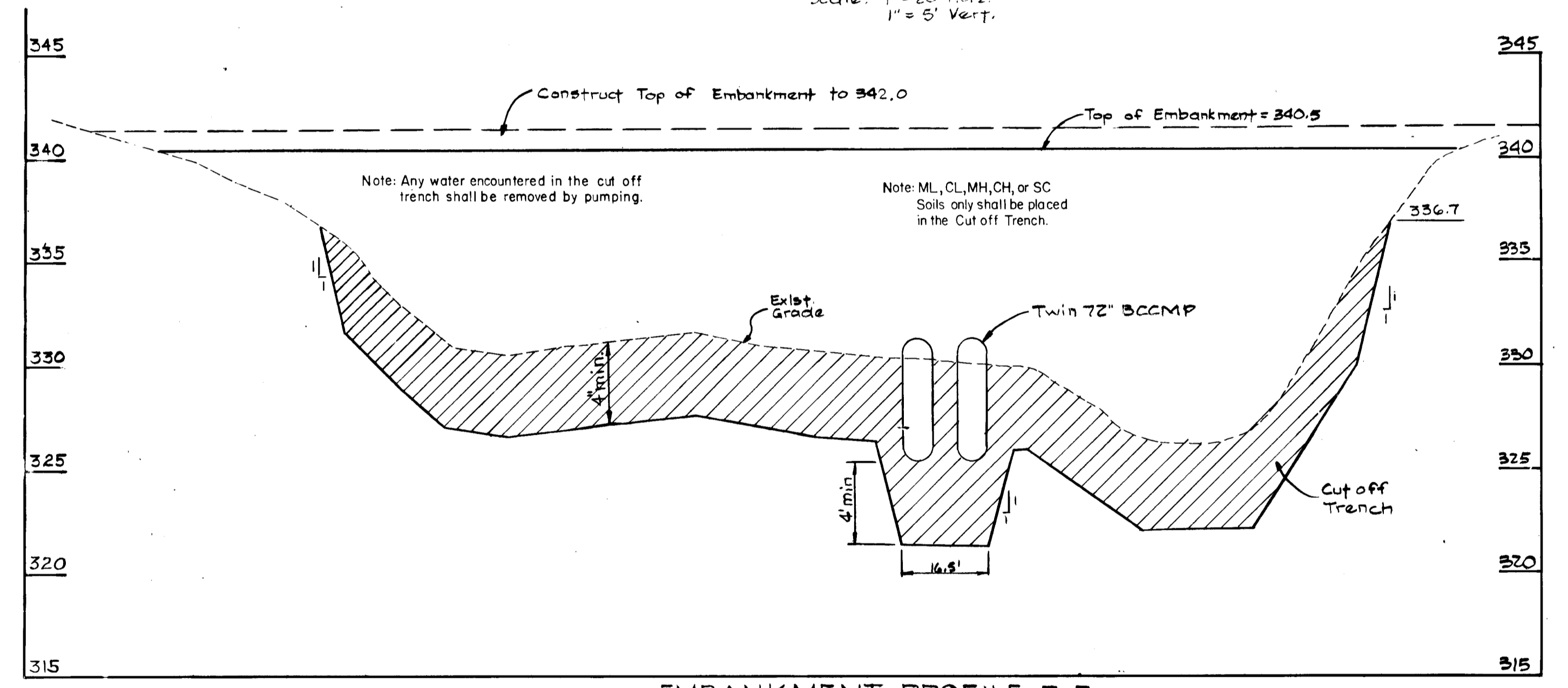
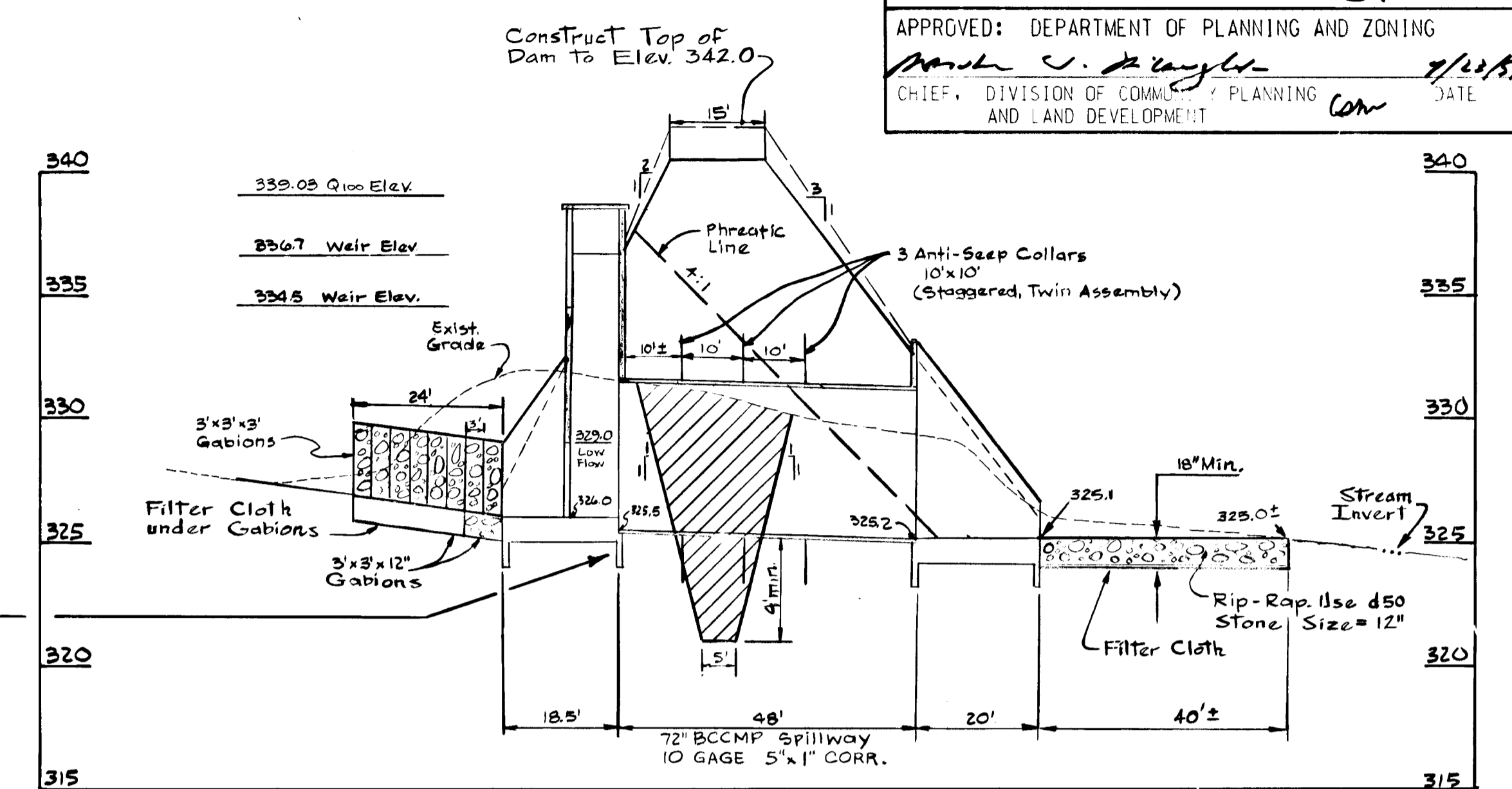
REFER TO THE 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR TEMPORARY SEEDING SPECIFICATIONS NOT COVERED.

REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA		
5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE: SEDIMENT CONTROL DETAILS		
SCALE: AS SHOWN		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Alan M. Danman 4/1/91
 REF. AND DEVELOPMENT DIVISION DATE
Lawrence W. Cheek 4/9/91
 CHIEF, BUREAU OF HIGHWAYS DATE
William E. Edy 4-17-91
 CHIEF, BUREAU OF ENGINEERS JH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark S. Taylor 4/2/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT Con DATE



NOTE:
 FOR 72" CORRUGATED METAL PIPE
 SPECIFICATIONS, SEE SHEET 23 OF 24.



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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."
Joseph H. Necker Jr. 10-17-90
 JOSEPH H. NECKER JR. DATE

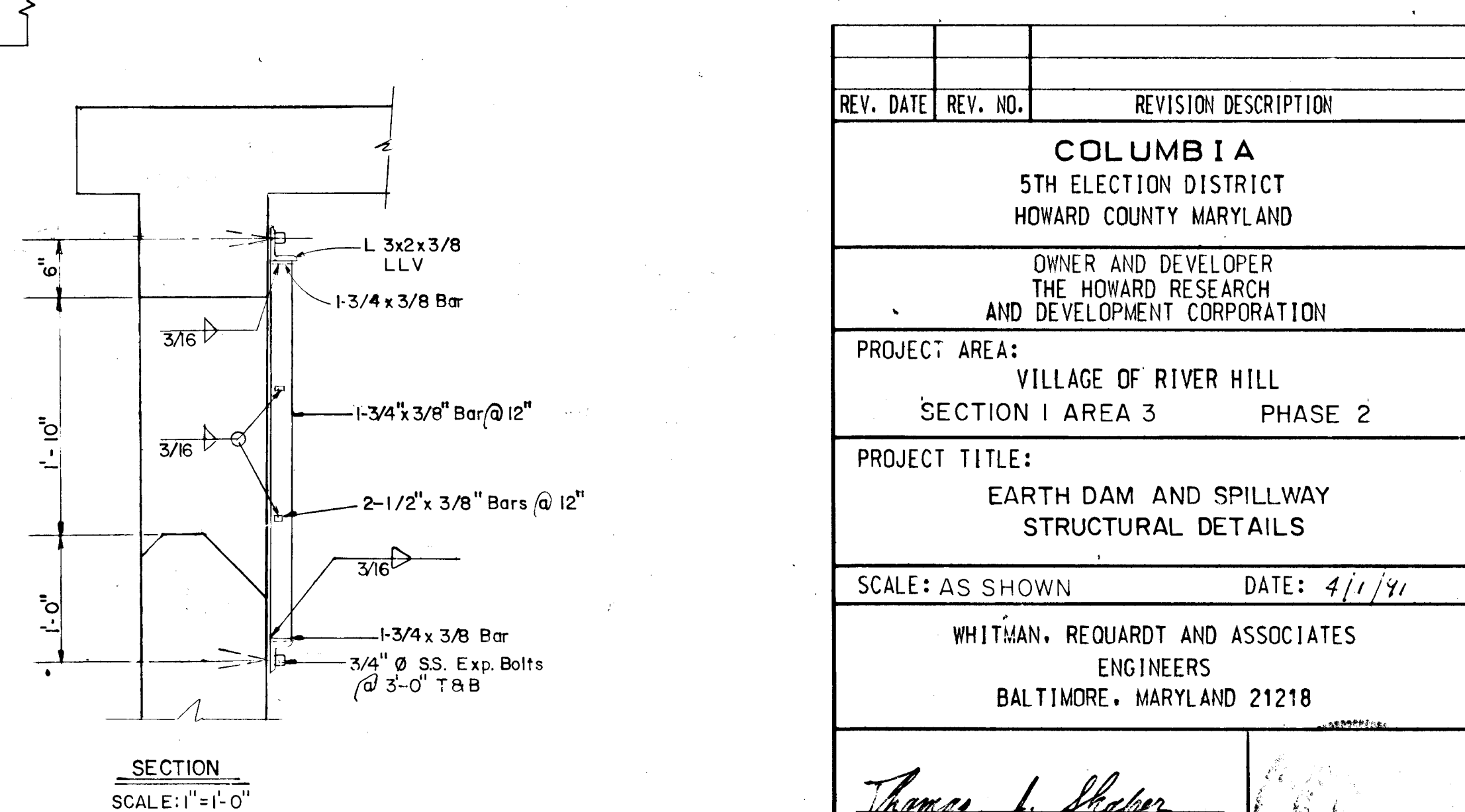
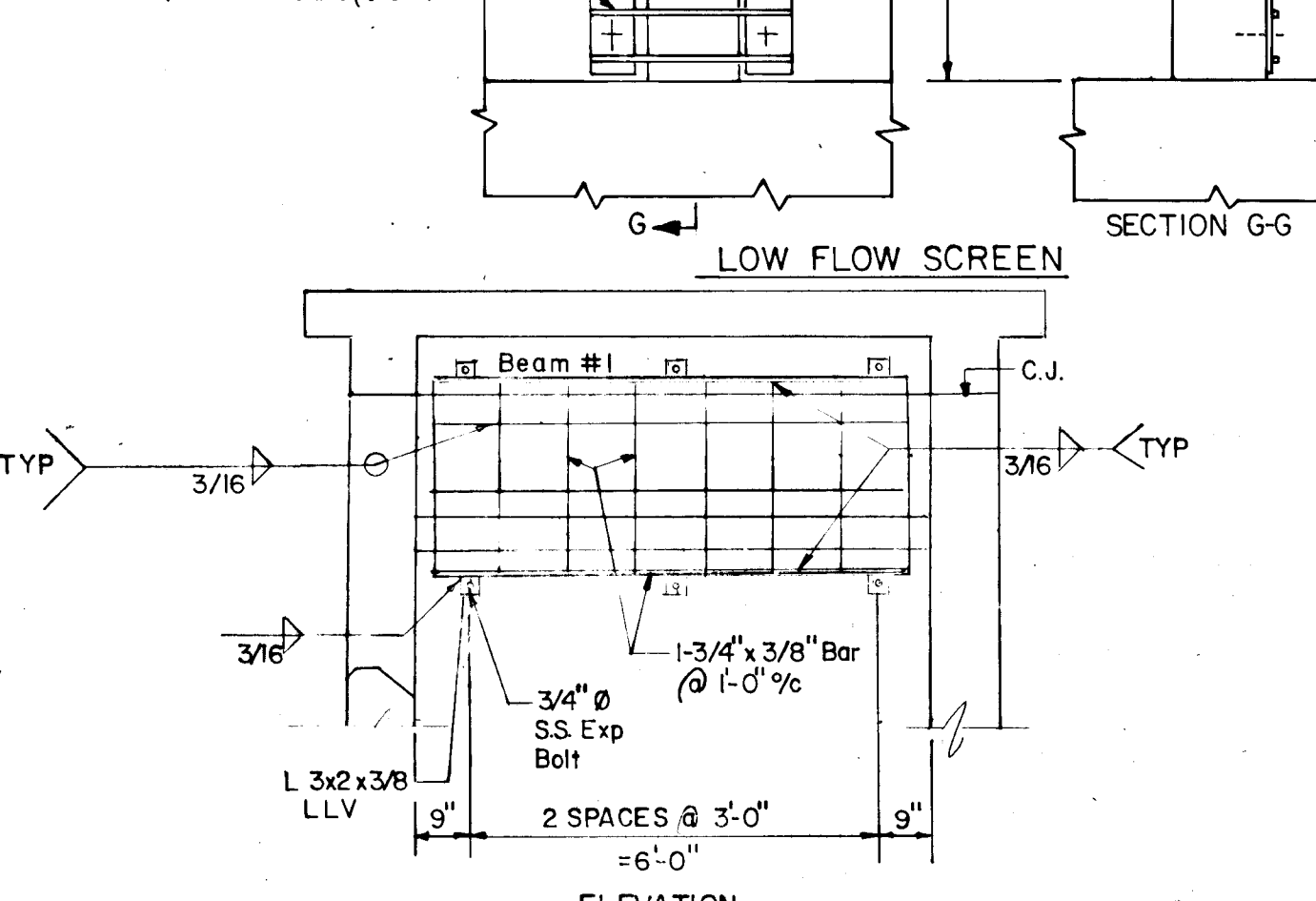
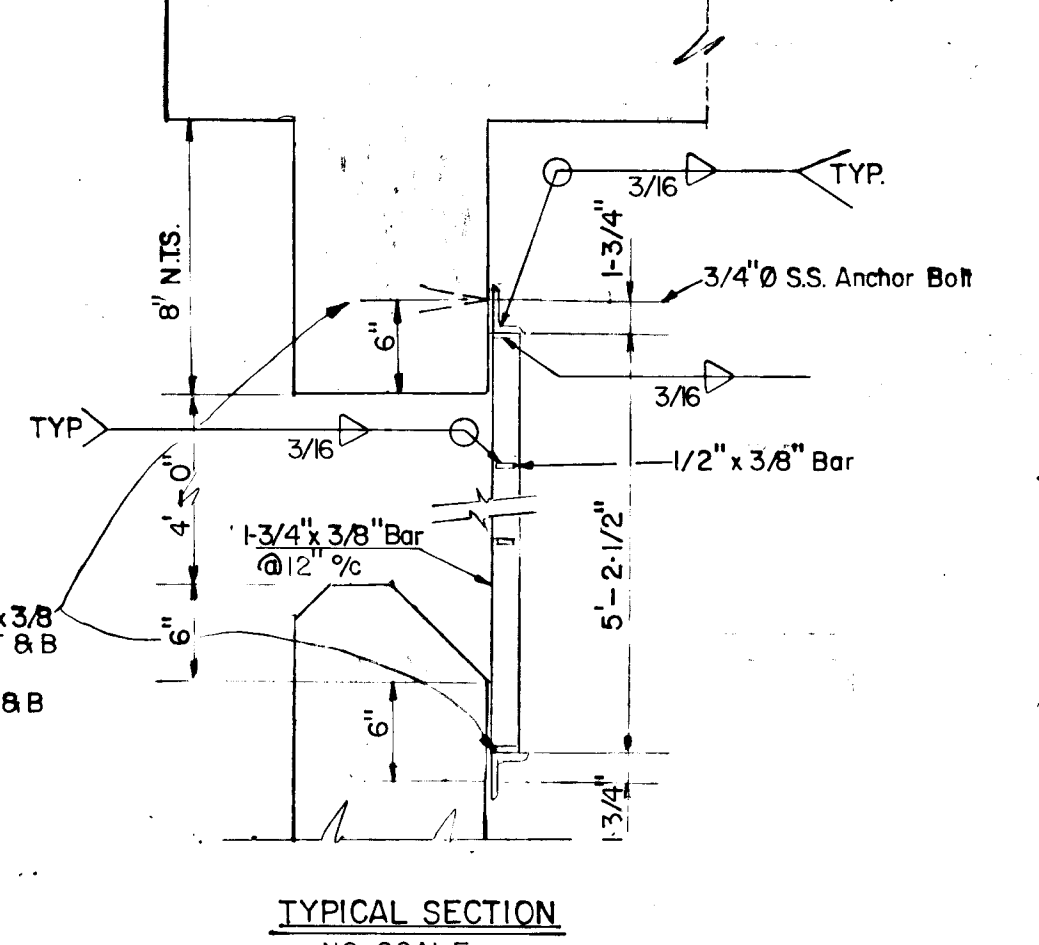
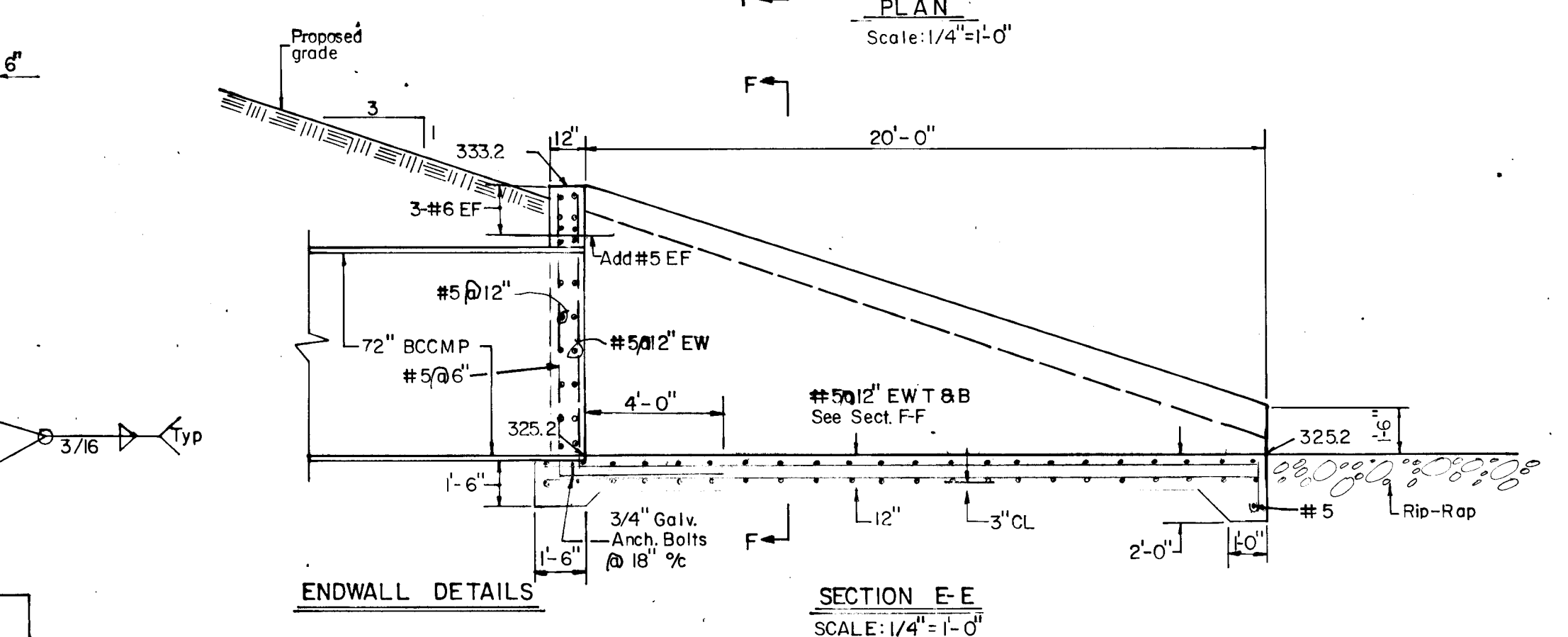
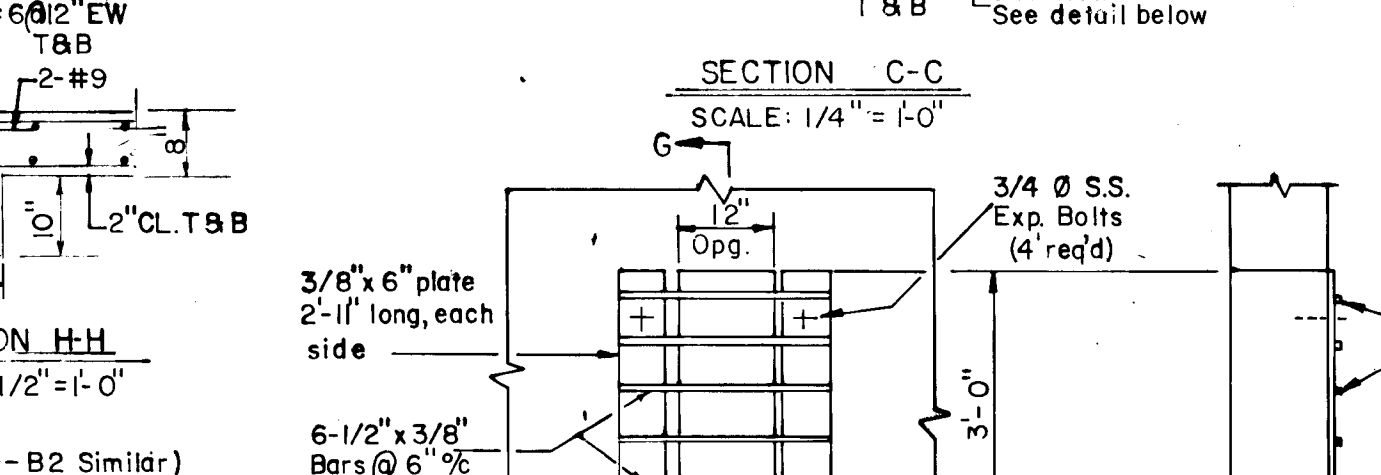
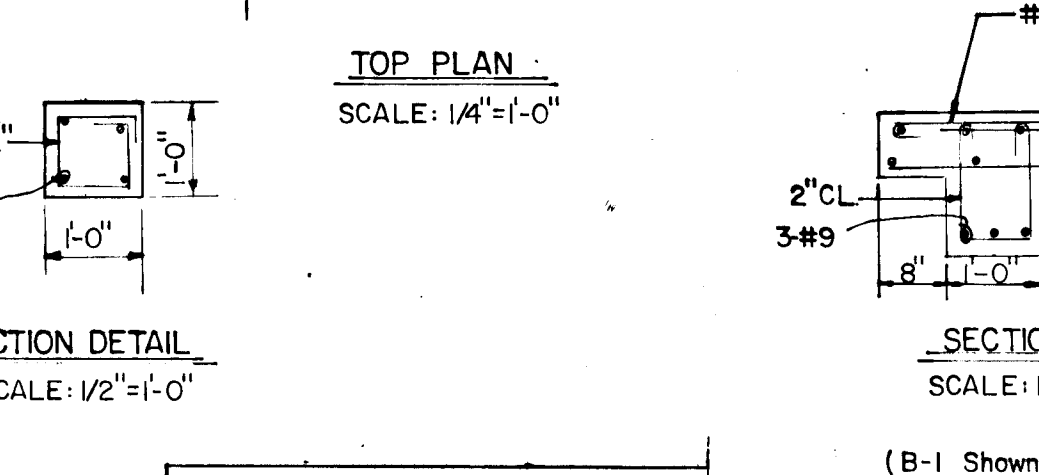
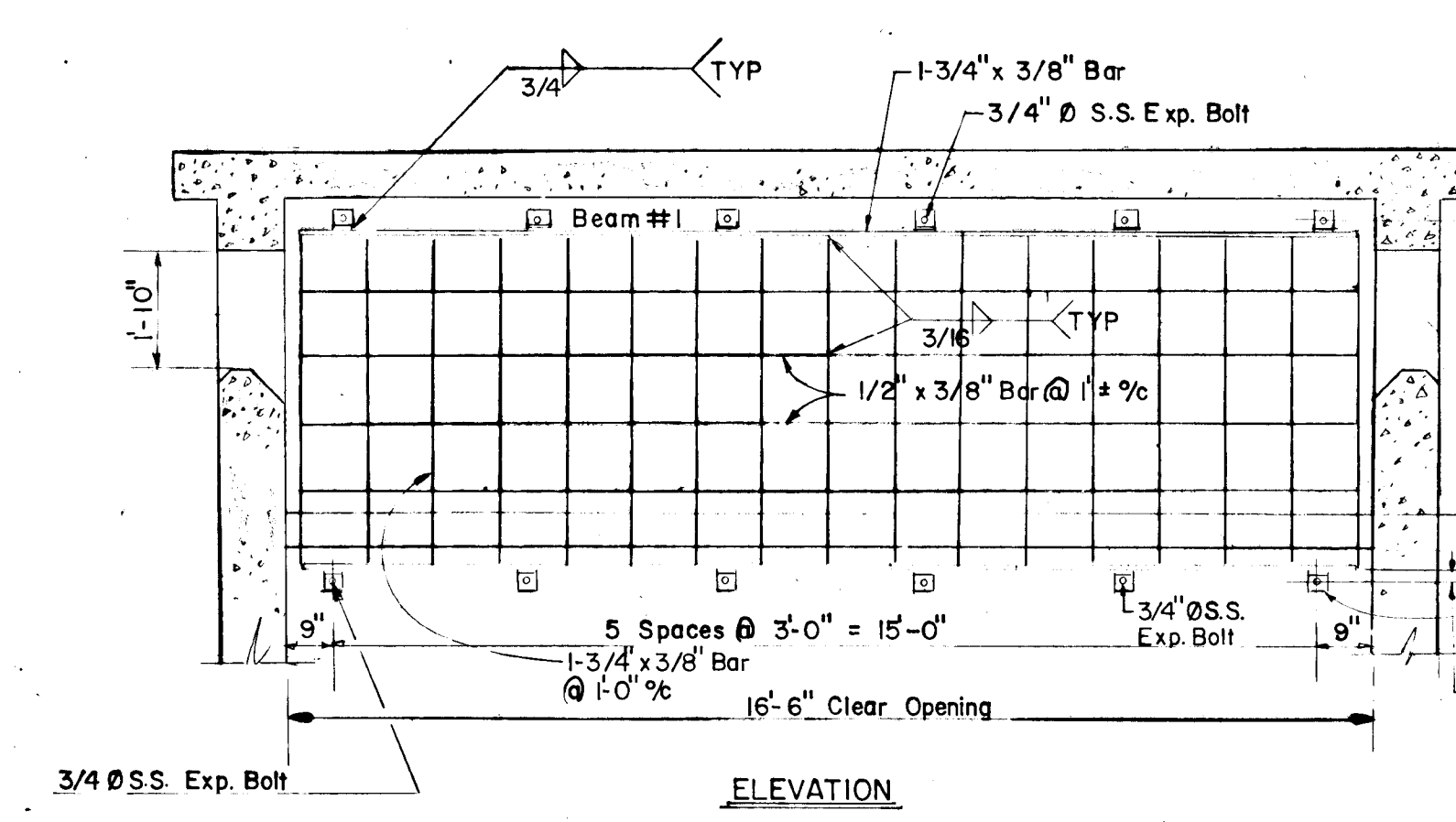
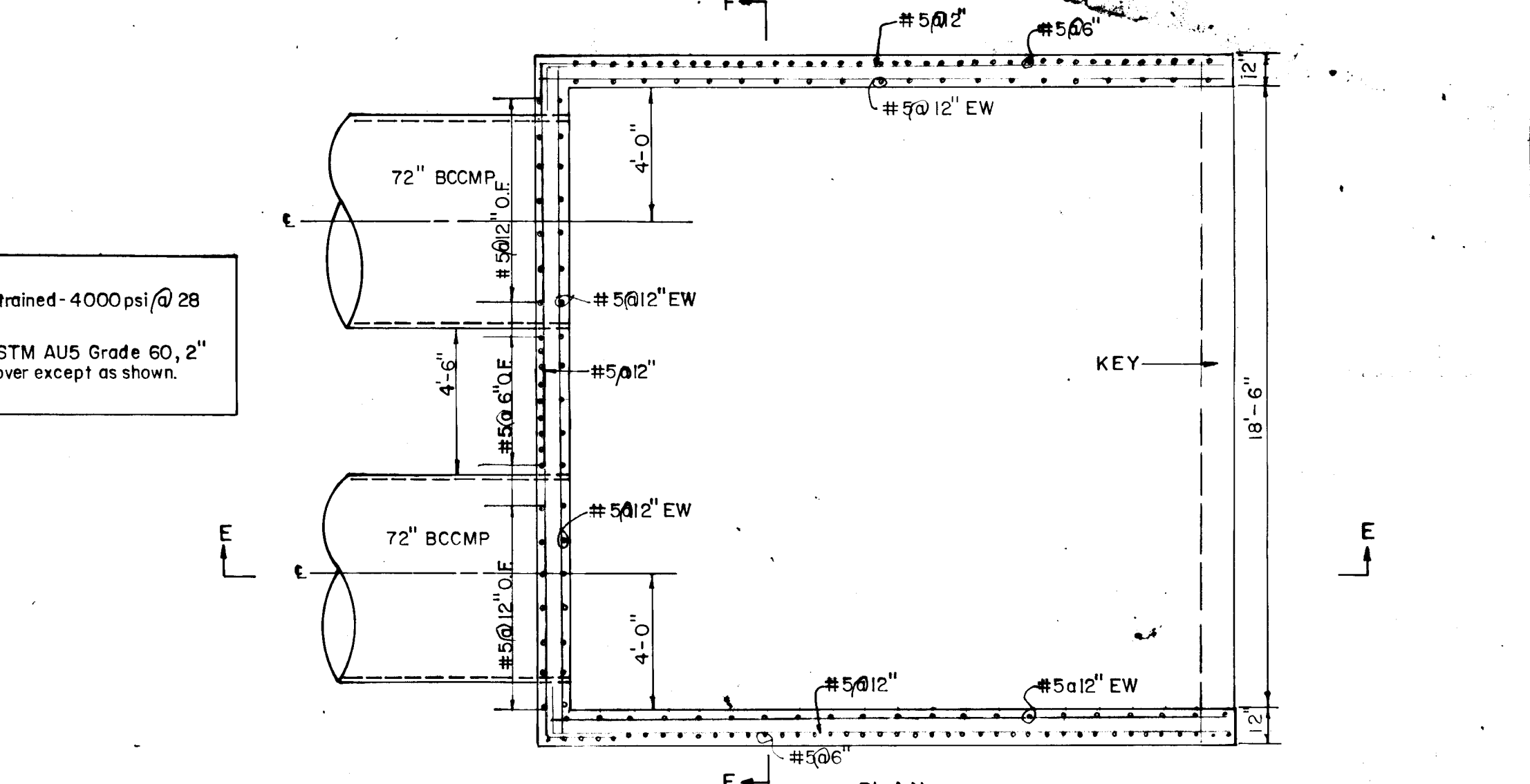
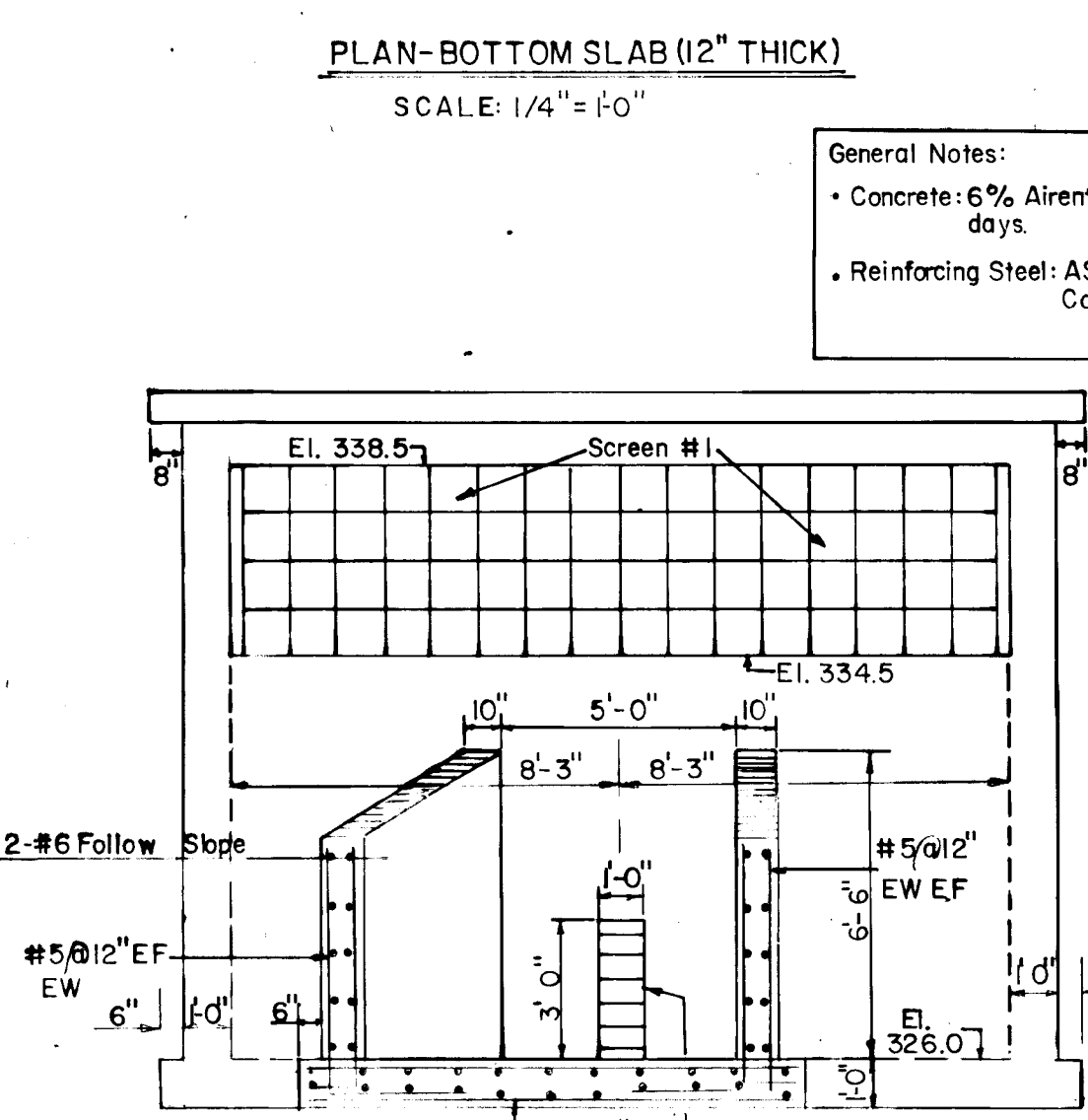
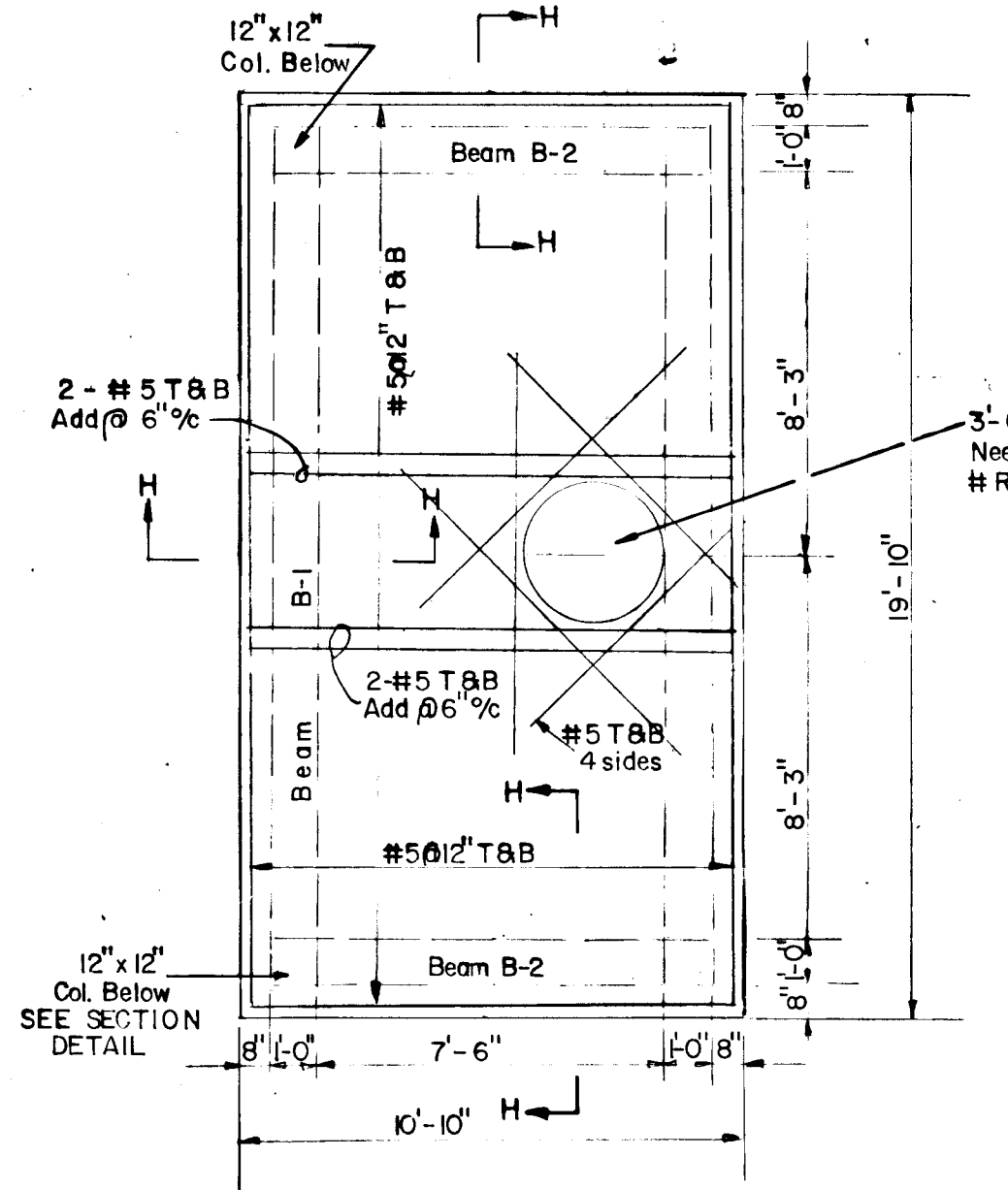
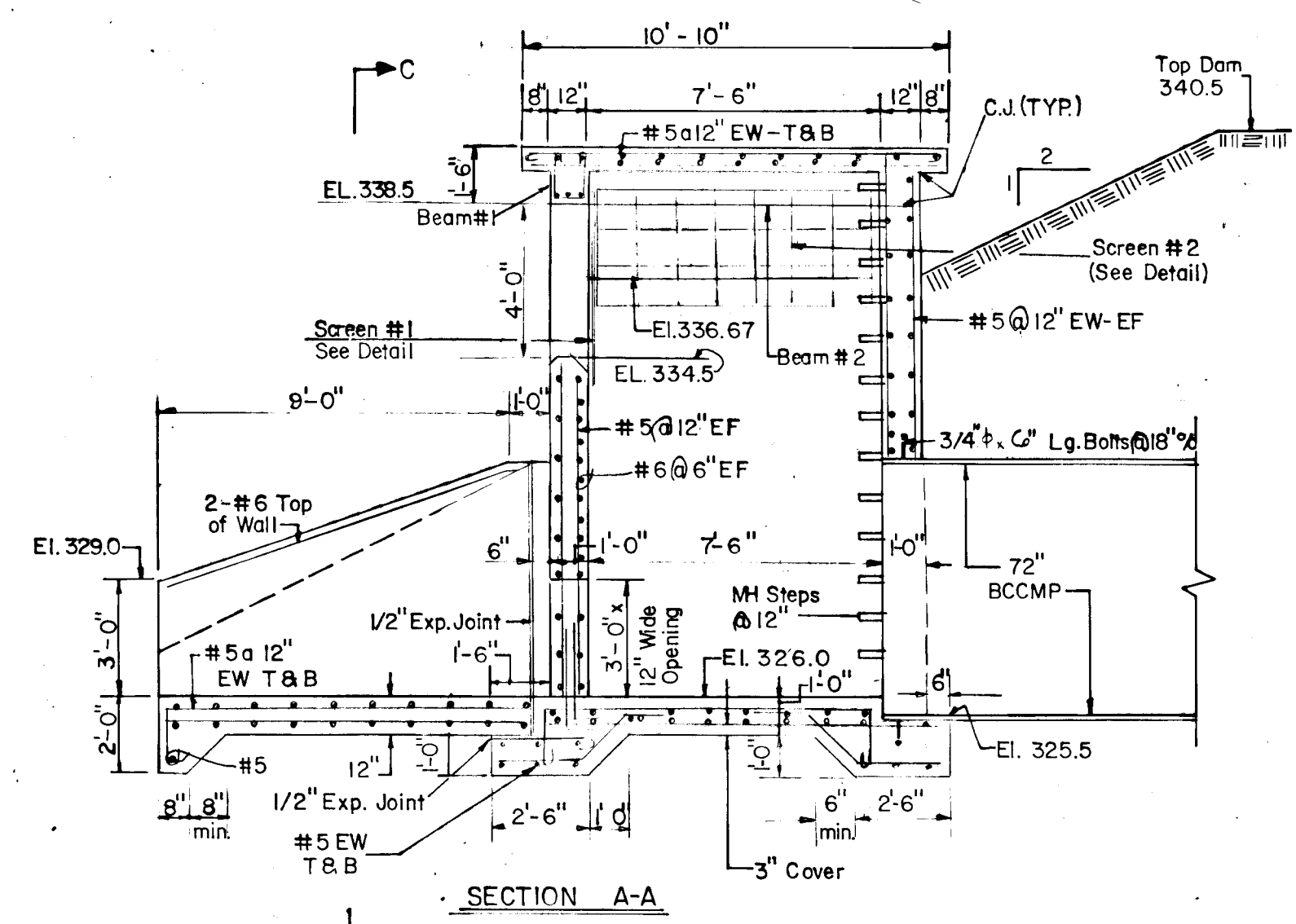
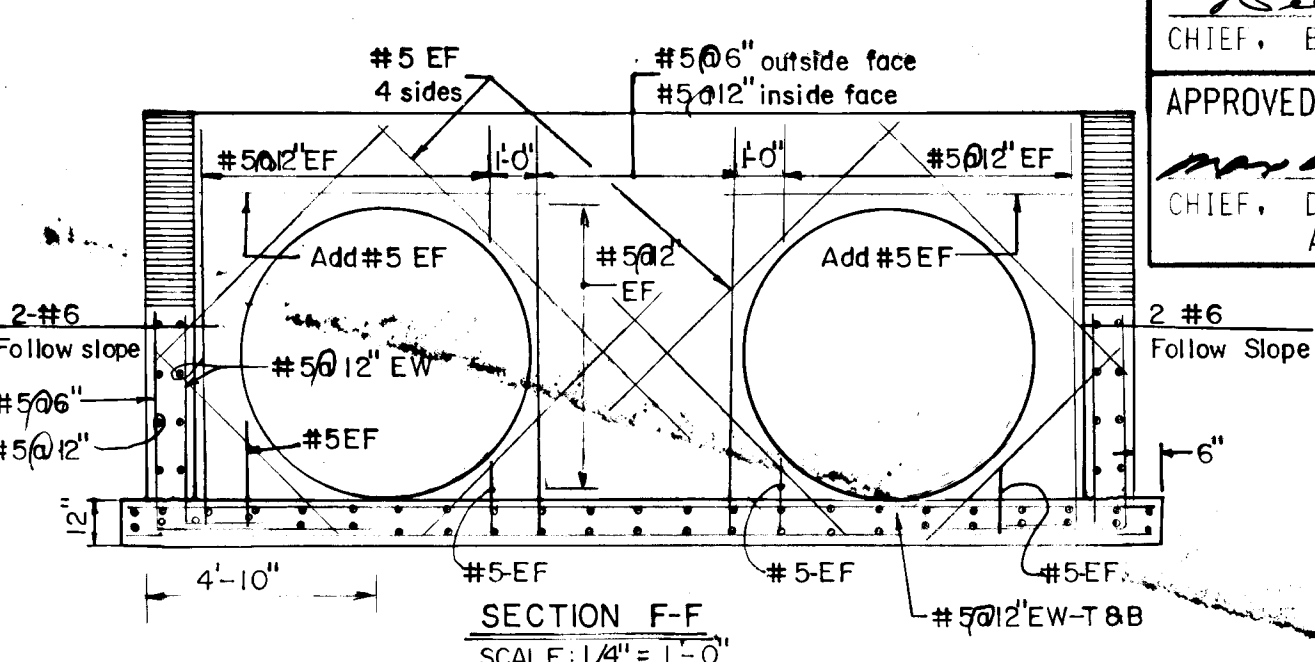
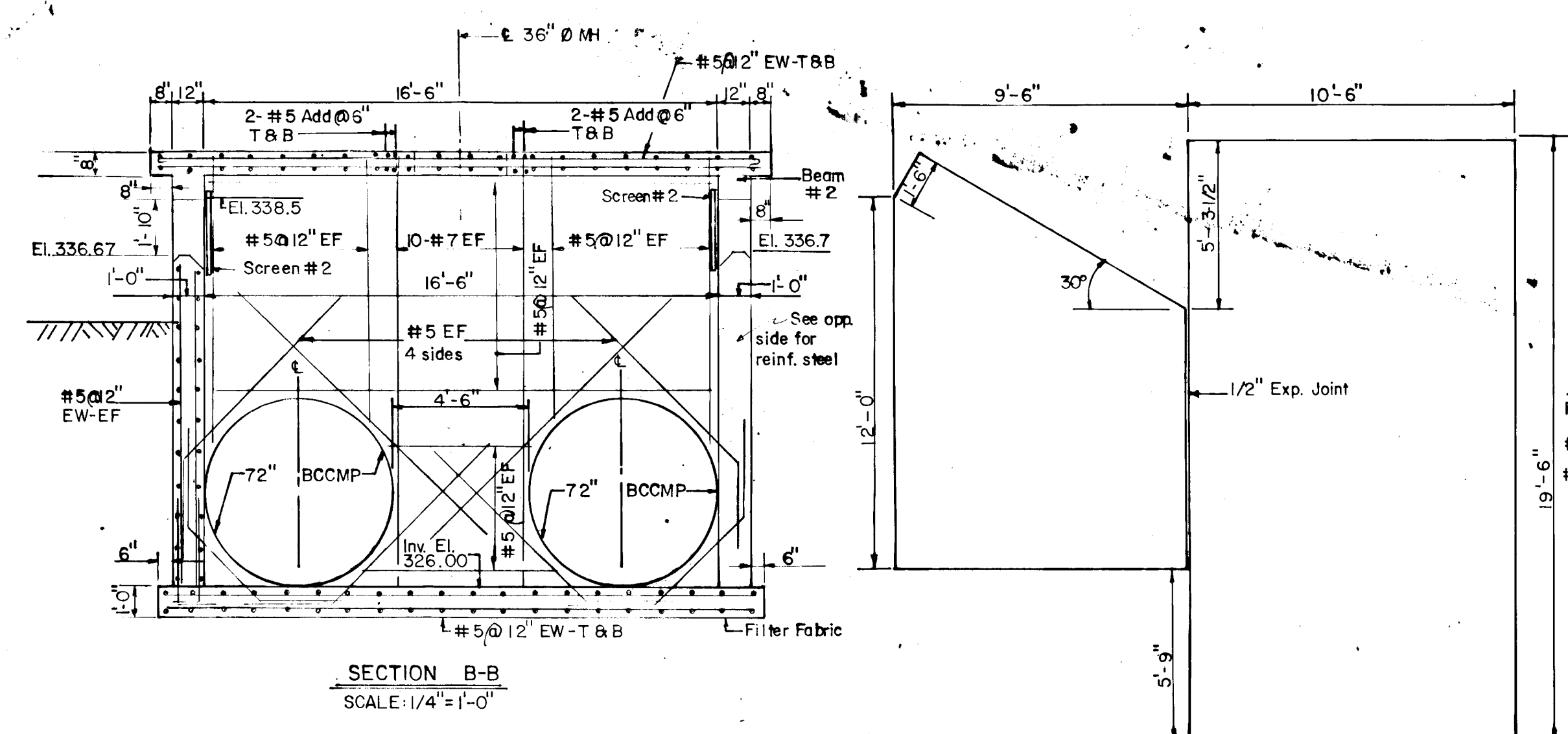
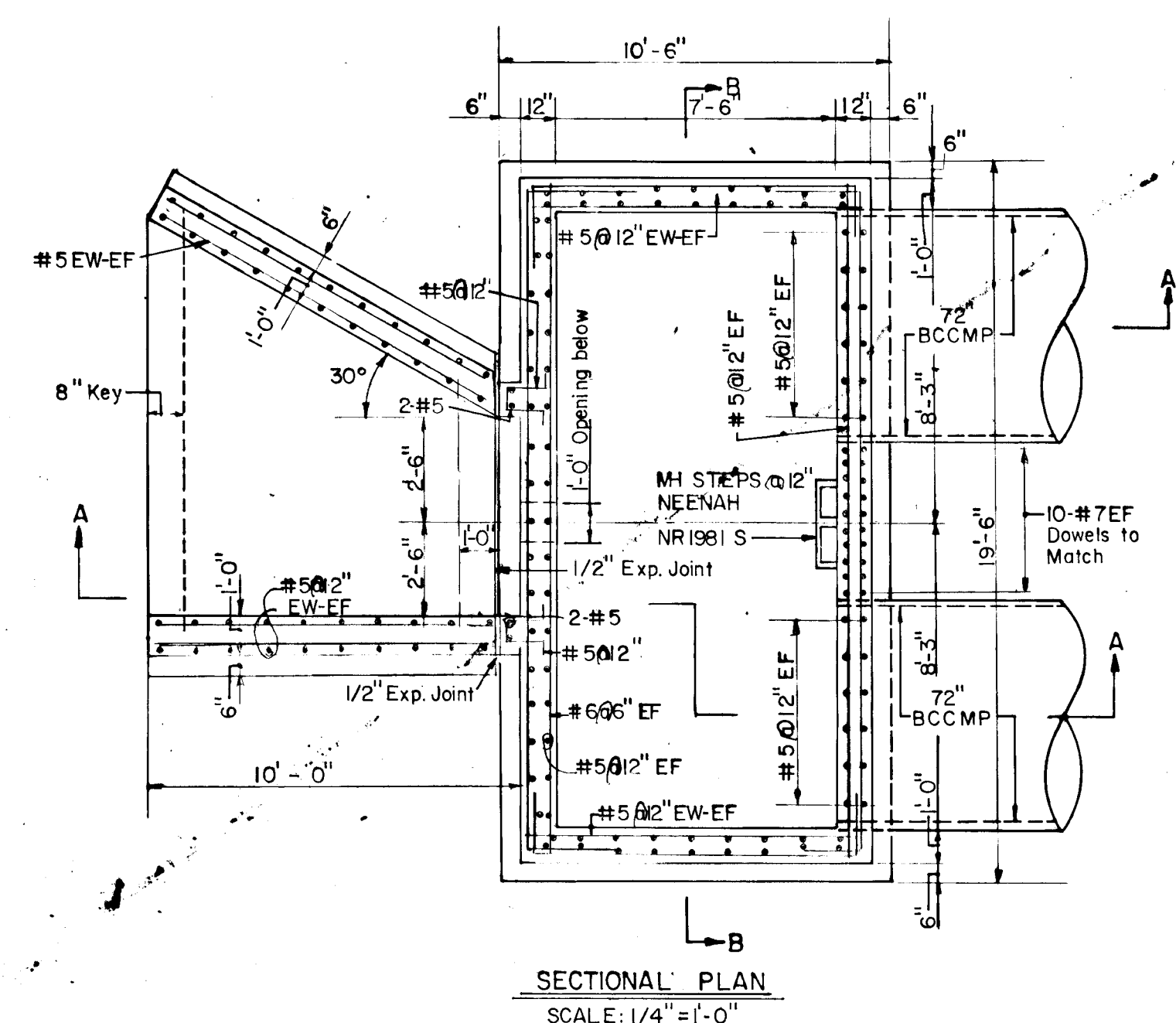
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
James M. Hahn 4/4/91
 U.S. SOIL CONSERVATION DISTRICT DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Robert W. Bickler 4/4/91
 HOWARD SOIL CONSERVATION DISTRICT 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 MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."
Thomas J. Shafer 10/17/90
 THOMAS J. SHAFER, REGISTRATION No. 8457 DATE

REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA		
5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2		
PROJECT TITLE: EARTH DAM AND SPILLWAY PLAN AND PROFILES		
SCALE: AS SHOWN		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHIEF, LAND DEVELOPMENT DIVISION
James M. Adams 4/19/91 DATE
Franklin W. Whitman 4/19/91 DATE
 CHIEF, BUREAU OF HIGHWAYS
William R. ... 4-17-91 DATE
 CHIEF, BUREAU OF ENGINEERING
 JH DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT
... 4/23/91 DATE
 CW DATE



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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."
Joseph H. Necker Jr. 10-19-90 DATE
 JOSEPH H. NECKER JR. DATE

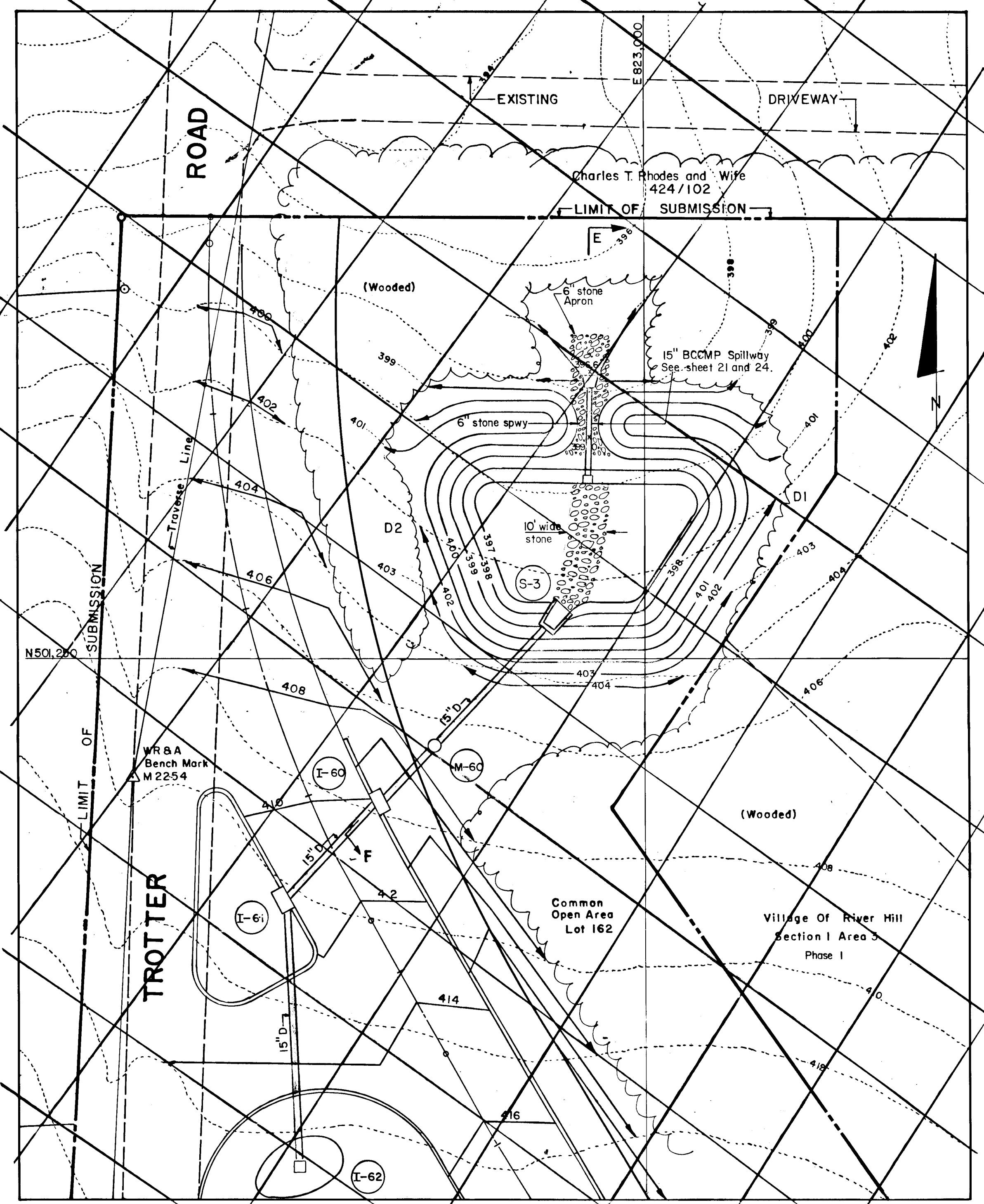
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
James M. Adams 4/19/91 DATE
 JAMES M. ADAMS DATE
 THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL, MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Robert W. Johnson 4/19/91 DATE
 ROBERT W. JOHNSON 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 MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."
Thomas J. Shafer 10/17/90 DATE
 THOMAS J. SHAFER, REGISTRATION NO. 8457 DATE

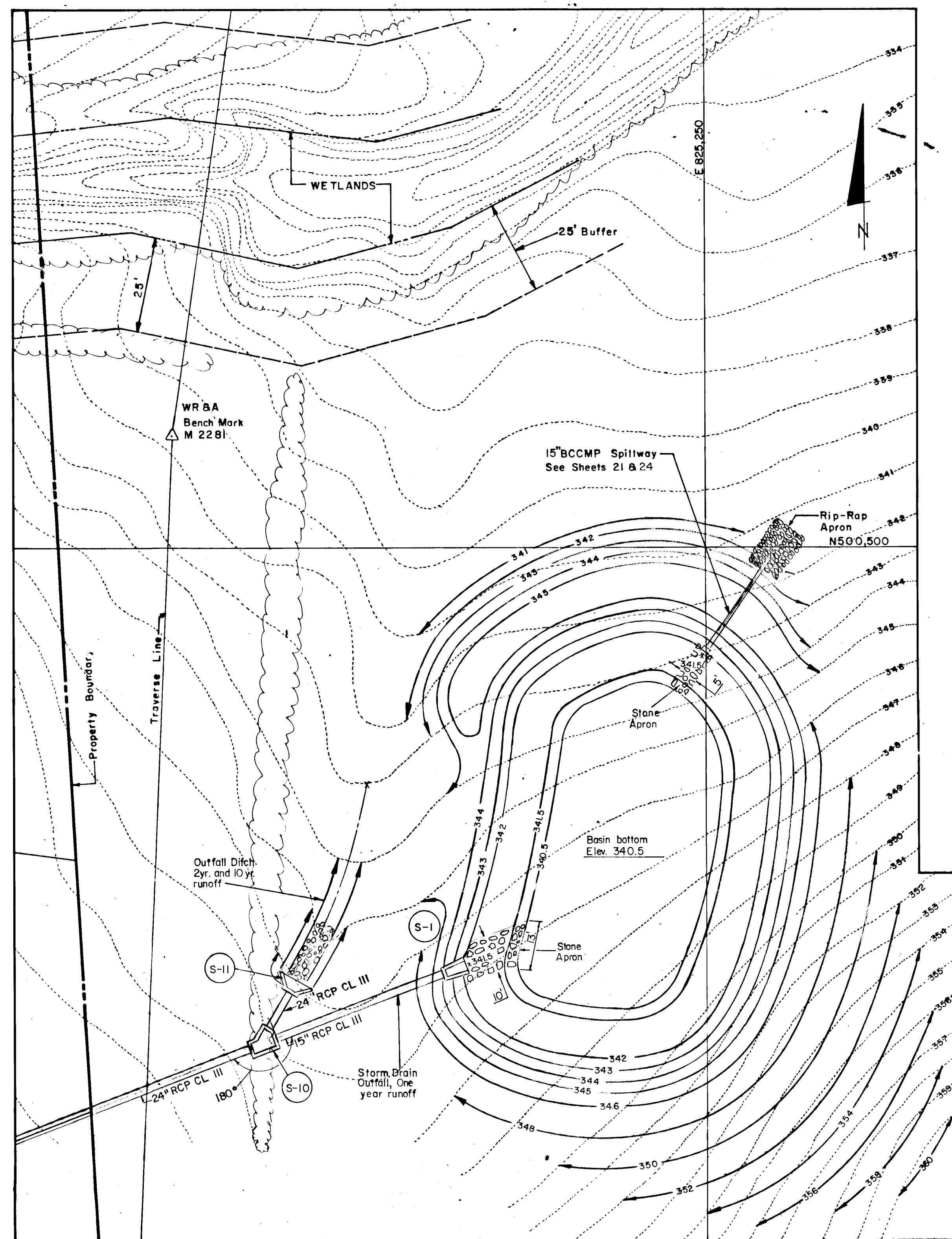
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA		
5TH ELECTION DISTRICT		
HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER		
THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA:		
VILLAGE OF RIVER HILL		
SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE:		
EARTH DAM AND SPILLWAY		
STRUCTURAL DETAILS		
SCALE: AS SHOWN		DATE: 4/19/91
WHITMAN, REQUARDT AND ASSOCIATES		
ENGINEERS		
BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i>		
THOMAS J. SHAFER		
REGISTERED ENGINEER		
NO. 8457		

1487

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, Land Development Division *4/17/91*
Rowelle W. Weiland DATE
 Chief, Bureau of Highways
William S. Jones DATE
 Chief, Bureau of Engineering *JH* DATE
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Thomas J. Shafer DATE
 Chief, Division of Community Planning and Land Development *cm* DATE



PLAN
 BASIN #6
 SCALE: 1" = 20'



PLAN
 BASIN #4
 SCALE: 1" = 20'

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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."
Joseph H. Necker Jr. DATE 10-19-90

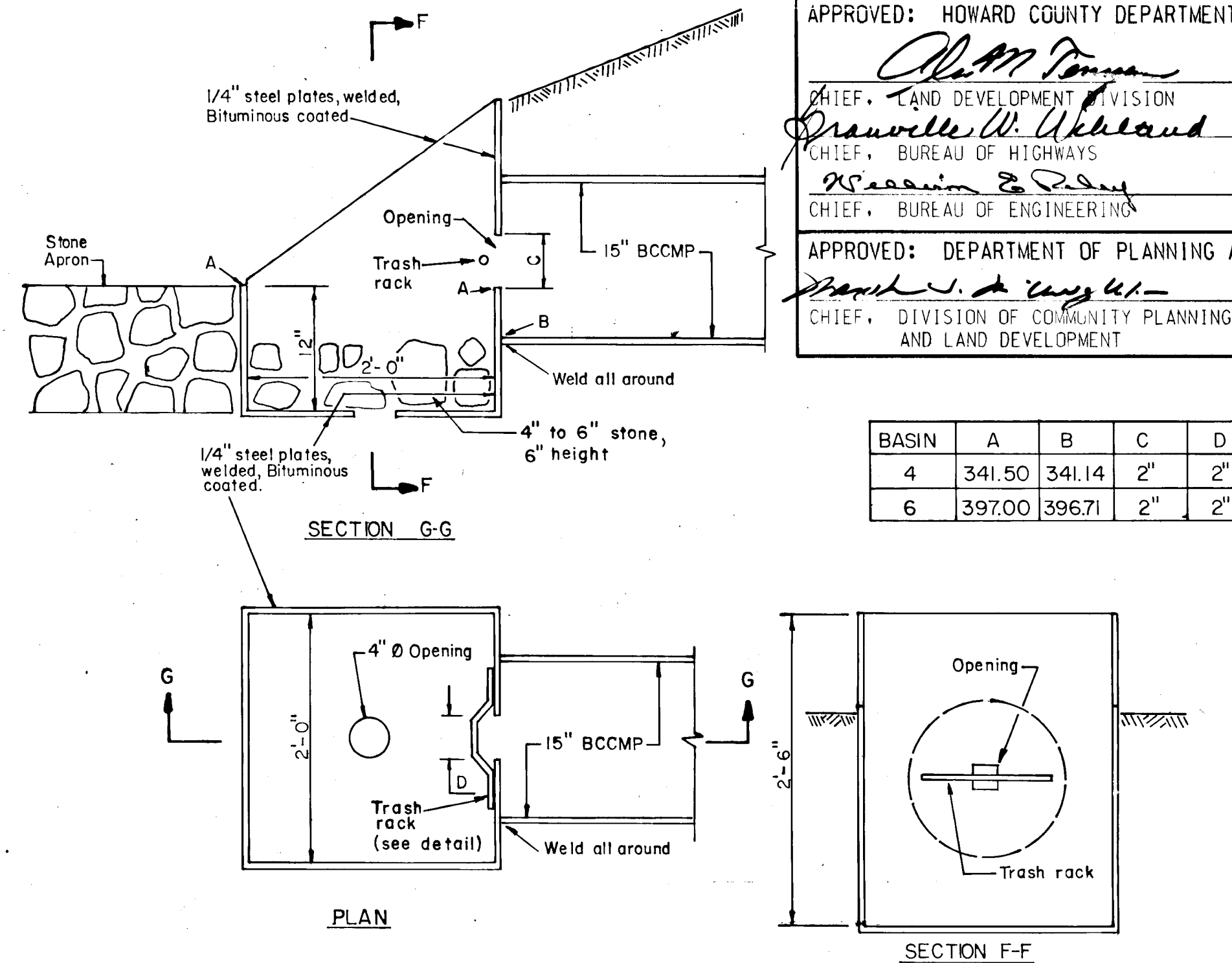
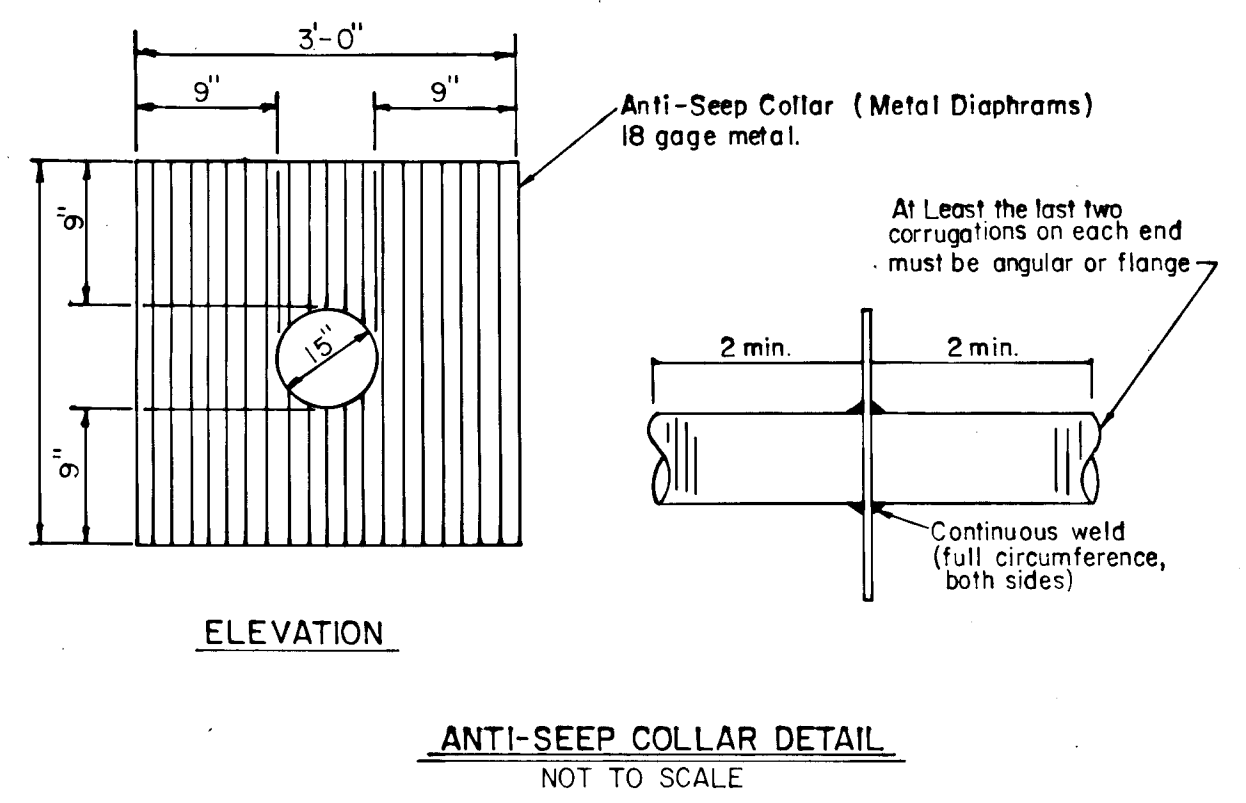
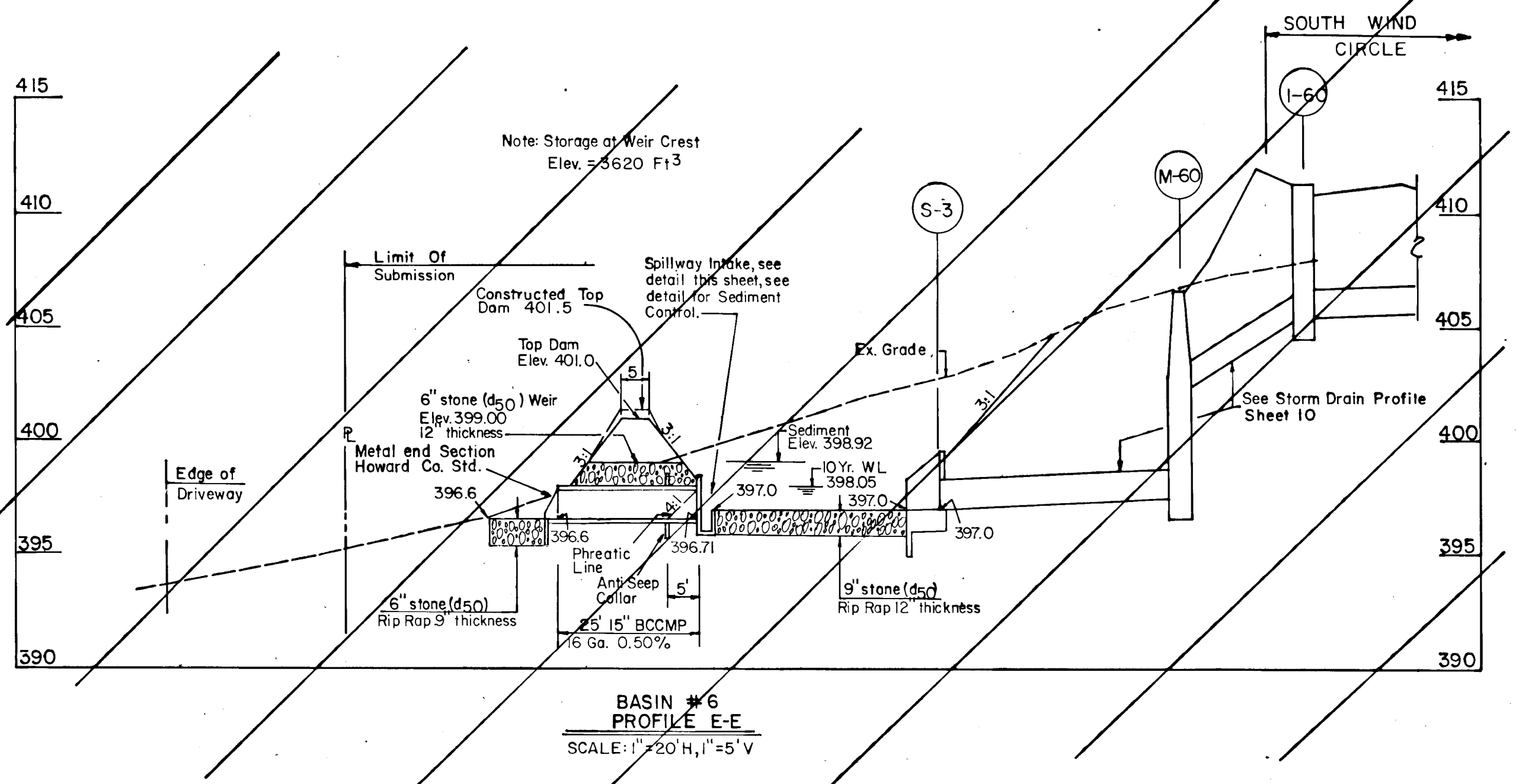
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
Robert W. Zickler DATE 4/14/91
 U.S. SOIL CONSERVATION SERVICE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Robert W. Zickler DATE 4/14/91
 HOWARD SOIL CONSERVATION DISTRICT

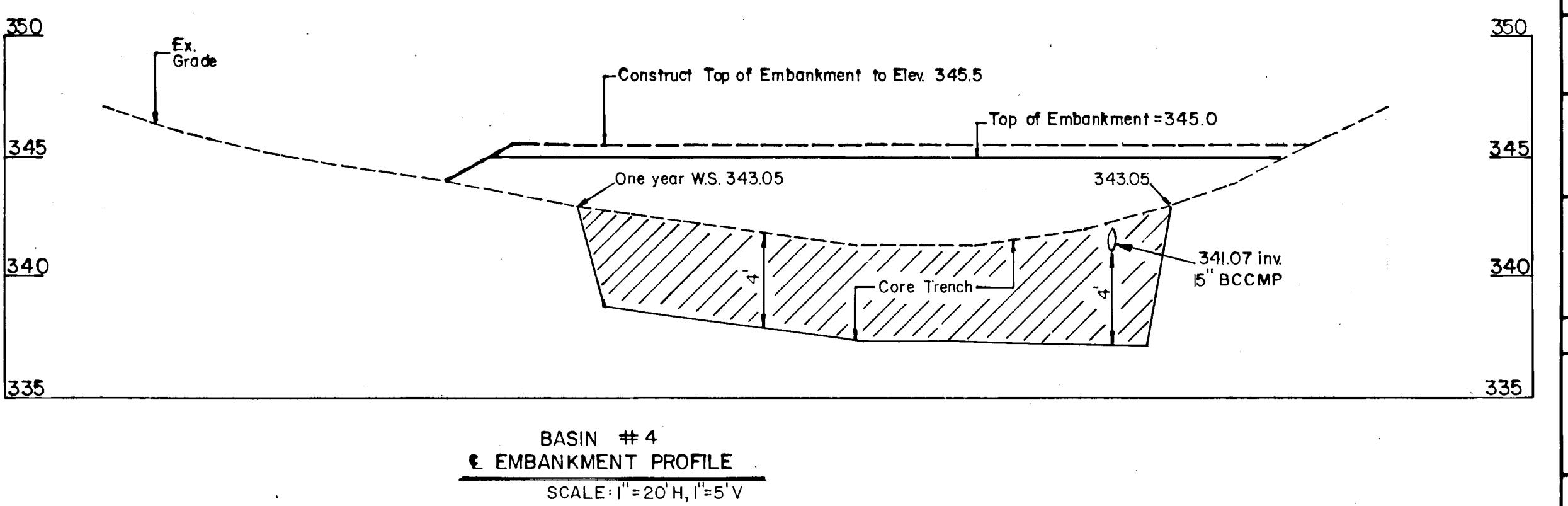
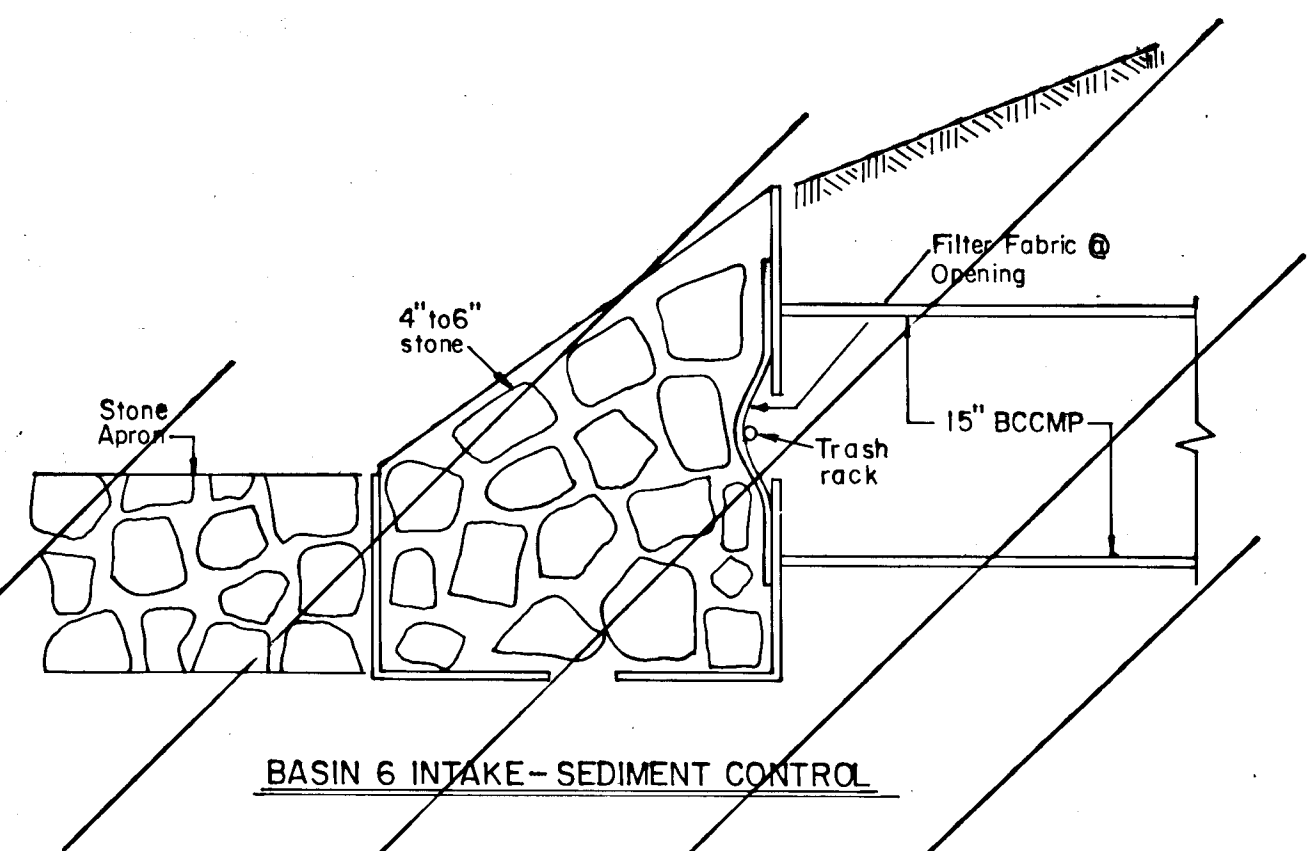
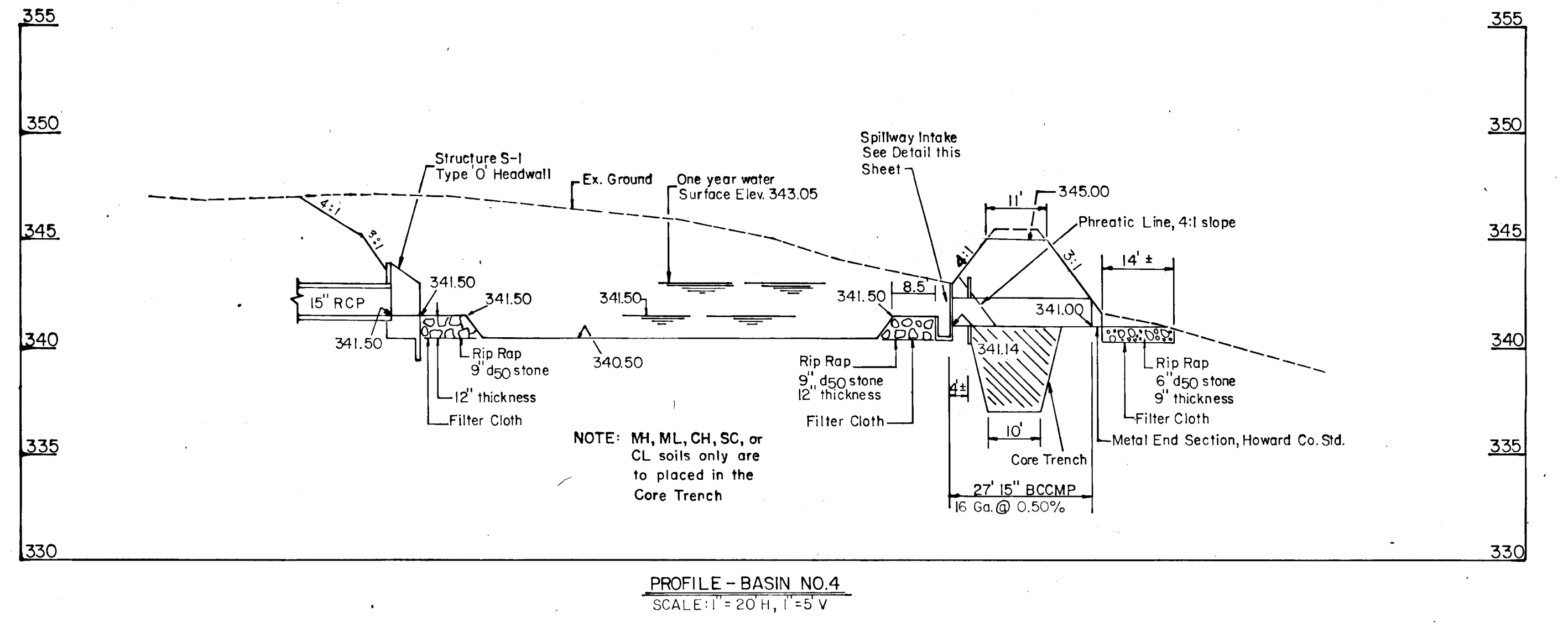
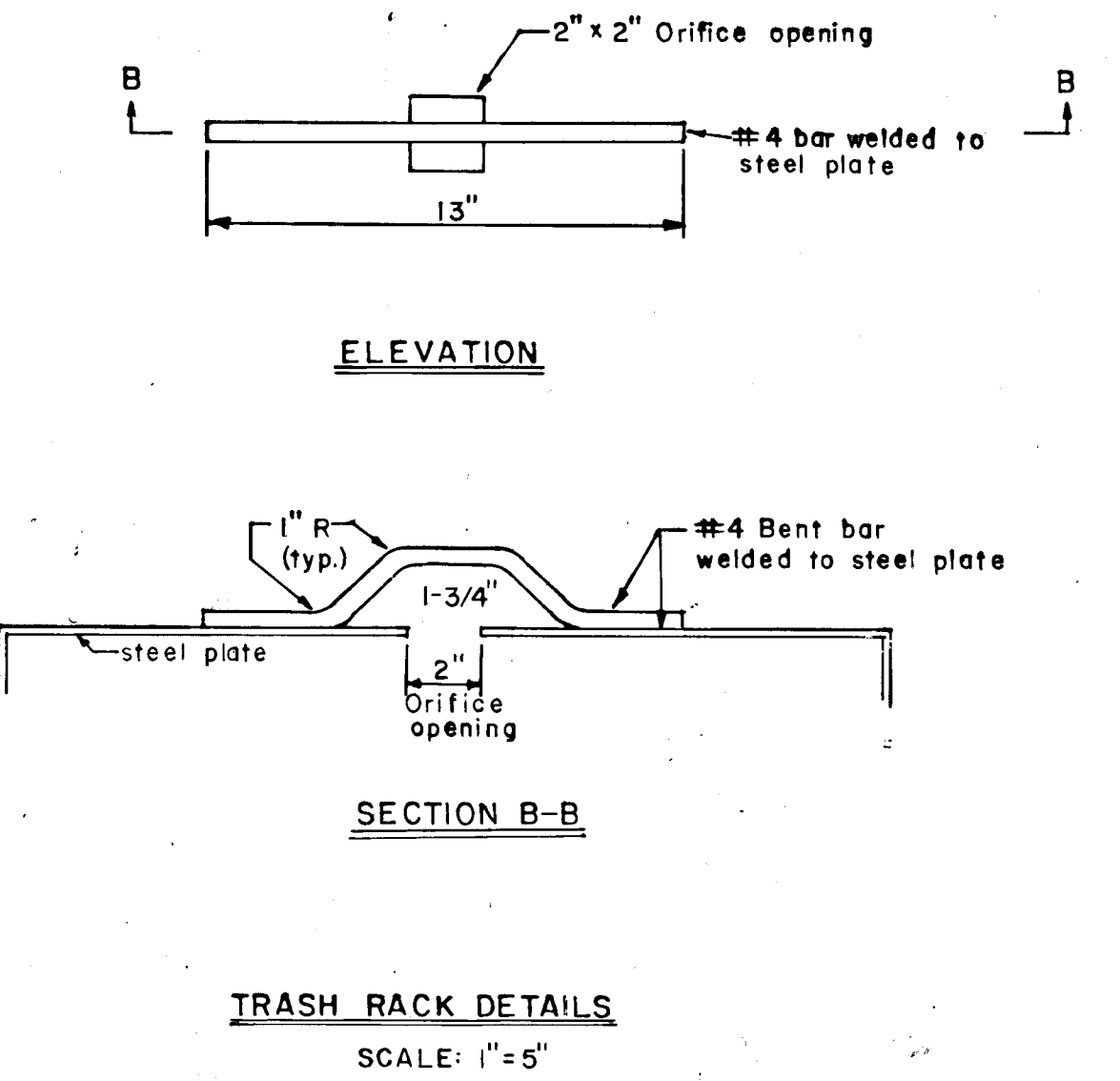
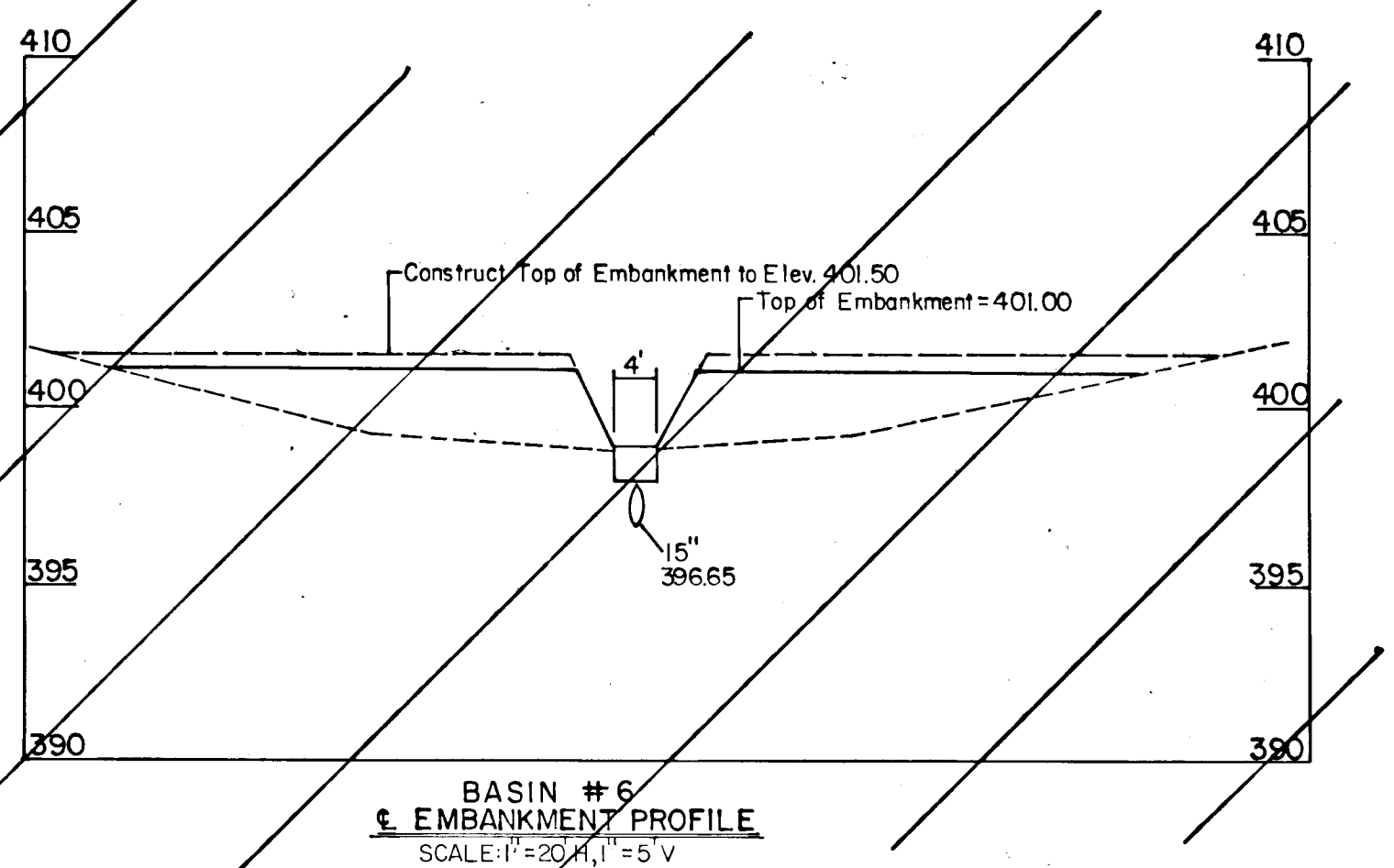
BY THE ENGINEER:
 "I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."
Thomas J. Shafer DATE 10/17/90
 THOMAS J. SHAFER
 Registration No. B457

June 10, 1991	1	Remove Basin 6
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE: WATER QUALITY BASIN 4 DETENTION BASIN 6		
SCALE: AS SHOWN		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHIEF, LAND DEVELOPMENT DIVISION
Drayville W. Uhlend 4/19/91
 CHIEF, BUREAU OF HIGHWAYS
William B. Riley 4-17-91
 CHIEF, BUREAU OF ENGINEERING
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT
Thomas A. Shafer 4/17/91



BASIN	A	B	C	D
4	341.50	341.14	2'	2'
6	397.00	396.71	2"	2"



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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."

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 MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

BY THE SOIL CONSERVATION DISTRICT:
 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.
James M. Helm 4/14/91
 S.S. SOIL CONSERVATION SERVICE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
Thomas A. Shafer 10/17/90
 THOMAS A. SHAFER
 Registration No. 8457

REV. DATE	REV. NO.	REVISION DESCRIPTION
June 10, 1991	1	Removed Basin 6 Details

COLUMBIA
 5TH ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

OWNER AND DEVELOPER
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

PROJECT AREA:
 VILLAGE OF RIVER HILL
 SECTION I AREA 3 PHASE 2

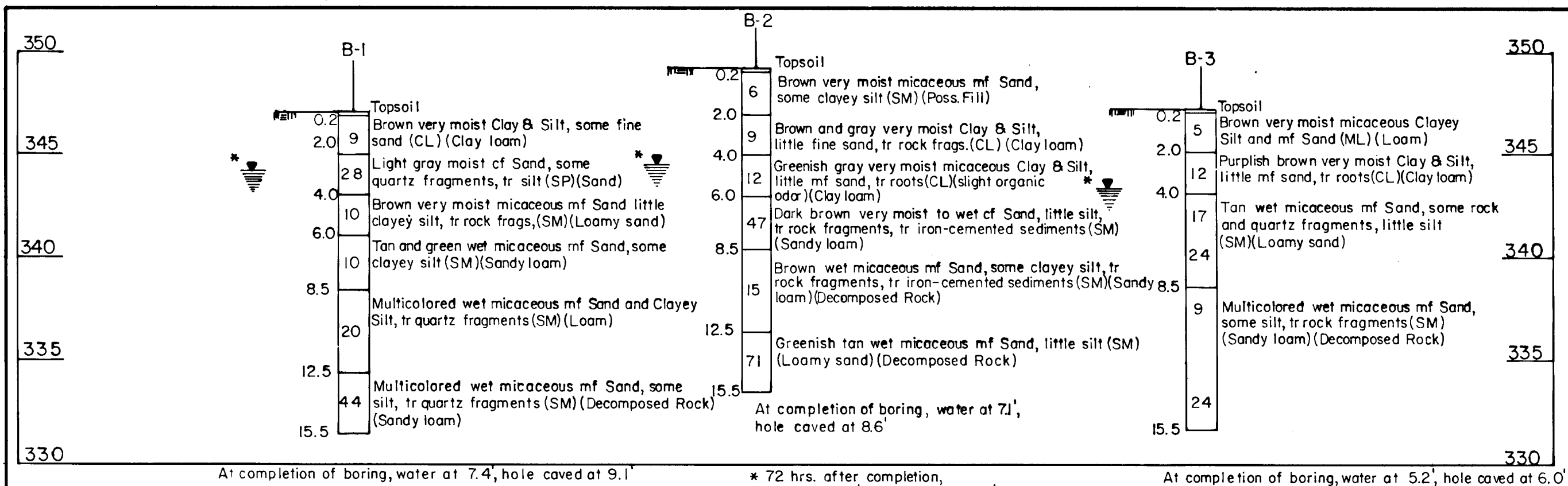
PROJECT TITLE:
 WATER QUALITY BASIN 4
 DETENTION BASIN 6

SCALE: AS SHOWN DATE: 4/1/91

WHITMAN, REQUARDT AND ASSOCIATES
 ENGINEERS
 BALTIMORE, MARYLAND 21218

Thomas A. Shafer
 THOMAS A. SHAFER
 REGISTERED ENGINEER
 NO. 8457

1941

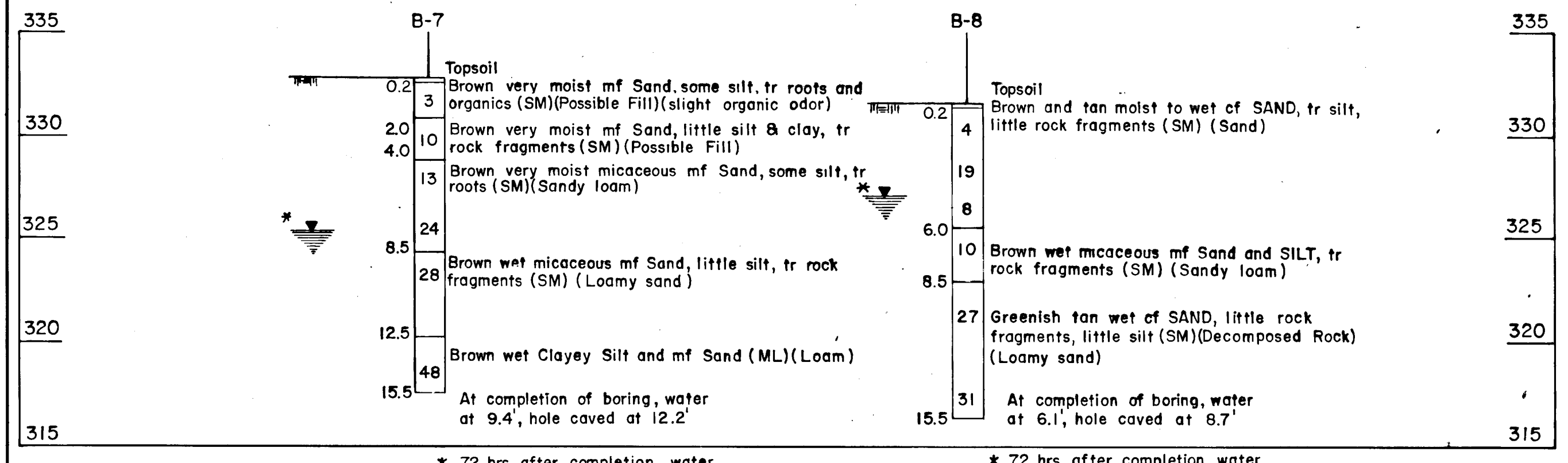


At completion of boring, water at 7.4', hole caved at 9.1' * 72 hrs. after completion, water at 3.6', hole caved at 5.8'

* 72 hrs. after completion, water at 4.8', hole caved at 7.4'

At completion of boring, water at 5.2', hole caved at 6.0' * 72 hrs. after completion, water at 3.8', hole caved at 5.1'

SECTION A-A



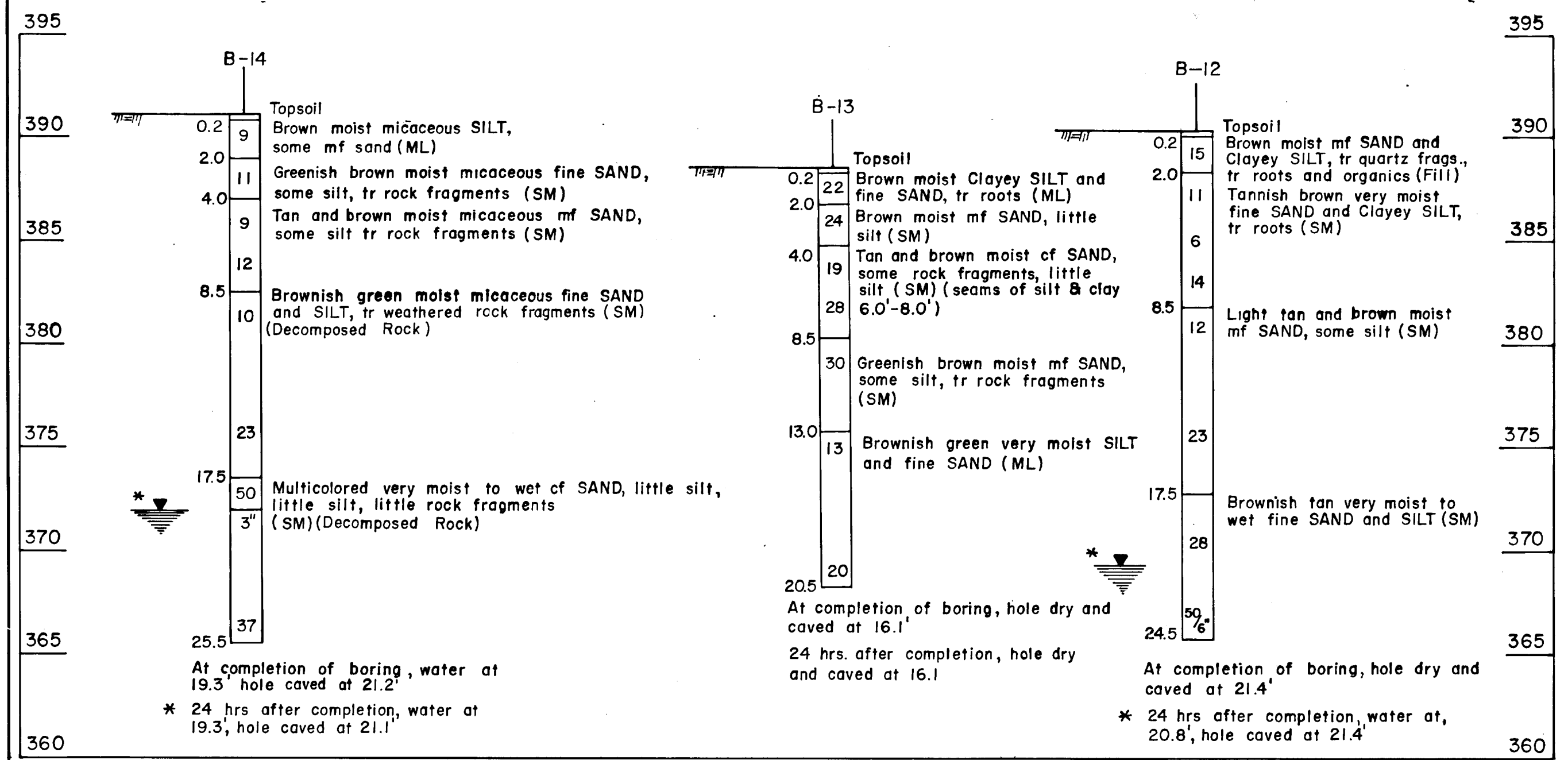
* 72 hrs after completion, water at 9.4', hole caved at 12.2'

* 72 hrs after completion, water at 7.2', hole caved at 10.1'

* 72 hrs after completion, water at 6.1', hole caved at 6.1'

* 72 hrs after completion, water at 4.6', hole caved at 6.1'

SECTION C-C

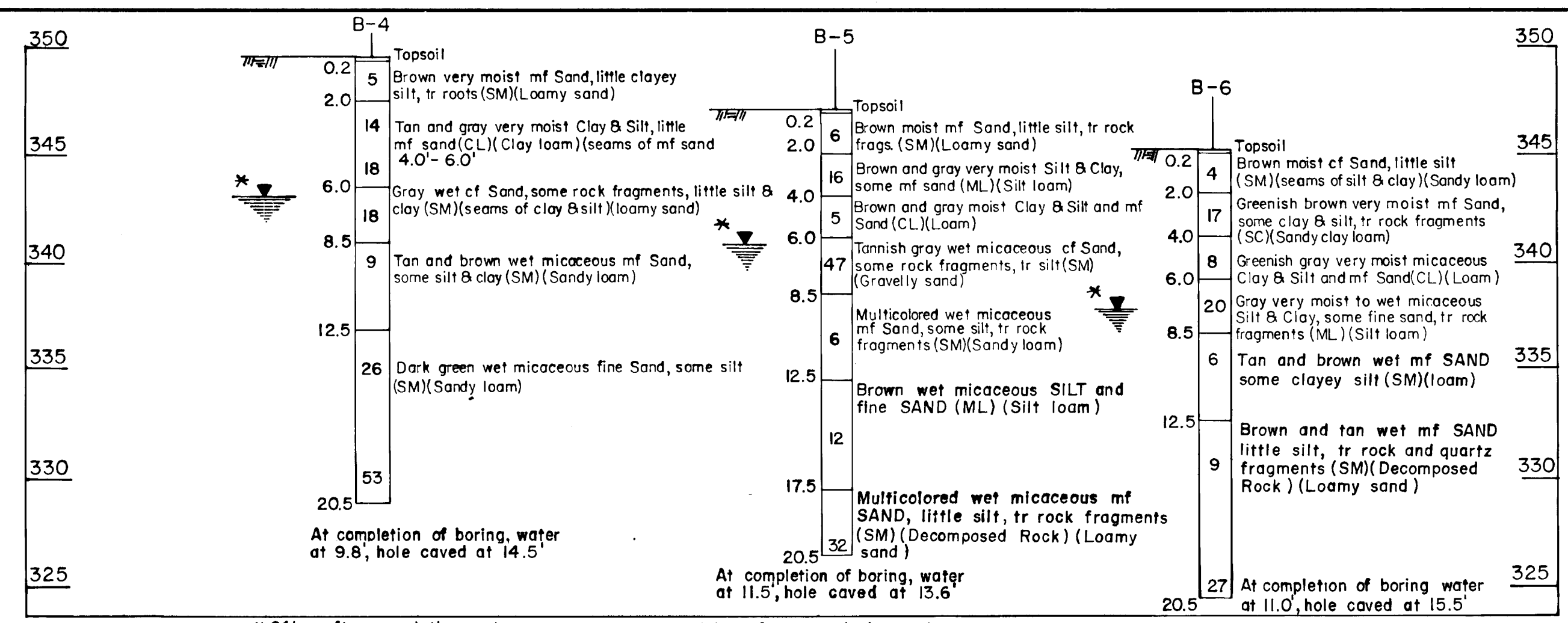


At completion of boring, water at 19.3', hole caved at 21.2' * 24 hrs after completion, water at 19.3', hole caved at 21.1'

At completion of boring, hole dry and caved at 16.1' * 24 hrs after completion, hole dry and caved at 16.1'

At completion of boring, hole dry and caved at 21.4' * 24 hrs after completion, water at 20.8', hole caved at 21.4'

SECTION E-E

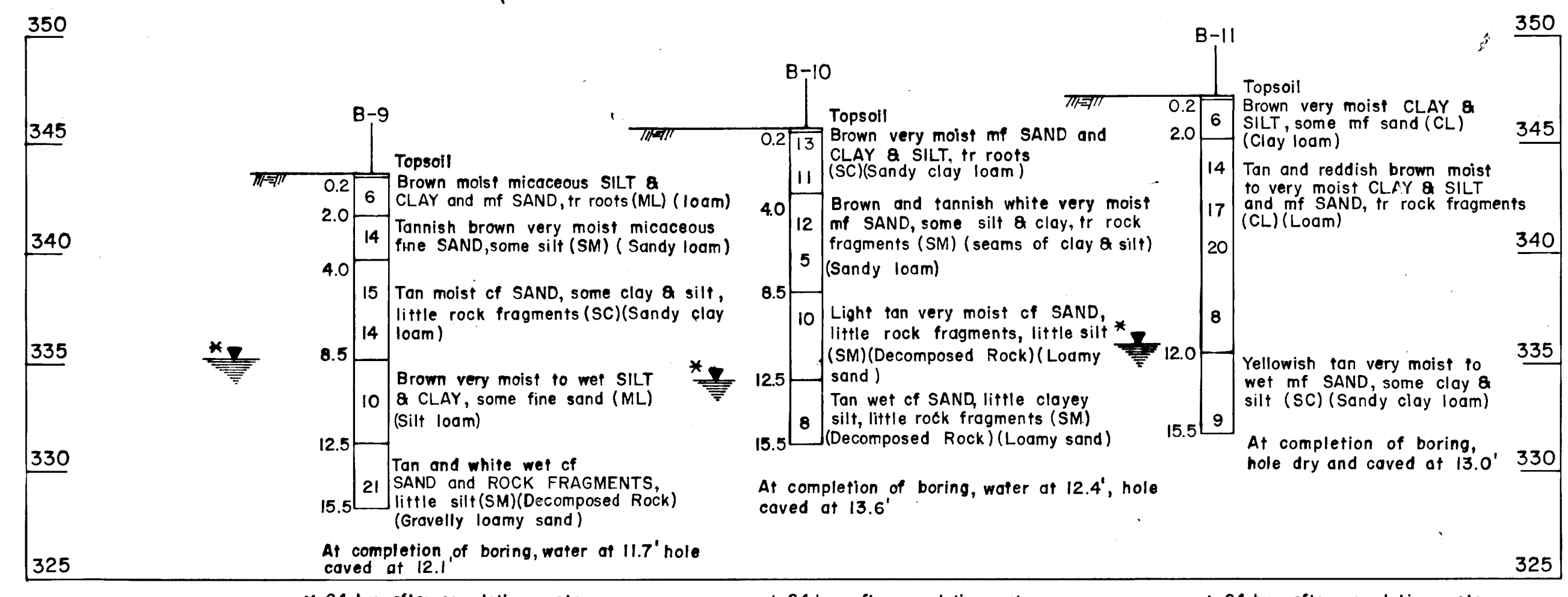


At completion of boring, water at 9.8', hole caved at 14.5' * 24 hrs. after completion, water at 7.1', hole caved at 10.2'

At completion of boring, water at 11.5', hole caved at 13.6' * 72 hrs. after completion water at 6.1', hole caved at 9.6'

At completion of boring water at 11.0', hole caved at 15.5' * 24 hrs after completion, water at 7.5', hole caved at 14.1'

SECTION B-B

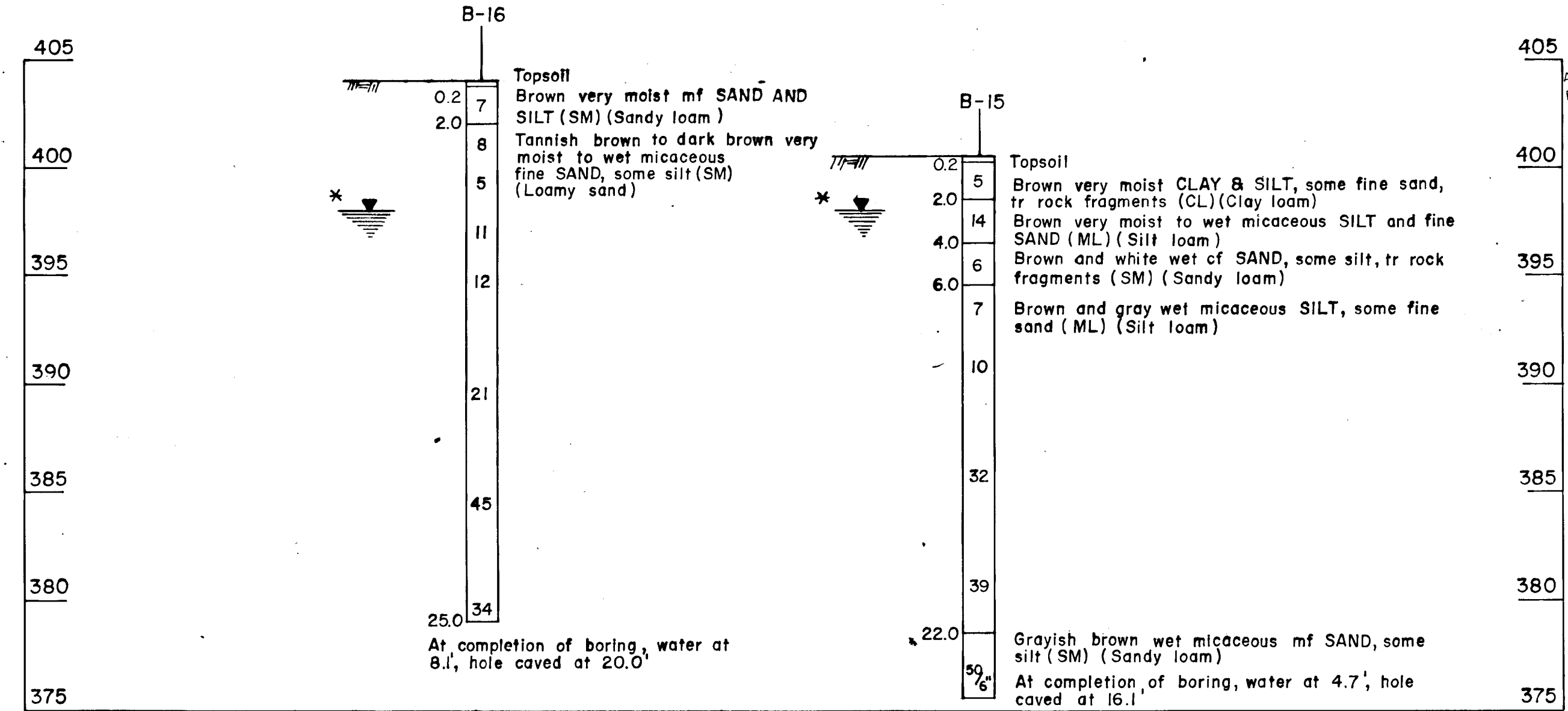


At completion of boring, water at 12.1' * 24 hrs after completion, water at 8.4', hole caved at 9.3'

At completion of boring, water at 12.4', hole caved at 13.6' * 24 hrs after completion, water at 12.3', hole caved at 12.5'

At completion of boring, hole dry and caved at 13.0' * 24 hrs after completion, water at 11.4', hole caved at 12.2'

SECTION D-D



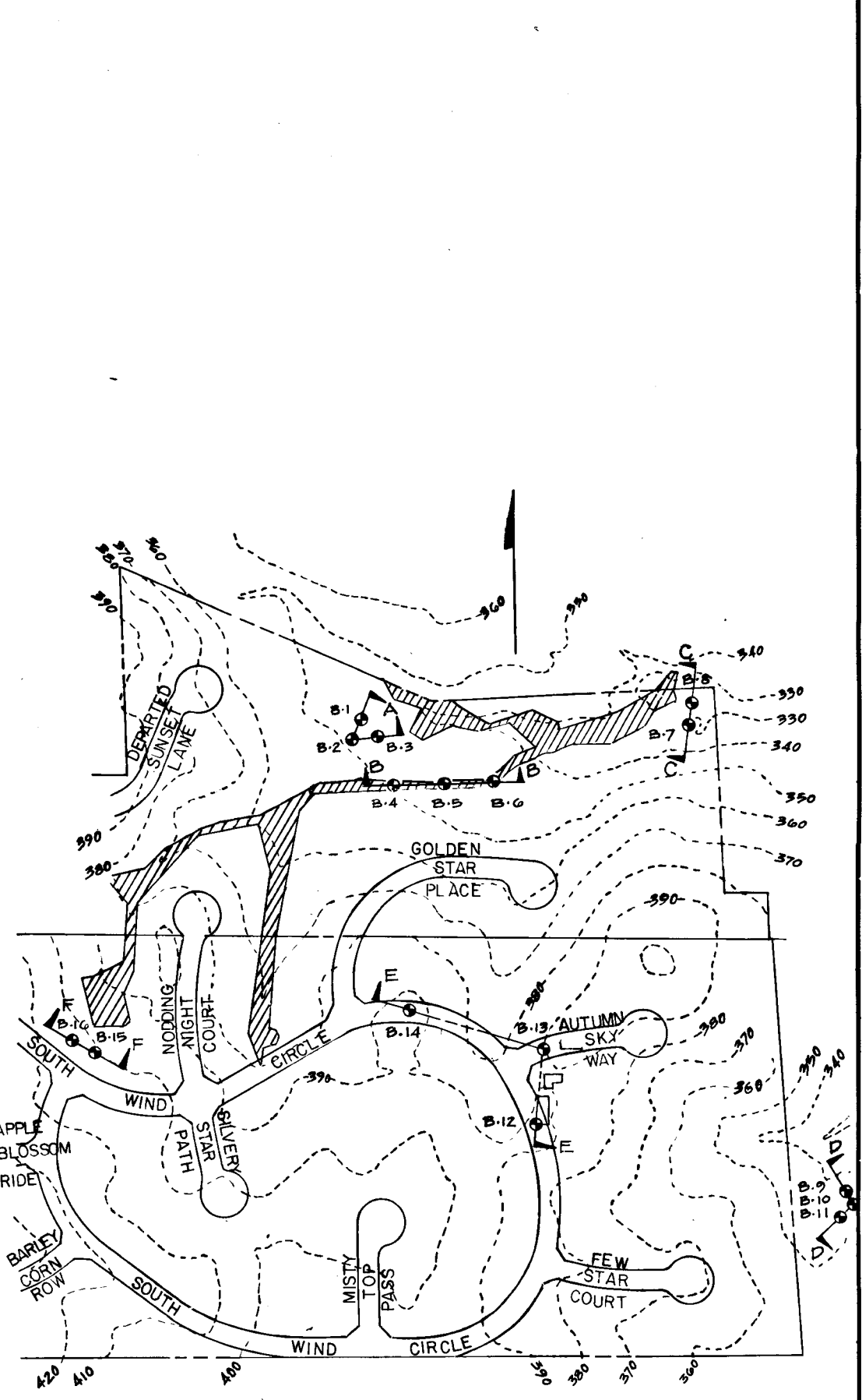
At completion of boring, water at 8.1', hole caved at 20.0' * 24 hrs after completion, water at 6.4', hole caved at 7.2'

At completion of boring, water at 4.7', hole caved at 16.1' * 24 hrs after completion, water at 3.1', hole caved at 11.1'

SECTION F-F

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 DATE: 4/17/91
 BY: [Signature]
 TITLE: CHIEF, BUREAU OF HIGHWAYS
 DATE: 4-17-91
 BY: [Signature]
 TITLE: CHIEF, BUREAU OF ENGINEERING

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 DATE: 4/19/91
 BY: [Signature]
 TITLE: CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT



REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2 PROJECT TITLE: BORINGS SCALE: _____ DATE: 4/1/91 WHITMAN, REQUARD AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218 [Signature] THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."
 [Signature] DATE: 10-19-90

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.
 [Signature] DATE: 4/4/91
 U.S. SOIL CONSERVATION SERVICE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
 [Signature] DATE: 4/4/91
 HOWARD SOIL CONSERVATION DISTRICT

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 MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."
 [Signature] DATE: 10/17/90
 THOMAS J. SHAFER
 REGISTRATION NO. 8457

1487

**STORMWATER MANAGEMENT
CONSTRUCTION SPECIFICATIONS**

1. 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 SWM Ponds and earth dam 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.

All cleared and grubbed material shall be disposed of outside and below 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.

2. EARTH FILL

MATERIAL
The fill material shall be taken from approved designated borrow area or areas. It shall be free of roots, stumps, wood, rubbish, oversize stones, frozen or other objectionable materials. The embankment shall be constructed to an elevation which provides for anticipated settlement to the design elevation. The fill height all along the length of the embankment shall be increased above the design elevation (including freeboard) as shown on the plans.

PLACEMENT
Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in 8-inch maximum thickness (before compaction) layers which are to be continuous over the entire length of the fill. The most porous borrow material shall be placed in the downstream portions of the embankment.

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 sheepfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction can be obtained with the equipment used. Where a minimum required density is specified, each layer of fill shall be compacted as necessary to obtain that density and is to be certified by the Engineer.

CUTOFF TRENCH
Where specified, a cutoff trench shall be excavated along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be as shown on the drawings, with the minimum width being four feet. The depth shall be at least four feet or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill material for the cutoff trench shall be the most impervious material available and shall be compacted with equipment or rollers to assure maximum density and minimum permeability.

3. STRUCTURAL BACKFILL

Backfill material 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 compaction equipment. The material needs 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 twenty-four inches or greater over the structure or pipe.

4. PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.
A. CORRUGATED METAL PIPE

1. 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 coating are commercially available: Nexon, Plastic-cote, Blac-Klad and Beth-co-loy Coated corrugated steel pipe shall meet the requirements of AASHTO M-245 and M-246.

2. CONNECTION-All connections with pipes must be completely watertight. Watertight coupling bands are not considered to be watertight.

3. 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.

4. LAYING PIPE-The pipe shall be placed with inside circumferential laps pointing downstream and with the longitudinal laps at the sides.

5. BACKFILLING-Backfilling shall conform to structural backfill as shown above.

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

5. CONCRETE

1. MATERIALS

A. CEMENT-Normal Portland cement shall conform to the latest ASTM Specification C-150.

B. WATER-The water used in concrete shall be clean, free from oil, acid, alkali, scales, organic matter or other objectionable substances.

C. SAND-The sand used in concrete shall be clean, hard, strong and durable, and shall be well graded with 100 percent passing a one-quarter inch sieve. Limestone sand shall not be used.

5. CONCRETE - Continued

1. MATERIALS
D. COARSE AGGREGATE-The coarse aggregate shall be clean, hard, strong and durable, and free from dirt. It shall be well graded with a maximum size of one and one-half (1-1/2) inches.
E. REINFORCING STEEL-The reinforcing steel shall be deformed bars of intermediate grade, billet steel or rail steel conforming to ASTM Specification A-615.

2. DESIGN MIX
The concrete shall be mixed in the following proportions, measured by weight. The water-cement ratio shall be 5-1/2 to 8 U.S. Gallons of water per 94 pound bag of cement. The combination of aggregates may be adjusted to produce a plastic and workable mix that will not produce harshness in placing or honey-combing in the structure.

3. MIXING
The concrete ingredients shall be mixed in batch mixers until the mixture is homogeneous and of uniform consistency. The mixing of each batch shall continue for not less than one and one-half minutes after all the ingredients, except the fill amount of water, are in the mixer. The minimum mixing time is predicted on proper control of the speed of rotation of the mixer and of the introduction of the material, including water, into the mixer. Water shall be added prior to, during and following the mixer-charging operations. Excessive overmixing requiring the addition of water to preserve the required concrete consistency shall not be permitted. Truck mixing will be allowed provided that the use of this method shall cause no violation of any applicable provisions of the specifications given here.

4. FORMS
The forms shall have sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure, tamping and vibration without deflection from the prescribed lines. They shall be mortar-tight and constructed so that they can be removed without hammering or prying against the concrete. The inside of forms shall be oiled with a non-staining mineral oil or thoroughly wetted before concrete is placed. Forms may be removed 24 hours after the placement of concrete. All wire ties and other devices used shall be recessed from the surface of the concrete.

5. REINFORCING STEEL
All reinforcing material shall be free of dirt, rust, scale, oil, paint or any other coatings. The steel shall be accurately placed and securely tied and blocked into position so that no movement of the steel will occur during placement of concrete.

6. CONSOLIDATING
Concrete shall be consolidated with internal type mechanical vibrators. Vibration shall be supplemented by spading and hand tamping as necessary to insure smooth and dense concrete along form surfaces, in corners and around embedded items.

7. FINISHING
Defective concrete, honeycombed areas, voids left by the removal of tie rods, ridges on all concrete surfaces permanently exposed to view or exposed to water on the finished structure, shall be repaired immediately after the removal of forms. All voids shall be reamed and completely filled with dry-patching mortar.

8. PROTECTION AND CURING
Exposed surfaces of concrete shall be protected from the direct rays of the sun for at least the first three (3) days. All concrete shall be kept continuously moist for at least ten (10) days after being placed. Moisture may be applied by spraying or sprinkling as necessary to prevent the concrete from drying. Concrete shall not be exposed to freezing during the curing period. Curing compounds may also be used.

9. PLACING TEMPERATURE
Concrete may not be placed at temperatures below 37 degrees with the temperature falling, or 34° with the temperature rising.

6. 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 (if required) in accordance with the vegetative treatment specifications.

7. 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. See sheets 14 thru 17.

8. COUPLING BANDS, ANTI-SEEP COLLARS, ETC.

Coupling bands, anti-seep collars, end 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.

9. CONNECTIONS

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 connectors 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 huggler 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.

PERMANENT SEEDING

ALL DISTURBED AREAS SHALL BE STABILIZED AS FOLLOWS:

- 1. SEEDED PREPARATION:** Loosen upper 3 inches of soil by raking, disking or other acceptable means before seeding.
- 2. SOIL AMENDMENTS:** Apply 2 tons per acre Dolomitic limestone (92 lbs./1,000 sq. ft.) and 800 lbs per acre 0-20 fertilizer (14 lbs./1,000 sq. ft.) Harrow or disc lime and fertilizer into upper three inches of soil. At time of seeding, apply 400 lbs. per acre (9.2 lbs./1,000 sq. ft.) of 38-0-0 Ureaform fertilizer and 500 lbs. per acre (11.5 lbs./1,000 sq. ft.) of 10-20-20 fertilizer.
- 3. SEEDING:** For the periods March 1 thru April 30, and August 1 thru October 15, see with 45 lbs. per acre (1.4 lbs./1,000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, see with 45 lbs. Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (.05 lbs./1,000 sq. ft.) of Weeping Lovegrass. During the period of October 16 thru February 28, protect site by: Option (1)-2 tons per acre of well anchored straw mulch and see as soon as possible in the spring, Option (2)-use sod. Option (3)-seed with 60 lbs./acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.
- 4. EROSION CONTROL FABRIC:** "HOLD GRO", Gulf State Pater Corporation, P.O.B. NO. 3199 Tuscaloosa, Alabama, 34504, or an approved equal. Install as recommended by the manufacturer.
- 5. MAINTENANCE:** Inspect all seeded areas and make needed repairs, replacement and reseeding.
- 6. Add Crown Vetch Leguminous Seed** to mixture on 2:1 and 3:1 slopes. Seed mixture shall be sown at the rate of 45 pounds/acre with Crown Vetch sown at 15 pounds/acre. Inoculant for Crown Vetch shall be at the rate of 6.7 oz. Powder or liquid culture per 20 pounds Crown Vetch. Seed inoculated with liquid culture shall be sown within 24 hours after treatment. Seed inoculated with powdered culture shall be sown within 48 hours after treatment. The seeding contractor may elect to apply the inoculated Legume Seed dry and in a separate operation prior to applying an aqueous mixture, or he may apply them in the aqueous mixture with the seed and commercial fertilizer using four times the quantity of inoculum recommended for dry leguminous seed application.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Alan M. Johnson 4/18/91
CHIEF, LAND DEVELOPMENT DIVISION

Drayville W. Welstead 4/19/91
CHIEF, BUREAU OF HIGHWAYS

W. Sedman 4-17-91
CHIEF, BUREAU OF ENGINEERING

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Thomas J. Shafer 4/20/91
CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT

REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION 1 AREA 3 PHASE 2		
PROJECT TITLE: SWM CONSTRUCTION SPECIFICATIONS		
SCALE: _____	DATE: 4/1/91	
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I WILL 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."

Joseph H. Necker Jr. 10-17-90
JOSEPH H. NECKER JR. DATE

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.

James M. Helms 4/4/91
J.S. SOIL CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

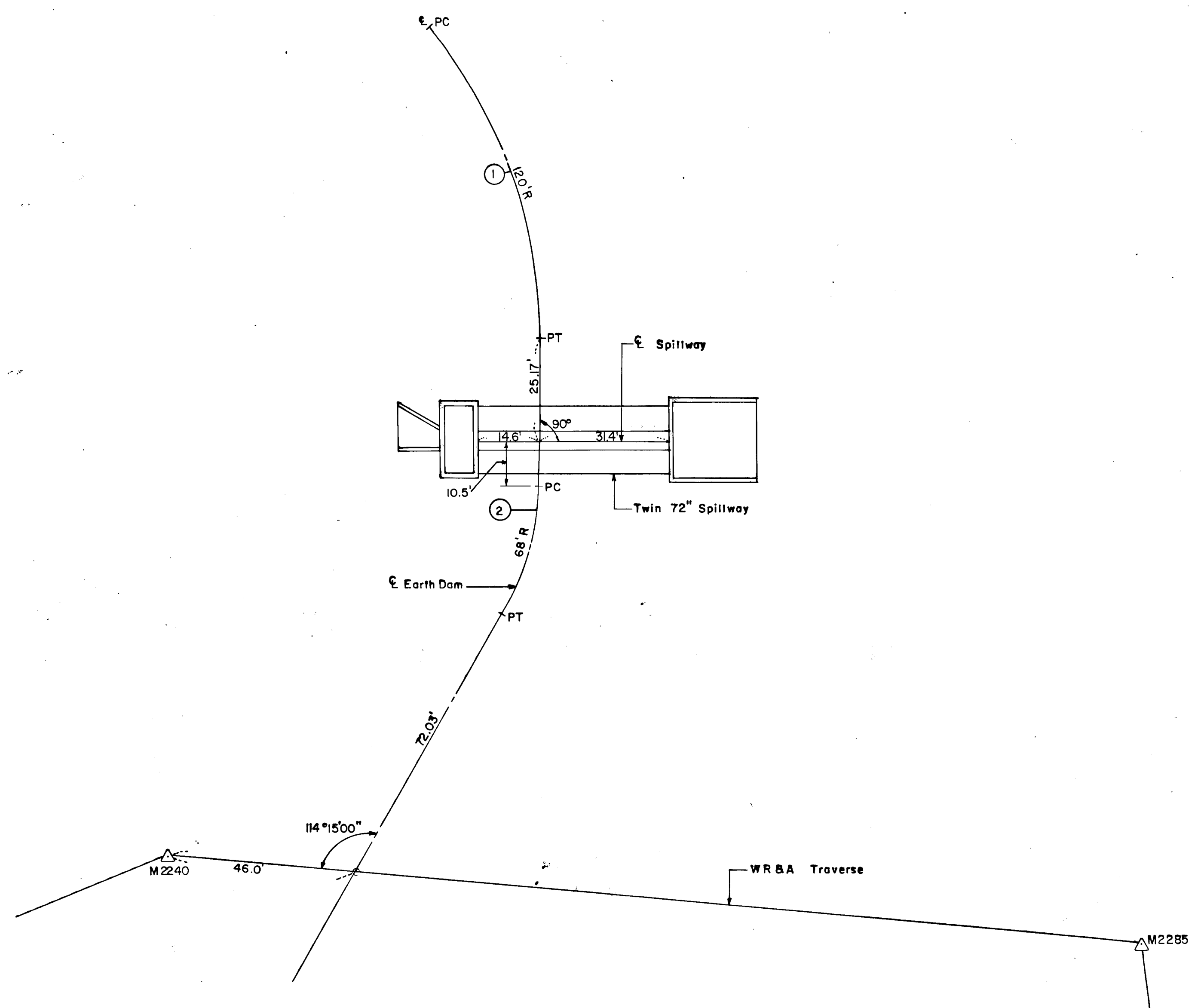
Robert W. Zickler 4/4/91
HOWARD SOIL CONSERVATION DISTRICT DATE

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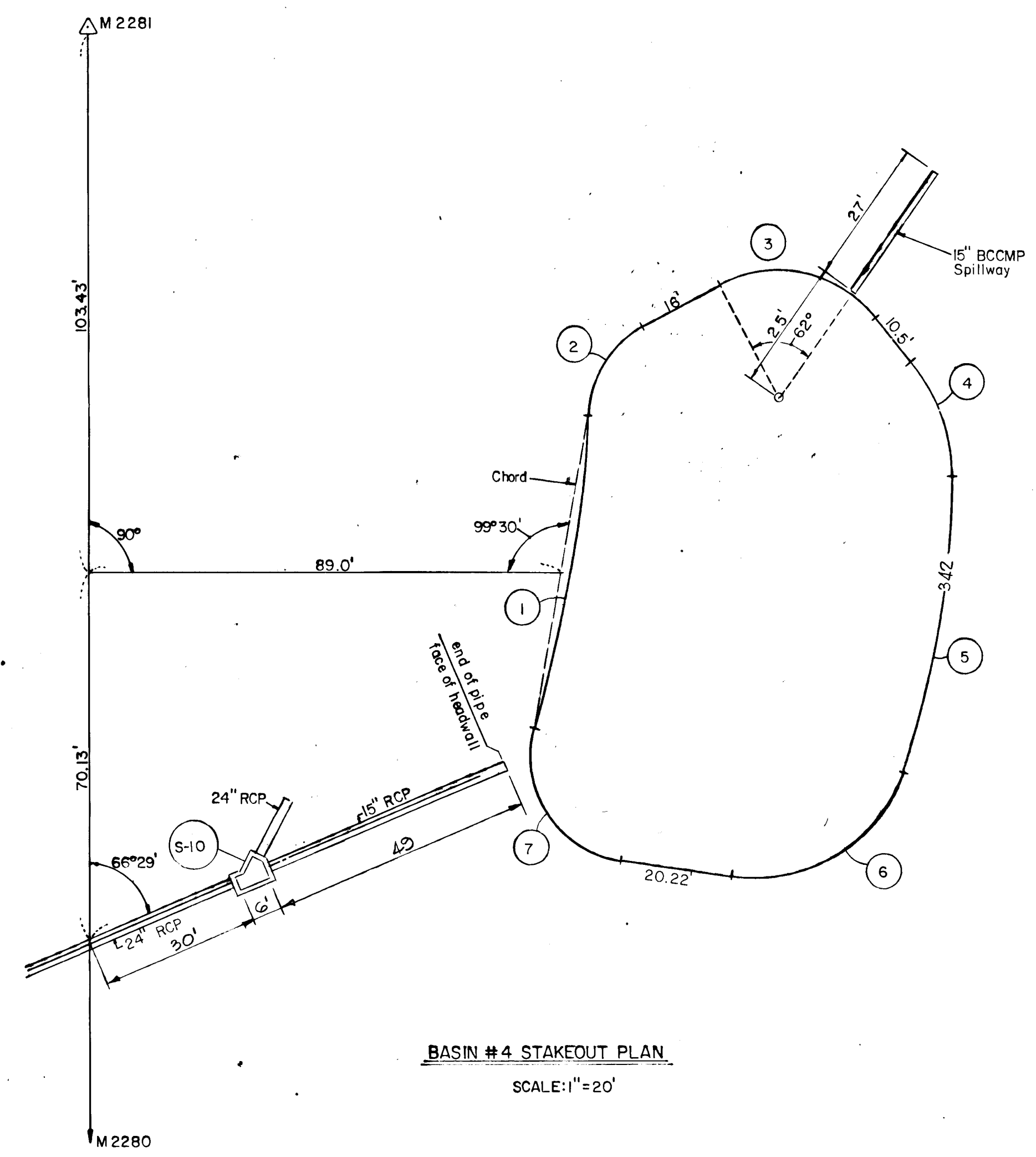
Thomas J. Shafer 10/17/90
THOMAS J. SHAFER
Registration No. 8457 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Alan M. Brown 4/17/91
 CHIEF, LAND DEVELOPMENT DIVISION
Drayville W. Wehrend 4/19/91
 CHIEF, BUREAU OF HIGHWAYS
William B. Ray 4-17-91
 CHIEF, BUREAU OF ENGINEERING
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Mark C. Taylor 4/20/91
 CHIEF, DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT



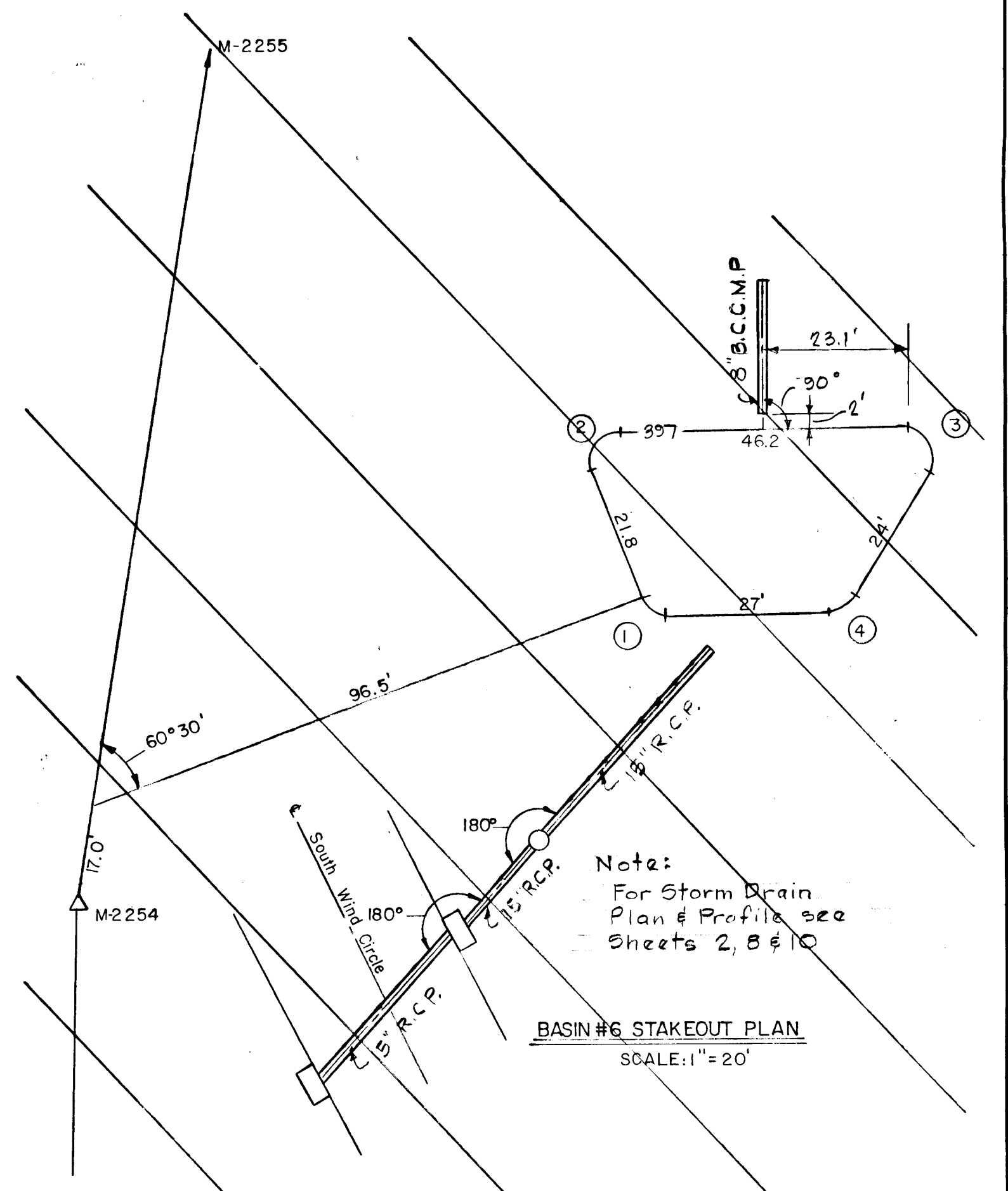
EMBankment Stakeout Plan
 SCALE: 1"=20'

DAM						
NO.	RADIUS	DELTA	ARC	TAN	CHORD	CHORD BEARING
1	120.00'	39°00'00"	81.68'	42.49'	80.11'	S 14°58'08" E
2	68.00'	28°30'00"	33.82'	17.27'	33.48'	S 18°46'51" W



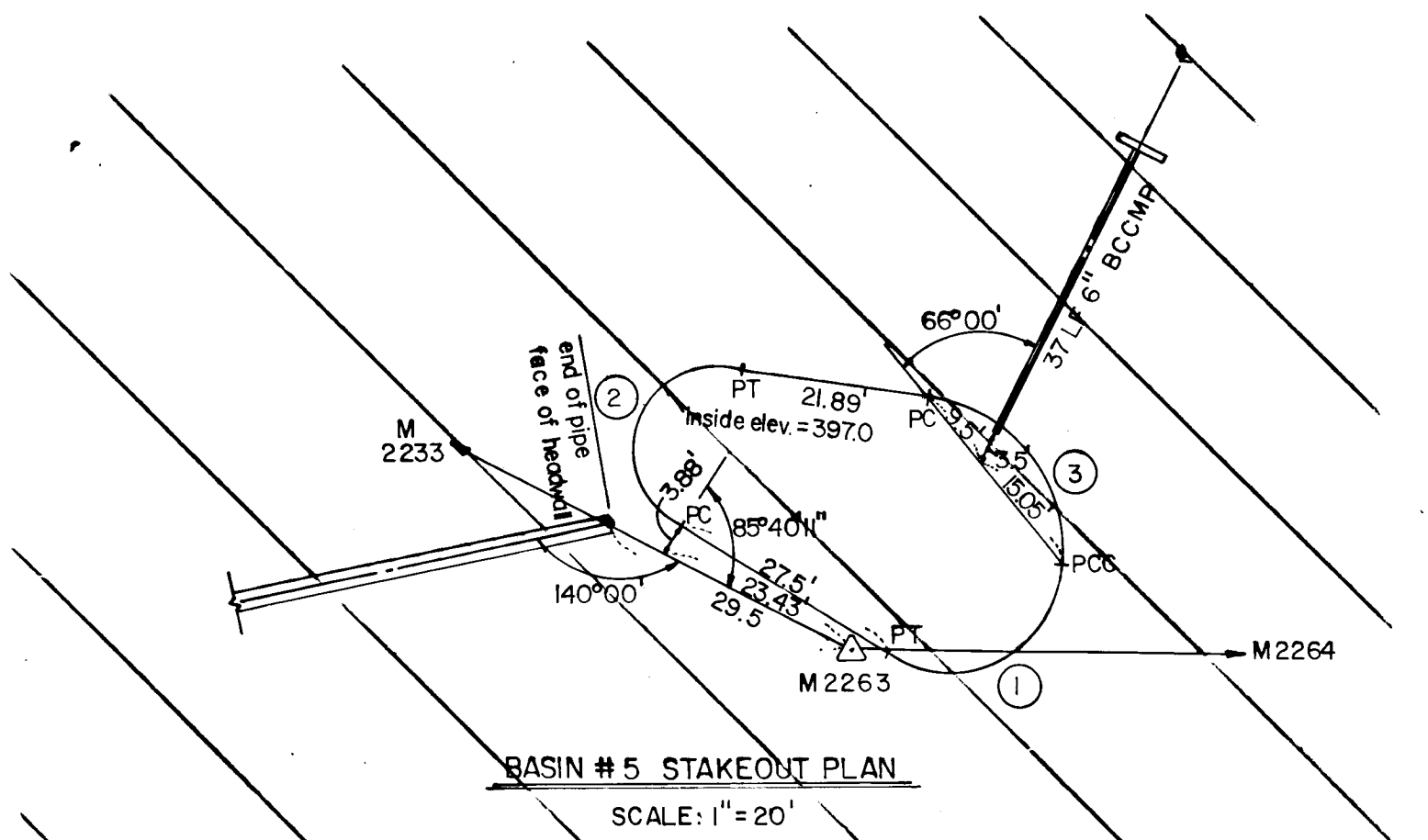
BASIN #4 STAKEOUT PLAN
 SCALE: 1"=20'

BASIN #4 - EAST						
NO.	RADIUS	DELTA	ARC	TAN	CHORD	CHORD BEARING
1	220.00	15°20'00"	58.88	29.61	58.70	N 09°10'06" E
2	19.60	60°50'00"	20.70	11.45	19.75	N 31°55'06" E
3	24.00	78°00'00"	32.67	19.43	30.21	S 78°39'54" E
4	33.00	40°30'00"	23.33	12.17	22.84	S 19°24'54" E
5	180.00	18°00'00"	56.55	28.51	56.32	S 09°50'06" W
6	29.50	81°22'31"	41.90	25.36	38.46	S 59°31'22" W
7	19.50	96°37'29"	32.88	21.90	29.12	N 31°28'38" W



BASIN #6 STAKEOUT PLAN
 SCALE: 1"=20'

BASIN #6 - ENTRANCE						
NO.	RADIUS	DELTA	ARC	TAN	CHORD	CHORD BEARING
1	4.00	71°30'00"	4.99	2.88	4.67	N 54°38'33" W
2	5.00	108°30'00"	9.47	6.94	8.11	N 35°21'27" E
3	5.00	123°30'00"	10.77	9.31	8.81	S 28°38'33" E
4	5.00	56°30'00"	4.93	2.69	4.73	S 61°21'27" W



BASIN #5 STAKEOUT PLAN
 SCALE: 1"=20'

BASIN #5 - SOUTH WIND CIRCLE						
NO.	RADIUS	DELTA	ARC	TAN	CHORD	CHORD BEARING
1	18.00'	86°00'00"	27.02	16.78	24.55	S 39°05'34" E
2	13.00'	118°00'00"	26.77	21.63	22.29	S 62°54'26" W
3	9.50'	154°00'00"	25.53	41.15	18.51	N 18°54'28" E

June 19, 1991	1	Removed Basin 6 Stakeout data
REV. DATE	REV. NO.	REVISION DESCRIPTION
COLUMBIA 5TH ELECTION DISTRICT HOWARD COUNTY MARYLAND		
OWNER AND DEVELOPER THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION		
PROJECT AREA: VILLAGE OF RIVER HILL SECTION I AREA 3 PHASE 2		
PROJECT TITLE: SWM AND WQ STAKEOUT PLAN		
SCALE: AS SHOWN		DATE: 4/1/91
WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS BALTIMORE, MARYLAND 21218		
<i>Thomas J. Shafer</i> THOMAS J. SHAFER REGISTERED ENGINEER NO. 8457		

BY THE DEVELOPER:
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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.
James M. Helm 4/14/91
 S.S. SOIL 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. Ziehm 4/14/91
 HOWARD SOIL CONSERVATION DISTRICT DATE

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Thomas J. Shafer 10/17/90
 THOMAS J. SHAFER
 Registration No. 8457 DATE

1489