

REVISIONS	
1.	ADD SHEET # 2 OF 2 / GRADING STUDY LOT 24

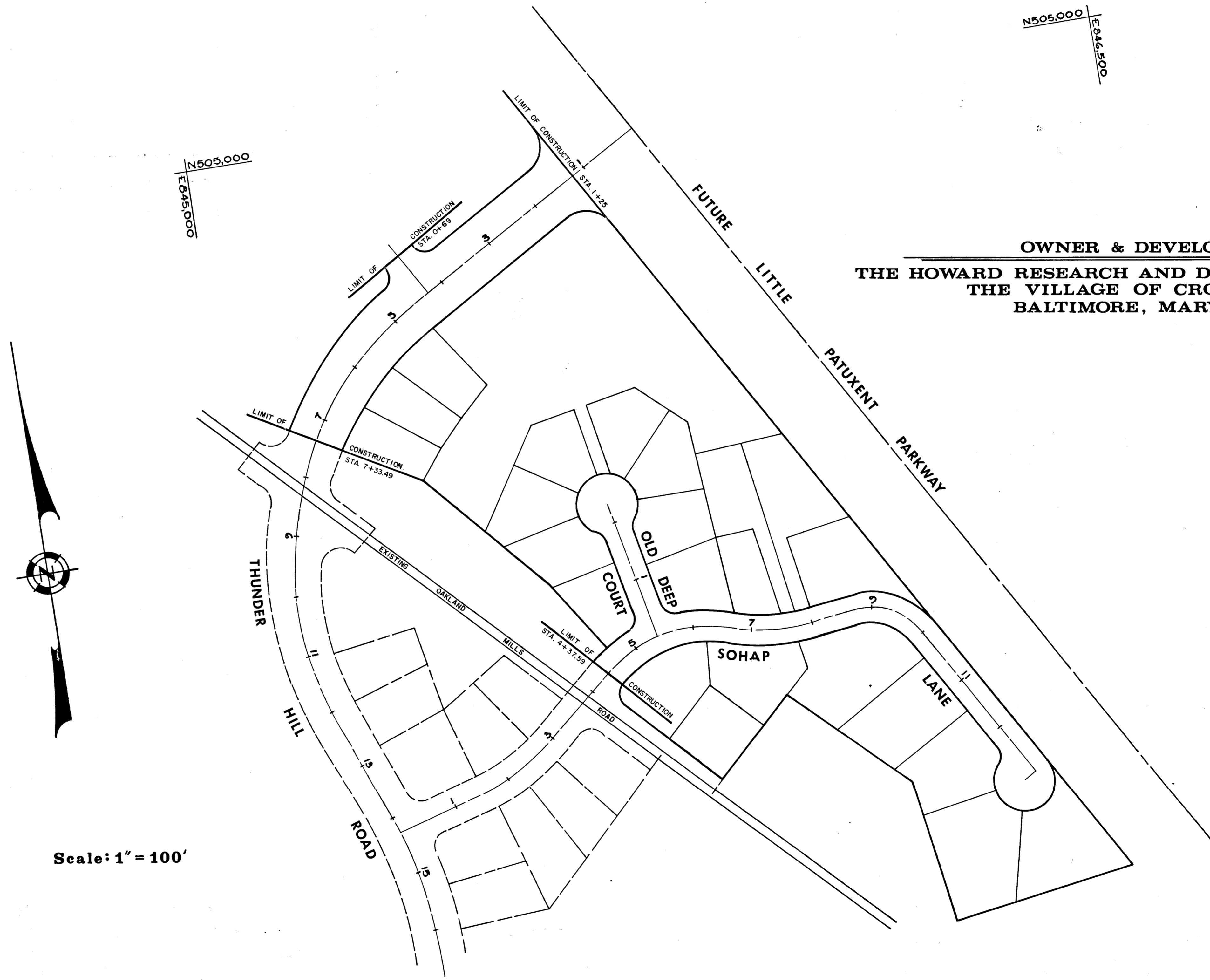
SHEET INDEX	
SHEET No.	DESCRIPTION
1	TITLE SHEET
2	THUNDER HILL ROAD
3	SOHAP LANE
4	OLD DEEP COURT
5	TYPICAL DETAILS
6	TYPICAL DETAILS
7	DRAINAGE AREA MAP
8	GRADING STUDY LOT #24

# COLUMBIA

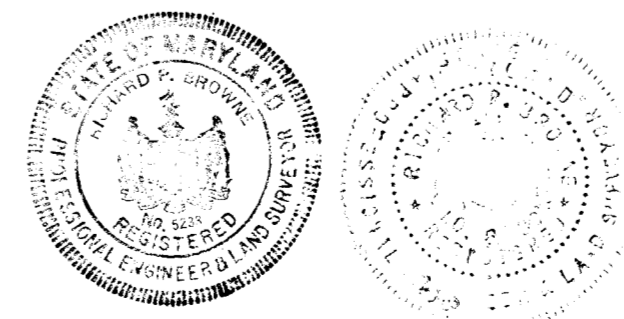
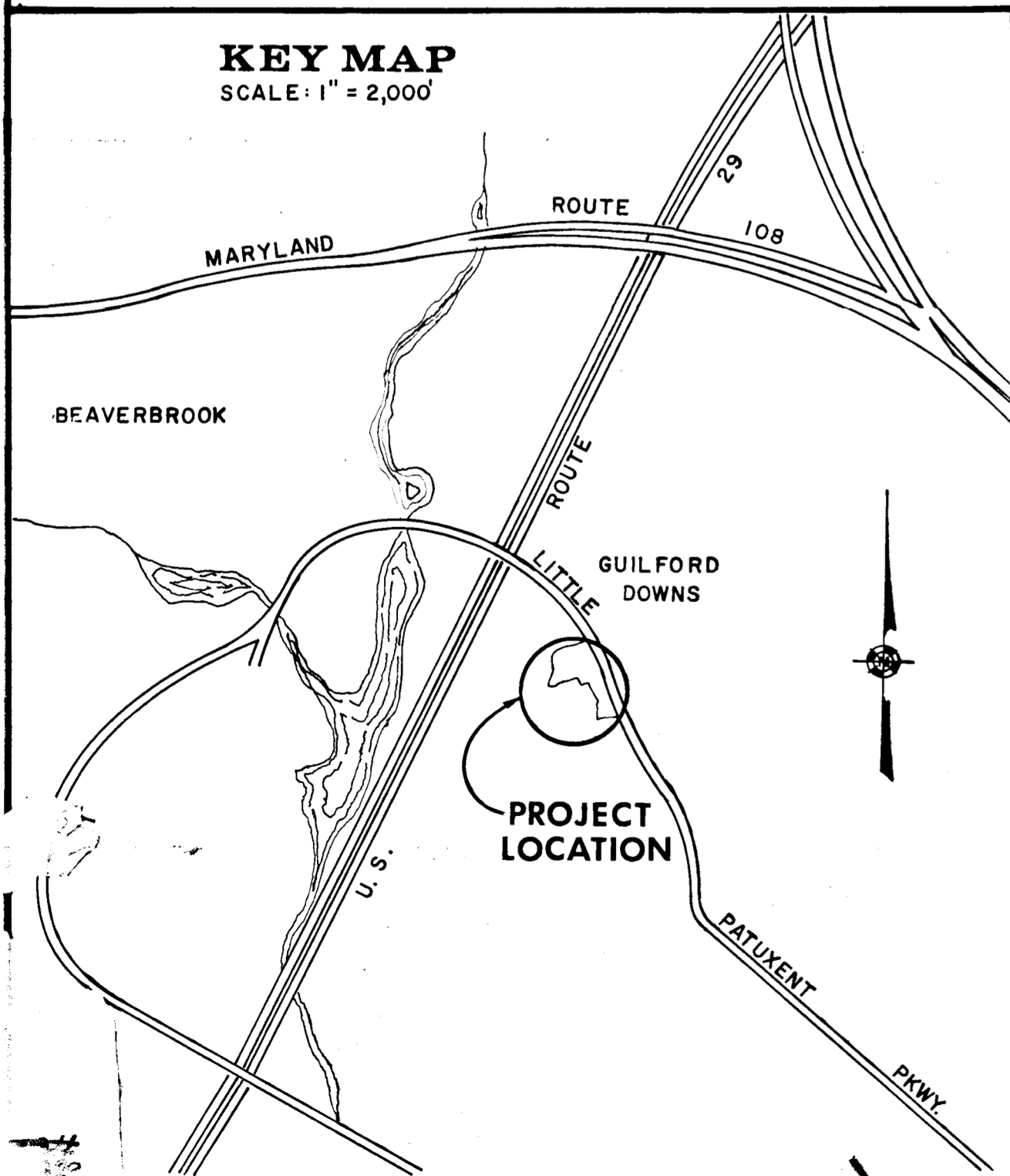
HOWARD COUNTY, MARYLAND  
6th ELECTION DISTRICT  
VILLAGE OF OAKLAND MILLS SEC. 4  
TALBOTT SPRINGS AREA 3

**NOTES:**

1. ALL DETAILS ARE FROM THE "ROAD CONSTRUCTION CODE AND STANDARD SPECIFICATIONS" ISSUED OR APPROVED BY HOWARD COUNTY.
2. THUNDER HILL ROAD IS DESIGNED FOR 35 MPH TRAFFIC SPEED, ALL OTHER ROADS ARE DESIGNED FOR 25 MPH TRAFFIC SPEED IN ACCORDANCE WITH A.A.S.H.O.



**OWNER & DEVELOPER**  
**THE HOWARD RESEARCH AND DEVELOPMENT CORP.**  
**THE VILLAGE OF CROSS KEYS**  
**BALTIMORE, MARYLAND**



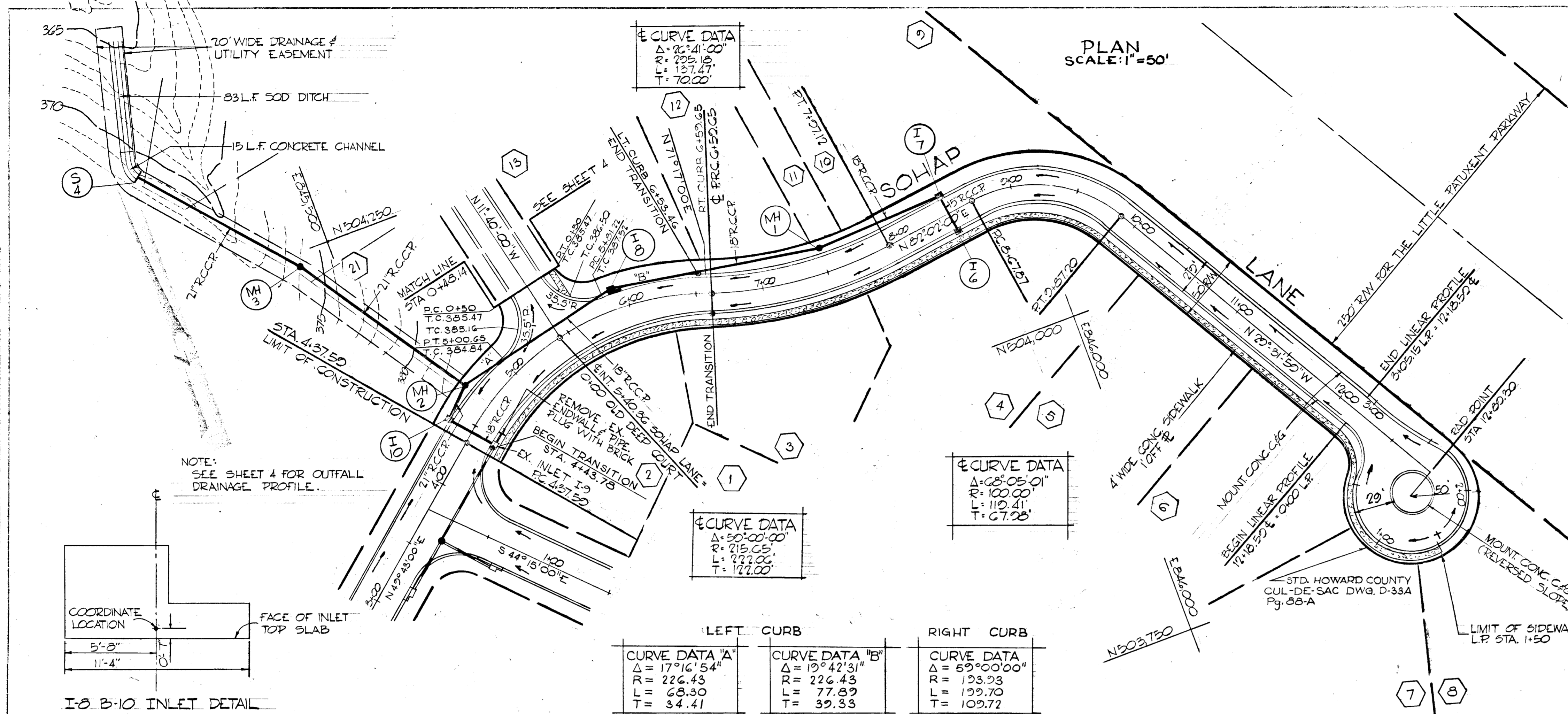
**RICHARD P. BROWNE ASSOCIATES**  
 CONSULTING ENGINEERS, PLANNERS  
 COLUMBIA, MARYLAND  
*Richard P. Browne*  
 RICHARD P. BROWNE, P.E. & L.S.  
 LIC. NO. 5239 STATE MD.

DEPARTMENT OF PUBLIC WORKS	DATE
<i>Thomas S. Orville</i> CHIEF, BUREAU OF HIGHWAYS	5-11-70
OFFICE OF PLANNING AND ZONING	DATE
<i>J.H. Lawson</i> CHIEF ENGINEER, DIVISION OF LAND	5-11-70









STORM DRAINAGE STRUCTURE SCHEDULE						
NO.	TYPE	LOCATION	INV. IN	INV. OUT	T.C.P. ELEV.	REMARKS
I-6	A-10 INLET	STA. 8+50 RT. E. (E INLET)	391.10	393.17		HO.CO STD. DWG. 64-A PAGE 119-A
I-7	A-10 INLET	STA. 8+50 LT. E. (E INLET)	390.50	392.25	395.17	HO.CO STD. DWG. 64-A PAGE 119-A
M-1	STD. MANHOLE	STA. 7+50 19.75' LT. E. (E MANHOLE)	388.37	388.17	393.87	HO.CO STD. DWG. D-103 PAGE 153
I-8	B-10 INLET	N504.40.41' E 343.286.47' (SEE DETAIL THIS SHEET)	382.92	382.72	UP 388.76	HO.CO STD. DWG. 64-B PAGE 119-B
E-9	EXISTING 'AS' INLET	STA. 4+44 RT. E. (E INLET)	377.02	376.82	384.23	HO.CO STD. DWG. 64-A PAGE 119-A
I-10	A-5 INLET	STA. 4+44 LT. E. (E INLET)	376.46	376.21	384.23	HO.CO STD. DWG. 64-A PAGE 119-A
M-2	STD. MANHOLE	N504.110.02' E 345.958.46' (E MANHOLE)	379.00	375.95	381.25	HO.CO STD. DWG. D-103 PAGE 153
M-3	STD. MANHOLE	N504.238.61' E 345.178.36' (E MANHOLE)	366.87	366.67		HO.CO STD. DWG. D-103 PAGE 153
5-4	STD. 'C' ENDWALL	SEE PLAN	365.31			HO.CO STD. DWG. D-52 PAGE 107

Richard P. Browne  
 RICHARD P. BROWNE PE # L3 5283

RICHARD P. BROWNE ASSOCIATES  
 CONSULTING ENGINEERS - PLANNERS  
 COLUMBIA, MARYLAND

Rev. Date: Rev. No.: Revision Description:

**COLUMBIA**  
 MARYLAND  
 6th ELECTION DISTRICT HOWARD COUNTY, MD.

HOWARD RESEARCH AND DEVELOPMENT CORP.  
 THE VILLAGE OF OAKLAND MILLS SEC. 7  
 TALBOTT SPRINGS AREA 3

PROJECT TITLE: **SOHAP LANE**

Des. By: T.K.S. Scale: AS SHOWN Des. No: 3 OF 10  
 Drawn By: J.B. F.E.T. Date: April 10, 1969 C.C.P. No.  
 Check By: T.K.S. Approved:

**APPROVED**  
 DIVISION OF  
 LAND DEVELOPMENT  
 OFFICE OF  
 PLANNING AND ZONING  
 OF HOWARD COUNTY  
 DATE: MAY 8 1970

LEFT CURB	RIGHT CURB
CURVE DATA 'A' $\Delta = 17^\circ 16' 54''$ $R = 226.43$ $L = 68.30$ $T = 34.41$	CURVE DATA 'B' $\Delta = 19^\circ 42' 31''$ $R = 226.43$ $L = 77.89$ $T = 39.33$

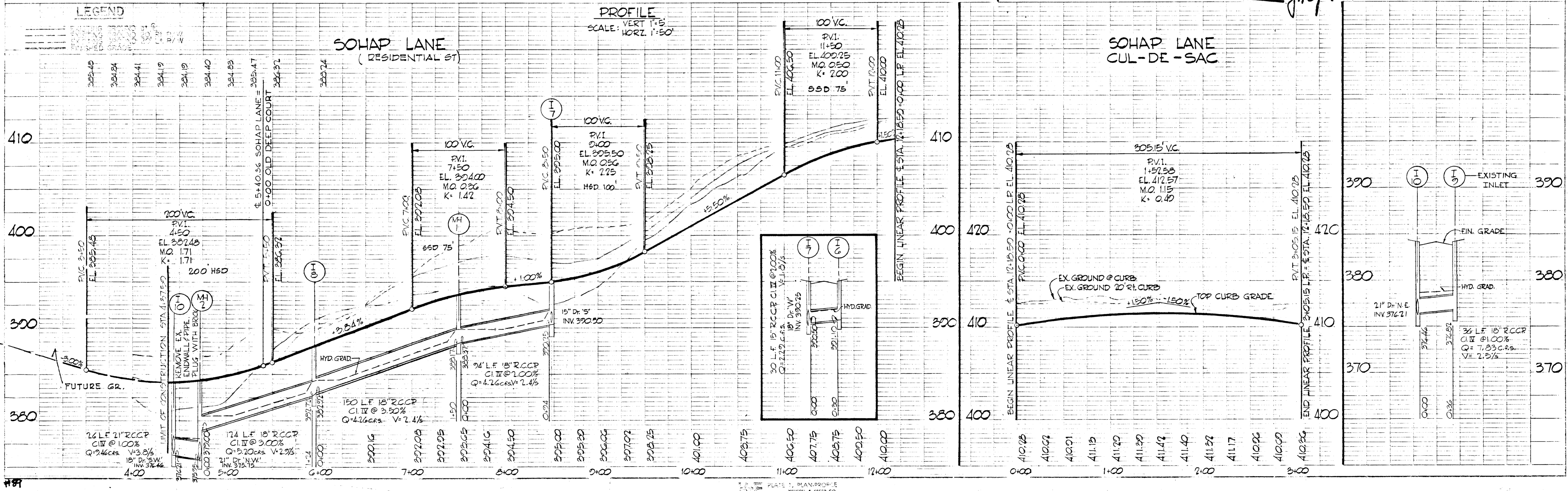
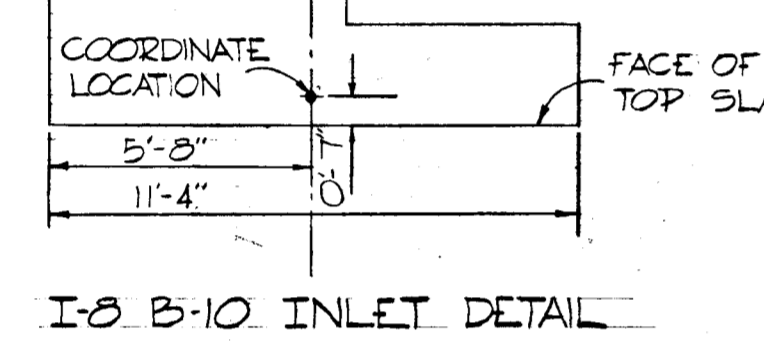
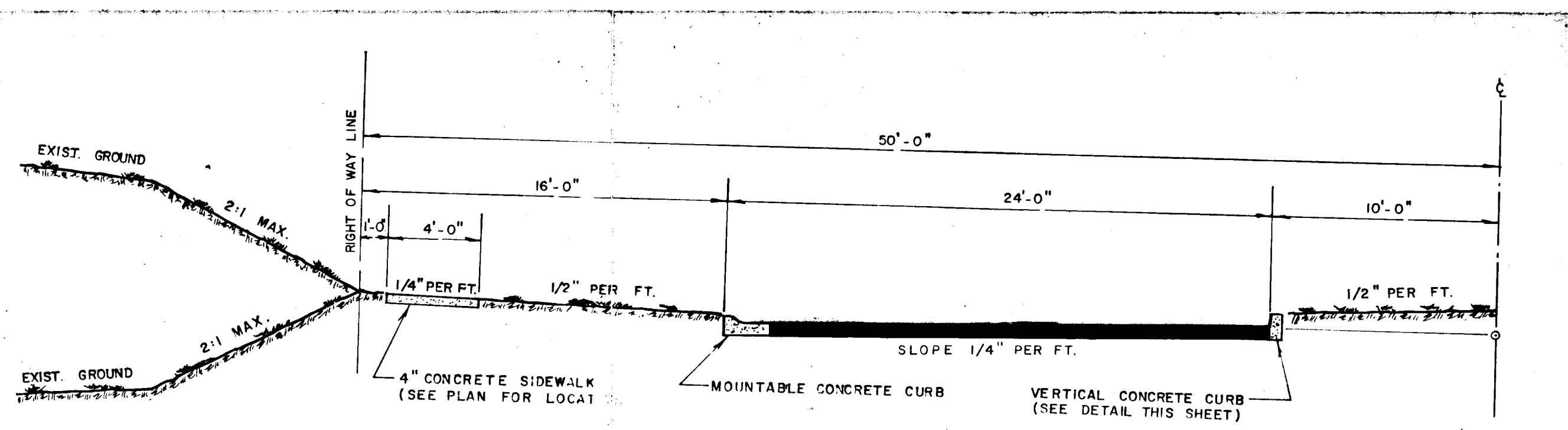


PLATE 1 PLAN PROFILE  
 48 7000 ALPHABETIC DRAWING PAPER 20700  
 MADE IN U.S.A.



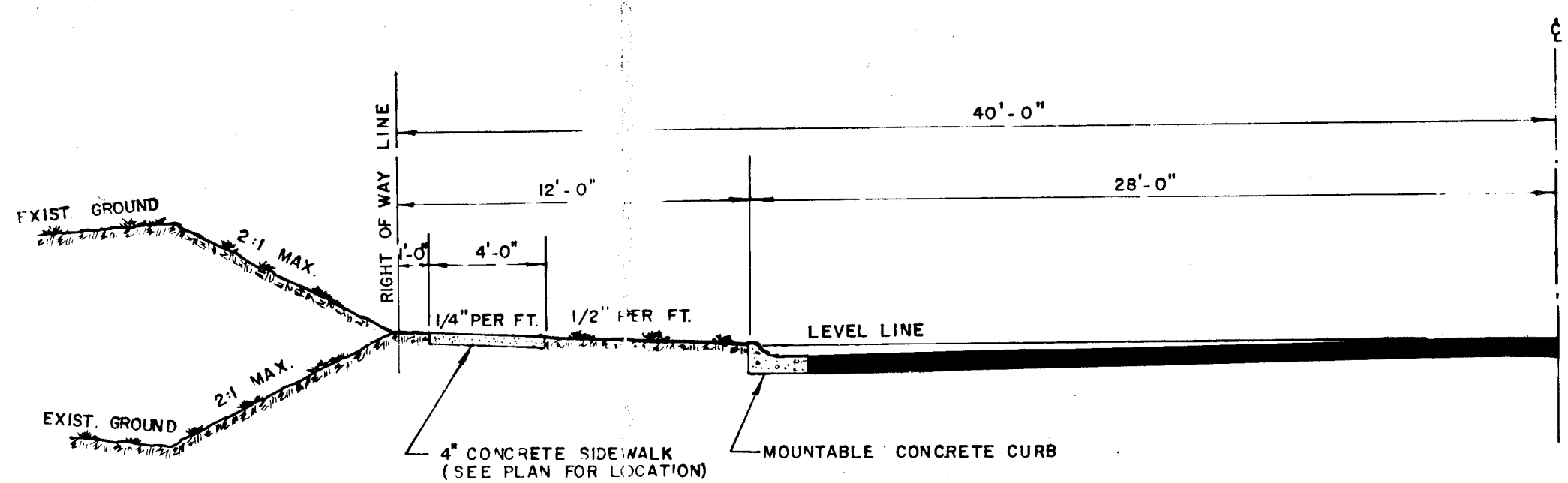




100' R.O.W. TYPICAL HALF-SECTION

SCALE: 1" = 5'

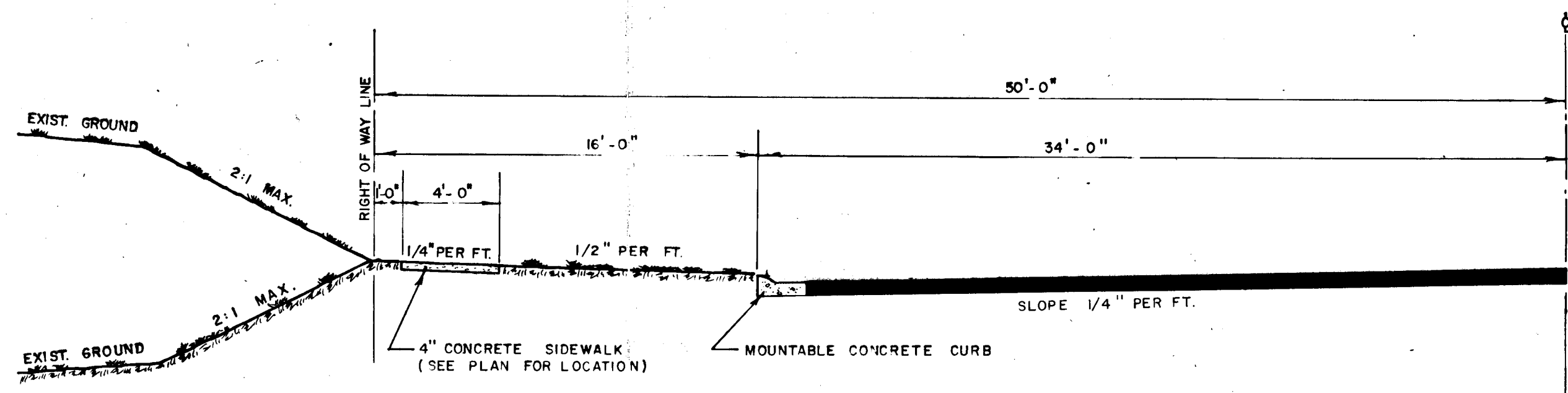
THUNDER HILL RD. STA 1+25 TO STA. 3+25



80' R.O.W. TYPICAL HALF-SECTION

SCALE: 1" = 5'

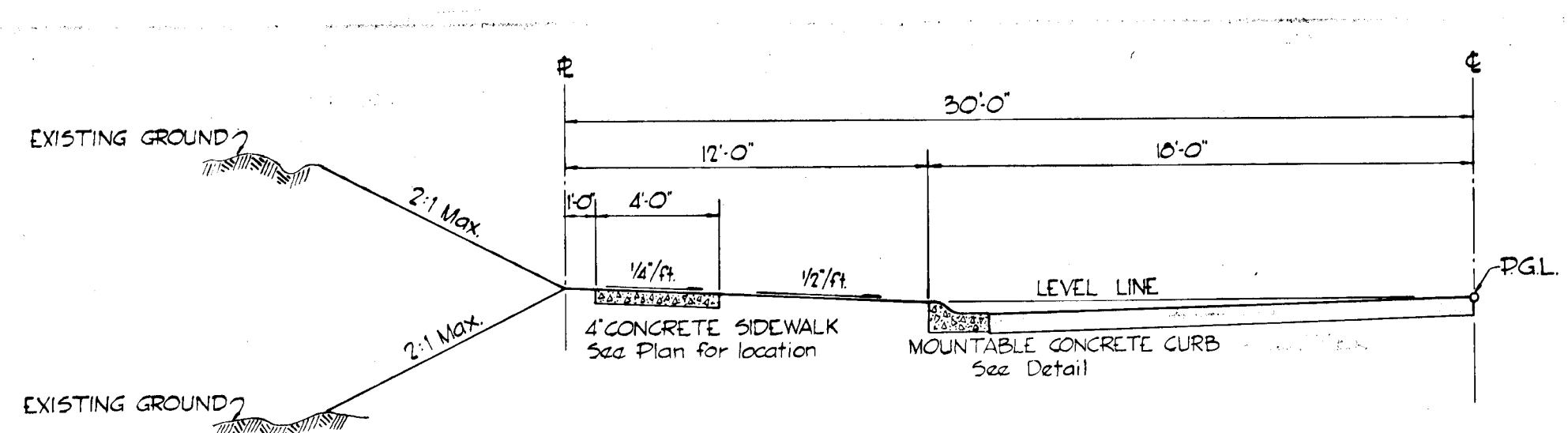
THUNDER HILL RD



100' R.O.W. TYPICAL HALF-SECTION

SCALE: 1" = 5'

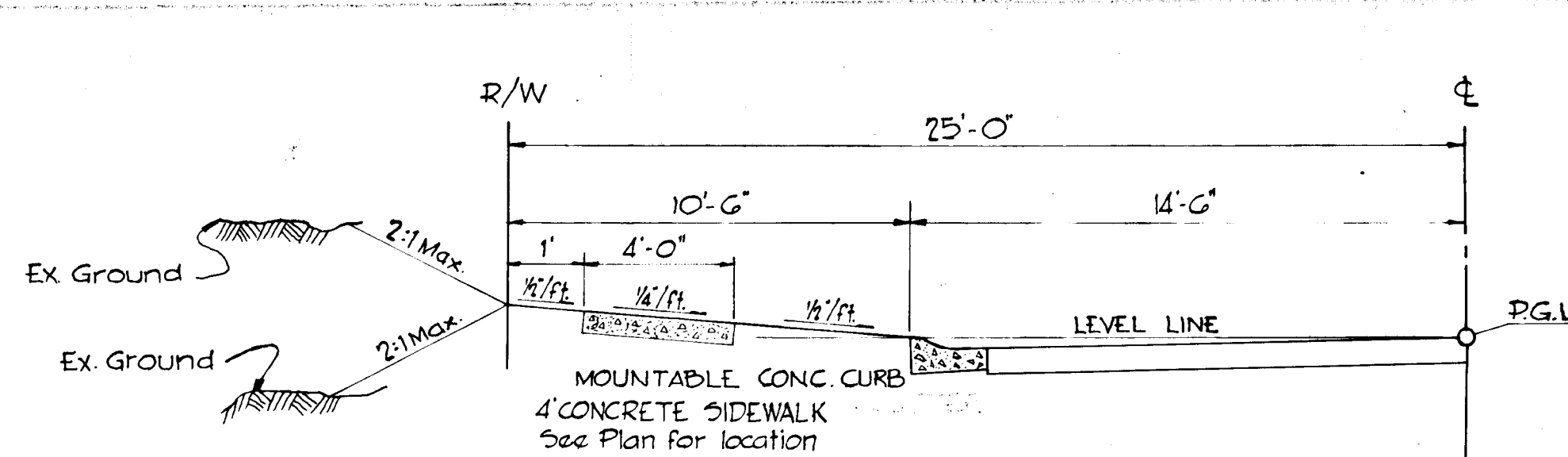
THUNDER HILL RD FROM STA 3+25 INTO TRANSITION



60' R.O.W. TYPICAL HALF-SECTION

SCALE: 1" = 5'

SOHAP LANE STA 4+37.59

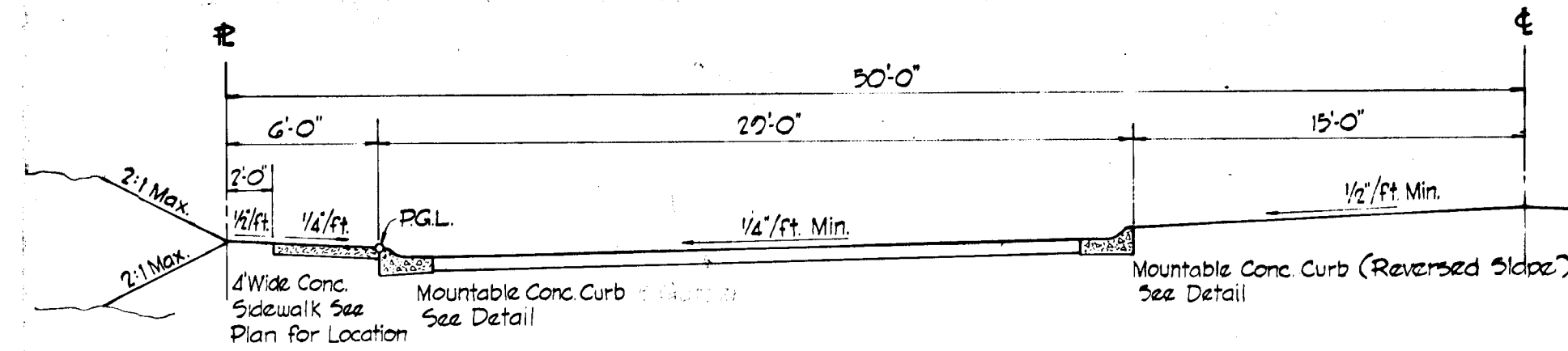


50' R.O.W. TYPICAL HALF-SECTION

NO SCALE

SOHAP LANE STA 4+37.59 TO 12+18.50

OLD DEEP COURT CROSSING



TYPICAL CUL-DE-SAC HALF-SECTION

NO SCALE

BITUMINOUS CONCRETE SURFACE	1 1/2"	BAND C-3	FINAL PHASE
BITUMINOUS CONCRETE BINDER	3/4"	BAND A-3	
BITUMINOUS CONCRETE BASE PLACED IN ONE COURSE	4"	BAND C-2 OR G-3	FIRST PHASE

CLEARING AND GRADING ARTICLE C-1  
SUBGRADE ARTICLE C-2  
BASE COURSE ARTICLE C-31 or C-33  
BINDER COURSE ARTICLE C-31  
SURFACE COURSE ARTICLE C-31

NOTE:  
PAVEMENT TO BE CONSTRUCTED IN ACCORDANCE  
WITH THE HOWARD COUNTY ROAD CONSTRUCTION  
CODE AND SPECIFICATIONS DWG D-113 PG 165

8" PAVEMENT DETAIL

NO SCALE

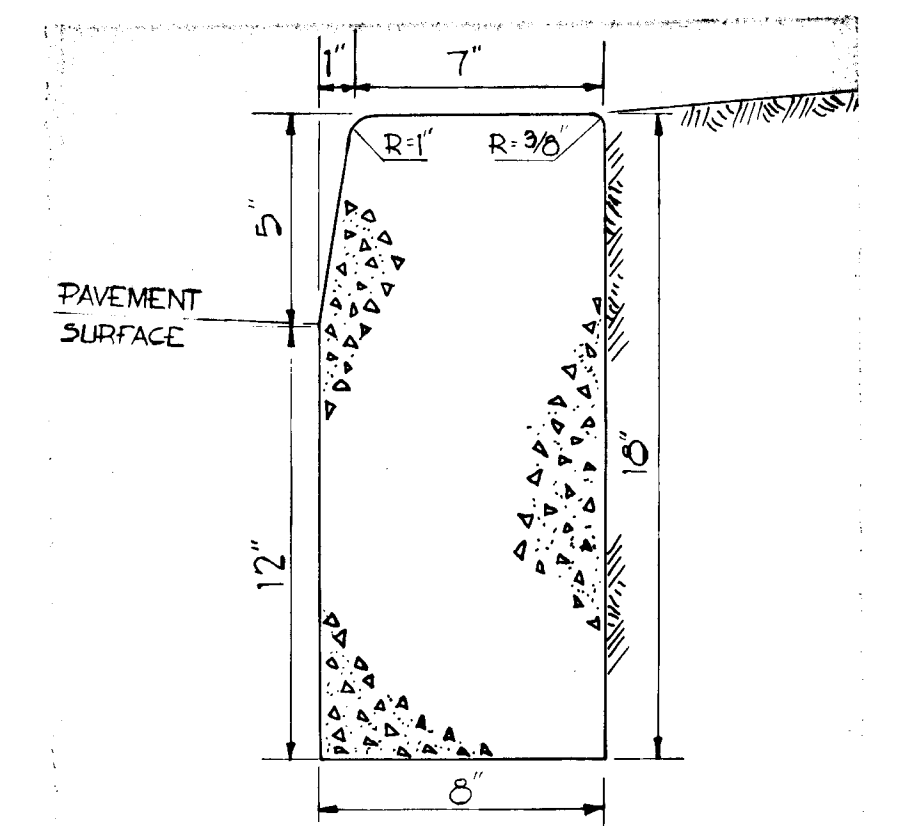
BITUMINOUS CONCRETE SURFACE	1 1/2"	BAND C-3	FINAL PHASE
BITUMINOUS CONCRETE BASE PLACED IN ONE COURSE	4"	BAND C-2 OR G-3	FIRST PHASE

CLEARING AND GRADING ARTICLE C-1  
SUBGRADE ARTICLE C-2  
BASE COURSE ARTICLE C-31 or C-33  
SURFACE COURSE ARTICLE C-31

NOTE:  
PAVEMENT TO BE CONSTRUCTED IN ACCORDANCE  
WITH THE HOWARD COUNTY ROAD CONSTRUCTION  
CODE AND SPECIFICATIONS DWG D-113 PG 165

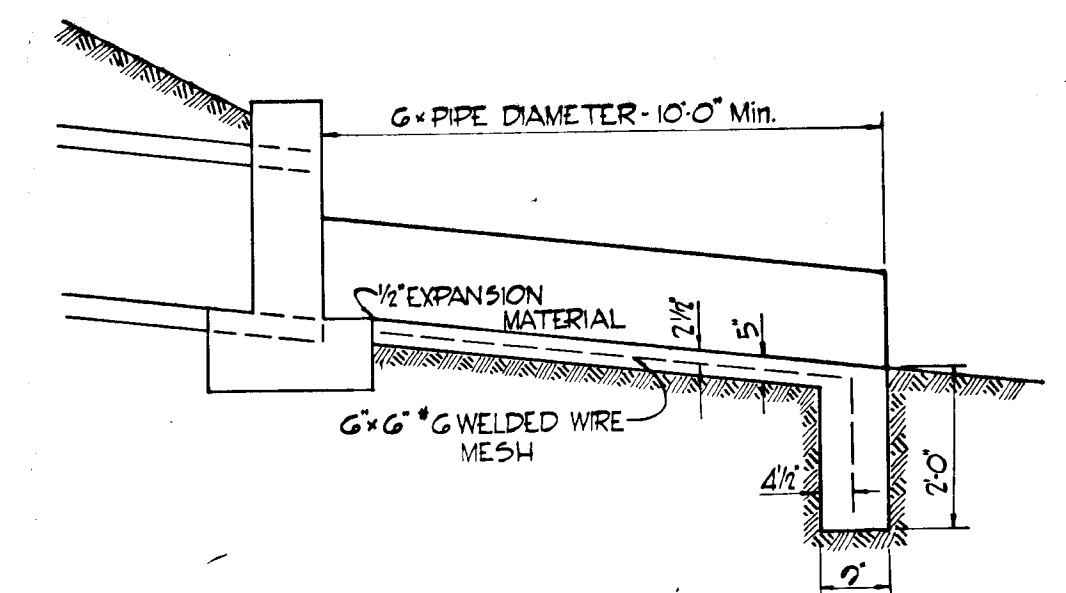
6 1/2" PAVEMENT DETAIL

NO SCALE



VERTICAL CONCRETE CURB

NO SCALE



TYPICAL CONCRETE CHANNEL  
AND  
CUTOFF WALL

NO SCALE

APPROVED  
DIVISION OF  
LAND DEVELOPMENT  
OFFICE OF  
PLANNING AND ZONING  
OF HOWARD COUNTY  
DATE: MAY 8 1976



RICHARD P. BROWNE ASSOCIATES  
CONSULTING ENGINEERS - PLANNERS  
COLUMBIA, MARYLAND

Rev Date Rev No Revision Description

**COLUMBIA**

6th ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

OWNER AND DEVELOPER  
HOWARD RESEARCH AND DEVELOPMENT CORP.  
THE VILLAGE OF CROSS KEYS - BALTIMORE, MARYLAND 21210

PROJECT AREA  
VILLAGE OF OAKLAND MILLS SEC. 4  
TALBOTT SPRINGS AREA 3

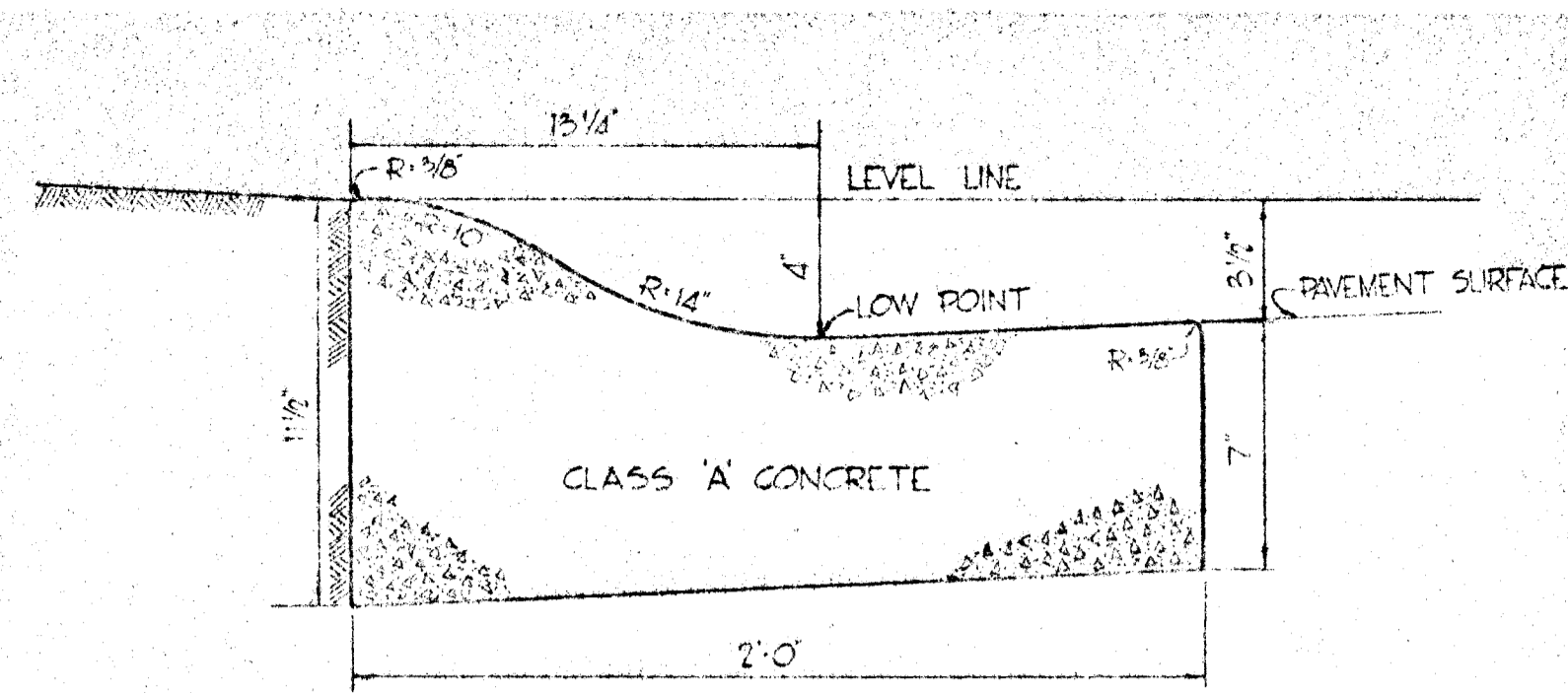
PROJECT TITLE  
TYPICAL DETAILS

Des By T.S. Scale: SHOWN Dwg No 50112

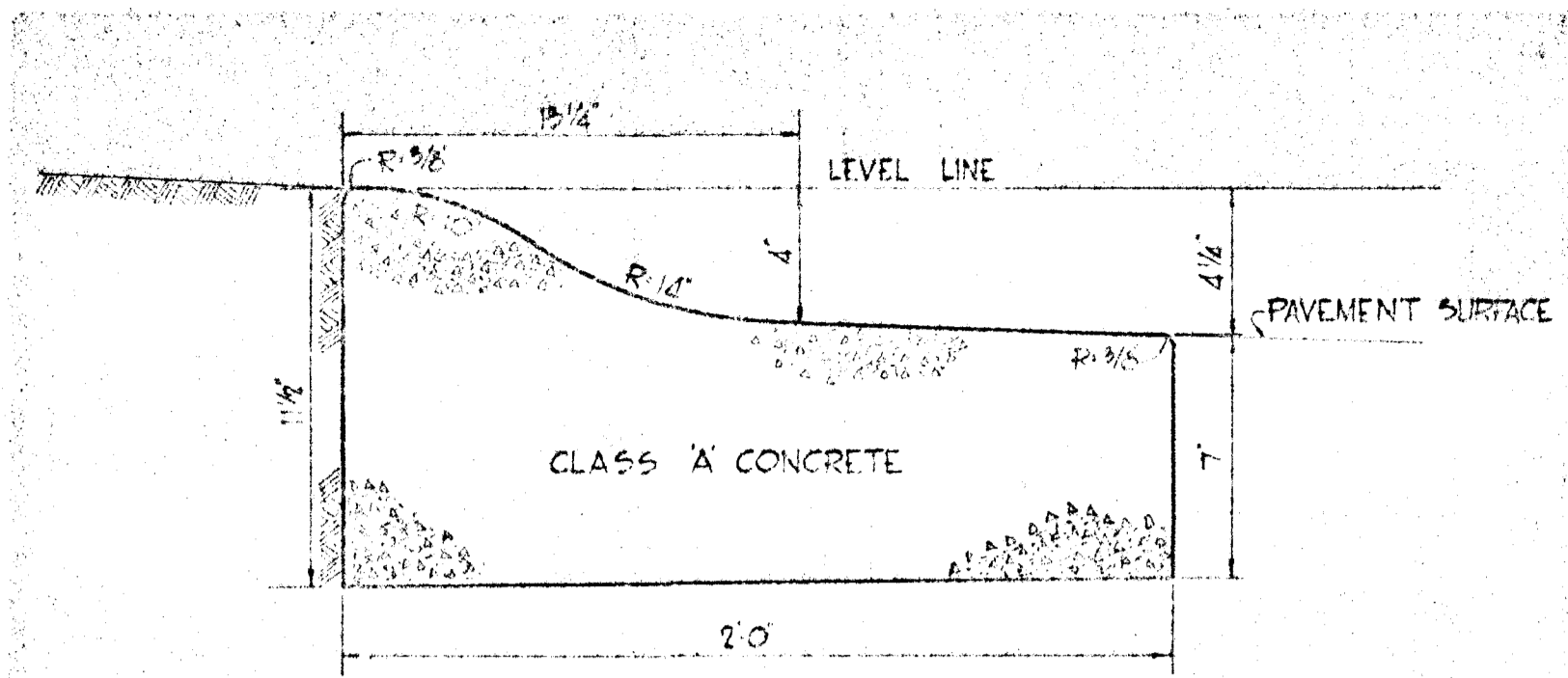
Drn By R.T.B. Date: APR 11, 1976 C.C.F. No

Chk By T.S. Approved

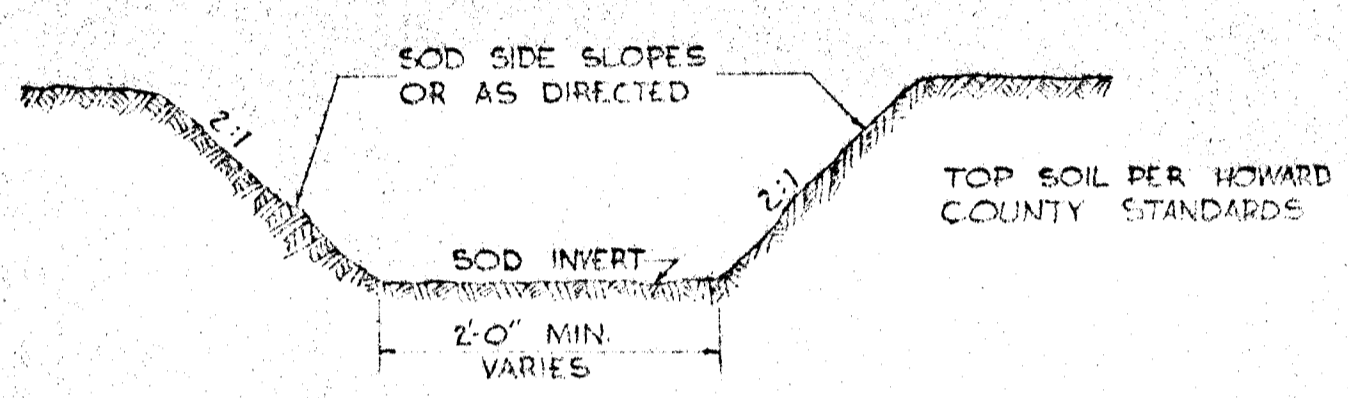




MOUNTABLE CONCRETE CURB  
NO SCALE

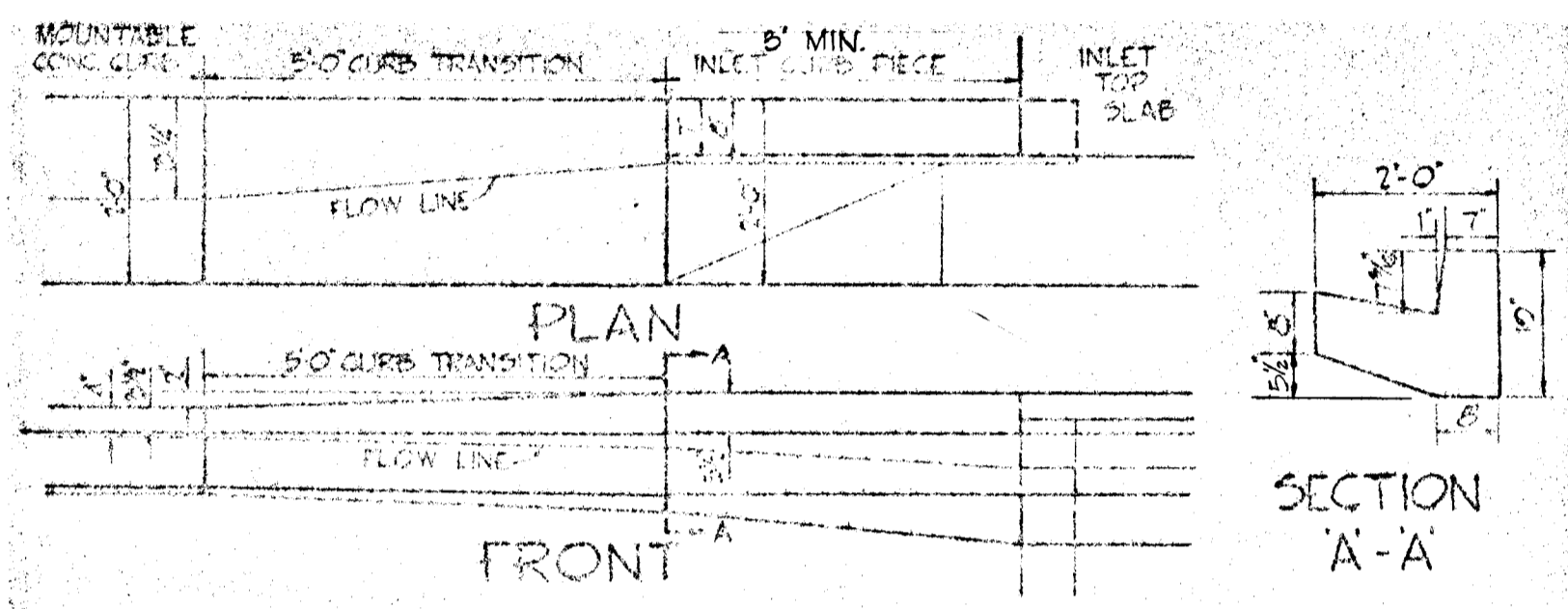


MOUNTABLE CONCRETE CURB  
FOR CUL-DE-SAC ISLANDS  
NO SCALE

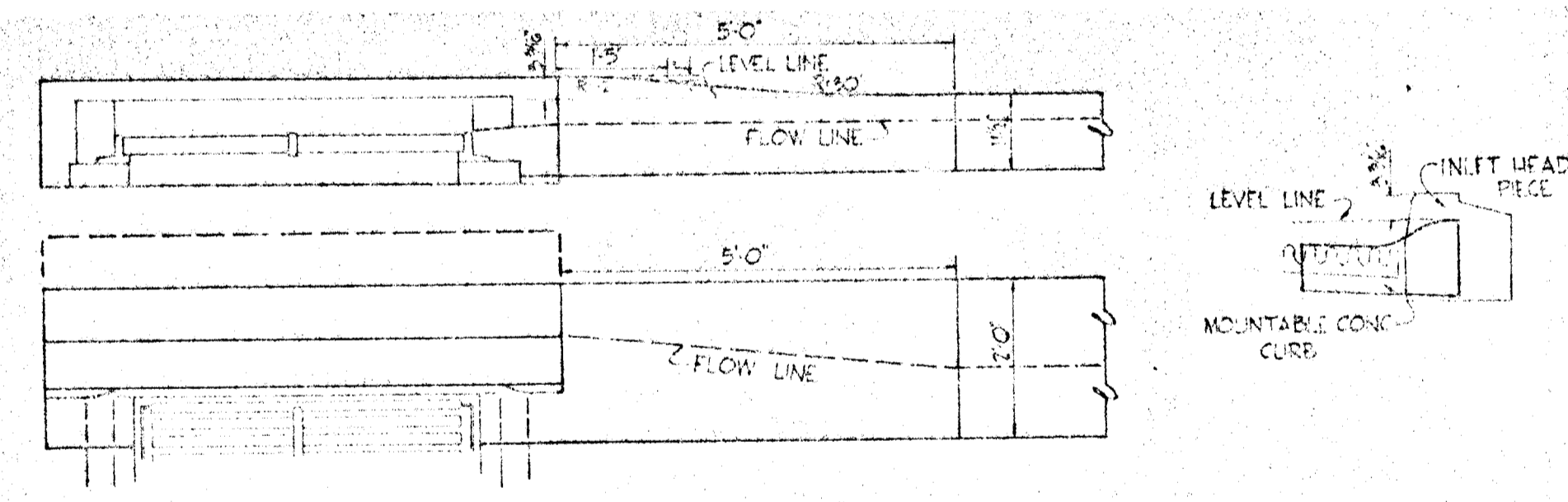


NOTE: ALL EXISTING DITCHES APPROACHING PROPOSED ENDWALLS SHALL BE TRIMMED IN ACCORDANCE WITH ARTICLE C.6 OF THE HOWARD COUNTY ROAD CONSTRUCTION CODE AND STANDARD SPECIFICATIONS.

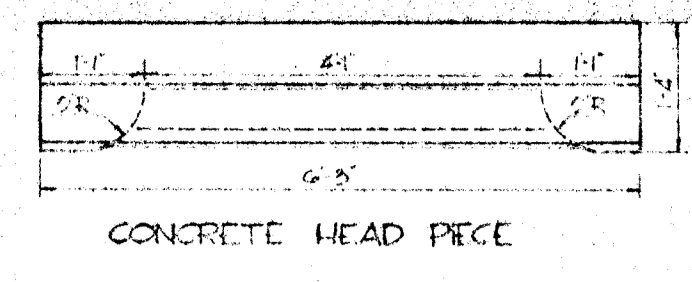
TYPICAL DRAINAGE DITCH  
NO SCALE



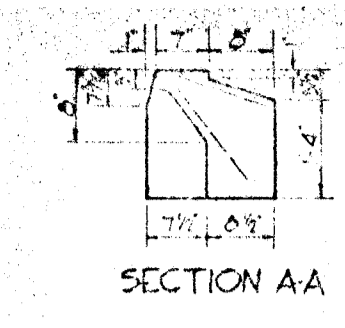
5' CURB TRANSITION  
TO BE PRECAST



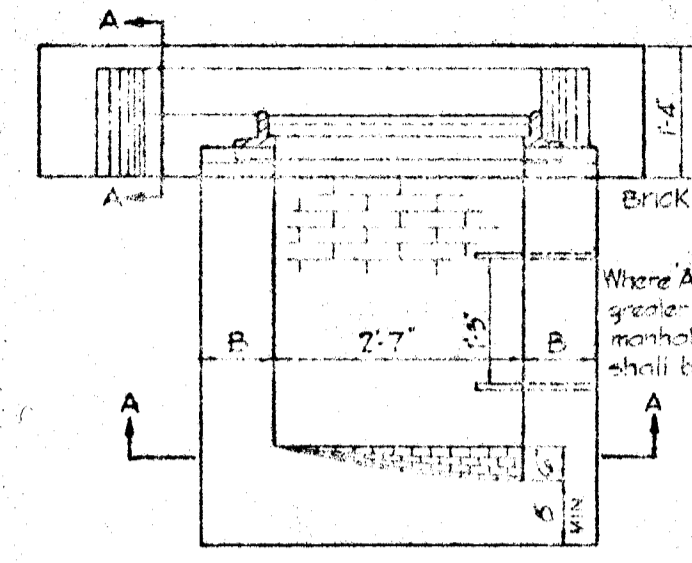
CURB TRANSITION  
MOUNTABLE CURB TO INLET HEAD PIECE



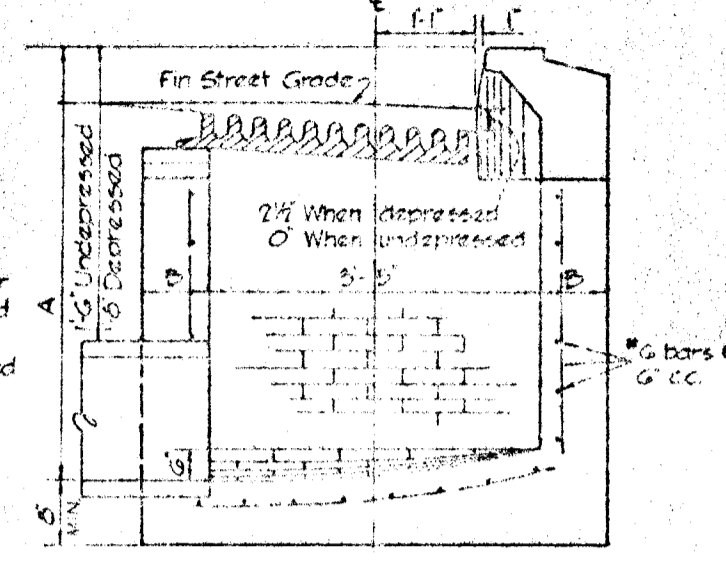
CONCRETE HEAD PIECE



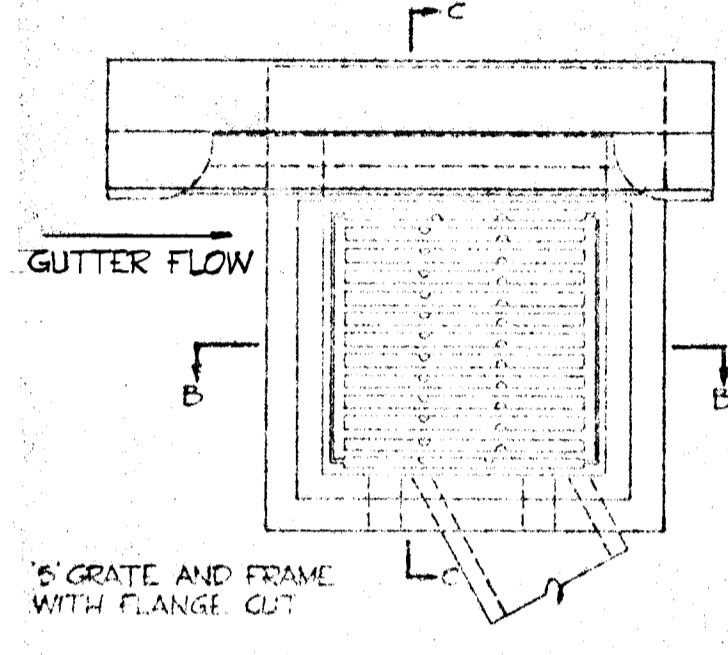
SECTION AA



SECTION B-B



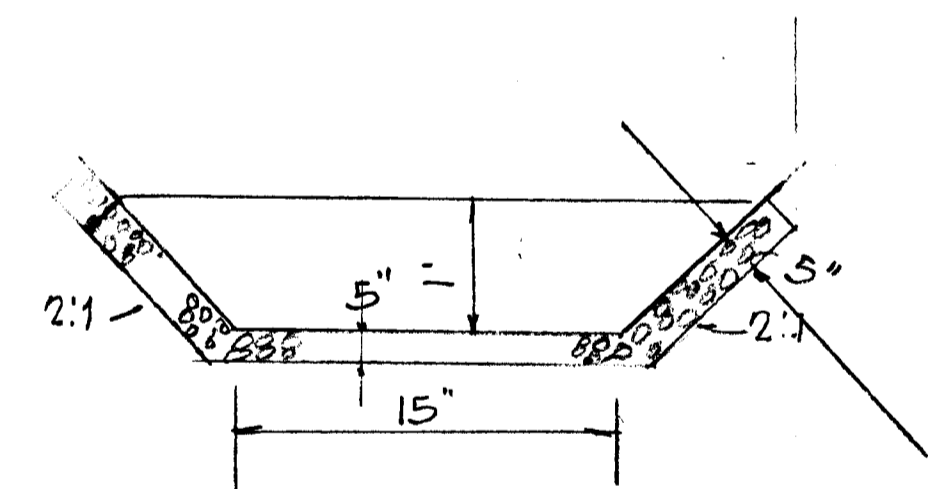
SECTION C-C



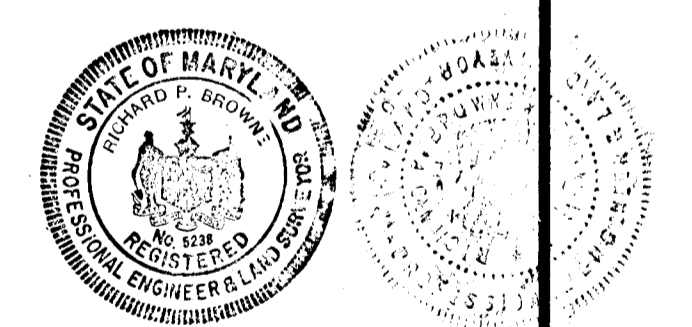
SECTION A-A

1. INLETS MAY BE CONSTRUCTED OF BRICK OR REINFORCED CONCRETE. SIZE, TYPE & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS.
2. THE INLET SHALL BE BRICK OR CLASS 'A' CONCRETE.
3. B-B WHERE A IS 7' OR LESS.
4. B-B WHERE A IS 7' TO 11'.
5. TOP 4" OF WALLS SHALL BE MASONRY. ADDITIONAL BRICK SHALL BE USED TO BRING THE GRATE TO GRADE IF REQUIRED.
6. REINFORCEMENT REQUIRED ON OUTSIDE AS WELL AS INSIDE OF WALLS WHEN A IS GREATER THAN 7' SPACING SAME AS INSIDE WALL.
7. PLACE AN EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT, BETWEEN THE FRAME AND ADJUTING RIGID PAVEMENT AND BETWEEN ENDS OF INLET CURB AND NORMAL CONCRETE CURB.

MODIFIED 'S' COMBINATION INLET  
NO SCALE



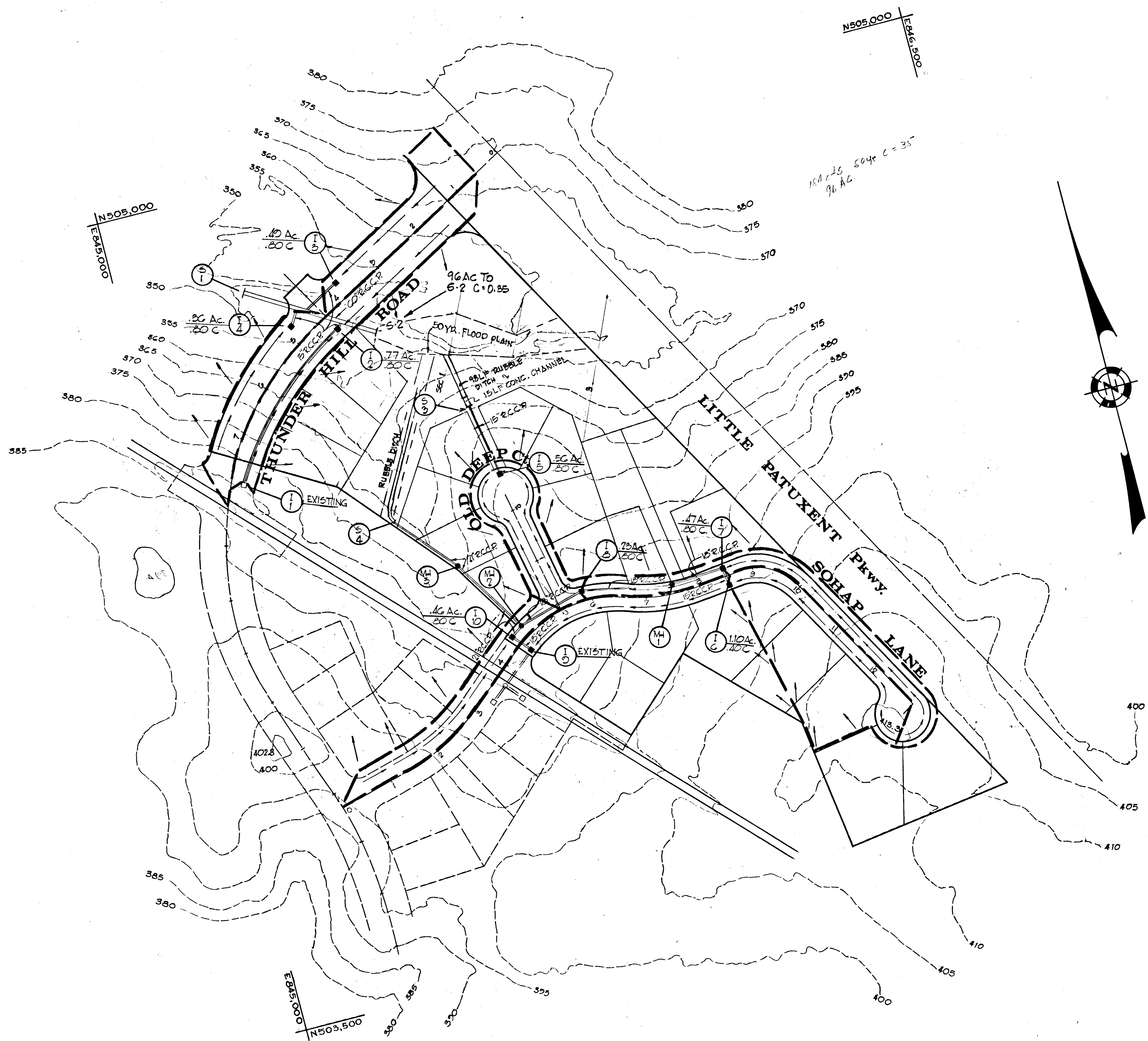
TYPICAL SECTION  
GROUTED RUBBLE DITCH  
NO SCALE



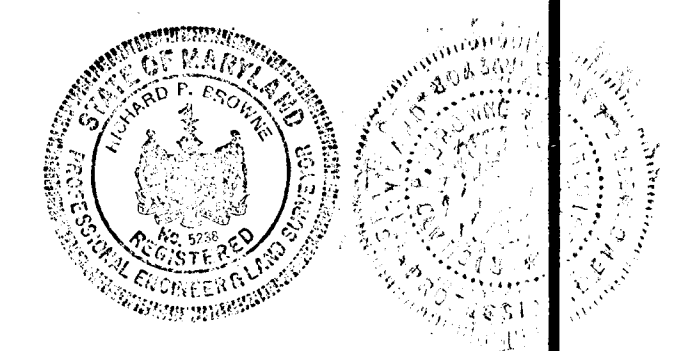
Richard P. Browne  
RICHARD P. BROWNE P.E. & L.S. #5233

APPROVED  
DIVISION OF  
LAND DEVELOPMENT  
OFFICE OF  
PLANNING AND ZONING  
OF HOWARD COUNTY  
DATE: MAY 8 1970

RICHARD P. BROWNE ASSOCIATES CONSULTING ENGINEERS - PLANNERS COLUMBIA, MARYLAND		
Rev Date	Rev No	Revision Description
<b>COLUMBIA</b>		
6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
OWNER AND DEVELOPER HOWARD RESEARCH AND DEVELOPMENT CORP. THE VILLAGE OF CROSS KEYS - BALTIMORE, MARYLAND 21210		
PROJECT AREA VILLAGE OF OAKLAND MILLS SEC. 4 TALBOTT SPRINGS AREA 3		
PROJECT TITLE TYPICAL DETAILS		
Des By	T.S.	Scale AS SHOWN Dwg No 60410
Drn By	F.T. & J.B.	Date APR. 10, 1969 C.C.F. No
Chk By	T.S.	Approved

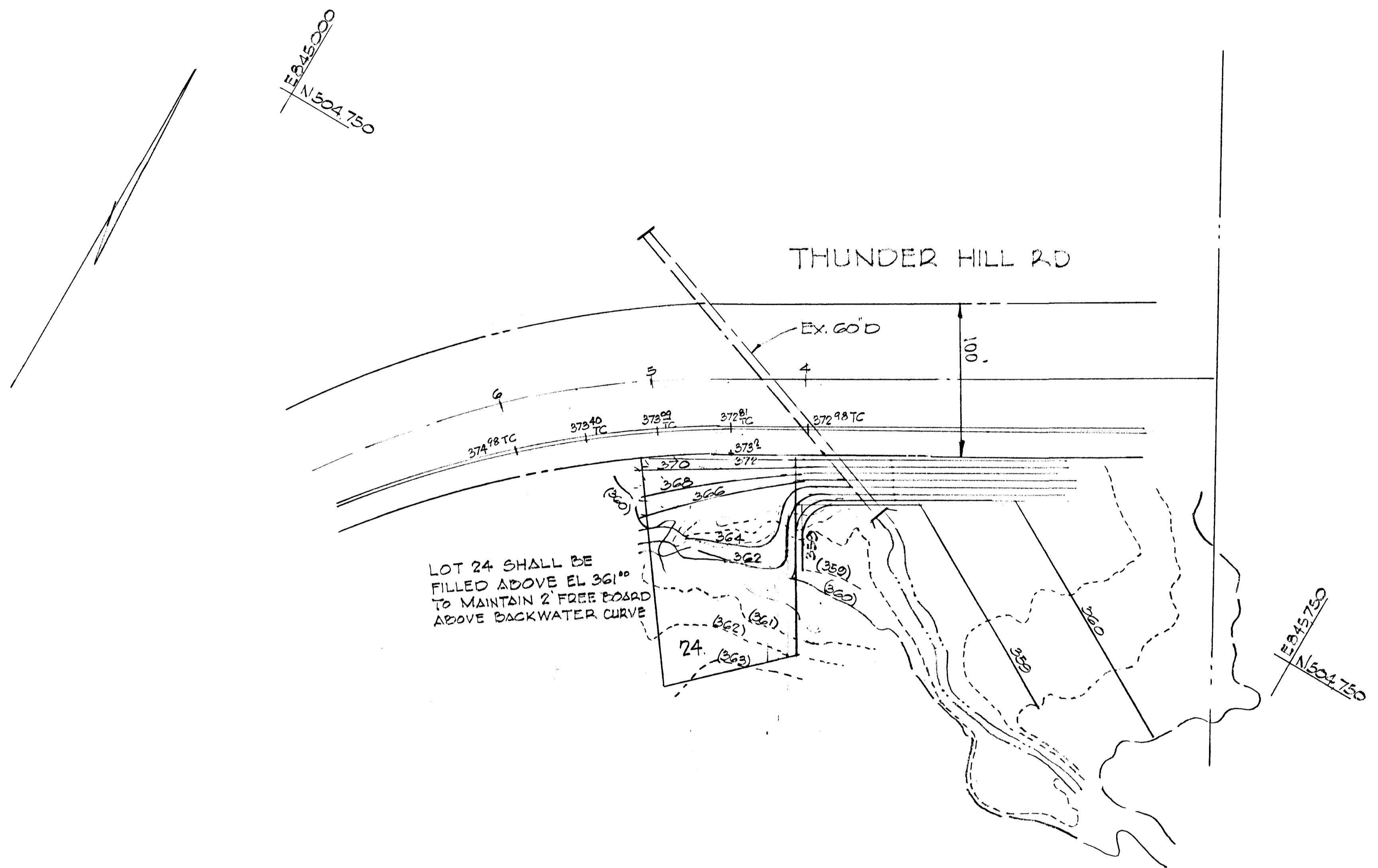


**APPROVED**  
 DIVISION OF  
 LAND DEVELOPMENT  
 OFFICE OF  
 PLANNING AND ZONING  
 OF HOWARD COUNTY  
 DATE: MAY 8 1970 *JMC*

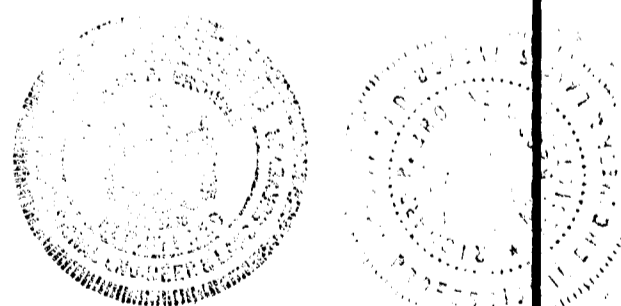


*Richard P. Browne*  
 RICHARD P. BROWNE PE & LS #5238

RICHARD P. BROWNE ASSOCIATES CONSULTING ENGINEERS - PLANNERS COLUMBIA, MARYLAND		
1/4 APR 70	1	ADDITION OF SOYR FLOOD PLAIN
Rev Date	Rev No	Revision Description
<b>COLUMBIA</b>		
6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
OWNER AND DEVELOPER HOWARD RESEARCH AND DEVELOPMENT CORP. THE VILLAGE OF CROSS KEYS - BALTIMORE, MARYLAND 21210		
PROJECT AREA VILLAGE OF OAKLAND MILLS SEC. 4 TALBOTT SPRINGS AREA 3		
PROJECT TITLE DRAINAGE AREA MAP		
Des By T.S.	Scale 1" = 100'	Dwg No 7 of 10
Drn By B.S.	Date APR. 10, 1969	C.C.F. No
Chk By T.S.	Approved	



**APPROVED**  
 DIVISION OF  
 LAND DEVELOPMENT  
 OFFICE OF  
 PLANNING AND ZONING  
 OF HOWARD COUNTY  
 DATE: MAY 8 1970 *JKC*

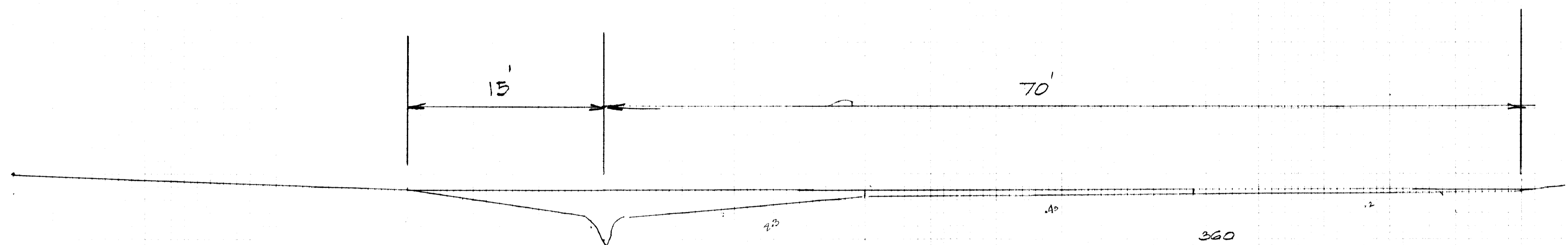


*Richard P. Browne*  
 RICHARD P. BROWNE P.E. & P.L.S. #57268

RICHARD P. BROWNE ASSOCIATES CONSULTING ENGINEERS - PLANNERS COLUMBIA, MARYLAND		
Date	Rev. No.	Revision Description
<b>COLUMBIA</b>		
6 <sup>TH</sup> ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
HOWARD RESEARCH AND DEVELOPMENT CORP. THE VILLAGE OF CROOK WOOD, WASHINGTON, MARYLAND 21010		
PROJECT AREA VILLAGE OF OAKLAND MILLS SEC. 4 TALBOTT SPRINGS AREA 2		
PROJECT TITLE GRADING STUDY LOT #24		
By: TKS	Scale: 1"=50'	Sheet No: 8 of 10
By: TKS	Date: MAY 8, 1970	Sheet No:
By: R.A.	Approved:	



360



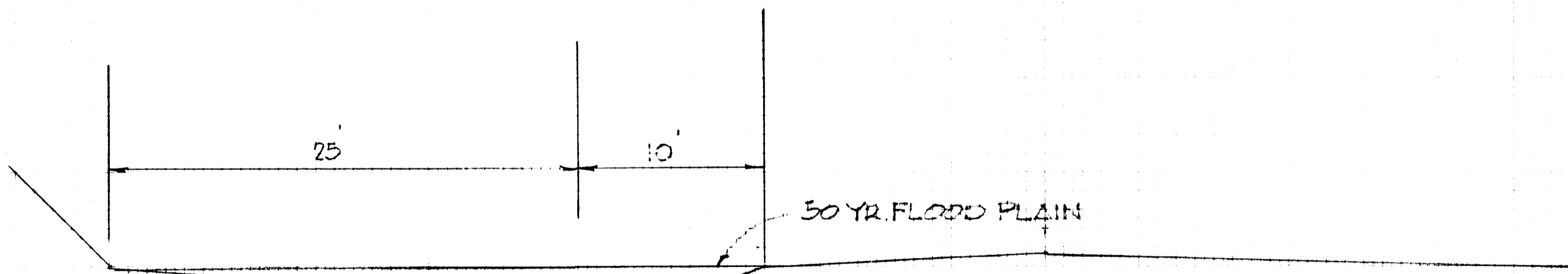
SECTION 3

$A = 72.50$   
 $WP = 85.00$   
 $HR = 0.85$   
 $n = .035$   
 $SL = 1.00\% \text{ AVG.}$

$\frac{1.486}{n} = 42.46 \cdot .897 \cdot 1.000$   
 $V = 3.81 \frac{1}{s}$   
 $Q = 276 \text{ CFS} >$   
 $Q_{REQ} = 184 \text{ CFS}$

**APPROVED**  
 DIVISION OF  
 LAND DEVELOPMENT  
 OFFICE OF  
 PLANNING AND ZONING  
 OF HOWARD COUNTY  
 DATE: MAY 8 1970

355



SECTION 2

$A = 56.25$   
 $WP = 36.0$   
 $HR = 1.50$   
 $n = .035$   
 $SL = 1.00\% \text{ AVG.}$

$\frac{1.486}{n} = 42.46 \cdot .74 \cdot 1.000$   
 $V = 5.7 \frac{1}{s}$   
 $Q = 320.6 \text{ CFS} >$   
 $Q_{REQ} = 184 \text{ CFS}$

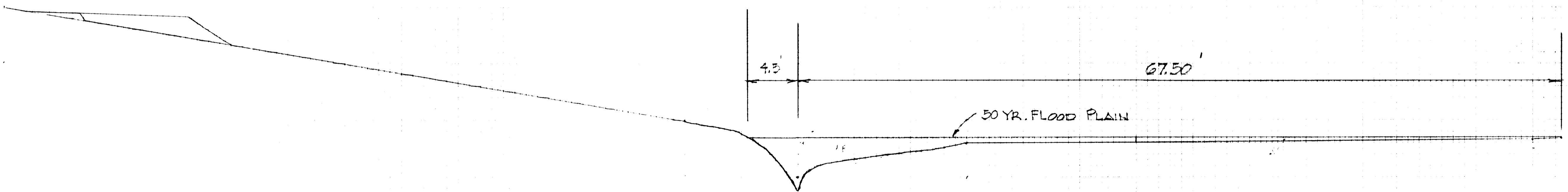
50 YR. FLOOD PLAIN

VILLAGE OF OAKLAND MILLS  
 SEC. 4 TALBOTT SPRINGS AR 3  
 50 YR. FLOOD STUDY  
 SCALE: 1" = 5'

RICHARD P. BROWNE ASSOCIATES  
 ENGINEERS - PLANNERS - ARCHITECTS  
 WAYNE, NEW JERSEY    COLUMBIA, MARYLAND

355

370



SECTION 1

RIGHT OR NORTH  
 $A = 55$   
 $WP = 74$   
 $HR = 0.74$   
 $n = .035$   
 $SL = 1.00\% \text{ AVG.}$

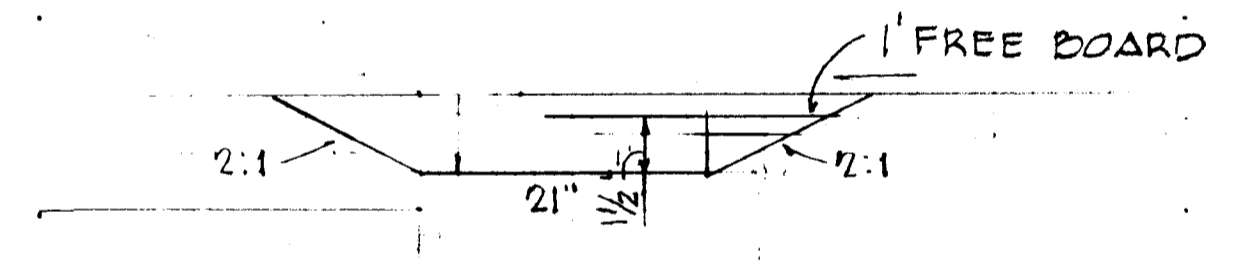
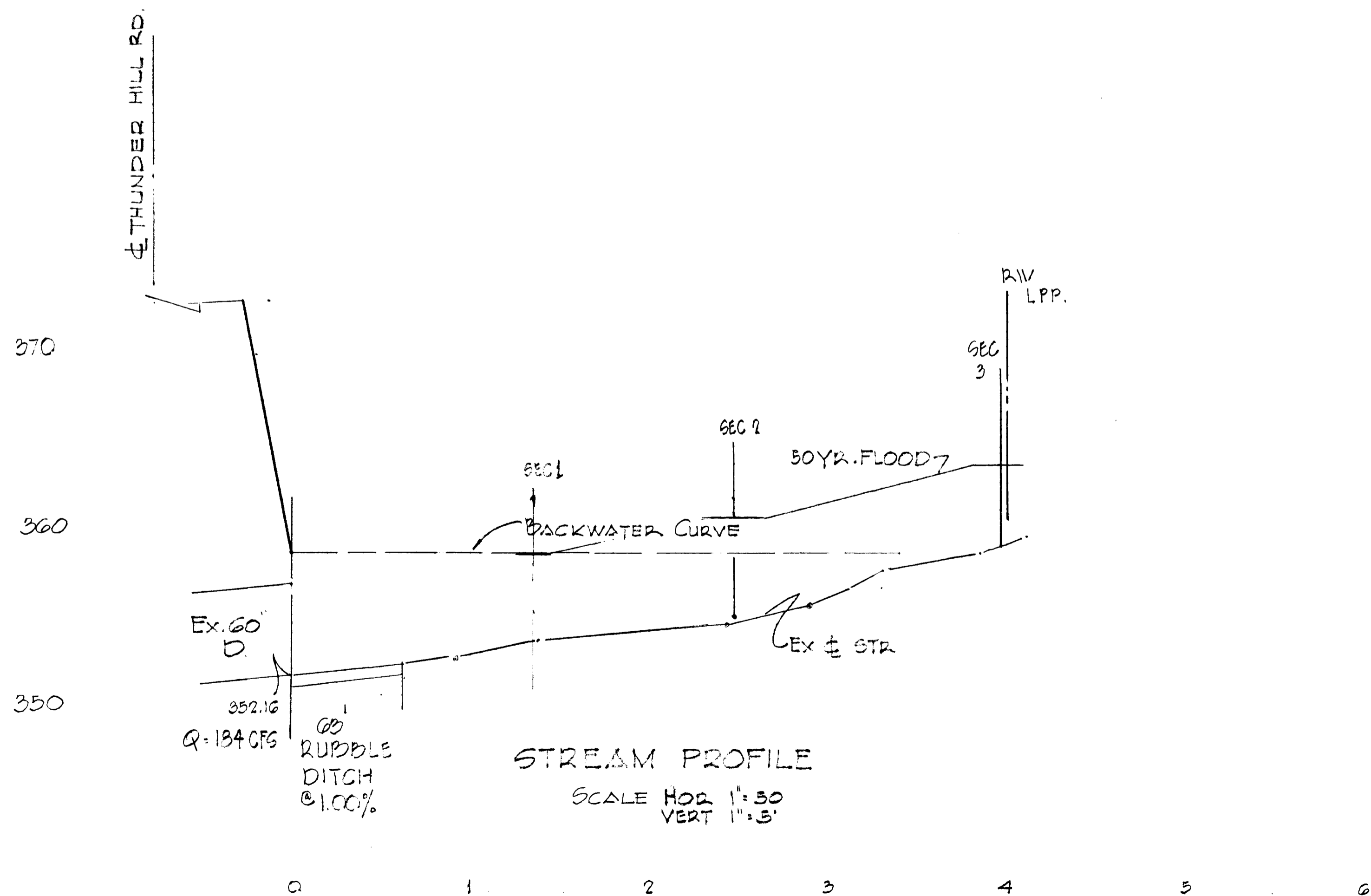
$\frac{1.486}{n} = 42.46 \cdot .74 \cdot 1.000$   
 $V = 2.4 \frac{1}{s}$   
 $Q = 190.85 \text{ CFS} >$   
 $Q_{REQ} = 184 \text{ CFS}$

50 YR. FLOOD PLAIN

#89

9 of 10

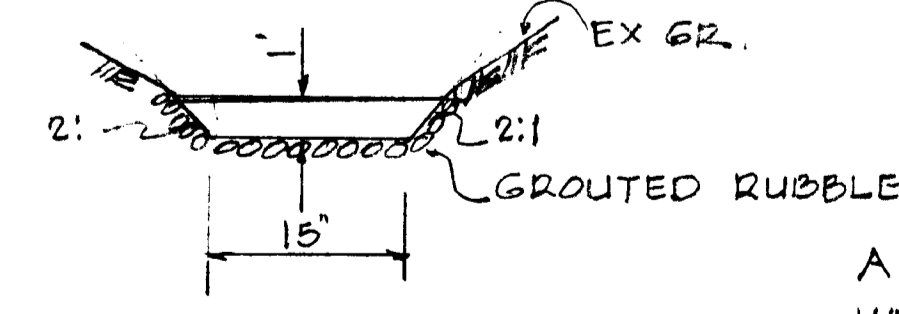
F 70-77 CUL



SOD OUTFALL DITCH  
S-4  
NO SCALE

A = 7.13  
 WP = 8.15  
 HR = 0.87  
 SL = 0.50%  
 n = .035  
 V = 2.71 1/5  
 Q = 19.32 CFS > 13

$V = \frac{1.486}{n} r^{2/3} s^{1/2} = 3.16$



RUBBLE OUTFALL S-3  
NO SCALE

A = 3.25  
 WP = 5.6  
 HR = 0.58%  
 SL = 11.00%  
 n = .030  
 V = 11.3 1/5  
 Q > 2.73 CFS

$\frac{1.486}{.030} = 49.4 \times .695 \times .33 = 11.3$

**APPROVED**  
 DIVISION OF  
 LAND DEVELOPMENT  
 OFFICE OF  
 PLANNING AND ZONING  
 OF HOWARD COUNTY  
 DATE: MAY 8 1979 *g/et*

VILLAGE OF OAKLAND MILLS  
 SEC. 4 TALBOTT SPRINGS DR. S  
 PROFILE  
 50 YR. FLOOD STUDY