

MANHOLE NO.	ELEV.	LOCATION
MH 24	404.58	INTX EAGLE & GUEDEL
MH 23	406.94	EAGLE CT. @ END
EX 211	411.38	4+00 GUEDEL DR.
MH 22	419.05	2+33 GUEDEL DR.
MH 21	420.15	INTX GUEDEL & HAWK
MH 20	429.56	HAWK CT. @ END
EX 212	420.34	1+85 GUEDEL
EX 213	424.93	0+22 GUEDEL
MH 19	418.37	1+22 SPARROW
MH 18	407.07	4+12 SPARROW
MH 17	405.50	4+80 SPARROW
MH 1	395.62	10+22 GUEDEL
MH 45	400.06	11+52 GUEDEL
MH 44	402.74	12+76 GUEDEL
MH 41	402.22	14+01 GUEDEL
MH 40	408.88	16+88 GUEDEL
MH 2	400.63	1+55 STARLING
MH 3	405.85	2+53 STARLING
MH 4	409.99	3+19 STARLING
MH 5	415.11	4+01 STARLING
MH 6	421.65	5+81 STARLING
MH 8	425.49	7+35 STARLING
MH 9	432.17	8+79 STARLING
MH 7	432.16	2+03 ORIOLE
MH 43	406.06	1+20 FINCH
MH 42	407.87	FINCH @ END

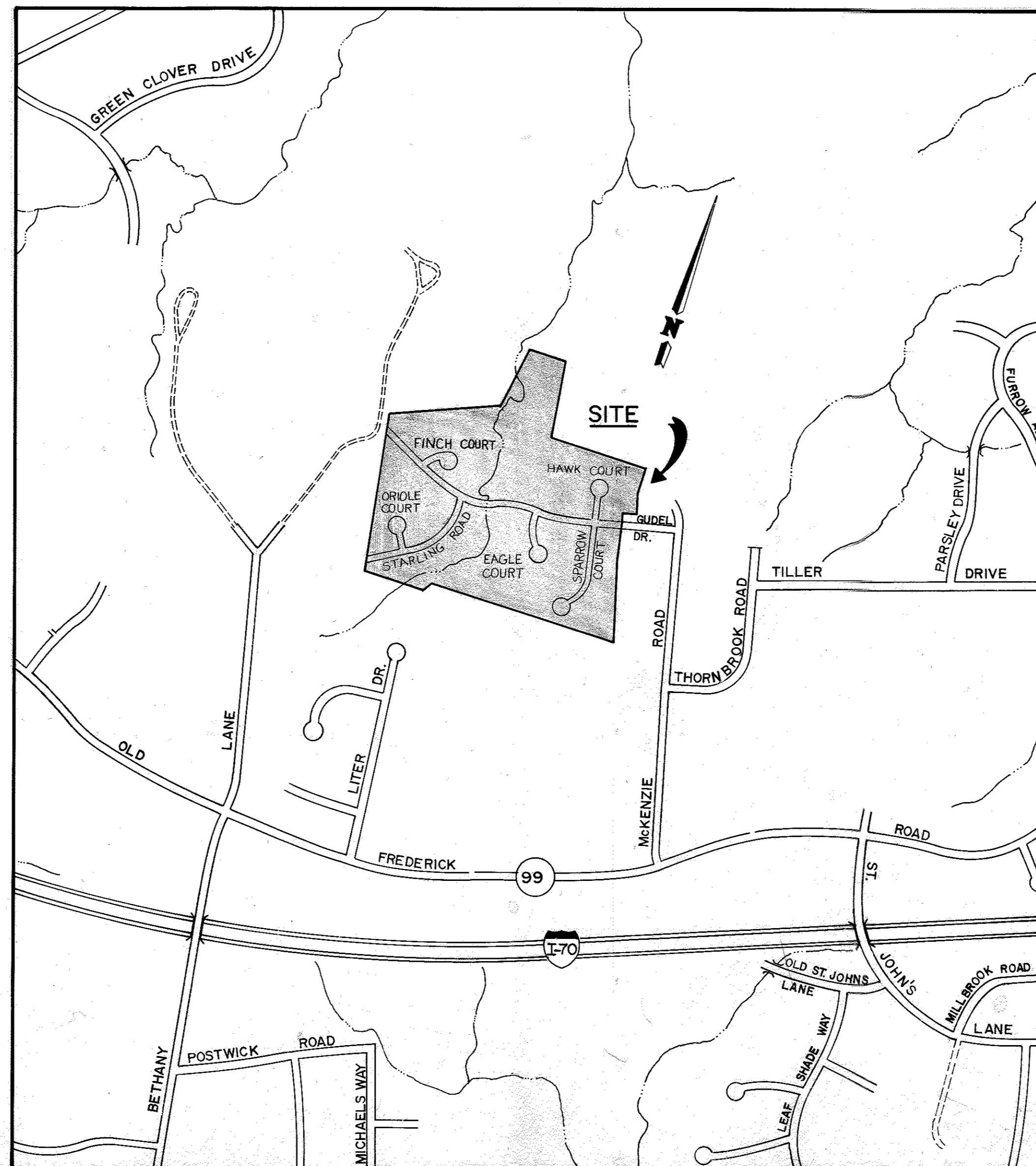
Note:
All Sewer Manholes Within Right of Way
Top of Rim Elevation.

McKENZIE MEADOWS SECTION TWO HOWARD COUNTY, MARYLAND FINAL ROAD CONSTRUCTION PLANS

INDEX

1. TITLE PAGE.
- 2-8. ROADWAY PLANS AND PROFILES.
- 9-10. STORM DRAIN PROFILES.
11. STREAM PROFILE. (REPLACED)
12. STORM DRAIN DETAILS.
- 13-15. ~~ARMCO/FOOTING-LOW-PROFILE ARCH (DELETED)~~
- 16-17. SEDIMENT & EROSION CONTROL
18. SEDIMENT & EROSION CONTROL DETAILS
- 19A. ~~SEDIMENT & EROSION CONTROL NOTES & DETAILS~~
19. DRAINAGE AREA MAP
20. ROADWAY DETAILS

PLAN REVISION NOTE: ON OR AROUND 12/6/2017 CAPITAL PROJECT D-1158, TITLED STARLING ROAD STREAM REHABILITATION, WAS CREATED TO STABILIZE APPROXIMATELY 2,500 LINEAR FEET OF AN UNNAMED TRIBUTARY TO THE PATAPSCO RIVER, LOCATED WITHIN TWO HOWARD COUNTY OPEN SPACE LOTS ILLUSTRATED WITHIN THE LIMITS OF THIS PLAN. AN ALTERNATIVE COMPLIANCE WAS PROCESSED THROUGH THE DEPARTMENT OF PLANNING AND ZONING UNDER WP-18-035, APPROVED ON 12/8/2017. TO WAIVER SECTIONS 16.155(A)(1)(II), 16.120(A) AND 16.1205(A)(7) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SUBJECT TO 5 CONDITIONS OF APPROVAL. FOR THE DETAILED CONDITIONS OF APPROVAL AND THE CURRENT SITE CONDITIONS WITHIN THE DISTURBED AREA PLEASE SEE THE CAPITAL PROJECT PLANS.



VICINITY MAP
SCALE: 1" = 600'

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH HOWARD COUNTY STANDARDS, SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
2. ALL UTILITY COMPANIES MUST BE NOTIFIED 24 HRS IN ADVANCE OF ANY CONSTRUCTION. CALL "MISS UTILITY" 48 HRS IN ADVANCE OF CONSTRUCTION - 1-800-257-7777.
3. STORM DRAINAGE TRENCHES WITHIN ROAD RIGHT-OF-WAYS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH HOWARD STANDARD SPECIFICATIONS.
4. ANY DAMAGE TO PUBLIC RIGHT-OF-WAYS, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.
5. CONTRACTOR TO NOTIFY THE HOWARD COUNTY INSPECTION DIVISION AT LEAST 3 DAYS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS. TELEPHONE 792-7272.
6. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION, CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
7. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 1978 EDITION.
8. NO STRUCTURE IS TO BE CONSTRUCTED ON OPEN SPACE LOTS 98, AND 99 AT A DISTANCE LESS THAN THE ZONING REGULATIONS ALLOW.
9. FOR LOCATION OF DRIVEWAY APRONS AND DEPRESSED CURBS, SEE SITE DEVELOPMENT PLANS.

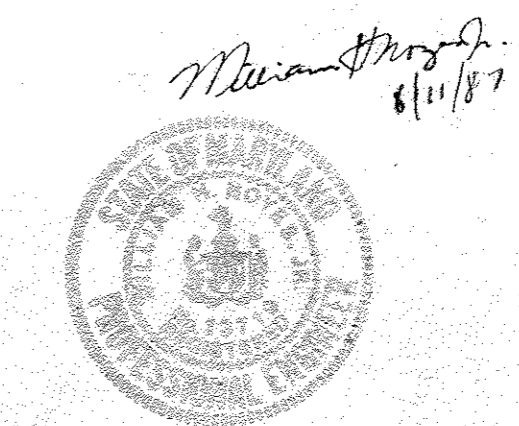
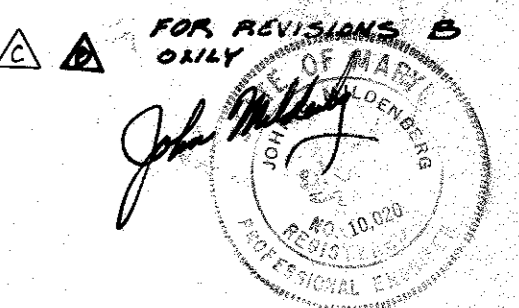
VERTICAL & HORIZONTAL

CONTROL FOR AS-BUILTS
ARE BASED ON M.D. STATE PLANS
AS PROJECTED BY H.O. CO.
MONUMENT 3441003 & 3442003.

As-Built
sheets 1-12



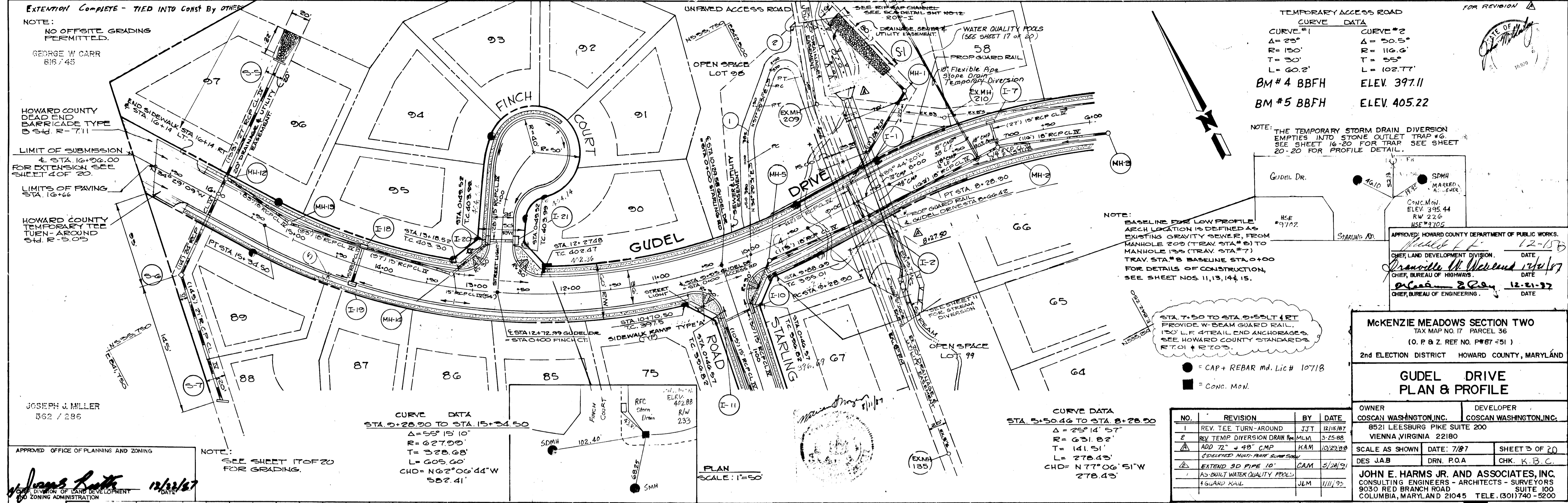
A/B 2-193



JOHN E. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
9030 RED BRANCH ROAD SUITE 100
COLUMBIA MARYLAND 21045 TELEPHONE (301) 740-5200

F-88-36 AS-BUILT

802



TEMPORARY ACCESS ROAD CURVE DATA

CURVE #1	CURVE #2
Δ = 25°	Δ = 50.5°
R = 150'	R = 116.6'
T = 30'	T = 55'
L = 60.2'	L = 102.77'
BM #4 BBFH	ELEV. 397.11
BM #5 BBFH	ELEV. 405.22

NOTE: THE TEMPORARY STORM DRAIN DIVERSION EMPTIES INTO STONE OUTLET TRAP #6. SEE SHEET 16-20 FOR TRAP. SEE SHEET 20-20 FOR PROFILE DETAIL.

NOTE: BASELINE FOR LOW PROFILE ARCH LOCATION IS DEFINED AS EXISTING GRAVITY SEWER, FROM MANHOLE 209 (TRAV. STA. #6) TO MANHOLE 135 (TRAV. STA. #7) TRAV. STA. #8 BASELINE STA. 0+00 FOR DETAILS OF CONSTRUCTION, SEE SHEET NOS. 11, 13, 14 & 15.

STA. 7+50 TO STA. 8+50 SET 4 FT PROVIDE W-BEAM GUARD RAIL 120' LF AT RAIL END ANCHORAGES. SEE HOWARD COUNTY STANDARDS RT.01 & RT.03.

- = CAP + REBAR md. Lic# 10718
- = CONC. MON.

CURVE DATA

STA. 9+28.90 TO STA. 15+34.50
Δ = 55° 15' 10"
R = 627.00'
T = 328.68'
L = 609.40'
CHD = N62°06'44"W
582.41'

CURVE DATA

STA. 5+50.46 TO STA. 8+28.90
Δ = 25° 14' 57"
R = 631.82'
T = 141.51'
L = 278.43'
CHD = N77°06'51"W
278.43'

MCKENZIE MEADOWS SECTION TWO
TAX MAP NO. 17 PARCEL 36
(O. P. & Z. REF. NO. P#67-51)
2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

GUDEL DRIVE PLAN & PROFILE

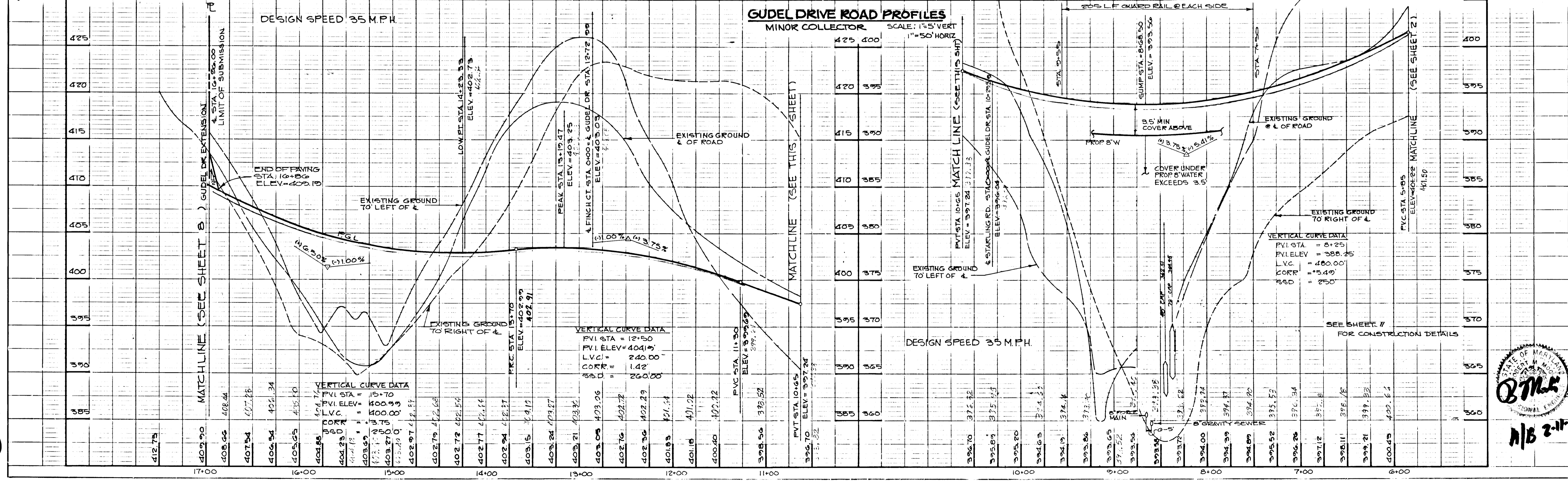
OWNER COSCAN WASHINGTON, INC.	DEVELOPER COSCAN WASHINGTON, INC.
8521 LEEBSBURG PIKE SUITE 200 VIENNA, VIRGINIA 22180	
SCALE AS SHOWN DATE: 7/87	SHEET 3 OF 20
DES. J.A.B.	DRN. P.O.A.
CHK. K.B.C.	

JOHN E. HARMS JR. AND ASSOCIATES, INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
8030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

APPROVED OFFICE OF PLANNING AND ZONING

James R. Rutter 12/22/87

DATE: 12/22/87



PROFILE

NO. _____

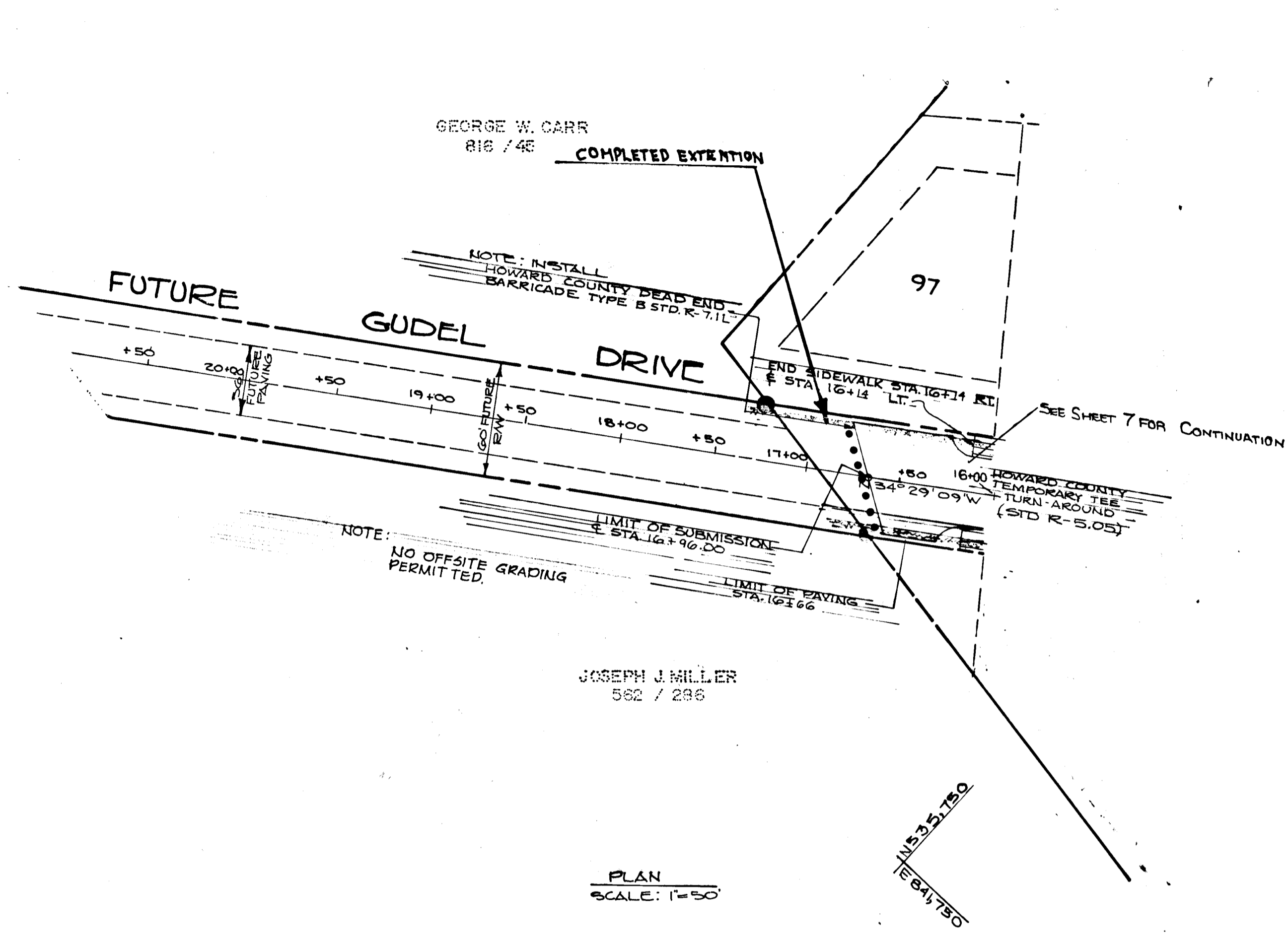
DATE _____

302

PLAN	DATE
BY	
SURVEYED	
NOTE BOOK	
ALIGNMENT CHECKED	
RT. OF WAY CHECKED	
NO.	

PROFILE	DATE
BY	
SURVEYED	
NOTE BOOK	
GRADES CHECKED	
B. M.'S. NOTED	
STRUCTURE NOTATIONS CHECKED	
NO.	

802



● = CAP + REBAR MD. LIC. # 10718
■ = CONC. MON.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
12-21-87
CHIEF, LAND DEVELOPMENT DIVISION. DATE
Shawville W. Wickland 12/21/87
CHIEF, BUREAU OF HIGHWAYS. DATE
R. B. 12-21-87
CHIEF, BUREAU OF ENGINEERING. DATE

NO.	REVISION	BY	DATE
1	REV. TEE TURN-AROUND	J.J.T.	12/15/87

MCKENZIE MEADOWS SECTION TWO
TAX MAP NO. 17 PARCEL 36
(O. P. & Z. REF. NO. P-87-51)
2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**FUTURE GUDEL DRIVE
PLAN & PROFILE**

OWNER: COSCAN WASHINGTON, INC.
DEVELOPER: COSCAN WASHINGTON, INC.
8521 LEESBURG PIKE SUITE 200
VIENNA, VIRGINIA 22180

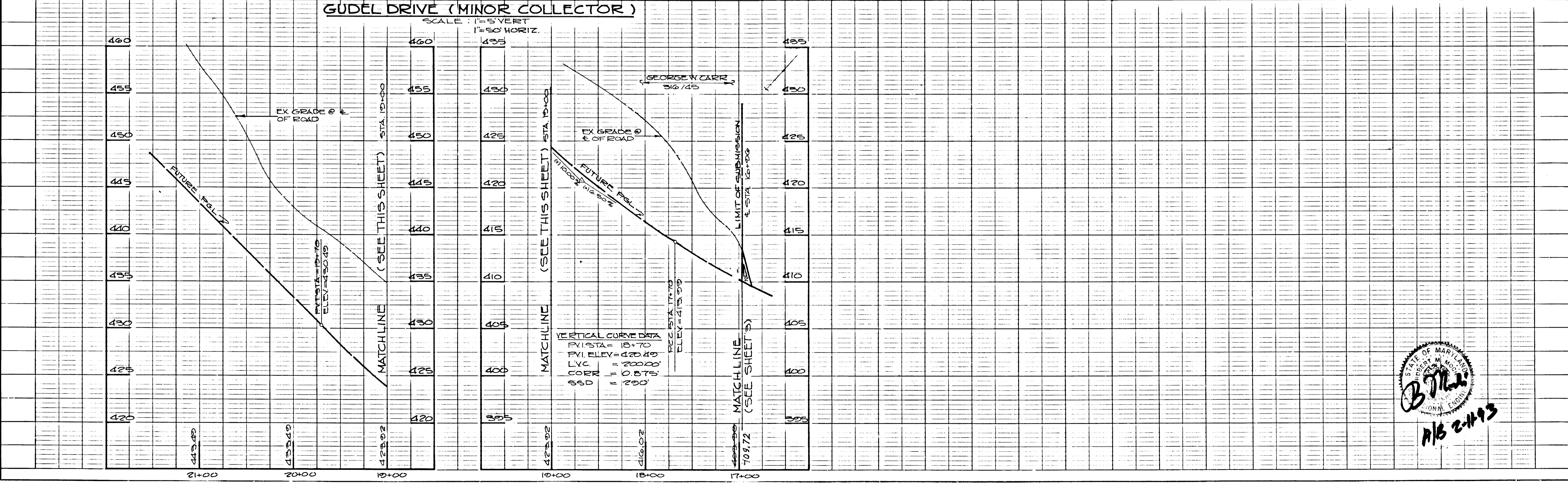
APPROVED OFFICE OF PLANNING AND ZONING

SCALE AS SHOWN DATE: 8/87 SHEET 4 OF 20
DES. J.A.B. DRN. P.O.A. CHK. K.F.C.

JOHN E. HARMS JR. AND ASSOCIATES, INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
9030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

GUDEL DRIVE (MINOR COLLECTOR)

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



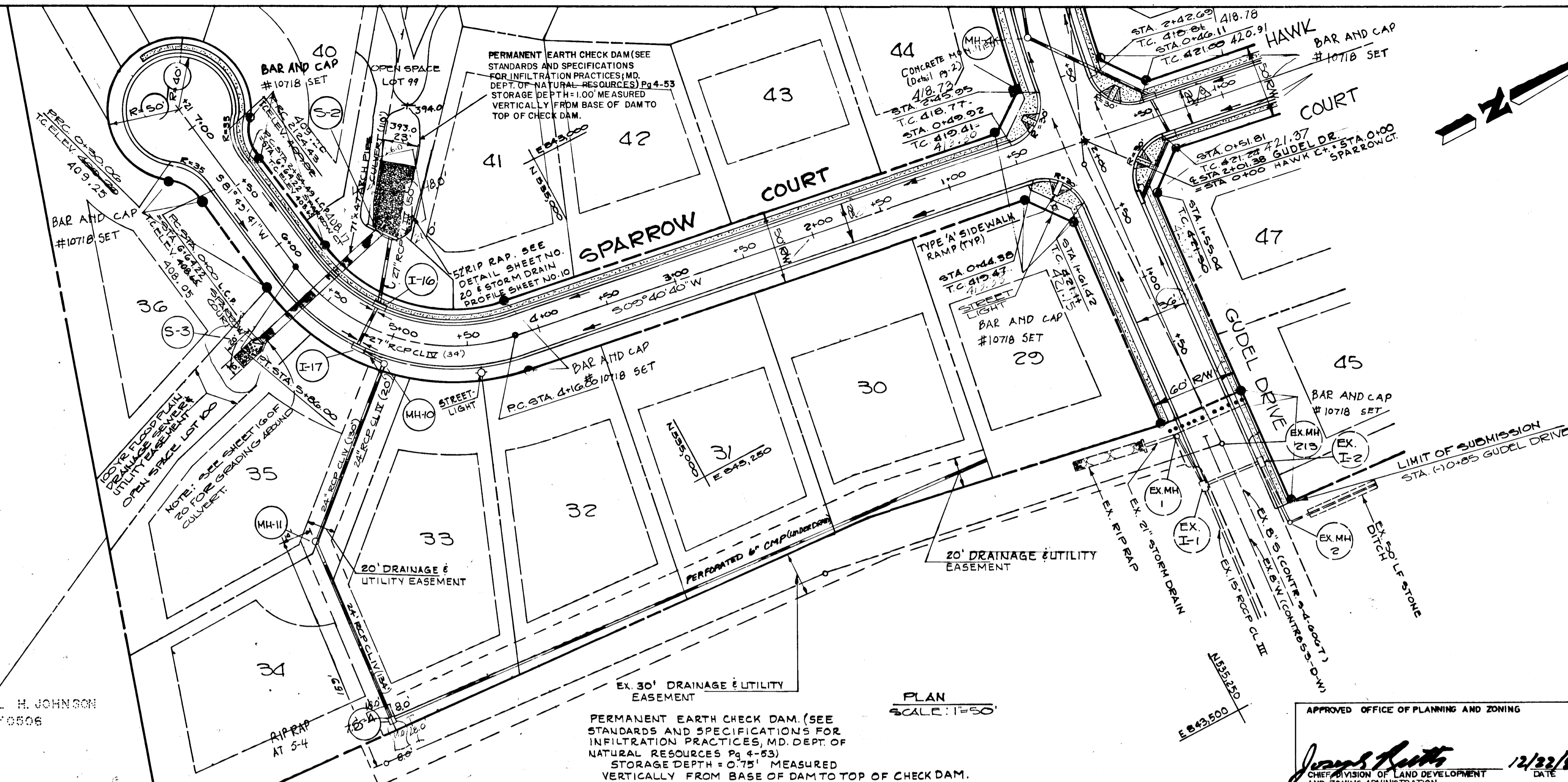
STATE OF MARYLAND
Professional Engineer
B. J. Miller
A/B 2443

CURVE DATA
STA 4+16.00 TO STA 5+26.00
Δ=72°09'01"
R=135.00'
L=170.00'
T=88.35'
CHD= S 45° 45' 10" W
158.00'

PLAN	NO.	REVISION	BY	DATE
NO.				

PROFILE	NO.	REVISION	BY	DATE
NO.				

DARRELL H. JOHNSON
308 / 0806



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
CHIEF, LAND DEVELOPMENT DIVISION, DATE 12/22/87
Drucille H. Wehner
CHIEF, BUREAU OF HIGHWAYS, DATE
William S. Kelly
CHIEF, BUREAU OF ENGINEERING, DATE

NO.	REVISION	BY	DATE
1	ADD 6" CMP SIDEWALK HAWK CT	KAM	9/13/90

McKENZIE MEADOWS SECTION TWO
TAX MAP NO. 17 PARCEL 36
(O. P. & Z. REF. NO. P-87-51)
2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**SPARROW COURT
PLAN & PROFILE**

OWNER: COSCAN WASHINGTON, INC. DEVELOPER: COSCAN WASHINGTON, INC.
8521 LEESBURG PIKE SUITE 200
VIENNA, VIRGINIA 22180

SCALE AS SHOWN DATE: 7/87 SHEET 5 OF 20
DES. J.A.B. DRN. P.O.A. CHK. K.B.C.

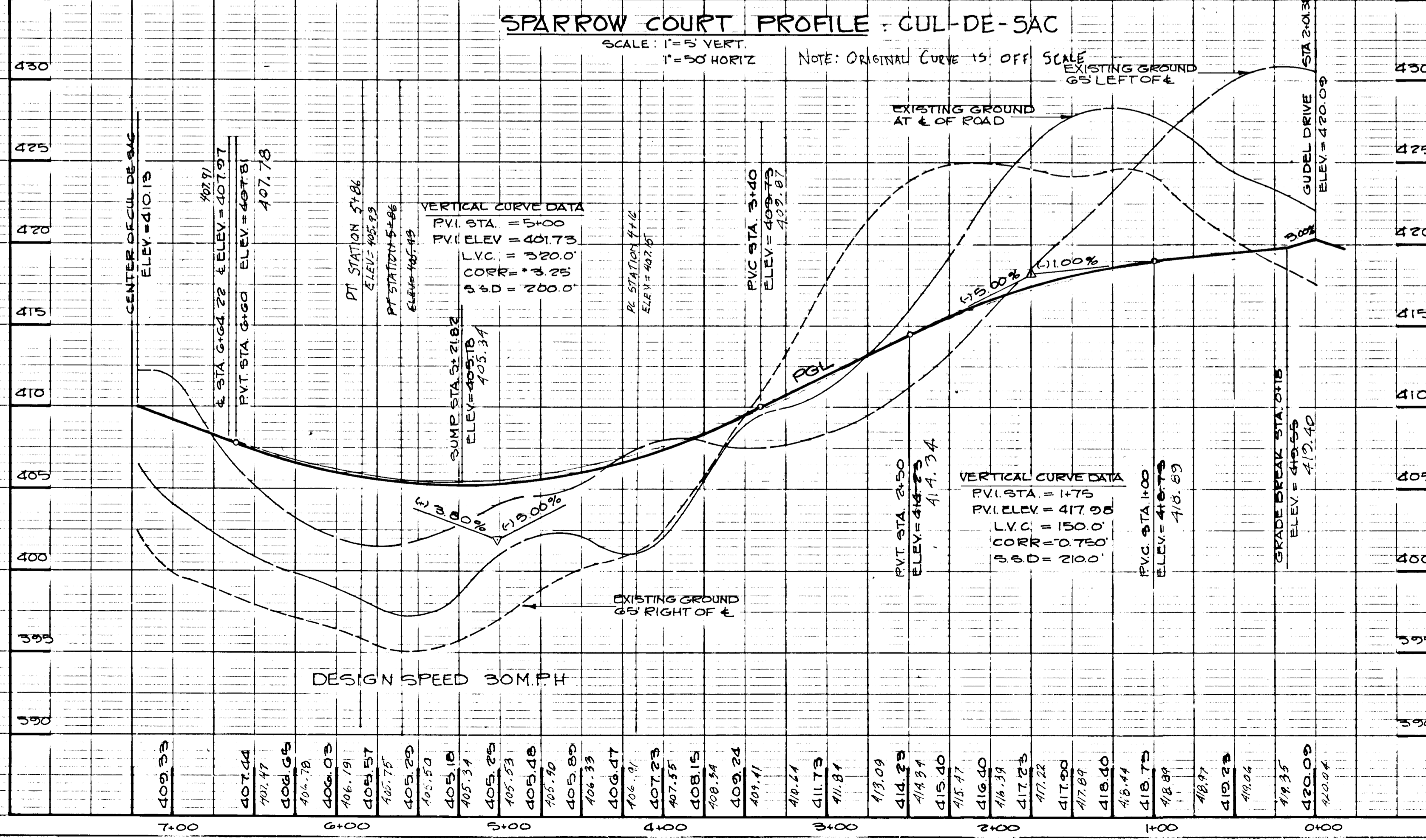
JOHN E. HARMS JR. AND ASSOCIATES, INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
9030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

APPROVED OFFICE OF PLANNING AND ZONING
James Smith 12/22/87
CHIEF DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION DATE

SPARROW COURT PROFILE - CUL-DE-SAC

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

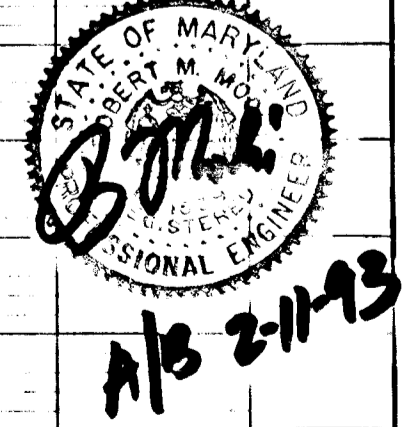
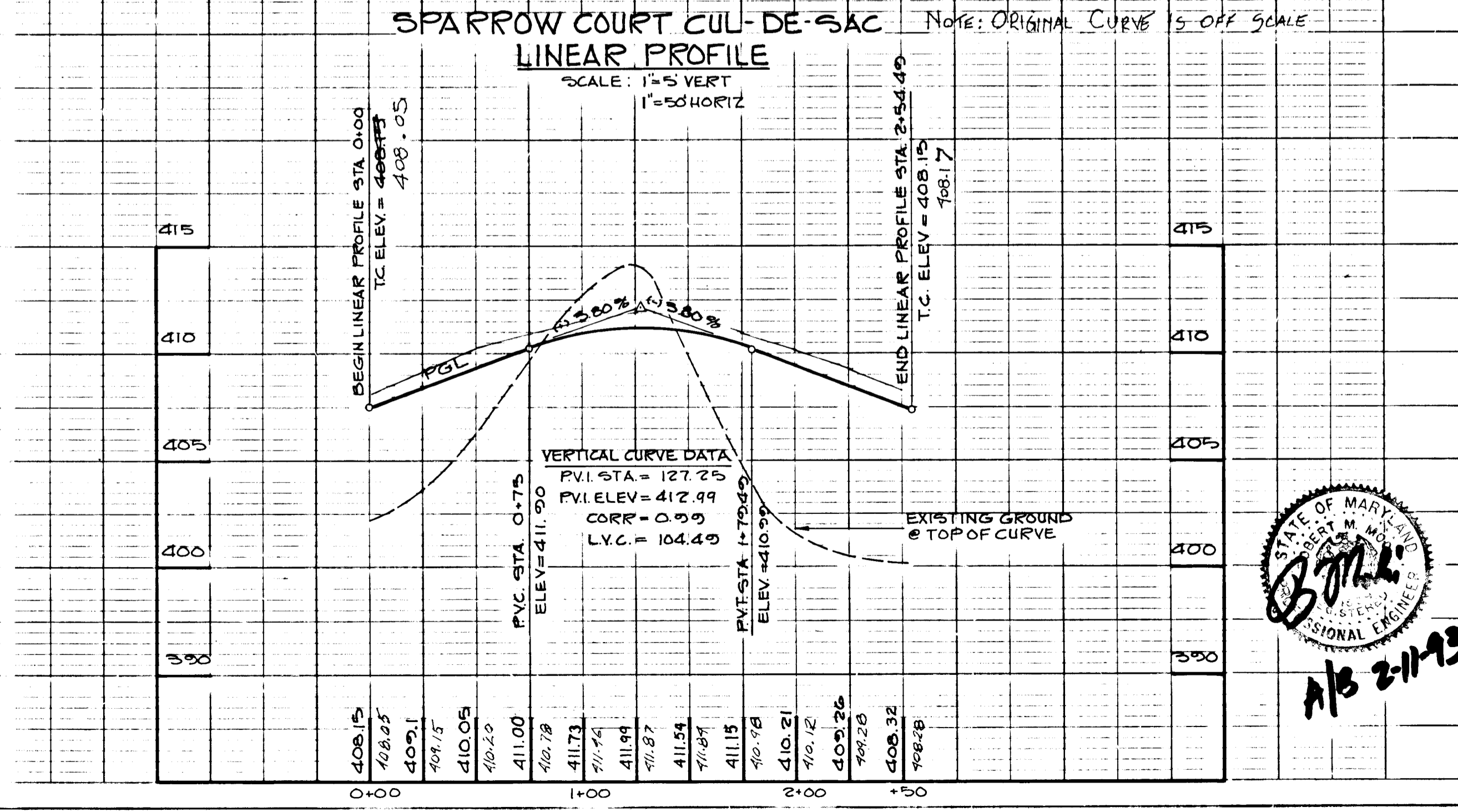
NOTE: ORIGINAL CURVE IS OFF SCALE
EXISTING GROUND 65' LEFT OF &
EXISTING GROUND AT & OF ROAD



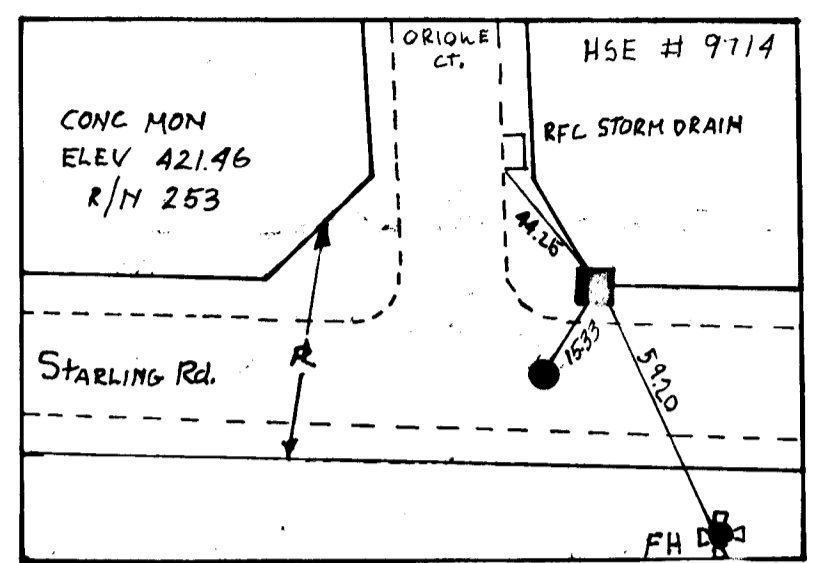
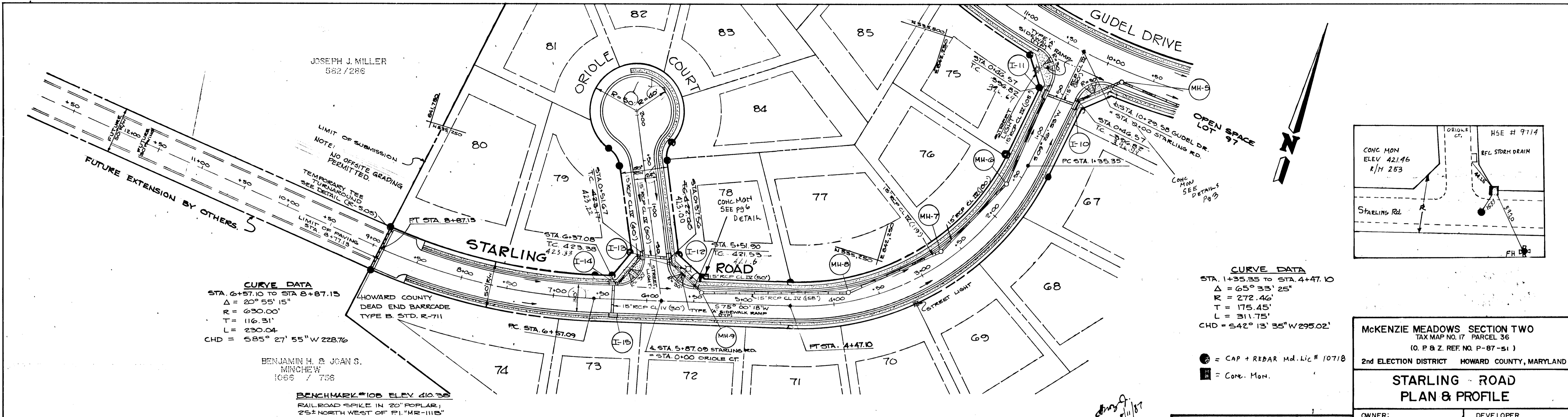
**SPARROW COURT CUL-DE-SAC
LINEAR PROFILE**

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

NOTE: ORIGINAL CURVE IS OFF SCALE



PLAN
 SURVEYED
 PLOTTED
 CHECKED
 BY
 DATE



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 [Signature]
 CHIEF, LAND DEVELOPMENT DIVISION
 DATE 12/15/87

[Signature]
 CHIEF, BUREAU OF HIGHWAYS
 DATE 12/21/87

[Signature]
 CHIEF, BUREAU OF ENGINEERING
 DATE 12/21/87

STARLING ROAD
PLAN
 SCALE: 1" = 50'

APPROVED OFFICE OF PLANNING AND ZONING
 [Signature]
 CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION
 DATE 12/22/87

NO.	REVISION	BY	DATE

McKENZIE MEADOWS SECTION TWO
 TAX MAP NO. 17 PARCEL 36
 (O. P. & Z. REF. NO. P-87-51)
 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

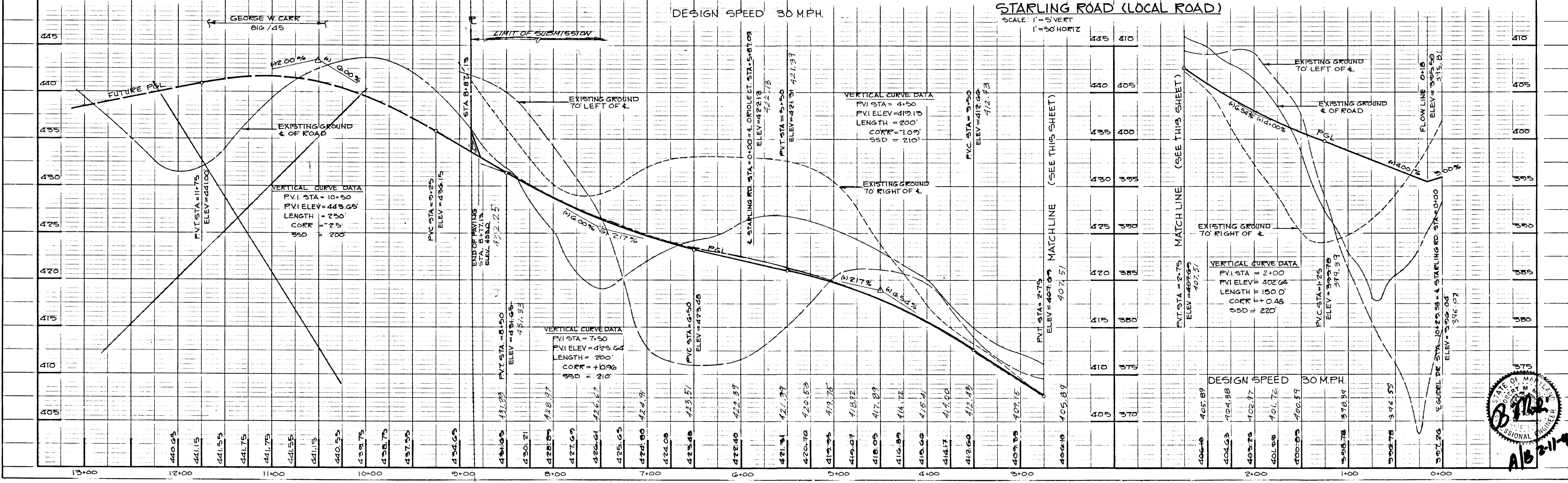
STARLING ROAD
PLAN & PROFILE

OWNER: COSCAN WASHINGTON, INC. DEVELOPER: COSCAN WASHINGTON, INC.
 8521 LEESBURG PIKE SUITE 200 VIENNA, VIRGINIA 22180

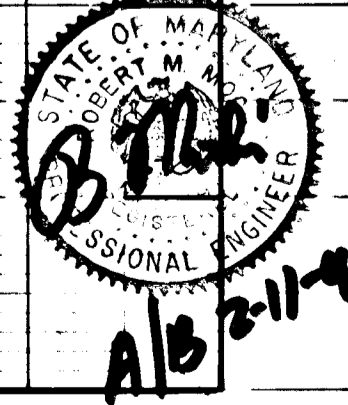
SCALE AS SHOWN DATE: 7/87 SHEET 6 OF 20
 DES. J.A.B. DRN. P.O.A. CHK. K.B.C.

JOHN E. HARMS JR. AND ASSOCIATES, INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 9030 RED BRANCH ROAD SUITE 100 COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

PROFILE
 SURVEYED
 PLOTTED
 CHECKED
 BY
 DATE

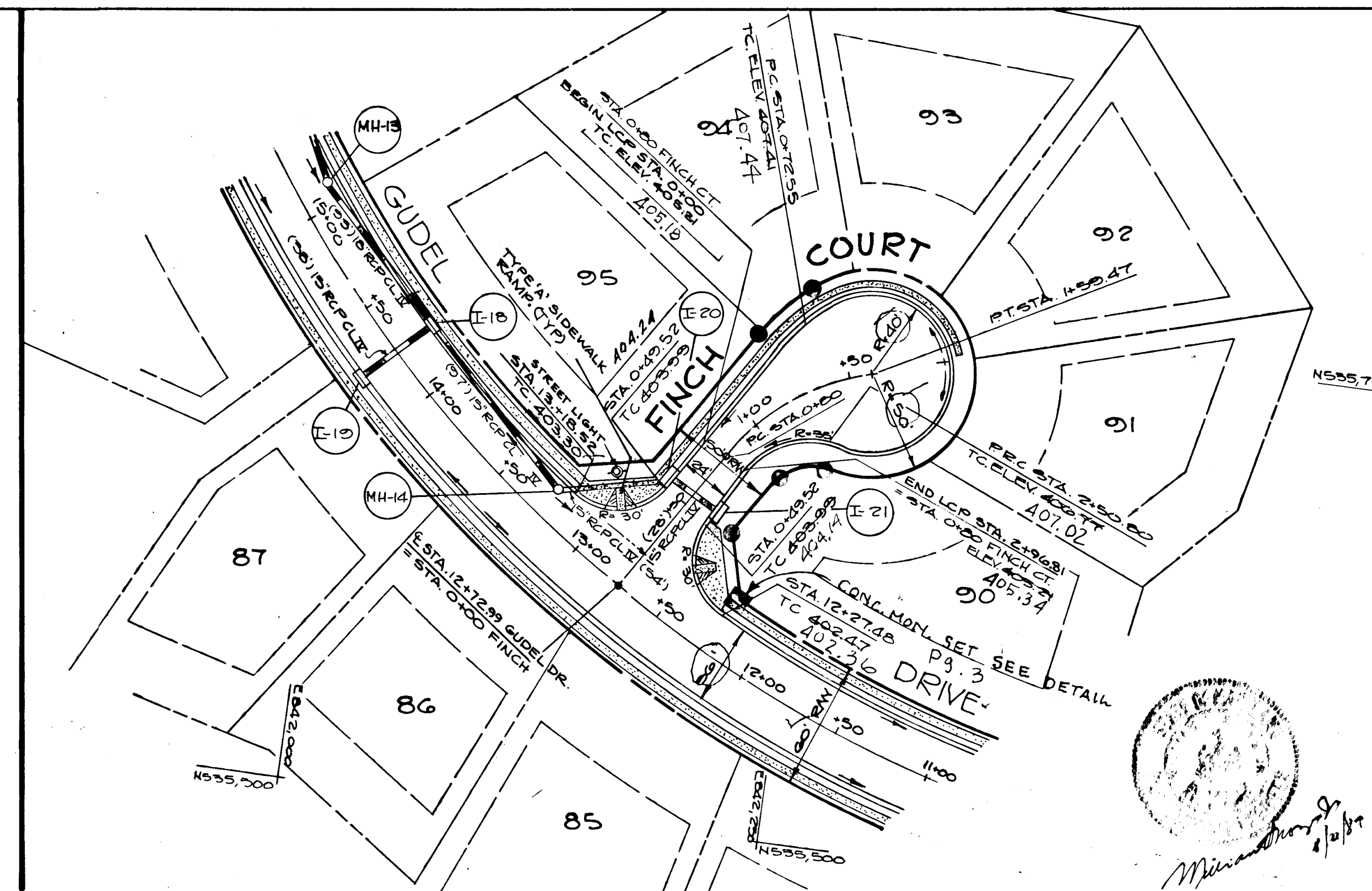
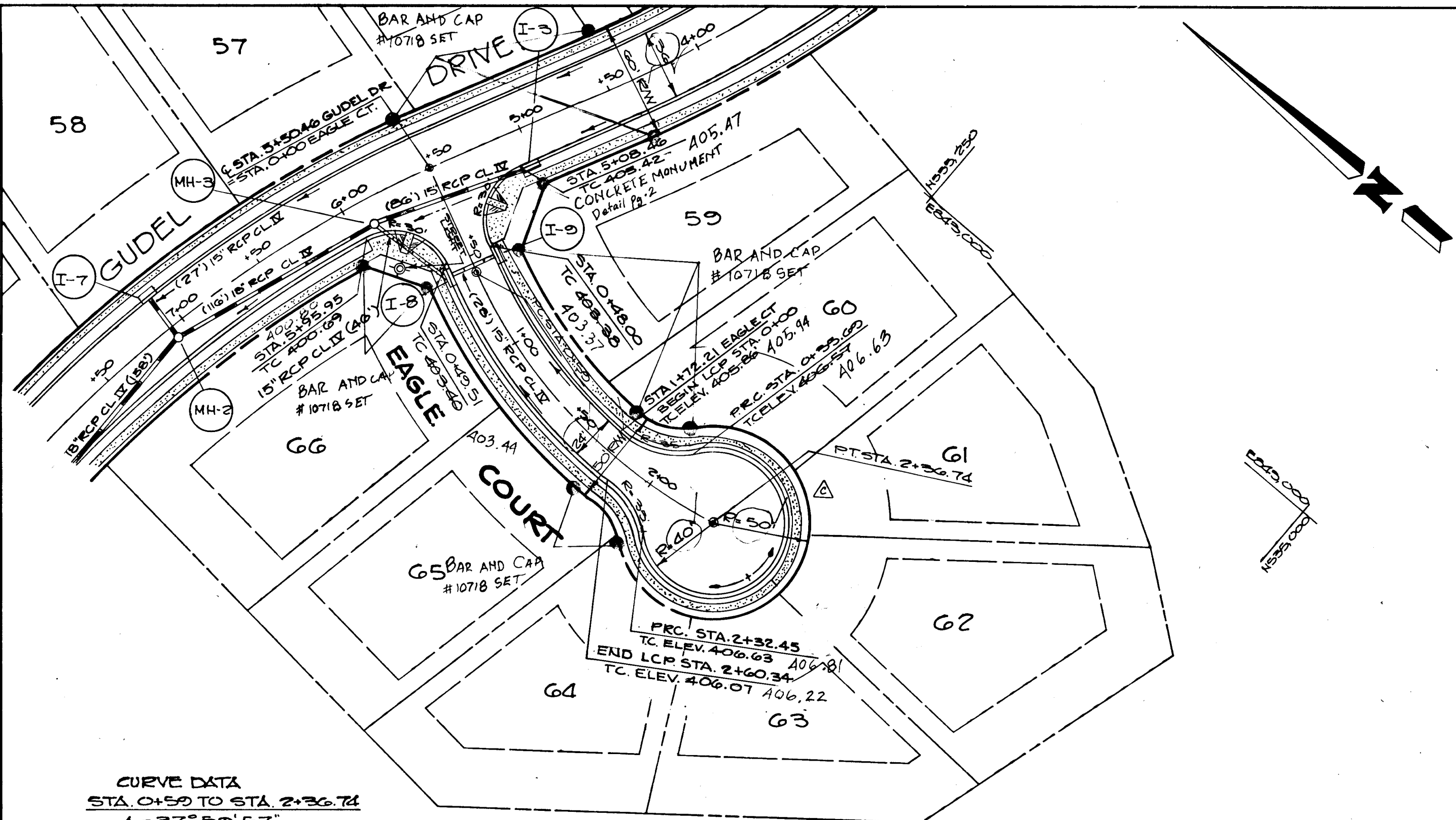


802



F-88-36

PLAN
 SURVEYED
 NOTE BOOK GRADES CHECKED
 ALIGNMENT CHECKED
 RT. OF WAY CHECKED
 NO.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
 CHIEF, LAND DEVELOPMENT DIVISION
 CHIEF, BUREAU OF HIGHWAYS
 CHIEF, BUREAU OF ENGINEERING

NO.	REVISION	BY	DATE
1	ADD SIDEWALK EAGLE CT.	KAM	9-13-90

MCKENZIE MEADOWS SECTION TWO
 TAX MAP NO. 17 PARCEL 36
 (O.P. & Z. REF. NO. S-87-57)
 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

EAGLE AND FINCH COURT
PLAN & PROFILES

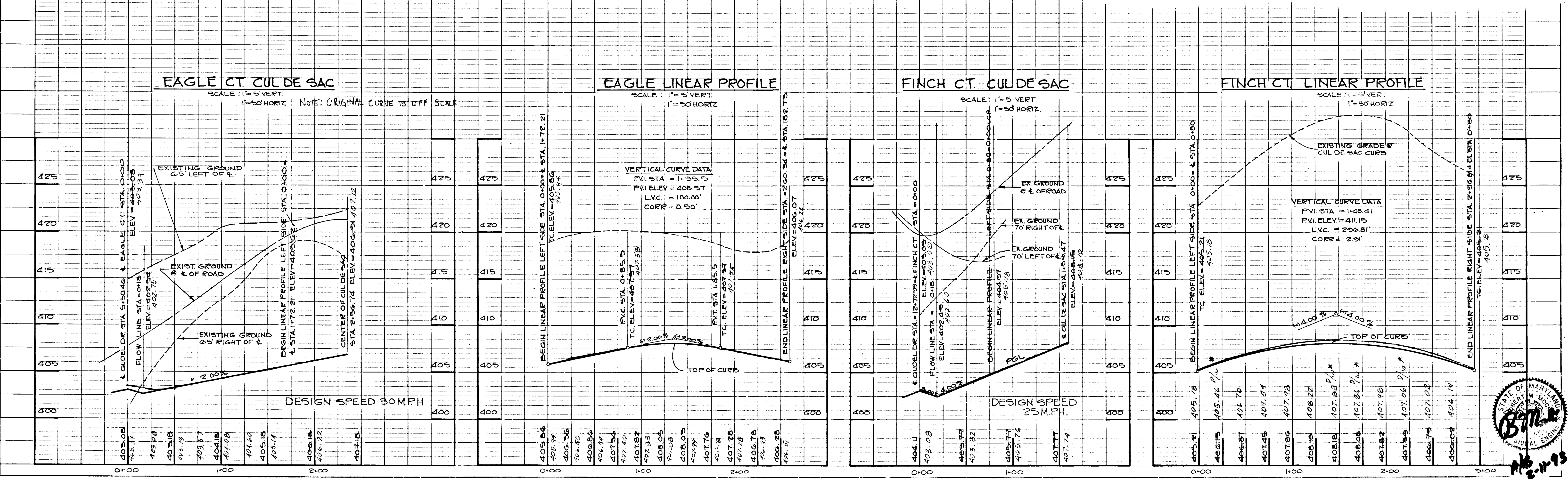
OWNER: COSCAN WASHINGTON, INC. DEVELOPER: COSCAN WASHINGTON, INC.
 8521 LEESBURG PIKE SUITE 200 VIENNA, VIRGINIA 22180

SCALE AS SHOWN DATE: 7/87 SHEET 7 OF 20
 DES. J.A.B. DRN. P.O.A. CHK. J.B.C.

JOHN E. HARMS JR. AND ASSOCIATES, INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 3030 RED BRANCH ROAD SUITE 100 COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

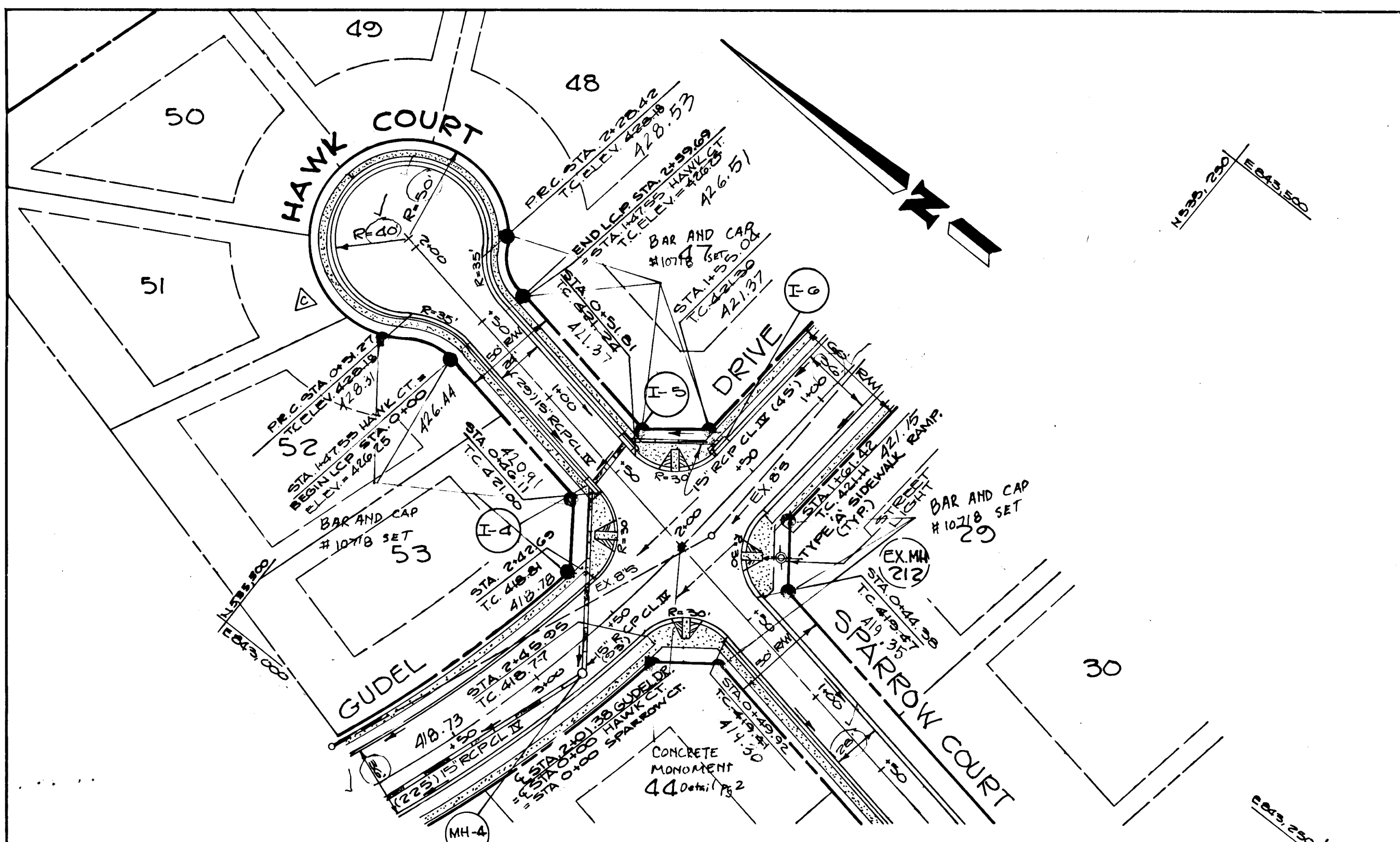
APPROVED OFFICE OF PLANNING AND ZONING

PROFILE
 SURVEYED
 NOTE BOOK GRADES CHECKED
 B.M.'S NOTED
 STRUCTURE NOTATIONS CHECKED
 NO.

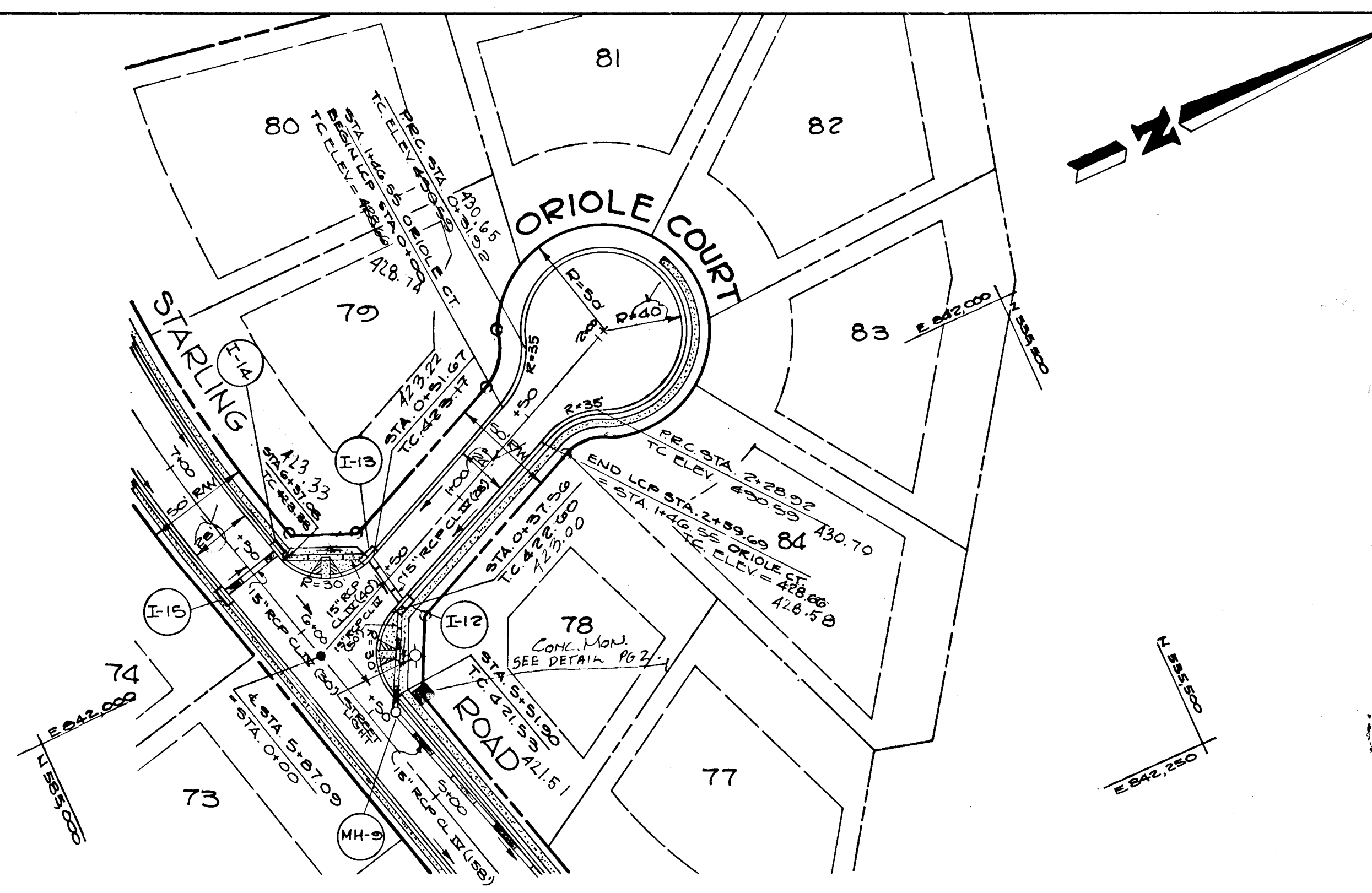


802

PLAN SURVEYED BY DATE
 PLOTTED BY
 CHECKED BY
 NO. OF WAYS CHECKED
 NO.



HAWK CT
 PLAN
 SCALE: 1"=50'



ORIOLE CT
 PLAN
 SCALE: 1"=50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHESTERLAND DEVELOPMENT DIVISION
 DATE: 12/12/87
 Chief, Bureau of Highways
 DATE: 12-21-87
 Chief, Bureau of Engineering

McKENZIE MEADOWS SECTION TWO
 TAX MAP NO. 17 PARCEL 36
 (O. P. & Z. REF. NO. P-87-51)
 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

HAWK AND ORIOLE COURT
PLAN & PROFILE

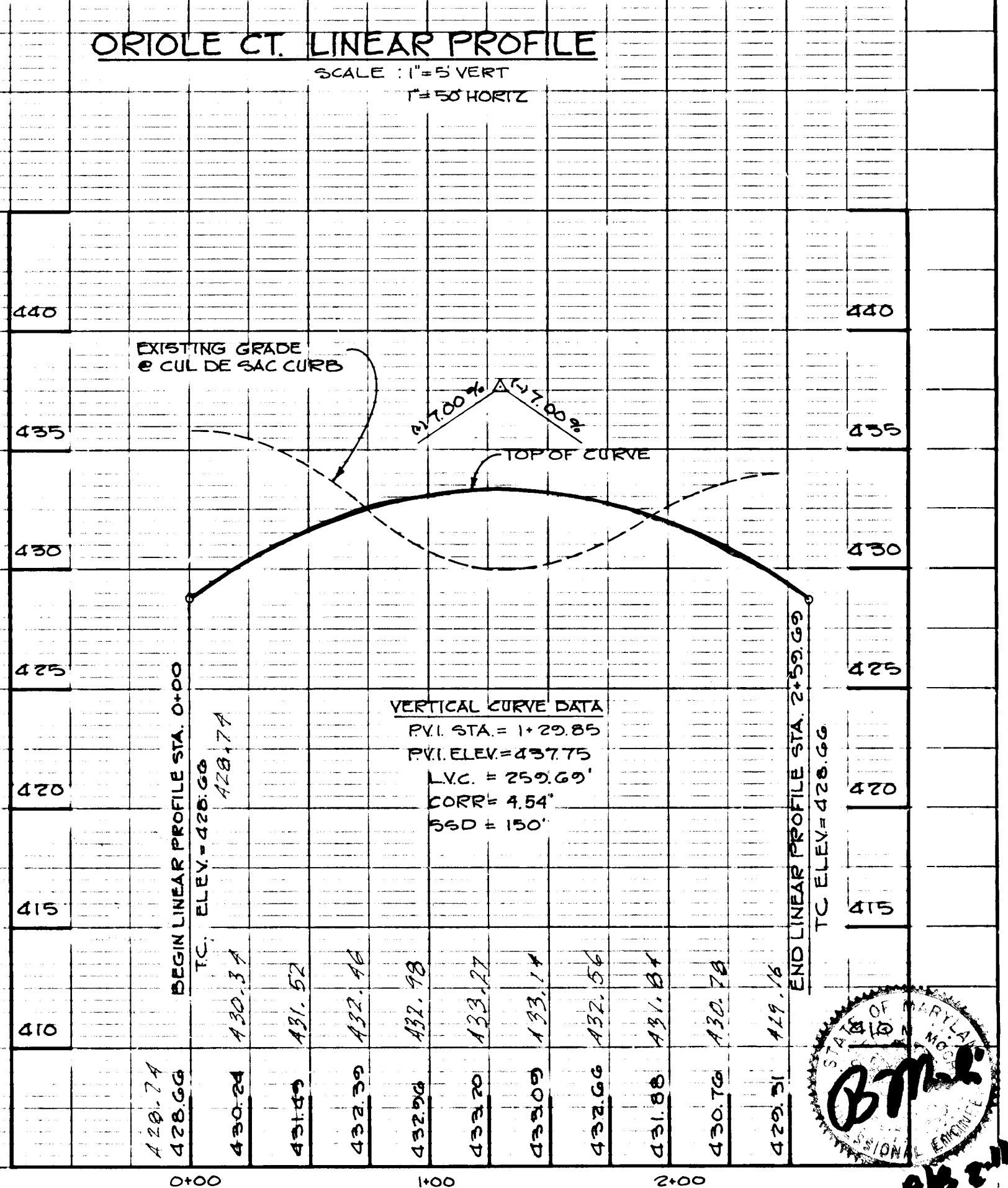
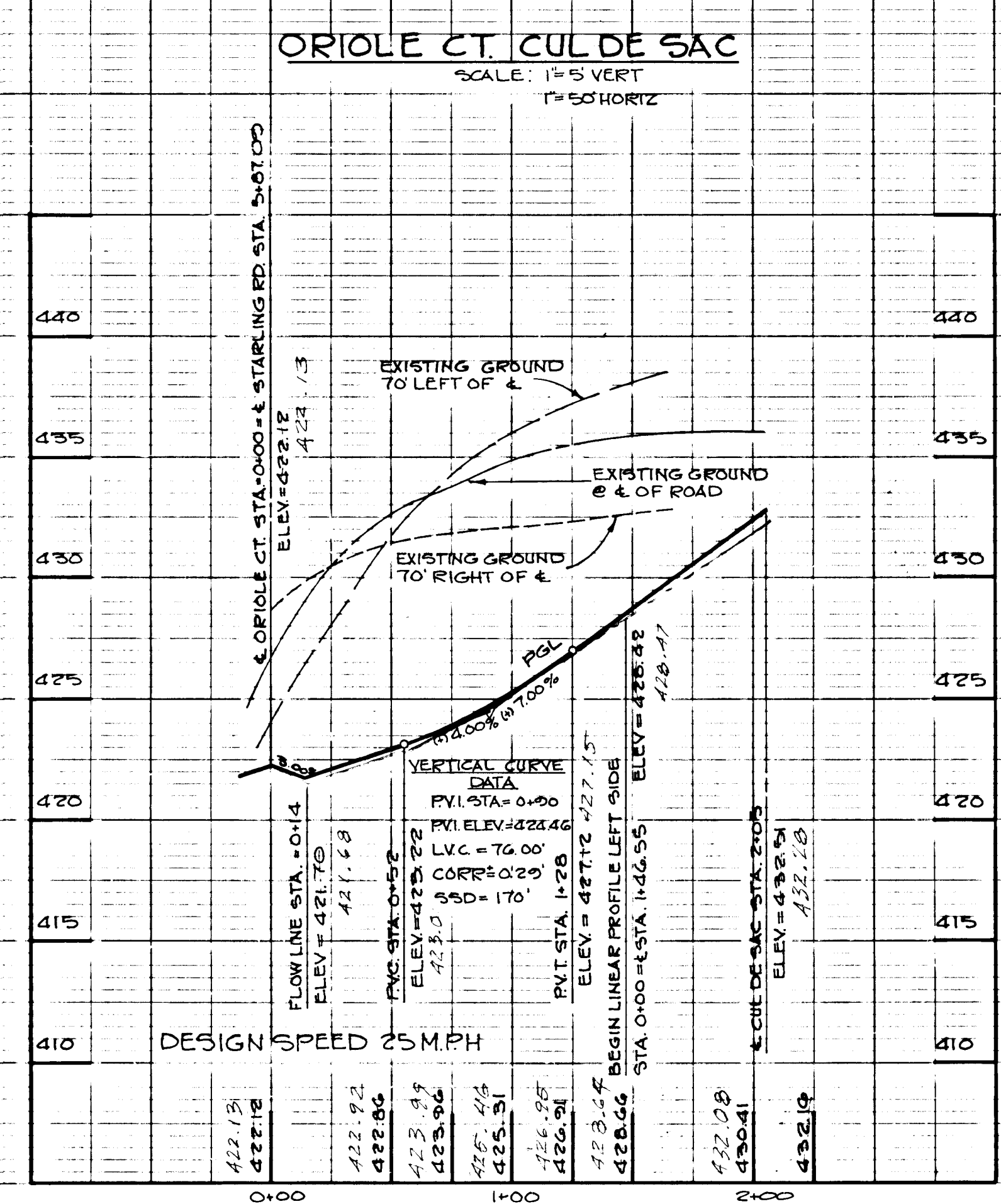
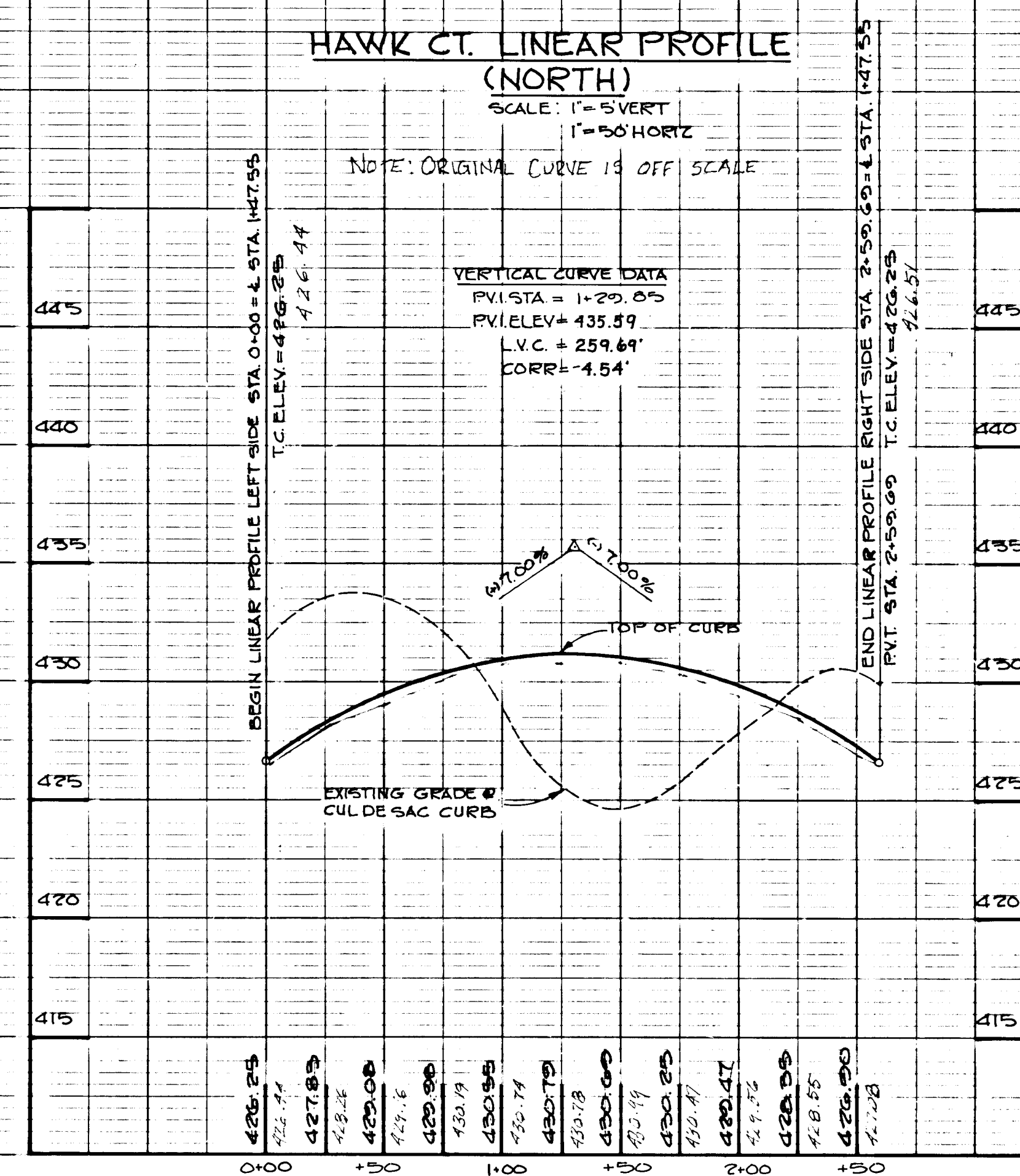
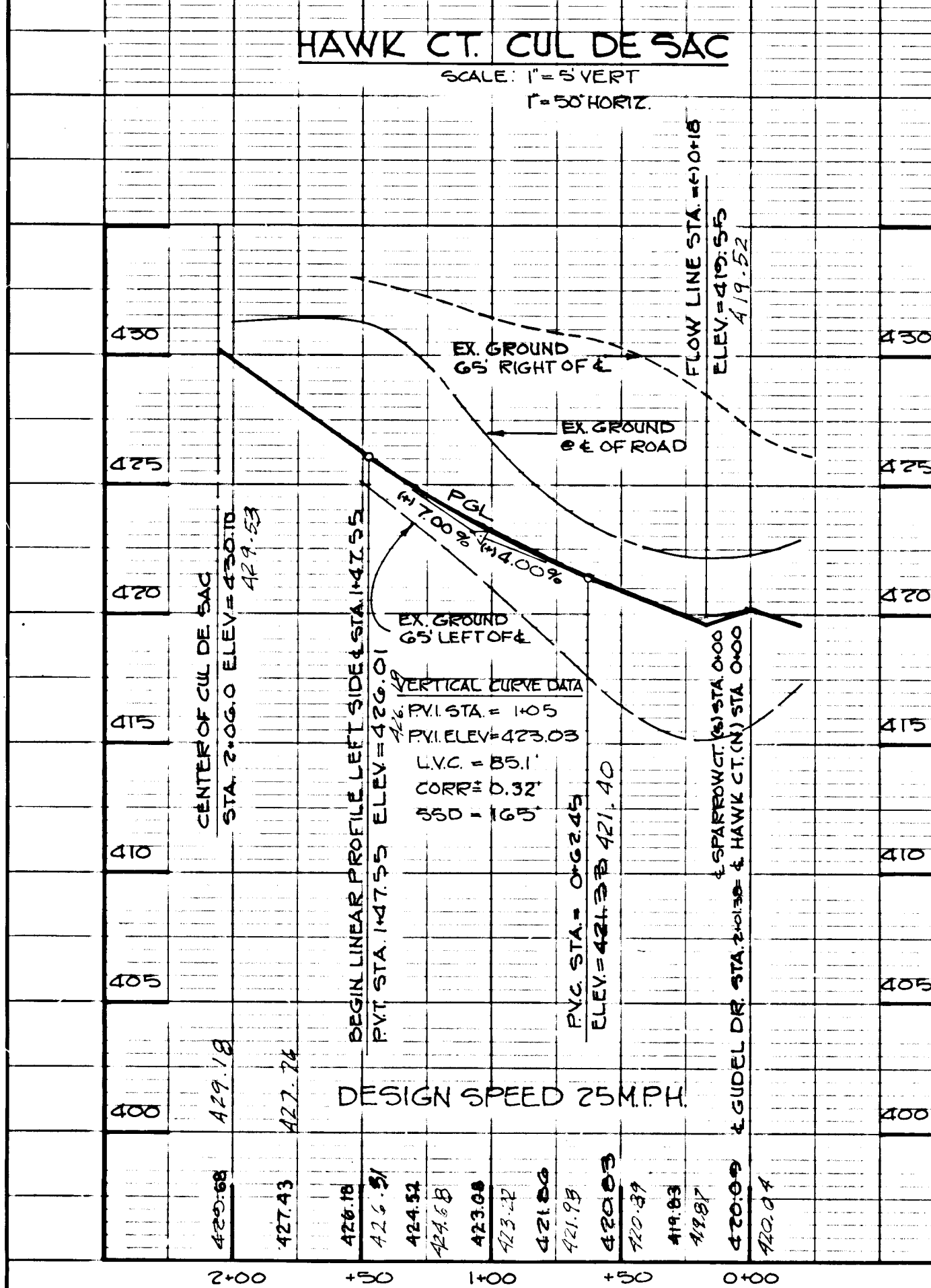
OWNER: COSCAN WASHINGTON, INC. DEVELOPER: COSCAN WASHINGTON, INC.
 8521 LEESBURG PIKE SUITE 200
 VIENNA, VIRGINIA 22180
 SCALE AS SHOWN DATE: 7/87 SHEET 8 OF 20
 DES. J.A.B. DRN. P.O.A. CHK. W.B.C.

JOHN E. HARMS JR. AND ASSOCIATES, INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 9030 RED BRANCH ROAD SUITE 100
 COLUMBIA, MARYLAND 21045 TELE. (301) 740-5200

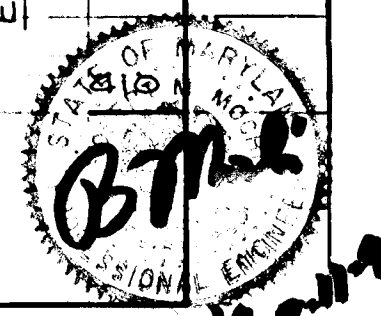
APPROVED OFFICE OF PLANNING AND ZONING

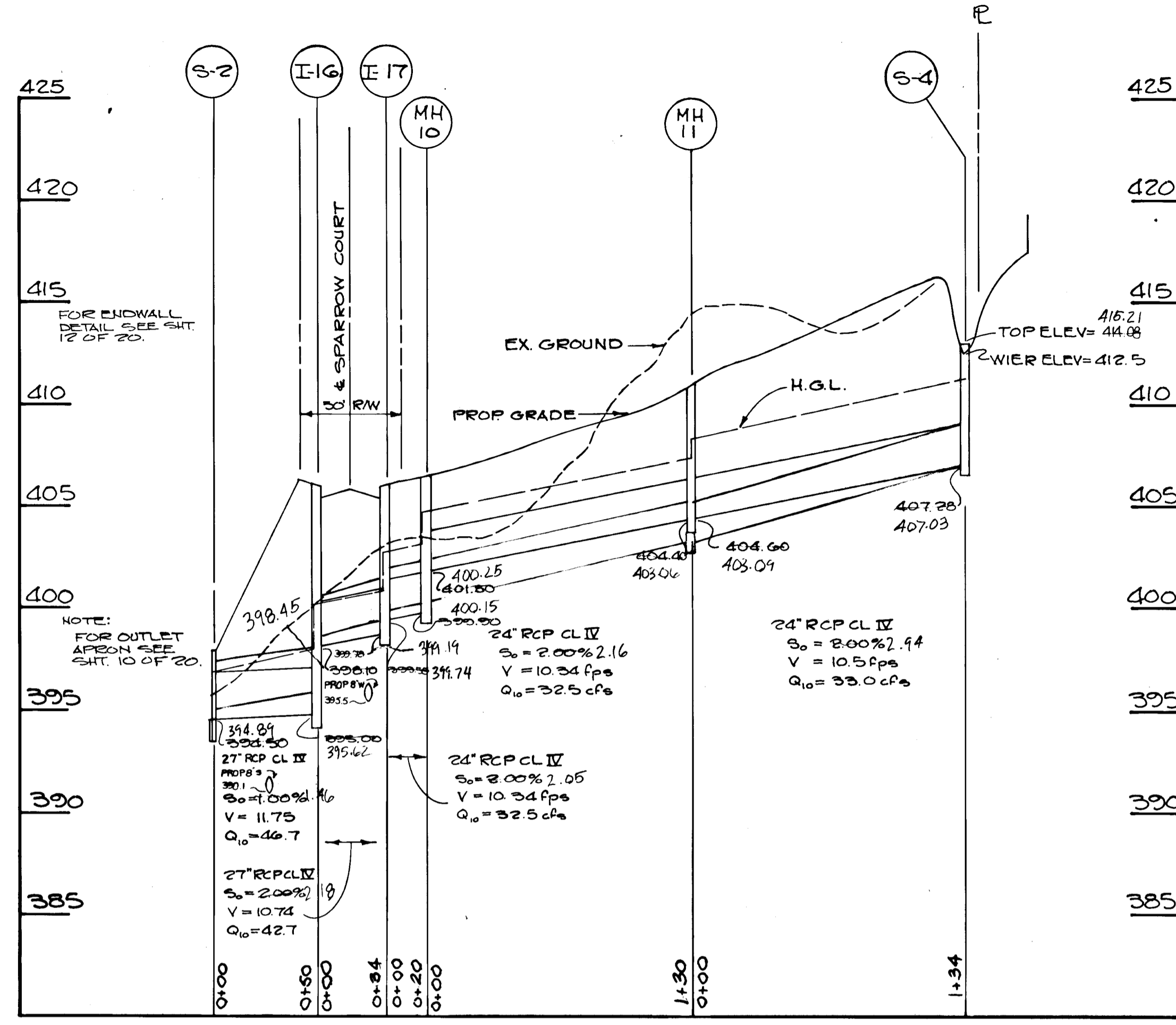
John E. Harms Jr. 12/12/87
 DIVISION OF LAND DEVELOPMENT
 AND ZONING ADMINISTRATION DATE

PROFILE SURVEYED BY DATE
 PLOTTED BY
 CHECKED BY
 NO. OF WAYS CHECKED
 NO.

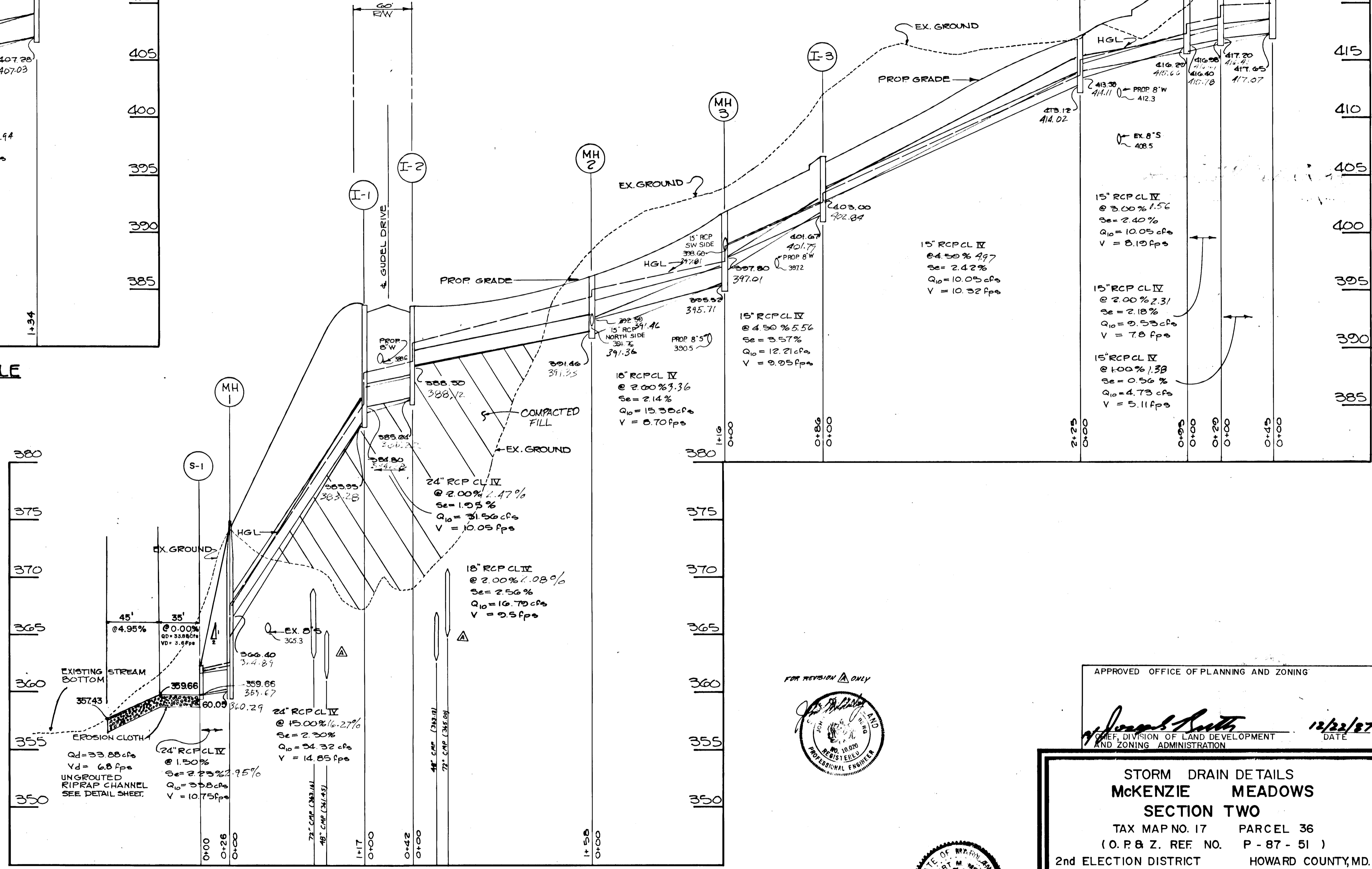


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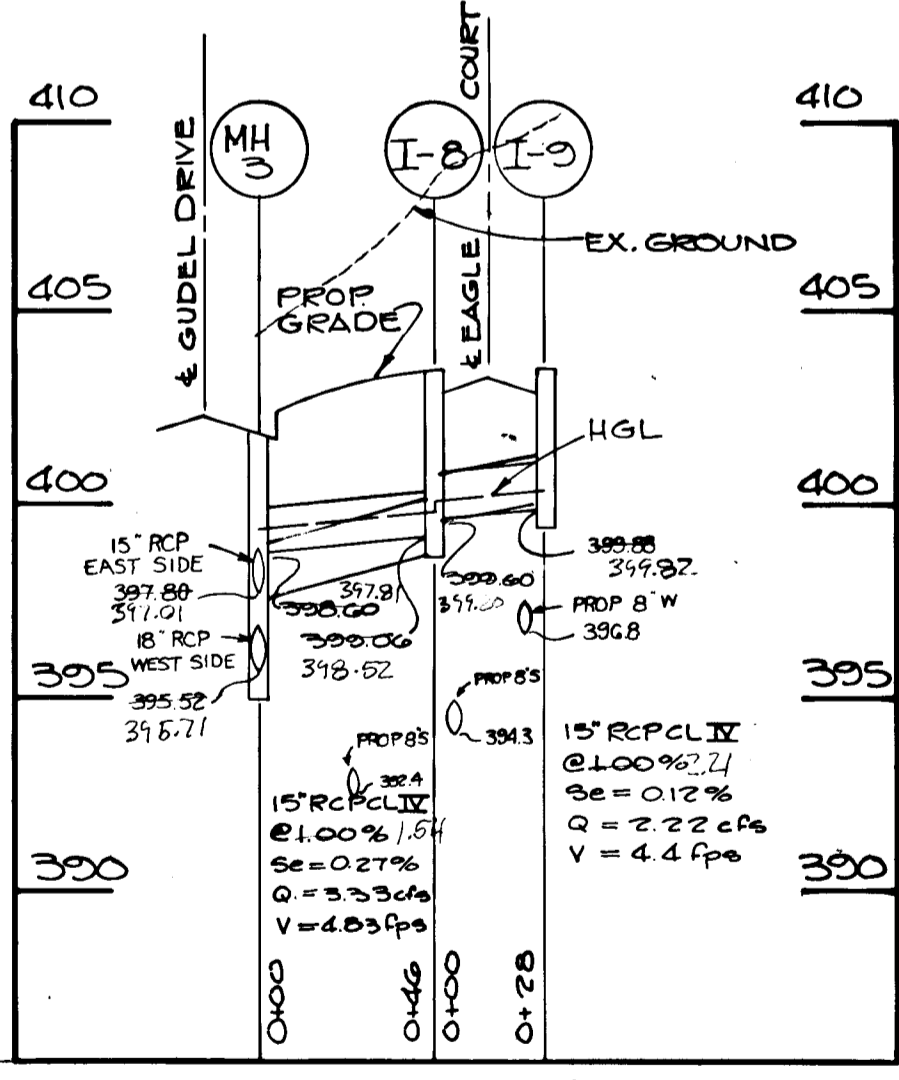




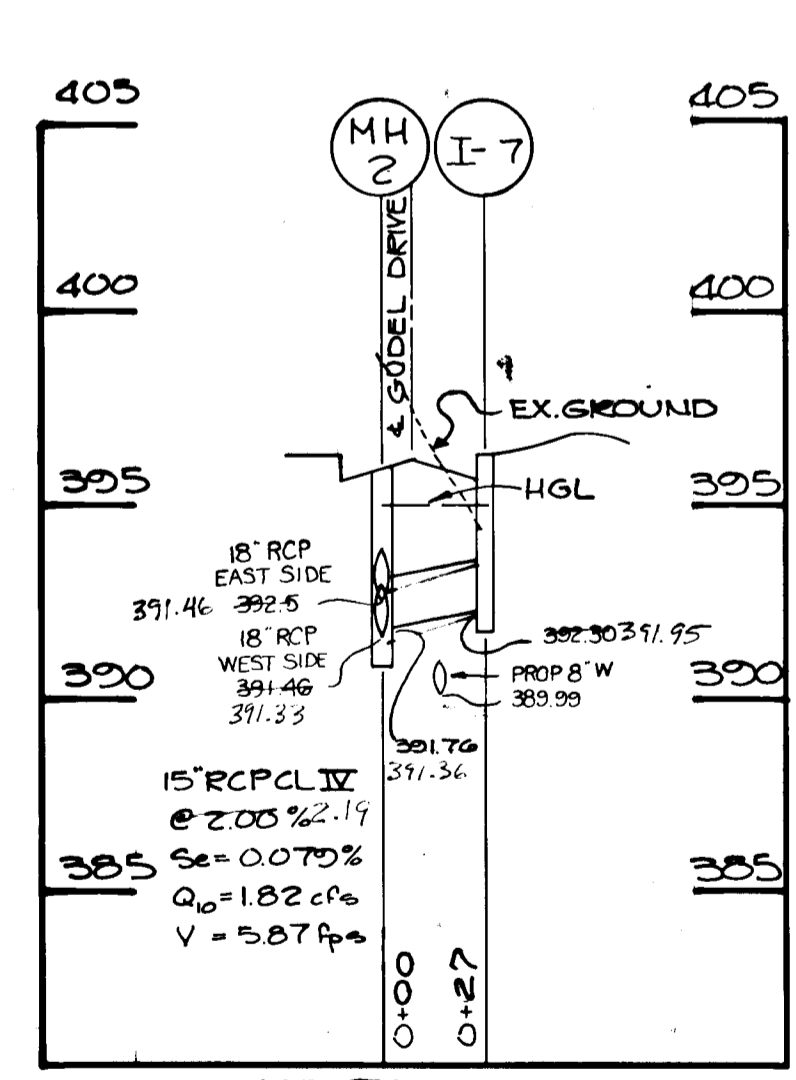
SPARROW COURT STORM DRAIN PROFILE
 SCALE: 1"=5' VERT
 1"=50' HORIZ



GUDEL DRIVE STORM DRAIN PROFILE
 SCALE: 1"=5' VERT
 1"=50' HORIZ



EAGLE COURT STORM DRAIN PROFILE
 SCALE: 1"=5' VERT
 1"=50' HORIZ



GUDEL DRIVE STORM DRAIN PROFILE
 SCALE: 1"=5' VERT
 1"=50' HORIZ

APPROVED OFFICE OF PLANNING AND ZONING
Joseph Smith
 CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION
 12/22/87 DATE



STORM DRAIN DETAILS
MCKENZIE MEADOWS
SECTION TWO
 TAX MAP NO. 17 PARCEL 36
 (O.P.B.Z. REF. NO. P-87-51)
 2nd ELECTION DISTRICT HOWARD COUNTY, MD.

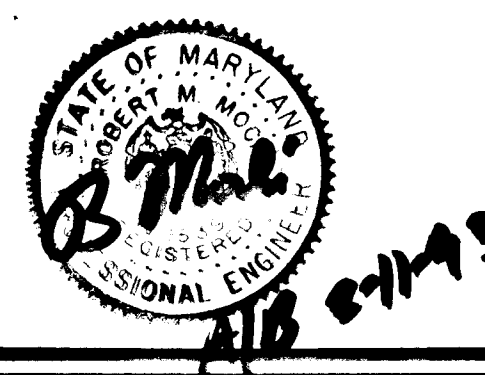
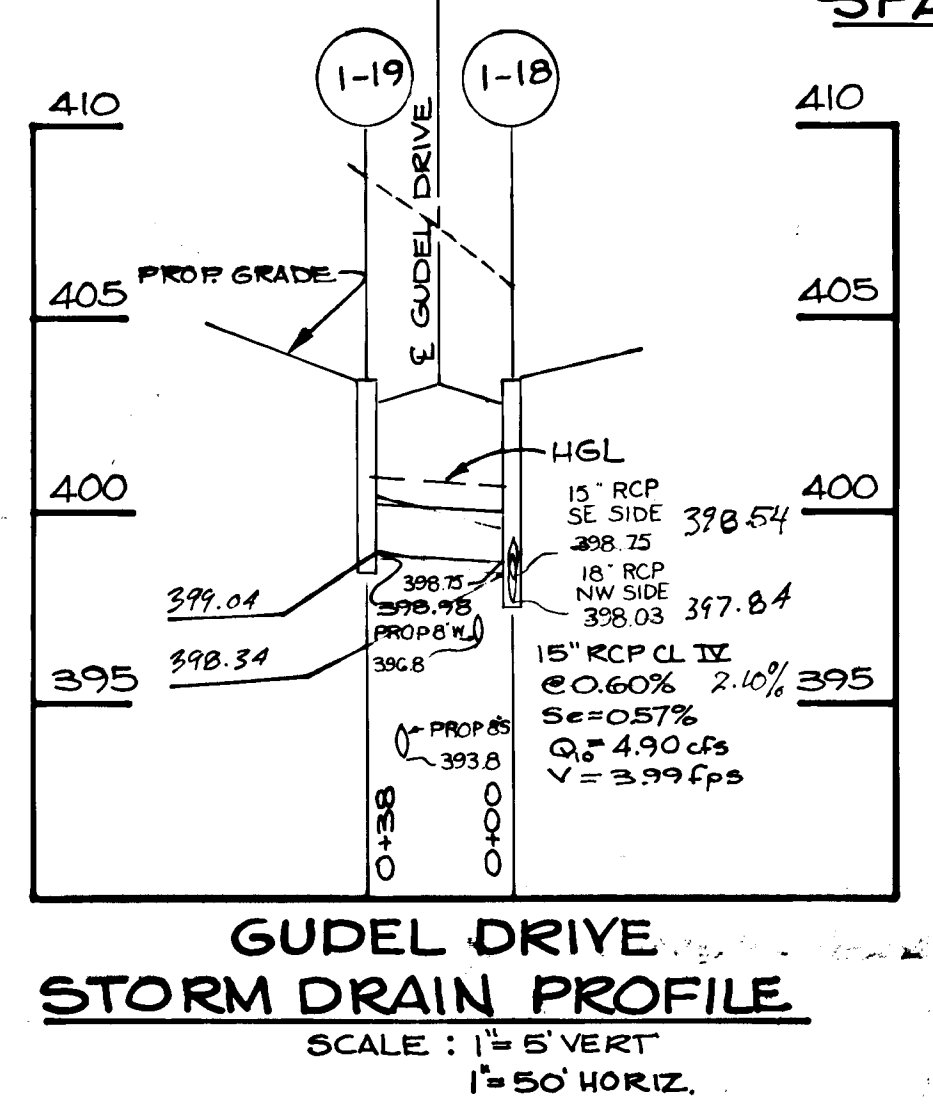
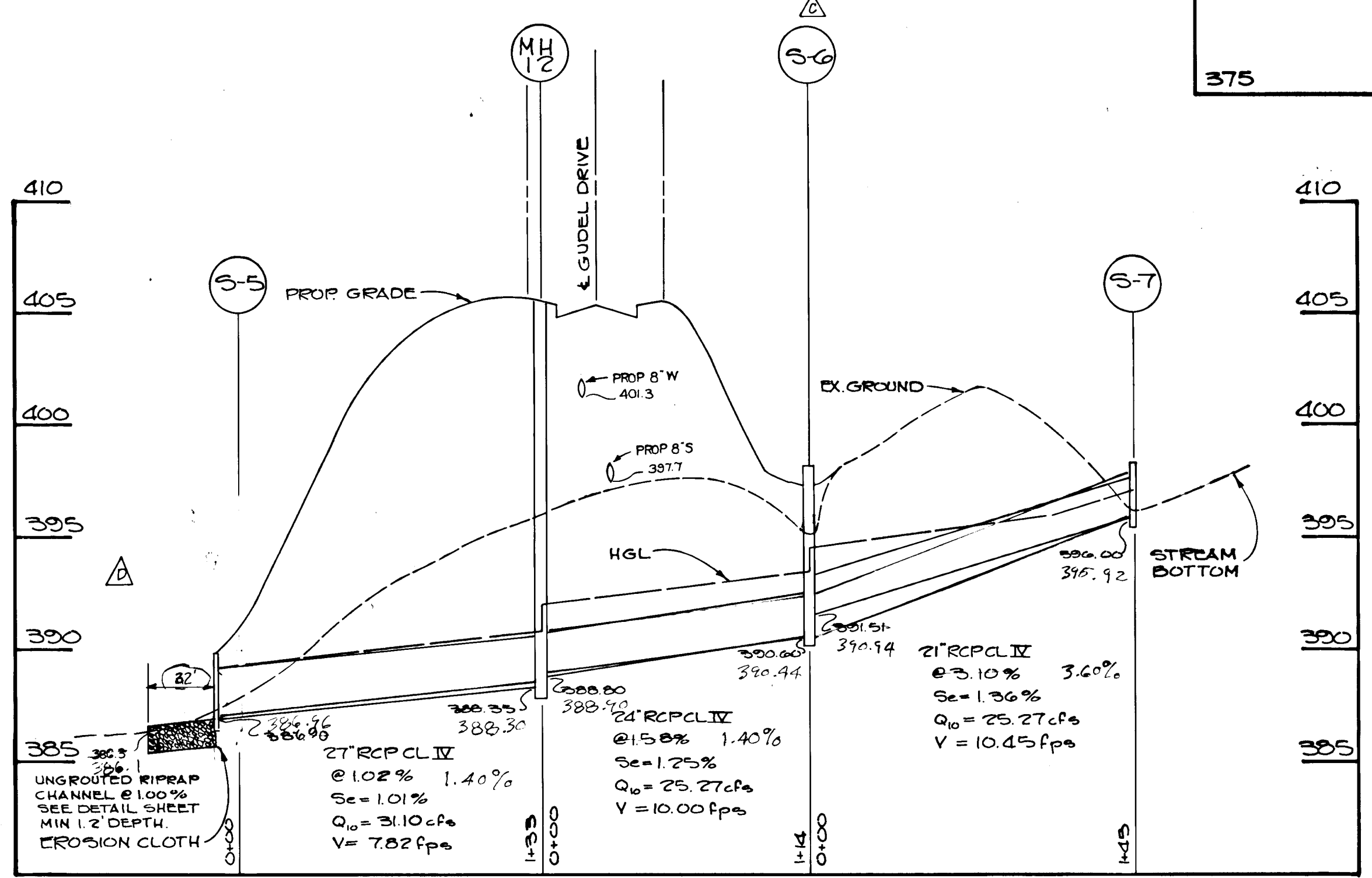
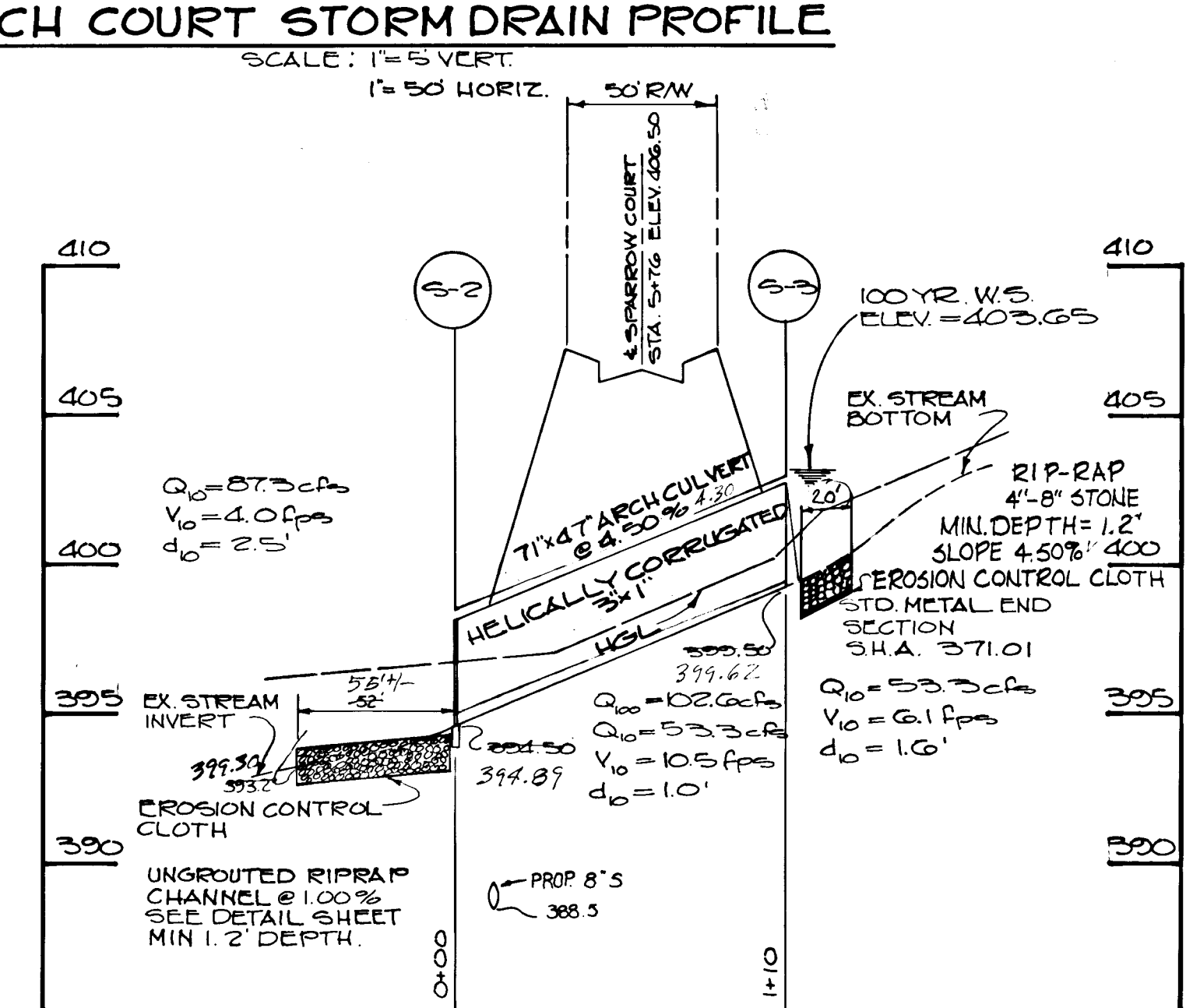
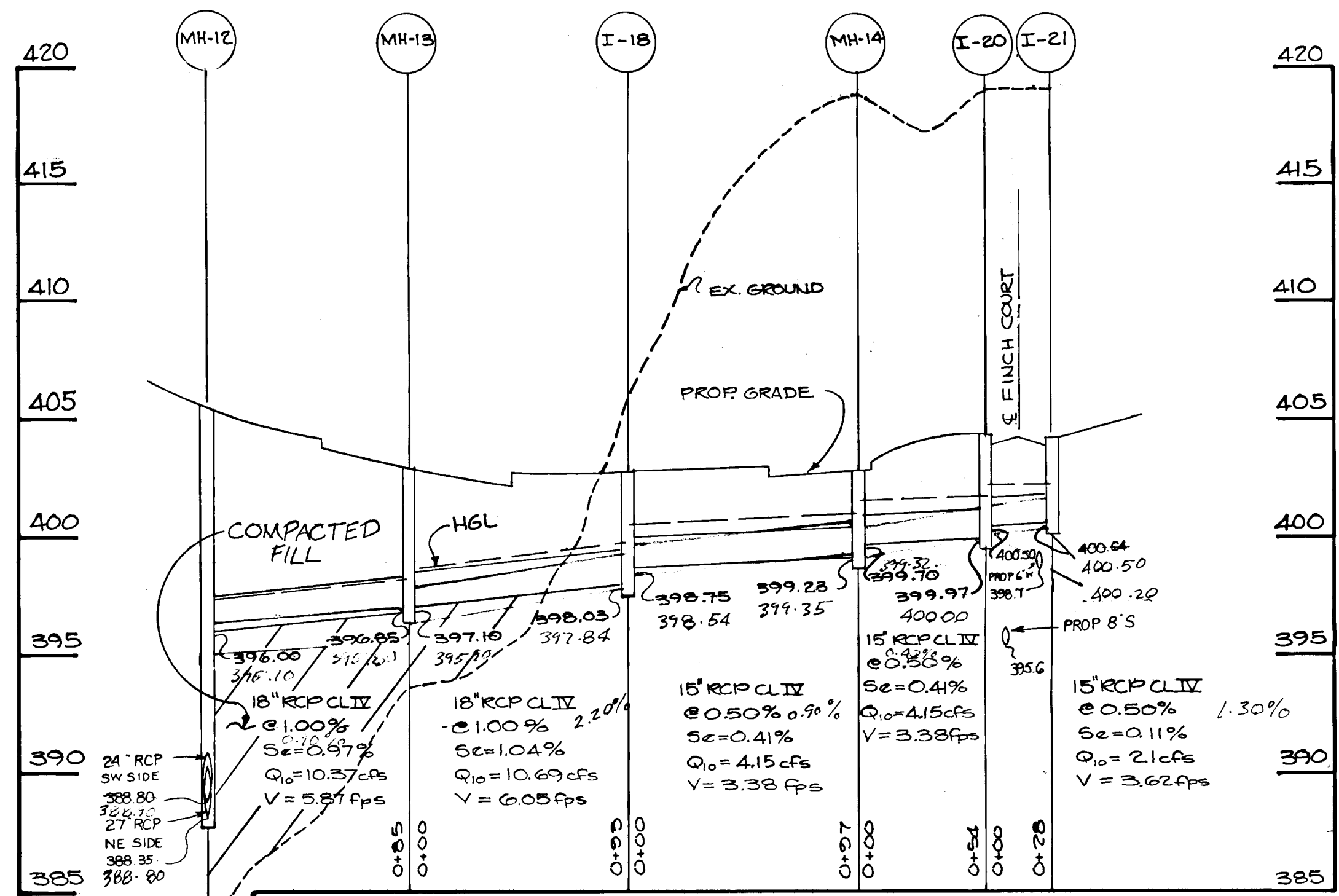
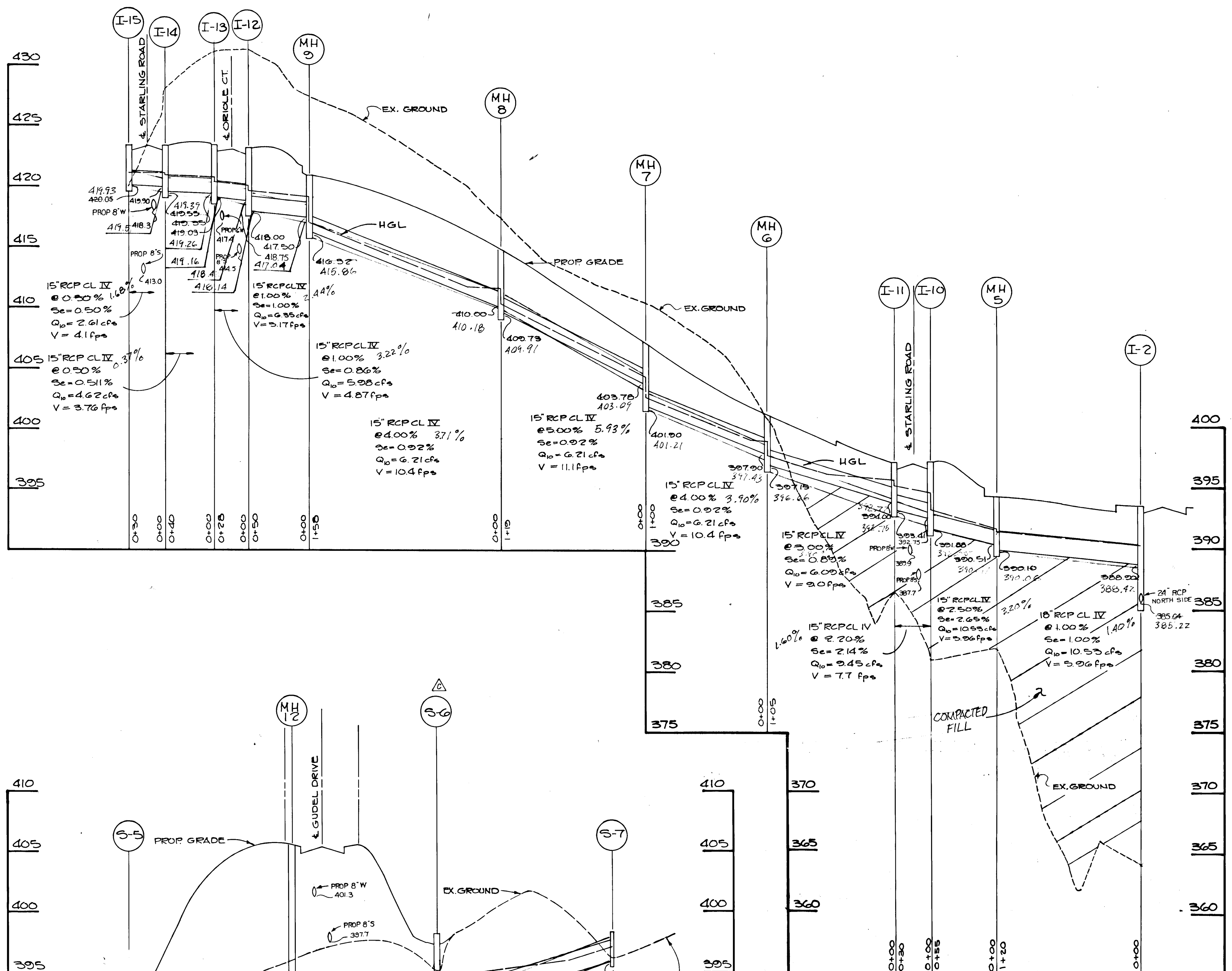
JOHN E. HARMS JR. AND ASSOCIATES INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 9030 RED BRANCH ROAD SUITE 100
 COLUMBIA, MARYLAND 21045 TELEPHONE (301) 740-5200



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
William J. Jones 12/11/87
 CHIEF, LAND DEVELOPMENT DIVISION
Dravetta W. Nease 12/21/87
 CHIEF, BUREAU OF HIGHWAYS
James R. ... 12-21-87
 CHIEF, BUREAU OF ENGINEERING

NO.	REVISION	BY	DATE
1	ADDED 72" x 48" CMP	KAM	12/23/87

DESIGNED BY: JAB
 DRAWN BY: POA
 CHECKED BY: K.B.C.
 DATE: 7/87
 SCALE: AS SHOWN
 W.O. NO. 4486002



STORM DRAIN DETAILS
MCKENZIE MEADOWS
 SECTION TWO
 TAX MAP NO. 17 PARCEL 36
 (O.P. & Z. REF. NO. P-87-51)
 2nd ELECTION DISTRICT HOWARD COUNTY, MD.

JOHN E. HARMS JR. AND ASSOCIATES INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 9030 RED BRANCH ROAD SUITE 100
 COLUMBIA, MARYLAND 21045 TELEPHONE (301) 740-5200

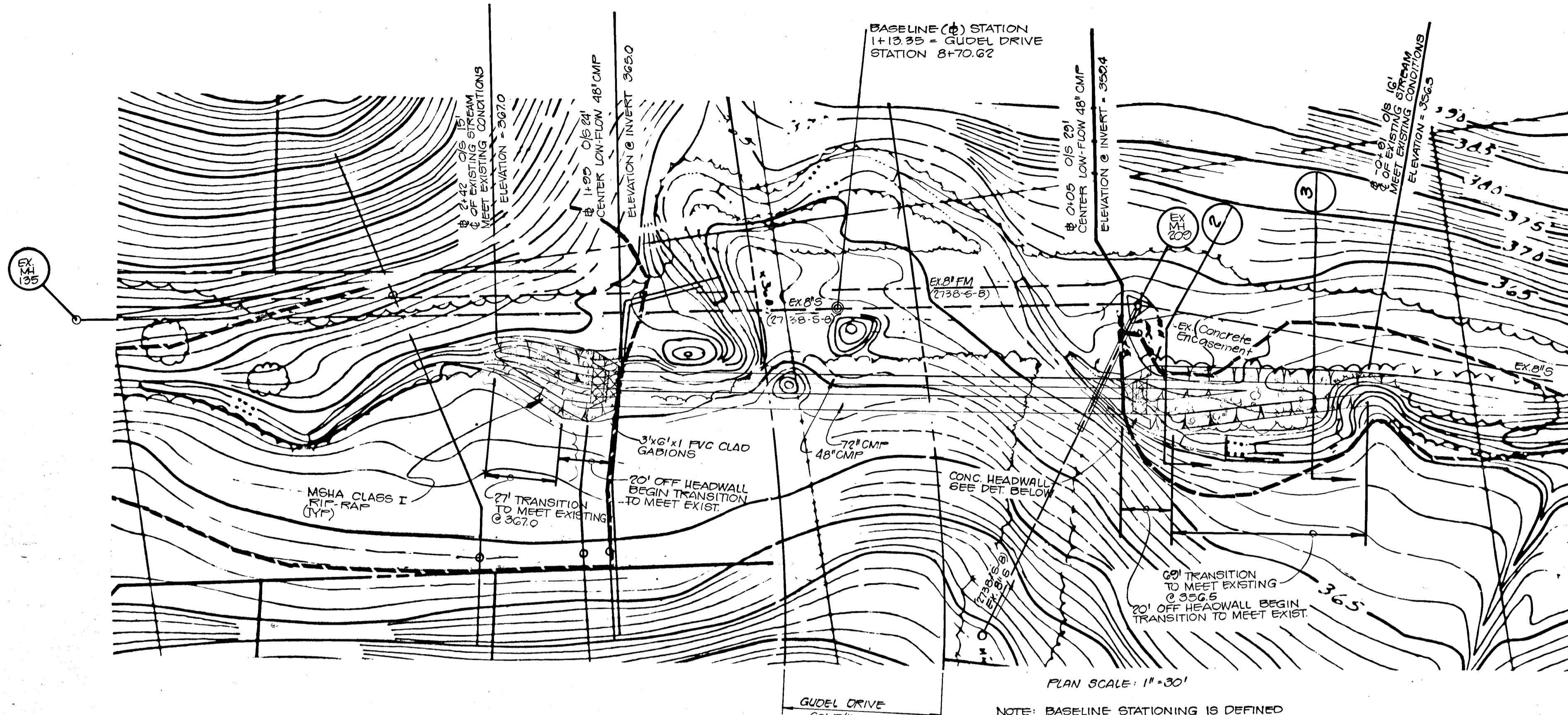
APPROVED OFFICE OF PLANNING AND ZONING
[Signature]
 DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION
 DATE: 12/22/87

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHIEF, LAND DEVELOPMENT DIVISION
[Signature] 10-15-87
 DATE
 CHIEF, BUREAU OF HIGHWAYS
[Signature]
 DATE
 CHIEF, BUREAU OF ENGINEERING
[Signature] 12-21-87
 DATE

NO.	REVISION	BY	DATE
1	ADJUST S-6	KAM	9-13-90
2	ADD 13 D LINE LOT 97	CAM	5-15-91

DESIGNED BY: JAB
 DRAWN BY: POA
 CHECKED BY: K.B.C.
 DATE: 7/87
 SCALE: AS SHOWN
 W.O. NO. 44 06002 10 SHEET OF 20

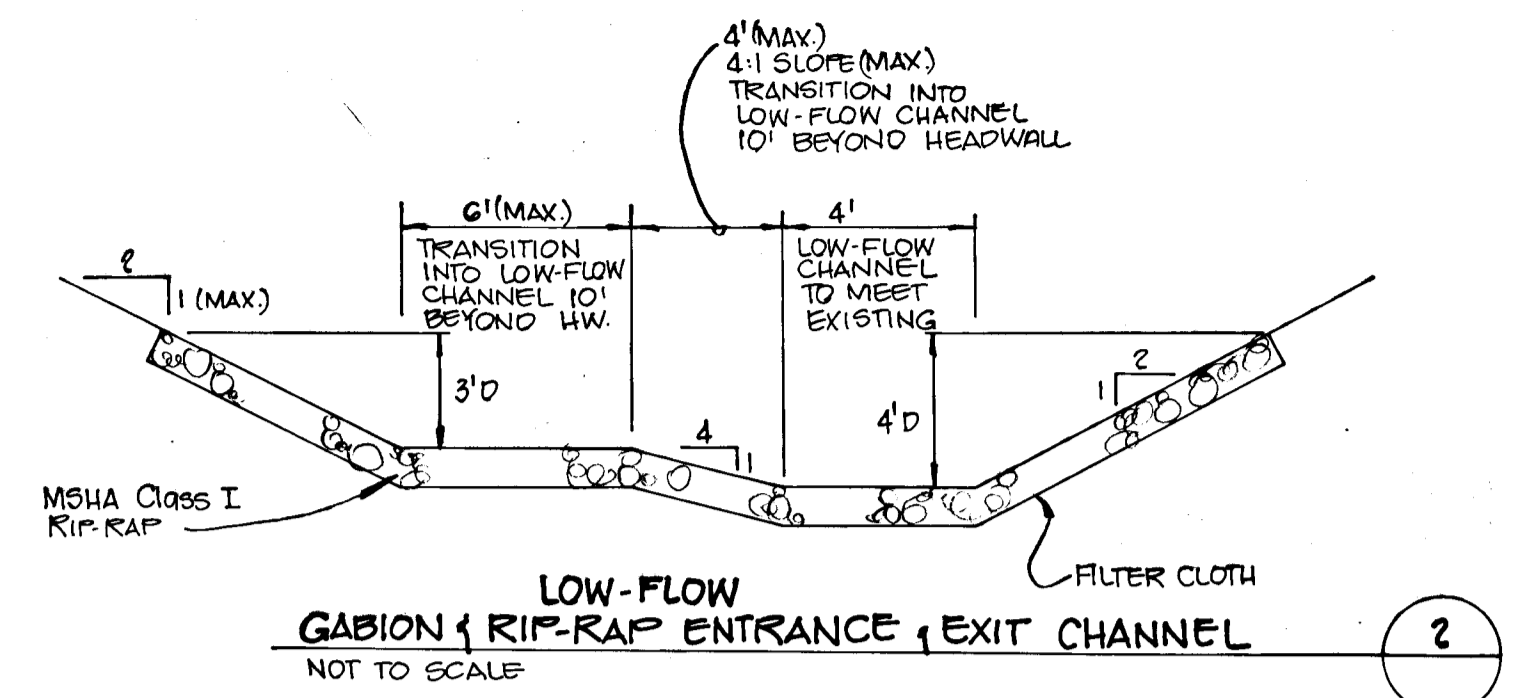
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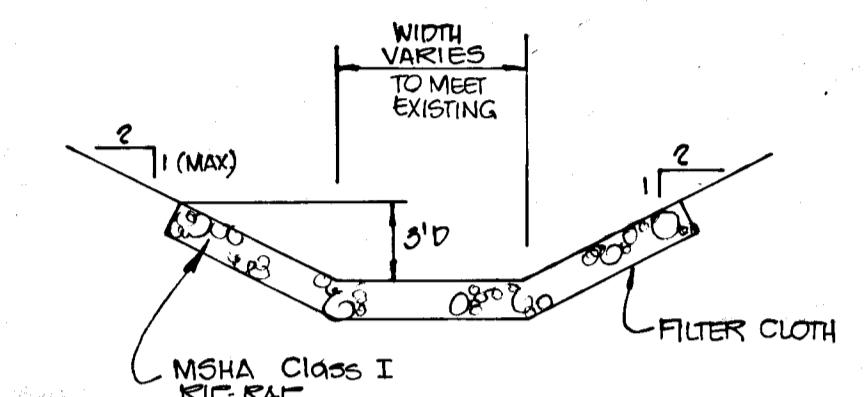
NOTE: BASELINE STATIONING IS DEFINED BY EXISTING GRAVITY SEWER FROM MH 209 TO MH 125 EXISTING MH 209 = BASELINE STATION 0+00

FOR PROPOSED GRADING SEE STREET TREE GRADING AND SEDIMENT CONTROL SHEET 17 OF 20 PREPARED BY JOHN E. HARKINS, JR. (ASSOCIATES), INC. FOR MCKENZIE MEADOWS SECTION 2, DATE 7/87.

STEEL CASING PIPE TO BE INSTALLED UNDER CONTRACT 24-1074-D TO REPLACE EXISTING 24" GRAVITY SEWER & 8" FORCE MAIN RUNNING PARALLEL TO PROPOSED CULVERT.



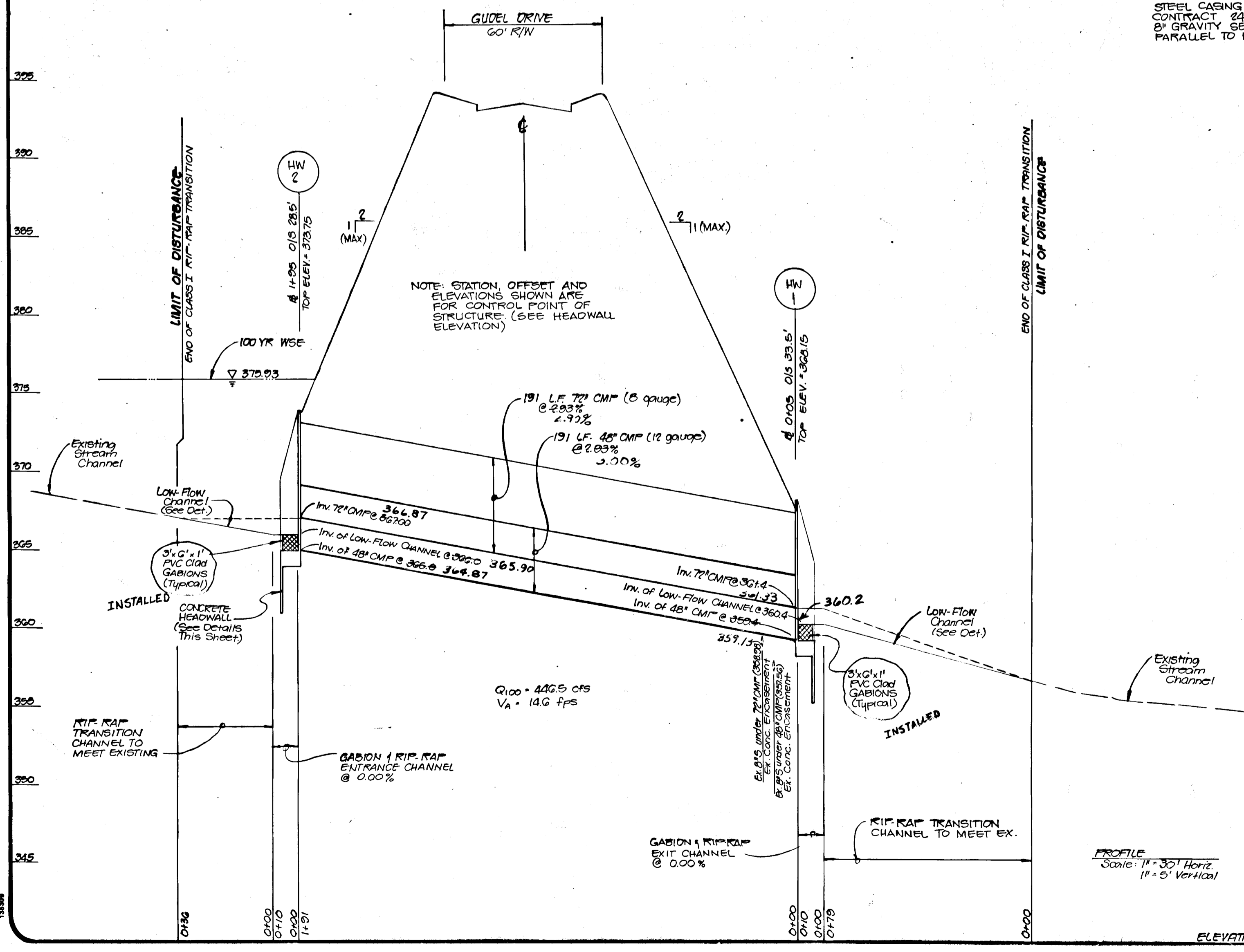
LOW-FLOW GABION RIP-RAP ENTRANCE, EXIT CHANNEL NOT TO SCALE



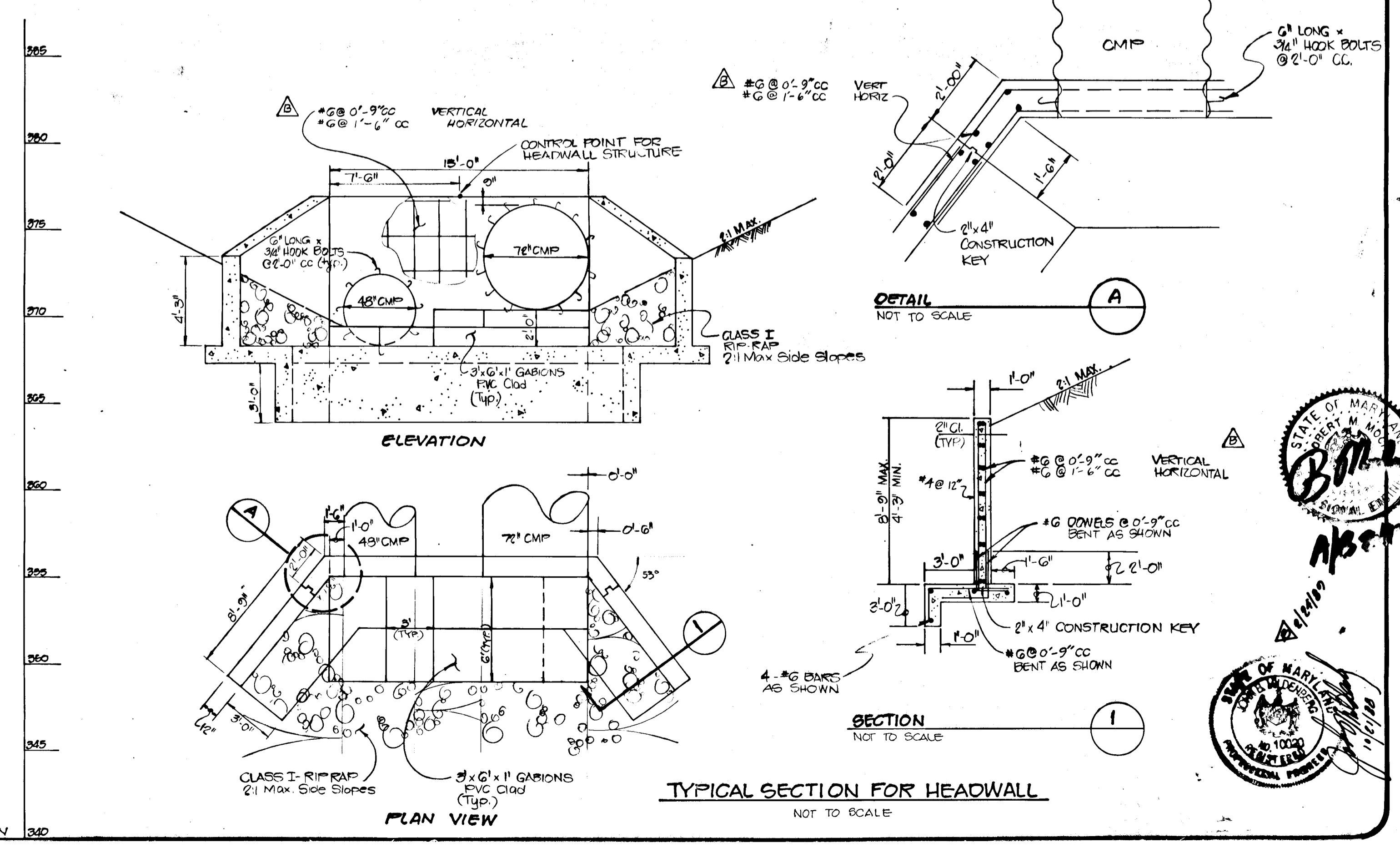
CHANNEL TRANSITION SECTION NOT TO SCALE

GENERAL NOTES

- All construction shall conform to MSHA Department of Transportation Standard Specifications for Construction 1 Materials, 1982 and the Howard County Design Manual, Volume III Standard Specifications and Details for Construction.
- For Headwall Details and Dimensions not shown refer to the MSHA Standard Headwall 8-84 (MO 352.02).
- Riprap shall be MSHA Class I.
- Concrete shall be MSHA, mix #3 (3500 psi).
- Chamfer all exposed concrete edges 1" x 1".
- Use #6 steel bars (3/4" dia). All reinforcement bars shall consist of deformed bars meeting the requirements of AASHTO M-31, Grade 60.



PROFILE Scale: 1" = 30' Horiz 1" = 5' Vertical



TYPICAL SECTION FOR HEADWALL NOT TO SCALE

date	OCT 1988
project	8804100
illustration	EMM
scale	AS SHOWN
engineering	KAY/TBM
approval	JEM

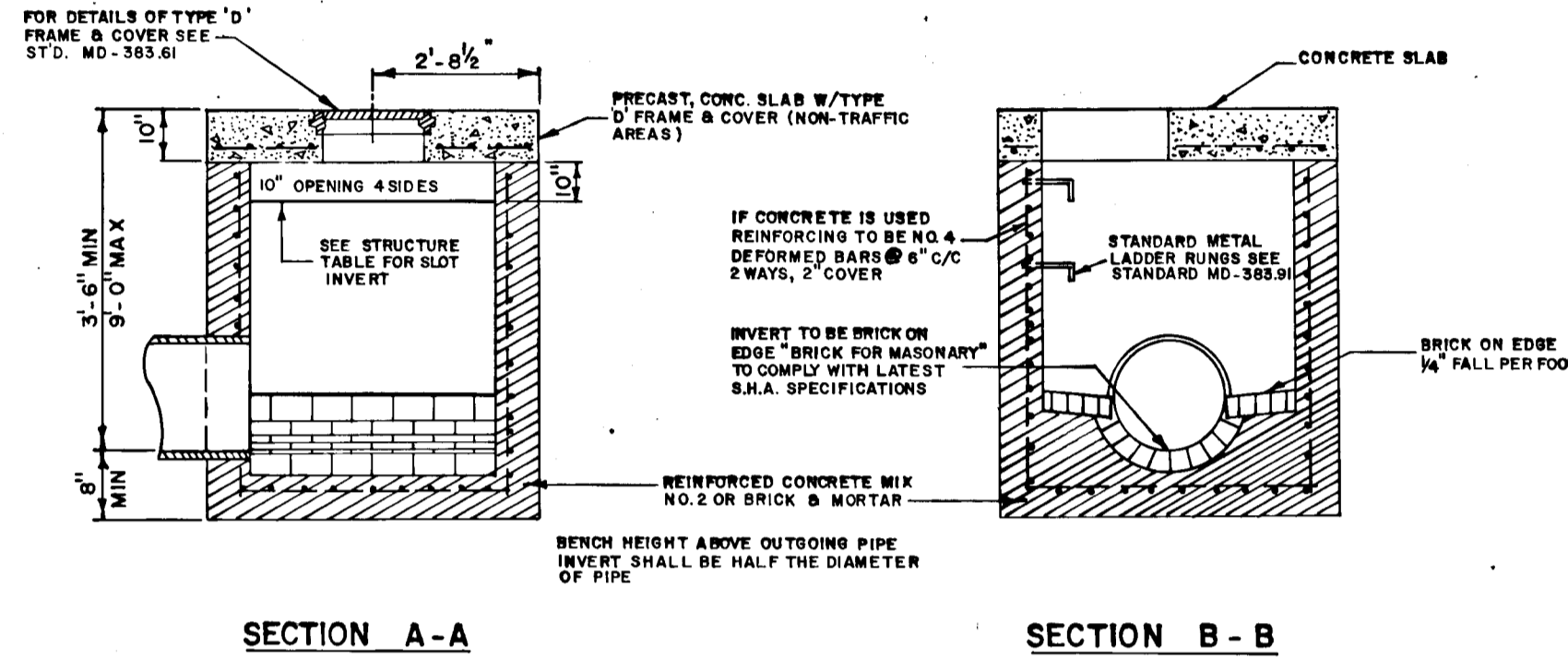
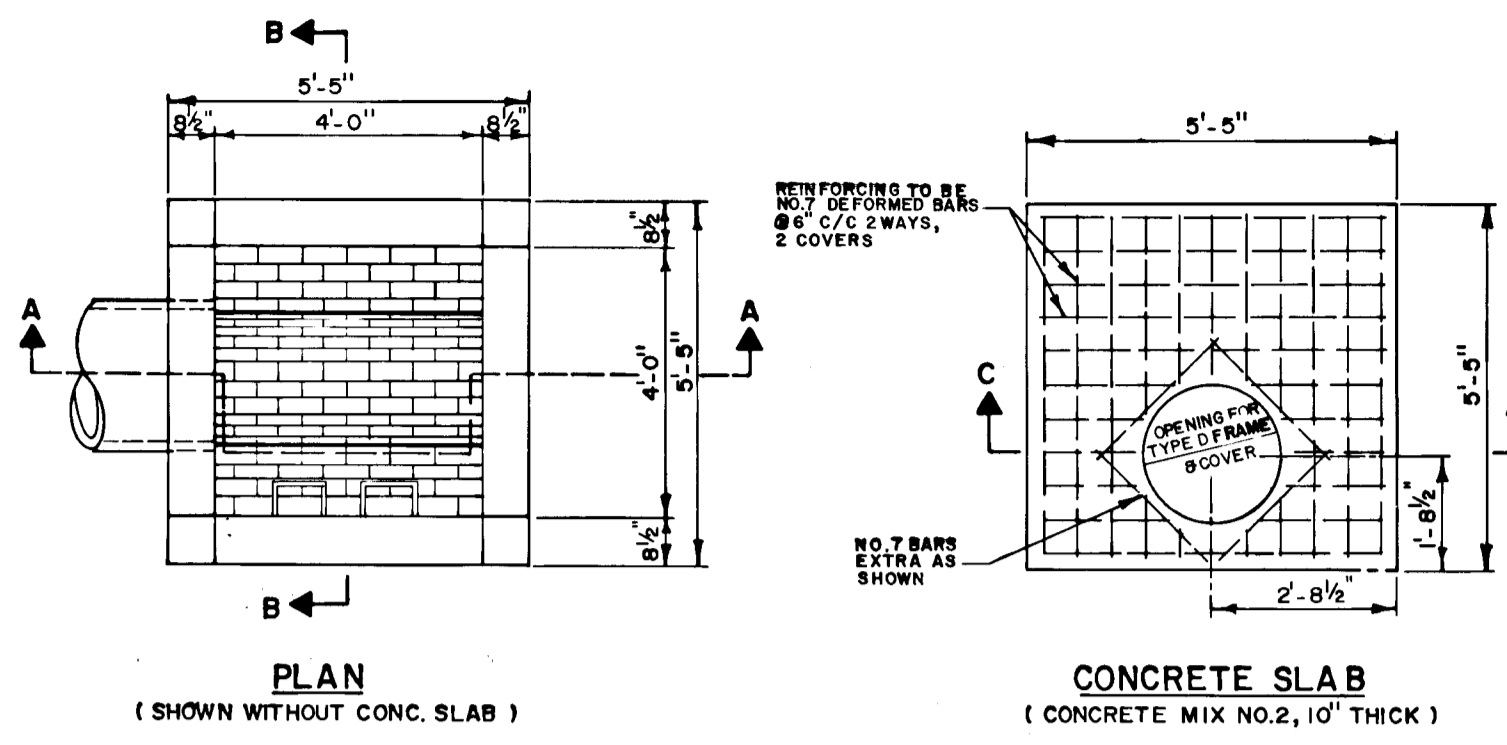
date	2/22/89
description	REVISED REINFORCING DETAIL
no	0
date	10/23/88
description	Submitted to Howard County
no	
date	
description	revisions

MCKENZIE MEADOWS
ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND
TAX MAP NO. 17 PARCEL 36
GUDEL DRIVE CULVERT CROSSING

MILDBERG OCHI & ASSOCIATES, INC.
ENGINEERS • SURVEYORS • PLANNERS
3300 Rock Ridge Road, Suite 225, Ellicott City, Maryland 21043-3350
(301) 961-8076 D.C. Mem. (301) 921-5788

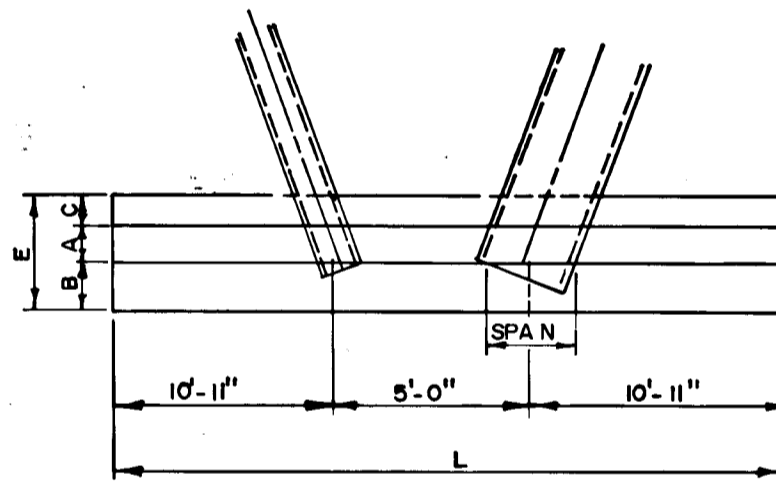
STANDARD SHALLOW MANHOLE MODIFIED

MD. S.H.A. STANDARD M.D. 383.00
(WITH TYPE 'D' FRAME AND COVER)

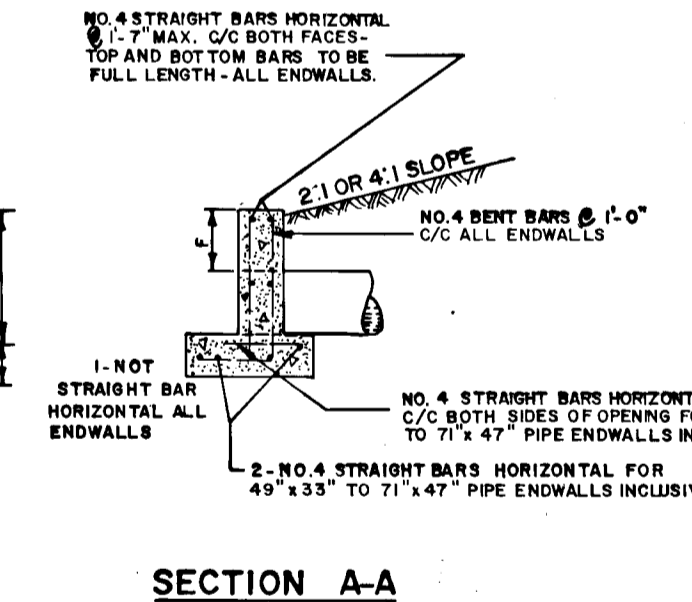


STANDARD TYPE C ENDWALL MODIFIED

MD. S.H.A. STANDARD NO. MD-355.01



DISPOSITION OF BARS DETAIL

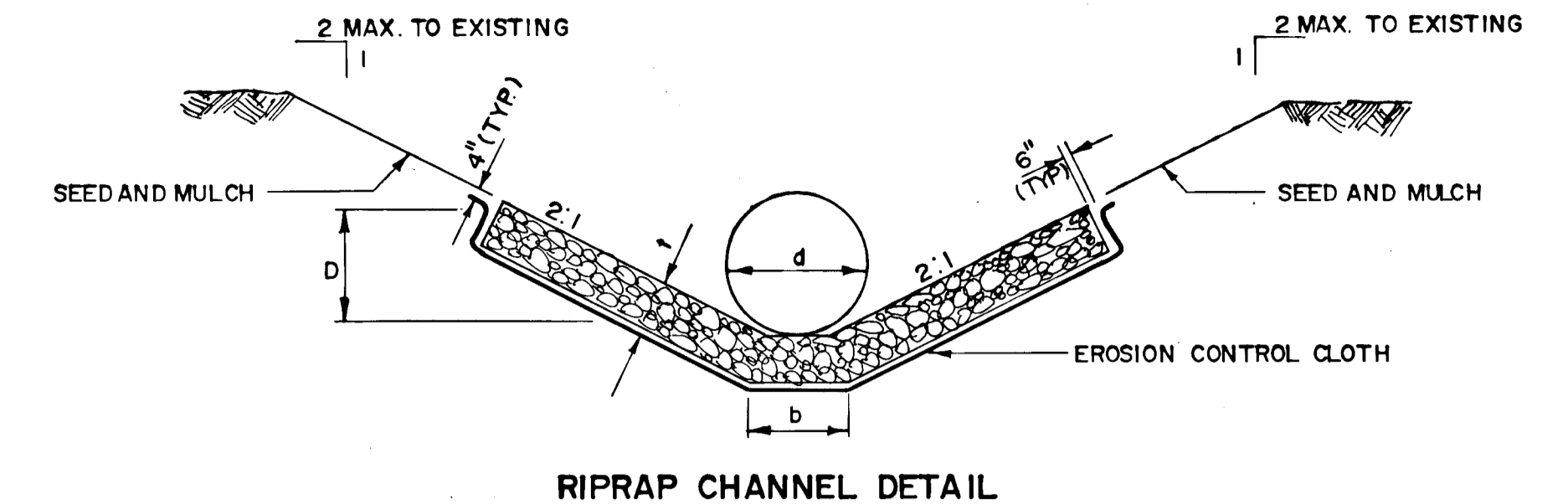


ELEVATION

OPENING	DIMENSIONS						QUANTITIES			
	D	A	B	C	E	F	H	L	CONC.	STEEL
AREA	SC. FT.								CY.	LB.
71.47	19.84	12"	20"	12"	3'-6"	10"	4'-9"	28'-0"	6.05	243

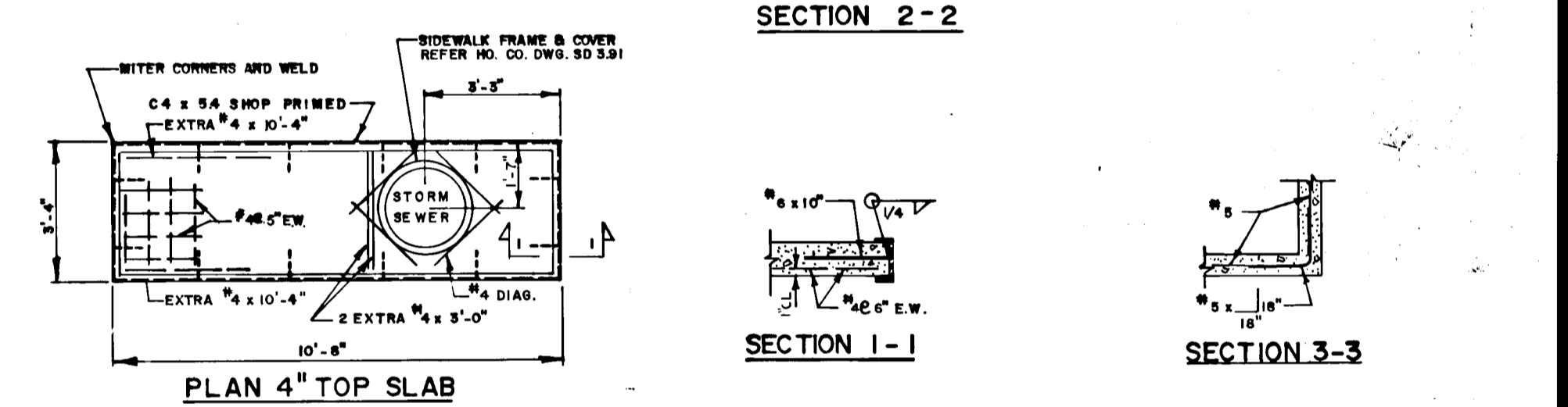
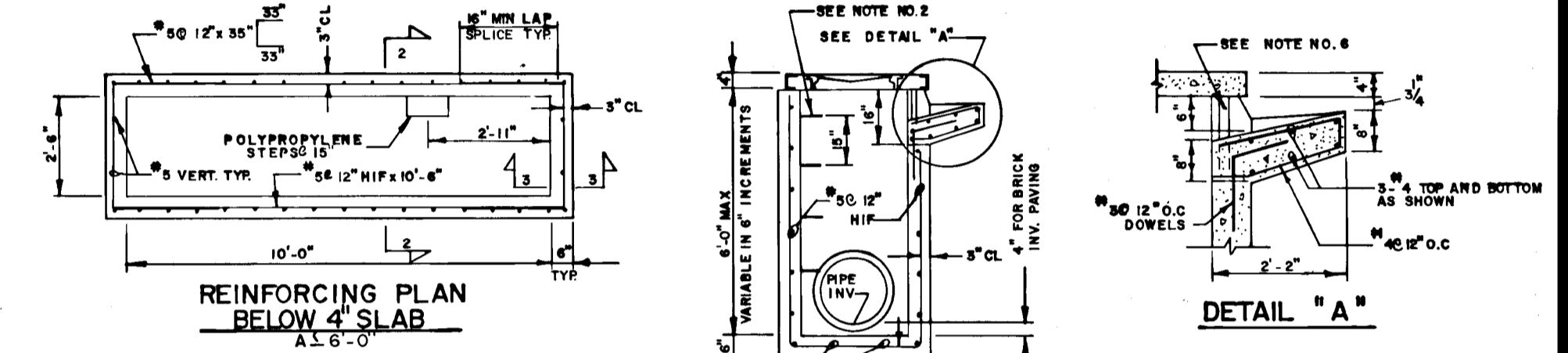
STRUCTURE SCHEDULE

STRUC.	TYPE	INVERT IN	INVERT OUT	TOP ELEV.	ROAD STA.	REMARKS
I-1	A-5	384.80'	383.95'	393.55'	€ STA. 8+68.50 GUDEL DR.	HO. CO. Std. S.D. 4.01
I-2	A-10	388.30'	385.64'	393.55'	€ STA. 8+68.50 GUDEL DR.	HO. CO. Std. S.D. 4.01
I-3	A-5 W/ DEFLECTORS	403.00'	401.67'	405.95'	€ STA. 4+99.00 GUDEL DR.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-4	A-5 W/ DEFLECTORS	416.40'	416.29'	421.21'	€ STA. 0+51.00 HAWK CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-5	A-10 W/ DEFLECTORS	417.20'	416.96'	421.46'	€ STA. 0+57.00 HAWK CT.	HO. CO. Std. S.D. 4.02, S.D. 4.83
I-6	A-10	---	417.65'	421.40'	€ STA. 1+50.00 GUDEL DR.	HO. CO. Std. S.D. 4.02
I-7	A-5 W/ DEFLECTORS	---	392.30'	396.23'	€ STA. 7+03.00 GUDEL DR.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-8	A-5 W/ DEFLECTORS	399.60'	399.06'	403.48'	€ STA. 0+53.00 EAGLE CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-9	A-5 W/ DEFLECTORS	---	399.88'	403.48'	€ STA. 0+53.00 EAGLE CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-10	A-5 W/ DEFLECTORS	392.75'	391.88'	392.01'	€ STA. 0+52.00 STARLING RD.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-11	A-10 W/ DEFLECTORS	394.00'	393.41'	397.28'	€ STA. 0+5700 STARLING RD.	HO. CO. Std. S.D. 4.02, S.D. 4.83
I-12	A-5 W/ DEFLECTORS	418.75'	418.00'	422.86'	€ STA. 0+44.00 ORIOLE CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-13	A-5 W/ DEFLECTORS	419.35'	418.75'	422.86'	€ STA. 0+50.00 ORIOLE CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-14	A-10	419.90'	419.55'	423.28'	€ STA. 6+38.00 STARLING RD.	HO. CO. Std. S.D. 4.02
I-15	A-10	---	420.05'	423.28'	€ STA. 6+38.00 STARLING RD.	HO. CO. Std. S.D. 4.02
I-16	A-5	398.10'	395.00'	405.36'	€ STA. 5+21.82 SPARROW CT.	HO. CO. Std. S.D. 4.01
I-17	A-10	399.50'	398.76'	405.36'	€ STA. 5+21.82 SPARROW CT.	HO. CO. Std. S.D. 4.02
I-18	A-5	398.75'	398.03'	402.79'	€ STA. 14+23.33 GUDEL DR.	HO. CO. Std. S.D. 4.01
I-19	A-5	---	398.98'	402.79'	€ STA. 14+23.33 GUDEL DR.	HO. CO. Std. S.D. 4.01
I-20	A-5 W/ DEFLECTORS	400.50'	399.97'	404.29'	€ STA. 0+57.00 FINCH CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
I-21	A-5 W/ DEFLECTORS	---	400.64'	404.29'	€ STA. 0+57.00 FINCH CT.	HO. CO. Std. S.D. 4.01, S.D. 4.83
MH-1	STANDARD MANHOLE	366.40'	360.05'	375.00'	SEE PLAN & PROFILE	HO. CO. Std. S.D. 5.01
MH-2	STANDARD MANHOLE	392.50'	391.46'	395.96'	€ STA. 7+03.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-3	STANDARD MANHOLE	397.80'	395.52'	401.83'	€ STA. 5+85.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-4	STANDARD MANHOLE	413.50'	413.12'	416.88'	€ STA. 2+80.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-5	STANDARD MANHOLE	390.50'	390.10'	394.36'	€ STA. 9+80.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-6	STANDARD MANHOLE	397.90'	397.15'	401.22'	€ STA. 1+65 STARLING RD.	HO. CO. Std. S.D. 5.01
MH-7	STANDARD MANHOLE	403.78'	401.90'	407.07'	€ STA. 2+70.00 STARLING RD.	HO. CO. Std. S.D. 5.01
MH-8	STANDARD MANHOLE	410.00'	409.73'	414.34'	€ STA. 3+83.00 STARLING RD.	HO. CO. Std. S.D. 5.01
MH-9	STANDARD MANHOLE	417.50'	416.32'	420.88'	€ STA. 5+44.00 STARLING RD.	HO. CO. Std. S.D. 5.01
MH-10	STANDARD MANHOLE	401.80'	399.90'	405.43'	€ STA. 5+03.00 SPARROW CT.	HO. CO. Std. S.D. 5.01
MH-11	STANDARD MANHOLE	404.60'	404.40'	412.00'	SEE PLAN & PROFILE	HO. CO. Std. S.D. 5.01
MH-12	STANDARD MANHOLE	396.00'	388.35'	405.70'	€ STA. 15+91.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-13	STANDARD MANHOLE	397.10'	396.85'	402.94'	€ STA. 15+08.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
MH-14	STANDARD MANHOLE	399.70'	399.23'	402.79'	€ STA. 13+25.00 GUDEL DR.	HO. CO. Std. S.D. 5.01
S-1	C- ENDWALL	---	359.00'	---	SEE PLAN AND PROFILE	HO. CO. Std. S.D. 5.21
S-2	C- ENDWALL MODIFIED METAL PIPE ARCH	---	394.50'	---	SEE PLAN, PROFILE AND DETAIL SHEET	S.H.A. Std. S.D. 355.01
S-3	Std. METAL END SECTION FOR 7'X47' ARCH METAL PIPE	399.5'	---	---	SEE PLAN AND PROFILE	S.H.A. MD-371.01
S-4	Std. SHALLOW MANHOLE MODIFIED WITH 10' SLOTS OPENING 4 SIDES	SLOT ELEV = 412.5'	407.28'	414.08'	SEE PLAN, PROFILE AND DETAIL SHEET	S.H.A. MD-383.00
S-5	A- HEADWALL	---	387.00'	---	SEE PLAN AND PROFILE	HO. CO. MD- S.D. 5.11
S-6	D-INLET (OPEN 4 SIDES)	SLOT ELEV = 387.50'	390.60'	398.35'	SEE PLAN AND PROFILE	* S.H.A. MD-383.00 (MODIFIED)
S-7	C- ENDWALL	396.00'	396.00'	---	SEE PLAN AND PROFILE	HO. CO. Std. S.D. 5.21



RIPRAP CHANNEL DESIGN DATA (n=0.04)

STRUC.	A ^{1/2}	W _p	R _H	R _L	S	S ^{1/2}	Q	V	d	D	b	t	d ₅₀	d _{MAX}
S-1A	9.2	9.6	0.96	0.97	0.010	0.10	33.8cb	3.6	24"	1.7'	2.0	1.2'	9"	14"
S-2	31.3	1.79	1.74	1.45	0.010	0.10	185cb	5.39	---	2.9'	5.0	1.2'	9"	14"
S-5	9.8	9.6	0.96	0.98	0.010	0.10	31.0	3.6	27"	1.7'	2.0	1.2'	6"	9"
S-1B	4.7	6.9	0.68	0.77	0.049	0.22	30.0	6.4fps	---	1.2	2.0	1.2'	6"	9"



PRECAST STANDARD TYPE A-10 INLET

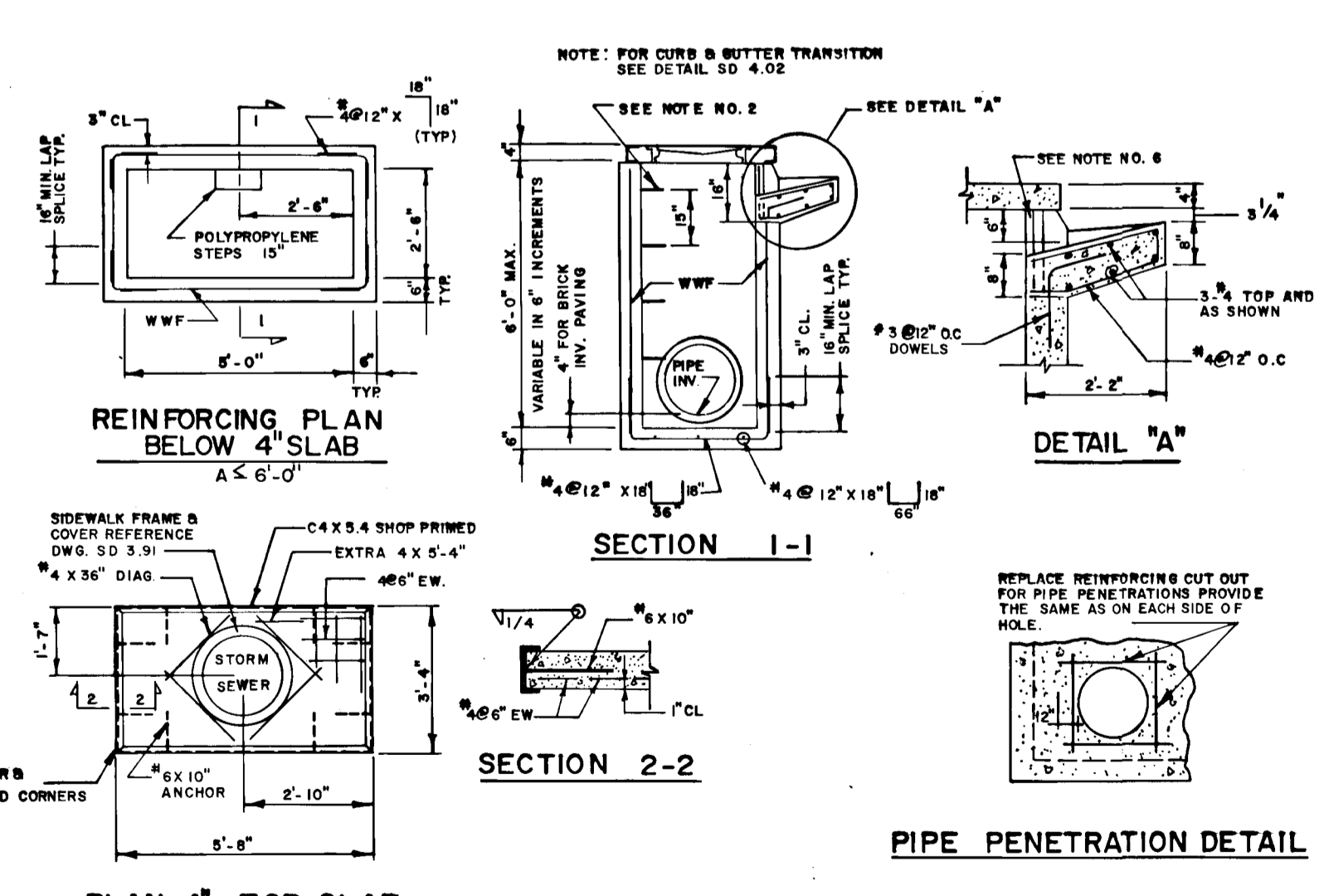
HOWARD COUNTY STANDARD NO. SD 4.41

NOTES:

- CONCRETE SHALL CONFORM TO MARYLAND DOT STANDARD SPECIFICATION FOR CONSTRUCTION MATERIALS 1982, MIX NO. 6. IN ADDITION, $f_c = 4500$ PSI @ 28 DAYS, CEMENT SHALL BE TYPE III, AND 8 COARSE AGGREGATE SHALL BE USED.
- POLYPROPYLENE STEPS SHALL BE TYPE PS4 OR PS5 AS MANUFACTURED BY M.A. INDUSTRIES, INC. STEP SHALL BE INSTALLED IN LINE WHERE $A > 3'-6"$ (SEE G.5.21).
- REFERENCE DRAWING FOR TYPE A-10 INLET IS HOWARD COUNTY STANDARD DRAWING NO. SD 4.02
- REINFORCING SCHEDULE IS BASED ON US METHOD AND DESIGN LOADS AS SPECIFIED IN AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 13th EDITION, 1983 AND INTERIM SPECIFICATIONS.
- WEIGHTS: 4" TOP SLAB WT = 2,000#
MAX. INLET BOX WT = 24,000# (10' HEIGHT, I.D.)
RISER WT / VF = 2,000# / VF
- PROVIDE 3" @ RUST PROOF STEEL PIPE, PAINTED GRAY AT MID POINT OF THROAT, FILL WITH CONCRETE.

NOTES:

- CONCRETE SHALL CONFORM TO MARYLAND DOT STANDARD SPECIFICATION FOR CONSTRUCTION MATERIALS 1982, MIX NO. 6. IN ADDITION, $f_c = 4500$ PSI @ 28 DAYS, CEMENT SHALL BE TYPE III AND 8 COARSE AGGREGATE SHALL BE USED. WWF 4x4-W4xW4 (0.24 SQ IN / FT.)
- POLYPROPYLENE STEP SHALL BE TYPE PS4 OR PS5 AS MANUFACTURED BY M.A. INDUSTRIES, INC. STEP SHALL BE INSTALLED IN LINE WHERE $A > 3'-6"$ (SEE G.5.21)
- REFERENCE DRAWING FOR TYPE A-5 INLET IS HOWARD COUNTY STANDARD DWG. NO. SD 4.01
- REINFORCING SCHEDULE IS BASED ON US METHOD AND DESIGN LOADS AS SPECIFIED IN AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 13th EDITION, 1983 AND INTERIM SPECIFICATIONS.
- WEIGHTS: 4" TOP SLAB = 950#
MAX. INLET BOX WT = 7,200#
RISER WT. / VF = 1,300# / VF
- PROVIDE 3" @ RUST PROOF STEEL PIPE, PAINTED GRAY AT MID POINT OF THROAT, FILL WITH CONCRETE.



PIPE PENETRATION DETAIL

PRECAST STANDARD TYPE A-5 INLET

HOWARD COUNTY STANDARD NO. SD. 4.40

APPROVED OFFICE OF PLANNING AND ZONING

DATE: 11/22/87
11/22/87
DATE: 11/22/87

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
DATE: 12/21/87
12/21/87
DATE: 12/21/87

NO.	REVISION	BY	DATE
1	ADJUST S-6	KAM	9-13-90

STORM DRAIN DETAILS
MCKENZIE MEADOWS
SECTION 2
TAX MAP NO. 17 PARCEL 36
(O.P. & Z. REF. NO. P-87-51)
2nd ELECTION DISTRICT HOWARD COUNTY, MD

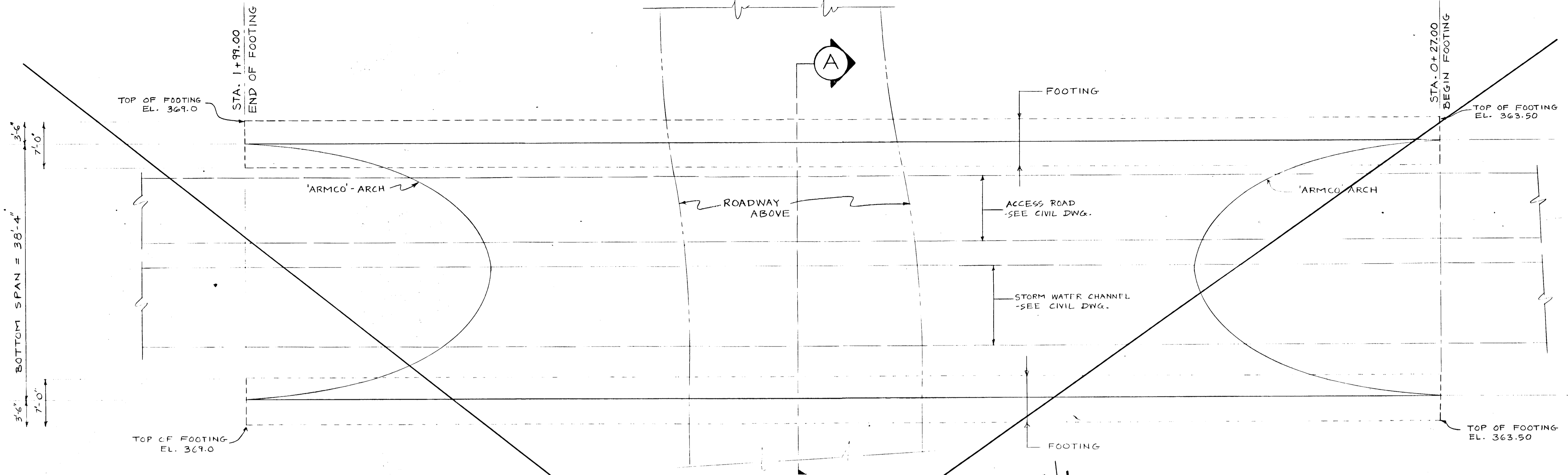
JOHN E. HARMS JR. AND ASSOCIATES INC.

CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS

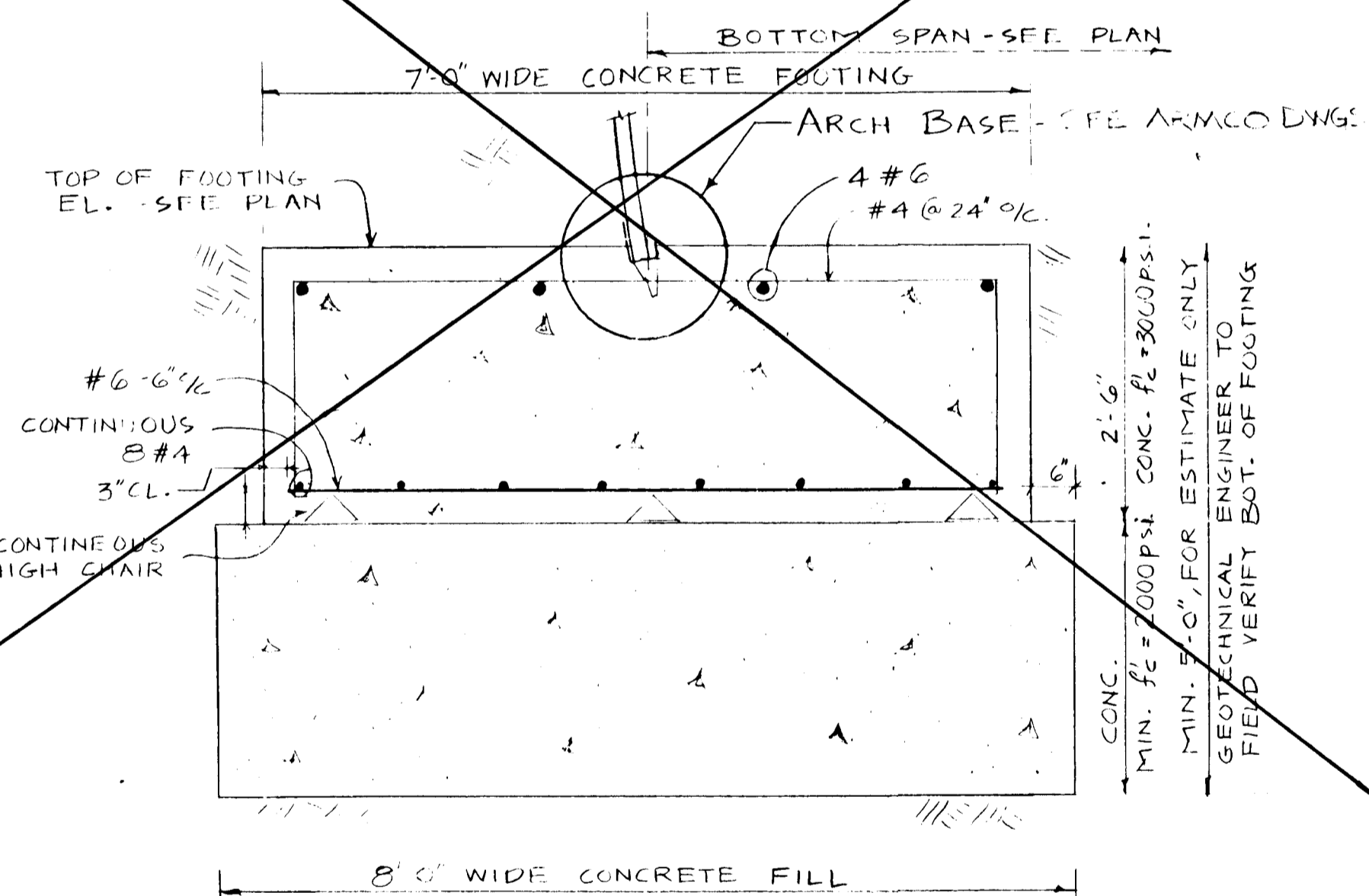
9030 RED BRANCH ROAD 21045 SUITE 100
COLUMBIA, MARYLAND

DESIGNED BY: J.A.B.
DRAWN BY: P.O.A.
CHECKED BY: K.B.C.
DATE: 7-87
SCALE: N.T.S.
W.O. NO.: 2486002

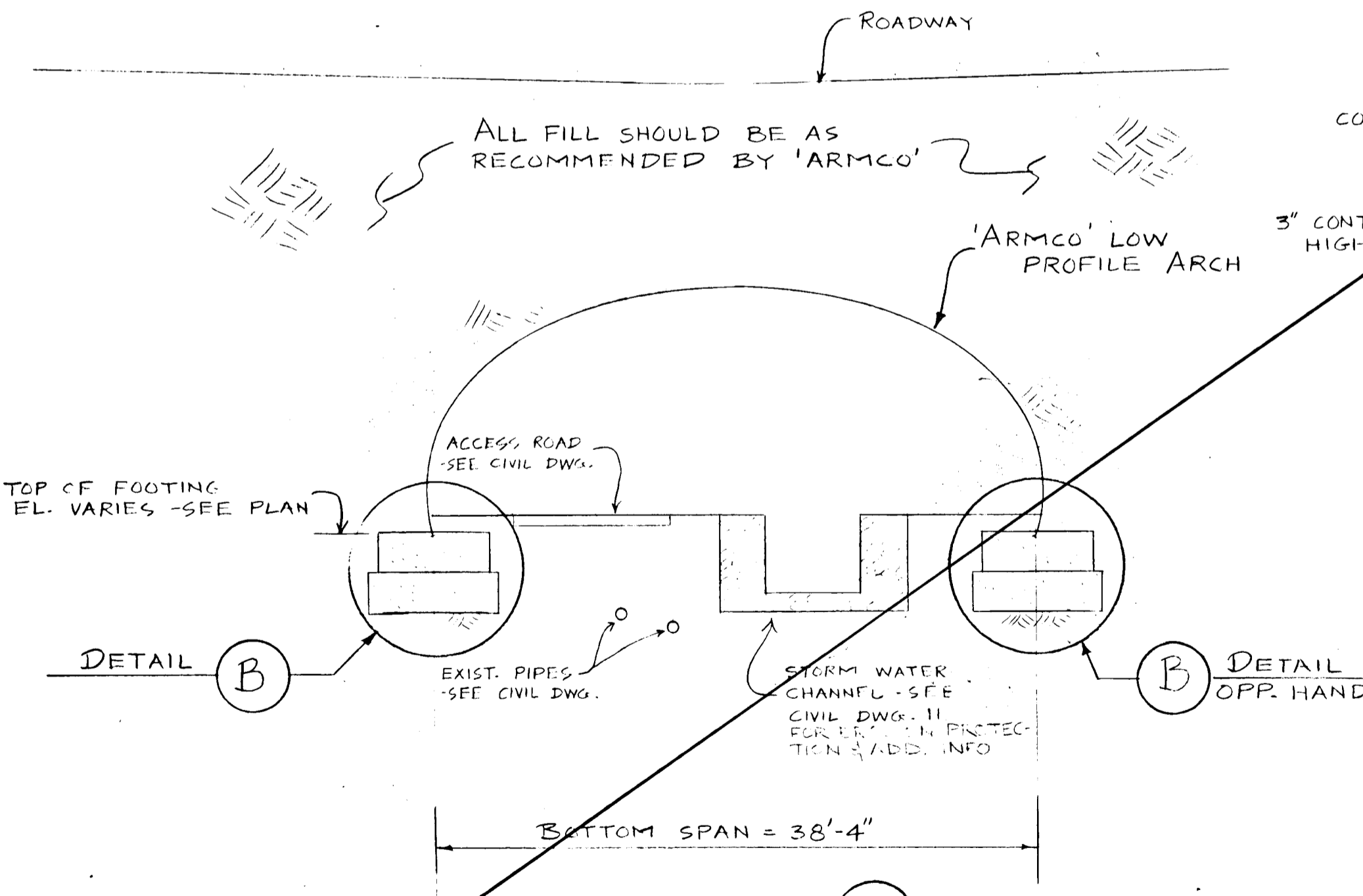
12 SHEET OF 20
F-88-36



FOUNDATION PLAN
SCALE - 1/8" = 1'-0"



TYPICAL FOOTING DETAIL (B)
SCALE - 3/4" = 1'-0"



SECTION (A)
SCALE - 1/8" = 1'-0"

GENERAL NOTES

- DESIGN LIVE LOADS:**
A. ARCH BASE: REACTIONS - HORIZONTAL, RH = 7.417 #/FT.
VERTICAL, RV = 45.434 #/FT.
- STANDARDS & DESIGN STRESSES:**
A. CONCRETE - SPECIFICATION - ACI 318 & ACI 301
USAGE: CLASS 3000 P.S.I. FOR ALL WORK UNLESS NOTED.
B. REINFORCING BARS - A615, GRADE 60.
- DIMENSION:** GENERAL CONTRACTOR TO VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK
- FOUNDATION:**
A. ELEVATIONS OF TOP OF FOOTINGS HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION
B. SHOULD IT BE FOUND NECESSARY TO VARY THE ELEVATIONS GIVEN TO SATISFY THE FOREGOING REQUIREMENTS, THE ENGINEER SHALL BE NOTIFIED BEFORE PROCEEDING WITH THE WORK.
C. ALL NEW FOOTINGS SHALL BE ON NATIVE UNDISTURBED SOIL AND ARE DESIGNED FOR AN ASSUMED SOIL BEARING CAPACITY OF 6500 P.S.F. WHICH MUST BE VERIFIED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER.
D. REFER TO GEOTECHNICAL REPORT BY ATEC ASSOCIATES, INC. FOR ADDITIONAL FOUNDATION AND INSPECTION INFORMATION.
E. ALL FILL SHOULD BE AS RECOMMENDED BY 'ARMCO' AND GEOTECHNICAL ENGINEER.
- CONCRETE:**
A. CHAMFER ALL EXPOSED CORNERS OF FORMED CONCRETE - 3/4"
B. SHOP DRAWINGS SHALL SHOW ALL NECESSARY SECTIONS AND DETAILS FOR PROPER POSITIONING OF REINFORCEMENT. PROVIDE APPROVED ACCESSORIES AS REQUIRED.
- TESTING AND INSPECTION:**
A. CONCRETE SHALL BE SAMPLED AND TESTED ACCORDING TO ACI 301-84 AND THE RESULTS OF THE TESTS SHALL BE FORWARDED TO THE ENGINEER.
B. NOTIFY ENGINEER FOR REVIEW OF FOUNDATIONS REINFORCEMENT IN PLACE PRIOR TO POURING ANY CONCRETE.

McKENZIE MEADOWS
FOUNDATION FOR ROAD ARCH
TAX MAP 17 PARCEL 36
2nd ELECTION DISTRICT HOWARD COUNTY, MD.

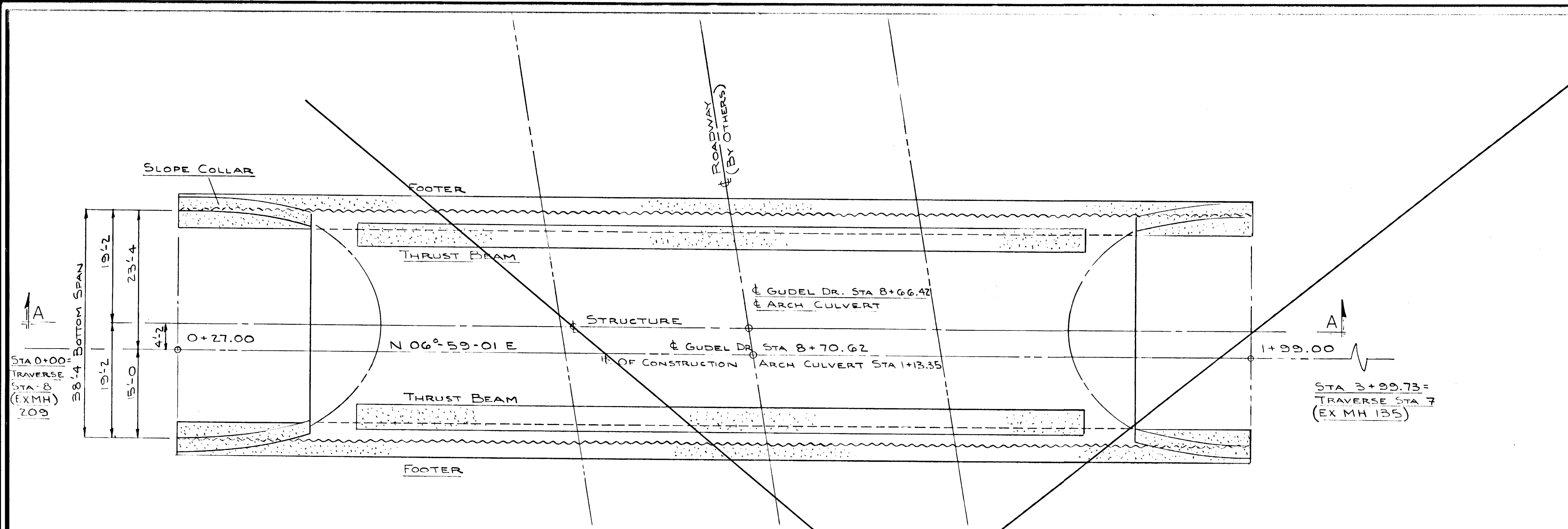
JOHN E. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
9030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELEPHONE 13011 740-5200

APPROVED OFFICE OF PLANNING AND ZONING
APPROVED HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, LAND DEVELOPMENT DIVISION
CHIEF, BUREAU OF HIGHWAYS
CHIEF, BUREAU OF ENGINEERING
12/22/87

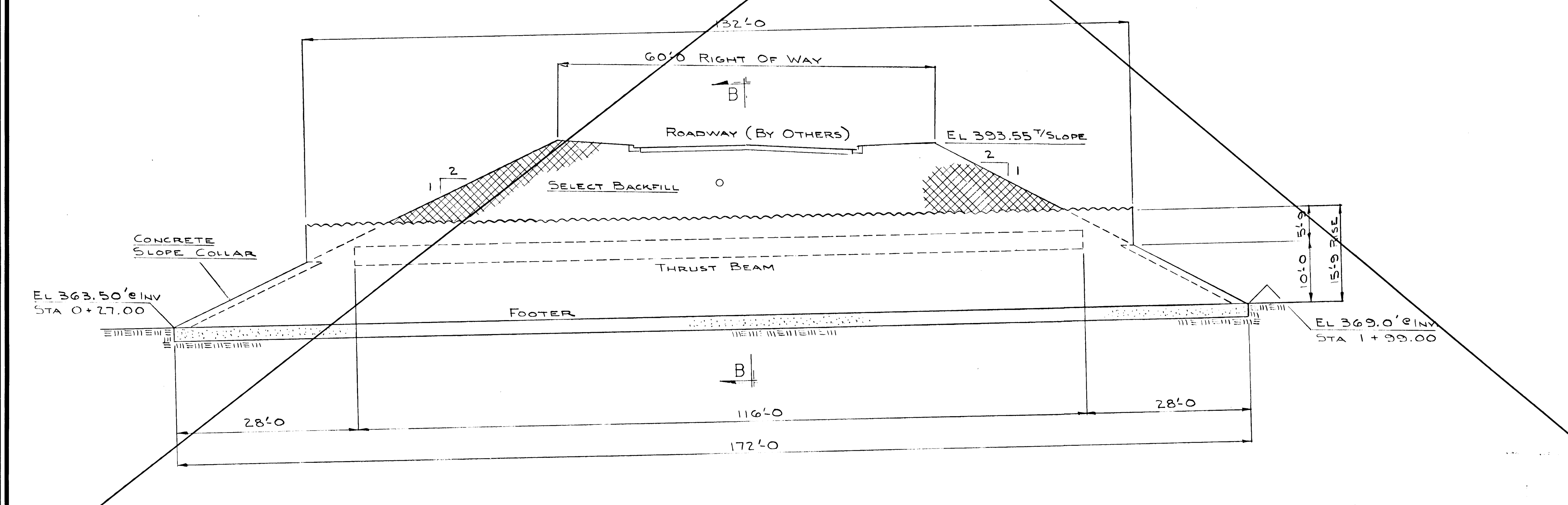
FAISANT ASSOCIATES, INC.
CONSULTING ENGINEERS
14 WEST 25TH ST.
BALTIMORE, MD. 21218

NO.	REVISION	BY	DATE

DESIGNED BY: ACP/EF
DRAWN BY: ACP
CHECKED BY: SJR
DATE: 7-28-87
SCALE: AS SHOWN
W.O. NO. 44-86000
13 SHEET OF 20



PLAN VIEW
SCALE 1"=10'-0"



SECTION A-A
ARCH CULVERT
SCALE 1"=10'-0"

BACKFILL

1. Select borrow, A-1 type material from AASHTO specification M-145 placed in 8-inch loose lifts and compacted to 90% of maximum density. Optimum moisture and maximum density shall be determined by AASHTO Test T-180, Method D. The top foot at subgrade elevation shall be compacted to 95% of maximum density as determined by the above test.
2. Each layer of backfill shall be compacted to a relative compaction of not less than 90%, per AASHTO Test Method No. T-180. Complete and regular monitoring of the pipe arch culvert shape shall be performed during the backfilling operation. Compaction equipment or methods which cause changes in pipe arch culvert shape in excess of 2%, or which cause damage to the structure shall not be used. Initial lifts over the crown of the pipe arch culvert are to be compacted to required density with hand operated equipment until the height of cover over the crown of the culvert reaches a minimum of 3 feet. Heavy construction equipment shall not be operated within 2 feet of the side plates of the pipe arch culvert and shall not pass over the pipe arch culvert until a minimum of 3 feet of compacted cover has been placed over the structure.

The manufacturer of the structural plate pipe arch shall provide inspection of all structural backfilling to 3 feet over the structure. This inspector shall approve all backfill materials and the placement and compaction thereof. The inspector shall have full authority to stop such work. The Owner shall have field density tests made of the compacted backfill at the request and direction of the manufacturer's inspector.
3. The material used in the fill at the time of compaction shall have a moisture content that is within 3% above or below the optimum moisture content as determined by the above described test. The material removed from the excavation for this structure may be used in the backfill if it meets the above criteria.

NOTES

- All Multi-Plate material to be galvanized and in accordance with AASHTO M-167.
- Erection of Low Profile Arch is in accordance with Section-9 of the AASHTO bridge specifications.
- Reinforced Concrete Thrust Beams are to be cast on assembled structure during backfilling with the reinforcing steel connected to the corrugated plates.
- Monitoring of structures shape and alignment along with the inspection and compaction testing of the backfill to be performed by a manufacturer representative or approved engineer.
- All concrete to have a minimum 28 day compressive strength of 3000 P.S.I. with cold weather provisions being taken if required as stipulated in the A.C.I. Code.

APPROVED OFFICE OF PLANNING AND ZONING
[Signature]
DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION
DATE 12/2/87

(O.P. & Z. REF. NO. P-87-51)

McKENZIE MEADOWS
SECTION TWO
FOUNDATION FOR ROAD ARCH
TAX MAP 17 PARCEL 36
2nd ELECTION DISTRICT HOWARD COUNTY, MD.

JOHN E. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
9030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELEPHONE 1301 740-5200



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, LAND DEVELOPMENT DIVISION
[Signature] DATE 12-1-87
CHIEF, BUREAU OF HIGHWAYS
[Signature] DATE 12-21-87
CHIEF, BUREAU OF ENGINEERING

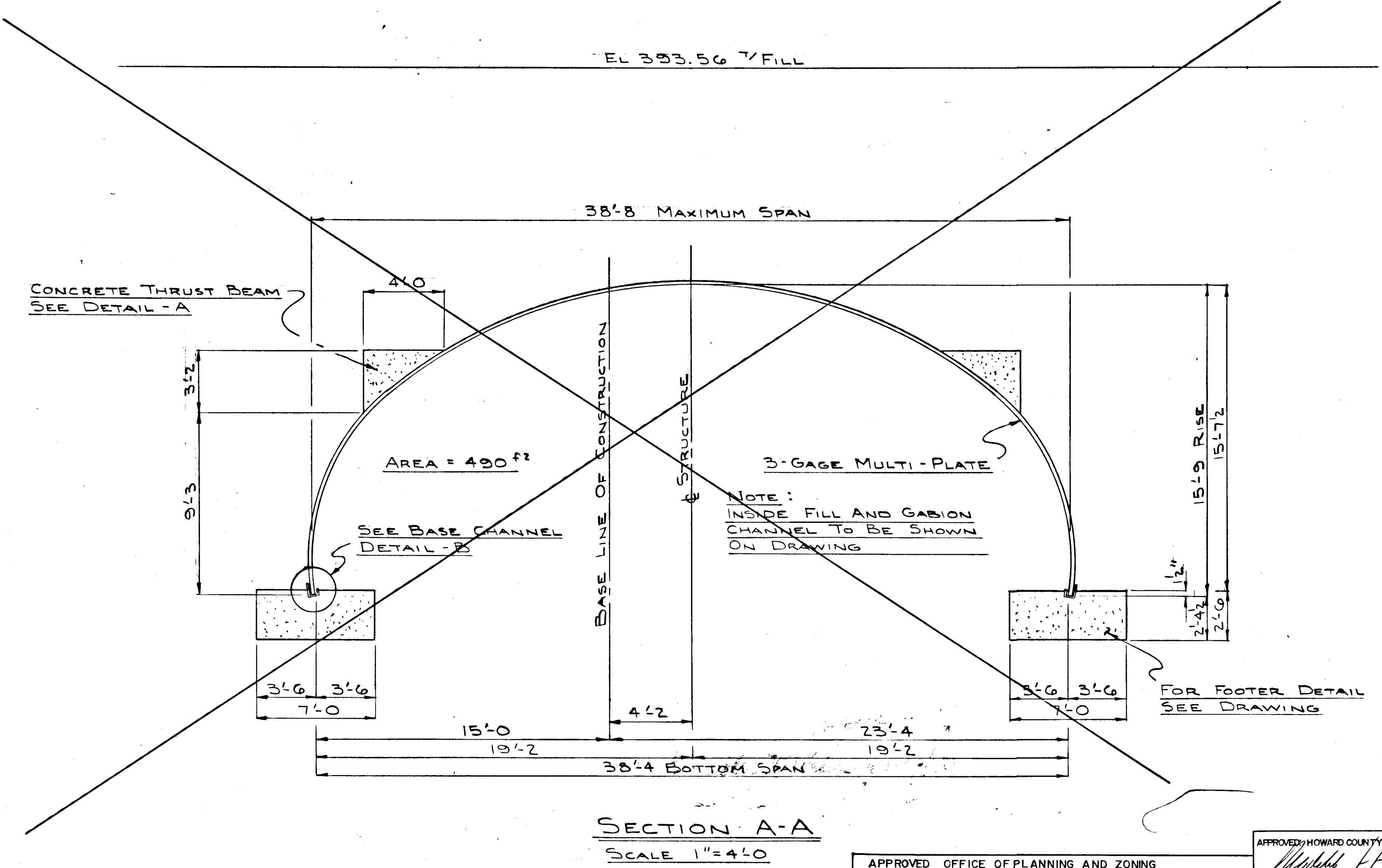
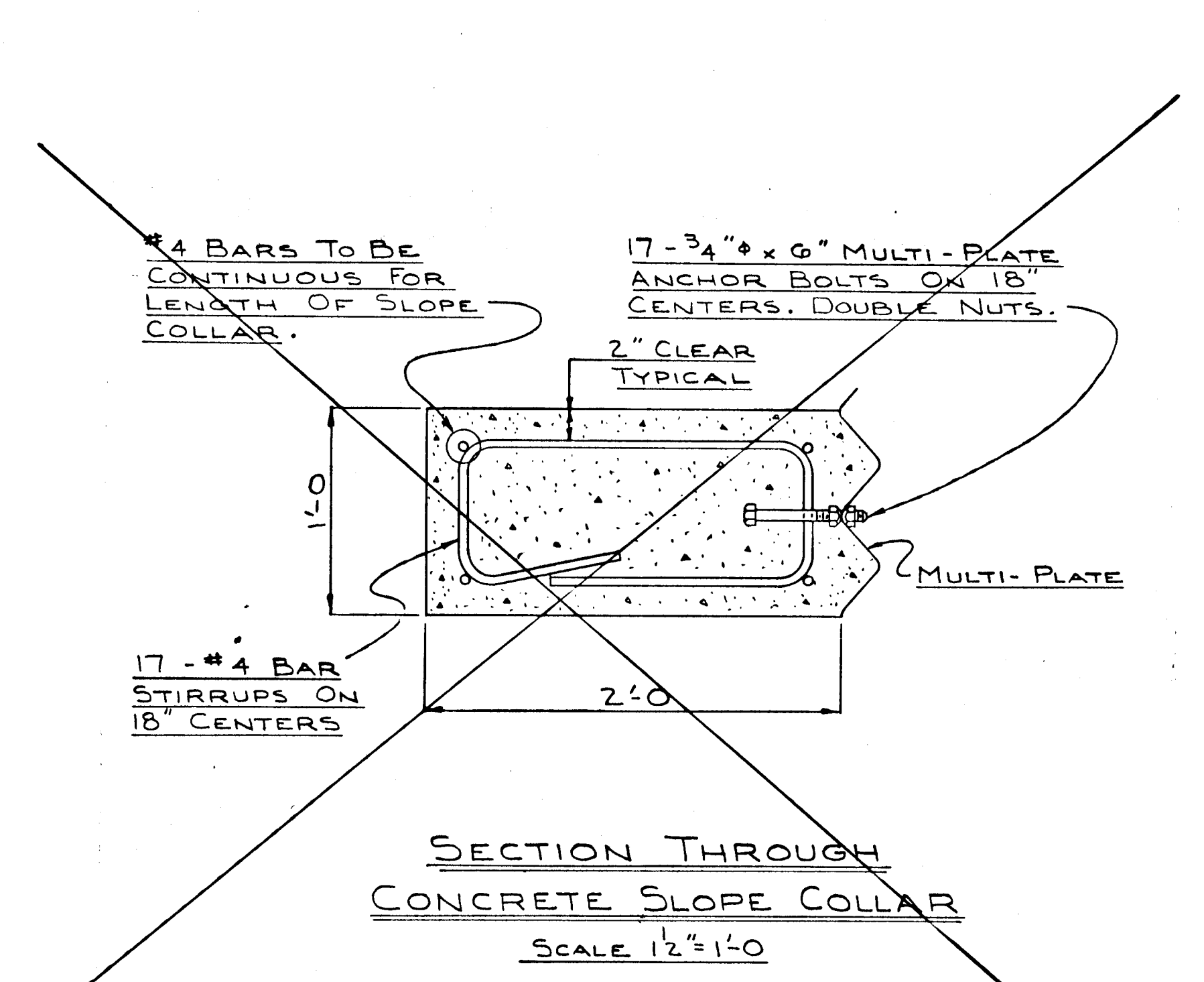
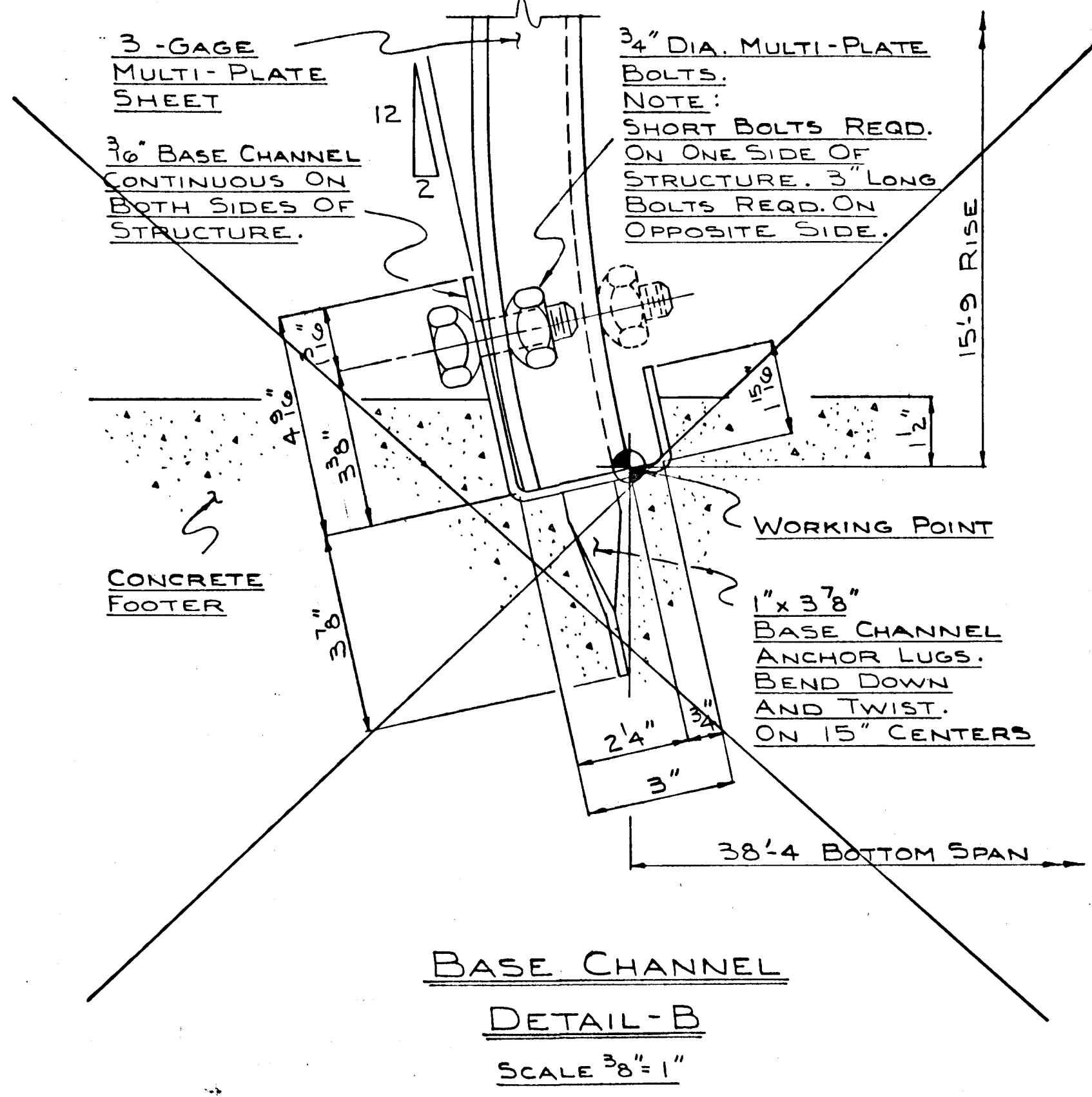
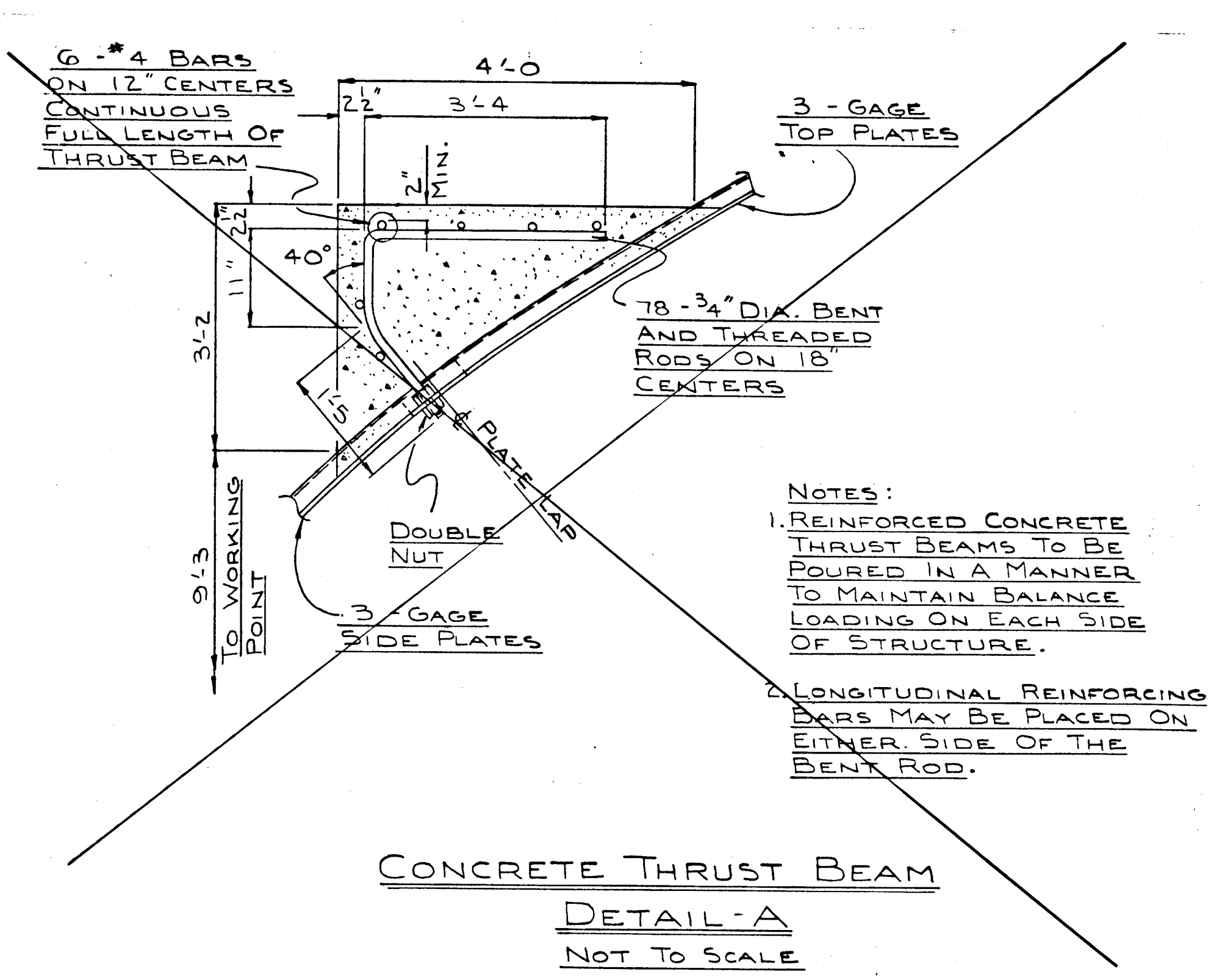
NO.	REVISION	BY	DATE

DESIGNED BY: _____
DRAWN BY: _____
CHECKED BY: _____
DATE: 7/87
SCALE: AS SHOWN
W.O. NO. 44-86-002 14 SHEET OF 20

CONTECH (ARMCO) 38'-4 SPAN x 15'-9 RISE, 3-GAGE, MULTI-PLATE, LOW PROFILE, SUPER SPAN STREAM ENCLOSURE

802

F-88-36



STRUCTURAL ANALYSIS

ARMCO (CONTECH) LOW PROFILE ARCH

SPAN = 38'-8"
 RISE = 15'-9"
 TOP RADIUS RT = 24'-0" = 288"
 CORNER RADIUS RC = 10'-11" = 131"
 STRUCTURE REFERENCE NO. = 126A42
 AREA = 495 SQ. FT.
 HEIGHT OF COVER = 16.5 FT.
 LIVE LOAD = H-20 HIGHWAY

COMPUTE RING COMPRESSION

- PRESSURE ON CROWN Pt = DL + LL
 DL = 16.5 x 120 = 1980 psf
 LL = AIST T 3-1 = 100 psf
 Pt = 2080 psf
- RING COMPRESSION C = $\frac{P_t \times R_t}{A}$
 = $\frac{2080 \times 24}{495}$
 = 4992 lb/ft of structure
- EFFECTIVE WALL STRESS $f_c = \frac{C}{A}$ for 3 gage (AISI T 1-10)
 = $\frac{4992 \text{ lb/ft} \times 3.658 \text{ in. sq. ft.}}{13647 \text{ psi}}$
- ULTIMATE WALL STRESS $D = 2 \times R_t = 576"$ $r = .692$ (1-10)
 $D/r = 833$
 $f_b = \frac{4.23 \times 10.9 \text{ sh}}{10/f \text{ sq}}$
 = 7116 psi
- DESIGN STRESS $f_d = f_b/2 = 3558 \text{ psi}$
 $f_c = 5f_d = 17790 \text{ psi} > 13647 \text{ psi, as req'd.}$
 Max. Allowable Wall Stress $f_y/2 = 33000/2 = 16500 \text{ psi} > f_c > 13647 \text{ psi, as req'd.}$
- SEAM STRENGTH $SS > C$ $SS = \text{ULTIMATE SEAM STR.}/2$ (1-12)
 $132000/2 = 66000 \text{ psi} > 49920 \text{ psi, as req'd.}$
- FLEXIBILITY FACTOR $FF = \frac{D \times D}{E}$ $E = 30 \times 10^6 \text{ PSI}$
 $FF = \frac{833 \times 833}{30 \times 10^6} = .07564$
 adjust SS arc = $.07564/5 = .015 < .020$ allowable

MOTT ASSOCIATES, INC.
 CONSULTING ENGINEERS

SUITE 200
 1001 CROMWELL BRIDGE RD.
 TOWSON, MD. 21284

Professional Engineer
 Charles W. Bradley

(O.P. & Z. REF. NO. P-87-51)

McKENZIE MEADOWS SECTION TWO FOUNDATION FOR ROAD ARCH

TAX MAP 17 PARCEL 36
 2nd ELECTION DISTRICT HOWARD COUNTY, MD.

JOHN E. HARMS JR. AND ASSOCIATES INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS

9030 RED BRANCH ROAD COLUMBIA, MARYLAND 21045 SUITE 100 TELEPHONE (301) 740-5200

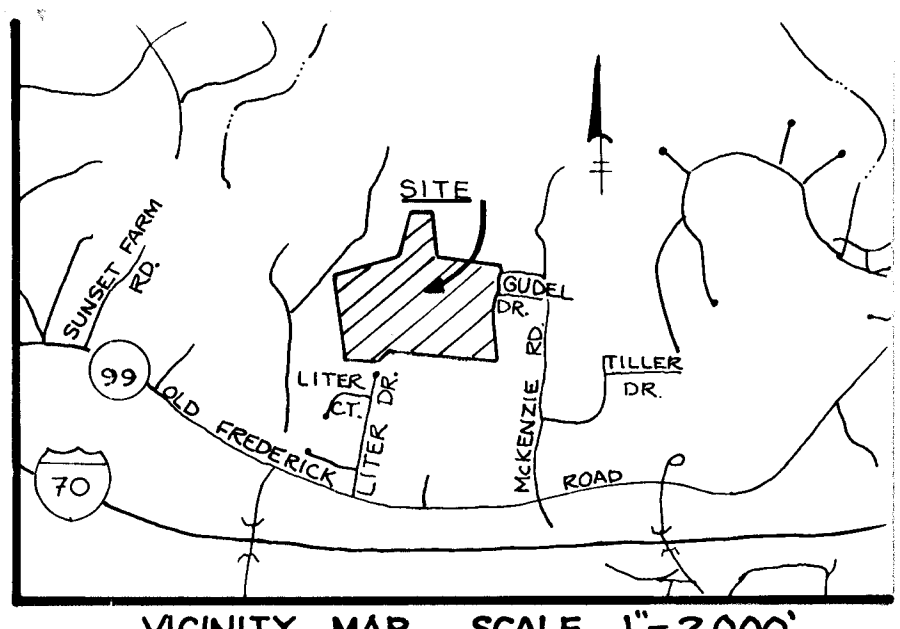
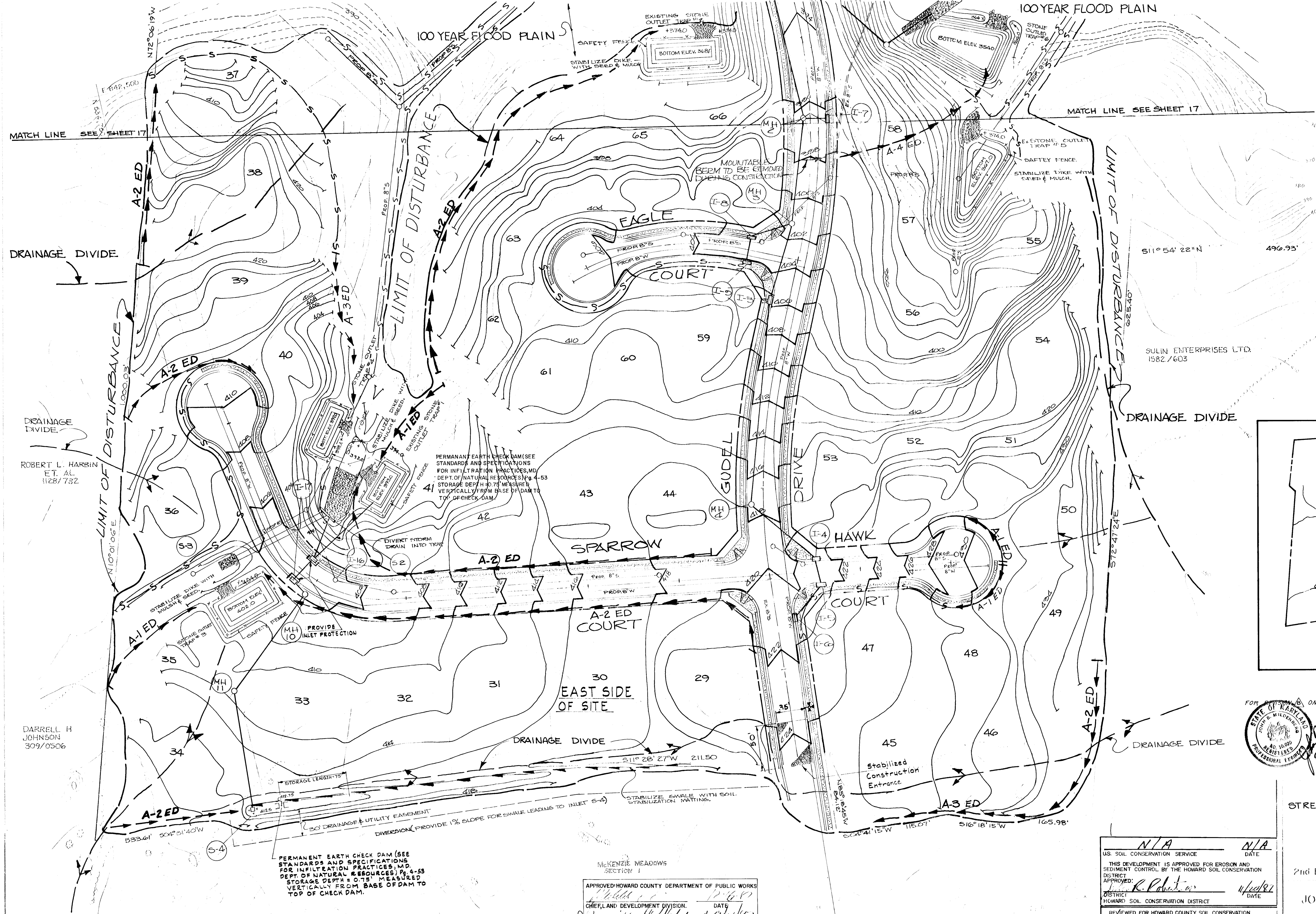
APPROVED OFFICE OF PLANNING AND ZONING

APPROVED HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, Land Development Division
 Chief, Bureau of Highways
 Chief, Bureau of Engineering

12/22/87

NO.	REVISION	BY	DATE

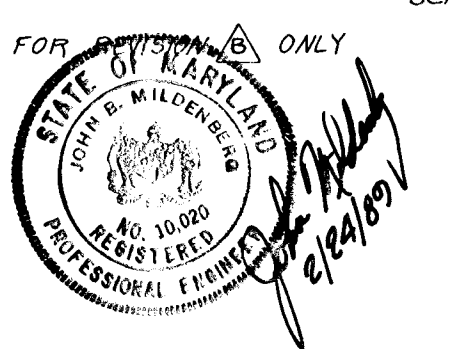
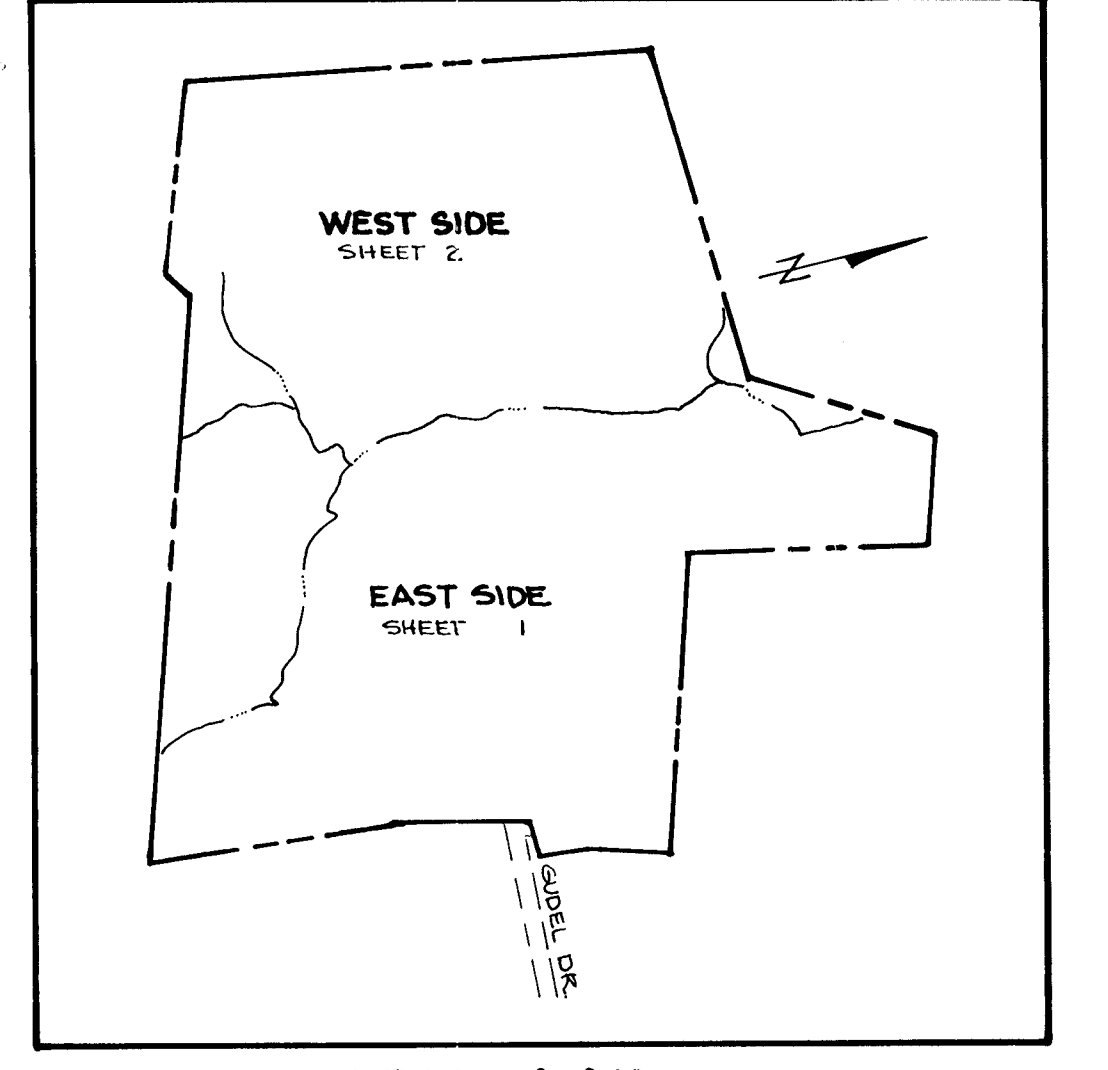
DESIGNED BY: _____
 DRAWN BY: _____
 CHECKED BY: _____
 DATE: 7/87
 SCALE: AS SHOWN
 W.O. NO. 44-86-002 15 SHEET OF 20



NOTE:
1. TOPOGRAPHY FROM POTOMAC AERIAL SURVEY.

LEGEND

SYMBOL	DESCRIPTION
	WETLAND
	EARTH DIKE
	SILT FENCE
	DRAINAGE DIVIDE
	STABILIZE CONSTRUCTION ENTRANCE
	FLOW DIRECTION
	LIMIT OF DISTURBANCE
	DIVERISON



(O.P. & Z. REF. NO. P-87-51)

STREET TREE, GRADING AND SEDIMENT CONTROL
McKENZIE MEADOWS
 SECTION 2
 TAX MAP 17 PARCEL 35
 2nd ELECTION DISTRICT HOWARD COUNTY, MD.

JOHN F. HARMS JR. AND ASSOCIATES INC.
 CONSULTING ENGINEERS ARCHITECTS SURVEYORS

9030 RED BRANCH ROAD SUITE 100
 COLUMBIA, MARYLAND 21046 TELEPHONE 301-260-4200

OWNER:
 COSCAN WASHINGTON INC.
 8521 LEESBURG PIKE
 SUITE 200
 VIENNA, VIRGINIA 22180
 PHONE (703) 556-9090

DEVELOPER:
 COSCAN WASHINGTON INC.
 8521 LEESBURG PIKE
 SUITE 200
 VIENNA, VIRGINIA 22180
 PHONE: (703) 556-9090

PERMANENT EARTH CHECK DAM (SEE STANDARDS AND SPECIFICATIONS FOR INFILTRATION PRACTICES, MD DEPT. OF NATURAL RESOURCES) Pg. 4-53 STORAGE DEPTH 0.75' MEASURED VERTICALLY FROM BASE OF DAM TO TOP OF CHECK DAM.

DEVELOPERS CERTIFICATE:
 "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 NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT."
 Signature: *Stephen P. ...* DATE: 8/6/87

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 CHIEF, LAND DEVELOPMENT DIVISION. DATE: 8/1/87
 Signature: *Joseph W. ...*
 CHIEF, BUREAU OF HIGHWAYS. DATE: 8/1/87
 Signature: *...*
 CHIEF, BUREAU OF ENGINEERING. DATE: 8/1/87
 Signature: *...*

ENGINEERING CERTIFICATE:
 "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 COUNTY SOIL CONSERVATION DISTRICT."
 Signature: *...* DATE: 8/1/87

APPROVED OFFICE OF PLANNING AND ZONING
 Signature: *...* DATE: 12/22/87

US SOIL CONSERVATION SERVICE DATE: N/A
 DISTRICT APPROVED: *R. P. ...* DATE: 4/28/87
 REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.
 Signature: *...* DATE: 11-20-87

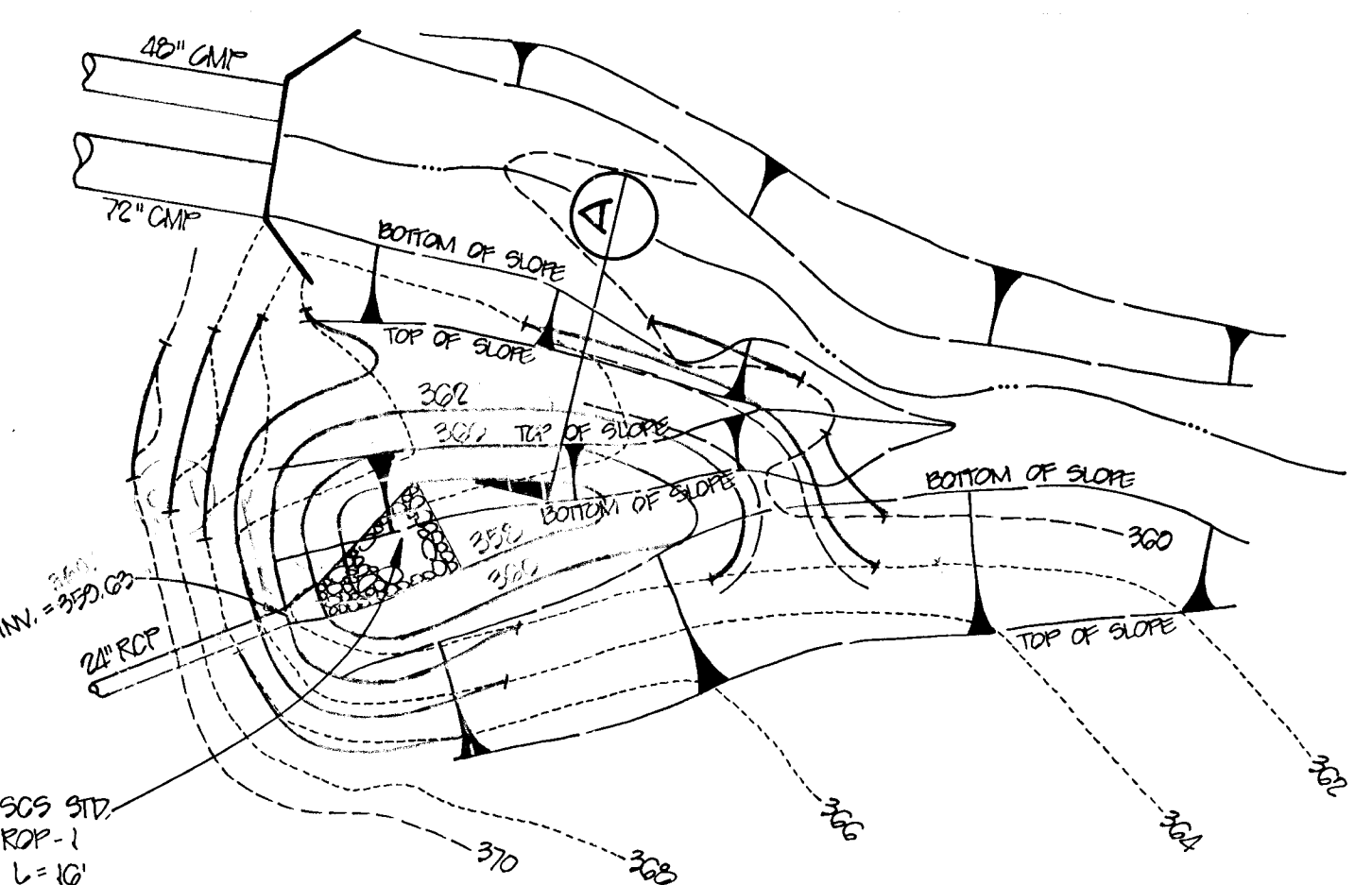
REVISIONS:
 1. Added the Temp. Diversion Pipe MUM 3/25/88
 2. REVISED SEDIMENT CONTROL LOTS 67-97 KAM 2/21/88

DESIGNED BY: JAB
 DRAWN BY: JJJ/POA
 CHECKED BY: K.B.C.
 DATE: MAR 1987
 SCALE: 1"=50'
 W.D. NO. 44-86-002C 16 SHEET OF 20

JOSEPH J. MILLER
562/286

EXISTING 20' R/W INGRESS
& EGRESS TO AND FROM
RTE 99 WITH USE IN
COMMON WITH OTHERS

GEORGE W. CARR
516/45



DETAIL - WATER QUALITY POOL
SCALE: 1" = 20'

SMALLWOOD PROPERTY
PLAT CMP 425

SECTION A
CARWOOD FARMS SUBDIVISION

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
DATE 12-11-87
CHIEF, LAND DEVELOPMENT DIVISION
CHIEF, BUREAU OF HIGHWAYS
CHIEF, BUREAU OF ENGINEERING

OWNER:
COSCAN WASHINGTON INC.
8521 LEESBURG PIKE
SUITE 200
VIENNA, VIRGINIA 22180
PHONE: (703) 356-9090
DEVELOPER:
COSCAN WASHINGTON INC.
8521 LEESBURG PIKE
SUITE 200
VIENNA, VIRGINIA 22180
PHONE: (703) 356-9090

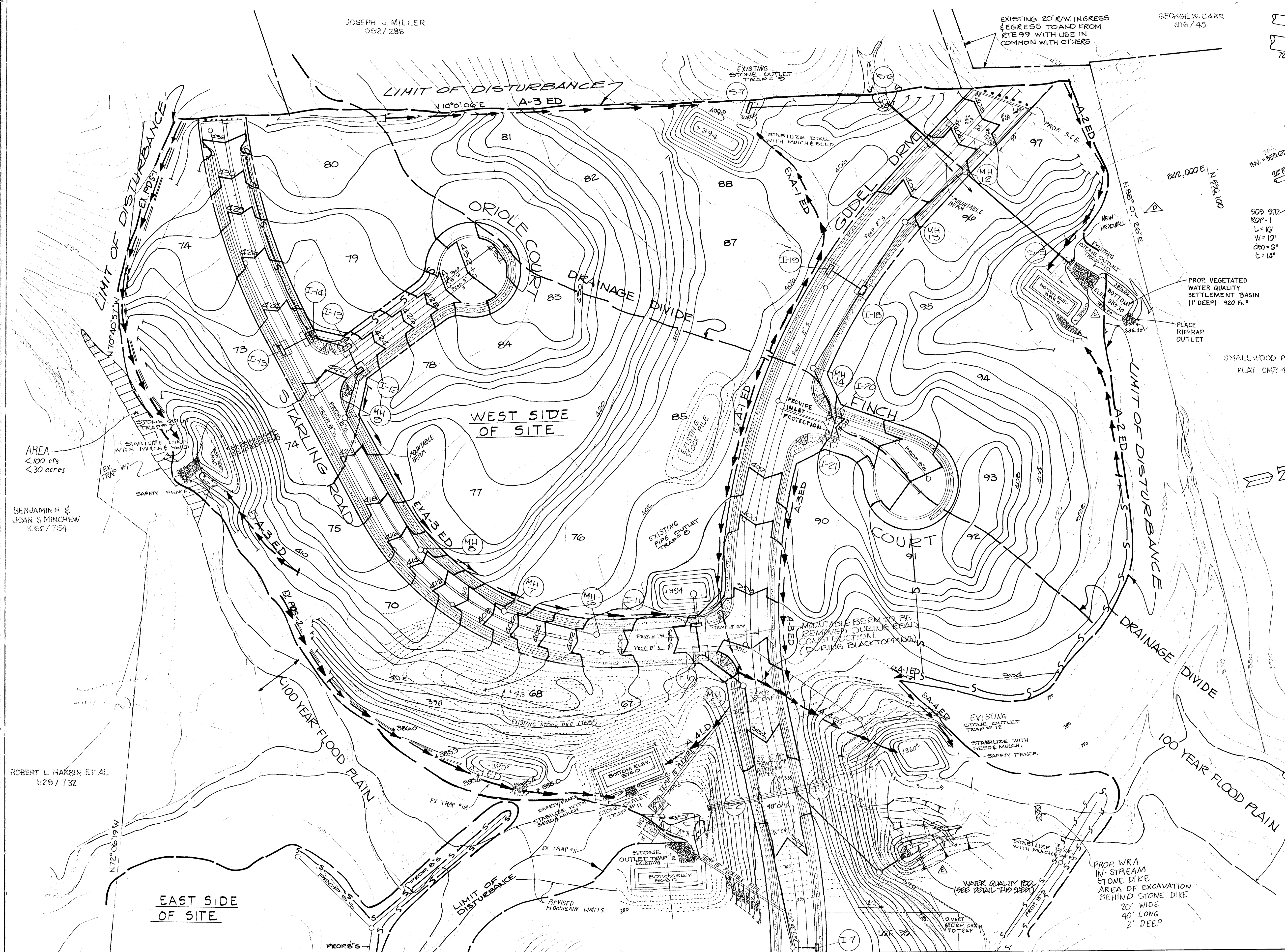
(OP&Z. REF. NO. P-87-51)

STREET TREE, GRADING AND SEDIMENT CONTROL
MCKENZIE MEADOWS
SECTION 2
TAX MAP 17 PARCEL 36
2nd ELECTION DISTRICT HOWARD COUNTY, MD.

JOHN L. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS ARCHITECTS SURVEYORS

8030 R.D. BRANCH ROAD
COLUMBIA, MD 21045
PHONE: (301) 740-1200

DESIGNED BY: J.A.B.
DRAWN BY: J.J.T.
CHECKED BY: K.B.C.
DATE: 7/87
SCALE: 1" = 50'
W.D. NO. 44-86-002D 17 OF 20



AREA
100 cfs
30 acres

BENJAMIN H. &
JOAN S. MINCHEW
1066/7754

ROBERT L. HARKIN ET AL
1128/732

MATCH LINE SEE SHEET 16

MATCH LINE SEE SHEET 17

APPROVED OFFICE OF PLANNING AND ZONING
12/22/87

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND METS TECHNICAL REQUIREMENTS.
11-20-87

THIS DEVELOPMENT IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
11-20-87

DEVELOPER'S CERTIFICATE

"I WE 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 NATURAL RESOURCES 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."

SIGNATURE OF DEVELOPER
DATE 01/6/87

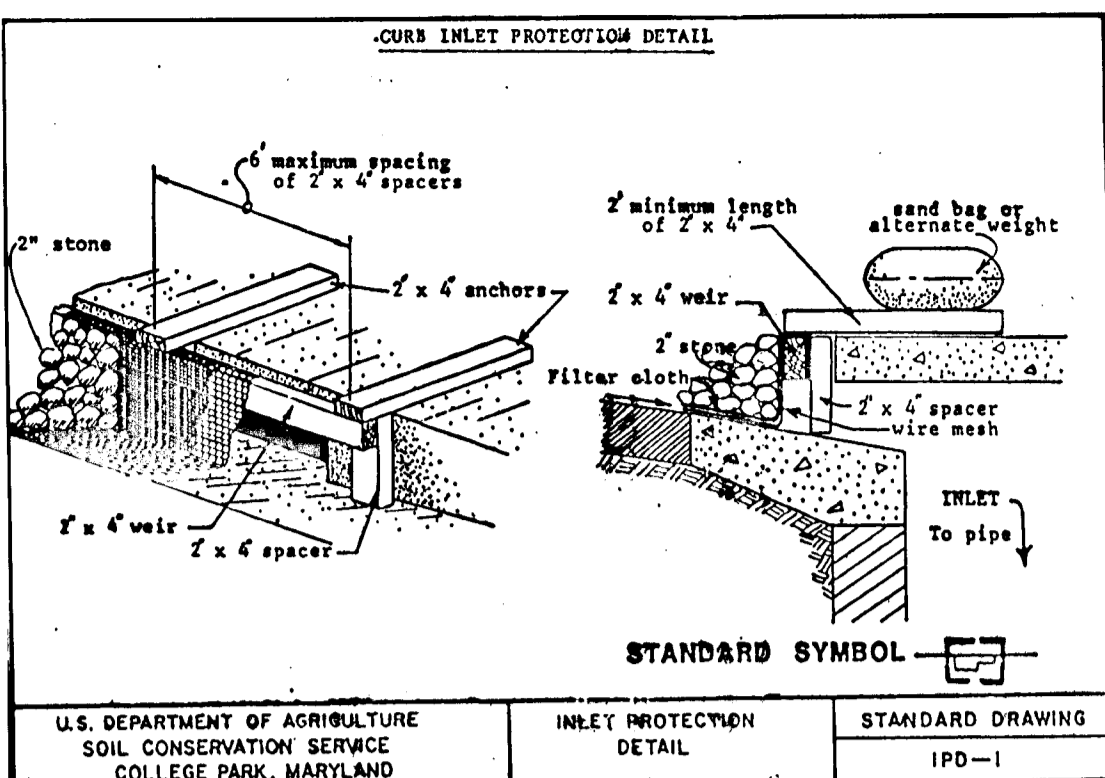
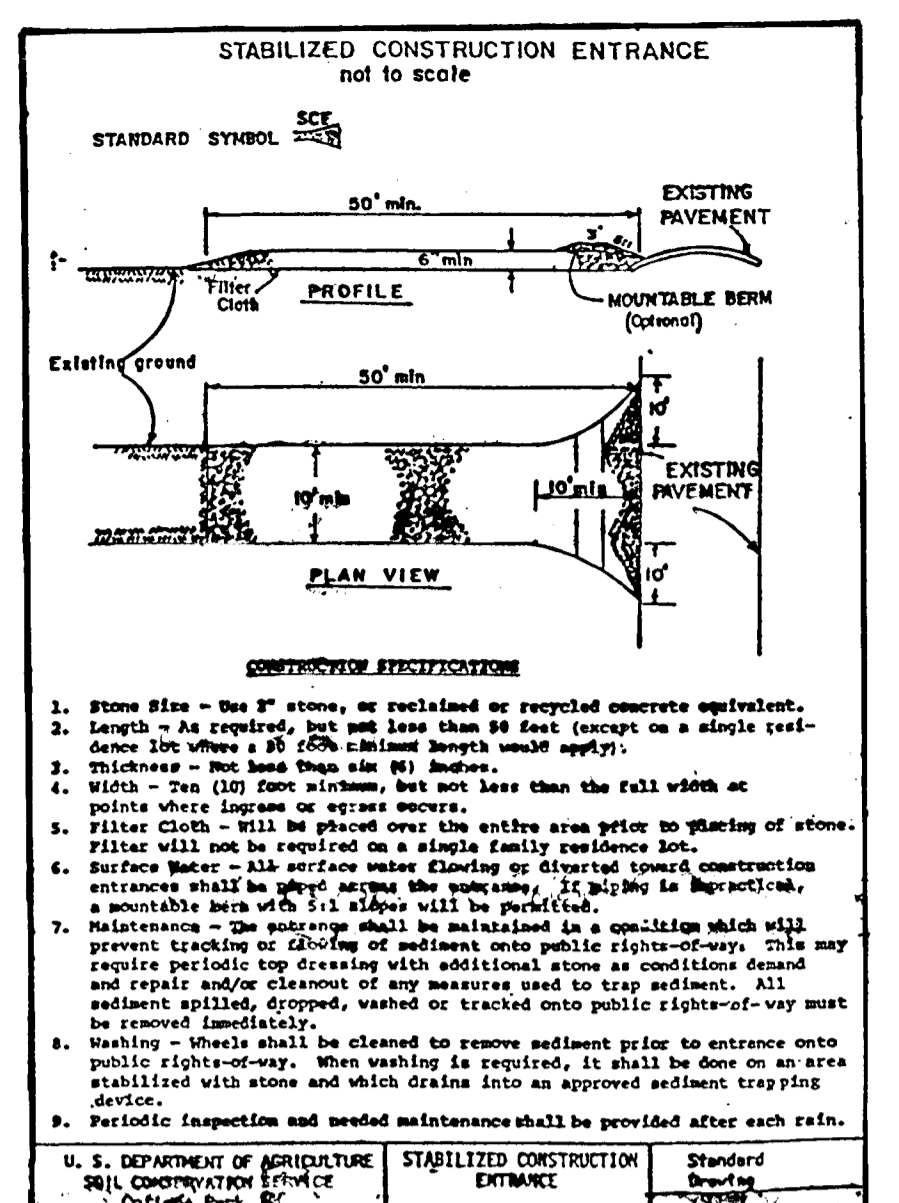
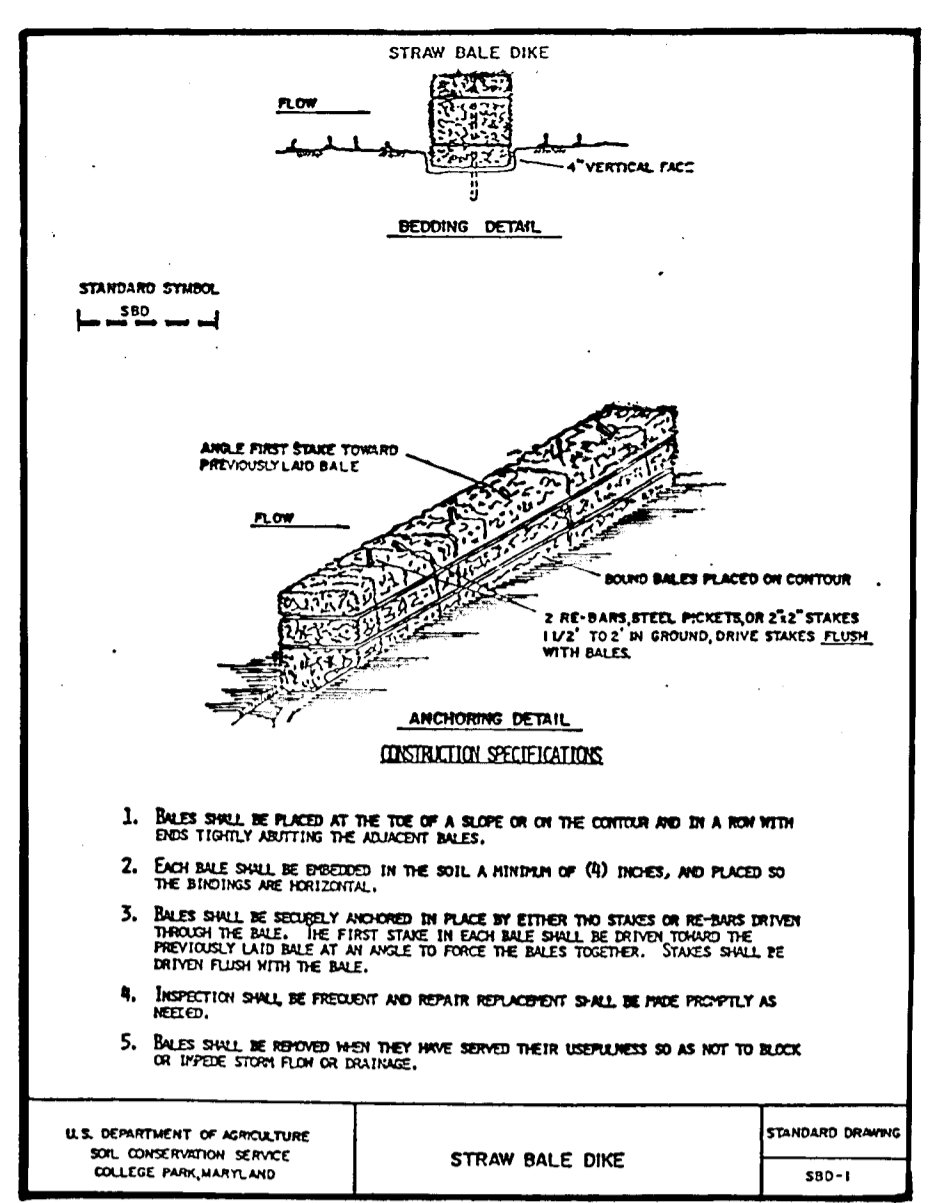
ENGINEERING CERTIFICATE

"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 COUNTY SOIL CONSERVATION DISTRICT."

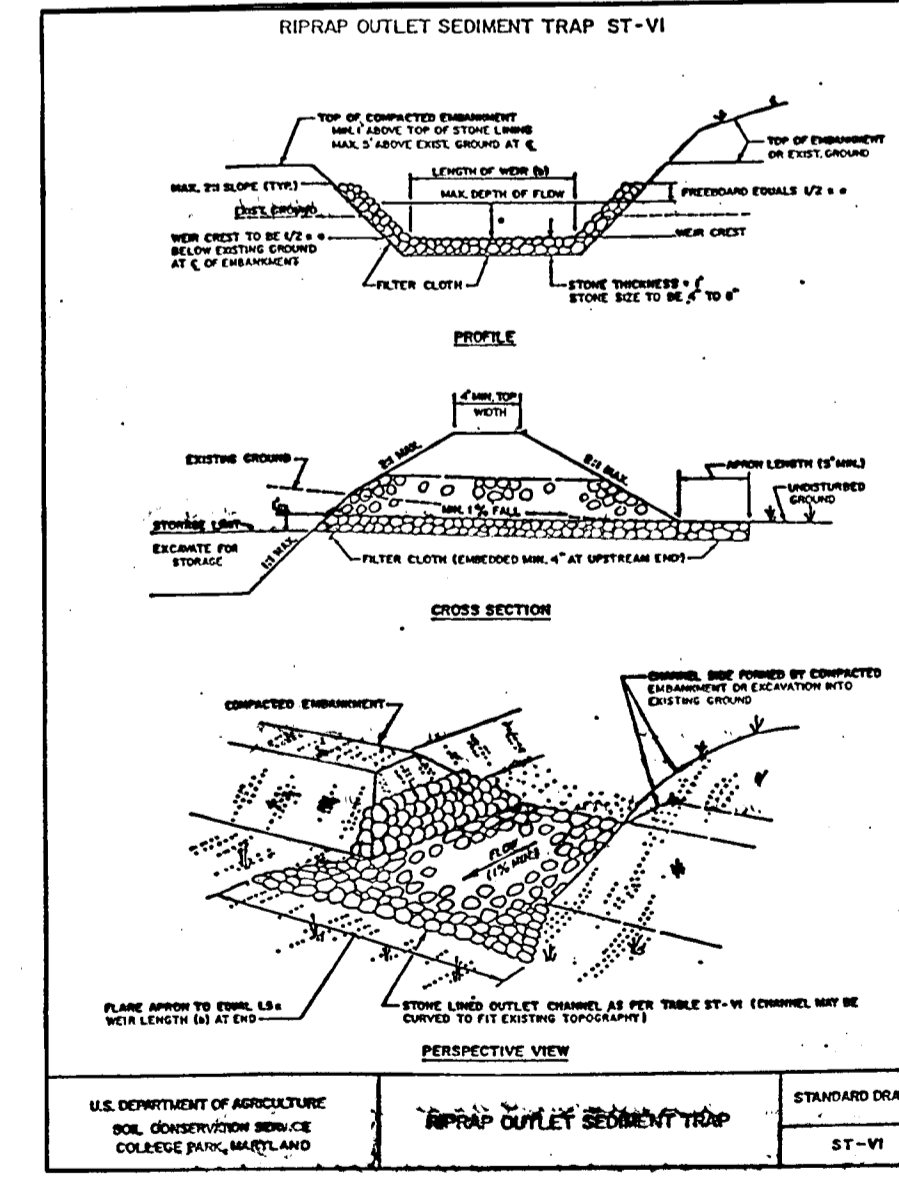
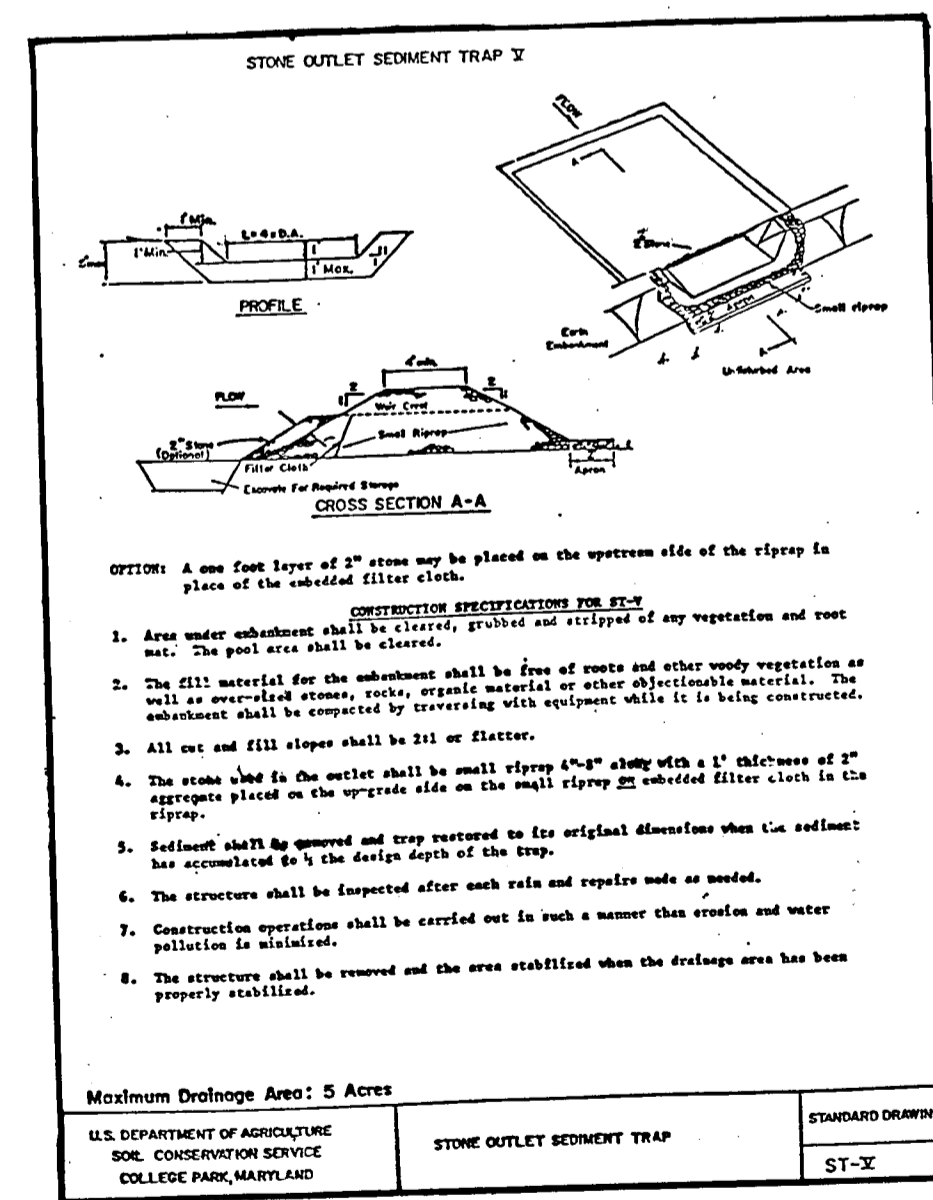
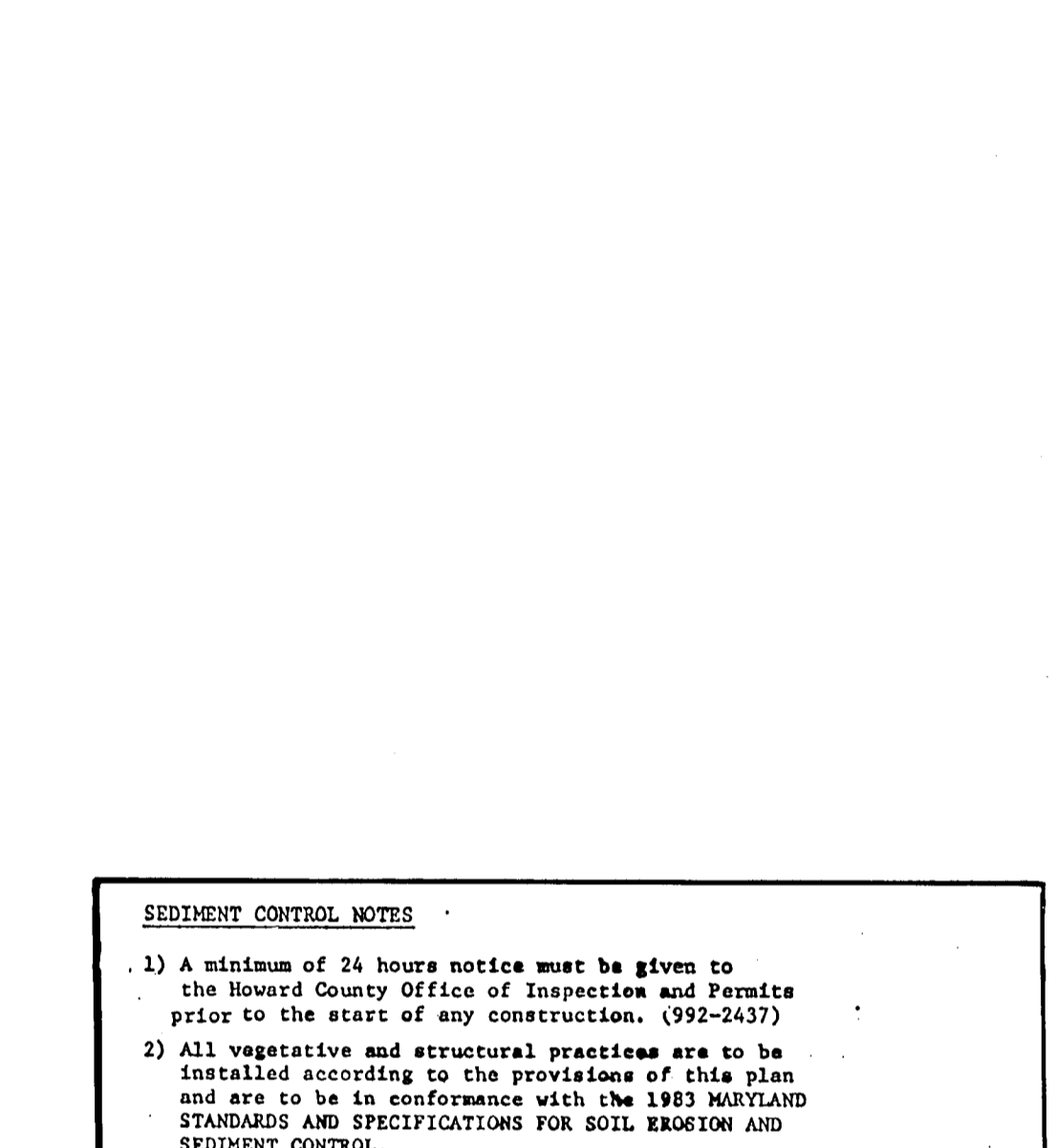
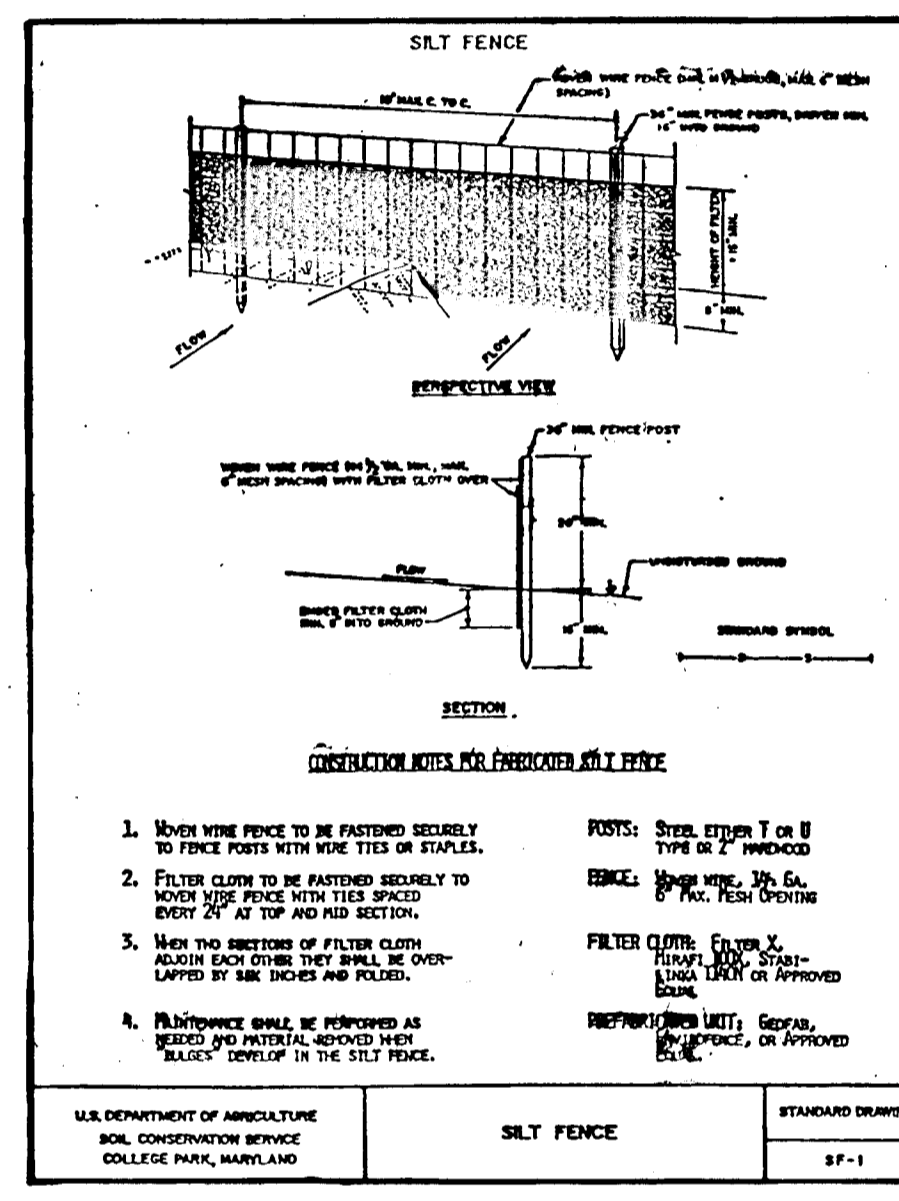
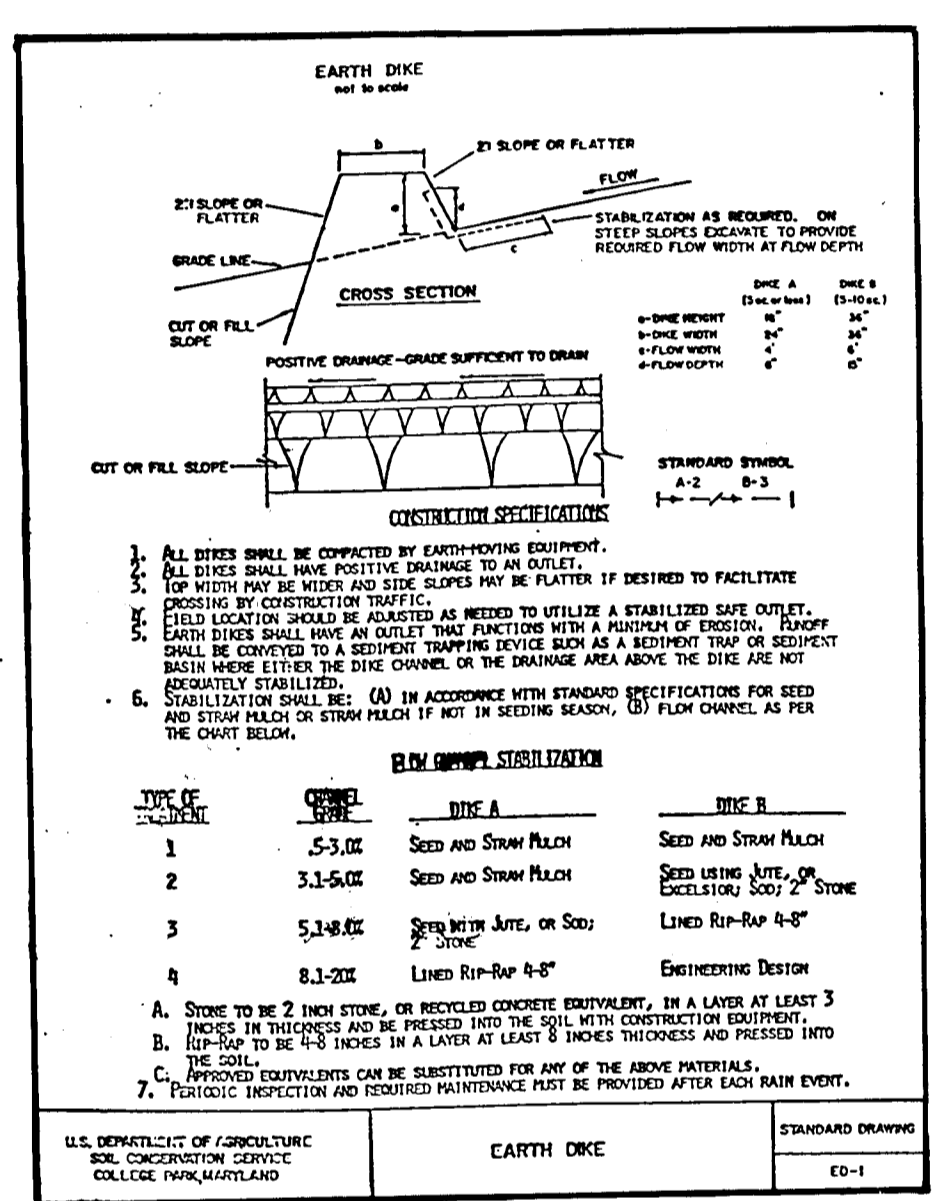
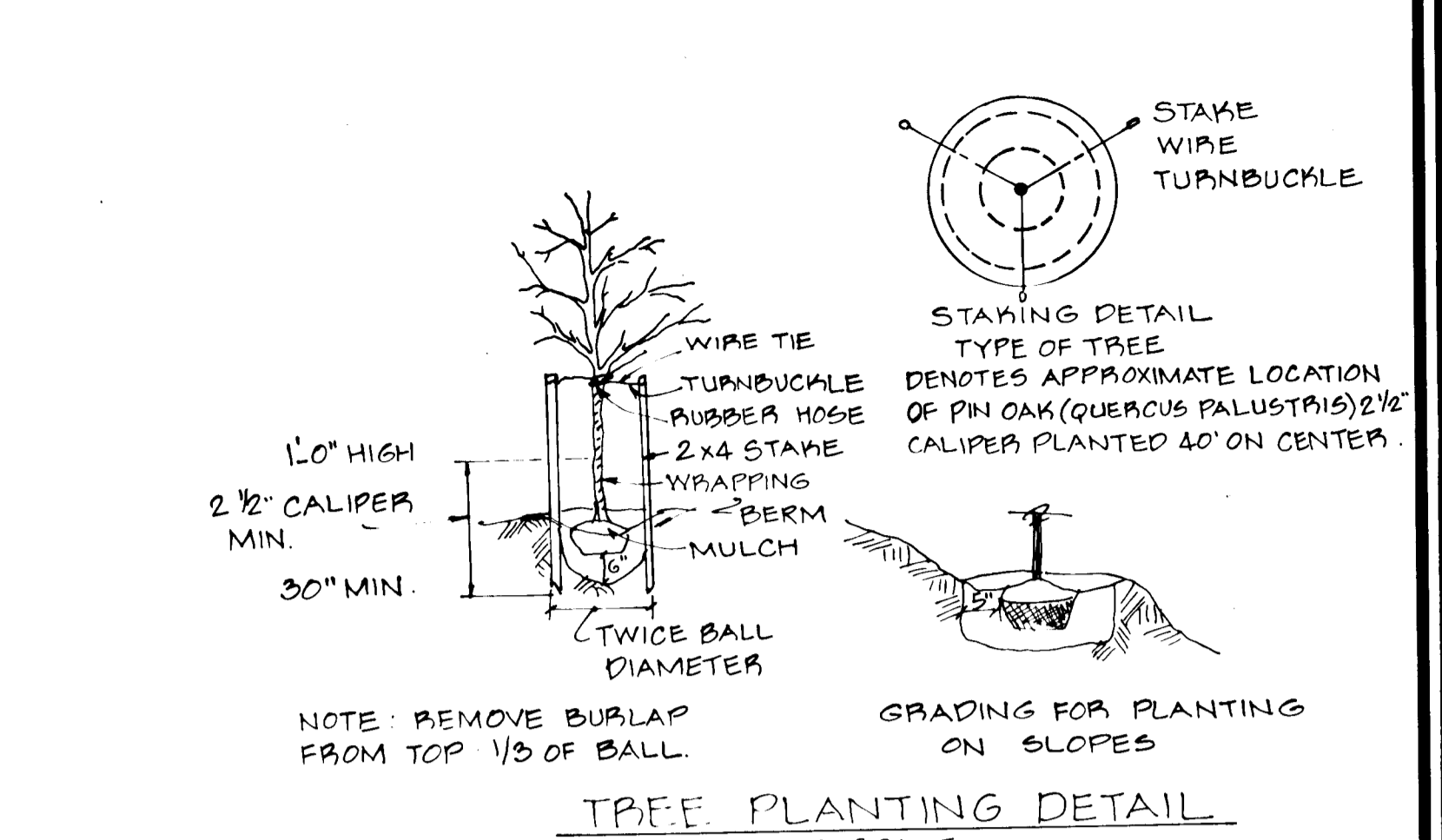
SIGNATURE OF ENGINEER
DATE 8/11/87

NO.	REVISION	BY	DATE
1	REV. TEE TURN-AROUND	J.J.T.	12/15/87
2	ADDED 72' x 48' CMP AND DELETED MULTI-PIECE REVISED SEDIMENT CONTROL	KAM	10/29/88
3	INCORPORATE WATER QUALITY BASINS	R.H.V.	1/23/90
4	ADD 10' S.D. LINE LOT 97	CAM	5-15-91

302



- SEQUENCE OF CONSTRUCTION**
1. OBTAIN GRADING PERMIT.
 2. NOTIFY HOWARD COUNTY BUREAU OF INSPECTIONS, LICENSE AND PERMITS (992-2437) AT LEAST 24 HOURS BEFORE STARTING WORK.
 3. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.
 4. INSTALL PERIMETER CONTROLS. INSTALL SILT FENCE AROUND SECTION 1 OF THE PROPOSED STREAM CHANNEL RELOCATION.
 5. BEGIN CONSTRUCTION OF SECTION 1 OF THE PROPOSED CHANNEL. CONSTRUCT THE CHANNEL WITHOUT DISTURBING THE EXISTING CHANNEL. UPON COMPLETION AND STABILIZATION OF THE CHANNEL, DIVERT THE EXISTING STREAM INTO SECTION 1.
 6. CONSTRUCT CULVERT AND HEADWALLS OF PROPOSED CROSSING AS SECTION 2 OF PROPOSED STREAM CHANNEL.
 7. BEGIN CONSTRUCTION OF SECTION 3 OF THE PROPOSED STREAM CHANNEL. FOLLOW THE SAME PROCEDURE AS OUTLINED IN STEP 5 FOR SECTION 1. UPON COMPLETION AND STABILIZATION OF THE CHANNEL, DIVERT THE EXISTING STREAM INTO SECTION 3.
 8. BEGIN CONSTRUCTION OF SECTION 4 OF THE PROPOSED STREAM CHANNEL. FOLLOW THE SAME PROCEDURE AS OUTLINED IN STEP 5 FOR SECTION 1. UPON COMPLETION AND STABILIZATION OF THE CHANNEL, DIVERT THE EXISTING STREAM INTO SECTION 4.
 9. BEGIN CONSTRUCTION OF SECTION 5 OF THE PROPOSED STREAM CHANNEL. FOLLOW THE SAME PROCEDURE AS OUTLINED IN STEP 5 FOR SECTION 1. UPON COMPLETION AND STABILIZATION OF THE CHANNEL, DIVERT THE EXISTING STREAM INTO SECTION 5.
 10. INSTALL TRAP NO. S 2, 6, 11, and 12.
 11. BEGIN CONSTRUCTION OF LOW PROFILE ARCH, STA. 8+70.62 GULLET DRIVE.
 12. INSTALL TRAPS NO. S 3 & 4.
 13. BEGIN CONSTRUCTION OF STORM DRAIN SYSTEM FROM S-4 TO S-2 UNDER SPARROW COURT.
 14. BEGIN CONSTRUCTION OF 71" X 47" PIPE CULVERT UNDER SPARROW COURT.
 15. CONSTRUCT AND STABILIZE SWALE FROM GULLET DRIVE TO S-4.
 16. INSTALL ALL REMAINING SEDIMENT CONTROL MEASURES ON SPARROW COURT AS NECESSARY.
 17. INSTALL WATER AND SEWER. PLACE SILT FENCE AROUND PROP. 8" SEWER AS SHOWN ON THE PLANS.
 18. DURING GRADING AND AFTER EACH RAINFALL, THE CONTRACTOR SHALL INSPECT AND PROVIDE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROL STRUCTURES SHOWN HEREBY.
 19. CONSTRUCT CONCRETE CURB AND GUTTER AND LAY ALL BASE COURSE.
 20. UPON STABILIZATION OF GRADED AREAS, INLETS SHALL BE OPEN AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE STORM DRAIN SYSTEMS.
 21. INSTALL REMAINDER OF STORM DRAIN SYSTEM AND OUTLET.
 22. REMOVE SEDIMENT TRAPS AND ALL OTHER SEDIMENT CONTROL DEVICES ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND AFTER INSPECTION BY THE SEDIMENT CONTROL INSPECTOR.



PERMANENT SEEDING NOTES

- 1) 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. (992-2437)
- 2) 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.
- 3) Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
- 4) 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.
- 5) 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. 52) and (Sec. 54), temporary seedings (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.
- 6) 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.
- 7) Site Analysis:
Total Area of Site: 44.75 Acres
Area Disturbed: 20.0 Acres
Area to be roofed or paved: 1.5 Acres
Area to be vegetatively stabilized: 24.0 Acres
Total Cut: 12,000,000 Cu. Yds
Office waste/borrow area location: [Location]
- 8) Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- 9) Additional sediment controls must be provided, if deemed necessary by the Howard County D/W sediment control inspector.
- 10) 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.

PERMANENT SEEDING NOTES

Apply to graded or cleared areas 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 loosened.

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:

- 1) Preferred - Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq ft) and 600 lbs per acre 10-10-10 fertilizer (14 lbs/1000 sq ft) before seeding. Scatter or disc into upper three inches of soil. At time of seeding, apply 100 lbs per acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq ft).
- 2) Acceptable - Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq ft) and 1000 lbs per acre 10-10-10 fertilizer (23 lbs/1000 sq ft) before seeding. Scatter 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 50 lbs per acre (1.4 lbs/1000 sq ft) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs per acre (.05 lbs/1000 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 seed as soon as possible in the spring. Option (2) Use sod. Option (3) Seed with 80 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 sq ft) of unspiced small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal per acre (5 gal/1000 sq ft) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 368 gallons per acre (6 gal/1000 sq ft) for anchoring.

Maintenance: Inspect all seeded areas and make needed repairs, replacements and reseedings.

TEMPORARY SEEDING NOTES

Apply to graded or cleared areas likely to be redistributed where a short-term vegetative cover is needed.

Seedbed Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

Soil Amendments: Apply 60 lbs per acre 10-10-10 fertilizer (14 lbs/1000 sq ft).

Seeding: For periods March 1 thru April 30 and from August 15 thru November 15, seed with 20 bushel per acre of annual ryegrass (3.2 lbs/1000 sq ft). For the period May 1 thru August 14, seed with 3 lbs per acre of weeping lovegrass (.07 lbs/1000 sq 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 sq ft) of unspiced small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal per acre (5 gal/1000 sq ft) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 368 gal per acre (6 gal/1000 sq ft) for anchoring.

Refer to the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

SEDIMENT TRAP SCHEDULE

SEDIMENT TRAP NO	1	2	3	4	7	8	9	5	6	10	11	12
TYPE OF TRAP	EX.50	EX.50	SO.	SO.	SO.	PO	SO.	EX.50	RO.	SO.	SO.	SO.
DRAINAGE AREA (AC)	1.3 AC	3.6 AC	3.2 AC	1.9 AC	3.1 AC	2.5 AC	2.4 AC	4.8 AC	13.0 AC	19.5 AC	13 AC	17 AC
STORAGE REQUIRED (CY)	187.0	242.0	215.0	127.3	207.0	167.0	160.0	322.0	871.0	1306	88	113
STORAGE PROVIDED (CY)	330.0	244.0	237.0	132.7	215.0	171.0	162.4	324.0	900.0	134.0	89	124
STORAGE ELEVATION (FT)	396.0	372.0	406.0	396.0	399.0	398.0	398.0	372.0	362.0	388.0	376	363
STORAGE DEPTH (FT)	3.0'	4.0'	4.0'	4.0'	5	4	4	5	8	3	2.0	3.0
WEIR LENGTH (FT)	7.0	15.0	13.0	8.0	13.0	-	10.0	20.0	16.0	8.0	7.0	7.0
BOTTOM ELEVATION (FT)	393.0	368.0	402.0	392.0	394.0	394.0	394.0	367.0	358.0	385.0	374	360
CLEANOUT ELEVATION (FT)	394.5	370.0	401.0	394.0	396.5	396.0	396.0	358.0	358.0	386.5	375	361.5
CREST ELEVATION (FT)	397.0	373.0	407.0	397.0	400.0	-	399.0	373.0	363.0	389.0	377	364
TOP OF DIKE ELEV.	398.0	374.0	408.0	398.0	401.0	400.0	400.0	374.0	366.0	390.0	378	365
BOTTOM TRAP DIMENSIONS	40' x 15'	60' x 12'	45' x 17'	42' x 10'	32' x 12'	45' x 15'	50' x 12'	52' x 25'	15' x 25'	47' x 12'	54' x 14'	24' x 8'

PO - PIPE OUTLET TRAP
RO - STONE OUTLET TRAP
EX.50 - EXISTING STONE OUTLET TRAP
RO - RIP RAP OUTLET TRAP
* - THESE TRAPS ARE TRIANGULAR IN SHAPE THE DIMENSIONS ARE APPROXIMATELY THE LARGEST BOTTOM WIDTH AND THE LENGTH
+ - TRAP #6 HAS TWO DIFFERENT WIDTHS.

APPROVED OFFICE OF PLANNING AND ZONING

[Signature]
DATE: 12/22/87

APPROVED HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[Signature]
DATE: 12/21/87

DEVELOPER'S CERTIFICATE

"I/We 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 Natural Resources Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard County Sediment Control Inspector."

[Signature]
DATE: 12/21/87

ENGINEERING CERTIFICATE

"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 County Soil Conservation District."

[Signature]
DATE: 12/21/87

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

[Signature] 11-20-87
DATE

U.S. SOIL CONSERVATION SERVICE

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

[Signature] 12/21/87
DATE

HOVARD SOIL CONSERVATION DISTRICT

NO.	REVISION	BY	DATE
A	ADDED 72' L'X 48' CMP BY	KAM	10/29/89
B	REVISION OF BERM AT CATCHMENTS	KAM	1/22/89
C	REVISION SEDIMENT CONTROL SEQUENCE & TRAP SCHEDULE	KAM	2/22/89

SEDIMENT EROSION CONTROL DETAIL

McKENZIE MEADOWS
SECTION 2

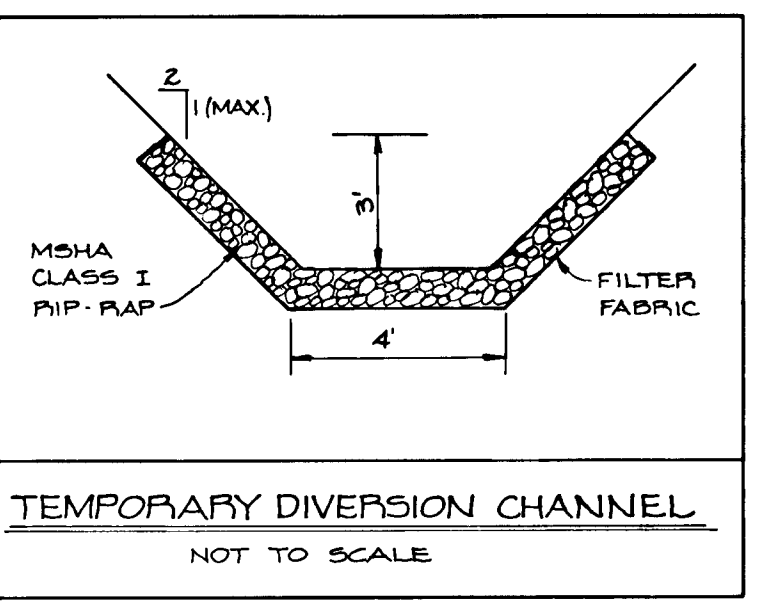
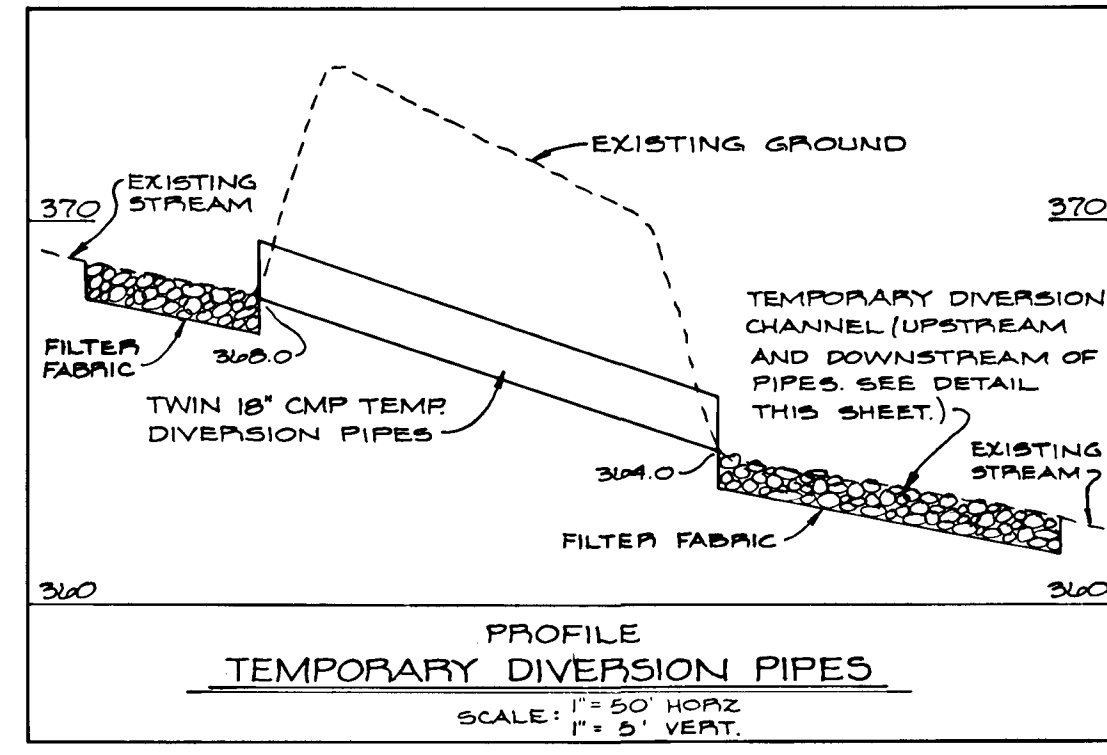
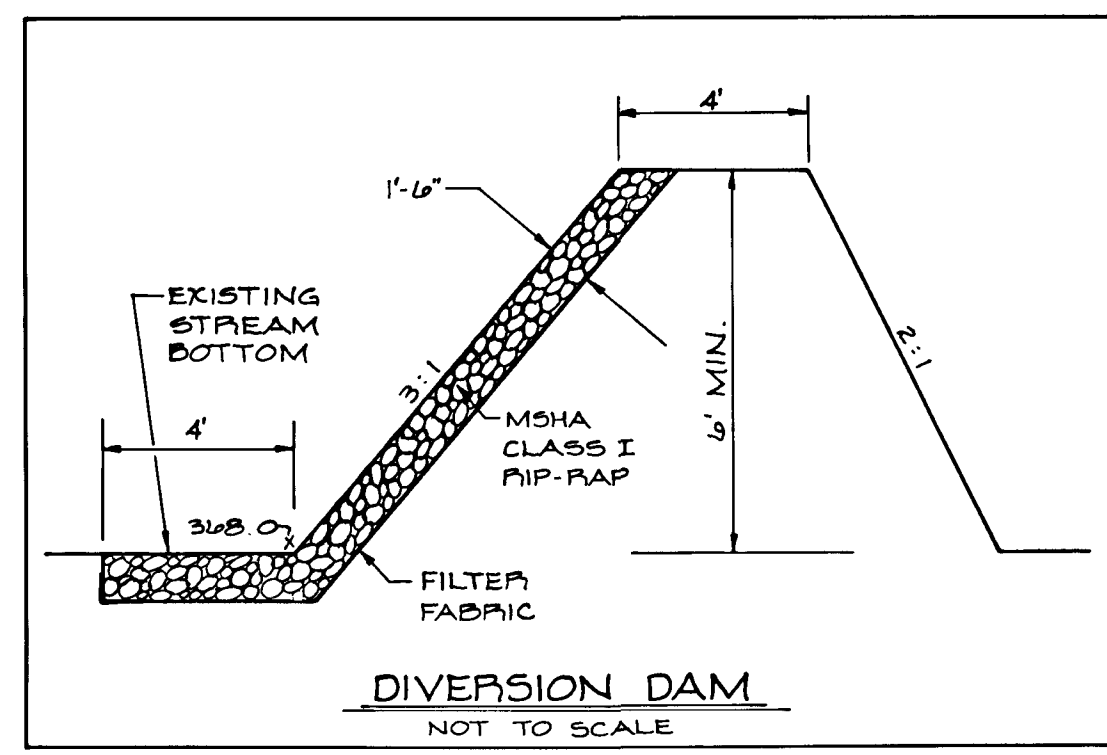
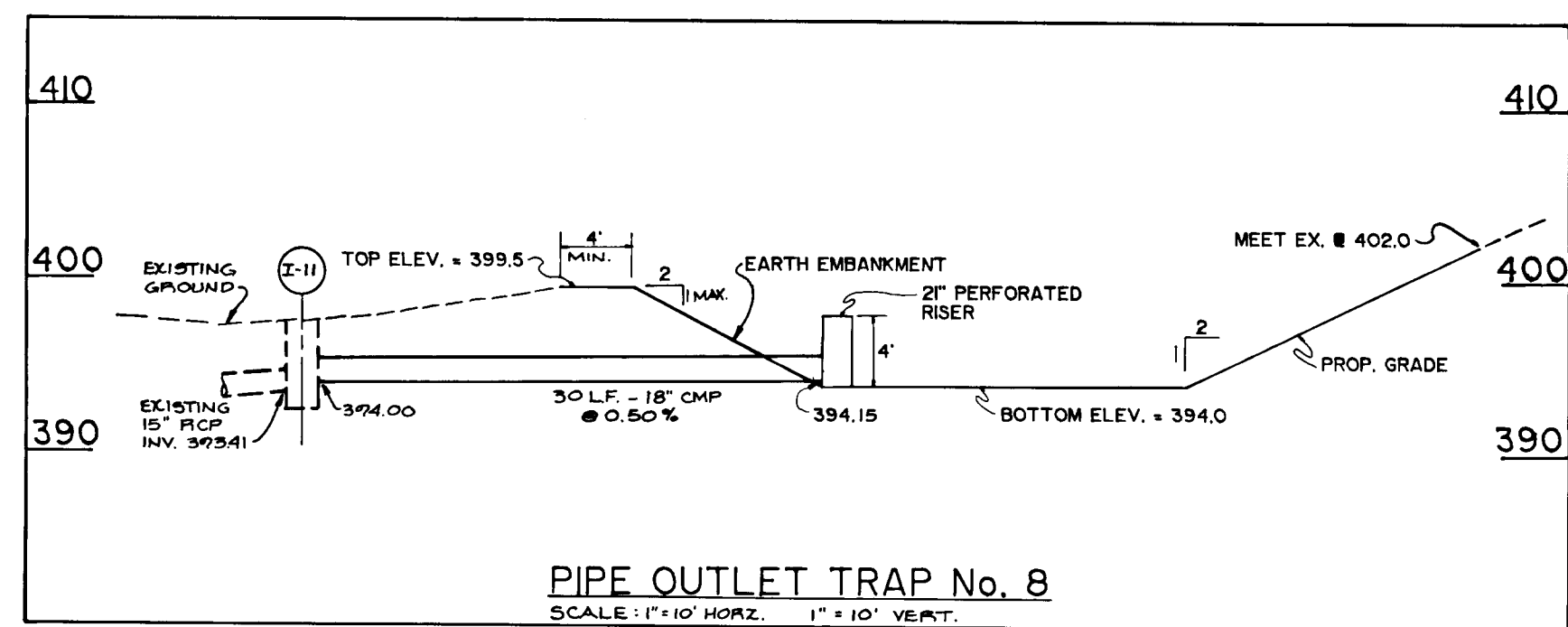
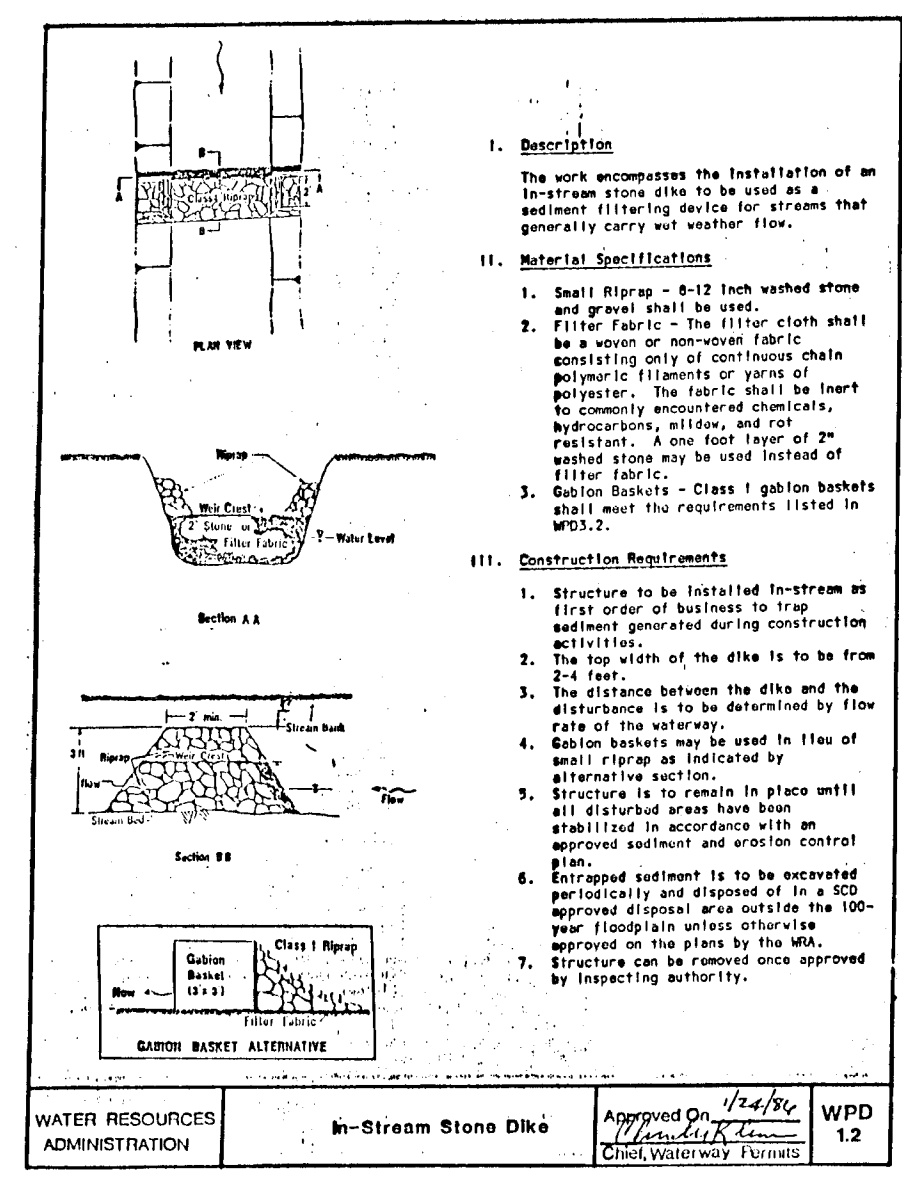
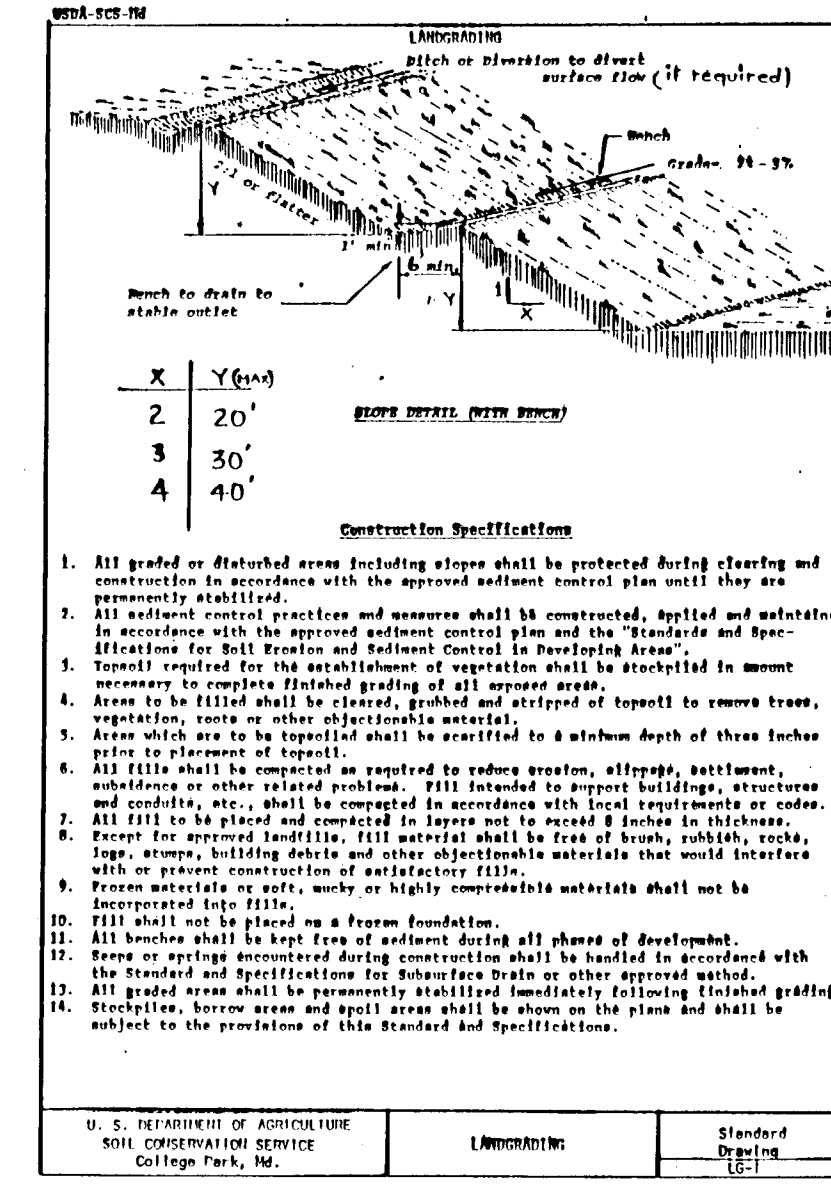
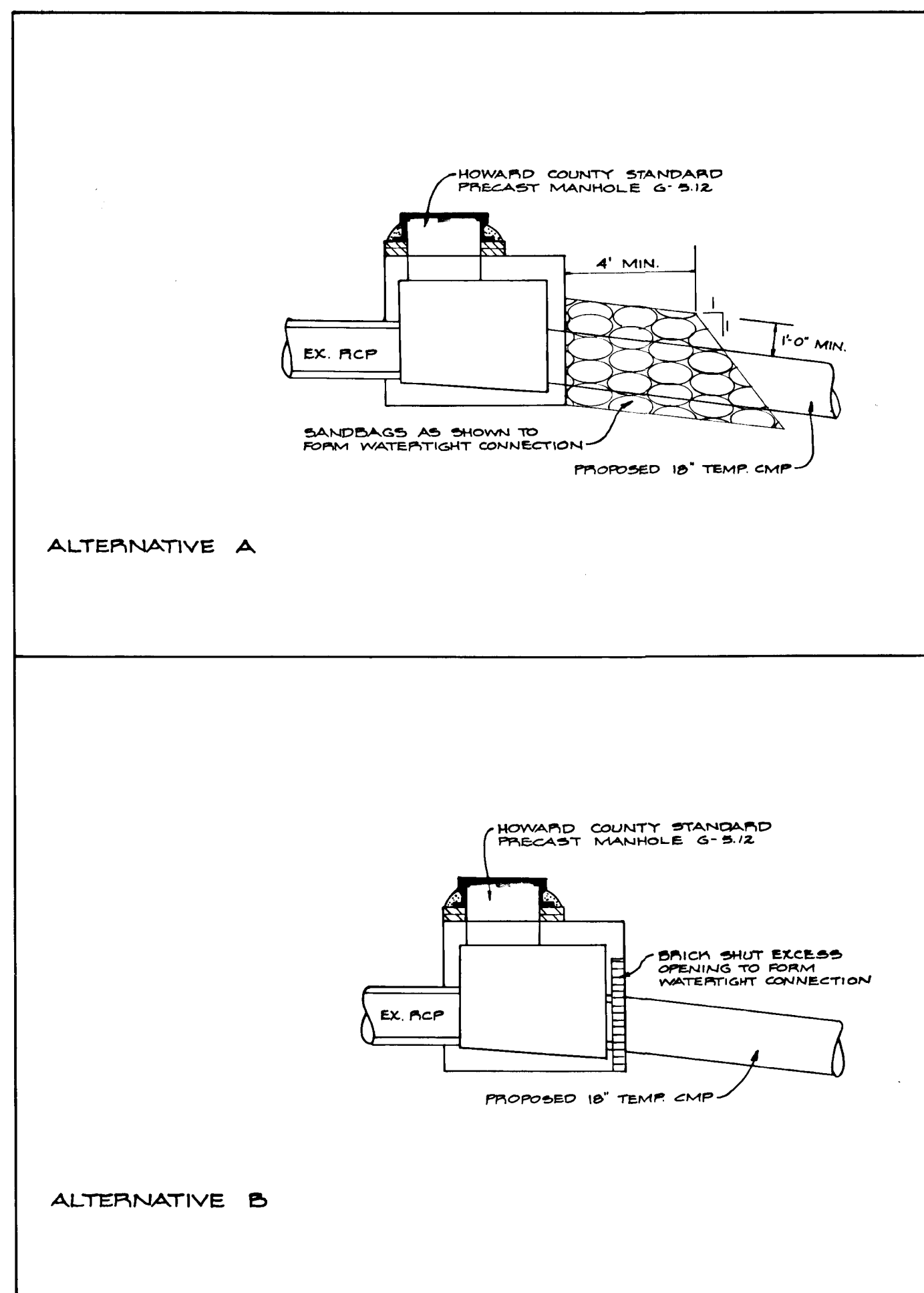
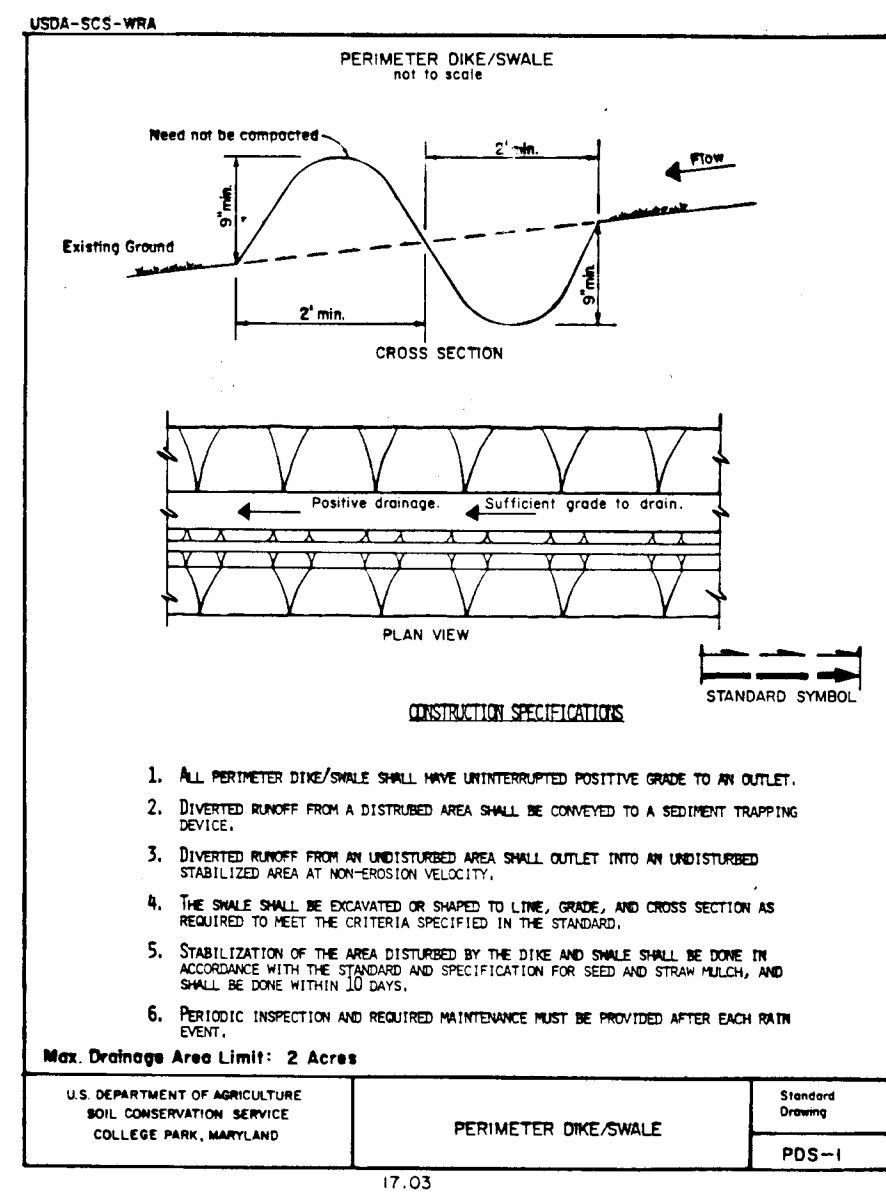
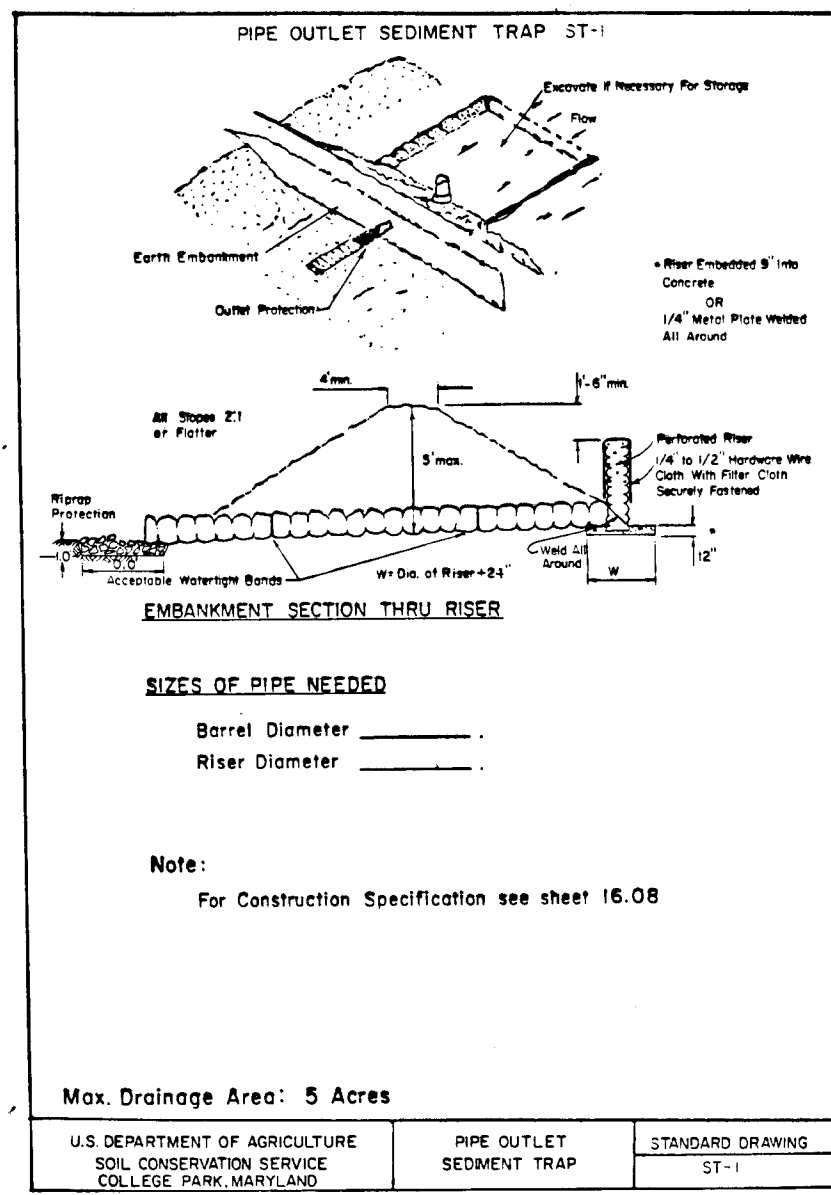
TAX MAP 17 PARCEL 36

2nd ELECTION DISTRICT HOWARD COUNTY, MD.

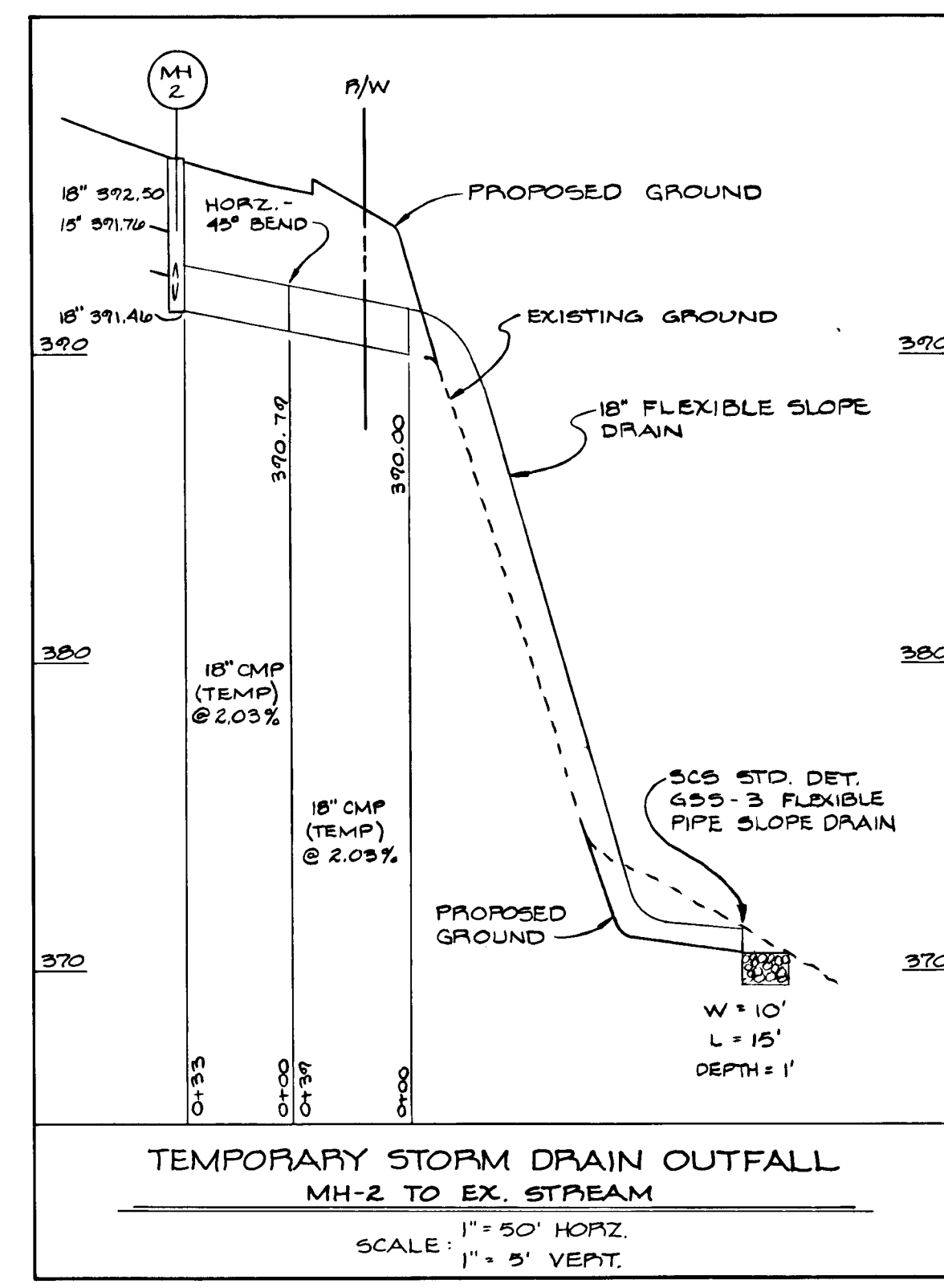
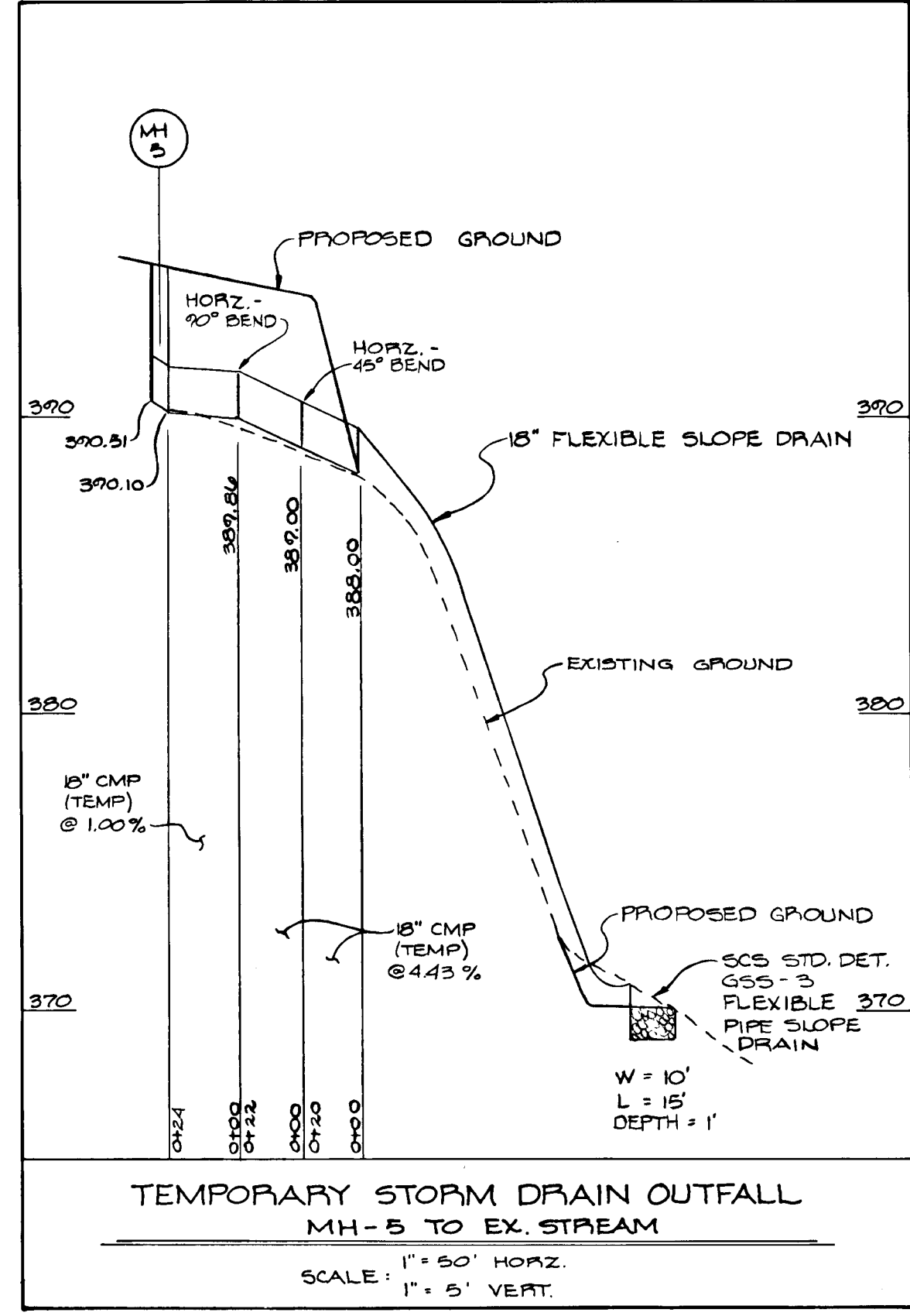
JOHN E. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS

9030 RED BRANCH ROAD COLUMBIA, MARYLAND 21045 SUITE 100 TELEPHONE 1301 740-5200

DESIGNED BY: J.A.B.
DRAWN BY: R.W.R.
CHECKED BY: K.B.C.
DATE: 7/87
SCALE: N/A
W.O. NO. 44-86-002D 18 SHEET OF 20



- Sequence of Operation for Loops 07 through 09 and Culvert Construction**
1. All existing sediment control devices are to remain in place unless indicated otherwise below.
 2. Construct stabilized construction entrance as indicated on the plan.
 3. Enlarge sediment traps numbered 7, 8, 9 and 12 to the sizes indicated on the plan.
 4. Relocate outlet location of existing trap number 11A as shown.
 5. Relocate trap number 8 from a stone outlet trap to a pipe outlet trap. Outlet trap into Inlet I-11. See detail sheet 18A of 20.
 6. Construct earth dikes and perimeter dike swales as indicated on plan.
 7. Construct mounds/benches in four (4) places as indicated on plan.
 8. Construct a Water Resources Administration In-Stream Stone Dike downstream of all disturbance as indicated on plan.
 9. Install temporary 18" CMP at Manhole 2 and 5. Attach flexible pipe conduit to temporary CMP and construct rip-rap outlet protection at both outlets of the flexible pipe conduit. See detail sheet 18A of 20.
 10. If existing twin 18" CMP diversion pipes interfere with culvert construction, remove and relocate. Relocation shall be from existing stream, upstream of disturbance to existing stream, downstream of disturbance.
 11. Construct temporary outfall between downstream end of diversion pipe and existing stream. Temporary outfall channel to extend beyond location of proposed headwall. Line with rip-rap per detail. See detail sheet 18A of 20.
 12. Construct temporary channel at upstream end of diversion pipe to divert stream through new diversion pipes, if necessary.
 13. Construct temporary diversion dam per detail on Sheet 18A of 20 to divert stream through new diversion pipes, if necessary.
 14. Construct proposed headwalls and culverts as shown on plan.
 15. Construct permanent rip-rap and gabion channel between downstream headwall and existing stream. Allow flow from the diversion pipes to enter downstream rip-rap and gabion channel.
 16. Construct permanent rip-rap and gabion channel between upstream headwall and existing stream. Do not break through to existing channel until rip-rap and gabion channel is in place.
 17. Break through to existing stream at upstream end of relocated channel.
 18. Divert stream through permanent culvert.
 19. Remove temporary diversion devices.
 20. Backfill culverts.
 21. Bring site to grade.
 22. During grading and after each rainfall, the contractor shall inspect and provide necessary maintenance on the sediment and erosion control measures shown herein.
 23. Install remainder of storm drain system and outlets.
 24. Construct concrete curb and gutter and lay all base course.
 25. Upon stabilization of graded areas, inlets shall be open and all accumulated sediment shall be removed from the storm drain system.
 26. Once all disturbed areas have been stabilized, and after inspection by the Sediment Control Inspector, remove sediment traps and all other sediment control devices, remove temporary 18" CMP from pipe outlet trap 8 and brick shut inlet I-11.



DEVELOPER'S CERTIFICATE

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

Signature of Developer: J. J. J. J.

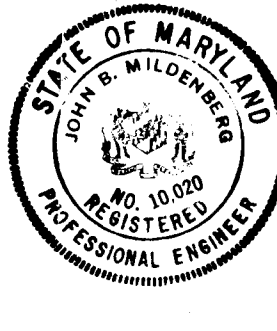
Date: 8/6/87

ENGINEERING CERTIFICATE:

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 County Soil Conservation District.

Signature of Engineer: J. J. J. J.

Date: 8/7/87



date	JAN. 1989
project	8804100
illustration	LSM
engineering	KAM
approval	RMM

SHEET INSERTED - REVISIONS TO SEDIMENT CONTROL - LOTS 16-17-18	2-1-87
description	revisions
NO.	date

MCKENZIE MEADOWS

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

TAX MAP NO. 17 PARCEL 36

SEDIMENT CONTROL NOTES & DETAILS

MILBERG, MOCHI & ASSOCIATES, INC.

ENGINEERS & SURVEYORS & PLANNERS

3300 North Ridge Road, Suite 205, Ellicott City, Maryland 21043-3350

(301) 461-0078 D.C. Metro (301) 621-5788

COORDINATE TABLE		
NO.	NORTH	EAST
1	535091.15	843330.08
2	534559.21	843287.95
3	534931.34	842135.45
4	534887.53	842083.06
5	535018.39	841709.76
6	536003.17	841883.73
7	536026.72	842602.60
8	536372.48	842795.63
9	536296.61	843022.01
10	535810.37	842919.49
11	535625.34	843516.89
12	535466.03	843470.29
13	535351.35	843460.89
14	535358.22	843377.05
15	535298.42	843372.15

CARWOOD FARMS SUBDIVISION

LOT 2
SMALLWOOD PROPERTY
PLAT CMP 4251

GEORGE W. CARR
316/45

LOT 109
18,000 #

LOT 71
18,000 #

LOT 111
14,000 #

EXISTING 20' ROW INGRESS & EGRESS TO AND FROM RTE 99 WITH USE IN COMMON WITH OTHERS.

OFF SITE RUNOFF TO BE CHANNELLED TO S-3 DRAINAGE AREA TO STRUCTURE 5-3-15 24.0 AC

POSSIBLE R-20 SUBDIVISION MINIMUM 14,000# LOTS

JOSEPH J. MILLER
562/286

POSSIBLE R-20 SUBDIVISION MINIMUM 14,000# LOTS

BENJAMIN H. & JOAN S. MINCHEW
1066/754

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
DATE: 12-16-87
CHIEF, LAND DEVELOPMENT DIVISION
APPROVED: W. H. HARM JR. DATE: 12-21-87
CHIEF, BUREAU OF HIGHWAYS
APPROVED: S. C. GAY DATE: 12-21-87
CHIEF, BUREAU OF ENGINEERING

APPROVED OFFICE OF PLANNING AND ZONING

APPROVED: [Signature] DATE: 12/21/87
DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION

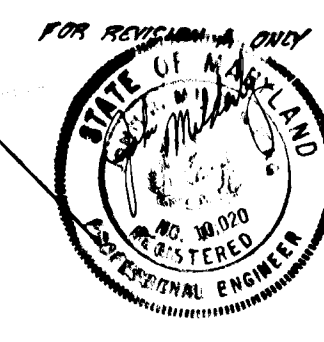
APPROVED OFFICE OF PLANNING AND ZONING

DATE: 12/21/87

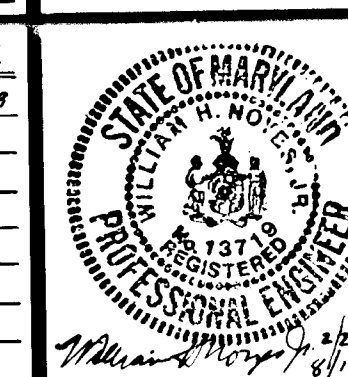
PLAN
Scale: 1" = 100'

DEVELOPER:
COSCAN WASHINGTON INC.
8521 LEESBURG PIKE
SUITE 200
VIENNA, VIRGINIA 22180
PHONE: (703) 356-9090

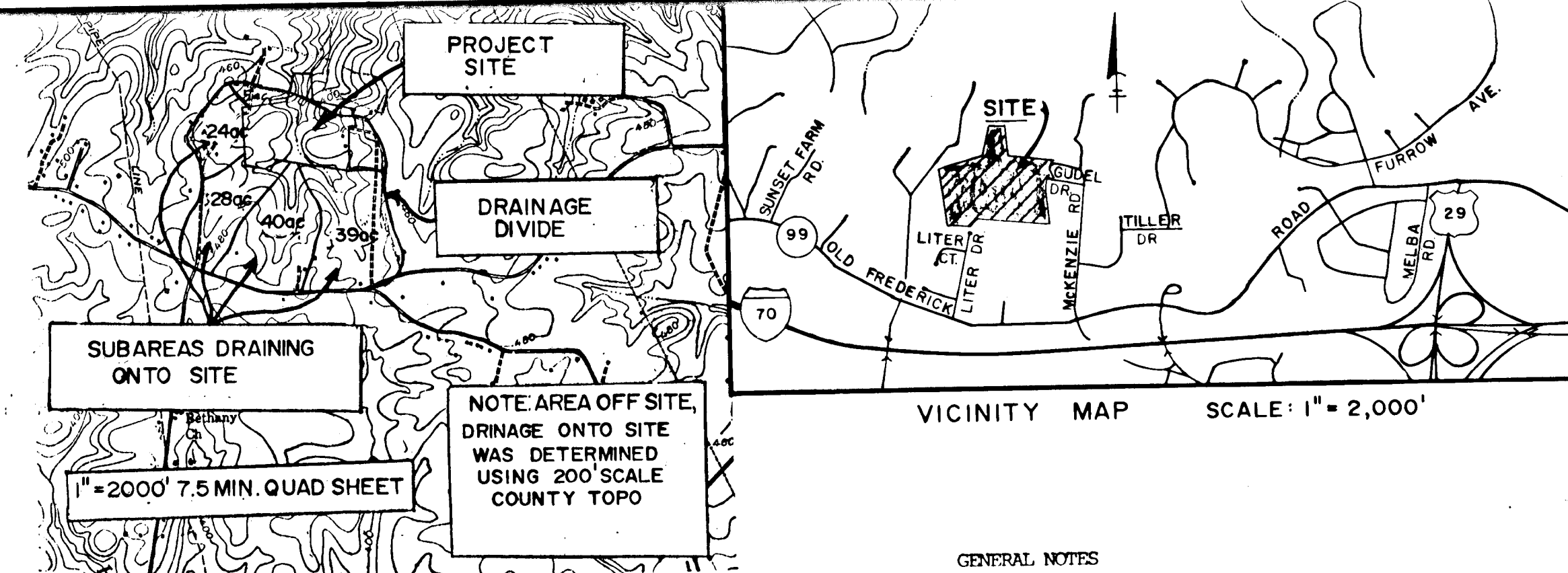
OWNER:
COSCAN WASHINGTON INC.
8521 LEESBURG PIKE
SUITE 200
VIENNA, VIRGINIA 22180
PHONE: (703) 356-9090



NO.	REVISION	BY	DATE
A	ADDED 72" 148" CMP	KAM	10/29/88



DESIGNED BY: J.A.B.
DRAWN BY: J.M.M.
CHECKED BY: W.H.H.
DATE: AUG. 1987
SCALE: 1" = 100'
W.O. NO. 44-86-0025 19 SHEET OF 20



- Existing Zoning: R-20
- Gross Area of Site: 44.3 AC
- Area of Proposed Lots: 26.8 AC
- Area of Proposed Road Right of Way: 5.0 AC.
- Number of Buildable Lots: 69
- Water and Sewer to be Public.
- Boundary Survey by John E. Harms, Jr. and Associates. OCT. 29, 1986
- Topography from Potomac Aerial Surveys. JUNE 16, 1986
- Gudel Drive and McKenzie Road are existing county roads.
- Pursuant to Howard County Design Manual, Volume 1, Storm Drainage, Sect. 10.3.1-4, documentation and a letter is being presented to the Director of Public Works for a Storm Water Management Waiver.

DRAINAGE AREA TABLE (C FACTOR BASED ON 25 YEAR STORM)				
SUB AREA	INLET	AREA	C FACTOR	% IMPERVIOUS
A	1-5	1.86	38	5%
B	1-6	1.83	38	5%
C	1-7	0.34	63	47%
E	1-3	0.71	49	23%
F	1-16	1.68	42	18%
G	1-17	4.44	25	7%
J	1-1	0.88	62	45%
K	1-9	0.69	46	17%
L	1-8	0.25	66	52%
M	1-10	0.32	71	59%
N	1-12	0.11	63	49%
O	1-13	0.62	45	16%
P	1-14	1.00	29	11%
Q	1-4	0.14	67	57%
R	1-2	1.45	48	22%
S	1-18	0.40	73	63%
T	1-19	1.80	40	9%
U	1-11	1.62	44	14%
V	1-15	1.80	29	5%
Y	1-20	0.51	59	40%
Z	1-21	0.55	57	36%

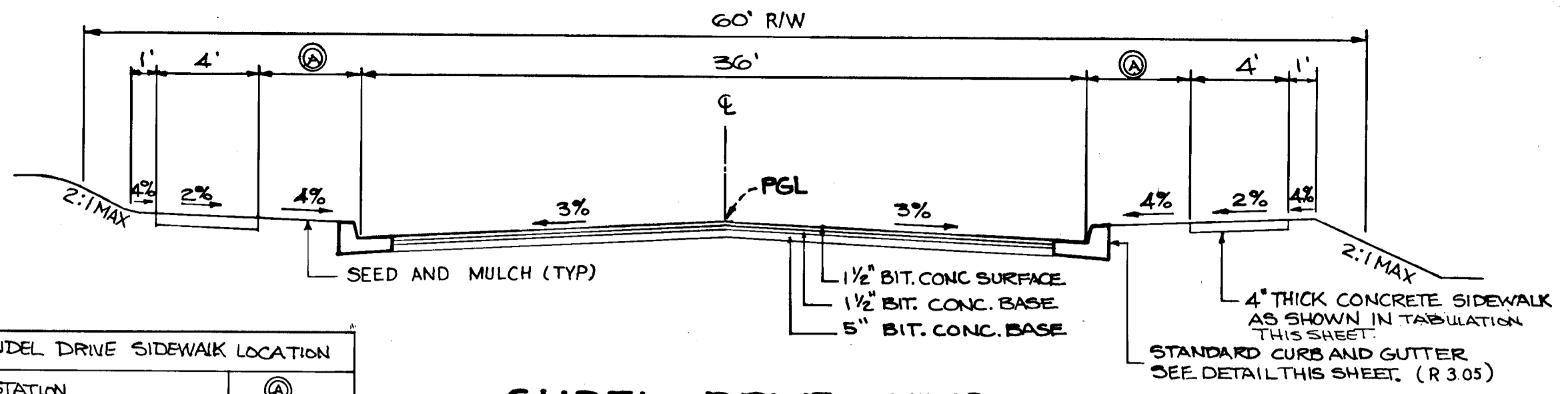
LEGEND
STREET LIGHT
STREET TREES
EXISTING TREE LINE

(O.P. & Z. REF. NO. P-87-51)

DRAINAGE AREA MAP
McKENZIE MEADOWS
SECTION 2
TAX MAP 17 PARCEL 36
2nd ELECTION DISTRICT HOWARD COUNTY, MD.

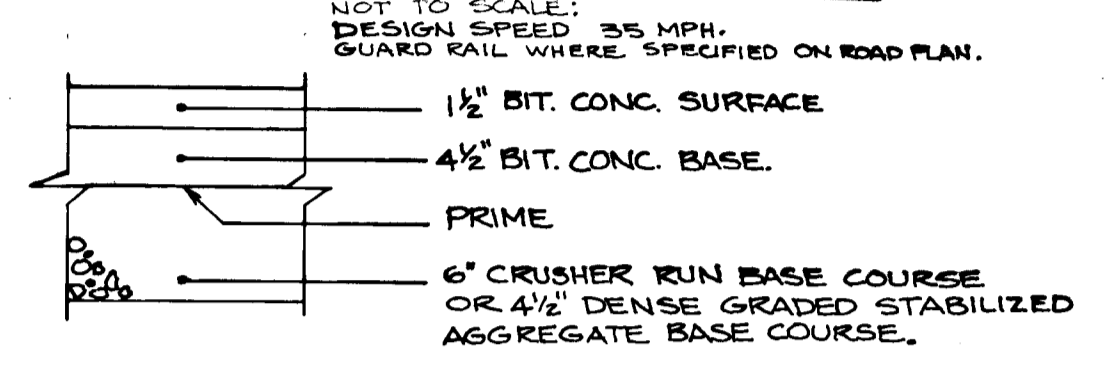
JOHN E. HARMS JR. AND ASSOCIATES INC.
CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS

8030 RED BRANCH ROAD SUITE 100
COLUMBIA, MARYLAND 21045 TELEPHONE (301) 740-5200

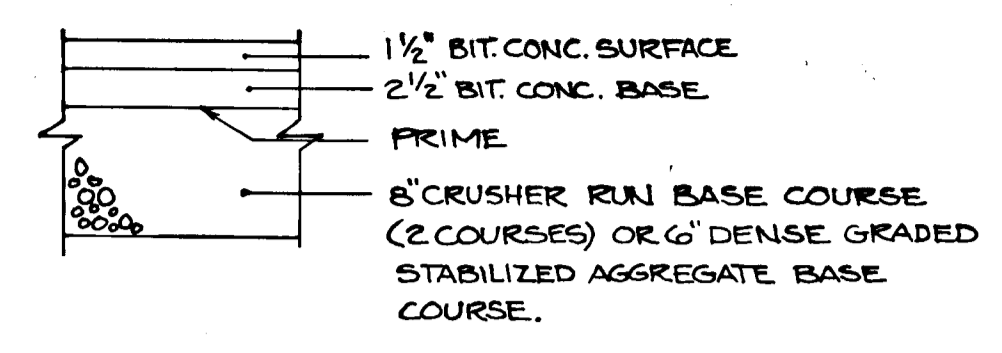


GUDEL DRIVE SIDEWALK LOCATION	
STATION	WIDTH
0+00 TO 9+88.69 LEFT	4'
10+70.50 TO END LEFT	7'
0+85 TO 12+27.48 RIGHT	4'
13+18.52 TO END RIGHT	7'

**GUDEL DRIVE - MINOR COLLECTOR
TYPICAL PAVING SECTION**

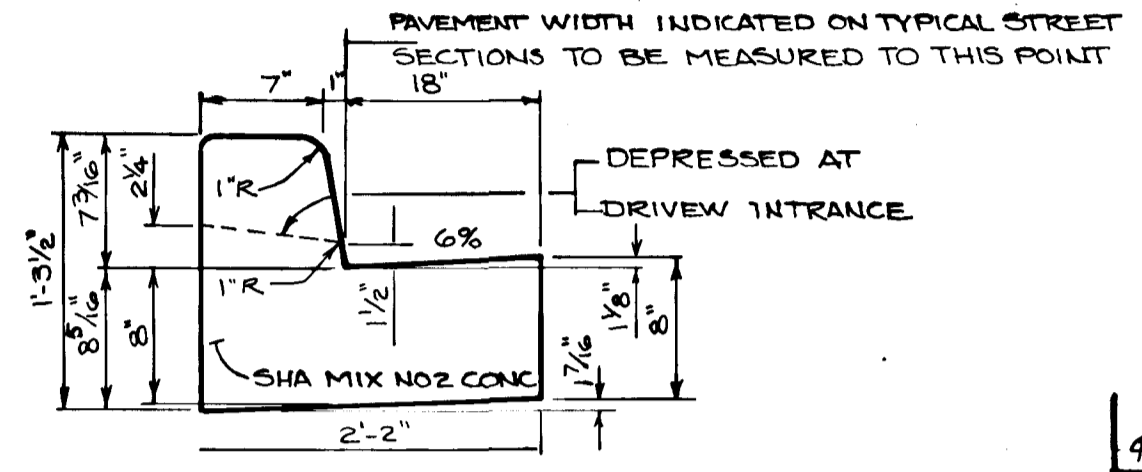


ALTERNATE PAVING SECTION P-3
NOT TO SCALE:



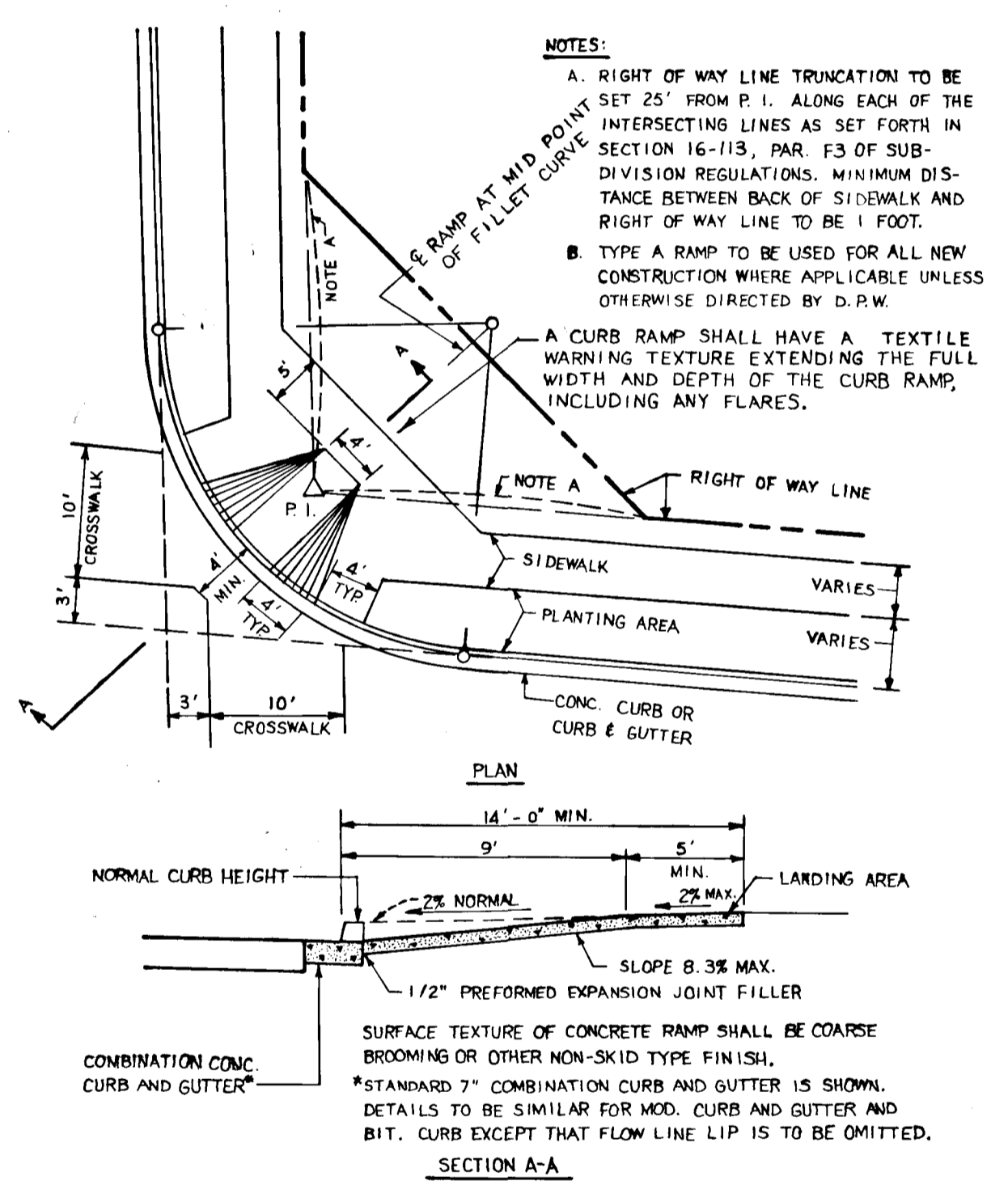
**DETAIL 1
ALTERNATE PAVING SECTION P-2**

NOT TO SCALE:



STANDARD CURB AND GUTTER DETAIL

NOT TO SCALE:



HANDICAPPED RAMP DETAIL

NOT TO SCALE:

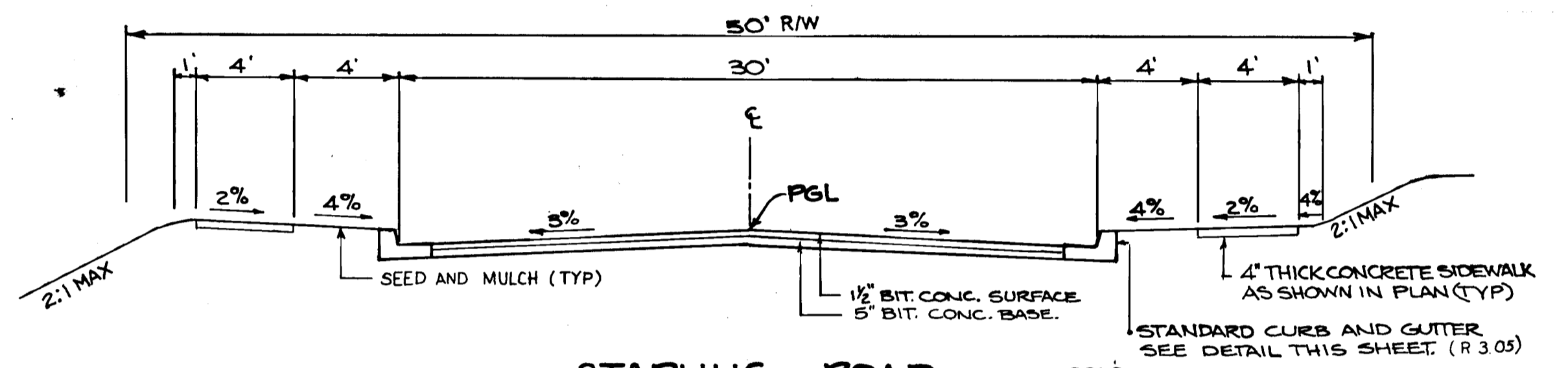
STREET LIGHT SCHEDULE

250-WATT MERCURY VAPOR LAMP
PENDANT MOUNTED FIXTURES ON A
25 FOOT GALVANIZED POLE
LOCATED NO LESS THAN 6' FROM
EDGE OF PAVEMENT.

- 1) LOCATED AT SOUTHEAST SIDE OF GUDEL DRIVE AND SPARROW COURT INTERSECTION.
- 2) LOCATED AT SOUTHWEST SIDE OF GUDEL DRIVE AND EAGLE COURT INTERSECTION.
- 3) LOCATED AT NORTHWEST SIDE OF GUDEL DRIVE AND FINCH COURT INTERSECTION.
- 4) LOCATED SOUTHWEST SIDE OF GUDEL DRIVE AND STARLING ROAD INTERSECTION.

175-WATT "MODERN" MERCURY VAPOR
LAMP POST TOP FIXTURES ON A 14-
FOOT GRAY FIBER GLASS POLE
LOCATED 2-10' FROM BACK OF CURB.

- 1) LOCATED AT NORTHEAST SIDE OF STARLING ROAD AND ORIOLE COURT INTERSECTION.

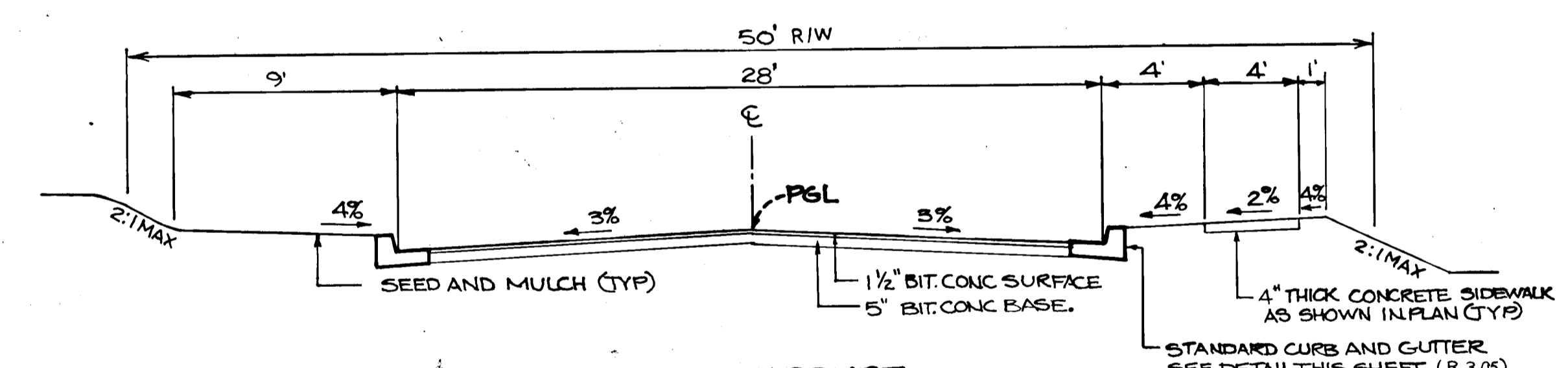


**STARLING ROAD - LOCAL ROAD
TYPICAL PAVING SECTION**

NOT TO SCALE:
DESIGN SPEED 30 MPH

ALTERNATE PAVING SECTION P-2

SEE DETAIL 1 ON THIS SHEET

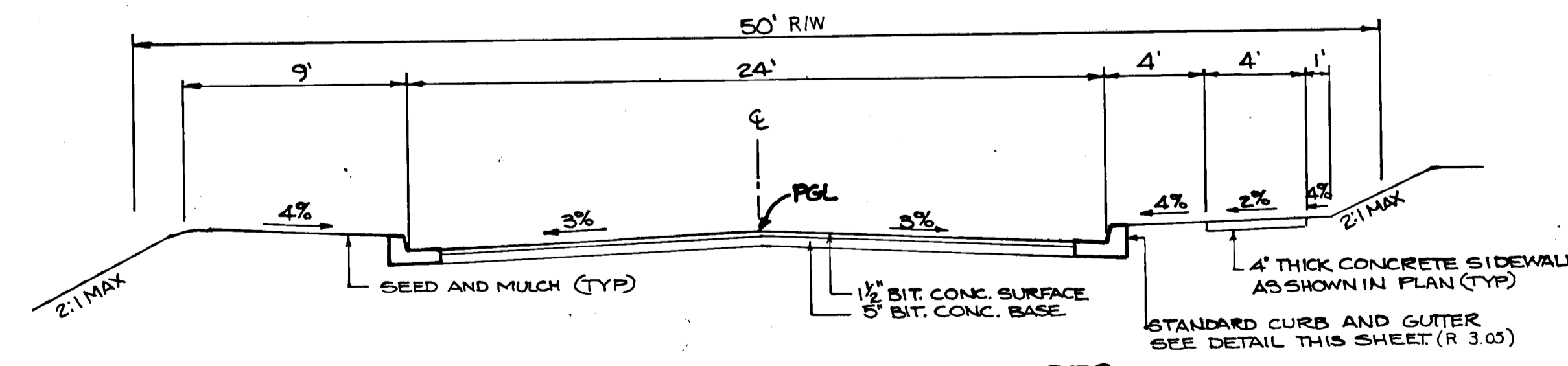


**SPARROW COURT - CUL-DE-SAC STREET
TYPICAL PAVING SECTION**

NOT TO SCALE:
DESIGN SPEED 30 MPH

ALTERNATE PAVING SECTION P-2

SEE DETAIL 1 ON THIS SHEET

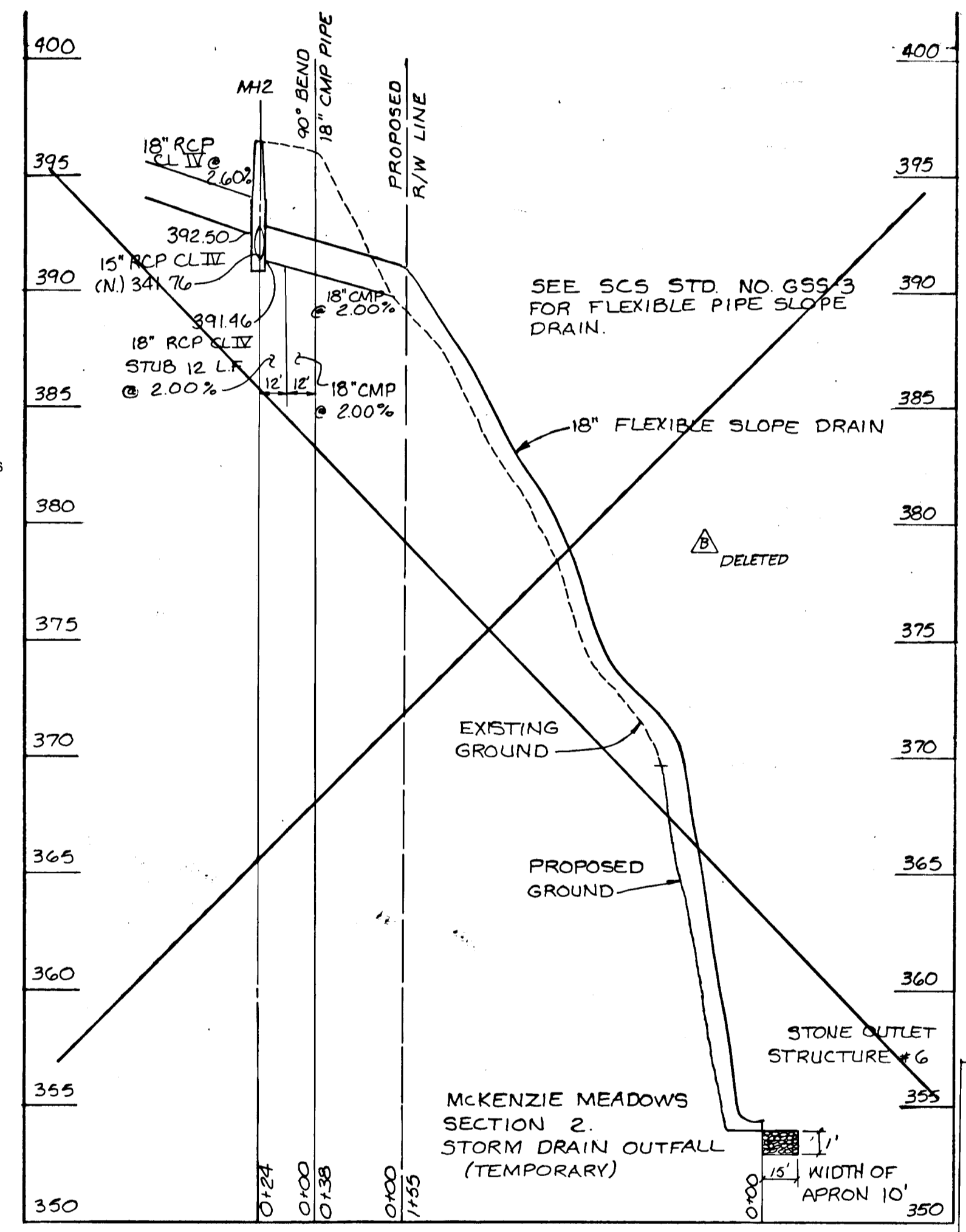


**EAGLE, FINCH, HAWK & ORIOLE COURTS - CUL-DE-SAC STREETS
TYPICAL PAVING SECTION**

NOT TO SCALE:
DESIGN SPEED 25 MPH

ALTERNATE PAVING SECTION P-2

SEE DETAIL 1 ON THIS SHEET



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Michael E. F. 12-6-87
 CHIEF AND DEVELOPMENT DIVISION DATE
James W. Harms 12/18/87
 CHIEF, BUREAU OF HIGHWAYS DATE
James S. Kelly 12-2-87
 CHIEF, BUREAU OF ENGINEERING DATE

APPROVED: OFFICE OF PLANNING AND ZONING
James Harms 12/22/87
 CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION DATE

DETAIL SHEET
MCKENZIE MEADOWS
 O P & Z REFERENCE P-87-51
 SECTION TWO
 TAX MAP NO 17 PARCELS 36
 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND.

JOHN E. HARMS JR. AND ASSOCIATES INC.
 CONSULTING ENGINEERS - ARCHITECTS - SURVEYORS
 9030 RED BRANCH ROAD SUITE 100
 COLUMBIA, MARYLAND 21045 TELEPHONE (301) 740-5200

NO.	REVISION	BY	DATE
1	REV. ADDED PROFILE S.D. & (temp)	MLM	3-25-88
2	REVISED SEDIMENT CONTROL LOTS 67-97	KAM	2/12/89
3	Add Sidewalk Chart	KAM	9/13/90

DESIGNED BY: J.A.B.
 DRAWN BY: R.W.R.
 CHECKED BY: K.B.C.
 DATE: 7-24-87
 SCALE: NOT TO SCALE
 W.O. NO. 44-86-002B 20 SHEET OF 20

202