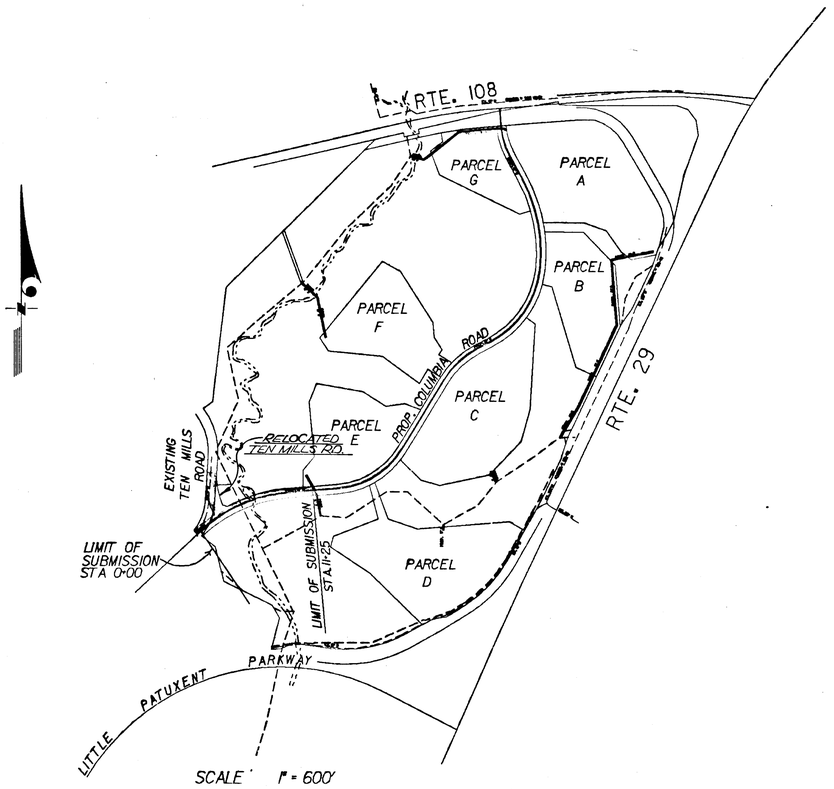
INDEX

SHEET NO.	TITLE
1	TITLE PAGE
2	STREET GRADE, STORM DRAIN & PAVING PLAN - COLUMBIA RD.
3	STREET GRADE, STORM DRAIN & PAVING PLAN - COLUMBIA RD.
4	STREET GRADE, STORM DRAIN & PAVING PLAN - TEN MILLS RD.
5	STORM DRAIN PROFILES AND DETAILS
6	DRAINAGE AREA MAP
7	SEDIMENT CONTROL
8	SEDIMENT CONTROL
9	COLUMBIA ROAD BRIDGE, GENERAL PLAN & ELEVATION
10	COLUMBIA ROAD BRIDGE, FOUNDATION PLAN, ABUTMENTS A & B
11	COLUMBIA ROAD BRIDGE, ABUTMENT A
12	COLUMBIA ROAD BRIDGE, ABUTMENT B
13	COLUMBIA ROAD BRIDGE, WINGWALL DETAILS
14	COLUMBIA ROAD BRIDGE, PIER 1
15	COLUMBIA ROAD BRIDGE, FRAMING PLAN AND TYPICAL SECTION
16	COLUMBIA ROAD BRIDGE, GIRDER ELEVATION
17	COLUMBIA ROAD BRIDGE, SUPERSTRUCTURE ELEVATIONS
18	COLUMBIA ROAD BRIDGE, CAMBER SCHEDULE/STANDARD DETAILS
19	COLUMBIA ROAD BRIDGE, STANDARD DETAILS
20	COLUMBIA ROAD BRIDGE, STANDARD DETAILS
21	COLUMBIA ROAD BRIDGE, STANDARD DETAILS
22	COLUMBIA ROAD BRIDGE, STANDARD DETAILS
23	COLUMBIA ROAD BRIDGE, BORING LOGS AND TESTS
24	PARCEL "D" - ENTRANCE CULVERT



GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL VOL. IV, DETAILS AND SPECIFICATIONS FOR CONSTRUCTION.
2. ALL UTILITY COMPANIES SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF CONSTRUCTION.
3. ALL INLETS SHALL BE HOWARD COUNTY STANDARDS UNLESS OTHERWISE SHOWN.
4. ALL STREET CURB RETURNS SHALL HAVE A 30.0' RADII UNLESS OTHERWISE NOTED.
5. STORM DRAIN TRENCHES WITHIN ROAD RIGHTS-OF-WAY SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH HOWARD COUNTY STANDARD SPECIFICATIONS.
6. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY AT T THE CONTRACTOR'S EXPENSE.
7. THE CONTRACTOR SHALL TEST PIT EXISTING UTILITIES WHERE DIRECTED BY THE ENGINEER A MINIMUM OF TWO WEEKS IN ADVANCE OF ANY CONSTRUCTION.
8. TEMPORARY COMPACTED 18" HIGH EARTH FILL DIVERSION DIKES SHALL BE CONSTRUCTED ABOUT THE LIPS OF FILL SLOPES ON THE R.O.W. CONCURRENTLY WITH THE INITIAL GRADING AND DIRECTED TO UNDISTURBED SOD AREAS AT THE END OF EACH DAY.
9. CONTRACTOR TO NOTIFY THE HOWARD COUNTY DEPT. OF INSPECTIONS AND PERMITS AT LEAST 3 DAYS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS. TELEPHONE NO. 992-2436.
10. ALL DISTURBED SLOPE AREAS TO BE STABILIZED AS SOON AS GRADING IS COMPLETED.
11. ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM OF 28 DAYS STRENGTH OF 3500 P.S.I..
12. ALL SWALES AND SLOPES SHALL BE PERMANENTLY SEEDED. SEE THE SEED SPECIFICATIONS ON SHEET 13.
13. TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 1981 REVISED EDITION.
14. POLY-FILTER-X OR EQUAL SHALL BE PLACED UNDER ALL STONE RIP RAP (FULL WIDTH AND LENGTH OF STONE).
15. STONE FOR RIP RAP SHALL BE AS SPECIFIED ON THE DRAWINGS. ALL RIP RAP SHALL BE UNPAVED, EXCEPT WHERE NOTED.
16. STUBS FOR 6" P.V.C. UNDERDRAIN PIPE TO BE INSTALLED AT CENTER OF EACH WALL OF EVERY INLET.
17. Contractor shall notify the following utilities or agencies at least five (5) working days before starting work shown on these plans:

    State Highway Administration - 531-5533

    Baltimore Gas & Electric Company - Underground Electric Distribution Customer Service - 685-0123

    Baltimore Gas & Electric Company - Ungerground Gas Distribution Customer Service - 685-0123

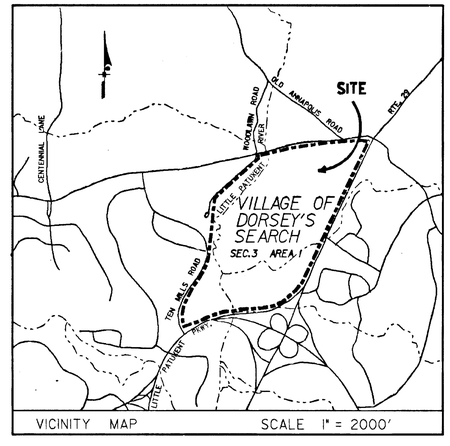
    Chesapeake & Potomac Telephone Company - 725-9976

    American Telephone & Telegraph - Cable Location Division - 393-3553

18. Street Trees - (67 Total) - The location type and number of trees shown on this plan are tentative and are used for bond purposes only. The final location and variety of trees may vary to accommodate field conditions and builders landscape program. Bond release is contingent upon Section 15.131 of the Howard County Subdivision Regulations, as approved by the Office of Planning and Zoning.
19. STORMWATER MANAGEMENT REQUIRED FOR THE PARCELS IN THIS DEVELOPMENT HAS BEEN WAIVED
20. Provide 250 watt Mercury Vapor Lamp (shown as thus ☼). Pendant Mounted fixtures on 30 ft. Aluminum Bronze Pole to be located at Sta. 11+00 Left &, 7+50 Left & and 3+75 Left &.

HOWARD COUNTY TRAVERSE #2841002 (EL. 381.548) N 511932.585 E 845,859.362

HOWARD COUNTY TRAVERSE #2841003 (EL. N/A) N 512,011.507 E 849,640.468



VILLAGE OF DORSEY'S SEARCH

SECTION 3 AREA 1 PHASE 191

COLUMBIA, MARYLAND

CONTRACT NO. 1

ROAD CONSTRUCTION DRAWINGS

PHASE II STA. 0+00 TO STA. 11+25 COLUMBIA ROAD

STA. 0+00 TO STA. 3+95.95 RELOCATED TEN MILLS ROAD

FIFTH ELECTION DISTRICT HOWARD CO., MARYLAND

BRUCE D. BOLTZ
MD. P.E. 12232

STATE OF MARYLAND — Bruce D. Boltz, Jr. — No. 12232 — REGISTERED

DATE

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION — DATE 2-3-86

THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044
(301) 992-6084

#1159

No.	REVISION	DATE	BY

ENGINEERS-ARCHITECTS-PLANNERS-SCIENTISTS-SURVEYORS-PHOTOGRAMMETRISTS

GREENHORNE & O'MARA, INC.

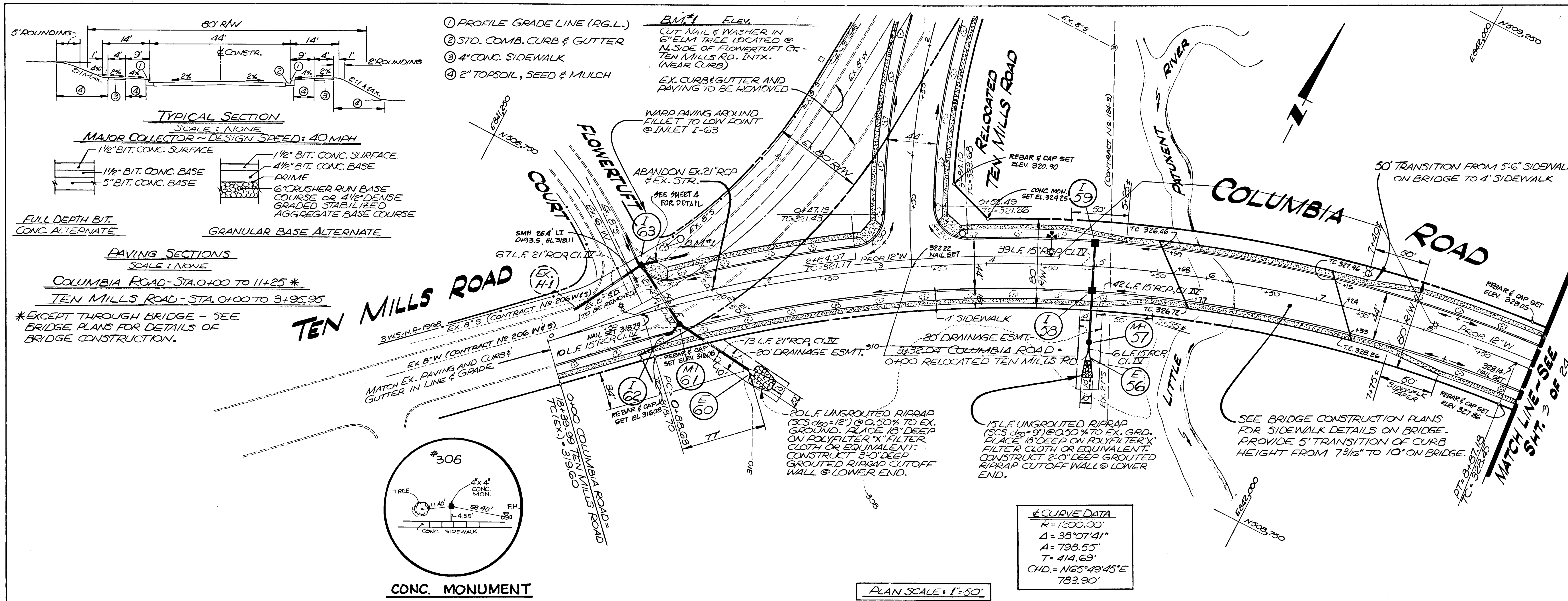
2 RESEARCH PLACE ROCKVILLE, MD. 20850

(301) 948-0900

ANNAPOLIS,MD-ATLANTA,GA-BECKLEY,WV-CULPEPER,VA-DENVER,CO-FAIRFAX,VA
GREENSBORO,NC-MONROE,MI-N.HUNTINGDON,PA-ROCKVILLE,MD-WILLISTON PARK,NY

DESIGN	SCALE AS SHOWN
CADD DRAWN GSK	1 OF 24
RHM CHECKED	SHEET
AUG. '85 DATE	JOB No. R-1216-X FILE No.

F-86-55



DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — 2-28-86 — DATE

APPROVED: HOWARD COUNTY OFFICE OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT & ZONING ADMINISTRATION — 2-3-86 — DATE

DATE	NO.	REVISION DESCRIPTION
8-12-87	2	ADDED STORM DRAIN FROM EX. A-1 TO I-63
12-3-86	1	SIDEWALK TAPERS @ BRIDGE

COLUMBIA
VILLAGE OF DORSEY'S SEARCH

SECTION 3 AREA I

PHASE - 191

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MD.

OWNER & DEVELOPER
THE HOWARD RESEARCH & DEVELOPEMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MD. 21043
(301) 992 - 6000

GREENHORNE AND O'MARA, INC.
ENGINEERS ARCHITECTS PLANNERS SURVEYORS
•2 RESEARCH PLACE ROCKVILLE, MARYLAND 20850
(301) 323-1929

AREA
TAX MAP NO. 30
PARCELS 124, 224 & 210

TITLE
GRADE ESTABLISHMENT STORM DRAINAGE AND PAVING PLAN

DESIGNED BY: JSL	SCALE: AS SHOWN	PROJECT NO.
DRAWN BY: JDP	DATE: AUG., '85	DRAWING NUMBER
CHECKED BY: BDB/RHM	APPROVED:	2 OF 24

PLAN — NOTE BOOK — No. — SURVEYED — PLOTTED — ALIGNMENT CHECKED — RT. OF WAY CHECKED — BY — DATE

PROFILE — NOTE BOOK — No. — SURVEYED — PLOTTED — GRADES CHECKED — B.M.'s NOTED — STRUCTURE NOTATIONS CHECKED — BY — DATE

#1159

PLATE 1 PLAN-PROFILE O. P. R. & R. E. STANDARD
DIETZGEN CORPORATION
PRINTED IN U.S.A.

AS-BUILT

F-86-55

R-1216-X

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

APPROVED: HOWARD COUNTY OFFICE OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION — DATE 2-7-86

DATE	NO.	REVISION DESCRIPTION

COLUMBIA
VILLAGE OF DORSEY'S SEARCH

SECTION 3 AREA I

PHASE - 191

ELECTION DISTRICT NO. HOWARD COUNTY, MD.

OWNER & DEVELOPER

THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21043
(301) 992-6000

GREENHORNE AND O'MARA, INC.
ENGINEERS ARCHITECTS PLANNERS SURVEYORS
*2 RESEARCH PLACE ROCKVILLE, MARYLAND 20850
(301) 323-1929

AREA

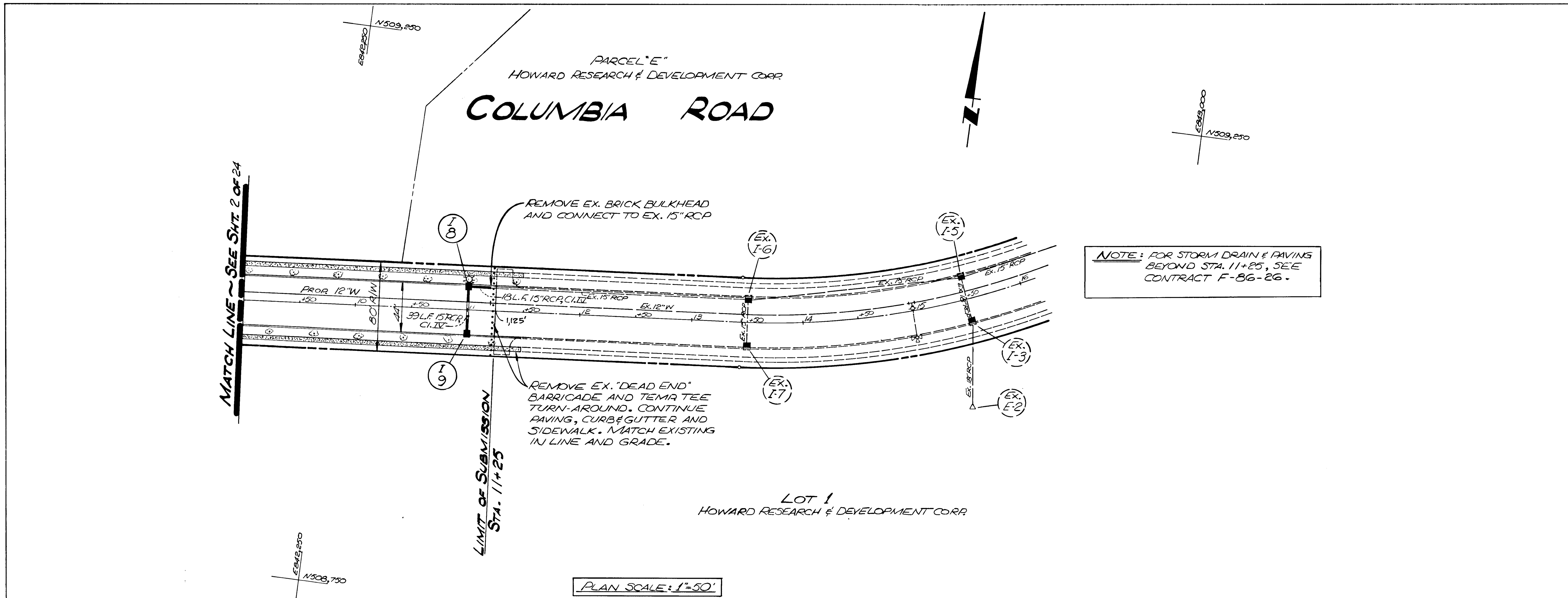
TAX MAP NO. 30
PARCELS 124, 224, & 210

TITLE

GRADE ESTABLISHMENT
STORM DRAINAGE AND PAVING PLAN

DESIGNED BY: JSL	SCALE: AS SHOWN	PROJECT NO.
DRAWN BY: JDP	DATE: AUG. 85	DRAWING NUMBER
CHECKED BY: BDB/RHM	APPROVED:	3 OF 24

STATE OF MARYLAND — Bruce D. Boltz Jr. — No. 12232



PARCEL "E"
HOWARD RESEARCH & DEVELOPMENT CORP.
COLUMBIA ROAD
N509,250
E849,250
N509,250
E849,000
MATCH LINE ~ SEE SHT. 2 OF 24
REMOVE EX. BRICK BULKHEAD AND CONNECT TO EX. 15" RCP
PROP. 12" W
80' R/W
39 LF 15" RCP, CL. IV
18 L.F. 15" RCP, CL. III
EX. 15" RCP
EX. 12" W
1,125'
I-8
I-9
EX. I-6
EX. I-7
EX. I-5
EX. I-3
EX. E-2
REMOVE EX. "DEAD END" BARRICADE AND TEMA TEE TURN-AROUND. CONTINUE PAVING, CURB & GUTTER AND SIDEWALK. MATCH EXISTING IN LINE AND GRADE.
LIMIT OF SUBMISSION STA. 11+25
NOTE: FOR STORM DRAIN & PAVING BEYOND STA. 11+25, SEE CONTRACT F-86-26.
LOT 1
HOWARD RESEARCH & DEVELOPMENT CORP.
E849,250
N508,750

PLAN SCALE: 1"=50'

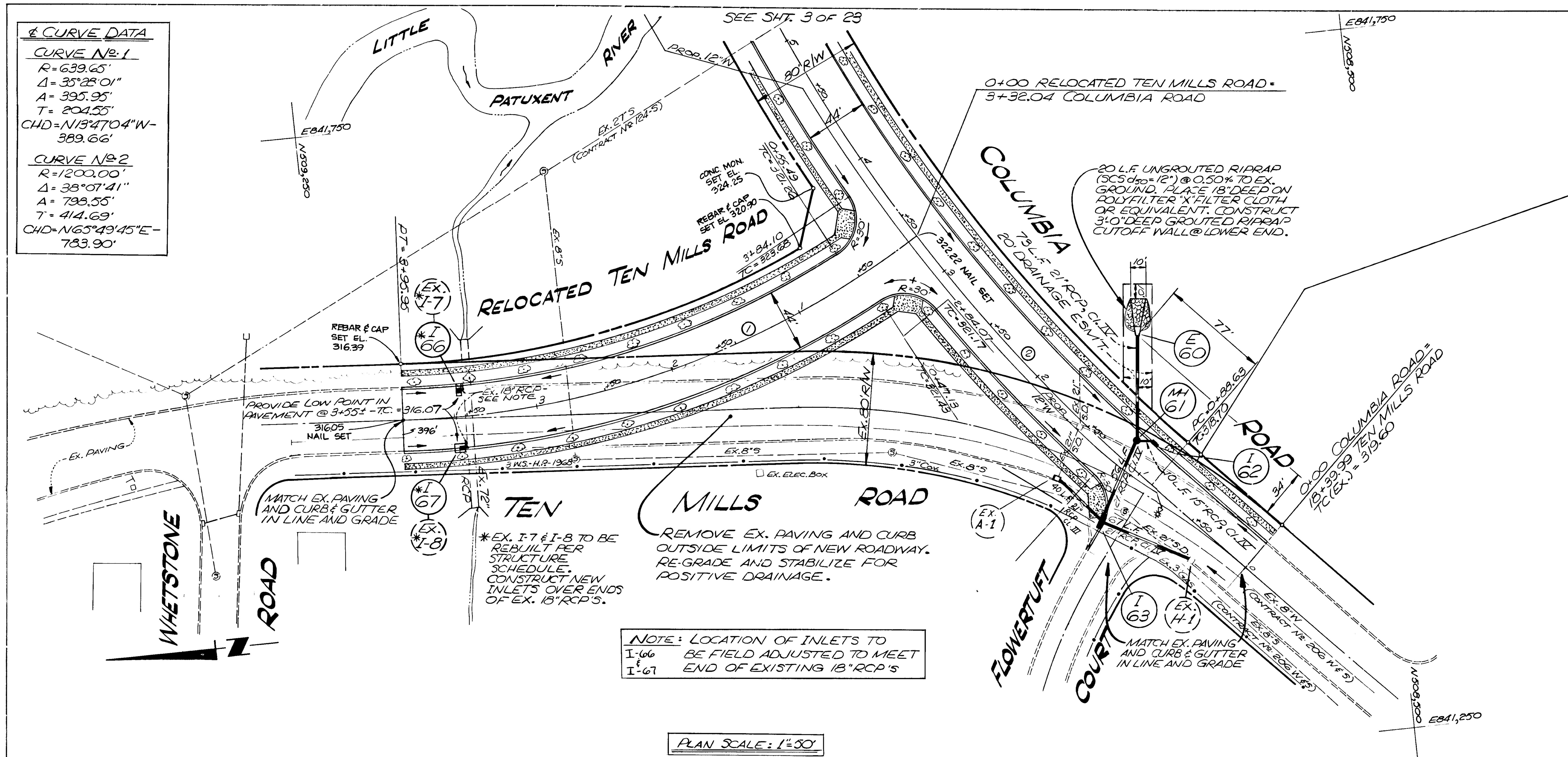
PROFILE SCALE: HORIZ. 1"=50' VERT. 1"=5'
150' V.C.
340
330
320
310
300
P.G.L.
-1.00%
-1.00%
326.08
MATCH EX. GRADE PER F-86-26
EX. GRD. 70' LT.
EX. GRD. @ ℄
EX. GRD. 70' RT.
℄ 328.02
℄ 327.60
℄ 327.17
℄ 326.61
℄ 326.05
℄ 325.80
+05 PVT 328.05
327.88
327.33
326.83
326.33
325.33
324.33
323.33
322.33
321.33
LIMIT OF SUBMISSION
11+25
9
+50
10
+00
+50
11
+00
12
+00
13
+00
14
+00
15
+00
16
+00

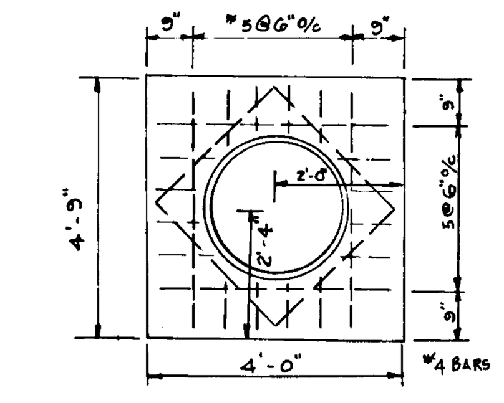
AS-BUILT SURVEY CERTIFIED BY RICHARD F. LANE, MD. PLS No. 301

PLATE 1 PLAN PROFILE

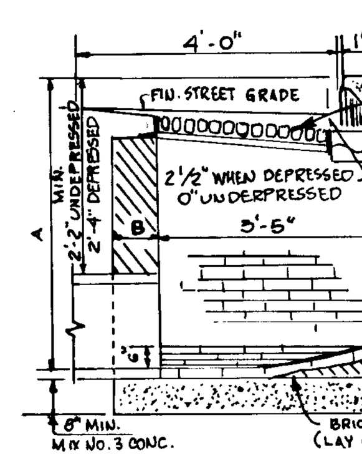
AS-BUILT

#1159





PART OF TYPE "D" INLET
HOWARD COUNTY DETAIL NO. SD 4.11



REMOVE GRATE & HEAD PIECE & SET 4'-0" x 4'-9" TYPE D SLAB AT SAME TOP ELEVATION AS TOP OF EXISTING HEAD PIECE (318.26)

EXTEND BRICK SIDEWALK AS NECESSARY TO SET TOP ELEVATION AND PROVIDE OPENINGS ON ALL SIDES.

EXISTING A-1 INLET
TYPE S COMB. INLET
HOWARD COUNTY DETAIL NO. SD-4.32

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

APPROVED: HOWARD COUNTY OFFICE OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT & ZONING ADMINISTRATION — DATE 2-7-86

DATE	NO.	REVISION DESCRIPTION
8-12-87	1	ADDED STORM DRAIN & DETAIL FROM EX. A-1 TO I-63

COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3 — AREA I
PHASE - 191

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MD.

OWNER & DEVELOPER
THE HOWARD RESEARCH & DEVELOPEMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MD. 21043
(301) 992 - 6000

GREENHORNE AND O'MARA, INC.
ENGINEERS ARCHITECTS PLANNERS SURVEYORS
2 RESEARCH PLACE ROCKVILLE, MARYLAND 20850
(301) 323-1929

AREA
TAX MAP NO. 30
PARCELS 124, 224 & 210

TITLE
GRADE ESTABLISHMENT STORM DRAINAGE AND PAVING PLAN

DESIGNED BY: JSL	SCALE: AS SHOWN	PROJECT NO.
DRAWN BY: JDP	DATE: AUG., '85	DRAWING NUMBER 4 OF 24
CHECKED BY: BDB/RHM	APPROVED:	

AS-BUILT SURVEY CERTIFIED BY RICHARD F. LANE, MD. PLS. No. 301

AS-BUILT

F-86-55 R-1216-X

#1159

STRUCTURE SCHEDULE

Nº	TYPE	TOP ELEVATION UPPER	TOP ELEVATION LOWER	LOCATION	INVERTS IN	INVERTS OUT
E56	Std. 15" Conc. End Section	–	62	℄ End 15" Pipe 77' Rt. ℄ Sta. 4+08.04	308.40	307.62 30
M57	4' Precast MH - G.5.11	314.62		℄ MH 68' Rt. ℄ Sta. 4+98.00	309.58	309.18
I58	"S" Comb. Undep. Inlet	325.83	325.70	℄ Box 20.02' Rt. ℄ Sta. 4+58.00	321.92 95	320.80 82
I59	"S" Comb. Undep. Inlet	325.83	325.70	℄ Box 20.02 Lt. ℄ Sta. 4+98.00	–	321.80 50
EG0	Std. 21" Conc. End Section		See Plan		308.83	308.69 94
MG1	4' Precast MH - G.5.12	318.38		℄ MH 17' Rt. ℄ Sta. 1+18	309.88	309.25 21
IG2	A-5 Inlet W = 2'-6"	318.41	95	℄ Box 23.02' Rt. ℄ Sta. 0+06.23	–	313.73
IG3	SEE DETAIL THIS SHEET	318.10	98	*** ℄ STA. 0+32	313.77	313.00 93
IG6*	Dbl. "S" Comb. Undep. Inlet Dep.	316.37	96	** ℄ Box 16.42' Rt. ℄ Sta. 3+58± 450±	–	Ex. 311.60
IG7	WRM Inlet MSHA Std. 374.05	316.37	57	** ℄ Box 21.58' Lt. ℄ Sta. 3+58± 450±	–	Ex. 311.70
ExH1	Ex. "S" Dep. Comb. Inlet	316.37	57	2800		309.91
I8	"S" Comb. Undep. Inlet	326.36	326.30	℄ Box 20.02' Lt. ℄ Sta. 11+00	322.20 92	322.10 06
I9	"S" Comb Undep Inlet	326.36	326.30	℄ Box 20.02' Rt. ℄ Sta. 11+00	–	323.62 06

** Location of Sts GG & G7 To be field adjusted to meet end of existing pipes. Existing Structures to be rebuilt or removed as necessary

* Normal to curb per SD-4.33

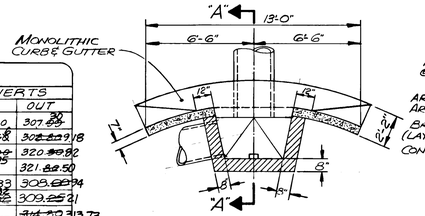
*** I-G3 TO BE LOCATED FROM ℄ STATIONING OF FLOWERTUFT COURT. INLET TO BE @ FACE OF CURB PER STD. SD 4.06 & MODIFIED TO BE RADIAL W/FILLET AS NECESSARY.

PIPE SCHEDULE

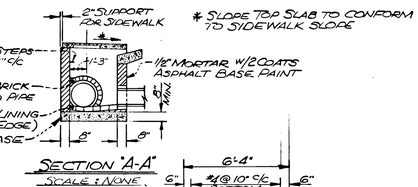
SIZE	TYPE	LENGTH
15"	RCP Cl. IV	154 L.F.
21"	RCP Cl. IV	67 L.F.
24"	RCP Cl. IV	139 L.F.

STRUCTURE SCHEDULE NOTES

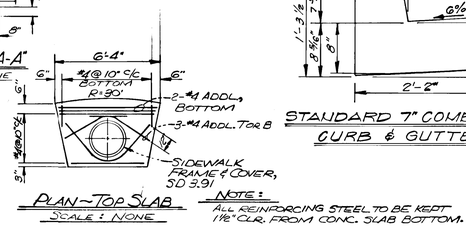
1. "S" Comb. Inlet Howard County Standard S.D. 4.32. ("DEP" & UNDEP" Designate Depressed & Undepressed Inlets Respectively)
2. DBL "S" Comb Inlet Howard County Standard S.D. 4.34. ("DEP" & "UNDEP" Designate Depressed & Undepressed Inlets Respectively)
3. A-10 Inlet Howard County Standard S.D. 4.02.
4. Conc. End Section Howard County Standard S.D. 5.51.
5. Precast Manhole Howard County Standard G 5.12 & G 5.13
6. All Storm Drain Pipe Bedding to be Class "C" Shaped Subgrade Unless Otherwise Noted. If Rock is Encountered the Trench Invert Should be Overexcavated 6 inches and the Overexcavation of 6" Inches Refilled with Granular Material.
7. ALL "S" INLETS SHALL HAVE RETICULAR GRATES PER HOWARD COUNTY STD. SD 4.93 .



PLAN - W/TOP SLAB REMOVED
SCALE : NONE



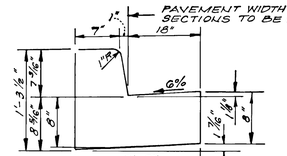
SECTION "A-A"
SCALE : NONE



PLAN - TOP SLAB
SCALE : NONE

NOTE:
ALL REINFORCING STEEL TO BE KEPT 1½" CLR. FROM CONC. SLAB BOTTOM.

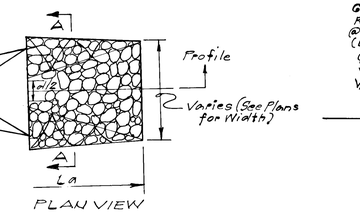
DETAIL - I-G3 INLET



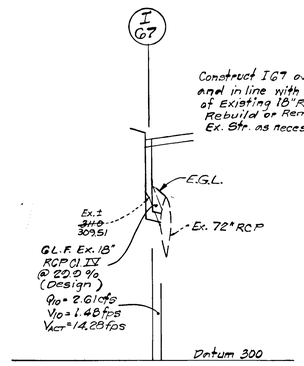
STANDARD 7" COMBINATION CURB & GUTTER

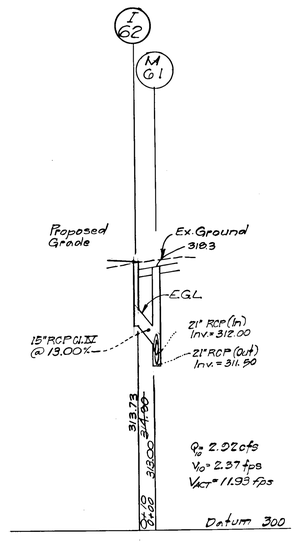
NOTES (FOR "DETAIL-I-G3 INLET")

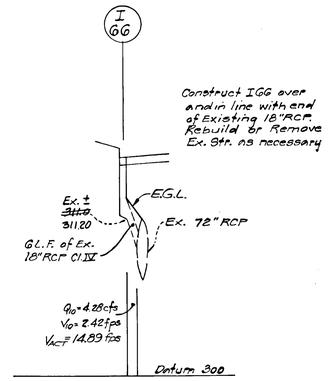
1. INVERTS SHALL BE BRICK.
2. BASE SHALL BE CLASS "A" CONCRETE.
3. WALLS SHALL BE BRICK (BR.), PLAIN CLASS "A" CONCRETE (PC.) OR REINFORCED CONCRETE (R.C.)
4. REINFORCING = #4 @ 10" c/c E.W. IN ℄ WALLS. REINFORCING CONTINUOUS @ CORNERS. ALL LAPS 1'-4".
5. TOP 4' OF WALLS SHALL BE BRICK MASONRY. ADDITIONAL BRICK SHALL BE USED TO BRING MH COVER TO EX. G.&D. IF REQ'D.
6. BENCH (AS PER TYPE "A" MH) SHALL BE BUILT INTO INLET WHERE DRAINS 24" & LARGER RUN THROUGH INLET.

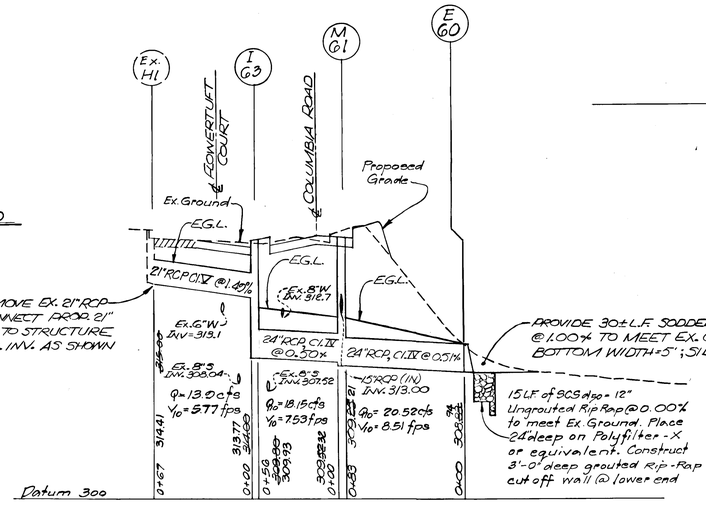


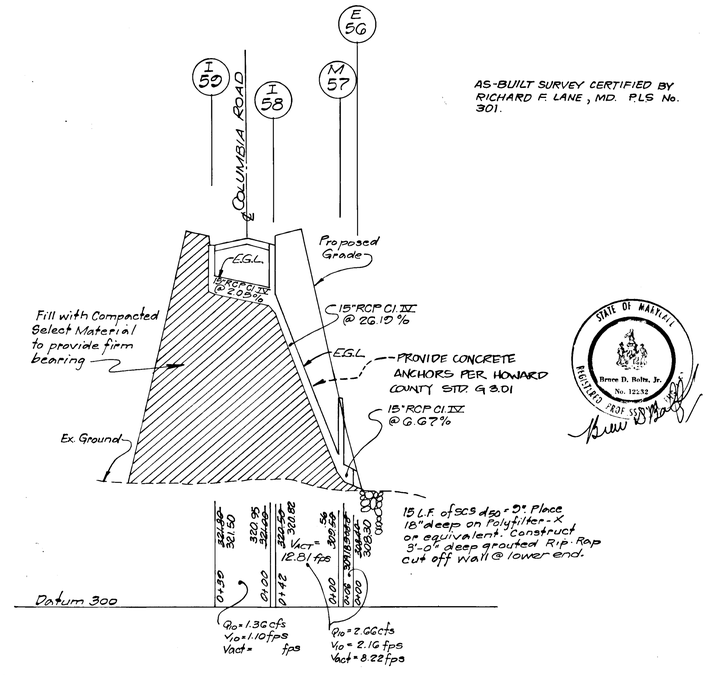
CROSS SECTION A-A
OUTFALL BELOW E-56 & E-60
SCALE : NONE











AS-BUILT SURVEY CERTIFIED BY RICHARD F. LANE, MD. P.L.S. No. 301.

STATE OF MARYLAND — ENGINEER — Bruce D. Bolte, Jr. — No. 12292 — TRADE SSB

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION — DATE 2-3-86

OWNER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044
(301) 992-6084

No.	REVISION	DATE	BY
1	REVISIONS TO STORM DRAIN PROFILE AS PER DPW LETTER 4/4/86	6/11/86	NRD

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
2 RESEARCH PLACE, ROCKVILLE, MARYLAND 20850
(301) 948-0900
GREENBELT, MD • ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO
FAIRFAX, VA • GREENSBORO, NC • MONROE, MI • EXPORT, PA • WILLISTON PARK, NY

STORM DRAIN PROFILES AND DETAILS
VILLAGE OF DORSEY'S SEARCH
SECTION 3 AREA 1 PHASE 191
5th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

JSL DESIGN	SCALE	Horiz. 1" = 50' Vert. 1" = 5'	
EG DRAWN	SHEET	5 OF 24	
BSP/RHM CHECKED			
Aug 1985 DATE	JOB No.	R-1216-X FILE No.	

#1159

F-86-55 AS-BUILT

OWNER/DEVELOPER

HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS

GREENHORNE & O'MARA, INC.
2 RESEARCH PLACE, ROCKVILLE, MARYLAND 20850
(301) 948-0900

GREENBELT, MD • ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO
FAIRFAX, VA • GREENSBORO, NC • MONROE, MI • EXPORT, PA • WILLISTON PARK, NY

DRAINAGE AREA MAP
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RHM DESIGN	SCALE 1" = 100'
RW/JDP DRAWN	6 OF 24
BDB CHECKED	SHEET
June, 85 DATE	JOB No.
	R-1216-X FILE No.

#1159

F-86-55

APPROVED:
HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] 2-28-86
CHIEF, BUREAU OF ENGINEERING [initials] 2-28-86 DATE

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

[signature] 2-3-86
CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. DATE

SEDIMENT CONTROL

by the Developer:

"I/We certify that all development and construction will be done according to this plan, and that many responsible personnel involved in the construction project will have a Certificaate of Attendance at a Department of Natural Resources Approved Training Program for the control of Sediment and Erosion before beginning the project".

[signature] 1-17-86
Signature of Developer — Date
Print name below signature
Joseph H. Nickel Jr.

By the Engineer:

STATE OF MARYLAND — ROBERT HAROLD MARMON — LIC. NO. 10537 — REGISTERED PROFESSIONAL ENGINEER

"I certify that this plan for erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District."

Robert H. Marmon 1-16-86
Signature of Engineer — Date
Print name below signature
Robert H. Marmon

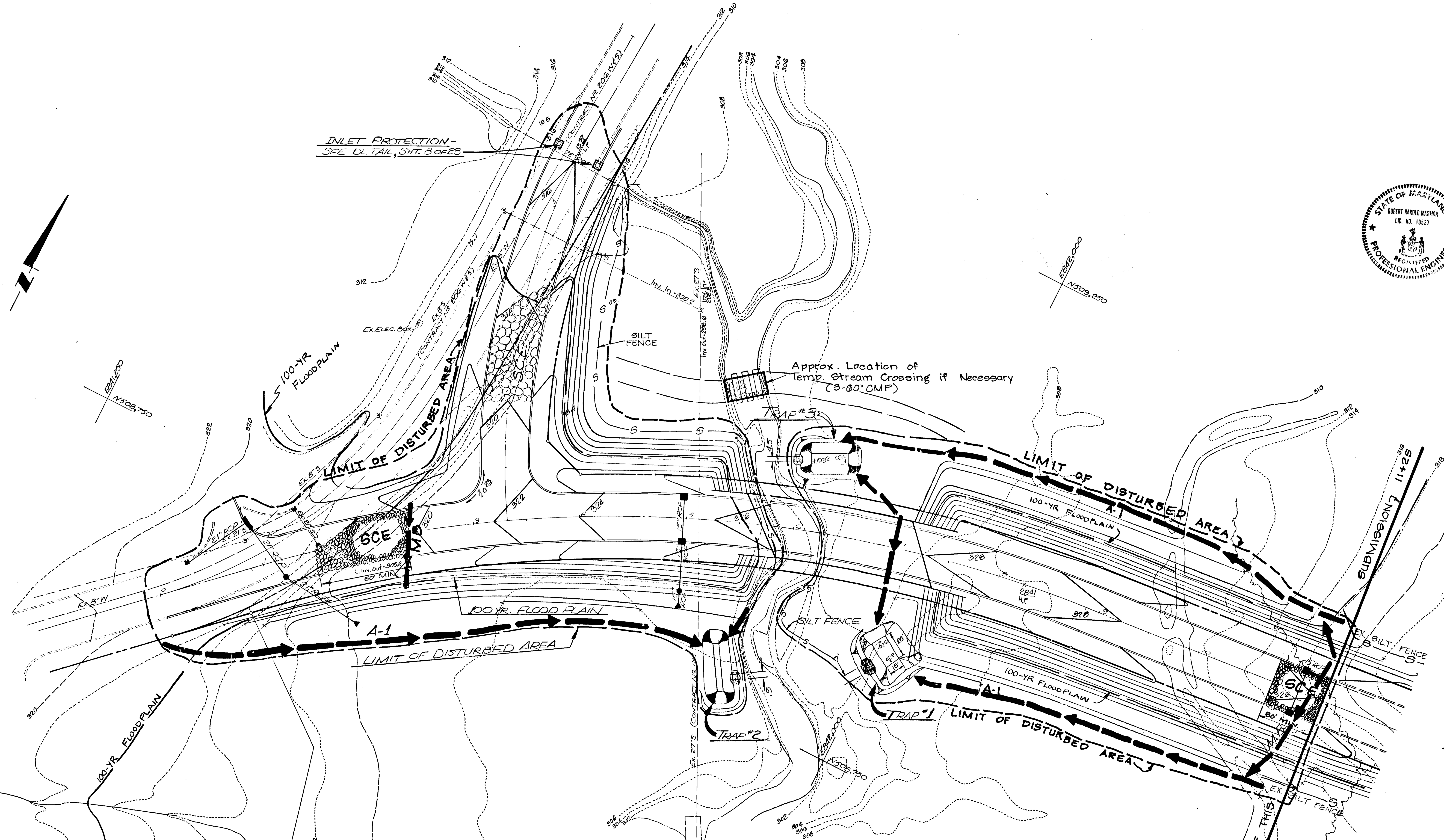
Reviewed for ________ S.C.D.
Name

an meets Technical Requirements.

J. Helmetz 2/4/86
U.S. Soil Conservation Service — Date

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

Stephen L. Fuler 1/28/86
Howard S.C.D. — Date



TEMP. STONE OUTLET SEDIMENT TRAPS

	TRAP #1	TRAP #2	TRAP #3
Drainage Area	= 1.7 Ac.	= 1.5 Ac.	= 1.1 Ac.
Required Storage	= 3060 ft³	= 2700 Ft.³	= 1980 Ft.³
Bottom Elev.	= 302.00	= 303.5	= 303.0
Crest Elev.	= 307.00	= 308.5	= 307.0
Crest Length	= 7'	= 6'	= 4.5'
Top of Embankment Elev.	= 308.00	= 309.5	= 308.0
Average Bottom Dim.	= 15' × 26'	= 5'×45'	= 10'×35'
Storage Depth.	= 4'	= 4'	= 3'
Approx. Storage Provided	= 3128 ft³	= 2750 Ft.³	= 1980 Ft.³
Max. Side Slopes	= 2:1	= 2:1	= 2:1
Clean Out Elev.	= 305.00	= 306.5	= 304.5

Note:
PERIMETER A-1 DIVERSION DIKES MAY REMAIN AS PERMANENT FEATURES WITH THE APPROVAL OF THE HOWARD CO. SEDIMENT CONTROL INSPECTOR.

OWNER/DEVELOPER:
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21043

No.	REVISION	DATE	BY
1	Add Perimeter Dike Note	3-13-89	GK

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
2 RESEARCH PLACE, ROCKVILLE, MARYLAND 20850
(301) 948-0900
GREENBELT, MD • ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO
FAIRFAX, VA • GREENSBORO, NC • MONROE, MI • EXPORT, PA • WILLISTON PARK, NY

SEDIMENT CONTROL PLAN (STREETS ONLY)
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

DESIGN: JSL — SCALE 1" = 50'
DRAWN: JDP/MZ
CHECKED: RHM — SHEET 7 OF 24
DATE: MAY, 85 — JOB No. — FILE No. R-1216-A

#1159

F-86-55

SEQUENCE OF CONSTRUCTION *

1. Obtain necessary permit to start grading, INCLUDING WRA PERMIT FOR BRIDGE CONSTRUCTION.
2. Clear and Grub Areas Necessary to construct Sediment Control Measures. (1 WEEK)
3. Construct all Sediment Control Measures. (1-2 WEEKS)
4. Clear & Grub Remainder of Site and Commence Road Grading. (5 WEEKS)
5. GRADE COLUMBIA ROAD & RELOCATED TEN MILLS ROAD. EX. TEN MILLS RD. TO REMAIN UNDISTURBED. STABILIZE FILL SLOPES WITHIN 7 DAYS.
6. COMMENCE BRIDGE CONSTRUCTION.
7. UPON COMPLETION OF GRADING, CONSTRUCT UTILITIES & STORM DRAINAGE.
8. COMMENCE CURB & GUTTER AND PAVING CONSTRUCTION.
9. UPON COMPLETION OF PAVING OF COLUMBIA ROAD AND RELOCATED TEN MILLS ROAD, TRAFFIC IS TO BE REDIRECTED AS NECESSARY ALONG NEW PAVING TO COMPLETE CONSTRUCTION.
10. STABILIZE ANY DISTURBED AREAS PER H.S.C.D. STANDARDS AND REMOVE TEMP. SEDIMENT CONTROL MEASURES. STABILIZE FILL SLOPES AGAIN AS REQ'D.

TEMPORARY SEEDING NOTES

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

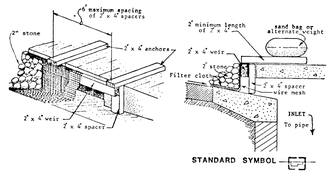
Seedbed Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding.

Soil Amendments: Apply 600 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 2½ bushel per acre of annual rye (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 1½ to 2 tons per acre (70 to 90 lbs/1000 sq ft) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal per acre (5 gal/1000 sq ft) of emulsified asphalt on flat areas. On slopes, 8 ft or higher, use 348 gal per acre (8 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.



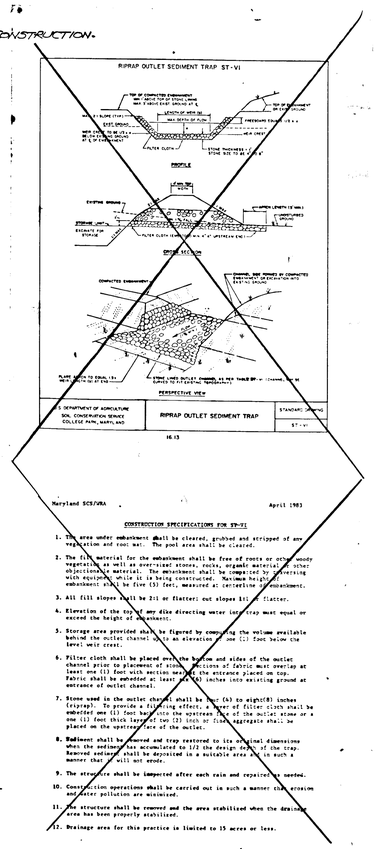
CURB INLET PROTECTION DETAIL
SCALE : NONE

SEDIMENT CONTROL 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 redisturbance, 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, Chaper 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. 51) sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52.) Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
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	290	Acres
Area Disturbed	10.5	Acres
Area to be roofed or paved	2.0	Acres
Area to be vegetatively stabilized	8.5	Acres
Total Cut	0	Cu. yds
Total Fill	45000	Cu. yds
Offsite waste/borrow area location	NONE	

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 DPW 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.

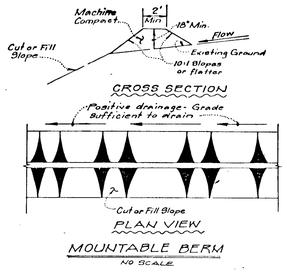


Maryland SCS/WRA — April 1983

CONSTRUCTION SPECIFICATIONS FOR ST-VI

1. The area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed. Maximum height of embankment shall be five (5) feet, measured at centerline of embankment.
3. All fill slopes shall be 2:1 or flatter; cut slopes 1:1 or flatter.
4. Elevation of the top of any dike directing water into trap must equal or exceed the height of embankment.
5. Storage area provided shall be figured by computing the volume available behind the outlet channel up to an elevation one (1) foot below the level weir crest.
6. Filter cloth shall be placed over the bottom and sides of the outlet channel prior to placement of stone. Sections of fabric must overlap at least one (1) foot with section nearest the entrance placed on top. Fabric shall be embedded at least six (6) inches into existing ground at entrance of outlet channel.
7. Stone used in the outlet channel shall be two (2) to eight(8) inches (riprap). To provide a filtering effect, a layer of filter cloth shall be embedded one (1) foot below into the upstream face of the outlet stone or a one (1) foot thick layer of two (2) inch or finer aggregate shall be placed on the upstream face of the outlet.
8. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area in such a manner that it will not erode.
9. The structure shall be inspected after each rain and repairs made as needed.
10. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
11. The structure shall be removed and the area stabilized when the drainage area has been properly stabilized.
12. Drainage area for this practice is limited to 15 acres or less.

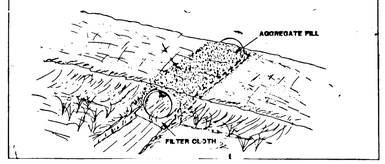
16.14

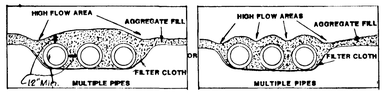


MOUNTABLE BERM
NO SCALE

* SEE SHEET 2A of 2A FOR ADDITIONAL SEDIMENT CONTROL AND SEQUENCE OF CONSTRUCTION.

TEMPORARY ACCESS CULVERT





Construction Specifications

a. Restrictions - No Construction or removal of a temporary access culvert will be permitted between October 1 through April 30 for all Class III and Class IV Trout Waters or between March 15 through June 15 for non-trout waterways.

b. Culvert Strength - All culverts shall be strong enough to support their cross sectional area under maximum expected loads.

c. Culvert Size - The size of the culvert pipe shall be the largest pipe diameter that will fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the existing channel. The minimum size culvert that may be used is a 12" diameter pipe.

d. Culvert Length - The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.

e. Filter Cloth - Filter cloth shall be placed on the streambed and streambanks prior to placement of the pipe culvert(s) and aggregate. The filter cloth shall cover the streambed and extend a minimum six inches and a maximum one foot beyond the end of the culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.

f. Culvert Placement - The invert elevation of the culvert shall be installed on the natural streambed grade to minimize interference with fish migration (free passage of fish).

g. Culvert Protection - The culvert(s) shall be covered with a minimum of one foot of aggregate. If multiple culverts are used they shall be separated by at least 12" of compacted aggregate fill. At a minimum, the bedding and fill material used in the construction of the temporary access culvert crossings shall conform with the aggregate requirements cited in Section I.H. 1. above.

h. Stabilization - All areas disturbed during culvert installation shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for "Critical Area Stabilization With Permanent Seeding."

Culvert Maintenance Requirements

a. Inspection - Periodic inspection shall be performed to ensure that the culverts, streambed, and streambanks are not damaged, and that sediment is not entering the stream or blocking fish passage or migration.

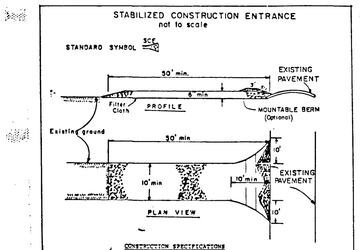
b. Maintenance - Maintenance shall be performed, as needed in a timely manner to ensure that structures are in compliance with this standard and specification. This shall include removal and disposal of any trapped sediment or debris. Sediment shall be disposed of and stabilized outside the waterway flood plain.

Culvert Removal and Clean-Up Requirements

a. Removal - When the crossing has served its purpose, all structures including culverts, bedding and filter cloth materials shall be removed within 14 calendar days. In all cases, the culvert materials shall be removed within one year of installation. No structure shall be removed during the spawning season (March 15 through June 15).

b. Final Clean-up - Final clean-up shall consist of removal of the temporary structure from the waterway, removal of all construction materials, restoration of original stream channel cross section, and protection of the stream banks from erosion. Removed material shall be stored outside of the waterway flood plain.

c. Method - Removal of the structure and clean up of the area shall be accomplished without construction equipment working in the waterway channel.

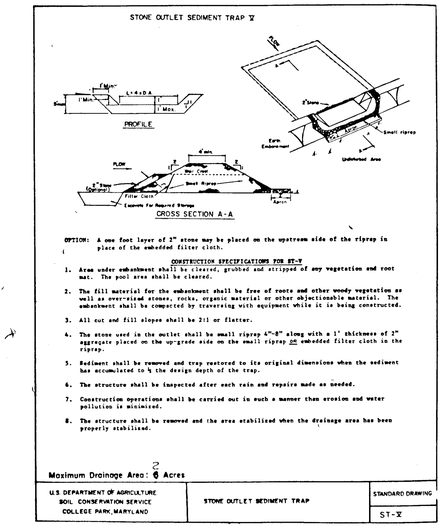


CONSTRUCTION SPECIFICATIONS

1. Stone Size - Use 2" stone, or reclaimed or recycled concrete equivalent.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than six (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Filter Cloth - Will be placed over the entire area prior to placing of stone. Filter will not be required on a single family residence lot.
6. Surface Water - All surface water flowing or directed toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Periodic inspection and needed maintenance shall be provided after each rain.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE College Park, Md.	STABILIZED CONSTRUCTION ENTRANCE	Standard Drawing SCE-VI

14.03



OPTION: A one foot layer of 2" stone may be placed on the upstream side of the riprap in place of the embedded filter cloth.

CONSTRUCTION SPECIFICATIONS FOR ST-Y

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots and other woody vegetation as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. All cut and fill slopes shall be 2:1 or flatter.
4. The stone used in the outlet shall be small riprap 4"-8" along with a 1' thickness of 2" aggregate placed on the up-grade side on the small riprap or embedded filter cloth in the riprap.
5. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to ½ the design depth of the trap.
6. The structure shall be inspected after each rain and repairs made as needed.
7. Construction operations shall be carried out in such a manner that erosion and water pollution is minimized.
8. The structure shall be removed and the area stabilized when the drainage area has been properly stabilized.

Maximum Drainage Area: 6 Acres

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE COLLEGE PARK, MARYLAND	STONE OUTLET SEDIMENT TRAP	STANDARD DRAWING ST-Y

CONSTRUCTION SPECIFICATIONS

1. ALL DIKES SHALL BE COMPACTED BY EARTH-MOVING EQUIPMENT.
2. ALL DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. ALL DIKE SLOPES SHALL BE 2:1 OR FLATTER; SLOPES MAY BE FLATTER IF DESIRED TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.
4. FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO UTILIZE A STABILIZED SAFE OUTLET.
5. EARTH DIKES SHALL HAVE AN OUTLET THAT FUNCTIONS WITH A MINIMUM OF EROSION. RUNOFF SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE SUCH AS A DESIGNATED TRAP OR SEDIMENT BASIN WHERE EITHER THE DIKE CHANNEL OR THE DRAINAGE AREA ABOVE THE DIKE ARE NOT ADEQUATELY STABILIZED.
6. DIKE CHANNEL EROSION SHALL BE (A) IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR SEED AND STRAW MULCH OR STRAW MULCH IF NOT IN SEEDING SEASON; (B) FLOW CHANNEL AS PER THE CHART BELOW.

FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	DIKE A	DIKE B
1	.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE, OR EXCELSIOR; AND 2" STONE
3	5.1-8.0%	SOD WITH JUTE, OR SOD & STONE	LINED RIP-RAP 4-8"
4	8.1-20%	LINED RIP-RAP 4-8"	ENGINEERING DESIGN

A. STONE TO BE 2 INCH STONE, OR RECYCLED CONCRETE EQUIVALENT, ON A LAYER AT LEAST 3 INCHES IN THICKNESS AND BE PRESSED INTO THE SOIL WITH CONSTRUCTION EQUIPMENT.
B. RIP-RAP TO BE 4-8 INCHES IN A LAYER AT LEAST 8 INCHES THICKNESS AND PRESSED INTO THE SOIL.
C. APPROVED EQUIVALENTS CAN BE SUBSTITUTED FOR ANY OF THE ABOVE MATERIALS.
7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE COLLEGE PARK, MARYLAND	EARTH DIKE	STANDARD DRAWING ED-I

16.15 — 1955

"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."

Signature of Developer — Date

Print name below signature

I certify that this plan for erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District."

Bruce D. Boltz — 9-23-85

Signature of Engineer — Date

Print name below signature

BRUCE D. BOLTZ, JR.

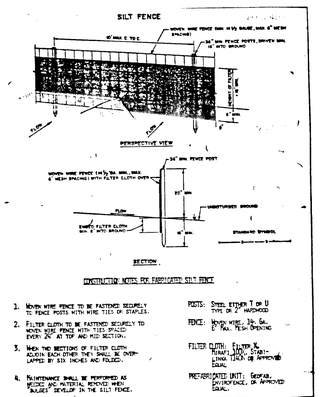
STATE OF MARYLAND — Bruce D. Boltz, Jr. — No. 12252 — REGISTERED PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — 2-28-86 DATE

APPROVED: HOWARD COUNTY OFFICE OF PLANNING AND ZONING

DIRECTOR, DEPARTMENT OF PLANNING & ZONING ADMINISTRATION — 2-7-86 DATE



CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24' AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIALS REMOVED WHEN BULGES DEVELOP IN THE SILT FENCE.

POSTS: STEEL EITHER T OR U TYPE OR 2" HARDWOOD

FENCE: WOVEN WIRE, 14½ GA. MIN. 6" MAX. MESH OPENING

FILTER CLOTH: FILTER X. WITH MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.

U.S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE COLLEGE PARK, MARYLAND	SILT FENCE	STANDARD DRAWING SF-I

Reviewed for Howard S.C.D.

and meets Technical Requirements.

J. Helm 7/ — 7/9/86

U.S. Soil Conservation Service — Date

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

Stephen L. Peales 7/9/86

Howard S.C.D. — Date

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21043

#1159

No.	REVISION	DATE	BY

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS

GREENHORNE & O'MARA, INC.

2 RESEARCH PLACE, ROCKVILLE, MARYLAND 20850
(301) 948-0900

GREENBELT, MD • ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO
FAIRFAX, VA • GREENSBORO, NC • MONROE, MI • EXPORT, PA • WILLISTON PARK, NY

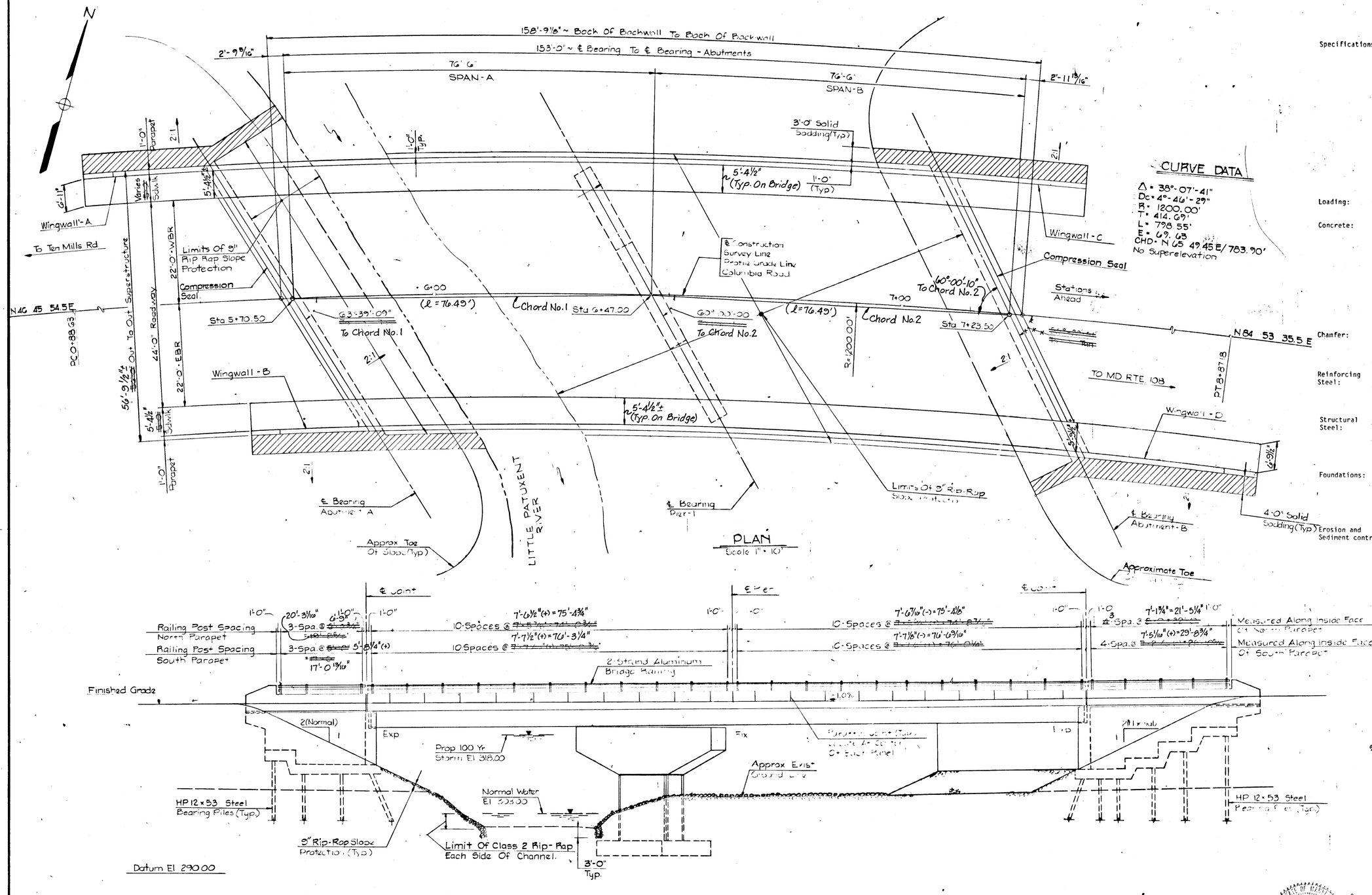
SEDIMENT CONTROL DETAILS & NOTES

COLUMBIA

VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 1B1
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

JSL DESIGN	SCALE NONE		
EG DRAWN	8 OF 24		
BDB CHECKED	SHEET		
AUG '85 DATE	JOB No.	R-1216-X FILE No.	

F-86-55



GENERAL NOTES

Specifications: Howard County Design Manual, Volume III - Roads and Bridges, Bureau of Engineering, Howard County, Maryland.

AASHTO Standard Specifications for Highway Bridges dated 1983 for design including all interim specifications.

Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction Materials dated January 1982, revisions thereof and additions thereto and Special Provisions for materials and Construction.

Concrete Design: Service Load Design Method except for pier column which is Load Factor Method.

Structural Steel Design: Elastic Design Method. main girders shall be designed as composite in positive moment regions only.

Loading: HS 20-44 with provisions for 2" future wearing surface (25 psf) and permanent bridge deck forms (15 psf).

Concrete: All superstructure concrete including parapets, abutment backwalls and parapet portion of wingwalls shall be Mix No. 6 (4500 psi). Slab concrete shall be low slump concrete. All other concrete shall be Mix No. 3 (3500 psi) and shall be air entrained except for footing concrete which shall not be air entrained. See Special Provisions.

Allowable concrete working stresses shall be as follows:

f'c = 3500	fc = 1350 psi
f'c = 4500 except bridge deck concrete	fc = 1800 psi
f'c = 4500 bridge deck concrete	fc = 1050 psi

Chamfer: All exposed corners of concrete shall be chamfered with 3/4" X 3/4" milled chamfer strips, except on unexposed footings or where indicated by the following notation on the Plans "Do Not Chamfer."

Reinforcing Steel: Reinforcing Steel shall conform to ASTM A-615 Grade 60. All splices, not shown, shall be lapped as per bar lap charts. Minimum cover for any bar shall be 2" unless otherwise noted. All Reinforcing Steel for Superstructure including Parapet, Abutments, Backwalls, Bearing Seat Pads, & Parapet Portions Of Wingwalls Shall Be Epoxy Coated See Specs.

Structural Steel: Structural steel shall be ASTM A-588 weathering steel except girder bearings. Girder steel shall include the additional requirements for Charpy V-notch testing of AASHTO M 22C for primary load carrying members. Girder bearings shall be ASTM A-36. See Special Provisions.

Foundations: Design soil bearing capacity 12 tons per square foot to be verified in the field by a qualified geotechnical engineer.

Erosion and Sediment control: For Erosion and Sediment See Sht. Nos. 7 & 8.

Greenhorne & O'Mara 2-28-86

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

Johnell Marriman 2-3-86
DIR. OF PLANNING & ZONING ADMIN. DATE

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING 2-3-86 DATE

Bridge No. HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

HF 1159

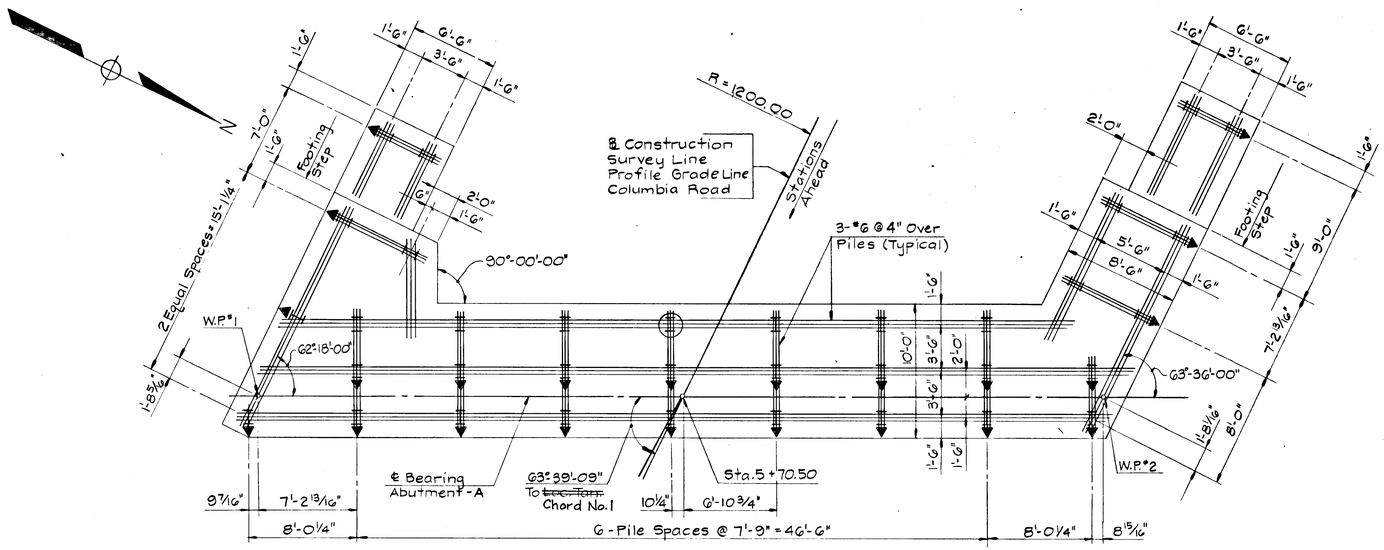
No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • EXPORT, PA • ROCKVILLE, MD • WILLISTON PARK, NY

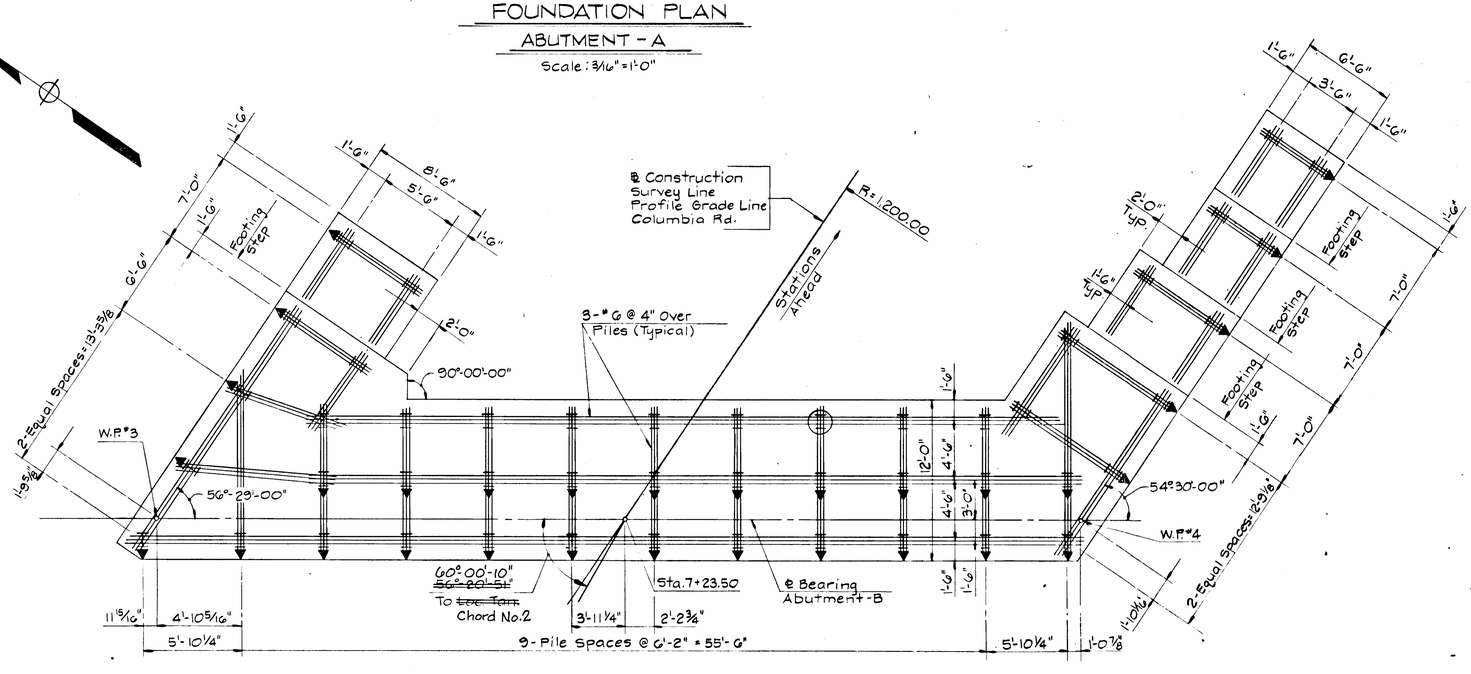
GENERAL PLAN AND ELEVATION
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE 1" = 10'	
KAB DRAWN	9 OF 23 SHEET	
DCC/RLP CHECKED		
8/85 DATE	JOB No.	FILE No.

F-86-55



FOUNDATION PLAN
ABUTMENT - A
Scale: 3/16" = 1'-0"



FOUNDATION PLAN
ABUTMENT - B
Scale: 3/16" = 1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

Legend

- I — Indicates Plumb Pile
- I (arrow) — Indicates Battered Pile 5:12 In Direction Of Arrows
- (I) — Indicates Test Pile
- W.P. — Indicates Work Points

Notes:

1. All Piles Shall Be HP12x53 Bearing Piles.
2. The Pile Design Bearing Value Is 70 Tons.
3. The Minimum Safe Bearing Value To Which The HP12x53 Piling Is To Be Driven Is 85 Tons.
4. The Minimum Penetration of The HP12x53 Piling Shall Be El. 292.00 For Abut.-A And El. 295.00 For Abut.-B.
5. The Estimated Tip Elevation For The HP12x53 Piling Is El. 287.00 For Abut.-A And El. 292.00 For Abut.-B.
6. Shop Plans Shall Show How Rebars Are To Be Tied As Well As How They Are To Be Held In Place Above Piling Wile Concrete Is Poured.

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

FOUNDATION PLAN ~ ABUTMENTS A & B
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE 3/16" = 1'-0"		
RMJ DRAWN	10 OF 24		
DCC/RLP CHECKED	SHEET		
8/85 DATE	JOB No.	612164	FILE No.

#1159

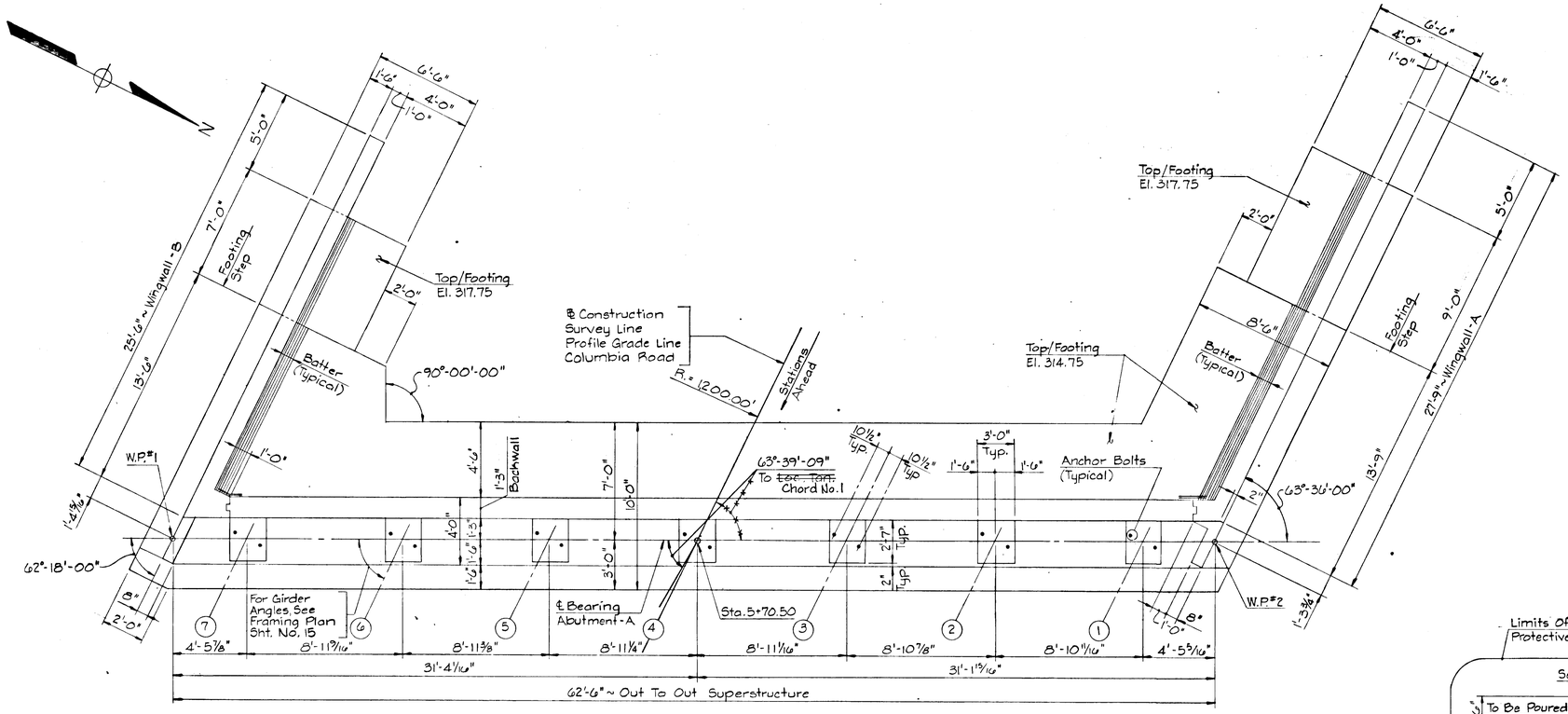
F-86-55

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-2-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

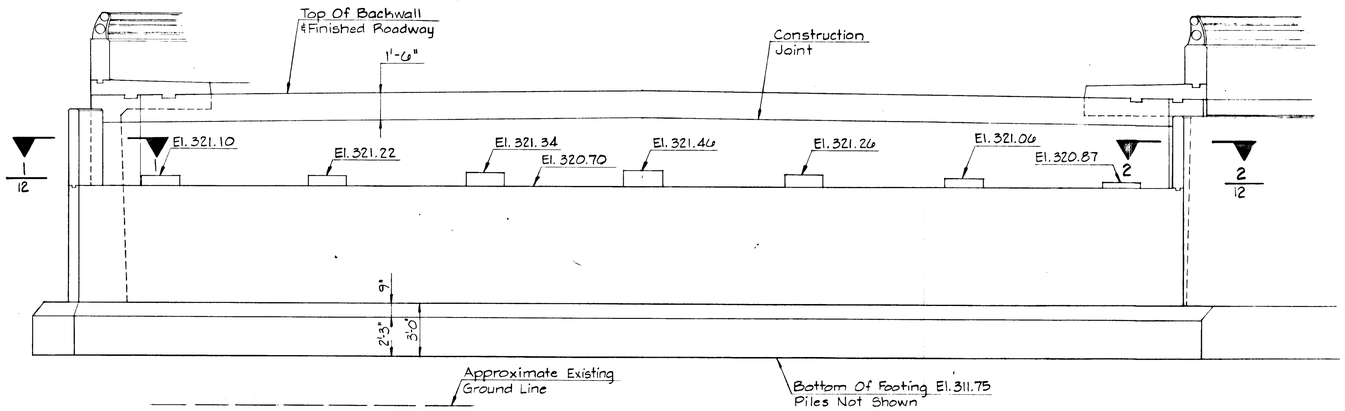
CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86



PLAN ~ ABUTMENT-A

Scale: 1/4" = 1'-0"

Note:
Sidewalk & Parapet Railing Not Shown In Plan For Clarity.



ELEVATION

Scale: 1/4" = 1'-0"

Note *:
Slope Abutment Seat 1/4" Per Foot Between Pads.

TYPICAL SECTION THRU ABUTMENTS

Scale: 3/8" = 1'-0"

Bridge No. #HO-137

OWNER/DEVELOPER

HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

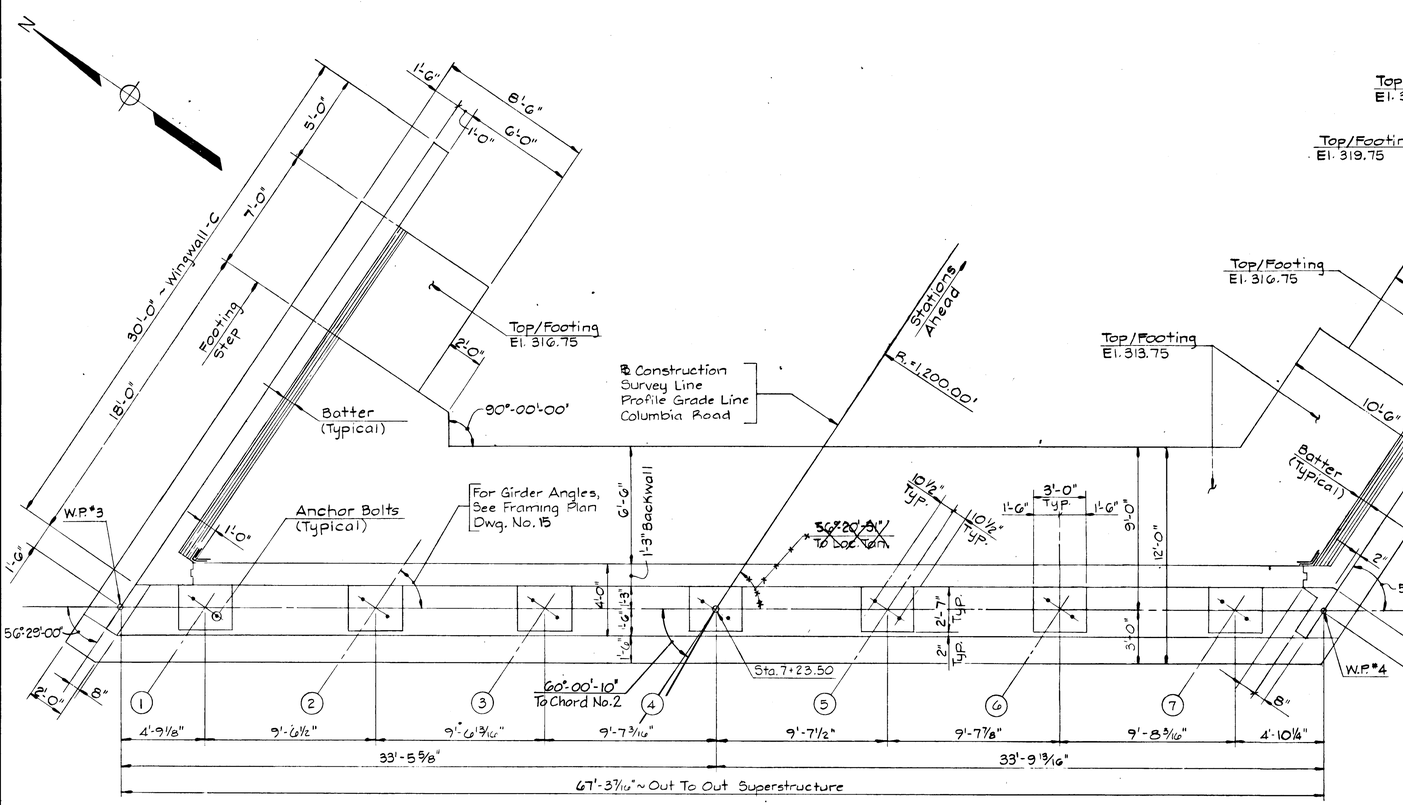
No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

ABUTMENT-A
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE AS Noted		
RMJ DRAWN	11 OF 24 SHEET		
DCC/RLP CHECKED			
8/85 DATE	JOB No.	R1316X FILE No.	

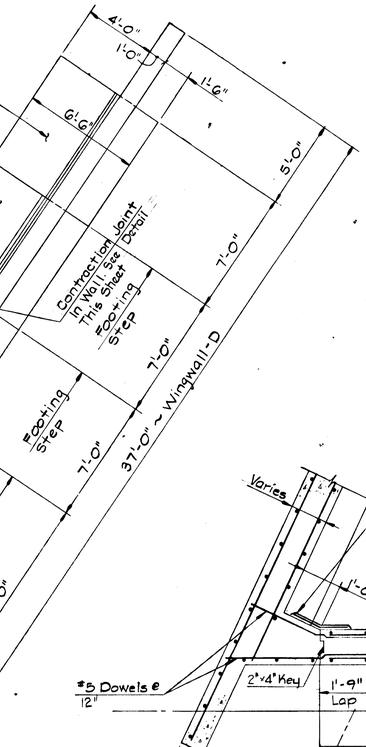
F-86-55

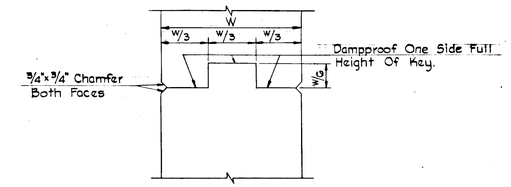


PLAN ~ ABUTMENT-B

Scale: 1/4"=1'-0"

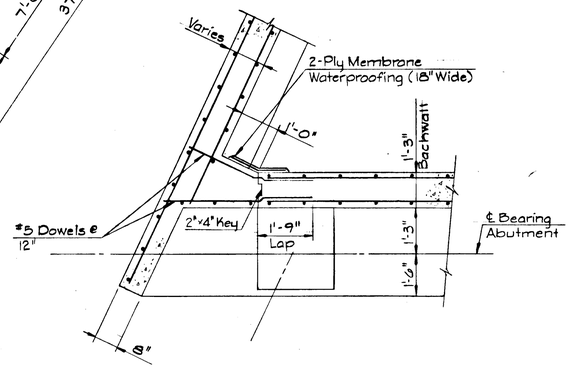
Note:
Sidewalk, Parapet & Railing Not Shown In Plan For Clarity





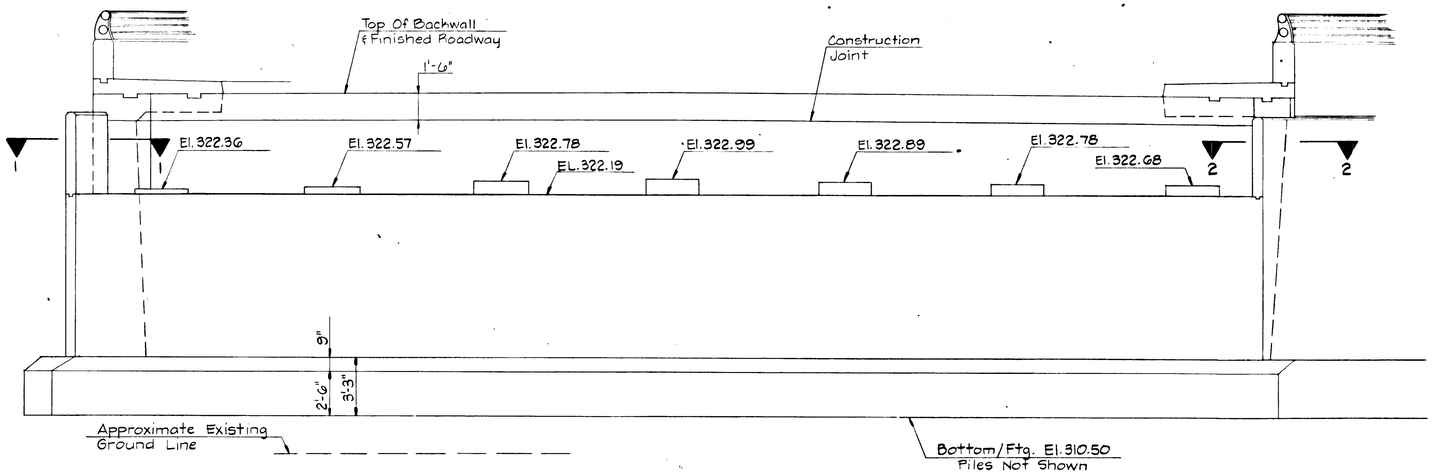
CONTRACTION JOINT DETAIL

Scale 1/2"=1'-0"



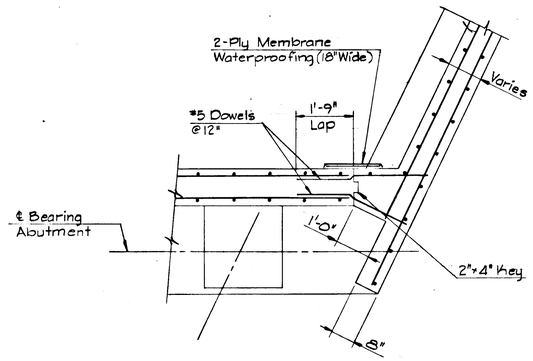
SECTION 1 - 1

Sheet Nos. 11 & 12
Scale: ½"=1'-0"



ELEVATION

Scale: 1/4"=1'-0"



SECTION 2 - 2

Sheet Nos. 11 & 12
Scale: ½"=1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

STATE OF MARYLAND — No. 11611 — REGISTERED PROFESSIONAL ENGINEER — Charles C. Freeman — 1/21/86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

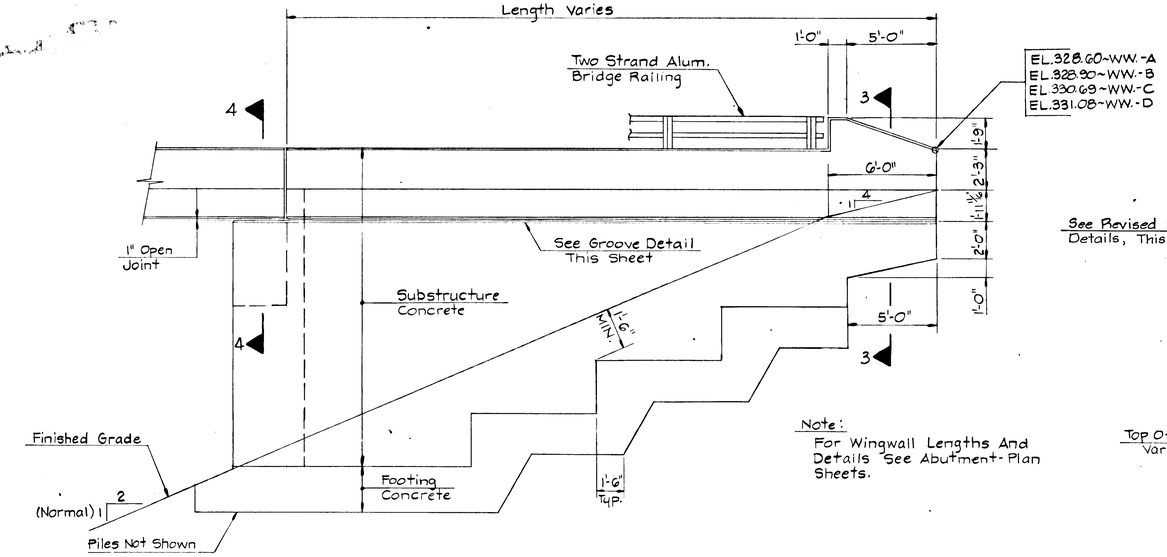
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

ABUTMENT - B
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE As Noted		
DSA DRAWN	12 OF 24 SHEET		
DCC CHECKED			
8/85 DATE	JOB No.	R-12161 FILE No.	

#1159

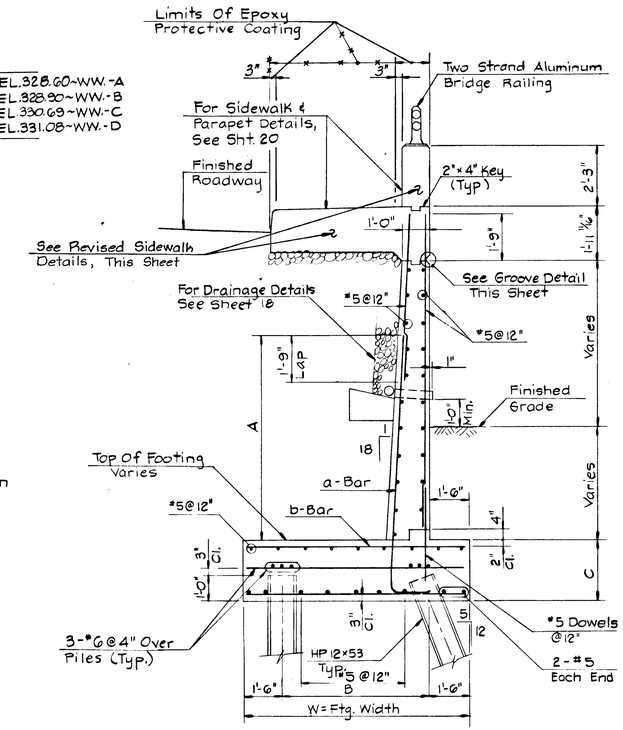
F-86-55



Note:
For Wingwall Lengths And Details See Abutment-Plan Sheets.

TYPICAL WINGWALL ELEVATION

Scale : 1/4"=1'-0"

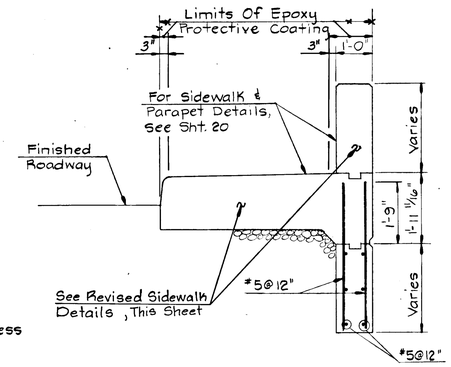


TYPICAL WINGWALL SECTION

Scale : 3/8"=1'-0"

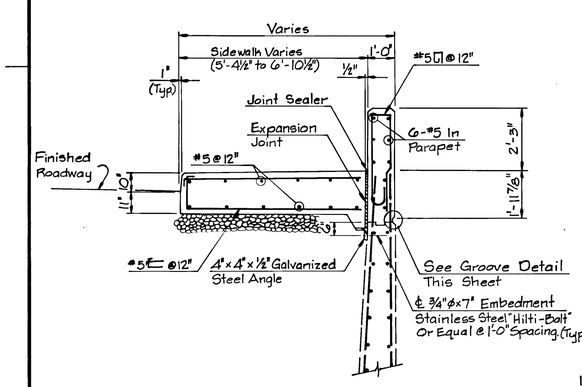
W.W. SCHEDULE			
W	10'-6"	8'-6"	6'-6"
A	10'-6"	7'-6"	4'-6"
B	7'-6"	5'-6"	3'-6"
C	*2'-6"	2'-3"	2'-3"
a-Bar	#10@12"	#8@12"	#6@12"
b-Bar	#8@12"	#7@12"	#6@12"

* Contractor Has Option To Use Same Footing Thickness As Abutment Footing.



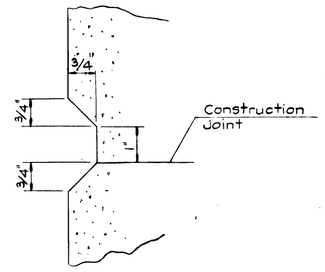
SECTION 3-3

Scale : 1/2"=1'-0"

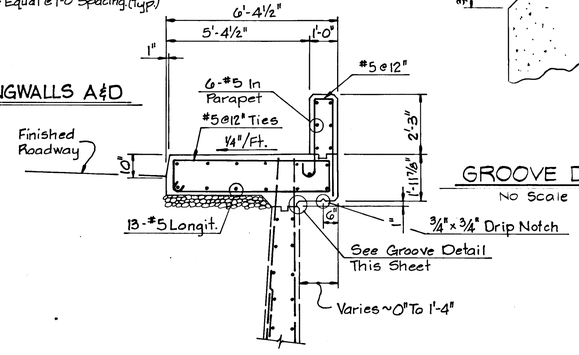


REVISED SECTION THRU WINGWALLS A&D

3/8"=1'-0"



Note: 2 Strand Railing Not Shown

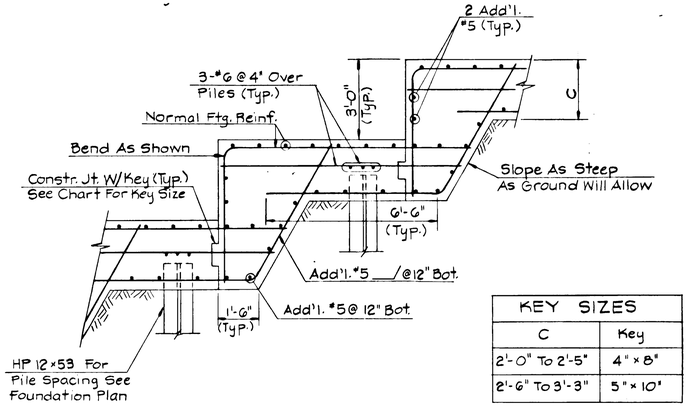


REVISED SECTION THRU WINGWALLS B&C

3/8"=1'-0"

GROOVE DETAIL

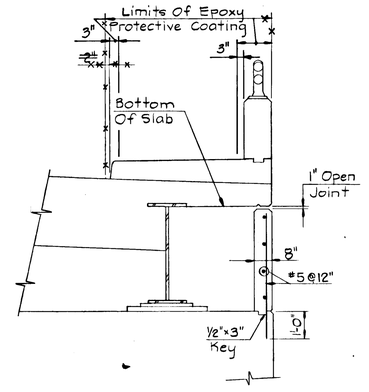
No Scale



TYPICAL FOOTING STEP DETAIL

Scale: 3/8"=1'-0"

KEY SIZES	
C	Key
2'-0" To 2'-5"	4" x 8"
2'-6" To 3'-3"	5" x 10"



SECTION 4-4

Scale : 3/8"=1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

Bridge No. #HO-137

OWNER/DEVELOPER

HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

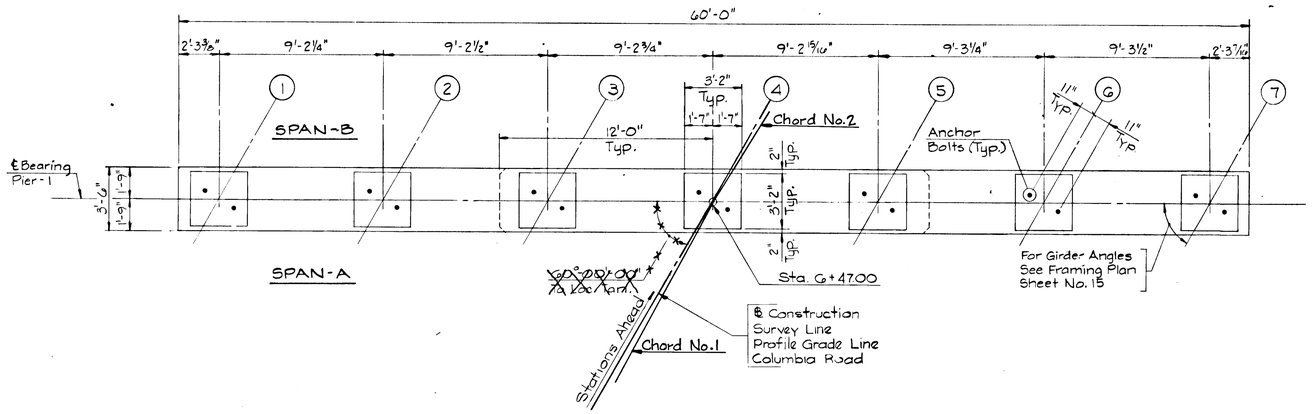
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

WINGWALL DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

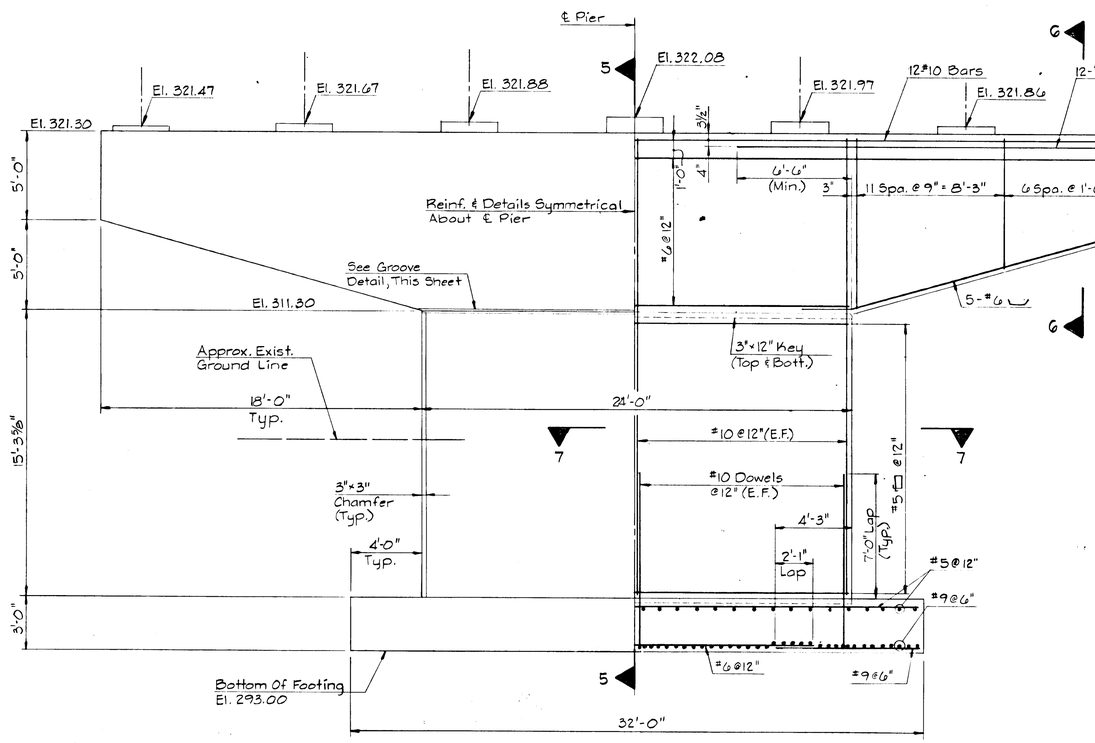
DESIGN RJL	SCALE As Noted
DRAWN DSA	13 OF 24
CHECKED DCC/RLP	SHEET
DATE 8/85	JOB No. / FILE No. 12126X

#1159

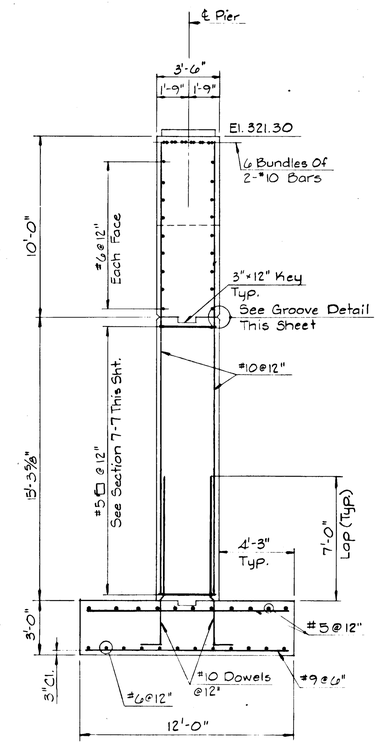
F-86-55



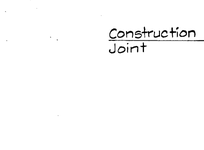
PLAN
Scale: 1/4" = 1'-0"



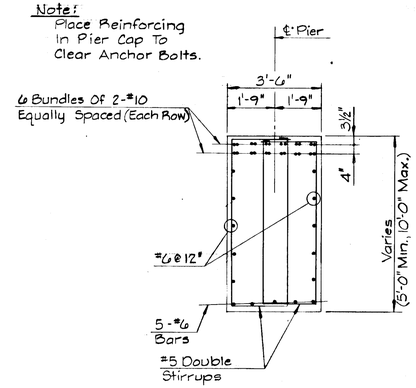
ELEVATION
Scale: 1/4" = 1'-0"



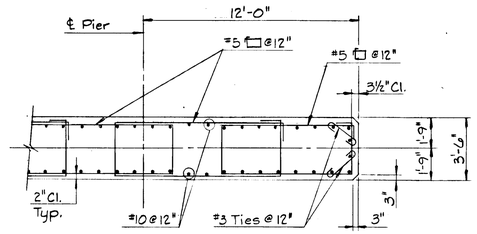
SECTION 5-5
Scale: 1/4" = 1'-0"



GROOVE DETAIL
No Scale



SECTION 6-6
Scale: 3/8" = 1'-0"



SECTION 7-7
Scale: 1/4" = 1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

Chief, Div. of Land Development & Zoning Admin. — Date: 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Chief, Bureau of Engineering — Date: 2-28-86

No. 11158 — Professional Engineer — 1/21/86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

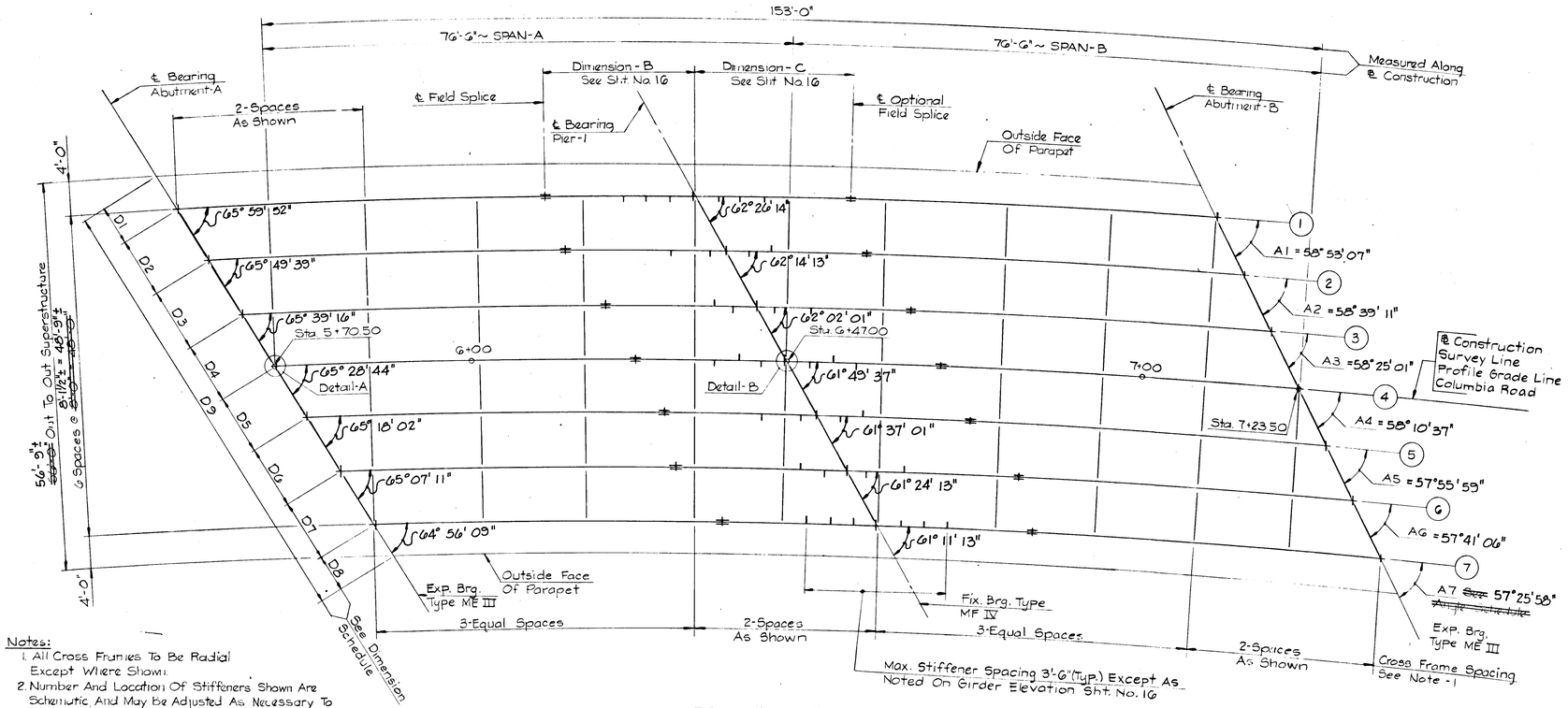
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

PIER - 1
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE As Noted
RMJ DRAWN	14 OF 24
DCC/RLP CHECKED	SHEET
8/85 DATE	JOB No. / FILE No. RJ1161

#1159

F-86-55



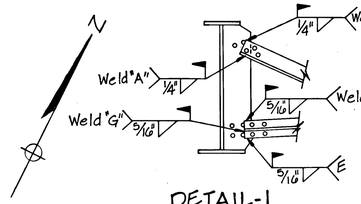
FRAMING PLAN

Scale: 1" = 10'

Notes:

1. All Cross Frames To Be Radial Except Where Shown.
2. Number And Location Of Stiffeners Shown Are Schematic And May Be Adjusted As Necessary To Clear Shop And Field Splices, Provided Indicated Maximum Spacing Is Not Exceeded.
3. For Bearing Shoe Details, See Sht. No. 19
4. For Splice And Connection Details, See Sht. No. 16
5. For Girder Details, See Slit No. 16
6. For Expansion Joint For Conduit See MDSHA Std. Detail BR-SS(0.01)-75-13, On Sht. No. 22

Note: All Angles Shown In Framing Plan Are Measured From The ℄ Bearing To The Local Tangent Of The Curved Girder.



DETAIL-1

Scale: ½" = 1'-0"

Welding Requirements:

1) Weld "A" - Min. Length = 4"
   Weld "B" - Min. Length = 1½"
   Sufficient Length Was Available To Meet 7" Min. Length In All Upper Connections Using Only "A" & "B" Welds.
2) Weld "E" - Min. Length = 1½"
   Weld "F" - Min. Length = 1½"
   Weld "G" - Min. Length = 3"
   Sufficient Length Was Available To Meet 8" Min. Length In All Lower Connections Using Only "E" & "F" And "G" Welds.
3) Bolt Holes In Cross-Frame Members & Connection Plates Were Left Open.

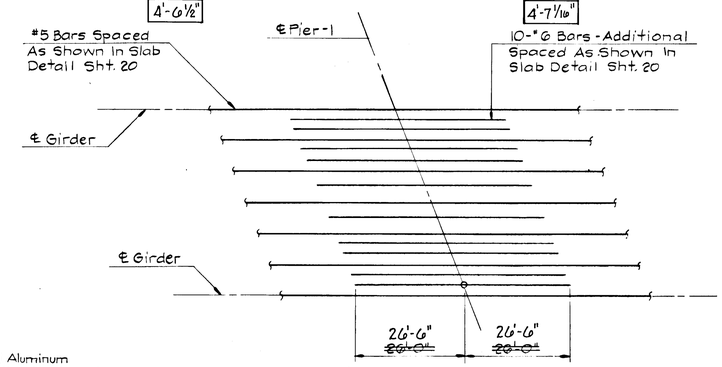
ANGLE SCHEDULE

LOCATION	A1	A2	A3	A4	A5	A6	A7
Abutment-A	64°-12'-28"	64°-01'-31"	63°-50'-25"	63°-39'-09"	63°-27'-43"	63°-16'-07"	63°-04'-19"
Pier-1	60°-38'-48"	60°-26'-04"	60°-13'-08"	60°-00'-00"	59°-46'-40"	59°-33'-07"	59°-19'-21"
Abutment-B	57°-05'-32"	56°-50'-52"	56°-35'-59"	56°-20'-51"	56°-05'-28"	55°-49'-49"	55°-33'-55"

Note: All Angles In Schedule Are Measured From The ℄ Bearing To The ~~Local Tangent Of Curved Girder~~ Chord Between Adjacent Bearings.

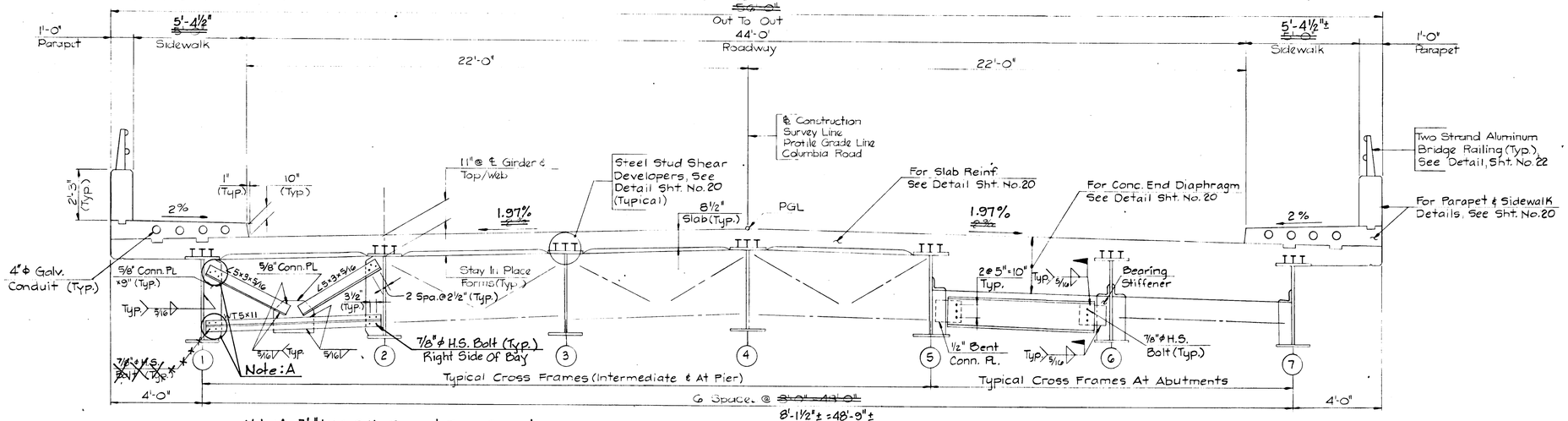
DIMENSION SCHEDULE

LOCATION	D1	D2	D3	D4	D5	D6	D7	D8	D9
Abutment-A	4'-5 5/16"	8'-10 1/16"	8'-10 7/8"	8'-11 1/16"	8'-11 1/4"	8'-11 3/8"	8'-11 5/16"	4'-5 7/8"	62'-6"
Pier-1	4'-7 1/16"	9'-2 1/4"	9'-2 1/2"	9'-2 3/4"	9'-2 15/16"	9'-3 1/4"	9'-3 1/2"	4'-7 7/16"	64'-8 1/16"
Abutment-B	4'-9 1/8"	9'-6 1/2"	9'-6 3/16"	9'-7 3/16"	9'-7 1/2"	9'-7 7/8"	9'-8 3/16"	4'-10 1/4"	67'-3 7/16"
	4'-4 3/4"							4'-5"	
	4'-5 1/2"							4'-5 15/16"	
	4'-6 1/2"							4'-7 1/16"	



DETAIL-ADDITIONAL SLAB REINFORCING AT PIER

No Scale



Note: A - 7/8" ℄ H.S. Bolts Removed From Connections At Left Side Of Each Bay (Typ.). Cross Frames Reconnected In Accordance With The Welding Procedures As Indicated In Detail-1, This Sheet.

TYPICAL SECTION

Scale: 3/8" = 1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

STATE OF MARYLAND — No. 11188 — REGISTERED PROFESSIONAL ENGINEER — 1/21/86

Bridge No. # HO-137

OWNER/DEVELOPER

HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY
5	Revisions Due To Stahe Out Error	1/5/88	RMJ

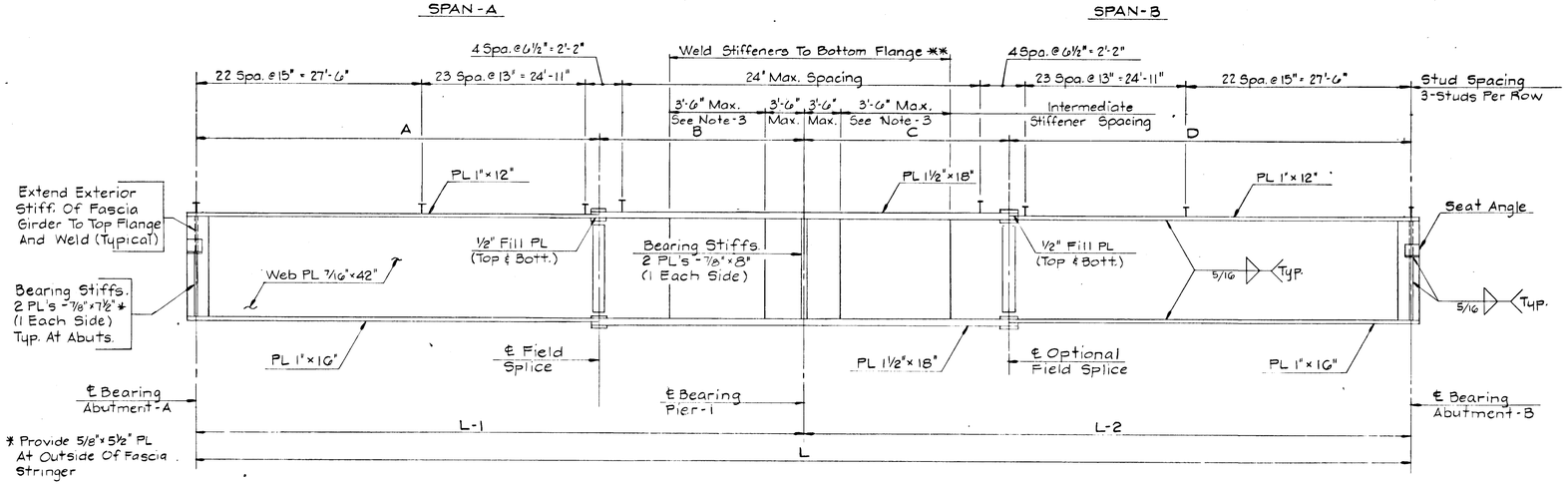
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

FRAMING PLAN & TYPICAL SECTION
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL	DESIGN	SCALE As Noted	
KAB	DRAWN	15	OF 16
DCC/RLP	CHECKED	SHEET	
8/85	DATE	JOB No.	FILE No.

#1159

F-86-55



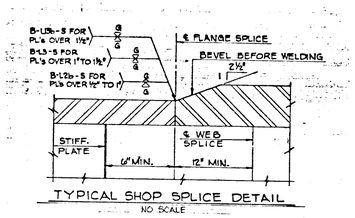
TYPICAL GIRDER ELEVATION

No Scale

Notes:

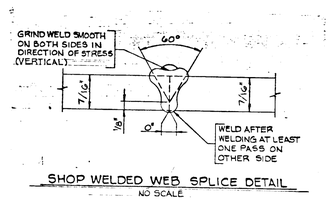
1. The Estimated Number Of Steel Stud Shear Developers Required For This Bridge Is 2450.
2. ** Indicates Tension Flange At Top.
3. Attach Two Or Three Intermediate Transverse Stiffeners @42" Max. Spacing. For Exact Number And Approximate Location, See Framing Plan.

GIRDER DIMENSION SCHEDULE								
GIRDER NO.	RADIUS	L	L-1	L-2	A	B	C	D
①	1224.00	152'-0 1/8"	76'-0 15/16"	75'-11 3/16"	53'-2 15/16"	22'-10"	22'-10"	53'-1 3/16"
②	1216.00	152'-3 5/16"	76'-2 9/16"	76'-1 3/8"	51'-9 9/16"	24'-5"	20'-10"	55'-3 3/8"
③	1208.00	152'-7 15/16"	76'-4 1/4"	76'-3 11/16"	53'-5 1/4"	22'-11"	22'-11"	53'-4 11/16"
④	1200.00	153'-0"	76'-6"	76'-6"	53'-7"	22'-11"	22'-11"	53'-7"
⑤	1192.00	153'-4 3/16"	76'-7 3/16"	76'-8 3/8"	53'-7 3/16"	23'-0"	22'-2"	54'-6 3/8"
⑥	1184.00	153'-8 1/2"	76'-9 5/8"	76'-10 7/8"	51'-4 5/8"	25'-5"	23'-1"	53'-9 7/8"
⑦	1176.00	154'-0 7/8"	76'-11 1/2"	77'-1 3/8"	53'-10 1/2"	23'-1"	23'-2"	53'-11 3/8"



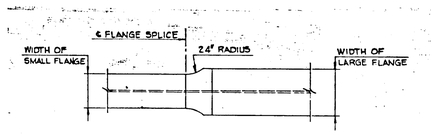
TYPICAL SHOP SPLICE DETAIL

NO SCALE



SHOP WELDED WEB SPLICE DETAIL

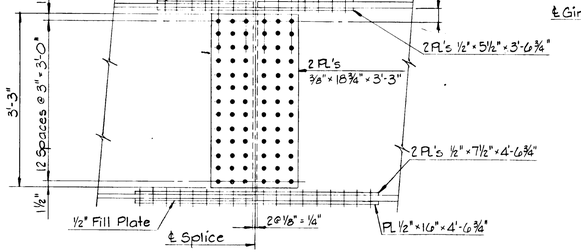
NO SCALE



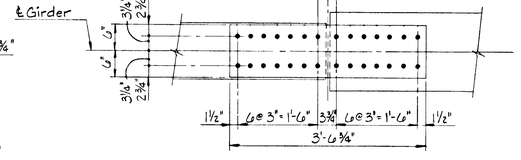
FLANGE PLATE TRANSITION DETAIL FOR SHOP SPLICE

NO SCALE

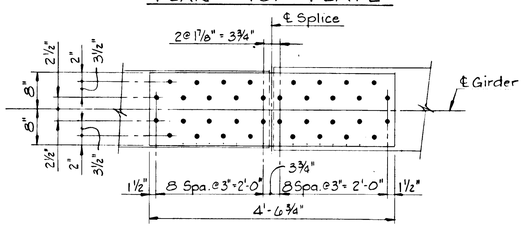
Note:
Space Studs To Miss Splice Bolts



ELEVATION



PLAN ~ TOP PLATE

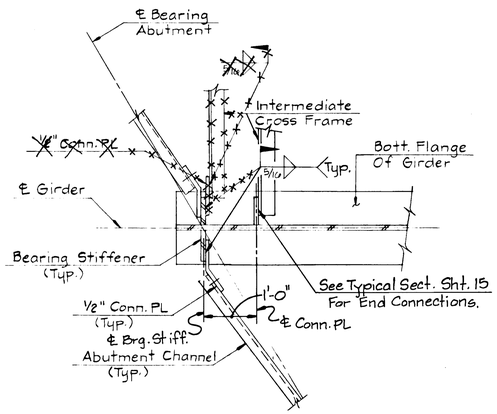


PLAN ~ BOTTOM PLATE

NOTE:
All Bolts To Be ⅞" ϕ High-Strength Bolts (15/16" ϕ Open Holes). AASHTO M164 (ASTM A325) Type 3.

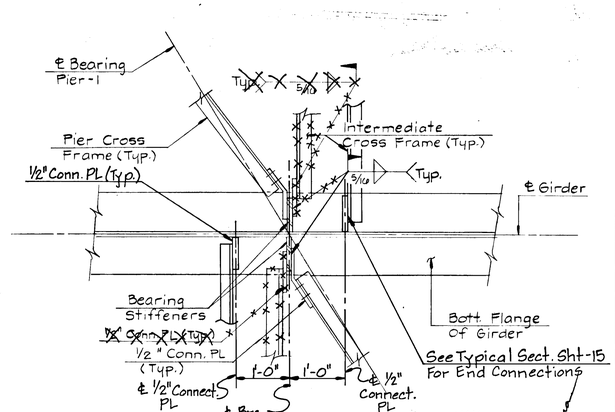
FIELD SPLICE DETAIL

Scale: 3/4" = 1'-0"



DETAIL-A

Scale: 3/4" = 1'-0"



DETAIL-B

Scale: 3/4" = 1'-0"

Note:
For Connection Locations See Framing Plan, Sht. No. 15.

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED:
HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

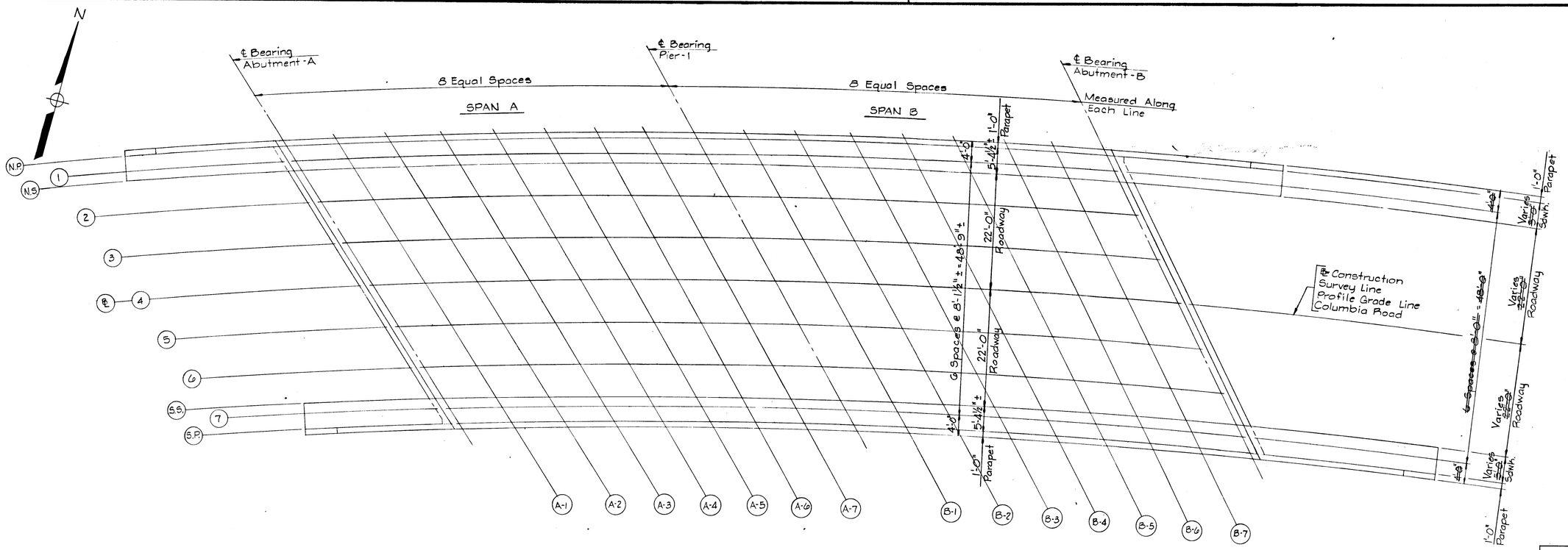
No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

GIRDER ELEVATIONS & DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE AS NOTED
DSA DRAWN	16 OF 24
DCC/RLP CHECKED	SHEET
8/85 DATE	JOB No. / FILE No. 81316X

F-86-55

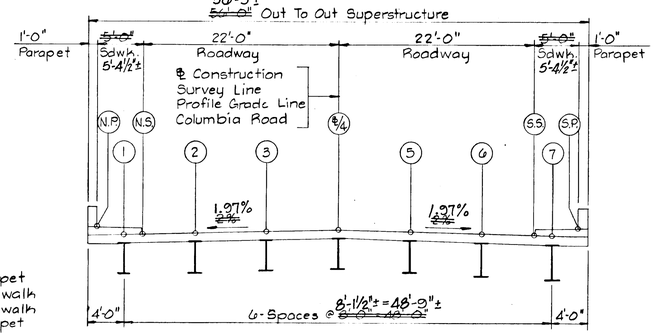


PLAN OF SUPERSTRUCTURE

Scale: 1" = 10'

ELEVATION SCHEDULE

Line	Abutment-A ℄ Bearing Station	P.G.L. Elev.	Fin. Elev.	SPAN-A A-1 Fin. Elev.	A-2 Fin. Elev.	A-3 Fin. Elev.	A-4 Fin. Elev.	A-5 Fin. Elev.	A-6 Fin. Elev.	A-7 Fin. Elev.	Pier-1 ℄ Bearing Station	P.G.L. Elev.	Fin. Elev.	SPAN-B B-1 Fin. Elev.	B-2 Fin. Elev.	B-3 Fin. Elev.	B-4 Fin. Elev.	B-5 Fin. Elev.	B-6 Fin. Elev.	B-7 Fin. Elev.	Abutment-B ℄ Bearing Station	P.G.L. Elev.	Fin. Elev.
N.P.	5+57.40	326.14	326.63	326.73	326.82	326.91	327.01	327.10	327.19	327.29	6+31.81	326.89	327.38	327.47	327.56	327.66	327.75	327.84	327.93	328.03	7+06.01	327.63	328.12
(1)	5+58.87	326.16	325.68	325.77	325.86	325.96	326.05	326.14	326.24	326.33	6+33.40	326.90	326.42	326.52	326.61	326.70	326.80	326.89	326.98	327.08	7+07.90	327.65	327.17
N.S.	5+59.82	326.17	325.73	325.82	325.92	326.01	326.10	326.20	326.29	326.38	6+34.56	326.92	326.48	326.57	326.66	326.76	326.85	326.94	327.04	327.13	7+09.17	327.66	327.22
(2)	5+62.69	326.20	325.88	325.97	326.06	326.16	326.25	326.35	326.44	326.53	6+37.90	326.95	326.63	326.72	326.82	326.91	327.00	327.10	327.19	327.29	7+13.02	327.70	327.38
(3)	5+66.57	326.24	326.08	326.17	326.27	326.36	326.45	326.55	326.64	326.74	6+42.42	326.99	326.83	326.93	327.02	327.12	327.21	327.31	327.40	327.50	7+18.22	327.75	327.59
(℄/4)	5+70.50	326.28	326.28	326.37	326.47	326.56	326.66	326.75	326.85	326.94	6+47.00	327.04	327.04	327.14	327.23	327.33	327.42	327.52	327.61	327.71	7+23.50	327.80	327.80
(5)	5+74.49	326.31	326.15	326.25	326.35	326.44	326.54	326.64	326.73	326.83	6+51.66	327.09	326.93	327.02	327.12	327.22	327.31	327.41	327.51	327.60	7+28.87	327.86	327.70
(6)	5+78.54	326.36	326.04	326.13	326.23	326.33	326.42	326.52	326.62	326.72	6+56.38	327.13	326.81	326.91	327.01	327.11	327.20	327.30	327.40	327.50	7+34.33	327.91	327.59
S.S.	5+81.62	326.39	325.95	326.04	326.14	326.24	326.34	326.44	326.53	326.63	6+59.98	327.17	327.73	326.83	326.93	327.02	327.12	327.22	327.32	327.42	7+38.48	327.95	327.52
(7)	5+82.66	326.40	325.92	326.01	326.11	326.21	326.31	326.41	326.51	326.60	6+61.19	327.18	326.70	326.80	326.90	327.00	327.10	327.19	327.29	327.39	7+39.88	327.97	327.49
S.P.	5+84.22	326.41	326.90	327.00	327.10	327.20	327.30	327.39	327.49	327.59	6+63.01	327.20	327.69	327.79	327.89	327.99	328.08	328.18	328.28	328.38	7+41.98	327.99	328.48



LEGEND:
- N.P. Denotes North Parapet
- N.S. Denotes North Sidewalk
- S.S. Denotes South Sidewalk
- S.P. Denotes South Parapet

NOTE:
For Pouring Sequence See Sht. 19

TYPICAL SECTION

Scale: 1/8" = 1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

STATE OF MARYLAND — No. 11828 — REGISTERED PROFESSIONAL ENGINEER — 12/86

Bridge No. #HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

No.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

SUPERSTRUCTURE ELEVATIONS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

RJL DESIGN	SCALE As Noted		
RMJ DRAWN	17 OF 24		
DCC/RLP CHECKED	SHEET		
8/85 DATE	JOB No.	91161 FILE No.	

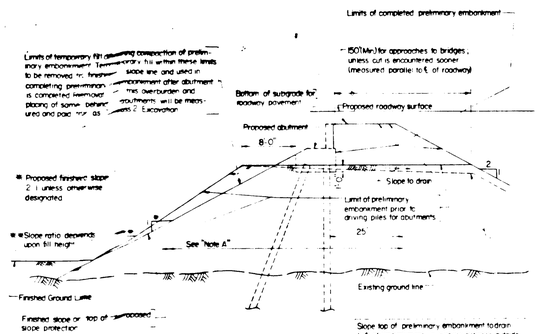
F-86-55

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-7-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF ENGINEERING — DATE 2-7-86



ELEVATION
Scale None

Limits of completed preliminary embankment

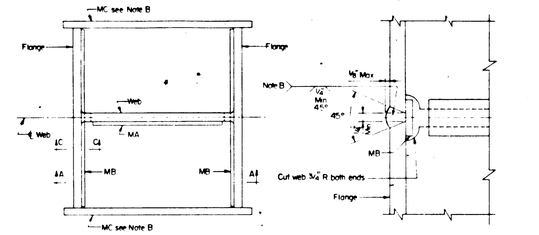
150 Min.) for approaches to bridges, unless cut is encountered sooner (measured parallel to ℄ of roadway)

Slope top of preliminary embankment to drain to ℄ of embankment (i.e. midway between outside shoulders) and from abutment to rear of fill along ℄ to carry drainage down rear embankment slope to sediment trap, or other erosion control device.

Temporarily seed and mulch front and back slopes to original ground line. Permanent seed and mulch or sod slopes. Install 4'-0" wide soil stabilization matting in top swale to original ground line (See Std. Sheet No. MC 708.01).

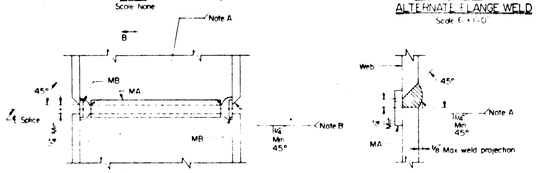
Note A
No boulders, rocks, or stumps, stumps, surface boulders and rocks to be removed from existing ground within this area of fill and all reverse limits

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT PRELIMINARY EMBANKMENT FOR PEDESTAL TYPE BRIDGE ABUTMENTS ON PILES	
REVISIONS		
FHWA APPROVAL DATE 1-9-76	STANDARD NO BR-FD(010)-75-17	SHEET 1 OF 1



PLAN
Scale None

SECTION C-C
ALTERNATE FLANGE WELD
Scale 6"=1'-0"



SECTION A-A
Scale None

SECTION B-B
Scale 6"=1'-0"

All material to be ASTM A 36

Material Required:

For HP 10 x 42	For HP 12 x 53	For HP 14 x 73
1 Bar MA 1'-3 3/16" x 7 1/4"	1 Bar MA 1'-3 3/16" x 9 3/16"	1 Bar MA 1'-5 1/16" x 1'-0"
2 Bars MB 1'-3 3/16" x 10"	2 Bars MB 1'-3 3/16" x 1'-0"	2 Bars MB 1'-3 3/16" x 1'-2 1/2"
2 Bars MC 3" x 3/8" x 11"	2 Bars MC 3" x 3/8" x 1'-1"	2 Bars MC 3" x 3/8" x 1'-3"

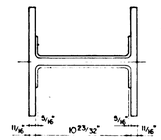
Note A
End of weld to be smooth and flush with web cut

Note B
For MC to be tack welded to flange at splice to back up end of flange weld, remove MC after weld is completed. End of weld must be smooth and flush with edge of flange. Grind weld smooth with edge of flange if pile is unsupported in weld area such as in air, water, or soft mud.

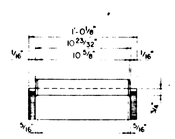
Note C
Let welds cool to air temperature before driving pile

Note D
No pile splicing to be allowed on any portion of pile that is to remain exposed or be above finished ground line in completed structure

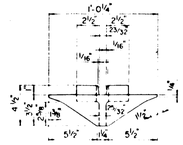
APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT STEEL H PILE SPLICE DETAILS	
REVISIONS		
FHWA APPROVAL DATE 8-24-76	NO BR-FD(001)-75-15	SHEET OF 1



PLAN
Scale 1½"=1'-0"



ELEVATION
Scale 1½"=1'-0"

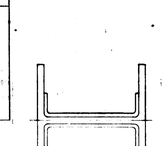


SIDE VIEW
Scale 1½"=1'-0"

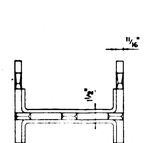
Size of Pile	Size of 45° Bevel	Size of Groove Weld
12 x 53	1/4	5/16
12 x 74	5/16	5/16

Note
1 Material Cast Steel ASTM A27 65/35
All Fillets 5/16
2 Point to be welded to pile with a continuous single bevel groove weld along outside face of flange. Exterior face of flange to be flame cut beveled at 45° prior to welding.
3 For each shipment of points a foundry certificate verifying material meets the specifications is required.

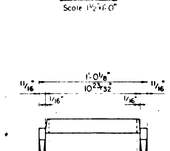
APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT PILE POINT FOR 12" H PILE	
REVISIONS		
9-29-80	STANDARD NO BR-FD(005)-79-85	SHEET 1 OF 1



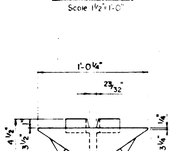
TOP PLAN
Scale 1½"=1'-0"



BOTTOM PLAN
Scale 1½"=1'-0"



ELEVATION
Scale 1½"=1'-0"

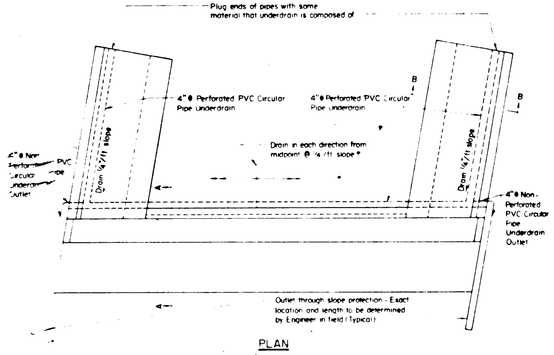


SIDE VIEW
Scale 1½"=1'-0"

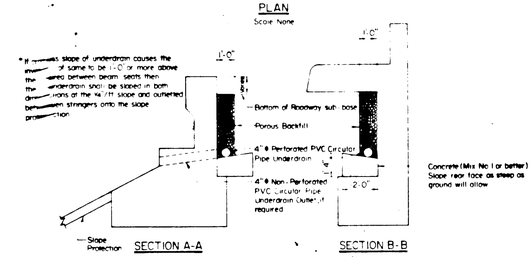
Size of Pile	Size of 45° Bevel	Size of Groove Weld
12 x 53	1/4	5/16
12 x 74	5/16	5/16

Note
1 Material Cast Steel ASTM A27 65/35
All Fillets 5/16
2 Point to be welded to pile with a continuous single bevel groove weld along outside face of flange. Exterior face of flange to be flame cut beveled at 45° prior to welding.
3 For each shipment of points a foundry certificate verifying material meets the specifications is required.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT TOOTHED PILE POINT FOR 12" H PILE	
REVISIONS		
9-29-80	STANDARD NO BR-FD(008)-79-88	SHEET 1 OF 1



PLAN
Scale None

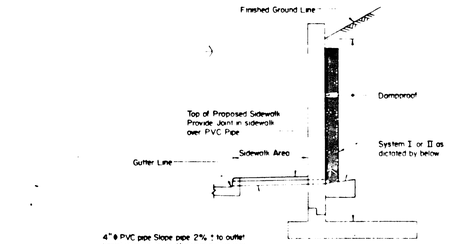


SECTION A-A
Scale None

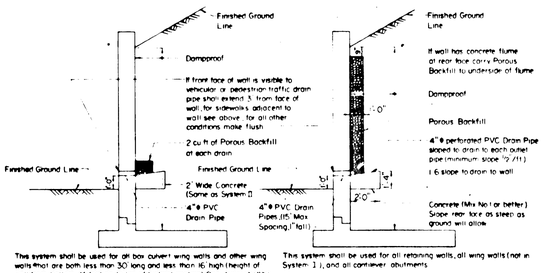
SECTION B-B
Scale None

Note
For types of underdrain See S.H.A. Standard No. MC 520.01 (a) Sub-Base Drainage Ditch Section. To be used for all abutments, regardless of the direction of the approach roadway grades. Minimum slope of Pipe Underdrain Outlets is 1/4"/ft. Porous backfill shall be stone conforming to AASHTO M 43 size No 57

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT DRAINAGE SYSTEM FOR PEDESTAL ABUTMENTS	
REVISIONS		
9-29-81	NO BR-SB(001)-80-101	SHEET 1 OF 1
FHWA APPROVAL DATE 6-20-80		



DRAIN AT SIDEWALK
Scale None

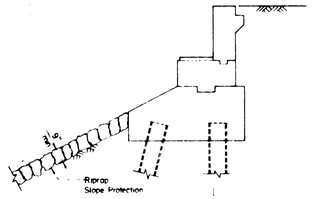


SYSTEM I
Scale None

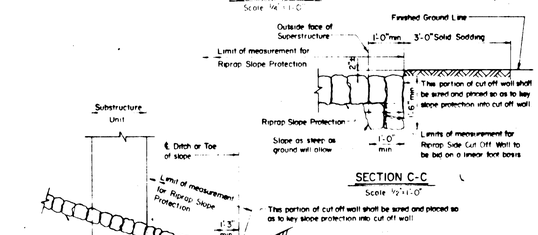
SYSTEM II
Scale None

Note
1 Exact elevation of drain to be determined by Engineer in the field
2 Porous Backfill shall be stone conforming to AASHTO M 43, Size No 57

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT RETAINING WALL, WING WALL, AND CANTILEVER ABUTMENT DRAINAGE SYSTEMS	
REVISIONS		
9-11-82	NO RW(001)-80-100	SHEET 1 OF 1
FHWA APPROVAL DATE 6-20-80		



SECTION A-A
Scale ¼"=1'-0"

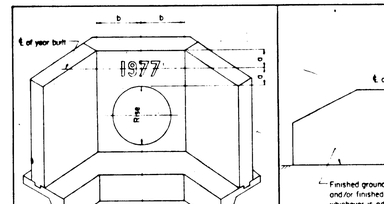


SECTION C-C
Scale ½"=1'-0"

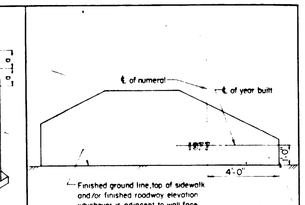
SECTION B-B
Scale ¼"=1'-0"

Note
1 Bottom Cut Off Wall may be eliminated if slope protection can be founded in rock
2 All material for riprap slope protection shall be Class I conforming to Subsection 905.01 of the Specifications
3 In areas where scupper downspouts will be discharging onto this type of slope protection a 6" blanket of selected backfill shall be placed under the slope protection for an area 5x5 centered under outlet. Cost of Selected Backfill to be included in Slope Protection items.

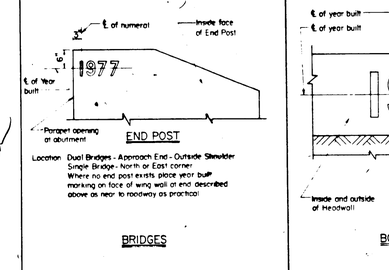
STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT RIPRAP SLOPE PROTECTION FOR BRIDGES CARRYING ROAD OVER ROAD OR RAILROAD	
NO M(6.02)-78-75	SHEET 3 OF 3



HEADWALLS FOR PIPES AND/OR PIPE ARCHES WITH RISE 5'-0" OR GREATER



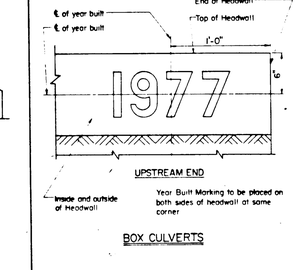
RETAINING WALLS



END POST

Location Dual Bridges - Approach End - Outside Shoulder
Single Bridge - North or East corner.
Where no end post exists place year built marking on face of wing wall at end described above as near to roadway as practical

BRIDGES



UPSTREAM END

Year Built Marking to be placed on both sides of headwall at same corner

BOX CULVERTS

Note
For details of Standard Numbers see Standards Numbers MD 400.01 thru MD 400.06
For existing structures where a year built is shown on the structure and structure is to be rehabilitated, the marking should read 1942 - 77 (old year first) - new year)
For existing structures with no year built marking contact Div of Bridge Development for old year

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT LOCATION OF YEAR BUILT MARKING	
REVISIONS		
11-14-78 1-4-80 8-25-80	STANDARD NO. M(0.02)-78-74	SHEET 1 OF 1
FHWA APPROVAL DATE 11-7-78		

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

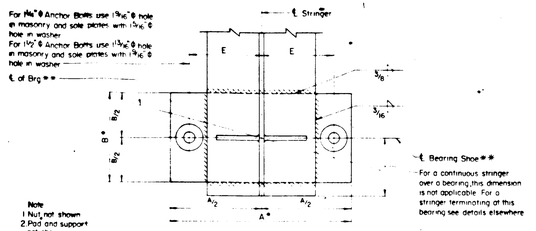
NO	REVISION	DATE	BY

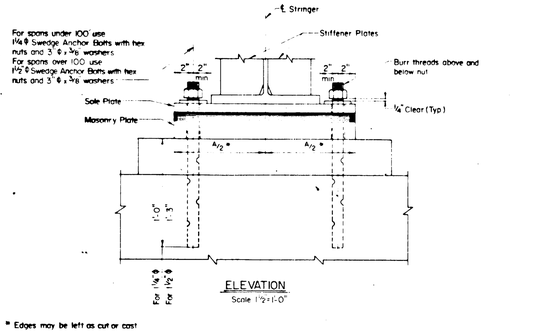
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS MD • ATLANTA GA • BECKELY WV • CULPEPER VA • DENVER CO • EXPORT PA • FAIRFAX VA
GREENSBORO NC • MONROE MI • RALEIGH NC • ROCKVILLE MD • TAMPA FL • WILLISTON PARK NY

STANDARD DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

SHA DESIGN	SCALE	
SHA DRAWN	18 OF 24	
DCC/RLP CHECKED	SHEET	
8/85 DATE	JOB No.	81216K FILE No.

F-86-55





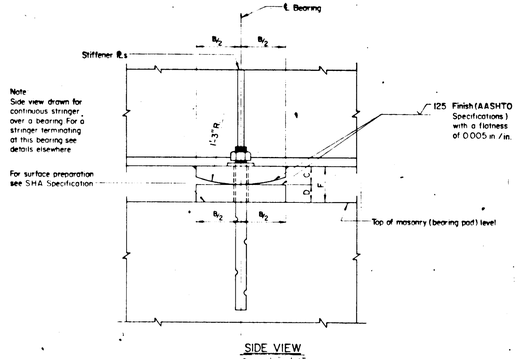
* Edges may be left as cut or cast

** Where bridge is not skewed, ℄ Brg and ℄ Shoe are coincident

APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
7-2-81 /
9-7-83 /
3-13-85 /
FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
FIXED BEARING
MEDIUM LENGTH SPANS

NO BR-SS(9.02)-80-115 SHEET 1 OF 2



Pier 1

DATA SCHEDULE										
Type	Sole Plate			Masonry ℄			Hole Loc	HGT	Loads (Kips)	
	A	B	C	A	B	D	E	F	Vert	Dead
MF-I	20	9	1¾	20	9	1¾	8	3½	150	75
MF-II	22	11	2	22	11	2	9	4	200	100
MF-III	24	12	2¼	24	12	2¼	10	4½	250	125
MF-IX	26	13	2½	26	13	2½	11	5	300	150
MF-X	30	15	2¾	30	15	2¾	13	5½	350	175
MF-XI	32	16	3	32	16	3	14	6	400	200

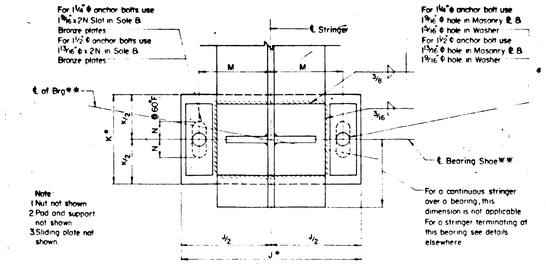
Note: All dimensions are in inches

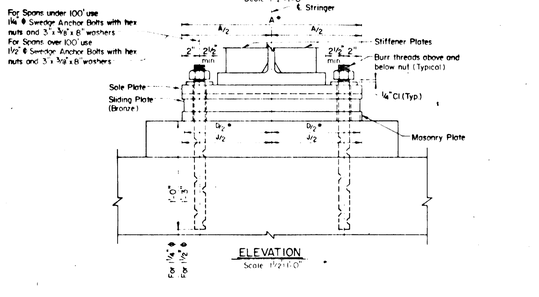
Note
1 Sole and masonry plates to be ASTM A-36 steel, pointed to match finished bridge color
2 Fill slots and holes around anchor bolts with non-hardening caulking compound or elastic joint sealer
3 250 RMS (Finish all over)
4 Rotation ½° ± Maximum
5 Design Bearing Load 10 KSI
6 Top of sole plate must be beveled to fit grade of bottom flange
7 Unless otherwise noted, bearings shall be placed normal to ℄ of stringer
8 Plates are to be shipped as units
9 If more than one size bearing is called for, Contractor may furnish all bearings of the larger size provided the bearing pads are altered to accomodate same. No increase in any prices bid will be allowed if this option is selected
10 All anchor bolts, nuts and washers shall be unpainted ASTM A-36 galvanized steel
11 Medium span range is considered 50' to 150' simple span lengths and comparable span continuous units

APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
9-7-83 /
/
/
FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
FIXED BEARING
MEDIUM LENGTH SPANS

NO BR-SS(9.02)-80-115 SHEET 2 OF 2





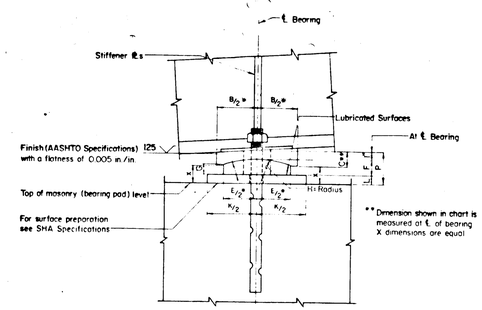
* Edges may be left as cut or cast

** Where bridge is not skewed, ℄ Brg and ℄ Shoe are coincident

APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
7-2-81 /
1-29-82 /
8-6-82 /
3-13-85 /
FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
BRONZE EXPANSION BEARING
MEDIUM LENGTH SPANS

NO BR-SS(9.01)-80-114 SHEET 1 OF 2



Abutments A & B

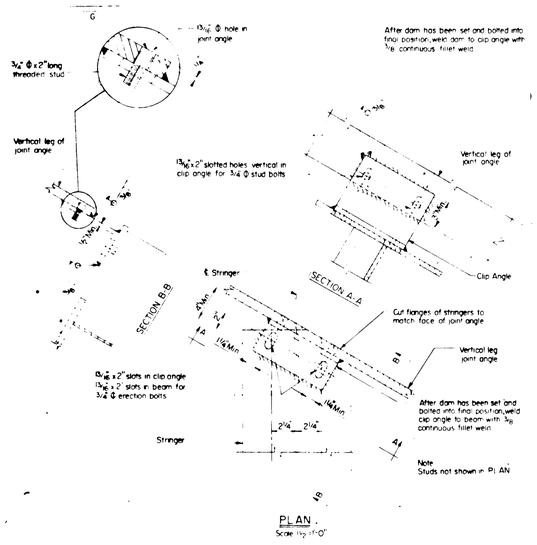
DATA SCHEDULE																
Type	Sole Plate			Sliding Plate			Radius	Masonry ℄		Hole Loc		HGT	Loads (Kips)			Total Expansion ± (OFF-20°F)
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Vert	Horiz	Dead	
ME-I	21	5½	2⅛	20	7½	1¾	15	11	21	11	1	8½	1½	3¾	150	15	75	1
ME-XII	23	11	1	22	9	⅞	15	12	23	12½	1	9½	2¼	3¾	200	20	100	1⅛
ME-III	25	11½	1	24	9½	1¾	15	15	25	13	1	10½	1½	3¾	250	25	125	1
ME-IV	26	13½	2⅜	25	11½	2⅛	15	15	26	16	1	11	2	4⅛	300	30	150	1½
ME-V	29	15½	2¾	28	13½	2½	15	18	29	17	1½	12½	2	4⅞	350	35	175	1¾
ME-VI	30	16½	2¾	29	14½	2½	15	18	30	20	1½	13	2¼	5⅛	400	40	200	2¼
ME VIII	15.5	16½	3½	32	17	2⅞	14	21	33.5	22½	1¾	14½	2¼	5½	500	50	250	2¾

Note
1 Sole and masonry plates to be ASTM A-36 steel, pointed to match finished bridge color, convex plate shall be a self lubricating bronze bearing plate conforming to Subsection 914.03 of the Specifications and the Special Provisions
2 Fill slots and holes around anchor bolts with non-hardening caulking compound or elastic joint sealer
3 250 RMS (Finish all over)
4 Rotation ½° ± Maximum
5 Design Masonry Bearing Load 10 KSI
6 Top of sole plate must be beveled to fit grade of bottom flange
7 Unless otherwise noted, bearings shall be placed normal to ℄ of stringer
8 Plates are to be shipped as units
9 If more than one size bearing is called for, Contractor may furnish all bearings of the larger size provided the bearing pads are altered to accomodate same. No increase in any prices bid will be allowed if this option is selected
10 All anchor bolts, nuts and washers shall be unpainted ASTM A-36 galvanized steel
11 Medium span range is considered 50' to 150' simple span lengths and comparable span continuous units

APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
9-7-83 /
5-31-84 /
/
FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
BRONZE EXPANSION BEARING
MEDIUM LENGTH SPANS

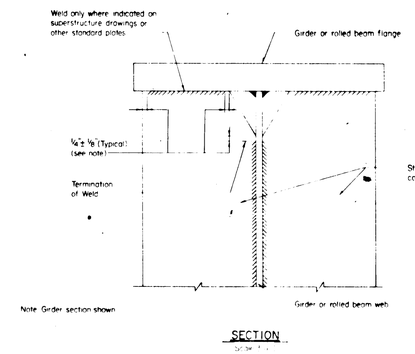
NO BR-SS(9.01)-80-114 SHEET 2 OF 2



APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
12-15-82 /
5-20-83 /
/
FHWA APPROVAL DATE 10-3-83

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
CLIP ANGLE DETAIL

NO BR-SS-(8.02)75-4 SHEET 1 OF 1



Notes
1 For all stiffeners (intermediate or bearing) top and bottom, including connection plates for channel diaphragms for all girders and rolled beams.
2 Welding, to flange as per this detail will only be required where joints or other standard sheets indicate stiffener is extended and welded to flange

APPROVAL
CHIEF, DIVISION OF BRIDGE DEVELOPMENT
DATE 11/14/86
REVISIONS
SHA / FHWA
/
/
/
FHWA APPROVAL DATE 10-3-83

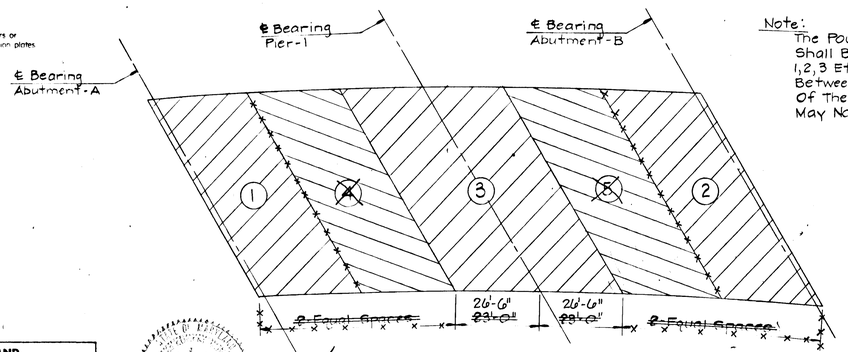
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
STIFFENER AND STRINGER CONNECTION PLATE WELD TERMINATION DETAIL

STANDARD NO BR-SS(8.10)83-154 SHEET 1 OF 1

CAMBER SCHEDULE

GIRDER NO.	DESCRIPTION	SPAN - A								SPAN - B								
		℄ Bearing Abut. - A	1/8 PT.	2/8 PT.	3/8 PT.	4/8 PT.	5/8 PT.	6/8 PT.	7/8 PT.	℄ Bearing Pier-1	1/8 PT.	2/8 PT.	3/8 PT.	4/8 PT.	5/8 PT.	6/8 PT.	7/8 PT.	℄ Bearing Abut. - B
(1) THRU (7)	△1	0	1/16	1/16	1/8	1/8	1/16	1/16	0	0	0	1/16	1/16	1/8	1/8	1/16	1/16	0
	△2	0	1/4	7/16	1/2	1/2	3/8	3/16	1/16	0	1/16	3/16	3/8	1/2	1/2	7/16	1/4	0
	△3	0	1/16	1/8	3/16	1/8	1/8	1/16	1/16	0	1/16	1/16	1/8	1/8	3/16	1/8	1/16	0
	TOTAL	0	3/8	5/8	13/16	3/4	9/16	5/16	1/8	0	1/8	5/16	9/16	3/4	13/16	5/8	3/8	0

△1 = Deflection Due To Dead Weight Of Steel Girders (In Inches)
△2 = Deflection Due To Dead Weight Of Concrete Roadway Slab (In Inches)
△3 = Deflection Due To Dead Weight Of Parapets & Sidewalks (In Inches)



BRIDGE DECK POURING SEQUENCE
No Scale

Note:
The Pouring Sequence For The Bridge Roadway Slab Shall Be Made In The Numbered Order Indicated; 1, 2, 3 Etc. There Must Be At Least Forty (40) Hours Between The Completion Of One Pour And The Start Of The Next Numbered Pour. This Pouring Sequence May Not Be Changed And No Alternate Will Be Considered.

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING
Chief, Div. of Land Development & Zoning Admin. — Date 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Chief, Bureau of Engineering — Date 2-24-86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

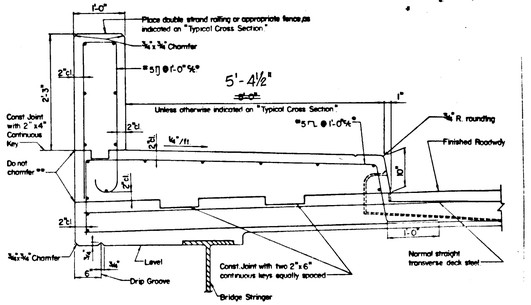
NO.	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS MD • ATLANTA GA • BECKELY WV • CULPEPER VA • DENVER CO • EXPORT PA • FAIRFAX VA
GREENSBORO NC • MONROE MI • RALEIGH NC • ROCKVILLE MD • TAMPA FL • WILLISTON PARK NY

CAMBER SCHEDULE & STANDARD DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

DSA/SHA DESIGN	SCALE
DSA/SHA DRAWN	19 OF 24
DSA/SHA CHECKED	SHEET
8/85 DATE	JOB No. 81216X
	FILE No.

F-86-55



SECTION
Scale ¾"=1'-0"

*Spacing to match that of normal deck steel, provided bar spacing can be kept between 12" and 14". For all other cases, spacing shall be as indicated above

**In order to insure a smooth and acceptable surface, 608.03.05 (Construction Joints) of the Specifications shall be strictly adhered to.

Note
1. All longitudinal bars are #5 spaced as shown, maximum spacing 1'-3"
2. All keys are nominal size.
3. For lists of normal longitudinal deck steel and truss bars not shown.

APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 8/29/84	
REVISIONS	
SHA	FHWA
7-12-82	
10-6-82	
1-11-83	
8-27-84	

FHWA APPROVAL DATE 7-29-85

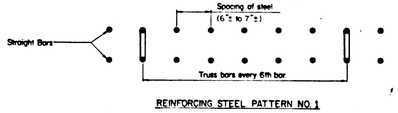
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
SIDEWALK WITH PARAPET
FOR BRIDGES OVER WATER AND/OR RAILROADS

STANDARD NO. BR-SS(6.21)-80-106 SHEET 1 OF 1

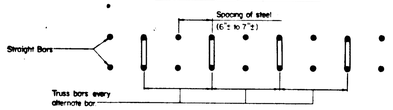
NOTES

Design
1. Latest AASHTO Standard Specifications for Highway Bridges
2. f'_c = 4500 p.s.i., f_c = 0.3 f'_c = 1350 p.s.i., f_s = 24,000 p.s.i
3. Design includes provision for 2" future wearing surface

General
1. Transverse bars shall be placed normal to ℄ stringers, except in case of curved stringers. When stringers are curved transverse bars shall be placed radially.
2. When skew angles are greater than 60° then Contractor may use either Reinforcing Steel Pattern No. 1 or No. 2 throughout bridge.

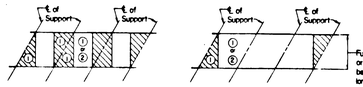


REINFORCING STEEL PATTERN NO. 1



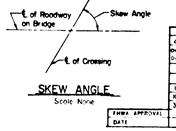
REINFORCING STEEL PATTERN NO. 2

1. The Contractor has the option of using Reinforcing Steel Pattern No. 1 or No. 2 in the unhatched portions of the decks shown below.
2. The Contractor shall use only Reinforcing Steel Pattern No. 1 in the hatched portions of the decks shown below.



SIMPLE SPAN BRIDGE — CONTINUOUS BRIDGE UNIT

TRANSVERSE BAR SPACING FOR SPANS WITH SKEW ANGLES LESS THAN 60°
Scale 1"=1'-0"



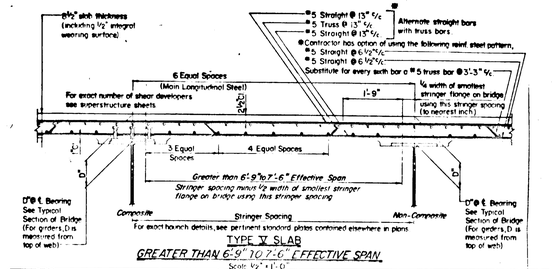
SKEW ANGLE
Scale None

APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 10/27/78	
REVISIONS	
SHA	FHWA
11-10-81	
10-4-82	
3-1-84	

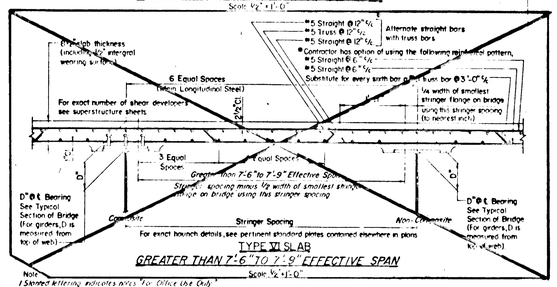
FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
BRIDGE DECK SLAB
GENERAL NOTES AND BAR SPACING

STANDARD NO. BR-SS(6.11)-79-90 SHEET 1 OF 1



TYPE V SLAB
GREATER THAN 6'-9" TO 7'-6" EFFECTIVE SPAN
Scale ½"=1'-0"



TYPE VI SLAB
GREATER THAN 7'-6" TO 7'-9" EFFECTIVE SPAN
Scale ½"=1'-0"

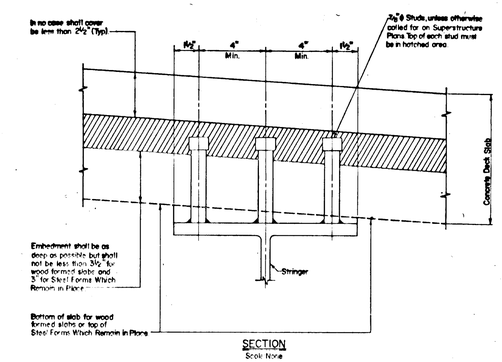
Note
1. Standard lettering indicates notes "For Office Use Only."
2. All steel sizes and spacing based on AASTM Designation A-615, Grade 60 (fs = 24,000 p.s.i.)
3. Transverse bars to be placed normal to centerline of stringers. (For curved girder see BR-SS(6.11)-79-90)
4. All longitudinal bars to be #5's placed as shown except if Note 5 requires and indicates larger bars.
5. On continuous bridges, over piers, additional longitudinal steel is to be added to the top of the slab between normal bars and is indicated thus ○. See pertinent Superstructure Sheets for the lengths and size of these additional bars.

APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 10/27/78	
REVISIONS	
SHA	FHWA
8-15-85	
4-21-86	

FHWA APPROVAL DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
TYPE V AND VI
BRIDGE DECK SLABS

STANDARD NO. BR-SS(6.14)-79-93 SHEET 1 OF 1



SECTION
Scale None

Note
1. For number of studs per row, and longitudinal spacing of rows see pertinent Superstructure sheets.
2. For flange widths less than 11", only two rows of studs are to be used.
3. Steel Forms Which Remain in Place not shown.

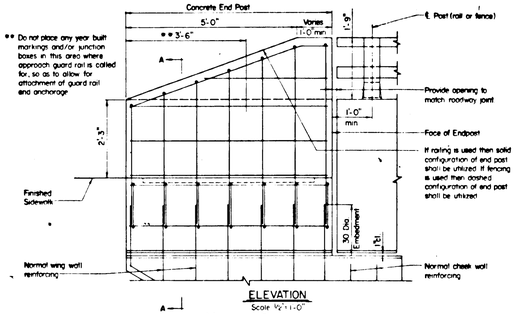
APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 10/27/78	
REVISIONS	
SHA	FHWA

FHWA APPROVAL DATE 11-5-76

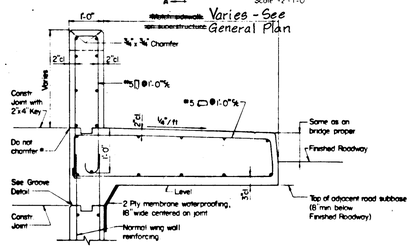
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
STEEL STUD SHEAR
DEVELOPER EMBEDMENT DETAIL

STANDARD NO. BR-SS(8.05)75-30 SHEET 1 OF 1

** Do not place any year built markings and/or junction boxes in this area where approach guard rail is called for, so as to allow for attachment of guard rail and anchorage.



ELEVATION
Scale ½"=1'-0"



SECTION A-A
Scale ½"=1'-0"

*In order to insure a smooth and acceptable surface, Section 608.03.05 (Construction Joints) will be strictly adhered to.

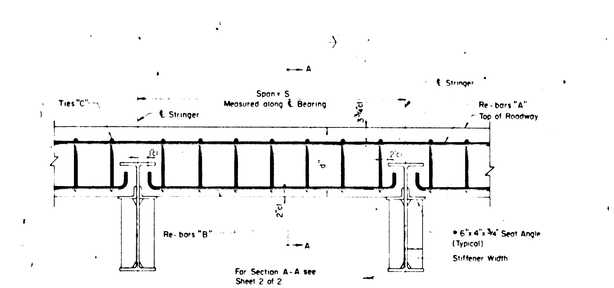
Notes
1. All longitudinal bars are #5 spaced as shown, maximum spacing 1'-3"
2. All keys are nominal size

APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 8/29/84	
REVISIONS	
SHA	FHWA

FHWA APPROVAL DATE 11-8-84

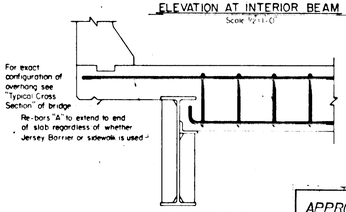
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
BRIDGE END POST (WITH SIDEWALK)
FOR BRIDGE WITH FENCE OR RAILING

STANDARD NO BR-SB(6.05)-84-162 SHEET 1 OF 1



ELEVATION AT INTERIOR BEAM
Scale ½"=1'-0"

*Longest leg of angle shall be increased as necessary to that angle exceeds stiffener width by at least ½"



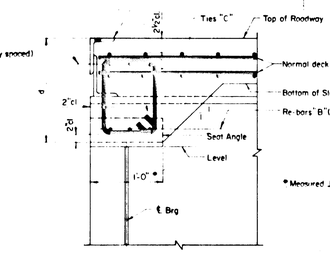
ELEVATION AT EXTERIOR BEAM
Scale ½"=1'-0"

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING
2-3-86
DIRECTOR OF PLANNING & ZONING DATE

APPROVED:
HOWARD COUNTY DEPT. OF PUBLIC WORKS
2-25-86
CHIEF, BUREAU OF ENGINEERING DATE

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
CONCRETE DIAPHRAGMS AT PIERS (WITH EXPANSION JOINTS) AND AT ALL ABUTMENTS

NO. BR-SS(6.22)-80-120 SHEET 1 OF 2



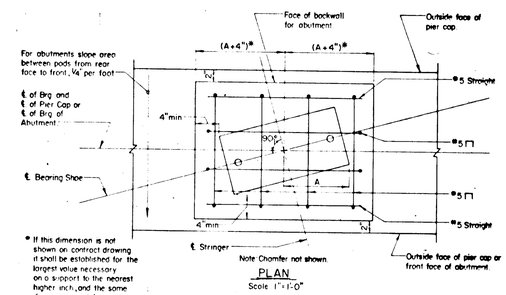
SECTION A-A
Scale None

Span = S	Depth of Diaphragm d	Re-bars "A"	Re-bars "B"	Ties "C"
Up to 8'	1'-11"	3-#7's	3-#7's	#5 @ 9" Maximum Spacing
over 8' to 11'	1'-11"	3-#8's	3-#8's	
over 11' to 14'	2'-0"	3-#8's	3-#8's	
over 14' to 16'	2'-1"	3-#9's	3-#9's	

Note
1. Studs and anchors for seat retainer angle, not shown.
2. All reinforcing steel types and spacings based on ASTM Designation A-615, Grade 60 (fs = 24,000 p.s.i.)

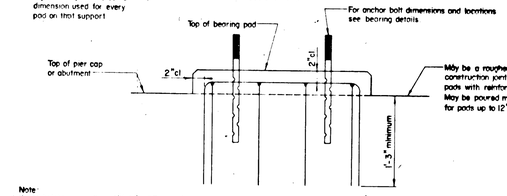
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
CONCRETE DIAPHRAGMS AT PIERS (WITH EXPANSION JOINTS) AND AT ALL ABUTMENTS

NO. BR-SS(6.22)-80-120 SHEET 2 OF 2



* If this dimension is not shown on contract drawing it shall be established for the largest value necessary on a support to the nearest higher inch, and the same dimension used for every pad on that support.

PLAN
Scale 1"=1'-0"



ELEVATION
Scale 1"=1'-0"

Note
1. If pad height is less than 4" (at ℄ of Bearing), all dimensions, etc. shown on this sheet will prevail except no reinforcing steel will be required and pad must be poured monolithically with support.
2. Anchor bolts shall be set in round holes drilled or cored into the masonry.
3. The drilled or cored holes shall have a diameter of at least 1" larger than the diameter of the bolts.
4. Holes shall be filled with non-shrink grout. Non-shrink grout shall have a min. comp. strength of 5000 p.s.i. in 7 days when tested in accordance with AASHTO T-106, except that the cube molds shall remain intact with a top firmly attached throughout the curing period. The non-shrink grout shall have a min. expansion of 0.05% after 7 days when tested in accordance with AASHTO T-160.
5. For size of pad see pertinent substructure sheets.
6. Space reinforcing steel to clear anchor bolts.

APPROVAL	
C.E. Greenhorne asst. chief, bridge development, date 10/27/78	
REVISIONS	
SHA	FHWA
3-30-83	
5-5-83	

FHWA APPROVAL DATE 2-27-81

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT
BEARING PAD WHERE ONLY A SINGLE SHOE IS REQUIRED ON A SUPPORT

NO. BR-SB(6.02)-80-121 SHEET 1 OF 1

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

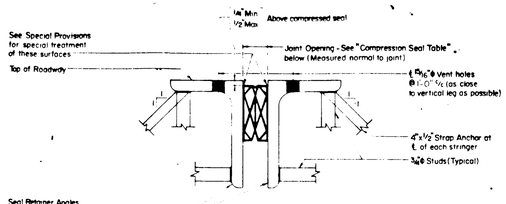
No	REVISION	DATE	BY
5	Revisions Due To Stake Out Error	1/5/88	RMJ

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

STANDARD DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

SHA DESIGN	SCALE
SHA DRAWN	20 OF 24 SHEET
DCC/RLP CHECKED	
8/85 DATE	JOB No R12126X
	FILE No

F-8655



SECTION
Scale None

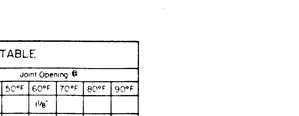
COMPRESSION SEAL TABLE							
Location	Uncompressed Seal Width	Joint Opening "B"					
		40°F	50°F	60°F	70°F	80°F	90°F
	1 3/4"			1 1/8"			
	3"			1 15/16"			
	5"			3"			
	6"			3 3/8"			

Note
1 The 1 3/4" and 3" seals to be one piece for full length of seal (no joints)
2 The 5" and 6" seals may have one shop splice per joint, if the length of joint exceeds 50'. Splice shall be at least 15' from gutter line.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT COMPRESSION SEAL JOINT AND RETAINING ANGLE DETAIL
REVISIONS: 10-3-79 12-12-79; 1-4-80 1-23-80; 11-27-80 6-23-83; 9-9-80 6-23-83	
FHWA APPROVAL DATE 11-30-78	STANDARD NO. BR-SS(701)-77-63 SHEET 1 OF 1

Note
1 The Contractor has the option of substituting the Ancel Frame Scaffolding System for steel forms which remain in place with the following exceptions:
a) Bridges over existing highways.
b) Bridges over high speed or electrified railroads.
2 Ancel Frames may never be used on any fracture critical member.
3 The Contractor has the option of substituting the Ancel Frame Scaffolding System for conventional overhang brackets on fascia stringers with the following exceptions:
a) Bridges over new or existing highways.
b) Bridges over navigable waterways with underclearance less than 30 feet.
4 In any instance where studs are allowed they shall remain in place.

SECTION
Scale None

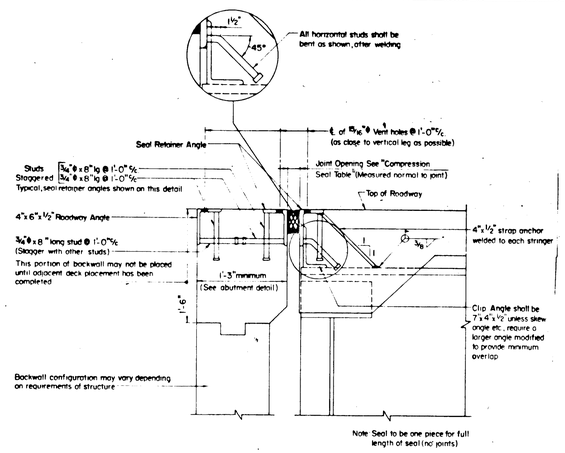


WHERE FORM IS BELOW BOTTOM OF FLANGE AND THERE ARE NO SHEAR CONNECTORS

WHERE FORM IS ABOVE BOTTOM OF FLANGE AND THERE ARE NO SHEAR CONNECTORS

Note
1 Permanent steel bridge deck forms and supports shall meet the requirements of Section 946.2 of the Specifications. Design: Span shall be the clear distance between beam and/or girder flanges less two (2) inches.
2 No welding of these forms to parts carrying tension will be permitted. These forms shall be vertically adjusted to attain line and grade as required.
3 Any permanently exposed form metal where the galvanized coating has been damaged shall be thoroughly cleaned, wire brushed and painted with two coats of zinc oxide zinc dust primer, Federal Specification TT-P-641d, Type II, zinc color added, to the satisfaction of the engineer. Minor heat discoloration in areas of welds need not be touched up.
4 Contractor has option of using this detail or that shown on 2 of 2, except for bridge decks with curved stringers or bridge with a flared re-bar pattern. For bridge with curved stringers or bridge with a flared re-bar pattern only the detail shown on sheet 2 of 2 can be used.
5 Where shear connections are utilized, normal manufacturers detailing may be utilized at stringer flange.

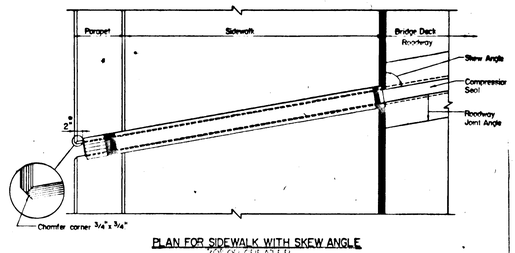
APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT STEEL FORMS WHICH REMAIN IN PLACE FOR CONCRETE SLABS ON STEEL STRINGERS RE-BARS ALIGNED WITH TROUGHS
REVISIONS: 1-28-79 6-20-80; 4-1-83 2-28-85; 9-18-84 2-28-85; 3-22-85 *; 2-1-85 *	
FHWA APPROVAL DATE 11-30-78	NO. BR-SS(6.06)-75-29 SHEET 1 OF 2



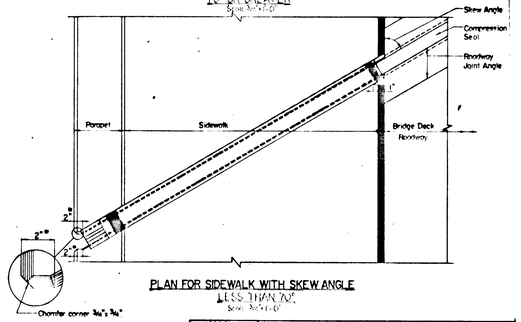
SECTION
Scale 1 1/2" = 1'-0"

Note
1 New bridge details shown.
2 When used for deck rehabilitation see Standard No. BR-SS(8.06)-78-72 showing special attachment of new clip angle.
3 Compression seal to be placed after joint angles are set, and deck and entire backwall are in place.
4 See Standard No. BR-SS(7.01)-77-63 for additional details.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT COMPRESSION SEAL ROADWAY JOINTS AT ABUTMENTS
REVISIONS: 1-27-82 6-23-83; 12-29-83 3-22-84; 7-20-84 *; 11-5-84 *	
FHWA APPROVAL DATE 4-4-80	NO. BR-SS(7.02)-79-64 SHEET 1 OF 1



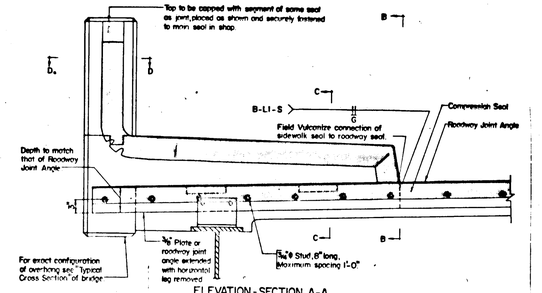
PLAN FOR SIDEWALK WITH SKEW ANGLE
20° OR GREATER
Scale 3/4" = 1'-0"



PLAN FOR SIDEWALK WITH SKEW ANGLE
LESS THAN 70°
Scale 3/4" = 1'-0"

* Dimension measured at top of parapet when special parapet is utilized.

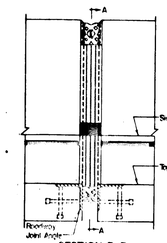
APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT FULL HEIGHT COMPRESSION SEAL ROADWAY JOINT AT SIDEWALKS
REVISIONS: 5-8-84 11-8-84; 6-21-84 11-8-84	
FHWA APPROVAL DATE 4-4-80	STANDARD NO. BR-SS(7.07)-79-96 SHEET 1 OF 2



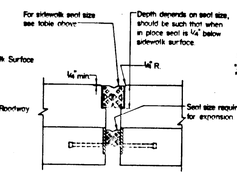
ELEVATION - SECTION A-A
Scale 3/4" = 1'-0"

Roadway Seal Size	1 3/4"	3"	5"	6"
Sidewalk Seal Size	3"	5"	6"	*

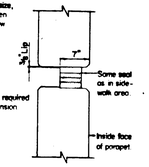
* For this width roadway seal the 1/4" lip shall be eliminated and a strip seal shall be used in sidewalk and parapet area.



SECTION B-B
Scale 3/4" = 1'-0"



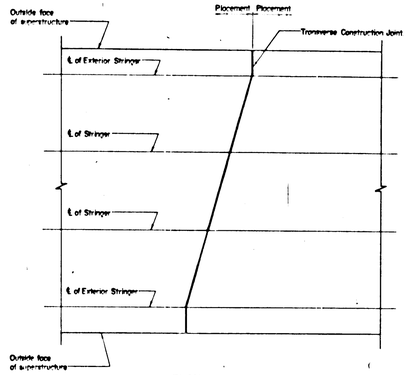
SECTION C-C
Scale 3/4" = 1'-0"



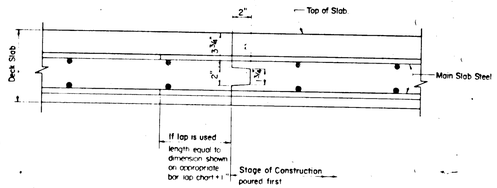
SECTION D-D
Scale 3/4" = 1'-0"

Note:
1 All sections shown for 90° skew.
2 All steel to be A.S.T.M. A-36, for painting specifications see Special Provisions.
3 Joint area shall be thoroughly cleaned just prior to placing of seal.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT FULL HEIGHT COMPRESSION SEAL ROADWAY JOINT AT SIDEWALKS
REVISIONS: 5-8-84 11-8-84; 6-21-84 11-8-84	
FHWA APPROVAL DATE 4-4-80	STANDARD NO. BR-SS(7.07)-79-96 SHEET 2 OF 2



PLAN
Scale None



SECTION
Scale 1 1/2" = 1'-0"

Note
1 Reinforcing steel to be continuous thru joint.
2 For location of construction joint see Standard No. BR-SS(6.07)-77-68.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT BRIDGE DECK SLAB CONSTRUCTION JOINT
REVISIONS: 5-21-76 10-10-80; 10-5-77 10-10-80; 10-5-77 2-28-85	
FHWA APPROVAL DATE 11-30-76	NO. BR-SS(6.07)-77-68 SHEET 1 OF 1

Note
For detail of construction joint see Standard No. BR-SS(6.07)-77-68.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT LAYOUT OF TRANSVERSE JOINT FOR SKEWED BRIDGE DECK
REVISIONS: 12-15-80 12-10-80	
FHWA APPROVAL DATE 10-17-76	STANDARD NO. BR-SS(6.05)-78-69 SHEET 1 OF 1

Note
1 For notes see sheet 1 of 2.
2 This detail is acceptable only on structures where the general notes under "Loading" states and 15 pounds per square foot for use of bridge deck forms.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT STEEL FORMS WHICH REMAIN IN PLACE FOR CONCRETE SLABS ON STEEL STRINGERS RE-BARS INDEPENDENT OF TROUGHS
REVISIONS:	
FHWA APPROVAL DATE 6-20-80	STANDARD NO. BR-SS(6.06)-75-29 SHEET 2 OF 2

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

[signature] 2-28-86
OFFICE OF LAND DEVELOPMENT & ZONING ADMIN. DATE

APPROVED:
HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] 2-28-86
CHIEF, BUREAU OF ENGINEERING DATE

[signature] 12/1/86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

#1159

No	REVISION	DATE	BY

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

STANDARD OF DATE
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

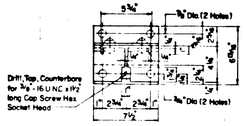
SHA DESIGN	AS NOTED (SCALE)
SHA DRAWN	21 OF 24 (SHEET)
DCC/RLP CHECKED	
8/85 DATE	JOB No. 82164 FILE No.

F-86-55

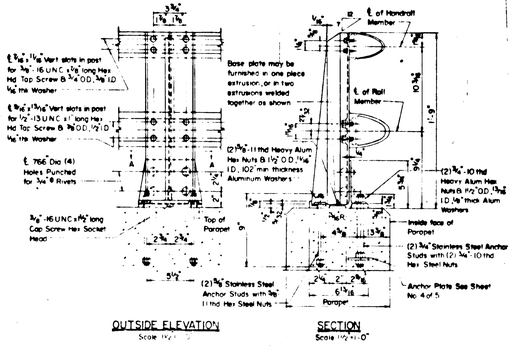
GENERAL NOTES

1. All railings shall be fabricated and erected as indicated on the contract drawing.
2. Posts to be set perpendicular to top of parapet. For post spacing see contract drawing (Maximum 8'-0" Spacing)
3. Rails shall be parallel to the grade of the roadway. Rail section to be attached to as many posts as possible, but not less than three (except where indicated otherwise on contract drawing).
4. The centerline of any splice and/or expansion joint is to be located at least 2'-0" away from centerline of a post except where indicated otherwise on plans. Expansion and/or splice joints for each strand of two strand railing are to be placed in the same location and in the same panel.
5. Material for rails, posts (including bases), splices and clamp bars shall conform to A.S.T.M. Designation B-221, Alloy 6061-T6. Rails shall have a mill finish. Posts shall have a mill finish except that any sawed surfaces shall have a finish comparable to 250 Micro-inch. Rails and splices may conform to A.S.T.M. Designation B-221, Alloy 6351-T5 for chemical composition only.
6. Material for rail and plates shall conform to A.S.T.M. Designation B-209, Alloy 6061-T6. Material for cast rail and caps shall conform to A.S.T.M. Designation B-108 Alloy 56-70A, 55A, and 57A for chemical composition only.
7. Material for anchor studs shall conform to A.S.T.M. Designation A-276, Type 430 or Type 304 Stainless Steel, annealed, hot finished, ultimate strength 70,000 p.s.i. min. 20% min. elongation. Threads may be rolled or cut.
8. Material for heavy aluminum nuts shall conform to A.S.T.M. Designation B-211, Alloy 6061-T6 or Alloy 6262-T9.
9. Material for steel nuts shall conform to A.S.T.M. Designation A-307.
10. Material for aluminum washers shall conform to A.S.T.M. Designation B-209, Alloy Alclad 2024-T4.
11. Material for rivets shall conform to A.S.T.M. Designation B-316, Alloy 6061-T6 and 6053-T61 for chemical composition only and shall conform with MIL-R-1150 in all other respects. These rivets shall be button head and cone point and shall be cold driven.
12. In lieu of rivets connecting post to post base, bolts may be used. Material for bolts shall be of stainless steel and shall conform to A.S.T.M. Designation A-193, Identification Symbol B-8. Nuts shall conform to A.S.T.M. Specification A-194 Type 8 or 8 NA. Material for washers shall conform to A.S.T.M. Specification A-276 Type 304. Specified Torque Level, bolts connecting ouse plate to post shall be 150 to 175 ft. lbs. Burr threads by center-punching at top of nut. Punch marks to be spaced at 120°.
13. Material for clamp bar top screws and cap screws shall be stainless steel and conform to A.S.T.M. Designation A-193, Identification Symbol B8.
14. Material for anchor plates shall be steel conforming to A.S.T.M. Designation A-36.
15. Material for pins shall conform to A.S.T.M. Designation Alloy 6061-T6 and pins shall be press fit.
16. Bottom of post bases shall be thoroughly coated with an approvert caulking compound or an approved zinc chromatic paint.
17. Weld metal for the welded base plate shall be 5356 A-1.

APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT GENERAL NOTES ALUMINUM BRIDGE RAILING
REVISIONS		
7-3-79	7-3-79	
6-4-80	6-18-80	
FHWA APPROVAL DATE 2-25-77		STANDARD NO BR-SS(5.01)76-35 SHEET 1 OF 5



SECTION A-A
Scale 1½"=1'-0"

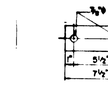


OUTSIDE ELEVATION
Scale 1½"=1'-0"

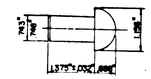
SECTION
Scale 1½"=1'-0"

Note
For all exposed and/or sawed edges - break all edges .1 inc radius invovled.

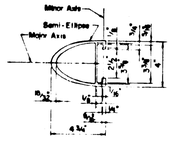
APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT TWO STRAND ALUMINUM BRIDGE RAILING
REVISIONS		
FHWA APPROVAL DATE 2-25-77		STANDARD NO BR-SS(5.01)76-35 SHEET 2 OF 5



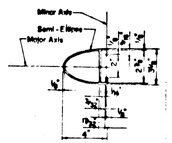
ANCHOR PLATE
Scale 1½"=1'-0"



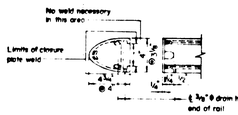
RIVET
Scale 6"=1'-0"



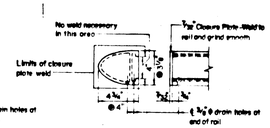
RAIL MEMBER
Scale None



HANDRAIL MEMBER
Scale None



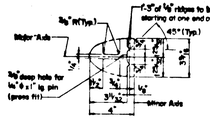
CAST RAIL END CAP
Scale 1½"=1'-0"



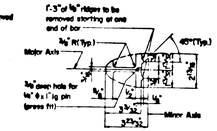
RAIL END PLATE
Scale 1½"=1'-0"

Note
At Contractors option, cast rail and caps may be substituted for rail and posts.
Open ends of all Handrails and Rails shall be closed.
Dimensions indicated thus ⊕ apply to Handrail.
Other dimensions apply to Rail.

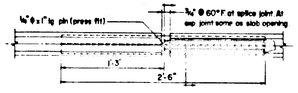
APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT MISCELLANEOUS DETAILS ALUMINUM BRIDGE RAILING
REVISIONS		
FHWA APPROVAL DATE 2-25-77		STANDARD NO BR-SS(5.01)76-35 SHEET 4 OF 5



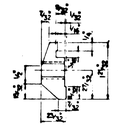
SECTION THRU SPLICE AND/OR EXPANSION BAR FOR RAIL MEMBER
Scale None



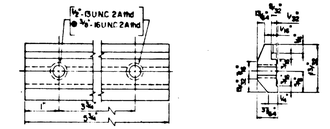
SECTION THRU SPLICE AND/OR EXPANSION BAR FOR HANDRAIL MEMBER
Scale None



ELEVATION JOINT DETAIL
Scale None



RAIL MEMBER SECTION



ELEVATION CLAMP BAR DETAILS
Scale 6"=1'-0"

HANDRAIL MEMBER SECTION

(⊕ Applies To Handrail Only)

APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT MISCELLANEOUS DETAILS ALUMINUM BRIDGE RAILING
REVISIONS		
FHWA APPROVAL DATE 2-25-77		STANDARD NO BR-SS(5.01)76-35 SHEET 3 OF 5

Bar Size	* LOCATION CATEGORY		
	A	B	C
# 4	2'-5"	1'-9"	1'-5"
# 5	3'-0"	2'-2"	1'-9"
# 6	3'-7"	2'-7"	2'-1"
# 7	4'-4"	3'-1"	2'-6"
# 8	5'-8"	4'-0"	3'-3"
# 9	7'-2"	5'-1"	4'-1"
# 10	9'-0"	6'-6"	5'-2"
# 11	11'-1"	7'-11"	6'-4"

* LOCATION CATEGORY

A-Bars in horizontal layers in top of pour with 12" or more of concrete below them such as; in footings, pier caps, etc.
B-All bars not in Category A spaced less than 6 inches apart.
C-All bars not in Category A spaced 6 inches or more apart.

Note:
1. When bar lap is not specified on the plans, the above dimensions shall be used.
2. These bar laps do not apply when bar is in lightweight concrete. Greater lengths are required for this material.
3. These bar laps only apply where the General Notes indicate "Reinforcing Steel Design f_s = 24,000 p.s.i."

APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 6 (4500 P.S.I.) CONCRETE
REVISIONS		
SHA	FHWA	
		STANDARD NO. M(6.05)-80-122 SHEET 1 OF 1

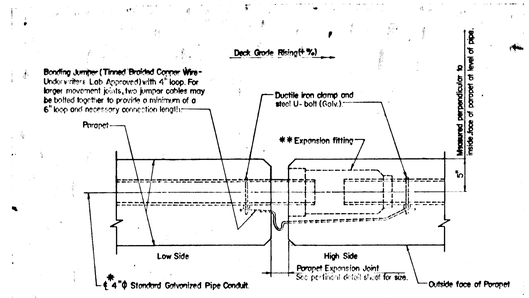
Bar Size	* LOCATION CATEGORY		
	A	B	C
# 4	2'-5"	1'-9"	1'-5"
# 5	3'-0"	2'-2"	1'-9"
# 6	3'-7"	2'-7"	2'-1"
# 7	4'-4"	3'-1"	2'-6"
# 8	4'-10"	3'-6"	2'-9"
# 9	6'-5"	4'-7"	3'-8"
# 10	8'-1"	5'-9"	4'-8"
# 11	10'-3"	7'-4"	5'-10"
# 14	12'-7"	9'-0"	7'-2"

* LOCATION CATEGORY

A - Bars in horizontal layers in top of pour with 12" or more of concrete below them such as; in footings, pier caps, etc.
B - All bars not in Category A spaced less than 6 inches apart.
C - All bars not in Category A spaced 6 inches or more apart.

Note
1. When bar laps is not specified on the plans, the above dimensions shall be used.
2. These bar laps do not apply when bar is in lightweight concrete. Greater lengths are required for this material.
3. These bar laps only apply where the General Notes indicate "Reinforcing Steel Design f_s = 24000 p.s.i."

STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 3 (3500 PSI) CONCRETE
NO M(6.07)-81-127 SHEET 1 OF 1



PLAN
Scale: ½"=1'-0"

*These are minimum size pipes and shall be used unless larger size conduit is called for on the plans. Vertical location of ℄ of this conduit shall be at least 4" below bottom of railing or fencing anchorage systems.

**Expansion fittings for use with rigid galvanized steel conduit shall consist of a malleable iron head and steel sleeve which shall be hot-dipped galvanized and assembled with a watertight packing gland, an insulated bushing, pressure ring and gasket and a #6 AWG copper bond to assure continuity of ground. The fitting shall provide, unless otherwise noted on the plans, 4" inches of movement for all compression seal roadway joints and 8" inches of movement for all other roadway joints, such as steel finger joints.

Notes:
1. Place expansion joint in pipe conduit and parapet at every expansion joint at both ends of deck.
2. # No. 10 galvanized pull wire to be provided for full length of conduit and left in place.
3. Contractor may furnish either PVC conduit as shown on sheet 2 of 2 or material shown on this detail. However only one type can be used throughout a structure.

APPROVAL		STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DIVISION OF BRIDGE DEVELOPMENT EXPANSION JOINT FOR CONDUIT IN PARAPETS
REVISIONS		
SHA	FHWA	
6-15-83		
4-16-84		
3-29-85		
7-16-85		
8-14-85		
FHWA APPROVAL DATE 6-14-85		STANDARD NO. BR-SS(0.01)-75-15 SHEET 1 OF 2

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING

Chief, Div. of Land Development & Zoning Admin. — Date 2-3-86

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Chief, Bureau of Engineering — Date 2-28-86

Bridge No. # HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY

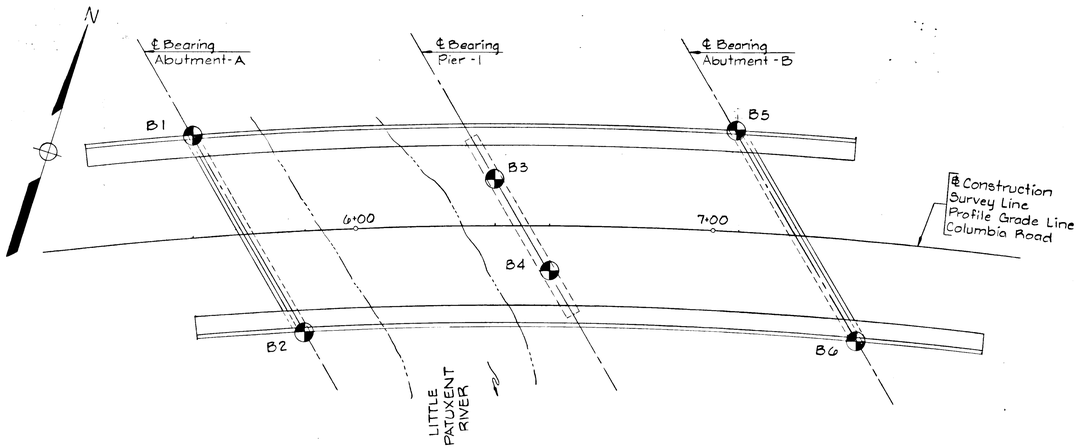
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS MD • ATLANTA GA • BECKELY WV • CULPEPER VA • DENVER CO • EXPORT PA • FAIRFAX VA
GREENSBORO NC • MONROE MI • RALEIGH NC • ROCKVILLE MD • TAMPA FL • WILLISTON PARK NY

STANDARD DETAILS
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 1B1
TAX MAP 30 ~ PARCELS 224, 224 & 210 -
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

SHA DESIGN	SCALE AS NOTED
SHA DRAWN	SHEET 22 OF 24
DCC/RLP CHECKED	
8/85 DATE	JOB No. R1216X
	FILE No.

F-86-55

#1159



BORING AND DRIVE TEST LOCATION PLAN

Scale : 1"=20'

B1 — STA. 5+54, 28 Ft. Lt. — 311.75 Bott/ Ftg.

N	DEPTH	
9	2.0	
23	4.5	
8	7.0	
16	9.5	
52	12.0	
176	14.5	
100/4	17.0	
54	19.5	
100/5	22.0	
100/3	24.5	
100/1	27.0	
100/1	29.0	

308.2
Brown, Slightly Wet, Medium Stiff To Very Stiff, Clayey SILT
302.7
See Note - A
297.7
Light Brown And Grey, Moist, Very Dense, Slightly Micaceous, Silty, Medium To Fine SAND
287.2
Brown, Moist, Very Dense, Micaceous Silty Fine SAND With Little Medium Sand
279.6

Note - A:
Grey, Saturated, Loose To Medium Dense, Silty Medium To Fine SAND With Trace To Some Fine Gravel

B2 — STA. 5+86, 28 Ft. Rt. — 311.75 Bott/ Ftg.

N	DEPTH	
4	2.0	
2	4.5	
2	7.0	
19	9.5	
41	12.0	
100/6	14.5	
100/3	19.5	
100/3	24.5	
100/3	29.5	

307.7
See Note - B
304.2
See Note - C
300.7
See Note - D
295.7
Brown, Moist, Very Dense, Micaceous Fine Sandy SILT
278.9

Note - B:
Brown, Slightly Wet, Very Loose, Micaceous Fine Sandy SILT

Note - C:
Grey, Saturated, Very Loose, Micaceous SILT With Trace Clay And Trace Fine Sand

Note - D:
Brown, Saturated, Medium Dense, Silty Medium To Fine SAND With Trace Course SAND And Little Fine Gravel

B3 — STA. 6+39, 13 FT. LT.

N	DEPTH	
4	2.0	
4	4.5	
53	7.0	
32	9.5	
100/6	12.0	
100/3	14.5	
100/5	19.5	
100/2	24.5	
100/3	27.0	
100/1	29.0	

307.2
Brown, Wet, Soft SILT With Little To Some Clay
301.7
See Note - E
299.2
Brown, Moist, Dense To Very Dense Micaceous Fine Sandy SILT
293.0 Bott/ Ftg.
278.6

Note - E:
Brown, Saturated, Very Dense Silty Coarse To Fine SAND And Fine Gravel

B4 — STA. 6+54, 13 FT. RT.

N	DEPTH	
6	2.0	
3	4.5	
15	7.0	
23	9.5	
100/5	12.0	
100/4	14.5	
100/4	19.5	
100/2	24.5	
100/1	29.0	

307.4
See Note - F
304.4
See Note - G
301.9
See Note - H
299.4
Brown, Moist, Medium Dense To Very Dense, SILT With Little Fine Sand
293.0 Bott/ Ftg.
278.8

Note - F:
Brown, Slightly Wet Medium Stiff Clayey SILT

Note - G:
Grey, Wet, Very Loose, SILT With Trace Fine Sand And Trace Roots

Note - H:
Brown, Saturated, Medium Dense, Silty Coarse To Fine SAND And Fine GRAVEL

B5 — STA. 7+07, 28 Ft. Lt. — 310.50 Bott/ Ftg.

N	DEPTH	
5	2.0	
17	4.5	
26	7.0	
21	9.5	
100/5	12.0	
100/2	14.5	
CORE 90% REC.	17.0	

307.7
Brown, Slightly Wet, Soft To Very Stiff Clayey SILT
302.2
Brown, Saturated, Medium Dense To Very Dense, Silty Coarse To Fine SAND With Little Fine Gravel
294.7
Intact Fragments Of Decomposed Rock
289.0

B6 — STA. 7+40, 28 Ft. Rt. — 310.50 Bott/ Ftg.

N	DEPTH	
4	2.0	
19	4.5	
27	7.0	
73	9.5	
100/6	12.0	
CORE 92% REC.	15.0	
CORE 100% REC.		

307.1
Brown To Grey, Wet To Slightly Wet, Soft To Very Stiff, Clayey SILT
301.6
See Note - J
298.6
Brown, Moist, Very Dense, Micaceous Silty Fine SAND
295.1
Light Grey, Darh Blue Grey, And Black, Schistosic Gneiss
285.1

Note - J
Grey, Saturated, Medium Dense, Silty Coarse To Fine SAND With Little Fine Gravel

APPROVED: HOWARD COUNTY OFFICE OF PLANNING & ZONING
CHIEF, DIV. OF LAND DEVELOPMENT & ZONING ADMIN. — DATE 2-3-86

APPROVED:
HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF ENGINEERING — DATE 2-28-86

Bridge No. #HO-137

OWNER/DEVELOPER
HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

No.	REVISION	DATE	BY

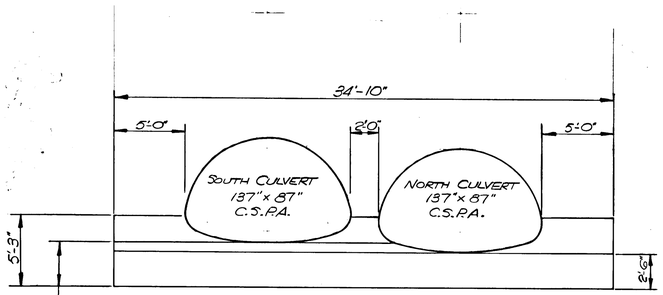
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770
(301) 982-2800
ANNAPOLIS, MD • ATLANTA, GA • BECKELY, WV • CULPEPER, VA • DENVER, CO • EXPORT, PA • FAIRFAX, VA
GREENSBORO, NC • MONROE, MI • RALEIGH, NC • ROCKVILLE, MD • TAMPA, FL • WILLISTON PARK, NY

BORING LOGS & DRIVE TEST
COLUMBIA
VILLAGE OF DORSEY'S SEARCH
SECTION 3, AREA 1, PHASE 191
TAX MAP 30 ~ PARCELS 124, 224 & 210
5TH ELECTION DISTRICT ~ HOWARD COUNTY, MARYLAND

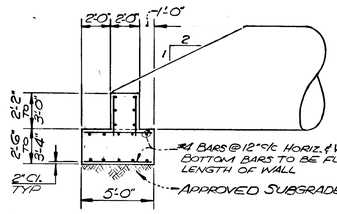
DESIGN	SCALE: NONE
RMJ DRAWN	23 OF 24 SHEET
DCC CHECKED	
8/85 DATE	JOB No. / FILE No. 12116X

#1159

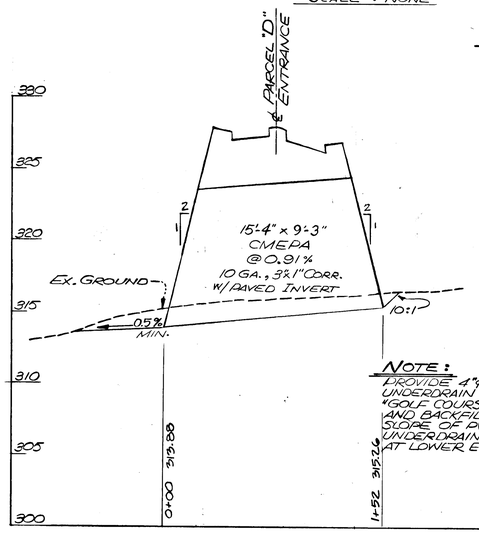
F-86-55



CONCRETE TOE WALL DETAIL
SCALE : NONE

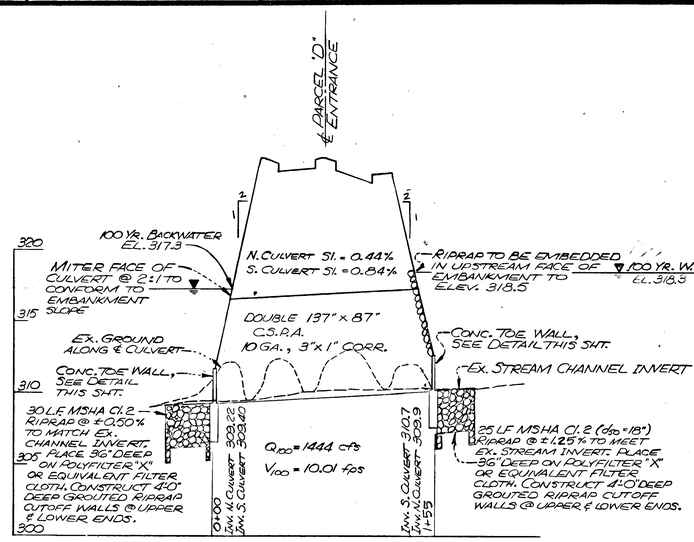


REINFORCEMENT DETAIL (NO SCALE)
(SEE DETAIL @ LEFT FOR DIMENSIONS)



NOTES:

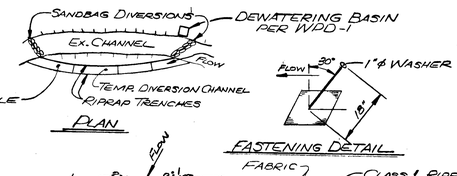
1. SELECT BACKFILL & BEDDING MATERIAL SHALL BE LOCAL CRUSHER RUN OR BANK RUN GRAVEL HAVING A MAXIMUM DRY WEIGHT NOT LESS THAN 115 POUNDS PER CUBIC FOOT AS DETERMINED BY AASHTO T99, METHOD A, WITH A LIQUID LIMIT NOT EXCEEDING 30, A PLASTICITY INDEX NOT EXCEEDING 6 CONFORMING TO MSHA SRC GRADATION CR-6 OR GRAVEL SB11.
2. PRIOR TO PLACEMENT OF SELECT BEDDING MATERIAL, CULVERT TRENCHES SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER. DEPTH OF BEDDING MATERIAL SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
3. EARTH BACKFILL, ABOVE SELECT BACKFILL MATERIAL, SHALL CONSIST OF SOIL HAVING A MAXIMUM DENSITY OF NOT LESS THAN 105 LBS. PER CUBIC FOOT AS DETERMINED BY AASHTO T99, METHOD A, WITH A LIQUID LIMIT NOT EXCEEDING 30, A PLASTICITY INDEX NOT EXCEEDING 6, CONTAINING NO STONES LARGER THAN 1 INCH IN THE GREATEST DIMENSION.
4. STREAM DIVERSION DETAILS ARE PER WRA'S "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION". SEE "GUIDELINES" FOR CONSTRUCTION DETAILS AND SPECIFICATIONS, AND SEQUENCE OF CONSTRUCTION.



SEQUENCE OF CONSTRUCTION FOR CULVERTS

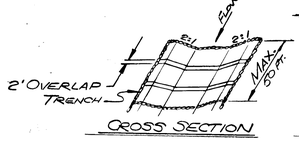
1. OBTAIN NECESSARY PERMITS TO COMMENCE CONSTRUCTION, INCLUDING W.R.A. PERMIT.
2. CONSTRUCT SILT FENCES AND S.C.E.
3. CONSTRUCT TEMP. ACCESS CULVERT TO ALLOW EXCAVATION OF DIVERSION.
4. DIVERT STREAM TO ALLOW CULVERT CONSTRUCTION.
5. REMOVE TEMP. ACCESS CULVERT.
6. CONSTRUCT CONCRETE TOE WALLS, RIPRAP CHANNELS AND INSTREAM CULVERTS.
7. RE-DIRECT STREAM THROUGH CULVERTS.
8. COMMENCE ROUGH GRADING FOR ENTRANCE ROAD TO PARCEL D.
9. CONSTRUCT GOLF COURSE CULVERTS.
10. STABILIZE FILL SLOPES WITHIN 7 DAYS.
11. UPON COMPLETION OF GRADING, RE-STABILIZE SLOPES AND REMOVE TEMP. SEDIMENT CONTROL MEASURES.

NOTE:
PROVIDE 4"ϕ PERFORATED PVC UNDERDRAIN AS INDICATED ON "GOLF COURSE CULVERT BEDDING AND BACKFILL DETAIL" (THIS SHT.) SLOPE OF PVC = 1.0%. BOTH UNDERDRAINS TO BE DAYLIGHTED AT LOWER END.

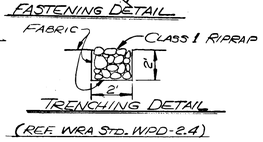


PLAN

FASTENING DETAIL

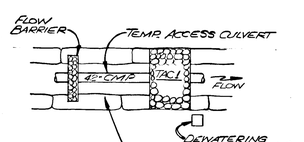


CROSS SECTION



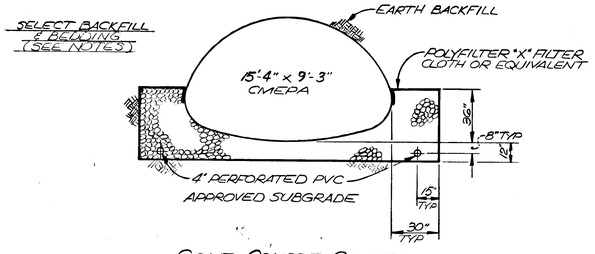
TRENCHING DETAIL
(REF. WRA STD. WPD-2.4)

FABRIC-BASED CHANNEL DIVERSION
NO SCALE

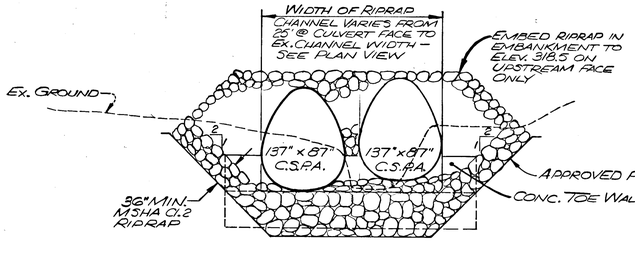


TEMP. ACCESS CULVERT DETAIL (WPD 2.1)

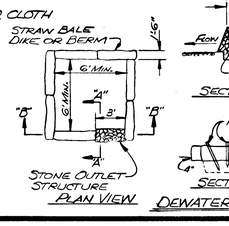
NOTE:
SEE SHT. 8 OF 24 FOR SEDIMENT CONTROL NOTES AND DETAILS

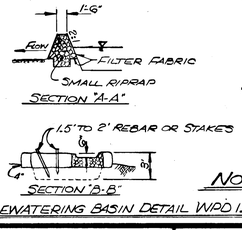


GOLF COURSE CULVERT
BEDDING & BACKFILL DETAIL
SCALE : NONE

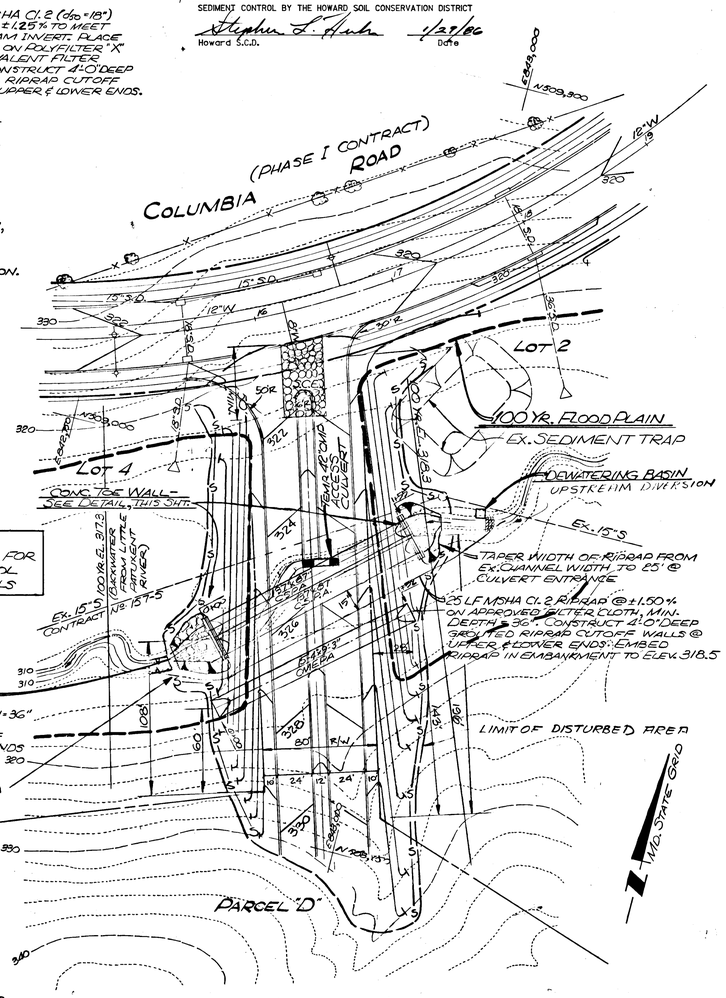


RIPRAP CHANNEL DETAIL
UPSTREAM & DOWNSTREAM OF CULVERTS
SCALE: HORIZ. 1"=10'
VERT. 1"=5





DEWATERING BASIN DETAIL WPD 1.1



PLAN SCALE : 1" = 50'

NOTE: CULVERTS ARE TO BE CONSTRUCTED AS PART OF PHASE II CONTRACT.

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

SEDIMENT CONTROL

by the Developers:
"I/We certify that all development and construction will be done according to this plan, and that many 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."

Carl H. Necker — 1-14-86
Signature of Developer — Date
Print name below signature
Joseph H. Necker, Jr.

By the Engineer:

I certify that his plan for erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District."

Robert H Marmon — 11-12-85
Signature of Engineer — Date
Print name below signature
ROBERT H. MARMON
Reviewed for S.C.D.
Name

and meets Technical Requirements.

J. Holmes — 2/14/86
U.S. Soil Conservation Service — Date

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

Stephen L. Hahn — 1/27/86
Howard S.C.D. — Date

STATE OF MARYLAND — ROBERT HENRY MARMON — LIC. NO. 10537 — REGISTERED PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS

Richard E. Story — 2-28-86
CHIEF, BUREAU OF ENGINEERING — DATE

DEPARTMENT OF PLANNING AND ZONING

Joseph W. Rosenbaum — 2-3-86
CHIEF, DIVISION OF LAND DEVELOPMENT AND ZONING ADMINISTRATION — DATE

THE HOWARD RESEARCH & DEVELOPEMENT CORPORATION
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044
(301) 992-6084

No.	REVISION	DATE	BY
4	ADDED DEWATERING BASIN & T.A.C. DET.; ADJUST S. CULVERT	12-15-86	JDP
3	REV. CULVERT INV.; ADDED CHANN. DIVER. DETAIL	10-10-86	JDP
2	REVISE TUNNEL CULVERT TO 15'4"x 9'-3"	8-19-86	
1	WIDEN PARCEL 'D' ENTRANCE, ADJUST CULVERTS	MAY '86	JWL

ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS
GREENHORNE & O'MARA, INC.
2 RESEARCH PLACE, ROCKVILLE, MARYLAND 20850
(301) 948-0900
GREENBELT, MD • ANNAPOLIS, MD • ATLANTA, GA • BECKLEY, WV • CULPEPER, VA • DENVER, CO
FAIRFAX, VA • GREENSBORO, NC • MONROE, MI • EXPORT, PA • WILLISTON PARK, NY

PARCEL D ENTRANCE CULVERT
VILLAGE OF DORSEY'S SEARCH
SECTION 3 AREA 1 PHASE 191
5th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

JSL DESIGN	SCALE AS SHOWN
JDP DRAWN	24 OF 24 SHEET
RHM CHECKED	
NOV., '85 DATE	JOB No.
	R-1216-X FILE No.

#1159

F-86-55