HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD
OVER THE PATUXENT RIVER

HOWARD COUNTY CAPITAL PROJECT B-3837
MONTGOMERY COUNTY D.P.W. & T. PROJECT NO. 509132
S.H.A. PROJECT NO. H0767BM2
F.A. PROJECT NO. BRO-1(453)E

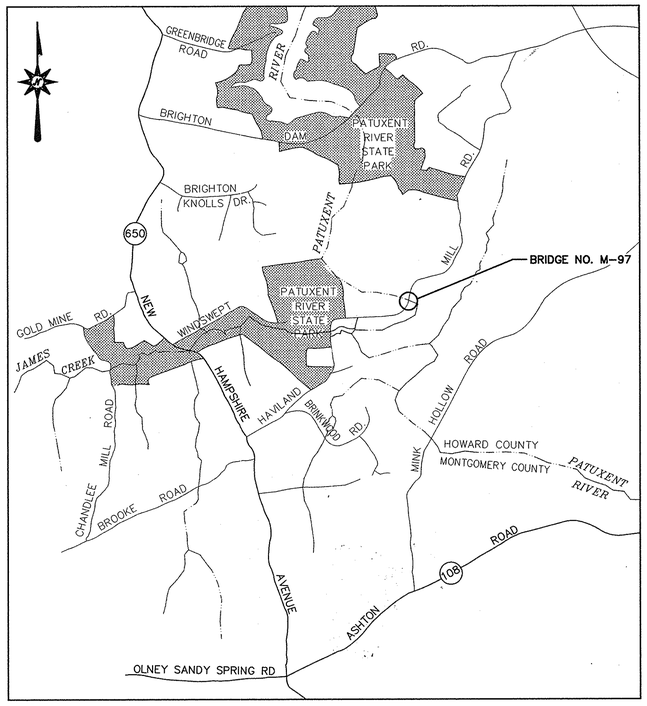
GENERAL NOTES

1. This contract shall be constructed under provisions of the Maryland Department of Transportation, State Highway Administration (S.H.A.) "Standard specifications for construction and materials," dated October 1993, and all subsequent addenda.
2. The Contractor shall notify the Department of Public Works/Bureau of Engineering/ Construction Inspection Division at (410) 313-1870 at least five (5) working days prior to the start of work.
3. The Contractor shall notify "Miss Utility" at 1-800-257-7777 at least forty-eight (48) hours prior to any excavation work.
4. Project Background:
   Location: Highland, Maryland
   Tax Map: 40
   Election District: 5
5. Traffic control devices, markings, and signing shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
6. Any damage caused by the Contractor to existing public right-of-way, existing paving, existing curb and gutter, existing utilities, etc. shall be corrected at the Contractor's expense.
7. The existing utilities shown hereon are located from the best information available, but no guarantee is made to their accuracy. The approximate location of existing utilities are shown for the Contractor's information and convenience. The Contractor shall locate existing utilities to his own satisfaction and well in advance of any construction activities. Additionally, the Contractor shall take all necessary precautions to protect all existing utilities and maintain uninterrupted service.
8. Horizontal and vertical datums are related to the Maryland State Plane Coordinate System as projected from Howard County Survey Control 39RI and Howard County Survey Control 39R2.
9. Clearing shall be limited to the "Limit of Disturbance" as shown on the sediment and erosion control plan. Grading shall be done in such a manner as to provide positive drainage. Contractor shall seed and mulch all disturbed areas except as otherwise directed.
10. The contractor shall take extreme caution not to disturb the existing vegetation outside the limits of construction. Soil stabilization shall conform to "Maryland Standards and Specifications for Soil Erosion and Sediment Control," dated 1994, published jointly by Water Management Administration, Soil Conservation Service, and State Soil Conservation Committee.
11. All fill areas shall be compacted to a minimum of 95% of the maximum dry density as determined and verified in accordance with AASHTO T-180.

BENCHMARKS

Howard County Survey Control
Description: 39RI, 3/4" Rebar flush w/ground
N 550,156.67268 E 1,311,998.5244 ELEV. 303.943'

Howard County Survey Control
Description: 39R2, 3/4" Rebar flush w/ground
N 550,069.6574 E 1,310,604.0997 ELEV. 303.524'



LOCATION MAP
SCALE: 1" = 2000'

TRAFFIC DATA

ROADWAY CLASSIFICATION	MINOR COLLECTOR	
DESIGN SPEED	40 M.P.H.	
A.D.T. (V.P.D.)	625 (1995)	700 (2015)

INDEX OF DRAWINGS

By the Owner/Developer:
"I/We certify that all development and/or construction will be done according to these plans, and that any responsible personnel involved in the construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

William F. Malone Jr. — Signature of Owner/Developer
Print name below signature
William F. Malone, Jr.
1/6/97 — Date

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

CHARLES S. NOLAN — Signature of Engineer
Print name below signature
1/2/97 — Date

These plans have been reviewed for the Howard Soil Conservation District and meet the technical requirements.

Cheryl K. Simmons — USDA-Natural Resources Conservation Service
01/09/97 — Date

These plans are approved for soil erosion and sediment control by the Howard Soil Conservation District.

John F. Robertson — Howard S.C.D.
1/9/97 — Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/6/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN
DRN: TC
CHK: CSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

TITLE SHEET
600' SCALE MAP NO. _____ BLOCK NO. _____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 1 OF 29

C 0536201-M97 B0053-01

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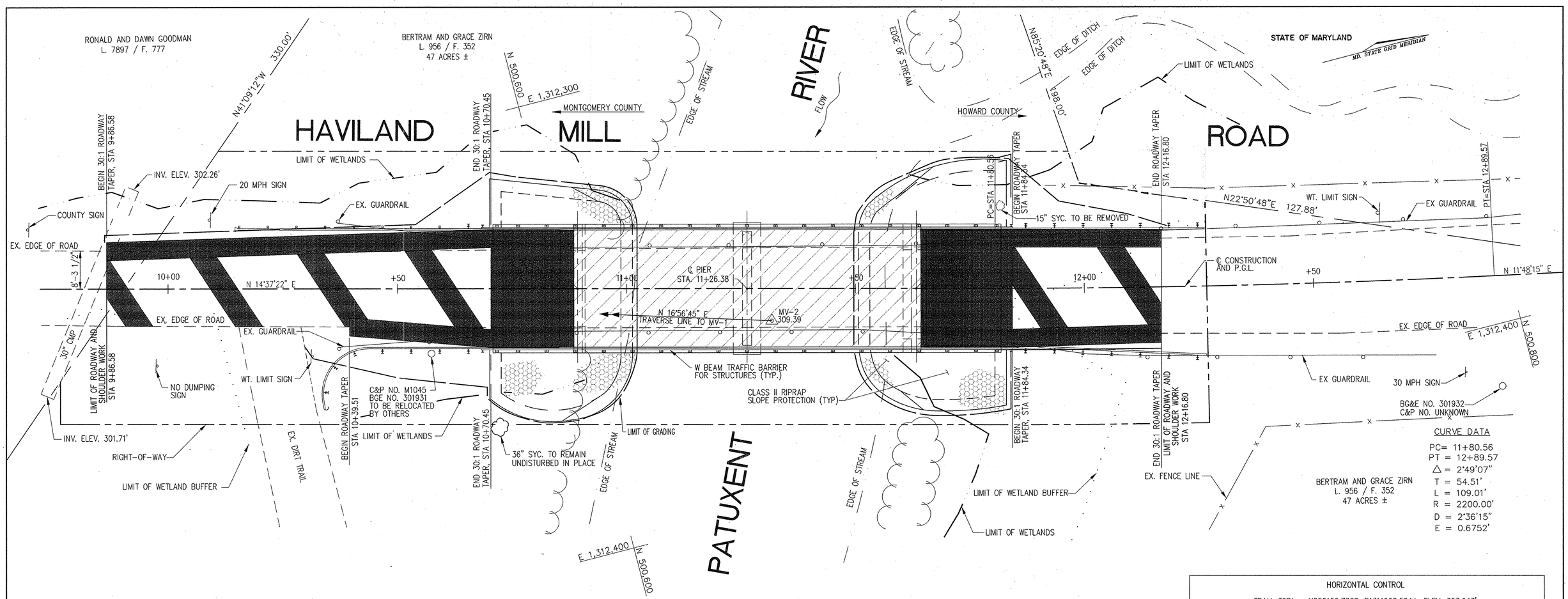


LEGEND

- LIMIT OF GRADING
- FENCE LINE
- RIGHT-OF-WAY
- EDGE OF EXISTING ROAD
- ℄ ROADWAY
- EDGE OF STREAM
- LIMIT OF WETLANDS
- LIMIT OF 25' WETLANDS BUFFER
- EXISTING TREE LINE
- LIMIT OF FULL DEPTH PAVEMENT
- LIMIT OF 1 1/2" OVERLAY
- LIMIT OF BRIDGE CONSTRUCTION

STA 10+34 TO STA 10+66.13, RT;
STA 11+86 TO STA 12+26.34, RT;
STA 11+86 TO STA 12+26.34, LT;
PROVIDE TRAFFIC BARRIER W BEAM
IN ACCORDANCE WITH MSHA STD 660.01

STA 10+15.50 TO 10+66.13, LT.
PROVIDE SPECIAL END TREATMENT
SEE SPECIAL PROVISIONS

STA 12+26.34, LT & RT;
TIE NEW TRAFFIC BARRIER W BEAM TO
EXISTING TRAFFIC BARRIER W BEAM

STA 10+36± TO STA 10+89±, RT;
STA 10+36± TO STA 10+89±, LT;
STA 11+64± TO STA 12+26.34, LT & RT;
REMOVE AND DISPOSE OF EXISTING
GUARDRAIL

STA 10+57(±) RT;
CONTRACTOR IS TO COORDINATE WITH
BGE FOR RELOCATION OF THIS POLE.
SEE SPECIFACATIONS.

STA 9+86.58 TO STA 10+70.45
STA 11+84.34 TO STA 12+16.80
MILL EXISTING PAVEMENT 1 1/2", AND
PROVIDE 1 1/2" OVERLAY AS SHOWN

STA 9+86.58 & STA 12+16.80
PROVIDE 1 1/2" SAWCUT FULL
WIDTH OF HAVILAND MILL ROAD.

STA 10+70.45 TO STA 10+87.59
STA 11+65.33 TO STA 11+84.34
REMOVE EXISTING PAVEMENT.
PROVIDE FULL DEPTH PAVEMENT,
FULL WIDTH OF HAVILAND MILL ROAD

STA 9+86.58 TO STA 10+70.45, LT.
STA 10+39.51 TO STA 10+70.45, RT;
STA 11+84.34 TO STA 12+16.80, LT & RT;
PROVIDE 2" SAWCUT, REMOVE EXIST.
PAVEMENT & BASE WIDEN 4' MIN. WIDTH

CONTRACTOR IS TO REMOVE AND
DISPOSE OF ALL EXISTING
WEIGHT LIMIT SIGNS

HORIZONTAL CONTROL

TRAV. 39R1 = N550156.7268, E1311998.5244; ELEV. 303.943'
-3/4" REBAR FLUSH W/ GROUND

TRAV. 39R2 = N550069.6274, E1310604.0997; ELEV. 303.524
-3/4" REBAR FLUSH W/ GROUND

TRAV. MV-1 = N550281.546, E1312249.518; ELEV. 309.64
REBAR, SET IN SHOULDER, APPROX. 4' FROM EDGE OF EASTBOUND LANE, APPROX. 17' SOUTH OF BG&E POLE #301930

TRAV. MV-2 = N550641.328, E1312359.142; ELEV. 309.39
PK NAIL SET IN PAVEMENT AT EDGE OF EASTBOUND LANE APPROX. 1' INSIDE OF LANE, 5'± NORTH OF ℄ OF PIER

℄ CONSTRUCTION & P.G.L. STA 10+00 = N550515.91, E1312319.11;

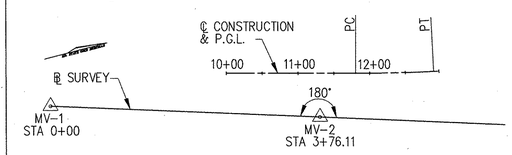
℄ CONSTRUCTION & P.G.L. STA 11+00 = N550612.67, E1312344.36;

℄ SURVEY STA 2+44.475, 1.735' LT =
℄ CONSTRUCTION STA 10+00,

℄ SURVEY STA 3+44.392, 5.788' LT. =
℄ CONSTRUCTION STA 11+00

℄ SURVEY STA 4+24.889, 9.053' LT =
℄ CONSTRUCTION PC STA 11+80.56

℄ SURVEY STA 5+33.651, 16.167' LT =
℄ CONSTRUCTION PT STA 12+89.57



GEOMETRIC LAYOUT DATA

NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
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4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — 22152 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN
DRN: SMI
CHK: CSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

600' SCALE MAP NO._____ BLOCK NO._____

ROADWAY PLAN

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: 1" = 10'

SHEET 2 OF 29

B0053_02

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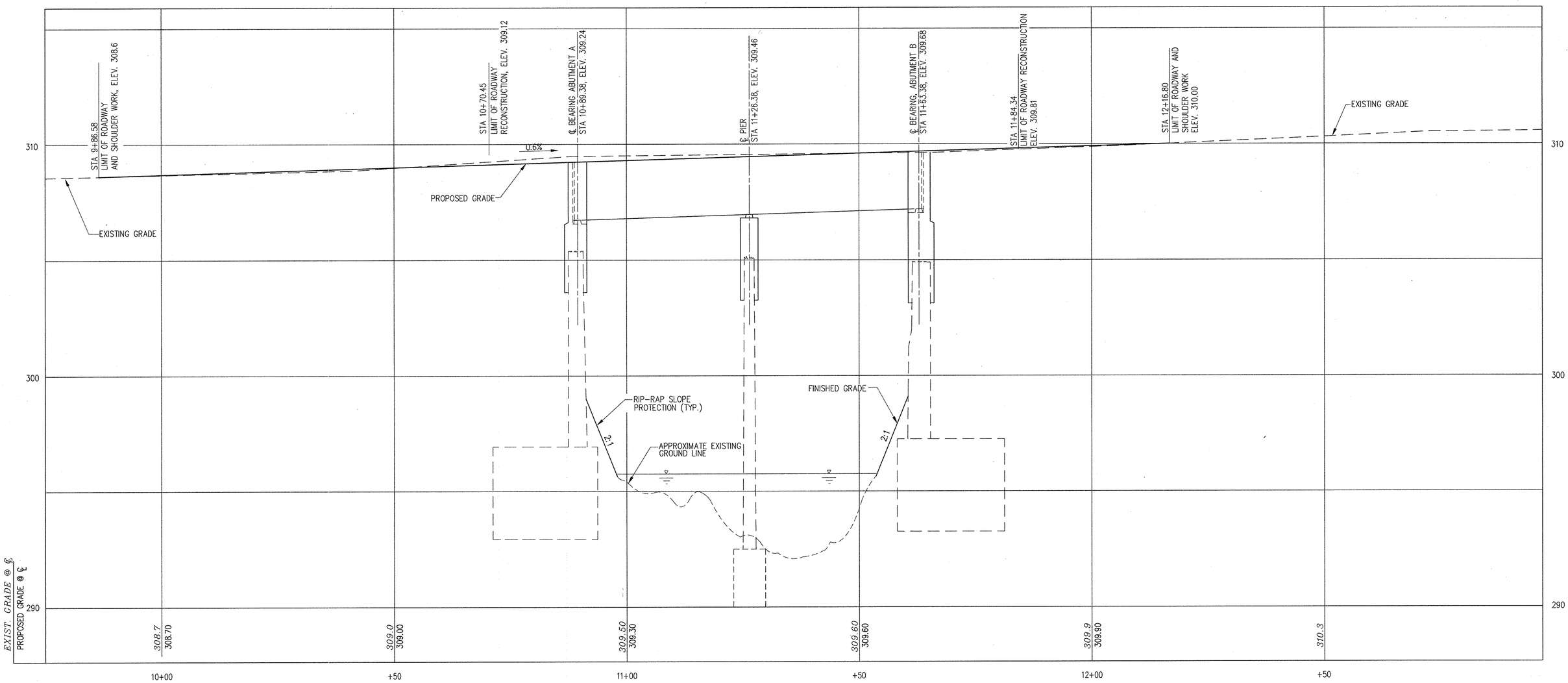
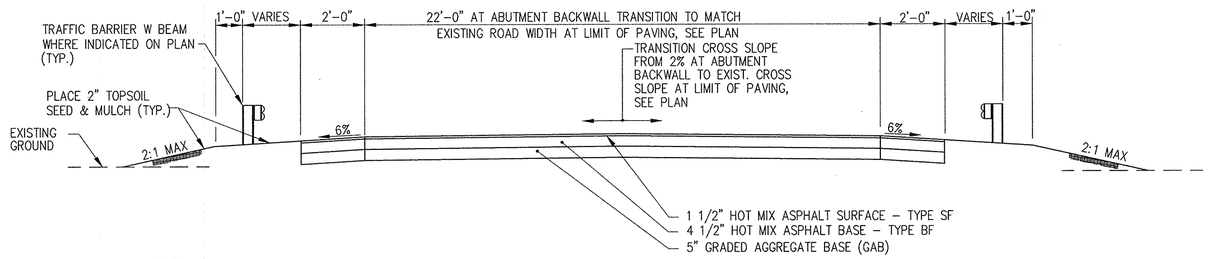


ROADWAY PROFILE

SCALE: HORIZ. 1' = 10'
VERT. 1" = 2'



NOTE
COMPACT SUBGRADE TO 95%
OF DRY WEIGHT DENSITY AS
DETERMINED BY AASHTO
T-99-74 METHOD "A"

TYPICAL ROADWAY SECTION

SCALE: NONE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — JAMES S. NOLAN — No. 15213 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN	BY	NO.	REVISION	DATE
DRN: SMI				
CHK: CSN				
DATE: JAN. 1997				

ROADWAY PROFILE AND TYPICAL SECTION

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: AS SHOWN

SHEET 3 OF 29

B0053_03

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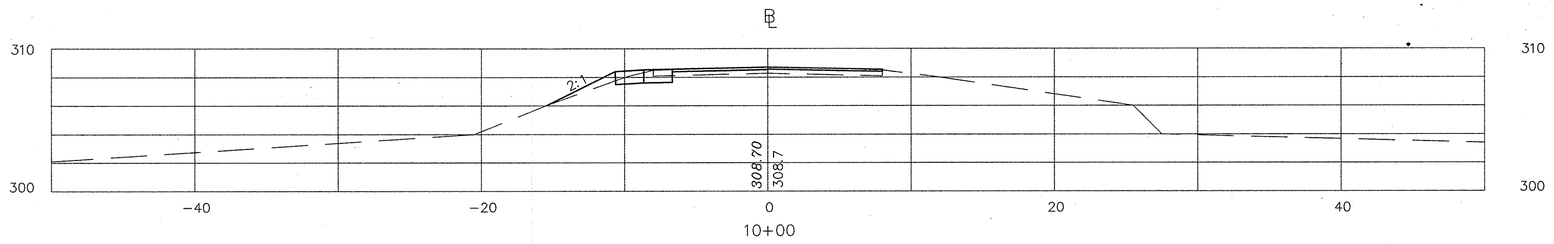
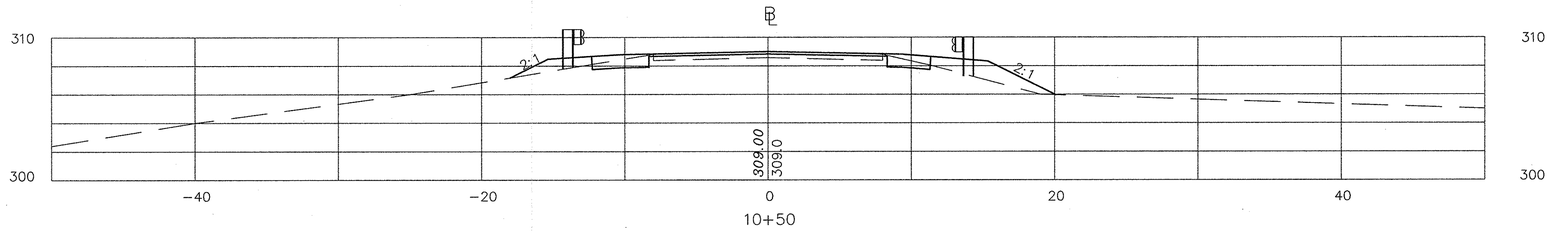
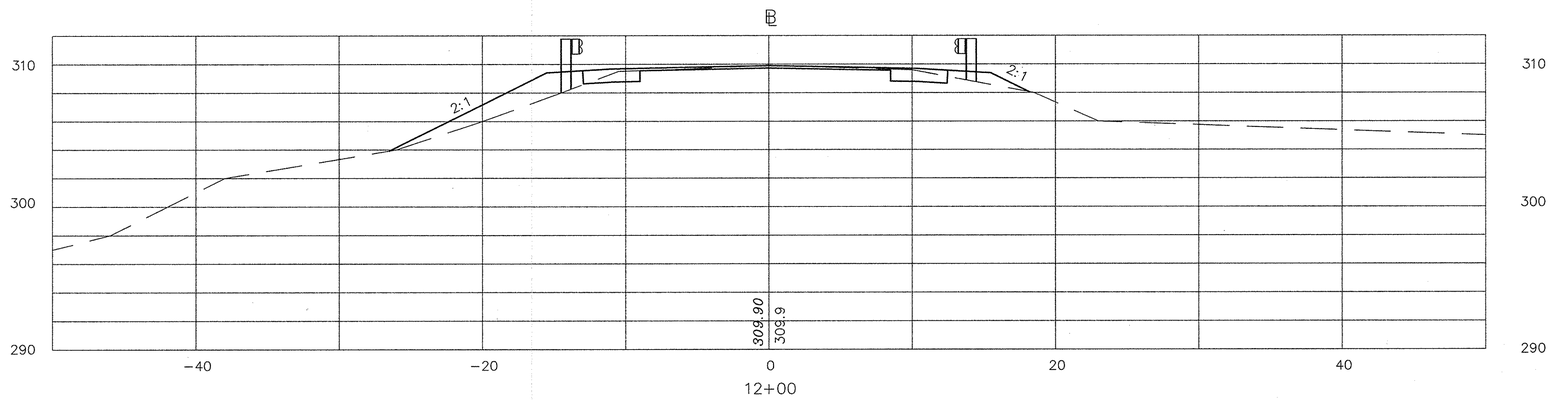




STA 11+00 AND 11+50 ON BRIDGE



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
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CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

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4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 *FAX: (410) 995-1363*

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15213 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN				
DRN: TC				
CHK: CSN				
DATE: JAN. 1997	BY	NO.	REVISION	DATE

ROADWAY CROSS SECTIONS

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: 1" = 5'

SHEET 4 OF 29

B0053_04

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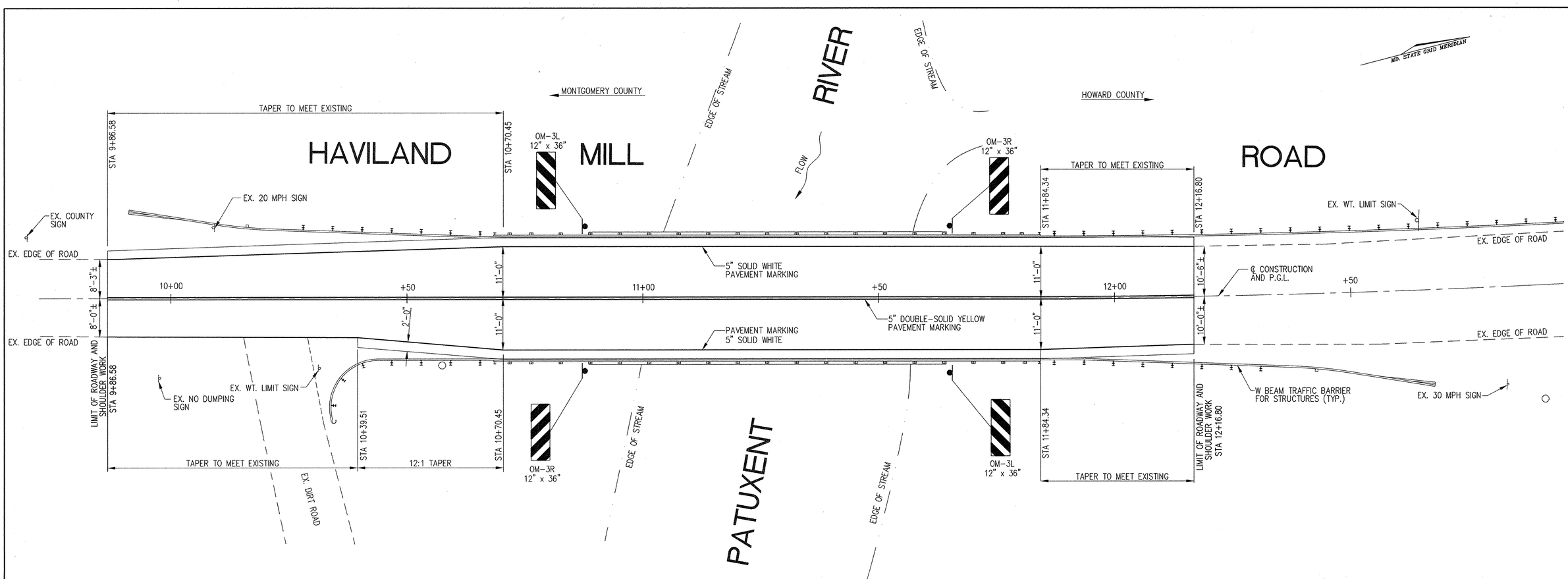

LEGEND

- EDGE OF EXISTING ROAD
- ℄ ROADWAY
- EDGE OF STREAM

THIS PLAN IS FOR LAYOUT OF PERMANENT SIGNING AND PAVEMENT MARKINGS ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

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SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 *FAX: (410) 995-1363*

STATE OF MARYLAND — CHARLES B. DOUGHERTY — 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB	BY	NO.	REVISION	DATE
DRN: SMI				
CHK: JSN				
DATE: JAN. 1997				

SIGNING AND PAVEMENT MARKING PLAN

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: 1" = 10'

SHEET 5 OF 29

B0053_05

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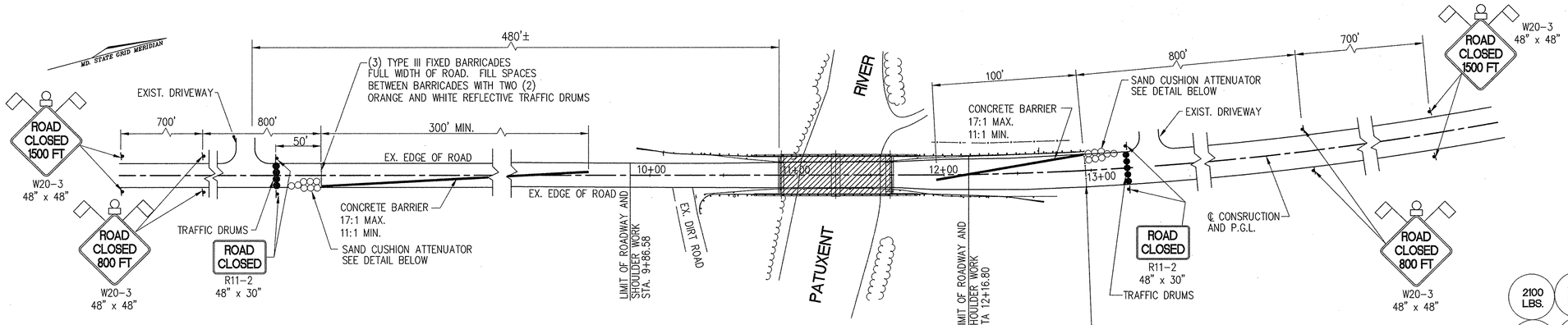
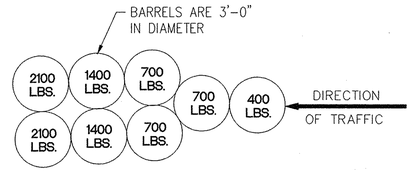


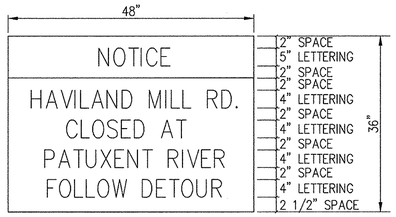
BRIDGE TCP DETAIL
SCALE: 1" = 40'



SAND CUSHION ATTENUATOR DETAIL
NOT TO SCALE

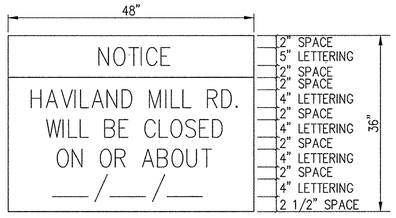
CONSTRUCTION SIGN TABLE

SYMBOL	M.U.T.C.D. DESIGNATION	MESSAGE	SIZE	QUANTITY	COLOR	
					BACKGROUND	CHARACTERS
①	R11-2	ROAD CLOSED	48" X 30"	2	WHITE	BLACK
②	M4-9	DETOUR ↑	30" X 24"	10	ORANGE	BLACK
③	M4-9R	DETOUR →	30" X 24"	4	ORANGE	BLACK
④	M4-9L	DETOUR ←	30" X 24"	5	ORANGE	BLACK
⑤	M4-9R - advance	DETOUR ↱	30" X 24"	4	ORANGE	BLACK
⑥	M4-9L - advance	DETOUR ↰	30" X 24"	4	ORANGE	BLACK
⑦	R11-2A (MOD)	NOTICE HAVILAND MILL RD. CLOSED AT PATUXENT RIVER FOLLOW DETOUR	48" X 36" (SEE DETAIL 1)	6	YELLOW WHITE	BLACK BLACK
⑧	----------	ROAD CLOSED _ MILES AHEAD LOCAL TRAFFIC ONLY	60" X 30"	4	WHITE	BLACK
⑨	----------	HAVILAND MILL RD.	30" X 12" (SEE DETAIL 2)	27	WHITE	BLACK
⑩	M4-8A	END DETOUR	24" X 18"	2	ORANGE	BLACK
⑪	M4-10R	DETOUR →	48" X 18"	2	ORANGE	BLACK
⑫	M4-10L	← DETOUR	48" X 18"	2	ORANGE	BLACK
⑬	W20-3	ROAD CLOSED 1/2 MILE	48" X 48"	2	ORANGE	BLACK
⑭	W20-3	ROAD CLOSED 1500 FT.	48" X 48"	4	ORANGE	BLACK
⑮	W20-3	ROAD CLOSED 800 FT.	48" X 48"	4	ORANGE	BLACK
⑯	R11-2A (MOD)	NOTICE HAVILAND MILL RD. WILL BE CLOSED ON OR ABOUT __/__/__	48" X 36" (SEE DETAIL 3)	2	YELLOW WHITE	BLACK BLACK
⑰	W20-3	ROAD CLOSED 1 MILE	48" X 48"	4	ORANGE	BLACK



DETAIL 1
NOT TO SCALE

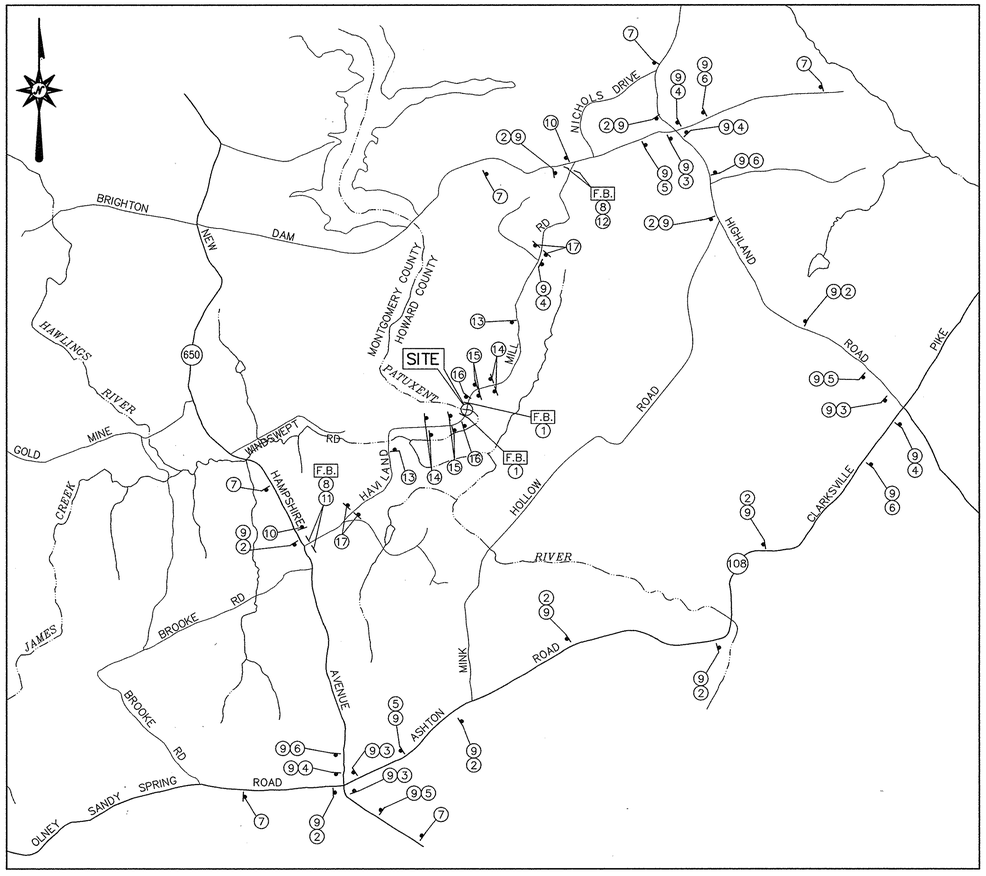
DETAIL 2
NOT TO SCALE



DETAIL 3
NOT TO SCALE

NOTE:

1. SIGN (16) SHALL BE INSTALLED TWO WEEKS PRIOR TO ROAD CLOSING.
2. TYPE III FIXED BARRICADES AT BRIDGE SHALL HAVE 3 REFLECTORIZED RAIL FACES EACH. TYPE III BARRICADES AT THE INTERSECTION OF HAVILAND MILL RD. AND MD 650 AND THE INTERSECTION OF HAVILAND MILL RD AND BRIGHTON DAM RD. SHALL HAVE A TOTAL OF 6 REFLECTORIZED RAIL FACES EACH.
3. SIGN (9), HAVILAND MILL RD., SHALL ALWAYS BE MOUNTED ABOVE M4-9 SIGNS.
4. SIGNS (13) (14) (15) AND (17) SHALL HAVE FLAGS AND LIGHTS MOUNTED ON THEM



DETOUR ROUTE
SCALE: 1" = 2000'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
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4785 DORSEY HALL DRIVE
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ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 996-1363

STATE OF MARYLAND — CHARLES S. NOLAN — 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN				
DRN: TC				
CHK: CSN				
DATE: JAN. 1997	BY	NO.	REVISION	DATE

DETOUR PLAN

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: AS SHOWN

SHEET 6 OF 29

B0053_06

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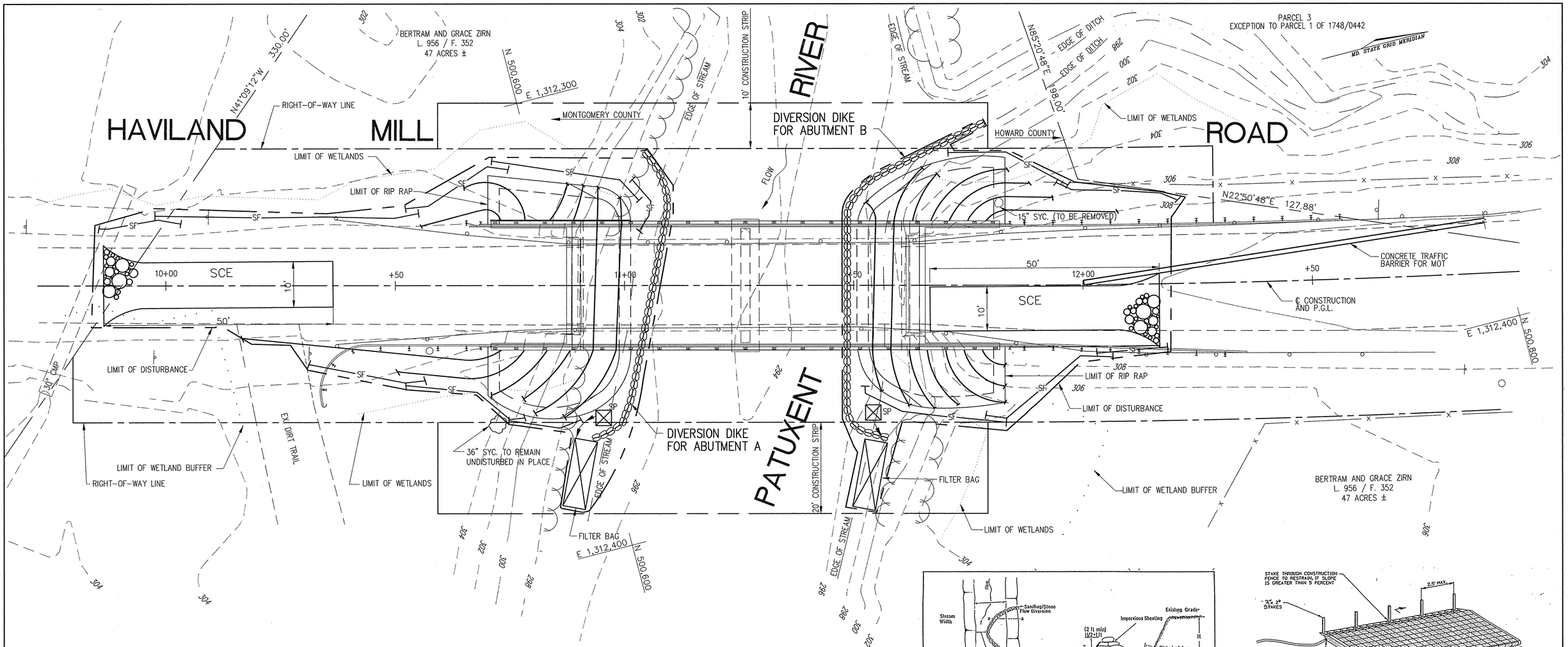


LEGEND

- LIMIT OF DISTURBANCE'
- SF — SILT FENCE
- EDGE OF STREAM
- LIMIT OF WETLANDS
- LIMIT OF 25' WETLANDS BUFFER
- EXISTING TREE LINE
- DIVERSION DIKE
- SP — SUMP PIT
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- LIMIT OF CONSTRUCTION STRIP
- RIGHT-OF-WAY/PROPERTY LINE

NOTES:

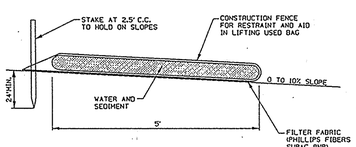
1. EQUIPMENT ACCESS SHALL BE FROM THE EXISTING ROADWAY. NO ADDITIONAL CLEANING WILL BE ALLOWED BEYOND THAT WHICH IS IS INDICATED ON THESE PLANS.
2. THE CONTRACTOR SHALL LOCATE THE STAGING AREA TO AVOID DISCHARGE OF DEBRIS INTO THE WATERWAY. NO ADDITIONAL CLEARING OF COUNTY OWNED RIGHT-OF-WAY WILL BE ALLOWED BEYOND THAT WHICH IS INDICATED ON THESE PLANS FOR CREATION OF A STAGING AREA.

I. Description
The work shall consist of installing flow diversions for the purpose of erosion control when construction activities take place within the stream channel such as bank stabilization or bridge abutment construction.

II. Material Specifications
1. Sandbags: Sandbags shall consist of materials which are resistant to ultra-violet radiation, tearing and puncture and woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
2. Stone: Stone shall be washed and have a minimum diameter of 6 inches.
3. Sheeting: Sheeting shall consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

III. Construction Requirements
1. All erosion and sediment control devices shall be installed as the first order of work.
2. The diversion structure shall be installed from upstream to downstream.
3. The height of the diversion structure shall be one half the distance from stream bed to stream bank plus one foot, as indicated on the cross-section view.
4. All excavated materials shall be disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the WRA.
5. All dewatering of the construction area shall be pumped to a dewatering basin prior to re-entering the stream.
6. Sheeting shall be overlapped such that the upstream portion covers the downstream portion with at least an 18-inch overlap.
7. Sediment control devices are to remain in place until all disturbed areas are stallized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

WATER RESOURCES ADMINISTRATION	Sandbag/Stone Diversion	Approved On 1/24/97 Chief, Waterway Permits	WPD 2,3



SECTION

NOTES:
1. FILTER BAG SHALL BE PLACED ON A SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE AND ANY WORK AREAS.
2. WIDTH AND LENGTH SHALL BE AS SHOWN IN THE TABLE.
3. THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.
4. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
5. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.

FILTER BAG
TEMPORARY EROSION CONTROL MEASURE (FB)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97	CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97	CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — DOUGLAS S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN	BY	NO.	REVISION	DATE
DRN: SMI				
CHK: CSN				
DATE: JAN. 1997				

SEDIMENT AND EROSION CONTROL PLAN

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: 1" = 10'

SHEET 7 OF 29

B0053_07

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SPECIFICATIONS FOR VEGETATION ESTABLISHMENT

PERMANENT SEEDING NOTES

Apply to graded or cleared areas not subject to immediate further disturbance where a permanent long-lived vegetative cover is needed.

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

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

1. Preferred--Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq. ft.) and 600 lbs per acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs per acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq. ft.)
2. Acceptable--Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq. ft.) and 1000 lbs. per acre 10-10-10 fertilizer (23 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil.

Seeding--For the periods March 1 thru April 30, and August 1 thru October 15, seed with 60 lbs per acre (1.4 lbs/1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs per acre (.05 lbs/1000 sq. ft.) of weeping lovegrass. During the period of October 16 thru February 28, protect site by: Option (1) - 2 tons per acre of will anchored straw mulch and seed as soon as possible in the spring. Option (2) - Use sod. Option (3) - Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

Mulching--Apply 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq. ft.) for anchoring.

Maintenance--Inspect all seeding areas and make needed repairs, replacements and reseedings.

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, disking or other acceptable means before seeding, if not previously loosened.

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 October 15, seed with 2-1/2 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 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted weed free 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 additional rates and methods not covered.

STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspections, Licenses and Permits, Sediment Control Division prior to the start of any construction, (313-1850).
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 most current "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", and revisions thereto.
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, Chapter 12, of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (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

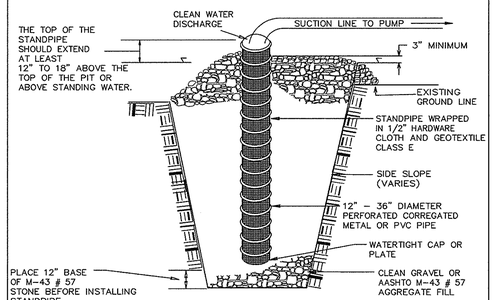
Total Area of Site	0.33	Acres
Area Disturbed	0.19	Acres
Area to be roofed of paved	0.14	Acres
Area to be vegetatively stabilized	0.05	Acres
Total Cut	50	Cu. Yds.
Total Fill	20	Cu. Yds.
Offsite Waste/Borrow Area Location To Be Determined By Contractor at a site with an active grading permit.		

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 control must be provided, if deemed necessary by the Howard County 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.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which can be backfilled and stabilized within one working day, whichever is shorter.

SEQUENCE OF CONSTRUCTION

1. The Contractor shall notify the Maryland Department of the Environment, Water Management Administration (410) 974-2755, the Howard County Bureau of Engineering, Construction Inspection Division, (410) 313-1870, and the Howard County Sediment Control Division, (410) 313-1855 at least 48 hours prior to the beginning of construction.
2. The Contractor shall obtain a Howard County Grading Permit prior to the beginning construction.
3. Delineate the limits of disturbance at the site.
4. Install Stabilized Construction Entrances as shown.
5. For Bridge abutment widening and placement of slope protection, install a sandbag stream diversion meeting the requirements of WPD2.3, diverting water away from one stream bank.
6. Place filter bag in accordance with detail FB.
7. Dewater the excavation, and widen Abutment "A", each side.
8. Place Slope Protection at face of Abutment "A".
9. Stabilize the disturbed area.
10. Redivert the channel with sandbags to protect the opposite stream bank.
11. Dewater the excavation, and widen Abutment "B".
12. Place slope protection at face of Abutment "B".
13. Stabilize the disturbed area.
14. Remove the sandbag diversion.
15. Restore disturbed area.
16. Construct Bridge Superstructure.
17. Install silt fence at the edge of fill, and construct the roadway, insuring that no sediment enters the steam.
18. Clean up the construction site.
19. Seed and Mulch all disturbed areas.
20. After the final stabilization of the entire site, including both the bridge and the roadway construction areas, and with the authority of the Sediment Control Inspector, remove all sediment controls.

DETAIL 20B - SUMP PIT



CROSS SECTION

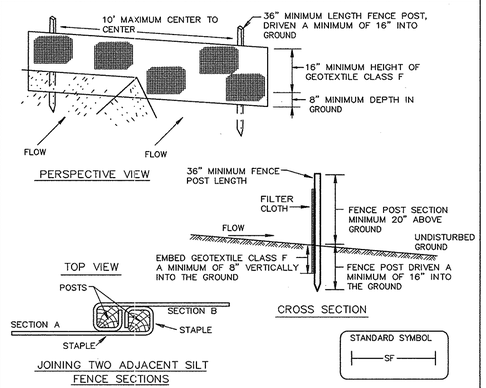
STANDARD SYMBOL: SP

Construction Specifications

1. Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.
2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with 1/2" hardware cloth and Geotextile Class E. The perforations shall be 1/2" x 6" slits or 1" diameter holes.
3. A base of filter material consisting of clean gravel or #57 stone should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.
4. The standpipe should extend 12" to 18" above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 3" minimum above the anticipated standing water elevation.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE D - 13 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 - SILT FENCE



JOINING TWO ADJACENT SILT FENCE SECTIONS

STANDARD SYMBOL: SF

Construction Specifications

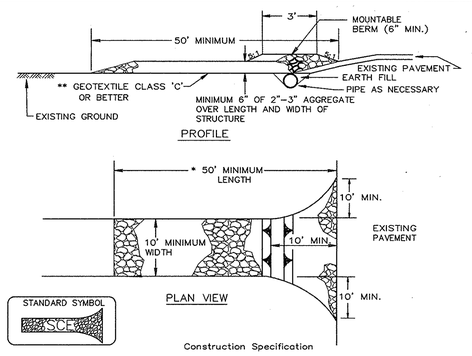
1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft ⁄ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SPECIFICATIONS FOR TOPSOIL

Definition: Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

Purpose: To provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:
   i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.
   ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
   iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

III. For sites having disturbed areas under 5 acres:
   i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:
   i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
      a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
      b. Organic content of topsoil shall be not less than 1.5 percent by weight.
      c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
      d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

   Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by appropriate authority, may be used in lieu of natural topsoil.
   ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

Reviewed for HOWARD Name S.C.D. and meets Technical Requirements Date
Signature
USDA, NATURAL RESOURCES CONS. SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Approved John R. Robertson Date 1/9/97
Signed B.D.B.

V. Topsoil Application
   i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.
   ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4"-8" higher in elevation.
   iii. Topsoil shall be uniformly distributed in a 4"-8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
   iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

VI. Alternative for Permanent Seeding. - Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
   i. Composted Sludge Material for use as soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:
      a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of Environment under COMAR 26.04.06.
      b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a Ph of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
      c. Composted sludge shall be applied at the rate of 1 ton/1,000 square feet.
   ii. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1000 square feet, and 1/3 the normal lime application rate.

SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

STABILIZED CONSTRUCTION ENTRANCE

Construction Specification

1. Length - minimum of 50'* (30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3"), or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES B. D'ANDRADE — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB					
DRN: SMI					
CHK: JSN					
DATE: JAN. 1997	BY	NO.	REVISION	DATE	600' SCALE MAP NO._____ BLOCK NO._____

SEDIMENT AND EROSION CONTROL NOTES AND DETAILS

REHABILITATION OF BRIDGE NO. M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: NONE

SHEET 8 OF 29

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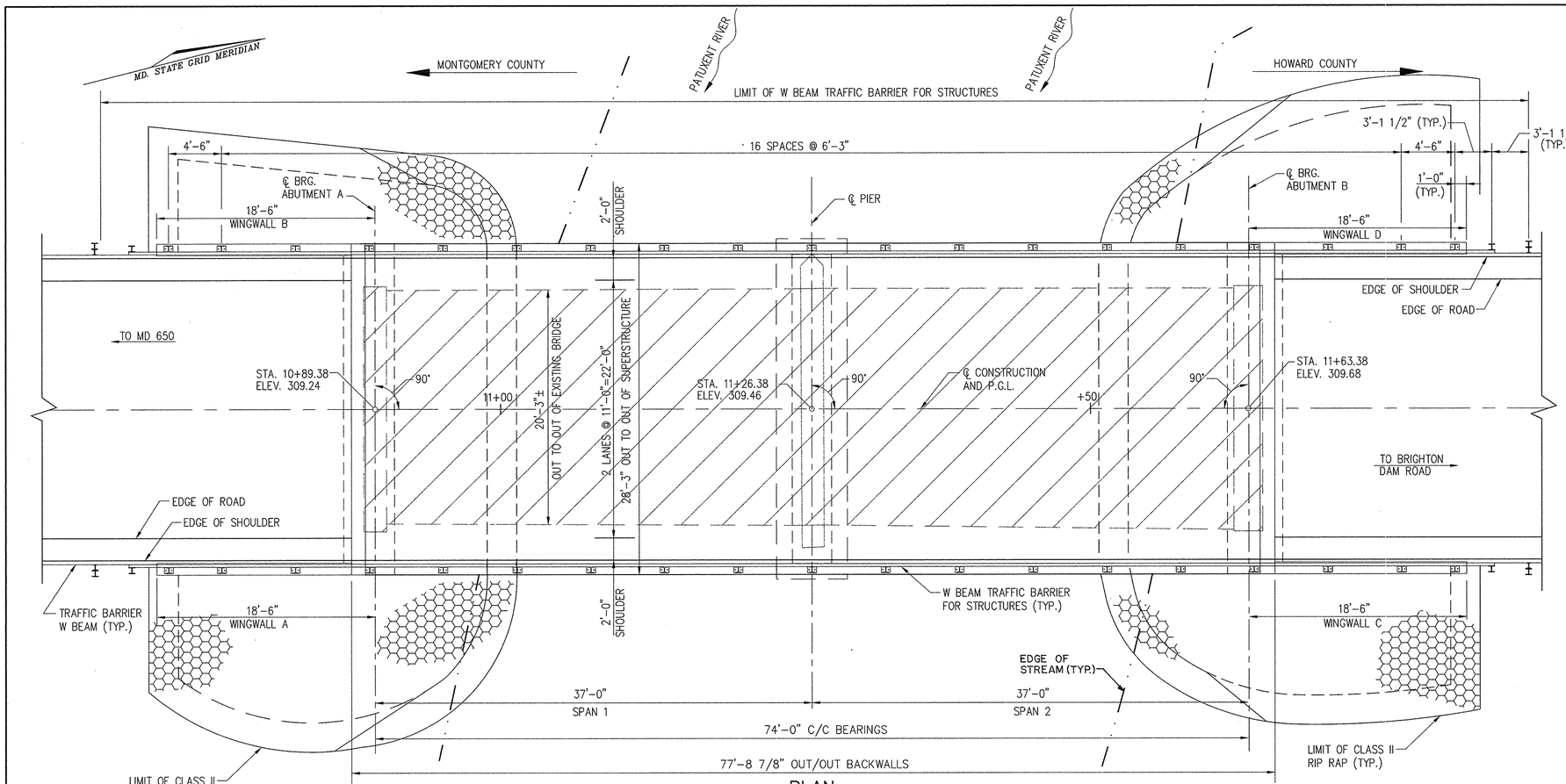
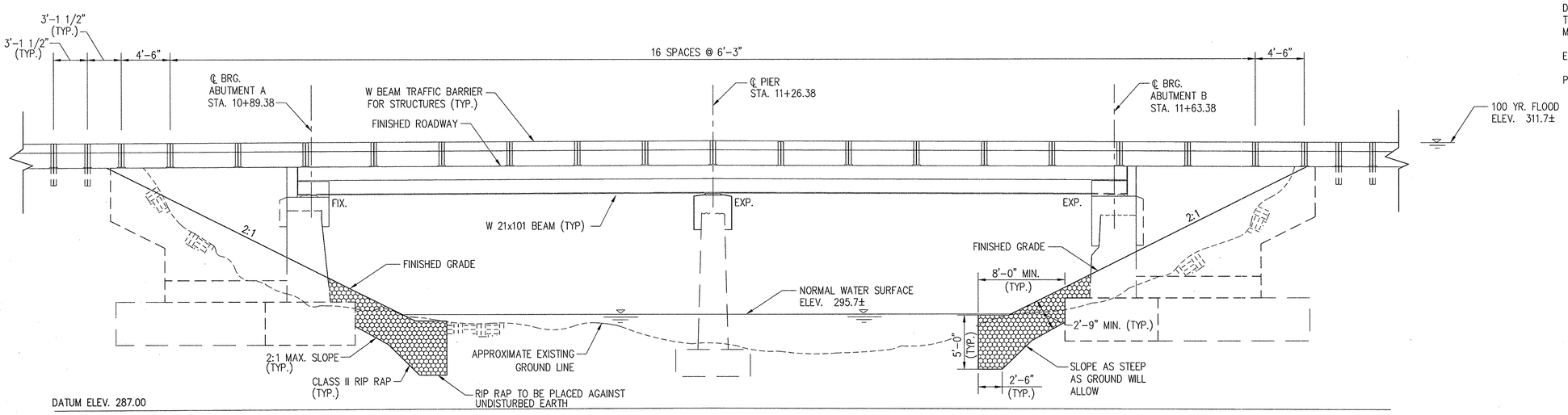


PLAN

SCALE: 3/16" = 1'-0"



ELEVATION

SCALE: 3/16" = 1'-0"

GENERAL NOTES

SPECIFICATIONS: SHA SPECIFICATIONS DATED OCTOBER, 1993 REVISIONS THEREOF AND ADDITIONS THERETO AND SPECIAL PROVISIONS FOR MATERIALS AND CONSTRUCTION.

AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DATED 1992 FOR DESIGN INCLUDING ALL INTERIM SPECIFICATIONS THROUGH 1995.

CONCRETE DESIGN: SERVICE LOAD DESIGN METHOD fc = 1200 PSI EXCEPT THAT IN BRIDGE DECK SLABS SUPPORTED BY STRINGERS IT SHALL BE 1350 PSI.

REINFORCING STEEL DESIGN: fs = 24,000 PSI.

STRUCTURAL STEEL DESIGN: ELASTIC DESIGN METHOD

LOADING: HS 25 WITH PROVISIONS FOR FUTURE 2" WEARING SURFACE AND 15 LB/SF FOR USE OF STEEL BRIDGE DECK FORMS WHICH REMAIN IN PLACE.

CONCRETE: ALL CONCRETE FOR ABUTMENT BACKWALLS AND ENTIRE SUPERSTRUCTURE SHALL BE MIX NO. 6 (4500 PSI). ALL OTHER STRUCTURE CONCRETE SHALL BE MIX NO. 3 (3500 PSI).

SUBSTRUCTURE CONCRETE SHALL BE TINTED TO MATCH THE COLOR OF THE EXISTING SUBSTRUCTURE CONCRETE TO REMAIN.

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, WITH THE EXCEPTION OF BARS AT THE TOP OF THE PIER AND AT THE BOTTOM AND SIDES OF ALL FOOTINGS WHICH SHALL HAVE 3" MINIMUM COVER.

FOR TIES AND STIRRUPS; STANDARD ACI BENDING TOLERANCES ARE MODIFIED TO PLUS (+) ZERO INCHES, MINUS (−) NORMAL ACI BENDING TOLERANCES.

ONLY GRADE 60 CAN BE USED ON THIS PROJECT

REINFORCING STEEL IN THE FOLLOWING AREAS SHALL BE EPOXY COATED:

−ENTIRE SUPERSTRUCTURE
−ABUTMENT BACKWALLS
−ALL BEARING SEAT PADS
−ABUTMENT BRIDGE SEAT AREAS

KEYS: ALL KEYS ARE NOMINAL SIZE.

STRUCTURAL STEEL: STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M A 709 GRADE 50, INCLUDING THE ADDITIONAL REQUIREMENTS FOR CHARPY V−NOTCH TESTING OF AASHTO M 270 FOR PRIMARY LOAD CARRYING MEMBERS.

EXISTING STRUCTURE: ALL DIMENSIONS AFFECTED BY THE GEOMETRICS, AND/OR LOCATION OF THE EXISTING STRUCTURE SHALL BE CHECKED IN THE FIELD BY THE CONTRACTOR, BEFORE ANY CONSTRUCTION IS DONE, AND BEFORE ANY REINFORCING STEEL, ETC., IS ORDERED OR FABRICATED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY THE ENGINEER WITH ALL FIELD DIMENSIONS REQUIRED TO CHECK DETAIL DRAWINGS. THE ± MARKS SHOWN WITH DIMENSIONS AND STATIONS DO NOT INDICATE ANY DEGREE OF PRECISION. THESE MARKS (±) INDICATE EXISTING DIMENSIONS AND STATIONS THAT MAY VARY AND DO REQUIRE FIELD VERIFICATION BY THE CONTRACTOR.

EXISTING STRUCTURE SHOWN IN LONG DASHED LINES.

PORTIONS OF EXISTING STRUCTURE SHOWN HATCHED, TO BE REMOVED.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS − CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995−3651 FAX: (410) 995−1363

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN				
DRN: SMI				
CHK: BDB				
DATE: JAN. 1997	BY	NO.	REVISION	DATE

GENERAL PLAN AND ELEVATION

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE M−97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B−3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE 3/16" = 1'−0"

SHEET 9 OF 29

B0053_09

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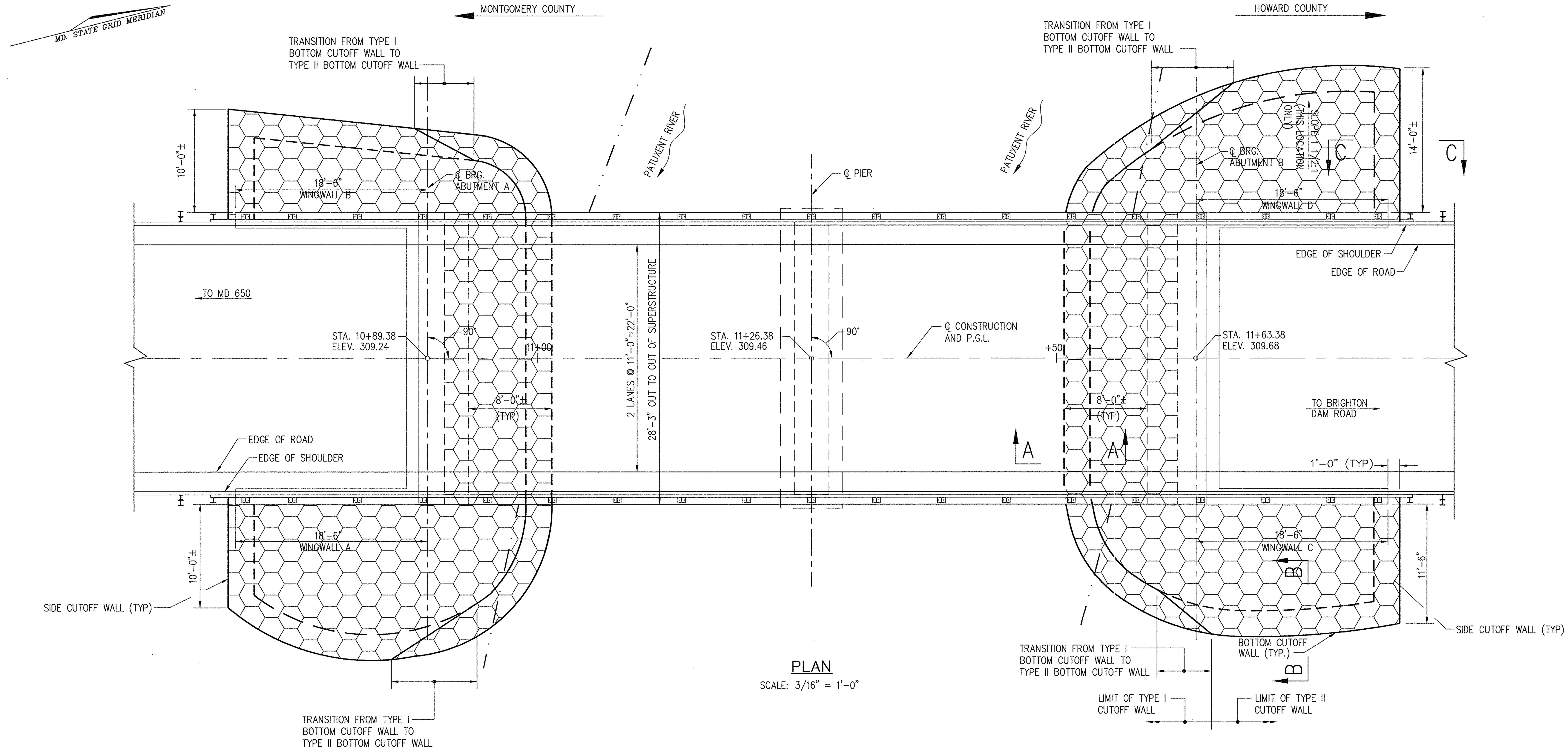
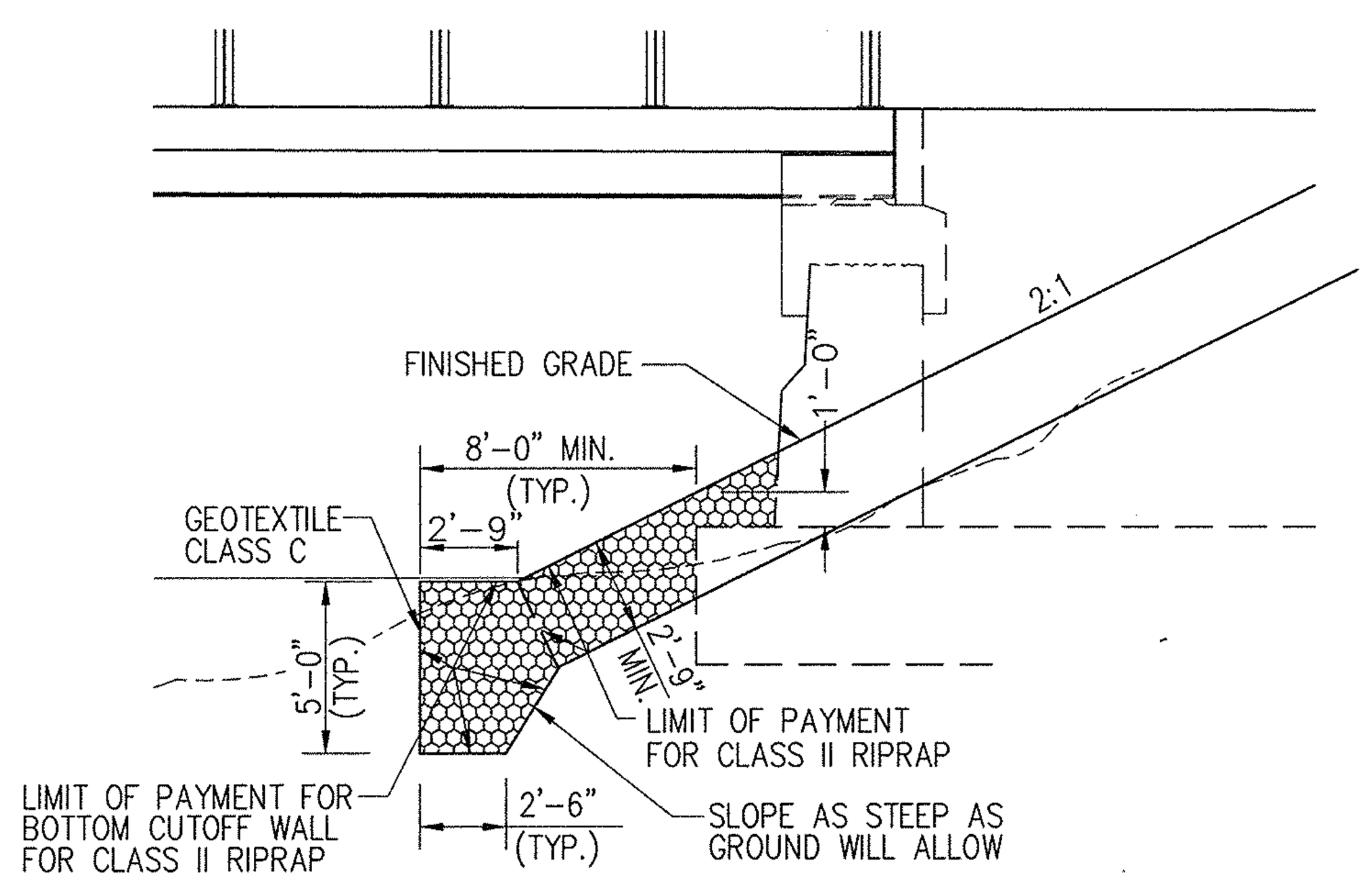


PLAN

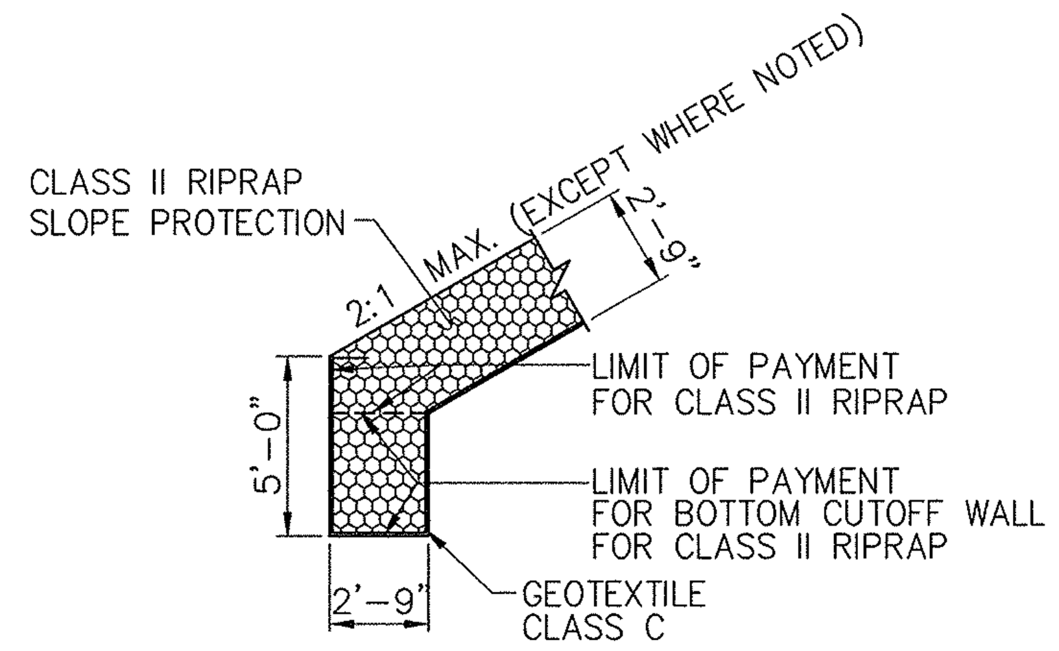
SCALE: 3/16" = 1'-0"

THIS PLAN IS FOR THE LAYOUT AND PLACEMENT OF THE SLOPE PROTECTION AT THE ABUTMENTS ONLY



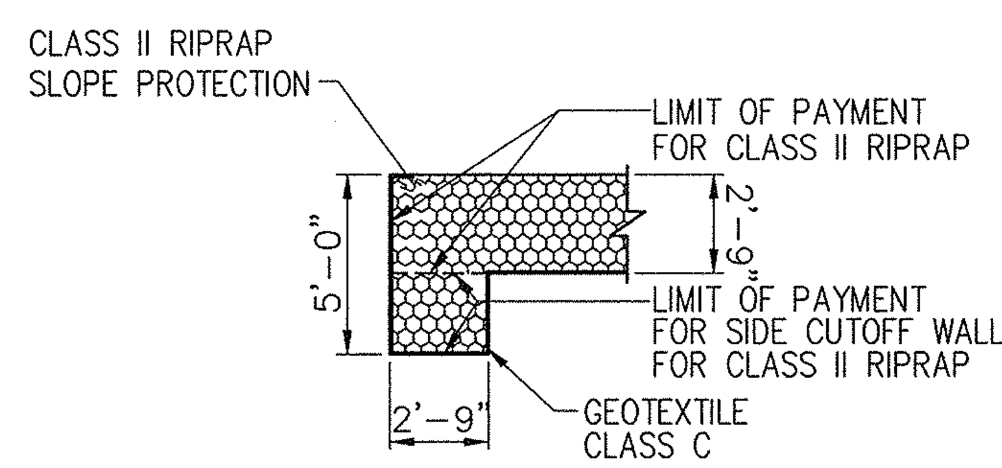
SECTION A–A
TYPE I
TYPICAL BOTTOM CUTOFF WALL AT FACE OF ABUTMENT

SCALE: 3/16" = 1'-0"



SECTION B–B
TYPE II
TYPICAL BOTTOM CUTOFF WALL ALONG WINGWALL

SCALE: 3/16" = 1'-0"



SECTION C–C
TYPICAL SIDE CUTOFF WALL AT BACK OF WINGWALL

SCALE: 3/16" = 1'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS – CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — No. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: JSN			
DRN: SMI			
CHK: BDB			
DATE: JAN. 1997	BY	NO.	REVISION	DATE

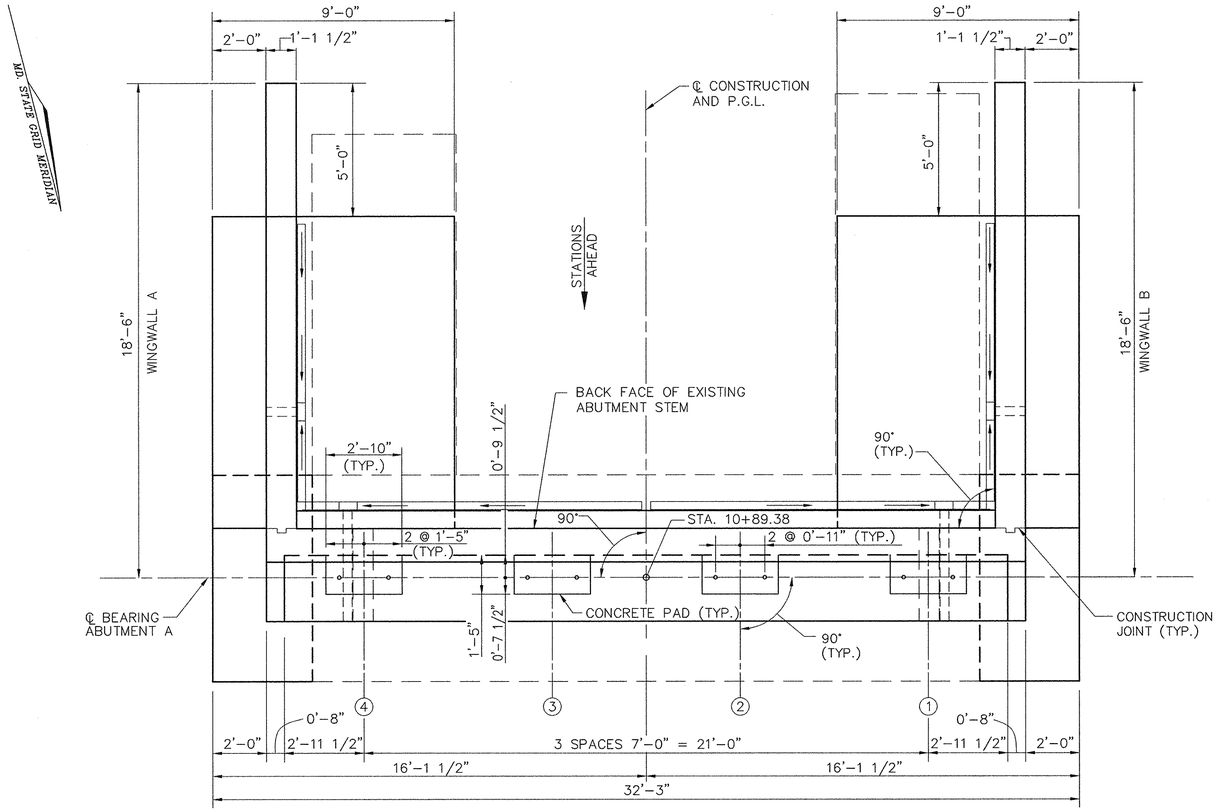
SLOPE PROTECTION PLAN

600' SCALE MAP NO.______ BLOCK NO.______

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

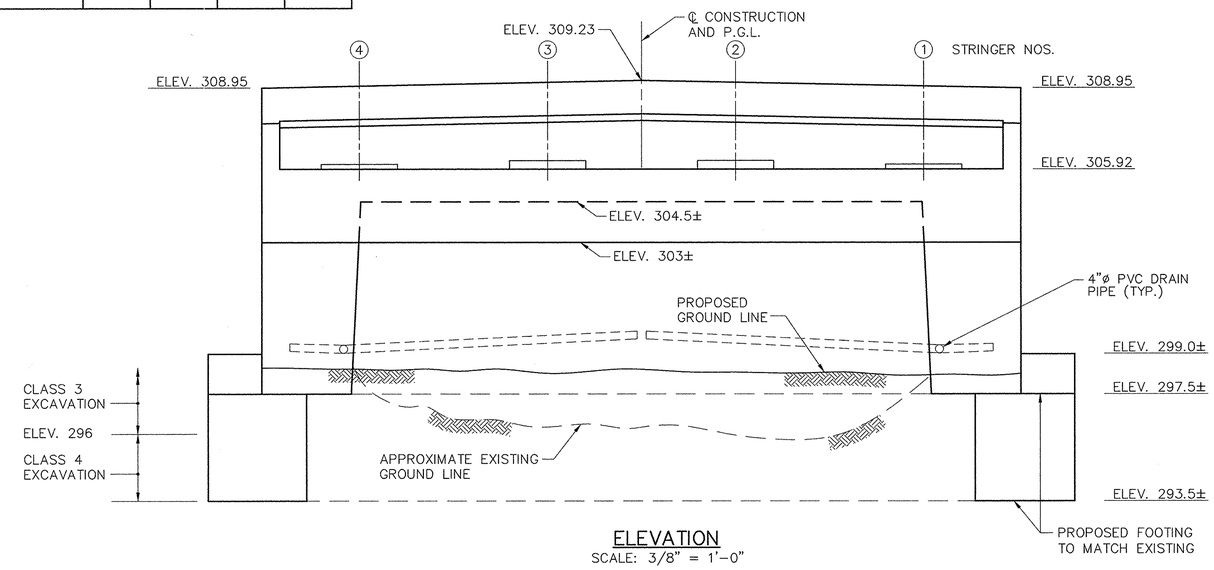
SCALE 3/16" = 1'-0"

B0053_10

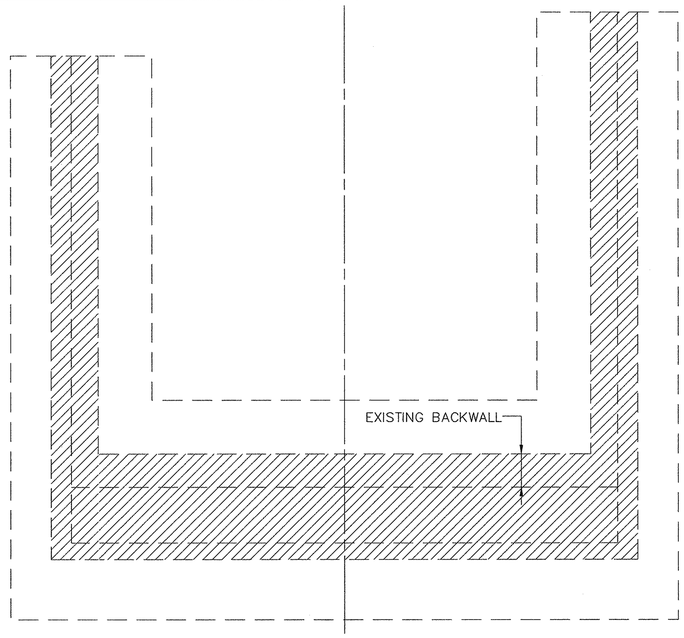


PLAN
SCALE: 3/8" = 1'-0"

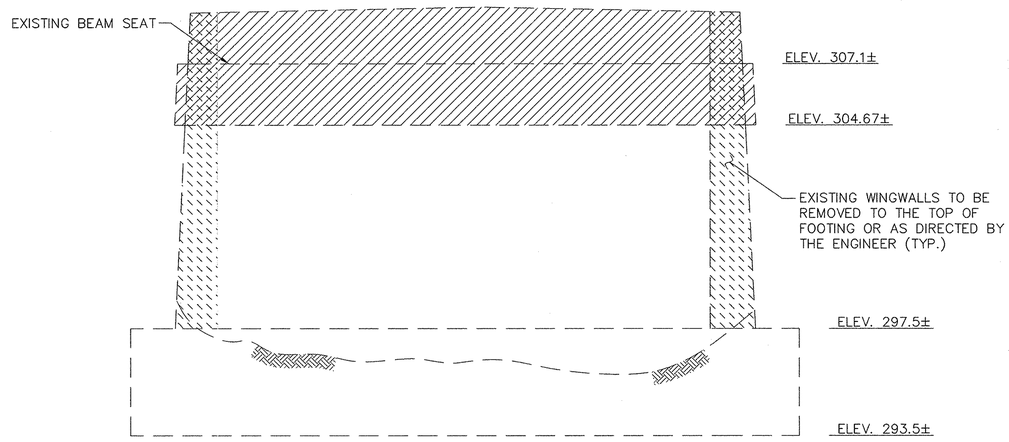
STRINGER NOS.	4	3	2	1
PAD ELEVATIONS	306.08	306.22	306.22	306.08



ELEVATION
SCALE: 3/8" = 1'-0"



EXISTING PLAN
SCALE: 3/8" = 1'-0"



EXISTING ELEVATION
SCALE: 3/8" = 1'-0"

NOTES:

1. FOR CONCRETE BEARING PAD DETAILS SEE DETAIL NO. BR-SB(6.02)-80-121 ON SHEET 23.
2. BEAM SEAT ELEVATIONS ARE TAKEN AT THE BACK EDGE OF BEAM SEAT.
3. EXISTING CONCRETE REMOVAL SHOWN THUS. ▨
4. FOR PROPOSED TYPICAL SECTION THROUGH ABUTMENT SEE SHEETS 13 AND 14.
5. FOR WINGWALL DETAILS SEE SHEET 15.
6. FOR ELEVATION VIEWS OF WINGWALLS SEE SHEET 15.
7. FOR DETAIL OF STEPPED FOOTING SEE DETAIL NO. RW(6.09)-83-155 ON SHEET 26.
8. FOR DRAINAGE TROUGH CATCH BASIN DETAILS SEE DETAIL NO. BR-SS(7.17)-95-313 ON SHEET 25. FOR LOCATION OF DRAINAGE THOUGH SEE DETAIL ON SHEET 14.
9. FOR DETAILS OF DRAINAGE SYSTEM. SEE DETAIL NO. RW(0.01)-80-100 ON SHEET 26.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
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CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — 10452 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

600' SCALE MAP NO._____ BLOCK NO._____

ABUTMENT A

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE 3/8" = 1'-0"

SHEET 11 OF 29

B0053_11

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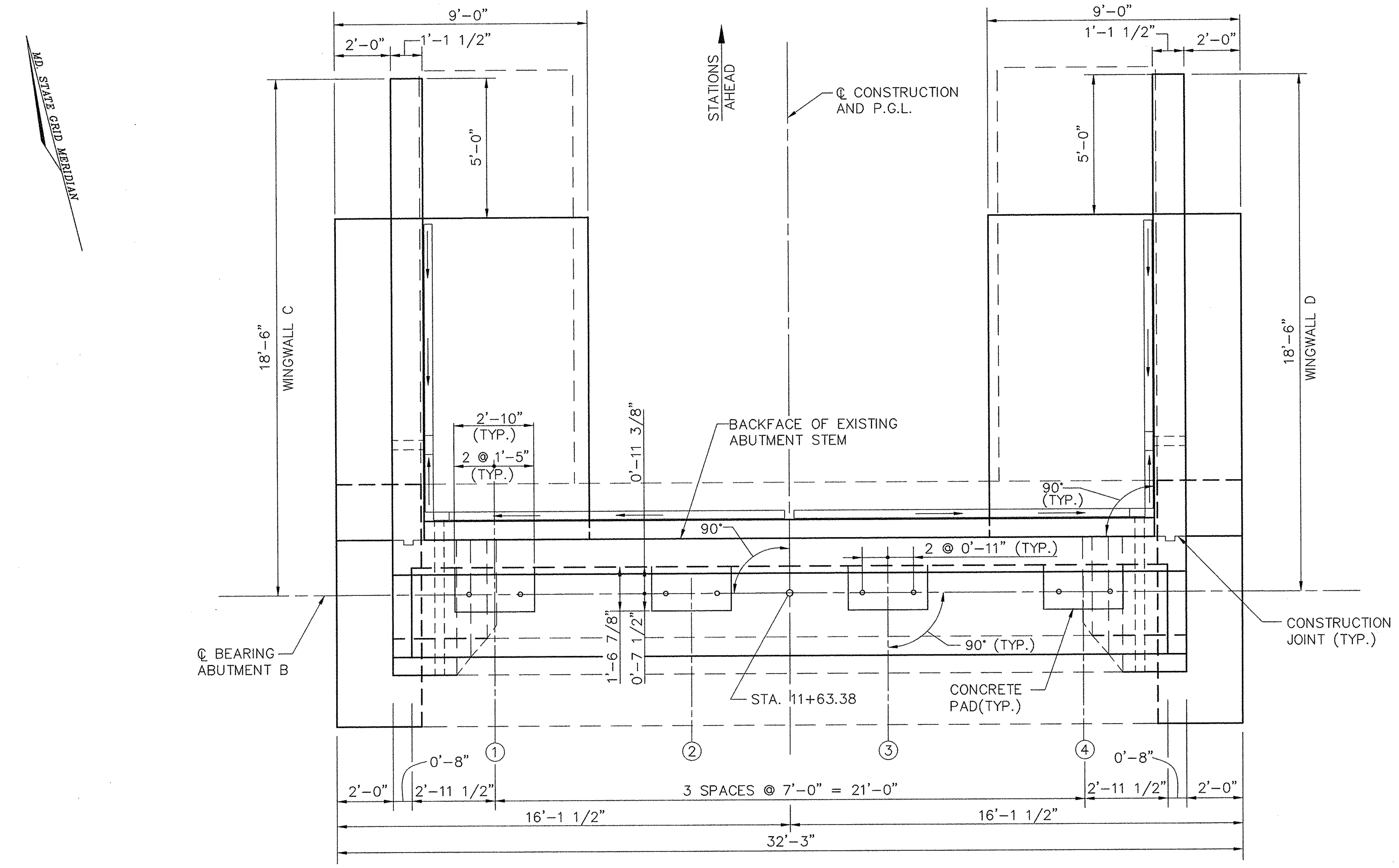
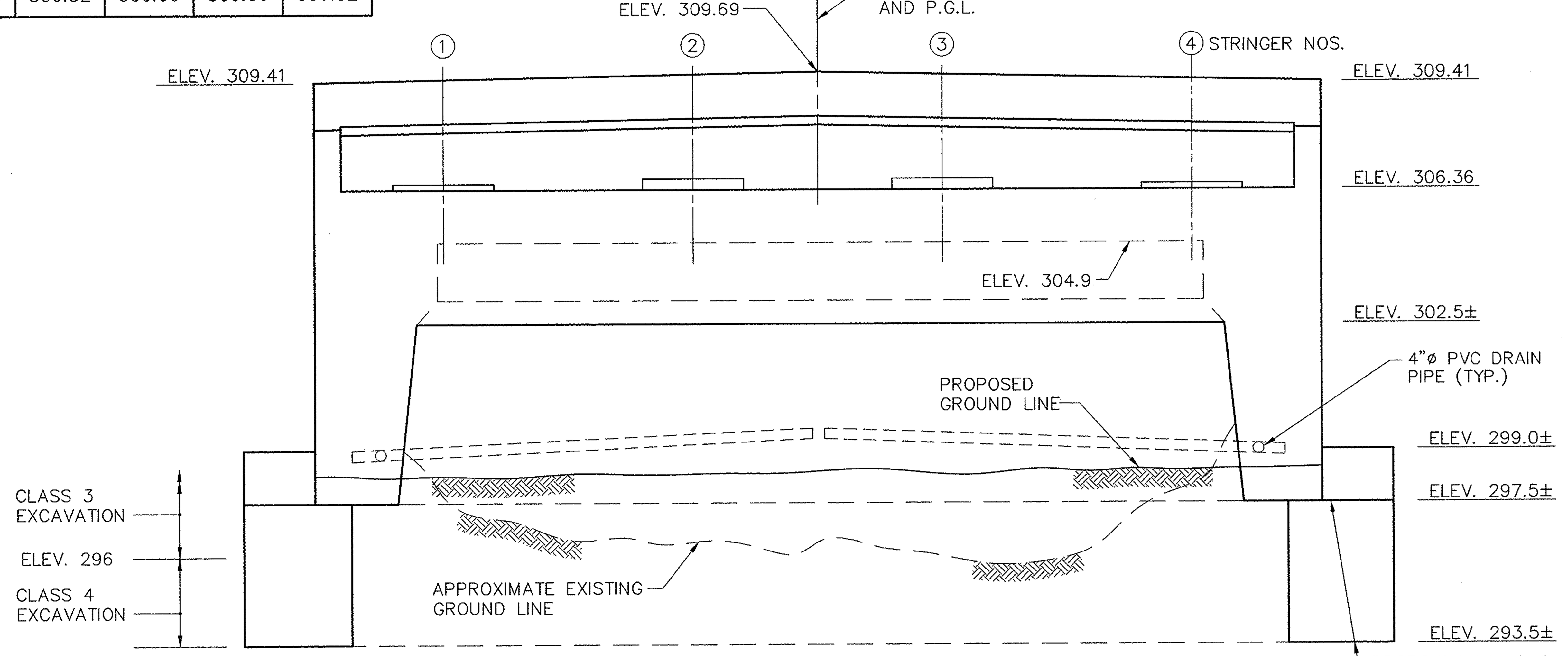
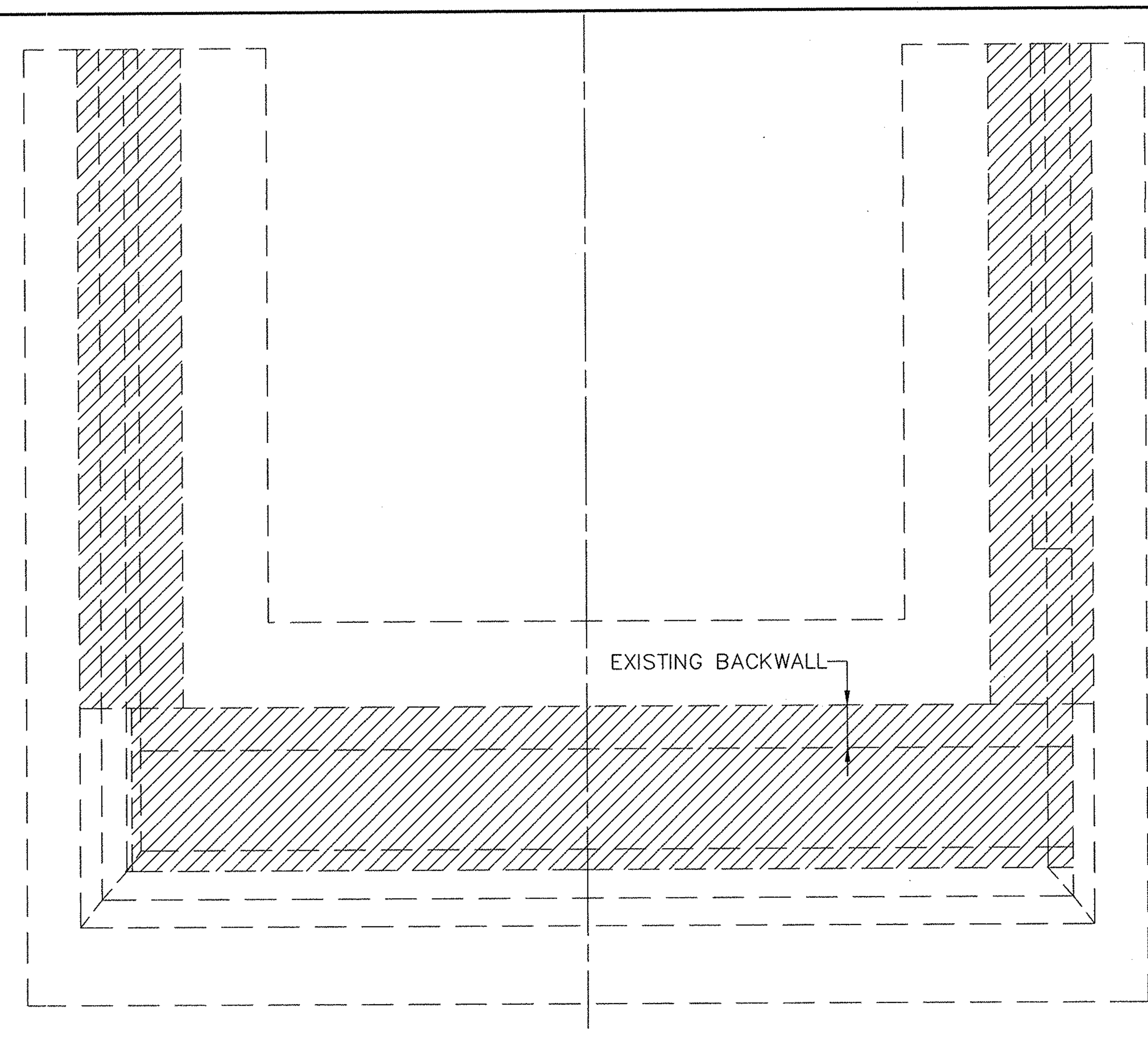


PLAN
SCALE: 3/8" = 1'-0"

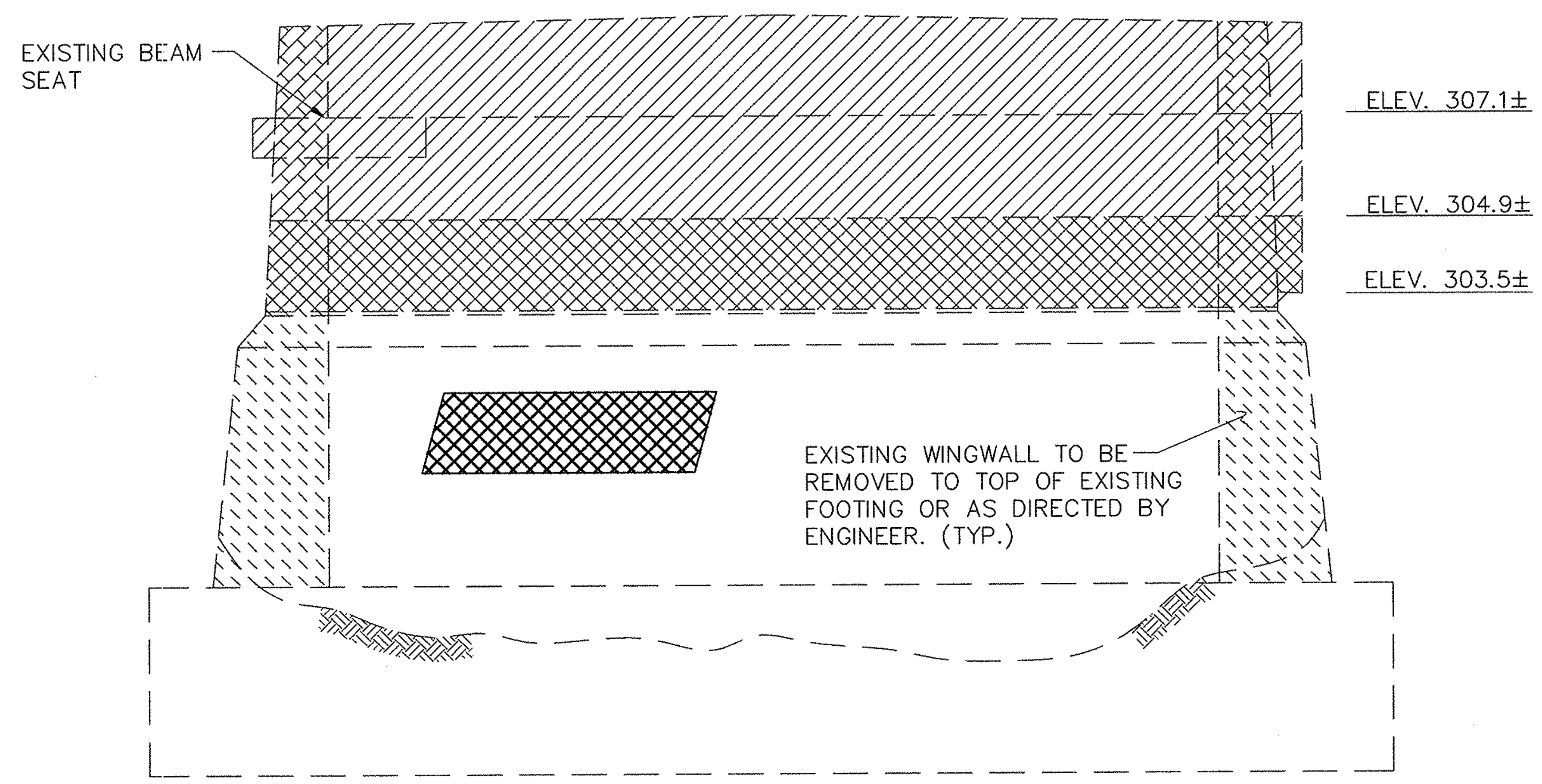
STRINGER NOS.	1	2	3	4
PAD ELEVATIONS	306.52	306.66	306.66	306.52



ELEVATION
SCALE: 3/8" = 1'-0"



EXISTING PLAN
SCALE: 3/8" = 1'-0"



EXISTING ELEVATION
SCALE: 3/8" = 1'-0"

NOTES:

1. FOR CONCRETE BEARING PAD DETAILS SEE DETAIL NO. BR-SB(6.02)-80-121 ON SHEET 23.
2. BEAM SEAT ELEVATIONS ARE TAKEN AT THE BACK EDGE OF BEAM SEAT.
3. EXISTING CONCRETE REMOVAL SHOWN THUS [hatch]
4. EXISTING CONCRETE REMOVAL TO SOUND CONCRETE SHOWN THUS [hatch]
5. EXISTING CONCRETE REMOVAL TO SOUND CONCRETE (MIN. 6" DEPTH) SHOWN THUS [hatch]. REPLACE WITH MIX NO. 6 CONCRETE FOR SUBSTRUCTURE REPAIR.
6. FOR PROPOSED TYPICAL ABUTMENT SECTION SEE SHEETS 13 AND 14.
7. FOR WINGWALL DETAILS SEE SHEET 15.
8. FOR ELEVATION VIEWS OF WINGWALLS SEE SHEET 15.
9. FOR DETAIL OF STEPPED FOOTING SEE DETAIL NO. RW(6.09)-83-155 ON SHEET 26.
10. FOR DRAINAGE TROUGH CATCH BASIN DETAILS SEE DETAIL NO. BR-SS(7.17)-95-313 ON SHEET 25. FOR LOCATION OF DRAINAGE THOUGH OUTLET SEE DETAIL ON SHEET 14.
11. FOR DETAILS OF DRAINAGE SYSTEM SEE DETAIL NO. RW(0.01)-80-100 ON SHEET 26.

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS – CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

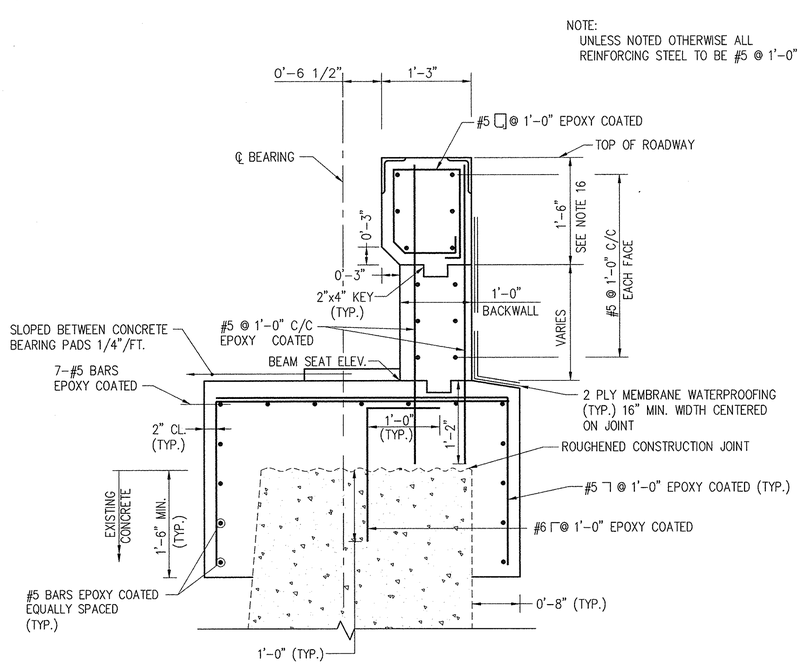
600' SCALE MAP NO.______ BLOCK NO.______

ABUTMENT B

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

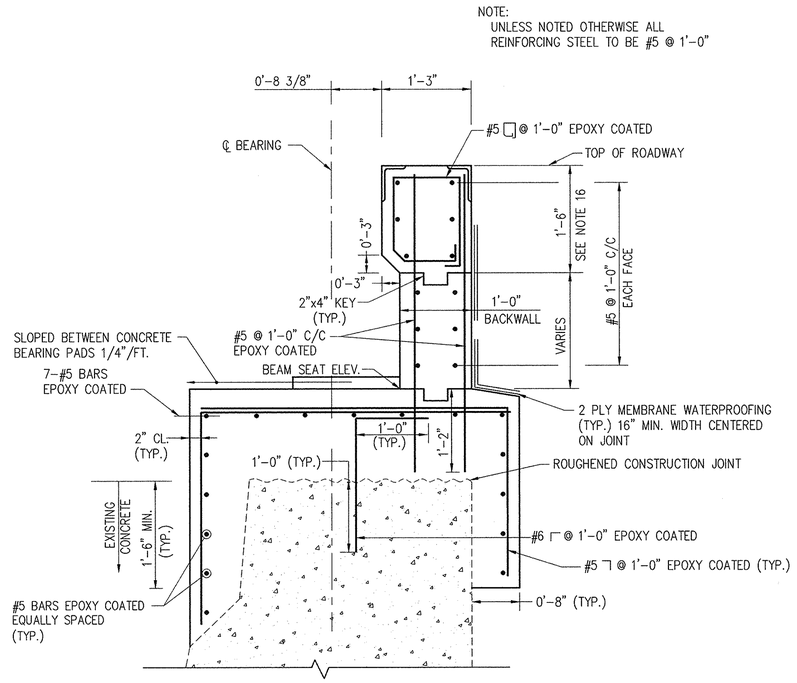
SCALE 3/8" = 1'-0"

B0053-12



ABUTMENT A SECTION

SCALE: 1" = 1'-0"

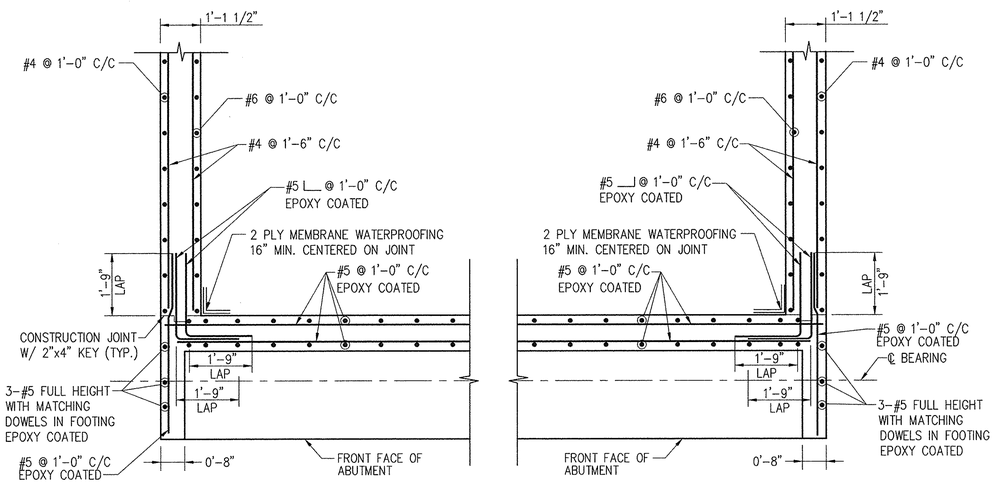


ABUTMENT B SECTION

SCALE: 1" = 1'-0"

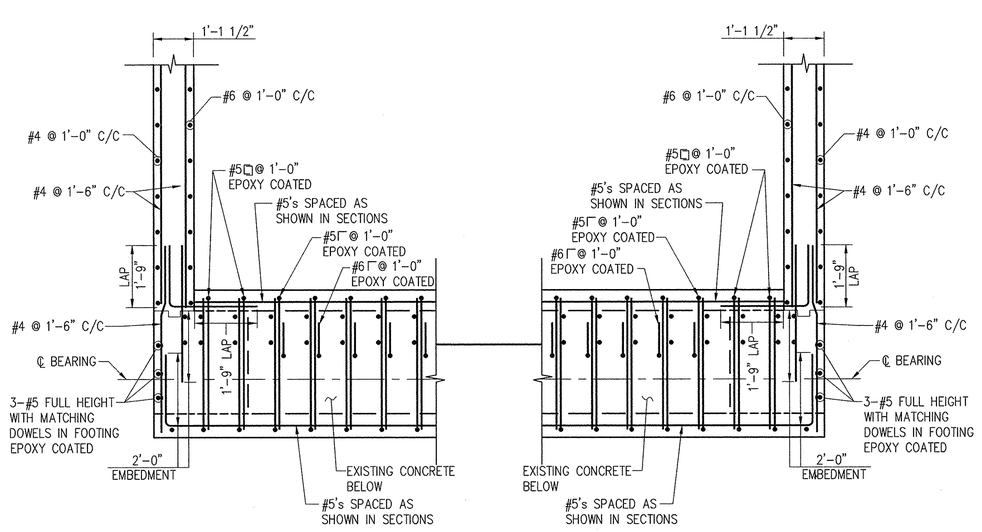
NOTES:

1. EXISTING REINFORCING STEEL TO BE INCORPORATED IN THE FINAL STRUCTURE SHALL BE BE STRAIGHTENED AND CLEANED. CARE SHALL BE TAKEN NOT TO DAMAGE THESE BARS.
2. ANY EXISTING REINFORCING STEEL, WHICH IS TO BE INCORPORATED INTO THE FINAL STRUCTURE:
   A. AND IN THE OPINION OF THE ENGINEER HAS LOST 20% OR MORE OF ITS ORIGINAL CROSS SECTIONAL AREA, SHALL BE CUT OUT. A NEW BAR OF SAME DIAMETER SHALL BE PROVIDED AND PLACED SO AS TO HAVE THE MINIMUM REQUIRED LAP AT EACH END OF THE NEW BAR, OR MODIFIED AS PER ITEM C BELOW.
   B. WHERE THE REQUIRED LAP LENGTH IS AVAILABLE, SHALL BE USED AS A DOWEL.
   C. WHERE THE REQUIRED BAR LAP IS NOT AVAILABLE OR LIMITS OF CONCRETE REMOVAL TO ACHIEVE BAR LAP WOULD BE TOO GREAT, A WELDED OR APPROVED MECHANICAL SPLICE SHALL BE PROVIDED. SEE STANDARD NO. M(6.01)-75-12.
3. ALL EXISTING REINFORCING STEEL WHICH EXTENDS INTO AN AREA IN WHICH EPOXY COATED REINFORCING STEEL IS REQUIRED SHALL BE CLEANED AND EPOXY COATED.
4. IF EXPECTED REINFORCING STEEL IS MISSING, OR A PATTERN DIFFERING FROM THAT SHOWN ON THE EXISTING PLANS UNCOVERED, THEN THE DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT SHALL BE CONTACTED FOR EVALUATION.
5. GROUT FOR DOWELS SHALL BE A NON-SHRINK EPOXY GROUT CONSISTING OF SAND AND EPOXY MIXED BY VOLUME ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 6500 PSI IN 72 HOURS WHEN TESTED IN ACCORDANCE WITH M.S.M.T. 501. SAND FOR EPOXY GROUT SHALL CONFORM TO SECTION 903.11 OF THE SPECIFICATIONS.
6. ALL EXISTING CONCRETE SURFACES WHICH ARE TO BE IN CONTACT WITH NEW CONCRETE SHALL BE COATED WITH AN EPOXY BONDING COMPOUND. SEE SPECIAL PROVISIONS.
7. FOR DETAILS OF DRAINAGE SYSTEM II SEE DETAIL RW(0.01)-80-100 ON SHEET 26.
8. ALL LONGITUDINAL BARS SHALL BE #5 BARS SPACED AS SHOWN UNLESS OTHERWISE NOTED.
9. ALL REINFORCING STEEL IN THE ABUTMENT CAP AND BACKWALL SHALL BE EPOXY COATED.
10. FOR DETAILS OF COMPRESSION JOINT SEAL, ROADWAY AND SEAL RETAINER ANGLES SEE DETAIL NO. BR-SS(7.01)-77-63 AND BR-SS(7.02)-79-64 ON SHEETS 24 AND 25.
11. ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS OTHERWISE NOTED.
12. FOR REINFORCEMENT LAP LENGTHS NOT SHOWN SEE SHEET 27.
13. FOR REINFORCEMENT DEVELOPMENT LENGTHS NOT SHOWN SEE SHEETS 27 AND 28.
14. CONTRACTOR HAS THE OPTION OF LAPPING STEM REINFORCEMENT WITH TOE REINFORCEMENT AND/OR DOWELS AS SHOWN; OR BY EXTENDING THE TOE AND/OR DOWEL REINFORCEMENT FULL HEIGHT. HOWEVER NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR EITHER ALTERNATE.
15. FOR CONCRETE BEARING PAD DETAILS SEE DETAIL NO. BR-SB(6.02)-80-121 ON SHEET 23.
16. THIS PORTION OF THE BACKWALL TO BE POURED AFTER SUPERSTRUCTURE IS COMPLETE IN PLACE.



SECTION ABOVE BEAM SEAT BOTH ABUTMENTS

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



SECTION BELOW BEAM SEAT BOTH ABUTMENTS

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

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND DIRECTOR OF PUBLIC WORKS — DATE 1/22/97 CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97 CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97	NOLAN ASSOCIATES, INC. *ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS* 4785 DORSEY HALL DRIVE SUITE 124 ELLICOTT CITY, MARYLAND 21042 *PHONE: (410) 995-3651* *FAX: (410) 995-1363*	STATE OF MARYLAND — CHARLES S. NOLAN — No. 12612 — PROFESSIONAL ENGINEER

DES: BDB					
DRN: TC					
CHK: JSN					
DATE: JAN. 1997	BY	NO.	REVISION	DATE	600' SCALE MAP NO._____ BLOCK NO._____

ABUTMENT DETAILS - 1

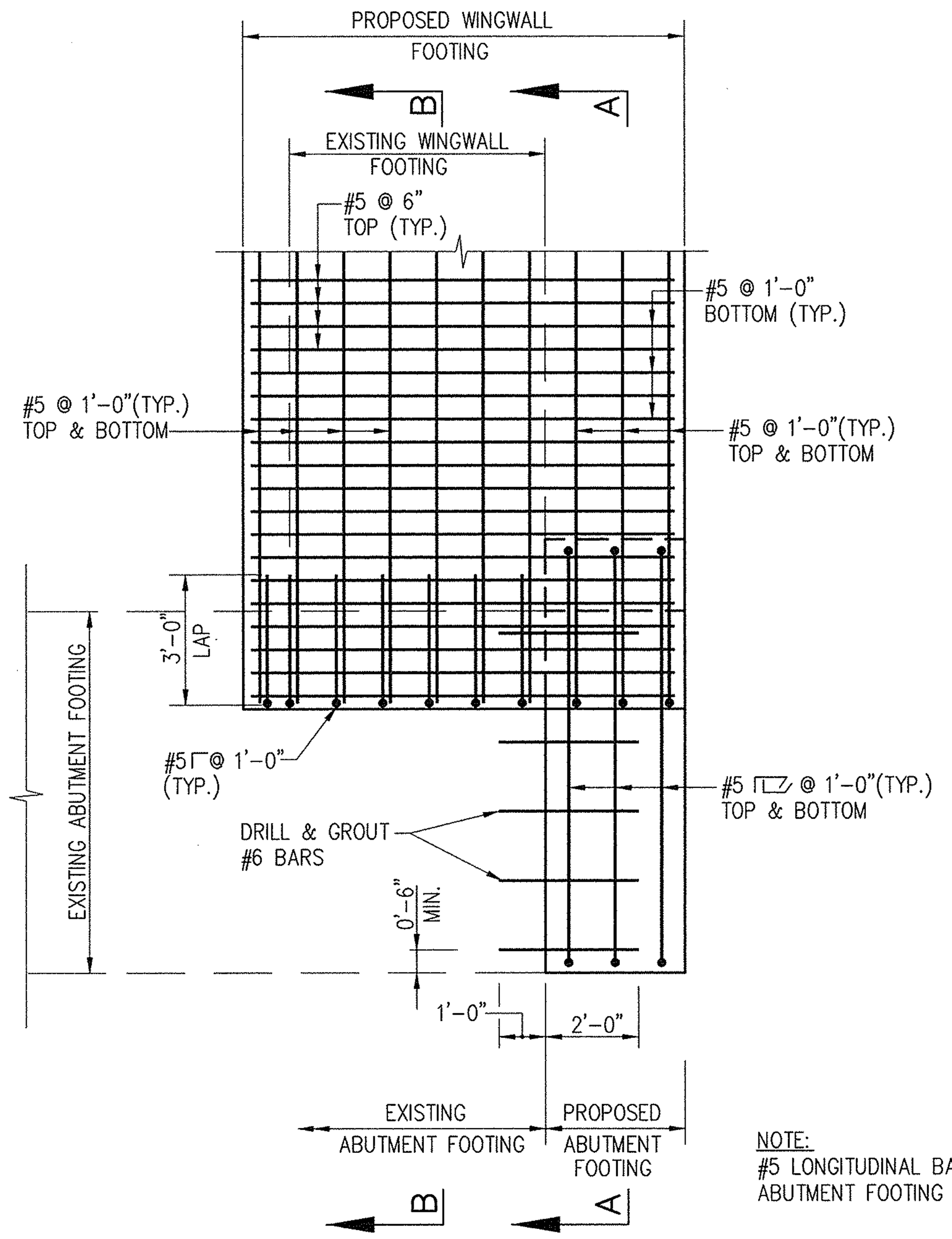
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 13 OF 29

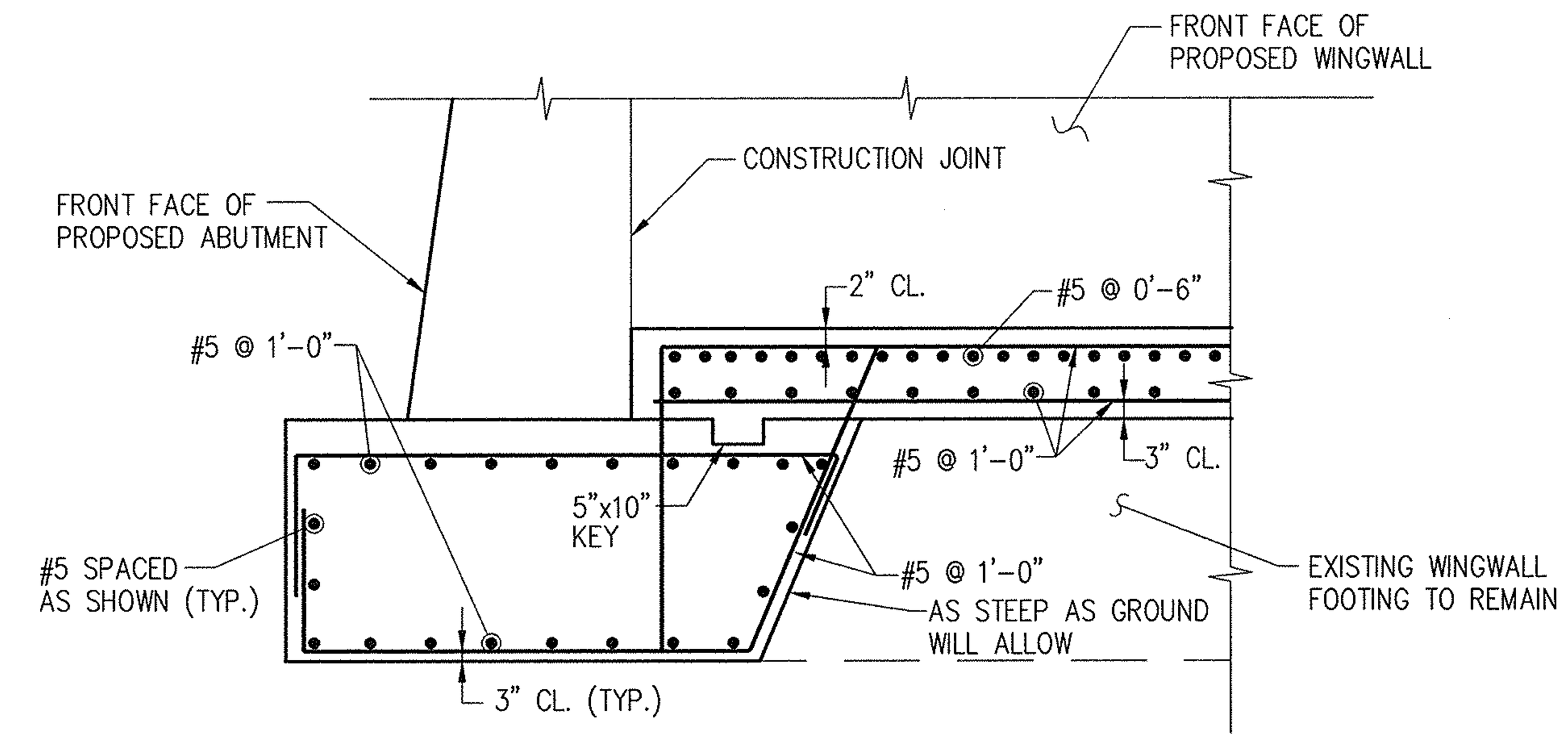
B0053-13

G:\USERS\CNOLAN\PUBS\JOBS\950234\ACAD\95234AD1 Wed Dec 18 14:36:54 1996

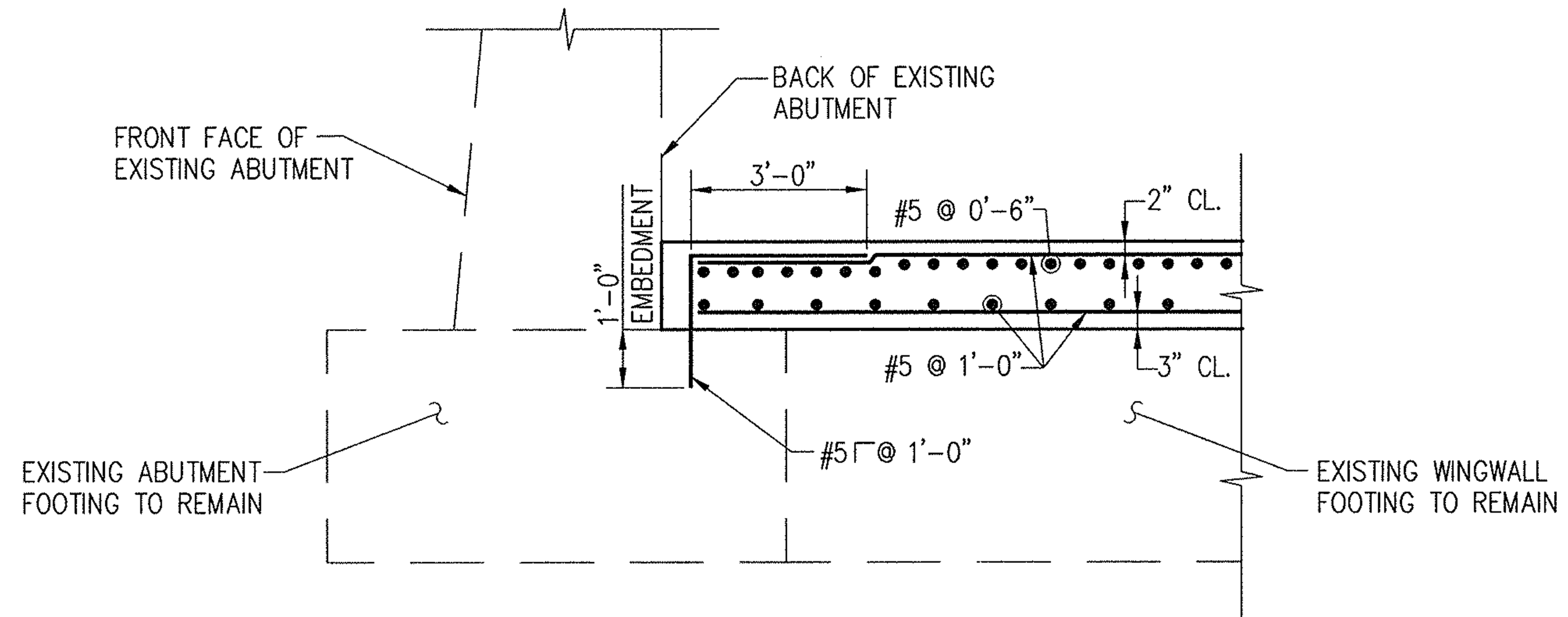


NOTE:
#5 LONGITUDINAL BARS IN PROPOSED ABUTMENT FOOTING NOT SHOWN

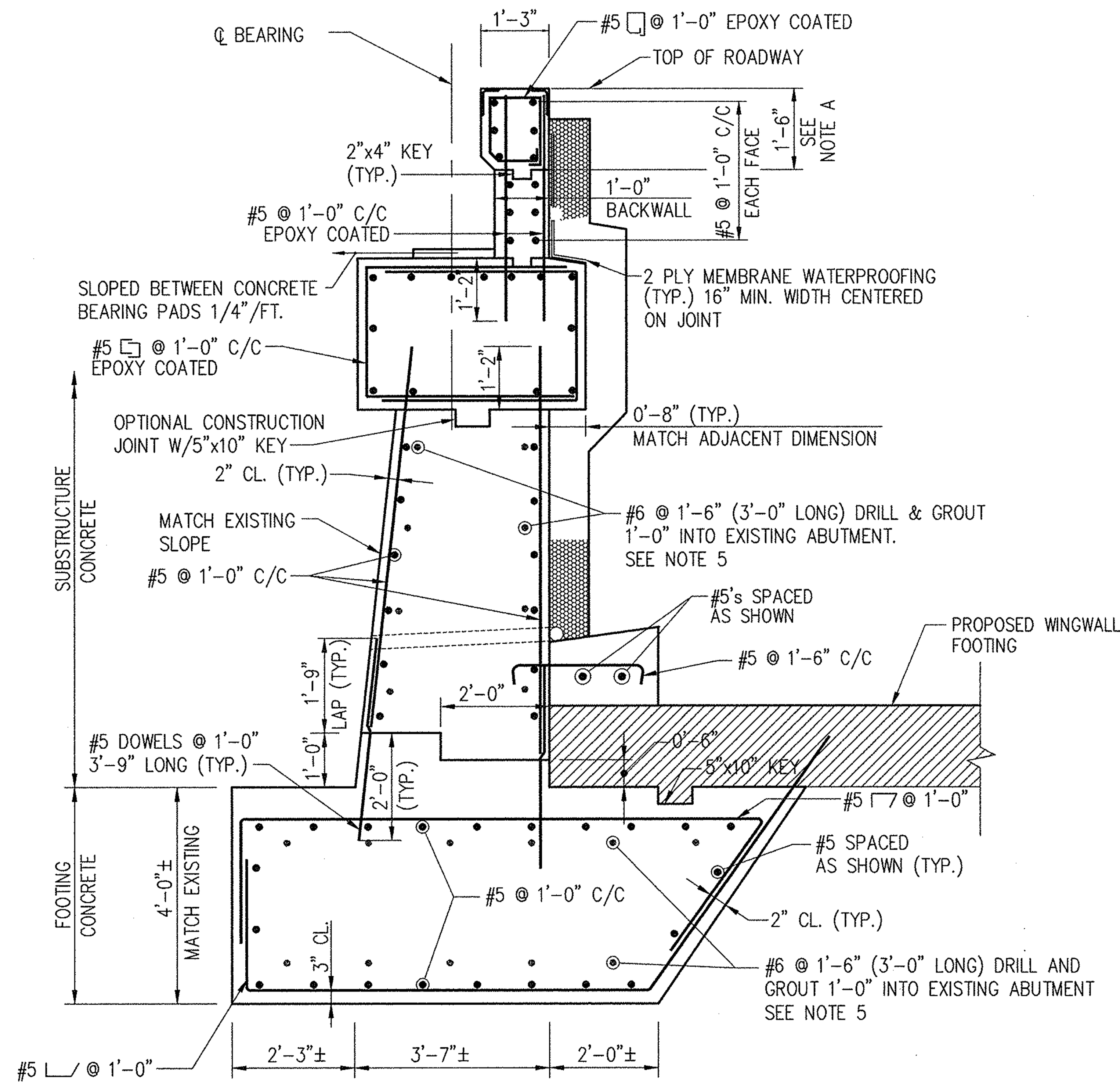
PARTIAL FOOTING REINFORCEMENT PLAN (TYP.)
SCALE: 3/8" = 1'-0"



SECTION A–A
SCALE: 3/8" = 1'-0"

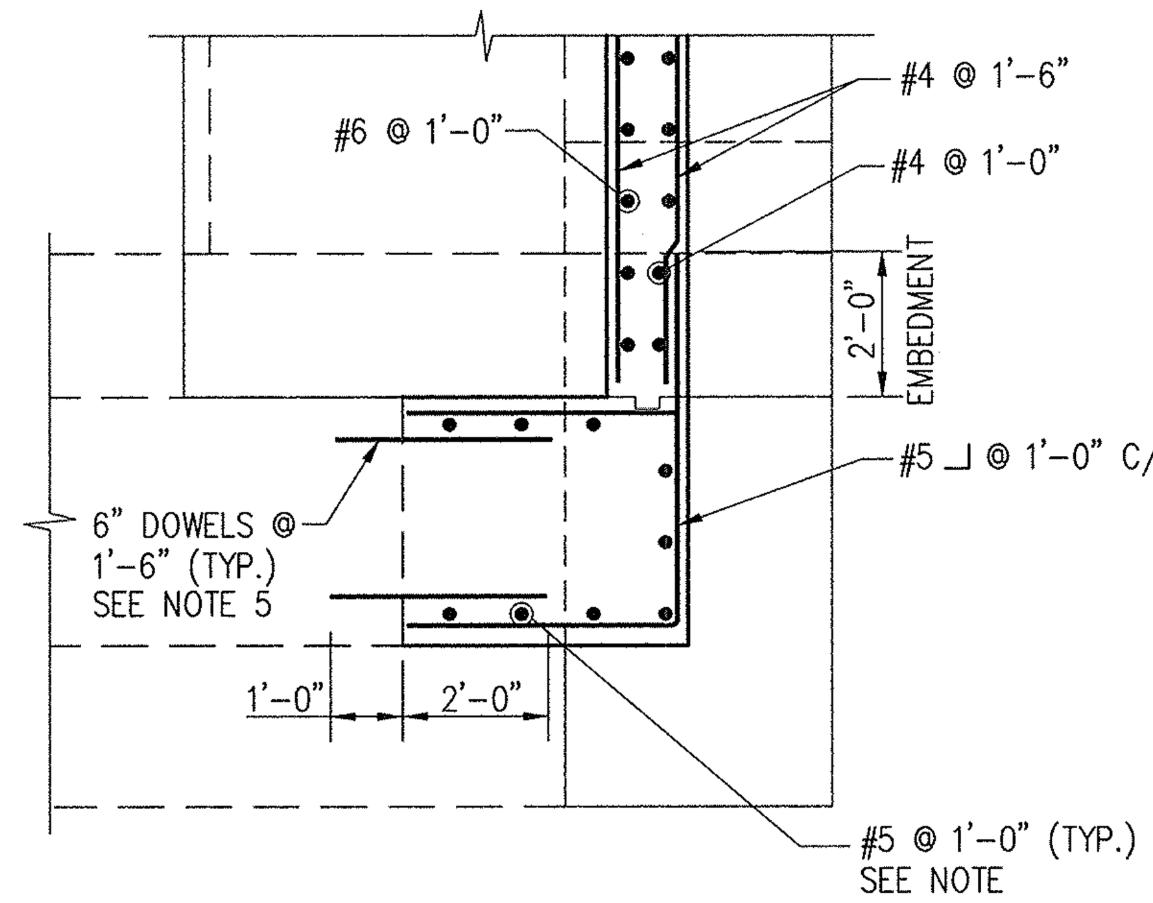


SECTION B–B
SCALE: 3/8" = 1'-0"



PROPOSED TYPICAL ABUTMENT SECTION
SCALE: 1/2" = 1'-0"

NOTE A:
THIS PORTION OF THE BACKWALL TO BE POURED AFTER SUPERSTRUCTURE IS COMPLETE IN PLACE.



PARTIAL STEM REINFORCEMENT PLAN (TYP.)
SCALE: 3/8" = 1'-0"

NOTE:
FOR #5 VERTICAL BARS OVER EXISTING FOOTING, LAP WITH #6 DOWEL (3'-0" LONG) DRILLED AND GROUTED 1'-0" INTO EXISTING ABUTMENT FOOTING CONCRETE.

NOTES:
1. SEE ABUTMENT DETAILS-1 SHEET AND ABUTMENT PLAN AND ELEVATION SHEET FOR PERTINENT DIMENSIONS NOT SHOWN.
2. SEE ABUTMENT DETAIL-1 SHEET FOR NOTES ON INCORPORATING EXISTING REINFORCING STEEL INTO THE FINAL STRUCTURE.
3. FOR REINFORCEMENT NOT SPECIFICALLY MARKED, SEE ABUTMENT SECTIONS ON SHEET 13.
4. PROPOSED ABUTMENT AND WINGWALL FOOTINGS SHALL BE POURED AGAINST UNDISTURBED EARTH OR EXISTING FOOTINGS TO REMAIN.
5. REINFORCEMENT DRILLED INTO EXISTING CONCRETE SHALL NOT BE DRILLED CLOSER THAN 6" TO ANY FACE OF EXISTING CONCRETE.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS – CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB				
DRN: TC				
CHK: JSN				
DATE: JAN. 1997	BY	NO.	REVISION	DATE

ABUTMENT DETAILS – 2

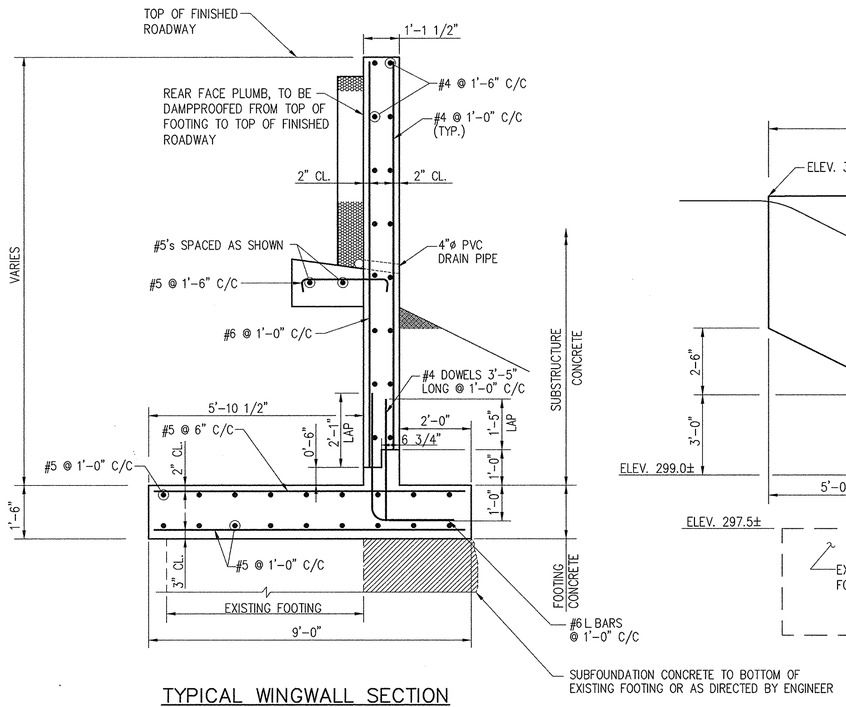
600' SCALE MAP NO.______ BLOCK NO.______

REHABILITATION OF BRIDGE M–97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B–3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

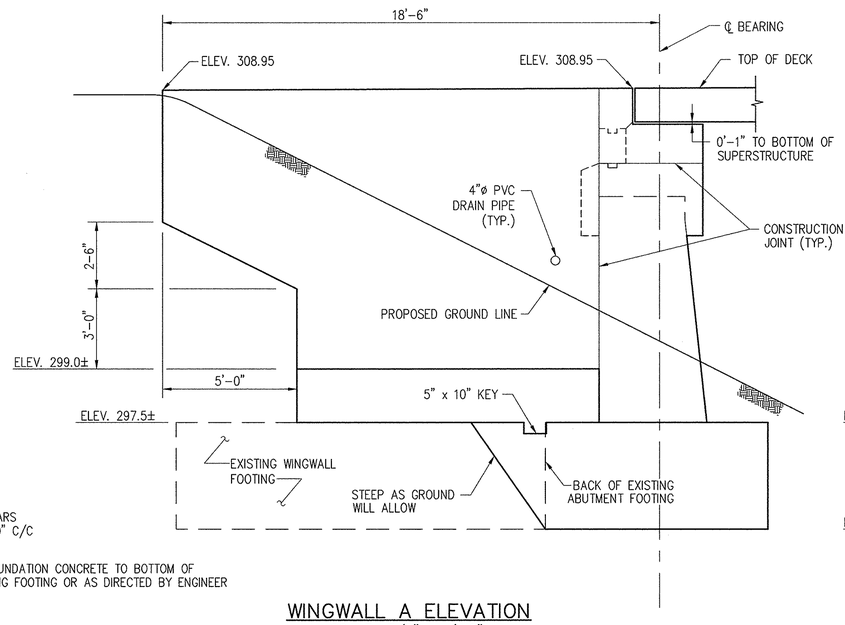
SCALE AS SHOWN

B0053_14

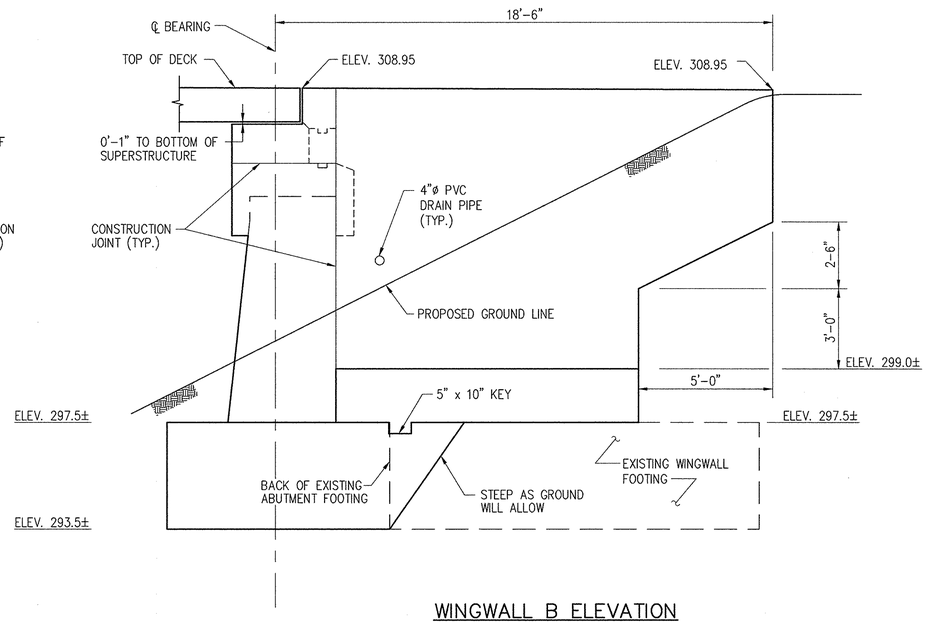
G:\USERS\DOLAN\PUB\JOBS\95023A\ACAD\95023A02 Tue Dec 31 13:03:45 1996



TYPICAL WINGWALL SECTION
SCALE: 1/2" = 1'-0"

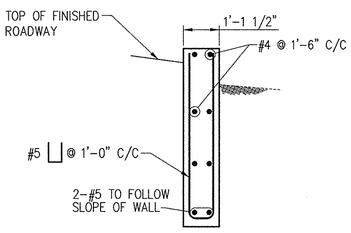


WINGWALL A ELEVATION
SCALE: 3/8" = 1'-0"

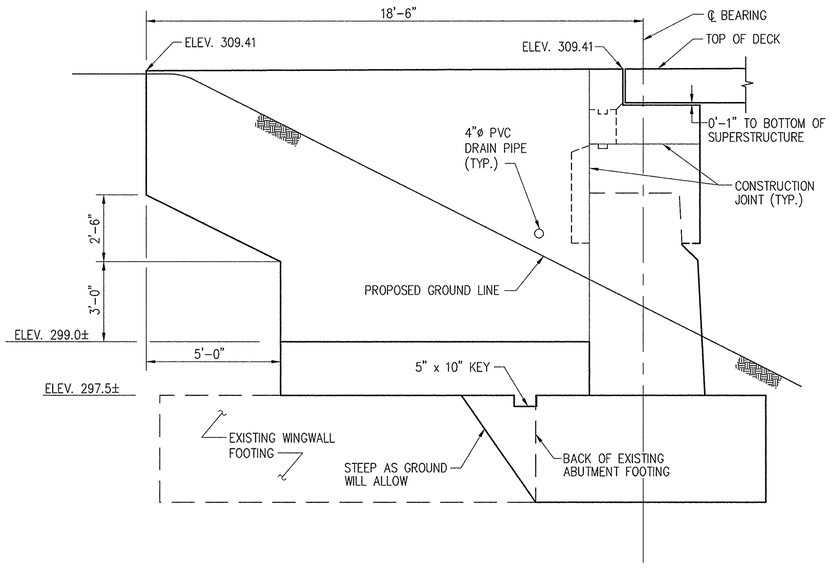


WINGWALL B ELEVATION
SCALE: 3/8" = 1'-0"

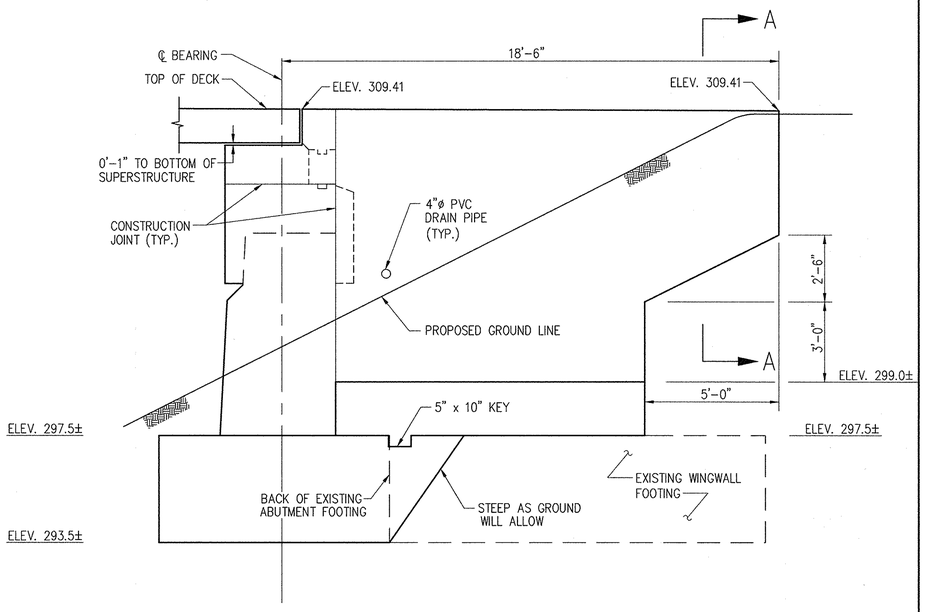
ABUTMENT A



SECTION A-A
SCALE: 1/2" = 1'-0"



WINGWALL C ELEVATION
SCALE: 3/8" = 1'-0"



WINGWALL D ELEVATION
SCALE: 3/8" = 1'-0"

ABUTMENT B

NOTES:

1. FOR DETAILS OF DRAINAGE SYSTEM II SEE DETAIL NO. RW(0.01)-80-100 ON SHEET NO 26.
2. ALL LONGITUDINAL BARS SHALL BE #5 BARS SPACED AS SHOWN UNLESS OTHERWISE NOTED.
3. ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS OTHERWISE NOTED.
4. FOR REINFORCEMENT LAP LENGTHS NOT SHOWN SEE SHEET NO. 27.
5. FOR REINFORCEMENT DEVELOPMENT LENGTHS NOT SHOWN SEE SHEETS 27 AND 28.
6. FOR DETAILS OF STEPPED FOOTING SEE DETAIL NO. RW(6.09)-83-155 ON SHEET NO. 26.
7. CONTRACTOR HAS THE OPTION OF LAPPING STEM REINFORCEMENT WITH TOE REINFORCEMENT AND/OR DOWELS AS SHOWN; OR BY EXTENDING THE TOE AND/OR DOWEL REINFORCEMENT FULL HEIGHT. HOWEVER NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR EITHER ALTERNATE.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES B. NOLAN — No. 15218 — REGISTERED PROFESSIONAL ENGINEER

DES:	BDB
DRN:	TC
CHK:	JSN
DATE:	JAN. 1997

BY	NO.	REVISION	DATE

WINGWALL DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

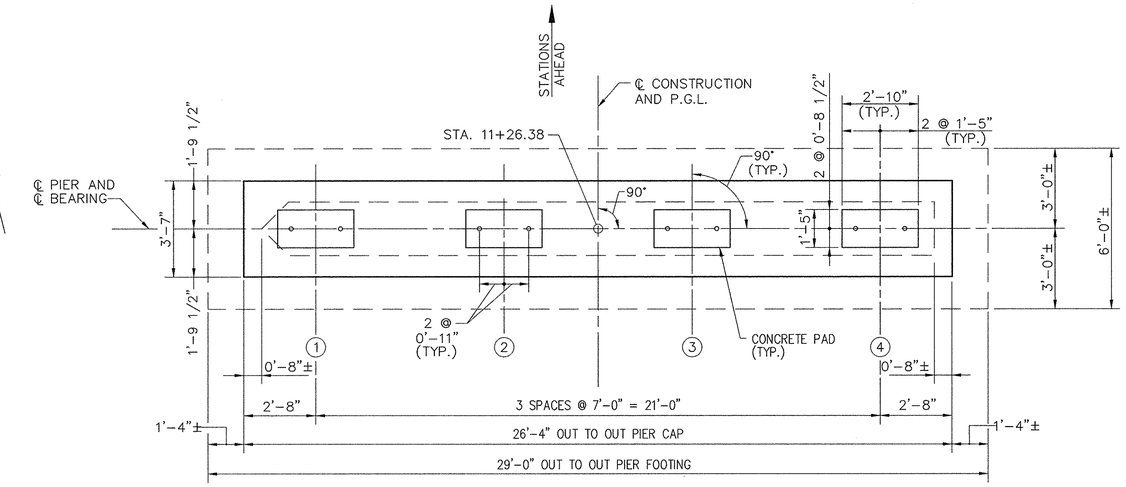
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

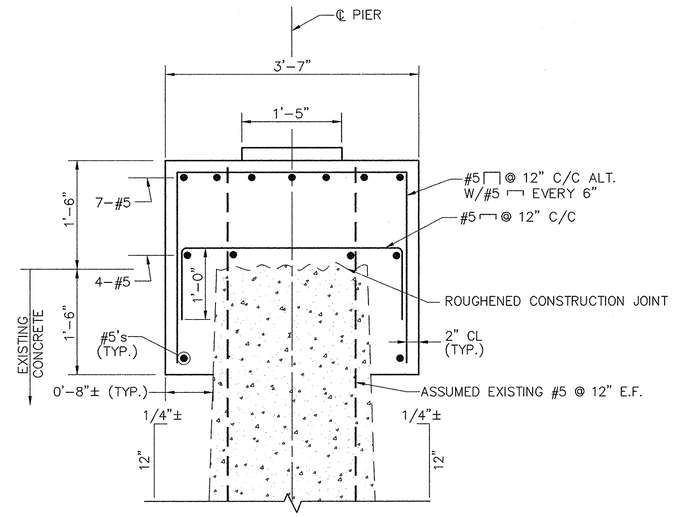
SHEET 15 OF 29

B0053_15

G:\USERS\CNOLAN\PUBLV\DBS\95023A\ACAD\95023AWMD Wed Dec 18 10:44:56 1996

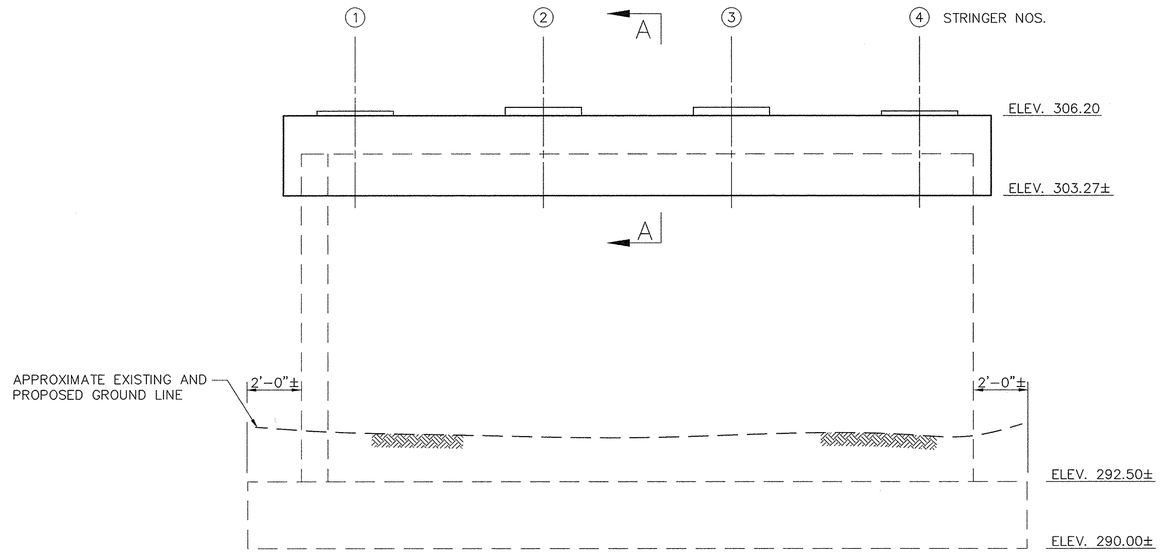


PLAN
SCALE: 3/8" = 1'-0"

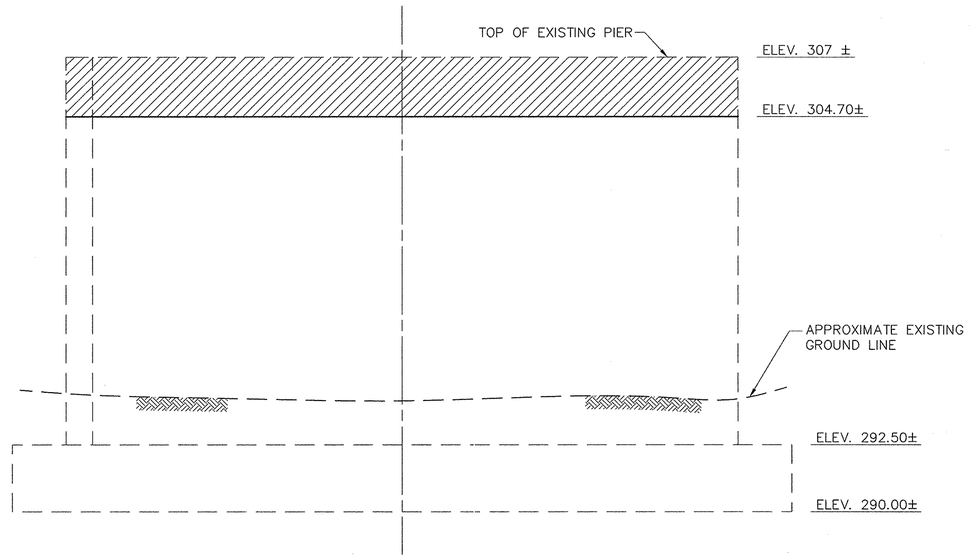


SECTION A-A
SCALE: 1" = 1'-0"

STRINGER NOS.	1	2	3	4
PAD ELEVATIONS	306.36	306.50	306.50	306.36



ELEVATION
SCALE: 3/8" = 1'-0"



EXISTING ELEVATION
SCALE: 3/8" = 1'-0"

NOTE:

1. FOR DETAILS OF CONCRETE BEARING PAD SEE DETAIL NO. BR-SB(6.02)-80-120 ON SHEET 23.
2. FOR REINFORCEMENT DEVELOPMENT LENGTHS NOT SHOWN SEE SHEETS 27 AND 28.
3. FOR REINFORCEMENT LAP LENGTHS NOT SHOWN SEE SHEET 27.
4. REFER TO SHEET 13 FOR NOTES ON METHODS OF INCORPORATING EXISTING REINFORCING STEEL INTO NEW WORK.
5. EXISTING CONCRETE REMOVAL SHOWN THUS ▨

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

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STATE OF MARYLAND — CHARLES B. DOLAN — NO. 13212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

PIER

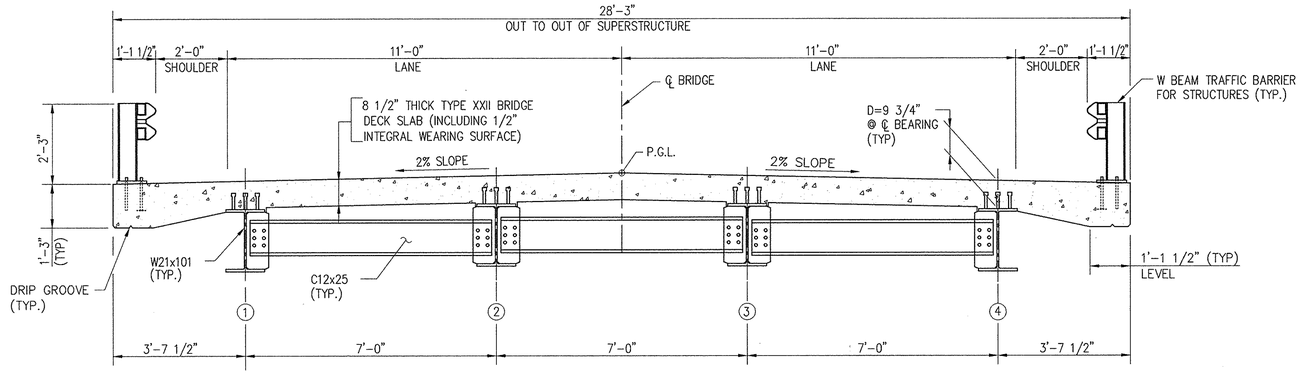
600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

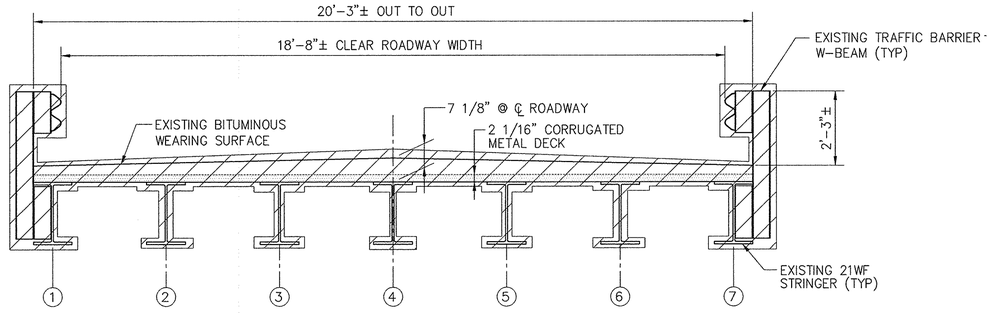
SCALE 3/8" = 1'-0"
SHEET 16 OF 29

B0053_16

G:\USERS\CNOLAN\PUBV\JOBS\95023A\ACAD\95023AP1R Wed Dec 18 10:23:59 1996



TYPICAL SECTION
SCALE: 1/2" = 1'-0"



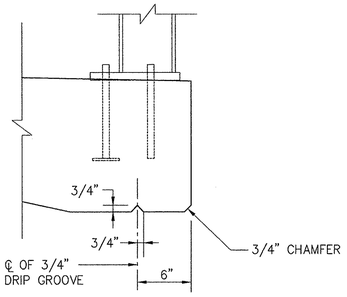
TYPICAL SECTION – EXISTING BRIDGE
SCALE = NONE

TO BE REMOVED

NOTE: FOR PORTIONS OF SUBSTRUCTURE TO BE REMOVED, REFER TO SHEETS 11 AND 12.

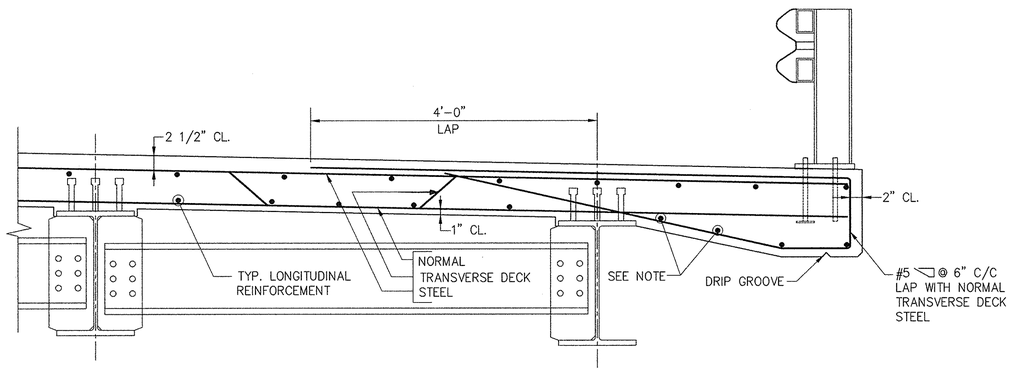
NOTES:

1. FOR ADDITIONAL STRINGER DETAILS SEE SHEET NO. 18.
2. FOR STEEL STUD SHEAR DEVELOPER EMBEDMENT DETAILS, SEE DETAIL NO. BR-SS(8.05)-75 -30 ON SHEET 26.
3. FOR DETAILS OF STEEL FORMS, WHICH REMAIN IN PLACE, SEE DETAIL NO. BR-SS(6.06)-75-29 ON SHEET 23.
4. FOR DETAILS OF CONCRETE DIAPHRAGMS AT ABUTMENTS SEE DETAIL NO. BR-SS(6.22)-80-120 ON SHEET 24.
5. FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE DETAIL NO. BR-SS(8.03)-75-11 ON SHEET 26.
6. FOR DETAILS OF BEARING STIFFENERS FOR ROLLED STEEL BEAMS, SEE DETAIL NO. BR-SS (8.08)-80-103 ON SHEET 26.
7. "D" IS MEASURED FROM TOP OF FLANGE TO TOP OF BRIDGE DECK SLAB.



DRIP GROOVE DETAIL
SCALE: 1 1/2" = 1'-0"

DEAD LOAD DEFLECTIONS									
	SPAN 1				SPAN 2				
	℄ BEARING ABUTMENT A	1/4	1/2	3/4	℄ PIER	1/4	1/2	3/4	℄ BEARING ABUTMENT B
	STRINGERS 1 AND 4								
△ STEEL	0	0.020	0.024	0.010	0	0.010	0.024	0.020	0
△ CONCRETE	0	0.185	0.217	0.094	0	0.094	0.217	0.185	0
△ S.D.L.	0	0.014	0.017	0.007	0	0.007	0.017	0.014	0
TOTAL DEAD LOAD DEFLECTION	0	0.219	0.258	0.111	0	0.111	0.258	0.219	0
	STRINGERS 2 AND 3								
△ STEEL	0	0.020	0.024	0.010	0	0.010	0.024	0.020	0
△ CONCRETE	0	0.157	0.184	0.080	0	0.080	0.184	0.157	0
△ S.D.L.	0	0.014	0.016	0.007	0	0.007	0.016	0.014	0
TOTAL DEAD LOAD DEFLECTION	0	0.191	0.224	0.097	0	0.097	0.224	0.191	0



TYPICAL OVERHANG REINFORCEMENT DETAIL
SCALE: 1" = 1'-0"

NOTE:
ALL LONGITUDINAL REINFORCEMENT IN THE DECK SLAB OVERHANG SHALL BE #5 BARS PLACED AS SHOWN.

NOTES:

1. NO DEAD LOAD AND VERTICAL CURVE CAMBER IS REQUIRED FOR STRINGERS NO. 1-4 OF SPANS NO. 1 AND 2. IF THESE BEAMS ARE NOT ROLLED EXACTLY TRUE THEY SHALL BE FABRICATED AND ERECTED WITH THEIR CONCAVE SIDES DOWN WITH A CAMBER TOLERANCE OF THREE QUARTERS (3/4) INCH OVER.
2. POSITIVE DEFLECTIONS ARE IN THE DOWNWARD DIRECTION.

LEGEND

△ STEEL: DENOTES DEFLECTION DUE TO WEIGHT OF STRUCTURE STEEL.

△ CONCRETE: DENOTES DEFLECTION DUE TO WEIGHT OF CONCRETE DECK, INCLUDING A 1/2" INTEGRAL WEARING SURFACE, HAUNCHES AND 15 P.S.F. FOR STAY IN PLACE FORMS.

△ S.D.L.: DENOTES ADDITIONAL DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD (W BEAM TRAFFIC BARRIER)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
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ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES B. NOLAN — No. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB				
DRN: TC				
CHK: JSN				
DATE: JAN. 1997				
BY	NO.	REVISION	DATE	

TYPICAL SECTION

600' SCALE MAP NO. _____ BLOCK NO. _____

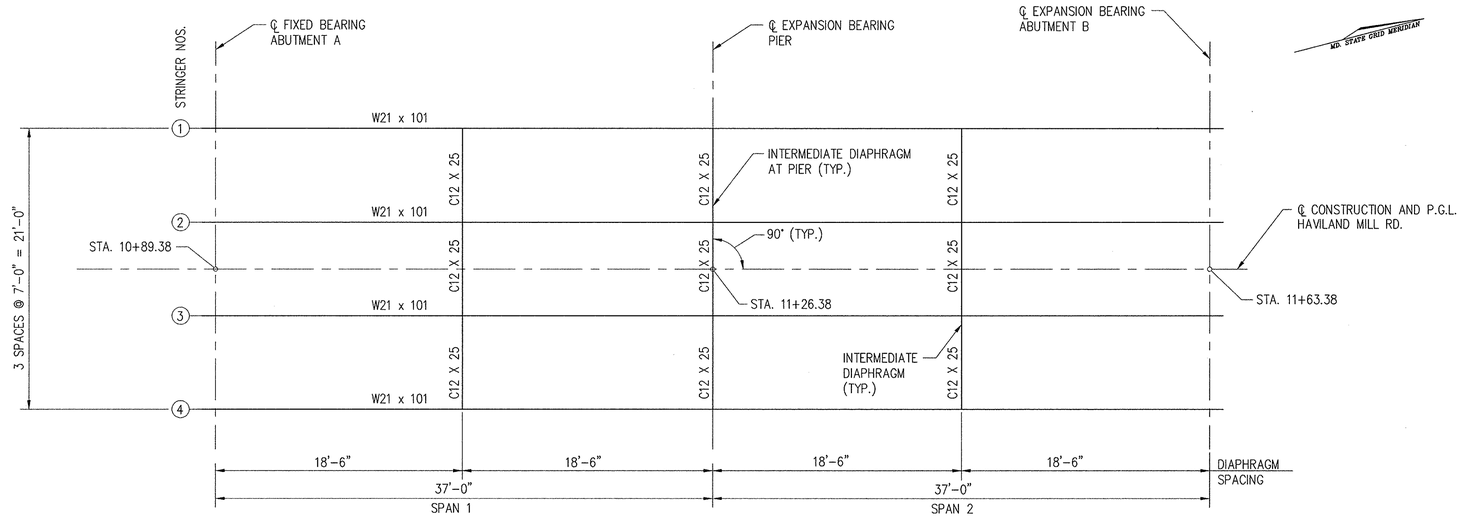
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 17 OF 29

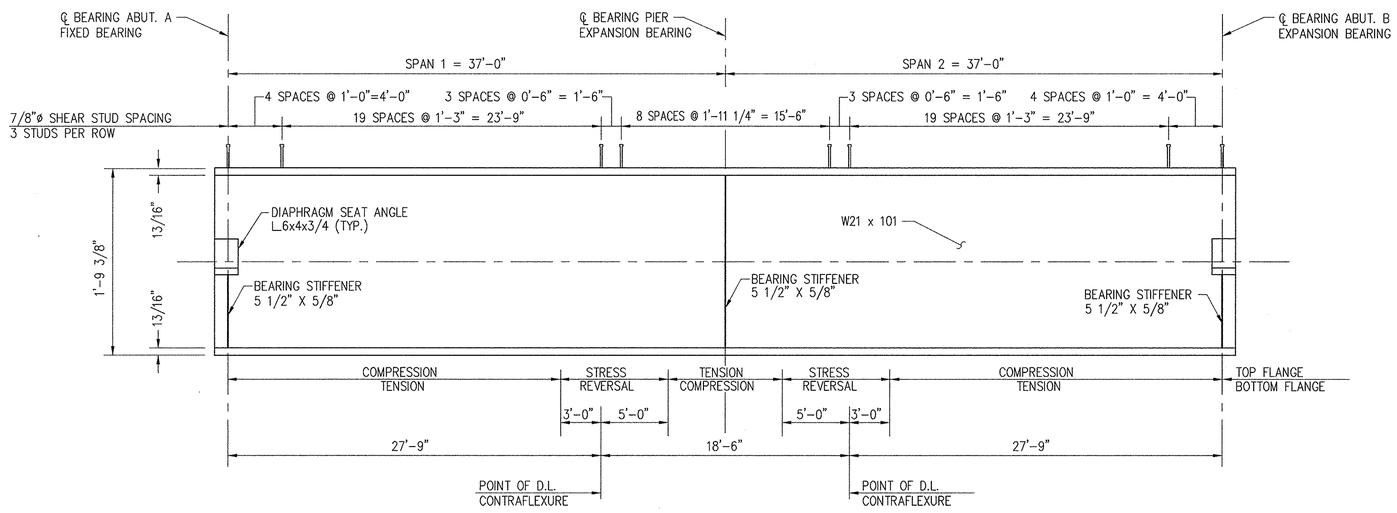
B0053-17

G:\USERS\CNOLAN\PUBV\J085\95023A\ACAD\95023ATYP Wed Dec 18 10:16:12 1996



FRAMING PLAN

SCALE: 3/16" = 1'-0"



STRINGER ELEVATION

SCALE: 3/16" = 1'-0" HORIZ.
1 1/2" = 1'-0" VERT.

NOTES:

1. FOR LAMINATED ELASTOMERIC BEARING PAD DETAILS SEE SHEET NO. 19.
2. FOR INTERMEDIATE DIAPHRAGM DETAILS SEE DETAIL NO. BR-SS(8.03)-75-11 ON SHEET NO. 26.
3. FOR ADDITIONAL SUPERSTRUCTURE DETAILS SEE SHEET NO. 19.
4. FOR BEARING STIFFENER DETAILS SEE DETAIL NO. BR-SS(8.08)-80-103 ON SHEET NO. 26.
5. FOR DETAILS OF CONCRETE DIAPHRAGM AT ABUTMENT SEE DETAIL NO. BR-SS(6.22)-80-120 ON SHEET NO. 24.
6. FOR SHEAR STUD SHEAR DEVELOPER EMBEDMENT DETAILS SEE DETAIL NO. BR-SS(8.05)-75-30 ON SHEET NO. 26.
7. FOR CLIP ANGLE DETAILS SEE DETAIL NO. BR-SS(8.02)-75-4 ON SHEET NO. 25.
8. THE TOTAL NUMBER OF STUDS FOR THIS BRIDGE IS 732.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
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STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

600' SCALE MAP NO. _____ BLOCK NO. _____

FRAMING PLAN AND STRINGER ELEVATION

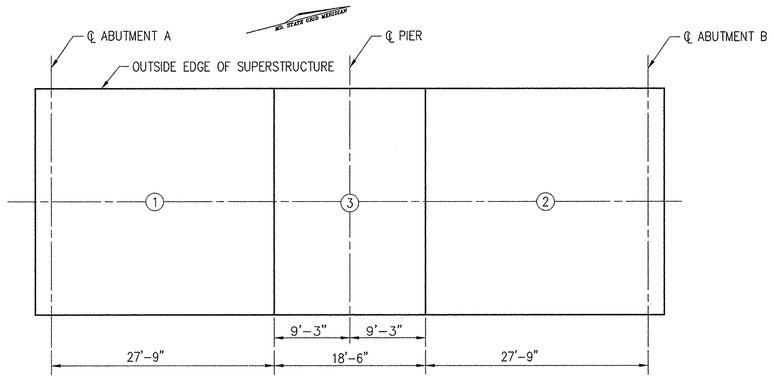
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 18 OF 29

B0053_18

G:\USERS\CNOLAN\PWP\J0859\95203A\MCAD\95234FRA Wed Dec 18 10:13:38 1996



POURING SEQUENCE – SCHEME A, B AND C

NOT TO SCALE

NOTE:

POURS NUMBERED 1 AND 2 MAY BE REVERSED.

SCHEME A NOTES:

1. THE CONTRACTOR SHALL FOLLOW THE POURING SEQUENCES SHOWN ON THESE PLANS. NO OTHER POURING SEQUENCE WILL BE ALLOWED.
2. THE POURING SEQUENCE FOR THE BRIDGE DECK SLAB SHALL BE MADE IN THE NUMBERED ORDER INDICATED, EXCEPT AS MODIFIED BELOW.
3. THERE MUST BE AT LEAST FORTY (40) HOURS BETWEEN THE COMPLETION OF ONE NUMBERED POUR AND THE START OF THE NEXT NUMBERED POUR.

SCHEME B NOTES:

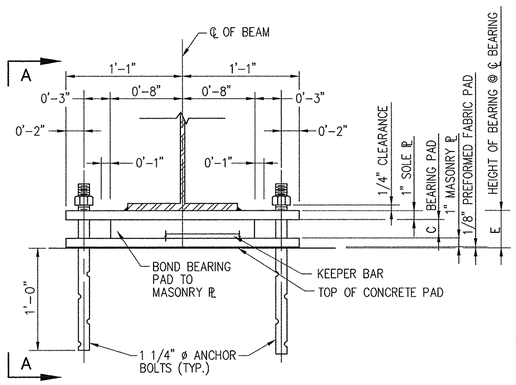
AS AN ALTERNATE TO SCHEME A, THE CONTRACTOR MAY PLACE THE POSITIVE MOMENT AREAS (i.e., POURS NUMBERED 1 AND 2) CONSECUTIVELY WITHOUT WAITING BY PROVIDING ONE FULL CREW AND TWO SETS OF EQUIPMENT. THERE MUST BE AT LEAST FORTY (40) HOURS BETWEEN THE COMPLETION OF POURS NUMBERED 1 AND 2 AND THE START OF POUR NUMBERED 3. TO USE SCHEME B, THE FOLLOWING CONDITIONS MUST BE SATISFIED:

A.) IF A BREAKDOWN OF EQUIPMENT OCCURS DURING PLACEMENT. THE SECOND SET OF EQUIPMENT SHALL BE USED TO COMPLETE THE REMAINING UNPOURED PORTION OF THE STRUCTURE.

SCHEME C NOTES:

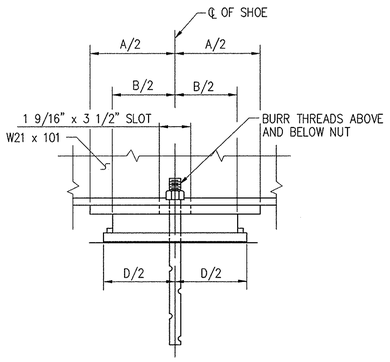
AS AN ALTERNATE TO SCHEMES A AND B, THE CONTRACTOR MAY PLACE THE ENTIRE BRIDGE DECK SLAB BY PROVIDING ONE FULL CREW AND TWO SETS OF EQUIPMENT, STARTING AT EITHER ABUTMENT AND WORKING TOWARDS THE NEAREST D.I.P. THEN FROM THE NEXT D.I.P. TO THE FAR ABUTMENT. AFTER COMPLETION OF THE POSITIVE MOMENT SECTIONS OF THE STRUCTURE (i.e., POURS NUMBERED 1 AND 2) THE NEGATIVE MOMENT SECTION MAY BE POURED. TO USE SCHEME C, THE FOLLOWING CONDITION MUST BE SATISFIED:

A.) IF A BREAKDOWN OF EQUIPMENT OCCURS DURING PLACEMENT, THE SECOND SET OF EQUIPMENT SHALL BE USED TO COMPLETE THE REMAINING UNPOURED PORTION OF THE STRUCTURE.



ELEVATION EXPANSION BEARING

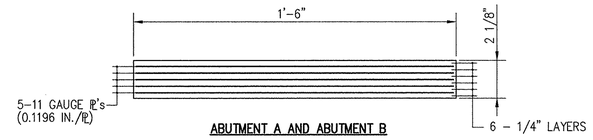
SCALE: 1 1/2" = 1'-0"



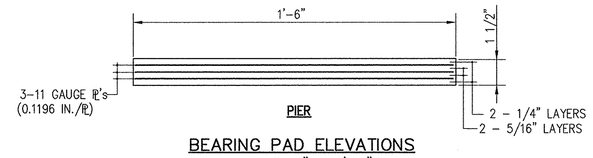
SECTION A–A EXPANSION BEARING

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

UNIT	SOLE PLATE A	LAMINATED BEARING PAD B	LAMINATED BEARING PAD C	MASONRY PLATE D	HEIGHT E
ABUTMENT A (FIXED)	13"	7"	2 1/8"	9"	4 1/4"
PIER (EXPANSION)	14"	8"	1 1/2"	10"	3 5/8"
ABUTMENT B (EXPANSION)	13"	7"	2 1/8"	9"	4 1/4"



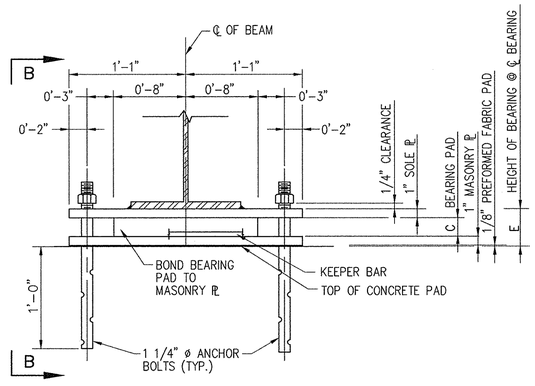
ABUTMENT A AND ABUTMENT B



PIER

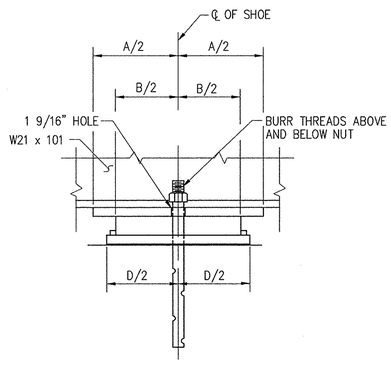
BEARING PAD ELEVATIONS

SCALE: 3" = 1'-0"



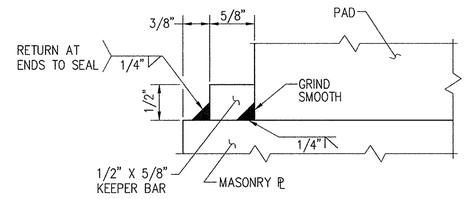
ELEVATION FIXED BEARING

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



SECTION B–B FIXED BEARING

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



KEEPER BAR DETAIL

SCALE: 1" = 1"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
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CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/10/97

NOLAN ASSOCIATES, INC.
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PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — NO. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES:	BDB
DRN:	TC
CHK:	JSN
DATE:	JAN. 1997

BY	NO.	REVISION	DATE

SUPERSTRUCTURE DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

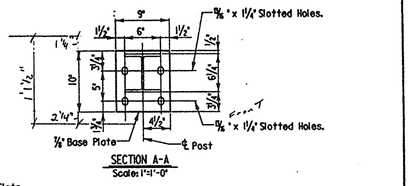
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

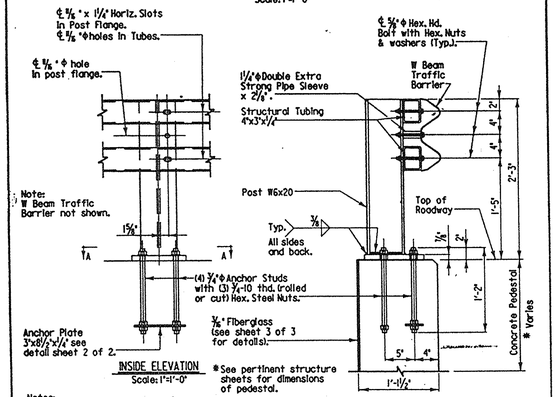
SHEET 19 OF 29

B0053-19

G:\USERS\DNOLAN\PUBS\JOBS\95023A\ACAD\95023ASSD Thu Dec 19 09:42:44 1996



SECTION A-A
Scale: 1"=1'-0"



INSIDE ELEVATION
Scale: 1"=1'-0"

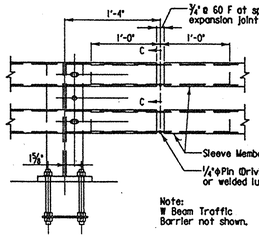
*See pertinent structure sheets for dimensions of pedestal.

SECTION
Scale: 1"=1'-0"

Notes:
1. Panel lengths of structural tubing members shall be attached continuously to a minimum of three posts except at abutments with expansion joints.
2. All steel components shall be galvanized, after fabrication, unless otherwise shown on Plans.
3. Structural tubing section shall meet ASTM A 709 Grade 50. All other steel except bolts shall meet ASTM A 709 Grade 36.
4. All anchor studs and nuts shall meet ASTM A 325.
5. Maximum post spacing 6'-3".
6. Posts shall be set vertical for level or low side roadway and perpendicular to high side superelevated roadway.
7. Fiberglass to be used only when indicated on pertinent structure sheets.

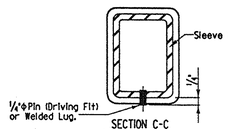
W BEAM TRAFFIC BARRIER FOR STRUCTURES

SHEET 1 OF 3

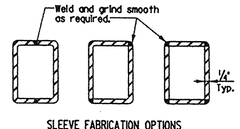


Note: W Beam Traffic Barrier not shown.

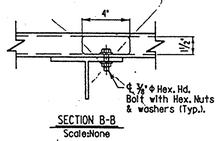
RAIL SPLICE DETAIL
Scale: 1"=1'-0"



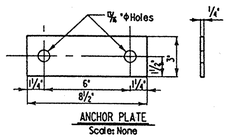
SECTION C-C
Scale: None



SLEEVE FABRICATION OPTIONS
Scale: None



SECTION B-B
Scale: None

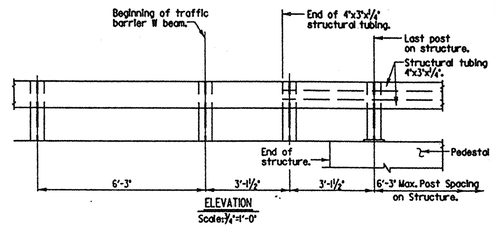


ANCHOR PLATE
Scale: None

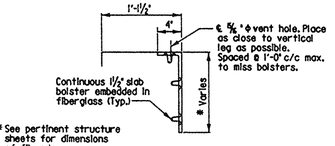
Note: The difference between the outside dimensions of the sleeve and the inside dimensions of the rail shall not exceed ⅛" along either axis.

W BEAM TRAFFIC BARRIER FOR STRUCTURES

SHEET 2 OF 3

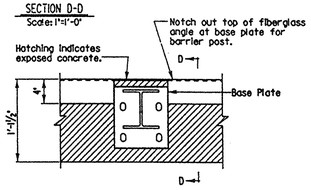


ELEVATION
Scale: ¾"=1'-0"



*See pertinent structure sheets for dimensions of fiberglass.

SECTION D-D
Scale: 1"=1'-0"



FIBERGLASS ANGLE PLAN
Scale: 1"=1'-0"

Fiberglass shall conform to the following requirements:

1. The material shall have a density of 1.25 g/cm³ min., as determined by A.S.T.M. D 792. It shall not have an absorption of more than 1.0 percent as measured by A.S.T.M. D 570.
2. The tensile strength of the material shall be measured in the longitudinal and transverse directions on specimens cut to an approximate size of ½" x 5". When tested in accordance with A.S.T.M. D 638, the average of 5 specimens in each direction shall yield a 10,000 p.s.i. minimum strength.
3. The thickness shall be ⅜" (+1/8" - 0") unless otherwise noted. The surfaces of the fiberglass designed to bond with other materials shall be free of bond inhibiting agents.
4. The color shall match Federal Standard 595-26622 gray.

W BEAM TRAFFIC BARRIER FOR STRUCTURES

SHEET 3 OF 3

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/7/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

TRAFFIC BARRIER FOR STRUCTURES DETAILS

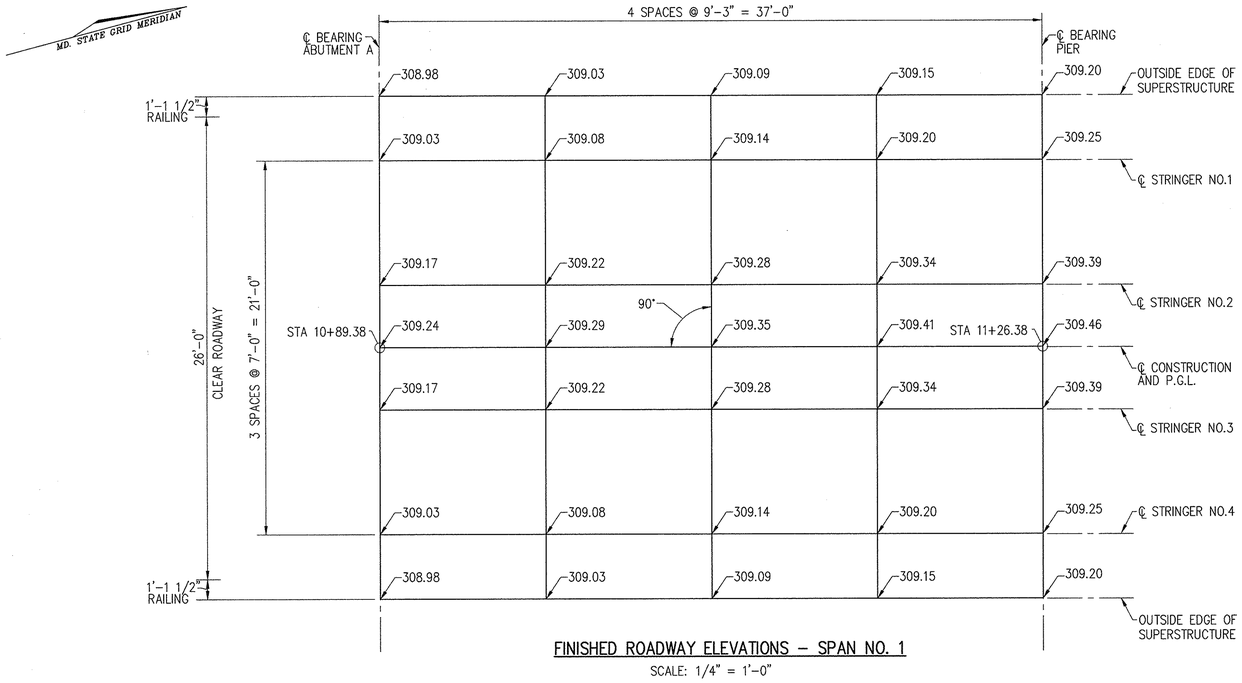
600' SCALE MAP NO. _____ BLOCK NO. _____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 20 OF 29

B0053_20

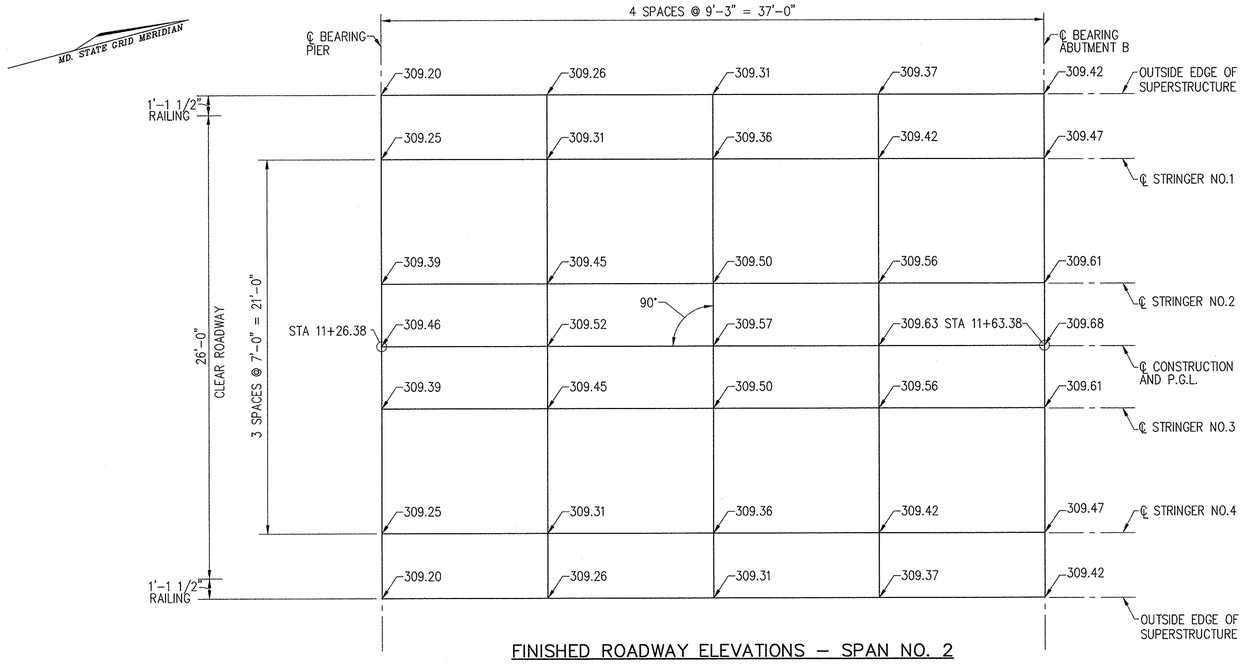


FINISHED ROADWAY ELEVATIONS – SPAN NO. 1

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

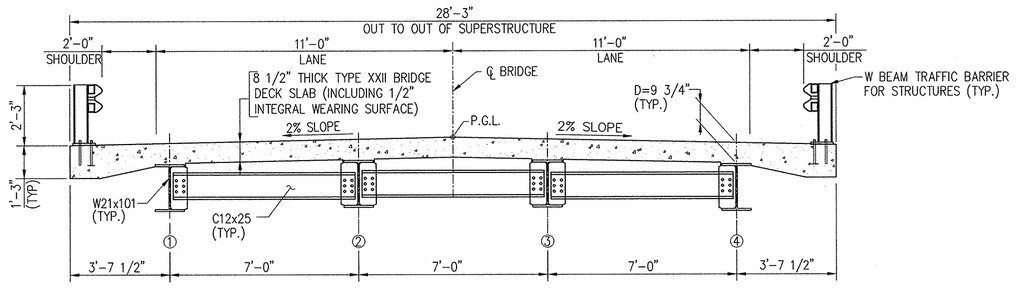
NOTES:

1. FOR VERTICAL CURVE DATA SEE SHEET NO. 3
2. FINISHED ROADWAY ELEVATIONS SHOWN ARE TOP OF PROPOSED CONCRETE DECK.



FINISHED ROADWAY ELEVATIONS – SPAN NO. 2

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



TYPICAL SECTION

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James P. Irwin 1/22/97
DIRECTOR OF PUBLIC WORKS — DATE

Robert H. Keppler 1/10/97
CHIEF, BUREAU OF ENGINEERING — DATE

Charles M. Landeo 1-20-97
CHIEF, BUREAU OF HIGHWAYS — DATE

Elizabeth A. Calvert 1/7/97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE

NOLAN ASSOCIATES, INC.
ENGINEERS – CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 *FAX: (410) 995-1363*

STATE OF MARYLAND — CHARLES S. FLOYD — 21522 — REGISTERED PROFESSIONAL ENGINEER

DES:	BDB
DRN:	TC
CHK:	JSN
DATE:	JAN. 1997

BY	NO.	REVISION	DATE

FINISHED ROADWAY ELEVATIONS

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 21 OF 29

B0053_21

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BORING LOG

SINCE 1881 — FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: W68168G — DATE: January 1996

Client: Nolan Associates

Project: Bridge M-97 Rehab, Highland, Maryland

Boring No.: B-1 (1 of 1) | Total Depth 40.0' | Elev: | Location:

Type of Boring: Wash Boring | Started: 12/27/95 | Completed: 12/27/95 | Driller: N. Lazaro, CME-55

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Feet)	Moisture Content%	REMARKS
		0-12' bridge deck and open air to footing				Water Levels: Stream Level at 16' below bridge deck
-12.0	12.0	Concrete footing; 2.5' of good concrete 1.5' of possible mud mat				
-16.0	16.0	Brown, silty SAND, some rock fragments, little mica (SM) Decomposed Rock	35-34-33	18.0 19.5	10.8	
			35-34-50/4"	22.0 23.5	16.7	
			100/6"	27.0 28.5	10.9	
-30.0	30.0	Split Spoon Refusal at 30 feet	3"/3"	29.5 29.8	13.2	
		Gray schist bedrock consisting of 1" to 5" long pieces of solid core, numerous horizontal fractures, slightly weathered, some filled with mica REC=100% RQD=22%		30.0 35.0		
-35.0	35.0	Gray schist bedrock consisting of 1" to 5" long pieces of solid core, numerous horizontal fractures, slightly weathered, some filled with mica, quartz seams at 39.2 and 39.8' REC=100% RQD=27%		40.0		
-40.0	40.0	BORING TERMINATED AT 40 FEET.				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

SINCE 1881 — FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: W68168G — DATE: January 1996

Client: Nolan Associates

Project: Bridge M-97 Rehab, Highland, Maryland

Boring No.: B-2 (1 of 1) | Total Depth 32.0' | Elev: | Location:

Type of Boring: Wash Boring | Started: 12/28/95 | Completed: 12/28/95 | Driller: N. Lazaro, CME-55

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Feet)	Moisture Content%	REMARKS
		0-17' bridge deck and open air to footing				Water Levels: Stream Level at 16' below bridge deck
-17.0	17.0	Concrete footing				
-19.5	19.5	Brown, weathered schist bedrock consisting of 1/4" to 1" thick pieces solid core, numerous near horizontal fractures, slightly weathered with some sand. REC=100% RQD=0		19.5		
-22.0	22.0	Gray schist bedrock consisting of 1/4" to 5" long pieces of solid core. Numerous near horz breaks with slight weathering. REC=100% RQD=21%		22.0		
-27.0	27.0	Gray schist bedrock consisting of 1/2" to 4" long pieces of solid core. Numerous near horz breaks with slight weathering. Verical fractures at 30.2' to 30.4', and 31.1 to 31.6'. REC=100% RQD16%		27.0		
-32.0	32.0	BORING TERMINATED AT 32 FEET.		32.0		

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

SINCE 1881 — FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: W68168G — DATE: January 1996

Client: Nolan Associates

Project: Bridge M-97 Rehab, Highland, Maryland

Boring No.: B-3 (1 of 1) | Total Depth 19.1' | Elev: | Location:

Type of Boring: Wash Boring | Started: 12/29/95 | Completed: 12/29/95 | Driller: N. Lazaro, CME-55

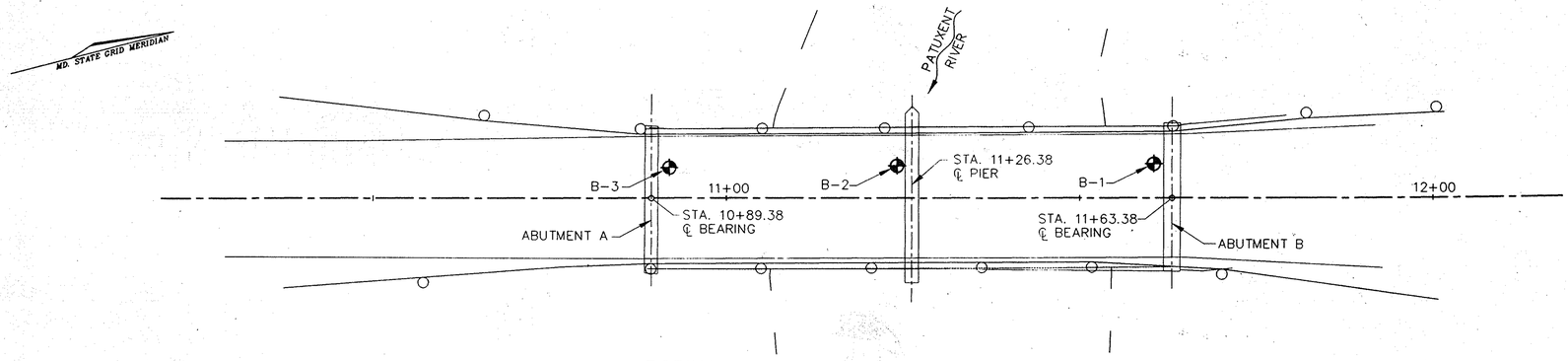
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (Feet)	Moisture Content%	REMARKS
		0-12' bridge deck and open air to footing.				Water Levels: Stream Level at 16' below bridge deck
-12.0	12.0	Concrete footing, 4'3" thick.				
-16.2	16.2	Gray, fine to coarse SAND and GRAVEL, wet, dense (SP) --- Decomposed rock at 18.3'	25-20-18	17.0 18.5		
-19.0	19.0	ROLLER CONE REFUSAL AT 19 FEET ON BEDROCK.				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

DATUM EL. 265.50

DATUM EL. 265.50

BORINGS AND DRIVE TESTS
SCALE= 1/4" = 1'-0"



BORINGS AND DRIVE TESTS LOCATION PLAN
SCALE= 1" = 10'-0"

NOTES:

1. BORINGS AND DRIVE TESTS WERE TAKEN IN DECEMBER, 1995 BY FROEHLING & ROBERTSON, INC.
2. N = BLOWS ON SAMPLING SPOON BY 140 LB. WEIGHT FALLING 30" INDICATING SUCCESSIVE SIX (6) INCH INCREMENTS OF PENETRATION IN LIEU OF BLOWS PER FOOT, PENETRATIONS LESS THAN 6" ARE INDICATED BY NO. OF BLOWS OVER THE DEPTH OF PENETRATION.
3. % = % OF ROCK CORE RECOVERY WITHIN RANGE INDICATED, RQD = % ROCK QUALITY DESIGNATION.
4. BORINGS AND SAMPLINGS CONFORM TO AASHTO DESIGNATION T-206 AND T-225.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/9/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: JSN
DRN: TC
CHK: CSN
DATE: JAN. 1997

BY	NO	REVISION	DATE

BORING PLAN

600' SCALE MAP NO. _____ BLOCK NO. _____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO.
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 22 OF 29

B0053_22

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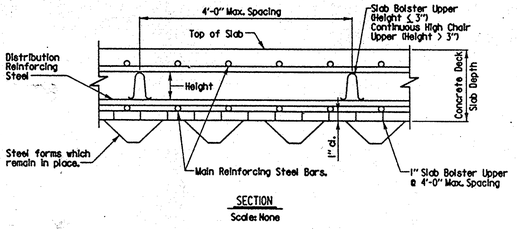


SECTION
Scale: None

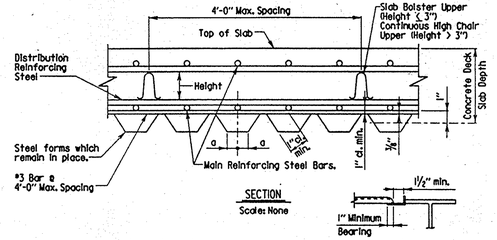
Notes:
1. For notes see sheet 1 of 2.
2. This detail is acceptable only on structures where the General Notes under "Loading" states "and 15 pounds per square foot for use of bridge deck forms.
3. Supports for rebar shall be provided by Contractor.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

STEEL FORMS WHICH REMAIN IN PLACE FOR CONCRETE SLABS ON STEEL STRINGERS RE-BARS INDEPENDENT WITH TROUGH

NO. BR-SS(6.06)-75-29 SHEET 2 OF 2

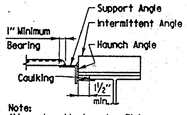
Notes:
1. The Contractor has the option of substituting the Ancel Frame Scaffolding System for steel forms which remain in place with the following exceptions:
   a) Bridges over existing highways.
   b) Bridges over high speed or electrified railroads.
2. Ancel Frames may never be used on any fracture 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

Notes:
1. Permanent steel deck forms and supports shall conform to 909.10. 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 dust primer, Federal Specification TT-P-641d, Type II, no 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 rebar pattern. For bridge with curved stringers or bridge with a flared rebar pattern only the detail shown on sheet 2 of 2 can be used.
5. Where shear connectors are utilized, normal manufacturers detailing may be utilized at stringer flange.
6. Supports for rebar shall be provided by Contractor.



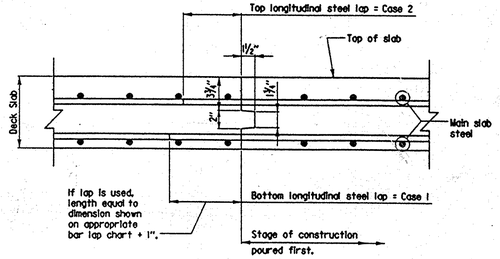
Note:
Alternate attachments will be considered, that provide the 1½" concrete encasement of top flange.

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

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

STEEL FORMS WHICH REMAIN IN PLACE FOR CONCRETE SLABS ON STEEL STRINGERS RE-BARS ALIGNED WITH TROUGH

NO. BR-SS(6.06)-75-29 SHEET 1 OF 2



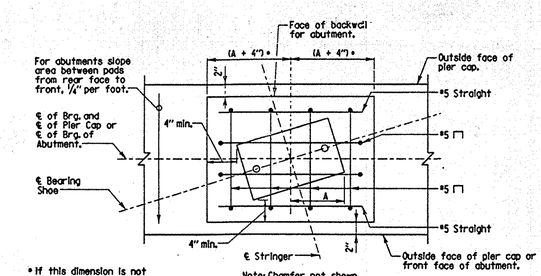
SECTION
Scale: 1½" = 1'-0"

Notes:
1. Reinforcing steel to be continuous thru joint.
2. Entire face of construction joint shall be coated with an approved epoxy bonding compound.
3. All dimensions shown are actual dimensions.
4. See lap charts for length of splices.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

BRIDGE DECK SLAB DETAIL AT TRANSVERSE CONSTRUCTION JOINT

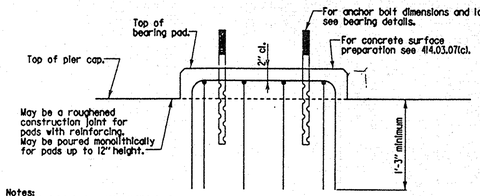
NO. BR-SS(6.07)-77-68 SHEET 1 OF 1



* 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.

Note: Chamfer not shown.

PLAN
Scale: 1" = 1'-0"



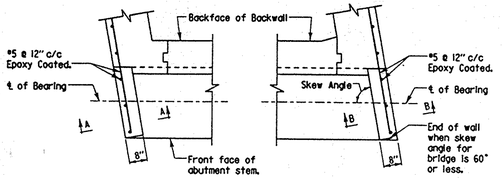
ELEVATION
Scale: 1" = 1'-0"

Notes:
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 nonshrink grout. Nonshrink 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 nonshrink grout shall have a minimum expansion of 0.0% after 7 days when tested in accordance with AASHTO T-160.
5. For size of pad see pertinent substructure sheets. If not available see note in plan above.
6. Space reinforcing steel to clear anchor bolts.

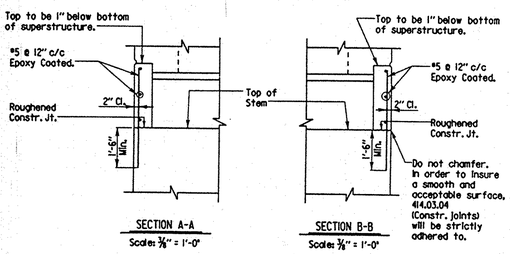
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

BEARING PAD WHERE ONLY A SINGLE SHOE IS REQUIRED ON A SUPPORT

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



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



SECTION A-A
Scale: 3/16" = 1'-0"

SECTION B-B
Scale: 3/16" = 1'-0"

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

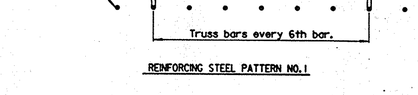
CHEEK WALL AT BRIDGE ABUTMENT

NO. BR-SB(6.10)-85-176 SHEET 1 OF 1

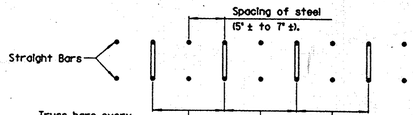
NOTES

Design:
1. Latest A.A.S.H.T.O. 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.
3. When the effective span is less than 5'-9", all bars shall be straight top and bottom. No truss bars are to be used.

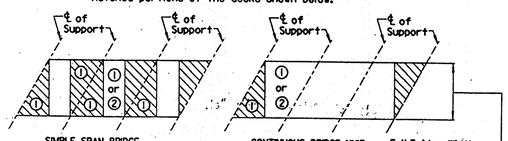


REINFORCING STEEL PATTERN NO. 1

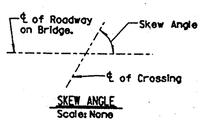


REINFORCING STEEL PATTERN NO. 2

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.



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



SKEW ANGLE
Scale: None

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

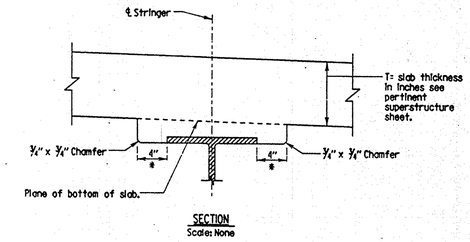
BRIDGE DECK SLAB GENERAL NOTES AND BAR SPACING

NO. BR-SS(6.11)-79-90 SHEET 1 OF 2

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

BRIDGE DECK SLAB GENERAL NOTES AND BAR SPACING

NO. BR-SS(6.11)-79-90 SHEET 2 OF 2



SECTION
Scale: None

Note:
1. * Omit concrete haunch by dropping bottom of concrete slab to bottom of top flange on spans of 30'-0" or less c/c of bearings.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

CONCRETE HAUNCH DETAIL FOR BRIDGE DECKS FORMED WITH TIMBER

NO. BR-SS(6J7)-79-98 SHEET 1 OF 1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/7/97

NOLAN ASSOCIATES, INC.
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PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

STANDARD DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

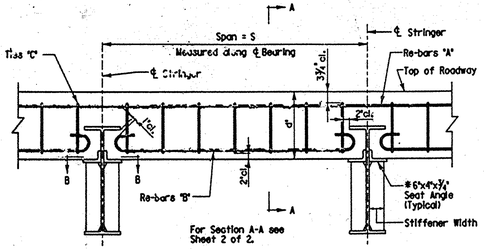
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 23 OF 29

B0053_23

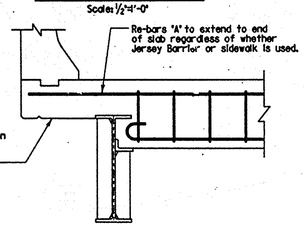
G:\USERS\CNOLAN\PUBS\950223A\MCAD\950223STN Thu Oct 31 15:53:34 1996



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

ELEVATION AT INTERIOR BEAM

Scale: ½"=1'-0"



ELEVATION AT EXTERIOR BEAM

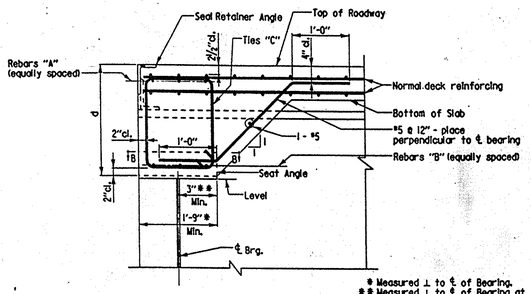
Scale: ½"=1'-0"

Note:
1. For Section B-B, see Standard No. BR-SS18.121-85-170.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

CONCRETE DIAPHRAGMS AT PIERS (WITH EXPANSION JOINTS) AND AT ALL ABUTMENTS

NO. BR-SS16.22)-80-120 SHEET 1 OF 2



SECTION A-A

Scale: None

* Measured ⊥ to ℄ of Bearing.
** Measured ⊥ to ℄ of Bearing at Edge of Bearing Stiffener.

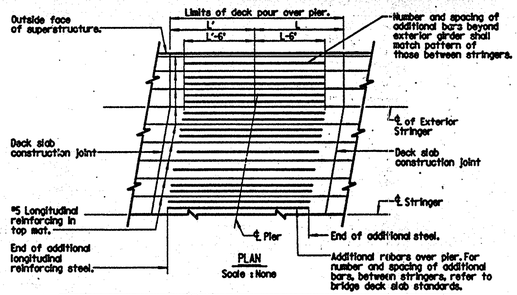
Span = S	Depth of Diaphragm = d	Re-bars "A"	Re-bars "B"	Ties "C"
Up to 8'	1'-11"	3-#7's	3-#7's	#5 @ 9" Spacing Maximum Place ⊥ to ℄ Bearing
over 8' to 11'	1'-11"	3-#8's	3-#8's	
over 11' to 14'	2'-0"	3-#8's	3-#8's	
over 14' to 16'	2'-1"	3-#9's	3-#9's	

Note:
1. Studs and anchors for seal retainer angle, not shown.
2. All reinforcing steel sizes and spacings based on ASTM Designation A-615, Grade 60 (fs = 24,000 p.s.i.).
3. For Section B-B, see Standard No. BR-SS18.121-85-170.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

CONCRETE DIAPHRAGMS AT PIERS (WITH EXPANSION JOINTS) AND AT ALL ABUTMENTS

NO. BR-SS16.22)-80-120 SHEET 2 OF 2

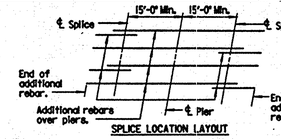


PLAN

Scale: None

Bridge # M-97	Description HAVILAND MILL RD.		
Location	L' (Back Stationing Span)	L (Ahead Stationing Span)	Bar Size *
Pier 1	9'-3"	9'-3"	#5
Pier			
Pier			
Pier			
Pier			
Pier			

*All bars to be #5 unless otherwise noted in this column.



SPLICE LOCATION LAYOUT

Note:
1. If additional longitudinal reinforcing in pour requires splicing, then the reinforcing shall be spliced as per Splice Location Layout.

STATE OF MARYLAND
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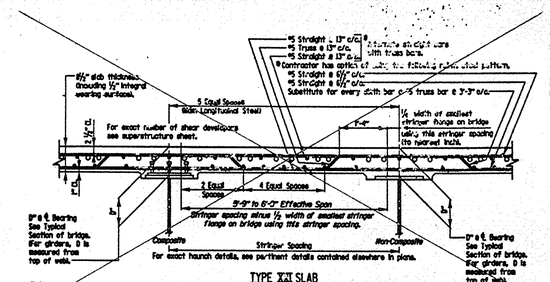
ADDITIONAL LONGITUDINAL REINFORCING IN TOP OF CONTINUOUS DECK SLABS OVER PIERS

NO. BR-SS16.30)-88-195 SHEET 1 OF 1

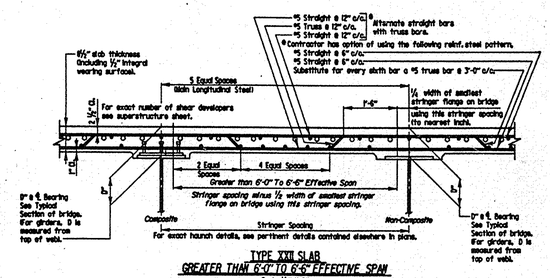


TYPE XVII SLAB

5'-9" TO 6'-5" EFFECTIVE SPAN

Scale: ½"=1'-0"

Note:
For effective spans less than 5'-9" see Note 3 on 516 No. BR-SS16.10-79-50.



TYPE XVII SLAB

GREATER THAN 6'-0" TO 6'-5" EFFECTIVE SPAN

Scale: ½"=1'-0"

Note:
Slanted lettering indicates notes "For Office Use Only."

Note:
1. All steel sizes and spacing based on ASTM Designation A-615, Grade 60 (fs=24,000 p.s.i.).
2. Transverse bars to be placed normal to centerline of stringers. For curved girder see BR-SS16.10-79-50.
3. All longitudinal bars are to be #5's placed as shown except if Note 4 requires and indicates larger bars.
4. 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 Detail No. BR-SS16.30-88-195 for the lengths and size of these additional bars.

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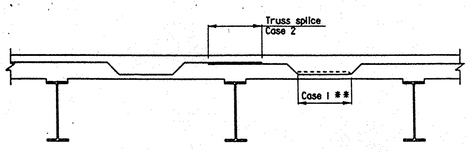
TYPE XVII AND XVIII BRIDGE DECK SLABS HS25 LOADING

NO. BR-SS16.32)-89-209 SHEET 1 OF 1



** This splice location can only be used if truss bottom leg dimension is greater than or equal to lap length.

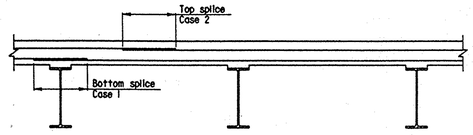
No more than one splice may occur within each 45'-0" width of deck.

All bars must splice in the same plane (all in top of slab or all in bottom of slab).

SECTION

OPTIONAL TRANSVERSE TRUSS BAR SPLICE

Scale: None



Optional splices shown may not be used for decks 45'-0" or less in width.

SECTION

OPTIONAL TRANSVERSE STRAIGHT BAR SPLICE

Scale: None

Notes:
1. See sheet 2 of 2 for longitudinal steel splice details.
2. Refer to pertinent bar lap charts for definition of cases and lap lengths.

STATE OF MARYLAND
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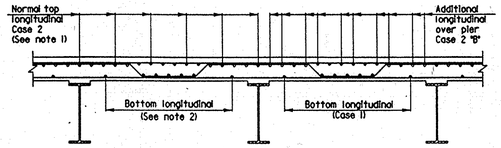
OFFICE OF BRIDGE DEVELOPMENT

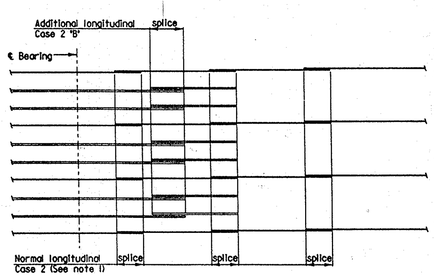
BRIDGE DECK SLAB SPLICE LOCATIONS

NO. BR-SS16.42)-95-311 SHEET 1 OF 2



SECTION

Scale: None



PLAN

TOP LONGITUDINAL SPLICES

Scale: None

Notes:
1. Top normal longitudinal splice length shall not be increased in area of additional longitudinal bars over pier.
2. Category of bottom longitudinal splice based on spacing of bars in bottom of truss.

Spacing
(Category B or C)

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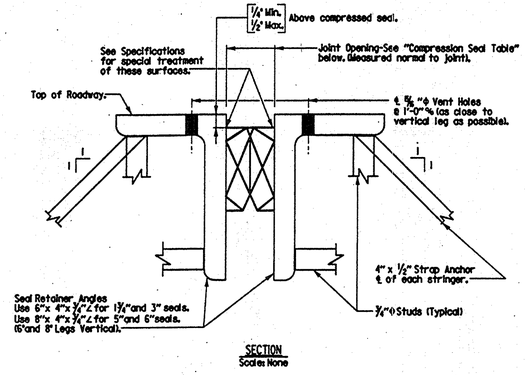
BRIDGE DECK SLAB SPLICE LOCATIONS

NO. BR-SS16.42)-95-311 SHEET 2 OF 2



SECTION

Scale: None

COMPRESSION SEAL TABLE

Location	Uncompressed Seal Width	Joint Opening a 40°F	50°F	60°F	70°F	80°F	90°F	Movement Rating
ABUTMENT A	1¾"	1⅛"	1⅛"	1¼"	1⅛"	1⅛"	1⅛"	0.56"
ABUTMENT B	3"	2 1/16"	2"	1⅝"	1 7/8"	1 13/16"	1 ¾"	1.25"
	5"			3"				2.50"
	6"			3⅜"				2.85"

Note:
1. The 1¾" 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.

STATE OF MARYLAND
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STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

COMPRESSION SEAL JOINT AND RETAINING ANGLE DETAIL

NO. BR-SS17.01)-77-63 SHEET 1 OF 1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 4/7/97

NOLAN ASSOCIATES, INC.
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PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN.1997

BY	NO.	REVISION	DATE

STANDARD DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 24 OF 29

B0053_24

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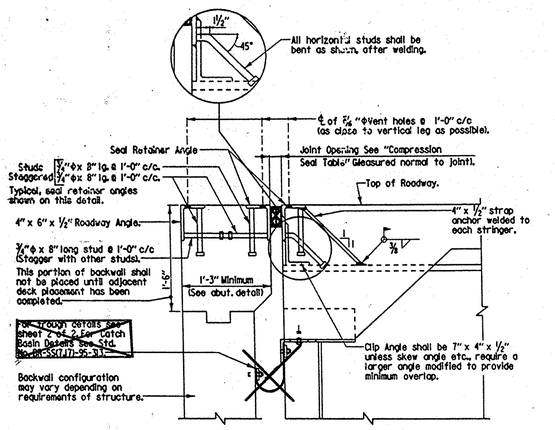


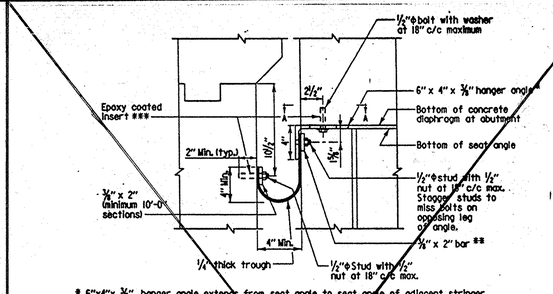
SECTION
Scale: 1" = 1'-0"

Notes:
1. New bridge details shown.
2. When used for deck rehabilitation see Standard No. BR-SS18.06)-78-72 showing special attachment of new clip angle.
3. Compression seal to be placed in one continuous piece, after joint angles are set, and deck and entire backwall are in place.
4. See Standard No. BR-SS17.01)-77-63 for additional details.
5. Ship and erect seal retaining angles as a unit.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

COMPRESSION SEAL ROADWAY JOINTS AT ABUTMENTS

NO. BR-SS17.02)-79-64 SHEET 1 OF 2



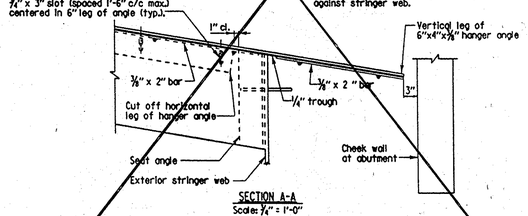
* 6"x4"x ⅜" hanger angle extends from seat angle to seat angle of adjacent stringer. Extend vertical leg of angle beyond exterior stringer to support trough. See Section A-A.

** Bar discontinuous at stringer web. See Section A-A.

*** At the Contractor's option drilled anchor inserts or cast-in-place studs may be used. No additional compensation will be allowed for either of these options.

SECTION
Scale: 1½" = 1'-0"

After trough is in place move 6" x 4" hanger angles back to tighten neoprene against stringer web.



SECTION A-A
Scale: ¾" = 1'-0"

Notes:
1. All angles and bar plates shall be unpainted A 709 Grade 36 galvanized steel.
2. All bolts, studs, and nuts shall be unpainted A 709 Grade 36 galvanized steel.
3. Trough material shall conform to 911.11.
4. Holes in trough material shall be drilled in the field.

STATE OF MARYLAND
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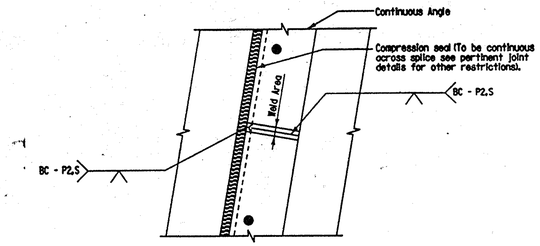
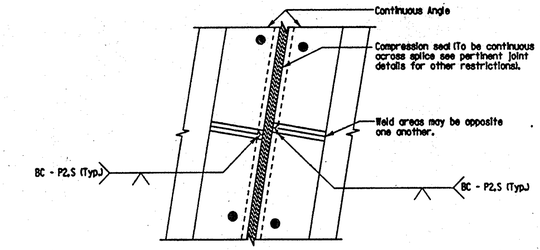
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

NEOPRENE TROUGH DETAILS FOR COMPRESSION SEAL ROADWAY JOINTS AT ABUTMENTS

NO. BR-SS17.02)-79-64 SHEET 2 OF 2



PLAN
JOINT AT ABUTMENTS - WHERE ONE SIDE OF JOINT IS ARMORED
Scale: None



PLAN
JOINT AT PIERS AND ABUTMENTS - WHERE BOTH SIDES OF JOINTS ARE ARMORED
Scale: None

Note:
Whenever possible the need for this splice should be limited. Preferably, the minimum spacing between joints shall be 40'. If there are breaks in the crown or if the joint is skewed, splices may be made at all breaks in slope and may follow the direction of centerline of bridge instead of being perpendicular to centerline of bearing.

STATE OF MARYLAND
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ROADWAY JOINT ANGLE SHOP SPLICES FOR NON-SEQUENTIAL CONSTRUCTION

NO. BR-SS17.(5)-86-198 SHEET 1 OF 1

GENERAL NOTES

Specifications: Latest Specifications and Special Provisions for materials and construction. Latest AASHTO Standard Specifications for Highway Bridges for design.

Materials: Catch basins shall be fiberglass conforming to 921.13.

Downspouts shall be fiberglass or PVC.

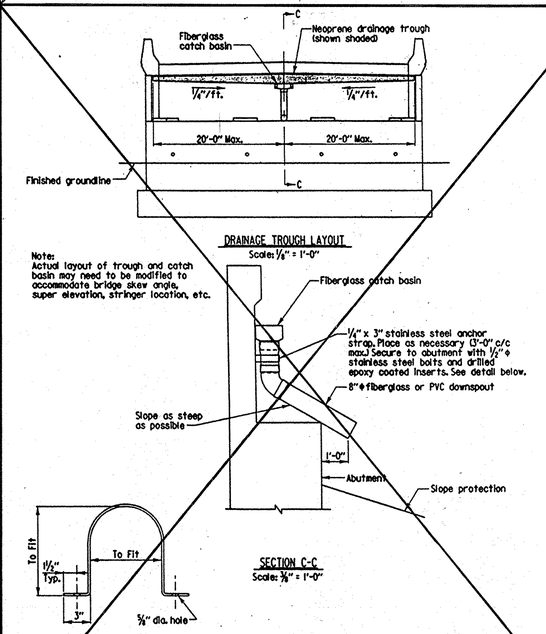
Stainless steel bolts shall conform to A 193, Identification Symbol B 8 Type 304.

Measurement and Payment: The furnishing, fabricating, erecting, etc. of the drainage trough, catch basins, and downspouts, complete in place, shall be included in the pertinent superstructure concrete, item.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

DRAINAGE TROUGH CATCH BASIN GENERAL NOTES

NO. BR-SS17.17)-95-313 SHEET 1 OF 3



DRAINAGE TROUGH LAYOUT
Scale: ⅛" = 1'-0"

Note:
Actual layout of trough and catch basin may need to be modified to accommodate bridge skew angle, super elevation, stringer location, etc.

SECTION C-C
Scale: ⅜" = 1'-0"

ANCHOR STRAP DETAIL
Scale: 1½" = 1'-0"

STATE OF MARYLAND
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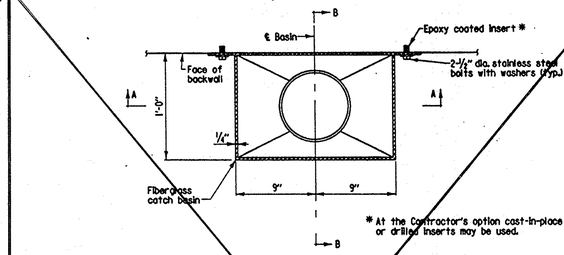
OFFICE OF BRIDGE DEVELOPMENT

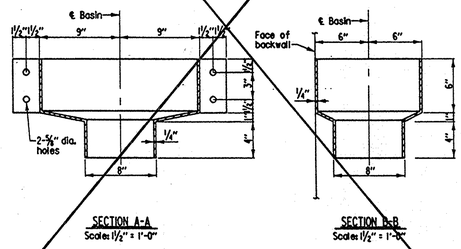
DRAINAGE TROUGH CATCH BASIN CATCH BASIN LOCATION DETAILS

NO. BR-SS17.17)-95-313 SHEET 2 OF 3



* At the Contractor's option cast-in-place or drilled inserts may be used.

DRAINAGE TROUGH CATCH BASIN
Scale: 1½" = 1'-0"



SECTION A-A
Scale: 1½" = 1'-0"

SECTION B-B
Scale: 1½" = 1'-0"

STATE OF MARYLAND
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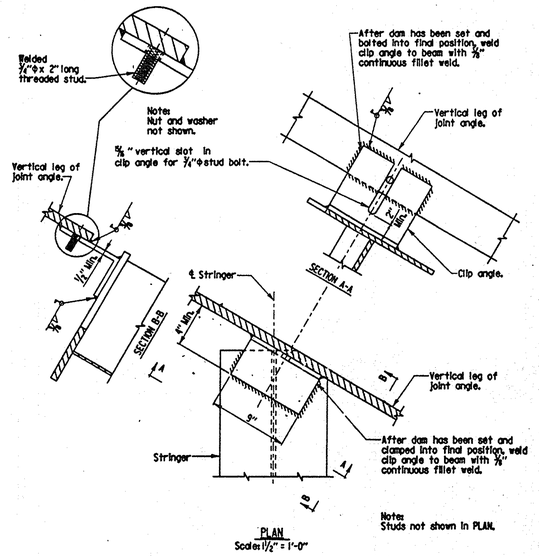
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

DRAINAGE TROUGH CATCH BASIN DETAILS

NO. BR-SS17.17)-95-313 SHEET 3 OF 3



PLAN
Scale: 1½" = 1'-0"

Notes:
Studs not shown in PLAN.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

CLIP ANGLE DETAIL

NO. BR-SS18.02)-75-4 SHEET 1 OF 1

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/7/97

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BY	NO.	REVISION	DATE

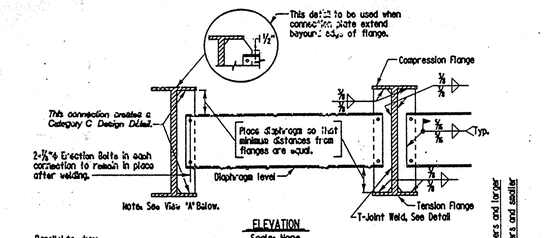
STANDARD DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

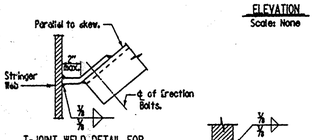
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

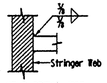
SHEET 25 OF 29



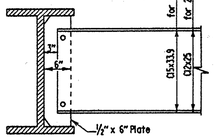
ELEVATION
Scale: None



T-JOINT WELD DETAIL FOR SKEW ANGLE OVER 70° TO 90°
Scale: None



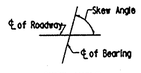
T-JOINT WELD DETAIL FOR SKEW ANGLE 70° OR LESS
Scale: None



VIEW A
Scale: None

Notes:
1. *Slant lettering indicates notes "For Office Use Only"*
2. Where the angle between the center line of roadway and the center line of bearing is 70° or less place diaphragms at 90 to the stringers. diaphragms shall be spaced as shown in detail this sheet and as noted below.
3. Where aforementioned angle is greater than 70° the diaphragms shall be parallel to the centerline of bearing of the stringers.
4. Space intermediate diaphragms at 20'± to 25'±, i.e. for spans. Non-curved bridges only).
   Up to 25'ø bearings-no intermediate Diaphragm.
   From 25' to 50'ø bearings-One intermediate Diaphragm.
   From 50' to 75'ø bearings-Two intermediate Diaphragms, etc.
   (See Framing Plan).
5. All diaphragms are to be completely connected to stringers before deck slab is poured.

DIAPHRAGM SPACING 70° OR LESS SKEW
Scale: None

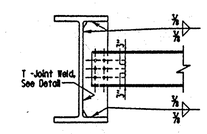


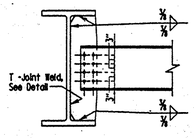
SKEW ANGLE
Scale: None

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

ROLLED STEEL BEAMS
INTERMEDIATE DIAPHRAGM DETAILS
WELDED CONNECTIONS

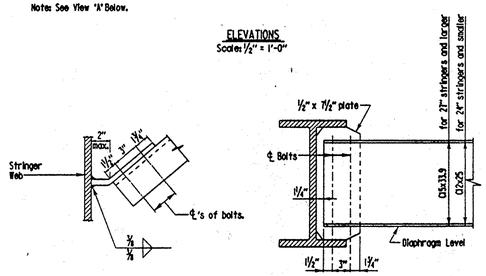
NO. BR-SS18.03)-75-11 SHEET 1 OF 2





Note: See View "A" Below.

ELEVATIONS
Scale: ½" = 1'-0"



Note: Dimensions shown are for 90° connections.

T-JOINT WELD DETAIL FOR SKEW ANGLE OVER 70° TO 90°
Scale: None

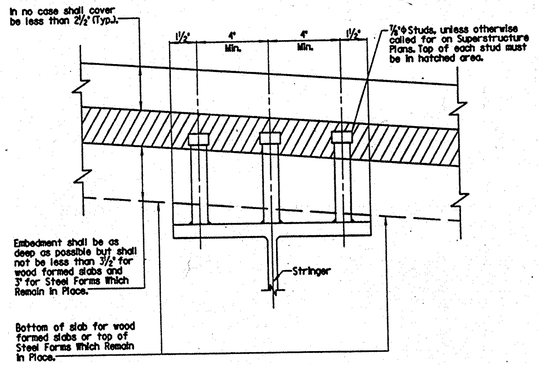
VIEW 'A'
Scale: None

Notes:
1. For notes and all details not shown see sheet 1 of 2.
2. Contractor has option to use either welded or bolted connection. However only one type of connection may be used per bridge.
3. All bolts to be ⅞"ø ASTM A325.
4. All bolts holes to be 15/16"ø.
5. Bolt spacing applies regardless of skew.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

ROLLED STEEL BEAMS
INTERMEDIATE DIAPHRAGM DETAILS
BOLTED CONNECTIONS

NO. BR-SS18.03)-75-11 SHEET 2 OF 2



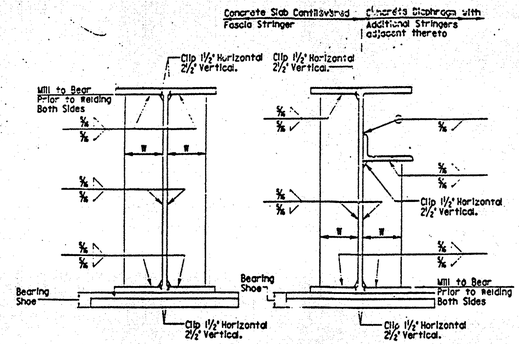
ELEVATION
Scale: None

Notes:
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.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

STEEL STUD SHEAR
DEVELOPER EMBEDMENT DETAIL

NO. BR-SS18.05)-75-30 SHEET 1 OF 1



AT PIERS
(WHERE STRINGER IS CONTINUOUS OVER SUPPORT)
Scale: None

AT PIERS
(WHERE STRINGER IS NOT CONTINUOUS OVER SUPPORT) AND AT ABUTMENTS
Scale: None

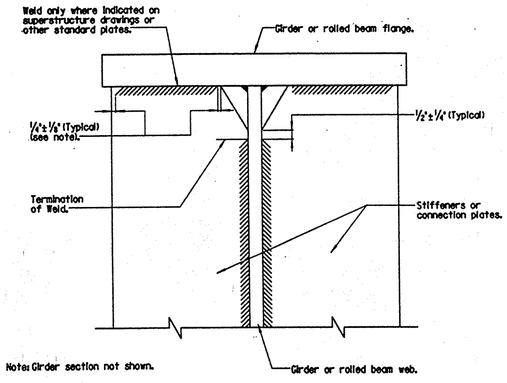
Location	Web Stiffener Width	Stiffener Thickness
Abutment A	5 1/2"	5/8"
Pier	5 1/2"	5/8"
Pier		
Pier		
Abutment B	5 1/2"	5/8"

Slanted lettering indicates notes "For Office Use Only".
Stiffener width to thickness ratio: 10 or less.
Width of stiffener: To nearest ½" about ½" less than distance from face of web to edge of flange.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

BEARING STIFFENERS FOR ROLLED STEEL BEAMS

NO. BR-SS18.08)-80-103 SHEET 1 OF 1



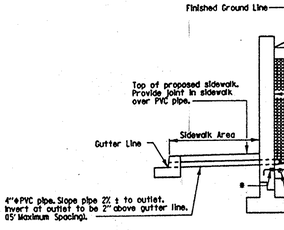
SECTION
Scale: 3"=1'-0"

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

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

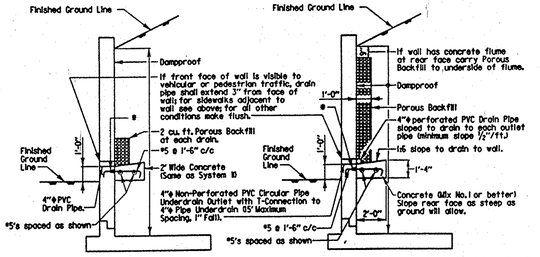
STIFFENER AND STRINGER CONNECTION PLATE WELD TERMINATION DETAIL

NO. BR-SS18J01-83-154 SHEET 1 OF 1



DRAIN AT SIDEWALK
Scale: None

* #5 Threaded Rebar Dowel Coupler at 1'-6" c/c.



SYSTEM I
Scale: None

SYSTEM II
Scale: None

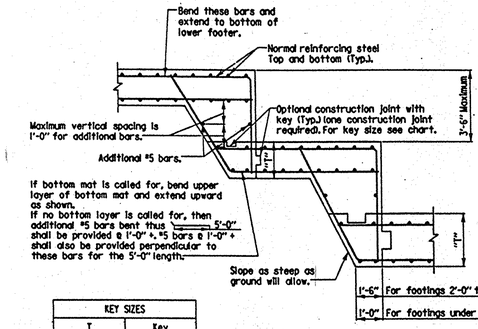
OTHER RELATED STANDARDS
REBAR-BD(2.01)-93-285
REBAR-PL(4.001)-93-286

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

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

RETAINING WALL, WING WALL AND CANTILEVER ABUTMENT DRAINAGE SYSTEMS

NO. RW10.01-80-100 SHEET 1 OF 1



KEY SIZES	
T	Key
1'-0" to 1'-5"	2" x 4"
1'-6" to 1'-11"	3" x 6"
2'-0" to 2'-5"	4" x 8"
2'-6" to 3'-0"	5" x 10"

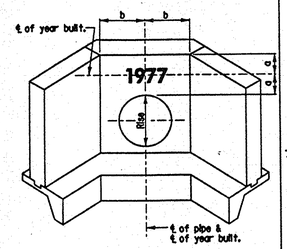
TYPICAL SECTION
Scale: ⅜"=1'-0"

Notes:
1. All keys are nominal size.

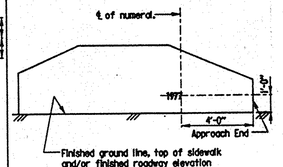
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

STEPPED FOOTING DETAIL

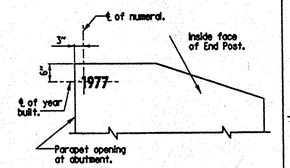
NO. RW16.09)-83-155 SHEET 1 OF 1



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



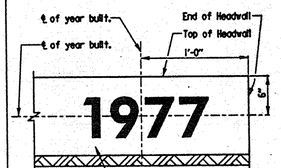
RETAINING WALLS



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.400.04.
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 contact Division of Bridge Development for for old year.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT

LOCATION OF YEAR BUILT MARKING

NO. MK0.02)-78-74 SHEET 1 OF 1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/7/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 *FAX: (410) 995-1363*

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

STANDARD DETAILS

600' SCALE MAP NO._____ BLOCK NO._____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 26 OF 29

B0053_26

G:\USERS\CNOLAN\PUBLJOBS\95023A\CAD\95234STN Thu Oct 31 15:54:27 1996

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'-1"	3'-3"
#9	7'-2"	5'-1"	4'-1"
#10	9'-1"	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, fs= 24,000 p.s.i.'

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
BAR LAP DIMENSIONS FOR
GRADE 60 REINFORCING STEEL
IN MIX NO. 6 (4500 P.S.I.) CONCRETE
NON-EPOXY COATED REINFORCING
NO. M(6.05)-80-122 SHEET 1 OF 3

BAR SIZE	* LOCATION CATEGORY			3 Times Bar Diameter	6 Times Bar Diameter	= c/c Spacing
	A	B	C			
#4	2'-11"	2'-7"	2'-1"	1½"	3"	3½"
#5	3'-8"	3'-3"	2'-7"	1⅞"	3¾"	4⅜"
#6	4'-5"	3'-10"	3'-1"	2¼"	4½"	5¼"
#7	5'-3"	4'-7"	3'-8"	2⅝"	5¼"	6⅛"
#8	6'-10"	6'-1"	4'-10"	3"	6"	7"
#9	8'-8"	7'-8"	6'-1"	3⅜"	6¾"	7⅞"
#10	11'-0"	9'-8"	7'-9"	3¾"	7⅝"	8¾"
#11	13'-6"	11'-11"	9'-6"	4¼"	8½"	9⅞"

* 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, fs= 24,000 p.s.i.'

CASE NO.1 - For bars coated with epoxy with cover less than 3 times the bar diameter or clear spacing between bars less than 6 times the bar diameter.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
BAR LAP DIMENSIONS FOR
GRADE 60 REINFORCING STEEL
IN MIX NO. 6 (4500 P.S.I.) CONCRETE
EPOXY COATED REINFORCING CASE NO.1
NO. M(6.05)-80-122 SHEET 2 OF 3

BAR SIZE	* LOCATION CATEGORY		
	A	B	C
#4	2'-9"	2'-0"	1'-7"
#5	3'-6"	2'-6"	2'-0"
#6	4'-2"	3'-0"	2'-5"
#7	4'-11"	Does Not Exist	2'-10"
#8	6'-6"		3'-9"
#9	8'-2"		4'-8"
#10	10'-5"		6'-0"
#11	12'-9"		7'-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, fs= 24,000 p.s.i.'

CASE NO.2 - For bars coated with epoxy not in Case No.1.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
BAR LAP DIMENSIONS FOR
GRADE 60 REINFORCING STEEL
IN MIX NO. 6 (4500 P.S.I.) CONCRETE
EPOXY COATED REINFORCING CASE NO.2
NO. M(6.05)-80-122 SHEET 3 OF 3

BAR SIZE	* LOCATION CATEGORY			3 Times Bar Diameter	6 Times Bar Diameter	= c/c Spacing
	A	B	C			
#4	2'-11"	2'-7"	2'-1"	1½"	3"	3½"
#5	3'-8"	3'-3"	2'-7"	1⅞"	3¾"	4⅜"
#6	4'-5"	3'-10"	3'-1"	2¼"	4½"	5¼"
#7	5'-3"	4'-7"	3'-8"	2⅝"	5¼"	6⅛"
#8	6'-10"	6'-1"	4'-10"	3"	6"	7"
#9	8'-8"	7'-8"	6'-1"	3⅜"	6¾"	7⅞"
#10	11'-0"	9'-8"	7'-9"	3¾"	7⅝"	8¾"
#11	13'-6"	11'-11"	9'-6"	4¼"	8½"	9⅞"

* 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, fs= 24,000 p.s.i.'

CASE NO.1 - For bars coated with epoxy with cover less than 3 times the bar diameter or clear spacing between bars less than 6 times the bar diameter.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
BAR LAP DIMENSIONS FOR
GRADE 60 REINFORCING STEEL
IN MIX NO. 3 (3500 P.S.I.) CONCRETE
EPOXY COATED REINFORCING CASE NO.1
NO. M(6.07)-81-127 SHEET 2 OF 3

BAR SIZE	* LOCATION CATEGORY		
	A	B	C
#4	2'-9"	2'-0"	1'-7"
#5	3'-6"	2'-6"	2'-0"
#6	4'-2"	3'-0"	2'-5"
#7	5'-7"	Does Not Exist	3'-3"
#8	7'-4"		4'-3"
#9	9'-4"		5'-4"
#10	11'-10"		6'-9"
#11	14'-6"		8'-3"

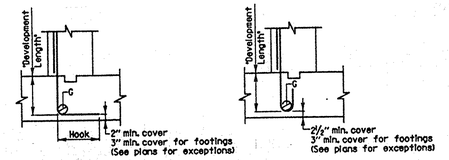
* LOCATION CATEGORY

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, fs= 24,000 p.s.i.'

CASE NO.2 - For bars coated with epoxy not in Case No.1.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
BAR LAP DIMENSIONS FOR
GRADE 60 REINFORCING STEEL
IN MIX NO. 3 (3500 P.S.I.) CONCRETE
EPOXY COATED REINFORCING CASE NO.2
NO. M(6.07)-81-127 SHEET 3 OF 3



STANDARD 90° HOOK

STANDARD 180° HOOK

BAR SIZE	* LOCATION CATEGORY		
	D	E	F
#4	8"	11"	9"
#5	9"	1'-1"	11"
#6	11"	1'-4"	1'-1"
#7	1'-1"	1'-6"	1'-3"
#8	1'-3"	1'-9"	1'-5"
#9	1'-5"	1'-11"	1'-7"
#10	1'-7"	2'-2"	1'-9"
#11	1'-9"	2'-5"	1'-11"

RECOMMENDED END HOOKS ALL GRADES			
BAR SIZE	Finished bend diameter 6 in.	180 Degree hooks	90 Degree hooks
#4	3"	6"	8"
#5	3½"	7"	10"
#6	4½"	8"	1'-0"
#7	5¼"	10"	1'-2"
#8	6"	11"	1'-4"
#9	9½"	1'-3"	1'-7"
#10	10½"	1'-5"	1'-10"
#11	1'-0"	1'-7"	2'-0"

* LOCATION CATEGORY:

D- All bars terminating with a standard 180° hook with side cover (normal to plane of hook) not less than 2½" in. and for 90° deg. hook, cover on bar extension beyond hook not less than 2" in.
E- All bars not in Category D.
F- All bars with hook enclosed vertically or horizontally within ties or stirrup-ties spaced along the full development length not greater than 3d where d is the diameter of the hooked bar.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'
4. If depth of member does not allow bar development length indicated in Categories A, B, and C Std. No. M(6.41)-90-214 then hook shall be added to all bars not conforming, as per D,E & F.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS OF HOOKED
BARS FOR GRADE 60 REINFORCING STEEL
IN MIX NO. 3 (3500 P.S.I.) CONCRETE
NO. M(6.08)-86-178 SHEET 1 OF 1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 4/7/97

NOLAN ASSOCIATES, INC.
ENGINEERS – CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

STANDARD DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

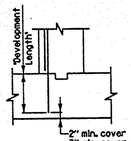
REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 27 OF 29

B0053_27

G:\USERS\CNOLAN\PUB\JOBS\96023A\MCAD\96023ASTN Thu Oct 31 15:54:44 1996



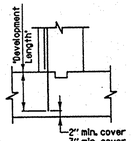
STANDARD STRAIGHT BAR

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

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'
4. If depth of member does not allow bar development length indicated in Categories A, B, and C, then hook shall be added to all bars not conforming, as per D, E, and F per Std. No. M6.01-86-178.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.3 (3500 P.S.I.) CONCRETE NON-EPOXY COATED REINFORCING
NO. M(6J4)-90-214 SHEET 1 OF 3



STANDARD STRAIGHT BAR

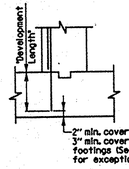
BAR SIZE	* LOCATION CATEGORY			3 Times Bar Diameter	6 Times Bar Diameter	c/c Spacing
	A	B	C			
#4	1'-9"	1'-6"	1'-3"	1½"	3"	3½"
#5	2'-2"	1'-11"	1'-6"	1⅞"	3¾"	4⅜"
#6	2'-7"	2'-3"	1'-10"	2¼"	4½"	5¼"
#7	3'-6"	3'-1"	2'-6"	2⅝"	5¼"	6⅛"
#8	4'-1"	3'-7"	2'-10"	3"	6"	7"
#9	5'-1"	4'-6"	3'-7"	3⅜"	6¾"	7⅞"
#10	6'-6"	5'-9"	4'-7"	3⅞"	7¾"	8⅞"
#11	7'-11"	7'-0"	5'-7"	4¼"	8½"	9⅞"

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These bar laps only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'

CASE NO.1 - For bars coated with epoxy with cover less than 3 times the bar diameter or clear spacing between bars less than 6 times the bar diameter.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.3 (3500 P.S.I.) CONCRETE EPOXY COATED REINFORCING CASE NO.1
NO. M(6J4)-90-214 SHEET 2 OF 3



STANDARD STRAIGHT BAR

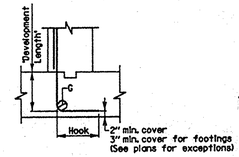
BAR SIZE	* LOCATION CATEGORY		
	A	B	C
#4	1'-8"	1'-2"	1'-0"
#5	2'-1"	1'-6"	1'-2"
#6	2'-5"	1'-9"	1'-5"
#7	3'-4"	Does Not Exist	1'-11"
#8	4'-4"		2'-6"
#9	5'-6"		3'-2"
#10	6'-11"		4'-0"
#11	8'-6"		4'-11"

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

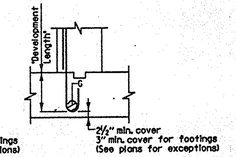
Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These bar laps only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'

CASE NO.2 - For bars coated with epoxy not in Case No.1.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.3 (3500 P.S.I.) CONCRETE EPOXY COATED REINFORCING CASE NO.2
NO. M(6J4)-90-214 SHEET 3 OF 3



STANDARD 90° HOOK



STANDARD 180° HOOK

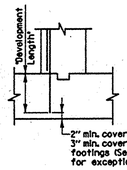
BAR SIZE	* LOCATION CATEGORY		
	D	E	F
#4	7"	9"	8"
#5	8"	1'-0"	9"
#6	10"	1'-2"	11"
#7	11"	1'-4"	1'-1"
#8	1'-1"	1'-6"	1'-3"
#9	1'-3"	1'-9"	1'-5"
#10	1'-4"	1'-11"	1'-7"
#11	1'-6"	2'-2"	1'-9"

BAR SIZE	RECOMMENDED END HOOKS ALL GRADES		
	Finished bend diameter G in.	180 Degree hooks	90 Degree hooks
#4	3"	6"	8"
#5	3½"	7"	10"
#6	4½"	8"	1'-0"
#7	5¼"	10"	1'-2"
#8	6"	11"	1'-4"
#9	9½"	1'-3"	1'-7"
#10	10½"	1'-5"	1'-10"
#11	1'-0"	1'-7"	2'-0"

* LOCATION CATEGORY:
D- All bars terminating with a standard 180° hook with side cover (normal to plane of hook) not less than 2½ in., and for 90° deg. hook, cover on bar extension beyond hook not less than 2" in.
E- All bars not in Category D.
F- All bars with hook enclosed vertically or horizontally within ties or stirrup-ties spaced along the full development length not greater than 3d where d is the diameter of the hooked bar.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'
4. If depth of member does not allow bar development length indicated in Categories A, B, and C, Std. No. M(6J6)-90-216, then hook shall be added to all bars not conforming, as per D, E & F.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS OF HOOKED BARS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 6 (4500 P.S.I.) CONCRETE
NO. M(6J0)-86-180 SHEET 1 OF 1



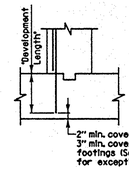
STANDARD STRAIGHT BAR

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

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'
4. If depth of member does not allow bar development length indicated in Categories A, B, and C, then hook shall be added to all bars not conforming, as per D, E, and F per Std. No. M6.01-86-180.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.6 (4500 P.S.I.) CONCRETE NON-EPOXY COATED REINFORCING
NO. M(6J6)-90-216 SHEET 1 OF 3



STANDARD STRAIGHT BAR

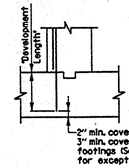
BAR SIZE	* LOCATION CATEGORY			3 Times Bar Diameter	6 Times Bar Diameter	c/c Spacing
	A	B	C			
#4	1'-9"	1'-6"	1'-3"	1½"	3"	3½"
#5	2'-2"	1'-11"	1'-6"	1⅞"	3¾"	4⅜"
#6	2'-7"	2'-3"	1'-10"	2¼"	4½"	5¼"
#7	3'-4"	2'-9"	2'-2"	2⅝"	5¼"	6⅛"
#8	4'-1"	3'-7"	2'-10"	3"	6"	7"
#9	5'-1"	4'-6"	3'-7"	3⅜"	6¾"	7⅞"
#10	6'-6"	5'-9"	4'-7"	3⅞"	7¾"	8⅞"
#11	7'-11"	7'-0"	5'-7"	4¼"	8½"	9⅞"

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'

CASE NO.1 - For bars coated with epoxy with cover less than 3 times the bar diameter or clear spacing between bars less than 6 times the bar diameter.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.6 (4500 P.S.I.) CONCRETE EPOXY COATED REINFORCING CASE NO.1
NO. M(6J6)-90-216 SHEET 2 OF 3



STANDARD STRAIGHT BAR

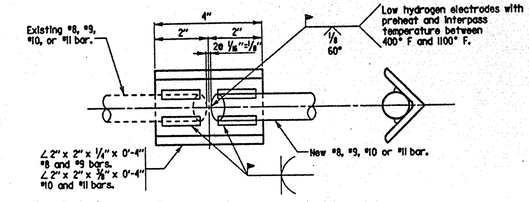
BAR SIZE	* LOCATION CATEGORY		
	A	B	C
#4	1'-8"	1'-2"	1'-0"
#5	2'-1"	1'-6"	1'-2"
#6	2'-5"	1'-9"	1'-5"
#7	3'-4"	Does Not Exist	1'-11"
#8	4'-4"		2'-6"
#9	5'-6"		3'-2"
#10	6'-11"		4'-0"
#11	8'-6"		4'-11"

* 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" apart.
C- All bars not in Category A spaced 6" inches or more apart.

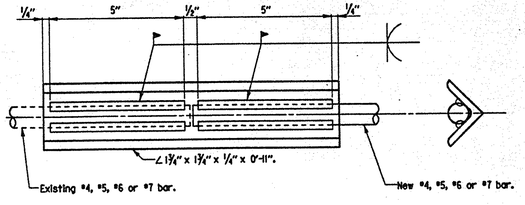
Note:
1. When development length is not specified on the plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate 'Reinforcing Steel Design, fs= 24,000 p.s.i.'

CASE NO.2 - For bars coated with epoxy not in Case No.1.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DEVELOPMENT LENGTH DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.6 (4500 P.S.I.) CONCRETE EPOXY COATED REINFORCING CASE NO.2
NO. M(6J6)-90-216 SHEET 3 OF 3



DETAIL FOR WELD SPLICE FOR #8, #9, #10 OR #11 BARS
Scale: 3/8" = 1"



DETAIL FOR WELD SPLICE FOR #4, #5, #6 OR #7 BARS
Scale: 3/4" = 1"

Notes:
1. Angles shall be made of A36 or AISI1010, 1015 or 1020 steel.
2. E7018 electrodes shall be used in making the above welded splices.
3. If sufficient bar lap is not available when existing reinforcing steel is exposed, this detail to extend bars shall be used. Cost of these connections shall be included in contract prices bid on pertinent concrete items.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF BRIDGE DEVELOPMENT
DETAIL FOR SPLICE WELDING REINFORCING STEEL
NO. M(6.01)-75-12 SHEET 1 OF 1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 4/1/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

STANDARD DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE AS SHOWN

SHEET 28 OF 29

B0053-28

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SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY		PROPOSAL QUANTITY	COMMENTS
1001	CLEARING AND GRUBBING	L.S.				
1002	ENGINEER'S OFFICE NO. 2	L.S.				
1003	MAINTENANCE OF TRAFFIC	L.S.				
1004	TEMPORARY TRAFFIC SIGNS TYPE III RETROREFLECTIVE SHEETING	S.F.	625		625	
1005	PRECAST TEMPORARY CONCRETE BARRIER FOR MAINTENANCE OF TRAFFIC	L.F.	400		400	
1006	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA.	10		10	
1007	CONSTRUCTION STAKEOUT	L.S.				
1008	MOBILIZATION	L.S.				
1009	TEMPORARY CRASH CUSHION SAND FILLED PLASTIC BARRELS FOR MAINTENANCE OF TRAFFIC	BBL	16		16	
1010	REPLACE TEMPORARY CRASH CUSHION SAND FILLED PLASTIC BARRELS FOR MAINTENANCE OF TRAFFIC	BBL	8		8	
1011	DRUMS FOR MAINTENANCE OF TRAFFIC	EA.	12		12	
2001	CLASS 1 EXCAVATION	C.Y.	55		55	
2002	CLASS 1-A EXCAVATION	C.Y.	20		20	
2003	CLASS 2 EXCAVATION	C.Y.	20		20	
2004	COMMON BORROW	C.Y.	55		55	
2005	TEST PIT EXCAVATION	C.Y.	10		10	
3001	STABILIZED CONSTRUCTION ENTRANCE	TON	42		42	
3002	REHABILITATE STABILIZED CONSTRUCTION ENTRANCE	TON	10		10	
3003	GEOTEXTILE CLASS F FOR SLOPE SILT FENCE	L.F.	375		375	
4001	MAINTENANCE OF STREAM FLOW	L.S.				
4002	REMOVAL OF PORTIONS OF EXISTING STRUCTURE	L.S.				
4003	CLASS 3 EXCAVATION	C.Y.	300		300	
4004	CLASS 4 EXCAVATION	C.Y.	25		25	
4005	DRILLED HOLES IN MASONRY	L.F.	148		148	
4006	FOOTING CONCRETE FOR BRIDGE	C.Y.	40		40	
4007	SUBSTRUCTURE CONCRETE FOR BRIDGE	L.S.				
4008	SUPERSTRUCTURE CONCRETE FOR BRIDGE	L.S.				
4009	SUBSTRUCTURE REPAIR USING MIX NO. 6 CONCRETE	C.Y.	1		1	
4010	EPOXY COATED REINFORCING STEEL IN SUPERSTRUCTURE	L.S.				
4011	FABRICATED STRUCTURAL STEEL	L.S.				
4012	STEEL STUD SHEAR DEVELOPERS	L.S.				
4013	EPOXY PROTECTIVE COATING ON ABUTMENTS	L.S.				
4014	TRAFFIC BARRIER W BEAM FOR BRIDGE	L.F.	243		243	
4015	CLASS II RIPRAP FOR SCOUR PROTECTION	TON	425		425	
4016	BOTTOM CUTOFF WALLS FOR CLASS II RIPRAP SLOPE PROTECTION FOR BRIDGE, TYPE I	L.F.	120		120	
4017	BOTTOM CUTOFF WALLS FOR CLASS II RIPRAP SLOPE PROTECTION FOR BRIDGE, TYPE II	L.F.	70		70	
4018	SIDE CUTOFF WALLS FOR CLASS II RIPRAP SLOPE PROTECTION FOR BRIDGE	L.F.	40		40	
4019	SUBFOUNDATION CONCRETE	C.Y.	20		20	
4020	FLOODLIGHTING	N.U.	3		3	

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY		PROPOSAL QUANTITY	COMMENTS
5001	5" SUBBASE USING GRADED AGGREGATE	S.Y.	200		200	
5002	MILLING EXISTING ASPHALT PAVEMENT, 1 1/2" DEPTH	S.Y.	250		250	
5003	HOT MIX ASPHALT BASE-BF	TON	50		50	
5004	HOT MIX ASPAHLT SURFACE-SF	TON	35		35	
5005	5" YELLOW WATERBORNE TRAFFIC PAINT	L.F.	460		460	
5006	5" WHITE WATERBORNE TRAFFIC PAINT	L.F.	460		460	
6001	TRAFFIC BARRIER W-BEAM	L.F.	120		120	
6002	TRAFFIC BARRIER W-BEAM SPECIAL END TREATMENT	EA.	1		1	
6003	REMOVE AND DISPOSE OF EXISTING TRAFFIC BARRIER	L.F.	230		230	
7001	PLACING FURNISHED TOPSOIL 2" DEPTH	S.Y.	100		100	
7002	SEEDING ROADSIDE AREAS	S.Y.	100		100	
8001	SHEET ALUMINUM SIGNS	S.F.	12		12	
8002	REMOVE EXISTING GROUND MOUNTED SIGNS AND SUPPORTS	S.F.	10		10	

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/22/97
CHIEF, BUREAU OF ENGINEERING — DATE 1/10/97
CHIEF, BUREAU OF HIGHWAYS — DATE 1-20-97
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 1/7/97

NOLAN ASSOCIATES, INC.
ENGINEERS - CIVIL/STRUCTURAL/INSPECTIONS
4785 DORSEY HALL DRIVE
SUITE 124
ELLICOTT CITY, MARYLAND 21042
PHONE: (410) 995-3651 FAX: (410) 995-1363

STATE OF MARYLAND — CHARLES S. NOLAN — No. 15212 — REGISTERED PROFESSIONAL ENGINEER

DES: BDB
DRN: TC
CHK: JSN
DATE: JAN. 1997

BY	NO.	REVISION	DATE

SUMMARY OF QUANTITIES

600' SCALE MAP NO.______ BLOCK NO.______

REHABILITATION OF BRIDGE M-97
HAVILAND MILL ROAD OVER THE PATUXENT RIVER
CAPITAL PROJECT B-3837
ELECTION DISTRICT NO. 5
HOWARD COUNTY / MONTGOMERY COUNTY

SCALE: AS SHOWN

B0053_29