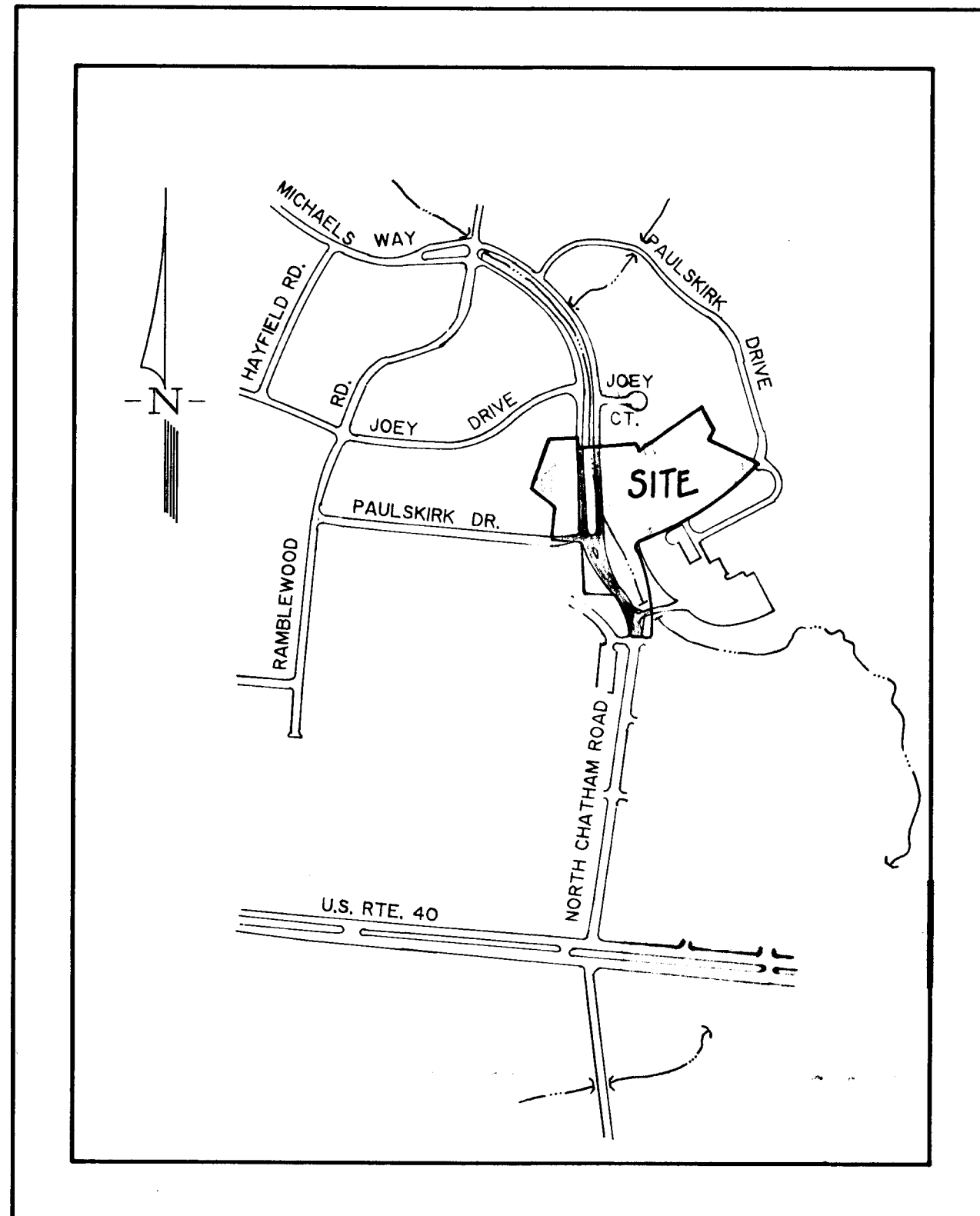


Index of Sheets

1. Title Sheet
2. Plan View - North Chatham Road
3. Roadway Profiles
4. Plan - North Chatham Road & US Rte 40
5. Typical Sections & Details
6. Geometric Layout
7. Maintenance of Traffic
8. Maintenance of Traffic
9. Temporary Stream Diversion Plan & Sediment Control Plan for initial construction
10. Sediment Control
11. Sediment Control - Notes & Details
12. Stormwater Management Profiles & Details - SWM No. 1
13. Notes & Details
14. Storm Drain Profiles
- ~~15-16. Water & Sewer Relocation Plan/Profile~~
15. Details - Twin 9'-6" x 6'-5" Culvert
16. Details - Twin 9'-6" x 6'-5" Culvert
17. Landscaping Plan
- 18-23. U.S. Rte 40 & North Chatham Road Signalization Plan

VICINITY MAP

SCALE: 1" = 600'



CAPITAL PROJECT No. J-4088
NORTH CHATHAM ROAD

IMPROVEMENTS
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS

#29

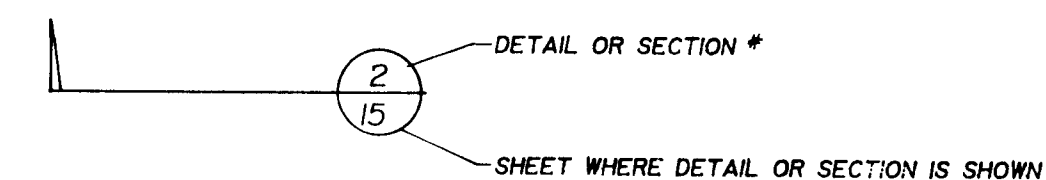
Plan Legend

	EX.	PROP.
Right of Way	---	---
Edge of Pavement	---	---
Curb	---	---
Pavement	---	---
Traverse Station	△	
Guardrail	▽	▽
Gabion		▨
Traffic Flow		→
Storm Drain Pipe	---	---
Wellands	---	---
County easement	---	---

Profile Legend

Ex. &/or PGL	---
Ex. Grade @ P	---
R/W @ RT	---
R/W @ LT	---
Profile Elevations	---

Structural Legend



1. ADDED STREAM & PROPOSED ROADWAY TO VICINITY MAP (10/1/91)

No in-stream construction shall take place on this job from March 1 and June 15, inclusive, of any year.

Waterway Construction Permit No. 89-WC-1180
Corps of Engineers Permit No. 91-1167
Water Quality Certification No. 91-WQ-0325

C449 AZ01

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James A. ...
DIRECTOR OF PUBLIC WORKS DATE 11/6/92

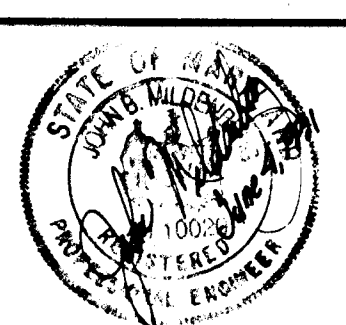
Gregory ...
CHIEF, BUREAU OF ENGINEERING DATE 11-15-92

Ernest ...
CHIEF, DIVISION OF ROADS, BRIDGES & STORM DRAINAGE DATE 11/1/92

Bronville N. ...
CHIEF, BUREAU OF HIGHWAYS DATE 1/1/92

MILDENBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS • SURVEYORS • PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro No. (301) 621-5768



DES:	JBM/KAM
DRN:	TJP
CHK:	JBM
PROJ #	89031.00
DATE:	Oct. '91
BY:	NO.
REVISION	
DATE	

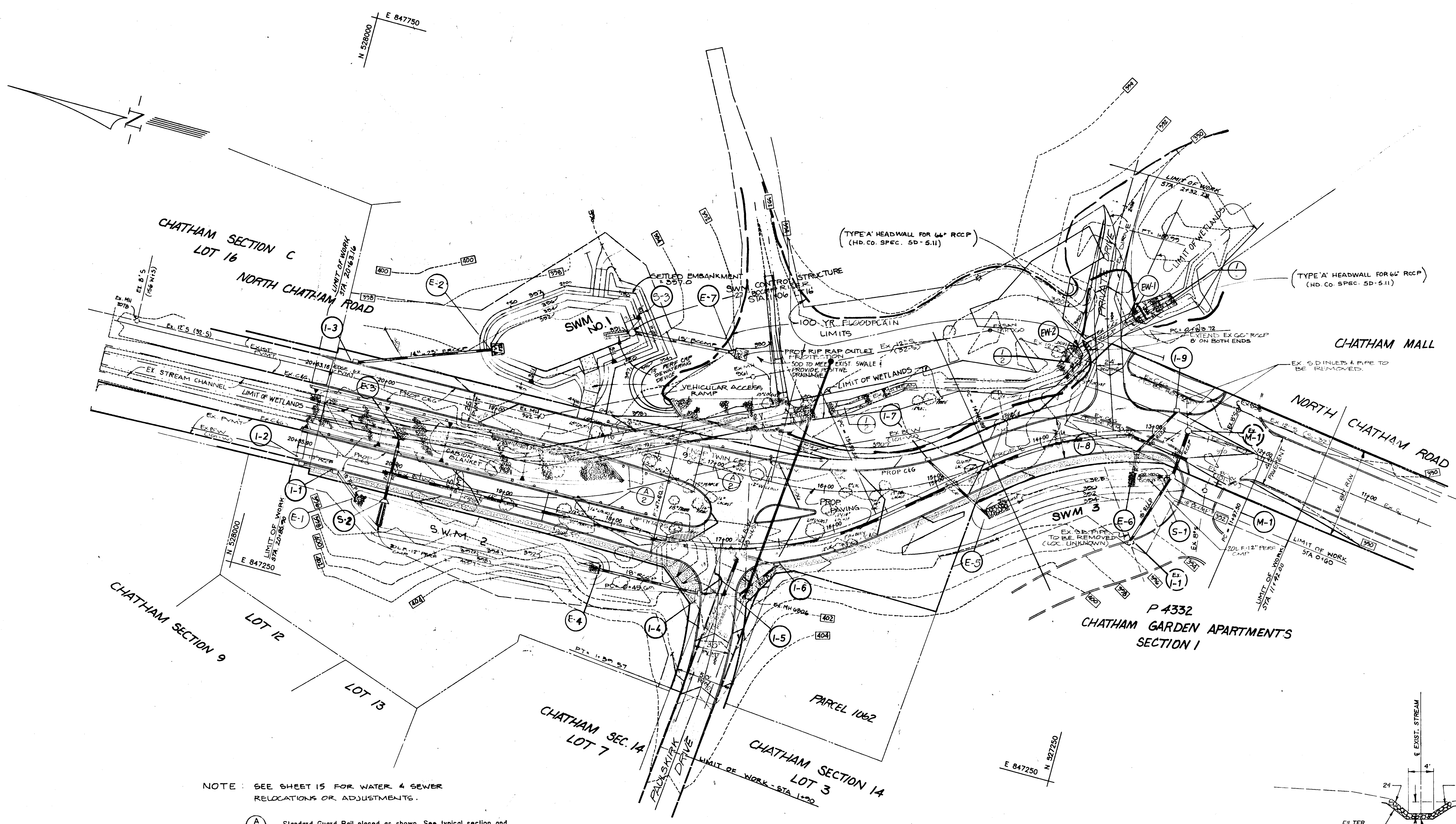
TITLE SHEET

600' SCALE MAP NO. _____ BLOCK NO. _____

NORTH CHATHAM ROAD
IMPROVEMENTS
CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

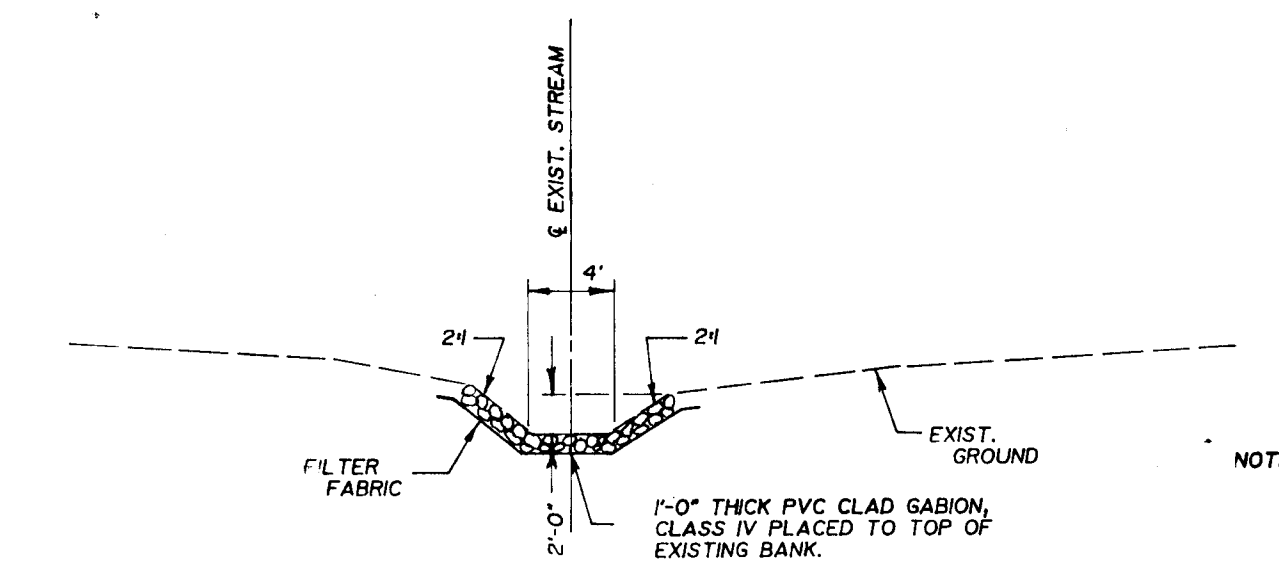
SCALE AS SHOWN

SHEET 1 OF 23



NOTE: SEE SHEET 15 FOR WATER & SEWER RELOCATIONS OR ADJUSTMENTS.

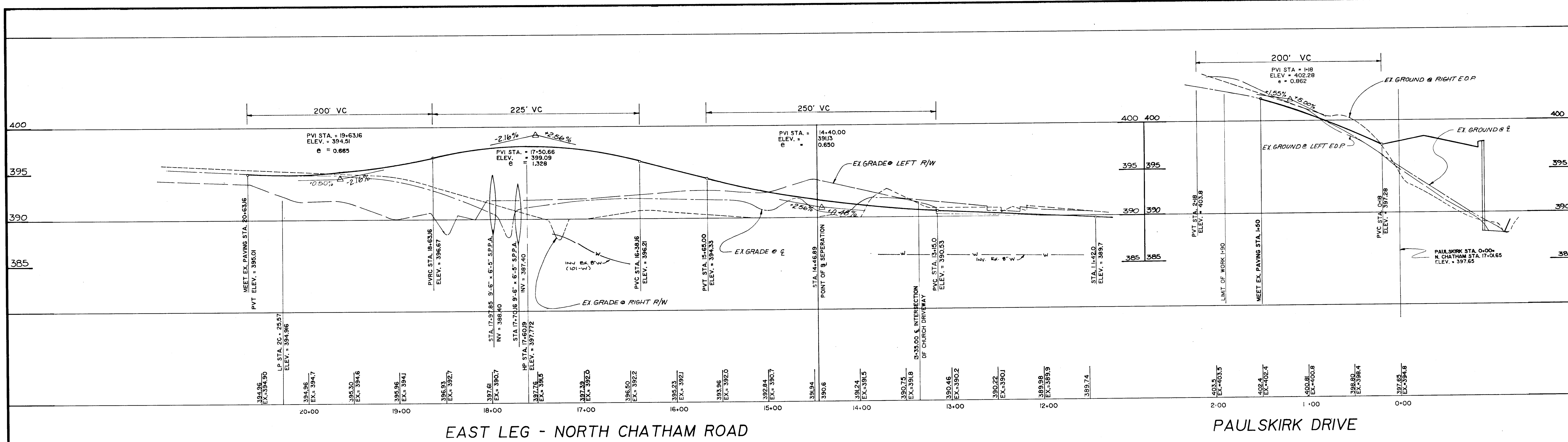
(A) Standard Guard Rail placed as shown. See typical section and Traffic Barrier W-Beam Tabulation, Sheet 5.



DETAIL - GABION PROTECTION FOR EXISTING CHANNEL (1) N.T.S.

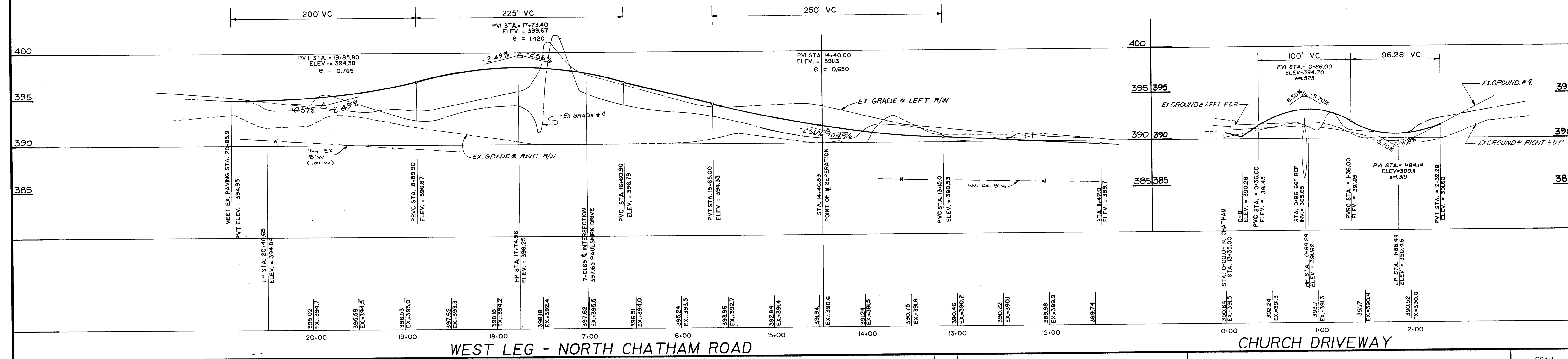
1. REVISED FROM TOP OF SWM No. 1, P.E. J. MURPHY - H.C. CO. D.P.W. (6/1/91)
 2. REVISED FROM CHANGES IN SWM No. 1, P.E. M.D. COMMENTS (6/1/91)
 3. REVISED DETAIL 1 CHANNEL PROTECTION (8/10/92)

<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>James A. ...</i> DIRECTOR OF PUBLIC WORKS</p> <p><i>... ..</i> CHIEF, BUREAU OF ENGINEERING</p> <p>DATE: 1-15-92</p>	<p>MILDENBERG MOCHI & ASSOCIATES, INC. ENGINEERS • SURVEYORS • PLANNERS</p> <p>3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350 (301) 461-0078 D.C. Metro: (301) 621-5768</p>		<p>DES: TJP DRN: TJP CHK: JEM PROJ: #0001 DATE: Oct. 1991</p>	<p>PLAN VIEW</p>	<p>NORTH CHATHAM ROAD IMPROVEMENTS</p> <p>CAPITAL PROJECT No. J-4088 ELECTION DISTRICT No. 2 HOWARD COUNTY, MARYLAND</p>	<p>SCALE: 1" = 50'</p> <p>SHEET 2 OF 23</p>
<p>CHEF, BRDAS, BRIDGES, & STORM DRAINAGE DATE: <i>Francis W. Wetland</i> 1/15/92 CHIEF, BUREAU OF HIGHWAYS</p>		<p>BY NO. REVISION DATE</p>		<p>600' SCALE MAP NO. BLOCK NO.</p>		



PROFILE SCALE

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



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 DATE 1-15-92
 DATE 1-15-92

MILDENBERG, MOCHI & ASSOCIATES, INC.
 ENGINEERS - SURVEYORS - PLANNERS
 3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
 (301) 461-0078 D.C. Metro: (301) 621-5788

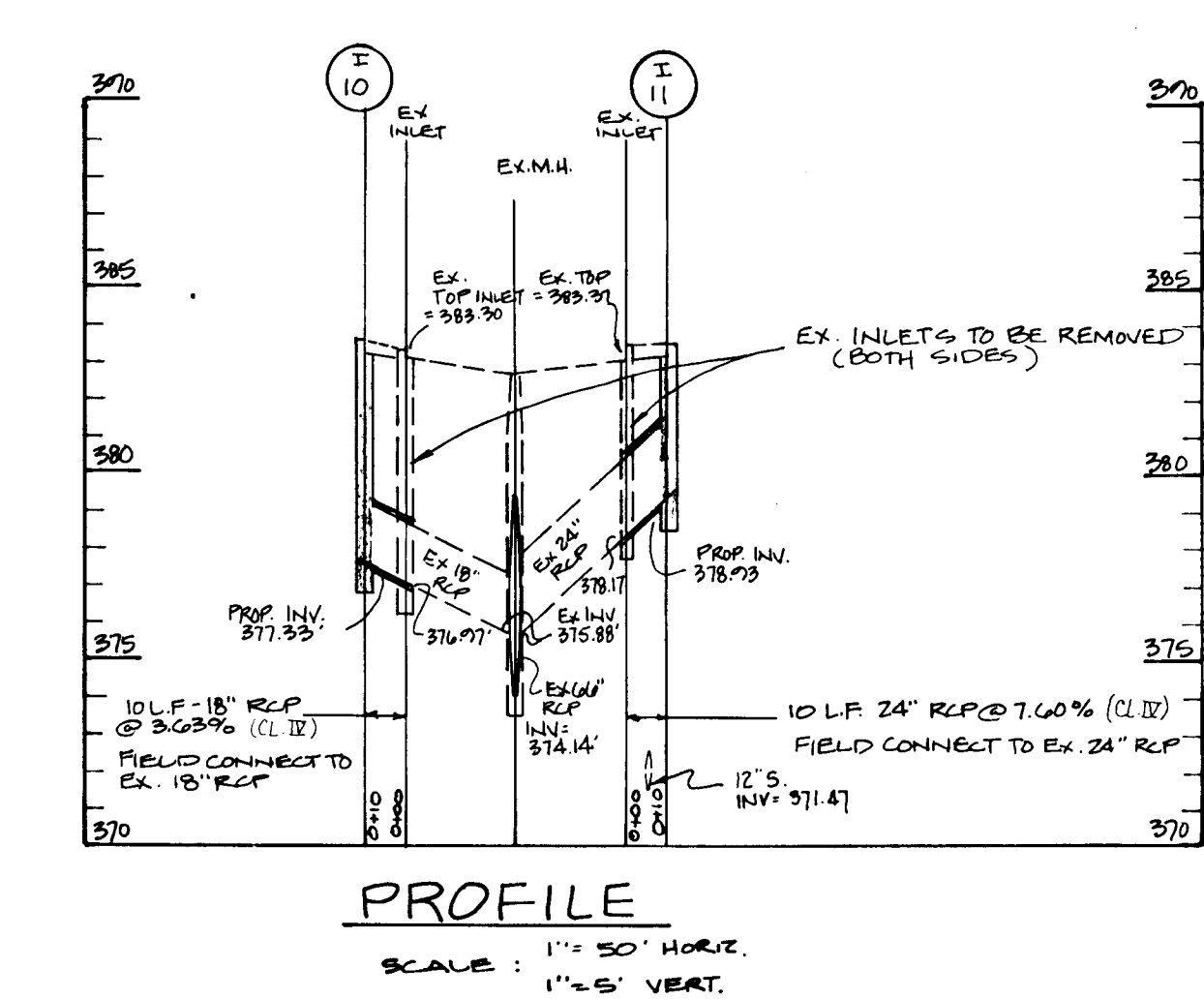
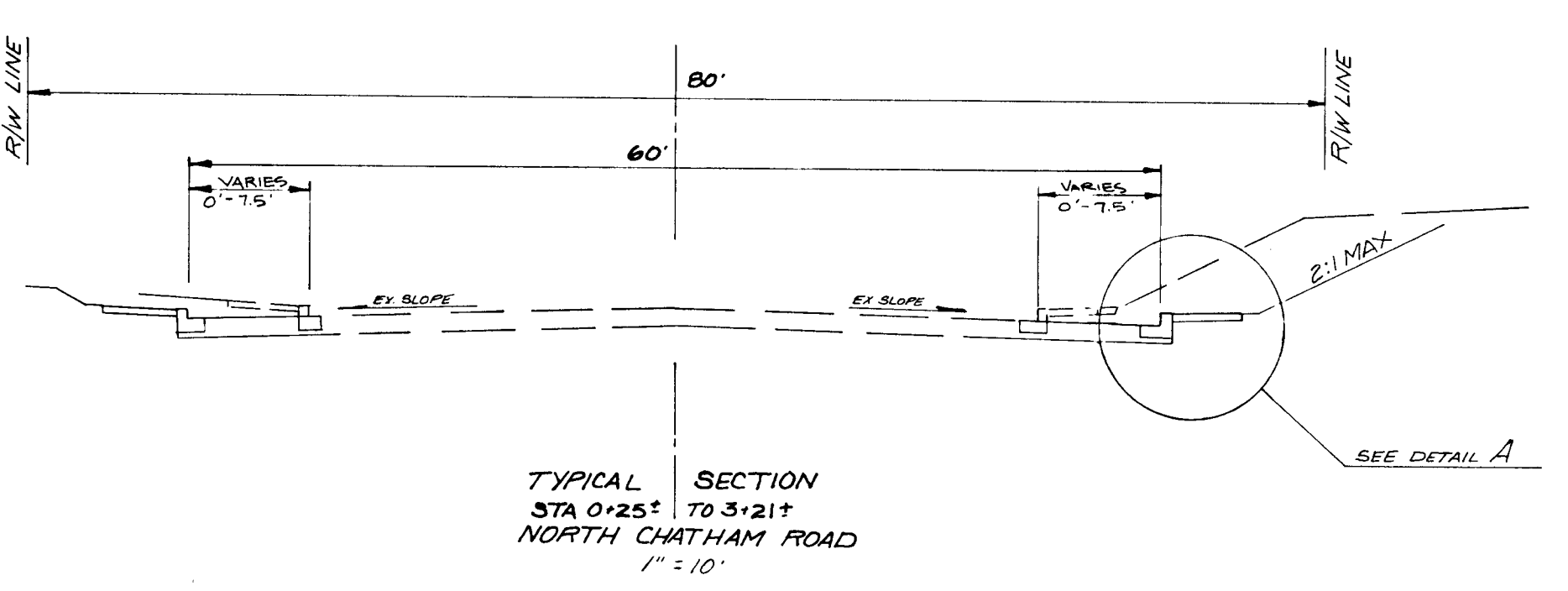
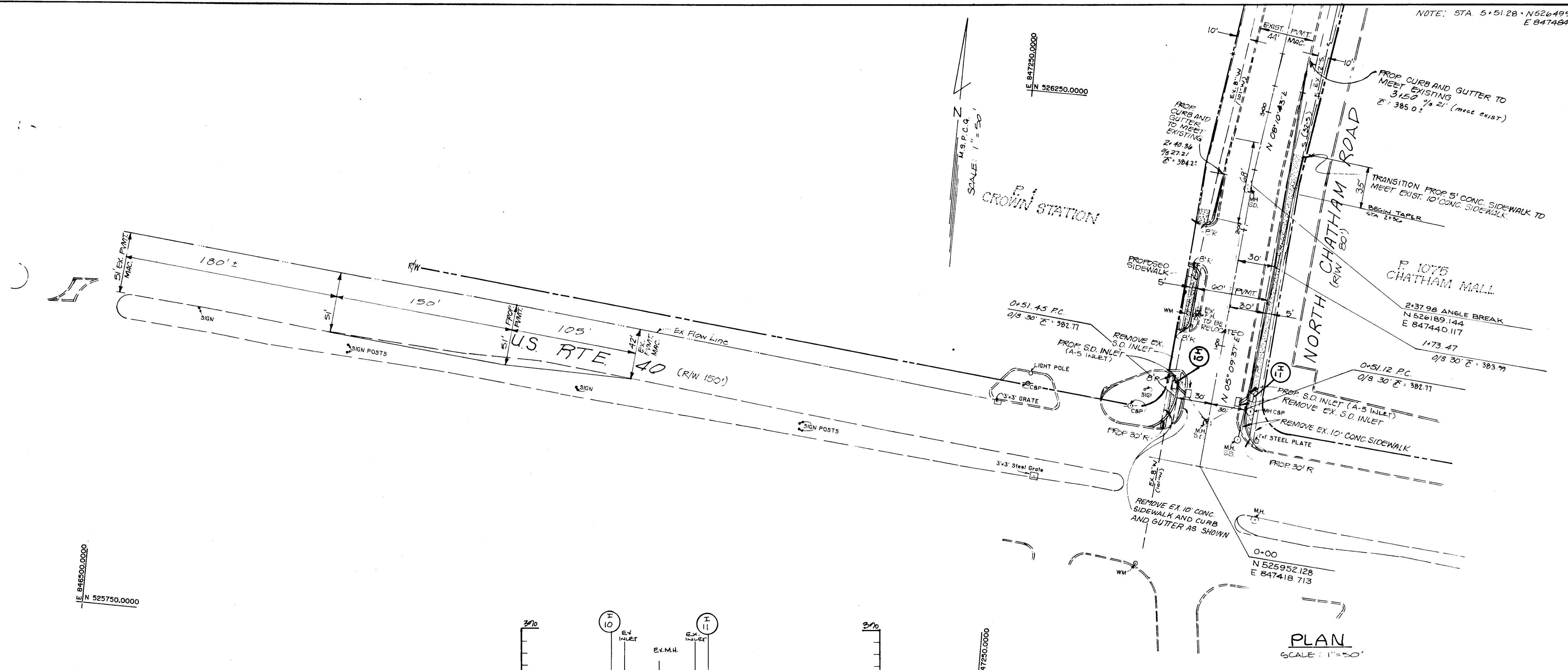


DES: TJP	BY:	NO.	REVISION	DATE
DRN: DDD/TJP				
CHK: JBM				
PROJ. # 89031				
DATE: MAY 91				

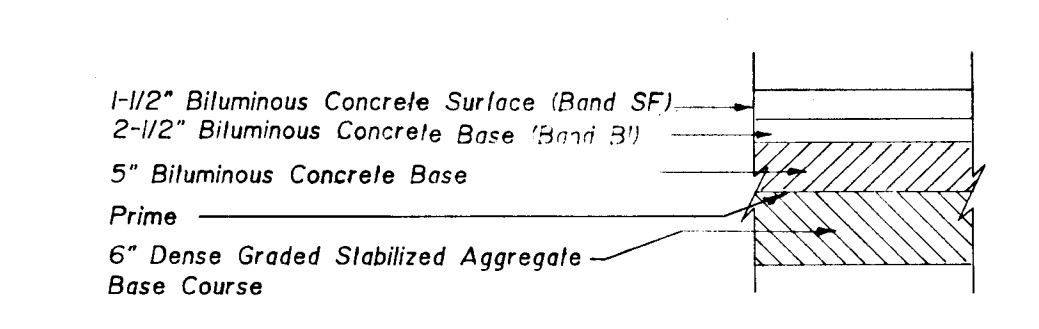
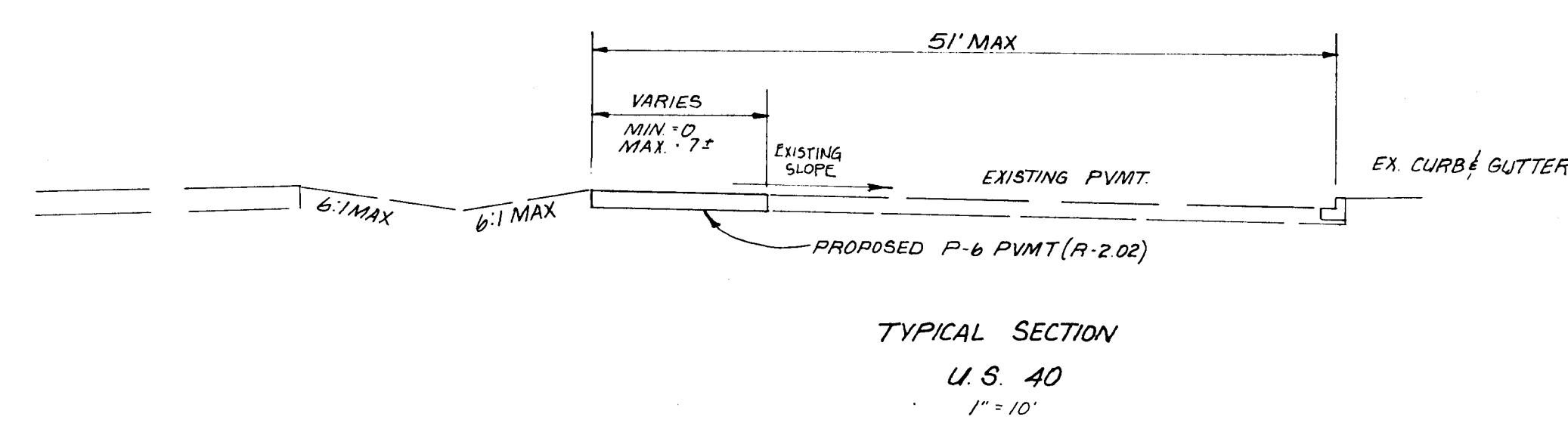
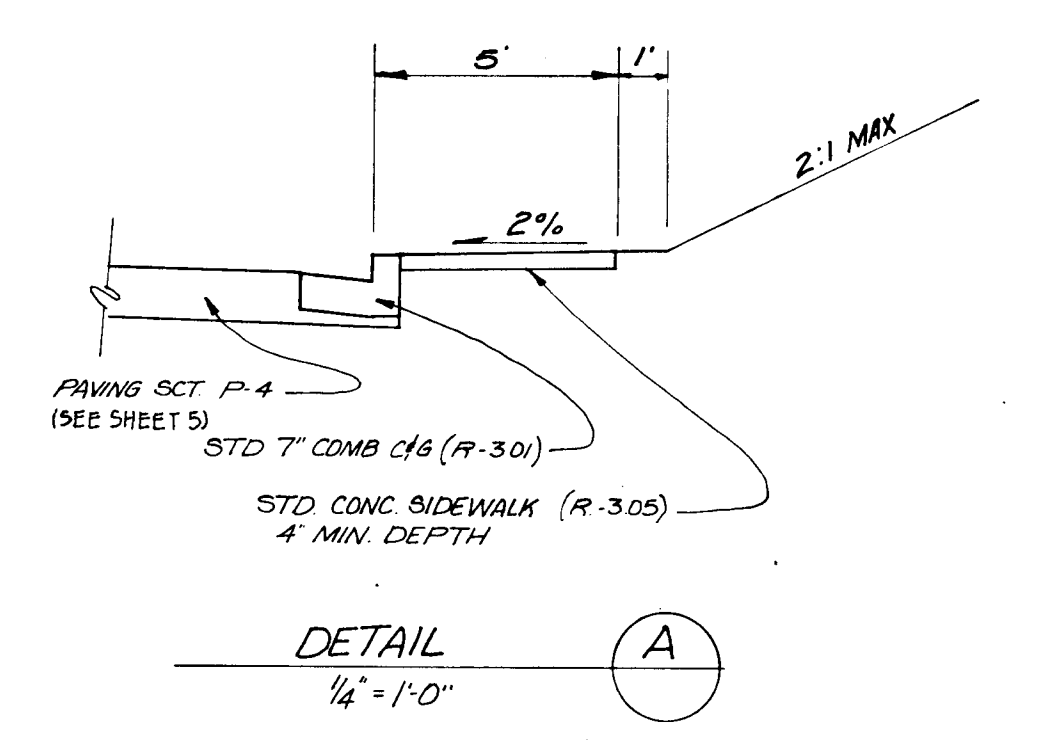
ROADWAY PROFILES
 600' SCALE MAP NO. BLOCK NO.

NORTH CHATHAM ROAD IMPROVEMENTS
 CAPITAL PROJECT No. J-4088
 ELECTION DISTRICT No. 2
 HOWARD COUNTY, MARYLAND

NOTE: STA 5+51.28 N526499.244
E 847484.745

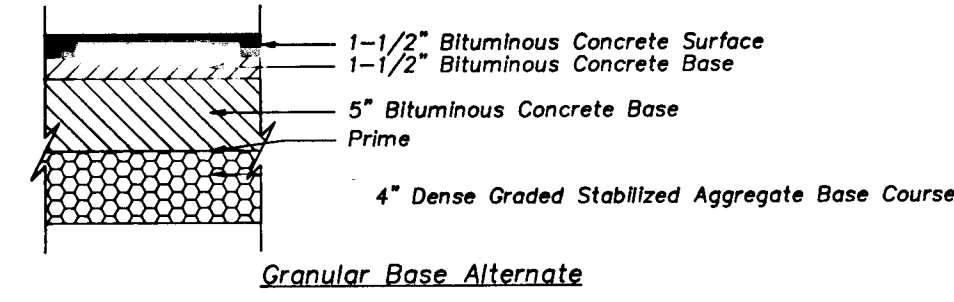


INLET		SCHEDULE			
NO	TYPE	INV. IN	INV. OUT	ETA-%	DETAIL
10	A-5 INLET*	-	377.93'	047-30'L	S.D. 401
11	A-5 INLET*	-	378.03'	047-30'R	S.D. 401

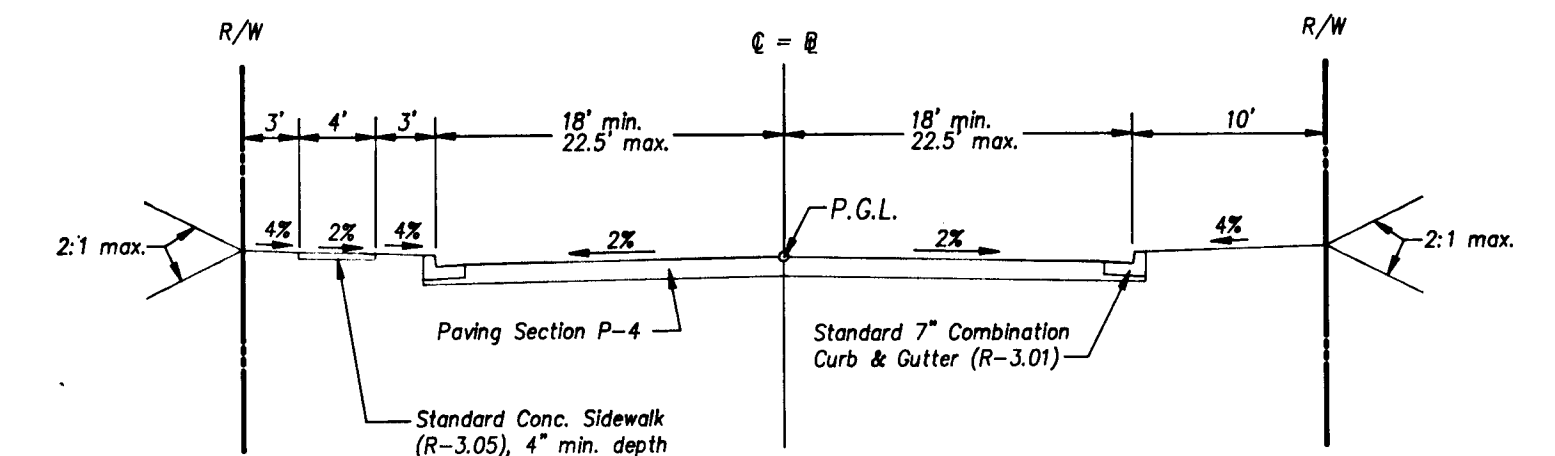


1) 95% SUBMITTAL TO HOWARD COUNTY REELED

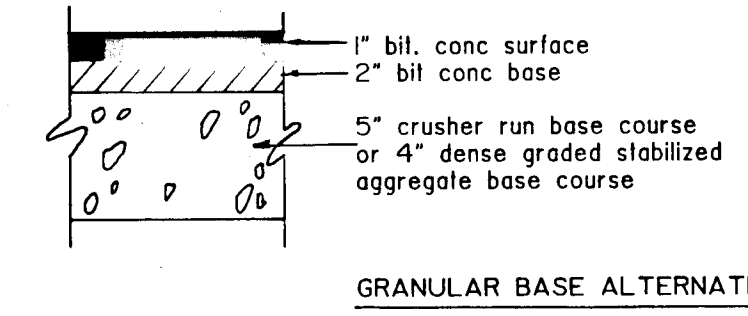
<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>[Signature]</i> 1-15-92 DIRECTOR OF PUBLIC WORKS DATE</p> <p><i>[Signature]</i> 1-15-92 CHIEF, BUREAU OF HIGHWAYS DATE</p>	<p>MILDENBERG, MOCHI & ASSOCIATES, INC. ENGINEERS • SURVEYORS • PLANNERS</p> <p>3300 North Ridge Road, Suite 235 Ellicott City, Maryland 21043-3350 (301) 461-0078 D.C. Metro: (301) 621-5768</p>		<p>DES: JEM</p> <p>DRN: D.D.D.</p> <p>CHK: TJP</p> <p>DATE: Oct. 1991</p>	<p>PLAN & TYPICAL SECTIONS NORTH CHATHAM RD. & US RTE. 40</p>	<p>NORTH CHATHAM ROAD IMPROVEMENTS</p> <p>CAPITAL PROJECT No. J-4088 ELECTION DISTRICT No. 2 HOWARD COUNTY, MARYLAND</p>	<p>SCALE AS SHOWN</p> <p>SHEET 4 OF 23</p>
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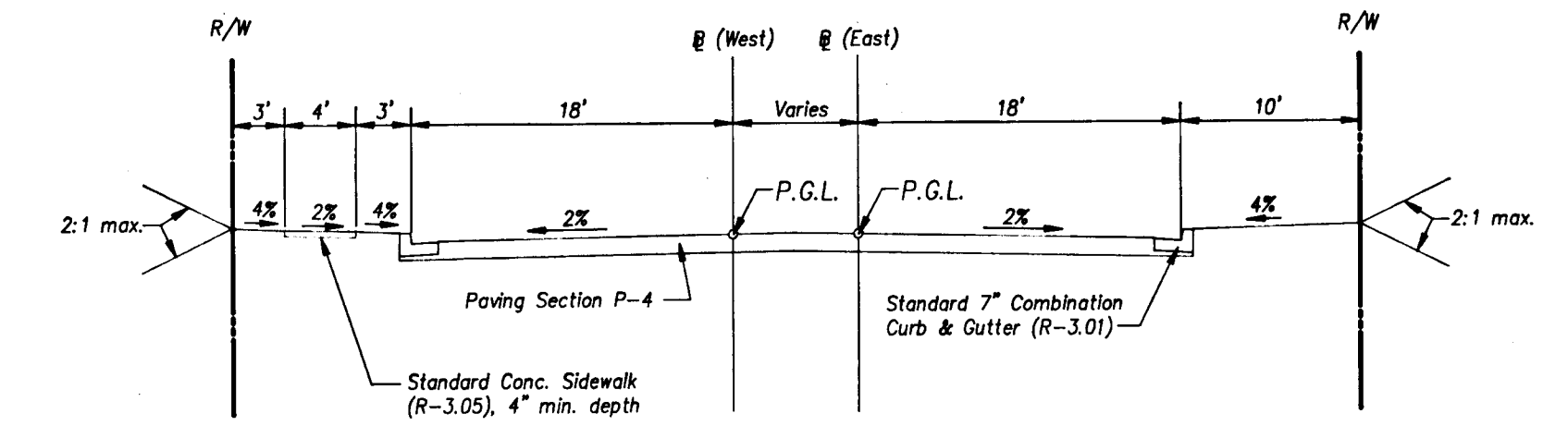
PAVING SECTION P-4
Not to Scale



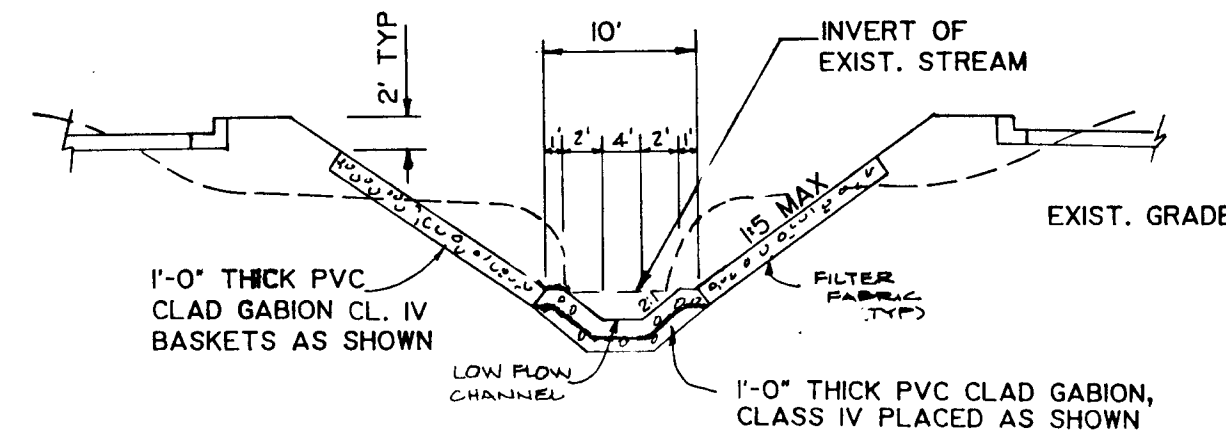
From Sta. 11+50 to Sta. 14+46.89
Not to Scale



PAVING SECTION P-1
NOT TO SCALE

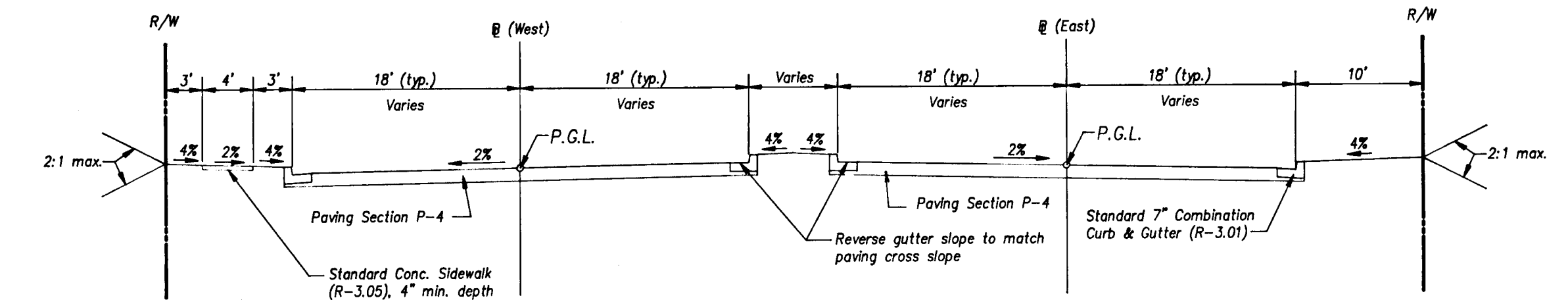


From Sta. 14+46.89 East to Sta. 16+05 East
From Sta. 14+46.89 West to Sta. 16+11 West
From Sta. 16+53 East to Sta. 16+99 East
From Sta. 16+71 West to Sta. 17+19 West
Not to Scale



FROM END OF CONC. CHANNEL TO HEADWALL OF TWIN CELL 9' - 6\"/>

TYPICAL SECTION CHANNEL IMPROVEMENT
NOT TO SCALE

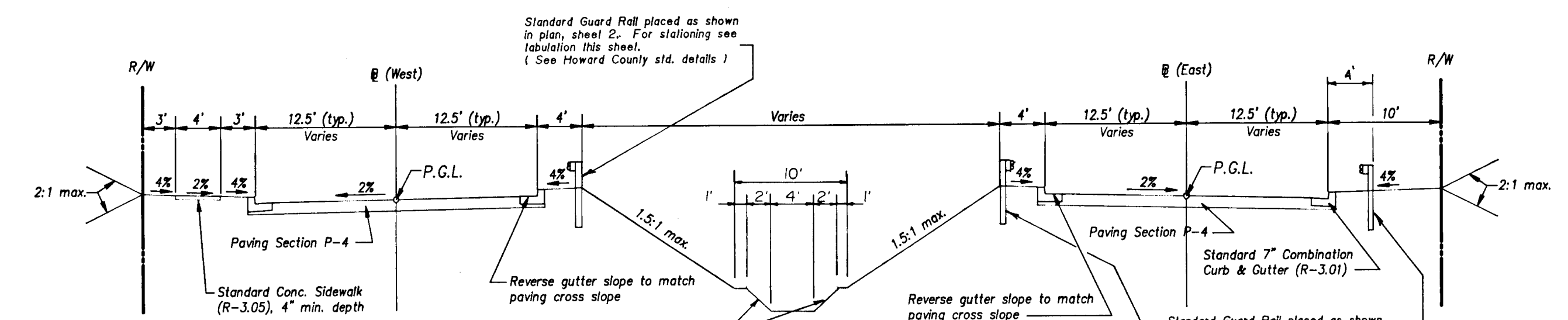


From Sta. 16+05 East to Sta. 16+53 East
From Sta. 16+11 West to Sta. 16+71 West
From Sta. 16+99 East to Sta. 17+82 East
From Sta. 17+19 West to Sta. 18+05 West
Not to Scale

TRAFFIC BARRIER W-BEAM TABULATION

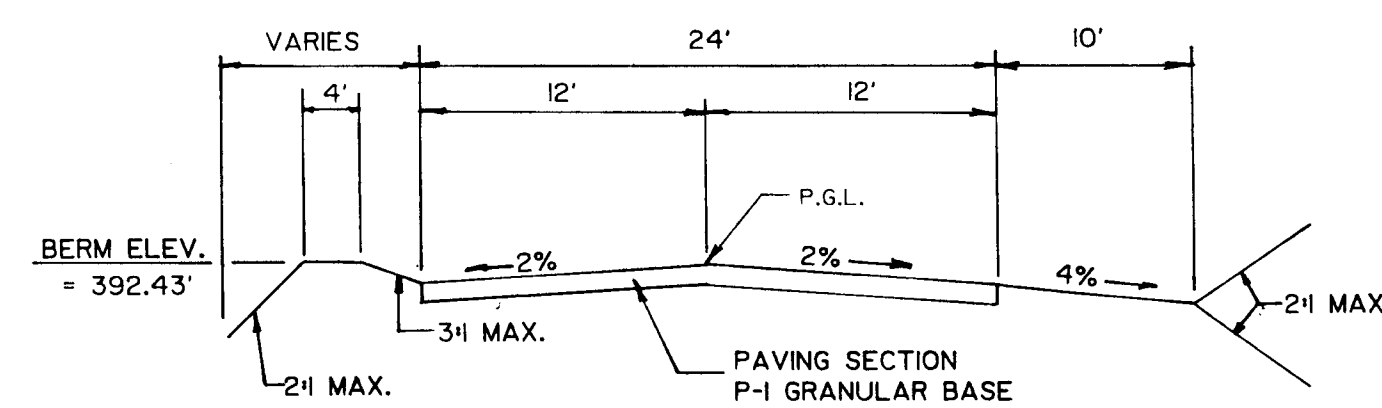
BEGIN TYPE I END FLARE	EAST B 16+05 o/s 28'R	Ho. Co. Sid. R7.13
BEGIN NORMAL GUARD RAIL SECTION	EAST B 16+96 o/s 21'R	Ho. Co. Sid. R7.01
END GUARD RAIL WITH TRAIL END ANCHORAGE	EAST B 18+00 o/s 17'R	Ho. Co. Sid. R7.03
BEGIN TYPE I END FLARE	EAST B 17+13 o/s 24'L	Ho. Co. Sid. R7.13
BEGIN NORMAL GUARD RAIL SECTION	EAST B 18+00 o/s 17'L	Ho. Co. Sid. R7.01
END GUARD RAIL WITH TRAIL END ANCHORAGE	EAST B 20+63 o/s 16.5'L	Ho. Co. Sid. R7.03
BEGIN GUARD RAIL WITH TRAIL END ANCHORAGE	WEST B 17+75 o/s 16.5'R	Ho. Co. Sid. R7.03
BEGIN TYPE I END FLARE	WEST B 19+99 o/s 16.5'R	Ho. Co. Sid. R7.13 *
END TYPE I END FLARE	WEST B 20+85 o/s 16.5'R	Ho. Co. Sid. R7.13 *

* Standard end flare modified as shown on plan, sheet 2.

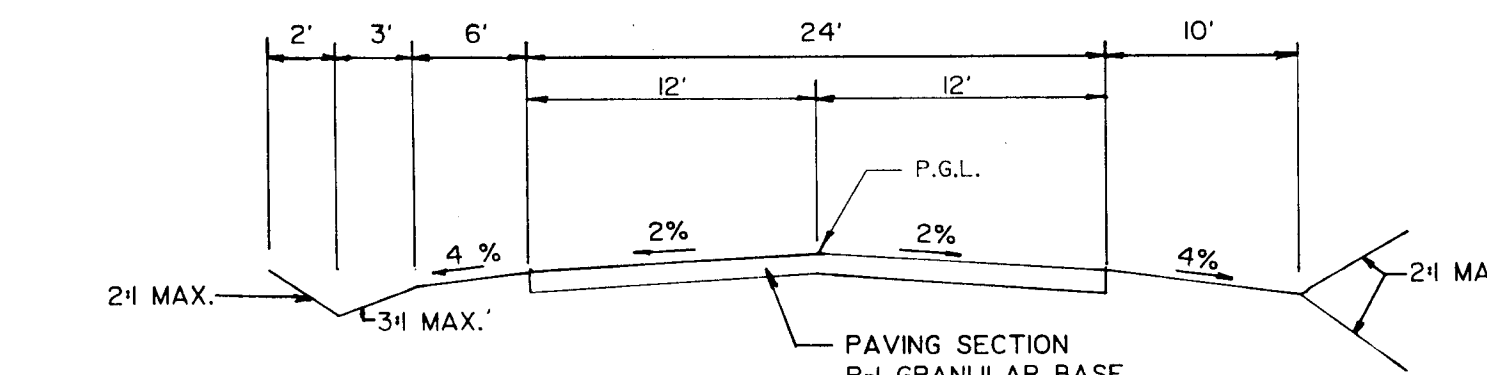


From Sta. 17+82 East to Sta. 20+63.16 East
From Sta. 18+05 West to Sta. 20+85.90 West

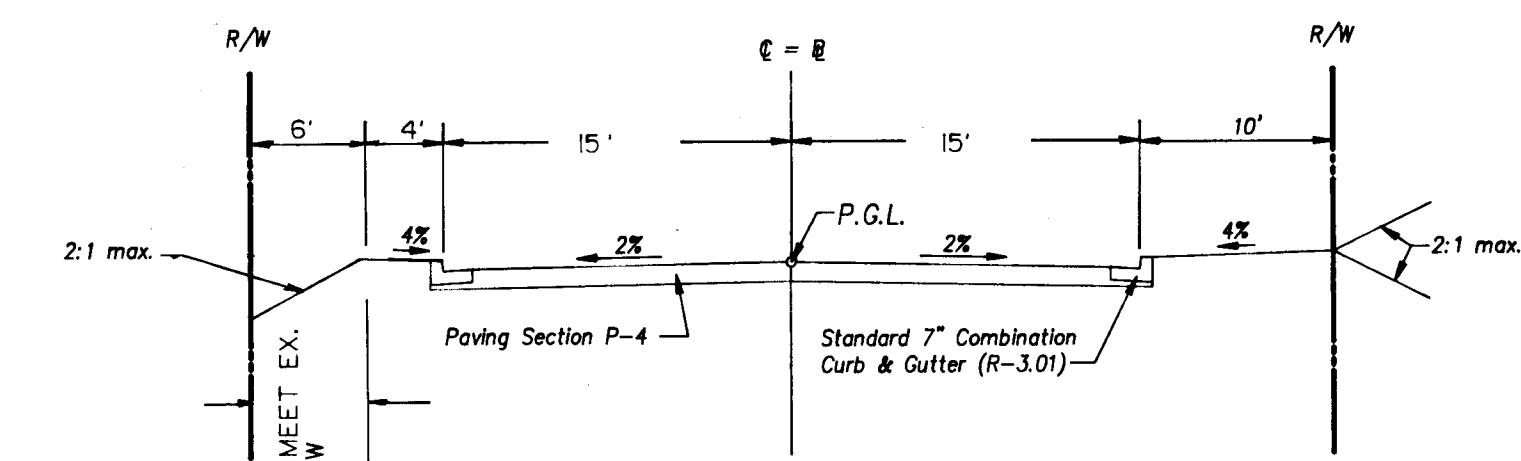
TYPICAL SECTIONS NORTH CHATHAM ROAD
Not to Scale



TYPICAL SECTION-STATION 0+00-0+65 CHURCH DRIVEWAY
NOT TO SCALE



TYPICAL SECTION-STATION 0+65-END CHURCH DRIVEWAY
NOT TO SCALE



TYPICAL SECTION PAULSKIRK DRIVE
Not to Scale

REVISED TYPICAL SECTION CHANNEL IMPROVEMENT 18/28/91

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 1/15/92
 Chief, Bureau of Engineering: *[Signature]* 1-15-92
 Chief, Roads, Bridges, & Storm Drainage: *[Signature]* 1/15/92
 Chief, Bureau of Highways: *[Signature]* 1/15/92

MILDENBERG MOCHI & ASSOCIATES, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
 (301) 461-0078 D.C. Metro: (301) 621-5788



DES: JLM				
DRN: JLM				
CHK: JBM				
PROJ. # 89031				
DATE: MAY 1991	BY	NO.	REVISION	DATE

TYPICAL SECTIONS AND DETAILS

600' SCALE MAP NO. _____ BLOCK NO. _____

NORTH CHATHAM ROAD IMPROVEMENTS

CAPITAL PROJECT No. J-4088
 ELECTION DISTRICT No. 2
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 5 OF 23

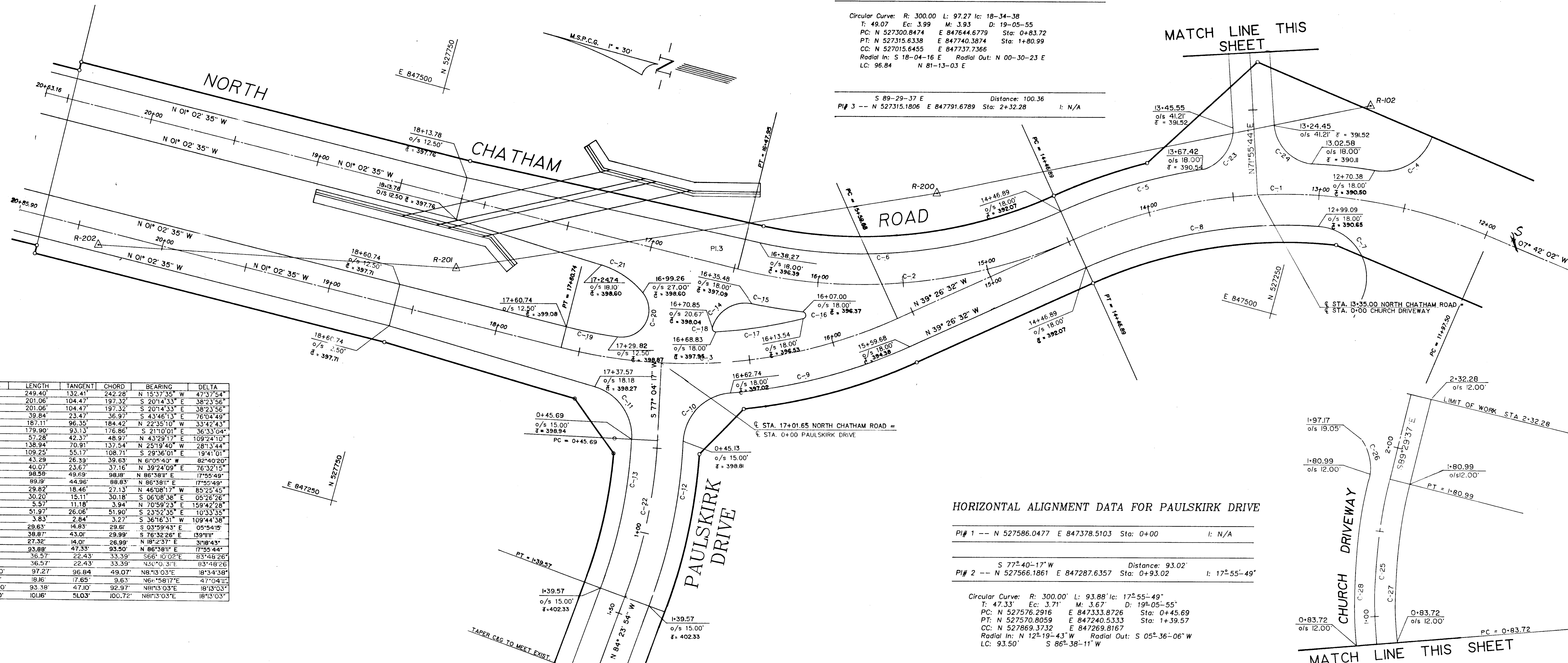
HORIZONTAL ALIGNMENT FOR CHURCH DRIVEWAY

PI# 1 -- N 527274.8785 E 847565.0897 Sta: 0+00 I: N/A

N 71-55-44 E Distance: 132.78
PI# 2 -- N 527316.0674 E 847691.3235 Sta: 1+32.78 I: 18-34-38

Circular Curve: R: 300.00' L: 97.27' I: 18-34-38
T: 49.07' Ec: 3.99' M: 3.93' D: 19-05-55
PC: N 527300.8474 E 847644.6779 Sta: 0+83.72
PT: N 527315.6338 E 847740.3874 Sta: 1+80.99
CC: N 527015.6455 E 847377.7366
Radial In: S 18-04-16 E Radial Out: N 00-30-23 E
LC: 96.84' N 81-13-03 E

S 89-29-37 E Distance: 100.36
PI# 3 -- N 527315.1806 E 847791.6789 Sta: 2+32.28 I: N/A



CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
C-1	300.00'	249.40'	132.41'	242.28'	N 153°37'56" W	47°37'54"
C-2	300.00'	201.06'	104.47'	197.32'	S 201°43'33" E	38°23'56"
C-3	300.00'	201.06'	104.47'	197.32'	S 201°43'33" E	38°23'56"
C-4	30.00'	39.84'	23.47'	36.97'	S 43°46'13" E	76°04'49"
C-5	318.00'	187.11'	96.35'	184.42'	N 223°51'10" W	33°42'43"
C-6	282.00'	179.90'	93.13'	176.86'	S 21°10'01" E	36°33'04"
C-7	30.00'	57.28'	42.37'	48.97'	N 43°29'17" E	109°24'10"
C-8	282.00'	138.94'	70.91'	137.54'	N 25°19'40" W	281°34'44"
C-9	318.00'	109.25'	55.17'	108.71'	S 29°36'01" E	194°10'11"
C-10	30.00'	43.29'	26.33'	39.63'	N 61°05'42" W	62°40'20"
C-11	30.00'	40.07'	23.67'	37.16'	N 39°24'09" E	76°32'15"
C-12	315.00'	98.59'	49.69'	98.18'	N 86°38'11" E	17°55'49"
C-13	285.00'	89.19'	44.96'	88.63'	N 86°38'11" E	17°55'49"
C-14	20.00'	29.82'	18.46'	27.13'	N 46°08'17" W	85°25'45"
C-15	318.00'	30.20'	15.11'	30.18'	S 06°08'38" E	05°26'26"
C-16	2.00'	5.57'	11.18'	3.94'	N 70°59'23" E	159°42'28"
C-17	282.00'	51.97'	26.06'	51.90'	S 23°52'35" E	10°33'35"
C-18	2.00'	3.83'	2.84'	3.27'	S 36°16'31" W	109°44'38"
C-19	287.50'	29.63'	14.83'	29.61'	S 03°59'43" E	09°54'49"
C-20	16.00'	38.87'	43.01'	29.99'	S 76°32'26" E	139°11'11"
C-21	50.00'	27.32'	14.01'	26.99'	N 18°23'37" E	31°8'43"
C-22	300.00'	93.89'	47.33'	93.90'	N 86°38'11" E	17°55'49"
C-23	25.00'	36.57'	22.43'	33.39'	S 66°18'02" E	63°48'26"
C-24	25.00'	36.57'	22.43'	33.39'	N 30°03'31" E	63°48'26"
C-25	300.00'	97.27'	96.84'	49.07'	N 81°13'03" E	18°34'38"
C-26	22.00'	18.16'	17.65'	9.63'	N 6°58'17" E	47°04'11"
C-27	288.00'	93.38'	47.10'	92.97'	N 81°13'03" E	18°34'38"
C-28	32.00'	10.16'	5.03'	10.07'	N 61°15'03" E	18°13'03"

HORIZONTAL ALIGNMENT DATA FOR PAULSKIRK DRIVE

PI# 1 -- N 527586.0477 E 847378.5103 Sta: 0+00 I: N/A

S 77°40'-17" W Distance: 93.02'
PI# 2 -- N 527566.1861 E 847287.6357 Sta: 0+93.02 I: 17°55'-49"

Circular Curve: R: 300.00' L: 93.88' I: 17°55'-49"
T: 47.33' Ec: 3.71' M: 3.67' D: 19°05'-55"
PC: N 527576.2916 E 847333.8726 Sta: 0+45.69
PT: N 527570.8059 E 847240.5333 Sta: 1+39.57
CC: N 527869.3732 E 847269.8167
Radial In: N 12°19'-43" W Radial Out: S 05°36'-06" W
LC: 93.50' S 86°38'-11" W

N 84°23'-54" W Distance: 153.25'
PI# 3 -- N 527581.1451 E 847135.1160 Sta: 2+45.50 I: N/A

HORIZONTAL ALIGNMENT DATA FOR EAST CENTERLINE

PI# 1 -- N 526844.2356 E 847537.2435 Sta: 9+00 I: N/A

N 07°42'-02" E Distance: 429.90'
PI# 2 -- N 527270.1498 E 847595.6908 Sta: 13+29.91 I: 47°08'-34"

Circular Curve: R: 300.00' L: 249.40' I: 47°37'-54"
T: 132.41' Ec: 27.92' M: 25.55' D: 19°05'-55"
PC: N 527139.0853 E 847576.8285 Sta: 11+97.50
PT: N 527372.4094 E 847511.5678 Sta: 14+46.89
CC: N 527181.8199 E 847279.8878
Radial In: N 81°48'-38" W Radial Out: N 50°33'-28" E
LC: 242.28' N 15°37'-35" W

N 39°26'-32" W Distance: 236.88'
PI# 3 -- N 527453.0867 E 847445.1994 Sta: 15+51.36 I: 38°23'-56"

Circular Curve: R: 300.00' L: 201.06' I: 38°23'-56"
T: 104.47' Ec: 17.67' M: 16.69' D: 19°05'-55"
PC: N 527372.4094 E 847511.5678 Sta: 14+46.89
PT: N 527557.376 E 847443.2976 Sta: 16+47.95
CC: N 527562.9989 E 847743.2479
Radial In: N 50°33'-28" E Radial Out: S 88°57'-25" W
LC: 197.32' N 20°14'-33" W

N 01°02'-35" W Distance: 519.68'
PI# 4 -- N 527972.6815 E 847435.7388 Sta: 20+63.16 I: N/A

HORIZONTAL ALIGNMENT DATA FOR WEST CENTERLINE

PI# 1 -- N 526844.2356 E 847537.2435 Sta: 9+00 I: N/A

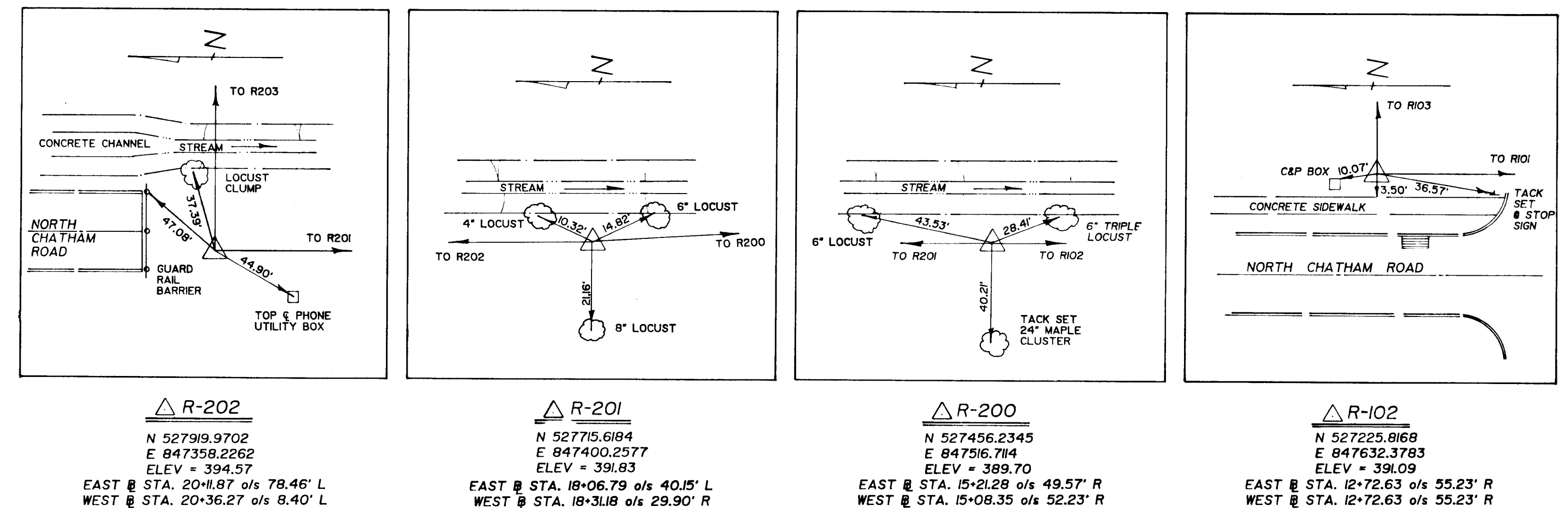
N 07°42'-02" E Distance: 429.90'
PI# 2 -- N 527270.1498 E 847595.6908 Sta: 13+29.91 I: 47°08'-34"

Circular Curve: R: 300.00' L: 249.40' I: 47°37'-54"
T: 132.41' Ec: 27.92' M: 25.55' D: 19°05'-55"
PC: N 527139.0853 E 847576.8285 Sta: 11+97.50
PT: N 527372.4094 E 847511.5678 Sta: 14+46.89
CC: N 527181.8199 E 847279.8878
Radial In: N 81°48'-38" W Radial Out: N 50°33'-28" E
LC: 242.28' N 15°37'-35" W

N 39°26'-32" W Distance: 349.67'
PI# 3 -- N 527540.1914 E 847373.5435 Sta: 16+64.15 I: 38°23'-56"

Circular Curve: R: 300.00' L: 201.06' I: 38°23'-56"
T: 104.47' Ec: 17.67' M: 16.69' D: 19°05'-55"
PC: N 527459.5141 E 84739.9120 Sta: 15+59.68
PT: N 527644.6422 E 847371.6417 Sta: 17+60.74
CC: N 527850.1036 E 847671.5920
Radial In: N 50°33'-28" E Radial Out: S 88°57'-25" W
LC: 197.32' N 20°14'-33" W

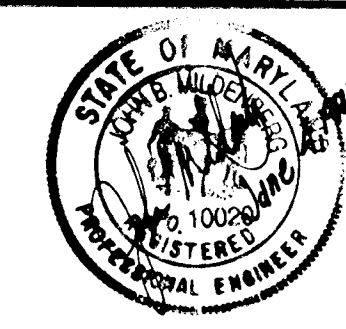
N 01°02'-35" W Distance: 429.63'
PI# 4 -- N 527969.7494 E 847365.7223 Sta: 20+85.90 I: N/A



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] DATE: 1/15/92
Chief, Bureau of Engineering: [Signature] DATE: 1-15-92
Chief, Bureau of Highway: [Signature] DATE: 1/15/92

MILDENBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro: (301) 621-5768

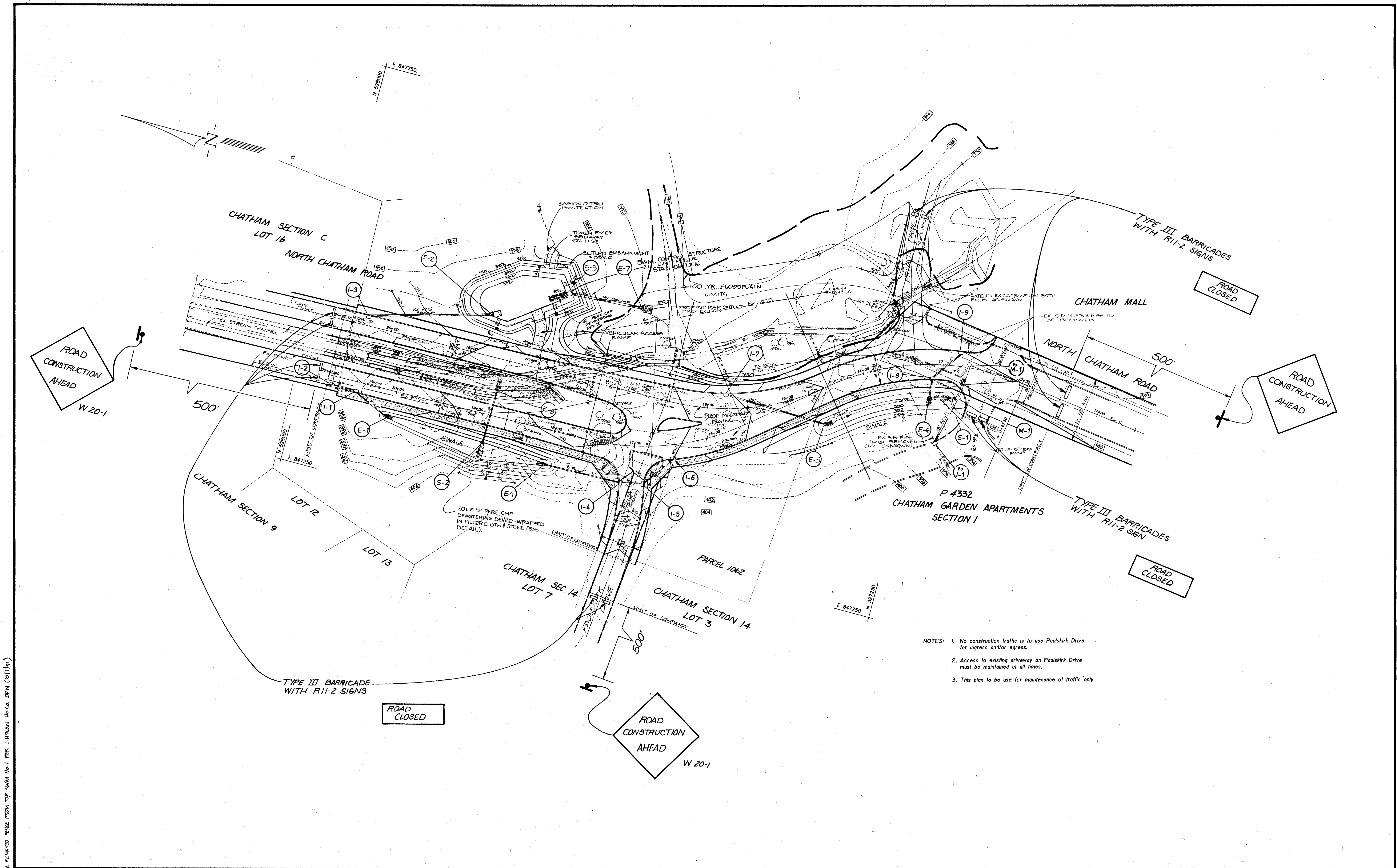


DES:	JBM
DRN:	LJG/TJP
CHK:	JBM
PROJ. #	89031
DATE:	MAY 1992
BY:	NO.
REVISION:	
DATE:	
600' SCALE MAP NO.	BLOCK NO.

GEOMETRIC LAYOUT

NORTH CHATHAM ROAD IMPROVEMENTS
CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 6 OF 23



- NOTES:
1. No construction traffic is to use Paulskirk Drive for ingress and/or egress.
 2. Access to existing driveway on Paulskirk Drive must be maintained at all times.
 3. This plan to be used for maintenance of traffic only.

1. REMOVED FROM TOP SHEET PER J. HOLLAN HO. CO. DPN (10/1/92)

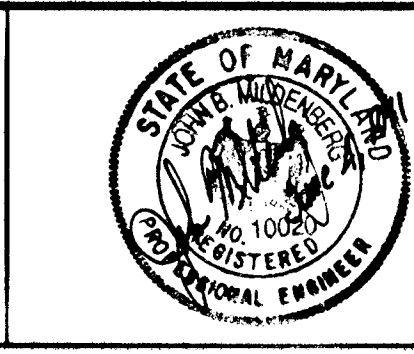
DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 1/15/92 *[Signature]* 1-15-92
 DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 1/15/92 *[Signature]* 1/15/92
 CLYDE H. ANDERSON, COLLECTOR DANIELLE W. WILKINSON

MILDENBERG MOCHI & ASSOCIATES, INC.
 ENGINEERS - SURVEYORS - PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
 (301) 461-0077 P.O. Metro: (301) 671-5168



DES. TJP	
DRN. TJP	
CHK. JEM	
PROJ. # 00001	
(A) MAY 1992	

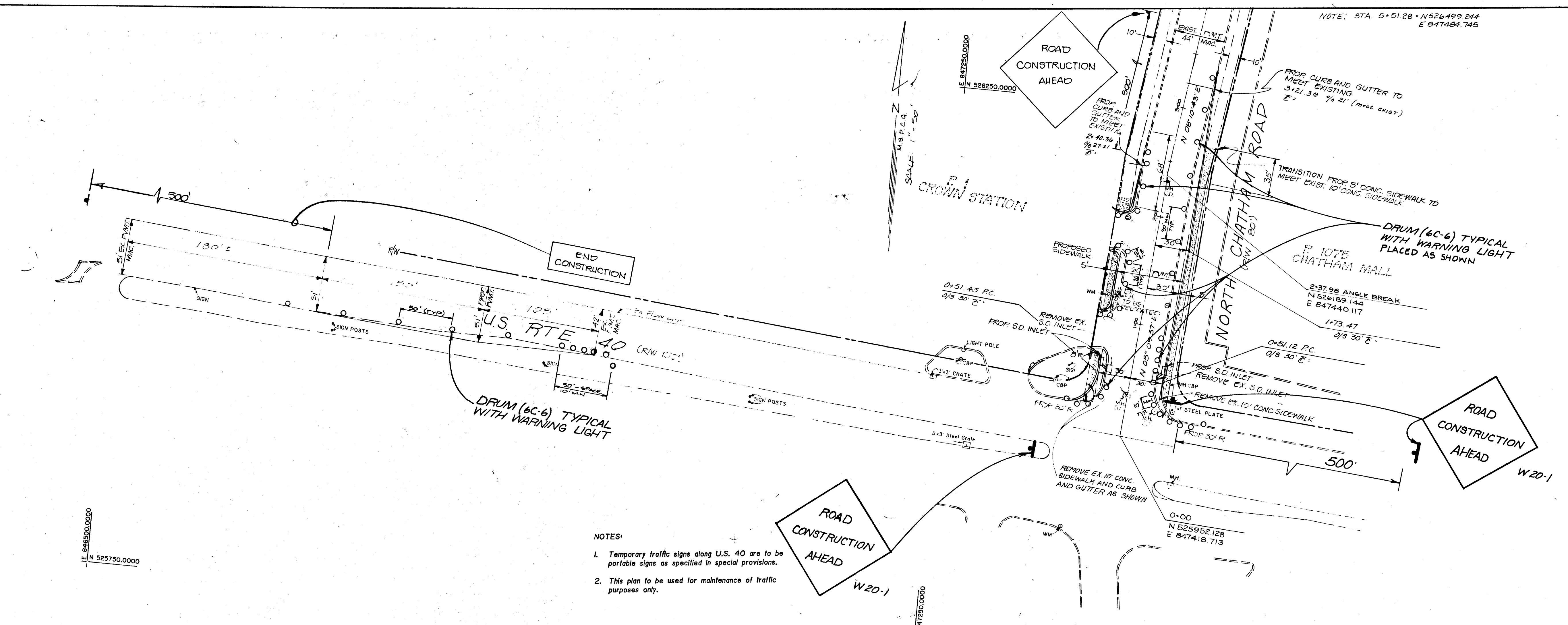
MAINTENANCE OF TRAFFIC PLAN

NORTH CHATHAM ROAD IMPROVEMENTS
 CAPITAL PROJECT No. J-4088
 ELECTION DISTRICT No. 2
 HOWARD COUNTY, MARYLAND

SCALE:
 1" = 50'

SHEET
 7 OF 23

NOTE: STA. 5+51.28 N 526499.244
E 847484.745

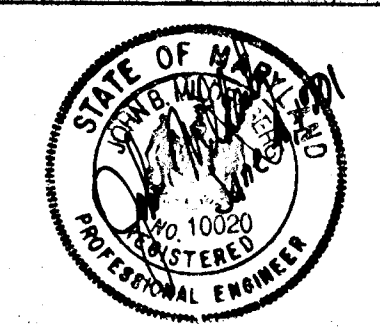


2) APPROVED TRAFFIC SIGN NOTE PER HQ 66 REG 150.0015 (01/1/74)
3) 95% COMPLETION TO HOWARD COUNTY RR & D.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James J. ...
DIRECTOR OF PUBLIC WORKS
DATE: 1-15-92
Traville W. ...
CHIEF, BUREAU OF ENGINEERING
DATE: 1/15/92
CHIEF, DIVISION OF ROADS, BRIDGES & STORM DRAINAGE

MILDENBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS • SURVEYORS • PLANNERS
3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-3078 D.C. Metro: (301) 621-5788



DES: JPM					
DRN: D.U.D.					
CHK: TJP					
DATE: MAY 1991	BY:	NO.	REVISION	DATE	600' SCALE MAP NO. _____ BLOCK NO. _____

MAINTENANCE OF TRAFFIC PLAN

NORTH CHATHAM ROAD IMPROVEMENTS
CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND.

SCALE AS SHOWN
SHEET 8 OF 23

Sediment Control
Sequence of Construction

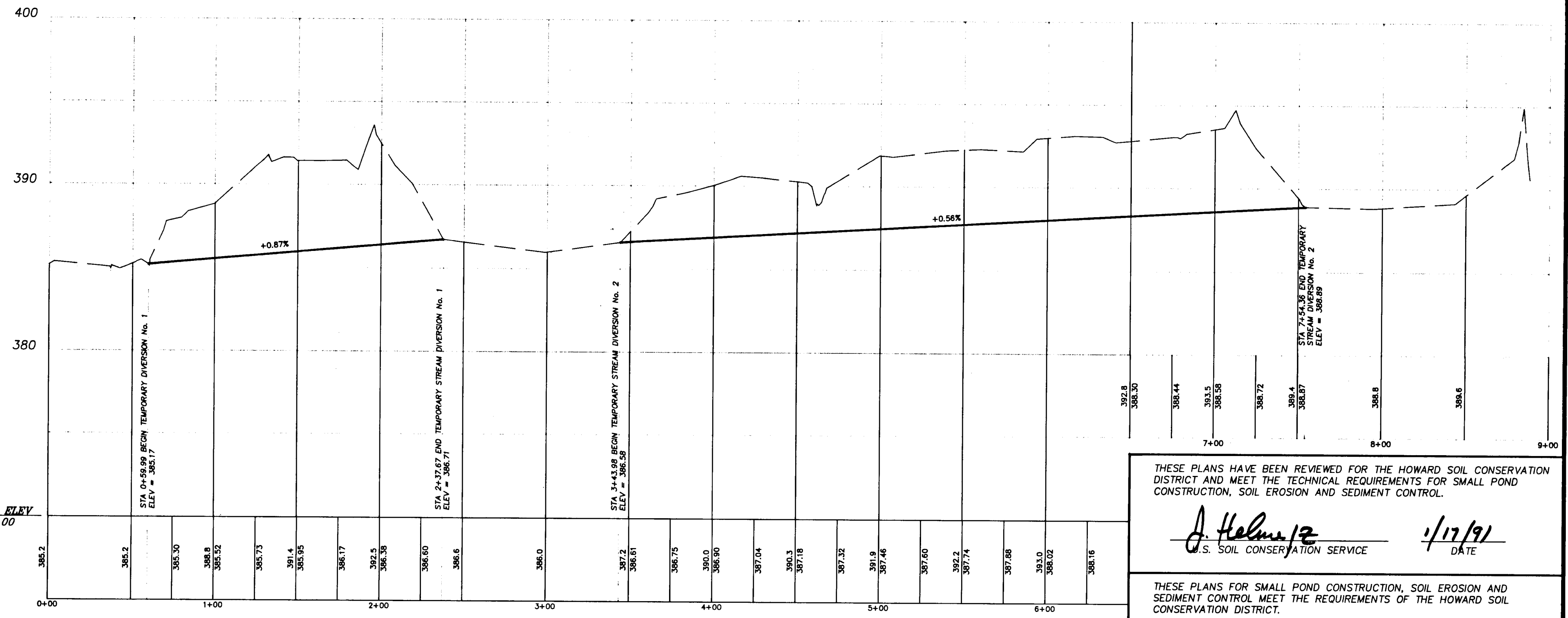
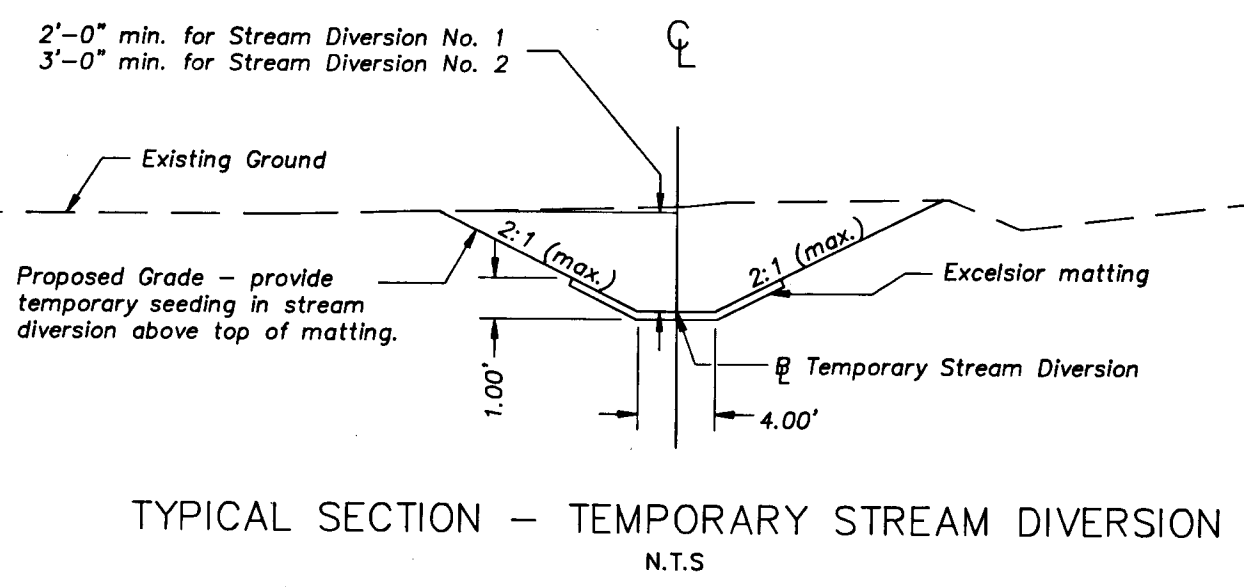
- Obtain grading permit.
- Install stabilized construction entrances as indicated on plan.
- Install temporary access culverts (2-6'4" x 4'9" CMPA), as indicated on detail, sheet 11 of 23.
- Construct temporary stream diversion as indicated on Sequence of Construction for Temporary Channel Diversion, as listed on this sheet.
- Begin construction of new culvert as indicated on Sequence of Construction for Culvert Crossing, sheet 15 of 23.
- Construct temporary stream diversion at Church driveway. See Sequence of Construction and details indicated for Temporary Channel Diversion as listed on this sheet.
- Begin construction of Church driveway culvert extension and headwalls.
- Construct earth dikes, perimeter dike swales and asphalt berms.
- Construct sediment basin no. 1, see sheet 10 of 23.
- Construct sediment basin no. 2, including storm drain line from S-2 to E-3; construct sediment basin no. 3, including storm drain lines Ex I-1 to MH-1, S-1 and Ex M-1. See sheet 10 of 23.
- Construct remaining storm drain system as site is brought to grade. Maintain positive drainage from low point at 20+50+ to drain to existing stream. This area may be brought to grade when stone base is in place and disturbed areas are stabilized.
- When site is stabilized remove accumulated sediment from sediment basin and traps and convert to SWM structure.
- Stabilize disturbed areas.
- With approval of sediment control inspector, remove remaining sediment control devices and stabilize areas.

Sequence of Construction
Temporary Channel Diversion

- Begin excavation for temporary channel diversion at downstream limits of diversion. Do not breakthrough to existing channel.
- Excavate temporary channel to limits indicated. Place excelsior matting along channel invert as shown on typical section of temporary channel diversion. Do not breakthrough to existing channel.
- Provide sandbag flow diversion at downstream limits of temporary channel. See detail on sheet 11 of 23. Breakthrough to existing channel at downstream limits of diversion. Leave sandbags in place to prevent stream from flowing into new diversion channel. Provide excelsior matting on disturbed areas.
- Provide sandbag flow diversion at upstream limits of temporary channel. See detail on sheet 11 of 23. Breakthrough to existing channel at upstream limits of diversion. Leave sandbags in place to prevent stream from flowing into new diversion channel. Provide excelsior matting on disturbed areas.
- Relocate sandbags at upstream limits to cross existing stream and divert stream to new temporary diversion channel. Relocate sandbags at downstream limits to cross existing stream to prevent sediments from work area from entering stream.
- Provide silt fence along banks of diversion channel as shown.
- Pump area of construction as required by pumping into dewatering basin. See detail on sheet 11 of 23.

HORIZONTAL ALIGNMENT DATA FOR TEMPORARY STREAM DIVERSIONS No. 1 & No. 2

PIVOT	Station	Distance	Notes
PIV 1	N 527223.6331 E 847756.1317	Sta: 0+00	i: N/A
PIV 2	N 56-36-04 W	Distance: 37.52	i: 38-43-24
PIV 3	N 527244.2859 E 847724.8089	Sta: 0+37.52	
PIV 4	S 84-40-33 W	Distance: 22.47	i: 18-38-13
PIV 5	N 527242.2009 E 847702.4361	Sta: 0+59.99	
PIV 6	N 76-41-15 W	Distance: 40.07	i: 30-16-27
PIV 7	N 527251.4286 E 847663.4382	Sta: 1+00.06	
PIV 8	N 46-24-48 W	Distance: 92.92	i: 31-48-13
PIV 9	N 527315.4938 E 847596.1320	Sta: 1+93.72	
PIV 10	N 33-00-00 W	Distance: 270.59	i: 22-35-18
PIV 11	N 527813.0579 E 847414.3420	Sta: 7+34.91	
PIV 12	N 10-24-42 W	Distance: 60.26	i: 07-58-59
PIV 13	N 527872.3294 E 847403.4513	Sta: 7+94.65	
PIV 14	N 02-25-42 W	Distance: 48.91	i: 01-04-30
PIV 15	N 527921.1926 E 847401.3790	Sta: 8+43.56	
PIV 16	N 01-21-12 W	Distance: 44.63	i: N/A
PIV 17	N 527965.8057 E 847400.3250	Sta: 8+88.19	



- NOTES:
- Contractor shall bring supplies and equipment required to construct improvements to culvert beneath church driveway onto site through church parking lot.
 - Vehicles shall not cross stream except at temporary access culvert.
 - This plan is to be used for temporary stream diversion and sediment control purposes only.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

J. Helms /1/17/91
S. SOIL CONSERVATION SERVICE DATE

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

Rolando Ziehm /1/17/91
HOWARD SOIL CONSERVATION DISTRICT DATE

1. Revised Temporary Stream Diversion Alignment per HSD comments (10/29/91)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James A. ... 1-15-92
DIRECTOR OF PUBLIC WORKS DATE

William ... 1-15-92
CHIEF, BUREAU OF ENGINEERING DATE

William ... 1-15-92
CHIEF, BUREAU OF HIGHWAYS DATE

MILDBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro: (301) 621-5768

Bob Mochi 1-13-92

DES:	TJP			
DRN:	TJP			
CHK:	JBM			
PROJ. #	89031			
DATE:	OCT. '91			
BY	NO.	REVISION	DATE	

TEMPORARY STREAM DIVERSION
PLAN & SEDIMENT CONTROL PLAN
FOR INITIAL CONSTRUCTION

600' SCALE MAP NO. BLOCK NO.

NORTH CHATHAM ROAD
IMPROVEMENTS

CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

SCALE: 1" = 50'

SHEET 9 OF 23

PERMANENT SEEDING NOTES

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

Seeded Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, unless previously loosened.

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

1. Preferred: Apply two (2) tons per acre dolomitic limestone (92 lbs/1000 square feet) and 600 lbs. per acre 10-10-10 fertilizer (14 lbs/1000 square feet) before seeding. Harrow or disc into upper three (3) inches of soil. At time of seeding, apply 100 lbs. per acre 30-0-0 ureaform fertilizer (9 lbs/1000 square feet).
2. Acceptable: Apply two (2) tons per acre dolomitic limestone (92 lbs/1000 square feet) and 1000 lbs per acre 10-10-10 fertilizer (23 lbs/1000 square feet) before seeding. Harrow or disc into upper three (3) inches of soil.

Seeding: For the periods March 1 through April 30, and August 1 thru October 15, seed with 60 lbs per acre (14 lbs/1000 square feet) of Kentucky 31 Tall Fescue. For the period May 1 through July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs per acre (15 lbs/1000 square feet) of weeping lovegrass. During the period of October 16 through February 28, protect site by: Option 1) 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring. Option 2) use sod. Option 3) Seed with 60 lbs per acre Kentucky 31 Tall Fescue and mulch with 2 tons per acre well anchored straw.

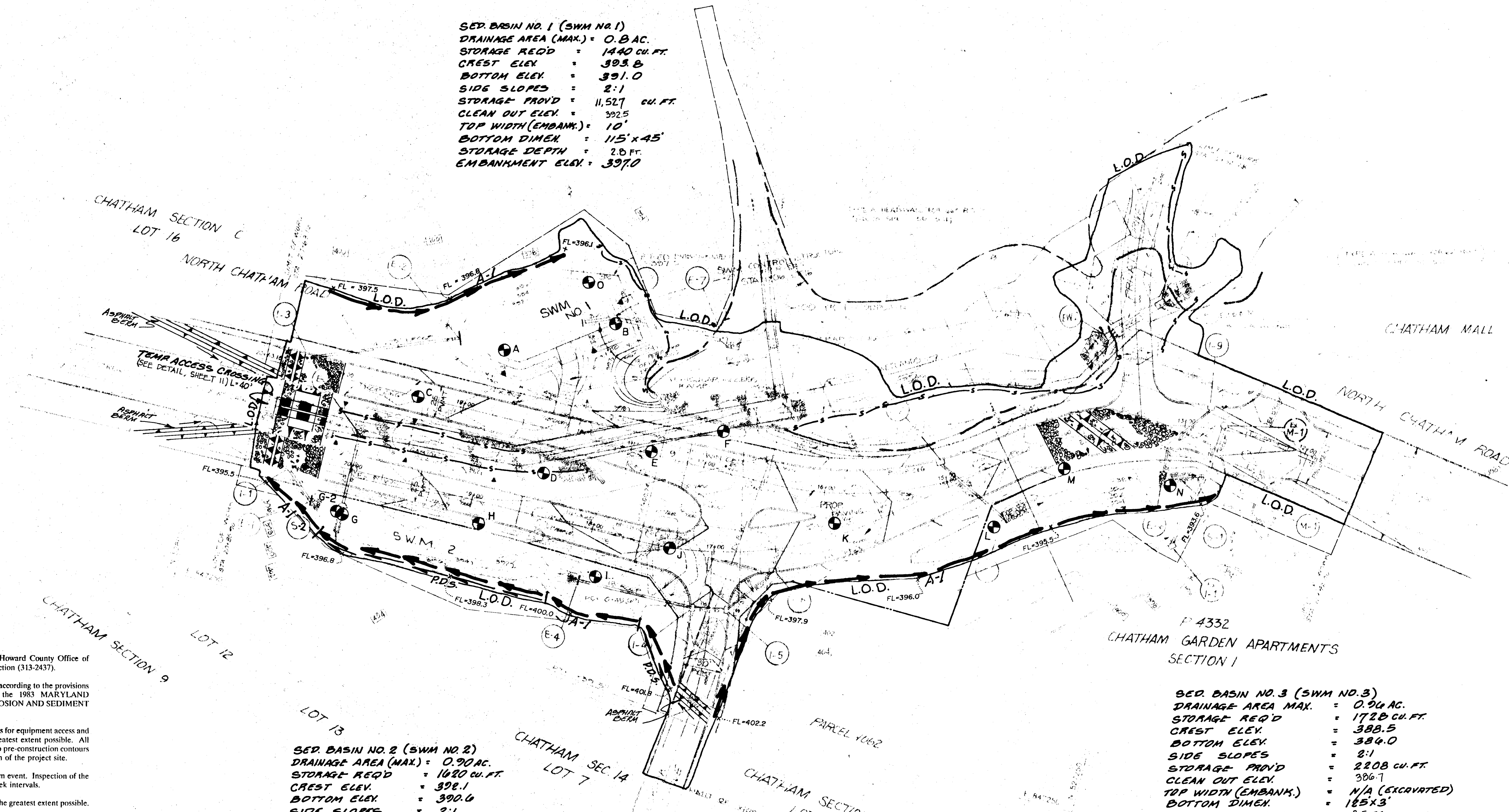
Mulching: Apply 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 square feet) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gallons/1000 square feet) of emulsified asphalt on flat areas. On slopes 8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

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

SED. BASIN NO. 1 (SWM NO. 1)
 DRAINAGE AREA (MAX.) = 0.8 AC.
 STORAGE REQ'D = 1440 CU. FT.
 CREST ELEV. = 393.8
 BOTTOM ELEV. = 391.0
 SIDE SLOPES = 2:1
 STORAGE PROV'D = 11,527 CU. FT.
 CLEAN OUT ELEV. = 392.5
 TOP WIDTH (EMBANK.) = 10'
 BOTTOM DIMEN. = 115' x 45'
 STORAGE DEPTH = 2.5 FT.
 EMBANKMENT ELEV. = 397.0

SED. BASIN NO. 2 (SWM NO. 2)
 DRAINAGE AREA (MAX.) = 0.90 AC.
 STORAGE REQ'D = 1620 CU. FT.
 CREST ELEV. = 398.1
 BOTTOM ELEV. = 390.6
 SIDE SLOPES = 2:1
 STORAGE PROV'D = 3378 CU. FT.
 CLEAN OUT ELEV. = 391.3
 TOP WIDTH (EMBANK.) = N/A (EXCAVATED)
 BOTTOM DIMEN. = 225' x 20'
 STORAGE DEPTH = 1.5 FT.
 EMBANKMENT ELEV. = N/A

SED. BASIN NO. 3 (SWM NO. 3)
 DRAINAGE AREA MAX. = 0.90 AC.
 STORAGE REQ'D = 1720 CU. FT.
 CREST ELEV. = 388.5
 BOTTOM ELEV. = 384.0
 SIDE SLOPES = 2:1
 STORAGE PROV'D = 2208 CU. FT.
 CLEAN OUT ELEV. = 386.7
 TOP WIDTH (EMBANK.) = N/A (EXCAVATED)
 BOTTOM DIMEN. = 185' x 3'
 STORAGE DEPTH = 2.5 FT.
 EMBANKMENT ELEV. = N/A



SEDIMENT CONTROL NOTES

1. A minimum of 24 hours notice must be given to the Howard County Office of Inspections and Permits prior to the start of any construction (313-2437).
2. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
3. Impacts to the riparian corridor and nontidal wetland areas for equipment access and sediment control devices should be minimized to the greatest extent possible. All unavoidable temporary impact areas should be restored to pre-construction contours and vegetation within 100 feet upstream and downstream of the project site.
4. Sediment controls should be maintained after every storm event. Inspection of the sediment controls should occur at a minimum of two week intervals.
5. Clearing in the riparian corridor should be minimized to the greatest extent possible.
6. Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within:
 - a) 7 calendar days for all perimeter slopes and all slopes greater than 3:1;
 - b) 14 days as to all other disturbed or graded areas on the project site.
7. All sediment traps shown must be fenced and warning signs posted around their perimeter in accordance with Volume I, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
8. All disturbed areas must be stabilized within the time period specified above in accordance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seedings (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
9. 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.
10. Site Analysis:

Total Area of Site:	4.13 Acs
Area Disturbed:	4.13 Acs
Area to be roofed or paved:	1.44 Acs
Area to be vegetatively stabilized:	2.59 Acs
Total Cut:	6,575 C.Y.
Total Fill:	10,056 C.Y.

 Borrow area to be from an approved site with sediment control devices in place.
11. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
12. Additional sediment controls must be provided, if deemed necessary by the Howard County DFW sediment control Inspector.

NOTE: This plan to be used for sediment control purposes only.

Legend

- Existing Ground
- Proposed Ground
- Earth Dikes
- Perimeter Dike Swale
- Stabilized Construction Entrance with Mountable Berm
- Asphalt Berm
- Silt Fence
- Trees
- Limit of Disturbance
- Boring Location
- County Easement
- Flow Line Elevation

TEMPORARY SEEDING NOTES

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

Seeded Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, unless previously loosened.

Soil Amendments: Apply 600 lbs per acre 10-10-10 fertilizer (14 lbs/1000 square feet).

Seeding: For periods March 1 through April 30 and from August 15 through November 15, seed with 2-1/2 bushels per acre of annual rye (3.2 lbs/1000 square feet). For the period May 1 through August 14, seed with 3 lbs per acre of weeping lovegrass (07 lbs/1000 square feet). For the period November 16 through 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 square feet) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gallons/1000 square feet) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gallons/1000 square feet) for anchoring.

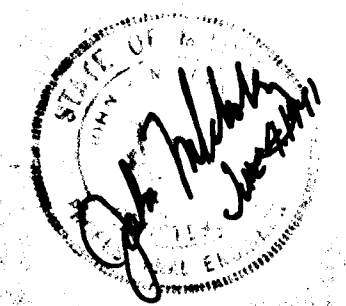
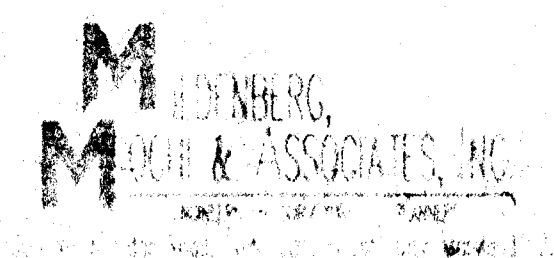
Refer to the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

J. Halperin 1/17/91
 SOIL CONSERVATION SERVICE DATE

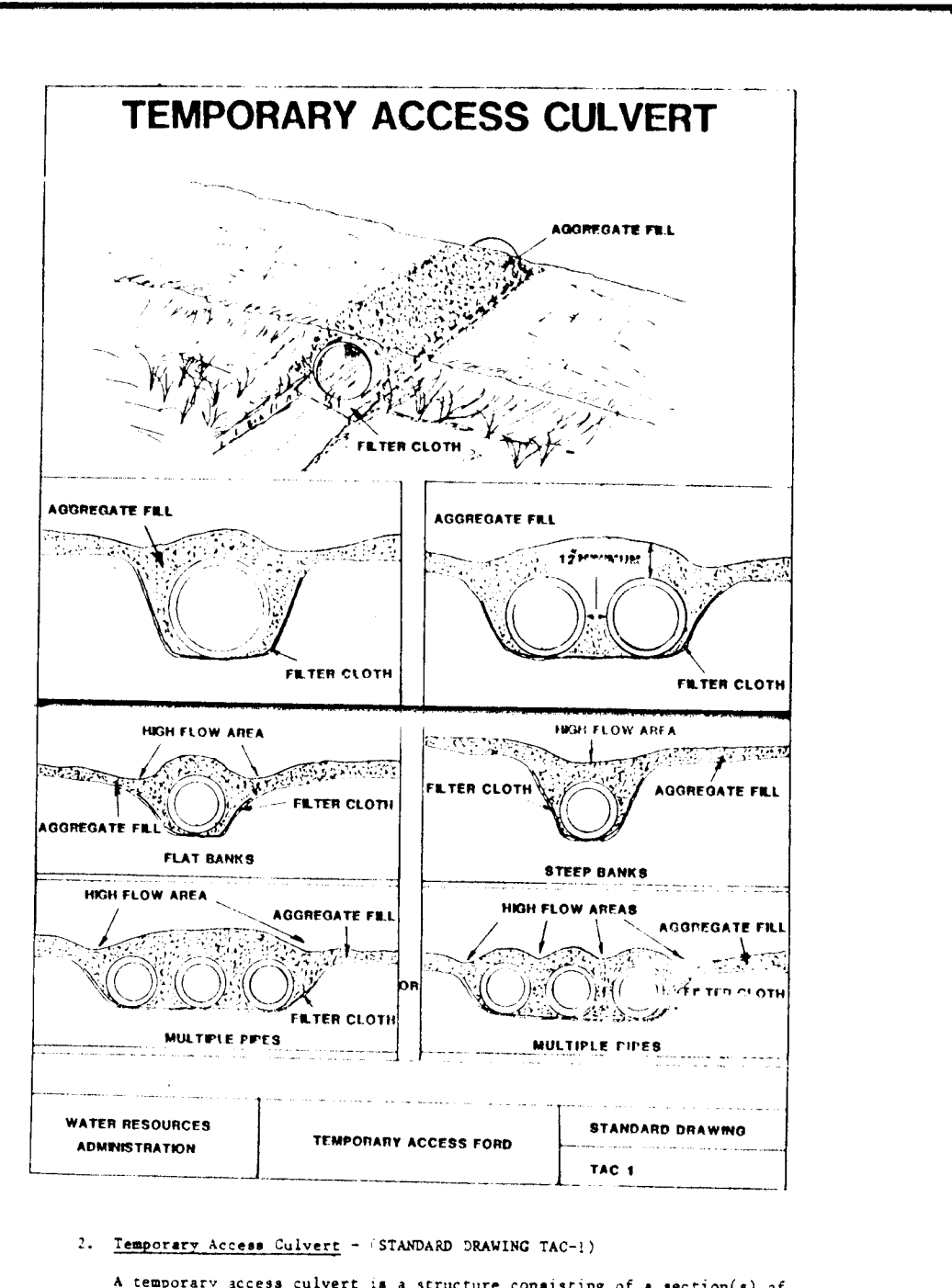
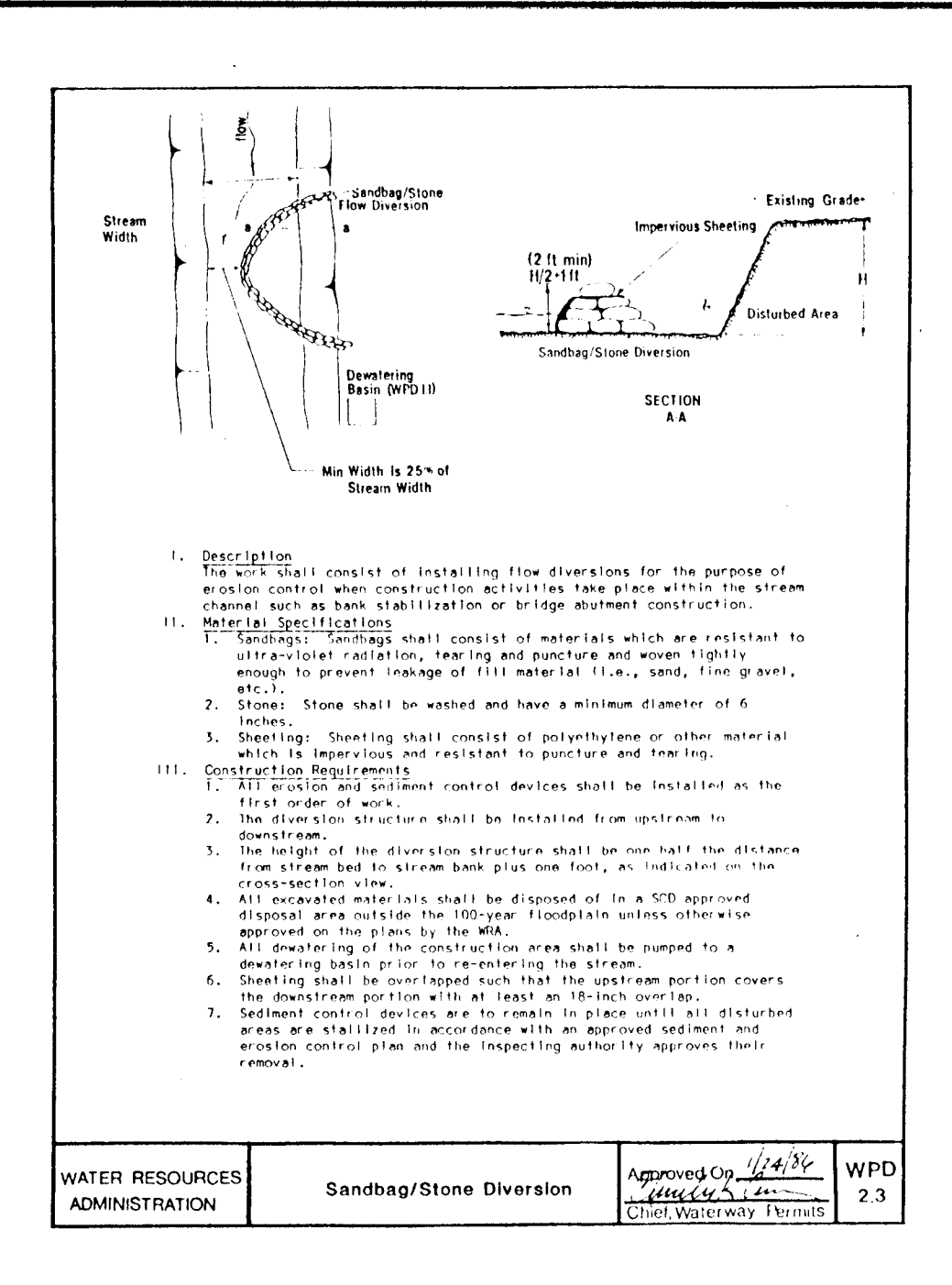
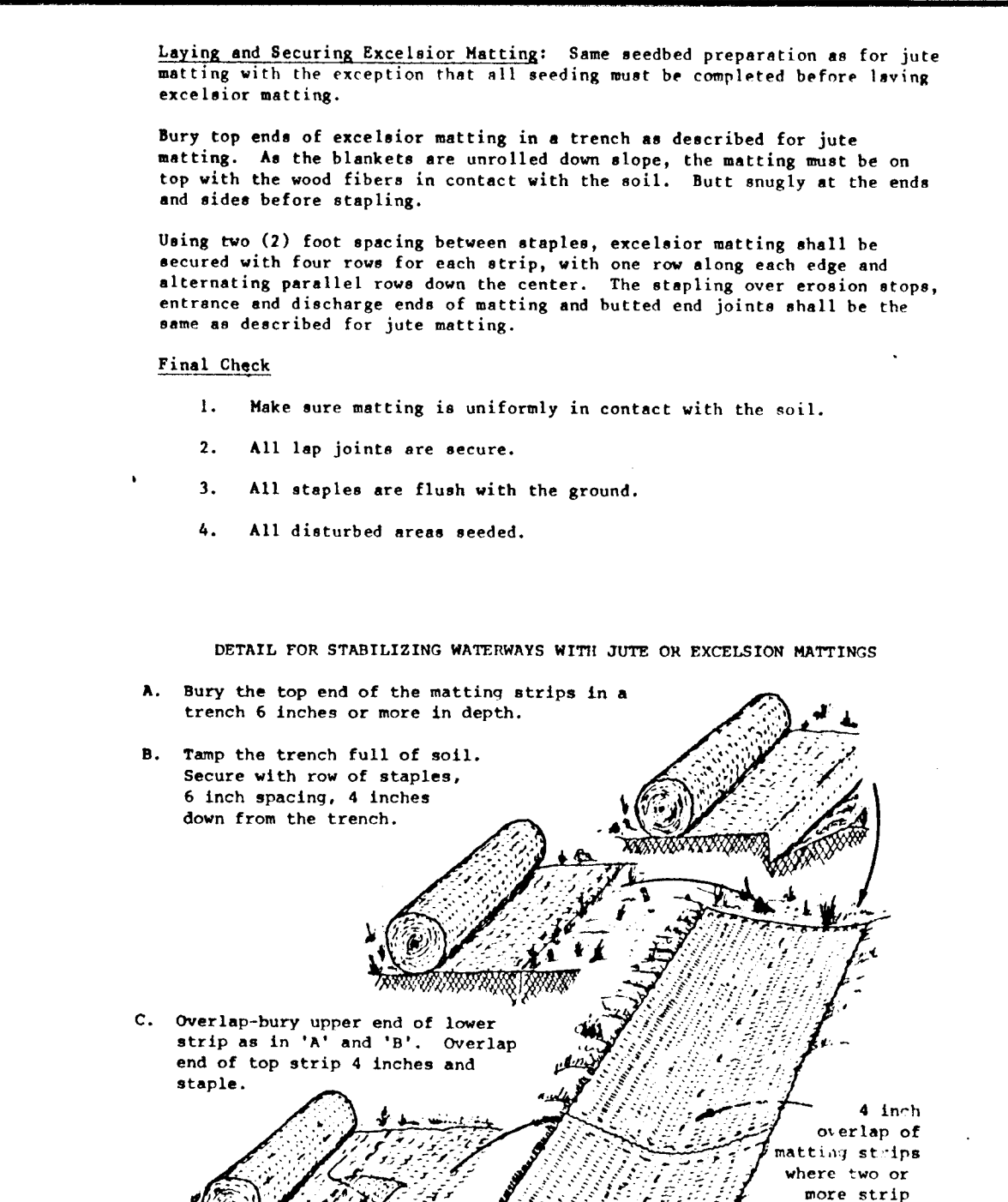
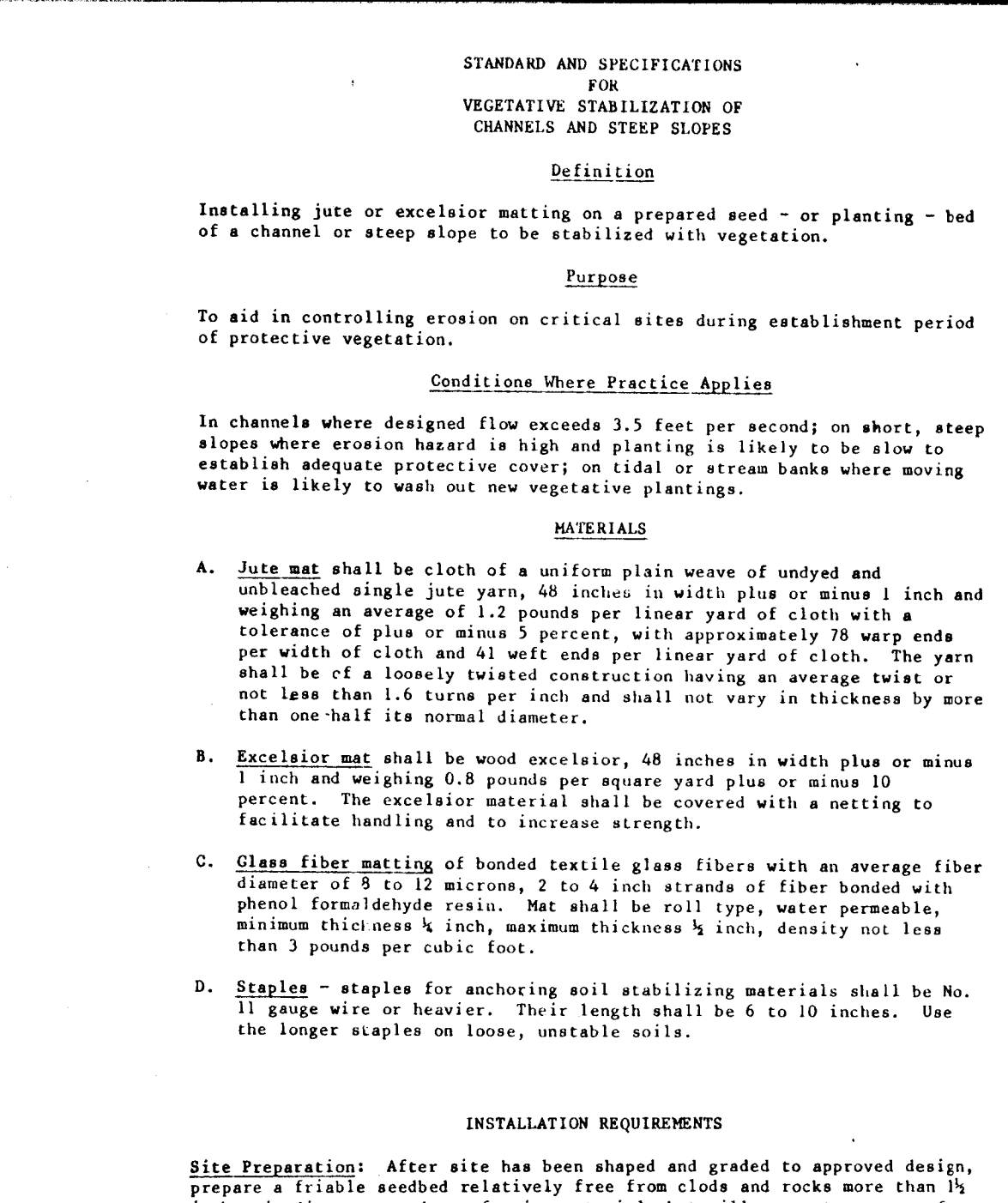
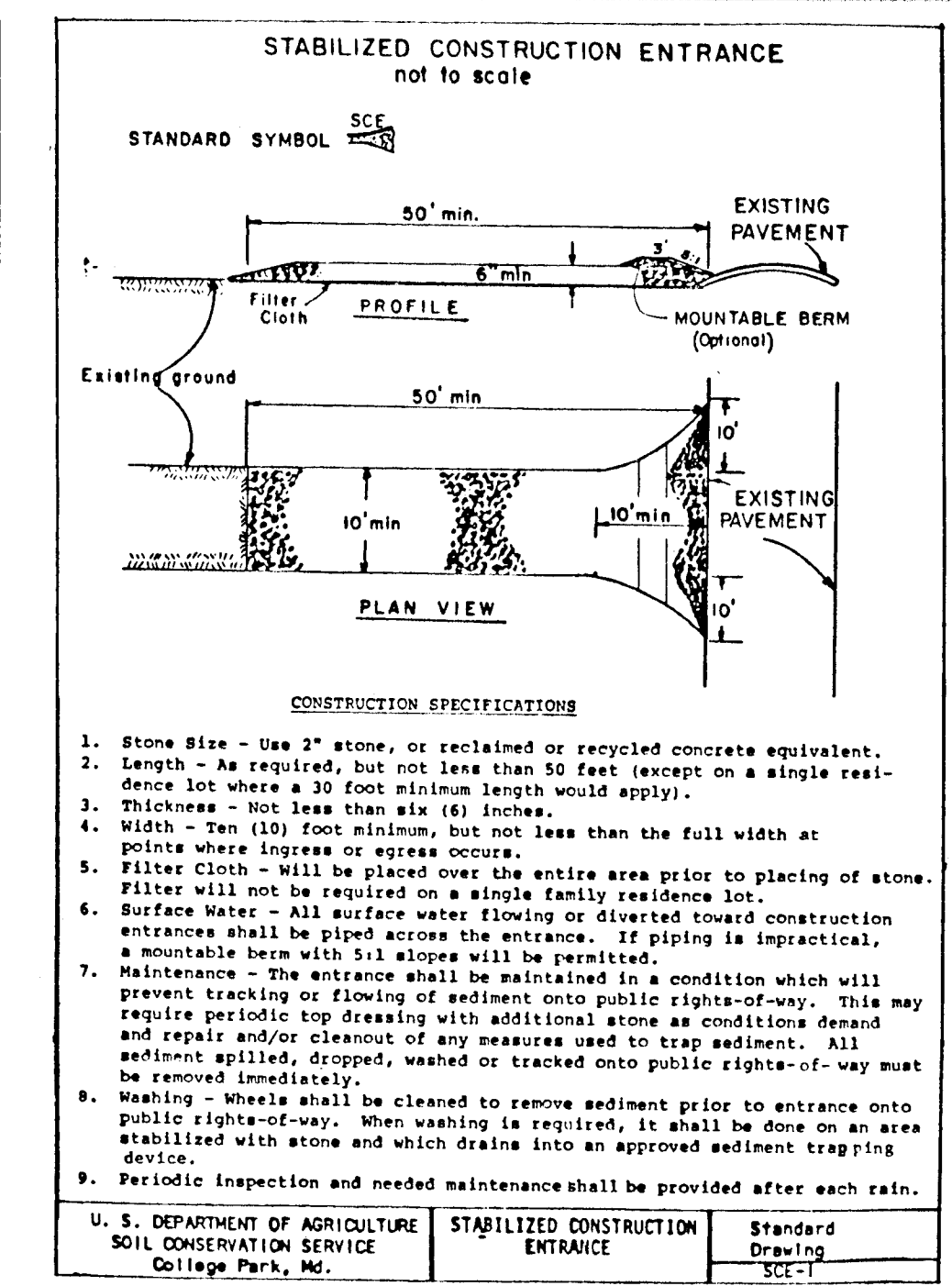
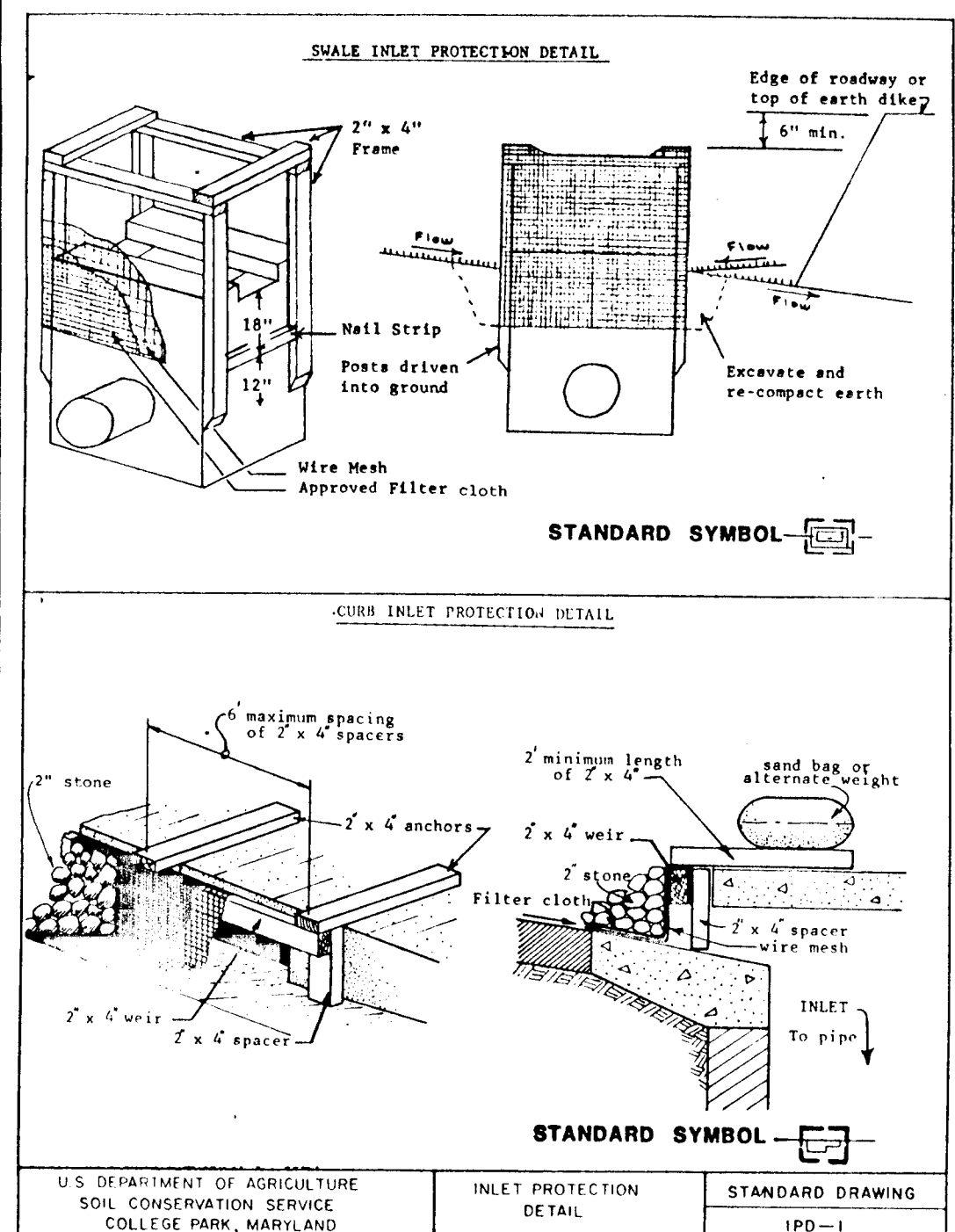
Robert J. Zahm 1/17/91
 HOWARD SOIL CONSERVATION DISTRICT DATE

James G. ...
Elizabeth ...
Janis ...



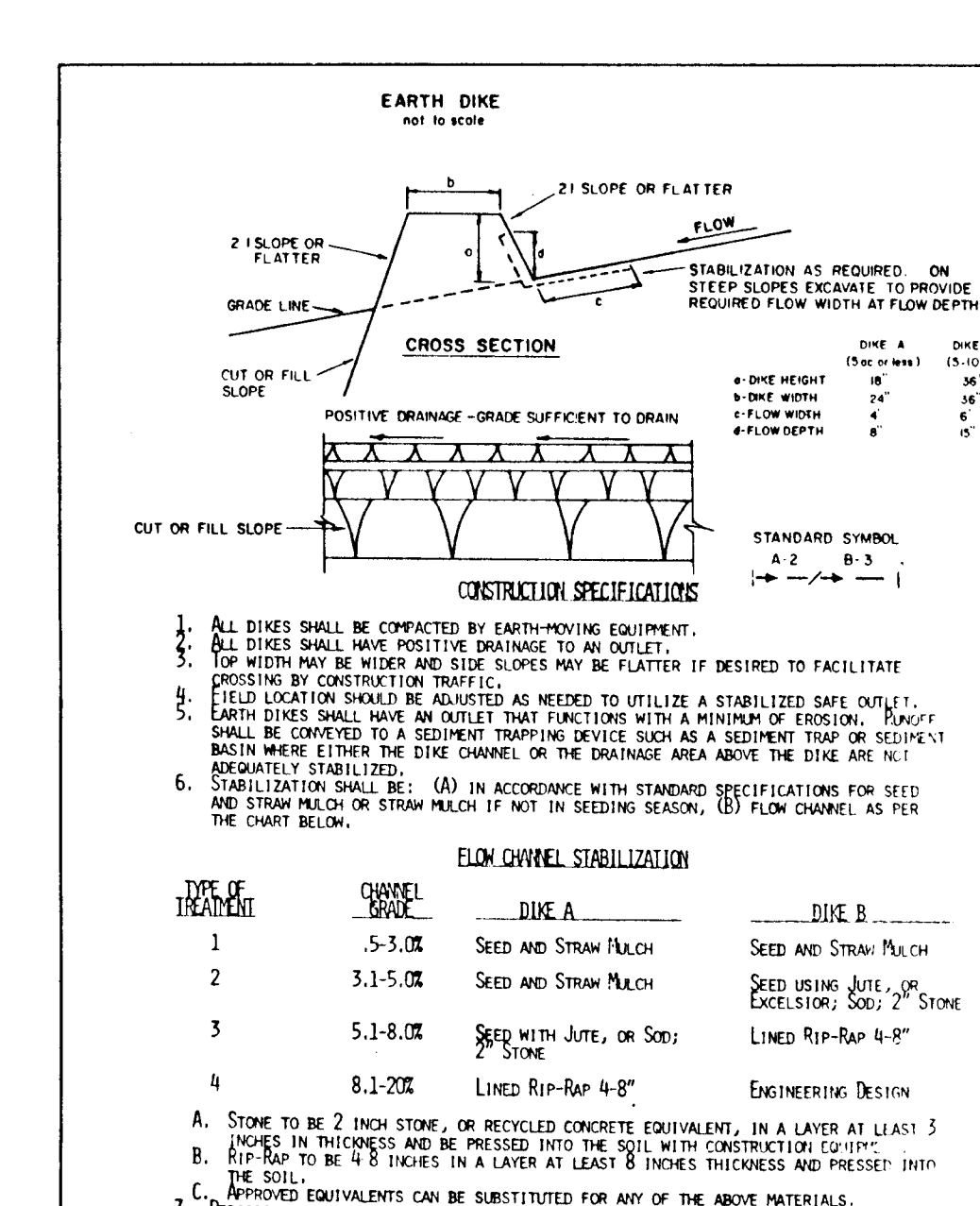
SEDIMENT CONTROL PLAN VIEW

NORTH CHATHAM ROAD IMPROVEMENTS



Construction Specifications

- Materials**
 - A. Wooden frame** is to be constructed of 2" x 4" construction grade lumber.
 - B. Wire mesh** must be of sufficient strength to support filter fabric, and stone for curb inlets, with water fully impounded against it.
 - C. Filter cloth** must be of a type approved for this purpose resistant to sunlight with sieve size, K05, 40-85, to allow sufficient passage of water and removal of sediment.
 - D. Stone** is to be 2" in size and clean, since fines would clog the cloth.
- Procedure**
 - A. Swale, ditchline or yard inlet protection.**
 - Excavate completely around inlet to a depth of 18" below notch elevation.
 - Drive 2 x 4 post 1' into ground at four corners of inlet. Place nail strip between posts on overlap. Assemble top portion of 2 x 4 frame using end joint shown. Top of frame (weir) must be 4" below edge of roadway adjacent to inlet.
 - Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
 - Stretch filter cloth tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet notch elev. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
 - Backfill around inlet in compacted 4" layers until layer of earth is even with notch elevation on ends and top elevation on sides.
 - If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weir).
 - This structure must be inspected frequently and the filter fabric replaced when clogged.
 - Curb Inlet Protection.**
 - Attach a continuous piece of wire mesh (30" min. width by throat length plus 4") to the 2" x 4" weir (measuring throat length plus 2") as shown on the standard drawing.
 - Place a piece of approved filter cloth (40-85 sieve) of the same dimensions as the wire mesh over the inlet mesh and securely attach to the 2" x 4" weir.
 - Securely nail the 2" x 4" weir to 9" long vertical spacers to be located between the weir and inlet face (max. 6" apart).
 - Place the assembly against the inlet throat and nail (minimum 2" lengths of 2" x 4" to the top of the weir at space locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
 - The assembly shall be placed so that the end spacers are a minimum 1" beyond both ends of the throat opening.
 - Form the wire mesh and filter cloth to the concrete gutter and against the face of curb on both sides of the inlet. Place clean 2" stone over the wire mesh and filter fabric in such a manner as to prevent water from entering the inlet under or around the filter cloth.
 - This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
 - Assure that storm flow does not bypass inlet by installing temporary earth or asphalt ditch directing flow into inlet.



INSTALLATION REQUIREMENTS

Site Preparation: After site has been shaped and graded to approved design, prepare a friable seedbed relatively free from clods and rocks more than 3/4 inches in diameter, and any foreign material that will prevent contact of the protective mat with the soil surface.

Planting: Lime, fertilize, and seed in accordance with seeding or other type of planting plan, except when using jute matting on a seeded area, apply approximately one-half the seed after laying the mat. The protective matting can be laid over sprigged areas where small grass plants have been planted. Where ground covers are to be planted, lay the protective matting first and then plant through the matting according to design of planting.

Erosion Stops: (For use on steep, highly erodible watercourses) Erosion stops are made of glass fiber strips, excelsior matting strips or tightly folded jute matting blanket or strips. They are placed in narrow trenches 6 to 12 inches deep across the channel and left flush with the soil surface. They are to cover the full cross-section of designed flow.

How Used: Under jute or excelsior matting.

- Approximately 3 feet down channel from point of entry of a concentrated flow such as from culverts, tributary channels or diversions.
- At points where change in gradient or course of channel occurs.
- Spacing of erosion stops on long slopes will vary from 20 to 100' (set depending upon the erodibility of the soil and velocity and volume of flow).

Installation:

Erosion stops should extend beyond the channel liner to full design cross-section of the channel to check any rills that might form outside the channel lining.

The trench may be dug with a spade or a mechanical trencher making sure that the down slope face of the trench is flat; it should be uniform and perpendicular to line of flow to permit proper placement and stapling of the glass fiber matting.

The erosion stop should be deep enough to generate solid material or below level of rilling in sandy soils. In general, erosion stops will vary from 6 to 12 inches in depth.

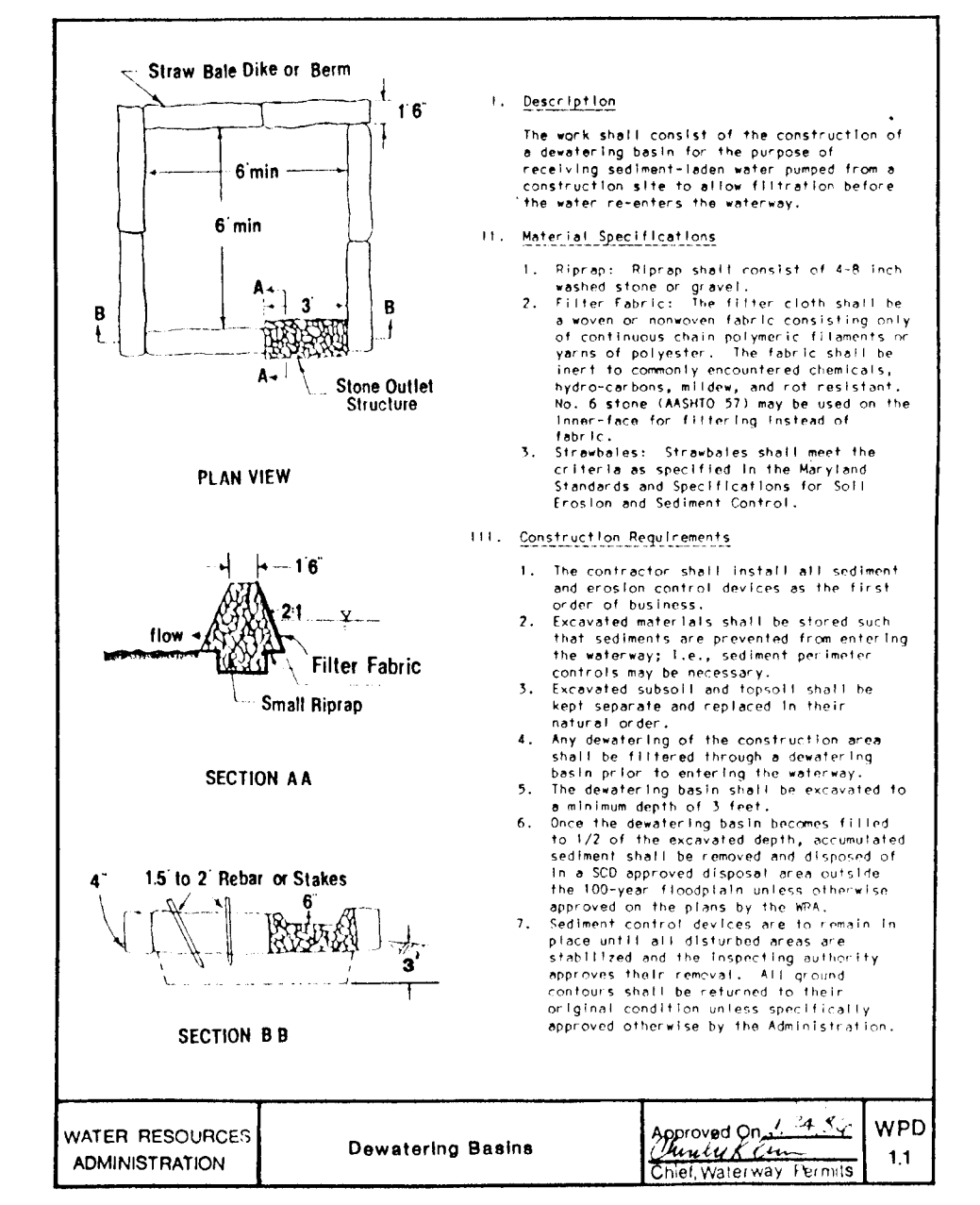
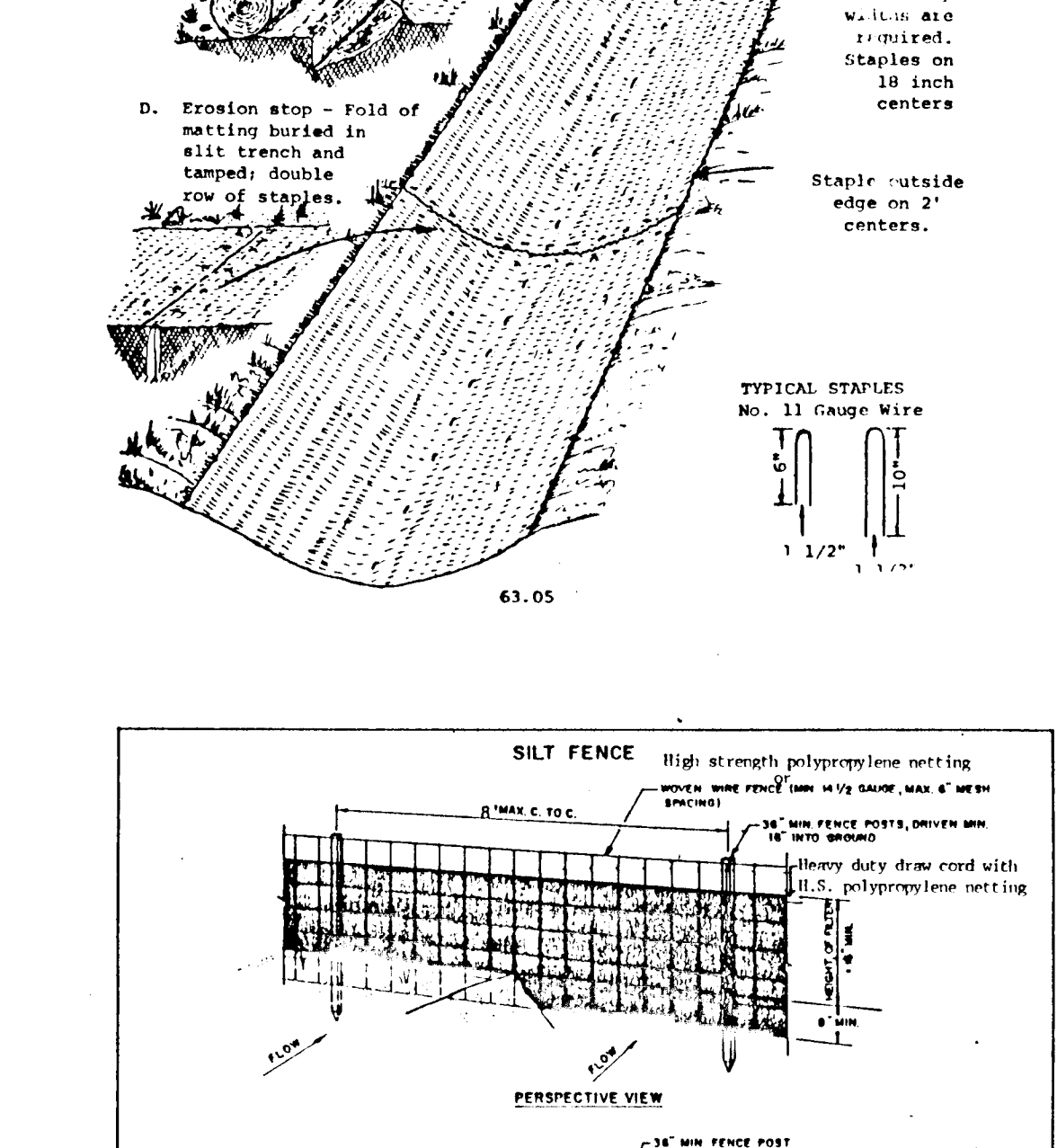
The erosion stop mats should be wide enough to allow a minimum of 2 inch turnover at bottom of trench for stapling while maintaining the top edge flush with channel surface.

Tamp back fill firmly and to a uniform gradient of channel.

Erosion Stop Detail

CONSTRUCTION NOTES FOR ERODIBLE SILT FENCE

- High strength polypropylene netting or other fabric to be fastened securely to fence posts with 1/2" x 1/2" staples.
- FILTER CLOTH TO BE FASTENED TO POSTS WITH 1/2" x 1/2" STAPLES TO TOP AND MID SECTION.
- WHEN TOP SECTION OF FILTER CLOTH ADJACENT TO EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FASTENED.
- PAINTWORK SHALL BE REPAIRED AS NEEDED AND MATERIAL REPAIRED WHEN "BLAGS" DEVELOP IN THE SILT FENCE.



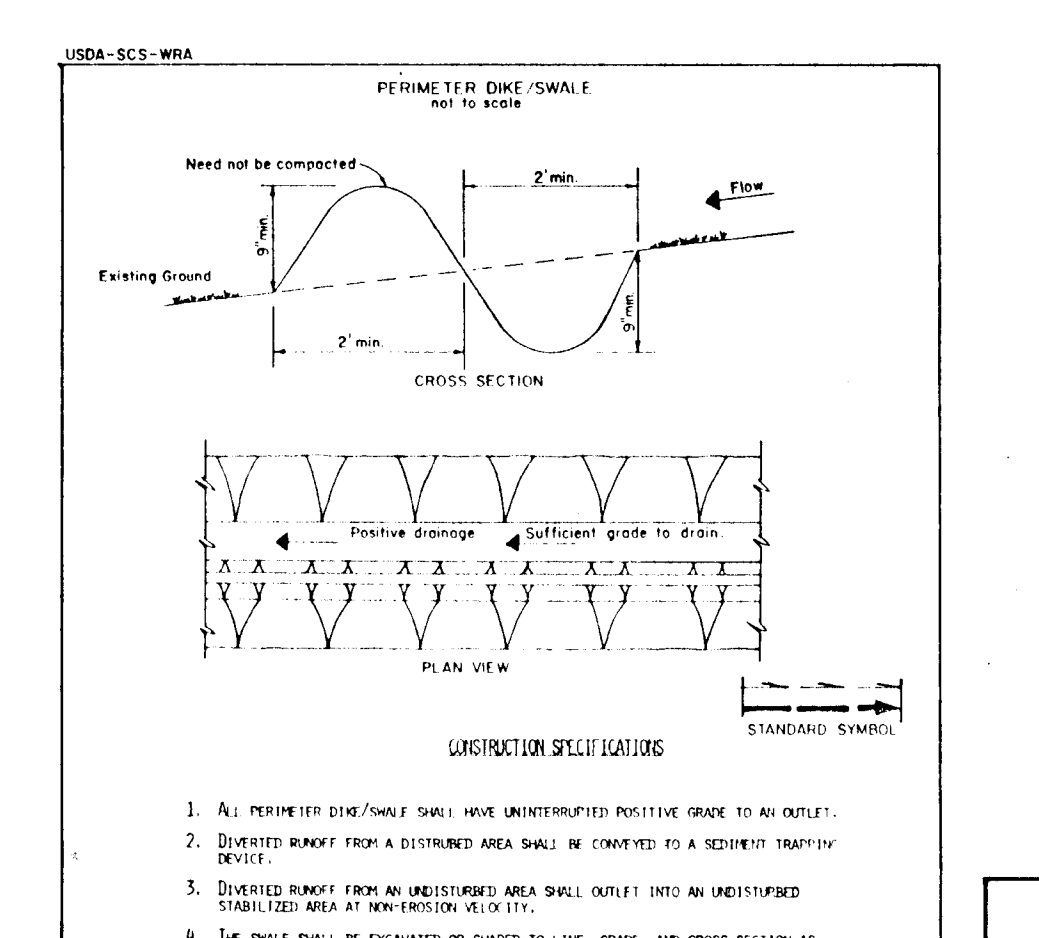
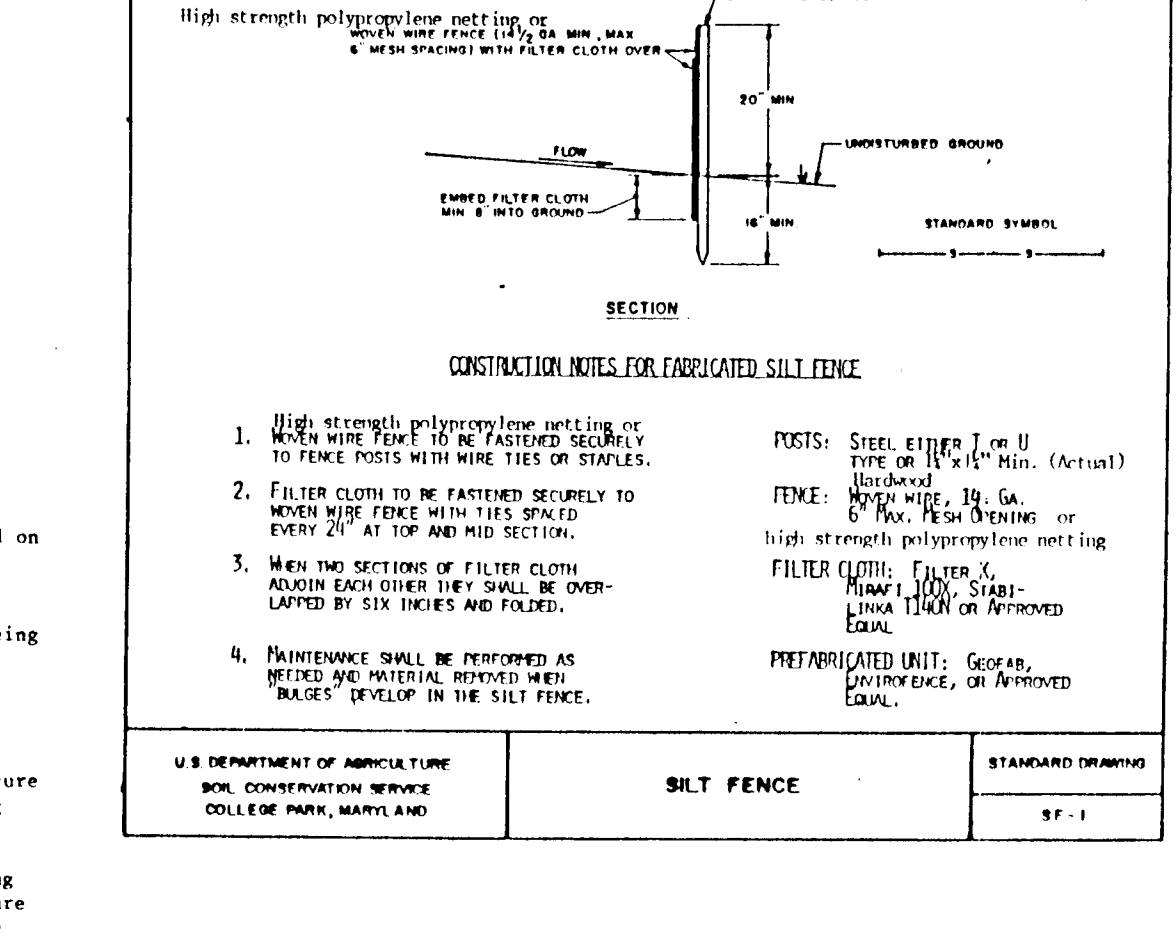
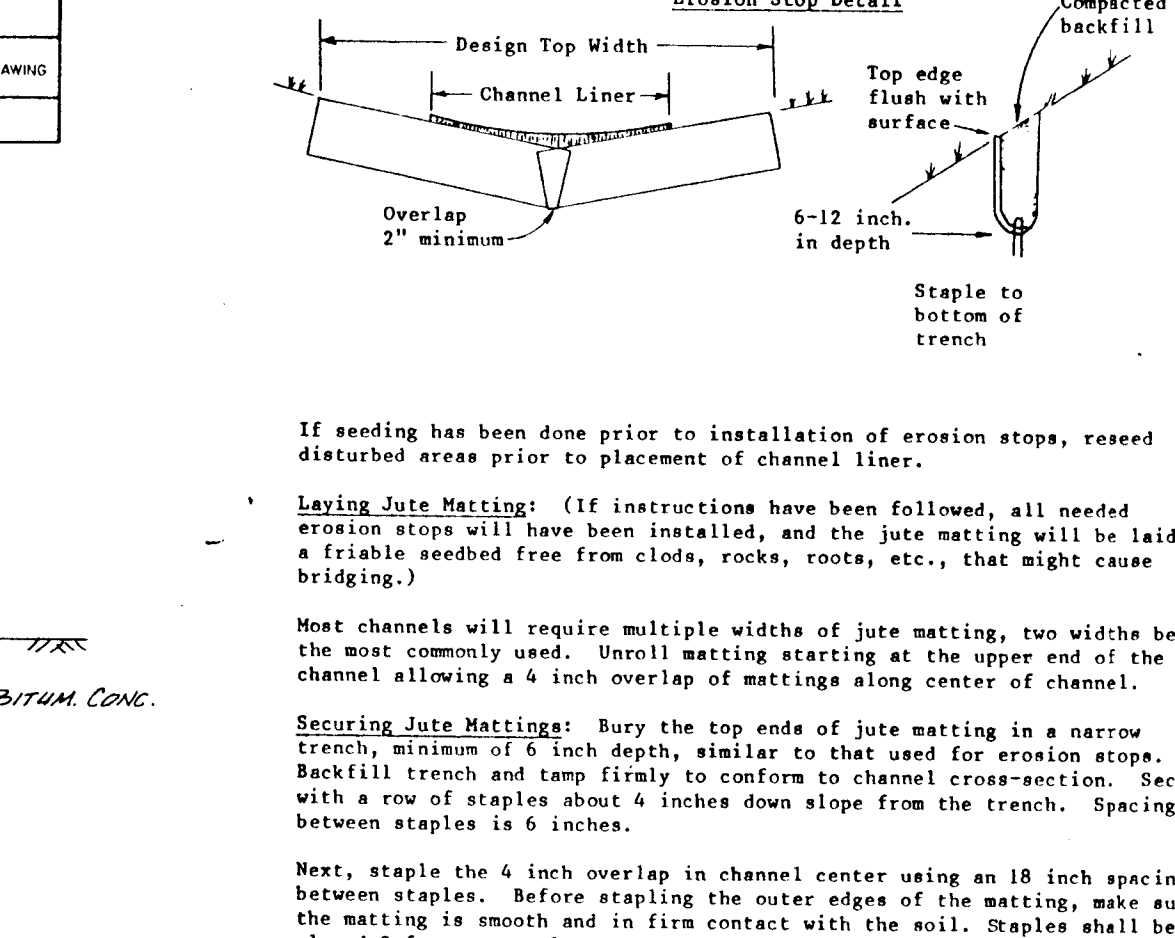
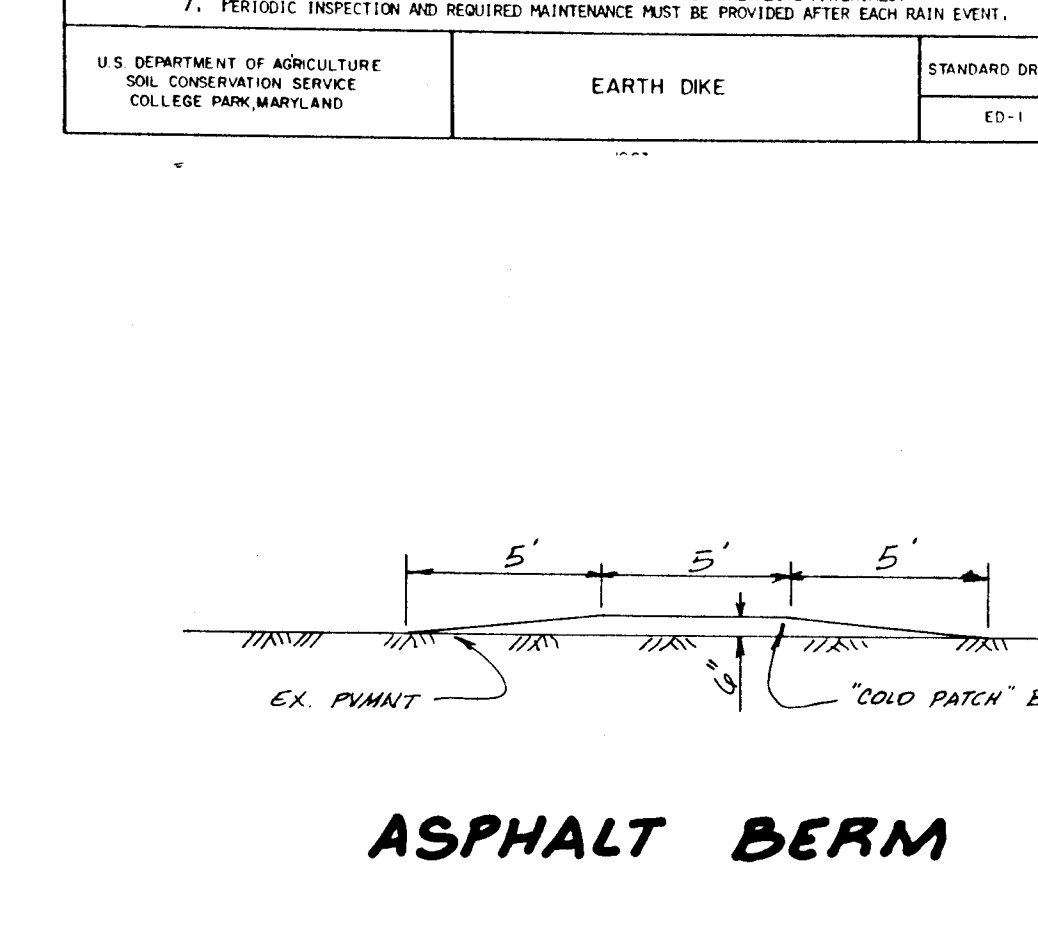
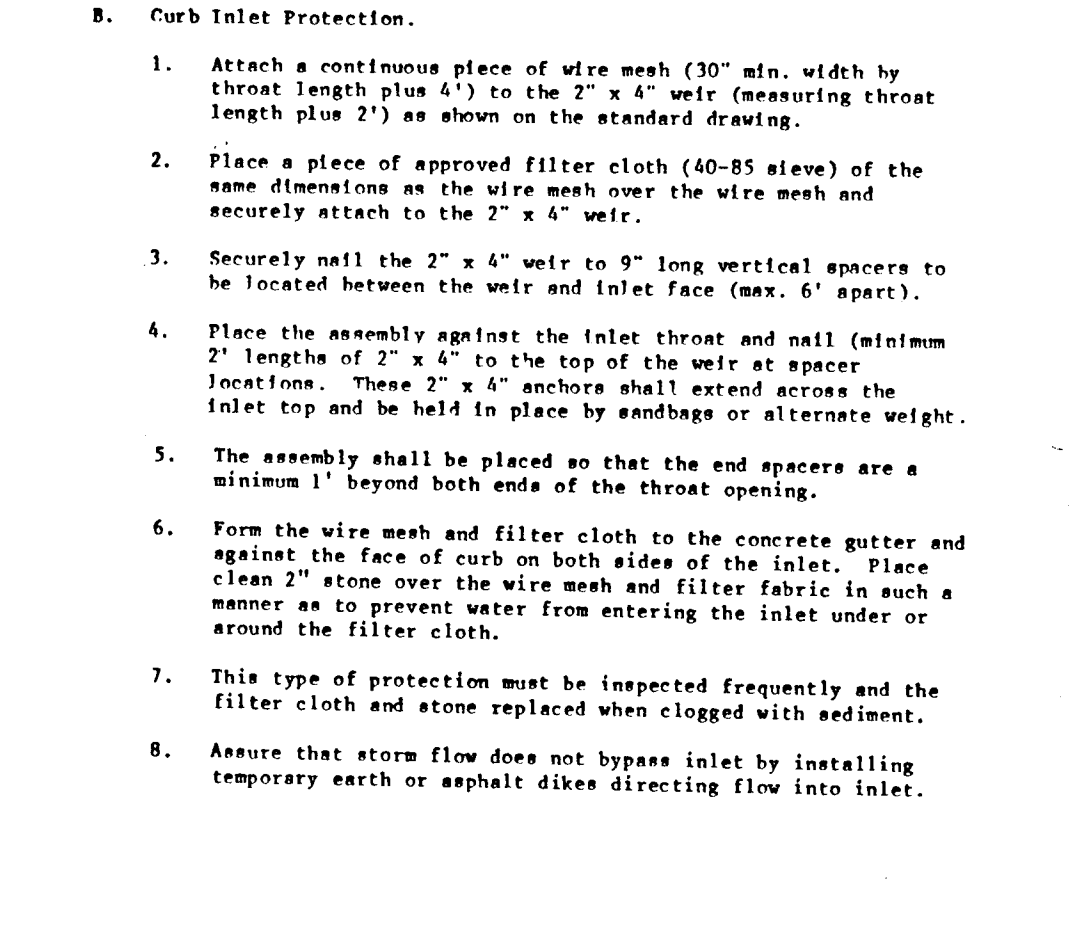
CONSTRUCTION SPECIFICATIONS

- Materials**
 - A. Riprap:** Riprap shall consist of 4/8 inch washed stone or gravel.
 - B. Filter fabric:** The filter fabric shall be a woven fabric made of continuous chain polymer filaments of polypropylene, polyethylene, or polyethylene terephthalate. It shall be inert to commonly encountered chemicals, hydrocarbons, acids, and not resistant to UV radiation.
 - C. Stakes:** Stakes shall meet the criteria as specified in the Maryland Standards and Specifications for Soil Erosion and Sediment Control.
- Construction Requirements**
 - The contractor shall install all sediment and erosion control devices in the final order of business.
 - Erosion control materials shall be stored such that sediment is prevented from entering the waterway. i.e., sediment control materials shall be stored in a manner that prevents sediment from entering the waterway.
 - Excavated silt and spoil shall be kept separate and repaired in their natural order.
 - Any deleterious of the construction area shall be filtered through a dewatering basin prior to entering the waterway.
 - The dewatering basin shall be excavated to a minimum depth of 3 feet.
 - The dewatering basin shall be excavated to a depth of 12" of the excavated depth, accumulated sediment shall be removed and disposed in a USDO approved disposal area outside the construction area. The disposal area shall be approved by the MW. The disposal area shall remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal. All ground material shall be replaced to the original condition unless specifically approved otherwise by the Administration.
- Final Check**
 - Make sure matting is uniformly in contact with the soil.
 - All lap joints are secure.
 - All staples are flush with the ground.
 - All disturbed areas seeded.

PERIMETER DIRT SWALE

CONSTRUCTION SPECIFICATIONS

- All perimeter dirt/swale shall have UNDISTURBED POSITIVE GRADE TO AN OUTLET.
- DISBURSED RUNOFF FROM A DISTURBED AREA SHALL BE CONFINED TO A DESIGNATED TREATMENT DEVICE.
- DISBURSED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED TREATMENT AREA AT MINIMUM VELOCITY.
- THE SWALE SHALL BE REPAIRED OR REPLACED TO ORIGINAL GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
- STABILIZATION OF THE AREA DISTURBED BY THE SWALE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL. SWALE SHALL BE DONE WITHIN 10 DAYS.
- PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.



ENGINEER'S CERTIFICATE

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

John B. Hildreth
Director of Public Works
Date: 6-4-1991

DEVELOPER'S CERTIFICATE

I/We certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that all responsible personnel involved in the construction project will have a certificate of attendance at a Department of Environment approved training program for the control of sediment and erosion before beginning the project. I also authorize periodic on-site inspection by a Howard soil Conservation District or their authorized agents, as are deemed necessary.

Signature of Developer/Title: [Signature]
Date: 1-15-92

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James G. [Signature] 1-16-92
DIRECTOR OF PUBLIC WORKS DATE

Michael J. [Signature] 1-15-92
CHIEF, BUREAU OF ENGINEERING DATE

Charles H. Anderson 4/16/92
CHIEF, CIVIL ENGINEERING DATE

Francis W. Wallace 4/15/92
CHIEF, BUREAU OF HIGHWAYS DATE

MILDENBERG,
MOCHI & ASSOCIATES, INC.

ENGINEERS • SURVEYORS • PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 (301) 621-5768

DES:	JBM
DRN:	UBM
CHK:	TJP
PROJ. #	89031
DATE:	MAY 91
BY:	NO.
REVISION	
DATE	6:00" SCALE MAP NO.
BLOCK NO.	

SEDIMENT CONTROL
NOTES & DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
COLLEGE PARK, MARYLAND

STANDARD DRAWING
SF-1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
COLLEGE PARK, MARYLAND

STANDARD DRAWING
PDS-1

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

J. Helm 1/17/91
SOIL CONSERVATION SERVICE DATE

Robert E. Zieh 1/17/91
HOWARD SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James G. [Signature] 1-16-92
DIRECTOR OF PUBLIC WORKS DATE

Michael J. [Signature] 1-15-92
CHIEF, BUREAU OF ENGINEERING DATE

Charles H. Anderson 4/16/92
CHIEF, CIVIL ENGINEERING DATE

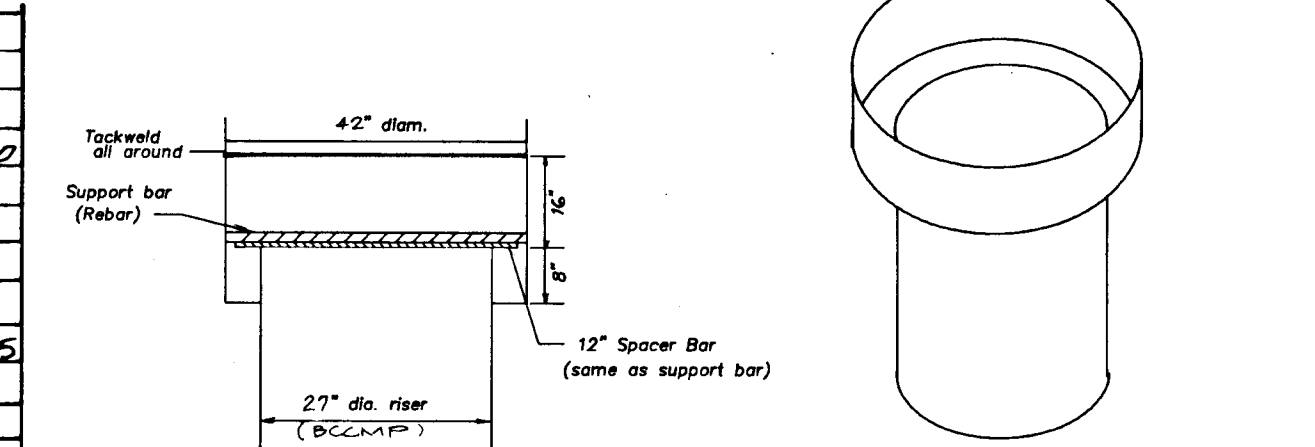
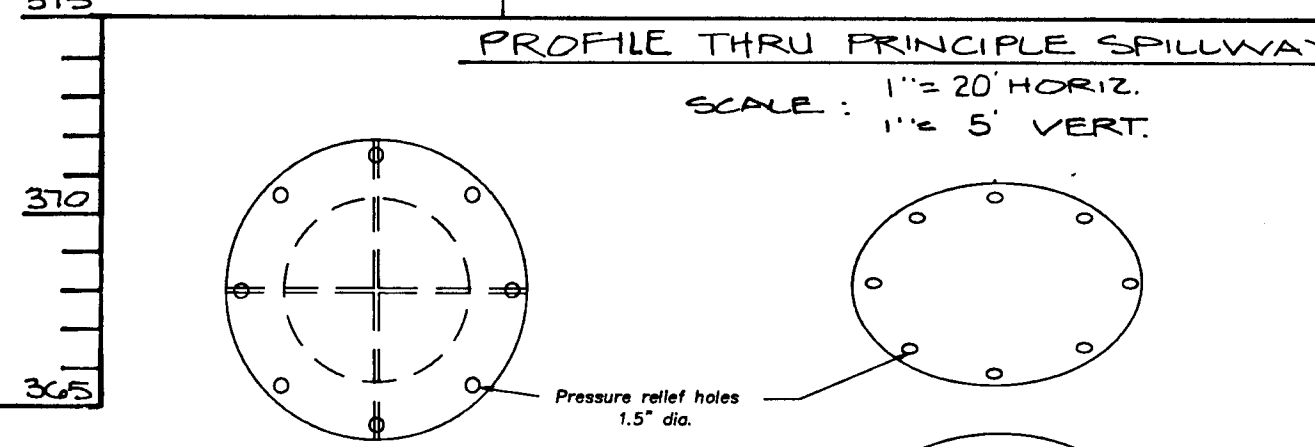
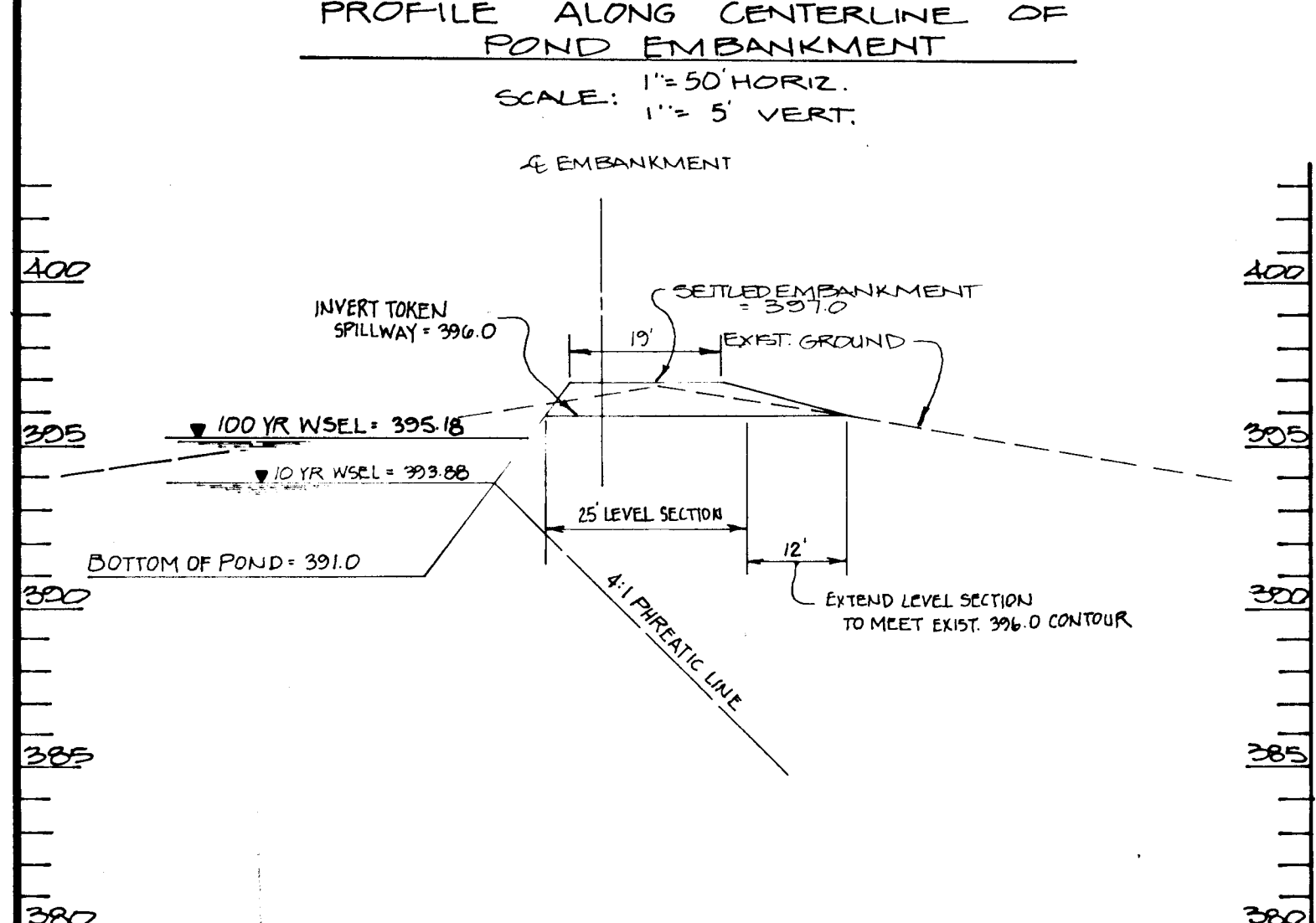
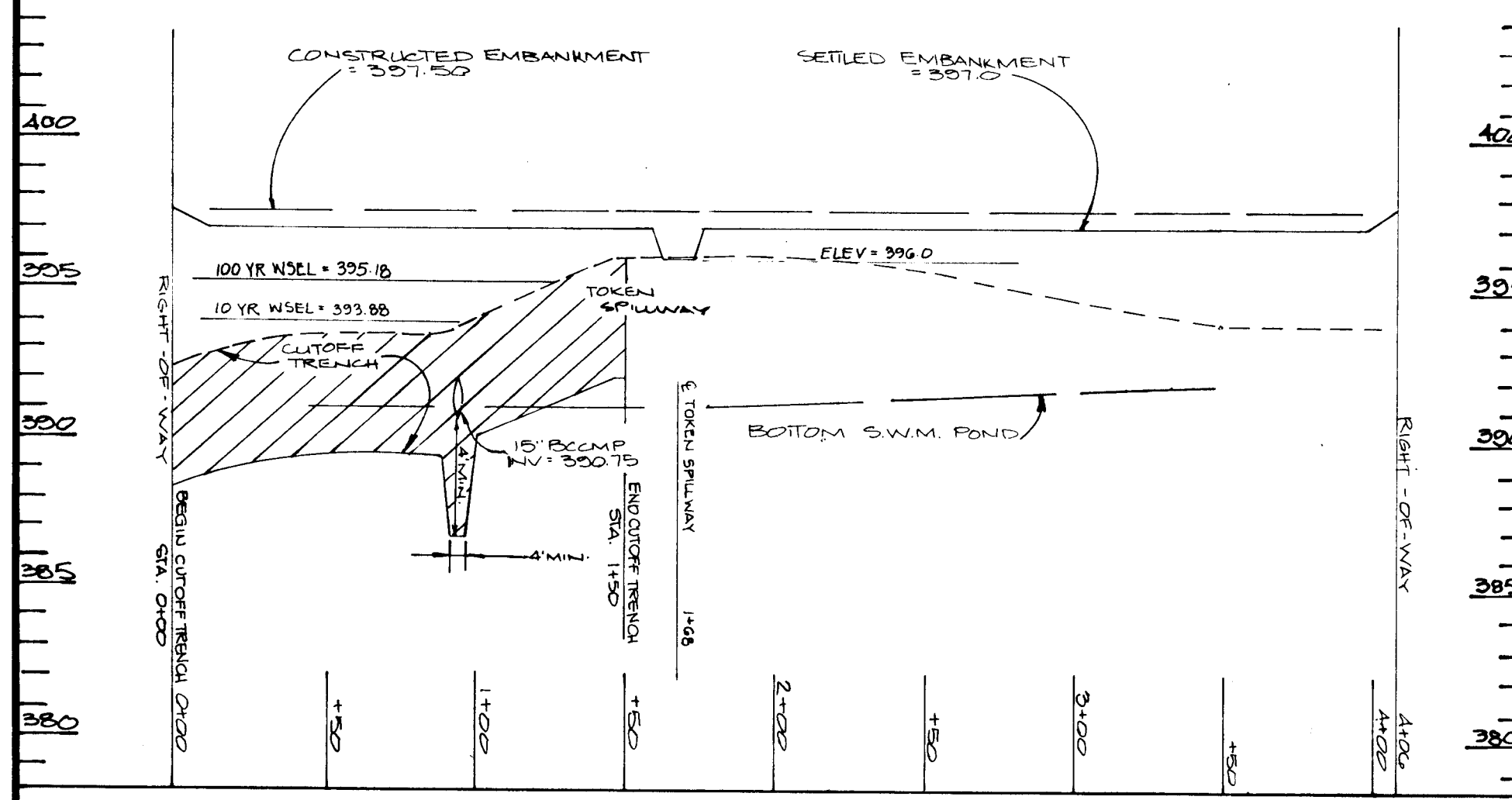
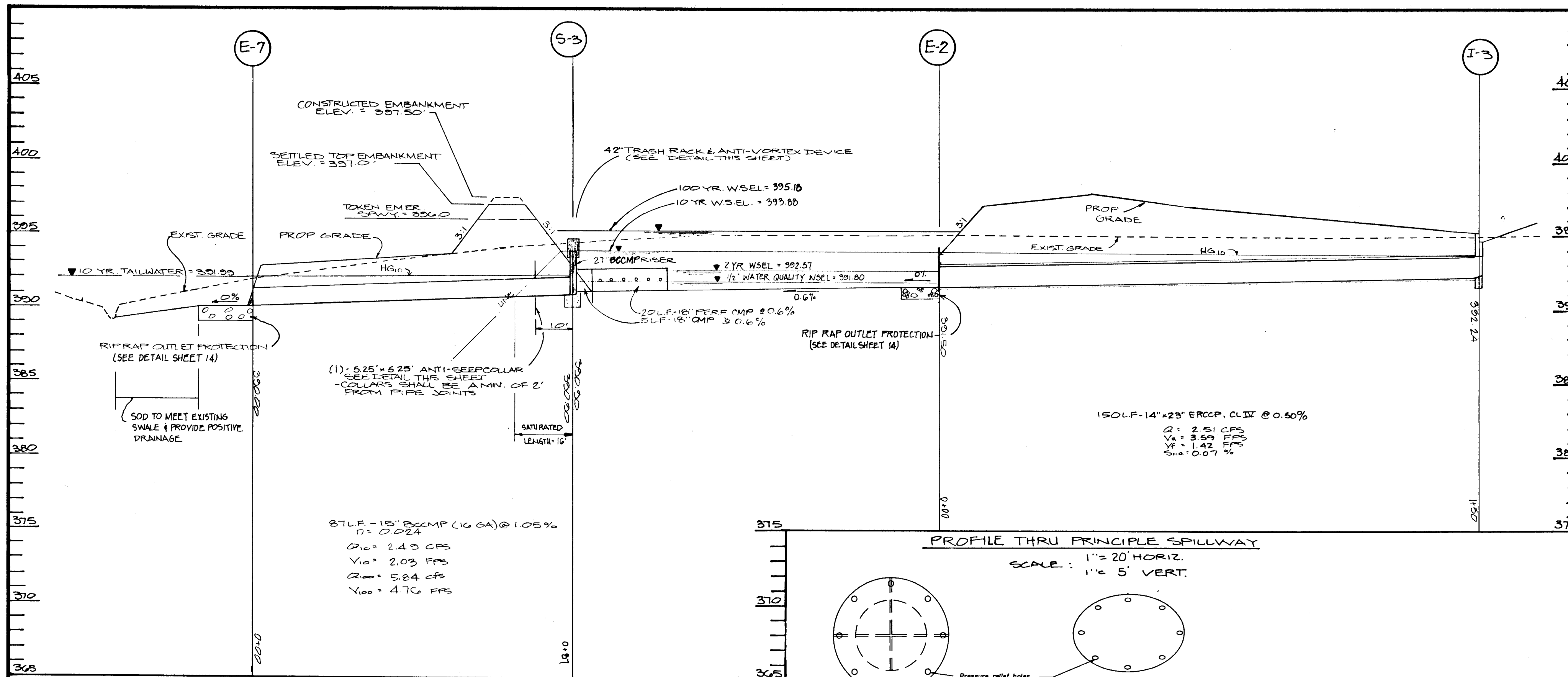
Francis W. Wallace 4/15/92
CHIEF, BUREAU OF HIGHWAYS DATE

NORTH CHATHAM ROAD IMPROVEMENTS

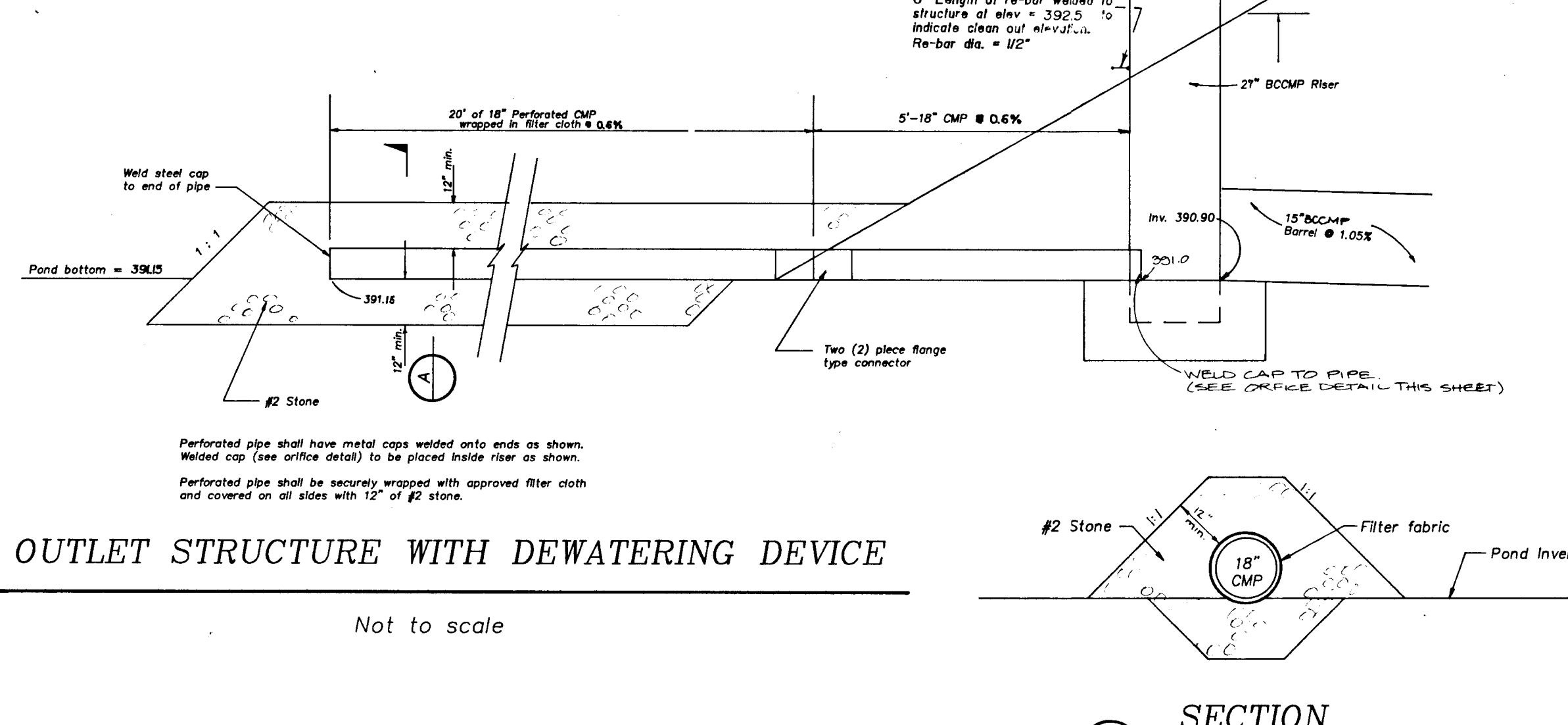
CAPITAL PROJECT J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

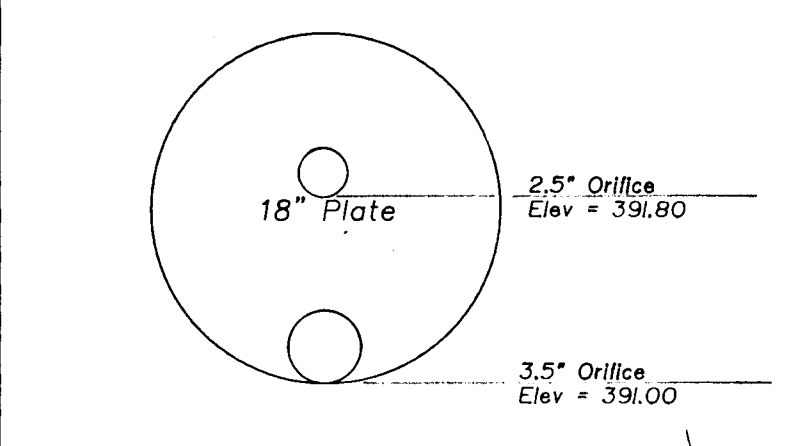
SHEET 11 OF 23



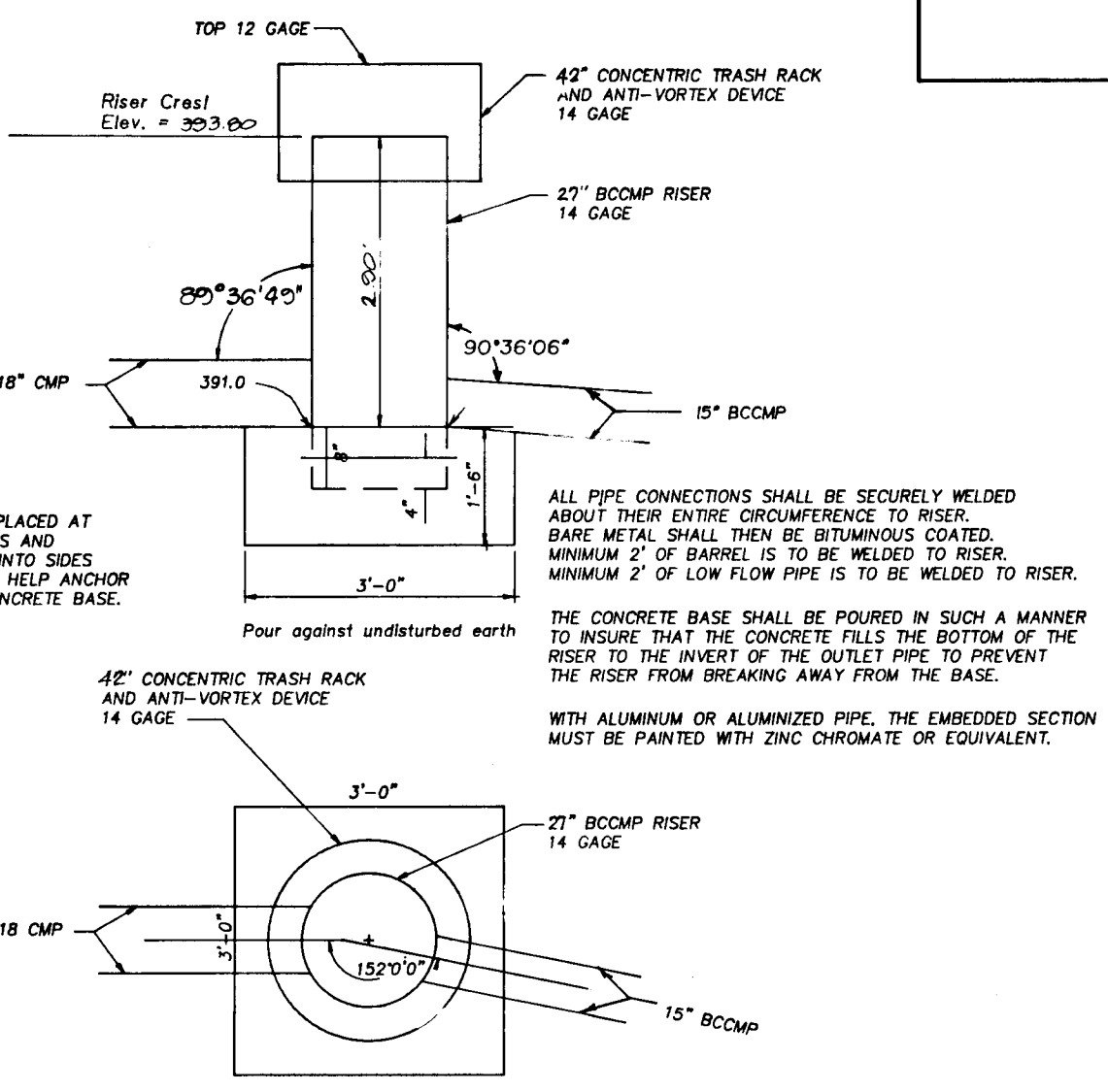
CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE
Not to scale



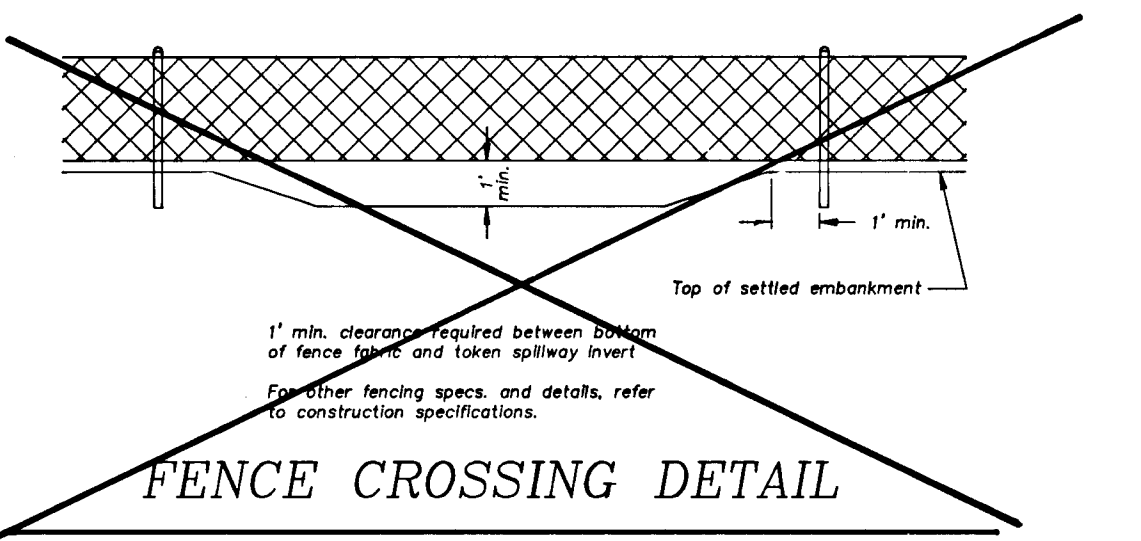
OUTLET STRUCTURE WITH DEWATERING DEVICE
Not to scale



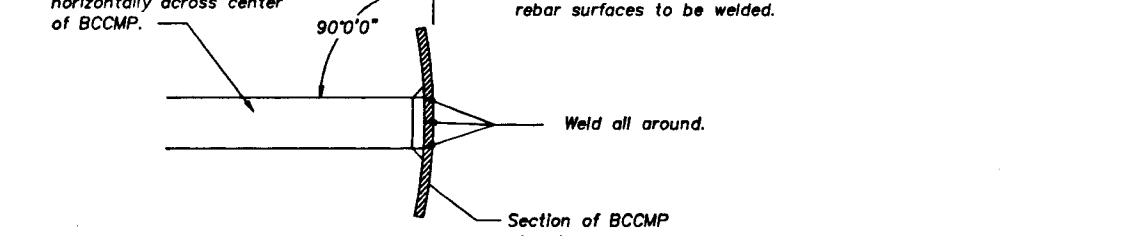
ORIFICE DETAIL
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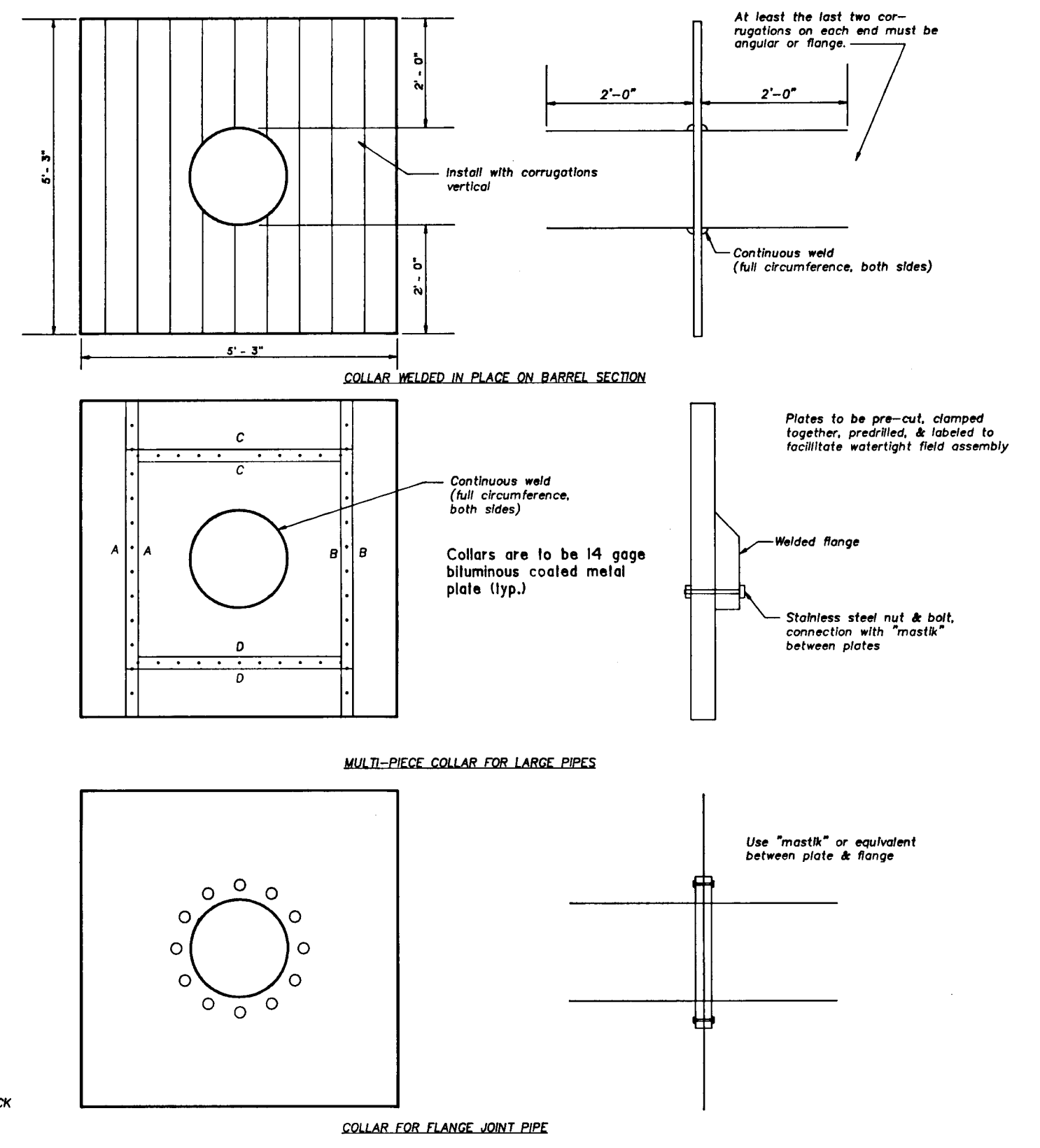
CMP RISER FABRICATION DETAIL
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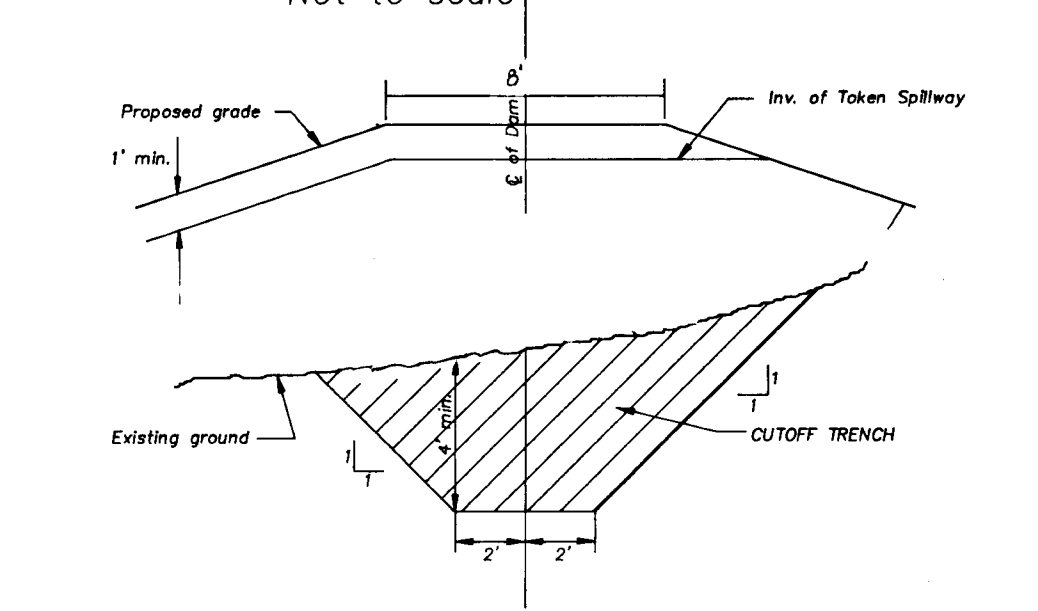
FENCE CROSSING DETAIL
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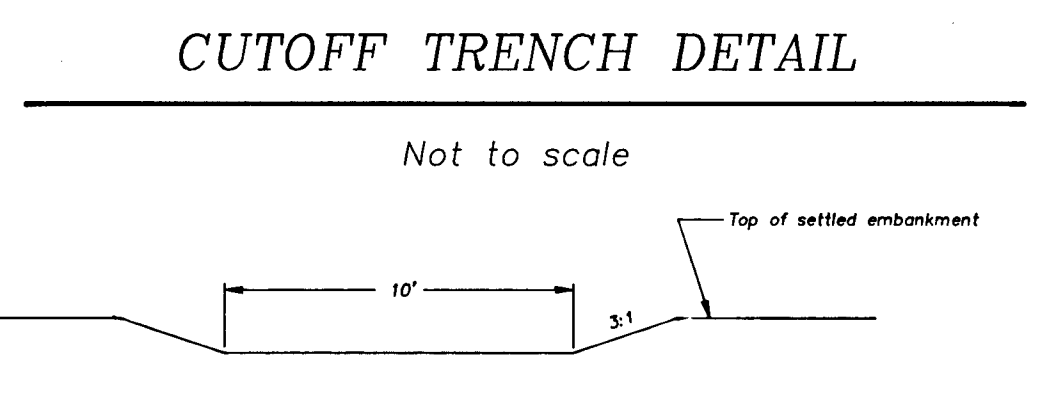
TRASH RACK WELDING DETAIL
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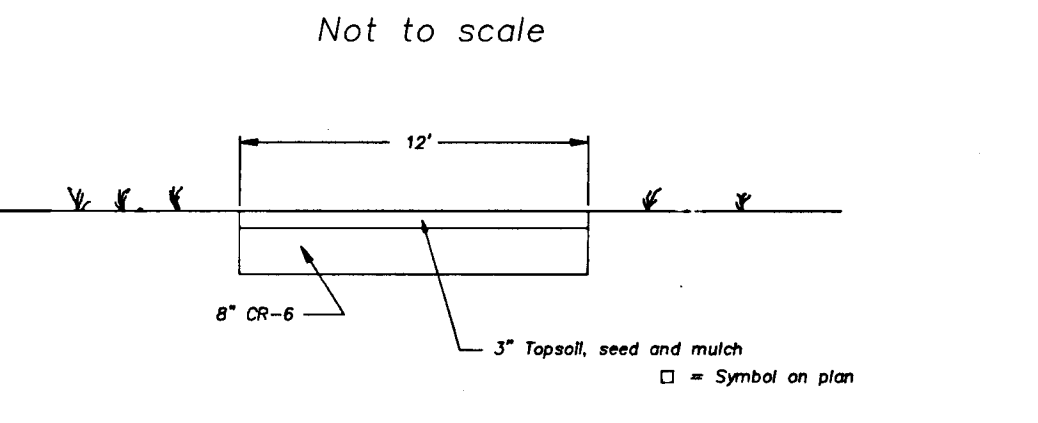
TYPICAL ANTI-SEEP COLLARS
Not to scale



CUTOFF TRENCH DETAIL
Not to scale



TOKEN SPILLWAY SECTION
Not to scale

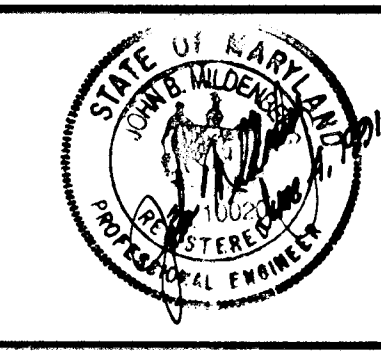


SWM ACCESS DETAIL
Not to scale

3. Removed low flow channel from SWM No. 1 per MCE comments (10/7/91).
2. Revised per HSCD comments (10/7/91).
1. REVISED SWM No. 1 (6/4/91). TJP

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
James A. Schumacher, Director of Public Works
1-15-92
G. William B. Ray, Chief, Bureau of Engineering
1-15-92

MILDENBERG MOCHI & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro: (301) 621-5768



DES: LAR	BY	NO.	REVISION	DATE
DRN: LAR				
CHK: JEM				
PROJ: #8024				
DATE: MAY 1991				

STORMWATER MANAGEMENT
PROFILES & DETAILS
SWM NO. 1
600' SCALE MAP NO. _____ BLOCK NO. _____

NORTH CHATHAM ROAD IMPROVEMENTS
CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND
SCALE AS SHOWN
SHEET 12 OF 23

STORMWATER MANAGEMENT CONSTRUCTION SPECIFICATIONS

1. GENERAL

Unless otherwise noted, all materials and construction shall conform to these specifications and to the following:

"Standards and Details for Construction" of the Howard County Maryland, Department of Public Works, 1986 and as amended.

"Standard Specifications for Construction and Materials" of the Maryland State Highway Administration, 1982 and as amended.

"Standards and Specifications for Erosion and Sediment Control" of the Soil Conservation Service of Maryland (MD-1/2), July 1981 and as amended.

2. SITE PREPARATION

Areas designated for borrow areas, embankment and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1.

Areas to be covered by the sand or reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on these plans. Trees, brush and stumps shall be cut approximately level with the ground surface.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam or reservoir as directed by the Developer or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use in the embankment and other designated areas.

3. EARTHWORK AND EARTH FILL

3.1 Material

The earth fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, oversize stones, frozen or other objectionable material. The embankment shall be constructed to an elevation which provides for anticipated settlement to the design elevation. The fill height at along the length of the embankment shall be increased ten (10) percent above the design elevation (including freeboard) unless otherwise shown on the plans. All fill material shall meet the requirements of the Unified Soil Classification Cl or ML unless otherwise noted.

3.2 Placement

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

3.3 Compaction

The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed a minimum of four (4) compact passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture so that it can be formed into a ball without crumbling. If water can be squeezed out of the ball, it is too wet to compact properly. Each layer of fill shall be compacted as necessary to obtain ninety-five (95) percent of ASSHTO T-99 and is to be certified by the Geotechnical Engineer.

3.4 Sutoff Trench

Where specified, a Sutoff Trench shall be excavated along or parallel to the centerline of the embankment as shown on these plans. The bottom width of the trench shall be as shown on the drawings, with the minimum width being four (4) feet. The depth shall be as shown on the plans and shall be at least four (4) feet below existing grade. The side slopes of the trench shall be 1:1 or flatter. The backfill material for the cutoff trench shall be compacted with equipment or rollers to assure maximum density and minimum permeability, except as noted on the plans. The backfill shall be compacted to a minimum of 95 percent of the maximum dry density of the backfill material. All cutoff trench backfill material shall meet the requirements of Unified Soil Classification ML, CL, MH or CH.

3.5 Structural Backfill

Backfill material to be placed adjacent to structure shall be of the type and quality conforming to that specified for the adjoining fill material. The backfill shall be placed in horizontal layers not to exceed four (4) inches in thickness and compacted by hand tampers or other compaction equipment. The material needs to fit completely in spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four (4) feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe unless there is compacted fill of twenty-four (24) inches or greater over the structure pipe.

4. PIPE CONDUITS

4.1 Corrugated Metal Pipe

Materials - This pipe and its appurtenances shall be advanced and fully bituminous coated and shall conform to all of the requirements of AASHTO Specification M-190, Type A with watertight coupling bands. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound.

Connections - All connections with pipe must be completely watertight. The drain pipe or larri connection to the riser shall be welded all around. Watertight coupling bands shall be used at all joints. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered watertight.

Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unsuitable soil is encountered, all such material shall be removed and replaced with suitable earth to provide adequate support.

Laying pipe - The pipe shall be placed with inside circumferential lap pointing downstream and with the longitudinal lap at the side.

4.3 Backfilling and Other Details

Backfilling shall conform to Structural Backfill as shown above. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. **Materials** - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM Designation C-361. An approved equivalent is AWWA Specification C-302.

2. **Bedding** - All reinforced concrete pipe conduits shall be laid in a concrete bedding for their entire length. This bedding shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 10% of its outside diameter with a minimum thickness of 3 inches, or as shown on the drawings.

3. **Laying pipe** - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 2 feet from the riser.

4. **Backfilling** shall conform to "Structure Backfill."

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

5. STRUCTURES

Concrete structures shall meet minimum requirements set forth in the Maryland State Highway Administration "Standards and Specifications for Construction and Materials," 1982, as amended, including:

5.1 Concrete

Section 918 (Portland Cement Concrete Mixtures), Mix No. 2

5.2 Reinforcement

Section 610 (Reinforcement for Concrete Structures)
Section 911 (Reinforcing Steel, Wire Rope and Wire Fabric)

In addition, reinforcing steel shall meet ASTM Specification A615, Grade 60. Steel angles, anchor bars and appurtenances shall be ASTM A36.

6. STABILIZATION

All borrow areas shall be graded to provide proper drainage and left in a slightly condition. An exposed surface of the embankment, driveway, spoil and borrow areas, and berms shall be stabilized in accordance with the specifications shown herein and with the 1982 Maryland Standards and Specifications for Soil Erosion and Sediment Control as amended, immediately after finishing grading. All soil shall be seeded. Unless otherwise noted, all other disturbed areas shall be stabilized with permanent seeding.

Fertilizer: 13-10-10 @ 115 lbs./1000 sq. ft.
Seed: Dried-witch inoculated @ 15 lbs./1000 sq. ft.
Kry-21 Tall fescue @ 15 lbs./1000 sq. ft.
Mucic: Trax @ 40 lbs./1000 sq. ft.
Asphalt Tie-down: Jutes @ 50 lbs./1000 sq. ft.
Flat areas: Flat areas @ 50 lbs./1000 sq. ft.

7. EROSION AND SEDIMENT CONTROL

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized, as shown on these plans and as set forth in the 1982 Standards and Specifications for Soil Erosion and Sediment Control of the Soil Conservation Service of Maryland, Howard County Soil Conservation District, as amended.

8. FILTER FABRIC

Where specified, MRAF #40 or equivalent shall be used.

DESIGN SUMMARY

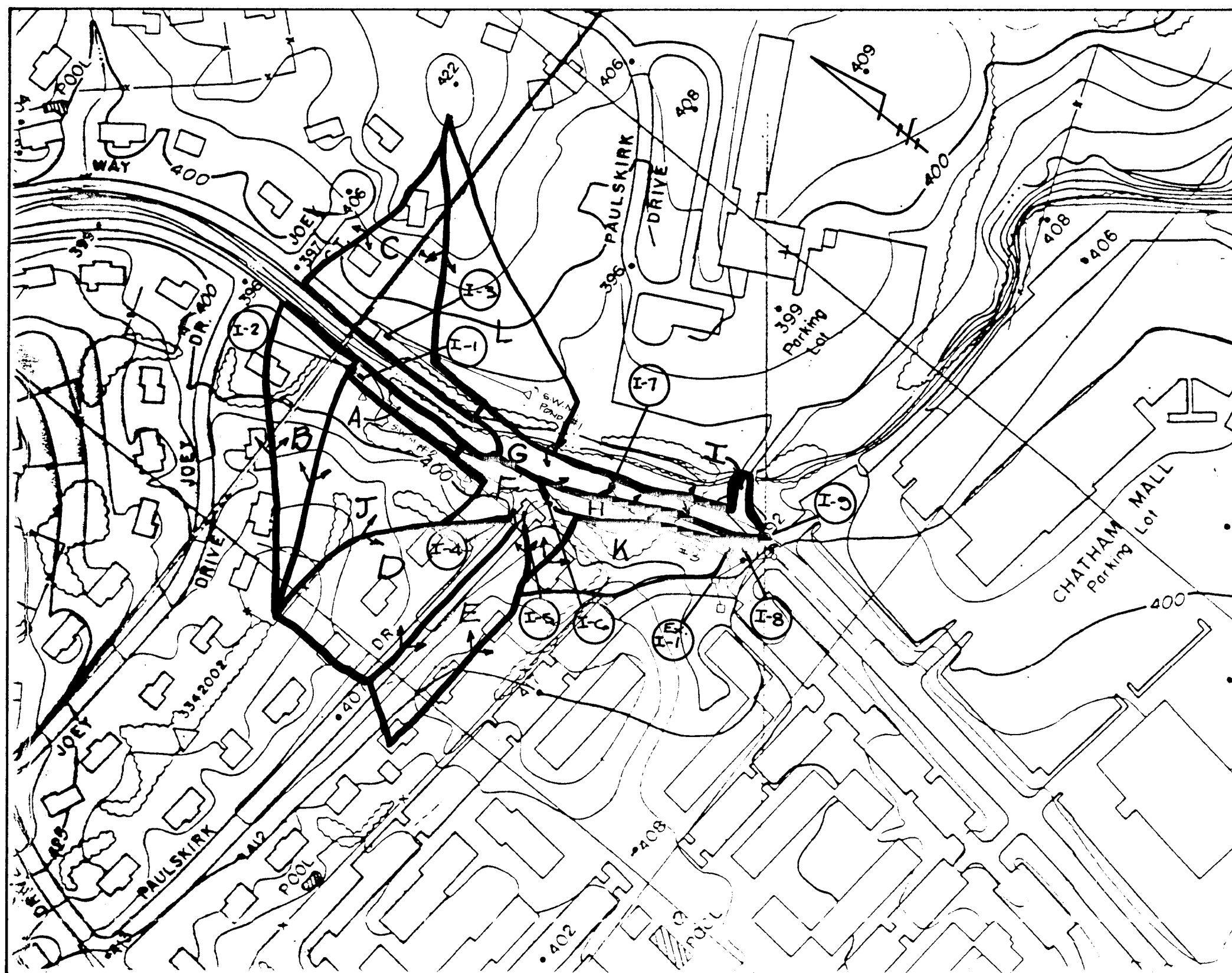
Design Storm	Allowable Release Rate	Facility Inflow	Facility Discharge	Water Surface Elevation	Storage Volume (Ac.ft.)
2 Year	0.19 cfs	3.66 cfs	0.19 cfs	396.36 ft.	0.16 Ac.ft.
10 Year	3.03 cfs	8.05 cfs	2.43 cfs	394.26 ft.	0.205 Ac.ft.
100 Year	N/A cfs	14.33 cfs	5.74 cfs	395.03 ft.	0.238 Ac.ft.

Structure Classification: A (EXTENSIVE EXHAUSTION)

Storage-Height Product: 1.65

Watershed Area to Facility (Acres): 2.66 AC

Level of Management Provided by Facility: 1/2 WATER QUALITY, 1/2 FLOW



AREA	ACRES	"C" FACTOR	INLET
A	0.25	0.90	I-1
B	1.04	0.38	I-2
C	1.18	0.38	I-3
D	1.64	0.38	I-4
E	0.78	0.38	I-5
F	0.46	0.70	I-6
G	0.33	0.90	I-7
H	0.26	0.90	I-8
I	0.21	0.90	I-9
J	1.37	0.38	
K	0.77	0.38	
L	1.48	0.38	

NOTE: AREAS J, K, & L ARE INTERCEPTED BY SWALE 1, SWALE 2, SWAMP POND 1 RESPECTIVELY

ID	TYPE	INV IN	INV OUT	TOP ELEV	REMARKS	CL STA / O/S
I-1	A-5 W/DEFLECTORS	391.57	391.32	395.13	SD - 40'	20+48.65 12.5' L W B N CHAT
I-2	A-5 W/DEFLECTORS	-	391.73	395.21	"	20+80 12.5' L W B N CHAT
I-3	A-5 W/DEFLECTORS	-	392.24	395.21	SD - 40'	20+25 57.12' E B N CHAT
I-4	"	392.68	392.58	398.74	"	0+45 15.0' R PAULSKIRK
I-5	"	393.08	392.83	398.64	"	0+45 15.0' L PAULSKIRK
I-6	"	-	393.33	396.81	"	16+55 18' L W B N CHAT
I-7	"	-	388.76	393.02	"	15+00 18' R E B N CHAT
I-8	"	386.84	386.59	390.71	"	13+14 18' L E B N CHAT
I-9	"	-	387.07	390.55	"	12+82 18' R E B N CHAT
S-1	MOD'A HEADWALL	-	386.0	-	SD - 5' 11", 18"	12+90, 40' L N CHAT
S-2	"	-	390.3	-	SD - 5' 11", 24"	18+72, 35' L W B N CHAT
S-3	27" RISER	-	390.9	-	- 27"	17+99, 99' R E B N CHAT
E-1	TYPE 'C' ENDWALL - 18"	-	391.17	-	SD - 5' 21"	20+07 32' L
E-2	TYPE 'C' ENDWALL - 24"	-	391.50	-	SD - 5' 21" w/1/2" 23" ERCP	19+50 55' R
E-3	TYPE 'C' ENDWALL - 24"	-	389.28	-	SD - 5' 21"	17+75 25' R
E-4	TYPE 'C' ENDWALL - 18"	-	392.00	-	SD - 5' 21"	18+00 43' L
E-5	TYPE 'C' ENDWALL - 15"	-	388.42	-	SD - 5' 21"	14+70 40' L
E-6	TYPE 'C' ENDWALL - 18"	-	386.5	-	SD - 5' 21"	13+18 40' L
E-7	METAL END SECTION - 18"	-	390.0	-	-	17+05 103' R
E-8	TYPE 'A' HEADWALL	-	-	-	-	-
E-9	"	-	-	-	-	-
M-1	MANHOLE	385.7	385.45	392.0	6-5' 12"	12+80 40' L

* TOP OF CURB ELEVATION @ CL OF STRUCTURE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *James J. ...* 11/6/92
Chief, Bureau of Engineering: *Robert B. ...* 1-15-92

Chief, Bureau of Storm Drainage: *John ...* 1/15/92
Chief, Bureau of Highways: *David W. ...* 1/15/92

MILDENBERG, MOCHI & ASSOCIATES, INC.
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3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-1350
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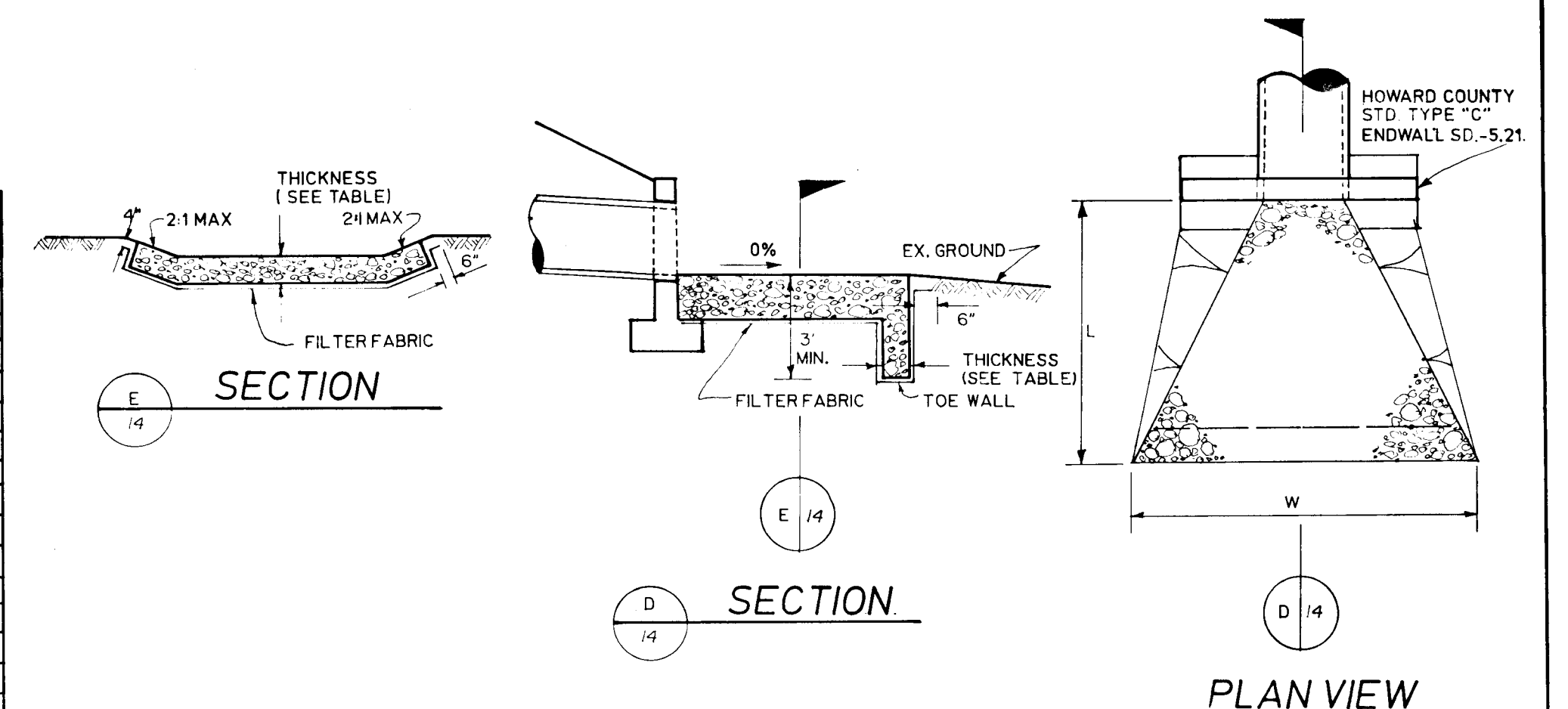
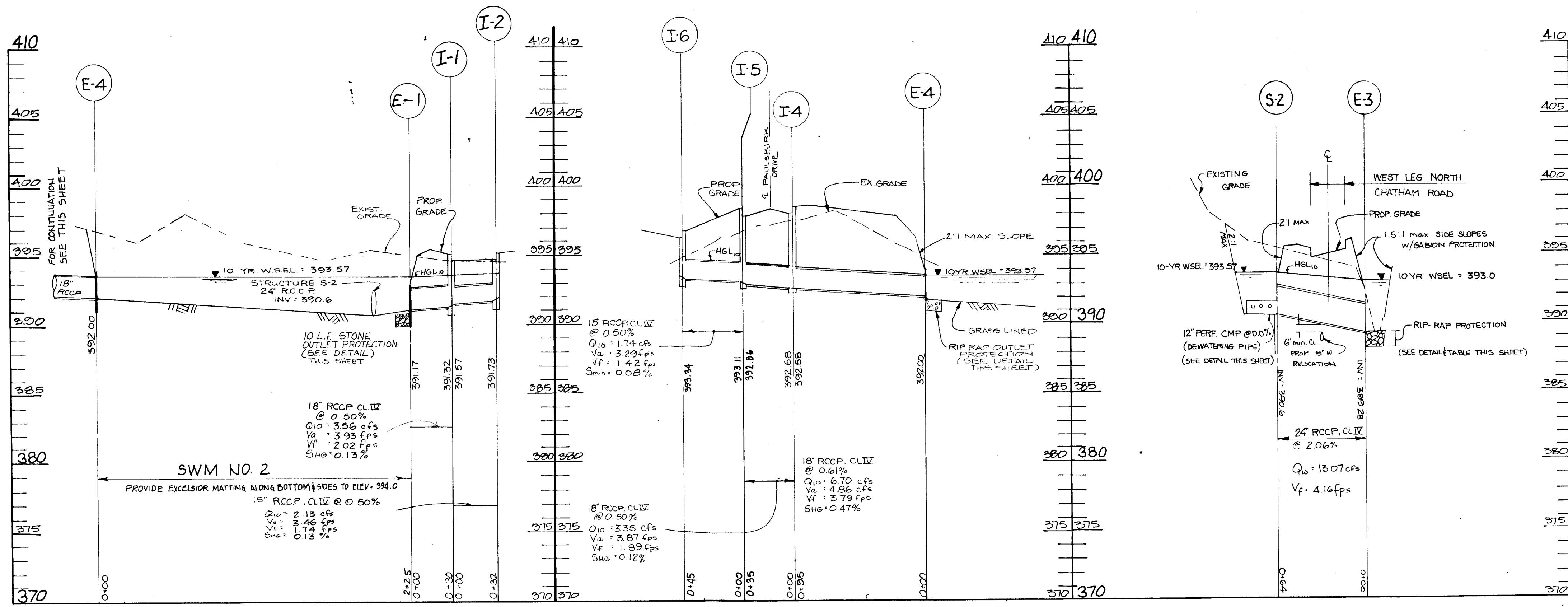
NOTES & DETAILS

DATE: MAY 1992 BY: NO. REVISION DATE: 600' SCALE MAP NO. BLOCK NO.

NORTH CHATHAM ROAD IMPROVEMENTS

CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 13 OF 23



RIP-RAP OUTLET PROTECTION DETAIL
NOT TO SCALE

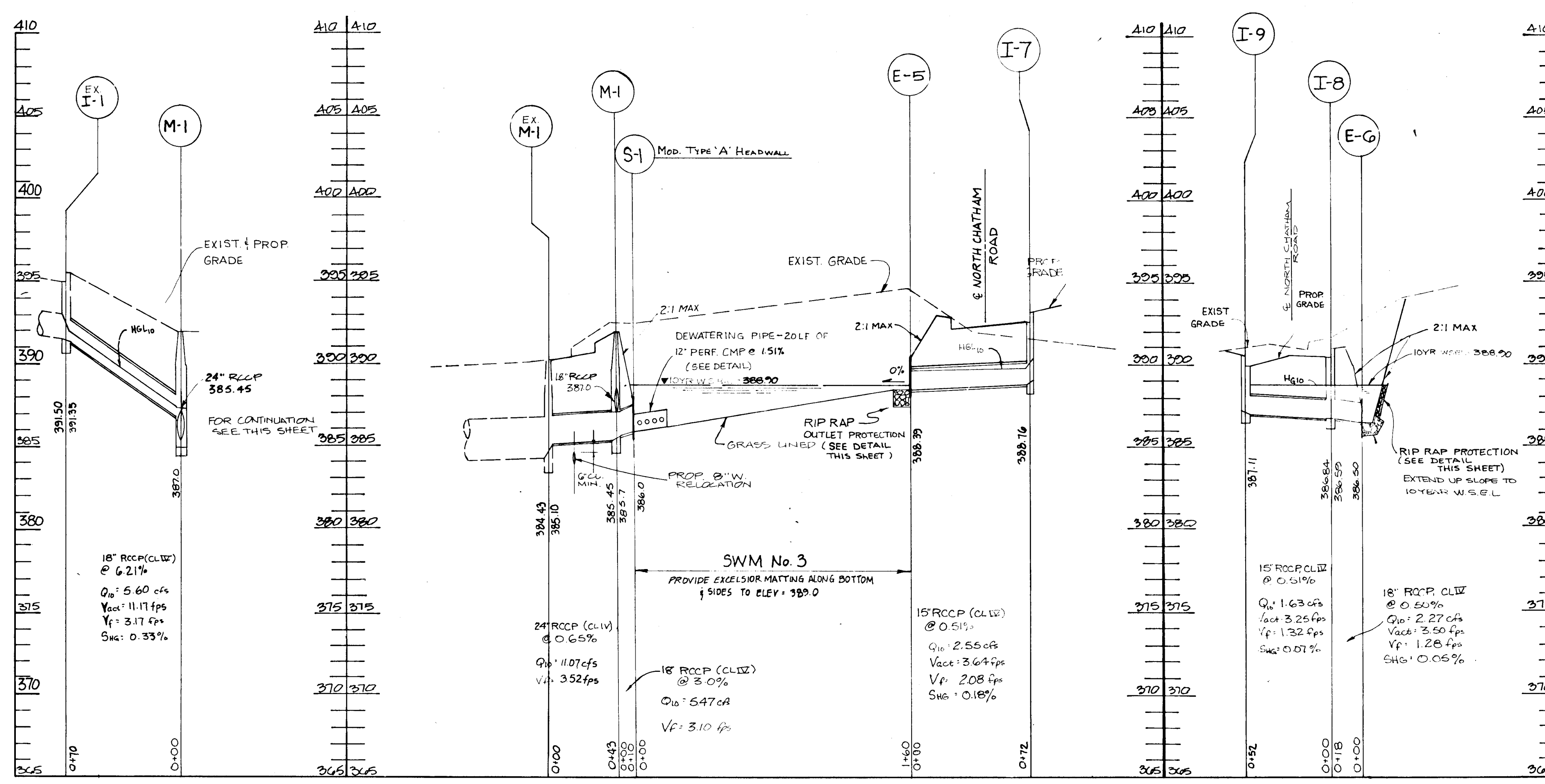
OUTLET PROTECTION					
STRUCTURE	LENGTH (FT)	WIDTH (FT)	d50	dMAX	THICKNESS
E - 1	10'	6.0'	4"	6"	9"
E - 2	10'	6.0'	4"	6"	9"
E - 3	15'	10.0'	9"	14"	20"
E - 4	10'	6.0'	4"	6"	9"
E - 5	10'	6.0'	4"	6"	9"
E - 6	10'	6.0'	4"	6"	9"
E - 7	15'	10'	9"	6"	15"

STORM DRAIN PROFILE & SWM No. 2
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

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

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

SEE SHEET 13 OF 17 FOR STRUCTURE SCHEDULE



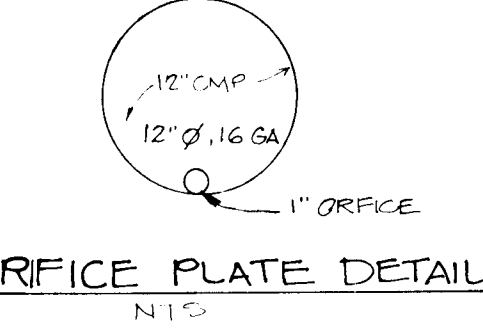
STORM DRAIN PROFILE
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

STORM DRAIN PROFILE & SWM No. 3
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

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

TYPICAL GRASS SWALE
SCALE: 1" = 5'

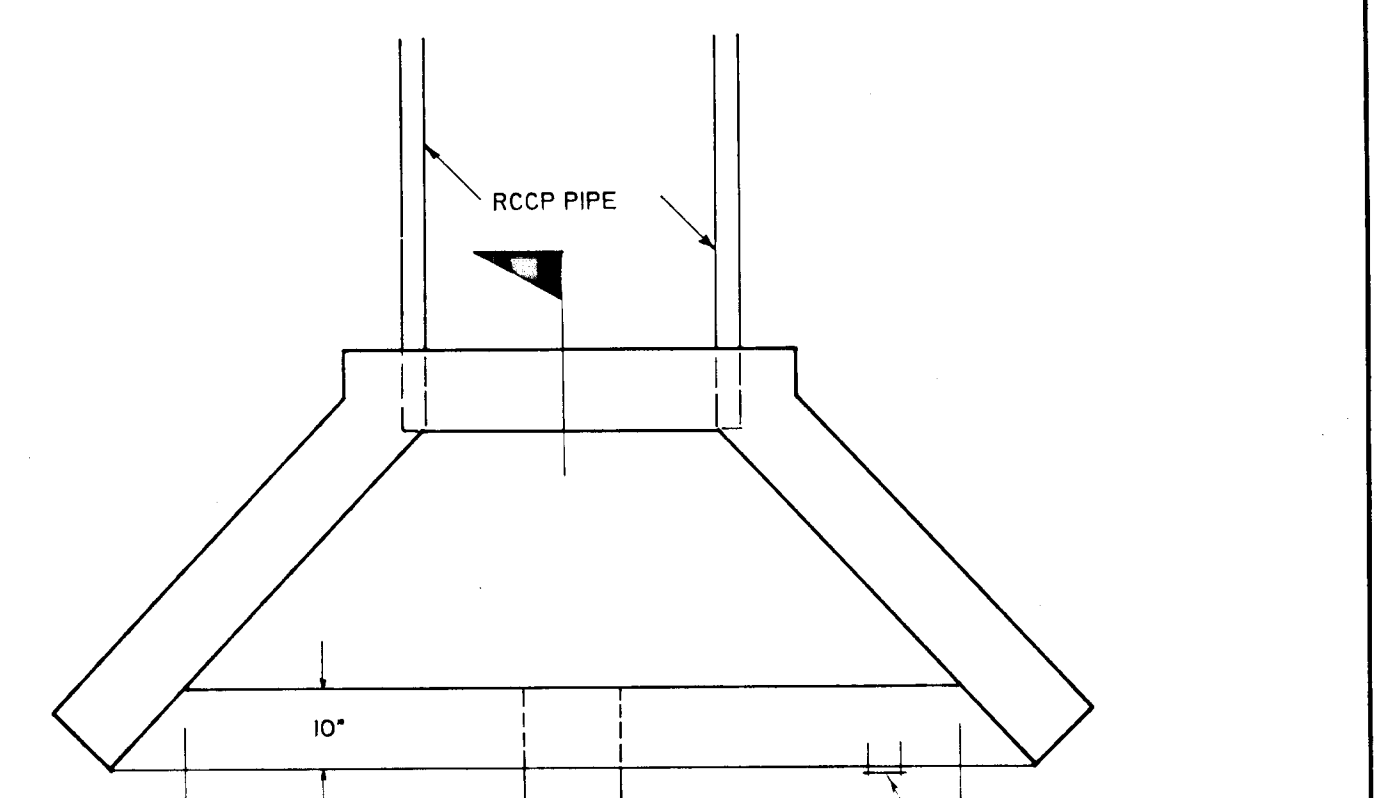
MOD. TYPE "A" HEADWALL - STRUCTURE SCHEDULE						
STRUCT.	PIPE SIZE	INV. PIPE	WEIR ELEV.	INV. TOP CMP	TOP ELEV.	PIPE HEIGHT
S-1	18"	390.00	390.50	390.00	399.0	2.5'
S-2	24"	390.60	392.10	390.60	394.10	2.0'



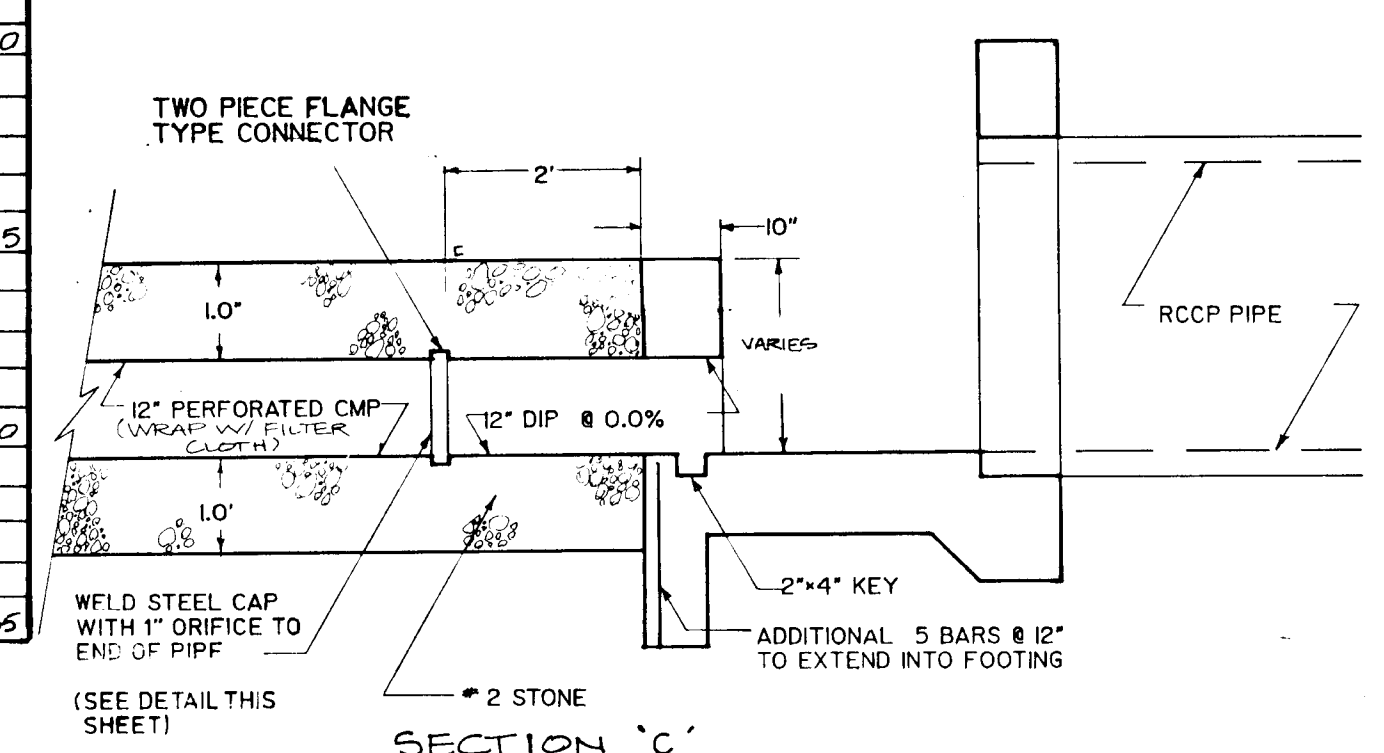
ORIFICE PLATE DETAIL
N.T.S.

MODIFIED TYPE "A" HEADWALL (S-1, S-2)
NOT TO SCALE

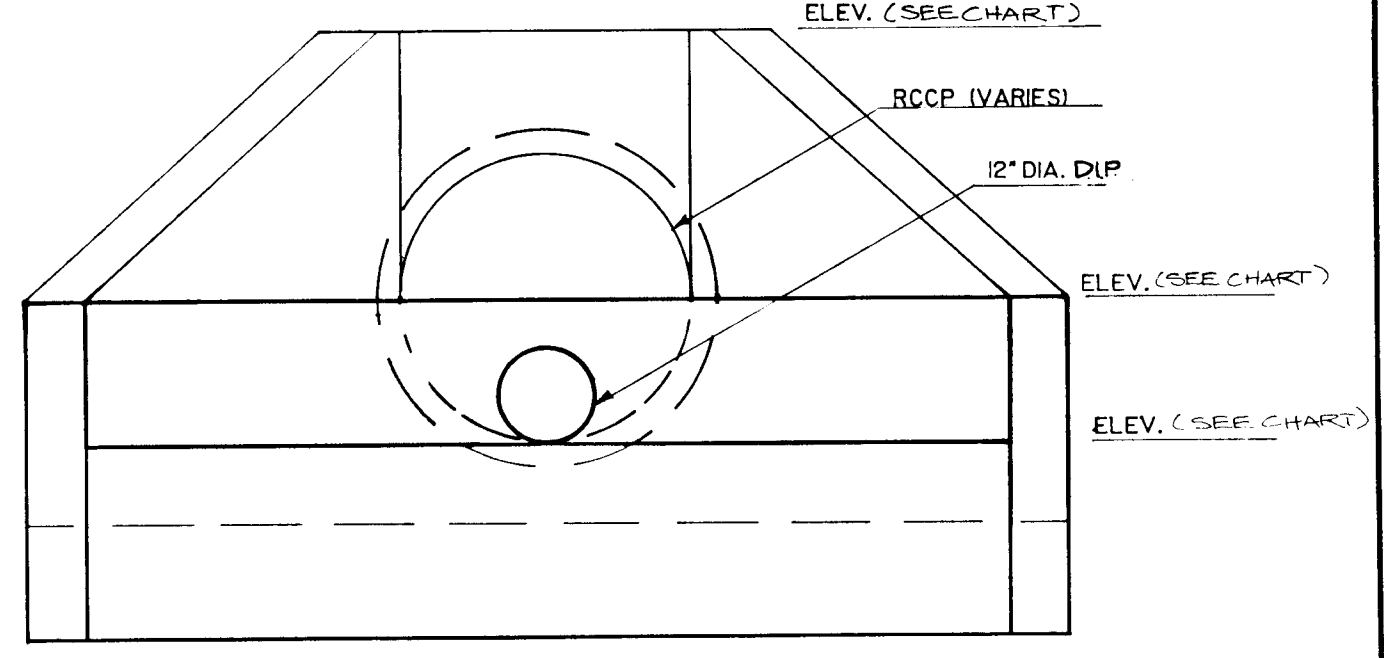
REFER TO HOWARD CO. STD. S.D.S. II TYPE "A" HEADWALL FOR CIRCULAR PIPE FOR DIMENSIONS, DETAILS AND SPECIFICATIONS NOT SHOWN



PLAN VIEW



SECTION 'C'



FRONT ELEVATION

L. Revised storm drain profiles E-1 to M-1, M-1 to E-5, I-9 to I-8 & I-6 to I-5 (1/7/01)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Compton 1/15/02
DIRECTOR OF PUBLIC WORKS DATE

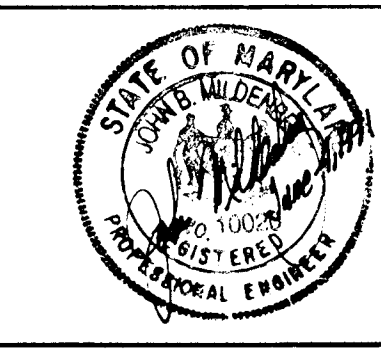
McGinnis & Ryan 1-15-02
CHIEF, BUREAU OF ENGINEERING DATE

Shaw 1/15/02
CHIEF, DIVISION OF ROADS, BRIDGES & STORM DRAINAGE DATE

Wolcott 1/15/02
CHIEF, BUREAU OF HIGHWAYS DATE

MILDENBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS • SURVEYORS • PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro: (301) 621-5768



DES: TJP/DAB	BY	NO.	REVISION	DATE
DRN: TJP/DAB				
CHK: JBM				
DATE: MAY 1979				

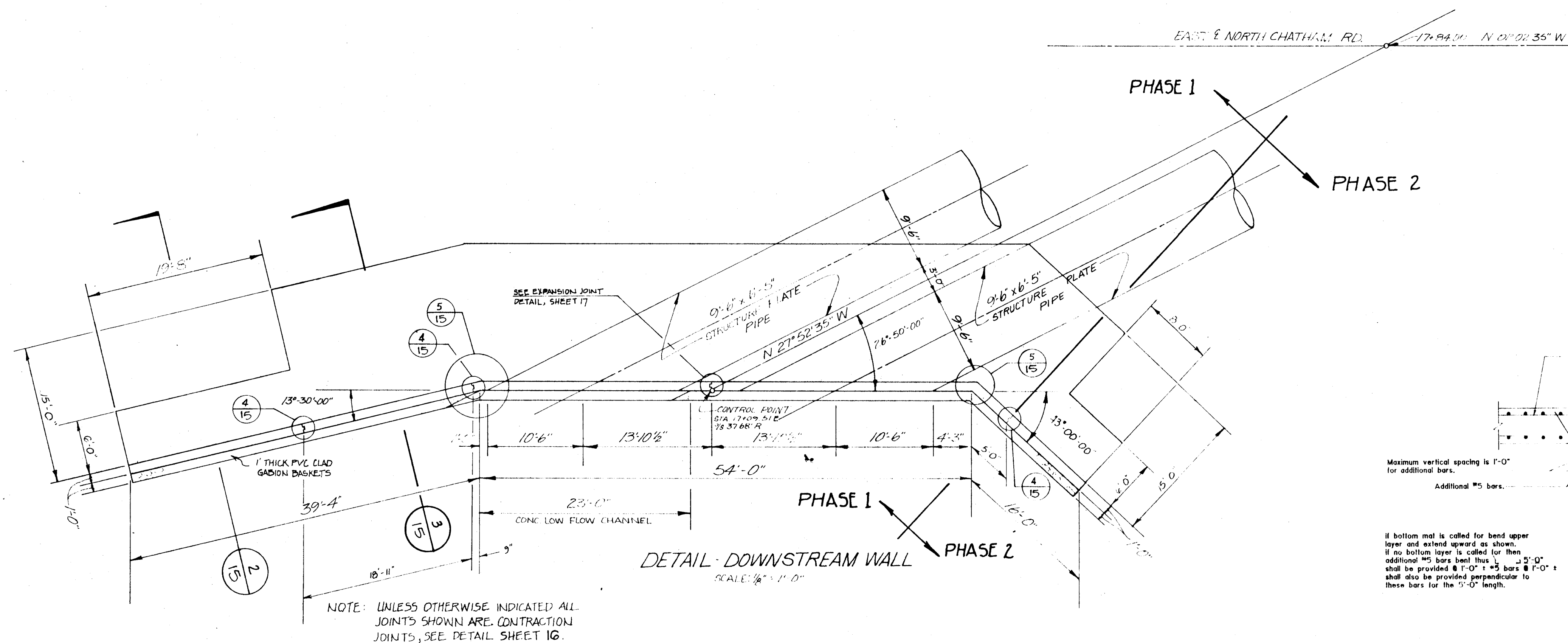
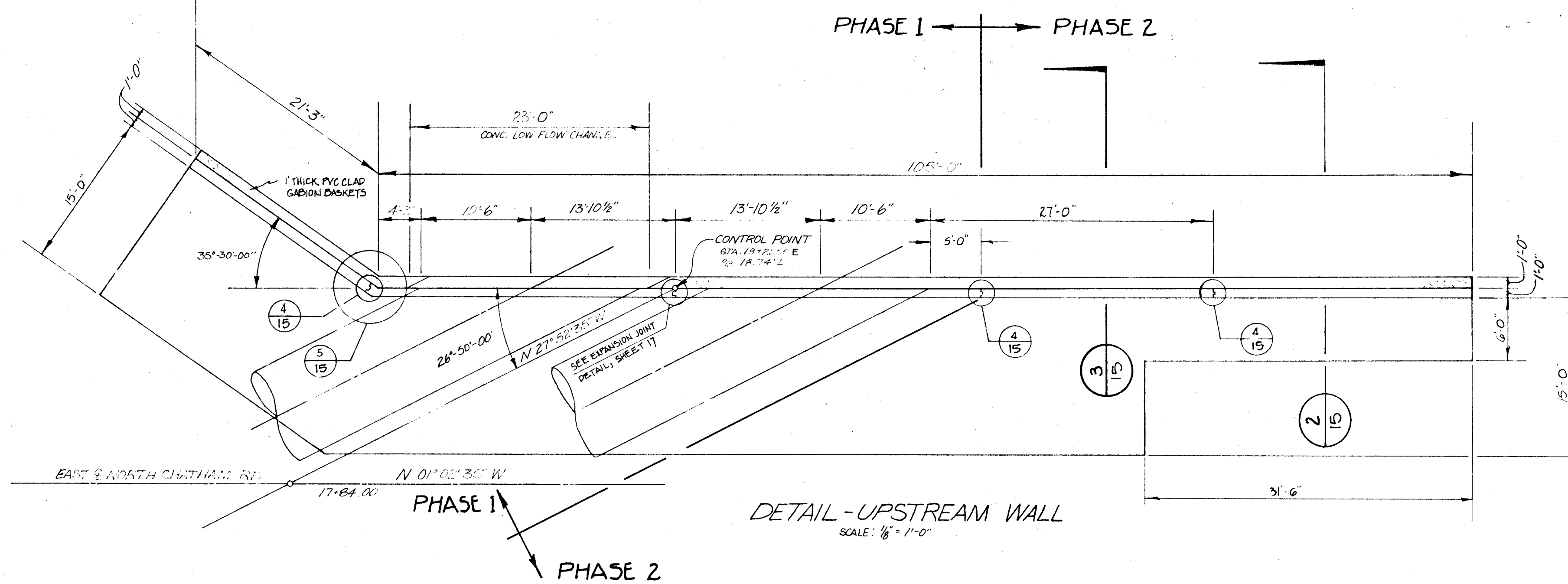
600' SCALE MAP NO. _____		BLOCK NO. _____	
--------------------------	--	-----------------	--

NORTH CHATHAM ROAD IMPROVEMENTS

CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 14 OF 23



GENERAL NOTES

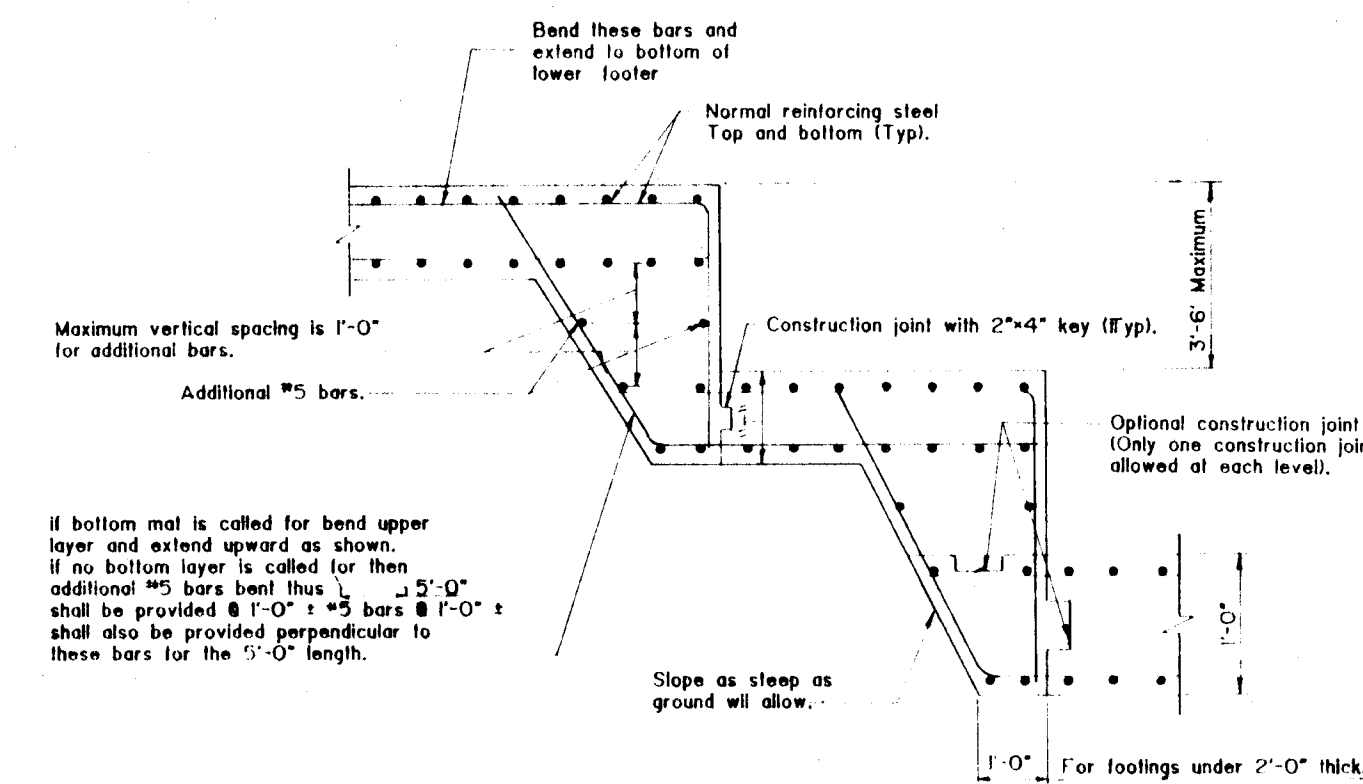
1. Concrete retaining wall with wing walls for pipe culverts designed in accordance with AASHTO standard specifications for highway bridges, Section 5.
2. Structures are designed for an equivalent fluid pressure of 39.6 P.C.F.
3. Vehicular load is in accordance with AASHTO vehicles to produce maximum stress and MD. Type 3 or Type 3S2 vehicle whichever governs.
4. Concrete shall conform to $f'c=3500$ P.S.I. at 28 days.
5. Reinforcing steel shall conform to A.S.T.M. A-615 grade 60 $f_s=24000$ P.S.I. - lap splices shall be in accordance with A.C.I. 318 for Type "C".
6. All exposed edges of concrete shall be chamfered $3/4"$ x $3/4"$.
7. Presumed soil bearing pressure= 4000 P.S.F. upon completion of excavations to $1'0"$ below pipe inverts, the excavations shall be inspected by a registered professional soils engineer. At his direction it may be necessary to carry out additional excavation below the founding elevation(s) shown on the plan to remove unsuitable material and backfill with #2 stone or AASHTO A-1 material.
8. The contractor shall submit structural plate pipe shop drawings certified by professional engineer registered in the state of Maryland for engineer's approval.

BACKFILL OF PIPE

1. Backfill to be placed and tamped under the haunches of the pipe by hand.
2. Backfill to be placed in $6"$ layers equally on each side of pipe and each layer shall be thoroughly compacted to 95% modified proctor density.
3. Provide CR-6 material as backfill from one foot below invert grades shown to a point $2'-6"$ above invert grades and a minimum of 4 feet on each side of culvert for remainder of backfill. Refer to Article 34.02 of the specification (MSHA Section 602).
4. The manufacturer of the arch shall provide a qualified representative present during the entire operation of construction to monitor the installation and configuration of the arch.
5. Regular monitoring of the arch shape at the center-line and both quarter points shall be performed and recorded by the contractor during the backfill operation in addition to the manufacturer's recommendations.
6. The minimum two foot cover shall be monitored and maintained in order for construction equipment to be allowed to pass over the arch, until such times as final grade is to be set.
7. For bedding requirements, refer to Article 34.02 of specification.

SEQUENCE OF CONSTRUCTION FOR CULVERT CROSSING

1. Divert stream as indicated in Sequence of Construction, Temporary Channel Diversion sheet 9 of 25.
2. Install culverts and construct Phase 1 of upstream and downstream headwalls.
3. Upon completion of Phase 1 of headwall construction and with approval of the Engineer, re-route stream through low flow channel in southern culvert of twin cell culvert.
4. Complete Phase 2 of upstream and downstream headwall construction.



LOCATION CATEGORY

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

LOCATION CATEGORY

A: Bars in horizontal layers in top of slab with 10% more of concrete below them such as in footings, per cap etc.
 B: All bars not in Category A should extend from the center support.
 C: All bars not in Category A should extend from each support.

STATE OF MARYLAND
 DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION
 DIVISION OF BRIDGE DESIGN
 BRIDGE DESIGN SECTION
 GRADE AND REINFORCING STEEL
 IS-MAN-003-3 (REVISED) 2/1992

Revised per Howard County, MD comments 1/20/92

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James J. Lee 1/15/92
 DIRECTOR OF PUBLIC WORKS

William E. Reag 1-15-92
 CHIEF, BUREAU OF ENGINEERING

Elizabeth Anderson Cole 1/15/92
 CHIEF ENGINEER & CIVIL ENGINEER

Lawrence H. McLeod 1/15/92
 CHIEF, BUREAU OF HIGHWAYS

MILDENBERG MOCHI & ASSOCIATES, INC.
 ENGINEERS • SURVEYORS • PLANNERS

3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
 (301) 461-0078 D.C. Metro: (301) 621-5768

John M. Mochi
 J. Mochi
 J. Mochi

DES: TJP	NO.	REVISION
DRN: TJP	BY	NO.
CHK: JRM	DATE	NO.
PROJ. # 89031	DATE	NO.
DATE: MAY 91	BY	NO.

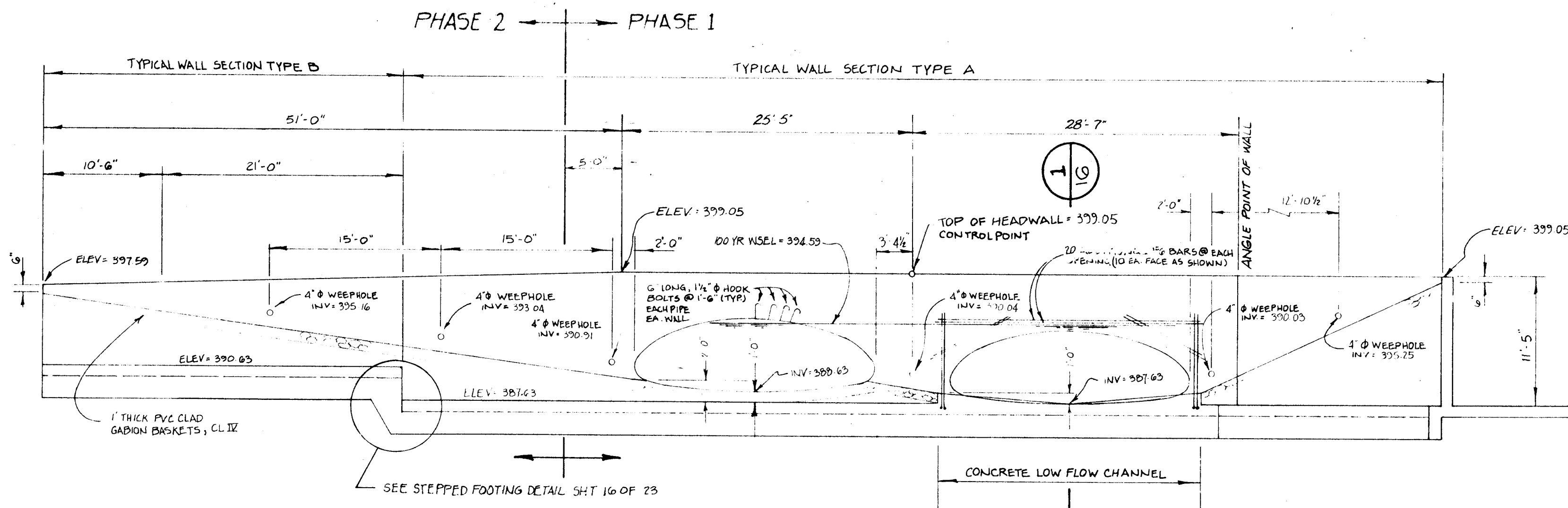
DETAILS
 TWIN CELL 9'-6" x 6'-5"
 STRUCTURAL PLATE PIPE ARCH
 S.P.P.A.

DATE: 600' SCALE MAP NO. BLOCK NO.

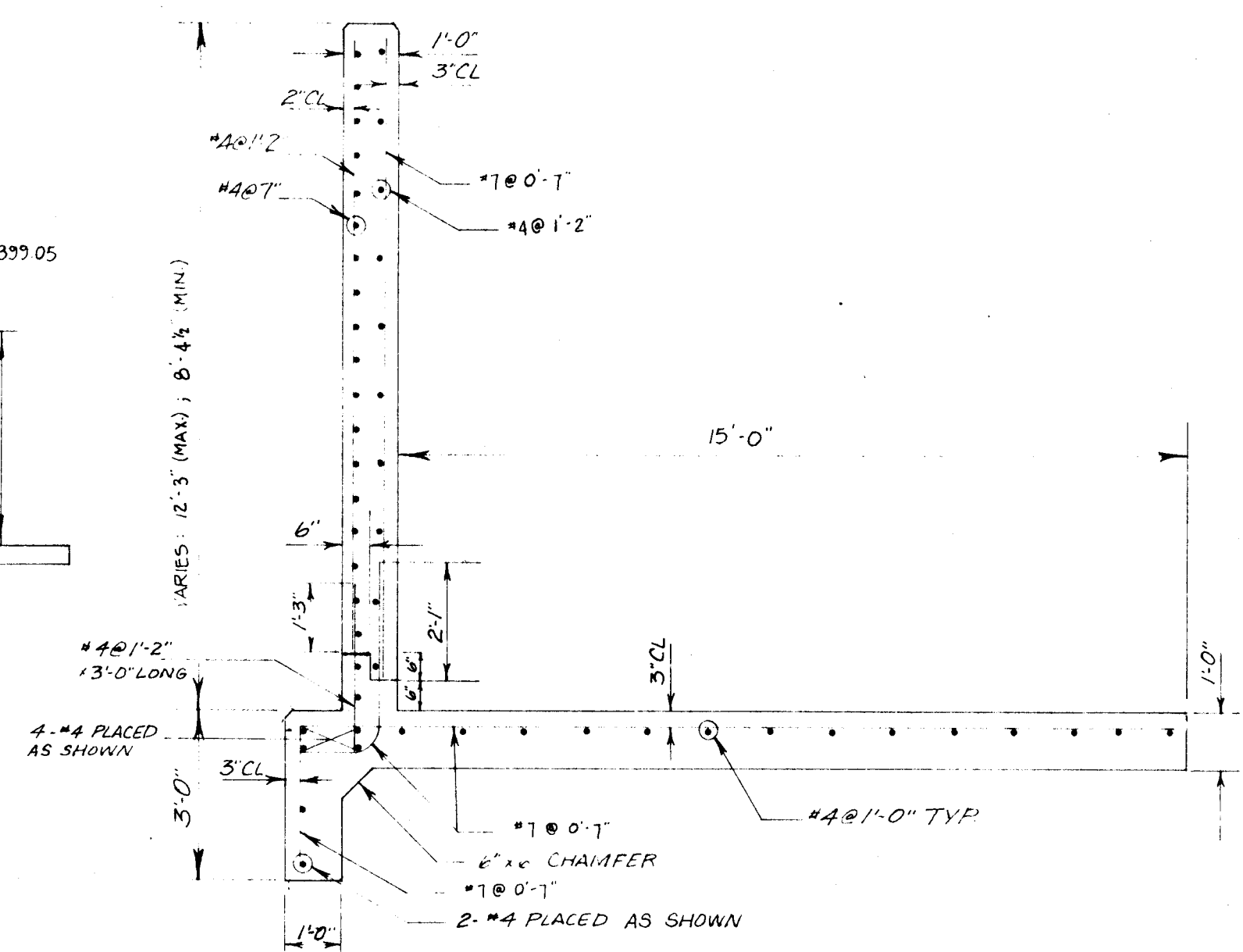
NORTH CHATHAM ROAD IMPROVEMENTS

CAPITAL PROJECT No. J-4088
 ELECTION DISTRICT No. 2
 HOWARD COUNTY, MARYLAND

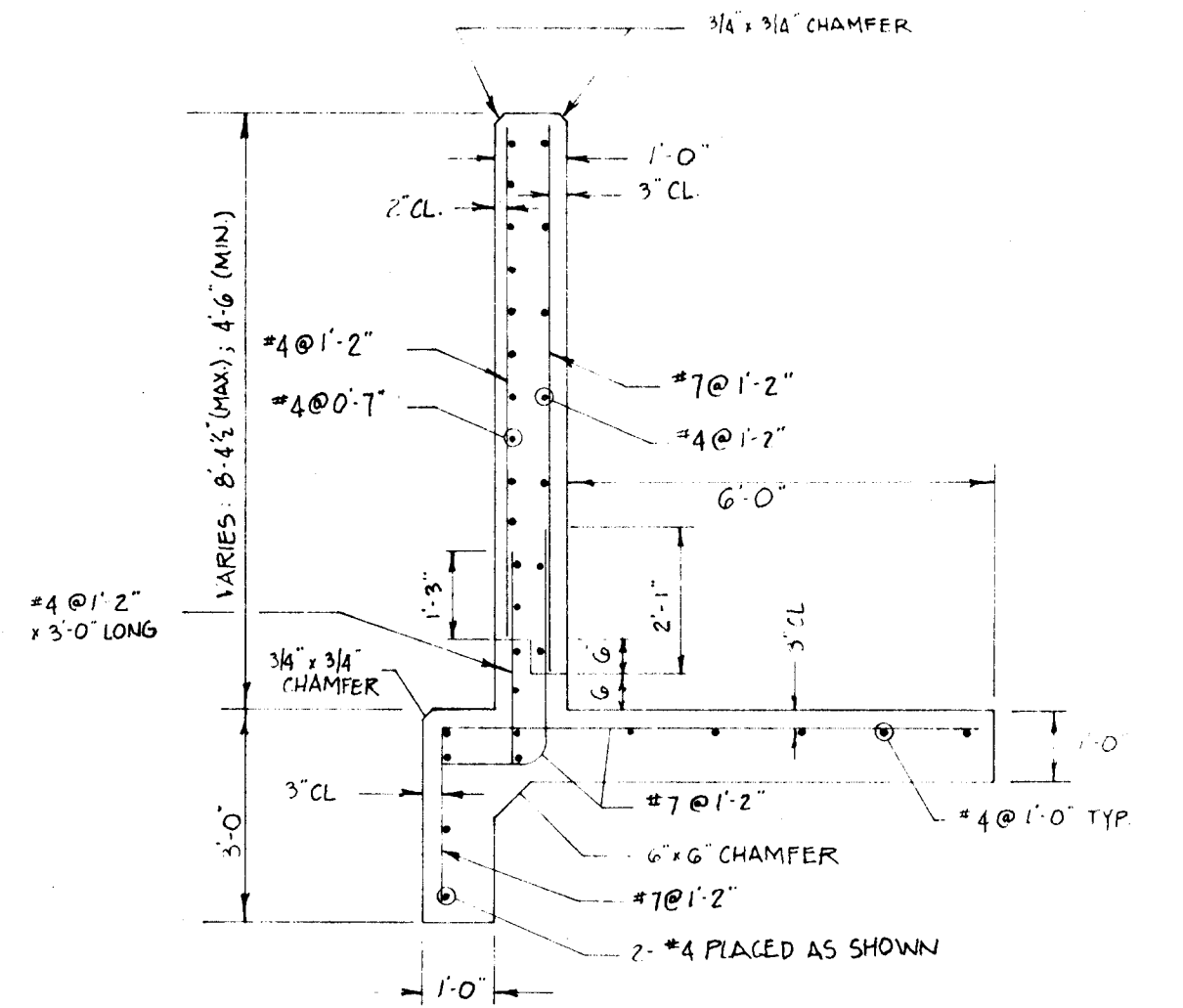
SCALE: AS SHOWN
 SHEET NO. 15 OF 23



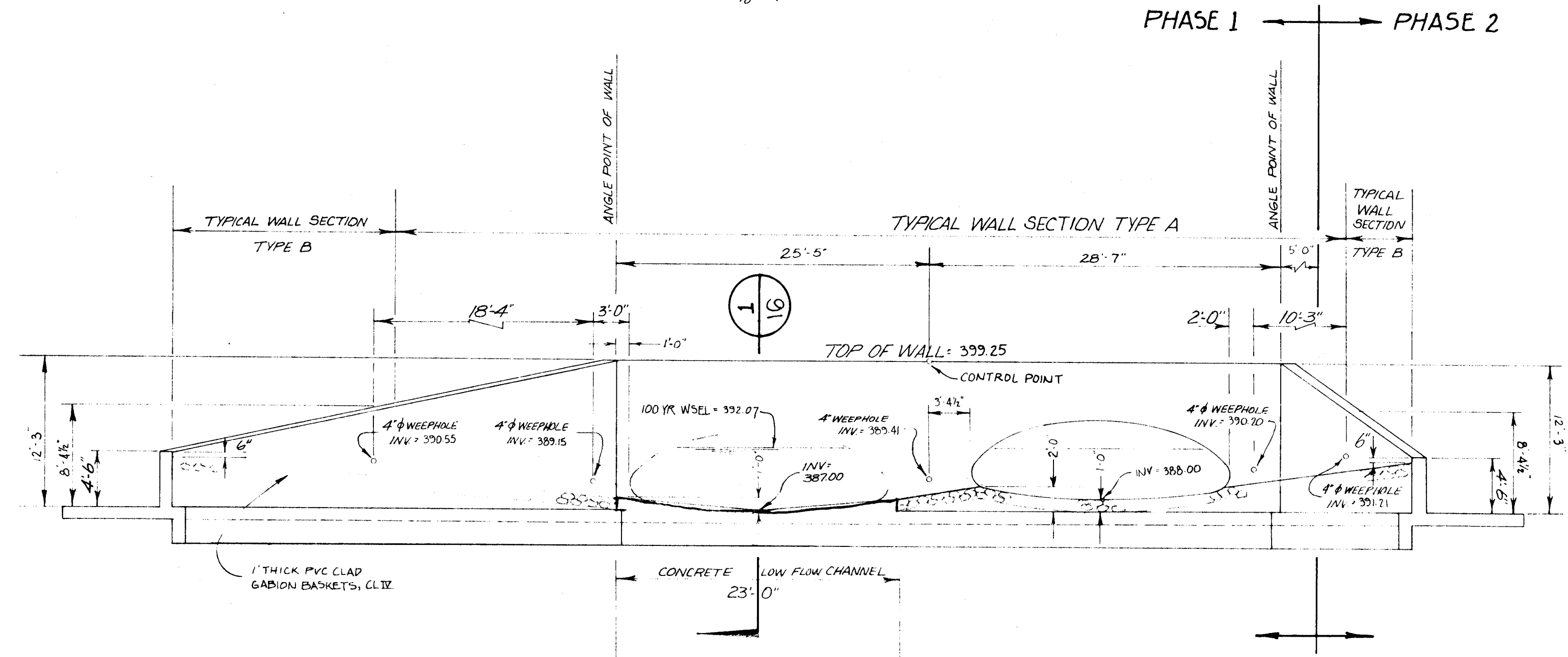
ELEVATION - UPSTREAM HEADWALL
SCALE: 1/8" = 1'-0"



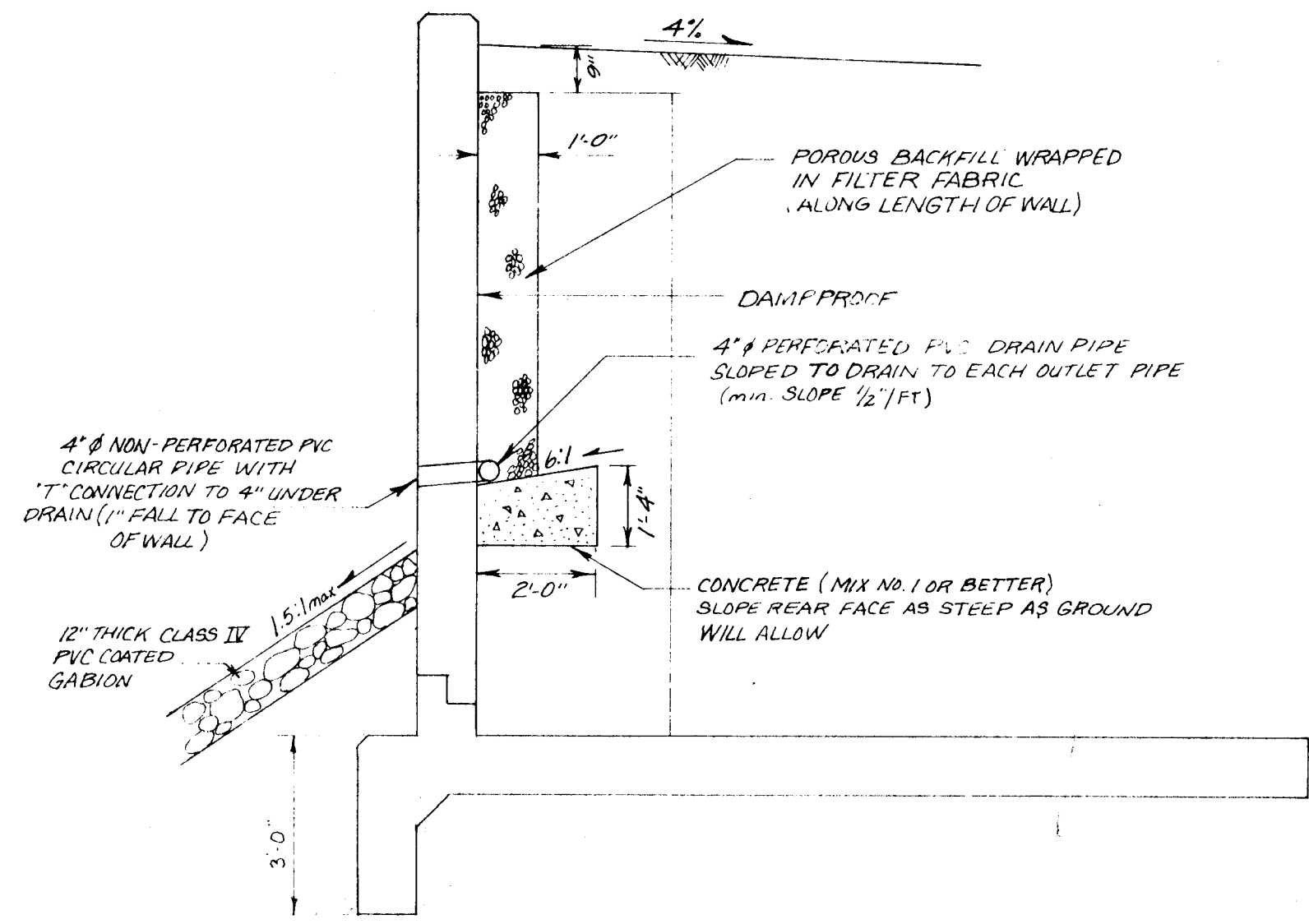
TYPICAL WALL SECTION TYPE A
SCALE: 3/8" = 1'-0"



TYPICAL WALL SECTION TYPE B
SCALE: 3/8" = 1'-0"



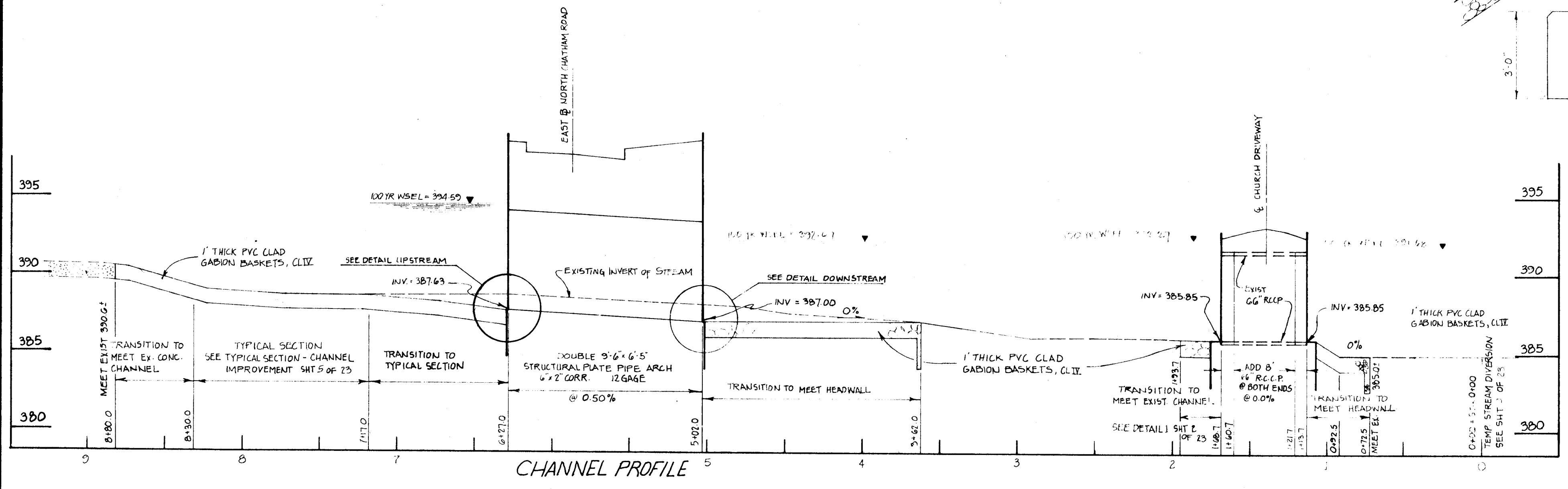
ELEVATION - DOWNSTREAM HEADWALL
SCALE: 1/8" = 1'-0"



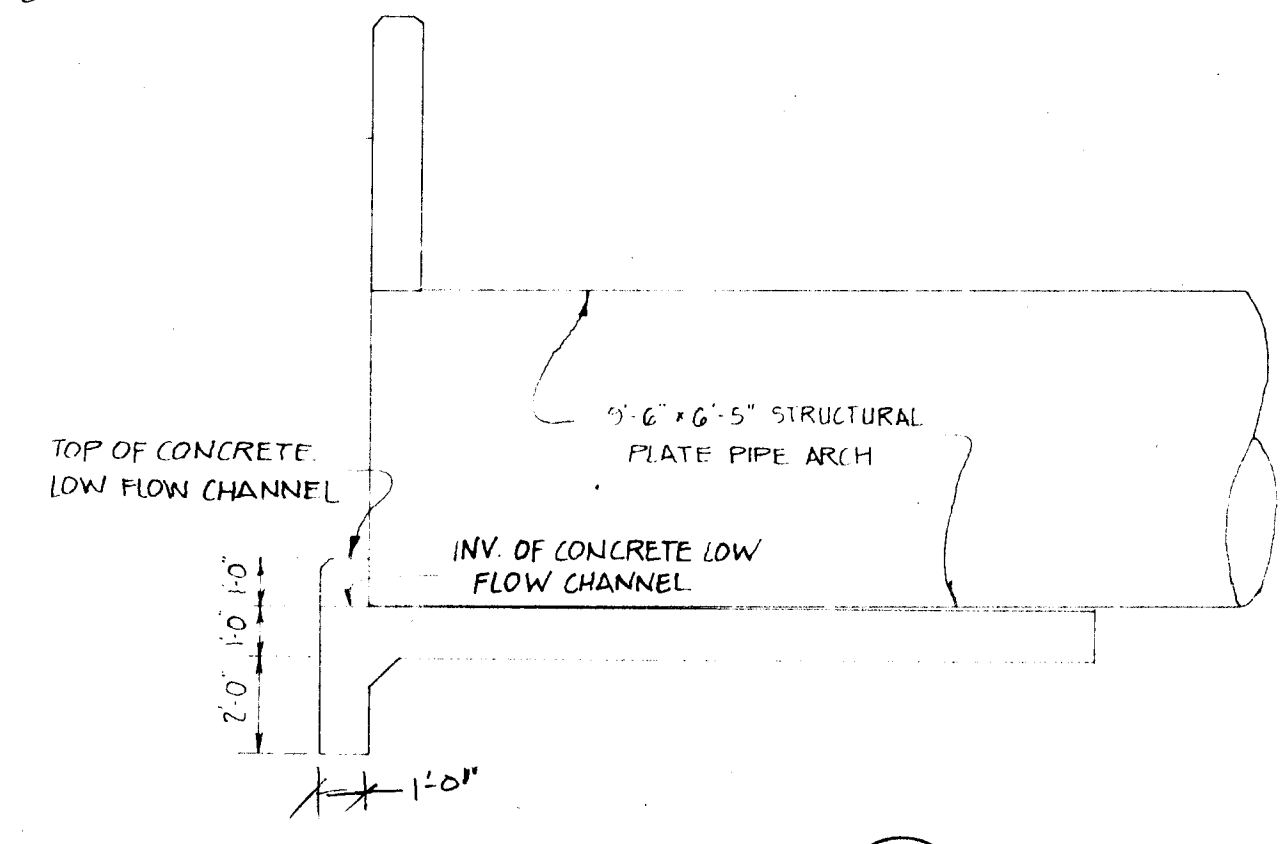
DRAINAGE DETAIL OF WALL
SCALE: 3/8" = 1'-0"

WALL HEIGHT	VERTICAL		HORIZONTAL	
	A	C	B	D
12'-3"	*10'-1"	*4'-0 1/2"	*4'-0 1/2"	*4'-0 T
11'-5"	*10'-1"	*4'-0 1/2"	*4'-0 1/2"	*4'-0 T
8'-4 1/2" TO 6'-0"	*10'-1"	*4'-0 1/2"	*4'-0 1/2"	*4'-0 T

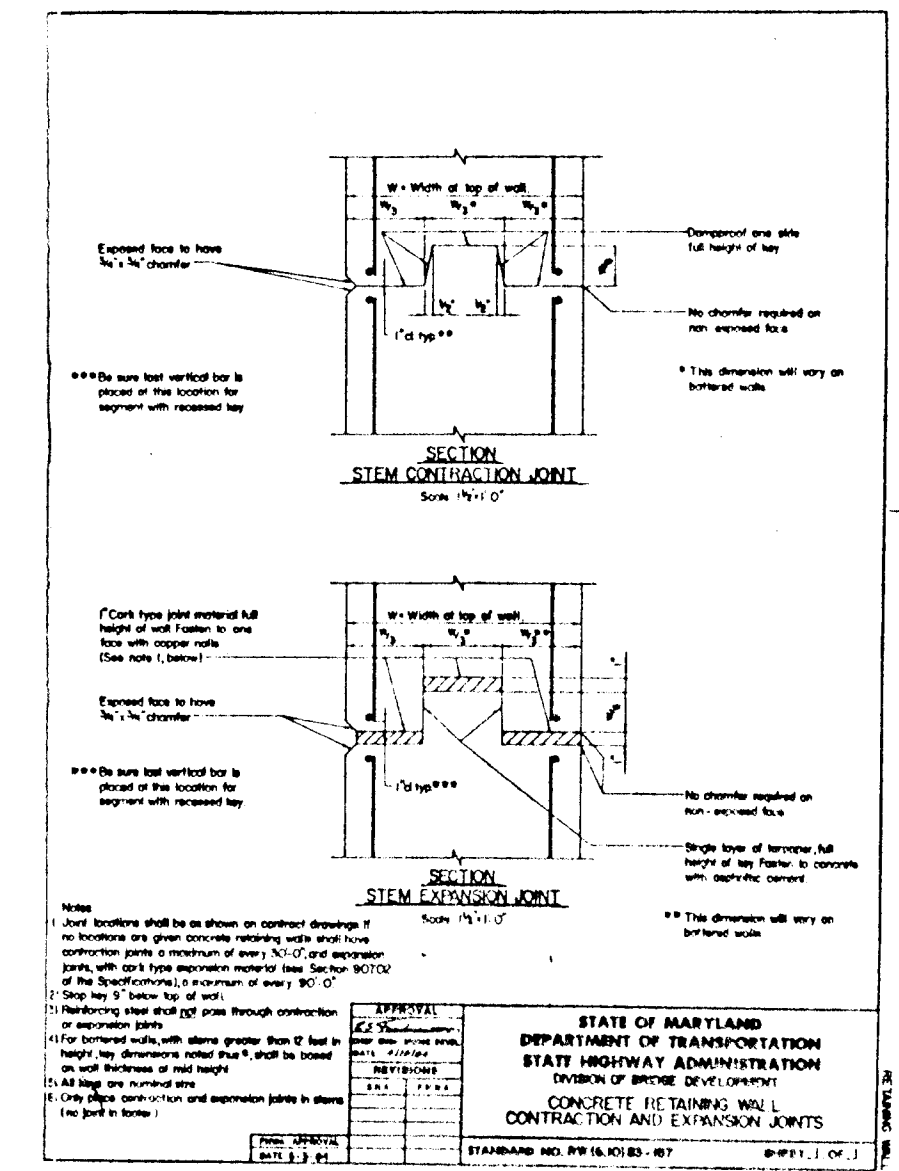
TYPICAL WALL ANGLE
SCALE: 1/8" = 1'-0"



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



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



CONTRACTION & EXPANSION JOINTS
SCALE: 1/8" = 1'-0"

2. Revisions per Howard County DPW comments (08/09/17) 1. ADDED 100 YR WSEL'S TO CHANNEL PROFILE (08/27/19)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: *James J. Lu* 1/15/92
Date: 1/15/92
Chief, Bureau of Engineering: *William R. Ray* 1-15-92
Date: 1-15-92
Chief, Bureau of Highway: *Elizabeth Johnson Galia* 1/16/92
Date: 1/16/92
Chief, Bureau of Highway: *Dawnielle W. Williams* 1/15/92
Date: 1/15/92

MILDBERG, MOCHI & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3399 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350
(301) 461-0078 D.C. Metro: (301) 627-5168

John M. Mochi
Director

DES: TJP
DRN: TJP
CHK: JBM
PROJ: #89031
DATE: MAY 91
BY: NO.
REVISION
DATE: 600' SCALE MAP NO. BLOCK NO.

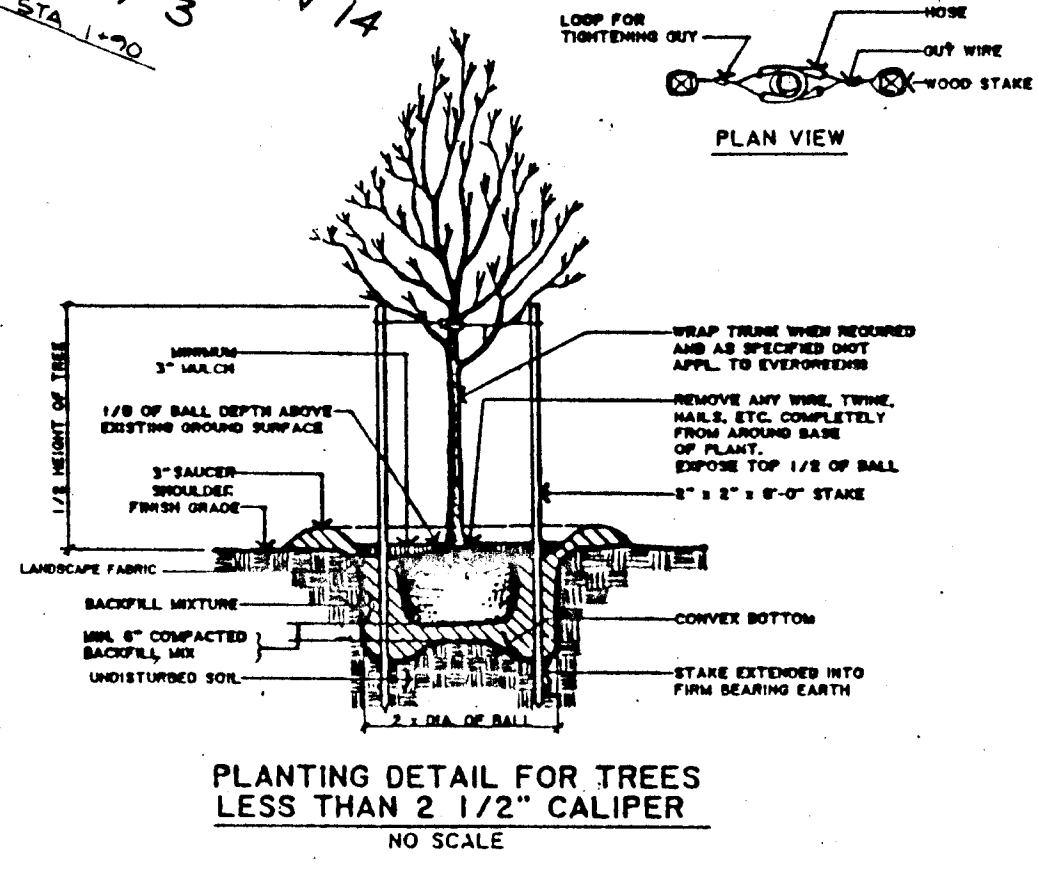
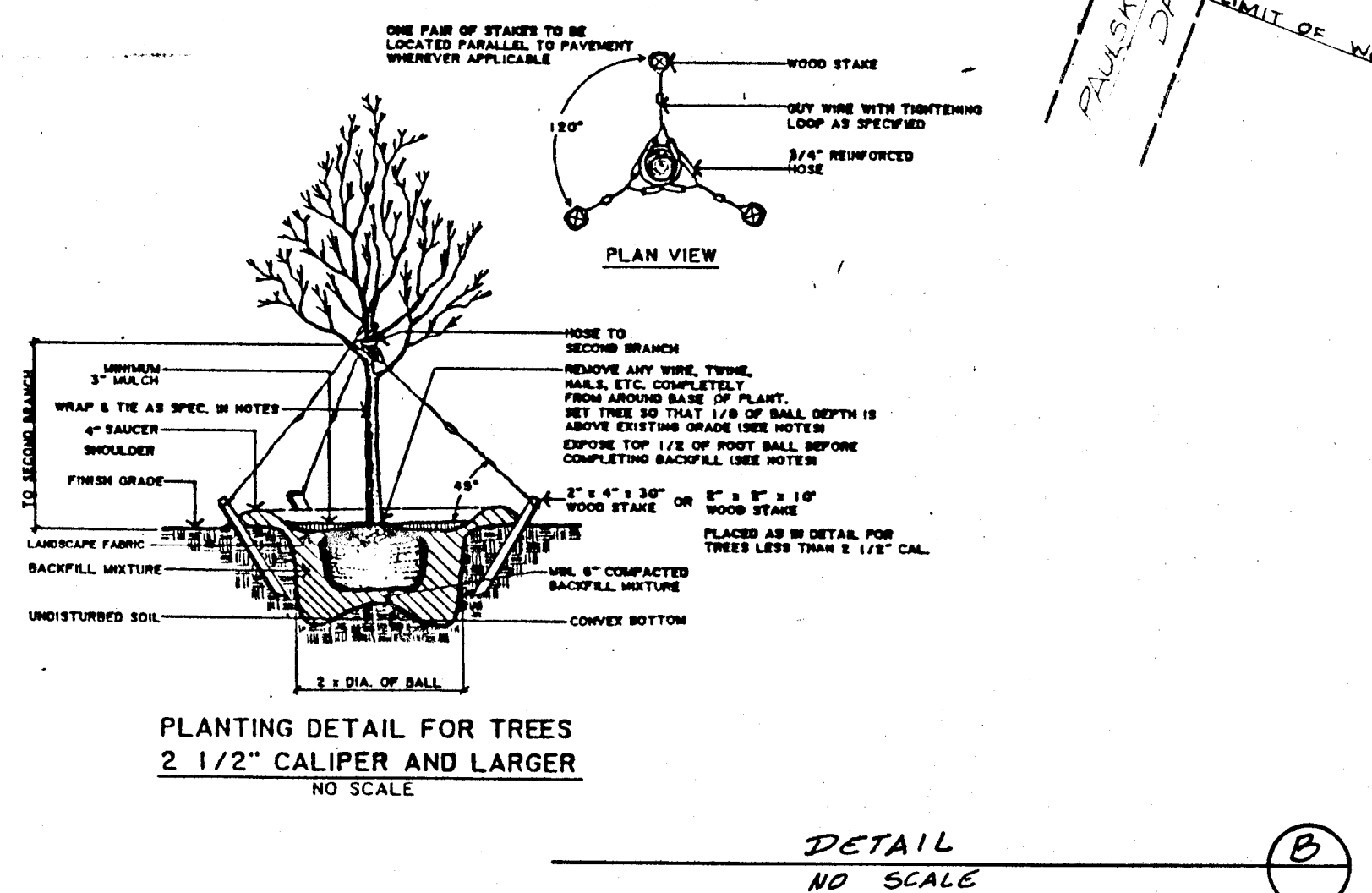
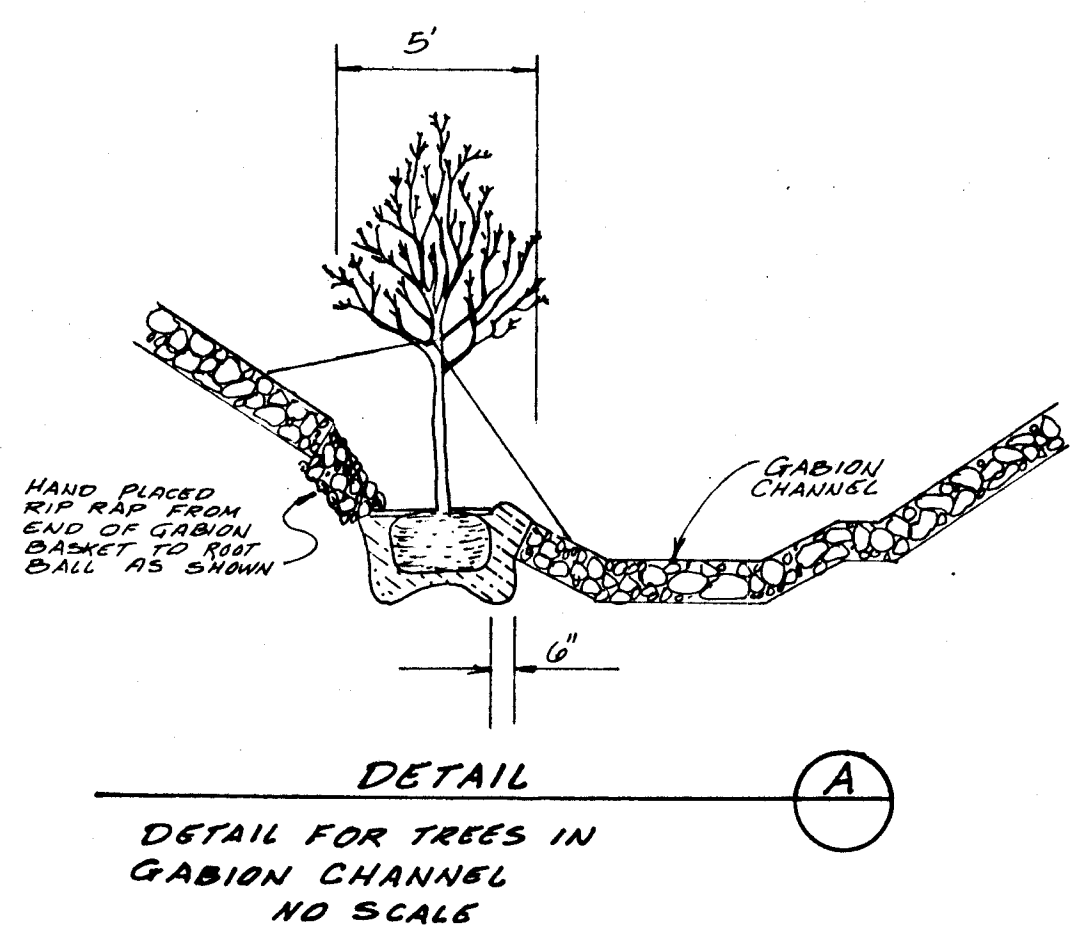
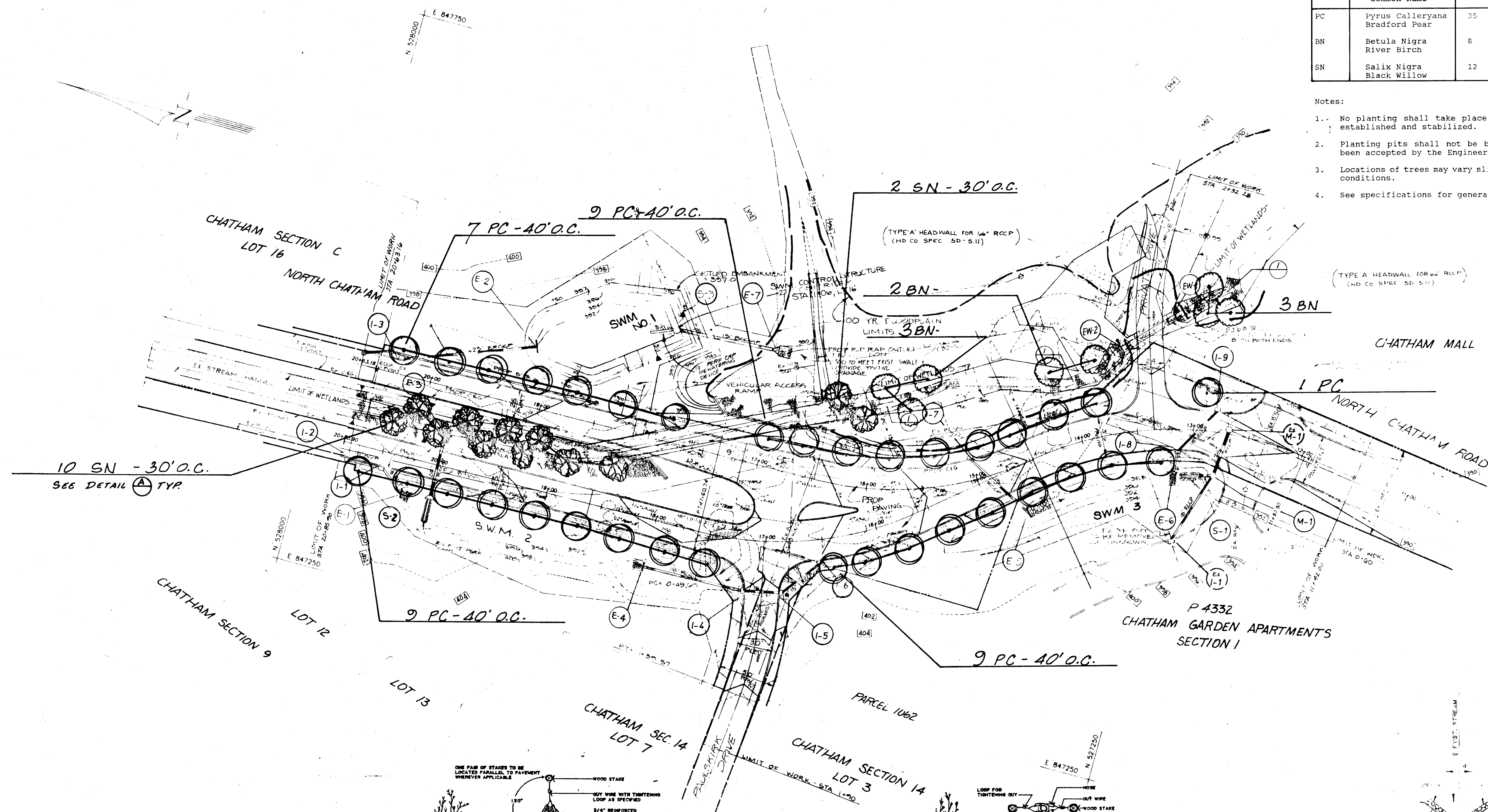
DETAILS
TWIN CELL 9'-6" x 6'-5"
STRUCTURAL PLATE PIPE ARCH
S.P.P.A.

NORTH CHATHAM ROAD
IMPROVEMENTS
CAPITAL PROJECT No. J-4088
ELECTION DISTRICT No. 2
HOWARD COUNTY, MARYLAND
SHEET 16 OF 23

Code	Botanical Name Common Name	Quantity	Size	Root	Remarks
PC	Pyrus Calleryana Bradford Pear	35	2-2-1/2 cal	B&B	Wrap and Stake
BN	Betula Nigra River Birch	8	5-6 ft. height	B&B	Min. 2 stems per clump Stake
SN	Salix Nigra Black Willow	12	2-2-1/2 cal	B&B	Wrap and Stake

Notes:

- No planting shall take place until the final grade is established and stabilized.
- Planting pits shall not be backfilled until they have been accepted by the Engineer.
- Locations of trees may vary slightly to accommodate field conditions.
- See specifications for general planting requirements.



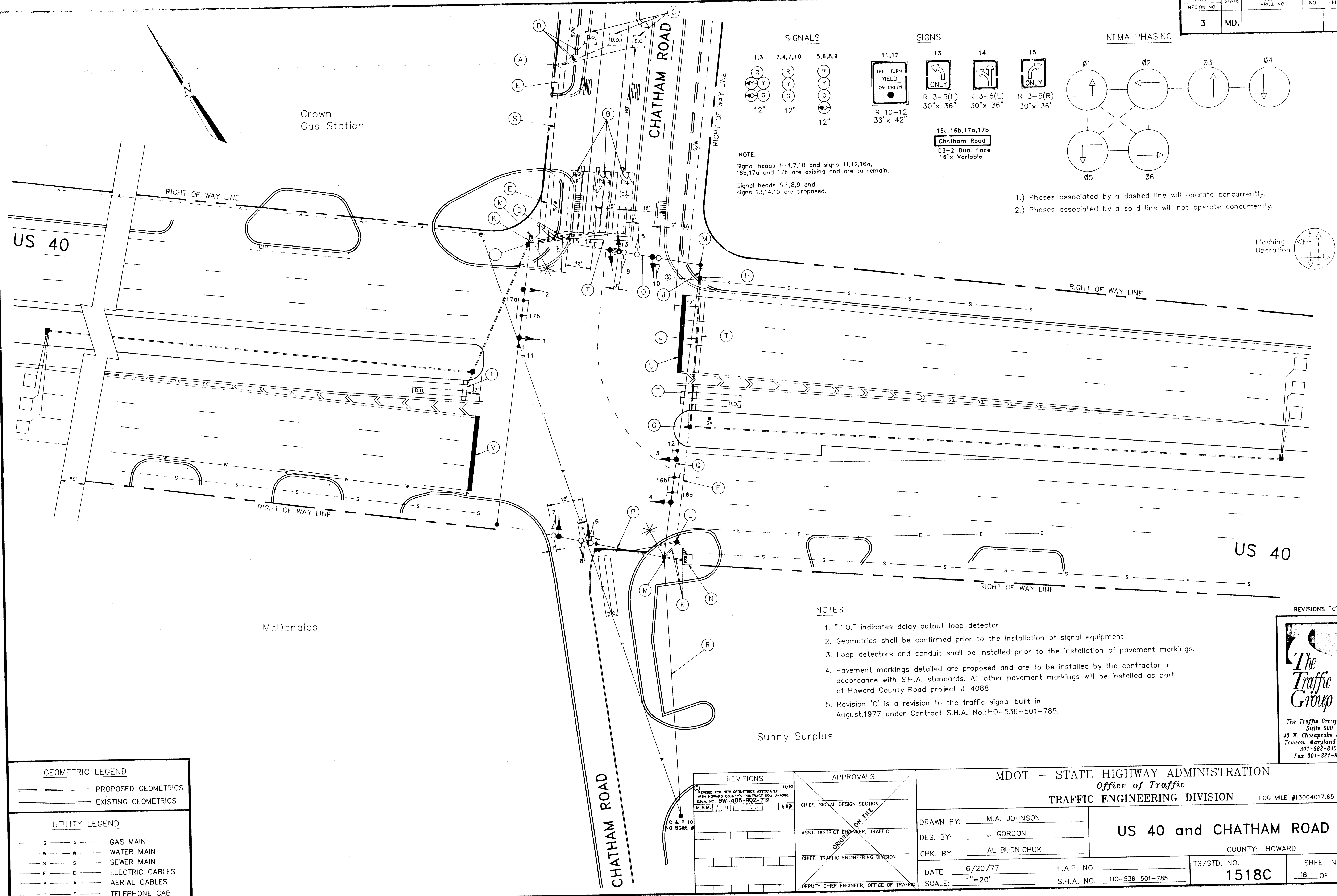
DETAIL - GABION PROTECTION FOR EXISTING CHANNEL

NOTE: SEE CHANNEL PROFILE SHEET 17 OF 23 FOR BEGINNING & ENDING STATIONS FOR PLACEMENT OF GABION PROTECTION

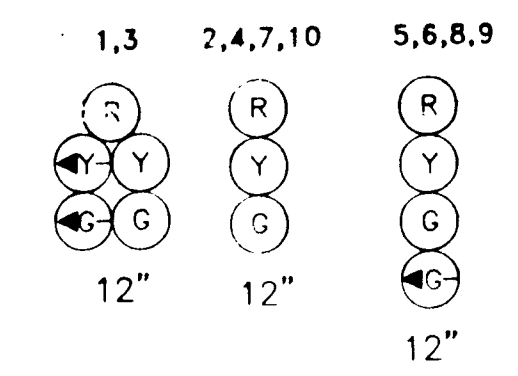
REVISIONS: 1. 11/15/92 - REVISED DETAIL C CHANNEL PROTECTION (S/10/92)
 2. 11/15/92 - REVISED DETAIL B CHANNEL PROTECTION (S/10/92)
 3. 11/15/92 - REVISED DETAIL A CHANNEL PROTECTION (S/10/92)

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Jama R. Lee</i> 1/15/92 DIRECTOR <i>Kenneth Gray</i> 1-15-92 CHIEF, BUREAU OF ENGINEERING <i>Elizabeth Calderon Calca</i> 1/15/92 CHIEF, PUBLIC UTILITIES & STORM DRAINAGE DATE <i>Granville W. Wallace</i> 1/15/92 CHIEF, BUREAU OF HIGHWAYS DATE		MILDENBERG, MOCHI & ASSOCIATES, INC. ENGINEERS - SURVEYORS - PLANNERS 3300 North Ridge Road, Suite 235, Ellicott City, Maryland 21043-3350 (301) 461-0078 D.C. Metro (301) 671-5766		DRN: [] CHK: [] PRD: [] DATE: Oct 92 BY: NO	REVISION: [] DATE: 6/02 SCALE: MAP NO. BLOCK NO.	PLAN VIEW LANDSCAPE PLAN	NORTH CHATHAM ROAD IMPROVEMENTS CAPITAL PROJECT No. J-4084 ELECTION DISTRICT No. 2 HOWARD COUNTY, MARYLAND	SCALE: 1" = 40' SHEET 17 OF 23
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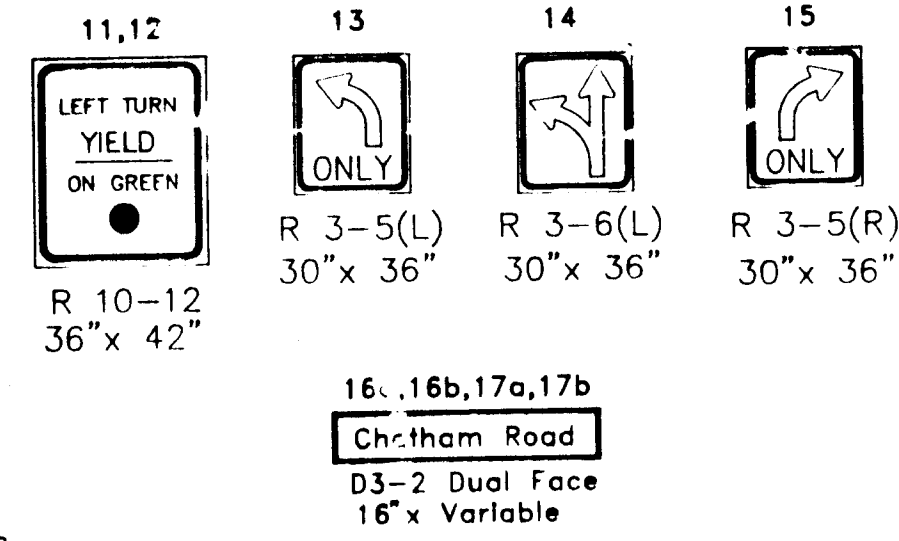
FHWA REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	MD.			



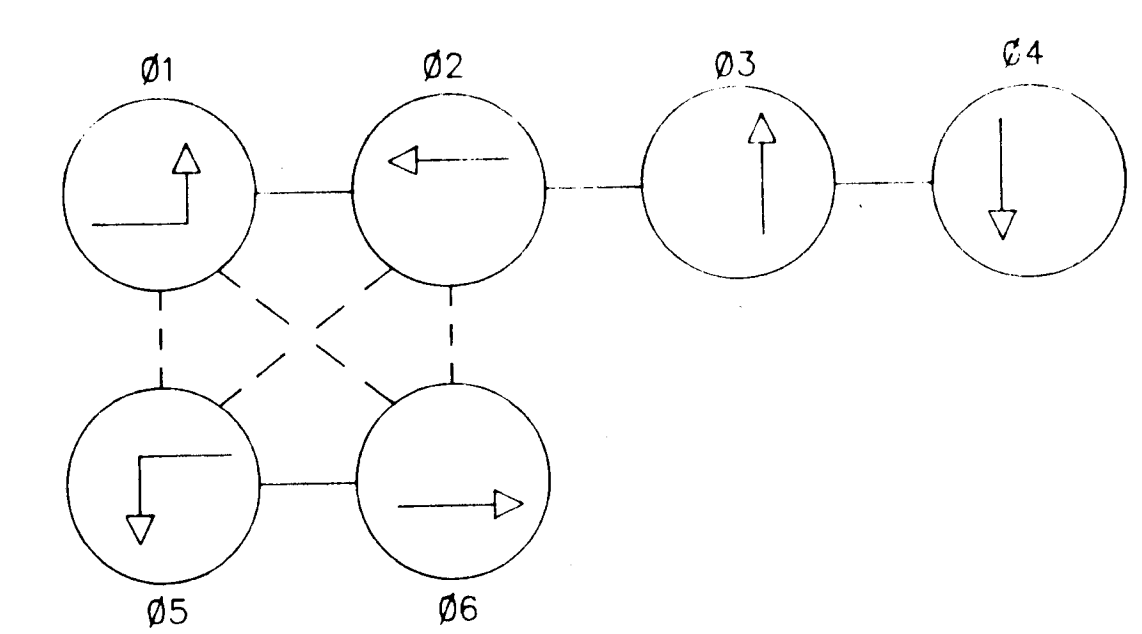
SIGNALS



SIGNS

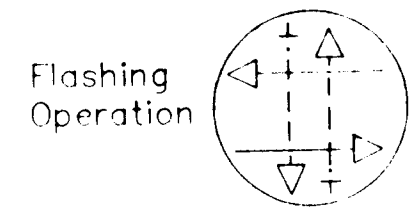


NEMA PHASING



- 1.) Phases associated by a dashed line will operate concurrently.
- 2.) Phases associated by a solid line will not operate concurrently.

NOTE:
Signal heads 1-4,7,10 and signs 11,12,16a, 16b,17a and 17b are existing and are to remain.
Signal heads 5,6,8,9 and signs 13,14,15 are proposed.



NOTES

1. "D.O." indicates delay output loop detector.
2. Geometrics shall be confirmed prior to the installation of signal equipment.
3. Loop detectors and conduit shall be installed prior to the installation of pavement markings.
4. Pavement markings detailed are proposed and are to be installed by the contractor in accordance with S.H.A. standards. All other pavement markings will be installed as part of Howard County Road project J-4088.
5. Revision 'C' is a revision to the traffic signal built in August, 1977 under Contract S.H.A. No.: HO-536-501-785.

GEOMETRIC LEGEND	
	PROPOSED GEOMETRICS
	EXISTING GEOMETRICS
UTILITY LEGEND	
	GAS MAIN
	WATER MAIN
	SEWER MAIN
	ELECTRIC CABLES
	AERIAL CABLES
	TELEPHONE CAB

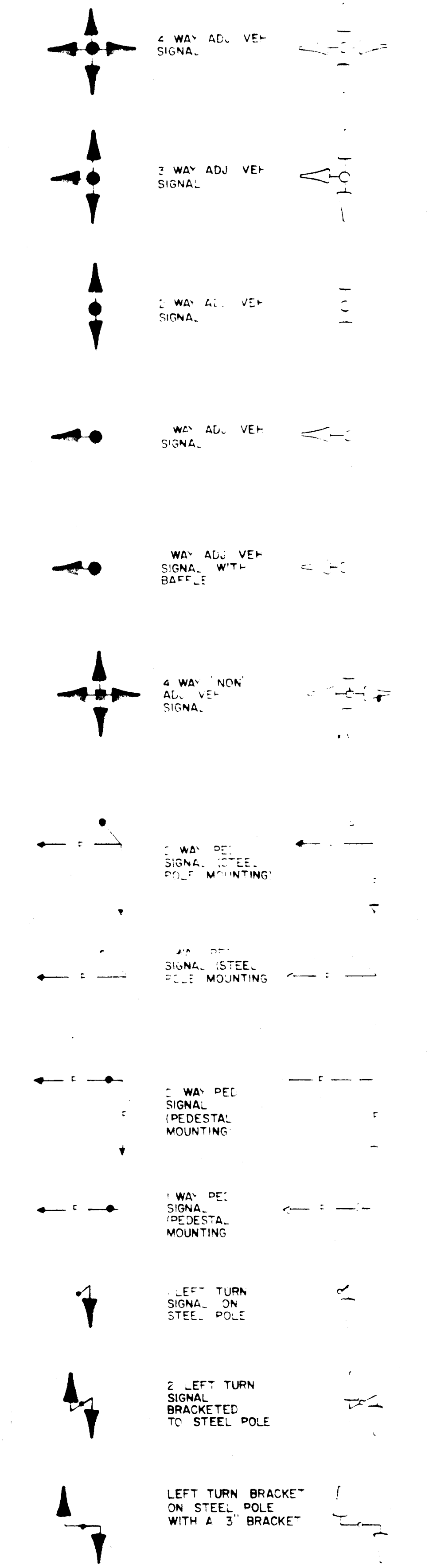
REVISIONS	APPROVALS
11/90 REVISED FOR NEW GEOMETRICS ASSOCIATED WITH HOWARD COUNTY'S CONTRACT NO. J-4088. S.H.A. NO. BW-405-802-712 M.A.M.	CHIEF, SIGNAL DESIGN SECTION ASST. DISTRICT ENGINEER, TRAFFIC CHIEF, TRAFFIC ENGINEERING DIVISION DEPUTY CHIEF ENGINEER, OFFICE OF TRAFFIC

MDOT - STATE HIGHWAY ADMINISTRATION Office of Traffic TRAFFIC ENGINEERING DIVISION		LOG MILE #13004017.65
DRAWN BY: M.A. JOHNSON DES. BY: J. GORDON CHK. BY: AL BUDNICHUK	US 40 and CHATHAM ROAD COUNTY: HOWARD	
DATE: 6/20/77 SCALE: 1"=20'	F.A.P. NO. S.H.A. NO. HO-536-501-785	TS/STD. NO. 1518C SHEET NO. 18 OF 23

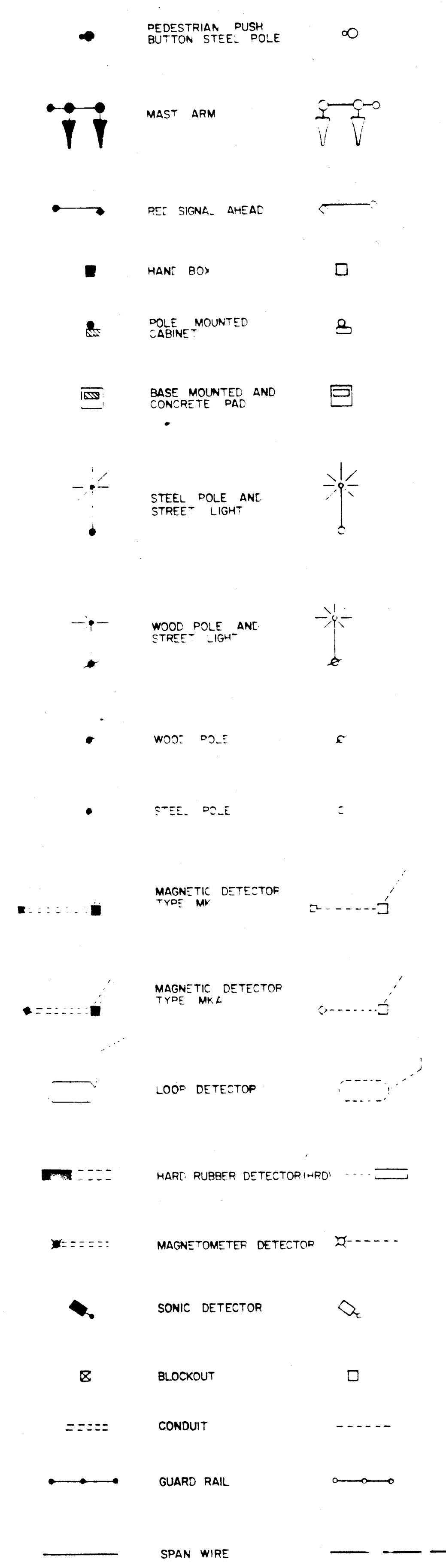
REVISIONS "C"

The Traffic Group, Inc.
 Suite 600
 40 W. Chesapeake Avenue
 Towson, Maryland 21204
 301-583-8405
 Fax 301-321-8458

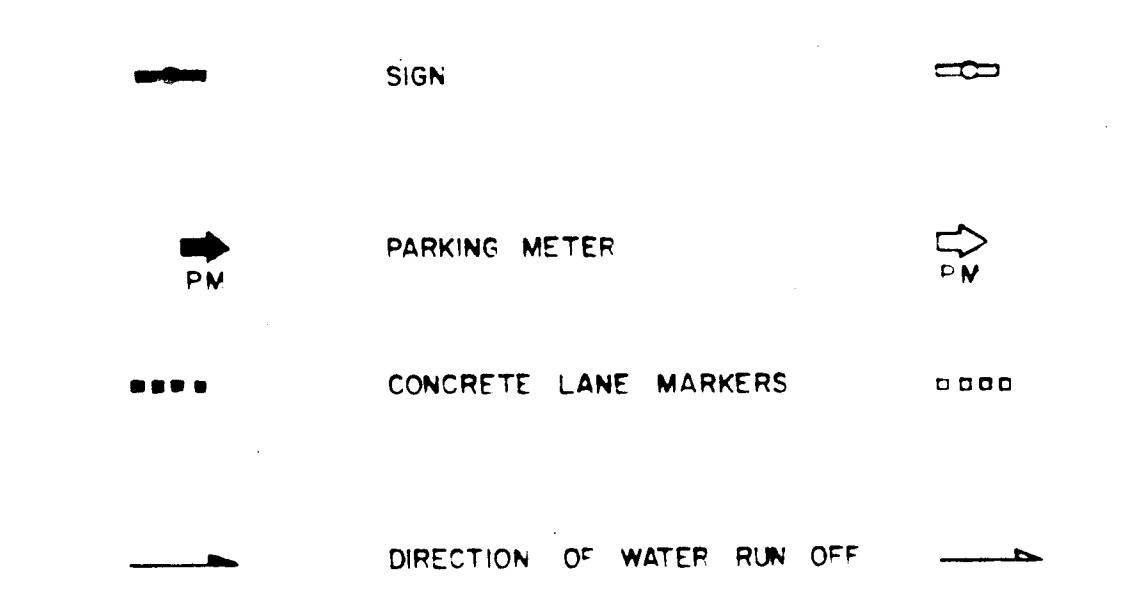
EXISTING PROPOSED



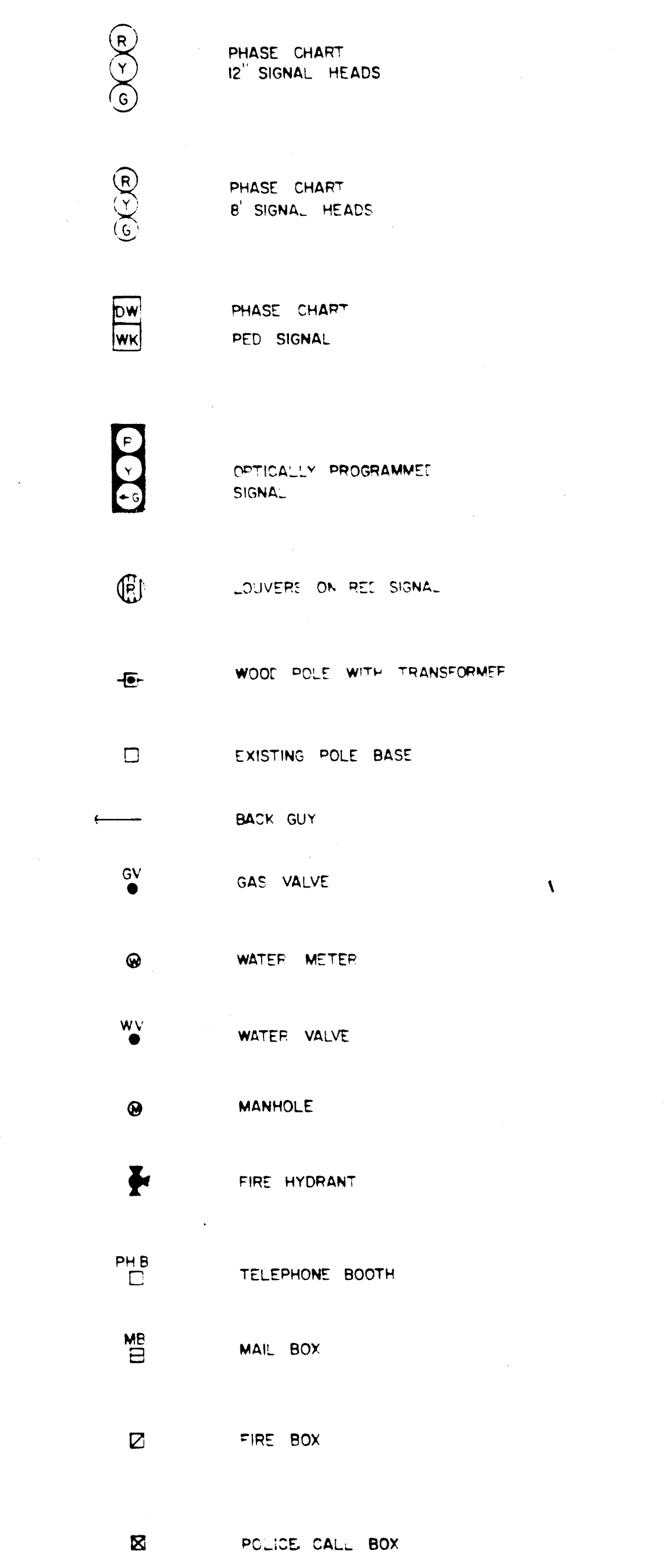
EXISTING PROPOSED



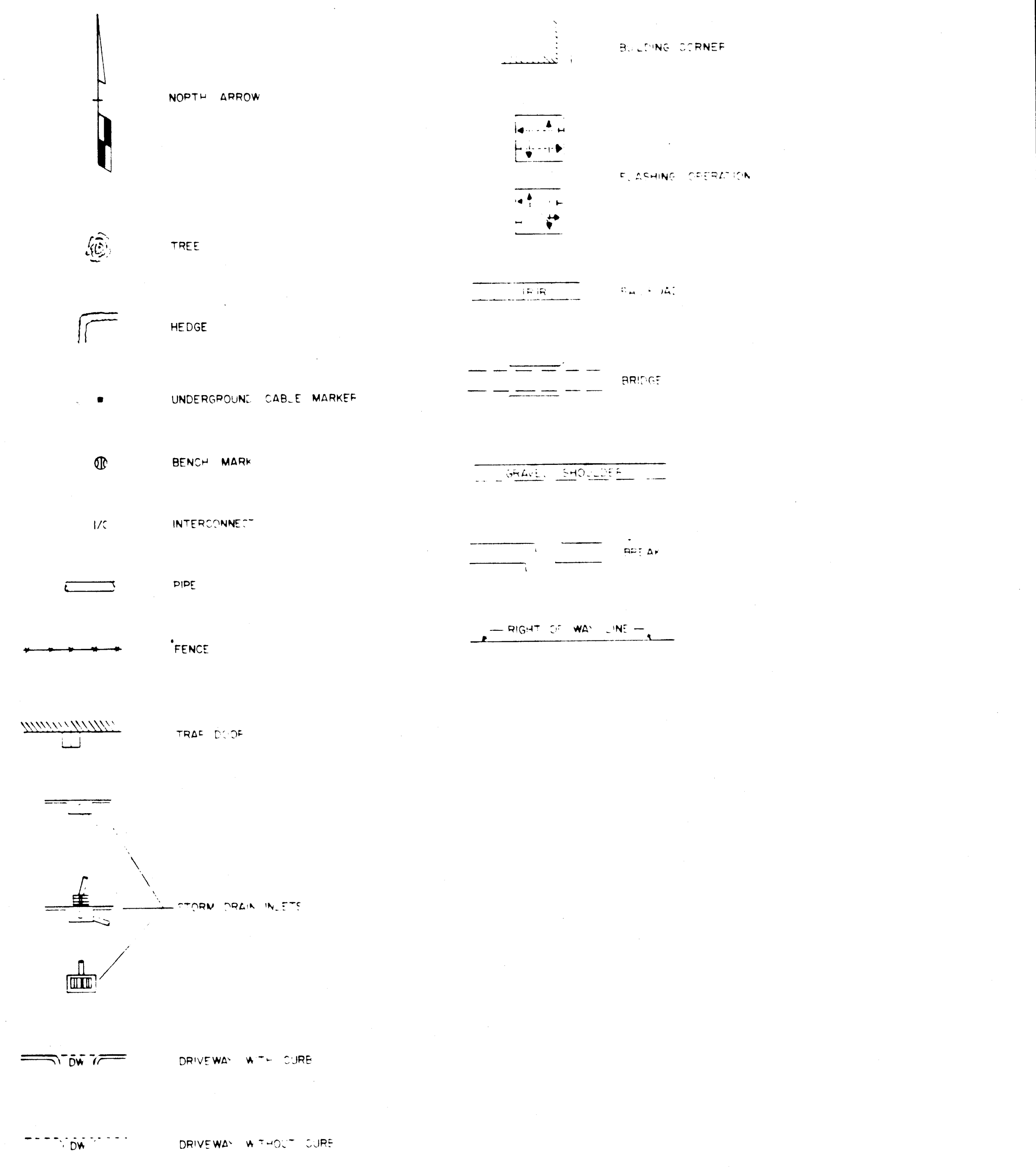
EXISTING PROPOSED



DESIGN STANDARD SYMBOLS

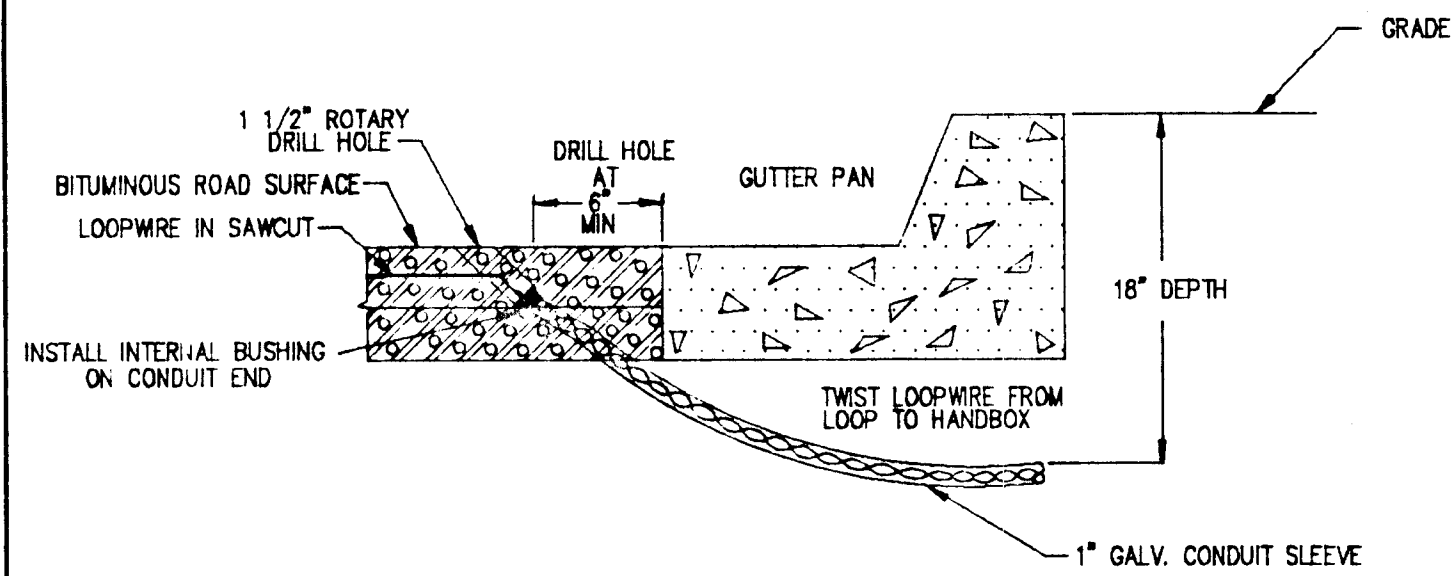


DESIGN STANDARD SYMBOLS



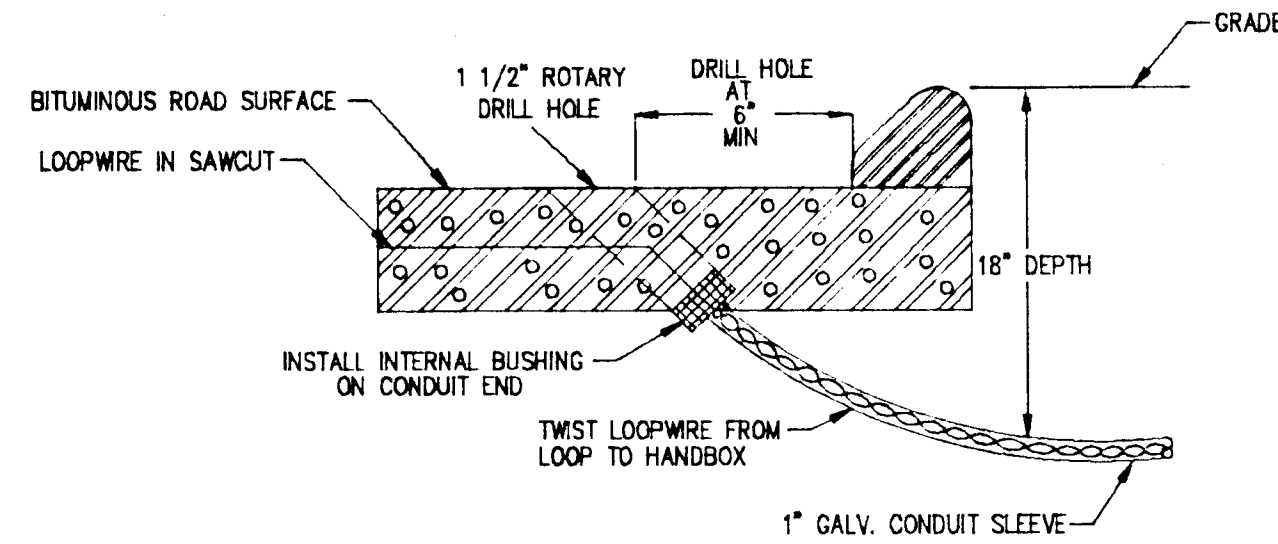
APPROVAL CHIEF SIGNAL DESIGN SECTION	RE-DRAWN	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION BUREAU OF TRAFFIC ENGINEERING OFFICE OF TRAFFIC SYMBOL SHEET SCALE: _____ CONTRACT NO. BW-405-802-712 DRAWN BY M. SCHNEIDER COUNTY _____ DESIGNED BY _____ SIGNAL NO. _____ CHECKED BY _____ DRAWING NO. TS-525L
APPROVAL DISTRICT TRAFFIC ENGINEER	RE-DRAWN	
APPROVAL CHIEF BUREAU OF TRAFFIC ENGINEERING	RE-DRAWN	
APPROVAL DEPUTY CHIEF ENGINEER OFFICE OF TRAFFIC	A 8-2-79 REVISED TO INCLUDE UPDATED SYMBOLS NPW	

TYPE 'A' CURB AND GUTTER DETAIL



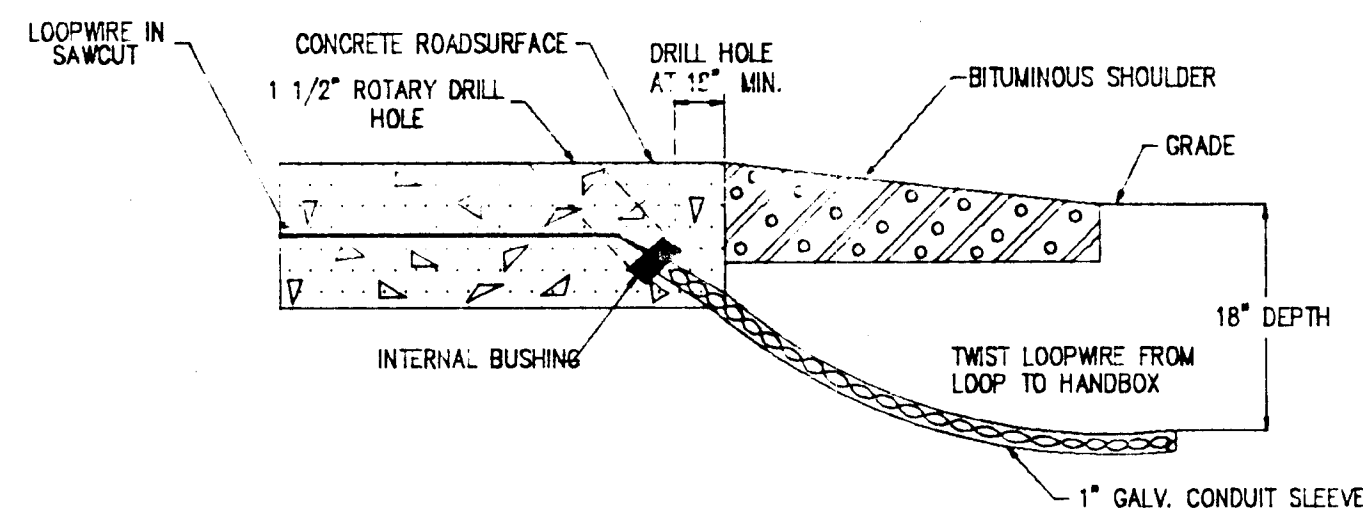
NOTE: INSTALL DUCT SEAL IN CONDUIT END FROM ROAD/SHOULDER SURFACE

TYPE 'B' CURB - DETAIL



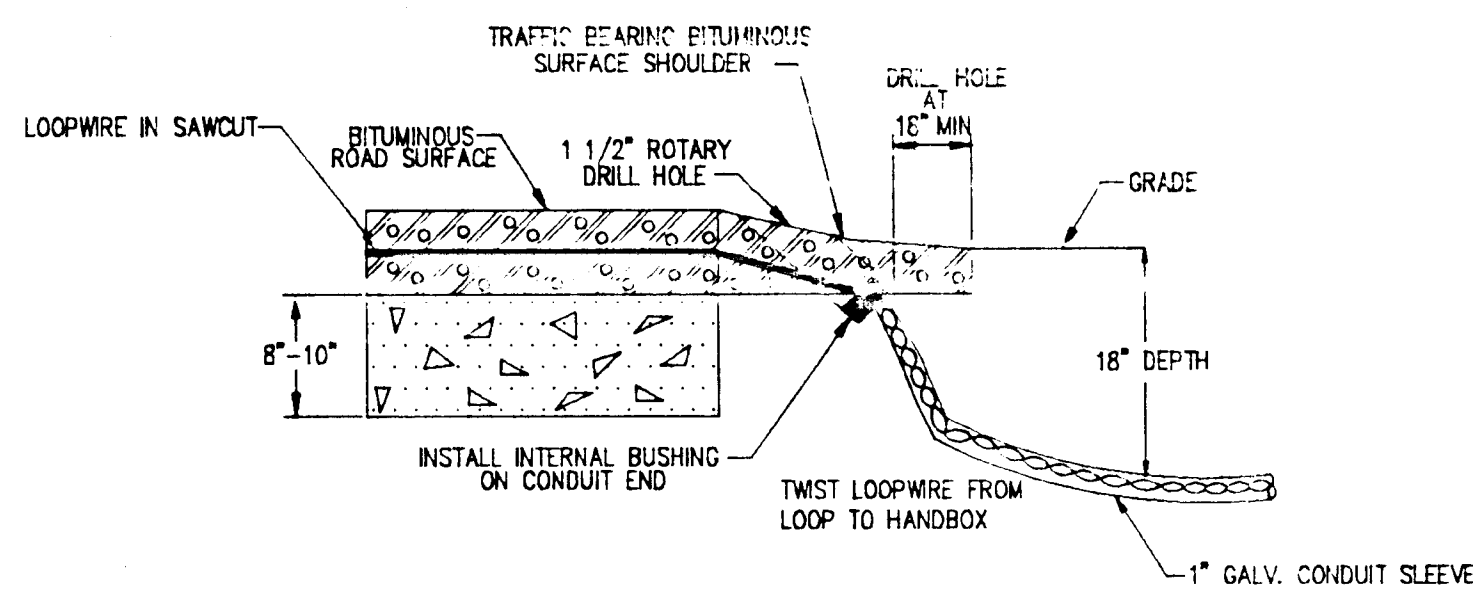
NOTE: INSTALL DUCT SEAL IN CONDUIT END FROM ROAD/SHOULDER SURFACE

CONCRETE ROAD SURFACE WITH BITUMINOUS DETAIL



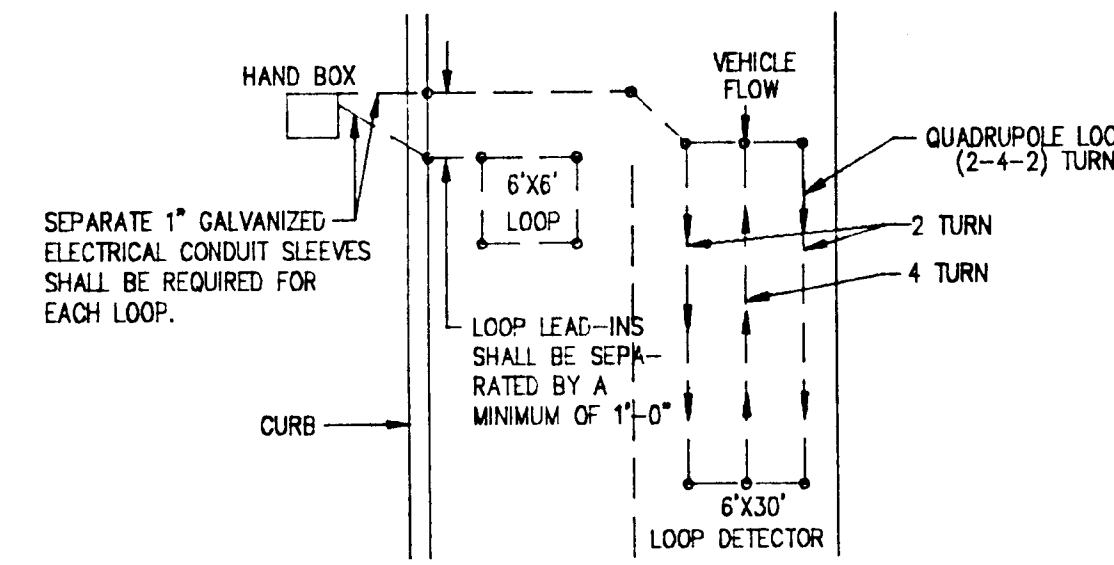
NOTE: INSTALL DUCT SEAL IN CONDUIT END FROM ROAD/SHOULDER SURFACE

BITUMINOUS ROAD SURFACE AND SHOULDER DETAIL



NOTE: INSTALL DUCT SEAL IN CONDUIT END FROM ROAD/SHOULDER SURFACE

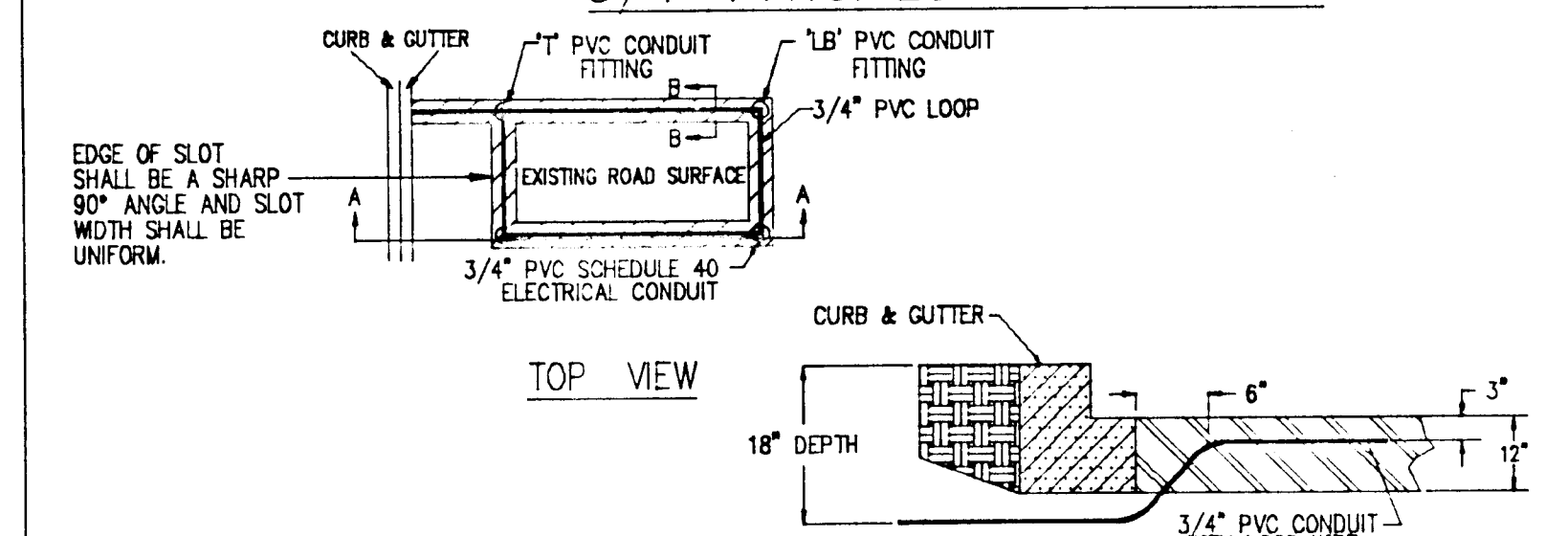
LOOP PLACEMENT



NOTES:

1. WHEN A PROPOSED LOOP CROSSES A ROADWAY JOINT, THE LOOP SHALL BE PLACED IN TWO SECTIONS.
2. THE LOOPS ARE TO BE PLACED IN THE CENTER OF THE LANE UNLESS OTHERWISE NOTED ON PLANS.
3. PRESENCE LOOP DETECTORS ARE TO BE PLACED 12" TO 18" BEHIND THE EXISTING OR PROPOSED STOP LINE.
4. SAW CUTTING OF GUTTER PANS IS NOT ALLOWED. (SEE STANDARD NO. 1)
5. SAW CUT AT LEAD-INS SHALL BE 5/8" WIDE AND SAW CUT FOR LOOP DETECTORS SHALL BE 3/8" WIDE.

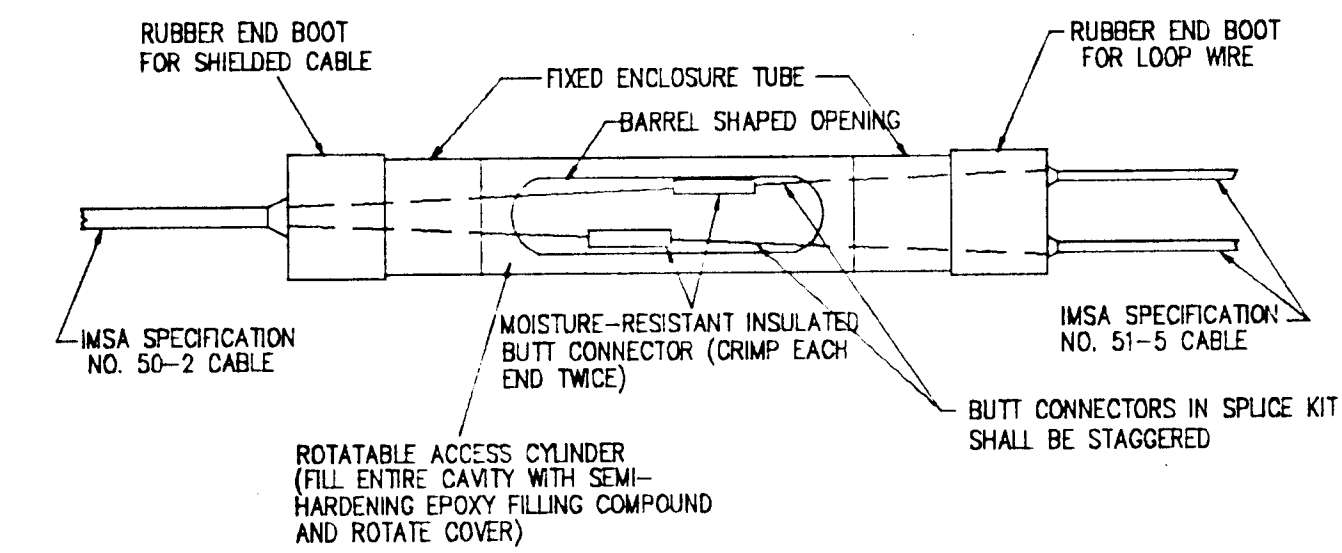
3/4" P.V.C. LOOP PLACEMENT



NOTES:

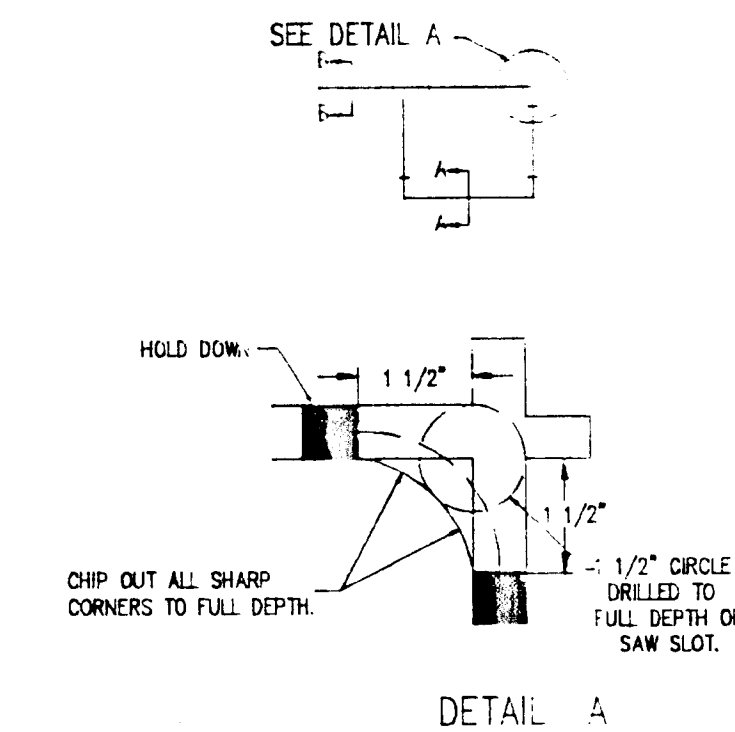
1. FILL ENTIRE SLOT WITH CONCRETE MIX #6 WITH HIGH EARLY STRENGTH ADDITIVE IF EXISTING ROAD SURFACE IS CONCRETE.
2. IF EXISTING ROAD SURFACE IS BITUMINOUS CONCRETE, FILL SLOT WITH CONCRETE MIX #6 TO WITHIN 1 1/2" OF ROAD SURFACE THEN FILL REMAINING SLOT WITH TEMPORARY COLD PATCH BITUMINOUS CONCRETE UNTIL CONCRETE HAS CURED. THEN PLACE ANT. STRIP COMPOUND AND 1 1/2" HOT MIX SF CAP TO ROAD GRADE AFTER REMOVAL OF TEMPORARY COLD PATCH.
3. FROM LOOP DETECTOR TO ROAD EDGE SHALL BE FULLY EXCAVATED WITH SLOT.

LOOP DETECTOR WIRE/SHIELDED CABLE SPLICE KIT



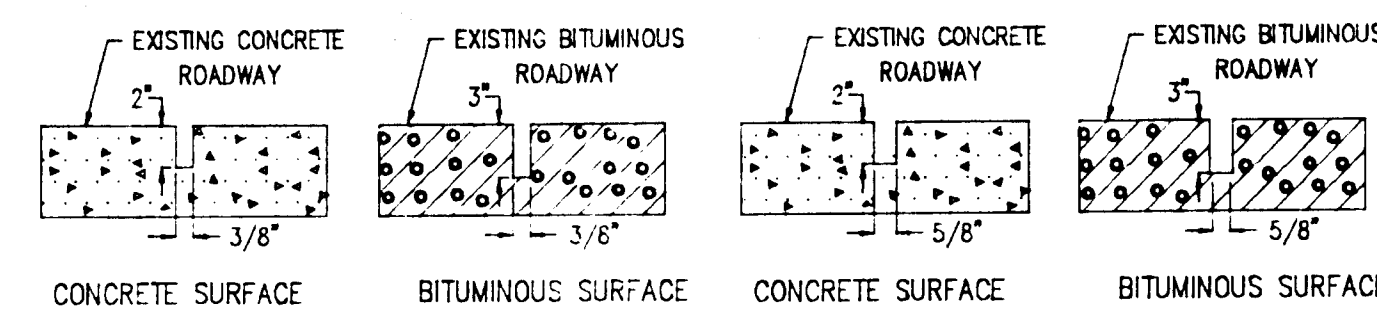
- NOTES:
1. ENCLOSURE TO BE 3M TYPE 3832 WITH 3M TYPE 4403-B SEMI-HARDENING EPOXY FILLING COMPOUND OR EQUIVALENT.
 2. INSULATED BUTT CONNECTORS TO BE 3M TYPE MNG148CM-SEALANT FILLED TYPE WITH INSULATION GRIP.

SAWCUT DETAIL

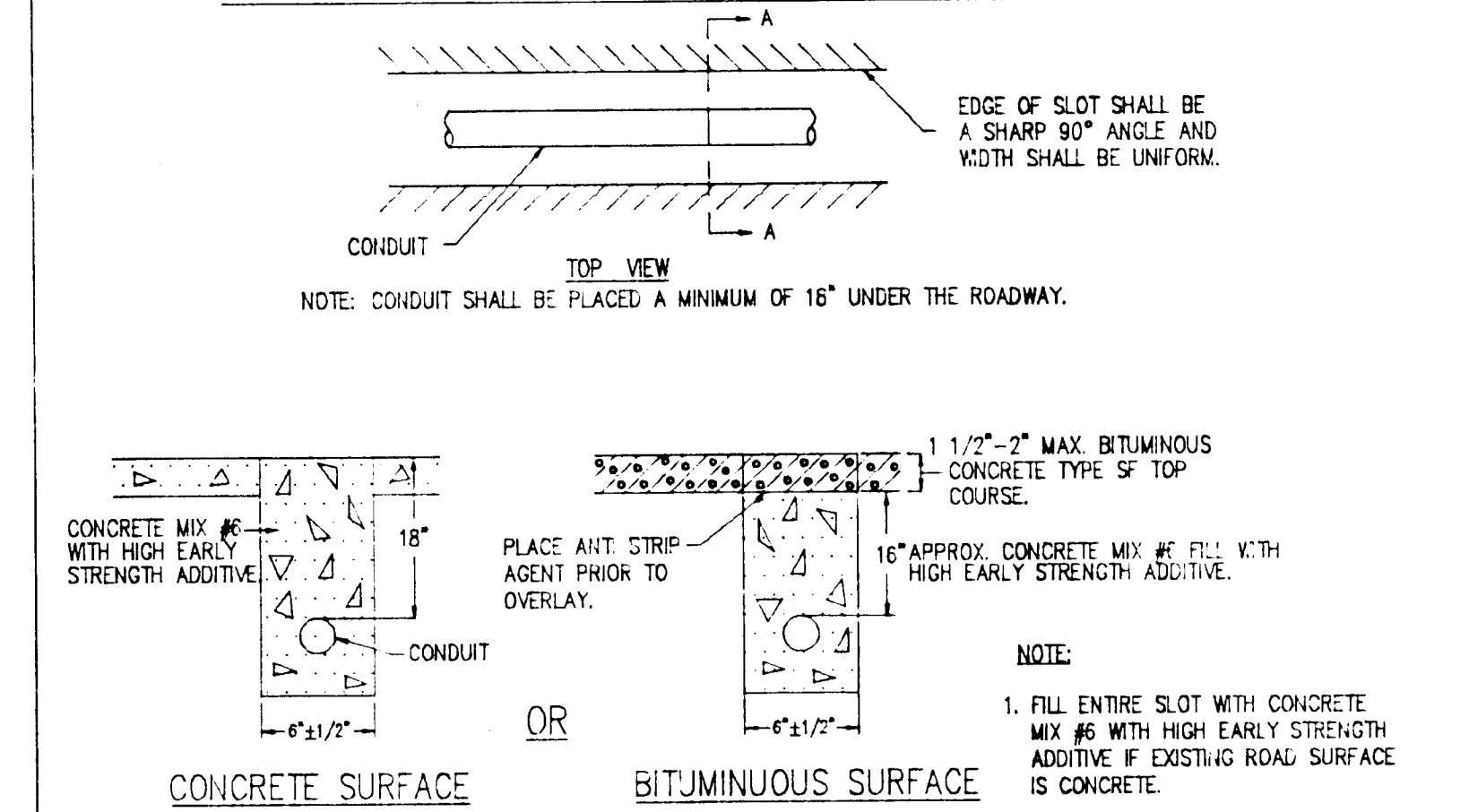


NOTES:

1. PLACE THE LOOPWIRE NEAR THE CENTER OF THE SLOT TO ALLOW THE SEALANT TO FLOW ON BOTH SIDES OF THE WIRE.
2. BACKEROD OR WEDGES SHALL BE PLACED AT 3" INTERVALS TO HOLD LOOPWIRE IN SAWCUT PRIOR TO SEALING.
3. THERE SHALL BE NO SPLICING ALLOWED EXCEPT IN HANDBOX.
4. NUMBER OF TURNS IS SPECIFIED IN SPECIAL PROVISION.
5. ALL ROTARY DRILL HOLES TO BE DONE PRIOR TO SAWCUTTING.
6. ENTIRE SLOT SHALL BE FILLED WITH LOOP SEALANT.
7. ALL WIRING FROM LOOP TO HANDBOX SHALL BE TWISTED.



GALVANIZED CONDUIT IN SLOTTED PAVEMENT



NOTE:

1. FILL ENTIRE SLOT WITH CONCRETE MIX #6 WITH HIGH EARLY STRENGTH ADDITIVE IF EXISTING ROAD SURFACE IS CONCRETE.
2. IF EXISTING ROAD SURFACE IS BITUMINOUS CONCRETE, FILL SLOT WITH CONCRETE MIX #6 TO WITHIN 1 1/2" OF ROAD SURFACE; THEN FILL REMAINING SLOT WITH TEMPORARY COLD PATCH BITUMINOUS CONCRETE UNTIL CONCRETE HAS CURED. UPON CONCRETE CURING REMOVE TEMPORARY COLD PATCH AND PLACE ANT. STRIP COMPOUND AND 1 1/2" HOT MIX SF CAP TO ROAD GRADE.

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LOOP DETECTOR LEAD-IN INSTALLATION

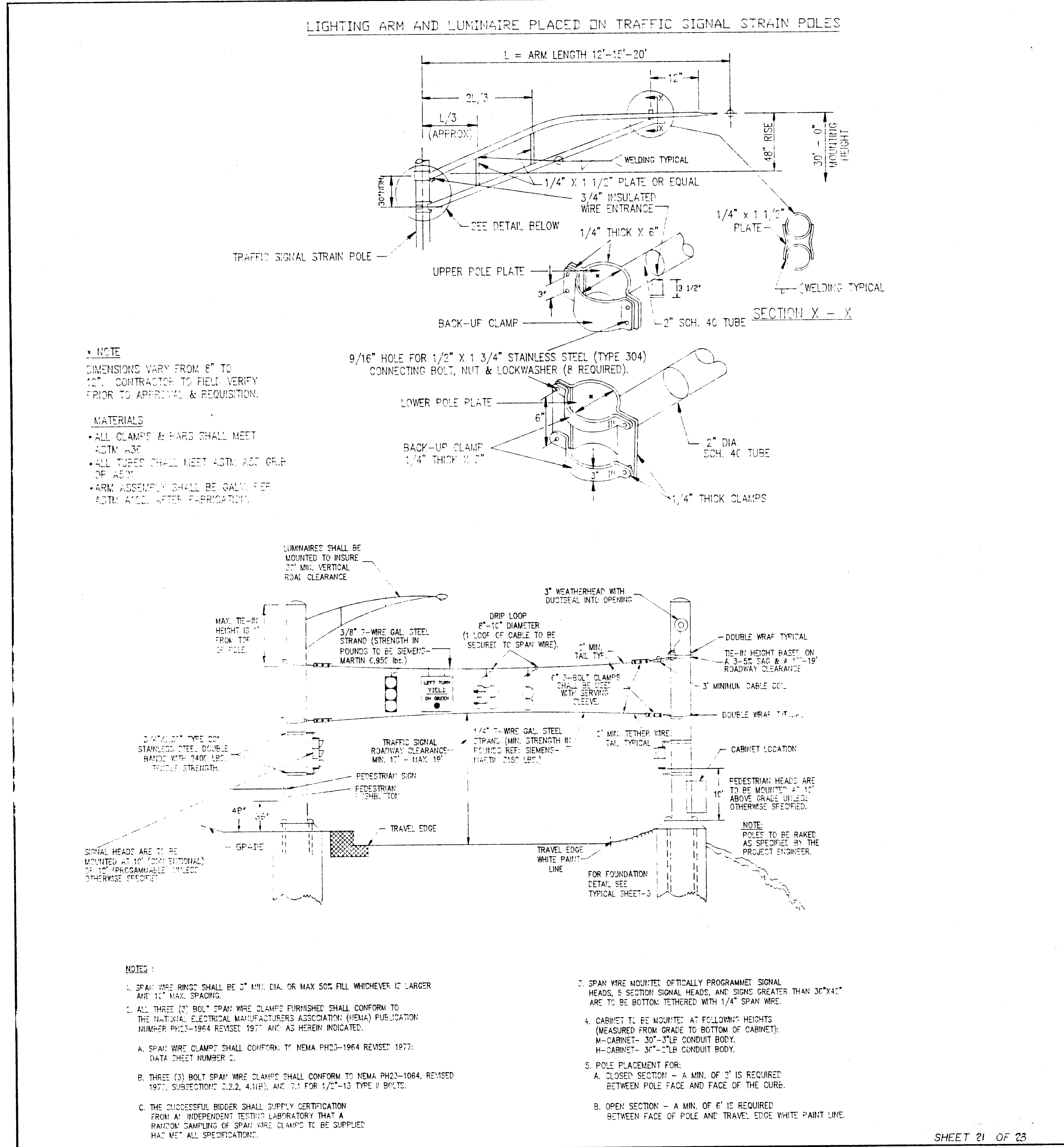
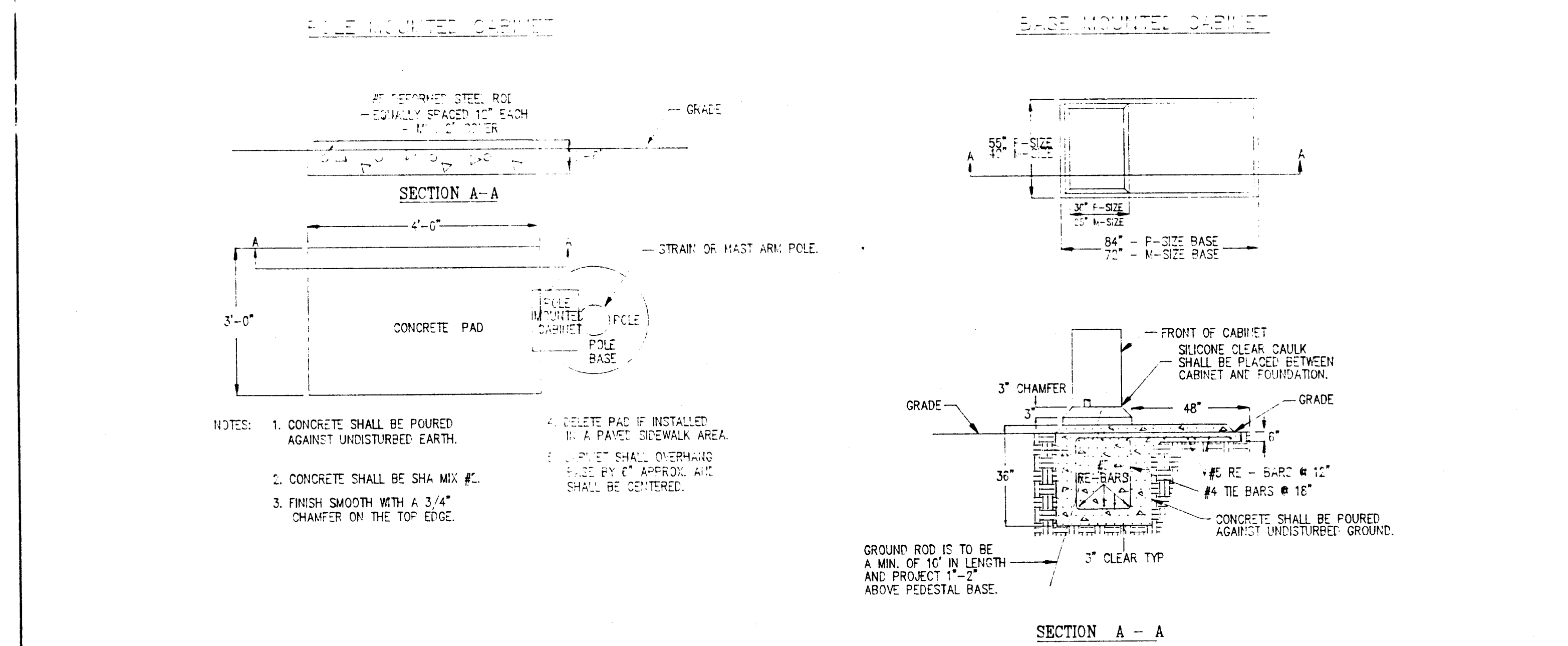
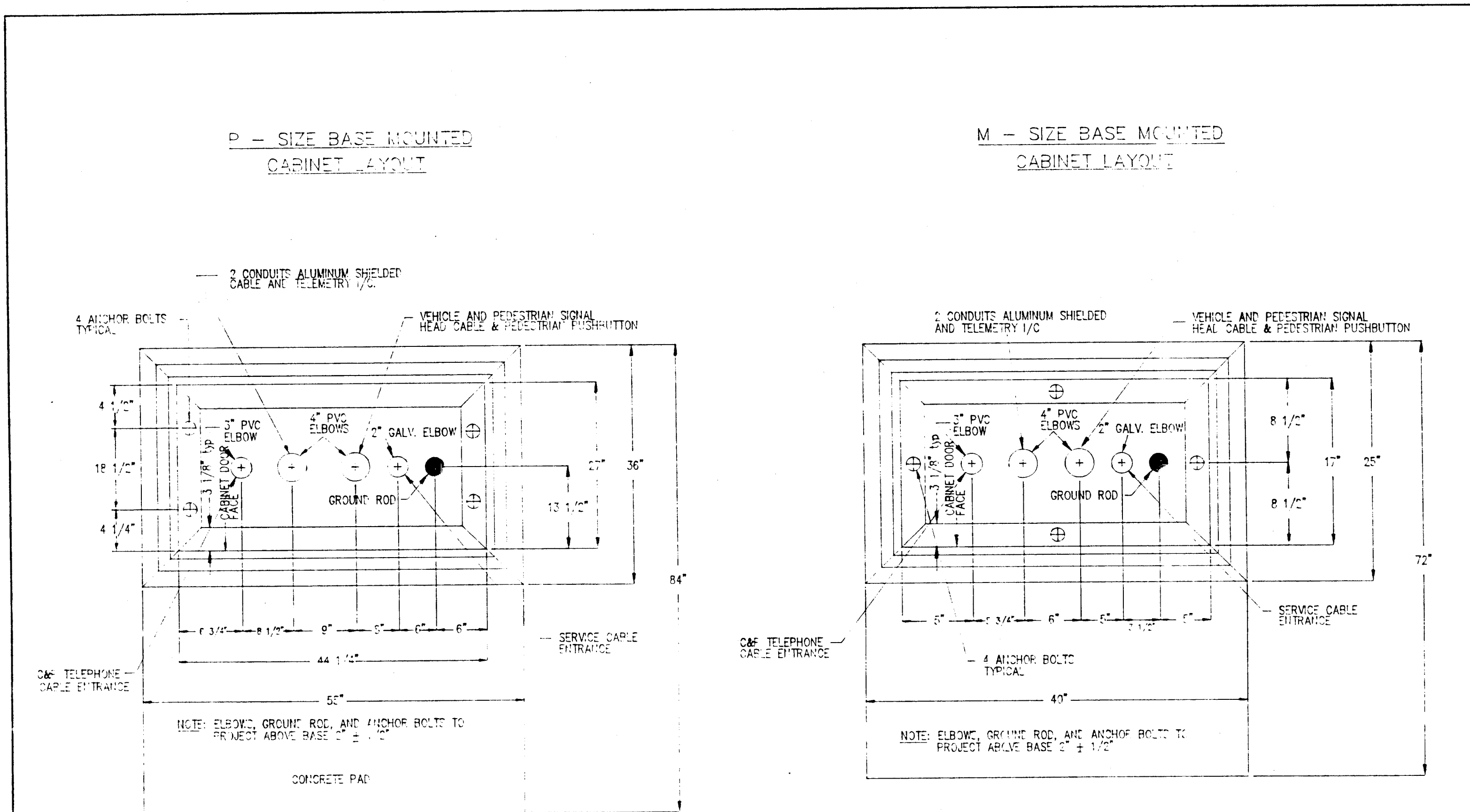
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LOOP PLACEMENT

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BASE/POLE MOUNTED CABINET

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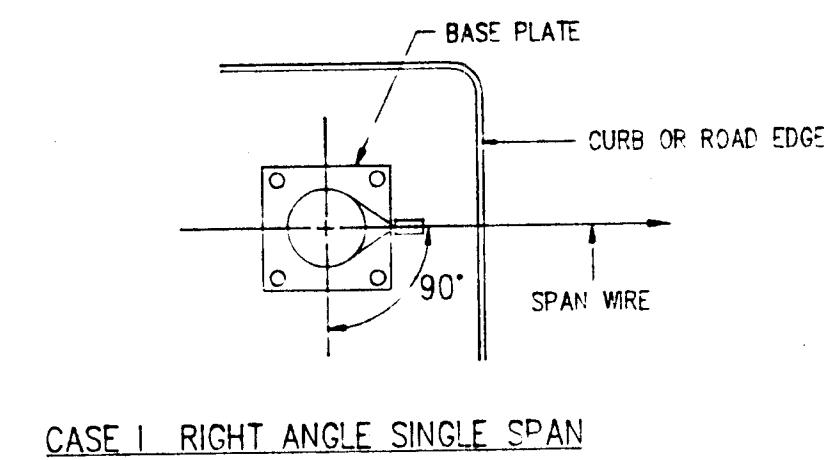
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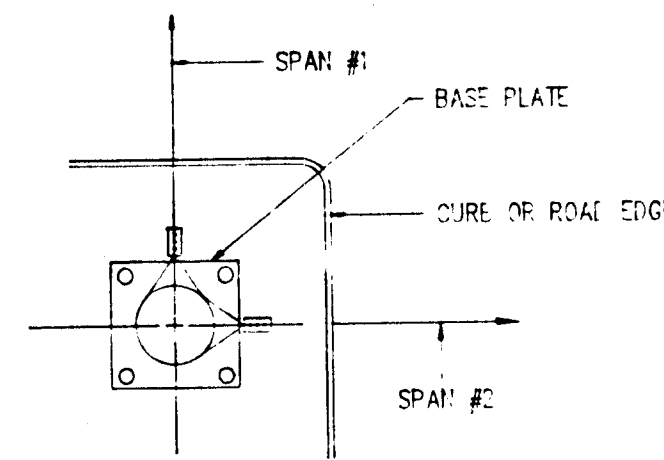
PLACEMENT OF STRAIN POLE AND INCIDENTAL HARDWARE

Section: SIGNAL DESIGN Date: 8/09 Std no: 4

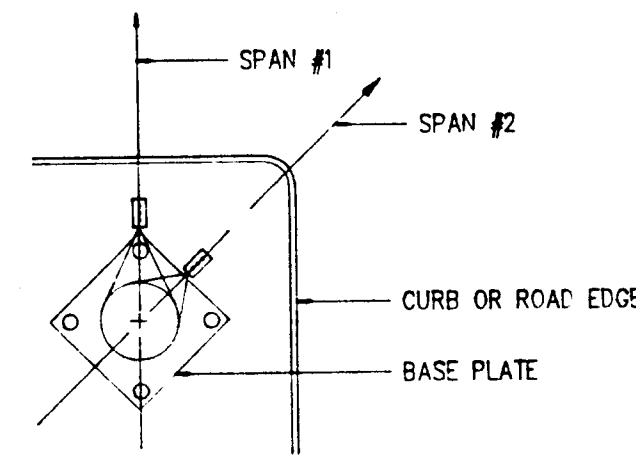
ORIENTATION OF STRAIN POLE
WITH RESPECT TO SPAN WIRE ATTACHMENT(S)



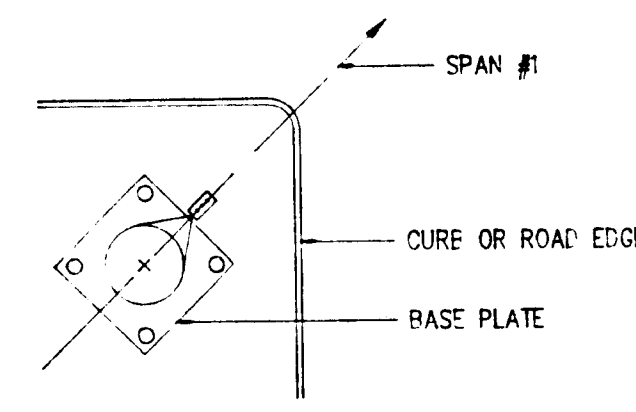
CASE I RIGHT ANGLE SINGLE SPAN



CASE II BOX SPAN OR STANDARD SPAN

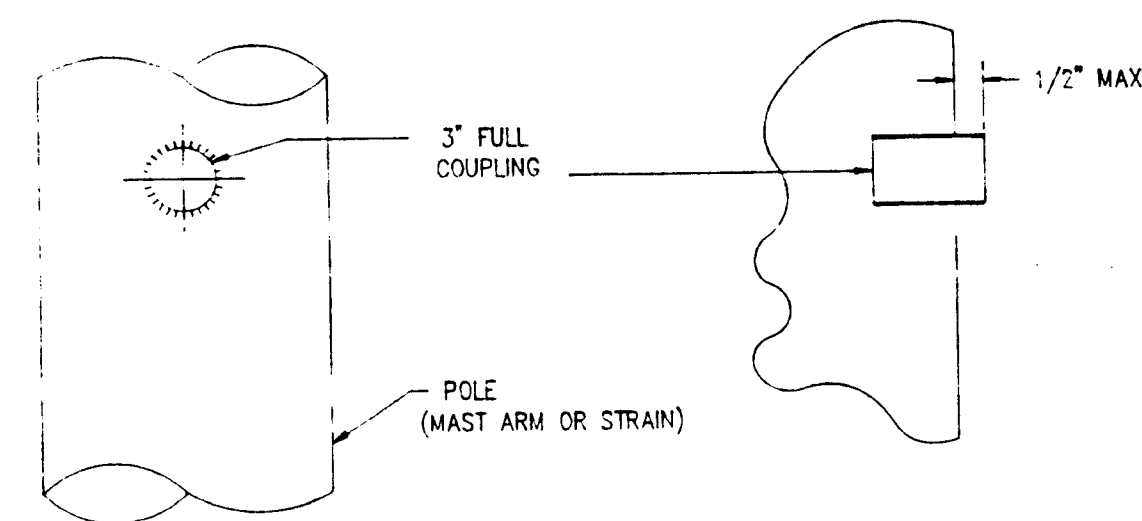


CASE III MODIFIED 'Z' DOUBLE SPAN



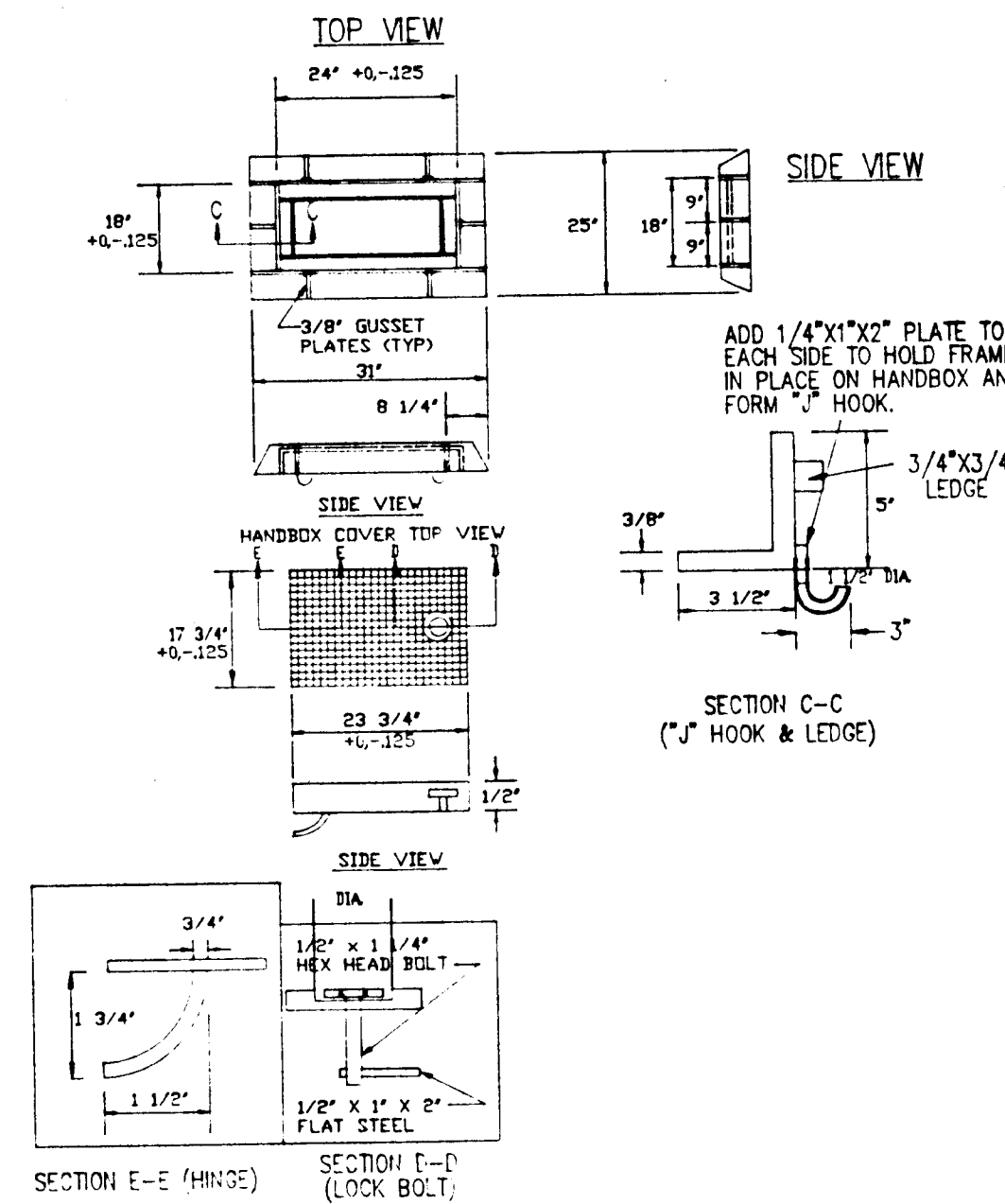
CASE IV DIAGONAL SINGLE SPAN

FIELD DRILLED POLE/ARM DETAIL

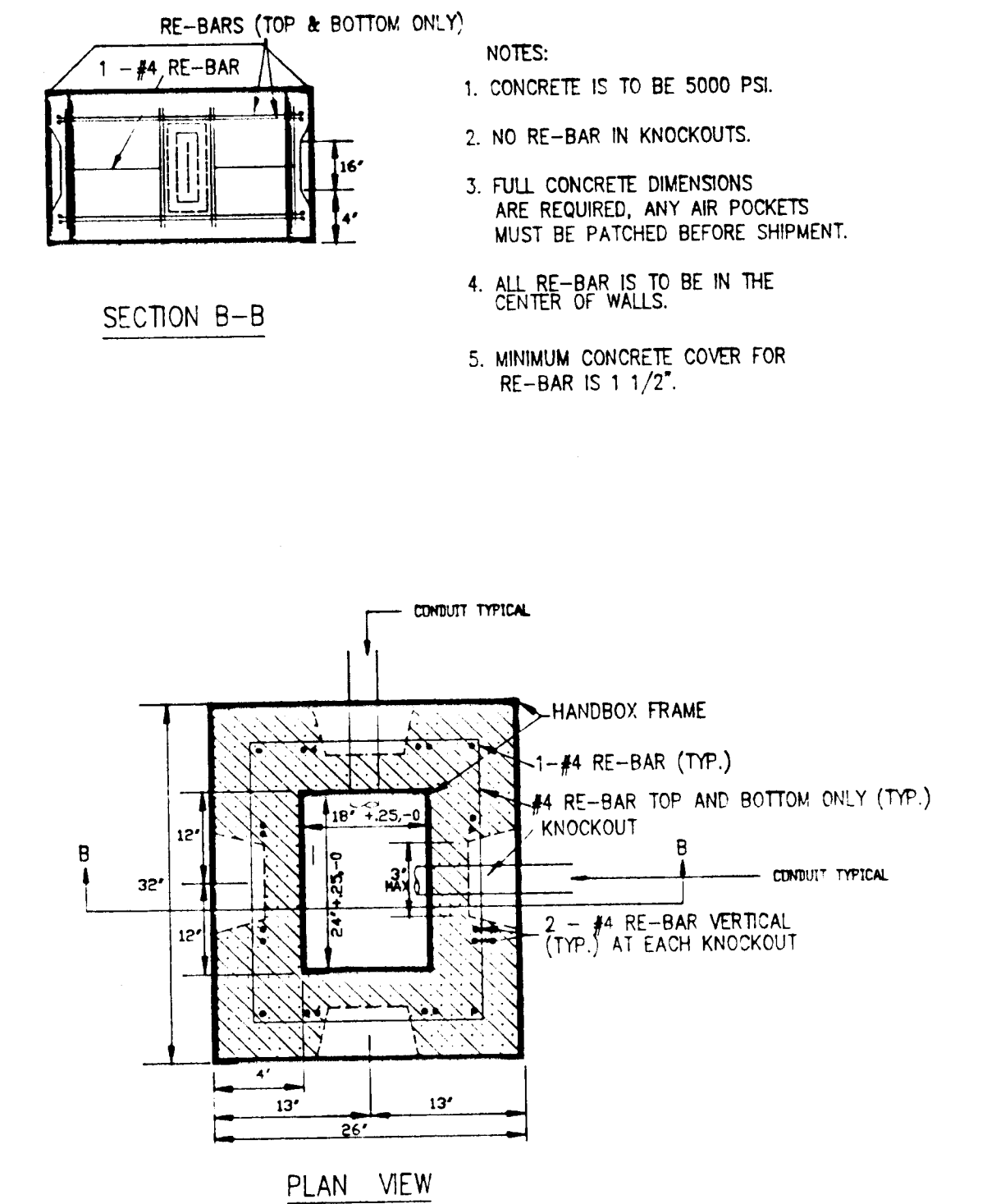


- NOTES:
1. DRILL HOLE IN THE POLE TO FIT STANDARD PIPE COUPLING. FIELD WELD COUPLING TO MEET AWS WELDING SPECIFICATIONS.
 2. WELDING TO BE PERFORMED BY A CERTIFIED WELDER.
 3. ALL WELDING SHALL BE INSPECTED AND APPROVED BY SHA LAB PERSONNEL.
 4. THE AFFECTED AREA SHALL BE CLEANED WITH METAL WIRE BRUSH AND SPRAYED WITH COLD GALVANIZED COMPOUND.
 5. A HOLE MAY BE DRILLED WITHOUT WELDING A BLIND COUPLING FOR 3/4" THRU 1 1/2" SIZE, PROVIDED THERE IS NO OTHER HOLE WITHIN 12". AFTER DRILLING THE HOLE FOLLOW NOTE #4.
 6. 3" FULL COUPLING SHALL HAVE INSIDE CHASE NIPPLE.
 7. FOR COUPLING DETAILS SEE SPECIFICATIONS (SP-31A, SP-31B) FOR MASTARM.

HANDBOX FRAME AND COVER

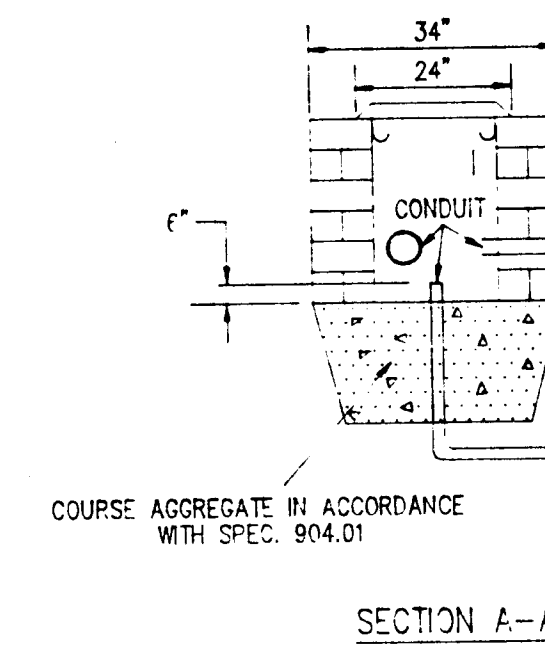


STANDARD PRECAST HANDBOX

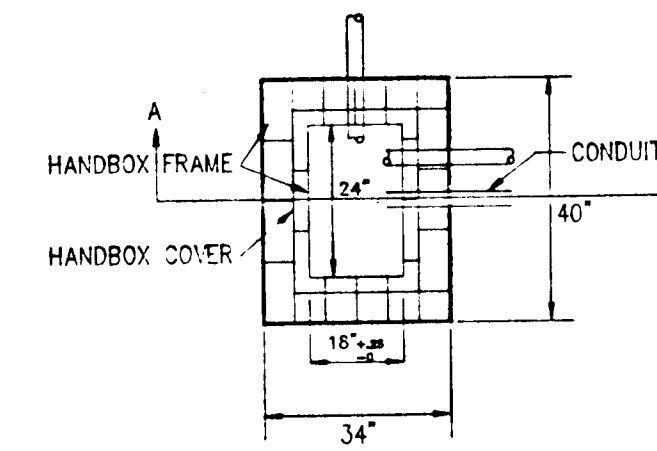


- NOTES:
1. CONCRETE IS TO BE 5000 PSI.
 2. NO RE-BAR IN KNOCKOUTS.
 3. FULL CONCRETE DIMENSIONS ARE REQUIRED, ANY AIR POCKETS MUST BE PATCHED BEFORE SHIPMENT.
 4. ALL RE-BAR IS TO BE IN THE CENTER OF WALLS.
 5. MINIMUM CONCRETE COVER FOR RE-BAR IS 1 1/2".

ALTERNATE HANDBOX CONSTRUCTION



SECTION A-A



PLAN VIEW

NOTES ON HANDBOX CONSTRUCTION

1. ANY SPACES BETWEEN THE CONDUIT AND THE HANDBOX WALL SHALL BE PATCHED WITH MORTAR AS APPROVED BY THE ENGINEER.
2. ALL METAL CONDUIT ENDS SHALL BE BONDED WITH OTHER CONDUIT ENDS USING BONDING BUSHINGS AND NO. 8 AWG SOLID BORE COPPER WIRE.
3. ALL ELECTRICAL CABLES ARE REQUIRED TO HAVE 3" MIN. SLACK IN HANDBOX. THIS WIRE IS TO BE SECURED IN THE HANDBOX OR IT DOES NOT LIE ON THE BOTTOM OF THE HANDBOX.
4. ALL LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES IN THE HANDBOX SHALL BE IN ACCORDANCE WITH THE STANDARD SHOWN ON STANDARD NO. 2.
5. WHEN ALL CONDUIT AND ELECTRICAL WIRE IS IN PLACE, THE END OF THE CONDUIT SHALL BE SEALED WITH DUCT SEALER OR OTHER PLIABLE MATERIAL AS APPROVED BY THE ENGINEER.
6. ALTERNATE HAND BUILT BRICK HANDBOX SHALL BE USED FOR CONDUIT SIZES LARGER THAN 3" AS DIRECTED BY THE ENGINEER.
7. HANDBOX FRAME & COVER SHALL BE GALVANIZED PER ASTM A-123 & A-153.
8. HANDBOX TO BE INSTALLED AT FINAL GRADE.
9. HANDBOX FRAME TO BE PLACED INTO MORTAR BED ON HANDBOX TOP AND PARGED.
10. ALL CONDUITS ENTERING FROM HANDBOX SUMP INTO HANDBOX SHALL PROJECT 6" ABOVE SUMP TOP.
11. ALL CONDUIT ENTERING FROM HANDBOX SIDE WALL SHALL PROJECT 2" MAX.

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ORIENTATION OF STRAIN POLE &
FIELD DRILLED POLE/ARM DETAIL

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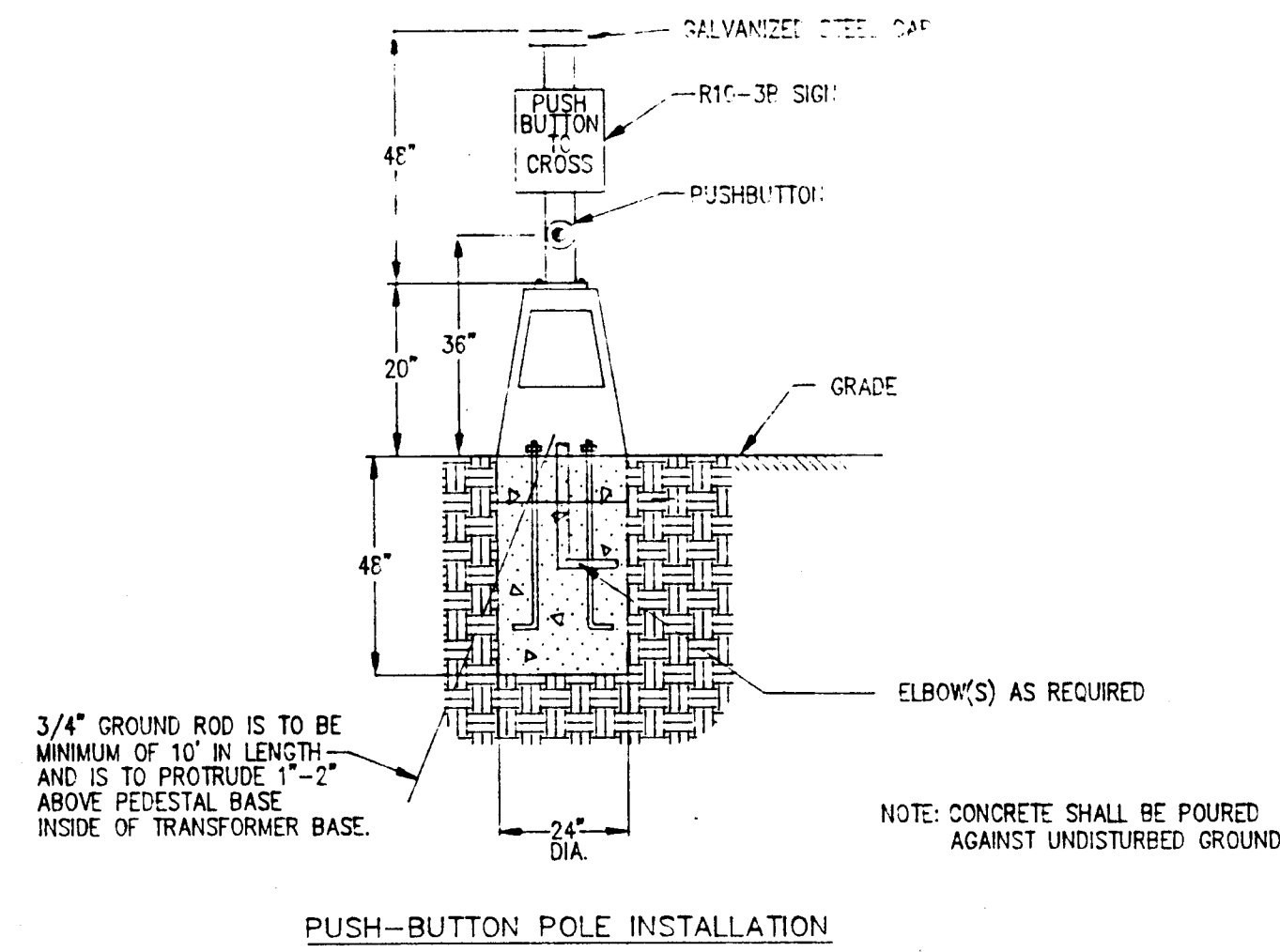
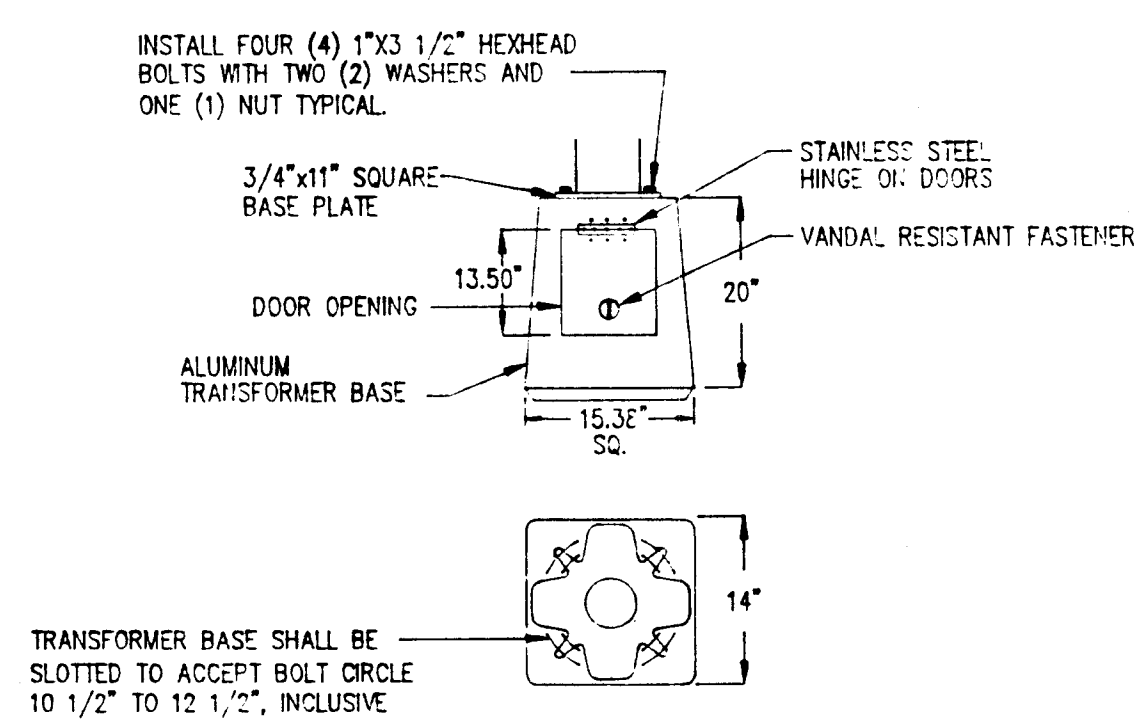
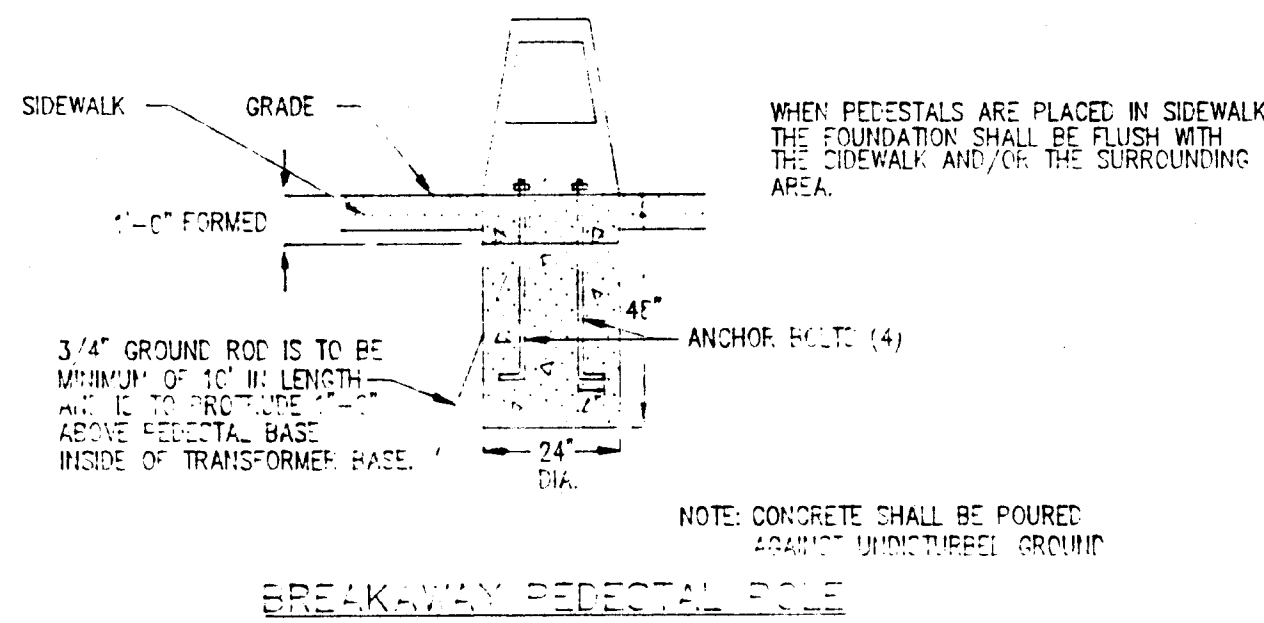
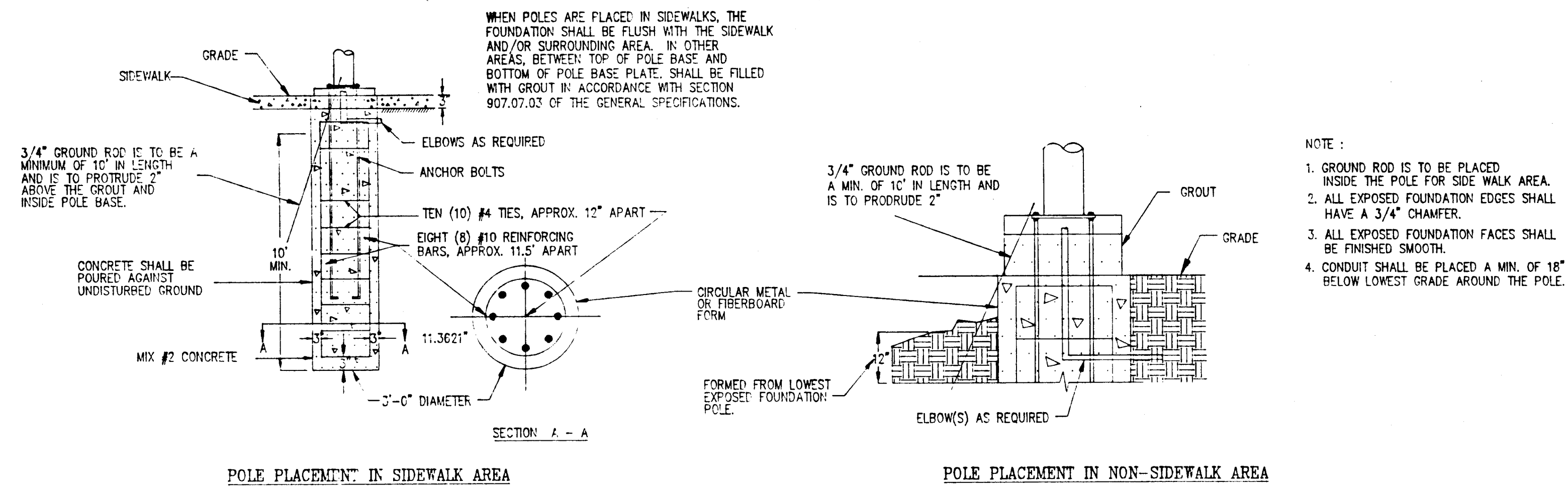
STANDARD PRECAST HANDBOX

BW-405-802-712

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FOUNDATIONS

FOUNDATIONS FOR STRAIN POLE AND MAST ARM POLE



CONSTRUCTION DETAILS

- Install handbox.
- Install 6' x 30' loop detector encased in 1/4" flexible tubing, quadrupole type (2-4-2).
- Install 6' x 6' loop detector encased in 1/4" flexible tubing (3 turns).
- Install 1" galvanized steel electrical conduit for detector wire.
- Install 2" polyvinyl chloride electrical conduit - trenched.
- Install 3" galvanized steel electrical conduit - slotted.
- Use existing handbox, pull back existing loop wire and re-wire existing loop wire through new conduit run.
- Remove existing handbox.
- Cap and abandon existing conduit.
- Use existing conduit.
- Use existing handbox.
- Use existing steel strain pole.
- Use existing controller and cabinet. Install two (2) two-channel loop detector amplifiers with time delay output in the cabinet. The existing phasing will be changed by the Maryland State Highway Administration as described in the project description.
- Use existing span wire, remove existing 3-section signal head, relocate existing signal head and install signal heads and signs as shown. Maintain proper clearances when installing 4-section head.
- Use existing span wire, remove existing R10-12 sign, relocate existing signal head, and install signal heads as shown. Maintain proper clearances when installing 4-section head.
- Use existing steel span wire.
- Use existing power feed.
- Install 2" galvanized steel electrical conduit - pushed.
- Install preformed pavement markings - white 24" wide stop line.
- Remove existing stop line.
- Install preformed pavement marking - white 24" wide stop line over existing stop line.

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FOUNDATIONS

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