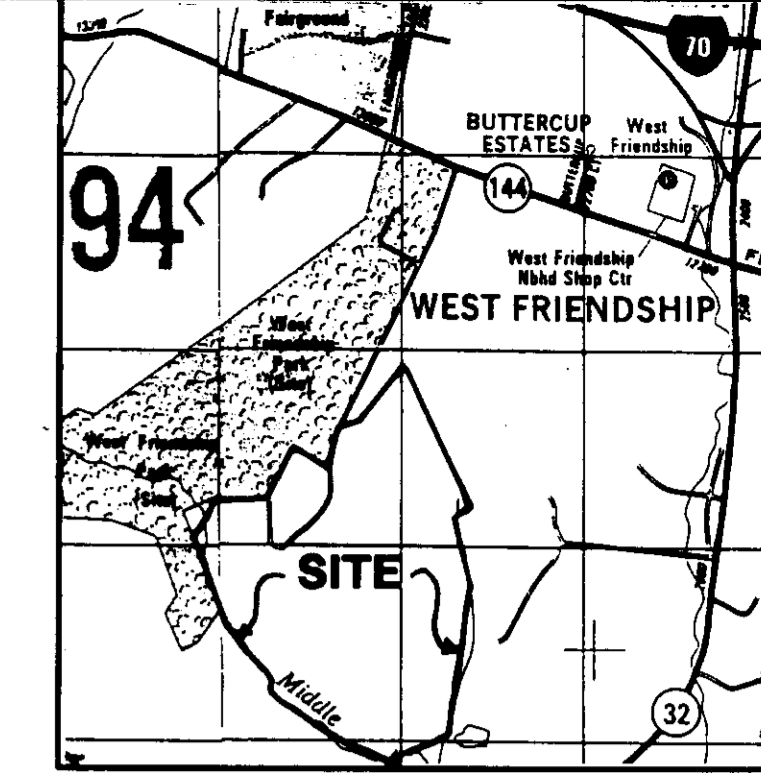


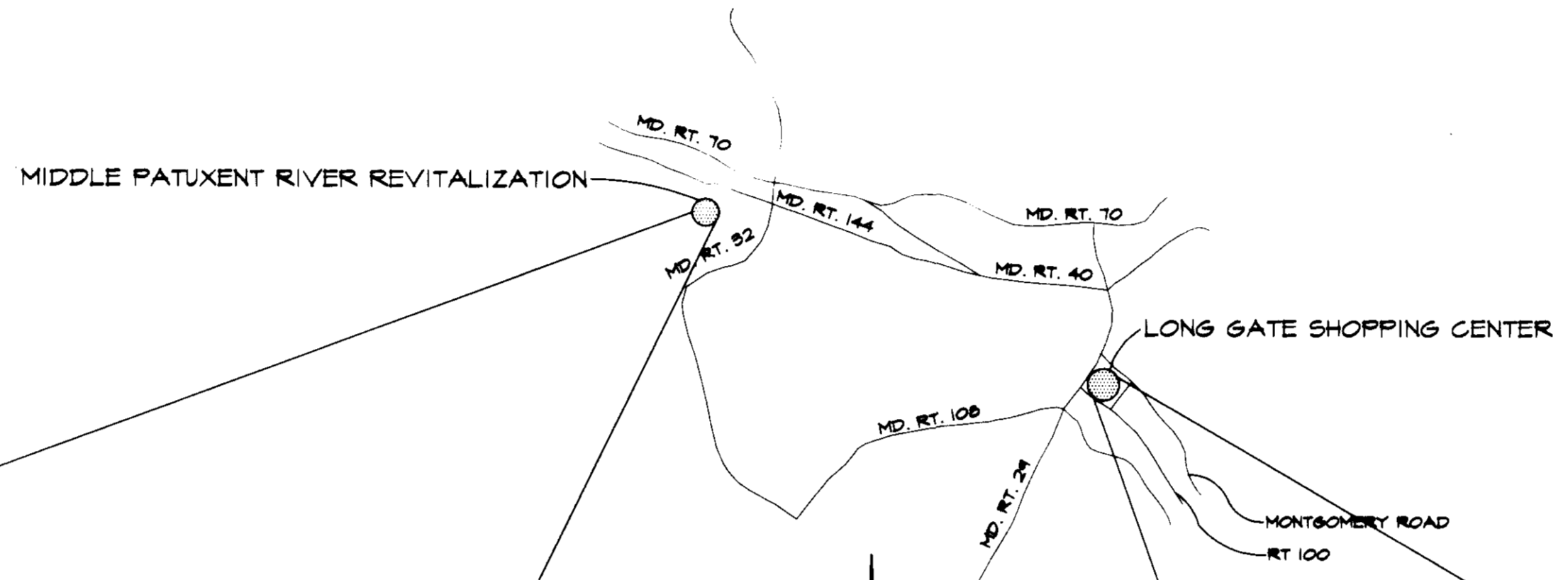
MIDDLE PATUXENT RIVER REVITALIZATION PHASE 2 WETLAND MITIGATION PROGRAM FOR LONG GATE SHOPPING CENTER



VICINITY MAP
SCALE: 1" = 2000'
* COPYRIGHT ADC THE MAP PEOPLE
PERMITTED USE NO. 2084225

LEGEND

- EXISTING TREELINE
- PROPOSED TREELINE
- FOREST CONSERVATION LIMIT
- WETLAND 25' BUFFER
- STREAM 75' BUFFER
- LIMIT OF 100 YR. FLOODPLAIN
- SOILS
- GROUNDWATER MONITORING WELL
- LIMIT OF DISTURBANCE
- SILT FENCE
- SUPER SILT FENCE
- TREE PROTECTION / CONSTRUCTION FENCE
- EARTH DIKE
- MOUNTABLE BERM
- TEMP. SEDIMENT TRAP



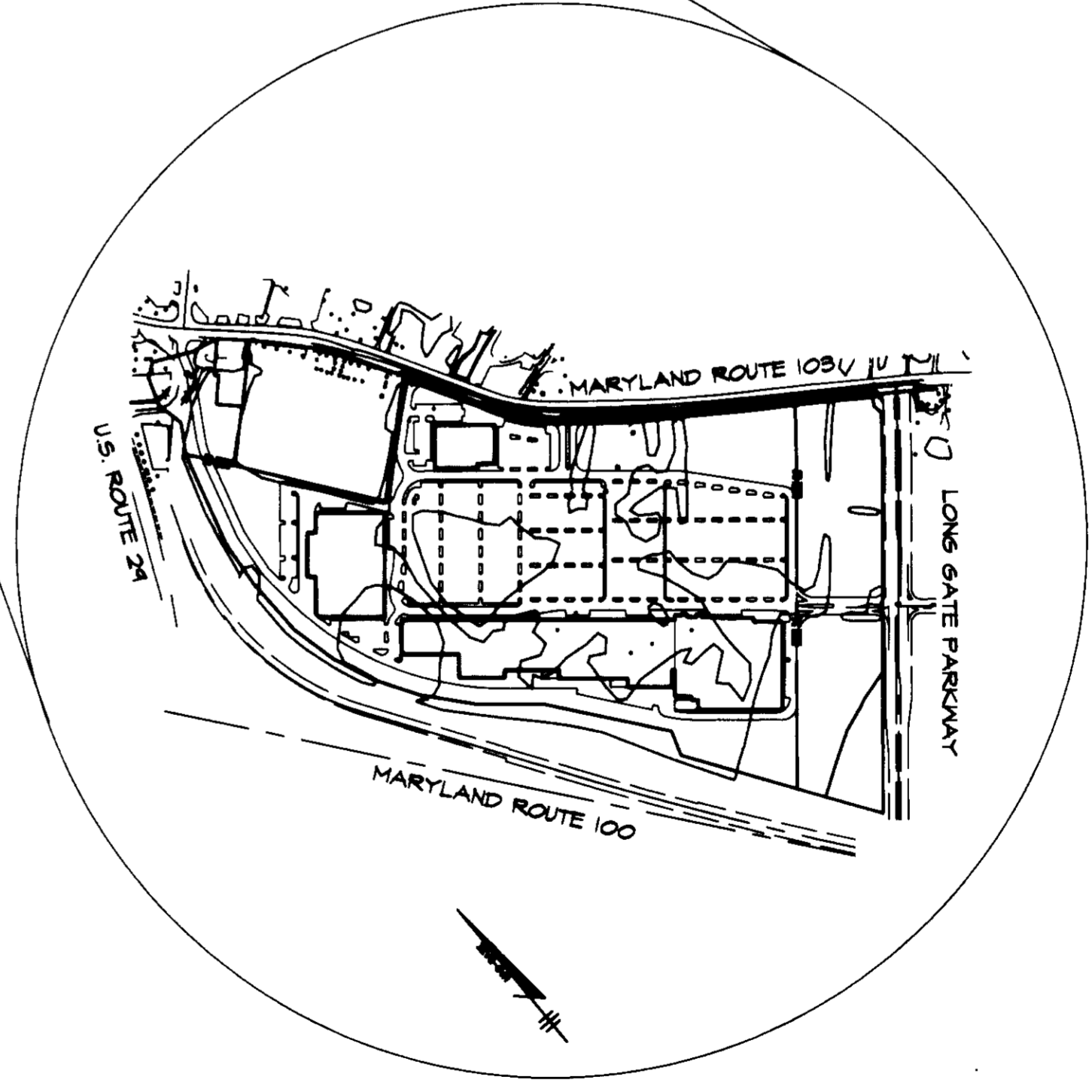
VICINITY MAP
SCALE: 1" = 3 MILES
GENERAL NOTES

1. LIMIT OF DISTURBANCE FOR WETLAND CREATION AREAS ONLY. PHASE LINES ARE REPRESENTATIVE OF BOTH CREATION AREAS AND ENHANCEMENT AREAS. NO GRADING, STAGING OF EQUIPMENT, OR STOCKPILING IS TO OCCUR OUTSIDE OF LIMIT OF DISTURBANCE.
2. WETLAND PERMIT NUMBERS FOR LONG GATE SHOPPING CENTER
TRACKING NO. 144864878
NONTIDAL WETLAND PERMIT NO. 45-NT-0254
MIDDLE PATUXENT RIVER CLOSURE PERIOD: MARCH 1 THRU JUNE 15
3. WETLAND PERMIT NUMBERS FOR MIDDLE PATUXENT RIVER REVITALIZATION PROJECT
TRACKING NO. 144861560
NONTIDAL WETLAND PERMIT NO. 46-NT-0280
MIDDLE PATUXENT RIVER CLOSURE PERIOD: MARCH 1 THRU JUNE 15
4. THE CONTRACTOR MUST NOTIFY "MISS UTILITY" AT 1-800-257-7177 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
6. NOTE: 100 YEAR FLOODPLAIN AND NONTIDAL WETLAND LIMITS OBTAINED FROM PLANS PREPARED BY FISHER, COLLINS & CARTER, DATED DEC. 1992.
7. SITE TABULATION

GROSS SITE AREA:	136.90 ACRES
100 YEAR FLOODPLAIN:	36.75 ACRES
NET TRACT AREA:	100.15 ACRES
ZONED:	RC-DEO
FOREST CONSERVATION AREA:	18.10 ACRES
WETLAND MITIGATION	
WETLAND CREATION:	8.10 ACRES
FORESTED:	7.14 ACRES
EMERGENT:	0.80 ACRES
SUBMERGED AQUATIC:	0.11 ACRES
OPEN WATER:	0.00 ACRES
WETLAND ENHANCEMENT:	8.85 ACRES
FORESTED:	8.85 ACRES
TOTAL CREDIT:	10.50 ACRES
STREAM RESTORATION	1620 LINEAR FEET
8. NOTE: THERE MAY BE NO STAGINGS, STOCKPILINGS OR STORAGE OF EQUIPMENT AND/OR MATERIALS WITHIN FOREST CONSERVATION AREAS ONCE THE FOREST CONSERVATION EASEMENT IS PLANTED.
9. PREVIOUS FILE REFERENCES: F-44-55 AND SDP-95-62



MIDDLE PATUXENT RIVER REVITALIZATION AREA
(REPLACEMENT SITE)
SCALE: 1" = 1600'



LONG GATE SHOPPING CENTER
(IMPACT SITE)
SCALE: 1" = 1000'

NO.	SHEET INDEX TITLE
1	COVER SHEET
2	SEQUENCE OF CONSTRUCTION AND MITIGATION SUMMARY
3	SCHEMATIC OF CONTROLS
4	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
5	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
6	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
7	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
8	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
9	GRADINGS, SEDIMENT AND EROSION CONTROL PLAN
10	GRADINGS & SEDIMENT CONTROL DETAILS AND SPECIFICATIONS
11	GRADINGS & SEDIMENT CONTROL DETAILS AND SPECIFICATIONS
12	DRAINAGE AREA MAP
13	PLANTING PLAN
14	PLANTING PLAN
15	PLANTING PLAN
16	PLANTING PLAN
17	PLANTING PLAN
18	PLANTING PLAN
19	PLANTING LIST (PHASE I AND PHASE II)
20	PLANTING LIST (PHASE III AND PHASE IV)
21	PLANTING DETAILS AND SPECIFICATIONS
22	STREAM STABILIZATION PLAN
23	STREAM STABILIZATION PLAN
24	STREAM STABILIZATION PLAN
25	STREAM STABILIZATION PLAN
26	STREAM STABILIZATION PLAN
27	STREAM STABILIZATION PLAN
28	STREAM STABILIZATION DETAILS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

[Signature] 2/1/96 DATE

[Signature] 7/31/96 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 7/31/96 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH

PROPERTY ADDRESS: 12955 FREDERICK PIKE

PREVIOUS OWNER/DESCRIPTION:
WEST FRIENDSHIP ESTATES, SECTION 1, LOTS 1-56
PRESERVATION PARCEL D, PLAT NO. 11492-11449

OWNER	DEVELOPER
HOWARD COUNTY, MD 3430 COURT HOUSE DRIVE ELLICOTT CITY, MD 21043 LIBER 3754 FOLIO 211	OPUS EAST, L.L.C. 6707 DEMOCRACY BLVD. SUITE 510 BETHESDA, MD 20817 301-493-4444

PROJECT: MIDDLE PATUXENT RIVER REVITALIZATION

AREA: TAX MAP 15 PARCEL 92
9RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: COVER SHEET

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING - ENVIRONMENTAL SERVICES - PLANNING - SURVEYING
8818 Centre Park Drive - Suite 200 - Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96 DATE

DESIGNED BY: DK, RR, CK

DRAWN BY: RR, CK

PROJECT NO: 95P113901

DATE: JULY 25, 1996

SCALE: AS SHOWN

[Signature]

DRAWING NO. 1 OF 28

SEQUENCE OF CONSTRUCTION

I. Sediment Erosion Control

1. Obtain Howard County Grading Permit, Waterways Construction Permit, and Nontidal Wetland Permit.
 2. Install construction and tree protection fencing. (2 WEEKS)
 3. Reforestation plantings as per Forest Conservation Plans, for fulfillment of Forest Conservation Act obligations, may be installed during any Phase. (See Forest Conservation Plans for species, location, details and specifications). (3 MONTHS)
- II. Phase I**
1. Install temporary construction access #1. (1 WEEK)
 2. Clear and grub site, mow or brush hog areas within the limit of disturbance if necessary (Do not mow existing wetlands). (1 WEEK)
 3. Install temporary silt fence for Phase I and permanent stockpile area #1. (1 WEEK)
 4. Install clean water diversion dikes and mounding berms, as specified for Phase I. All clean water diversion dikes and flows must remain unobstructed. (2 WEEKS)
 5. Rough grade area indicated to be used as temporary sediment basin for Phase I (2 WEEKS)
 6. Install pump and temporary filter bag. (Filter bag shall be replaced after bag is filled with sediment. Sediment from bag shall be spread in permanent stockpile area #1.) (1 WEEK)
 7. Rough grade mitigation areas within Phase I. (6 WEEKS)
 8. Fine grade creation areas to establish finished grade. (2 WEEKS)
 9. Stabilize, using seed mix and rate as specified (see designated stabilization areas note). (1 WEEK)
 10. When area is stabilized, re-check grades to determine if any settling has occurred. Correct grades as necessary.
 11. Divert clean water diversion into Phase I Creation Area as shown and stabilize. (See note) (1 WEEK)
 12. Install Phase I mitigation planting Creation Areas and Enhancement Areas as per plans. (1 WEEKS)
 13. Stabilize any areas disturbed during plant installation. (2 WEEKS)
 14. Using Temporary Construction access #2, rough grade areas along the Phase I stream banks, taking extreme care to minimize the amount of sediment entering the stream. (2 WEEKS)
 15. Fine grade as per stream stabilization plans. (1 WEEK)
 16. Install biologs as specified. Use precautions to minimize sediment entering the stream. (4 WEEKS) (See Phase I Stream Stabilization Plans, Sheets 21 thru 26, for a more detailed Stream Stabilization Sequence of Construction). Biologs must be installed after grading along stream edge and prior to completion of stream bank grading.
 17. Install wattles & fascines as specified. (4 WEEKS)
 18. Backfill with moist topsoil leaving wattles slightly exposed.
 19. Install excelsior stabilization blanket, secure as necessary. (2 WEEKS)
 20. Install live canes and/or bare root material. (2 WEEKS)
 21. Install live posts in stream. (1 WEEK)
 22. Stabilize bare ground as per Grading, Sediment & Erosion Control Plans. (2 WEEKS)
 23. Upon approval of the Howard County Sediment Control Inspector, remove Phase I sediment control devices.

III. Phase II

1. Upon completion of Phase I, install Phase II construction fence. (1 WEEK)
Note: All access to Phase II shall be via Construction Access #1. There shall be no disturbance within Forest Conservation Easements and the Phase I mitigation area, unless otherwise specified.
2. Clear and grub site, mow or brush hog areas within the limit of disturbance if necessary (Do not mow existing wetlands). (1 WEEK)
3. Install temporary silt fence for Phase II and silt fence for permanent stockpile area #2. (1 WEEK)
4. Install clean water diversion dikes, as specified for Phase II. All clean water diversion dikes and flows must remain unobstructed. (2 WEEKS)
5. Rough grade area indicated to be used as temporary sediment basin for Phase II (2 WEEKS)
6. Install pump and temporary filter bag. (Filter bag shall be replaced after bag is filled with sediment. Sediment from bag shall be spread in permanent stockpile area #2.) (1 WEEK)
7. Rough grade mitigation areas within Phase II. (4 WEEKS)
8. Fine grade creation areas to establish finished grade. (1 WEEK)
9. Stabilize, using seed mix and rate as specified (see designated stabilization areas note).
10. When area is stabilized, re-check grades to determine if any settling has occurred. Correct grades as necessary.
11. Install Phase II mitigation planting Creation Areas and Enhancement Areas as per plans. (5 WEEKS)
12. Stabilize any areas disturbed during plant installation. (2 WEEKS)
13. Upon approval of the Howard County Sediment Control Inspector, remove Phase II sediment control devices.

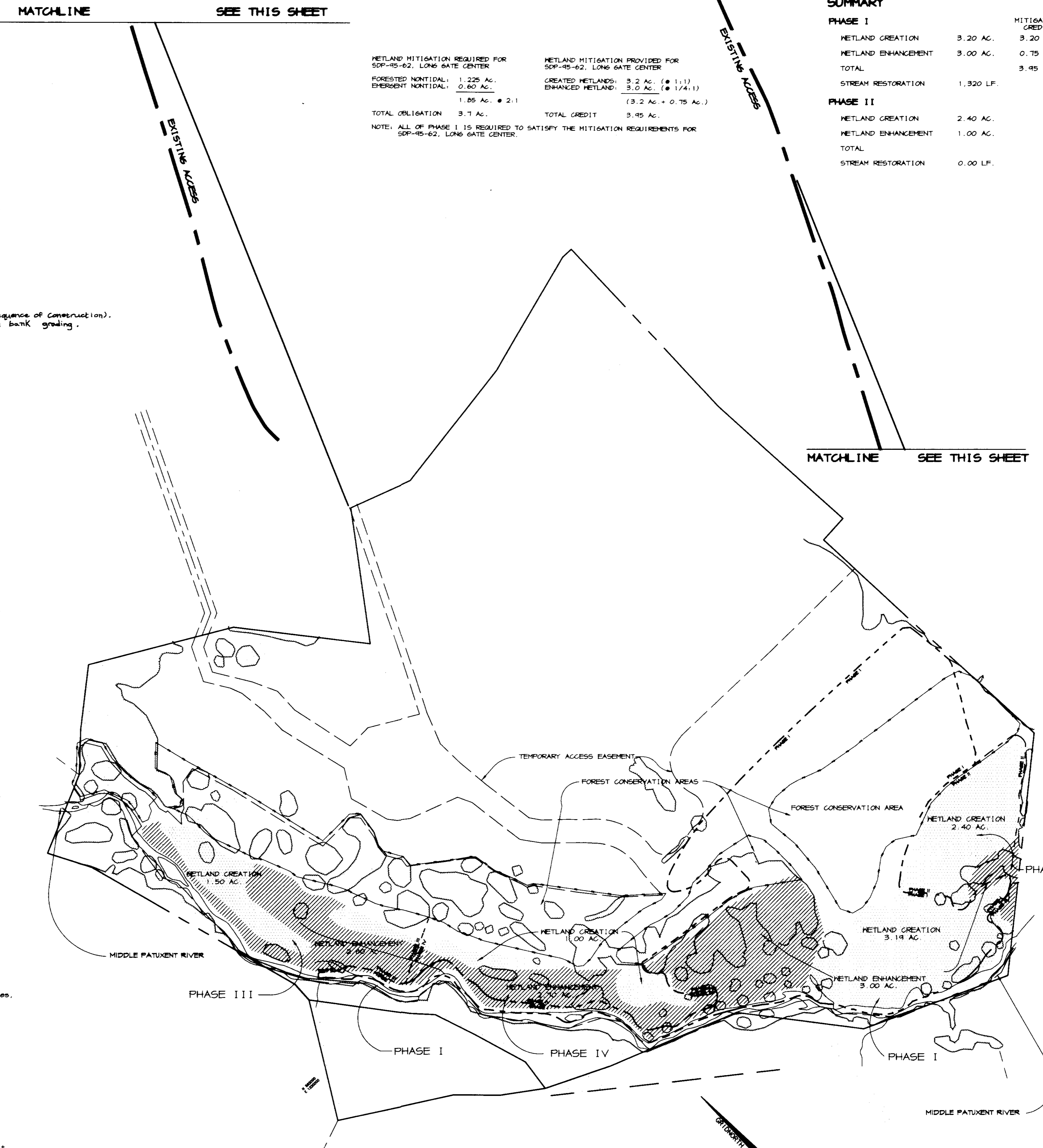
IV. Phase III

1. Upon completion of Phase I and Phase II, install Phase III construction fence & Temporary Access #2 construction fence. (1 WEEK)
2. Install temporary construction access #3. (1 WEEK)
Note: All access to Phase III & Phase IV shall be via Construction Access #2 and #3.
3. Clear & grub Phase III, mow or brush hog areas within the limit of disturbance as necessary. (Do not mow existing wetlands.) Use Temporary Construction Access #2. (1 WEEK)
4. Install clean water diversion dikes, as specified for Phase III. All clean water diversion dikes and flows must remain unobstructed. (2 WEEKS)
5. Rough grade areas along the Phase III stream banks, taking extreme care to minimize the amount of sediment entering the stream. (2 WEEKS)
6. Fine grade and stabilize stream banks using bio-engineering techniques as per stream restoration plans and details (see Stream Restoration plans for a more detailed stream restoration sequence of construction). (1 WEEK)
7. Upon completion of the stream restoration, install silt fence and super silt fence as shown. (1 WEEK)
8. Rough grade area indicated to be used as temporary sediment basin for Phase III (2 WEEKS)
9. Install pump and temporary filter bag. (Filter bag shall be replaced after bag is filled with sediment. Sediment from bag shall be spread in permanent stockpile area #2.) (1 WEEK)
10. Rough grade wetland mitigation areas within Phase III. Use Permanent Stockpile #2 (see sheet 7 of 26 for Stockpile Plan). (4 WEEKS)
Note: Upon approval from the Howard County Sediment Inspector, Temporary Staging & Stockpiling may occur within Phase IV. However, proper sediment control devices must be installed and no additional disturbances to nontidal wetlands may result.
11. Fine grade creation areas to establish finished grade. (1 WEEK)
12. Stabilize, using seed mix and rate as specified (see designated stabilization areas note). (2 WEEKS)
13. When wetland creation area is stabilized, re-check grades to determine if any settling has occurred. Correct grades as necessary.
14. Install Phase III Mitigation planting for Creation & Enhancement areas as per Plans. (5 WEEKS)
15. Upon approval of the Howard County Sediment Control Inspector, remove Phase III sediment control devices, Temporary Access #3 and proceed to Phase IV.

V. Phase IV

1. Upon completion of the Phase III grading and stabilization install Phase IV Construction Fence and Silt Fence. (1 WEEK)
2. Install any sediment control devices not previously installed during Phase III construction. (1 WEEK)
3. Rough grade area indicated to be used as temporary sediment basin for Phase IV (2 WEEKS)
4. Install pump and temporary filter bag. (Filter bag shall be replaced after bag is filled with sediment. Sediment from bag shall be spread in permanent stockpile area #2.) (1 WEEK)
5. Rough grade wetland mitigation areas within Phase IV. (3 WEEKS)
6. Fine grade creation areas. (1 WEEK)
7. Stabilize, using seed mix and rate as specified (see designated stabilization areas note). (2 WEEKS)
8. When creation areas are stabilized, re-check grades to determine if any settling has occurred. Correct grades as necessary.
9. Install Phase IV Creation & Enhancement plantings as per plans. (4 WEEKS)
10. Stabilize any areas disturbed during plant installation. (2 WEEKS)
11. Upon approval of the Howard County Sediment Control Inspector, remove Phase IV sediment control devices.

NOTE:
PHASES I, II, III AND IV MAY BE CONSTRUCTED INDEPENDENTLY



WETLAND MITIGATION REQUIRED FOR SOP-95-62, LONG GATE CENTER		WETLAND MITIGATION PROVIDED FOR SOP-95-62, LONG GATE CENTER	
FORESTED NONTIDAL:	1.225 AC.	CREATED WETLANDS:	3.2 AC. (# 1:1)
EMERGENT NONTIDAL:	0.60 AC.	ENHANCED WETLANDS:	3.0 AC. (# 1/4:1)
	1.85 AC. @ 2:1		(3.2 AC. + 0.75 AC.)
TOTAL OBLIGATION:	3.7 AC.	TOTAL CREDIT:	3.95 AC.

NOTE: ALL OF PHASE I IS REQUIRED TO SATISFY THE MITIGATION REQUIREMENTS FOR SOP-95-62, LONG GATE CENTER.

SUMMARY

PHASE I		MITIGATION CREDIT	PHASE III	
WETLAND CREATION	3.20 AC.	3.20 AC.	WETLAND CREATION	1.50 AC.
WETLAND ENHANCEMENT	3.00 AC.	0.75 AC.	WETLAND ENHANCEMENT	2.60 AC.
TOTAL		3.95 AC.	TOTAL	
STREAM RESTORATION	1,320 LF.		STREAM RESTORATION	300 LF.

PHASE II		MITIGATION CREDIT	PHASE IV	
WETLAND CREATION	2.40 AC.		WETLAND CREATION	1.00 AC.
WETLAND ENHANCEMENT	1.00 AC.		WETLAND ENHANCEMENT	2.60 AC.
TOTAL			TOTAL	
STREAM RESTORATION	0.00 LF.		STREAM RESTORATION	0.00 LF.

SUPPLEMENTAL INFORMATION

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

John P. Robertson 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

BY THE DEVELOPER:

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

John P. Robertson 7/29/96
DEVELOPER DATE

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Farrell 7-24-96
ENGINEER DATE

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

J. H. Warfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John P. Robertson 8/1/96
DIRECTOR DATE

John P. Robertson 7/29/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

John P. Robertson 7/29/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

REVISED PER COUNTY COMMENTS	
DATE NO.	REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-483-4444

PROJECT: MIDDLE PATUXENT RIVER REVITALIZATION

AREA: TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: SEQUENCE OF CONSTRUCTION AND MITIGATION SUMMARY

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96 DATE	DESIGNED BY: DK, RR, CK
	DRAWN BY: RR
	PROJECT NO: 95P113901
	DATE: JULY 25, 1996
	SCALE: 1" = 200'
<i>J. Farrell</i>	DRAWING NO. 2 OF 28

MITIGATION SUMMARY PLAN
SCALE: 1" = 200'



SCHEMATIC OF SEDIMENT/EROSION CONTROLS
SCALE: 1" = 200'

- LEGEND**
- LIMIT OF DISTURBANCE
 - - - - - TEMPORARY SEDIMENT BASIN
 - PHASE LINE
 - ||||| TREE PROTECTION FENCE
 - SUPER SILT FENCE
 - SILT FENCE
 - EARTH DIKE

SUPPLEMENTAL INFORMATION

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

John R. Colton 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

BY THE DEVELOPER :

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

John R. Colton 7.24.96
DEVELOPER DATE

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Farrell 7.24.96
ENGINEER DATE

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

J. L. Warfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John S. Smith 8/1/96
DIRECTOR DATE

John Dammann 7/31/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Jim Zimmerman 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER

ORUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **SCHEMATIC OF CONTROLS**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

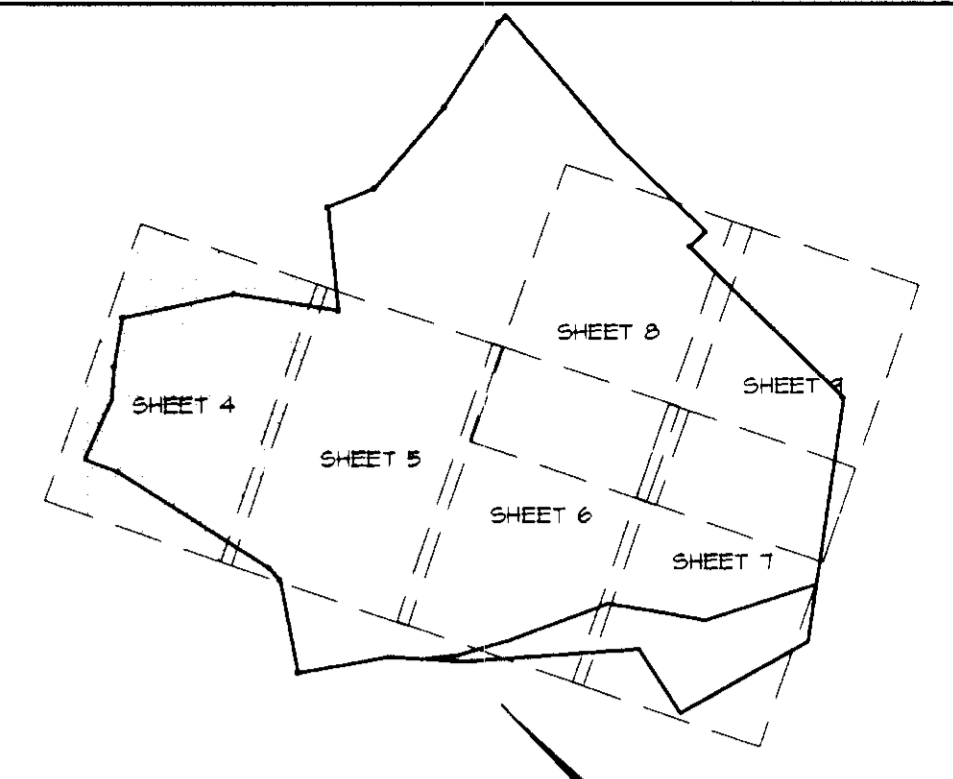
J. Farrell 7.24.96
DATE

DESIGNED BY : DK, RR, CK
DRAWN BY: KH
PROJECT NO : 95P113901
DATE : JULY 25, 1996
SCALE : 1" = 200'
DRAWING NO. 3 OF 28

- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY AFTER GRADING IS COMPLETED. BIOLOG MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS, IMMEDIATELY AFTER GRADING IS COMPLETED.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 28. (SEE TEMPORARY SEEDING NOTE SHEET 1)
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.

PROPERTY OF
HOWARD COUNTY, MARYLAND
635/333

PROPERTY OF
HOWARD COUNTY, MARYLAND
635/331



SHEET INDEX

SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :

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

John R. Bond 7.24.96
DEVELOPER DATE

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Larell 7.24.96
ENGINEER DATE

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. H. Warfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John R. Robertson 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

James A. White 8/1/96
DIRECTOR DATE

Alvin Dammus 7/31/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Jim Stumm 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO.	REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

7.24.96
DATE

DESIGNED BY: DK, RR, CK

DRAWN BY: RR, CK

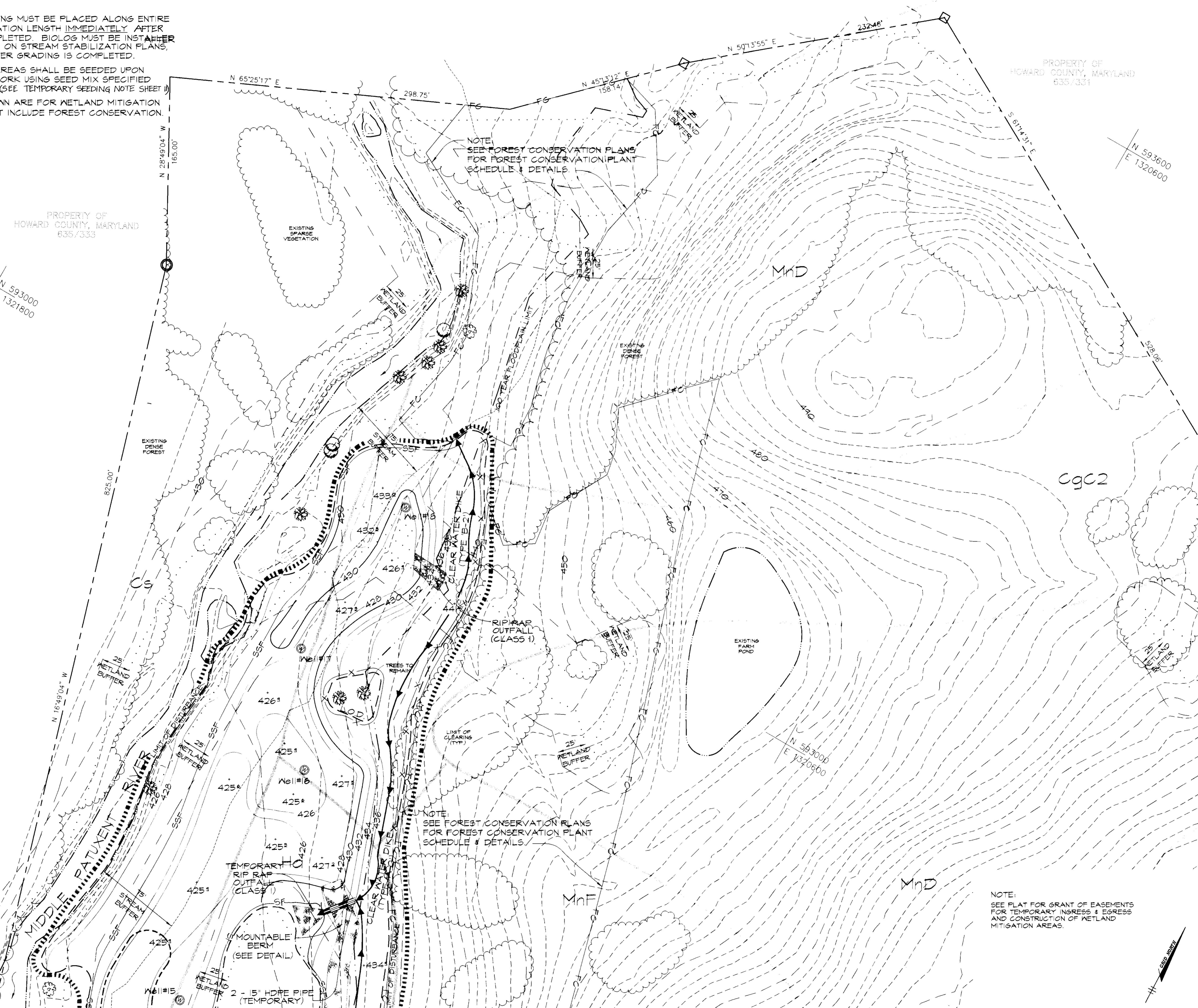
PROJECT NO : 95P113901

DATE : JULY 25, 1996

SCALE : 1" = 40'

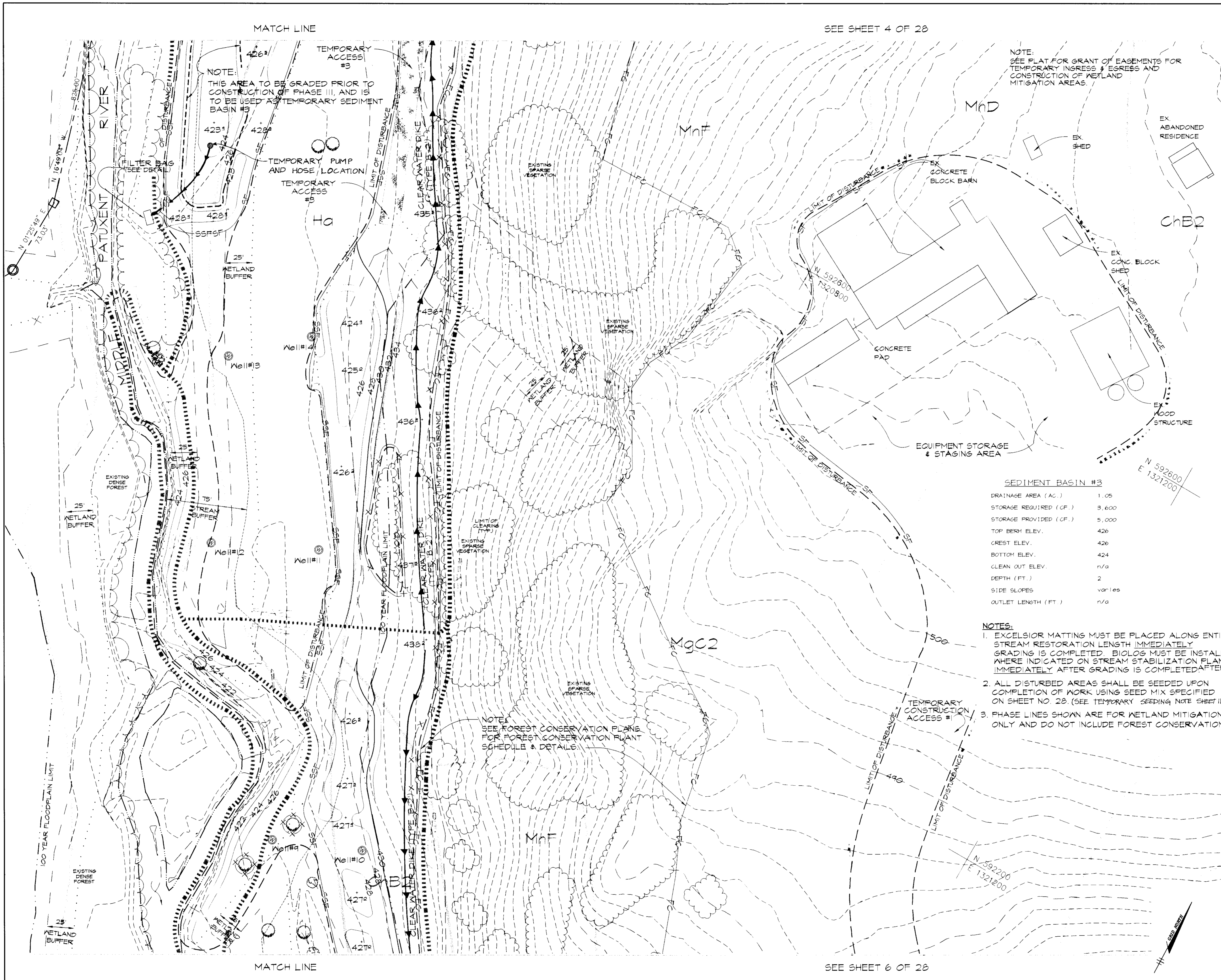
DRAWING NO. 4 OF 28

J. Larell



NOTE:
SEE PLAN FOR GRANT OF EASEMENTS FOR TEMPORARY INGRESS & EGRESS AND CONSTRUCTION OF WETLAND MITIGATION AREAS.

SEE SHEET 5 OF 28

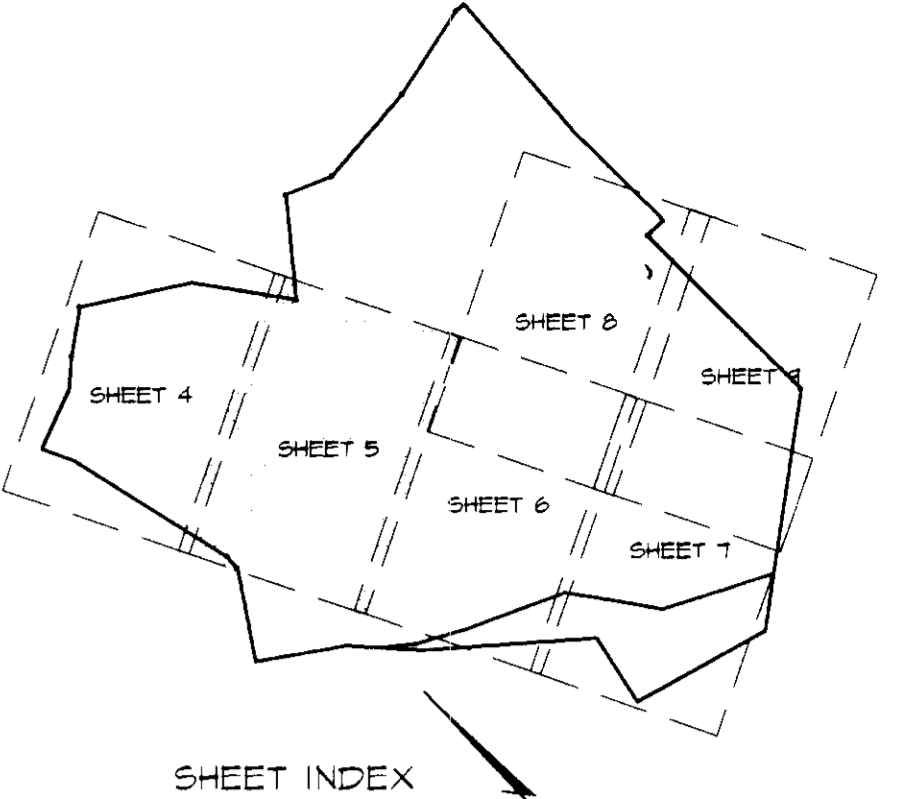


MATCH LINE

SEE SHEET 4 OF 28

NOTE:
THIS AREA TO BE GRADED PRIOR TO CONSTRUCTION OF PHASE III, AND IS TO BE USED AS TEMPORARY SEDIMENT BASIN #3

NOTE:
SEE PLAN FOR GRANT OF EASEMENTS FOR TEMPORARY INGRESS & EGRESS AND CONSTRUCTION OF WETLAND MITIGATION AREAS.



SUPPLEMENTAL INFORMATION

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

John M. Bell 7.24.96
DEVELOPER DATE

BY THE ENGINEER:
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Laeth 7.24.96
ENGINEER DATE

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. H. Warfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John R. Pletcher 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John J. Scott 8/1/96
DIRECTOR DATE

William Dammann 7/31/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Ann Sweeney 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

SEDIMENT BASIN #3

DRAINAGE AREA (AC.)	1.05
STORAGE REQUIRED (CF.)	3,600
STORAGE PROVIDED (CF.)	5,000
TOP BERM ELEV.	426
CREST ELEV.	426
BOTTOM ELEV.	424
CLEAN OUT ELEV.	n/a
DEPTH (FT.)	2
SIDE SLOPES	varies
OUTLET LENGTH (FT.)	n/a

- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY GRADING IS COMPLETED. BIOLGS MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS, IMMEDIATELY AFTER GRADING IS COMPLETED AFTER.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 28. (SEE TEMPORARY SEEDING NOTE SHEET 11)
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.

NOTE:
SEE FOREST CONSERVATION PLANS FOR FOREST CONSERVATION PLANT SCHEDULE & DETAILS.

DATE	NO.	REVISION

OWNER / DEVELOPER
ORP EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20811
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

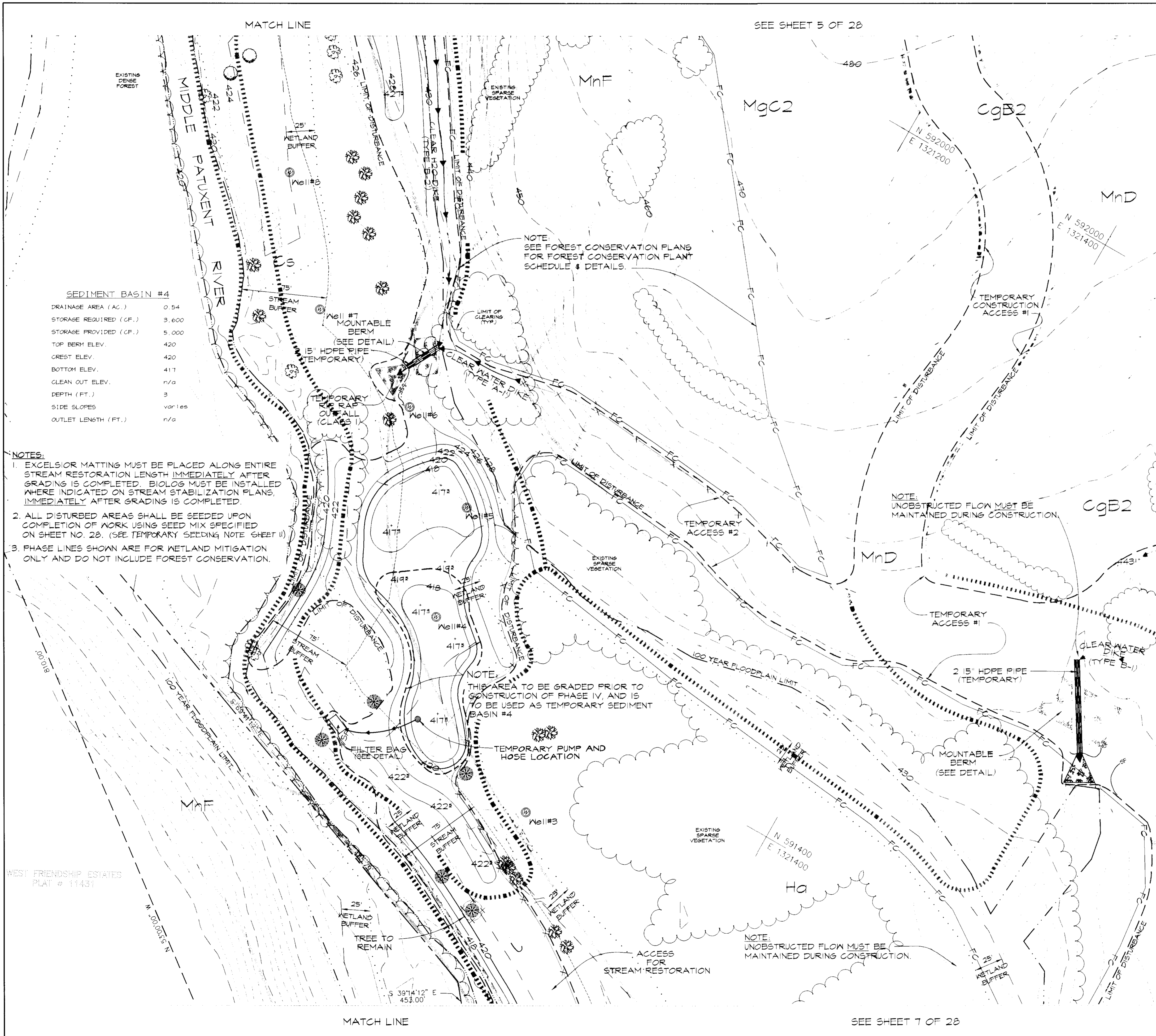
AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96 DATE	DESIGNED BY: DK, RR, CK
<i>J. Laeth</i>	DRAWN BY: RR, CK
	PROJECT NO: 95P113901
	DATE: JULY 25, 1996
	SCALE: 1" = 40'
	DRAWING NO. 5 OF 28

SEE SHEET 6 OF 28



SEDIMENT BASIN #4

DRAINAGE AREA (AC.)	0.54
STORAGE REQUIRED (CF.)	3,600
STORAGE PROVIDED (CF.)	5,000
TOP BERM ELEV.	420
CREST ELEV.	420
BOTTOM ELEV.	417
CLEAN OUT ELEV.	n/a
DEPTH (FT.)	3
SIDE SLOPES	varies
OUTLET LENGTH (FT.)	n/a

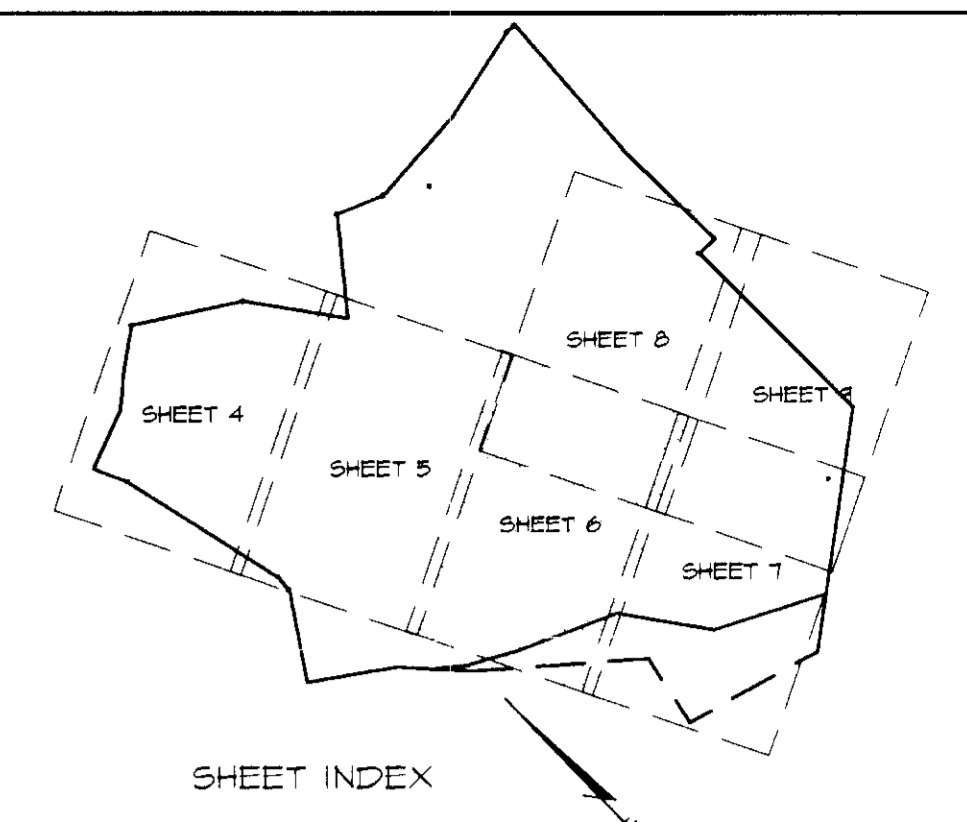
- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY AFTER GRADING IS COMPLETED. BIOLOG MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS, IMMEDIATELY AFTER GRADING IS COMPLETED.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 20. (SEE TEMPORARY SEEDING NOTE SHEET II)
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.

NOTE: THIS AREA TO BE GRADED PRIOR TO CONSTRUCTION OF PHASE IV, AND IS TO BE USED AS TEMPORARY SEDIMENT BASIN #4

NOTE: SEE FOREST CONSERVATION PLANS FOR FOREST CONSERVATION PLANT SCHEDULE & DETAILS.

NOTE: UNOBSTRUCTED FLOW MUST BE MAINTAINED DURING CONSTRUCTION.

NOTE: UNOBSTRUCTED FLOW MUST BE MAINTAINED DURING CONSTRUCTION.



SUPPLEMENTAL INFORMATION

BY THE DEVELOPER:

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

John R. Rhoton 7.14.96
DEVELOPER DATE

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Farrell 7.24.96
ENGINEER DATE

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. H. Wainwright 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John R. Rhoton 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

Jim Shields 8/1/96
DIRECTOR DATE

William J. Jurek 7/29/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Gina Jurek 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER

OPJS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 60
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT: MIDDLE PATUXENT RIVER REVITALIZATION

AREA: TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: GRADING, SEDIMENT AND EROSION CONTROL PLAN

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7.24.96
DATE

DESIGNED BY: DK, RR, CK
DRAWN BY: RR, CK
PROJECT NO: 95P113901
DATE: JULY 25, 1996
SCALE: 1" = 40'
DRAWING NO. 6 OF 28

J. Farrell

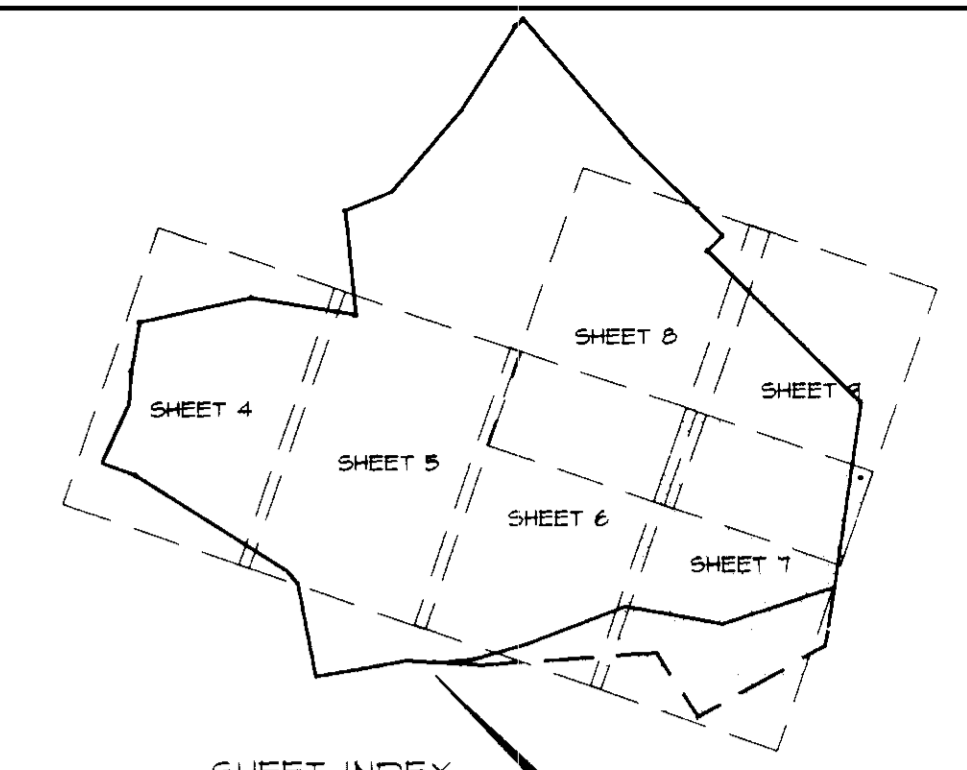
SEE SHEET 8 OF 28

MATCH LINE

SEE SHEET 7 OF 28

MATCH LINE

SEE SHEET 6 OF 28



SHEET INDEX
SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :

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

John R. Paul 7.24.96
DEVELOPER DATE

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Savelle 7.24.96
ENGINEER DATE

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. L. Warlick 7.29.96
NATURAL RESOURCES CONSERVATION SERVICE DATE

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

Jim K. Robertson 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

David B. Smith 8/1/96
DIRECTOR DATE

Wendy Danner 7/24/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Anna Szymanski 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

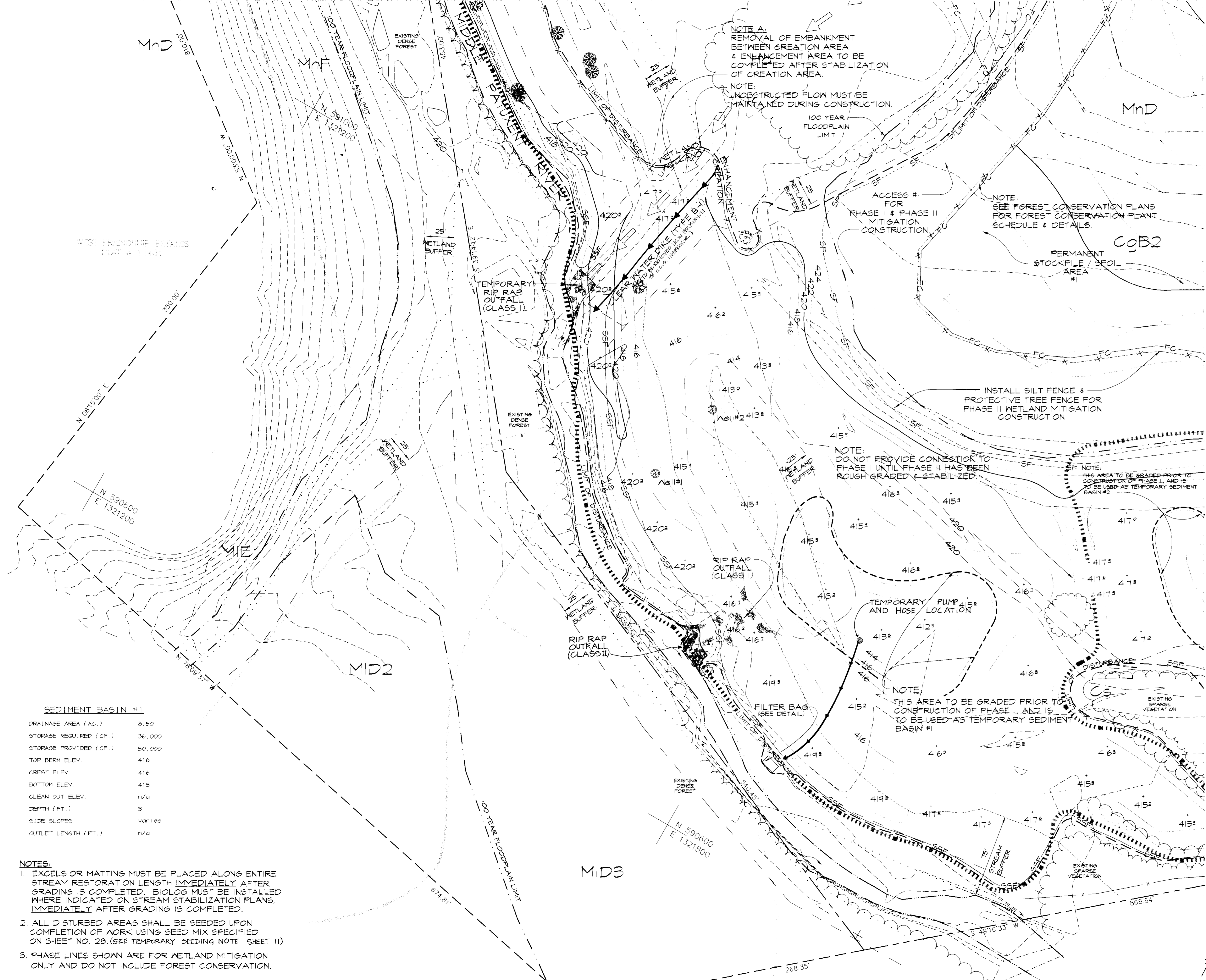
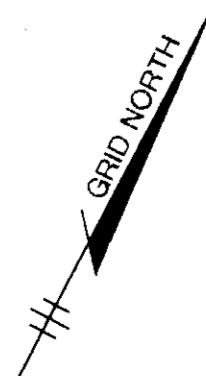
RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

7.24.96
DATE

DESIGNED BY : DK, RR, CK
DRAWN BY : RR, CK
PROJECT NO : 95P113901
DATE : JULY 25, 1996
SCALE : 1" = 40'
DRAWING NO. 7 OF 28

SEE SHEET 9 OF 28

MATCH LINE



NOTE A:
REMOVAL OF EMBANKMENT BETWEEN CREATION AREA & ENHANCEMENT AREA TO BE COMPLETED AFTER STABILIZATION OF CREATION AREA.

NOTE:
UNOBSTRUCTED FLOW MUST BE MAINTAINED DURING CONSTRUCTION.

NOTE:
SEE FOREST CONSERVATION PLANS FOR FOREST CONSERVATION PLANT SCHEDULE & DETAILS.

NOTE:
DO NOT PROVIDE CONNECTION TO PHASE I UNTIL PHASE II HAS BEEN ROUGH GRADED & STABILIZED.

NOTE:
THIS AREA TO BE GRADED PRIOR TO CONSTRUCTION OF PHASE II, AND IS TO BE USED AS TEMPORARY SEDIMENT BASIN #2.

NOTE:
THIS AREA TO BE GRADED PRIOR TO CONSTRUCTION OF PHASE I, AND IS TO BE USED AS TEMPORARY SEDIMENT BASIN #1.

SEDIMENT BASIN #1

DRAINAGE AREA (AC.)	8.50
STORAGE REQUIRED (CF.)	36,000
STORAGE PROVIDED (CF.)	50,000
TOP BERM ELEV.	416
CREST ELEV.	416
BOTTOM ELEV.	413
CLEAN OUT ELEV.	n/a
DEPTH (FT.)	3
SIDE SLOPES	varies
OUTLET LENGTH (FT.)	n/a

- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY AFTER GRADING IS COMPLETED. BIOLOG MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS IMMEDIATELY AFTER GRADING IS COMPLETED.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 28. (SEE TEMPORARY SEEDING NOTE SHEET 11)
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.

WEST FRIENDSHIP ESTATES
PLAT # 11431

CgB2

MID2

MID3

MnD

MnT

MIE

MnD

N 590600
E 1321200

N 590600
E 1321800

N 001018

N 000055 N

330.00'

N 0815 00' E

N 590600
E 1321200

N 1809 37' W

674.81'

100 YEAR FLOODPLAIN LIMIT

268.35'

868.64'

S 49 18 33' W

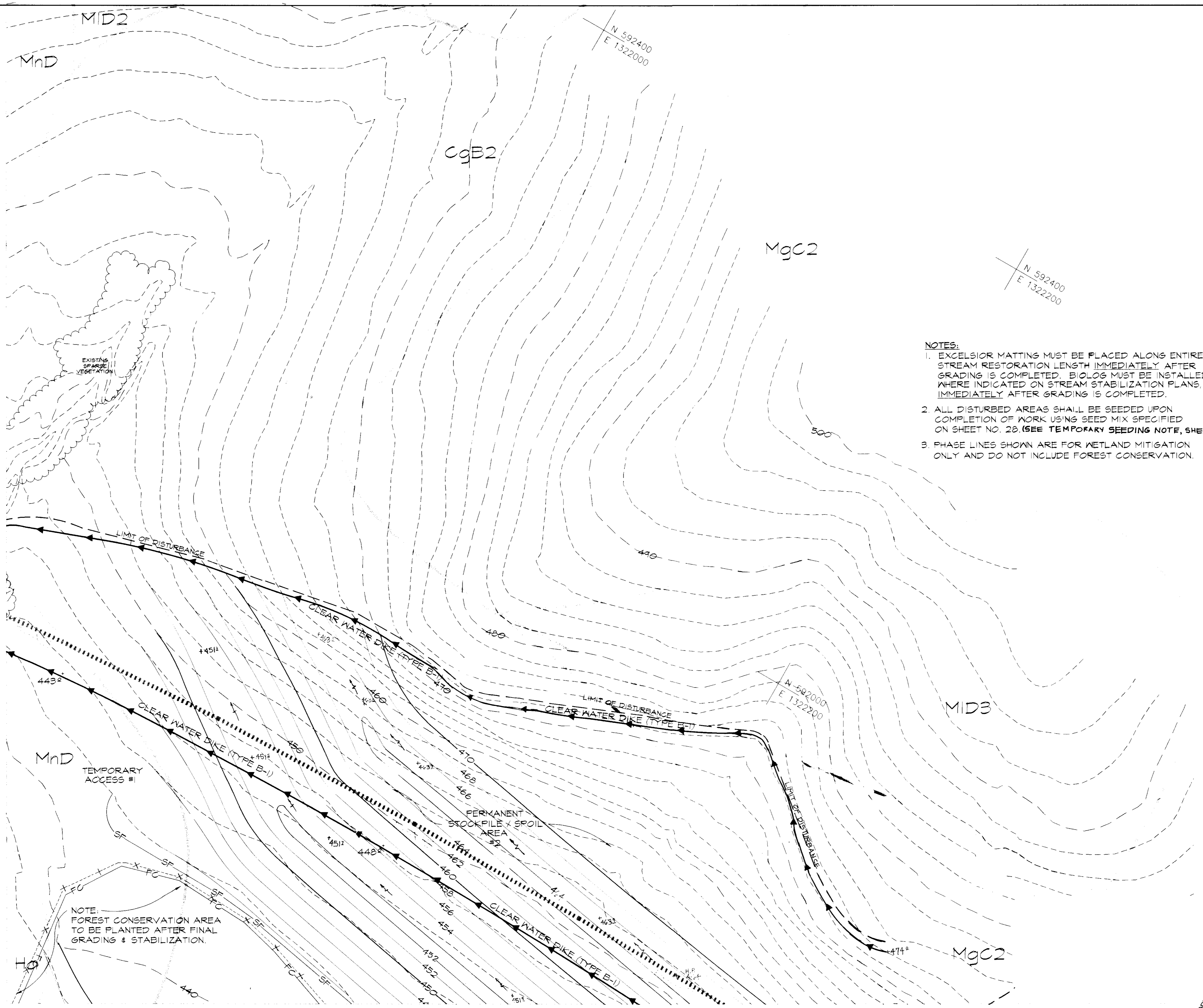
268.35'

SEE SHEET 6 OF 28

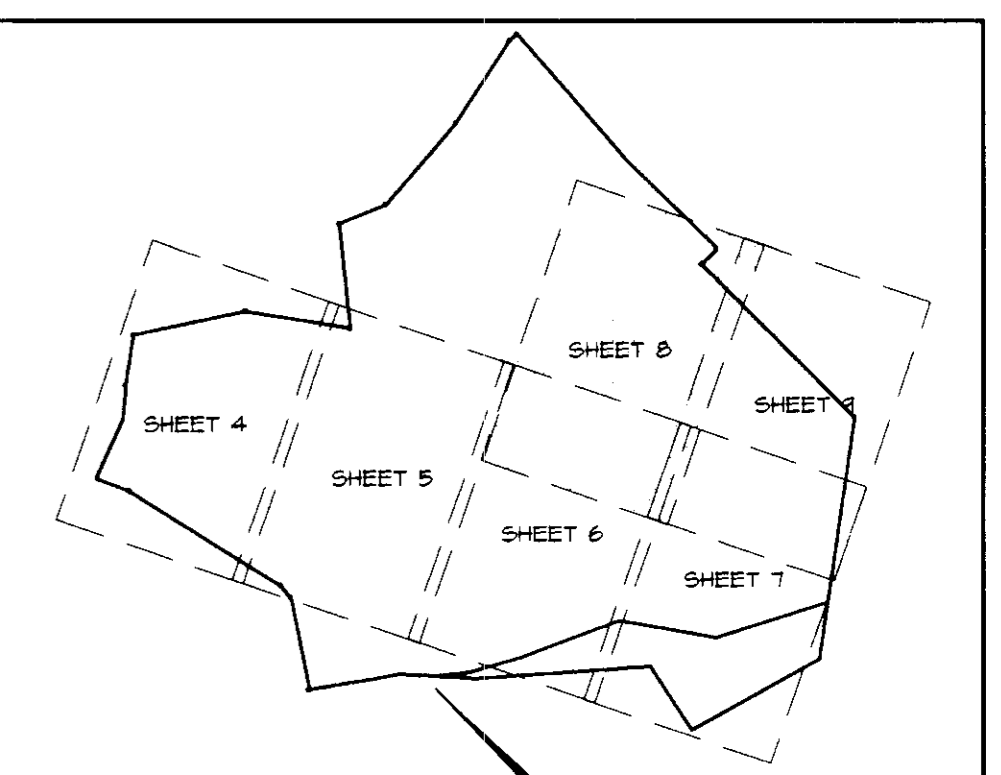
MATCH LINE

MATCH LINE

SEE SHEET 9 OF 28



- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY AFTER GRADING IS COMPLETED. BIOLOG MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS IMMEDIATELY AFTER GRADING IS COMPLETED.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 28. (SEE TEMPORARY SEEDING NOTE, SHEET 11).
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.



SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :

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

John R. Ruel 7.24.96
DEVELOPER DATE

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Farrell 7.24.96
ENGINEER DATE

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. M. Washfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John R. Robertson 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Carol Kettle 8/1/96
DIRECTOR DATE

Chris Drummer 7/29/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Jim Swannery 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

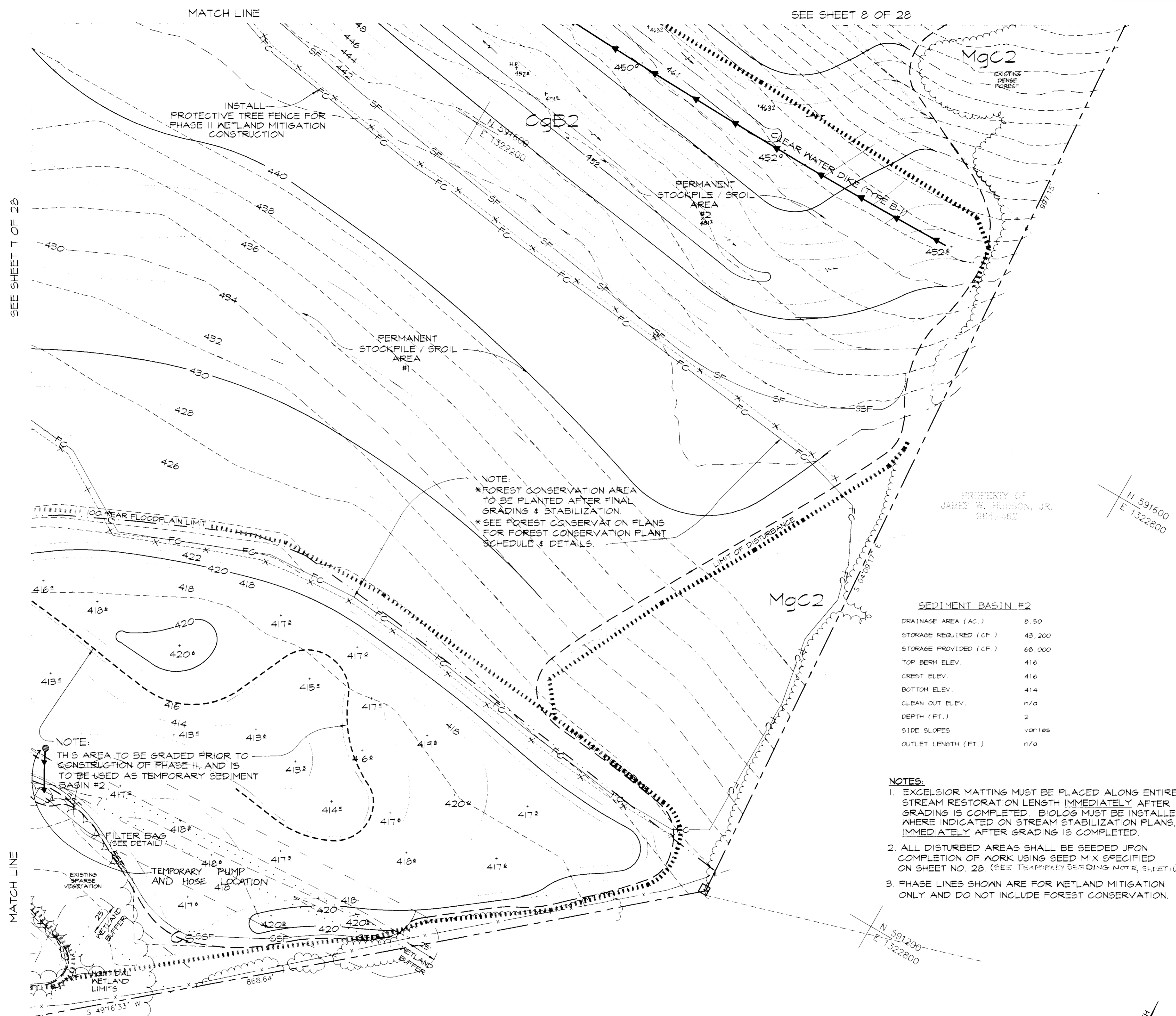
AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

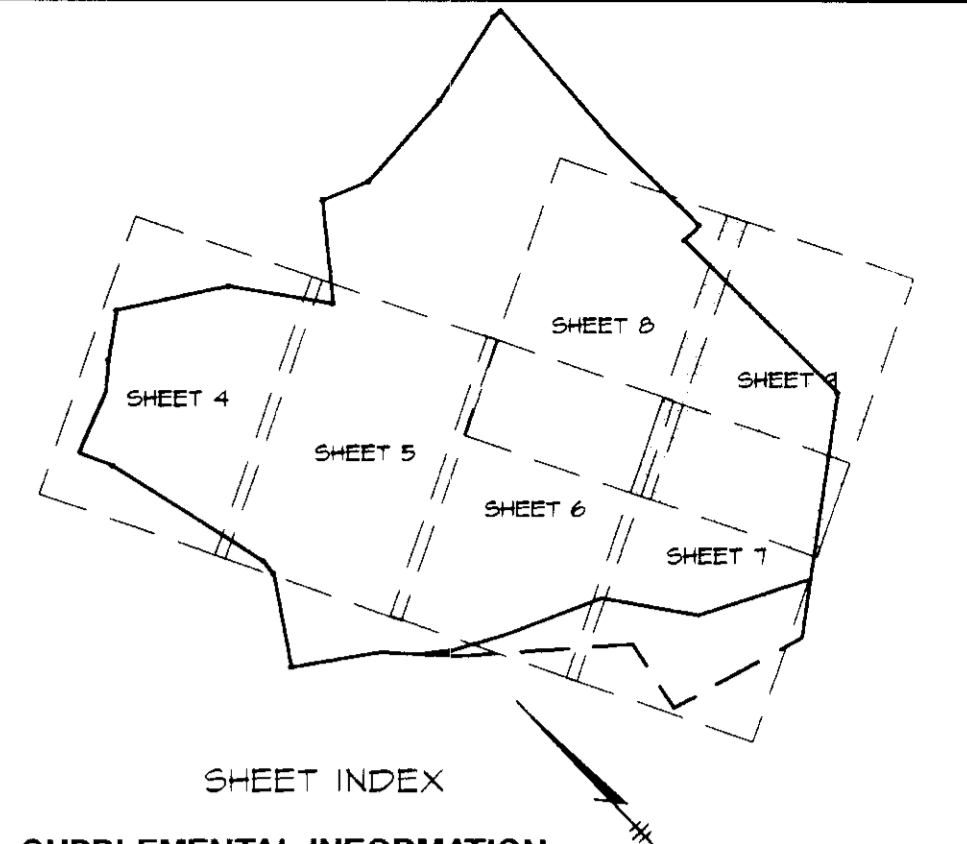
7.24.96 DATE	DESIGNED BY : DK, RR, CK
<i>J. Farrell</i>	DRAWN BY : RR, CK
	PROJECT NO : 95P113901
	DATE : JULY 25, 1996
	SCALE : 1" = 40'
	DRAWING NO. 8 OF 28

SDP-96-143



SEE SHEET 7 OF 28

SEE SHEET 8 OF 28



SUPPLEMENTAL INFORMATION

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

[Signature] 7.24.96
 DEVELOPER DATE

BY THE ENGINEER :
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 7.24.96
 ENGINEER DATE

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.

[Signature] 7/28/96
 NATURAL RESOURCES CONSERVATION SERVICE DATE

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

[Signature] 7-29/96
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

[Signature] 8/1/96
 DIRECTOR DATE

[Signature] 7/31/96
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/31/96
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
 3RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX : 410-997-9282

7.24.96
 DATE
 DESIGNED BY : DK, RR, CK
 DRAWN BY : RR, CK
 PROJECT NO : 95P113901
 DATE : JULY 25, 1996
 SCALE : 1" = 40'
 DRAWING NO. 9 OF 28

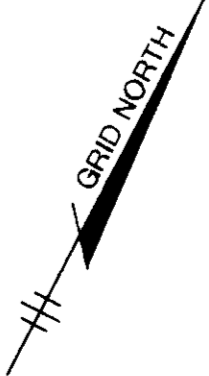
SEDIMENT BASIN #2

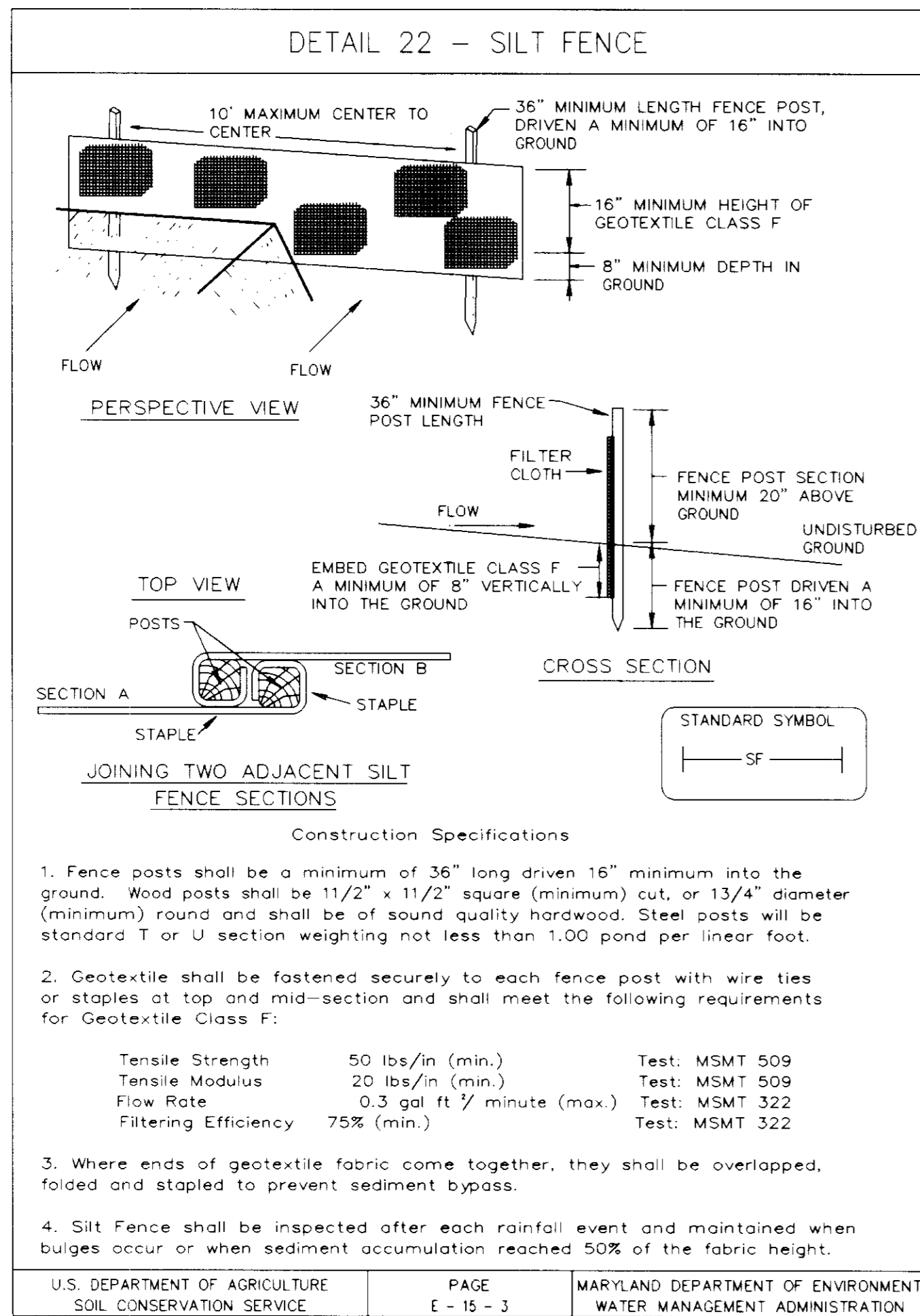
DRAINAGE AREA (AC.)	8.50
STORAGE REQUIRED (CF.)	43,200
STORAGE PROVIDED (CF.)	68,000
TOP BERM ELEV.	416
CREST ELEV.	416
BOTTOM ELEV.	414
CLEAN OUT ELEV.	n/a
DEPTH (FT.)	2
SIDE SLOPES	varies
OUTLET LENGTH (FT.)	n/a

- NOTES:**
- EXCELSIOR MATTING MUST BE PLACED ALONG ENTIRE STREAM RESTORATION LENGTH IMMEDIATELY AFTER GRADING IS COMPLETED. BIOLOS MUST BE INSTALLED WHERE INDICATED ON STREAM STABILIZATION PLANS, IMMEDIATELY AFTER GRADING IS COMPLETED.
 - ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION OF WORK USING SEED MIX SPECIFIED ON SHEET NO. 28 (SEE TEMPORARY SEEDING NOTE, SHEET 1).
 - PHASE LINES SHOWN ARE FOR WETLAND MITIGATION ONLY AND DO NOT INCLUDE FOREST CONSERVATION.

N 591600
 E 1322800

N 591200
 E 1322800





SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE H-26-3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

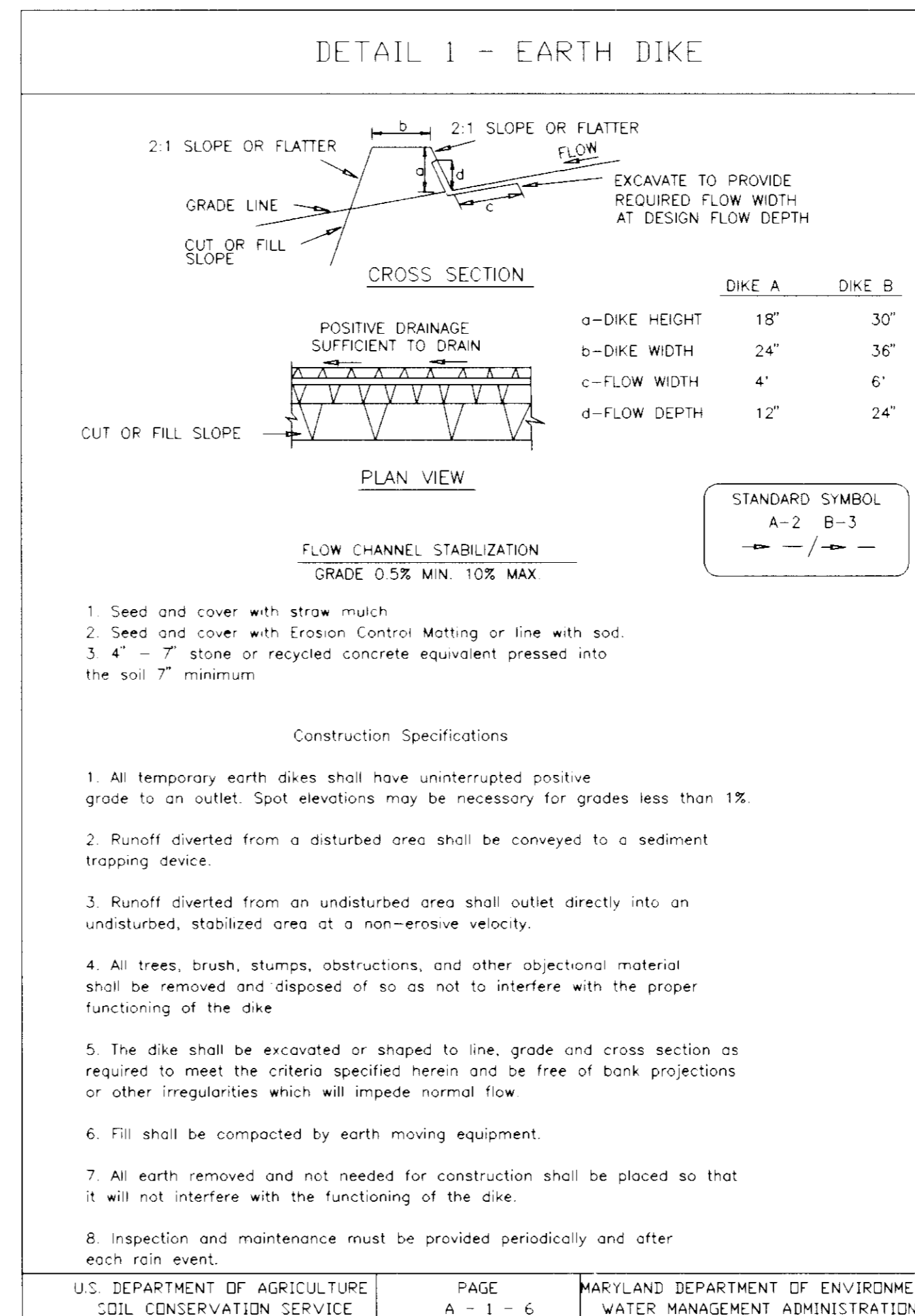
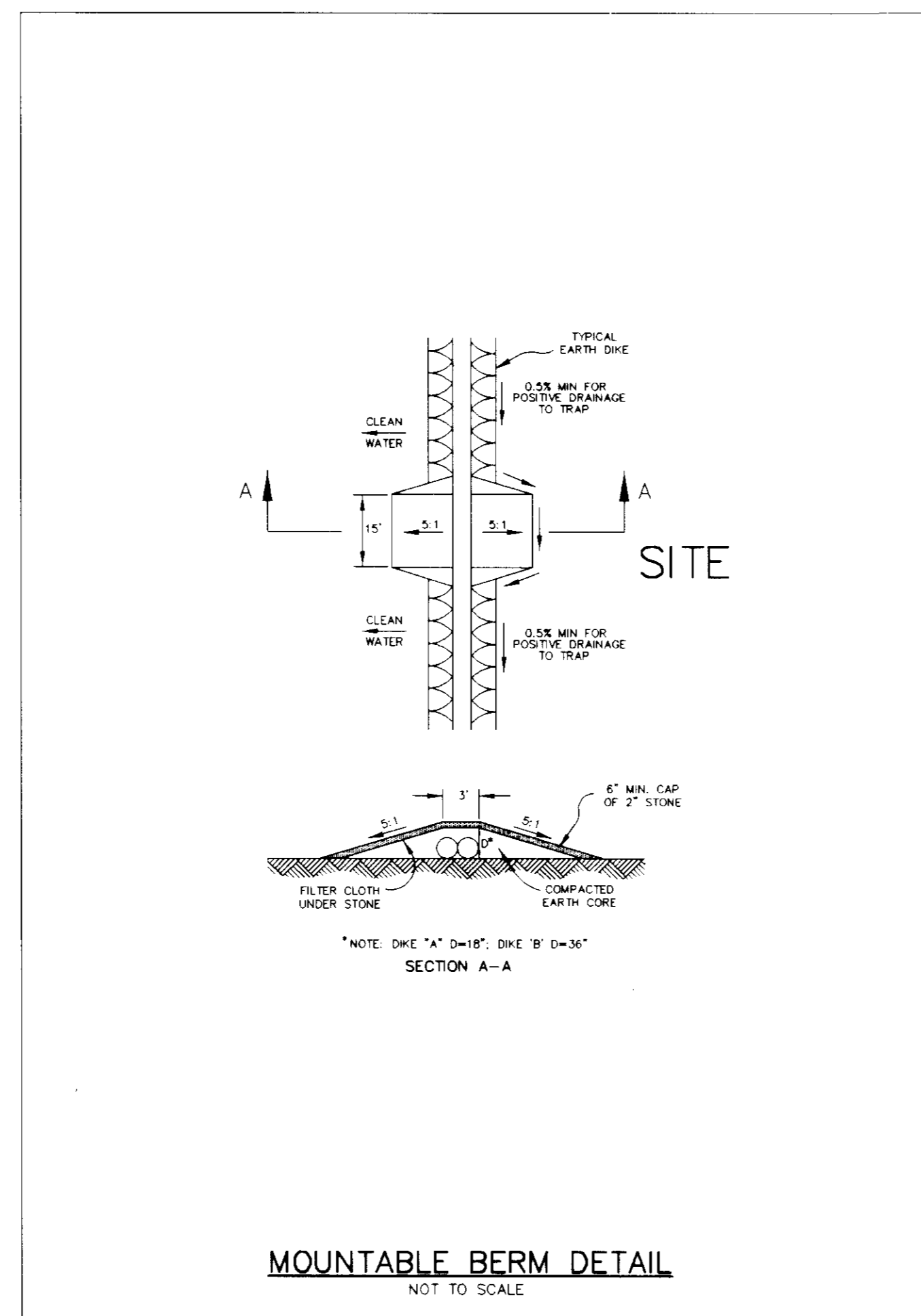
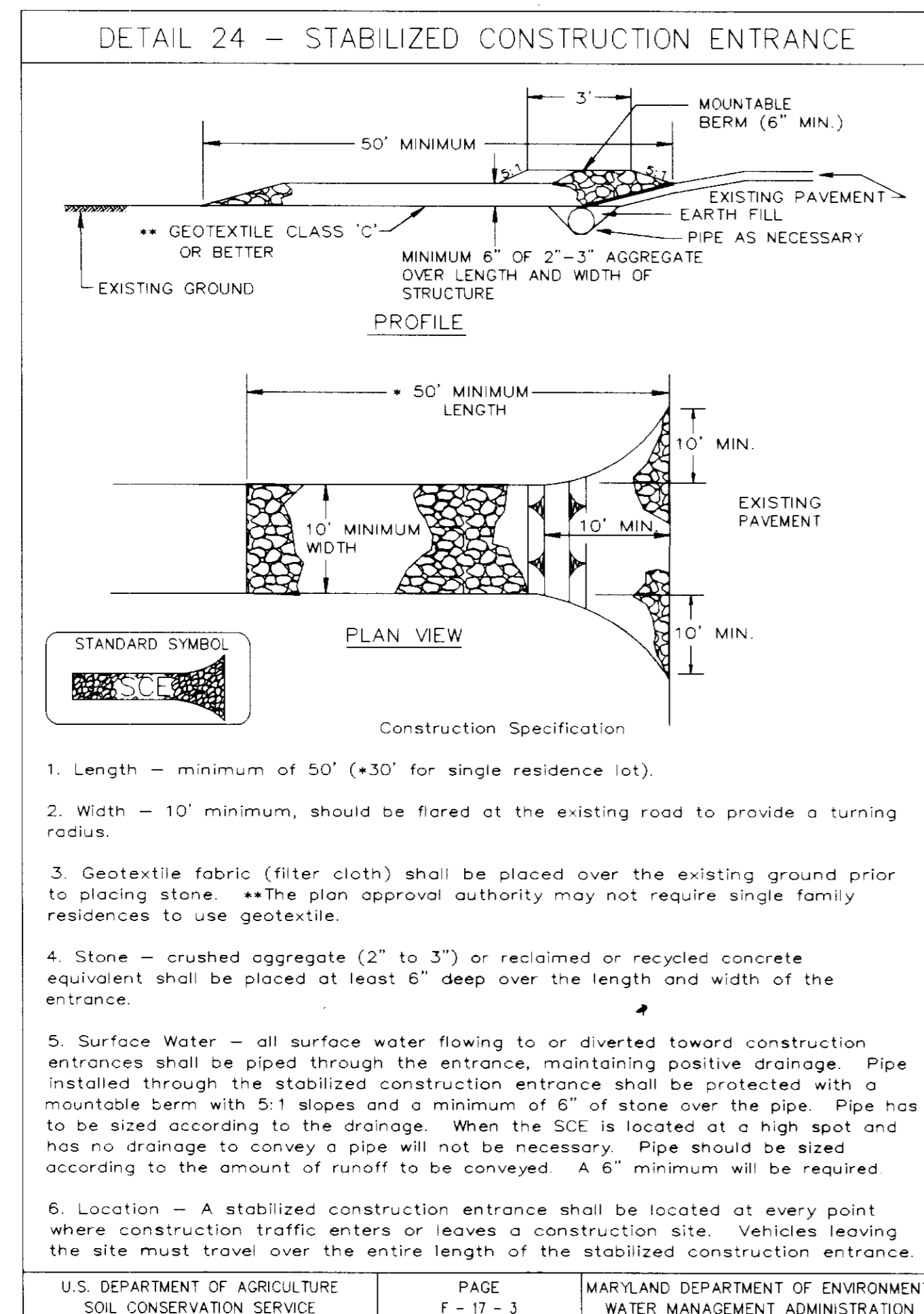
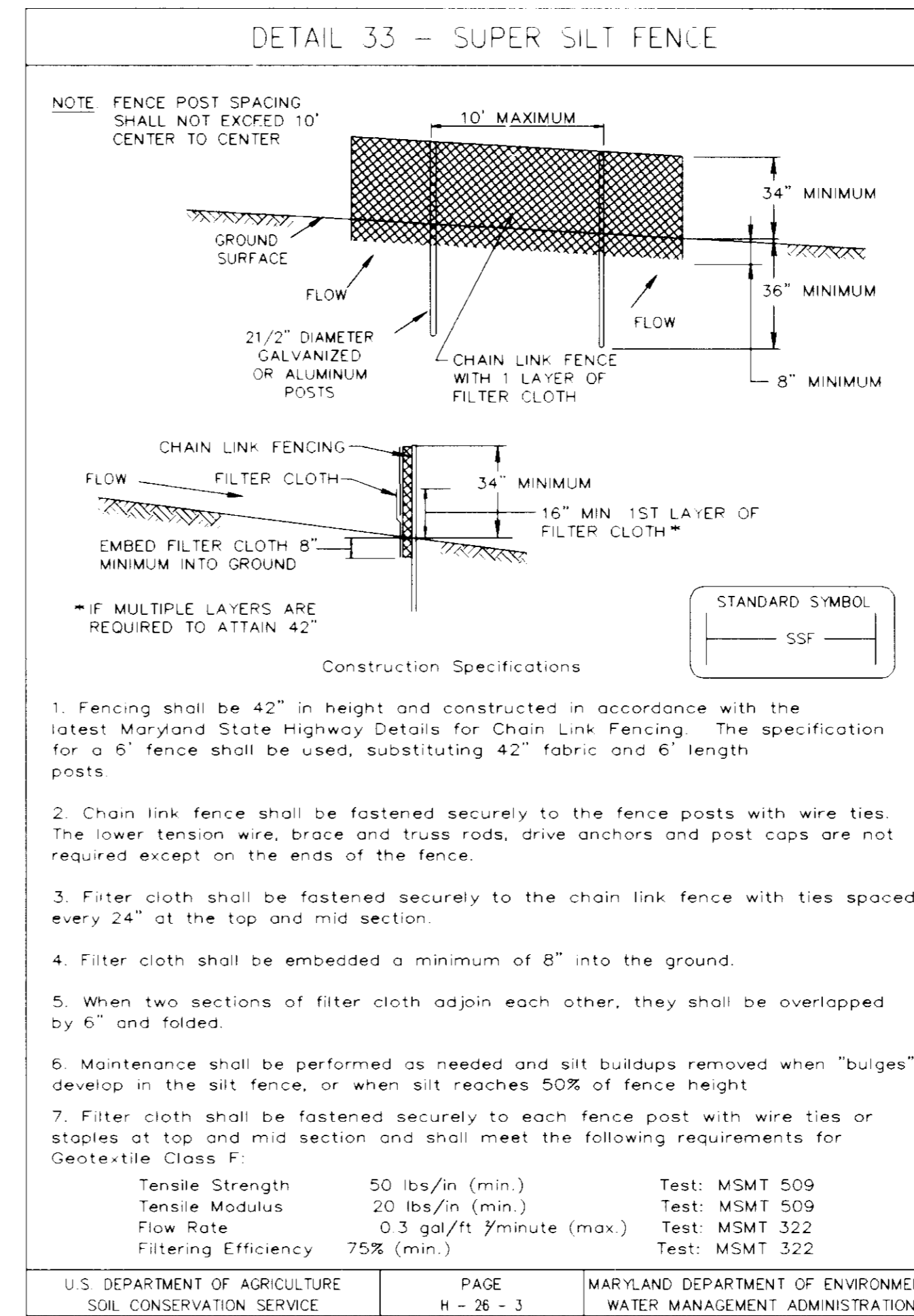
SILT FENCE

Silt Fence Design Criteria

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

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

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



SUPPLEMENTAL INFORMATION

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

John R. Roberts 7/29/96
HOWARD SOIL CONSERVATION DISTRICT DATE

BY THE DEVELOPER:

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

John W. Paul 7-24-96
DEVELOPER DATE

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Sarell 7-24-96
ENGINEER DATE

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

J. H. Wainfield 7/29/96
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John S. Sarell 8/1/96
DIRECTOR DATE

Allen Damm 7/21/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

John Damm 7/21/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO. REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **GRADING & SED. CONT. DETAILS AND SPECIFICATIONS**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96
DATE

DESIGNED BY: DK, RR, CK

DRAWN BY: RR, CK

PROJECT NO: 95P113901

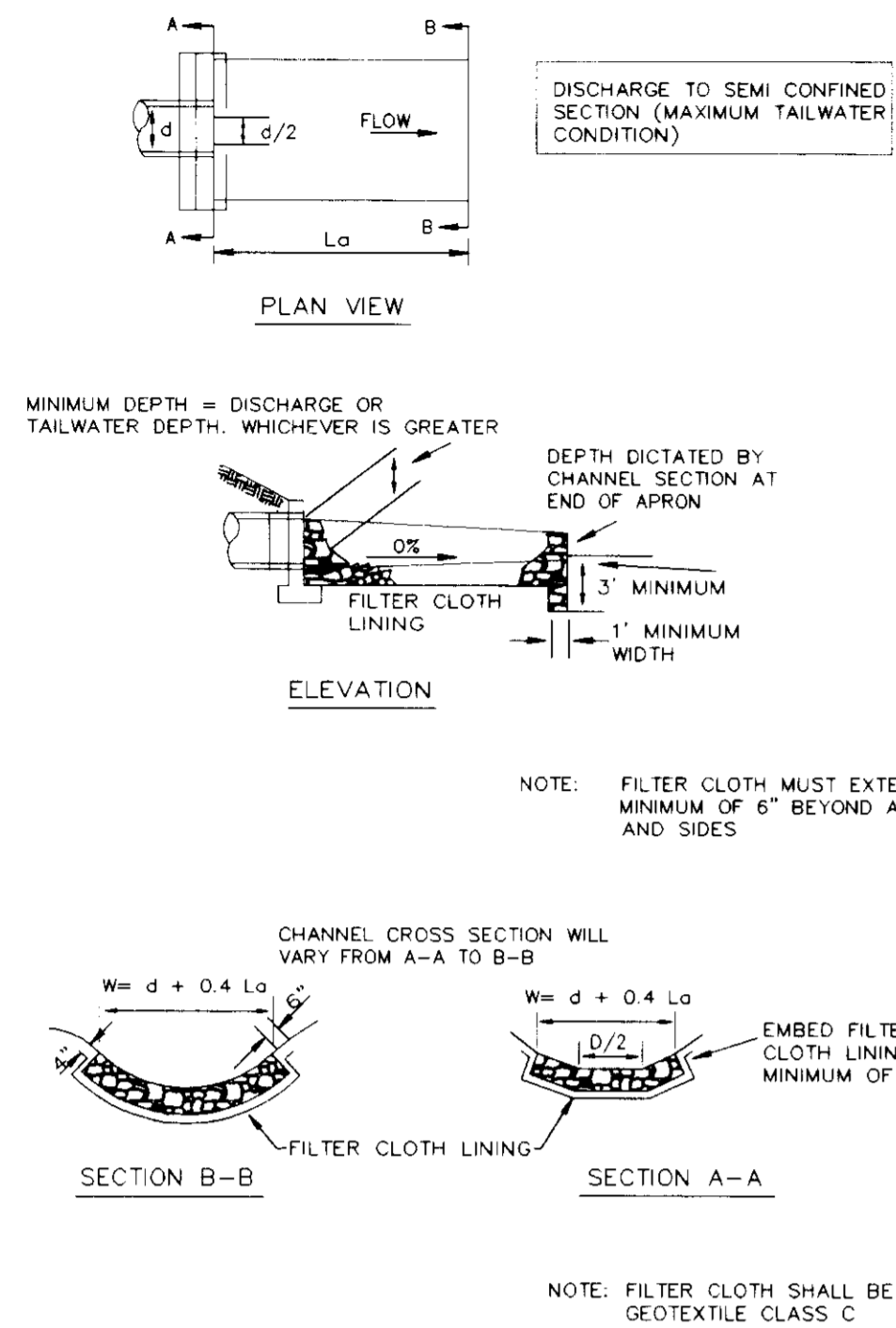
DATE: JULY 25, 1996

SCALE: NOT TO SCALE

DRAWING NO. 10 OF 28

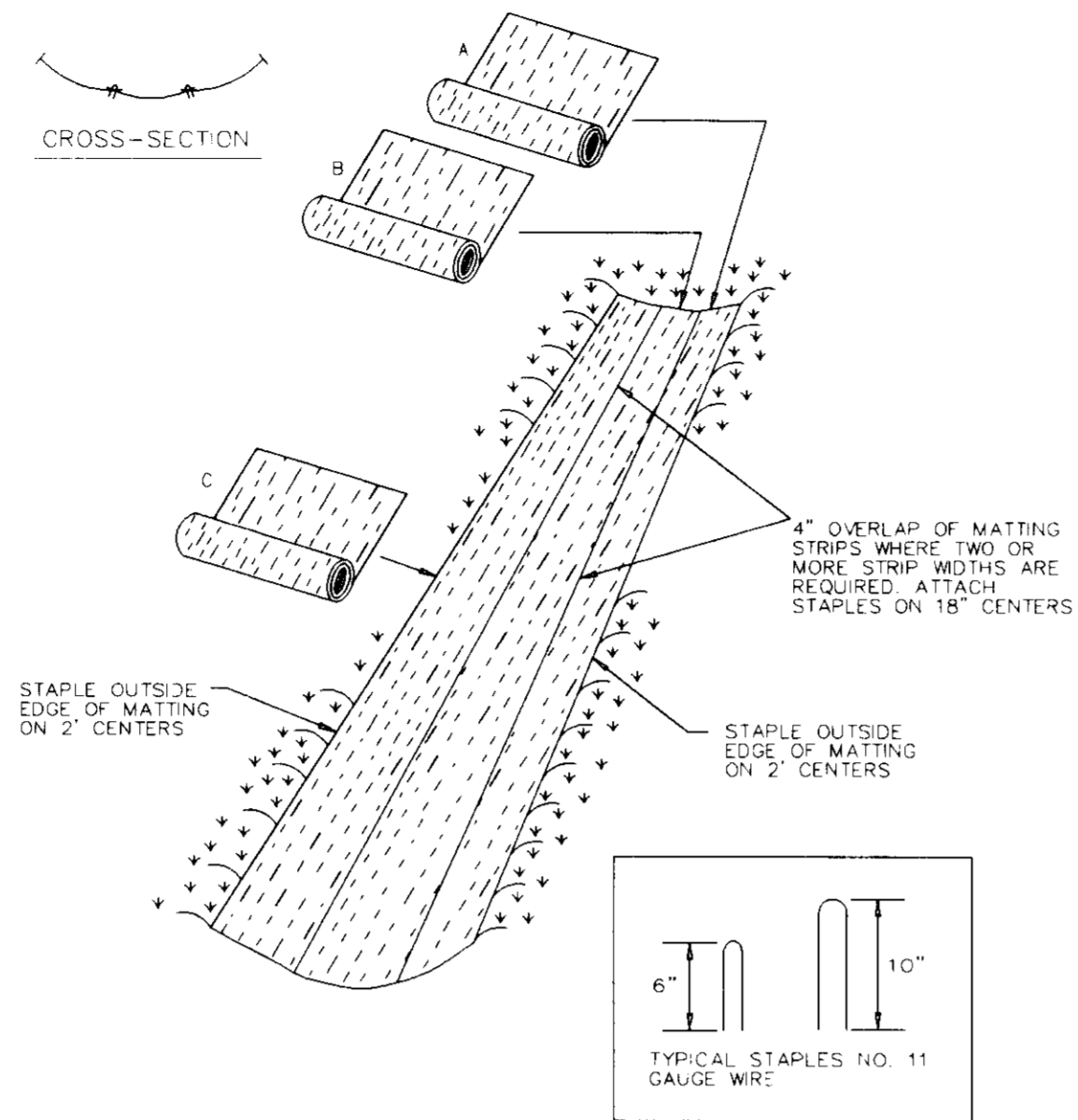
J. Sarell

DETAIL 25 - ROCK OUTLET PROTECTION I



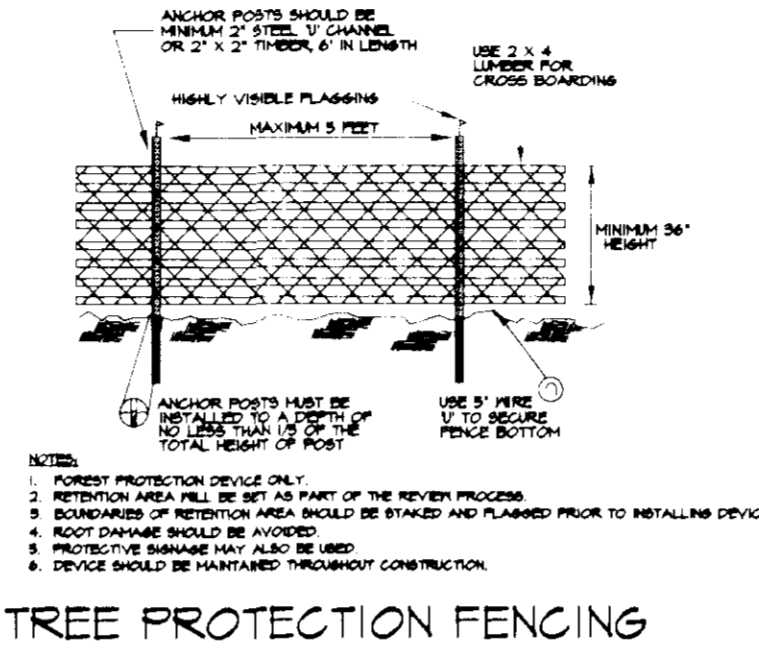
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE F-18-8 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 30 - EROSION CONTROL MATTING

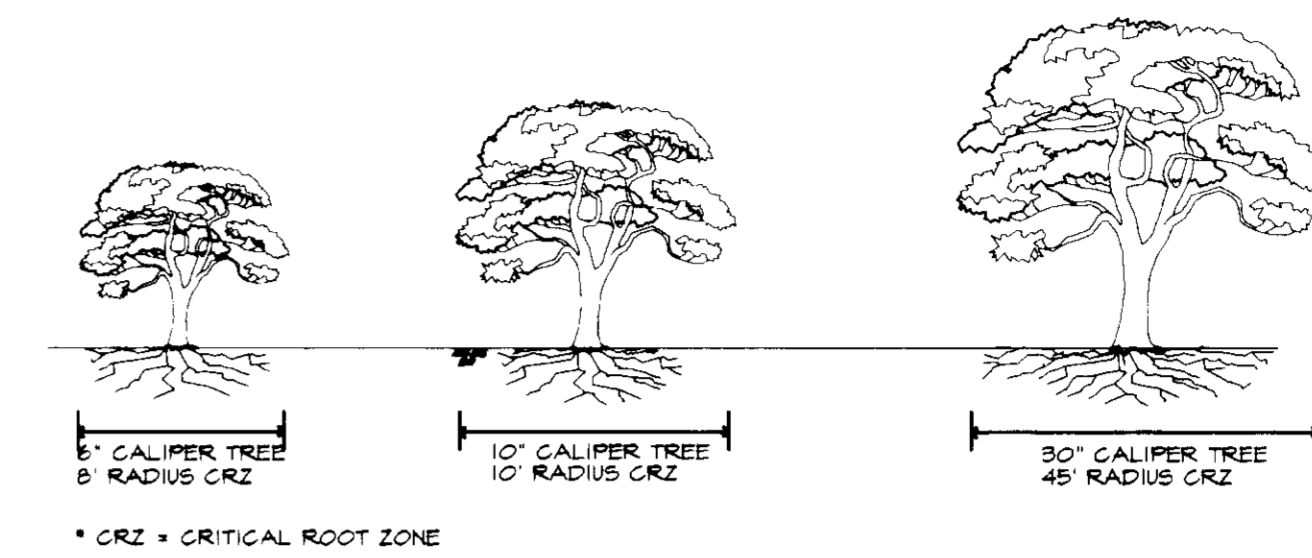


U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE G-22-2 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BLAZE ORANGE PLASTIC MESH



CRITICAL ROOT ZONE



TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDING PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOKED.

SOIL AMENDMENTS: APPLY 100 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS PER 1000 SQUARE FEET).

SEEDING: FROM 15000 MARCH 15 TO APRIL 30 AND FROM AUGUST 15 TO NOV 15, SEED WITH 2 1/2 BUSHES PER ACRE OF ANNUAL RYE (3 LBS PER 1000 SQ FT). FOR THE PERIOD FROM DECEMBER 15 TO FEBRUARY 15, SEED WITH 3 LBS PER ACRE OF WINTER RYEGRASS (2.0 LBS PER 1000 SQ FT). FOR THE PERIOD FROM 16 FEBRUARY TO 15 APRIL, SEED WITH 2 TONS PER ACRE OF WHEAT. ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOIL.

MULCHING: APPLY 1-2 TO 2 TONS PER ACRE (10 TO 90 LBS PER 1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING ANCHORING TOOL OR 2 1/2" GAL PER ACRE (5 GAL PER 1000 SQ FT) OF ENRICHED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FT OR HIGHER, USE 3 1/2" GAL PER ACRE (8 GAL PER 1000 SQ FT) OF ANCHORING.

REFER TO THE 1989 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

SUPPLEMENTAL INFORMATION

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

John R. Roberts 7/29/96 DATE
HOWARD SOIL CONSERVATION DISTRICT

BY THE DEVELOPER:

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

John R. Roberts 7/29/96 DATE
DEVELOPER

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Larell 7/24/96 DATE
ENGINEER

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

John W. Williams 7/29/96 DATE
NATURAL RESOURCES CONSERVATION SERVICE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

James H. Smith 8/1/96 DATE
DIRECTOR

Chris Williams 7/24/96 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION

John Williams 7/31/96 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT MIDDLE PATUXENT RIVER REVITALIZATION

AREA TAX MAP 15 PARCEL 32 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE GRADING & SED. CONT. DETAILS AND SPECIFICATIONS

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7/24/96 DATE

DESIGNED BY: DK, RR, CK

DRAWN BY: RR, CK

PROJECT NO: 95P113901

DATE: JULY 25, 1996

SCALE: NOT TO SCALE

J. Larell

DRAWING NO. 11 OF 28

ROCK OUTLET PROTECTION

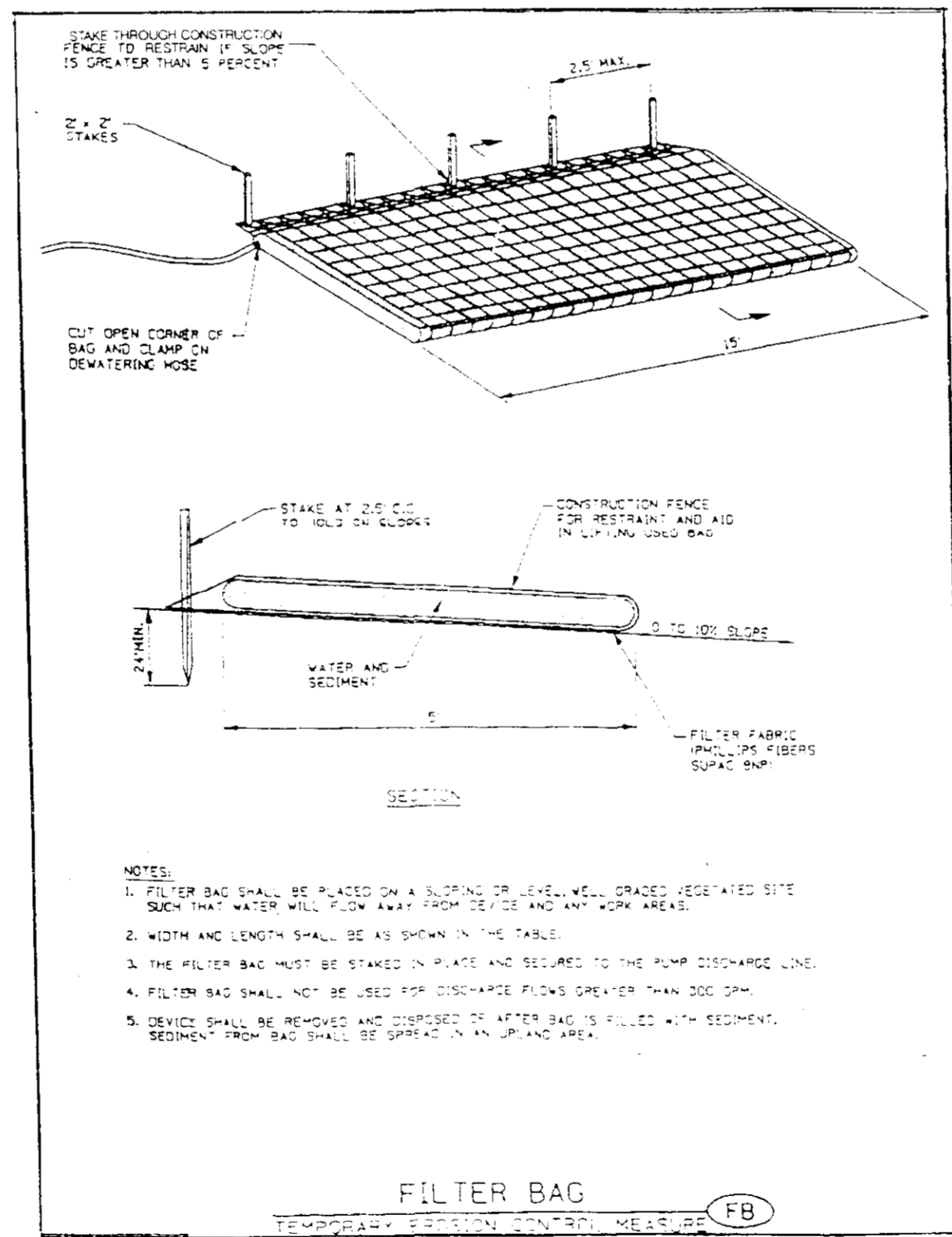
- Construction Specifications
- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
 - The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
 - Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.
 - Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
 - The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE F-18-8A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

EROSION CONTROL MATTING

- Construction Specifications
- Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
 - Staple the 4" overlap in the channel center using an 18" spacing between staples.
 - Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
 - Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
 - Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
 - The discharge end of the matting liner should be similarly secured with 2 double rows of staples.
- Note: If flow will enter from the edge of the matting then the area affected by the flow must be keyed-in.

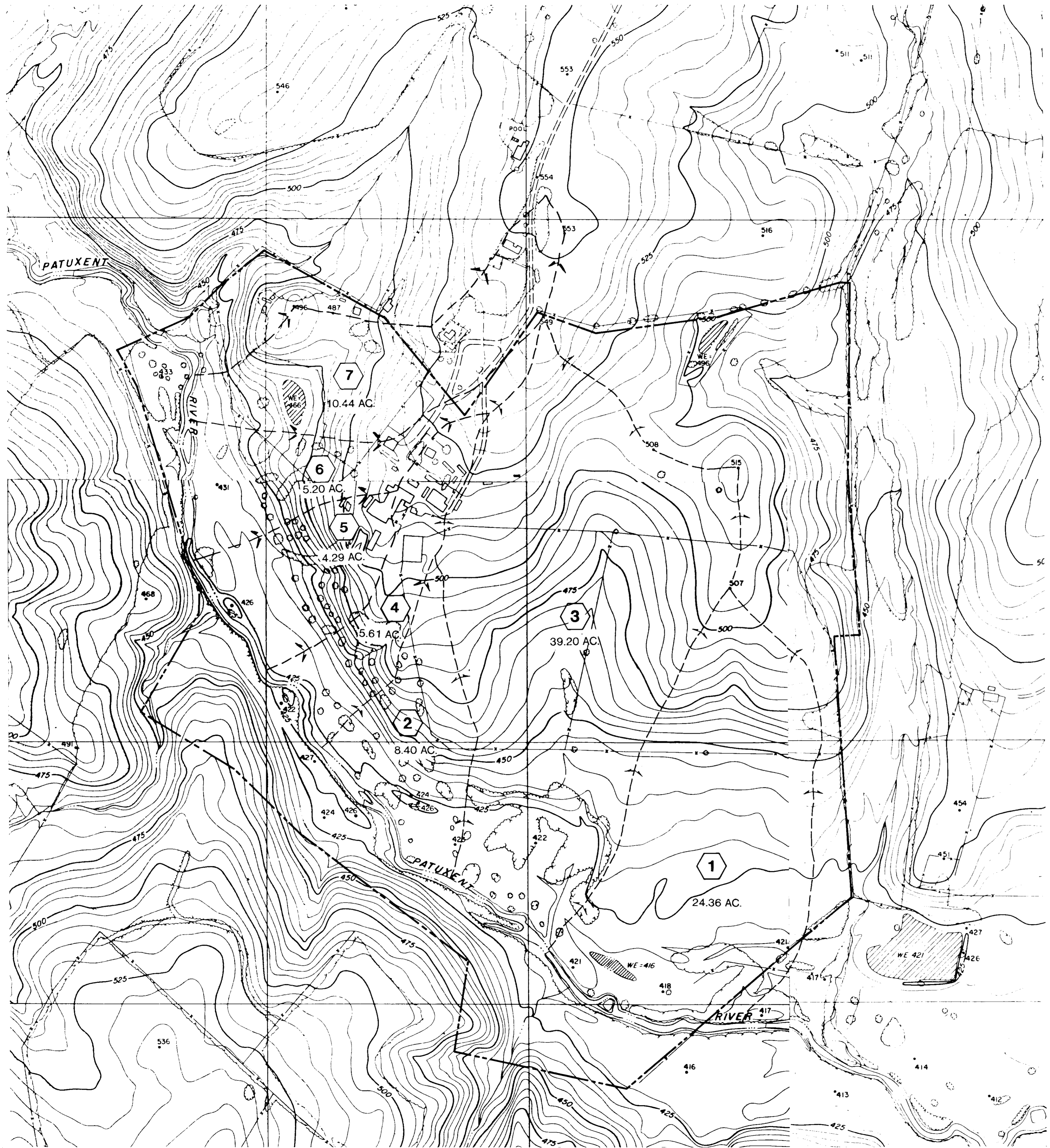
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE G-22-2A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



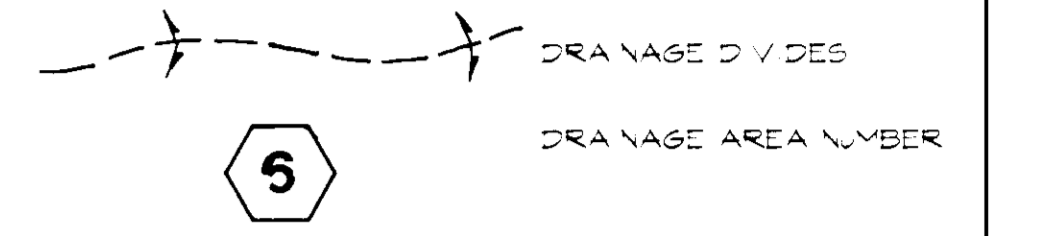
SEDIMENT CONTROL NOTES

- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL AND EROSION CONTROL, AND REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 17 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, Dikes, PERIMETER SLOPES AND ALL SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THE PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1991 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL AND EROSION CONTROL FOR PERMANENT SEEDINGS (SEC. 51), SOIL (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONG CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- 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.
- SITE ANALYSIS:

TOTAL AREA OF SITE	136.90 ACRES
AREA DISTURBED	35.61 ACRES
AREA TO BE ROOFED OR PAVED	0.00 ACRES
AREA TO BE VEGETATIVELY STABILIZED	35.61 ACRES
TOTAL CUT	60,000.00 CU. YDS.
TOTAL FILL	60,000.00 CU. YDS.
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE GRADING WILL BEGUN ONLY AFTER ALL PERIMETER SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED AND ARE IN A FUNCTIONING CONDITION.
- SEDIMENT WILL BE REMOVED FROM TRAPS WHEN ITS DEPTH REACHES CLEAN OUT ELEVATION SHOWN ON THE PLANS.
- CUT AND FILL QUANTITIES PROVIDED UNDER SITE ANALYSIS DO NOT REPRESENT BID QUANTITIES. THESE QUANTITIES DO NOT DISTINGUISH BETWEEN TOPSOIL, STRUCTURAL FILL OR EMBANKMENT MATERIAL, NOR DO THEY REFLECT CONSIDERATION OF UNDERCUTTING OR REMOVAL OF UNSUITABLE MATERIAL. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH SITE CONDITIONS WHICH MAY AFFECT THE WORK.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 AC., APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACKFILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.



LEGEND



SUPPLEMENTAL INFORMATION

BY THE DEVELOPER:
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A COURSE OF TRAINING APPROVED BY THE HOWARD COUNTY DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Richard R. Rupp 7.24.96
 DEVELOPER DATE

BY THE ENGINEER:
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

J. Farrell 7.24.96
 ENGINEER DATE

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.
[Signature] 7/27/96
 NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED - HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.
[Signature] 8/1/96
 DIRECTOR DATE
[Signature] 7/31/96
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] 7/31/96
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO. REVISION
 OWNER / DEVELOPER
 OPUS EAST LLC
 6107 DEVOUCCRAY BOULEVARD
 SUITE 50
 BELTERRA VILLAGE AND 2087
 30-493-4444

PROJECT: MIDDLE PATUXENT RIVER REVITALIZATION

AREA: TAX MAP 5 PARCEL 32
 3RD ELECT. DISTRICT
 HOWARD COUNTY MARYLAND

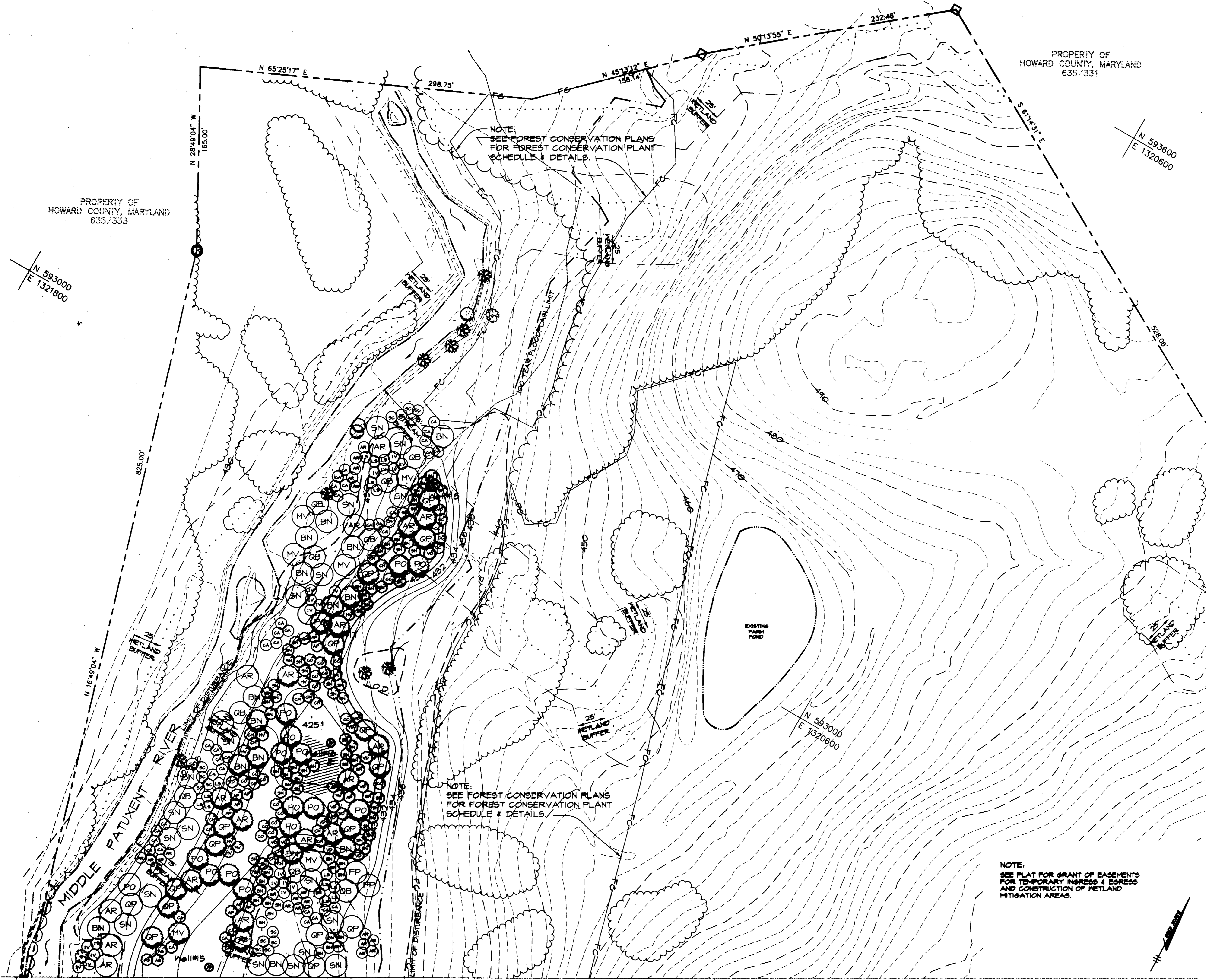
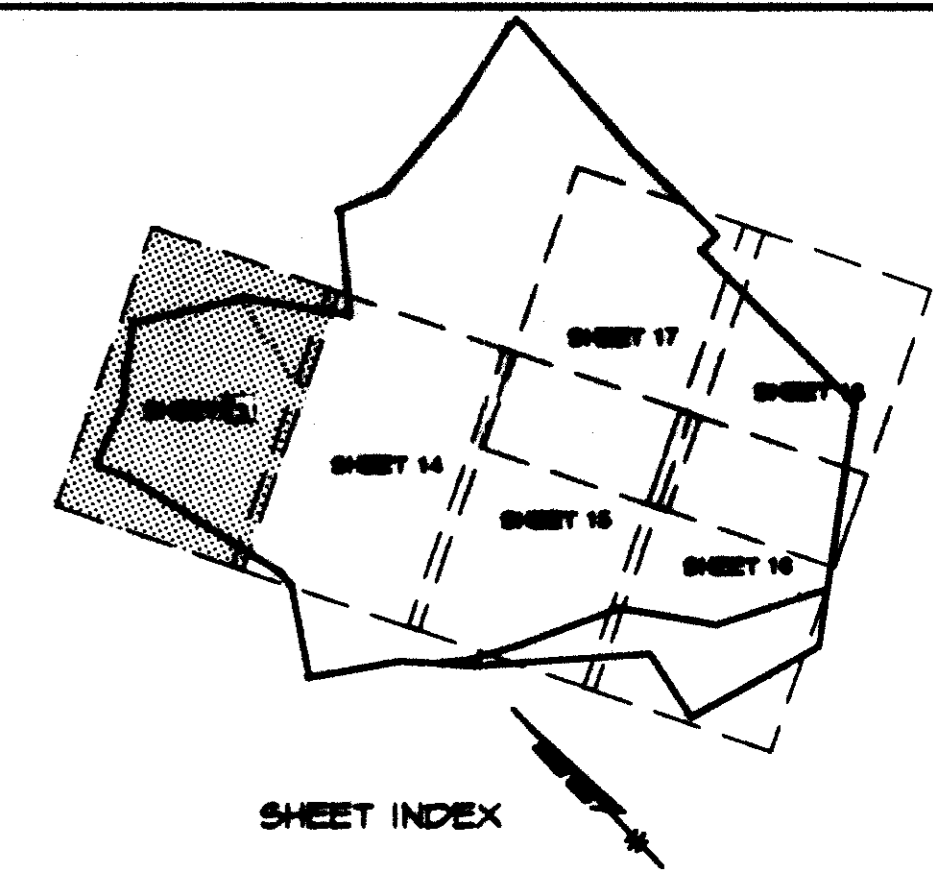
TITLE: DRAINAGE AREA MAP

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX: 410-997-9282

7.24.96
 DATE
 DESIGNED BY: CK
 DRAWN BY: RR, ML
 PROJECT NO: 95P113901
 DATE: JULY 25, 1996
 SCALE: 1" = 200'
 DRAWING NO. 12 OF 28
J. Farrell

PROPERTY OF
HOWARD COUNTY, MARYLAND
635/331

PROPERTY OF
HOWARD COUNTY, MARYLAND
635/333



NOTE:
SEE FOREST CONSERVATION PLANS
FOR FOREST CONSERVATION PLANT
SCHEDULE & DETAILS.

NOTE:
SEE FOREST CONSERVATION PLANS
FOR FOREST CONSERVATION PLANT
SCHEDULE & DETAILS.

NOTE:
SEE PLAT FOR GRANT OF EASEMENTS
FOR TEMPORARY INGRESS & EGRESS
AND CONSTRUCTION OF WETLAND
MITIGATION AREAS.

SUPPLEMENTAL INFORMATION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

[Signature] DIRECTOR DATE *7/25/96*
[Signature] CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE *7/25/96*
[Signature] CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE *7/25/96*

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-415-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15, PARCEL 92
 3RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **PLANTING PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 6818 Centre Park Drive • Suite 200 • Columbia, MD 21046
 410-997-8900 FAX: 410-997-9282

DATE 7-24-96	DESIGNED BY: DK, RR, CK
 DOUGLAS M. ROPECK COMAR 08.19.06.01	DRAWN BY: RR, CK
	PROJECT NO: 95P113901
	DATE: JULY 25, 1996
SCALE: 1" = 40'	DRAWING NO. 13 OF 28

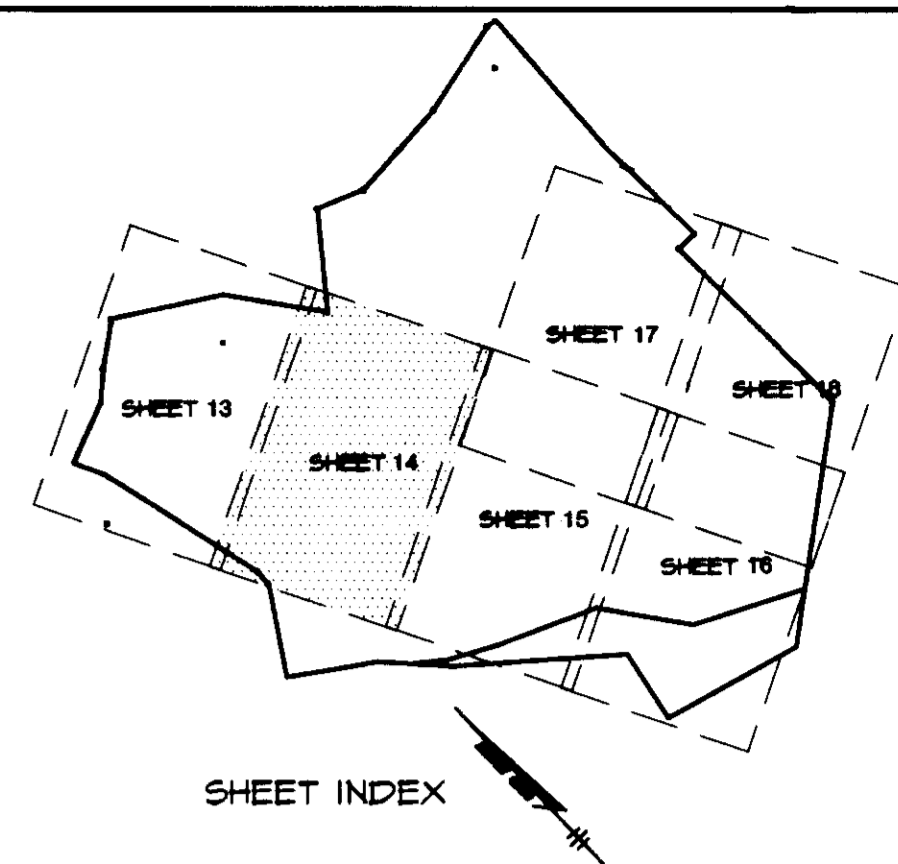
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SEE SHEET 14 OF 28

MATCH LINE

SEE SHEET 13 OF 28

NOTE:
SEE PLAT FOR GRANT OF EASEMENTS FOR
TEMPORARY INGRESS & EGRESS AND
CONSTRUCTION OF WETLAND
MITIGATION AREAS.



NOTE:
SEE FOREST CONSERVATION PLAN
FOR FOREST CONSERVATION PLANT
SCHEDULE & DETAILS.

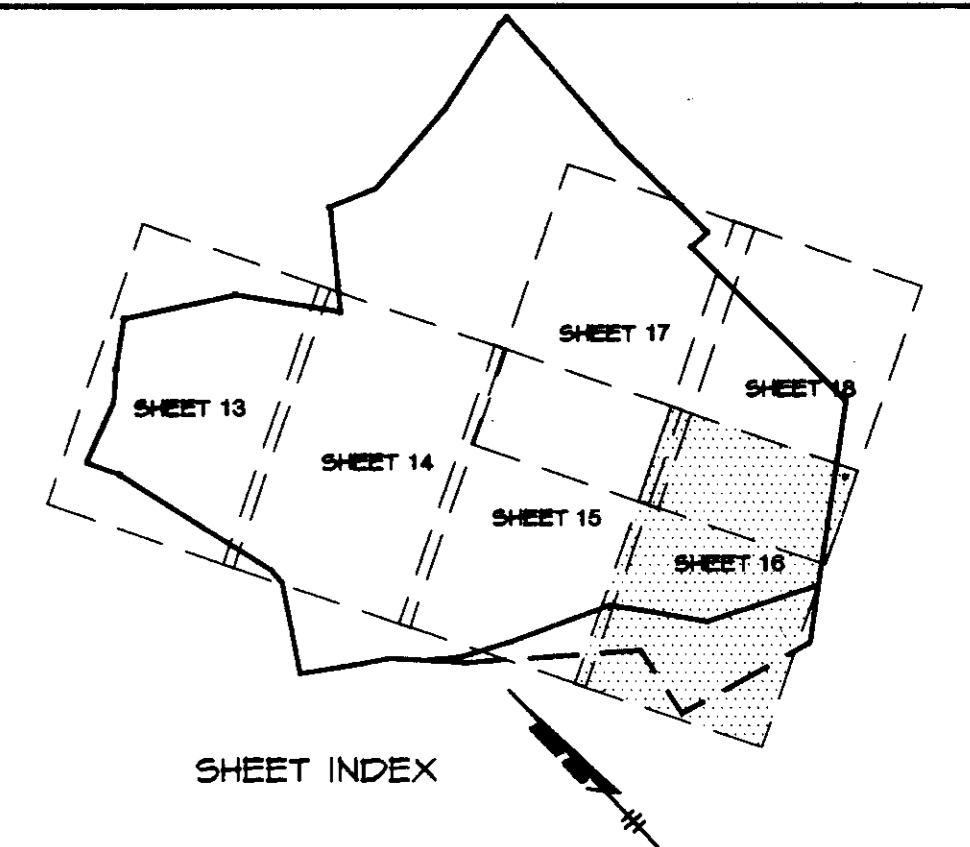
SUPPLEMENTAL INFORMATION	
APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.	
<i>[Signature]</i> DIRECTOR	8/1/96 DATE
<i>[Signature]</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	7/21/96 DATE
<i>[Signature]</i> CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH	7/29/96 DATE
DATE NO.	REVISION
OWNER / DEVELOPER	
OPUS EAST, L.L.C. 6701 DEMOCRACY BOULEVARD SUITE 510 BETHESDA, MARYLAND 20817 301-443-4444	
PROJECT MIDDLE PATUXENT RIVER REVITALIZATION	
AREA TAX MAP 15 PARCEL 92 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND	
TITLE PLANTING PLAN	
RIEMER MUEGGE & ASSOCIATES, INC. ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045 410-997-8900 FAX : 410-997-9282	
7-24-96 DATE	DESIGNED BY : DK, RR, CK DRAWN BY: RR, CK PROJECT NO : 95P113901 DATE : JULY 25, 1996 SCALE : 1" = 40' DRAWING NO. 14 OF 28
<i>[Signature]</i> DOUGLAS R. KOPECK COMAR 08.19.06.01	

MATCH LINE

SEE SHEET 15 OF 28

MATCH LINE

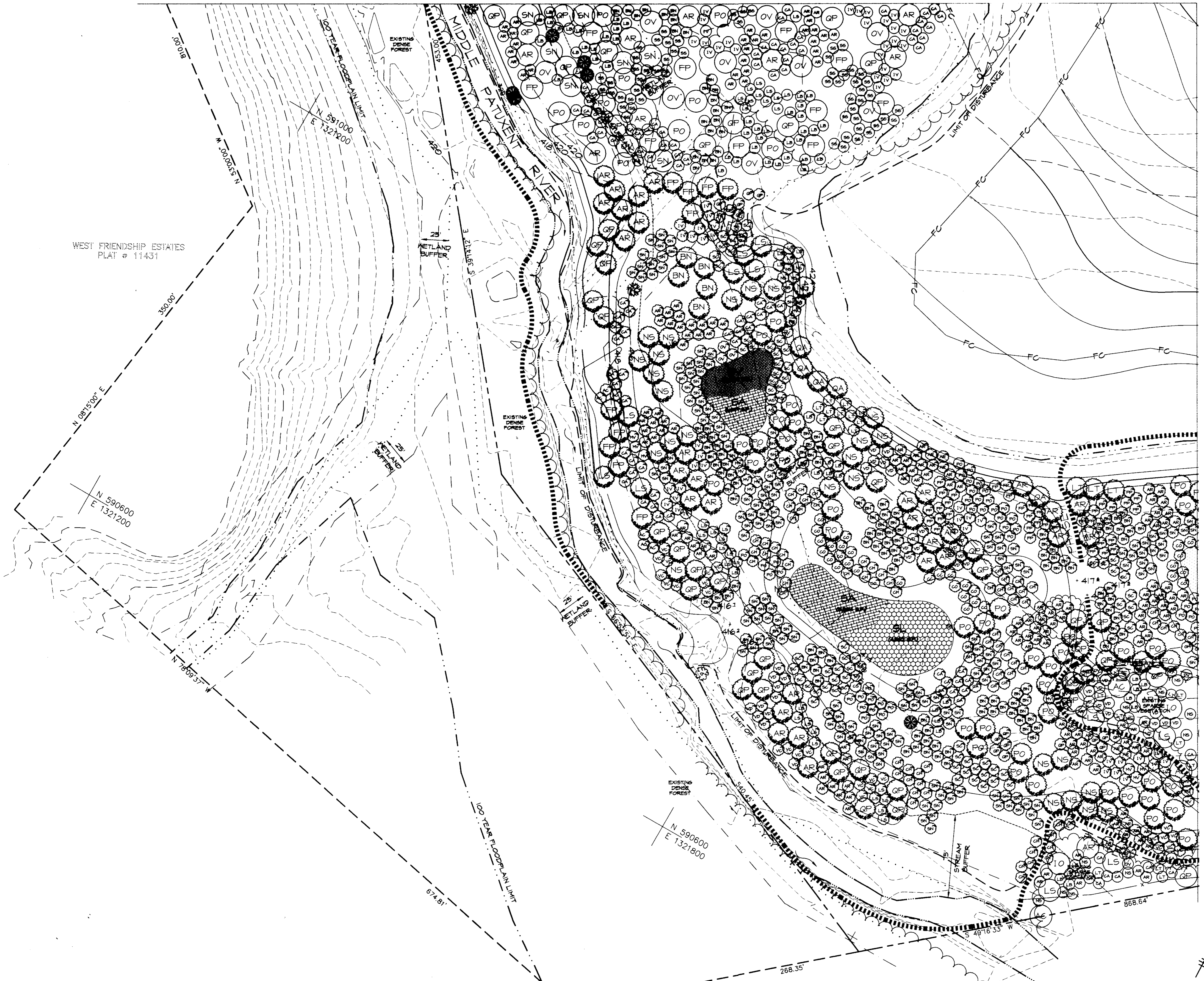
SEE SHEET 15 OF 28



SHEET INDEX

SEE SHEET 18 OF 28

WEST FRIENDSHIP ESTATES
PLAT # 11431



SUPPLEMENTAL INFORMATION

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

[Signature] 8/1/96
DIRECTOR DATE

[Signature] 7/15/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO. REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 310
BETHESDA, MARYLAND 20817
301-443-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **PLANTING PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

7-24-96
DATE

DESIGNED BY : DK, RR, CK

DRAWN BY: RR, CK

PROJECT NO : 95P113901

DATE : JULY 25, 1996

SCALE : 1" = 40'

DRAWING NO. 18 OF 28

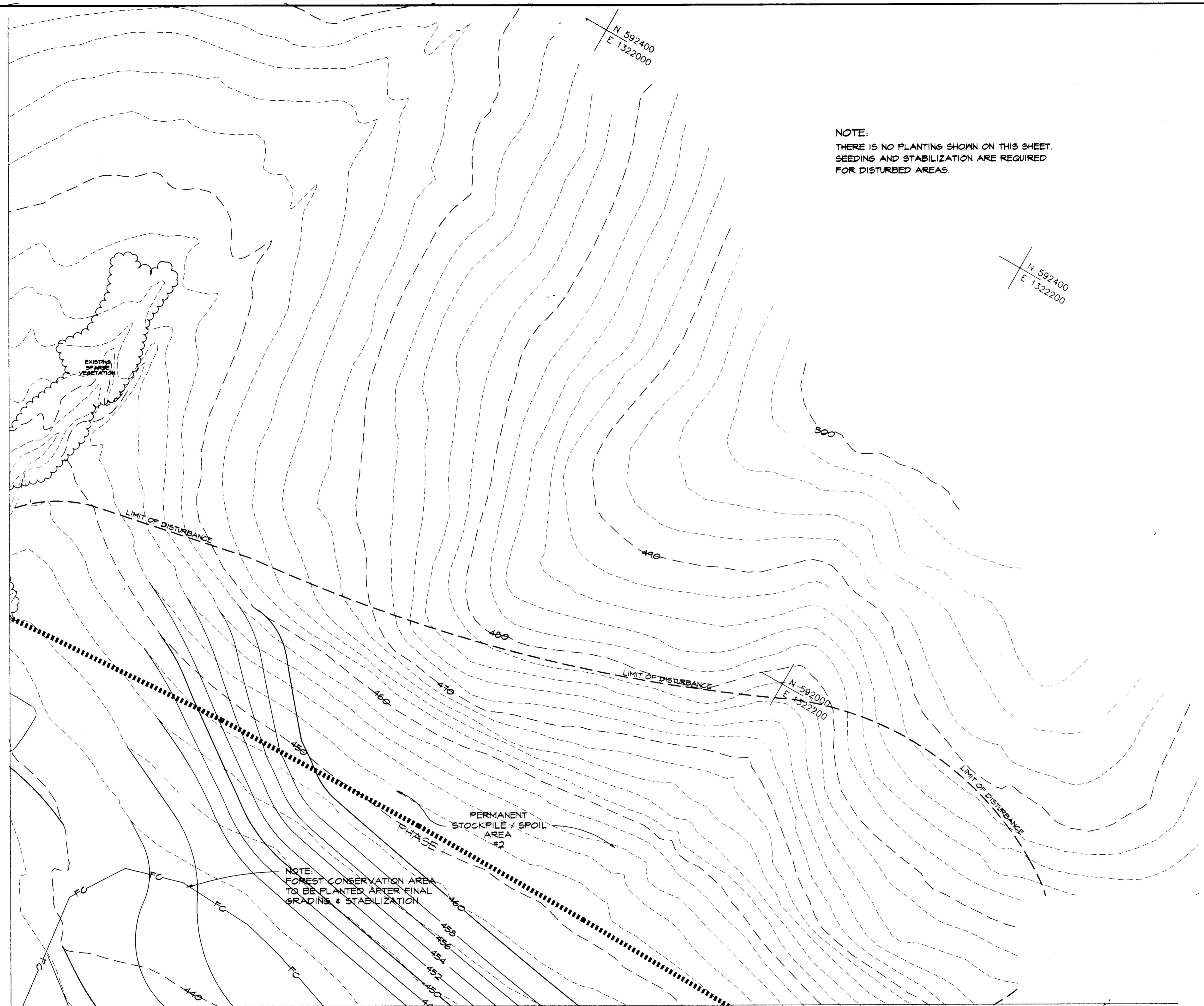
[Signature]
DOUGLAS R. KOPECK
COMAR 08.19.06.01

SEE SHEET 15 OF 28

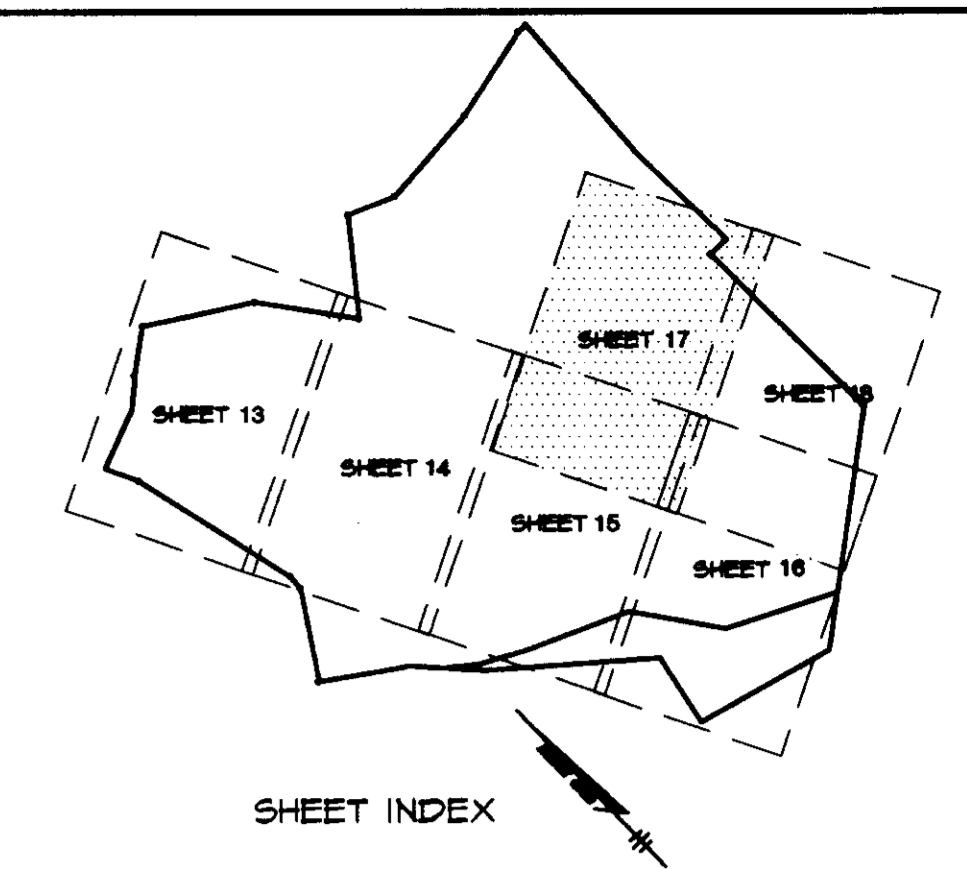
MATCH LINE

MATCH LINE

SEE SHEET 18 OF 28



NOTE:
THERE IS NO PLANTING SHOWN ON THIS SHEET.
SEEDING AND STABILIZATION ARE REQUIRED
FOR DISTURBED AREAS.



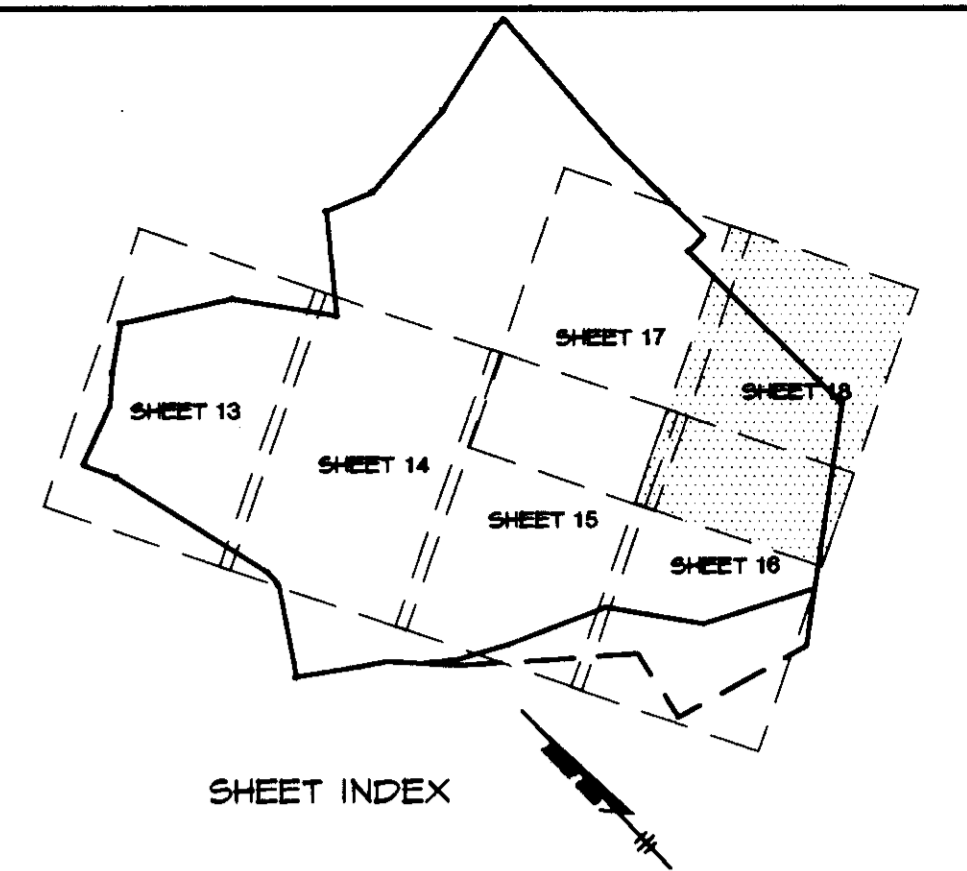
SUPPLEMENTAL INFORMATION	
APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.	
DIRECTOR <i>[Signature]</i>	DATE 8/1/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION <i>[Signature]</i>	DATE 7/24/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH <i>[Signature]</i>	DATE 7/31/96
DATE NO.	REVISION
OWNER / DEVELOPER	
OPUS EAST, LLC. 6701 DEMOCRACY BOULEVARD SUITE 510 BETHESDA, MARYLAND 20817 301-493-4444	
PROJECT MIDDLE PATUXENT RIVER REVITALIZATION	
AREA TAX MAP 15 PARCEL 32 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND	
TITLE PLANTING PLAN	
RIEMER MUEGGE & ASSOCIATES, INC. ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045 410-997-8900 FAX : 410-997-9282	
DATE 7-24-96	DESIGNED BY : DK, RR, CK
	DRAWN BY: RR, CK
	PROJECT NO : 95P113901
	DATE : JULY 25, 1996
	SCALE : 1" = 40'
	DRAWING NO. 17 OF 28

[Signature]
DOUGLAS R. KOPECK
COMAR 08.19.06.01

MATCH LINE

SEE SHEET 17 OF 28

SEE SHEET 16 OF 28



MATCH LINE

SUPPLEMENTAL INFORMATION		
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.		
DIRECTOR: <i>[Signature]</i>	DATE: 8/1/96	
CHIEF, DEVELOPMENT ENGINEERING DIVISION: <i>[Signature]</i>	DATE: 7/31/96	
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH: <i>[Signature]</i>	DATE: 7/31/96	
DATE	NO.	REVISION
OWNER / DEVELOPER		
OPUS EAST, L.L.C. 6707 DEMOCRACY BOULEVARD SUITE 510 BETHESDA, MARYLAND 20817 301-443-4444		
PROJECT: MIDDLE PATUXENT RIVER REVITALIZATION		
AREA: TAX MAP 15 PARCEL 32 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE: PLANTING PLAN		
RIEMER MUEGGE & ASSOCIATES, INC. ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045 410-997-8900 FAX: 410-997-9282		
DATE: 7-24-96	DESIGNED BY: DK, RR, CK	
	DRAWN BY: RR, CK	
	PROJECT NO: 95P113901	
	DATE: JULY 25, 1996	
	SCALE: 1" = 40'	
	DRAWING NO: 18 OF 28	

WETLAND CREATION AREA PHASE I

ENHANCEMENT AREA PHASE I

WETLAND CREATION AREA PHASE II

KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
TREES					
AR	20	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
AR	105	ACER RUBRUM Red Maple	10-24" HT.	CONT.	FAC
BN	5	BETULA NIGRA River Birch	1" CAL.	B4B/CONT.	FACH
BN	42	BETULA NIGRA River Birch	10-24" HT.	CONT.	FACH
FP	51	FRAXINUS PENNSYLVANICA Green Ash	1" CAL.	B4B/CONT.	FAC
LT	10	LIRIODENDRON TULIPIFERA Tulip Poplar	10-24" HT.	CONT.	FAC-
LS	7	LIQUIDAMBAR STYRACIFLUA Sweet gum	1" CAL.	B4B/CONT.	FAC
LS	25	LIQUIDAMBAR STYRACIFLUA Sweet gum	10-24" HT.	CONT.	FAC
NS	27	NYSSA SYLVATICA Black Gum	1" CAL.	B4B/CONT.	FACH-
NS	5	NYSSA SYLVATICA Black Gum	10-24" HT.	CONT.	FACH-
PO	41	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH+
PO	30	PLATANUS OCCIDENTALIS American Sycamore	10-24" HT.	CONT.	FACH+
QA	5	QUERCUS ALBA White Oak	1" CAL.	B4B/CONT.	FACU
QP	24	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH-
QP	16	QUERCUS PALUSTRIS Pin Oak	10-24" HT.	CONT.	FACH-
SN	142	SALIX NIGRA Black Willow	10-24" HT.	CONT.	FACH+
AC	6	AHELANCHIER CANADENSIS Serviceberry	10-24" HT.	CONT.	FAC
CC	3	CERIS CANADENSIS Red Bud	10-24" HT.	CONT.	FAC-
MV	20	MAGNOLIA VIRGINIANA Sweetbay Magnolia	10-24" HT.	CONT.	FACH+
OV	3	OSTRYA VIRGINIANA Ironwood	10-24" HT.	CONT.	FACH+
SHRUBS					
AS	3	ALNUS SERRULATA Smooth Alder	10-24" HT.	CONT.	OBL
CA	40	CLETHRA ALNIFOLIA Clethra	10-24" HT.	CONT.	FAC+
CH	65	CORNUS AMOMUM Silky Dogwood	10-24" HT.	CONT.	FACH
CS	3	CORNUS SERICEA Redtwig Dogwood	10-24" HT.	CONT.	FACH
CO	22	CEPHALANTHUS OCCIDENTALIS Buttonbush	10-24" HT.	CONT.	OBL
IV	35	ILEX VERTICELLATA Highbush Blueberry	10-24" HT.	CONT.	FACH+
LB	10	LINDERA BENZOIN Spice Bush	10-24" HT.	CONT.	FACH-
SC	65	SAMBUCUS CANADENSIS Elderberry	10-24" HT.	CONT.	FACH+
VC	30	VACCINIUM CORYMBOSUM Highbush Blueberry	10-24" HT.	CONT.	FACH
VD	26	VIBURNUM DENTATUM Arrowwood Viburnum	10-24" HT.	CONT.	FACH
EMERGENT					
SL	580	SAGITTARIA LATIFOLIA Duck Potato	PEAT POT	CONT.	FACH
SA	600	SCIRPUS AMERICANUS Three-Square Bulrush	PEAT POT	CONT.	FACH+
SV	250	SCIRPUS VALIDUS Soft Stem Bulrush	PEAT POT	CONT.	OBL

* NOTE:

BARE ROOT PLANTS SHALL BE RANDOMLY INTERSPERSED WITH PLANTS SHOWN ON PLANTING PLAN. NO MORE THAN 10 OF ANY ONE SPECIES SHALL BE PLANTED TOGETHER IN SUCCESSION.

*BARE ROOT

SHRUBS

TREES

TREES

KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
TREES					
AR	44	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
AR	71	ACER RUBRUM Red Maple	10-24" HT.	CONT.	FAC
BN	54	BETULA NIGRA River Birch	10-24" HT.	CONT.	FACH
FP	34	FRAXINUS PENNSYLVANICA Green Ash	1" CAL.	B4B/CONT.	FAC
LS	47	LIQUIDAMBAR STYRACIFLUA Sweet gum	10-24" HT.	CONT.	FAC
LT	25	LIRIODENDRON TULIPIFERA Tulip Poplar	10-24" HT.	CONT.	FAC-
NS	25	NYSSA SYLVATICA Black Gum	1" CAL.	B4B/CONT.	FACH
PO	35	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH
QP	21	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH
QP	26	QUERCUS PALUSTRIS Pin Oak	10-24" HT.	CONT.	FACH
SN	13	SALIX NIGRA Black Willow	24-36" HT.	CONT.	FACH+
SN	5	SALIX NIGRA Black Willow	10-24" HT.	CONT.	FACH+
AC	5	AHELANCHIER CANADENSIS Serviceberry	1" CAL.	CONT.	FACH+
DV	10	DIOSPYROS VIRGINIANA Persimmon	1" CAL.	CONT.	FACH+
IO	2	ILEX OPACA American Holly	1" CAL.	CONT.	FACH+
OV	21	OSTRYA VIRGINIANA Ironwood	1" CAL.	CONT.	FACH+
SHRUBS					
CA	206	CLETHRA ALNIFOLIA Summersweet	10-24" HT.	CONT.	FAC+
IV	120	ILEX VERTICELLATA Highbush Blueberry	10-24" HT.	CONT.	FACH+
LB	146	SAMBUCUS CANADENSIS Elderberry	10-24" HT.	CONT.	FACH+
SS	150	SALIX SERICEA Silky Willow	10-24" HT.	CONT.	FACH+
VD	23	VIBURNUM DENTATUM Arrowwood Viburnum	10-24" HT.	CONT.	FACH+
*BARE ROOT					
	100	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
	100	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
	100	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH
	100	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
	50	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
	50	VIBURNUM DENTATUM Arrowwood Viburnum	12-14" HT.	BR	FAC

KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
TREES					
AR	11	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
AR	100	ACER RUBRUM Red Maple	10-24" HT.	CONT.	FAC
BN	3	BETULA NIGRA River Birch	1" CAL.	B4B/CONT.	FACH
BN	61	BETULA NIGRA River Birch	10-24" HT.	CONT.	FACH
FP	55	FRAXINUS PENNSYLVANICA Green Ash	10-24" HT.	CONT.	FAC
LT	25	LIRIODENDRON TULIPIFERA Tulip Poplar	1" CAL.	B4B/CONT.	FAC-
LS	17	LIQUIDAMBAR STYRACIFLUA Sweet gum	1" CAL.	B4B/CONT.	FAC
LS	35	LIQUIDAMBAR STYRACIFLUA Sweet gum	10-24" HT.	CONT.	FAC
PO	17	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH+
PO	60	PLATANUS OCCIDENTALIS American Sycamore	10-24" HT.	CONT.	FACH+
QP	14	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH-
SN	60	SALIX NIGRA Black Willow	10-24" HT.	CONT.	FACH+
SHRUBS					
CA	30	CLETHRA ALNIFOLIA Clethra	10-24" HT.	CONT.	FAC+
CH	10	CORNUS AMOMUM Silky Dogwood	10-24" HT.	CONT.	FACH
CS	20	CORNUS SERICEA Redtwig Dogwood	10-24" HT.	CONT.	FACH
CO	20	CEPHALANTHUS OCCIDENTALIS Buttonbush	10-24" HT.	CONT.	OBL
IV	20	ILEX VERTICELLATA Highbush Blueberry	10-24" HT.	CONT.	FACH+
SC	50	SAMBUCUS CANADENSIS Elderberry	10-24" HT.	CONT.	FACH+
VC	35	VACCINIUM CORYMBOSUM Highbush Blueberry	10-24" HT.	CONT.	FACH
VD	26	VIBURNUM DENTATUM Arrowwood Viburnum	10-24" HT.	CONT.	FACH
EMERGENT					
CS	685	CAREX STRICTA Tussock Sedge	PEAT POT	CONT.	FACH
SA	304	SCIRPUS AMERICANUS Three-Square Bulrush	PEAT POT	CONT.	FACH+
SV	256	SCIRPUS VALIDUS Soft Stem Bulrush	PEAT POT	CONT.	OBL

ENHANCEMENT AREA PHASE II

KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
TREES					
AR	11	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
AR	24	ACER RUBRUM Red Maple	10-24" HT.	CONT.	FAC
LS	8	LIQUIDAMBAR STYRACIFLUA Sweet gum	1" CAL.	CONT.	FAC
LT	24	LIRIODENDRON TULIPIFERA Tulip Poplar	10-24" HT.	CONT.	FAC-
NS	24	NYSSA SYLVATICA Black Gum	10-24" HT.	B4B/CONT.	FACH
QP	10	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH
AC	4	AHELANCHIER CANADENSIS Serviceberry	1" CAL.	CONT.	FACH+
DV	8	DIOSPYROS VIRGINIANA Persimmon	10-24" HT.	CONT.	FACH+
IO	2	ILEX OPACA American Holly	1" CAL.	CONT.	FACH+
SHRUBS					
CA	15	CLETHRA ALNIFOLIA Summersweet	10-24" HT.	CONT.	FAC+
LB	20	SAMBUCUS CANADENSIS Elderberry	10-24" HT.	CONT.	FACH+
VD	22	VIBURNUM DENTATUM Arrowwood Viburnum	10-24" HT.	CONT.	FACH+
*BARE ROOT					
	15	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
	15	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
	15	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH
	15	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
	8	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
	8	VIBURNUM DENTATUM Arrowwood Viburnum	12-14" HT.	BR	FAC

SUPPLEMENTAL INFORMATION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

[Signature] 8/1/96
DIRECTOR DATE

[Signature] 7/31/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER

OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-498-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **PLANT LIST (PHASE I AND PHASE II)**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96
DATE

DESIGNED BY: DK, RR, CK
DRAWN BY: RR, CK
PROJECT NO: 95P113901
DATE: JULY 25, 1996
SCALE: NO SCALE
DRAWING NO. 19 OF 28

[Signature]
DOUGLAS R. KOPECK
COMAR 08.19.06.01

WETLAND CREATION AREA PHASE III

TREES	KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
	AR	18	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
	BN	16	BETULA NIGRA River Birch	1" CAL.	B4B/CONT.	FACH
	PO	19	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH+
	SN	65	SALIX NIGRA Black Willow	18-24" HT.	CONT.	FACH
	QP	17	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH
	CA	10	CORYLUS AMERICANA American Hazelnut	18-24" HT.	CONT.	FAC+
	CC	10	CERCIS CANADENSIS Red Bud	18-24" HT.	CONT.	FAC-
	MV	4	MAGNOLIA VIRGINIANA Sweetbay Magnolia	1" CAL.	CONT.	FACH+
	MV	14	MAGNOLIA VIRGINIANA Sweetbay Magnolia	18-24" HT.	CONT.	FACH+
	OV	6	OSTRYA VIRGINIANA Ironwood	18-24" HT.	CONT.	FACH+
SHRUBS	AS	20	ALNUS SERRULATA Smooth Alder	18-24" HT.	CONT.	OBL
	AP	24	ARONIA PRUNIFOLIA Red Chokecherry	18-24" HT.	CONT.	FACH
	CO	16	CEPHALANTHUS OCCIDENTALIS Buttonbush	18-24" HT.	CONT.	OBL
	CH	28	CORNUS AMOMUM Silky Dogwood	18-24" HT.	CONT.	FACH
	VD	27	VIBURNUM DENTATUM Arrowwood Viburnum	18-24" HT.	CONT.	FAC
EMERGENT	CS	78	CAREX STRICTA Tussock Sedge	PEAT POT	CONT.	OBL
	JE	178	JUNCUS EFFUSUS Soft Rush	PEAT POT	CONT.	FACH+
	PV	160	PELTANDRA VIRGINICA Arrow Arum	PEAT POT	CONT.	OBL
	SP	56	SCIRPUS CYPERINUS Hoopgrass	PEAT POT	CONT.	FACH+
	SC	127	SCIRPUS PUNGENS Common three-square	PEAT POT	CONT.	FACH
*BARE ROOT		20	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
		20	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
		20	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH+
		20	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
		20	QUERCUS PALUSTRIS Pin Oak	12-14" HT.	BR	FACH
		50	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
		50	CORNUS AMOMUM Silky Dogwood	12-14" HT.	BR	FACH

ENHANCEMENT AREA PHASE III

TREES	KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
	AR	13	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
	AR	55	ACER RUBRUM Red Maple	18-24" HT.	CONT.	FAC
	BN	40	BETULA NIGRA River Birch	18-24" HT.	CONT.	FACH
	FP	10	FRAXINUS PENNSYLVANICA Green Ash	1" CAL.	B4B/CONT.	FAC
	LS	50	LIQUIDAMBAR STYRACIFLUA Sweet Gum	18-24" HT.	CONT.	FAC
	PO	11	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH
	QB	13	QUERCUS BICOLOR SWAMP WHITE OAK	1" CAL.	CONT.	FACH
	QP	13	QUERCUS PALUSTRIS Pin Oak	18-24" HT.	CONT.	FACH
	SN	31	SALIX NIGRA Black Willow	24-36" HT.	CONT.	FACH+
	SN	62	SALIX NIGRA Black Willow	18-24" HT.	B4B/CONT.	FACH+
	MV	7	MAGNOLIA VIRGINIANA Sweetbay Magnolia	1" CAL.	CONT.	FACH+
	OV	21	OSTRYA VIRGINIANA Ironwood	1" CAL.	CONT.	FACH+
SHRUBS	CA	82	CLETHRA ALNIFOLIA Summersweet	18-24" HT.	CONT.	FAC+
	IV	69	ILEX VERTICILLATA Winterberry	18-24" HT.	CONT.	FACH+
	SC	64	SAMBUCUS CANADENSIS Elderberry	18-24" HT.	CONT.	FACH+
*BARE ROOT		105	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
		100	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
		100	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH
		100	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
		50	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
		50	VIBURNUM DENTATUM Arrowwood Viburnum	12-14" HT.	BR	FAC

WETLAND CREATION AREA PHASE IV

TREES	KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
	AR	22	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
	BN	3	BETULA NIGRA River Birch	1" CAL.	B4B/CONT.	FACH
	PO	10	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH+
	SN	15	SALIX NIGRA Black Willow	18-24" HT.	CONT.	FACH
	QB	5	QUERCUS BICOLOR Swamp White Oak	1" CAL.	B4B/CONT.	FACH
	QP	9	QUERCUS PALUSTRIS Pin Oak	1" CAL.	B4B/CONT.	FACH-
	CC	3	CERCIS CANADENSIS Red Bud	18-24" HT.	CONT.	FAC-
	MV	8	MAGNOLIA VIRGINIANA Sweetbay Magnolia	18-24" HT.	CONT.	FACH+
	OV	12	OSTRYA VIRGINIANA Ironwood	18-24" HT.	CONT.	FACH+
SHRUBS	AS	15	ALNUS SERRULATA Smooth Alder	18-24" HT.	CONT.	OBL
	AP	10	ARONIA PRUNIFOLIA Red Chokecherry	18-24" HT.	CONT.	FACH
	CO	40	CEPHALANTHUS OCCIDENTALIS Buttonbush	18-24" HT.	CONT.	OBL
	CH	27	CORNUS AMOMUM Silky Dogwood	18-24" HT.	CONT.	FACH
	SC	10	SAMBUCUS CANADENSIS Elderberry	18-24" HT.	CONT.	FACH+
	VD	7	VIBURNUM DENTATUM Arrowwood Viburnum	18-24" HT.	CONT.	FAC
EMERGENT	CS	1090	CAREX STRICTA Tussock Sedge	PEAT POT	CONT.	OBL
	JE	296	JUNCUS EFFUSUS Soft Rush	PEAT POT	CONT.	FACH+
	PV	240	PELTANDRA VIRGINICA Arrow Arum	PEAT POT	CONT.	OBL
	SP	160	SCIRPUS CYPERINUS Hoopgrass	PEAT POT	CONT.	FACH+
*BARE ROOT		20	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
		40	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
		40	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH+
		40	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
		20	QUERCUS PALUSTRIS Pin Oak	12-14" HT.	BR	FACH
		75	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
		50	CORNUS AMOMUM Silky Dogwood	12-14" HT.	BR	FACH

* NOTE:

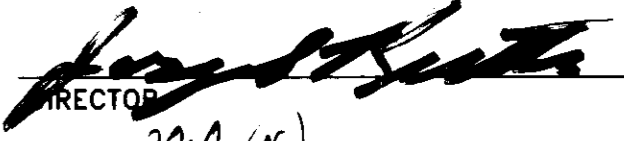


BARE ROOT PLANTS SHALL BE RANDOMLY INTERSPERSED WITH PLANTS SHOWN ON PLANTING PLAN. NO MORE THAN 10 OF ANY ONE SPECIES SHALL BE PLANTED TOGETHER IN SUCCESSION.

ENHANCEMENT AREA PHASE IV

TREES	KEY	QTY.	BOTANICAL/COMMON NAME	SIZE	REMARKS	WETLAND INDICATOR STATUS
	AR	13	ACER RUBRUM Red Maple	1" CAL.	B4B/CONT.	FAC
	AR	44	ACER RUBRUM Red Maple	18-24" HT.	CONT.	FAC
	BN	13	BETULA NIGRA River Birch	1" CAL.	CONT.	FACH
	BN	57	BETULA NIGRA River Birch	18-24" HT.	CONT.	FACH
	FP	9	FRAXINUS PENNSYLVANICA Green Ash	1" CAL.	B4B/CONT.	FAC
	LS	32	LIQUIDAMBAR STYRACIFLUA Sweet Gum	18-24" HT.	CONT.	FAC
	LT	50	LIRIODENDRON TULIPIFERA Tulip Poplar	18-24" HT.	CONT.	FAC
	PO	30	PLATANUS OCCIDENTALIS American Sycamore	1" CAL.	B4B/CONT.	FACH
	QB	8	QUERCUS BICOLOR Swamp White Oak	18-24" HT.	CONT.	FACH
	QP	11	QUERCUS PALUSTRIS Pin Oak	1" CAL.	CONT.	FACH
	SN	9	SALIX NIGRA Black Willow	24-36" HT.	CONT.	FACH+
	SN	63	SALIX NIGRA Black Willow	18-24" HT.	CONT.	FACH+
	MV	8	MAGNOLIA VIRGINIANA Sweetbay Magnolia	1" CAL.	CONT.	FACH+
SHRUBS	CA	66	CLETHRA ALNIFOLIA Summersweet	18-24" HT.	CONT.	FAC+
	IV	85	ILEX VERTICILLATA Winterberry	18-24" HT.	CONT.	FACH+
	SC	70	SAMBUCUS CANADENSIS Elderberry	18-24" HT.	CONT.	FACH+
	SS	4	SALIX SERICEA Silky Willow	18-24" HT.	CONT.	FACH+
*BARE ROOT		100	ACER RUBRUM Red Maple	12-14" HT.	BR	FAC
		100	BETULA NIGRA River Birch	12-14" HT.	BR	FACH
		100	PLATANUS OCCIDENTALIS American Sycamore	12-14" HT.	BR	FACH
		100	SALIX NIGRA Black Willow	12-14" HT.	BR	FACH+
		50	CEPHALANTHUS OCCIDENTALIS Buttonbush	12-14" HT.	BR	OBL
		50	VIBURNUM DENTATUM Arrowwood Viburnum	12-14" HT.	BR	FAC

SUPPLEMENTAL INFORMATION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

 DIRECTOR 8/1/96 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 7/2/96 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH 7/2/96 DATE

DATE NO. REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-493-4444

PROJECT MIDDLE PATUXENT RIVER REVITALIZATION

AREA TAX MAP 15 PARCEL 32 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND

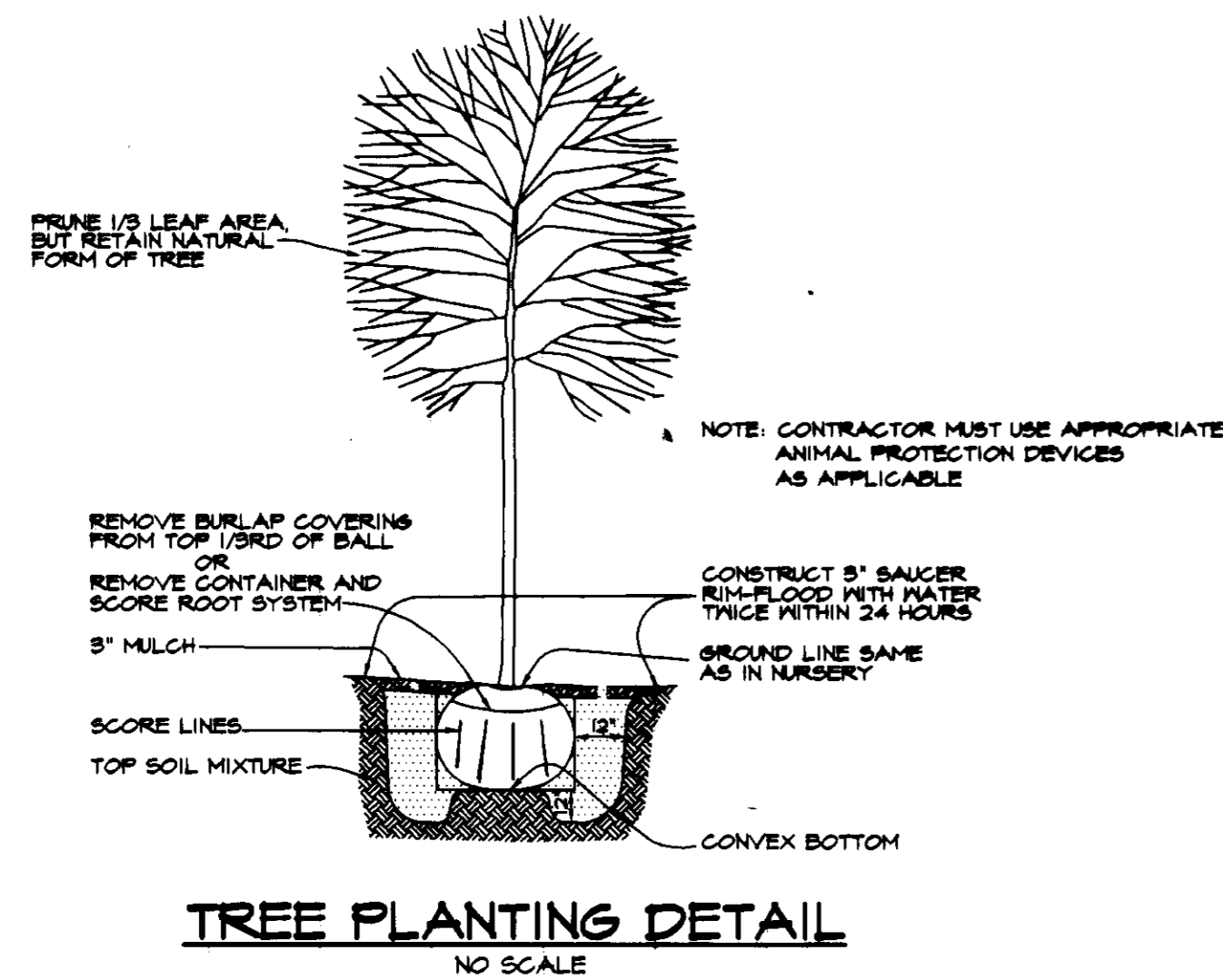
TITLE PLANT LIST (PHASE III AND PHASE IV)

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX: 410-997-9282

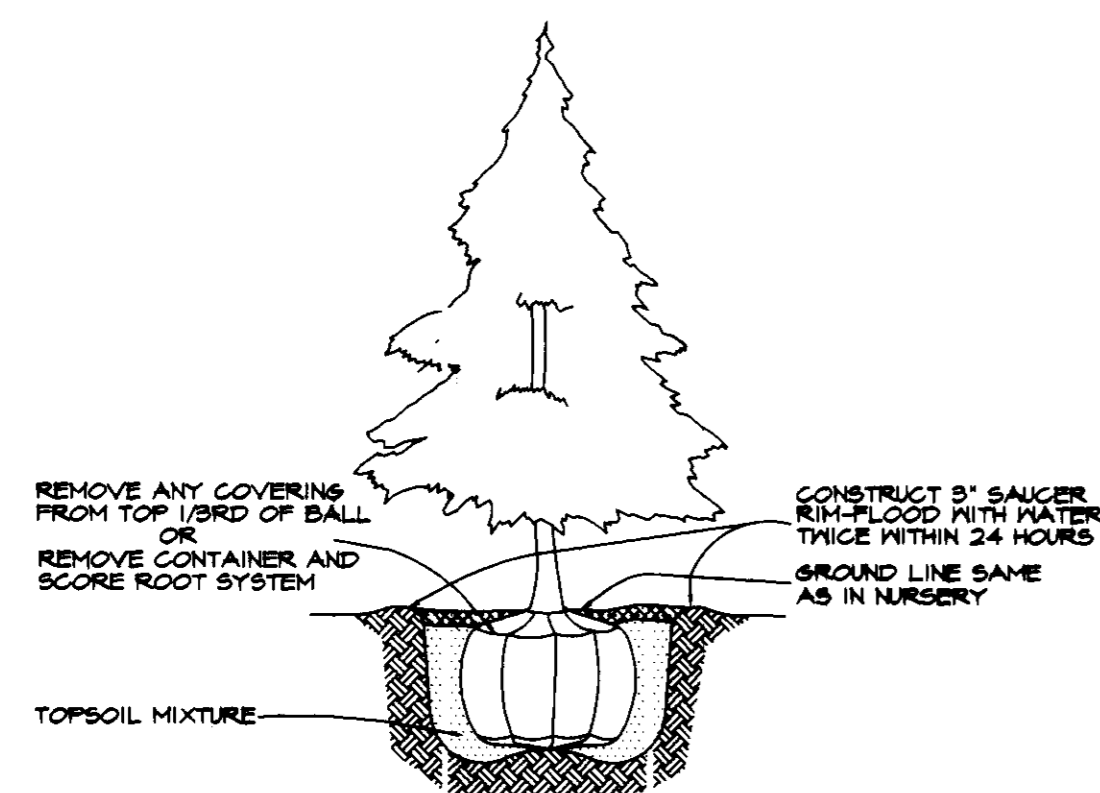
7-24-96 DATE

DESIGNED BY: DK, RR, CK
 DRAWN BY: RR, CK
 PROJECT NO: 95P113901
 DATE: JULY 25, 1996
 SCALE: NO SCALE
 DRAWING NO. 20 OF 28

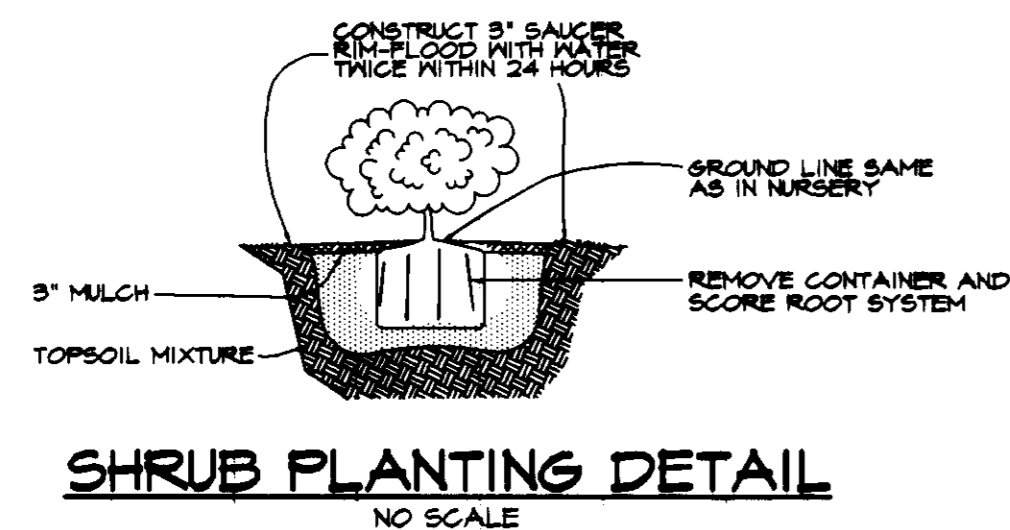

 DOUGLAS R. KOPECK
 COMAR 08.19.06.01



TREE PLANTING DETAIL
NO SCALE

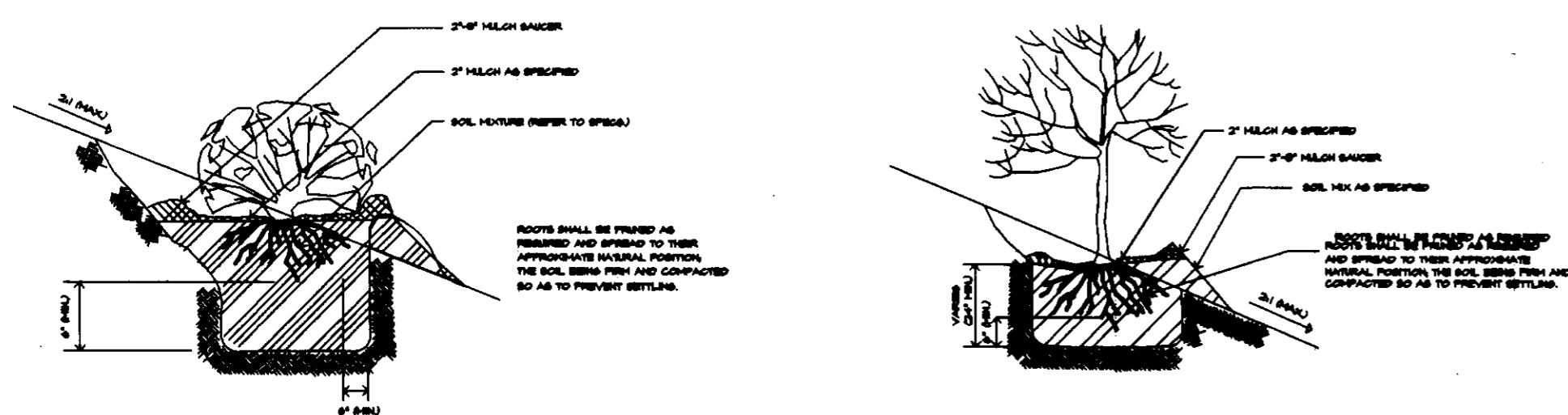


EVERGREEN PLANTING DETAIL
NO SCALE



SHRUB PLANTING DETAIL
NO SCALE

BARE ROOT TREE PLANTING & SHRUB PLANTING ON SLOPES (TYPICAL)
NO SCALE



I. PERMANENT SEEDING

Seedbed Preparation for Stockpile & Disturbed Upland Areas Only:

Flat areas and slopes up to 3:1 slope shall be loose and friable to a depth of at least 8 inches. The top layer of soil shall be loosened by raking, disking or other acceptable means before seeding. Slopes steeper than 3:1 shall have slopes steeper than 3:1 shall have the top 1 to 8 inches of soil loose and friable before seeding.

Soil Amendments: Use one of the following schedules.

- 1) Preferred - Apply 2 tons per acre dolomitic limestone (42 LBS/1000 SF) and 800 LBS per acre 10-10-10 fertilizer (14 LBS/1000 SF) before seeding. Harrow or disc into upper three inches of soil. At time of seeding, apply 30-0-0 ureaform fertilizer (21 LBS/1000 SF).
- 2) Acceptable - Apply 2 tons per acre dolomitic limestone (42 LBS/1000 SF) and 1000 LBS per acre 10-10-10 fertilizer (28 LBS/1000 SF) before seeding. Harrow or disc into upper three inches of soil.

On slopes steeper than 3:1 slope, the lime and fertilizer shall be worked the best way possible. On sloping land, the final harrowing or disking operation should be on the contour wherever feasible. No attempt should be made drag any disced area to make the soil surface smooth after disking.

Seeding:

Seeding for Wetland Mitigation and Wetland Creation Areas:

All disturbed areas shall be seeded and mulched upon completion of all grading work, using seeding as specified. All stabilization in wetland areas shall be of the following species:

- Annual Ryegrass, (*Lolium multiflorum*)
- Millet, (*Betaria Italica*)
- Barley, (*Hordeum sp.*)
- Oats, (*Avena sp.*)
- and/or
- Rye, (*Secale cereale*)

These species allow for the stabilization of the site, while allowing for the voluntary revegetation of wetland species. Kentucky-31 Fescue shall not be utilized in the wetland or buffer areas.

Seeding for Stockpile Area Only:

For the periods March 1 thru April 30, and August 1 thru October 15. Seed with 60 LBS per acre (1.4 LBS/1000 SF) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31. Seed with 60 LBS Kentucky 31 Tall Fescue per acre and 2 LBS per acre (.05 LBS/1000 SF) of Sleeping Lovegrass.

For the period October 16 thru February 28, protect site by:
Option (1) 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring.
Option (2) Use sod.
Option (3) Seed with 60 LBS/acre (1.4 LBS/1000 SF) Kentucky 31 Tall Fescue and mulch with 2 tons per a

Care must be taken when seeding stockpile area such that K-31 does not cover wetland mitigation and wetland creation areas. Apply seed uniformly with a cyclone seeder, drill, cult/packer seeder or hydroseeder (slurry includes seed and fertilizer) on a firm, moist seedbed. Maximum seeding depth should be 1/4 inch on clayey soils and 1/2 inch on sandy soils, when using other than hydroseeder method of application. Note: If hydroseeding is used and the seed and fertilizer are mixed, they shall be mixed on site and the seeding shall be immediate without interruption.

Mulching - See Mulching Specification

Irrigation:

If soil moisture is deficient, supply new seedlings with adequate water for plant growth until they are firmly established, if feasible. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Maintenance:

Irrigation - If soil moisture becomes deficient, irrigate to prevent loss of stand of protective vegetation, if feasible. Repairs - Inspect all seeded areas for failures and make necessary repairs, replacements, and reseeded within the planting season, if possible.

- 1) If stand is inadequate for erosion control, overseed and fertilize, using half of the rates originally applied.
- 2) If stand is over 60% damaged, reestablish following original line, fertilizer, seedbed preparation and seeding recommendations.

II. PLANTING SPECIFICATION AND NOTES

- 1. Topsoil shall be salvaged from within the project limit of work as indicated on the Plan. Salvaged topsoil shall be stockpiled for ultimate application to the mitigation area.
- 2. Topsoil mixture for all plant material: 200 LB dehydrated raw manure and ten 5.5 cu. ft. bale of peat humus on site furnished topsoil. Composted sludge in the amount of 4.0 cu. yds. may be substituted for the raw manure, peat moss or peat humus.
- 3. All mixing shall be confined to the planting area and shall be accomplished to the satisfaction of the Engineer.

Wetland Plant Establishment:

- 1. Plant species required are normally unavailable from standard landscape nursery sources. The Contractor must make arrangements with competent wetlands restoration specialists to insure a supply of the required material.
- 2. The Contractor and/or his subcontractor should be aware of the site design conditions and should take all prudent steps to insure that the plant material specified on the plans is acclimated to wetland conditions prior to delivery to the job site. If the plant material is available from sources where wetland conditions are duplicated at the nursery, the Contractor should favor these sources as the supplier.
- 3. Fertilizer for wetland trees and shrubs shall be a 21 gr. tightly compressed, long lasting, slow-release (2 year) planting tablet with a minimum guaranteed analysis of 20-10-5.
- 4. Fertilizer for container grown material shall apply the following rates:
1 gal. Container 1 ea. 21 gr. Tablets
3 gal. Container 2 ea. 21 gr. Tablets
5 gal. Container 3 ea. 21 gr. Tablets
7 gal. Container 5 ea. 21 gr. Tablets
- 5. 5#B or Container stock shall be positioned in the planting hole. Backfill halfway up the root ball. Place tablet(s) beside the root ball approximately 1 inch from the root tips. Do not place tablets in the bottom of the hole. Complete backfill, tamp.

Planting Schedule:

It is recommended that planting be completed early in the Spring (or Fall, if applicable).

Planting Material:

- 1. Rootstock of wetland plant material must be kept moist during the transport from the source to the job site.
- 2. Plant material shall be planted in the soil provided with each planting pit excavated to a size sufficient to contain the entire rootstock or root mass without cramping.

III. MONITORING AND WARRANTY:

Monitoring:

- A five (5) year monitoring program shall be required from the date of completion of the mitigation project. The monitoring shall include annual inspection of the site and a written report noting:
 - A. Description of how the mitigation project meets mitigation project standards in Comar Regulation 15J.
 - B. Photographs of the site.
 - C. The commercial source of plant material.
 - D. Identification and removal of any noxious weeds present in the wetland areas.
 - E. Description of any modifications which have been or need to be made to maintain project standards in Comar Regulation 15J.

Warranty:

A two (2) year maintenance and replacement warranty shall be required. The mitigation area must be assessed by Riemer Muegge & Associates, Inc. to determine an 85% survival rate at the end of the two-year period.

NOTE:

SEE STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATIONS MONITORING PROTOCOL FOR MITIGATION PROJECTS GREATER THAN ONE - HALF ACRE DATED JULY 28, 1995.

SUPPLEMENTAL INFORMATION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 8/1/96
DIRECTOR DATE
[Signature] 7/31/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] 7/31/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO. REVISION

OWNER / DEVELOPER
OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT MIDDLE PATUXENT RIVER REVITALIZATION

AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE PLANTING DETAILS AND SPECIFICATIONS

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96
DATE

DESIGNED BY: DK, RR, CK

DRAWN BY: RR, CK

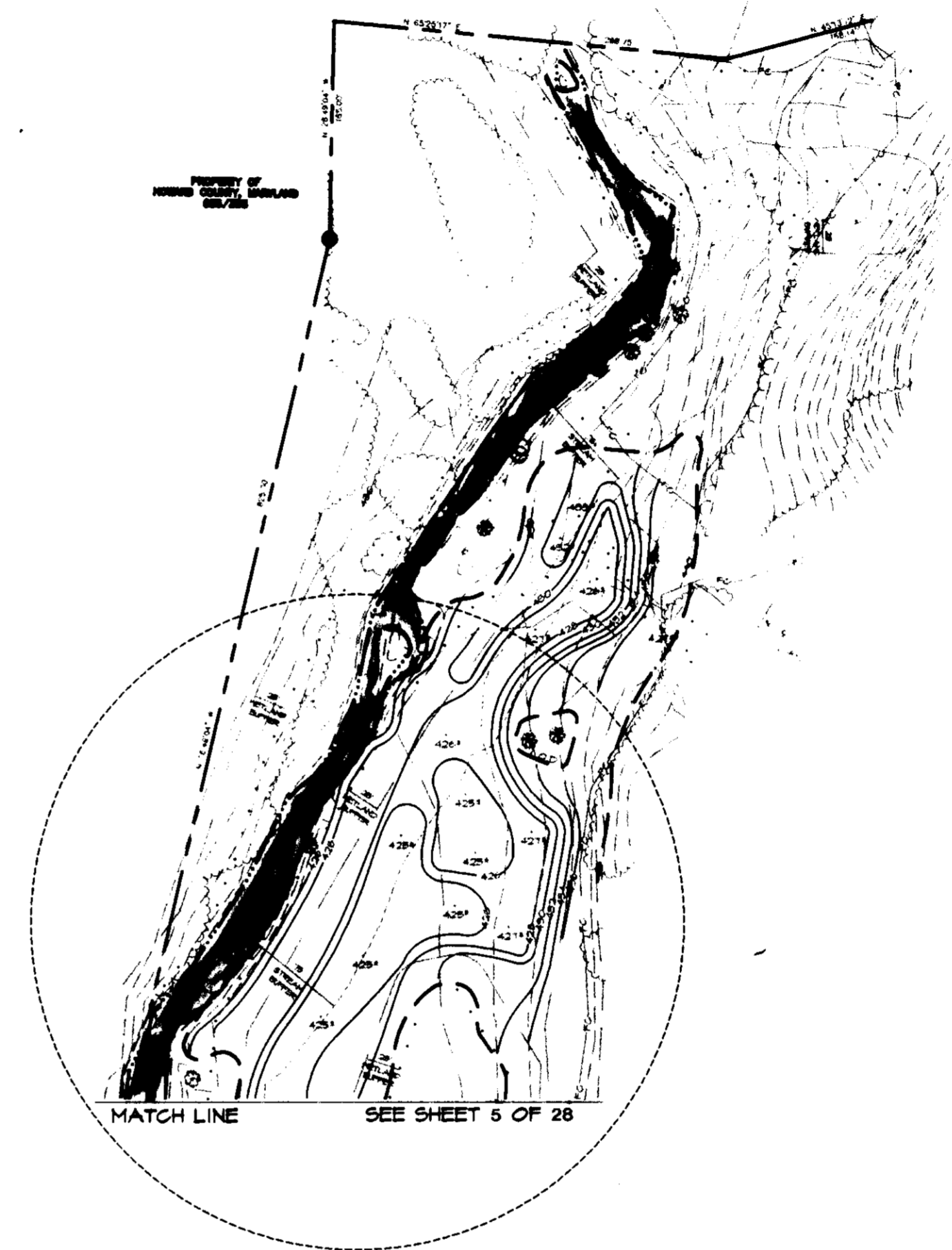
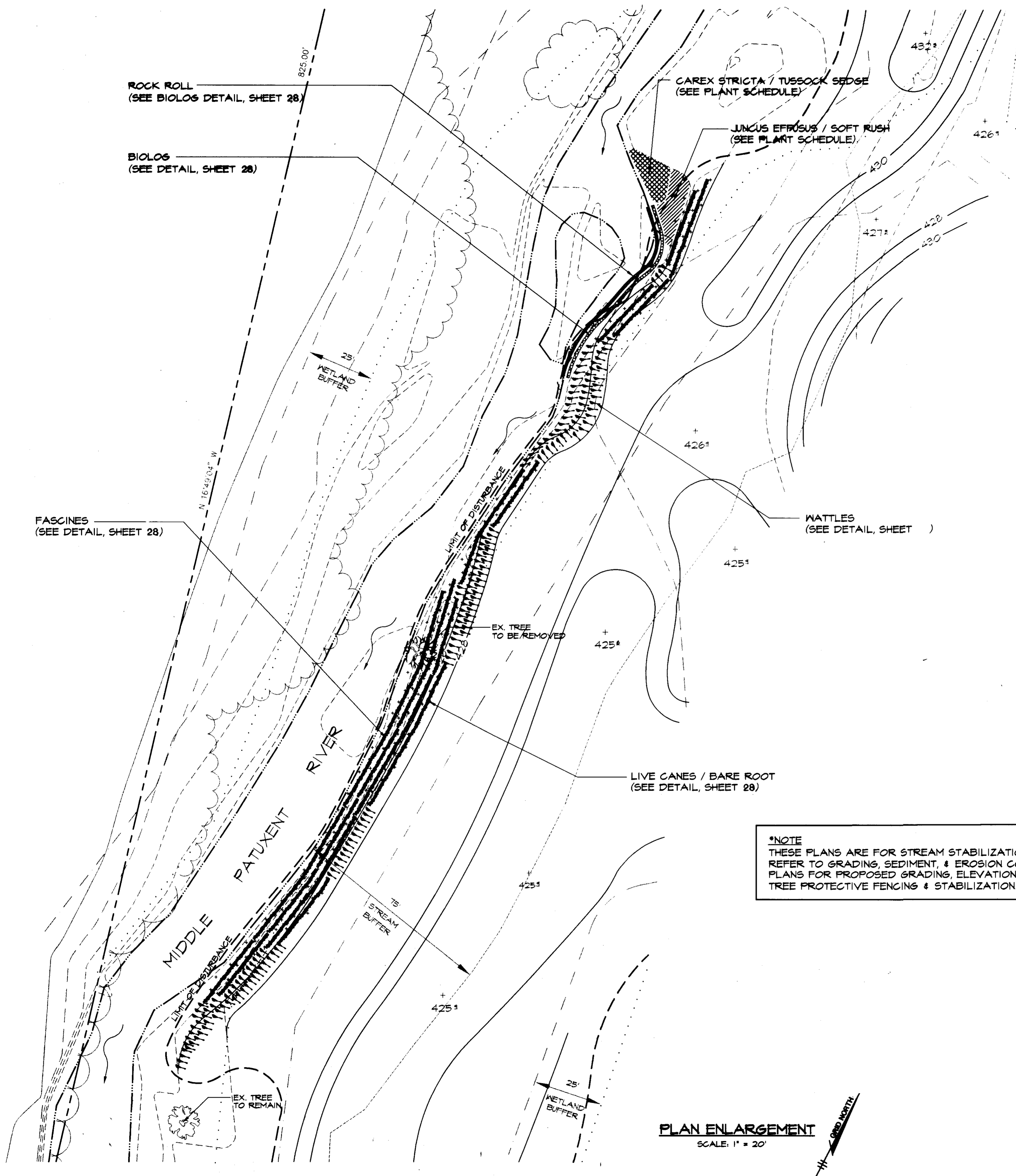
PROJECT NO.: 95P113901

DATE: JULY 25, 1996

SCALE: NOT TO SCALE

DRAWING NO. 21 OF 28

[Signature]
DOUGLAS R. KOPECK
COMAR 08.19.06.01



***NOTE**
 THESE PLANS ARE FOR STREAM STABILIZATION ONLY-
 REFER TO GRADING, SEDIMENT, & EROSION CONTROL
 PLANS FOR PROPOSED GRADING, ELEVATIONS,
 TREE PROTECTIVE FENCING & STABILIZATION.

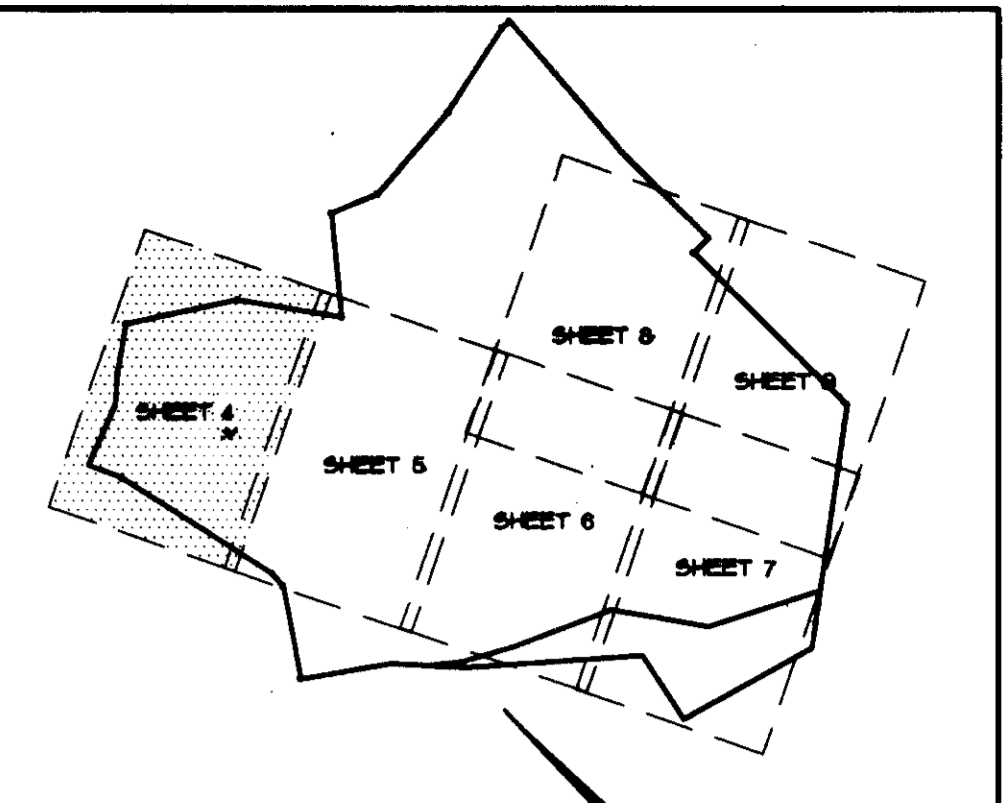
PLAN
 SCALE: 1" = 100'



LEGEND

- EXISTING TREELINE
- EXISTING TREE
- WETLAND & 25' BUFFER
- STREAM & 75' BUFFER
- PROPOSED GRADE
- PROP. WATTLE
- PROP. FASCINE
- PROP. LIVE CANE / BARE ROOT
- PROP. BIOLOG
- PROP. HERBACEOUS MATERIAL

PLAN ENLARGEMENT
 SCALE: 1" = 20'



SHEET INDEX
SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION
 WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY
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 PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A
 DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING
 PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION
 BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE
 PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL
 CONSERVATION DISTRICT.

Chen... 7-24-96
 DEVELOPER DATE

BY THE ENGINEER :
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT
 CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN
 BASED ON MY PERSONAL KNOWLEDGE OF THE SITE
 CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE
 WITH THE REQUIREMENTS OF THE HOWARD SOIL
 CONSERVATION DISTRICT.

ENGINEER DATE

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. JUL 7/29/96

J. K. Wolf... 7/29/96
 NATURAL RESOURCES CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL
 EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS
 OF THE HOWARD SOIL CONSERVATION DISTRICT. JUL 7/29/96

John R. Robertson 7/29/96
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND
 ZONING.

James... 8/1/96
 DIRECTOR DATE

... 7/21/96
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

... 7/21/96
 CHIEF, DIVISION OF LAND DEVELOPMENT
 AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-443-4444

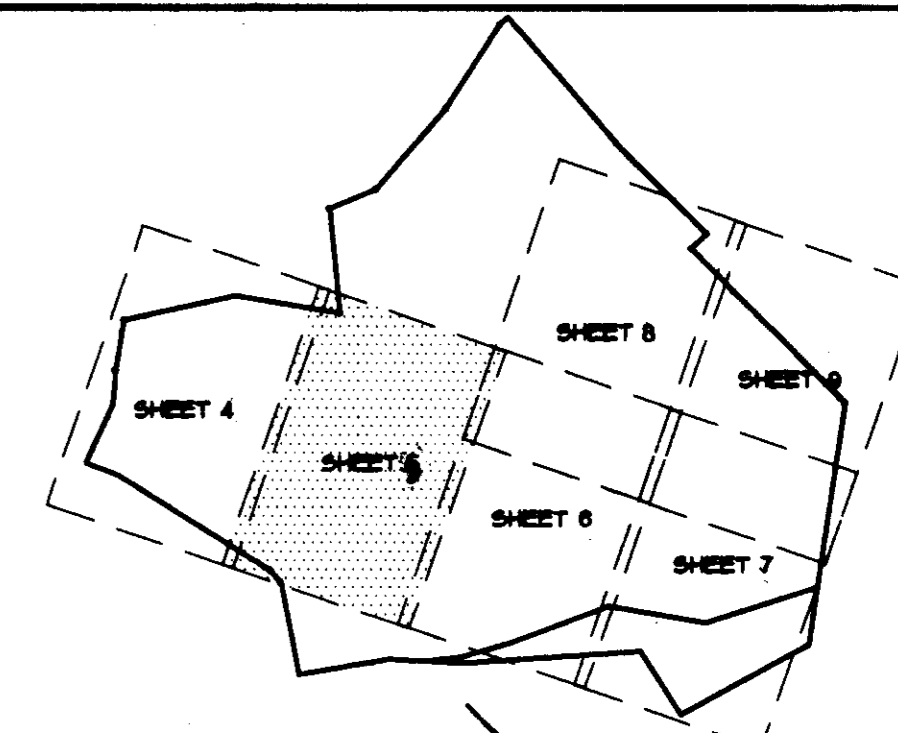
PROJECT **MIDDLE PATUXENT RIVER
 REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
 3RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX : 410-997-9282

7-24-96
 DATE
 DESIGNED BY : DK, RR
 DRAWN BY : RR
 PROJECT NO : 95P113902
 DATE : JULY 25, 1996
 SCALE : AS SHOWN
 DRAWING NO. 22 OF 28



SHEET INDEX

SUPPLEMENTAL INFORMATION

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

John R. Red **7-24-96**
 DEVELOPER DATE

BY THE ENGINEER :
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

ENGINEER DATE

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. *7/29/96*

J. A. ... **7/29/96**
 NATURAL RESOURCES CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. *7/29/96*

John R. Red **7/29/96**
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

... **7/29/96**
 DIRECTOR DATE

... **7/29/96**
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

... **7/29/96**
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-443-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 92
 9RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21046
 410-997-8900 FAX : 410-997-9282

7-24-96
 DATE

DESIGNED BY : DK, RR

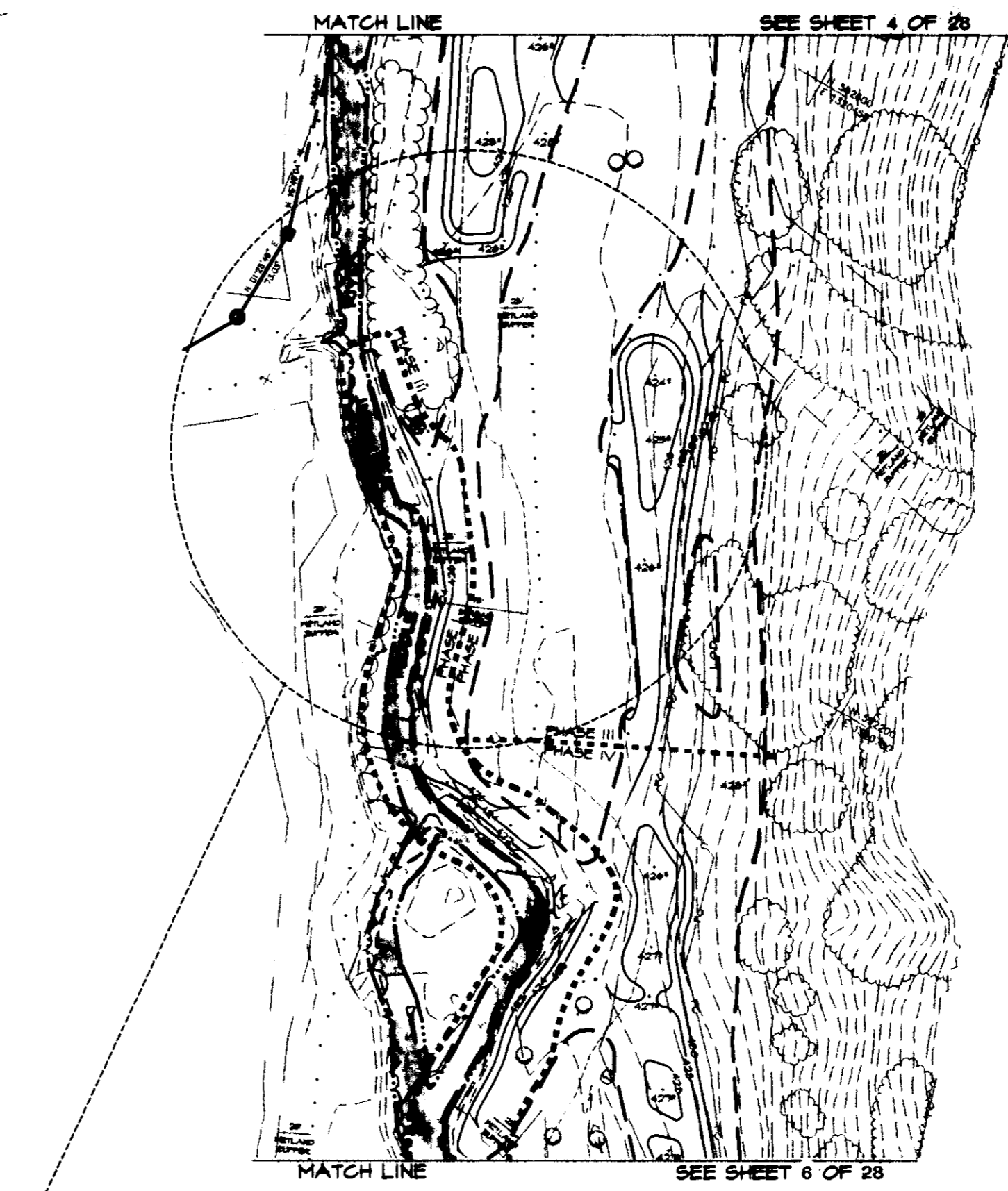
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PROJECT NO : 95P113902

DATE : JULY 25, 1996

SCALE : AS SHOWN

DRAWING NO. **28** OF **28**



INDICATES LIMIT OF 20 SCALE ENLARGEMENT

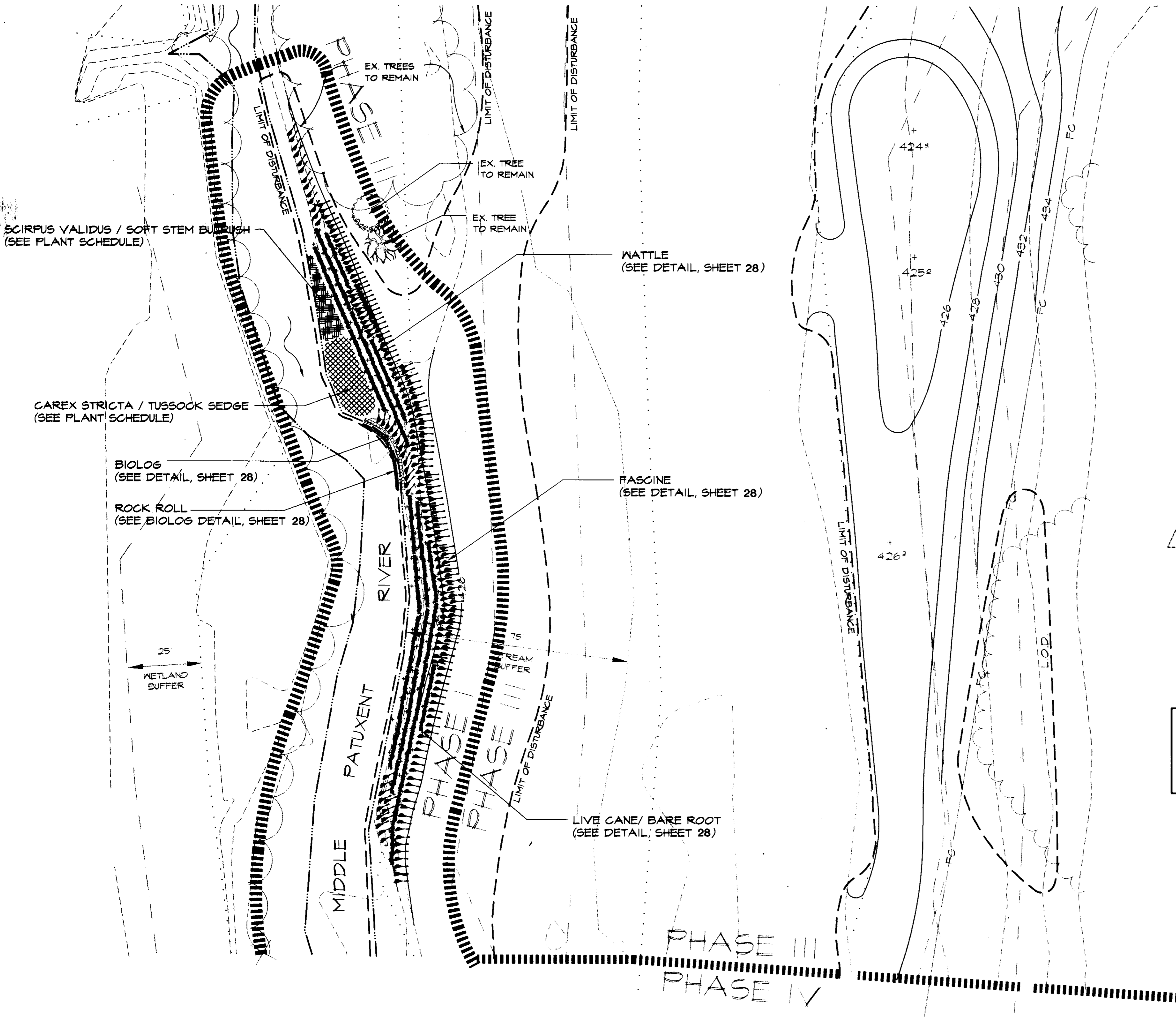
PLAN
 SCALE: 1" = 100'



***NOTE**
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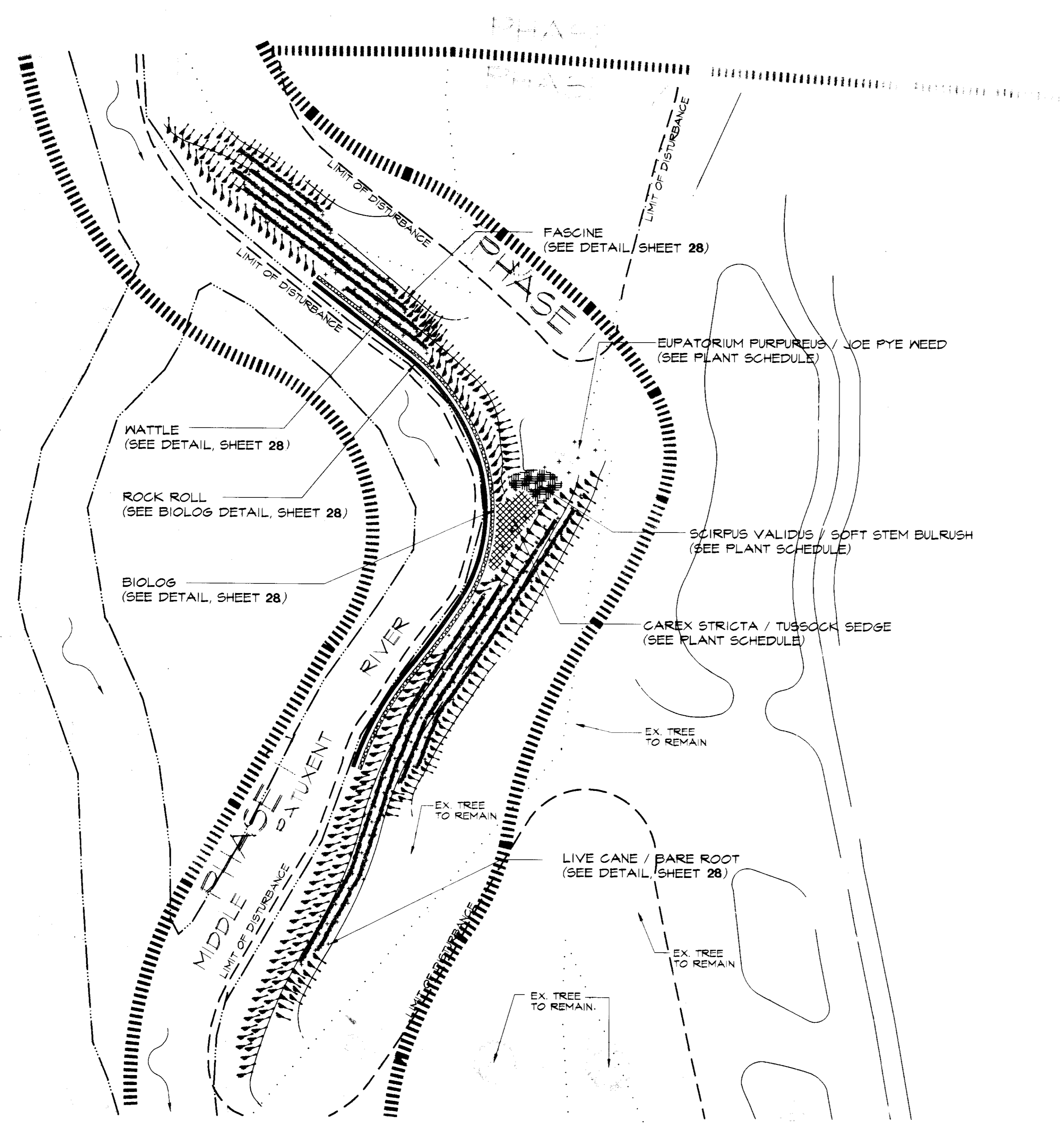
LEGEND

- EXISTING TREELINE
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- PROP. WATTLE
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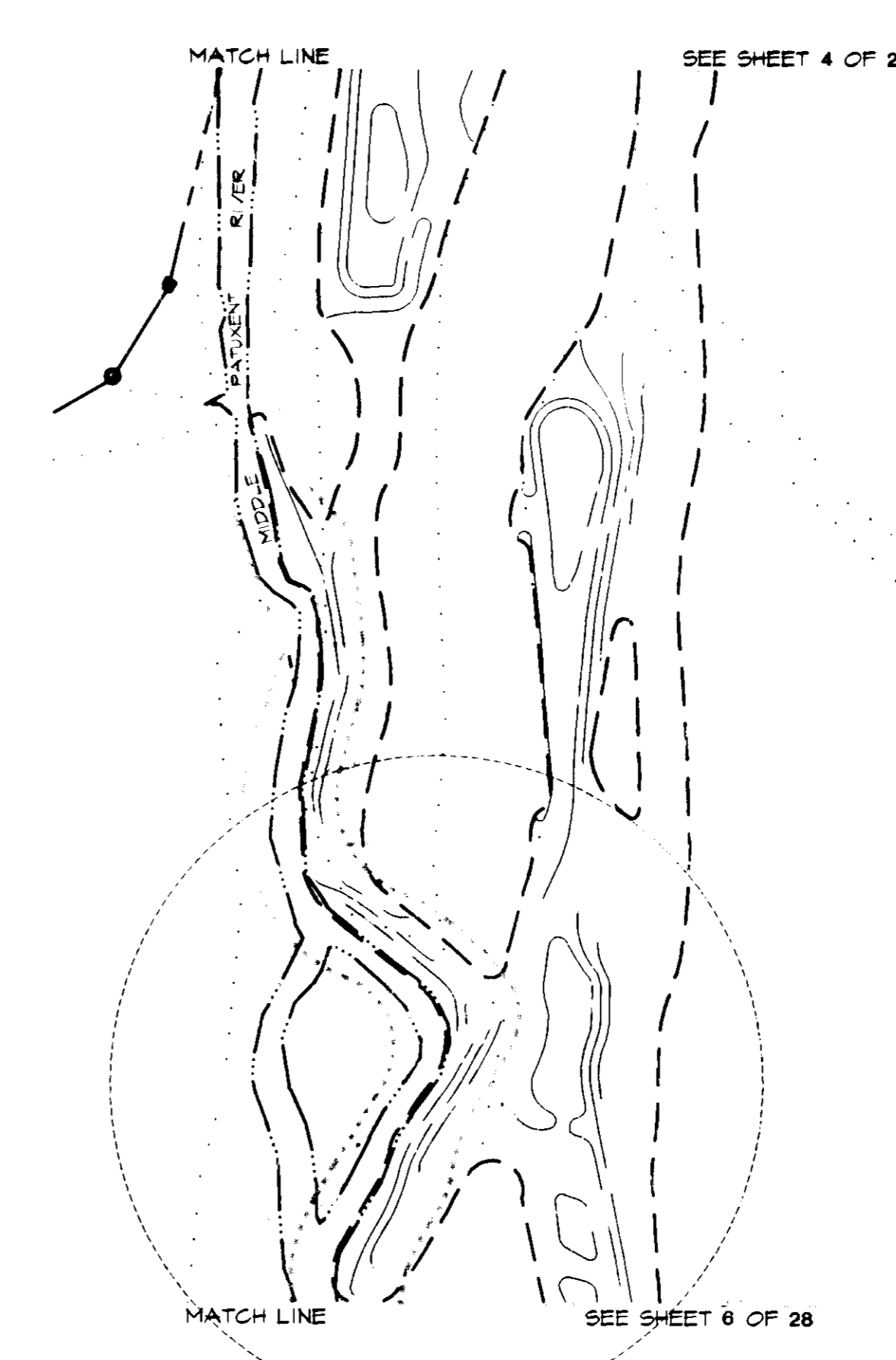


PLAN ENLARGEMENT
 SCALE: 1" = 20'





PLAN ENLARGEMENT
SCALE: 1" = 20'



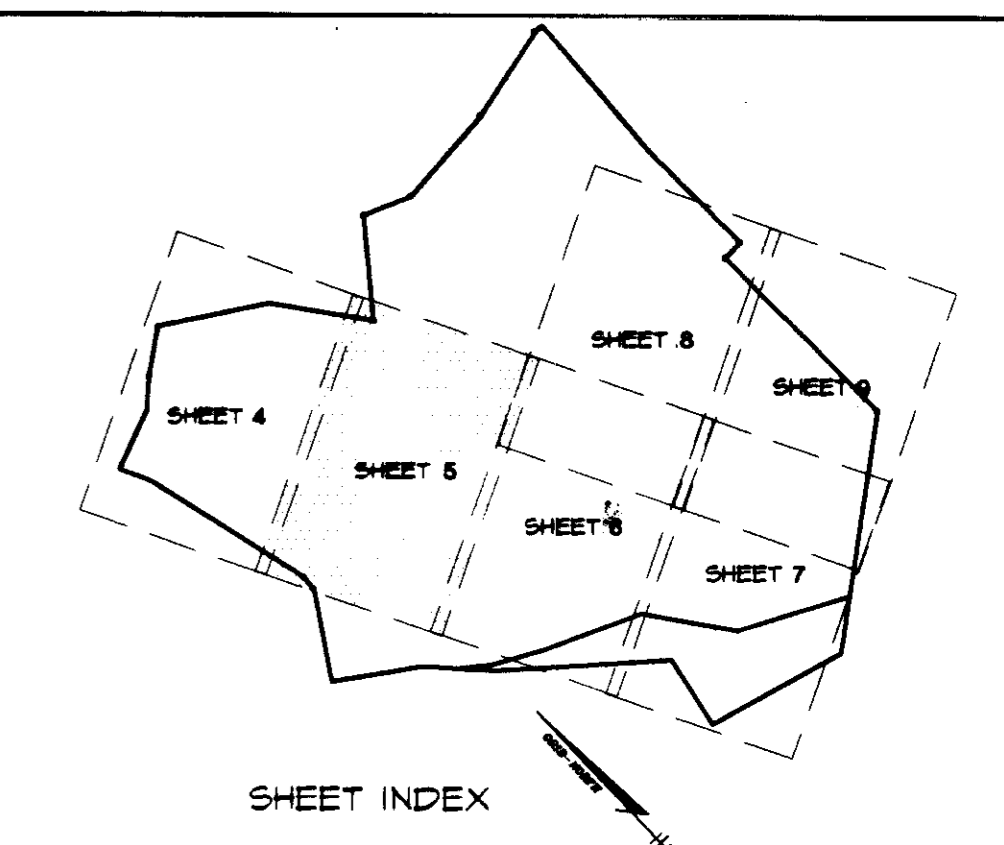
INDICATES LIMITS OF 20 SCALE ENLARGEMENT

PLAN
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- PROP. HERBACEOUS MATERIAL



SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :

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

DEVELOPER: *Chen R. Rd.* DATE: 7-24-96

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

ENGINEER: _____ DATE: _____

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. 7/24/96

J. H. Wald DATE: 7/24/96
NATURAL RESOURCE CONSERVATION SERVICE

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

John R. Pollock DATE: 7/24/96
HOWARD SOIL CONSERVATION DISTRICT

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

James S. Smith DATE: 8/1/96
DIRECTOR

Alan D. Summers DATE: 7/24/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Ann Summers DATE: 7/24/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH

DATE	NO.	REVISION

OWNER / DEVELOPER
OPUS EAST, L.L.C.
6107 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-443-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

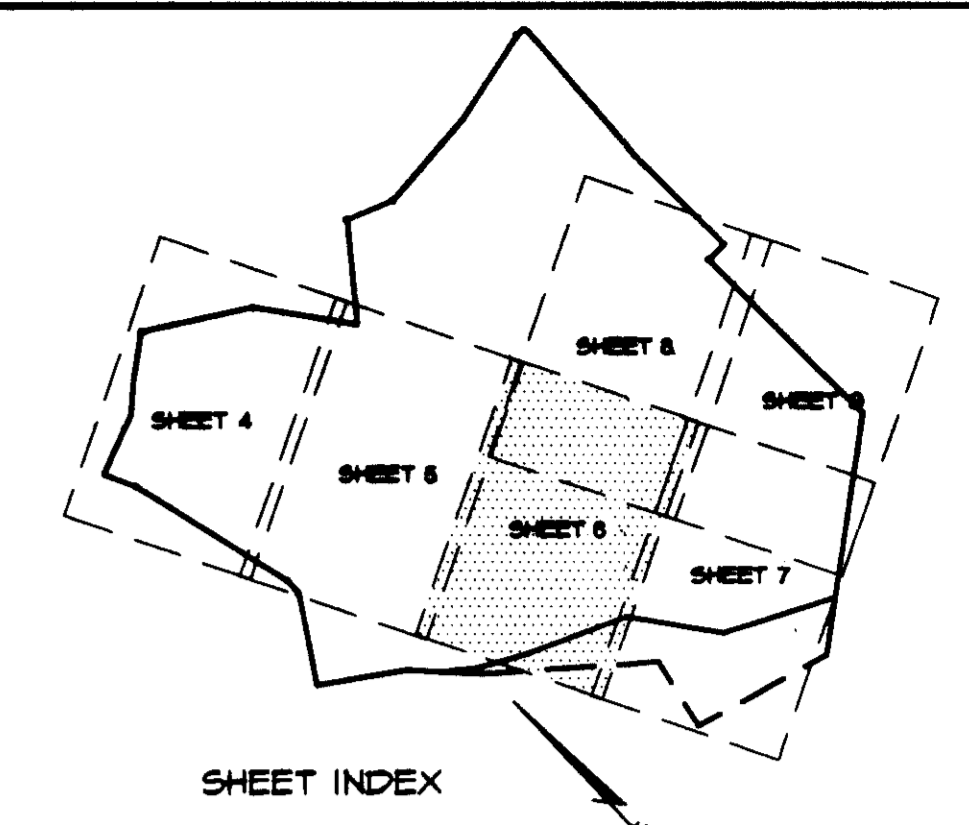
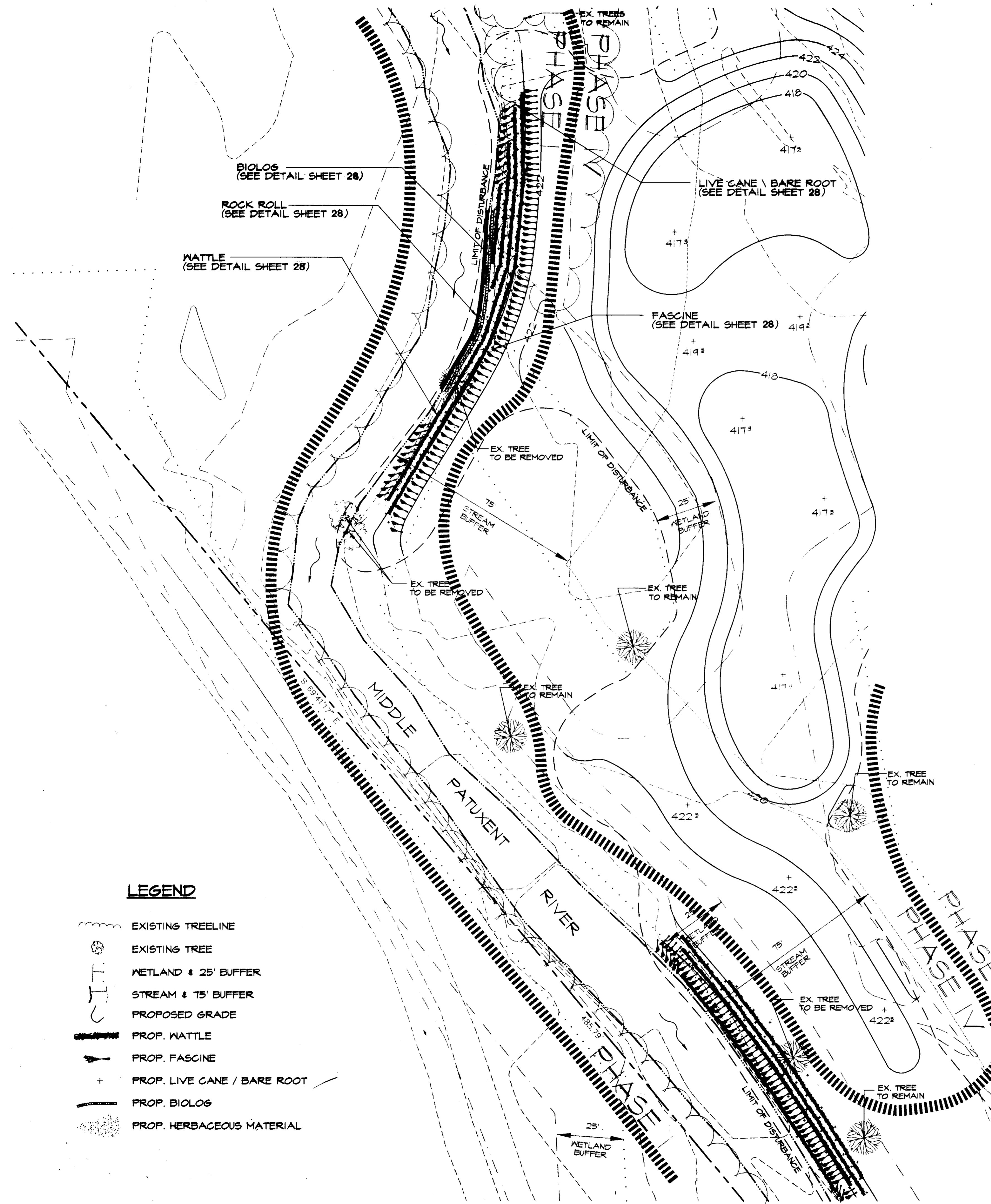
AREA TAX MAP 15 PARCEL 32
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

DATE: 7-24-96	DESIGNED BY : DK, RR
	DRAWN BY: RR
	PROJECT NO : 95P113902
	DATE : JULY 25, 1996
	SCALE : AS SHOWN
	DRAWING NO. 24 OF 28

DOUGLAS R. KOPECK
COMAR 08.19.06.01



SUPPLEMENTAL INFORMATION

BY THE DEVELOPER :

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

John W. Roub 7-24-96
 DEVELOPER DATE

BY THE ENGINEER :

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

ENGINEER DATE

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. *John W. Roub* 7/29/96

John W. Roub 7/29/96
 NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John W. Roub 7/29/96
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John W. Roub 8/1/96
 DIRECTOR DATE

John W. Roub 7/29/96
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

John W. Roub 7/21/96
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 32
 3RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX : 410-997-9282

7-24-96
 DATE

DESIGNED BY : DK, RR

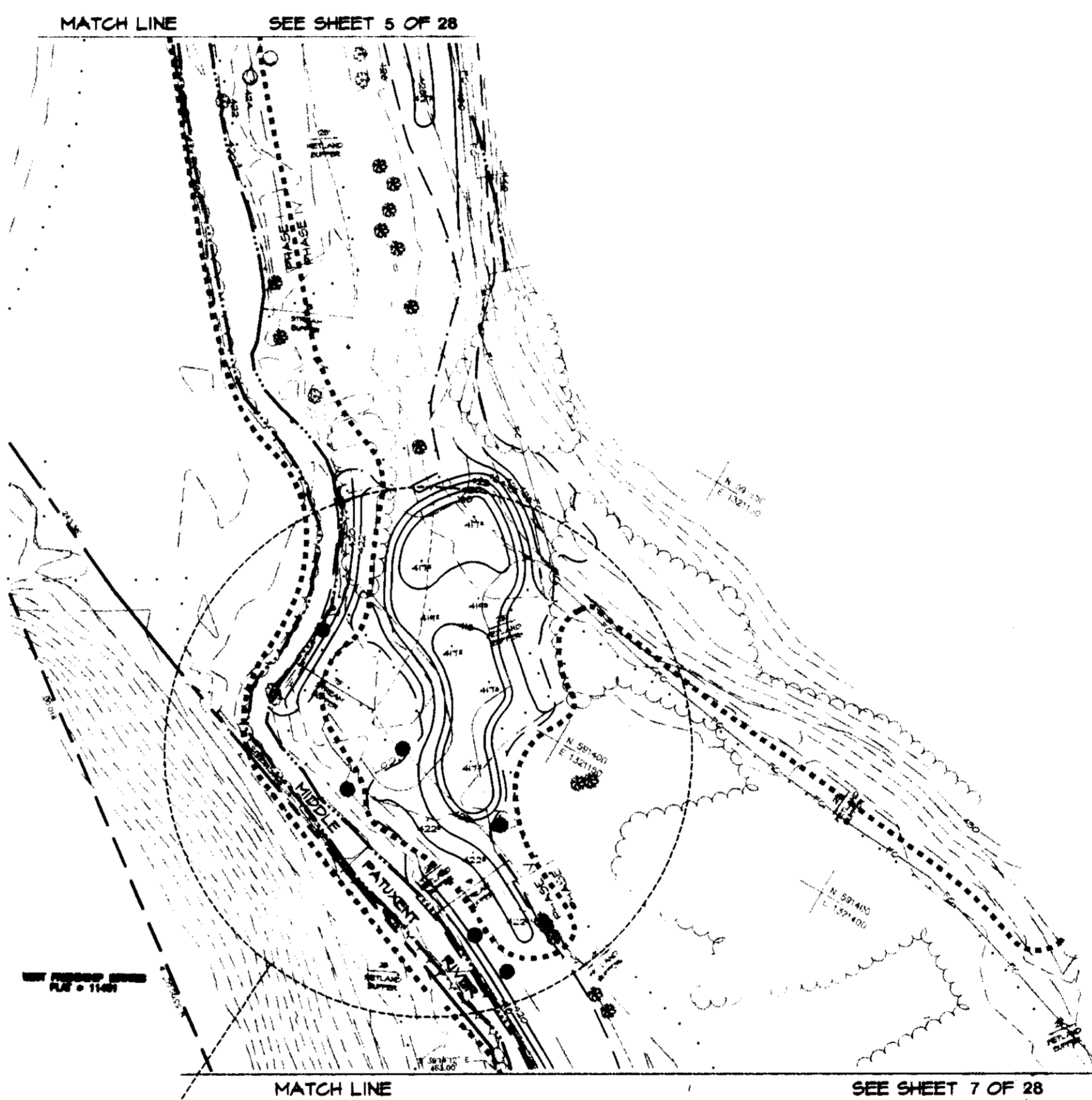
DRAWN BY : RR

PROJECT NO : 95P113902

DATE : JULY 25, 1996

SCALE : AS SHOWN

DRAWING NO. 25 OF 28

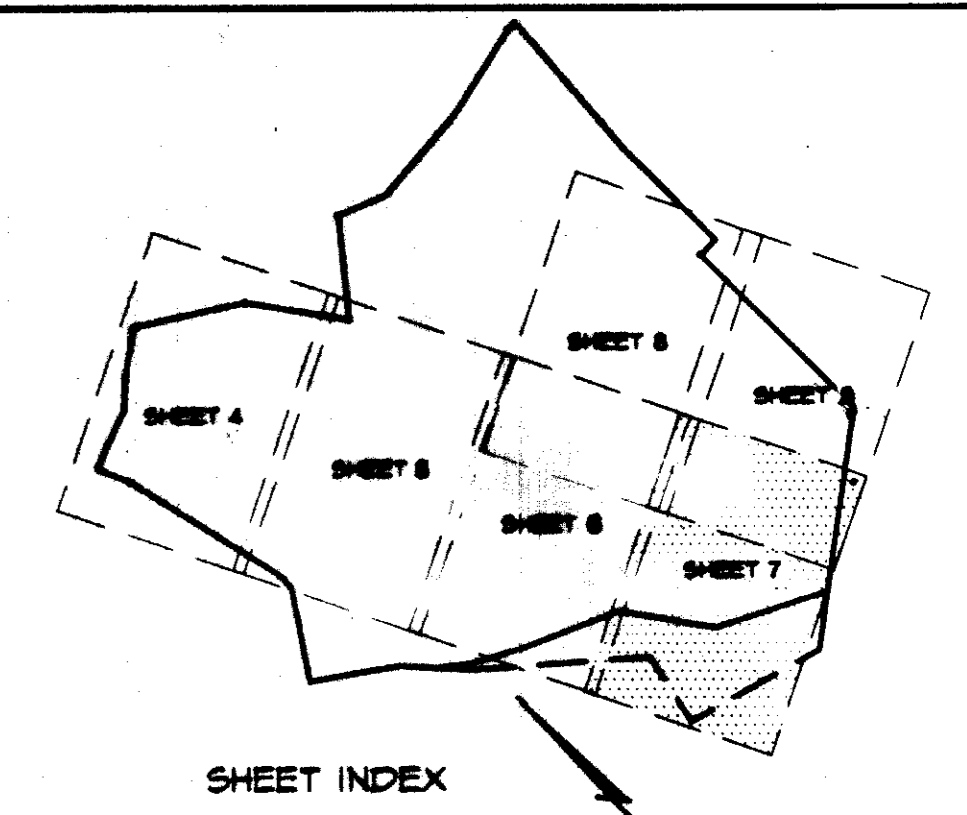
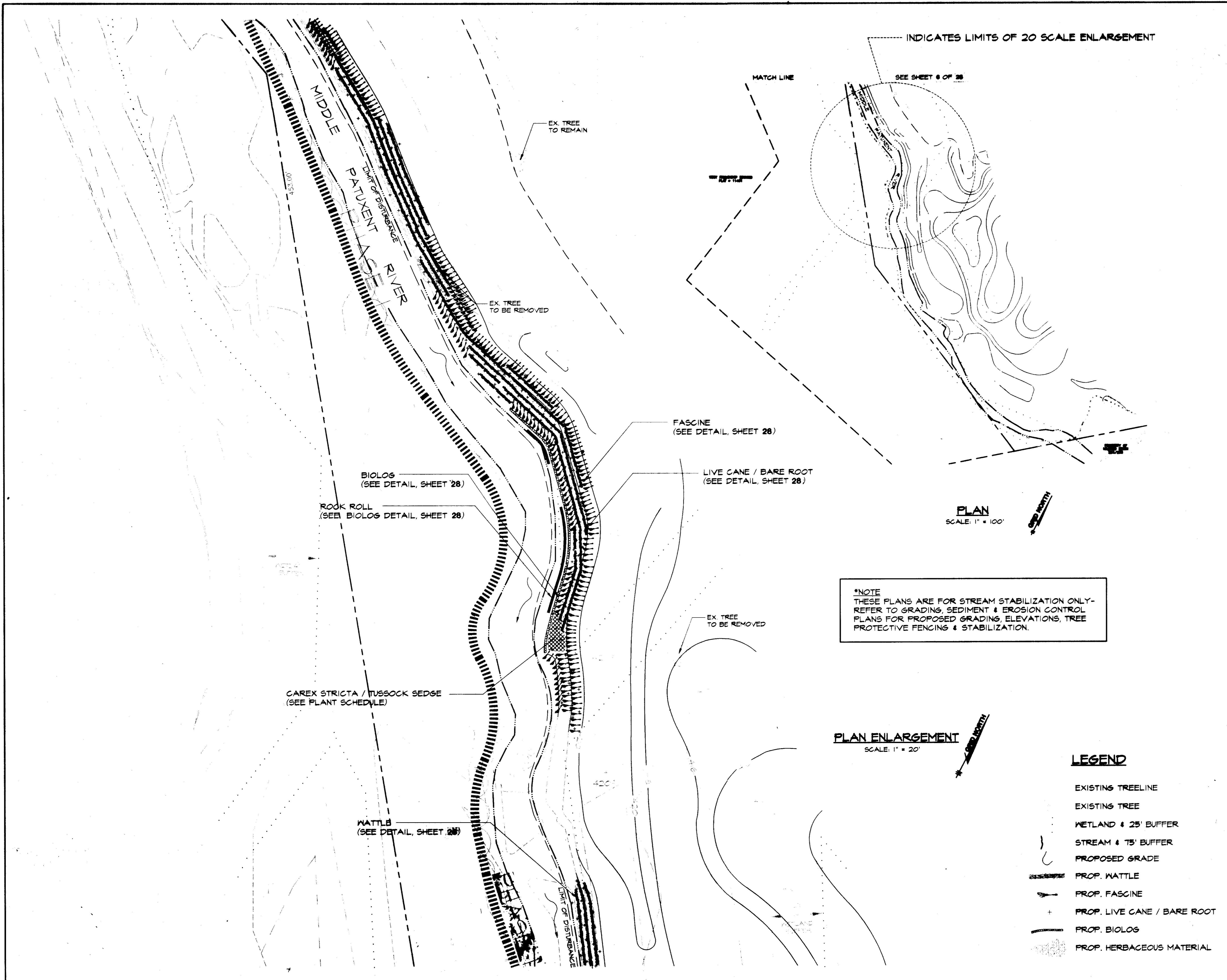


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PLAN ENLARGEMENT
 SCALE: 1" = 20'

LEGEND

- EXISTING TREELINE
- EXISTING TREE
- WETLAND & 25' BUFFER
- STREAM & 15' BUFFER
- PROPOSED GRADE
- PROP. WATTLE
- PROP. FASCINE
- PROP. LIVE CANE / BARE ROOT
- PROP. BIOLG
- PROP. HERBACEOUS MATERIAL



SUPPLEMENTAL INFORMATION

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[Signature] **7/27/96**
 DEVELOPER DATE

BY THE ENGINEER :
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] **7/27/96**
 ENGINEER DATE

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.
[Signature] **7/27/96**
 NATURAL RESOURCES CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[Signature] **7/27/96**
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.
[Signature] **8/1/96**
 DIRECTOR DATE

[Signature] **7/27/96**
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] **7/27/96**
 CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
 OPUS EAST, L.L.C.
 6707 DEMOCRACY BOULEVARD
 SUITE 510
 BETHESDA, MARYLAND 20817
 301-443-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**

AREA TAX MAP 15 PARCEL 52
 3RD ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION PLAN**

RIEMER MUEGGE & ASSOCIATES, INC.
 ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
 8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
 410-997-8900 FAX : 410-997-9282

7-27-96
 DATE

DESIGNED BY : DK, RR
 DRAWN BY: RR
 PROJECT NO : 95P113902
 DATE : JULY 25, 1996
 SCALE : AS SHOWN
 DRAWING NO. **26** OF 28

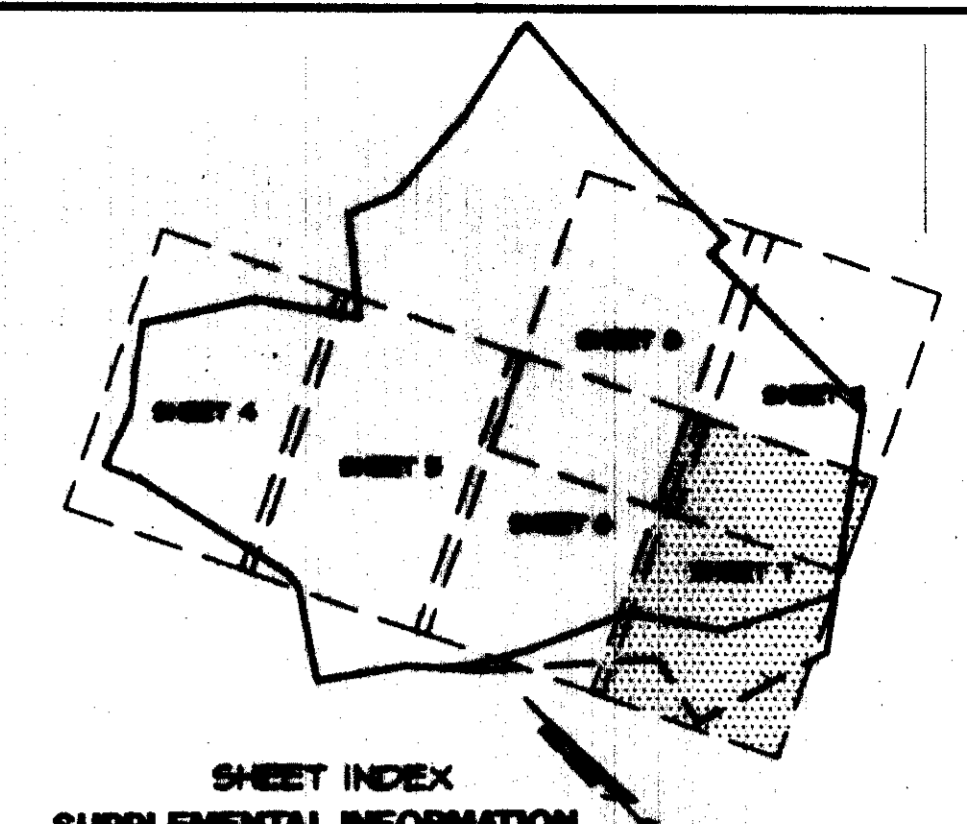
[Signature]
 DOUGLAS R. KOPECK
 COMAR 08.19.06.01

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PLAN
 SCALE: 1" = 100'

PLAN ENLARGEMENT
 SCALE: 1" = 20'

- LEGEND**
- EXISTING TREELINE
 - EXISTING TREE
 - WETLAND & 25' BUFFER
 - STREAM & 75' BUFFER
 - PROPOSED GRADE
 - PROP. WATTLE
 - PROP. FASCINE
 - PROP. LIVE CANE / BARE ROOT
 - PROP. BILOG
 - PROP. HERBACEOUS MATERIAL



SHEET INDEX
SUPPLEMENTAL INFORMATION

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

[Signature] 7/27/96
DEVELOPER DATE

BY THE ENGINEER :
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

ENGINEER DATE

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

[Signature] 7/27/96
DATE

APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.
[Signature] 7/27/96
DIRECTOR DATE

[Signature] 7/27/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/27/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE	NO.	REVISION

OWNER / DEVELOPER
ORUS EAST, LLC.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-445-4444

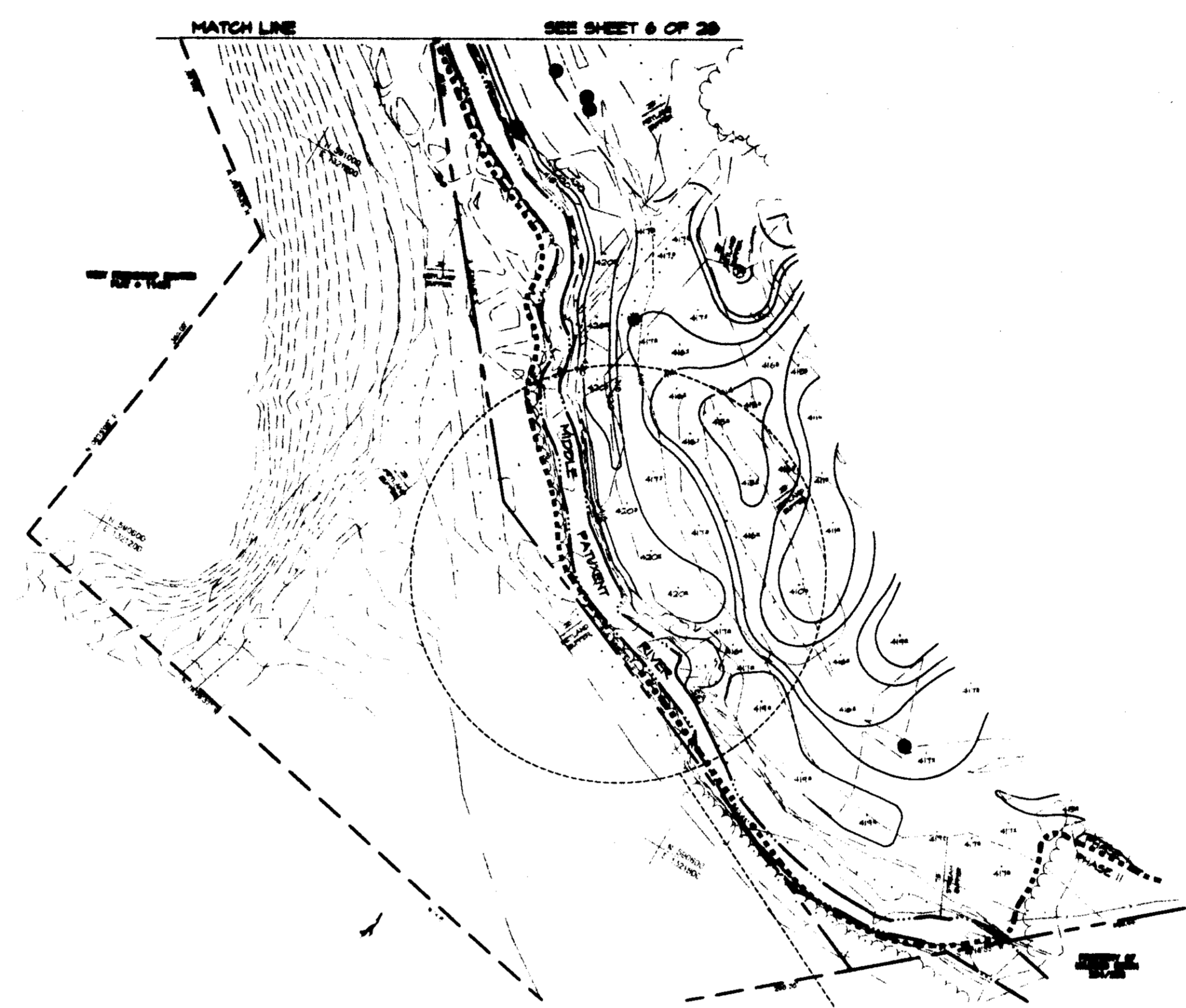
PROJECT
MIDDLE PATUXENT RIVER REVITALIZATION

AREA
TAX MAP 15 PARCEL 92
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE
STREAM STABILIZATION PLAN

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX : 410-997-9282

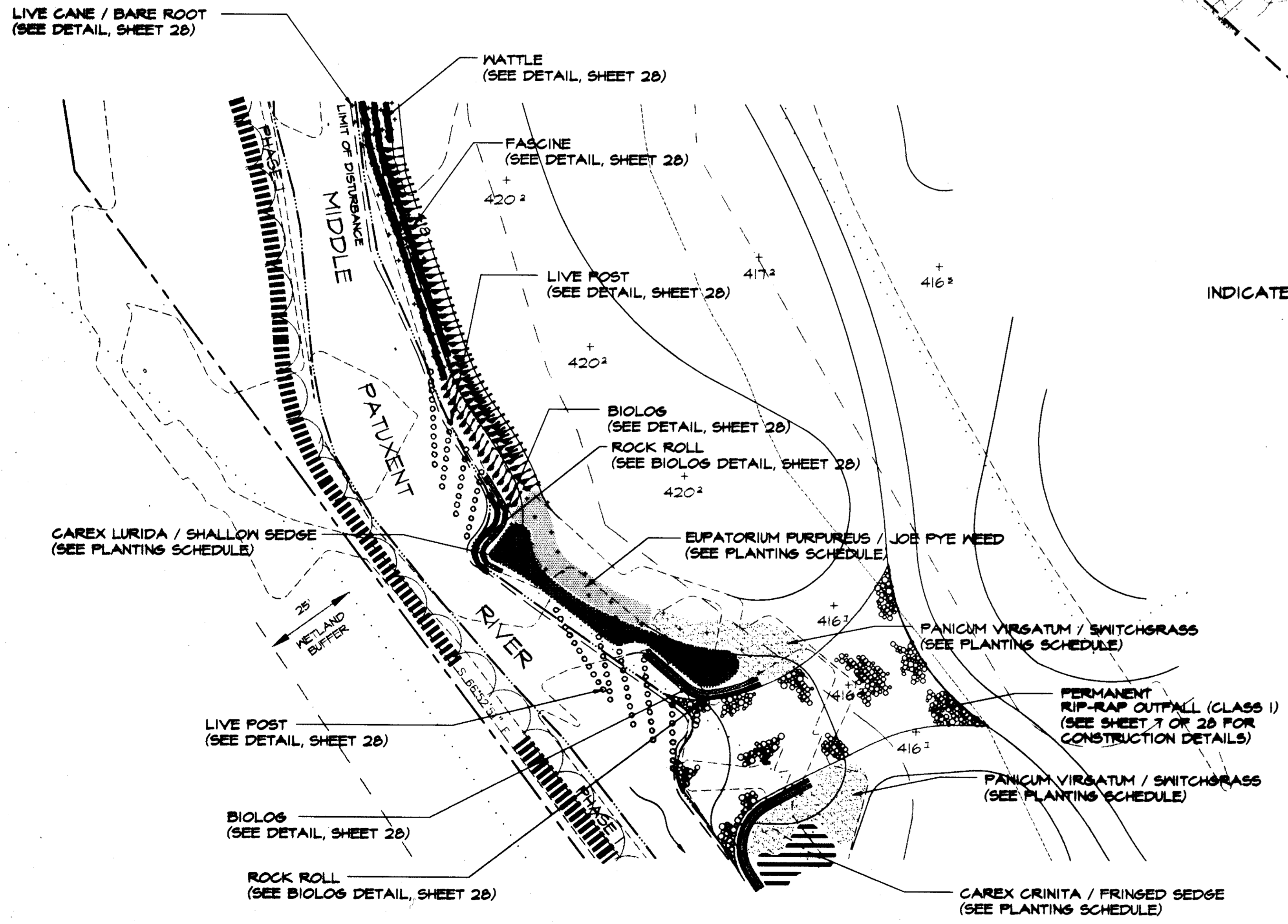
7-27-96 DATE	DESIGNED BY : DK, RR
	DRAWN BY: RR
	PROJECT NO : 95P113902
	DATE : JULY 25, 1996
	SCALE : AS SHOWN
<i>[Signature]</i> DOUGLAS R KOPECK COMAR 06.19.06.01	DRAWING NO. 27 OF 28



INDICATES LIMIT OF 20 SCALE ENLARGEMENT

PLAN
SCALE: 1" = 100'

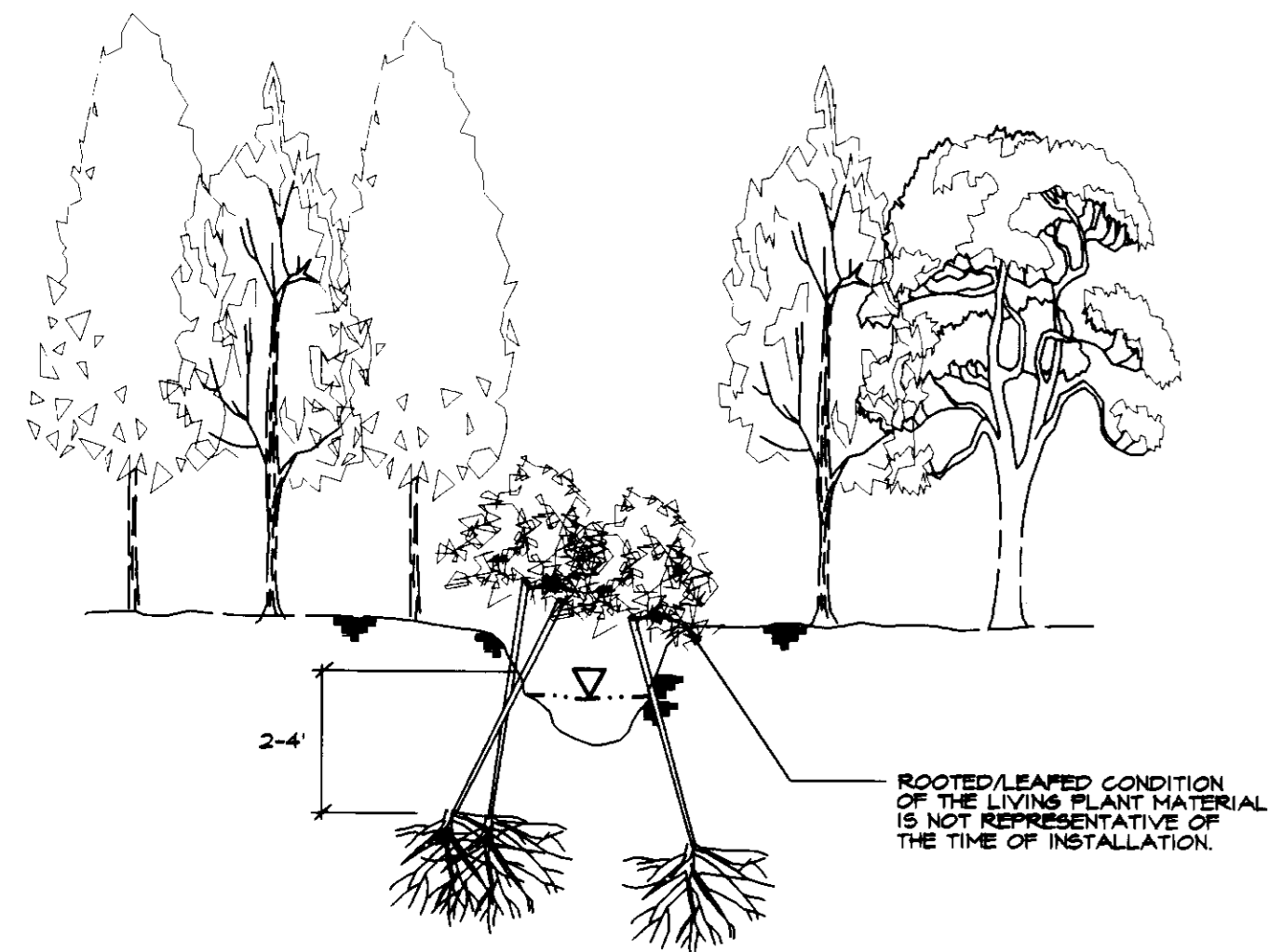
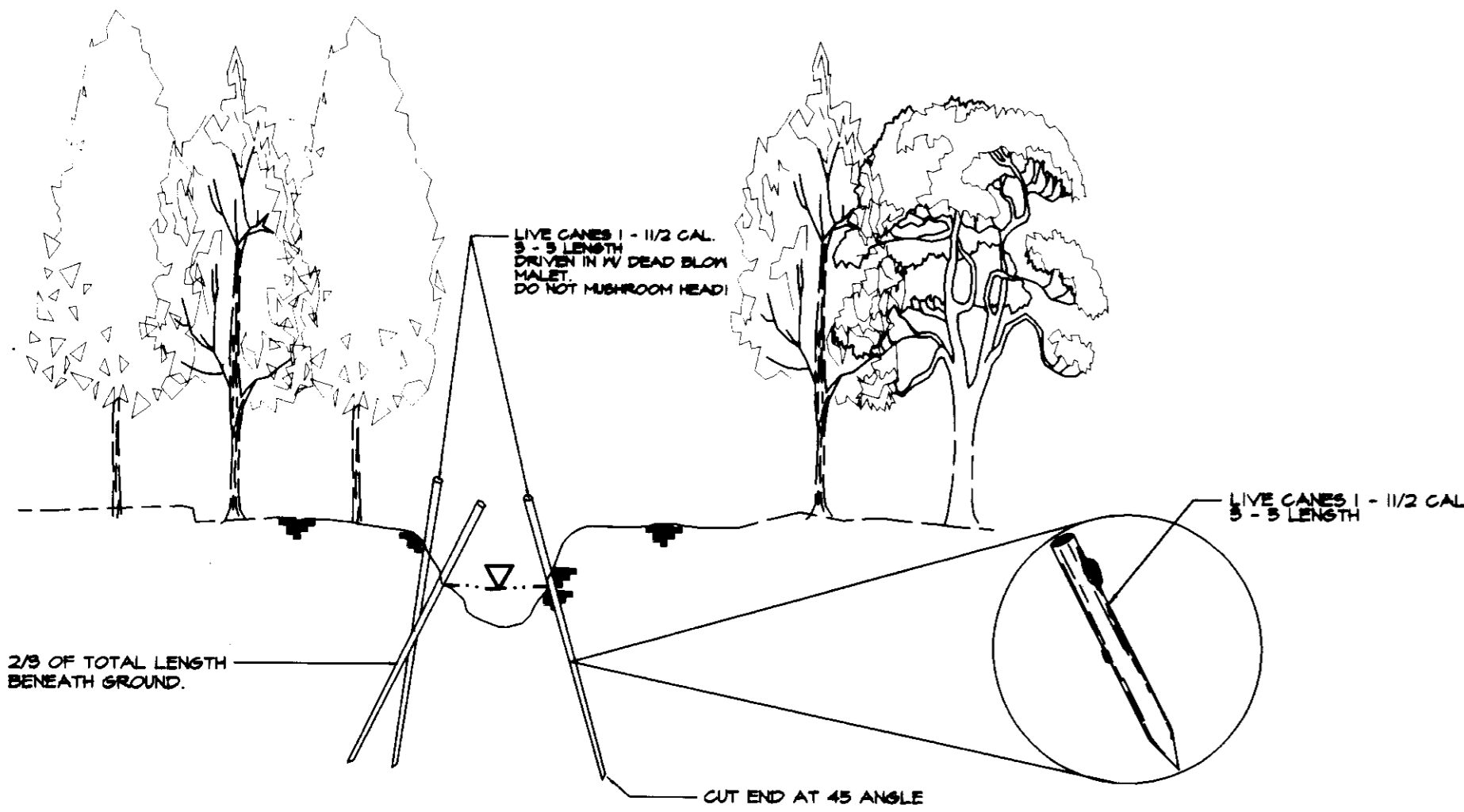
***NOTE**
THESE PLANS ARE FOR STREAM STABILIZATION ONLY. REFER TO GRADING, SEDIMENT & EROSION CONTROL PLANS FOR PROPOSED GRADING, ELEVATIONS, TREE PROTECTIVE FENCING & STABILIZATION.



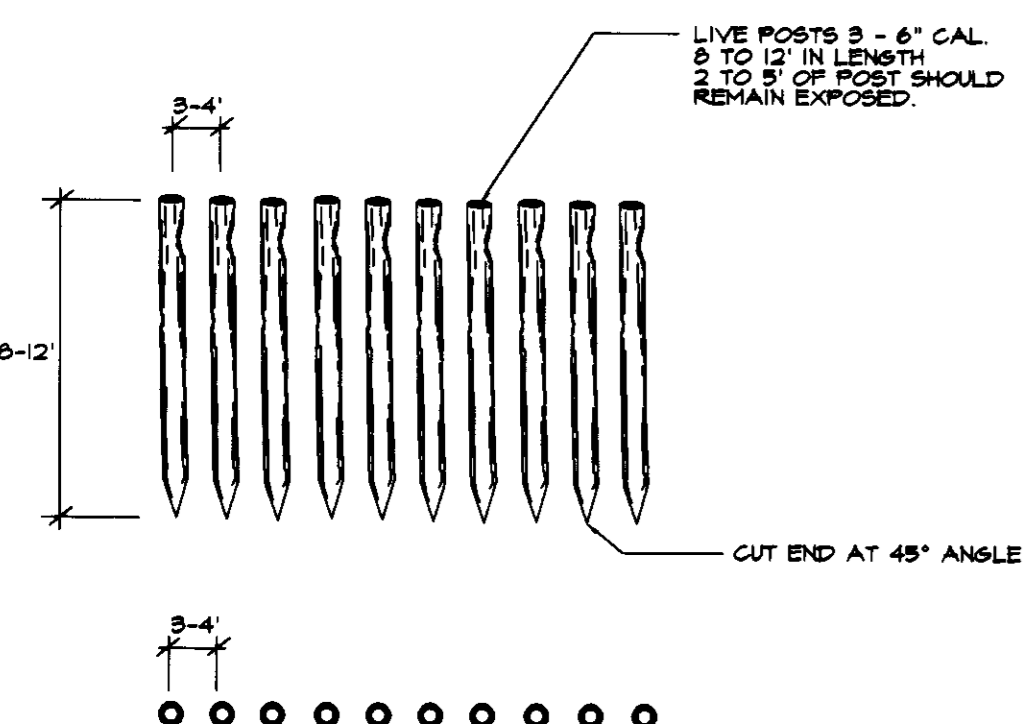
PLAN ENLARGEMENT
SCALE: 1" = 20'

LEGEND

- EXISTING TREELINE
- EXISTING TREE
- WETLAND & 25' BUFFER
- STREAM & 75' BUFFER
- PROPOSED GRADE
- PROP. WATTLE
- PROP. FASCINE
- PROP. LIVE CANE / BARE ROOT
- PROP. BIOLG
- PROP. HERBACEOUS MATERIAL

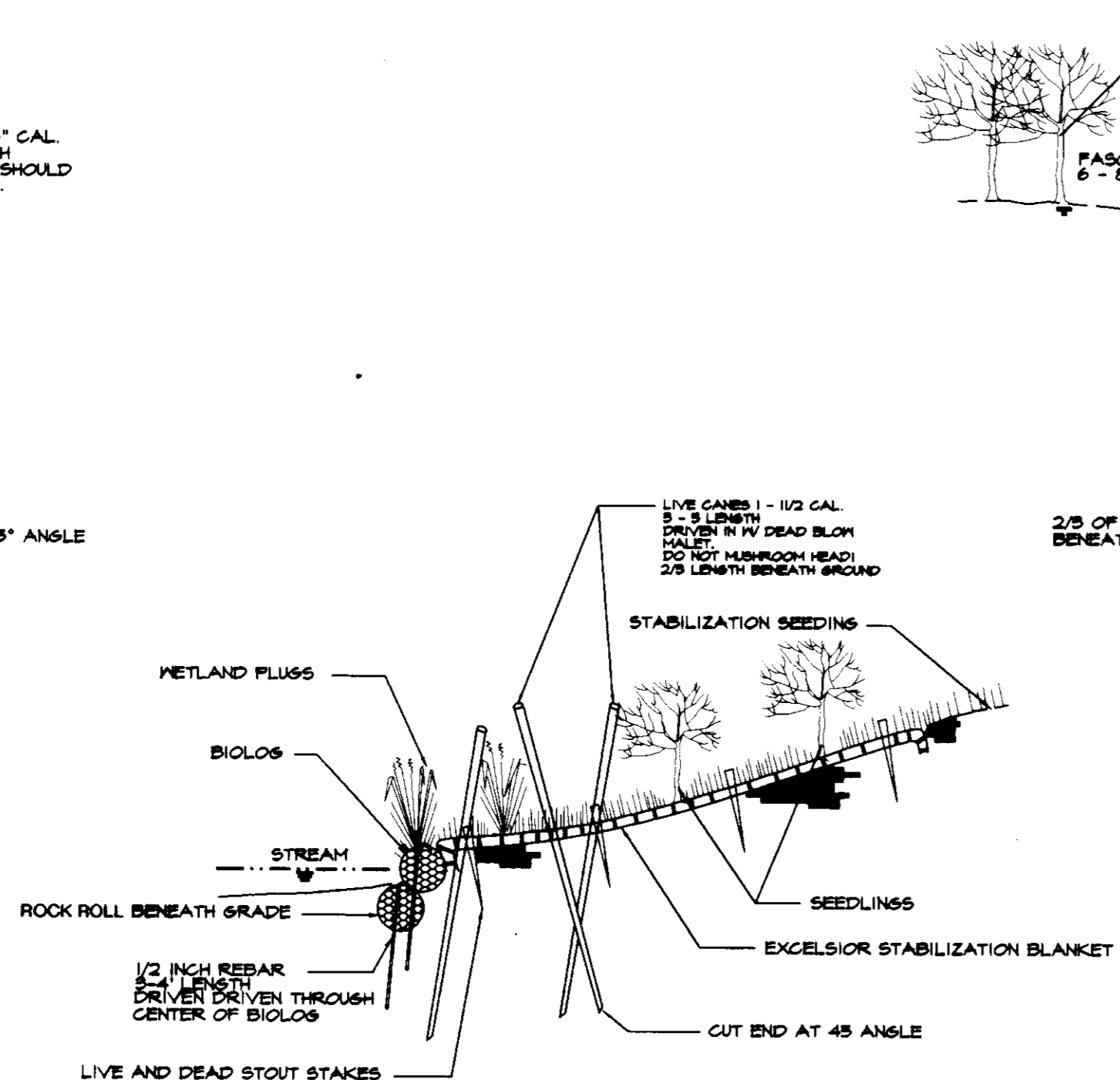


DETAIL 'A' LIVE CANES
NOT TO SCALE



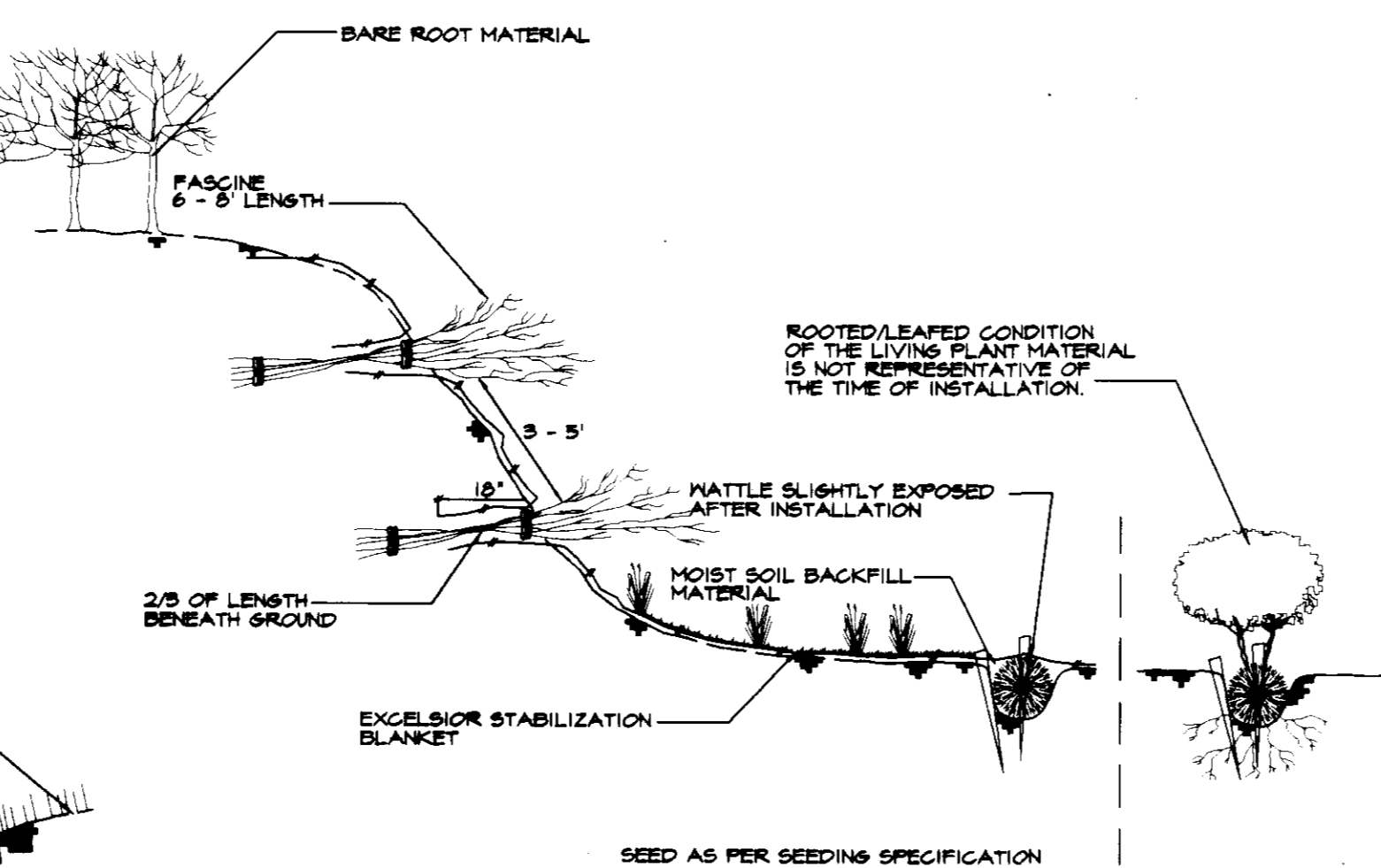
NOTE:
BOTTOM OF POSTS SHOULD BE AT LEAST 2' BELOW THE LEVEL OF MAXIMUM STREAM BED SCOURING.

DETAIL 'B' LIVE POSTS
NOT TO SCALE

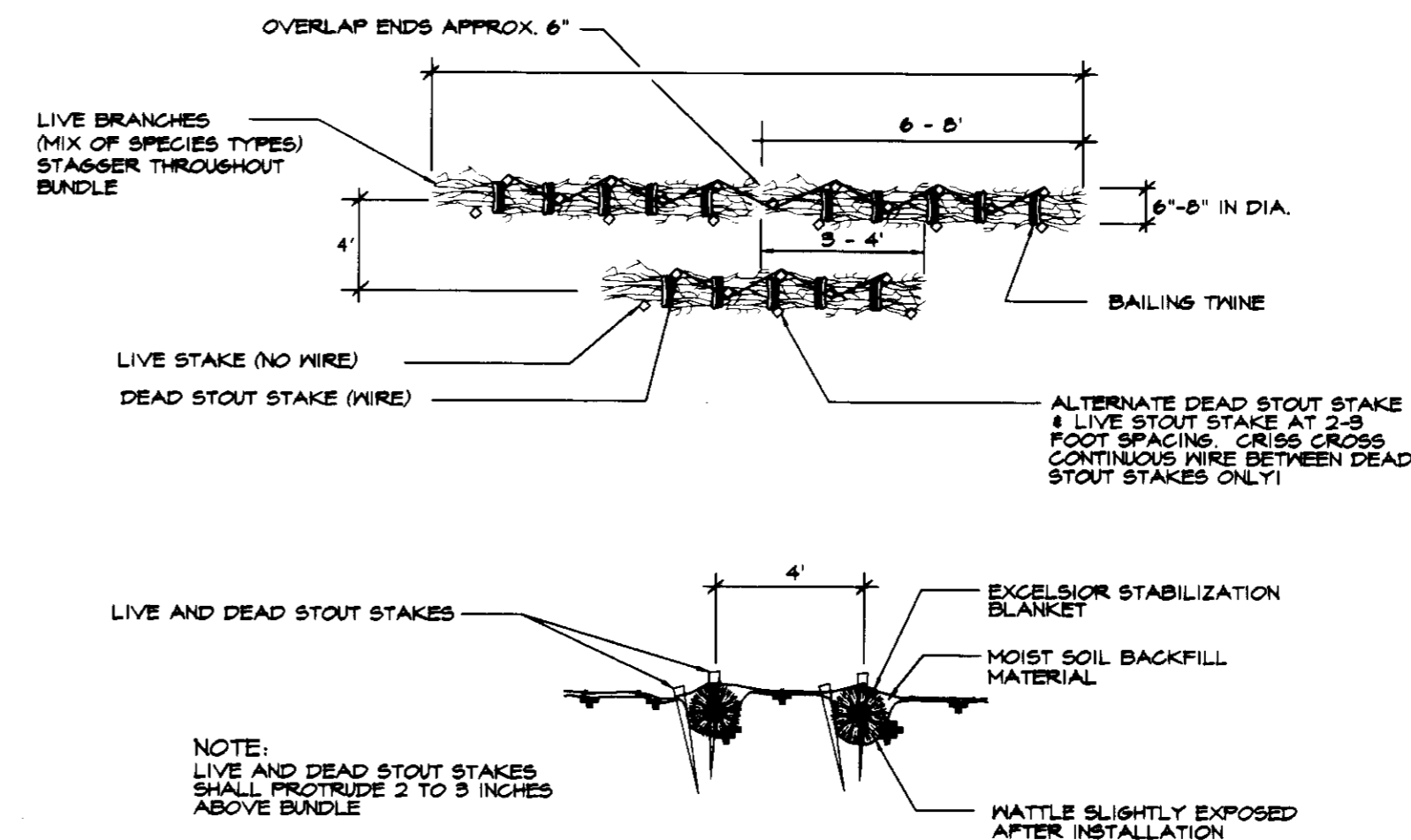


BIOLOS DESCRIPTION:
100% COCONUT FIBER BIOLOS SHALL BE MACHINE FABRICATED CYLINDER ENCASED IN A 100% COCONUT FIBER NETTING. FIBER SHALL BE PACKED TIGHTLY INTO NETTING AND SHALL WEIGH MINIMUM 4 LBS. PER LINEAR FOOT. NETTING SHALL BE APPROXIMATELY TWO INCH MESH WITH JOINTS TIED TO PREVENT MISALIGNMENT. MESH TWINE SHALL BE OF SUFFICIENT THICKNESS TO YIELD 55 LBS. TENSILE STRENGTH PER YARN WHEN DRY OR 40 LBS. TENSILE STRENGTH PER YARN WHEN WET.

DETAIL 'C' BIOLOS
NOT TO SCALE



DETAIL 'D' FASCINES
NOT TO SCALE



1. STAKE CONTOUR
2. TRENCH ABOVE STAKES 1/2 DIA. OF MATTLES
3. PLACE BUNDLES IN TRENCH
4. ADD STAKES THROUGH 4 BUNDLE BUNDLES
5. COVER MATTLES WITH SOIL, TAMP FIRMLY

DETAIL 'E' MATTLES
NOT TO SCALE

PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME COMMON NAME	SIZE	REMARKS
LIVE CANES				
[Symbol]	900	CORNUS AMOMUM SILKY DOGWOOD	1-1/2" CAL. 5 - 5' LENGTH	OBTAINED ON SITE (SEE DETAIL 'A')
[Symbol]	916	CORNUS SERICEA REDOSIER DOGWOOD	1-1/2" CAL. 5 - 5' LENGTH	OBTAINED ON SITE (SEE DETAIL 'A')
[Symbol]	500	SALIX NIGRA BLACK WILLOW	1-1/2" CAL. 5 - 5' LENGTH	OBTAINED ON SITE (SEE DETAIL 'A')
LIVE POSTS				
[Symbol]	160	SALIX NIGRA BLACK WILLOW	3 - 6" CAL. 8 - 12' LENGTH	OBTAINED ON SITE (SEE DETAIL 'B')
BIOLOS				
[Symbol]	26	BIOLOS	16" DIA. 20 LENGTH	SEE DETAIL 'C'
FASCINES				
[Symbol]	127	FASCINE	6 - 8' LENGTH	SEE DETAIL 'D'
MATTLES				
[Symbol]	908	MATTLE	6 - 8' DIA. 6 - 8' LENGTH	SEE DETAIL 'E'
BARE ROOT				
[Symbol]	300	CORNUS SERICEA REDOSIER DOGWOOD	3-4" HEIGHT B.R.	4' O.C. (SEE DETAIL)
[Symbol]	251	SALIX COTTETI "BANKERS' DOGWOOD" WILLOW	3-4" HEIGHT B.R.	4' O.C. (SEE DETAIL)
[Symbol]	190	SALIX PURPUREA "STREAMCO" PURPLEOSIER WILLOW	3-4" HEIGHT B.R.	4' O.C. (SEE DETAIL)
[Symbol]	975	SALIX NIGRA BLACK WILLOW	3-4" HEIGHT B.R.	4' O.C. (SEE DETAIL)
HERBACEOUS				
[Symbol]	410	CAREX GRINITA FRINSED SEDGE	2" PEAT POT	2' O.C. (SEE NOTE 5)
[Symbol]	950	CAREX LURIDA SHALLOW SEDGE	2" PEAT POT	2' O.C. (SEE NOTE 5)
[Symbol]	650	CAREX STRICTA TUSSOCK SEDGE	2" PEAT POT	2' O.C. (SEE NOTE 5)
[Symbol]	240	EUPATORIUM PURPUREUM PURPLE JOE PYE WEED	2" PEAT POT	2' O.C.
[Symbol]	300	JUNCUS EFFUSUS SOFT RUSH	2" PEAT POT	2' O.C. (SEE NOTE 5)
[Symbol]	450	PANICUM VIRGATUM SWITCHGRASS	2" PEAT POT	2' O.C.
[Symbol]	270	SCIRPUS VALIDUS SOFT STEM BULRUSH	2" PEAT POT	2' O.C. (SEE NOTE 5)

NOTE:
1. ALTERNATE BARE ROOT AND LIVE CANES ALONG LENGTH OF STREAM BANK AS SHOWN ON PLAN.
2. BARE ROOT TREES MAY BE SUBSTITUTED FOR LIVE CANES AT A 1:1 RATIO IF LIVE CANES CAN NOT BE OBTAINED.
3. PLANT EVERY 1' ALONG THE LENGTH OF THE ENTIRE BIOLOS USING HERBACEOUS PLANT MATERIAL.
4. RANDOMLY SPACE BARE ROOT PLANT MATERIAL SO THAT NO MORE THAN 7 OF ANY PARTICULAR SPECIES ARE PLANTED IN SUCCESSION.

SPECIFICATIONS FOR STREAM RESTORATION ONLY

WETLAND PLANT ESTABLISHMENT:

- BLACK WILLOW TO BE USED FOR LIVE CANES
- PLANT MATERIAL MUST BE CUT AND INSTALLED WHILE DORMANT CARE MUST BE TAKEN TO KEEP PLANT MATERIAL MOIST AT ALL TIMES.
- PLANT SPECIES REQUIRED ARE NORMALLY UNAVAILABLE FROM STANDARD LANDSCAPE NURSERY SOURCES. THE CONTRACTOR MUST MAKE ARRANGEMENTS WITH COMPETENT NURSERY RESTORATION SPECIALISTS TO INSURE A SUPPLY OF THE REQUIRED MATERIAL.
- THE CONTRACTOR AND/OR THEIR SUBCONTRACTOR SHOULD BE AWARE OF THE SITE DESIGN CONDITIONS AND SHOULD TAKE ALL PRUDENT STEPS TO INSURE THAT THE PLANT MATERIAL SPECIFIED ON THE PLANS IS ACCLIMATED TO WETLAND CONDITIONS PRIOR TO DELIVERY TO THE JOB SITE. IF THE PLANT MATERIAL IS AVAILABLE FROM SOURCES WHERE WETLAND CONDITIONS ARE DUPLICATED AT THE NURSERY, THE CONTRACTOR SHOULD FAVOR THESE SOURCES AS THE SUPPLIER.

SEEDING

- ALL DISTURBED AREAS SHALL BE SEEDING UPON COMPLETION OF WORK, USING SEED MIX AS SPECIFIED.
- ALL STABILIZATION IN THE EXISTING WETLANDS, WETLAND BUFFERS, AND UPLAND AREAS SHALL BE THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LILIUM MULTIFLORUM), HILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (Avena SP.), AND/OR RYE (SECALE CERVALE). THESE SPECIES ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALLOWING FOR THE VOLUNTARY REVEGETATION OF WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE BUT MUST BE APPROVED BY MARYLAND DEPARTMENT OF THE ENVIRONMENT. KENTUCKY 31 PEGUOL SHALL NOT BE UTILIZED IN THE WETLAND OR BUFFER AREAS. THE AREA MUST BE SEEDING AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION.

PLANTING SCHEDULE:

- IT IS RECOMMENDED THAT PLANTING BE COMPLETED EARLY IN THE SPRING
- WORK SHALL BE COMPLETED FROM BOTTOM OF SLOPE TO TOP.

WARRANTY:

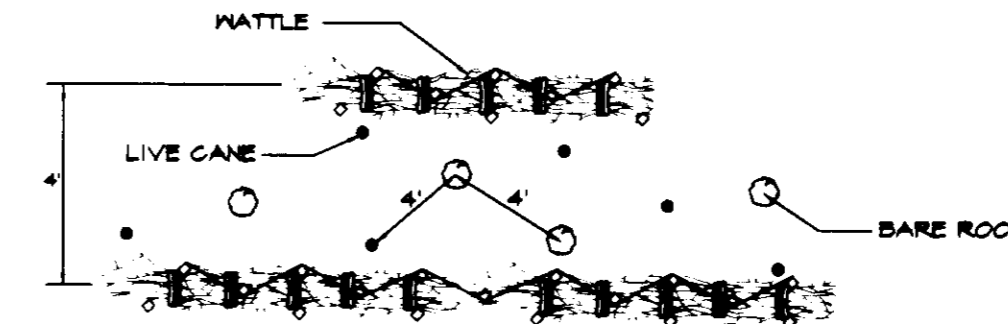
- A TWO (2) YEAR MAINTENANCE AND REPLACEMENT WARRANTY SHALL BE REQUIRED.
- THE STREAM STABILIZATION AREA MUST BE ASSESSED BY RIEMER MUEGGE & ASSOCIATES, INC. TO DETERMINE AN 85% SURVIVAL RATE AT THE END OF THE TWO YEAR PERIOD.

GENERAL NOTES

- CONTACT MISS UTILITY WITHIN 48 HOURS OF ANY DISTURBANCE PHONE: 1-800-291-7777
- THERE WILL BE NO STAGING OR STORING OF EQUIPMENT WITHIN THE LIMIT OF THE NORTHERL WETLANDS OR THE 25' BUFFER UNLESS OTHERWISE INDICATED.

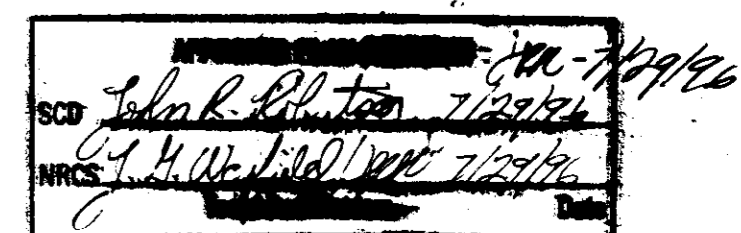
SEQUENCE OF CONSTRUCTION

- INSTALL SEDIMENT & EROSION CONTROL DEVICES AS SHOWN ON GRADING, SEDIMENT & EROSION CONTROL PLANS, PHASE I.
- ROUGH & FINE GRADE AS PER GRADING PLANS.
- INSTALL BIOLOS AS SPECIFIED. USE PRECAUTIONS TO MINIMIZE SEDIMENT ENTERING THE STREAM.
- INSTALL MATTLES & FASCINES AS SPECIFIED.
- BACKFILL WITH MOIST TOPSOIL LEAVING MATTLES SLIGHTLY EXPOSED.
- INSTALL EXCELSIOR STABILIZATION BLANKET, SECURE AS NECESSARY.
- INSTALL LIVE CANES AND/OR BARE ROOT PLANT MATERIAL.
- INSTALL LIVE POSTS IN STREAM.
- STABILIZE BARE GROUND AS PER GRADING, SEDIMENT & EROSION CONTROL PLANS.
- UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, PROCEED TO PHASE II. REPEAT SEQUENCE OF CONSTRUCTION.



NOTE:
RANDOMLY SPACE TREES SO THAT NO MORE THAN 5 (BARE ROOT) OR 7 (LIVE CANES) ARE PLANTED IN SUCCESSION.

TYPICAL DETAIL FOR LIVE CANES & BARE ROOT MATERIAL
NOT TO SCALE



SUPPLEMENTAL INFORMATION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

John B. Blanton 8/1/96
DIRECTOR DATE
John Blanton 7/21/96
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
Gene Summerville 7/21/96
CHIEF, DIVISION OF LAND DEVELOPMENT AND RESEARCH DATE

DATE NO. REVISION
OWNER / DEVELOPER
OPUS EAST, L.L.C.
6707 DEMOCRACY BOULEVARD
SUITE 510
BETHESDA, MARYLAND 20817
301-493-4444

PROJECT **MIDDLE PATUXENT RIVER REVITALIZATION**
AREA TAX MAP 15 PARCEL 92
3RD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE **STREAM STABILIZATION DETAILS & SPECIFICATIONS**

RIEMER MUEGGE & ASSOCIATES, INC.
ENGINEERING • ENVIRONMENTAL SERVICES • PLANNING • SURVEYING
8818 Centre Park Drive • Suite 200 • Columbia, MD 21045
410-997-8900 FAX: 410-997-9282

7-24-96
DATE
DESIGNED BY: DK, RR
DRAWN BY: RR
PROJECT NO.: 95P113902
DATE: JULY 25, 1996
SCALE: AS SHOWN
DRAWING NO. 28 OF 28