

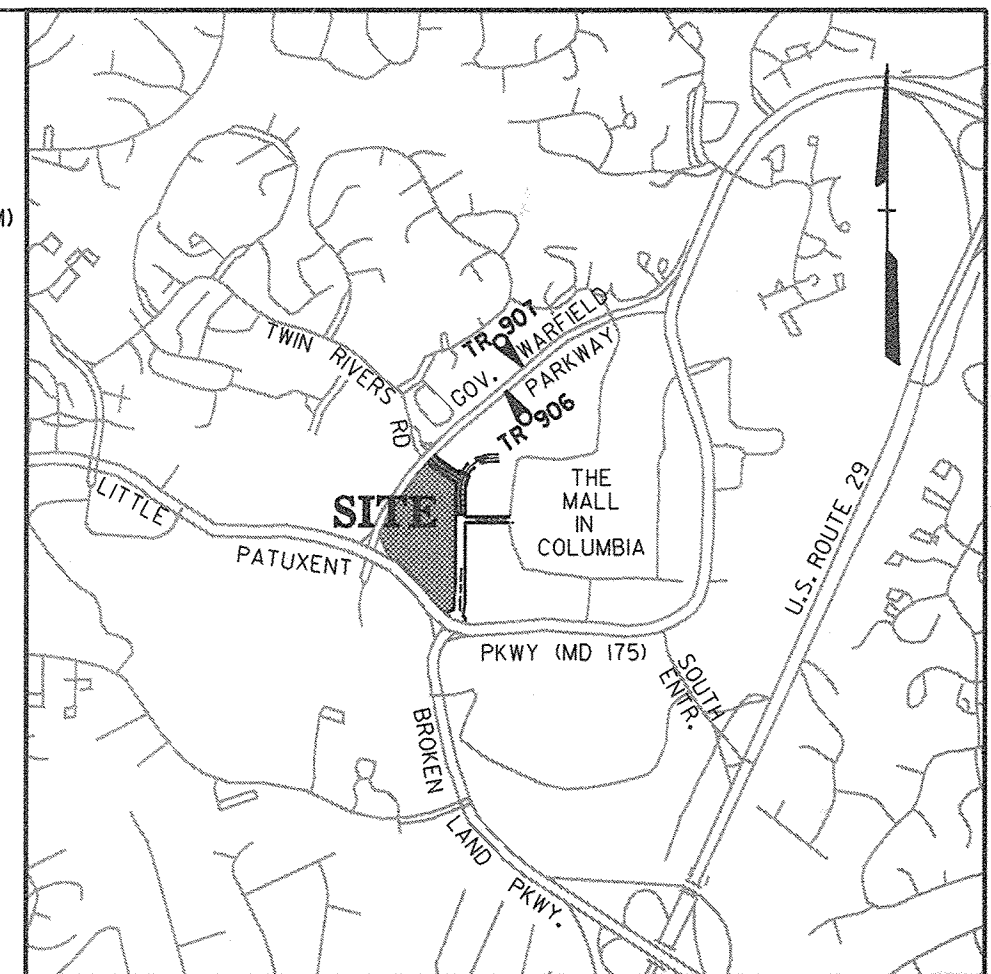
FINAL PLAN

TOWN CENTER

SECTION 2 AREA 9 PHASE 224

PARCELS A & B; LOT 1

BENCHMARK		DESCRIPTION
ELEVATIONS SHOWN HEREON ARE BASED ON THE FOLLOWING TRAVERSE STATIONS ESTABLISHED BY FISHER, COLLINS AND CARTER, INC. (NGVD 29 VERTICAL DATUM)		
TR 906	N 504280.630	E 838550.3680 ELEV. 381.500
TR 907	N 504400.6701	E 838647.7101 ELEV. 394.150



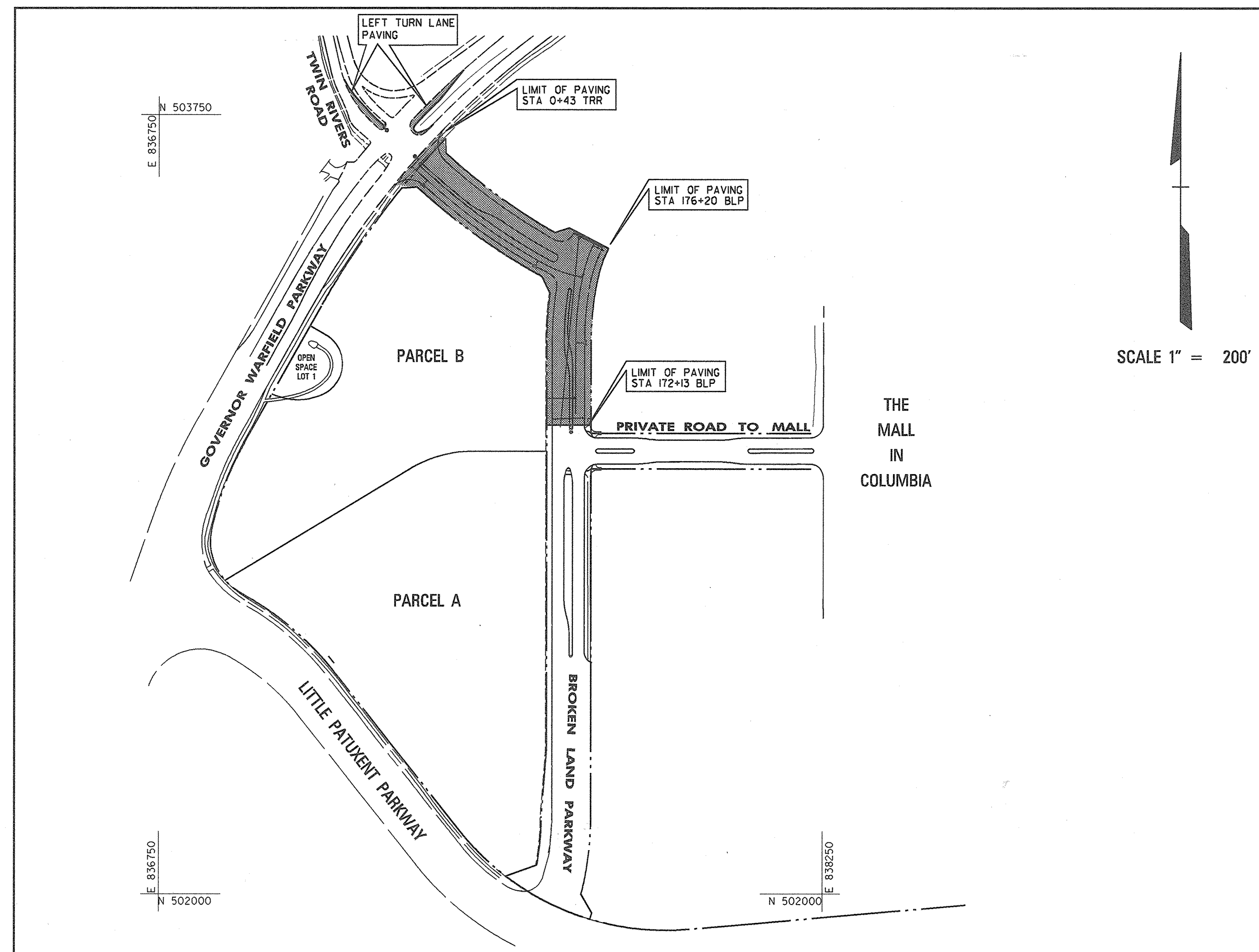
LOCATION MAP
SCALE: 1" = 2000'

GENERAL NOTES

- All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
- The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection division at 410-313-1880 at least five (5) working days prior to the start of work.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs be in place prior to the placement of any asphalt.
- Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993) and as modified by "Guidelines for Street Lights in Residential Developments (June 1993)." A minimum spacing of 20' shall be maintained between any street light and any tree.
- The existing topography is taken from survey with 2' contour intervals. Portions of the field run topography shown hereon have been compiled from prior topographic surveys by "Shanaberger & Lane" and "Fisher, Collins and Carter, Inc." in 1994. All other topography shown is by "DMW" dated 1995.
- The coordinates shown hereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System. Howard County Monument Nos. TR 101 and TR 102 were used for traverse control system for this project. Howard County Monument Nos. TR 906 and TR 907 were used to establish the elevations for this project.
- Water is Public. Contract No. is 24-3221-D and the drainage area is Little Patuxent.
- Sewer is Public. Contract No. is 24-3221-D and the drainage area is Little Patuxent.
- SWM quantity will be provided by regional facility located on west side of Broken Land Parkway, south of Little Patuxent Parkway. Water quality treatment for Broken Land Parkway extension is available at existing facility located northwest of Little Patuxent Parkway / Broken Land Parkway intersection. See F-91-57 for Water Quality and F-85-131 for Water Quantity.
- Existing utilities are based on Existing Construction Plans (Contract Nos. C-440-W and 24-3221-D).
- There is no floodplain on this site.
- No wetlands exist on this site per field determination by "Datt, McCune, Walker" on 8-17-94.
- The traffic study for this project was prepared by Wells and Associates.
- Sidewalk ramps shall meet current ADA requirements.
- Project background information:
 Subdivision Name TOWN CENTER
 Tax Map: 36
 Section/Area: Section 2, Area 9
 Lot/Parcel: part of parcel 81
 Zoning: NT
 Election District: 5th
 Total Tract Area: 19.0 acres
 Section area: n/a
 Number of Proposed Lots: 2
 Preliminary Equivalent Sketch Plan Approval Date APRIL 24, 1996
 DPZ Reference Number SP-96-09
- Waiver Petition, File number WP - 96 - 74 was approved April 11, 1996 waiving Section 16.145 (c)(16) which requires that the location of buildings, parking areas, internal streets, etc. be shown for apartment projects on the sketch plan.
- Vehicle ingress and egress to Broken Land Parkway will be permitted only at the points of access approved by the Department of Planning and Zoning and the Department of Public Works. Vehicle access to Governor Warfield Parkway, Little Patuxent Parkway and Twin Rivers Road is prohibited.
- Proposed water and sewer are shown under contract # 24-3554-D

5th ELECTION DISTRICT

HOWARD COUNTY, MARYLAND



DRAINAGE AREA: MIDDLE PATUXENT
TREATMENT AREA: LITTLE PATUXENT WATER QUALITY
MANAGEMENT CENTER-SAVAGE
HOWARD COUNTY

SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD CONSTRUCTION PLAN
3	STORM DRAIN PROFILES AND CONSTRUCTION DETAILS
4	MASS GRADING PLAN
5	DRAINAGE AREA MAP
6	EROSION AND SEDIMENT CONTROL PLAN
7	EROSION AND SEDIMENT CONTROL DETAILS
8	EROSION AND SEDIMENT CONTROL
9	STRIPING AND SIGNAGE PLAN
10	SIGNAL MODIFICATION PLAN

Professional Certification

I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the Laws of the State of Maryland.
 License No. 12976
 Expiration Date: May 26, 2018

[Signature]
9/2/16

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
[Signature] 1-20-97
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
[Signature] 1/24/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
[Signature] 1/24/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

AS-BUILT:



[Signature] 2/0/1998
 G. SCOTT SHANABERGER
 PROF. L.S. #10849

SHANABERGER & LANE
 8725 TOWN & COUNTRY BLVD.
 SUITE 104
 ELLICOTT CITY, MARYLAND 21043

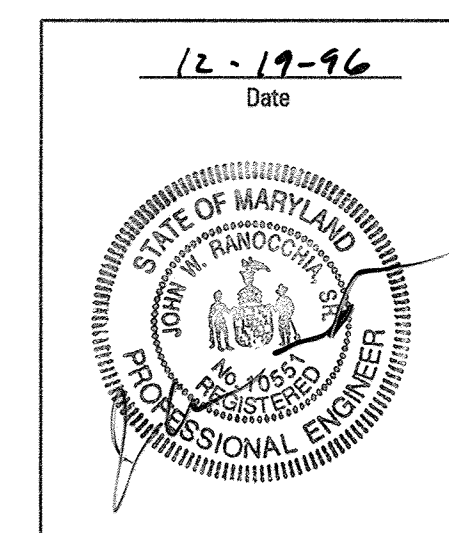
Date	No.	Revision Description

TOWN CENTER
SECTION 2, AREAS 9, PHASE 224
PARCELS A & B; LOT 1

OWNER / DEVELOPER:
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION
 THE ROUSE BUILDING
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

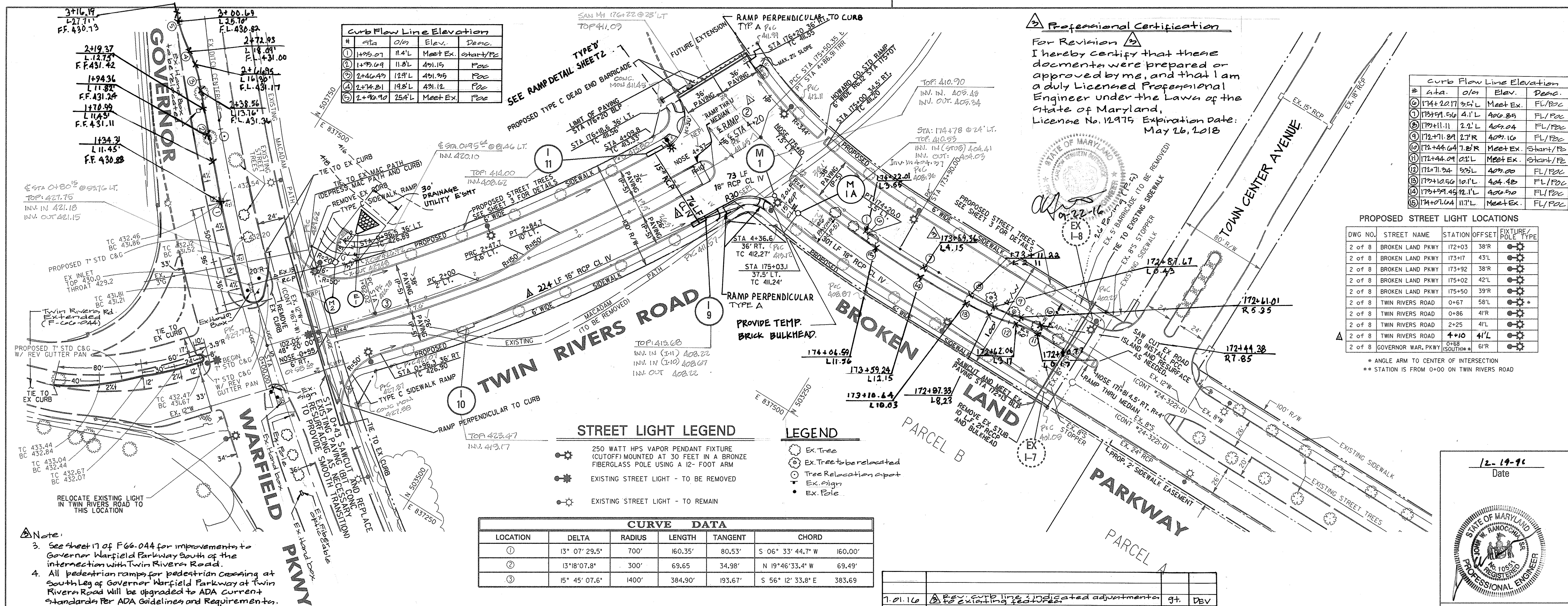
DMW
 Datt McCune Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-2555
 Fax 296-4708

A Team of Land Planners,
Landscape Architects,
Engineers, Surveyors &
Environmental Professionals



SUBDIVISION NAME TOWN CENTER	SECTION/AREA 2 / 9	LOT/PARCEL # 81
PLAT* OR L/P BLOCK ZONE NT	TAX/ZONE MAP 36	ELECT. DISTRICT 5th
WATER CODE	SEWER CODE	
TITLE SHEET		
Des By JWS	Scale AS SHOWN	Proj. No. 95019C
Drn By JWS	Date DEC 19, 1996	
Chk By JWR	Approved	1 OF 10

Date	Revision	By	Appr.
7.01.2016	Revised sheet Index	JT	DEV.



Curb Flow Line Elevation

#	Sta	Off	Elev.	Desc.
1	1495.07	11.4'L	491.15	Meet Ex. Start/End
2	1496.09	11.8'L	491.15	Meet Ex. Start/End
3	2146.49	12.9'L	491.95	Meet Ex. Start/End
4	2147.81	19.8'L	491.12	Meet Ex. Start/End
5	2149.10	25.4'L	491.12	Meet Ex. Start/End

Curb Flow Line Elevation

#	Sta	Off	Elev.	Desc.
1	1741.22	17.5'L	409.85	Meet Ex. Start/End
2	1741.11	2.2'L	409.04	Meet Ex. Start/End
3	1741.11	2.2'L	409.10	Meet Ex. Start/End
4	1741.11	2.2'L	409.10	Meet Ex. Start/End
5	1741.11	2.2'L	409.10	Meet Ex. Start/End
6	1741.11	2.2'L	409.10	Meet Ex. Start/End
7	1741.11	2.2'L	409.10	Meet Ex. Start/End
8	1741.11	2.2'L	409.10	Meet Ex. Start/End
9	1741.11	2.2'L	409.10	Meet Ex. Start/End
10	1741.11	2.2'L	409.10	Meet Ex. Start/End

PROPOSED STREET LIGHT LOCATIONS

DWG NO.	STREET NAME	STATION	OFFSET	FIXTURE	POLE TYPE
2 of 8	BROKEN LAND PKWY	172+03	38R	FL/PC	FL/PC
2 of 8	BROKEN LAND PKWY	173+17	43L	FL/PC	FL/PC
2 of 8	BROKEN LAND PKWY	173+92	38R	FL/PC	FL/PC
2 of 8	BROKEN LAND PKWY	175+02	42L	FL/PC	FL/PC
2 of 8	BROKEN LAND PKWY	175+50	39R	FL/PC	FL/PC
2 of 8	TWIN RIVERS ROAD	0+67	58L	FL/PC	FL/PC
2 of 8	TWIN RIVERS ROAD	0+86	47R	FL/PC	FL/PC
2 of 8	TWIN RIVERS ROAD	2+25	47L	FL/PC	FL/PC
2 of 8	TWIN RIVERS ROAD	4+10	41'L	FL/PC	FL/PC
2 of 8	GOVERNOR WAR. PKWY	0+85	61R	FL/PC	FL/PC

STREET LIGHT LEGEND

- 250 WATT HPS VAPOR PENDANT FIXTURE (CUTOFF) MOUNTED AT 30 FEET IN A BRONZE FIBERGLASS POLE USING A 12- FOOT ARM
- EXISTING STREET LIGHT - TO BE REMOVED
- EXISTING STREET LIGHT - TO REMAIN

LEGEND

- Ex. Tree
- Ex. Tree to be relocated
- Tree Relocation spot
- Ex. Sign
- Ex. Pole

CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
1	13° 07' 23.5"	700'	160.35'	80.53'	S 06° 33' 44.7" W 160.00'
2	13° 18' 07.8"	300'	69.65'	34.98'	N 19° 46' 33.4" W 69.49'
3	15° 45' 07.6"	1400'	384.90'	193.67'	S 56° 12' 33.8" E 383.69'

REVISIONS

No.	Date	Description	By	App'd
1	12.19.96	As-Built	JWS	JEF

Note:
 3. See sheet 17 of F66.044 for improvements to Governor Warfield Parkway South of the intersection with Twin Rivers Road.
 4. All pedestrian rampway pedestrian crossing at South Leg of Governor Warfield Parkway at Twin Rivers Road will be upgraded to ADA current standards per ADA Guidelines and Requirements.

NOTE
 1. Lane closure during the construction of the Lane modifications will be provided per SHA Detail MD 102.10-02.
 2. Final location of hand boxes will be determined in the field by DPW-Traffic Division based upon both the existing conditions and the Proposed Improvements shown on these plans.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Paul
 CHIEF, BUREAU OF HIGHWAYS 12-20-97
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Richard M. Paul
 CHIEF, DIVISION OF LAND DEVELOPMENT 1/21/97
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
William D. ...
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 1/24/97
 DATE

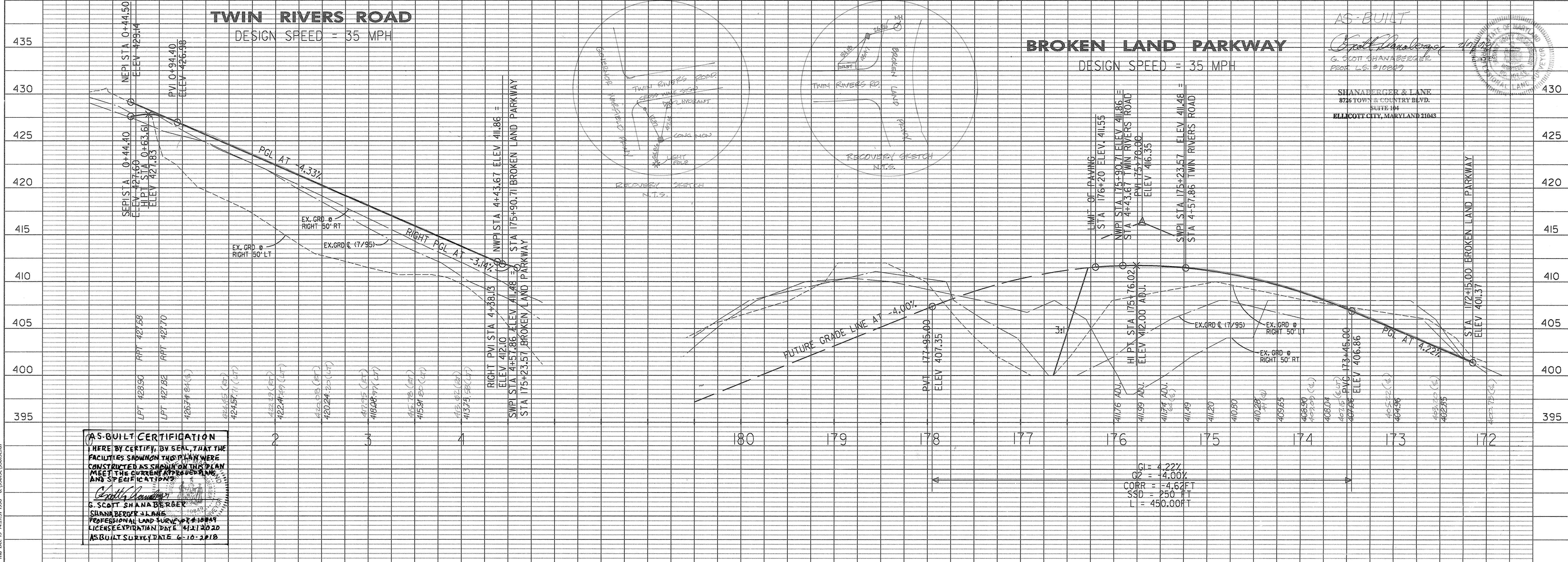
REVISIONS

Date	No.	Revision Description
12/3/97	1	ADD MANHOLE M-1A & M-2 & E-1
7/24/97	2	REL. ST. LIGHT L-9+HC RAMP

TOWN CENTER
 SECTION 2, AREA 9, PHASE 224
 PARCELS A & B; LOT 1
 OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

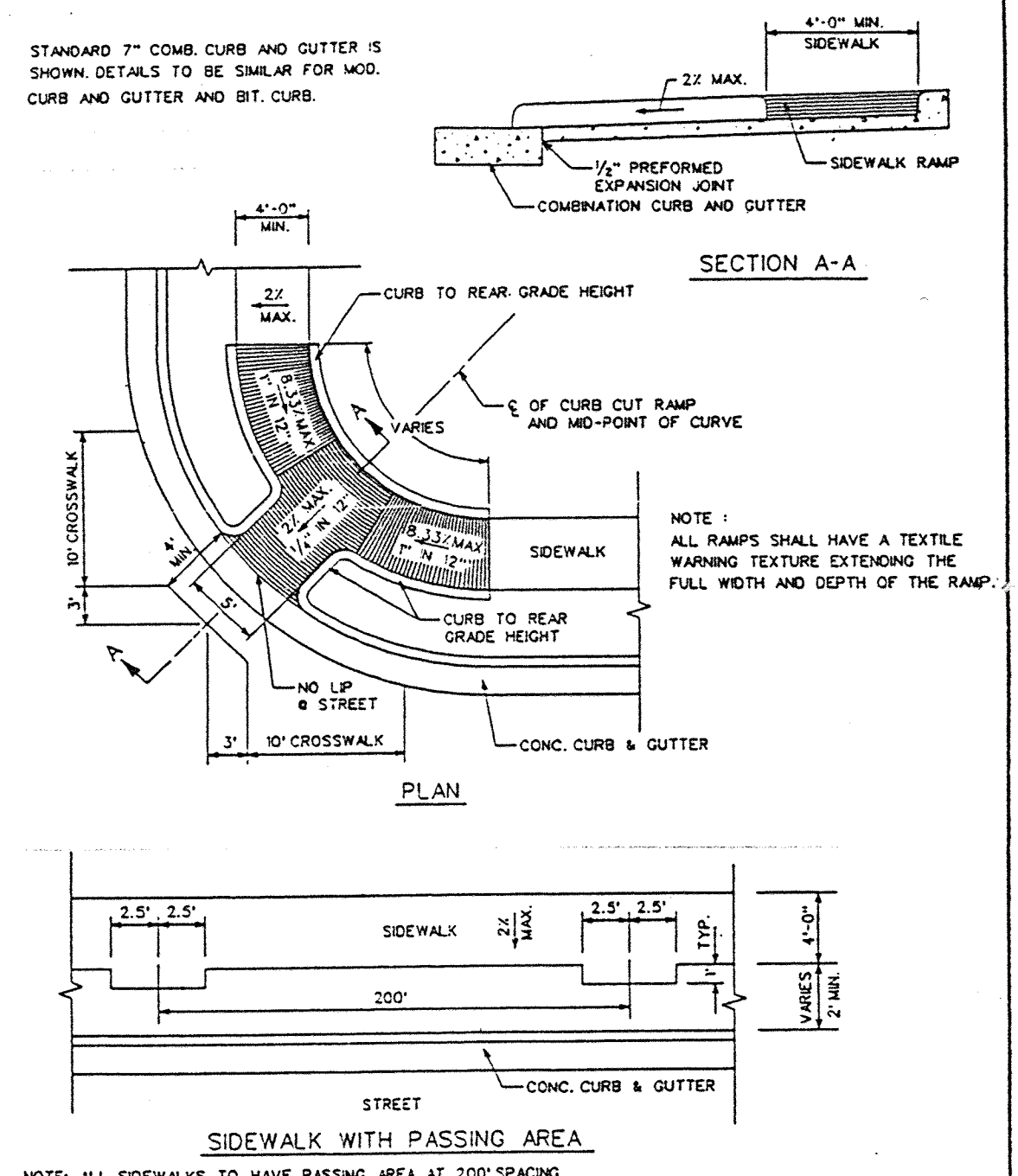
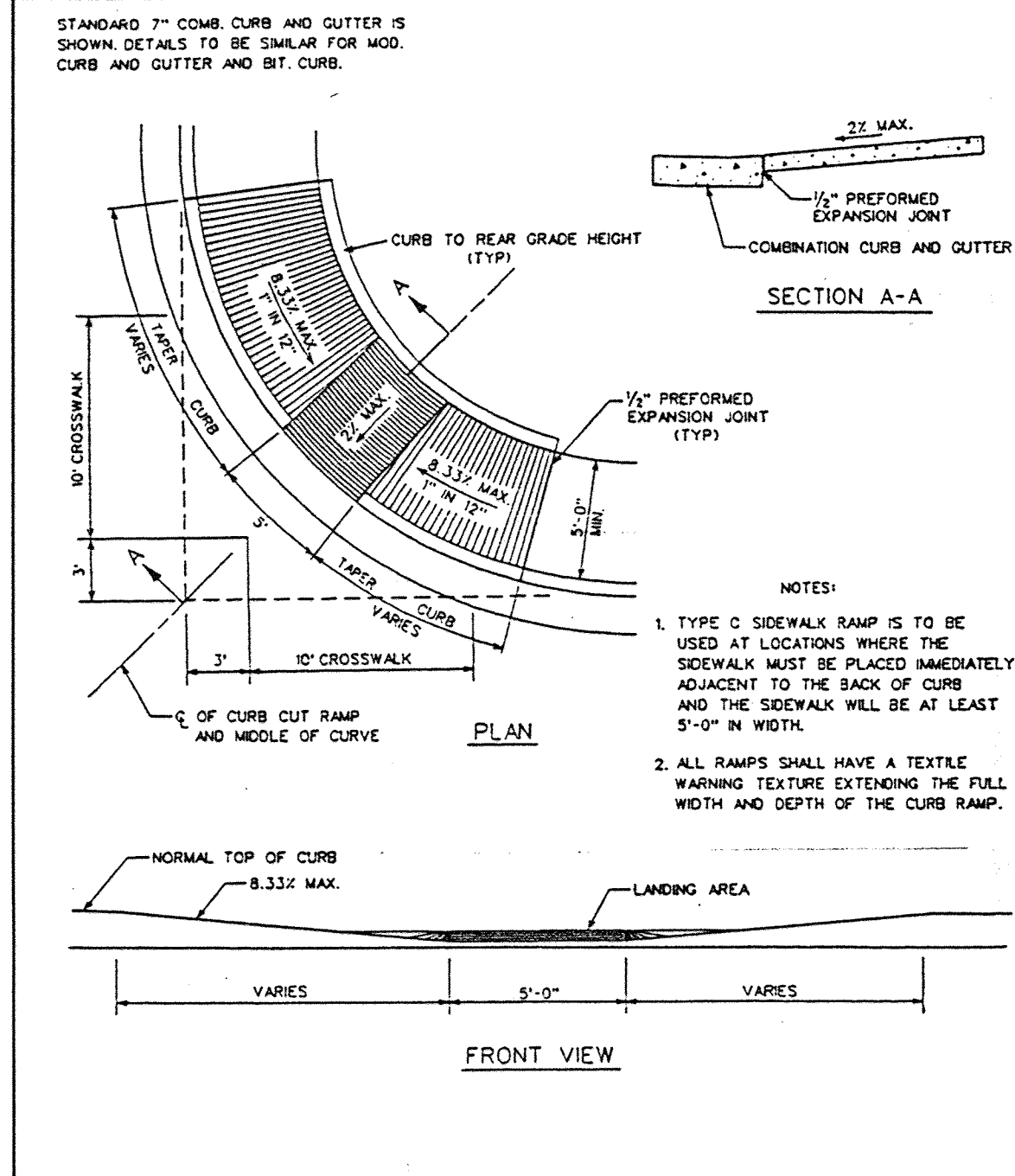
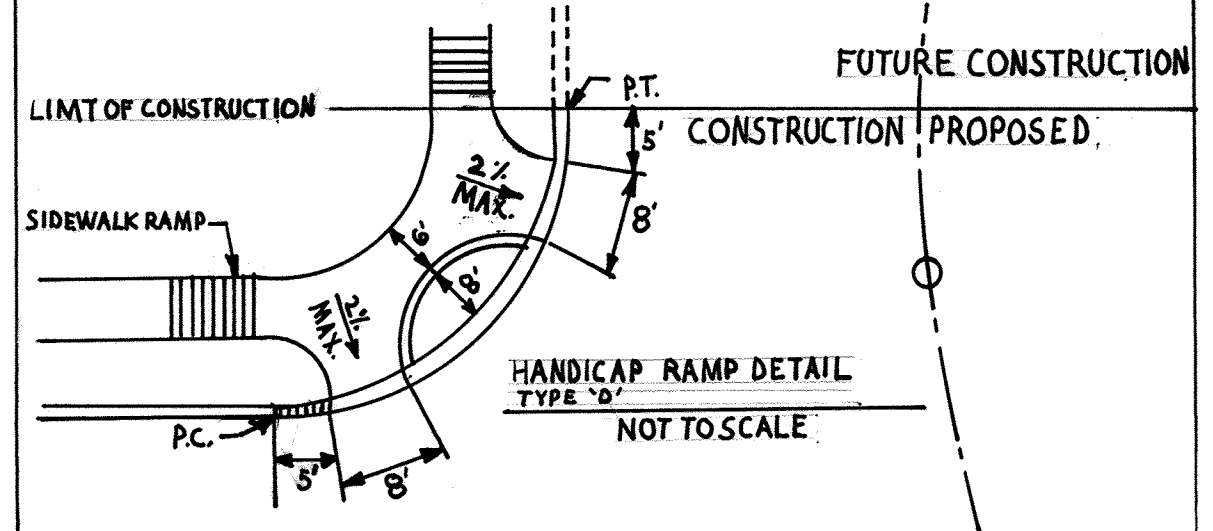
DMW
 Dan McConno Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3088
 Fax: 296-4705
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 2 AREA 9 PHASE 224
 TAX MAP 36 PARCEL 81
 5th ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND
 TITLE ROAD CONSTRUCTION PLAN
 Des By JWS Scale 1" = 50' Proj. No. 95019C
 Dwn By JEF Date DEC 19, 1996
 Chk By JWR Approved 2 OF 10



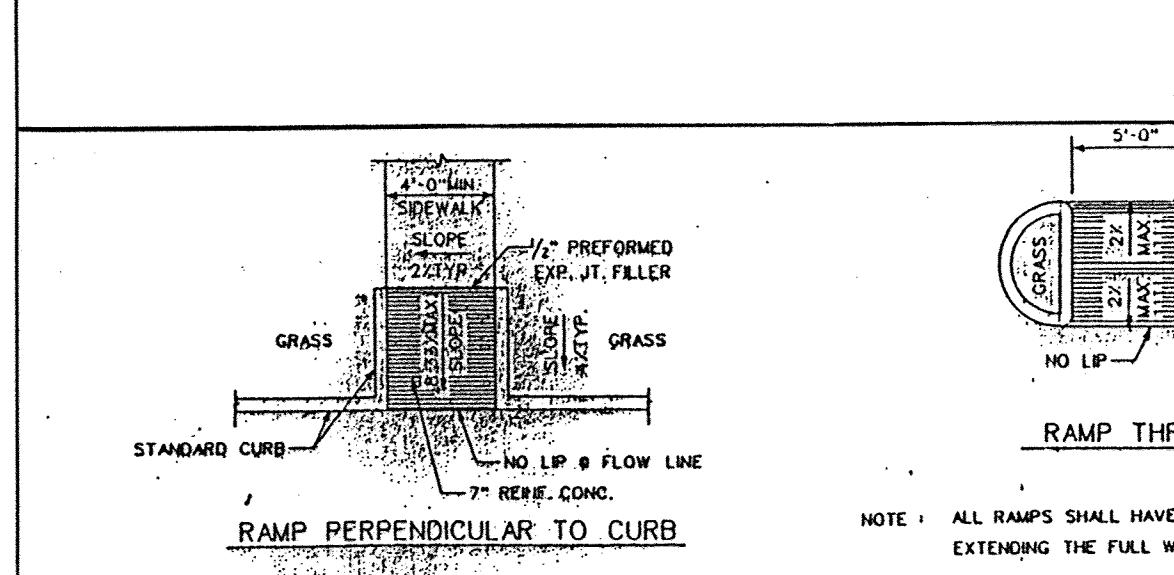
AS-BUILT CERTIFICATION
 I HEREBY CERTIFY, BY SEAL, THAT THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS PLAN MEET THE CURRENT APPROVED PLANS AND SPECIFICATIONS.
Scott Shanaberger
 SCOTT SHANABERGER
 SHANABERGER & LANE
 PROFESSIONAL LAND SURVEYORS
 LICENSE EXPIRATION DATE 11/21/2020
 AS-BUILT SURVEY DATE 6-10-2018

AS-BUILT
Scott Shanaberger
 G. SCOTT SHANABERGER
 PEOR. L.S. #100007
 SHANABERGER & LANE
 8736 TOWN & COUNTRY BLVD.
 SUITE 104
 ELLICOTT CITY, MARYLAND 21043



HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief - Bureau of Engineering Date

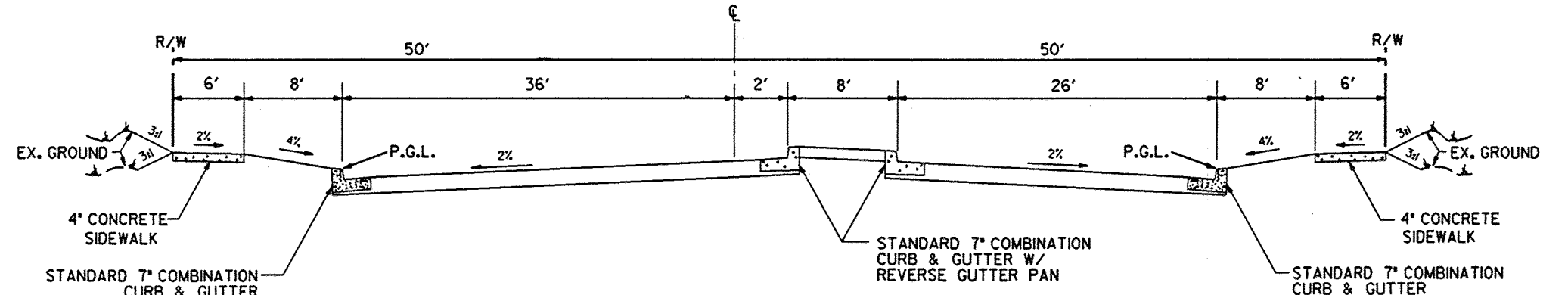
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief - Bureau of Engineering Date



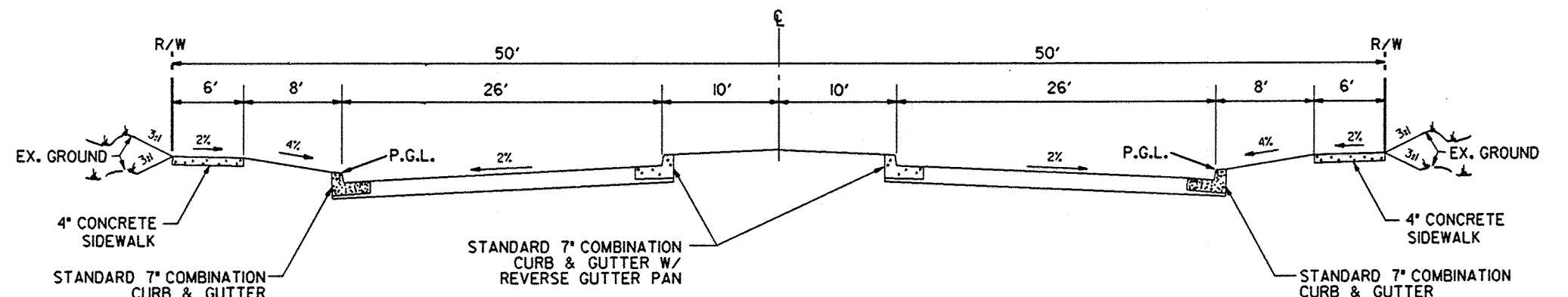
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief - Bureau of Engineering Date

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief - Bureau of Engineering Date

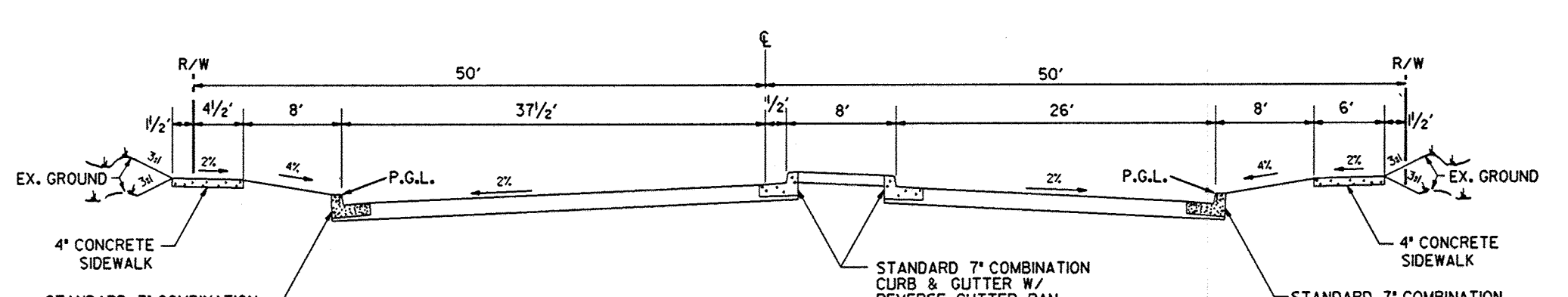
NOTE: DESIGN SPEED = 35 M.P.H. AND P-5 PAVING - ALL SECTIONS



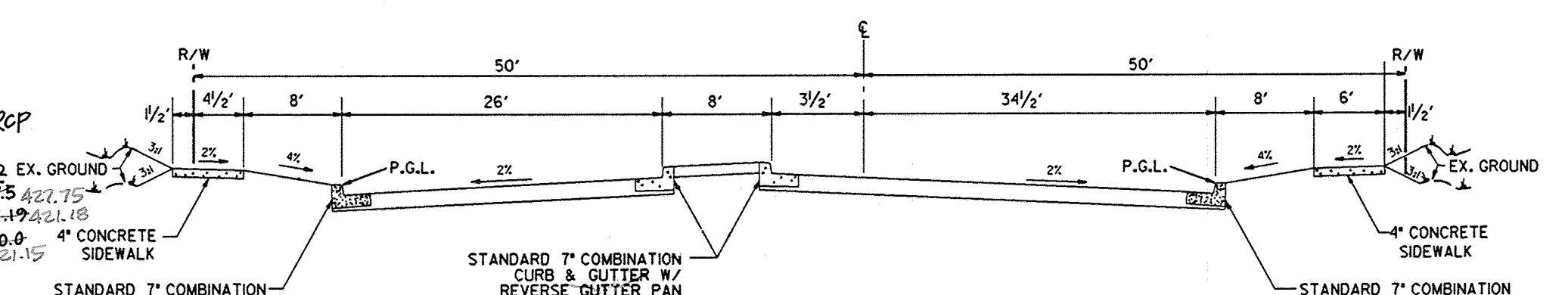
TYPICAL FULL SECTION (100' RIGHT-OF-WAY)
TWIN RIVERS ROAD STATION 0+59 TO 2+00
NOT TO SCALE



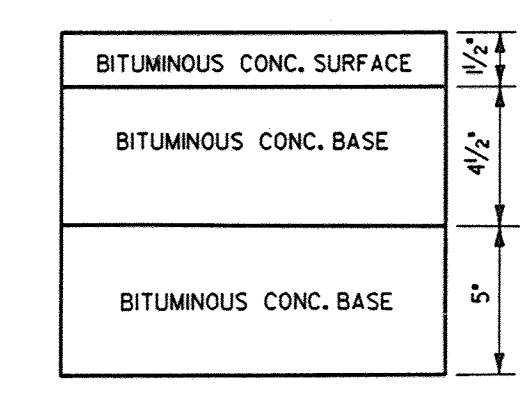
TYPICAL FULL SECTION (100' RIGHT-OF-WAY)
TWIN RIVERS ROAD STATION 2+85 TO 4+27
NOT TO SCALE



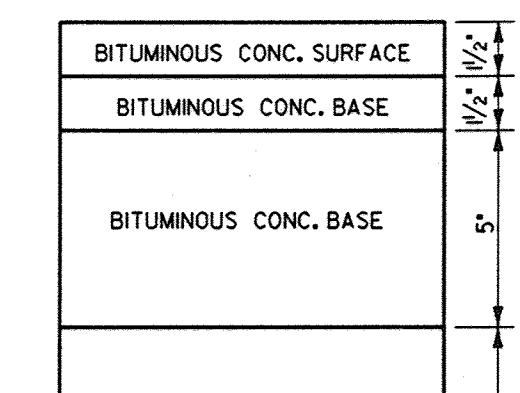
TYPICAL FULL SECTION (100' RIGHT-OF-WAY)
BROKEN LAND PARKWAY STATION 172+13 TO 173+00
NOT TO SCALE



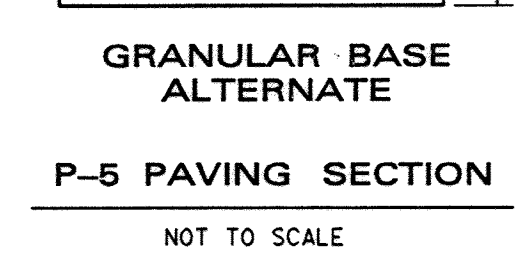
TYPICAL FULL SECTION (100' RIGHT-OF-WAY)
BROKEN LAND PARKWAY STATION 174+20 TO 175+06
NOT TO SCALE



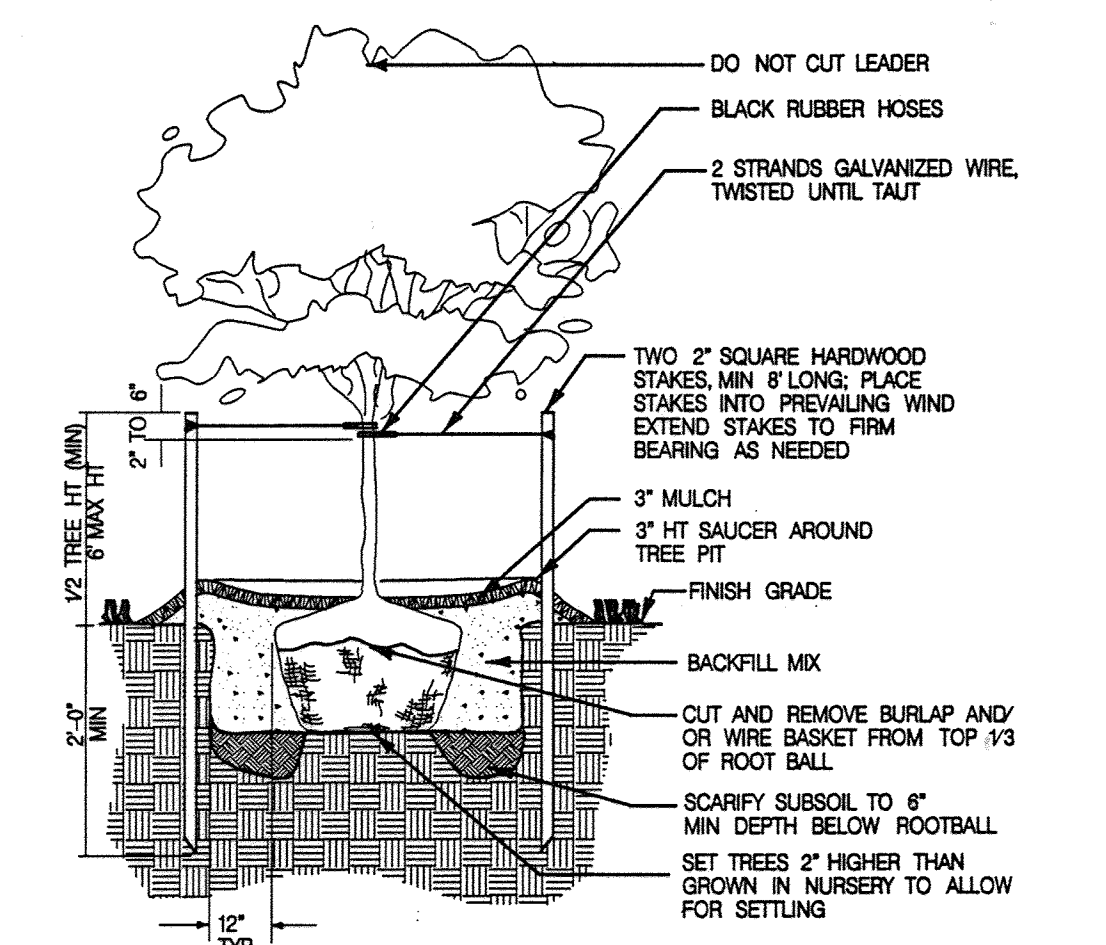
FULL DEPTH ALTERNATE



GRANULAR BASE ALTERNATE



P-5 PAVING SECTION



TREE PLANTING DETAIL
NOT TO SCALE

QUANTITY OF TREES	COMMON NAME	BOTANICAL NAME	HEIGHT
25	PIN OAK	QUERCUS PALustris	10'

NOTE: THE DEVELOPER IS RESPONSIBLE FOR THE INSTALLATION OF ALL STREET TREES AND THE REQUIRED PERIMETER AND SITE LANDSCAPING WILL BE PROVIDED BY THE BUILDER(S) IN CONJUNCTION WITH THE SITE DEVELOPMENT PLANS. SPACING BETWEEN STREET LIGHT AND ANY STREET TREE MUST BE 20' MIN.

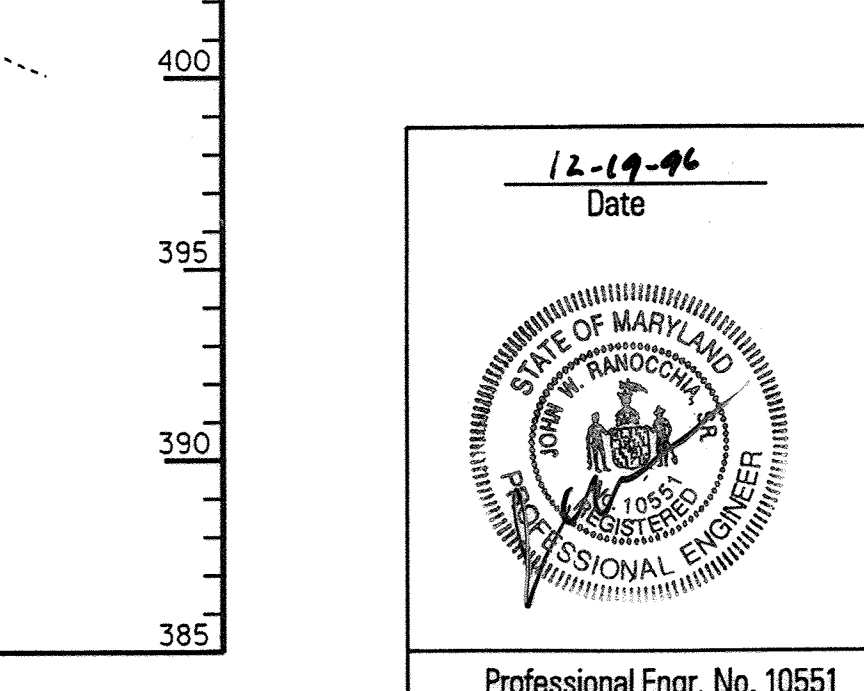
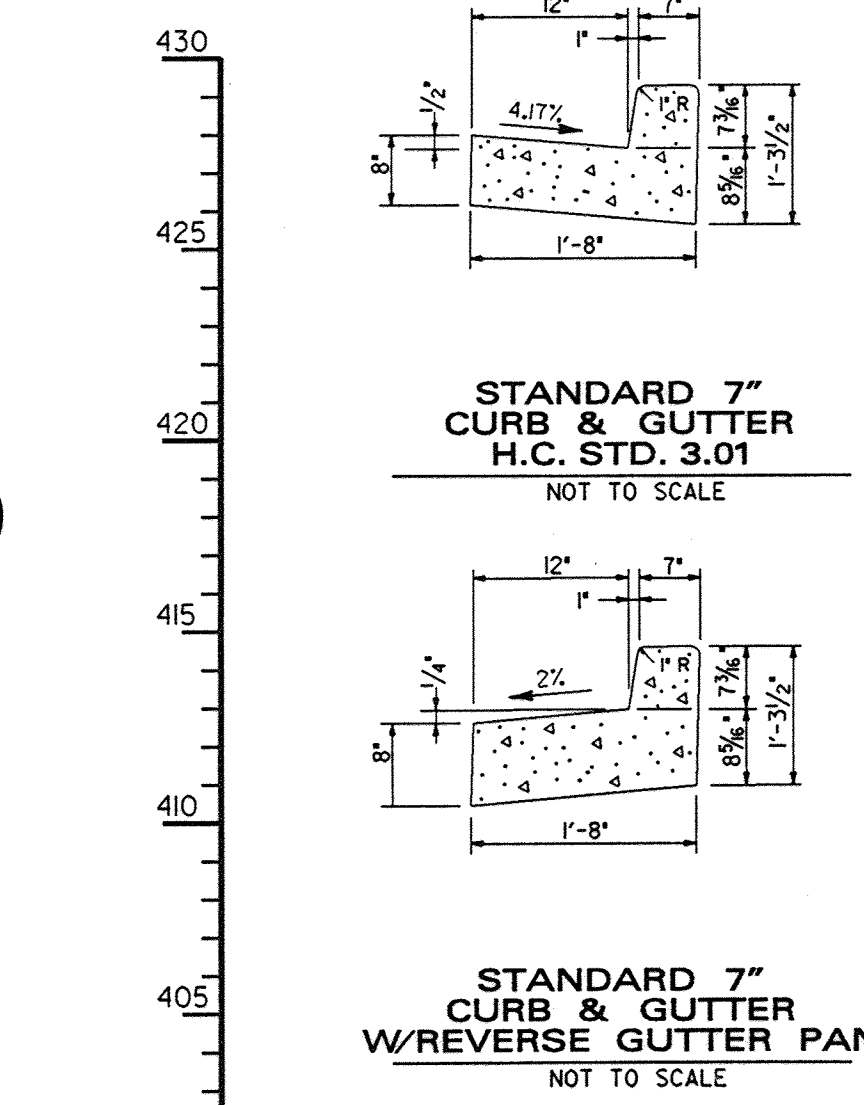
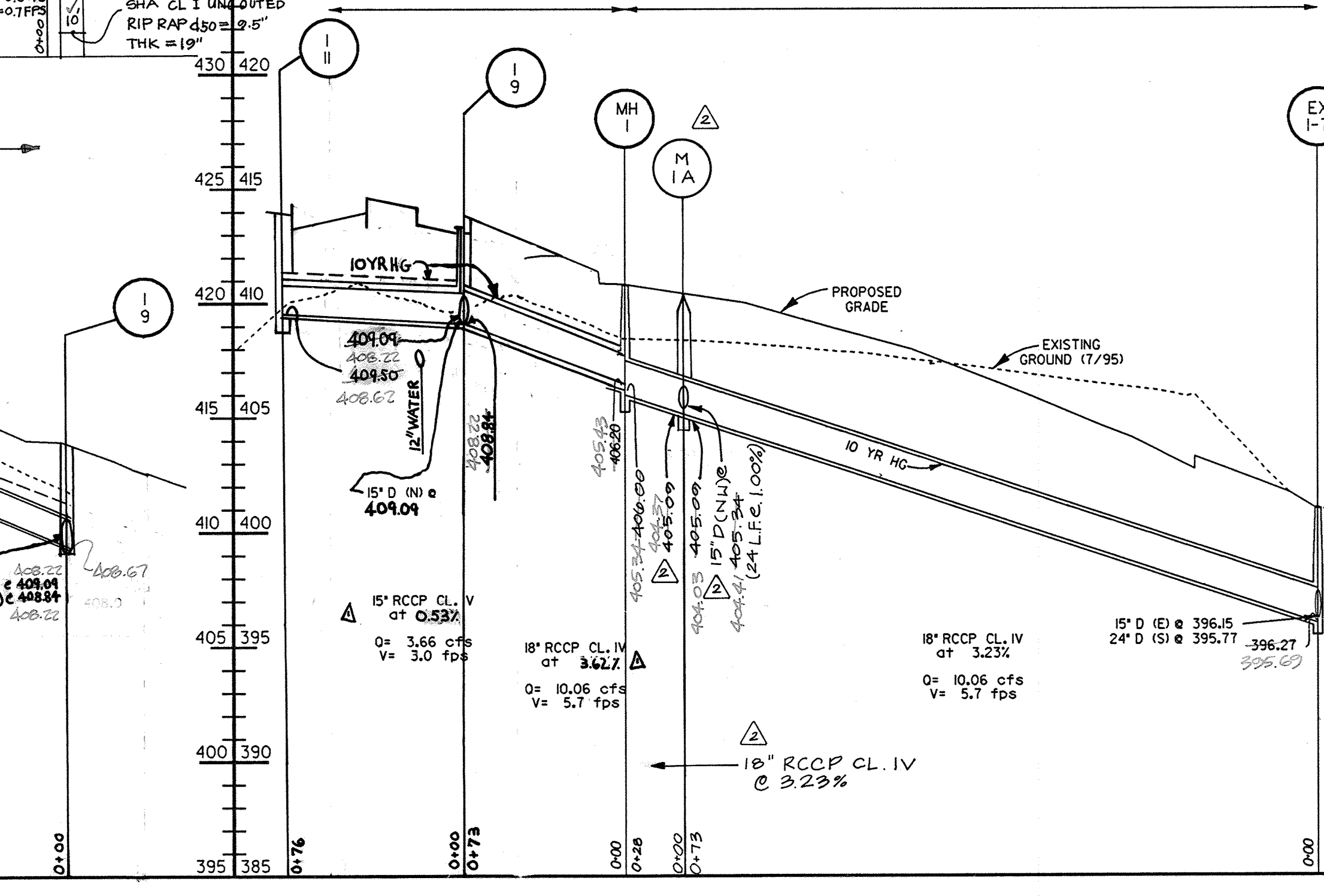
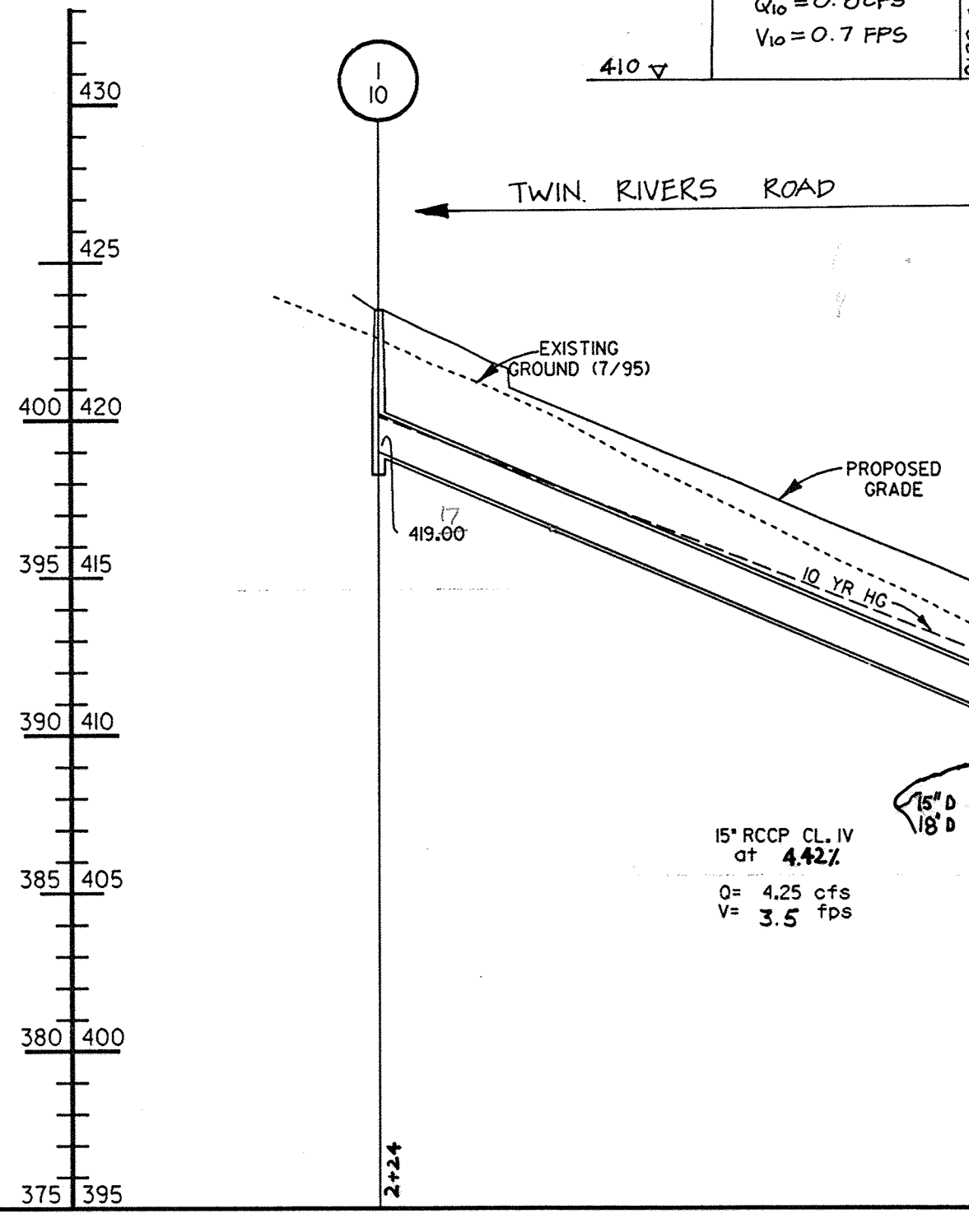
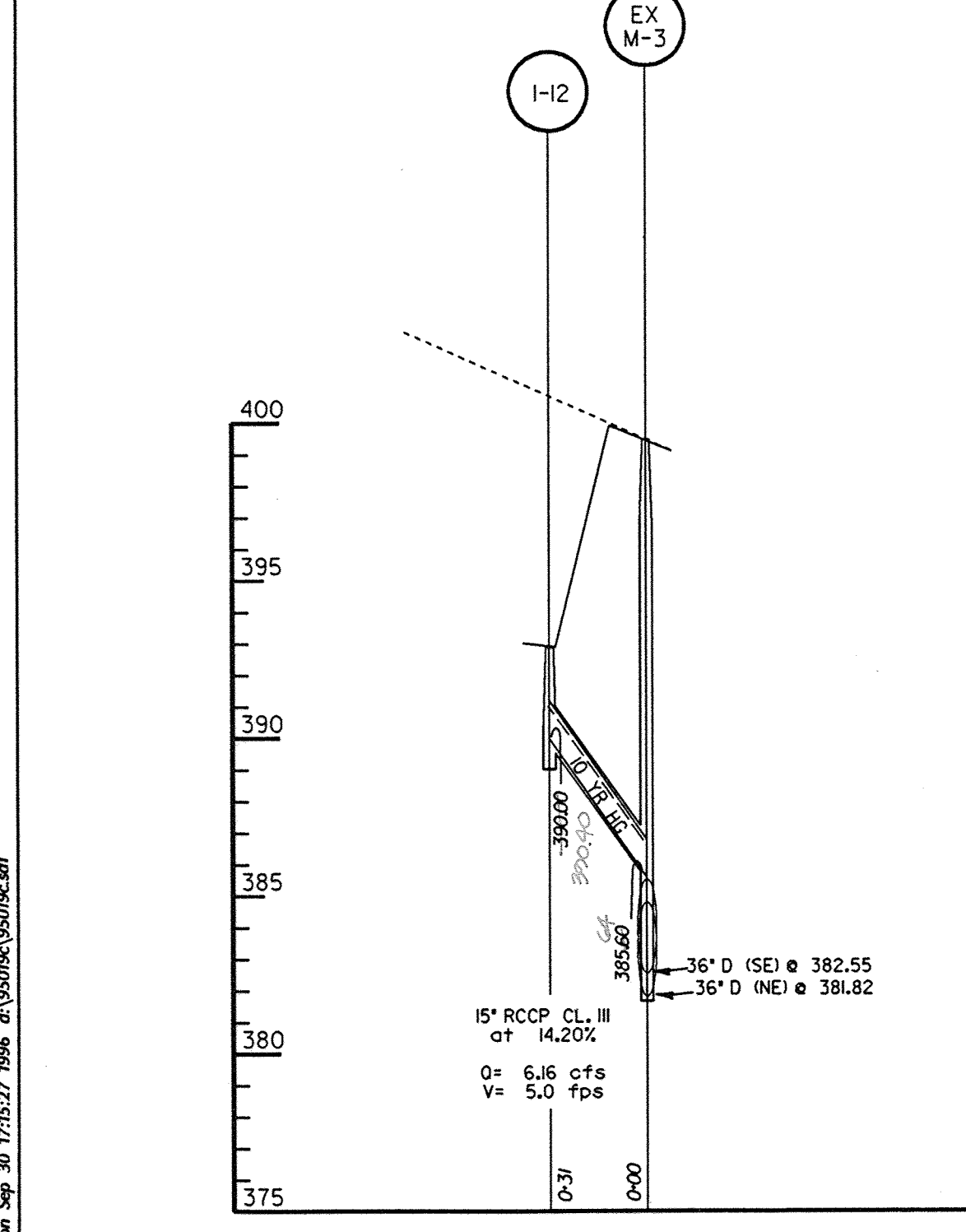
NO.	TYPE	WIDTH	TOP ELEV.	INV. OUT	STD DETAIL	LOCATION
I-9	A-10	3.0	413.78	408.84	SD4.4	TWIN RIVER ROAD STA 4+00.36' RT ✓
I-10	A-15	2.5	423.49	419.00	SD4.4 *	TWIN RIVER ROAD STA 1+25.36' RT ✓
I-11	A-15	2.5	413.90	409.50	SD4.4 *	TWIN RIVER ROAD STA 3+91.5 36' LT ✓
I-12	TYPE D	2.5	392.99	390.00	SD4.1	SEE PLAN
I-13	EX INLET TYPE D		RAISE TO 368.8	EX 346.25	SD4.1	EXISTING
M-2	STD MH	4.0	427.87	426.0	SEE PLAN	
E-1	STD INP SECTION	4.0	418.0	418.0	SEE PLAN	
M-1	STD MH	4.0	411.28	406.00	G 5.0	BROKEN LAND PARKWAY STA 175+06.30' LT
M-1A	STD MH	4.0	410.87	406.00	G 5.0	BROKEN LAND PARKWAY STA. 174+00.28' LT

NOTE: A-10 MODIFIED LENGTH OF OPENING = 15'
NOTE: ELEVATION REPRESENTS TOP OF CURB @ CL HEADPIECE FOR A-10 AND A-15 INLETS
OPENING TO BE PLACED ON ALL FOUR (4) SIDES
REMOVE EXISTING GRATE, RAISE TOP OF INLET TO ELEV 368.8 AND WEIR INVERT TO ELEV 368.0.
MAKE TYPE D INLET WITH OPENINGS TO BE PLACED ON ALL FOUR (4) SIDES

AS-BUILT

STATE OF MARYLAND
PROFESSIONAL ENGINEER
G. SCOTT SHANABERGER
PROF. LICENSE # 10849

SHANABERGER & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 104
ELLCOTT CITY, MARYLAND 21043



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
[Signature] Chief, Bureau of Highways 1-20-97 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
[Signature] Chief, Division of Land Development 1/21/97 DATE

[Signature] Chief, Development Engineering Division 1/24/97 DATE

Date	No.	Revision Description
12/3/97	A	REVISE PROFILE & STRUCTURE SCHEDULE TO ADD M-1A
7/24/97	A	REL. ST. LIGHT, I-9, ADDED RAMP DETAIL

TOWN CENTER
SECTION 2, AREA 9, PHASE 224
PARCELS A & B; LOT 1

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

DMW
Duff McCune Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 294-3338
Fax 296-4708

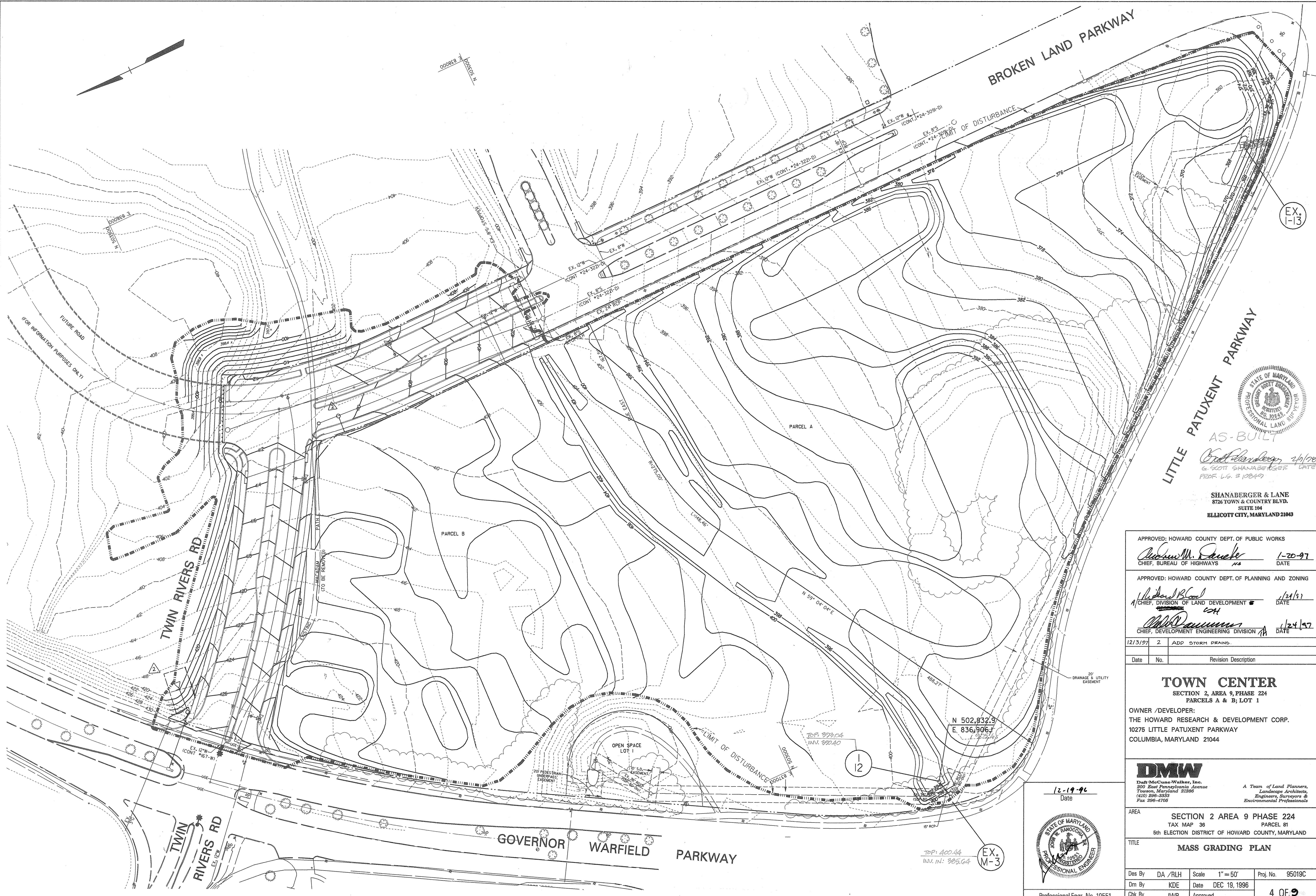
A Team of Land Planners,
Landscape Architects,
Engineers, Surveyors &
Environmental Professionals

AREA: SECTION 2 AREA 9 PHASE 224
TAX MAP 38 PARCEL 81
5th ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: **STORM DRAIN PROFILES AND CONSTRUCTION DETAILS**

Des By: RLH/JWS Scale: AS SHOWN Proj. No.: 95019C
Dm By: JWS Date: DEC 19, 1996
Chk By: JWR Approved

Professional Engr. No. 10551



EX. 1-13



AS-BUILT
G. Scott Shanaberger 2/1/98
 G. SCOTT SHANABERGER DATE
 PROF. L.S. # 10849

SHANABERGER & LANE
 8726 TOWN & COUNTRY BLVD.
 SUITE 104
 ELLICOTT CITY, MARYLAND 21043

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Andrew M. Davelle 1-20-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

Richard B. Bond 1/21/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

W.D. Dammus 1/24/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

12/3/97	2	ADD STORM DRAINS.
Date	No.	Revision Description

TOWN CENTER

SECTION 2, AREA 9, PHASE 224
 PARCELS A & B; LOT 1

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



Darr McNamee Walker, Inc.
 300 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 286-3333
 Fax 286-4708

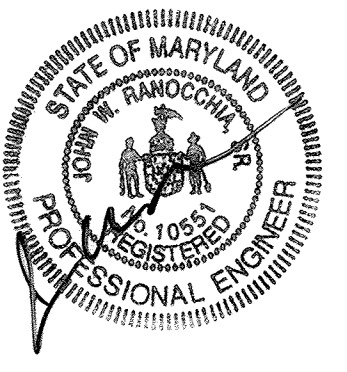
A Team of Land Planners,
 Landscape Architects,
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 Environmental Professionals

AREA SECTION 2 AREA 9 PHASE 224
 TAX MAP 38 PARCEL 81
 6th ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE **MASS GRADING PLAN**

Des By DA /RLH Scale 1" = 50' Proj. No. 95019C
 Dm By KDE Date DEC 19, 1996
 Chk By JWR Approved 4 OF 9

12-19-96
 Date



Professional Engr. No. 10551

TOP: A00.44
 INV. IN: 305.64
 EX. M-3

55

Thu, Dec 19 14:33:12 1996, 413620953950002.mpl

SEDIMENT TRAP TABLES			
TRAP NUMBER	#1	#2	
TRAP TYPE	ST-IV	ST-IV	
EXISTING DRAINAGE AREA AC.	5.7	9.6	
INTERIM DRAINAGE AREA AC.	5.7	9.6	
PROPOSED DRAINAGE AREA AC.	5.7	9.6	
STORAGE REQUIRED C.F.	WET	10260	17280
	DRY	10260	17280
	TOTAL	20520	34560
STORAGE PROVIDED C.F.	WET	13700	18375
	DRY	13625	22575
	TOTAL	27325	40950
EXISTING GROUND ELEV.	398	360	
TOP EMBANKMENT ELEV.	396	360	
WEIR CREST ELEV.	395	359	
WET STORAGE ELEV./OUTLET ELEV.	392.9	356.25	
CLEANOUT ELEV.	391.95	355.25	
BOTTOM ELEV.	390	354	
DEPTH OF CHANNEL (g)	NA	NA	
OUTLET WIDTH (b)	23'	39'	
BOTTOM DIMENSION	56' X 79'	59' X 109'	
TRAP SIDESLOPES	2:1	2:1	
TRAP DEPTH	WET	2.9	2.5
	DRY	2.1	2.5
	TOTAL	5	5
BARREL DIAMETER	NA	NA	
RISER DIAMETER	NA	NA	
WET STORAGE ZONE ELEV.	390-392.9	354.0-356.25	
DRY STORAGE ZONE ELEV.	392.9-395.0	356.25-359.0	

DEVELOPER'S CERTIFICATION:

"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 of 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 inspection by the Howard Soil Conservation District."

J. J. J. 1/9/97 Date

ENGINEER'S CERTIFICATION:

"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."

John W. Ranocchia, Sr. PE 10551 12-19-96 Date

Reviewed for Howard Soil Conservation District and meets Technical Requirements.

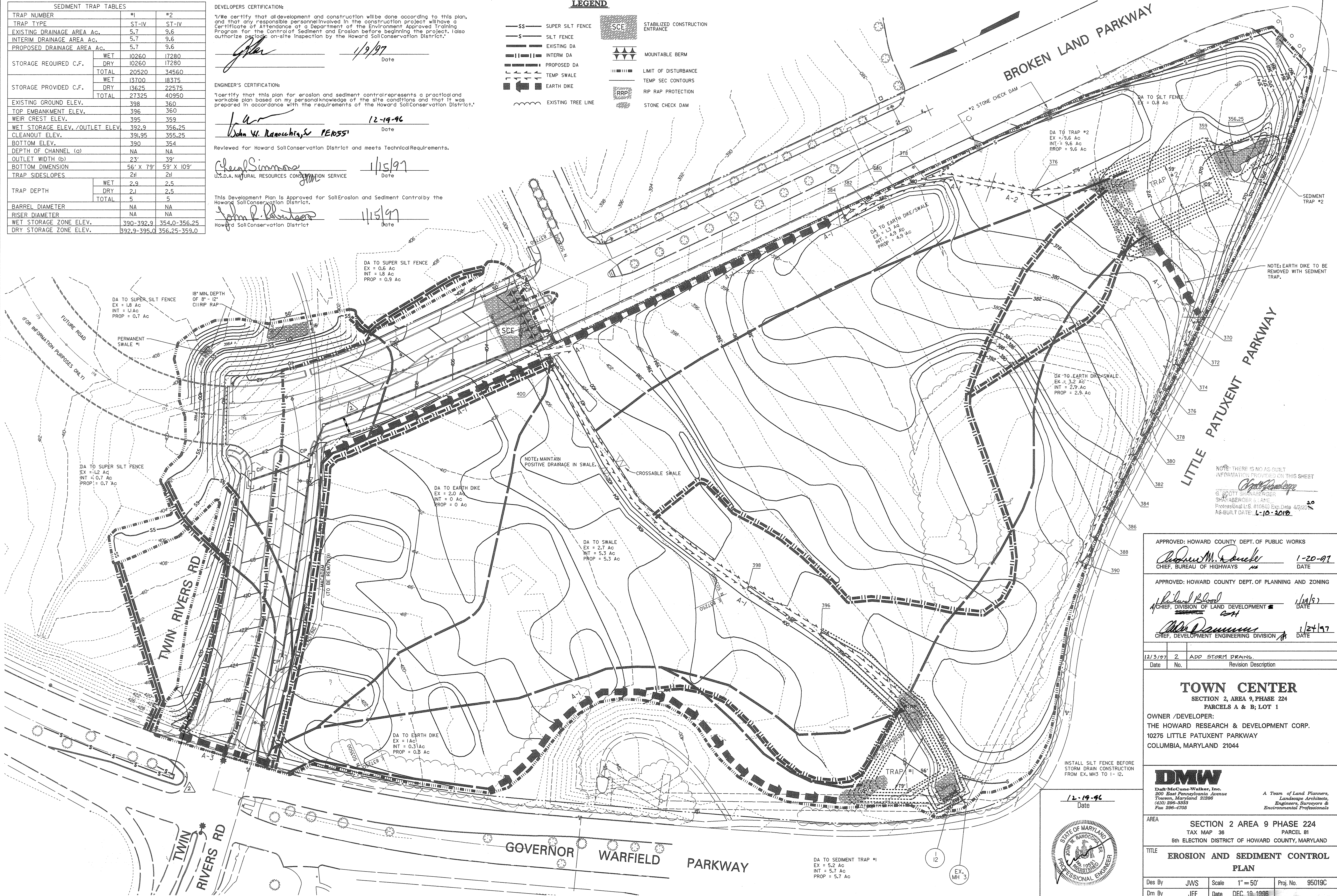
Charles Simmons 1/15/97 Date
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

This Development Plan is Approved for Soil Erosion and Sediment Control by the Howard Soil Conservation District.

John P. Robinson 1/15/97 Date
Howard Soil Conservation District

LEGEND

- SS SUPER SILT FENCE
- S SILT FENCE
- EXISTING DA
- INTERM DA
- PROPOSED DA
- TEMP SWALE
- EARTH DIKE
- EXISTING TREE LINE
- SCE STABILIZED CONSTRUCTION ENTRANCE
- MOUNTABLE BERM
- LIMIT OF DISTURBANCE
- TEMP SEC CONTOURS
- RRP RIP RAP PROTECTION
- STONE CHECK DAM



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Robert M. Dwyer 1-20-97 DATE
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Richard Blund 1/21/97 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

John P. Robinson 1/24/97 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

12/3/97 2 ADD STORM DRAINS.
 Date No. Revision Description

TOWN CENTER
 SECTION 2, AREA 9, PHASE 224
 PARCELS A & B, LOT 1

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

DMW
 Dan McCune-Walkers, Inc.
 300 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 286-3838
 Fax 286-4708

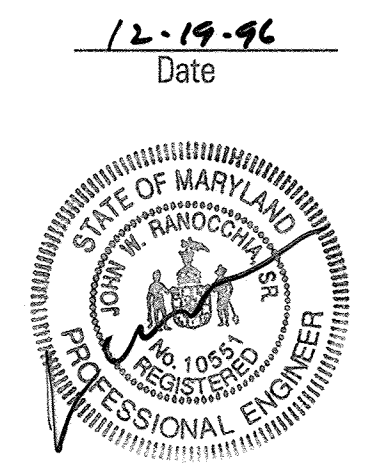
A Team of Land Planners,
 Landscape Architects,
 Engineers, Surveyors &
 Environmental Professionals

AREA SECTION 2 AREA 9 PHASE 224
 TAX MAP 36 PARCEL 81
 6th ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE EROSION AND SEDIMENT CONTROL PLAN

Des By JWS Scale 1" = 50' Proj. No. 95019C
 Dwn By JEF Date DEC 19, 1996
 Chk By JWR Approved 6 of 9

Professional Engr. No. 10551



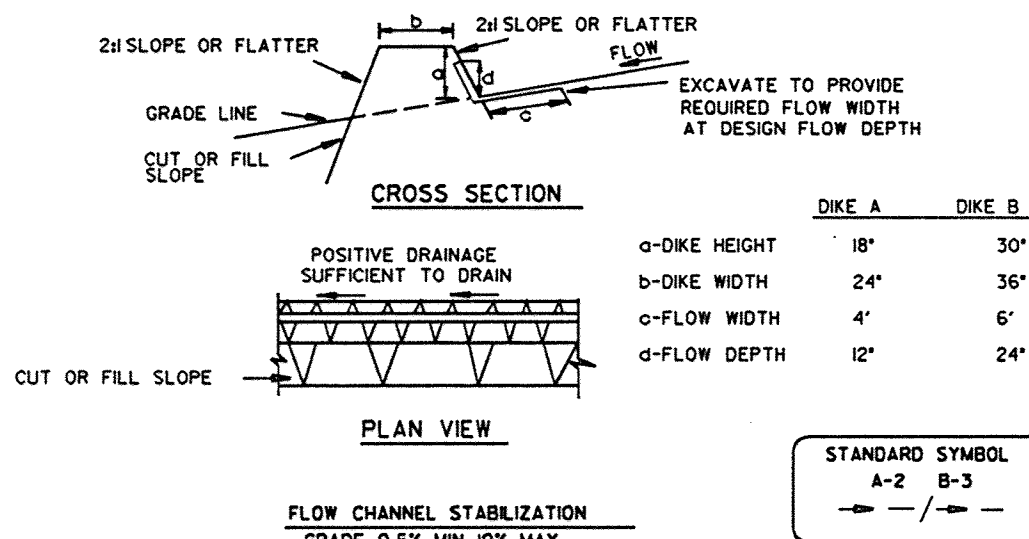
The Dec. 19, 1027-10 1996. 41,90009, 95019C-47

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTION AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION (930-247).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
3. FOLLOWING RAINFALL, SOIL DISTURBANCE OR RESTORATION, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
- SEVEN CALENDAR DAYS FOR ALL PERMITS SEDIMENT CONTROL STRUCTURES, DIKES, PERMETER SLOPES AND ALL SLOPES GREATER THAN 3%.
 - FOURTEEN DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 22 OF THE HOWARD COUNTY DESIGN MANUAL, "STORM DRAINAGE".
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SECTION 50, SOI SECTION 50). TEMPORARY SEEDING (SECTION 50) AND MULCHING (SECTION 50). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMITS FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	19.0 ACRES
AREA DISTURBED	19.0 ACRES
AREA TO BE VEGETATIVELY STABILIZED	1.3 ACRES
TOTAL CUT	117.2 CUBIC YARDS
TOTAL FILL	2020.0 CUBIC YARDS
OFF-SITE WASTE/BORROW AREA LOCATION	WASTE #1

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED IF DEEMED NECESSARY BY THE HOWARD COUNTY OFFICE OF SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH 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.

HOWARD COUNTY SEDIMENT CONTROL GENERAL NOTES



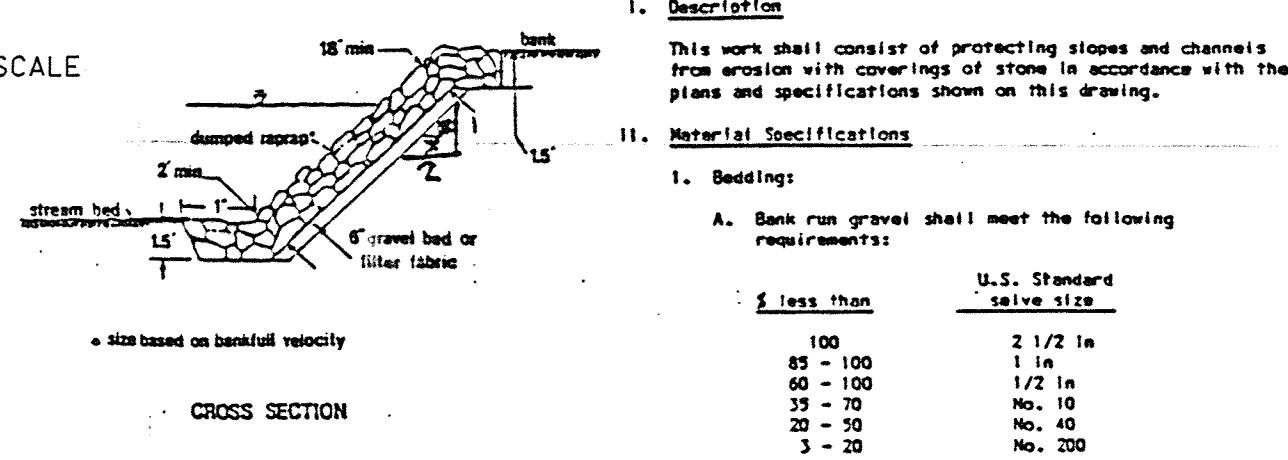
- Seed and cover with straw mulch.
- Seed and cover with Erosion Control Matting or lime with sod.
- 4" - 7 stone or recycled concrete equivalent pressed into the soil 7" minimum.

Construction Specifications

- Temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
- Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
- Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
- All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
- The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
- Fill shall be compacted by earth moving equipment.
- All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
- Inspection and maintenance must be provided periodically and after each rain event.

EARTH DIKE

NOT TO SCALE



2.4.0 MATERIALS SPECIFICATIONS

Table 2.3 Stone Size

SIZE RANGE	D ₁₀	D ₅₀	AASHTO	WEIGHT
NUMBER 57*	3/8" - 1 1/2"	1 1/2"	M-43	N/A
NUMBER 1	2" - 3"	2 1/2"	M-43	N/A
REP-RAP**	4" - 7"	5 1/2"	N/A	N/A
CLASS I	N/A	9.5"	N/A	150lb max
CLASS II	N/A	16"	N/A	700lb max
CLASS III	N/A	23"	N/A	2000lb max

2.4.0 MATERIALS SPECIFICATIONS

Table 2.3 Stone Size

BASKET THICKNESS INCHES	MM	SIZE OF INDIVIDUAL STONES INCHES	MM
6	150	3 - 5	75 - 125
9	225	4 - 7	100 - 175
12	300	4 - 7	100 - 175
18	450	4 - 7	100 - 175
36	910	4 - 12	100 - 300

2.4.0 MATERIALS SPECIFICATIONS

Table 2.3 Stone Size

CLASS	APPEARING OPENING SIZE MM. MAX.	GRAB TENSILE STRENGTH LB. MIN.	BURST STRENGTH PSI. MIN.
A	0.30	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (SILT FENCE)	0.40-0.80*	90	190

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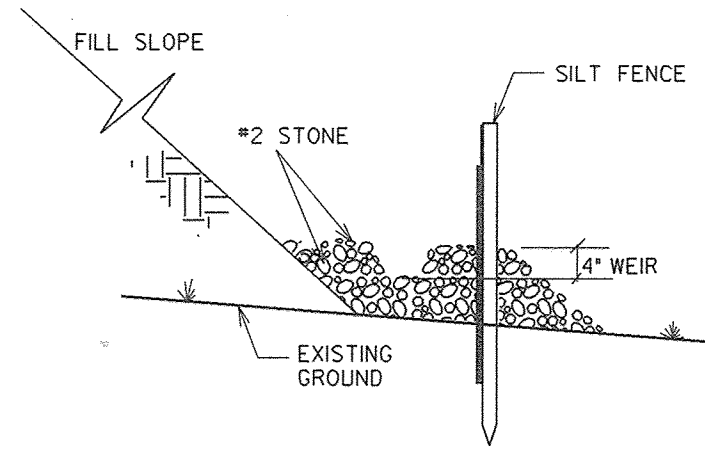
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36	91		

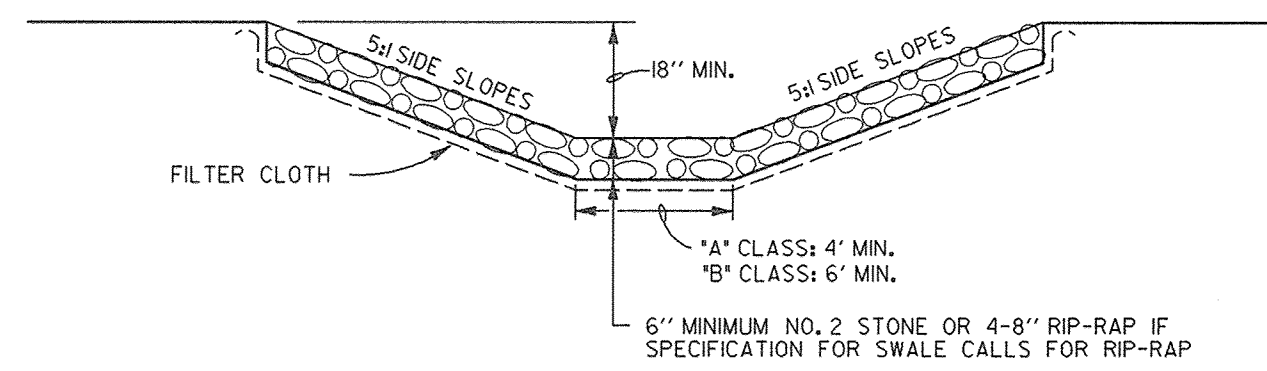
STD. SILT FENCE	SUPER SILT FENCE
#2 STONE	#2 STONE
12" HIGH	12" HIGH
24" HIGH	24" HIGH
50'-100' O.C.	50'-100' O.C.

OR 4' MIN. VERTICAL CHANGE IN ELEV.

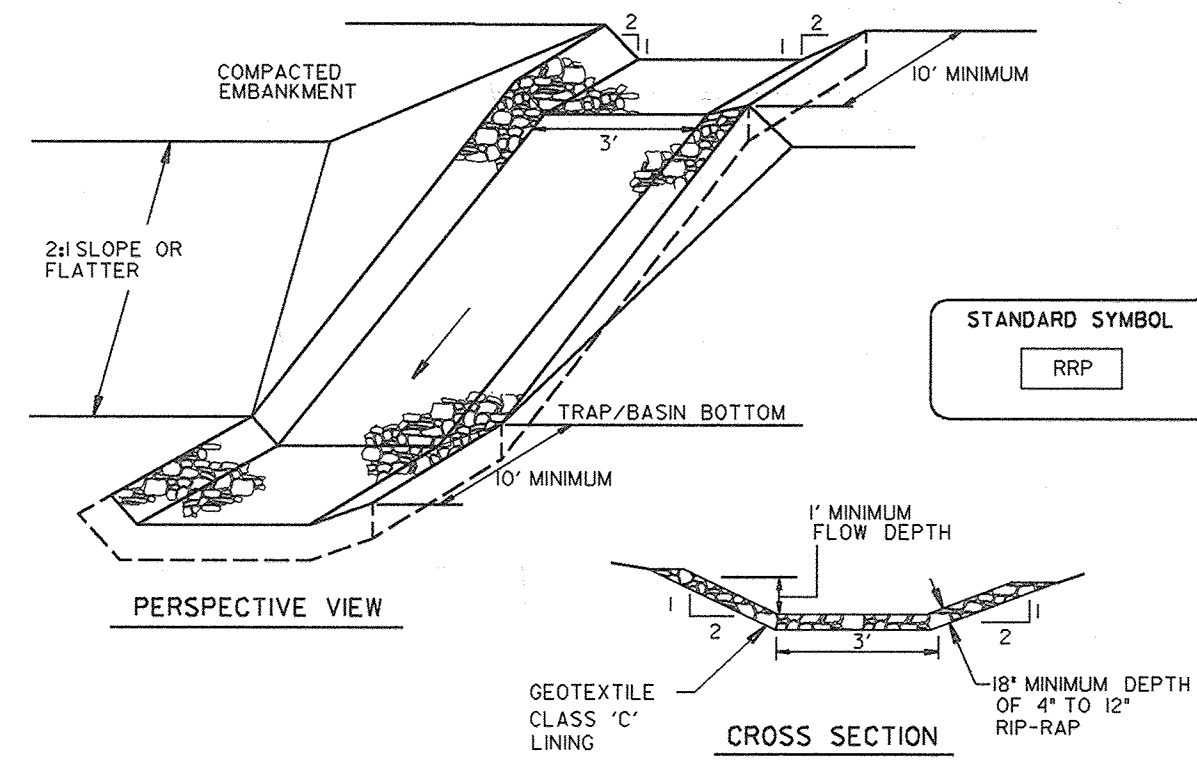


SECTION
LIMITED USE WHERE SILT FENCE DOESN'T FOLLOW CONTOURS

#2 STONE CHECK DAM



CROSSABLE SWALE



Construction Specifications

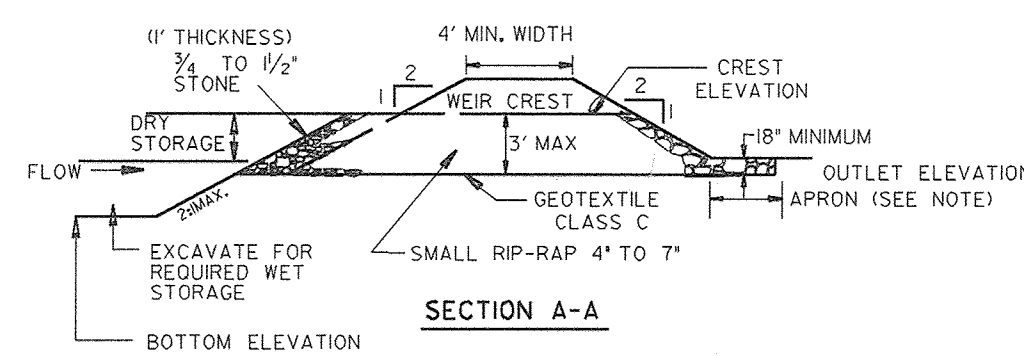
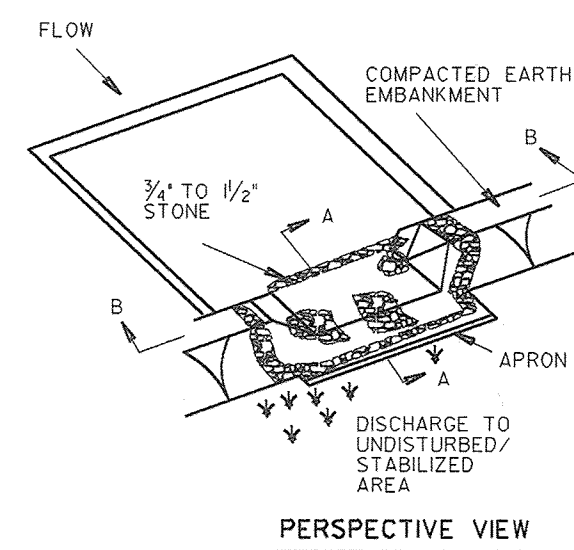
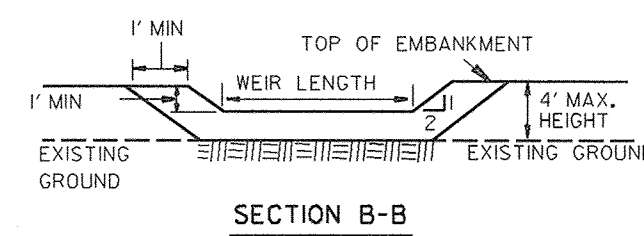
- Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' minimum bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18".
- Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
- Entrance and exit sections shall be installed as shown on the detail section.
- Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
- Gablon Inflow Protection may be used in lieu of Rip-rap Inflow Protection.
- Rip-rap should blend into existing ground.
- Rip-rap inflow Protection shall be used where the slope is between 4:1 and 10:1 for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

B - 6 - 2

MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

RIP-RAP INFLOW PROTECTION



NOTE: 5' MIN LENGTH UP TO 5 ACRES, OVER 5 ACRES USE 10' MIN

Construction Specifications

- The area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
- The fill material for the embankment shall be free of roots or other woody vegetation as well as over-sized stones, rocks, or organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed. Maximum height of embankment shall be 4', measured at centerline of embankment.
- All cut and fill slopes shall be 2:1 or flatter.
- Elevation of the top of any dike directing water into trap must equal or exceed the height of trap embankment.
- Storage area provided shall be figured by computing the volume measured from top of excavation, (for storage requirements see Table 9).
- Geotextile Class C shall be placed over the bottom and sides of the outlet channel prior to placement of stone. Section of fabric must overlap at least 1' with section nearest the entrance placed on top. Fabric shall be embedded at least 6" into existing ground at entrance of outlet channel.
- 4" - 7" stone shall be used to construct the weir and 4" - 12" or Class 1 rip-rap shall be used to construct the outlet channel.
- Outlet - An outlet shall include a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge point shall be provided as necessary.
- Outlet channel must have positive drainage from the trap.
- Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 of the wet storage depth of the trap (500 cu/cy). Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
- The structure shall be inspected periodically after each rain and repaired as needed.
- Construction of traps shall be carried out in such a manner that sediment pollution is abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentrated inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
- The structure shall be dewatered by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

C - 9 - 16

MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

STONE / RIP-RAP OUTLET SEDIMENT TRAP - ST IV NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

C - 9 - 26A

MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

STONE / RIP-RAP OUTLET SEDIMENT TRAP - ST IV NOT TO SCALE

SEQUENCE OF OPERATION

- Obtain all necessary permits for construction.
- Notify Howard County Office of Inspections and Permits (410) 313-8555 a minimum of 48 hours prior to the start of any construction. (2 days)
- Clear and grub for and install stabilized construction entrance. (1 day)
- Clear and grub for and install permanent swale and storm drain from MHS to 1-2. Stabilize immediately. (6 days)
- Clear and grub for and install Sediment Traps #1 & 2. (2 weeks)
- Clear and grub for and install erosion and sediment control measures. Fill in existing swale under proposed intersection of Broken Land Parkway and Twin Rivers Road. (3 weeks)
- With the approval of ESC Inspector, clear and grub the remainder of the site. (1 week)
- Mass grade site and provide dust controls needed. (3 weeks)
- Install utilities. Stabilize all non-active graded surfaces with temporary seeding. Provide inlets with protection, CIP. (4 weeks)
- Fine grade all paved surfaces. Install curb and gutter. Apply road subbase. (2 weeks)
- Fine grade all grass areas and stabilize with permanent seeding. (1 week)
- Pave roadway, install sidewalks. (2 weeks)
- With the prior permission of the Sediment Control Inspector and the Howard County Sediment Control Division, remove all sediment control devices except swale and earth dikes that will remain to direct water into storm drain system. Fine grade and stabilize these areas. (2 weeks)
- Install landscaping. (1 week)

DEVELOPERS CERTIFICATION

"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 permit site inspection by the Howard Soil Conservation District."

[Signature] 1/9/97
Date

ENGINEER'S CERTIFICATION

"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] 12-19-96
Date

Reviewed for Howard Soil Conservation District and meets Technical Requirements.

[Signature] 1/13/97
Date

This Development Plan is approved for Soil Erosion and Sediment Control by the Howard Soil Conservation District.

[Signature] 1/15/97
Date

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[Signature] 1-20-97
Date

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

[Signature] 1/16/97
Date

[Signature] 1/24/97
Date

Date No. Revision Description

TOWN CENTER
SECTION 2, AREA 9, PHASE 224
PARCELS A & B; LOT 1

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

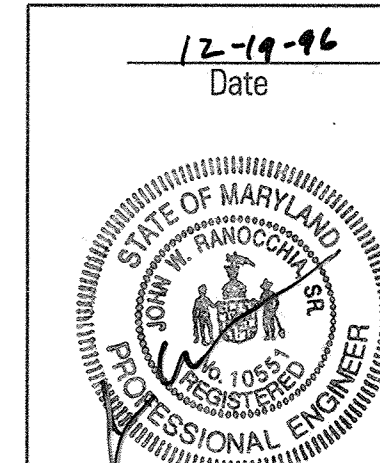
DMW
Duff-MoCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 396-3333
Fax: 396-4706

A Team of Land Planners,
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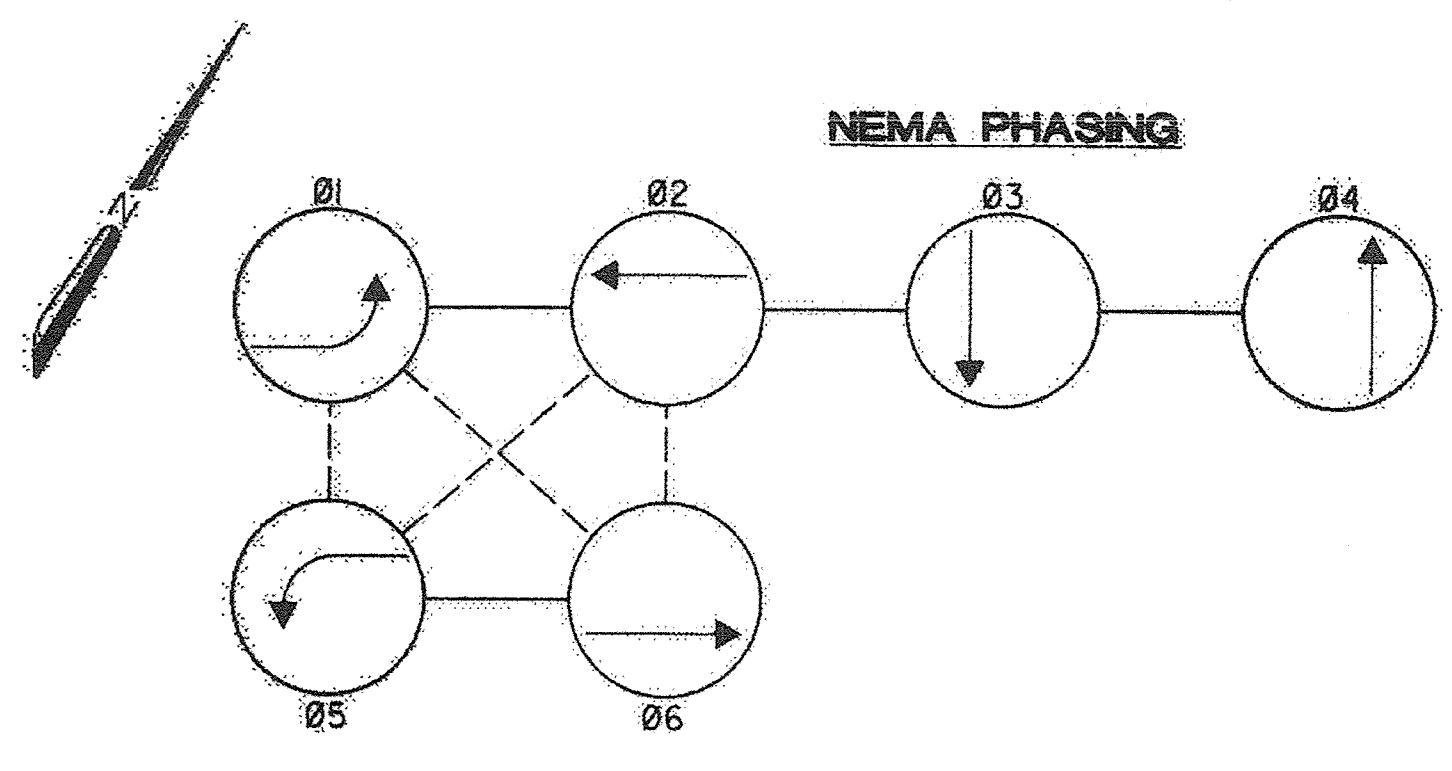
AREA SECTION 2 AREA 9 PHASE 224
TAX MAP 36 PARCEL 81
5th ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE EROSION AND SEDIMENT CONTROL AND PAVEMENT STRIPING DETAILS

Des By	JWS	Scale	AS SHOWN	Proj. No.	95019C
Drn By	JEF	Date	DEC 19, 1996		
Chk By	JWR	Approved			8 OF 9



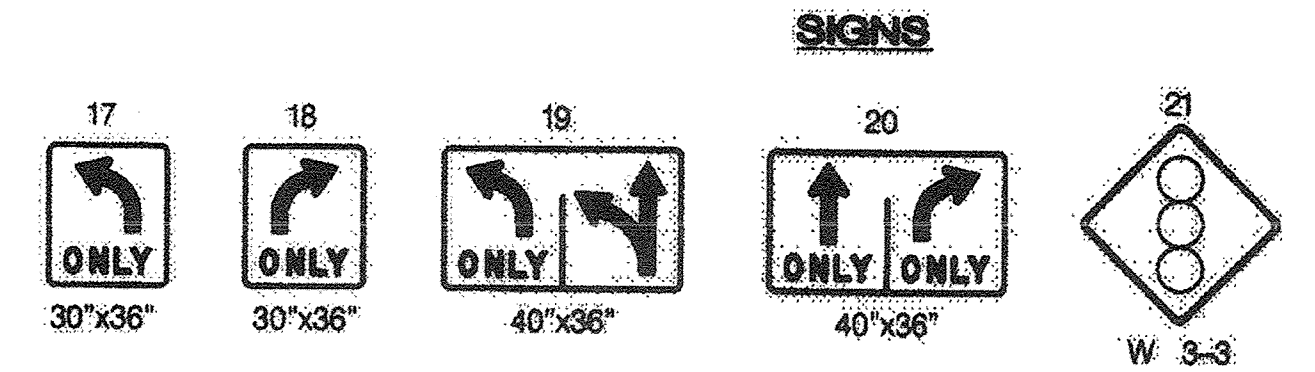
Professional Engr. No. 10551



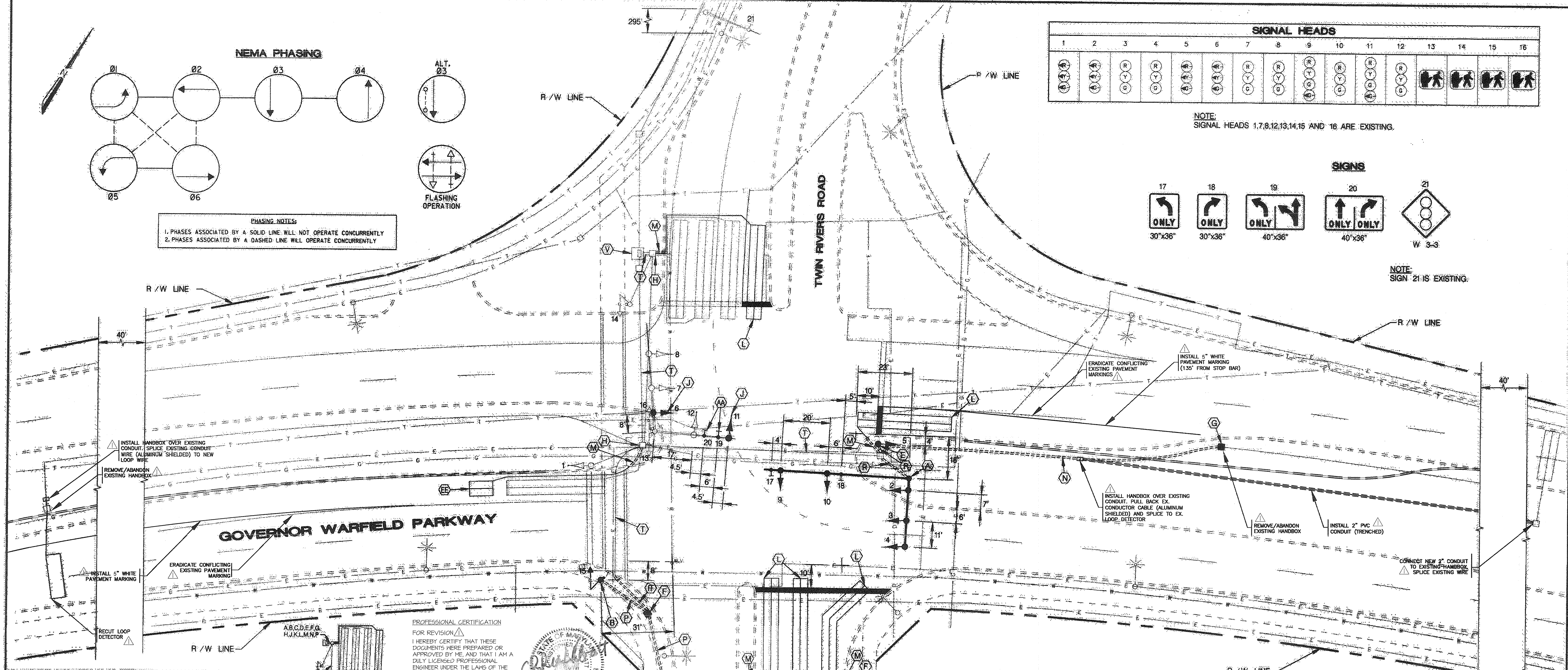
PHASING NOTES:
 1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY
 2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY

SIGNAL HEADS															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

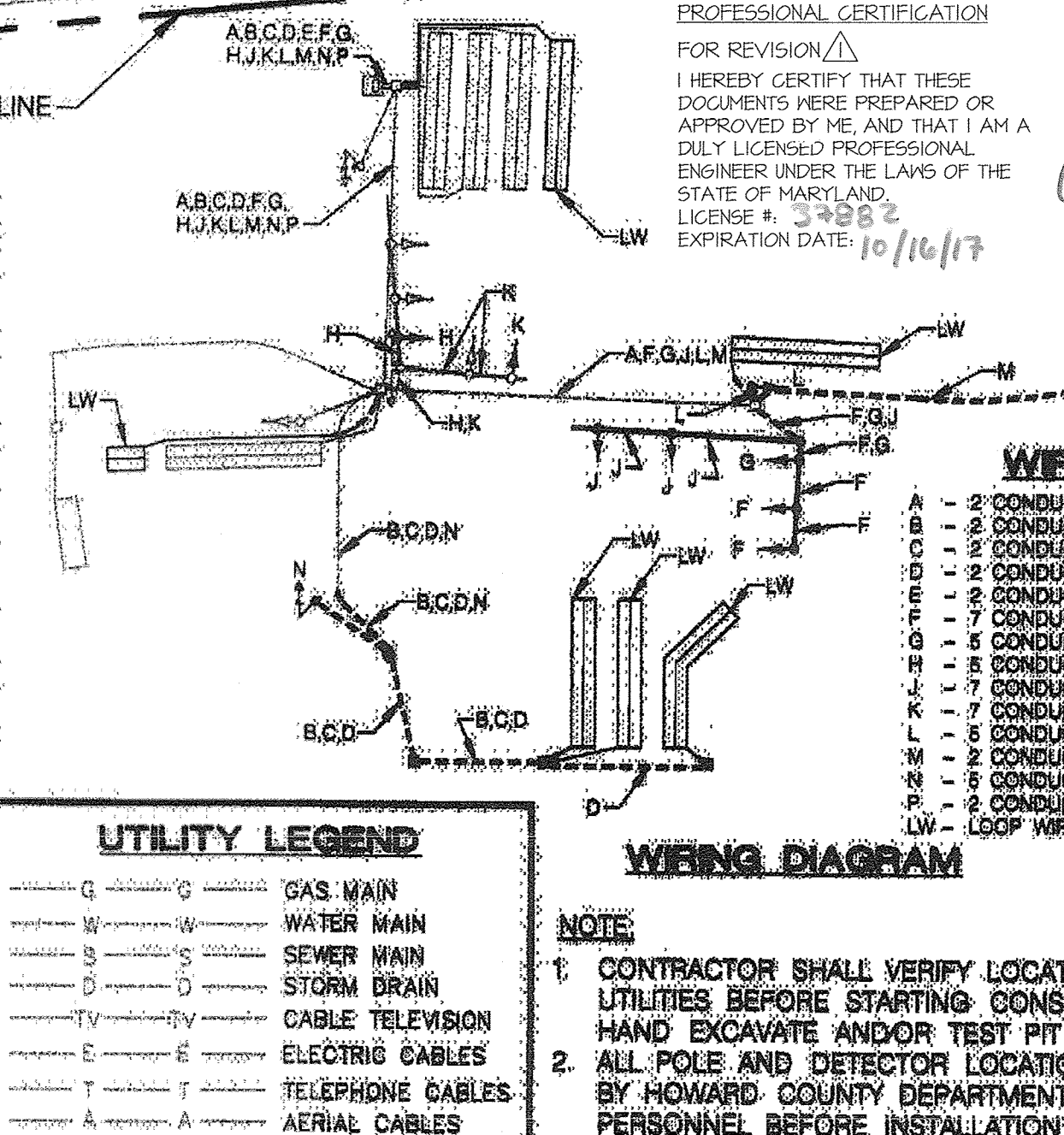
NOTE:
SIGNAL HEADS 1,7,8,12,13,14,15 AND 16 ARE EXISTING.



NOTE:
SIGN 21 IS EXISTING.



LEGEND	
PROPOSED	EXISTING



PROFESSIONAL CERTIFICATION
 FOR REVISION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
 LICENSE # 3-9882
 EXPIRATION DATE: 10/14/17
 10/13/16

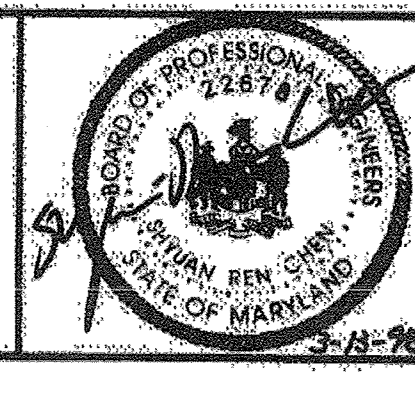
WIRING LEGEND
 A - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 B - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 C - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 D - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 E - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 F - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)
 G - 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
 H - 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
 I - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)
 J - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)
 K - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 L - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 M - 5 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 N - 5 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 P - 2 CONDUCTOR CABLE (ALUMINUM, SHIELDED)
 LW - LOOP WIRE

CONSTRUCTION DETAILS
 A. INSTALL 28-FOOT STEEL SIGNAL POLE WITH 30-FOOT MAST ARM, 82-FOOT MAST ARM TRAFFIC SIGNAL HEADS, SIGNS, CONCRETE FOUNDATION AND GROUND ROD. (NOTE: ONE 2-INCH GALVANIZED STEEL 90-DEGREE ELBOW).
 B. INSTALL CONCRETE FOUNDATION AND GROUND ROD FOR 10-FOOT STEEL BREAKAWAY PEDESTAL POLE, PEDESTRIAN SIGNAL HEAD, PUSHBUTTON, AND SIGN. (NOTE: ONE 2-INCH GALVANIZED STEEL 90-DEGREE ELBOW).
 C. INSTALL 10-FOOT STEEL BREAKAWAY PEDESTAL POLE, SIGNAL HEAD, CONCRETE FOUNDATION AND GROUND ROD. (NOTE: ONE 2-INCH GALVANIZED STEEL 90-DEGREE ELBOW).
 D. INSTALL HANDBOX.
 E. INSTALL HANDBOX OVER EXISTING CONDUIT.
 F. USE EXISTING HANDBOX.
 G. INSTALL SIGNAL HEAD ON EXISTING MAST ARM.
 H. INSTALL 6-FOOT BY 40-FOOT QUADRUPOLE TYPE VEHICLE LOOP DETECTOR (2-4-2-TURNS).
 I. INSTALL 1-INCH GALVANIZED STEEL ELECTRICAL CONDUIT FOR LOOP DETECTOR SLEEVE.
 J. INSTALL 2-INCH P.V.C. ELECTRICAL CONDUIT (TRENCHED).
 K. INSTALL 2-INCH GALVANIZED STEEL ELECTRICAL CONDUIT (TRENCHED).
 L. INSTALL 2-INCH GALVANIZED STEEL ELECTRICAL CONDUIT (HAND TRENCHED).
 M. INSTALL 3-INCH GALVANIZED STEEL ELECTRICAL CONDUIT (TRENCHED).
 N. USE EXISTING CONDUIT.
 O. USE EXISTING ELECTRICAL CABLE PULL FROM EXISTING HANDBOX TO NEW HAND BOX.
 P. USE EXISTING TRAFFIC SIGNAL CONTROLLER.
 Q. INSTALL SIGN ON EXISTING MAST ARM.
 R. INSTALL 6-FOOT BY 10-FOOT QUADRUPOLE TYPE VEHICLE LOOP DETECTOR (2-4-2-TURNS).
 S. INSTALL 2-INCH GALVANIZED STEEL ELECTRICAL CONDUIT (TRENCHED) AND CONNECT TO EXISTING CONDUIT.

Revised Final Road Construction Plan
AS-BUILT
3-13-98

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Chief, Bureau of Engineering: *Rudolf Sponn* 3/29/98
 Chief, Bureau of Highways: *Christopher M. ...* 5-27-98
 Chief, Traffic Engineering Division: *...* 3/23/99

A/E GROUP, INC.
 ENGINEERS + PLANNERS
 11409 Cronhill Drive
 Owings Mills, Maryland 21117
 A/E Job No: 96-309-015



DES: J.F.L.	DATE: 02/97
DRN: J.N.W.	BY: NO.
CHK: E.G.S.	REVISION
DATE: 02/97	DATE: 9800 SCALE MAP NO. DATE:

CAPITAL PROJECT NO.
T-7047PP

GOVERNOR WARFIELD PARKWAY AT TWIN RIVERS ROAD
 SCALE: 1" = 20'
 SHEET 10 OF 10
 APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Highways: *M. ...* 11/16/96
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
 Chief, Division of Land Development: *...* 11-4-16
 Chief, Development Engineering Division: *...* 1-2-16