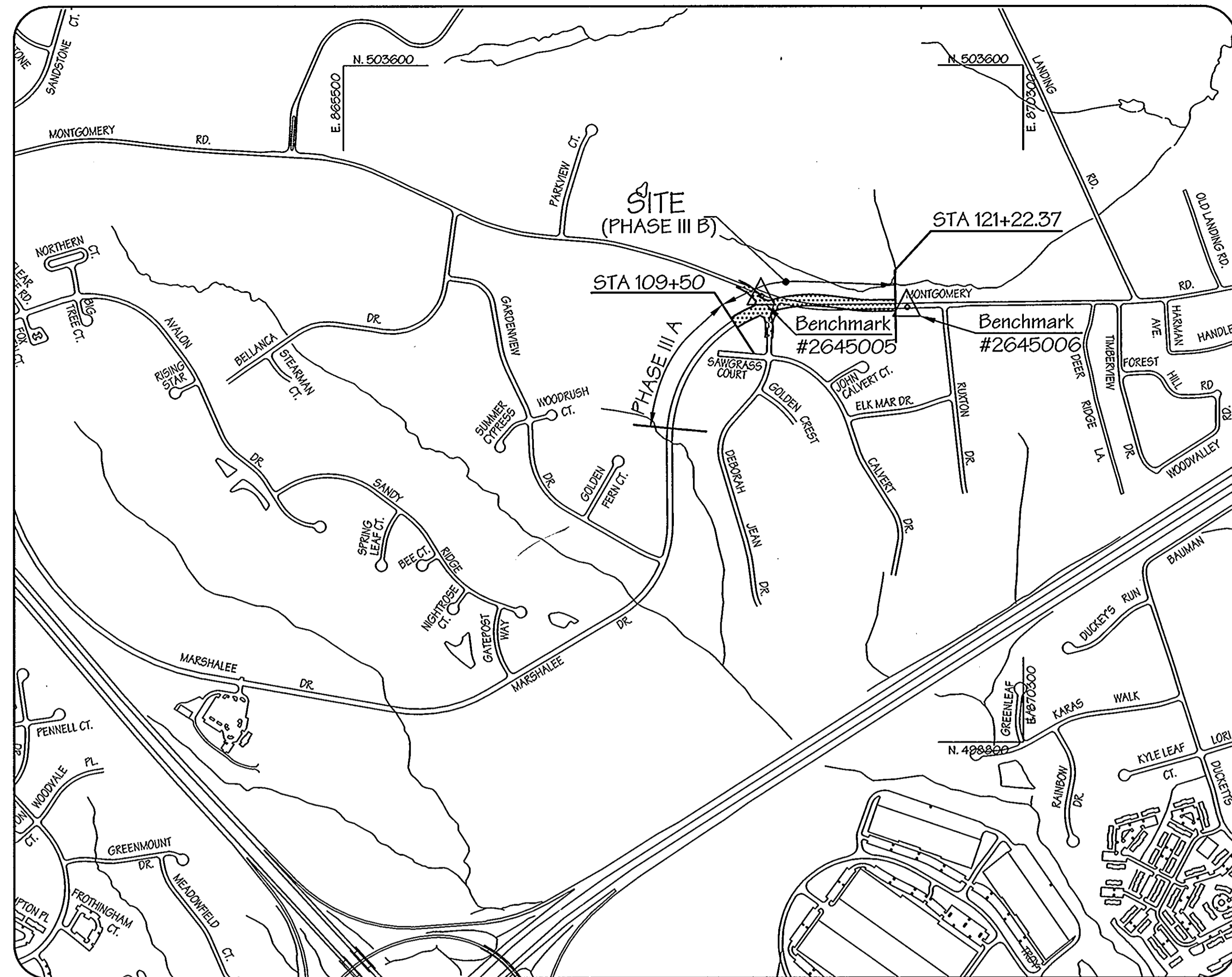


GENERAL NOTES

- All construction shall be in accordance with the latest Standards and Specifications of Howard County, plus MSHA Standards & Specifications as 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 forty-eight (48) hours prior to any excavation work.
- Project Background:
Location: Elbridge, Maryland
Tax Map: 37
Election District: 1st
- Traffic control devices, markings, and signing shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
- Any damage caused by the Contractor to existing public right-of-way, existing paving, existing curb and gutter, existing utilities, etc. shall be corrected at the Contractor's expense.
- The existing utilities shown hereon are located from construction drawings of record. The approximate locations of existing utilities are shown for the Contractor's information and convenience. The Contractor shall locate existing utilities to his own satisfaction and well in advance of any construction activities. Additionally, the Contractor shall take all necessary precautions to protect all existing utilities and maintain uninterrupted service.
- Horizontal and vertical datums are related to the Maryland State Plane Coordinate System as projected from Howard County Control Station No. 2644006 and Howard County Control Station No. 2644005 (NAD 27). This allows for a smooth transition into the previously approved and constructed NAD 27 adjoining subdivisions: Lyndwood Manor & Marshalee Woods.
- All hydraulic data is for the 10-year storm unless otherwise noted.
- All fill areas shall be compacted to a minimum of 95% of the maximum dry density as determined and verified in accordance with AASHTO T-180.
- Water Quantity Stormwater Management has been waived for this project by the Howard County Department of Public Works.
Water Quality management is met within the proposed "Vortechmics" Underground Systems.
- All Limits of Disturbance must be approved on site by the following or their agents:
A.) LDE, Inc.
B.) Howard County Department of Public Works Construction Inspection Division.
- This Plan assumes that construction work proposed under F 96-66 Capitol Project J-4136 Phase III A has been completed.
- Where test pits have been made on existing utilities, they are noted by the symbol at the location of the test pit. A table containing the results of the test pit or pits is included on the drawings (See Sheet 8). Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the Contractor two weeks in advance of construction operations at his own expense. Required test pits to be dug are represented by the symbol .



LOCATION MAP
1" = 600'

INDEX OF SHEETS	
No.	Description
1	Cover Sheet
2	Typical Road Sections & Road Details
3	"Phase III B" Marshalee Drive Stations 109+50 thru 111+88.17 Montgomery Road Stations 111+88.17 thru 121+22.68 Relocated Montgomery Road & Deborah Jean Drive Stations 10+00 thru 14+78.59
4	"Phase III B" Roadway Profile Stations 109+50 thru 121+22.68 & 10.00 thru 14+78.59
5	Cross Sections
6	Cross Sections
7	Drainage Area Map
8	Storm Drain Profiles
9	Grading, Soil Erosion & Sediment Control Plan
10	Grading, Soil Erosion & Sediment Control Plan Details
11	Maintenance of Traffic Plan - PHASE 1
12	Maintenance of Traffic Plan - PHASE 2
13	Maintenance of Traffic Plan - PHASE 3
14	Maintenance of Traffic Plan - PHASE 4
15	Maintenance of Traffic Plan - PHASE 5
16	Street Light and Landscaping Plan
17	Paving and Striping Plan
18	Vortechmics - Details
2200	Water Main Relocation

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
MARSHALEE DRIVE

STATION 109+50 TO 121+22.37
CAPITAL PROJECT J-4136
PHASE III B

BENCHMARKS

Ho. Co. Monument # 2645005
Elevation: 291.929
North 501966.231 East 868453.612
Description: Concrete Monument 0.3 ft. below surface at top of bank

Ho. Co. Monument # 2645006
Elevation: N/A
North 501884.354 East 869482.835
Description: Concrete Monument 0.2 ft. below surface at top of bank

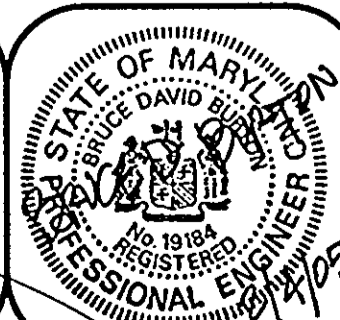
Owner: Howard County, Maryland
3430 Court House Drive
Ellicott City, MD. 21043
Developer: Marshalee Woods Limited Partnership
8835 Unit F Columbia 100 Parkway
Columbia, MD. 21045

DEPARTMENT OF PUBLIC WORKS

John P. B... 2/11/05
DIRECTOR OF PUBLIC WORKS
Michelle Z. ... 2-14-05
CHIEF, BUREAU OF HIGHWAYS

Steve Shavar 2/11/05
CHIEF, DIVISION OF TRANSPORTATION
PROJECTS AND WATERSHED MANAGEMENT

LDE Inc.
Engineers, Surveyors, Planners
9250 Runsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9540



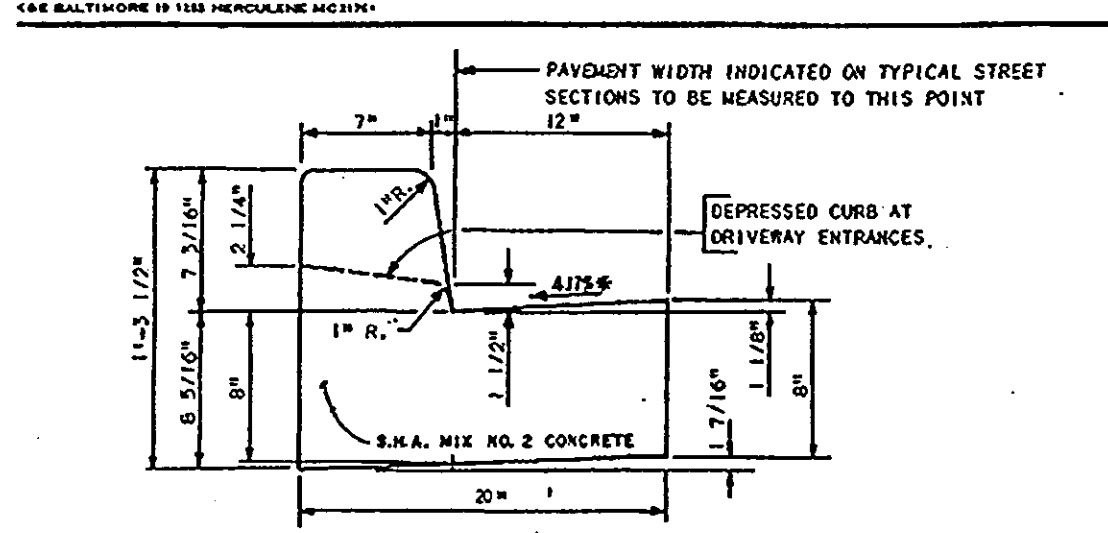
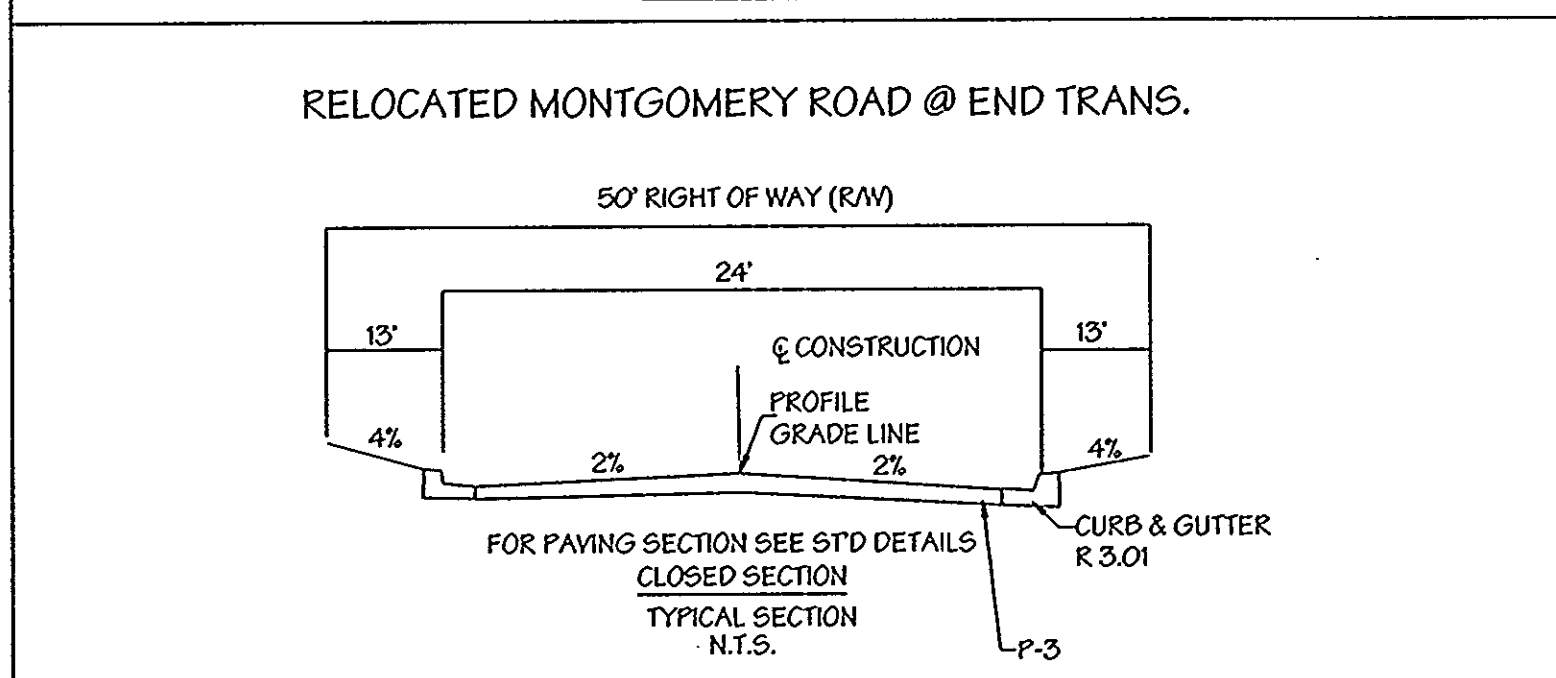
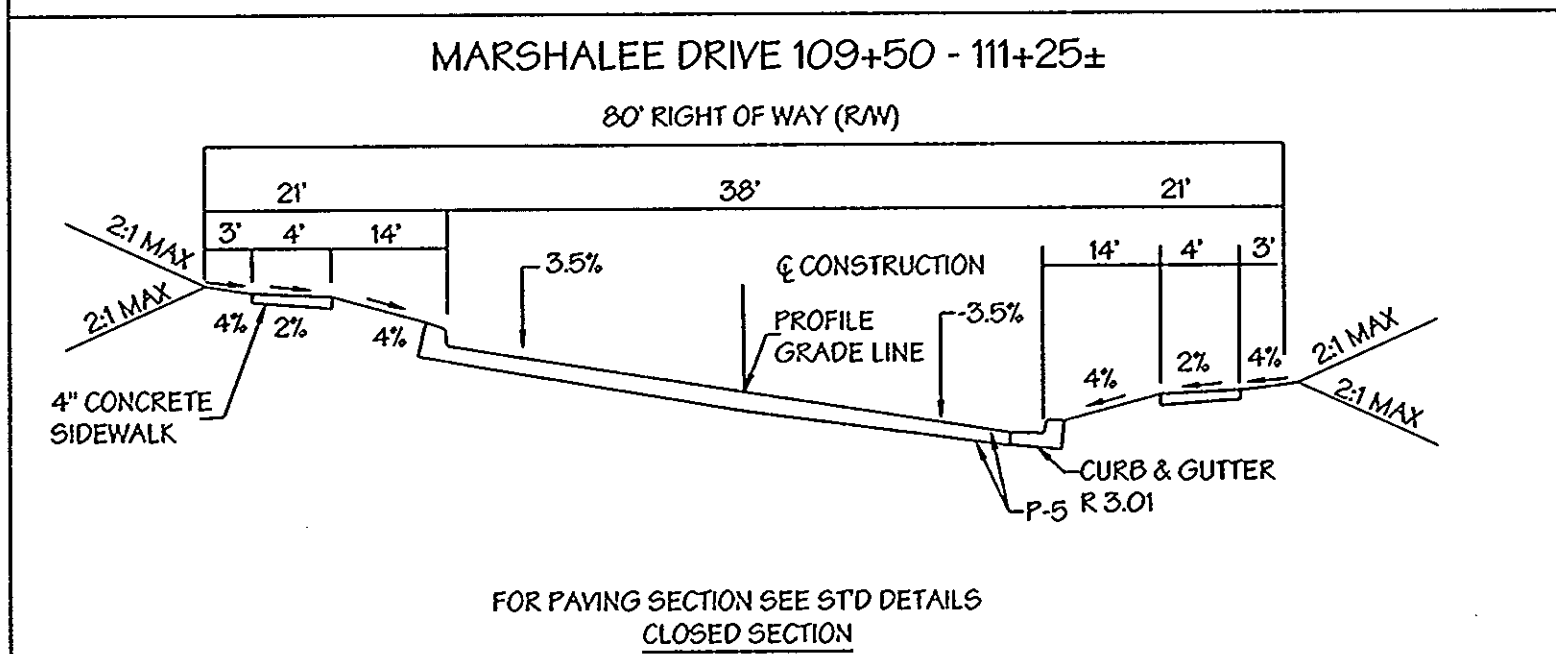
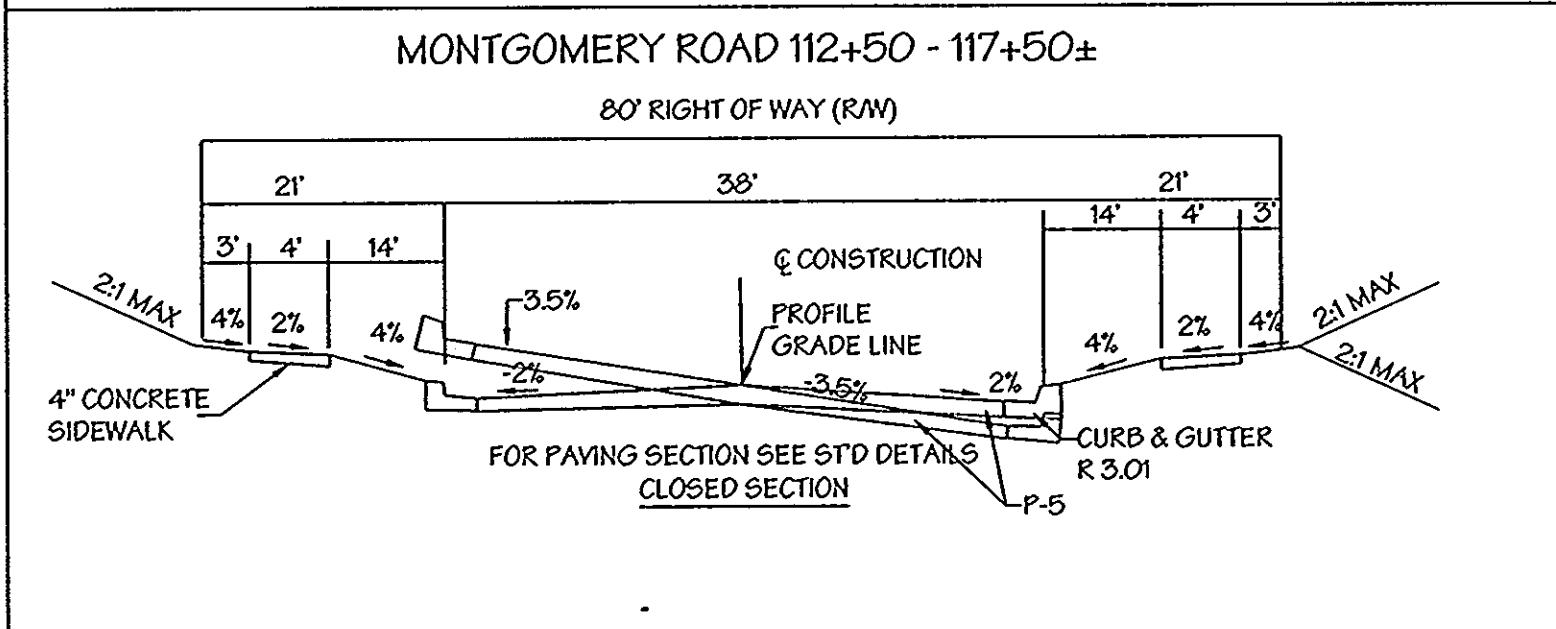
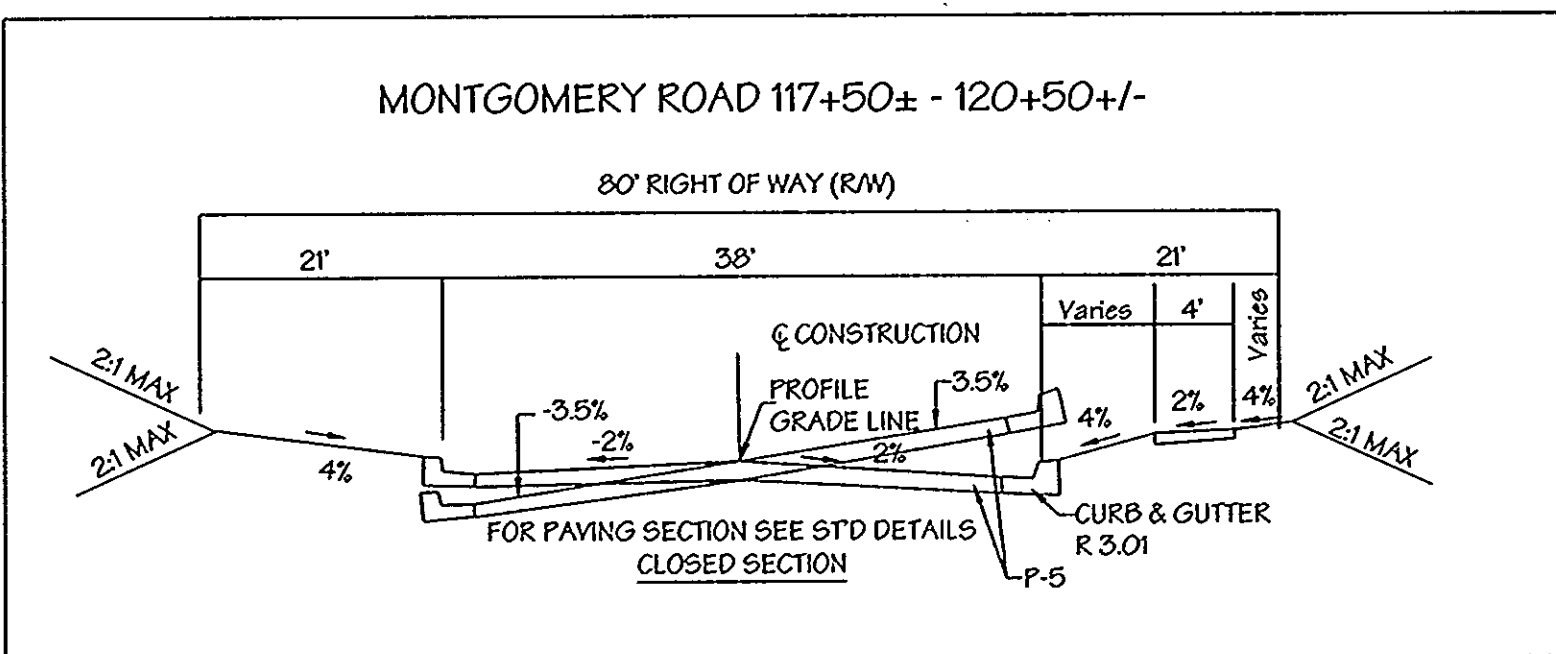
DESIGNED	E.D.S.	DRAWN	LDE	CHECKED	B.D.B.	DATE	BY	NO.	AS-BUILD DATA SHOWN	REVISION	DATE
KCI	1					2/2005					

Cover Sheet
MAP NO. 37
BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
As Shown
SHEET
1 OF 18

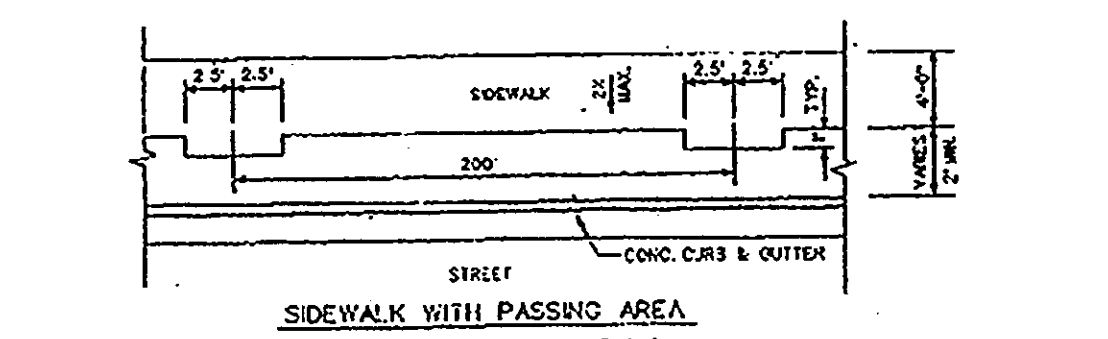
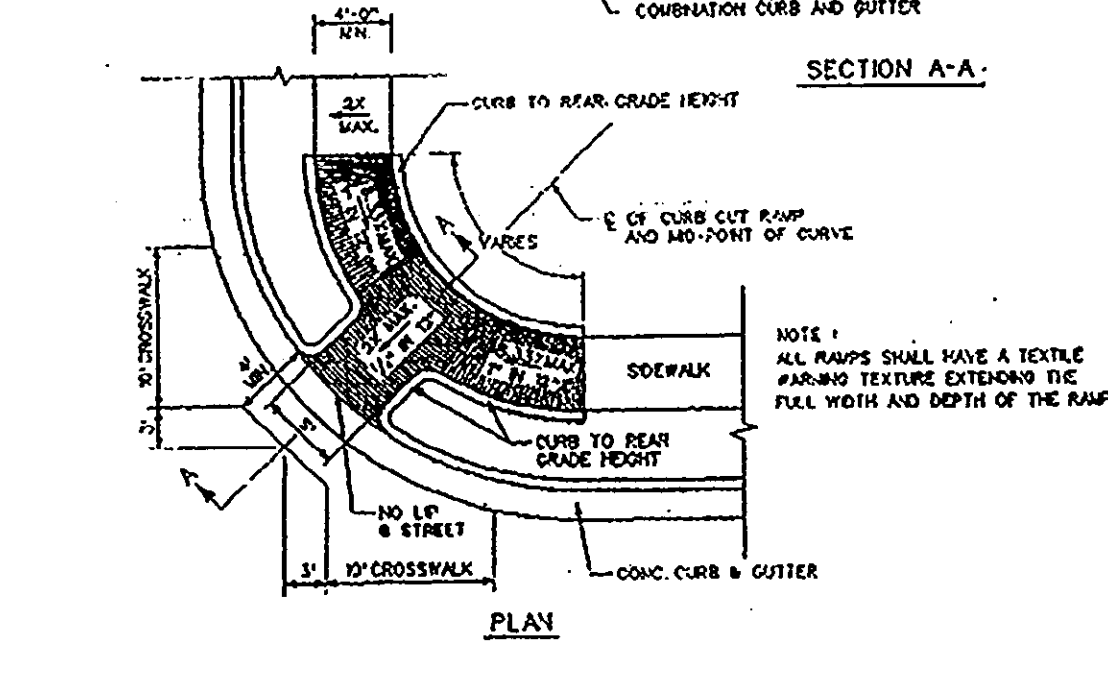
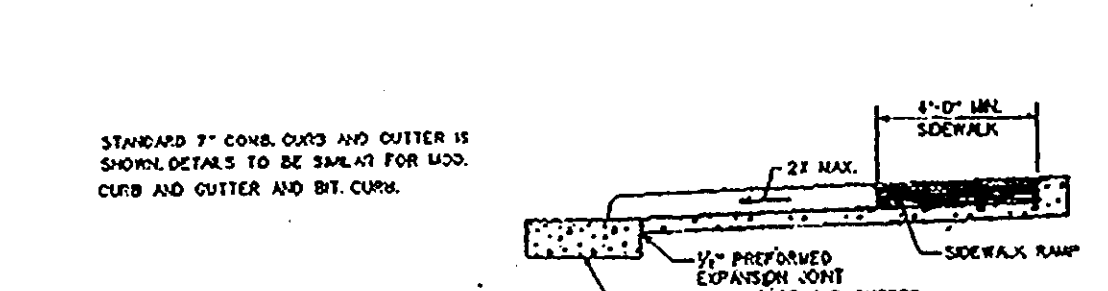
F:\CAPITAL PROJECT J-4136\mg\PROJ\ELC.dwg, DATE: 2/14/2005 2:45:54 PM



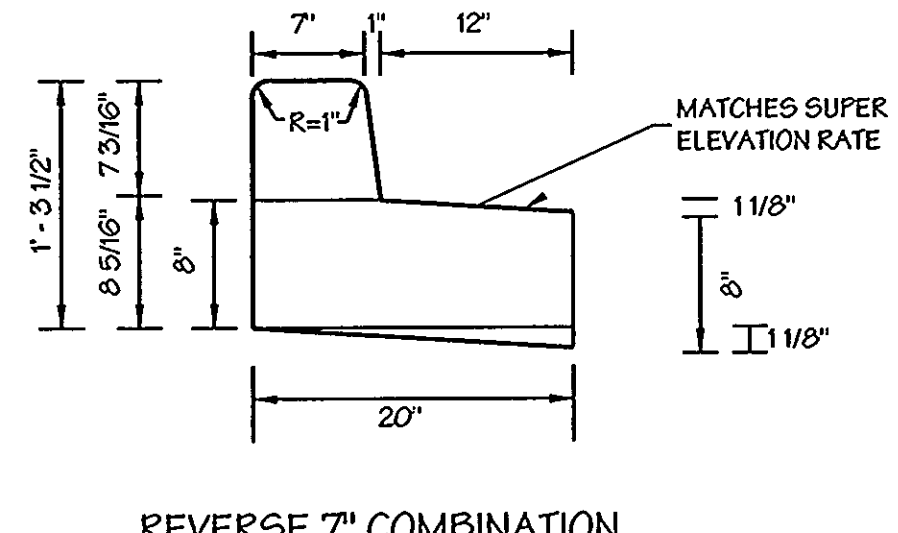
STANDARD 7' COMBINATION CURB AND GUTTER

CUTTER PAN AT THE MEDIAN EDGE OF INTERMEDIATE ARTERIALS OR THE HIGH SIDE OF SUPERELEVATED SECTIONS SHALL BE SLOPED AT THE SAME RATE AND IN THE SAME DIRECTION AS THE PAVEMENT. MATCH PAVEMENT CROSS SLOPE WHEN CURB IS LOCATED ON THE LOW SIDE OF SUPERELEVATED SECTION AND THE RATE OF SUPERELEVATION IS GREATER THAN 3% FOR MODIFIED CURB AND GUTTER.

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



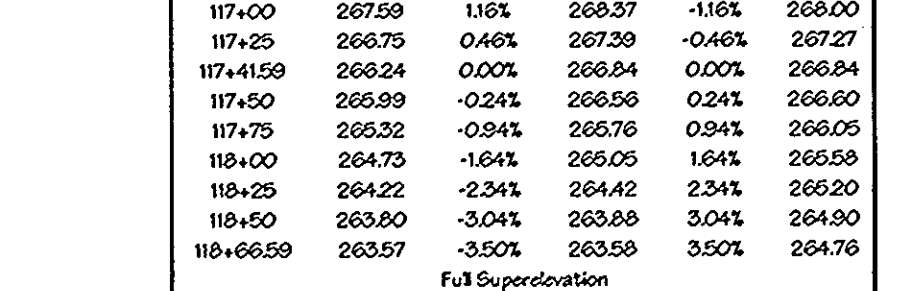
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief, Bureau of Engineering



REVERSE 7' COMBINATION CURB & GUTTER

NO SCALE

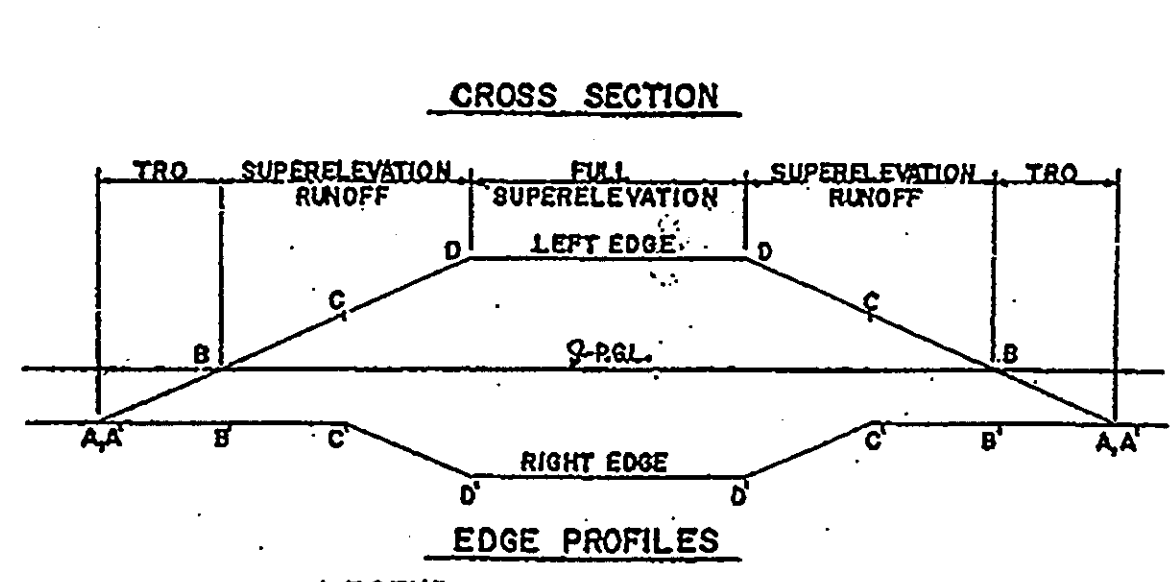
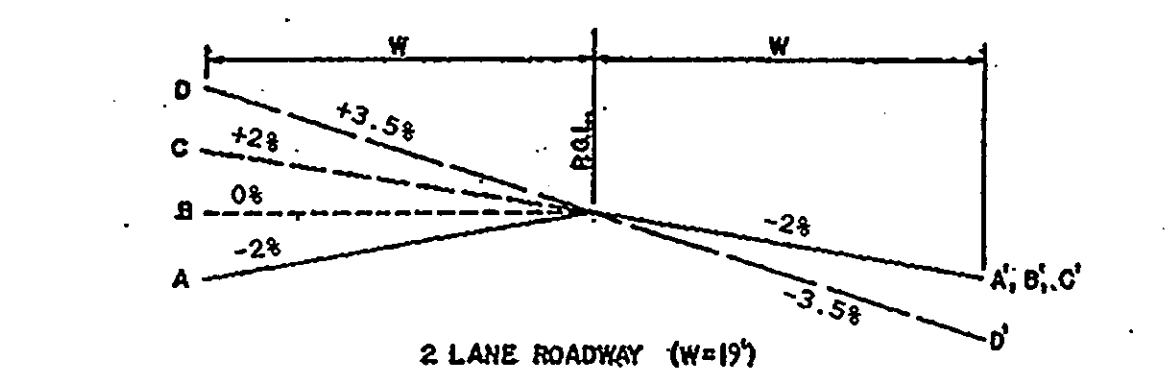
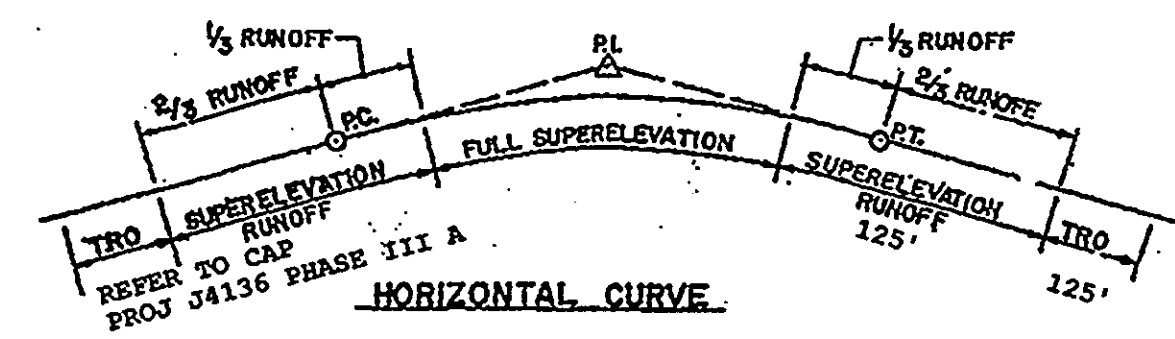
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief, Bureau of Engineering



Marshalee Drive - Superelevation Table

CL STATION	CL ELEVATION	Cross Slope Left Side	IC Left	Cross Slope Right Side	IC Right
116+16.59	270.85	3.50%	272.05	-3.50%	270.87
116+25	270.52	3.25%	271.67	-3.25%	270.57
116+50	269.52	2.50%	270.54	-2.50%	269.69
116+75	268.92	1.80%	269.41	-1.80%	268.80
117+00	267.59	1.16%	268.37	-1.16%	268.00
117+25	266.75	0.46%	267.29	-0.46%	267.27
117+41.59	266.24	0.00%	266.84	0.00%	266.84
117+50	265.99	-0.24%	266.59	0.24%	266.60
117+75	265.32	-0.84%	266.76	0.84%	266.05
118+00	264.75	-1.64%	266.05	1.64%	265.59
118+25	264.22	-2.34%	264.42	2.34%	265.20
118+50	263.80	-3.04%	263.88	3.04%	264.90
118+66.59	263.57	-3.50%	263.59	3.50%	264.76
119+26.07	263.04	-3.50%	263.05	3.50%	264.23
119+50	262.89	-2.80%	263.08	2.80%	264.05
119+75	262.98	-2.10%	263.20	2.10%	263.90
119+79.64	262.97	-2.00%	263.23	2.00%	263.89
120+00	263.05	-2.00%	263.30	1.43%	263.87
120+25	263.21	-2.00%	263.46	0.73%	263.90
120+50	263.47	-2.00%	263.71	0.00%	264.05
120+51.07	263.48	-2.00%	263.72	0.00%	264.04
120+75	263.80	-2.00%	264.08	-0.67%	264.24
121+00	264.15	-2.00%	264.43	-1.37%	264.46
121+22.50	264.17	-2.00%	264.45	-2.00%	264.37

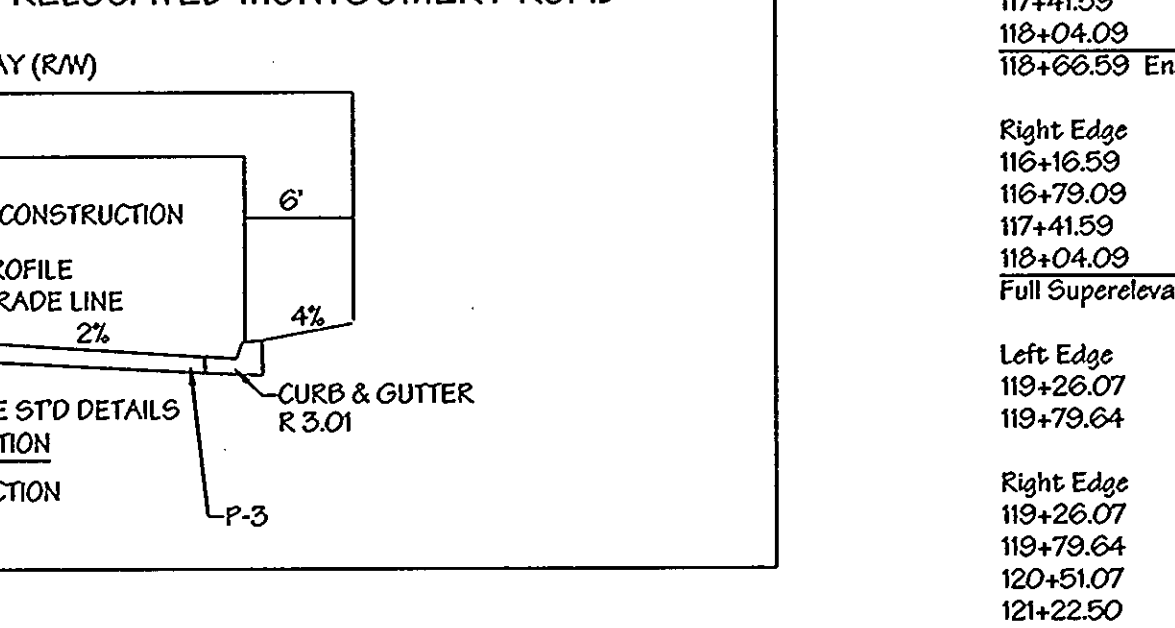
Notes: Normal / Existing Typical Section Roadway Beyond 121+22.50



LEGEND
PC - POINT OF CURVATURE
PT - POINT OF TANGENCY
TRO - TANGENT RUNOUT
PGL - PROFILE GRADE LINE

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
METHOD OF ATTAINING SUPERELEVATION MODIFIED

FIGURE: 2-07
DATE: 1/28
REVISED:



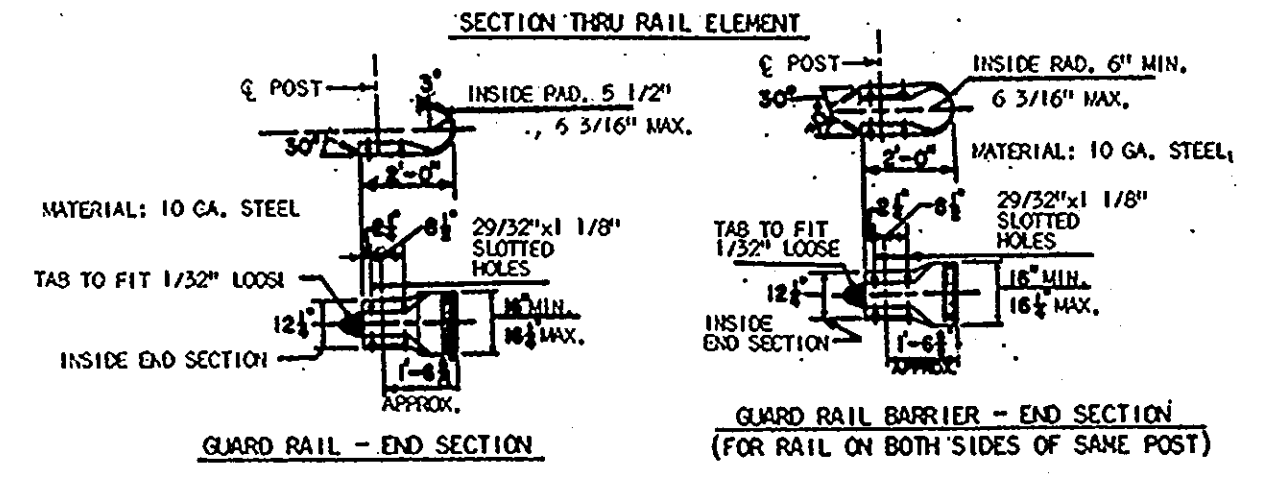
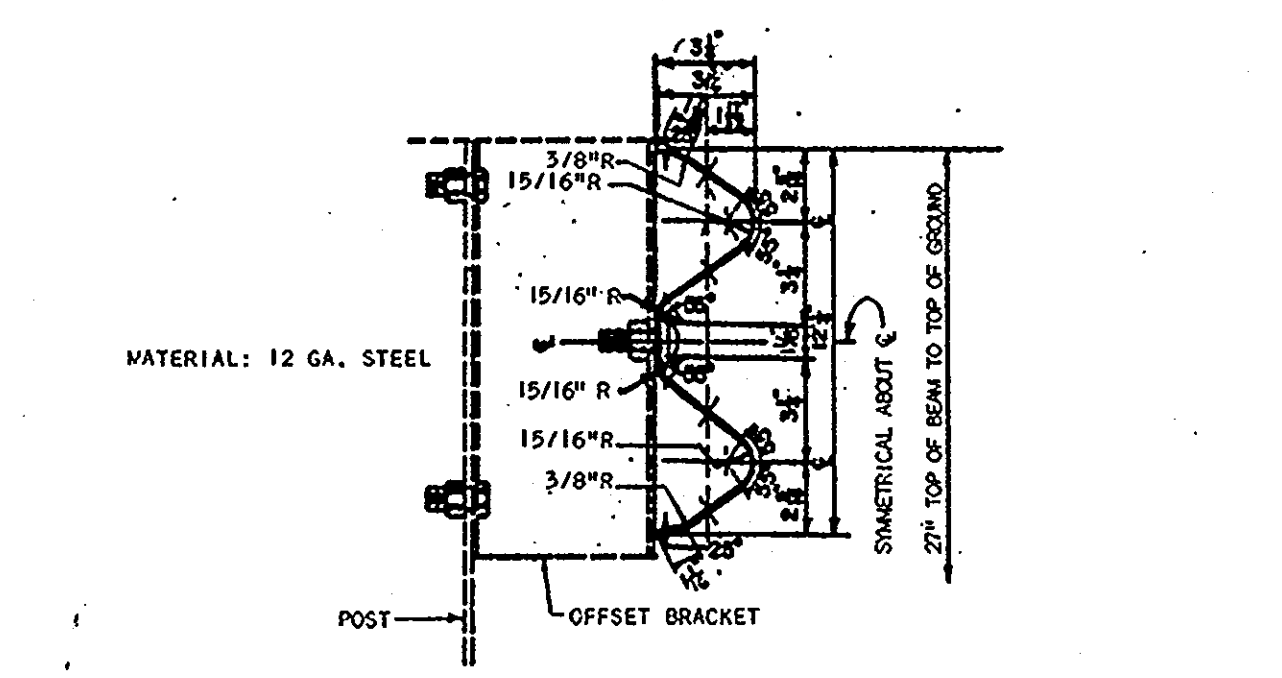
FOR PAVING SECTION SEE STD DETAILS CLOSED SECTION TYPICAL SECTION N.T.S.

Left Edge
116+16.59 Begin Transition from 3.5% to 2%
116+79.09 Begin Transition from 2% to 0%
117+41.59 Begin Transition from 0% to -2%
118+04.09 Begin Transition from -2% to -3.5%
118+66.59 End Transition to -3.5% Right (Full Superelevation)

Right Edge
116+16.59 Begin Transition from -3.5% to -2%
116+79.09 Begin Transition from -2% to 0%
117+41.59 Begin Transition from 0% to 2%
118+04.09 Begin Transition from 2% to 3.5%
Full Superelevation 118+66.59 to 119+26.07

Left Edge
119+26.07 Begin Transition from -3.5% to -2%
119+79.64 End Transition to -2%

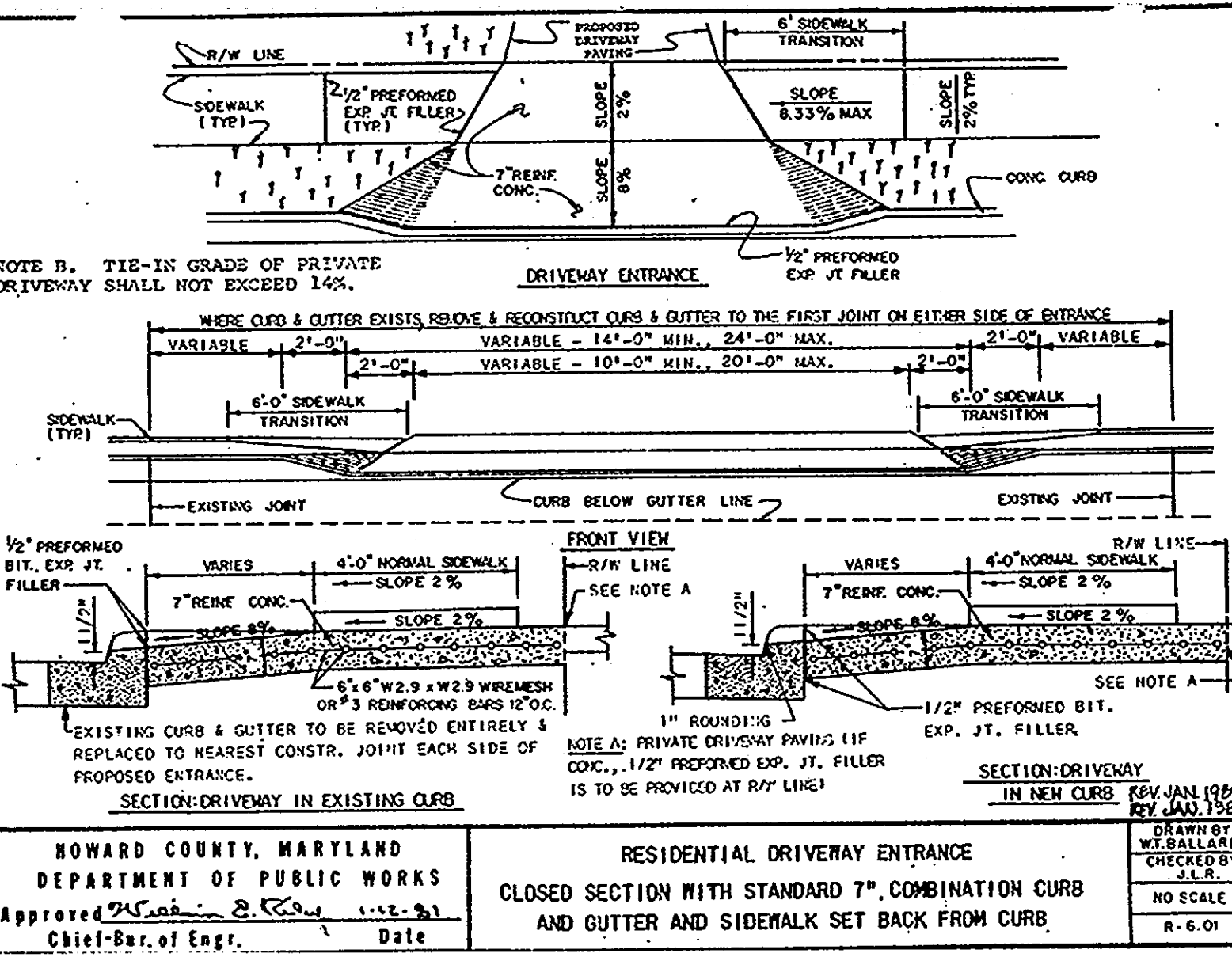
Right Edge
119+26.07 Begin Transition from 3.5% to 2%
119+79.64 Begin Transition from 2% to 0%
120+51.07 Begin Transition from 0% to -2%
121+22.50 End Transition to -2%



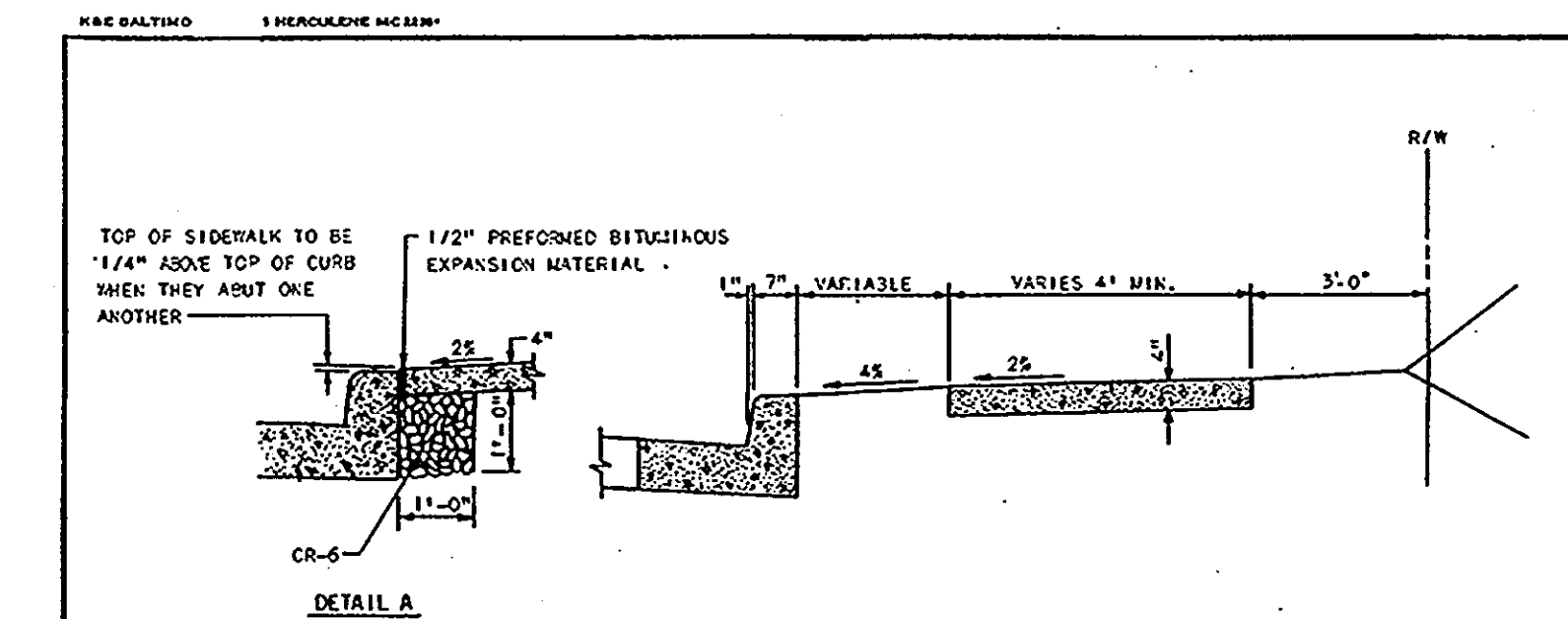
NOTES:
1. ALL DIMENSIONS ARE SUBJECT TO MFG. TOLERANCES.
2. RAIL ELEMENTS ARE FURNISHED SHOP CURVED OR CONVEX TO RADIUS BETWEEN 20 FT. AND 150 FT.
3. THE STEEL FOR RAIL ELEMENTS AND BOLTS IS OF A QUALITY TO DEVELOP SPECIFICATION VALUES FOR BEAM AND TENSILE STRENGTHS.
4. FOR MATERIALS, MATERIAL PROCESSING AND ASSEMBLY, SEE SPECIFICATIONS.
5. FOR OFFSET BRACKET DETAIL, SEE STD. NO. R-7-02
6. POSTS TO BE 10'-9\"/>

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief, Bureau of Engr.

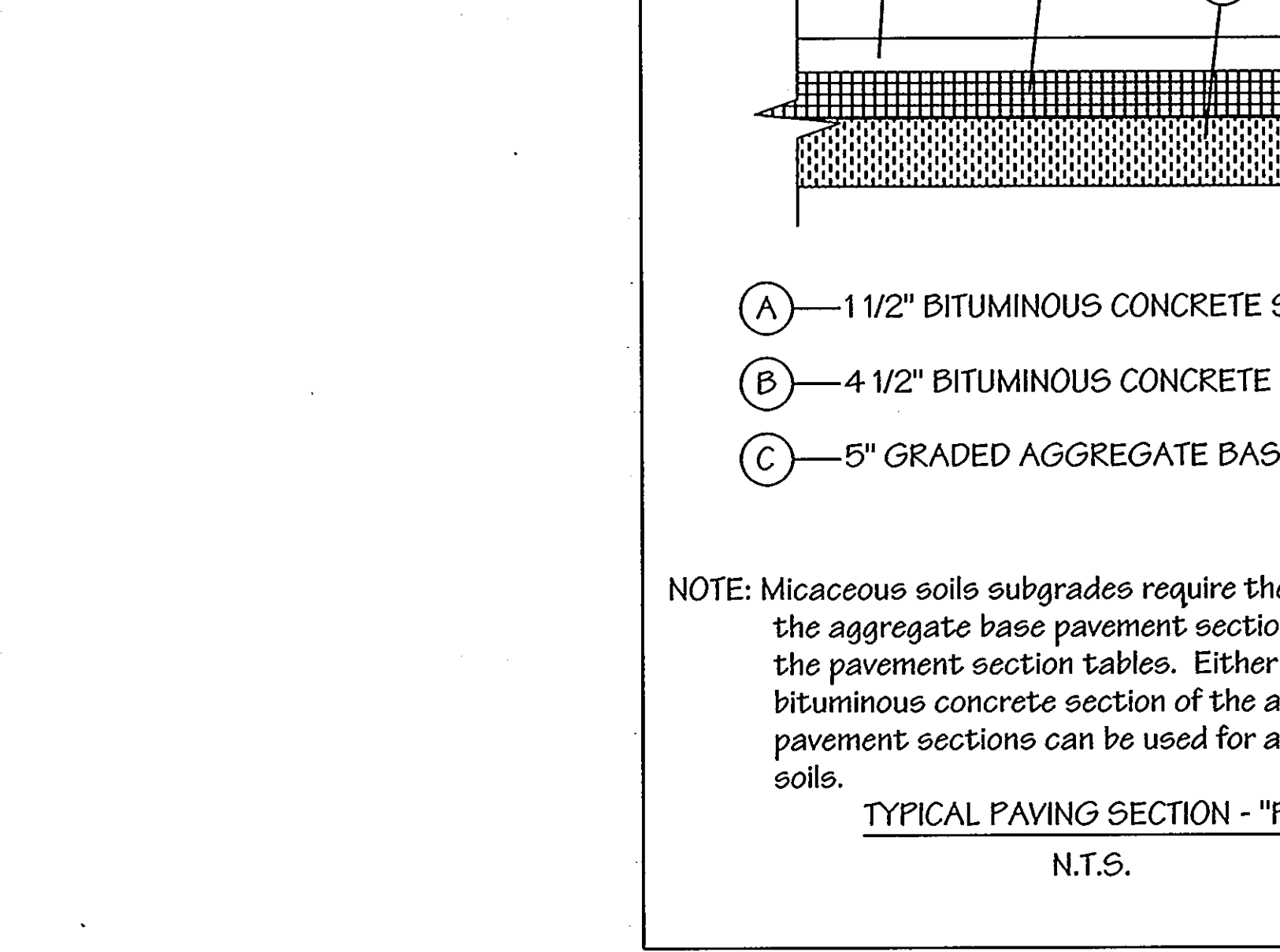
GUARD RAIL W/ BEAM
GENERAL NOTES AND DETAILS
NO SCALE
R-7.0L



HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief, Bureau of Engr.

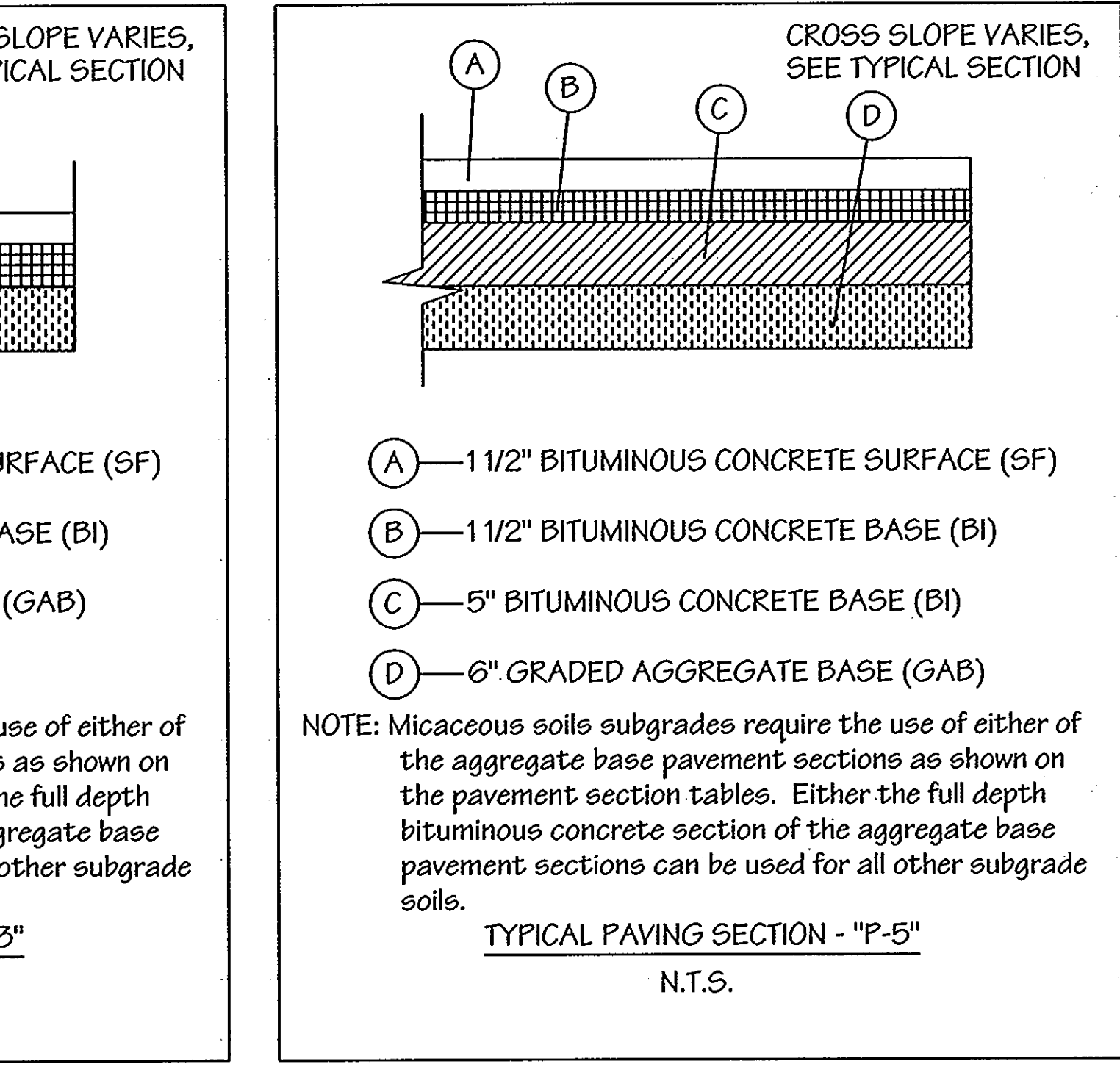


HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
Approved: [Signature] Chief, Bureau of Engr.



NOTE: Micaceous soils subgrades require the use of either of the aggregate base pavement sections as shown on the pavement section tables. Either the full depth bituminous concrete section of the aggregate base pavement sections can be used for all other subgrade soils.

TYPICAL PAVING SECTION - "P-3"
N.T.S.



NOTE: Micaceous soils subgrades require the use of either of the aggregate base pavement sections as shown on the pavement section tables. Either the full depth bituminous concrete section of the aggregate base pavement sections can be used for all other subgrade soils.

TYPICAL PAVING SECTION - "P-5"
N.T.S.

DEPARTMENT OF PUBLIC WORKS
[Signature] Director of Public Works
[Signature] Chief, Bureau of Highways

LDE Inc.
Engineers, Surveyors, Planners
2520 Rumsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9540


DESIGNED E.D.S.
DRAWN L.D.E.
CHECKED B.D.B.
DATE 2/2005

Typical Road Sections & Road Details
MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
As Shown
SHEET
2 of 18

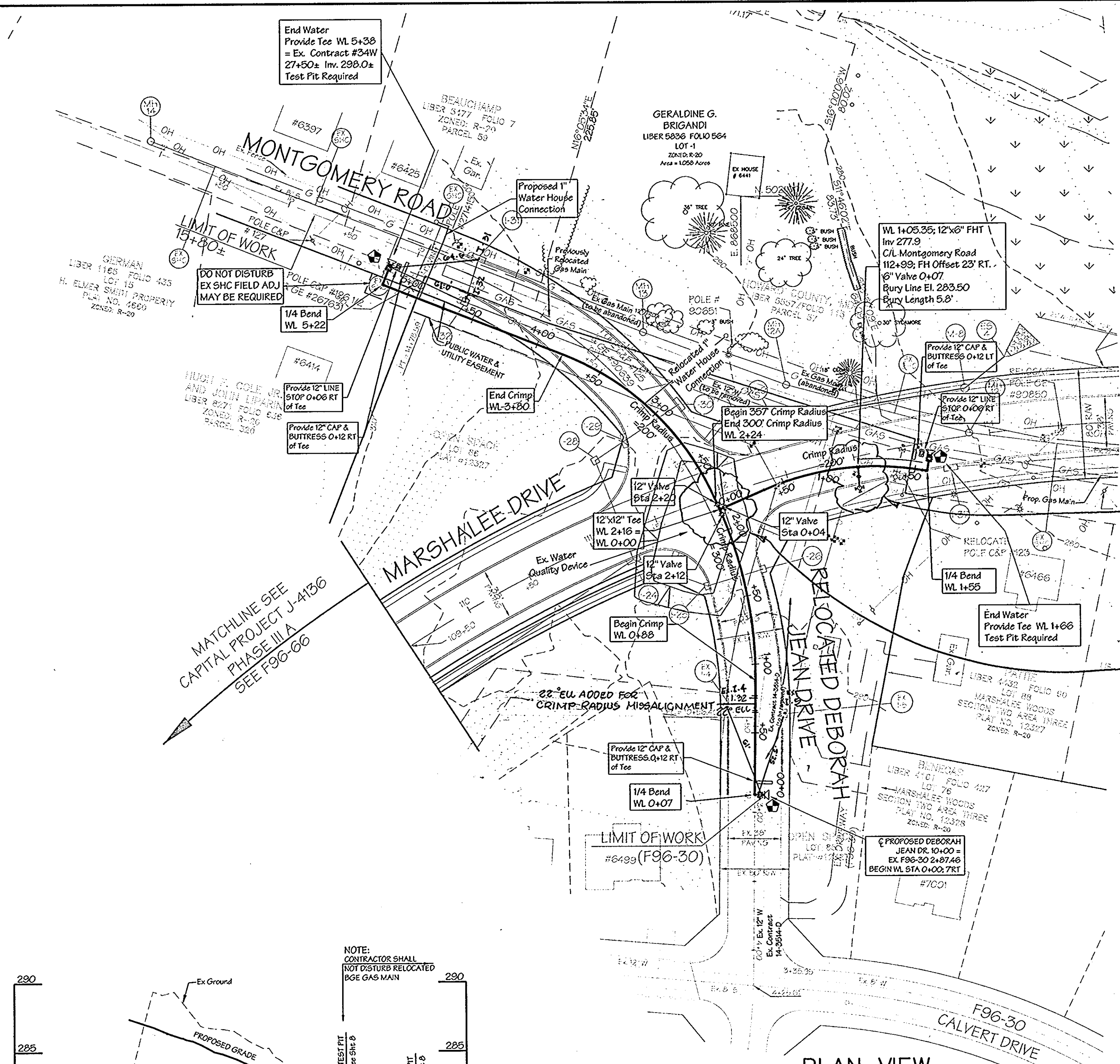
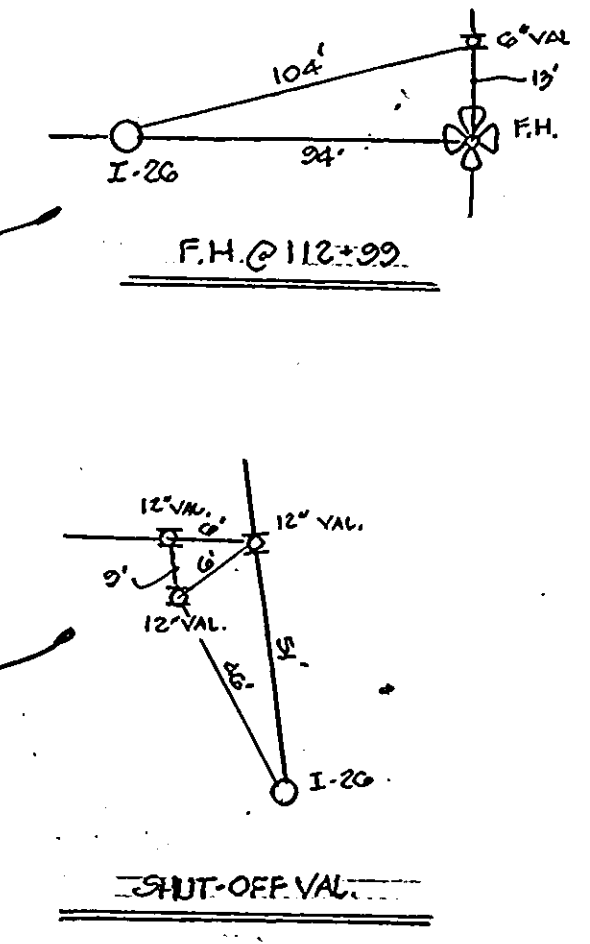
GENERAL NOTES

PART I: GENERAL

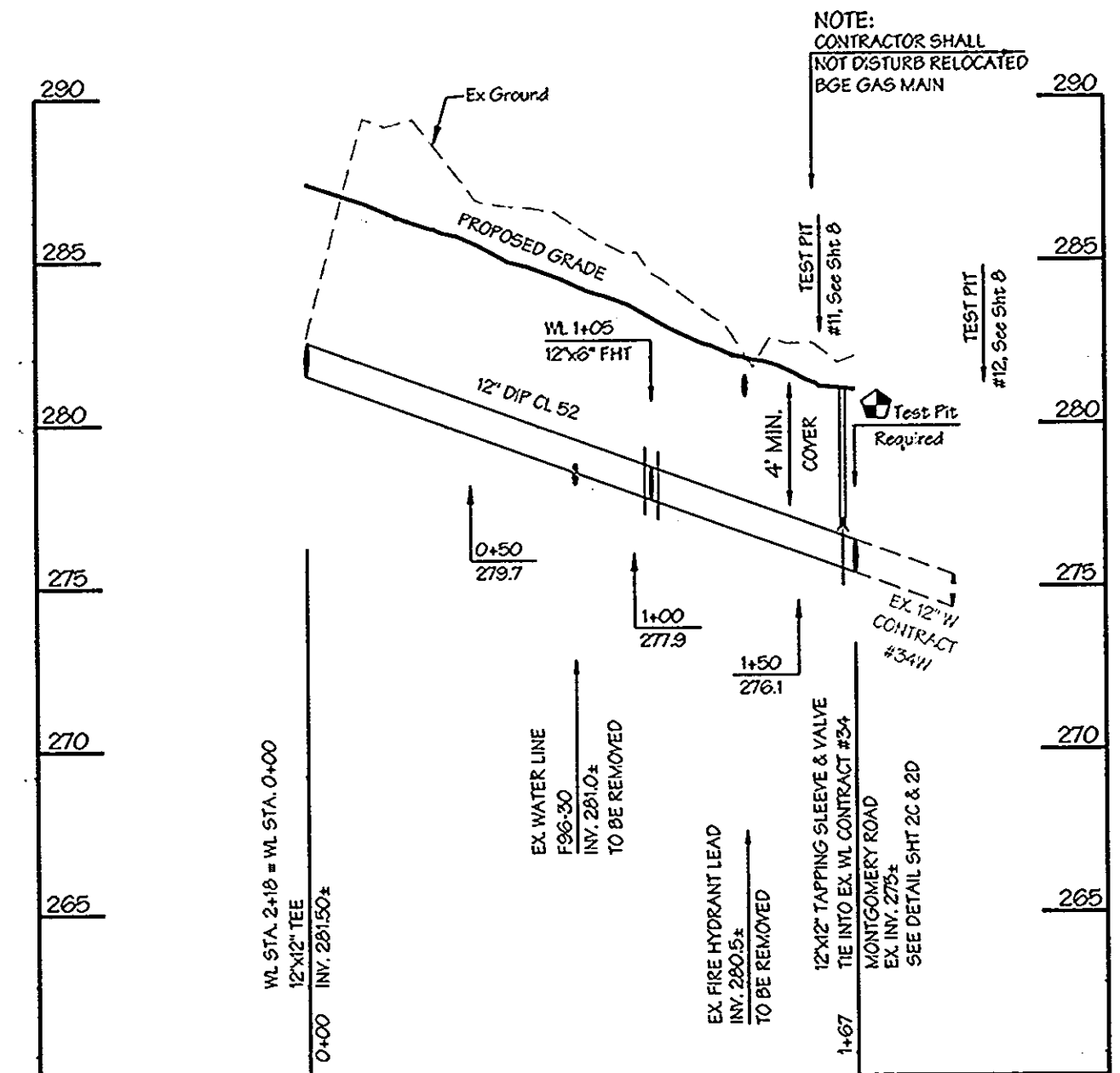
1. Approximate location of existing mains are shown. The Contractor shall take all necessary precautions to protect existing mains and services and maintain uninterrupted service. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer at the Contractor's expense.
2. All horizontal controls are based on Maryland State Coordinates, NAD 83/91.
3. All vertical controls are based on NAVD 88.
4. All pipe elevations shown are invert elevations unless otherwise noted on the plans.
5. Clear all utilities by a minimum of 12 inches. Clear all poles by 5'-0" minimum or tunnel as required unless otherwise noted. The owner has contacted the utility companies and has made arrangements for bracing of poles as shown on the drawings. In the event the Contractor's work requires the bracing of additional poles, any cost incurred by the Owner for bracing of additional poles or damages shall be deducted from monies owed the Contractor. The Contractor shall coordinate with the utility companies to schedule the bracing of the poles, if required.
6. For details not shown on the drawing, and for materials and construction methods, use Howard County Design Manual, Volume IV, Standard Specifications and Details for Construction (latest edition). The Contractor shall have a copy of Volume IV on the job.
7. Where test pits have been made on existing utilities, they are noted by the symbol  at the location of the test pit. A note or notes containing the results of the test pit or pits is included on the drawing (See Sheet). Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the Contractor two weeks in advance of construction operations at his own expense.
8. Contractor shall notify the following utility companies or agencies at least five (5) working days before starting work shown on these plans:
 - a. AT&T: (800) 252-1133
 - b. BGE (Contractor Services): (410) 850-4620
 - c. BGE (Underground damage control): (410) 787-9068
 - d. Bureau of Utilities: (410) 313-4900
 - e. Miss Utility: 1-800-257-7777
 - f. State Highway Administration: (410) 531-5533
 - g. Verizon: 1-800-743-0033 / 410-224-9210
 - h. Construction Inspection Division (410-313-1880)
9. Trees and shrubs are to be protected from damage to maximum extent. Trees and shrubs within the construction area are not to be removed or damaged by the Contractor.
10. Contractor shall remove trees, stumps and roots along line of excavation. Payment for such removal shall be included in the unit price bid for construction of the main.

PART II: WATER

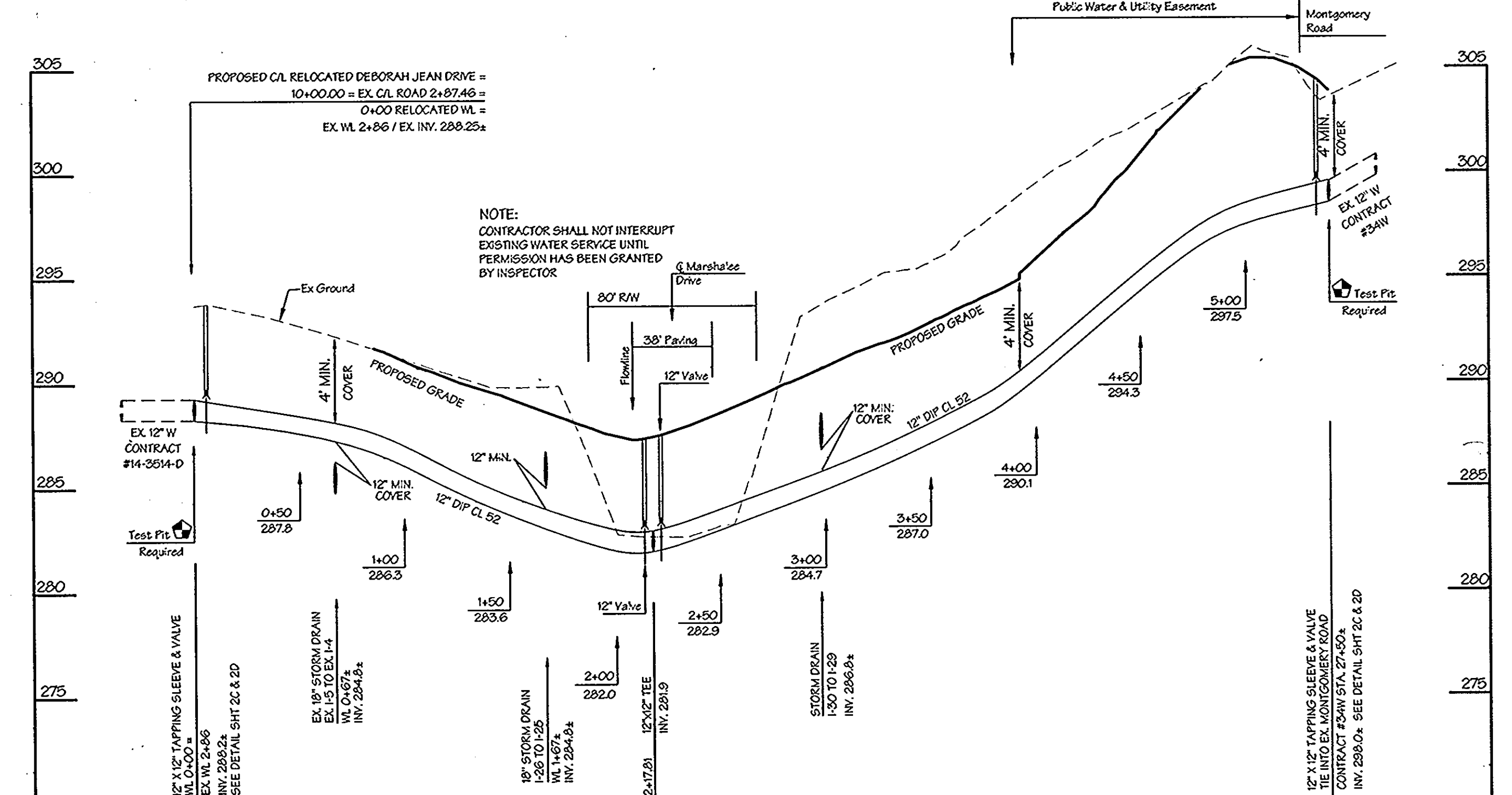
1. All water main materials shall be as specified and approved by the Howard County Department of Public Works.
2. Tops of all water mains to have a minimum of 3 1/2' cover unless otherwise noted.
3. Valves adjacent to the tees shall be strapped to the tees.
4. All fittings shall be buttressed or anchored with concrete in accordance with the Standard Details unless otherwise provided for on the drawings.
5. Fire hydrants shall be set to the bury line elevations shown on the drawings. All fire hydrants shall be restrained and buttressed with concrete in accordance with the Standard Details. Soil around the fire hydrant shall be compacted in accordance with Section 1000 and 1005 of the Standard Specifications.
6. The Contractor shall not operate any water main valves on the existing water system.
7. All water house connections shall be for inside meter setting unless otherwise noted on plans or in specifications.
8. For sprinkler system for all townhomes or multi-family dwelling units should have a minimum of 1 1/2" connection with a 1" meter. (Model 70).
9. Water house connection ball valves shall be set within the grassy area 2' behind the sidewalk or curb line.
10. Mechanical joints shall be required in all fill areas.




PLAN VIEW
SCALE: 1" = 50'



RELOCATED PUBLIC 12" WATER MAIN - ROAD STATIONS 111+90+/- THRU 113+50+/- MONTGOMERY ROAD
SCALE: 1" = 50 HORIZ - 1" = 5' VERT.



RELOCATED PUBLIC 12" WATER MAIN ROAD STATIONS 15+15+/- MONTGOMERY ROAD THRU 10+00 DEBORAH JEAN DRIVE
SCALE: 1" = 50 HORIZ - 1" = 5' VERT.

NOTE TO CONTRACTORS:
THE LOCATION OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND DEPTH OF ANY EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK. WHERE TEST PITS ARE REQUIRED, THE SYMBOL  IS SHOWN. ANY CONFLICTS SHOULD BE BROUGHT TO THE ENGINEERS ATTENTION FOR POSSIBLE REDESIGN / FIELD ADJUSTMENTS.

DEPARTMENT OF PUBLIC WORKS

[Signature] 9/1/06
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 9/1/06
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 9/1/06
CHIEF, BUREAU OF HIGHWAYS DATE

[Signature] 9/1/06
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
Engineers, Surveyors, Planners
9250 Ramsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9540

DESIGNED	E.D.S.		
DRAWN	L.D.E.		
CHECKED	K.C.I.	Z	AS-BUILT DATA SHOWN
DATE	8/2/006		
BY	NO.	REVISION	DATE
			2/20/08

Plan View
WATER MAIN RELOCATION
Marshalee Drive Sta. 109+50 thru 111+88.17
Montgomery Road 111+88+/- thru 113+50+/-
Relocated Deborah Jean Drive 10+00 thru 12+19.32
& Montgomery Road - 12+19.32 thru 14+10+/-
MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND
RELOCATED CONTRACT # 14-3514-D & 34W

CAPITAL PROJECT J-4136/PHASE III B/WATER/PLAN 8/20/06/2006 1430 PM

SCALE
1" = 50'
SHEET
28 OF 18

SEQUENCE OF CONSTRUCTION

- Contractor shall test pit the existing 12" Water Mains for verification of existing invert elevations and existing horizontal joint locations. Contractor shall notify LDE, Inc. prior to beginning any work at 410-715-1070, if 12" x 12" Tapping Sleeve station, per sheet 2B, is within 2 feet of existing pipe joint or if cover over proposed cap & buttress is less than 3.5 feet. Where applicable, the proposed Tapping Sleeve, Line Stop and proposed end cap shall be contained to one pipe length. With permission from Howard County inspector, contractor may "mechanically restrain" pipe joint if required.

- Contractor shall take all necessary precautions to protect the newly relocated (2006) Gas Main during 12" water main relocation.

TAPPING SLEEVE & VALVE

1. Install two proposed 12" x 12" Tapping Sleeve & Valve on the existing Water Main # 34W at Water Main Stations 5+37.65 & 1+65.52 as shown in PLAN VIEW - Sheet 2B along existing Montgomery Road.
2. Install Tapping Sleeve & Valve on the existing Water Main # 14-3514-D at Water Main Station O+00 as shown in PLAN VIEW - Sheet 2B along Deborah Jean Drive.
3. All valves shall be closed upon completion of proposed sleeve installation.
4. Install concrete buttress' at all 12" x 12" Tapping Sleeves per Ho. Co. Standard Detail W-2.25. Contractor shall have a geotechnical engineer certify the bearing pressure of the existing soils to be 3000 psf minimum prior to installation of all buttress or adjust buttress design as specified by the contractors Geotechnical/Structural engineer..
5. Upon completion of above, attach tapping device to open 12" valve and tap into existing main. All existing water main "coupons" shall be recovered upon pipe tap and cutter retraction.
6. Close 12" Valve & remove tapping device.
7. Repeat steps 5 & 6 for the remaining two (2) 12" taps.
8. Complete installation of relocated 12" water main in accordance with the PLAN VIEW - Sheet 2B and Howard County specifications.
9. Upon completion of 12" relocated water main installation and with permission from Howard County inspector, test relocated 12" water mains.
10. Install short / workable piece of pipe to 12" valve at tapping sleeves. Connect end of tested 12" relocated water main to above workable piece via spacer & sleeve per Ho. Co. Standard Detail W-4.15.
11. Open 12" valves and place 12" relocated mains in service.
12. Provide new water service connections to Parcels 59 & 57.

EXISTING 12" WATER MAIN ABANDONMENT & REMOVAL AT DEBORAH JEAN DRIVE

NOTE: Deborah Jean Drive shutdown and water main capping per PLAN VIEW - Sheet 2B, shall occur overnight. All effected residences shall be notified at least 5 days prior to shutdown.

1. Prior to Deborah Jean Drive shutdown, contractor shall have a geotechnical engineer certify the bearing pressure of the existing soils to be 3000 psf minimum prior to installation of the buttress or adjust buttress design as specified by the contractors Geotechnical/Structural engineer.
2. Contractor shall close existing valves at the Deborah Jean Drive / Calvert Drive & Sawgrass Court intersection. Water service to Calvert Drive residences is backed through Contract #14-3120-D and #14-3529-D. Sawgrass Court is backed through Contract #14-3284-D.
3. With permission from Howard County inspector, proceed by closing existing valves at the existing Deborah Jean Drive / Montgomery Road and Deborah Jean Drive / Calvert Drive & Sawgrass Court intersections as well as at the proposed tapping sleeve and valve at Station O+00 per PLAN VIEW - Sheet 2B. This will mark the beginning the shutdown for Deborah Jean Drive residences.
4. With water shutdown, cut ex 12" water main and install mechanical couplings (if required), end caps and buttress per Ho. Co. Standard Detail W-2.25. Again, contractor shall have a geotechnical engineer certify a bearing pressure of 3000 psf minimum prior to installation of all buttress or adjust buttress design as required.
5. Upon completion of cap & buttress installation, and with permission of Howard County inspector, restore water service to Deborah Jean Drive residences by opening valves at Station O+00 and at the Deborah Jean Drive / Calvert Drive & Sawgrass Court intersections, marking the end of the shutdown.
6. Contractor shall proceed with the removal of the existing 12" water main.

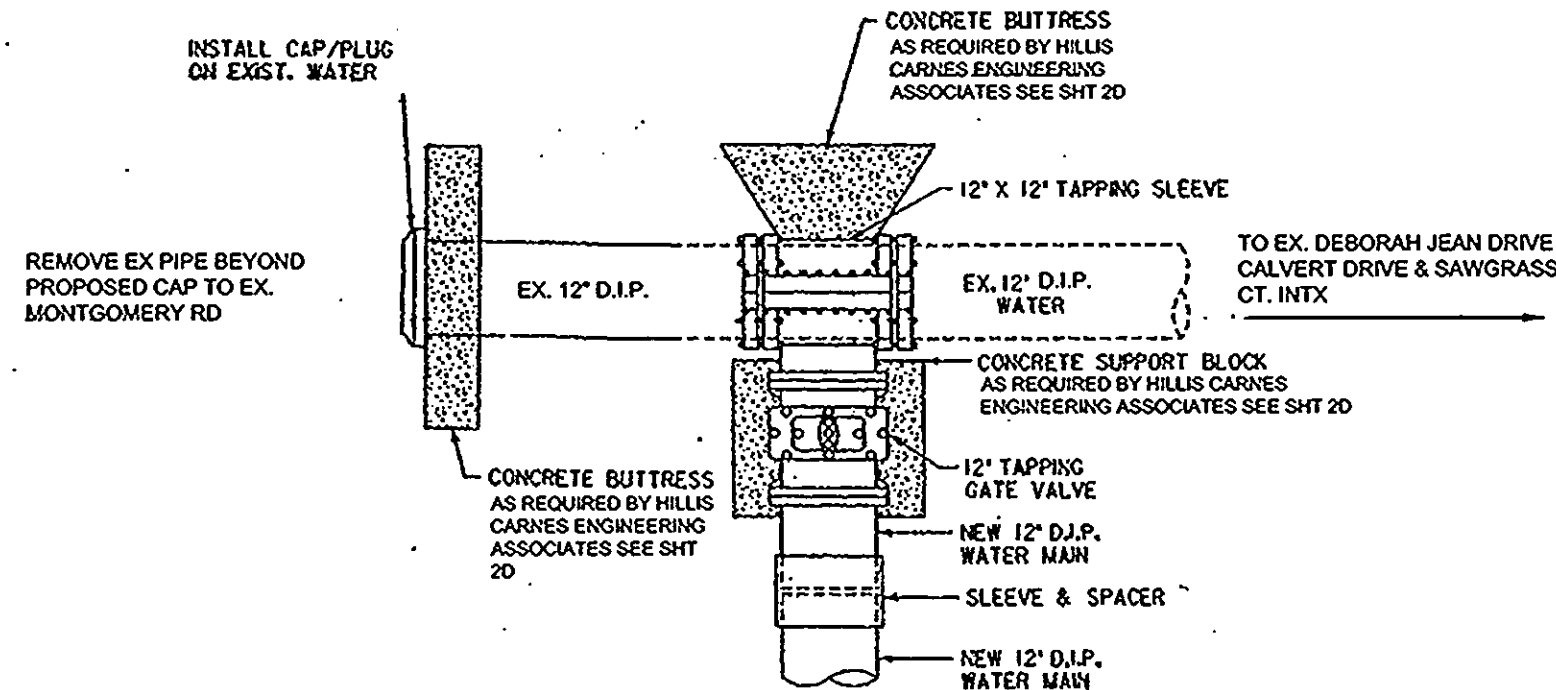
SEQUENCE OF CONSTRUCTION (con't)

EXISTING 12" WATER MAIN ABANDONMENT AT MONTGOMERY ROAD

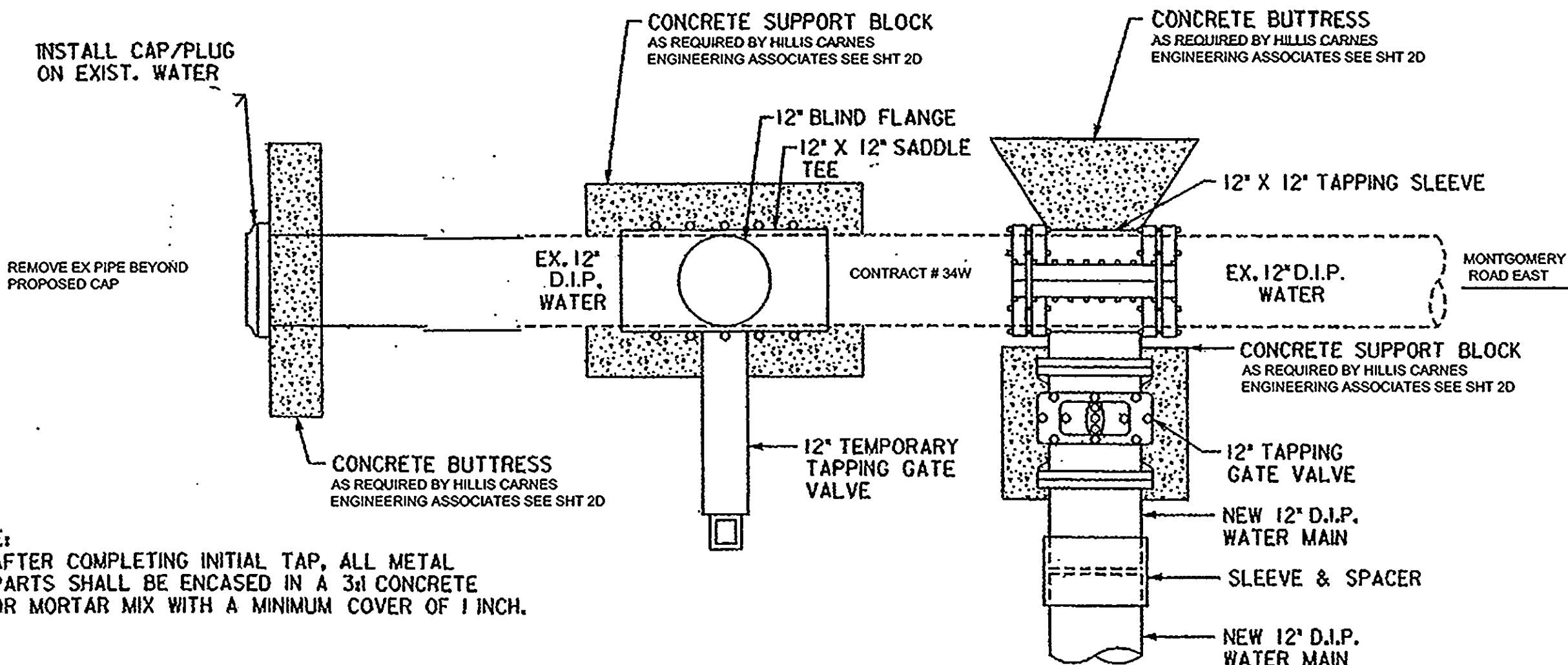
1. Contractor shall have a geotechnical / structural engineer, design a proper support block capable of supporting load of LineStop Machine per Line Stop manufacturer specifications, taking into account existing soil conditions & bearing pressures.
2. Install saddle tees and temporary gate valves on existing Contract #34W as shown in PLAN VIEW - Sheet 2B. Temporary gate valve shall be closed.
3. Attach tapping machine to temporary gate valves at the two (2) LineStop locations.
4. Upon completion of above, open gate valve and tap into existing main. The existing water main "coupons" shall be recovered upon pipe tap and cutter retraction.
5. Close temporary gate valve & remove tapping device.
6. With properly designed support block in place per geotechnical / structural engineer design, install LineStop machine on each temporary gate valve.
7. Open temporary gate valves and simultaneously insert Line Stopping plugging device into existing main to stop flow through existing 12" main (Contract #34W). Flow will continue through newly relocated main.
8. Upon successful flow interruption, cut existing water main and install mechanical couplings (if required), end caps and buttress per Ho. Co. Standard Detail W-2.25. Contractor shall have a geotechnical engineer certify a bearing pressure of 3000 psf minimum prior to installation of all buttress or adjust buttress design as required.
9. Upon completion of cap & buttress installation, and with permission of Howard County inspector, remove LineStop machine, attach completion machine and install completion plug in each of the two (2) tee outlets of the above saddle tees.
10. Remove completion machine and temporary gate valves. Install 12" blind flanges on each tee outlet.
11. Contractor shall proceed with the removal of the existing 12" water main.

ITEM	QUANTITIES ESTIMATED	QUANTITIES AS BUILT		
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
12" TAPPING SLEEVE & VALVE (EA)	3	3	TYLER	TYLER/FERGUSON WATER WORKS
12" LINE STOP (EA)	2	2	HYDRO STOP	ADS ENVIRONMENTAL SER.
12" CAP & BUTTRESS (EA)	3	3	TYLER	TYLER/FERGUSON WATER WORKS
12" WATER (L.F.)	684	694	TYTON	TYTON JOINT PIPE/U.S. PIPE
12" VALVE (EA.)	3	3	MUELLER	MUELLER/FERGUSON WATER WORKS
12" x 12" TEE (EA.)	1	1	TYLER	TYLER
12" x 6" FIRE HYDRANT TEE (EA.)	1	1	TYLER	"
12" - 1/4 BEND (EA.)	3	3	TYLER	"
6" WATER (L.F.)	16	16	TYTON	TYTON JOINT PIPE/U.S. PIPE
6" VALVE (L.F.)	1	1	MUELLER	MUELLER CO./FERGUSON WATER WORK
6" FIRE HYDRANT (EA.)	1	1	MUELLER	"
1" WHC (L.F.)	98	98	TYPE "K"	"

NAME OF UTILITY CONTRACTOR: _____ CHECK BOX: Survey & Drafting Division As Built Date: _____

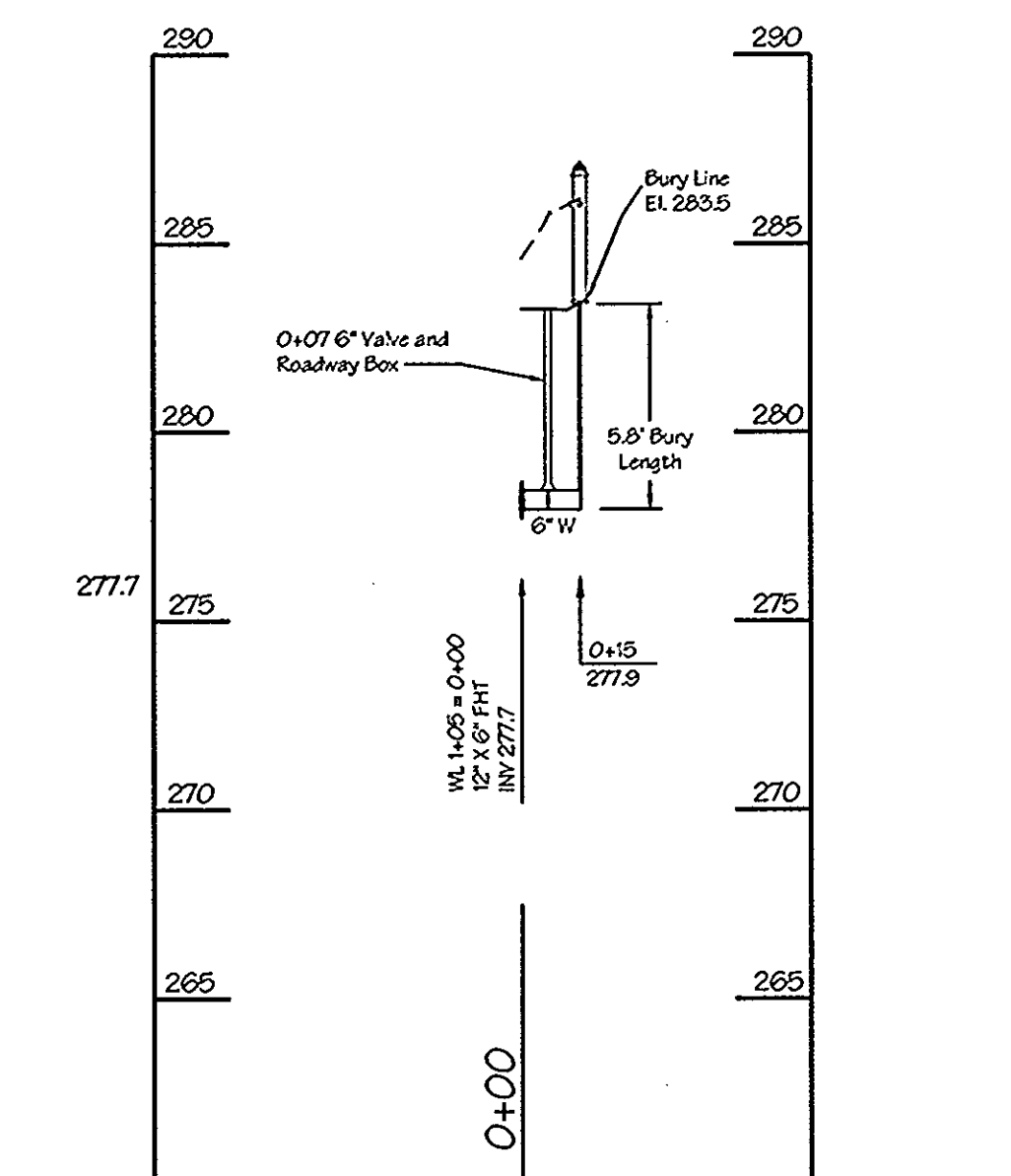


CONNECTION DETAIL ALONG DEBORAH JEAN DRIVE
EX WL STATION 2+87+/- = PROPOSED RELOCATION WL STATION O+00
N.T.S.

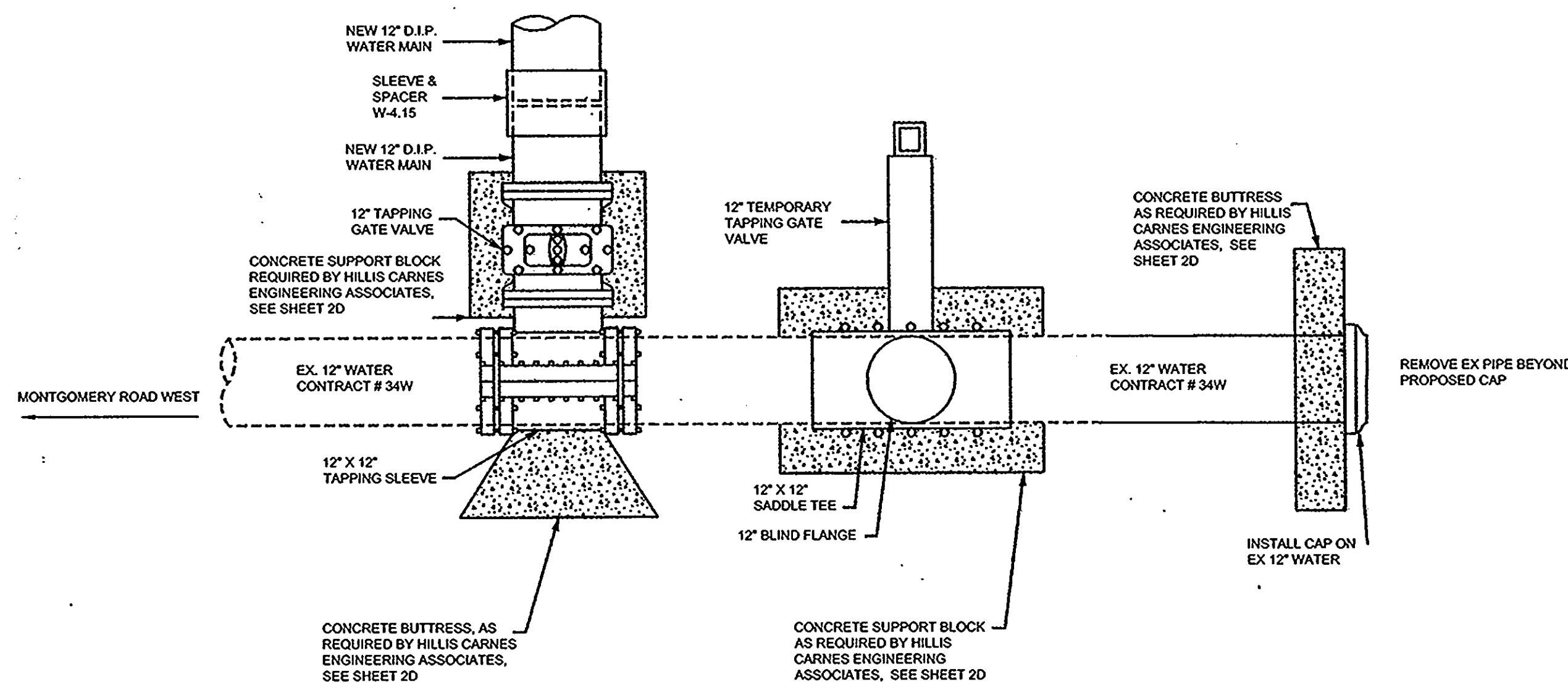


CONNECTION DETAIL ALONG MONTGOMERY ROAD
EX WL STATION 23+40+/- = PROPOSED RELOCATION WL STATION 1+65
N.T.S.

NOTE:
1. AFTER COMPLETING INITIAL TAP, ALL METAL PARTS SHALL BE ENCASED IN A 3:1 CONCRETE OR MORTAR MIX WITH A MINIMUM COVER OF 1 INCH.



PROFILE - FIRE HYDRANT
MONTGOMERY ROAD - CL ROAD STATION 113+00+/-
SCALE: 1" = 50 HORIZ - 1" = 5' VERT.



CONNECTION DETAIL ALONG MONTGOMERY ROAD
EX WL STATION 27+50+/- = PROPOSED RELOCATION WL STATION 5+38
N.T.S.

NOTE TO CONTRACTORS:

THE LOCATION OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND DEPTH OF ANY EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK. WHERE TEST PITS ARE REQUIRED, THE SYMBOL IS SHOWN. ANY CONFLICTS SHOULD BE BROUGHT TO THE ENGINEERS ATTENTION FOR POSSIBLE REDESIGN / FIELD ADJUSTMENTS.

FILED PROJECT: J-4136\WATER2.dwg, PLAN, 8/20/2006 1:53:34 PM

DEPARTMENT OF PUBLIC WORKS

[Signature] 9/6/06 DATE
DIRECTOR OF PUBLIC WORKS
[Signature] 9/6/06 DATE
CHIEF, BUREAU OF HIGHWAYS

[Signature] 9/5/06 DATE
CHIEF, BUREAU OF ENGINEERING
[Signature] 9/5/06 DATE
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT

LDE Inc.
Engineers, Surveyors, Planners
9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9540



DESIGNED	E.D.S.			
DRAWN	L.D.E.			
CHECKED	B.D.B.	K.C.1	2	AS-BUILT DATA SHOWN
DATE	LDE	1		New sheet for existing water main relocation
				2/2006
DATE				8/2006
BY	NO.			REVISION
				DATE

Profile & Details
WATER MAIN RELOCATION
Marshalee Drive Sta. 109+50 thru 111+88.17
Montgomery Road 111+88+/- thru 113+50+/-
Relocated Deborah Jean Drive 10+00 thru 12+19.32
& Montgomery Road - 12+19.32 thru 14+10+/-

MAP NO. 37 BLOCK 15

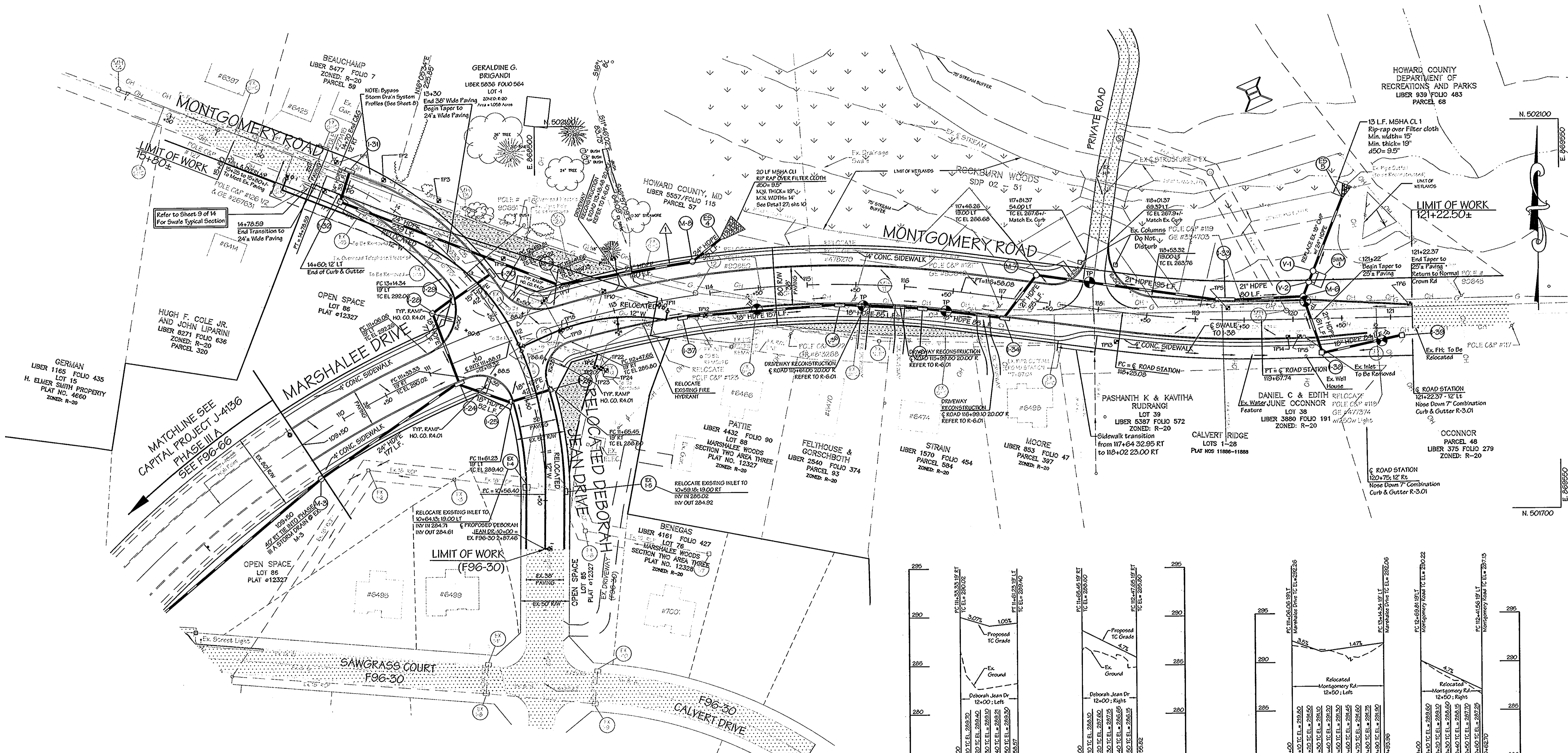
MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B - CONTRACT # 14-3514-D
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND
RELOCATED CONTRACT # 14-3514-D & 34W

SCALE
1" = 50'
SHEET
2C of 18

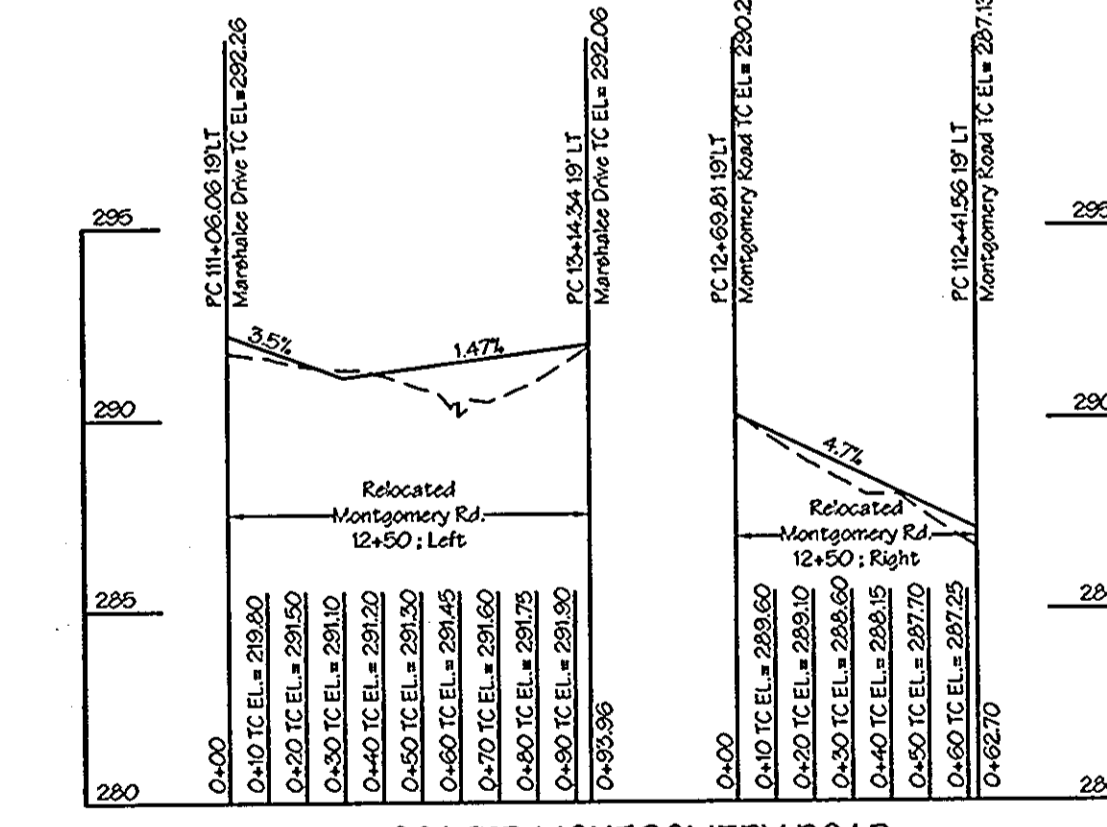
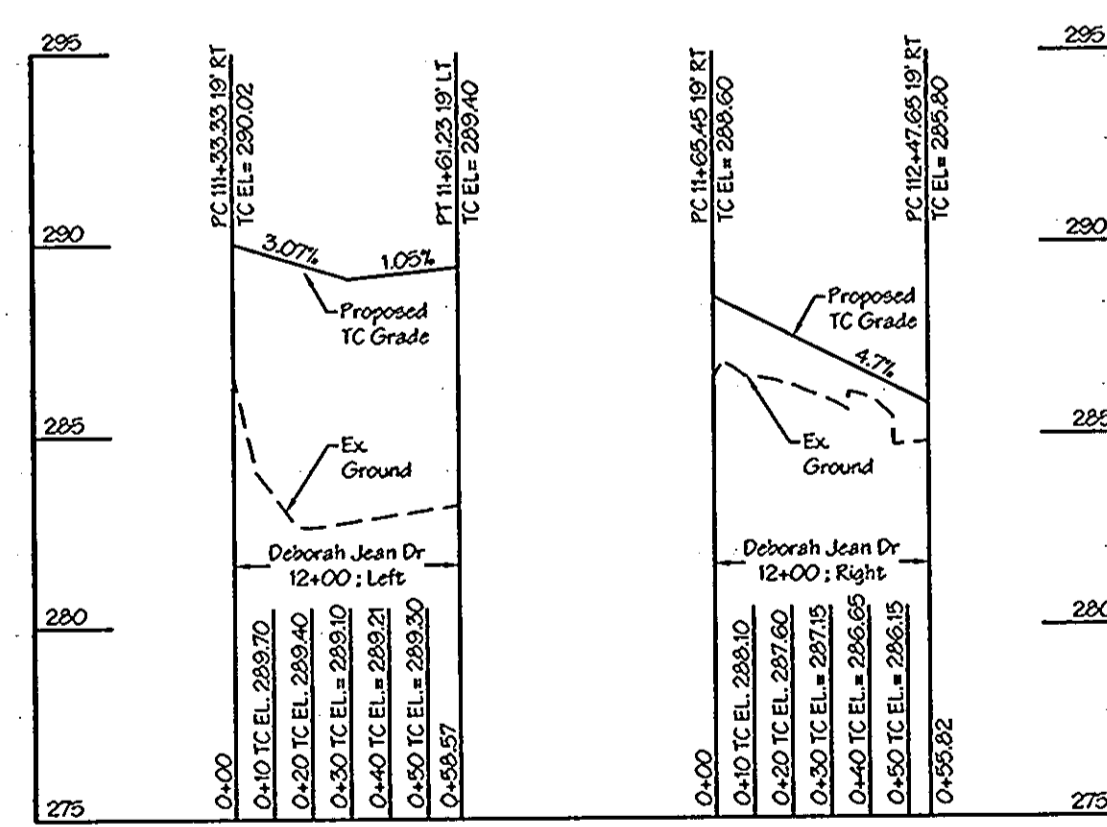
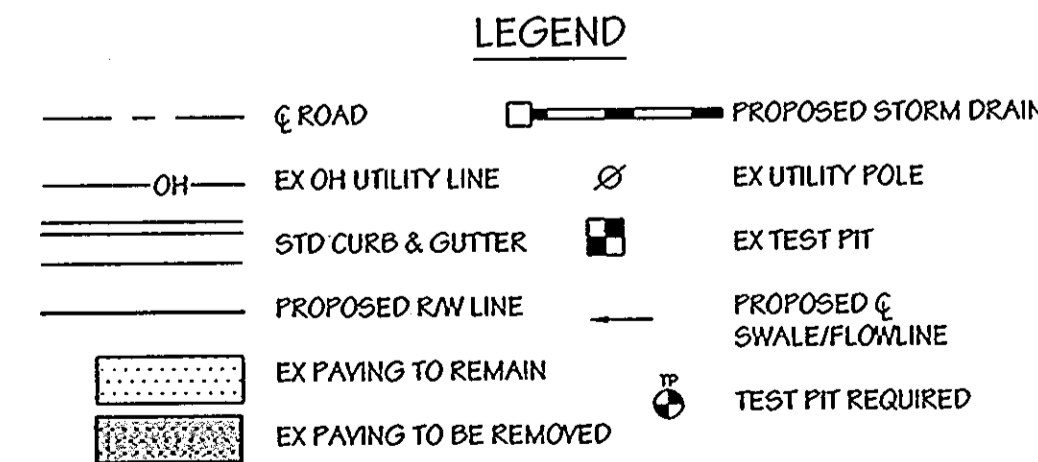
MARSHALEE DRIVE & MONTGOMERY ROAD COORDINATE POINTS		
STATION	NORTHING	EASTING
109+50	501775.1185	868259.6517
111+88.17 INTX.	501879.5059	868473.1049
116+58.08 PT	501926.3595	868936.3363
117+ INTX.		
118+25.08 PC	501904.0241	869101.8327
119+67.74 PT	501895.0758	869244.0946
121+22.68		
LIMIT OF WORK	501897.4384	869398.7025

RELOCATED MONTGOMERY ROAD & RELOCATED DEBORAH JEAN DRIVE		
STATION	NORTHING	EASTING
10+00	501665.6184	868507.9869
12+19.32	501879.5060	868473.1052
14+78.59	502051.4190	868287.1103

CURVE DATA TABLE							
Curve	Length	Radius	Chord Bearing	Chord Distance	Delta	Tangent	S/E
109+50 116+58.08	708.08'	1000.00'	N77°24'05"E	693.38'	40°34'12"	369.61'	.035/ft
118+25.08 119+67.74	142.66'	1000.00'	S86°24'03"E	142.54'	8°10'27"	71.45'	.035/ft
10+58.40 14+78.59	422.20'	350.00'	N33°56'39"W	397.06'	69°06'54"	241.07'	N/A



- NOTE:**
- The Existing Driveways to Montgomery Road, #6470, #6474 and #6498 shall be reconstructed per Howard County Standard Detail R-6.01. See sheet 2.
 - Sidewalk Ramps shall be provided per Howard County Standard Detail R-4.01, see sheet 2.
 - Existing Inlets Along Relocated Deborah Jean Drive (I-4) & (I-5) Shall be Relocated as Detailed Hereon. The Existing Inlets Shall be Shifted Holding the Existing Invert Elevations of F96-30.
 - Refer to sheet 3 for Profiles of I-26 to M-3 and I-30 to I-24.
 - The Contractor Shall be Responsible for Adjusting the Existing Sewer Manhole Tops to Proposed Grade Elevations.
 - Existing Inlets (12, 13, 14 & 15) and End Sections (5-5, 5-6 & 5-7) are to be removed.
 - See sheet 2 for the driveway reconstruction requirements.



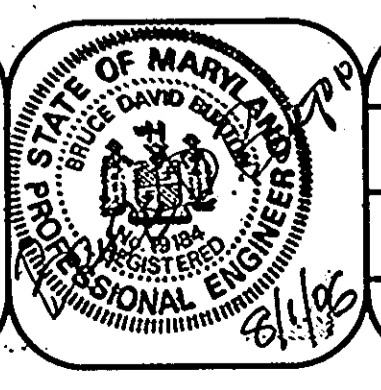
DEPARTMENT OF PUBLIC WORKS

[Signature] 8/16/06
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8/19/06
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/19/06
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
Engineers, Surveyors, Planners
9250 Runney Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9340



DESIGNED	DRAWN	CHECKED	DATE	BY	NO.	REVISION	DATE
E.D.S.	L.D.E.	B.D.P.	2/2005	LDE	1	REVISE BYPASS STORM DRAIN	6/2006

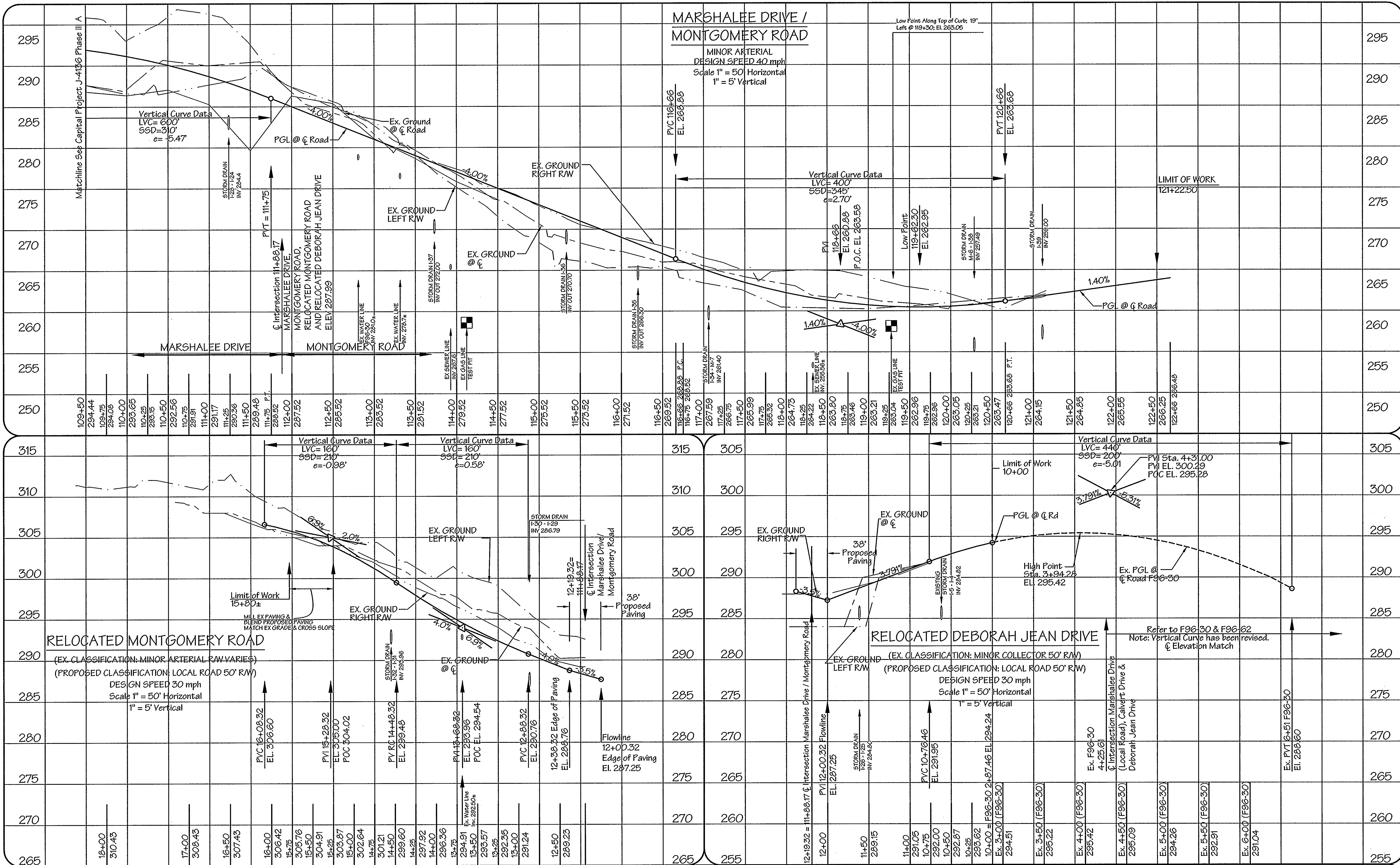
Plan View
Marshalee Drive
Sta. 109+50 thru 111+88.17
Montgomery Road 111+88.17 thru 121+22.68
Relocated Deborah Jean Drive 10+00 thru 12+19.32
& Montgomery Road - 12+19.32 thru 14+78.59

MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
1" = 50'
SHEET
3 of 18

CAPITAL PROJECT J-4136/PHASE III B/PLAN/PLAN 11/17/2005 14:25:54



CAPITAL PROJECT J-4136/PHASE III/PROFILE, 2/14/05 3:02:13 PM

DEPARTMENT OF PUBLIC WORKS

[Signature] 2/14/05
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/11/05
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 2/14/05
 CHIEF, BUREAU OF HIGHWAYS DATE

[Signature] 2/11/05
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045
 (410)715-1070 - (301)596-3424 - FAX(410)715-9540

PROFESSIONAL ENGINEER
 STATE OF MARYLAND
 No. 12415
 2/14/05

DESIGNED	E.D.S.	DATE
DRAWN	LDE	
CHECKED	B.D.B.	
DATE	2/20/05	

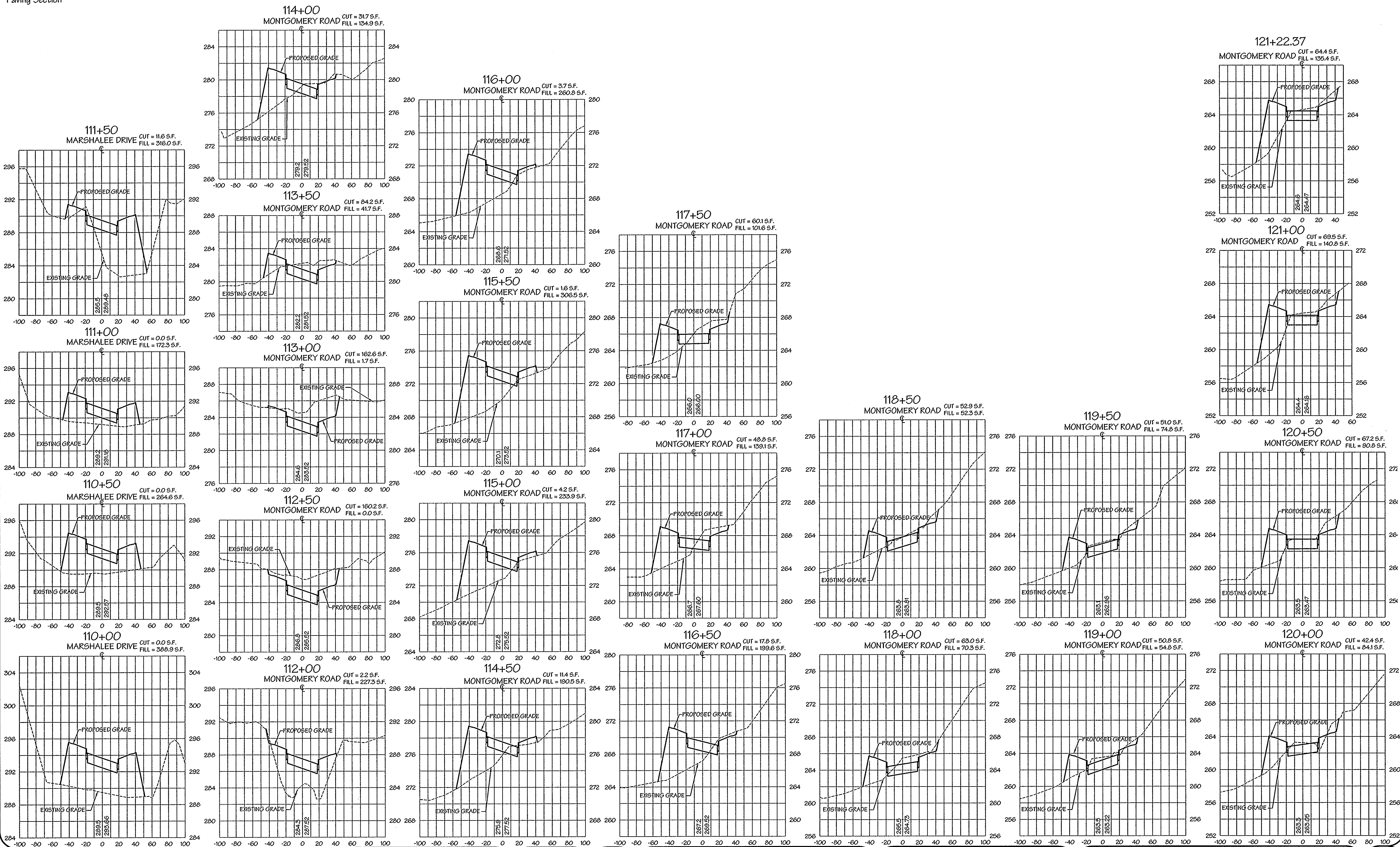
BY	NO.	REVISION	DATE

ROAD PROFILES
 Relocated Deborah Jean Drive 10+00 - 12+00.32,
 Montgomery Road (Local) - 12+38.32 - and
 Marshalee Drive 109+50 - 111+88.17 /
 Montgomery Road 111+88.17 - 121+22.63
 MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT

SCALE AS SHOWN
 SHEET 4 OF 18

NOTE: Cut and Fill Values Do Not Include Paving Section



DEPARTMENT OF PUBLIC WORKS
 Director of Public Works
 DATE 2/14/05
 Chief, Bureau of Engineering
 DATE 2/11/05
 Chief, Division of Transportation Projects and Watershed Management
 DATE 2/11/05

Steve Shaver
 Chief, Division of Transportation Projects and Watershed Management
 DATE 2/11/05

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Runsey Road, Suite 106 Columbia, Maryland - 21045
 (410)715-1070 - (301)596-3424 - FAX(410)715-9540



DESIGNED	E.D.S.				
DRAWN	LDE				
CHECKED	B.D.B.				
DATE	2/2005	BY	NO.	REVISION	DATE

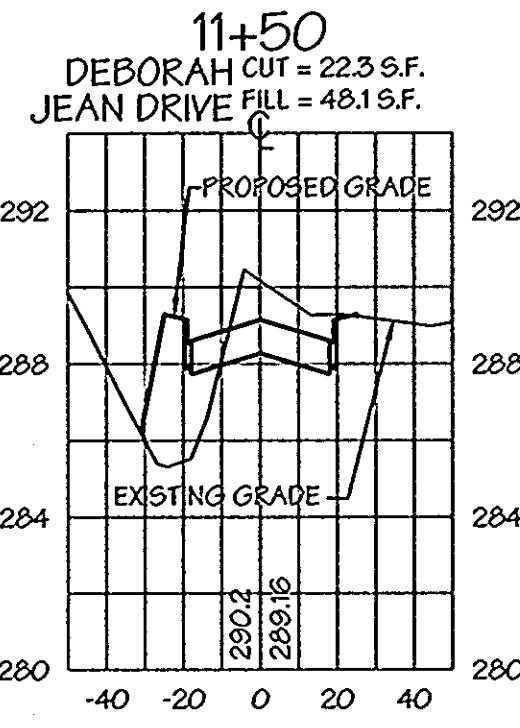
MARSHALEE DRIVE / MONTGOMERY ROAD
 CROSS SECTIONS
 110+00 TO 121+22.37
 MAP NO. 37
 BLOCK 15

MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

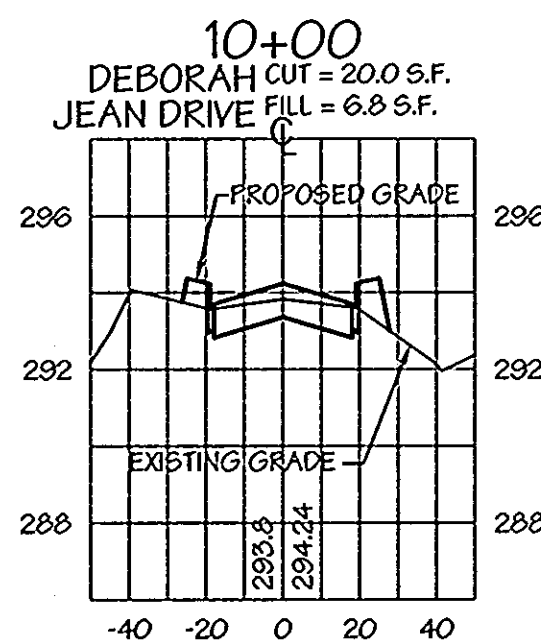
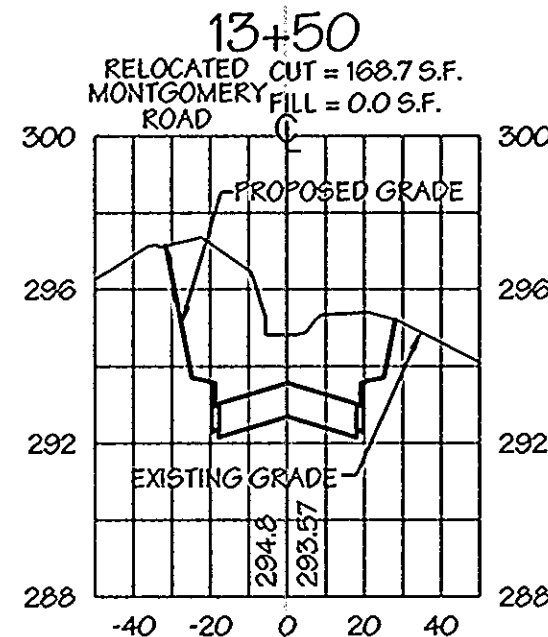
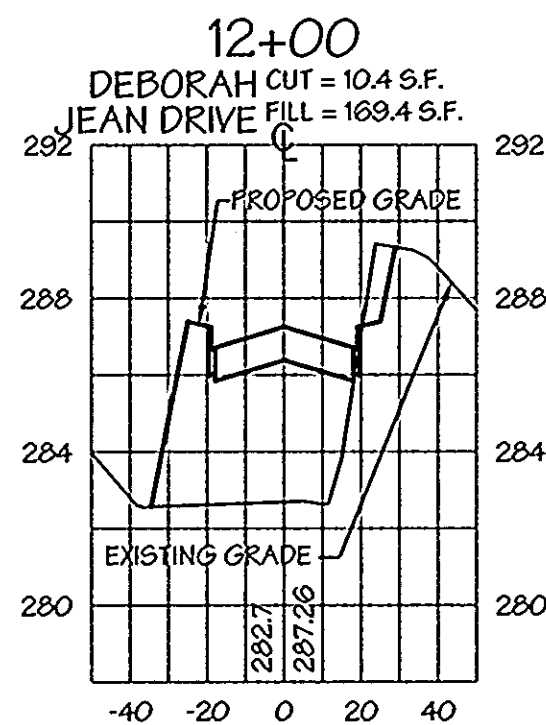
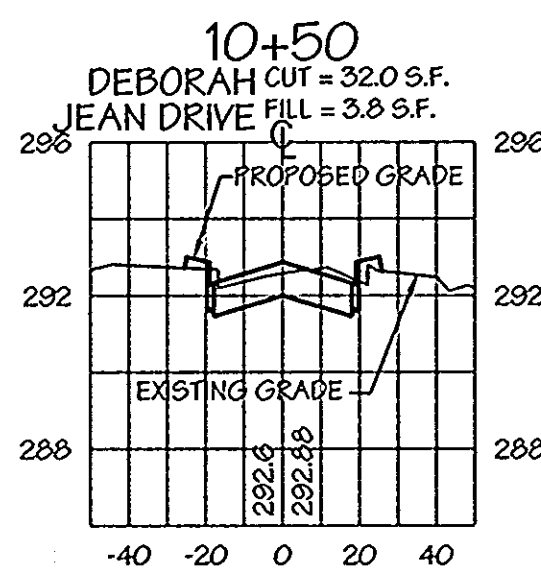
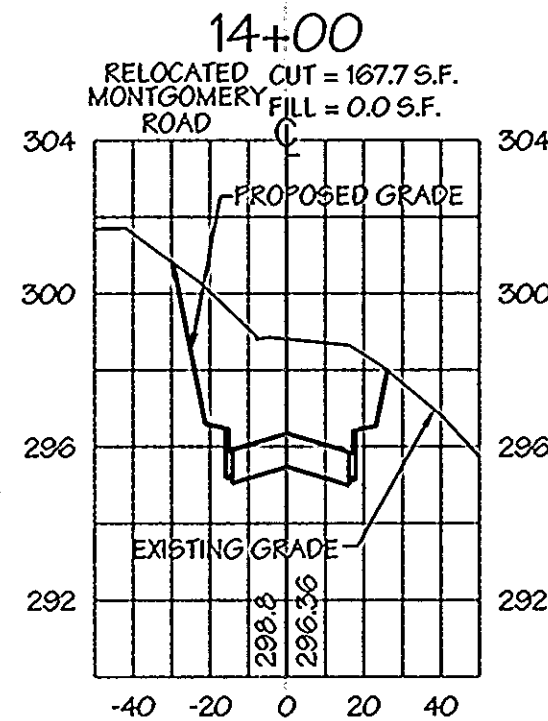
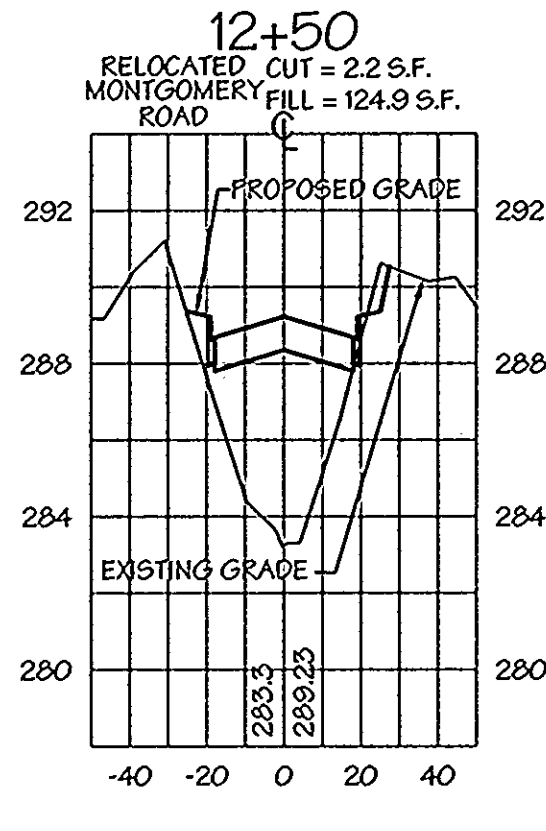
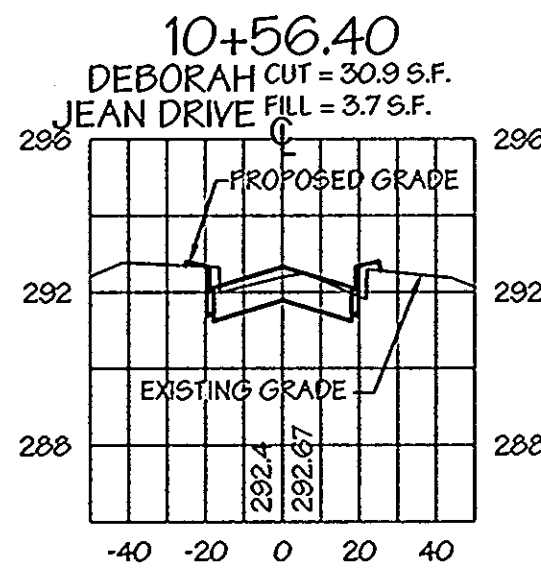
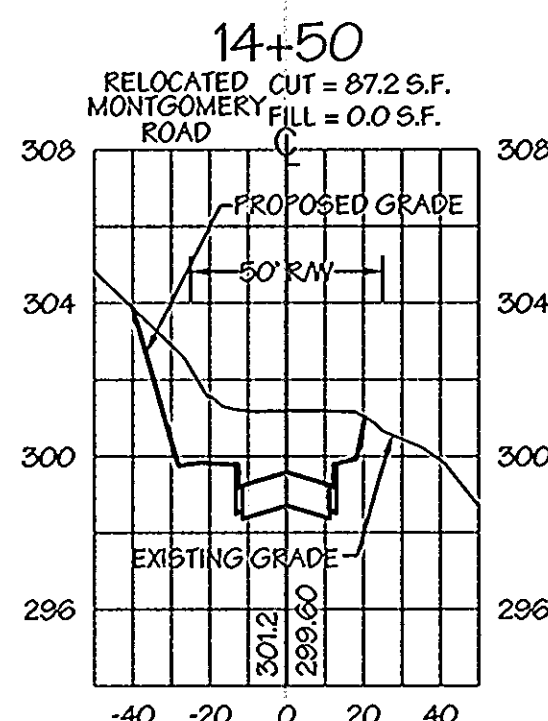
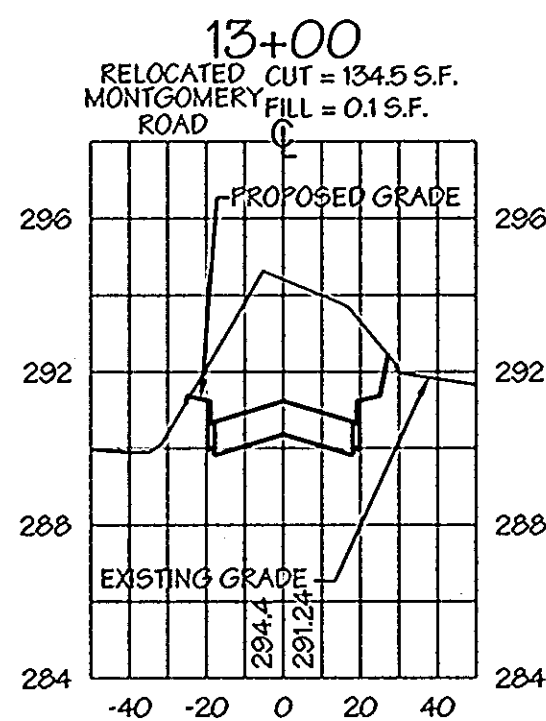
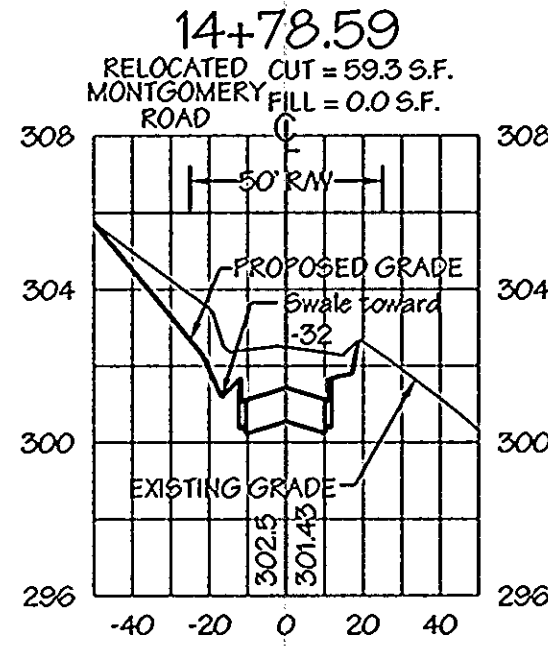
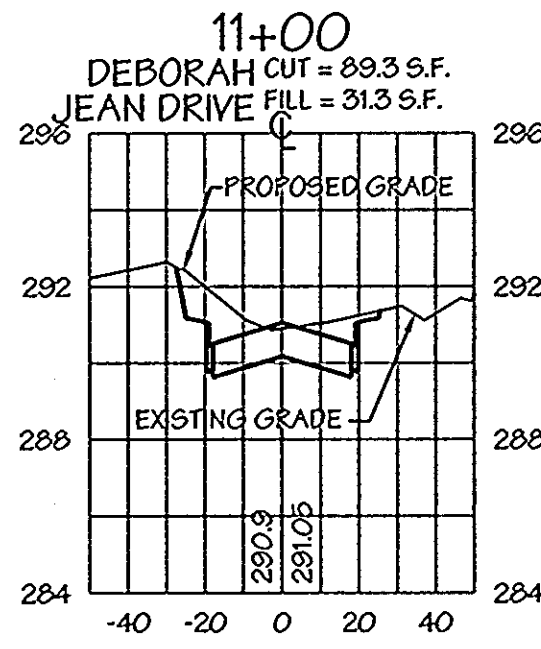
SCALE
 1"=5' Vert.
 1"=50' Hor.
 SHEET
 5 OF 18

CAPITAL PROJECT J-4136/Map 37/Cross Sections 110+00 to 121+22.37

NOTE: Cut and Fill Values Do Not Include Paving Section



Scale: 1" = 5' Vertical
1" = 50' Horizontal



CAPITAL PROJECT J-4136 - PHASE 3B
Marshalee Drive / Montgomery Road - EARTHWORK

Road Station	Cut (SF)	Fill (SF)	Average Cut (SF)	Average Fill (SF)	Diff. in Dist (Ft)	Cut Cubic Feet	Fill Cubic Feet
11000	0.0	388.9	0.00	326.75	0	0.0	0.0
11050	0.0	264.6	0.00	218.45	50	0.0	16337.5
11100	0.0	172.3	0.00	144.15	50	0.0	10922.5
11150	11.6	316.0	5.80	244.15	50	290.0	12207.5
11200	2.2	227.3	6.90	271.65	50	345.0	13582.5
11250	160.2	0.0	161.40	0.85	50	4060.0	5682.5
11300	162.6	1.7	123.40	21.70	50	8070.0	42.5
11350	84.2	41.7	57.95	88.30	50	6170.0	1085.0
11400	31.7	134.9	21.55	162.70	50	2897.5	4415.0
11450	11.4	190.5	7.80	212.20	50	1077.5	8135.0
11500	4.2	233.9	2.90	270.20	50	390.0	10610.0
11550	1.6	306.5	2.65	283.65	50	145.0	12510.0
11600	3.7	260.8	10.75	230.20	50	132.5	14182.5
11650	17.8	199.6	33.30	169.35	50	537.5	11510.0
11700	48.8	139.1	54.45	120.35	50	1665.0	8467.5
11750	60.1	101.6	61.55	85.95	50	2722.5	6017.5
11800	63.0	70.3	57.95	61.30	50	2897.5	3065.0
11850	52.9	52.3	51.85	53.55	50	2592.5	2677.5
11900	50.8	54.8	50.90	64.80	50	2545.0	3240.0
11950	51.0	74.8	46.70	79.45	50	2335.0	3972.5
12000	42.4	84.1	54.80	87.45	50	2740.0	4372.5
12050	67.2	90.8	68.35	115.80	50	3417.5	5790.0
12100	69.5	140.8	66.95	138.10	50	3417.5	5790.0
12122.4	64.4	135.4	32.20	67.70	22.37	1497.7	3089.3
12125	0.0	0.0			2.63	84.7	178.1
TOTAL						1841	6200

CAPITAL PROJECT J-4136 - PHASE 3B
Deborah Jean Drive / Relocated Montgomery Road - EARTHWORK

Road Station	Cut (SF)	Fill (SF)	Average Cut (SF)	Average Fill (SF)	Diff. in Dist (Ft)	Cut Cubic Feet	Fill Cubic Feet
1000	20.0	6.8				0.0	0.0
1050	32.0	3.8	26.00	5.30	50	1300.0	265.0
1056.40	30.9	3.7	31.45	3.75	6.4	201.3	24.0
1100	89.3	31.3	60.10	17.50	43.6	2620.4	763.0
1150	22.3	48.1	56.80	39.70	50	2790.0	1985.0
1200	10.4	169.4	16.35	108.75	50	817.5	5437.5
1250	2.2	124.9	6.30	147.15	50	315.0	7357.5
1300	134.5	0.1	68.35	62.50	50	3417.5	3125.0
1350	168.7	0.0	151.60	0.05	50	7580.0	2.5
1400	167.7	0.0	168.20	0.00	50	8410.0	0.0
1450	87.2	0.0	127.45	0.00	50	6372.5	0.0
1478.59	59.3	0.0	73.25	0.00	28.59	2094.2	0.0
1480	0.0	0.0	29.65	0.00	1.41	41.8	0.0
TOTAL						1332	702

DEPARTMENT OF PUBLIC WORKS

Director of Public Works
2/11/05
Steve Sharan
2/11/05

Chief, Bureau of Engineering
2/11/05
Steve Sharan
2/11/05

LDE Inc.
Engineers, Surveyors, Planners
9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX(410)715-9540



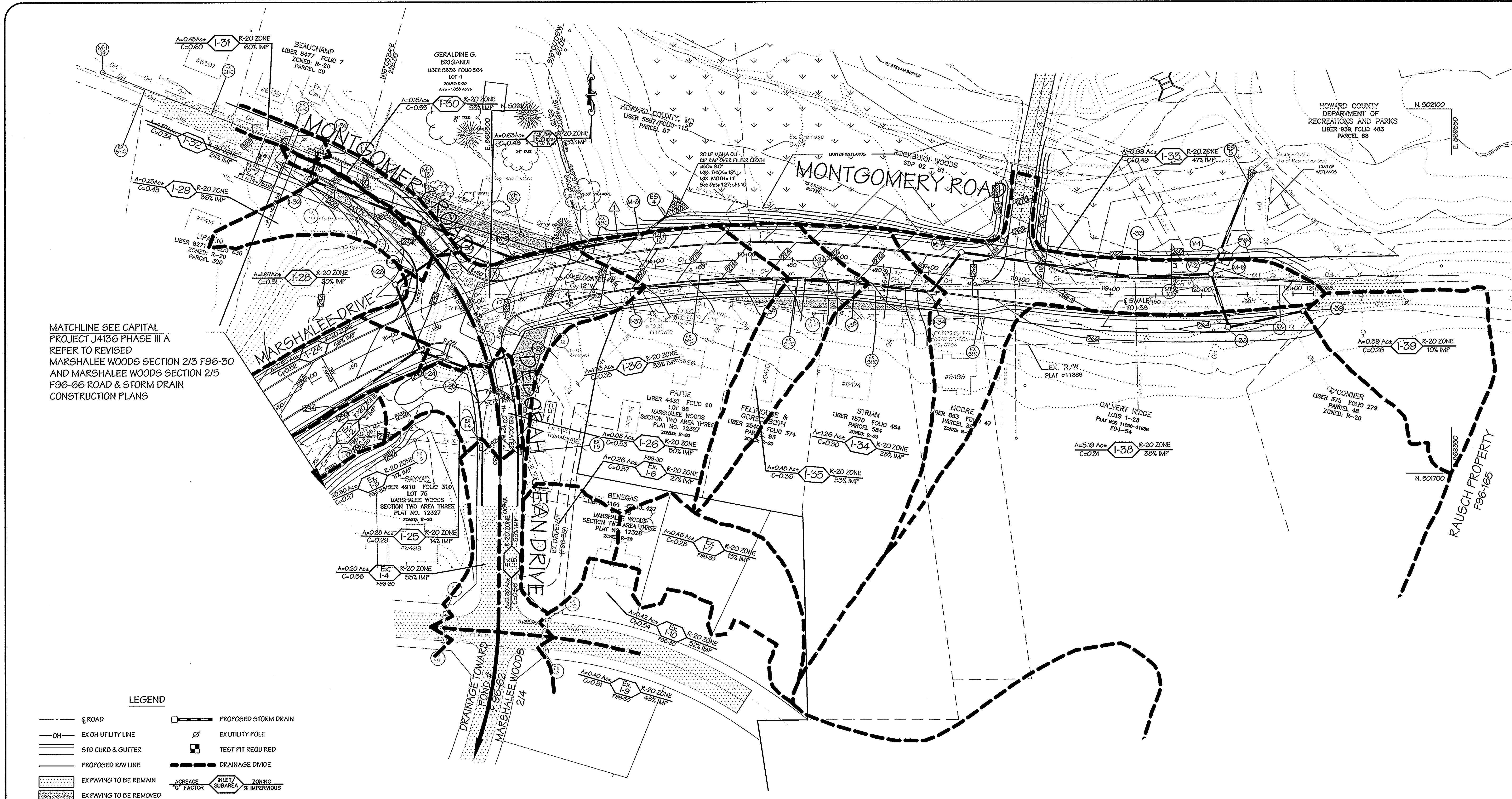
DESIGNED E.D.S.			
DRAWN LDE			
CHECKED B.D.B.			
DATE 2/2005	BY	NO.	REVISION
			DATE

DEBORAH JEAN DRIVE / MONTGOMERY POND
CROSS SECTIONS
10+00 TO 14+78.59

MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
1"=5' Vert.
1"=50' Hor.
SHEET
6 OF 18



MATCHLINE SEE CAPITAL PROJECT J4136 PHASE III A REFER TO REVISED MARSHALEE WOODS SECTION 2/3 F96-30 AND MARSHALEE WOODS SECTION 2/5 F96-66 ROAD & STORM DRAIN CONSTRUCTION PLANS

LEGEND

---	ROAD	---	PROPOSED STORM DRAIN
OH	EX OH UTILITY LINE	⊗	EX UTILITY POLE
---	STD CURB & GUTTER	⊠	TEST PIT REQUIRED
---	PROPOSED R/W LINE	---	DRAINAGE DIVIDE
---	EX PAVING TO BE REMAIN	ACREAGE	INLET
---	EX PAVING TO BE REMOVED	C FACTOR	SUBAREA
			ZONING
			% IMPERVIOUS

DEVELOPER CERTIFICATE
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT OR THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY.

Paul D. Sporn 8/10/06
 SIGNATURE OF DEVELOPER DATE

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

Paul D. Sporn 8/10/06
 SIGNATURE OF ENGINEER DATE

DEPARTMENT OF PUBLIC WORKS

John D. ... 8/10/06
 DIRECTOR OF PUBLIC WORKS DATE

Walter J. ... 8-9-06
 CHIEF, BUREAU OF HIGHWAYS DATE

Paul D. Sporn 8/10/06
 CHIEF, BUREAU OF ENGINEERING DATE

... 8/9/06
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Runsey Road, Suite 106 Columbia, Maryland - 21045
 (410)715-1070 - (301)596-3424 - FAX (410)715-9540



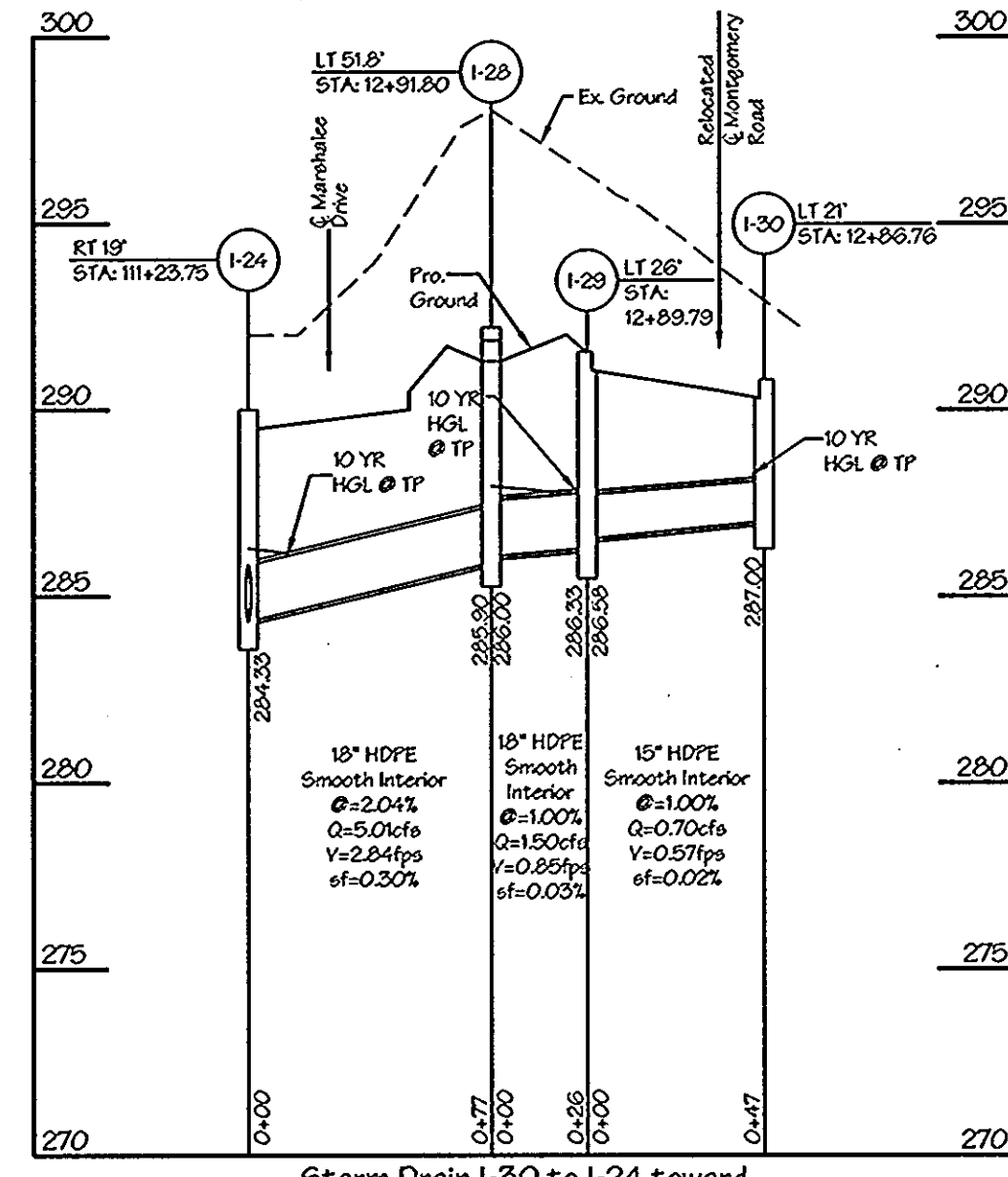
DESIGNED	E.D.S.		
DRAWN	L.D.E.		
CHECKED	B.D.B.		
DATE	LDE	REVISE BYPASS STORM DRAIN	6/20/06
2/20/05	BY NO.	REVISION	DATE

Drainage Area Map
 MAP NO. 37 BLOCK 15

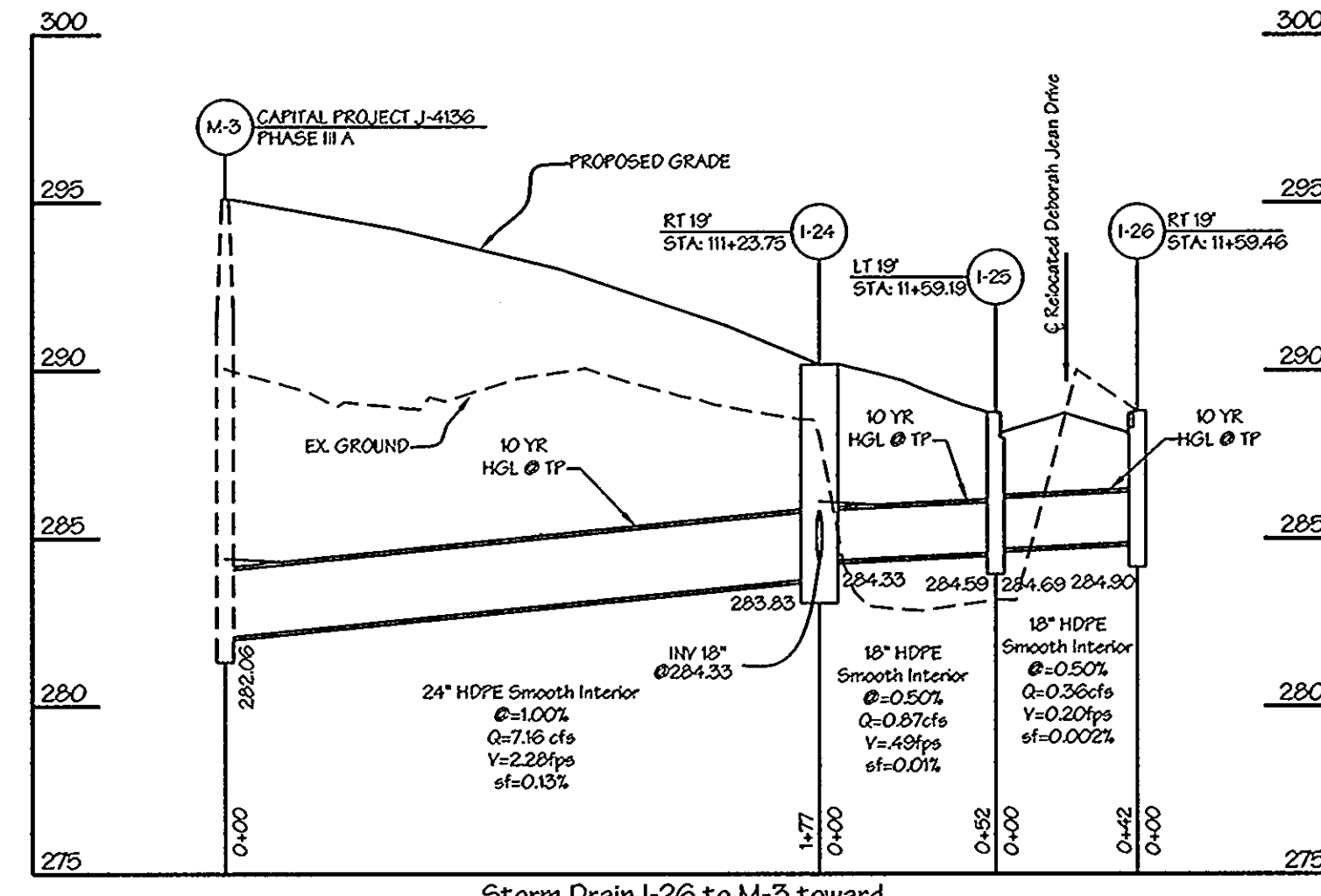
MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
 1"=50'
 SHEET
 7 of 18

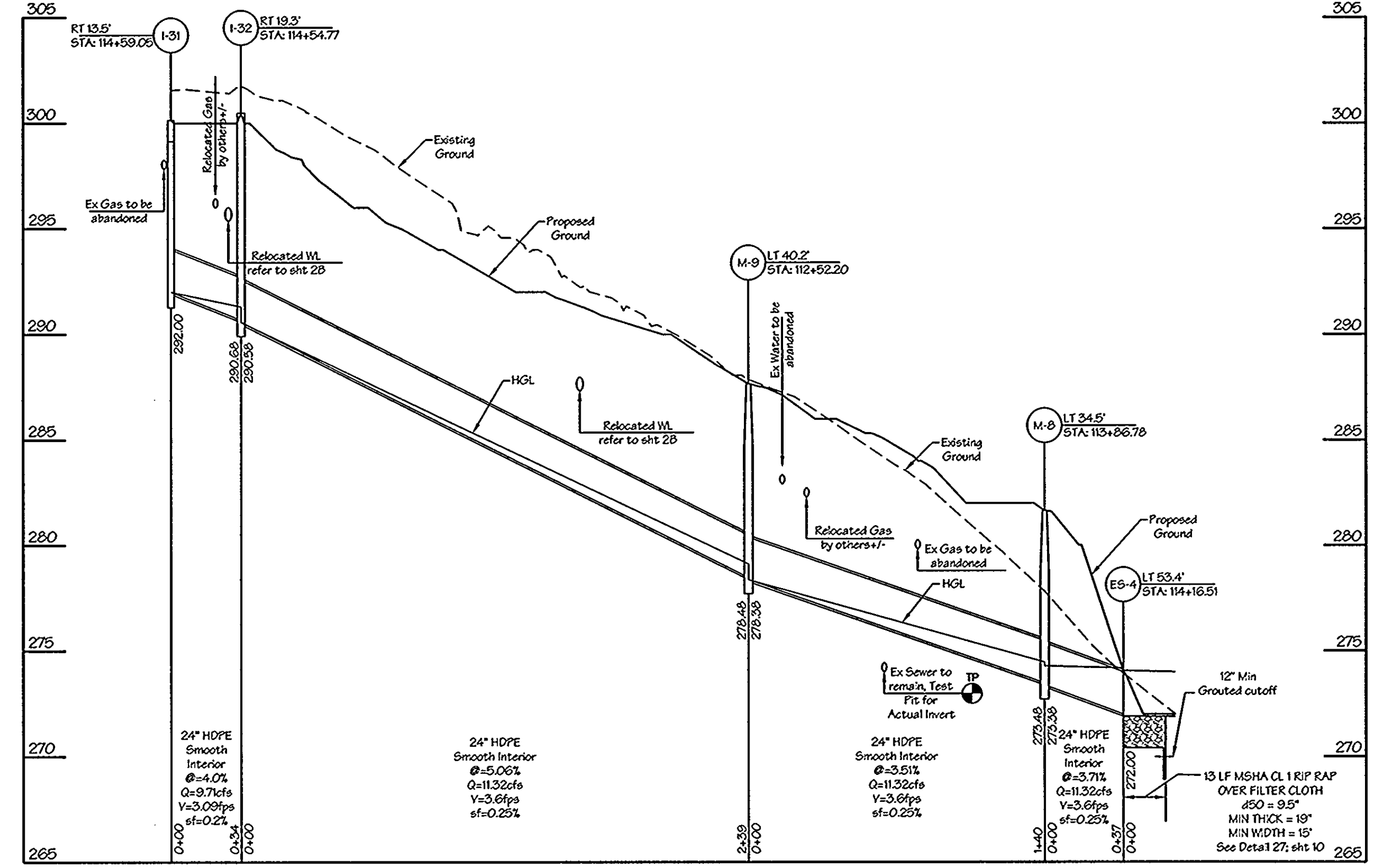
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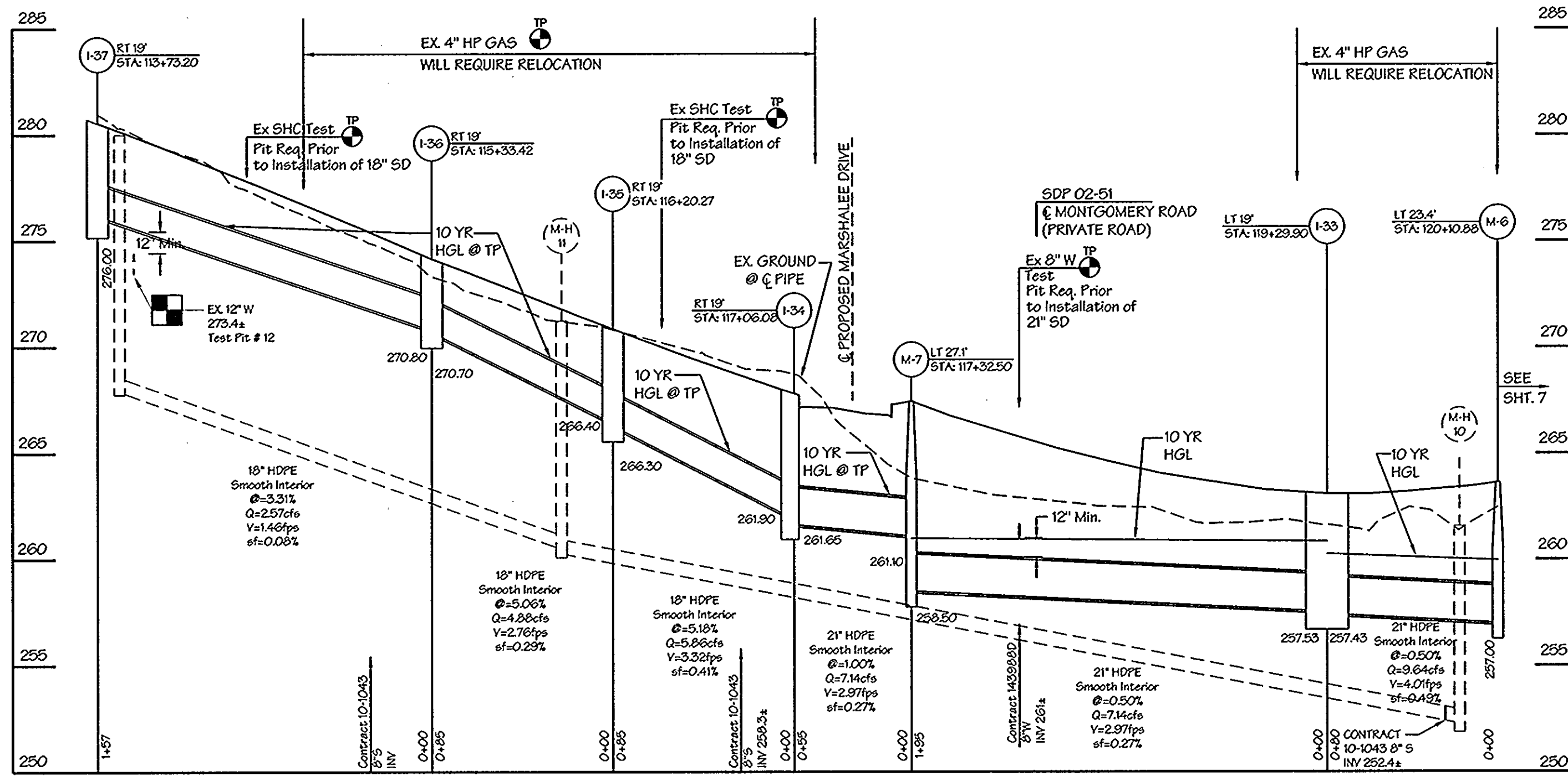
Storm Drain I-30 to I-24 toward Pond #3 F96-30 (Phase 3A)



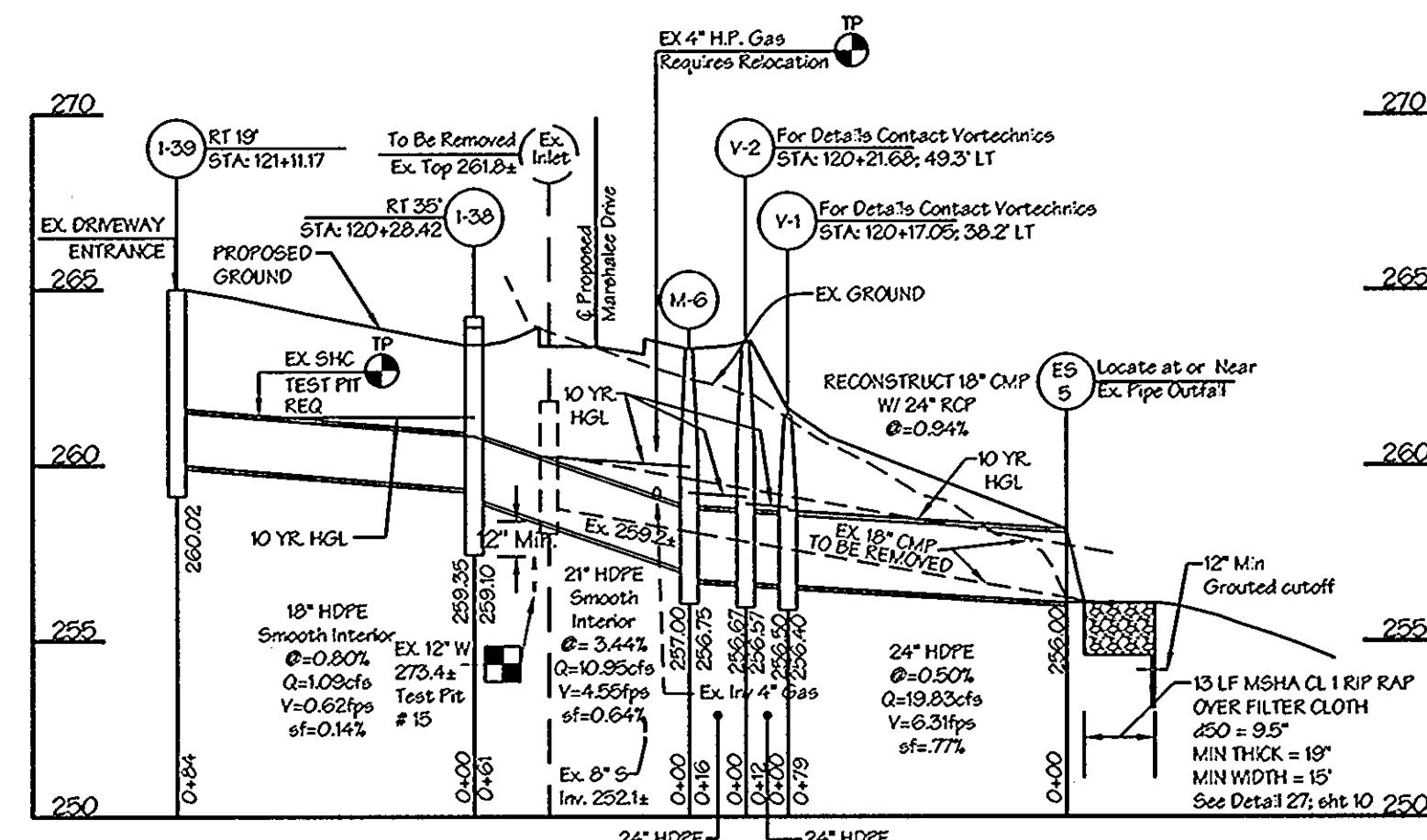
Storm Drain I-26 to M-3 toward Pond #3 F96-30 (Phase 3A)



Notes:
For Test Pit Locations, refer to Sheet 3



- Notes:
- Where test pits have been made on existing utilities, they are noted by the symbol at the location of the test pit (See Sheet 3). The table containing the results of the test pit or pits is included hereon.
 - Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the Contractor two weeks in advance of construction operations at his own expense. Proposed Test Pits are represented by the symbol.
 - LDE, Inc. shall be notified of all conflicts for possible redesign.



Size	Class	Total Length*
15"	HDPE Smooth Interior	47
18"	HDPE Smooth Interior	608
21"	HDPE Smooth Interior	391
24"	HDPE Smooth Interior	734

* The total length of pipe does not take into account the slope of the pipe. This total is for linear feet only.

Test Hole #	Survey	Ground Elevation	Field Measured	Top of Utility
1	Peg	301.41	3.21	298.20
2	Peg	288.86	2.57	286.29
3	Peg	295.39	3.66	291.74
4	Peg	283.69	3.67	280.02
5	P.K. Nail	262.09	3.28	258.81
6	P.K. Nail	263.02	3.58	259.44
7	"	301.12	4.20	296.92
8	"	300.41	4.32	296.09
9	P.K. Nail	289.64	4.02	285.62
10	"	284.12	4.59	279.54
11	P.K. Nail	281.36	4.41	276.95
12	P.K. Nail	278.69	4.25	274.44
13	Peg	284.62	3.91	280.71
14	P.K. Nail	261.38	3.81	257.57
15	P.K. Nail	261.30	3.82	257.48
16	Peg	288.29	3.76	284.53
17	Peg	288.76	0.91	287.85
18	Peg	289.93	6.09	283.84
19	Peg	289.99	1.19	288.79
20	Peg	287.50	3.51	283.99
21	Peg	287.50	1.59	285.91
22	Peg	287.66	3.53	284.13
23	Peg	287.74	4.66	283.08
24	Peg	287.79	1.12	286.67

Str. No.	Structure Type	Inv. In	Inv. Out	Top Elevation or Upper / Lower	Detail	Location	Remarks
I-24	COG-10	284.33 / 284.33	283.83	290.52 / 290.15	MD-374.51	11+23.75; 19' RT	
I-25	COG-5	284.60	284.59	289.50 / 289.40	MD-374.51	11+59.19; 19' LT	
I-26	COG-5	284.90	284.90	288.75 / 288.60	MD-374.51	11+59.46; 19' RT	
I-28	Yard Inlet	286.00	285.90	290.00	MD-381.02	12+81.90; 51.8' LT	
I-29	COG-10	286.58	286.33	291.65 / 291.50	MD-374.51	12+89.78; 24.09' LT	
I-30	COG-10	-	287.00	291.12 / 290.68	MD-374.51	12+86.76; 19' RT	
I-31	COG-10	-	282.00	300.90 / 300.18	MD-374.51	14+59.05; 42.5' RT	
I-32	Type "D"	290.66	290.58	300.33	MD-378.05	14+54.77; 19.3' LT	See Note 1 - throat Upblast Side Only
I-33	COG-20	257.53	257.43	262.98	MD-374.61	11+28.90; 19' LT	
I-34	COG-10	261.90	261.65	267.96 / 267.64	MD-374.51	11+28.08; 19' LT	
I-35	COG-10	266.40	266.30	270.91 / 270.47	MD-374.51	11+20.27; 19' RT	
I-36	COG-10	270.80	270.70	274.33 / 273.89	MD-374.51	11+35.42; 19' RT	
I-37	COG-10	-	278.00	280.74 / 280.30	MD-374.51	11+88.09; 21.0' RT	
I-38	Yard Inlet	259.35	259.10	263.50	MD-381.02	120+28.42; 35' RT	
I-39	Type "S"	-	260.02	265.00	MD-374.75	121+11.71; 19' RT	See Note 2
M-6	Manhole	257.00	256.75	256.30	MD-383.01	120+10.88; 23.4' LT	
M-7	Manhole	261.10	259.50	267.50	MD-383.01	117+32.50; 27.1' LT	
M-8	Manhole	273.48	273.38	281.80	MD-383.01	113+86.78; 34.5' LT	
M-9	Manhole	278.48	278.38	287.70	MD-383.01	112+52.20; 40.2' LT	
V-1	Junction Manhole	256.50	256.40	261.00	MD-383.01	120+21.68; 49.26' LT	See Sheet 18 / Vortechics
V-2	Bypass Manhole	256.67	256.57	264.00	MD-383.01	120+17.05; 3.8, 19' LT	See Sheet 18 / Vortechics
ES-4	HDPE End Section	272.00	274.00	-	-	114+16.51; 53.42' LT	Typical HDPE Flare End Section
ES-5	HDPE End Section	256.00	258.00	-	-	-	Typical HDPE Flare End Section

- Existing Offsite Drainage shall be channelled toward I-32 behind proposed curb & gutter
- Field Verify Existing Surface Elevation. Inlet grate top shall be at existing ground elevation 265.0 +/-

DEVELOPER CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT OR THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY.
[Signature] 5/9/06 DATE

ENGINEER'S CERTIFICATE
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[Signature] 5/9/06 DATE

DEPARTMENT OF PUBLIC WORKS

[Signature] 5/9/06 DATE
DIRECTOR OF PUBLIC WORKS

[Signature] 5/9/06 DATE
CHIEF, BUREAU OF ENGINEERING

[Signature] 5/9/06 DATE
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT

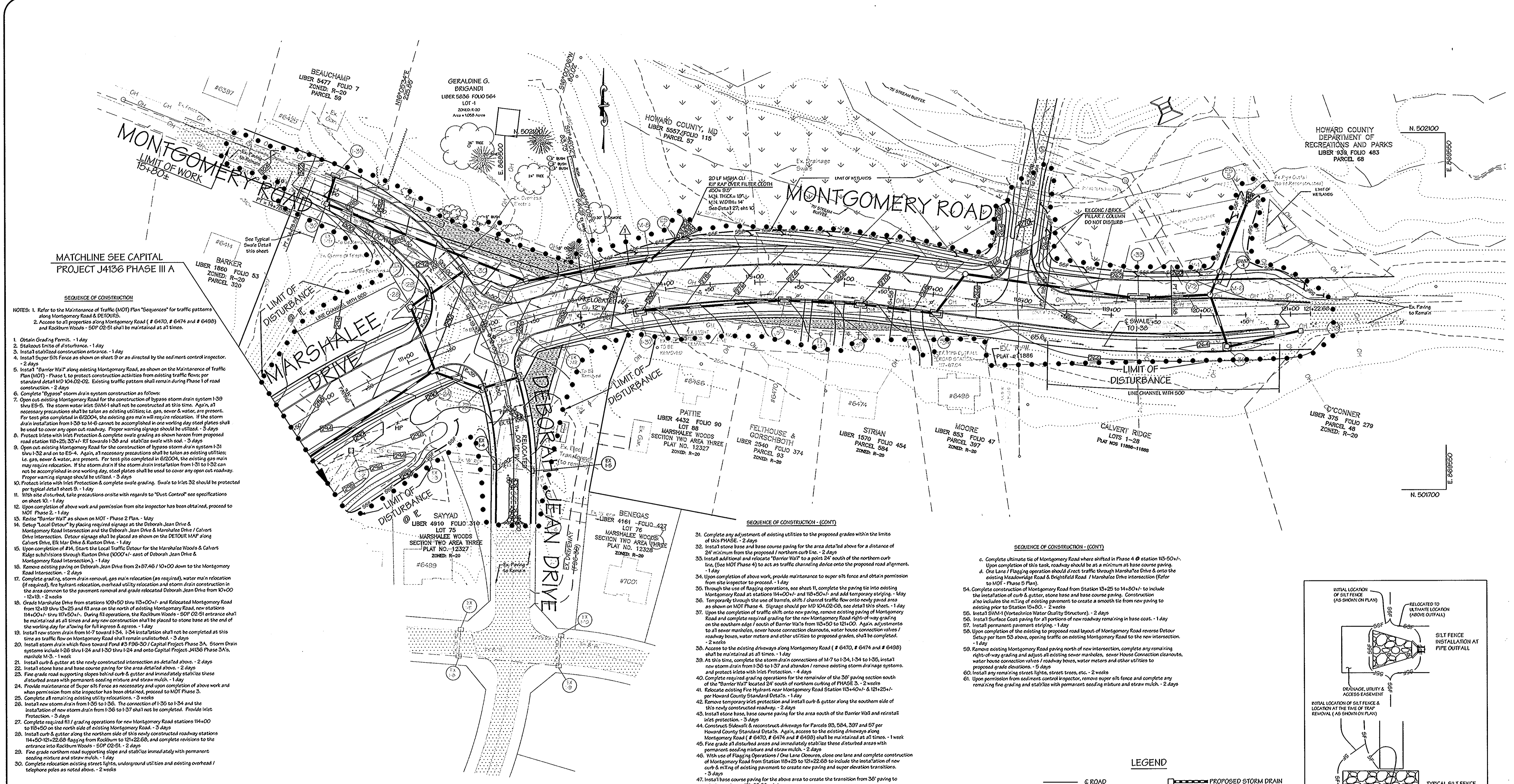
LDE Inc.
Engineers, Surveyors, Planners
9250 Runney Road, Suite 106 Columbia, Maryland - 21043
(410)715-1070 - (301)596-3424 - FAX(410)715-9540

DESIGNED E.D.S.
DRAWN L.D.E.
CHECKED B.D.B.
DATE LDE 6/2006
BY NO. REVISION REVISION DATE MAP NO. 37

Storm Drain Profiles
BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

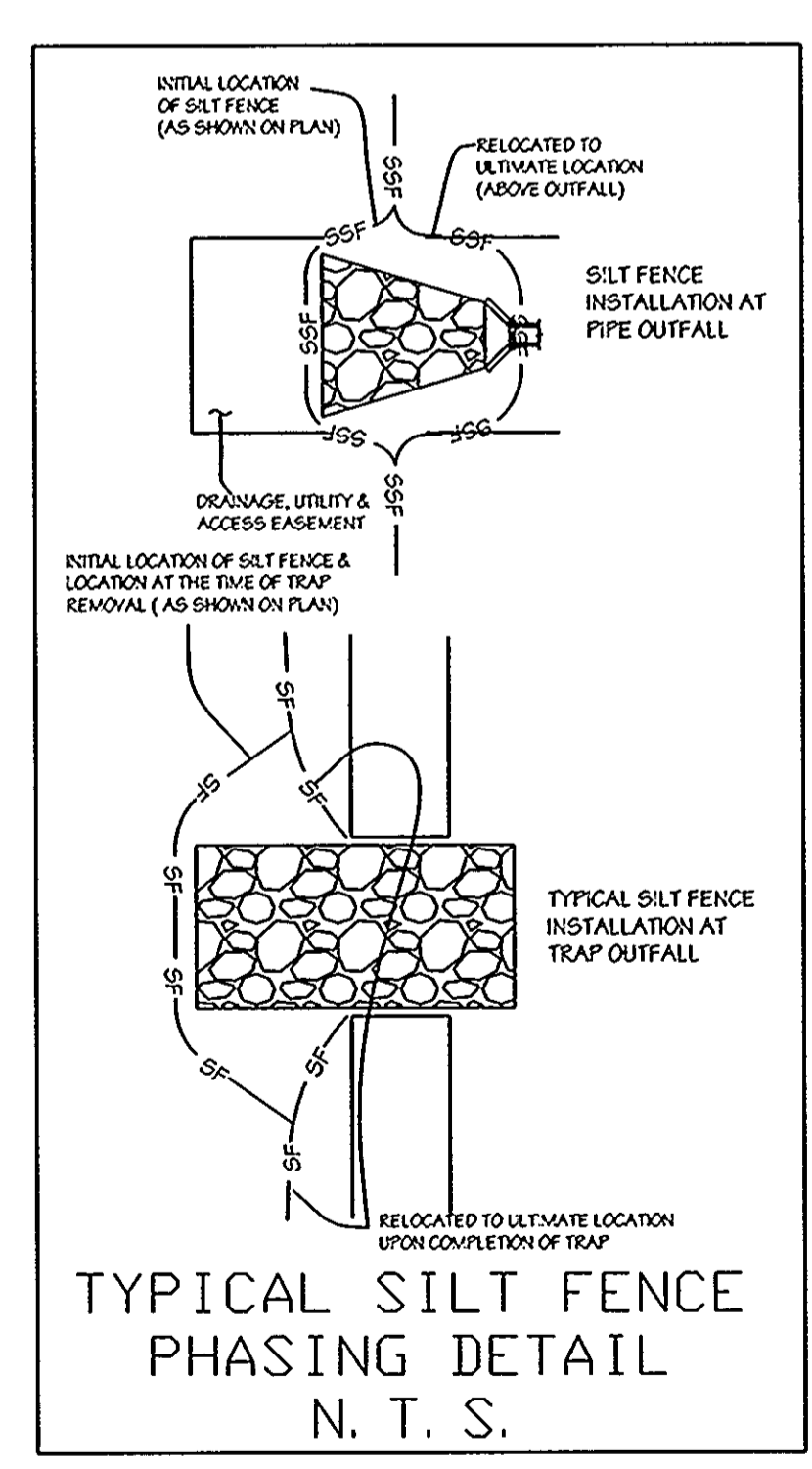
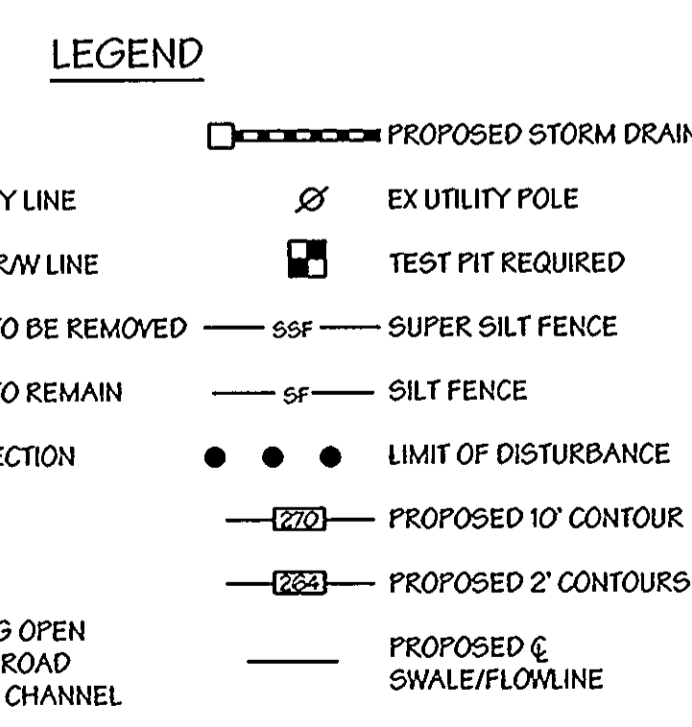
SCALE 1"=50'
SHEET 8 OF 18



- NOTES:** 1. Refer to the Maintenance of Traffic (MOT) Plan "Sequences" for traffic patterns along Montgomery Road & DETOURS.
2. Access to all properties along Montgomery Road (# 6470, # 6474 and # 6488) and Rockburn Woods - SDP 02-51 shall be maintained at all times.
1. Obtain Grading Permit. - 1 day
 2. Stakeout limits of disturbance. - 1 day
 3. Install established construction and safety signs, cones & water, are present. - 1 day
 4. Install Super Silt Fence as shown on sheets 9 or as directed by the sediment control inspector. - 2 days
 5. Install "Barrier Wall" along existing Montgomery Road, as shown on the Maintenance of Traffic Plan (MOT) - Phase 1 to protect construction activities existing traffic flows per standard detail MD 104.02-02. Existing traffic pattern shall remain during Phase 1 of road construction. - 2 days
 6. Complete "bypass" storm drain system construction as follows:
 7. Open up existing Montgomery Road for the construction of bypass storm drain system I-39 thru E5-5. The storm water inlet SWM-1 shall not be constructed at this time. Again, all necessary precautions shall be taken as existing utilities, gas, sewer & water, are present. For test pits completed in 6/20/04, the existing gas main will require relocation. If the storm drain installation from I-39 to M-6 cannot be accomplished in one working day steel plates shall be used to cover any open cut roadway. Proper warning signage should be utilized. - 3 days
 8. Protect inlets with Inlet Protection & complete swale grading as shown below from proposed road station 110+25.33' RT towards I-39 and establish swale with soil. - 3 days
 9. Open up existing Montgomery Road for the construction of bypass storm drain system I-31 thru I-32 and on to E5-5. Again, all necessary precautions shall be taken as existing utilities, i.e. gas, sewer & water, are present. For test pits completed in 6/20/04, the existing gas main may require relocation. If the storm drain in the storm drain installation from I-31 to I-32 can not be accomplished in one working day steel plates shall be used to cover any open cut roadway. Proper warning signage should be utilized. - 3 days
 10. Protect inlets with Inlet Protection & complete swale grading. Swale to Inlet 32 should be protected per typical detail sheet 5. - 1 day
 11. With site disturbed, take precautions on-site with regards to "Dust Control" see specifications on sheet 10. - 1 day
 12. Upon completion of above work and permission from site inspector has been obtained, proceed to MOT Phase 2. - 1 day
 13. Remove "Barrier Wall" as shown on MOT - Phase 2 Plan. - 1 day
 14. Set-up "Local Detour" by placing required signage at the Deborah Jean Drive & Marshalee Drive / Calvert Drive Intersection. Detour signage shall be placed as shown on the DETOUR MAP along Calvert Drive, Elk Mar Drive & Ruxton Drive. - 1 day
 15. Upon completion of #14, Start the Local Traffic Detour for the Marshalee Woods & Calvert Ridge subdivisions through Ruxton Drive (100' RT east of Deborah Jean Drive & Montgomery Road Intersection). - 1 day
 16. Remove existing paving on Deborah Jean Drive from 2+87.46 / 10+00 down to the Montgomery Road Intersection. - 2 days
 17. Complete grading, storm drain removal, gas main relocation (as required), water main relocation (if required), fire hydrant relocation, overhead utility relocation and storm drain construction in the area common to the pavement removal and grade relocated Deborah Jean Drive from 10+00 to 12+15. - 2 weeks
 18. Grade Marshalee Drive from stations 109+50 thru 113+00 RT and Relocate Montgomery Road from 12+19 thru 13+25 and RT area on the north of existing Montgomery Road, new stations 114+00 RT thru 117+50 RT. During fill operations, the Rockburn Woods - SDP 02-51 entrance shall be maintained at all times and any new construction shall be placed to stone base at the end of the working day for allowing for full ingress & egress. - 1 day
 19. Install new storm drain from 12+15 to 13+24. 13+24 installation shall not be completed at this time as traffic flow on Montgomery Road shall remain undisturbed. - 3 days
 20. Install storm drain which flows toward Pond # 3 F96-30 / Capital Project Phase 3A. Storm Drain systems include I-25 thru I-24 and I-30 thru I-24 and onto Capital Project J4136 Phase 3A, marshalee M-3. - 1 week
 21. Install curb & gutter at the newly constructed intersection as detailed above. - 2 days
 22. Install stone base and base course paving for the area detailed above. - 2 days
 23. Fine grade road supporting slopes behind curb & gutter and immediately stabilize these disturbed areas with permanent seeding mixture and straw mulch. - 1 day
 24. Provide maintenance of Super silt Fence as necessary and upon completion of above work and when permission from site inspector has been obtained, proceed to MOT Phase 3. - 3 days
 25. Complete all remaining existing utility relocations. - 3 weeks
 26. Install new storm drain from I-35 to I-36. The connection of I-35 to I-34 and the installation of new storm drain from I-36 to I-37 shall not be completed. Provide Inlet Protection. - 3 days
 27. Complete required fill / grading operations for new Montgomery Road stations 114+00 to 118+50 on the north side of existing Montgomery Road. - 3 days
 28. Install curb & gutter along the northern side of the newly constructed roadway stations 114+50 thru 121+22.68 flagging from Rockburn to 121+22.68, and complete revisions to the entrance into Rockburn Woods - SDP 02-51. - 2 days
 29. Fine grade northern road supporting slope and stabilize immediately with permanent seeding mixture and straw mulch. - 1 day
 30. Complete relocation existing street lights, underground utilities and existing overhead / telephone poles as noted above. - 2 weeks

- SEQUENCE OF CONSTRUCTION - (CONT)**
31. Complete any adjustment of existing utilities to the proposed grades within the limits of this PHASE. - 2 days
 32. Install stone base and base course paving for the area detailed above for a distance of 24' minimum from the proposed northern curb line. - 2 days
 33. Install additional and relocate "Barrier Wall" to a point 24' south of the northern curb line. (See MOT Phase 4) to act as traffic channeling device onto the proposed road alignment. - 1 day
 34. Upon completion of above work, provide maintenance to super silt fence and obtain permission from site inspector to proceed. - 1 day
 35. Through the use of flagging operations, see sheet 11, complete the paving tie into existing Montgomery Road at stations 114+00 RT and 118+50 RT and add temporary striping. - 1 day
 36. Temporarily through the use of barriers, shift / channel traffic flow onto newly paved area as shown on MOT Phase 4. Signage should per MD 104.02-02, see detail 10a sheet. - 1 day
 37. Upon the completion of traffic shifts onto new paving, remove existing paving of Montgomery Road and complete required grading for the new Montgomery Road right-of-way grading on the southern edge / south of Deborah Jean Drive from 114+00 to 121+00. Again, adjustments to all sewer manholes, sewer house connection cleanouts, water house connection valves / roadway boxes, water meters and other utilities to proposed grades, shall be completed. - 2 weeks
 38. Access to the existing driveways along Montgomery Road (# 6470, # 6474 and # 6488) shall be maintained at all times. - 1 day
 39. At this time, complete the storm drain connections of M-7 to I-34, I-34 to I-35, install new storm drain from I-36 to I-37 and abandon / remove existing storm drainage systems, and protect inlets with Inlet Protection. - 4 days
 40. Complete required grading operations for the remainder of the 36' paving section south of the "Barrier Wall" located 24' south of northern curbing of PHASE 3. - 2 weeks
 41. Relocate existing Fire Hydrant near Montgomery Road Station 113+40 RT & 121+25 RT per Howard County Standard Data. - 1 day
 42. Remove temporary inlet protection and install curb & gutter along the southern side of this newly constructed roadway. - 2 days
 43. Install stone base, base course paving for the area south of the Barrier Wall and reestablish inlet protection. - 3 days
 44. Construct Sidewalk & reconstruct Driveways for Parcels 83, 584, 397 and 57 per Howard County Standard Data. Again, access to the existing driveways along Montgomery Road (# 6470, # 6474 and # 6488) shall be maintained at all times. - 1 week
 45. Fine grade all disturbed areas and immediately stabilize these disturbed areas with permanent seeding mixture and straw mulch. - 2 days
 46. With use of Flagging Operations / One Lane Closures, close one lane and complete construction of Montgomery Road from Station 118+25 to 121+22.68 to include the installation of new curb & mitering of existing pavement to create new paving and super elevation transitions. - 3 days
 47. Install base course paving for the above area to create the transition from 36' paving to existing paving at 121+22.68. - 1 day
 48. Install Surface Coat paving for all portions of new roadway currently in base coat. - 1 day
 49. Install temporary pavement striping with 30' Paving from 113+00 to 121+22.68. - 1 day
 50. Traffic Patterns shall remain shifted onto existing Montgomery Road at Station 113+50 until all phases of Capital Project J4136 Marshalee Drive is completed from Meadowlands (the 100' to new intersection at Deborah Jean (See Phase 5 Detour Map)).
 51. Upon complete setup of Detour signage and during off peak or night time only using one lane construction / flagging operations proceed as follows simultaneously. - 1 day
 - a. Detour traffic at Shady Oak Lane / Marshalee Drive and Montgomery Road Intersection thru Marshalee Drive and Close Montgomery Road 1200' east of Parkview Court. (Refer to MOT - Phase 5 Plan)
 - b. Remove the covering of the detour signage and remove the Road Closure Signage at the Deborah Jean Drive / Calvert Drive Intersection and Block / Close Montgomery Road at northwestern point of the proposed intersection.

- SEQUENCE OF CONSTRUCTION - (CONT)**
- a. Complete ultimate tie of Montgomery Road where shifted in Phase 4 @ station 113+50 RT. Upon completion of this task, roadway should be at a minimum at base course paving.
 - a. One Lane / Flagging operation should direct traffic through Marshalee Drive & onto the existing Meadowlands Road & Brightfield Road / Marshalee Drive Intersection (Refer to MOT - Phase 5 Plan)
54. Complete construction of Montgomery Road from Station 13+25 to 14+50 RT to include the installation of curb & gutter, stone base and base course paving. Construction also includes the mitering of existing pavement to create a smooth tie from new paving to existing prior to Station 15+00. - 2 weeks
 55. Install SWM-1 (Vortices Water Quality Structure). - 2 days
 56. Install Surface Coat paving for all portions of new roadway remaining in base coat. - 1 day
 57. Install permanent pavement striping. - 1 day
 58. Upon completion of the existing to proposed road layout of Montgomery Road reverse Detour Setup per Item 50 above, opening traffic on existing Montgomery Road to the new intersection. - 2 days
 59. Remove existing Montgomery Road paving north of new intersection, complete any remaining right-of-way grading and adjust all existing sewer manholes, sewer house connection cleanouts, water house connection valves / roadway boxes, water meters and other utilities to proposed grade elevations. - 3 days
 60. Install any remaining street lights, street trees, etc. - 2 weeks
 61. Upon permission from sediment control inspector, remove super silt fence and complete any remaining fine grading and stabilize with permanent seeding mixture and straw mulch. - 2 days



NOTES: 1) REMOVE ALL EXISTING STORM DRAINS.
2) PROVIDE TRIANGULAR CHANNEL TO CONVEY EXISTING OPEN SECTION ROADWAY CHANNEL FROM MONTGOMERY ROAD STATION 14+85± TOWARD PROPOSED INLET 32, LINE CHANNEL W/ MSHA CL 1 RIP-RAP. SEE DETAIL THIS SHEET.

DEVELOPER CERTIFICATE

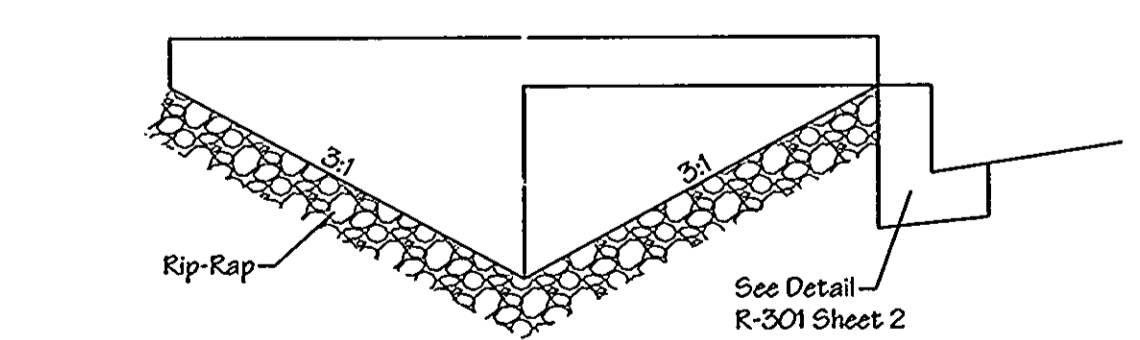
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Signature 8/9/06 DATE

ENGINEER'S CERTIFICATE

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Signature 8/9/06 DATE



10 Yr Flow Depth = 7'1
10 Yr Q = 9.79 cfs
10 Yr V = 6.49 fps

Typical Swale from Montgomery Road Sta. 14+85± Toward Inlet 32

DEPARTMENT OF PUBLIC WORKS

Signature 8/9/06 DATE
DIRECTOR OF PUBLIC WORKS

Signature 8/9/06 DATE
CHIEF, BUREAU OF ENGINEERING

Signature 8/9/06 DATE
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT

LDE Inc.
Engineers, Surveyors, Planners
9250 Runney Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX (410)715-9540

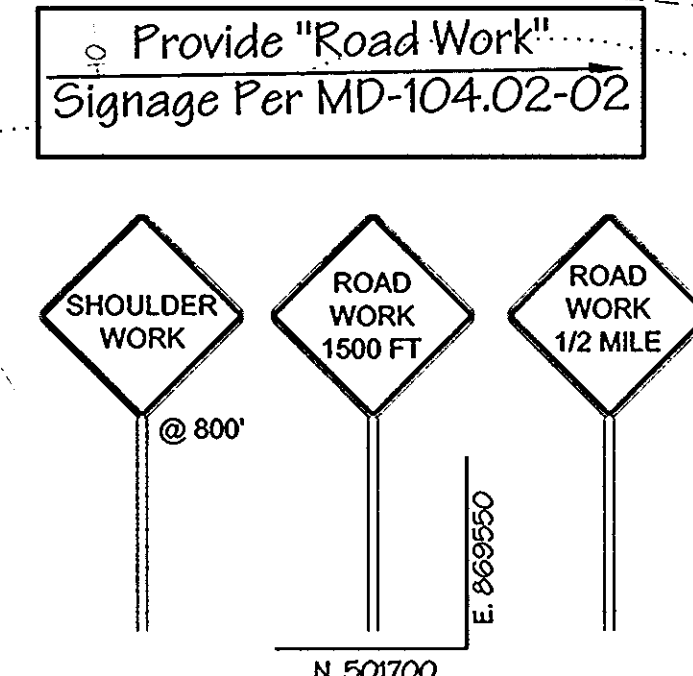
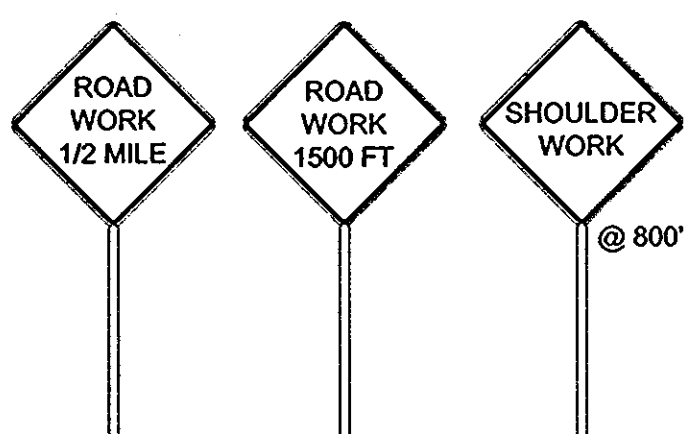
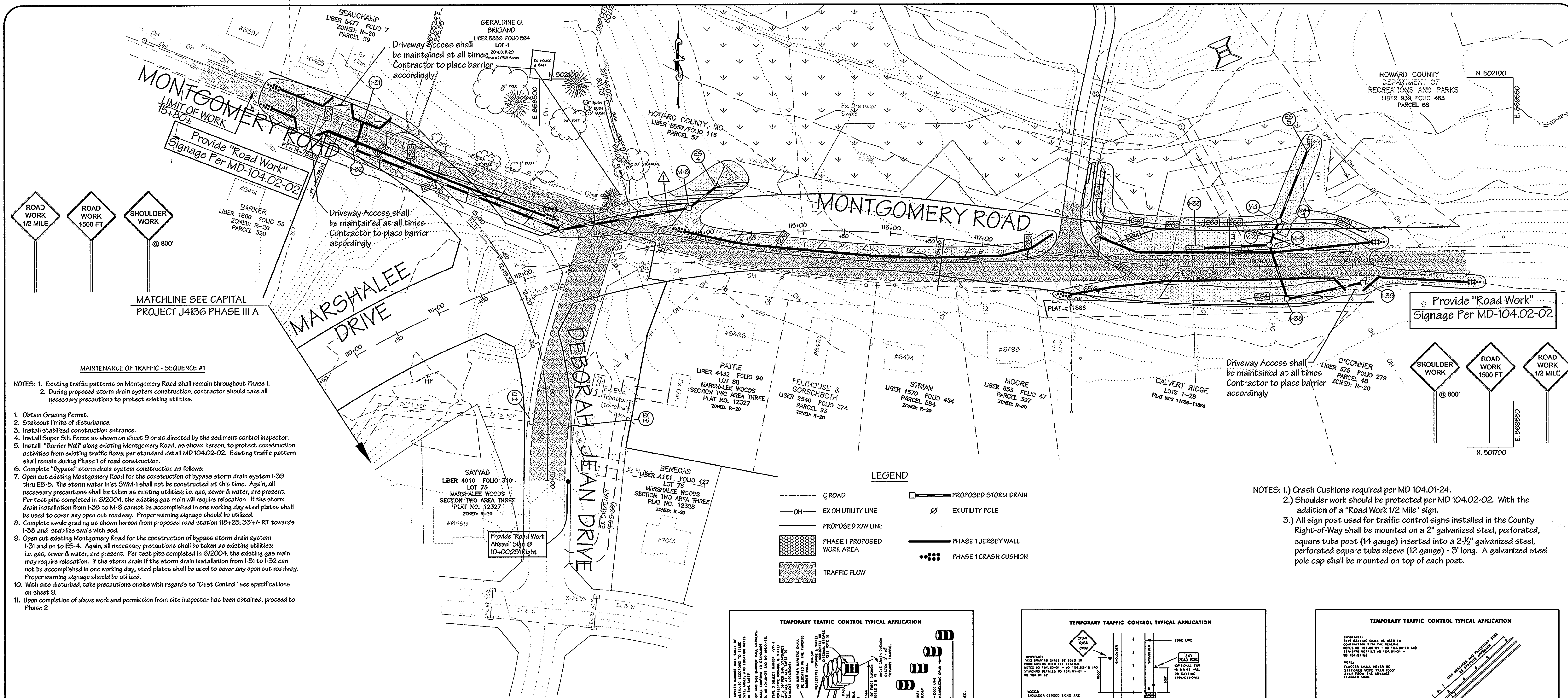
DESIGNED E.D.S.	DRAIN L.D.E.	CHECKED D.B.B.	DATE 2/20/05
LDE	REVISE BYPASS STORM DRAIN		6/2006
BY NO.	REVISION		DATE

Grading and Soil Erosion & Sediment Control Plan
MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE: 1"=50'
SHEET: 9 of 13

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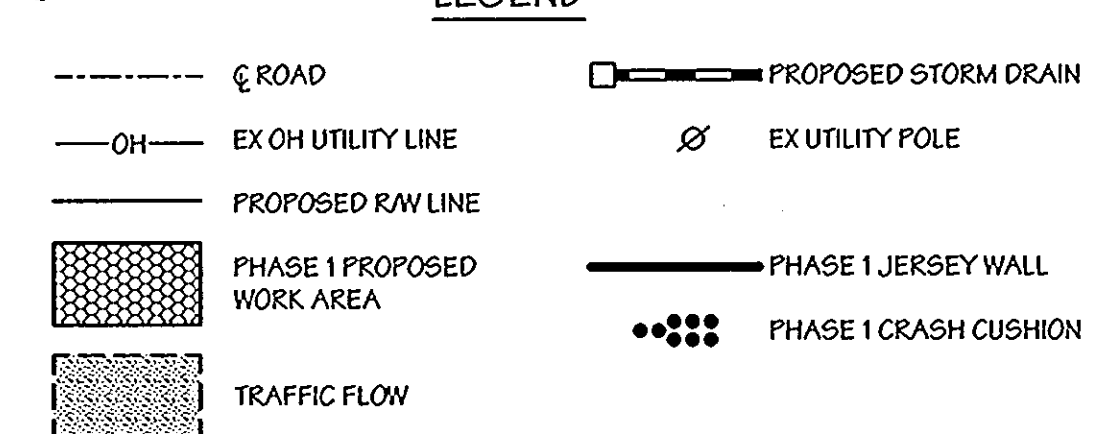


MAINTENANCE OF TRAFFIC - SEQUENCE #1

NOTES: 1. Existing traffic patterns on Montgomery Road shall remain throughout Phase 1.
2. During proposed storm drain system construction, contractor should take all necessary precautions to protect existing utilities.

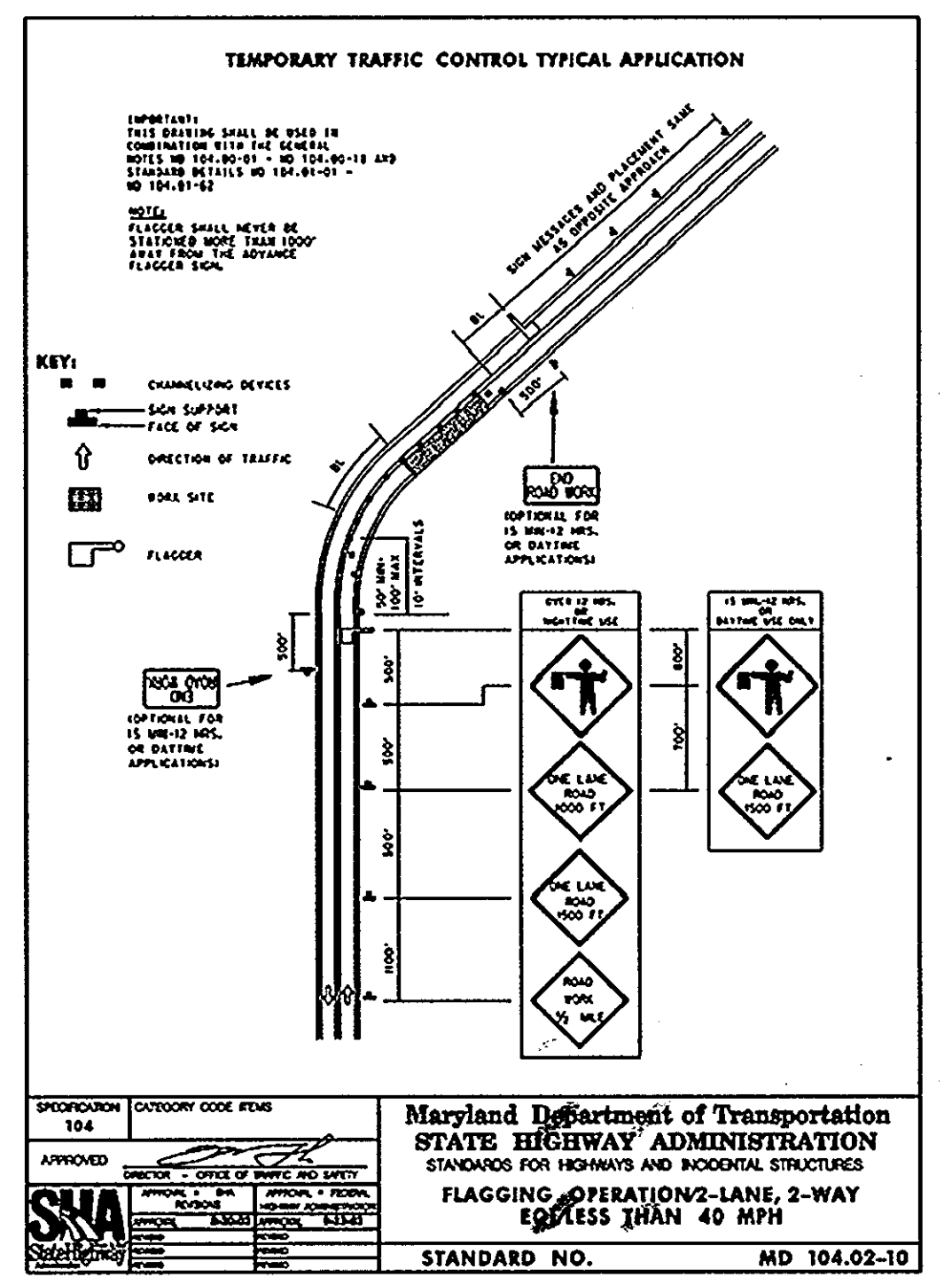
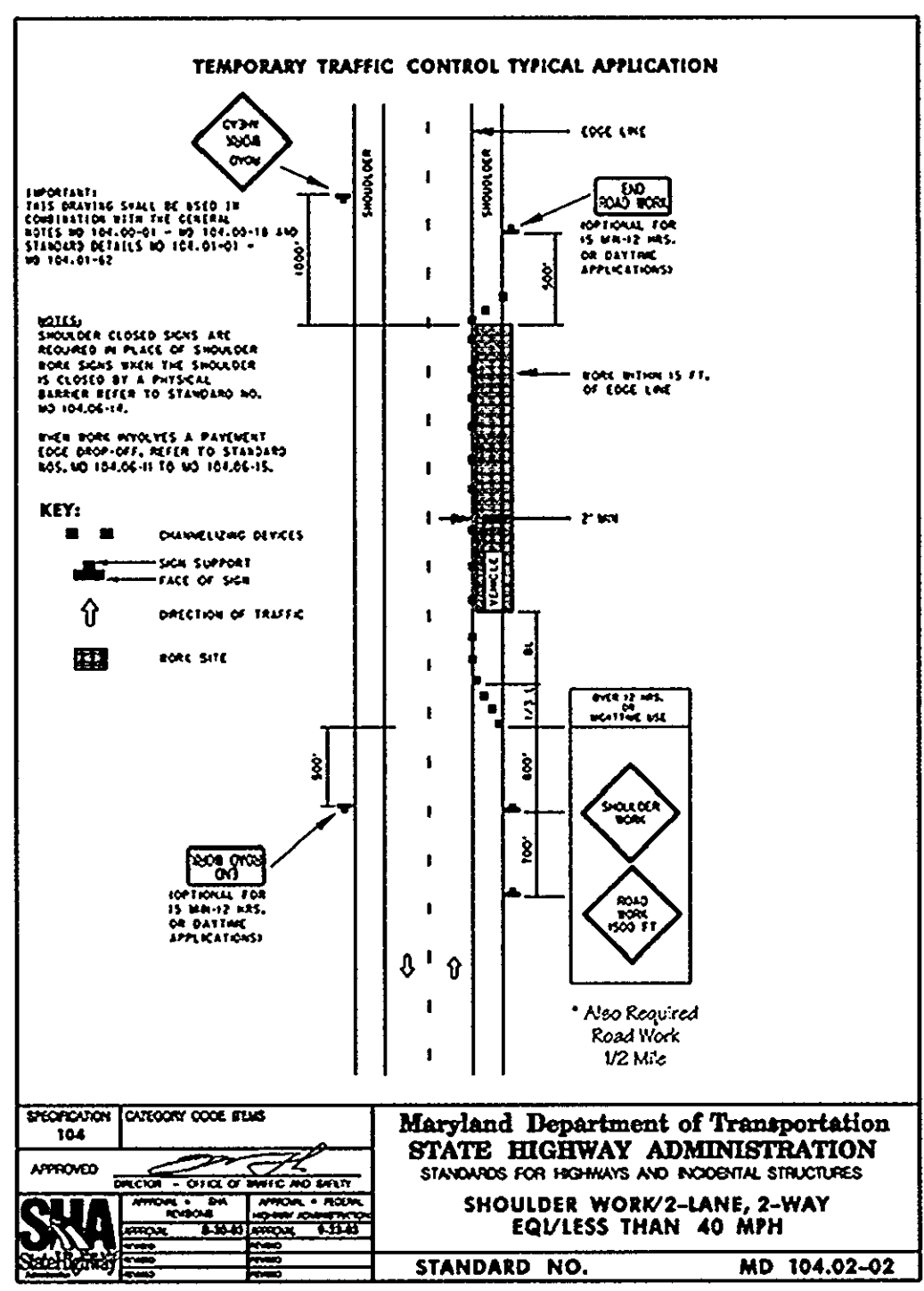
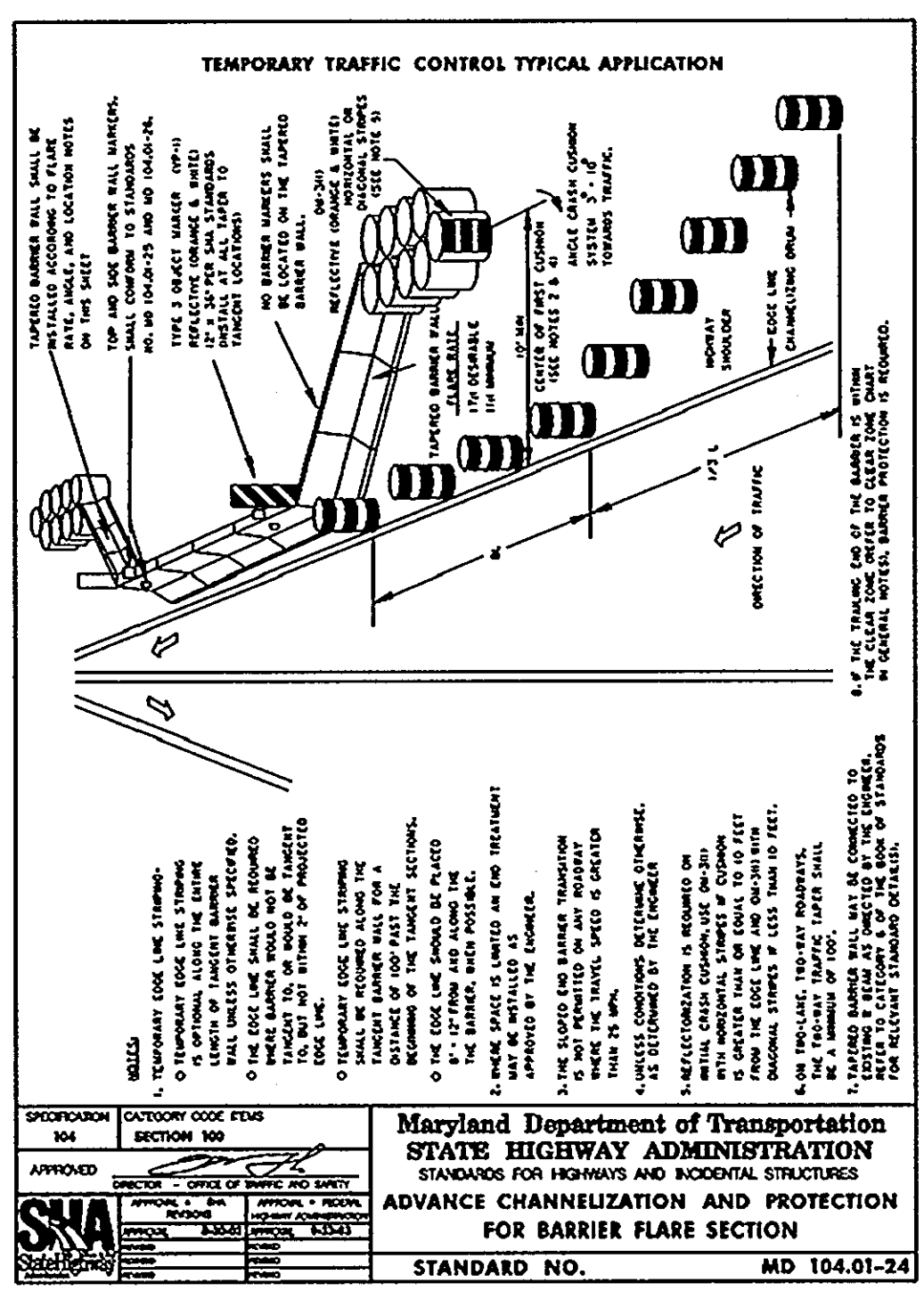
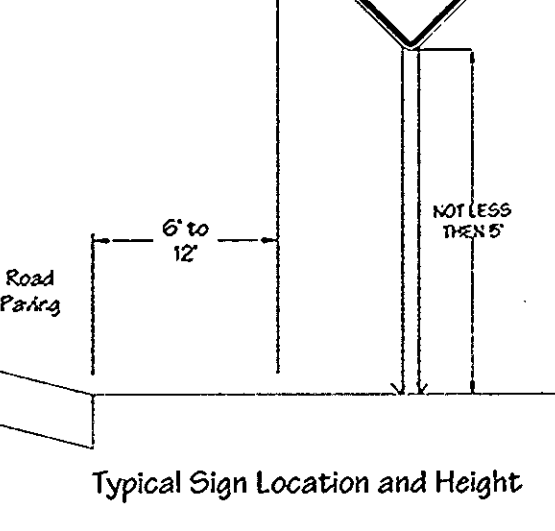
- Obtain Grading Permit.
- Stakeout limits of disturbance.
- Install stabilized construction entrance.
- Install Super Silt Fence as shown on sheet 9 or as directed by the sediment control inspector.
- Install "Barrier Wall" along existing Montgomery Road, as shown hereon, to protect construction activities from existing traffic flows; per standard detail MD 104.02-02. Existing traffic pattern shall remain during Phase 1 of road construction.
- Complete "Bypass" storm drain system construction as follows:
- Open cut existing Montgomery Road for the construction of bypass storm drain system I-39 thru ES-5. The storm water inlet SWM-1 shall not be constructed at this time. Again, all necessary precautions shall be taken as existing utilities; i.e. gas, sewer & water, are present. Per test pits completed in 6/2004, the existing gas main will require relocation. If the storm drain installation from I-39 to M-6 cannot be accomplished in one working day steel plates shall be used to cover any open cut roadway. Proper warning signage should be utilized.
- Complete swale grading as shown hereon from proposed road station 110+25; 33'+/- RT towards I-39 and stabilize swale with sod.
- Open cut existing Montgomery Road for the construction of bypass storm drain system I-31 and on to ES-4. Again, all necessary precautions shall be taken as existing utilities; i.e. gas, sewer & water, are present. Per test pits completed in 6/2004, the existing gas main may require relocation. If the storm drain if the storm drain installation from I-31 to I-32 can not be accomplished in one working day, steel plates shall be used to cover any open cut roadway. Proper warning signage should be utilized.
- With site disturbed, take precautions onsite with regards to "Dust Control" see specifications on sheet 9.
- Upon completion of above work and permission from site inspector has been obtained, proceed to Phase 2

LEGEND



- NOTES: 1.) Crash Cushions required per MD 104.01-24.
2.) Shoulder work should be protected per MD 104.02-02. With the addition of a "Road Work 1/2 Mile" sign.
3.) All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.

NOTE:
Contractor shall install Barrier / Jersey wall end treatments & flare rates at all private driveways and truck entrances / exits in accordance with MD 104.01-24.



DEPARTMENT OF PUBLIC WORKS

slabe 8/2/06
DIRECTOR OF PUBLIC WORKS DATE

slabe 8/9/06
CHIEF, BUREAU OF HIGHWAYS DATE

slabe 8/9/06
CHIEF, BUREAU OF ENGINEERING DATE

slabe 8/9/06
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
Engineers, Surveyors, Planners

9250 Ramsey Road, Suite 106 Columbia, Maryland - 21045
(410)715-1070 - (301)596-3424 - FAX (410)715-9540

DESIGNED	E.D.S.		
DRAWN	L.D.E.		
CHECKED	B.D.B.		
DATE	LDE	REVISE BYPASS STORM DRAIN	6/2006
	BY NO.	REVISION	DATE

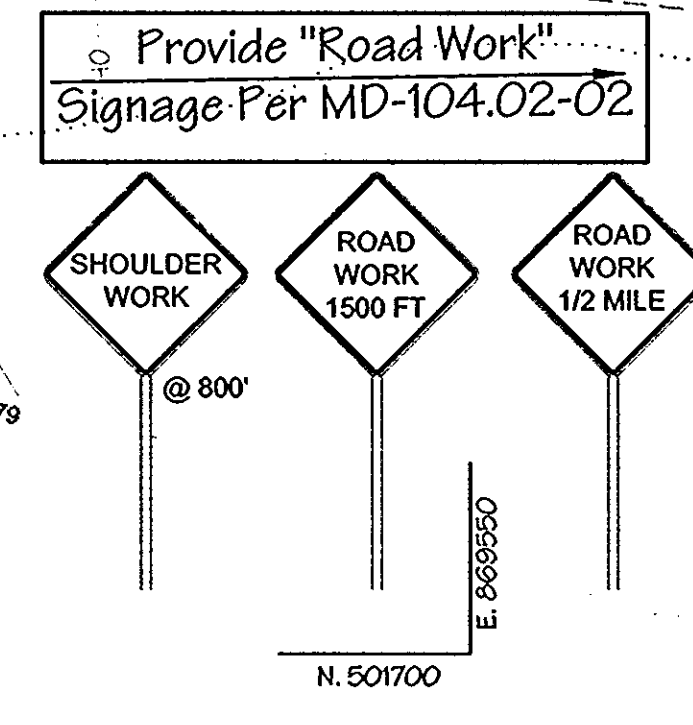
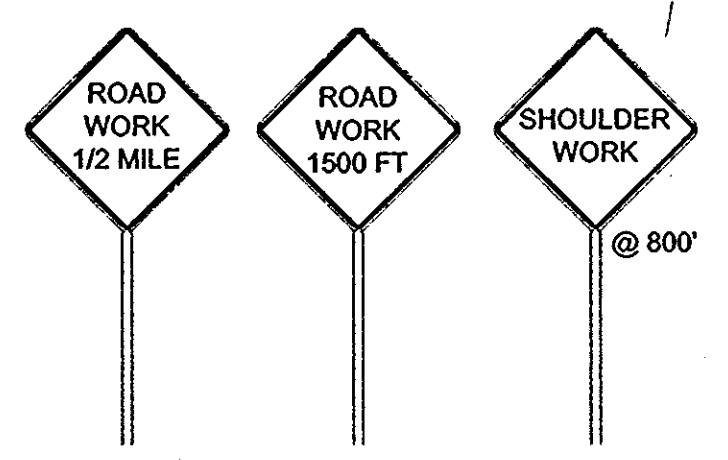
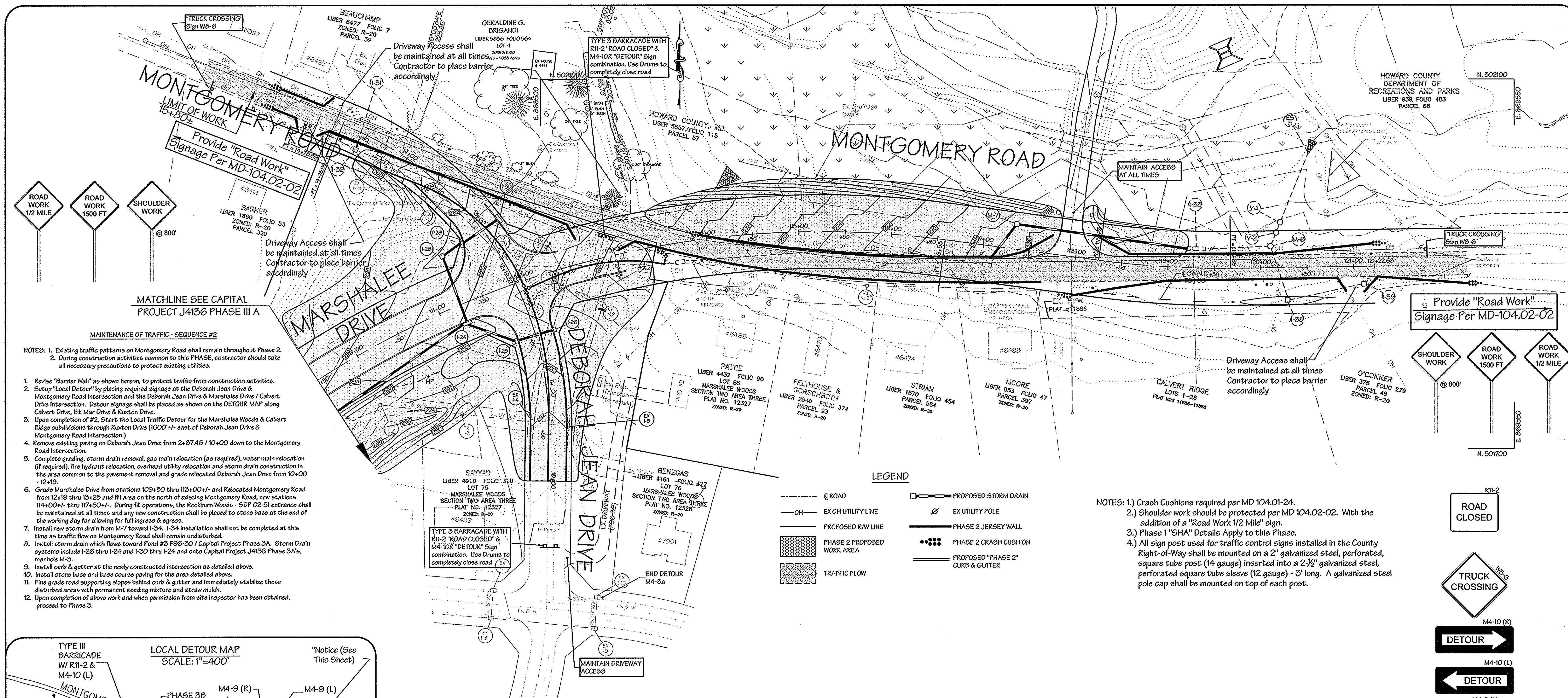
Maintenance of Traffic Plan
PHASE 1

MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

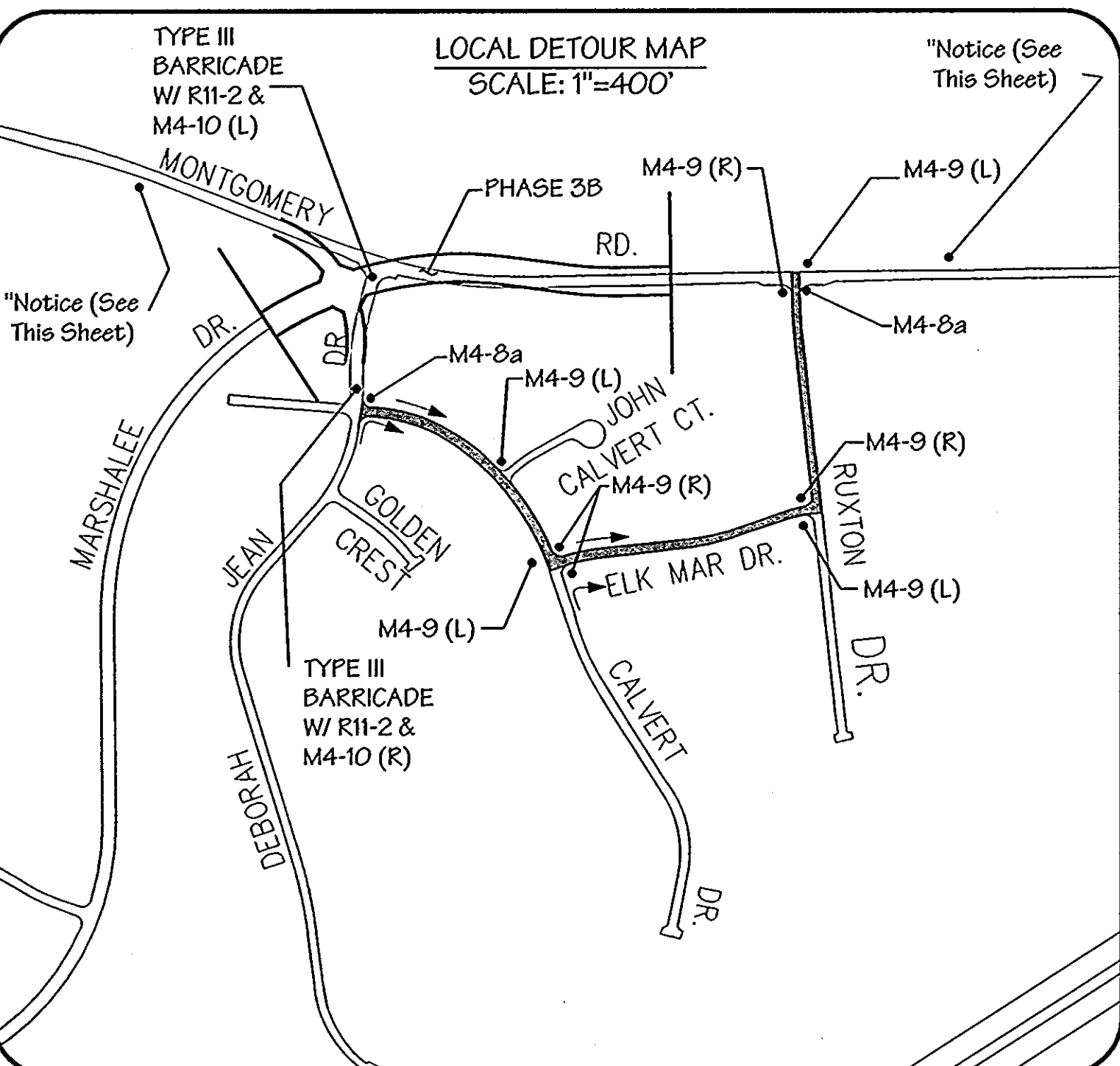
SCALE
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SHEET
11 of 18

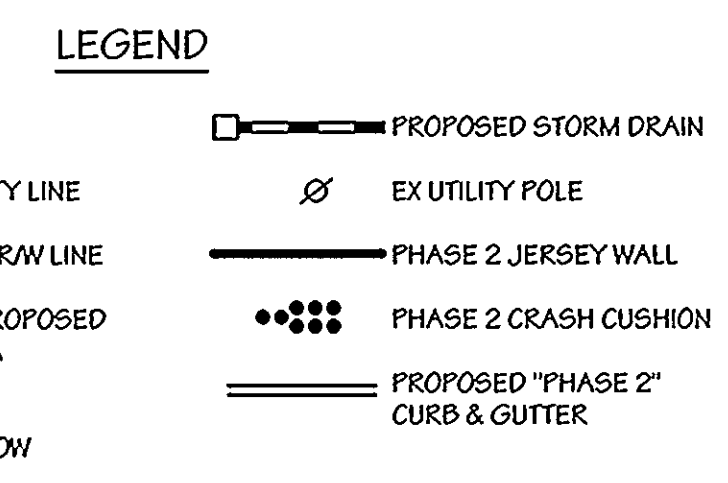


MATCHLINE SEE CAPITAL PROJECT J4136 PHASE III A

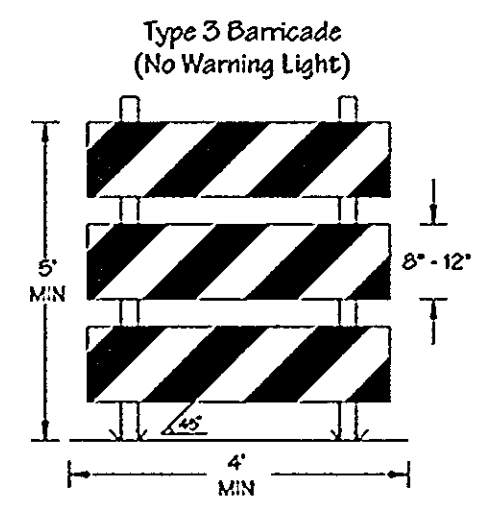
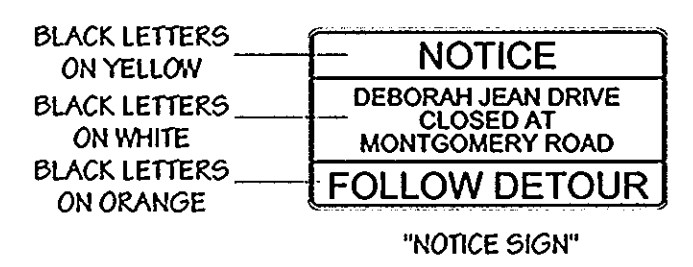
- MAINTENANCE OF TRAFFIC - SEQUENCE #2**
- NOTES: 1. Existing traffic patterns on Montgomery Road shall remain throughout Phase 2.
 2. During construction activities common to this PHASE, contractor should take all necessary precautions to protect existing utilities.
1. Revise "Barrier Wall" as shown hereon, to protect traffic from construction activities.
 2. Setup "Local Detour" by placing required signage at the Deborah Jean Drive & Montgomery Road Intersection and the Deborah Jean Drive & Marshalee Drive / Calvert Drive Intersection. Detour signage shall be placed as shown on the DETOUR MAP along Calvert Drive, Elk Mar Drive & Ruxton Drive.
 3. Upon completion of #2, Start the Local Traffic Detour for the Marshalee Woods & Calvert Ridge subdivisions through Ruxton Drive (1000'+/- east of Deborah Jean Drive & Montgomery Road Intersection.)
 4. Remove existing paving on Deborah Jean Drive from 2+87.46 / 10+00 down to the Montgomery Road Intersection.
 5. Complete grading, storm drain removal, gas main relocation (as required), water main relocation (if required), fire hydrant relocation, overhead utility relocation and storm drain construction in the area common to the pavement removal and grade relocated Deborah Jean Drive from 10+00 - 12+19.
 6. Grade Marshalee Drive from stations 109+50 thru 113+00+/- and Relocated Montgomery Road from 12+19 thru 13+25 and fill area on the north of existing Montgomery Road, new stations 114+00+/- thru 117+50+/- . During fill operations, the Rockburn Woods - SDF 02-51 entrance shall be maintained at all times and any new construction shall be placed to stone base at the end of the working day for allowing for full ingress & egress.
 7. Install new storm drain from M-7 toward I-34. I-34 installation shall not be completed at this time as traffic flow on Montgomery Road shall remain undisturbed.
 8. Install storm drain which flows toward Pond #3 F96-30 / Capital Project Phase 3A. Storm Drain systems include I-26 thru I-24 and I-30 thru I-24 and onto Capital Project J4136 Phase 3A's, manhole M-3.
 9. Install curb & gutter at the newly constructed intersection as detailed above.
 10. Install stone base and base course paving for the area detailed above.
 11. Fine grade road supporting slopes behind curb & gutter and immediately stabilize these disturbed areas with permanent seeding mixture and straw mulch.
 12. Upon completion of above work and when permission from site inspector has been obtained, proceed to Phase 3.



NOTE: Contractor shall install Barrier / Jersey wall end treatments & flare ways at all private driveways and truck entrances / exits in accordance with MD 104.01-24.



- NOTES: 1.) Crash Cushions required per MD 104.01-24.
 2.) Shoulder work should be protected per MD 104.02-02. With the addition of a "Road Work 1/2 Mile" sign.
 3.) Phase 1 "SHA" Details Apply to this Phase.
 4.) All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.



DEPARTMENT OF PUBLIC WORKS

John M. ... 8/9/06
 DIRECTOR OF PUBLIC WORKS DATE

Walter ... 8/9/06
 CHIEF, BUREAU OF HIGHWAYS DATE

... 8/9/06
 CHIEF, BUREAU OF ENGINEERING DATE

... 8/9/06
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

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 Engineers, Surveyors, Planners
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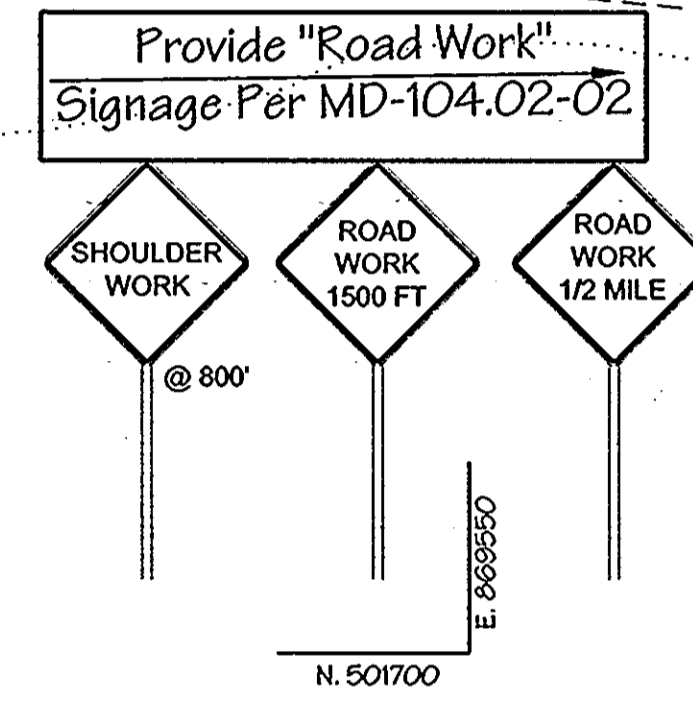
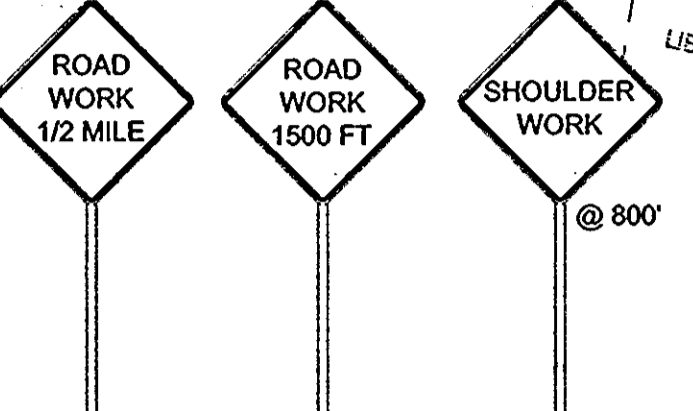
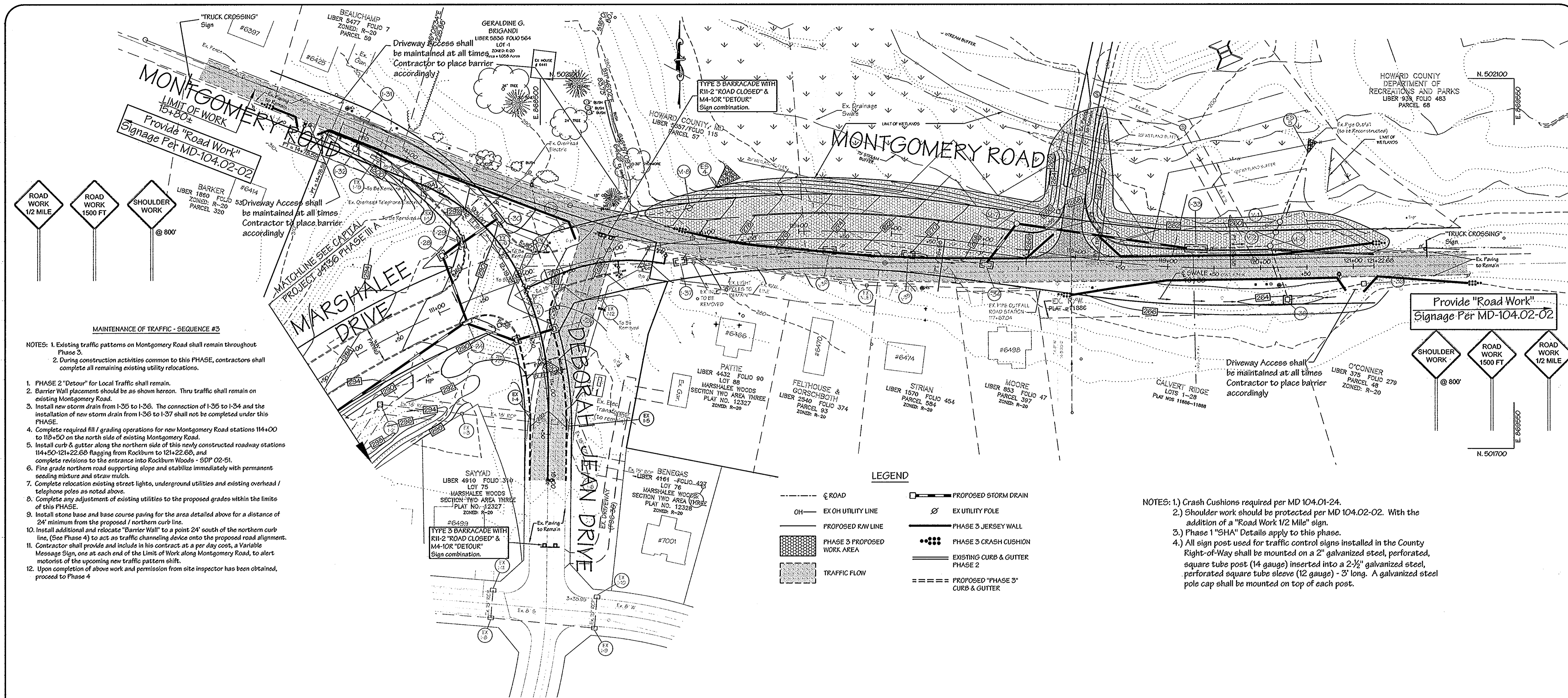
DESIGNED	E.D.S.		
DRAWN	L.D.E.		
CHECKED	B.D.B.		
DATE	LDE	REVISE BYPASS STORM DRAIN	6/2006
	BY	NO.	REVISION
			DATE

Maintenance of Traffic Plan
 PHASE 2
 MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
 1"=50'
 SHEET
 12 of 18

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MAINTENANCE OF TRAFFIC - SEQUENCE #3

- NOTES: 1. Existing traffic patterns on Montgomery Road shall remain throughout Phase 3.
 2. During construction activities common to this PHASE, contractors shall complete all remaining existing utility relocations.
1. PHASE 2 "Detour" for Local Traffic shall remain.
 2. Barrier Wall placements should be as shown hereon. Thru traffic shall remain on existing Montgomery Road.
 3. Install new storm drain from 1-35 to 1-36. The connection of 1-35 to 1-34 and the installation of new storm drain from 1-36 to 1-37 shall not be completed under this PHASE.
 4. Complete required fill / grading operations for new Montgomery Road stations 114+00 to 118+50 on the north side of existing Montgomery Road.
 5. Install curb & gutter along the northern side of this newly constructed roadway stations 114+50-121+22.68 flagging from Rockburn to 121+22.68, and complete revisions to the entrance into Rockburn Woods - SDP 02-51.
 6. Fine grade northern road supporting slope and stabilize immediately with permanent seeding mixture and straw mulch.
 7. Complete relocation existing street lights, underground utilities and existing overhead / telephone poles as noted above.
 8. Complete any adjustment of existing utilities to the proposed grades within the limits of this PHASE.
 9. Install stone base and base course paving for the area detailed above for a distance of 24' minimum from the proposed / northern curb line.
 10. Install additional and relocate "Barrier Wall" to a point 24' south of the northern curb line. (See Phase 4) to act as traffic channeling device onto the proposed road alignment.
 11. Contractor shall provide and include in his contract at a per day cost, a Variable Message Sign, one at each end of the Limit of Work along Montgomery Road, to alert motorists of the upcoming new traffic pattern shift.
 12. Upon completion of above work and permission from site inspector has been obtained, proceed to Phase 4.

- NOTES: 1.) Crash Cushions required per MD 104.01-24.
 2.) Shoulder work should be protected per MD 104.02-02. With the addition of a "Road Work 1/2 Mile" sign.
 3.) Phase 1 "SHA" Details apply to this phase.
 4.) All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.

NOTE:
 Contractor shall install Barrier / Jersey wall end treatments & flare rates at all private driveways and truck entrances / exits in accordance with MD 104.01-24.

DEPARTMENT OF PUBLIC WORKS

[Signature] 8/9/06
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8/9/06
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/9/06
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045
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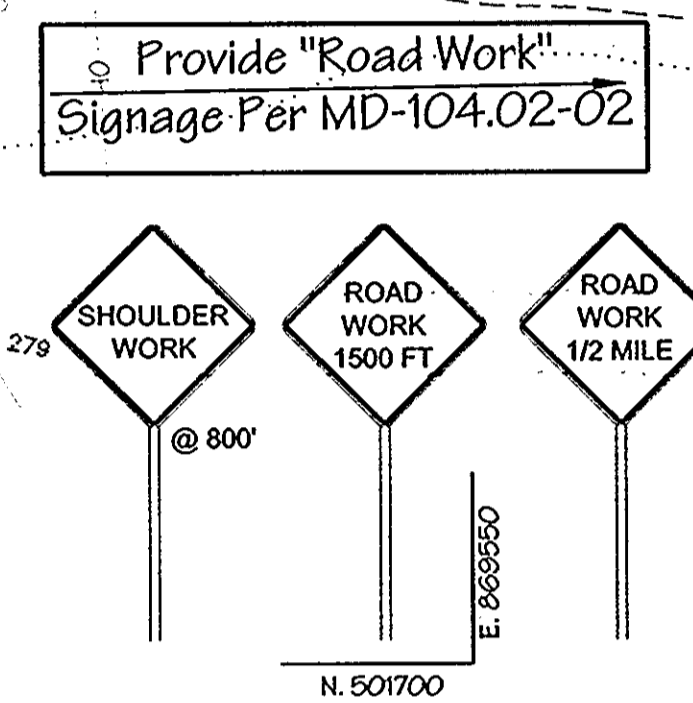
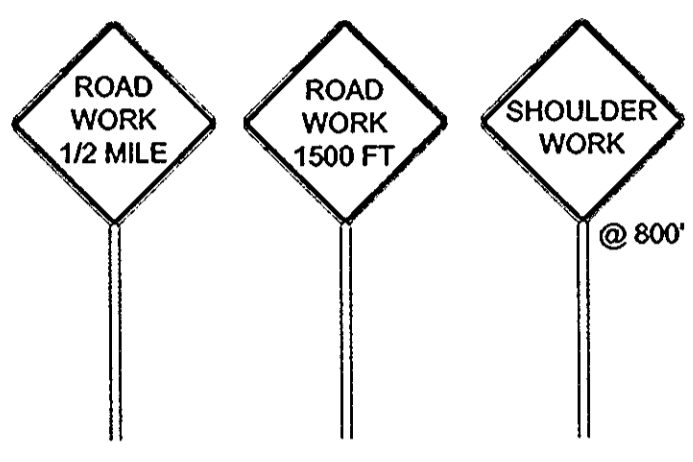
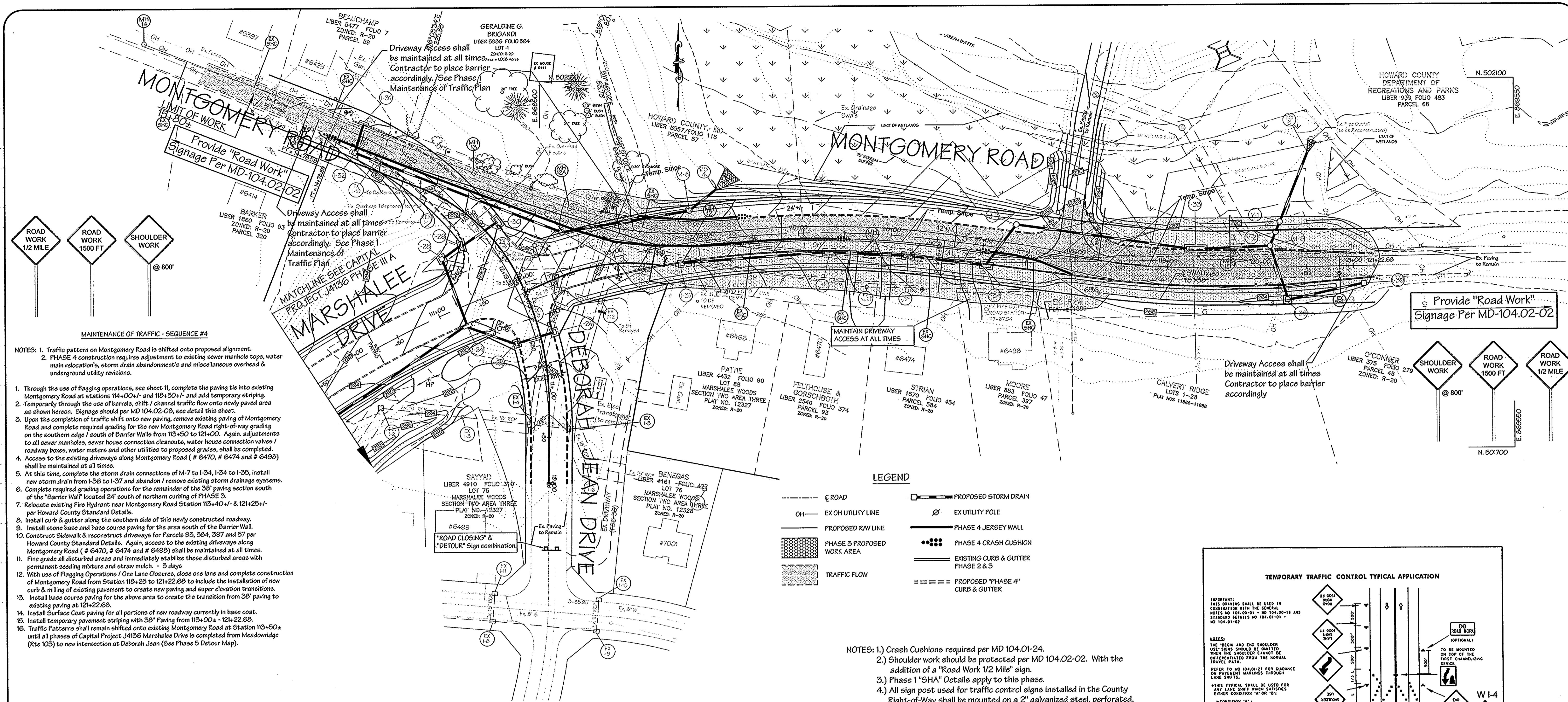
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DRAWN	L.D.E.			
CHECKED	B.D.B.			
DATE	LDE	REVISE BYPASS STORM DRAIN	6/2006	
2/2005	BY NO.	REVISION	DATE	

Maintenance of Traffic Plan
 PHASE 3

MAP NO. 37 BLOCK 15

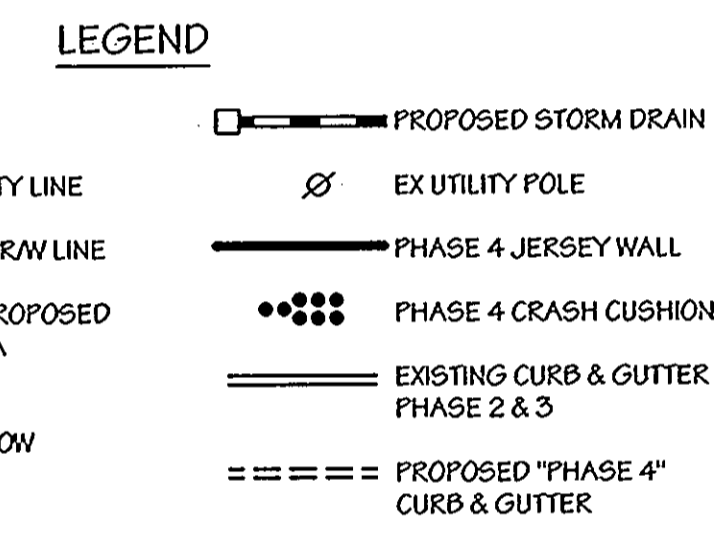
MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
 1"=50'
 SHEET
 13 of 18

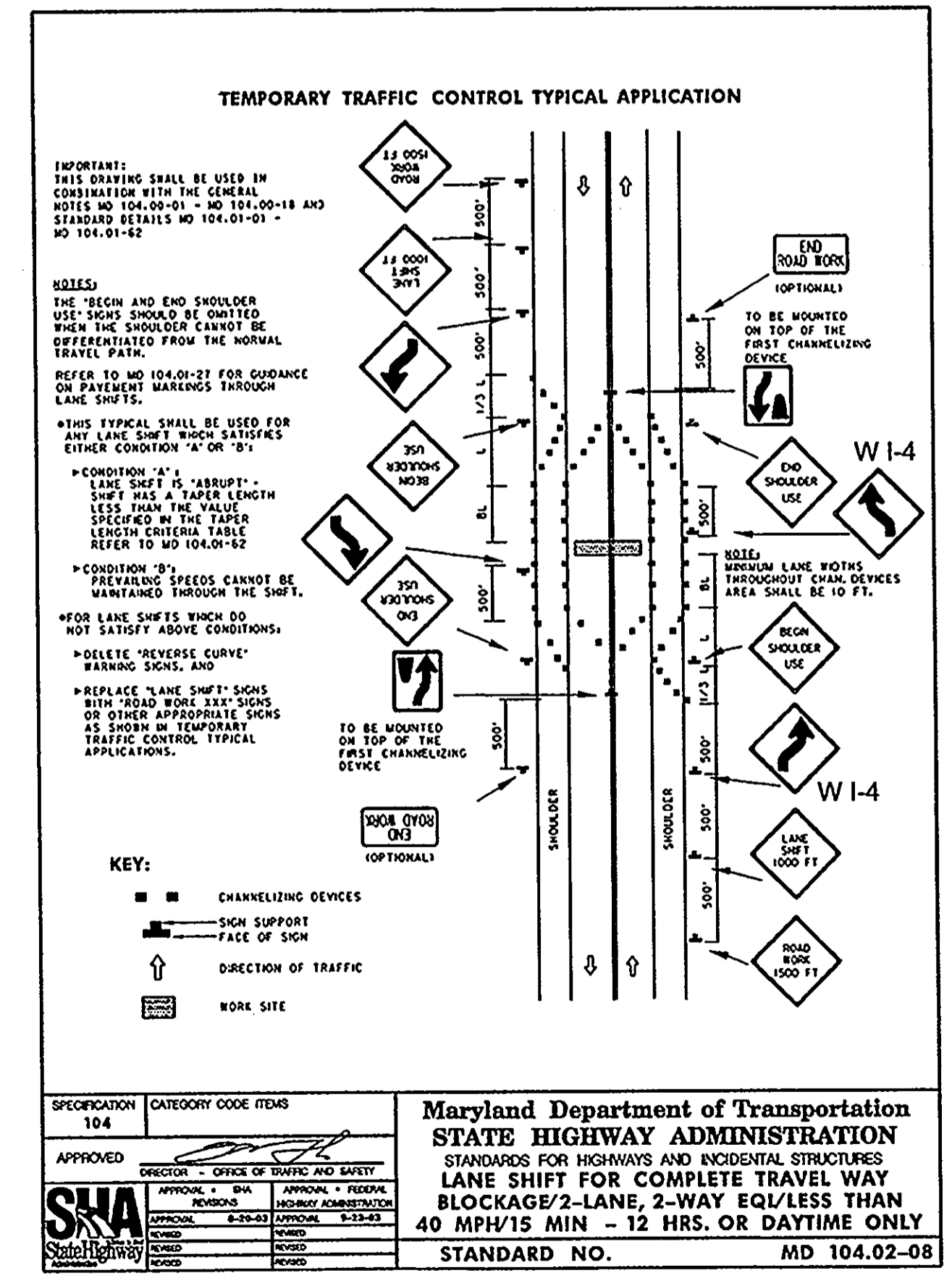


- MAINTENANCE OF TRAFFIC - SEQUENCE #4**
- NOTES: 1. Traffic pattern on Montgomery Road is shifted onto proposed alignment.
 2. PHASE 4 construction requires adjustment to existing sewer manhole tops, water main relocation's, storm drain abandonment's and miscellaneous overhead & underground utility revisions.
- Through the use of flagging operations, see sheet 11, complete the paving tie into existing Montgomery Road at stations 114+00+/- and 118+50+/- and add temporary striping.
 - Temporarily through the use of barrels, shift / channel traffic flow onto newly paved area as shown hereon. Signage should per MD 104.02-03, see detail this sheet.
 - Upon the completion of traffic shifts onto new paving, remove existing paving of Montgomery Road and complete required grading for the new Montgomery Road right-of-way grading on the southern edge / south of Barrier Walls from 113+50 to 121+00. Again, adjustments to all sewer manholes, sewer house connection cleanouts, water house connection valves / roadway boxes, water meters and other utilities to proposed grades, shall be completed.
 - Access to the existing driveways along Montgomery Road (# 6470, # 6474 and # 6498) shall be maintained at all times.
 - At this time, complete the storm drain connections of M-7 to I-34, I-34 to I-35, install new storm drain from I-36 to I-37 and abandon / remove existing storm drainage systems.
 - Complete required grading operations for the remainder of the 3rd paving section south of the "Barrier Wall" located 24' south of northern curbing of PHASE 3.
 - Relocate existing Fire Hydrant near Montgomery Road Station 113+40+/- & 121+25+/- per Howard County Standard Details.
 - Install curb & gutter along the southern side of this newly constructed roadway.
 - Install stone base and base course paving for the area south of the Barrier Wall.
 - Construct Sidewalk & reconstruct driveways for Parcels 93, 584, 397 and 57 per Howard County Standard Details. Again, access to the existing driveways along Montgomery Road (# 6470, # 6474 and # 6498) shall be maintained at all times.
 - Fine grade all disturbed areas and immediately stabilize these disturbed areas with permanent seeding mixture and straw mulch. - 3 days
 - With use of Flagging Operations / One Lane Closures, close one lane and complete construction of Montgomery Road from Station 118+25 to 121+22.68 to include the installation of new curb & milling of existing pavement to create new paving and super elevation transitions.
 - Install base course paving for the above area to create the transition from 3rd paving to existing paving at 121+22.68.
 - Install Surface Coat paving for all portions of new roadway currently in base coat.
 - Install temporary pavement striping with 3rd Paving from 113+00+/- to 121+22.68.
 - Traffic Patterns shall remain shifted onto existing Montgomery Road at Station 113+50+/- until all phases of Capital Project J4136 Marshalee Drive is completed from Meadowridge (Rte 103) to new intersection at Deborah Jean (See Phase 5 Detour Map).

NOTE:
 Contractor shall install Barrier / Jersey wall end treatments & flare rates at all private driveways and truck entrances / exits in accordance with MD 104.01-24.



- NOTES: 1.) Crash Cushions required per MD 104.01-24.
 2.) Shoulder work should be protected per MD 104.02-02. With the addition of a "Road Work 1/2 Mile" sign.
 3.) Phase 1 "SHA" Details apply to this phase.
 4.) All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.



DEPARTMENT OF PUBLIC WORKS

[Signature] 8/9/06
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8/9/06
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/9/06
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045
 (410)715-1070 - (301)596-3424 - FAX(410)715-9340

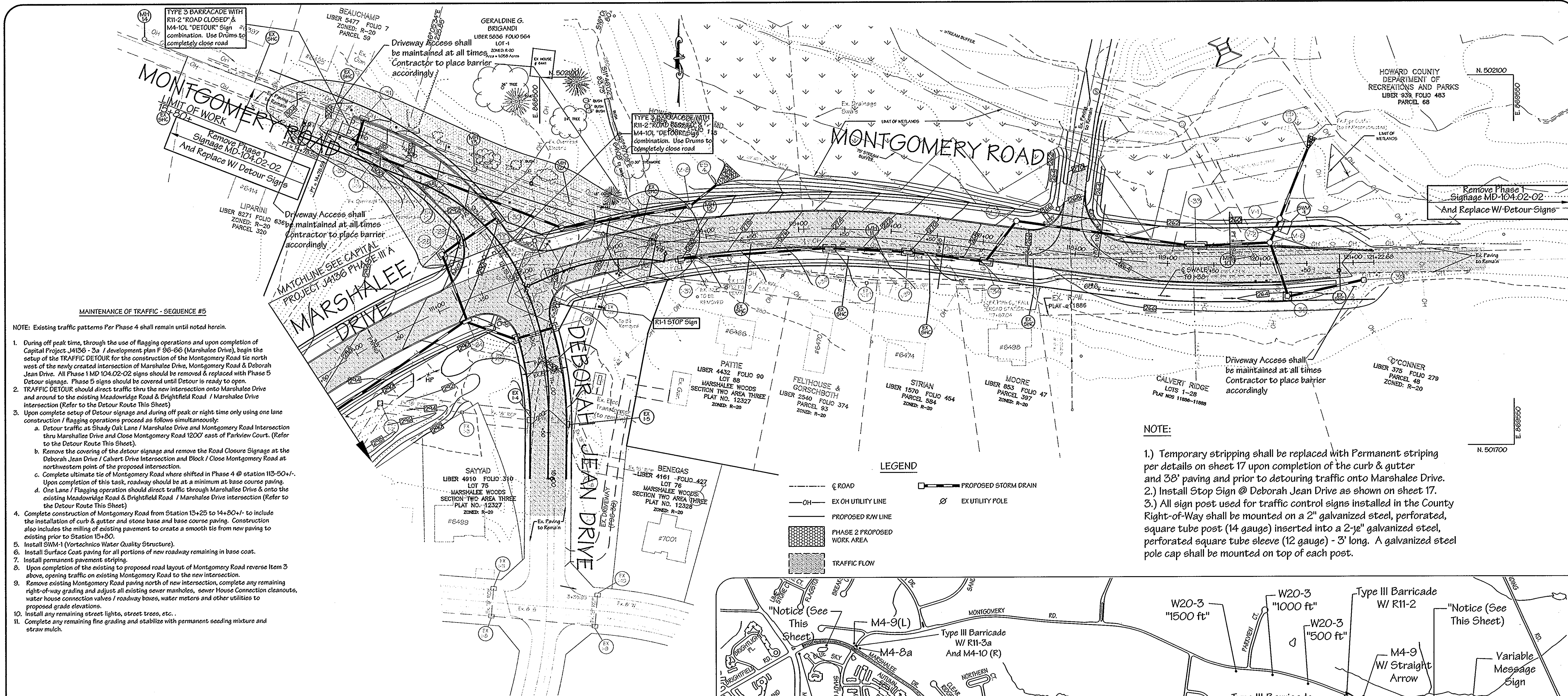
STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 2/2005

DESIGNED	E.D.S.	DATE
DRAWN	L.D.E.	DATE
CHECKED	B.D.B.	DATE
DATE	BY	NO.
2/2005		
REVISION	REVISION	DATE
REVISION BYPASS STORM DRAIN		6/2006

Maintenance of Traffic Plan
 PHASE 4
 MAP NO. 37 BLOCK 15

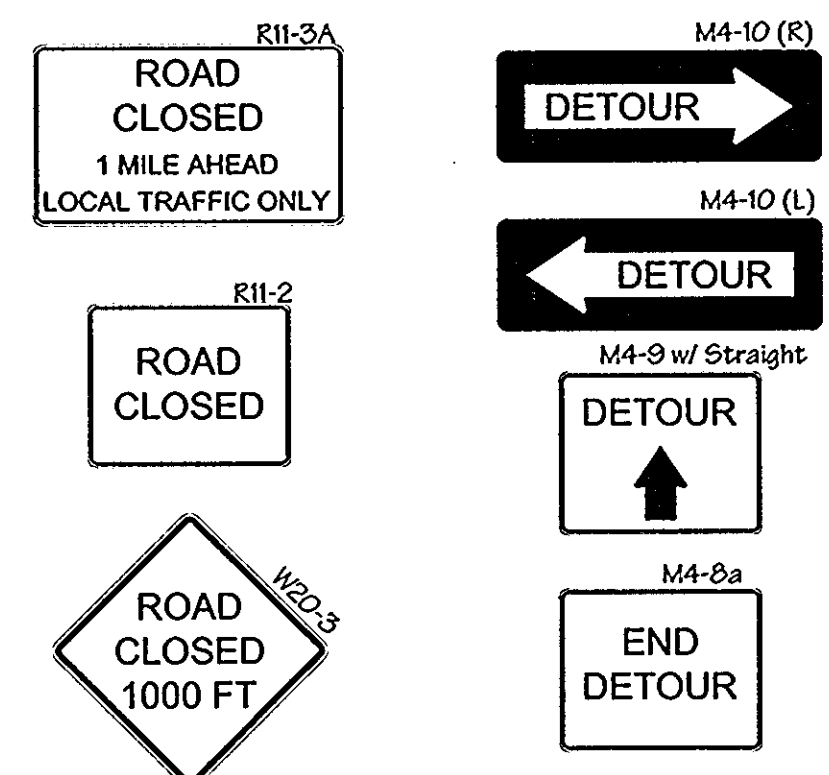
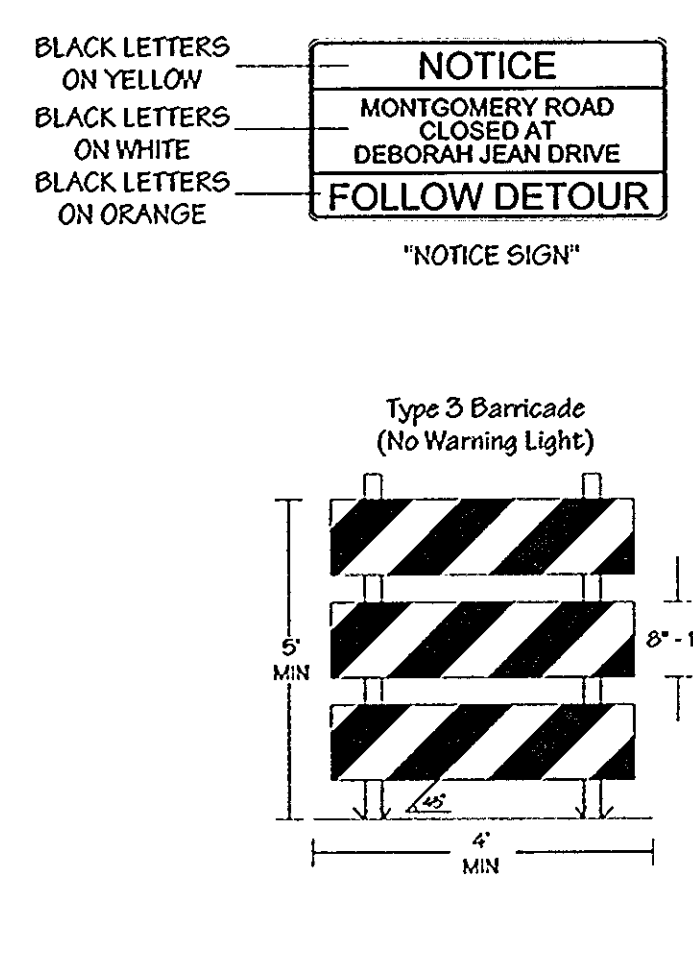
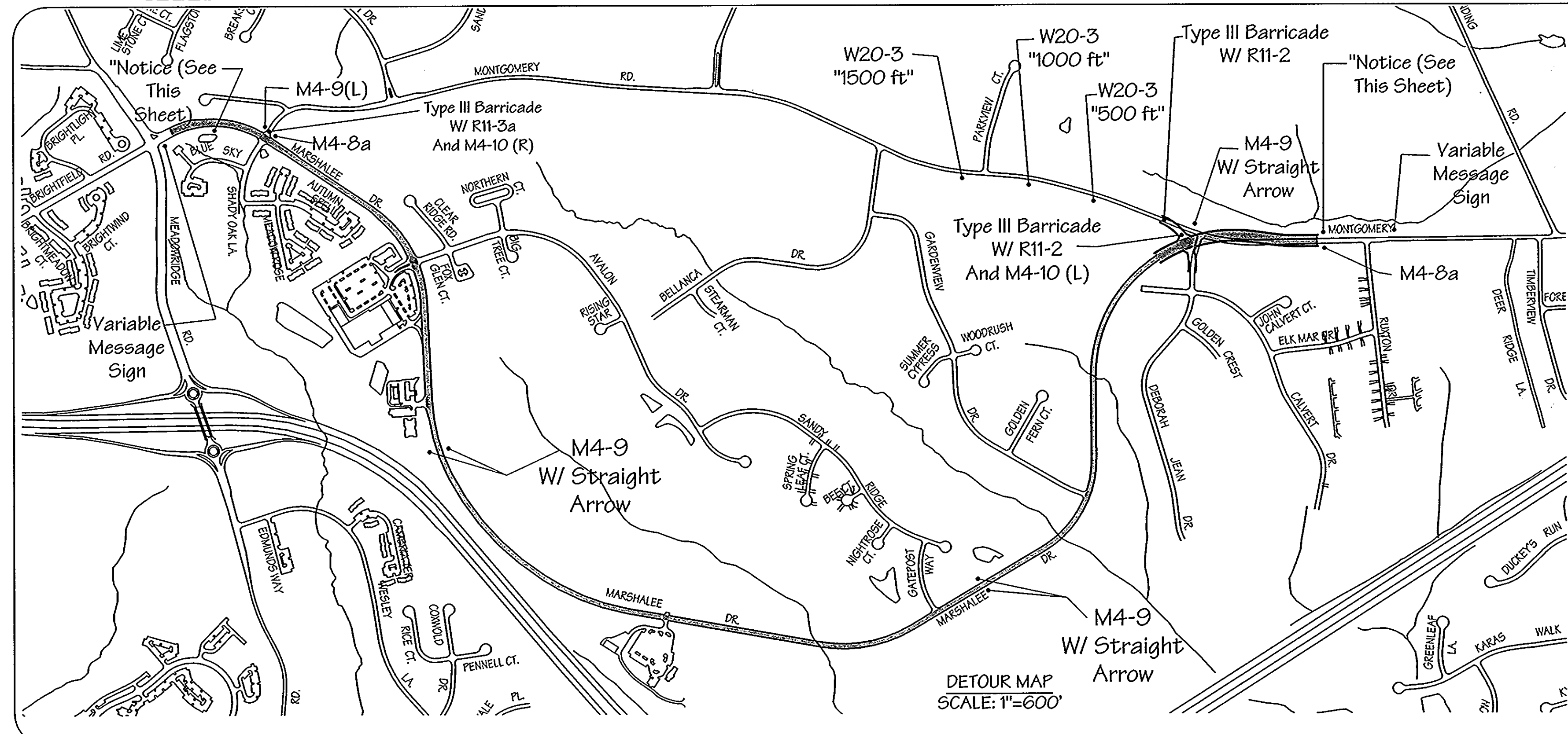
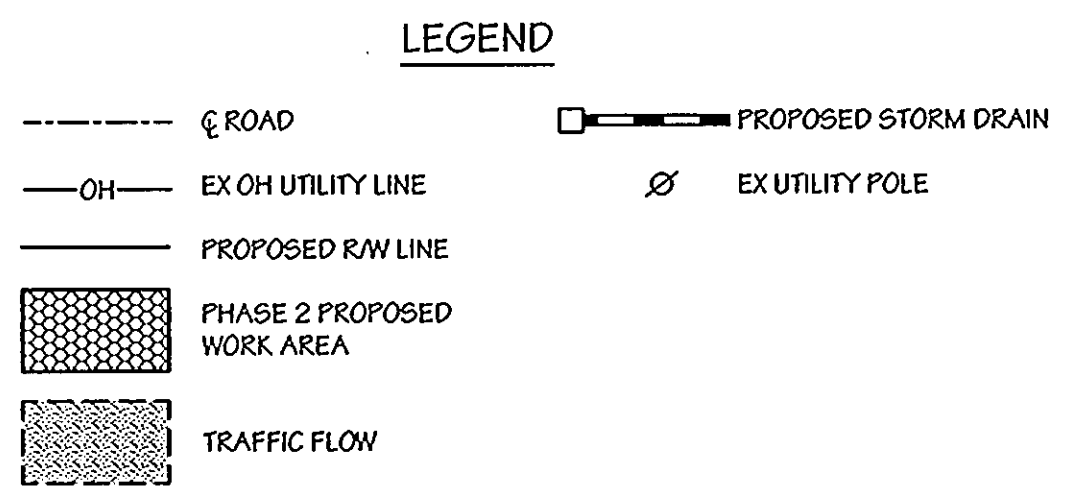
MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE: 1"=50'
 SHEET: 14 OF 18



- MAINTENANCE OF TRAFFIC - SEQUENCE #5**
- NOTE: Existing traffic patterns Per Phase 4 shall remain until noted herein.
- During off peak time, through the use of flagging operations and upon completion of Capital Project J4136 - 3a / development plan F 96-66 (Marshalee Drive), begin the setup of the TRAFFIC DETOUR for the construction of the Montgomery Road tie north west of the newly created intersection of Marshalee Drive, Montgomery Road & Deborah Jean Drive. All Phase 1 MD 104.02-02 signs should be removed & replaced with Phase 5 Detour signage. Phase 5 signs should be covered until Detour is ready to open.
 - TRAFFIC DETOUR should direct traffic thru the new intersection onto Marshalee Drive and around to the existing Meadowridge Road & Brightfield Road / Marshalee Drive intersection (Refer to the Detour Route This Sheet)
 - Upon complete setup of Detour signage and during off peak or night time only using one lane construction / flagging operations proceed as follows simultaneously:
 - Detour traffic at Shady Oak Lane / Marshalee Drive and Montgomery Road Intersection thru Marshalee Drive and Close Montgomery Road 1200' east of Parkview Court. (Refer to the Detour Route This Sheet)
 - Remove the covering of the detour signage and remove the Road Closure Signage at the Deborah Jean Drive / Calvert Drive Intersection and Block / Close Montgomery Road at northwestern point of the proposed intersection.
 - Complete ultimate tie of Montgomery Road where shifted in Phase 4 @ station 113+50+/-'. Upon completion of this task, roadway should be at a minimum at base course paving.
 - One Lane / Flagging operation should direct traffic through Marshalee Drive & onto the existing Meadowridge Road & Brightfield Road / Marshalee Drive intersection (Refer to the Detour Route This Sheet)
 - Complete construction of Montgomery Road from Station 13+25 to 14+80+/- to include the installation of curb & gutter and stone base and base course paving. Construction also includes the milling of existing pavement to create a smooth tie from new paving to existing prior to Station 15+80.
 - Install SWM-1 (Vortech Water Quality Structure).
 - Install Surface Coat paving for all portions of new roadway remaining in base coat.
 - Install permanent pavement striping.
 - Upon completion of the existing to proposed road layout of Montgomery Road reverse Item 3 above, opening traffic on existing Montgomery Road to the new intersection.
 - Remove existing Montgomery Road paving north of new intersection, complete any remaining right-of-way grading and adjust all existing sewer manholes, sewer House Connection cleanouts, water house connection valves / roadway boxes, water meters and other utilities to proposed grade elevations.
 - Install any remaining street lights, street trees, etc.
 - Complete any remaining fine grading and stabilize with permanent seeding mixture and straw mulch.

- NOTE:**
- Temporary striping shall be replaced with Permanent striping per details on sheet 17 upon completion of the curb & gutter and prior to detouring traffic onto Marshalee Drive.
 - Install Stop Sign @ Deborah Jean Drive as shown on sheet 17.
 - All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.



DEPARTMENT OF PUBLIC WORKS

[Signature] 8/19/06
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8-9-06
CHIEF, BUREAU OF HIGHWAYS DATE

[Signature] 8/19/06
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/19/06
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

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DESIGNED	E.D.S.		
DRAWN	L.D.E.		
CHECKED	B.D.B.		
DATE	6/2006		
LDE	REVISE BYPASS STORM DRAIN		
BY	NO.	REVISION	DATE

Maintenance of Traffic Plan
PHASE 5
MAP NO. 37 BLOCK 15

MARSHALEE DRIVE
CAPITAL PROJECT J-4136
PHASE III B
1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

SCALE
1"=50'
SHEET
15 of 18

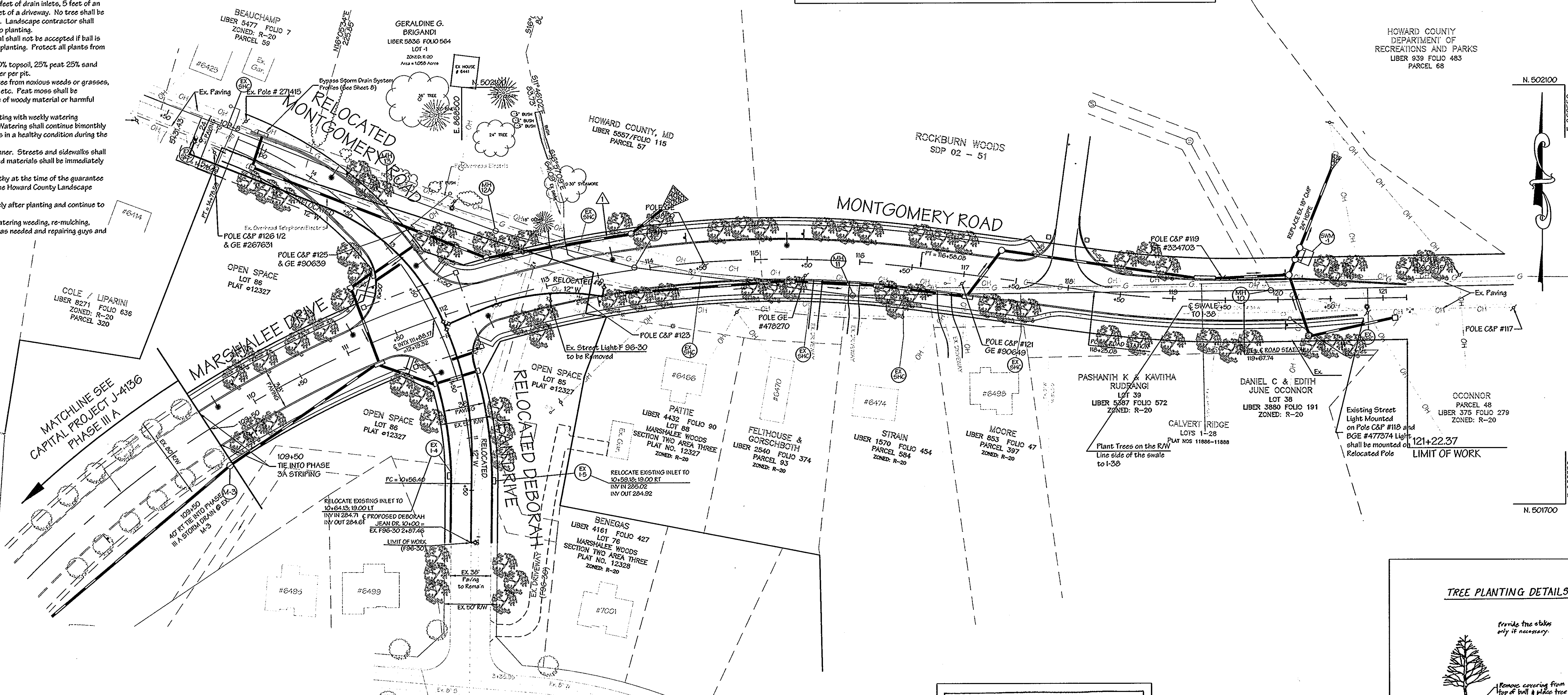
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TREE PLANTING NOTES

1. Notify "Miss Utility" 72 hours prior to installation of all plant material.
2. Plant installation must conform to the minimum standards cited in the latest edition of Landscape Specification Guidelines, published by the Landscape Contractors Association.
3. Plants to be located in the field by the owner or owner's representative. Notify owner 72 hours in advance of planting.
4. A Certification of Landscape Installation is required as per the Howard County Landscape Ordinance.
5. The number, size, location of plants shall not be changed without the approval of the Landscape Architect. Substitutions must be included in the recommended plant list in the Howard County Landscape Ordinance.
6. Trees may not be planted within 5 feet of drain inlets, 5 feet of an open space access strip and 10 feet of a driveway. No tree shall be planted within 20' of a street light. Landscape contractor shall contact the Traffic Division prior to planting.
7. Baled and burlapped plant material shall not be accepted if ball is cracked or broken before or during planting. Protect all plants from drying by other sun of wind.
8. Tree pits shall be backfilled with 50% topsoil, 25% peat 25% sand with one pound of 10-10-10 fertilizer per pit.
9. Top soil shall be sandy loam soil free from noxious weeds or grasses, roots, clay clumps, stones, sticks, etc. Peat moss shall be commercial with pi 4.5 to 5.5, free of woody material or harmful minerals.
10. All plants shall be watered at planting with weekly watering thereafter for the first 90 days. Watering shall continue bimonthly or as necessary to maintain plants in a healthy condition during the guarantee period.
11. Maintain the site in an orderly manner. Streets and sidewalks shall be swept clean. All rejected or dead materials shall be immediately removed from the site.
12. Plant material to be alive and healthy at the time of the guarantee period (one year), as specified in the Howard County Landscape Ordinance.
13. Maintenance shall begin immediately after planting and continue to the end of guaranteed period.
14. Maintenance consist of pruning, watering weeding, re-mulching, resetting plants to proper grades as needed and repairing guys and stakes as needed.

Street Light Legend						
Street Name	Symbol	Centerline Station	Offset	Lamp Type	Post Type	Pole Type
Marshalee Drive	---	109+67.08	25' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Marshalee Drive	---	111+10.10	25' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	112+40.49	25' Rt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	113+65.40	25' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	115+30.32	25' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	120+83**	18' Rc.	250 Watt HPS	Overhead	BGE Pole - Arm length to be determined
Deborah Jean Drive	---	11+65	25' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	12+70.45	23' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm
Montgomery Road	---	13+84.87	23' Lt.	250 Watt HPS	Pendant Mounted	30' Bronze Fiberglass Pole-12' Arm

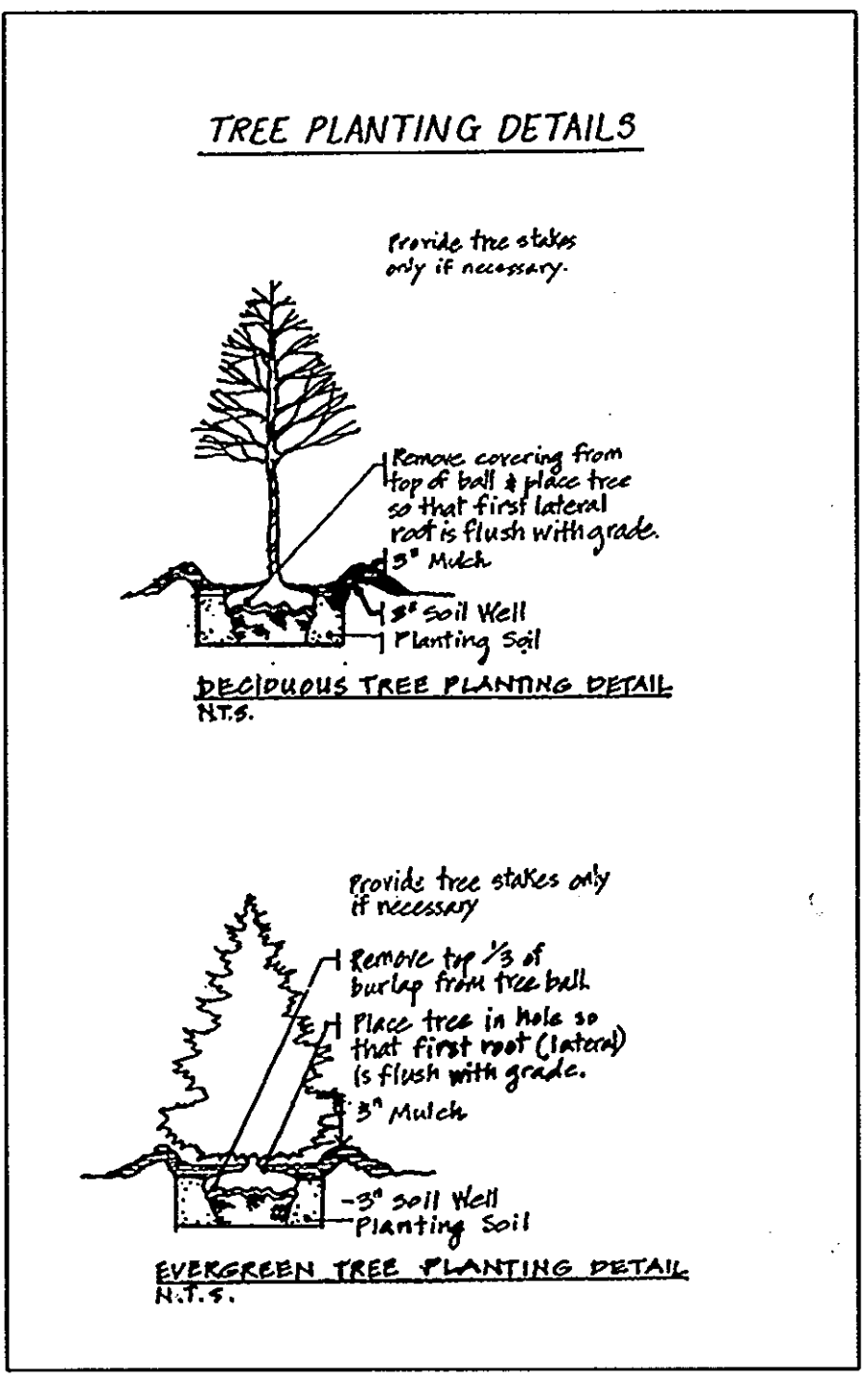
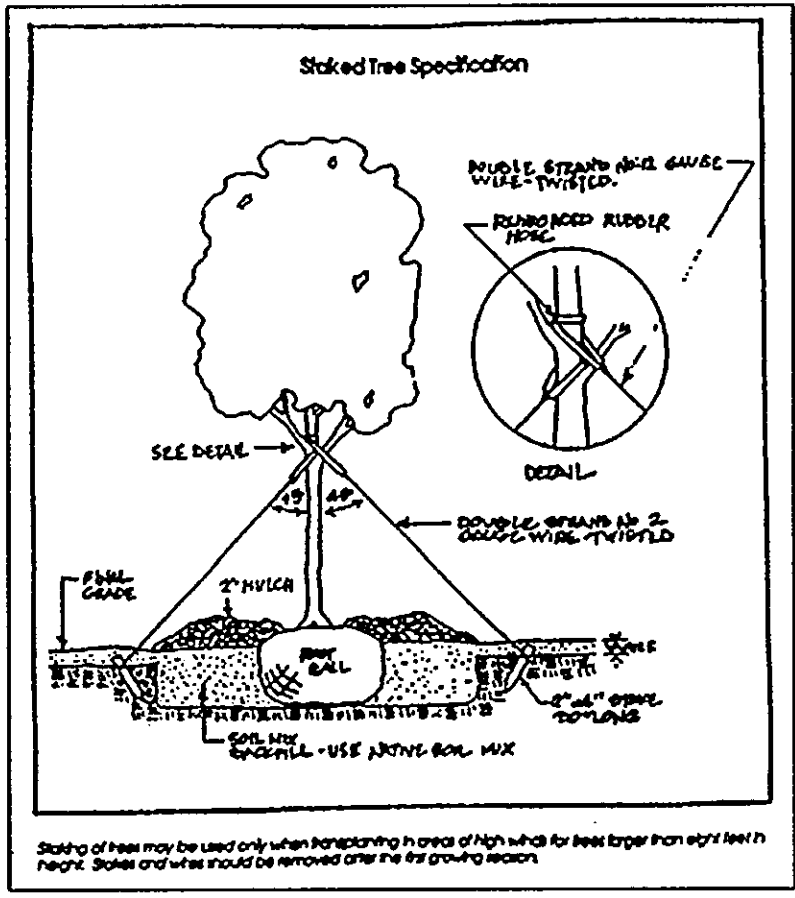
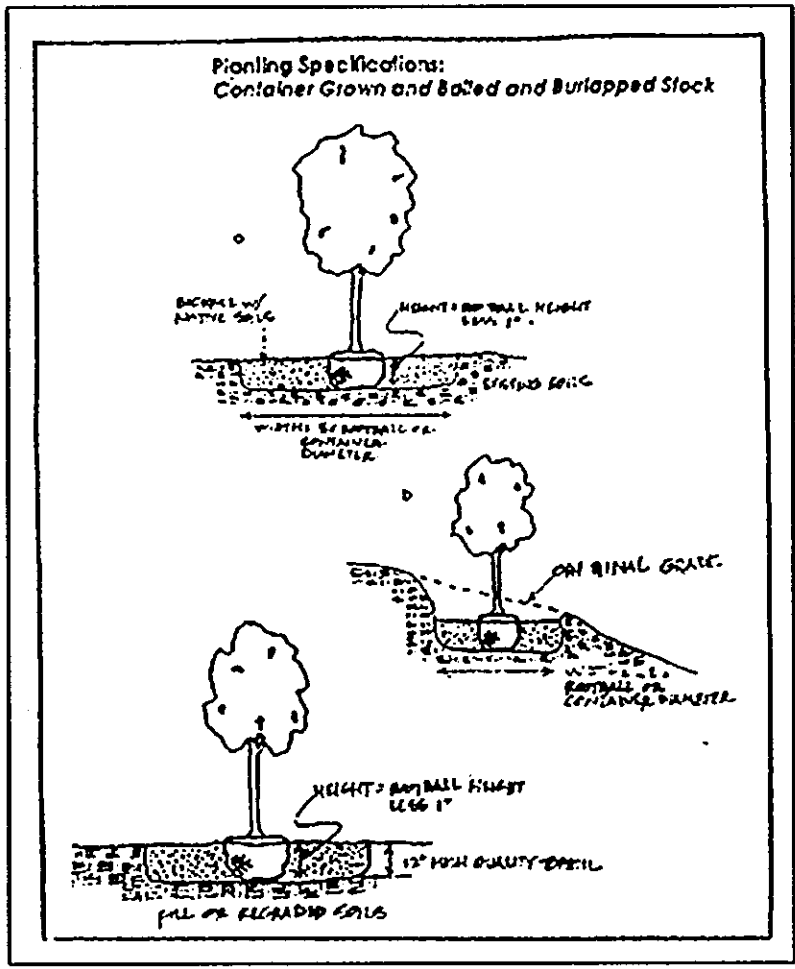
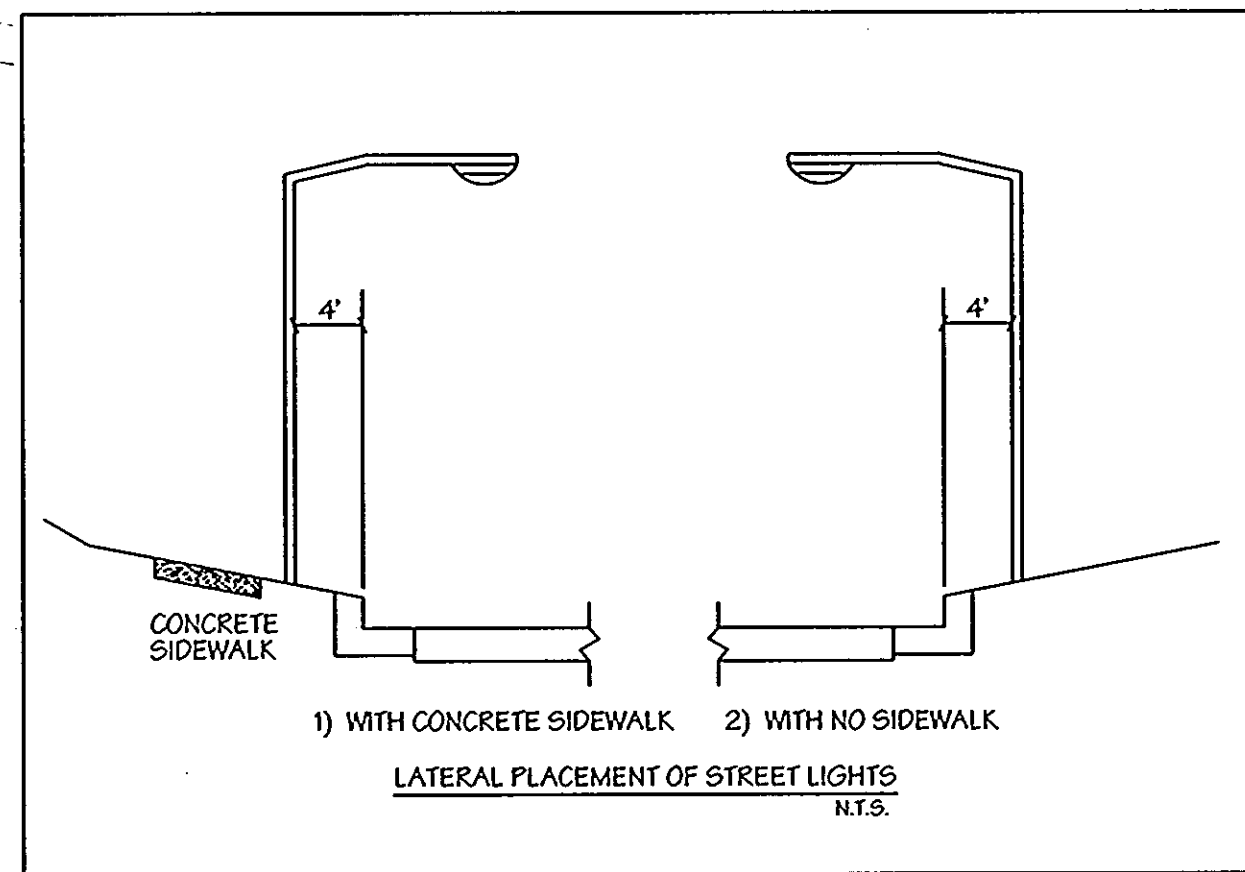
Note: Howard County will supply lighting & BGE will install.
** See Plan



STREET TREE REQUIREMENTS= 1 PER 40'

Montgomery Road 934 LF x 2 Sides = 46 Trees Req. --- 46 Provided
 Relocated Deborah Jean Drive 220 LF x 2 Sides = 11 Trees Req. --- 11 Provided
 Marshalee Drive 239 LF x 2 Sides = 12 Trees Req. --- 12 Provided
 Relocated Montgomery Road 260 LF x 2 Sides = 13 Trees Req. --- 13 Provided
TOTAL REQUIRED = 82 TREES --- 82 PROVIDED

STREET TREE PLANTING SCHEDULE				
NO.	KEY	BOTANICAL / COMMON NAME	SIZE	COMMENT
B2		Platanus x acerifolia 'Columbia' Columbia London Plane	2" - 2-1/2" Cal.	B&B
B2 Total Street Trees				



CAPITAL PROJECT J-4136/PHASE III/LANDSCAPE, 7/17/2006 2:56:55 PM

DEPARTMENT OF PUBLIC WORKS

[Signature] 8/18/06
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8/19/06
 CHIEF, BUREAU OF HIGHWAYS DATE

[Signature] 8/19/06
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/19/06
 CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DATE

LDE Inc.
 Engineers, Surveyors, Planners
 9250 Rumsay Road, Suite 106 Columbia, Maryland - 21045
 (410)715-1070 - (301)596-3424 - FAX(410)715-9540

DESIGNED BY E.D.S.
 DRAWN BY L.D.E.
 CHECKED BY B.D.B.
 DATE 2/2005

REVISIONS:

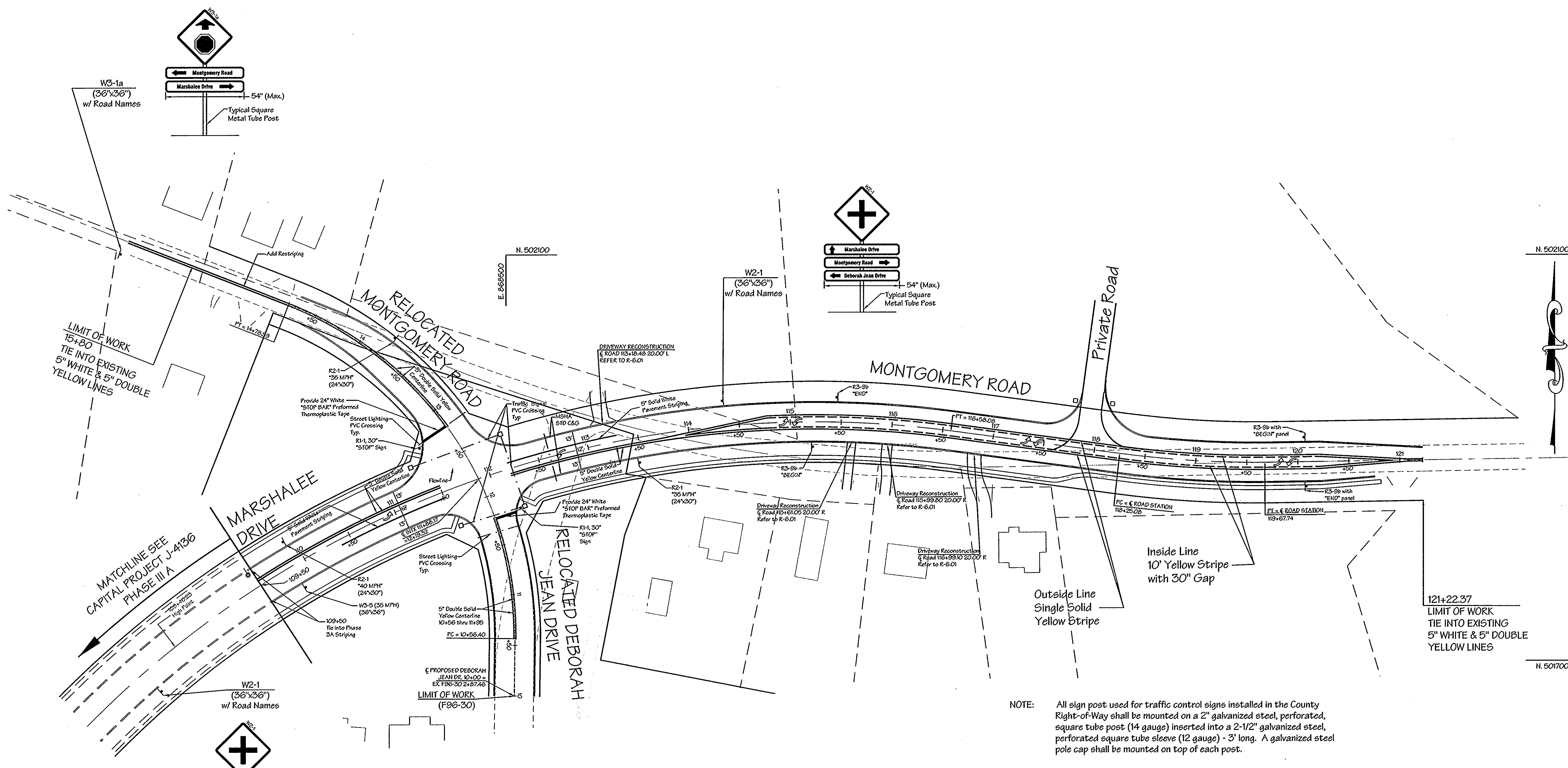
NO.	REVISION	DATE
1	REVISE BYPASS STORM DRAIN	6/2006

STREET LIGHT & LANDSCAPING PLAN
 MAP NO. 37
 BLOCK 15

MARSHALEE DRIVE
 CAPITAL PROJECT J-4136
 PHASE III B
 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

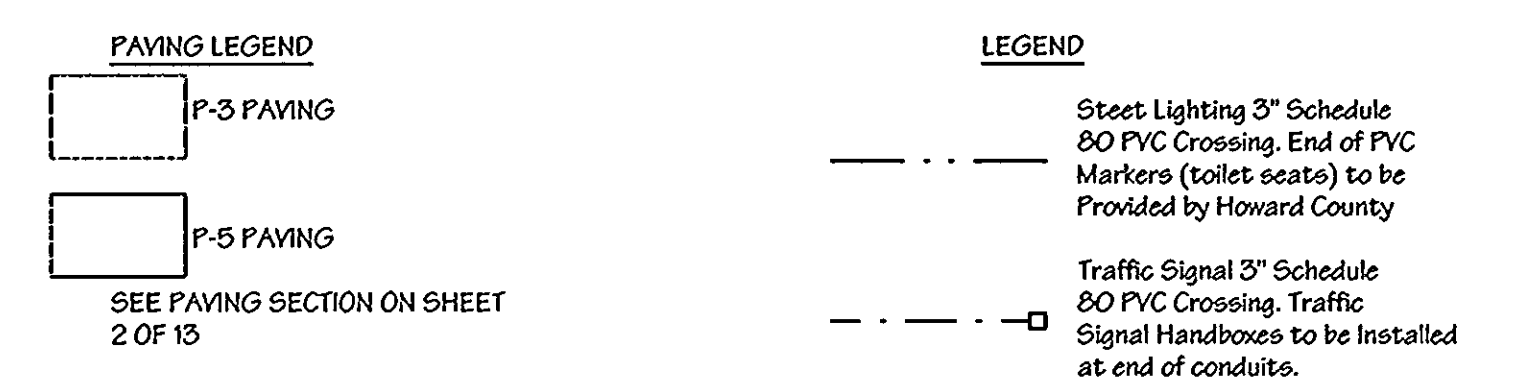
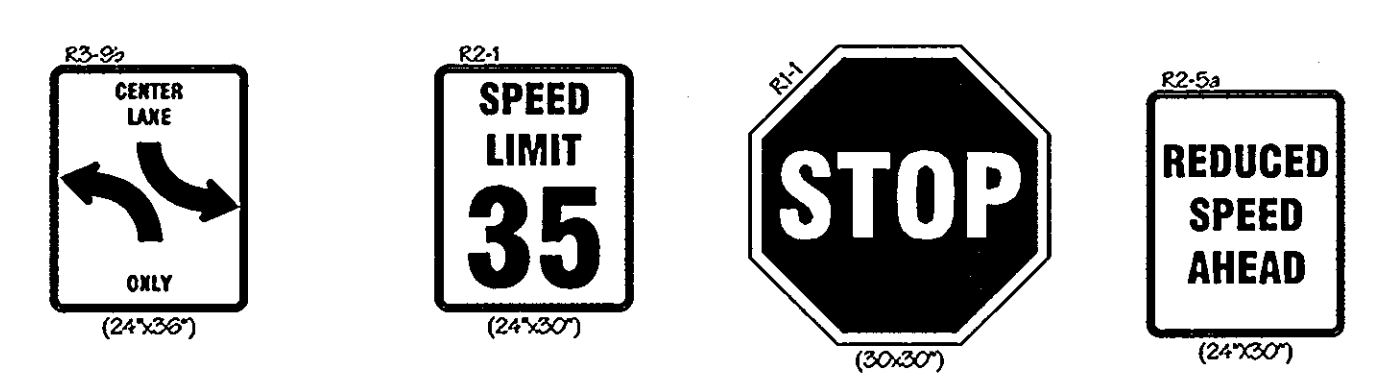
SCALE
 1" = 50'
 SHEET
 16 of 18

CAPITAL PROJECT J-4136.dwg/PWS/STR.dwg, PWS/STR.dwg, PWS/STR.dwg, 2/14/05 4:02:21 PM



NOTE: All sign post used for traffic control signs installed in the County Right-of-Way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.

- NOTES:
1. All signs shall be mounted on square metal tube posts.
 2. Sign locations are approximate. Traffic Engineer shall mark in field prior to installation.
 3. Traffic Engineer shall mark the pavement markings; i.e. stop bars & striping in the field.



<p>DEPARTMENT OF PUBLIC WORKS</p> <p><i>[Signature]</i> 2/14/05 DIRECTOR OF PUBLIC WORKS DATE</p> <p><i>[Signature]</i> 2/14/05 CHIEF, BUREAU OF HIGHWAYS DATE</p>	<p>LDE Inc. Engineers, Surveyors, Planners 9250 Runsey Road, Suite 106 Columbia, Maryland - 21045 (410)715-1070 - (301)596-3424 - FAX(410)715-9540</p>		<p>DESIGNED E.D.S.</p> <p>DRAWN LDE</p> <p>CHECKED B.D.B.</p> <p>DATE 2/20/05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>BY</th> <th>NO.</th> <th>REVISION</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	BY	NO.	REVISION	DATE					<p>PAVING & STRIPING PLAN</p> <p>MAP NO. 37 BLOCK 15</p>	<p>MARSHALEE DRIVE CAPITAL PROJECT J-4136 PHASE III B 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND</p>	<p>SCALE 1"= 50'</p> <p>SHEET 17 OF 18</p>
BY	NO.	REVISION	DATE												

VORTECHS STORMWATER TREATMENT SYSTEM

MAINTENANCE
The Vortechs System should be inspected at regular intervals and maintained when necessary to ensure optimum performance.

Inspection
Inspection is the key to effective maintenance and is easily performed. Vortechs recommends ongoing quarterly inspections of the accumulated sediment.

The Vortechs System should be cleaned when inspection reveals that the sediment depth has accumulated to within six inches of the dry-weather water surface elevation.

Cleaning
Maintaining the Vortechs System is easiest when there is no flow entering the System. For this reason, it is a good idea to schedule the cleanout during dry weather.

In Vortechs installations where the risk of large petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment.

Accumulated sediment is typically evacuated through the manhole over the grit chamber. Simply remove the cover and insert the vacuum hose into the grit chamber.

If maintenance is not performed as recommended, sediment may accumulate outside the grit chamber. If this is the case, it may be necessary to pump out all chambers.

Manhole covers should be securely seated following cleaning activities, to ensure that surface runoff does not leak into the unit from above.

INSPECTION & MAINTENANCE LOG
Table with columns: Model, Location, Date, Water Depth to Sediment, Floatable Layer Thickness, Maintenance Performed, Maintenance Personnel, Comments.

- 1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface.

SECTION 02721 STORMWATER TREATMENT SYSTEM

PART 1.00 GENERAL DESCRIPTION

1. Work Included:
The Contractor, and/or a manufacturer selected by the Contractor and approved by the Engineer, shall furnish all labor, materials, equipment and incidentals required and install all precast concrete stormwater treatment systems and appurtenances in accordance with the Drawings and these specifications.

2. QUALITY CONTROL INSPECTION
A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements.

B. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close textured and free of blisters, cracks, roughness and exposure of reinforcement.

C. Imperfections may be repaired, subject to the acceptance of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final acceptance.

1.3 SUBMITTALS

A. Shop Drawings
The Contractor shall be provided with dimensional drawings and, when specified, utilize these drawings as the basis for preparation of shop drawings showing details for construction, reinforcing, joints and any cast-in-place appurtenances.

B. Affidavit on patent infringement
The Contractor shall submit to the Engineer, prior to installation of the stormwater treatment system, an affidavit regarding patent infringement rights stating that any suit or claim against the Owner due to alleged infringement rights shall be defended by the Contractor who will bear all the costs, expenses and attorney's fees incurred thereof.

C. Performance Documentation
The following documentation must be submitted by the Contractor and approved by the Engineer prior to the manufacture and delivery of any materials.

1. Laboratory Data
The stormwater treatment system supplier shall provide documentation of Total Suspended Solids (TSS) removal efficiency from laboratory testing conducted on the supplier's full-scale system.

- a. TSS removal efficiency versus operating rate for the full operating range of the stormwater treatment system for a 50-micron particle size.

2. Field Test Data

The stormwater treatment system supplier shall provide documentation of TSS removal efficiency from field testing conducted on an installed system. The documentation shall be in accordance with the following:

- a. The testing and documentation shall have been conducted by an independent third party.

3. Manufacturing Experience
The stormwater treatment system supplier shall provide evidence of at least 5 years of successful product design and use. The supplier shall provide an installation list of projects, model sizes installed and installation dates where the same type systems as specified herein have been designed and produced by the supplier.

PART 2.00 PRODUCTS

2.1 MATERIALS AND DESIGN 2.1

A. Concrete for precast stormwater treatment systems shall conform to ASTM C 807 and C 850 and meet the following additional requirements:

- 1. The wall thickness shall not be less than 6 inches (152 mm) or as shown on the dimensional drawings. In all cases the wall thickness shall be no less than the minimum thickness necessary to sustain HS20-44 (MS18) loading requirements as determined by a Licensed Professional Engineer.

B. Internal aluminum plate components shall be aluminum alloy 5082-H32 in accordance with ASTM B 209.

C. Sealant to be utilized at the base of the swirl chamber shall be 60 durometer extruded nitrile butadiene rubber (Buna N) and shall be provided to the contractor pre-caster for installation.

D. Brick or masonry used to build the manhole frame to grade shall conform to ASTM C 32 or ASTM C 139 and shall be installed in conformance with all local requirements.

E. Casting for manhole frames and covers shall be in accordance with ASTM A48, CL 20B and AASHTO M105. The manhole frame and cover shall be equivalent to Campbell Foundry Pattern #1009A or #1012D custom cast with the Vortechs logo and words "VortechsTM Stormwater Treatment System".

F. A bitumen sealant in conformance with ASTM C 990 shall be utilized in the sealing of the joint between the swirl chamber and the vault at the long wall tangent points. The butyl material shall be 3/4 inch thick by 3/4 inch wide.

2.2 PERFORMANCE

Each storm water treatment system shall adhere to the following performance specifications at the design treatment capacities, as listed below:

Table 2.2: Design table with columns: Vortechs Model, Design Treatment Capacity (cfs)/(l/s), Sediment Storage (yd³)/(m³). Rows include models 1000, 2000, 3000, 4000, 5000, 7000, 9000, 11000, 16000.

Each stormwater treatment system shall include a circular aluminum "swirl chamber" (or "grit chamber") with a tangential inlet to induce a swirling flow pattern that will accumulate and store settleable solids in a manner and a location that will prevent resuspension of previously captured particulates.

Each stormwater treatment system shall be of a hydraulic design that includes flow controls designed and certified by a professional engineer using accepted principles of fluid mechanics that raise the water surface inside the tank to a pre-determined level in order to prevent the re-entrainment of trapped floating contaminants.

Each stormwater treatment system shall be capable of removing 85% of the net annual Total Suspended Solids (TSS) load based on a 50-micron particle size. Annual TSS removal efficiency models shall be based on documented removal efficiency performance from full scale laboratory tests.

Individual stormwater treatment systems shall have usable sediment storage capacity of not less than the corresponding volume listed in Table 2.2. The systems shall be designed such that the pump-out volume is less than 1/2 of the total system volume. The systems shall be designed to not allow surcharge of the upstream piping network during dry weather conditions.

A water-lock feature shall be incorporated into the design of the stormwater treatment system to prevent the introduction of trapped oil and floatable contaminants to the downstream piping during routine maintenance and to ensure that no oil escapes the system during the ensuing rain event.

The stormwater treatment system manufacturer shall furnish documentation which supports all product performance claims and features, storage capacities and maintenance requirements.

Stormwater treatment systems shall be completely housed within one rectangular structure.

2.3 MANUFACTURER

Each stormwater treatment system shall be of a type that has been installed and used successfully for a minimum of 5 years. The manufacturer of said system shall have been regularly engaged in the engineering design and production of systems for the physical treatment of stormwater runoff during the aforementioned period.

Each stormwater treatment system shall be a Vortechs System as manufactured by Vortechs, Inc., 200 Enterprise Drive, Scarborough, Maine 04074, phone: 207-885-9850, fax: 207-885-9825; and as protected under U.S. Patent #5,759,415 or approved equal.

PART 3.00 EXECUTION

3.1 INSTALLATION

A. Each Stormwater Treatment System shall be constructed according to the sizes shown on the Drawings and as specified herein. Install at elevations and locations shown on the Drawings or as otherwise directed by the Engineer.

B. Place the precast base unit on a granular subbase of minimum thickness of six inches (152 mm) after compaction or of greater thickness and compaction if specified elsewhere. The granular subbase shall be checked for level prior to setting and the precast base section of the trap shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5% the base section shall be removed and the granular subbase material re-levelled.

C. Prior to setting subsequent sections place bitumen sealant in conformance with ASTM C 990-91 along the construction joint in the sealant that is already in place.

D. After setting the base and wall or riser sections, prepare to install the swirl chamber. Place the 3/4-inch thick by 3/4-inch wide butyl mastic seal vertically on the outside of the swirl chamber starting one inch (1") above the bottom of the swirl chamber and continuing to a height equal to the elevation of the bottom of the upper aperture of the swirl chamber.

using HIL TI brand stainless steel drop-in wedge anchors or equivalent 3/8-inch diameter by 2-3/4 inch minimum length at heights of approximately three inches (3") off the floor and at fifteen inch (15") intervals to approximately the same height of the butyl mastic sealant (at locations of pre-drilled holes in aluminum components). Apply a continuous bead of Sikaflex-1a sealant to the intersection of the inside bottom edge of the extruded seal and the vault floor.

E. Prior to setting the precast roof section, bitumen sealant equal to ASTM C 990 shall be placed along the top of the oil baffle wall (Baffle A), using more than one layer of mastic if necessary, to a thickness at least 1-inch greater than the nominal gap between the top of the baffle and the roof section. The nominal gap shall be determined either by field measurement or the shop drawings. After placement of the roof section has compressed the butyl mastic sealant in the gap, finish sealing the gap with an approved non-shrink grout on both sides of the gap using the butyl mastic as a backing material to which to apply the grout.

F. After setting the precast roof section of the stormwater treatment system, set precast concrete manhole riser sections, to the height required to bring the cast iron manhole covers to grade, so that the sections are vertical and in true alignment with a 1/4 inch (6 mm) maximum tolerance allowed. Backfill in a careful manner, bringing the fill up to 6-inch (152 mm) lifts on all sides. If leaks appear, clean the inside joints and caulk with lead wool to the satisfaction of the Engineer. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of Stormwater Treatment Systems shall conform to ASTM specification C 891 "Standard Practice for Installation of Underground Precast Utility Structures".

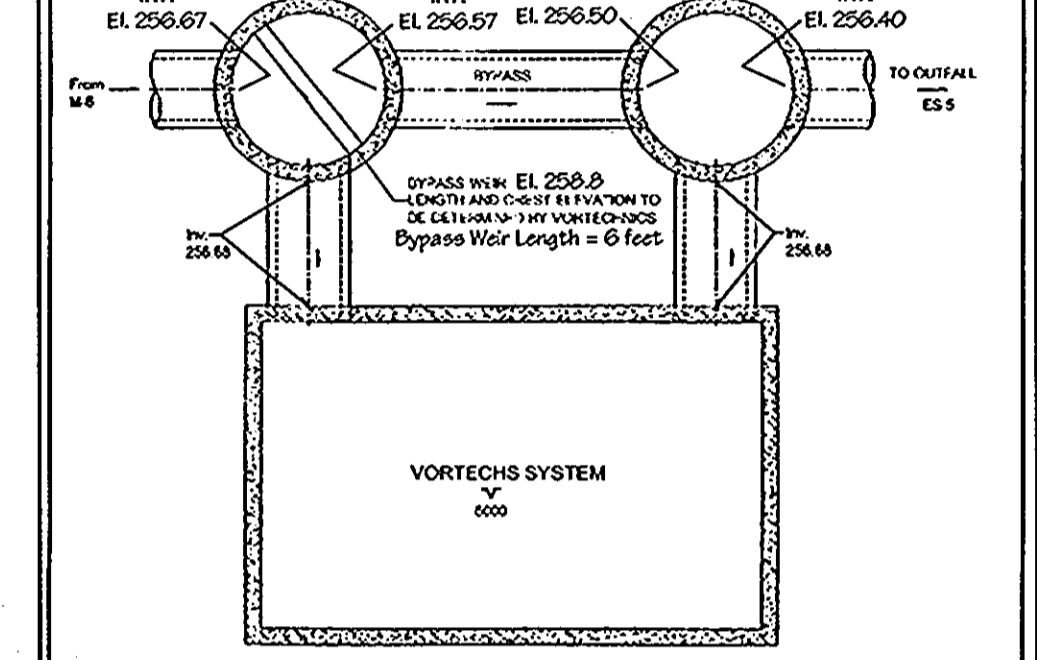
G. Holes made in the concrete sections for handling or other purposes shall be plugged with a nonshrink grout or by using grout in combination with concrete plugs.

H. Where holes must be cut in the precast sections to accommodate pipes, do all cutting before setting the sections in place to prevent any subsequent jarring which may loosen the mortar joints. The Contractor shall make all pipe connections.

NOT FOR INFORMATIONAL PURPOSES ONLY

NOT INTENDED AS A CONSTRUCTION DOCUMENT

-BYPASS AND JUNCTION STRUCTURES NOT SUPPLIED BY VORTECHS-

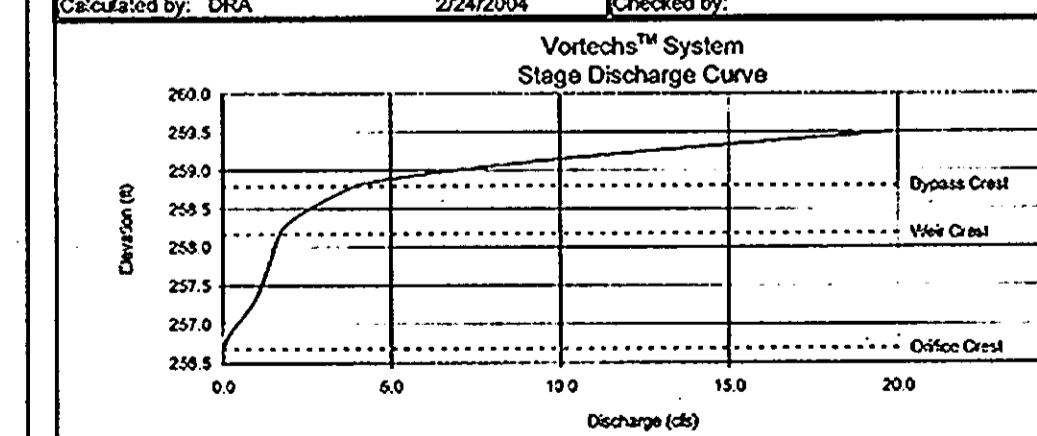


ACTUAL ORIENTATION AND LAYOUT MAY VARY DUE TO SITE SPECIFIC CONSIDERATIONS

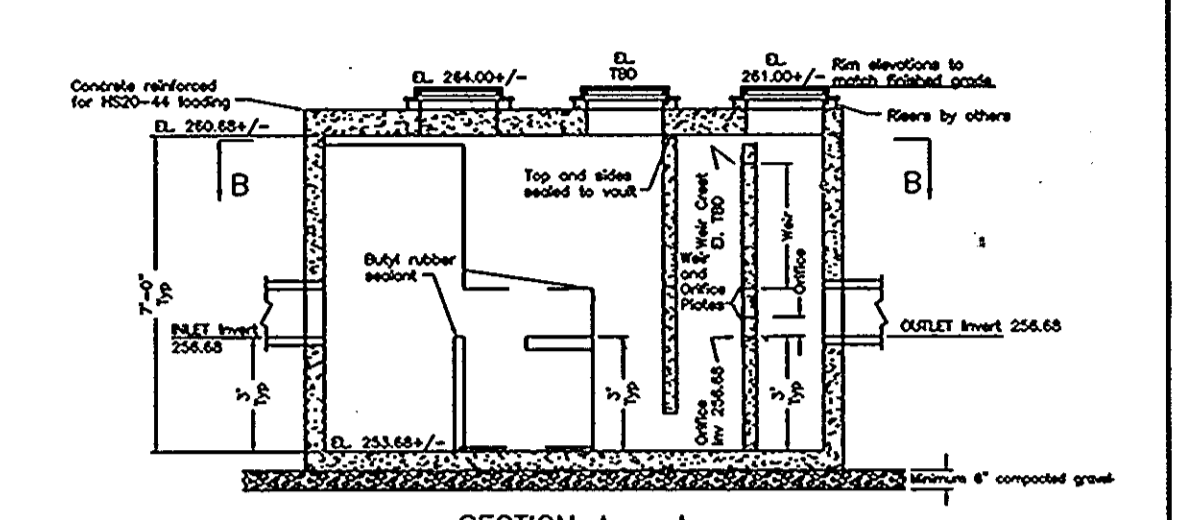
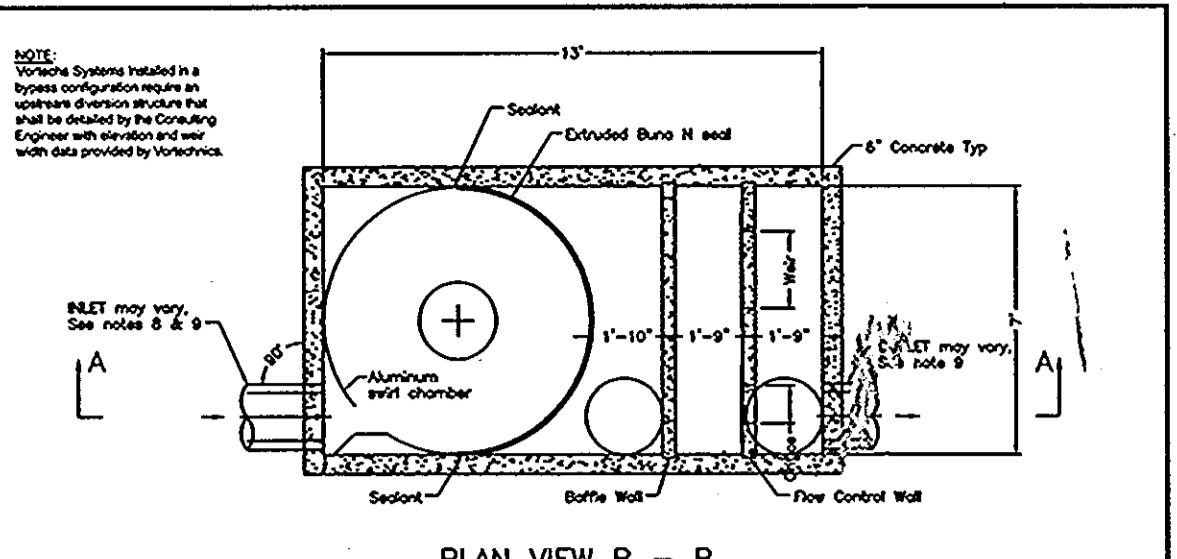
STANDARD BYPASS LAYOUT VORTECHS STORMWATER TREATMENT SYSTEM

Vortechs Stormwater Treatment Systems FLOW CALCULATIONS

Flow Calculations table with columns: Head (ft), Elevation (ft), Orifice Flow (cfs), Year Flow (cfs), Bypass Flow (cfs), Total Flow (cfs). Includes data for various flow rates and elevations.



Files\Vortechs\projects\5263AD501-064.xls AP 22/42004



- 1. The Vortechs System shall be installed in accordance with the Drawings and these specifications.
2. The Vortechs System shall be installed in accordance with the Drawings and these specifications.

STANDARD DETAIL STORMWATER TREATMENT SYSTEM VORTECHS MODEL 5000. Includes Vortechs logo and contact information.

ACTUAL FINAL DESIGN / SHOP DRAWINGS SHALL BE PREPARED BY VORTECHS - Contractor shall contact VORTECHS to order SWM-1 (Model 5000) - Shop drawings shall be supplied to LDC, Inc. for review and approval prior to fabrication & delivery.

DEVELOPER CERTIFICATE

I HEREBY CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

ENGINEER'S CERTIFICATE

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL IS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE PROJECT SITE AND THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF MARYLAND.

DEPARTMENT OF PUBLIC WORKS. Includes signatures and dates for the Director of Public Works and Chief, Bureau of Highways.

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

Signature and date of the reviewer for the Howard Soil Conservation District.

LDE Inc. Engineers, Surveyors, Planners. 9250 Rumsey Road, Suite 106 Columbia, Maryland - 21045. Includes phone and fax numbers.

DESIGNED BY: LDE. CHECKED BY: LDE. DATE: 2/2005. Table with columns for revision and date.

VORTECHNICS - Details

MAP NO. 37 BLOCK 15

MARSHALEE DRIVE CAPITAL PROJECT J-4136 PHASE III B 1st ELECTION DISTRICT, HOWARD COUNTY, MARYLAND. Includes sheet number 18 OF 13.