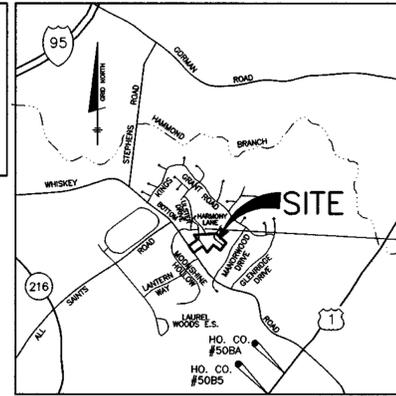


GENERAL NOTES

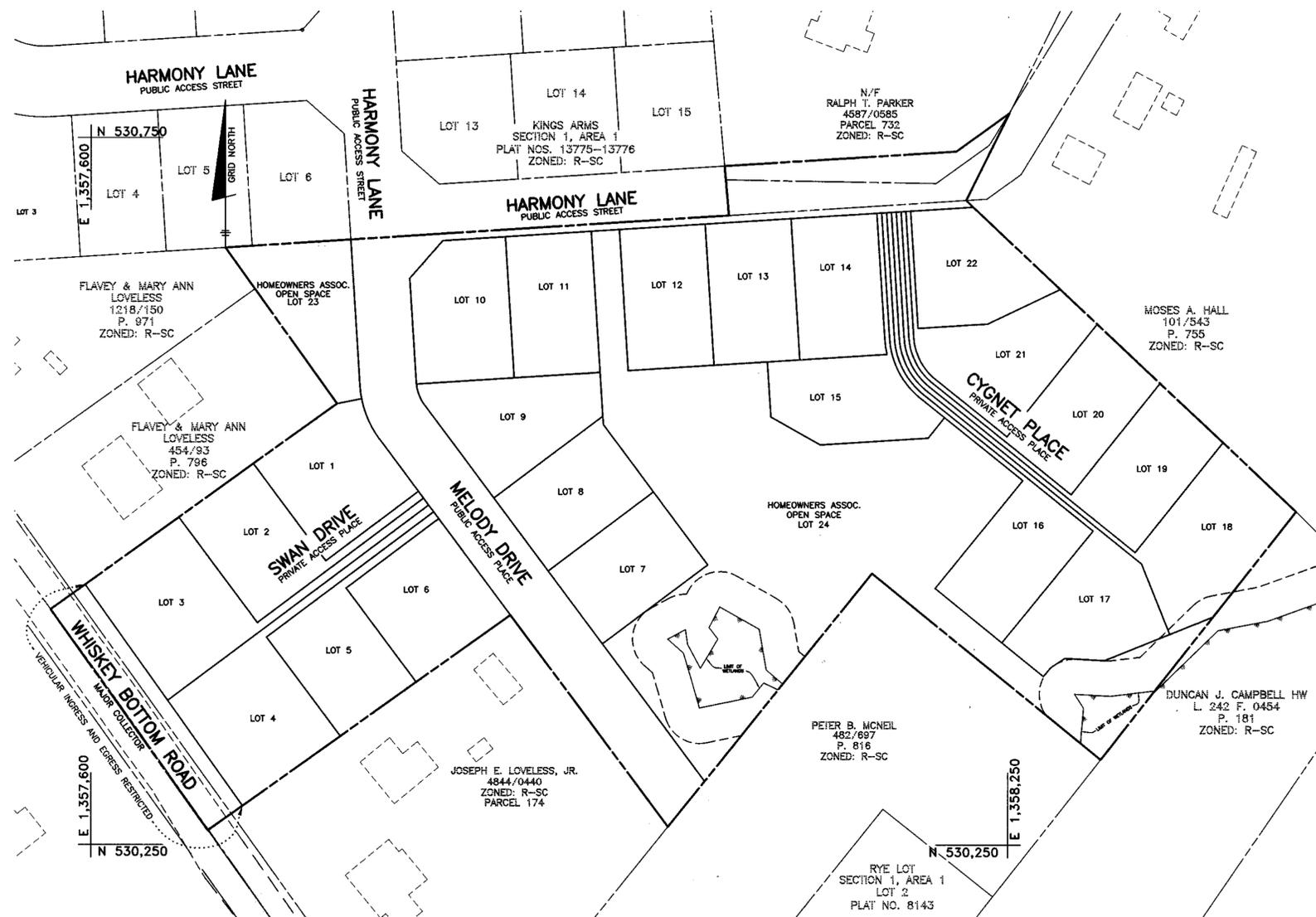
- 1.) ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE, UNLESS WAIVER(S) HAVE BEEN APPROVED.
- 2.) THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- 3.) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 4.) TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- 5.) STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993). A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- 6.) THE EXISTING TOPOGRAPHY SHOWN IS BASED ON FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. IN APRIL, 2000.
- 7.) THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 508A AND 5085 WERE USED FOR THIS PROJECT.
- 8.) WATER AND SEWER SYSTEMS ARE PUBLIC UNDER CONTRACT NUMBER 24-3959-D. THE DRAINAGE AREA IS PATUXENT.
- 9.) STORMWATER MANAGEMENT SHALL BE PROVIDED BY EXTENDED DETENTION. THE FACILITY IS TO BE A CLASS 'A' STRUCTURE. THE FACILITY WILL BE PRIVATELY OWNED AND MAINTAINED.
- 10.) THERE ARE NO 100-YR FLOODPLAINS, STREAMS OR STEEP SLOPES LOCATED ON-SITE.
- 11.) WETLAND DELINEATION PROVIDED BY ECO-SCIENCE PROFESSIONALS, INC. DATED OCTOBER, 1998.
- 12.) TRAFFIC STUDY WAS PREPARED BY LEE CUNNINGHAM & ASSOCIATES, INC. DATE MAY, 1999.
- 13.) FOREST STAND DELINEATION PROVIDED BY ECO-SCIENCES, INC. DATED OCTOBER, 1998.
- 14.) NO DISTURBANCE SHALL OCCUR IN THE WETLANDS OR 25' WETLAND BUFFER EXCEPT AS PERMITTED BY THE DEPARTMENT OF PLANNING AND ZONING.
- 15.) MINIMUM BUILDABLE LOT SIZE SHALL BE 6,000 SQUARE FEET.
- 16.) THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
- 17.) TO THE BEST OF OUR KNOWLEDGE THERE ARE NO CEMETERY LOCATIONS ON-SITE.
- 18.) BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED ON OR ABOUT JANUARY, 2001 BY BENCHMARK ENGINEERING, INC.
- 19.) ALL EXISTING WELLS AND SEPTICS IF LOCATED ON THIS PROPERTY SHALL BE ABANDONED AND VERIFICATION OF THE ABANDONMENT SHALL BE SUBMITTED TO THE HEALTH DEPARTMENT PRIOR TO RECORDATION OF THE PLAT OF SUBDIVISION.
- 20.) FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT OF WAY LINE AND NOT THE FLAG OR PIPESTEM LOT DRIVEWAY.
- 21.) DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
  - a) WIDTH - 12' (14' SERVING MORE THAN ONE RESIDENCE).
  - b) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN).
  - c) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS.
  - d) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
  - e) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
  - f) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
  - g) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- 22.) DRY WELLS WILL BE PROVIDED FOR THE HOUSES ON LOTS 16-20 WHICH ARE NOT CONTROLLED AND ARE OVERMANAGED BY THE PROPOSED EXTENDED DETENTION POND.
- 23.) TO FULFILL THE REQUIREMENTS OF SECTION 16.1800 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT, AN OFFSITE REFORESTATION EASEMENT OF 3.2 ACRES IS PROPOSED ON NON-BUILDABLE PRESERVATION PARCEL 'B' OF HIGH FOREST ESTATES (F-98-167) PER REVISION PLAT F-02-56 TO BE RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY. THE ORIGINAL FOREST CONSERVATION PLAN FOR HIGH FOREST ESTATES WAS RECORDED UNDER F-98-165 AS BIG BRANCH OVERLOOK. A REVISION PLAT HAS BEEN PROVIDED AND WILL BE RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY, MARYLAND.
- 24.) A JOINT FEDERAL/STATE APPLICATION FOR THE ALTERATION OF THE NONTIDAL WETLANDS AND BUFFER LOCATED AT THE END OF MELODY DRIVE AND AT THE CROSSING OF THE PROPOSED SEWER LINE WAS RECEIVED AT THE MARYLAND DEPARTMENT OF THE ENVIRONMENT ON SEPTEMBER 26, 2001. THE WMA WILL ISSUE A LETTER OF AUTHORIZATION ONCE THE FINAL PLANS HAVE BEEN SIGNED. TRACKING NUMBER 01-NT-0435/200166476.

# ROAD AND STORM DRAIN CONSTRUCTION PLANS KINGS ARMS SECTION 2 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

BENCH MARKS--(NAD'83)			
HO. CO. #508A	EL. N/A	STANDARD DISC ON CONC. MONUMENT	
N 527561.6702'	E 1359772.5936'		
HO. CO. #5085	EL. 178.242'	STANDARD DISC ON CONC. MONUMENT	
N 524999.3640'	E 1357925.6751'		



VICINITY MAP  
SCALE: 1" = 2000'



PLAN VIEW  
SCALE: 1" = 50'

SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD PLAN
3	ROAD PROFILES AND DETAILS
4	HARMONY LANE CROSS-SECTIONS
5	TRAFFIC CONTROL PLAN
6	STORM DRAIN DRAINAGE AREA MAP
7	STORM DRAIN PROFILES AND SWM CONSTRUCTION SPECS.
8	GRADING, SEDIMENT AND EROSION CONTROL PLAN
9	SEDIMENT CONTROL NOTES AND DETAILS
10	STORMWATER MANAGEMENT DETAILS
11	LANDSCAPE PLAN
12	OFFSITE REFORESTATION PLAN
13	OFFSITE REFORESTATION NOTES AND DETAILS

NO.	DATE	REVISION

**BENCHMARK**  
ENGINEERS & LAND SURVEYORS & PLANNERS  
**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 A FAX: 410-465-6644  
EMAIL: Benchmark@coia.com

1/15/02

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

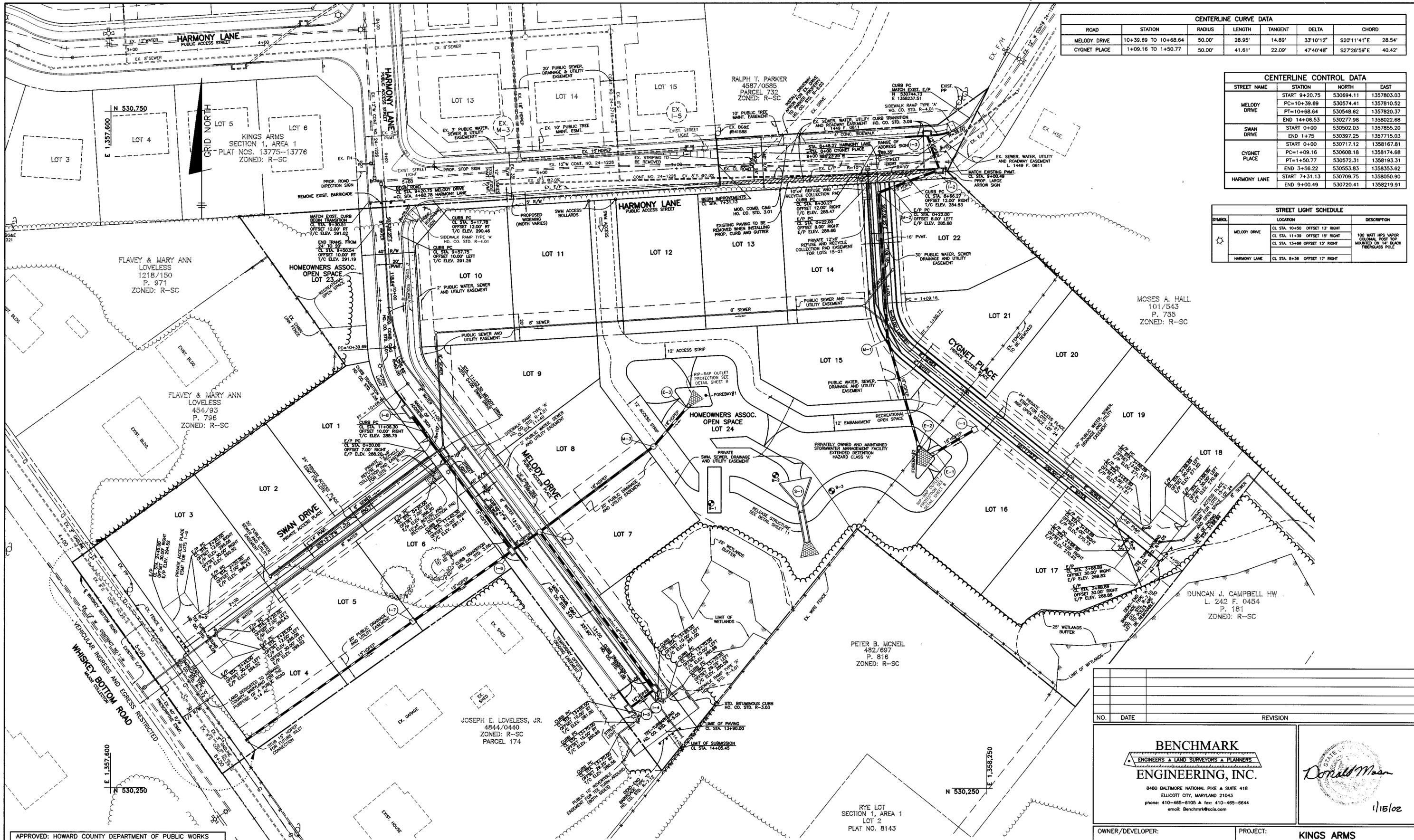
*Andrew M. Anable* 2/1/02  
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Cindy Hanote* 3/1/02  
CHIEF, DIVISION OF LAND DEVELOPMENT

*Michael P. ...* 2/1/02  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

OWNER/DEVELOPER:  SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	PROJECT: <b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
TITLE: <b>TITLE SHEET</b> S-99-23 P-00-14	LOCATION: TAX MAP: 47, GRID: 22 PARCELS: 174, 496 AND 732 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: FEBRUARY 18, 2001 JANUARY 2, 2002	PROJECT NO. 1139 SHEET 1 OF 13
DESIGN: DBT DRAFT: DBT CHECK: DAM	SCALE: AS SHOWN



CENTERLINE CURVE DATA						
ROAD	STATION	RADIUS	LENGTH	TANGENT	DELTA	CHORD
MELODY DRIVE	10+39.89 TO 10+68.64	50.00'	28.95'	14.89'	33°10'12"	S2°11'41"E 28.54'
CYGNET PLACE	1+09.16 TO 1+50.77	50.00'	41.61'	22.09'	47°40'48"	S27°26'59"E 40.42'

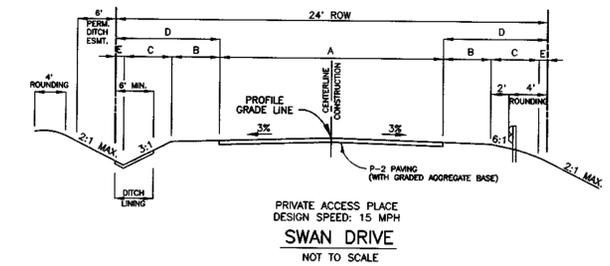
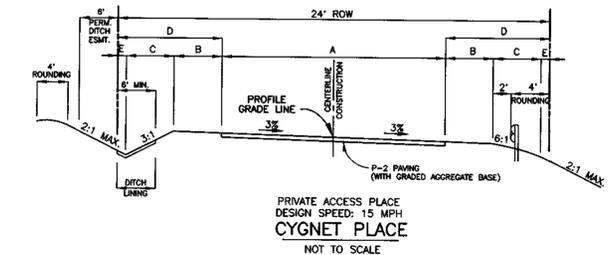
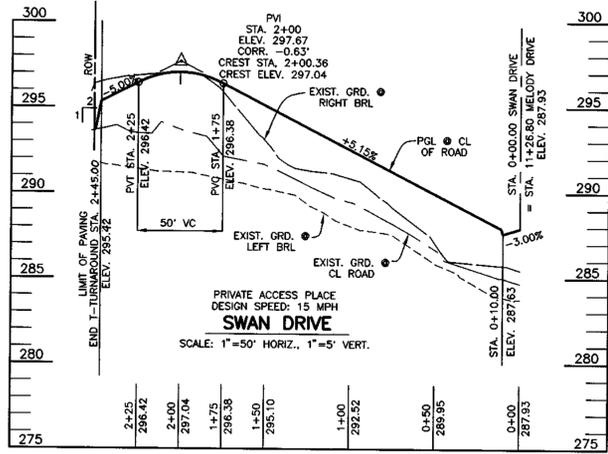
CENTERLINE CONTROL DATA			
STREET NAME	STATION	NORTH	EAST
MELODY DRIVE	START 9+20.75	530694.11	1357803.03
	PC=10+39.89	530574.41	1357810.52
	PT=10+68.64	530548.62	1357820.37
SWANN DRIVE	END 14+06.53	530277.98	1358022.68
	START 0+00	530502.03	1357855.20
CYGNET PLACE	END 14+75	530397.25	1357715.03
	START 0+00	530717.12	1358167.81
	PC=14+09.16	530608.18	1358174.68
HARMONY LANE	PT=1+50.77	530572.31	1358193.31
	END 3+56.22	530553.83	1358353.62
	START 7+31.13	530708.75	1358050.90
	END 9+00.49	530720.41	1358219.91

STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
☀	MELODY DRIVE CL STA. 10+50 OFFSET 13' RIGHT	100 WATT HPS VAPOR COLONIAL POST TOP MOUNTED ON 14" BLACK FIBERGLASS POLE
	CL STA. 11+39 OFFSET 15' RIGHT	
	CL STA. 13+66 OFFSET 13' RIGHT	
☀	HARMONY LANE CL STA. 8+36 OFFSET 17' RIGHT	

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Robert M. Qualle* 2-14-02  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Hamat* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*John P. ...* 2/16  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

PLAN VIEW  
 SCALE: 1" = 30'

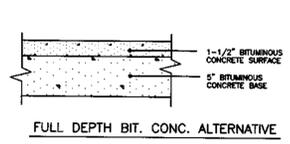
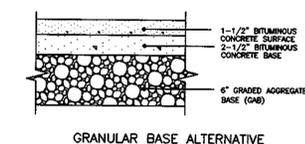
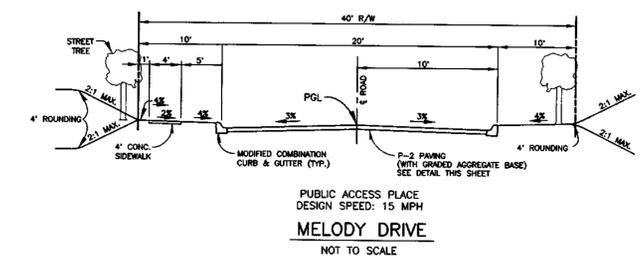
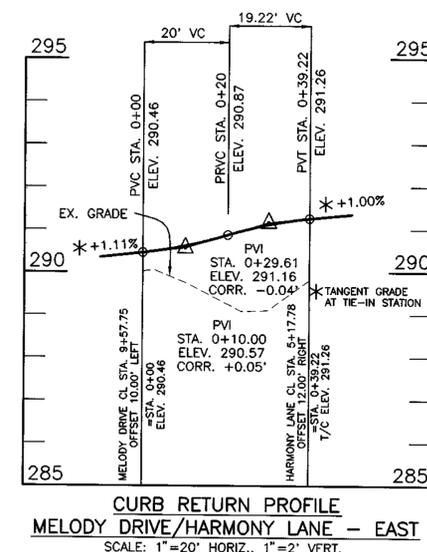
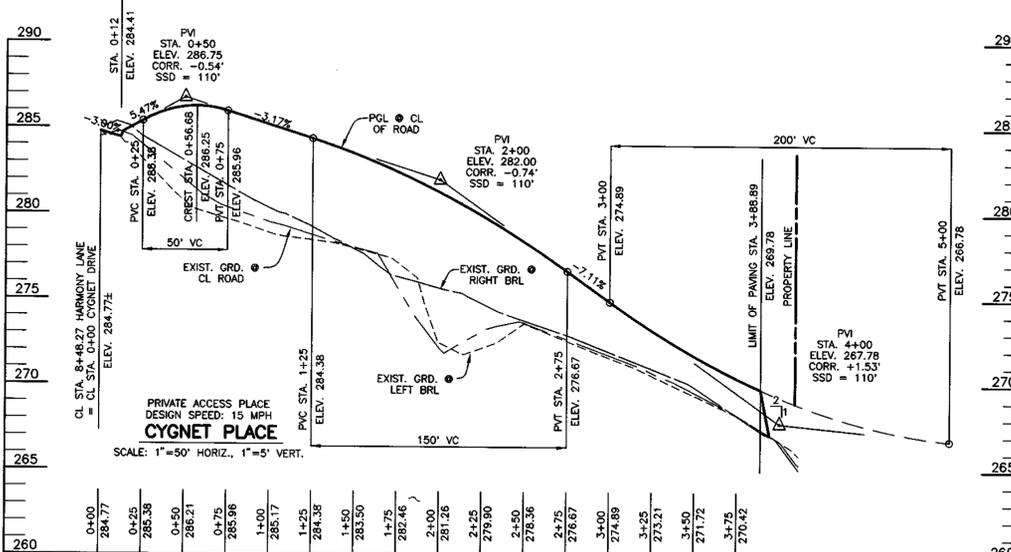
NO. DATE REVISION	
<b>BENCHMARK</b> ENGINEERS & LAND SURVEYORS & PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 phone: 410-465-6105 A fax: 410-465-6644 email: Benchmark@bcia.com	
OWNER/DEVELOPER:	PROJECT:
SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	<b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
TITLE:	ROAD PLAN
DATE: FEBRUARY 18, 2001 JANUARY 2, 2002	PROJECT NO. 1139 SHEET 2 OF 13
DESIGN: DBT DRAFT: DBT CHECK: DAM	SCALE: AS SHOWN



NOTE: USE GUARD RAIL WHERE INDICATED BY FIGURE 2.14.

CLASSIFICATION	A	B	C	D	E	R/W
ACCESS PLACE	PRIVATE - 100 ADT	14'	4'	1'	5'	24'
	PUBLIC - 200 ADT	18'	4'	4'	11'	40'
ACCESS STREET	PRIVATE - 100 ADT	22'	4'	4'	11'	40'
	PUBLIC - 100 ADT	24'	4'	4'	13'	50'
MINOR COLLECT.	PRIVATE - 100 ADT	24'	4'	4'	13'	50'

\* 10' FOR CYGNET PLACE

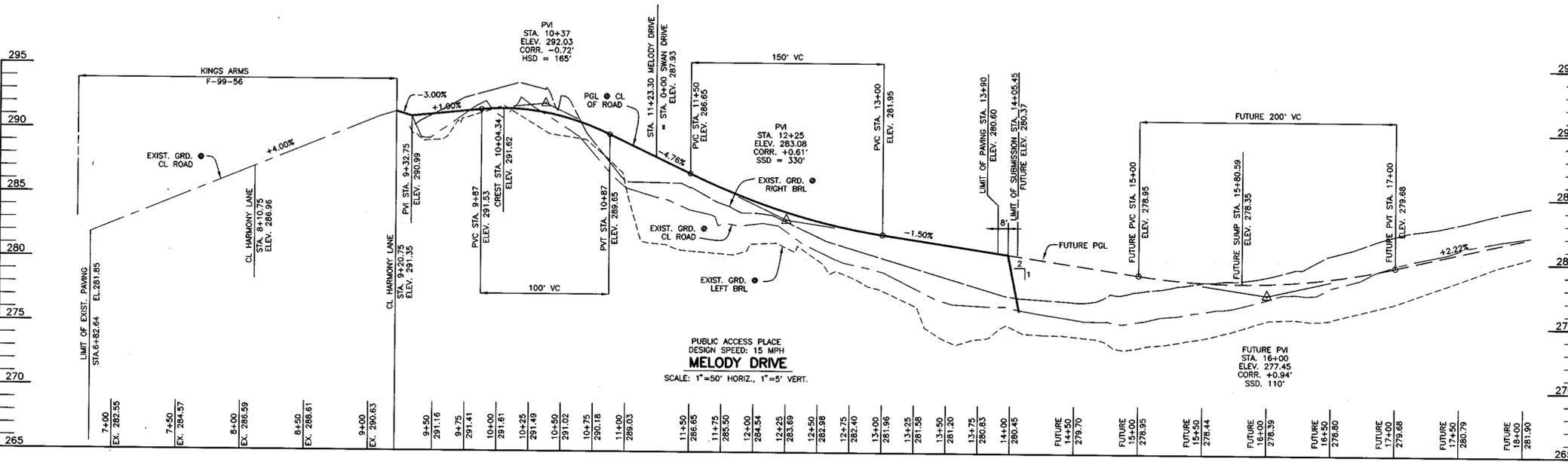


P-2 PAVING DETAIL  
NOT TO SCALE

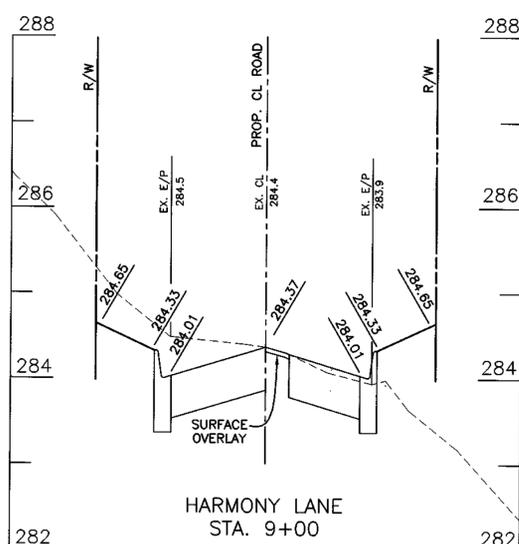
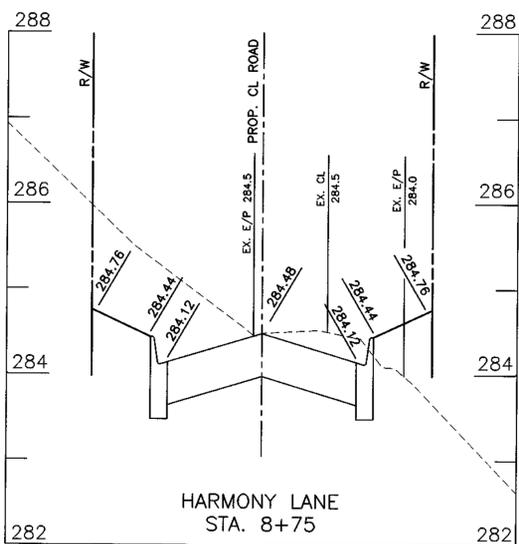
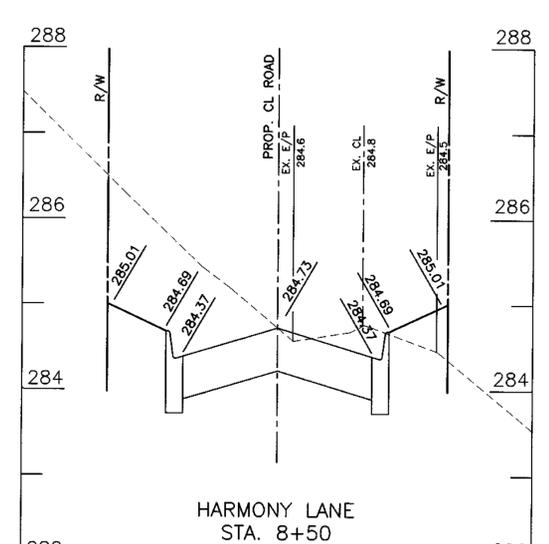
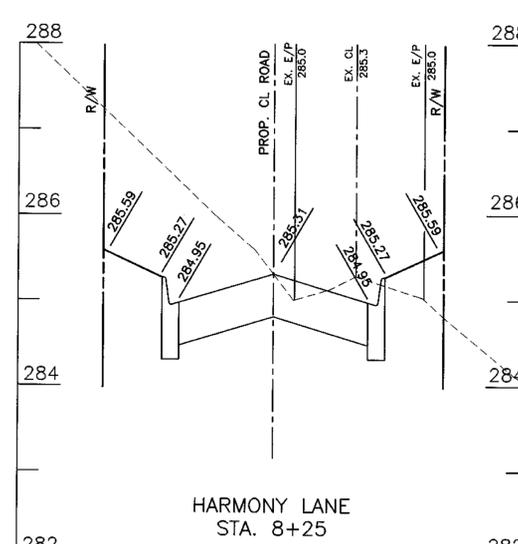
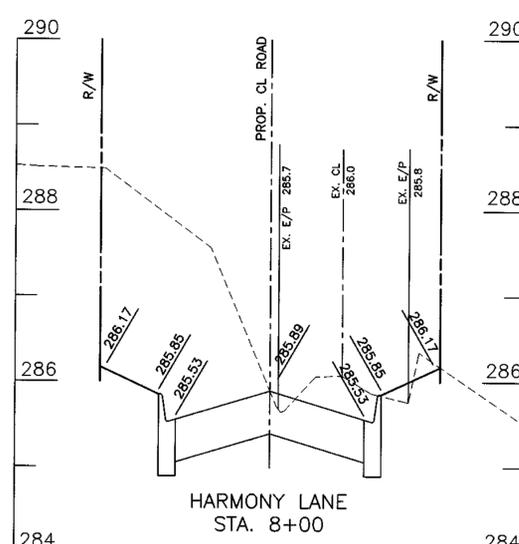
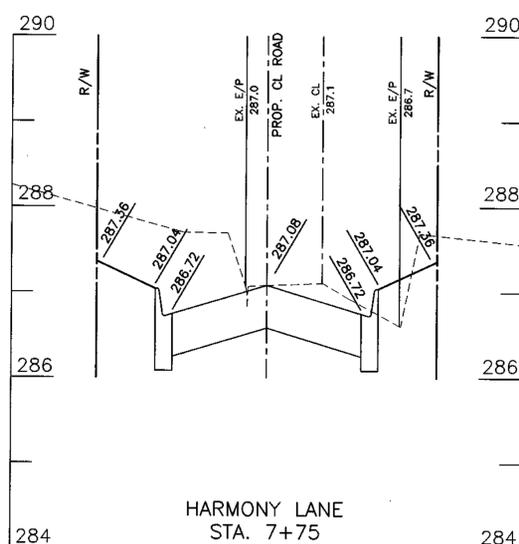
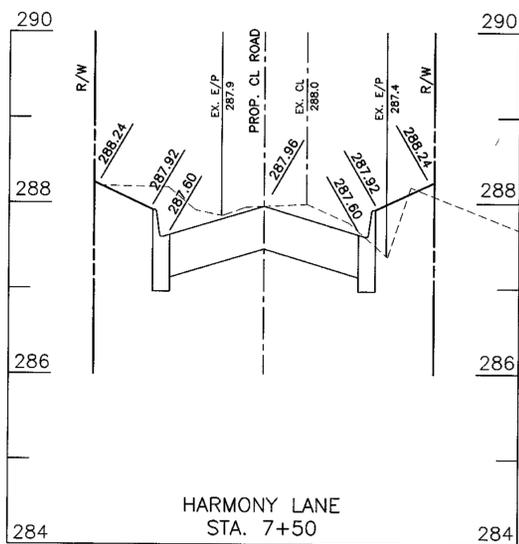
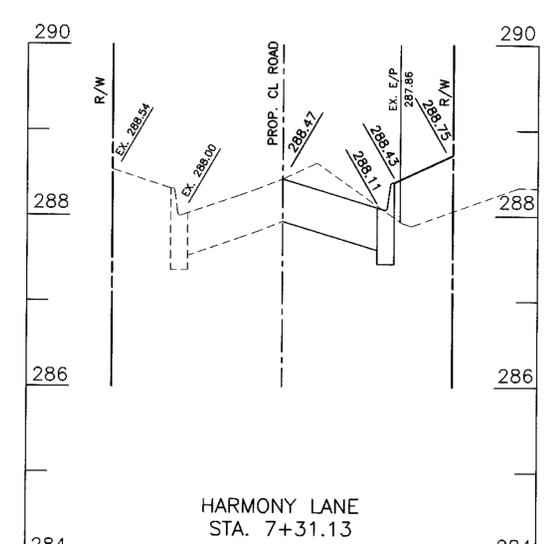
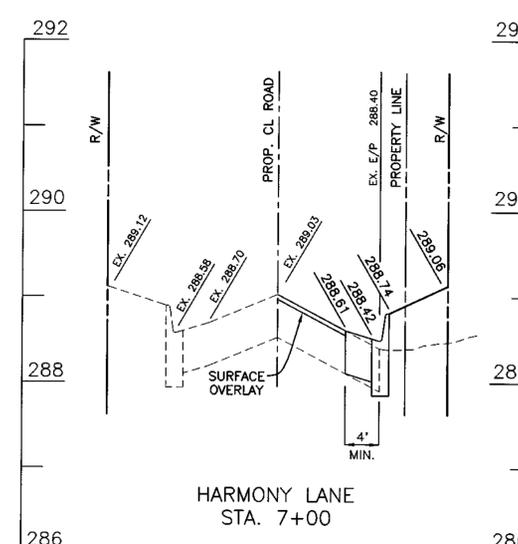
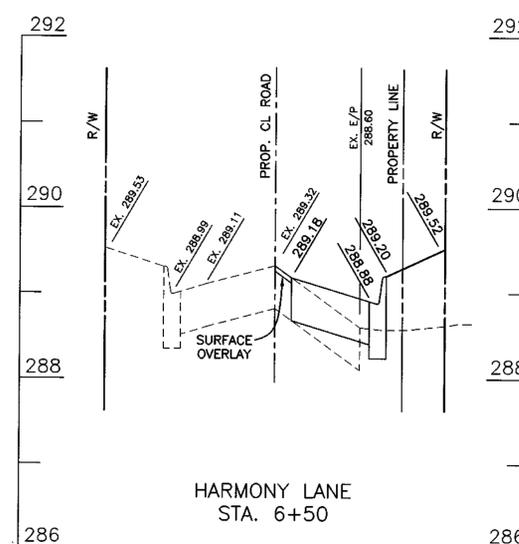
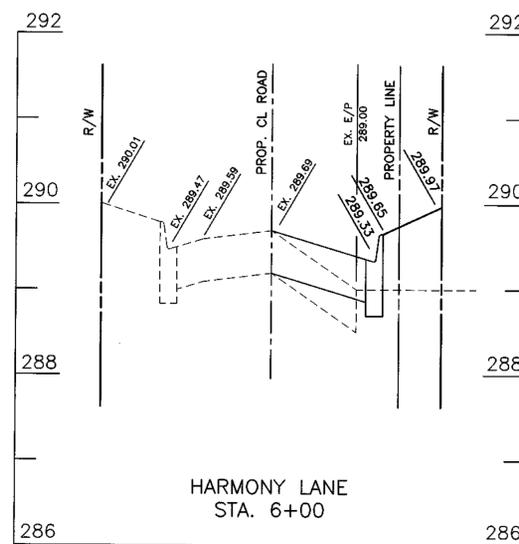
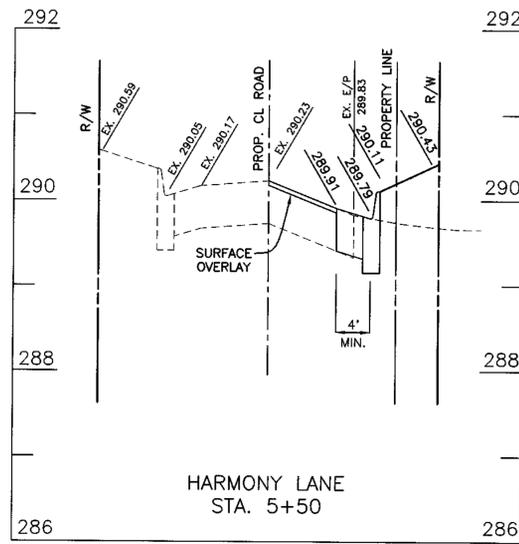
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Richard M. Danks* 2/14/02  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*John Hanita* 3/1/02  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

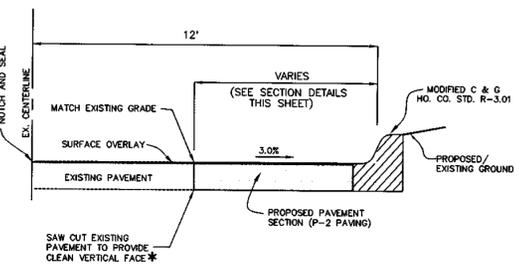
*Michael J. ...* 2/1/02  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



NO.	DATE	REVISION
<b>BENCHMARK</b> ENGINEERS & LAND SURVEYORS & PLANNERS <b>ENGINEERING, INC.</b> 6480 BALTIMORE NATIONAL PIKE A SUITE 418 ELLICOTT CITY, MARYLAND 21043 phone: 410-465-6105 A fax: 410-465-6644 email: Benchmark@earthlink.net		
OWNER/DEVELOPER:		PROJECT:
SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		<b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
LOCATION:		TAX MAP: 47, GRID: 22 PARCELS: 174, 496 AND P/O 732 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE:		<b>ROAD PROFILES AND DETAILS</b>
DATE: FEBRUARY 18, 2001 JANUARY 2, 2002		PROJECT NO. 1139
DESIGN: DBT	DRAFT: DBT	CHECK: DAM
SCALE: AS SHOWN	SHEET 3	OF 13



- NOTES:
1. THE SURFACE OVERLAY SHALL BE CARRIED TO THE CENTERLINE OF THE ROAD AND BE NOTCHED AND SEALED.
  2. SURFACE OVERLAY COURSE TO BE EQUAL TO SURFACE COURSE OF TYPICAL PAVING SECTION OF SUBDIVISION.
  3. CENTERLINE OF ROAD TO BE MILLED AT DEPTH OF 1-1/2" x 1' WIDE USING A MILLING MACHINE.



STA. 4+82.78 TO 7+31.13 (RIGHT)  
**PAVEMENT DETAIL FOR  
 HARMONY LANE WIDENING**  
 NOT TO SCALE

\* NOTE:  
 A MINIMUM 1 FOOT SAWCUT INTO THE EXISTING PAVING IS REQUIRED.

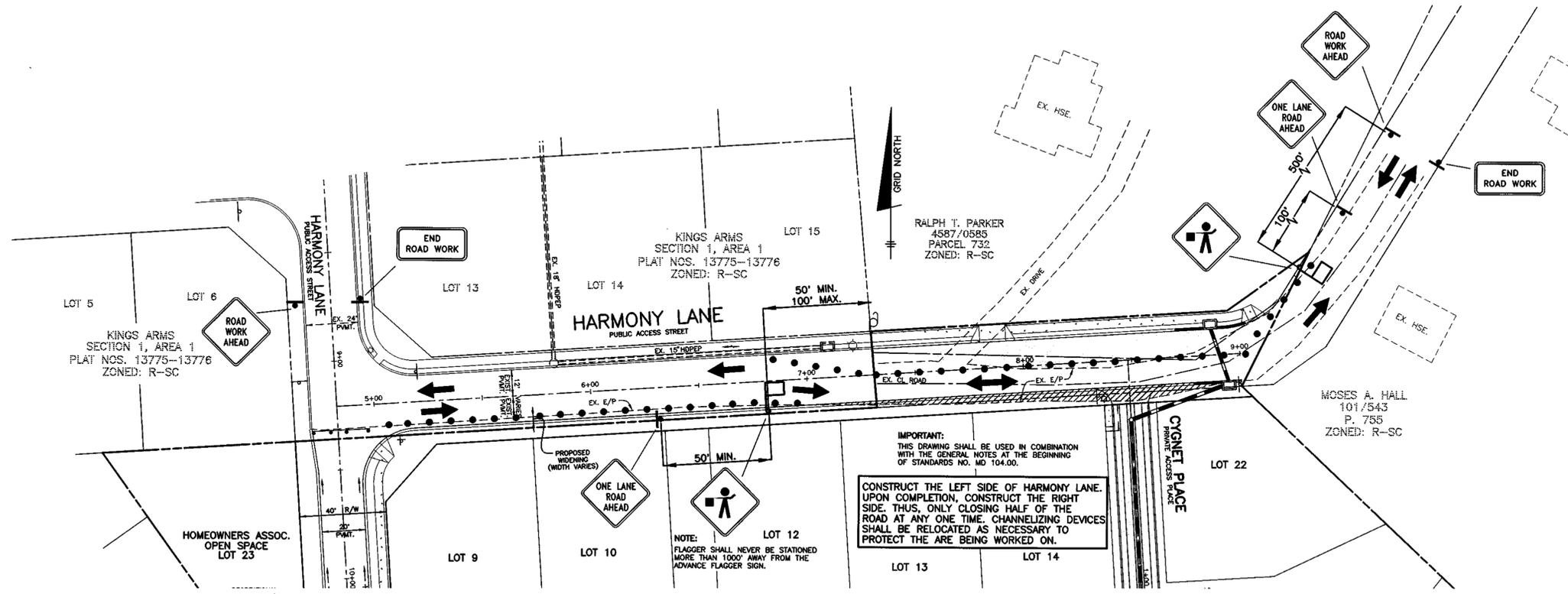
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Sparks* 2-14-02  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Harrold* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE

*Chris Deane* 2/11/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION (P/R)

**WIDENING SECTIONS FOR  
 HARMONY LANE**  
 SCALE: 1" = 10' HORIZ., 1" = 1' VERT.

NO.		DATE		REVISION	
<b>BENCHMARK</b> ENGINEERS • LAND SURVEYORS • PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE • SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6844			 1/15/02		
OWNER/DEVELOPER:			PROJECT:		
SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244			<b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24		
DATE: FEBRUARY 18, 2001 JANUARY 2, 2002			LOCATION: TAX MAP: 47, GRID: 22 PARCELS: 174, 496 AND P/O 732 830 ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
DESIGN: DBT			TITLE: HARMONY LANE CROSS-SECTIONS		
DRAFT: DBT			S-99-23 P-00-14		
CHECK: DAM			DATE: FEBRUARY 18, 2001 JANUARY 2, 2002		
SCALE: AS SHOWN			PROJECT NO. 1139		
SHEET 4 OF 13					



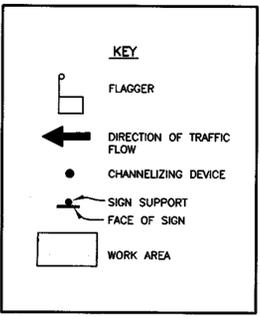
**PLAN VIEW**  
SCALE: 1" = 30'

**IMPORTANT:**  
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES AT THE BEGINNING OF STANDARDS NO. MD 104.00.

**CONSTRUCT THE LEFT SIDE OF HARMONY LANE. UPON COMPLETION, CONSTRUCT THE RIGHT SIDE. THUS, ONLY CLOSING HALF OF THE ROAD AT ANY ONE TIME. CHANNELIZING DEVICES SHALL BE RELOCATED AS NECESSARY TO PROTECT THE ARE BEING WORKED ON.**

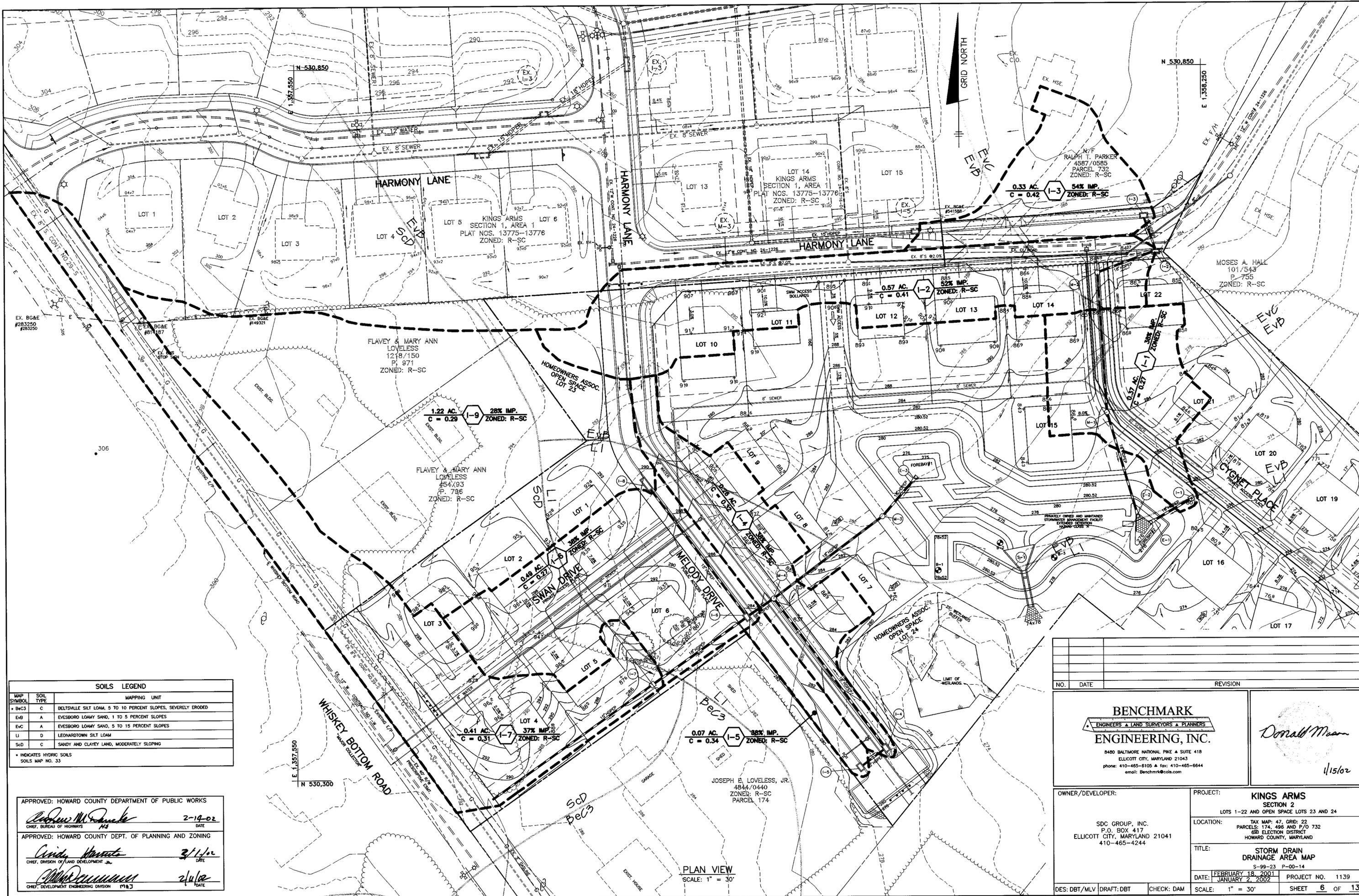
**NOTE:**  
THE CONTRACTOR SHALL SCHEDULE TO COMPLETE A MINIMUM OF A STONE BASE BY THE END OF EACH DAY AND THE ROAD SHALL BE RETURNED TO TWO LANE TRAFFIC WHEN NOT ATTENDED BY FLAGGERS.

**NOTE:**  
FLAGGER SHALL NEVER BE STATIONED MORE THAN 1000' AWAY FROM THE ADVANCE FLAGGER SIGN.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 2/14/02  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*[Signature]* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/11/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.		DATE		REVISION	
<b>BENCHMARK</b> ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6844				<i>Donald Mear</i> 1/15/02	
OWNER/DEVELOPER:			PROJECT:		
SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244			<b>KINGS ARMS SECTION 2</b> LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24		
TITLE:			LOCATION:		
TRAFFIC CONTROL PLAN			TAX MAP: 47, GRID: 22 PARCELS: 174, 498 AND P70 732 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
DATE:			PROJECT NO.:		
FEBRUARY 18, 2001			1139		
JANUARY 2, 2002			SHEET 5 OF 13		
DESIGN: DBT	DRAFT: DBT	CHECK: DAM	SCALE: AS SHOWN		



SOILS LEGEND		
MAP SYMBOL	SOIL TYPE	MAPPING UNIT
Bc3	C	DELTSVILLE SILT LOAM, 5 TO 10 PERCENT SLOPES, SEVERELY ERODED
EVB	A	EVEBORO LOAMY SAND, 1 TO 5 PERCENT SLOPES
EVC	A	EVEBORO LOAMY SAND, 5 TO 15 PERCENT SLOPES
LI	D	LEONARDTOWN SILT LOAM
SdC	C	SANDY AND CLAYEY LAND, MODERATELY SLOPING

\* INDICATES HYDRIC SOILS  
SOILS MAP NO. 33

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Decker* 2-19-02  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Andy Harvath* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*William J. Decker* 2/10/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION

**BENCHMARK**  
 ENGINEERS • LAND SURVEYORS • PLANNERS  
**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 phone: 410-465-6105 • fax: 410-465-6644  
 email: Benchmark@cois.com

*Donald Maan*  
1/15/02

OWNER/DEVELOPER:  SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	PROJECT: <b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
TITLE: <b>STORM DRAIN DRAINAGE AREA MAP</b> S-99-23 P-00-14	DATE: FEBRUARY 18, 2001 JANUARY 2, 2002
DES: DBT/MLV DRAFT: DBT CHECK: DAM	PROJECT NO. 1139 SHEET 6 OF 13

PLAN VIEW  
 SCALE: 1" = 30'

**STORMWATER MANAGEMENT FACILITY  
CONSTRUCTION SPECIFICATIONS**

These specifications are appropriate to all parts within the scope of the Standard for practice MD-376. All references to ASTM and AASHTO specifications apply to the most recent version.

**Site Preparation**

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Clearing shall be done to a depth of no greater than 11". All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry streambed management plans, a minimum of a 25-foot radius around the least structure shall be cleared.

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

**Fill**

**Material** - The fill material shall be taken from approved designated borrow areas. If shall be free of roots, stumps, wood, rubbish, stones greater than 5" from any aggregate material. The material shall be placed in layers not exceeding 12" in thickness and compacted to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #20 sieve. Consideration may be given to use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.

Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

**Placement** - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill material shall be placed in maximum 9" thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portion of the embankment. The fill shall be placed and compacted concurrently with fill placement and not excavated into the embankment.

**Compaction** - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one wheel track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ± 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain the required density to be certified by the Engineer of the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

**Backfill** - The outer trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be a least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

**Embankment Core** - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

**Structure Backfill**

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

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 2-21.1 modified. The mixture shall have a minimum 200 psi 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum 12" (measured perpendicular to the outside of the pipe) of flowable fill shall be placed on top, on end, on the side of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to ensure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent flooding the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any additional soil to be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a constructed fill of 24" or greater over the structure or pipe. Backfill material outside the structure backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

**Pipe Details**

All pipes shall be circular in cross section.

**Corrugated Metal Pipe** - All of the following criteria shall apply for corrugated metal pipe:

1. Material - (Polymer Coated Steel Pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

Material - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be primed with one coat of zinc chromate primer or two coats of asphalt.

Material - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-190 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be primed with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, and sections, etc., must be composed of the same material and coatings as the pipe. Metals must be installed in stainless materials with use of rubber or plastic insulating material at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Coupling bands are not considered to be watertight.

All connection shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the gaskets. The following pipe connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, preformed to the flange, bolt circle, attached between adjacent flanges; a 12-inch wide standard lap type bond with 1/2-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide huffer type bond with 3-ring gaskets having a minimum diameter of 1/2 inch greater than the connection depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long circular corrugated bond using a minimum of 4 (four) rods and nuts, 2 on each connection pipe and a 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal coating or a neoprene bond.

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

5. Backfilling shall conform to "Structure Backfill".

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

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

1. Material - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe to a thickness of at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell and spigot joints shall be made in accordance with the manufacturer's of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be taken to ensure that the bedding is placed to the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "Structure Backfill".

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

**Plastic Pipe** - The following criteria shall apply for plastic pipe:

1. Material - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2411. Corrugated HDPE (Density Polyethylene (DPE)), pipe, conduits and fittings shall conform to the following: 4" - 12" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M24 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

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

4. Backfilling shall conform to "Structure Backfill".

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

**Drainage Diagrams** - When a drainage diagram is used, a registered professional engineer shall supervise the design and construction inspection.

**Concrete**

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

**Rock Riprap**

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

Geotextiles shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

**Care of Water during Construction**

All work on permanent structures shall be carried out in areas free from water. The contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the society or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level of the location being raised shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

**Stabilization**

All borrow areas shall be graded to provide proper drainage and left in a slightly condition. All exposed surfaces of the embankment, spillway, and borrow areas, and farms shall be stabilized by seeding, sowing, fertilizing and mulching in accordance with the Natural Resource Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

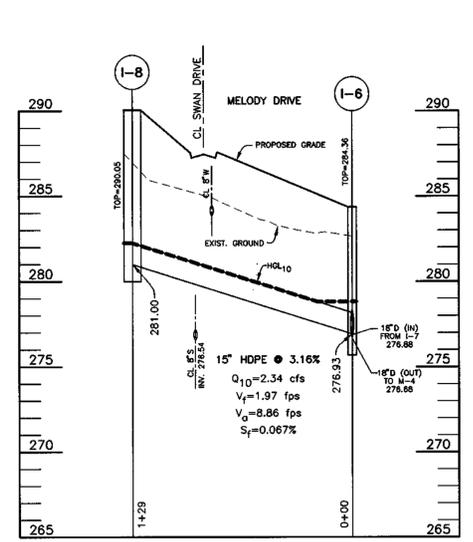
**Erosion and Sediment Control**

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

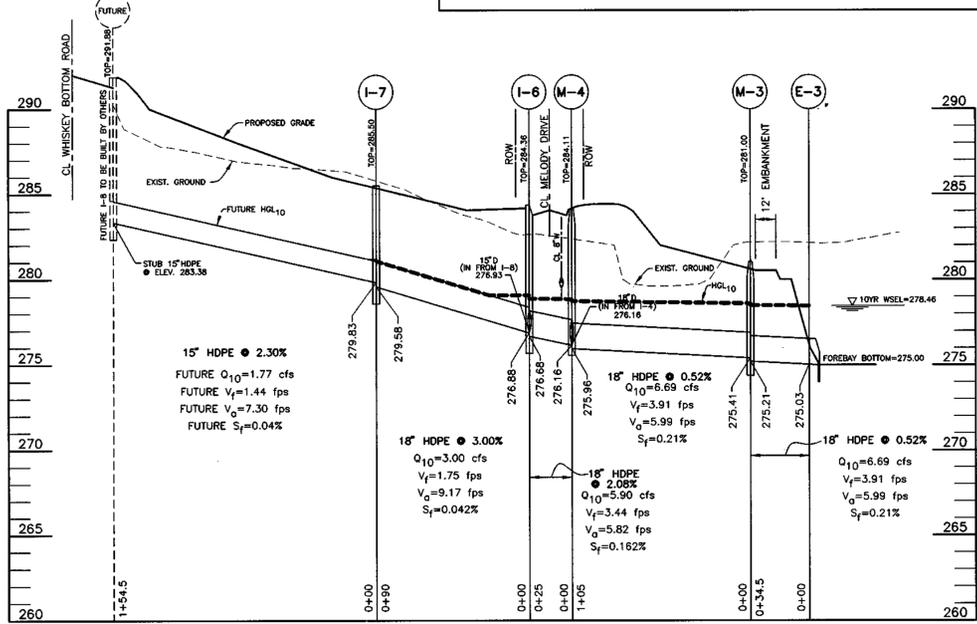
RUN	SIZE	LENGTH	TYPE
E-1 TO I-1	18"	31'	HDPE
E-2 TO M-1	18"	78.5'	HDPE
M-1 TO M-2	18"	108'	HDPE
M-2 TO I-2	18"	48'	HDPE
I-2 TO I-3	15"	29.5'	HDPE
E-3 TO M-3	18"	34.5'	HDPE
M-3 TO M-4	18"	105'	HDPE
M-4 TO I-4	18"	144.5'	HDPE
I-4 TO I-5	15"	24.5'	HDPE
M-4 TO I-6	18"	25'	HDPE
I-6 TO I-7	18"	90'	HDPE
I-6 TO I-8	15"	129'	HDPE
I-7 TO STUB	15"	154.5'	HDPE

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
E-1	18" CONC. END SECTION	N 530499.20 E 1358214.28	276.04	276.00	-	SD - 5.52
E-2	18" CONC. END SECTION	N 530506.40 E 1358198.31	276.04	276.00	-	SD - 5.52
E-3	18" CONC. END SECTION	N 530528.54 E 1358025.30	275.03	275.00	-	SD - 5.52
I-1	TYPE 'D' INLET	N 530514.86 E 1358241.03	-	276.35	280.66	SD - 4.01 OR 4.40
I-2	A-5	CL STA. 8+94.29 HARMONY LANE OFFSET 12.43' RIGHT	279.04	278.79	284.63	SD - 4.02 OR 4.41
I-3	A-5	CL STA. 8+87.00 HARMONY LANE OFFSET 12.43' LEFT	-	279.34	284.67	SD - 4.02 OR 4.41
I-4	A-5	CL STA. 13+59.33 MELODY DRIVE OFFSET 10.43' LEFT	277.16	276.91	281.37	SD - 4.02 OR 4.41
I-5	A-5	CL STA. 13+59.33 MELODY DRIVE OFFSET 10.43' RIGHT	-	277.29	281.37	SD - 4.11 OR 4.39
I-6	A-5	CL STA. 12+13.80 MELODY DRIVE OFFSET 10.43' RIGHT	278.93 (18") 278.88 (18")	276.68	284.36	SD - 4.11 OR 4.39
I-7	TYPE 'D' INLET	N 530372.95 E 1357824.34	279.83	279.58	285.50	SD - 4.02 OR 4.41
I-8	A-10	CL STA. 10+85.00 MELODY DRIVE OFFSET 10.43' RIGHT	-	281.00	290.05	SD - 4.11 OR 4.39
M-1	4'-0" MANHOLE	CL STA. 1+33.51 CYGNET PLACE OFFSET 6.57' RIGHT	277.03	276.83	284.10	G - 5.12
M-2	4'-0" MANHOLE	CL STA. 0+27.39 CYGNET PLACE OFFSET 0.00'	278.31	278.11	286.08	G - 5.12
M-3	4'-0" MANHOLE	CL STA. 12+14.87 MELODY DRIVE OFFSET 118.25' LEFT	275.41	275.21	281.00	G - 5.12
M-4	4'-0" MANHOLE	CL STA. 12+14.87 MELODY DRIVE OFFSET 12.95' LEFT	276.16 (18") 276.16 (18")	275.96	284.11	G - 5.12
S-1	SEE DETAIL	N 530454.20 E 1358112.45	275.00	274.78	280.52	-

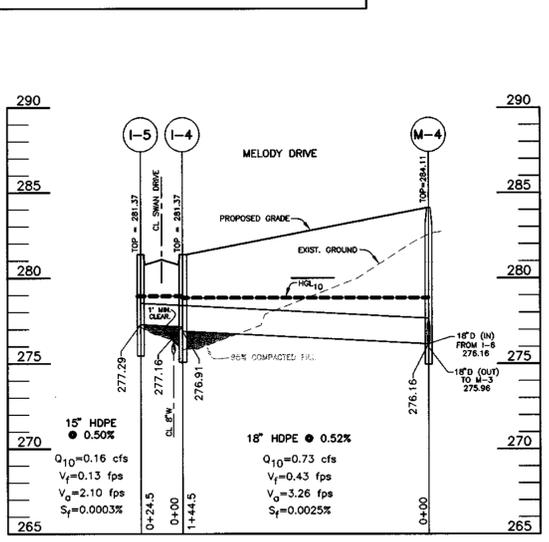
- STRUCTURE ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
- STRUCTURE ELEVATION AND LOCATION FOR INLETS IS AT THE TOP OF CURB AT MIDPOINT OF THE INLET.
- STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT THE CONNECTION OF PIPE AND END SECTION.
- PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
- ALL STORM DRAINS SHALL BE CLASS IV HIGH DENSITY POLYETHYLENE PIPE UNLESS OTHERWISE NOTED.



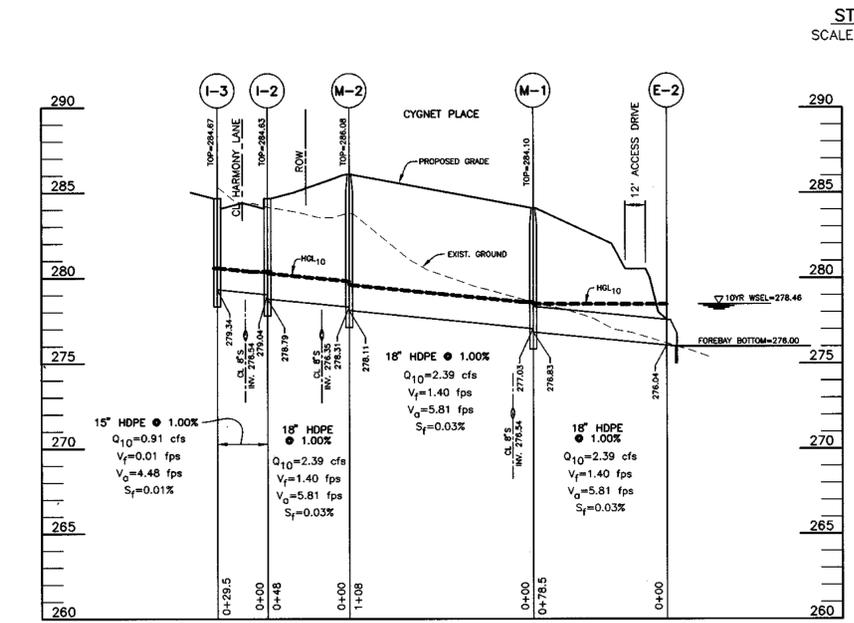
**STORM DRAIN PROFILE**  
SCALE: 1"=50' HORIZ., 1"=5' VERT.



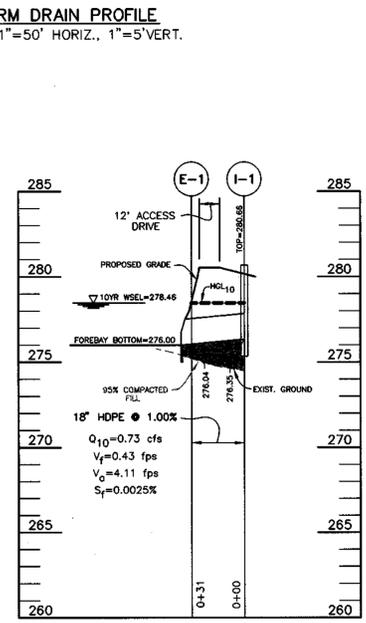
**STORM DRAIN PROFILE**  
SCALE: 1"=50' HORIZ., 1"=5' VERT.



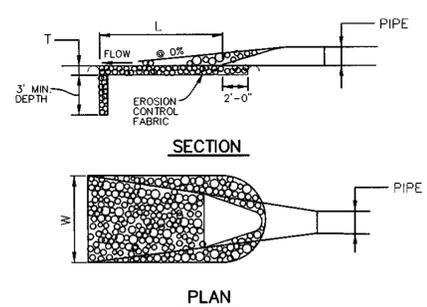
**STORM DRAIN PROFILE**  
SCALE: 1"=50' HORIZ., 1"=5' VERT.



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



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



STRUCTURE	D-50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
E-1	9.5'	10'	12'	19"	I
E-2	9.5'	10'	12'	19"	I
E-3	9.5'	10'	12'	19"	I
S-1	9'	12'	14'	19"	I

**OUTLET PROTECTION DETAIL**  
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Robert M. Daniels* 2/14/02  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*John Hamilton* 3/1/02  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mike Damman* 2/11/02  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844

OWNER/DEVELOPER: SDC GROUP, INC.  
P.O. BOX 417  
ELLICOTT CITY, MARYLAND 21041  
410-465-4244

PROJECT: **KINGS ARMS**  
SECTION 2  
LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
PARCELS: 174, 496 AND P/0 732  
6th ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: **STORM DRAIN PROFILES AND STORMWATER MANAGEMENT CONSTRUCTION SPECS.**  
S-99-23 P-00-14

DATE: FEBRUARY 18, 2001 PROJECT NO. 1139  
JANUARY 2, 2002 SHEET 7 OF 13

DES: MLV/DBT DRAFT: DBT CHECK: DAM SCALE: AS SHOWN

**OPERATION, MAINTENANCE AND INSPECTION NOTE**  
 INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378), THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OPERATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

**AS-BUILT CERTIFICATION**  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

PE NO. \_\_\_\_\_  
 DONALD A. MASON DATE \_\_\_\_\_

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUITABLE AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

**DEVELOPER'S 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 THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

James R. Moly III 1/17/02  
 SDC GROUP, INC. DATE

**ENGINEER'S CERTIFICATE**  
 "I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, 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. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Donald Mason 1/15/02  
 ENGINEER - DONALD A. MASON, P.E. # 21443 DATE

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

Jim Meyer  
 NATURAL RESOURCES CONSERVATION SERVICE DATE

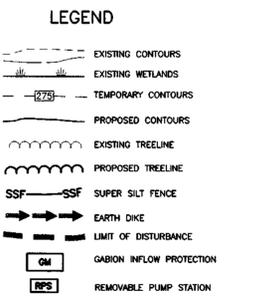
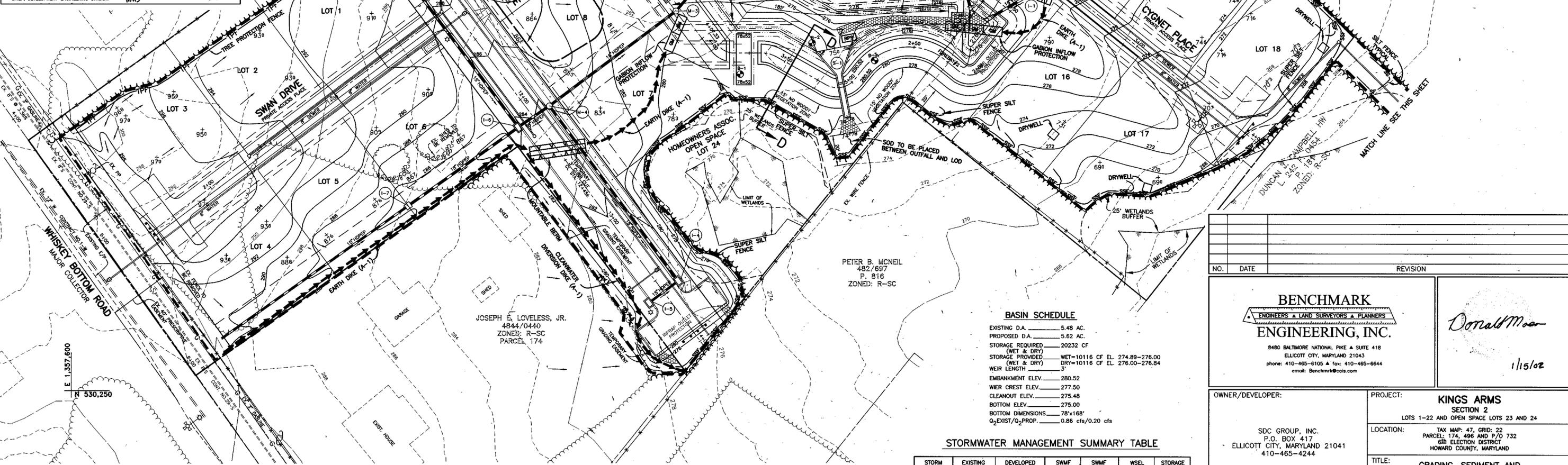
**APPROVED:**  
 THESE PLANS MEET THE SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

2/2/02  
 HOWARD SOIL CONSERVATION DISTRICT DATE

**APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS**  
 2-14-02  
 CHIEF, BUREAU OF HIGHWAYS DATE

**APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING**  
 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

2/11/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



**NOTES:**  
 ACCESS ALONG EXISTING HARMONY LANE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL SCHEDULE TO COMPLETE EACH DAY AND THE ROAD SHALL BE RETURNED TO TWO LANE TRAFFIC WHEN NOT ATTENDED BY FLAGGERS.

**BASIN SCHEDULE**

EXISTING D.A.	5.48 AC.
PROPOSED D.A.	5.62 AC.
STORAGE REQUIRED (WET & DRY)	20232 CF
STORAGE PROVIDED (WET & DRY)	WET=10116 CF EL. 274.89-276.00
	DRY=10116 CF EL. 276.00-276.84
WEIR LENGTH	3'
EMBANKMENT ELEV.	280.52
WEIR CREST ELEV.	277.50
CLEANOUT ELEV.	275.48
BOTTOM ELEV.	275.00
BOTTOM DIMENSIONS	78'x168'
Q <sub>EXIST</sub> /Q <sub>PROP.</sub>	0.86 cfs/0.20 cfs

**STORMWATER MANAGEMENT SUMMARY TABLE**

STORM FREQUENCY	EXISTING RUNOFF (cfs)	DEVELOPED DISCHARGE (cfs)	SWMF INFLOW	SWMF DISCHARGE	WSEL (feet)	STORAGE (ac-ft)
2	3.20	2.75	6.22	0.87	277.61	0.22245
10	11.96	10.01	15.36	8.86	278.30	0.35482
100	24.49	27.31	26.73	23.62	278.94	0.45047

**PLAN VIEW**  
 SCALE: 1" = 30'

NO.	DATE	REVISION
<b>BENCHMARK</b> ENGINEERS & LAND SURVEYORS & PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 phone: 410-465-6105 & fax: 410-465-6644 email: Benchmark@coia.com		
OWNER/DEVELOPER: SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244		PROJECT: <b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24 LOCATION: TAX MAP: 47, GRID: 22 PARCEL: 174, 498 AND P/O 732 G10 ELECTION DISTRICT HOWARD COUNTY, MARYLAND TITLE: <b>GRADING, SEDIMENT AND EROSION CONTROL PLAN</b> S-99-23 P-00-14 DATE: FEBRUARY 18, 2001 PROJECT NO. 1139 SCALE: AS SHOWN SHEET 8 OF 13
DES: DBT/MLV	DRAFT: DBT	CHECK: DAM

SEDIMENT CONTROL NOTES

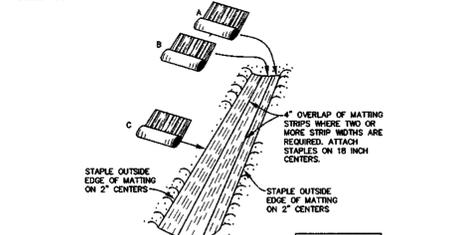
- 1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION... 2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT 'MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL', REVISIONS THEREIN AND... 3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, Dikes, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, (B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

TEMPORARY SEEDBED PREPARATIONS

- APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED. SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED. SOIL AMENDMENTS: APPLY 800 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT). SEEDING: FOR PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT) FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF MEADOW LOWGROSS (0.7 LBS/1000 SQ FT) FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28. PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOU.

PERMANENT SEEDBED PREPARATIONS

- SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED. SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES. 1. PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 800 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0-0 UREAFORM FERTILIZER (8 LBS/1000 SQ FT). 2. ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.



- CONSTRUCTION SPECIFICATIONS 1. KEY-IN THE MATTING BY PLACING THE TOP EDGES OF THE MATTING IN A NARROW TRENCH 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH, SPACING BETWEEN STAPLES IS 6". 2. STAPLE THE 4" OVERLAP IN THE CHANNEL CENTER USING AN 18" SPACING BETWEEN STAPLES. BEFORE STAPLING THE OUTER EDGES OF THE MATTING, MAKE SURE THE MATTING IS SMOOTH AND IN FIRM CONTACT WITH THE SOIL.

SOIL STABILIZATION MATTING

NOT TO SCALE

TOPSOIL SPECIFICATIONS

- I. Topsoil salvaged from the existing site may be used provided that it meets that standards set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experiment Station. II. Topsoil Specifications - Soil to be used on topsoil must meet the following: 1. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist approved by the appropriate approval authority. Topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by volume of cinders, stones, logs, coarse fragments, gravel, sticks, roots, twigs, or other materials larger than 1-1/2" in diameter.

DRY WELL DETAIL

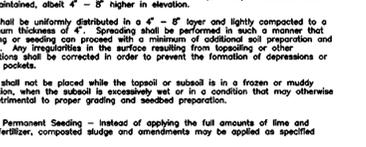
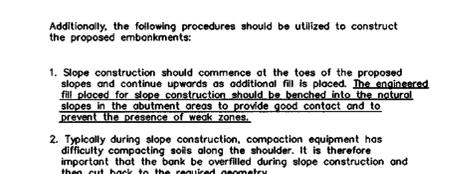


Table with 4 columns: LOT NUMBER, DEPTH (FT.), LENGTH (FT.), WIDTH (FT.). Rows 16, 17, 18, 20.

HILLS-CARNES ENGINEERING ASSOCIATES, INC. RECOMMENDATIONS

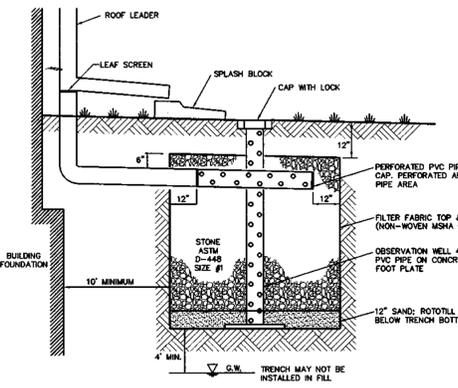
- Embankment and Cut-out trench Construction The site should be stripped of topsoil and any other unsuitable materials from the embankment or structure area in accordance with Soil Conservation Guidelines. After stripping operations have been completed, the exposed subgrade materials should be profiled with a loaded dumptruck or similar equipment in the presence of a geotechnical engineer or his/her representative. For areas that are not accessible to a dump truck, the exposed materials should be observed and tested by a geotechnical engineer or his/her representative utilizing a Dynamic Cone Penetrometer. Any excessively soft or loose materials identified by profiling or penetrometer testing should be excavated to suitable firm soil, and then grades re-established by backfilling with suitable soil.



- 1. Slope construction should commence at the toes of the proposed slopes and continue upwards as additional fill is placed. The engineer shall allow for slope construction to be launched into the natural slopes in the abutment areas to provide good contact and to prevent the presence of weak zones. 2. Typically during slope construction, compaction equipment has difficulty compacting soils along the shoulder. It is therefore important that the bank be overfilled during slope construction and then cut back to the required geometry.

SEQUENCE OF CONSTRUCTION

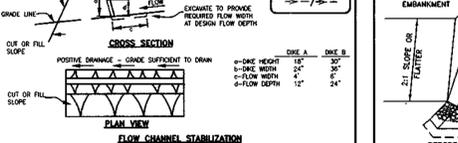
- NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION DAY 1 1. OBTAIN GRADING PERMIT. THE WMA WILL ISSUE A LOA FOR THE PROPOSED WETLANDS DISTURBANCE ONCE FINAL PLANS ARE SIGNED. TRACKING NUMBER 01-NI-0435/200166476. DAY 2-7 2. CLEAR AND GRUB AS REQUIRED TO INSTALL SEDIMENT CONTROL DEVICES ONLY AND INSTALL THE DEVICES. DAY 8-20 3. CONSTRUCT STORMWATER MANAGEMENT FACILITY/SEDIMENT TRAP AND MODIFY TO SMOOTH AND IN FIRM CONTACT WITH THE SOIL. DAY 21-27 4. CLEAR AND GRUB REMAINDER OF SITE AND ROUGH GRADE. DAY 28-35 5. CONSTRUCT WATER AND SEWER MAINS AND OTHER UTILITIES. DAY 36-42 6. INSTALL CURB AND GUTTER AND FINISH. DAY 43-49 7. FINE GRADE REMAINING AREAS AND STABILIZE. DAY 50-55 8. WITH THE APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR CONVERT SWMP/SEDIMENT TRAP TO PERMANENT USE, REMOVE REMAINING SEDIMENT CONTROL DEVICES AND STABILIZE ALL REMAINING DISTURBED AREAS WITH PERMANENT STABILIZATION.



DRY WELL DETAIL

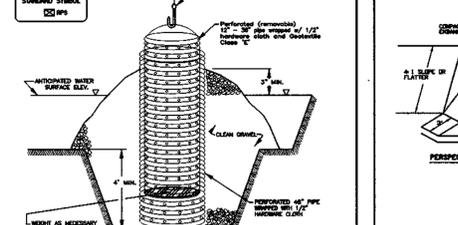
Table with 4 columns: LOT NUMBER, DEPTH (FT.), LENGTH (FT.), WIDTH (FT.). Rows 16, 17, 18, 20.

DETAIL 1 - EARTH DIKE



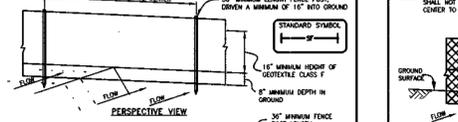
- 1. Seed and cover with straw mulch. 2. Seed and cover with Erosion Control Matting or fill with sod. 3. 4" - 7" stone or recycled concrete equivalent placed into the soil 7" minimum. CONSTRUCTION SPECIFICATIONS 1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades greater than 10%.

DETAIL 20A - REMOVABLE PUMPING STATION



- 1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the inner pipe. The water pipe shall be installed with 1/2" clearance. 2. After installing the water pipe, backfill around water pipe with 3" aggregate. 3. The inside steel pipe (center pipe) should be constructed by perforating a standard pipe with 1/2" x 1/2" diameter holes at 6" centers. The center pipe shall be installed with 1/2" clearance from the aggregate. 4. The center pipe should extend 12" to 18" above the finished water surface elevation of their crest elevation when discharging a beam.

DETAIL 22 - SILT FENCE



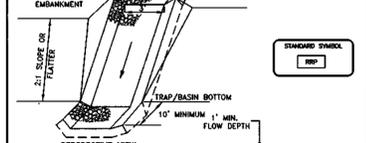
- CONSTRUCTION NOTES FOR FABRICATED SILT FENCE 1. Fence posts shall be a minimum of 1/2" x 1/2" square (minimum) cut, or 1 1/4" diameter (minimum) round and shall be spaced at a maximum of 10.00 feet per linear foot. 2. Silt fence cloth shall be fastened securely to each fence post with wire ties or staples of top and mid-section and shall meet the following requirements for Geotextile Class F: Tensile Strength 50 lbs/ft. (min.) Test: MSMT 509 Flow Rate 0.5 gpm/ft. (min.) Test: MSMT 509 Filtering Efficiency 75% (min.) Test: MSMT 522

Table for Hillis-Carnes Engineering Associates, Inc. showing project details, location, and soil test results for various borings.

Table for Hillis-Carnes Engineering Associates, Inc. showing project details, location, and soil test results for various borings.

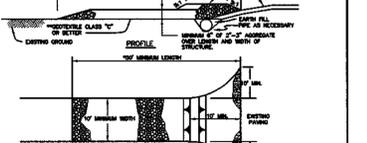
Table for Hillis-Carnes Engineering Associates, Inc. showing project details, location, and soil test results for various borings.

DETAIL 5 - RIP-RAP INFLOW PROTECTION



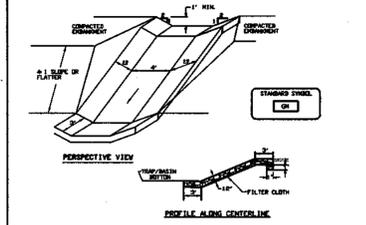
- 1. All lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3 (min.) bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18". 2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C. 3. Entrance and exit lengths shall be installed on both the detail section. 4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility. 5. Gabion Inflow Protection shall be used in lieu of Rip-Rap Inflow Protection. 6. Rip-Rap Protection should blend into existing ground. 7. Rip-rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Slope Inflow Control.

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



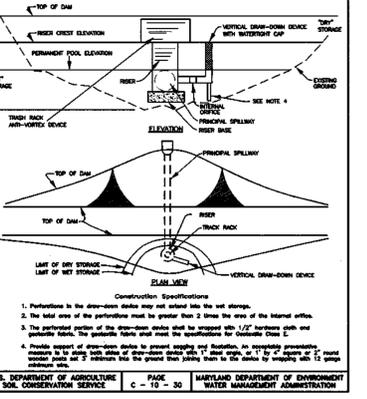
- 1. Length - minimum of 50' (50' for single residence lots). 2. 18"-10" minimum, should be placed at the existing road to provide a turning radius. 3. Bedding fabric (filter cloth) shall be placed over the existing ground prior to installing rip-rap with good approved authority and not require slope stability treatment to be applied. 4. A 6" - 8" minimum aggregate (2" to 3") or recycled or washed concrete, rip-rap shall be placed at least 6" deep over the bedding fabric. 5. Surface Water - At surface water flows to an adjacent existing construction, rip-rap shall be placed through the rip-rap to the existing construction. The rip-rap shall be placed through the rip-rap to the existing construction. The rip-rap shall be placed through the rip-rap to the existing construction.

DETAIL 6 - GABION INFLOW PROTECTION

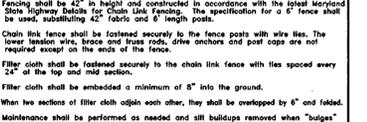


- 1. Gabion inflow protection shall be constructed of 6" x 3" x 6" gabion baskets forming a trapezoidal cross section 2' deep, with 2:1 side slopes, and a 3" bottom width. 2. Geotextile Class C shall be installed under all gabion baskets. 3. The stone used to fill the gabion baskets shall be 4" - 7". 4. Gabions shall be installed in accordance with manufacturers recommendations. 5. Gabion Inflow Protection shall be used where concentrated flow is present on slopes steeper than 4:1.

BASIN DRAW-DOWN SCHEMATIC



SUPER SILT FENCE



- CONSTRUCTION SPECIFICATIONS 1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Design for Chain Link Fencing. The specification for a 5' fence shall be used, substituting 42" fabric and 1/2" diameter wire. 2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and cross rods, drive anchors and post caps are not required except on the ends of the fence. 3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section. 4. Filter cloth shall be embedded a minimum of 8" into the ground. 5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded. 6. Maintenance shall be performed as needed and silt bulges removed when "bulges" develop in the silt fence, or when fill reaches 50% of fence height. 7. Filter cloth shall be fastened securely to each fence post with wire ties or staples of top and mid-section and shall meet the following requirements for Geotextile Class F: Tensile Strength 50 lbs/ft. (min.) Test: MSMT 509 Flow Rate 0.5 gpm/ft. (min.) Test: MSMT 509 Filtering Efficiency 75% (min.) Test: MSMT 522

DETAIL 33 - SUPER SILT FENCE

NOT TO SCALE

ENGINEER'S CERTIFICATE

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

Developer's Certificate: I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THE PLAN OF EROSION AND SEDIMENT CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION OF THIS 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/WE ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY.

Approved: James R. Mosley III, P.E., Engineer, dated 1/15/02.

Approved: Jim Meyers, National Resources Conservation Service, dated 2/27/02.

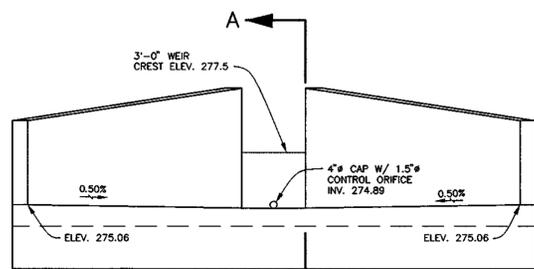
Approved: Howard County Department of Public Works, dated 2-14-02.

Approved: Howard County Dept. of Planning and Zoning, dated 7/1/02.

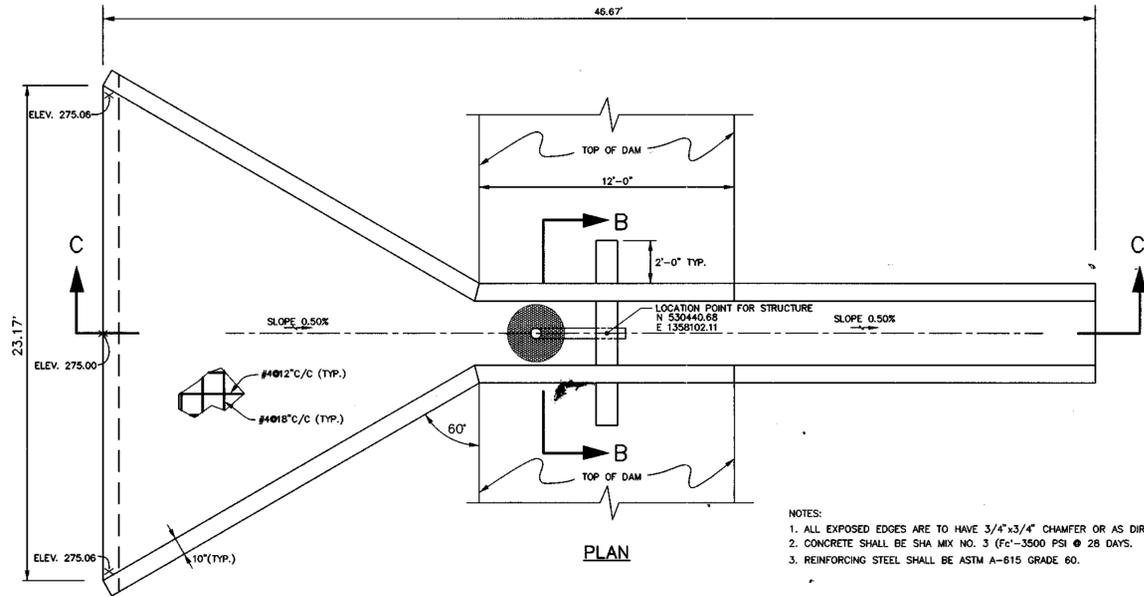
Approved: Chief, Development Engineering Division, dated 2/11/02.

BENCHMARK ENGINEERING, INC. logo and contact information: 8480 BALTIMORE NATIONAL PIKE A SUITE 418, ELLICOTT CITY, MARYLAND 21043.

Table with columns for NO., DATE, REVISION, OWNER/DEVELOPER, PROJECT, LOCATION, TITLE, DATE, PROJECT NO., SCALE, SHEET.

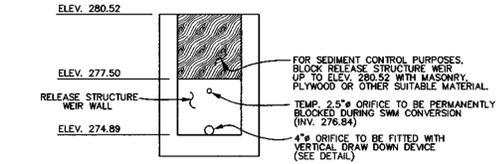


FRONT ELEVATION



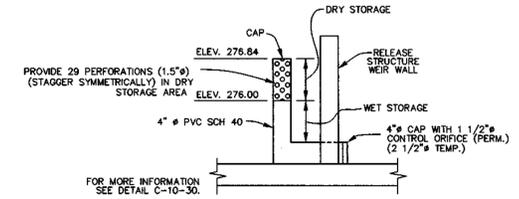
PLAN

- NOTES:
1. ALL EXPOSED EDGES ARE TO HAVE 3/4"x3/4" CHAMFER OR AS DIRECTED.
  2. CONCRETE SHALL BE SHA MIX NO. 3 (F<sub>c</sub>'=3500 PSI @ 28 DAYS).
  3. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.



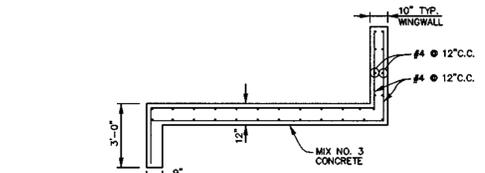
RELEASE STRUCTURE WEIR BLOCKING DETAIL FOR TEMPORARY STORMWATER MANAGEMENT

SCALE: 1" = 4'

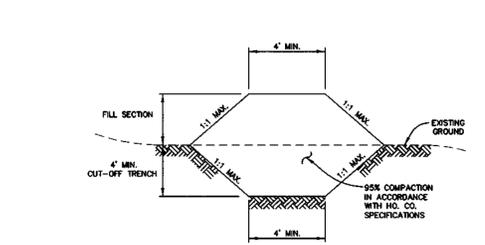


TEMPORARY DEWATERING DEVICE DETAIL

NOT TO SCALE

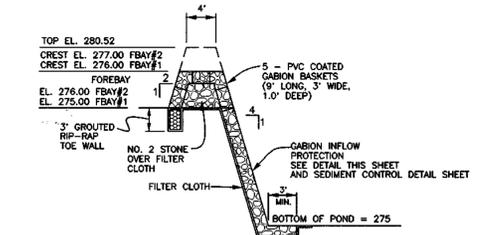


SECTION A-A



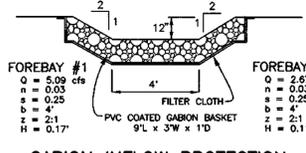
CORE TRENCH SECTION

NOT TO SCALE



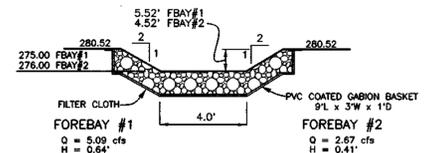
TYPICAL SECTION OF GABION WEIR AT FOREBAY

NOT TO SCALE



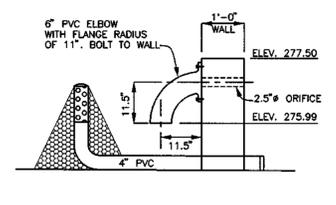
GABION INFLOW PROTECTION CHANNEL AT FOREBAY

NOT TO SCALE



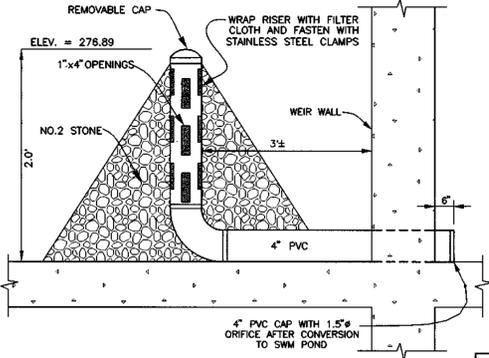
PROFILE THROUGH FOREBAY WEIR

NOT TO SCALE



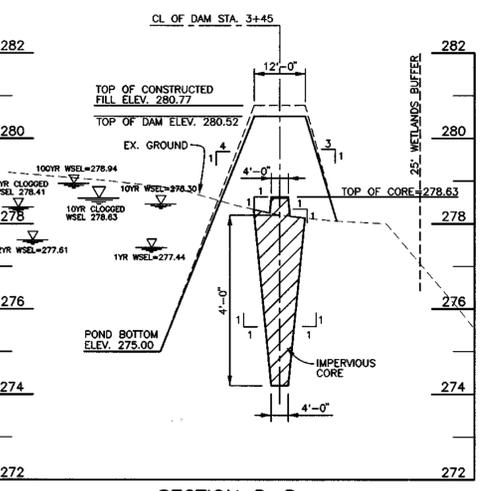
TRASH RACK (INVERTED ELBOW) FOR 2.5" ORIFICE

SCALE: 1" = 2'



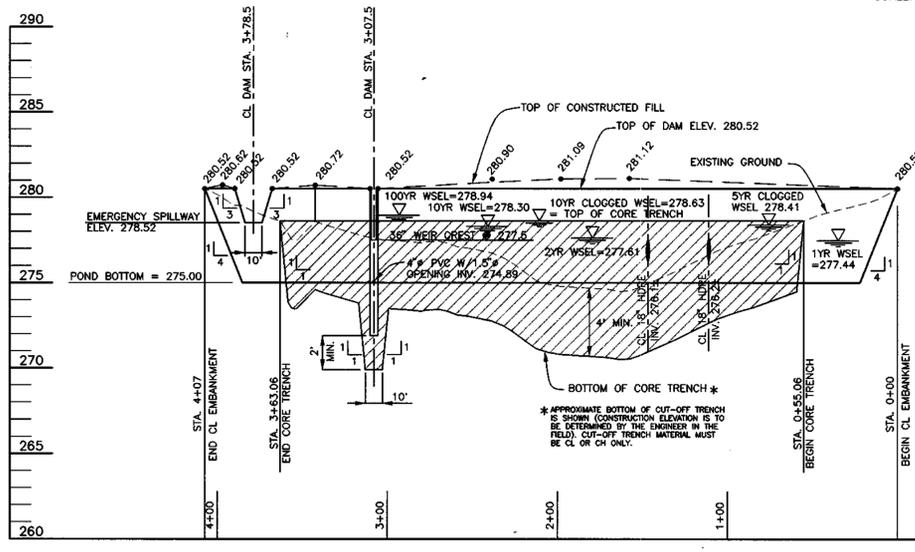
PERMANENT DEWATERING DEVICE DETAIL

NOT TO SCALE



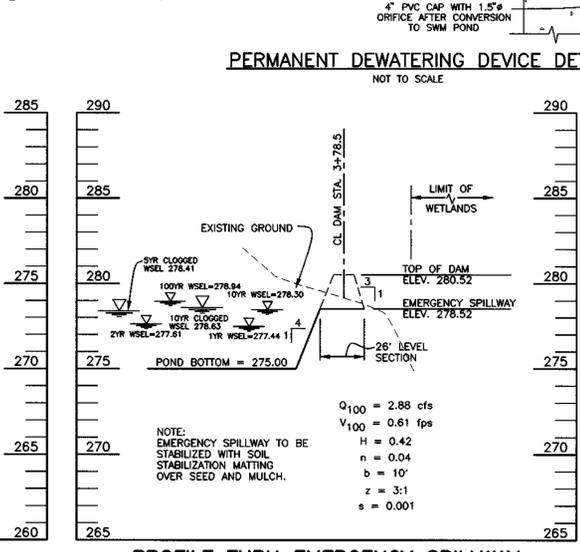
SECTION D-D

SCALE: 1"=20' HORIZ., 1"=2' VERT.



PROFILE ALONG CL EMBANKMENT

SCALE: 1"=50' HORIZ., 1"=5' VERT.



PROFILE THRU EMERGENCY SPILLWAY

SCALE: 1"=50' HORIZ., 1"=5' VERT.

OPERATION, MAINTENANCE AND INSPECTION NOTE  
INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS (M&S-376). THE POND OWNER(S) AND ANY SUCCESSORS, OR AGENTS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

AS-BUILT CERTIFICATION  
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.  
DONALD A. MASON  
PE NO. \_\_\_\_\_  
DATE \_\_\_\_\_

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

DEVELOPER'S 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 OPERATION AND MAINTENANCE OF SMALL POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.  
James R. Masley III vs  
SDC GROUP, INC. 1/17/02  
DATE

ENGINEER'S CERTIFICATE  
I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, 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. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.  
Donald Mason  
ENGINEER - DONALD A. MASON, P.E. # 21443 1/15/02  
DATE

APPROVED:  
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL.  
Jim Angulo vs  
NATURAL RESOURCES CONSERVATION SERVICE 2/20/02  
DATE

APPROVED:  
THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
Howard Soil Conservation District 2/23/02  
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
Andrew M. Daniels vs  
CHIEF, BUREAU OF HIGHWAYS 2-14-02  
DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
Cynthia Hamster vs  
CHIEF, DIVISION OF LAND DEVELOPMENT 2/11/02  
DATE  
M&Z

OPERATION AND MAINTENANCE SCHEDULE OF PRIVATELY OWNED AND MAINTAINED STORMWATER MANAGEMENT FACILITY

- ROUTINE MAINTENANCE
1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
  2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
  3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
  4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- NON-ROUTINE MAINTENANCE
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
  2. SEDIMENT SHOULD BE REMOVED FROM THE POND NO LATER THAN WHEN THE CAPACITY OF THE POND IS HALF FULL OF SEDIMENT, WHEN DEMAND NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY HOWARD COUNTY'S DEPARTMENT OF PUBLIC WORKS.

NO.	DATE	REVISION

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS

**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 • FAX: 410-465-6644  
EMAIL: Benchmark@cois.com

OWNER/DEVELOPER: SDC GROUP, INC.  
P.O. BOX 417  
ELLCOTT CITY, MARYLAND 21041  
410-465-4244

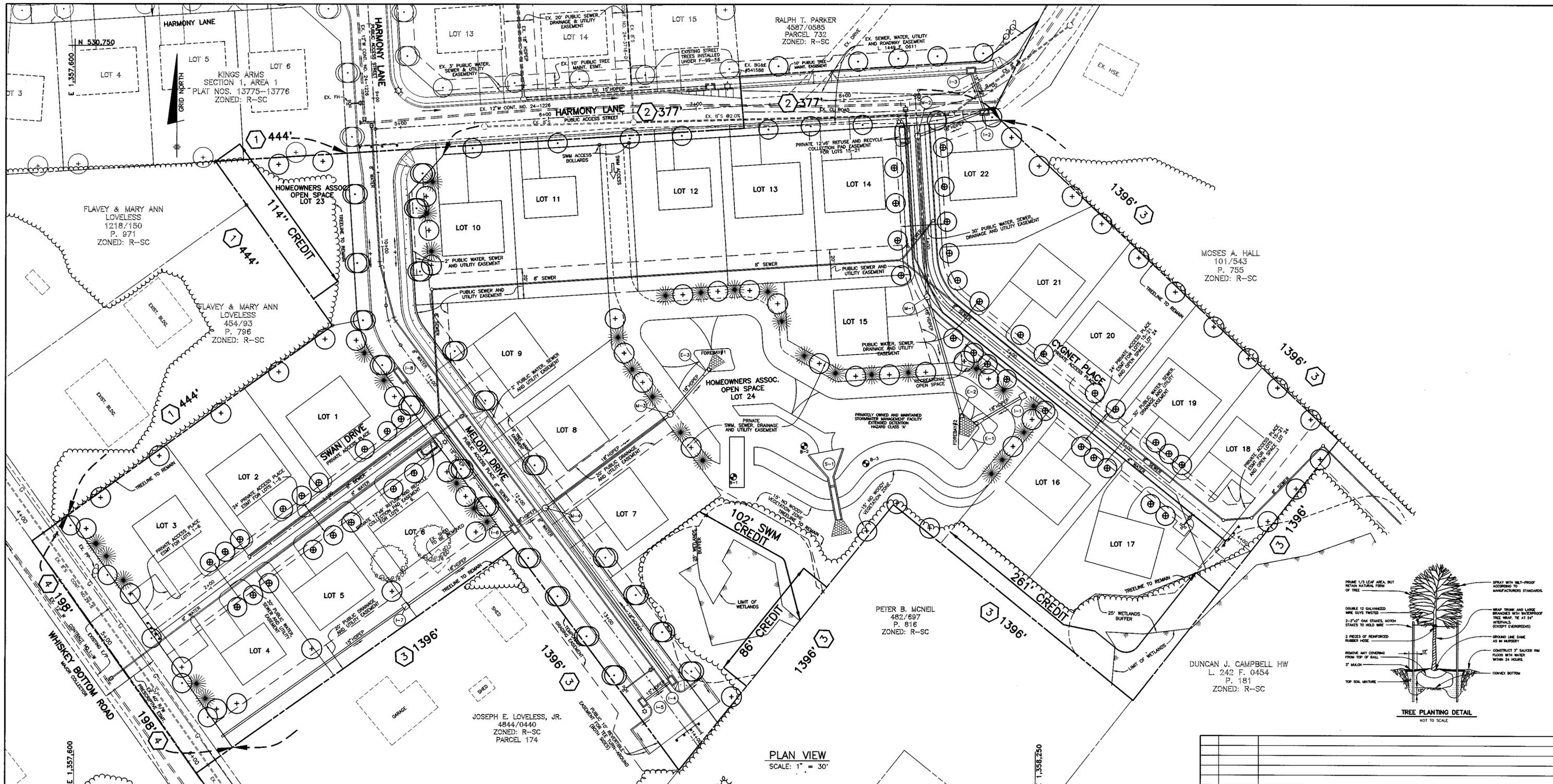
PROJECT: **KINGS ARMS SECTION 2**  
LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
PARCELS: 174, 496 AND P/O 732  
GSD ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: **STORMWATER MANAGEMENT DETAILS**  
S-99-23 P-00-14

DATE: FEBRUARY 18, 2001  
JANUARY 2, 2002 PROJECT NO. 1139

DESIGN: MLV DRAFT: DBT CHECK: DAM SCALE: AS SHOWN SHEET 10 OF 13



PLAN VIEW  
SCALE: 1" = 30'

**LANDSCAPE NOTES:**

- TREES SHOULD BE PLANTED A MINIMUM OF 6 FEET FROM THE EDGE OF PAVING AND MUST BE A MINIMUM OF 5 FEET FROM ANY STORM DRAIN.
- TREES MUST BE PLANTED A MINIMUM OF 5 FEET FROM AN OPEN SPACE ACCESS STRIP AND 10 FEET FROM A DRIVEWAY.
- SEE TREE PLANTING DETAIL - THIS SHEET.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
- FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$35,850.00.

SCHEDULE D SWM AREA LANDSCAPING	
LINEAR FEET OF PERIMETER	883
LINEAR FEET OF EXISTING WOODS LINE	102
LINEAR FEET OF REQUIRED PLANTING	781
BUFFER TYPE	"B"
NUMBER OF TREES REQUIRED	16
SHADE TREES	20
EVERGREEN TREES	20
CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	YES, 11.8%
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO
NUMBER OF TREES PROVIDED	16
SHADE TREES	20
EVERGREEN TREES	20
OTHER TREES (2:1 SUBSTITUTE)	20

LANDSCAPE LEGEND	
	STREET TREES TO BE PROVIDED BY THE DEVELOPER TO BE INCORPORATED ON FINAL PLANS.
	SHADE TREES ALONG PERIMETER AND STORMWATER MANAGEMENT TO BE PROVIDED BY THE DEVELOPER AND INCORPORATED ON FINAL PLANS.
	EVERGREEN TREES ALONG PERIMETER AND STORMWATER MANAGEMENT AREA TO BE PROVIDED BY THE DEVELOPER AND INCORPORATED ON FINAL PLANS.
	EVERGREEN SHRUBS TO BE PLANTED ALONGSIDE TRASH PAD LOCATIONS TO BE PROVIDED BY THE DEVELOPER AND INCORPORATED ON FINAL PLANS.

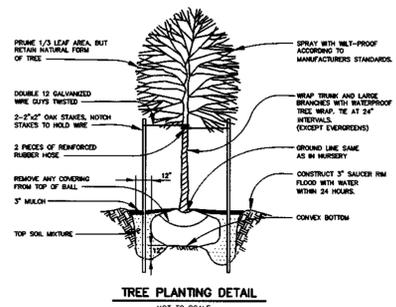
PUBLIC STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	21	ACER RUBRA (Red Maple)	2 1/2" MIN. CAL. B&B FULL HEAD
	19	ACER SACCHARUM (Sugar Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

PRIVATE STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	44	ACER GRiseum (Paperbark Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

LANDSCAPE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	55	PLATANUS ACERIFOLIA 'Bloodgood' (Bloodgood London Plane)	2 1/2" MIN. CAL. B&B FULL HEAD
	33	PINUS STROBUS (Eastern White Pine)	5'-6" ht. UNSHEARED
	40	JUNIPERUS CHINENSIS 'SEA GREEN' (Sea Green Juniper)	18"-24" SP

SCHEDULE A PERIMETER LANDSCAPE EDGE							
CATEGORY	ADJACENT TO ROADS				ADJACENT TO PERIMETER PROP.		ADJACENT TO TRASH PADS
	LOT 1 B	LOT 6 B	LOT 9 B	② N/A	① A	③ A	
LANDSCAPE TYPE	78'	85'	111'	377'	192'	444'	1396'
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER							36' (EACH)
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	YES, 114'	YES, 347'
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED	78 LF.	85 LF.	111 LF.	377 LF.	192 LF.	330 LF.	1049 LF.
SHADE TREES	2	2	3	N/A	4	7	21
EVERGREEN TREES	2	3	3	N/A	5	-	1
OTHER TREES (2:1 SUBSTITUTE)	-	-	-	-	-	-	-
SHRUBS	-	-	-	-	-	-	-
NUMBER OF PLANTS PROVIDED	2	2	3	-	4	7	21
SHADE TREES	2	2	3	-	4	7	21
EVERGREEN TREES	2	3	3	-	5	-	1
OTHER TREES (2:1 SUBSTITUTE)	-	-	-	-	-	-	-
SHRUBS (0:1 SUBSTITUTE)	-	-	-	-	-	-	-
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)							20 (EACH PAD)

② EXISTING WOODS 20' OR GREATER IN WIDTH.



NO.	DATE	REVISION

**BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS**  
 8480 BALTIMORE NATIONAL PIKE A SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 phone: 410-465-6105 A fax: 410-465-6644  
 email: Benchmark@aol.com

*Donald Mear*  
1/29/02

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Donahue* 2-14-02  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Hantz* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*John P. ...* 2/1/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

OWNER/DEVELOPER: SDC GROUP, INC.  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 410-465-4244

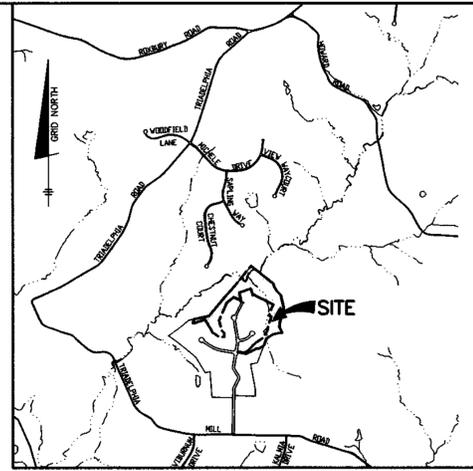
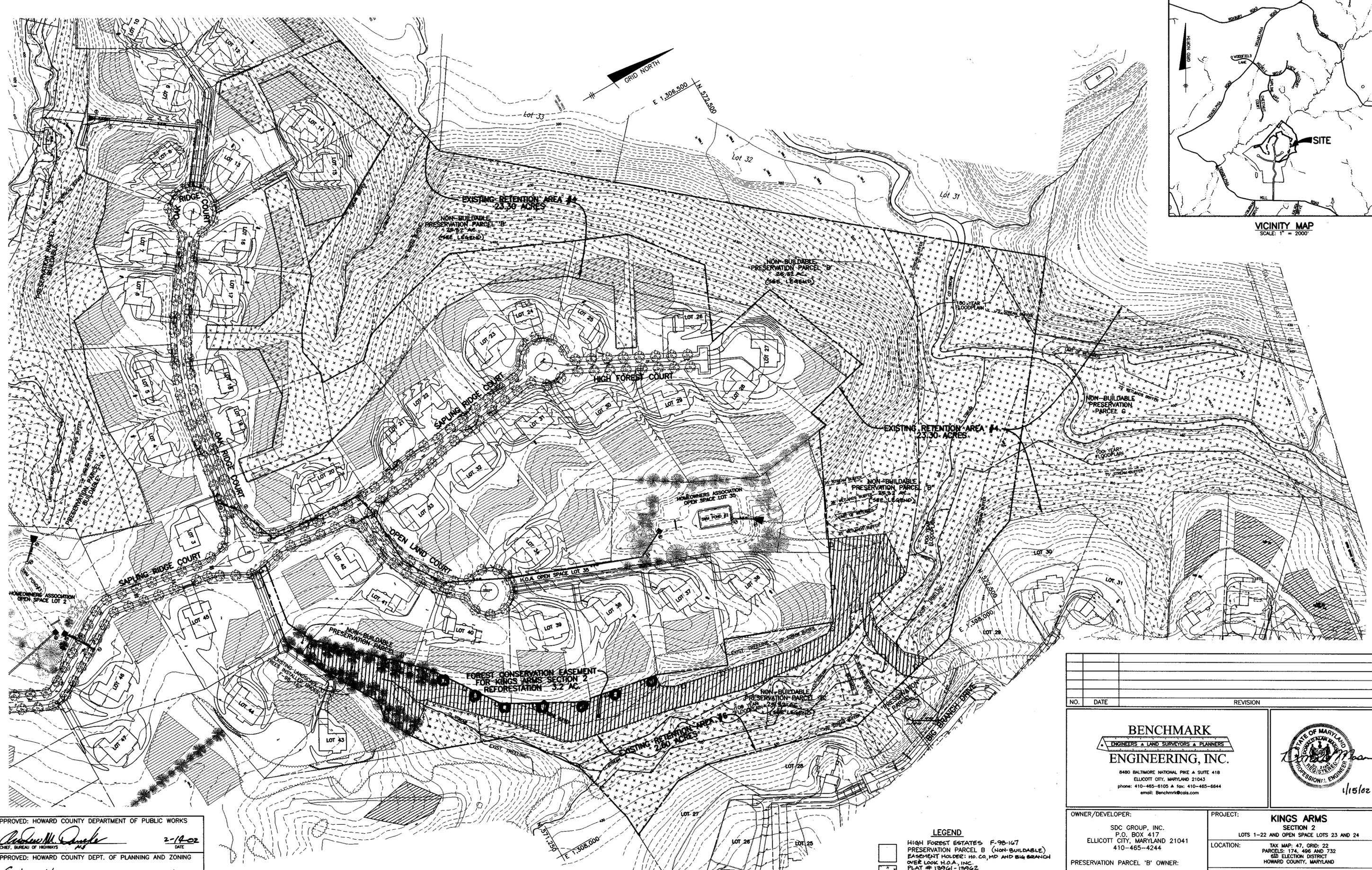
PROJECT: **KINGS ARMS SECTION 2**  
 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
 PARCEL: 174, 496 AND P/O 732  
 6th ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: **LANDSCAPE PLAN**

DATE: FEBRUARY 18, 2001  
 JANUARY 2, 2002

DESIGN: DBT DRAFT: DBT CHECK: DAM SCALE: AS SHOWN SHEET 11 OF 13



VICINITY MAP  
SCALE: 1" = 2000'

NO.	DATE	REVISION

**BENCHMARK**  
ENGINEERS & LAND SURVEYORS & PLANNERS  
**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
phone: 410-465-6105 & fax: 410-465-6644  
email: Benchmark@bcas.com

1/15/02

OWNER/DEVELOPER: SDC GROUP, INC. P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	PROJECT: <b>KINGS ARMS</b> SECTION 2 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
PRESERVATION PARCEL 'B' OWNER: RIDGE VIEW, L.L.C. c/o ADAMS & ADAMS 8808 CENTRE PARK DRIVE, SUITE 205 COLUMBIA, MARYLAND 21045	LOCATION: TAX MAP: 47, GRID: 22 PARCELS: 174, 498 AND 732 8th ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DESIGN: DBT DRAFT: DBT CHECK: DAM	TITLE: OFFSITE REFORESTATION FOREST CONSERVATION PLAN AT HIGH FOREST ESTATES (F-98-167)(F-02-56) S-99-23 P-00-14 DATE: FEBRUARY 18, 2001 OCTOBER 19, 2001 PROJECT NO. 1139 SCALE: AS SHOWN SHEET 12 OF 13

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Howard County Seal* 2-14-02  
DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Krametz* 3/1/02  
DATE

*John P. Casals* 2/1/02  
DATE

**Eco-Science Professionals, Inc.**  
CONSULTING EC01051878

MD DNR Qualified Professional  
USACOE Wetland Designer  
Certification # W00090MD061004422  
*John P. Casals*

PLAN VIEW  
SCALE: 1" = 100'

- LEGEND**
- HIGH FOREST ESTATES F-98-167
  - PRESERVATION PARCEL B (NON-BUILDABLE)
  - EASEMENT HOLDER: HO. CO, MD AND BIG BRANCH OVER LOOK H.O.A., INC. PLAT # 19961-19962
  - EXISTING FOREST CONSERVATION EASEMENTS
  - PROPOSED REFORESTATION EASEMENT FOR KINGS ARMS 2 (F-01-130) 3.2 AC. (F-02-56, HIGH FOREST ESTATES)
  - SIGNAGE LOCATIONS

# KINGS ARMS SECTION 2 Offsite Planting Schedule

## Planting Area (3.2 acres)

Qty.	Species	Size	Spacing
7	<i>Fraxinus americana</i> - White ash	1" cal.	*
125	<i>Acer rubrum</i> - Red maple	2-3' whip	**
33	<i>Cercis canadensis</i> - Red bud	2-3' whip	**
130	<i>Betula pennsylvanica</i>	2-3' whip	**
150	<i>Liriodendron tulipifera</i> - Poplar	2-3' whip	** ^
50	<i>Rhus typhina</i> - Black gum	2-3' whip	**
125	<i>Prunus serotina</i> - Black cherry	2-3' whip	** ^
125	<i>Platanus occidentalis</i> - Sycamore	2-3' whip	**
100	<i>Quercus rubra</i> - Red oak	2-3' whip	**
80	<i>Viburnum dentatum</i> - Arrowwood	2-3' b.t.	**
80	<i>Viburnum prunifolium</i> - Blackhaw	2-3' b.t.	**

**Note:** \*\* Plantings to be spaced on 11 foot centers, no shelters required - plantings should be installed in rows to facilitate future maintenance. Where possible rows should be made along contour.

^ - species should not be planted in wetlands or on stream bank

\* One caliper plants shall be planted in locations shown by -

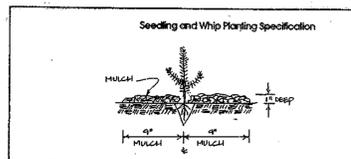
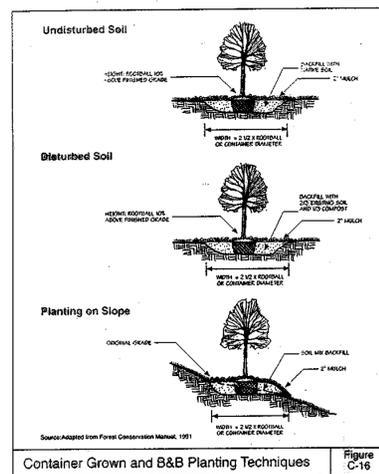
b.t. - branched transplant

## Planting Notes:

- Mulch/soil control must be performed as part of this planting plan.
- Bare-root plant material may be used to offset the cost of multi-trunk root removal and maintenance. If bare-root material is used it must be planted in March-April and an anti-desiccant gel should be utilized to protect root systems. Container grown stock is recommended.
- Plants should be flagged to aid on location during maintenance. Plantings should also be planted in grid pattern to facilitate maintenance and removal of invasive and exotic species.

Estimated Planting/Maintenance Cost: \$16,000

**NOTE:**  
SURETY IN THE AMOUNT OF \$69,696.00 HAS BEEN POSTED AS PART OF THE DEVELOPER'S AGREEMENT FOR THE 3.2 ACRE REFORESTATION EASEMENT.



## Planting/Soil Specifications

- Planting of nursery stock shall take place between March 15th and April 30th. Container stock may be planted September 1-October 30.
- A twelve (12) inch layer of topsoil shall be spread over all afforestation areas impacted by site grading to ensure a suitable planting area. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
- All bare-root planting stock shall have their root systems dipped into an anti-desiccant gel prior to planting.
- Plants shall be installed so that the top of root mass is level with the top of existing grade. Backfill in the planting pits shall consist of 3 parts existing soil to 1 part pine fines or equivalent.
- Fertilizer shall consist of Agriferm 22-8-2, or equivalent, applied as per manufacturer's specifications.
- A two (2) inch layer of hardwood mulch shall be placed over the root area of all plantings. Plant material shall be transported to the site in a sealed or covered truck. Plants shall be kept moist prior to planting.
- All non-organic debris associated with the planting operation shall be removed from the site by the contractor.

## Sequence of Construction

- Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
- Upon completion of the planting, signage shall be installed as detailed on sheet 13.
- Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

## Maintenance of Plantings

- Maintenance of plantings shall last for a period of 24 months.
- All plant material shall be watered twice a month during the 1st growing season. Watering may be more or less frequent depending on weather conditions. During second growing season, once a month during May-September, if needed.
- Invasive species and noxious weeds will be removed from reforestation areas. Old field successional species will be retained.
- Plants will be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
- Dead branches will be pruned from plantings.

## Guarantee Requirements

- After one growing season, plant material shall be maintained at 90% survival threshold. A 75 percent survival rate of forested plantings will be required at the end of the 24 month maintenance period. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season.
- The contractor will not be liable for plant loss due to theft or vandalism.

## Surety for Reforestation

- The developer shall post a surety (bond, letter of credit) to ensure that reforestation plantings are completed. Upon acceptance of the plantings by the County, the bond shall be released.

## Multiflora Rose Control Note

Multiflora rose is prevalent in certain areas to be afforested. Prior to planting all multiflora rose shall be removed. Removal of the rose may be performed with mowing and herbicide treatments. Physical removal of all top growth following by a periodic herbicide treatment of stump sprouts is recommended. Native tree and shrub species occurring within the rose thickets should be retained wherever possible. Herbicide treatments shall occur on 2 month intervals during the first growing season and once each in the spring and fall for subsequent years. Herbicide used shall be made specifically to address woody plant material and shall be applied as per manufacturer's specifications. Care should be taken not to spray planted trees or naturally occurring native tree/shrub seedlings. It is recommended that initiation of rose removal begin at least six months prior to planting.

## Planting Density Requirements

3.2 acres \* 700 units/acre = 2240 units required  
 One inch caliper: 7 plants \* 3.5 units/plant = 24.5 units  
 Whips: 1,108 plants \* 2 units/plant = 2,216 units  
 2,240.5 units provided

## PLANTING NOTES:

- Planting stock should be 3' to 4' whips and 1 1/2 to 2 gallon container stock at a minimum, with 5' - 6' trees for the oaks, maple and white pine.
- Only composted mulch may be used.
- Whips should be planted an average of 11ft. on center with 5 ft. trees an average of 15 ft. (see random planting detail). Pines should be concentrated on the outside perimeter of Planting Area #2 (adjacent to the lots).
- White oak, white pine and flowering dogwood should be planted outside of wetland limits and wetland buffer in Planting Area #1. Larger trees should be planted along the outside perimeter with a random planting scheme inside. Pines should be concentrated on the outside perimeter.

## APPENDIX G FOREST CONSERVATION WORKSHEET

BASIC SITE DATA		ACRES (1/10 acre)
GROSS SITE AREA	5.6	
AREA WITHIN 100 YEAR FLOODPLAIN	0.0	
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (IF APPLICABLE)	N/A	
NET TRACT AREA	5.6	
LAND USE CATEGORY (R-RLD, R-RMD, R-S, C/I/O, I)	R-SC	

INFORMATION FOR CALCULATIONS		ACRES (1/10 acre)
A. NET TRACT AREA	5.6	
B. REFORESTATION THRESHOLD (20% x A)	1.1	
C. AFFORESTATION MINIMUM (15% x A)	0.8	
D. EXISTING FOREST ON NET TRACT AREA	5.1	
E. FOREST AREAS TO BE CLEARED	4.6	
F. FOREST AREAS TO BE RETAINED	0.0	

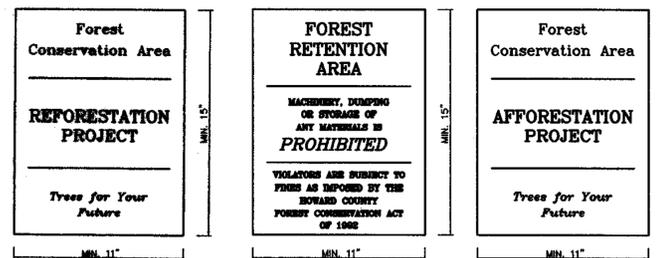
## III. DETERMINING REQUIREMENTS: AFFORESTATION OR REFORESTATION

- Reforestation**  
If existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and clearing of forest areas is proposed, reforestation requirements may apply.  
GO TO SECTION IV
- Afforestation**  
If existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and no clearing of existing forest resources is proposed, no reforestation is required. No further calculations are needed.  
GO TO SECTION V

IV. REFORESTATION CALCULATIONS		ACRES (1/10 acre)
A. NET TRACT AREA	5.6	
B. REFORESTATION THRESHOLD (20% x A)	1.1	
D. EXISTING FOREST ON NET TRACT AREA	5.1	
E. FOREST AREAS TO BE CLEARED	5.1	
F. FOREST AREAS TO BE RETAINED	0.0	
G. FOREST AREAS CLEARED ABOVE REFORESTATION THRESHOLD (D-F, if F equals or is greater than B, Alternate 1) (D-B, if F is less than B, Alternate 2)	4.0	
H. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD (B-F, if applicable)	1.1	
I. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD (A-F, Retention Credit, if applicable)	N/A	

## SELECT THE ALTERNATE THAT APPLIES:

- Clearing above the threshold only**  
If forest areas to be retained equal or are greater than the reforestation threshold (if F equals or is greater than B), the following calculations apply:  
 REFORESTATION FOR CLEARING ABOVE THRESHOLD:  $G \times 1/4$   
 CREDIT FOR FOREST AREAS RETAINED ABOVE THRESHOLD:  $I$   
 TOTAL REFORESTATION REQUIRED:  $(G \times 1/4) - I$   
 If the total reforestation requirement is equal to or less than 0, no reforestation is required.
- Clearing below the threshold**  
If forest areas to be retained are less than the reforestation threshold (if F is less than B), the following calculations apply:  
 REFORESTATION FOR CLEARING ABOVE THRESHOLD:  $G \times 1/4$   
 REFORESTATION FOR CLEARING BELOW THRESHOLD:  $H \times 2$   
 TOTAL REFORESTATION REQUIRED:  $(G \times 1/4) + (H \times 2)$   
 Since clearing occurs below the threshold, no forest retention credit is possible.



SIGNAGE  
NOT TO SCALE

KINGS ARMS 2 SITE DATA		ACRES
GROSS AREA:		5.6
EX. LOTS/UNFORESTED PRESERVATION		0.0
PARCEL/FLOODPLAIN:		5.6
NET TRACT AREA (NTA):		5.1
EXISTING FOREST ON NTA:		5.1
REFORESTATION THRESHOLD:		1.1
FOREST TO BE CLEARED:		5.1
FOREST TO BE RETAINED (NTA):		0.0
REFORESTATION REQUIRED:		3.2
REFORESTATION PROPOSED:		3.2

**BENCHMARK ENGINEERING, INC.**  
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 ELLICOTT CITY, MARYLAND 21043  
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 email: Benchmark@cois.com

STATE OF MARYLAND PROFESSIONAL ENGINEER 1/15/02

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 Andrew M. Daniels 2/19/02  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
 Chris Hamata 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: [Signature] 2/11/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

**Eco-Science Professionals, Inc.**  
 CONSULTING ECOLOGISTS  
 P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional  
 USACOE Wetland Delistee  
 Certification # WDCP93MD061004482  
 John P. Ciesla

NO.	DATE	REVISION

OWNER/DEVELOPER:  
 SDC GROUP, INC.  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 410-465-4244

PRESERVATION PARCEL 'B' OWNER:  
 RIDGE VIEW, L.L.C.  
 c/o ADAMS & ADAMS  
 8808 CENTRE PARK DRIVE, SUITE 205  
 COLUMBIA, MARYLAND 21045

PROJECT: **KINGS ARMS SECTION 2**  
 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
 PARCEL: 174, 406 AND P/O 732  
 6th ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: **OFFSITE REFORESTATION FOREST CONSERVATION NOTES AND DETAILS**  
 S-99-23 P-00-14 E-02-56

DATE: **OCTOBER 19, 2001** PROJECT NO. 1139  
 SCALE: AS SHOWN SHEET 13 OF 13

DESIGN: DBT DRAFT: DBT CHECK: DAM

**STORMWATER MANAGEMENT FACILITY  
CONSTRUCTION SPECIFICATIONS**

These specifications are appropriate to all ponds within the scope of the Standard for project MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

**Site Preparation**

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to the center of the embankment, and cut off trench shall be removed. Channel banks and sharp knolls shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fence, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 2'-2" radius around the inlet structure shall be cleared.

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

**Earth Fill**

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6" in diameter or other objectionable material. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #20 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Special design must have construction supervised by a geotechnical engineer.

Materials used in the outer shell of the embankment must have the capability to support operation of the facility required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 9 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one wheel track of hauling equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

**Structure Backfill**

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjacent fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The principal spillway shall be compacted with construction equipment. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi, 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" measured perpendicular to the outside of the pipe of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slope shall be 7" to ensure flowability. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all inlet pipe shall be submerged. Any adjusting soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall be placed in layers adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structure backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment material.

**Pipe Conduits**

All pipes shall be circular in cross section.

**Corrugated Metal Pipe** - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated Steel Pipe) - Steel pipes with polymeric coating shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall meet the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be primed with one coat of zinc chromate primer or two coats of asphalt. The pH of the surrounding soils shall be between 4 and 9.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be primed with one coat of zinc chromate primer or two coats of asphalt. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coating as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Drainage bands are not considered to be watertight.

All connection shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the gaskets. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepared to fit the flange hole, sandwiched between adjacent flanges; a 12-inch wide standard top type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide rubber type band with 3/8-inch gaskets having a minimum diameter of 1 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 3/4-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

Helicorrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

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

5. Backfilling shall conform to "Structure Backfill".

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

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

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-381.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cross for their entire length. This bedding/cross shall consist of high slump concrete placed under the pipe and up the sides of the pipe to at least 50% of its outside diameter with a minimum thickness of 8 inches. Where a concrete cross is not required, structural reinforced, flowable fill may be used as described in "Structure Backfill" section of this document. Grave bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell and upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent the bedding from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "Structure Backfill".

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

**Plastic Pipe** - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" - 12" inch pipe shall meet the requirements of AASHTO M222 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

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

4. Backfilling shall conform to "Structure Backfill".

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

**Drainage Diaphragms** - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

**Concrete**

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

**Back Riprap**

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

Geotextile shall be placed under the riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

**Cure of Water during Construction**

All work on permanent structures shall be carried out in areas free from water. The contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation and other parts of the work free and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the piling and compacting of material in required excavations, the water level at the location being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water pumps from which the water shall be pumped.

All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-242) or as shown on the accompanying drawings.

**Erosion and Sediment Control**

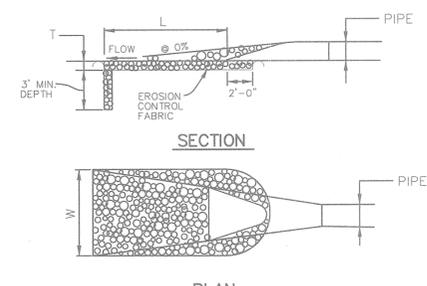
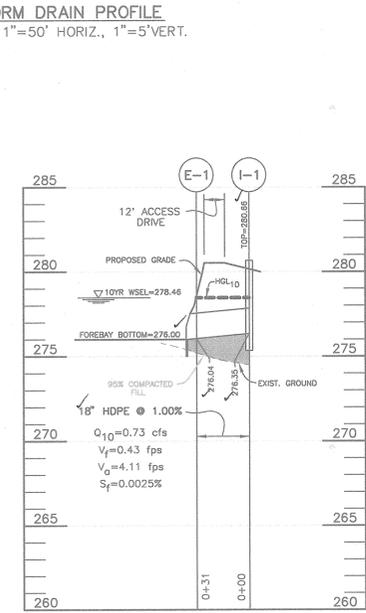
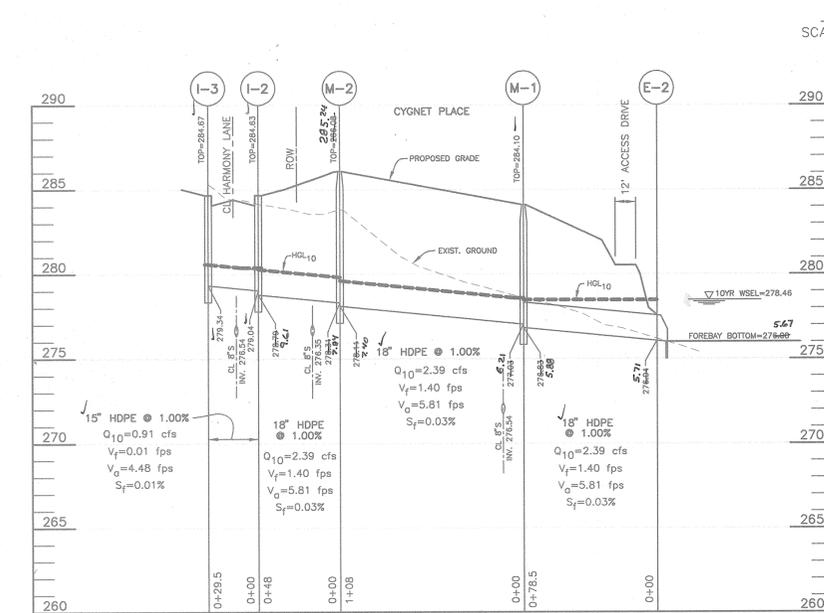
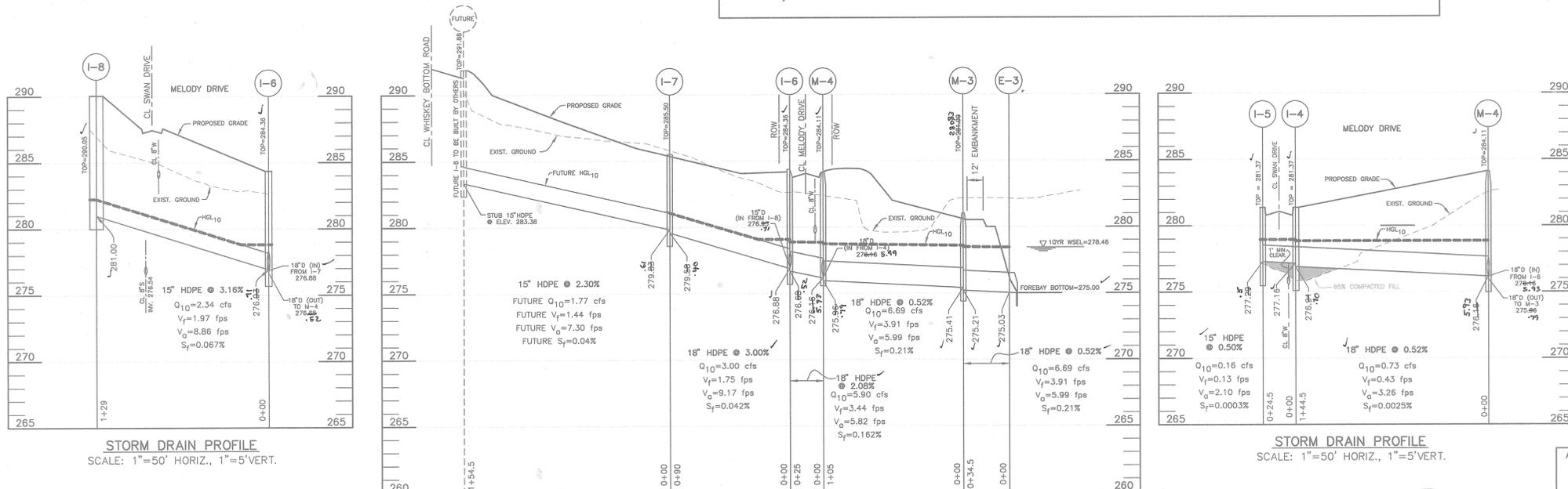
Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

RUN	SIZE	LENGTH	TYPE
E-1 TO I-1	18"	31'	HDPE
E-2 TO M-1	18"	78.5'	HDPE
M-1 TO M-2	18"	108'	HDPE
M-2 TO I-2	18"	48'	HDPE
I-2 TO I-3	18"	29.5'	HDPE
E-3 TO M-3	18"	34.5'	HDPE
M-3 TO M-4	18"	105'	HDPE
M-4 TO I-4	18"	144.5'	HDPE
I-4 TO I-5	15"	24.5'	HDPE
M-4 TO I-6	18"	25'	HDPE
I-6 TO I-7	18"	90'	HDPE
I-8 TO I-9	15"	129'	HDPE
I-7 TO STUB	15"	154.5'	HDPE

**STRUCTURE SCHEDULE**

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
E-1	18" CONC. END SECTION	N 530499.20 E 1358214.28	276.04	276.00	-	SD - 5.52
E-2	18" CONC. END SECTION	N 530506.40 E 1358198.31	276.04	276.00	-	SD - 5.52
E-3	18" CONC. END SECTION	N 530528.54 E 1358025.30	275.03	275.00	-	SD - 5.52
I-1	TYPE 'D' INLET	N 530514.86 E 1358241.03	-	276.35	280.66	SD - 4.01 OR 4.40
I-2	A-5	CL STA. 8+94.29 HARMONY LANE OFFSET 12.43' RIGHT	279.04	279.09	284.63	SD - 4.02 OR 4.41
I-3	A-5	CL STA. 8+87.00 HARMONY LANE OFFSET 12.43' LEFT	-	279.34	284.67	SD - 4.02 OR 4.41
I-4	A-5	CL STA. 13+59.33 MELODY DRIVE OFFSET 10.43' LEFT	277.16	276.94	281.37	SD - 4.02 OR 4.41
I-5	A-5	CL STA. 13+59.33 MELODY DRIVE OFFSET 10.43' RIGHT	-	277.29	281.37	SD - 4.11 OR 4.39
I-6	A-5	CL STA. 12+14.87 MELODY DRIVE OFFSET 10.43' LEFT	276.88 (18")	276.88 (18")	284.36	SD - 4.11 OR 4.39
I-7	TYPE 'D' INLET	N 530372.95 E 1357824.34	279.25	279.66	285.50	SD - 4.02 OR 4.41
I-8	A-10	CL STA. 10+85.00 MELODY DRIVE OFFSET 10.43' RIGHT	-	281.00	290.05	SD - 4.11 OR 4.39
M-1	4'-0" MANHOLE	CL STA. 1+433.51 CYNET PLACE OFFSET 6.57' RIGHT	276.03	276.83	284.10	G - 5.12
M-2	4'-0" MANHOLE	CL STA. 0+27.39 CYNET PLACE OFFSET 0.00'	276.34	276.44	286.08	G - 5.12
M-3	4'-0" MANHOLE	CL STA. 12+14.87 MELODY DRIVE OFFSET 118.25' LEFT	275.41	275.21	284.09	G - 5.12
M-4	4'-0" MANHOLE	CL STA. 12+14.87 MELODY DRIVE OFFSET 12.95' LEFT	276.44 (18")	275.88 (18")	284.11	G - 5.12
S-1	SEE DETAIL	N 530454.20 E 1358112.45	275.00	274.78	280.52	-

- 1) STRUCTURE ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
- 2) STRUCTURE ELEVATION AND LOCATION FOR INLETS IS AT THE TOP OF CURB AT MIDPOINT OF THE INLET.
- 3) STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT THE CONNECTION OF PIPE AND END SECTION.
- 4) PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
- 5) ALL STORM DRAINS SHALL BE CLASS IV HIGH DENSITY POLYETHYLENE PIPE UNLESS OTHERWISE NOTED.



STRUCTURE	D=50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
E-1	9.5"	10'	12'	19"	I
E-2	9.5"	10'	12'	19"	I
E-3	9.5"	10'	12'	19"	I
S-1	9"	12'	14'	19"	I

OUTLET PROTECTION DETAIL  
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Robert M. Davel*  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 2/14/02

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Anda Hennis*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/11/02

*Donald Man*  
 PROFESSIONAL ENGINEER  
 DATE: 2/11/02



NO.	DATE	REVISION

**BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS**  
 ENGINEERING, INC.  
 8480 BALTIMORE NATIONAL PIKE A SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6644

*Donald Man*  
 PROFESSIONAL ENGINEER  
 DATE: 1/16/02

OWNER/DEVELOPER: SDC GROUP, INC.  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 410-465-4244

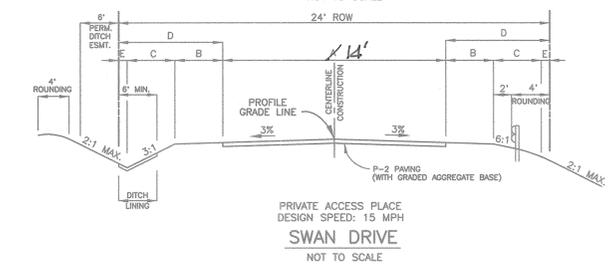
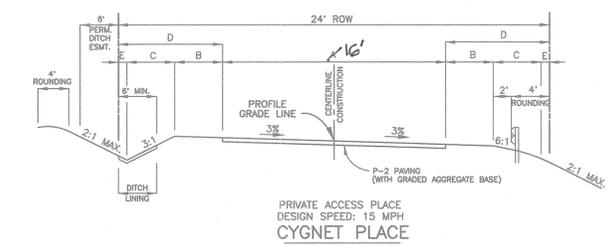
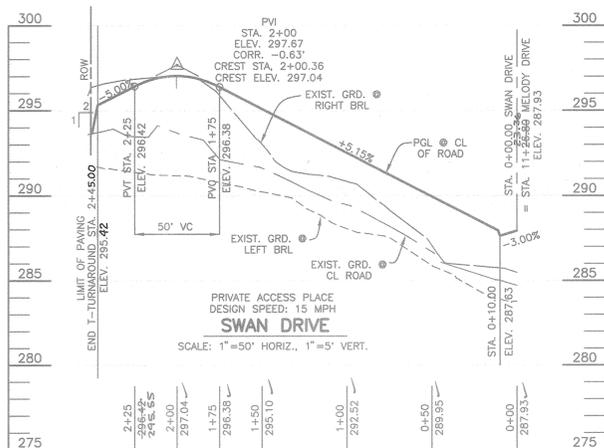
PROJECT: **KINGS ARMS SECTION 2**  
 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
 PARCELS: 174, 486 AND P/O 732  
 881 ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: **STORM DRAIN PROFILES AND STORMWATER MANAGEMENT CONSTRUCTION SPECS.**  
 S-99-23 P-00-14

DATE: FEBRUARY 18, 2001 PROJECT NO. 1139  
 JANUARY 2, 2002 SHEET 7 OF 13

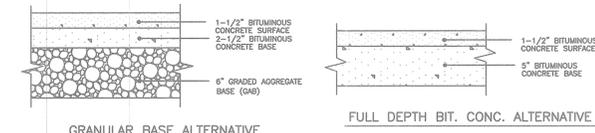
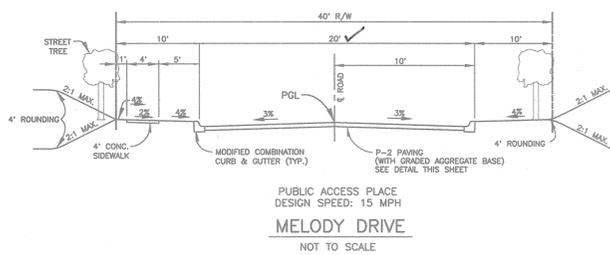
DES: MLV/DBT DRAFT: DBT CHECK: DAM SCALE: AS SHOWN



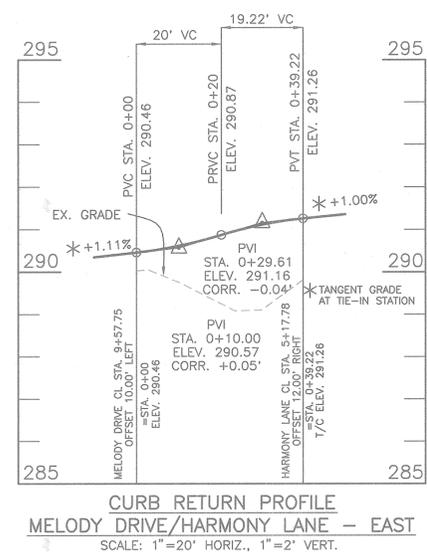
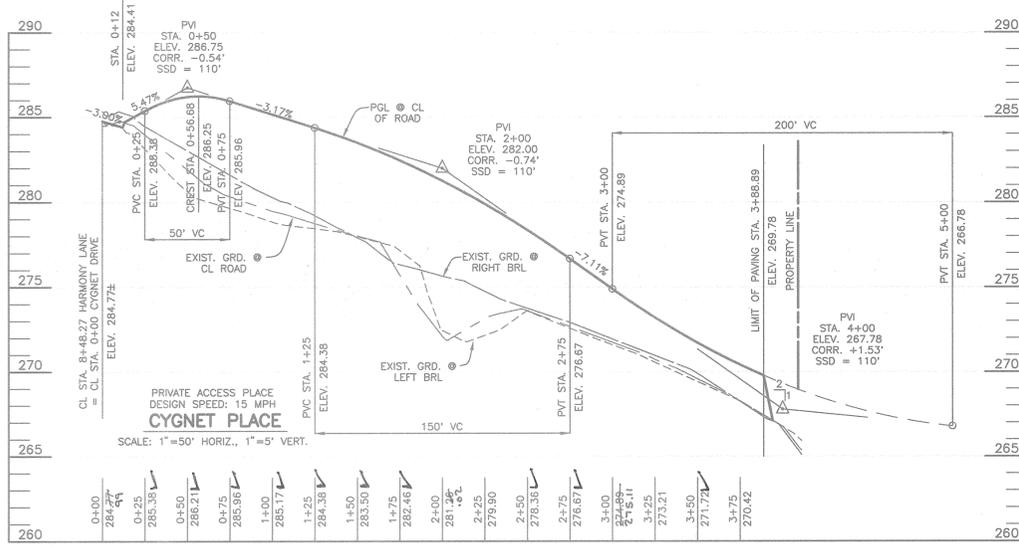
NOTE: USE GUARD RAIL WHERE INDICATED BY FIGURE 2.14.

CLASSIFICATION	A	B	C	D	E	R/W
PRIVATE - 100 ADT	14'	4'	1'	5'	0'	24'
PUBLIC - 200 ADT	18'	4'	4'	11'	3'	40'
PRIVATE - 100 ADT	22'	4'	4'	9'	1'	40'
PRIVATE - 100 ADT	24'	4'	4'	13'	5'	50'
MINOR COLLECT.	24'	4'	4'	13'	5'	50'

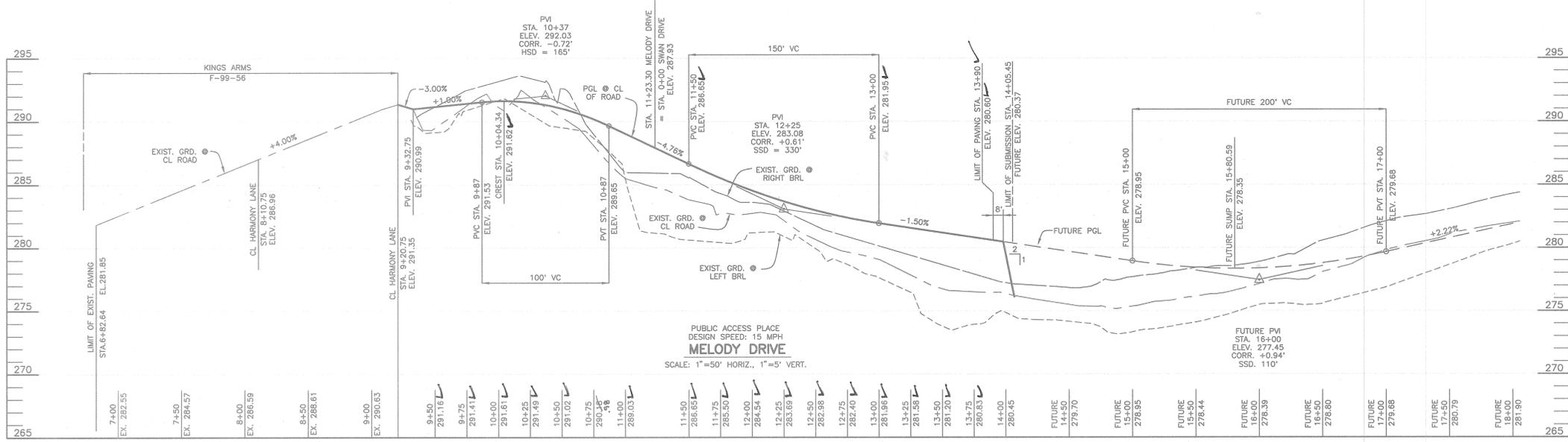
\* 16' FOR CYGNET PLACE



P-2 PAVING DETAIL  
NOT TO SCALE



CURB RETURN PROFILE  
MELODY DRIVE/HARMONY LANE - EAST  
SCALE: 1"=20' HORIZ., 1"=2' VERT.



PUBLIC ACCESS PLACE  
MELODY DRIVE  
SCALE: 1"=50' HORIZ., 1"=5' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Andrew M. Daulton* 2/19/02  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Chris Hamilton* 3/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Donald M. Mason* 2/4/02  
 AS-BUILT 1/8/05  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS  
 8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 phone: 410-465-6105 • fax: 410-465-6844  
 email: Benchmark@ccs.com

STATE OF MARYLAND PROFESSIONAL ENGINEER  
*Donald M. Mason*  
 1/15/02

NO.	DATE	REVISION

OWNER/DEVELOPER: SDC GROUP, INC.  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 410-465-4244

PROJECT: **KINGS ARMS SECTION 2**  
 LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
 PARCELS: 174, 496 AND P/O 732  
 6th ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: **ROAD PROFILES AND DETAILS**

DATE: FEBRUARY 18, 2001  
 JANUARY 2, 2002

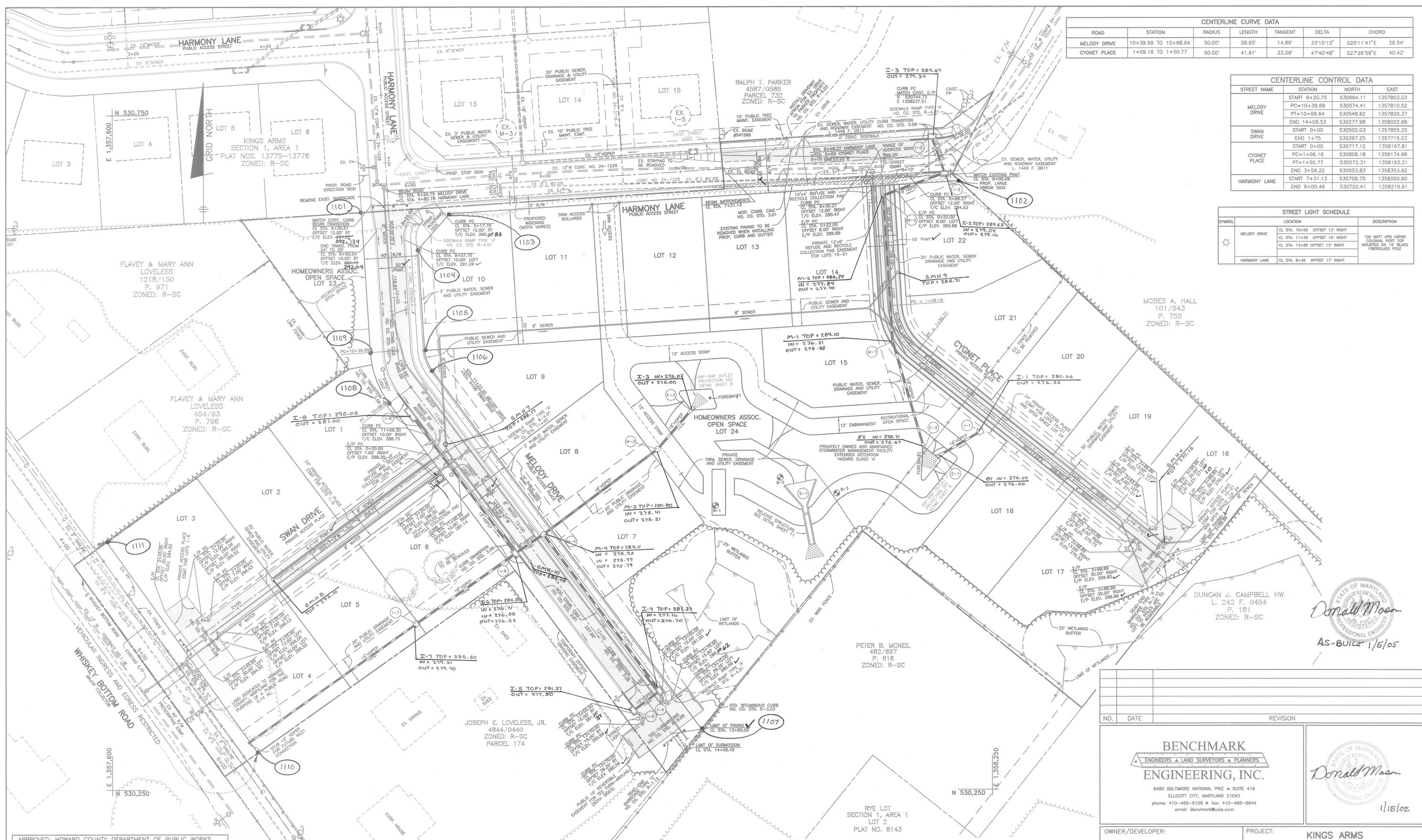
PROJECT NO. 1139

DESIGN: DBT DRAFT: DBT CHECK: DAM SCALE: AS SHOWN SHEET 3 OF 13

CENTERLINE CURVE DATA						
ROAD	STATION	RADIUS	LENGTH	TANGENT	CHORD	
MELODY DRIVE	10+39.69 TO 10+68.64	50.00'	28.95'	14.89'	33°10'12"	S20°11'41"E 28.54'
CYGNET PLACE	1+09.16 TO 1+50.77	50.00'	41.61'	22.09'	47°40'48"	S27°26'59"E 40.42'

CENTERLINE CONTROL DATA				
STREET NAME	STATION	NORTH	EAST	
MELODY DRIVE	START 9+20.75	530694.11	1357803.03	
	PC=10+39.69	530574.41	1357810.52	
	PT=10+68.64	530548.62	1357820.37	
SWAN DRIVE	END 14+06.53	530277.98	1358022.68	
	START 0+00	530502.03	1357855.20	
	END 1+75	530397.25	1357715.03	
CYGNET PLACE	START 0+00	530717.12	1358167.81	
	PC=1+09.16	530608.18	1358174.68	
	PT=1+50.77	530572.31	1358193.31	
HARMONY LANE	END 3+56.22	530553.83	1358353.62	
	START 7+31.13	530709.75	1358050.90	
	END 9+00.49	530720.41	1358219.91	

STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
(Symbol)	MELODY DRIVE CL STA. 10+50 OFFSET 13' RIGHT CL STA. 11+39 OFFSET 15' RIGHT CL STA. 13+68 OFFSET 13' RIGHT	100 WATT HPS VAPOR COLONIAL POST TOP MOUNTED ON 14" BLACK FIBERGLASS POLE
(Symbol)	HARMONY LANE CL STA. 8+38 OFFSET 17' RIGHT	



PLAN VIEW  
SCALE: 1" = 30'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Howard M. Donnell* 2-14-02  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Samat* 2/1/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*Chris O'Donnovan* 2/1/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS  
**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
phone: 410-465-8105 • fax: 410-465-8644  
email: Benchmark@bca.com

1/15/02

OWNER/DEVELOPER: SDC GROUP, INC. P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 410-465-4244	PROJECT: <b>KINGS ARMS SECTION 2</b> LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24
TITLE: <b>ROAD PLAN</b>	TAX MAP: 47, GRID: 22 PARCEL: 174, 496 AND P/O 732 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: FEBRUARY 18, 2001 JANUARY 2, 2002	PROJECT NO. 1139 SHEET 2 OF 13
DESIGN: DBT DRAFT: DBT CHECK: DAM	SCALE: AS SHOWN

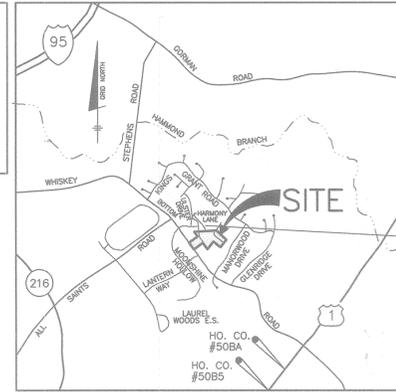
GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE, UNLESS WAIVER(S) HAVE BEEN APPROVED.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993). A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- THE EXISTING TOPOGRAPHY SHOWN IS BASED ON FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. IN APRIL, 2000.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 50BA AND 50BS WERE USED FOR THIS PROJECT.
- WATER AND SEWER SYSTEMS ARE PUBLIC UNDER CONTRACT NUMBER 24-3959-D. THE DRAINAGE AREA IS PATUXENT.
- STORMWATER MANAGEMENT SHALL BE PROVIDED BY EXTENDED DETENTION. THE FACILITY IS TO BE A CLASS "A" STRUCTURE. THE FACILITY WILL BE PRIVATELY OWNED AND MAINTAINED.
- THERE ARE NO 100-YR FLOODPLAINS, STREAMS OR STEEP SLOPES LOCATED ON-SITE.
- WETLAND DELINEATION PROVIDED BY ECO-SCIENCE PROFESSIONALS, INC. DATED OCTOBER, 1998.
- TRAFFIC STUDY WAS PREPARED BY LEE CUNNINGHAM & ASSOCIATES, INC. DATE MAY, 1999.
- FOREST STAND DELINEATION PROVIDED BY ECO-SCIENCES, INC. DATED OCTOBER, 1998.
- NO DISTURBANCE SHALL OCCUR IN THE WETLANDS OR 25' WETLAND BUFFER EXCEPT AS PERMITTED BY THE DEPARTMENT OF PLANNING AND ZONING.
- MINIMUM BUILDABLE LOT SIZE SHALL BE 6,000 SQUARE FEET.
- THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
- TO THE BEST OF OUR KNOWLEDGE THERE ARE NO CEMETERY LOCATIONS ON-SITE.
- BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED ON OR ABOUT JANUARY, 2001 BY BENCHMARK ENGINEERING, INC.
- ALL EXISTING WELLS AND SEPTICS IF LOCATED ON THIS PROPERTY SHALL BE ABANDONED AND VERIFICATION OF THE ABANDONMENT SHALL BE SUBMITTED TO THE HEALTH DEPARTMENT PRIOR TO RECORDED OF THE PLAT OF SUBDIVISION.
- FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT OF WAY LINE AND NOT THE FLAG OR PIPESTEM LOT DRIVEWAY.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
  - WIDTH - 12' (14' SERVING MORE THAN ONE RESIDENCE).
  - SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.).
  - GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS.
  - STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H2S LOADING).
  - DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
  - STRUCTURE CLEARANCES - MINIMUM 12 FEET.
  - MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- DRY WELLS WILL BE PROVIDED FOR THE HOUSES ON LOTS 16-20 WHICH ARE NOT CONTROLLED AND ARE OVERMANAGED BY THE PROPOSED EXTENDED DETENTION POND.
- TO FULFILL THE REQUIREMENTS OF SECTION 16.1800 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT, AN OFFSITE REFORESTATION EASEMENT OF 3.2 ACRES IS PROPOSED ON NON-BUILDABLE PRESERVATION PARCEL "B" OF HIGH FOREST ESTATES (F-98-187) PER REVISION PLAT F-02-56 TO BE RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY. THE ORIGINAL FOREST CONSERVATION PLAN FOR HIGH FOREST ESTATES WAS RECORDED UNDER F-98-165 AS BIG BRANCH OVERLOOK. A REVISION PLAT HAS BEEN PROVIDED AND WILL BE RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY, MARYLAND.
- A JOINT FEDERAL/STATE APPLICATION FOR THE ALTERATION OF THE NONTIDAL WETLANDS AND BUFFER LOCATED AT THE END OF MELODY DRIVE AND AT THE CROSSING OF THE PROPOSED SEWER LINE WAS RECEIVED AT THE MARYLAND DEPARTMENT OF THE ENVIRONMENT ON SEPTEMBER 26, 2001. THE WMA WILL ISSUE A LETTER OF AUTHORIZATION ONCE THE FINAL PLANS HAVE BEEN SIGNED. TRACKING NUMBER 01-NI-0435/200166476.

# ROAD AND STORM DRAIN CONSTRUCTION PLANS KINGS ARMS SECTION 2 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

BENCH MARKS-(NAD'83)

HO. CO. #50BA	EL. N/A
STANDARD DISC ON CONC. MONUMENT	
N 527561.6702'	E 1359772.5936'
HO. CO. #50BS	EL. 178.242'
STANDARD DISC ON CONC. MONUMENT	
N 524999.3640'	E 1357925.6751'



VICINITY MAP  
SCALE: 1" = 2000'

RIGHT OF WAY ELEVATION CHART NAD 83

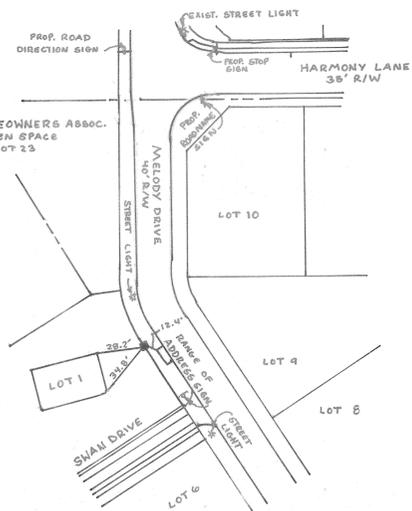
R/W P. NO.	DESCRIPTION	ELEVATIONS
1101	REBAR & CAP SET	292.13
1102	REBAR & CAP SET	293.60
1103	REBAR & CAP SET	290.81
1104	CONC. MON.	291.43
1105	REBAR & CAP SET	291.34
1106	REBAR & CAP SET	290.55
1107	REBAR & CAP SET	295.94
1108	CONC. MON.	290.79
1109	REBAR & CAP SET	291.88
1110	REBAR & CAP SET	289.77
1111	REBAR & CAP SET	299.67



PLAN VIEW  
SCALE: 1" = 50'

SHEET INDEX

NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD PLAN
3	ROAD PROFILES AND DETAILS
4	HARMONY LANE CROSS-SECTIONS
5	TRAFFIC CONTROL PLAN
6	STORM DRAIN DRAINAGE AREA MAP
7	STORM DRAIN PROFILES AND SWM CONSTRUCTION SPECS.
8	GRADING, SEDIMENT AND EROSION CONTROL PLAN
9	SEDIMENT CONTROL NOTES AND DETAILS
10	STORMWATER MANAGEMENT DETAILS
11	LANDSCAPE PLAN
12	OFFSITE REFORESTATION PLAN
13	OFFSITE REFORESTATION NOTES AND DETAILS



NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
phone: 410-465-6105 A fax: 410-465-6844  
email: Benchmark@bceils.com

*Donald W. Mason*  
1/15/02

OWNER/DEVELOPER: SDC GROUP, INC.  
P.O. BOX 417  
ELLICOTT CITY, MARYLAND 21041  
410-465-4244

PROJECT: **KINGS ARMS SECTION 2**  
LOTS 1-22 AND OPEN SPACE LOTS 23 AND 24

LOCATION: TAX MAP: 47, GRID: 22  
PARCELS: 174, 496 AND 732  
6th ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: **TITLE SHEET**  
S-99-23 P-00-14

DATE: FEBRUARY 18, 2001  
JANUARY 2, 2002

PROJECT NO. 1139

DESIGN: DBT DRAFT: DBT CHECK: DAM SCALE: AS SHOWN SHEET 1 OF 13

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Charles M. Smith* 2/14/02  
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Cindy Harman* 3/1/02  
CHIEF, DIVISION OF LAND DEVELOPMENT

*Chris Damann* 2/16/02  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

