GENERAL NOTES

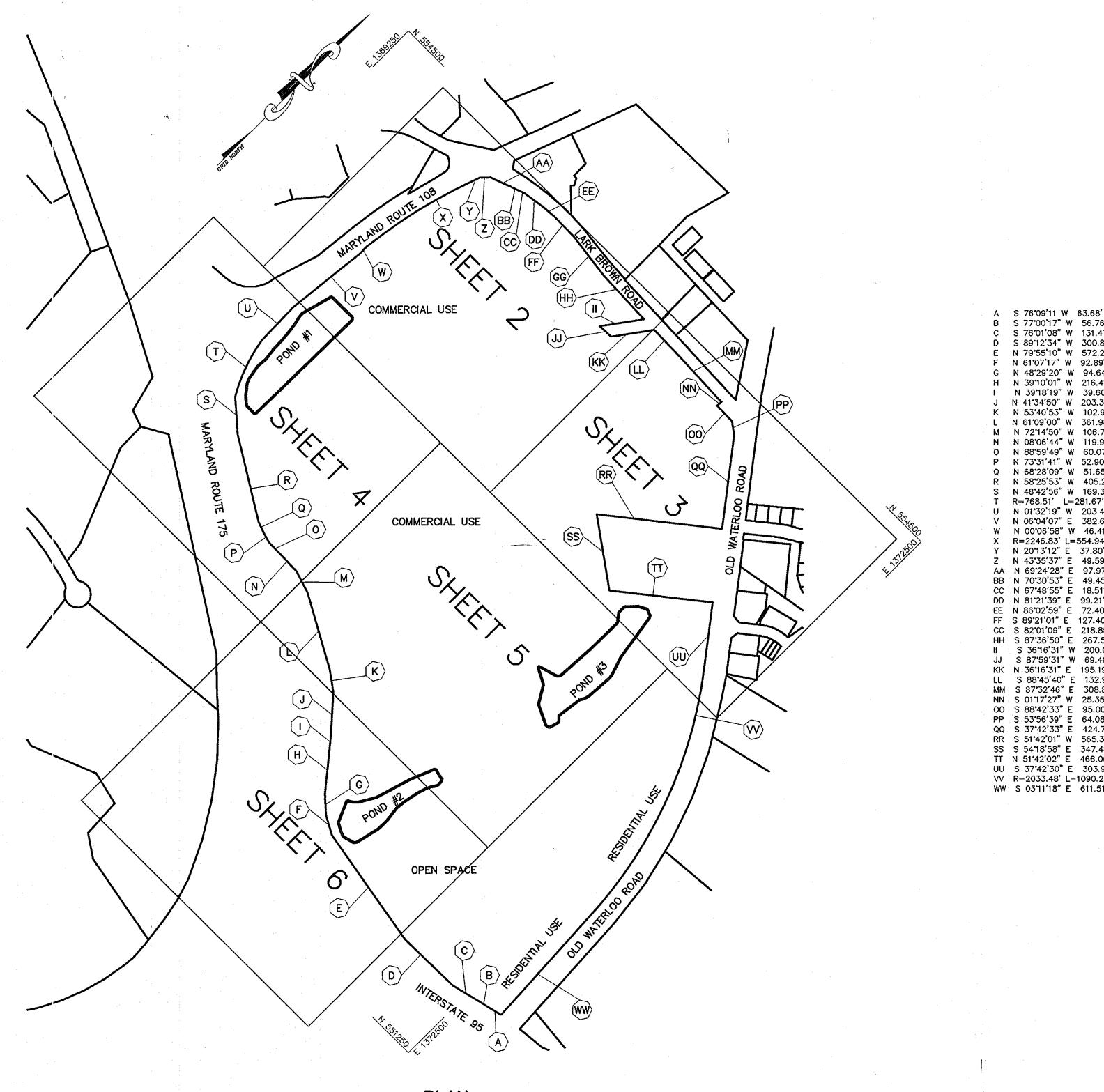
. THE EXISTING TOPOGRAPHY IS TAKEN FROM AERIAL AND FIELD RUN SURVEY MAPS WITH MAXIMUM TWO FOOT CONTOUR INTERVALS PREPARED BY DAFT McCUAN & WALKER, INC. DATED MAY 2003.

2. STREAMS AND WETLANDS ARE BASED ON FIELD OBSERVATIONS BY DAFT MCCUNE & WALKER, INC. AND CONFIRMED BY ON-SITE MEETING WITH US ARMY CORP. OF ENGINEERS ON DEC. 13, 2002.

- 3. THE BOUNDARY SURVEY FOR THIS PROJECT WAS PREPARED BY DAFT, McCUNE & WALKER, INC. SEPT. 2002.
- 4. SUBJECT PROPERTY ZONED NEWTOWN PER 2-2-04 COMPREHENSIVE ZONING PLAN.
- 5. SEE DEPARTMENT OF PLANNING AND ZONING FILE NO'S.: S-03-05, WP-04-113, PB-360, FDP-240, WP-04-135
- 6. THERE ARE NO KNOWN CEMETERIES OR GRAVE SITES ON THIS PROPERTY.
- 7. SOIL MAP #30.
- 8. STREAM BUFFERS ARE DETERMINED BY LAND USE ADJOINING THE OPEN SPACE. EMPLOYMENT USE = 50' BUFFER FROM ANY STREAM. RESIDENTIAL USES = 50' BUFFER FOR INTERMITTENT STREAMS AND 75' BUFFER FOR PERENNIAL STREAMS.
- 9. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- 10. 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.
- 11. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK
- 12. TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT
- 13. 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. 37GD AND 43AI WERE USED FOR THIS PROJECT.
- 14. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. EXISTING UTILITIES ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION.
- 📶 5. FLOODPLAIN STUDY WAS PREPARED BY **PATTON HARRIS RUST 🕴 ASSOCIATES, 🙉 DATED 2005**.
- 16. ALL ELEVATIONS SHOWN ARE BASED ON THE U.S.C. AND G.S. MEAN SEA LEVEL DATUM, 1929.
- 17. THE CONTRACTOR SHALL TEST PIT EXISTING UTILITIES AT LEAST (5) DAYS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS.
- 18. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- 19. ALL EXISTING STRUCTURES TO BE REMOVED PRIOR TO GRADING.
- 20. EXISTING STRUCTURES MUST BE DEMOLISHED PRIOR TO DEVELOPMENT OF SITE.
- 21. THE STORMWATER MANAGEMENT FACILITIES PROPOSED FOR THIS SITE ARE ALL PRIVATELY OWNED AND MAINTAINED. WATER QUALITY VOLUME AND CHANNEL PROTECTION WILL BE PROVIDED IN TWO WET PONDS AND ONE MICROPOOL EXTENDED DETENTION POND. REV MANAGEMENT WILL BE ADDRESSED AT THE TIME OF ULTIMATE SITE DEVELOPMENT OF THE INDIVIDUAL PARCELS. NO STORMWATER MANAGEMENT IS PROVIDED FOR RESIDENTIAL USE PARCELS ALONG OLD WATERLOO ROAD.
- 22. LANDSCAPING IS ONLY BEING PROVIDED FOR THE SWM FACILITIES. LANDSCAPING FOR THE REST OF THE SITE WILL BE ADDRESSED AT THE SITE PLAN STAGE FOR CONSTRUCTION OF BUILDINGS AND OTHER IMPROVEMENTS.
- 23. WP-04-113 DENIED REQUEST TO WAIVE SECTION 16.155...a.1.(i), WHICH REQUIRES APPROVAL OF SITE DEVELOPMENT PLAN PRIOR TO ISSUANCE OF GRADING OR BUILDING PERMIT, TO ALLOW THE PETITIONER TO MASS GRADE THE SUBJECT PROPERTY. THE REASONS FOR DENIAL ARE AS FOLLOWS:
- 1.) THE APPROVAL OF THIS WAIVER WOULD NULLIFY THE INTENT OF THE REGULATIONS, ONE OF WHICH IS TO GUIDE THE ORDERLY DEVELOPMENT OF PROPERTY IN THE COUNTY, BECAUSE THE SUBJECT PROPERTY IS NOT AT A POINT IN THE THE DEVELOPMENT REVIEW PROCESS AT WHICH IT WOULD BE REASONABLE TO BEGIN GRADING. THE PROPERTY HAS NOT BEEN RECORDED UNDER A FINAL PLAN, NOR HAVE ANY SITE DEVELOPMENT PLANS BEEN SUBMITTED FOR CONSIDERATION. PRELIMINARY ENGINEERING FOR INFRASTRUCTURE AND STORMWATER MANAGEMENT HAVE NOT BEEN SUBMITTED OR APPROVED; THEREFORE, THE PARAMETERS FOR MASS GRADING HAVE NOT BEEN DETERMINED. IN ESSENCE, THEN, THIS WAIVER IS PREMATURE.
- 2.) SEE THE ATTACHED COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION.
- 3.) THE APPLICANT HAS NOT PROVIDED ADEQUATE JUSTIFICATION TO WAIVE THE REQUIREMENTS FOR OBTAINING AN APPROVED SITE DEVELOPMENT PLAN FOR MASS GRADING PLAN FOR THIS PROJECT.
- 4.) A SITE DEVELOPMENT PLAN FOR MASS GRADING WILL BE REQUIRED TO BE SUBMITTED, REVIEWED AND APPROVED BY THIS DIVISION AS THIS SITE INVOLVES MULTIPLE STORMWATER MANAGEMENT FACILITIES, FLOODPLAINS, AND EXTENSIVE PUBLIC ROAD IMPROVEMENTS.
- 5.) A PRELIMINARY FOR THE REQUIRED ROAD IMPROVEMENTS TO MARYLAND ROUTE 108 AND TO LARK BROWN ROAD MUST BE SUBMITTED, REVIEWED AND APPROVED PRIOR TO APPROVAL OF A MASS GRADING PLAN FOR THIS DEVELOPMENT.
- 24. WP-04-135 APPROVED REQUEST TO WAIVE SECTION 16.146.a.(1), WHICH REQUIRES SUBMISSION OF PRELIMINARY PLAN APPLICATION WITHIN A CERTAIN TIME AFTER APPROVAL OF A SKETCH PLAN, AND PRIOR TO SUBMISSION OF A FINAL PLAN.
- APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
- 1.) THE FINAL PLAN SHALL BE SUBMITTED WITHIN 4 MONTHS OF APPROVAL FOR THIS WAIVER (ON OR BEFORE 10/23/04) FOR THE AREA ASSOCIATED WITH PHASE 1; WITHIN 6 MONTHS OF APPROVAL OF THIS WAIVER (ON OR BEFORE 12/23/04) FOR THE AREA ASSOCIATED WITH PHASE 2; AND WITHIN 9 MONTHS OF APPROVAL OF THIS WAIVER (ON OR BEFORE 03/23/05) FOR THE NON-RESIDENTIAL AREA OF THE SUBDIVISION. YOU MAY SUBMIT A SINGLE FINAL PLAN APPLICATION TO COVER THE ENTIRE SUBDIVISION SINCE THE MILESTONE DATE TO REMAIN IN COMPLIANCE WITH APFO REQUIREMENTS.
- 2.) YOU MAY NOT CONVERT THE ROADS TO PUBLIC ROADS.
- 3.) YOU WILL HAVE TO COMPLY WITH ALL SHA REQUIREMENTS FOR ROAD IMPROVEMENTS ON ROUTE 108, IN CONJUNCTION WITH THE REVIEW AND APPROVAL OF THE FINAL.
- 25. THIS PROJECT IS EXEMPT FROM THE FOREST CONSERVATION BECAUSE THE PROPERTY IS ZONED NEWTOWN.
- 26. PROPOSED STORMWATER MANAGEMENT DRAINAGE AREA BOUNDARIES WILL REQUIRE VERIFICATION AT THE ULTIMATE DEVELOPMENT SDP SUBMITTED. MODIFICATIONS TO DRAINAGE AREAS CURRENTLY SHOWN FOR THESE POND DESIGNS MAY REQUIRE ADDITIONAL SWM. DRAINAGE AREA PERCENT IMPERVIOUSNESS VALUES USED TO DESIGN PROPOSED PONDS MUST BE VERIFIED AT THE TIME ULTIMATE DEVELOPMENT SITE DEVELOPMENT PLAN SUBMITTAL, ANY INCREASE IN DRAINAGE AREA PERCENT IMPERVIOUSNESS VALUES WILL REQUIRE STORMWATER MANAGEMENT. AT THE ULTIMATE DEVELOPMENT SITE DEVELOPMENT PLAN SUBMISSION, FOREBAY REQUIREMENTS WILL BE VERIFIED. ADDITIONAL FOREBAY LOCATIONS AND STORAGE VOLUME MAY BE REQUIRED AT THAT TIME.

BRISON RAST

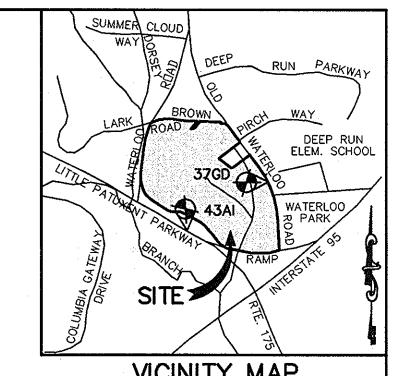
6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND



B S 77°00'17" W 56.76' C S 76°01'08" W 131.47' D S 8912'34" W 300.81' E N 79*55'10" W 572.20' F N 61'07'17" W 92.89' G N 48'29'20" W 94.64' H N 39'10'01" W 216.41' I N 39"18'19" W 39.60' J N 41°34'50" W 203.38' K N 53'40'53" W 102.97' L N 61°09'00" W 361.98' M N 72'14'50" W 106.79' N N 08'06'44" W 119.96' O N 88'59'49" W 60.07' P N 73*31'41" W 52.90' Q N 68'28'09" W 51.65' R N 58*25'53" W 405.22' S N 48*42'56" W 169.33' T R=768.51' L=281.67' U N 01'32'19" W 203.47' V N 06'04'07" E 382.67' W N 00'06'58" W 46.41' X R=2246.83' L=554.94' Y N 2043'12" E 37.80' Z N 43*35'37" E 49.59' AA N 69°24'28" E 97.97' BB N 70°30'53" E 49.45' CC N 67*48'55" E 18.51' DD N 81°21'39" E 99.21' EE N 86'02'59" E 72.40' FF S 89'21'01" E 127.40' GG S 82°01'09" E 218.85' HH S 87*36'50" E 267.54' II S 3646'31" W 200.00' JJ S 87'59'31" W 69.48' KK N 3646'31" E 195.19' LL \$ 88*45'40" E 132.92' MM S 87'32'46" E 308.86' NN S 01"7'27" W 25.35' 00 S 88'42'33" E 95.00' PP S 53'56'39" E 64.08' QQ S 37'42'33" E 424.74' RR S 51'42'01" W 565.37' SS S 5418'58" E 347.48' TT N 51*42'02" E 466.06' UU S 37*42'30" E 303.97' VV R=2033.48' L=1090.21' WW S 0311'18" E 611.51'

AS-BUILT

SHANABERGER & LANE 8726 TOWN & COUNTRY BLVD. SUITE 201 ELLICOTT CITY, MARYLAND 21043



BENCHMARKS

CONTROL STATION 37GD ELEVATION 290.19 N 553,237.211 E 1,372,353.600

CONTROL STATION 43AI ELEVATION 307.455 N 552,081.826 E 1,370,625.818

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND DATE CHIEF, DEVELOPMENT ENGINEERING DIVISION CHIEF, DIVISION OF LAND DEVELOPMENT 1.20.05 | REVISED GENERAL NOTES DATE NO. REVISION OWNER / DEVELOPER HRD LAND HOLDINGS, INC. HOWARD RESEARCH AND DEVELOPMENT CORPORATION THE ROUSE BUILDING 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044 410-992-6000 **PROJECT**

BENSON EAST

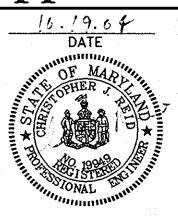
TAX MAP 37 & 43 ZONED - NEWTOWN PARCELS 482, 587, 382, 421, 547 6th ELECTION DISTRICT

HOWARD COUNTY, MARYLAND TITLE

TITLE SHEET

Patton Harris Rust & Associates,pc Engineers. Surveyors. Planners. Landscape Architects.

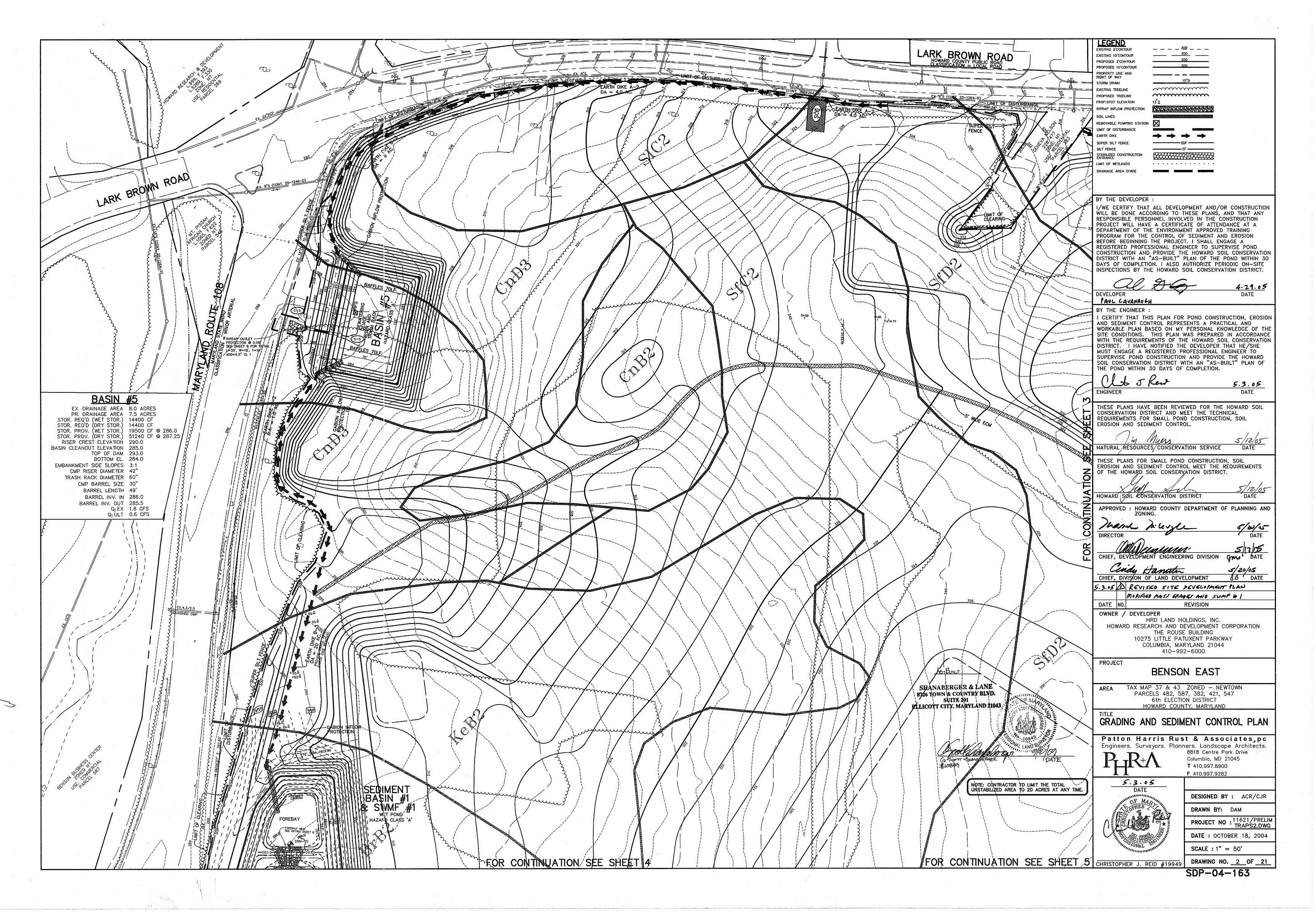
8818 Centre Park Drive Columbia, MD 21045 T 410.997.8900 **F** 410.997.9282

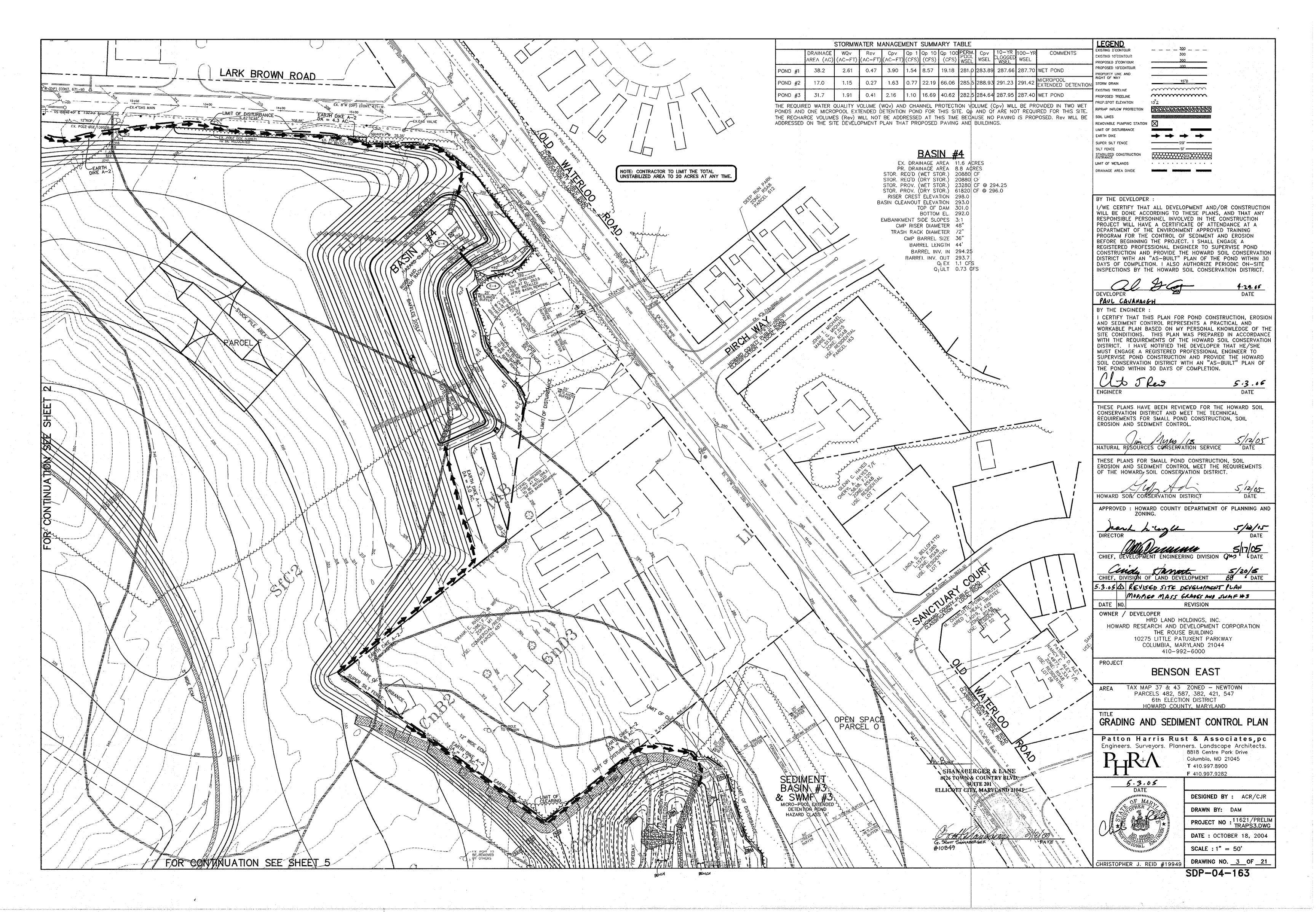


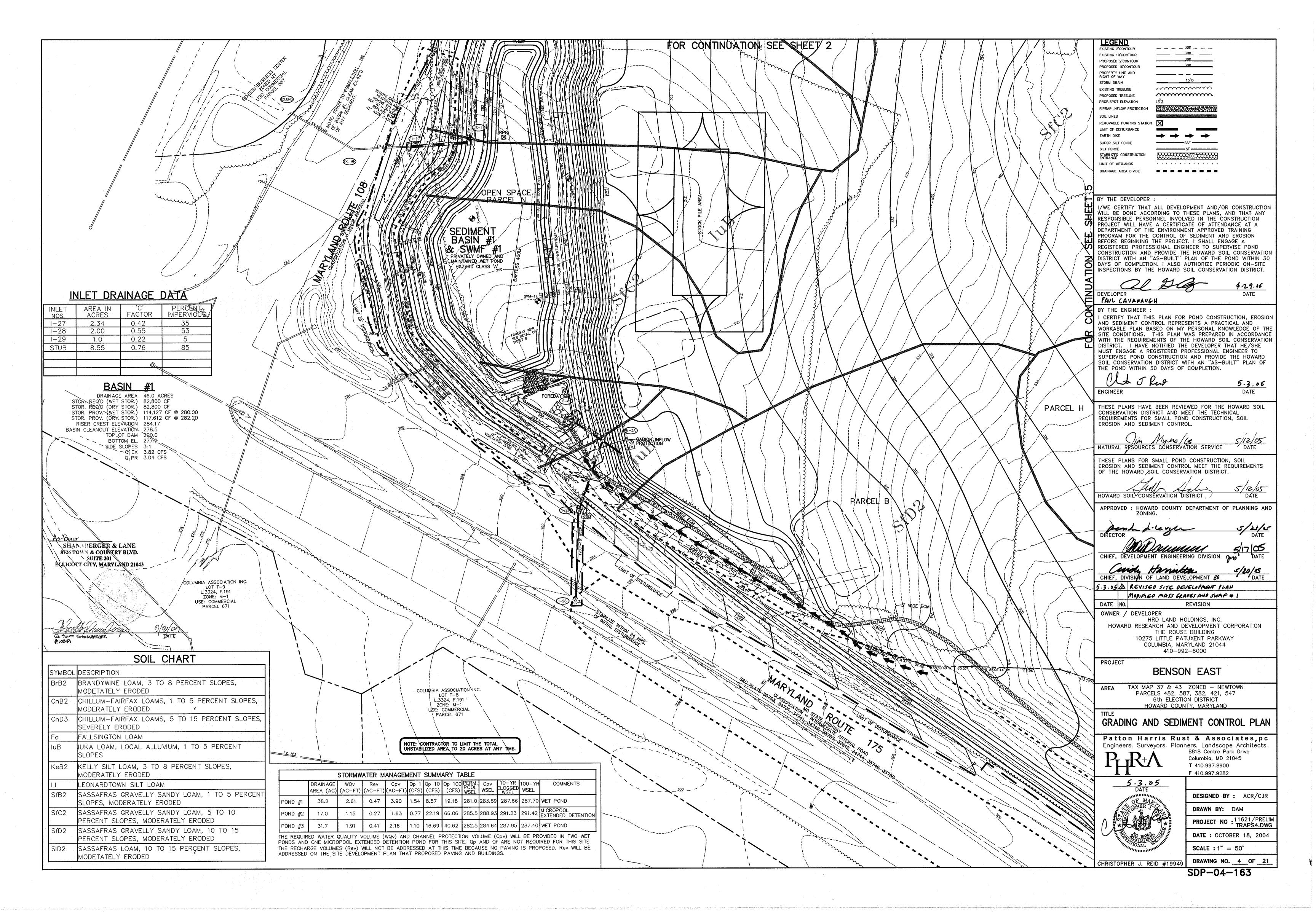
DESIGNED BY : ACR/CJR

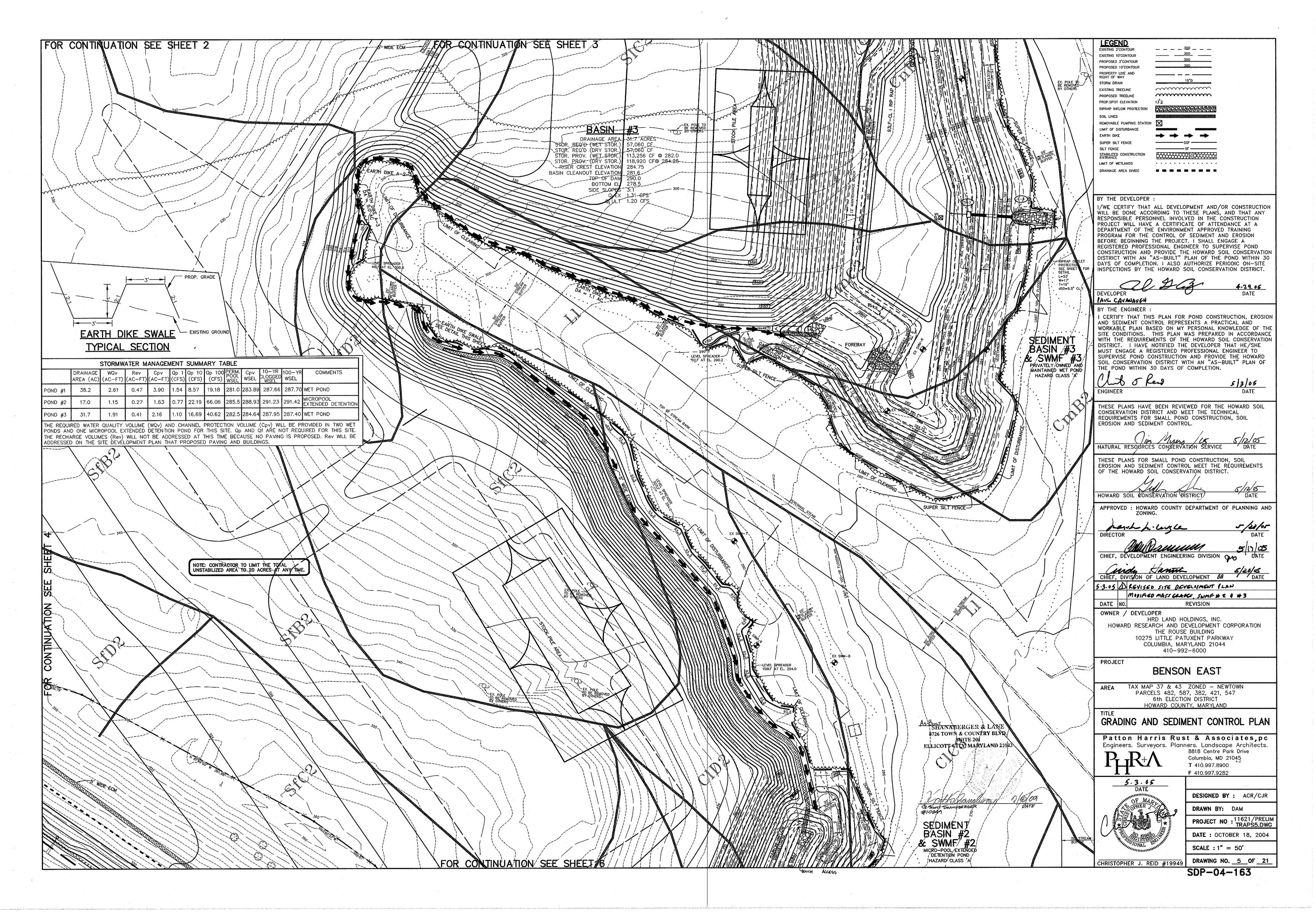
DRAWN BY: DAM PROJECT NO : 11621/PRELIM TRAPS1.DWG DATE: OCTOBER 18, 2004

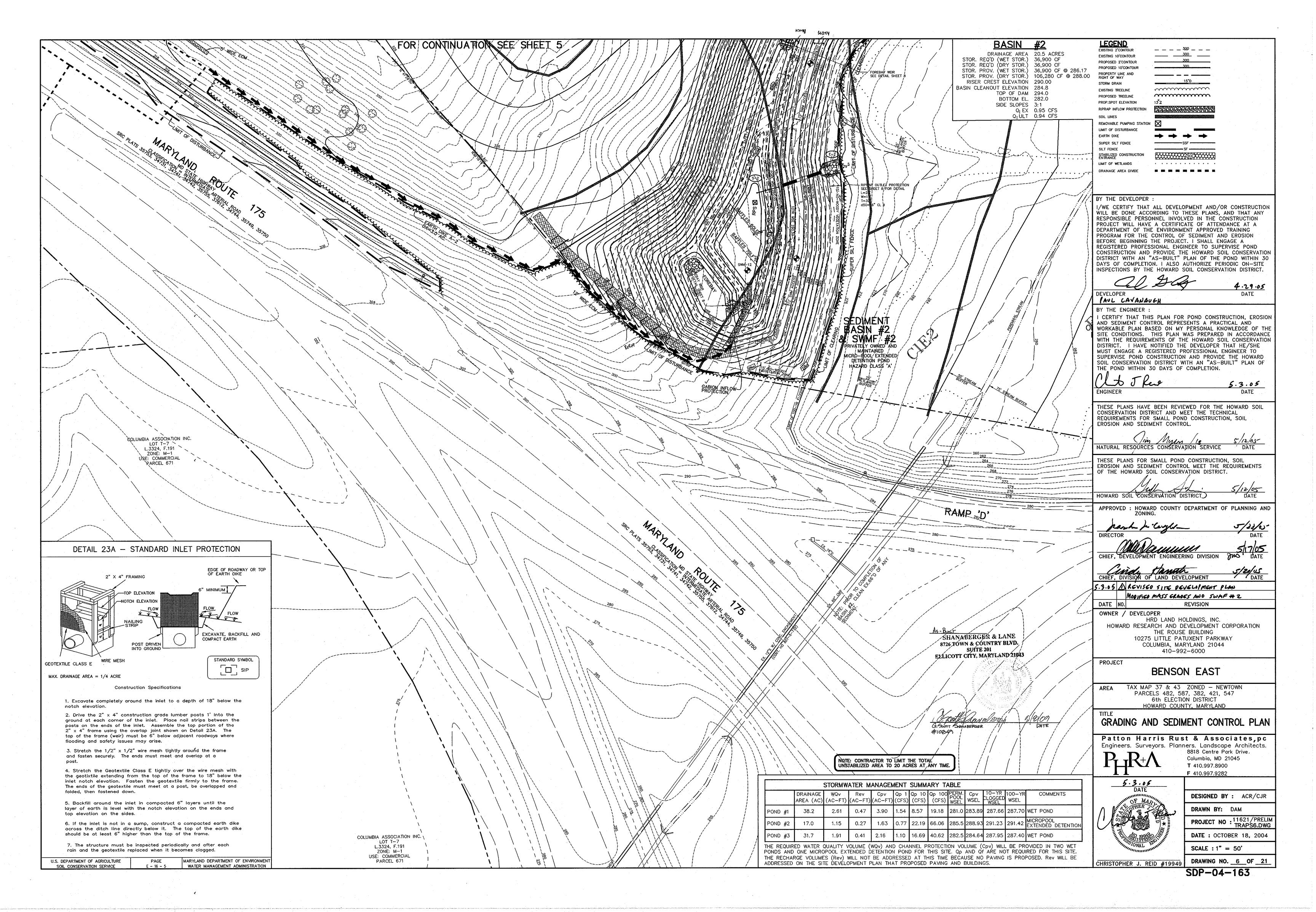
SCALE : AS SHOWN DRAWING NO. __1__OF __21_ CHRISTOPHER J. REID #19949

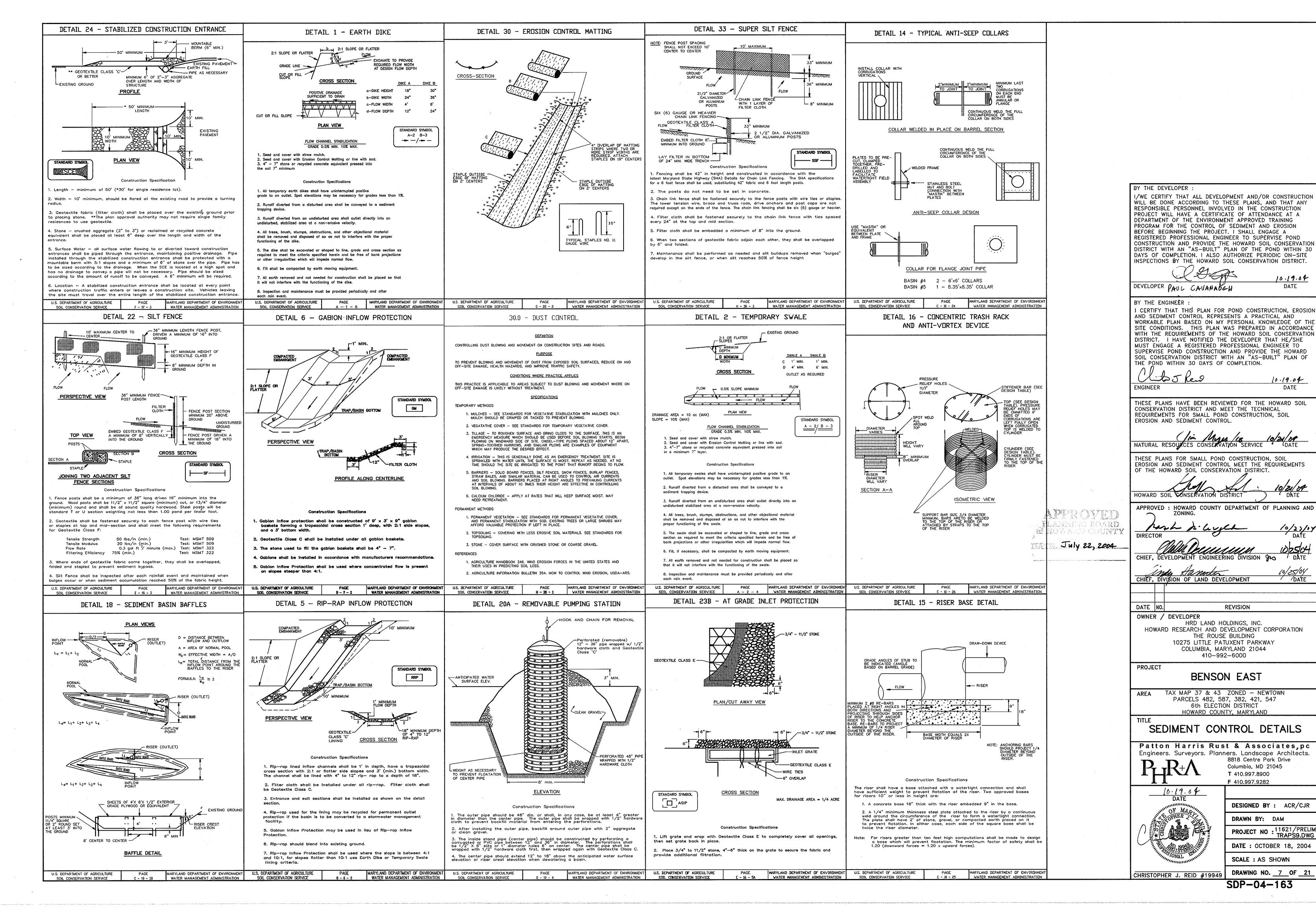












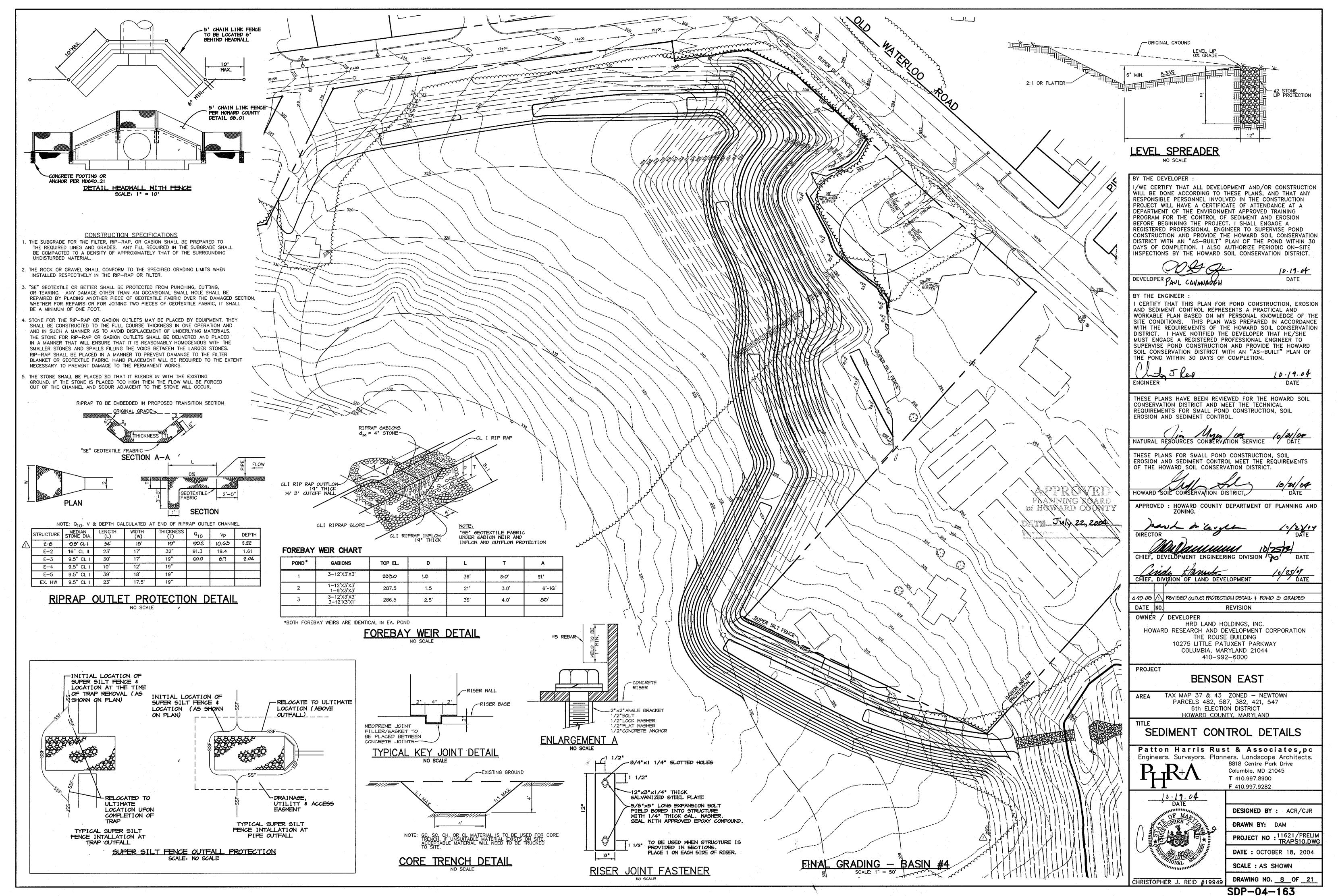
10.19.04

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SITE PREPARATION

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoll. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. 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 stormwater management ponds, a minimum of a 25 foot radius around the injet 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 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, mood, rubbish, stones greater than 6°, frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification 6C, SC, CH, or CL and must have at least 30% passing the #200 sleve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8-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 tread track of the equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tire 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 met that mater can be squeezed out.

When required by the reviewing agency the mimimum required density shall not be ess 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).

Cutoff 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 i to 1 or flatter. The backfill shall compacted with construction equipment, rollers, or hand tampers to assure maximum density and maximum 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 I to I 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 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 2000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to 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 slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four Inched in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all volds 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 structural 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.

All pipes shall be circular in cross section.

at least 24 mils in thickness

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

Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 4 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 Specifications M-274 with matertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soll 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 painted with one coat of zinc chromate primer or two coats of asohalt.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to to the requirements of AASHTO Specifications M-196 or M-21% 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 painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized boits mat be used for connections. the pH of the surrounding soils shall be between 4

- Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coted as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at
- 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. Dimple bands are not considered to be watertight.

All connections 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 band width. The following type connections are acceptable for pipes less than 24" in diameter; flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepunched to the flange boil circle, sandwiched between adjacent flanges; a 12 inch wide standard lap type band with 12 inch wide by 3/8 inch thick closed cell circular neoprene gasket; and a 12 inch wide hugger type band with o-ring gaskets having a minimum diameter of 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 ends. A 24 inch wide by 3/8 inch thick closed cell circular neoprene gasket will be installed with 12 inch on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the figner is also acceptable.

Helically corrugated 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

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

is not permitted.

. Materials - Reinforced concrete pipe shall have bell and spigot joints with

rubber gaskets and shall equal or exceed ASTM Designation C-361. Bedding - All reinforced concrete pipe conduits shall be laid in a concrete bedding/cradie for their entire length. This bedding/cradie shall consist of high slump concrete placed under the pipe and up the side of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradie is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this stanard. Gravel bedding

- 3. Laying pipe Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 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 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 10 inch pipe shall meet the requirements of AASHTO M252 Type 5, and 12" through 24" shall meet the requirements of AASHTO M294 Type 5.
- Joints and connections to anti-seep collars shall be completely watertight.
 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.

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 riprop 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 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 the various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from mater 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 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 of required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water to sumps from which the water shall be pumped.

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. 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

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.

and Specifications for Critical Area Planting (MD-342) or as shown on the

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

TEMPORARY SEEDING NOTES

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 600 lbs. per acre 10-10-10 fertilizer (14 lbs. per 1000 sq.ft.).

Seeding: For periods March I thru April 30 and from August 15 thru November 15, seed with 2-1/2 bushels per acre of annual rye (3.2 lbs. per 1000 sq.ft.). For the period May I thru August 14, seed with 3 lbs. per acre of weeping lovegrass (0.07 lbs. per 1000 sq.ft.). For the period November 16 thru February 28, protect site by applying 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

Mulching: Apply 1-1/2 to 2 tons per acre (70 to 90 lbs. per 1000 eq.ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gai. per acre (5 gai. per 1000 eq.ft.) of emulsified asphalt on flat areas. On slopes, 8 ft. or higher, use 347 gai. per acre (8 gai.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

PERMANENT SEEDING NOTES

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

Seedbed Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously

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

- he following schedules:

 1) Preferred Apply 2 tons per acre dolomitic limestone (92 lbs. per 1000 sq.ft.) and 600 lbs. per acre 10-10-10 fertilizer (14 lbs. per 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 ureaform fertilizer (9 lbs. per 1000 sq.ft.).
- 2) Acceptable Apply 2 tons per acre dolomitic limestone (92 lbs. per 1000 sq.ft.) and 1000 lbs. per acre 10-10-10 fertilizer (23 lbs. per 1000 sq.ft.) before seeding. Harrow or disc into

Seeding: For the period March | thru April 30 and from August | thru October 15, seed with 60 lbs. per acre (1.4 lbs. per 1000 sq.ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs. Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (0.05 lbs. per 1000 sq.ft.) of weeping lovegrass. During the period October 16 thru February 20, protect site by one of the following actions:

- 1) 2 tons per acre of well-anchored mulch straw and seed as soon as possible in the spring.

 2) Use sod
- 3) Seed with 60 lbs. per acre Kentucky 31 Tall Fescue and mulch with 2 tons per acre well anchored straw.

Mulching: Apply 1-1/2 to 2 tons per acre (70 to 90 lbs. per 1000 sq.ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal. per acre (5 gal. per 1000 sq.ft.) of emulsified asphalt on flat areas. On slopes, 8 ft. or higher, use 347 gal. per acre (8 gal. per 1000 sq.ft.) for anchoring.

Maintenance : Inspect all seeded areas and make needed repairs.

OPERATION, MAINTENANCE AND INSPECTION

INSPECTION OF THE POND SHOWN HEREON SHALL BE PERFORMED AT LEAST ONCE ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATION FOR PONDS" (MD378). THE POND OWNER 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 SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

21.0 STANDARD AND SPECIFICATIONS

FOR TOPSOIL Definition

Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

To provide a suitable soll medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

- a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
- c. The original soil to be vegetated contains material toxic to plant growth.
 d. The soil is so acidic that treatment with limestone is not feasible.
 II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require
- special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

 Construction and Material Specifications
- Topsoil salvaged from the existing site may be used provided that it meets the standards as 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 Experimentation Station.
- II. Topsoil Specifications Soil to be used as topsoil must meet the following:
- i. 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 and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½° in diameter.
- Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistie, or others as specified.
- III. Where subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
- II. For sites having disturbed areas under 5 acres:

 Place topsoil (if required) and apply soil amendments as specified in <u>20.0 Vegetative</u>
 <u>Stabilization</u> Section I Vegetative Stabilization Methods and Materials.
- III. For sites having disturbed areas over 5 acres:

dissipation of phyto-toxic materials.

- i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

 a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less
- than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.

 b. Organic content of topsoil shall be not less than 1.5 percent by weight.

 c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

 d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit
- Note: Topsoil substitutes to amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority may be used in lieu of natural topsoil.
- ii. Place topsoil (if required) and apply soil amendments as specified in <u>20.0 Vegetative</u> <u>Stabilization</u> Section I Vegetative Stabilization Methods and Materials.
- V. Topsoil Application
 - i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.
 - ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" 8" higher in elevation.
 - iii. Topsoil shall be uniformly distributed in a 4" 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
 - iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- VI. Alternative for Permanent Seeding instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
- i. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for site having disturbed areas under 5 acres shall conform to the following requirements:
- a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
 b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. If compost does not meet these requirements,
- the appropriate constituents must be added to meet the requirements prior to use.

 c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.

 d. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate.

References: Guideline Specifications, Soil Preparation and Sodding. MD-VA, Pub. #1, Cooperative

Extension Service, University of Maryland and Virginia Polytechnic Institutes. Revised 1973.

STANDARD SEDIMENT CONTROL NOTES

- 1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
- 2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
- 3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A)7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED
- 4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS
 POSTED AROUND THE PERIMETER IN ACCORDANCE WITH VOL. I, CHAPTER 7, OF
 THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- 5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING, AND MULCHING (SEC. G.). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHED OF GRASSES.
- 6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- 7. SITE ANALYSIS:

TOTAL CUT

TOTAL AREA OF SITE
AREA DISTURBED
AREA TO BE ROOFED OR PAVED
AREA TO BE VEGETATIVELY STABILIZED

OR GRADED AREAS ON THE PROJECT SITE.

93.5 ACRES
0 ACRES
93.5 ACRES
*300,000 CY
*300,000 CY

122.8 ACRES

- TOTAL FILL
 OFFSITE WASTE AREA LOCATION TO HAVE ACTIVE GRADING PERMIT.
 *QUANTITIES ARE FOR COUNTY FEE PURPOSES ONLY. CONTRACTOR IS
- RESPONSIBLE FOR VERIFICATION OF ACTUAL QUANTITIES.

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

OPERATION AND MAINTENANCE SCHEDULE OF PRIVATELY OWNED AND MAINTAINED STORMWATER MANAGEMENT FACILITY WET POND AND MICROPOOL EXTENDED DETENTION POND

- ROUTINE MAINTENANCE

 1. Facility shall be inspected anually 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, the bottom of the pond, and maintenance access should be moved as needed.
- 3. Debris and litter next to the outlet structure 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 the detection of any

damage. The components should be inspected during routine

maintenance operations.

2. Sediment should be removed when its accumulation significantly reduces the design storage, interfere with the function of the riser, when deemed necessary for aesthetic reasons, or when deemed necessary by the Howard County's Department of Public

SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- OBTAIN GRADING PERMIT.

 2. INSTALL STABILIZED CONSTRUCTION ENTRANCE, SILT FENCE, SUPER SILT FENCE, AND SEDIMENT BASINS #1-5. (4 WEEKS).
- 3. INSTALL EARTH DIKES ONCE SEDIMENT BASINS ARE FUNCTIONING. (1 WEEK)
 4. INSTALL T-28 TO E-8 & STUB AND PROVIDE INLET PROTECTION (1 WEEK)
 5. UPON ACCEPTANCE BY THE COUNTY INSPECTOR, CONTRACTOR TO PROCEED WITH ROUGH GRADING OF ENTIRE SITE. (12 MONTHS) CONTRACTOR TO PROVIDE DUST CONTROL AS NECESSARY AND AS DIRECTED BY THE INSPECTOR. CONTRACTOR TO INSPECT, REPAIR OR REPLACE EARTH DIKES DAILY WHILE MAINTAINING POSITIVE DRAINAGE TO BASINS.
- 6. APPLY TOPSOIL AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH PERMANENT SEEDING NOTES. (2 WEEKS)
- 7. UPON PERMISSION OF COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES AND CONVERT SEDIMENT BASINS TO PERMANENT STORM WATER MANAGEMENT FACILITIES. CONVERT
- FACILITY IN THE FOLLOWING STEPS:
 A. PUMP OUT STANDING WATER IN BASIN USING PUMPING STATION. (2 DAYS)
- B. REMOVE ACCUMULATED SEDIMENT. (2 DAYS)
 C. REMOVE TEMPORARY DRAW DOWN DEVICE AND PLYWOOD. (1 DAY)
- D. INSTALL POND DRAIN AND ORIFICE PLATES. (3 DAYS)
 E. STABILIZE REMAINING DISTURBED AREAS IN ACCORDANCE WITH PERMANENT SEEDING NOTES. (3 DAYS)

APPROVED
PLANNING BOARD
BE HOWARD COUNTY
DATE July 22, 2004

BY THE DEVELOPER :

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

DEVELOPER PAUL CAVANAUGH

10.19.64 DATE

10.19.14

DATE

BY THE ENGINEER :

I 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.

Old These

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

NATURAL RESOURCES CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS

OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOLE CONSERVATION DISTRICT • DATE

DIRECTOR DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION TO DATE

(1/2/1)

(1/2/1)

(1/2/1)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND

CHIEF, DIVISION OF LAND DEVELOPMENT DAT

05/20/05 A REVISED S.O.C. & AREA DISTURBED

OWNER / DEVELOPER

HRD LAND HOLDINGS, INC.

HOWARD RESEARCH AND DEVELOPMENT CORPORATION

THE ROUSE BUILDING

10275 LITTLE PATUXENT PARKWAY

COLUMBIA, MARYLAND 21044

410-992-6000

REVISION

PROJECT

TITLE

DATE NO.

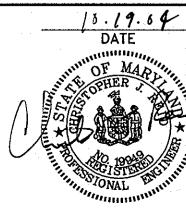
BENSON EAST

TAX MAP 37 & 43 ZONED — NEWTOWN PARCELS 482, 587, 382, 421, 547
6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

NOTES

Patton Harris Rust & Associates, pc
Engineers. Surveyors. Planners. Landscape Architects.
8818 Centre Park Drive
Columbia, MD 21045
T 410.997.8900

F 410.997.9282



DESIGNED BY : ACR/CJR

DRAWN BY: DAM

PROJECT NO: 11621/PRELIM TRAPS11.DWG

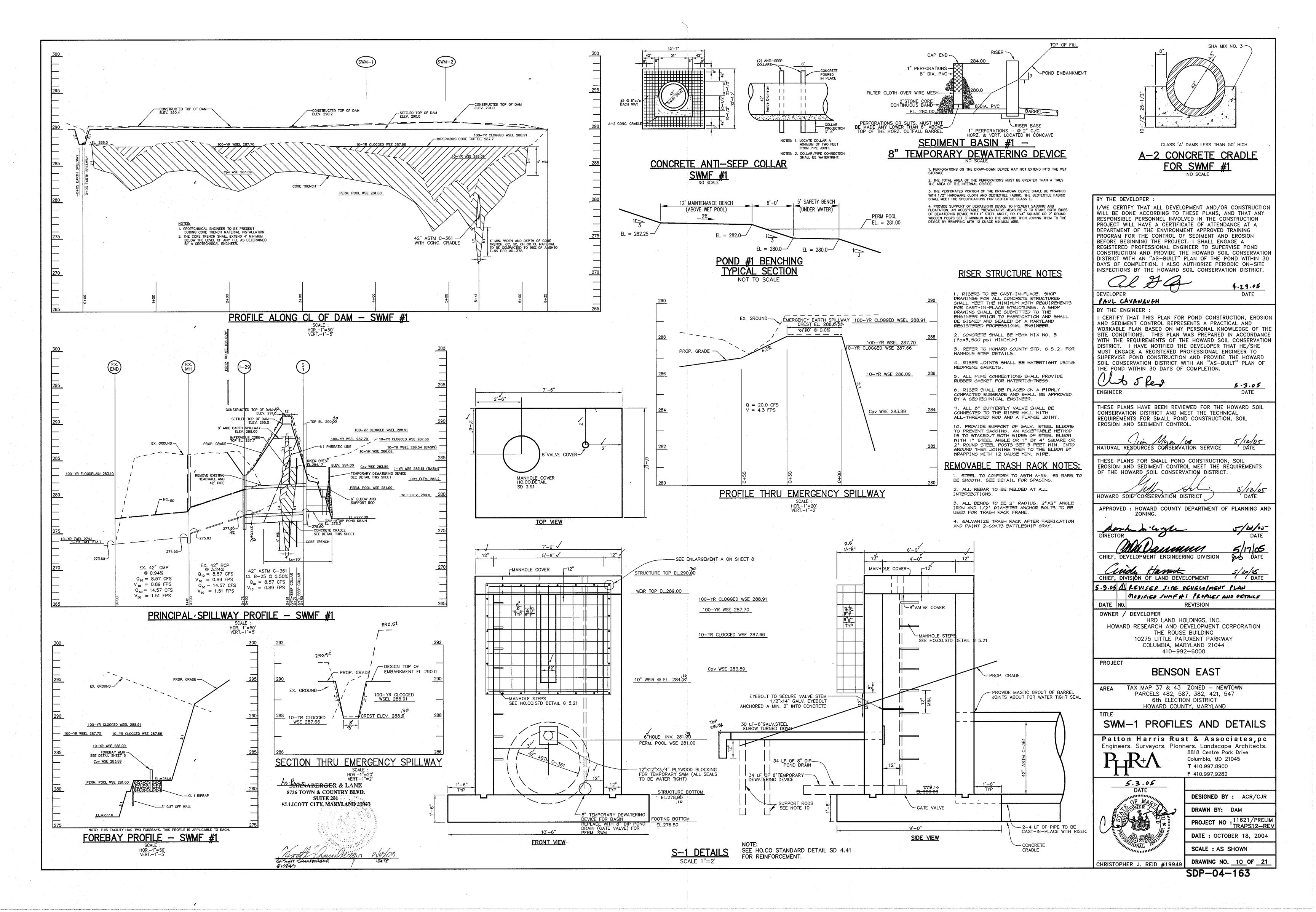
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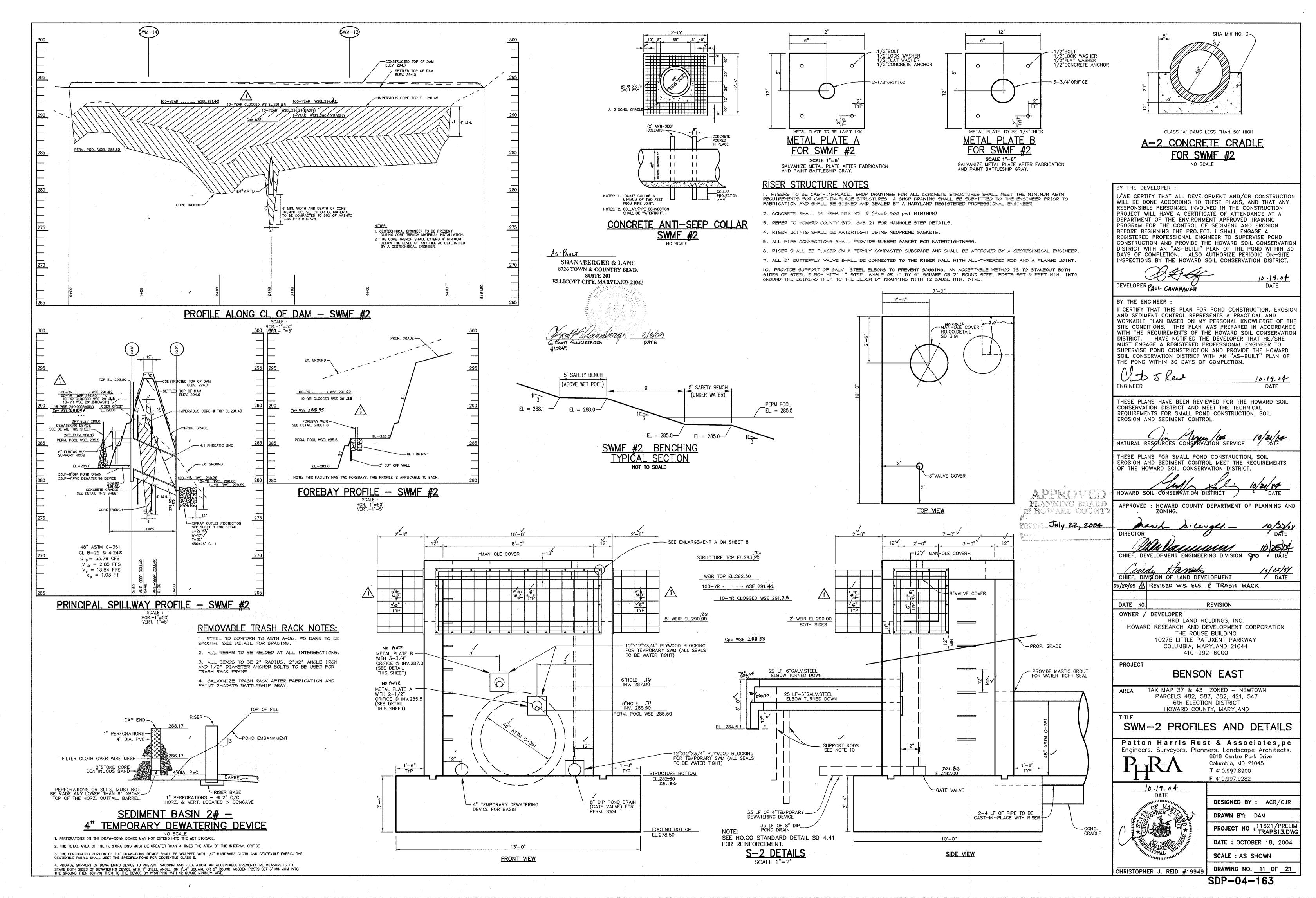
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CHRISTOPHER J. REID #19949

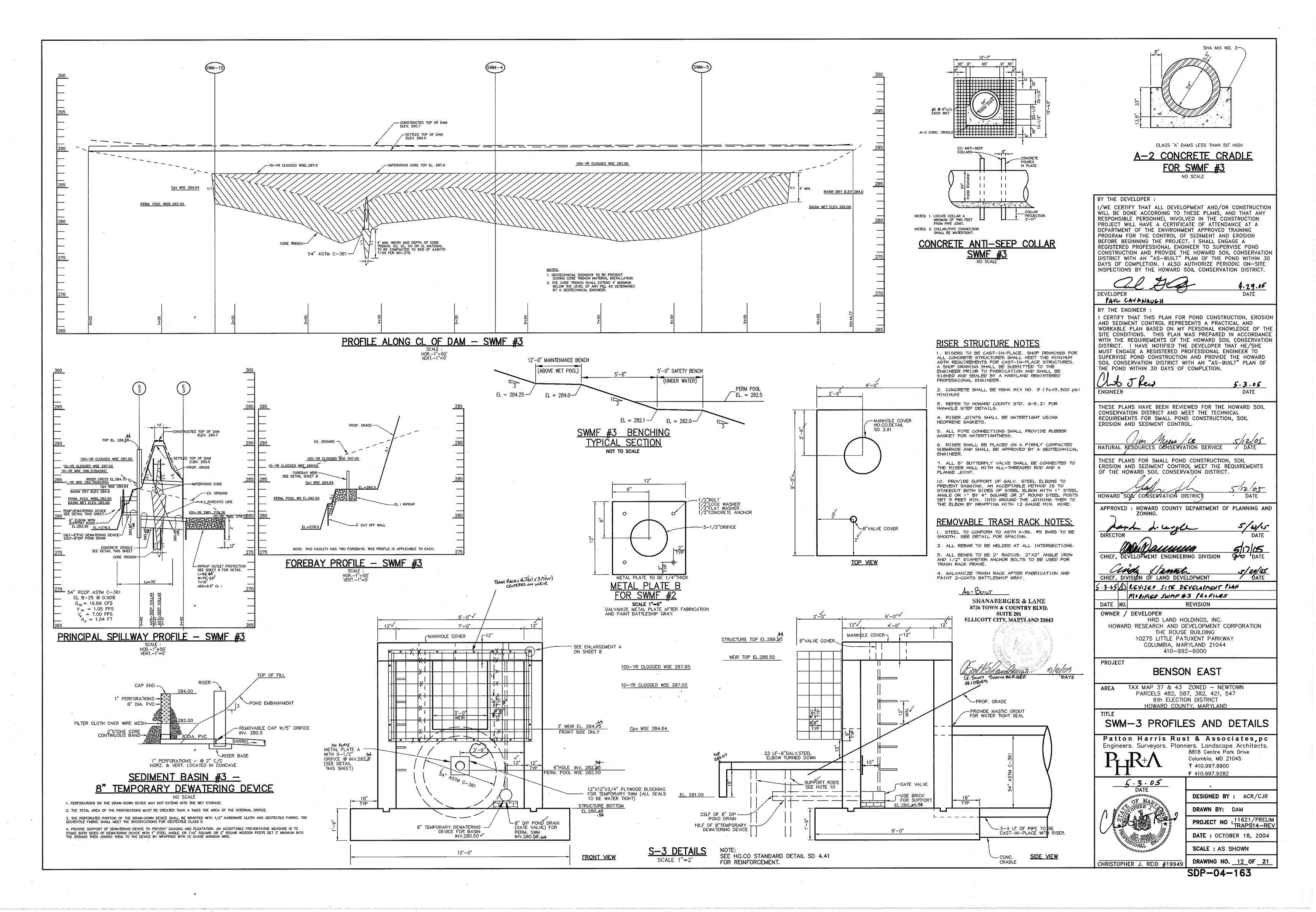
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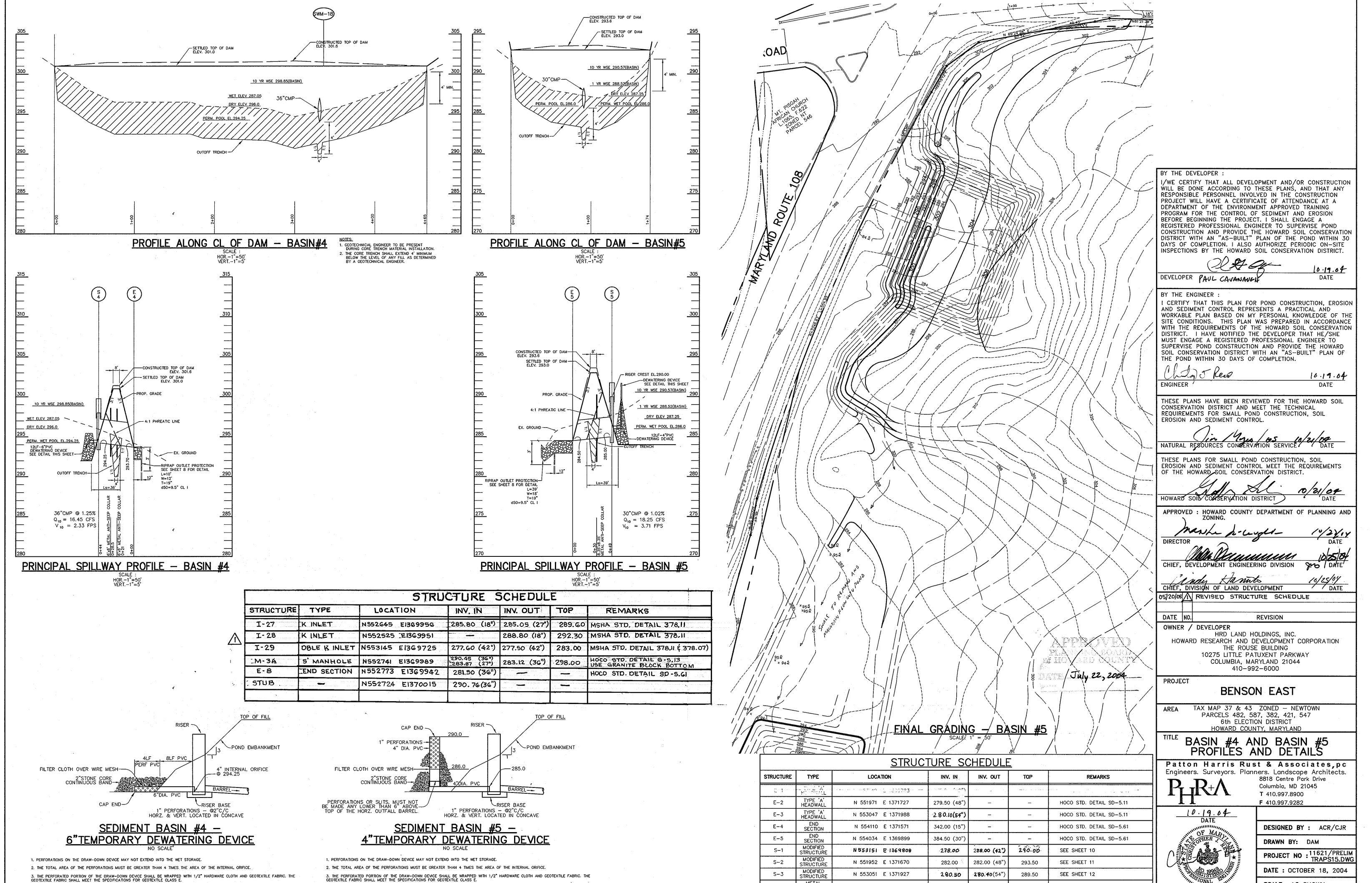
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4. PROVIDE SUPPORT OF DEWATERING DEVICE TO PREVENT SAGGING AND FLOATATION. AN ACCEPTABLE PREVENTATIVE MEASURE IS TO

STAKE BOTH SIDES OF DEWATERING DEVICE WITH 1" STEEL ANGLE, OR 1'x4" SQUARE OR 2" ROUND WOODEN POSTS SET 3" MINIMUM INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GUAGE MINIMUM WIRE.

4. PROVIDE SUPPORT OF DEWATERING DEVICE TO PREVENT SAGGING AND FLOATATION. AN ACCEPTABLE PREVENTATIVE MEASURE IS TO

STAKE BOTH SIDES OF DEWATERING DEVICE WITH 1" STEEL ANGLE, OR 1'x4" SQUARE OR 2" ROUND WOODEN POSTS SET 3' MINIMUM INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GUAGE MINIMUM WIRE.

METAL RISER

N 554144 E 1371542

N 554024 E 1369946

294.25

285.0

294.25 (36"

285.00 (30")

299.00

291.00

S-4

S-5

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CHRISTOPHER J. REID #19949

DRAWING NO. <u>13</u> OF <u>21</u>

SEE SHEET 13

SEE SHEET 13

WATER AT 294.2 BROWN MOIST CLAYEY SILT WITH SAND BROWN MOIST SANDY SILT WITH GRAVEL TAN MOIST SILTY SAND, TRACE GRAVEL GRAY AND TAN MOIST SILTY CLAY. TAN MOIST CLAYEY SAND DARK BROWN MOIST SILTY SAND RACE SAND AND GRAVEL WATER AT 284.0 TAN, GRAY, PINK MOTTLED MOIST SANDY CLAY MOTTLED MOIST SILTY CLAY WITH SAND BROWN MOIST SILTY SAND WATER AT 297.0 OLIVE MOIST CLAYEY SILT RED BROWN MOIST CLAY WITH SAND ORANGE TAN MOIST CLAY WITH SAND BROWN MOIST GRAVEL, AND SAND WITH REDDISH TAN MOIST SAND WITH SILT TAN WET SAND WITH SILT TAN, GRAY, PINK MOTTLED SAND WITH TAN WET SANDY CLAY WATER AT 283.3 WATER AT 281.6 GREEN AND BROWN MOIST CLAYEY SILT REDDISH TAN WET SAND WITH SILT GREEN GRAY MOIST SILTY SAND AN MOIST SAND WITH SILT DARK BROWN MOIST SAND WITH SILT TAN MOIST CLAYEY SILT WITH SAND BROWN MOIST SILTY SAND BOTTOM OF HOLE BOTTOM OF DRY HOLE BOTTOM OF DRY HOLE BOTTOM OF HOLE BORING SWM-18 BORING SWM-13 BORING SWM-15 BORING SWM-16 BORING SWM-17 BORING SWM-11 BORING SWM-12 BORING SWM-14 BORING SWM-10

6. CONSTRUCTION CONSIDERATIONS FOR SWMF #1, #2 AND #3

General Earthwork Requirements

Controlled compacted fill will be required for the embankments around the SWM ponds. The fill for these areas was assumed to be obtained from the SWM pond areas as well as other nearby regions. Some of the surficial on-site soils as described in Section 4.0 are suitable for use as impermeable core trench materials based on their soil classification (SC, CL, and CH).

The maximum dry density (AASHTO T-99) for the residual soil samples ranged from 86.8 to 119.1 pcf with optimum moisture contents ranging from 12.5% to 34.5%. The natural

moisture content of the fill materials on site was generally above the optimum moisture content. Based on these conditions, significant drying of the soil by discing and aeration or other means of manipulation can be anticipated during the earthwork process. Furthermore, the micaceous component of the on-site soils makes it susceptible to loss of strength upon exposure to free water. Therefore, it would be prudent to schedule clearing and grubbing, stripping, and earthwork operations for the warmer, dryer periods of the year (if possible) so that construction schedules will not be delayed due to inclement weather.

All fill placed for the embankment, utility backfill, or any other location requiring stable support or minimal settlement shall be constructed as controlled compacted fill. Controlled compacted fill and foundations excavations shall meet the following requirements:

- a) Within the described construction areas, strip the vegetation, topsoil, and any organic, contaminated, or otherwise unsuitable materials to expose clean soils. The subject area shall encompass the SWM ponds and extend outward from the edges a minimum of 5 feet plus I additional foot horizontally for every foot of new fill to be placed, or cut to be excavated.
- b) Proofroll the stripped soil surface with a fully loaded, tandem-axle dump truck, or other approved equipment, under the observation of a geotechnical engineer or highly qualified senior level soils technician, to verify and establish a uniform, dense and stable condition. Any soft, yielding, organic, contaminated, or otherwise unacceptable spots detected shall be overexcavated and replaced with controlled compacted fill.
- c) Any material used for controlled fill shall be inspected and approved for use by a geotechnical engineer or qualified soils technician prior to use on the site. All fill shall be free from topsoil, boulders, cobbles, roots, organic matter, and debris. Preliminary approval of the borrow material shall not constitute general acceptance of all materials in the deposit or source of supply, and the acceptance shall be subject to field tests taken at the discretion of the geotechnical engineer or qualified soils technician.
- d) Compacted fill should be placed in horizontal, successive, uniform layers having a maximum uncompacted lift thickness of 8 inches. Each lift should be compacted uniformly to a minimum of 95 percent of the Standard Proctor maximum dry density as determined by AASHTO T-99 (ASTM D-698). The moisture content of the materials shall be maintained within ± 3% of the optimum moisture content in order to attain the required degree of compaction. Each lift should be uniformly and evenly blade mixed during spreading to ensure uniformity of the material in each layer. If the work deteriorates prior to placement of the next lift, the layer shall be recompacted and reshaped accordingly.

- e) Successive lifts of compacted fill shall not be placed until the layer under construction has been compacted to the required density as measured by a geotechnical engineer or qualified soils technician. Successive runs of equipment shall be staggered over the width of each layer.
- Where fills are to be placed on slopes, the original ground should be deeply scarified or where slopes are steeper than 5 horizontal to 1 vertical the slope should be stepped or benched, when considered necessary by the Engineer, in order that the placement of fill may be accomplished in horizontal lifts.

It is noted that this methodology is recommended both as preparation for areas to receive new fill, as well as locations where cut is required to establish the proposed grades such as foundation excavations. In cut areas, the proofrolling and selective undercutting shall be accomplished after excavation down to the proposed grades has been completed.

6.2. Dewatering

Groundwater measurements suggest that groundwater infiltration may be encountered in SWM facilities during construction. All excavations should be properly graded to avoid the accumulation of groundwater and surface water near foundation locations. Dewatering measures will most likely be required at these locations. Furthermore, contractors should provide suitable dewatering equipment to remove any water that has accumulated in

1. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and

grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of

cleared until completion of the dam embankment unless the pool area is to be used for borrow. In

order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway)

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments

The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the riser

crest elevation. The minimum bottom width shall be two feet, but wide enough to permit operation

of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction

requirements shall be the same as those for the embankment. The trench shall be dewatered during

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall

be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable

material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW

& SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment.

Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall

contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water

can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in

six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be

obtained by routing and hauling the construction equipment over the fill so that the entire surface of

each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use

of a compactor. The embankment shall be constructed to an elevation 10 percent higher than

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel stub by welding

the full circumference making a watertight structural connection. Concrete risers shall be poured with

the principal spillway in place or precast with voids around the principal spillway filled with concrete

or shrink proof grout for watertight connection. The barrel stub must be attached to the riser at the

same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser

base shall be watertight. All connections between barrel sections must be achieved by approved

watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of

impervious soil as the embankment is constructed. Breaching the embankment to install the harrel is unacceptable. Pervious materials such as sand, gravel, or crushed stone shall not be used as

backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be

placed in four inch lifts and hand compacted under and around the pipe to at least the same density

as the adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over

5. Emergency Spillway: The emergency spillway shall be installed in undisturbed ground. The

achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical

to the successful operation of the emergency spillway and must be constructed within a tolerance of

the principal spillway and hand compacted before crossing it with construction equipment.

shall be cleared of all brush, trees, and other objectionable materials.

the backfilling-compaction operations. For dewatering see Section D.

the design height to allow for settlement.

topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be

6. Vegetative Treatment: Stabilize the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon basin completion and monitored and maintained

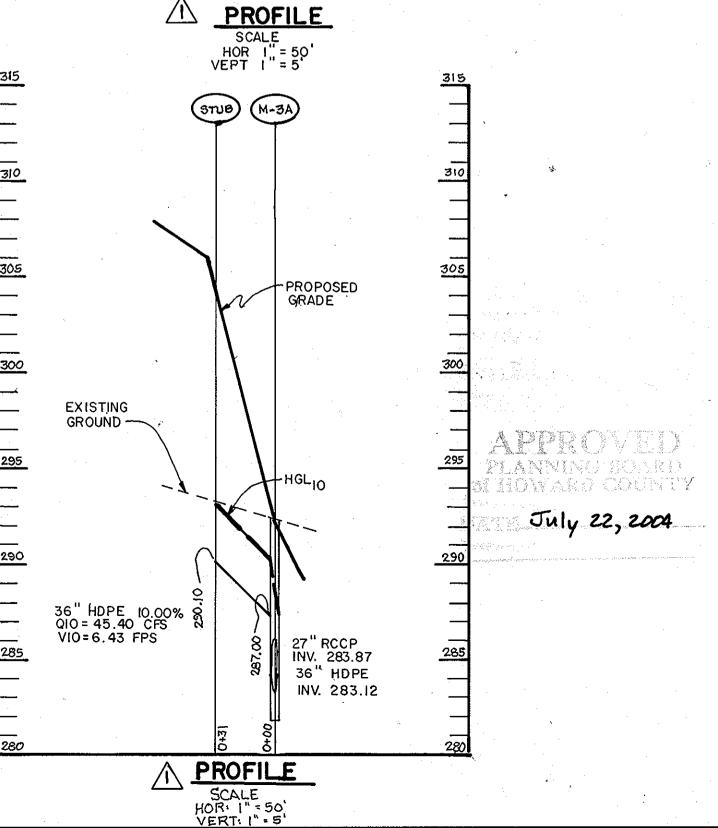
7. Safety: Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using methods in Section D - Dewatering), graded, and back filled.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed contributory drainage areas, temporary sediment basins, if initially built and certified to meet permanent standards, may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with 295 approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains

(E-8) (1-28) 1-27 (M-3A) EXISTING GROUND--PROPOSED GRADE RIPRAP OUTLET PROTECTION SEE SHEET 8 FOR DETAIL T=19' d50=9,5"= CL. I 24'RCCP@ 2,38% Q10= 9,35 CFS 27" RCCP@1.22 % 36" HDPE QIO = 17.39 CFS Ø 3.38 % VIO=4.37 FPS Q25=20.05 CFS V25=5.04 FPS QIO= 60.55 CFS VIO= 8,57 FPS V25 = 6.08 FPS OVe=10.63FPS (



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

10.19.07 DEVELOPER PAUL CAVANAVEL DATE

BY THE ENGINEER

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.

Choto J Reve 10.19.08

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.

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

Cindy Hamile
CHIEF, DIVISION OF LAND DEVELOPMENT

5.24.05 ADDED TWO PROFILES

OWNER / DEVELOPER HRD LAND HOLDINGS, INC. HOWARD RESEARCH AND DEVELOPMENT CORPORATION THE ROUSE BUILDING

10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044 410-992-6000

BENSON EAST

TAX MAP 37 & 43 ZONED - NEWTOWN PARCELS 482, 587, 382, 421, 547 6th ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

DETAIL SHEET

Patton Harris Rust & Associates,pc Engineers. Surveyors. Planners. Landscape Architects.

8818 Centre Park Drive Columbia, MD 21045 **T** 410.997.8900 **F** 410.997.9282

16.19.04

DESIGNED BY : ACR/CJR DRAWN BY: DAM

PROJECT NO : 11621/PRELIM TRAPS8.DWG **DATE:** OCTOBER 18, 2004

SCALE : AS SHOWN DRAWING NO. __14_OF:__21_

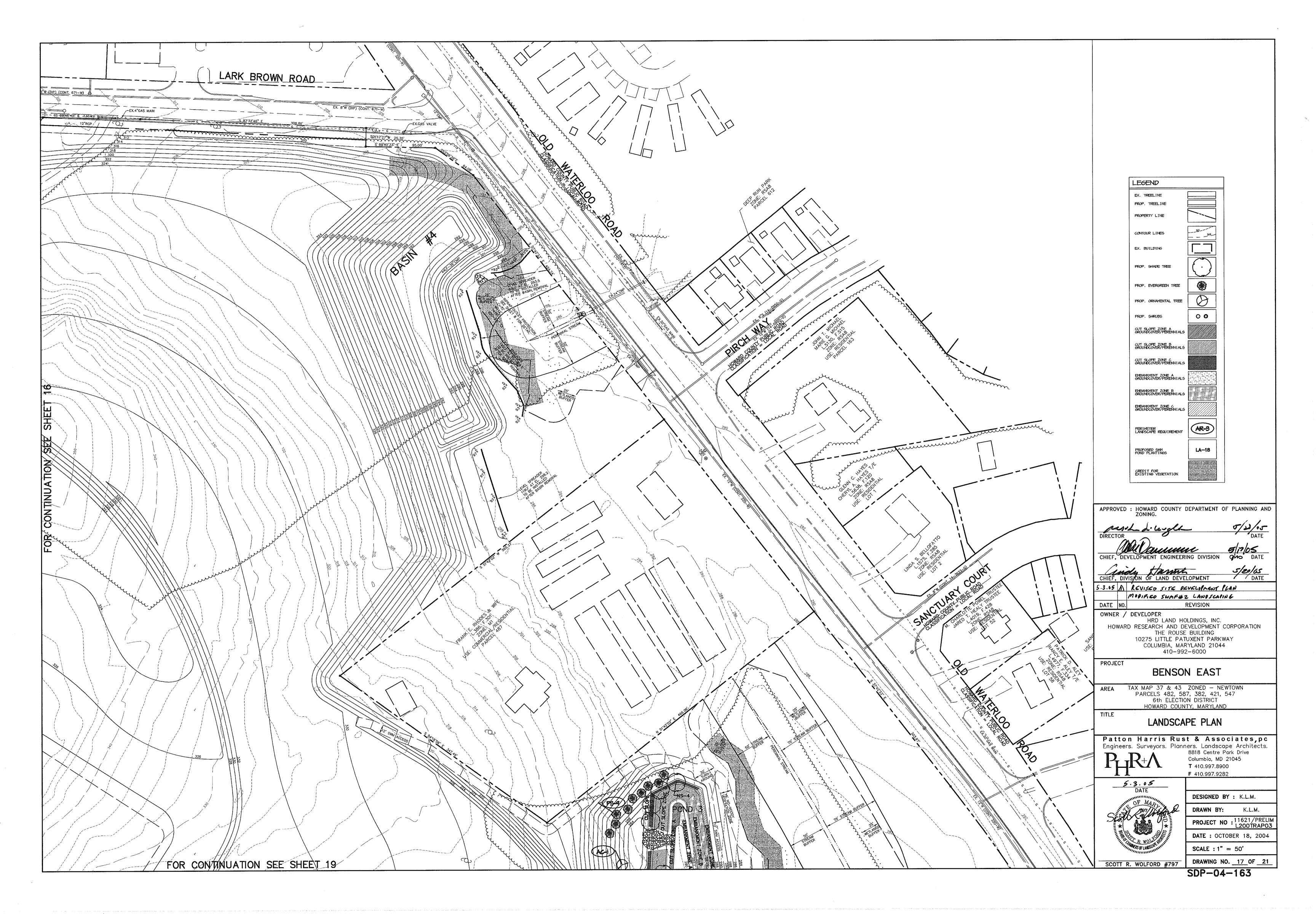
CHRISTOPHER J. REID #19949 SDP-04-163

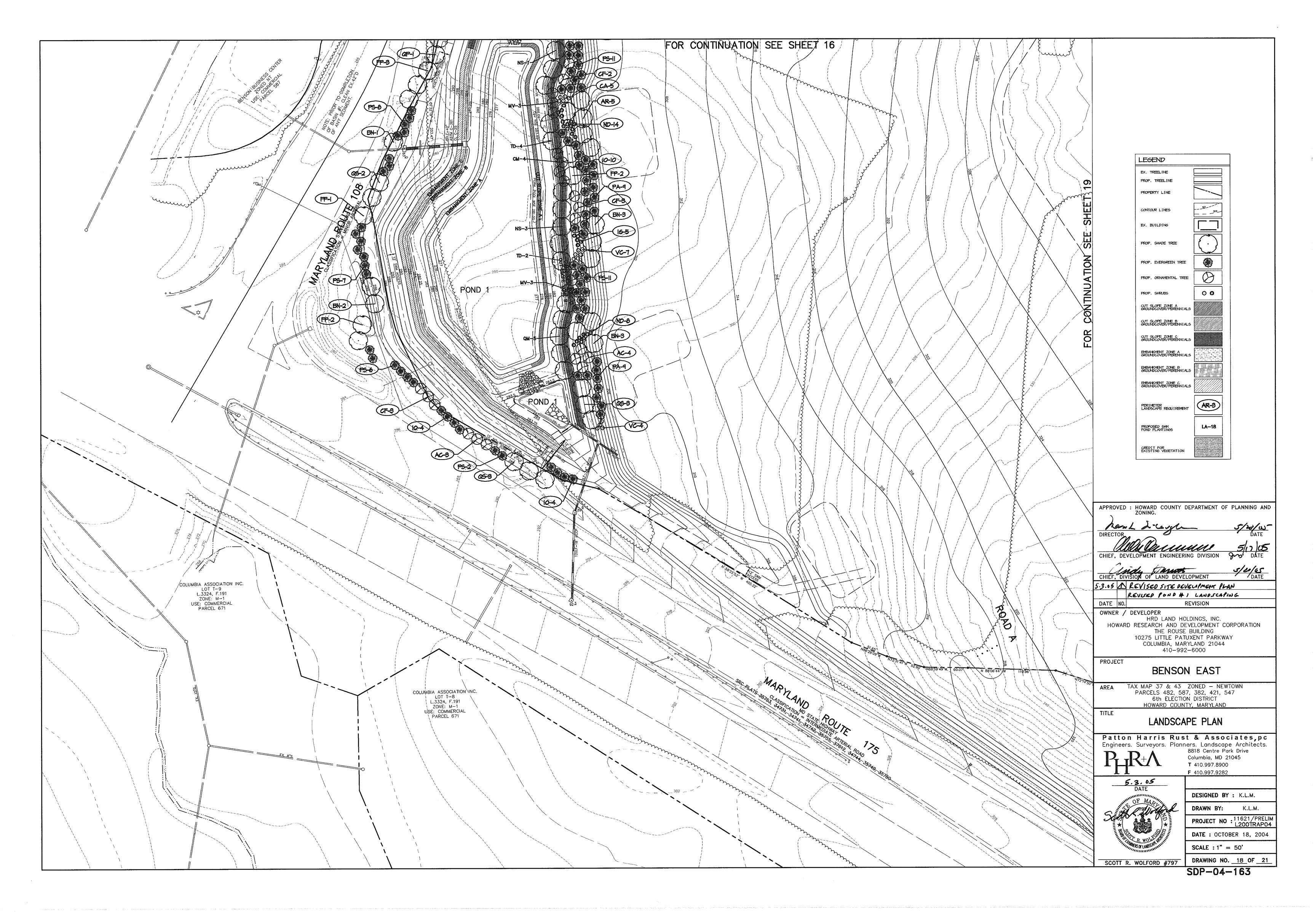
BASIN CONSTRUCTION SPECIFICATIONS

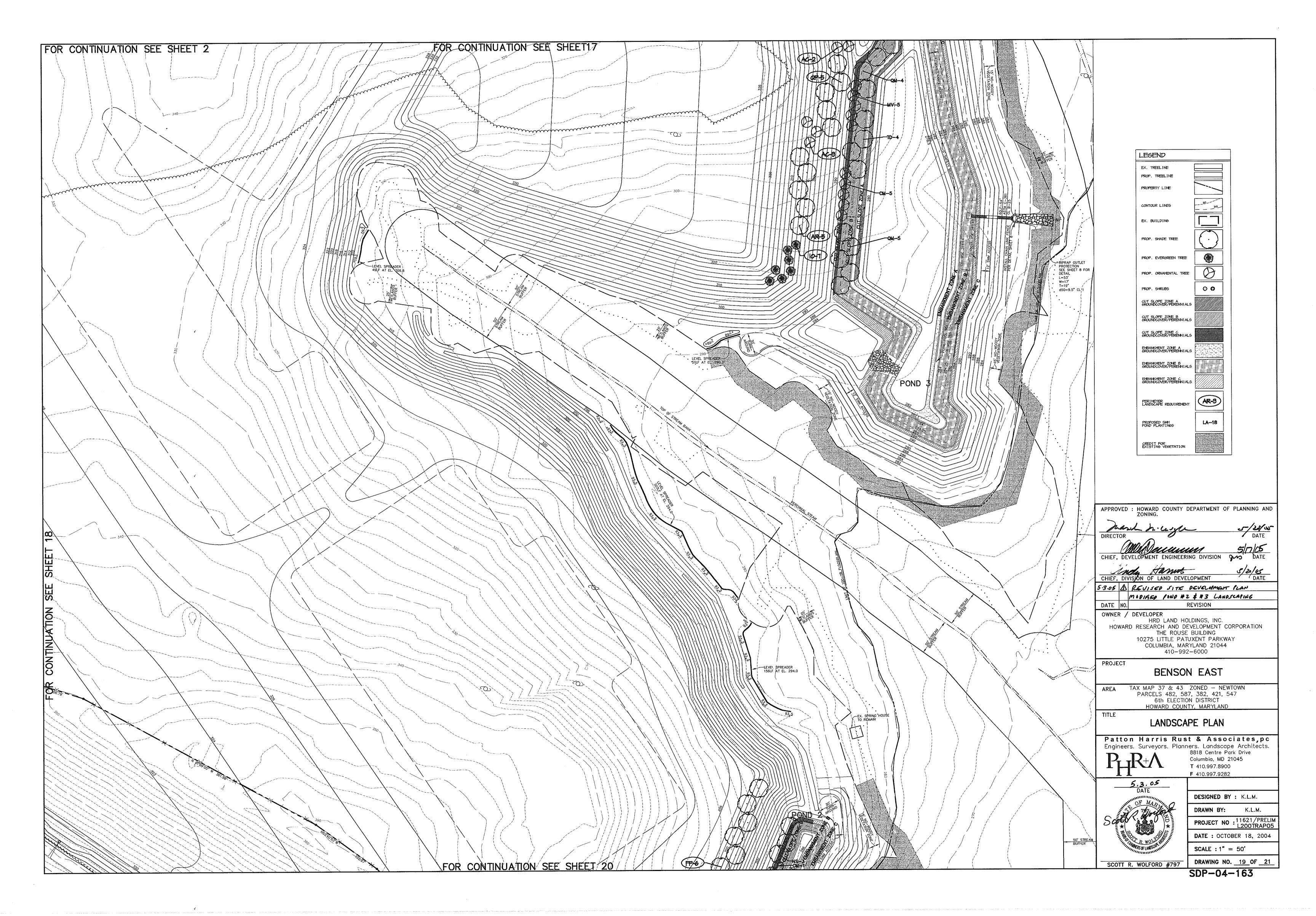


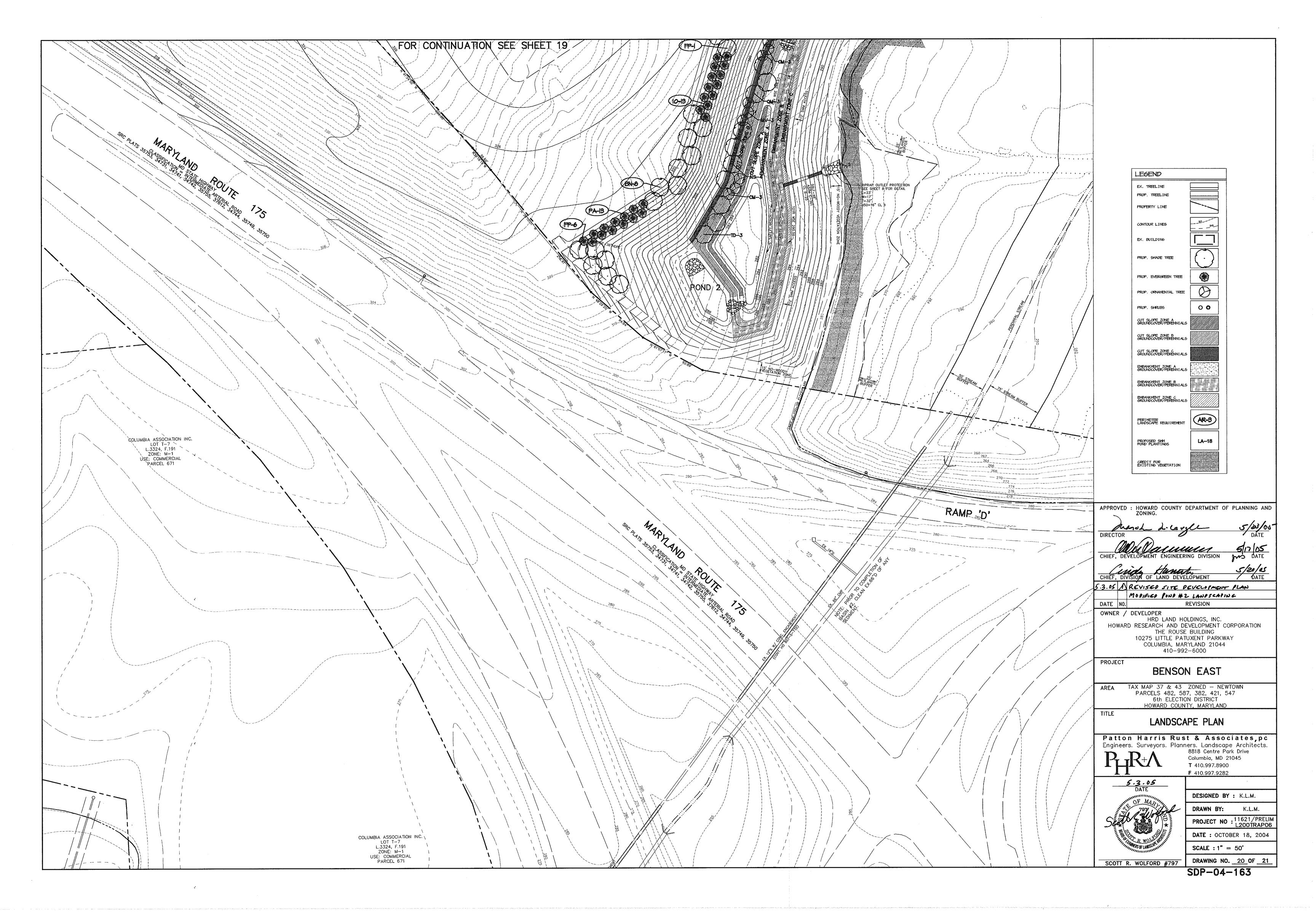
SDP-04-163











	<u> </u>		
SCHEDULE D - STORMWATER MANAGEMENT PERIMET	ER LAND	SCAPING	,
S.W.M. POND PERIMETER	1	2	3
LANDSCAPE TYPE	C	B	В
LINEAR FEET OF TOTAL PERIMETER	±1,9051	±1,616'	±1,823
CREDIT FOR EX. VEGETATION (NO OR YES & %)	NO	YES	YES
		930	1,200
CREDIT FOR OTHER PROP. LANDSCAPING (NO OR YES & %)	NO	NO	NO
LINEAR FEET OF REMAINING PERIMETER	1,9051	6861	6231
NUMBER OF TREES REQUIRED: SHADE TREES EVERGREEN TREES	48 95	21 26	13 16
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION, 50% MAX.)	40 95 16*	21 26 0	10 16 6*

* SUBSTITUTION NOTES: Perimeter 1: 16 ornamental trees were substituted for 8 shade trees. Perimeter 3: 6 ornamental trees were substituted for 3 shade trees.

		STORMWATER MANAGEMENT PERIME	TEK PLANT	L121	
SYMBOL	QTY.	SCIENTIFIC/ COMMON NAME	ZE ROOT	RE	MARKS
AR	10	Acer rubrum 'Red Sunset' Red Sunset Red Maple	2.5'-3' cal.	B4B	Plant as shown
BN	17	Betula nigra 'Heritage' Heritage River Birch	2.5°-3° cal.	B4B	Plant as shown
FP	21	Franxinus pennsylvanica 'Marshall's Seedless' Marshall's Seedless Green Ash	2.5°-3° cal.	B4B	Plant as shown
œ	15	Quercus palustris Pin Oak	2.5'-3' cal.	Bŧ₿	Plant as shown
Ø₽	11	Quercus phellos Willow Oak	2.5'-3' cal.	B₫₿	Plant as shown
10	41	llex opaca American Holly	5'-6' ht.	B4B	Plant as shown
PA	39	Picea ables Norway Spruce	6'-8' ht.	B4B	Plant as shown
P5	59	Pinus strobus Eastern White Pine	6'-8' ht.	B4B	Plant as shown
AC	16	Amelanchier canadensis Serviceberry	8'-10' ht.	B4B	Plant as shown
CF	11	Cornus kousa Kousa Dogwood	8'-10' ht.	B4B	Plant as shown
CA	5	Clethra ainifolla Summersweet Clethra	2.5' - 3' ht.	CONT.	Plant as shown
16	5	Ilex glabra 'Shamrock' Shamrock Inkberry	18-24" ht.	CONT.	Plant as shown
ND	31	Nandina domestica 'Gulf Stream' Gulf Stream Nandina	18-24° ht.	CONT.	Plant as shown
VC	11	Viburnum carlesii Koreanspice Viburnum	2.5' - 3' ht.	CONT.	Plant as shown

KEY	QTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*
T SLO	PE ZONE	A				
	15	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	15	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	cont.	4' SPACING	(1,2),3
	15	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5
	15	RHODODENDRON VISCOSUM SWAMP AZALEA	2.5'-3' НТ.	CONT.	4' SPACING	(1,2,3) 4
	120	ANDROPOGON VIRGINICUS BROOMSEDGE	I GAL.	CONT.	24" SPACING	(1,2,3) 4
	120	SAGGITARIA LATIFOLIA ARROWHEAD	I GAL.	CONT.	24" SPACING	(4,5,),6
UT SLO	OPE ZONE	В	¢'			
TD	6	TAXODIUM DISTICHUM BALD CYPRESS	2.5"-3" CAL.	B≰B	PLANT AS SHOWN	(1,2,)3
NS	3	NYSSA SYLVATICA BLACK GUM	2.5"-3" CAL.	B4B	PLANT AS SHOWN	1, (2,3)
ØM.	5	QUERCUS MICHAUXII SWAMP/CHESTNUT OAK	2.5"-3" CAL.	B4B	PLANT AS SHOWN	1, (2,3,4,5)
	24	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	24	COMMON BUTTONBUSH ITEA LAEVIGATA MINTERBERRY HOLLY	2.5'-3' HT. 2.5'-3' HT.	CONT.	4' SPACING 4' SPACING	(1,2),3
		COMMON BUTTONBUSH [TEA LAEVIGATA				
	24	COMMON BUTTONBUSH ITEA LAEVIGATA MINTERBERRY HOLLY LEUCOTHOE AXILLARIS	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	24	COMMON BUTTONBUSH I TEA LAEVIGATA MINTERBERRY HOLLY LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE RHODODENDRON VISCOSUM	2.5'-3' HT. 18-24" SP.	CONT.	4' SPACING 4' SPACING	(1,2),3

STORMWATER MANAGEMENT POND PLANT LIST - POND 1 CUT SLOPE

CM	4	DOWNY HAWTHORNE	5-6' HT.	B¢B	PLANT AS SHOWN	1,2,(3,4,5)
MV	6	MAGNOLIA VIRGINIANA SHAMP MAGNOLIA	5-6' HT.	BIB	PLANT AS SHOWN	**
	45	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5
	45	RHODODENDRON VISCOSUM SWAMP AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
	45	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	45	ITEA LAEVIGATA MINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	360	EUPATORIUM PURPUREA JOE PYE WEED	i GAL.	CONT.	24" SPACING	***
	360	IRIS VERSICOLOR 'BLUE FLAG' BLUE FLAG IRIS	1 6AL.	CONT.	24" SPACING	(1,2),3
STO	RMWAT	TER MANAGEMENT POND	PLANT LI	ST -	POND 1 EME	BANKMENT
KEY	OTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*

2.5"-3" CAL. B4B PLANT AS SHOWN

	T	SCIENTIFIC/	**		05.40040	701/54
KEY	QTY.	COMMON NAME	SIZE	ROOT	SPACING	ZONE*
BANKM	ENT ZONE	. A				
	145	ANDROPOSON VIRSINICUS BROOMSEDSE	1 6AL.	CONT.	24" SPACING	(1,2,3) 4
	145	ALTHAEA OFFICINALIS COMMON MARSH-MALLOW	1 6AL.	CONT.	24" SPACING	(1,2,3)
	145	CAREX ELATA 'AUREA'*** BOWLES GOLDEN SEDGE	2" PEAT POT	CONT.	24" SPACING	(1,2)3
	145	SAGGITARIA LATIFOLIA ARROWHEAD	1 GAL.	CONT.	24" SPACING	(4,5,),6
BANKM	ENT ZONE	В				
	150	LOBELIA KALMII BROOK LOBELIA	1 GAL.	CONT.	24° SPACING	(1,2),3
	150	HYDROCOTYLE UMBELLETA PENNYMORT	1 GAL.	CONT.	24" SPACING	(1,2),3
	150	JUNCUS EFFUSUS SOFT RUSH	1 6AL.	CONT.	24" SPACING	(2,3),4
	150	PONTEDERIA CORDATA PICKERELWEED	1 GAL.	CONT.	24" SPACING	2,3
BANKM	ENT ZONE	E C	s*			
	295	COREOPSIS VERTICILLATA WHORLED COREOPSIS	1 6AL.	CONT.	24° SPACING	(2,3),4
	295	EUPATORIUM PURPUREA JOE PYE WEED	1 GAL.	CONT.	24" SPACING	***
	295	IRIS VERSICOLOR 'BLUE FLAG' BLUE FLAG IRIS	1 6AL.	CONT.	24" SPACING	(1,2),3
	295	MONARDA DIDYMA	1 6AL.	CONT.	24° SPACING	3,4,5

ZONE C- COASTAL LEUCOTHOE-14

CUT SLOPE

ZONE B-

CUT SLOPE

CUT SLOPE

STO	RMMA	TER MANAGEMENT POND	PLANT L	IST -	POND 2 CU	T SLOPE
KEY	QTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*
UT SLO	PE ZONE	Α				
	10	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	10	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	10	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5
	10	RHODODENDRON VISCOSUM SWAMP AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
	76	ANDROPOSON VIRSINICUS BROOMSEDSE	1 GAL.	CONT.	24" SPACING	(1,2,3) 4
	76	SAGGITARIA LATIFOLIA ARRONHEAD	1 GAL.	CONT.	24" SPACING	(4,5,),6
CUT SLC	PE ZONE	В				
TD	3	TAXODIUM DISTICHUM BALD CYPRESS	2.5"-3" CAL.	B4B	PLANT AS SHOWN	(1,2,)3
QM .	3	QUERCUS MICHAUXII SMAMP/CHESTNUT OAK	2.5"-3" CAL.	B4B	PLANT AS SHOWN	1, (2,3,4,5)
СМ	3	CRATAEGUS MOLLIS DOWNY HANTHORNE	5-6' HT.	B4B	PLANT AS SHOWN	1,2, (3, 4, 5)
	38	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	38	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	38	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5
	38	RHODODENDRON VISCOSUM SHAMP AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
	310	LOBELIA KALMII BROOK LOBELIA	1 6AL.	CONT.	24" SPACING	(1,2),3
	310	HYDROCOTYLE UMBELLETA PENNYMORT	1 6AL.	сонт.	24° SPACING	(1,2),3
CUT SI	PE ZONE	C	···			
NS	7	NYSSA SYLVATICA BLACK GUM	2.5°-3° CAL.	B¢B	PLANT AS SHOWN	1, (2,3)
CM	4	CRATAEGUS MOLLIS DOWNY HAWTHORNE	5-6' HT.	BŧB	PLANT AS SHOWN	1,2,(3,4,5)
MV	3	MAGNOLIA VIRGINIANA SWAMP MAGNOLIA	5-6' HT.	B≰B	PLANT AS SHOWN	**
	15	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24° SP.	CONT.	4' SPACING	(1,2,3,4),5
	+	RHODODENDRON VISCOSUM		4015	AL SPACING	(1 0 3) 4

i GAL.

CONT. 24" SPACING

(1,2),3

SWAMP AZALEA
CEPHALANTHUS OCCIDENTALIS

COMMON BUTTONBUSH

ITEA LAEVIGATA

BLUE FLAG IRIS

STO	RMMAT	ER MANAGEMENT POND	PLANT LI	ST -	POND 2 EME	BANKMENT
KEY	QTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*
MBANK	ENT ZONE	E A				
	78	ANDROPOSON VIRGINICUS BROOMSEDSE	1 GAL.	CONT.	24" SPACING	(1,2,3)
	78	ALTHAEA OFFICINALIS COMMON MARSH-MALLOW	1 GAL.	CONT.	24" SPACING	(1,2,3)
	78	CAREX ELATA 'AUREA'*** BOWLES GOLDEN SEDGE	2" PEAT POT	CONT.	24" SPACING	(1,2)3
	78	SAGGITARIA LATIFOLIA ARROWHEAD	1 GAL.	CONT.	24" SPACING	(4,5,),6
MBANK	IENT ZON	E B				······
	364	LOBELIA KALMII BROOK LOBELIA	1 GAL.	сонт.	24" SPACING	(1,2),3
	364	HYDROCOTYLE UMBELLETA PENNYMORT	1 6AL.	CONT.	24" SPACING	(1,2),3
	364	JUNCUS EFFUSUS SOFT RUSH	1 <i>6</i> AL.	CONT.	24" SPACING	(2,3),4
	364	PONTEDERIA CORDATA PICKERELMEED	I GAL.	CONT.	24" SPACING	2,3
MBANK	MENT ZON	EC				
	161	COREOPSIS VERTICILLATA WHORLED COREOPSIS	I GAL.	CONT.	24" SPACING	(2,3),4
	161	EUPATORIUM PURPUREA JOE PYE WEED	1 6AL.	CONT.	24° SPACING	444
	161	IRIS VERSICOLOR 'BLUE FLAG' BLUE FLAG IRIS	1 6AL.	CONT.	24° SPACING	(1,2),3
	161	MONARDA DIDYMA BEEBALM	1 6AL.	CONT.	24" SPACING	3,4,5

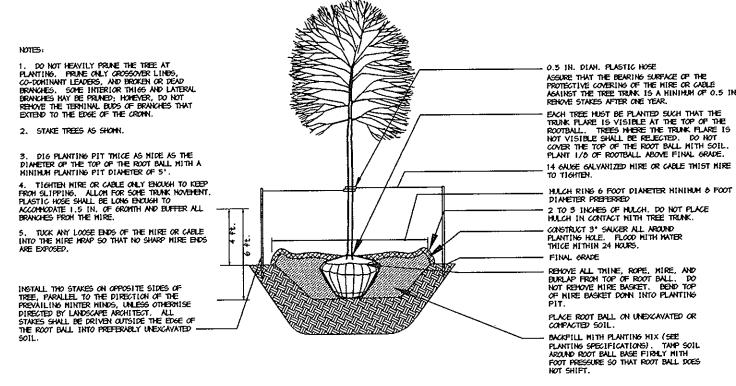
* HYDROLOGIC ZONES ACCORDING TO APPENDIX A OF THE MARYLAND MODEL STORMWATER ** KNOWN TO TOLERATE INNUNDATION AS WELL AS DRY AREAS ACCORDING TO DIRR, MICHAEL A., MANUAL OF WOODY LANDSCAPE PLANTS. *** COMMONLY USED BIORETENTION SPECIES ACCORDING TO TABLE A.4 IN APPENDIX A OF THE MARYLAND MODEL STORMWATER MANAGEMENT ORDINANCE JULY 2000. **** ALSO KNOWN AS CAREX STRICTA 'AUREA'

SWM PLANT LIST NOTES:

1. SHRUBS SHALL BE PLANTED IN GROUPS OF 10-15 OF SAME SPECIES.

2. PERENNIALS SHALL BE PLANTIED IN GROUPS OF 60-80 OF SAME SPECIES.

AREAS WHICH ARE ABOVE THE PERMANENT POOL AND ARE NOT SHOWN TO BE PLANTED WITH SHRUBS OR GROUNDCOVERS SHALL HAVE A PERMANENT GRASS COVER.



ZONE C-

EMBANKMENT

ZONE B-

EMBANKMENT

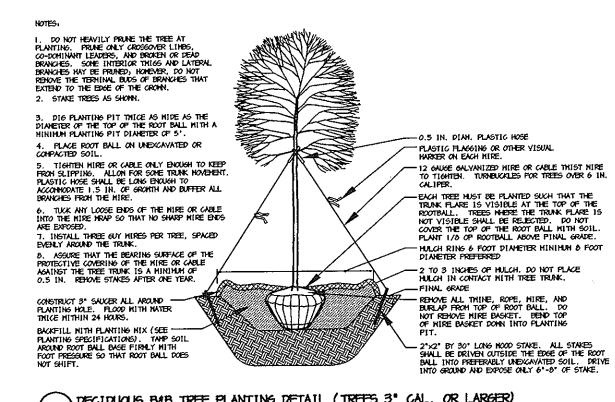
ZONE A-

EMBANKMENT

DECIDUOUS BAB TREE PLANTING DETAIL (TREES 3" CAL. OR SMALLER)

	PLANT LI	ST -	- POND 2 CU	T SLOPE	STO	ORMWA"	TER MANAGEMENT POND	PLANT LI	ST -	- POND 3 CU	T SLOPE
_	SIZE	ROOT	SPACING	ZONE*	KEY	QTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*
					CUT SLO	PE ZONE	Α				
	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		14	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		14	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5		14	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5
	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4		14	RHODODENDRON VISCOSUM SWAMP, AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
	1 GAL.	CONT.	24" SPACING	(1,2,3) 4		110	ANDROPOSON VIRGINICUS BROOMSEDSE	1 GAL.	CONT.	24" SPACING	(1,2,3) 4
	1 GAL.	CONT.	24" SPACING	(4,5,),6		110	SAGGITARIA LATIFOLIA ARROWHEAD	1 6AL.	CONT.	24" SPACING	(4,5,),6
					CUT SLC	PE ZONE	В				
	2.5"-3" CAL.	B4B	PLANT AS SHOWN	(1,2,)3	סד	4	TAXODIUM DISTICHUM BALD CYPRESS	2.5°-3° CAL.	Đ4B	PLANT AS SHOWN	(1,2,)3
	2.5"-3" CAL.	B4B	PLANT AS SHOWN	1, (2,3,4,5)	GM1	9	QUERCUS MICHAUXII SMAMP/CHESTNUT OAK	2.5"-3" CAL.	B4B	PLANT AS SHOWN	1, (2,3,4,5
	5-6' HT.	B4B	PLANT AS SHOWN	1,2, (3, 4, 5)		60	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		60	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
_	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		60	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),
	18-24" SP.	CONT.	4' SPACING	(1,2,3,4),5		60	RHODODENDRON VISCOSUM SWAMP AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
	2.5'-3' HT.	сонт.	4' SPACING	(1,2,3) 4		470	LOBELIA KALMII BROOK LOBELIA	1 6AL.	CONT.	24° SPACING	(1,2),3
	1 6AL.	CONT.	24" SPACING	(1,2),3		470	HYDROCOTYLE UMBELLETA PENNYWORT	1 6AL.	CONT.	24° SPACING	(1,2),3
	1 GAL.	сонт.	24" SPACING	(1,2),3	CIT SIC	PE ZONE			1		
_					NS	4	NYSSA SYLVATICA BLACK GUM	2.5°-3" CAL.	B&B	PLANT AS SHOWN	1, (2,3)
-	2.5°-3° CAL.	Bŧ₿	PLANT AS SHOWN	1, (2,3)	СМ	5	CRATAEGUS MOLLIS DOWNY HANTHORNE	5-6' HT.	B4B	PLANT AS SHOWN	1,2,(3,4,5
-	5-6' HT.	B≰B	PLANT AS SHOWN	1,2,(3,4,5)	MV	5	MAGNOLIA VIRGINIANA SWAMP MAGNOLIA	5-6' HT.	B4B	PLANT AS SHOWN	**
	5-6' HT.	B4B	PLANT AS SHOWN	**		14	LEUCOTHOE AXILLARIS COASTAL LEUCOTHOE	18-24° 5P.	CONT.	4' SPACING	(1,2,3,4),
	18-24° 5P.	CONT.	4' SPACING	(1,2,3,4),5		14	RHODODENDRON VISCOSUM SWAMP AZALEA	2.5'-3' HT.	CONT.	4' SPACING	(1,2,3) 4
_	2.5'-3' НТ.	CONT.	4' SPACING	(1,2,3) 4		14	CEPHALANTHUS OCCIDENTALIS COMMON BUTTONBUSH	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		14	ITEA LAEVIGATA WINTERBERRY HOLLY	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3
	2.5'-3' HT.	CONT.	4' SPACING	(1,2),3		115	EUPATORIUM PURPUREA JOE PYE MEED	1 6AL.	CONT.	24° SPACING	***
	I GAL.	CONT.	24° SPACING	444		115	IRIS VERSICOLOR 'BLUE FLAG' BLUE FLAG IRIS	1 GAL.	CONT.	24" SPACING	(1,2),3
-		l'							•	·	

\sim . \sim	<u>KMMA I</u>	ER MANAGEMENT POND	PLANT LI	<u> </u>	POND 3 EME	BANKMEN
KEY	QTY.	SCIENTIFIC/ COMMON NAME	SIZE	ROOT	SPACING	ZONE*
EMBANKI	MENT ZON	E A				
	235	ANDROPOSON VIRSINICUS BROOMSEDSE	1 6AL.	CONT.	24" SPACING	(1,2,3)
	235	ALTHAEA OFFICINALIS COMMON MARSH-MALLOM	1 GAL.	CONT.	24" SPACING	(1,2,3
	235	CAREX ELATA 'AUREA'*** BONLES GOLDEN SEDGE	2" PEAT POT	CONT.	24" SPACING	(1,2)3
	235	SAGGITARIA LATIFOLIA ARRONHEAD	1 GAL.	CONT.	24" SPACING	(4,5,),
	1030	BROOK LOBELIA	I GAL.	CONT.	24" SPACING	1 (1.2).
	1030	LOBELIA KALMII	1 GAL.	CONT.	24" SPACING	(1,2),
	1000					
	1030	HYDROCOTYLE UMBELLETA PENNYMORT	1 GAL.	CONT.	24" SPACING	
		HYDROCOTYLE UMBELLETA	1 6AL.	CONT.	24" SPACING 24" SPACING	(1,2),
	1030	HYDROCOTYLE UMBELLETA PENNYWORT JUNCUS EFFUSUS	-			(1,2), (2,3),
	1030	HYDROCOTYLE UMBELLETA PENNYWORT JUNCUS EFFUSUS SOFT RUSH PONTEDERIA CORDATA PICKERELMEED	1 6AL.	CONT.	24" SPACING	(1,2),
	1030	HYDROCOTYLE UMBELLETA PENNYWORT JUNCUS EFFUSUS SOFT RUSH PONTEDERIA CORDATA PICKERELMEED	1 6AL.	CONT.	24" SPACING	(1,2),
 EMBANK	1030 1030 1030 MENT ZON	HYDROCOTYLE UMBELLETA PENNYWORT JUNCUS EFFUSUS SOFT RUSH PONTEDERIA CORDATA PICKERELMEED WE C COREOPSIS VERTICILLATA	I GAL.	CONT.	24" SPACING 24" SPACING	(1,2), (2,3), 2,3
EMBANK	1030 1030 1030 MENT ZON	HYDROCOTYLE UMBELLETA PENNYMORT JUNCUS EFFUSUS SOFT RUSH PONTEDERIA CORDATA PICKERELMEED WE C COREOPSIS VERTICILLATA WHORLED COREOPSIS EUPATORIUM PURPUREA	1 6AL. 1 6AL.	CONT.	24" SPACING 24" SPACING 24" SPACING	(1,2), (2,3), 2,3



DECIDUOUS BEB TREE PLANTING DETAIL (TREES 3° CAL. OR LARGER)

PLANTING SPECIFICATIONS

1. Plants, related material, and operations shall meet the detailed description, as given on the plans and as described herein. Where discrepancies exist between Standards & Guidelines referenced within these specifications and the Howard County Landscape Manual, the latter takes precedence.

2. All plant material, unless otherwise specified, that is not nursery grown, uniformly branched, does not have a vigorous root system, and does not conform to the most recent edition of the American Association of Nurserymen (AAN) Standards will be rejected. Plant material that is not healthy, vigorous, free from defects, decay, disfiguring roots, sunscald injuries, abrasions of the bark, plant disease, insect pest eggs, borers and all forms of insect infestations or objectionable disfigurements will be rejected. Plant material that is weak or which has been cut back from larger grades to meet specified requirements will be rejected. Trees with forked leaders will be rejected. All B & B plants shall be freshly dug; no healed-in plants or plants from cold storage will be accepted.

3. Unless otherwise specified, all general conditions, planting operations, details and planting specifications shall conform to the most recent edition of the "Landscape Specification Guidelines by the Landscape Contractors Association of MD, DC, & VA", (hereinafter "Landscape Guidelines") approved by the Landscape Contractors Association of Metropolitan Washington and the Potomac Chapter of the American Society of Landscape Architects.

4. Contractor shall guarantee all plant material for a period of one year after date of acceptance in accordance with the appropriate section on the Landscape Guidelines. Contractor's attention is directed to the maintenance requirements found within the one year specifications including watering and replacement of specified plant material.

5. Contractor shall be responsible for notifying all relevant and appropriate utility companies, utility contractors, and "Miss Utility" a minimum of 48 hours prior to the beginning of any work. Contractor may make minor adjustments in spacing and location of plant material to avoid conflicts with utilities. Major changes will require the approval of the landscape architect. Damage to existing structure and utilities shall be repaired at the expense of the Contractor.

6. Protection of existing vegetation to remain shall be accomplished via the temporary installation of 4 foot high snow fence at the drip line, see detail.

7. Contractor is responsible for installing all material in the proper planting season for each plant type. All planting is to be completed within growing season of completion of site construction. Do not plant Pinus strobus or XCupressacyparis leylandii between November 15 and March 15. Landscape plants are not to be installed before site is graded to final grade.

8. Contractor to regrade, fine grade, sod, hydroseed and straw mulch all areas disturbed by their work.

9. Bid shall be based on actual site conditions. No extra payment shall be made for work arising from actual site conditions differing from those indicated on drawings and specifications.

10. Plant quantities are provided for the convenience of the contractor only. If discrepancies exist between quantities shown on plan and those shown on the plant list, the quantities on the plan take precedence. Where discrepancies on the plan exist between the symbols and the callout leader, the number of symbols take precedence.

11. All shrubs and groundcover areas shall be planted in continuous planting beds, prepared as specified, unless otherwise indicated on plans. (See Specification 13). Beds to be mulched with minimum 2" and maximum 3" of composted, double-shredded hardwood mulch throughout.

12. Positive drainage shall be maintained on planting beds (minimum 2 percent slope).

13. Bed preparation shall be as follows: Till into a minimum depth of 6" 1 yard of Compro or Leafgro per 200 SF of planting bed, and 1 yard of topsoil per 100 SF of bed. Add 3 lbs of standard 5-10-5 fertilizer per cubic yard of planting mix and till. Ericaceous plants (Azaleas, Rhododendrons, etc.): top dress after planting with iron sulfate or comparable product according to package directions. Taxus baccata 'Repandens' (English weeping yews): Top dress after planting with 1/4 to 1/2 cup lime each.

14. Planting mix: For trees not in a prepared bed, mix 50% Compro or Leafgro with 50% soil from tree hole to use as backfill, see tree planting detail.

15. Weed & insect control: Incorporate a pre-emergent herbicide into the planting bed following recommended rates on the label. For tree planting, apply a pre-emergent on top of soil and root ball before mulching. Caution: For areas to be planted with a ground cover, be sure to carefully check the chemical used to assure its adaptability to the specific groundcover to be treated. Maintain the mulch weed-free for the extent of the warranty period. Under no circumstances is a pesticide containing chlorpyrifos to be used as a means of pest control.

16. Water: All plant material planted shall be watered thoroughly the day of planting. All plant material not yet planted shall be properly protected from drying out until planted. At a minimum, water unplanted plant material daily and as necessary to avoid dessication.

17. Pruning: Do not heavily prune trees and shrubs at planting. Prune only broken, dead, or diseased branches.

18. All areas within contract limits disturbed during or prior to construction not designated to receive plants and mulch shall be fine graded, grass seed planted, and covered with straw mulch.

GENERAL NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE

2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED

AS PART OF THE GRADING PERMIT IN THE AMOUNT OF \$45,150. 71 SHADE TREES @ \$300 = \$21,300

22 ORNAMENTAL TREES @ \$150 = \$3,300 137 EVERGREEN TREES @ \$150 = \$20,550 0 SHRUBS @ \$30 = \$0

THIS PLAN IS FOR LANDSCAPING PURPOSES ONLY.

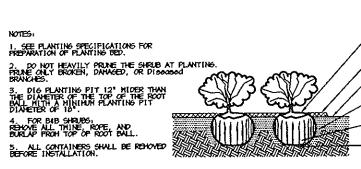
4. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.

5. ALL MATERIAL SELECTED SHALL BE EQUAL TO OR BETTER THAN THE REQUIREMENTS OF THE "USA STANDARD FOR NURSERY STOCK", LATEST EDITION, AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

6. ALL MATERIAL SHALL BE PLANTED IN ACCORDANCE WITH THE MINIMUM STANDARDS CITED IN THE LATEST EDITION OF "LANDSCAPE SPECIFICATION" GUIDELINES" PUBLISHED BY THE LANDSCAPE CONTRACTORS ASSOCIATION.

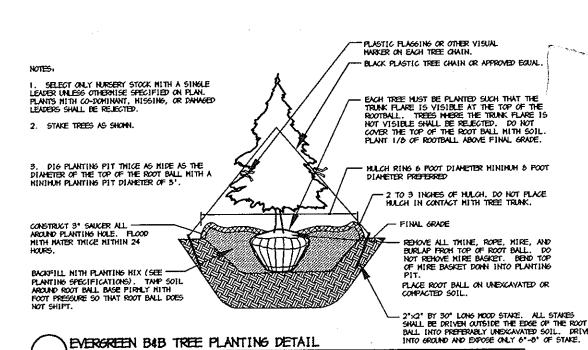
7. AT THE TIME OF INSTALLATION, ALL SHRUBS AND OTHER PLANTINGS SHALL BE OF THE PROPER HEIGHT AND/OR SPREAD REQUIREMENTS IN ACCORDANCE WITH THIS PLAN AND THE HOWARD COUNTY LANDSCAPE

8. NO SUBSTITUTIONS OR RELOCATION OF PLANTS MAY BE MADE WITHOUT PRIOR APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING OF HOWARD COUNTY. ANY DEVIATION FROM THIS LANDSCAPE PLAN MAY RESULT IN A REQUIREMENT FOR SUBMITTAL OF AN OFFICIAL "REDLINE REVISION" TO THE SITE DEVELOPMENT PLAN(S) AND/OR DENIAL IN THE RELEASE OF LANDSCAPE SURETY.



- DO NOT COMER THE TOP OF THE ROOT BALL HITH SOIL. PLANT 1/8 OF ROOTBALL ABOVE FINAL GRADE. ---- FINAL GRADE TAMP SOIL AROUND BALL BASE FIRMLY HITH FOOT PRESCURE SO THE ROOT BALL DOES NOT SHIFT.

SHRUB BED PLANTING DETAIL - BAB AND CONTAINER SHRUBS



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND DATE DATE CHIEF, DIVISION OF LAND DEVELOPMENT

5.3.05 D REVISED SITE DEVELILMENT ILAN MODIFIED PLANT LIST REVISION DATE NO. OWNER / DEVELOPER HRD LAND HOLDINGS. INC.

HOWARD RESEARCH AND DEVELOPMENT CORPORATION THE ROUSE BUILDING 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044 410-992-6000

PROJECT

BENSON EAST

TAX MAP 37 & 43 ZONED - NEWTOWN PARCELS 482, 587, 382, 421, 547 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

LANDSCAPE SCHEDULES,

NOTES AND DETAILS Patton Harris Rust & Associates, pc Engineers. Surveyors. Planners. Landscape Architects.

8818 Centre Park Drive Columbia, MD 21045 **T** 410.997.8900 **F** 410.997.9282

DESIGNED BY: K.L.M.

DRAWN BY: K.L.M. PROJECT NO : 11621/PRELIM L200TRAP07 **DATE:** OCTOBER 18, 2004

SCOTT R. WOLFORD #797 SDP-04-163

SCALE : AS SHOWN DRAWING NO. 21 OF 21

5.3.05

DEVELOPER'S /BUILDER'S CERTIFICATE:

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION. ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

SIGNATURE PAUL CAVANAULH

TYPICAL PLANTING DETAIL FOR OUT SLOPE ZONES A, B, AND C

TYPICAL PLANTING DETAIL FOR EMBANKMENT ZONES A, B, AND C