

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE.
- NO PERMIT WILL BE REQUIRED FROM THE DEPARTMENT OF PLANNING AND ZONING SINCE THE LIMIT OF DISTURBANCE WILL BE WITHIN THE LIMIT OF DISTURBANCE OF SDP 78-47.
- THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- 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.
- SURVEY OF THIS SITE WAS PERFORMED BY AB CONSULTANT, INC. - JUNE 2006.
- THERE IS NO WETLAND WITHIN THE PROJECT LIMIT. A WETLAND DELINEATION WAS PERFORMED BY KCI ON MAY 7, 2007.
- THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. BENCHMARKS SHOWN HEREON WERE PROVIDED BY HOWARD COUNTY SURVEY DIVISION AND AB CONSULTANTS.
- STORMWATER MANAGEMENT IS NOT REQUIRED FOR THIS PROJECT SINCE THE PROJECT WILL NOT ADD IMPERVIOUS AREA NOR WILL IT CHANGE THE EXISTING HYDROLOGY OF THE SITE.
- OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
- THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
- CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.
- SHOULD CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, CONTRACTOR SHALL NOTIFY KCI TECHNOLOGIES, INC. IMMEDIATELY TO RESOLVE THE SITUATION.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- CONTRACTOR SHALL NOTIFY BUREAU OF UTILITIES AT (410) 313-4900 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.

HOWARD COUNTY  
DEPARTMENT OF PUBLIC WORKS

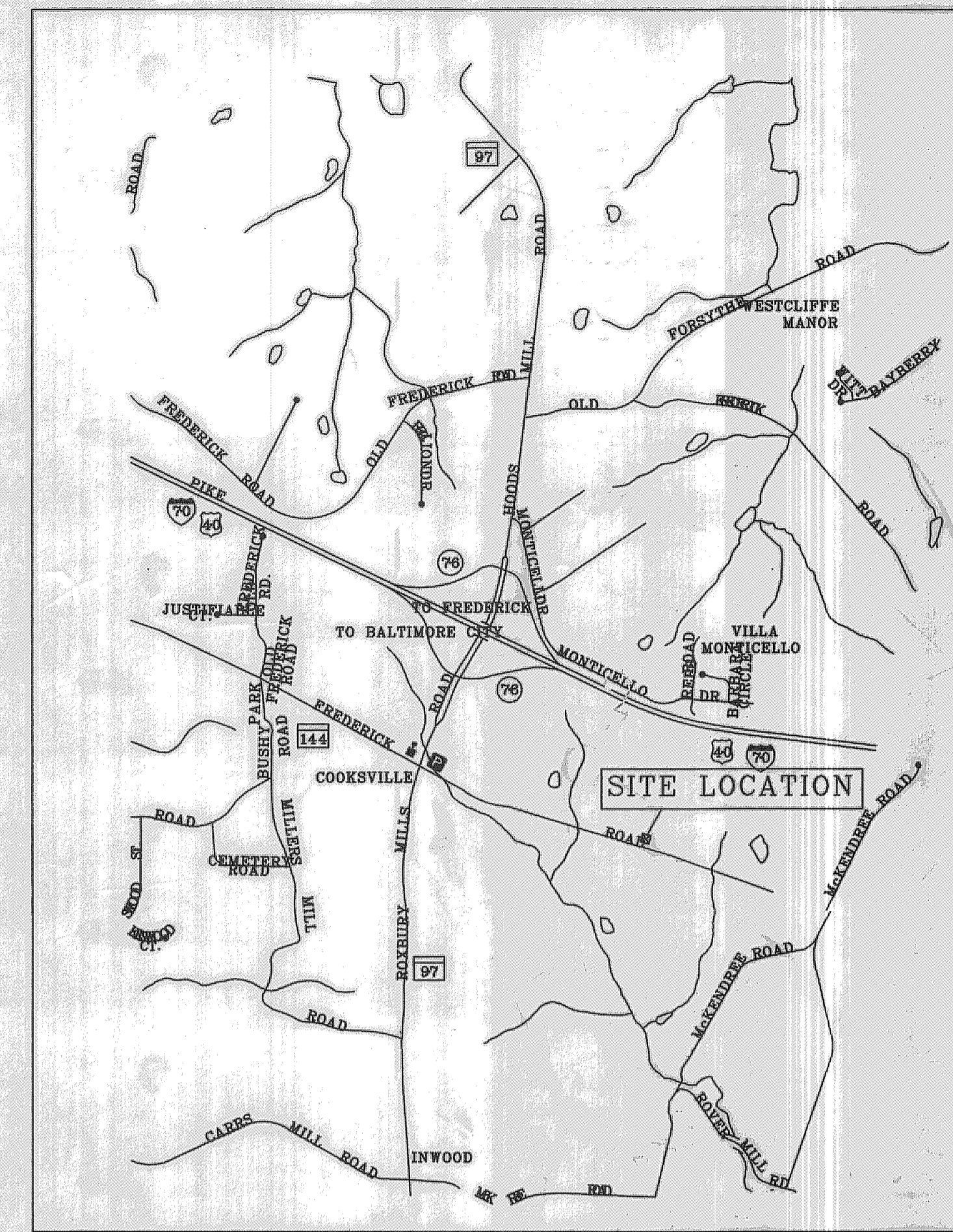
WEST ZONE REPAIR CENTER  
SWM POND RETROFIT  
100% DESIGN SUBMITTAL  
CAPITAL PROJECT No.

LEGEND

	EX. TREES
	EXIST. MAJOR CONTOUR
	EXIST. MINOR CONTOUR
	PROP. MAJOR CONTOUR
	PROP. MINOR CONTOUR
	EXIST. PROPERTY LINE
	WATERS OF THE US
	ORANGE SAFETY FENCE
	LIMIT OF DISTURBANCE
	CLEAN WATER DIVERSION FENCE
	SUPER SILT FENCE
	SILT FENCE
	REMOVABLE PUMPING STATION
	SILT BAG DEWATERING DEVICE
	EARTH DIKE
	INTAKE & DISCHARGE HOSES
	DIVERSION PIPE
	SANDBAG DAM
	SAVE TREE
	REMOVE TREE
	TRY TO SAVE TREE
	EXISTING FLOODPLAIN
	PROPOSED FLOODPLAIN
	EX. WATER LINE
	EX. SEWER LINE (VITRIFIED CLAY PIPE)
	EX. STORM DRAIN
	EX. OVERHEAD ELECTRIC
	EX. UNDERGROUND CABLE TV
	EX. UNDERGROUND TELEPHONE
	EX. GAS LINE

SHEET INDEX

- TITLE SHEET
- STORMWATER MANAGEMENT PLAN
- SWM DETAILS AND NOTES
- SWM DETAILS AND NOTES
- SOIL BORING LOGS
- SEDIMENT AND EROSION CONTROL PLAN
- SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
- SEDIMENT AND EROSION CONTROL DETAILS



SCALE: 1" = 1500'

NO.	REVISIONS DESCRIPTION	DATE

ENGINEERS  
PLANNERS  
SCIENTISTS  
CONSTRUCTION MANAGERS

TECHNOLOGIES  
www.kci.com

WEST ZONE REPAIR CENTER  
SWM POND RETROFIT

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046

TITLE SHEET

SCALE:	AS SHOWN
DATE:	9/17/07
KCI JOB NO.:	01-043223.15
CAPITAL PROJECT NO.:	
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

SHEET NO.: 1 OF 8

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.

Signature: *[Signature]* PE NO. 31201 DATE 7/28/10

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE

Signature: *[Signature]* DATE 10/23/07

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

Signature: *[Signature]* DATE 10/23/07

HOWARD SOIL CONSERVATION DISTRICT

ENGINEER'S CERTIFICATE

"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."

Signature of Engineer (PRINT NAME BELOW SIGNATURE): *Saifuddin Ahmed* DATE 9/17/07

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 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. ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Signature of Developer (PRINT NAME BELOW SIGNATURE): *Howard E. Saltzman* DATE 9/19/07



EP.07.09

**CONSTRUCTION SPECIFICATIONS (Maryland Code 378 Pond - January 2000)**

These specifications are appropriate to all ponds within the scope of the Standard for practice 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 of topsoil. 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 inlet 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, wood, 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 GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. 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. 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 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 heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepfoot, 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 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 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 over (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 of 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 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 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.

**Pipe Conduits**

All pipes shall be circular in cross section.

**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 (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.

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 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 painted with one coat of zinc chromate primer or two coats of asphalt.

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE *[Signature]* 12/8/07 DATE

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

*[Signature]* 10/23/07 DATE  
HOWARD SOIL CONSERVATION DISTRICT

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 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 painted 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.

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

- 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 bandwidth. 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, pre-punched to the flange bolt 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 end. 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 caulking or a neoprene bead.

- 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.

- Backfilling shall conform to "Structure Backfill".

- 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:

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

- Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bed-ding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe 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.

- 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.

- Backfilling shall conform to "Structure Backfill".

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

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

- 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 S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

- 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.

- Backfilling shall conform to "Structure Backfill".

- 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.

**Rock 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 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**

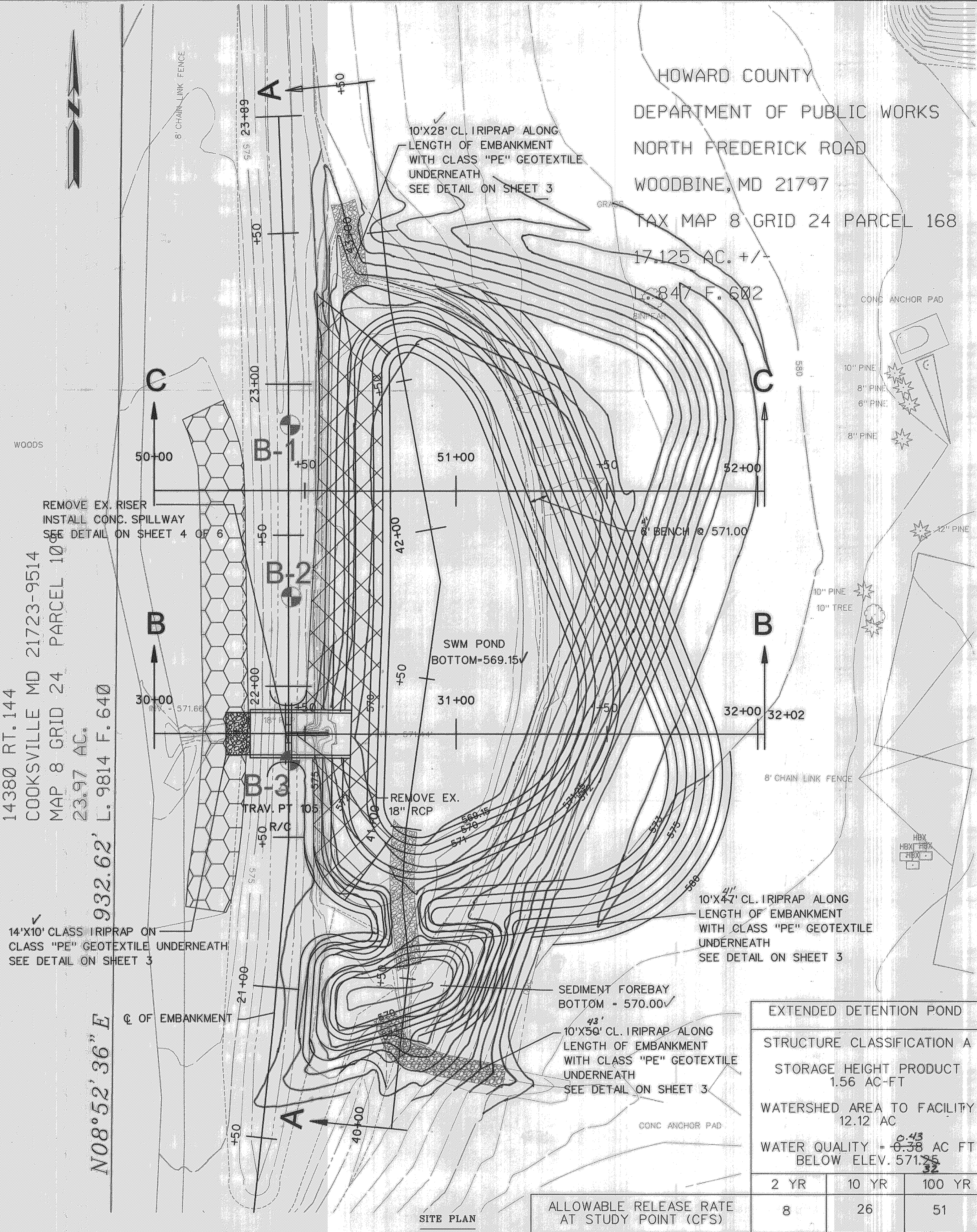
All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, in-stall, 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 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 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 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, 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-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.

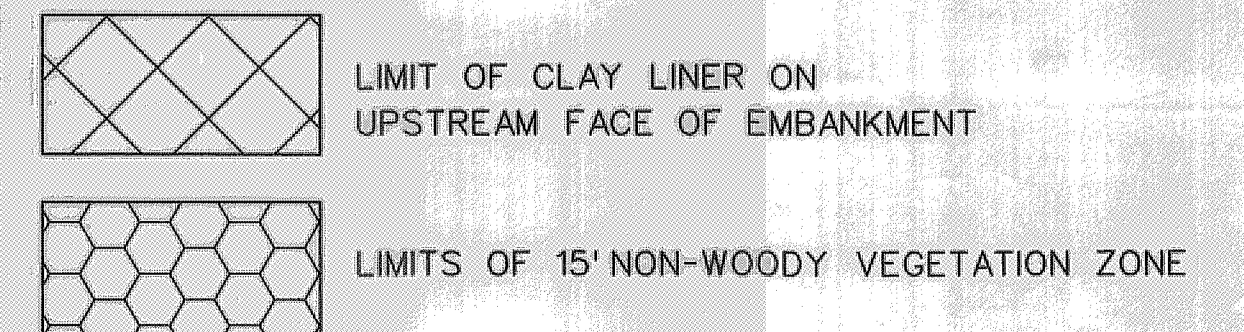


HOWARD COUNTY  
DEPARTMENT OF PUBLIC WORKS  
NORTH FREDERICK ROAD  
WOODBINE, MD 21797  
TAX MAP 8 GRID 24 PARCEL 168  
17.125 AC. +/-  
847 F. 602

VON BERG ODA REVOCABLE TRUST  
14380 RT. 144  
COOKSVILLE MD 21723-9514  
MAP 8 GRID 24 PARCEL 10  
23.97 AC.  
932.62' L. 9814 F. 640  
14'X10' CLASS IRIPRAP ON  
CLASS "PE" GEOTEXTILE UNDERNEATH  
SEE DETAIL ON SHEET 3

EXTENDED DETENTION POND			
STRUCTURE CLASSIFICATION A			
STORAGE HEIGHT PRODUCT 1.56 AC-FT			
WATERSHED AREA TO FACILITY 12.12 AC			
WATER QUALITY - 0.43 BELOW ELEV. 571.35			
2 YR	10 YR	100 YR	

ALLOWABLE RELEASE RATE AT STUDY POINT (CFS)	8	26	51
FACILITY INFLOW (CFS)	21	43	73
FACILITY DISCHARGE (CFS)	3	18	51.48
STUDY POINT DISCHARGE (CFS)	3	18	51.48
WATER SURFACE ELEV. (FT)	573.31 29	574.51 45	575.32 21
STORAGE VOLUME (AC-FT)	0.39 0.72	0.66 1.28	0.87 1.69



DATE

NO. REVISIONS DESCRIPTION

ENGINEERS  
PLANNERS  
SCIENTISTS  
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES  
www.kci.com

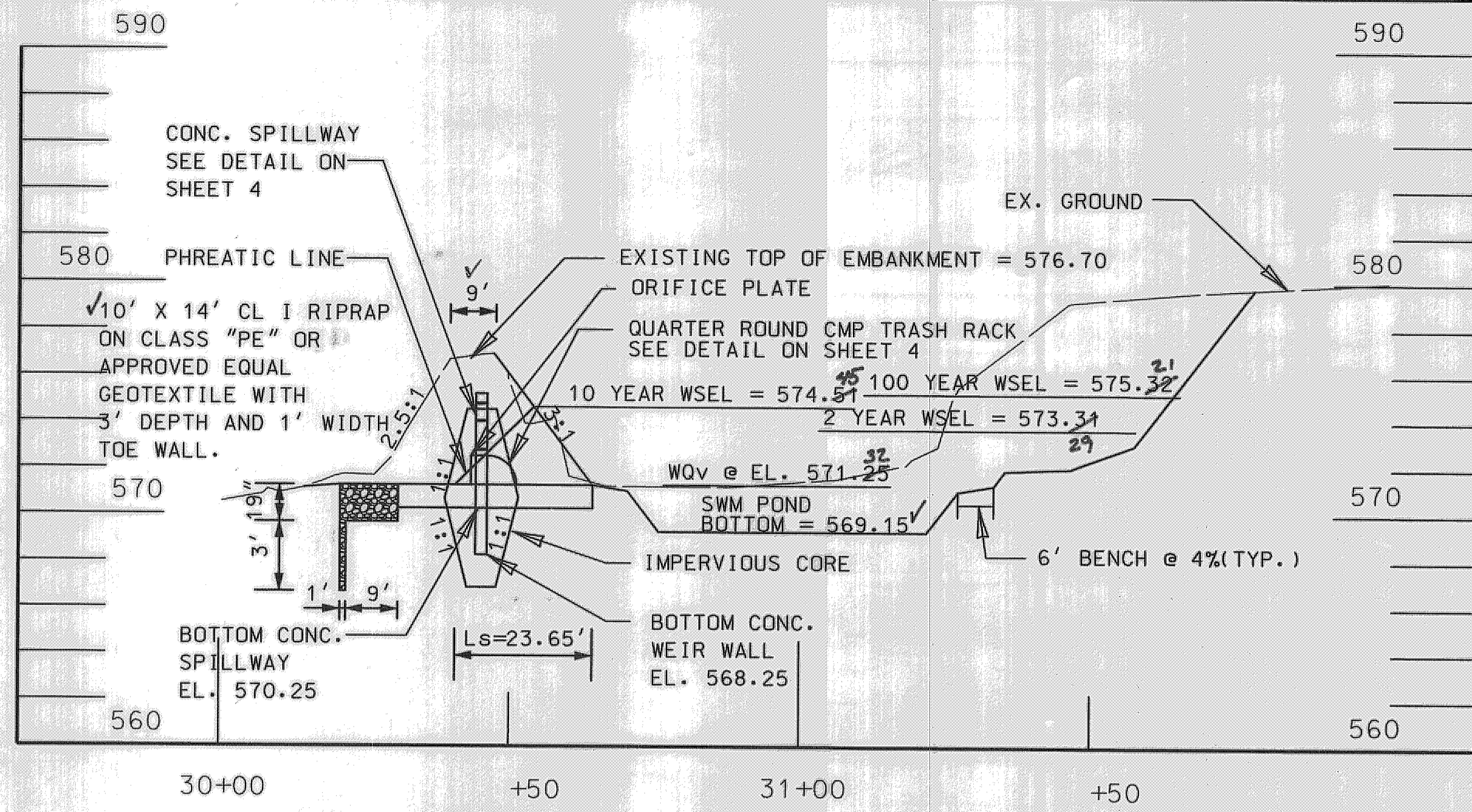
WEST ZONE REPAIR CENTER  
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HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046

STORMWATER MANAGEMENT PLAN

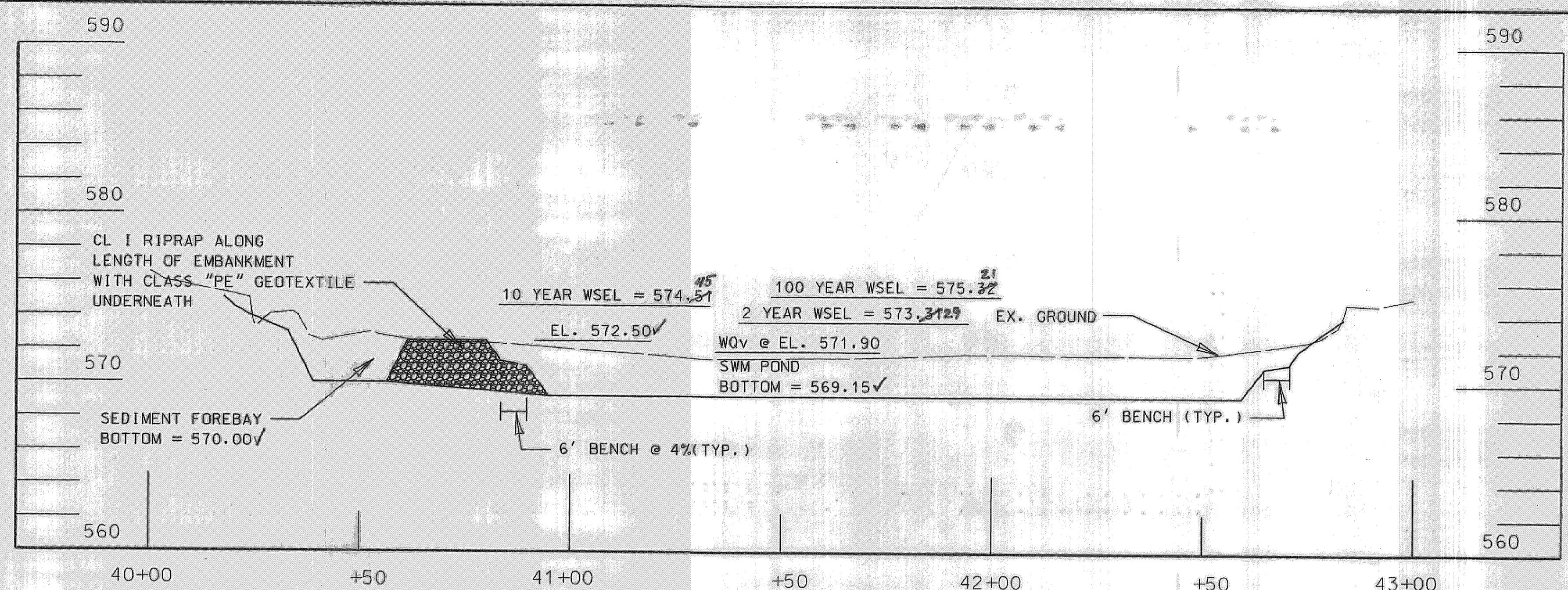
SCALE: AS SHOWN  
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SHEET NO.: 2 OF 8



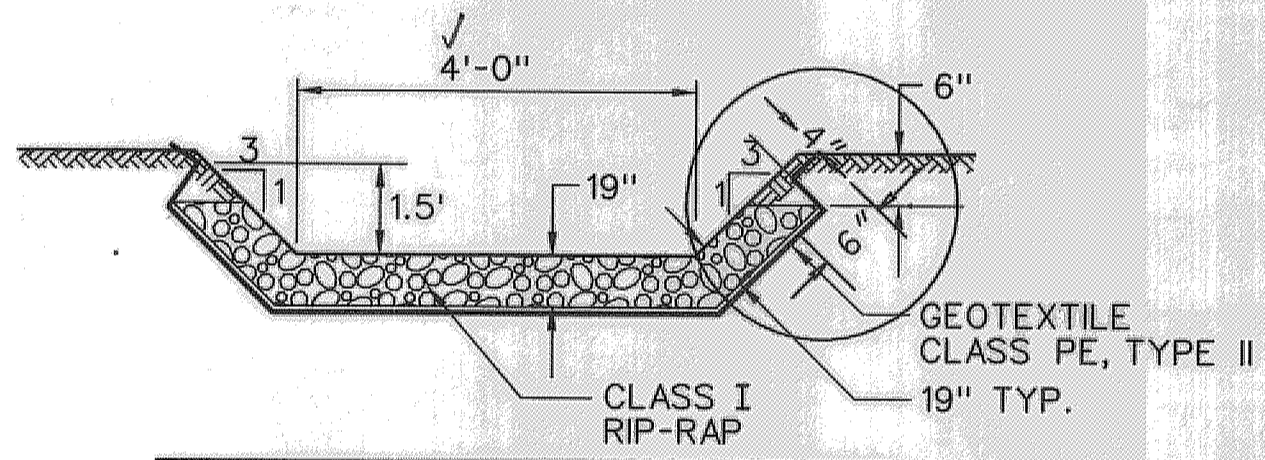
SEC B-B

SCALE: HORZ- 1" = 20' VERT-1" = 5'



SEC A-A

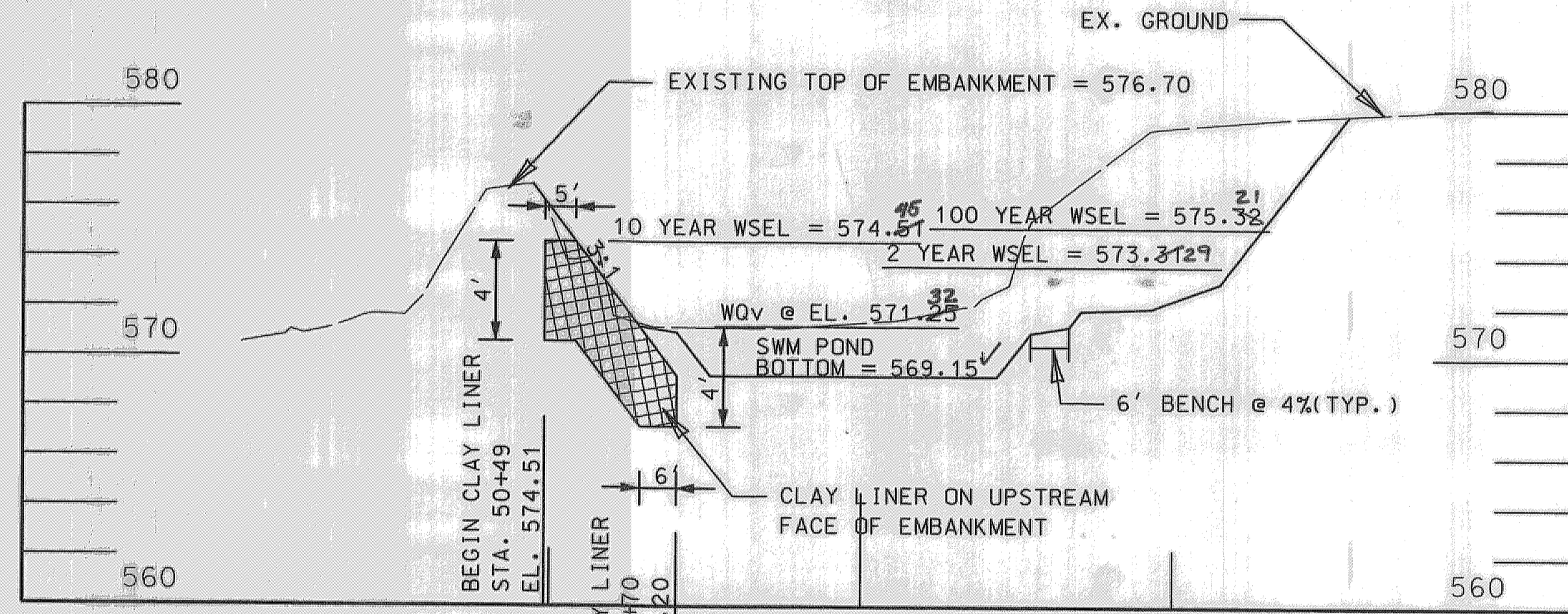
SCALE: HORZ- 1" = 20' VERT-1" = 5'



RIP-RAP DETAIL

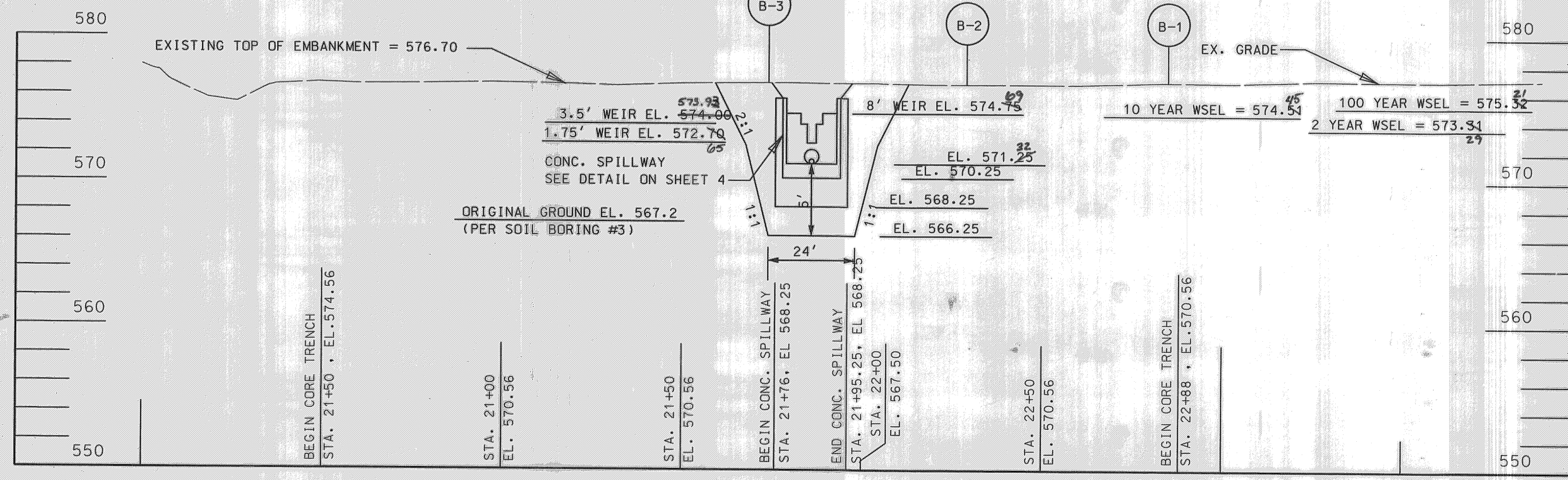
N.T.S.

FILTER FABRIC LINING SHALL BE EMBEDDED A MINIMUM OF 4" AND SHALL EXTEND AT LEAST 6" BEYOND THE EDGE OF THE RIP-RAP



SEC C-C

SCALE: HORZ- 1" = 20' VERT-1" = 5'



PROFILE ALONG CENTER OF EMBANKMENT

SCALE: HORZ- 1" = 20' VERT-1" = 5'

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.

DATE: 12/14/07

DATE: 10/23/07

HOWARD SOIL CONSERVATION DISTRICT

NO.	REVISIONS DESCRIPTION	DATE

ENGINEERS  
PLANNERS  
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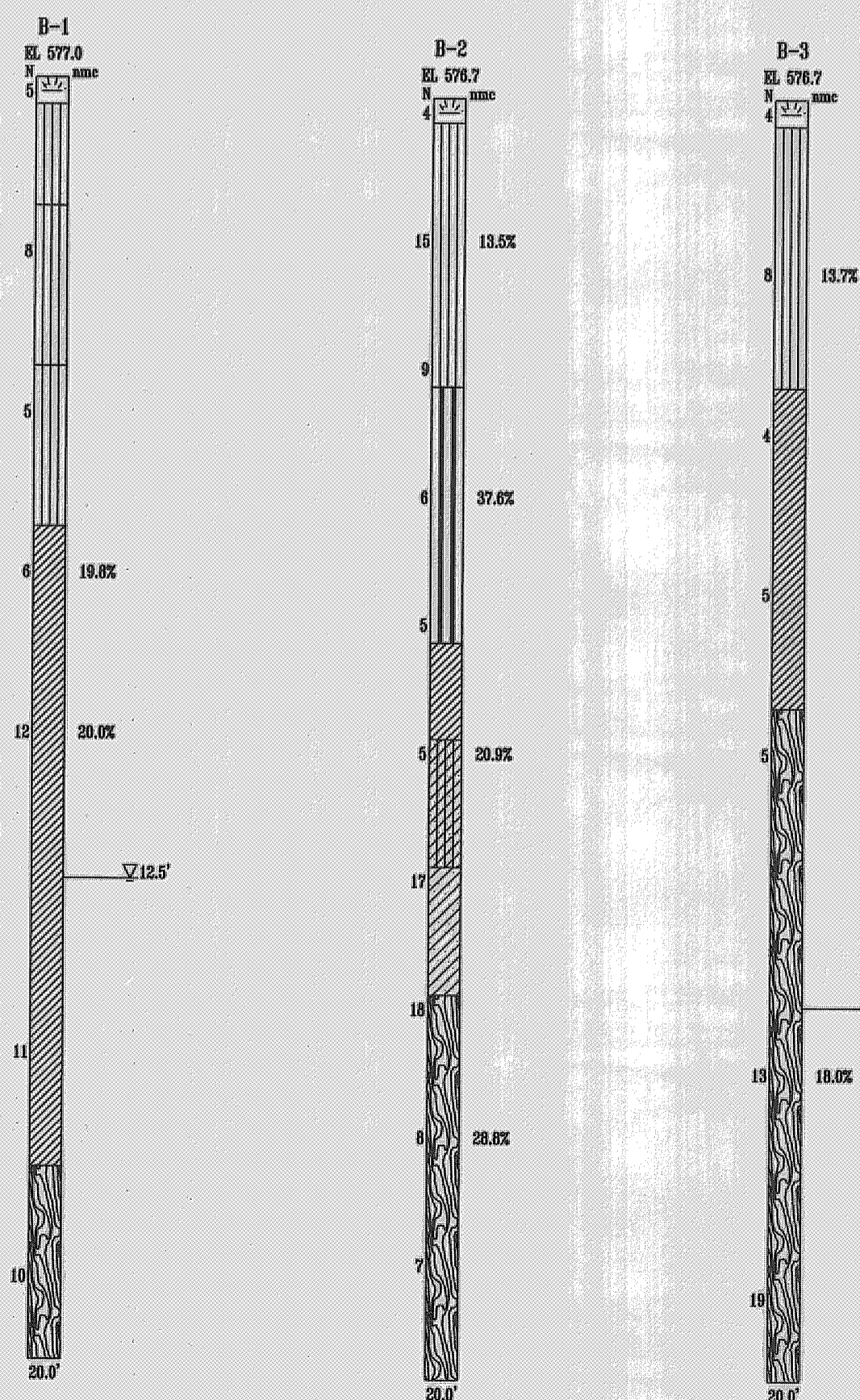
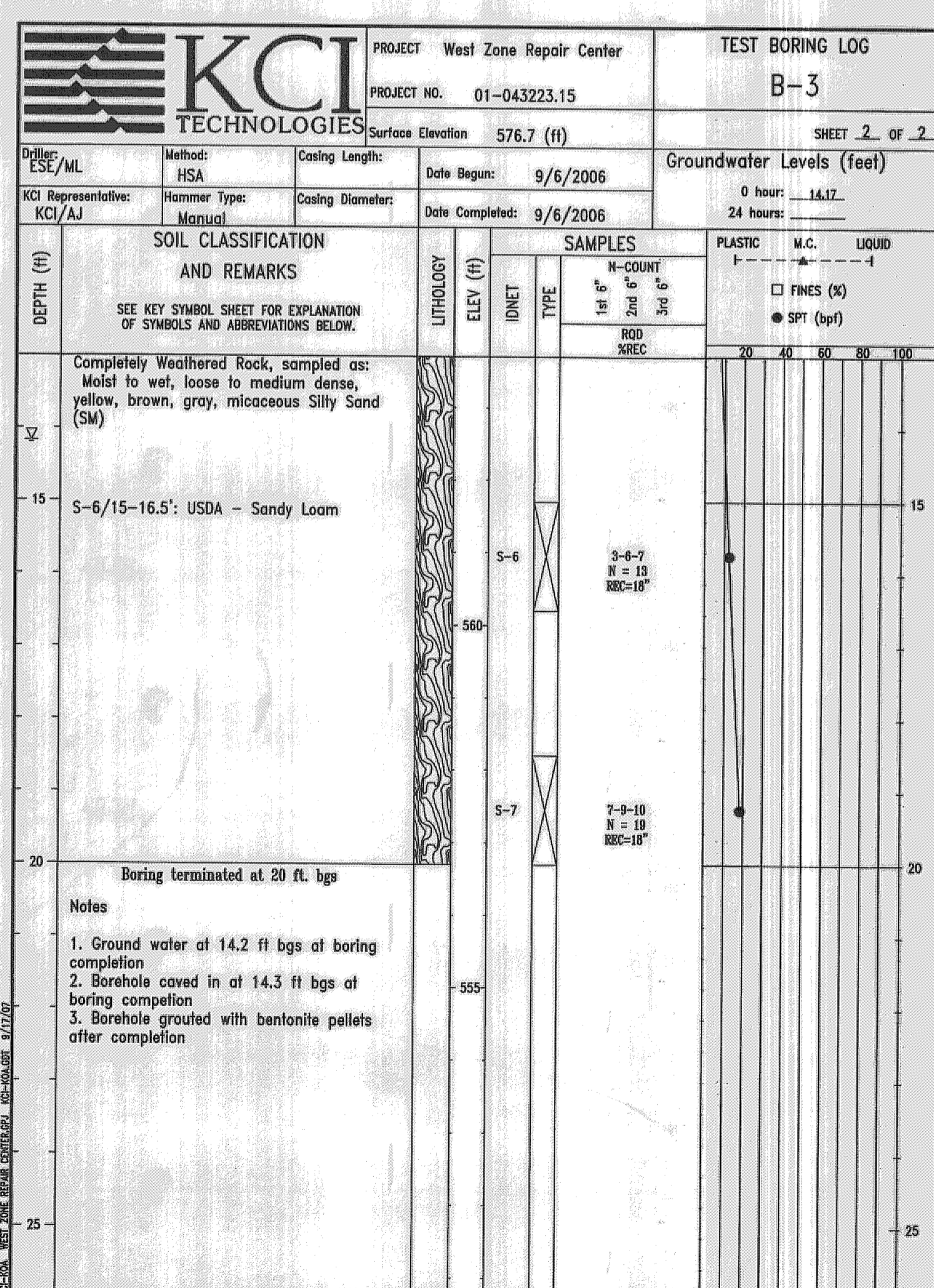
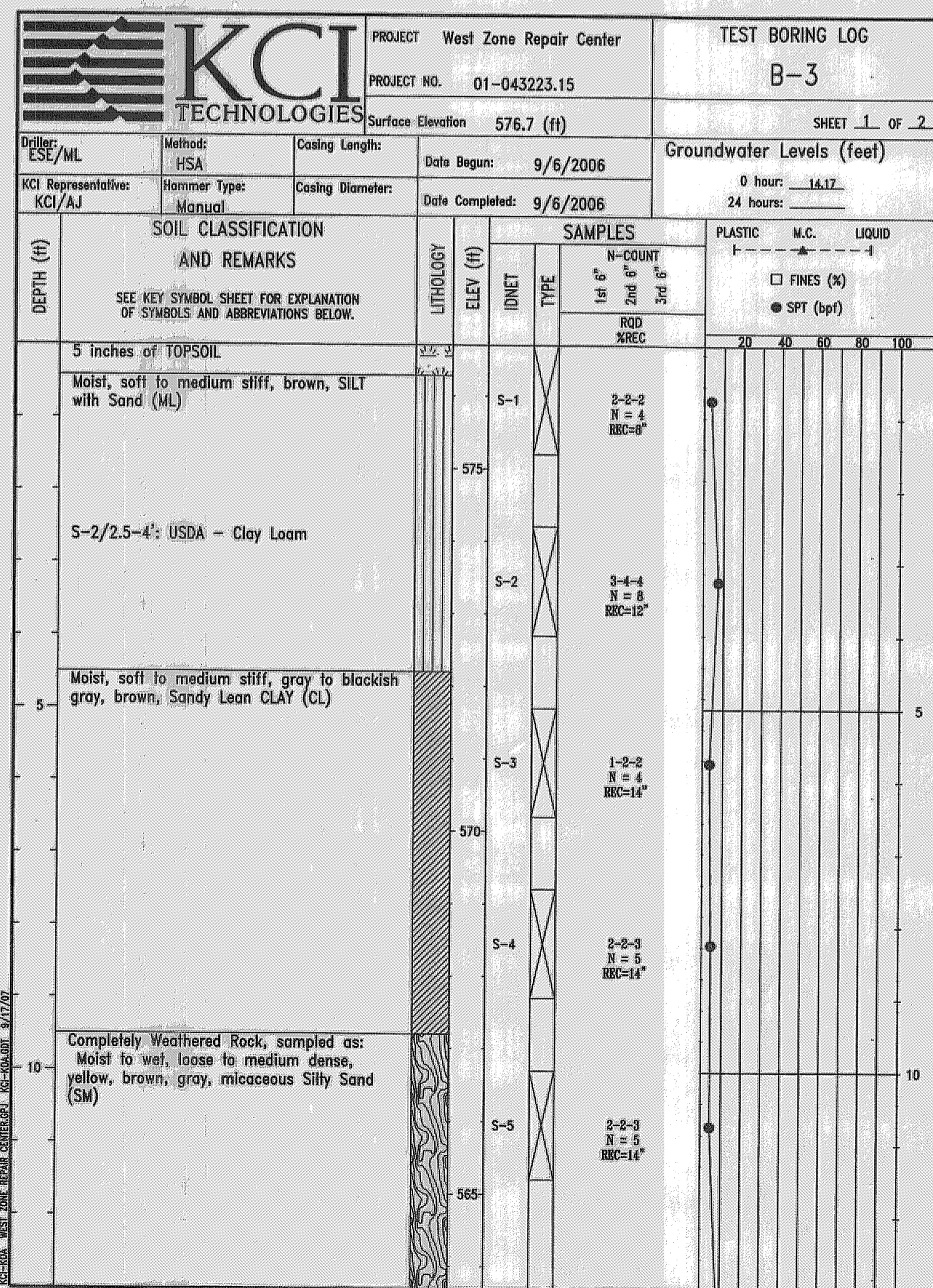
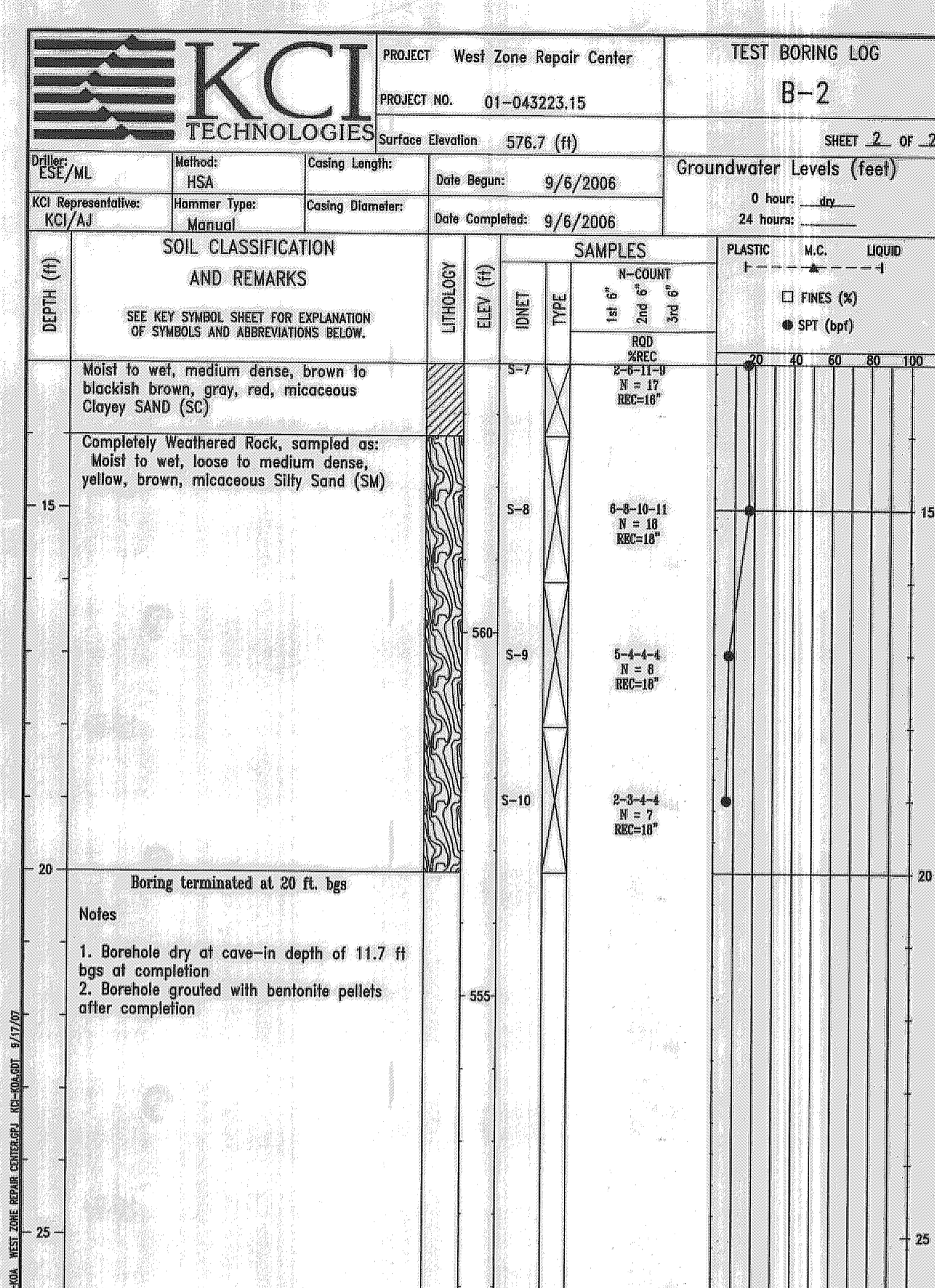
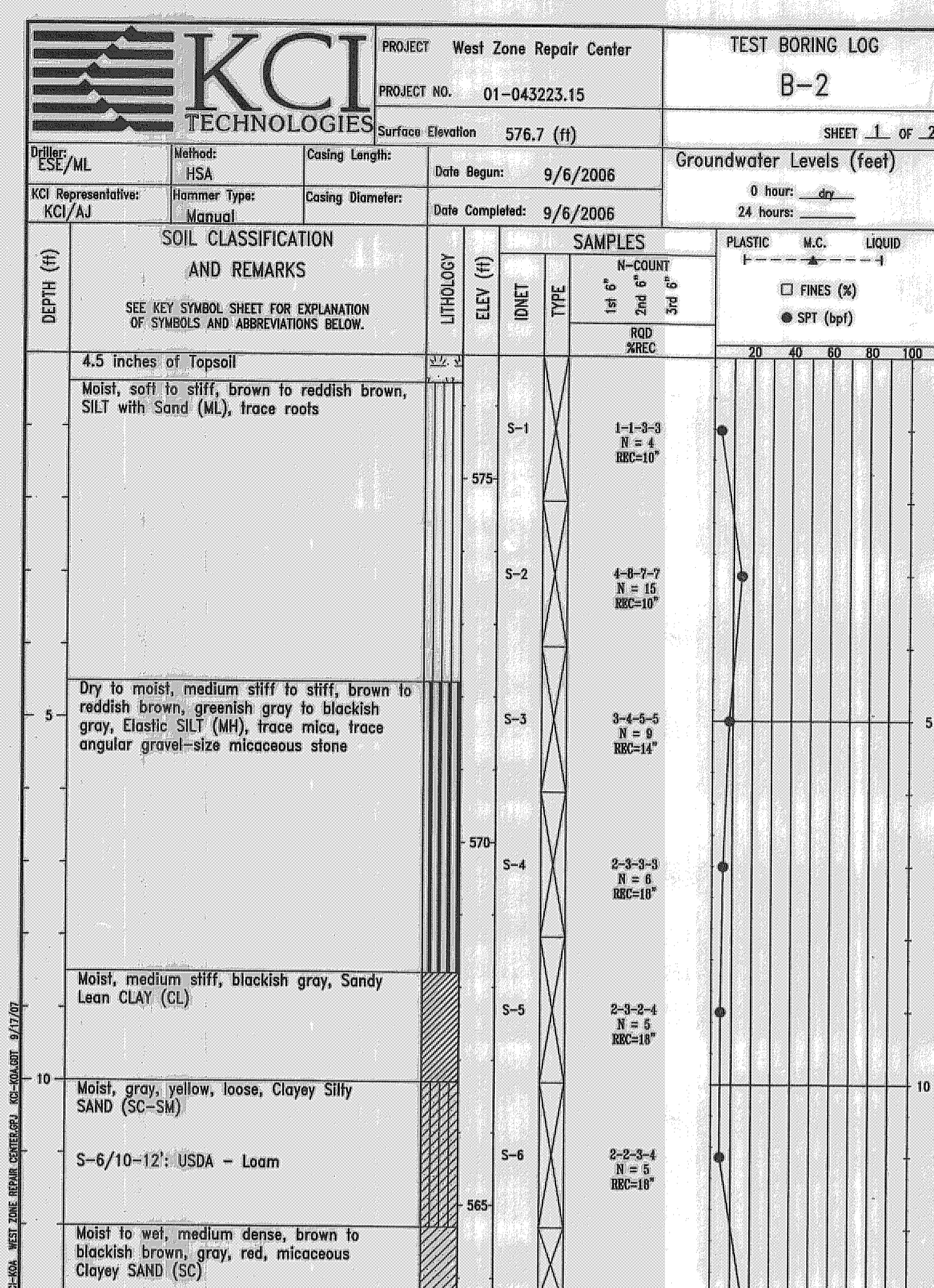
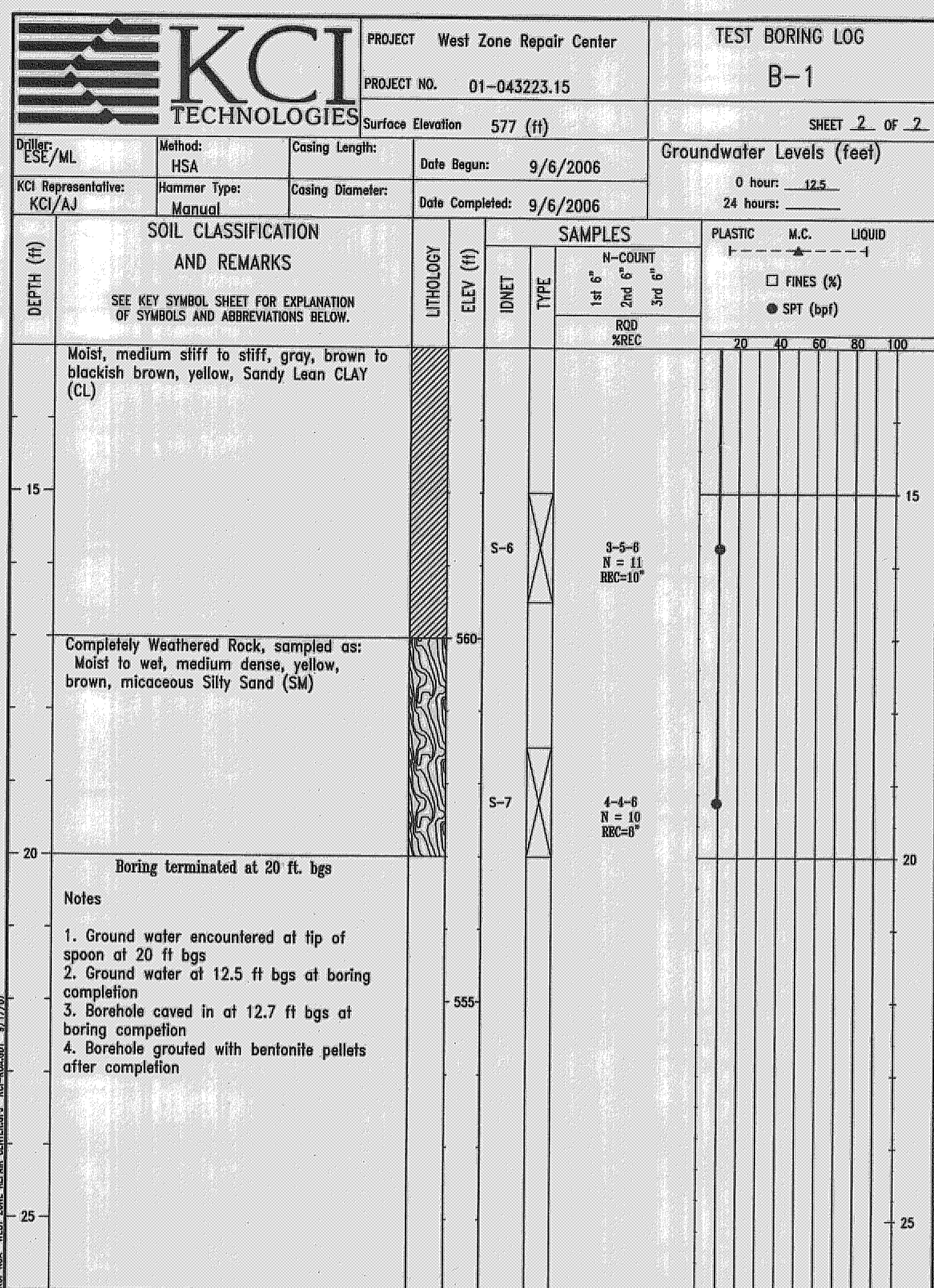
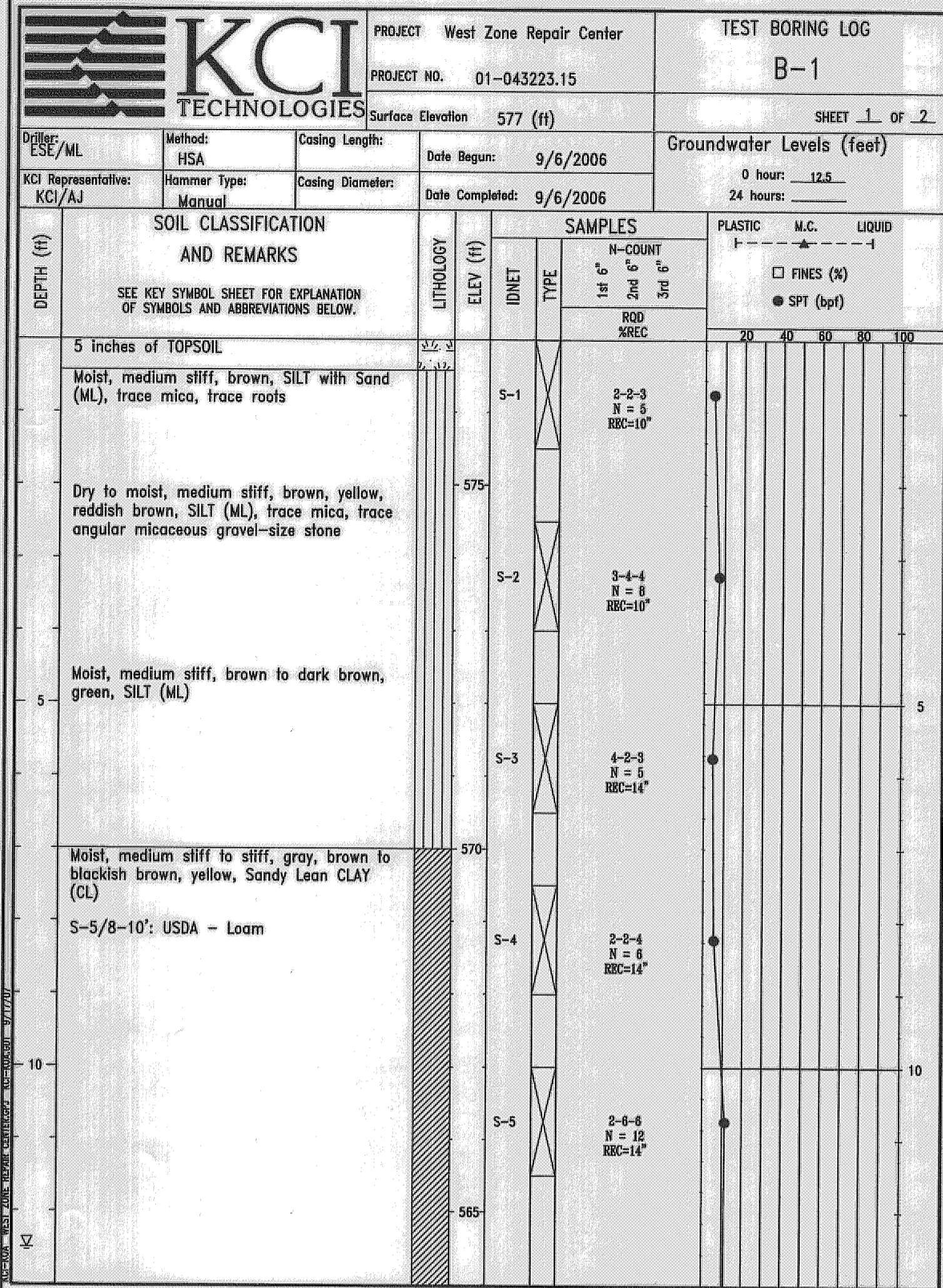
WEST ZONE REPAIR CENTER  
SWM POND RETROFIT

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
STORMWATER MANAGEMENT DIVISION  
6100 WINDY GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046

STORMWATER  
MANAGEMENT  
DETAILS AND  
NOTES

SCALE:  
DATE: 9/17/07  
KCI JOB NO.: 01-043223.15  
CAPITAL PROJECT NO.:  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:





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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE

DATE: 10/23/07

DATE: \_\_\_\_\_

NO. REVISIONS DESCRIPTION

ENGINEERS  
PLANNERS  
SCIENTISTS

CONSTRUCTION MANAGERS

**KCI TECHNOLOGIES** www.kci.com

WEST ZONE REPAIR CENTER  
SWM POND RETROFIT

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
5150 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046

SCALE: \_\_\_\_\_

DATE: 9/17/07

KCI JOB NO.: 01-043223.15

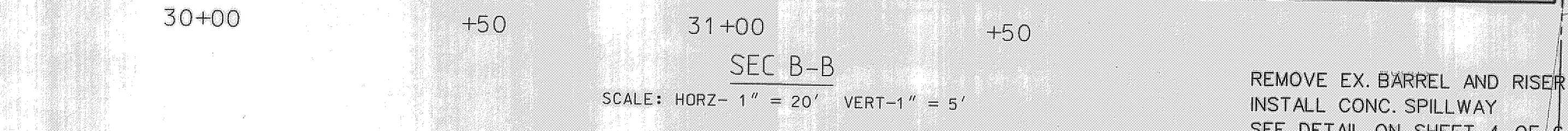
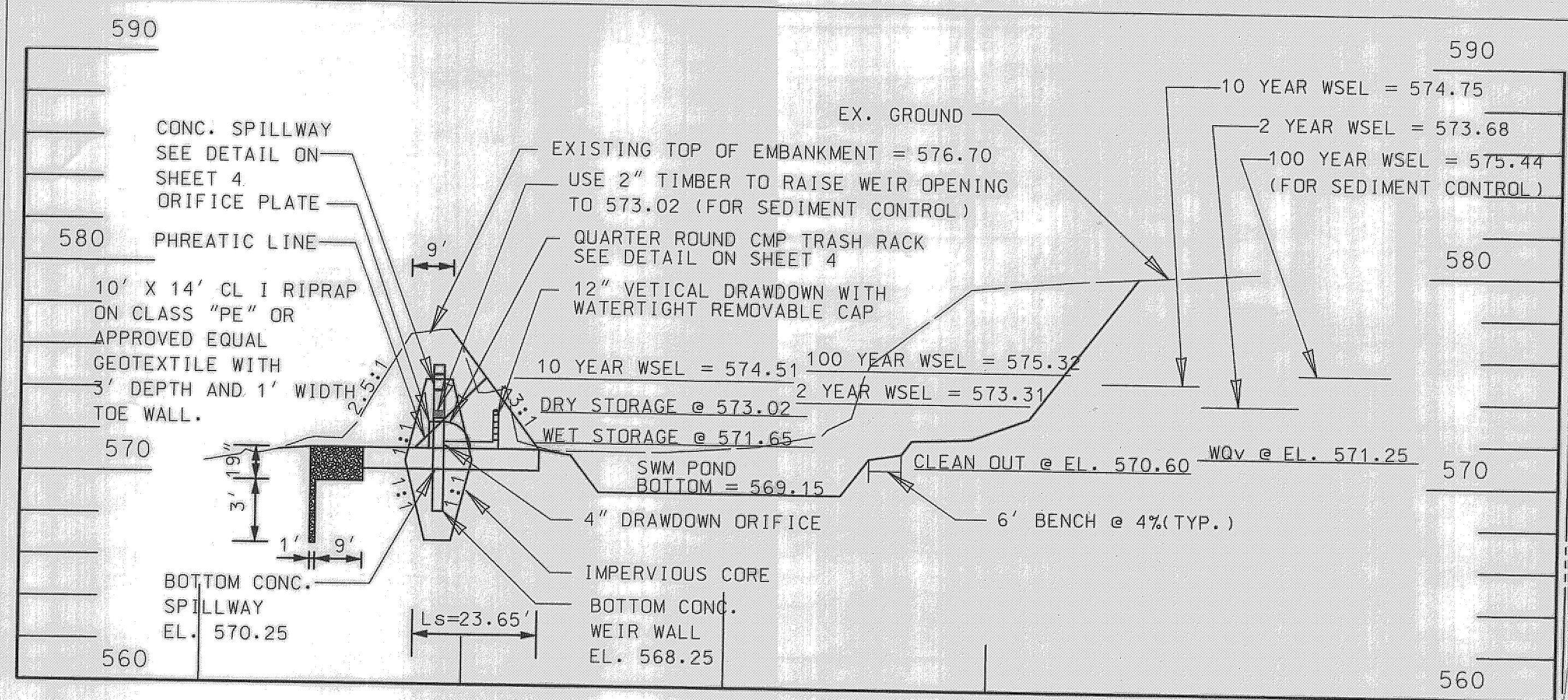
CAPITAL PROJECT NO.: \_\_\_\_\_

PERMIT ISSUE: \_\_\_\_\_

CONSTRUCTION ISSUE: \_\_\_\_\_

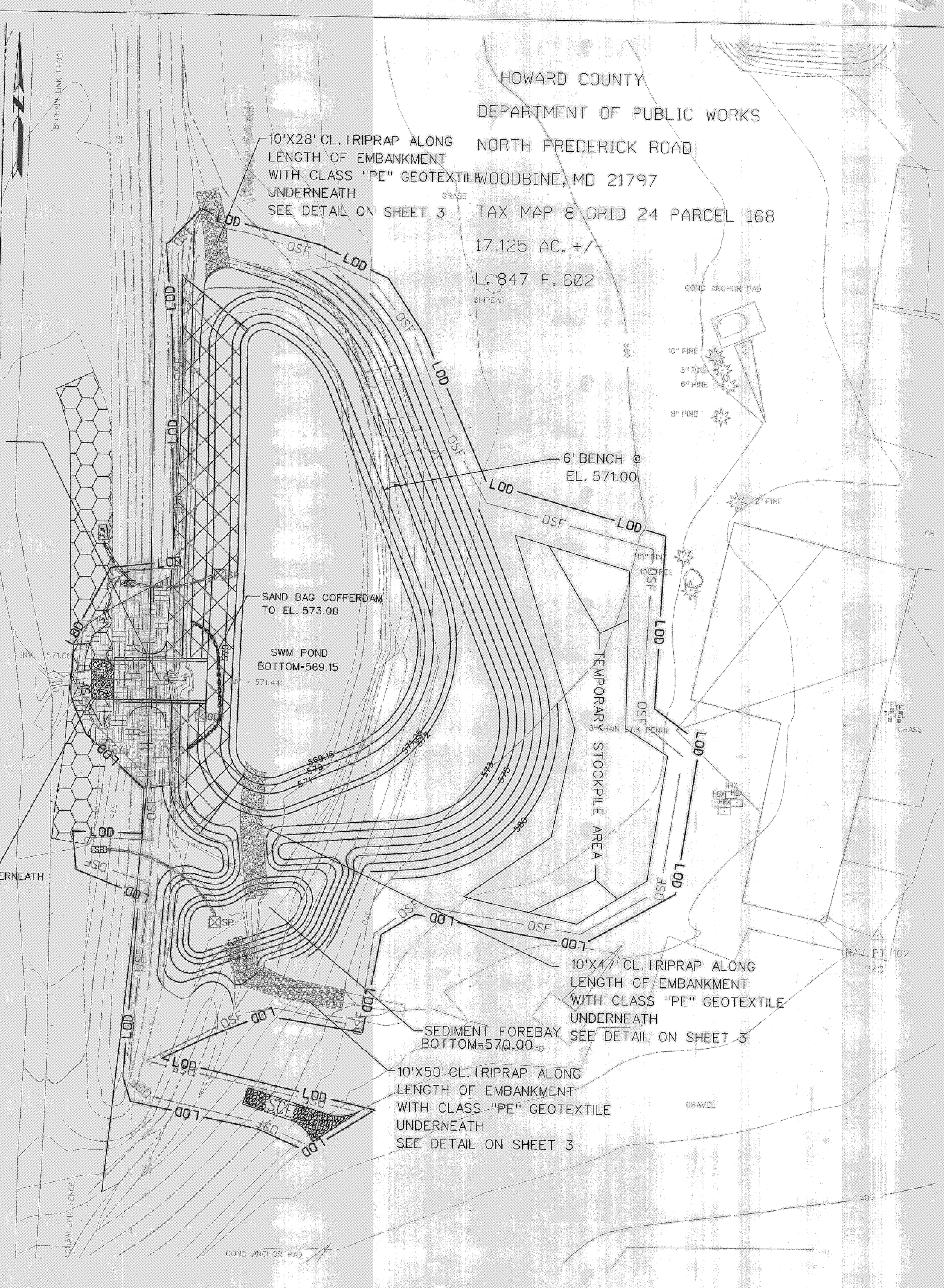
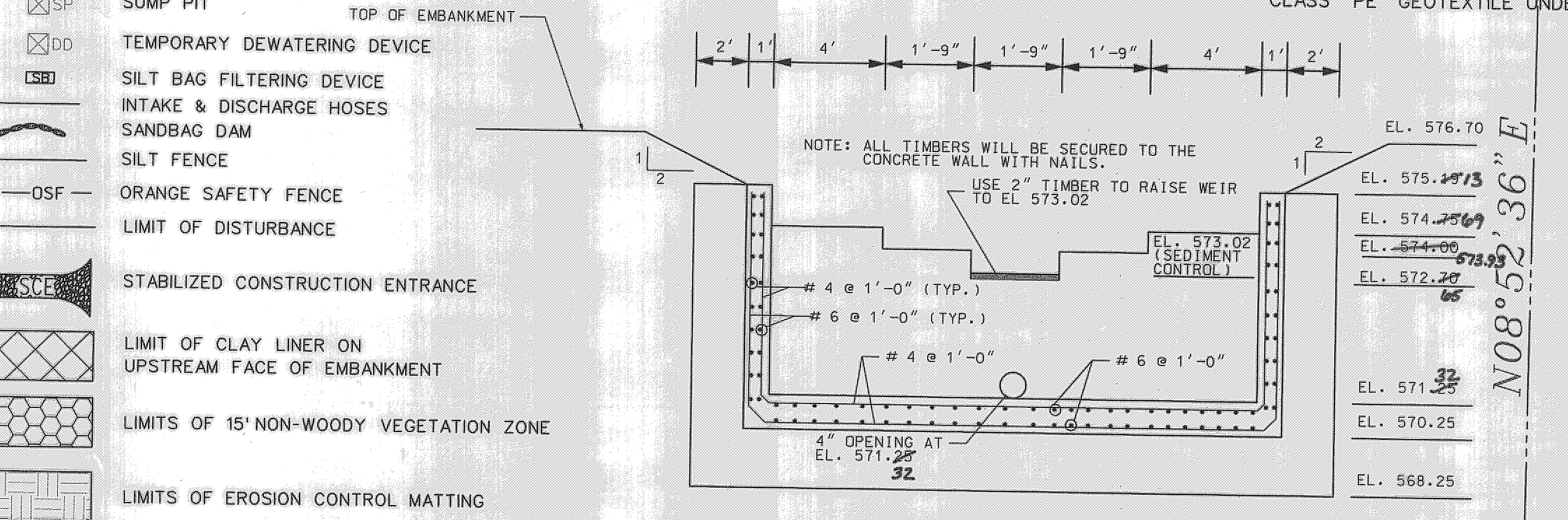
SOIL BORING LOGS

SHEET NO.: 5 OF 8

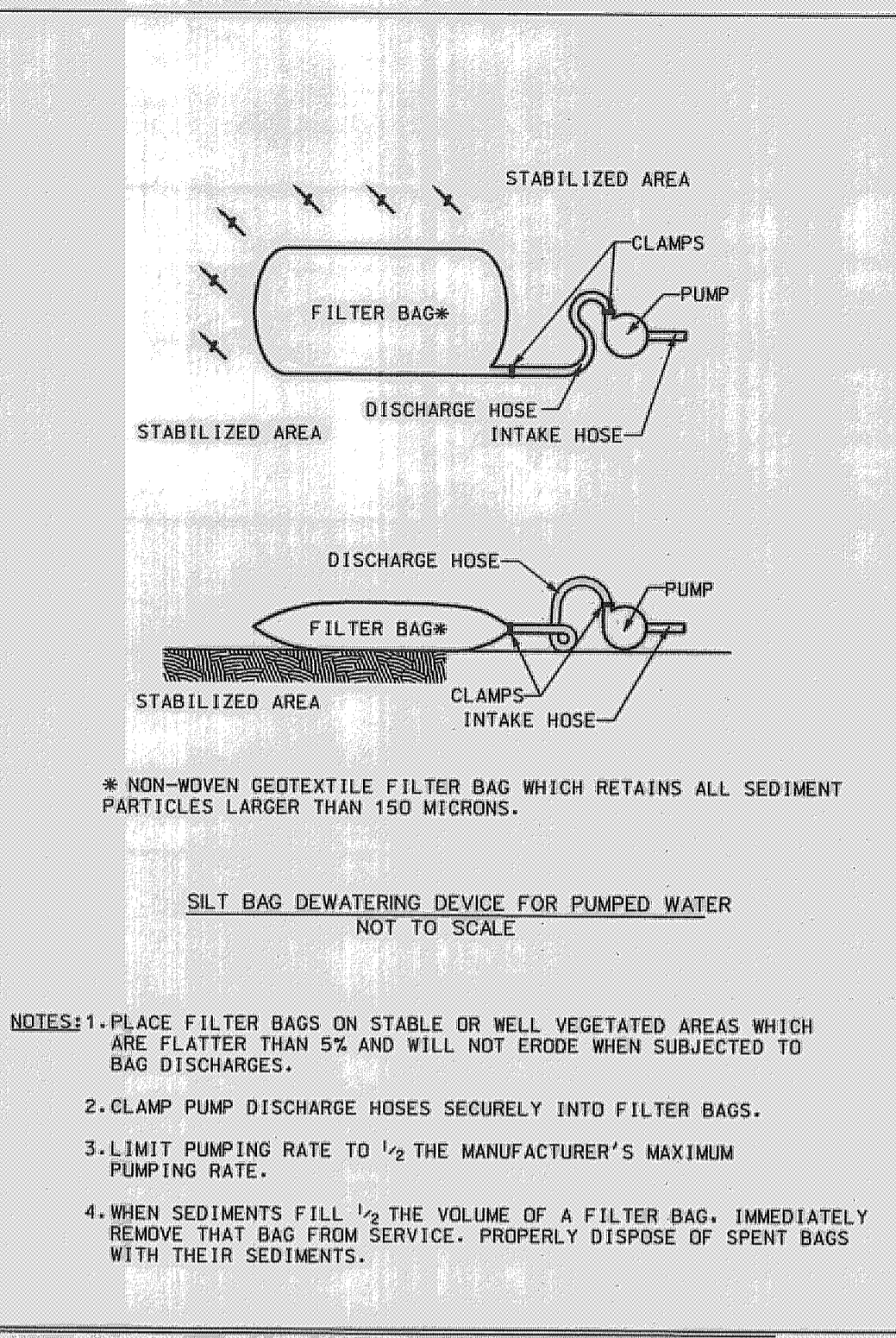
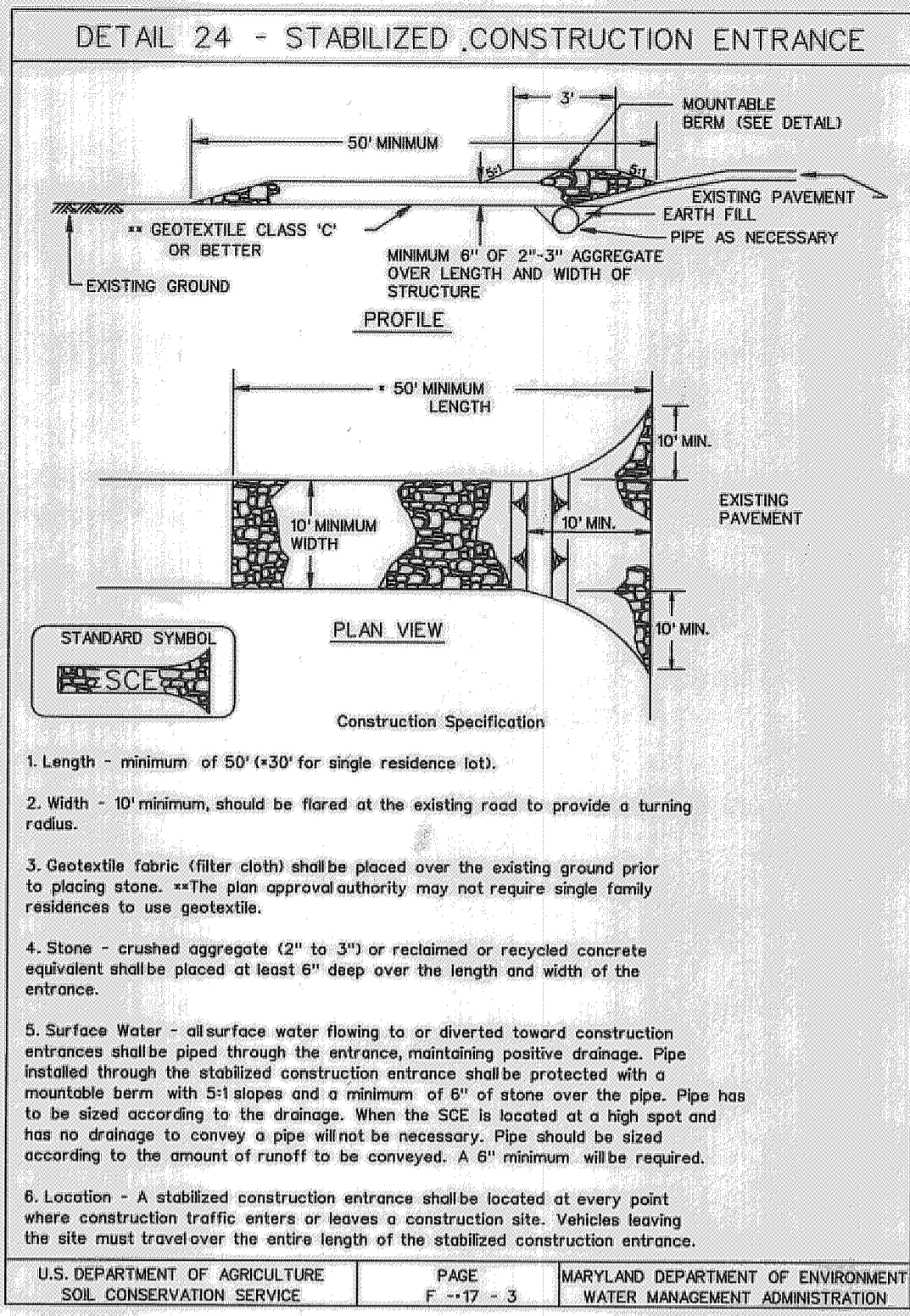


- SEQUENCE OF CONSTRUCTION**
- 1 WEEK 1. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AND THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/ BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION (410-313-1880) AT LEAST 5 DAYS PRIOR TO BEGINNING ANY WORK.
  - 1 DAY 2. CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, AND A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION.
  - 1 DAY 3. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
  - 3 DAYS 4. EXCAVATE SEDIMENT FOREBAY AND INSTALL SUMP PIT AND SAND BAG COFFERDAM.
  - 5 DAYS 5. WITH THE PERMISSION FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR REMOVE THE EXISTING RISER STRUCTURE AND PRINCIPAL SPILLWAY AND CONSTRUCT THE CONCRETE SPILLWAY AS SHOWN ON SHEET 4. OBSTRUCT THE WEIR OPENING WITH TIMBER TO EL. 573.02. ATTACH A VERTICAL DRAWDOWN DEVICE WITH THE ORIFICE PLATE FROM EL. 571.65 AS SHOWN ON THIS SHEET. THE TRASH RACK SHALL NOT BE INSTALLED AT THIS POINT.
  - 1 DAY 6. INSTALL REMAINING SEDIMENT CONTROL MEASURES AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN AND REMOVE SAND BAGS COFFERDAM.
  - 5 DAYS 7. INSTALL CLAY LINER TO THE UPSTREAM FACE OF THE EMBANKMENT.
  - 5 DAYS 8. WITH THE PERMISSION FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR BEGIN GRADING OF SWM POND.
  - 2 DAYS 9. PERMANENTLY STABILIZE ALL DISTURBED AREAS WITH TOPSOIL OR AS SPECIFIED ON THE PLAN. DRAINAGE ENTRAPPED AREA AS SHOWN ON THE PLANS. NO SEDIMENT-LADEN FLOW SHALL BE ALLOWED TO ENTER THE DOWNSTREAM CHANNEL.
  - 2 DAYS 10. REMOVE THE TIMBER FROM WEIR AND ORIFICE OPENINGS AND INSTALL THE TRASH RACK AND ORIFICE PLATE AS SHOWN ON THE PLAN. CLOSE THE OPENING AT EL. 571.65 WITH CONCRETE MIX NO. 2.
  - 2 DAYS 11. WHEN THE SITE IS STABILIZED AND WITH THE PERMISSION OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES AND STABILIZE ANY AREAS DISTURBED BY THIS ACTIVITY.

- LEGEND**
- EX. TREES
  - 180 EXIST. MAJOR CONTOUR
  - 183 EXIST. MINOR CONTOUR
  - 346 PROP. CONTOURS
  - PROP. CONTOURS
  - SOIL DIVIDE
  - SUMP PIT
  - TEMPORARY DEWATERING DEVICE
  - SILT BAG FILTERING DEVICE INTAKE & DISCHARGE HOSES
  - SANDBAG DAM
  - SILT FENCE
  - OSF ORANGE SAFETY FENCE
  - LIMIT OF DISTURBANCE
  - STABILIZED CONSTRUCTION ENTRANCE
  - LIMIT OF CLAY LINER ON UPSTREAM FACE OF EMBANKMENT
  - LIMITS OF 15' NON-WOODY VEGETATION ZONE
  - LIMITS OF EROSION CONTROL MATTING



REVISIONS DESCRIPTION  
 NO. DATE  
 ENGINEERS  
 PLANNERS  
 SCIENTISTS  
 CONSTRUCTION MANAGERS  
 KCI TECHNOLOGIES www.kci.com  
 WEST ZONE REPAIR CENTER SWM POND RETROFIT  
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 COLUMBIA, MARYLAND 21046  
 SEDIMENT AND EROSION CONTROL PLAN  
 SCALE: 1" = 20'  
 DATE: 9/17/07  
 KCI JOB NO.: 01-043223.15  
 CAPITAL PROJECT NO.:  
 PERMIT ISSUE:  
 CONSTRUCTION ISSUE:  
 SHEET NO.: 6 OF 8



**FILTER BAG SPECIFICATIONS**

- FILTER BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
- ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD. SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
- FILTER BAG SHALL HAVE A NOZZLE LARGE ENOUGH TO ACCOMMODATE A FOUR(4) INCH DIAMETER PUMP DISCHARGE HOSE.
- NOZZLE SHALL BE SEALED TIGHTLY AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE TO PREVENT UNFILTERED WATER FROM ESCAPING.
- FILTER BAG SHALL BE PLACED ON A LEVEL OR GENTLY SLOPING (5% MAXIMUM) AREA.
- FILTER BAG SHALL BE PLACED UPON A BASE OF STRAW BALES OR THREE (3) INCHES OF CLEAN STONE TO PROMOTE DEWATERING THROUGH BOTTOM SURFACE OF THE FILTER BAG.
- PUMPING RATES SHALL BE CONTROLLED TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG. AS THE BAG BECOMES FILLED WITH SEDIMENT THE PUMPING RATE SHALL BE REDUCED.
- THE FILTER BAG SHALL BE DEWATERED, REMOVED AND DISPOSED OF UPON COMPLETION OF PUMPING OPERATIONS OR AFTER IT HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. THE DEWATERED SEDIMENT FROM THE BAG SHALL BE SPREAD IN AN UPLAND AREA AND STABILIZED WITHIN 24 HOURS.
- THE GEOTEXTILE FABRIC SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS WITH PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

WEIGHT	10 OZ/YD	ASTM D-3776
GRAB TENSILE	210 LBS	ASTM D-4632
PUNCTURE	150 LBS	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT <sup>2</sup>	ASTM D-4491
PERMEABILITY (SEC)	1.3	ASTM D-4991
UV RESISTANCE	70%	ASTM D-4355
APPARENT OPENING SIZE (AOS)	40-80	ASTM D-4751

**SILT BAG DEWATERING DEVICE FOR PUMPED WATER NOT TO SCALE**

**NOTES:** 1. PLACE FILTER BAGS ON STABLE OR WELL VEGETATED AREAS WHICH ARE FLATTER THAN 5% AND WILL NOT ERODE WHEN SUBJECTED TO BAG DISCHARGES.  
2. CLAMP PUMP DISCHARGE HOSES SECURELY INTO FILTER BAGS.  
3. LIMIT PUMPING RATE TO 1/2 THE MANUFACTURER'S MAXIMUM PUMPING RATE.  
4. WHEN SEDIMENTS FILL 1/2 THE VOLUME OF A FILTER BAG, IMMEDIATELY REMOVE THAT BAG FROM SERVICE. PROPERLY DISPOSE OF SPENT BAGS WITH THEIR SEDIMENTS.

**NOTE:** ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

**TEMPORARY VEGETATIVE STABILIZATION**

A) SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES BY DISCING, RAKING OR OTHER ACCEPTABLE MEANS.  
B) SOIL AMENDMENTS: APPLY 600 LBS PER ACRE OF 10-10-10 FERTILIZER AND TWO TONS PER ACRE OF LIME.  
C) SEEDING: \* FOR PERIODS OF MARCH 1 TO APRIL 30 AND AUGUST 15 TO NOVEMBER 15, SEED WITH 2.5 BU PER ACRE OF CEREAL RYE PLUS 30 LBS PER ACRE OF TALL FESCUE OR 5 LBS PER ACRE OF REDTOP OR 20 LBS PER ACRE OF PERENNIAL RYEGRASS. \*\* FOR PERIOD OF MAY 1 TO AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS OR 40 LBS PER ACRE OF JAPANESE OR FOXTAIL MILLET.  
FOR THE PERIOD OF NOVEMBER 16 TO FEBRUARY 28, PROTECT THE SITE BY APPLYING TWO TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING OR USE SOO.  
D) MULCHING SPECIFICATIONS: MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING. APPLY 2 TONS PER ACRE OF STRAW OVER ALL SEEDED AREAS. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHALL BE INCREASED TO 2.5 TONS PER ACRES. \*\* MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND AND WATER. THE TYPE OF MULCH ANCHORING USED MUST COMPLY WITH THE 1994 MARYLAND STANDARD AND SPECIFICATIONS.  
\* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE 1994 MARYLAND STANDARD AND SPECIFICATIONS, CHAPTER 20, TABLE 25.  
\*\* IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE 1994 MARYLAND STANDARD AND SPECIFICATION, CHAPTER 20.

**PERMANENT VEGETATIVE STABILIZATION**  
ALL DISTURBED AREAS, WHICH ARE NOT TO BE PAVED, SHALL BE PERMANENTLY STABILIZED AS FOLLOWS:  
A) SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES BY RAKING, DISCING, OR OTHER ACCEPTABLE MEANS AFTER SPREADING FOUR INCHES OF TOPSOIL.  
B) SOIL AMENDMENTS: APPLY 500 LBS PER ACRE OF 10-10-10 FERTILIZER AND TWO TONS PER ACRE OF LIME.  
C) SEEDING: \* FOR PERIODS OF MARCH 1 TO MAY 15 AND AUGUST 15 TO OCTOBER 15, SEED WITH 125 LBS PER ACRE OF TALL FESCUE, 15 LBS PER ACRE OF PERENNIAL RYEGRASS, AND 10 LBS OF KENTUCKY BLUEGRASS. \*\* FOR PERIOD OF MAY 16 TO AUGUST 14, SEED WITH 110 LBS PER ACRE OF TALL FESCUE AND 3 LBS PER ACRE OF WEEPING LOVEGRASS. \*\*\* FOR PERIOD OF OCTOBER 16 TO FEBRUARY 28, PROTECT SITE BY: OPTIONS - 1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING 2) 2 TONS PER ACRE OF MULCH WITH 10 LBS PER ACRE OF TALL FESCUE AND MULCH WITH 2 TONS PER ACRE OF WELL ANCHORED STRAW.  
NOTE: FOR QUICK COVER WITH TALL FESCUE, ADD 2 LBS OF SMALL GRAIN PER 1,000 SQ. FT.  
D) MULCHING SPECIFICATIONS: MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING. APPLY 2 TONS PER ACRE OF STRAW OVER ALL SEEDED AREAS. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHALL BE INCREASED TO 2.5 TONS PER ACRES. \*\* MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND AND WATER. THE TYPE OF MULCH ANCHORING USED MUST COMPLY WITH THE 1994 MARYLAND STANDARD AND SPECIFICATIONS.

**HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES**

- 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).
- 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 SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
- 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 ditches greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
- All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol.1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
- All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
- Site Analysis:  
Total Area of Site: 1.01 Acres  
Area Disturbed: 0 Acres  
Area to be roofed or paved: 0 Acres  
Area to be vegetatively stabilized: 1.01 Acres  
Total Cut: 2539 Cu. Yds.  
Total Fill: 152 Cu. Yds.  
Offsite waste/borrow area location: A site with active grading permit. Approval from SCD Inspector is required.
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
- 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 disturbances or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
- Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

**21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL**

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

**Purpose**  
To provide a suitable soil 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**

- This practice is limited to areas having 2:1 or flatter slopes where:
  - The texture of the exposed subsoil/parent materials not adequate to produce vegetative growth.
  - The soil materials are so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
  - The original soil to be vegetated contains material toxic to plant growth.
  - The soils so acidic that treatment with limestone is not feasible.
- 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 Experiment Station.
- Topsoil Specifications - Soil to be used as topsoil must meet the following:
  - 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 1 1/2" in diameter.
  - Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, johnsongrass, nutedge, poison ivy, thistle, or others as specified.
  - Where the 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.

**III. For sites having disturbed areas under 5 acres:**

- Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section - - Vegetative Stabilization Methods and Materials.

**IV. For sites having disturbed areas over 5 acres:**

- On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
  - 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.
  - Organic content of topsoil shall be not less than 1.5 percent by weight.
  - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
  - 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 dissipation of phyto-toxic materials.

**Note:** Topsoil substitutes or 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.

- Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section - -

**V. Topsoil Application**

- 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.
- Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.
- 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.
- 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 seeded preparation.

**PERMANENT SEEDING SUMMARY**

SEED MIXTURE (HARDINESS ZONE 6B ) FROM TABLE 25				FERTILIZER RATE (10-20-20)			LIME
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P205	K20
1	TALL FESCUE (85%)	125	3/1-5/15	1-2 INCH	90 LB/AC (2.0 LB/ 1000 SF)	175 lb/oo (4.0 LB/ 1000 SF)	2 tons/oo (100 LB/ 1000 SF)
	PERENNIAL RYEGRASS (10%)	15	8/15-10/15				
	KENTUCKY BLUEGRASS (5%)	10					
2	KENTUCKY BLUEGRASS (50%) HARD FESCUE (40%) RED TOP (10%)	150	3/1-5/15 8/15-10/15	1-2 INCH			

**TEMPORARY SEEDING SUMMARY**

SEED MIXTURE (HARDINESS ZONE 6B ) FROM TABLE 26				FERTILIZER RATE (10-10-10)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P205	K20
1	RYE	140	3/1-4/30 8/15-11/15	1-2 INCH			
2	RYE PLUS FOXTAIL MILLET	150	3/1-4/30 5/1-8/14 8/15-11/15	1 INCH			

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

USDA - NATURAL RESOURCES CONSERVATION SERVICE      DATE 10/23/07

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

HOWARD SCD      DATE 10/23/07

DATE: \_\_\_\_\_

NO. REVISIONS DESCRIPTION: \_\_\_\_\_

ENGINEERS: \_\_\_\_\_  
PLANNERS: \_\_\_\_\_  
SCIENTISTS: \_\_\_\_\_  
CONSTRUCTION MANAGERS: \_\_\_\_\_

WEST ZONE REPAIR CENTER  
SWM POND RETROFIT

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
STORMWATER MANAGEMENT DIVISION  
1000 UNIVERSITY BLVD  
COLUMBIA, MARYLAND 21048

SEDIMENT AND EROSION CONTROL NOTES & DETAILS

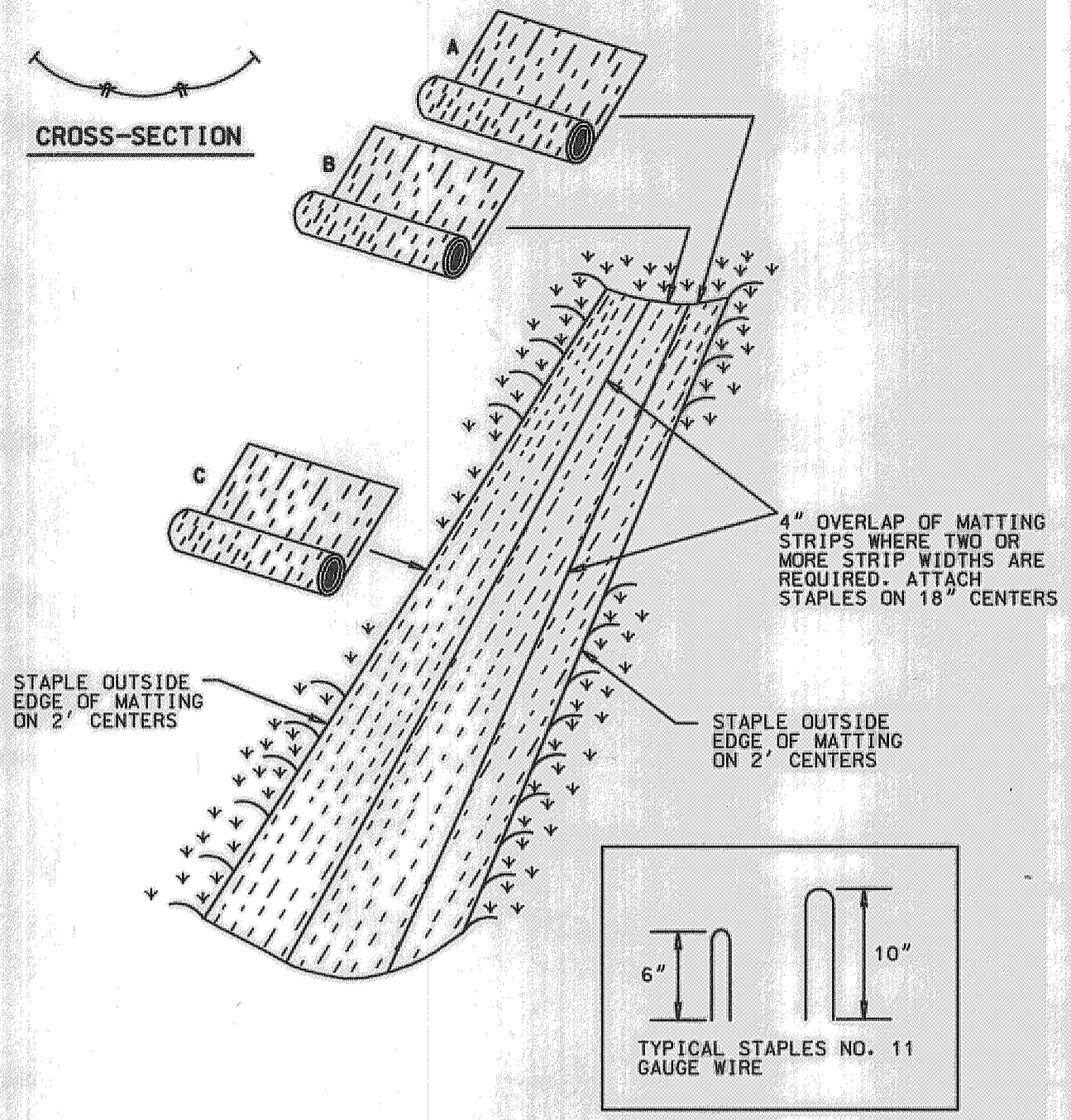
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DATE: 9/17/07  
KCI JOB NO.: 01-043223.15  
CAPITAL PROJECT NO.: \_\_\_\_\_  
PERMIT ISSUE: \_\_\_\_\_  
CONSTRUCTION ISSUE: \_\_\_\_\_

SHEET NO.: 7 OF 8

KCI FILE NO.: 2004 \ 01043223.15 \ DRAWINGS \ ES02wzrc.dgn

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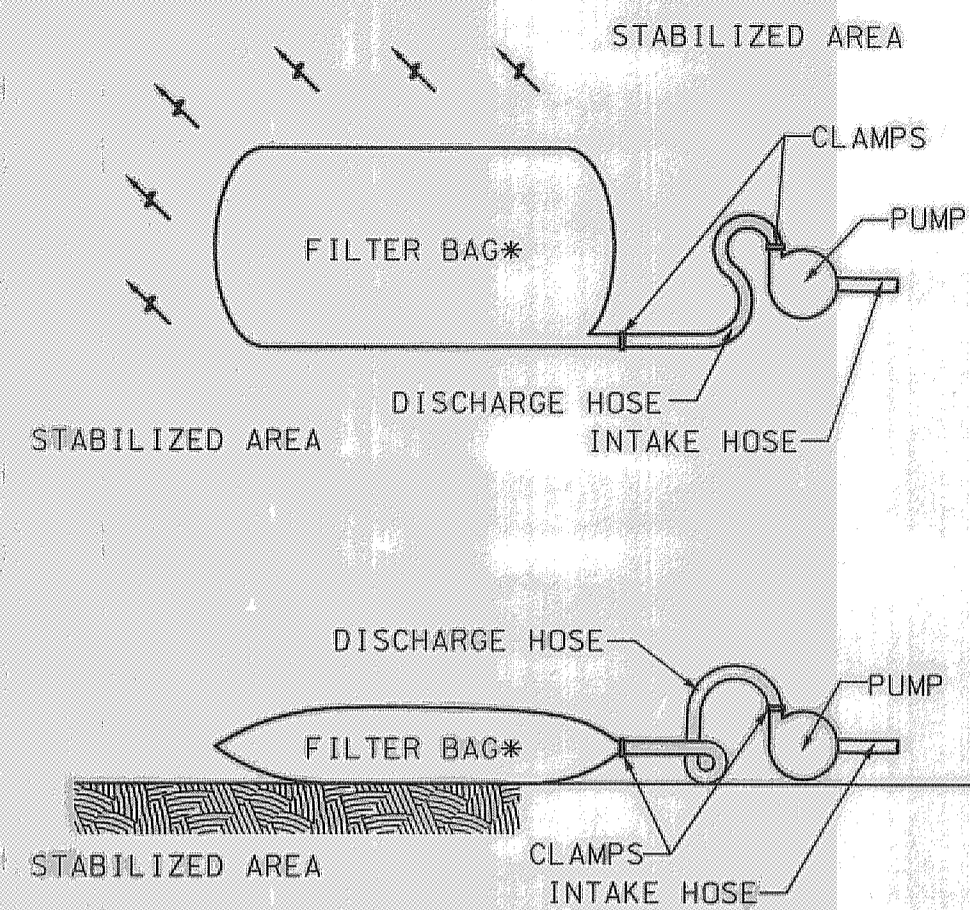
DETAIL 30 - EROSION CONTROL MATTING



EROSION CONTROL MATTING

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

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



\* NON-WOVEN GEOTEXTILE FILTER BAG WHICH RETAINS ALL SEDIMENT PARTICLES LARGER THAN 150 MICRONS.

SILT BAG DEWATERING DEVICE FOR PUMPED WATER NOT TO SCALE

- NOTES:
- PLACE FILTER BAGS ON STABLE OR WELL VEGETATED AREAS WHICH ARE FLATTER THAN 5% AND WILL NOT ERODE WHEN SUBJECTED TO BAG DISCHARGES.
  - CLAMP PUMP DISCHARGE HOSES SECURELY INTO FILTER BAGS.
  - LIMIT PUMPING RATE TO 1/2 THE MANUFACTURER'S MAXIMUM PUMPING RATE.
  - WHEN SEDIMENTS FILL 1/2 THE VOLUME OF A FILTER BAG, IMMEDIATELY REMOVE THAT BAG FROM SERVICE. PROPERLY DISPOSE OF SPENT BAGS WITH THEIR SEDIMENTS.

NOTE: ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

- FILTER BAG SPECIFICATIONS
- FILTER BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
  - ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD. SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
  - FILTER BAG SHALL HAVE A NOZZLE LARGE ENOUGH TO ACCOMMODATE A FOUR(4) INCH DIAMETER PUMP DISCHARGE HOSE.
  - NOZZLE SHALL BE SEALED TIGHTLY AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE TO PREVENT UNFILTERED WATER FROM ESCAPING.
  - FILTER BAG SHALL BE PLACED ON A LEVEL OR GENTLY SLOPING (5% MAXIMUM) AREA.
  - FILTER BAG SHALL BE PLACED UPON A BASE OF STRAW BALES OR THREE (3) INCHES OF CLEAN STONE TO PROMOTE DEWATERING THROUGH BOTTOM SURFACE OF THE FILTER BAG.
  - PUMPING RATES SHALL BE CONTROLLED TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG. AS THE BAG BECOMES FILLED WITH SEDIMENT THE PUMPING RATE SHALL BE REDUCED.
  - THE FILTER BAG SHALL BE DEWATERED, REMOVED AND DISPOSED OF UPON COMPLETION OF PUMPING OPERATIONS OR AFTER IT HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. THE DEWATERED SEDIMENT FROM THE BAG SHALL BE SPREAD IN AN UPLAND AREA AND STABILIZED WITHIN 24 HOURS.
  - THE GEOTEXTILE FABRIC SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS WITH PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:
- |                             |                            |             |
|-----------------------------|----------------------------|-------------|
| WEIGHT                      | 10 OZ/YD                   | ASTM D-3776 |
| GRAB TENSILE                | 210 LBS.                   | ASTM D-4632 |
| PUNCTURE                    | 150 LBS.                   | ASTM D-4833 |
| FLOW RATE                   | 70 GAL/MIN/FT <sup>2</sup> | ASTM D-4491 |
| PERMITIVITY (SEC)           | 1.3                        | ASTM D-4991 |
| UV RESISTANCE               | 70%                        | ASTM D-4355 |
| APPARENT OPENING SIZE (AOS) | 40-80                      | ASTM D-4751 |

OPERATION, MAINTENANCE AND INSPECTION

INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, NRCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE PONDOWNER(S) 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.

DATE

NO. REVISIONS DESCRIPTION

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS

KCI TECHNOLOGIES www.kci.com

KCI FILE NO.: 2004 \ 0104322315 DRAWINGS

WEST ZONE REPAIR CENTER SWM POND RETROFIT

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT DIVISION 6700 COLUMBIA WASHINGTON 21046

SEDIMENT AND EROSION CONTROL DETAILS

SCALE: N/A

DATE: 9/17/07

KCI JOB NO.: 01-043223.15

CAPITAL PROJECT NO.:

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 8 OF 8

Figure 2. Temporary Sediment Basin Design Data Sheet

Computed by: SA Date: 12/1/06 Checked by: MBL Date: 12/13/06

Project name: WEST ZONE SWM POND Basin #: 1

Location: HOWARD COUNTY, MD

Total area draining to basin: 12.12 acres (ac)

Basin Volume Design

- Note: 1. Also see Surface Area Design #30, this form.
2. To convert ft<sup>3</sup> to yd<sup>3</sup>, divide ft<sup>3</sup> by 27. To convert ft<sup>2</sup> to yd<sup>2</sup>, divide ft<sup>2</sup> by 9.
- Min. required vol. = 3600 ft<sup>3</sup>/ac x 12.12 ac. drainage = 43,632 ft<sup>3</sup>
  - Actual Volume of basin = 80,630 ft<sup>3</sup>
  - Excavate 15,444 ft<sup>3</sup> (yd<sup>3</sup>) to obtain required capacity.
  - Vol. at dewatering elev. = 1800 ft<sup>3</sup>/ac x 12.12 ac. = 21,916 ft<sup>3</sup>
  - Vol. of basin at clearest = 900 ft<sup>3</sup>/ac x 12.12 ac. = 10,908 ft<sup>3</sup>
  - Elevation corresponding to min. required volume of basin (riser crest elevation) 573.65 ft.
  - Permanent pool elevation 571.65 ft.
  - Distance from riser crest elevation to permanent pool elevation 1.99 ft.
  - Basin clearest elevation 572.62 ft.
  - Distance from riser crest elevation to clearest elevation 2.95 ft.

Spillway Design N/A

Principal Spillway (Open) (See Detail 11)

12. Design Principal Spillway (Barrel) discharge, Design Q<sub>10</sub> = 19 cfs (min. 10% of 10 year peak or 8" Diameter Pipe)
13. H = ft.; Barrel length = ft.
14. Barrel Diam. in. Note: Q<sub>10</sub> must equal or exceed Design Q<sub>10</sub>. Q<sub>10</sub> = Q (from Table 13 or 14) x (length correction factor) = cfs.
15. Riser Diameter in.; Riser Height ft.; Riser Height (h) = ft.
16. Trash Rack Diam. in.; Trash Rack Height = in.

NOTE: A table showing design data shall be included on the plan for each basin.

C-10-10

Emergency Spillway (Open) N/A

- Emergency spillway cap., Q<sub>10</sub> = Q<sub>10</sub> - Q<sub>10</sub> = 20 - 20 = 0 cfs
- Width 14 ft; H<sub>p</sub> ft
- Entrance channel slope N/A %.
- Exit channel slope %.

Anti-Seep Collar Design (If Required)

- y = ft.; z = %; pipe slope = %; L<sub>s</sub> = ft
- Use collars, ft. - in. square; projection = ft.

Design Elevations

- Riser Crest = 573.65 ft.
- Design High Water = 576.70 ft.
- Emergency Spillway Crest = 574.75 ft.
- Min. settled top of dam = 0.5 ft.
- Permanent pool = 571.65 ft.
- Bottom of Basin = 569.15 ft.
- Draw-down orifice invert = 571.65 ft.

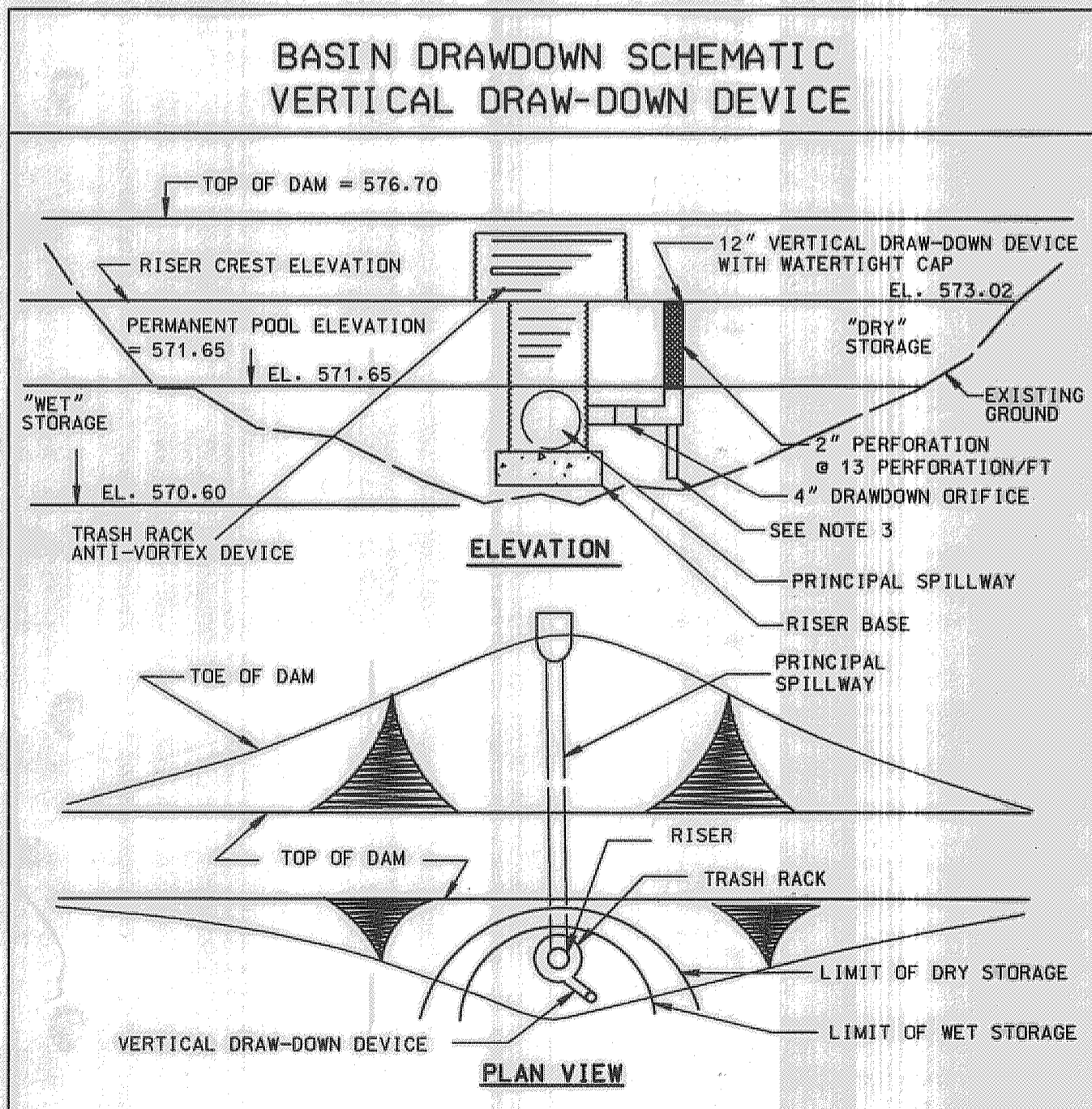
Surface Area Design

- Min. basin surface area; SA ≥ 0.0035 x Q<sub>10</sub> = 0.0035 x 19 cfs ≤ 0.16 ac. = 0.067 Ac < 0.16 Ac.

Draw-down Device

- Draw-down device orifice diameter = 4 in. (From Table 11)
- A<sub>1</sub> = Total area of perforations ≥ 4A<sub>2</sub>  
 $A_1 = (\# \text{ of perforation/foot} \times \text{perforation area ft}^2) \times \text{perforated section length ft.}$   
 $A_1 = 27 \times 13 \times 1.37 = 487.17 \text{ ft}^2$   
 $A_2 = \text{Internal orifice area (from Table 11 or computed)} = 0.087 \text{ L}^2 \text{ (ORIFICE) FT}^2$   
 $4A_2 = 0.35 \text{ FT}^2$   
 THEREFORE,  $A_1 > 4A_2$   
 TOTAL PERFORATION = 13 x 1.37 = 17.81 FT<sup>2</sup>

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Construction Specifications

- Perforations in the draw-down device may not extend into the wet storage.
- The total area of the perforations must be greater than 2 times the area of the internal orifice.
- The perforated portion of the draw-down device shall be wrapped with 1/2" hardware cloth and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class E.
- Provide support of draw-down device to prevent sagging and floatation. An acceptable preventative measure is to stake both sides of draw-down device with 1" steel angle, or 1" by 4" square or 2" round wooden posts set 3' minimum into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-10-38 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

PLotted: 01-13 PM on Tuesday, October 09, 2007  
 FILE: M:\2004\0104322315\Drawings\ES303.dwg