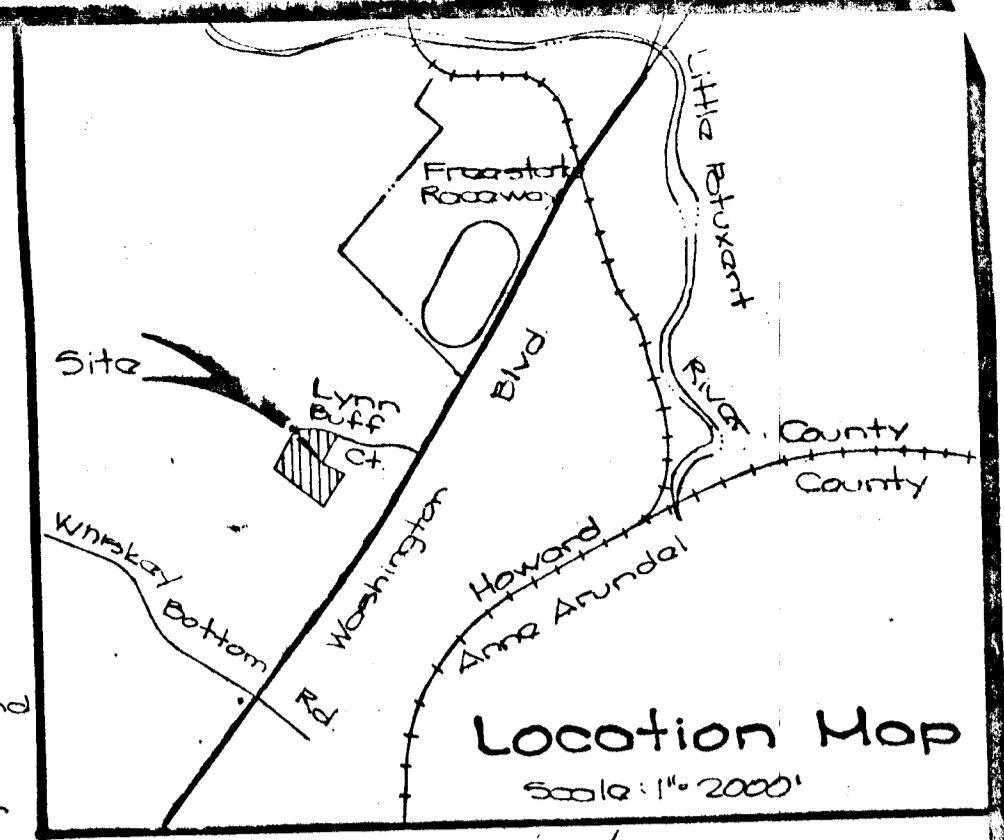


487 ORIGINAL 2ND

Parcel D
U.S. #1 Joint Venture
Plot No. 3592

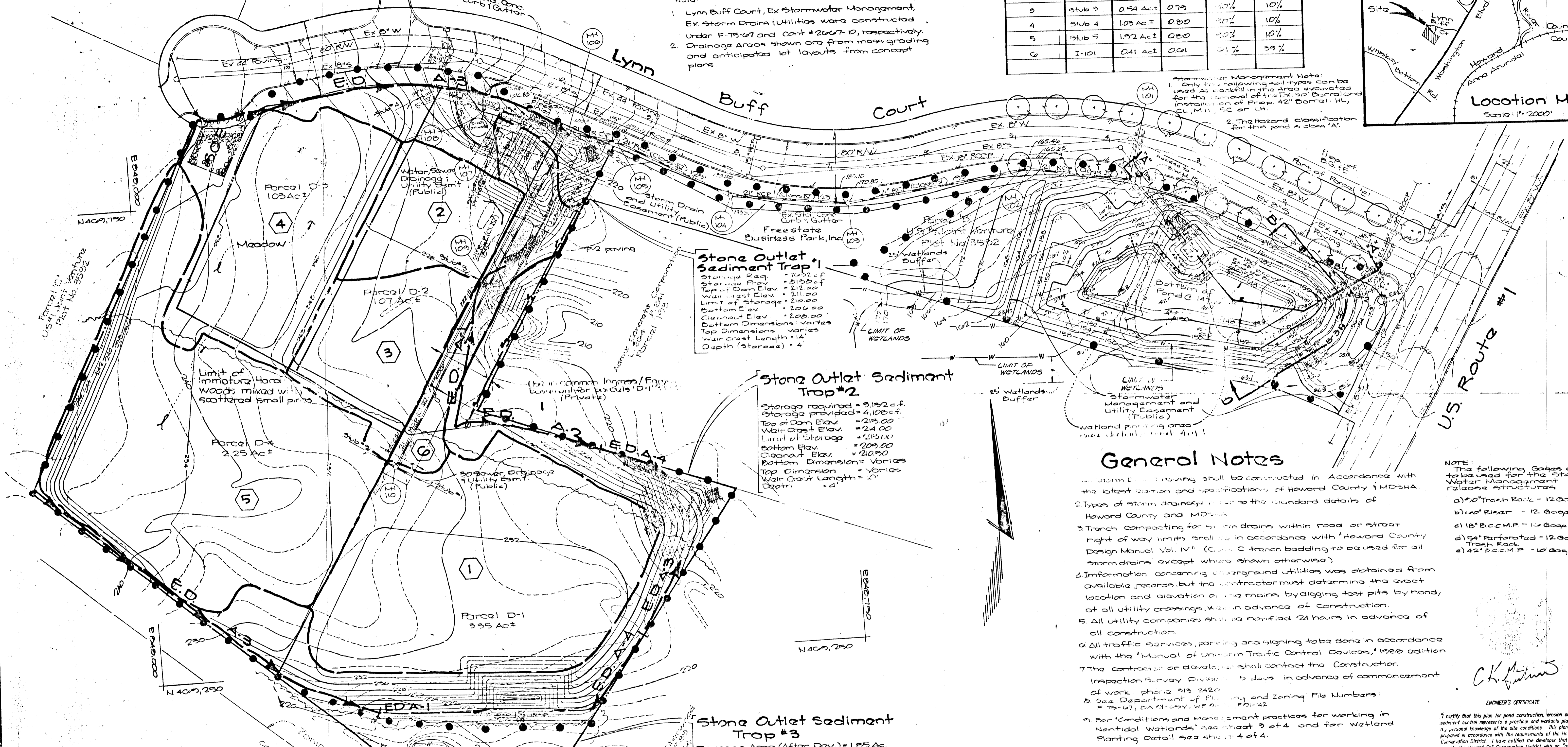
Drainage Area Tabulation

Drainage Area	Structure No.	Area	C Value	% Area Flooded	% Area Grassed
1	Stub 1	1.53 Ac ±	0.80	10%	10%
2	Stub 2	0.24 Ac ±	0.80	10%	10%
3	Stub 3	0.54 Ac ±	0.79	10%	10%
4	Stub 4	1.03 Ac ±	0.80	10%	10%
5	Stub 5	1.92 Ac ±	0.80	10%	10%
6	I-101	0.41 Ac ±	0.01	0%	39%



Note:
1. Lynn Buff Court, Ex Stormwater Management, Ex Storm Drains (Utilities) were constructed under E-75-67 and Cont #2667-D, respectively.
2. Drainage Areas shown are from mass grading and anticipated lot layouts from concept plans.

Stormwater Management Note:
1. Only the following soil types can be used as backfill in the area excavated for the removal of the Ex. 30" Barral and installation of Prop. 42" Barral: H, CL, MH, SC or CH.
2. The Hazard classification for this pond is class 'A'.



General Notes

- Stormwater Management shall be constructed in accordance with the latest edition and specifications of Howard County and MDSHA.
- Types of storm drainage structures to be constructed shall be in accordance with Howard County and MDSHA.
- Trench composting for storm drains within road or street right of way limits shall be in accordance with "Howard County Design Manual Vol. IV" (Class C trench bedding to be used for all storm drains except where shown otherwise).
- Information concerning underground utilities was obtained from available records, but the contractor must determine the exact location and elevation of the mains by digging test pits by hand, at all utility crossings, well in advance of construction.
- All utility companies shall be notified 24 hours in advance of all construction.
- All traffic services, parking and signing to be done in accordance with the "Manual of Uniform Traffic Control Devices," 1988 edition.
- The contractor or developer shall contact the Construction Inspection Survey Division 5 days in advance of commencement of work, phone 913 2420.
- See Department of Planning and Zoning File Numbers: E-75-67, EA 91-09V, WP 91-02-142.
- For Conditions and Management practices for working in Nontidal Wetlands, see sheet 3 of 4 and for Wetland Planting Detail see sheet 4 of 4.

NOTE: The following gauges are to be used for the storm water management release structures:
a) 12" Trash Rack - 12 Gauge
b) 18" Riser - 12 Gauge
c) 18" B.C.C.M.P. - 12 Gauge
d) 54" Perforated - 12 Gauge
e) 42" B.C.C.M.P. - 10 Gauge

Approved: Howard County Department of Public Works
John M. Penzance 1/10/92
Chief, Land Development Division Date JH
Denise W. Wehrsted 1/10/92
Chief, Bureau of Highways Date DWA
William E. Riley 1.21.92
Chief, Bureau of Engineering Date JH
Approved: Howard County Department of Planning and Zoning
Emma Blomart 1/20/92
Chief, Division of Community Planning and Land Development Date JH

Legend

- LIMIT OF WETLANDS
- Drainage Area Division
- Limit of Disturbance
- Earth Dike (E.D.)
- Temporary Grading for Sediment Control
- Straw Bale / Silt Fence
- Stone Construction Entrance

These plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.
Robert W. Zimm 12/23/91
District Engineer
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.
Robert W. Zimm 12/21/91
District Engineer

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 must provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.
CK Johnson 4-4-92
Date

DEVELOPER'S/BUILDER'S CERTIFICATE
I 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 will provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periods, on-site inspection by HSCD.
Robert W. Zimm 4-APRIL 91
Signature of Developer/Builder Date

Street Tree Schedule				
Quantity	Symbol	Potential Name / Common Name	Size	Remarks
24	(Symbol)	Prunus serrulata Kwanzan / Kwanzan Flowering Cherry	1 1/2" - 2" Cal 7.0' Ht	D & D

G.L.W. GUTSCHICK LITTLE & WEPER, P.A.
ENGINEERS, PLANNERS, SURVEYORS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK - BURTONSVILLE, MD 20886
TELEPHONE: (301) 421-4024

NO.	DATE	DESCRIPTION	BY	APP'R.
1	4/25/94	change I-101 to stub #2 to private brick shut 15' x 10'	MCF	

Owner
Freestate Business Park, Inc.
% Adler Development Group
11350 Random Hills Road
Suite 720
Fairfax, Virginia 22030

AS-BUILT Mass Grading Plan STORM DRAIN & SWM PLAN
U.S. #1 Joint Venture, Parcel "D"
Election District No. 6
Howard County, Maryland

SCALE	ZONING	GL.W. FILE NO.
1" = 50'	M-1	00090
DATE	TAX MAP	SHEET
NOV. 1993	47	10 of 4

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 MUST PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

CK [Signature] 4-4-91 DATE

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

Robert W. Ziehm 12/23/91 DATE
HOWARD SOIL CONSERVATION DISTRICT

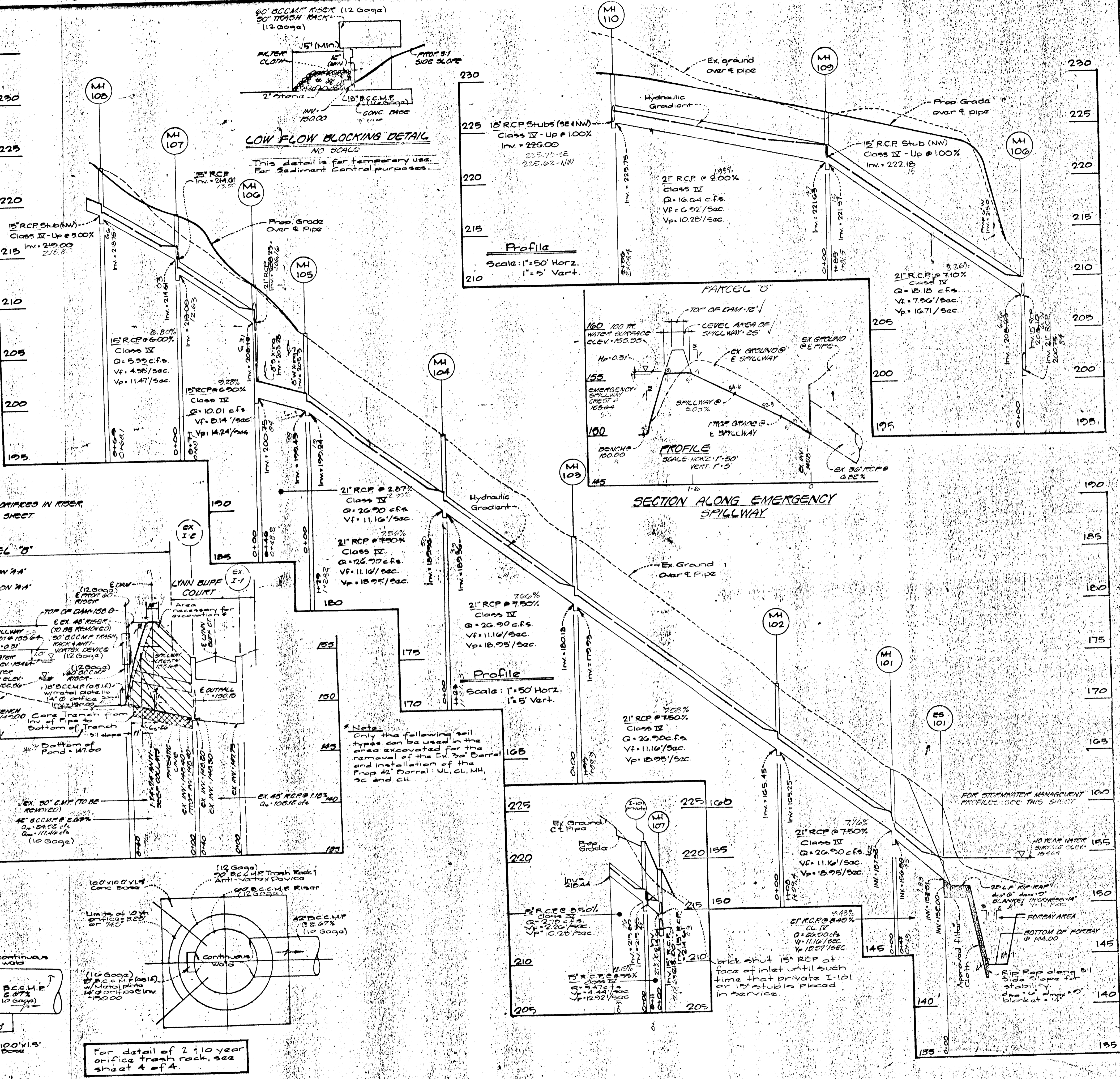
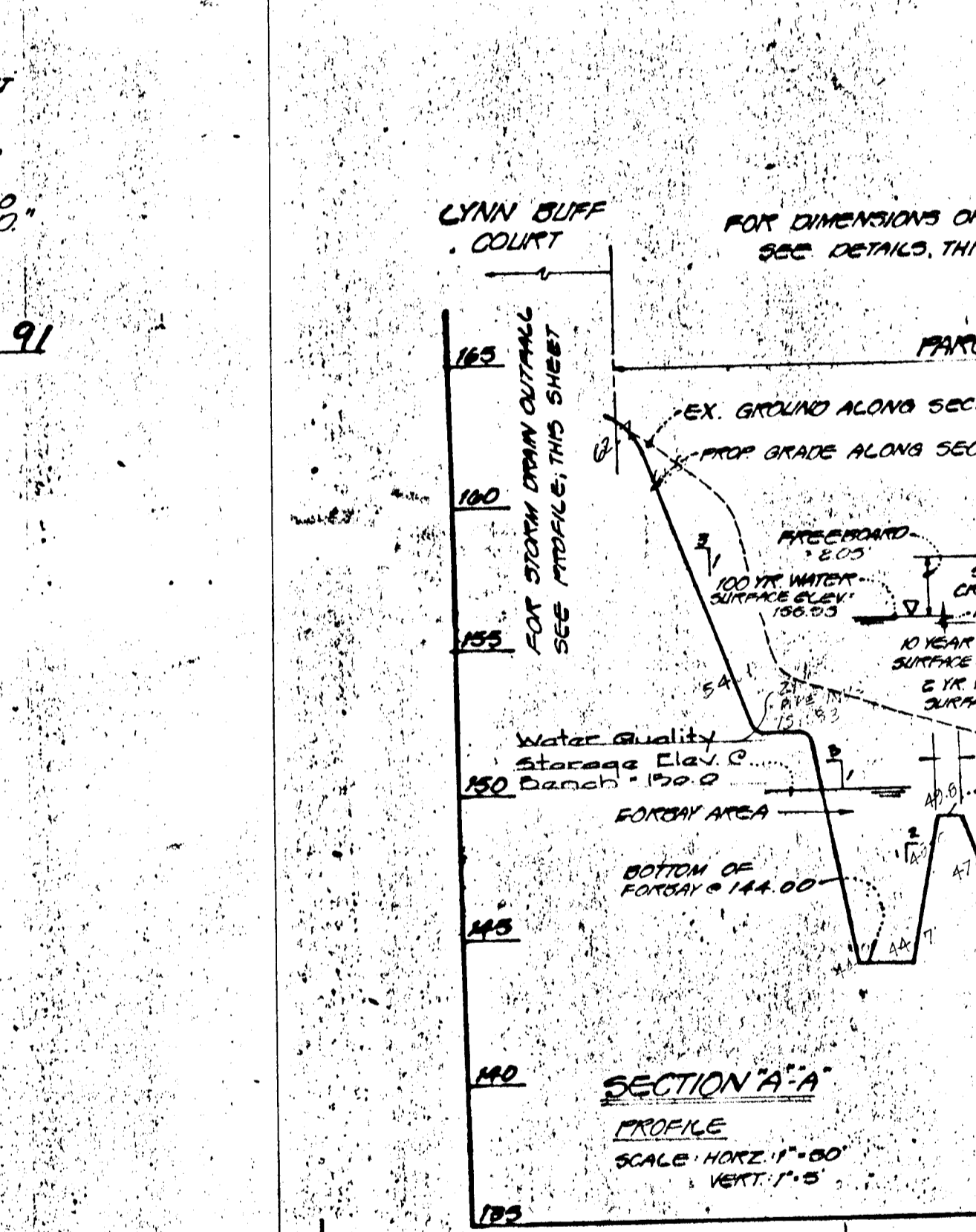
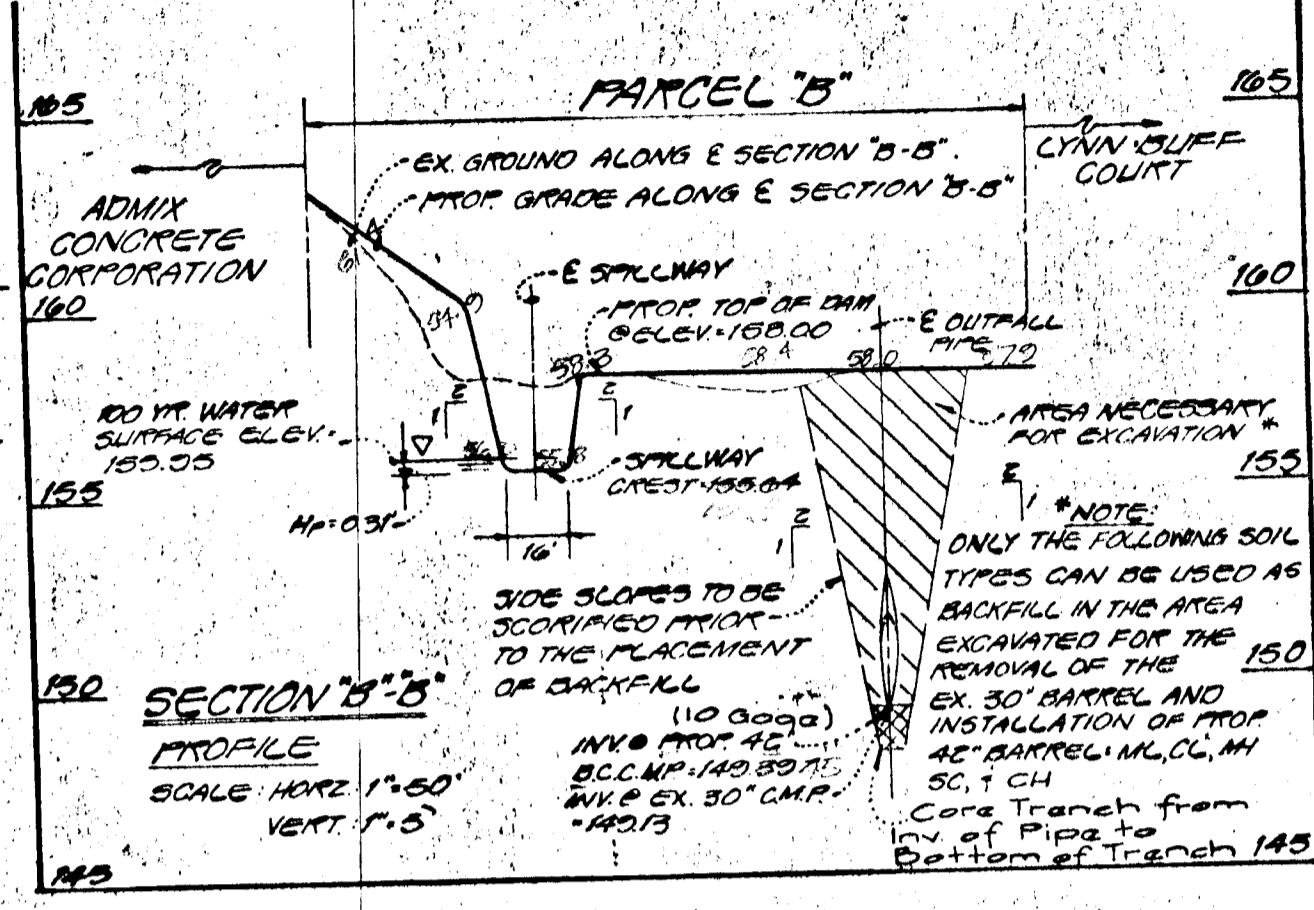
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

U.S. SOIL CONSERVATION SERVICE DATE

DEVELOPER'S/BUILDER'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 ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEGINSING THE PROJECT. I/WE WILL 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 INSPECTION BY HSCD.

[Signature] 4 APRIL 91 DATE
SIGNATURE OF DEVELOPER/BUILDER



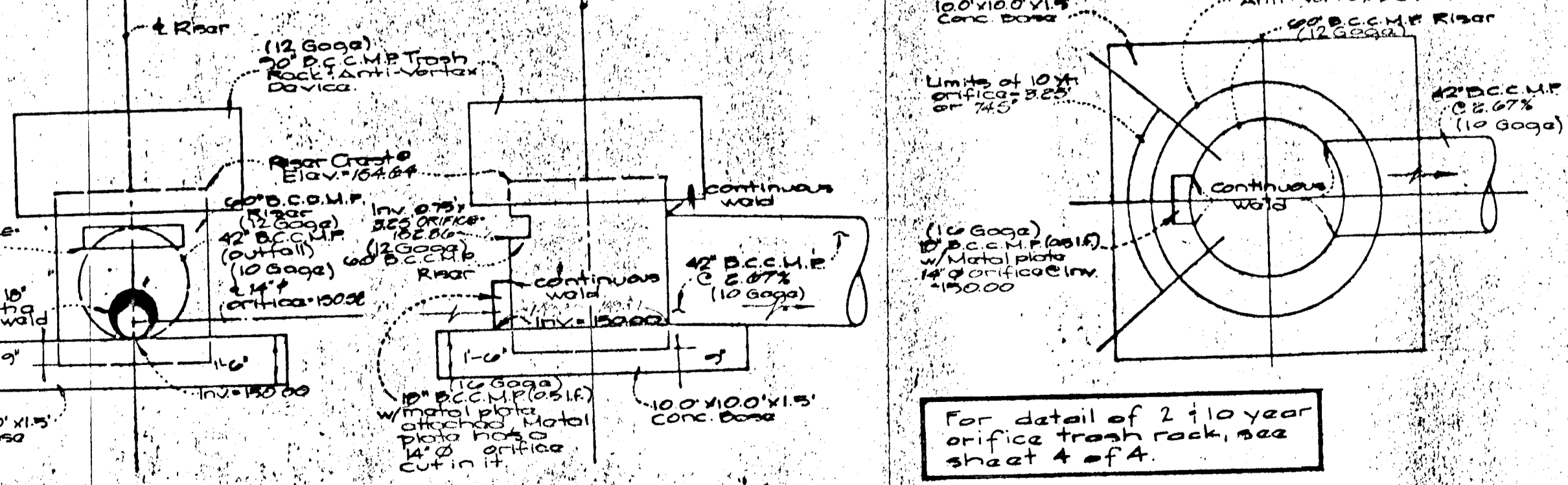
LOW FLOW BLOCKING DETAIL
NO SCALE
This detail is for temporary use. For sediment control purposes.

Profile
Scale: 1"=50' Horiz.
1"=5' Vert.

Profile
Scale: 1"=50' Horiz.
1"=5' Vert.

* Note: Only the following soil types can be used in the area excavated for the removal of the Ex. 30" Barrel and installation of the Prop. 42" Barrel: MU, CL, MH, SC and CH.

brick shut 15" RCP at face of inlet until such time that private I-101 or 15" stub is placed in service.



Riser Details
Scale: 1"=4'

For detail of 2 1/2 year orifice trash rack, see sheet 4 of 4.

2nd ORIGINAL
487

Approved: Howard County Department of Public Works
[Signature] 1/10/92
Chief, Land Development Division
[Signature] 1/10/92
Chief, Bureau of Highways
[Signature] 1/10/92
Chief, Bureau of Engineering
Approved: Howard County Department of Planning and Zoning
[Signature] 1/10/92
Chief, Division of Community Planning and Land Development

GUTSCHICK LITTLE & WEBER, P.A.
ENGINEERS, PLANNERS, SURVEYORS

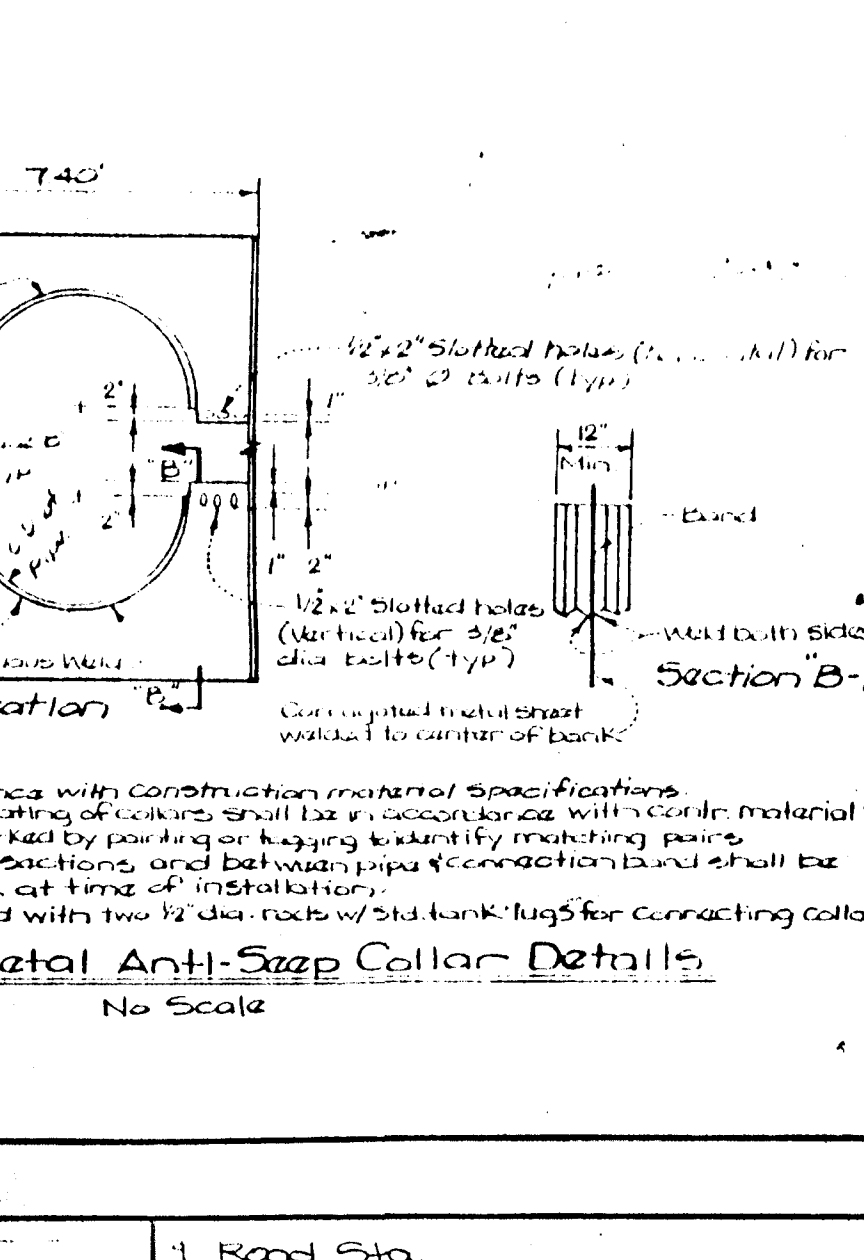
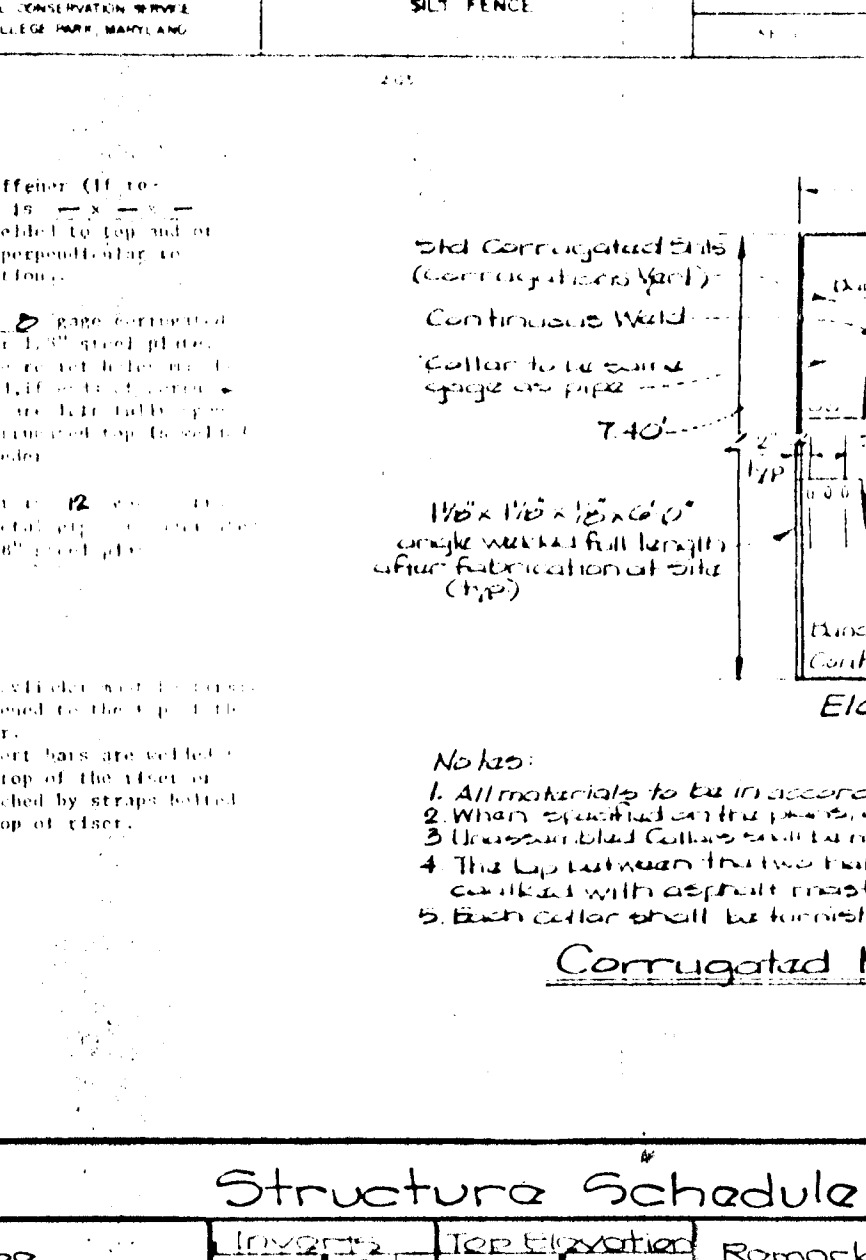
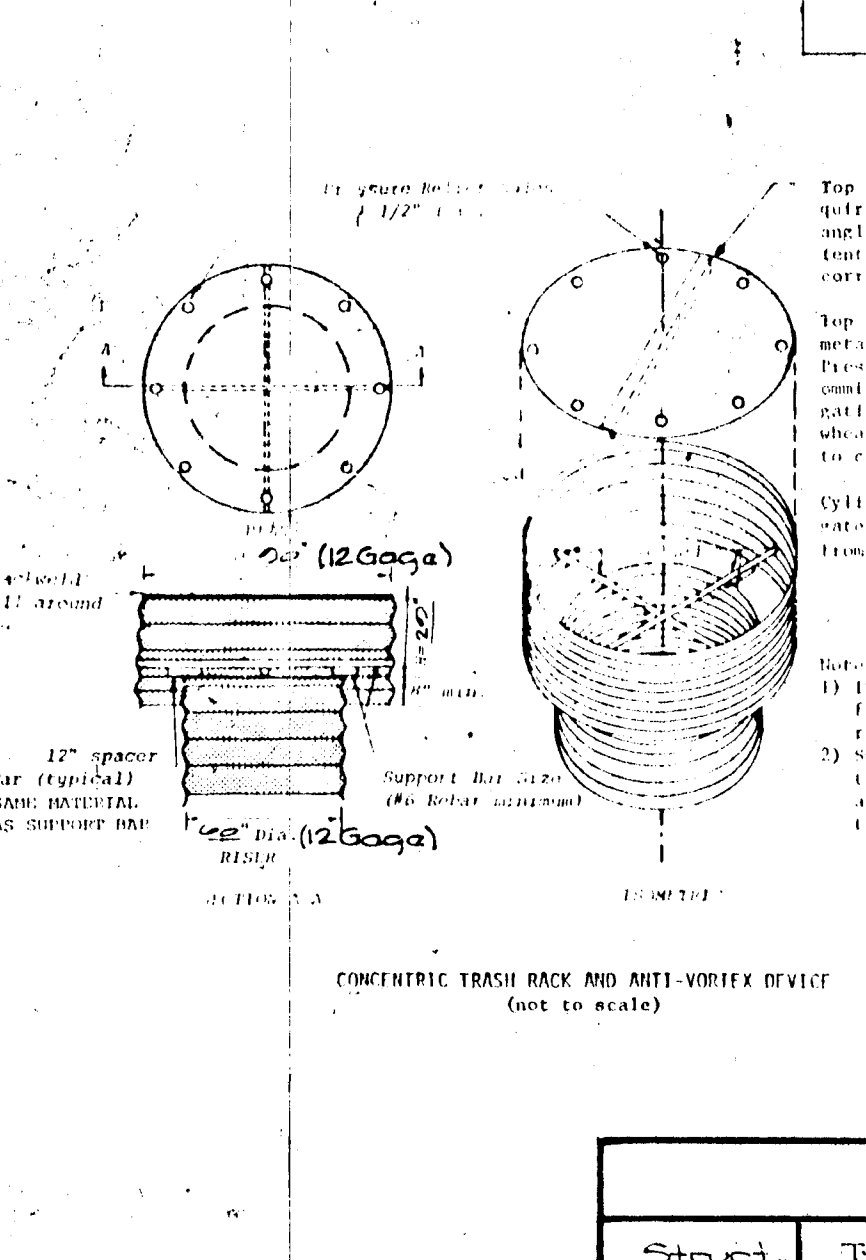
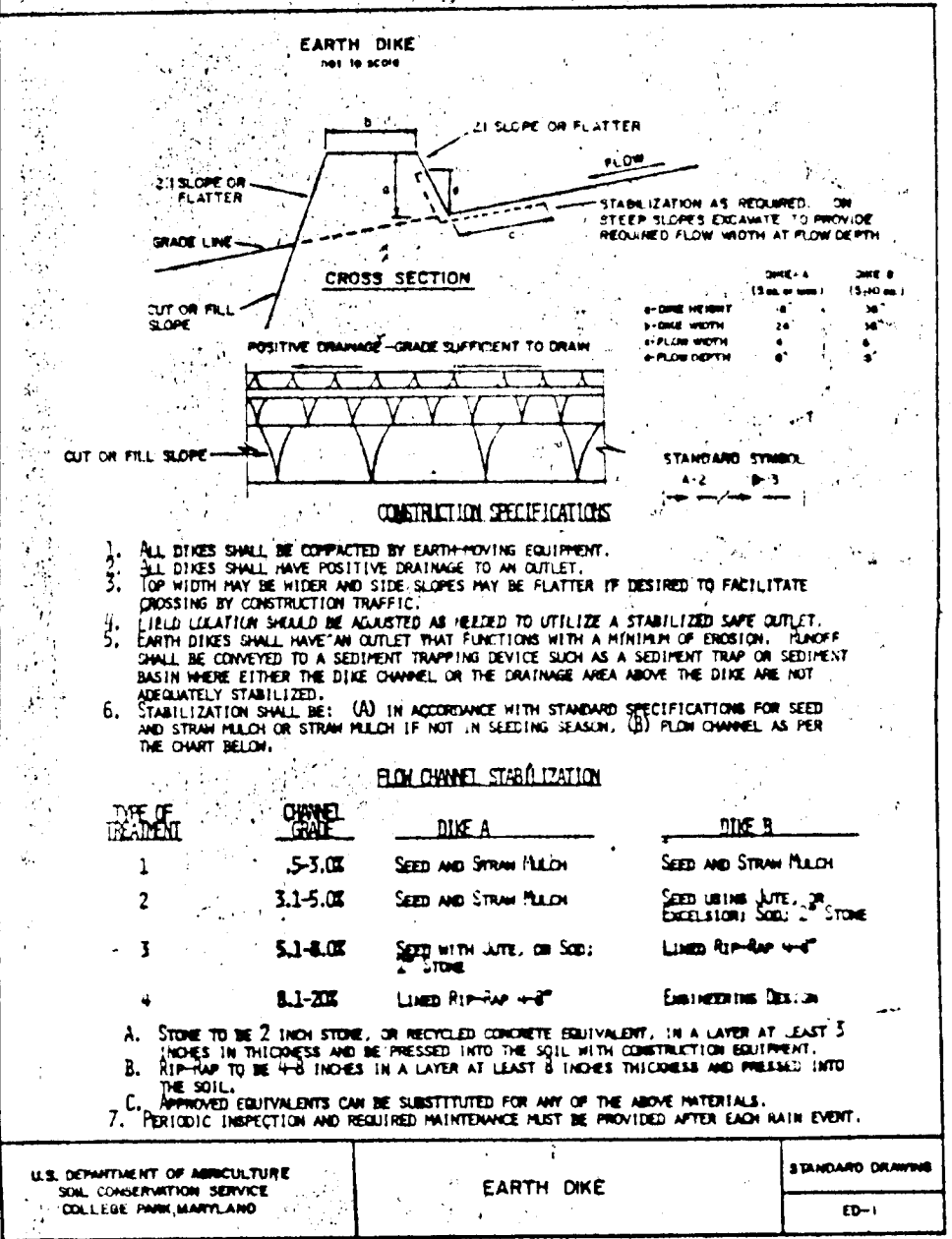
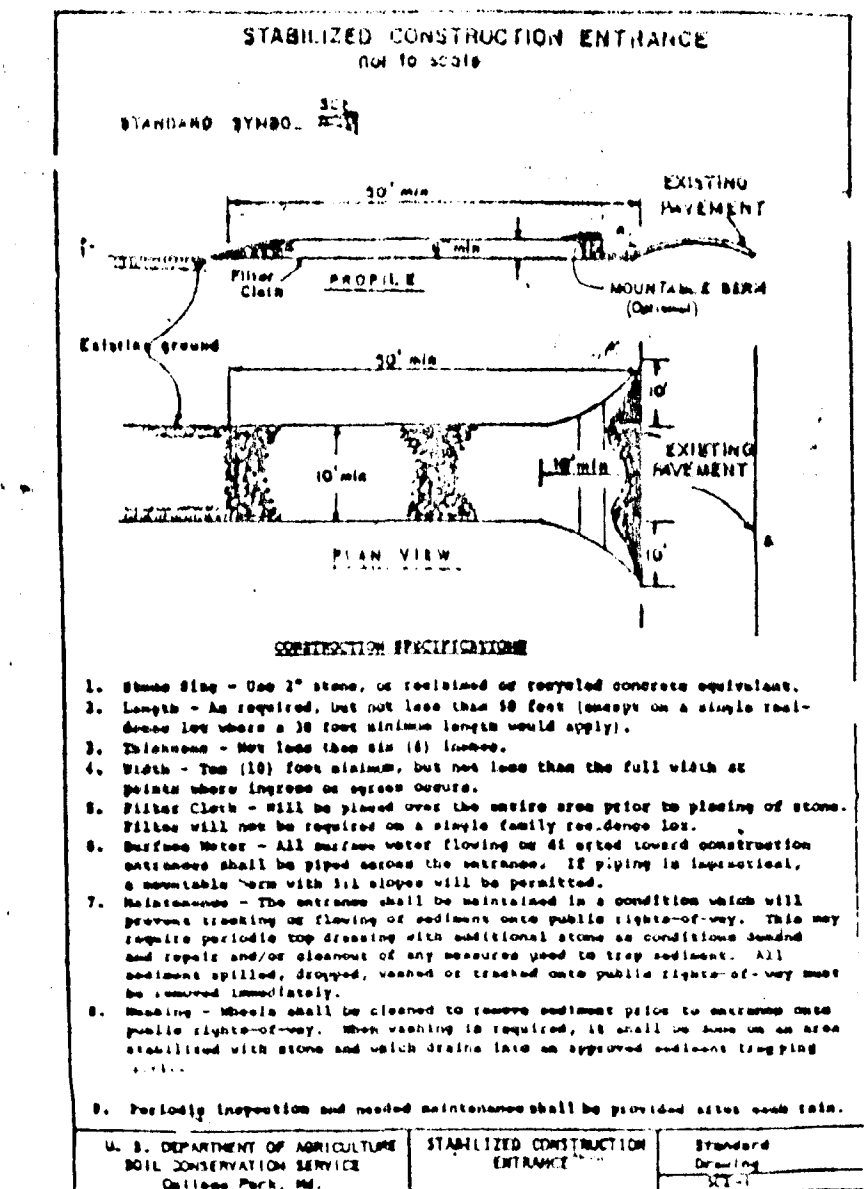
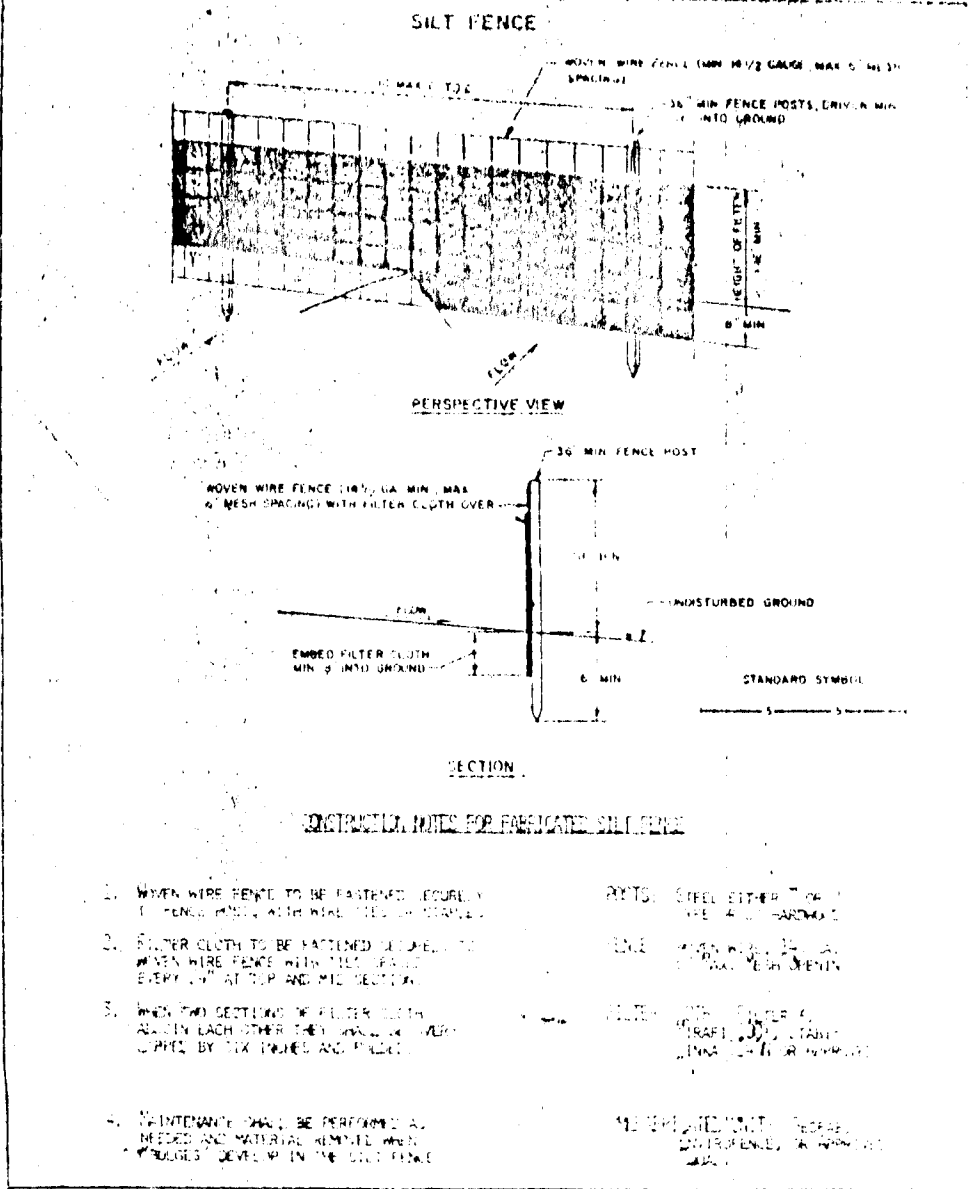
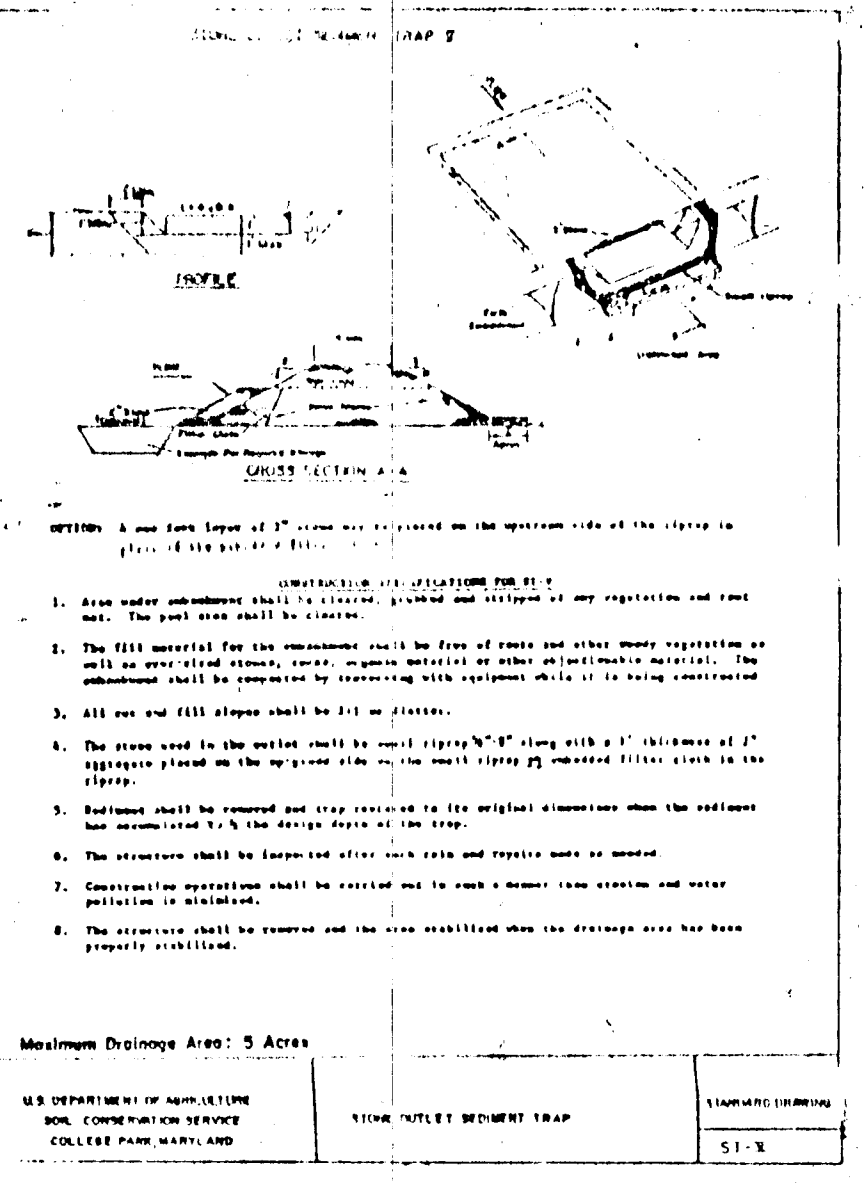
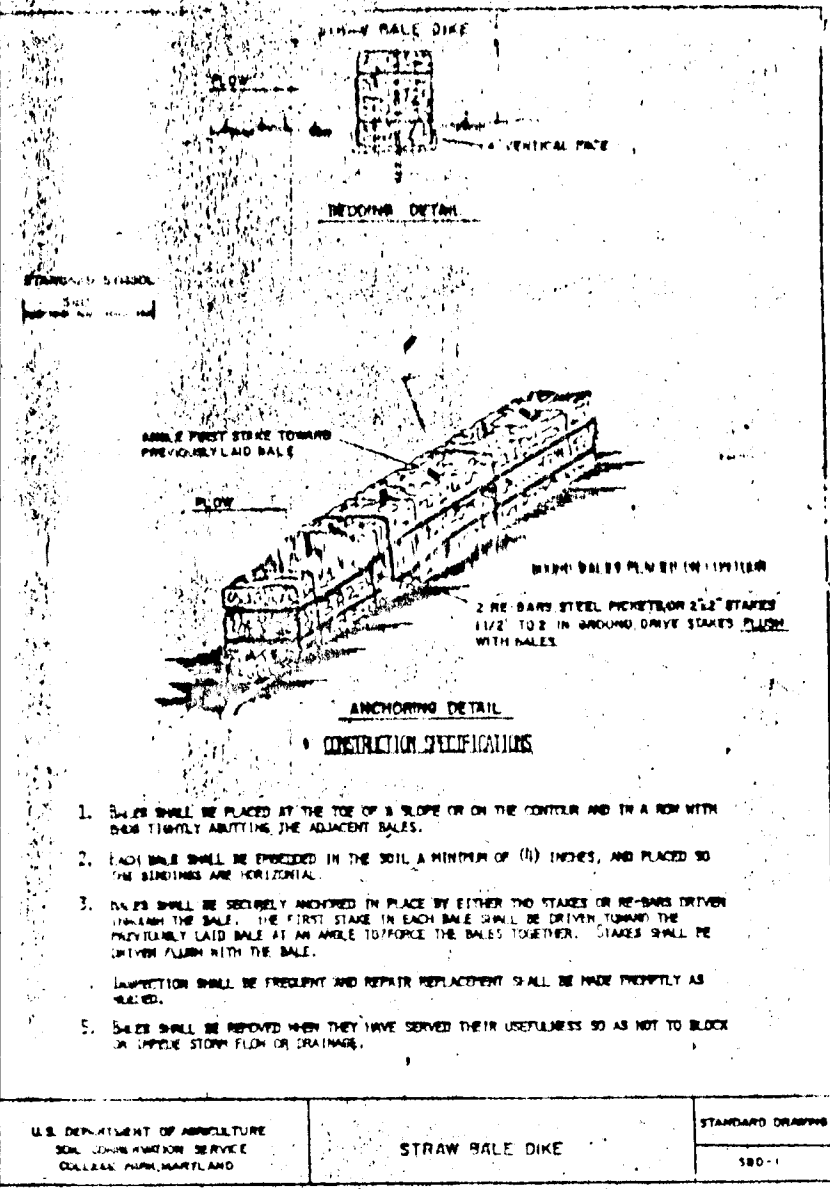
Owner: Freestate Business Park, Inc.
% Adler Development Group
11550 Random Hills Road

Storm Drain Profiles & SW
U.S. #1 Joint Venture, Parcel "D"

SCALE	ZONING	G.L.W. FILE NO.
AS SHOWN	M-1	90090
DATE	TAX MAP NO.	SHEET
Oct 1991	17	2 of 4
Nov. 1993		

2ND ORIGINAL

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Conditions and Management Practices For Working in Nontidal Wetlands

a) Remove excess fill, construction material or debris to an upland disposal area outside the buffer.

b) If backfill is obtained, use clean material free of waste material products, unsightly debris, toxic material, or any other deleterious substance.

c) To protect important aquatic species, in-stream work is prohibited as determined by the classification of the stream as follows:

1) Class I Wetland: In-stream work may not be conducted during the period March 1 through June 15, inclusive, during any year.

d) The applicant shall successfully create an emergent wetland on the site within 30 days of completion of construction in accordance with November 13, 1991 letter from Environmental Resources, Inc.

Structure Schedule

Struct.	Type	Inv. to 10'	Inv. to 20'	Top Elevation	Bottom Elevation	Remarks	1. Road Sta.
MH 101	Standard MH	157.52	154.50	163.76	---	Std. Det. G5.11	Lynn Buff Court 3+70.36' Left
MH 102	Standard MH	165.45	165.25	171.50	---	"	Lynn Buff Court 4+88.34' Left
MH 103	"	180.65	179.55	186.62	---	"	Lynn Buff Court 6+85.37' Left
MH 104	"	189.55	189.36	194.81	---	"	Lynn Buff Court 7+97.44' Left
MH 105	"	199.23	199.24	207.60	---	"	Lynn Buff Court 9+25.35' Left
MH 106	"	208.73	200.75	216.80	---	"	Lynn Buff Court 9+75.45' Left
MH 107	"	214.61	215.00	218.75	---	"	Lynn Buff Court 10+55.52' Left
MH 108	"	216.80	216.75	223.50	---	"	Lynn Buff Court 11+88.45' Left
MH 109	"	222.16	221.87	226.42	---	"	See Plan - Sheet 1 of 4
MH 110	"	226.00	225.75	230.00	---	"	See Plan - Sheet 1 of 4
ES 101	Std End Section	157.52	152.00	---	---	Std. Det. SD5.51	See Plan - Sheet 1 of 4
I-101	A-5 Inlet	215.80	215.55	221.97	221.63	Std. Det. SD4.01	See Plan - Sheet 1 of 4

Pipe Schedule

Type	Quantity
15" R.C.P. Class II	204 lf
18" R.C.P. Class II	26 lf
21" R.C.P. Class II	1005 lf

These Plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.

Robert W. Zick 12/23/91
Howard Soil Conservation District

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.

John A. Smith 12/24/91
Soil Conservation Service

DEVELOPER'S/BUILDER'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 will 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 inspection by HSCD."

Samuel Adler 4 APR 91
Signature of Developer/Builder Date

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 must provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

CK Butler 4-4-91
Signature of Engineer Date

- SEEDING CONTROL NOTES**
- A minimum of 24 hours notice must be given to the Howard County Office of Inspection and Permitting prior to the start of any construction. (201-2437)
 - Any vegetative and structural practices which are included according to the provisions of this standard are to be in conformance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
 - 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 and perimeter slopes, and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
 - All sediment traps, dikes, etc. must be fenced and warning signs posted around their perimeter in accordance with Vol. 1, Chapter 12, of the HOWARD COUNTY EROSION CONTROL MANUAL, Storm Drainage.
 - All disturbed areas must be stabilized during the time period specified above in accordance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42), temporary stabilization, with grass alone or with straw mulch when recommended seeding date, an not a later proper germination and establishment of grasses.
 - All sediment control structures are to be in place and are to be maintained in operative condition. Permission for their removal has been obtained from the Howard County Sediment Control Inspector.
 - Site Area:
Total Area of Site: 10.18 Acres
Area Disturbed: 9.06 Acres
Area to be seeded or paved: 0.25 Acres
Area to be vegetatively stabilized: 9.03 Acres
Total Cut: 24,490 Cu. Yds.
Total Fill: 24,490 Cu. Yds.
Off-site waste/borrow: see location
 - 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 DPW 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 disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.

- TEMPORARY SEEDING NOTES**
- Apply to graded or cleared areas likely to be redisturbed where a short-term vegetative cover is needed.
- Seeded Preparation: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding (unless previously loosened).
- Soil Amendments: Apply 600 lbs per acre 10-10-10 fertilizer (14 lbs/1000 sq ft).
- Seeding: For periods March 1 thru April 30 and from August 15 thru November 15, seed with 2-1/2 bushel per acre of annual rye (3.2 lbs./1000 sq.ft.). For the period May 1 thru August 14, seed with 3 lbs per acre of weeping lovegrass (.07 lbs./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./1000 sq ft) of unrattled small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal per acre (5 gal/1000 sq ft) of emulsified asphalt on flat areas. On slopes 8 ft or higher, use 343 gal per acre (8 gal/1000 sq ft) for anchoring.
- Refer to the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.
- CONSTRUCTION SEQUENCE**
- OBTAIN GRADING PERMIT AND ARRANGE PRE-CONSTRUCTION MEETING WITH INSPECTOR.
 - INSTALL STONE CONSTRUCTION ENTRANCE.
 - CONSTRUCT STONE OUTLET SEDIMENT TRAPS 1, 2, AND 3.
 - INSTALL EARTH DIKES, SILT FENCE, AND/OR STORMWATER DIKES.
 - CLEAR AND GRADE SITE.
 - INSTALL REPLACEMENT PIPING IN STORMWATER MANAGEMENT POND AND REGRADE AS SHOWN ON THESE PLANS.
 - INSTALL STORM DRAIN SYSTEM.
 - BEGIN STABILIZING SITE EXCEPT IN THE AREA OF THE PROPOSED DRIVE.
 - BACKFILL TRAP #1 AND REPLACE WITH SILT FENCE. DOWNGRADE OF ANY WORK IN ORDER TO CONSTRUCT DRIVEWAY.
 - STABILIZE REMAINING DISTURBED AREAS.
 - REMOVE SEDIMENT CONTROL MEASURES ONLY WHEN AREAS SERVED BY THESE MEASURES ARE STABILIZED AND PERMISSION IS GRANTED BY THE SEDIMENT CONTROL INSPECTOR.
 - BACKFILL TRAP #3 ONLY WHEN AREAS SERVED BY THESE TRAPS ARE STABILIZED AND PERMISSION IS GRANTED BY THE SEDIMENT CONTROL INSPECTOR. ESTABLISH PROPOSED DRIVE IN THESE AREAS.
 - REMOVE SILT FENCE IN AREA OF TRAP #3 ONLY AFTER THIS AREA HAS BEEN STABILIZED.

Approved: Howard County Department of Public Works
 Chief, Land Development Division
John A. Smith 1/19/92
 Chief, Bureau of Highway
John A. Smith 1/19/92
 Chief, Bureau of Engineering
 Approved: Howard County Dept of Planning & Zoning
 Chief, Division of Community Planning & Land Development
John A. Smith 1/19/92

GLW GUTSCHICK LITTLE & WEBER, P.A.
 ENGINEERS, PLANNERS, SURVEYORS
 3909 NATIONAL DRIVE SUITE 250 BURTONSVILLE OFFICE PARK BURTONSVILLE, MD 20886
 TELEPHONE: (301) 421-4024

Owner: Frostata Business Park, Inc.
 % Adler Development Group
 11350 Randon Hills Road
 Suite 720
 Fairfax, Virginia 22030

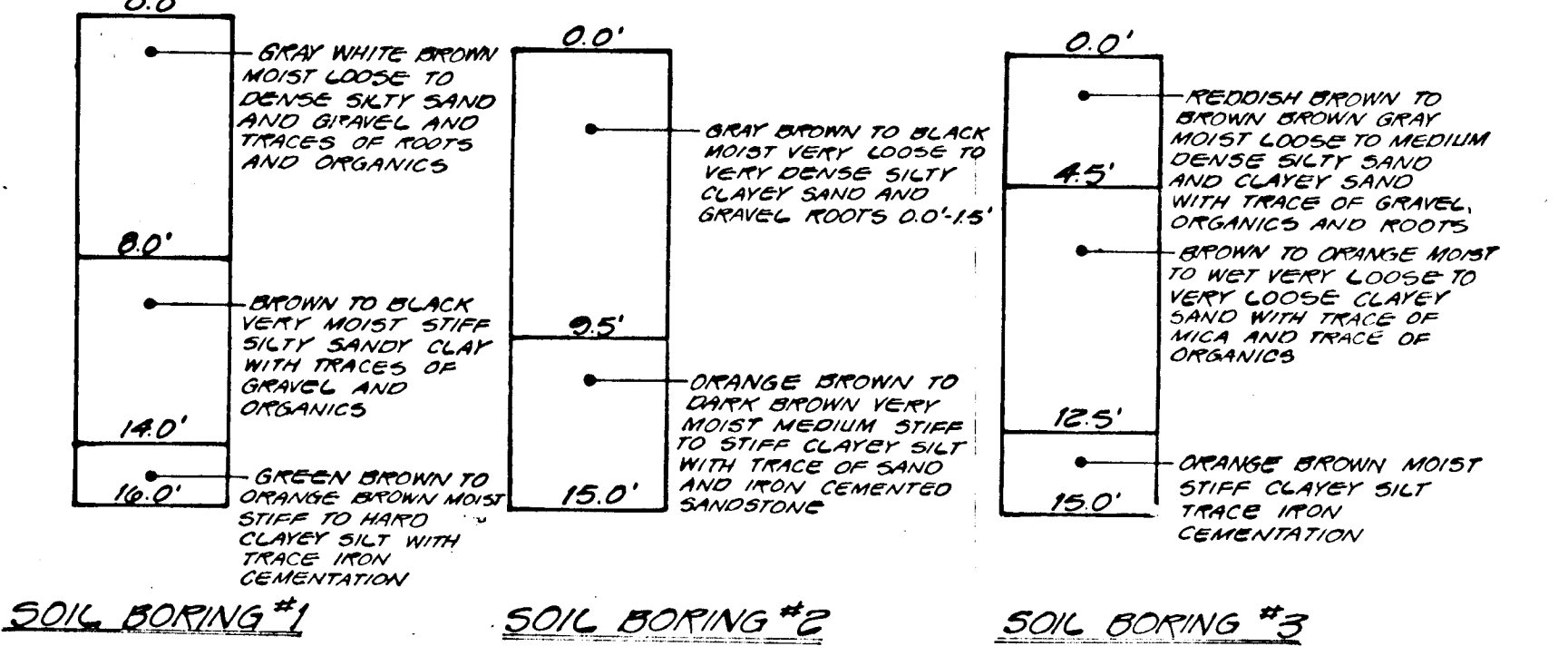
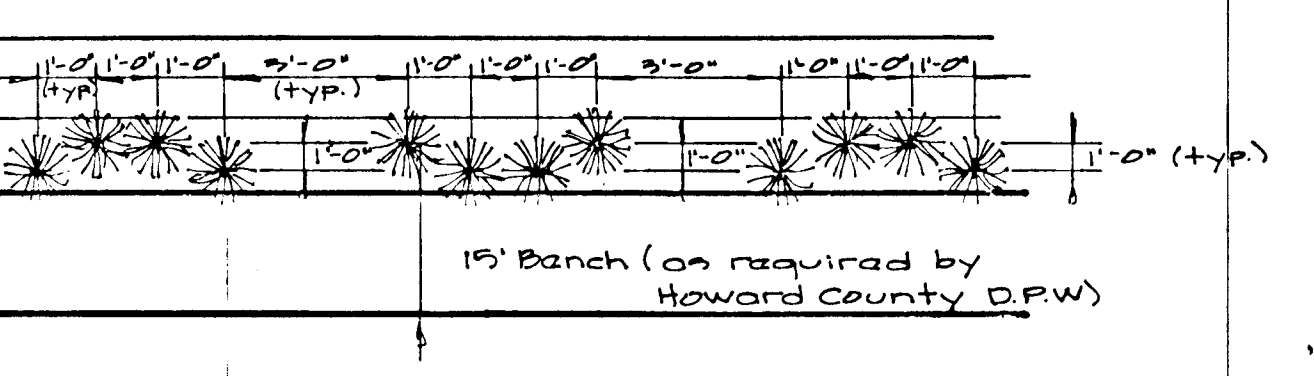
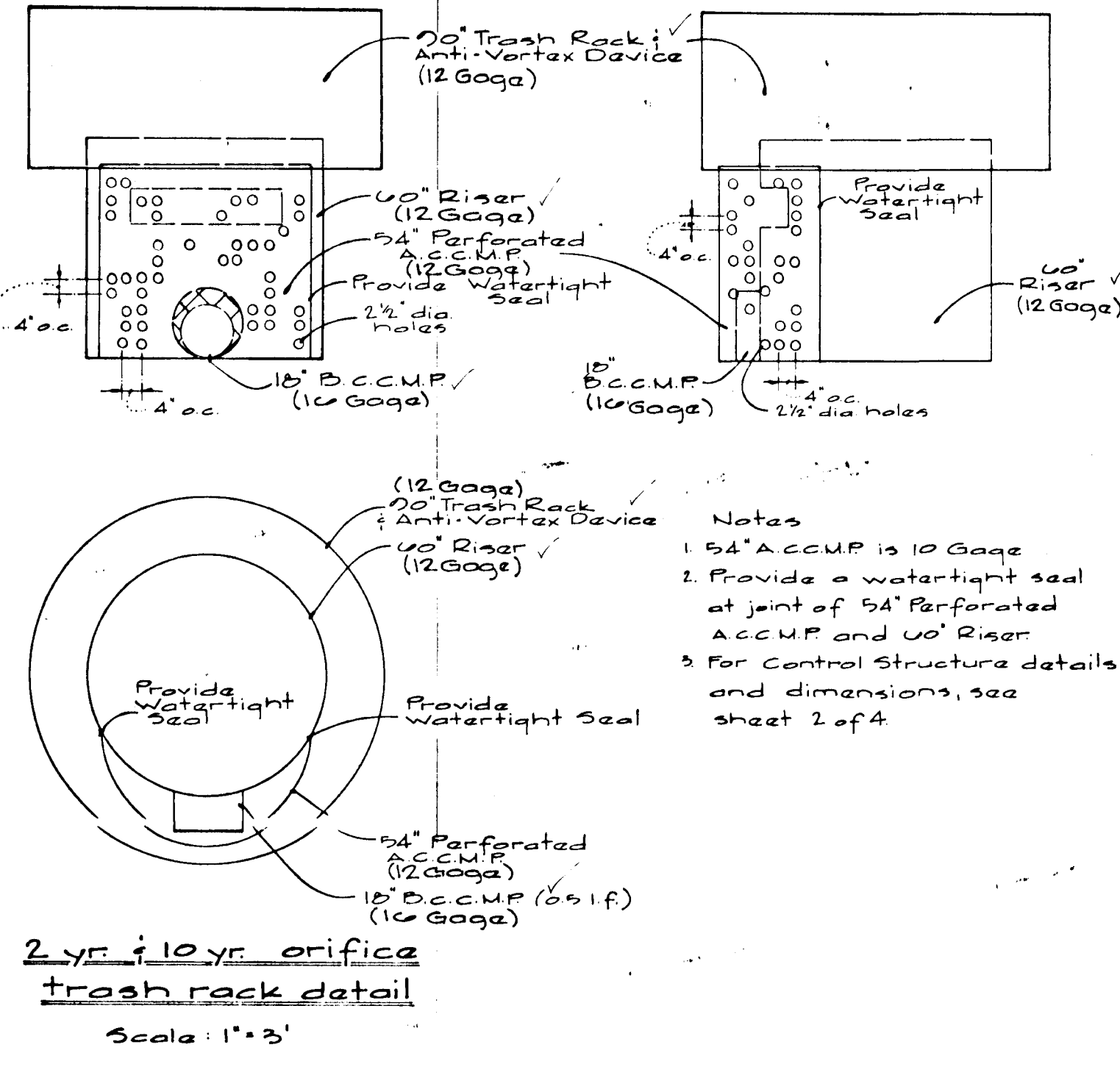
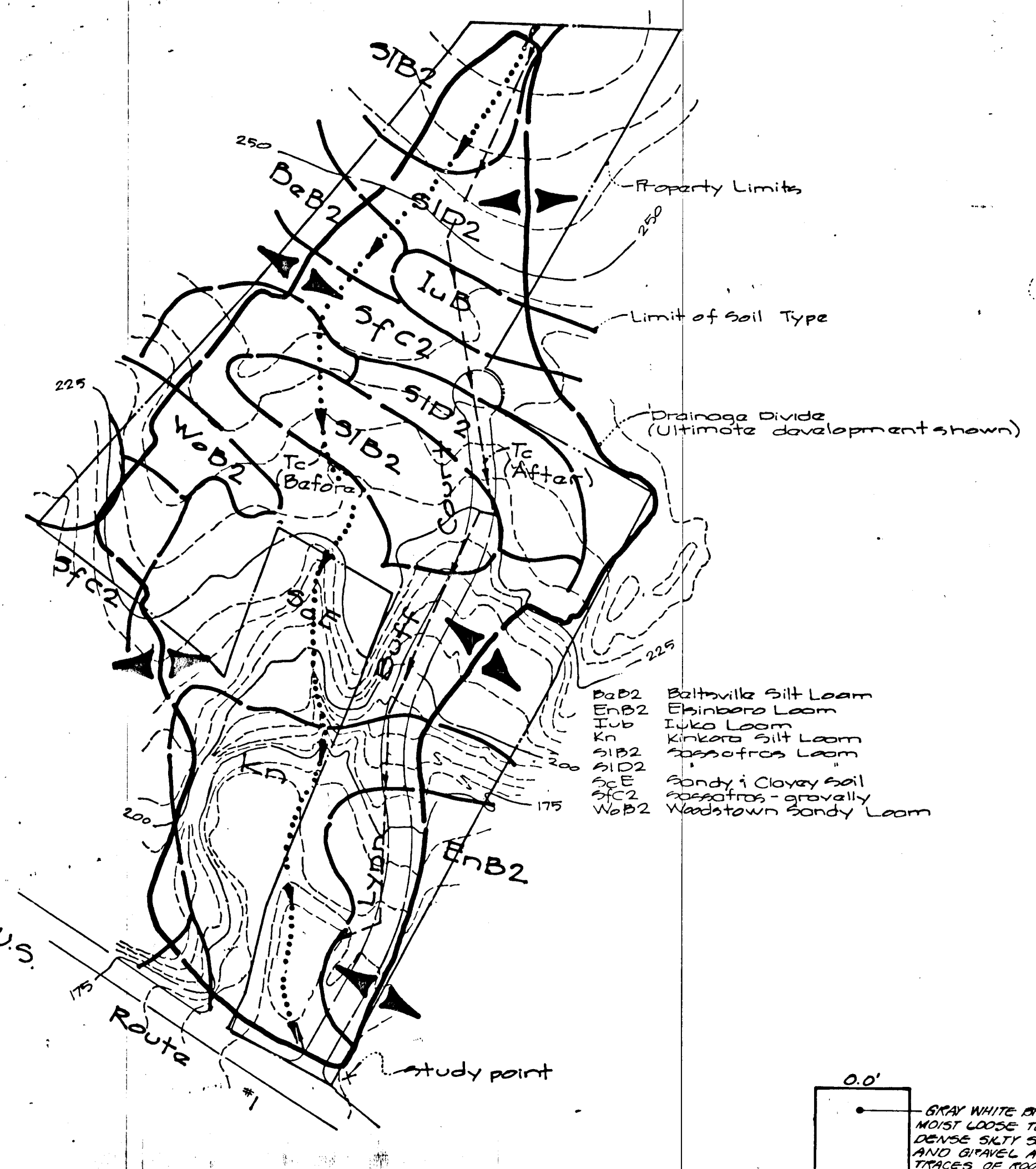
45-BUILT STORMWATER Sediment Control Notes & Details & PLAN

U.S. #1 Joint Venture, Parcel "D"
 Elevation District No. 68 Howard County, Maryland

SCALE	ZONING	G.L.W. FILE NO.
As Shown	M-1	90090
DATE	TAX MAP NO.	SHEET
Oct '91	17	30 of 1

2 MP ORIGINAL

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Wetland Planting Notes

1) The plantings will be between elevation 147 & 150, just inside the bench.
 2) Planting will consist largely of *Scirpus Pungens*, (Formerly *Americanus*), and *Duck Potato*, *Sagittaria latifolia* and a smaller amount of *Pickeral weed*, *Pontaderia cordata*.
 3) Any substitution must be approved by Environmental Resources, Inc., the wetlands consultant.
 4) Species shall be selected based upon availability.
 5) Each clump shall be made up of same species; however, plant type shall be randomly selected for clumps around pond.

APPROVED: Howard County Dept. of Public Works
 Chief, Land Development Division
 1/17/91
 DATE

APPROVED: Howard County Dept. of Planning
 Chief, Division of Community Planning and Land Development
 1/20/91
 DATE

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.

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 must provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.

These Plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.

DEVELOPER'S/BUILDER'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 will 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 inspection by HSCD.

STORM WATER MANAGEMENT POND NOTES

I. SITE PREPARATION:

A. Areas designated for borrow areas, embankment, and structural forms 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 no steeper than 1:1.
 B. Areas to be covered by pond or reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, logs, and stumps shall be cut approximately level with the ground surface.

C. 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.

II. EARTH FILL

A. MATERIAL: The fill material shall be taken from approved designated borrow area or areas. It shall be free of roots, stumps, wood, rubbish, oversized stones, frozen or other objectionable materials. The embankment shall be constructed to an elevation which provides for anticipated settlement to the design elevation. The fill height at along the length of the embankment shall be increased above the design elevation (including freeboard) as shown on the plans.
 B. PLACEMENT: Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in 8-inch maximum thickness (before compaction) layers which are to be continuous over the entire length of the fill. The most porous borrow material shall be placed in the downstream portions of the embankment.
 C. 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 tired, or vibratory roller. Fill material shall contain sufficient moisture so that the required degree of compaction can be obtained with the equipment used. Where a minimum required density is specified, each layer of fill shall be compacted as necessary to obtain that density and is to be certified by the Geotechnical Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99. The dam embankment should be formed of material conforming to the Unified Soil Classification; GC, SM, SC, ML, MH, CH and CL.
 D. CUTOFF TRENCH: The cutoff trench shall be excavated 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 or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill material for the cutoff trench shall be the most impervious material available, such as SC, CL, ML, CL and CH; and shall be compacted with construction equipment or rollers to assure maximum density and minimum permeability.

III. STRUCTURAL BACKFILL:

Backfill material 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 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 the structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe.

IV. PIPE CONDUITS: (all pipes shall be circular in cross-section)

A. CORRUGATED METAL PIPE:

1. MATERIALS (Steel Pipe) - This pipe and its appurtenances shall be galvanized and fully bituminous coated and shall conform to the requirements of AASHTO Specifications M-190 Type A with watertight coupling bands. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. The following coatings are commercially available: Mexon, Plast-Cote, Bloc-Krod, and Behm-Co-Lox. Coated corrugated steel pipe shall meet the requirements of AASHTO M-245 and M-246.
 2. MATERIALS (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274-791 with watertight coupling bands or flanges.

B. DESIGN MIX

The concrete shall be mixed in the following proportions, measured by weight. The water-cement ratio shall be 5-1/2 to 6 U.S. Gals. of water/94-pound bag of cement. The proportion of materials for the trial mix shall be 1:2.3-1/2. The combination of the aggregates may be adjusted to produce a plastic and workable mix that will not produce harshness in placing or handling in the structure.

C. MIXING

The concrete ingredients shall be mixed in batch mixers until the mixture is homogeneous and of uniform consistency. The mixing of each batch shall continue for not less than one and one-half minutes after all the ingredients, except the full amount of water, are in the mixer. The minimum mixing time is predicted on proper control of the speed of rotation of the mixture and of the introduction of the materials including water, into the mixer. Water shall be added prior to, during, and following the mixer-charging operations. Excessive overmixing requiring the addition of water to produce the required concrete consistency shall not be permitted. Truck mixing will be allowed provided that the use of this method shall cause no violation of any applicable provisions of the specifications given here.

D. FORMS

The forms shall have sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure, tamping and vibration without deflection from the prescribed lines. They shall be mortar-tight and constructed so they can be removed without hammering or prying against the concrete. The inside of the forms shall be oiled with a non-staining mineral oil or thoroughly wetted before concrete is placed. Forms may be removed 24 hours after the placement of concrete. All wire ties and other devices used shall be recessed from the surface of the concrete.

E. REINFORCING STEEL

All reinforcing material shall be free of dirt, rust, scale, oil, paint or any other coatings. The steel shall be accurately placed and securely tied and blocked into position so that no movement of the steel will occur during placement of concrete.

F. CONSOLIDATION

Concrete shall be consolidated with internal type mechanical vibrators. Vibration shall be supplemented by spading and hand tamping as necessary to insure smooth and dense concrete along form surfaces, in corners and around embedded items.

G. FINISHING

Defective concrete, honey combed areas, voids left by removal of the rods, ridges on all concrete surfaces permanently exposed to view or exposed to water on the finished structure, shall be repaired immediately after the removal of forms. All voids shall be reamed and completely filled with dry patching mortar.

H. PROTECTION AND CURING

Exposed surfaces of concrete shall be protected from the direct rays of the sun for at least the first three days. All concrete shall be kept continuously moist for at least ten days after being placed. Moisture may be applied by spraying or sprinkling as necessary to prevent the concrete from drying. Concrete shall not be exposed to freezing during the curing period. During compounds may also be used.

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. Coupling bands, anti-seep collars, and sections, etc. must be composed of the same material as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of Zinc Chromate Primer. Hot dip galvanized bolts may be used for connections. The PH of the surrounding soils shall be less than 9 and greater than 4.

CONNECTIONS

All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around where the pipe and riser are metal. Watertight coupling bands or flanges shall be used at all joints. 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.

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.

LAYING PIPE

The pipe shall be placed with inside circumferential laps pointing downstream and with the longitudinal laps at the sides.

Backfilling shall conform to structural backfill as shown above.

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

REINFORCED CONCRETE PIPE:

1. MATERIALS: Reinforced concrete pipe shall have a rubber gasket joint and shall equal or exceed ASTM Specification C-361. An approved equivalent is AWWA Specification C-301.
 2. BEDDING: All reinforced concrete pipe conduits shall be laid in a concrete bedding for their entire length. This bedding shall consist of high slump concrete placed under the pipe and up the sides of the pipe to least 10% of its outside diameter with a minimum thickness of 3", or as shown on the drawings.
 3. LAYING PIPE: Bell and spigot pipe shall be placed with the bell and upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe.

Backfilling shall conform to structural backfill as shown above.

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

For pipes of other materials, specific specifications shall be shown on the drawings.

CONCRETE:

1. CEMENT - Normal Portland cement shall conform to latest ASTM Specification C-150.
 2. WATER - The water used in concrete shall be clean, free from oil, acid, alkali, scales, organic matter or other objectionable substances.
 3. SAND - The sand used in concrete shall be clean, hard, strong, and durable, and shall be well graded with 100% passing a one quarter inch sieve. Limestone sand shall not be used.
 4. COARSE AGGREGATE - The coarse aggregate shall be clean, hard, strong and durable and free from clay and dirt. It shall be well graded with a maximum size of one-and-one-half (1-1/2) inches.
 5. REINFORCING STEEL - The reinforcing steel shall be deformed bars of intermediate grade steel or rail steel conforming to ASTM Specification A-615.

DESIGN MIX

The concrete shall be mixed in the following proportions, measured by weight. The water-cement ratio shall be 5-1/2 to 6 U.S. Gals. of water/94-pound bag of cement. The proportion of materials for the trial mix shall be 1:2.3-1/2. The combination of the aggregates may be adjusted to produce a plastic and workable mix that will not produce harshness in placing or handling in the structure.

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The concrete ingredients shall be mixed in batch mixers until the mixture is homogeneous and of uniform consistency. The mixing of each batch shall continue for not less than one and one-half minutes after all the ingredients, except the full amount of water, are in the mixer. The minimum mixing time is predicted on proper control of the speed of rotation of the mixture and of the introduction of the materials including water, into the mixer. Water shall be added prior to, during, and following the mixer-charging operations. Excessive overmixing requiring the addition of water to produce the required concrete consistency shall not be permitted. Truck mixing will be allowed provided that the use of this method shall cause no violation of any applicable provisions of the specifications given here.

FORMS

The forms shall have sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure, tamping and vibration without deflection from the prescribed lines. They shall be mortar-tight and constructed so they can be removed without hammering or prying against the concrete. The inside of the forms shall be oiled with a non-staining mineral oil or thoroughly wetted before concrete is placed. Forms may be removed 24 hours after the placement of concrete. All wire ties and other devices used shall be recessed from the surface of the concrete.

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APPROVED: Howard County Dept. of Public Works
 Chief, Land Development Division
 1/17/91
 DATE

APPROVED: Howard County Dept. of Planning
 Chief, Division of Community Planning and Land Development
 1/20/91
 DATE

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 must provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.

DEVELOPER'S/BUILDER'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 will 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 inspection by HSCD.

PREPARED FOR:
 FREESTATE BUSINESS PARK, INC.
 96 ADLER DEVELOPMENT GROUP
 11350 RANDOM HILLS ROAD
 SUITE 720

AS-BUILT STORM DRAIN & SWM
 STORMWATER MANAGEMENT NOTES & DETAILS

U.S. #1 JOINT VENTURE, PARCEL "D"

DATE: NOV. 1993
 SCALE: 1"=40'
 ZONING: M-1
 G.L.W. FILE NO.: 20-090

