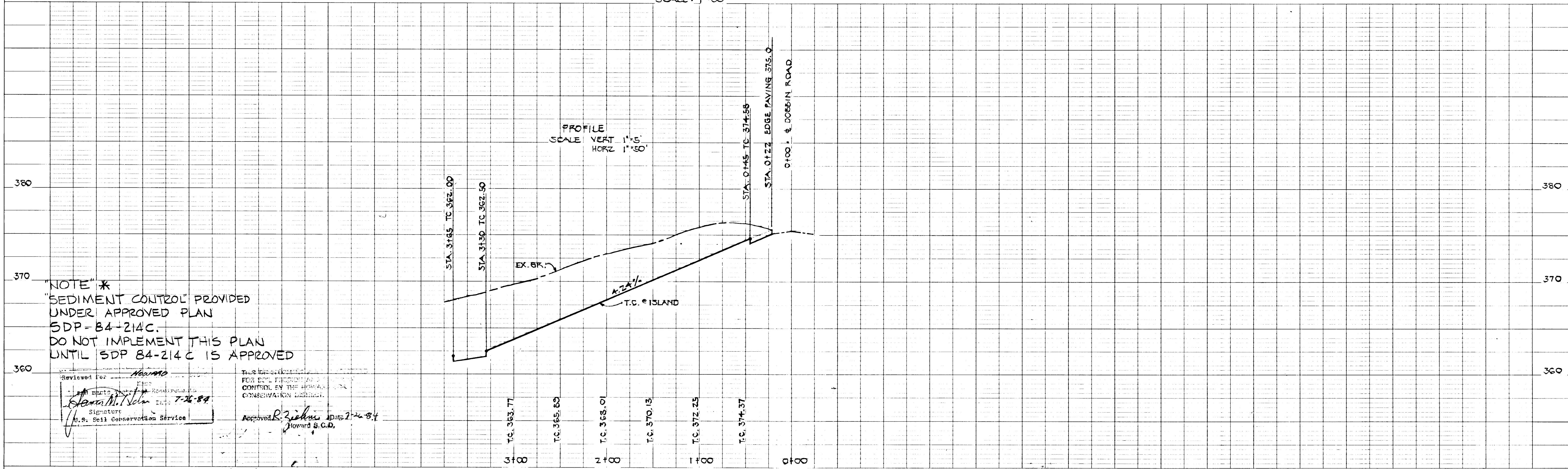
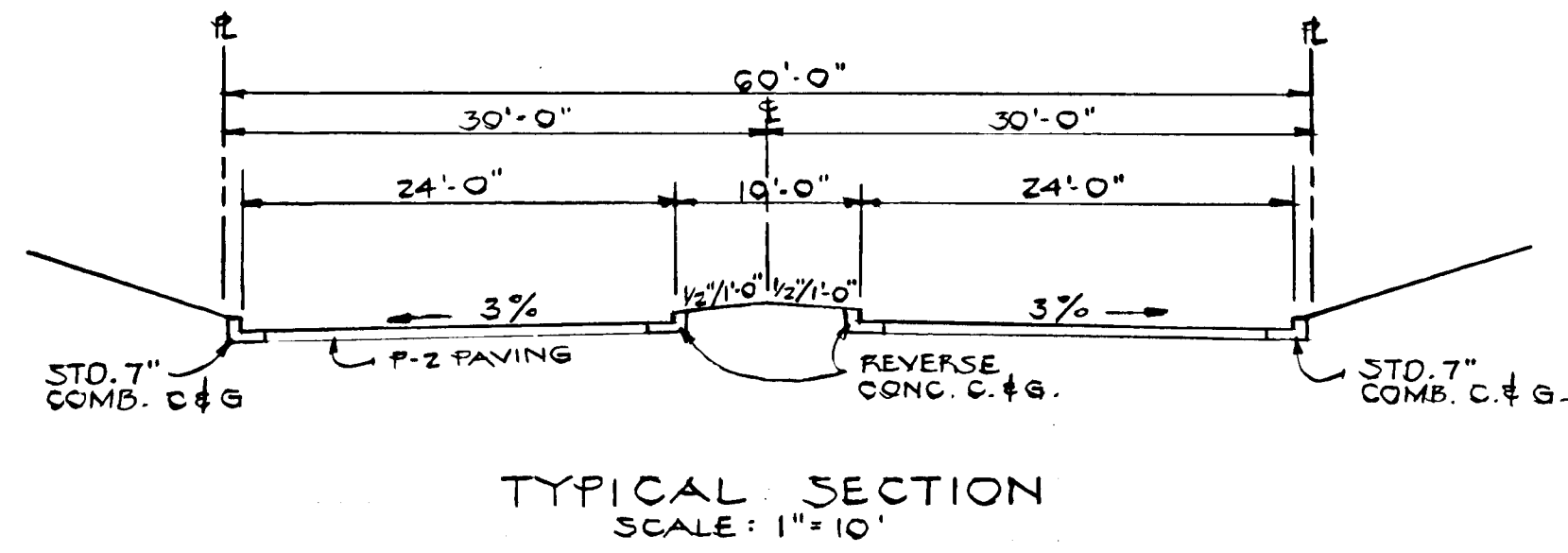
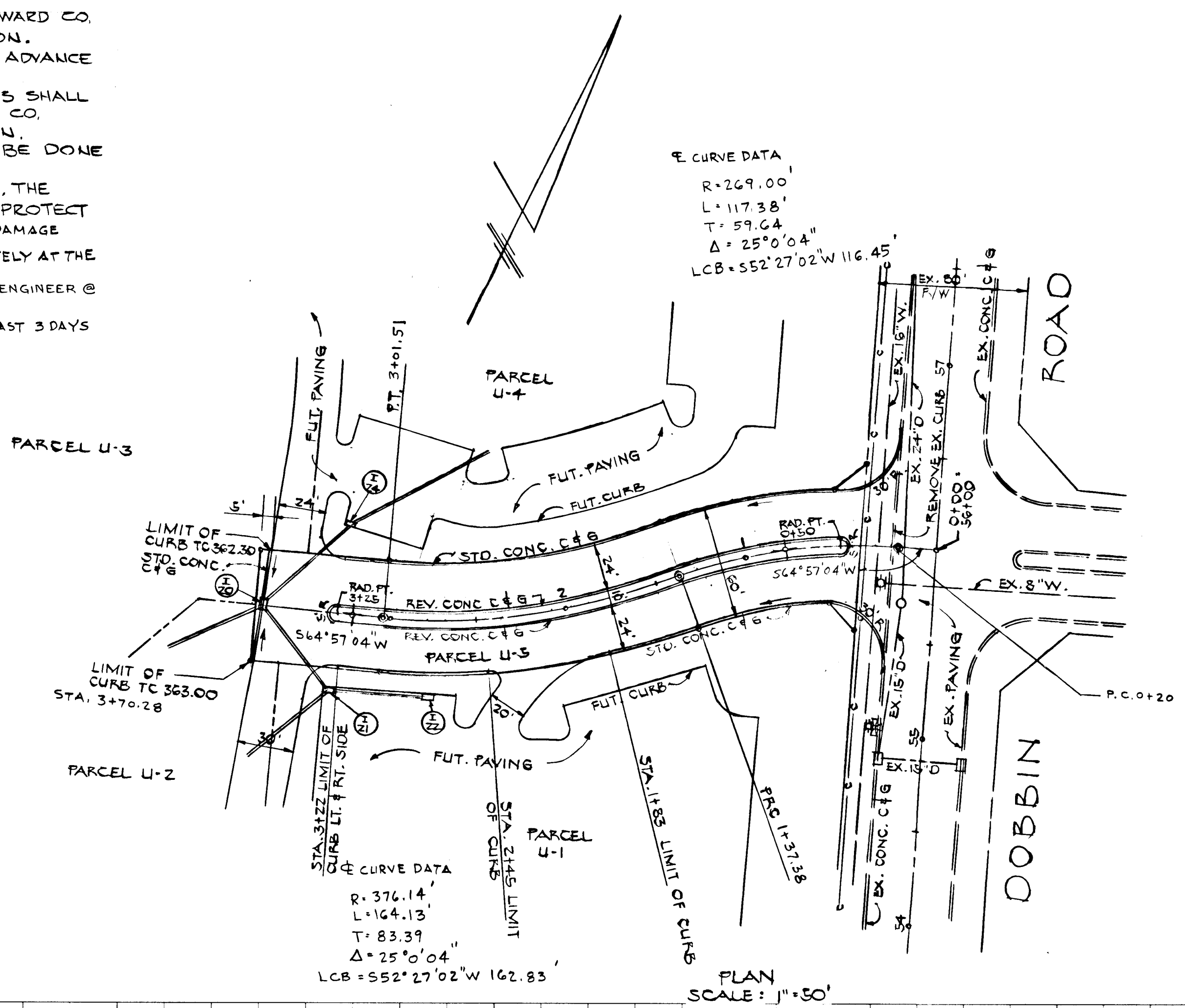
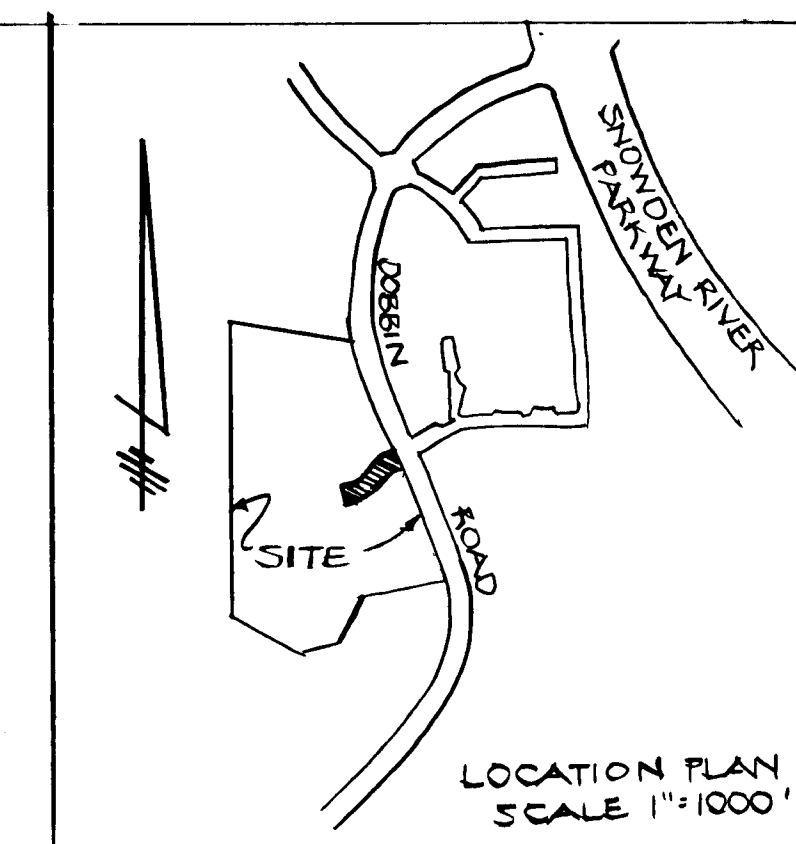


GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH HOWARD CO. STANDARDS, SPECIFICATIONS & DETAILS FOR CONSTRUCTION.
2. ALL UTILITY COMPANIES MUST BE NOTIFIED 24 HRS IN ADVANCE OF CONSTRUCTION.
3. STORM DRAIN TRENCHES WITHIN ROAD RIGHTS-OF-WAYS SHALL BE BACKFILLED & COMPACTED IN ACCORDANCE WITH HOWARD CO. STANDARDS, SPECIFICATIONS & DETAILS FOR CONSTRUCTION.
4. ANY DAMAGE TO PUBLIC RIGHTS-OF-WAYS OR PAVING WILL BE DONE AT THE DEVELOPER EXPENSE.
5. APPROXIMATE LOCATIONS OF EXISTING UTILITIES ARE SHOWN, THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES & TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTORS OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTORS EXPENSE.
6. THE CONTRACTOR SHALL TEST PIT EXISTING UTILITIES WHERE DIRECTED BY THE ENGINEER @ LEAST 2 WEEKS IN ADVANCE OF ANY CONSTRUCTION.
7. CONTRACTOR SHALL NOTIFY HOWARD CO. DEPT. OF INSPECTION & PERMIT @ LEAST 3 DAYS BEFORE STARTING WORK. 392-7436.
8. + STREET LIGHTS



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Reviewed for: *Howard*
 Date: *7-26-84*

Signature: *Arthur E. Leonard*
 Chief - Land Development, Zoning & Plat Date: *5/4/84*

HUDKINS ASSOCIATES, INC.
 101 SHELL BUILDINGS
 200 EAST JORTA ROAD
 TOWSON, MARYLAND 21204
 828-9060

Signature: *Arthur E. Leonard*
 Date: *5/4/84*



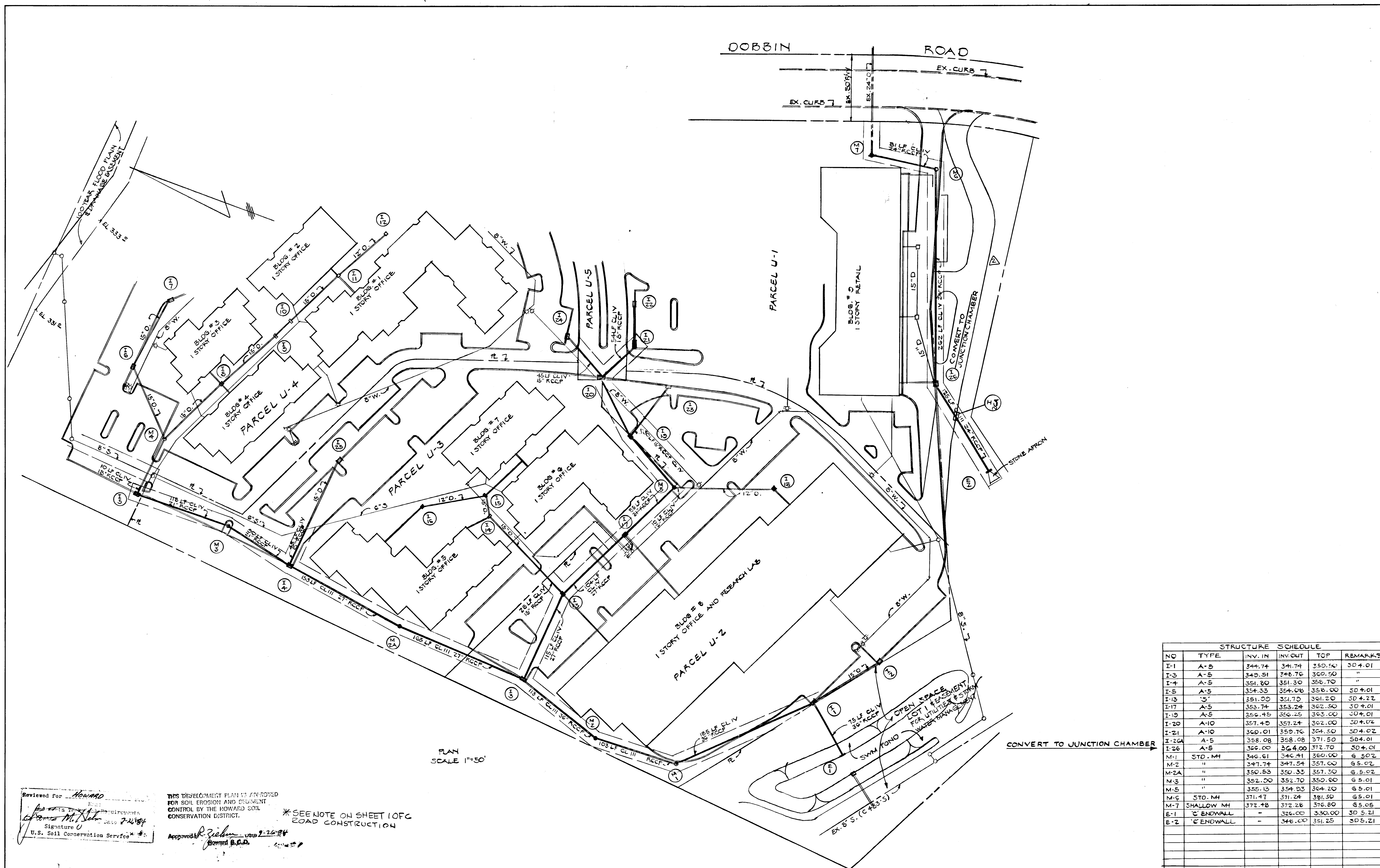
DES: DWB	BY: NO	REVISION	DATE
DRN: DWB			
CHK: A.L.			
DATE:			

ROAD AND STORM DRAIN PLAN AND PROFILE

600' SCALE MAP NO. _____ BLOCK NO. _____

COMMON ACCESS ROAD - PARCEL U-5
 COLUMBIA BUSINESS CENTER
 PARCELS U-1 THRU U-5
 DOBBIN ROAD COMMERCIAL CENTER I-1
 ELECT. DIST. 6 HOWARD CO., MD.

SCALE AS SHOWN
 SHEET 1 of 6



STRUCTURE SCHEDULE					
NO	TYPE	INV. IN	INV. OUT	TOP	REMARKS
I-1	A-5	344.74	341.74	350.50	SD 4.01
I-3	A-5	349.51	348.76	360.50	"
I-4	A-5	351.80	351.30	358.70	"
I-5	A-5	354.33	354.08	358.00	SD 4.01
I-13	S	351.00	351.70	361.20	SD 4.22
I-17	A-5	353.74	353.24	362.50	SD 4.01
I-19	A-5	356.49	356.25	363.00	SD 4.01
I-20	A-10	357.40	357.24	362.00	SD 4.02
I-21	A-10	360.01	359.76	364.50	SD 4.02
I-26A	A-5	358.08	358.08	371.50	SD 4.01
I-26	A-5	366.00	364.00	372.70	SD 4.01
M-1	STD. MH	346.61	346.41	360.00	6.50Z
M-2	"	347.74	347.54	357.00	6.50Z
M-2A	"	350.53	350.33	357.70	6.50Z
M-3	"	352.00	352.70	350.00	6.50Z
M-5	"	355.13	354.93	364.20	6.50Z
M-6	STD. MH	371.47	371.24	381.50	6.50Z
M-7	SHALLOW MH	372.48	372.28	376.80	6.50Z
E-1	C' ENDWALL	-	326.00	330.00	SD 5.21
E-2	C' ENDWALL	-	346.00	351.25	SD 5.21

PLAN SCALE 1"=50'

Reviewed for Howard
 Signature Howard B. C.D.
 U.S. Soil Conservation Service

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

*SEE NOTE ON SHEET 1 OF 2 ROAD CONSTRUCTION

Approved Howard B. C.D.
 Signature Howard B. C.D.
 Chief, Bureau of Engineering

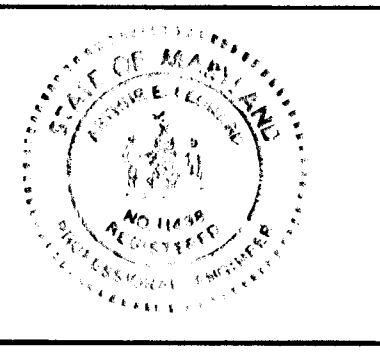
DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE
 CHIEF, BUREAU OF UTILITIES DATE

Signature Arthur E. Jourd 5/14/84
 CHIEF, LAND DEVELOPMENT

HUKKINS ASSOCIATES, INC.
 101 SHELL BUILDING
 200 EAST JOPPA ROAD
 TOWSON, MARYLAND 21284
 828-0060

Signature Arthur E. Jourd 5/14/84



DES: DWB
 DRN: DWB
 CHK: AL
 DATE: 11/1/84

BY NO. REVISION DATE

AS PER REQUEST BY BUREAU OF ENGINEERING 11/1/84

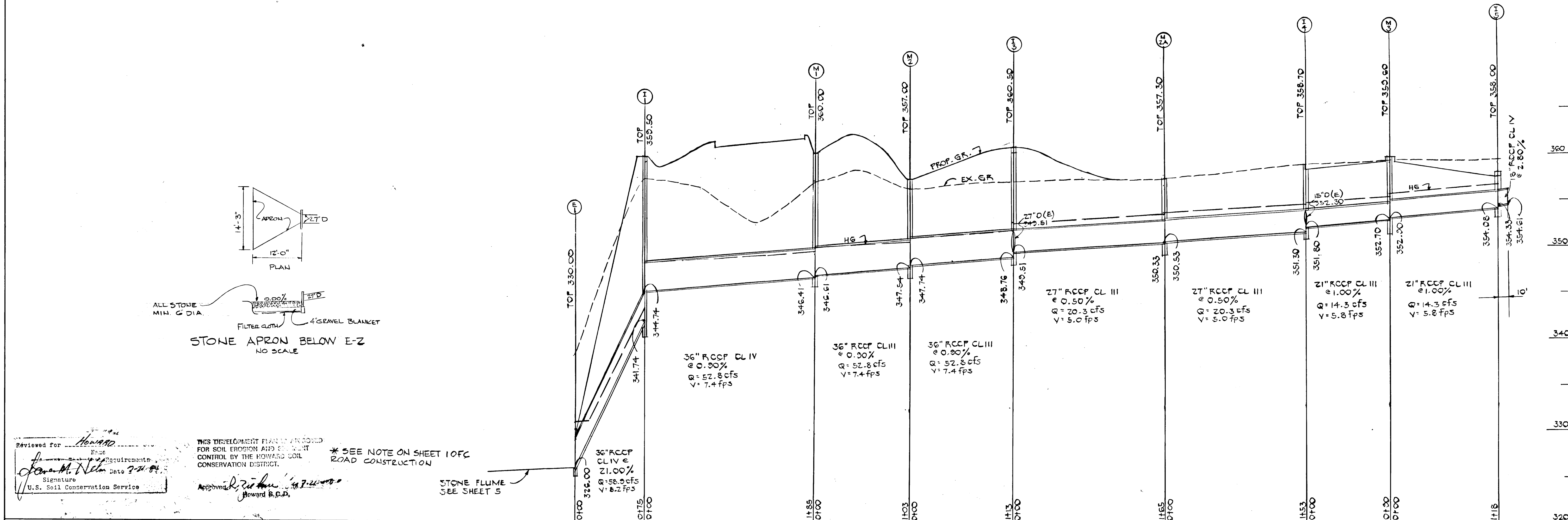
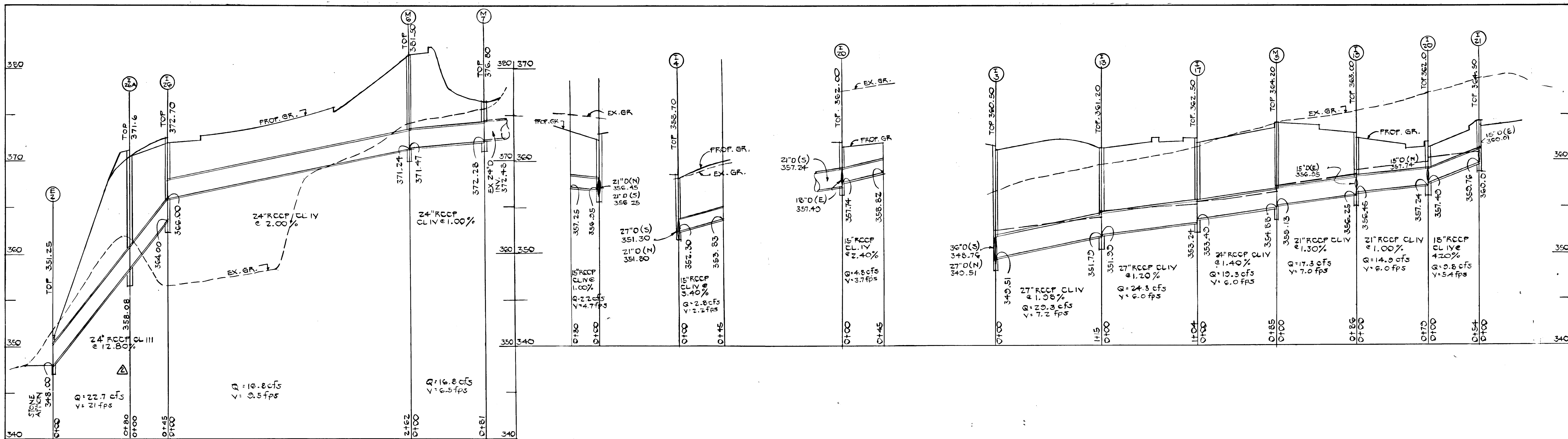
ROAD AND STORM DRAIN PLAN AND PROFILE

600' SCALE MAP NO. _____ BLOCK NO. _____

COLUMBIA BUSINESS CENTER
 PARCELS U-1 THRU U-5
 DOBBIN ROAD COMMERCIAL CENTER 1-1
 ELECT. DIST. 6
 HOWARD CO., MD.

SCALE AS SHOWN
 SHEET 2 OF 6

EF-84-133C



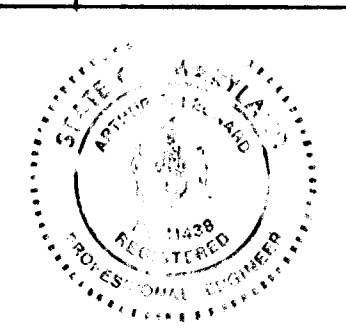
Reviewed for Howard
 Name
 Requirements
 Signature Howard B. C. P. Date 7-21-84
 U.S. Soil Conservation Service

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SILT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.
 * SEE NOTE ON SHEET 1 OF 2 ROAD CONSTRUCTION
 Approved: Howard B. C. P.
 Howard B. C. P.

STONE FLUME
 SEE SHEET 5

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 DIRECTOR OF PUBLIC WORKS
 CHIEF - BUREAU OF UTILITIES

HUDKINS ASSOCIATES, INC.
 200 EAST JOPPA ROAD
 ROOM 101, SHELL BUILDING
 TOWSON, MARYLAND 21204
 Arthur E. Jernstedt 5-17-84



DES: DWB			
DRN: DWB			
CHK: AL			
DATE:	EJM	AS PER REQUEST BY BUREAU OF ENGINEERING	11/1/84
BY NO.		REVISION	DATE

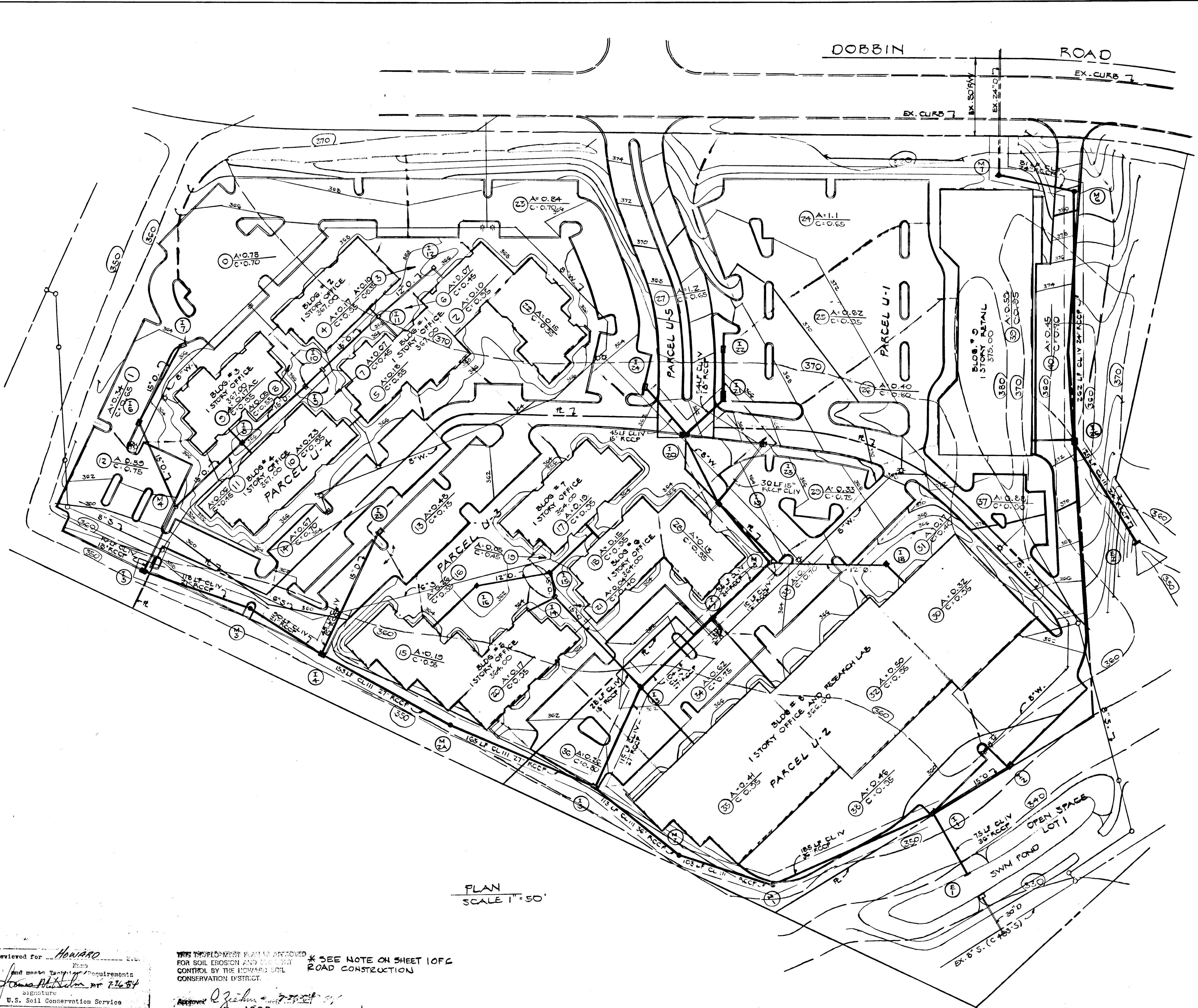
ROAD AND STORM DRAIN PLAN AND PROFILE
 600' SCALE MAP NO. _____ BLOCK NO. _____

COLUMBIA BUSINESS CENTER
 PARCELS U-1 THRU U-5
 DOBBIN ROAD COMMERCIAL CENTER, I-1
 ELECT. DIST. G
 HOWARD CO., MD.

SCALE AS SHOWN
 SHEET 3 OF 6

#885

F-133C



PLAN
SCALE 1" = 50'

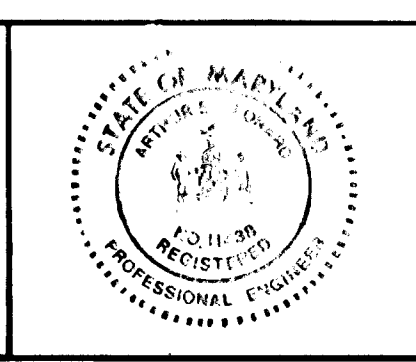
STRUCTURE SCHEDULE					
NO	TYPE	INV. IN	INV. OUT	TOP	REMARKS
I-1	A-5	344.74	341.74	350.50	304.01
I-3	A-5	349.51	346.76	350.50	"
I-4	A-5	351.80	351.30	358.70	"
I-5	A-5	354.33	354.08	358.00	504.01
I-10	"	351.00	351.70	361.20	504.27
I-17	A-5	353.74	353.24	362.50	504.01
I-19	A-5	356.45	356.25	363.00	504.01
I-20	A-10	357.40	357.24	362.00	504.02
I-21	A-10	360.01	359.76	364.50	504.02
I-23	A-5	-	361.25	366.00	504.01
I-26	A-5	366.00	363.75	372.70	504.01
M-1	STD. MH	346.61	346.41	360.00	6.50Z
M-2	"	347.74	347.54	357.00	6.5.0Z
M-2A	"	350.53	350.33	357.30	6.5.0Z
M-3	"	352.00	352.70	350.00	6.5.01
M-5	"	355.13	354.93	364.20	6.5.01
M-6	STD. MH	371.47	371.24	381.50	6.5.01
M-7	SHALLOW MH	372.48	372.28	376.80	6.5.05
E-1	'C' ENDWALL	-	326.00	330.00	505.21
E-2	'C' ENDWALL	-	346.00	351.25	505.21

Reviewed for Howard
and made no requirements
Thomas H. Smith 7-26-84
signature
U.S. Soil Conservation Service

THIS DEVELOPMENT PLAN IS APPROVED
FOR SOIL EROSION AND SEDIMENT
CONTROL BY THE HOWARD SOIL
CONSERVATION DISTRICT.
* SEE NOTE ON SHEET 1 OF 6
ROAD CONSTRUCTION
Howard S. G. D.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS DATE
CHIEF, BUREAU OF UTILITIES DATE

HUKKINS ASSOCIATES, INC.
101 SHELL BUILDING
200 EAST JOFFA ROAD
TOWSON, MARYLAND 21284
828-0000
Arthur E. Howard 5-17-84



DES: DWB
DRN: DWB
CHK: AL
DATE: BY NO. REVISION DATE

DRAINAGE AREA
MAP
600' SCALE MAP NO. BLOCK NO.

COLUMBIA BUSINESS CENTER,
PARCELS U-1 THRU U-5
DOBBIN ROAD COMMERCIAL CENTER 1-1
ELECT. DIST. G
HOWARD CO., MD.

SCALE
AS
SHOWN
SHEET
4 OF 6

SOIL CONSERVATION SERVICE
MARYLAND
CONSTRUCTION SPECIFICATIONS
FOR
PONDS

These specifications are appropriate for ponds within the scope of the Standard for practice 378.

I. SITE PREPARATION

Areas under the borrow areas, embankment, and structural works shall be cleared, grubbed and the topsoil stripped to remove all trees, vegetation, roots or other objectionable material. Channel banks and sharp breaks shall be sloped to no steeper than 1:1.

Areas covered by the 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 and stumps shall be cut approximately level with the ground surface.

All cleared and grubbed material shall be disposed of outside 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

Material

The fill material shall be taken from approved designated borrow area or areas. It shall be free of roots, stumps, wood, rubbish, over-size 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 all along the length of the embankment shall be increased above the design elevation (including freeboard) as shown on the plans.

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.

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 road track of the 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 can be obtained with the equipment used.

Cutoff Trench

Where specified, a 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 and shall be compacted with 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 a structure. Under no circumstances shall the contractor drive equipment over any part of a concrete structure or pipe unless there is a compacted fill of twenty-four inches or greater over the structure or pipe.

IV. PIPE CONDUITS

A. Corrugated Metal Pipe

- Materials - (Steel Pipe) - This pipe and its appurtenances shall be galvanized and fully bituminous coated and shall conform to the requirements of AASHTO Specification M-190 Type A with watertight coupling bands. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound.

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. Coupling bands, anti-seep collars, end 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.

Helically corrugated pipe In addition to the requirements above shall have either continuously welded seams or have lock seams which are caulked, during fabrication, with a neoprene bead.

- 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. Watertight coupling bands shall be used at all joints. Anti-seep collars shall be connected to the pipe in such a manner as to 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.
 - 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.
- B. Reinforced Concrete Pipe
- Materials - Reinforced concrete pipe shall have a rubber gasket joint and shall equal or exceed ASTM Specification C-361. Approved equivalents are AWWA Specification C-300, 301, and 302.
 - 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 at least 10% of its diameter with a minimum thickness of 3" as shown on the drawings.
 - 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.
 - Backfilling shall conform to structural backfill as shown above.
 - Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.
- C. For pipes of other materials, specific specifications shall be shown on the drawings.

CONCRETE

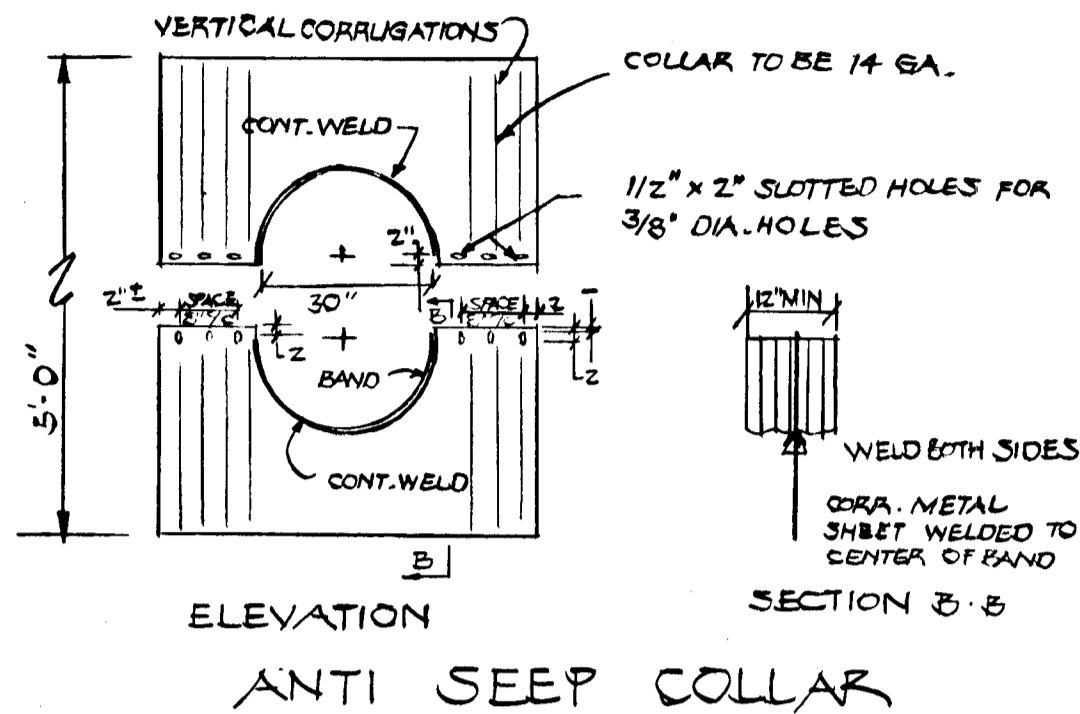
1. Materials

- Cement - Normal Portland cement shall conform to the latest ASTM Specification C-150.
- Water - The water used in concrete shall be clean, free from oil, acid, alkali, scales, organic matter or other objectionable substances.
- Sand - The sand used in concrete shall be clean, hard, strong and durable, and shall be well graded with 100 percent passing a one-quarter inch sieve. Limestone sand shall not be used.
- Coarse Aggregate - The coarse aggregate shall be clean, hard, strong and durable, and free from clay or dirt. It shall be well graded with a maximum size of one and one-half (1-1/2) inches.
- Reinforcing Steel - The reinforcing steel shall be deformed bars of intermediate grade billet 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. gallons of water per 94 pound bag of cement. The proportion of materials for the trial mix shall be 1:2:3-1/2. The combination of aggregates may be adjusted to produce a plastic and workable mix that will not produce harshness in placing or honeycombing in the structure.
- 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 mixer and of the introduction of the materials, including water, into the mixer. Water shall be added prior to, during, and following the mixing-charging operations. Excessive overmixing requiring the addition of water to preserve 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 that they can be removed without hammering or prying against the concrete.
The inside of 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.
- 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.
- Consolidating - 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.
Finishing - Defective concrete, honeycombed areas, voids left by the removal of tie 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.
- Protection and Curing - Exposed surfaces of concrete shall be protected from the direct rays of the sun for at least the first three (3) days. All concrete shall be kept continuously moist for at least ten (10) 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. Curing compounds may also be used.
- Placing Temperature - Concrete may not be placed at temperatures below 37° F with the temperature falling, or 34° with the temperature rising.

VI. 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, fertilizing and mulching (if required) in accordance with the vegetative treatment specifications shown on or accompanying the drawings.



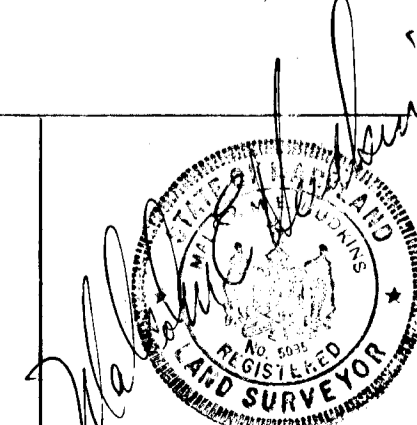
Reviewed For: Howard
Signature: Howard
Date: 7-26-84
U.S. Soil Conservation Service

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.
Approved: R. Zielman
Date: 7-26-84

* SEE NOTE ON SHEET 1 OF 2 ROAD CONSTRUCTION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

HUDKINS ASSOCIATES, INC.
101 SHELL BUILDING
200 EAST JOPPA ROAD
TOWSON, MARYLAND 21284
828-3060



DES: DWB			
DRN: DWB			
CHK: AL			
DATE:	BY NO.	REVISION	DATE

STORM WATER
MANAGEMENT

COLUMBIA BUSINESS CENTER
PARCELS U-1 THRU U-5
DOBBIN ROAD COMMERCIAL CENTER I-1
ELECT. DIST. 6
HOWARD CO., MD

SCALE AS SHOWN
SHEET 6 OF 6