

NO.	REVISION	Date
1	Rev MHS loc & adjust 6" roof drain - add emergency exit to Warehouse #3	7/17/98

AS-BUILT
SDP 89-74

GENERAL NOTES

- All materials and construction to be in accordance with the Howard County Road Construction Code and Specifications
- This plan is covered by Final Development Plan Phase 25-A-II
- Any damage to county owned rights of way shall be corrected at the developer's expense
- Installation of Traffic Control Devices shall be in accordance with the latest edition of the "Manual of Uniform Traffic Control Devices"
- Topography was compiled from actual field survey
- All coordinates are based on Howard County Geodetic Control Traverse which is based on the Maryland State Plane Coordinate System
- Information concerning underground utilities was obtained from available records, but the contractor must determine the exact location and elevation of mains by digging test pits, by hand, at all utility crossings well in advance of construction
- The contractor or developer shall contact the Construction Inspection/Survey Division 24 hrs in advance of commencement of work at 792-2630
- All downspouts shall be handled by connecting to storm
- Trench bedding for storm drainage shall be in accordance with Howard County Std 'SD 6201
- Previous plan #'s F-79-117, SDP-80-133, SDP-81-39, SDP-88-30
- The developer agrees to work with the Department of Licenses and Inspections to resolve any problems caused by roof water discharged
- Handicap parking details shall be in accordance with the "Maryland Building Code for the Handicapped" Section 501-705 and details on sheet 2

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/We certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that all responsible personnel involved in the construction project will have a Certificate of Attendance at a Dept of Natural Resources Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District or their authorized agents, as are deemed necessary. I will provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.

Signature of Developer/Builder: *Robert J. Ziel* Date: 10/20/88

These plans have been reviewed for the requirements of the Howard Soil Conservation District for small pond construction, soil erosion and sediment control.

Signature: *James M. Helm* Date: 12/1/89

SITE ANALYSIS

Total Area of Site: 75.31 Acres
 Total Area of Warehouse No 3 (New Addition): 0.149 Acres
 Total Area of Disturbance: 0.80 Acres
 Zoned: New Town Industrial use FDP Phase 25-A-II
 Total No of Employees: Existing 80, Proposed 80

Parking Analysis for Warehouse No 3
 Required 1 space per 2 employees
 Spaces required: 8 employees - 2 spaces = 3 spaces provided

Parking Analysis for Existing Office Buildings
 a) number of employees: 80
 b) total sq ft of existing office space: 24,849 sq ft
 number of parking: 1 per 500 sq ft = 50 spaces
 c) total spaces of warehouses, test station & treatment facility: number of parking: 1 per 2 employees
 Total Number of spaces for Site: Required 65, Provided 150
 Building Coverage = 50% Maximum
 298,050 / 42,129 = 15.14%

Building	Sq Ft
Existing office building no 1	4550
Existing office building no 2	3472
Existing office building no 3	8160
Existing warehouse no 1	5472
Existing warehouse no 2	1430
Existing waste treatment facility	6129
Existing test station	3472
Proposed warehouse no 3	1430
Total	42,129

ENGINEER'S CERTIFICATE

I hereby certify that this plan for Erosion and Sediment Control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he must provide the Howard Soil Conservation District with a red-lined "as-built" plan of the pond at completion.

Signature: *G. Nelson Clark* Date: 10/20/88

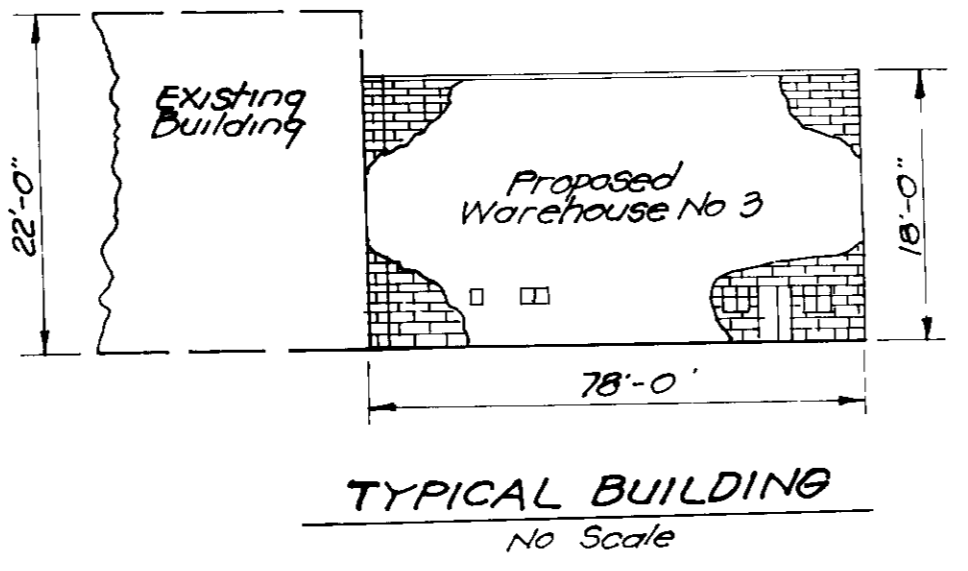
APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT
 COUNTY HEALTH OFFICER: *[Signature]* DATE: 3-16-90

APPROVED HOWARD COUNTY DEPT OF PLANNING & ZONING
 DIRECTOR: *[Signature]* DATE: 4-2-90

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE STORM DRAINAGE SYSTEMS AND PUBLIC ROADS HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 DIRECTOR: *[Signature]* DATE: 3-5-90

CHIEF BUREAU OF ENGINEERING: *[Signature]* DATE: 3-5-90

APPROVED
 NOV 8, 1989



CLARK • FINEFROCK & SACKETT, INC.
 ENGINEERS • PLANNERS • SURVEYORS
 7135 MINSTREL WAY • COLUMBIA MD 21045 • (301) 381-7200 - BALTO • (301) 621-8100 - WASH

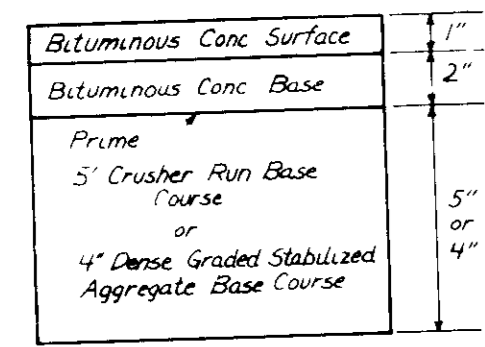
DESIGNED: DGT
 DRAWN: BAL
 CHECKED: DGT
 DATE: 9/1/89

SITE DEVELOPMENT, SEDIMENT/EROSION CONTROL PLAN
 PROPOSED WAREHOUSE NO THREE
 LOT 34
COLUMBIA
 OAKLAND RIDGE INDUSTRIAL PARK
 SECTION TWO
 2ND ELECTION DISTRICT
 HOWARD COUNTY MARYLAND

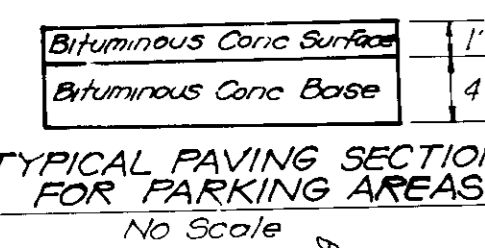
SCALE: 1" = 30'
 DRAWING: 1d'4
 JOB NO: 87-107
 FILE NO: 87-107X

FOR: NIRO ATOMIZER INC
 8165 RUMSEY ROAD
 COLUMBIA MD 21045

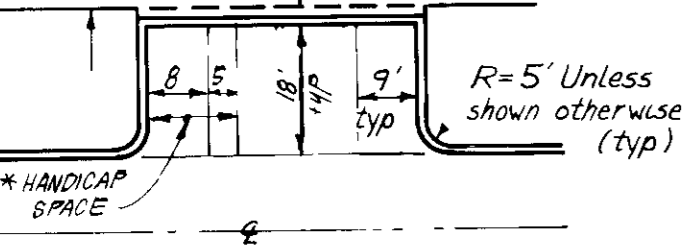
No	REVISION	Date
1	Remove W&S Notes of SHC Profile.	7/17/90



ALTERNATE PAVING SECTION FOR PARKING AREAS (SECTION P-1) NO SCALE

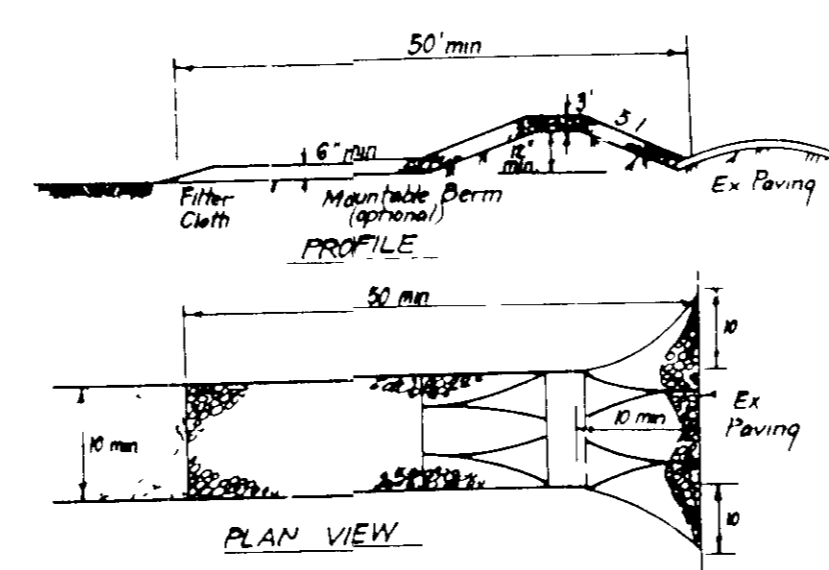


TYPICAL PAVING SECTION FOR PARKING AREAS NO SCALE



TYPICAL PARKING NO SCALE

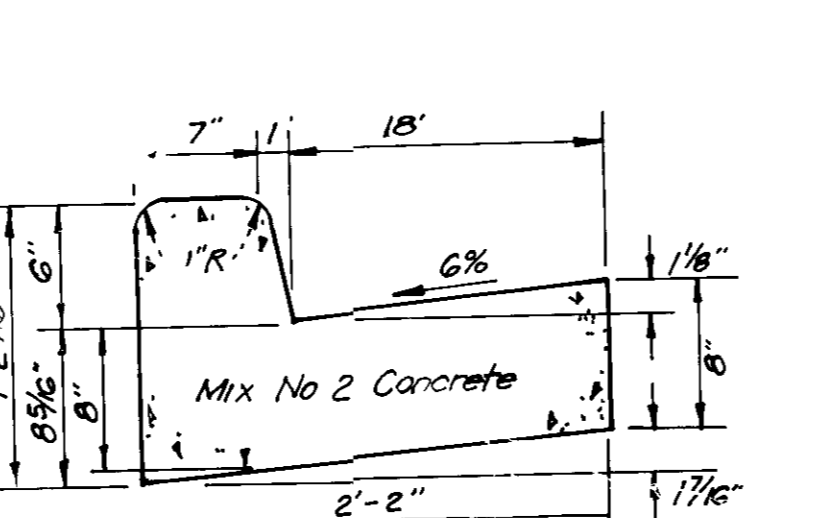
* Two 8' Handicap Spaces may share the 5' Aisle see plan for location of 5' aisle



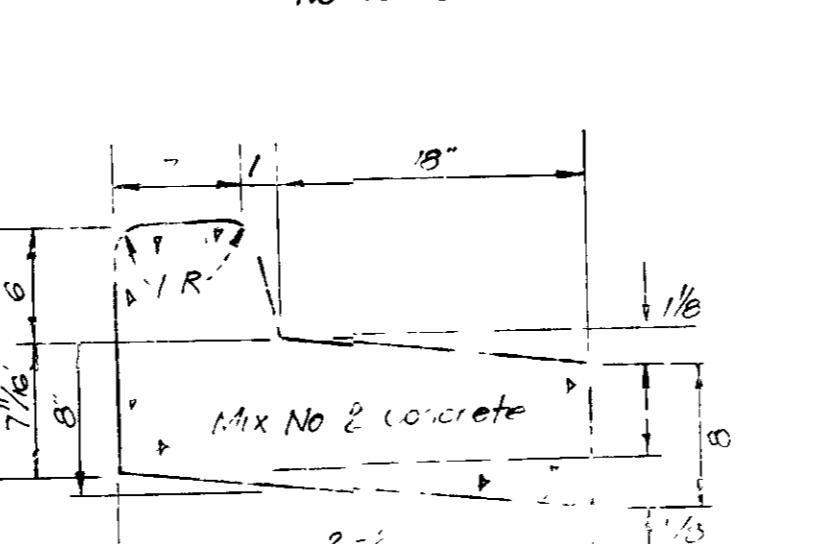
STABILIZED CONSTRUCTION ENTRANCE (SCE) NO SCALE

- CONSTRUCTION SPECIFICATIONS:**
1. Stone size - Use 2" stone or reclaimed or recycled concrete equivalent
 2. Length - As required, but not less than 50 feet (exception a single residence lot where a 30 foot minimum length would apply)
 3. Thickness - Not less than six (6) inches
 4. Width - Ten (10) feet minimum, but not less than the full width of points where ingress or egress occurs
 5. Filter Cloth - Will be placed over the entire area prior to placing of stone. Filter will not be required on a single-family residential lot.
 6. Surface Water - All surface water flowing or diverted toward construction entrance shall be piped across the entrance. If piping is impractical, a mountable berm with 5/8" slope will be permitted.
 7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or blowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanup of any measures used to trap sediment. All sediment applied, dropped, washed or tracked onto public rights-of-way must be removed immediately.
 8. Washing - Where it shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
 9. Periodic inspection and needed maintenance shall be provided after each rain.

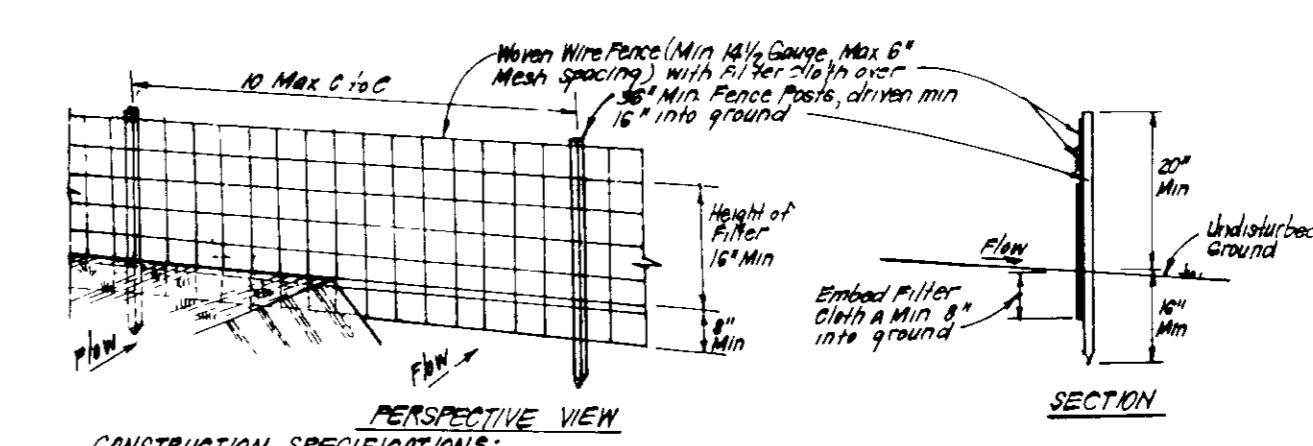
STABILIZED CONSTRUCTION ENTRANCE (SCE) NO SCALE



STANDARD 6" COMBINATION CURB & GUTTER NO SCALE



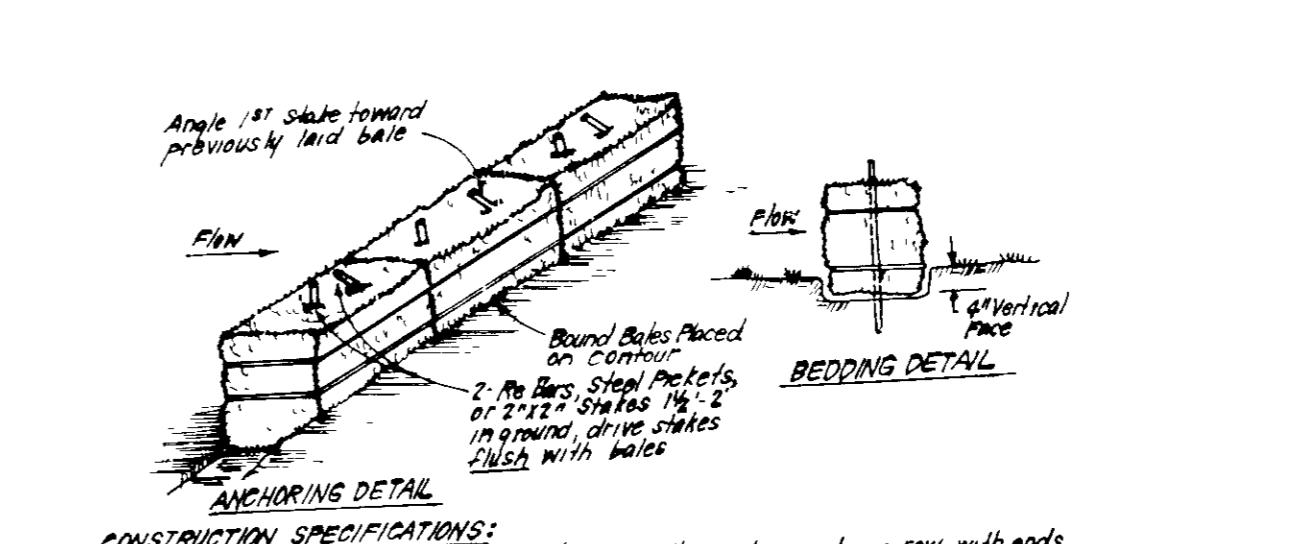
REVERSE 6" COMBINATION CURB & GUTTER NO SCALE



SILT FENCE DETAIL (S) NO SCALE

- CONSTRUCTION SPECIFICATIONS:**
1. When wire fence is fastened securely to fence posts with wire ties or staples
 2. Filter cloth is to be fastened securely to woven wire fence with ties spaced every 24" at top and mid section
 3. When 2 sections of filter cloth adjoin each other they shall be overlapped by 6" and stapled
 4. Maintenance shall be performed as needed and material removed when "blow-off" develops in silt fence

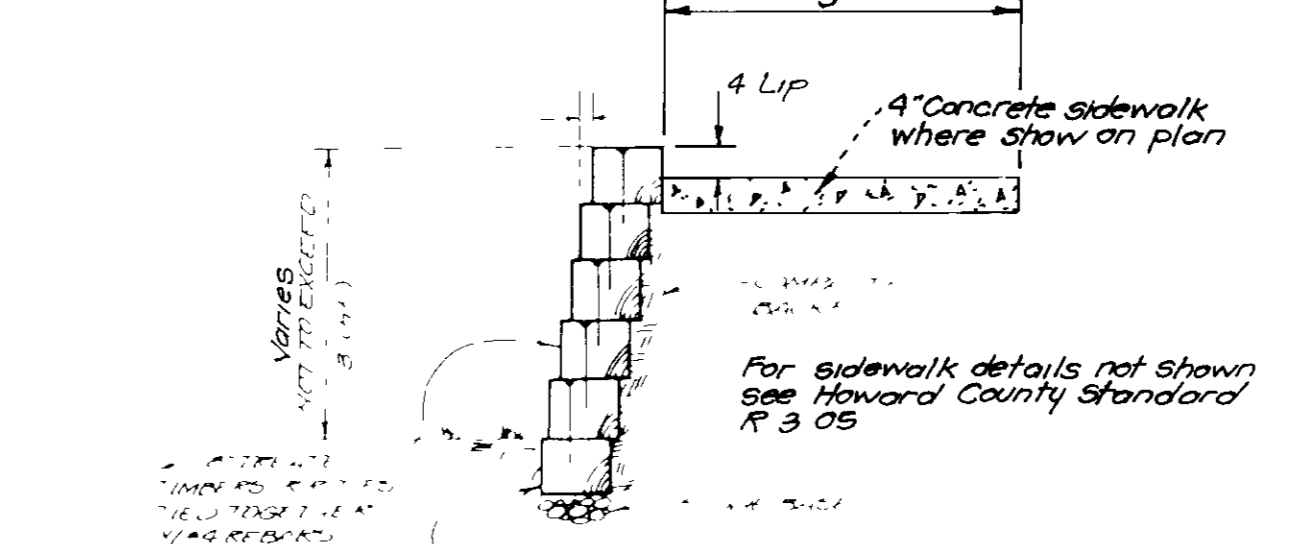
SILT FENCE DETAIL (S) NO SCALE



STRAW BALE DIKE DETAIL (SBD) NO SCALE

- CONSTRUCTION SPECIFICATIONS:**
1. Bales shall be stacked at the top of a slope or on the contour and in a row with ends tightly abutting the adjacent bales
 2. Each bale shall be interlocked in the soil a min of 4" and placed so the bindings are horizontal
 3. Bales shall be securely anchored in place by either 2 stakes or re bars driven thru the bales
 4. The 18" stake in each bale shall be driven toward the upstream end of the dike
 5. The 18" stake in each bale shall be driven toward the downstream end of the dike
 6. Inspections shall be frequent and repair/replacement shall be made promptly as needed
 7. Stakes shall be removed when they have served their usefulness so as not to block or impede storm flow or drainage

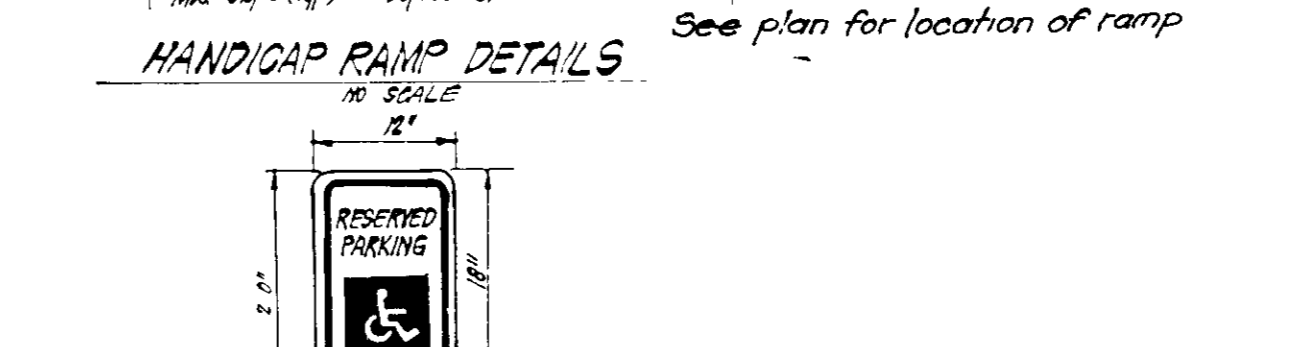
STRAW BALE DIKE DETAIL (SBD) NO SCALE



TYPICAL RETAINING WALL ADJACENT TO WALK DETAIL NO SCALE



HANDICAP RAMP DETAILS NO SCALE



HANDICAP PARKING SIGN DETAIL NO SCALE

- PERMANENT SEEDING NOTES**
- 1) Minimum of 24 hours notice must be given to Howard County Office of Inspection and Permit prior to the start of any construction (992-2437)
 - 2) All vegetative and structural practices are to be installed according to the provisions of the plan and are to be in conformance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
 - 3) Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within a 7 calendar days for all permanent sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1. 3) 14 days as to all other disturbed or graded areas on the project site
 - 4) 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
 - 5) All disturbed areas must be stabilized within the time period specified above in accordance with the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seedings (Sec. 51) and (Sec. 56), temporary seedings (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.
 - 6) All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
 - 7) Site Analysis

Total Area of Site	750' Acres
Area Disturbed	0.80' Acres
Area to be roofed or paved	0.15' Acres
Area to be vegetatively stabilized	0.65' Acres
Total Cut	3072' Cu Yds
Total Fill	883' Cu Yds
Offsite waste/borrow area location	N/A
 - 8) Any sediment control practices which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
 - 9) Additional sediment control must be provided, if deemed necessary by the Howard County DSW sediment control inspector.
 - 10) On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
 - 11) If houses are to be constructed on an "As-Built" basis, at random, Single Lot Sediment Control, as shown below shall be implemented.
 - 12) All pipes to be blocked at the end of each lot (see detail below). N/A
 - 13) The total amount of straw bale/dike/silt fence equals 790' L.F.

PERMANENT SEEDING NOTES

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

Seeded Preparation - Loosen upper three inches of soil by raking, discing or other acceptable means before seeding

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

- 1) Preferred - Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq ft) and 600 lbs per acre 10-10-10 fertilizer (14 lbs/1000 sq ft) before seeding. Harrow or disc into upper three inches of soil. At time of seeding, apply 400 lbs per acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq ft)
- 2) Acceptable - Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq ft) and 1000 lbs per acre 10-10-10 fertilizer (23 lbs/1000 sq ft) before seeding. Harrow or disc into upper three inches of soil

Seeding - For the periods March 1 thru April 30, and August 1 thru October 15, seed with 60 lbs per acre (1.5 lbs/1000 sq ft) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs per acre (0.5 lbs/1000 sq ft) of weeping lovegrass. During the period of October 16 thru February 28, protect site by Option (1) 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring. Option (2) Use sod. Option (3) Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

Mulching - Apply 1 1/2 to 2 tons per acre (70 to 90 lbs/1000 sq ft) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq ft) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq ft) for anchoring.

Maintenance - Inspect all seeded areas and make needed repairs, replacements and reseeding

TEMPORARY SEEDING NOTES

Apply to graded or cleared areas likely to be redistributed 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

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 25 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 (0.75 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 unrotted 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 348 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

NOV 8, 1989

Reviewed for HOWARD E.C.D. Name and meets Technical Requirements James M. Helm 12/1/89 Signature Date U.S. Soil Conservation Service

DEVELOPER'S/BUILDER'S CERTIFICATE
I/We certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that all responsible personnel involved in the construction project will have a Certificate of Attendance at a Dept of Natural Resources Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District or their authorized agents, as are deemed necessary.
Signature of Developer/Builder: Roger S. Anderson Date: 10 20 88

ENGINEER'S CERTIFICATE
I hereby certify that this plan for Erosion and Sediment Control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.
Signature: G. Nelson Clark Date: 10 20 88

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS HOWARD COUNTY HEALTH DEPARTMENT	3-16-90
COUNTY HEALTH OFFICER	DATE
APPROVED HOWARD COUNTY DEPT OF PLANNING & ZONING	4.3.90
DIRECTOR	DATE
CHIEF DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT	3-22-90
APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE STORM DRAINAGE SYSTEMS AND PUBLIC ROADS HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS	3-5-90
DIRECTOR	DATE
CHIEF BUREAU OF ENGINEERING	3-5-90
	DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Signature: John L. Robertson Date: 12/1/89

CLARK • FINEFROCK & SACKETT, INC ENGINEERS • PLANNERS • SURVEYORS	
DESIGNED	SITE DEVELOPMENT PLAN, DETAILS PROPOSED WAREHOUSE NO THREE LOT 94
DRAWN	COLUMBIA
CHECKED	OAKLAND RIDGE INDUSTRIAL PARK SECTION TWO
DGT	2ND ELECTION DISTRICT HOWARD COUNTY MARYLAND
DATE	FOR NIRD ATOMIZER INC 997-8700 2905 Ruffin Road Columbia, MS 2045
9-1-89	
SCALE	1" = 30'
DRAWING	2 of 4
JOB NO	87-107
FILE NO	87-107X

S.D.P. 39-74

(INFILTRATION BASIN)

3.2.6 Construction Specifications

The construction of all infiltration basins should comply with the criteria set forth in the Maryland SCS Standards and Specifications 378-Ponds dated July, 1981 or subsequent revisions and the additional criteria provided below.

3.2.6.1 Schedule

The sequence of various phases of basin construction shall be coordinated with the overall project construction schedule. A program should schedule rough excavation of the basin with the rough grading of the site. Subject to permit use of the material as fill in cutbank areas. The material from the basin could serve as a sedimentation basin. To assist in erosion control, the sediment control during construction should be near final stages. Excavation should never be used prematurely for runoff disposal. Erosion on untreated, freshly constructed slopes within the watershed area should be newly formed basin with a heavy concentration of sediment. This could seriously impair the natural infiltration characteristics of the basin floor. Final grade of an infiltration basin shall not be attained until after the basin as a sediment control basin is completed.

Specifications for basin construction should state: (1) the various points in progress drainage may be directed to the basin, and (2) the means by which this delay in use is to be accomplished. Due to the wide variety of conditions encountered among projects, each should be separately evaluated in order to postpone use as long as is reasonably possible.

3.2.6.2 Excavation

Initial basin excavation should be carried to within 1 foot of the final elevation of the basin floor. Final excavation to the finished grade should be deferred until all disturbed areas on the watershed have been stabilized or protected. The final phase excavation should remove all accumulated sediment. Relatively light tracked equipment is recommended for this operation to avoid compaction of the basin floor. After the final grading is completed, the basin floor should be deeply tilled by means of rotary tillers or disc harrows to provide a well-aerated, highly porous surface texture.

3.2.6.3 Lining Material

Infiltration basins may be lined with a 6- to 12-inch layer of filter material such as coarse sand to help prevent the buildup of impervious deposit on the soil surface. The filter layer can be replaced or cleaned when it becomes clogged. When a 6-inch layer of coarse organic material is specified for lining (such as hulls, leaves, stems, etc.) or spading into the basin floor to increase the permeability of the soils, the basin floor should be soaked or inundated for a brief period, then allowed to dry subsequent to this operation. This induces the organic material to decay rapidly, loosening the upper soil layer.

Establishing dense vegetation on the basin side slopes and floor is recommended. A dense vegetative stand will not only prevent erosion and sloughing, but will also provide a natural means of maintaining relative infiltration rates. Erosion protection of inflow points to the basin should also be provided. Removal of accumulated sediment is a problem only at the basin floor. Little maintenance is normally required to maintain the infiltration capacity of slope areas.

Selection of suitable vegetative materials for the side slope and all other areas to be stabilized with vegetation and application of required fertilizer and mulches shall be done in accordance with the Maryland Standards and Specifications for Soil Erosion and Sediment Control. Local Extension Agencies should also be consulted.

3.2.7.1 Inspection Schedule

Drainage systems must be inspected on a regular basis to insure that they are functioning properly. Inspections should be conducted at the following intervals:

3.2.7.2 Sediment Control Effect on Vegetation Assess

Cleanout frequency of infiltration basins will depend on the extent of vegetated or nonvegetated and will be a function of their capacity, discharge characteristics, volume of inflow, and sediment characteristics. They should be inspected at least once a year. Inspections may require more frequent inspection and cleanout.

Grass bottoms on infiltration basins seldom need replacement. Grass serves as a good filter material. This is particularly true of Kentucky Bluegrass, which is extremely hardy and can withstand several years of submergence. If silty water is allowed to trickle through the grass, the loosened material is strained out within a few yards. The established turf on a basin floor will grow up through the openings forming a porous turf and preventing the formation of an impervious layer. Grass filtration would work well with long, narrow, shallow-type basins (ditches, etc.) depressions where highway runoff flows down a grassy slope between the roadway and the basin. Kentucky Bluegrass requires special attention and looks attractive when trimmed. Grass plants on basin slopes will also prevent erosion.

3.2.7.3 Sediment Removal From Nonvegetated Basin

(a) **Technique** - Remove sediment only when the basin floor is completely dry, after the silt layer has mud-cracked and separated from the basin floor. Equipment maneuverability and precise blade control are essential in wet areas and can greatly reduce the quantity of material to be removed.

(b) **Frequency** - All sediment must be removed prior to tillage operations. As tilling is required periodically and at least once annually, the frequency of sediment removal will be related to small operations on a regular basis.

3.2.7.4 Tilling of Nonvegetated Basin Floor

In all cases, tilling must be preceded by thorough removal of surface sediment as previously above.

(a) **Purposes** - It is necessary to restore the natural infiltration capacity by overcoming the effects of surface compaction, and to control weed growth on the basin floor.

(b) **Technique** - Rotary tillers or disc harrows will normally serve this purpose. Light tractors should be employed for these operations. In the event that heavy equipment has caused deeper than normal compaction of the surface, these operations should be preceded by deep plowing. In its final condition after tilling, the basin floor should be level, smooth, and free of ridges and furrows to ease future removal of sediment and minimize the material to be removed during future cleanings. The amount of material to be removed is dependent on the last pass, which will vary.

(c) **Frequency** - In the spring, the basin floor should be tilled to a depth of 2 to 3 inches. The effects of frost and submergence on the basin floor capacity diminishes rapidly thereafter. To insure infiltration, the basin floor should be tilled thorough once each season. In areas where weeds are a problem to control vegetative growth, an additional tilling should be done during the growing season. Precaution should be taken to avoid the possibility of working sediment accumulated on the basin floor into the soil. Light cultivation for the purpose of weed control should be done again that any cultivation or tilling will be necessary for regular sediment removal.

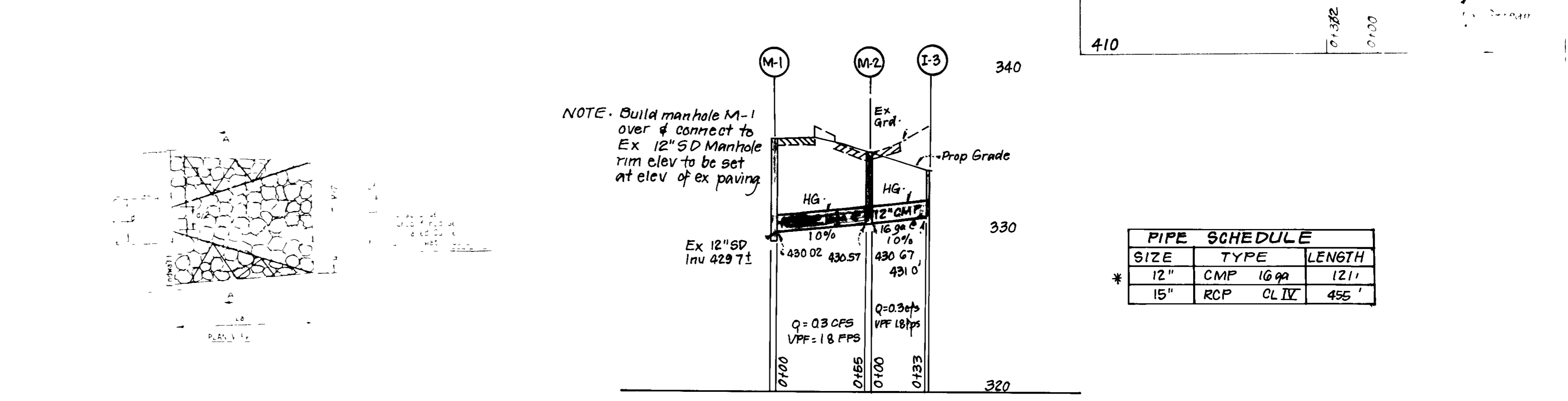
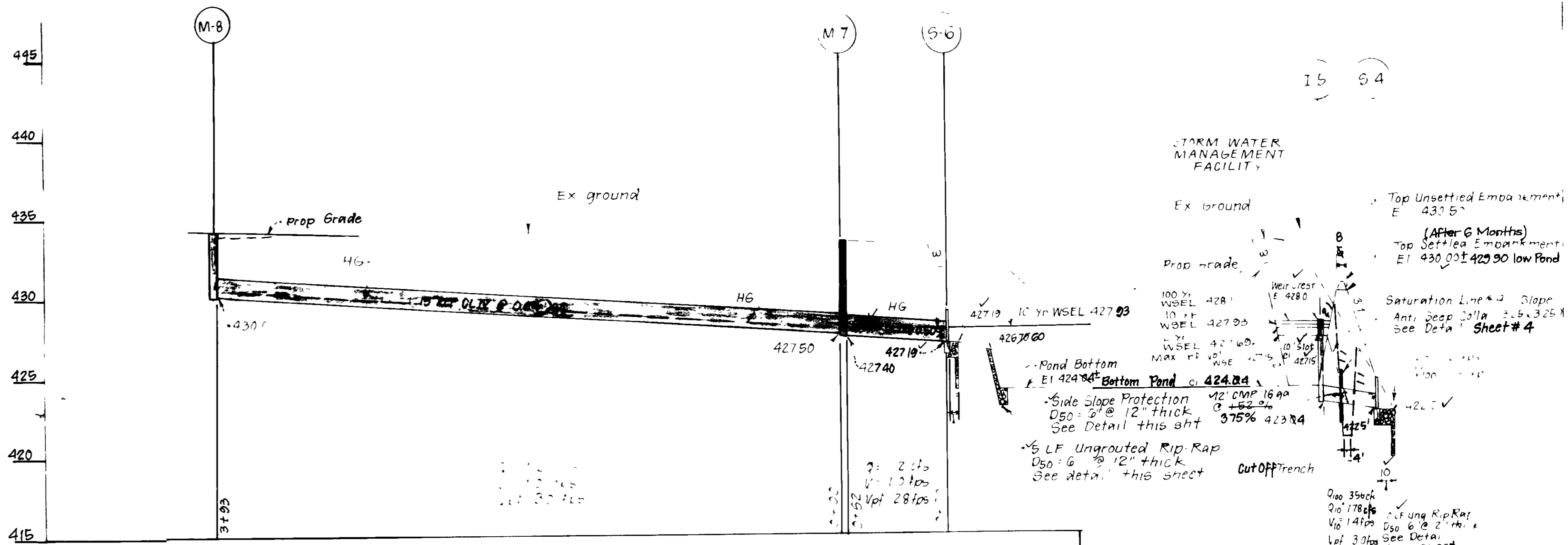
3.2.7.5 Side Slope Maintenance

(a) **Purpose** - To promote a dense turf on the basin floor, thereby enhancing infiltration through the soil surface and gradually taking over the slope areas.

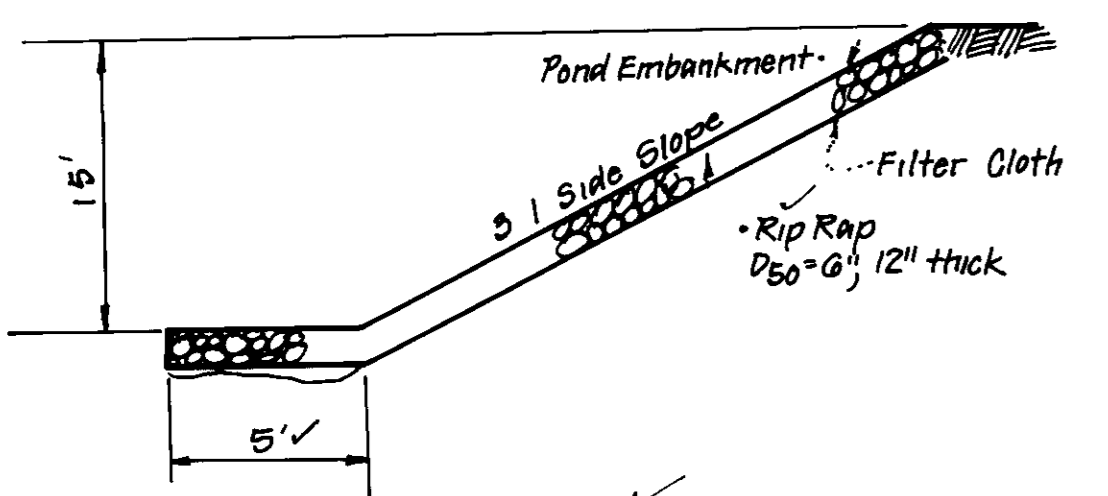
(b) **Frequency** - Grasses of the region are well adapted to the soil conditions, resistance, hardness, and ability to withstand various conditions. The species will also permit long intervals between cleanings. This is due to the relatively steep slopes which make mowing difficult. Mow once a year, once in June and again in September, as generally satisfactory fertilization with 10-6-4 ratio fertilizer at a rate of 500 lb per acre (50 lb per 1000 sq ft) may be required the second year after seeding.

3.2.8 References

- Becker, B.C., M.L. Clark, R.R. Kautzman, "Guidelines to Stormwater Management," prepared by Hittman Associates, Inc., and the Howard Soil Conservation District, November, 1979.
- Tourbiere, J.T., R. Westmacott, "A Handbook of Methods for Soil Conservation Resources in Land Development Urban Land Institute, Washington, D.C., 1978.
- Anonymous, "Controlling Storm Water Runoff," prepared by the Howard Soil Conservation District, November, 1979.
- Warren, J.B., "Underground Disposal of Storm Water Runoff," prepared by the California Department of Transportation in cooperation with the Federal Highway Administration, February 1980.
- Warren, R.J., "Recharge Basins for Storm Water Runoff," prepared by the Howard Soil Conservation District, Engineering Department, December, 1979.
- Warren, D.A. and E. Seabury, "Application of Storm Water Runoff Recharge Basins," Long Island, New York, State University of New York, Engineering Paper 2001-D, 1974.



PIPE SCHEDULE		
SIZE	TYPE	LENGTH
12"	CMP	16.99
15"	RCP	4.56



DETAIL - SIDE SLOPE PROTECTION
No Scale

CONSTRUCTION SEQUENCE

1. Install SBD/SF and stabilized construction entrances
2. Grade for proposed Warehouse #3. Construct Warehouse
3. Install storm drainage and infiltration basin
3. Immediately stabilize infiltration basin upon final grading
3. Construct 6" roof drain from proposed Warehouse #3 to M-8.
4. Upon permanent stabilization and approval of the Sediment Control Inspector remove sediment and Erosion Controls and stabilize.

No.	Days
2	
120	
14	
7	

APPROVED FOR THE DEPT. OF COMMUNITY PLANNING AND LAND DEVELOPMENT. DATE: 3-16-90. 4.3.90. 4/2/85. 3/5/80. 3.6.70.

APPROVED PLANNING BOARD OF HOWARD COUNTY. DATE: NOV 8, 1989.

No.	REVISION	Date
1	Rev profiles, str schedule Adjusted. M8 to M7 profile	7/16/90

These plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District. Approved: [Signature] 12/4/89

No.	TYPE	Inu In	Inu Out	Top Elev	Remarks	LOCATION
S-4	Type C Endwall	422.58.00	422.50.00	424.50.00	Ho Co Sta SDE21	See Plan
I-5	Special Structure	423.90.00	423.90.00	428.00.00	Special Str See Det Sheet #4	
S-6	Type C Endwall	427.19	427.19	429.19	Ho Co Sta SD 5.21	
M-7	Std Brick Manhole	427.50	427.40	433.30	Ho Co Sta G 5.01/48" Dia	
M-8	Shallow Brick Manhole	430.00	430.00	434.0	Ho Co Sta G 5.05/48" Dia	See Plan
M-1	Brick Manhole	430.02 Ex. 429.71	Ex. 429.71	435.9	Ho Co Std G5.01 48" Rd	
M-2	Shallow Brick Manhole	430.07	430.57	435.0	Ho Co Std G5.05 48" Sq	
I-3	C-Inlet	431.00	431.00	434.0	Ho Co Std SD 4.15	See Plan

* Use dimensions for 15" pipes
 Δ Special Structure - See Det. Sheet 4
 □ All Inv. fully developed

DEVELOPER'S/BUILDER'S CERTIFICATE

I/We certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that all personnel involved in the construction project will have a Certificate of Attendance at a Dept. of Natural Resources Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District or their authorized agents as are deemed necessary. I will provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. Signature: [Signature] Date: 9-1-89

POND AS-BUILT 12-3-91



ENGINEER'S CERTIFICATE. I hereby certify that this plan of development and Sediment Control meets the requirements of the site plan and that it 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 a Red-lined "as-built" plan of the pond within 30 days of completion. Signature: G Nelson Clark Date: 9-1-89

AS-BUILT SITE DEVELOPMENT PLAN, SWM & STORM DRAIN DETAILS PROPOSED WAREHOUSE NO THREE LOT 94 COLUMBIA OAKLAND RIDGE INDUSTRIAL PARK Section 2 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND For: Niro Atomizer Inc 9165 Kumbay Rd Columbia, Maryland 21045 897-8700 87-107 X S.D.P. 89-74

MD-378 CONSTRUCTION SPECIFICATIONS FOR PONDS

I. 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.

Areas to be covered by the pond or reservoir will be cleared of all trees, brush, logs, fence, rubbish, and other objectionable material unless otherwise designated on the plans. Trees, brush and stumps shall be cut approximately level with the ground surface.

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

Material
The fill material shall be taken from approved designated borrow area or areas. It shall be free of roots, stumps, wood, rubbish, overseas 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 tread track of the equipment or footstep shall be achieved by a maximum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction 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 Engineer.

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 as shown on the drawings, 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 equipment be driven 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

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 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.

Steel pipes with polymeric coatings shall have a minimum coating thickness of 9.00 inch (10 mil) on both sides of the pipe. The following coatings are commercially available: Hexon, Plast-Cote, Blac-Klad, and Beth-Cu-Loy. Coated corrugated steel pipe shall meet the requirements of AASHTO M-245 and M-246.

Materials - (Aluminized Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274-791 with watertight coupling bands or flanges.

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, 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 3/16 inch 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.

2. **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 or flanges shall be used at all joints. Anti-seep collars shall be connected to the pipe in such a manner as to the completely watertight. Dimple bands are not considered to be watertight.

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

4. **Laying pipe** - The pipe shall be placed with inside circumferential laps pointing downstream and with the longitudinal laps at the side.

5. **Backfilling** shall conform to structural backfill as shown above.

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

V. CONCRETE

1. Materials

- a. **Cement** - Normal Portland cement shall conform to the latest ASTM Specification C-150.
- b. **Water** - The water used in concrete shall be clean, free from oil, acid, alkali, scales, organic matter or other objectionable substances.
- c. **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.
- d. **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.
- e. **Reinforcing Steel** - The reinforcing steel shall be deformed bars of intermediate grade billet steel or rail steel conforming to ASTM Specification A-615.

2. **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.

3. **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 in per cent of the above.

4. **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.

5. **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.

6. **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.

7. **Finishing** - Defective concrete, honeycombed areas, voids left by the 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.

8. **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.

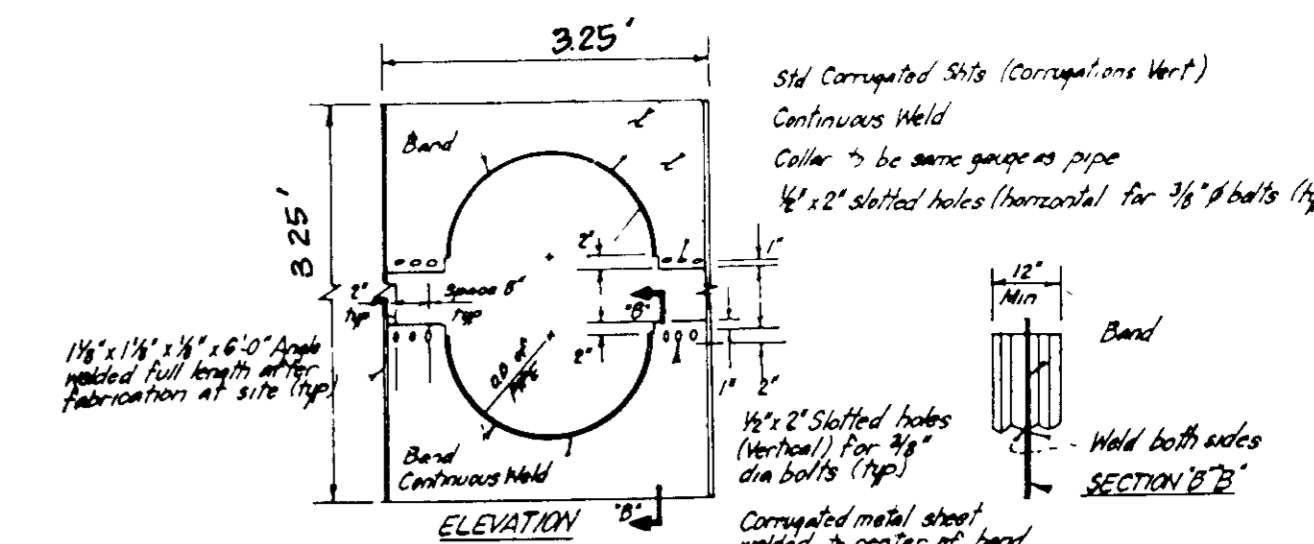
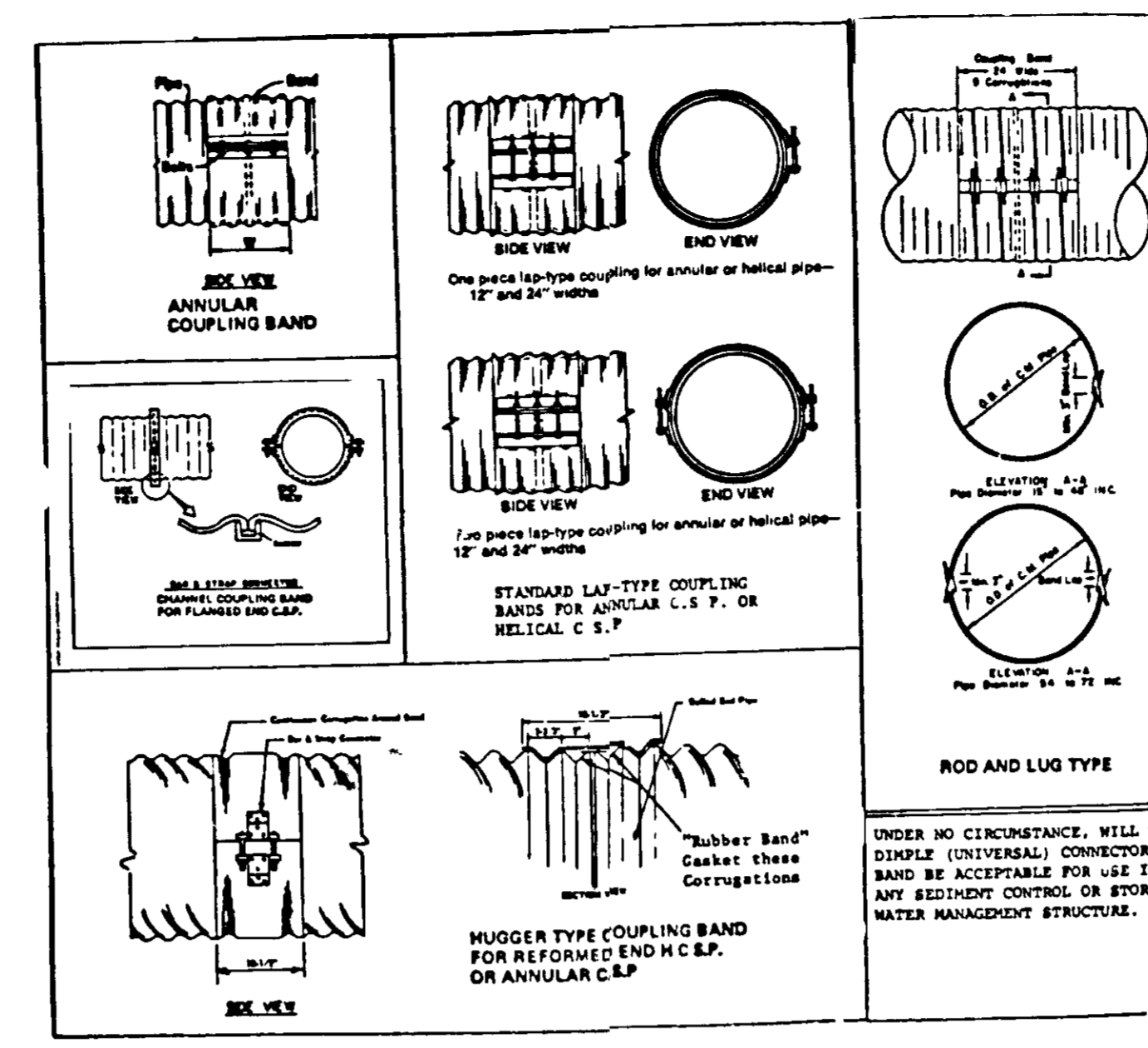
9. **Placing Temperature** - Concrete may not be placed at temperatures below 37° F with the temperature falling, or 36° with the temperature rising.

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

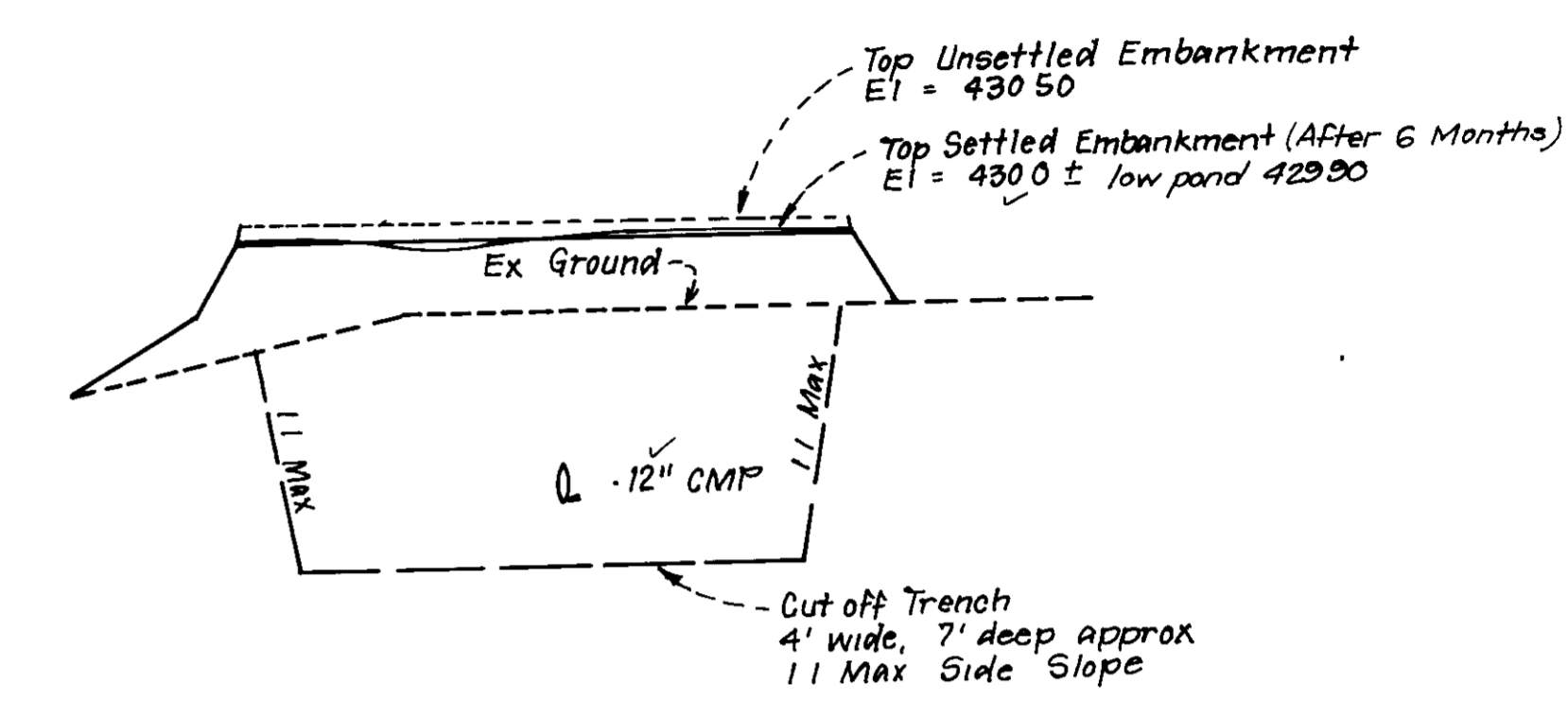
VII. EROSION AND SEDIMENT CONTROL

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 to be employed during the construction process.

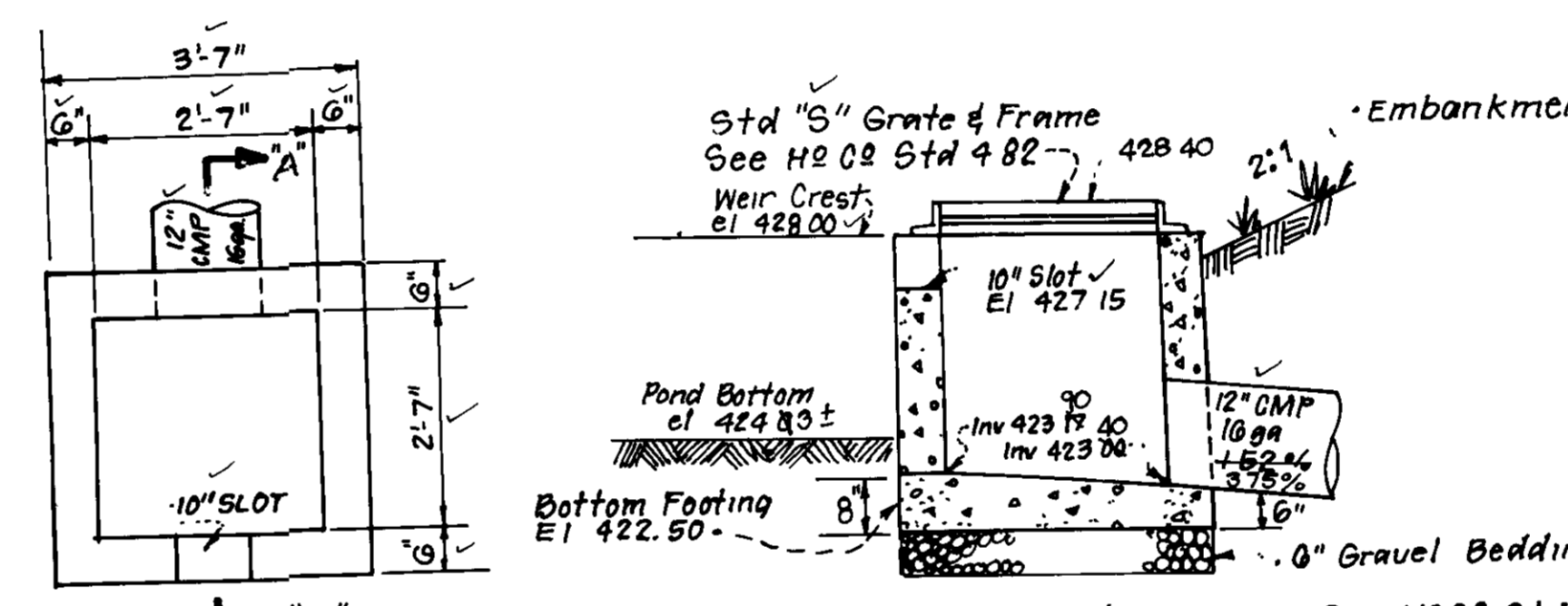


NOTES:
1. All materials to be in accordance with construction material specifications.
2. When specified on the plans, coating of collars shall be in accordance with contractor's specifications.
3. Use assembled collars shall be marked by painting or taping to identify matching pairs.
4. The lap between the top half sections and between the pipe and connection band shall be caulked with mastic at time of installation.
5. Each collar shall be furnished with two 1/2" diameter rods w/flat head nuts for connecting collars to pipe.

CORRUGATED METAL ANTI-SEEP COLLAR DETAILS
NO SCALE



PROFILE THRU DAM
Scale Vert 1"=5', Horz 1"=30'



PLAN VIEW BELOW GRATE

SECTION "A-A"
DETAIL- CONTROL STRUCTURE - I-65
NO SCALE

DEVELOPERS/BUILDERS CERTIFICATE
I/We certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that all responsible personnel involved in the construction project will have a Certificate of Attendance in a Dept. of Natural Resources Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District or their authorized agents, as are deemed necessary. I will provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.
Signature of Developer/Builder: [Signature] Date: 9-1-89

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.
[Signature] 12/1/89 Date



ENGINEER'S CERTIFICATE
I hereby certify that this plan for Erosion and Sediment Control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he must provide the Howard Soil Conservation District with a red-lined "as-built" plan of the pond within 30 days of completion.
Nelson Clark 9-1-89 Date

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS HOWARD COUNTY HEALTH DEPARTMENT
[Signature] 3-16-90 DATE
APPROVED HOWARD COUNTY DEPT. OF PLANNING & ZONING
[Signature] 4-2-90 DATE
DIRECTOR [Signature] 3/2/90 DATE
CHIEF DIVISION OF COMMUNITY PLANNING AND LAND DEVELOPMENT
APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE STORM DRAINAGE SYSTEMS AND PUBLIC ROADS HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[Signature] 3/5/90 DATE
DIRECTOR [Signature] 3-5-90 DATE
CHIEF BUREAU OF ENGINEERING

APPROVED PLAN FOR HOWARD COUNTY BOARD OF HEALTH
DATE NOV 8, 1989

CLARK • FINEROCK & SACKETT, INC. ENGINEERS • PLANNERS • SURVEYORS	
DESIGNED DGT	SITE DEVELOPMENT PLAN, SWM DETAILS PROPOSED WAREHOUSE NO THREE LOT 94 COLUMBIA 1"=30'
DRAWN GES	OAKLAND RIDGE INDUSTRIAL PARK SECTION TWO 2ND ELECTION DISTRICT HOWARD COUNTY, MARYLAND 4 of 4
CHECKED DGT	For: Niro Atomizer Inc 997-8700 3165 Rumsey Road Columbia, Maryland 21045 JOB NO. 87-107 FILE NO. 87-107-X
DATE 9-1-89	AS-BUILT S.D.P. 89-74