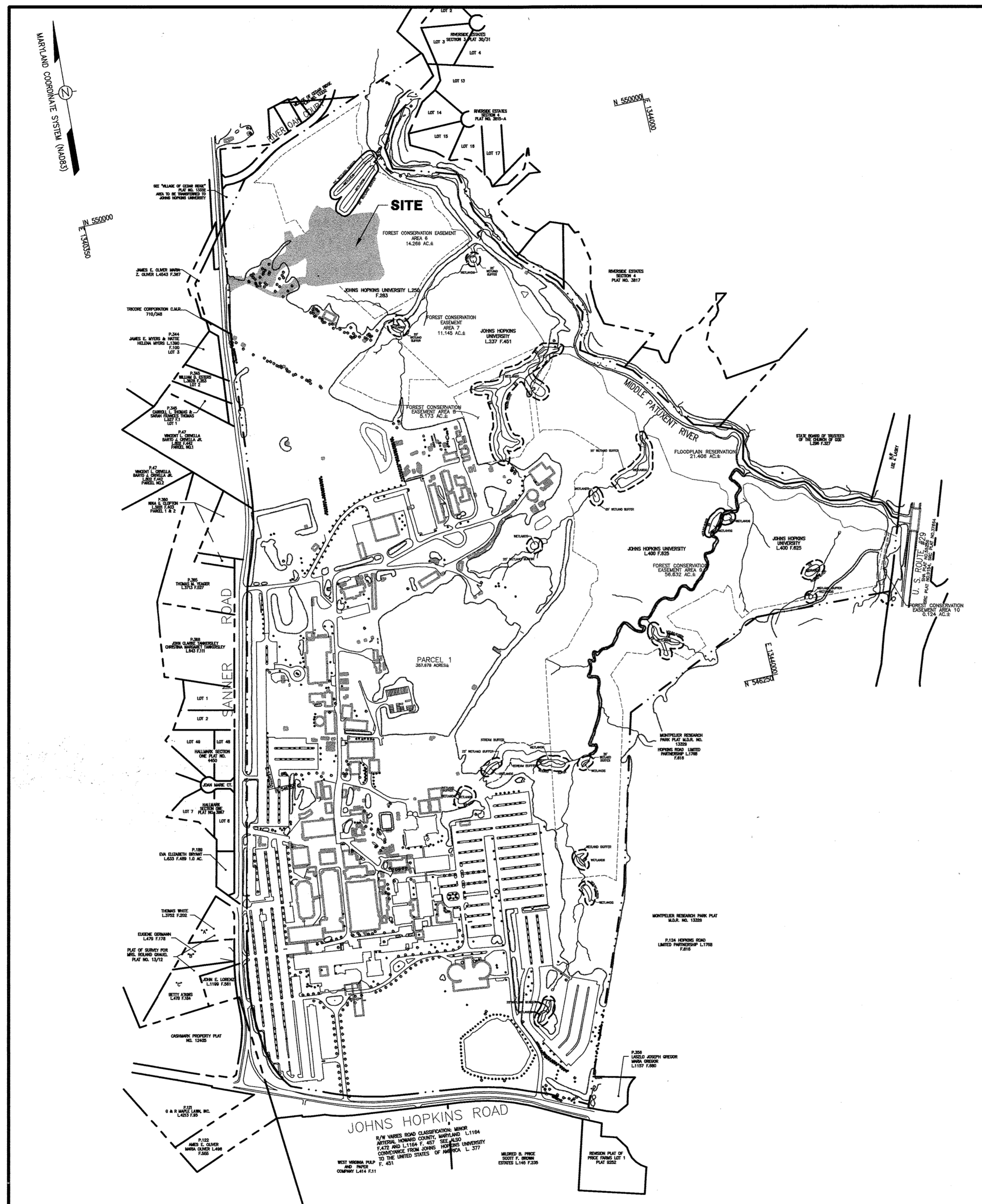


GENERAL NOTES

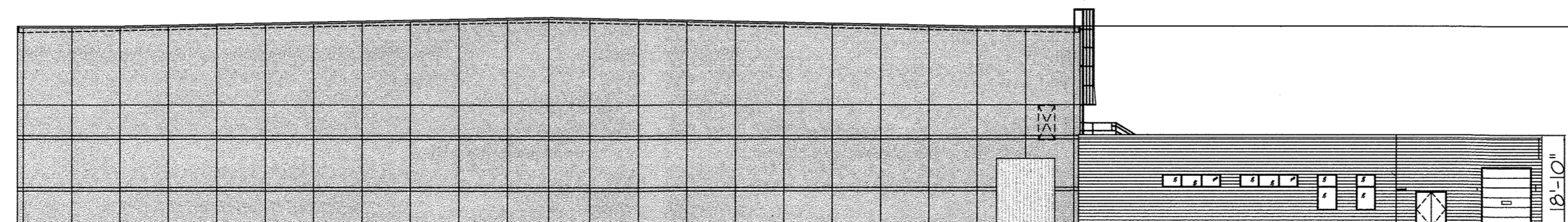
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL CONTACT THE CONSTRUCTION INSPECTION DIVISION 24 HOURS IN ADVANCE OF COMMENCEMENT OF WORK AT (410) 313-1880.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AND JHU/APL PLANT FACILITIES OFFICE (443) 778-0167 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION BEING DONE.
- CONTRACTOR TO SCHEDULE PRECONSTRUCTION MEETING WITH HOWARD COUNTY, CONSTRUCTION INSPECTION DIVISION (410-313-1880) PRIOR TO STARTING CONSTRUCTION.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES(MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY PAVING.
- THE LOCATION OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE BASED ON FIELD LOCATIONS SUPPLEMENTED WITH EXISTING UTILITY DRAWINGS, AND SHOULD BE VERIFIED BY THE CONTRACTOR TO HIS SATISFACTION PRIOR TO CONSTRUCTION. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING UTILITIES, AND ANY DAMAGE DONE TO THEM DUE TO CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY AT HIS OWN EXPENSE.
- CONTRACTOR IS RESPONSIBLE FOR ALL SITE CONDITIONS, CONSTRUCTION REQUIREMENTS, AND SHALL CONFORM TO ALL STATE, FEDERAL, AND COUNTY CONSTRUCTION REGULATIONS. THE CONTRACTOR IS NOT RELIEVED OF RESPONSIBILITY SHOULD ANY REQUIRED ITEMS PERTAINING TO SITE CONSTRUCTION NOT BE INCLUDED ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS AS SHOWN ON THESE PLANS.
- ANY DAMAGE TO EXISTING UTILITIES, PAVEMENT, OR CURB AND GUTTER DUE TO CONSTRUCTION ACTIVITY OUTSIDE THE LIMITS OF DISTURBANCE IS TO BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- WHERE NECESSARY, THE CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITIES AT LEAST FIVE (5) DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE DRAWINGS.
- CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY PROPERTY MONUMENTS, MARKERS, SIGNS, LIGHTS, OR ANY OTHER EXISTING SITE FEATURES DISTURBED DURING CONSTRUCTION.
- ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH TWO FOOT CONTOUR INTERVALS PREPARED BY WHITMAN, REQUARDT & ASSOCIATES, LP DATED JANUARY 2004. JHU APPLIED PHYSICS LAB AERIAL TOPOGRAPHY AND UTILITY INFORMATION SHOWN MAY NOT REFLECT CURRENT CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY CURRENT TOPOGRAPHY AND UTILITY INFORMATION TO HIS OWN SATISFACTION.
- THE SITE BOUNDARY, BEARINGS, AND COORDINATES SHOWN ARE BASED ON ELECTRONIC FILES OBTAINED FROM WHITMAN, REQUARDT AND ASSOCIATES.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE "1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROLS" PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION, SOIL CONSERVATION SERVICE, AND STATE SOIL CONSERVATION COMMITTEE.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM (AND 83). JOHNS HOPKINS UNIVERSITY CONTROL STATIONS NOS. HOPKINS, 41EA, G12, G7 AND G8 WERE USED FOR THIS PROJECT.

JOHNS HOPKINS APPLIED PHYSICS LABORATORY LIBRARIES SERVICE CENTER SITE DEVELOPMENT PLAN



OVERALL SITE MAP
SCALE: 1" = 500'

38. A SIMPLIFIED ECP PLAN WAS APPROVED BY HOWARD COUNTY, DEVELOPMENT ENGINEERING DIVISION ON APRIL 30, 2021.



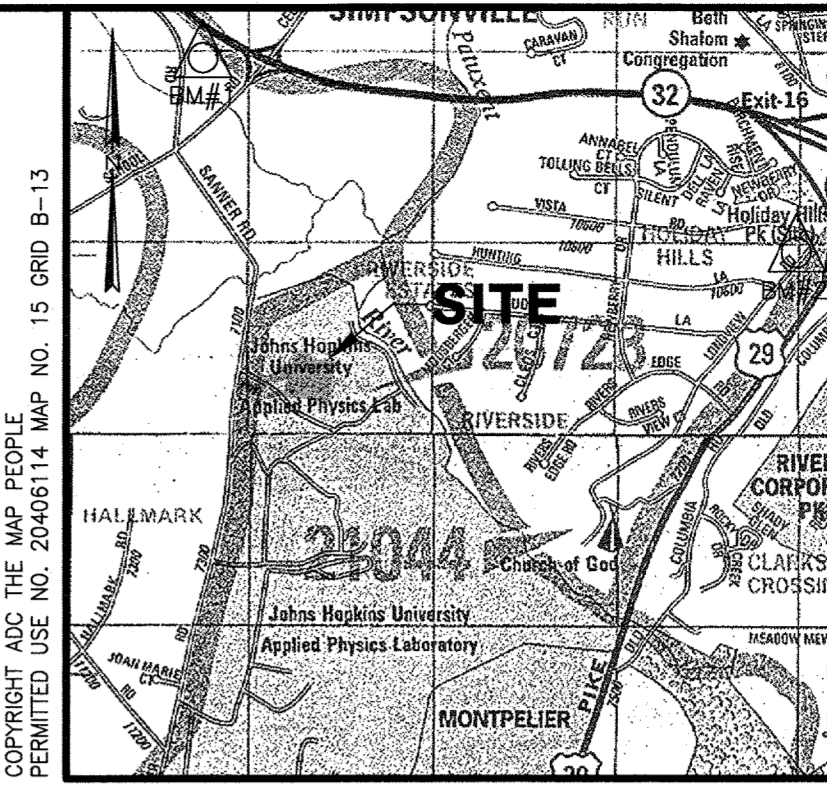
ARCHITECTURAL PROFILE
N.T.S.

BUILDING ADDITIONS ARE SIMILAR TO ORIGINAL BUILDING ELEVATION.



ARCHITECTURAL PROFILE
N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
 CHIEF, DIVISION OF LAND DEVELOPMENT 2/16/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 3/5/05



VICINITY MAP
SCALE: 1" = 2000'

- BENCHMARKS**
- B.M.#1 - HOWARD COUNTY BENCHMARK 4188 - EAST SIDE OF GUILFORD ROAD 1760' WEST OF PINDELL SCHOOL ROAD. NS53,338.80 E1,340,517.48 ELEV. 370.395
 - B.M.#2 - HOWARD COUNTY BENCHMARK 0057 - EAST SIDE OF LONGVIEW ROAD, SOUTH OF VISTA ROAD INTERSECTION. NS50,835.21 E1,347,017.69 ELEV. 398.925

SHEET INDEX

1	COVER SHEET
2	DEMOLITION PLAN
3	SITE LAYOUT PLAN
4	SITE GRADING PLAN
5	STORM DRAIN & UTILITY PLAN
6	SITE DETAILS
7	STORM DRAIN PROFILES
8	STORM DRAIN PROFILES
9	UTILITY PROFILES
10	UTILITY PROFILES
11	STORMWATER MANAGEMENT PLAN
12	STORMWATER MANAGEMENT PLAN
13	STORM DRAIN & SWM DRAINAGE AREA MAPS
14	MD 378 NOTES
15	GEOTECHNICAL REPORT
16	EROSION & SEDIMENT CONTROL PLAN
17	EROSION & SEDIMENT CONTROL DETAILS
18	LIGHTING & LANDSCAPING PLAN
19	LIGHTING & LANDSCAPING DETAILS
20	RETAINING WALL PLAN & GENERAL NOTES
21	RETAINING WALL PROFILE, TYPICAL SECTION & DETAILS
22	GRINDER PUMP DETAILS
23	EROSION & SEDIMENT CONTROL DETAILS/NOTES

BUILDING SQUARE FOOTAGE TABULATION

- 1. PROPOSED BUILDING COVERAGE = 34,724 S.F.
- 2. FUTURE (ULTIMATE) BUILDING COVERAGE = 26,815 S.F.
- 3. TOTAL (ULTIMATE) BUILDING COVERAGE = 68,622 S.F.
- 1. GROSS BUILDING SQUARE FOOTAGE = 38,206 S.F.
- 2. FUTURE (ULTIMATE) BUILDING SQUARE FOOTAGE = 89,920 S.F.
- 3. TOTAL (ULTIMATE) BUILDING SQUARE FOOTAGE = 128,126 S.F.

PROPOSED DISTURBANCE = 52,220 SF / 1.19 AC.
 SWM WILL BE REQUIRED WHEN CUMULATIVE LOD EXCEEDS 5000 SF.

SITE ANALYSIS DATA CHART

- TOTAL PROJECT AREA: 361 ACRES +/-
- AREA OF PLAN SUBMISSION: 6.45 ACRES +/-
- LIMIT OF DISTURBANCE: 6.45 ACRES +/-
- PRESENT ZONING: PEC
- PROPOSED USE: LIBRARY BOOK STORAGE FACILITY JOHNS HOPKINS UNIVERSITY
- EXISTING NUMBER OF EMPLOYEES (JHU/APL CAMPUS): 3646
- PROPOSED NUMBER OF EMPLOYEES (PER THIS PLAN): 20
- TOTAL NUMBER OF EMPLOYEES (JHU/APL CAMPUS, INCL. THIS PLAN): 3666
- MAXIMUM NUMBER OF EMPLOYEES ALLOWED PER APFO STUDY PER F-02-40: 3937
- EXISTING MINIMUM NUMBER OF PARKING SPACES REQUIRED BY ZONING: 2953 (F-02-40)
- EXISTING ONSITE PARKING SPACES (JHU/APL CAMPUS): 4793 (SDP 04-76)
- PROPOSED PARKING SPACES (PER THIS PLAN): 22 (INCL. 4 HC SPACES)
- TOTAL NUMBER OF ONSITE PARKING SPACES (JHU/APL CAMPUS, INCL. THIS PLAN): 4815
- EXISTING BUILDING COVERAGE (JHU/APL CAMPUS): 21.1 ACRES (SDP-04-133)
- PROPOSED BUILDING COVERAGE* (PER THIS PLAN): 68,622 SF OR 1.6 ACRES ±
- TOTAL BUILDING COVERAGE* (JHU/APL CAMPUS, INCL. THIS PLAN): 22.7 ACRES, 6.3% OF TOTAL LOT AREA
- *THE BUILDING COVERAGE INFORMATION INCLUDES THE FUTURE BUILDING AREA. SEE THE BUILDING SQUARE FOOTAGE TABULATION ON THIS SHEET.
- EXISTING GROSS FLOOR AREA COVERAGE (JHU/APL CAMPUS): 44.8 ACRES (SDP-04-133)
- PROPOSED GROSS FLOOR COVERAGE* (PER THIS PLAN): 128,126 SF OR 2.94 ACRES ±
- TOTAL GROSS FLOOR AREA COVERAGE* (JHU/APL CAMPUS, INCL. THIS PLAN): 47.74 ACRES, 13.2% OF TOTAL LOT AREA
- *THE GROSS FLOOR AREA COVERAGE INFORMATION INCLUDES THE FUTURE BUILDING AREA. SEE THE BUILDING SQUARE FOOTAGE TABULATION ON THIS SHEET.
- CASE NUMBERS - APPLICABLE IMPROVEMENTS:
 - F 02-40 - FOREST CONSERVATION, FLOODPLAIN, PUBLIC R/W
 - F 04-188 - FOREST CONSERVATION AND WETLANDS
 - SDP 04-35 - SWM BASIN G
 - SDP 04-66 - BALL FIELD ENTRANCE AND PARKING LOTS
 - SDP 04-76 - SERVICES AREA COMPLEX
 - SDP 04-133 - BASIN C SWM FACILITIES & LAYDOWN AREA
 - SDP 05-43 - SANNER ROAD IMPROVEMENTS
- SANITARY SEWER/ WATER SERVICE: PRIVATE ONSITE SYSTEM, PUBLIC CONNECTION
- EXISTING OPEN SPACE AREA (LOT AREA MINUS PARKING & BUILDINGS): 286 ACRES, 81.7% OF TOTAL LOT AREA (PROVIDED BY JHU APL)
- PROPOSED OPEN SPACE AREA: 283 ACRES, 78.4% OF TOTAL LOT AREA

OPTION 3: PREVIOUSLY ADDRESSED (Including Use of FC Bank)	FOREST CONSERVATION DATA SUMMARY
File Number: F-04-188	Project/Subdivision Name: JOHNS HOPKINS UNIVERSITY PROPERTY (APPLIED PHYSICS LABORATORY SITE)
Comment: Addressed by How. Co. Subdivision & Land Development Regulations, Sec. 16.1202.(6)(1)(i). See F-04-188 Plat # 17042 thru 17046.	

ADDRESS CHART			
LOT/PARCEL NO.	STREET ADDRESS		
289 / 1	14188 JOHNS HOPKINS ROAD LAUREL, MD 20723		
	7125 SANNER ROAD		

OWNER:				PERMIT INFORMATION CHART			
THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY 11100 JOHNS HOPKINS ROAD LAUREL, MD 20723 ATT. MR. JAMES LOESCH VOICE (443) 778-5134 FAX (443) 778-6122				SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL NO.	
				JOHNS HOPKINS UNIVERSITY PROPERTY (APPLIED PHYSICS LABORATORY SITE)	N/A	289 / 1	
				PLAT # OR L/F	GRID #	ZONE	TAX MAP NO.
				17042 - 17046	11	PEC	41
				ELECT. DIST.	CENSUS TRACT		
				5TH	605102		
				WATER CODE:	SEWER CODE:		
				E-21	6480000		

REVISIONS		
Asbuilt info added		03/06
REDLINE REVISION #1		5/1/21
REVISED ADDRESS		10/8/21

APPROVALS	
REQUESTOR	
PLANNING FACILITIES ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY
 JOHNS HOPKINS ROAD
 LAUREL, MARYLAND 20723-6099
 TAX MAP 41, GRID 16, PARCEL 1
 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

THE JOHNS HOPKINS UNIVERSITY

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GRAPHIC SCALE

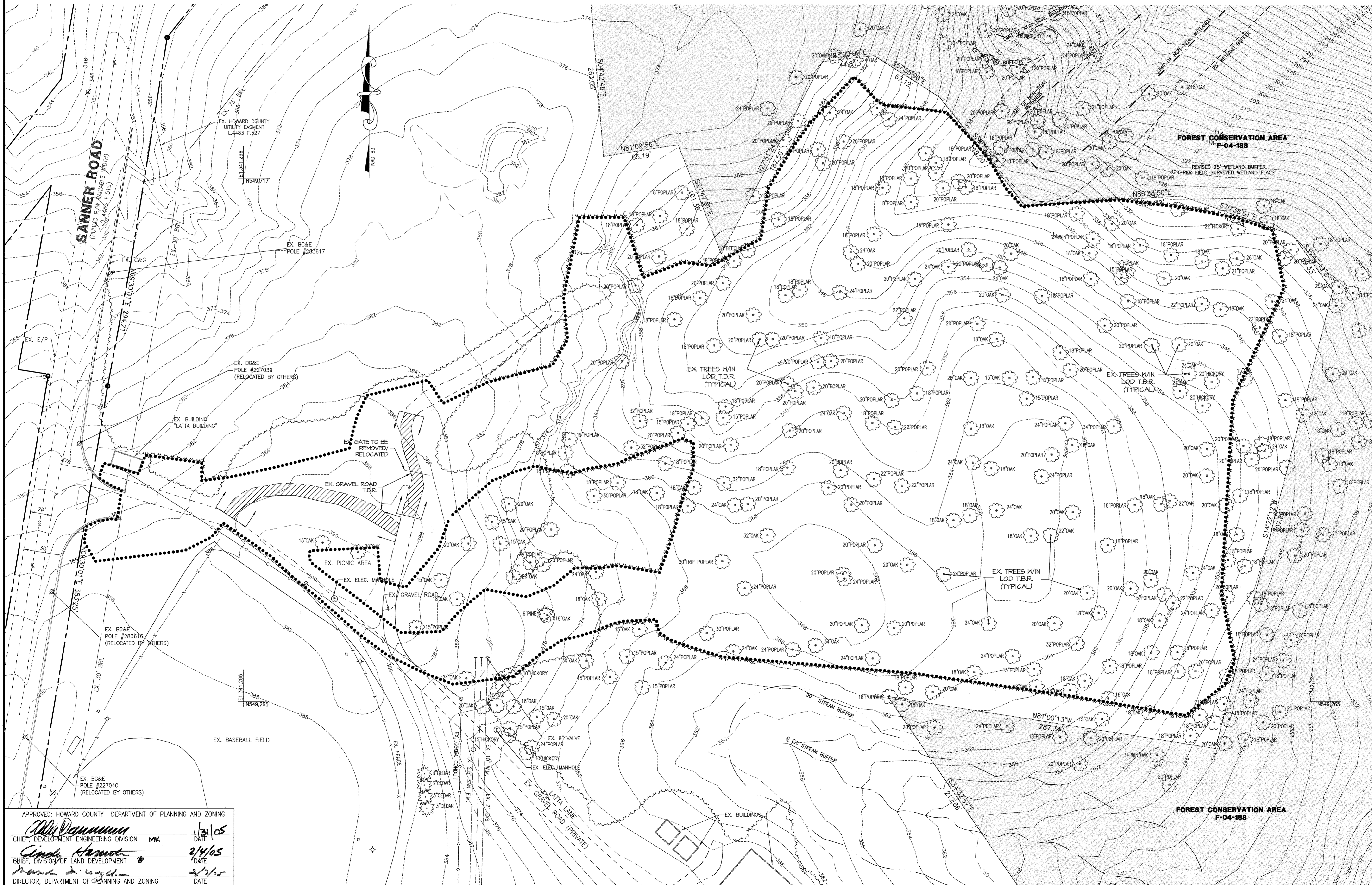
MRA
 MORRIS & RITCHIE ASSOCIATES, INC.
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
 14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1690
 FAX (410) 792-7385

COVER SHEET
 JOB NO.: 13685

SDP-1
 SHEET: 1 OF 23
 SCALE: AS SHOWN
 DES: MP CHECK: TCN DATE: 01-17-05

LEGEND

- EX. TREE LINE
- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. CASSEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. GAS
- EX. SANITARY F.M.
- EX. WATER
- EX. CONDUIT
- EX. WETLAND BUFFER
- EX. STREAM BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. FOREST CONSERVATION AREA
- PROP. LIMIT OF DISTURBANCE
- PROP. TREE LINE
- LIMITS OF REMOVAL FOR GRAVEL ROADS
- T.B.R. - TO BE REMOVED



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Colin Dammann
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
 DATE

David Hamilton
 CHIEF, DIVISION OF LAND DEVELOPMENT 2/1/05
 DATE

David D. Leight
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 2/1/05
 DATE

REVISIONS

NO.	DESCRIPTION

APPROVALS

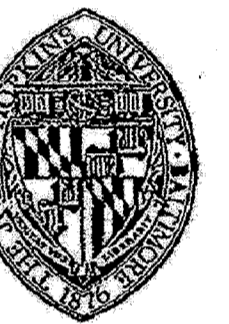
REQUESTER	DATE
PLANNING FACILITIES DEPT	
ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTOR	
COORDINATOR	
SENIOR LEADER	

THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

JOHNS HOPKINS ROAD
 LAUREL, MARYLAND 20723-6099

TAX MAP 41, GRID 16, PARCEL 1
 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

THE JOHNS HOPKINS UNIVERSITY

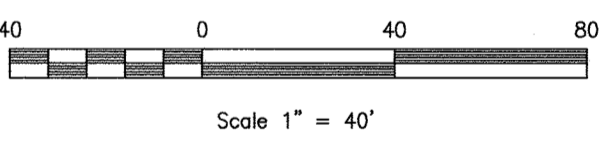


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GRAPHIC SCALE

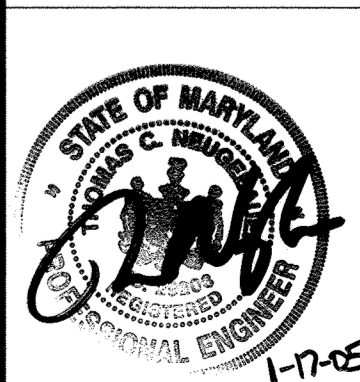


MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

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 LAUREL, MARYLAND 20707
 (410) 782-9782 or (301) 778-1680
 FAX (410) 782-7395

EXISTING CONDITIONS /DEMOLITION PLAN



JOB NO.: 13685

SDP-2

SHEET: 2 OF 23

SCALE: 1" = 40'

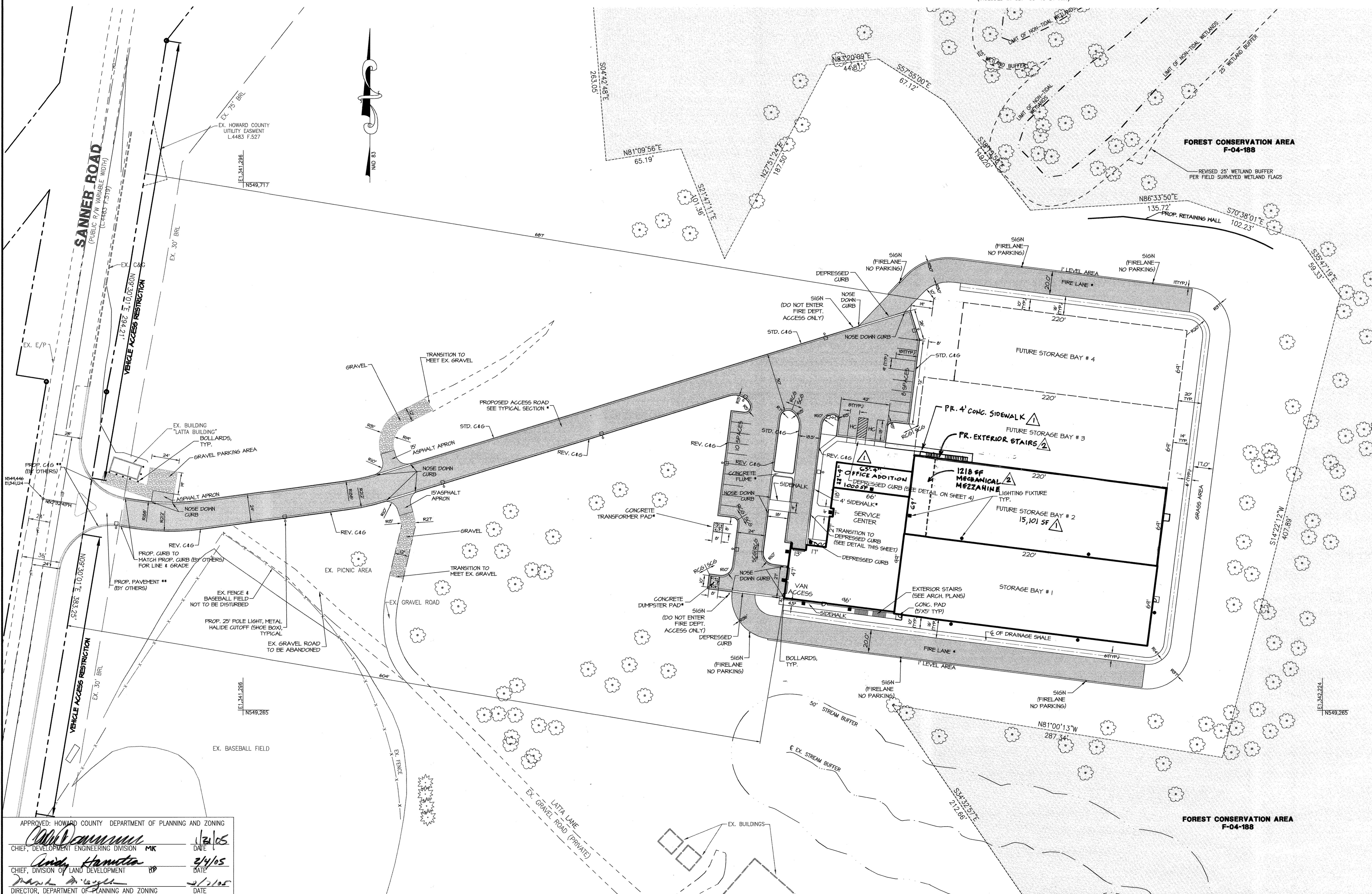
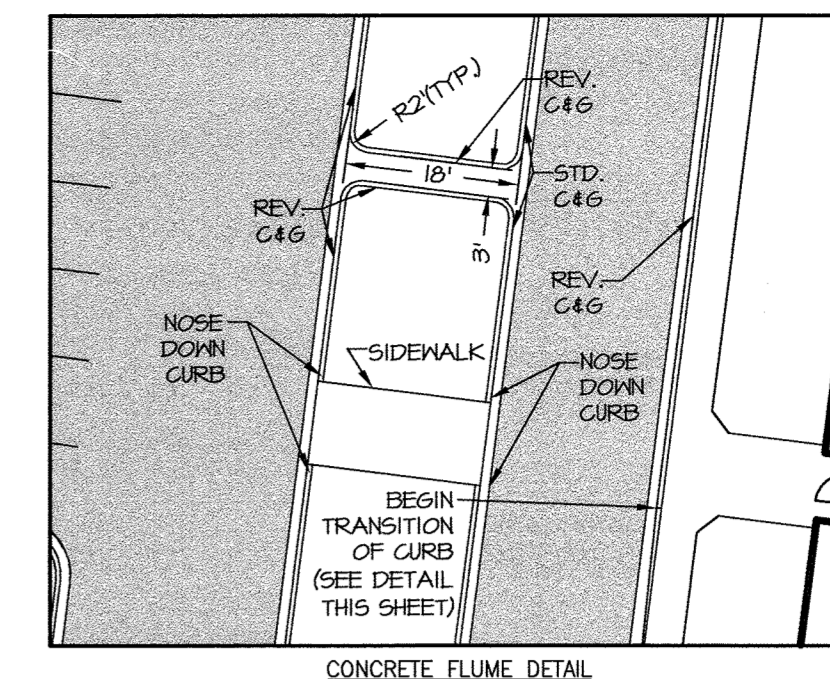
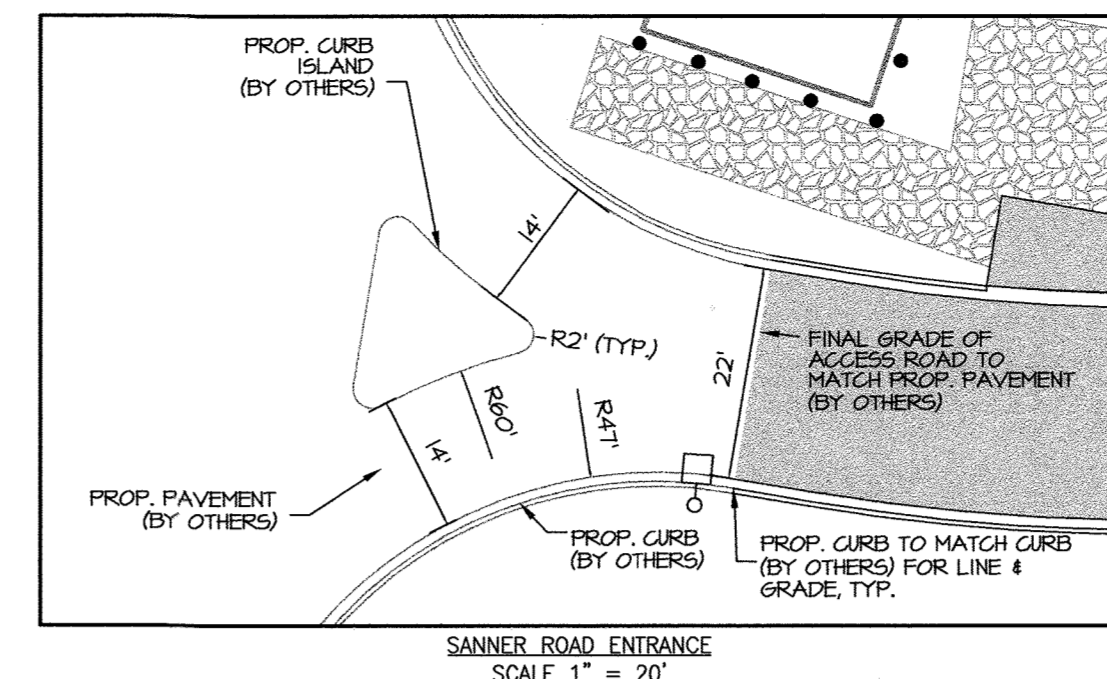
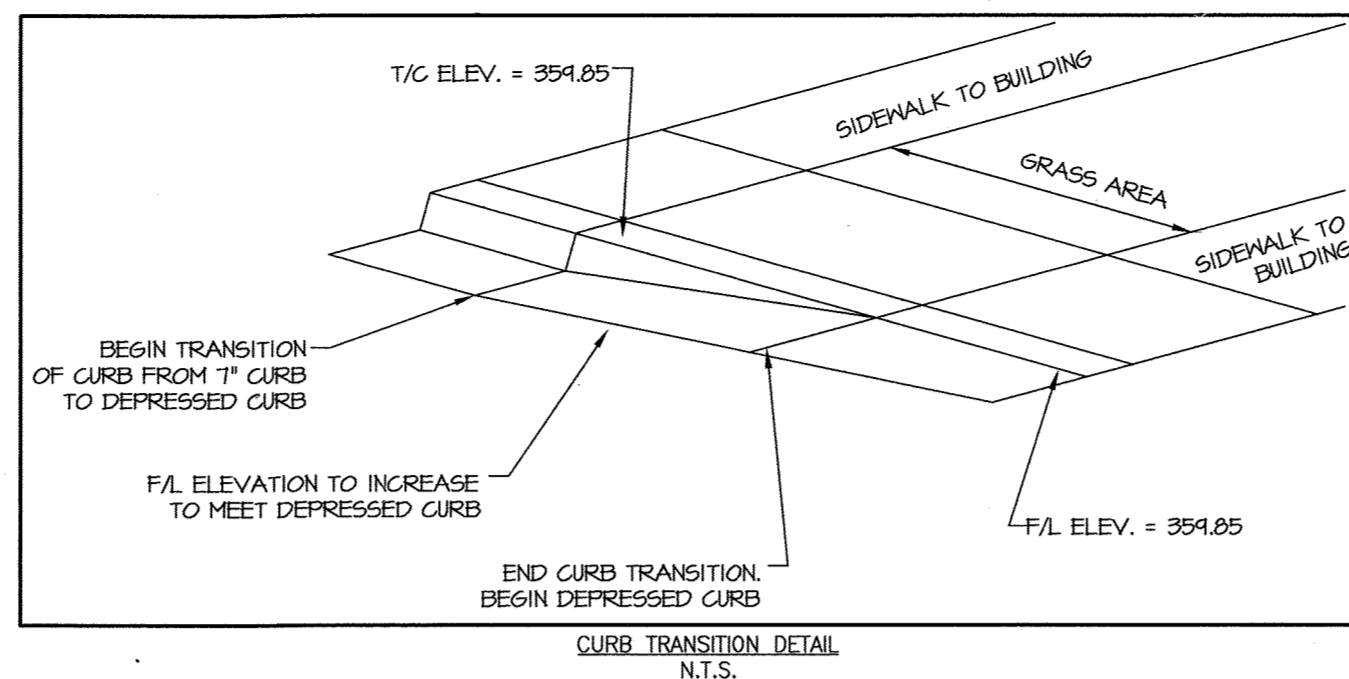
DES: LFB CHECK: TCN DATE: 01-17-05

LEGEND

- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. FOREST CONSERVATION AREA
- PROP. LIMIT OF DISTURBANCE
- PROP. TREE LINE
- PROP. CURB
- PROP. TURF FOR FIRELANE
- PROP. PAVEMENT
- PROP. CENTERLINE OF DRAINAGE SWALE
- PROP. FUTURE BUILDING
- PROP. BUILDING
- PROP. LIGHTING FIXTURE TYPE "A"
- PROP. LIGHTING FIXTURE TYPE "B"

NOTES

- ALL SPOT ELEVATIONS +300'
- * SEE DETAIL SHEET (SDP-6)
- RC21/2C6 (REV. CURB & GUTTER)(STD. CURB & GUTTER)
- ** SEE ROAD IMP. PLANS ENTITLED "SANNER ROAD IMPROVEMENTS" BY AMT (SDP-05-43)
- SEE DETAIL SHEET FOR ALL SITE PAVEMENT, CURB & GUTTER, SIDEWALK, CONCRETE PADS AND MISC. SITE DETAILS.
- ASPHALT APRON SECTION TO MATCH ACCESS ROAD TYP. PAVEMENT SECTION
- DEPRESSED CURB TO BE INSTALLED BETWEEN CURB NOSE DOWNS.



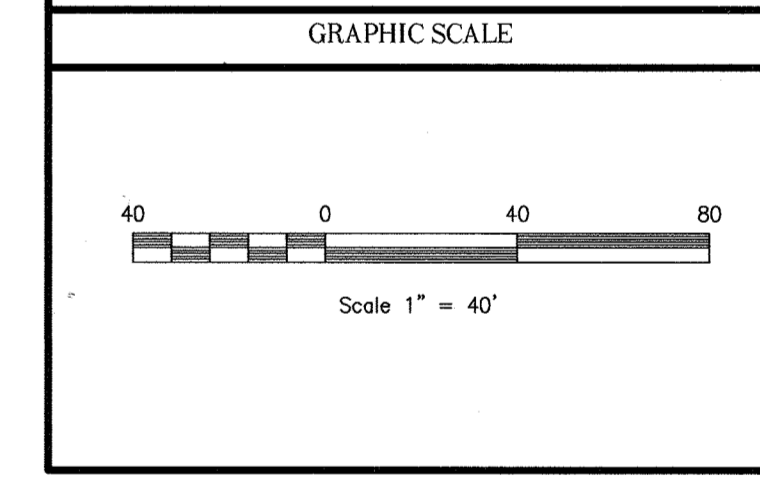
REVISIONS		
1	REDLINE REVISION #1	5/7/21
2	ADDED STAIRS + MEZZANINE	10/8/21

APPROVALS	
PROFESSIONAL ENGINEER	
PLANT FACILITIES DESIGN ENGINEER	
CODE COMPLIANCE REVIEW	
TSC GROUP	
TIF GROUP	
SAFETY OFFICER	
DIRECTOR	
OWNER	
COORDINATOR	
SIGNATURE	

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
 JOHNS HOPKINS ROAD
 LAUREL, MARYLAND 20723-6099
 TAX MAP 41, GRID 16, PARCEL 1
 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

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SITE LAYOUT PLAN	
For REVISIONS #1-2	JOB NO.: 13685
TCP 8/4/21	
STATE OF MARYLAND PROFESSIONAL ENGINEER	SDP-3
1-7-05	SHEET: 3 OF 23
SCALE: 1" = 40'	
DES: LFB	CHECK: TCN
	DATE: 01-17-05

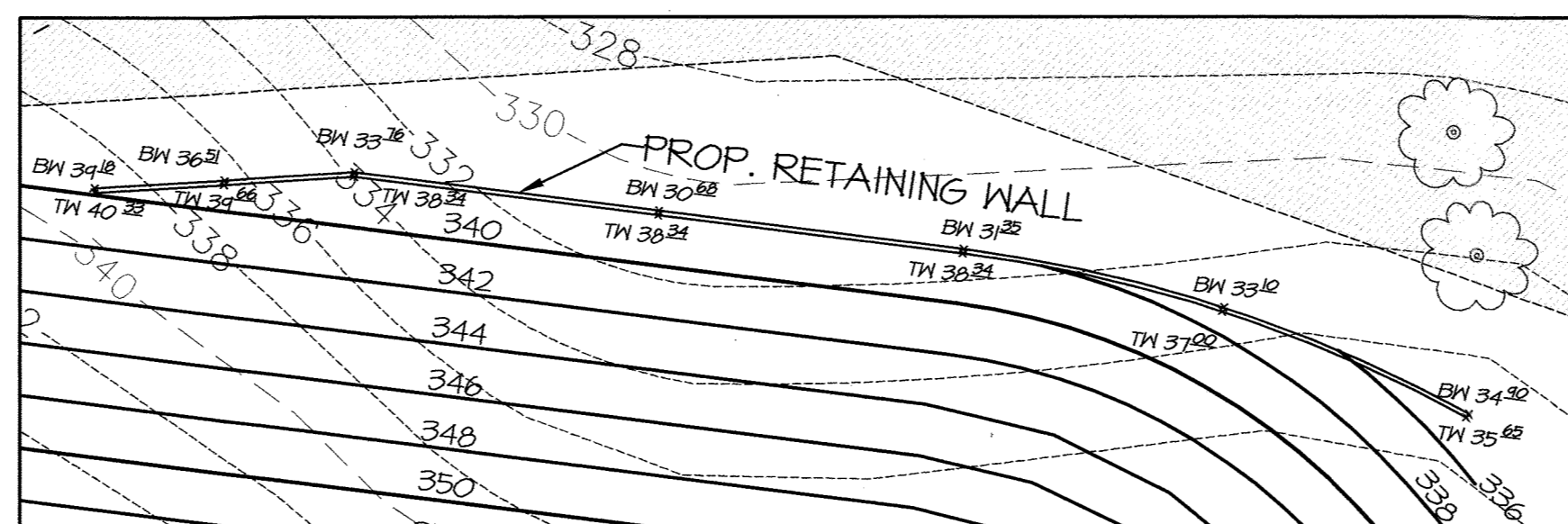
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division MK 1/21/05
 Chief, Division of Land Development RP 2/4/05
 Director, Department of Planning and Zoning 2/1/05

LEGEND

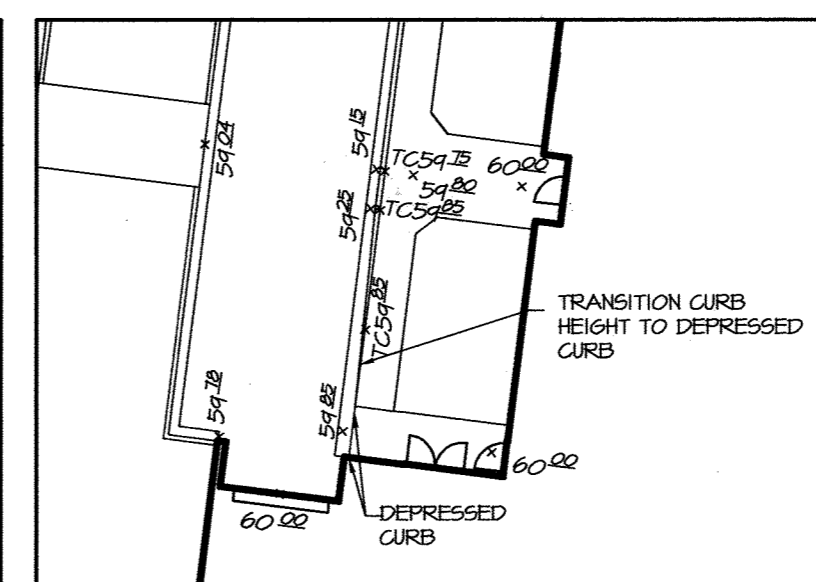
- EX. TREE LINE
- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. WETLAND BUFFER
- EX. STREAM BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. FOREST CONSERVATION AREA
- PROP. TREE LINE
- PROP. STORM DRAIN
- PROP. STORM DRAIN INLET
- PROP. CENTERLINE OF DRAINAGE
- PROP. FUTURE BUILDING
- PROP. BUILDING

NOTES

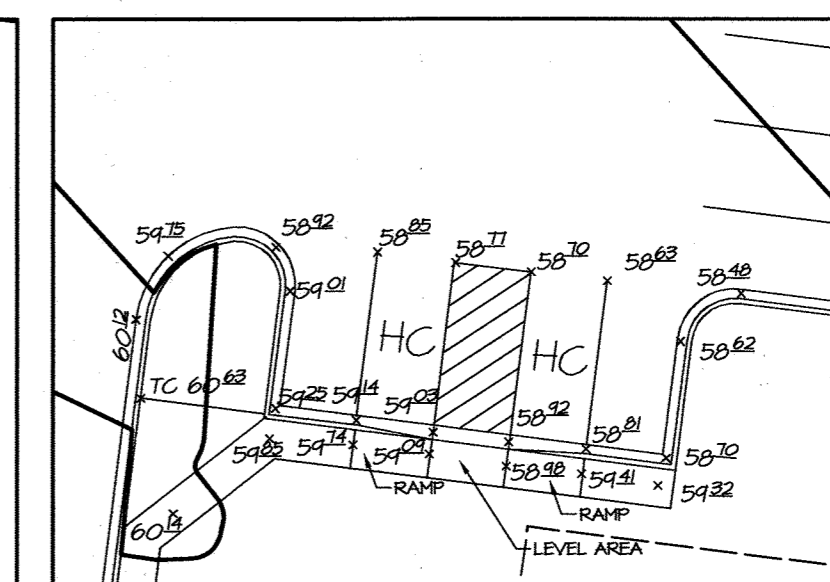
- ALL SPOT ELEVATIONS +300'
- * SEE DETAIL SHEET (SDP-6)
- RC61566
(REV. CURB & GUTTER) (STD. CURB & GUTTER)
- ** SEE ROAD IMP. PLANS ENTITLED "SANNER ROAD IMPROVEMENTS" BY AMT (SDP-05-43)
- SEE DETAIL SHEET FOR ALL SITE PAVEMENT, CURB & GUTTER, SIDEWALK, CONCRETE PADS AND MISC. SITE DETAILS.
- ASPHALT APRON SECTION TO MATCH ACCESS ROAD TYP. PAVEMENT SECTION



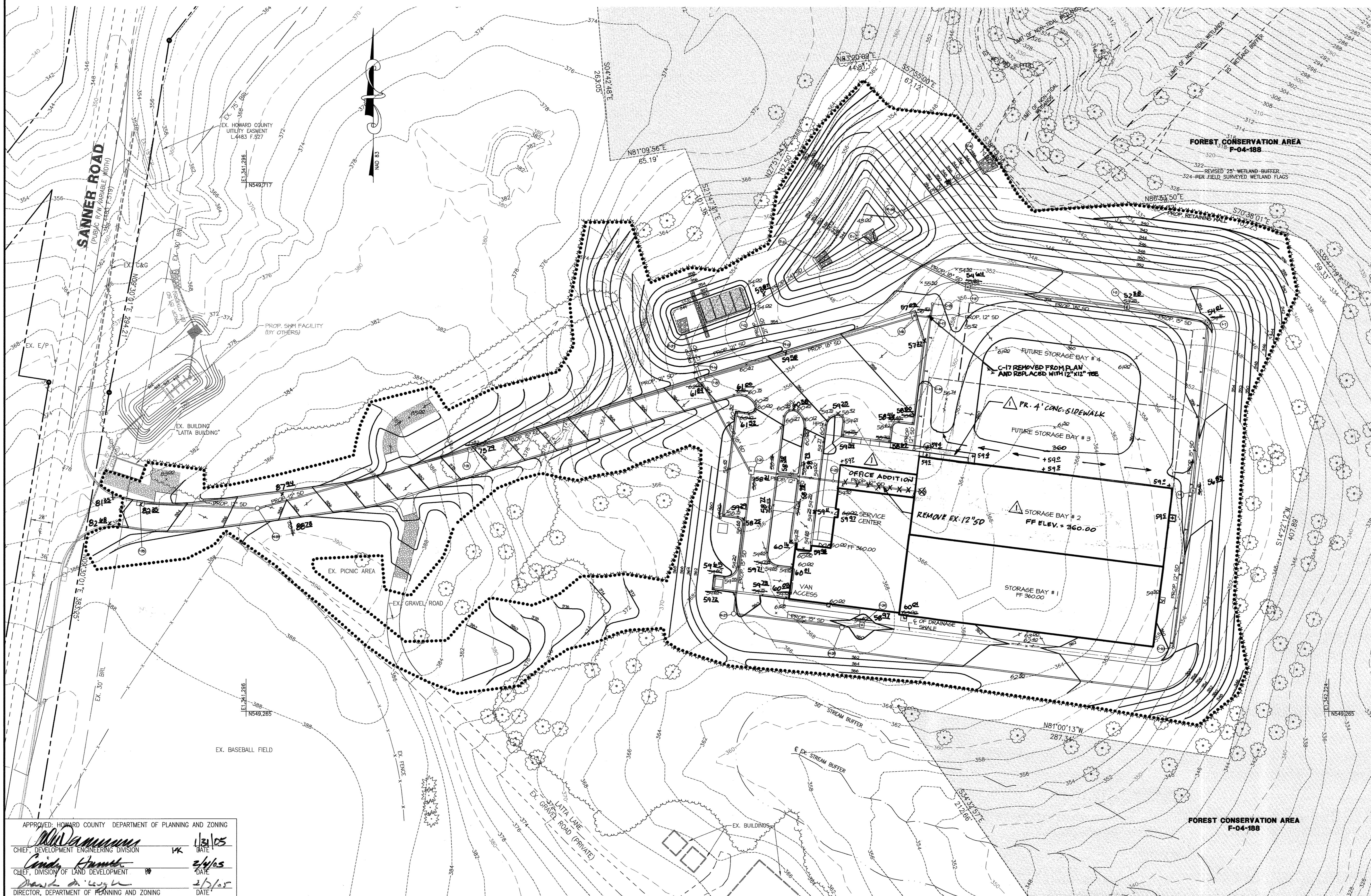
RETAINING WALL DETAIL
SCALE 1" = 20'
(SEE SHEETS 20-21 FOR RETAINING WALL CONSTRUCTION DETAIL)



SIDEWALK-DRIVEWAY TRANSITION DETAIL
SCALE 1" = 20'
(SEE "CURB TRANSITION DETAIL" SHEET 3)



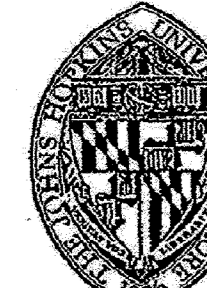
HANDICAPPED PARKING DETAIL
SCALE 1" = 20'
(REFER TO "HANDICAPPED RAMP" & "DEPRESSED CURB" DETAILS SHEET 6)



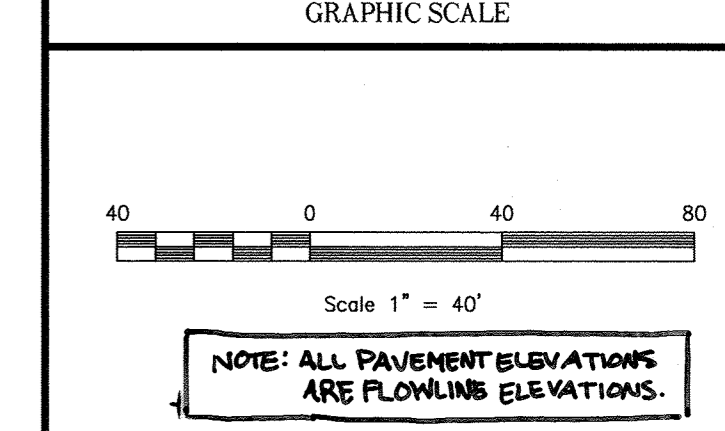
REVISIONS		
ASBUILT INFO ADDED		03/06
REDLINE REVISION #1		5/7/21

APPROVALS	
REGISTERED	
PLANNING FACILITIES/DEPT	
ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SURVEY	
OFFICE	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR ENGINEER	

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 TAX MAP 41, GRID 16, PARCEL 1
 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

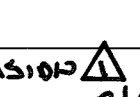
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 FAX (410) 782-7385

GRADING PLAN

FOR REVISION:  5/14/21
 JOB NO.: 13685

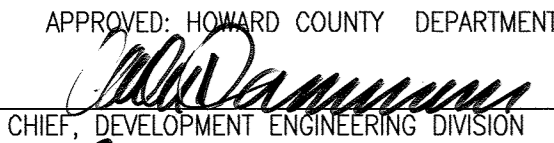
 **SDP-4**
 SHEET: 4 OF 23


SCALE: 1" = 40'


DES: LFB CHECK: TCN DATE: 01-17-05

SDP-05-42

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 1/31/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

 2/1/05
 CHIEF, DIVISION OF LAND DEVELOPMENT WB DATE

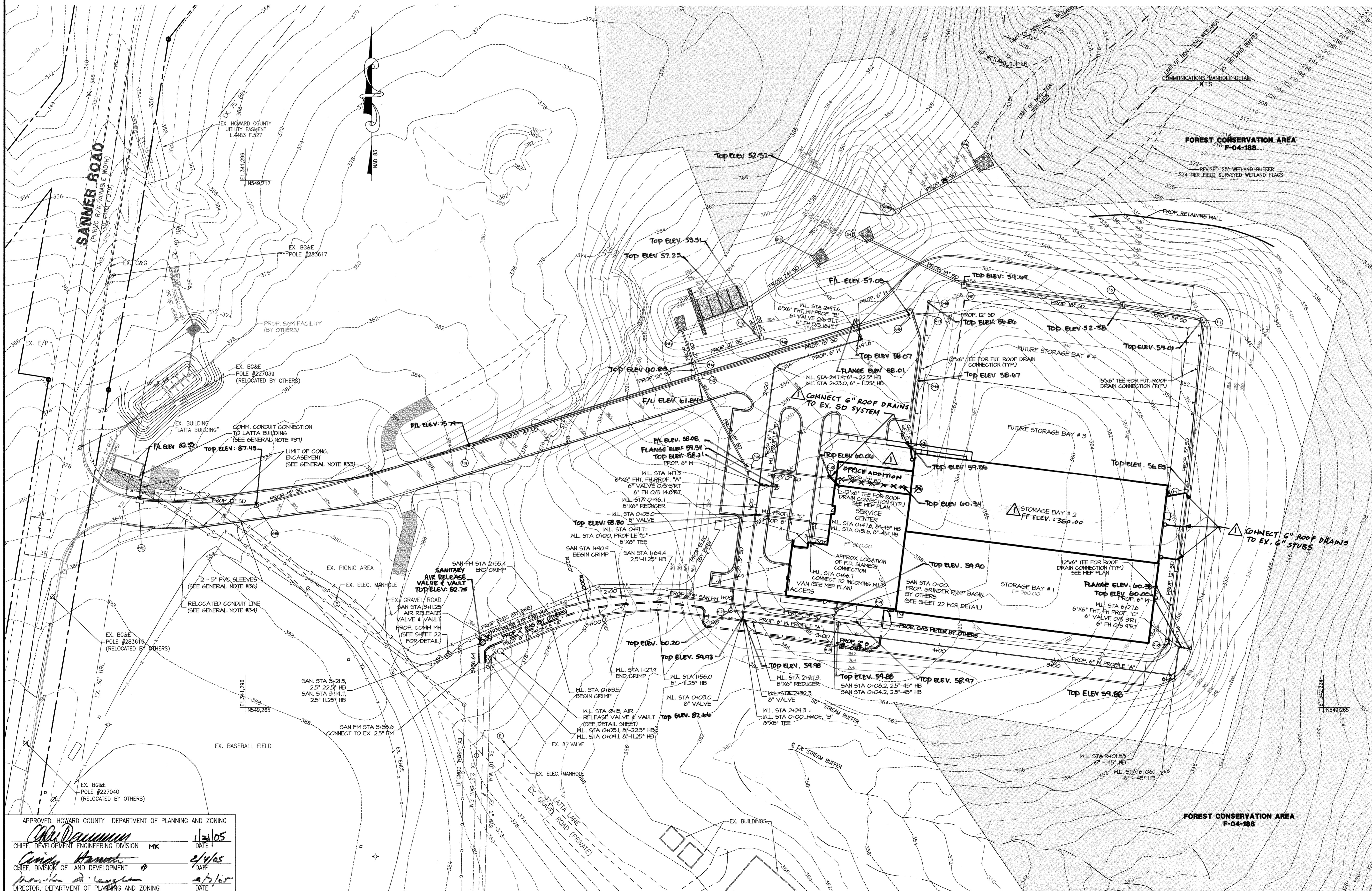
 2/5/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

LEGEND

	EX. TREE LINE		PROP. SUPER SILT FENCE
	EX. PROPERTY LINE		PROP. RIP RAP
	EX. PAVEMENT		PROP. LIMIT OF DISTURBANCE
	EX. BUILDING		PROP. TREE LINE
	EX. EASEMENT		PROP. STORM DRAIN
	EX. CURB		PROP. STORM DRAIN INLET
	EX. STORM DRAIN		PROP. GAS (BY OTHERS)
	EX. GAS		PROP. GAS (BY OTHERS)
	EX. SANITARY F.M.		PROP. SANITARY F.M.
	EX. WATER		PROP. WATER
	EX. CONDUIT		PROP. FIRE HYDRANT
	EX. WETLAND BUFFER		PROP. WATER VALVE
	EX. STREAM BUFFER		PROP. CURB
	EX. 2' CONTOUR		PROP. CENTERLINE OF DRAINAGE SWALE
	EX. 10' CONTOUR		PROP. FUTURE BUILDING
	EX. FOREST CONSERVATION A		PROP. BUILDING
	PROP. SILT FENCE		

NOTES

ALL SPOT ELEVATIONS +300'
 * SEE DETAIL SHEET (SDP-6)
 R261506
 (REV. CURB & GUTTER) (STD. CURB & GUTTER)
 ** SEE ROAD IMP. PLANS ENTITLED "SANNER ROAD IMPROVEMENTS" BY AMT (SDP-05-43)
 SEE DETAIL SHEET FOR ALL SITE PAVEMENT, CURB & GUTTER, SIDEWALK, CONCRETE PADS AND MISC. SITE DETAILS.
 ASPHALT APRON SECTION TO MATCH ACCESS ROAD TYP. PAVEMENT SECTION



REVISIONS	
AS BUILT INFO ADDED	03/06
REDFINE REVISION #1	5/7/21

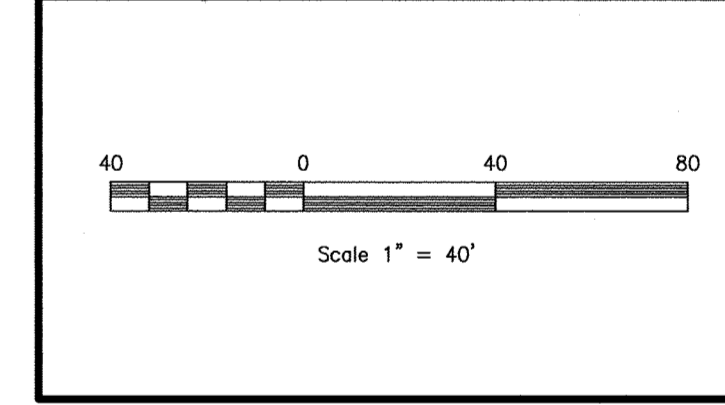
APPROVALS	
PROJECTOR	
PLANT FACULTY/ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
START DATE	
END DATE	
DIRECTOR	
COMMISSIONER	
SENIOR LEADER	

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APPLIED PHYSICS LABORATORY
 JOHNS HOPKINS ROAD
 LAUREL, MARYLAND 20723-6099
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 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

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 MORRIS & RITCHIE ASSOCIATES, INC.
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 14280 PARK CENTER DRIVE, SUITE A
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 FAX (410) 792-7395

UTILITY PLAN
 For Review 3-4-20
 JOB NO.: 13685

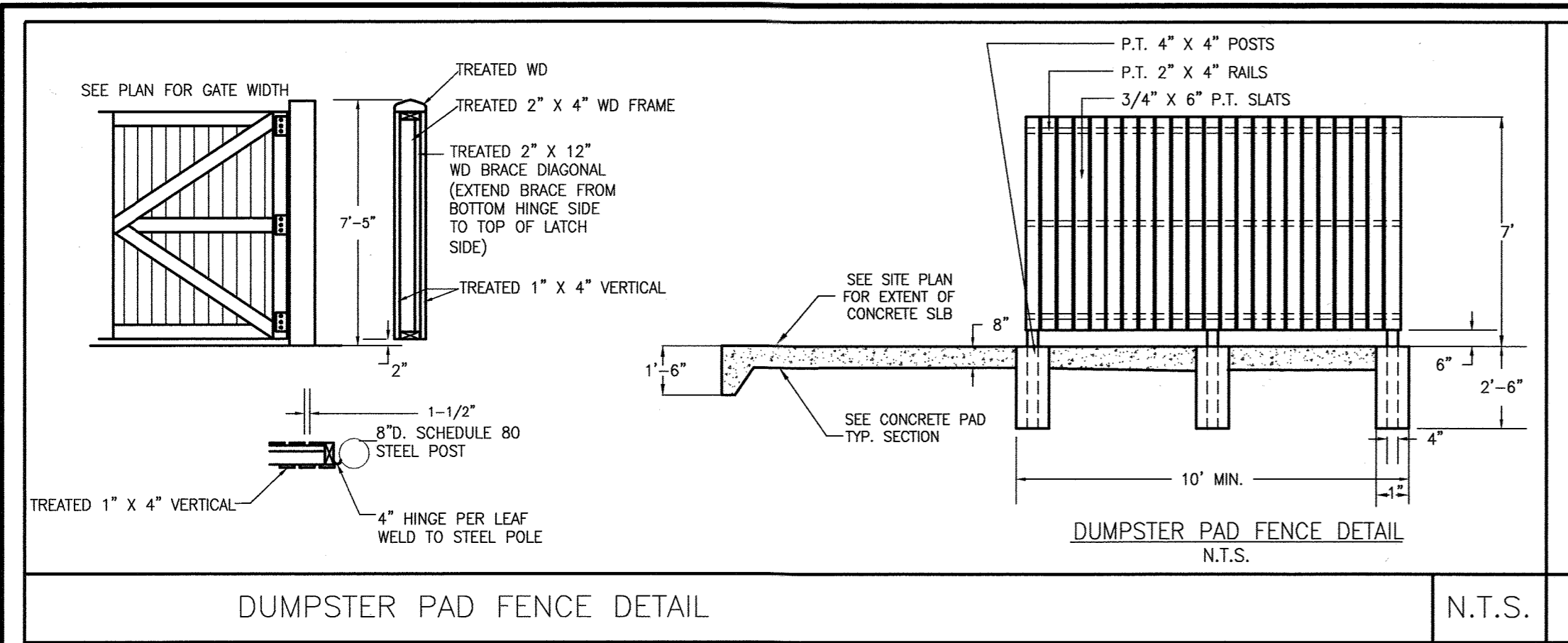
SDP-5
 SHEET: 5 OF 23
 SCALE: 1" = 40'
 DES: LFB CHECK: TCN DATE: 01-17-05
 SDP-05-42

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK
 DATE: 1/21/05

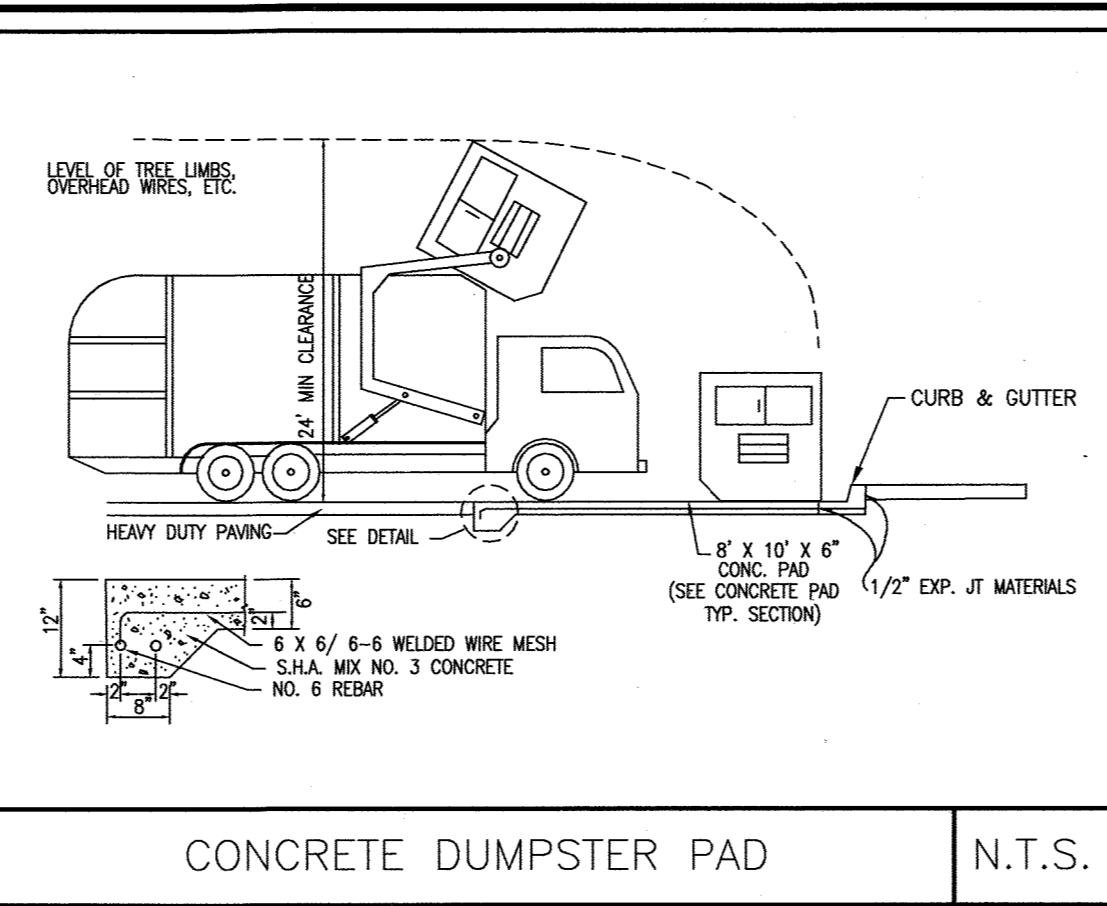
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 2/4/05

 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING
 DATE: 2/5/05



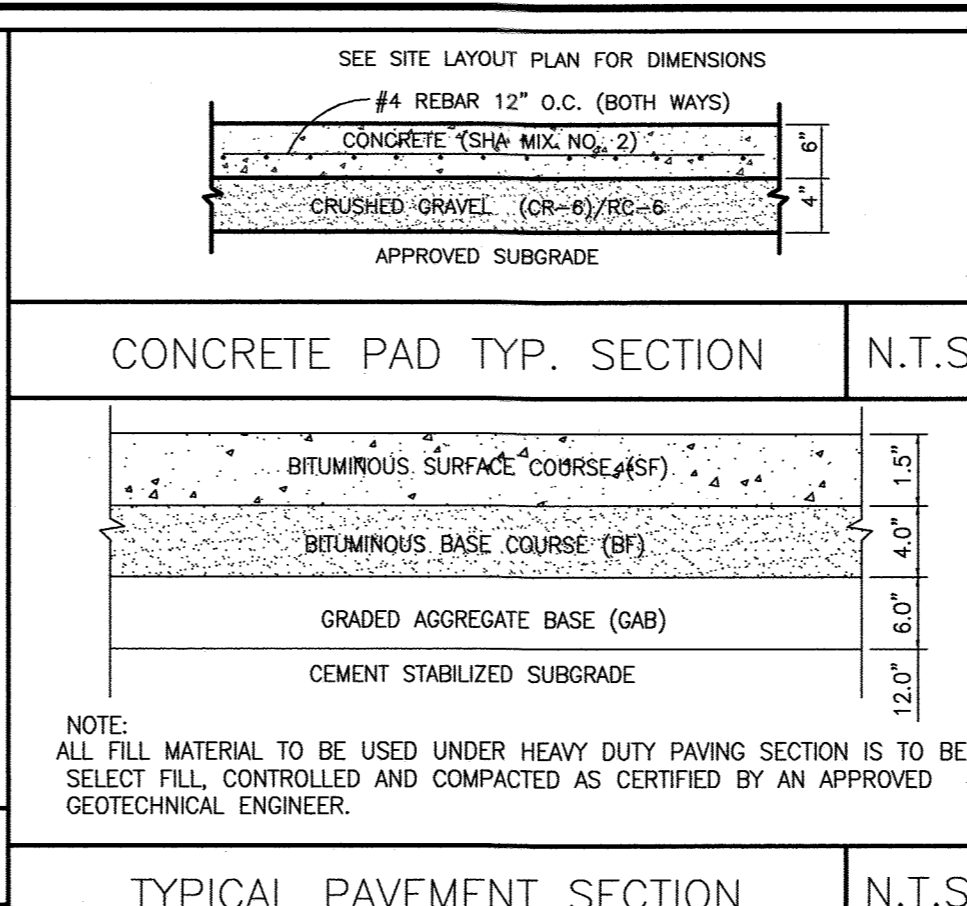
DUMPSTER PAD FENCE DETAIL

N.T.S.



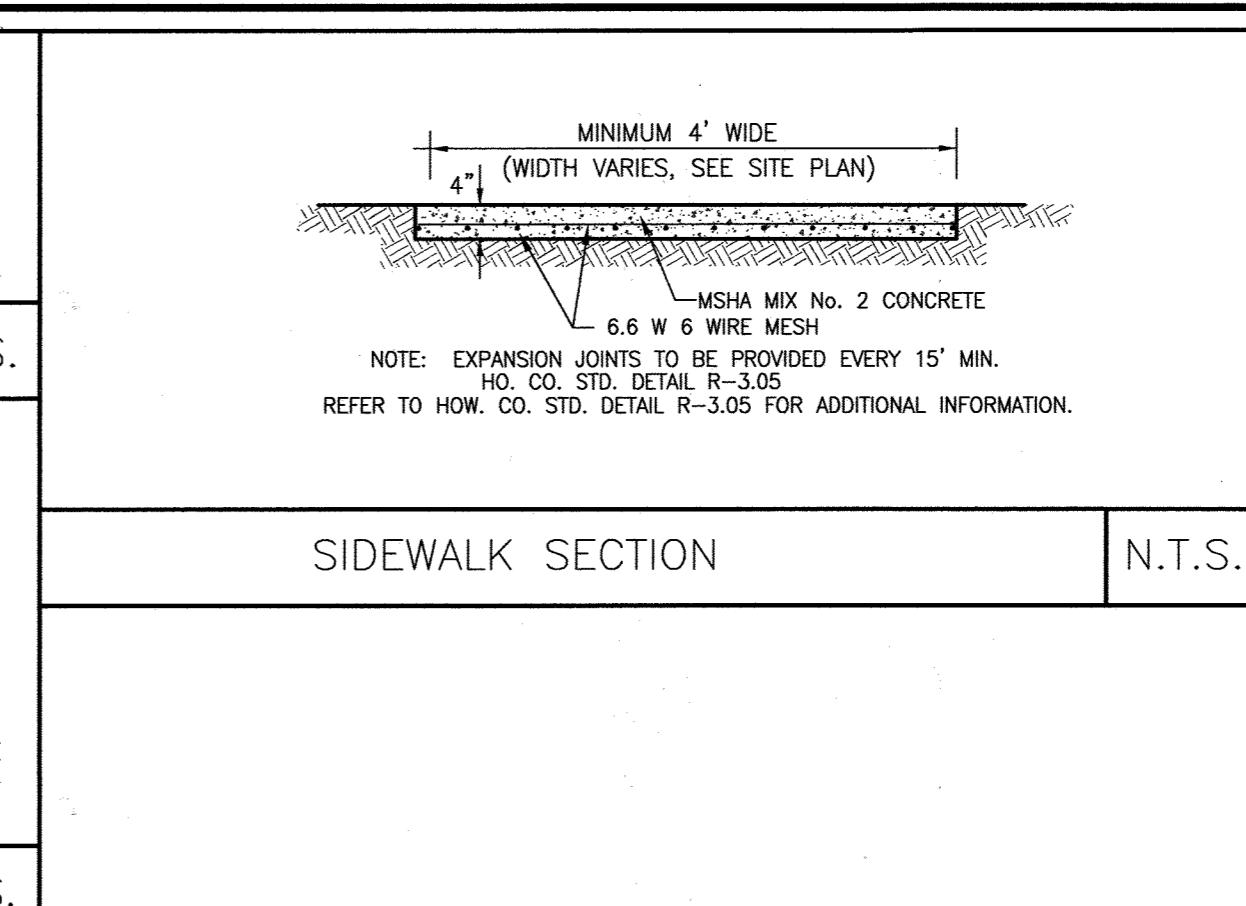
CONCRETE DUMPSTER PAD

N.T.S.



TYPICAL PAVEMENT SECTION

N.T.S.

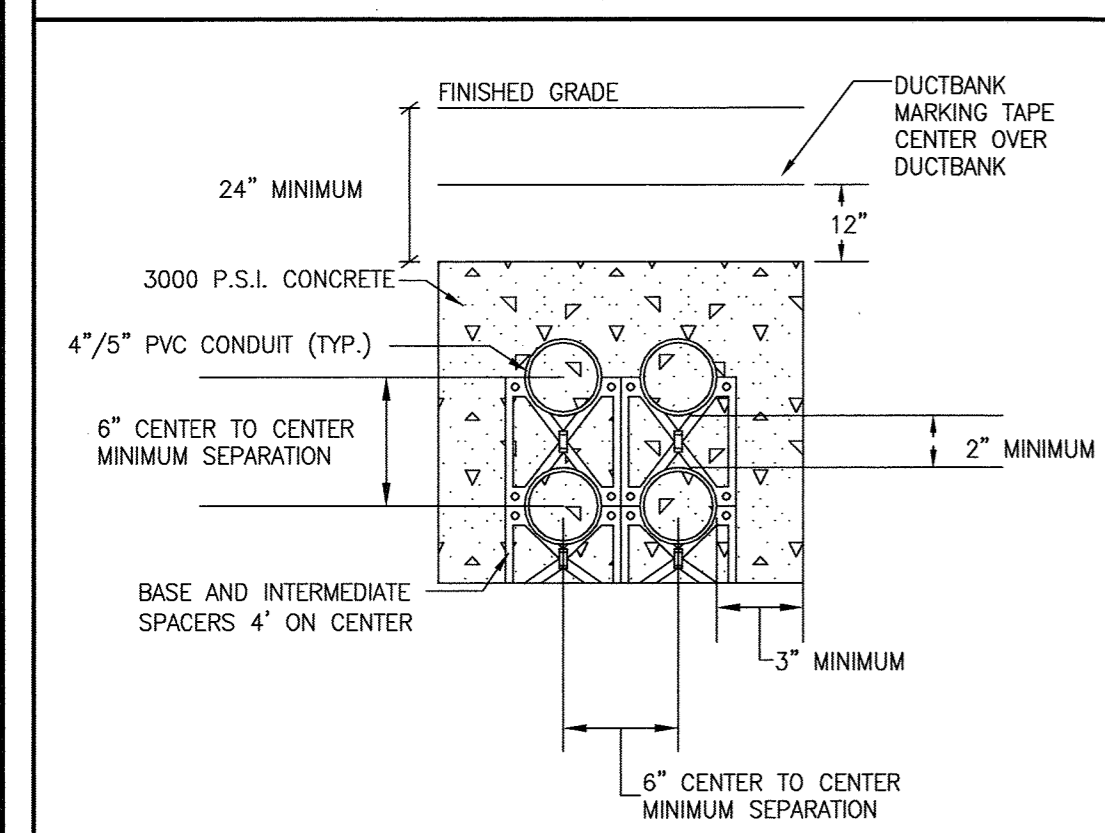


SIDEWALK SECTION

N.T.S.

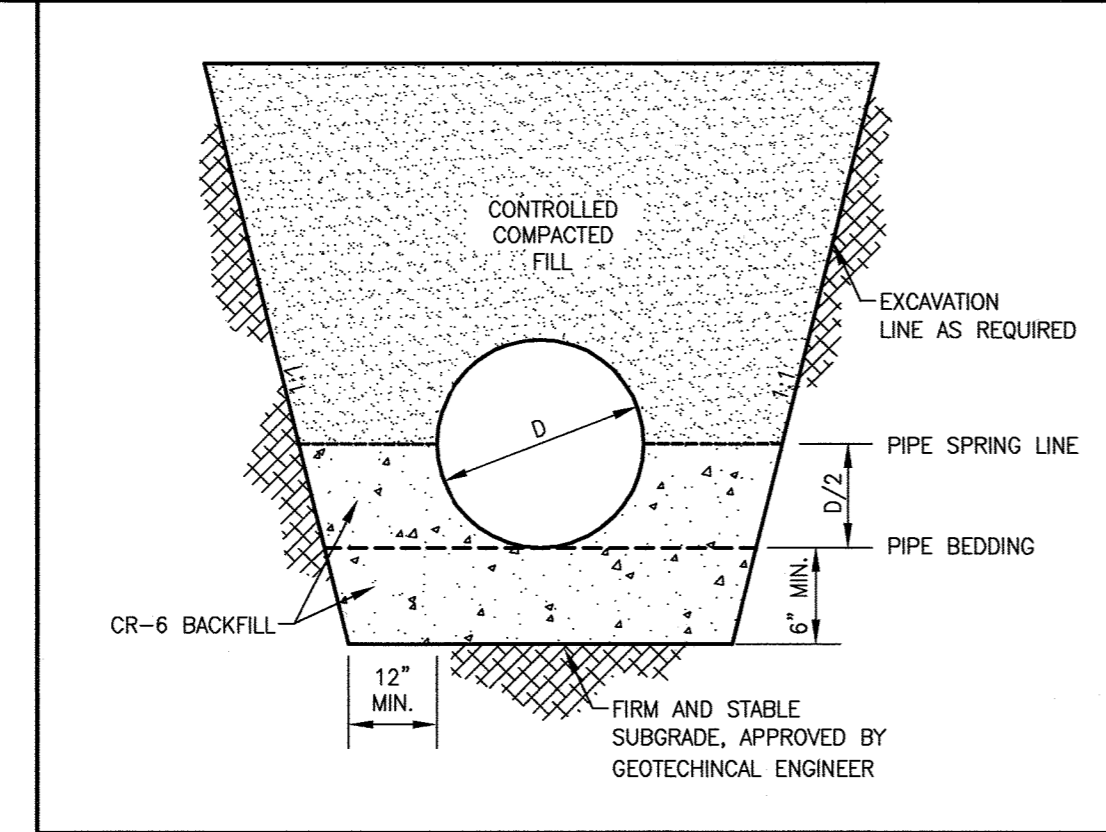
I. Materials
 A. Pipe Bedding Material - pipe bedding material shall consist of CR-6.
 B. Backfill Materials - Use CR-6 as backfill material to the minimum extent shown on the plans. The backfill for the remainder of the trench shall consist of on-site or off-site soils conforming to the requirement of the geotechnical report and City/County specifications. No stones larger than 2 inches should be allowed within 2 feet of the utility. Larger stones, up to 6 inches in the largest dimension can be used in lifts 2 feet above the utility. No organic material shall be allowed. For % passing #200 sieve, the soil moisture should be less than 35% and within 3 percentage points of optimum unless otherwise dictated by project engineer or County specifications. For fine-grained soils (greater than 35% passing #200 sieve), the soil moisture should be within 0 to plus 4 percent of optimum unless otherwise dictated by project engineer or County specifications.
 The compaction requirement shall be 92 percent of the Modified Proctor (ASTM D-1557) maximum dry density for material placed below the top 12-inches of roadway subgrade. The top 12 inches should be compacted to 97% unless otherwise recommended by the geotechnical engineer. The top 12 to 24 inches of soil may be required to meet certain material properties for subgrade support for pavements.
 II. Backfilling Procedures
 A. Contractor shall place level lifts of soil adjacent to and above the utility. The lift thickness shall be dependent upon the type of equipment being used for compaction and the materials. The following shall be used as a guide:
 1. Fine-Grained Materials - fine-grained materials (materials with more than 35% passing #200 sieve) should be compacted with sheep's-foot type roller. The lift thickness should not exceed 4 inches if hand operated equipment is used. Hand equipment will be required for compaction around manholes, structures and adjacent to and over the utility. If heavy construction sheep's-foot compaction equipment is used, a maximum loose lift thickness should be no greater than the length of the sheep's-foot or a maximum of eight inches. Each lift should be uniformly compacted with a sufficient number of passes to obtain the required degree of compaction.
 2. Granular Soils - granular soils (materials with less than 35% passing #200 sieve) should be compacted with a vibratory type compaction equipment. The loose lift thickness should not exceed 4 inches for hand operated equipment. Hand equipment will be required around manholes, structures and adjacent to and above the utility. If heavy vibratory compaction equipment is used, then the loose lift thickness can be increased to 8 inches. Each lift should be uniformly compacted with a sufficient number of passes to obtain the recommended degree of compaction.
 3. The backfill should be worked using hand tools around pipe haunch to provide uniform and firm support.
 B. If a lift fails to meet the required compaction, then the lift shall be re-compacted and retested. If the material is too wet or too dry, the moisture should be adjusted to within the required range prior to re-compaction.
 III. Testing
 Each lift of fill should be monitored for stability, lift thickness and compactive effort. A density test should be performed for each lift of fill placed per every 150 feet of trench. This requirement includes the utility lateral connections. The test procedure should be the sand cone method (ASTM D-1556) or the nuclear gauge method (ASTM D-2922). The test results shall be made available to the contractor upon the completion of the test. For each test, the technician shall record the following: Date, test location, test elevation, material type, degree of compaction, one-point results, lift thickness and moisture content.

UTILITY TRENCH NOTES



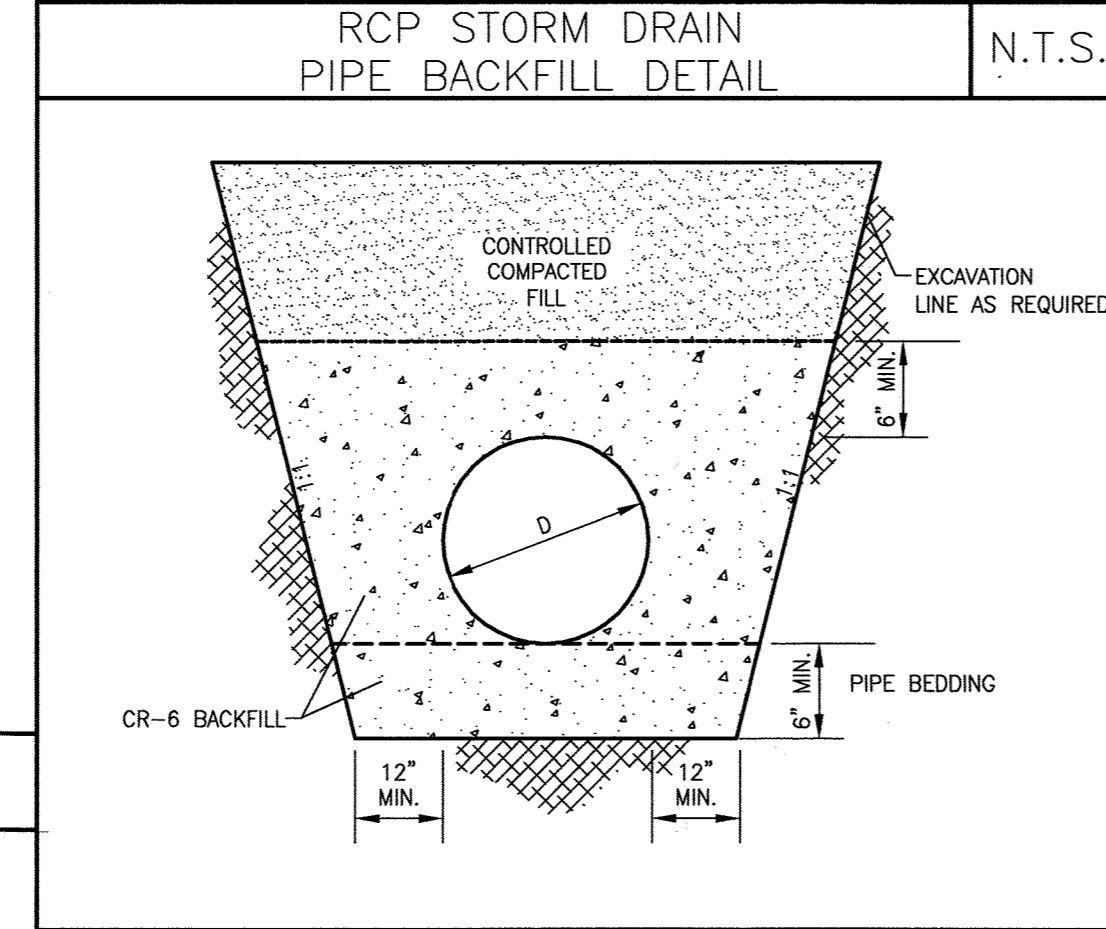
4-WAY (2'x2') DUCTBANK DETAIL (SEE MEP PLAN)

N.T.S.



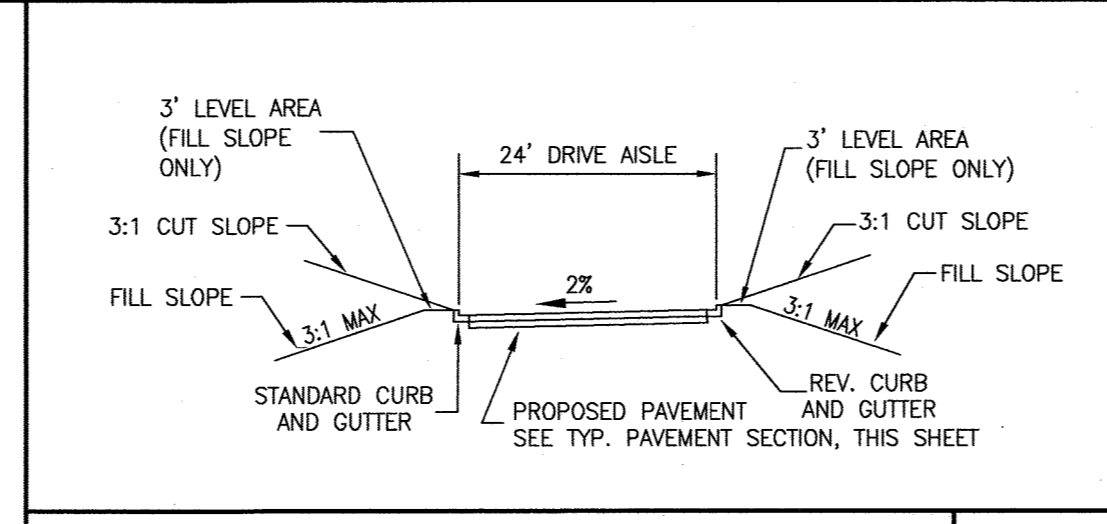
RCP STORM DRAIN PIPE BACKFILL DETAIL

N.T.S.



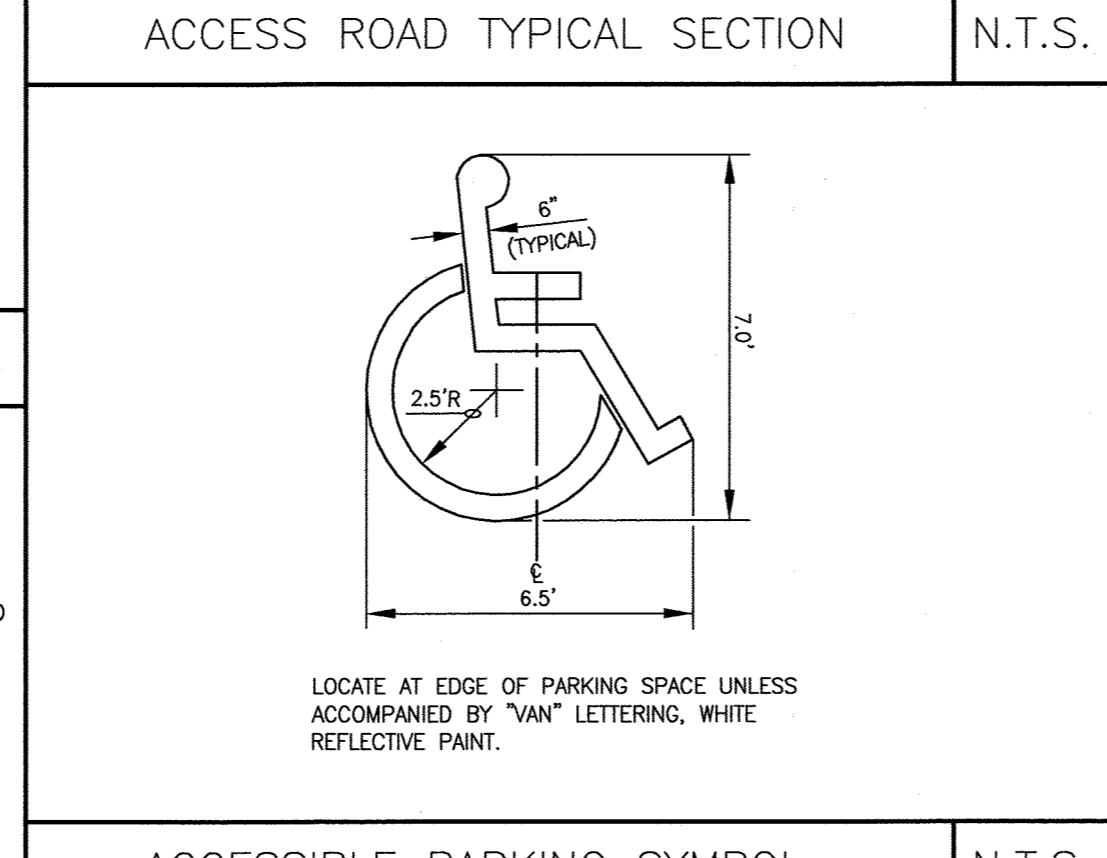
PVC/HDPE STORM DRAIN PIPE BACKFILL DETAIL

N.T.S.



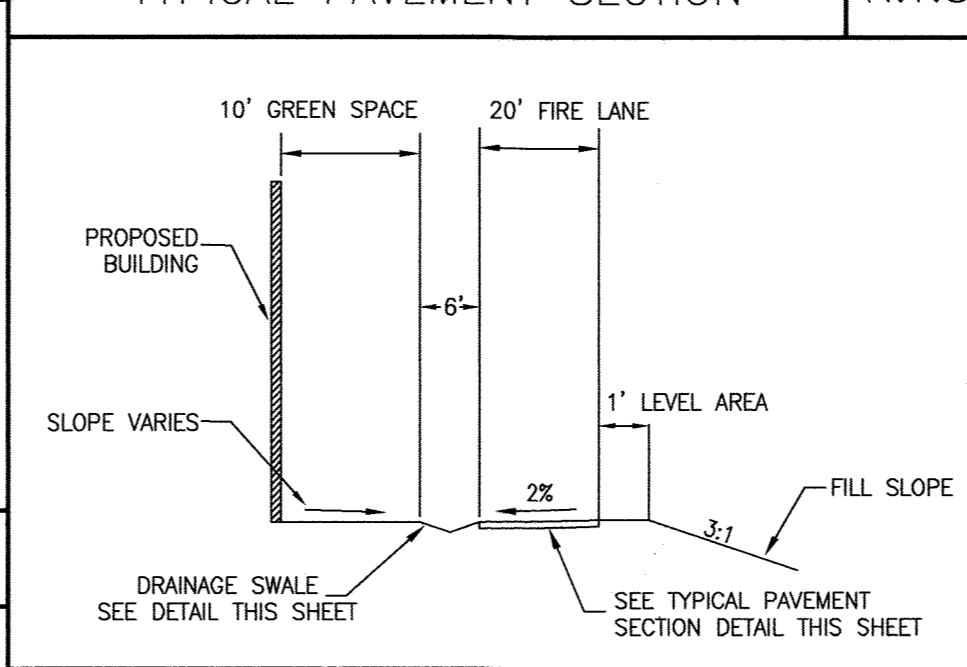
ACCESS ROAD TYPICAL SECTION

N.T.S.



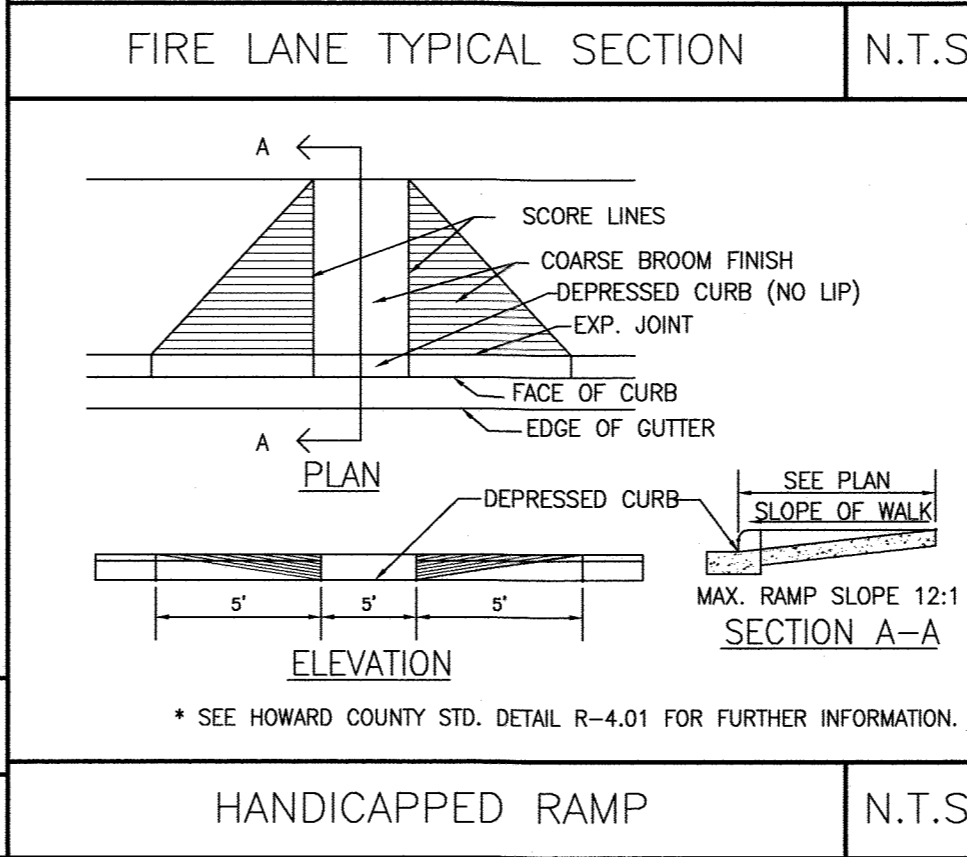
ACCESSIBLE PARKING SYMBOL

N.T.S.



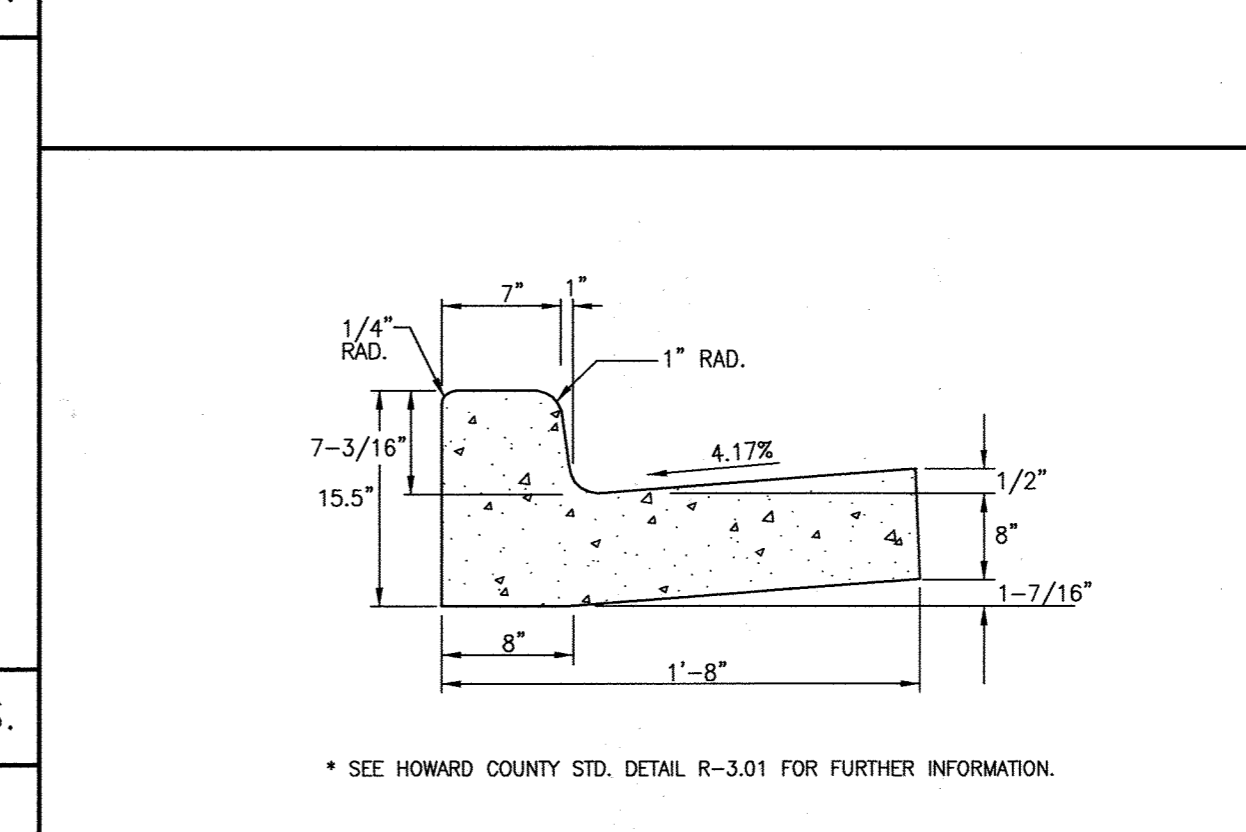
FIRE LANE TYPICAL SECTION

N.T.S.



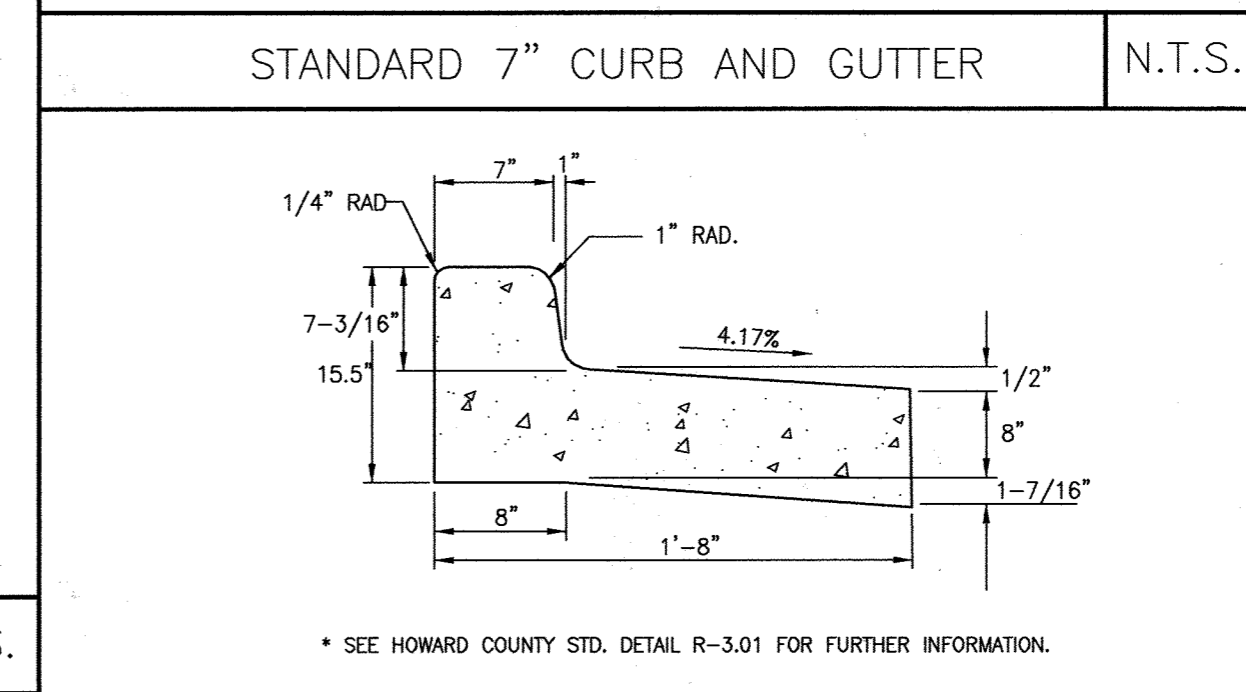
HANDICAPPED RAMP

N.T.S.



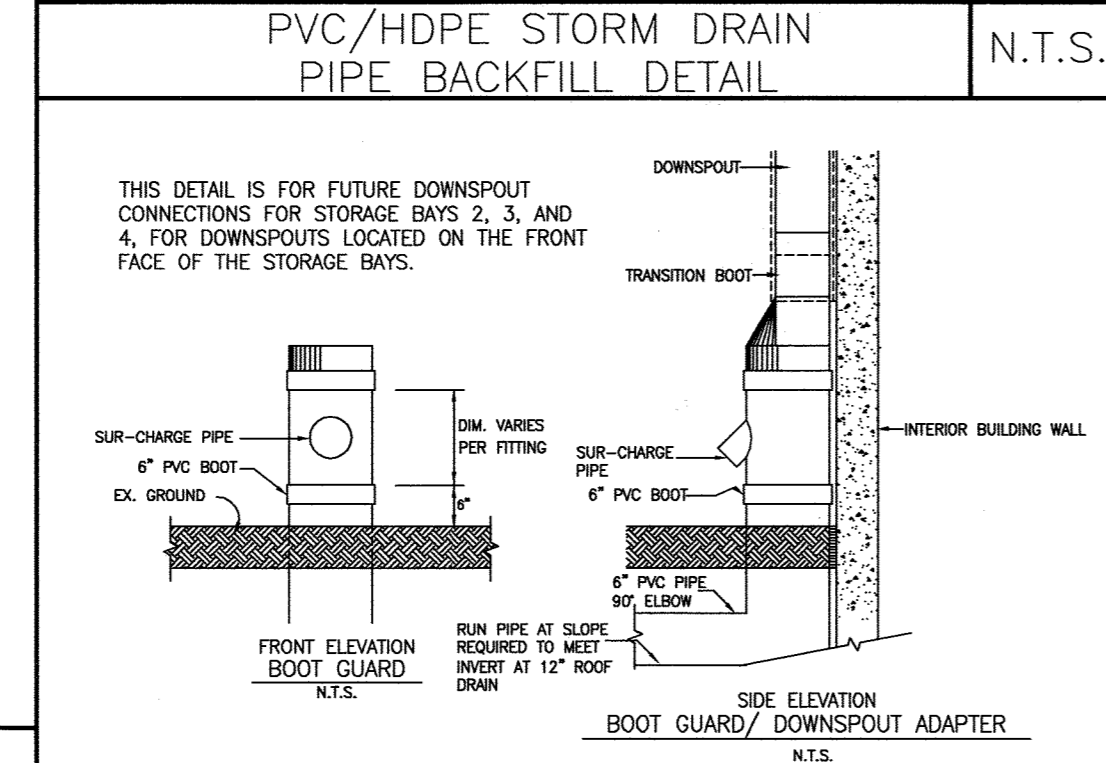
STANDARD 7" CURB AND GUTTER

N.T.S.



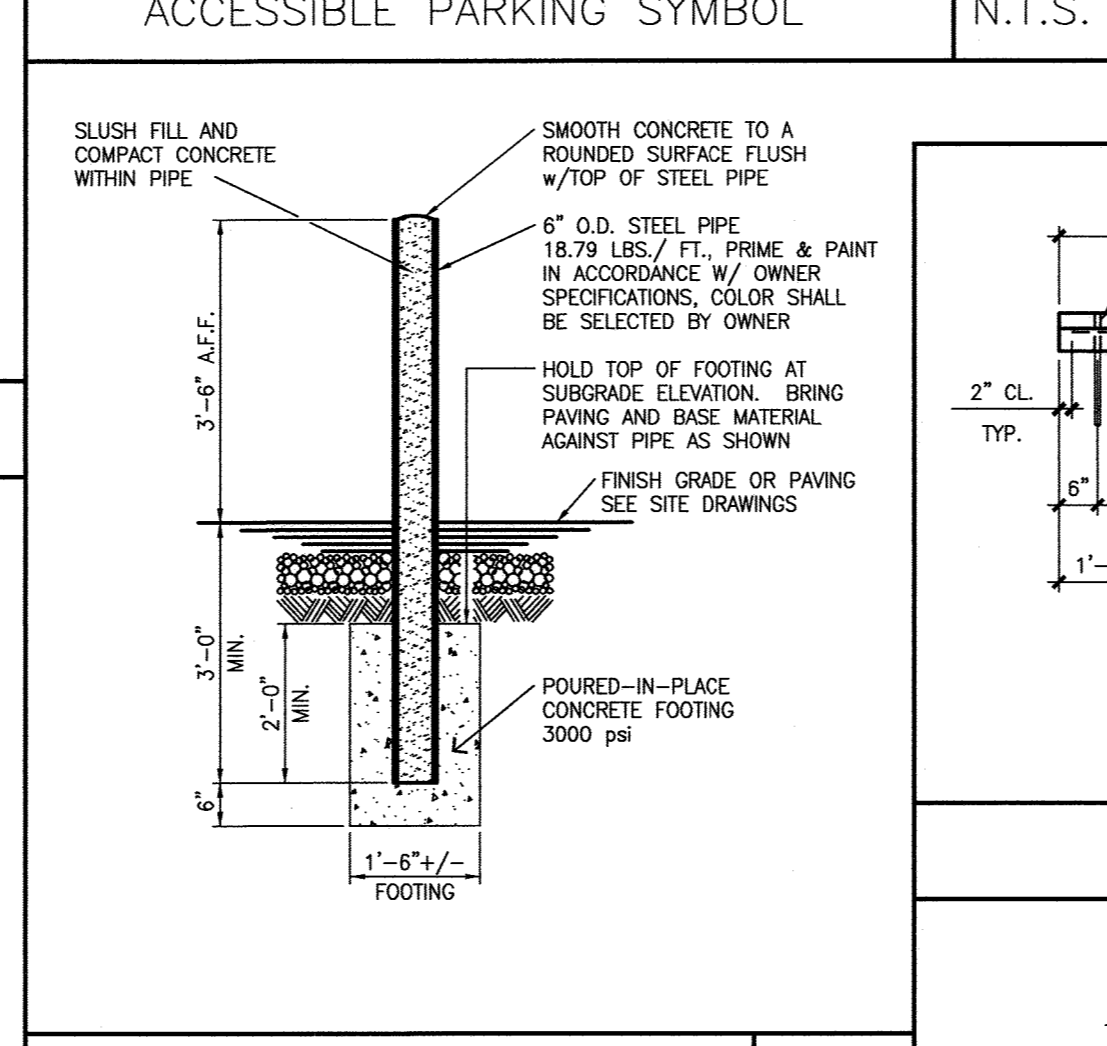
REVERSE 7" CURB AND GUTTER

N.T.S.



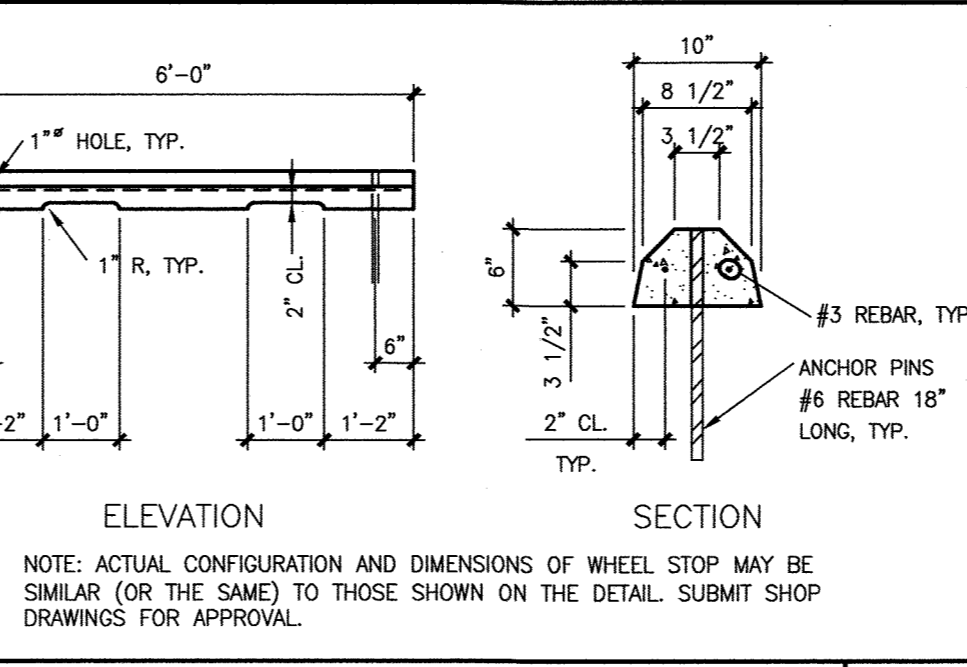
DOWNSPOUT ADAPTER DETAIL

N.T.S.



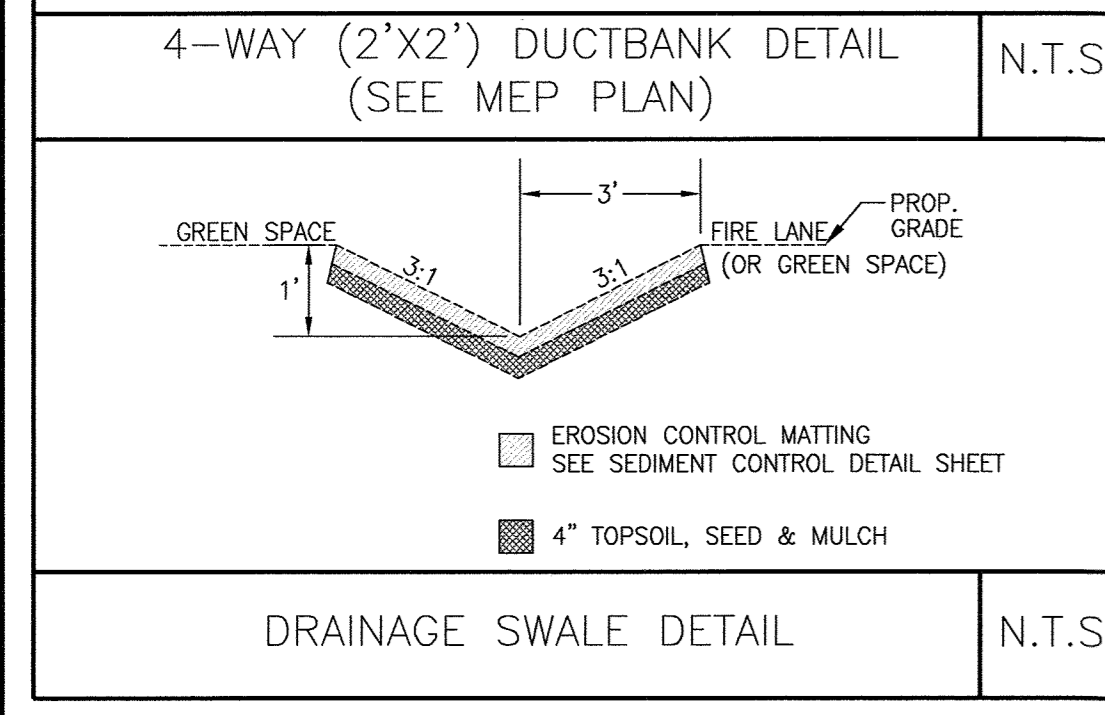
PIPE BOLLARD

N.T.S.



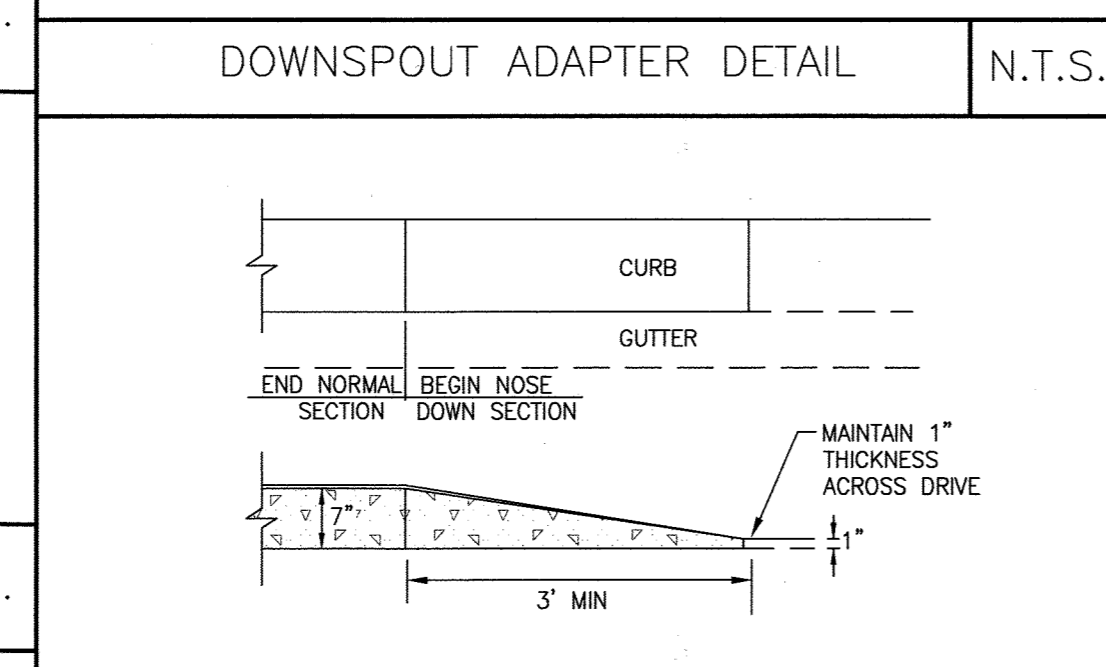
WHEELSTOP DETAIL

N.T.S.



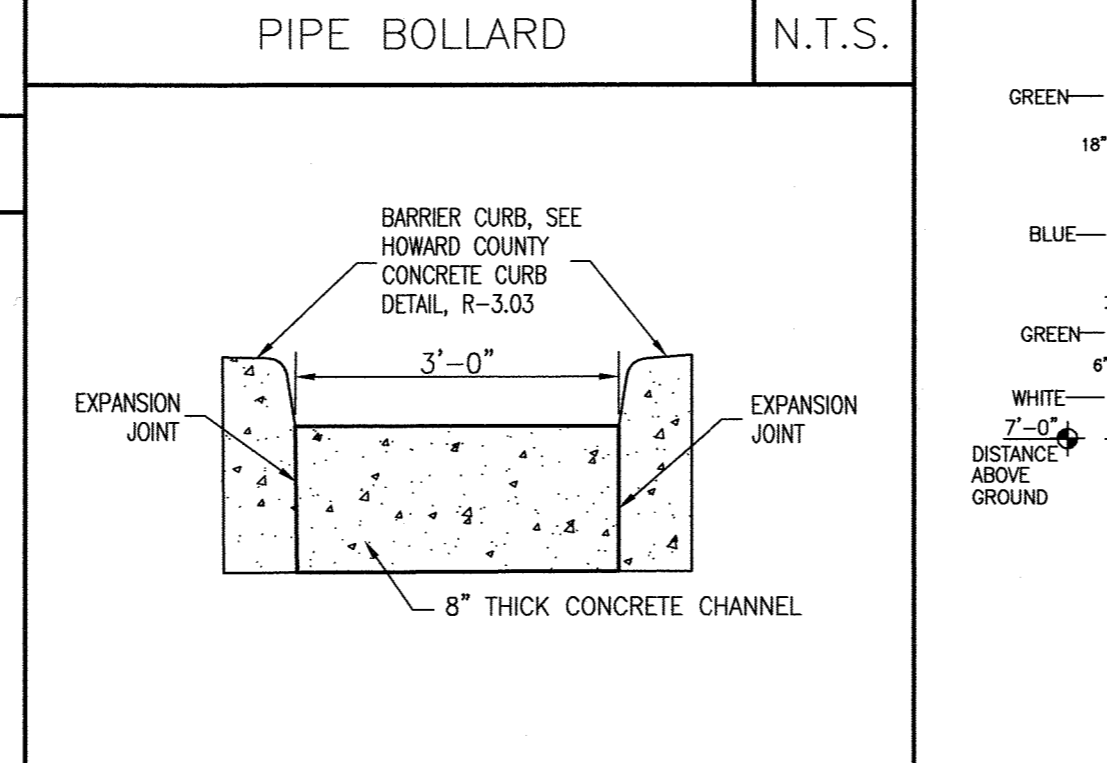
DRAINAGE SWALE DETAIL

N.T.S.



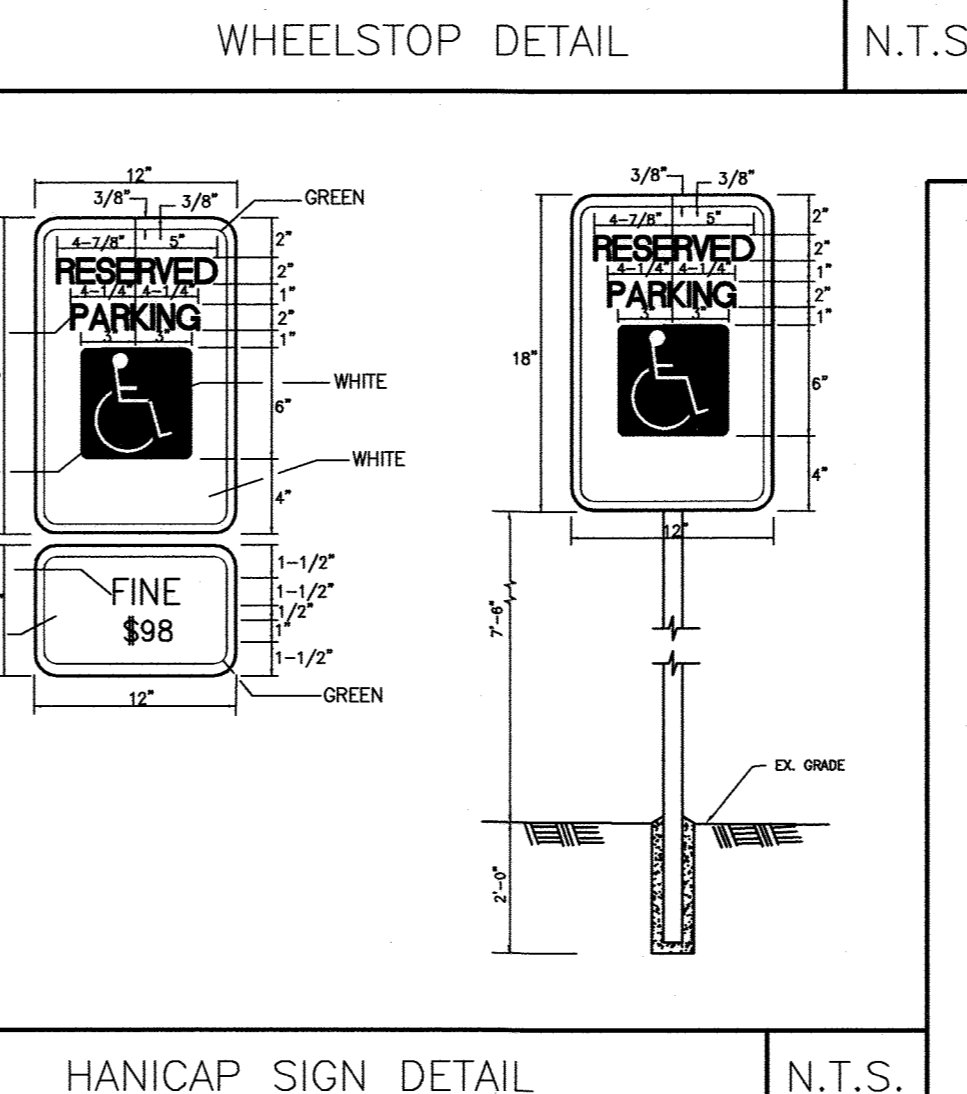
NOSE DOWN CURB

N.T.S.



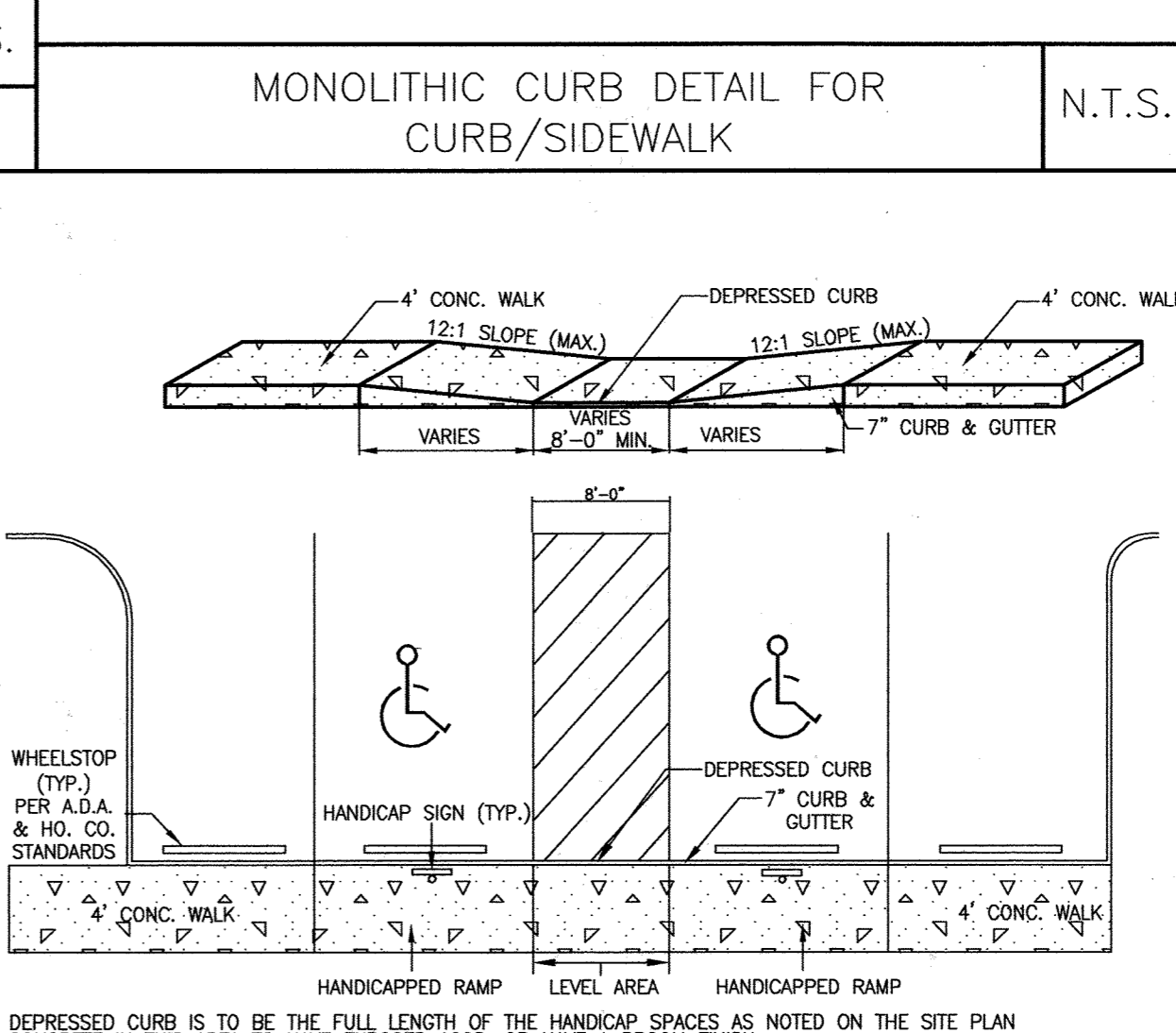
FLUME DETAIL

N.T.S.



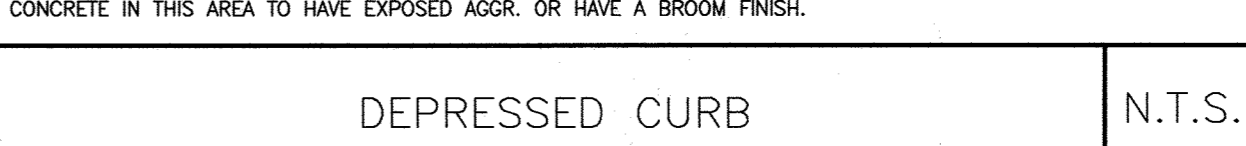
HANICAP SIGN DETAIL

N.T.S.



MONOLITHIC CURB DETAIL FOR CURB/SIDEWALK

N.T.S.



DEPRESSED CURB

N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 Chief, Division of Land Development
 Director, Department of Planning and Zoning

DATE: 1/21/05
 DATE: 2/14/05
 DATE: 2/16/05

REVISIONS	

APPROVALS	
REQUESTER	
PLANNING FACILITIES DEPT. ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SAFETY OFFICER	
DIRECTOR	
COORDINATOR	
SENIOR LEADER	

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 HOWARD COUNTY, MARYLAND

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GRAPHIC SCALE	

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 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
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 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1680
 FAX (410) 792-7395

SITE DETAILS
 JOB NO.: 13685
SDP-6
 SHEET: 6 OF 23
 SCALE: AS NOTED
 DES: LFB CHECK: TCN DATE: 01-17-05

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER

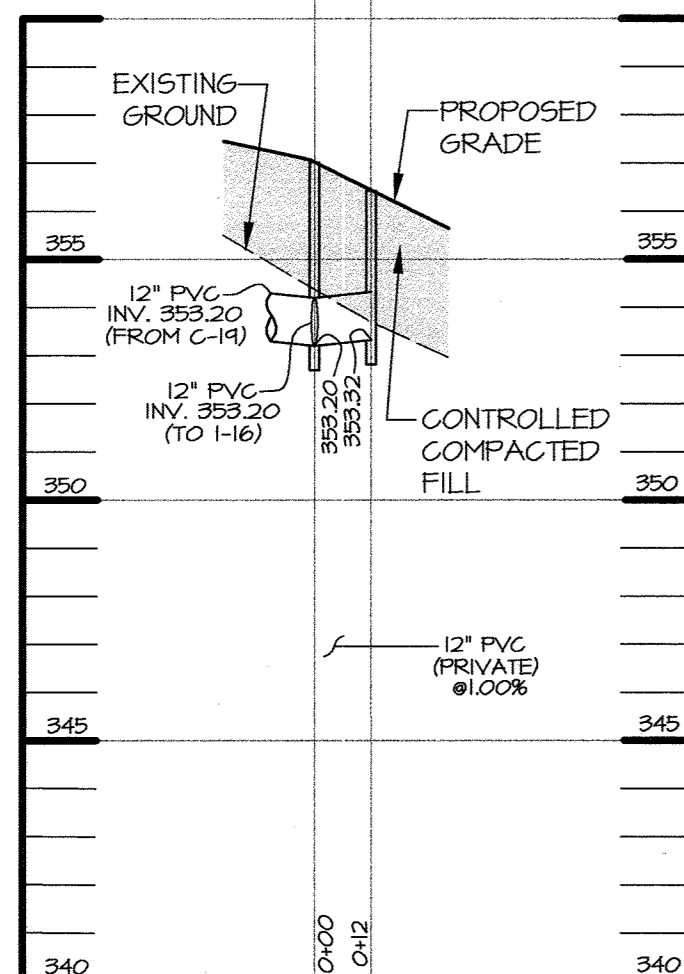
COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL

WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:

- A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
- B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.
- C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

STRUCTURE NOT INSTALLED.
C-17 REPLACED WITH 12" x 12" TEE.

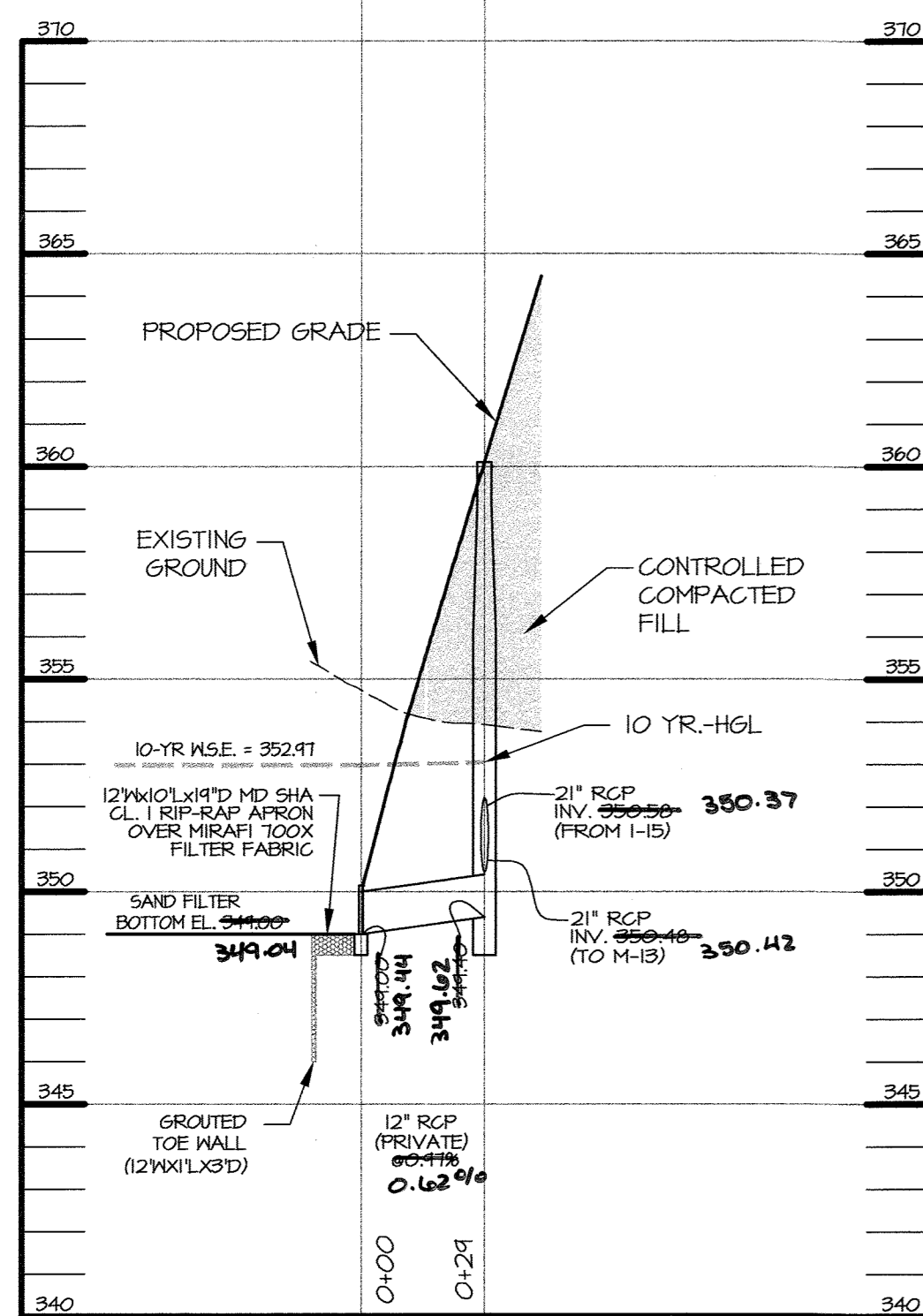
C-18 TOP = 356.66



STORM DRAIN PROFILE C-17 TO C-18

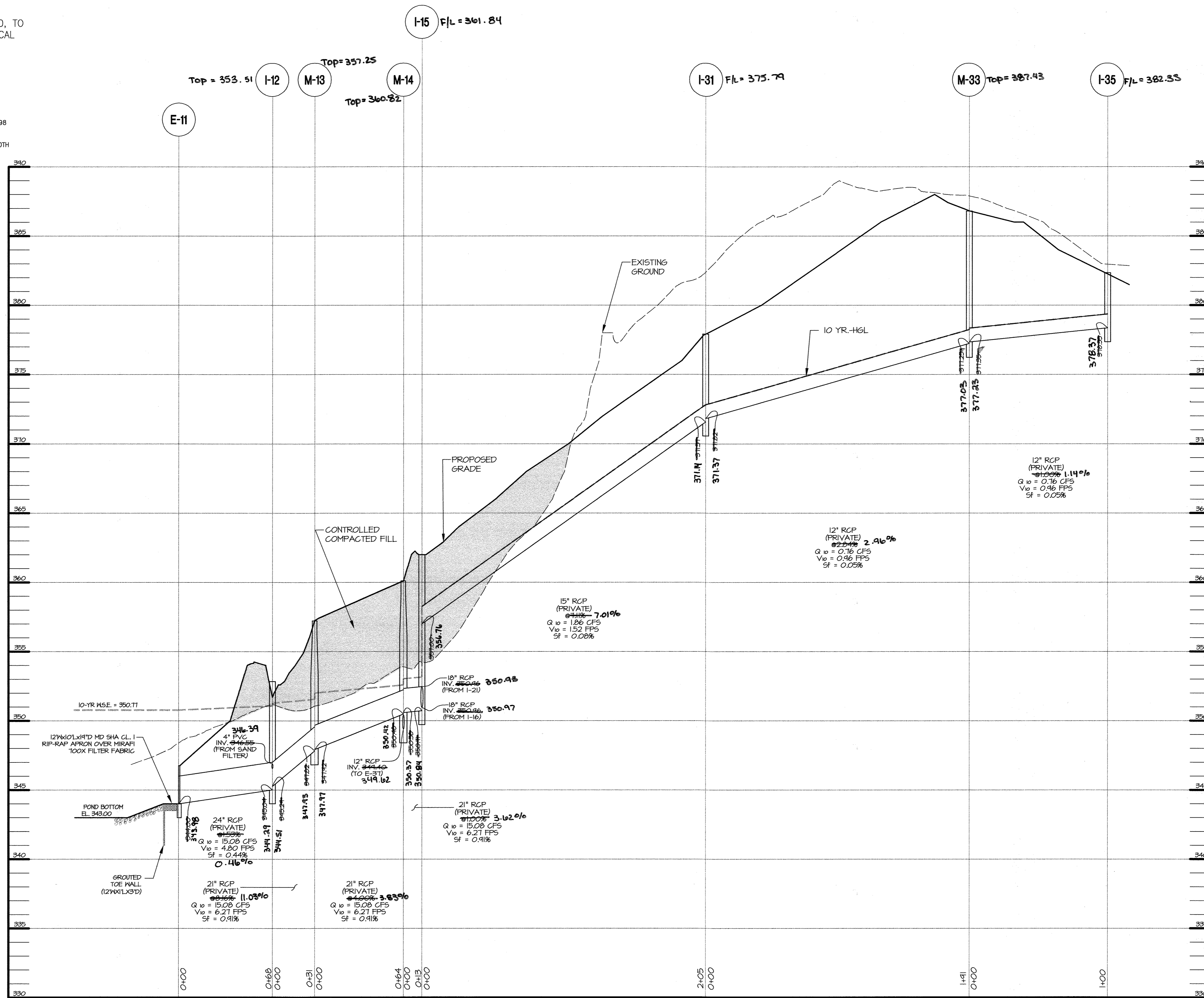
HOR. 1" = 40'
VERT. 1" = 4'

E-37 M-14 TOP = 360.82



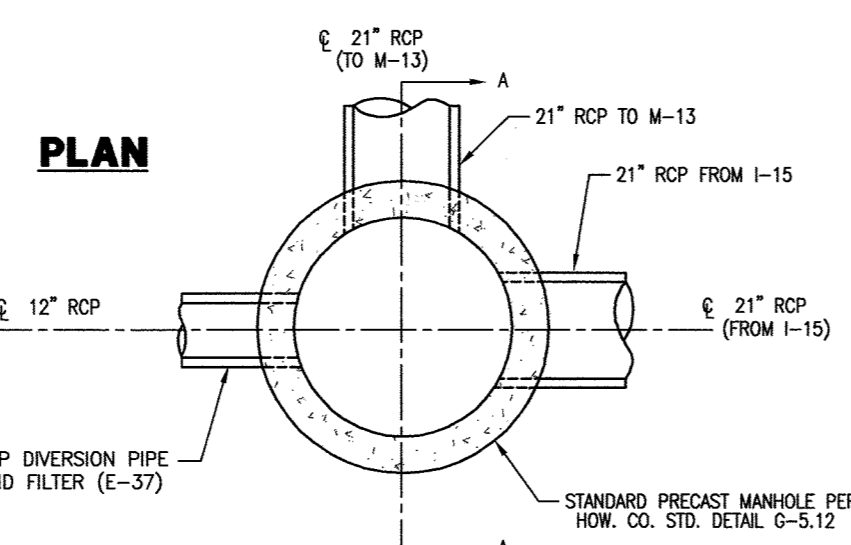
STORM DRAIN PROFILE E-37 TO M-14

HOR. 1" = 40'
VERT. 1" = 4'



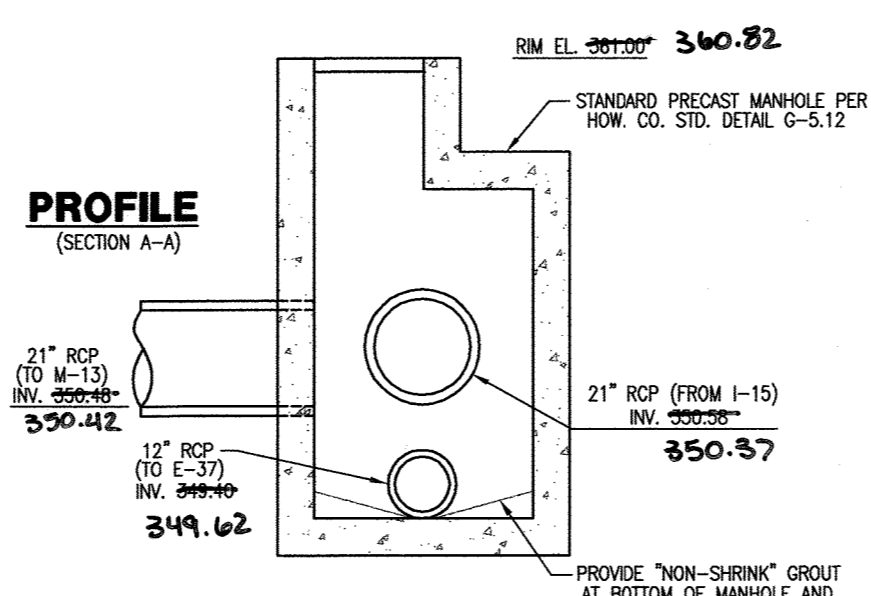
STORM DRAIN PROFILE E-11 TO I-35

HOR. 1" = 40'
VERT. 1" = 4'



STRUCTURE M-14 DETAIL

SCALE: N.T.S.



STRUCTURE M-14 DETAIL

SCALE: N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chris DeMunn 1/21/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE
David Hamilton 2/16/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
David A. Cooper 2/5/05
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

REVISIONS		
Asbuilt into Asbld		05/06

APPROVALS	
REQUESTER	
PLANNING FACILITIES DEPT. ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TRF GROUP	
SAFETY REVIEW	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

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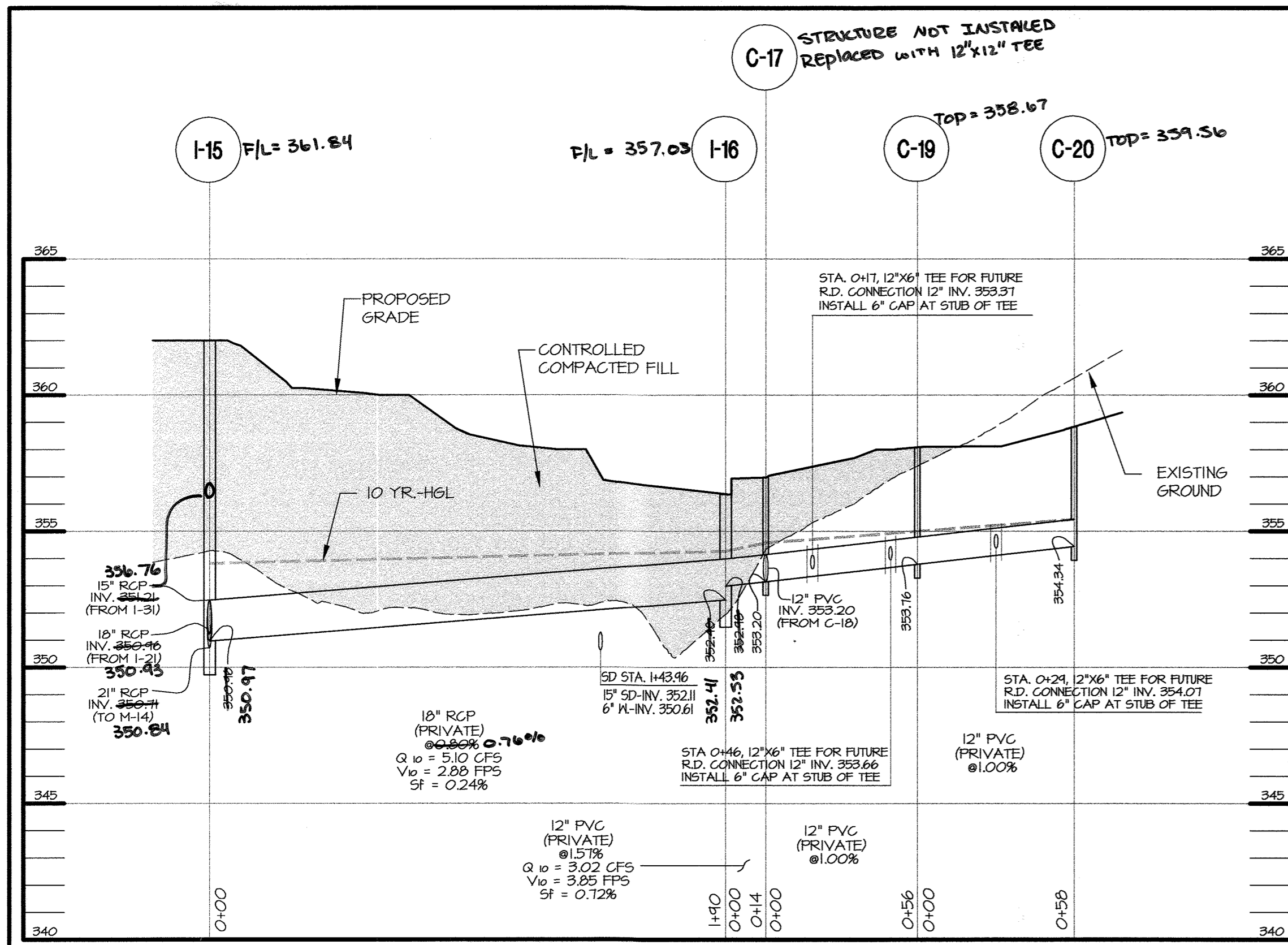
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GRAPHIC SCALE
AS SHOWN

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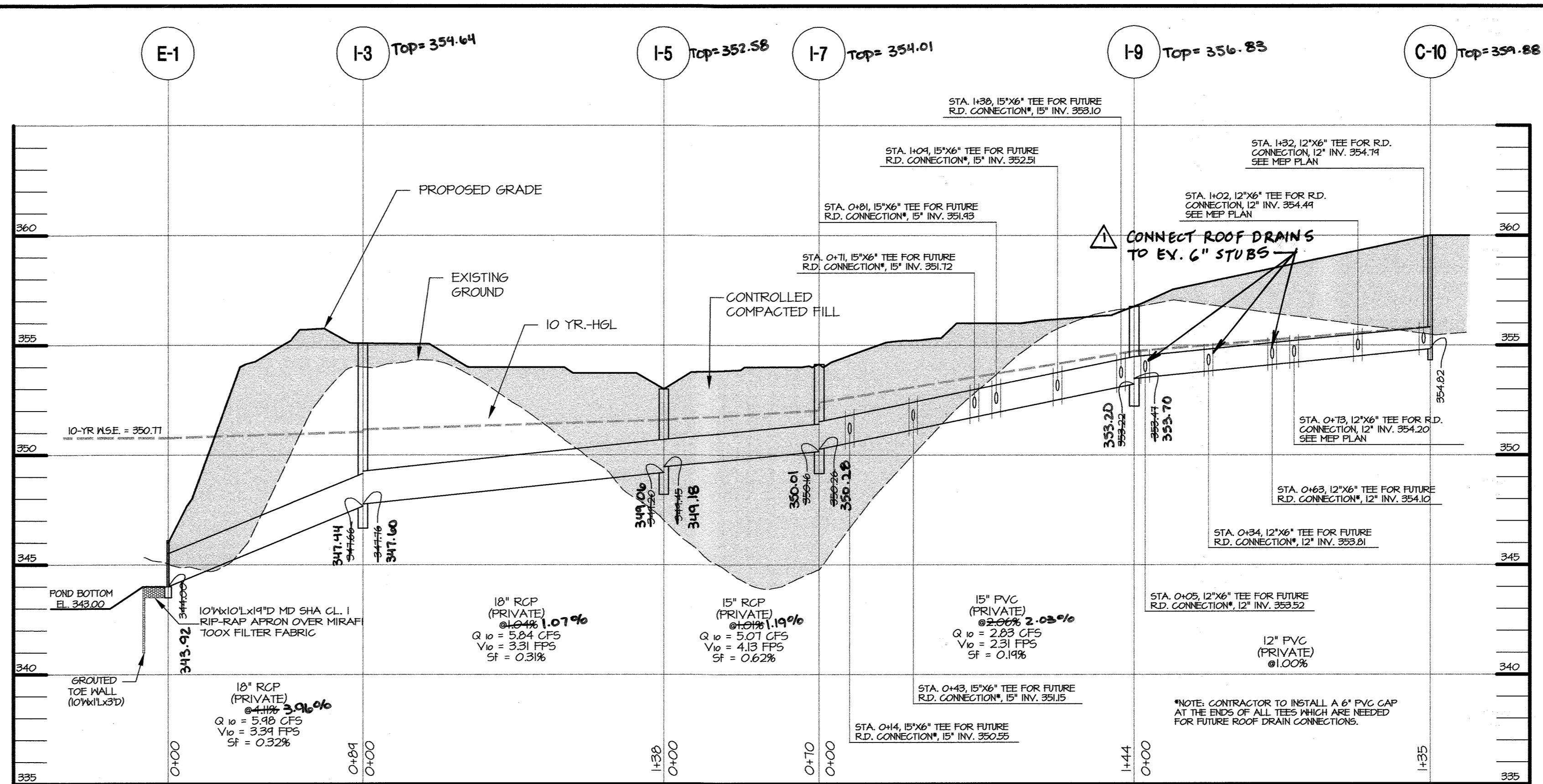
STORM DRAIN PROFILES
JOB NO.: 13685

SDP-7
1-17-05 SHEET: 7 OF 23
SCALE: 1" = 40'
DES: BCC CHECK: TCN DATE: 01-17-05



**STORM DRAIN PROFILE
I-15 TO C-20**

HOR. 1" = 40'
VERT. 1" = 4'



**STORM DRAIN PROFILE
E-1 TO I-9**

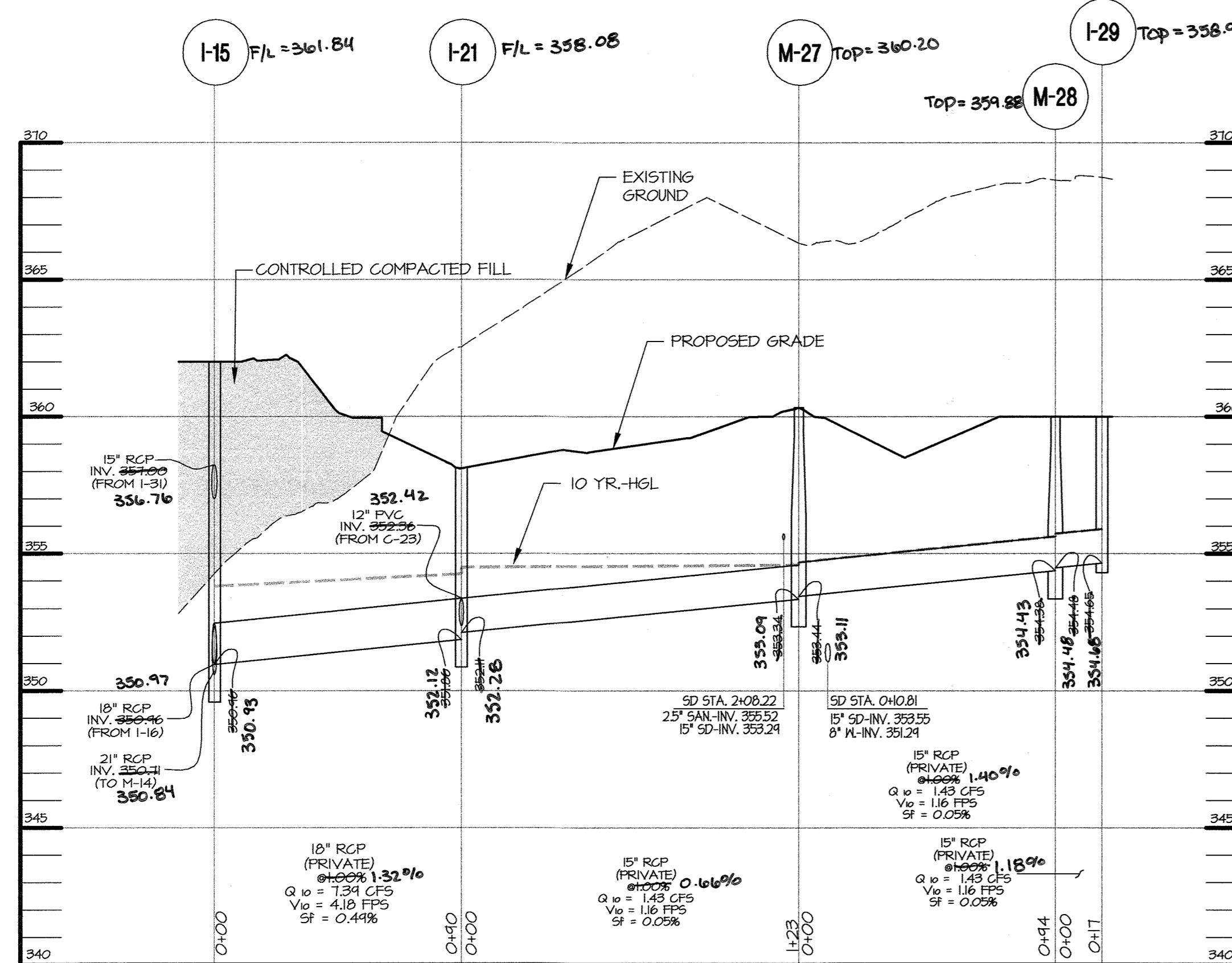
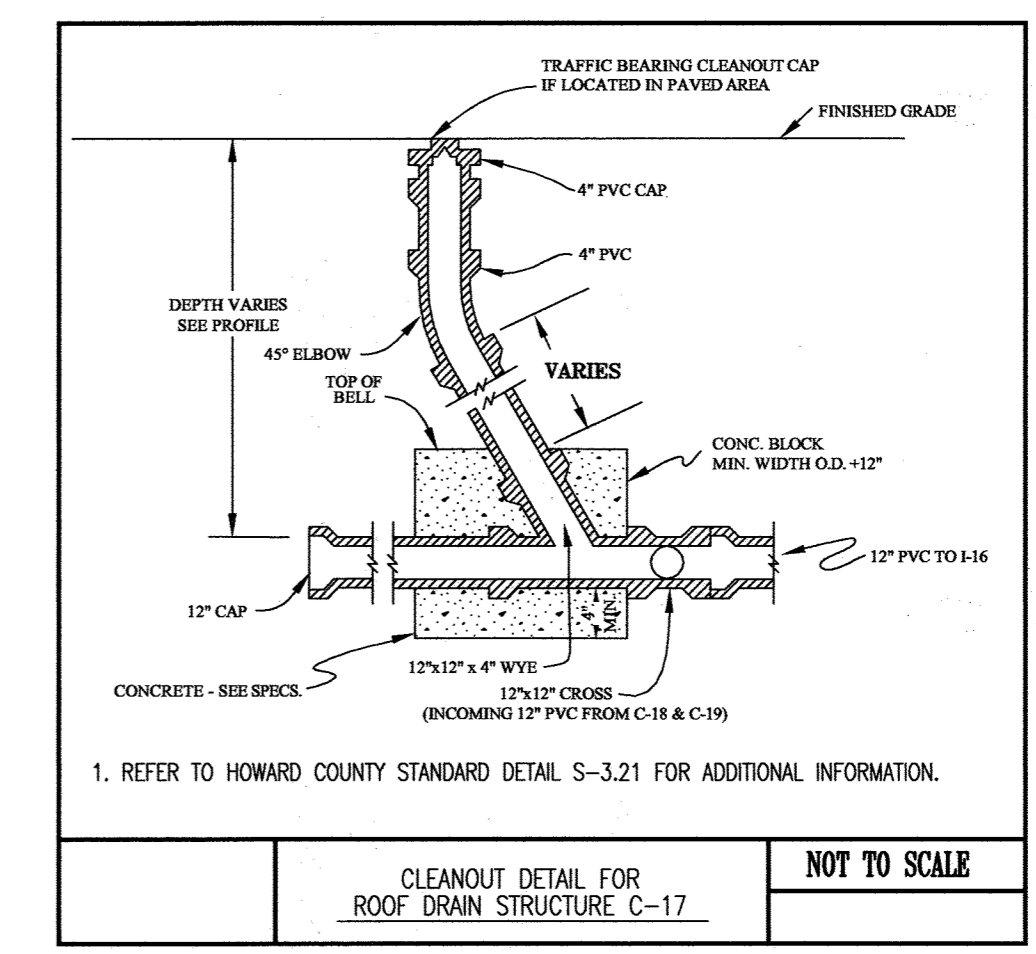
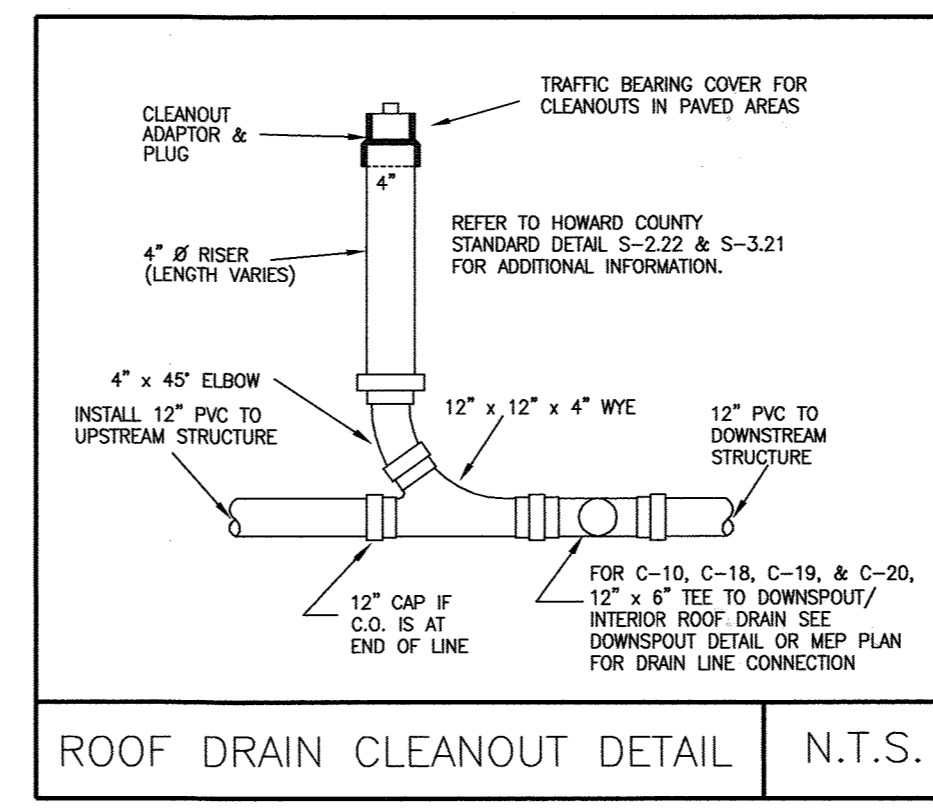
HOR. 1" = 40'
VERT. 1" = 4'

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL
WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:
A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LIFT SIZE LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.
C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

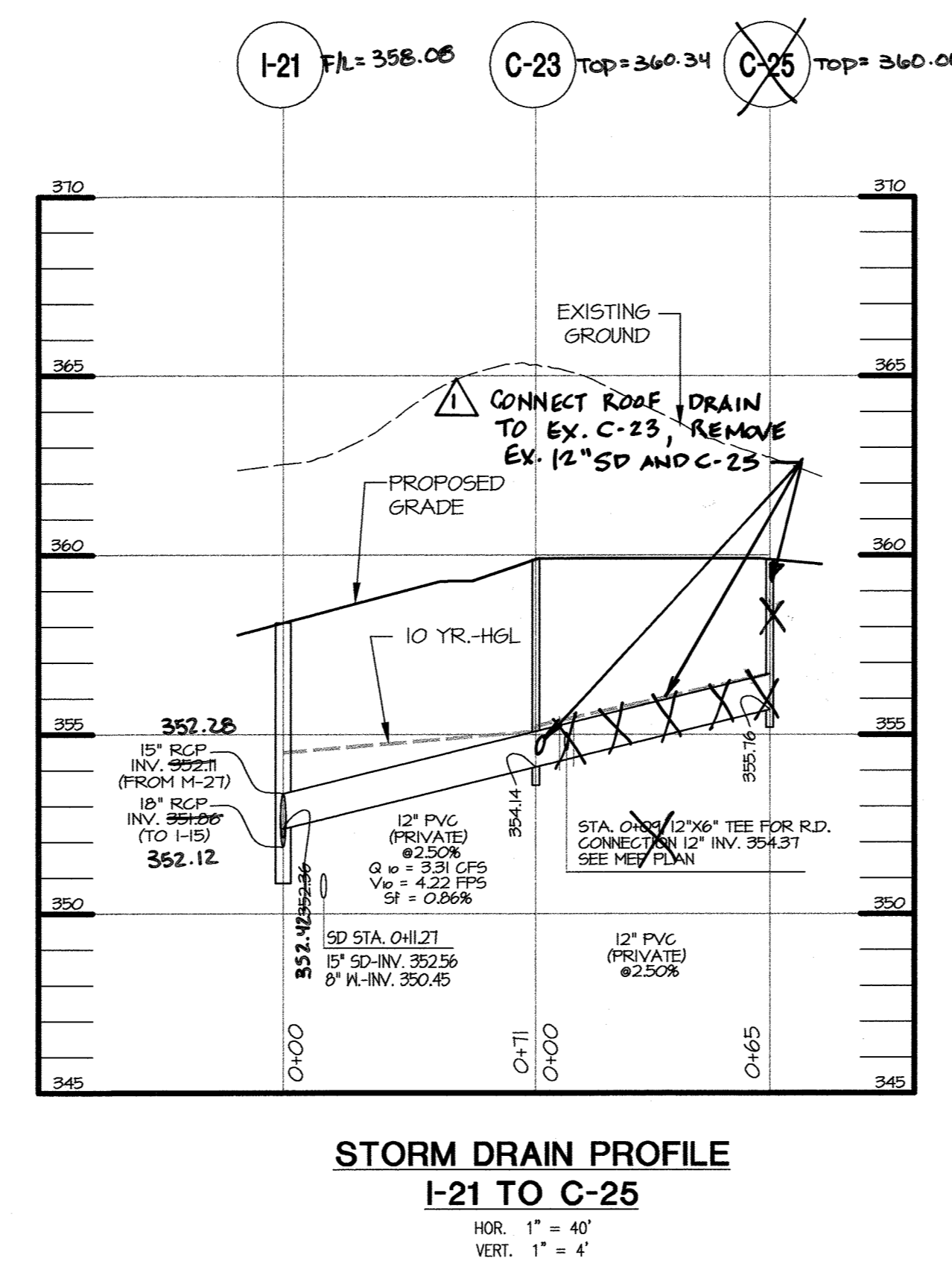
SIZE	TYPE	LENGTH
12"	RCP, CL. IV	320 FT
15"	RCP, CL. IV	509 FT
18"	RCP, CL. IV	507 FT
21"	RCP, CL. IV	108 FT
24"	RCP, CL. IV	68 FT

SIZE	TYPE	LENGTH
12"	PVC, SDR-35	411 FT
15"	PVC, SDR-35	144 FT



**STORM DRAIN PROFILE
I-15 TO I-29**

HOR. 1" = 40'
VERT. 1" = 4'



**STORM DRAIN PROFILE
I-21 TO C-25**

HOR. 1" = 40'
VERT. 1" = 4'

• COORDINATES TO CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & "S" INLETS, CENTER OF STRUCTURE FOR SINGLE WR INLETS, "D" INLET, MANHOLES & CLEANOUTS.
• TOP OF GRADE ELEVATION AT CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & "S" INLET, "D" INLET, MANHOLE & CLEANOUT ELEVATIONS ARE AT CENTER OF RIM.

STR NO.	TOP ELEV	INV IN	INV IN	INV IN	INV OUT	TYPE	REMARKS	NORTHING	EASTING
E-1	---	---	---	---	---	TYPE "C" ENDWALL CIRCULAR PIPE, HOWARD COUNTY STD. DETAIL SD-5.21		549866.1705	1341834.2355
E-11	---	---	---	---	---	TYPE "C" ENDWALL CIRCULAR PIPE, HOWARD COUNTY STD. DETAIL SD-5.21		549648.5005	1341787.0002
E-37	---	---	---	---	---	TYPE "E" HEADWALL CIRCULAR PIPE, HOWARD COUNTY STD. DETAIL SD-5.31		549588.9128	1341671.7747
C-10	360.00	---	---	---	354.82	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549319.6618	1342090.6772
C-17	357.80	353.20	353.20	---	353.20	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549601.8237	1341882.6896
C-18	357.50	---	---	---	353.32	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549613.5206	1341884.1629
C-19	358.10	353.78	---	---	353.78	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549546.3017	1341875.5960
C-20	359.30	---	---	---	354.34	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549489.0045	1341868.4787
C-23	359.80	354.14	---	---	354.14	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549462.0280	1341799.1943
C-25	359.95	---	---	---	355.76	MODIFIED CLEANOUT, HO. CO. STD. DET. S-2.22, S-3.21 (SEE DETAIL SHEET)		549452.8585	1341864.0517

• COORDINATES TO CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & "S" INLETS, CENTER OF STRUCTURE FOR SINGLE WR INLETS, "D" INLET, MANHOLES & CLEANOUTS.
• TOP OF GRADE ELEVATION AT CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & "S" INLET, "D" INLET, MANHOLE & CLEANOUT ELEVATIONS ARE AT CENTER OF RIM.

STR NO.	TOP ELEV	INV IN	INV IN	INV IN	INV OUT	TYPE	REMARKS	NORTHING	EASTING
I-3	355.30	347.76	---	---	---	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549632.4081	1341909.2087
I-5	353.25	349.45	---	---	---	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549610.6484	1342050.9949
I-7	354.15	350.26	---	---	---	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549597.4991	1342107.6104
I-9	356.91	353.47	---	---	---	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549453.8610	1342120.0361
I-12	353.33	345.29	345.55	---	---	PRECAST STANDARD TYPE "D" INLET, HOWARD COUNTY STD. DETAIL SD-4.39		549611.3234	1341730.1633
I-15	362.00	357.00	350.96	350.96	350.71	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549548.7066	1341685.7375
I-16	356.97	352.98	---	---	---	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549602.7474	1341868.9965
I-21	358.10	352.36	352.11	---	---	TYPE "S" DOUBLE INLET, HOWARD COUNTY STD. DETAIL SD-4.23		549470.7770	1341729.2960
I-29	359.40	---	---	---	---	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549343.6306	1341752.4709
I-31	377.82	371.82	---	---	---	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549489.2376	1341489.2441
I-35	382.35	---	---	---	---	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549443.0112	1341205.3774
M-13	358.00	347.92	---	---	---	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549582.0930	1341740.4056
M-14	358.10	350.58	---	---	---	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549561.4424	1341681.3865
M-27	360.35	353.44	---	---	---	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549348.4643	1341713.9534
M-28	360.25	354.48	---	---	---	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549336.7840	1341806.6824
M-33	387.00	377.35	---	---	---	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549438.5100	1341305.7072

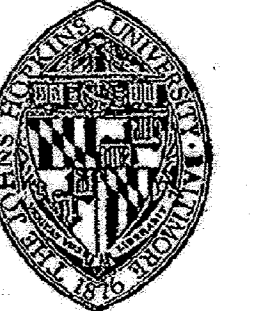
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 [Signature] 2/1/05
 CHIEF, DIVISION OF LAND DEVELOPMENT
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GRAPHIC SCALE

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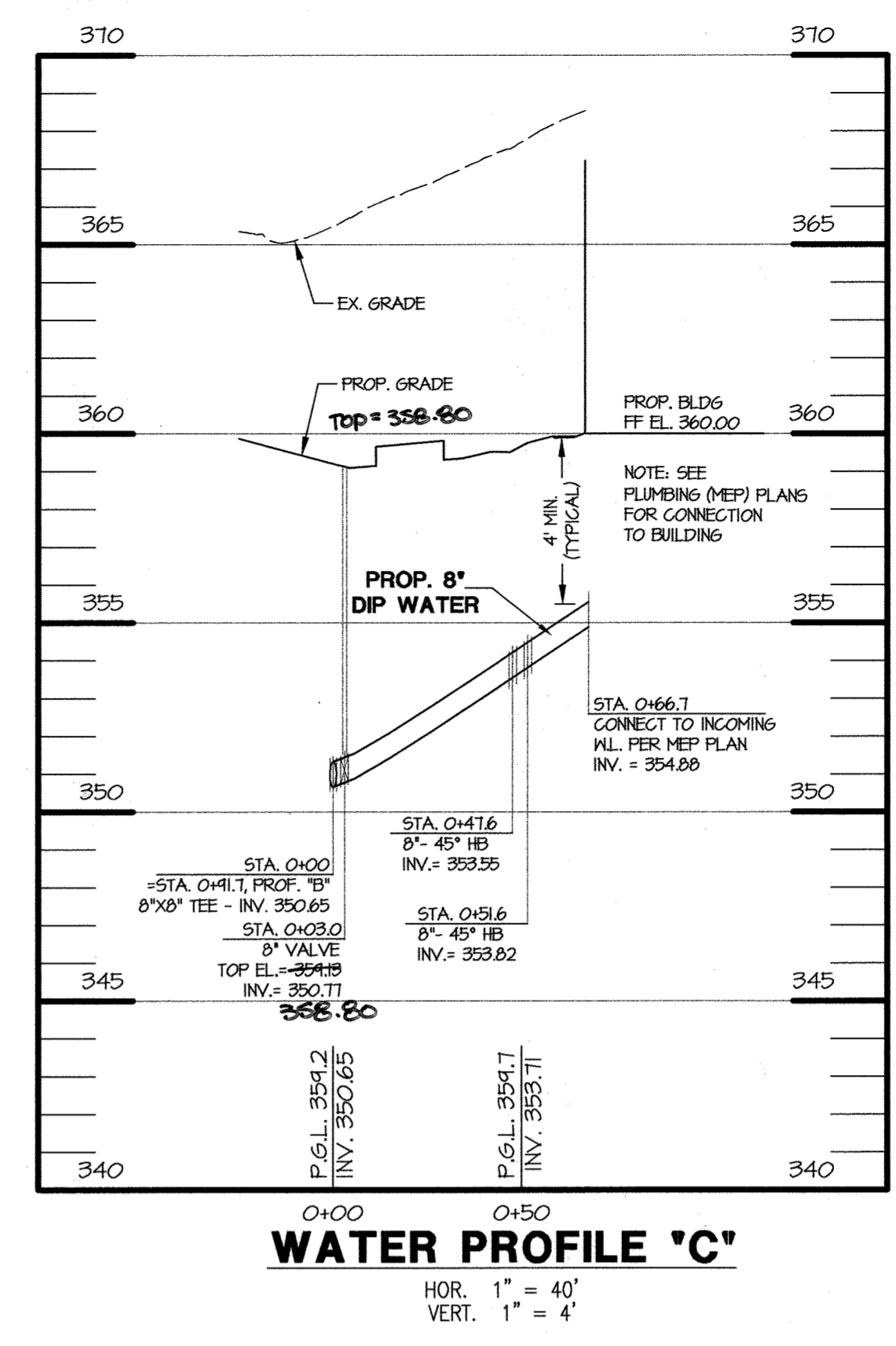
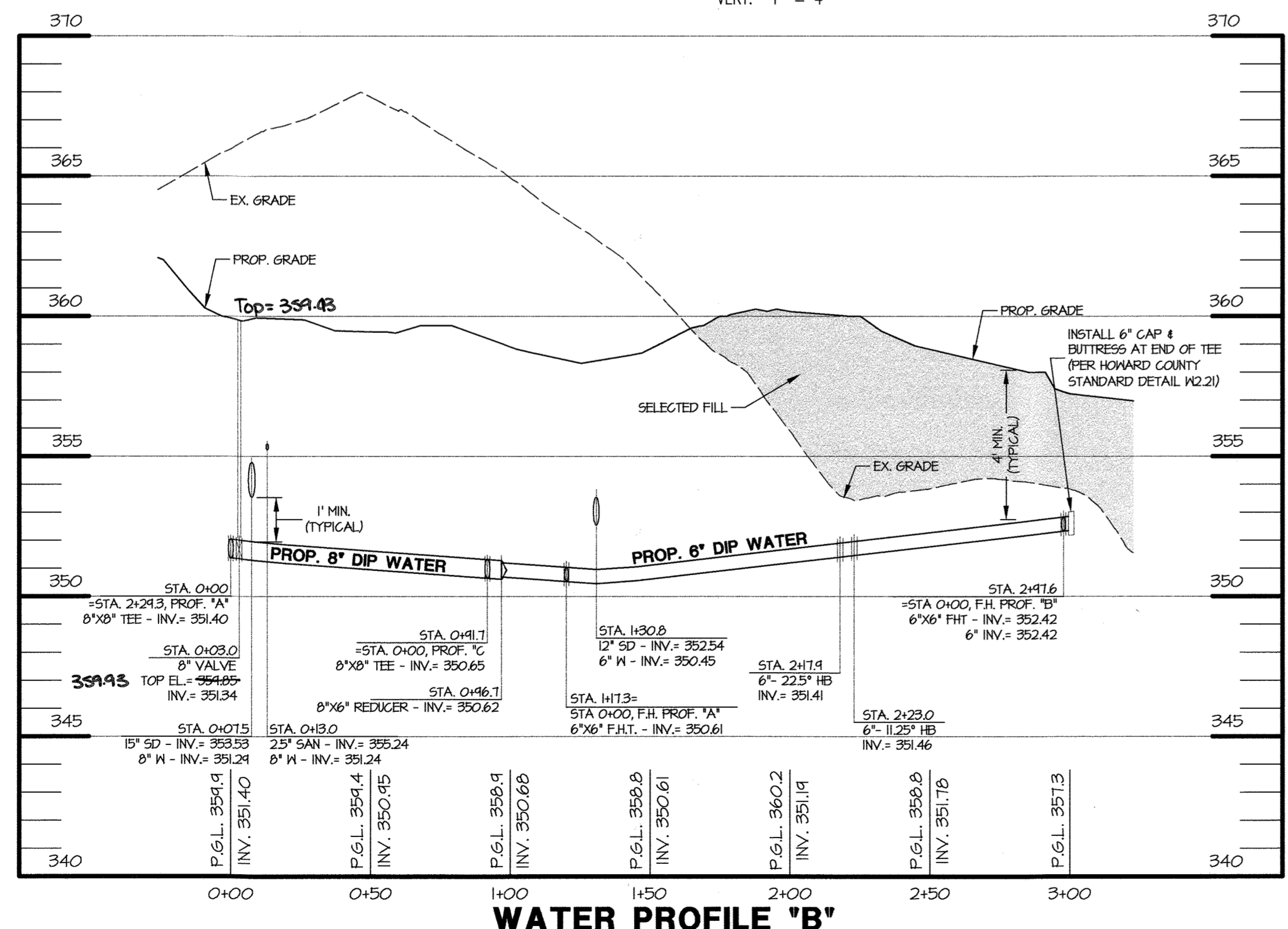
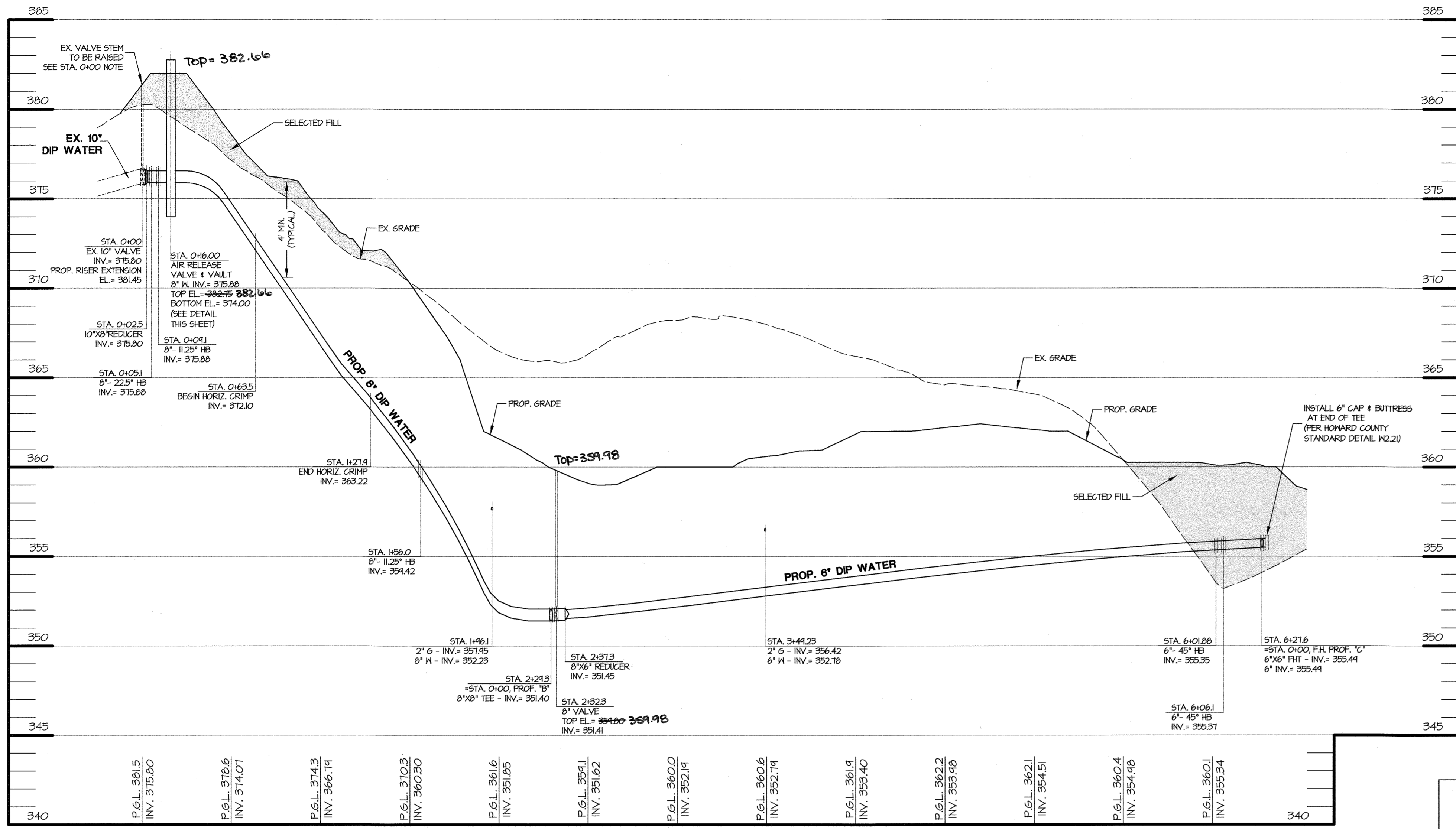
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STORM DRAIN PROFILES

For Revision 2-4-20
 JOB NO.: 13685
SDP-8
 SHEET: 8 OF 23

SCALE: 1" = 40'

DES: BCC CHECK: TCN DATE: 01-17-05

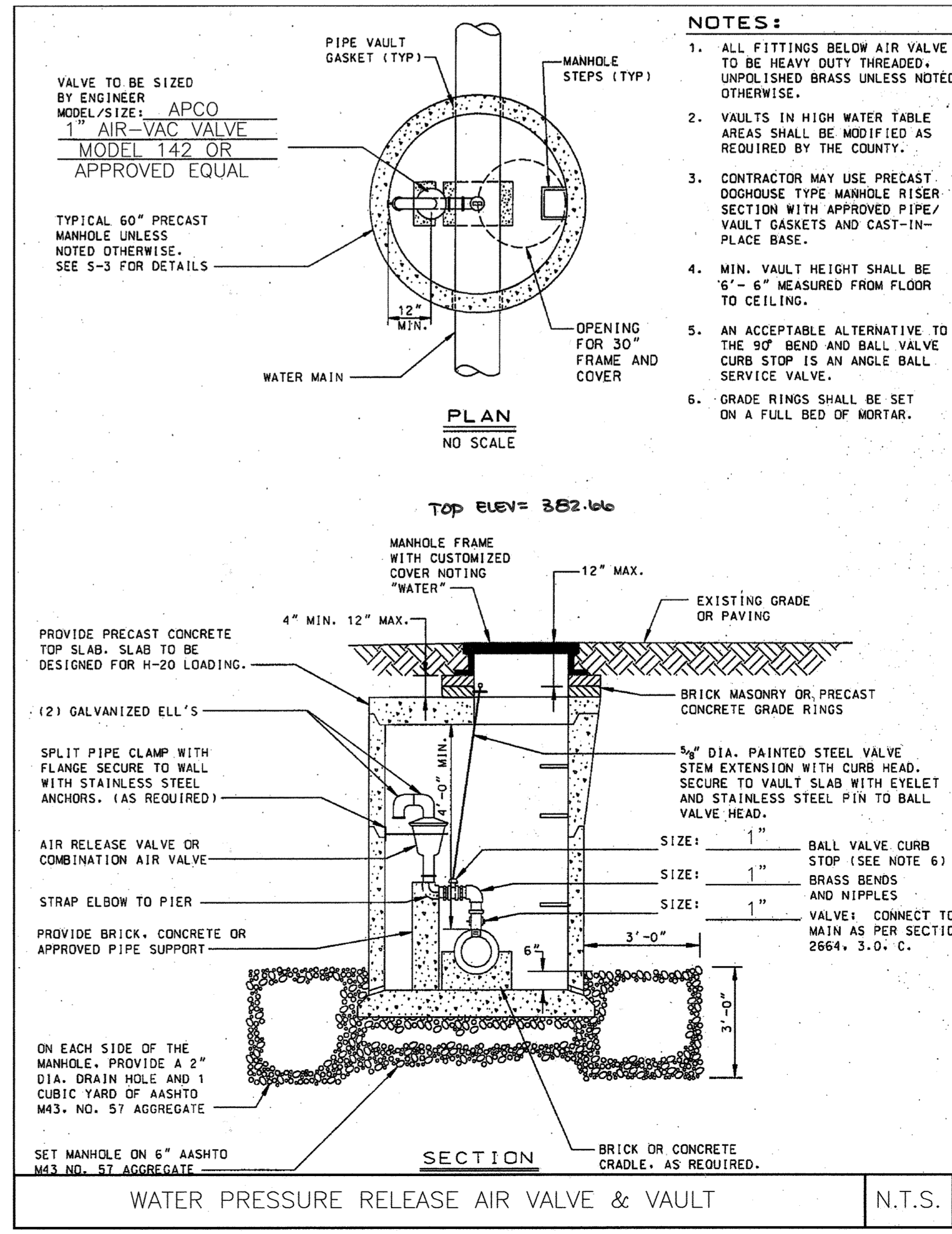


SEE SHEET 10 FOR WATER PIPE & FITTING SCHEDULES

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL

- WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:
- PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING GRAVE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
 - ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.
 - THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
 CHIEF, DIVISION OF LAND DEVELOPMENT 7/4/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 2/2/05

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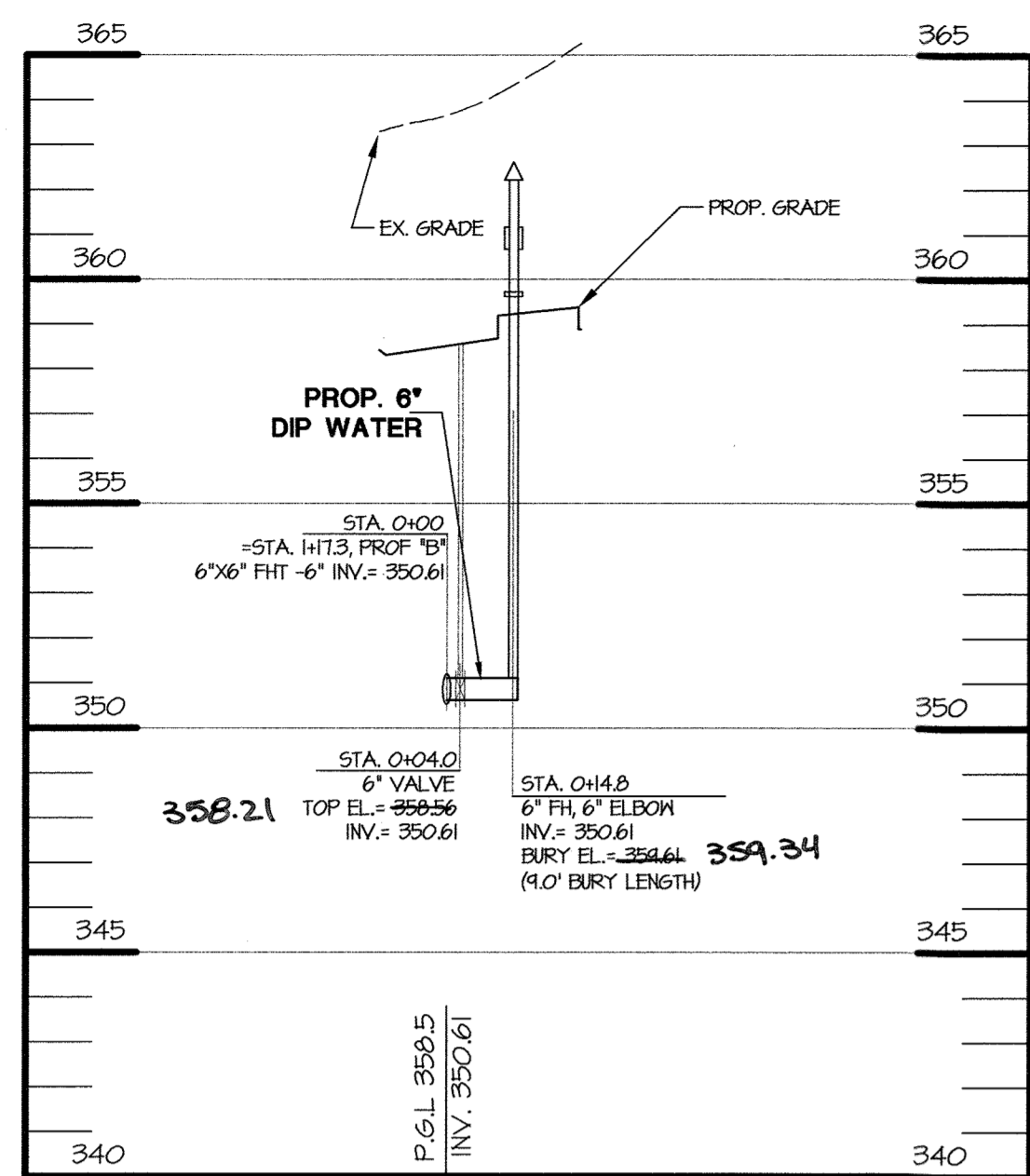
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UTILITY PROFILES

STATE OF MARYLAND
 JOB NO.: 13685
SDP-9
 1-7-05 SHEET: 9 OF 23

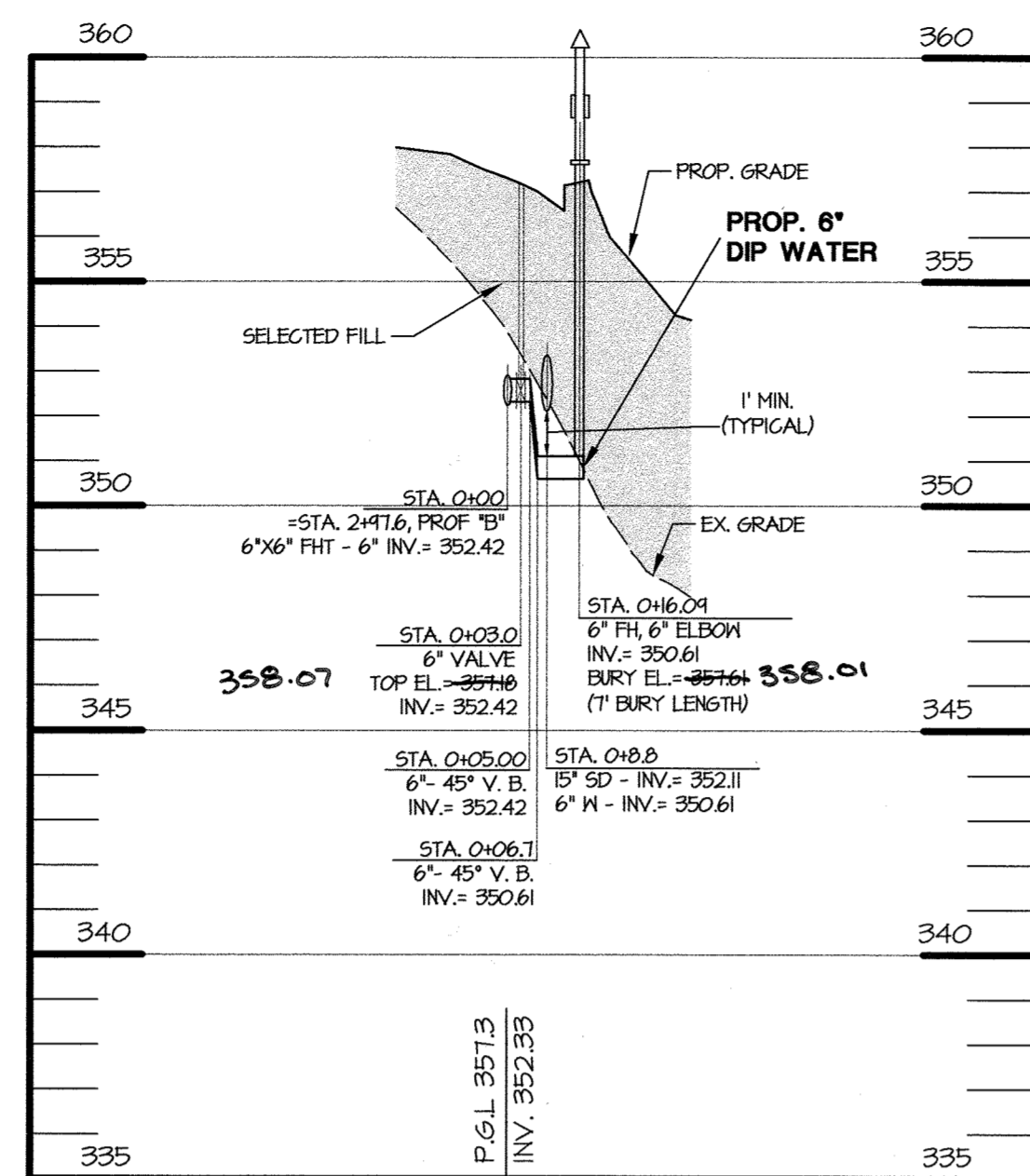
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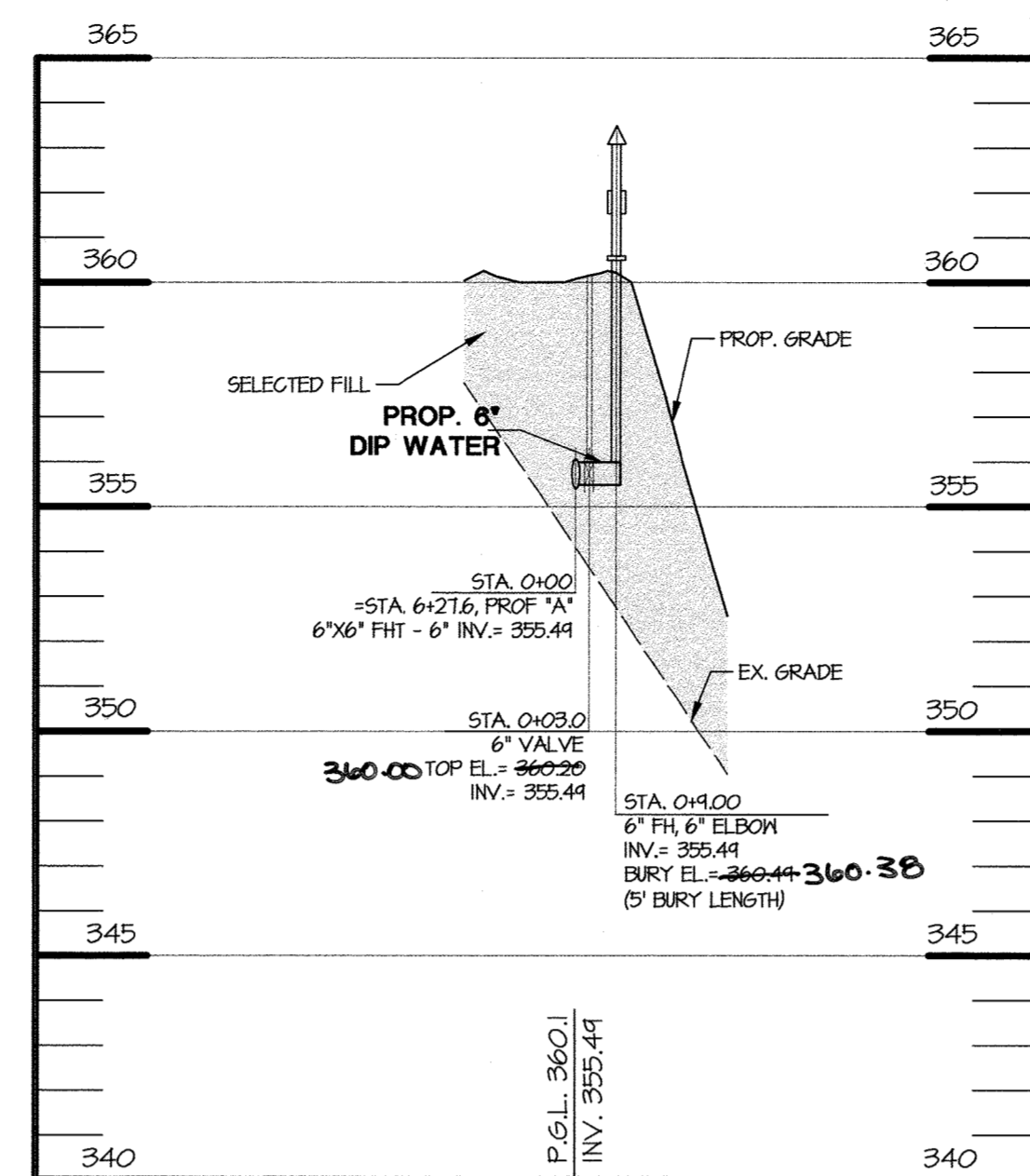
F.H. PROFILE 'A'

HOR. 1" = 40'
VERT. 1" = 4'



F.H. PROFILE 'B'

HOR. 1" = 40'
VERT. 1" = 4'



F.H. PROFILE 'C'

HOR. 1" = 40'
VERT. 1" = 4'

SANITARY PIPE SCHEDULE (PRIVATE)		
SIZE	TYPE	LENGTH
2.5"	PVC SDR 21	346 LF

WATER PIPE SCHEDULE (PRIVATE)		
SIZE	TYPE	LENGTH
10"	CLASS 50 DIP	2 LF
8"	CLASS 50 DIP	403 LF
6"	CLASS 50 DIP	622 LF

SANITARY PIPE FITTINGS SCHEDULE (PRIVATE)	
TYPE	QUANTITY
2.5"-45" HB	2
2.5"-22.5" HB	1
2.5"-11.25" HB	2
2.5"-45" VB	2
AIR RELEASE VALVE & VAULT	1

WATER PIPE FITTINGS SCHEDULE (PRIVATE)	
TYPE	QUANTITY
6" CAP & BUTTRESS	2
6" VALVE	3
8" VALVE	3
6" FIRE HYDRANTS	3
8"X8" TEE	2
6"X6" F.H.T.	3
8"-45" HB	2
8"-22.5" HB	1
8"-11.25" HB	2
6"-45" HB	2
6"-22.5" HB	1
6"-11.25" HB	1
6"-45" VB	2
10"X8" REDUCER	1
8"X6" REDUCER	2
AIR RELEASE VALVE & VAULT	1

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL

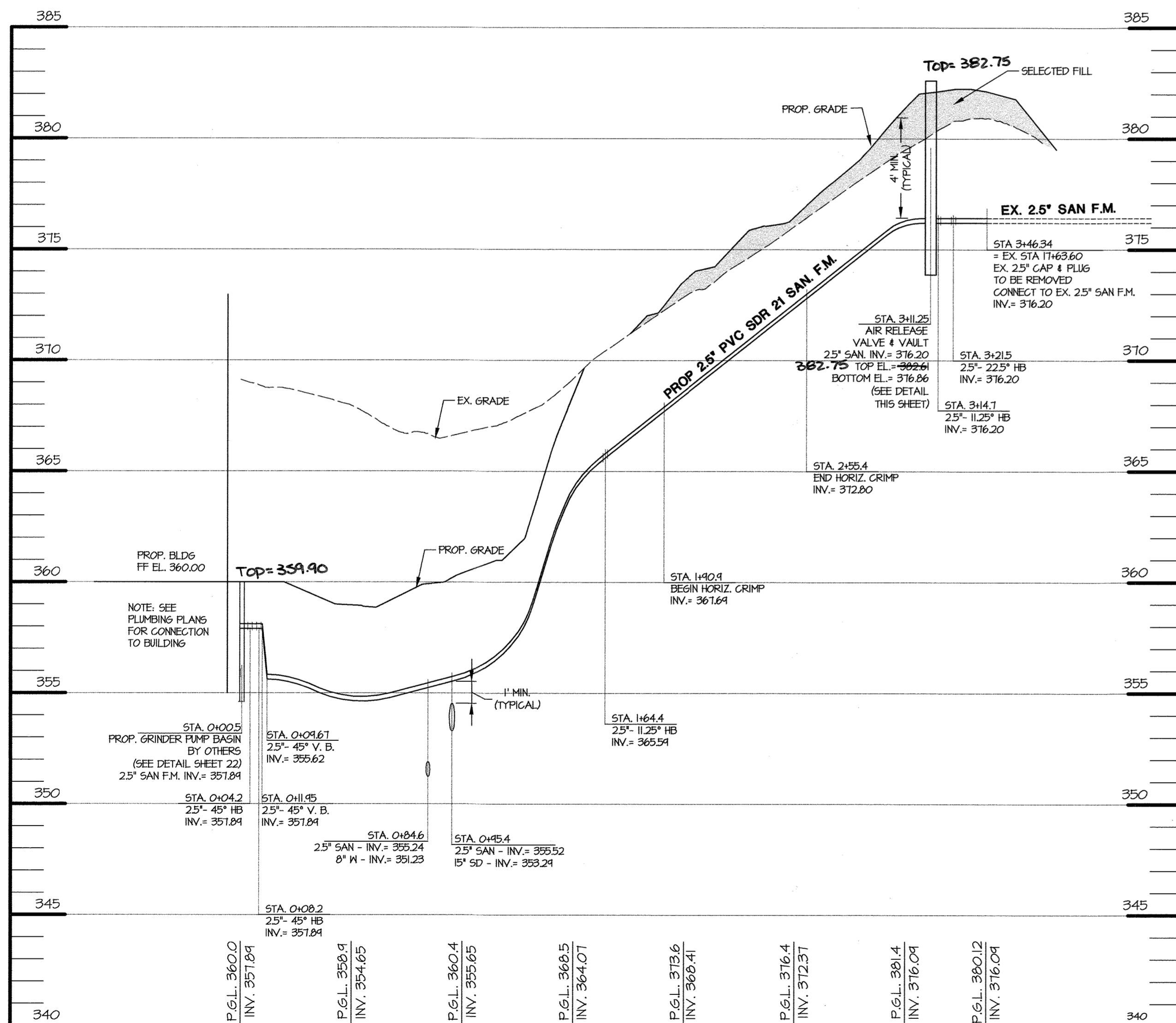
WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:

A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.

B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.

C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER



SANITARY F.M. PROFILE 'A'

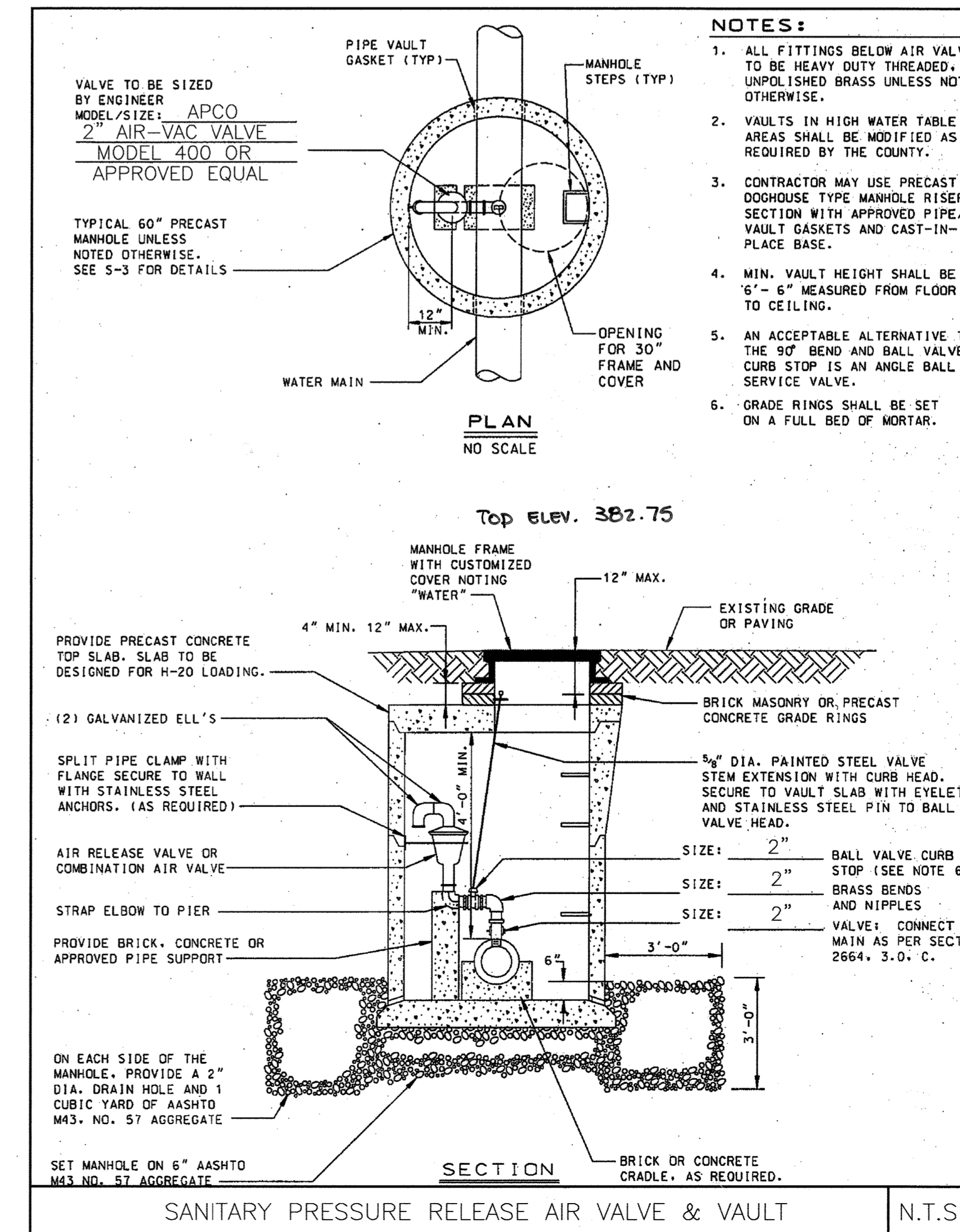
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VERT. 1" = 4'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION: *[Signature]* DATE: 1/21/05

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UTILITY PROFILES

STATE OF MARYLAND PROFESSIONAL ENGINEER

JOB NO.: 13685

SDP-10

1-17-05 SHEET: 10 OF 23

SCALE: 1" = 40'

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INFILTRATION TRENCH GENERAL NOTES AND SPECIFICATIONS

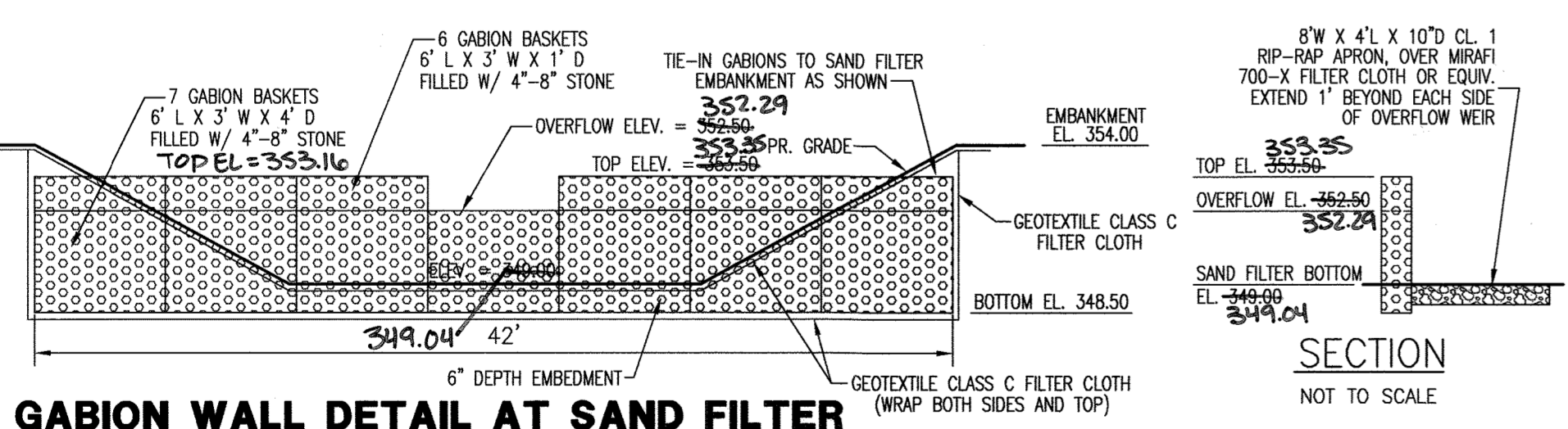
- AN INFILTRATION TRENCH MAY NOT RECEIVE RUN-UP UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE INFILTRATION TRENCH HAS RECEIVED FINAL STABILIZATION.
- HEAVY EQUIPMENT AND TRAFFIC SHALL BE RESTRICTED FROM TRAVELING OVER THE PROPOSED LOCATION OF THE INFILTRATION TRENCH TO MINIMIZE COMPACTION OF THE SOIL.
- EXCAVATE THE INFILTRATION TRENCH TO THE DESIGN DIMENSIONS. EXCAVATED MATERIALS SHALL BE PLACED AWAY FROM THE TRENCH SIDES TO ENHANCE TRENCH WALL STABILITY. LARGE TREE ROOTS MUST BE TRIMMED FLUSH WITH THE TRENCH SIDES IN ORDER TO PREVENT FABRIC PUNCTURING OR TEARING OF THE FILTER FABRIC DURING SUBSEQUENT INSTALLATION PROCEDURES. THE SIDE WALLS OF THE TRENCH SHALL BE ROUGHENED WHERE SHEARED AND SEALED BY HEAVY EQUIPMENT.
- A CLASS "C" GEOTEXTILE OR BETTER (SEE SECTION 24.0, MATERIAL SPECIFICATIONS, 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, MDE, 1994) SHALL INTERFACE BETWEEN THE TRENCH SIDE WALLS AND BETWEEN STONE RESERVOIR AND GRAVEL FILTER LAYERS. A PARTIAL LIST OF NON-WOVEN FABRICS THAT MEET THE CLASS "C" CRITERIA FOLLOWS. ANY ALTERNATIVE FILTER FABRIC MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.
 - AMCO 4552 CARTRIDGE FX-90S
 - GEOLON N70 MIRAFI 180-N
 - WEBTEC N07
- THE WIDTH OF GEOTEXTILE MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO THE TRENCH PERIMETER IRREGULARITIES AND FOR A 6-INCH MINIMUM TOP OVERLAP. THE FILTER FABRIC SHALL BE TUCKED UNDER THE SAND LAYER ON THE BOTTOM OF THE INFILTRATION TRENCH FOR A DISTANCE OF 6 TO 12 INCHES. STONES OR OTHER ANCHORING OBJECTS SHOULD BE PLACED ON THE FABRIC AT THE EDGE OF THE TRENCH TO KEEP THE TRENCH OPEN DURING WINDY PERIODS. WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UPHILL ROLL SHOULD LAP A MINIMUM OF 2 FEET OVER THE DOWNHILL ROLL IN ORDER TO PROVIDE A SHINGLED EFFECT.
- IF A 6" SAND FILTER LAYER IS PLACED ON THE BOTTOM OF THE INFILTRATION TRENCH, THE SAND FOR THE FILTRATION TRENCH SHALL BE WASHED AND MEET ASHTO-M-43, SIZE NO. 9 OR NO. 10. ANY ALTERNATIVE SAND GRADATION MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.
- THE STONE AGGREGATE SHOULD BE PLACED IN A MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. THE GRAVEL (ROUNDED "BANK RUN" GRAVEL IS PREFERRED) FOR THE INFILTRATION TRENCH SHALL BE WASHED AND MEET ONE OF THE FOLLOWING ASHTO-M-43, SIZE NO. 2 OR NO. 3.
- FOLLOWING THE STONE AGGREGATE PLACEMENT, THE FILTER FABRIC SHALL BE FOLDED OVER THE STONE AGGREGATE TO FORM A 6-INCH MINIMUM LONGITUDINAL LAP. THE DESIRED FILL SOIL OR STONE AGGREGATE SHALL BE PLACED OVER THE LAP AT SUFFICIENT INTERVALS TO MAINTAIN THE LAP DURING SUBSEQUENT BACKFILLING.
- CARE SHALL BE EXERCISED TO PREVENT NATURAL OR FILL SOILS FROM INTERMIXING WITH THE STONE AGGREGATE. ALL CONTAMINATED STONE AGGREGATE SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED STONE AGGREGATE.
- VOIDS MAY OCCUR BETWEEN FABRIC AND THE EXCAVATION SIDES SHALL BE AVOIDED. REMOVING BOULDERS OR OTHER OBSTACLES FROM THE TRENCH WALLS IS ONE SOURCE OF SUCH VOID. THEREFORE, NATURAL SOILS SHOULD BE PLACED IN THOSE VOID AT THE MOST CONVENIENT TIME DURING CONSTRUCTION TO ENSURE FABRIC CONFORMITY TO THE EXCAVATION SIDES.
- VERTICALLY EXCAVATED WALLS MAY BE DIFFICULT TO MAINTAIN IN AREAS WHERE SOIL MOISTURE IS HIGH OR WHERE SOFT COHESIVE OR COHESIONLESS SOILS ARE DOMINANT. THESE CONDITIONS MAY REQUIRE LAYING BACK OF THE SIDE SLOPES TO MAINTAIN STABILITY.
- PVC DISTRIBUTION PIPES SHALL BE SCHEDULE 40 AND MEET ASTM-D-1785. ALL FITTINGS SHALL MEET ASTM-D-2729. PERFORATIONS SHALL BE 3/8" IN DIAMETER. A PERFORATED PIPE SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT FO THE INFILTRATION TRENCH WALL. THE END OF THE PVC PIPE SHALL BE CAPPED. NOTE: PVC PIPE WITH A WALL THICKNESS CLASSIFICATION OF SDR-35 MEETING ASTM-D-3034 IS AN ACCEPTABLE SUBSTITUTE FOR THE SCHEDULE 40 PIPE.
- THE OBSERVATION WELL IS TO CONSIST OF 6-INCH DIAMETER PERFORATED PVC SCHEDULE 40 PIPE (M278 OR F758, TYPE PS 28) WITH A CAP SET FLUSH TO FINAL PAVED SURFACE AND IS TO BE LOCATED NEAR THE LONGITUDINAL CENTER OF THE INFILTRATION TRENCH. THE PIPE SHALL HAVE A PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING THE CAP. THE SCREW TOP LID SHALL BE A CLEANOUT WITH A LOCKING MECHANISM OR SPECIAL BOLT TO DISCOURAGE VANDALISM. THE DEPTH TO THE INVERT SHALL BE MARKED ON THE LID. THE PIPE SHALL BE PLACED VERTICALLY WITHIN THE GRAVEL PORTION OF THE INFILTRATION TRENCH AND A CAP PROVIDED AT THE BOTTOM OF THE PIPE. THE BOTTOM OF THE CAP SHALL REST ON THE INFILTRATION TRENCH BOTTOM.
- CORRUGATED METAL DISTRIBUTION PIPES SHALL CONFORM TO ASHTO-M-36, AND SHALL BE ALUMINIZED IN ACCORDANCE WITH ASHTO-M-274. ALUMINIZED PIPE IN CONTACT WITH CONCRETE SHALL BE COATED WITH AN INERT COMPOUND CAPABLE OF PREVENTING THE DELETERIOUS EFFECT OF ALUMINUM ON THE CONCRETE. PERFORATED DISTRIBUTION PIPES SHALL CONFORM TO ASHTO-M-36, CLASS 2 AND SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. AN ALUMINIZED METAL PLATE SHALL BE WELDED TO THE END OF THE PIPE.
- IF A DISTRIBUTION STRUCTURE WITH A WET WELL IS USED, A 4-INCH DRAIN PIPE SHALL BE PROVIDED AT OPPOSITE ENDS OF THE INFILTRATION TRENCH DISTRIBUTION STRUCTURE. TWO (2) CUBIC FEET OF POROUS BACKFILL MEETING ASHTO-M-43, SIZE NO. 57 SHALL BE PROVIDED AT EACH DRAIN.
- IF A DISTRIBUTION STRUCTURE IS USED, THE MANHOLE COVER SHALL BE BOLTED TO THE FRAME.

SAND FILTER SPECIFICATIONS

- MATERIAL SPECIFICATIONS FOR SAND FILTER
- THE ALLOWABLE MATERIALS FOR SAND FILTER CONSTRUCTION ARE DETAILED IN TABLE B.3.1. (SEE PAGE SDP-3)
- SAND FILTER TESTING SPECIFICATIONS
- UNDERGROUND SAND FILTERS, FACILITIES WITHIN SENSITIVE GROUNDWATER AQUIFERS, AND FILTERS DESIGNED TO SERVE URBAN HOT SPOTS ARE TO BE TESTED FOR WATER TIGHTNESS TO PLACEMENT OF FILTER MEDIA. ENTRANCES AND EXITS SHOULD BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO LEAKAGE FOR A PERIOD OF 8 HOURS.
- ALL OVERFLOW WEIRS, MULTIPLE ORIFICES AND FLOW DISTRIBUTION SLOTS ARE TO BE FIELD-TESTED TO VERIFY ADEQUATE DISTRIBUTION OF FLOWS.
- SAND FILTER CONSTRUCTION SPECIFICATIONS
- PROVIDE SUFFICIENT MAINTENANCE ACCESS (I.E., 12-FOOT-WIDE ROAD WITH LEGALLY RECORDED EASEMENT). VEGETATED ACCESS SLOPES ARE TO BE MAXIMUM OF 10%; GRAVEL SLOPES TO 15%; PAVED SLOPES TO 25%. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED. SURFACE ON FILTER BED IS TO BE LEVEL.
- ALL UNDERGROUND SAND FILTERS SHOULD BE CLEARLY DELINEATED WITH SIGNS SO THAT THEY MAY BE LOCATED WHEN MAINTENANCE IS DUE. SURFACE SAND FILTERS MAY BE PLANTED WITH APPROPRIATE GRASSES. SEE APPENDIX A.
- "POCKET" SAND FILTERS (AND RESIDENTIAL BIOTRETENTION FACILITIES TREATING AREAS LARGER THAN AN ACRE) SHALL BE SIZED WITH A STONE "WINDOW" THAT COVERS APPROXIMATELY 10% OF THE FILTER AREA. THIS "WINDOW" SHALL BE FILLED PEA GRAVEL (3/4" INCH STONE)

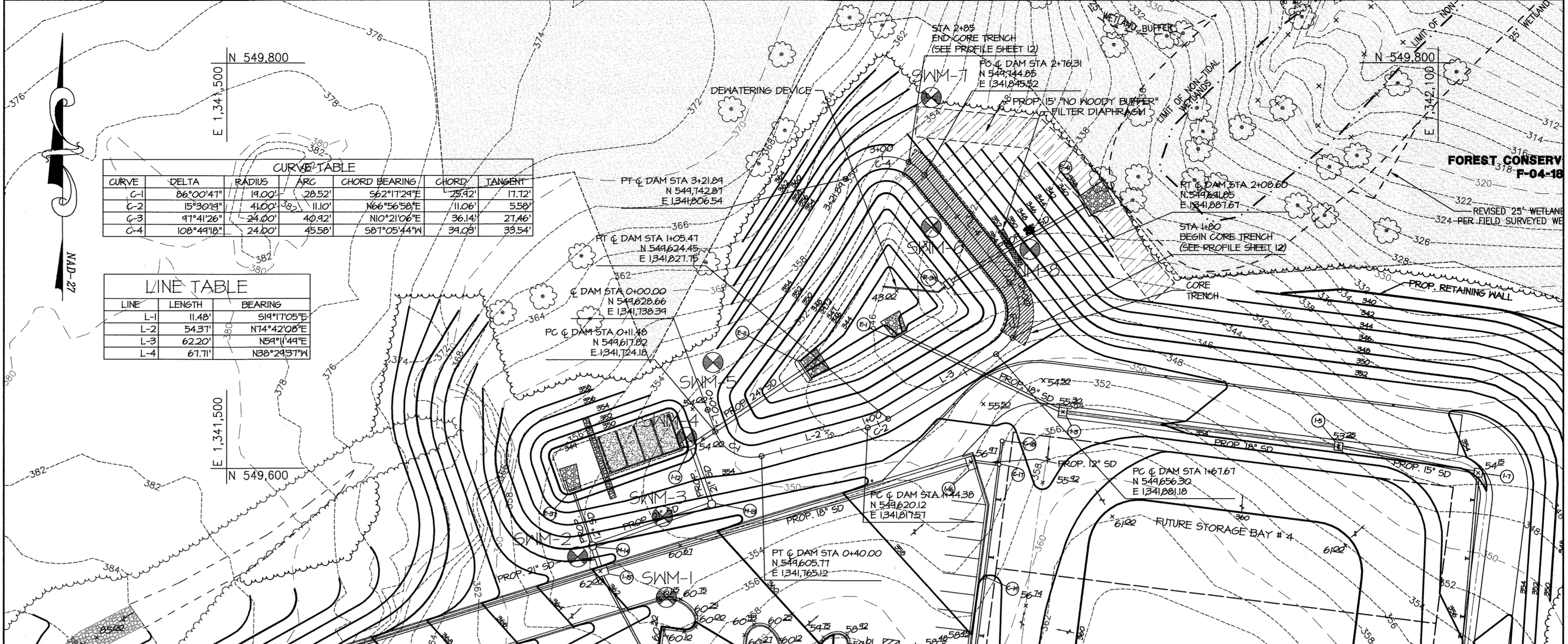
OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS

- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
- THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE A YEAR , WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
- FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF 3 (THREE) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
- DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATION AND AS NEEDED.
- VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- REMOVE SILT WHEN IT EXCEEDS 4 (FOUR) INCHES DEEP IN THE FOREBAY.
- WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
- A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH FACILITY DRAINS.
- THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.



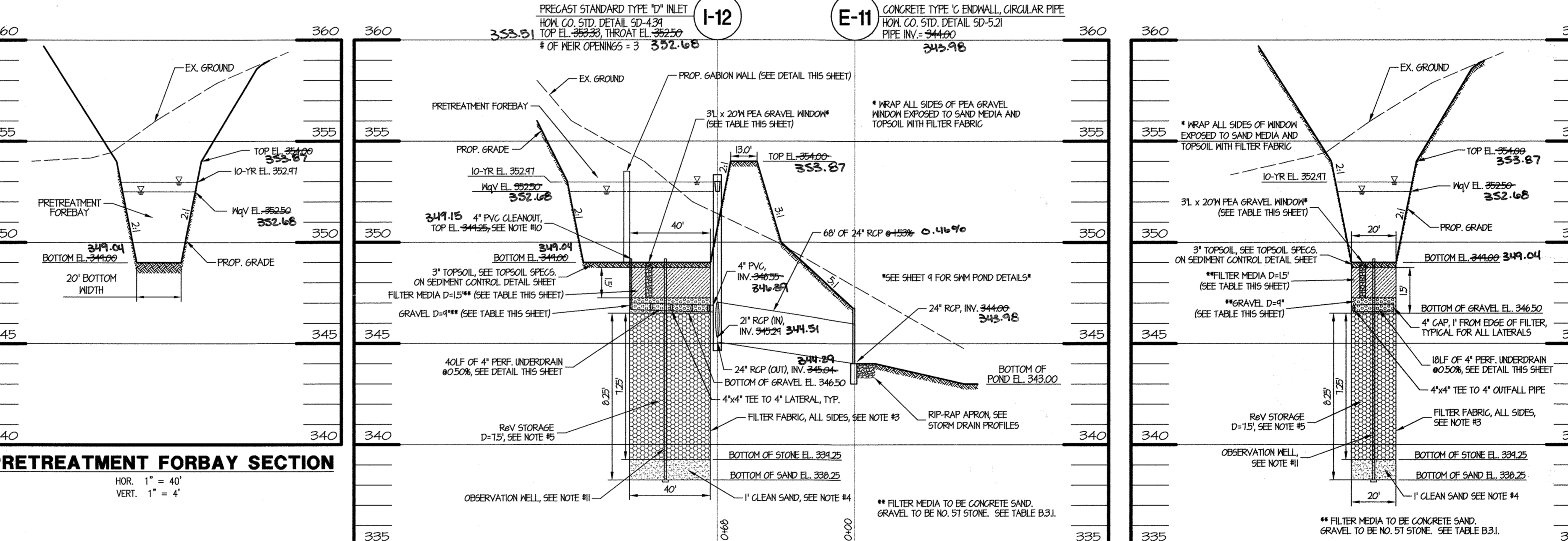
- INSTALLATION NOTES**
- GABION BASKETS SHALL BE CONSTRUCTED OF GALVANIZED U.S. GAUGE 11 MESH WIRE OR APPROVED EQUIVALENT.
 - GABION INSTALLATION SHALL BE PERFORMED ACCORDING TO GABION MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
 - TOP GABION BASKETS TO BE STAGGERED OVER BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.
 - TOP GABION BASKETS TO BE FASTENED TO BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK
 DATE: 1/21/05
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 2/16/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING
 DATE: 2/12/05



STORMWATER MANAGEMENT PLAN (PRIVATE FACILITY)

I-12 TO BE A PRECAST STRUCTURE WITH 3 WEIR OPENINGS PLACED AT THE FRONT AND SIDES OF THE INLET. BACK OF INLET (AGAINST FILL SLOPE) WILL NOT HAVE A WEIR OPENING.
 SCALE: 1" = 40'



PRETREATMENT FORBAY SECTION HOR. 1" = 40' VERT. 1" = 4'
SAND FILTER PROFILE HOR. 1" = 40' VERT. 1" = 4'
SAND FILTER SECTION HOR. 1" = 40' VERT. 1" = 4'

GRADATION CHART FOR ASTM C-33 CONCRETE SAND

SEIVE SIZE	mm	% PASSING
3/8 IN.	9.5	100
No.4	4.75	90-100
No.10	2.00	70-100
No.20	0.850	50-85
No.50	0.300	25-50
No.100	0.150	8-30
No.140	0.106	0-15
No.200	0.075	0-5

GRADATION CHART FOR No.57 STONE

SEIVE SIZE	% PASSING
1-1/2"	95-100
1/2"	25-60
No.4	0-10
No.8	0-5

DRAIN PIPE PERFORATION DETAIL

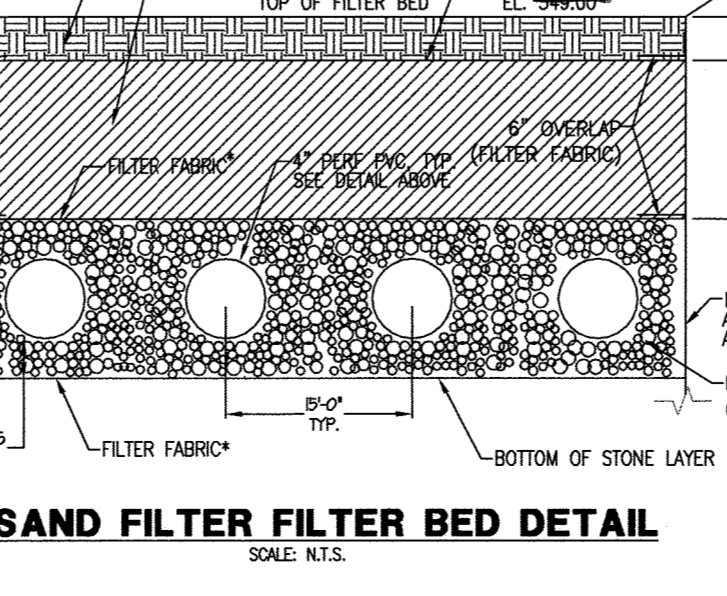
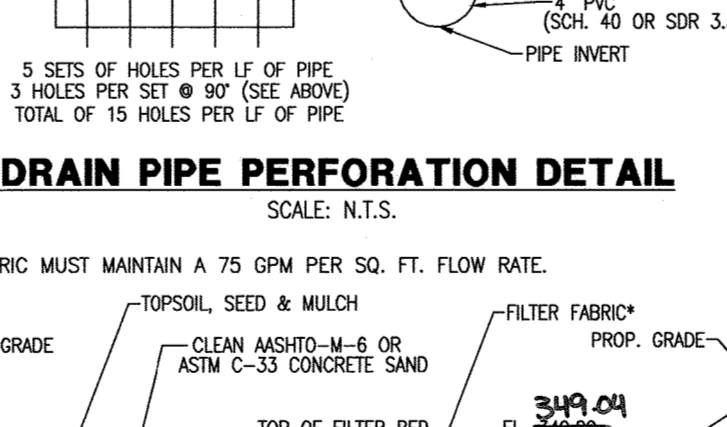


TABLE B.3.1 MATERIAL SPECIFICATIONS FOR SAND FILTERS

MATERIAL	SPECIFICATION/TEST METHOD	SIZE	NOTES
PEA GRAVEL	ASHTO-M-43	0.25" - 0.50"	WASHED, RIVER RUN, ROUND DIAMETER
SAND	CLEAN ASHTO-M-6 OR ASTM-C-33 CONCRETE SAND, SEE GRADATION CHART	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DABASE AND GRANISTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR POLYMERIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
PEAT	ASH CONTENT: <15% PH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY: 0.12 TO 0.15 G/CC	N/A	THE MATERIAL MUST BE REED-SIDE HEMIC PEAT, SHREDDED, UNCOMPACTED, UNIFORM, AND CLEAN.
LEAF COMPOST	ASHTO-M-43	N/A	DOUBLE WASHED NO. 57 STONE, SEE GRADATION CHART
UNDERDRAIN GRAVEL	ASHTO-M-43	0.375" TO 1.50"	
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH=125 LB.) ASTM-D-4632 (TENSILE STRENGTH=300 LB.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 75 GPM PER SQ. FT. FLOW RATE. NOTE: A 4" FILTER LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS. SEE INFILTRATION TRENCH GENERAL NOTE 3.
IMPERMEABLE LINER (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH 1,100 LB. ELONGATION 200%) ASTM-D-4632 (TENSILE STRENGTH= 150 LB./IN) ASTM-D-471 (WATER ADSORPTION: +8 TO -2% MASS)	30 MIL THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR ASHTO-M-278	4" - 6" RIGID SCH. 40 PVC OR SDR35	4" PER 6" ON CENTER, 3 HOLES PER ROW. SEE DRAIN PIPE PERFORATION DETAIL; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES. SEE INFILTRATION GENERAL NOTE 10.
CONCRETE (CAST-IN-PLACE)	MHA STANDARDS AND SPECS. SECTION 902, MIX NO. 3, F'c = 3500 PSI, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM-615-60	N/A	ON SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED: 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
CONCRETE (PRECAST)	PER PRE-CAST MANUFACTURER	N/A	SEE ABOVE NOTE
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM-A-123

REVISIONS

NO.	DATE	DESCRIPTION
1	03/00	AS-BUILT INFO ADDED

APPROVALS

REQUESTER	DATE
PLANT FACILITIES DEPT. ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SURVEY	
CONCRETE	
STRUCTURE	
SECTOR LEADER	

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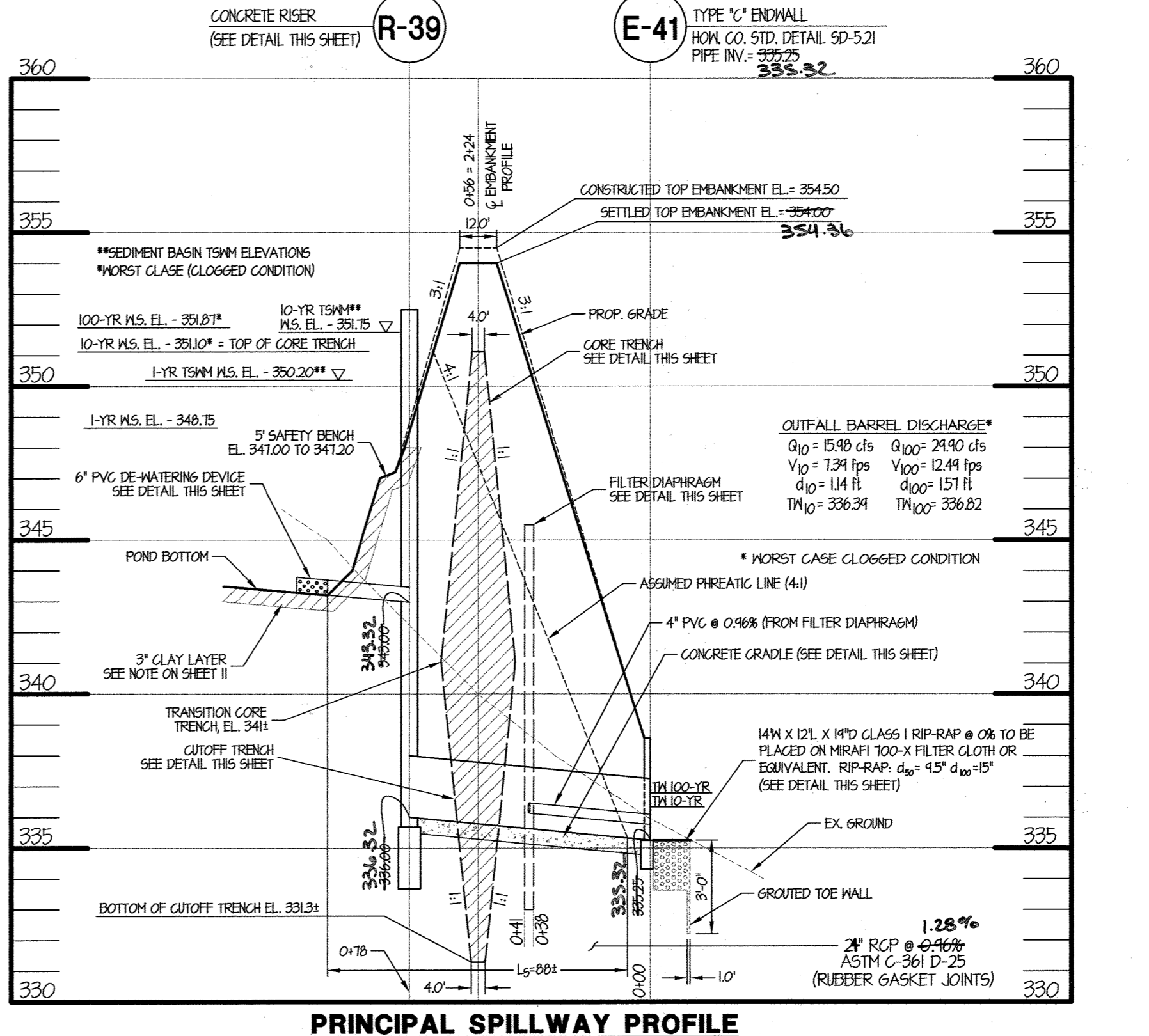
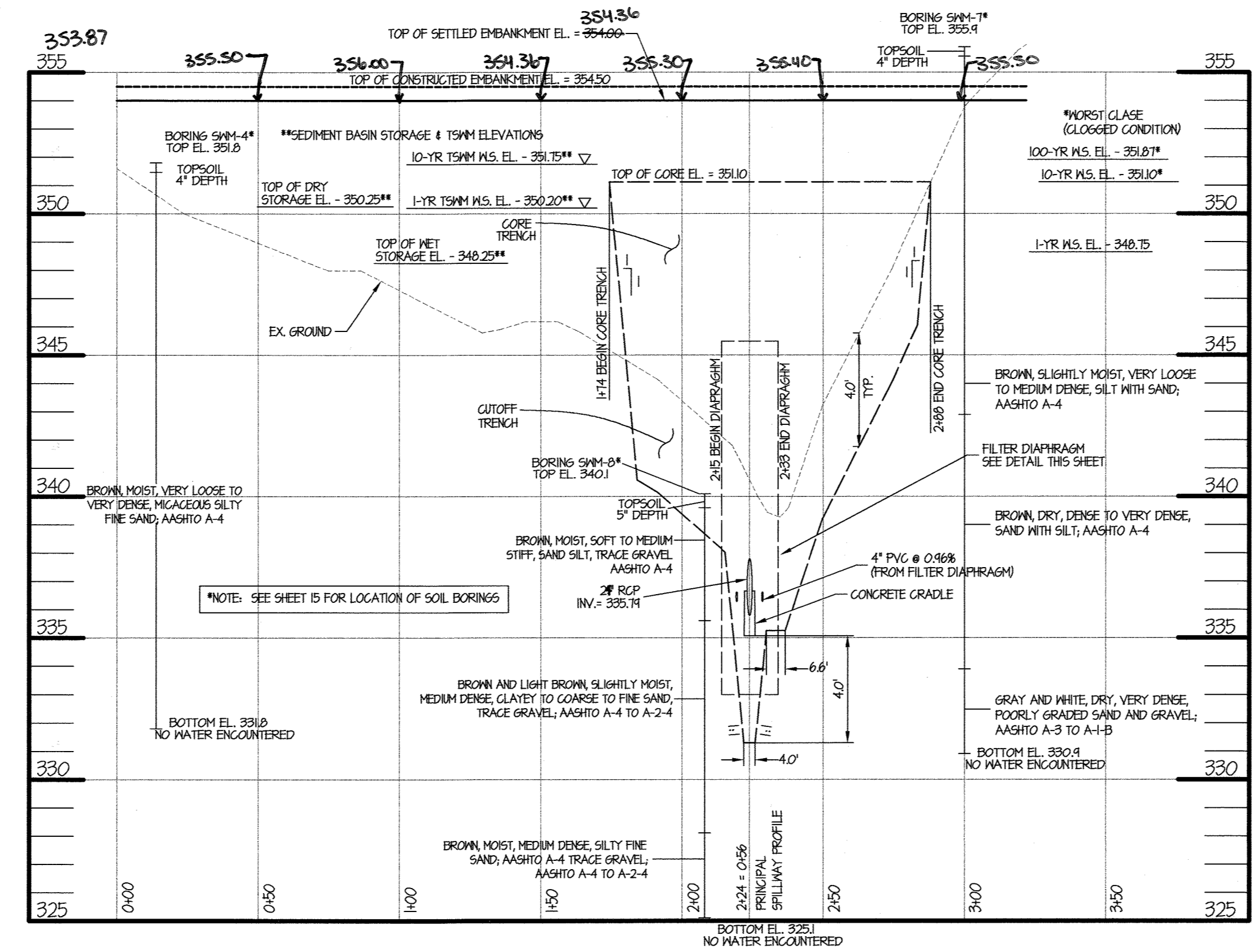
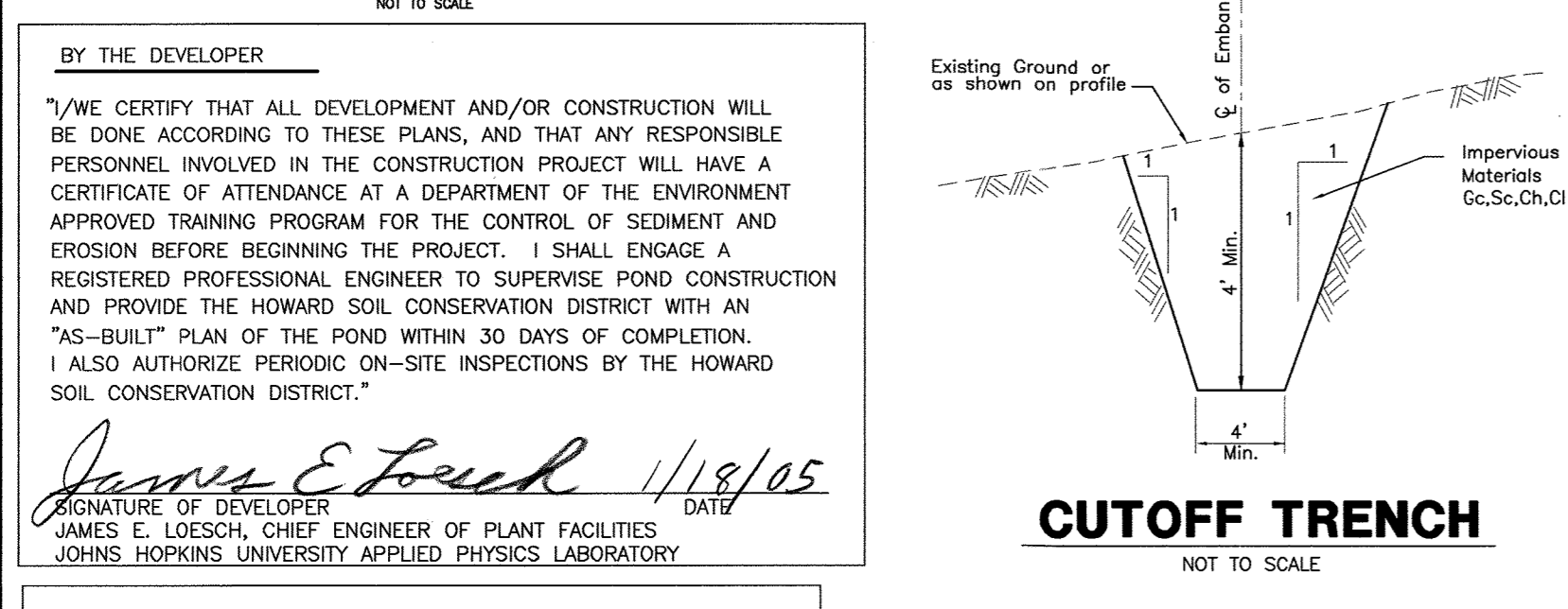
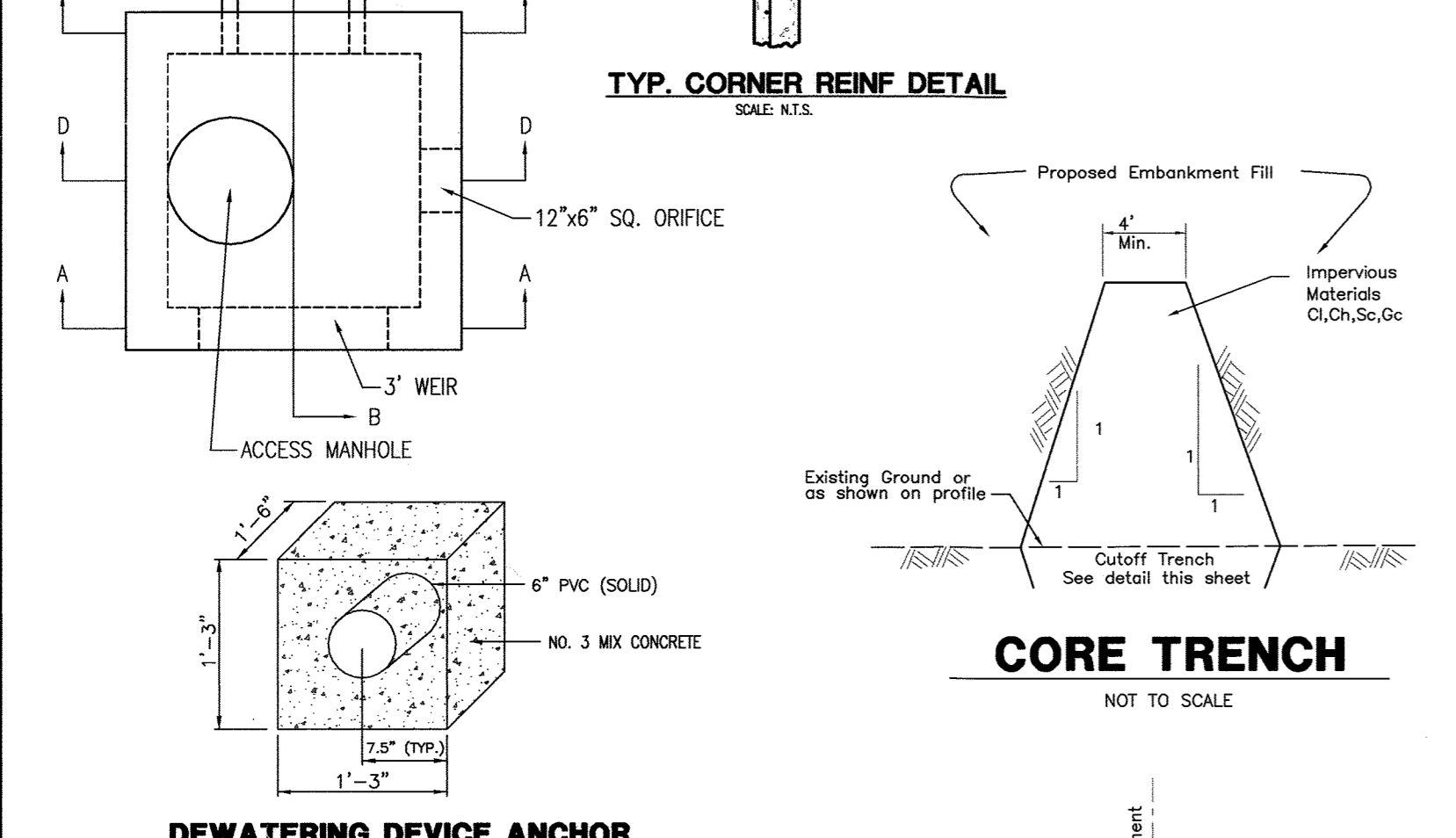
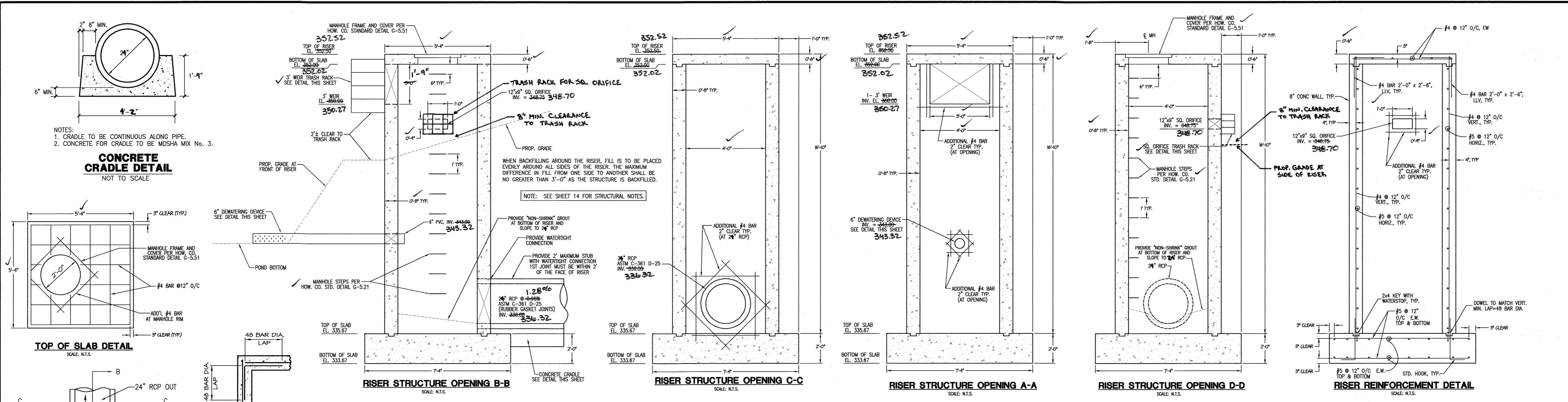
GRAPHIC SCALE



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 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1660
 FAX (410) 792-7395

SWM PLAN 1

JOB NO.: 13685	DATE: 1/21/05
SDP-11	DATE: 2/16/05
SHEET: 11 OF 23	DATE: 2/12/05
SCALE: 1" = 40'	DATE: 01-17-05
DES: KKB	CHECK: TCN



BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

James E. Lorsch 1/18/05
DATE
SIGNATURE OF DEVELOPER
JAMES E. LORSCH, CHIEF ENGINEER OF PLANT FACILITIES
JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

BY THE ENGINEER

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Thomas C. Neugebauer, P.E. 1-17-05
DATE
SIGNATURE OF ENGINEER
THOMAS C. NEUGEBAUER, P.E. MD LIC.#29203

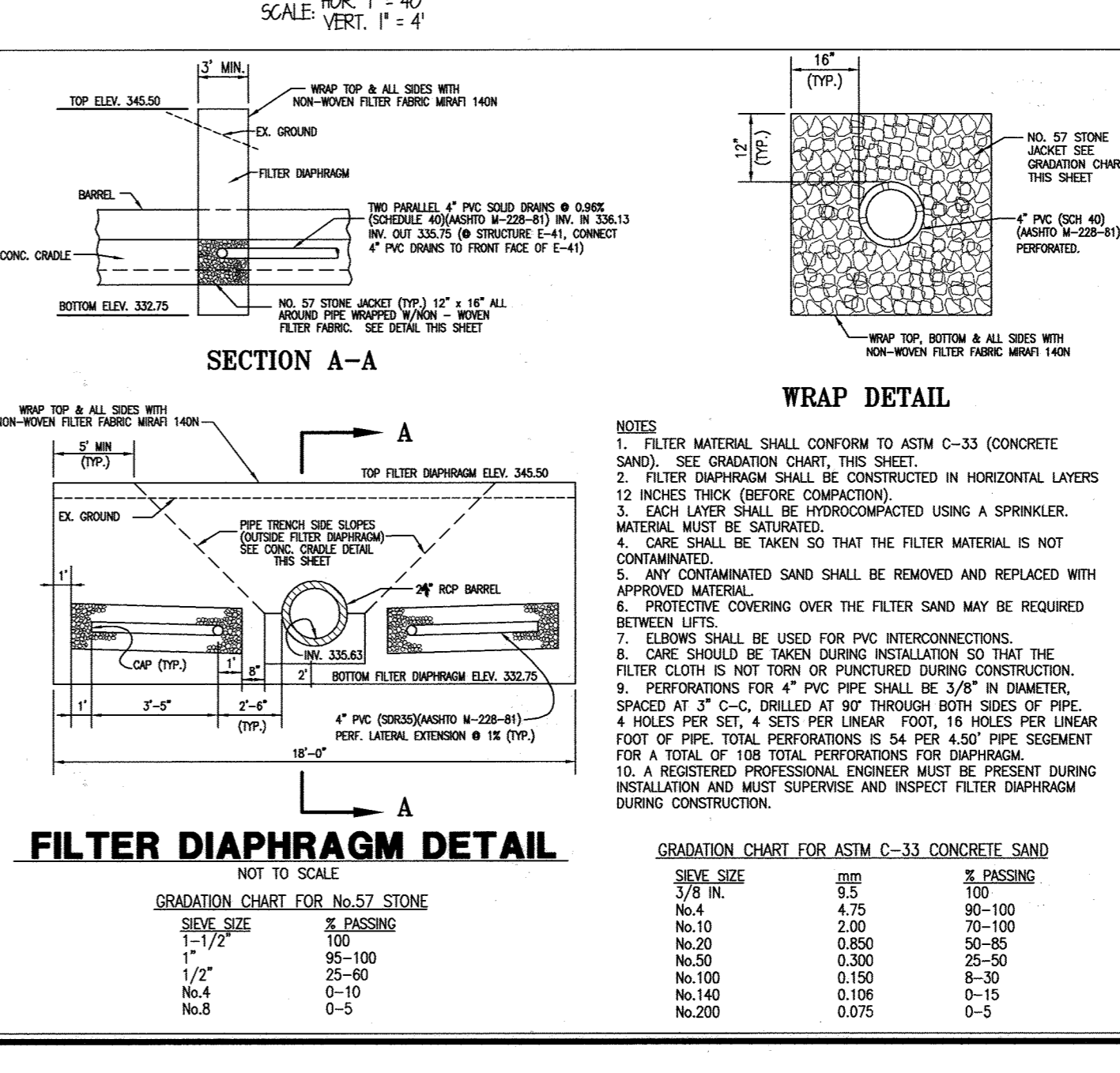
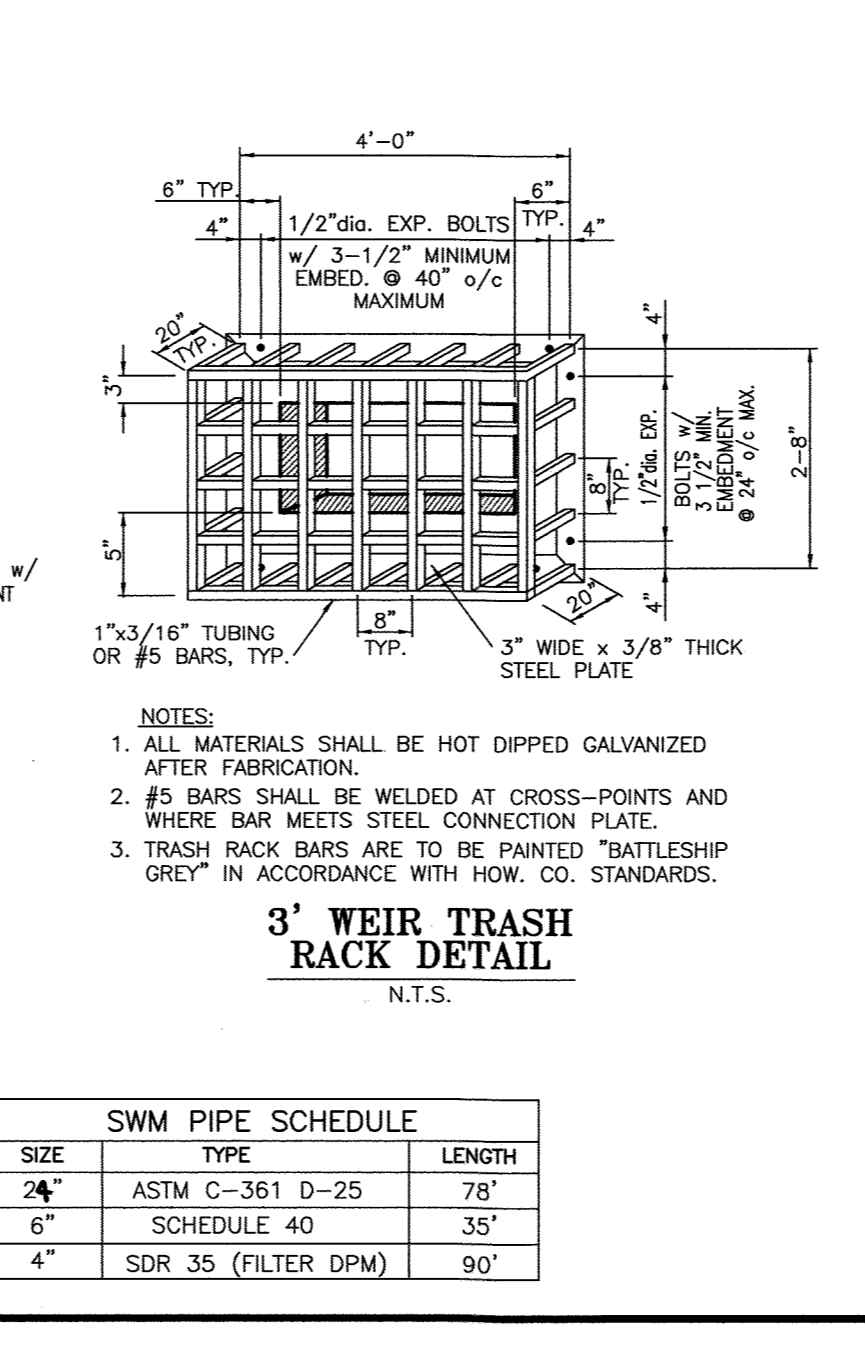
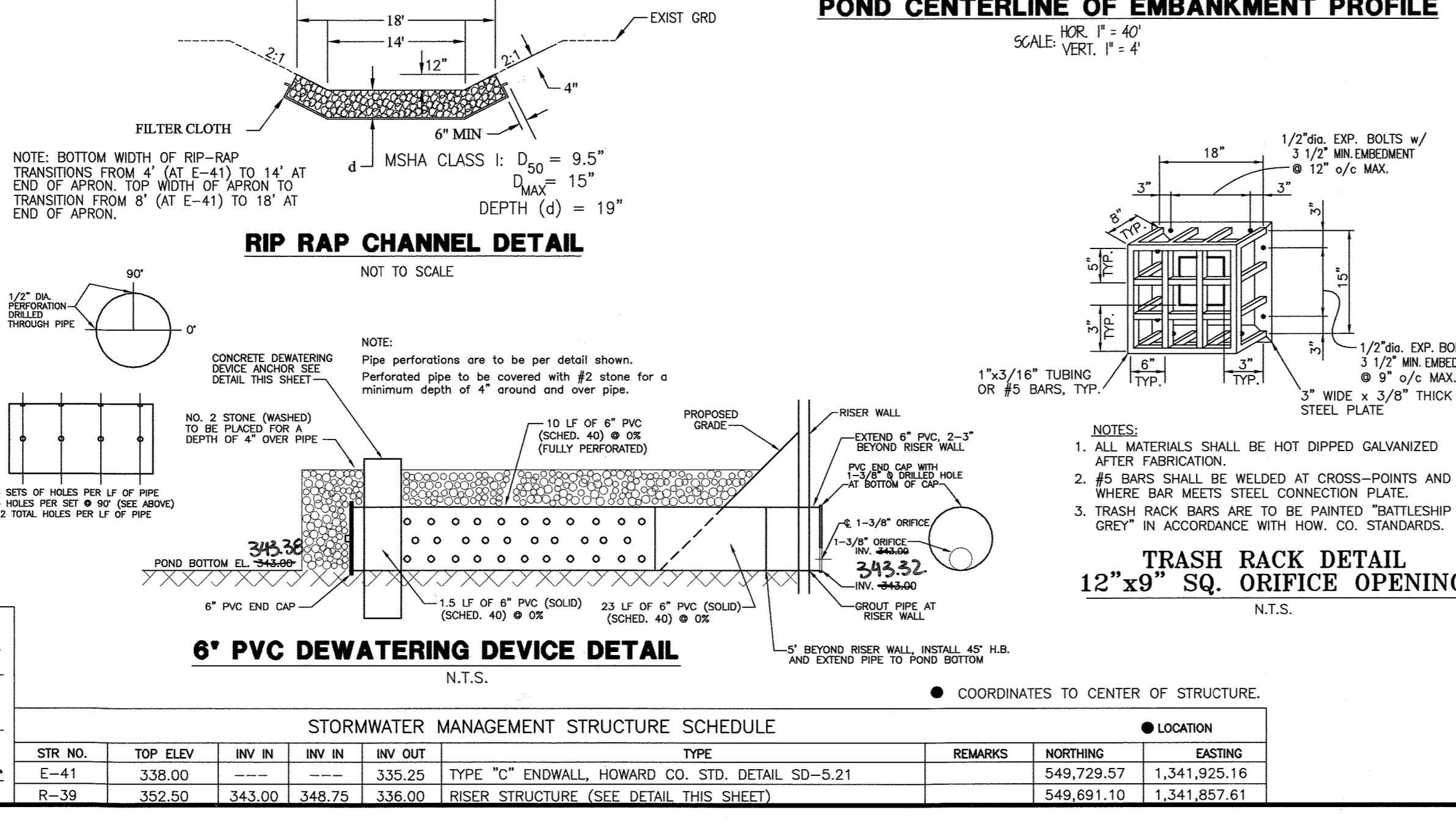
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Naps 1/26/05
DATE
U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE

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

John Selig 1/26/05
DATE
HOWARD SOIL CONSERVATION DISTRICT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Mike DeMunn 1/21/05
DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK
Chris Hancock 2/1/05
DATE
CHIEF, DIVISION OF LAND DEVELOPMENT
David J. Kelly 2/2/05
DATE
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING



REVISIONS

NO.	DESCRIPTION	DATE
1	As-built info added	03/06

APPROVALS

REQUESTER	DATE
PLANT FACILITIES CHIEF ENGINEER	
CODE COMPLIANCE REVIEW	
THE GROUP	
TRIP GROUP	
SAFETY OFFICER	
DIRECTORS OFFICE	
ADMINISTRATOR	
SENIOR LEADER	

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FAX (410) 792-7395

SWM PLAN 2

JOB NO.: 13685

SDP-12

1-17-05 SHEET: 12 OF 23

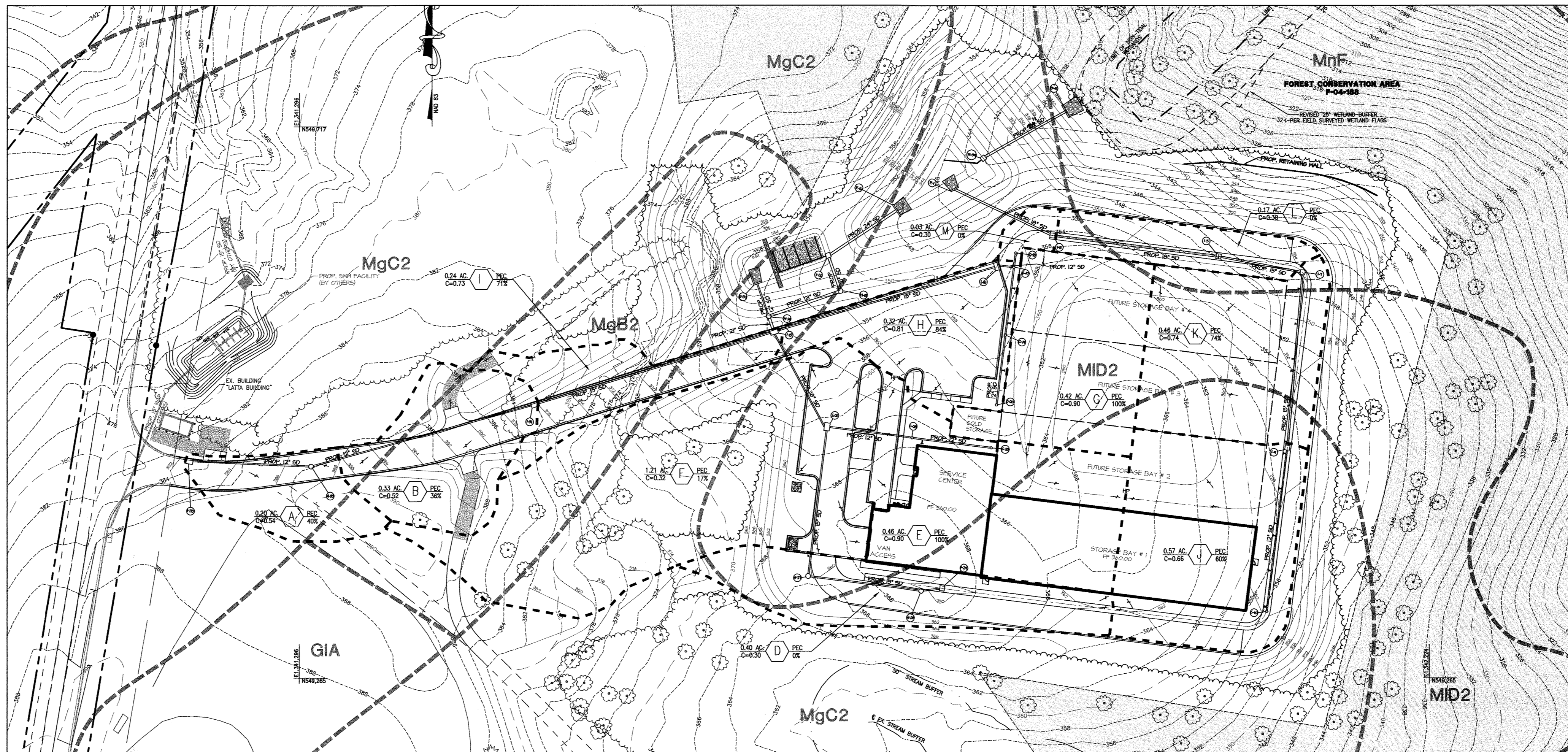
SCALE: 1" = 40'

DES: KKB CHECK: TCN DATE: 01-17-05

SDP-05-42

LEGEND

- EX. TREE LINE
- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. WETLAND BUFFER
- EX. STREAM BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. FOREST CONSERVATION AREA
- PROP. RIP RAP
- PROP. LIMIT OF DISTURBANCE
- PROP. STORM DRAIN
- PROP. STORM DRAIN INLET
- PROP. CURB
- PROP. TURF FOR FIRELANE
- PROP. CENTERLINE OF DRAINAGE SWALE
- PROP. FUTURE BUILDING
- PROP. BUILDING
- MgB2 SOIL TYPE
- 0.16 AC. (ZONING) PEC 4.4% (C FACTOR) (X IMPERVIOUS)
- STORM DRAIN DRAINAGE AREA DATA
- STORM DRAIN DRAINAGE DIVIDE
- PR. CONDITION DRAINAGE DIVIDE
- TIME OF CONCENTRATION PATH
- SOIL TYPE DIVIDE



STORM DRAIN DRAINAGE AREA MAP

SCALE: 1"=60'

SUMMARY OF PROP. FACILITY

DESIGN STORM	Proposed Facility Inflow (cfs)	Proposed Facility Discharge (cfs)	Facility Water Surface Elevation (ft)	Facility Storage Volume (acre-ft)
1 year	6.60	0.12	348.75	0.294
5 year	17.03	3.58	350.01	0.447
10 year*	23.50	15.98	351.10	0.348
100 year*	39.25	29.90	351.87	0.491

*WORST CASE CLOGGED CONDITION
 Drainage Area 6.57 acres
 Impervious Area 2.73 acres

SWM HYDROLOGIC DATA-PROPOSED CONDITION

TR-55 HYDROLOGIC DATA
 DRAINAGE AREA: 6.57 AC.
 RCN: 76
 SOIL TYPE: 'B'
 AREA LAWN: 3.84 AC.
 AREA IMPERVIOUS: 2.73 AC.
 AREA WOODS: 0.00 AC.

TIME OF CONCENTRATION PATH
 A-B 48' SHEET FLOW AT 4% GRASS, DENSE
 B-C 16' SHEET FLOW AT 25% GRASS, DENSE
 C-D 28' SHALLOW CONC. FLOW AT 2% PAVED
 D-E 55' OF OPEN CHANNEL FLOW AT 8 FPS
 TIME OF CONCENTRATION: 0.14 HR

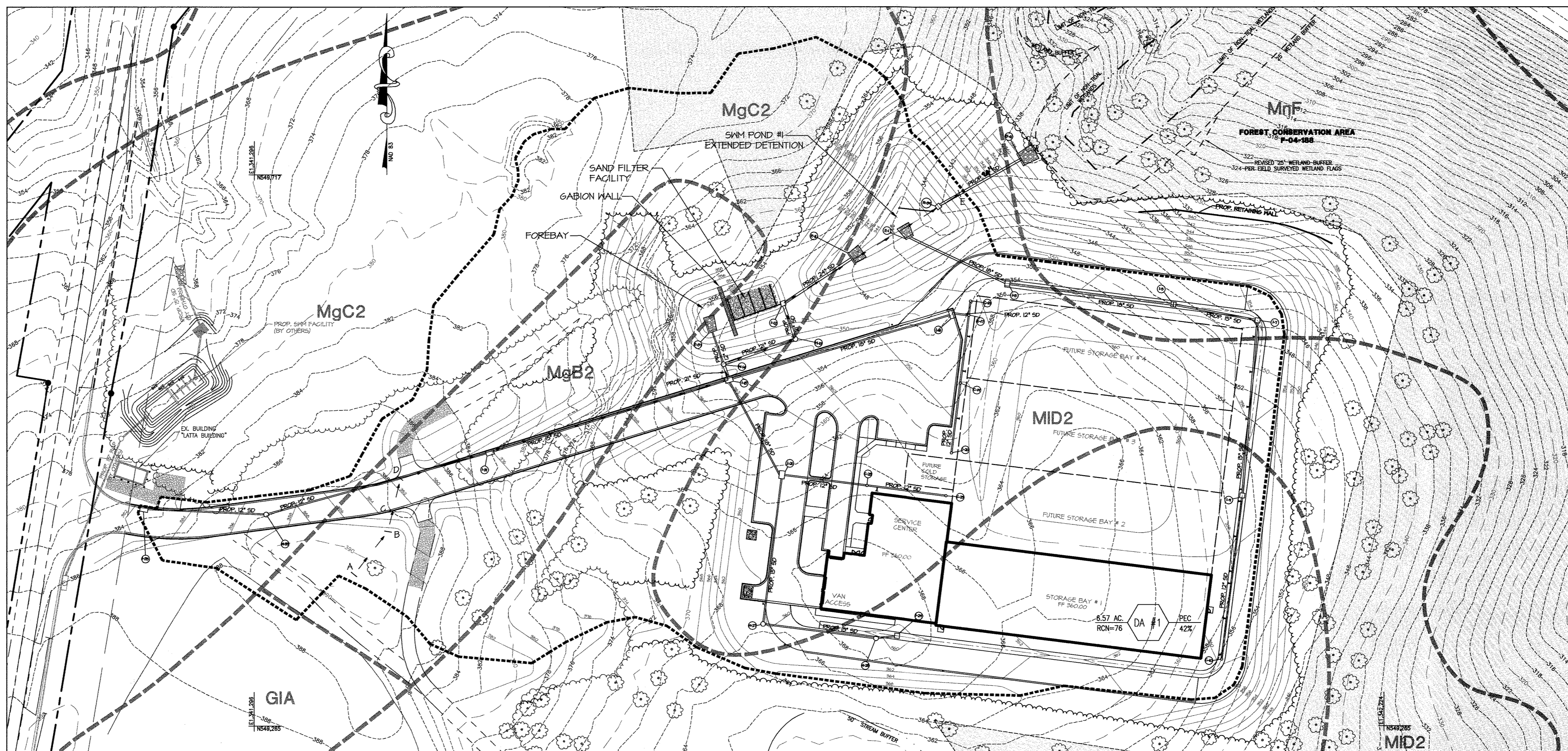
GENERAL SWM STORAGE REQUIREMENTS

STEP	REQUIREMENT	VOLUME REQUIRED (ac.-ft.)	NOTES
1	WATER QUALITY VOLUME (WqV)	0.2321 ac.-ft.	0.177 ac.-ft. PROVIDED BY SAND FILTER 0.061 ac.-ft. PROV. BY RECHARGE TRENCH
2	RECHARGE VOLUME (Rev)	0.0604 ac.-ft.	0.061 ac.-ft. PROVIDED BY RECHARGE TRENCH LOCATED UNDER SAND FILTER
3	CHANNEL PROTECTION VOLUME (CpV)	0.2714 ac.-ft. 0.15 cfs RELEASE RATE	RELEASE RATE=0.12 cfs @ WSEL=348.75 0.294 ac.-ft. PROVIDED @ WSEL=348.75
4	OVERBANK FLOOD PROTECTION VOLUME (Qp)	N/A	10.14 cfs @ WSEL=350.69 ** 15.98 cfs @ WSEL=351.10 **
5	EXTREME FLOOD PROTECTION VOLUME (Qf)	PROVIDE SAFE PASSAGE OF THE 100-YR EVENT IN FINAL DESIGN	28.55 cfs @ WSEL=351.79 ** 29.90 cfs @ WSEL=351.87 **

* NORMAL POND ROUTING
 ** WORST CASE (CLOGGED) POND ROUTING

SOILS LEGEND

SYMBOL	NAME/DESCRIPTION	SOIL TYPE
GIA	GLENELG LOAM, 0-3% SLOPES	B
MgB2	MANOR GRAVEL LOAM, 3%-8% SLOPES, MODERATELY ERODED	B
MgC2	MANOR GRAVEL LOAM, 8%-15% SLOPES, MODERATELY ERODED	B
MID2	MANOR GRAVEL LOAM, 15%-25% SLOPES, MODERATELY ERODED	B
MnF	MANOR VERY STONY LOAM, 25%-60% SLOPES	B



SWM DRAINAGE AREA MAP

SCALE: 1"=60'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

1/31/05
 2/1/05
 2/1/05

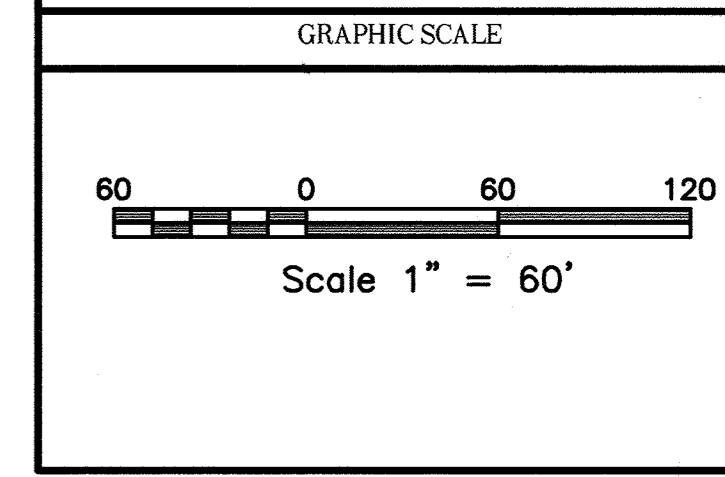
REVISIONS	

APPROVALS	
REQUESTER	
PLANT FACILITY DESIGNER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SURVEY OFFICER	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

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DRAINAGE AREA MAP

STATE OF MARYLAND PROFESSIONAL ENGINEER
 JOB NO.: 13685
SDP-13
 1-17-05 SHEET: 13 OF 23

SCALE: 1" = 60'

DES: KKB CHECK: TCN DATE: 01-17-05

SDP-05-42

LEGEND

- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. GAS
- EX. SANITARY F.M.
- EX. WATER
- EX. CONDUIT
- EX. WETLAND BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- PROP. SILT FENCE
- PROP. SUPER SILT FENCE
- PROP. RIP RAP
- PROP. LIMIT OF DISTURBANCE
- PROP. TREE LINE
- PROP. EARTH DIKE

AREAS OF CONCENTRATED FLOW ARE TO BE STABILIZED WITH EROSION CONTROL MATTING (ECM). SEE DETAIL ON ESC DETAIL SHEET.

SEQUENCE OF CONSTRUCTION

- | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------|----------|
| 1. OBTAIN ALL NECESSARY PERMITS. CONTACT THE HOWARD COUNTY OFFICE OF INSPECTIONS AT LEAST 48 HOURS PRIOR TO BEGINNING ANY WORK. | 1 DAY | 6. BEGIN BUILDING CONSTRUCTION AND RETAINING WALL CONSTRUCTION. | 120 DAYS |
| 2. CLEAR AND GRUB FOR INSTALLATION OF SEDIMENT CONTROLS ONLY. | 5 DAYS | 7. INSTALL PAVING, STORM DRAIN, AND UTILITY SERVICES. | 30 DAYS |
| 3. INSTALL PERIMETER SEDIMENT AND EROSION CONTROL DEVICES BELOW PROPOSED SWM POND/SEDIMENT BASIN. | 5 DAYS | 8. FINAL GRADE SITE AND PROVIDE PERMANENT STABILIZATION. | 15 DAYS |
| 4. INSTALL SWM FACILITY PER SWM PLAN AND DETAILS. MODIFY SWM RISER STRUCTURE PER DETAILS SHOWN ON SEDIMENT CONTROL DETAIL SHEET (FACILITY WILL SERVE AS A SEDIMENT BASIN DURING CONSTRUCTION). | 20 DAYS | 9. INSTALL SAND FILTER PER SWM PLAN. | 10 DAYS |
| 5. WITH GRADING INSPECTOR'S APPROVAL, CLEAR AND GRUB AREAS FOR GRADING. BEGIN GRADING FOR BUILDING, DRIVE ASLES, & PARKING AREAS. PROVIDE TEMPORARY STABILIZATION AS REQUIRED. | 30 DAYS | 10. WITH THE SEDIMENT CONTROL INSPECTOR'S APPROVAL, CONVERT SEDIMENT BASIN TO SWM FACILITY. | 10 DAYS |
| | | 11. PERMANENTLY STABILIZE ANY REMAINING DISTURBED AREAS. | 5 DAYS |
| | | 12. WITH THE SEDIMENT CONTROL INSPECTOR'S APPROVAL, REMOVE ALL REMAINING SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS. | 2 DAYS |

BASIN/STORM DRAIN INSTALLATION SEQUENCE

- CONSTRUCT STORM DRAIN SYSTEM BEGINNING AT M-13. INSTALL 55' +/- OF TEMP. 21" HOPE FROM BASIN BOTTOM TO M-13 TO SERVE AS TEMP. SD OUTFALL. INV. @ M-13 = 347.8 +/-.
- AT M-14 INSTALL TEMP. BULKHEAD IN PLACE OF OUTGOING 12" RCP TO SAND FILTER.
- PRIOR TO SAND FILTER INSTALLATION, DEWATER BASIN AND CONSTRUCT EMBANKMENT ACROSS BASIN BOTTOM TO SEPARATE SAND FILTER WORK AREA FROM BASIN. SEE GRADING FOR SAND FILTER AREA ON SWM PLANS.
- UPON COMPLETION OF SAND FILTER, BEGIN BASIN CONVERSION TO FINAL SWM FACILITY. REMOVE TEMP HOPE PIPE AND INSTALL STORM DRAIN SYSTEM FROM M-13 TO E-11.
- ONCE ALL UPSTREAM AREA HAVE BEEN STABILIZED, REMOVE TEMP. BULKHEAD AT M-14 AND INSTALL STORM DRAIN SYSTEM FROM M-14 TO E-37.

SEDIMENT BASIN SUMMARY TABLE

EXISTING DRAINAGE AREA	4.83 ACRES
PROPOSED DRAINAGE AREA	6.51 ACRES
NET STORAGE VOLUME REQ'D = 6.51 X 1800	11826 C.F.
DRY STORAGE VOLUME REQ'D = 6.51 X 800	5208 C.F.
TOTAL VOLUME REQUIRED	23652 C.F.
NET STORAGE VOLUME PROVIDED	27149 C.F.
NET STORAGE DEPTH	12125 C.F.
DRY STORAGE DEPTH	5225 C.F.
BOTTOM ELEVATION	1534 C.F.
CLEAROUT ELEVATION	347.00
LIMIT OF NET STORAGE ELEVATION	340.25
MINIMUM RISER CREST ELEVATION	348.85
PROVIDED RISER CREST ELEVATION	350.25
EMBANKMENT ELEVATION	354.00
DRAIN-DOWN DEVICE	6" PVC (4" ORIFICE)
OUTFALL BARREL TYPE	48" RCP
1-YR PRE-DEVELOPMENT SITE DISCHARGE	1.00 CFS
1-YR POST-DEVELOPMENT SITE DISCHARGE	14.86 CFS
1-YR POST-DEVELOPMENT BASIN DISCHARGE	112 CFS
1-YR STORM, WATER SURFACE ELEVATION	350.20
10-YR STORM, WATER SURFACE ELEVATION	351.75

BY THE DEVELOPER
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, 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 ALSO AUTHORIZE ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
 Signature: *James E. Loesch* 1/18/05
 NAME OF DEVELOPER: JAMES E. LOESCH, CHIEF ENGINEER OF PLANT FACILITIES, JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY
 BY THE ENGINEER
 I 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: *Thomas C. Neugebauer, P.E.* 1-17-05
 NAME OF ENGINEER: THOMAS C. NEUGEBAUER, P.E., MD LICENSE #29203

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.
 Signature: *Jim Mays* 1/26/05
 U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 Signature: *John Selig* 1/26/05
 HOWARD S.C.D. DATE

REVISIONS

REVISION #1	5/7/21
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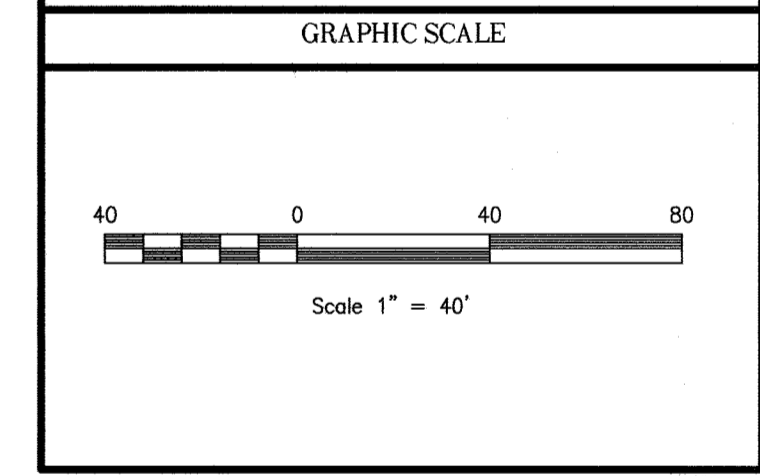
APPROVALS

REQUESTOR	
PLANT FACILITIES/DEPT ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SAFETY OFFICER	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
 JOHNS HOPKINS ROAD
 LAUREL, MARYLAND 20723-6099
 TAX MAP 41, GRID 16, PARCEL 1
 FIFTH (5TH) ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

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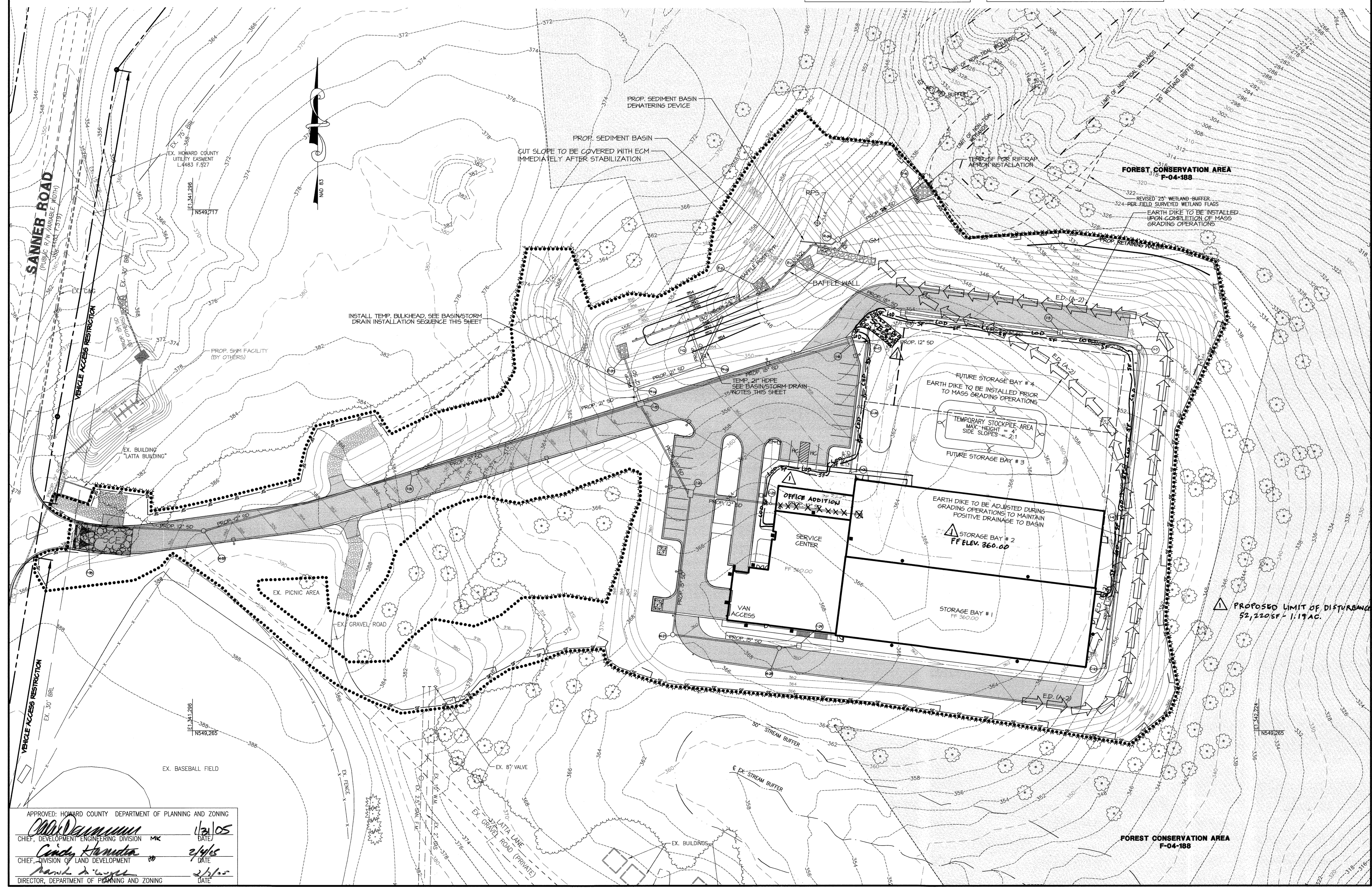


MRA
 MORRIS & RITCHE ASSOCIATES, INC.
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
 14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 779-1680
 FAX (410) 792-7395

SEDIMENT CONTROL PLAN

For Revision 2-4-21
 JOB NO.: 13685

SDP-16
 SHEET: 16 OF 23
 SCALE: 1" = 40'
 DES: BCC CHECK: TCN DATE: 01-17-05
 SDP-05-42



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Signature: *Chris Deammon* 1/21/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK
 Signature: *Andy Hamilton* 2/16/05
 CHIEF, DIVISION OF LAND DEVELOPMENT
 Signature: *Paul A. ...* 2/1/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE- NON-RESIDENTIAL	B	A
LINEAR FEET OF ROADWAY FRONTAGE/ PERIMETER	260'-30" DRIVEWAY 230'	2424' *
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES 165'	YES 2424'
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES 1/50 EVERGREEN TREES 1/40 SHRUBS	65 L.F. 1 SHADE TREE 2 EVERGREENS	N/A INTERNAL PROPERTY LINES
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (1:1 SUBSTITUTION) DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED	1 SHADE TREE 2 EVERGREENS PLACED IN ALTERNATE LOCATIONS (SEE NOTE BELOW)	N/A

* 2424 L.F. OF INTERNAL PROPERTY BOUNDARIES AND EXISTING SCREENED SANNER ROAD DO NOT GENERATE A PLANTING REQUIREMENT. THE 1 SHADE TREE AND 2 EVERGREEN TREES HAVE BEEN PROVIDED ELSEWHERE ON THE SITE DUE TO EXISTING TELECOMMUNICATIONS BUILDING AND EXISTING SCREENING OF BASEBALL FIELD ALONG SANNER ROAD FRONTAGE.

LEGEND

- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. GAS
- EX. SANITARY F.M.
- EX. WATER
- EX. CONDUIT
- EX. WETLAND BUFFER
- EX. STREAM BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. FOREST CONSERVATION AREA

- PROP. CURB
- PROP. TURF FOR FIRELANE
- PROP. FUTURE BUILDING
- PROP. BUILDING

- Canopy Tree
- Flowering Tree
- Evergreen Tree
- Shrubs
- Lighting symbols (see sht 19 for details)

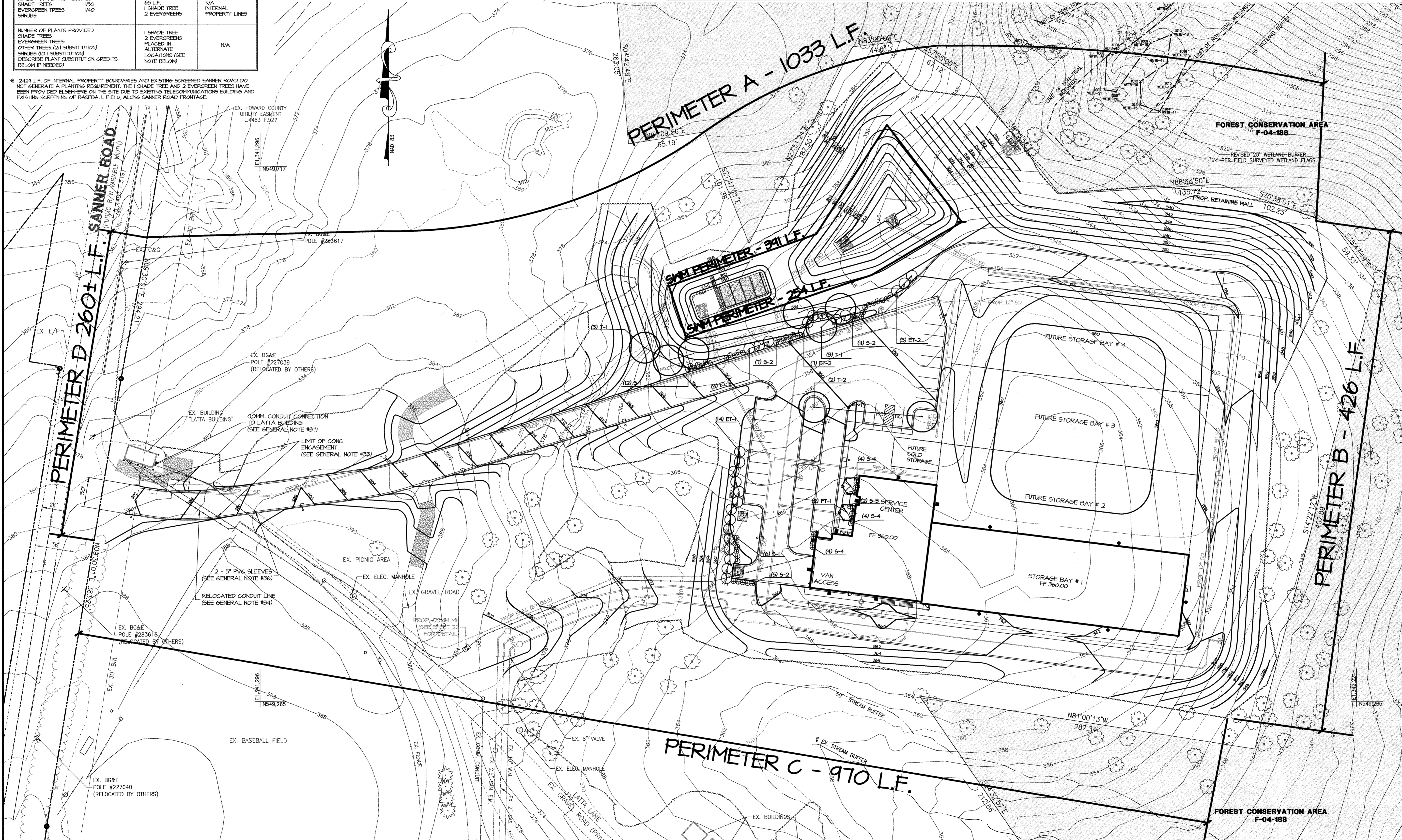
Schedule D Stormwater Management Area Landscaping

Linear Feet of Perimeter	645 (91 Credit for existing vegetation)
Credit for existing Vegetation (No, yes and if)	91 L.F. Yes, 60 & Preserved Vegetation
Credit for Other Landscaping (No, yes and if)	No
Number of Trees Required Shade Trees 1/50 LF Evergreen Trees 1/40 LF	13 Shade Trees (5 required due to ex. veg.) 16 Evergreen Trees (6 required due to ex. veg.)
Number of Trees Provided Shade Trees Flowering 4 Evergreen Trees (2:1 ratio) Shrubs (10:1 substitution ratio)	6 Shade Trees 4 Flowering 4 Evergreen Trees 30 Shrubs

PLANT SCHEDULE

Key	Quantity	Botanical Name / Common Name	Size	Root	Remarks
T-1	6	<i>Nyssa sylvatica</i> Black Gum	4" cal. min.	B & B	
T-2	2	<i>Ficus occidentalis</i> American Sycamore	4" cal. min.	B & B	
FT-1	2	<i>Lagerstromia indica</i> Cape Myrtle	8' hgt. min.	B & B	Multi-stem specimen

Evergreen Trees					
ET-1	14	<i>Cupressus sempervirens</i> Leyland Cypress	6" - 7"	B & B	Uniform sizes
ET-2	13	<i>Pinus thunbergiana</i> Japanese Black Pine	7" - 8"	B & B	
Shrubs					
S-1	18	<i>Celastrus alnifolia</i> Summersweet Celastrus	24"-36"	B & B	
S-2	23	<i>Amelanchier canadensis</i> Dwarf Honeysuckle	24"-36"	B & B	
S-3	2	<i>Vaccinium angustifolium</i> Late Lowbush Blueberry	24"-36"	B & B	
S-4	12	<i>Viburnum carlesii</i> Koreanopice Viburnum	36" min. hgt.	B & B	



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT 2/1/05
 DATE
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 2/2/05
 DATE

SCHEDULE 'B' PARKING LOT INTERNAL LANDSCAPING		
NUMBER OF PARKING SPACES	PLANTS REQUIRED	PLANTS PROVIDED
22	1:20 = 1 SHADE TREE	2 SHADE TREES

REVISIONS	

APPROVALS	
REQUESTER	
PLANT FACILITIES/DRIP ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIF GROUP	
SURVEY OFFICE	
DIRECTOR	
COORDINATOR	
SENIOR LEADER	

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GRAPHIC SCALE

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 (410) 792-9792 or (301) 778-1690
 FAX (410) 792-7395

LIGHTING AND LANDSCAPING PLAN
 JOB NO.: 13685
SDP-18
 SHEET: 18 OF 23
 SCALE: 1" = 40'
 DES: LFB CHECK: DWM DATE: 01-17-05
 SDP-05-42

PLANTING SPECIFICATIONS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work consists of all labor, materials, equipment and services necessary for and incidental to the execution and completion of the FINAL LANDSCAPE PLAN as indicated on the Drawings and specified herein.

1.02 REFERENCES AND QUALITY ASSURANCE

- A. Landscape Contractors Association MD-DC-VA (LCA), Landscape Specification Guidelines, latest edition where superseded by specific requirements herein.

1.03 STANDARD OF COMPARISON

- A. When requested by the Owner's Representative, the Contractor shall obtain approval of a "standard" of comparison, prior to the delivery of plant material to the site.

1.04 SUBMITTALS

- A. Source: Notify the Owner's Representative, in writing, of the source of all material at least ten (10) working days prior to delivery at the project site.

1.05 DELIVERY STORAGE AND HANDLING

- A. Store plants that cannot be planted within 8 hours in a sheltered place. Water and maintain as required until planted.

1.06 QUANTITIES AND SUBSTITUTIONS

- A. Quantities of plant material are based upon the plant lists shown on the Drawings.

1.07 PROJECT CONDITIONS

- A. Planting Season: September 15 to May 15.

1.08 DEFINITIONS

- A. Diameter at Breast Height (DBH): The diameter of a tree measured at a point on the trunk 4.5 feet above the ground.

2.09 SURVIVAL REQUIREMENT AND REPLACEMENTS

- A. The minimum survival rate shall be 100 percent of the total number of trees and shrubs planted at the end of the 12-month maintenance period.

2.10 PENALTY FOR VIOLATION

- A. Immediately following the completion of construction and installation of the plantings, the owner or owner's representative will be notified for an inspection of the entire project site.

PART 2 PRODUCTS

2.01 PLANTS

- A. Plant materials shall meet or exceed the requirements of A.A.N. standards, or as amended herein.

2.02 DECIDUOUS SHADE TREES

- A. Single straight leader, well branched, and symmetrical, without suckers or evidence of suckering, according to their normal habit.

2.03 EVERGREENS

- A. Sheared evergreen plant material shall not be acceptable.

2.04 SHRUBS

- A. At least 75% of the individual branches or canes of a shrub shall be to the height specified.

2.05 HERBICIDES

- A. Contact herbicide shall be "Round-up" or approved equal.

2.06 TOPSOIL FOR AMENDING EXISTING SOIL

- A. General Requirements (only where required by details on the Drawings):

2.07 FERTILIZER FOR POST PLANTING

- A. 5-10-5 (Plant food by minimum percentages):

2.08 PEAT MOSS

- A. Baled sphagnum peat moss, Type I-A, conforming to Federal Specification Q-P-1866.

2.09 MULCH

- A. Mulch shall be the following as indicated on the Drawings:

2.10 WATER

- A. Potable; if not available at the site from a public water supply, the Contractor shall provide water at no additional cost to the Owner.

2.11 ANTI-TRANSPARENT

- A. Shall be the following or approved equal:

2.12 ACCESSORIES

- A. Tree guying:

PART 3 EXECUTION

3.01 INITIAL INSPECTIONS

- A. Pre-construction meeting:

3.02 PREPARATION

- A. Tree protection fencing, signage and other pre-construction activities noted on the Drawings for retention areas shall be installed prior to any on-site clearing or grading operations.

3.03 EXCAVATION

- A. Unclassified: Excavate and remove surplus materials encountered, without additional cost to the Owner, to a depth sufficient to form soil walls as shown on the Drawings. Disposal of surplus material may be on-site if approved by the Owner's Representative.

3.04 PLANTING PROCEDURES

- A. Do not plant when ground is frozen or excessively wet.

3.05 MULCHING

- A. Plants and beds shall receive a 2 to 4 inch cover of mulch. Mulch shall be installed within 8 hours after planting has been completed.

3.06 STAKING, WRAPPING AND GUYING

- A. Stake trees, which require staking as shown on the Drawings, during the same day as planting.

3.07 PRUNING AND ANTI-TRANSPARENT APPLICATION

- A. Pruning: Any broken or damaged branches shall be removed. Damage, removal or pruning of tree leaders shall be cause for rejection.

3.08 POST-PLANTING FERTILIZATION

- A. Notify Owner's Representative prior to fertilizing operations.

3.09 CLEAN-UP

- A. Excess and waste materials shall be removed from the site before or upon completion of planting operations, or daily if required by the Owner's Representative.

3.10 WARRANTY

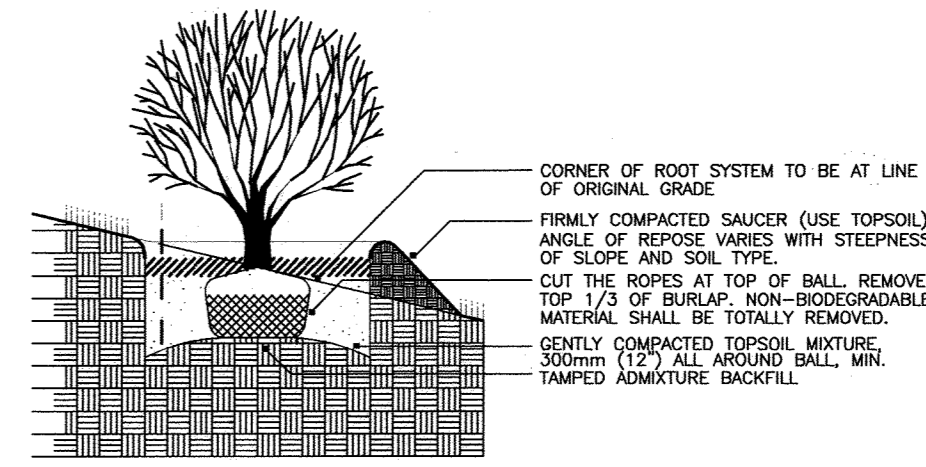
- A. Contractor shall warrant all plant material for a period of one (1) full year after the date of substantial completion against defects, unsatisfactory growth, disease or death.

3.11 MAINTENANCE

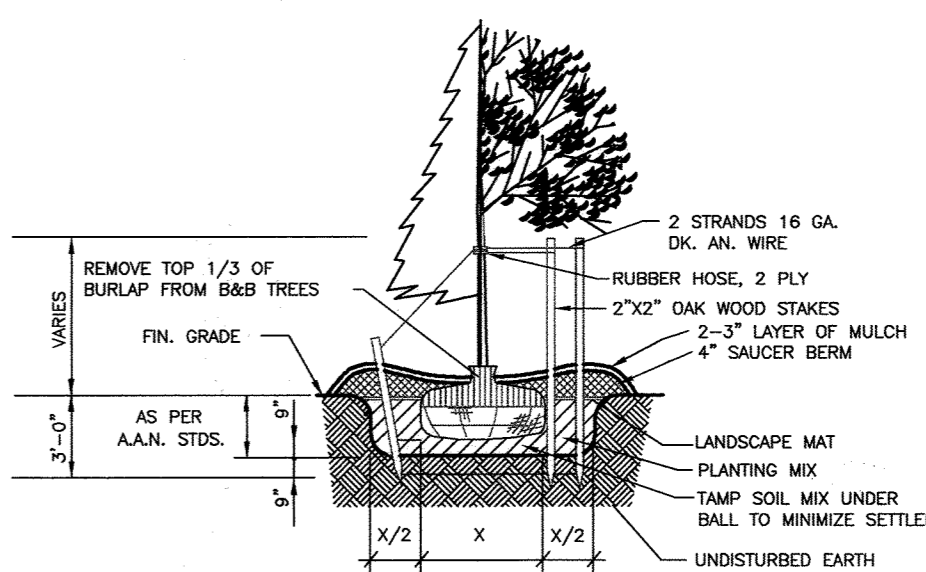
- A. Contractor shall inspect and provide necessary services throughout the 12-month maintenance period:

3.12 ACCEPTANCE

- A. Contractor must contact the Owner at least ten working days in advance to schedule acceptance inspection(s).



SHRUB PLANTING DETAIL (BALL & BURLAP OR CONTAINER) NOT TO SCALE



SHADE, FLOWERING OR EVERGREEN TREE PLANTING DETAIL NOT TO SCALE

GENERAL NOTES:

- 1. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE PERMITTED WITHOUT WRITTEN AUTHORIZATION OF THE LANDSCAPE ARCHITECT AND/OR HOWARD COUNTY PLANNING AND ZONING. THIS SHALL APPLY TO SUBSTITUTIONS OF SPECIES, SIZE, QUANTITY, AND LOCATION.

Table with 2 columns: REVISIONS, and empty rows for tracking changes.

Table with 2 columns: APPROVALS, and rows for PROJECT, PLANT FACILITIES, etc.

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GRAPHIC SCALE



MORRIS & RITCHE ASSOCIATES, INC. ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

LIGHTING AND LANDSCAPING DETAILS

JOB NO.: 13685 SHEET: 19 OF 23

SCALE: 1" = 40' DES: LFB CHECK: DWM DATE: 01-17-05



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

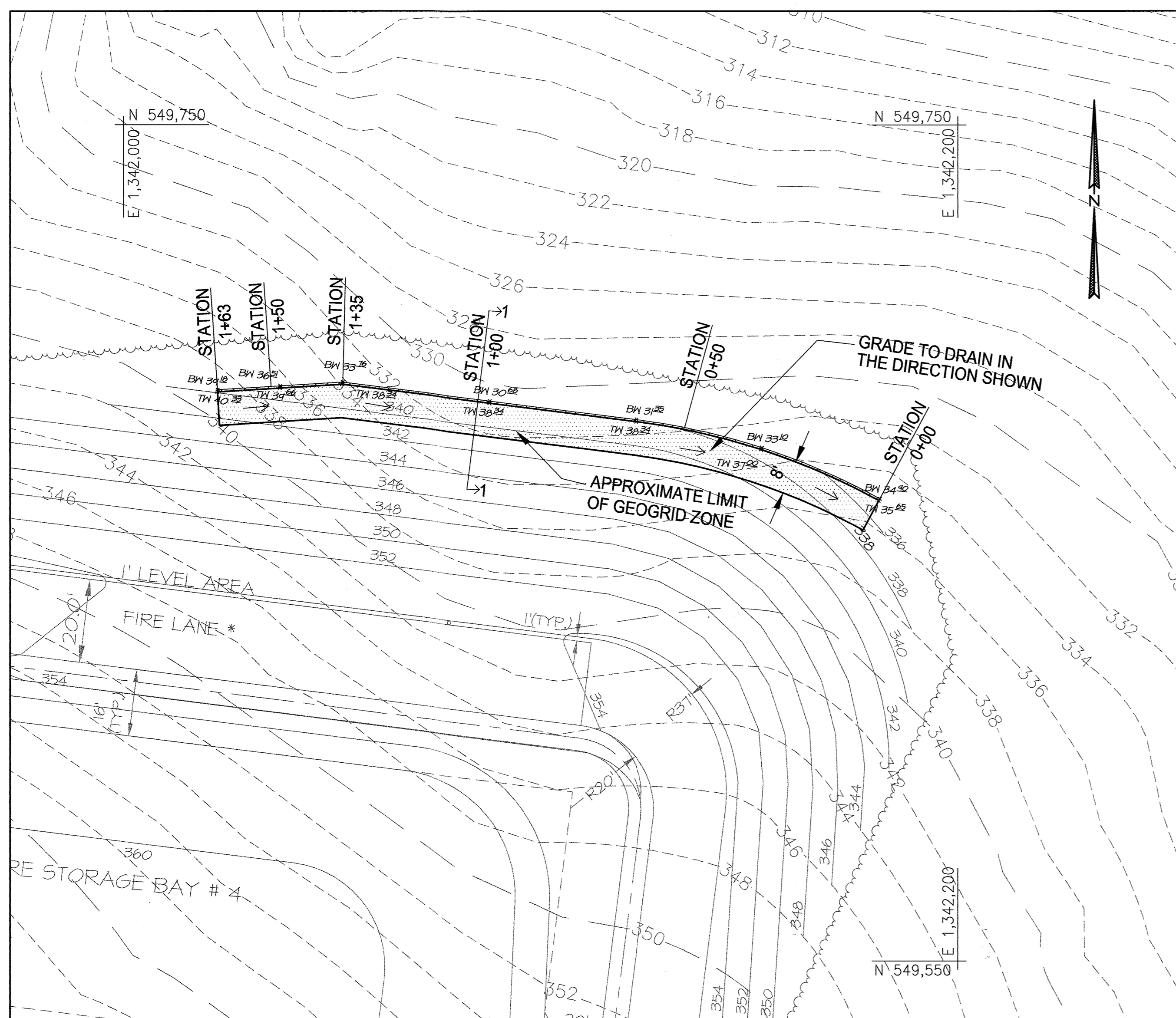
LIGHTING SPECIFICATIONS

Lighting specifications for KAD/KAC fixtures, including pole-mounted drop or flat lens cutoff, and technical details for ordering information.

Architectural Wall-Paks Building Mounted WFL specifications, including technical details, ordering information, and technical drawings of wall-mounted lighting fixtures.

POLE BASE DETAIL NOT TO SCALE technical drawing showing 400 wall metal hoist, 25' straight square aluminum pole, and 4 anchor bolts.

MRA logo and contact information for MORRIS & RITCHE ASSOCIATES, INC.



RETAINING WALL LOCATION PLAN

SCALE: 1" = 20'

The location plan was adopted from the "Johns Hopkins University, Libraries Service Center, Grading Plan", prepared by Morris & Ritchie Associates, Inc., dated July 20, 2004.

SEGMENTAL RETAINING WALL SPECIFICATIONS

PART 1 - GENERAL

- 1.1 Work includes furnishing and installing segmental retaining wall units, geogrid reinforcement, wall fill, and backfill to the lines and grades shown on the construction drawings and as specified herein. The contractor also includes the furnishing and installing all appurtenant materials, equipment, and labor required for construction of the geogrid reinforced, segmental retaining wall. All existing and proposed construction and site grading information was referenced from the Johns Hopkins, Libraries Service Center, Grading Plan, prepared by Morris & Ritchie Associates, Inc., dated July 20, 2004.
- 1.2 REFERENCE STANDARDS
 - A. ASTM C90-75 (1981 rev) - Hollow Load Bearing Masonry Units
 - B. ASTM C140-75 (1981 rev) - Sampling and Testing Concrete Masonry Units
 - C. ASTM C145-75 (1981 rev) - Solid Load Bearing Concrete Masonry Units
 - D. Geosynthetic Research Institute (GRI), GRI-GG4 - Determination of Long Term Design Strength of Geogrids.
 - E. ASTM D 638 - Test Method for Tensile Properties of Plastic
 - F. ASTM D 1248 - Specification of Polyethylene Plastics Molding and Extrusion Materials
 - G. ASTM D 4218 - Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle Furnace Technique
 - H. ASTM D 3034 - Specification for Polyvinyl Chloride (PVC) Pipe
 - I. ASTM C 1372 - Specifications for Segmental Retaining Wall Units
- 1.3 DELIVERY, STORAGE AND HANDLING
 - A. Contractor should check the materials upon delivery to assure that proper material has been received.
 - B. Contractor should prevent excessive mud, wet cement, epoxy, and like materials which may affect themselves, from coming in contact with the materials.
 - C. Geogrids should be stored above -20 degrees F.
 - D. Contractor should protect the materials from damage. Damaged material should not be incorporated into the reinforced retaining wall.
- 1.4 SUBMITTALS/CERTIFICATION

The contractor shall submit a Manufacturer's certification, prior to the start of the work, that the retaining wall system components meet the requirements of ASTM C 1372 and other requirements specified herein. This certification should be provided to the geotechnical engineer for review and approval prior to wall construction.

PART 2 - PRODUCTS

- 2.1 DEFINITIONS
 - A. Geogrid is a high density polyethylene, polyester, or polypropylene grid, specifically fabricated for use as a soil reinforcement.
 - B. Concrete retaining wall units are as detailed on the drawings and as specified herein.
 - C. Geosynthetic Drainage Composites are polyethylene net structure with non-woven geotextiles bonded to both sides.
 - D. Erosion Control Blankets consist of a web of polyolefin fibers securely bounded by polyolefin threads between two high strength polyolefin nets.
 - E. Backfill is the soil which is used as fill for the reinforced soil mass.
 - F. Foundation soil is the in-situ soil or controlled compacted fill placed below the bottom of the retaining wall and geogrid zone.
- 2.2 MATERIALS

The contractor should submit manufacturer's catalog and samples of the proposed materials for approval by the project geotechnical engineer a minimum of seven days before the start of construction. Materials should be transported to the site only after approval of the proposed materials by the project geotechnical engineer.

- A. Concrete Units
 1. Masonry units should be Keystone Standard II Retaining Wall Units. Substitution of other concrete units may be allowed with the prior approval of the Geotechnical Engineer.
 2. Concrete wall units should have a minimum 28 day compressive strength of 3000 psi, in accordance with ASTM C-90. The concrete should have adequate freeze/thaw protection with a maximum moisture absorption of 6 percent.
 3. Modular concrete materials shall conform to the requirements of ASTM C 1372 - Standard Specifications for Segmental Retaining Wall Units.
 4. The units shall pass 100 freeze/thaw cycles in water with less than 1% weight loss in accordance with ASTM C 1372.
 5. Exterior dimensions may vary. Units are required to have a minimum of one square foot of face area each.
 6. Units should have angled sides and be capable of attaining concave and convex alignment curves in accordance with manufacturer's recommendations.
 7. Units should be interlocked with non-corrosive reinforced fiberglass pins.
 8. Units should be interlocked as to provide a maximum of 1 inch of setback per block, where required.

- B. Leveling Pad

Material for leveling pad/footing should consist of compacted free-draining coarse aggregates meeting the requirements of ASTM #57 Stone or Graded Aggregate Base (GAB) per Maryland State Highway Administration Standard Specifications for Construction and Materials. A minimum of 6 inches deep and 30 inches wide compacted leveling pad is required.

- C. Fiberglass Connecting Pins
 1. Thermoset isophthalic polyester resin pultruded fiberglass reinforcement rods, a minimum one-half inch in diameter.
 2. Pins should have a minimum flexural strength of 128,000 psi and short beam shear of 6400 psi.
 3. For substitute concrete units, use of other compatible connector systems may be allowed with the prior approval of the geotechnical engineer.

- D. Geogrid

Geogrid should be Miragrid O7XT, or equivalent as approved by the geotechnical engineer. The geogrid should have an allowable strength of 1970 pounds per foot. The allowable strength is defined as the Ultimate Strength divided by reduction factors for creep, durability, installation damage and an overall factor of safety.

- E. Reinforced Backfill

Reinforced backfill soils should be non-plastic, controlled fill meeting the requirements of AASHTO A-2-4, or more granular. Based on the available subsurface information, suitable materials may be available from on-site excavations. However, segregation and stockpiling of suitable materials will be required. If adequate quantities of this material are not available on-site, imported backfill should meet the above requirements and should be approved by the geotechnical engineer.

- F. Controlled Fill

Controlled Fill soils to be placed outside the Reinforced Backfill area and where specified should consist of on-site or borrow soils meeting the requirements of AASHTO A-4 or more granular. All fill materials proposed to be placed behind the reinforced backfill should be placed as controlled fill compacted to 95 percent of maximum dry density in accordance with the Standard Proctor, ASTM D-698.

- G. Low-Permeability Soil

Low-permeability soils to be placed at the top of the wall where specified should consist of sandy, silty or clayey soils meeting the requirements of ML, CL, SM, or SC with a minimum of 25% passing the #200 sieve.

- H. Drainage Pipe

The drainage pipes should be perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034.

- I. Filter Fabric

Filter Fabric should be non-woven, polypropylene geotextile, 140 N manufactured by Nicolon Mirafi Group or approved equivalent.

- J. Erosion Control Blanket

Erosion Control Blanket should be Tensor TB 1000 manufactured by the Tensor Corporation or approved equivalent.

- K. Drainage Composite

The Drainage GeoComposite should be DC4200 Geotextile manufactured by Evergreen Technologies, Inc. or approved equivalent.

PART 3 - EXECUTION

- A. Excavation
 1. The contractor should excavate to the lines and grades shown on the construction drawings. Under no circumstances should the excavation lines and grades be exceeded, except with owner's approval. The contractor should protect the excavation from sloughing by placing a membrane over the face of the excavation.
 2. Prior to retaining wall construction and the placement of fill, all topsoil should be stripped and removed from the site.
 3. Excavations should be sloped or otherwise supported in accordance with Occupational Safety and Health Administration (OSHA) and other local and state regulations.

- B. Foundation Subgrade Preparation
 1. Foundation soil should be excavated as required for installation of leveling pad, geogrid and other elements and as shown on the construction drawings.
 2. Foundation soil should be examined by the Engineer to assure that the actual foundation soil strength meets or exceeds assumed design strength. Soils not meeting required strength should be removed and replaced with controlled, compacted material.
 3. Over-excavated areas should be filled with select and approved material and compacted to 95 percent of maximum dry density in accordance with the Standard Proctor, ASTM D-698.
 4. Allowable bearing pressure for natural and controlled, compacted fill soils should be as specified in Part 5.
 5. The exposed foundation subgrade should be proffered with a loaded dump truck. Any soft or unstable areas identified during proffering should be overexcavated and backfilled with Controlled Fill.
 6. Any fills required to establish sloping surfaces in front of the walls should consist of Controlled Fill and should be placed, compacted and field tested in accordance with the requirements specified herein.

- C. Leveling Pad
 1. The leveling pad should be placed as shown on the construction drawings with a minimum thickness of 6 inches.
 2. Leveling pad materials should be installed upon undisturbed in-situ soils or controlled, compacted backfill.
 3. Leveling Pad should be prepared to insure complete contact of retaining wall unit with base. Gaps should not be allowed.
- D. Unit Installation
 1. First course of concrete wall units should be placed on the leveling pad. The units should be checked for level and alignment. The first course is the most important to provide accurate and acceptable results.
 2. Insure that units are in full contact with base.
 3. Units are placed side by side for full length of wall alignment. Alignment may be done by means of a string line or offset from base line.
 4. Install fiberglass connecting pin.
 5. Lay up each course insuring that the connecting pins are inserted through front slot of the unit, and into the receiving slot in the course beneath. Repeat procedure to the extent of wall height.
 6. At the end of each course where the wall changes elevation, units should be turned into the backfill. Units should be laid as to create the minimum radius possible. Unless otherwise shown on the drawings, a minimum of one unit should be installed into the grade. Only the front face of the units should be visible from the side of the wall.
 7. Convex and concave curves should be made using compoc units or by trimming the Standard II units as required in accordance with manufacturer's recommendations.
 8. Cap units should be installed and bonded with construction adhesive or epoxy cement as required by manufacturer.
 9. Contractor should provide positive drainage for the back of the retaining wall during construction.

- E. Geogrid Installation
 1. All utilities in the vicinity of any retaining wall or geogrid reinforcement must be installed and properly backfilled prior to placing the geogrid soil reinforcement or constructing the wall.
 2. The geogrid soil reinforcement should be laid horizontally on compacted backfill, connected to the concrete wall units. Hook grid over the fiberglass connecting pin, pull taut, and anchor before backfill is placed on the geogrid.
 3. Slack in the geogrid at the wall unit connections should be removed in a manner, and to such a degree, as approved by the Engineer.
 4. Geogrid should be laid at the proper elevation and orientation as shown on the construction drawings or as directed by the Engineer.
 5. Correct orientation (roll direction) of the geogrid should be verified by the Contractor.
 6. Geogrid should be secured in-place with staples, pins, sand bags, or backfill as required by fill properties, fill placement procedures, or weather conditions, or as directed by the Engineer.
 7. Overlaps
 - a. Uniaxial geogrid does not need to be overlapped in the across the roll direction, except to contain the fill at the slope face when wrap-around facing is used. Uniaxial grid should be overlapped 48" in the rolled direction.
 - b. A layer of soil a minimum of 4 inches in thickness should be spread between uniaxial geogrid layers in the area to be overlapped, or as directed.

- F. Fill Placement
 1. Wall backfill material should be placed in no more than 8-inch lifts and compacted to 95 percent of the Standard Proctor (ASTM D-698).
 2. Backfill should be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in and/or movement of the geogrid.
 3. Only hand-operated compaction equipment should be allowed within 4 feet of the wall face.
 4. Backfill should be placed from the wall outward to insure that the geogrid remains taut.
 5. Tracked construction equipment should not be operated behind or above the wall.
 6. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning should be avoided.
 7. Place filter fabric between the unit core fill and the reinforced backfill as shown on plans. The filter fabric should be embedded a minimum of two feet into the reinforced fill.
 8. The finished sloping surface on the toe side of retaining walls should be protected by installing the permanent erosion control blanket and seeding in accordance with project requirements.

- G. DRAINAGE
 1. Drainage fill should be placed behind the wall to the limits shown. The drainage fill should be a minimum of 12-inches thick. The drainage fill should be ASTM #57 stone. The drainage fill should be wrapped in filter fabric (Mirafi 140N or equal) as shown on the drawings.
 2. Positive drainage should be maintained during and after construction. Soils within the reinforced zone that become wet during construction should be dried to optimum moisture or removed.
 3. Install the perforated drainage pipes and lateral drainage pipes incrementally along with the installation of concrete units and placement of fill.

PART 4 - CONSTRUCTION OBSERVATION AND TESTING

- A. Retaining walls should only be constructed under the observation of a Registered Professional Engineer and a certified (NICET, WACEL, or equivalent) soils technician.
- B. The required bearing pressure beneath the footing of the wall should be verified in the field by a certified soils technician. Testing documentation must be provided to the geotechnical engineer prior to the start of wall construction. The required test procedure shall be the Dynamic Cone Penetrometer (DCP) test ASTM STP-399.
- C. The suitability of fill material should be confirmed by the on-site soils technician.

PART 5 - DESIGN CRITERIA

1. Required minimum allowable foundation bearing pressure is 2,000 psf.
2. Design internal friction angle for reinforced soil = 30 degrees.
3. Design moist unit weight for reinforced soil = 125 pcf.
4. Retained soil internal friction angle = 30 degrees and cohesion = 0 psf.
5. Retained soil design moist unit weight = 125 pcf.
6. Foundation soil internal friction angle = 28 degrees and cohesion = 0 psf.
7. Foundation soil design moist unit weight = 120 pcf.
8. Retaining walls are not designed to resist hydrostatic pressure.

REVISIONS	

APPROVALS	
REQUESTOR	
PLANNING & ZONING DIVISION	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SAFETY OFFICER	
DIRECTOR	
COORDINATOR	
SENIOR LEADER	

THE JOHNS HOPKINS UNIVERSITY
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 JOHNS HOPKINS ROAD
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 TAX MAP 41, GRID 16, PARCEL 1
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GRAPHIC SCALE

MRA
 MORRIS & RITCHIE ASSOCIATES, INC.
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1690
 FAX (410) 792-7995

RETAINING WALL PLAN AND GENERAL NOTES

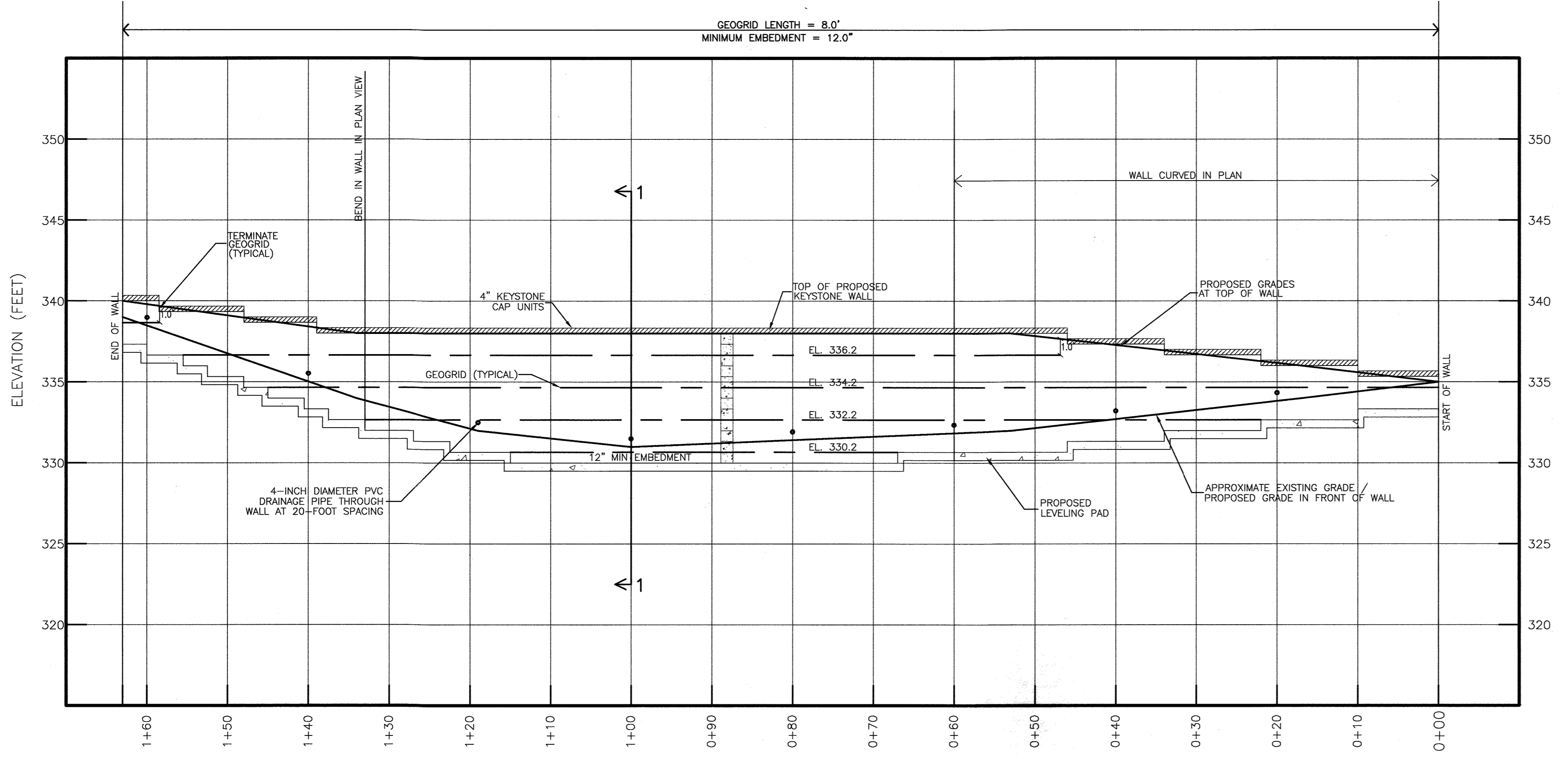
STATE OF MARYLAND PROFESSIONAL ENGINEER

 JOB NO.: 13685
SDP-20
 1-17-05 SHEET: 20 OF 23
 SCALE: AS SHOWN
 DES: SPL CHECK: RPM DATE: 01-17-05

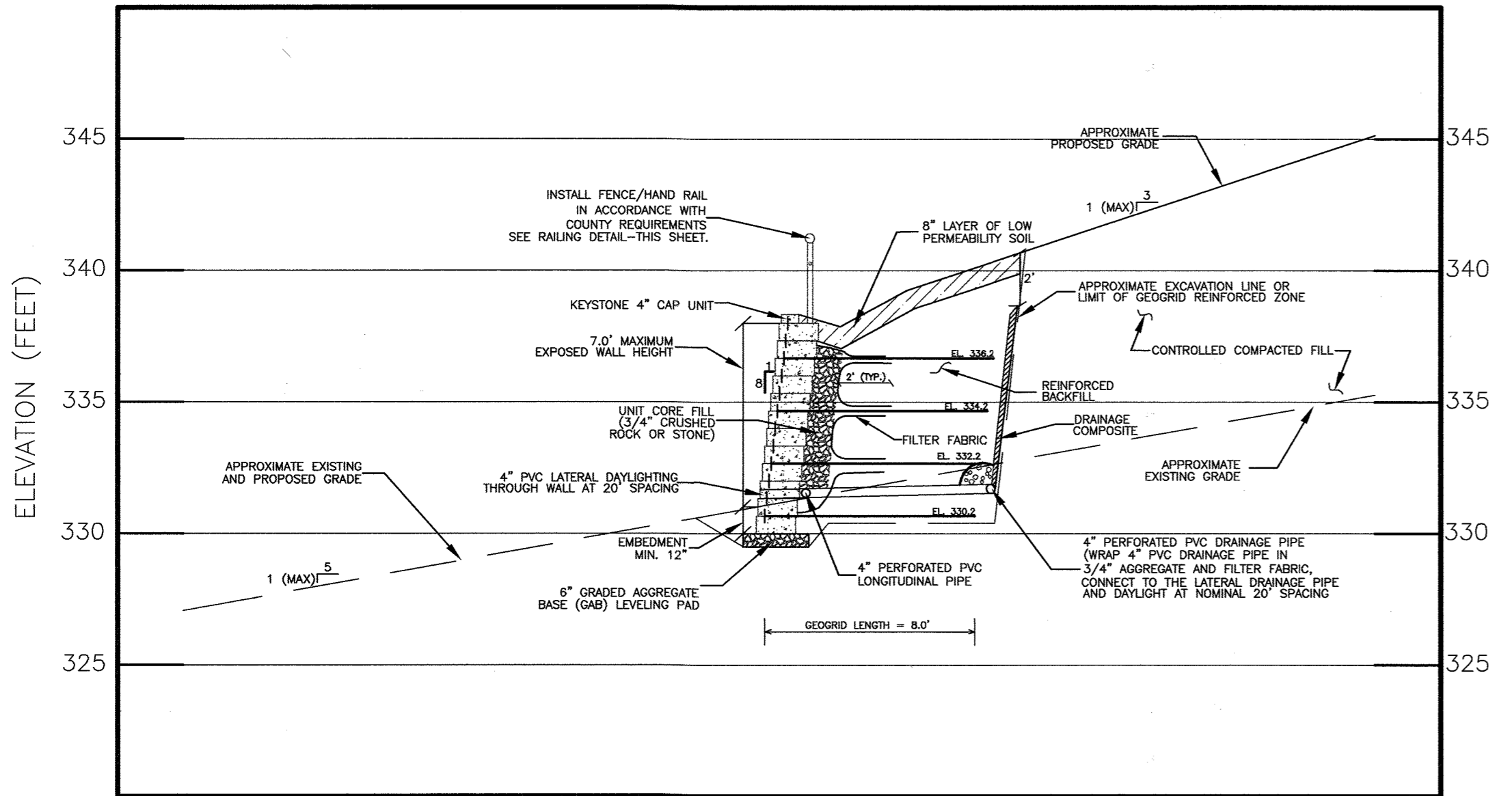
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

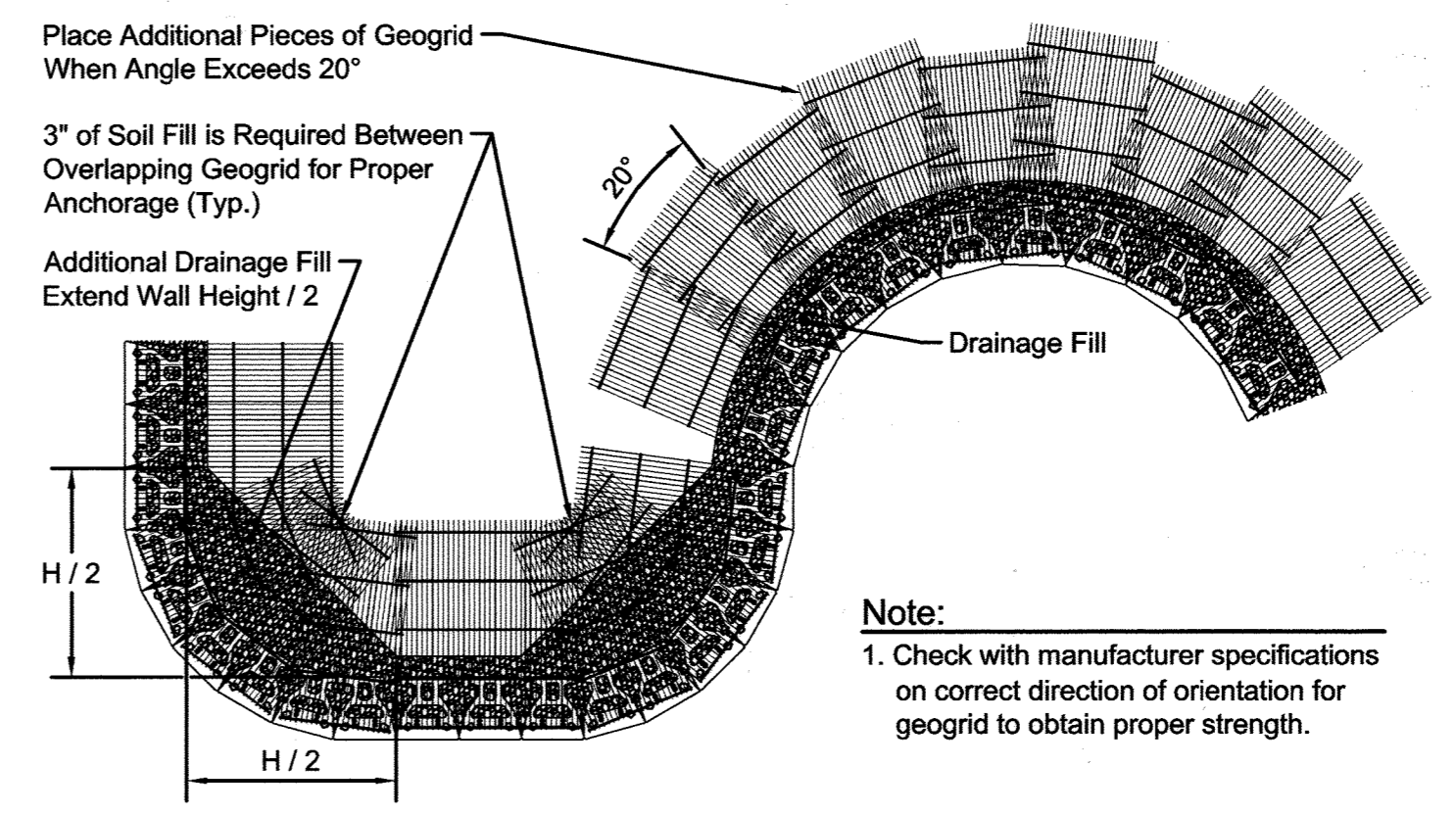
GTA
GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
 14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MD 20707
 (410) 792-9446 or (301) 470-4470
 FAX (410) 792-7395



RETAINING WALL PROFILE
 HORIZONTAL SCALE: 1" = 10'
 VERTICAL SCALE: 1" = 5'



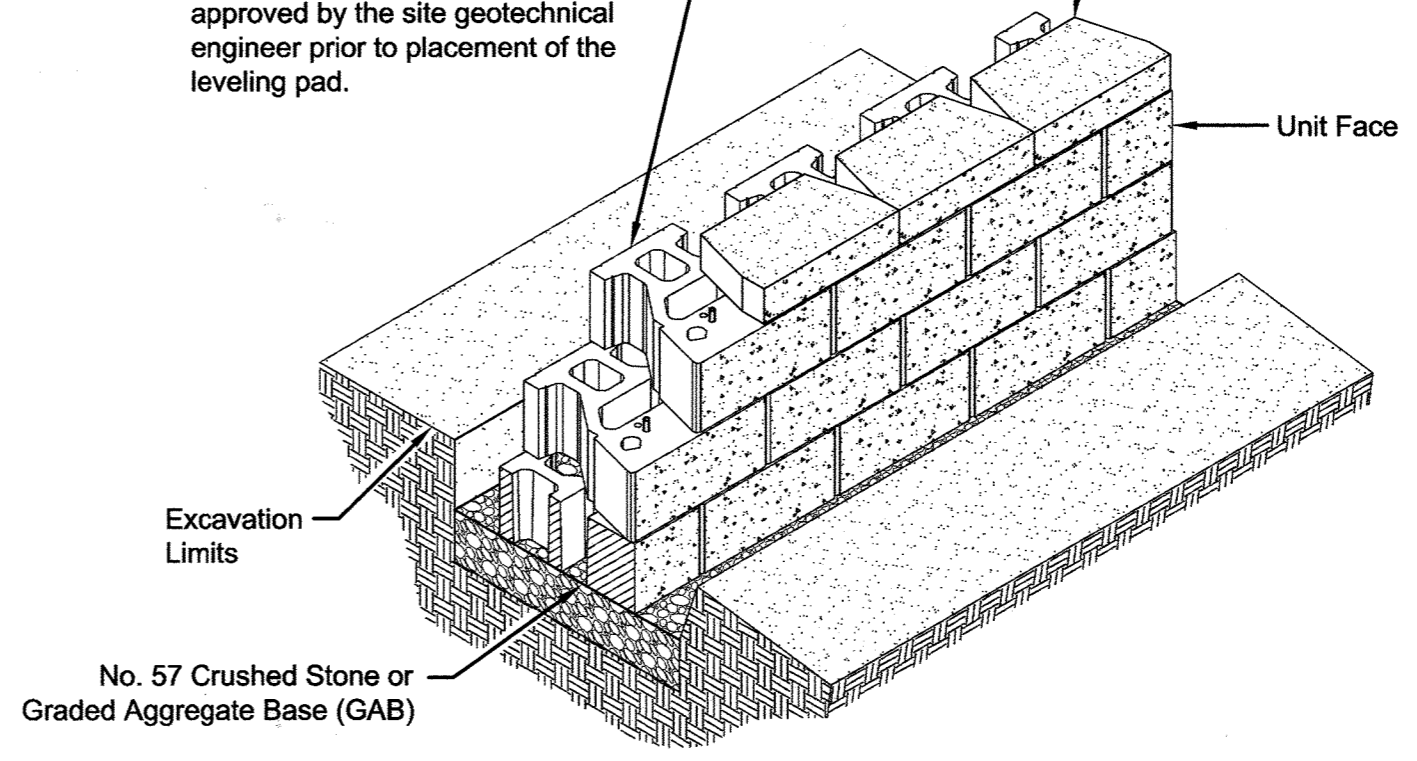
RETAINING WALL - SECTION 1 (APPROXIMATE STATION 1+00)
 HORIZONTAL SCALE: 1" = 5'
 VERTICAL SCALE: 1" = 5'



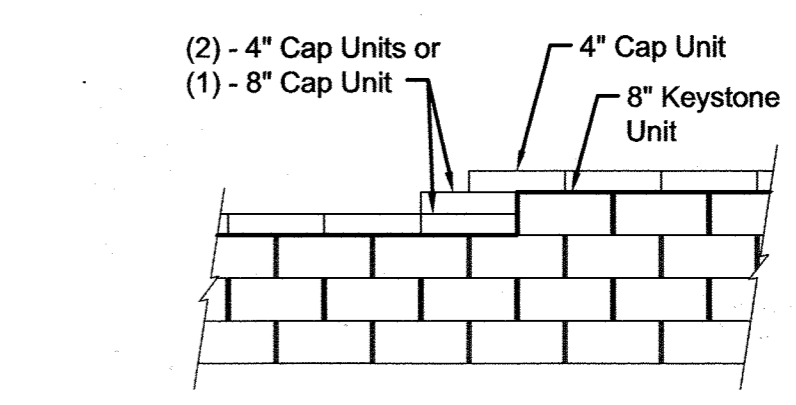
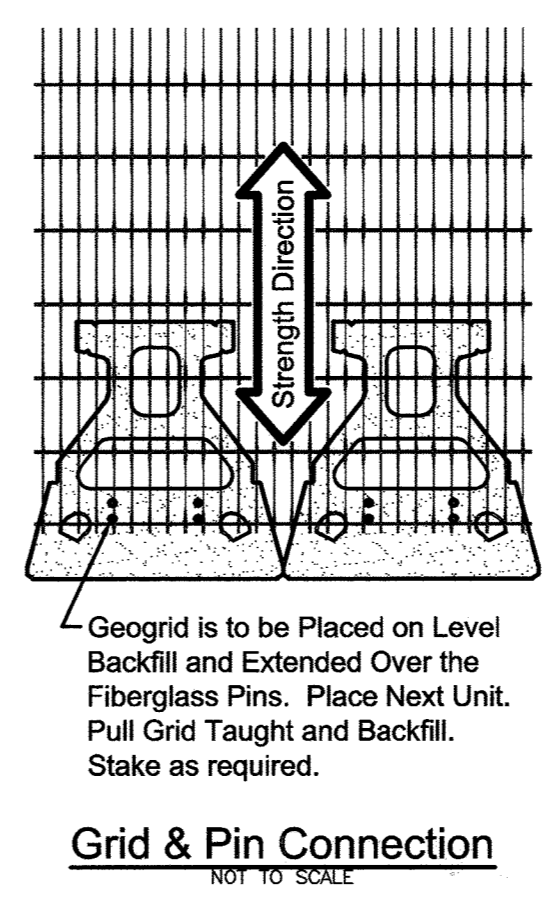
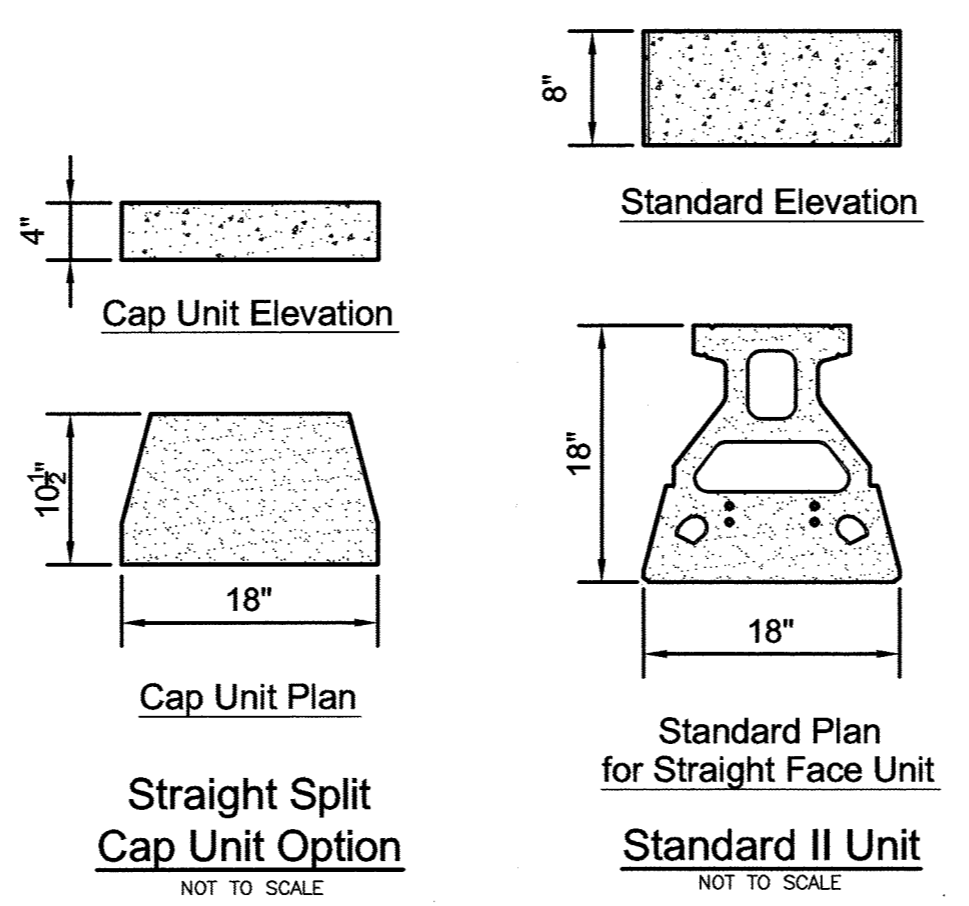
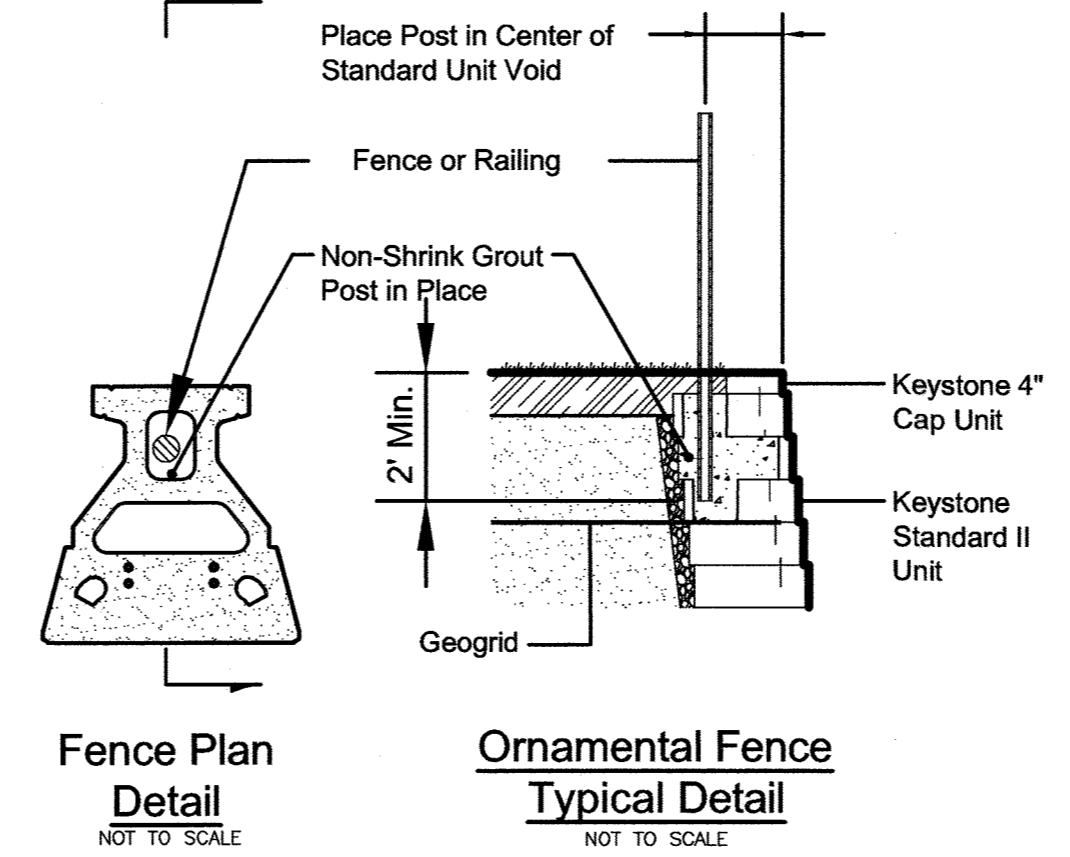
Geogrid Installation on Curves
 NOT TO SCALE

Base Leveling Pad Notes:
 1. The leveling pad is to be constructed of No. 57 crushed stone or GAB.
 2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

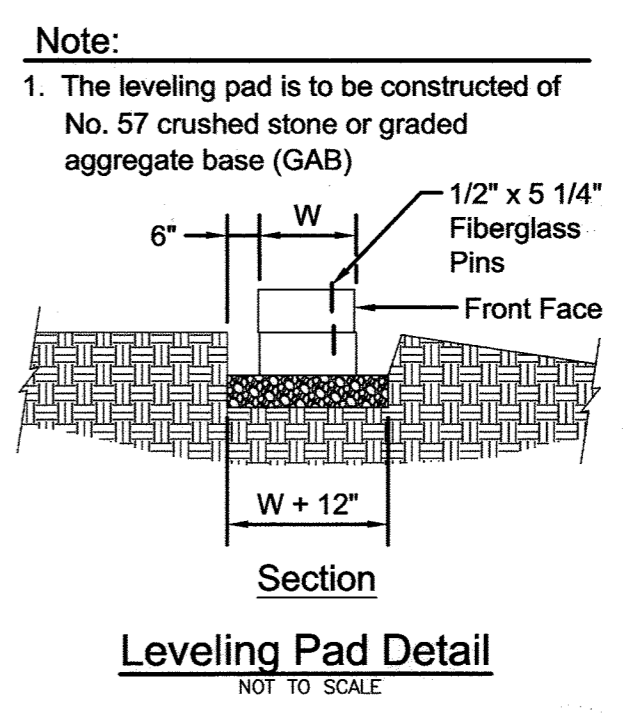
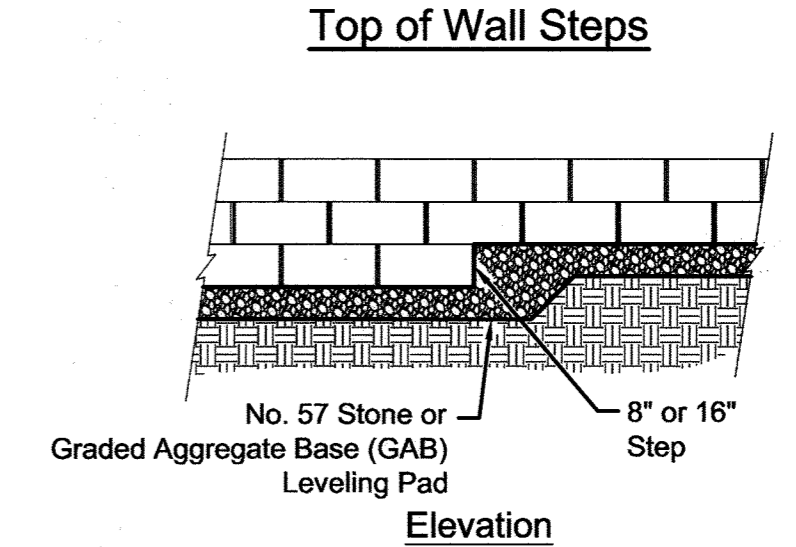
	Standard Unit	Cap Unit
Width:	18"	18"
Depth:	18"	10 1/2"
Height:	8"	4"
Weight:	108 lbs	50 lbs



Standard Unit/Base Pad Isometric Section View
 NOT TO SCALE



Note:
 1. Secure all cap units with Keystone Kapsel or equal.

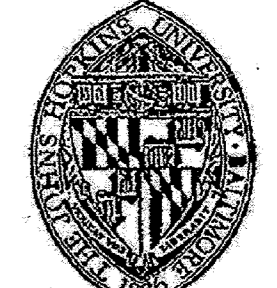


Note:
 1. The leveling pad is to be constructed of No. 57 crushed stone or graded aggregate base (GAB).

REVISIONS	

APPROVALS	
REQUESTER	
PLANT FACILITIES CHIEF	
ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTORS OFFICE	
COORDINATOR	
SUPERVISOR	

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 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1890
 FAX (410) 792-7395

RETAINING WALL PROFILE, TYPICAL SECTION AND DETAILS

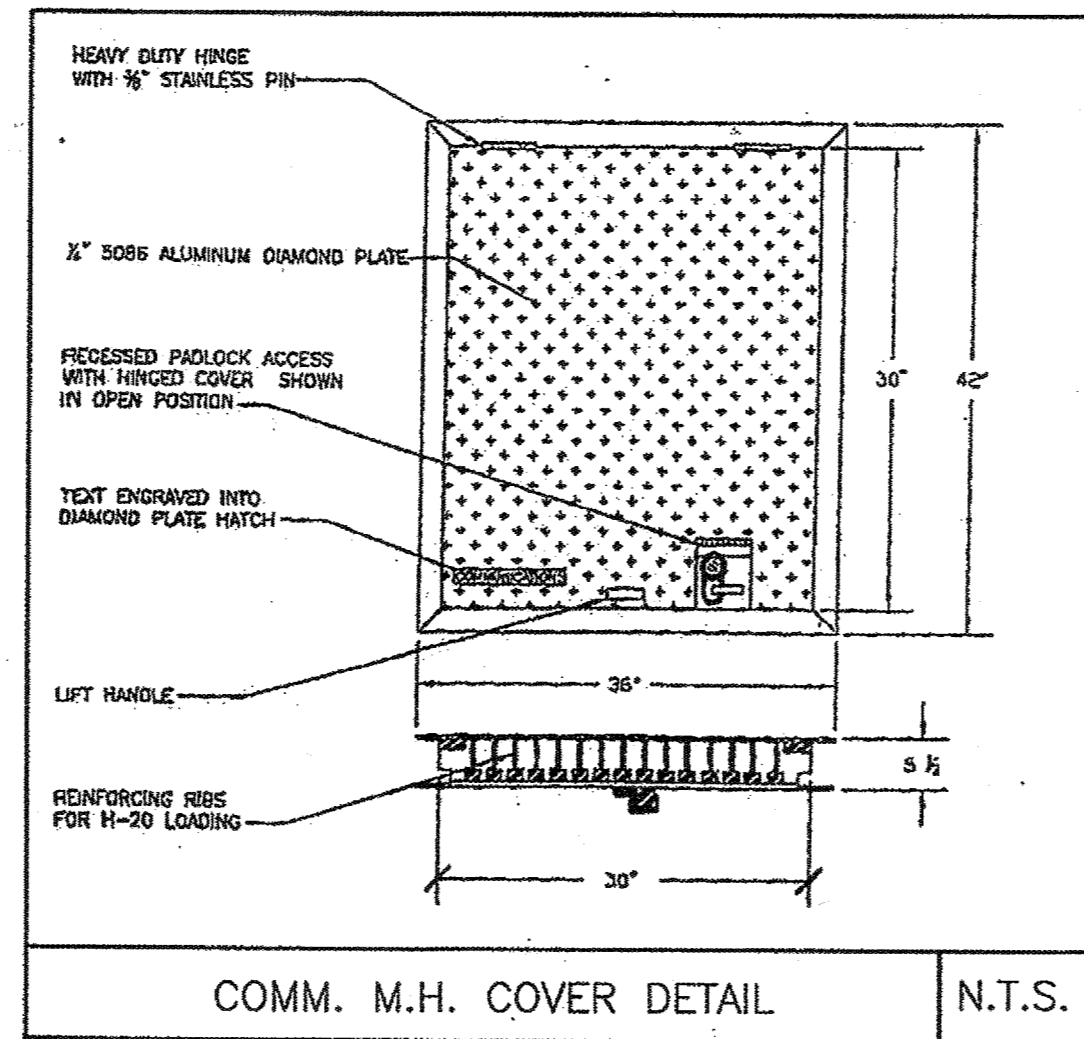
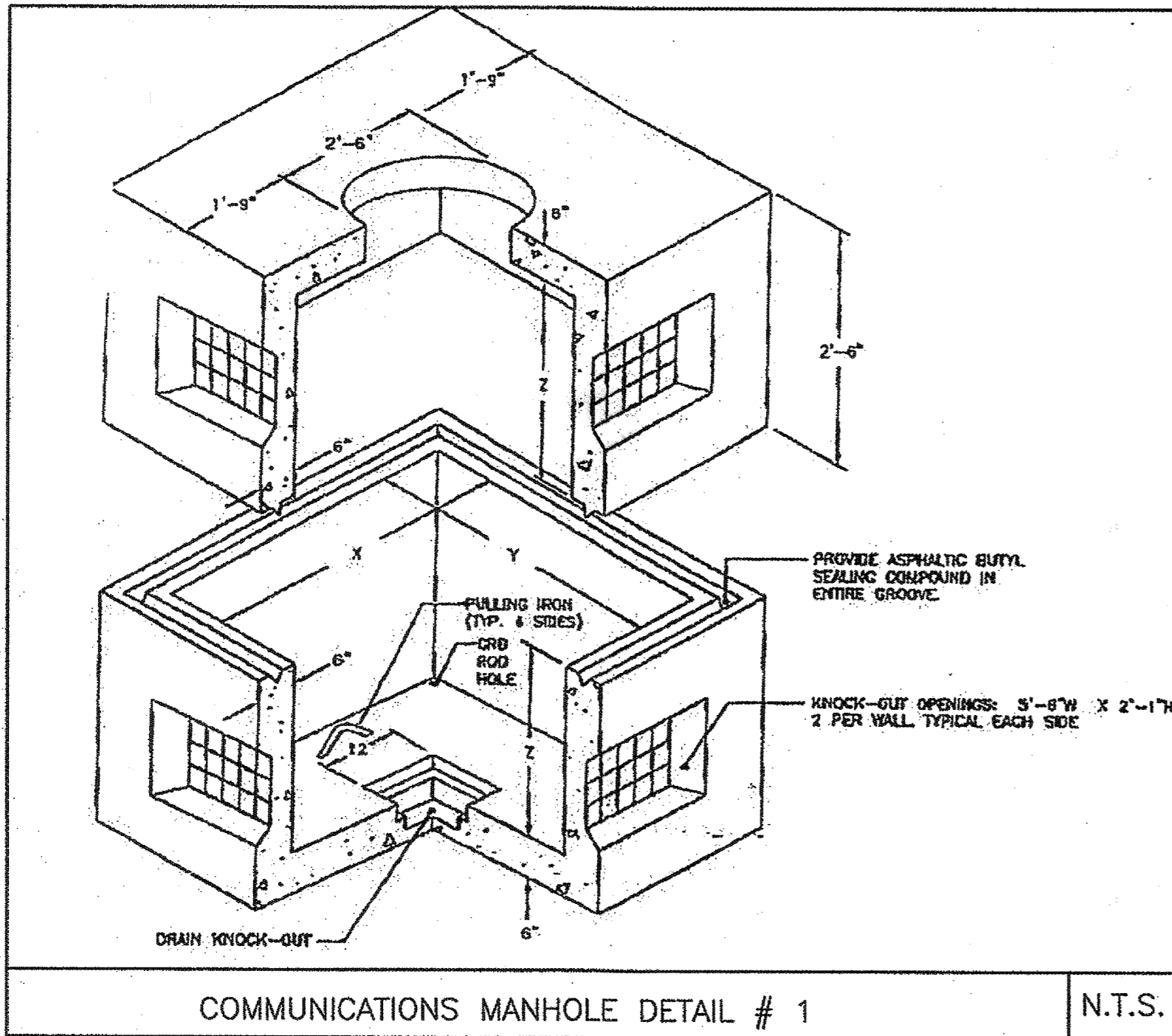
JOB NO.: 13685

SDP-21
 1-17-05 SHEET: 21 OF 23

SCALE: AS SHOWN
 DES: SPL CHECK: RPM DATE: 01-17-05

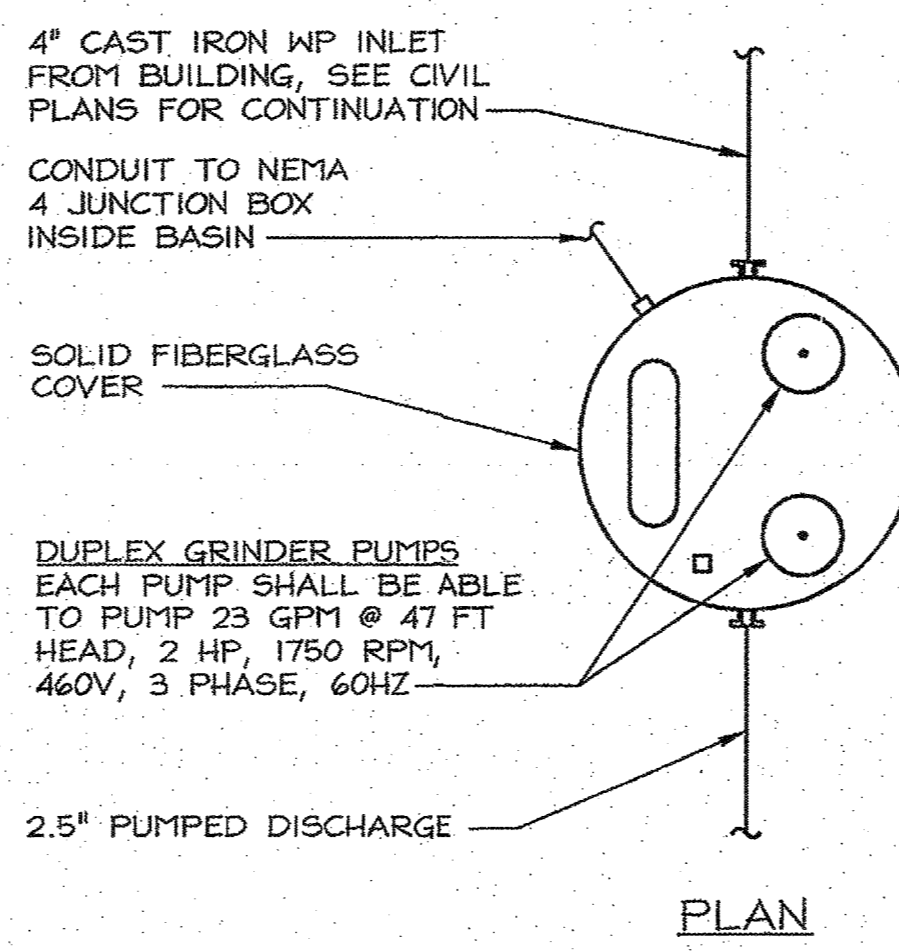
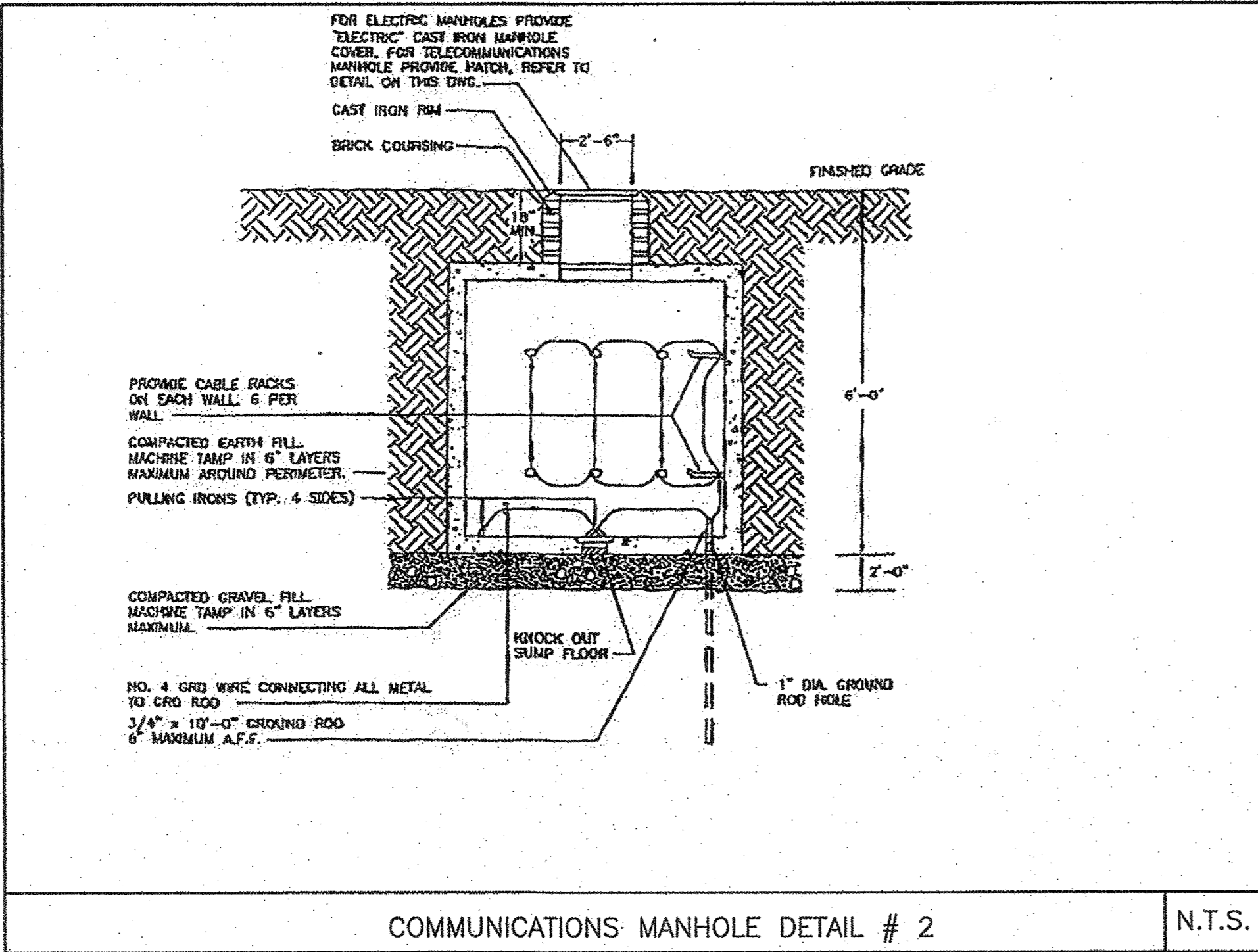
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK

 CHIEF, DIVISION OF LAND DEVELOPMENT

 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING



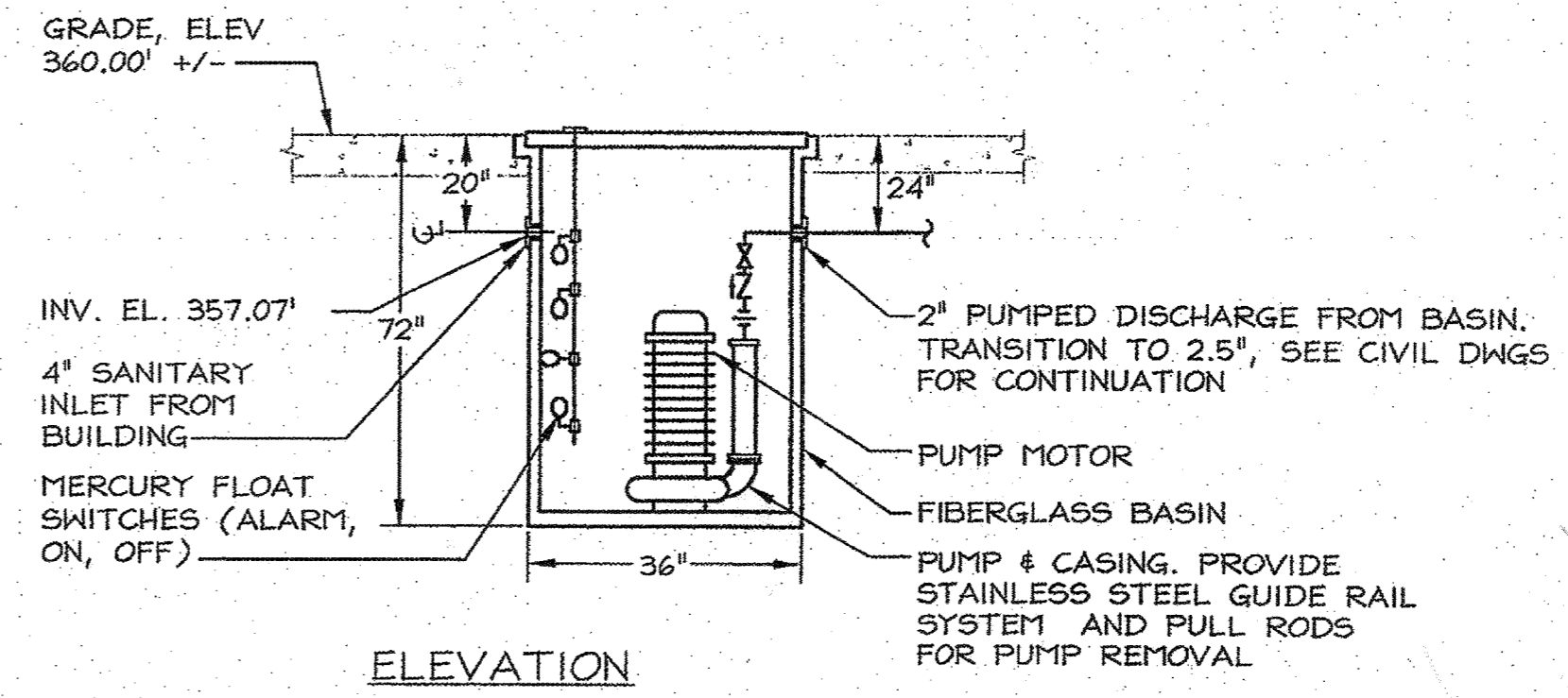
GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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 FAX (410) 792-7395



STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 1-17-05
 FOR COMM. M.H. ONLY



NOTE: GRINDER PUMP SHALL BE PROVIDED AS A TURNKEY PRE-PACKAGED SYSTEM BY PENTAIR, WITH REMOTE CONTROL AND ALARM PANEL. PANEL SHALL BE MONITORED BY JOHNSON CONTROLS METASYS SYSTEM.



DUPLEX SUBMERSIBLE GRINDER PUMP
 NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
 CHIEF, DIVISION OF LAND DEVELOPMENT 2/1/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 2/2/05

REVISIONS	

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ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIF GROUP	
SAFETY OFFICER	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

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GRAPHIC SCALE
Mullins Engineering Co., Inc.
 1257 ANNAPOLIS ROAD
 ODENTON, MD 21113
 410-519-0800
 FAX: 410-672-3977

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
 14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MARYLAND 20707
 (410) 782-9782 or (301) 778-1690
 FAX (410) 782-7385

GRINDER PUMP

STATE OF MARYLAND PROFESSIONAL ENGINEER
 1-17-05

JOB NO.: 13685
SDP-22
 SHEET: 22 OF 23

SCALE: N.T.S.

DES: AEM CHECK: AEM DATE: 01-17-05

B-4.8 STANDARDS AND SPECIFICATIONS

FOR PERMANENT STABILIZATION

DEFINITION

To stabilize disturbed soils with permanent vegetation.

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

CONDITIONS WHERE PRACTICE APPLIES

Exposed soils where ground cover is needed for 6 months or more.

CRITERIA

- 1. Select one or more of the species or mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone... 2. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes... 3. For areas having disturbed areas over 5 acres... 4. For areas requiring low maintenance...

B-4.1 STANDARDS AND SPECIFICATIONS

FOR TEMPORARY STABILIZATION

To stabilize disturbed soils with vegetation for up to 6 months.

To use fast growing vegetation that provides cover on disturbed soils.

CONDITIONS WHERE PRACTICE APPLIES

Exposed soils where ground cover is needed for a period of 6 months or less.

CRITERIA

- 1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone... 2. For areas having soil tests performed... 3. When stabilization is required outside of a seeding season... 4. Areas where turfgrass may be desired...

TEMPORARY SEEDING SUMMARY

Table with 8 columns: No., Species, Application Rate (lb/1000 sq ft), Seeding Date, Seeding Depth (inches), Fertilizer Rate (lb/1000 sq ft), Lime Rate (lb/1000 sq ft), and Line Rate.

B-4.2 STANDARDS AND SPECIFICATIONS

FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

The process of preparing the soils to sustain adequate vegetative stabilization.

To provide a suitable soil medium for vegetative growth.

CONDITIONS WHERE PRACTICE APPLIES

Where vegetative stabilization is to be established.

CRITERIA

- 1. Specifications: All seed must meet the requirements of the Maryland State Seed Law... 2. Application: Dry Seeding. This includes use of conventional drop or broadcast seeders... 3. Mulch: Mulch alone may be applied between the fall and spring seeding dates...

PERMANENT SEEDING SUMMARY

Table with 8 columns: No., Species, Application Rate (lb/1000 sq ft), Seeding Date, Seeding Depth (inches), Fertilizer Rate (lb/1000 sq ft), Lime Rate (lb/1000 sq ft), and Line Rate.

CRITERIA

- 1. General Specifications: Class of turfgrass and seed must be Maryland State Certified... 2. Soil Installation: During periods of excessively high temperature... 3. Soil Maintenance: In the absence of adequate rainfall, water daily during the first week...

B-4.3 STANDARDS AND SPECIFICATIONS

FOR SEEDING AND MULCHING

The application of seed and mulch to establish vegetative cover.

To protect disturbed soils from erosion during and at the end of construction.

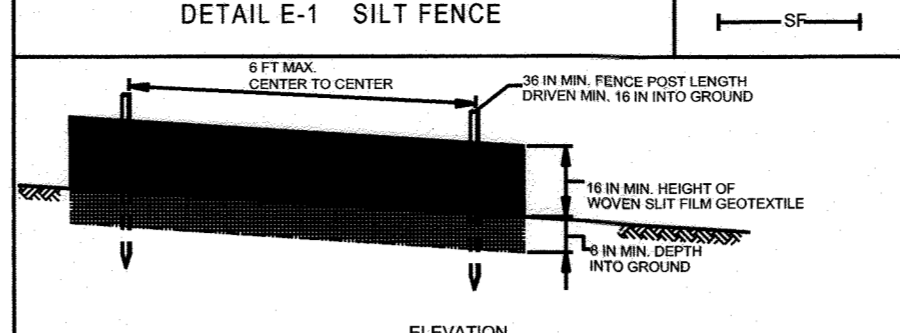
CONDITIONS WHERE PRACTICE APPLIES

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

CRITERIA

- 1. Specifications: All seed must meet the requirements of the Maryland State Seed Law... 2. Application: Dry Seeding. This includes use of conventional drop or broadcast seeders... 3. Mulch: Mulch alone may be applied between the fall and spring seeding dates...

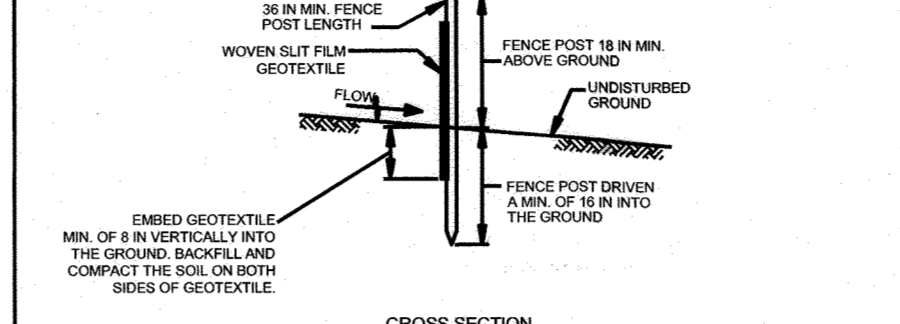
DETAIL E-1 SILT FENCE



DETAIL E-1 SILT FENCE

CONSTRUCTION SPECIFICATIONS: 1. USE WOOD POSTS... 2. USE #4 REINFORCING STEEL BARS... 3. USE WOVEN BURLAP GEOTEXTILE...

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE



DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

CONSTRUCTION SPECIFICATIONS: 1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN... 2. PIPE ALL SURFACE WATER FLOWING TO THE ENTRANCE...

Table with 4 columns: U.S. DEPARTMENT OF AGRICULTURE, NATIONAL RESOURCES CONSERVATION SERVICE, 2011, and MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION.

REVISIONS

Table with columns for Revision Number, Description, Date, and by Whom.

APPROVALS

Table for approvals with columns for Requester, Date, Signature, Title, and Position.

THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY. JOHNS HOPKINS ROAD, LAUREL, MARYLAND 20723-6099.

THE JOHNS HOPKINS UNIVERSITY LIBRARIES SERVICE CENTER. TAX MAP 41, GRID 16, PARCEL 1.

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SEQUENCE OF CONSTRUCTION. 1. THE LIMITS OF DISTURBANCE MUST BE FIELD MARKED PRIOR TO GRADING... 2. CONDUCT A PRE-CONSTRUCTION MEETING...

MRA MORRIS & RITCHE ASSOCIATES, INC. ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS. 14280 PARK CENTER DRIVE, SUITE A, LAUREL, MARYLAND 20707.

REVISION SEDIMENT CONTROL DETAILS. DEVELOPER'S CERTIFICATE. SIGNATURE OF DEVELOPER CHERYL HAWES JHU/APL DATE 8-9-21.

SCALE: AS SHOWN. SHEET: 23 OF 23. DES: MM CHECK: MM DATE: 01-17-05 4/23/2021.

HOWARD SOIL CONSERVATION DISTRICT

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

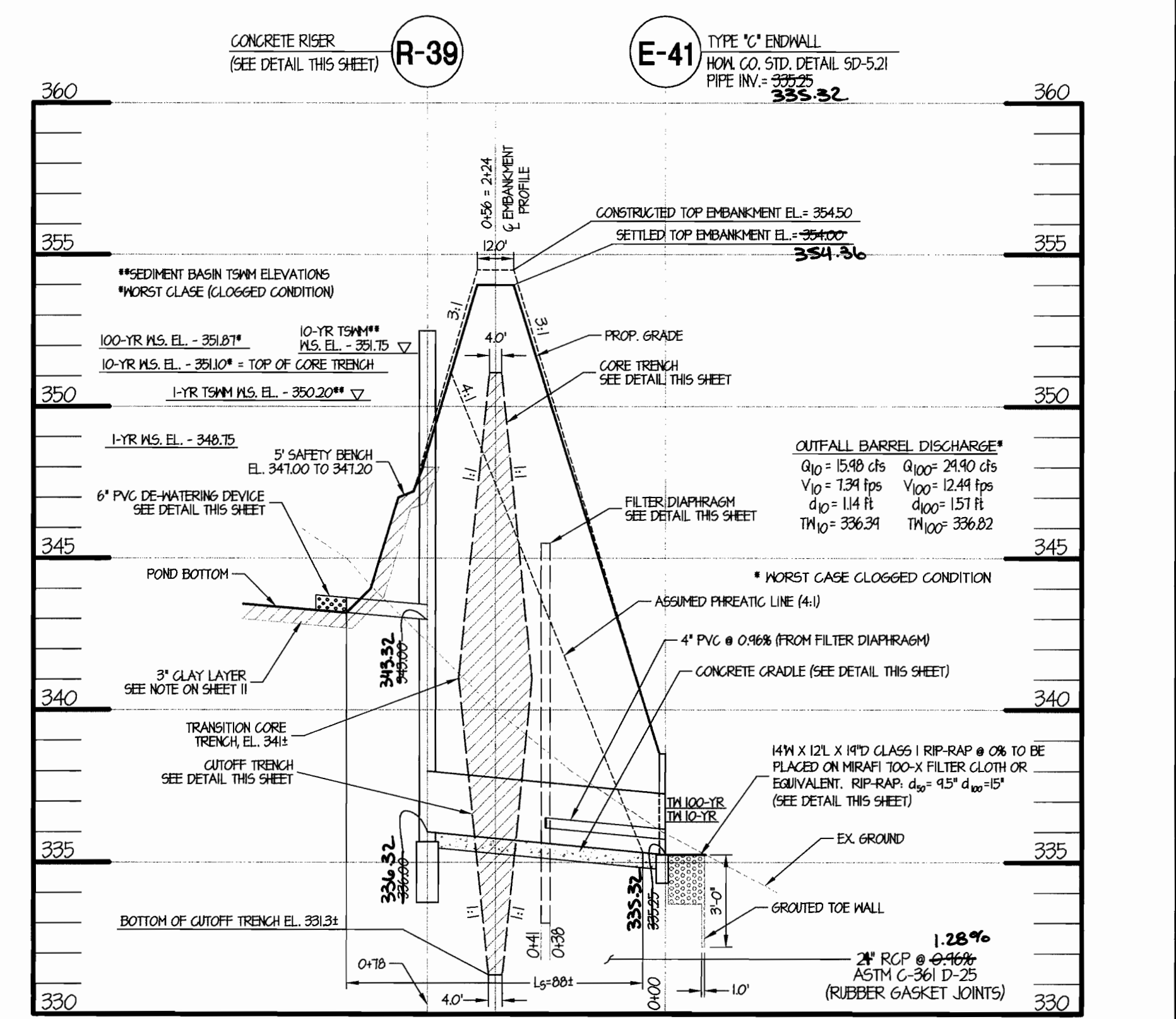
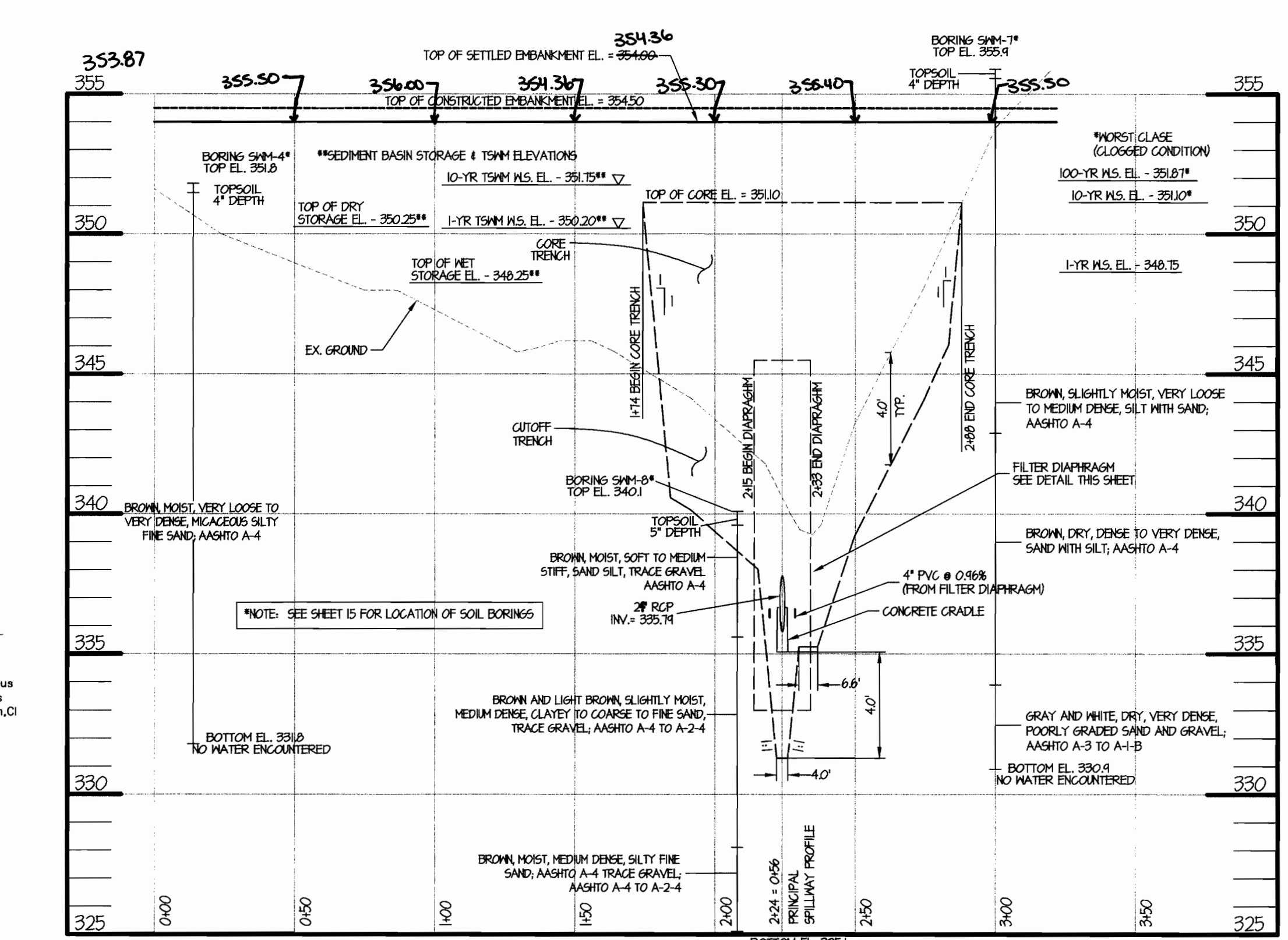
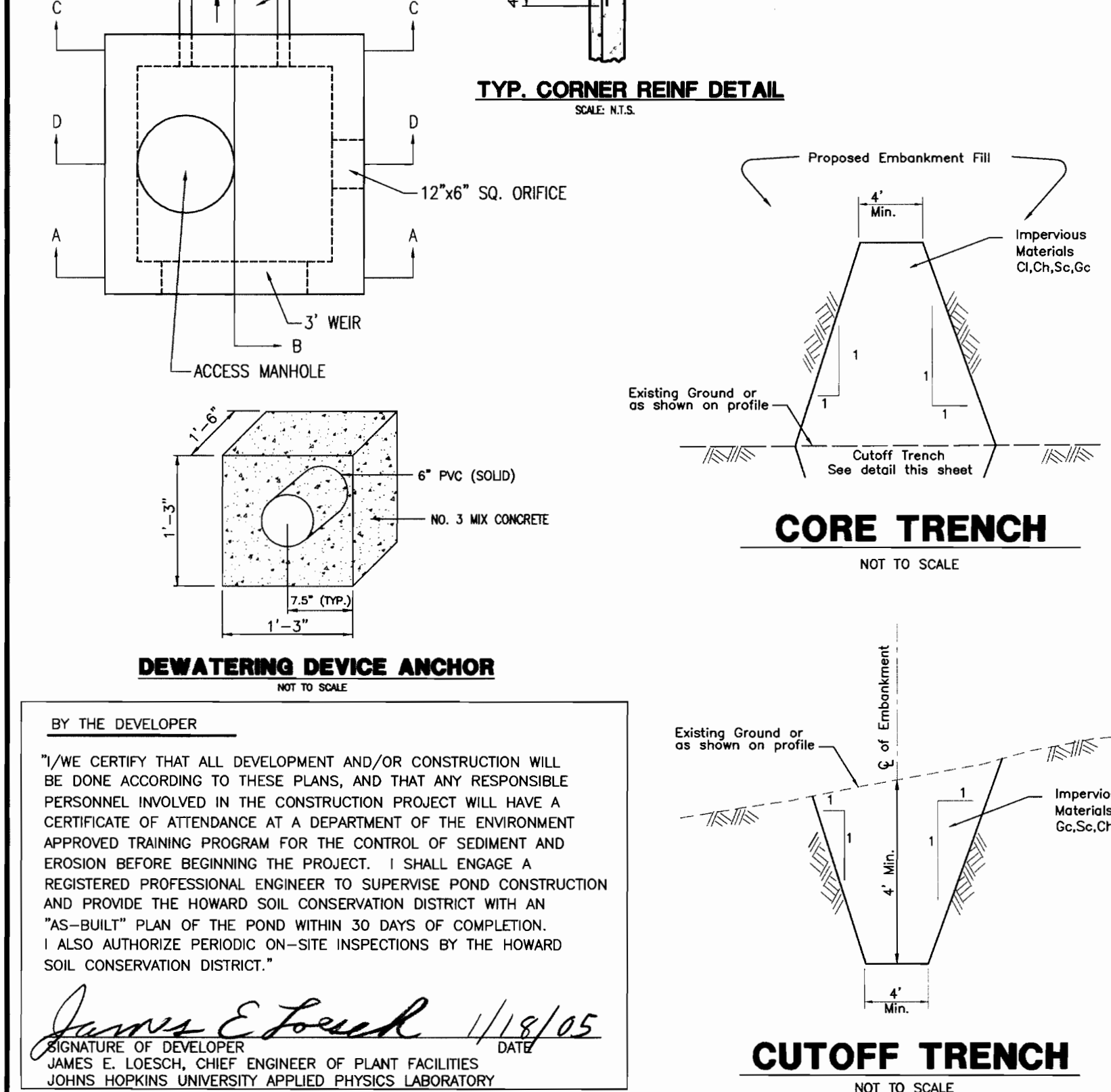
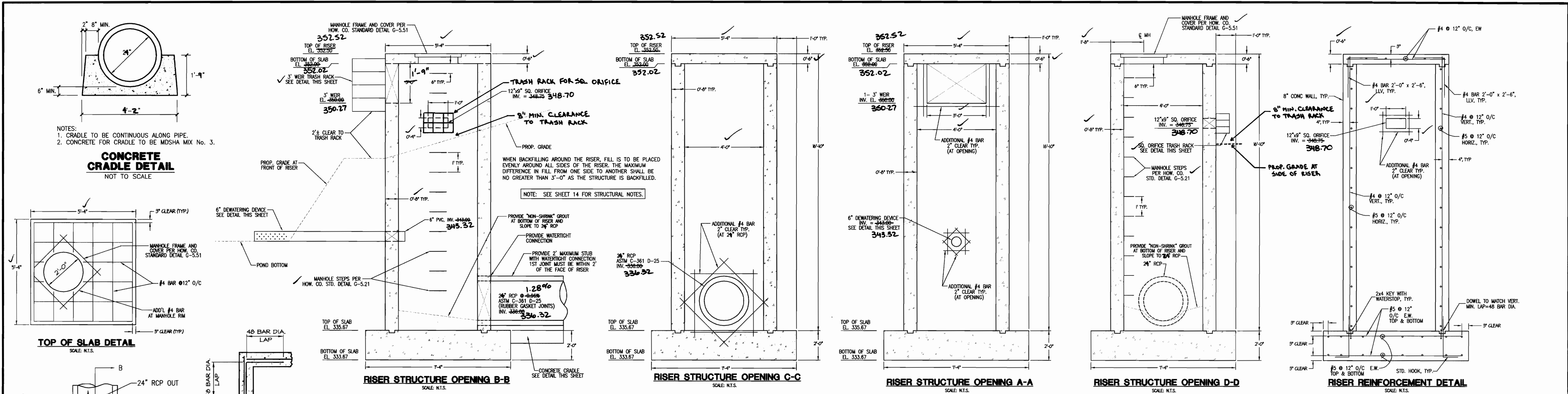
Signature of Thomas Neugebauer, P.E. DATE: 08/23/21. HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING. CHIEF, DEVELOPMENT ENGINEERING DIVISION. DATE: 8-30-21.

CHIEF, DIVISION OF LAND DEVELOPMENT. DATE: 9/3/21. DIRECTOR, DEPARTMENT OF PLANNING AND ZONING. DATE: 9-2-21.

ENGINEER'S CERTIFICATE. I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION 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 of Thomas Neugebauer, P.E. DATE: 8-4-2021. SIGNATURE OF DEVELOPER CHERYL HAWES JHU/APL DATE: 8-9-21.



BY THE DEVELOPER
I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

James E. Loesch 1/18/05
SIGNATURE OF DEVELOPER DATE
JAMES E. LOESCH, CHIEF ENGINEER OF PLANT FACILITIES
JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

BY THE ENGINEER
I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

Thomas C. Neugebauer, P.E. 1-17-05
SIGNATURE OF ENGINEER DATE
THOMAS C. NEUGEBAUER, P.E. MD LIC.#29203

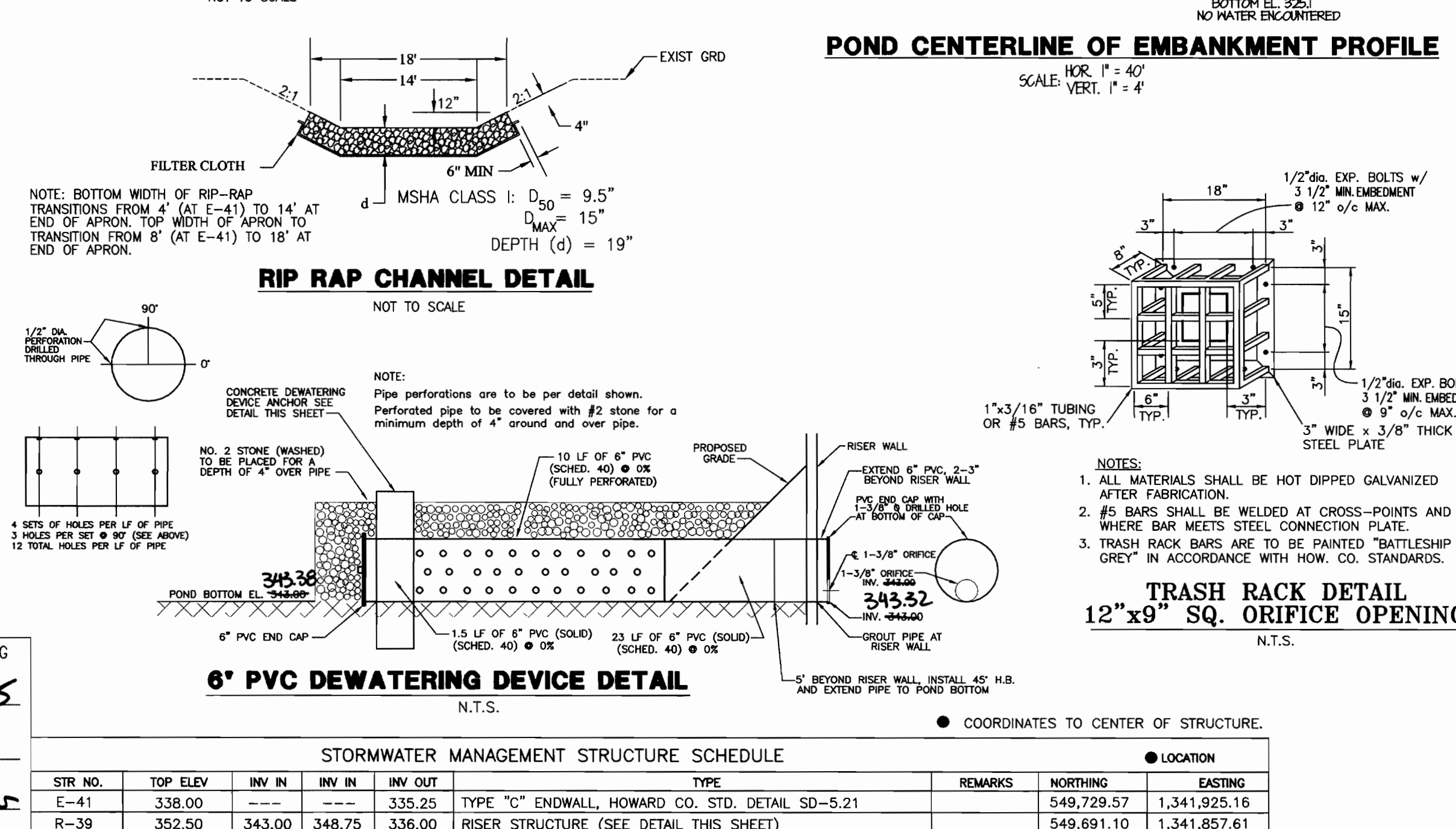
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Hays 1/26/05
U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

Paula A. 1/26/05
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 1/21/05
CHIEF, DIVISION OF LAND DEVELOPMENT 2/4/05
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING 2/3/05



STORMWATER MANAGEMENT STRUCTURE SCHEDULE

STR. NO.	TOP ELEV.	INV. IN	INV. OUT	TYPE	REMARKS	NORTHING	EASTING
E-41	338.00	---	335.25	TYPE "C" ENDWALL, HOWARD CO. STD. DETAIL SD-5.21		549,729.57	1,341,925.16
R-39	352.50	343.00	348.75	336.00	RISER STRUCTURE (SEE DETAIL THIS SHEET)	549,691.10	1,341,857.61

SWM PIPE SCHEDULE

SIZE	TYPE	LENGTH
24"	ASTM C-361 D-25	78'
6"	SCHEDULE 40	35'
4"	SDR 35 (FILTER DPM)	90'

GRADATION CHART FOR ASTM C-33 CONCRETE SAND

SIZE	% PASSING	NO. 10	NO. 20	NO. 40	NO. 60	NO. 100	NO. 200
3/8"	5.0	100	100	100	100	100	100
NO. 4	4.75	100	100	100	100	100	100
NO. 10	2.00	100	100	100	100	100	100
NO. 20	0.850	100	100	100	100	100	100
NO. 40	0.425	100	100	100	100	100	100
NO. 60	0.250	100	100	100	100	100	100
NO. 100	0.150	100	100	100	100	100	100
NO. 140	0.106	100	100	100	100	100	100
NO. 200	0.075	100	100	100	100	100	100

REVISIONS

NO.	DESCRIPTION	DATE
1	AS-BUILT INFO ADDED	03/06

APPROVALS

REQUESTER	DATE
PLANT FACILITIES DIVISION	
ENGINEERING	
CONSTRUCTION REVIEW	
TSC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTORS OFFICE	
COORDINATOR	
SENIOR DESIGNER	

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FIFTH (5TH) ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

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GRAPHIC SCALE

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14200 PARK CENTER DRIVE, SUITE A
LAUREL, MARYLAND 20707
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SWM PLAN 2
JOB NO.: 13685
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SHEET: 12 OF 22
SCALE: 1" = 40'
DES: KKB CHECK: TCN DATE: 01-17-05

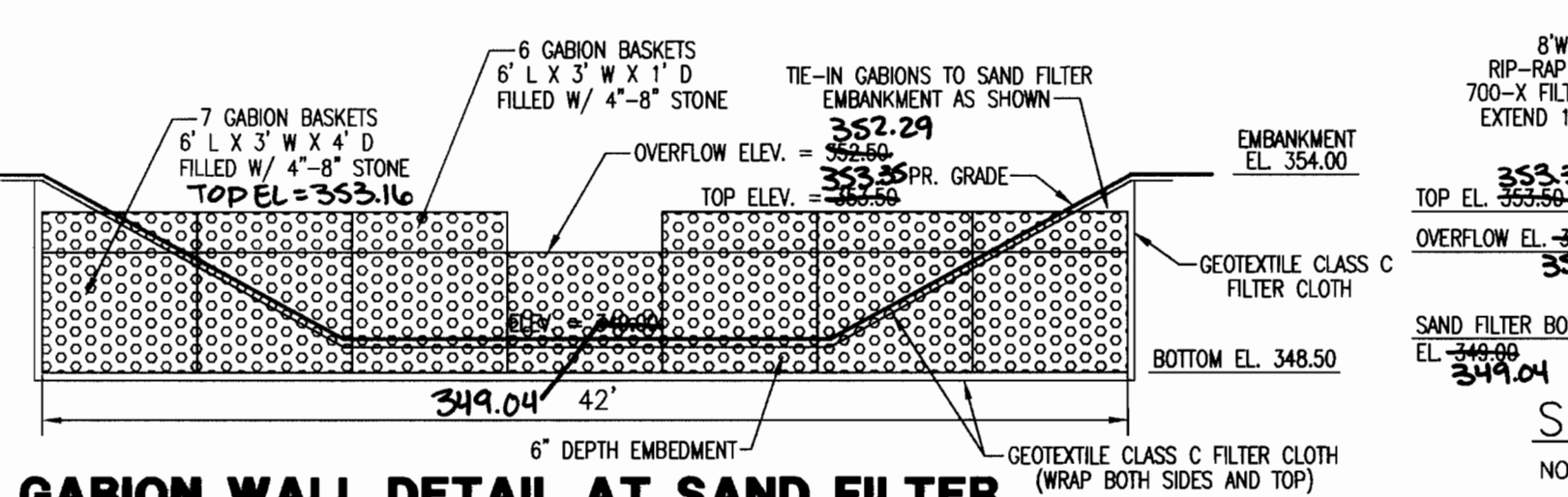
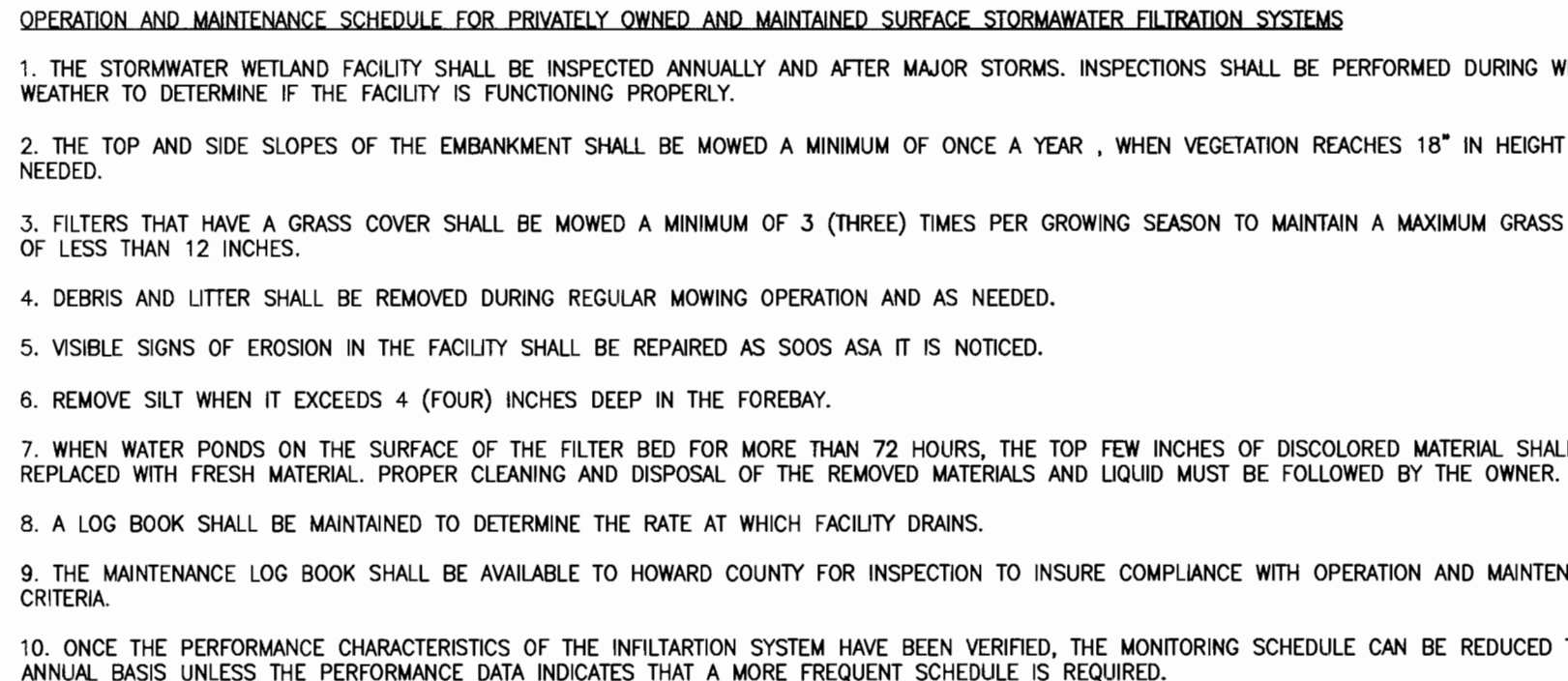
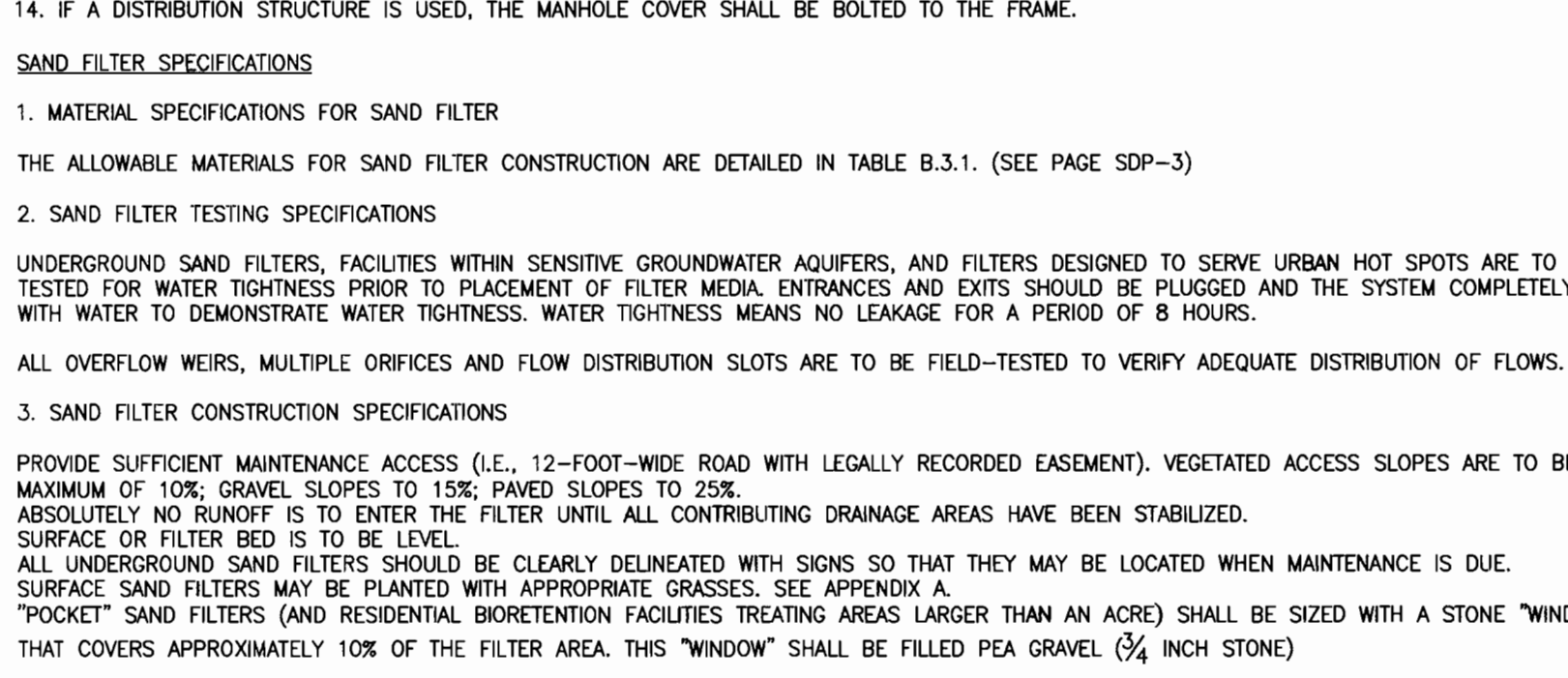
INFILTRATION TRENCH GENERAL NOTES AND SPECIFICATIONS

- AN INFILTRATION TRENCH MAY NOT RECEIVE RUN-OFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE INFILTRATION TRENCH HAS RECEIVED FINAL STABILIZATION.
- HEAVY EQUIPMENT AND TRAFFIC SHALL BE RESTRICTED FROM TRAVELING OVER THE PROPOSED LOCATION OF THE INFILTRATION TRENCH TO MINIMIZE COMPACTION OF THE SOIL.
- EXCAVATE THE INFILTRATION TRENCH TO THE DESIGN DIMENSIONS. EXCAVATED MATERIALS SHALL BE PLACED AWAY FROM THE TRENCH SIDES TO ENHANCE TRENCH WALL STABILITY. LARGE TREE ROOTS MUST BE TRIMMED FLUSH WITH THE TRENCH SIDES IN ORDER TO PREVENT FABRIC PUNCTURING OR TEARING OF THE FILTER FABRIC DURING SUBSEQUENT INSTALLATION PROCEDURES. THE SIDE WALLS OF THE TRENCH SHALL BE ROUGHENED WHERE SHEARED AND SEALED BY HEAVY EQUIPMENT.
- A CLASS "C" GEOTEXTILE OR BETTER (SEE SECTION 24.0, MATERIAL SPECIFICATIONS, 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, MDE, 1994) SHALL INTERFACE BETWEEN THE TRENCH SIDE WALLS AND BETWEEN STONE RESERVOIR AND GRAVEL FILTER LAYERS. A PARTIAL LIST OF NON-WOVEN FABRICS THAT MEET THE CLASS "C" CRITERIA FOLLOWS. ANY ALTERNATIVE FILTER FABRIC MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.
 - AMOCO 4552
 - GEOLON N70
 - WESTEC N07
 - CARTHAGE FX-80S
 - MIRAFI 180-N

THE WIDTH OF GEOTEXTILE MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO THE TRENCH PERMETER IRREGULARITIES AND FOR A 6-INCH MINIMUM TOP OVERLAP. THE FILTER FABRIC SHALL BE TUCKED UNDER THE SAND LAYER ON THE BOTTOM OF THE INFILTRATION TRENCH FOR A DISTANCE OF 6 TO 12 INCHES. STONES OR OTHER ANCHORING OBJECTS SHOULD BE PLACED ON THE FABRIC AT THE EDGE OF THE TRENCH TO KEEP THE TRENCH OPEN DURING WINDY PERIODS. WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UPHILL ROLL SHOULD LAP A MINIMUM OF 2 FEET OVER THE DOWNHILL ROLL IN ORDER TO PROVIDE A SINGLE EFFECT.

- IF A 6" SAND FILTER LAYER IS PLACED ON THE BOTTOM OF THE INFILTRATION TRENCH, THE SAND FOR THE FILTRATION TRENCH SHALL BE WASHED AND MEET AASHTO-M-43, SIZE NO. 9 OR NO. 10. ANY ALTERNATIVE SAND GRADATION MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.
- THE STONE AGGREGATE SHOULD BE PLACED IN A MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. THE GRAVEL (ROUNDED "BANK RUN" GRAVEL IS PREFERRED) FOR THE INFILTRATION TRENCH SHALL BE WASHED AND MEET ONE OF THE FOLLOWING AASHTO-M-43, SIZE NO. 2 OR NO. 3.
- FOLLOWING THE STONE AGGREGATE PLACEMENT, THE FILTER FABRIC SHALL BE FOLDED OVER THE STONE AGGREGATE TO FORM A 6-INCH MINIMUM LONGITUDINAL LAP. THE DESIRED FILL SOIL OR STONE AGGREGATE SHALL BE PLACED OVER THE LAP AT SUFFICIENT INTERVALS TO MAINTAIN THE LAP DURING SUBSEQUENT BACKFILLING.
- CARE SHALL BE EXERCISED TO PREVENT NATURAL OR FILL SOILS FROM INTERMIXING WITH THE STONE AGGREGATE. ALL CONTAMINATED STONE AGGREGATE SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED STONE AGGREGATE.
- VOIDS MAY OCCUR BETWEEN FABRIC AND THE EXCAVATION SIDES SHALL BE AVOIDED. REMOVING BOULDERS OR OTHER OBSTACLES FROM THE TRENCH WALLS IS ONE SOURCE OF SUCH VOIDS. THEREFORE, NATURAL SOILS SHOULD BE PLACED IN THOSE VOIDS AT THE MOST CONVENIENT TIME DURING CONSTRUCTION TO ENSURE FABRIC CONFORMITY TO THE EXCAVATION SIDES.
- VERTICALLY EXCAVATED WALLS MAY BE DIFFICULT TO MAINTAIN IN AREAS WHERE SOIL MOISTURE IS HIGH OR WHERE SOFT COHESIVE OR COHESIONLESS SOILS ARE DOMINANT. THESE CONDITIONS MAY REQUIRE LAYING BACK OF THE SIDE SLOPES TO MAINTAIN STABILITY.
- PVC DISTRIBUTION PIPES SHALL BE SCHEDULE 40 AND MEET ASTM-D-1785. ALL FITTINGS SHALL MEET ASTM-D-2729. PERFORATIONS SHALL BE 3/8" IN DIAMETER. A PERFORATED PIPE SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. THE END OF THE PVC PIPE SHALL BE CAPPED. NOTE: PVC PIPE WITH A WALL THICKNESS CLASSIFICATION OF SDR-35 MEETING ASTM-D-3034 IS AN ACCEPTABLE SUBSTITUTE FOR THE SCHEDULE 40 PIPE.
- THE OBSERVATION WELL IS TO CONSIST OF 6-INCH DIAMETER PERFORATED PVC SCHEDULE 40 PIPE (M278 OR F758, TYPE PS 28) WITH A CAP SET FLUSH TO FINAL PAVED SURFACE AND IS TO BE LOCATED NEAR THE LONGITUDINAL CENTER OF THE INFILTRATION TRENCH. THE PIPE SHALL HAVE A PLASTIC COLLAR WITH RISERS TO PREVENT ROTATION WHEN REMOVING THE CAP. THE SCREW TOP LID SHALL BE A CLEANOUT WITH A LOCKING MECHANISM OR SPECIAL BOLT TO DISCOURAGE VANDALISM. THE DEPTH TO THE INVERT SHALL BE MARKED ON THE LID. THE PIPE SHALL BE PLACED VERTICALLY WITHIN THE GRAVEL PORTION OF THE INFILTRATION TRENCH AND A CAP PROVIDED AT THE BOTTOM OF THE PIPE. THE BOTTOM OF THE CAP SHALL REST ON THE INFILTRATION TRENCH BOTTOM.
- CORRUGATED METAL DISTRIBUTION PIPES SHALL CONFORM TO AASHTO-M-36, AND SHALL BE ALUMINIZED IN ACCORDANCE WITH AASHTO-M-274. ALUMINIZED PIPE IN CONTACT WITH CONCRETE SHALL BE COATED WITH AN INERT COMPOUND CAPABLE OF PREVENTING THE DECELERIOUS EFFECT OF ALUMINUM ON THE CONCRETE. PERFORATED DISTRIBUTION PIPES SHALL CONFORM TO AASHTO-M-36, CLASS 2 AND SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. AN ALUMINIZED METAL PLATE SHALL BE WELDED TO THE END OF THE PIPE.
- IF A DISTRIBUTION STRUCTURE WITH A WET WELL IS USED, A 4-INCH DRAIN PIPE SHALL BE PROVIDED AT OPPOSITE ENDS OF THE INFILTRATION TRENCH DISTRIBUTION STRUCTURE. TWO (2) CUBIC FEET OF POROUS BACKFILL MEETING AASHTO-M-43, SIZE NO. 57 SHALL BE PROVIDED AT EACH DRAIN.
- IF A DISTRIBUTION STRUCTURE IS USED, THE MANHOLE COVER SHALL BE BOLTED TO THE FRAME.

- SAND FILTER SPECIFICATIONS**
- MATERIAL SPECIFICATIONS FOR SAND FILTER
 - SAND FILTER TESTING SPECIFICATIONS
- UNDERGROUND SAND FILTERS, FACILITIES WITHIN SENSITIVE GROUNDWATER AQUIFERS, AND FILTERS DESIGNED TO SERVE URBAN HOT SPOTS ARE TO BE TESTED FOR WATER TIGHTNESS PRIOR TO PLACEMENT OF FILTER MEDIA. ENTRANCES AND EXITS SHOULD BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO LEAKAGE FOR A PERIOD OF 8 HOURS.
- ALL OVERFLOW WEIRS, MULTIPLE ORIFICES AND FLOW DISTRIBUTION SLOTS ARE TO BE FIELD-TESTED TO VERIFY ADEQUATE DISTRIBUTION OF FLOWS.
- SAND FILTER CONSTRUCTION SPECIFICATIONS**
- PROVIDE SUFFICIENT MAINTENANCE ACCESS (I.E., 12-FOOT-WIDE ROAD WITH LEGALLY RECORDED EASEMENT). VEGETATED ACCESS SLOPES ARE TO BE MAXIMUM OF 10% GRADE WITH CONCRETE SLOPES TO 25%. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED. SURFACE OR FILTER BED IS TO BE LEVEL.
- ALL UNDERGROUND SAND FILTERS SHOULD BE CLEARLY DELINEATED WITH SIGNS SO THAT THEY MAY BE LOCATED WHEN MAINTENANCE IS DUE. SURFACE SAND FILTERS MAY BE PLANTED WITH APPROPRIATE GRASSES. SEE APPENDIX A.
- "POCKET" SAND FILTERS (AND RESIDENTIAL BIORETENTION FACILITIES TREATING AREAS LARGER THAN AN ACRE) SHALL BE SIZED WITH A STONE "WINDOW" THAT COVERS APPROXIMATELY 10% OF THE FILTER AREA. THIS "WINDOW" SHALL BE FILLED PEA GRAVEL (3/4" INCH STONE).
- OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS**
- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
 - THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE A YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
 - FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF 3 (THREE) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
 - DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATION AND AS NEEDED.
 - VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
 - REMOVE SILT WHEN IT EXCEEDS 4 (FOUR) INCHES DEEP IN THE FOREBAY.
 - WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
 - A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH FACILITY DRAINS.
 - THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
 - ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.



INSTALLATION NOTES

- GABION BASKETS SHALL BE CONSTRUCTED OF GALVANIZED US GAUGE 11 MESH WIRE OR APPROVED EQUIVALENT.
- GABION INSTALLATION SHALL BE PERFORMED ACCORDING TO GABION MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
- TOP GABION BASKETS TO BE STAGGERED OVER BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.
- TOP GABION BASKETS TO BE FASTENED TO BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

1/31/05
DATE

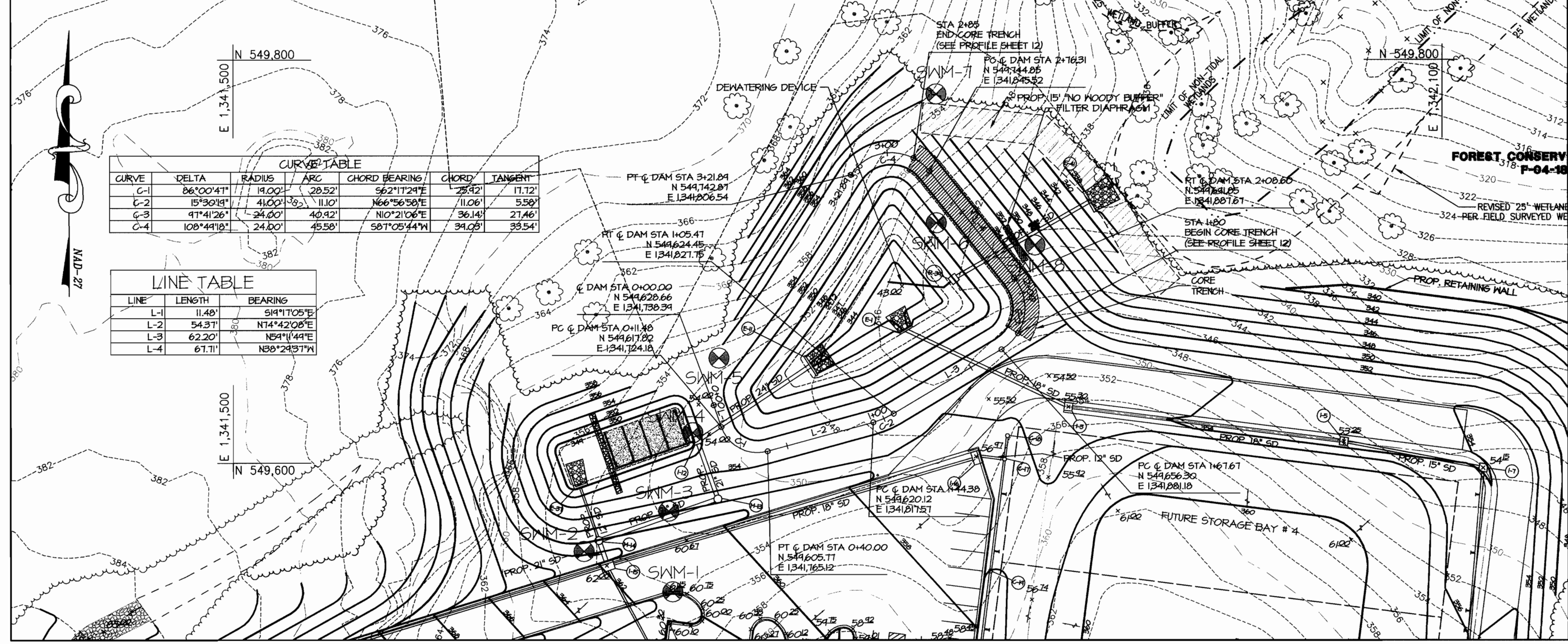
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CHIEF, DEVELOPMENT ENGINEERING DIVISION MK

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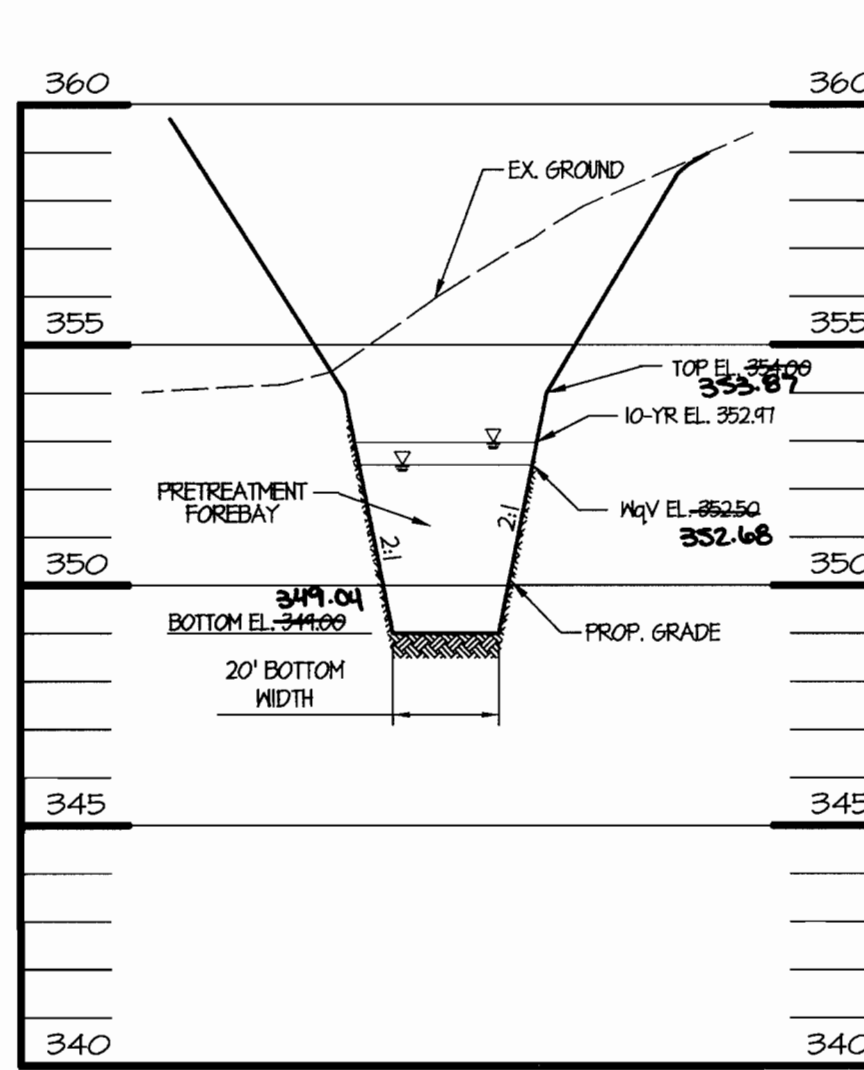
DIRECTOR, DEPARTMENT OF PLANNING AND ZONING



STORMWATER MANAGEMENT PLAN (PRIVATE FACILITY)

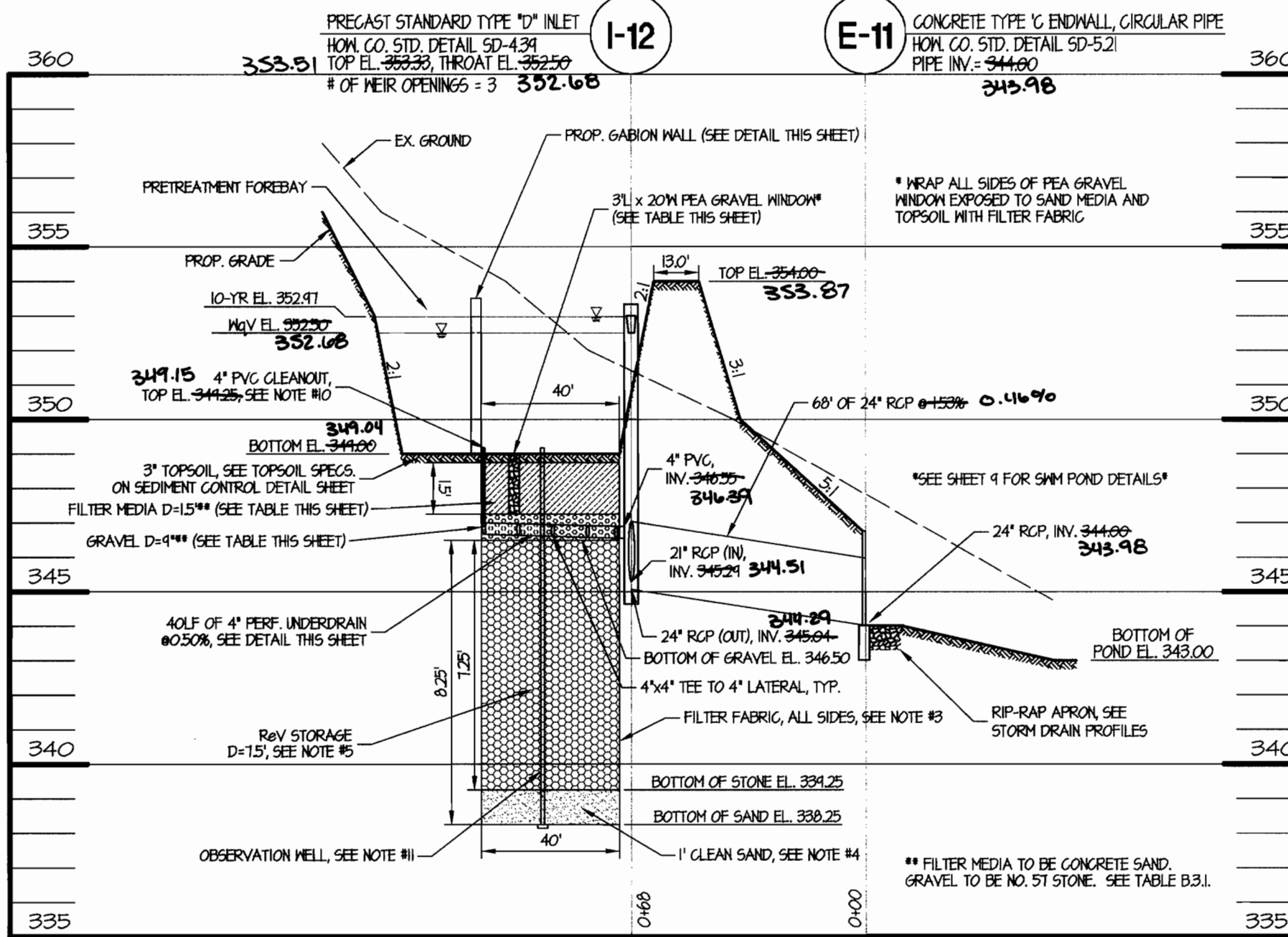
SCALE: 1" = 40'

I-12 TO BE A PRECAST STRUCTURE WITH 3 WEIR OPENINGS PLACED AT THE FRONT AND SIDES OF THE INLET. BACK OF INLET (AGAINST FILL SLOPE) WILL NOT HAVE A WEIR OPENING.



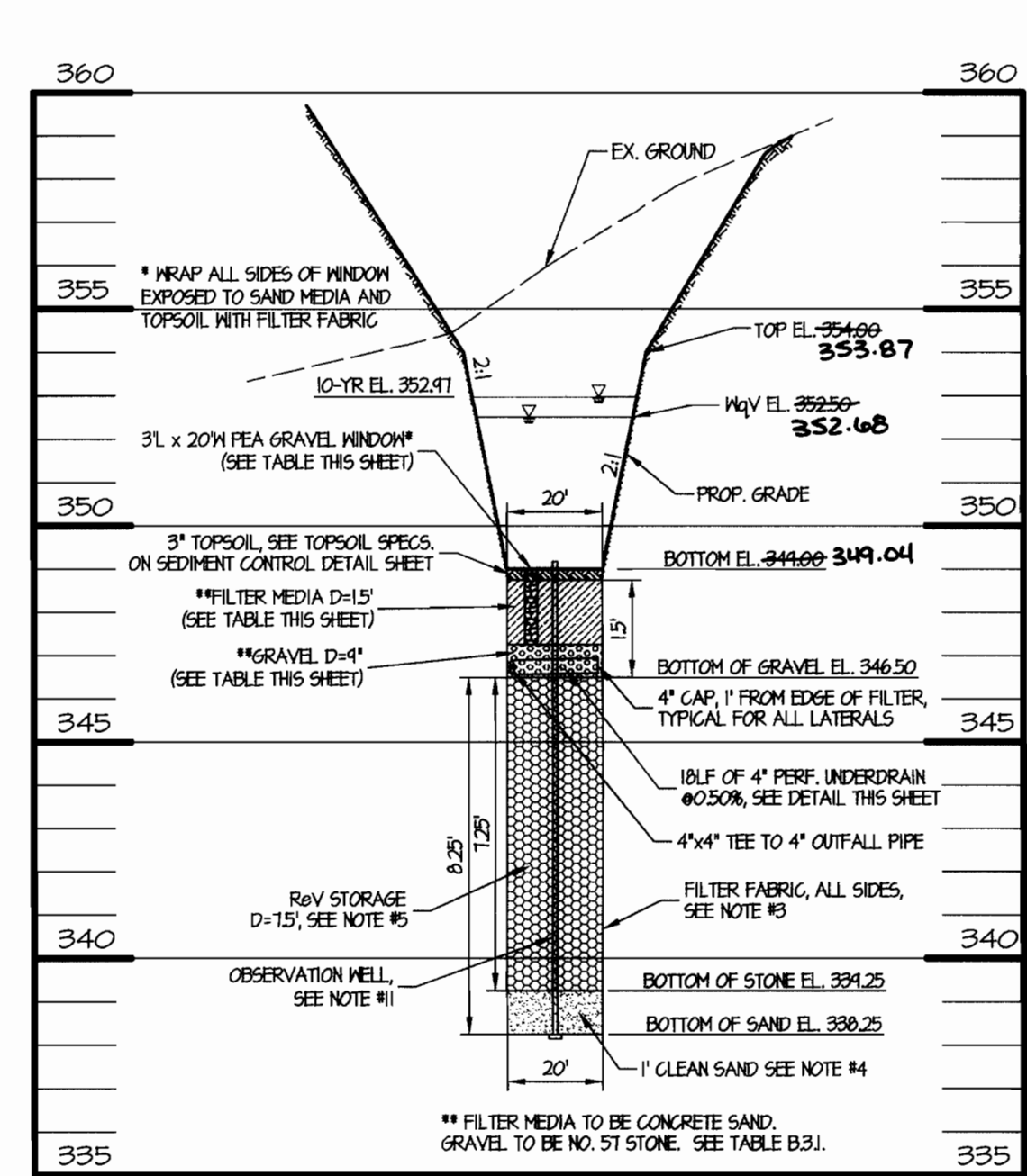
PRETREATMENT FOREBAY SECTION

HOR. 1" = 40'
VERT. 1" = 4'



SAND FILTER PROFILE

HOR. 1" = 40'
VERT. 1" = 4'



SAND FILTER SECTION

HOR. 1" = 40'
VERT. 1" = 4'

GRADATION CHART FOR ASTM C-33 CONCRETE SAND

SEIVE SIZE	mm	% PASSING
3/8 IN.	9.5	100
No.4	4.75	90-100
No.10	2.00	70-100
No.20	0.850	50-85
No.50	0.300	25-50
No.100	0.150	8-30
No.140	0.106	0-15
No.200	0.075	0-5

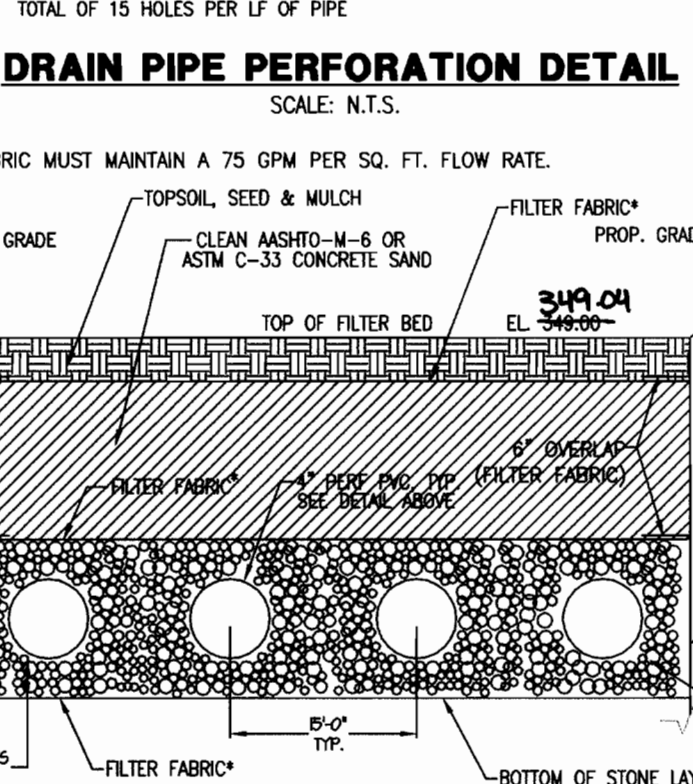
GRADATION CHART FOR No.57 STONE

SEIVE SIZE	% PASSING
1-1/2"	100
1"	95-100
1/2"	25-60
No.4	0-10
No.8	0-5



DRAIN PIPE PERFORATION DETAIL

SCALE: N.T.S.



SAND FILTER FILTER BED DETAIL

SCALE: N.T.S.

TABLE B.3.1 MATERIAL SPECIFICATIONS FOR SAND FILTERS

MATERIAL	SPECIFICATION/TEST METHOD	SIZE	NOTES
PEA GRAVEL	AASHTO-M-43	0.25" - 0.50"	WASHED, RIVER RUN, ROUND DIAMETER
SAND	CLEAN AASHTO-M-6 OR ASTM-C-33 CONCRETE SAND, SEE GRADATION CHART	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DUNESAND AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR POLYMERIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND
PEAT	ASH CONTENT: <15% PH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY 0.12 TO 0.15 G/CC	N/A	THE MATERIAL MUST BE REED-SIDE HOMO PEAT, SHREDED, UNCOMPACTED, UNIFORM, AND CLEAN.
LEAF COMPOST	AASHTO-M-43	0.375" TO 1.50"	DOUBLE WASHED NO. 57 STONE. SEE GRADATION CHART
UNDERDRAIN GRAVEL	ASTM-D-4833 (PUNCTURE STRENGTH-125 LB.) ASTM-D-4632 (TENSILE STRENGTH-300 LB.)	N/A	MUST MAINTAIN 75 GPM PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES NEAR TO "SEPARATE" SAND FILTER LAYERS. SEE INFILTRATION GENERAL NOTE 3.
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH 1,100 LB./INCH) ASTM-D-524 (TEAR RESISTANCE - 150 LB./IN.) ASTM-D-471 (WATER ADSORPTION: +8 TO -2% MASS)	30 MIL THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
IMPERMEABLE LINER (IF REQUIRED)	MESH STANDARDS AND SPECS. SECTION 902 MIX NO. 3, Fc = 3500 PSL. NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM-615-60	N/A	ON SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED: 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO-M-278	4"-6" RIGID SCH. 40 PVC OR SDR35	3/4" PERFORATION, 3 HOLES PER ROW. SEE DRAIN PIPE PERFORATION DETAIL. 40 PVC OR SDR35
CONCRETE (CAST-IN-PLACE)	PER PRE-CAST MANUFACTURER	N/A	SEE ABOVE NOTE
CONCRETE (PRECAST)	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM-A-123
NON-REBAR STEEL	ASTM A-36	N/A	SEE ABOVE NOTE

REVISIONS		
Asbuilt	Info ADDED	03/06

APPROVALS	
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PLANT EXCUTTING/INSP.	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SAFETY OFFICER	
DIRECTOR	
COORDINATOR	
SENIOR LEADER	

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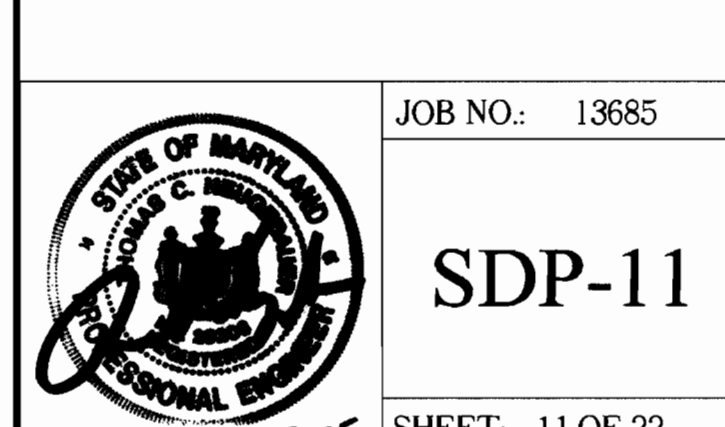
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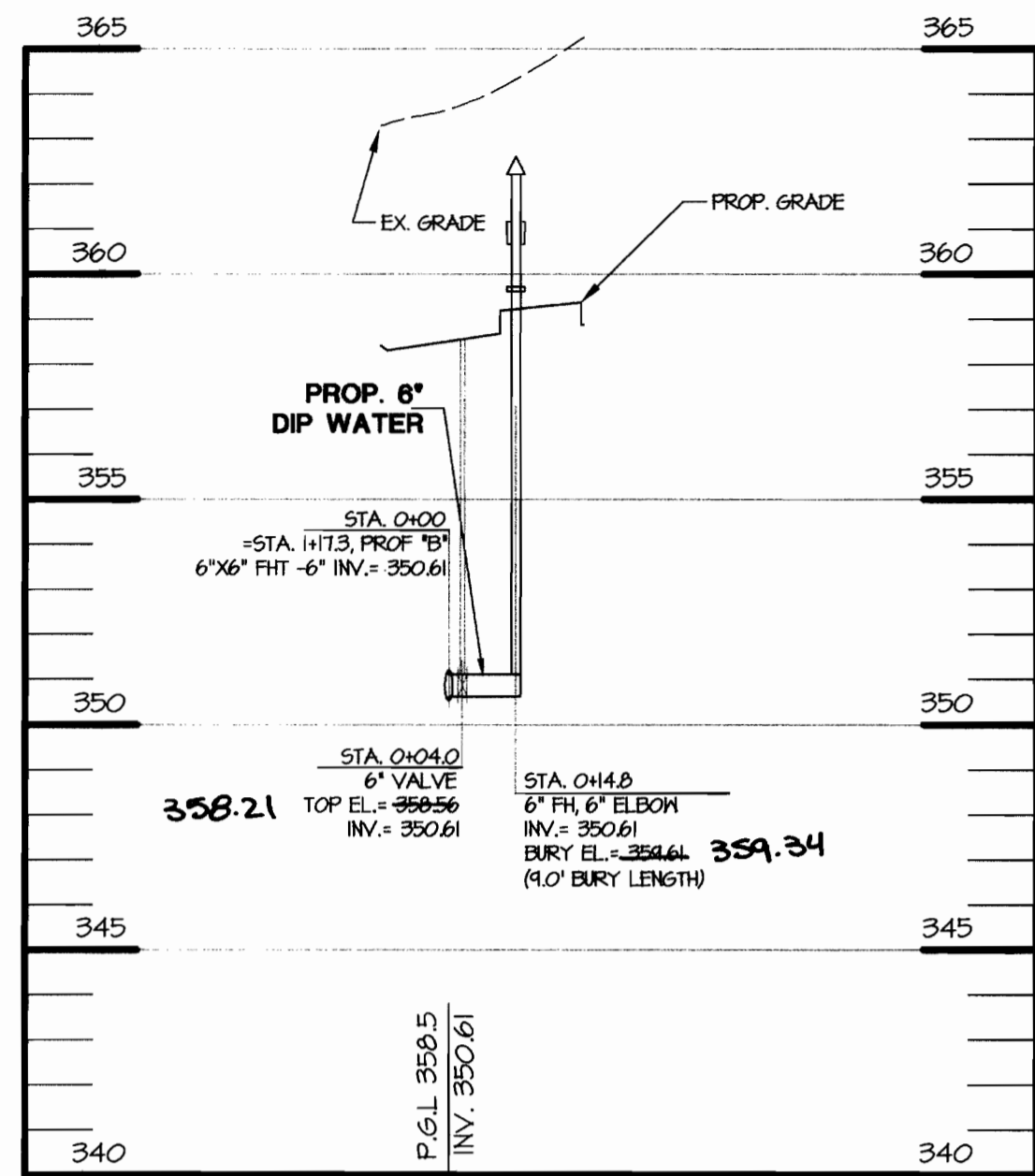
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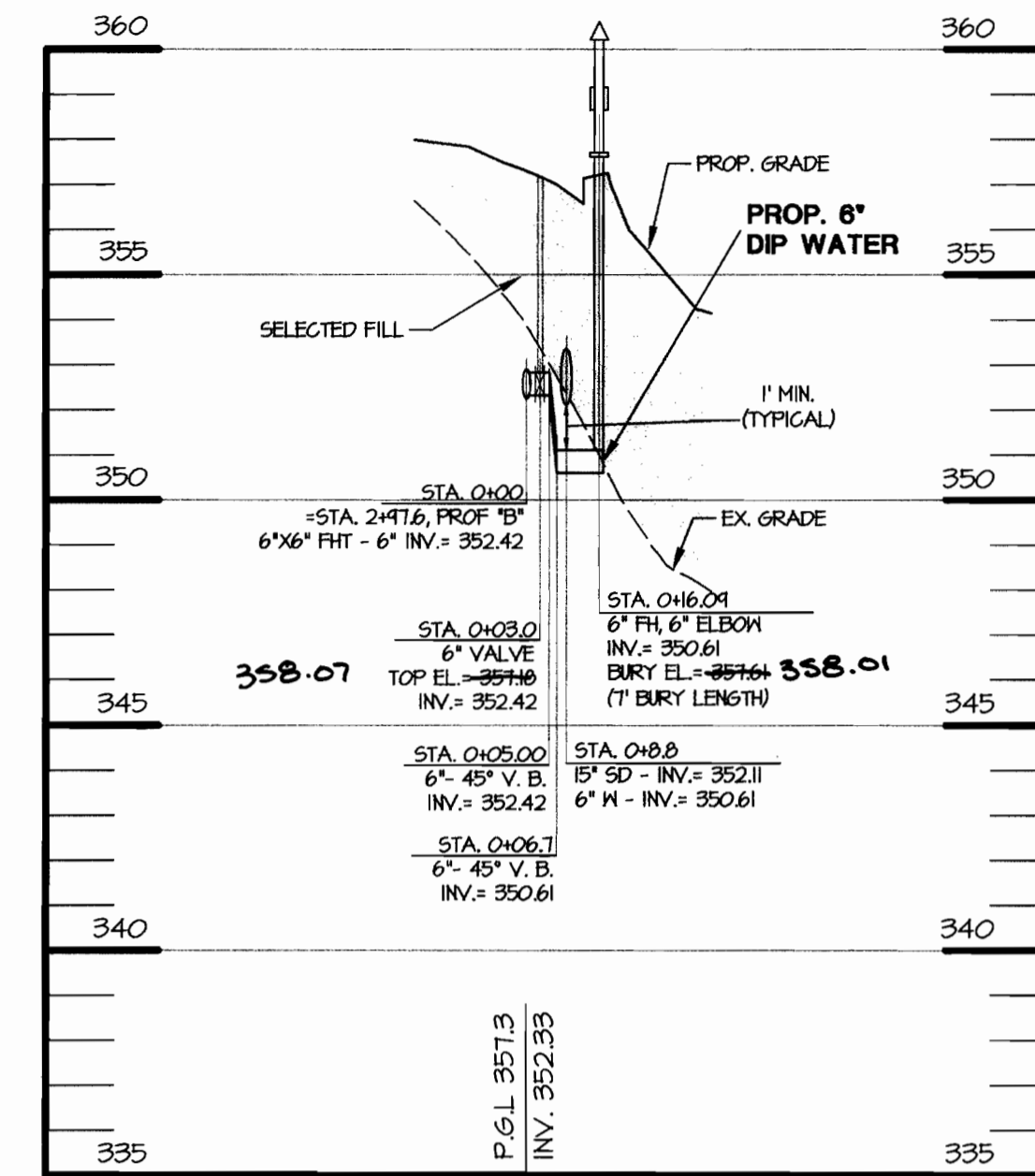


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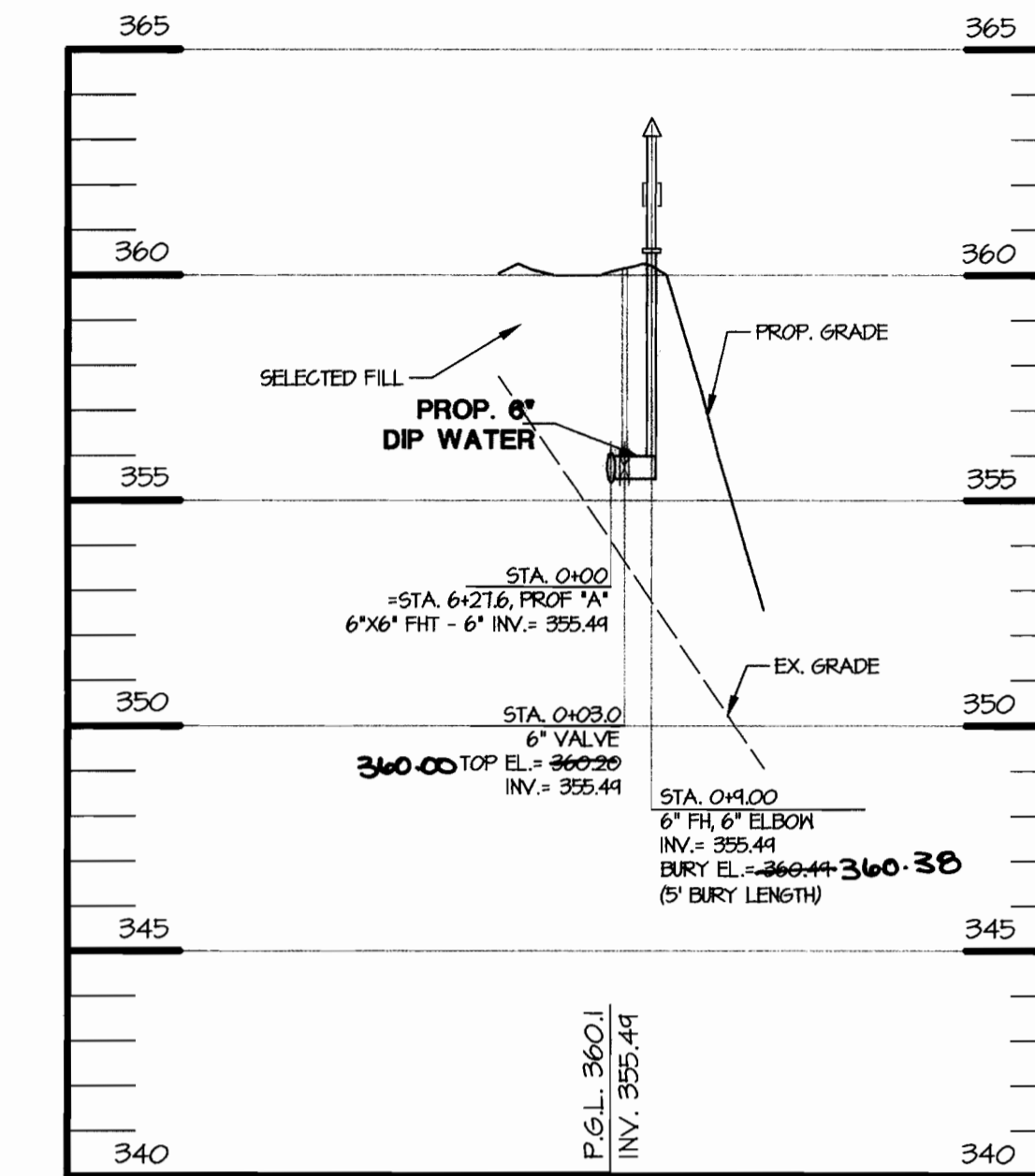
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HOR. 1" = 40'
VERT. 1" = 4'



F.H. PROFILE 'B'
HOR. 1" = 40'
VERT. 1" = 4'



F.H. PROFILE 'C'
HOR. 1" = 40'
VERT. 1" = 4'

SANITARY PIPE SCHEDULE (PRIVATE)		
SIZE	TYPE	LENGTH
2.5"	PVC SDR 21	346 LF

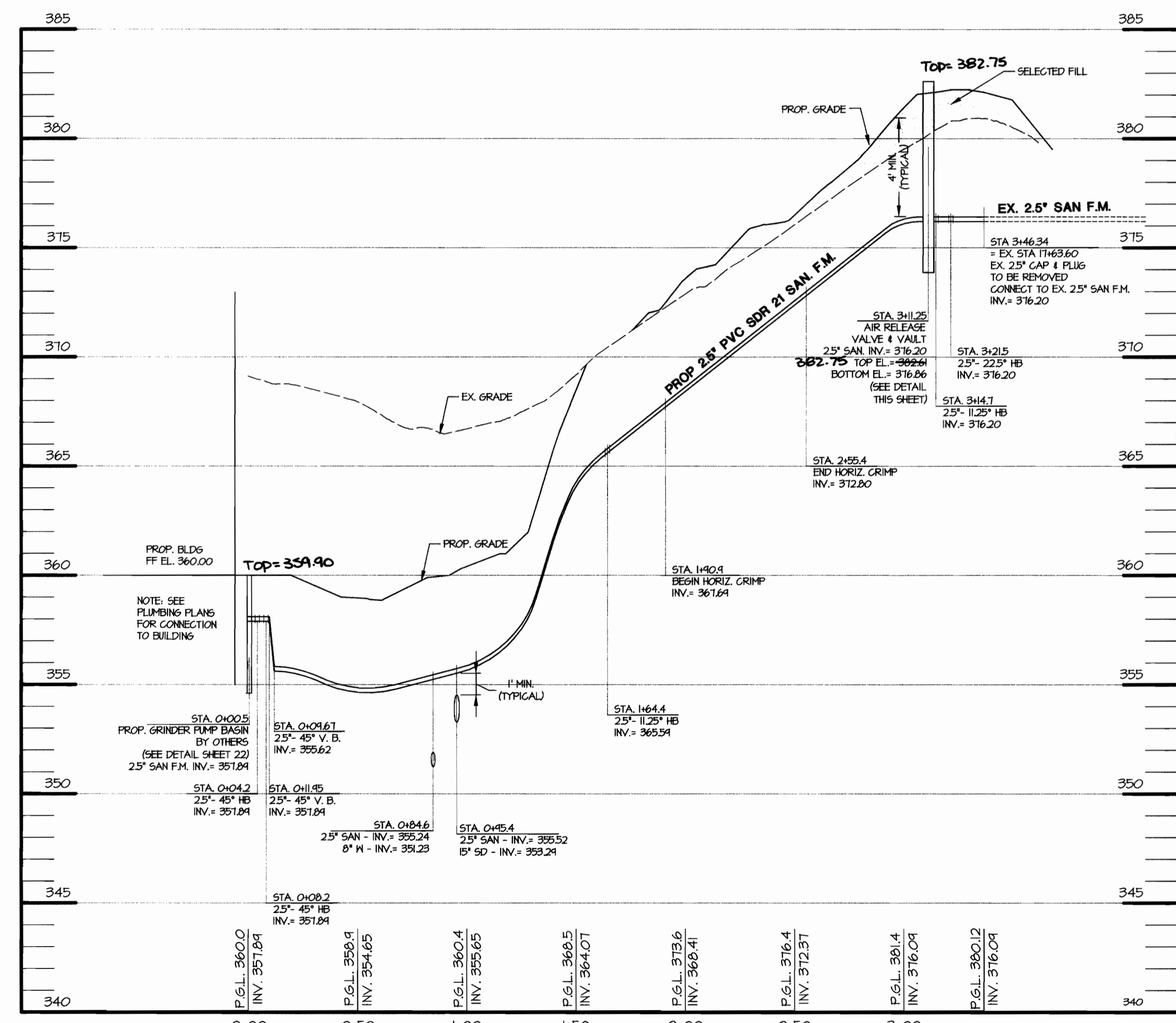
WATER PIPE SCHEDULE (PRIVATE)		
SIZE	TYPE	LENGTH
10"	CLASS 50 DIP	2 LF
8"	CLASS 50 DIP	403 LF
6"	CLASS 50 DIP	622 LF

SANITARY PIPE FITTINGS SCHEDULE (PRIVATE)	
TYPE	QUANTITY
2.5"-45" HB	2
2.5"-22.5" HB	1
2.5"-11.25" HB	2
2.5"-45" VB	2
AIR RELEASE VALVE & VAULT	1

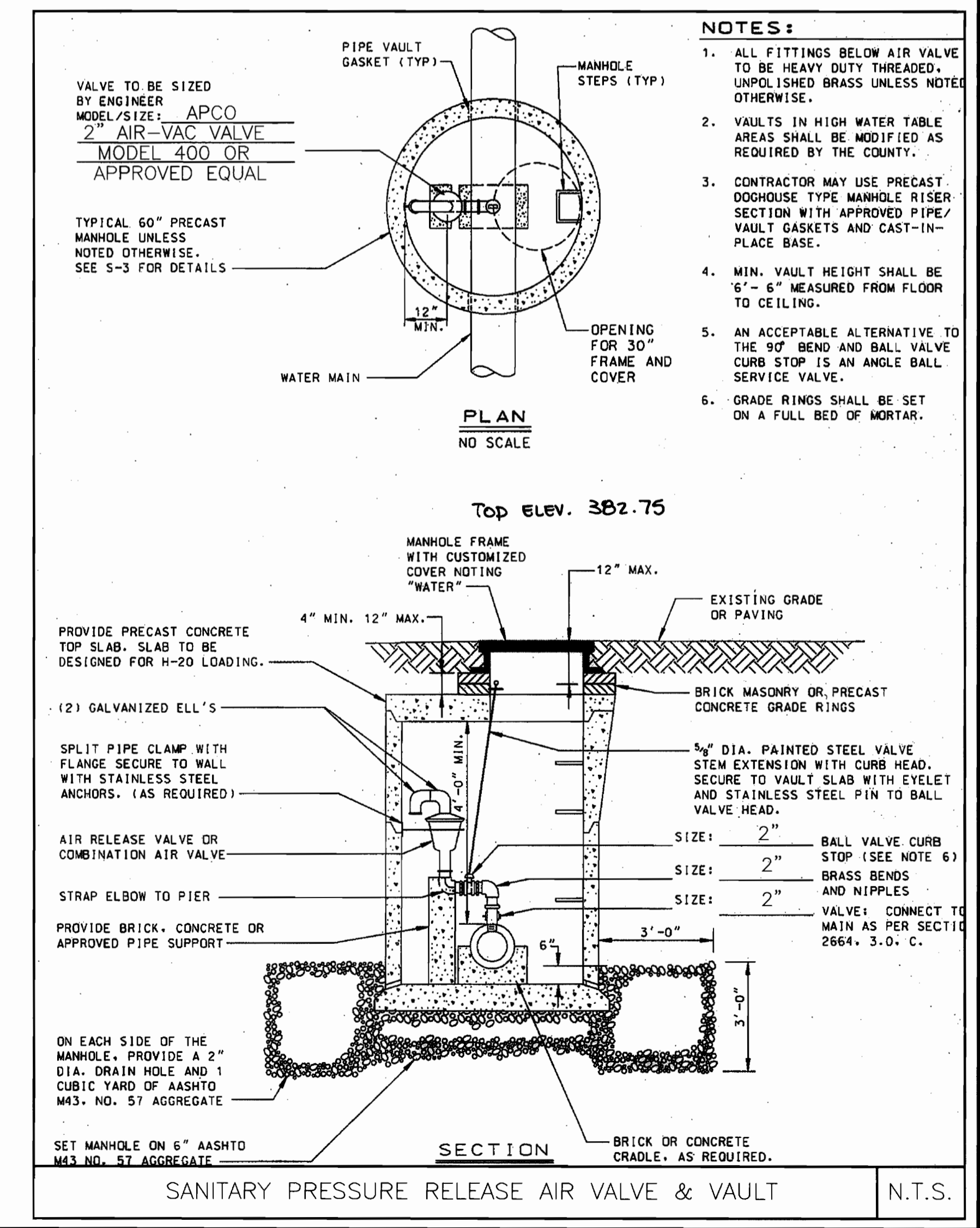
WATER PIPE FITTINGS SCHEDULE (PRIVATE)	
TYPE	QUANTITY
6" CAP & BUTTRESS	2
6" VALVE	3
8" VALVE	3
6" FIRE HYDRANTS	3
8"x8" TEE	2
6"x6" F.H.T.	3
8"-45" HB	2
8"-22.5" HB	1
8"-11.25" HB	2
6"-45" HB	2
6"-22.5" HB	1
6"-11.25" HB	1
6"-45" VB	2
10"x8" REDUCER	1
8"x6" REDUCER	2
AIR RELEASE VALVE & VAULT	1

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL
WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:
A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO METHOD T-180.
C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER



SANITARY F.M. PROFILE 'A'
HOR. 1" = 40'
VERT. 1" = 4'



- NOTES:**
- ALL FITTINGS BELOW AIR VALVE TO BE HEAVY DUTY THREADED, UNPOLISHED BRASS UNLESS NOTED OTHERWISE.
 - VAULTS IN HIGH WATER TABLE AREAS SHALL BE MODIFIED AS REQUIRED BY THE COUNTY.
 - CONTRACTOR MAY USE PRECAST DOORHOUSE TYPE MANHOLE RISER SECTION WITH APPROVED PIPE/VAULT GASKETS AND CAST-IN-PLACE BASES.
 - MIN. VAULT HEIGHT SHALL BE 6'-6" MEASURED FROM FLOOR TO CEILING.
 - AN ACCEPTABLE ALTERNATIVE TO THE 90° BEND AND BALL VALVE CURB STOP IS AN ANGLE BALL SERVICE VALVE.
 - GRADE RINGS SHALL BE SET ON A FULL BED OF MORTAR.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] DATE: 1/21/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] DATE: 2/16/05
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] DATE: 2/16/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

REVISIONS		
NO.	DESCRIPTION	DATE
1	As-built info ADDED	02/06

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CODE COMPLIANCE REVIEW	
TIC GROUP	
TIP GROUP	
SAFETY OFFICER	
DIRECTOR	
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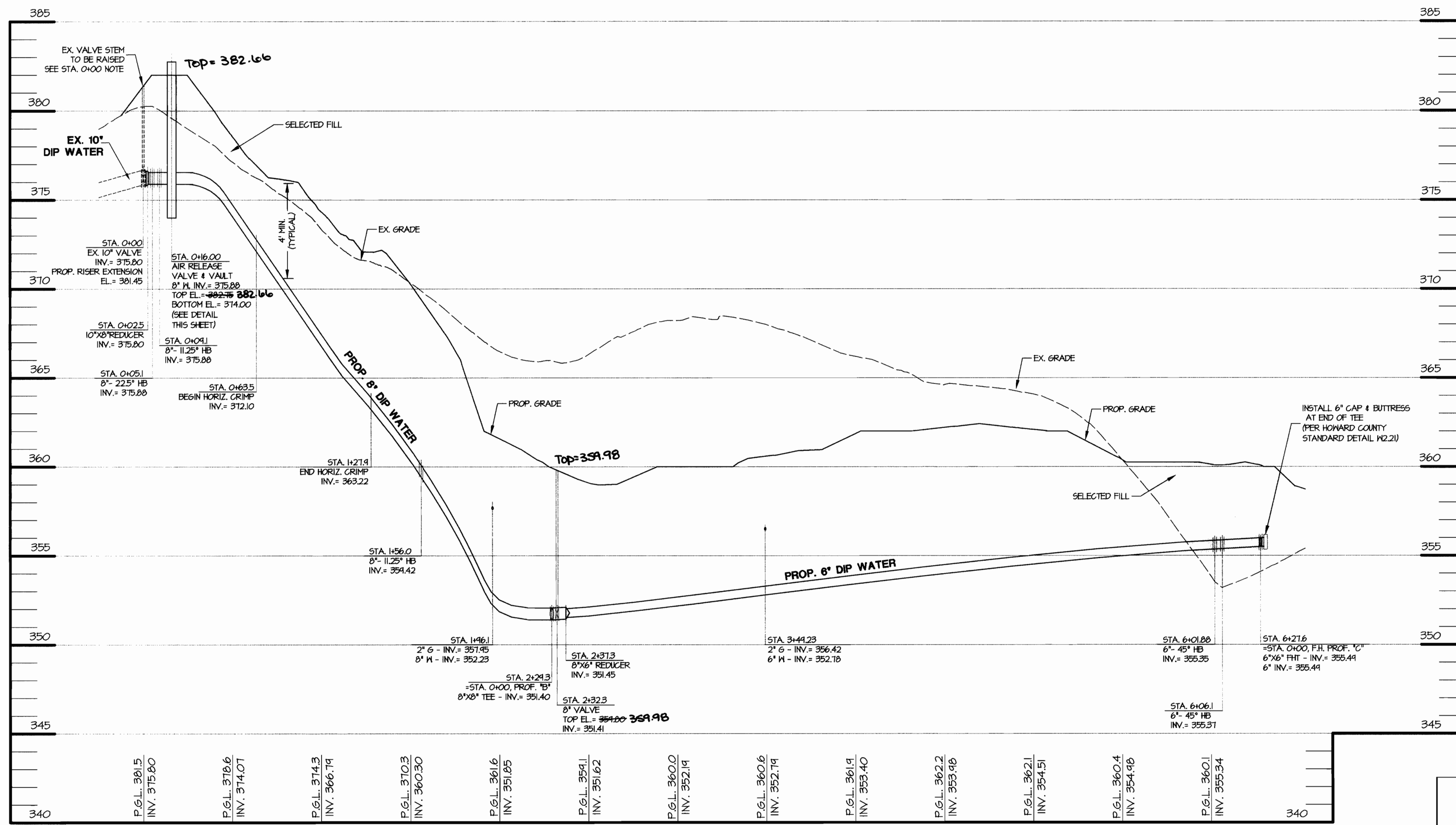
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GRAPHIC SCALE

AS SHOWN

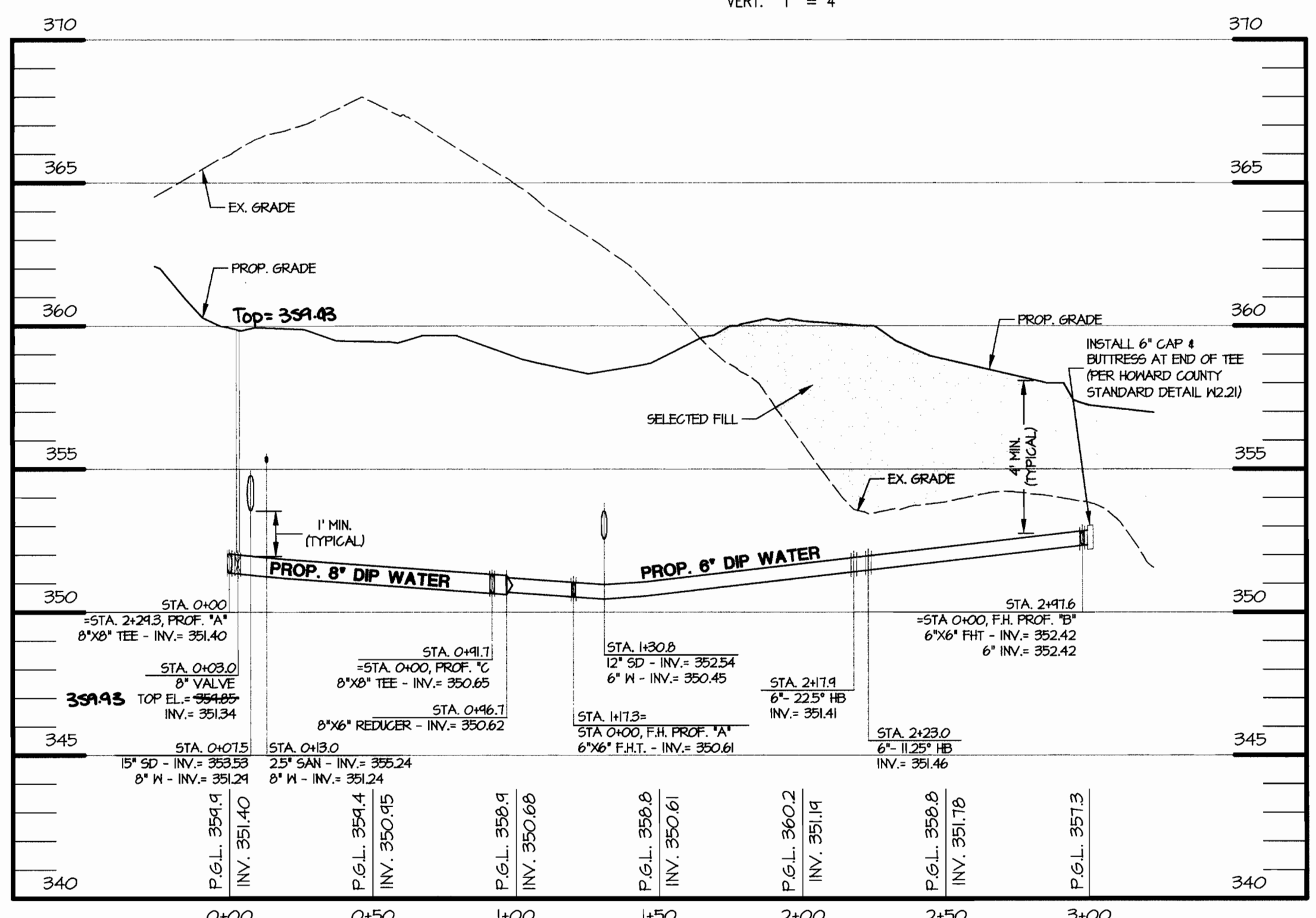
MRA
 MORRIS & RITCHE ASSOCIATES, INC.
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
 14280 PARK CENTER DRIVE, SUITE A
 LAUREL, MARYLAND 20707
 (410) 792-9792 or (301) 776-1690
 FAX (410) 792-7395

UTILITY PROFILES
 JOB NO.: 13685
SDP-10
 1-17-05 SHEET: 10 OF 22
 SCALE: 1"=40'
 DES: LFB CHECK: TCN DATE: 01-17-05



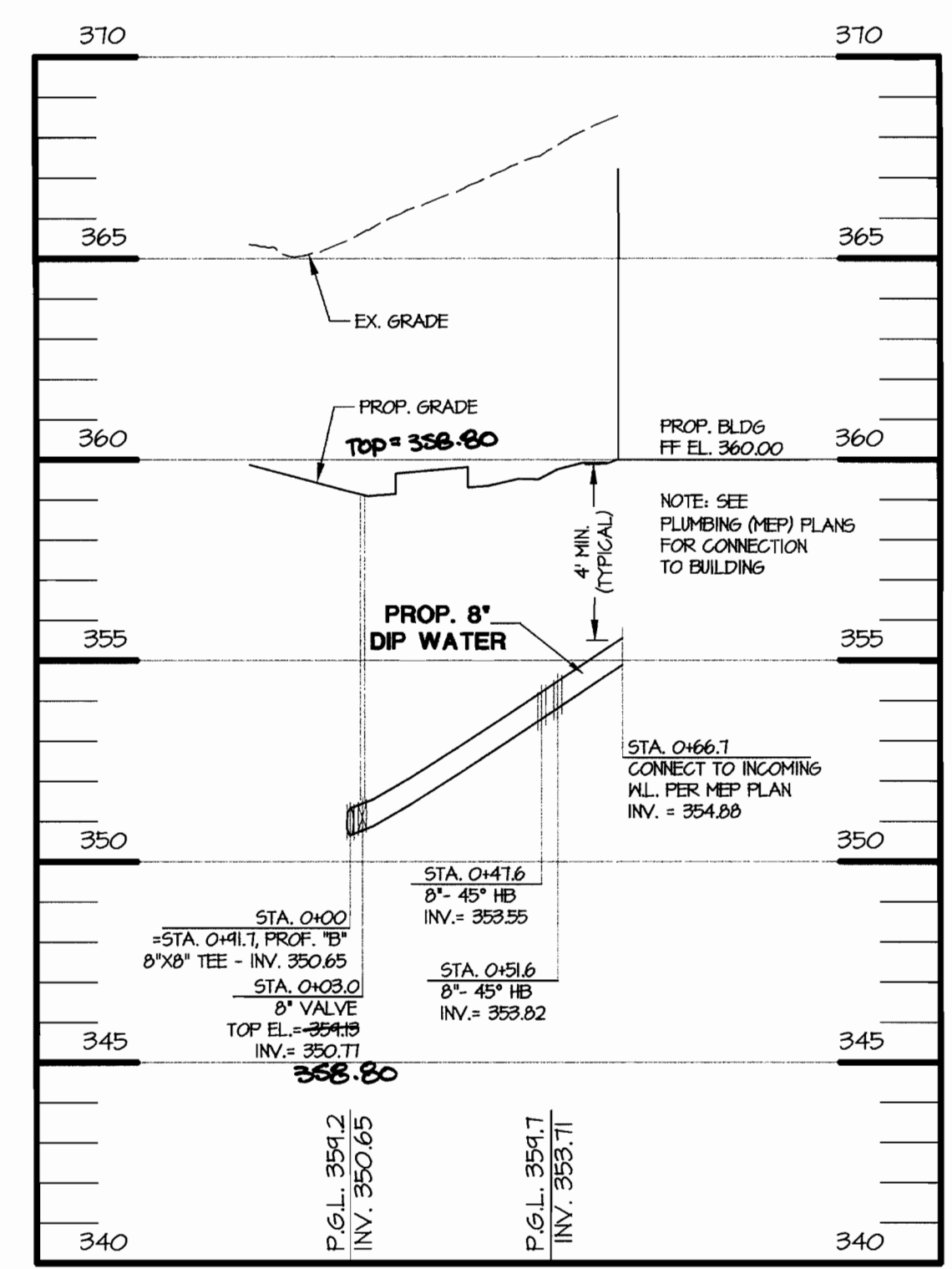
WATER PROFILE 'A'

HOR. 1" = 40'
VERT. 1" = 4'



WATER PROFILE 'B'

HOR. 1" = 40'
VERT. 1" = 4'



WATER PROFILE 'C'

HOR. 1" = 40'
VERT. 1" = 4'

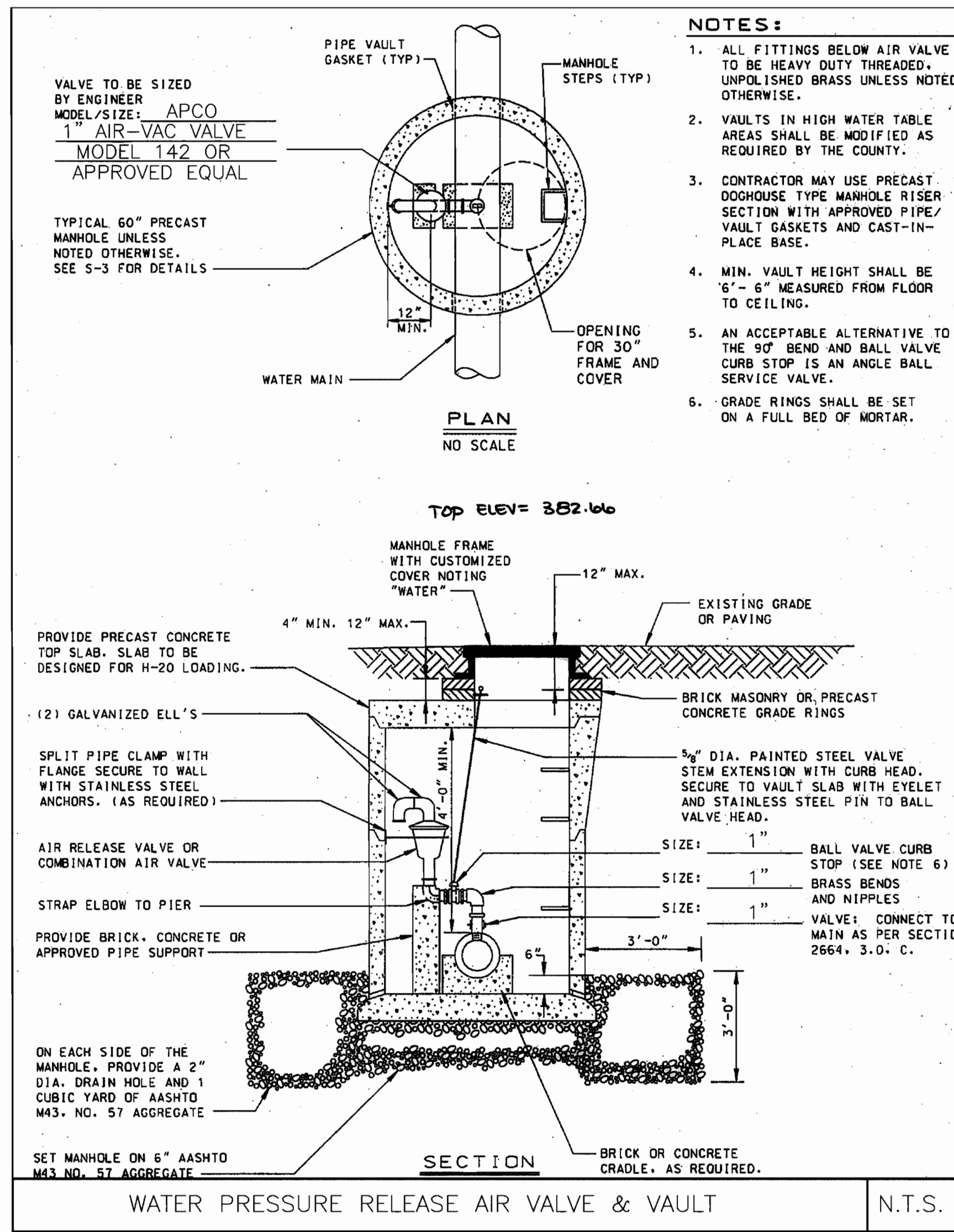
SEE SHEET 10 FOR WATER PIPE & FITTING SCHEDULES

COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL

WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:

- A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
- B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LIFT LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.
- C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER



NOTES:

1. ALL FITTINGS BELOW AIR VALVE TO BE HEAVY DUTY THREADED, UNPOLISHED BRASS UNLESS NOTED OTHERWISE.
2. VAULTS IN HIGH WATER TABLE AREAS SHALL BE MODIFIED AS REQUIRED BY THE COUNTY.
3. CONTRACTOR MAY USE PRECAST DOORHOUSE TYPE MANHOLE RISER SECTION WITH APPROVED PIPE/VAULT GASKETS AND CAST-IN-PLACE BASE.
4. MIN. VAULT HEIGHT SHALL BE 6'-6" MEASURED FROM FLOOR TO CEILING.
5. AN ACCEPTABLE ALTERNATIVE TO THE 90° BEND AND BALL VALVE CURB STOP IS AN ANGLE BALL SERVICE VALVE.
6. GRADE RINGS SHALL BE SET ON A FULL BED OF MORTAR.

WATER PRESSURE RELEASE AIR VALVE & VAULT N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 1/21/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE
 [Signature] 2/4/05
 CHIEF, DIVISION OF LAND DEVELOPMENT RP DATE
 [Signature] 2/3/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

REVISIONS	
As-built info added	03/10/06

APPROVALS	
REQUESTER	
PLANT FACILITY/OWNER ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TRIP GROUP	
SURVEY OFFICER	
DIRECTORS OFFICE	
COMPARATOR	
SENIOR LEADER	

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GRAPHIC SCALE

AS SHOWN



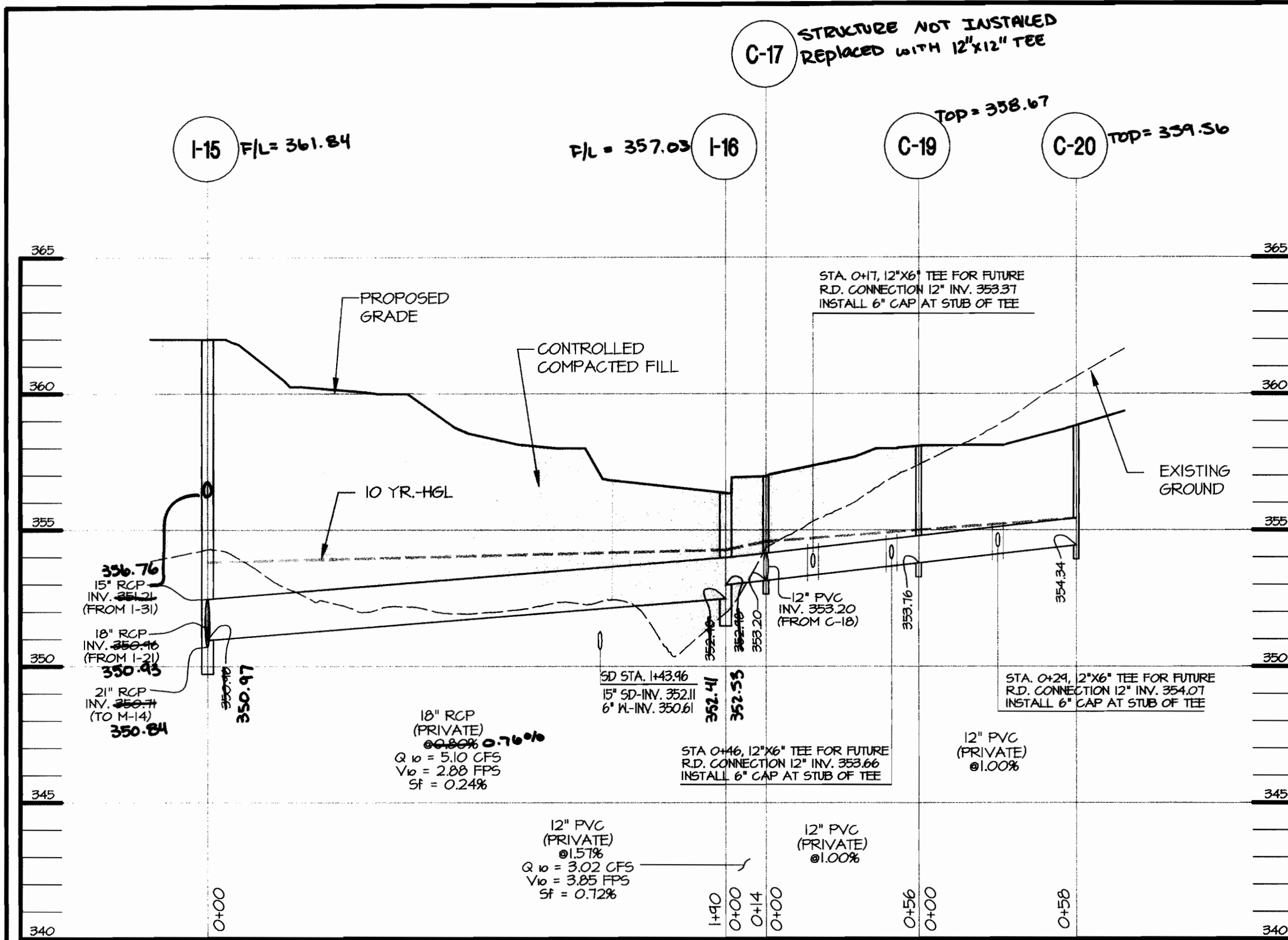
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 LAUREL, MARYLAND 20707
 (410) 782-9782 or (301) 776-1660
 FAX (410) 782-7385

UTILITY PROFILES

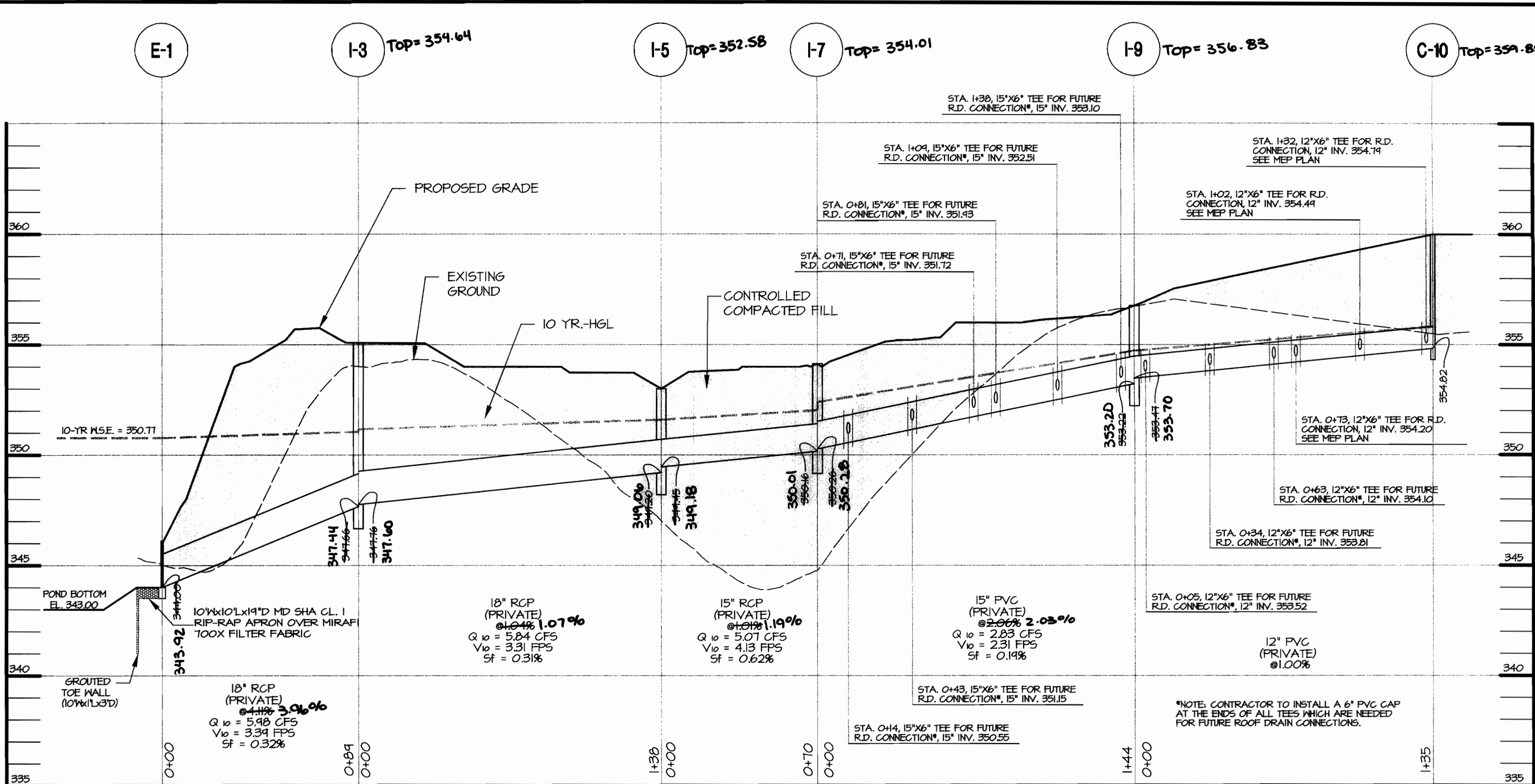
STATE OF MARYLAND
 DEPARTMENT OF GENERAL SERVICES
 JOB NO.: 13685
SDP-9
 1-7-05 SHEET: 9 OF 22

SCALE: 1" = 40'

DES: LFB CHECK: TCN DATE: 01-17-05



STORM DRAIN PROFILE I-15 TO C-20
 HOR. 1" = 40'
 VERT. 1" = 4'



STORM DRAIN PROFILE E-1 TO I-9
 HOR. 1" = 40'
 VERT. 1" = 4'

CONTROLLED AND COMPACTED FILL PER AASHTO T-180, TO BE CERTIFIED BY AN APPROVED ON-SITE GEOTECHNICAL ENGINEER

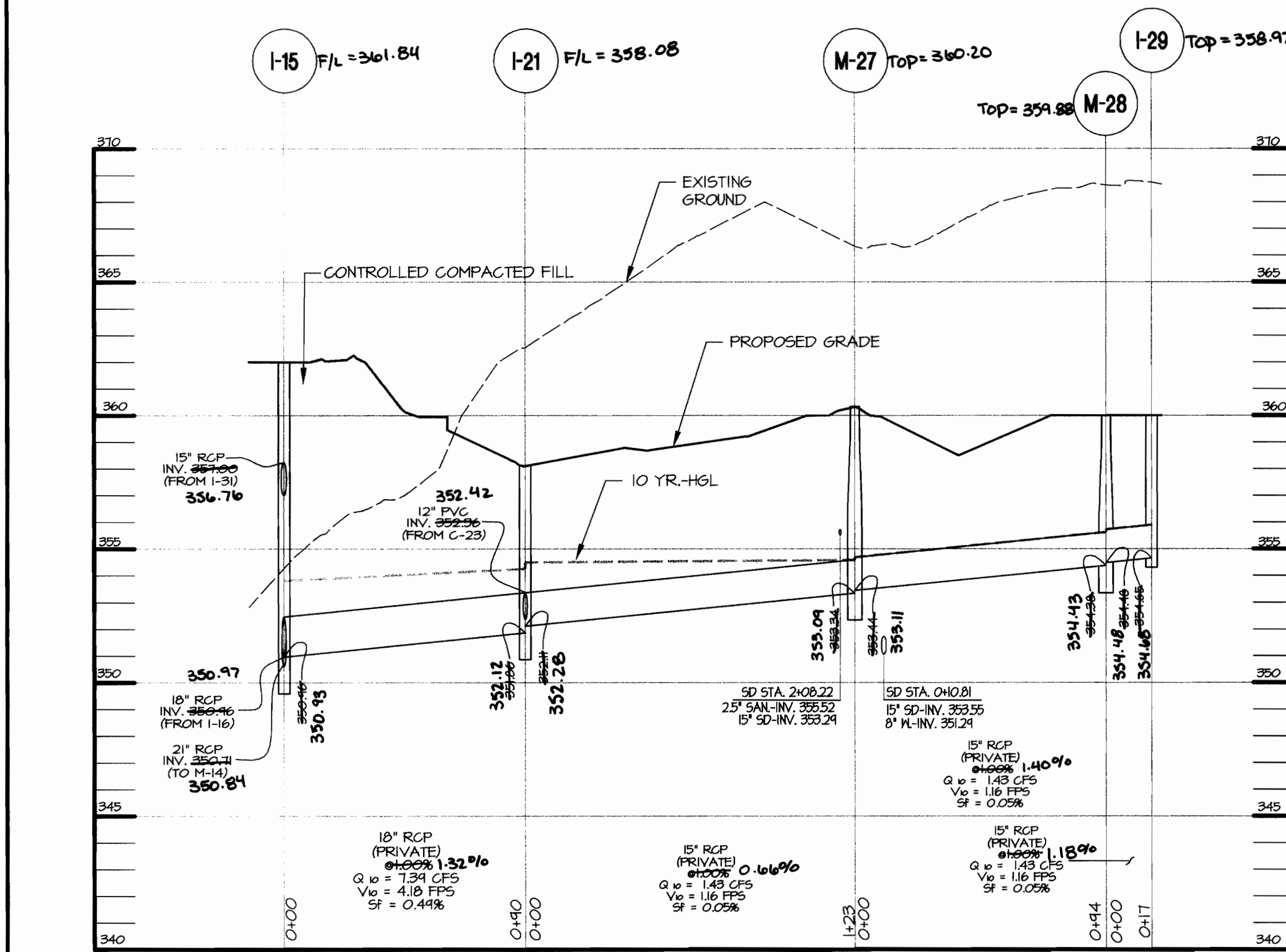
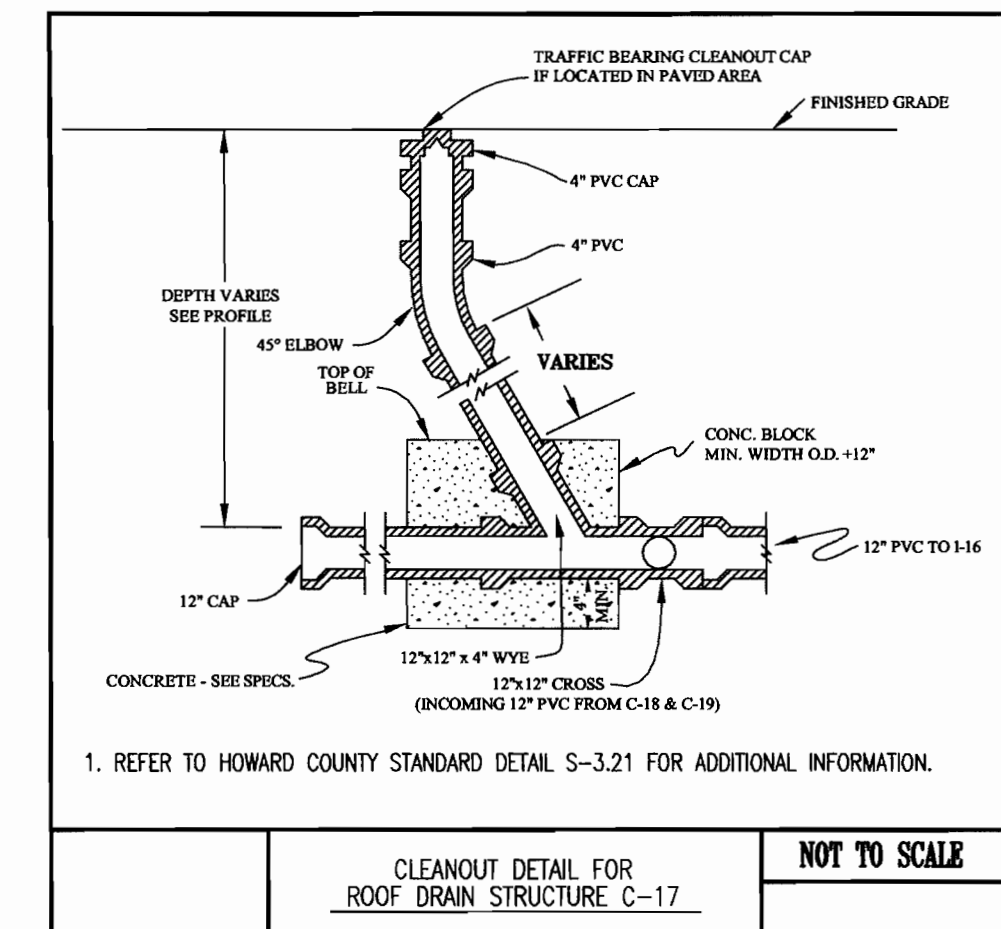
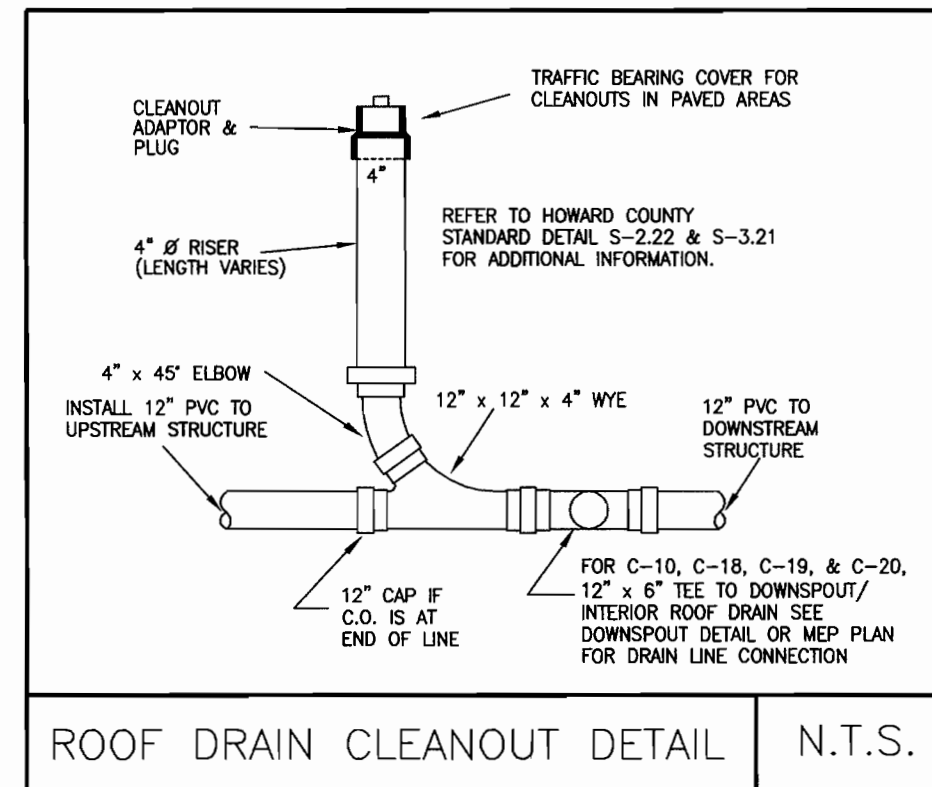
COMPACTED SPECIFICATIONS FOR UTILITIES IN FILL
 WHERE UTILITY PIPES ARE TO BE PLACED ON COMPACTED FILL, THE FOLLOWING APPLIES:
 A. PRIOR TO PLACEMENT OF COMPACTED FILL, ANY SOFT OR OTHERWISE UNSUITABLE SOILS ENCOUNTERED AT THE EXISTING RAVINE BOTTOM OR SLOPE, SHALL BE UNDERCUT AND REMOVED FROM THE CONSTRUCTION AREA.
 B. ACCEPTABLE COMPACTED FILL SHALL BE PLACED IN SIX INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY A.A.S.H.T.O. METHOD T-180.
 C. THE COMPACTED FILL SHALL BE BENCHED INTO THE EXISTING VIRGIN SLOPES WITH EACH LIFT PLACED TO A SMOOTH TRANSITION FROM VIRGIN TO FILL SOILS.

STORM DRAIN PIPE SCHEDULE

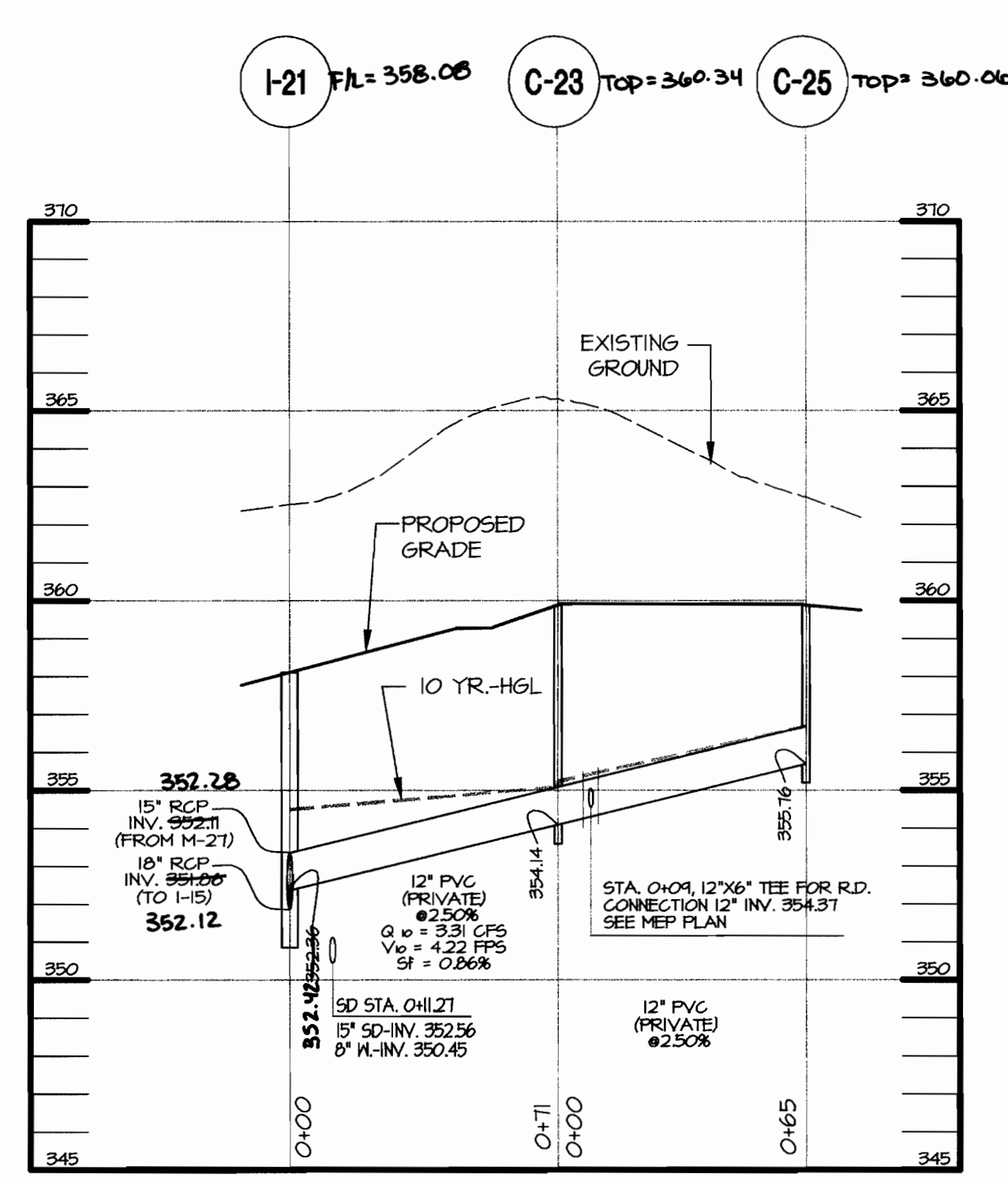
SIZE	TYPE	LENGTH
12"	RCP, CL. IV	320 FT
15"	RCP, CL. IV	509 FT
18"	RCP, CL. IV	507 FT
21"	RCP, CL. IV	108 FT
24"	RCP, CL. IV	68 FT

STORM DRAIN PIPE SCHEDULE

SIZE	TYPE	LENGTH
12"	PVC, SDR-35	411 FT
15"	PVC, SDR-35	144 FT



STORM DRAIN PROFILE I-15 TO I-29
 HOR. 1" = 40'
 VERT. 1" = 4'



STORM DRAIN PROFILE I-21 TO C-25
 HOR. 1" = 40'
 VERT. 1" = 4'

COORDINATES TO CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & 'S' INLETS, CENTER OF STRUCTURE FOR SINGLE WR INLETS, 'D' INLET, MANHOLES & CLEANOUTS. TOP OF GRATE ELEVATION AT CENTER OF STRUCTURE AT FLOWLINE FOR DOUBLE WR & 'S' INLET. 'D' INLET, MANHOLE & CLEANOUT ELEVATIONS ARE AT CENTER OF RIM.

STORM DRAIN STRUCTURE SCHEDULE

STR. NO.	TOP ELEV.	INV. IN	INV. IN	INV. IN	INV. OUT	TYPE	REMARKS	NORTHING	EASTING
E-1	355.30	347.76	---	---	347.66	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549632.4081	1341909.2087
I-5	353.25	349.45	---	---	349.20	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549610.6484	1342050.9949
I-7	354.15	350.26	---	---	350.16	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549597.4991	1342107.8104
I-9	356.91	353.47	---	---	353.22	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549453.8610	1342120.0361
I-12	353.33	345.29	346.55	---	345.04	PRECAST STANDARD TYPE 'D' INLET, HOWARD COUNTY STD. DETAIL SD-4.39		549611.3234	1341730.1633
I-15	362.00	357.00	350.96	350.96	350.71	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549548.7066	1341685.7375
I-16	356.97	352.98	---	---	352.48	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549602.7474	1341868.9965
I-21	358.10	352.36	352.11	---	351.86	TYPE 'S' DOUBLE INLET, HOWARD COUNTY STD. DETAIL SD-4.23		549470.7770	1341729.2960
I-29	359.40	---	---	---	354.65	SINGLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.37		549343.6306	1341752.4709
I-31	377.82	371.82	---	---	371.57	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549489.2376	1341489.2441
I-35	362.35	---	---	---	378.35	DOUBLE WR INLET, HOWARD COUNTY STD. DETAIL SD-4.35		549443.0112	1341203.3774
M-13	358.00	347.92	---	---	347.82	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549582.0930	1341740.4056
M-14	361.00	350.58	---	---	350.48	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549561.4424	1341681.3865
M-27	360.35	353.44	---	---	353.34	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549348.4643	1341713.9534
M-28	360.25	354.48	---	---	354.38	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549336.7840	1341806.6824
M-33	367.00	377.35	---	---	377.25	STANDARD PRECAST MANHOLE, HOWARD COUNTY STD. DETAIL G-5.12		549438.5100	1341305.7072

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 1/21/05
 CHIEF DEVELOPMENT ENGINEERING DIVISION MK DATE

[Signature] 2/16/05
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 2/17/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

REVISIONS

Asbuilt info Added	03/06

APPROVALS

INQUIRY	
PLANNING FACILITIES DEPT. ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TIC GROUP	
SAFETY OFFICER	
DIRECTOR'S OFFICE	
COORDINATOR	
SENIOR LEADER	

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GRAPHIC SCALE

AS SHOWN



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 (410) 792-0792 or (301) 793-1690
 FAX (410) 792-7395

STORM DRAIN PROFILES

JOHN OF MARYLAND
 STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 1-17-05

JOB NO.: 13685
SDP-8
 SHEET: 8 OF 22

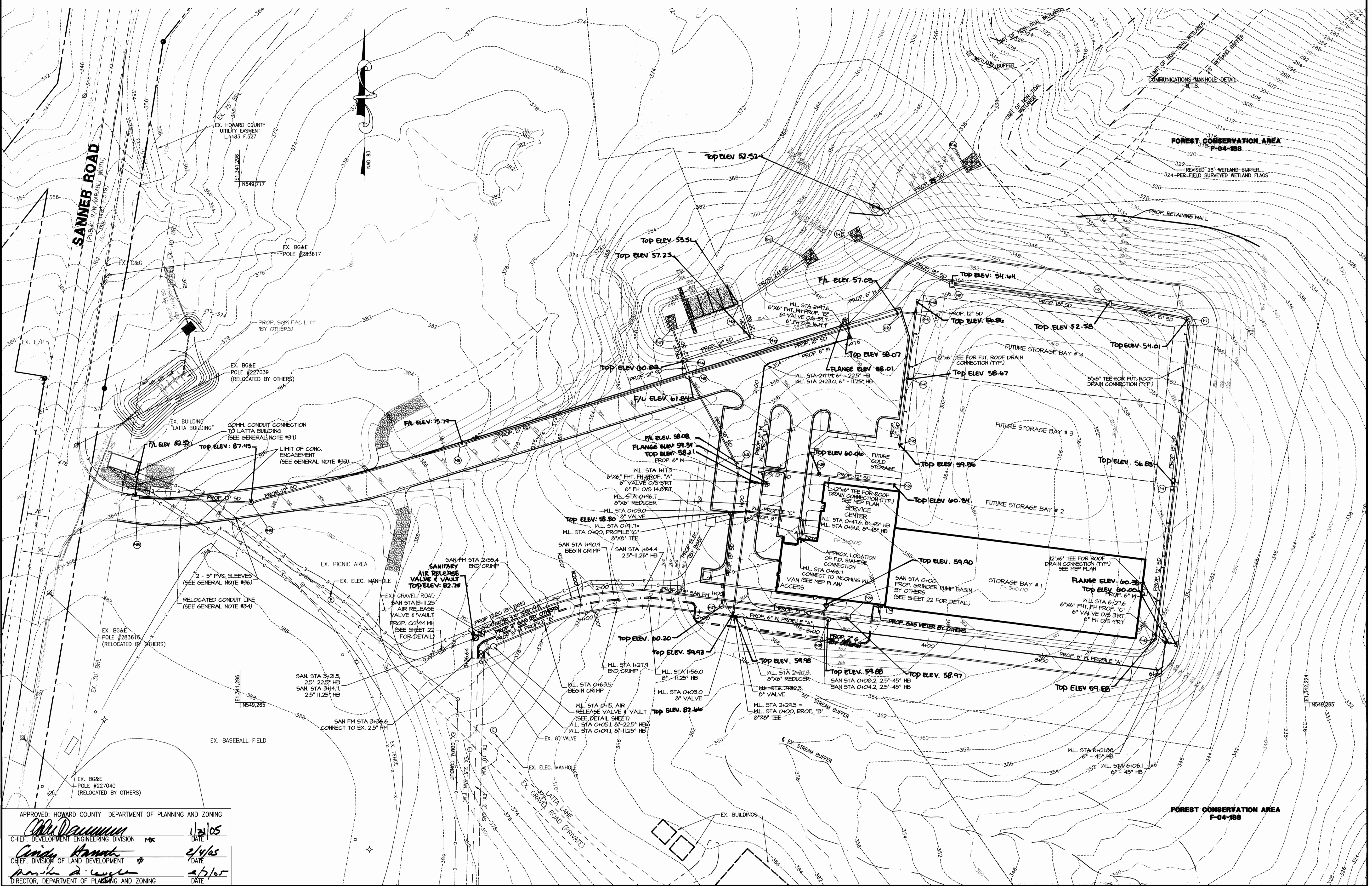
SCALE: 1" = 40'
 DES: BCC CHECK: TCN DATE: 01-17-05
 SDP-05-42

LEGEND

- EX. TREE LINE
- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. GAS
- EX. SANITARY F.M.
- EX. WATER
- EX. CONDUIT
- EX. WETLAND BUFFER
- EX. STREAM BUFFER
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. FOREST CONSERVATION #
- EX. SILT FENCE
- PROP. SUPER SILT FENCE
- PROP. RIP RAP
- PROP. LIMIT OF DISTURBANCE
- PROP. TREE LINE
- PROP. STORM DRAIN
- PROP. STORM DRAIN INLET
- PROP. ELECTRIC (BY OTHERS)
- PROP. GAS (BY OTHERS)
- PROP. SANITARY F.M.
- PROP. WATER
- PROP. FIRE HYDRANT
- PROP. WATER VALVE
- PROP. CURB
- PROP. CENTERLINE OF DRAINAGE SWALE
- PROP. FUTURE BUILDING
- PROP. BUILDING

NOTES


ALL SPOT ELEVATIONS +300'
 * SEE DETAIL SHEET (SDP-6)
 ** SEE ROAD IMP. PLANS ENTITLED "SANNER ROAD IMPROVEMENTS" BY AMT (SDP-05-43)
 SEE DETAIL SHEET FOR ALL SITE PAVEMENT, CURB & GUTTER, SIDEWALK, CONCRETE PADS AND MISC. SITE DETAILS.
 ASPHALT APRON SECTION TO MATCH ACCESS ROAD TYP. PAVEMENT SECTION



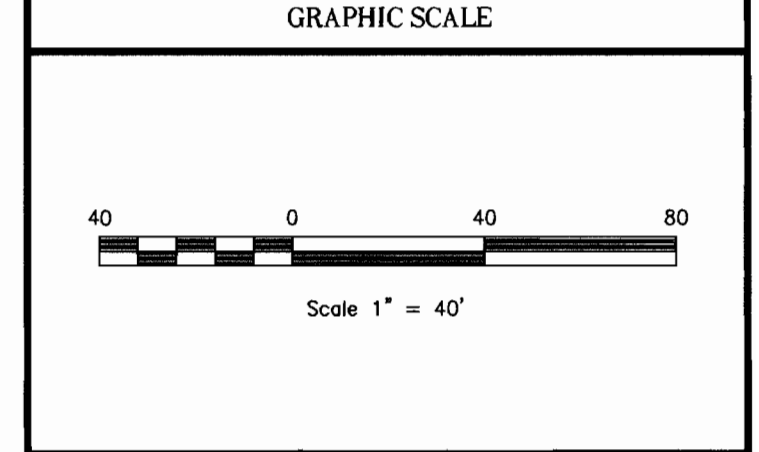
REVISIONS	
AS BUILT MFD ADDED	05/06

APPROVALS	
REQUESTER	
PLANT FACILITY/DEPT. ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTORS OFFICE	
COORDINATOR	
SENIOR LEADER	

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 (410) 782-8782 or (301) 778-1690
 FAX (410) 782-7365

UTILITY PLAN

STATE OF MARYLAND
 NATIONAL ENGINEERING EXAMINERS BOARD

JOB NO.: 13685
SDP-5
 1-17-05 SHEET: 5 OF 22

SCALE: 1" = 40'

DES: LFB CHECK: TCN DATE: 01-17-05

SDP-05-42

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Michael D. ... 1/21/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

Cindy ... 2/4/05
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

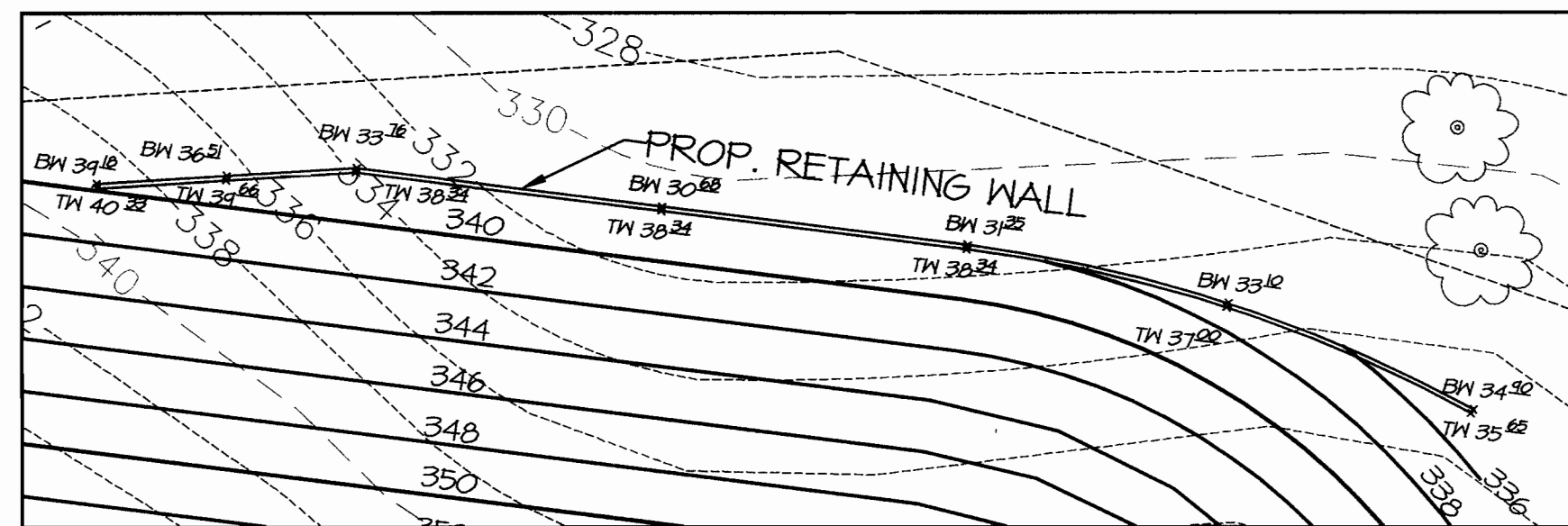
... 2/5/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING DATE

LEGEND

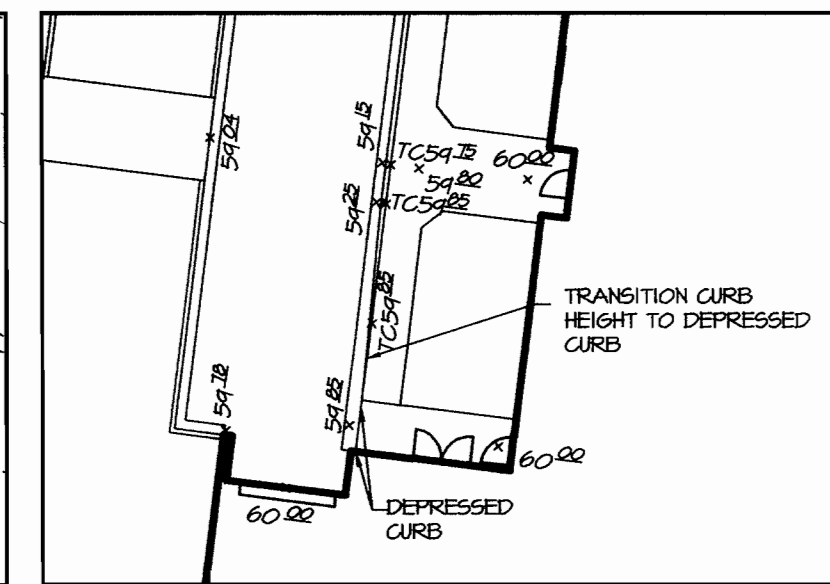
- EX. TREE LINE
- EX. PROPERTY LINE
- EX. PAVEMENT
- EX. BUILDING
- EX. EASEMENT
- EX. CURB
- EX. STORM DRAIN
- EX. STORM DRAIN
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- EX. FOREST CONSERVATION AREA
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- PROP. CENTERLINE OF DRAINAGE
- PROP. FUTURE BUILDING
- PROP. BUILDING

NOTES

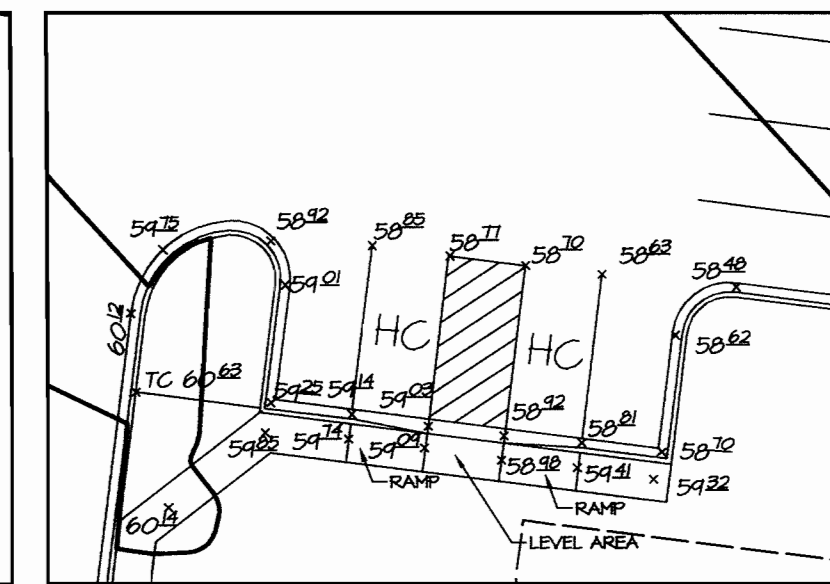
- ALL SPOT ELEVATIONS +300'
- * SEE DETAIL SHEET (SDP-6)
- (REV. CURB & GUTTER) (STD. CURB & GUTTER)
- ** SEE ROAD IMP. PLANS ENTITLED "SANNER ROAD IMPROVEMENTS" BY AMT (SDP-05-43)
- SEE DETAIL SHEET FOR ALL SITE PAVEMENT, CURB & GUTTER, SIDEWALK, CONCRETE PADS AND MISC. SITE DETAILS.
- ASPHALT APRON SECTION TO MATCH ACCESS ROAD TYP. PAVEMENT SECTION



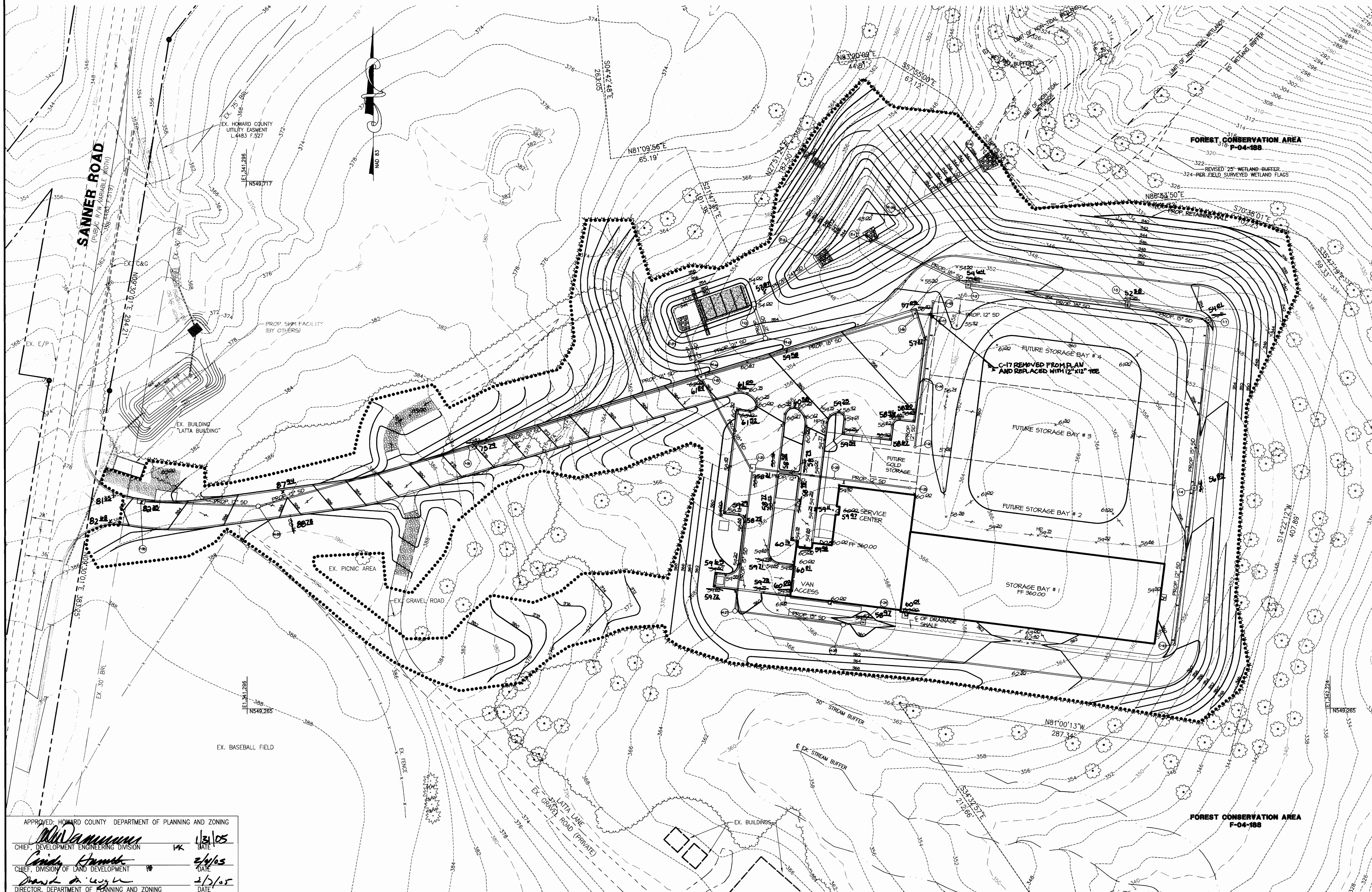
RETAINING WALL DETAIL
SCALE 1" = 20"
(SEE SHEETS 20-21 FOR RETAINING WALL CONSTRUCTION DETAIL)



SIDEWALK-DRIVEWAY TRANSITION DETAIL
SCALE 1" = 20"
(SEE "CURB TRANSITION DETAIL" SHEET 3)




HANDICAPPED PARKING DETAIL
SCALE 1" = 20"
(REFER TO "HANDICAPPED RAMP" & "DEPRESSED CURB" DETAILS SHEET 6)



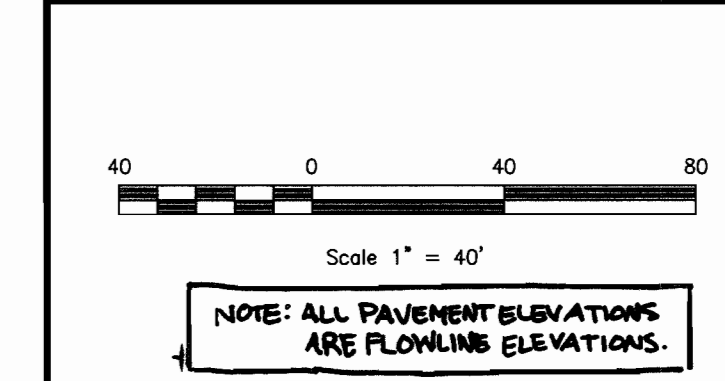
REVISIONS		
ASBUILT	DATE	ADDED
		03/06

APPROVALS	
REQUESTER	
PLANNING FACULTY/STAFF	
ENGINEER	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TSP GROUP	
SAFETY OFFICER	
DIRECTOR	
OFFICE	
COORDINATOR	
SENIOR LEADER	

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 FAX (410) 792-7986

GRADING PLAN

JOB NO.: 13685

 **SDP-4**

DATE: 01-17-05 SHEET: 4 OF 22

SCALE: 1" = 40'

DES: LFB CHECK: TCN DATE: 01-17-05

SDP-05-42

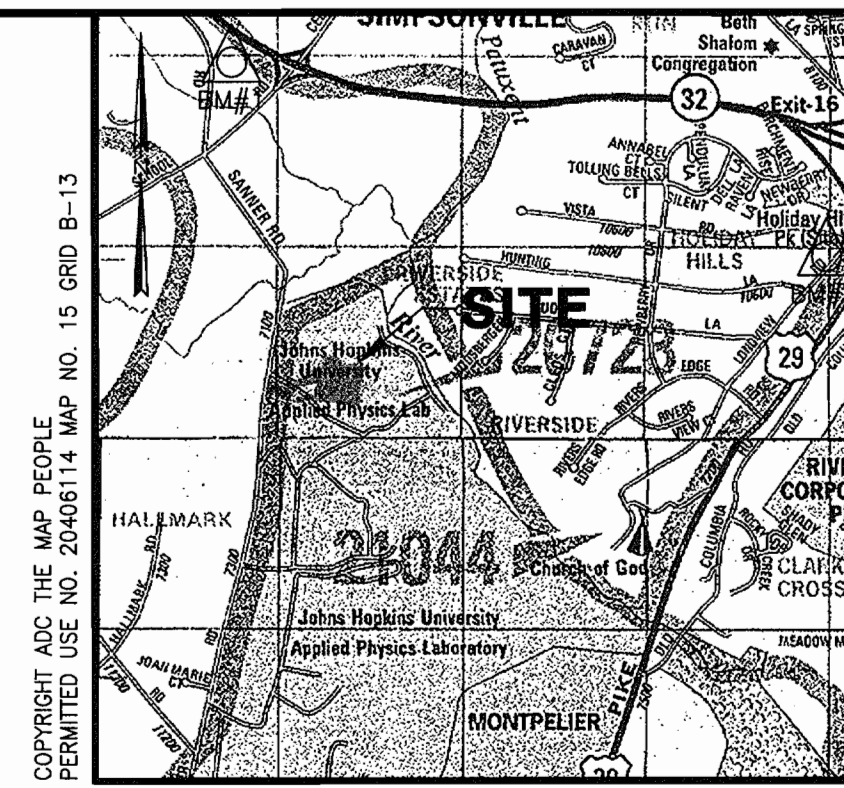
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 1/31/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
[Signature] 2/4/05
 CHIEF, DIVISION OF LAND DEVELOPMENT
[Signature] 2/5/05
 DIRECTOR, DEPARTMENT OF PLANNING AND ZONING

GENERAL NOTES

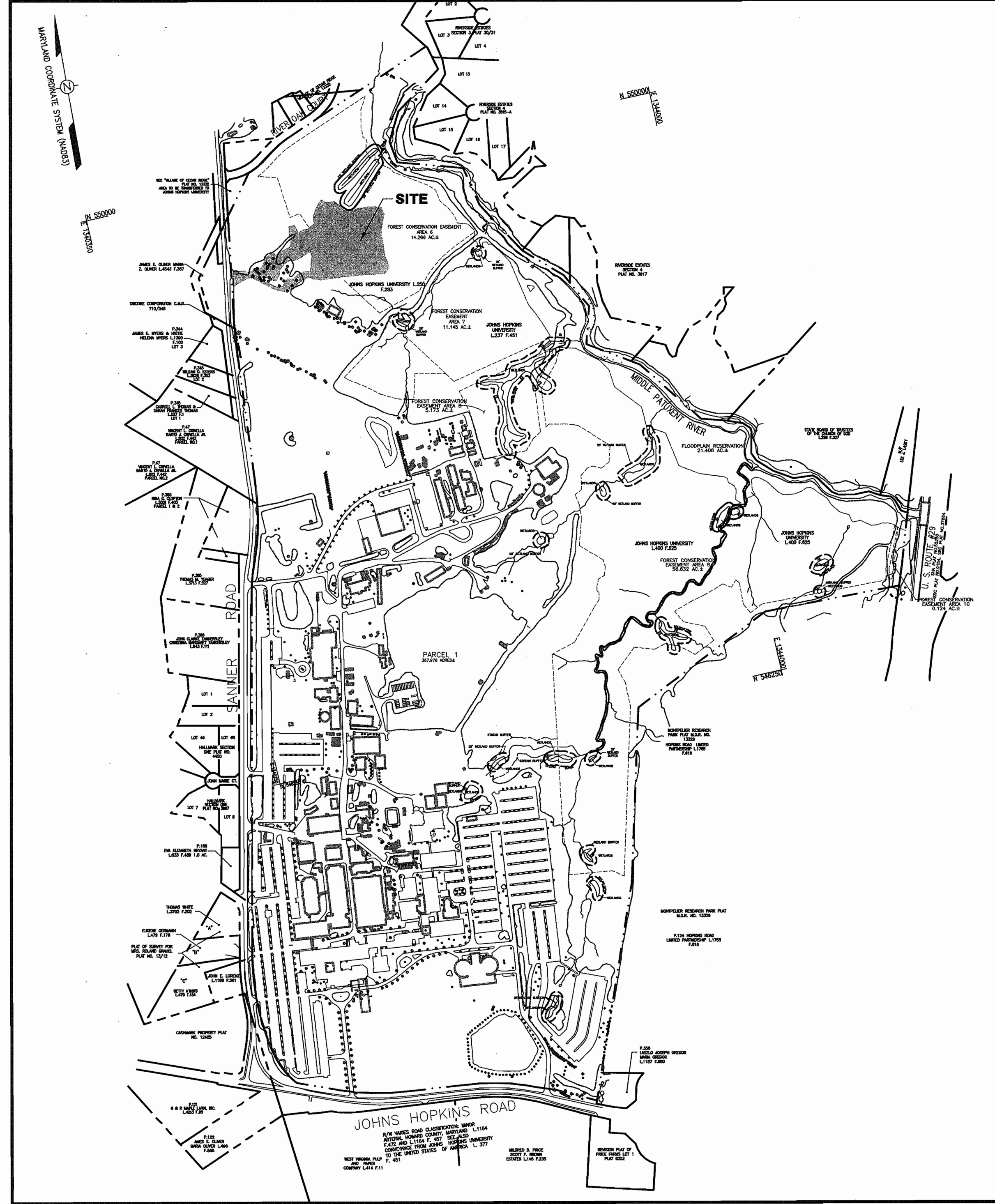
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL CONTACT THE CONSTRUCTION INSPECTION DIVISION 24 HOURS IN ADVANCE OF COMMENCEMENT OF WORK AT (410) 313-1880.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AND JHU/APL PLANT FACILITIES OFFICE (443) 778-0167 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION BEING DONE.
- CONTRACTOR TO SCHEDULE PRECONSTRUCTION MEETING WITH HOWARD COUNTY, CONSTRUCTION INSPECTION DIVISION (410-313-1880) PRIOR TO STARTING CONSTRUCTION.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY PAVING.
- THE LOCATION OF EXISTING UTILITIES AS SHOWN ON THIS PLAN ARE BASED ON FIELD LOCATIONS SUPPLEMENTED WITH EXISTING UTILITY DRAWINGS, AND SHOULD BE VERIFIED BY THE CONTRACTOR TO HIS SATISFACTION PRIOR TO CONSTRUCTION. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING UTILITIES, AND ANY DAMAGE DONE TO THEM DUE TO CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY AT HIS OWN EXPENSE.
- CONTRACTOR IS RESPONSIBLE FOR ALL SITE CONDITIONS, CONSTRUCTION REQUIREMENTS, AND SHALL CONFORM TO ALL STATE, FEDERAL, AND COUNTY CONSTRUCTION REGULATIONS. THE CONTRACTOR IS NOT RELIEVED OF RESPONSIBILITY SHOULD ANY REQUIRED ITEMS PERTAINING TO SITE CONSTRUCTION NOT BE INCLUDED ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS AS SHOWN ON THESE PLANS.
- ANY DAMAGE TO EXISTING UTILITIES, PAVEMENT, OR CURB AND GUTTER DUE TO CONSTRUCTION ACTIVITY OUTSIDE THE LIMITS OF DISTURBANCE IS TO BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- WHERE NECESSARY, THE CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITIES AT LEAST FIVE (5) DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE DRAWINGS.
- CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY PROPERTY MONUMENTS, MARKERS, SIGNS, LIGHTS, OR ANY OTHER EXISTING SITE FEATURES DISTURBED DURING CONSTRUCTION.
- ALL PLAN DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH TWO FOOT CONTOUR INTERVALS PREPARED BY WHITMAN, REGARDT & ASSOCIATES, LP DATED JANUARY 2004. JHU APPLIED PHYSICS LAB AERIAL TOPOGRAPHY AND UTILITY INFORMATION SHOWN MAY NOT REFLECT CURRENT CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY CURRENT TOPOGRAPHY AND UTILITY INFORMATION TO HIS OWN SATISFACTION.
- THE SITE BOUNDARY, BEARINGS, AND COORDINATES SHOWN ARE BASED ON ELECTRONIC FILES OBTAINED FROM WHITMAN, REGARDT AND ASSOCIATES.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE "1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROLS" PUBLISHED JOINTLY BY THE WATER RESOURCES ADMINISTRATION, SOIL CONSERVATION SERVICE, AND STATE SOIL CONSERVATION COMMITTEE.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83). JOHNS HOPKINS UNIVERSITY CONTROL STATIONS NOS. HOPKINS, 41E, G12, G7 AND G8 WERE USED FOR THIS PROJECT.

JOHNS HOPKINS APPLIED PHYSICS LABORATORY LIBRARIES SERVICE CENTER SITE DEVELOPMENT PLAN



VICINITY MAP
SCALE: 1" = 2000'

- BENCHMARKS**
- B.M.#1 - HOWARD COUNTY BENCHMARK 418B - EAST SIDE OF GUILFORD ROAD 1750' WEST OF PINDELL SCHOOL ROAD. N553,338.80 E1,340,517.48 ELEV. 370.395
 - B.M.#2 - HOWARD COUNTY BENCHMARK 0057 - EAST SIDE OF LONGVIEW ROAD, SOUTH OF VISTA ROAD INTERSECTION. N650,835.21 E1,347,017.69 ELEV. 398.925



OVERALL SITE MAP
SCALE: 1" = 500'

BUILDING SQUARE FOOTAGE TABULATION

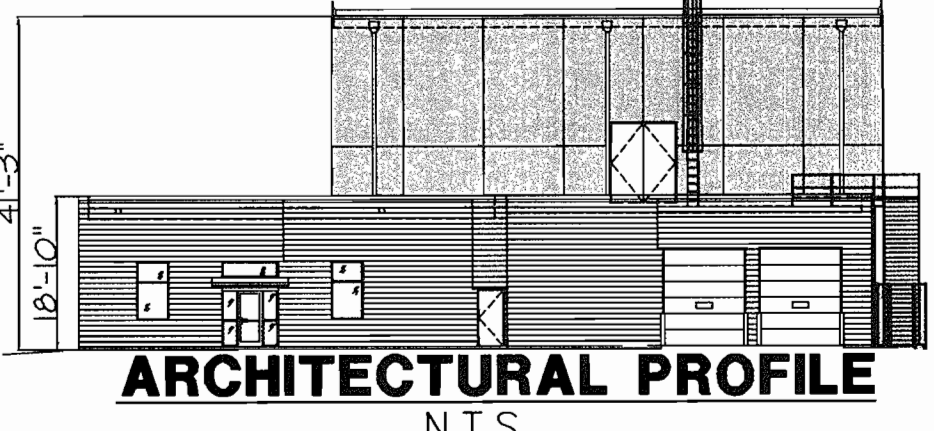
1. PROPOSED BUILDING COVERAGE =	23,055 S.F.
2. FUTURE (ULTIMATE) BUILDING COVERAGE =	45,587 S.F.
3. TOTAL (ULTIMATE) BUILDING COVERAGE =	68,622 S.F.
1. GROSS BUILDING SQUARE FOOTAGE =	38,206 S.F.
2. FUTURE (ULTIMATE) BUILDING SQUARE FOOTAGE =	89,920 S.F.
3. TOTAL (ULTIMATE) BUILDING SQUARE FOOTAGE =	128,126 S.F.

SHEET INDEX

1	COVER SHEET
2	DEMOLITION PLAN
3	SITE LAYOUT PLAN
4	SITE GRADING PLAN
5	STORM DRAIN & UTILITY PLAN
6	SITE DETAILS
7	STORM DRAIN PROFILES
8	STORM DRAIN PROFILES
9	UTILITY PROFILES
10	UTILITY PROFILES
11	STORMWATER MANAGEMENT PLAN
12	STORMWATER MANAGEMENT PLAN
13	STORM DRAIN & SWM DRAINAGE AREA MAPS
14	MD 378 NOTES
15	GEOTECHNICAL REPORT
16	EROSION & SEDIMENT CONTROL PLAN
17	EROSION & SEDIMENT CONTROL DETAILS
18	LIGHTING & LANDSCAPING PLAN
19	LIGHTING & LANDSCAPING DETAILS
20	RETAINING WALL PLAN & GENERAL NOTES
21	RETAINING WALL PROFILE, TYPICAL SECTION & DETAILS
22	GRINDER PUMP DETAILS

SITE ANALYSIS DATA CHART

1. TOTAL PROJECT AREA:	361 ACRES +/-
2. AREA OF PLAN SUBMISSION:	6.45 ACRES +/-
3. LIMIT OF DISTURBANCE:	6.45 ACRES +/-
4. PRESENT ZONING:	PEC
5. PROPOSED USE:	LIBRARY BOOK STORAGE FACILITY JOHNS HOPKINS UNIVERSITY
6. EXISTING NUMBER OF EMPLOYEES (JHU/APL CAMPUS):	3646
7. PROPOSED NUMBER OF EMPLOYEES (PER THIS PLAN):	20
8. TOTAL NUMBER OF EMPLOYEES (JHU/APL CAMPUS, INCL. THIS PLAN):	3666
9. MAXIMUM NUMBER OF EMPLOYEES ALLOWED PER APFO STUDY PER F-02-40:	3937
10. EXISTING MINIMUM NUMBER OF PARKING SPACES REQUIRED BY ZONING:	2953 (F-02-40)
11. EXISTING ONSITE PARKING SPACES (JHU/APL CAMPUS):	4793 (SDP 04-76)
12. PROPOSED PARKING SPACES (PER THIS PLAN):	22 (INCL. 4 HC SPACES)
13. TOTAL NUMBER OF ONSITE PARKING SPACES (JHU/APL CAMPUS, INCL. THIS PLAN):	4815
14. EXISTING BUILDING COVERAGE (JHU/APL CAMPUS):	21.1 ACRES (SDP-04-133)
15. PROPOSED BUILDING COVERAGE* (PER THIS PLAN):	68,622 SF OR 1.6 ACRES ±
16. TOTAL BUILDING COVERAGE* (JHU/APL CAMPUS, INCL. THIS PLAN):	22.7 ACRES, 6.3% OF TOTAL LOT AREA
*THE BUILDING COVERAGE INFORMATION INCLUDES THE FUTURE BUILDING AREA. SEE THE BUILDING SQUARE FOOTAGE TABULATION ON THIS SHEET.	
17. EXISTING GROSS FLOOR AREA COVERAGE (JHU/APL CAMPUS):	44.8 ACRES (SDP-04-133)
18. PROPOSED GROSS FLOOR COVERAGE* (PER THIS PLAN):	128,126 SF OR 2.94 ACRES ±
19. TOTAL GROSS FLOOR AREA COVERAGE* (JHU/APL CAMPUS, INCL. THIS PLAN):	47.74 ACRES, 13.2% OF TOTAL LOT AREA
*THE GROSS FLOOR AREA COVERAGE INFORMATION INCLUDES THE FUTURE BUILDING AREA. SEE THE BUILDING SQUARE FOOTAGE TABULATION ON THIS SHEET.	
20. CASE NUMBERS - APPLICABLE IMPROVEMENTS:	
F 02-40	- FOREST CONSERVATION, FLOODPLAIN, PUBLIC R/W
F 04-188	- FOREST CONSERVATION AND WETLANDS
SDP 04-35	- SWM BASIN G
SDP 04-66	- BALL FIELD ENTRANCE AND PARKING LOTS
SDP 04-76	- SERVICES AREA COMPLEX
SDP 04-133	- BASIN C SWM FACILITIES & LAYDOWN AREA
SDP 05-43	- SANNER ROAD IMPROVEMENTS
21. SANITARY SEWER/ WATER SERVICE: PRIVATE ONSITE SYSTEM, PUBLIC CONNECTION	
22. EXISTING OPEN SPACE AREA (LOT AREA MINUS PARKING & BUILDINGS):	286 ACRES, 81.7% OF TOTAL LOT AREA (PROVIDED BY JHU/APL)
23. PROPOSED OPEN SPACE AREA:	283 ACRES, 78.4% OF TOTAL LOT AREA



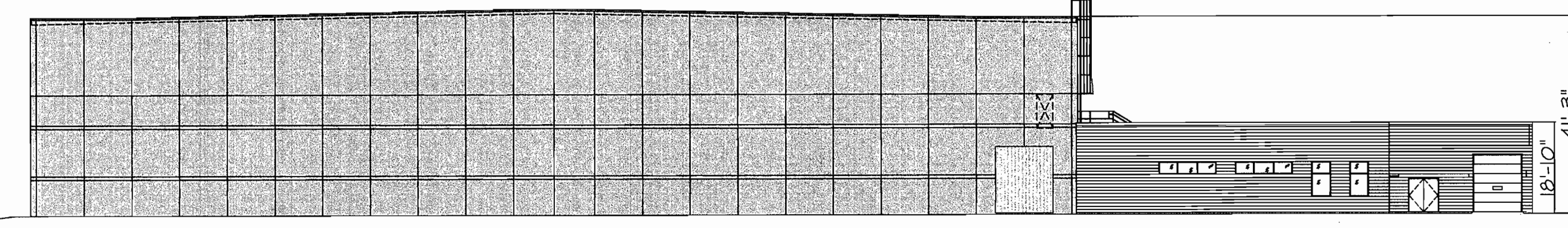
ARCHITECTURAL PROFILE
N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division MK 1/21/05

Chief, Division of Land Development JMS 2/1/05

Director, Department of Planning and Zoning DML 1/21/05



ARCHITECTURAL PROFILE
N.T.S.

OPTION 3: PREVIOUSLY ADDRESSED (including Use of FC Bank)	FOREST CONSERVATION DATA SUMMARY
File Number: F-04-188	Project/Subdivision Name: JOHNS HOPKINS UNIVERSITY PROPERTY (APPLIED PHYSICS LABORATORY SITE)
Comment: Addressed by How. Co. Subdivision & Land Development Regulations, Sec. 16.1202.6(1)(i). See F-04-188 Plat # 17042 thru 17046.	

ADDRESS CHART	
LOT/PARCEL NO.	STREET ADDRESS
289 / 1	11100 JOHNS HOPKINS ROAD LAUREL, MD 20723

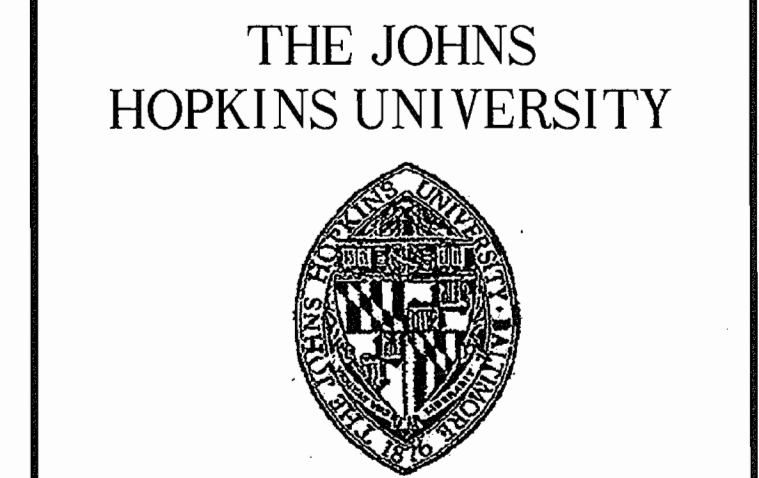
OWNER:		PERMIT INFORMATION CHART			
THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY 11100 JOHNS HOPKINS ROAD LAUREL, MD 20723 ATT: MR. JAMES LOESCH VOICE (443)778-6122 FAX (443)778-6122		SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL NO.	
		JOHNS HOPKINS UNIVERSITY PROPERTY (APPLIED PHYSICS LABORATORY SITE)	N/A	289 / 1	
PLAT # OR L/F	GRID #	ZONE	TAX MAP NO.	ELECT. DIST.	CENSUS TRACT
17042 - 17046	11	PEC	41	5TH	605102
WATER CODE:		SEWER CODE:			
E-21		6480000			

REVISIONS	
Asbuilt info added	03/06

APPROVALS	
REQUESTOR	
PLANNING DIVISION	
CODE COMPLIANCE REVIEW	
TIC GROUP	
TRP GROUP	
UTILITY OFFICER	
DIRECTOR'S OFFICE	
CONTRACTOR	
SENIOR LEADER	

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
JOHNS HOPKINS ROAD
LAUREL, MARYLAND 20723-6099

TAX MAP 41, GRID 16, PARCEL 1
FIFTH (5TH) ELECTION DISTRICT
HOWARD COUNTY, MARYLAND



LIBRARIES SERVICE CENTER

JHU/APL INTERNAL USE

THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

GRAPHIC SCALE



MORRIS & RITCHE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
14280 PARK CENTER DRIVE, SUITE A
LAUREL, MARYLAND 20707
(410) 782-9792 or (301) 778-1690
FAX (410) 782-7385

COVER SHEET

JOB NO.: 13685

SDP-1

SHEET: 1 OF 22

SCALE: AS SHOWN

DES: MP CHECK: TCN DATE: 01-17-05

SDP-05-42