CONSTRUCTION SPECIFICATIONS

1. GENERAL:

Unless otherwise noted, this stormwater management facility shall be constructed in accordance with and all materials shall comply with the following:

a. Baltimore County Department of Public Works Standard Specifications and Details for Construction 1976, Errata & Addenda.

b. Maryland Department of Transportation State Highway Administration, October, 1993 Standard Specification for construction and Material.

2. TIMING:

This underground management facility shall not be placed in service until all of the contributing drainage areas have been stabilized and approved by the responsible inspector.

3. SITE PREPARATION:

Areas under the proposed facility shall be cleared, grubbed, and topsoil stripped. All trees, debris, vegetation, roots, or other objectionable or organic material shall be removed.

4. TRENCH PREPARATION:

Excavate the 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 during subsequent installation procedures. Boulders or other obstacles shall be placed in from the trench walls and natural soils shall be placed in these voids at the most convenient time during construction to ensure fabric conformity to the excavation sides.

5. FABRIC LAYDOWN:

The filter fabric roll shall be cut to the proper width prior to installation. The cut width must include sufficient material to conform to well perimeter irregularities and for a six (6) inch minimum top overlap. Place the fabric roll over the well and unroll a sufficient length to allow placement of the fabric down into the well. Stones or other anchoring objects should be placed on the fabric at the edge of the well to keep the lined well open during windy periods. When overlaps are required between rolls, the upstream roll shall lap a minimum of two (2) feet over the downstream roll in order to provide a shingled effect. The overlap ensures fabric continuity or the fabric conforms to the excavation surface during aggregate placement and compaction.

6. AGGREGATE PLACEMENT AND COMPACTION:

Drainage aggregate shall be placed in lifts and compacted using plate compactors. As a rule of thumb, a maximum loose lift thickness of 12 inches is recommended.

7. OVERLAPPING AND COVERING:

Following aggregate placement, the fabric previously weighted by stones should be folded over the aggregate to form a 24 inch minimum longitudinal lap. The desired fill soil should be placed over the lap at sufficient intervals to maintain the lap during subsequent backfilling.

8. CARE OF WATER DURING CONSTRUCTION:

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, and drainage channels necessary to protect the areas to be occupied by the permanent works and to furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from the various parts of the work and for maintaining the excavations, foundations, and other parts of the work free from water as required or directed by the Engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. The removal of water from the required excavation and the foundations shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom of the required excavations and will allow satisfactory performance of all construction operations.
During the placing and compacting of material in required excavations, the water level at the locations being filled shall be maintained below the bottom of the excavations at such locations, which may require draining the water to sumps from which the water shall be pumped.

9. CONTAMINATION:

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.

10. EARTH FILL:

Material: The fill material where needed shall be taken from an approved borrow area. All material shall be free from roots, stumps, wood, rubbish, oversized stones, frozen or other objectionable materials.
Placement: All areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in eight (8) inch maximum thickness (before compaction) layers which are to be continuous over the entire length of the fill.
Compaction: The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of equipment and compaction shall be achieved by minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. All compaction is to be 95 percent of the maximum density as determined by A.A.S.H.T.O. Specification T-99 (Standard Proctor) and is to be certified for each layer by the Soils Engineers at the time of construction.

11. STRUCTURAL BACKFILL:

Backfill material shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers and compacted by hand tampers or other compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipes. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four (4) feet, measured horizontally, to any part of a structure or pipe unless there is a compacted fill of 24 inches or greater over the structure or pipe.

12. REMOVAL AND REPLACEMENT OF DEFECTIVE FILL:

Fill placed at densities lower than specified minimum density or a moisture contents outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the specifications shall be reworked to meet the requirements or removed and replaced by acceptable fill. The bottoms of such excavations shall be finished flat or gently curving and at the sides of such excavations the adjacent sound fill shall be trimmed to a slope not steeper than three (3) feet horizontally to one (1) foot vertically extending from the bottom of the excavation to the fill surface.

13. PIPE CONDUITS

a. MATERIALS (REINFORCED CONCRETE PIPE). Reinforced concrete pipe shall have standard joints. This pipe shall meet applicable Baltimore County Standards.

b. MATERIALS (CORRUGATED STEEL PIPE). This pipe and its appurtenances shall be galvanized and fully bituminous coated and shall conform to the requirements of A.A.S.H.T.O. specifications M-190 Type A. Any bituminous coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Coated CMP shall have a minimum coating thickness of 10 mil. on both sides of the pipe and shall meet the requirements of A.A.S.H.T.O. M-245 and M-246.

c. MATERIALS (POLYVINYL CHLORIDE (PVC) PIPE):
1. PVC pipe shall conform to ASTM F758, Type PS28.
2. All perforated pipe shall have 3/8" diameter circular perforations, equally spaced along the invert of the pipe.

d. LAYING PIPE: Bell and spigot pipe shall be placed with the bell and upstream. CMP pipe shall be placed with inside circumferential laps pointing downstream and with the longitudinal laps at the sides. Joints shall be made in accordance with recommendations of the manufacturer of the material.

e. BEDDING. The pipe shall be firmly and uniformly bedded throughout its entire length. Where soft, spongy, or other unstable soils is encountered, all such materials shall be removed and replaced with suitable material compacted to provide adequate support.

f. OTHER DETAILS: (Silt Trapping Devices, etc.) shall be as shown on the drawings.

14. CONCRETE:

Concrete shall meet minimum requirements set forth in Maryland State Highway Administration Standard Specifications for Construction and Materials Section 918 (Portland Cement Concrete Mixtures), Mix No. 3. Reinforcing steel shall be A.S.T.M. A-615, Grade 60. Steel angles and anchor bars shall be A.S.T.M. A-36.

15. FILTER CLOTH:

All filter cloth shall conform to MIRIFI-140N, SUPAC 5P, Dupont Typar No. 3341 or 3401 or equivalent.

16. EROSION CONTROL FACILITIES:

All disturbed areas shall be controlled by an Erosion and Sediment Control Plan which has been approved by the Baltimore County Soil Conservation District (B.C.S.C.D.).

17. STABILIZATION:

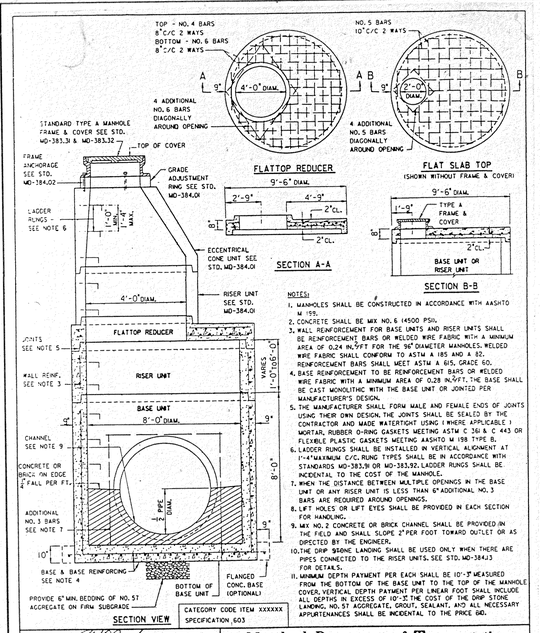
All borrow and spoil areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces shall be stabilized by seeding and applying straw mulch in accordance with "Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas" immediately after finished grading.

18. CONSTRUCTION INSPECTION BY DESIGNATED ENGINEERS

The construction of this facility and certification that this facility has been built in accordance with the plans shall be under the supervision of a Registered Professional Engineer. The Engineer shall be notified sufficiently in advance of construction in order that arrangements can be made for (1) Inspection and volume certification of the open excavation, (2) Inspection of filter fabric and stone aggregate placement, (3) Inspection of pipe trench and bedding, and (4) Supervision of backfilling and compaction testing. The Engineer shall have the responsibility and authority to make minor changes in the plan in order to compensate for unusual conditions encountered during construction as long as such changes do not diversely affect the performance or the facility. Major changes to the design which may result from site conditions encountered during construction must be reviewed and approved by the Design Engineer and the B.C.S.C.D. prior to initiation of construction.

19. TRASH RACK

a. Perforated corrugated metal pipe shall be fully perforated around the circumference of the pipe with 3/8" diameter holes providing a minimum of 5.51 square inches of openings per square foot of surface area. Example : 30 - 3/8" diameter openings per square foot.

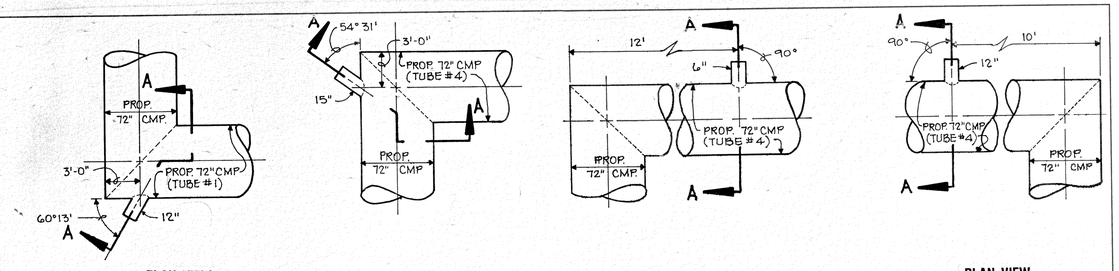


APPROVED [signature]

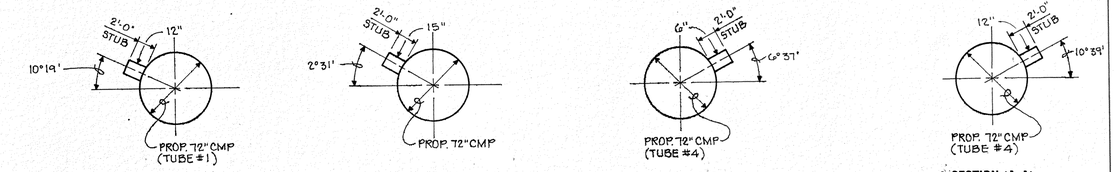
APPROVED SHA REVISIONS	APPROVAL A FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 2-12-97	APPROVAL 1-5-97
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

CATEGORY CODE ITEM XXXXXX
SPECIFICATION 603

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
96" DIAMETER PRECAST MANHOLE
FOR 72" PIPES
STANDARD NO. MD-384.09



PLAN VIEW



SECTION 'A-A'

STUB #1 DETAIL
NO SCALE

STUB #2 DETAIL
NO SCALE

STUB #3 DETAIL
NO SCALE

STUB #4 DETAIL
NO SCALE

APPROVED [signature] Chief
4-1-98
Clean Water Management Division
BALTO. CO DEPT. OF ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT
4/1/98

HILLIS – CARNES ENGINEERING ASSOCIATES, INC.

Page 1 of 1

RECORD OF SOIL EXPLORATION

Project Name Creative Realty — Boring # B-1
Location Baltimore County, Maryland — Job # 97299A

SAMPLER					
Datum	Hammer Wt. 140 Lbs.	Hole Diameter	6"	Foreman	M. Shanaberger
Surf. Elev. 502.37	Hammer Drop 30 Inches	Rock Core Dia.	-	Inspector	
Date Started 10-28-97	Pipe Size 2.0 Inches OD	Boring Method	HSA	Date Completed	10-28-97

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
Possible Fill	Orange brown, moist, medium dense micaceous sandy silt/silty sand (ML/SM) (Clay Loam)			I	4-7-6	1	4.5"	9" Topsoil
		2.0						
	Brown, moist, medium dense micaceous sandy silt (ML) (Sandy Loam)			I	6-6-7	2	17"	No groundwater encountered while drilling
		4.5	5					
	Brown to greenish brown, moist loose to medium dense micaceous silty sand trace rock fragments (SM) (Sandy Loam)			D	6-5-4	3	15"	Caved in at 9' at Completion
				L	4-4-6	4	0"	* Caved in at 9' after 24 hours
			10					
		11.5		D	6-6-10	5	17"	Backfilled after 24 hours
	Bottom of Test Hole at 11.5'		15					
			20					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED, PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT.; AFTER 24 hr. Dry * FT.; AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

HILLIS – CARNES ENGINEERING ASSOCIATES, INC.

Page 1 of 1

RECORD OF SOIL EXPLORATION

Project Name Creative Realty — Boring # B-2
Location Baltimore County, Maryland — Job # 97299A

SAMPLER					
Datum	Hammer Wt. 140 Lbs.	Hole Diameter	6"	Foreman	M. Shanaberger
Surf. Elev. 504.97	Hammer Drop 30 Inches	Rock Core Dia.	-	Inspector	
Date Started 10-27-97	Pipe Size 2.0 Inches OD	Boring Method	HSA	Date Completed	10-27-97

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Orange brown, dry, medium dense sandy silt (ML) (Clay Loam) (Possible Fill)			I	3-6-7	1	12"	12" Topsoil
		2.0						
	Brown, moist, medium dense to loose micaceous fine sandy silt (ML) (Sandy Loam)			I/D	9-7-7	2	17"	Groundwater encountered at 13.5' while drilling
			5					
		8.5		D	3-3-8	3	16"	Caved in at 8.5' at Completion
	Tan to orange brown, moist to wet, medium dense silty sand (SM) (Sandy Loam)		10	D	3-8-11	4	17"	* Caved in at 8' after 24 hours
		14.5		D	6-6-8	5	15"	Backfilled after 24 hours
	Bottom of Test Hole at 14.5'		15					
			20					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED, PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT.; AFTER 24 hr. Dry * FT.; AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

DATE	RIGHT OF WAY	REF.	ROAD PERMIT AND GRADES	P. W. A. DIR. NO.	CONTRACT NO.	REVISED AS PER RECORD PRINT J.O.	DRAFTSMAN	DATE
			PERMIT REQUESTED					
			PERMIT NUMBER					
			GRADE ESTABLISHED					
			PROFILE NUMBER					

THIS PLAN IS SEALED & CERTIFIED AS BEING IN ACCORDANCE WITH THE APPROVED DEVELOPMENT PLAN.

DESIGNED A.O.D. — D. S. THALER & ASSOC., INC. — BUREAU OF ENGINEERING & CONSTRUCTION
DRAWN C.D.H. — ENGINEER [signature] — REVIEWED
CHECKED E.I.S. — DATE 11-4-97 LIC. NO. 16580 — DATE

HIGHWAYS | STRUCTURES | STORM DRAINS | WATER | SEWER | FIELD ENGINEER

BUREAU OF ENGINEERING AND CONSTRUCTION — APPROVED ___ CHIEF — DATE ___
DEPARTMENT OF PUBLIC WORKS — APPROVED ___ DIRECTOR — DATE ___

LEVEL BK.	KEY SHEET	SCALE	DATE	REVISION	BY
—	P-NE	PLAN: AS SHOWN			
DETAIL BK.	POSITION SHEET	PROFILE: HOR. N/A VERT.			
—	34 NW 24				

BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS BUREAU OF ENGINEERING AND CONSTRUCTION
STORM WATER MANAGEMENT
CONSTRUCTION SPECIFICATIONS, DETAILS AND SOIL BORINGS
SUBDIVISION CREATIVE REALTY — EL. DISTRICT NO. — BALTIMORE COUNTY TYPE NUMBER ___

JOB ORDER NO. ___ SHEET 3 OF 3 — DWG. NO. ___ — FILE: ___