

**UTILITY TRENCHES AND MANHOLES**

The excavations for the utility trenches shall be made with 1H:1V or flatter side slopes in accordance with applicable OSHA excavation standards detailed in 29 CFR, Part 1926 and shall be adequately protected against sudden cave-in or sloughing by using steel trench boxes.

The backfill in the utility trenches shall conform to the requirements of the Fairfax County, Department of Environmental Management Memorandum dated January 23, 1990, in addition to the requirements for "Site Preparation and Earthwork".

The backfill against the manhole structures shall conform to the requirements stated under "Site Preparation and Earthwork". The fill material shall not have rock fragments larger than 150mm (6 inches) and each lift shall be compacted as specified.

**UNDERDRAINAGE FOR SIDEWALKS**

The provision of underdrains below the sidewalk shall be governed by the current Fairfax County Public Facility Manual. Tests for plasticity index and grain-size distribution shall be conducted on representative subgrade samples to establish the need for underdrainage along the sidewalks, in sections where the gradient is 3 percent or steeper.

**PAVEMENT**

Moderately to highly plastic soils, (LI > 40 and PI > 20), if encountered at or below the subgrade elevation of the streets and roadways, shall be removed to a minimum of 600 mm (2 feet) below the street subgrade(s) and replaced with approved fill material under controlled conditions.

The soil subgrade in the paved areas, including sidewalks, curb and gutter, and driveway aprons, shall be compacted to at least ninety-five percent (95%) of the maximum dry density as determined by VTM-1 test method up to 150 mm (6 inches) below the planned subgrade elevations for controlled fills. The upper 150 mm (6 inches) of the subgrade for natural soils, as well as controlled fills shall be compacted to one hundred percent (100%) of these values. The moisture content of the subgrade soils shall be within plus or minus two (±2) percentage points of the optimum moisture content.

The subgrade shall be tested for laboratory C.B.R. under soaked conditions in accordance with VDOT requirements. The design of the pavement elements shall then be made on the basis of these data.

Underdrains may have to be installed behind the curb and gutters if perched water conditions are encountered along their alignment. This will be decided after the mass-grading is completed.

**DEMOLITION OF OLD STRUCTURES**

Any existing structures, including footings, slabs, basement walls, driveways, drainfields and septic tanks, etc., shall be removed from all building pads and pavement areas, including at least 3 feet offsets from any building or pavement. All soils undercut below the planned grades shall be replaced with engineered fill. It is our experience that debris-laden fills are usually encountered in the vicinity of existing structures. All existing fills shall be removed to suitable-bearing native subgrade and replaced with approved structural fill.

Any water well(s) shall be abandoned and sealed as per the Fairfax County and State Health Department regulations.

Any demolition of existing building(s) and other structures shall be carried out under the supervision of the Geotechnical Engineer of Record.

**RESPONSIBILITY OF DEVELOPER**

According to Fairfax County Codes, review and approval of plans, specifications, and reports by the County with or without recommendations by the Geotechnical Review Board, shall in no way relieve the developer of the responsibility for the design, construction and performance of the structures and pavement on the project and damage to surrounding properties.

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was issued to better allow for the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the Contractor could be liable for substantial penalties.

The Contractor is solely responsible for designing and constructing stable, temporary excavations and shall shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The Contractor's "responsible person", as defined in 29 CFR Part 1926, shall evaluate the soil exposed in the excavations as part of the Contractor's safety procedures. In no case shall slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in all local, state, and federal safety regulations.

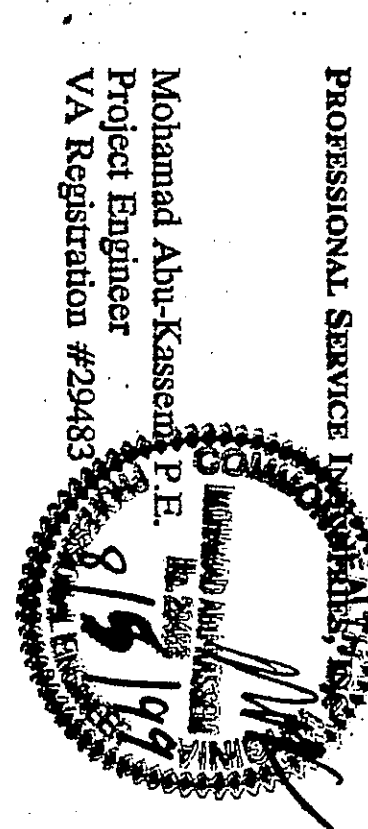
We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the Contractor's or other parties' compliance with local, state, and federal safety or other regulations.

**CONSTRUCTION OBSERVATIONS**

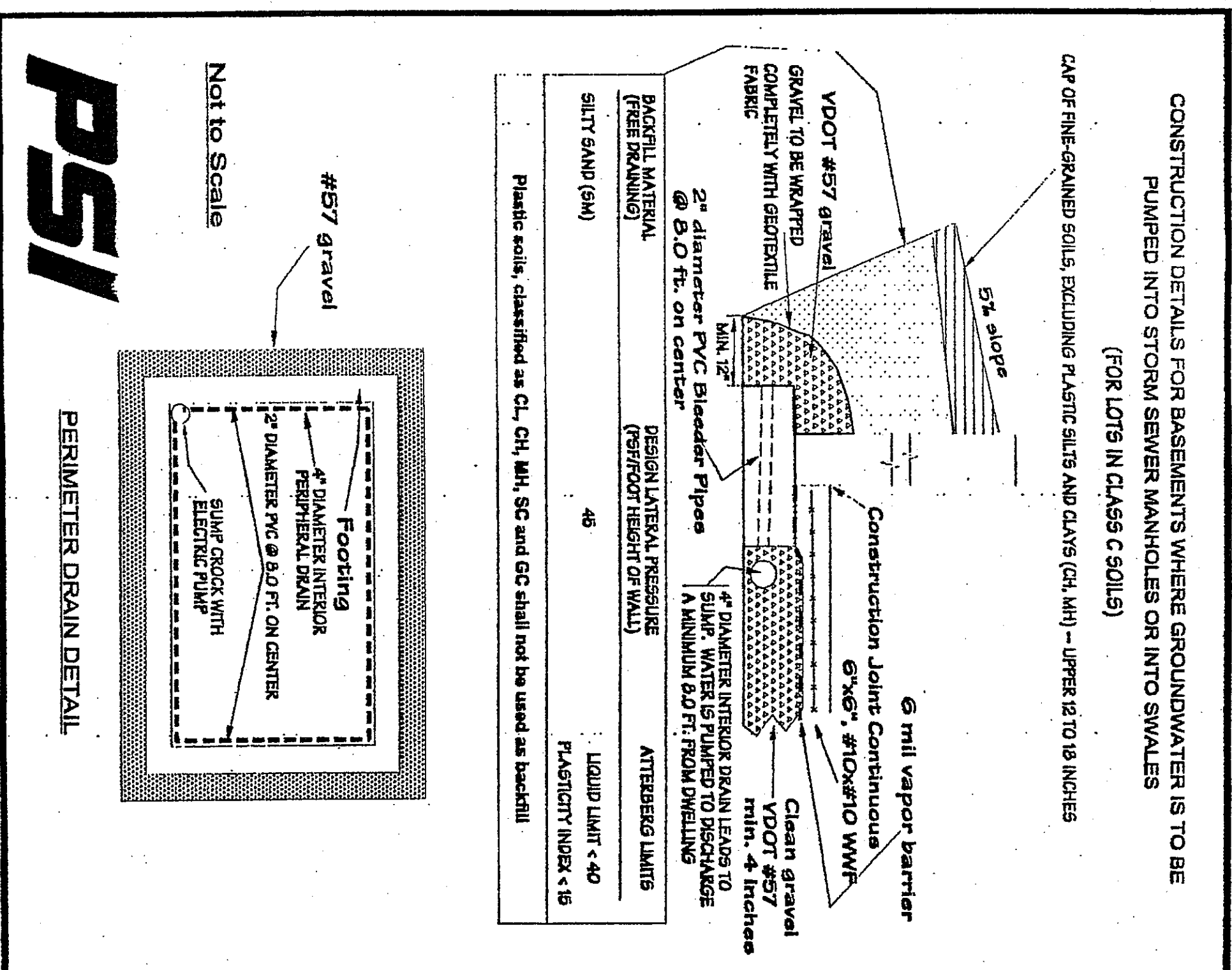
Fairfax County Public Facilities Manual requires that:

- All construction involving problem soil shall be performed under the full-time observation of the Geotechnical Engineer of Record.
- The Geotechnical Engineer of Record shall furnish a written opinion to the County as to whether or not the work has been performed in accordance with the approved plans and his recommendations for work in the vicinity of the units to be occupied prior to the issuance of residential use permits.

Professional Service Industries, Inc. (PSI) have reviewed the plans and certify that they have been prepared in accordance with the recommendations made in the geotechnical report dated June 17, 1999.



PROFESSIONAL SERVICE INDUSTRIES, INC.  
 PROFESSIONAL ENGINEER  
 Mohammad Abu-Kassem, P.E.  
 Project Engineer  
 VA Registration #29483

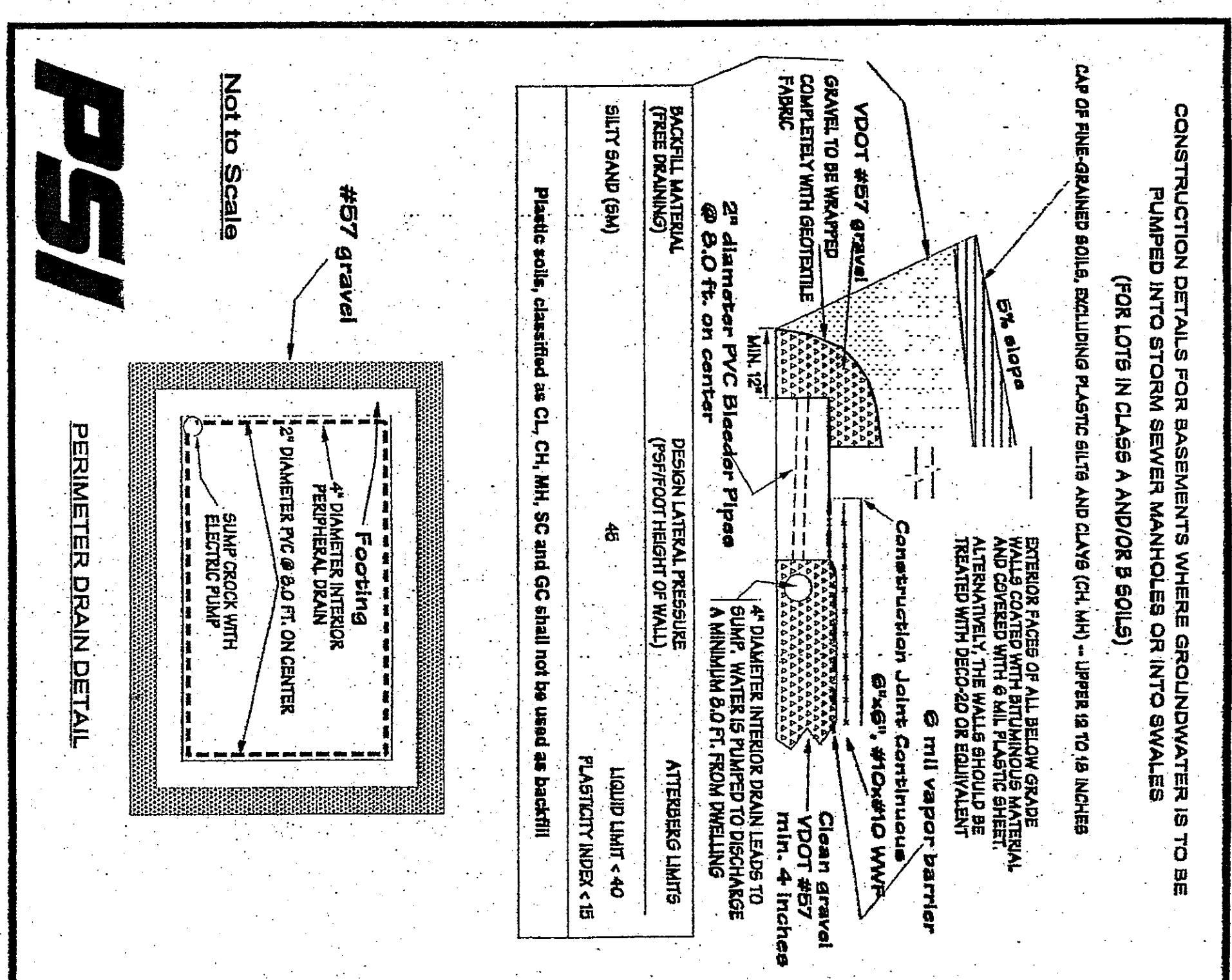


**SUMMARY OF LABORATORY TEST RESULTS METRO PLACE AT DUNN LORING, PARCELS C, D2, AND E PSI PROJECT NO.: 463-96057**

TEST LOCATION	STRATUM I (FILL)	STRATUM II	STRATUM III
SAMPLE INTERVAL (FEET)	1B-4	1B-3	1B-2
USCS CLASSIFICATION	2.5-4 GC	0-1.5 ML	2.5-4 ML
AASHTO CLASSIFICATION	A-7.5(9)	A-8(10)	A-7.5(16)
NATURAL MOISTURE CONTENT (%)	18.2	20.8	24.9
PERCENT PASSING #200 SIEVE (%)	44.3	88.0	99.4
LIQUID LIMIT (%)	58	36	44
PLASTICITY INDEX	30	25	32
MAXIMUM DRY DENSITY PER VTM-1 (PCF)	28	11	12
OPTIMUM MOISTURE CONTENT (%)	—	—	—

**SUMMARY OF LABORATORY TEST RESULTS (PREVIOUS STUDY) METRO PLACE AT DUNN LORING, PARCELS C, D2, AND E PSI PROJECT NO.: 463-96057**

TEST LOCATION	STRATUM I			STRATUM II			STRATUM III		
	B-2	B-10	B-18	B-19	B-9	B-14	B-16	B-21	
SAMPLE INTERVAL (FEET)	0-8	0-1.5	2.5-4	2.5-4	5-6.5	0-8	13.5-15	0-12	
USCS CLASSIFICATION	ML	CL	ML	SC	ML	ML	ML	ML	
AASHTO CLASSIFICATION	A-4(0)	A-7.6(1.5)	A-7.6(11.4)	A-7.6(5.8)	A-4(0)	A-4(0)	A-4(0)	A-4(0)	
NATURAL MOISTURE CONTENT (%)	18.9	24.3	17.7	15.9	21.1	18.5	35.8	23.7	
PERCENT PASSING #200 SIEVE (%)	NP	NP	46	44	93.5	82.0	84.4	71.5	
LIQUID LIMIT (%)	NP	NP	28	25	NP	NP	NP	NP	
PLASTICITY INDEX	NP	NP	21	19	NP	NP	NP	NP	
MAXIMUM DRY DENSITY PER VTM-1 (PCF)	109.1	—	—	—	NP	NP	NP	NP	
OPTIMUM MOISTURE CONTENT (%)	18.5	—	—	—	22.9	—	—	20.5	



No.	REVISION	DATE	BY

PLANNING • SITE ENGINEERING • TRANSPORTATION • ENVIRONMENTAL SURVEILLANCE/PLANNING

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GEOTECHNICAL REQUIREMENTS - PARCELS C1, D2 & E

**METRO PLACE AT DUNN LORING**  
 PARCEL C1

PROVIDENCE DISTRICT  
 FAIRFAX COUNTY, VIRGINIA

DESIGN: SIH  
 DRAWN: [Name]  
 CHECKED: [Name]  
 DATE: 8/99

SCALE: AS SHOWN

SHEET: 24 OF 35

PROJ. NO.: 5169ADE  
 FILE NO.: PP-805