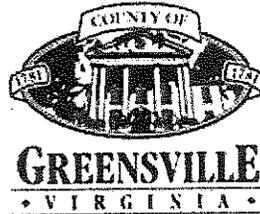


# Preliminary Architectural Feasibility Report

For



## Greensville County Sheriff's Office Expansion Greensville County Government Center Campus

Prepared for:

### **GREENSVILLE COUNTY BOARD OF SUPERVISORS**

Peggy R. Wiley – Chairman  
Michael W. Ferguson – Vice-Chairman  
James C. Vaughan  
Margaret T. Lee, Ed.D.

Coordinated by:

K. David Whittington – County Administrator  
Charles M. Veliky – Chief Building Official  
Sheriff James R. Edwards, Jr.  
Major William T. Jarratt, Jr.  
Betsy Veliky

May 16, 2014

**BAXTER BAILEY**  
**& ASSOCIATES**  
ARCHITECTS  
11 East Franklin Street  
Richmond, VA 23219

## Contents

- A. Need for the Facility**
- B. Existing Facility**
- C. Proposed Facility**
- D. Building Site Information**
- E. Cost Estimate**
- F. Annual Operating Budget for Facility and Owner**
- G. Preliminary Design**
- H. Construction Problems**
- I. Conclusions**

## **EXHIBITS**

- I. Architectural Report**
  - Evaluation of Existing Conditions
  - Analysis of Building Deficiencies
  - Alternative Solutions
  - Final Report/ Delivery
- II. Geotechnical Engineering Report**
- III. Environmental Report**
- IV. Related Correspondence**

Preliminary Architectural Feasibility Report  
For  
Greenville County  
Sheriff's Office Expansion

**A. Need for the Facility**

The Greenville County Sheriff's Office, designed in 2001 and constructed in 2002, currently houses Sheriff Edwards and an enlarging staff which has grown over the last twelve years to approximately 35 persons. As a result of such growth as well as advances in technology, the existing facility has become incapable of meeting the space needs and security requirements of the user, and a fully accredited facility.

The deficiencies set forth by Sheriff Edwards and key staff members include but are not limited to the following: At this time, 3 to 4 deputies share each of the four Shift Rooms, while the optimal number of deputies sharing each is two; Insufficient Evidence Room; No Interrogation Room; Insufficient Briefing/ Conference Room space; No Information Technology/Electronic equipment Room; Inadequate Records Storage; Inadequate security at the back Entrance of the Building that is used primarily by deputies; Inadequate Parking; The deficiencies of the Kitchen/Break Room/Vending Area due to 24 hour operation; Inadequate Video Surveillance System around and throughout the Building; Flooring in the Dispatch Office is stained and discolored; Inadequate Storage and Filing Area for the Dispatch Office. Dispatch Office limited to 2 stations while 3 are now needed, with a 4<sup>th</sup> scheduled for expansion.

The present staff Investigation Room is small and set up for 2 men with 3 Investigators in residence. A second Investigation Room is needed/ required. The present Chief Investigator's Office appears adequate.

All in all, the Sheriff and staff find there is a pressing need for enhancement and expansion of the current facility.

...

Attached is both an updated Space Needs Diagram and a Relationship of Spaces Diagram, which illustrates the requested/ required capacities, flow and layout of the proposed enhancements.

## **B. Existing Facility**

Presently, the Greenville County Sheriff's Office is housed in a relatively comfortable and modern context, having been constructed in 2002, as an all new facility. It is located at 174 Uriah Branch Drive within the Greenville County Government Center Campus. The current facility, while in very good repair and maintenance, is stressed by both deficiencies in physical office space and special operational systems; all as a result of growth of force activity and enforcement, and the enhanced security and management standards set by the current Sheriff.

The existing facility is of a pleasing appearance and thus provides a dignified and respectful centerpiece for its law enforcement mission. The existing facility is in good-to-excellent condition as regards the structure proper. The supportive mechanical and electrical systems at 12 years are mid-way in their overall life expectancy. These existing systems can/should remain in use until the end of their life cycle, all for optimal cost/benefit. The facility is also set up as the central hub for county-wide dispatch, 911 system and emergency operations. These systems are in need of expansion, and should/must be enhanced to meet current standards of performance.

The building is so situated that it can be reasonably expanded with additions to both left and right sides as well as in the rear. The site can be modified and expanded to include required additional parking as required, with little disruption to the original street infrastructure.

All in all, the present building and its grounds are in excellent condition, and both are good candidates for expansion & growth.

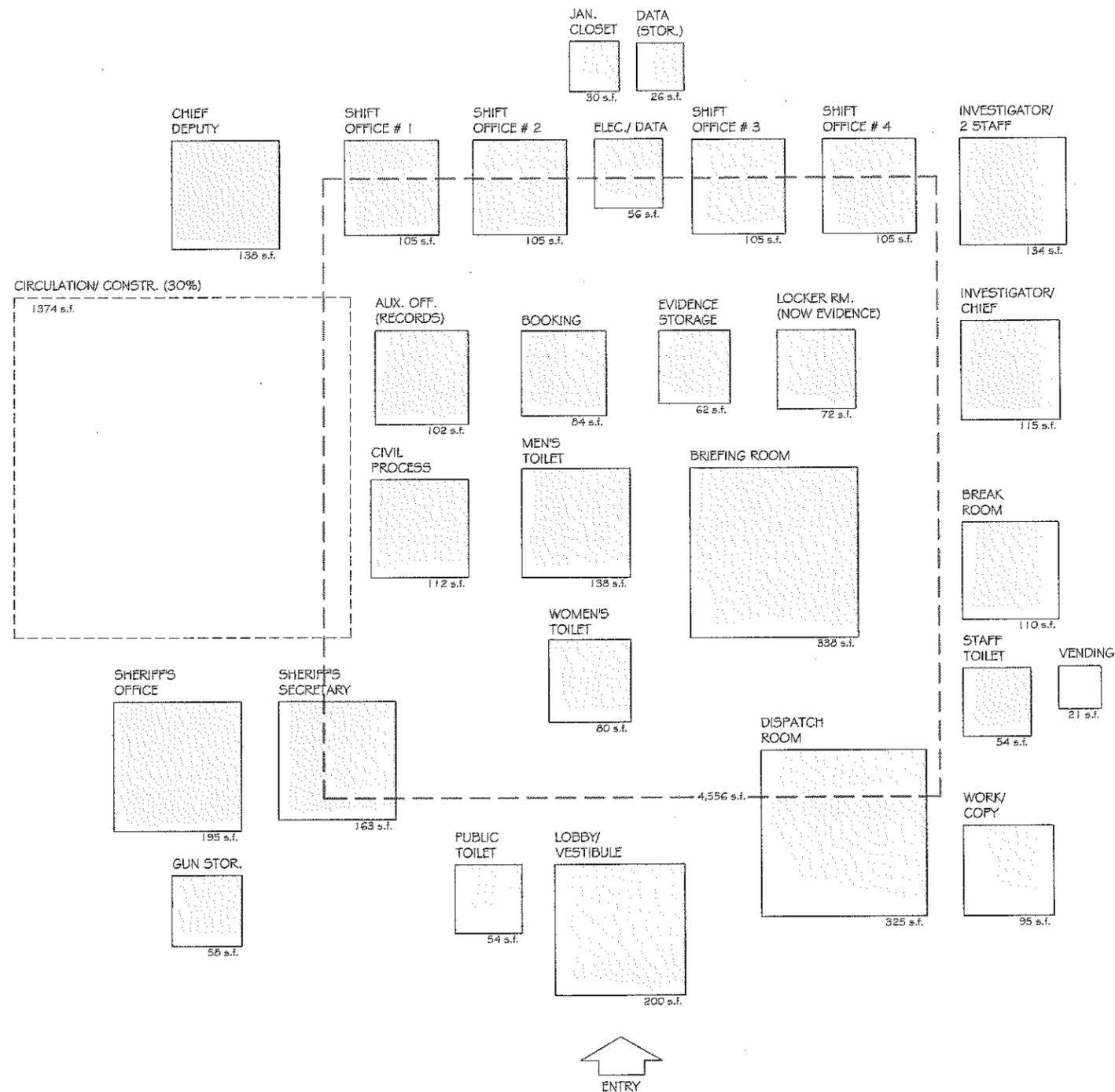
...

Attached are both an Existing Spaces Diagram and Relationship of Spaces Diagram, which illustrates the current capacity, flow and layout of spaces within the existing.

# GREENSVILLE COUNTY SHERIFF'S OFFICE EXISTING SPACES DIAGRAM:

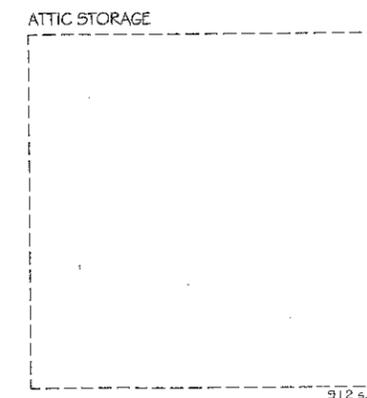
SCALE: 1/8" = 1'-0"

NOTE: SPACES DOCUMENTED HERE ARE TAKEN FROM  
THE EXISTING GREENSVILLE COUNTY SHERIFF'S OFFICE.



## EXISTING SPACES:

ASSIGNABLE AREAS	
LOBBY & VESTIBULE	200 s.f.
PUBLIC TOILET	54 s.f.
DISPATCH ROOM	325 s.f.
WORK/ COPY	95 s.f.
STAFF TOILET	54 s.f.
BREAK ROOM	110 s.f.
INVESTIGATOR/ CHIEF	115 s.f.
INVESTIGATOR/ 2 STAFF	134 s.f.
VENDING AREA	21 s.f.
BRIEFING ROOM	338 s.f.
SHIFT OFFICE #1	105 s.f.
SHIFT OFFICE #2	105 s.f.
SHIFT OFFICE #3	105 s.f.
SHIFT OFFICE #4	105 s.f.
ELEC./ DATA	56 s.f.
JANITOR'S CLOSET	30 s.f.
DATA (NOW STORAGE)	26 s.f.
CHIEF DEPUTY	138 s.f.
AUXILIARY OFFICE (NOW RECORDS)	102 s.f.
CIVIL PROCESS	112 s.f.
SHERIFF'S OFFICE	195 s.f.
GUN STORAGE/ SECURE	58 s.f.
SHERIFF'S SECRETARY	163 s.f.
LOCKER ROOM (NOW EVIDENCE)	72 s.f.
EVIDENCE STORAGE	62 s.f.
BOOKING	84 s.f.
WOMEN'S TOILET	80 s.f.
MEN'S TOILET	138 s.f.
<hr/>	
SUBTOTAL ASSIGNABLE SPACES (70%)	3,182 s.f.
CIRCULATION & CONSTRUCTION (30%)	1,374 s.f.
<hr/>	
TOTAL AREA/ FIRST FLOOR (100%)	4,556 s.f.
<hr/>	
ATTIC STORAGE	912 s.f.
<hr/>	
GROSS AREA	5,468 s.f.

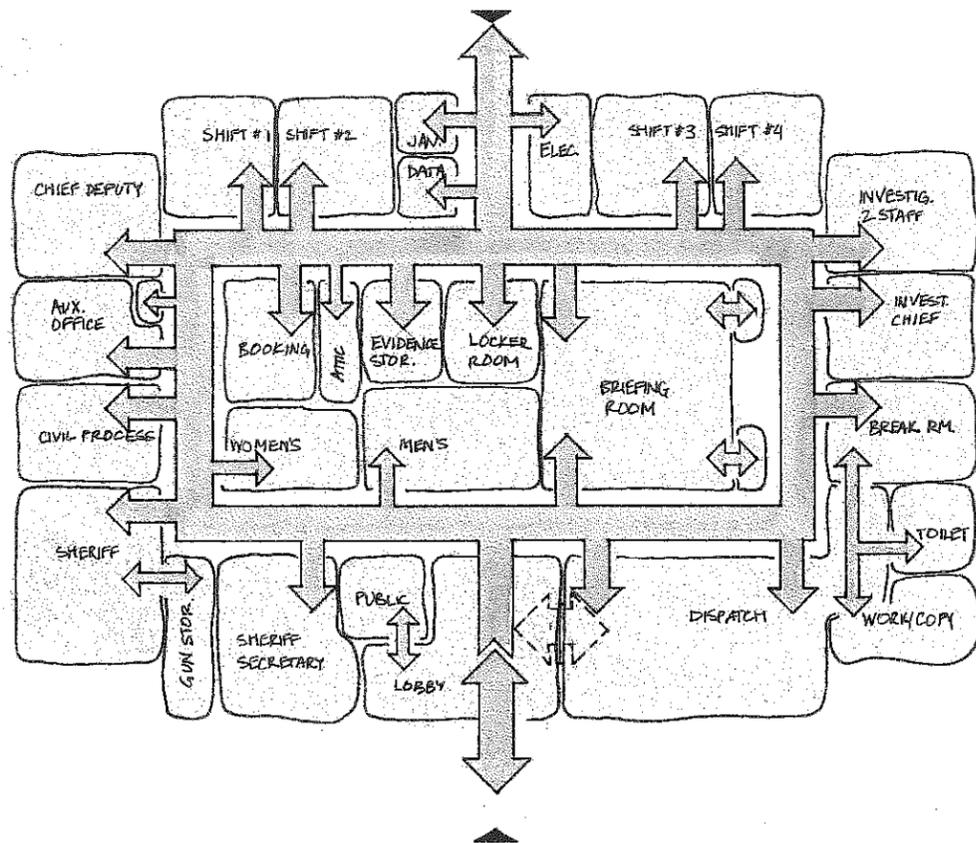


DATE: FEB. 26, 2014

JOB NUMBER:

DRAWN BY:  
CHECKED BY:

REVISIONS:



relationship of spaces - existing

SCALE: 1/8"=1'-0"

preliminary drawings

### C. Proposed Facility

As outlined in Section G – Preliminary Design Drawings, the proposed new facility will be comprised, in large part, by maintaining various existing spaces/ functions while also providing needed enhancements and enlargements through a series of additions to the existing building. The new additions are to be of the same/ similar style and building type as the original; all in keeping with Greenville County's approved Master Plan.

More specifically, the new facility calls for certain unaltered spaces retained within the original *assignable area* of 3,182 s.f.+/-; and the gentle modification and enlargement of other original areas thereby increasing the original *assignable area* to 4,466 s.f.+/-; this existing modified space will be augmented with 2,366 s.f.+/- of all *new assignable space* resulting in a fully revamped facility consisting of approximately 6,832 s.f.+/- of *net assignable space*. This assignable space when combined with the circulation and construction factor of 2,372 s.f.+/- (35%) will bring the total area of the completed project to approximately 9,204 s.f.+/. By including attic/ mechanical spaces, a grand total of 10,116 s.f. +/- is shown/ suggested.

Both on the interior and the exterior, the original basic building materials, methods of construction, and finishes will be respected and carried on, creating an all new, but seamless, addition that complements and respects the original. Where possible existing windows will be salvaged and relocated to the new exterior walls. Brick work and trim profiles will complement/ match the original. The rear portico & columns will be/ can be removed, reworked and relocated at the new rear addition.

Most if not all existing mechanical systems, which are about 12 years old and have another 15-20 year life cycle expectancy, will remain to support the original. All new energy efficient mechanical systems will be added to support the new construction and will run in tandem with existing, all for an integrated system.

Existing toilets are in 'like new' condition and will remain. New toilets will be added as necessary to support the additional space load.

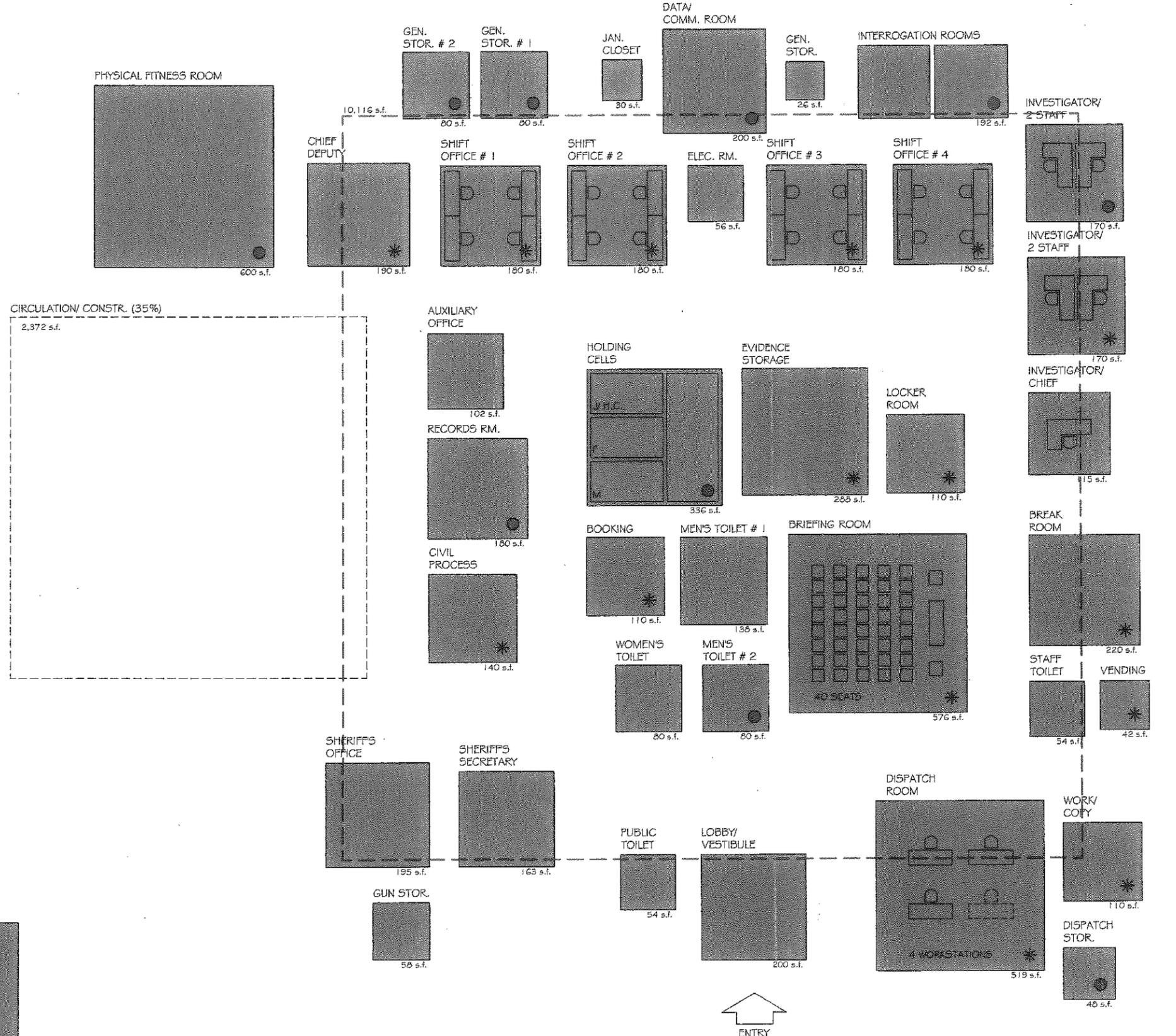
In summary, the County can maximize cost control over the total project by carefully adding to the existing, thereby creating an all new composite facility that meets current staff, technology and security requirements.

# GREENSVILLE COUNTY SHERIFF'S OFFICE SPACE NEEDS DIAGRAM:

SCALE: 1/8" = 1'-0"

UPDATED PER MEETING OF 3/18/2014. PRESENT: SHERIFF JAMES R. EDWARDS, JR., MAJOR WILLIAM T. JARRATT, JR., ADMIN. STAFF SPECIALIST BETSY VELIKY, AND J. BAXTER BAILEY & ZACK SAUNDERS OF BAXTER BAILEY & ASSOCIATES.

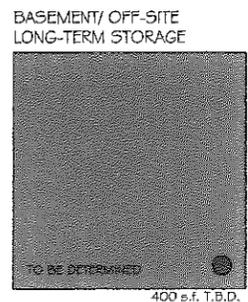
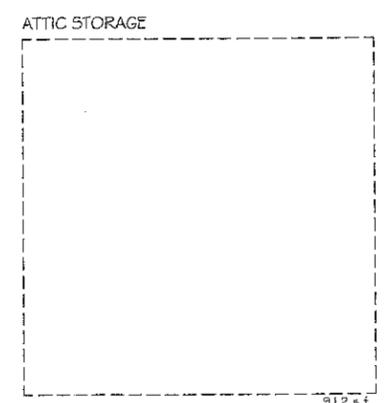
**BAXTER BAILEY & ASSOCIATES**  
ARCHITECTS  
11 EAST FRANKLIN STREET, RICHMOND, VIRGINIA 23219  
(804) 943-5200 FAX: (804) 943-5270



## SPACE NEEDS: ASSIGNABLE AREAS

EXISTING/ MODIFIED AREAS	
LOBBY & VESTIBULE	200 s.f.
PUBLIC TOILET	54 s.f.
* DISPATCH ROOM (325 x 140')	519 s.f.*
* WORK/ COPY (95 x 115')	110 s.f.*
STAFF TOILET	54 s.f.
* BREAK ROOM (110 x 200')	220 s.f.*
INVESTIGATOR/ CHIEF	115 s.f.
* INVESTIGATOR/ 2 STAFF	170 s.f.*
* VENDING AREA (4 MACHINES)	42 s.f.*
* BRIEFING/ CONF./ E.O.C. COMMAND RM.	576 s.f.*
* SHIFT OFFICE #1 (10' x 18')	180 s.f.*
* SHIFT OFFICE #2 (10' x 18')	180 s.f.*
* SHIFT OFFICE #3 (10' x 18')	180 s.f.*
* SHIFT OFFICE #4 (10' x 18')	180 s.f.*
ELEC. RM. (ELEC. ONLY/ NO DATA)	56 s.f.
JANITOR'S CLOSET	30 s.f.
GENERAL STORAGE (OLD DATA)	26 s.f.
* CHIEF DEPUTY	190 s.f.*
AUXILIARY OFFICE	102 s.f.
* CIVIL PROCESS (112 x 120')	140 s.f.*
SHERIFF'S OFFICE	195 s.f.
GUN STORAGE/ SECURE	58 s.f.
SHERIFF'S SECRETARY	163 s.f.
* EVIDENCE STORAGE (16' x 18')	288 s.f.*
* LOCKER ROOM	110 s.f.*
* BOOKING	110 s.f.*
WOMEN'S TOILET	80 s.f.
MEN'S TOILET (#1 - EXISTING)	138 s.f.
<b>SUBTOTAL - EXISTING/MODIFIED AREAS</b>	<b>4,466 s.f.</b>

NEW AREAS	
* DISPATCH STORAGE - NEW	48 s.f.
* INVESTIGATOR/ 2 STAFF - NEW	170 s.f.
* DATA/ COMMUNICATION ROOM - NEW	200 s.f.
* INTERROGATION - NEW (8' x 12')+(8' x 12')	192 s.f.
* HOLDING CELLS - NEW	336 s.f.
* RECORDS ROOM - NEW (10' x 18')	180 s.f.
* MEN'S TOILET (#2 - NEW)	80 s.f.
* PHYSICAL FITNESS RM. (20' x 30')	600 s.f.
* GENERAL STOR. # 1 - NEW (8' x 10')	80 s.f.
* GENERAL STOR. # 2 - NEW (8' x 10')	80 s.f.
* BASEMENT/ OFF-SITE LONG-TERM STOR.	400 s.f.
<b>SUBTOTAL - NEW AREAS</b>	<b>2,366 s.f.</b>
<b>NET AREA/ EXISTING + NEW</b> (65%)	<b>6,832 s.f.</b>
<b>CIRCULATION &amp; CONSTRUCTION</b> (35%)	<b>2,372 s.f.</b>
<b>TOTAL FLOOR AREA</b> (100%)	<b>9,204 s.f.</b>
<b>ATTIC STORAGE</b>	<b>912 s.f.</b>
<b>GROSS AREA</b>	<b>10,116 s.f.</b>



Owner: GREENSVILLE COUNTY BOARD OF SUPERVISORS  
K. David Whittington, County Administrator  
GREENSVILLE COUNTY  
James R. Edwards, Jr., Sheriff  
GREENSVILLE COUNTY

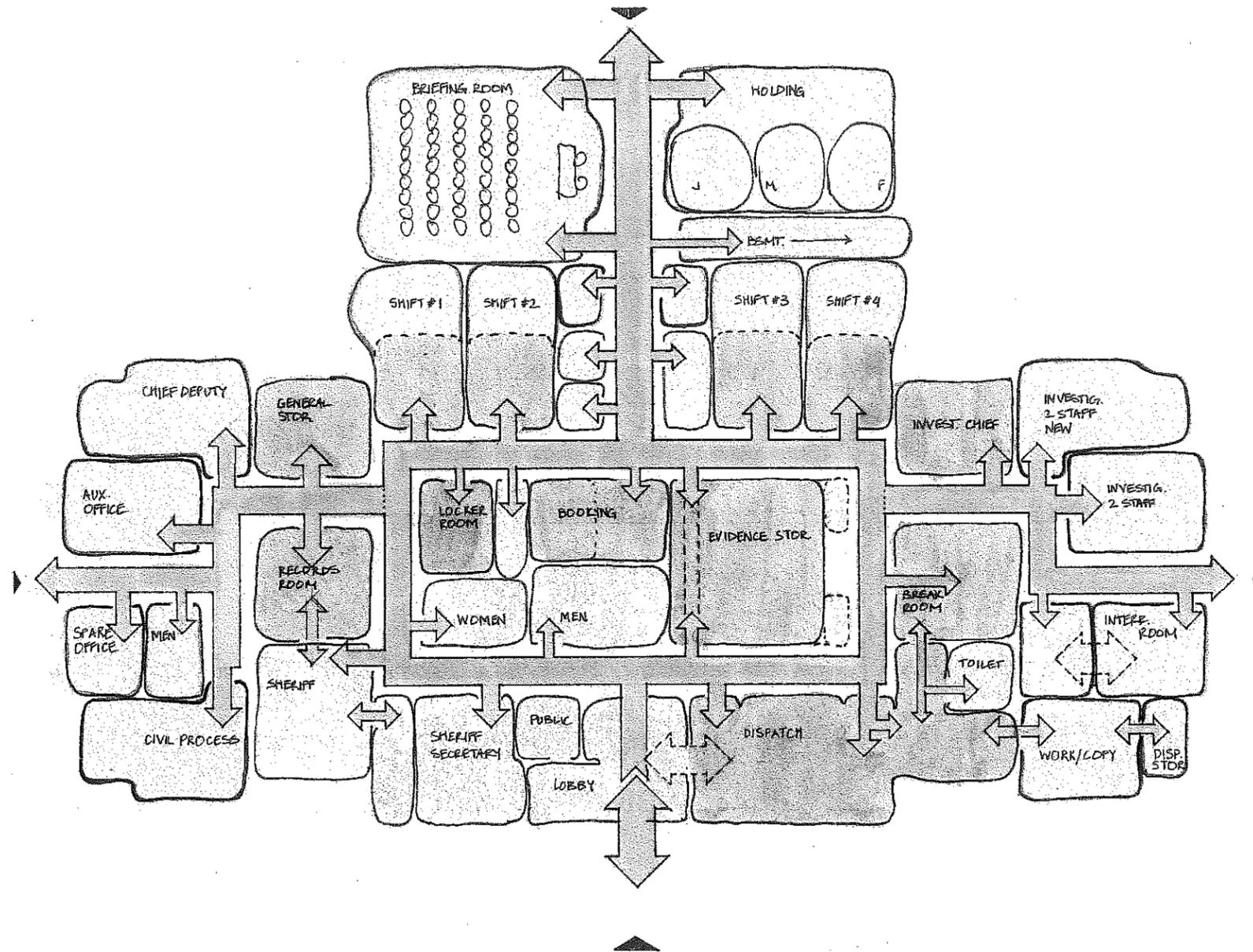
SPACE NEEDS ANALYSIS  
**GREENSVILLE COUNTY  
SHERIFF'S OFFICE EXPANSION**  
GREENSVILLE COUNTY GOVERNMENT CENTER  
EMPORIA, VIRGINIA

DATE: FEB. 26, 2014

JOB NUMBER:

DRAWN BY:  
CHECKED BY:

REVISIONS:  
1) MARCH 18, 2014



relationship of spaces - proposed expansion

SCALE: 1/8"=1'-0"

preliminary drawings

## **D. Building Site Information**

### **1. Amount of Land Required**

Presently the Sheriff's Office building is located on a deeded parcel of some 1.86 +/- acres. This parcel contains existing building, parking and vehicular circulation. There will be an anticipated building area increase from 4,556 s.f. (existing) to 9,204 s.f. (proposed) which will require an increase in total parking from the current 28 spaces to an ultimate of 45/46 spaces. By the careful development/ reassignment of a section of existing greenspace, additional parking can be developed bringing the total to 48 spaces; all without further expansion of the present parcel boundary. Thus, no additional land is required, and the site can/ will meet the needs of the proposed development.

### **2. Location**

The present location of the Sheriff's Office within the Greenville County Government Center Campus, at 174 Uriah Branch Drive, is adjacent to the Southside Regional Jail and the Southside Community Corrections Office. It is neighbor to other related County Offices including the Health Department, the District 19 Counseling Center, and the Southside Virginia Education Center. Uriah Branch Way feeds directly onto Route 301/ Sussex Drive, which in turn also connects directly to Interstate 95 within approximately one mile.

No alternate locations have been/ will be considered due to the optimal siting of the existing facility.

### **3. Site Plan (*legal, site grades, flood map*)**

Please see attached site plans: C-1 Master Plan/ Current, C-2 Site Plan/ Proposed; C-3 Utility Plan/ Existing.

#### **4. Site suitability**

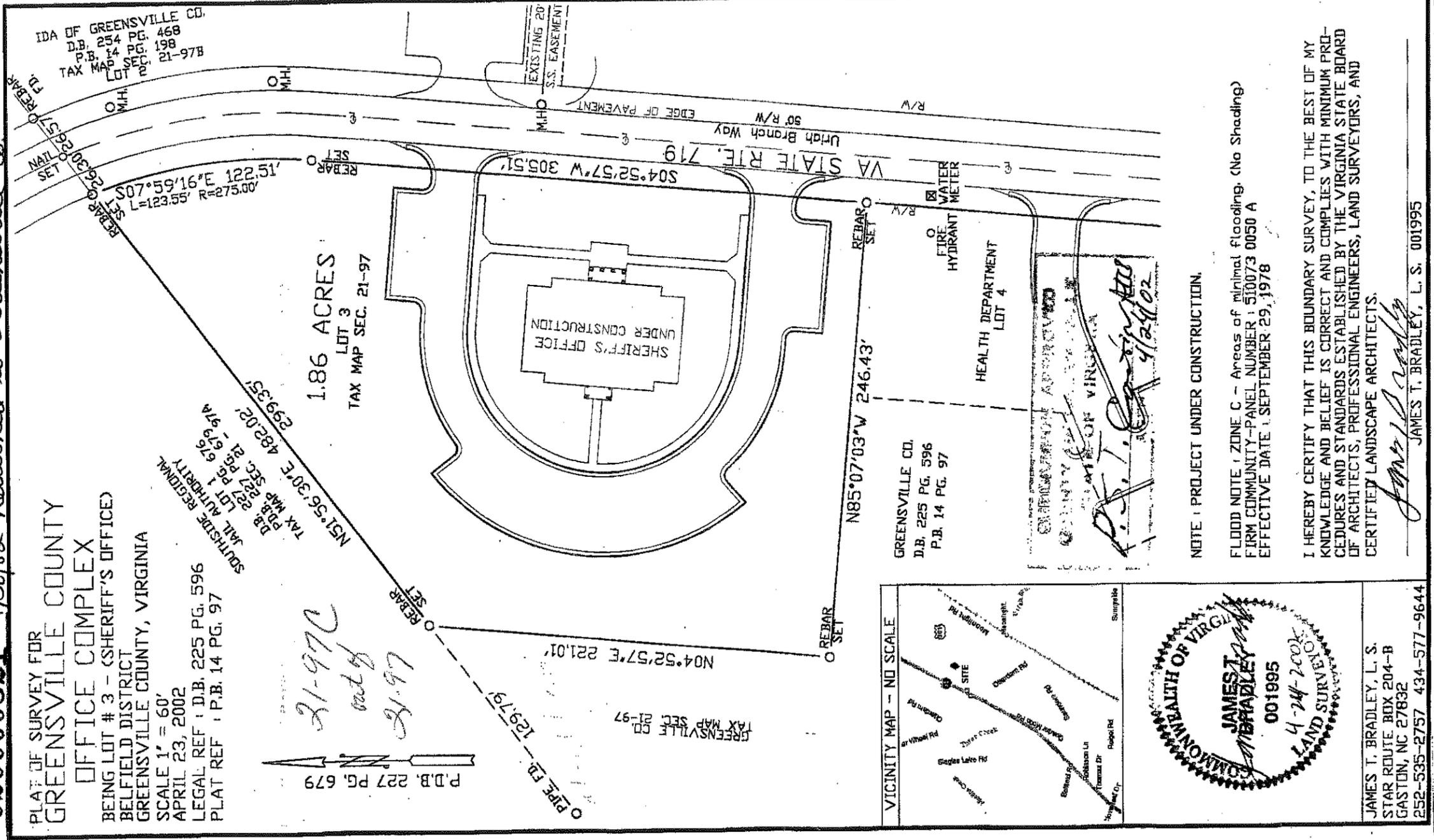
The suitability of the site is considered excellent to superior in that: (a) The existing Sheriff's Office is now in place, all within the larger Campus, complete with support utilities and infrastructure, including parking and circulation; (b) Easy access to the adjacent Regional Jail; (c) Easy access to main corridors 301/ Sussex Drive and I-95, as well as the City of Emporia. The existing site of the Sheriff's Office was originally selected for its optimal location within the Campus and can adequately be expanded for parking into open land adjacent. Requested additional parking & controlled circulation can be satisfactorily included to meet future needs. All-in-all this is an excellent site, fully prepared to accept the proposed expansion of both building and parking.

#### **5. Parking**

Sufficient parking will be made available at this site. Presently the Sheriff's Office has parking for 28 vehicles with excellent circulation off and onto Uriah Branch Way. The present parking area can be expanded by 6 spaces to total 34; while additional parking of 14 vehicles can be provided in a new lot adjacent to the existing. This brings the total spaces available to 48 +/- . This is slightly in excess of the stated minimum need of 45/46 spaces; and should provide long range parking sufficiency for all staff and visitors.

020000821 4/30/02 Returned to Greensville Co. 16

Inst. 2002 0000821



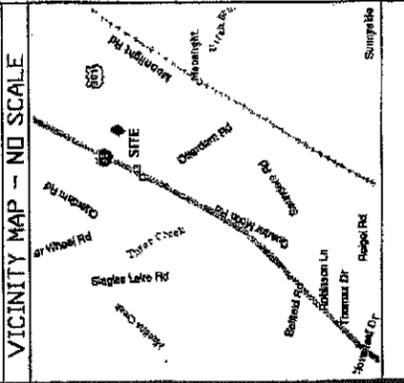
PLAT OF SURVEY FOR  
 GREENSVILLE COUNTY  
 OFFICE COMPLEX  
 BEING LOT # 3 - (SHERIFF'S OFFICE)  
 BELFIELD DISTRICT  
 GREENSVILLE COUNTY, VIRGINIA  
 SCALE 1" = 60'  
 APRIL 23, 2002  
 LEGAL REF: D.B. 225 PG. 596  
 PLAT REF: P.B. 14 PG. 97

SOUTHSIDE REGIONAL  
 JAIL AUTHORITY  
 LOT 1  
 P.B. 227 PG. 679  
 D.B. 227 PG. 676  
 TAX MAP SEC. 21-97A  
 N51°56'30"E 482.02'  
 299.35'

1.86 ACRES  
 LOT 3  
 TAX MAP SEC. 21-97

P.D.B. 227 PG. 679  
 21-97C  
 back of  
 21-97

O PIPE ED. 12979  
 GREENSVILLE CO.  
 TAX MAP SEC. 21-97



COMMONWEALTH OF VIRGINIA  
 JAMES T. BRADLEY  
 001995  
 4-24-2002  
 LAND SURVEYOR

JAMES T. BRADLEY, L. S.  
 STAR ROUTE BOX 204-B  
 GASTON, NC 27832  
 252-535-2757 434-577-9644

NOTE: PROJECT UNDER CONSTRUCTION.

FLOOD NOTE: ZONE C - Areas of minimal flooding. (No Shading)  
 FIRM COMMUNITY-PANEL NUMBER: 510073 0050 A  
 EFFECTIVE DATE: SEPTEMBER 29, 1978

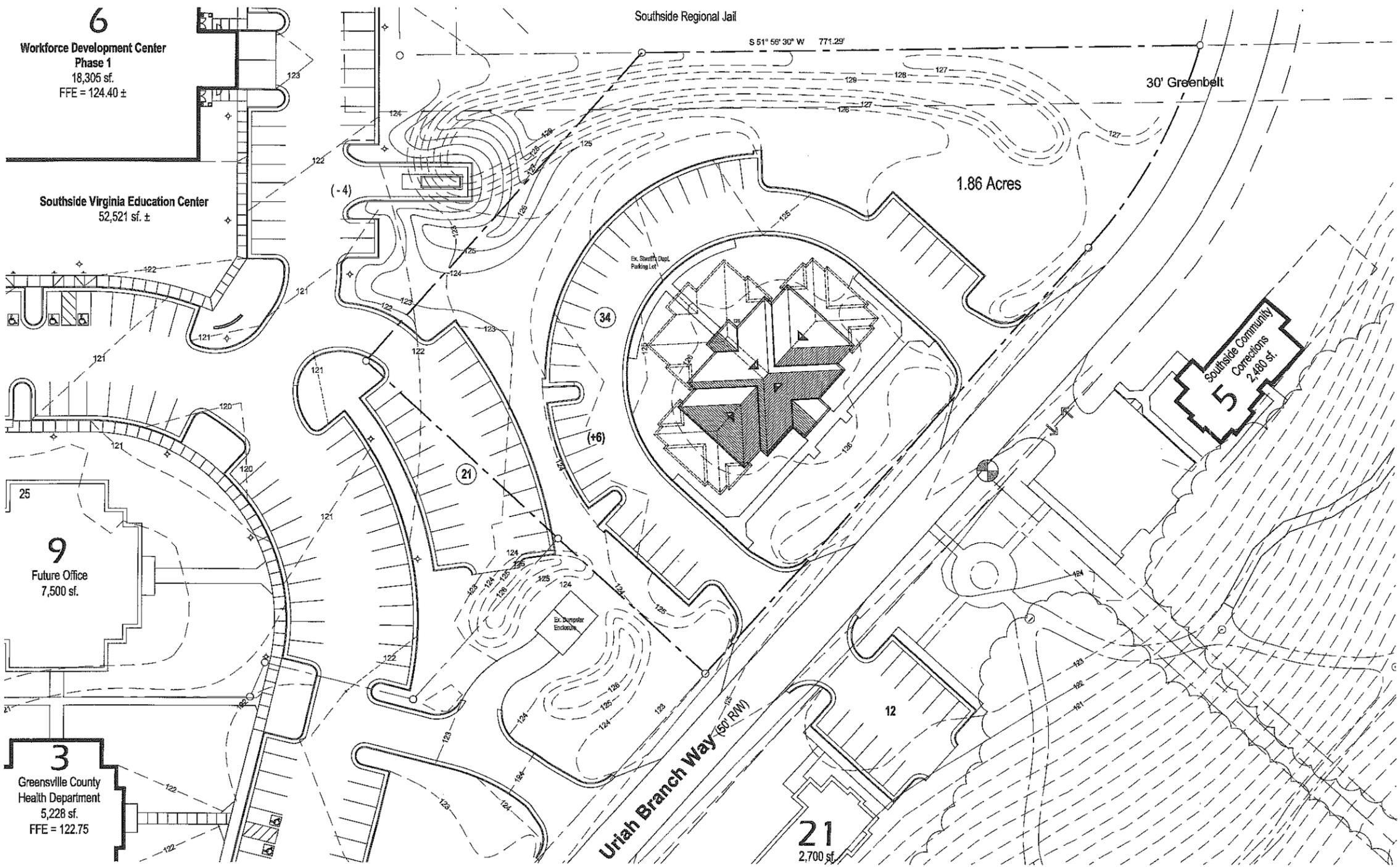
I HEREBY CERTIFY THAT THIS BOUNDARY SURVEY, TO THE BEST OF MY KNOWLEDGE AND BELIEF IS CORRECT AND COMPLIES WITH MINIMUM PROCEDURES AND STANDARDS ESTABLISHED BY THE VIRGINIA STATE BOARD OF ARCHITECTS, PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND CERTIFIED LANDSCAPE ARCHITECTS.

*James T. Bradley*  
 JAMES T. BRADLEY, L. S. 001995

VIRGINIA: In the Clerk's Office of the Circuit Court of Greensville County. The foregoing instrument was lodged in said office on the 30<sup>th</sup> day of April, 2002, and duly admitted to record at 12:10 P.M.

174 Ulrich Branch Way  
 Tester:

*Robert C. Wrenn*  
 ROBERT C. WRENN, Clerk

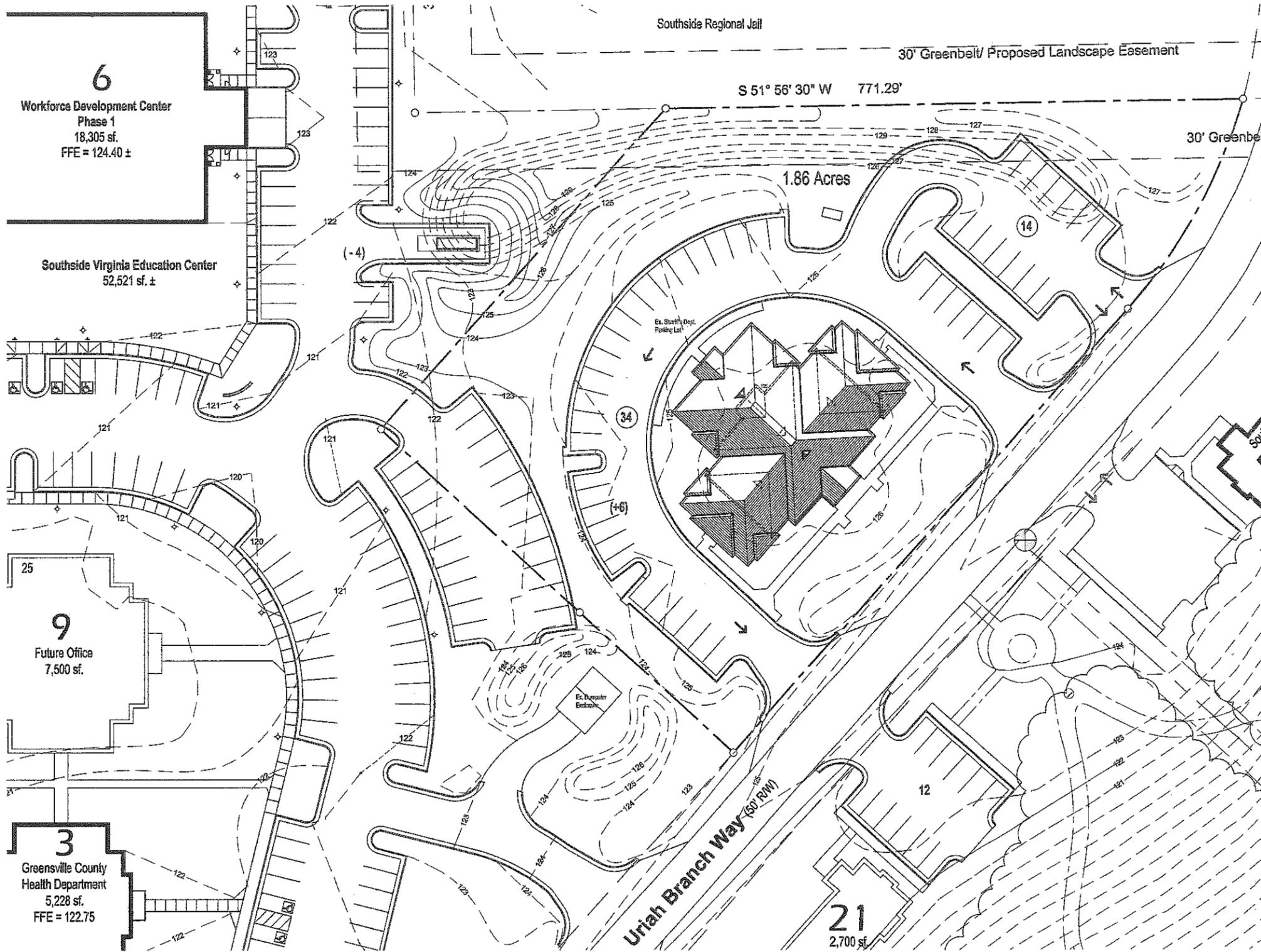


site plan/ architectural

AS SHOWN ON THE CURRENT GREENSVILLE COUNTY GOVERNMENT CENTER MASTER PLAN/ 2014. LOT INFORMATION TAKEN FROM SURVEY PROVIDED BY OWNER, DATED 4/30/02 BY JAMES T. BRADLEY, L.S.

SCALE: 1" = 30'





site plan/ proposed

SCALE: 1" = 30'

BUILDING SITE:	1.86 ac. +/-
TOTAL BUILDING AREA (GROUND LEVEL):	8,381 s.f. +/-
PARKING:	48 spaces +/-

preliminary drawings

DATE: MARCH 27, 2014

JOB NUMBER:

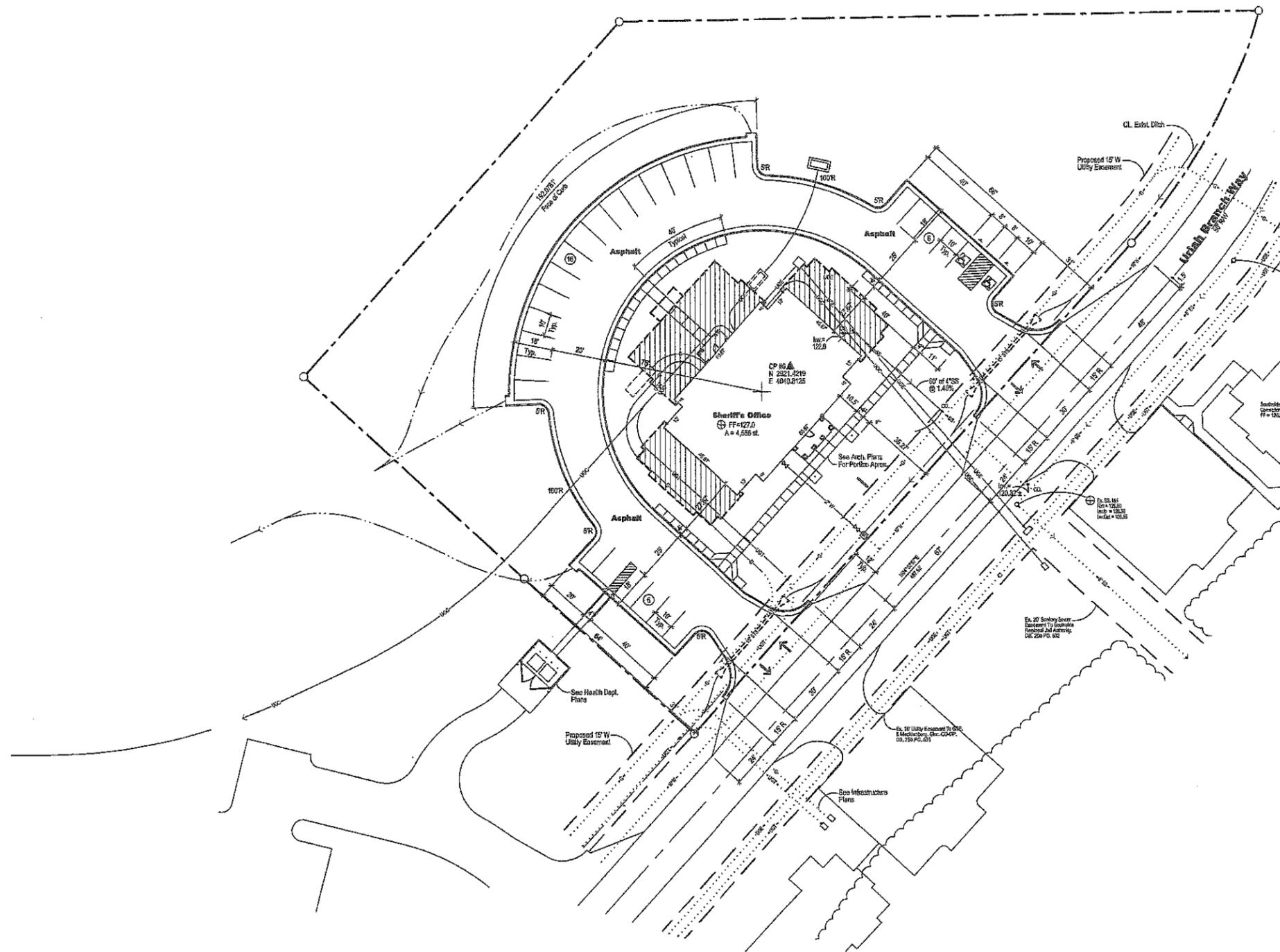
DRAWN BY:  
 CHECKED BY:

REVISIONS:

- 1.) APRIL 30, 2014
- 2.) MAY 13, 2014

PROPOSED

C-2



utility plan/ existing

NOTE: EXISTING SITE INFORMATION TAKEN FROM ORIGINAL WORKING DRAWINGS, DATED 10/19/01, REV. 1/16/02.

SCALE: 1" = 30'



preliminary drawings

DATE: MARCH 27, 2014

JOB NUMBER:

DRAWN BY:  
 CHECKED BY:

REVISIONS:

UTILITIES

C-3

## **E. Cost Estimates**

### **■ ADDITIONS & RENOVATIONS/ OPTION 1**

#### **Method/ Description:**

This budget prepared on current cost comparisons for similar and/or existing structures in/of the region, as well as the final project costs for the original structure, up-dated for inflation in current dollars. The project is to be a single story series of additions, equaling to 3,825 sf +/- and coupled with limited area renovation to the existing 4,556 sf, partial slab on grade, partial basement of 1,440 s.f., exterior of brick facing, wood stud walls and wood truss frame roof system, interior gypsum wall board partitions, doors/frames, gypsum wall board and acoustical tile ceilings, commercial thermal windows and ADA compliant features, Information Technology ready, vinyl composition, ceramic tile and carpet floors. New facility will be fully air conditioned and heated with state of the art energy efficient systems; both mechanical and electrical. The site will be lighted and enhanced for security. Additions will maintain design standards found in the existing Sheriff's Office. Site work will be compatible with existing and conform to the standards of the Master Plan / 2000 and Master Plan / 2014. Existing landscaping will be augmented with new, meeting campus standards.

### **■ ALL NEW FACILITY/ OPTION 2**

#### **Method/ Description:**

This budget prepared on current cost comparisons for similar and/or existing structures in/of the region, as well as the final project costs for the original structure, up-dated for inflation in current dollars. This new facility is to be a single-story structure of some 8,500 s.f. main level and partial basement of 6,000 s.f. +/- which will open onto a lower grade. Generally it will be constructed of the following: exterior of brick facing, wood stud walls and wood truss frame roof system, interior gypsum wall board partitions, doors/frames, gypsum wall board and acoustical tile ceilings, commercial thermal windows and ADA compliant features, Information Technology ready, vinyl composition, ceramic tile and carpet floors. New facility will be fully air conditioned and heated with state of the art energy efficient systems; both mechanical and electrical. The site will be lighted and enhanced for security. The new structure will maintain the design standards found in the Government Center Campus and will conform to the standards of the initial Master Plan/ 2000 and the new up-dated Master Plan/ 2014. The site will be enhanced with graphics and landscaping consistent with the County standards.

**PROJECT BUDGET/** PRE - DESIGN

04-04-14

**ADDITIONS & RENOVATIONS/ OPTION 1**

New Additions: 3,825 s.f. / Renovation: 4,556 s.f./ Basement: 1,440 s.f.

■ **Construction Costs:**

**Sitework**

Paving/ C&G/ Grading: <i>Use: 3,825 s.f. @ 25.00 p.s.f.</i>	\$ 95,625 +/-
Utility Modifications/ Enhancements: <i>Use: 3,825 s.f. @ 10.00 p.s.f.</i>	\$ 38,250 +/-
<b>Subtotal / Sitework</b>	<b>\$ 133,875 +/-</b>

**Building**

New Additions/ First Floor: <i>Use: 3,825 s.f. @ \$170.00 p.s.f.</i>	\$ 650,250 +/-
Renovations: <i>Use: 4,556 s.f. @ 30.00 p.s.f.</i>	\$ 136,680 +/-
Basement/ Optional <i>Use: 1,440 s.f. @ 60.00 p.s.f.</i>	\$ 86,400 +/-
<b>Subtotal / Building</b>	<b>\$ 873,330 +/-</b>

**Total Construction** **\$1,007,205 +/-**

■ **Other Costs:**

Land	\$ 25,000 +/-
Interest ( \$1,007,000 x 6% ÷ 2 )	\$ 30,200 +/-
Arch./ Eng./ Survey/ Test ( Factor 9% )	\$ 90,600 +/-
Legal	\$ 6,000 +/-
Clerk of Works	\$ 10,000 +/-
Equipment ( By Owner )	\$ 30,000 +/-
Telephone/ Communications @ \$10,000	
Computer/ I.T. @ \$10,000	
Security Equipment @ \$10,000	
Landscaping Allowance	\$ 25,000 +/-
Environmental Study	\$ 5,000 +/-
Design Contingencies ( Use 8% / \$1,007,205 )	\$ 80,600 +/-

**Total/ Other Costs** **\$ 302,400 +/-**

**TOTAL PROJECT COSTS :** **\$ 1,309,605 +/-**

**SUGGESTED BUDGET :** **\$ 1,310,000 +/-**

**PROJECT BUDGET/** PRE - DESIGN

04-04-14

**ALL NEW FACILITY/ OPTION 2**

New Building of 8,500 s.f. +/-; plus Basement of 6,000 s.f. +/-

■ **Construction Costs:**

**Sitework**

Paving/ C&G/ Grading: \$ 212,500 +/-  
 Use: 8,500 s.f. @ 25.00 p.s.f.

**Building**

New Construction/ First Floor: \$ 1,190,000 +/-  
 Use: 8,500 s.f. @ \$140.00 p.s.f.

New Construction/ Basement \$ 360,000 +/-  
 Use: 6,000 s.f. @ \$60.00 p.s.f.

---

**Total Construction** \$1,762,500 +/-

■ **Other Costs:**

Land \$ 25,000 +/-  
 Interest ( \$1,762,500 x 6% ÷ 2 ) \$ 53,000 +/-  
 Arch./ Eng./ Survey/ Test ( Factor 9% ) \$ 159,000 +/-  
 Legal \$ 6,000 +/-  
 Clerk of Works \$ 7,000 +/-  
 Equipment ( By Owner ) \$ 30,000 +/-  
     Telephone/ Communications @ \$10,000  
     Computer/ I.T. @ \$10,000  
     Security Equipment @ \$10,000  
 Landscaping Allowance \$ 45,000 +/-  
 Environmental Study \$ 5,000 +/-  
 Design Contingencies ( Use 8% / \$1,762,500 ) \$ 141,000 +/-

---

**Total/ Other Costs** \$ 471,000 +/-

---

**TOTAL PROJECT COSTS :** \$ 2,233,500 +/-

<b>SUGGESTED BUDGET :</b>	<b>\$ 2,235,000 +/-</b>
---------------------------	-------------------------

**F. Annual Operating Budget for Facility and Owner**

Industrial Development Authority				
Greenville County				
Greenville County Sheriff's Department				
Operating Budget for New Facility				
<b>Expenses</b>				
Lease of Equipment				\$ 3,200
Telecommunications				\$ 12,500
Custodians				\$ 8,887
Electrical				\$ 25,000
Heating				\$ 5,000
Water & Sewer				\$ 650
Property Insurance				\$ 2,000
Repair & Maintenance Supplies				\$ 1,000
Total				\$ 58,237
<b>Revenue</b>				
Contribution from Greenville County				\$ 58,237
Total				\$ 58,237

The above budget information prepared by Greenville County.

**G. Preliminary Design**

Floor Plan/ Existing	A-1
Floor Plan/ Proposed	A-2
Basement Plan/ Proposed Option	A-2.1
Elevation Studies	A-3
Elevation Studies	A-4

A-1

EXISTING

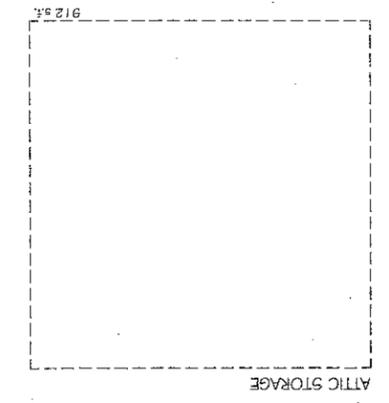
DATE: MARCH 7, 2014  
JOB NUMBER:  
DRAWN BY:  
CHECKED BY:  
REVISIONS:

PRELIMINARY ARCHITECTURAL REPORT  
**GREENSVILLE COUNTY  
SHERIFF'S OFFICE EXPANSION**  
GREENSVILLE COUNTY GOVERNMENT CENTER  
EMPORIA, VIRGINIA

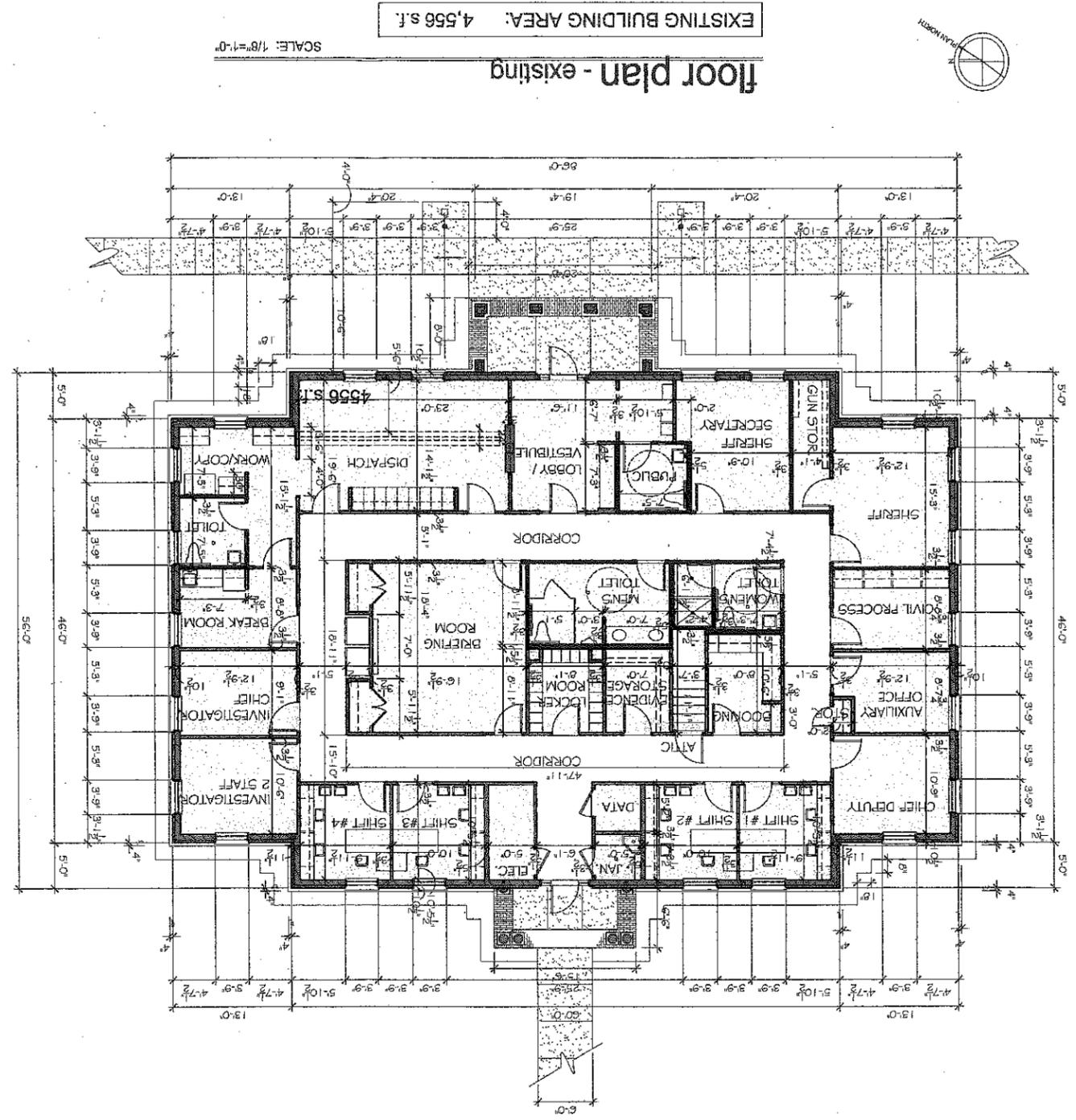
OWNER:  
GREENSVILLE COUNTY BOARD OF SUPERVISORS  
K. David Whiteington, County Administrator  
GREENSVILLE COUNTY  
James R. Edwards, Jr., Sheriff  
GREENSVILLE COUNTY

**BAXTER BAILEY  
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GREENSVILLE, VIRGINIA 22189  
PH: 540.251.2521 FAX: 540.251.4657

preliminary drawings



EXISTING SPACES:	
LOBBY & VESTIBULE	200 s.f.
PUBLIC TOILET	54 s.f.
DISPATCH ROOM	325 s.f.
WORK/COPY	95 s.f.
STAFF TOILET	54 s.f.
BREAK ROOM	110 s.f.
INVESTIGATOR/CHIEF	115 s.f.
INVESTIGATOR/2 STAFF	134 s.f.
VENDING AREA	21 s.f.
BRIEFING ROOM	338 s.f.
SHIFT OFFICE #1	103 s.f.
SHIFT OFFICE #2	103 s.f.
SHIFT OFFICE #3	103 s.f.
SHIFT OFFICE #4	103 s.f.
ELEC. DATA	56 s.f.
JANITORS CLOSET	30 s.f.
DATA (NOW STORAGE)	26 s.f.
CHIEF DEPUTY	156 s.f.
CIVIL PROCESS	112 s.f.
SHERIFFS OFFICE	195 s.f.
GUN STORAGE/SECURE	58 s.f.
SHERIFFS SECRETARY	163 s.f.
LOCKER ROOM (NOW EVIDENCE)	72 s.f.
EVIDENCE STORAGE	62 s.f.
BOOKING	64 s.f.
WOMENS TOILET	60 s.f.
MENS TOILET	136 s.f.
SUBTOTAL ASSIGNABLE SPACES (70%)	3,182 s.f.
CIRCULATION & CONSTRUCTION (30%)	1,374 s.f.
TOTAL AREA FIRST FLOOR (100%)	4,556 s.f.
ATTIC STORAGE	912 s.f.
GROSS AREA	5,468 s.f.

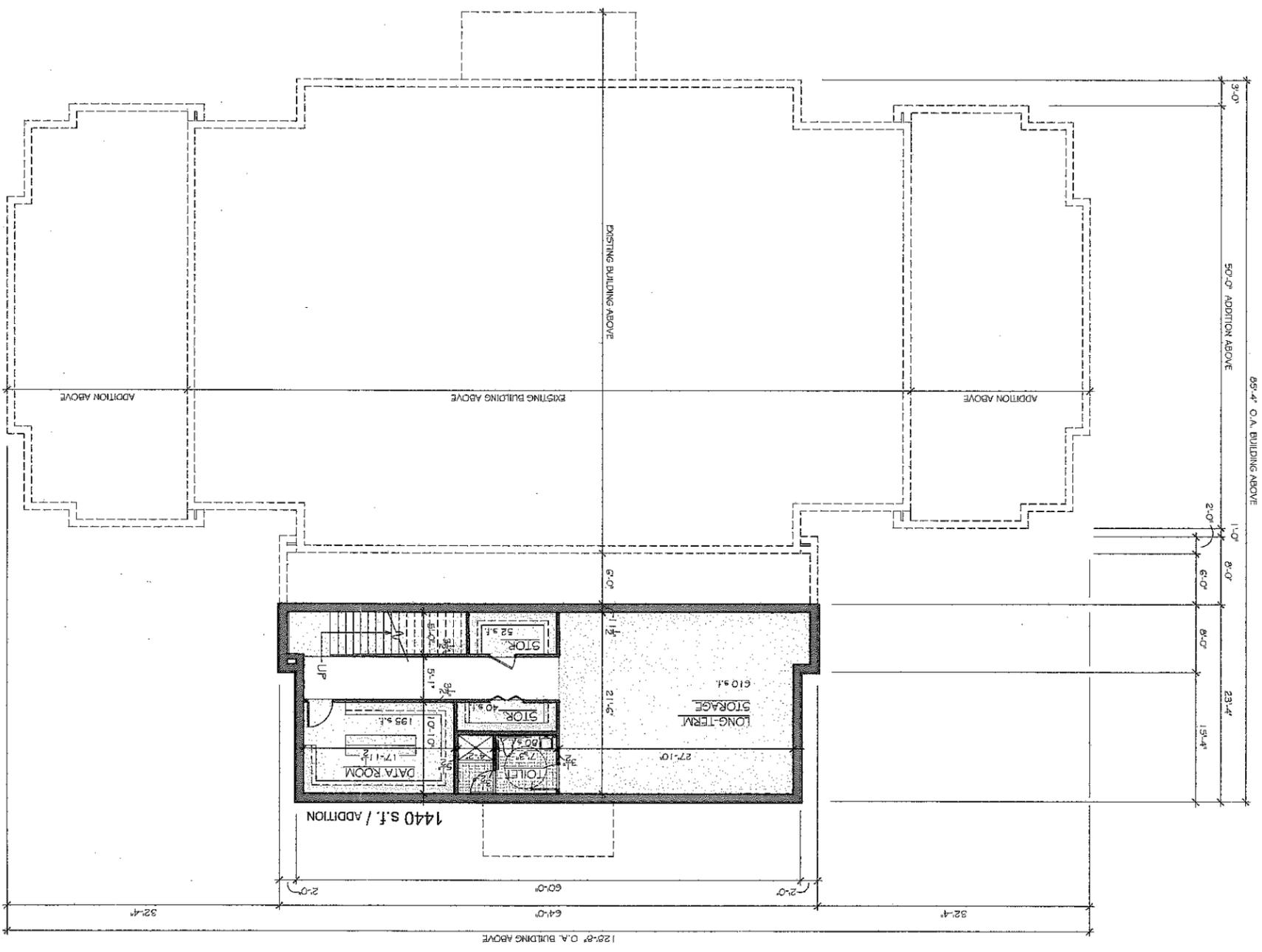


EXISTING BUILDING AREA: 4,556 s.f.

SCALE: 1/8"=1'-0"

floor plan - existing





EXISTING BUILDING AREA/ GROUND LEVEL:	4,556 s.f.
PROPOSED BUILDING AREA/ GROUND LEVEL:	3,825 s.f.
PROPOSED BUILDING AREA/ BSMT. LEVEL:	1,440 s.f.
TOTAL BUILDING AREA:	9,821 s.f.

**floor plan - proposed expansion @ basement level**  
 SCALE: 1/8"=1'-0"

preliminary drawings

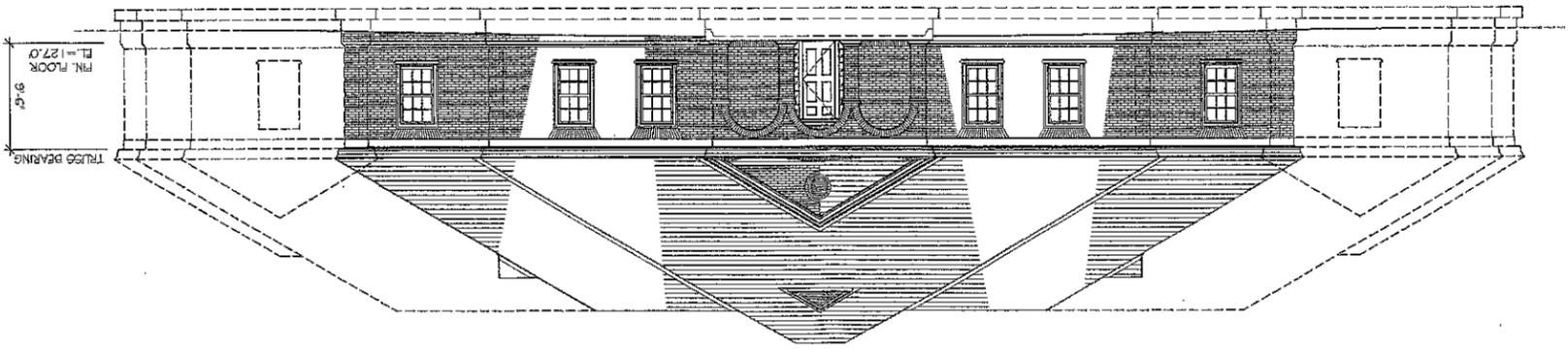
PROPOSED  
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DATE: MARCH 27, 2014  
 JOB NUMBER:  
 DRAWN BY:  
 CHECKED BY:  
 REVISIONS:  
 1.) APRIL 24, 2014

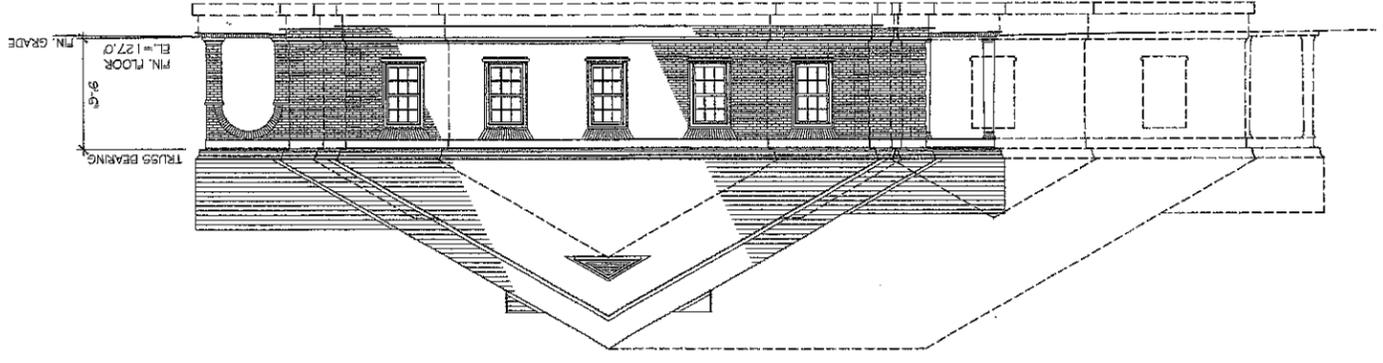
PRELIMINARY ARCHITECTURAL REPORT  
**GREENSVILLE COUNTY SHERIFFS OFFICE EXPANSION**  
 GREENSVILLE COUNTY GOVERNMENT CENTER  
 EMPORIA, VIRGINIA

OWNER:  
 GREENSVILLE COUNTY BOARD OF SUPERVISORS  
 K. David Whitlington, County Administrator  
 GREENSVILLE COUNTY  
 James R. Edwards, Jr., Sheriff  
 GREENSVILLE COUNTY

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 (804) 525-4533 FAX (804) 525-4530



east elevation - proposed expansion  
SCALE: 1/8"=1'-0"



south elevation - proposed expansion  
SCALE: 1/8"=1'-0"

preliminary drawings

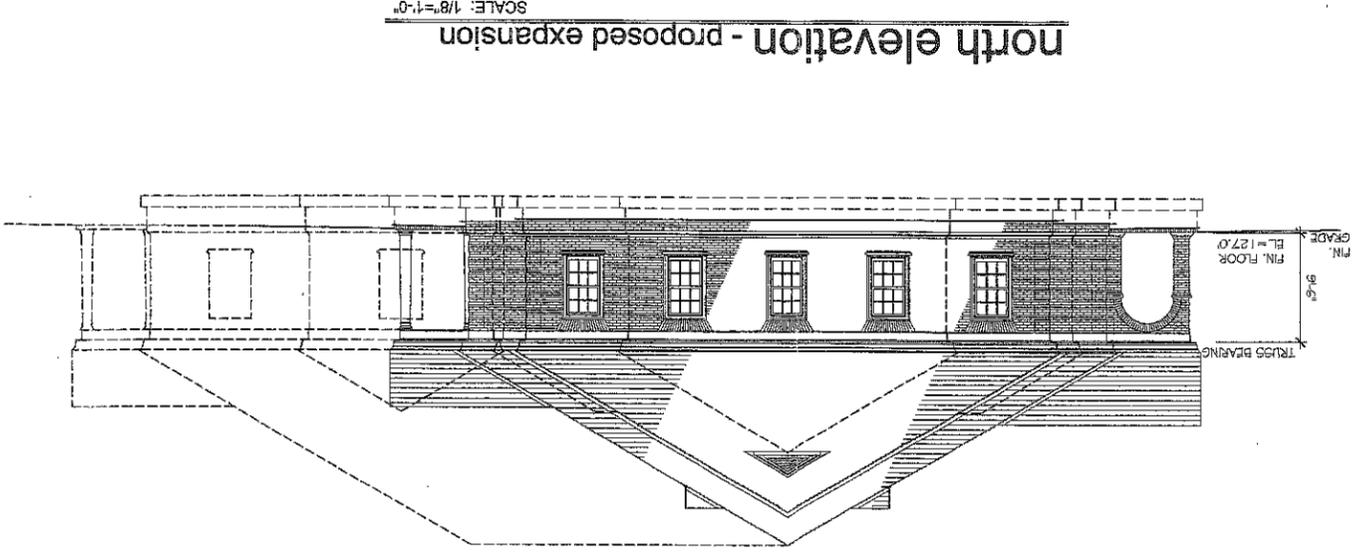
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A-3

DATE: MARCH 7, 2014  
JOB NUMBER:  
DRAWN BY:  
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REVISIONS:

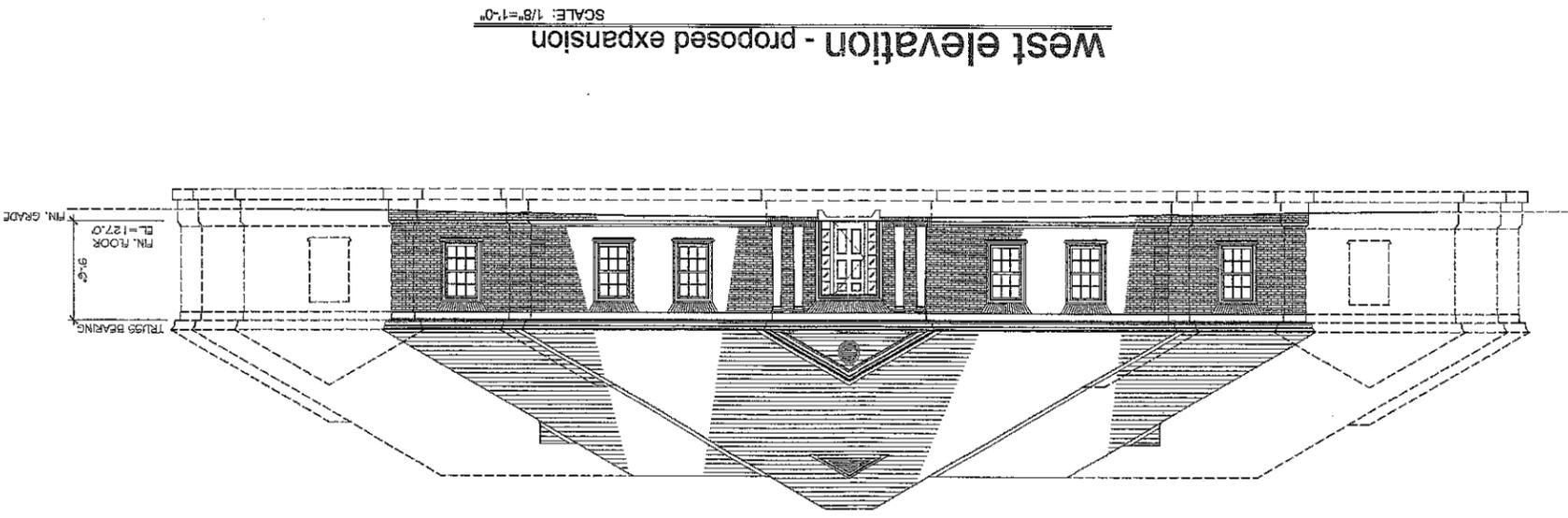
PRELIMINARY ARCHITECTURAL REPORT  
GREENSVILLE COUNTY  
SHERIFFS OFFICE EXPANSION  
GREENSVILLE COUNTY GOVERNMENT CENTER  
EMPORIA, VIRGINIA

Owner:  
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K. David Worthington, County Administrator  
GREENSVILLE COUNTY  
James R. Edwards, Jr., Sheriff  
GREENSVILLE COUNTY

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(804) 343-1800 FAX (804) 343-9270



north elevation - proposed expansion  
SCALE: 1/8"=1'-0"



west elevation - proposed expansion  
SCALE: 1/8"=1'-0"

preliminary drawings

A-4

PROPOSED

REVISIONS:

DRAWN BY:  
CHECKED BY:

JOB NUMBER:

DATE: MARCH 7, 2014

PRELIMINARY ARCHITECTURAL REPORT  
**GREENSVILLE COUNTY  
SHERIFFS OFFICE EXPANSION**  
GREENSVILLE COUNTY GOVERNMENT CENTER  
EMPORIA, VIRGINIA

Owner:  
GREENSVILLE COUNTY BOARD OF SUPERVISORS  
K. David Whitlington, County Administrator  
GREENSVILLE COUNTY  
James R. Edwards, Jr., Sheriff  
GREENSVILLE COUNTY

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## H. Construction Problems

Overall major 'construction problems' do not appear to be present at this site. This is to say that (a) soils are good and stable for this type of single-story construction; (b) land is available, cleared and sufficient for the additions proposed; (c) the existing building is in good to excellent condition and will accept relatively minor and limited interior renovations; (d) this structure is well detailed in its original format and can/ will receive additions in a straightforward manner with no adverse effect to the existing.

The one area that merits concern and caution, as the design develops, are the Underground Utilities found in the path of the proposed additions; and the effect of the utilities network to the new work. The network to be carefully considered and redesigned includes: (a) underground Electrical power entry and transformer location; (b) the underground Communications lines; and (c) the underground Sanitary Sewer line; all of which are located on the North side of the existing building within the footprint of the additions.

Also, on the South side of the existing building and within the footprint of the addition is located (a) underground Telephone entry; and (b) proposed future municipal Gas line.

Finally, to the West side and within that footprint lies (a) the primary underground Communications line coming from the Government Center Building; (b) an underground Telephone line; and (c) an existing domestic propane Gas line and tank array. Also on the West side of the structure is located (d) the auxiliary underground Electric power line connecting to the Emergency Generator across the driveway. All of these existing Utility lines must be identified, evaluated and ultimately relocated so as to not interfere with the new construction. Also they must be arranged and relocated so as to not interrupt service during construction. The Sheriff's Office must remain operational at all times.

While the Utilities are of concern these conditions can be managed through design and due diligence and should not be considered a significant impediment to the overall project.

## I. Conclusions

The County is faced with the option of either expanding the Present Facility in place, or building an All New Facility on an alternate site. The Present Facility is about 12 years old and in excellent condition with continued long life expectancy; but lacking in sufficient space and parking. Through a series of additions and modifications, we find that the existing facility can be sufficiently expanded to meet the present/ future needs of the Sheriff's Office; all for a cost of \$1,310,000 +/- approximately .

Conversely, the cost and impact of building an All New Facility has been considered, and a probable end cost of \$2,235,000 +/- is anticipated. While it would be nice to plan and build an all new facility; and while this would provide the County with an excellent opportunity to re-purpose the existing facility to another user; the impact of an additional capital outlay of \$925,000 +/- at this junction does not seem justifiable. This in light of there being no clear standing/ need for the re-purposing of the original.

This design team recommends in favor of Option # 1/ Additions and Renovations, finding it to be the most cost-effective approach in solving the current and pressing needs of the Sheriff's Office day-to-day operations.

Please refer to the two budget options offered under Cost Estimates, Section E.

# exhibit 1

## **Architectural Report**

---

Overview: In the original Proposal for Services for the preparation of requested Preliminary Architectural Report (PAR), regarding the proposed Sheriff's Office Expansion, a set of four primary tasks was set out, and accepted, as the 'base plate' for the development of this PAR Assignment.

Outlined here is a brief summary of the four tasks and how they have been implemented to guide and inform the PAR as a whole.

- Part 1 - Evaluation of Existing Conditions
- Part 2 - Analysis of Building Deficiencies
- Part 3 - Alternative Solutions
- Part 4 - Final Report Delivery

## exhibit 2

### Geotechnical Engineering Report

---

- Originally prepared by EEE Consulting, Inc., for Buildings #1, #2 and #4, all as part of the (initial) Greenville County Government Center, Master Plan/ 2000: and is included herein in its entirety.
  
- Boring BH #1 of this report deals directly with the soils beneath the present Sheriff's Office site; and as such remains relevant and useful to the Sheriff's Office Expansion outlined in this PAR.

# **ARCHITECTURAL REPORT**

---

## **GREENSVILLE SHERIFF'S OFFICE EXPANSION**

### **■ Part 1 – Evaluation of Existing Conditions**

As the Architects of Record for the original building of 2002, our familiarity with the construction and layout of the existing facility proved an invaluable resource as we conducted the first part of the PAR process. On site inspections coupled with the analysis of the original construction documents allowed for an informed evaluation of the existing building and site; with focus on the possibility for expansion. The existing building was found to be in good-to-excellent condition with regards to structure, and is expected to allow for an addition to both sides of the building as well as the rear. Supporting M/E/P systems were found to be adequate and are recommended to be left in place for the remainder of their life cycle, while new support systems are to be added for proposed additions. The site was found to allow for additional parking to be added without violating adjacent parcels. All-in-all both the building and site were deemed as excellent candidates for expansions/ enhancements.

### **■ Part 2 – Analysis of Building Deficiencies**

Upon meeting with Sheriff Edwards and key staff of the Greenville County Sheriff's Office, a room-by-room survey of the existing facility was conducted so as to best determine and record all existing building deficiencies, and to set-out in graphic form the specific Space Needs and general scope of work required/ requested in the proposed addition/ enhancements. This survey work, once in place and approved, formed the basis for the Program.

### **■ Part 3 – Alternative Solutions**

With the Space Needs/ Program in place, a Relationship of Spaces was established to guide the Preliminary Design of a series of additions/ renovations to the existing Sheriff's Office. The proposal to generally maintain the majority of the existing spaces/ functions while providing much needed enhancements and enlargements through a series of additions to the existing building was described in a series of Floor Plans and Elevations, with parking improvements described in the Proposed Site Plan. These Preliminary Design drawings are included herein and have been approved by the Sheriff and key staff members as adequately addressing the current and future Space Needs for the Sheriff's Office.

#### ■ **Part 4 – Final Report Delivery**

The final report in its completed form is contained herein and is complete and deliverable on May 16, 2014. We trust that this evaluation, analysis and proposal of alternative solutions which includes site concept design, preliminary drawings and project budgets will meet the needs and highest expectations of Greenville County. We have had great professional satisfaction in preparing this Preliminary Architectural Report.

# Geotechnical Engineering Evaluation

## Greensville County Government Center Buildings 1, 2, and 4

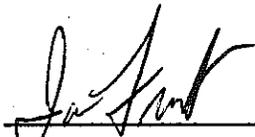
### Greensville County, Virginia

Prepared For:  
Baxter Bailey & Associates  
11 East Franklin Street  
Richmond, Virginia 23219

Prepared By:  
EEE Consulting, Inc.  
17112 Mountain Road  
P.O. Box 354  
Montpelier, Virginia 23192-0354

Project No. 01-030

June 2001



Ian G. Frost, CEP, AICP  
President



Michael R. Thomas, P.E.  
Director of Geotechnical Engineering



**EEE Consulting, Inc.**

Environmental, Engineering and Educational Solutions

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- A Boring Logs
- B Laboratory Test Results

## 1.0 INTRODUCTION

This report presents the results of a geotechnical engineering evaluation prepared for the proposed Buildings 1, 2, and 4 at the Greensville County Government Complex. Figure 1 presents the regional topography with the approximate location of the site shown and Figure 2 presents the general site layout and topography. EEE Consulting, Inc. of Richmond, Virginia performed this evaluation under contract to Greensville County.

This evaluation was performed to evaluate the geotechnical engineering conditions for the proposed structures. The scope of this evaluation did not include the evaluation of environmental concerns.

This report is provided for the sole use of Greensville County and their designated representatives. Use of this report by any other parties is not authorized and will be at such party's own risk. EEE Consulting disclaims liability for use or reliance of this report by other parties.

### 1.1 SITE DESCRIPTION

The site is located on the northwest side of US Route 301 (Sussex Drive) approximately 2 miles north of the Town of Emporia in Greensville County, Virginia. A relatively new road, Uriah Branch Way, which leads from US Route 301 to Southside Regional Jail, forms the east boundary of the area of development. Access to the proposed buildings will primarily be from Uriah Branch Way.

The property is relatively flat and consists of grass and mowed weeds. The site is relatively flat to slightly sloping toward the south. Near the intersection of Uriah Branch Way and U.S. Route 301 the roadway cut slopes at an inclination of about 4:1 (horizontal to vertical) from the property down to the roadway. Elevations on the site range from approximately 125 feet to 110 feet mean sea level (msl). The three proposed structures are a portion of the entire Government Complex and constitute the first phase of the development.

### 1.2 PROPOSED CONSTRUCTION

The proposed project consists of construction of three new office structures for the government complex. It is our understanding that Buildings 1 and 2 will be single story structures with typical wall loading in the range of 4,000 plf and column loads in the range of 20,000 to 25,000 pounds. Building 4 will likely be a three-story structure with a basement. It is anticipated that the structure will have a steel frame with both interior columns and perimeter wall footings. It is our understanding that there is currently no estimate of foundation loads for this structure.

### 1.3 OBJECTIVES AND SCOPE OF WORK

The objectives of this study were to evaluate subsurface conditions in the vicinity of the proposed structures and to develop geotechnical engineering recommendations to guide design and

construction of foundations and adjacent pavements. To accomplish these objectives, the following tasks were performed:

1. Four exploratory borings extended to depths of 20 to 30 feet were drilled within the footprints of the proposed structures to provide information on subsurface conditions. In addition, five exploratory probes were extended to a depth of five feet for analysis of subsurface conditions in the areas of proposed pavement. A geotechnical engineer classified collected soil samples in the field.
2. Laboratory tests were performed to measure pertinent soil properties.
3. Engineering analysis of the field and laboratory data was made to develop recommendations for foundation design and construction.

It should be noted that specific pavement designs were not requested as part of this evaluation. Laboratory testing was performed on near-surface soil samples to evaluate the California Bearing Ratios (CBR) of these materials. These values can be used along with traffic information to develop appropriate pavement designs. Table 1 presents a summary of the CBR test results; the detailed laboratory CBR results are presented in Appendix B.

The scope of this evaluation included evaluation of the geotechnical engineering conditions for the proposed structures. This scope did not include the evaluation of environmental concerns related to soil or groundwater contamination.

## 2.0 METHODS OF INVESTIGATION

Subsurface soil conditions at the site were evaluated by drilling four exploratory borings and five exploratory probes with a truck-mounted drill rig using continuous flight auger drilling techniques. The borings were drilled to depths ranging from 20 to 30 feet and the probes were drilled to a depth of five feet. The locations of the borings are shown on Figures 2. Detailed descriptions of the soils encountered are presented on the attached boring logs in Appendix A.

During the geotechnical evaluation, subsurface soils encountered in the borings, were sampled and used to evaluate foundation conditions for structures. Samples were obtained continuously to a depth of 10 feet, and at approximately 5-foot intervals, thereafter. The soils were sampled by driving a 2-inch diameter split barrel sampler into the soil with a 140-pound hammer free falling 30 inches using standard penetration test (SPT) procedures. The SPT borings were completed in general accordance with guidelines established in ASTM D-1586. Driving resistances for the split-barrel sampler are recorded on the attached boring logs (Appendix A). Representative portions of the split spoon samples were sealed and packaged in the field and delivered to a geotechnical engineering laboratory in Richmond, Virginia for classification and strength testing.

The laboratory testing program was directed primarily towards classification properties of the soils encountered in the borings. Prior to transport to the laboratory for testing, a geotechnical engineer visually classified the samples. Bulk samples of near surface soils were obtained from Probes P-1, P-2, P-3, P-4, and P-5. Laboratory testing of five of these bulk samples consisted of standard Proctor and California Bearing Ratio (CBR) tests. The results of these tests were used to evaluate compaction properties of the soil and to provide soil strength data for the pavement design. Natural Moisture Content, Percentage Passing the No. 200 Sieve, and Atterberg limits tests were performed on selected jar samples obtained from borings within the building footprints for purposes of classification of the soil. The following tests were performed as part of the laboratory program:

- ❖ Natural Moisture Content Test (ASTM D-2216),
- ❖ Percentage finer than the No. 200 sieve (ASTM D-1140),
- ❖ Atterberg limits test (ASTM D-4318),
- ❖ Standard Proctor compaction test (ASTM D-698), and
- ❖ California Bearing Ratio (CBR) test (ASTM D-1883).

The moisture content testing was performed on the near surface soils to assist with the evaluation of the depth to the water table and the suitability of excavated soils as structural fill.

The results of the laboratory tests are presented in Appendix B.

### 3.0 SITE CONDITIONS

#### 3.1 REGIONAL GEOLOGY AND MAPPED SOILS

The site is located within the Atlantic Coastal Plain physiographic province. The mapped surficial soils belong to the Windsor formation (Figure 3). The Windsor formation soils are described as lower Pleistocene to upper Pliocene in age and consist of gray and yellowish to reddish brown sand, gravel, silt, and clay. The surficial deposits are underlain by the soils of the Yorktown formation. The Yorktown formation is Miocene in age. The top of the Yorktown formation typically consists of a relatively thin layer of bluish gray to gray highly plastic clay. This layer typically acts as an aquaclude between the overlying soils and the underlying Yorktown soils. Below the highly plastic layer of the Yorktown formation the soils typically consists of bluish gray to gray, fossiliferous, medium dense silty sands, and firm to very stiff sandy silts and silty clays. Shell beds are often abundant in this formation. In the vicinity of the subject site the soils of the Yorktown formation are often quite thin and are underlain by bedrock.

#### 3.2 SUBSURFACE CONDITIONS

A total of four exploratory borings (from which split spoon samples were obtained) and five shallow exploratory probes (from which only bulk samples were obtained) were drilled across the area of proposed development to investigate the subsurface conditions. EEE Consulting selected the locations of the borings and probes in consultation with Jeff Robinson & Associates, LLPC. Field personnel from EEE located the borings by taping and pacing from building corners, which had recently been survey located. The locations of the proposed structures and the exploratory borings are shown on Figure 2.

The soils encountered in the exploratory borings generally consisted of layers of loose to dense clayey and silty, fine-to coarse-grained sand (SM/SC) and firm to hard silty, clay (CL/CH), which extended to the maximum depth explored in Borings 1 and 2 and to depths of about 18 to 18.5 feet in Borings 3 and 4. These soils were underlain in Borings 3 and 4 by slightly silty dark bluish gray clay, which extended to the bottoms of both borings. This clay contained numerous shell fragments, which is typical for the Yorktown formation soils.

The near surface sand layers alternated between fine-grained to coarse-grained sand in a clay matrix. The six shallow probes also encountered fine- to coarse-grained sands. A topsoil layer ranged in thickness across the site from non-existent to approximately 12 inches in thickness. At the bottom of each of Borings 3 and 4 a hard rock surface was encountered at the depth of 30 feet.

#### 3.3 GROUND WATER

Groundwater was encountered at depths of 16.5 and 13.9 feet in Borings 1 and 2 respectively at the time of drilling. Boring 1 had caved at a depth of 15.9 feet approximately 4 hours following drilling and Boring 2 had caved at a depth of 9 feet three hours following drilling. Groundwater was not

encountered in either Borings 3 or 4 at the time of drilling and both holes caved within six feet of the ground surface, during extraction of the hollow stem augers. All borings were backfilled with the soil cuttings following completion of the drilling operations.

Based on our review of laboratory soil moisture content data for Boring 3 it appears that the groundwater table should be expected at a depth of about 15 feet beneath the existing ground surface. It should be noted that fluctuations in the ground-water level might also occur due to variations in rainfall, temperature and other factors not evident within the short duration of this subsurface evaluation.

## 4.0 GEOTECHNICAL RECOMMENDATIONS

The following recommendations are based on a review of the attached boring logs and laboratory data, EEE's understanding of the proposed construction, and past experience with similar projects and subsurface conditions. Should the proposed development plans or structural conditions differ significantly from those on which our recommendations are based, EEE should be allowed the opportunity to review and evaluate the findings of this report so that the recommendations may be confirmed, extended, or modified as necessary. Should subsurface conditions be encountered during construction that are different from those encountered in this evaluation, then those differences should be reported to EEE for review and evaluation.

### 4.1 EARTHWORK

#### 4.1.1 Site Grading

Due to the relatively flat topography in the area of the proposed structures, it is likely that site grading to establish building pads will be minimal (cuts and fills less than about 3 feet). The existing embankment located at the southwest corner of Uriah Branch Way and U.S. Route 301 will be cut back to generate some fill soils for the construction. In addition, it is anticipated that Building 4 will have a one-story basement with a total depth of 10 to 12 feet. This excavation will also generate fill soil for use on the site. The soils generated by these excavations (excluding topsoil) will be suitable for re-use as structural fill. The clayey soil layers may be somewhat difficult to place and compact if they are allowed to become wet. Soils that are allowed to become wet will require drying prior to placement as structural fill. During site work all disturbed areas should be sloped to drain to suitable discharge facilities. Water should not be allowed to pond on exposed soil surfaces. Details regarding the placement and compaction of structural fill are presented in Section 4.1.4 Structural Fill.

Site work should begin with the clearing of all vegetation and topsoil from those areas designated for construction of the new facilities. All vegetation and any debris should be removed from the site. EEE estimates an average topsoil thickness of about 6-inches. Topsoil may be saved and used at the end of construction in landscape areas. Holes resulting from the removal of root balls or other underground obstructions should be properly backfilled with compacted structural fill soil.

Following stripping operations, areas at grade or designated to receive fill should be proofrolled with a partially loaded dump truck or similar piece of rubber tired equipment to identify those areas requiring repair. Any area which ruts or pumps excessively in the opinion of the geotechnical engineer should be repaired in the field as directed by the geotechnical engineer prior to the beginning of fill operations. Based on our observation and SPT information, it does not appear that large quantities of undercut will be required except where saturated soils are encountered.

Other than organic topsoil, the need for undercutting is directly related to the moisture condition of natural soils at the time earthwork is initiated. The natural near-surface soils are moderately well drained but may become soft and difficult to compact during the typically wetter winter months of

November through April or May. In addition, during these wetter months it is very difficult to dry soils that are above the optimum moisture content. To avoid delays during site grading operations, we recommend earthwork activities be scheduled after May and prior November, if possible, to facilitate site grading work.

#### **4.1.2 Excavation Considerations**

The sandy soils encountered in the exploratory borings may tend to slough when exposed in vertical cuts. The need for and design of temporary shoring should be the sole responsibility of the contractor. All excavations should conform to applicable OSHA guidelines for safety considerations.

#### **4.1.3 Ground-Water Control**

The groundwater surface was encountered in Borings 1 and 2 at a depth of about 14 to 16.5 feet beneath the ground surface at the time of the field exploration. At the time of the field exploration southern Virginia was experiencing below normal rainfall, which may have depressed the elevation of the groundwater table by up to several feet. Therefore, during a normal rainfall year the groundwater table may be several feet higher than encountered during the subsurface investigation. Based on the ground-water observations made during the field investigation, ground-water control may become an issue during construction depending on the depth of the basement for Building 4. The excavation for Building 4 may encounter the groundwater table if the excavation is extended much below a depth of 10 feet. If groundwater is encountered, the contractor should design an appropriate dewatering system. The ultimate determination of the need for temporary dewatering system and the design of such a system should be the responsibility of the contractor.

The basement walls for Building 4 should be waterproofed and should be designed in accordance with Section 4.2.2 Retaining Walls this report.

#### **4.1.4 Structural Fill**

All saturated and/or organic laden topsoil materials should be considered as unsuitable for reuse as structural fill and should be removed from the building area and disposed of properly. Overall, the soils encountered at the site will be suitable for reuse as structural fill beneath foundations and pavements. Prior to placement of the fill the natural soils should be scarified to a minimum depth of 6 inches. This scarification will provide adequate meshing of placed fill materials at the fill interface, which will minimize the potential of shear failure. All fill material placed on the site should be compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D 698) except in the final 12-inches beneath pavements and floor slabs where this requirement should be increased to 98 percent of the standard Proctor maximum dry density. Fill material should be placed in thin lifts not to exceed 8 inches (loose measure) and compacted within 2 percent of the optimum moisture content. The project specifications should require testing of each lift of fill to confirm the required degree of compaction is achieved. A Nuclear Moisture Density Gauge (NMDG) will be suitable for

compaction testing of on-site material if used as structural fill. Alternative methods of testing compaction (Sand Cone - ASTM D1556-90 or Drive Cylinder - ASTM D 2937-90) may be utilized periodically for verification of the accuracy of the NMDG test results during placement of structural fill. For earthwork volume considerations, a shrinkage factor of 10 to 15 percent is recommended when virgin soils are recompacted as engineered fill.

If off-site soils are used as structural fill, the materials best suited for this use are either a low plasticity clay (e.g., silty or sandy clay - CL) or relatively clean sands (SM, SC, SP, SW). Low plasticity clays should have plasticity indices and liquid limits less than about 25 and 45, respectively. Granular soils (sand) should have less than 40 to 50 percent passing the No. 200 sieve (percent fines). While soils can be used which have properties outside these limits, the higher the plasticity (plasticity index and liquid limit), and the more fines (percent passing the No. 200 sieve), the more moisture sensitive and the more difficult to compact. High plasticity clays and silts should not be used as structural fill.

#### **4.1.5 Utility Installation**

EEE recommends utility pipes be placed directly over at least 6 inches of open-graded crushed stone, such as No. 57 stone or clean sand to provide a leveling cushion and a stable base for the pipe. If very soft, unstable soil conditions are encountered at the invert elevation, the trenches should be overexcavated approximately 12 inches and replaced with clean sands or open graded stone. Determination of the need to undercut unsuitable soils should be made during construction by the geotechnical engineer or experienced senior soil technician.

All backfill placed over the pipe should be compacted to at least 95 percent of the standard Proctor maximum dry density except in the final foot beneath pavements or building subgrades where the requirement should be increased to 98 percent of the standard Proctor maximum dry density. If the soil cannot be compacted beneath and adjacent to the pipe, stone should be used for backfill. The initial lift of soil backfill over the pipe should consist of material not containing large pieces of rock or weathered rock to serve as a cushion over the pipe for subsequent fill placement and compaction. Additionally, in-place density tests should be performed to confirm backfill compaction requirements are being met. Most soils removed from the excavation may be utilized as backfill providing they can be suitably compacted. Shallow excavations (less than 3 feet deep) should hold a neat vertical line for temporary trench cuts; however, all excavations should be in accordance with applicable OSHA regulations for safety to workmen.

#### **4.1.6 Seismic Potential**

The proposed site lies within a band which extends up the east coast of the Mid-Atlantic states rated as Zone 1, as determined by the U.S. Coast and Geodetic Survey. This rating system ranges from 0 (no damage) to 3 (major damage) and estimates the seismic risk in the United States. Zone 1 is defined as being only a slight risk of minor damage due to a major earthquake. The probable frequency of occurrences of major earthquakes was not considered in assigning ratings to the various

zones; however, the proposed site is not in a high-intensity-earthquake-prone area of the United States. Based on Section 1610.0 Earthquake Loads of the 1996 BOCA National Building Code, the site soil profile falls into the category  $S_1$ , which corresponds to a Site Coefficient of 1.0. In addition, based on Figures 1610.0.3(1) and (2), we recommend that the design incorporate an Average Peak Velocity of 0.005 and an Average Peak Acceleration of 0.005.

## 4.2 FOUNDATION DESIGN AND ANALYSES

### 4.2.1 Shallow Foundations

The soils encountered at the site are suitable for support of shallow foundations for the proposed structures. Conventional continuous and isolated spread footings bearing on firm undisturbed native soils or on engineered fill may be used. All footings should be founded at least 18 inches below the nearest adjacent finished grade. Footings located adjacent to other footings or utility trenches should have their bearing surfaces situated below an imaginary 1.5 horizontal to 1 vertical plane projected upward from the bottom of the adjacent footing or utility trench.

At the above depths, the footings may be designed for an allowable bearing pressure of 3,000 pounds per square foot due to dead loads, 3,750 pounds per square foot due to dead plus live loads and 4,500 pounds per square foot for all loads including wind or seismic. The allowable load capacity calculated for dead loads includes a factor of safety of 3.0. The allowable bearing pressures are net values; therefore, the weight of the footing can be neglected for design purposes. All isolated spread footings should have a minimum width of 24 inches, and all continuous footings should have a minimum width of 18 inches. All continuous footings should be tied together with reinforcing steel. Maximum anticipated settlements of shallow foundations are 1.0 inch with a maximum differential settlement of approximately 0.5 inches.

All continuous footings should be designed with adequate top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. Any visible cracks in the bottoms of the footing excavations should be closed by wetting prior to construction of the foundations. To assure that footings are founded on appropriate material, we recommend that a geotechnical engineer observe the footing excavations prior to placing steel or concrete.

Lateral load resistance may be developed in friction between the footing bottom and the supporting subgrade. A friction coefficient of 0.30 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighing 300 pounds per cubic foot acting against the foundations may be used. If the foundations are poured neat against the soil, friction and passive resistance may be used in combination.

### 4.2.2 Retaining Walls

Restrained and unrestrained walls with a level surface or with a sloping surface flatter than 4:1 above the wall should be designed to resist an equivalent fluid pressure of 55 and 40 pounds per cubic foot,

respectively. If the structural engineer determines that there are surcharge loads on the walls, the walls should be designed to resist an additional uniform pressure equivalent to one-half or one-third of the maximum anticipated surcharge load applied to the surface behind restrained or unrestrained walls, respectively.

The above pressures assume that sufficient drainage will be provided behind the walls to prevent the build-up of hydrostatic pressures from surface and subsurface water infiltration. In cases where there is the possibility of the retaining wall extending below the water table or where perched water may accumulate behind the retaining wall, hydrostatic pressures should be added to the design soil pressures.

Walls constructed above the seasonal high water table may be designed with adequate drainage to avoid superimposing a hydrostatic load. Adequate drainage may be provided by an underdrain system consisting of a four-inch rigid perforated pipe bedded in 3/4-inch clean, open-graded rock. The entire rock/pipe unit should be wrapped in an approved non-woven, polyester geotextile. The rock and fabric placed behind the wall should be at least one foot in width and should extend to within one foot of finished grade. The upper one-foot of backfill should consist of on-site, compacted, impervious soils. Flexible, perforated pipe is not an acceptable pipe for use in the underdrain system. The underdrain pipe should be a rigid pipe that connects to a system of closed pipes that daylight from behind the wall. As an alternative to the underdrain system a series of weep-holes constructed at the bottom of the wall may be used. The construction of weep-holes through the wall will eliminate the need for the underdrain pipe behind the wall.

#### **4.2.3 Interior Floor Slabs-On-Grade**

We recommend that interior floor slabs be supported on a minimum of 6 inches of granular fill soil. The slabs may be designed for an assumed subgrade modulus of 90 pci in cut areas. This subgrade modulus may also be used in fill areas provided the upper 12 inches of the fill soil is compacted to a minimum of 95 percent of the standard Proctor maximum dry density. Prior to final construction of the slab, the subgrade surface should be proof-rolled to provide a smooth, firm surface for slab support. Any areas that exhibit pumping or rutting during proof rolling should be repaired by undercutting the area and backfilling with either washed stone or properly compacted engineered structural fill. The slabs should be appropriately reinforced according to structural requirements; concentrated loads may require additional reinforcing.

In areas where floor wetness would be undesirable, 4 inches of free draining gravel should be placed beneath the floor slab to serve as a capillary barrier between the subgrade soil and the slab. In order to minimize vapor transmission, an impermeable membrane should be placed over the gravel.

We also recommend that the specifications for slab-on-grade floors require that moisture emission tests be performed on the slab prior to the installation of any flooring. No flooring should be installed until acceptable moisture emission levels are recorded for the type of flooring to be used.

#### 4.2.4 Exterior Slabs-On-Grade

Exterior slabs-on-grade (concrete pavement areas) should be supported by a minimum of 6 inches of compacted granular backfill. The slabs may be designed for an assumed subgrade modulus of 90 pci in cut areas. This subgrade modulus may also be used in fill areas provided the upper 12 inches of the subgrade is compacted to a minimum of 95 percent of the standard Proctor maximum dry density. Prior to final construction of the slab, the subgrade surface should be proof-rolled to provide a smooth, firm surface for slab support. Any areas that exhibit pumping or rutting during proofrolling should be repaired by undercutting the area and backfilling with either washed stone or properly compacted soil.

#### 4.3 PAVEMENT DESIGN PARAMETERS

EEE has not been provided specific traffic loading information for this project. However five samples of the near surface soils were obtained for California Bearing Ratio Testing (CBR). The results of the CBR testing are discussed below with some general pavement design recommendations and presented in summary form on Table 1.

The CBR tests produced values in the range of 6.5 to 12.4. These values represent actual test results on existing materials at specific locations and should be appropriately reduced or recalculated based on applicable pavement design method.

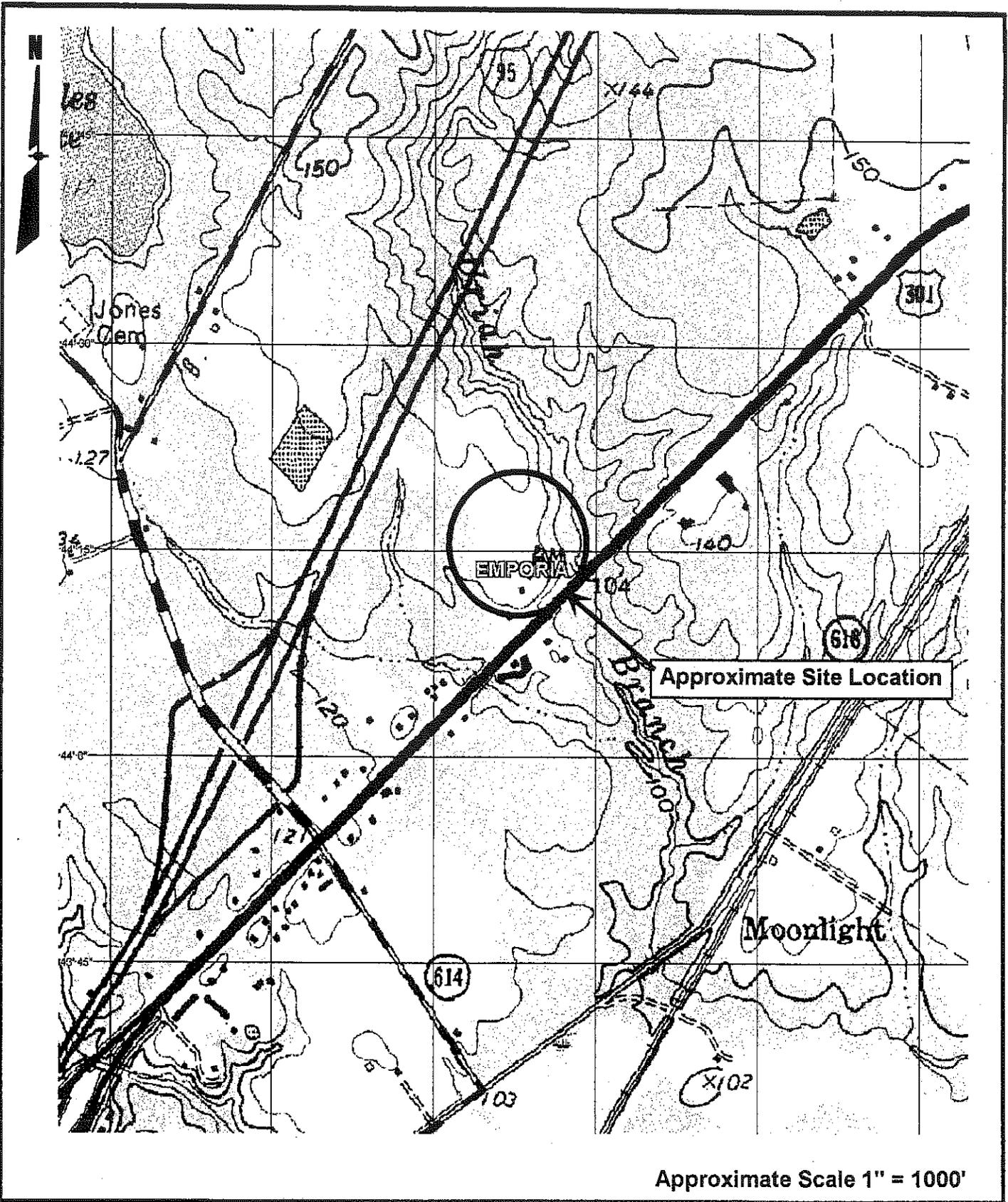
Pavement performance is directly related to subgrade support characteristics; therefore, the need for subgrade preparation immediately prior to base course placement is reemphasized as a necessary operation to provide a significant pavement service life.

Additionally, based on our experience with other projects in the area, we caution against operating heavy construction equipment on a partial pavement section. Numerous pavement failures and reduced pavement life have been observed at other facilities due to significant construction traffic operating on a reduced pavement section in which the final asphalt wearing course had not been placed. The omission of the final wearing course reduces the structural number of the pavement section such that the pavement section does not have suitable strength for supporting heavy loads. If the contractor chooses to delay placement of the final wearing course of asphalt until after completion of the majority of construction, we recommend that an increased pavement section be utilized to provide adequate support for the construction traffic.

**TABLE 1**  
**SUMMARY OF CALIFORNIA BEARING RATIO TESTS**

Boring No.	Sample Depth (ft)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	California Bearing Ratio (CBR)	
				0.1 inch penetration	0.2 inch penetration
B-5	1 to 5	124.0	10.1	7.0	7.3
B-6	1 to 5	124.5	10.0	12.4	13.9
B-7	1 to 5	120.5	12.0	12.3	12.0
B-8	1 to 5	124.0	10.5	6.5	6.7
B-10	1 to 5	124.0	10.0	7.4	7.8

## FIGURES

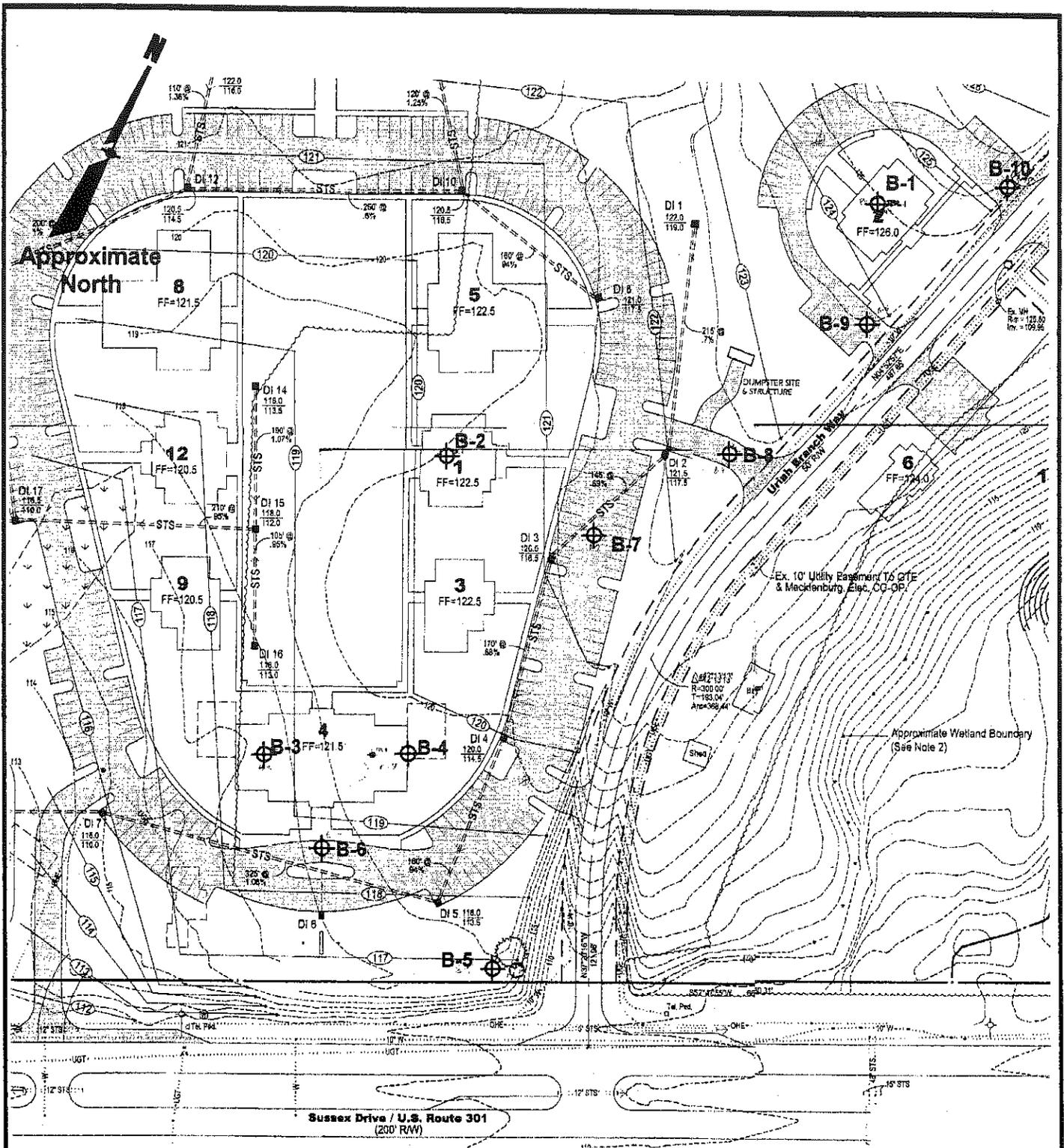


Approximate Scale 1" = 1000'



**EEE Consulting, Inc.**  
Environmental, Engineering and Educational Solutions

**FIGURE 1**  
**Area Topography**  
Greenville County, Virginia



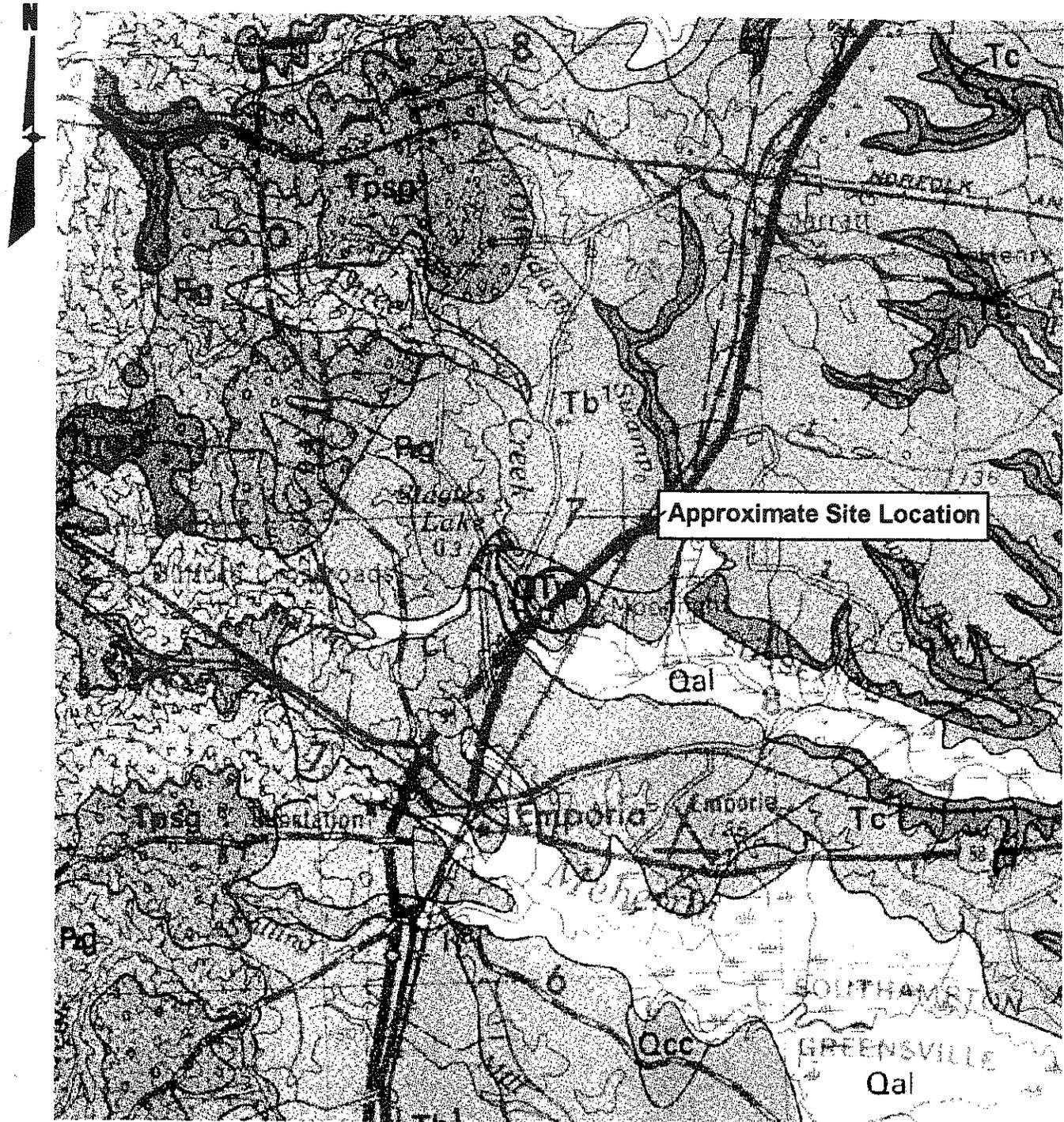
⊕ B-1 Approximate Boring Location

Base: Master Plan/2000 Grading and Environmental Plan prepared by Baxter Bailey & Associates Architects, dated March 19, 2001

Approximate Scale 1" = 130'

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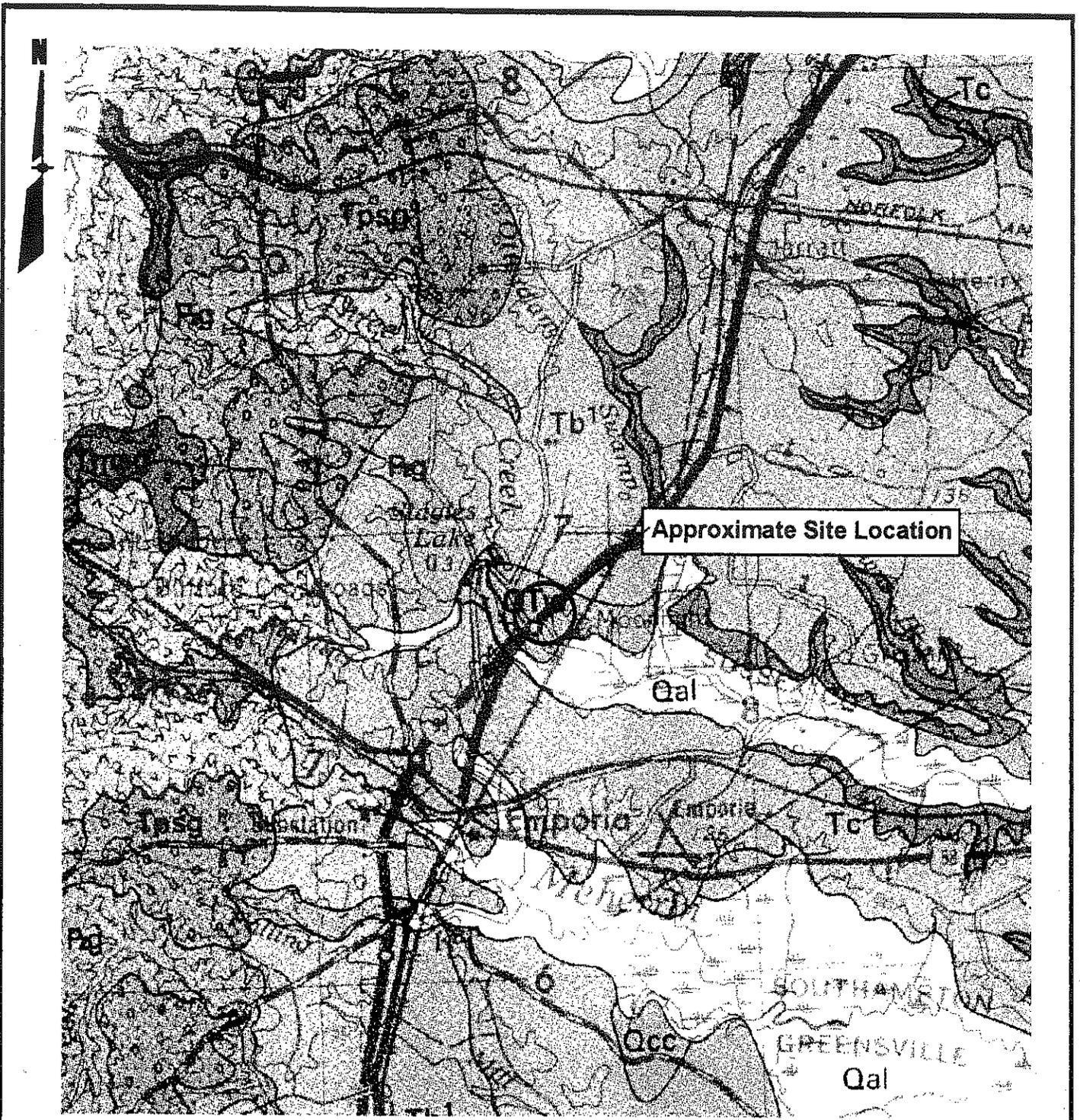
**FIGURE 2**  
**Site Plan and Boring Location Map**  
 Greenville County, Virginia



Windsor Formation - Gray and yellowish to reddish brown sand, gravel, silt, and clay.

Base: Geologic Map and Generalized Cross Sections of the Coastal Plain and Adjacent Parts of the Piedmont, Virginia by R. B. Mixom et al., dated 1989.

Approximate Scale 1" = 10,000'



Base: Geologic Map and Generalized Cross Sections of the Coastal Plain and Adjacent Parts of the Piedmont, Virginia by R. B. Mixom et al., dated 1989. Approximate Scale 1" = 10,000'

## APPENDICES

**APPENDIX A**

**BORING LOGS**

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests<sup>1</sup>

			Soil Classification			
			Group Symbol	Group Name <sup>2</sup>		
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines <sup>3</sup>	$Cu \geq 4$ and $1 \leq Cc \leq 3^4$	GW	Well graded gravel <sup>5,6,7</sup>	
			$Cu < 4$ and/or $1 > Cc > 3^4$	GP	Poorly graded gravel <sup>5,6,7</sup>	
		Gravels with Fines More than 12% fines <sup>3</sup>	Fines classify as ML or MH	GM	Silty gravel <sup>5,6,7</sup>	
		Fines classify as CL or CH	GC	Clayey gravel <sup>5,6,7</sup>		
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines <sup>3</sup>	$Cu \geq 6$ and $1 \leq Cc \leq 3^4$	SW	Well-graded sand <sup>5,6,7</sup>	
			$Cu < 6$ and/or $1 > Cc > 3^4$	SP	Poorly graded sand <sup>5,6,7</sup>	
Sands with Fines More than 12% fines <sup>3</sup>		Fines classify as ML or MH	SM	Silty sand <sup>5,6,7</sup>		
	Fines classify as CL or CH	SC	Clayey sand <sup>5,6,7</sup>			
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silt and Clays Liquid limit less than 50	inorganic	$PI > 7$ and plots on or above "A" line <sup>8</sup>	CL	Lean clay <sup>5,6,7</sup>	
			$PI < 4$ or plots below "A" line <sup>8</sup>	ML	Silt <sup>5,6,7</sup>	
		organic	Liquid limit - oven dried $< 75$ Liquid limit - not dried	OL	Organic clay <sup>5,6,7,8,9</sup> Organic silt <sup>5,6,7,8,9</sup>	
		Silt and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay <sup>5,6,7</sup>
				PI plots below "A" line	MH	Elastic silt <sup>5,6,7</sup>
			organic	Liquid limit - oven dried $< 75$ Liquid limit - not dried	OH	Organic clay <sup>5,6,7,8,9</sup> Organic silt <sup>5,6,7,8,9</sup>
	Highly organic soils	Primarily organic matter, dark in color, and organic odor		PT	Peat	

Soil Strength

Relative Density

Coarse Grained Soil, SAND

N-Value	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
>50	Very Dense

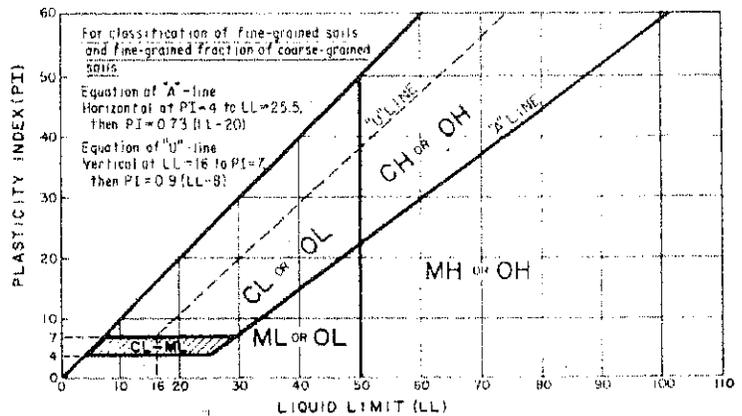
Consistency

Fine Grained Soil, SILT or CLAY

N-Value	Relative Density
0-1	Very Soft
2-4	Soft
5-8	Medium Stiff
9-15	Stiff
16-29	Very Stiff
>29	Hard

Moisture Content

Dry	No apparent moisture, dusty.
Damp	Apparent moisture, below the Plastic Limit
Moist	Significant moisture, at or above the Plastic Limit (can be rolled into a 1/8" thread).
Wet	Appears saturated, free water in voids and pores.



Further Descriptors

Mottled	Irregularly marked with patches of different colors, variegated.
Micaceous	Contains the mineral mica.
Relict Rock Structure	Distinct pattern of mineralization from parent rock.

























**APPENDIX B**

**LABORATORY TEST RESULTS**

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1  
Sample Depth 0-2'  
Visual Sample Description Brown Silty SAND

**Natural Moisture Content**

Pan ID	11
Pan Wt	187.39 grams
Pan + Soil (wet)	297.43 grams
Pan + Soil (dry)	289.28 grams
<i>Natural Moisture Content</i>	<i>8.0%</i>

# Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1

Sample Depth 2'-4'

Visual Sample Description Brown Clayey SAND w/ yellow-brown & red-brown mottling

## Natural Moisture Content

Pan ID	1
Pan Wt	195.42 grams
Pan + Soil (wet)	331.95 grams
Pan + Soil (dry)	312.40 grams
<i>Natural Moisture Content</i>	16.7%

## Coarse or Fine Grained

Pan + Soil retained on No. 200 sieve  
(dry) 260.70 grams

Percent Passing No. 200 Sieve 44.2%

## Atterberg Limits

### Liquid Limit

No of Blows	15	22	30
Pan ID	63	61	5
Pan Wt	10.80	10.88	11.04
Pan + Soil (wet)	21.73	19.13	20.3
Pan + Soil (dry)	17.76	16.28	17.21
Moisture Content	57%	53%	50%
Liquid Limit	54	52	51
<i>Liquid Limit</i>	52		

### Plastic Limit

Pan ID	76	A
Pan Weight	4.22	2.38
Pan + Soil (wet)	9.77	8.51
Pan + Soil (dry)	8.89	7.50
Moisture Content	19%	20%
<i>Plastic Limit</i>	19	
<i>Plastic Index</i>	32	

Group Symbol

SC

Group Name

Clayey SAND

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1  
Sample Depth 4'-6'  
Visual Sample Description Red-brown, Gray Clayey SAND

**Natural Moisture Content**

Pan ID	27
Pan Wt	193.69 grams
Pan + Soil (wet)	363.32 grams
Pan + Soil (dry)	343.31 grams
<i>Natural Moisture Content</i>	<i>13.4%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1  
Sample Depth 6'-8'  
Visual Sample Description Brown & Gray Sandy Fat CLAY

**Natural Moisture Content**

Pan ID	1
Pan Wt	195.42 grams
Pan + Soil (wet)	330.67 grams
Pan + Soil (dry)	310.52 grams
<i>Natural Moisture Content</i>	<i>17.5%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1  
Sample Depth 8'-10'  
Visual Sample Description Red-brown Sandy Fat CLAY with gray mottling

**Natural Moisture Content**

Pan ID	39
Pan Wt	192.95 grams
Pan + Soil (wet)	335.73 grams
Pan + Soil (dry)	313.19 grams
<i>Natural Moisture Content</i>	<i>18.7%</i>

## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1

Sample Depth 14.5'-16'

Visual Sample Description Yellow-brown fine Silty SAND

### Natural Moisture Content

Pan ID	33
Pan Wt	193.67 grams
Pan + Soil (wet)	347.41 grams
Pan + Soil (dry)	317.78 grams
<i>Natural Moisture Content</i>	<i>23.9%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-1  
Sample Depth 18.5'-20'  
Visual Sample Description Yellow-brown fine Silty SAND w/ gray mottling

**Natural Moisture Content**

Pan ID	7
Pan Wt	192.30 grams
Pan + Soil (wet)	328.18 grams
Pan + Soil (dry)	297.10 grams
<i>Natural Moisture Content</i>	<i>29.7%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-2  
Sample Depth 2'-4'  
Visual Sample Description Brown Clayey SAND w/ yellow-brown mottling

**Natural Moisture Content**

Pan ID	27
Pan Wt	193.69 grams
Pan + Soil (wet)	486.20 grams
Pan + Soil (dry)	447.30 grams
<i>Natural Moisture Content</i>	<i>15.3%</i>

**Coarse or Fine Grained**

Pan + Soil retained on No. 200 sieve (dry)	334.40 grams
Percent Passing No. 200 Sieve	44.5%

## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3

Sample Depth 0-2'

Visual Sample Description Brown Silty SAND

### Natural Moisture Content

Pan ID	42
Pan Wt	192.23 grams
Pan + Soil (wet)	330.78 grams
Pan + Soil (dry)	319.34 grams
<i>Natural Moisture Content</i>	<i>9.0%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3  
Sample Depth 2'-4'  
Visual Sample Description Brown Clayey SAND

**Natural Moisture Content**

Pan ID	38
Pan Wt	193.55 grams
Pan + Soil (wet)	352.52 grams
Pan + Soil (dry)	332.00 grams
<i>Natural Moisture Content</i>	<i>14.8%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3  
Sample Depth 4'-6'  
Visual Sample Description Yellow-brown Clayey SAND w/ gray mottling

**Natural Moisture Content**

Pan ID	8
Pan Wt	187.15 grams
Pan + Soil (wet)	482.20 grams
Pan + Soil (dry)	436.50 grams
<i>Natural Moisture Content</i>	<i>18.3%</i>

**Coarse or Fine Grained**

Pan + Soil retained on No. 200 sieve (dry)	355.80 grams
---	--------------

Percent Passing No. 200 Sieve	32.4%
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# Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3

Sample Depth 6'-8'

Visual Sample Description Brown Clayey SAND w/ GRAVEL

## Natural Moisture Content

Pan ID	11
Pan Wt	187.45 grams
Pan + Soil (wet)	330.37 grams
Pan + Soil (dry)	315.30 grams
<i>Natural Moisture Content</i>	11.8%

## Coarse or Fine Grained

Pan + Soil retained on No. 200 sieve (dry)	291.40 grams
--	--------------

Percent Passing No. 200 Sieve 18.7%

## Atterberg Limits

### Liquid Limit

No of Blows	17	23	35
Pan ID	71	69	68
Pan Wt	10.94	10.98	10.98
Pan + Soil (wet)	19.82	19.59	20
Pan + Soil (dry)	16.00	16.03	16.31
Moisture Content	75%	70%	69%
Liquid Limit	72	70	72
<i>Liquid Limit</i>	72		

### Plastic Limit

Pan ID	48	33
Pan Weight	2.39	2.38
Pan + Soil (wet)	7.35	7.96
Pan + Soil (dry)	6.48	6.96
Moisture Content	21%	22%
<i>Plastic Limit</i>	22	
<i>Plastic Index</i>	50	

Group Symbol

SC

**\*\*Need Sieve Analysis to properly**

Group Name

Clayey SAND

**Classify Sample**

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3  
Sample Depth 8'-10'  
Visual Sample Description Red-brown Fat CLAY with Sand & gray mottling

**Natural Moisture Content**

Pan ID	29
Pan Wt	191.93 grams
Pan + Soil (wet)	331.32 grams
Pan + Soil (dry)	300.02 grams
<i>Natural Moisture Content</i>	<i>29.0%</i>

## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3

Sample Depth 14.5'-16'

Visual Sample Description Brown coarse Silty SAND

### Natural Moisture Content

Pan ID	35
Pan Wt	192.76 grams
Pan + Soil (wet)	355.96 grams
Pan + Soil (dry)	326.19 grams
<i>Natural Moisture Content</i>	<i>22.3%</i>

## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3

Sample Depth 18.5'-20'

Visual Sample Description Gray Fat CLAY with Sand & shell fragments (Marine Clay)

### Natural Moisture Content

Pan ID	26
Pan Wt	194.59 grams
Pan + Soil (wet)	337.70 grams
Pan + Soil (dry)	282.28 grams
<i>Natural Moisture Content</i>	<i>63.2%</i>

## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-3

Sample Depth 24.5'-26'

Visual Sample Description Gray Fat CLAY with Sand & shell fragments (Marine Clay)

### Natural Moisture Content

Pan ID	31
Pan Wt	192.93 grams
Pan + Soil (wet)	287.25 grams
Pan + Soil (dry)	248.43 grams
<i>Natural Moisture Content</i>	<i>69.9%</i>

**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-5  
Sample Depth 0-5'  
Visual Sample Description Red-brown Silty SAND

**Natural Moisture Content**

Pan ID	18
Pan Wt	189.04 grams
Pan + Soil (wet)	393.30 grams
Pan + Soil (dry)	375.44 grams
<i>Natural Moisture Content</i>	<i>9.6%</i>

**Coarse or Fine Grained**

Pan + Soil retained on No. 200 sieve (dry)	298.70 grams
Percent Passing No. 200 Sieve	41.2%
Pan + Soil retained on No. 4 sieve (dry)	189.41 grams
Percent Passing No. 4 Sieve	99.8%

*Soil Classifies as Coarse-Grained Soil*

**Grain Size Distribution Calculations**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

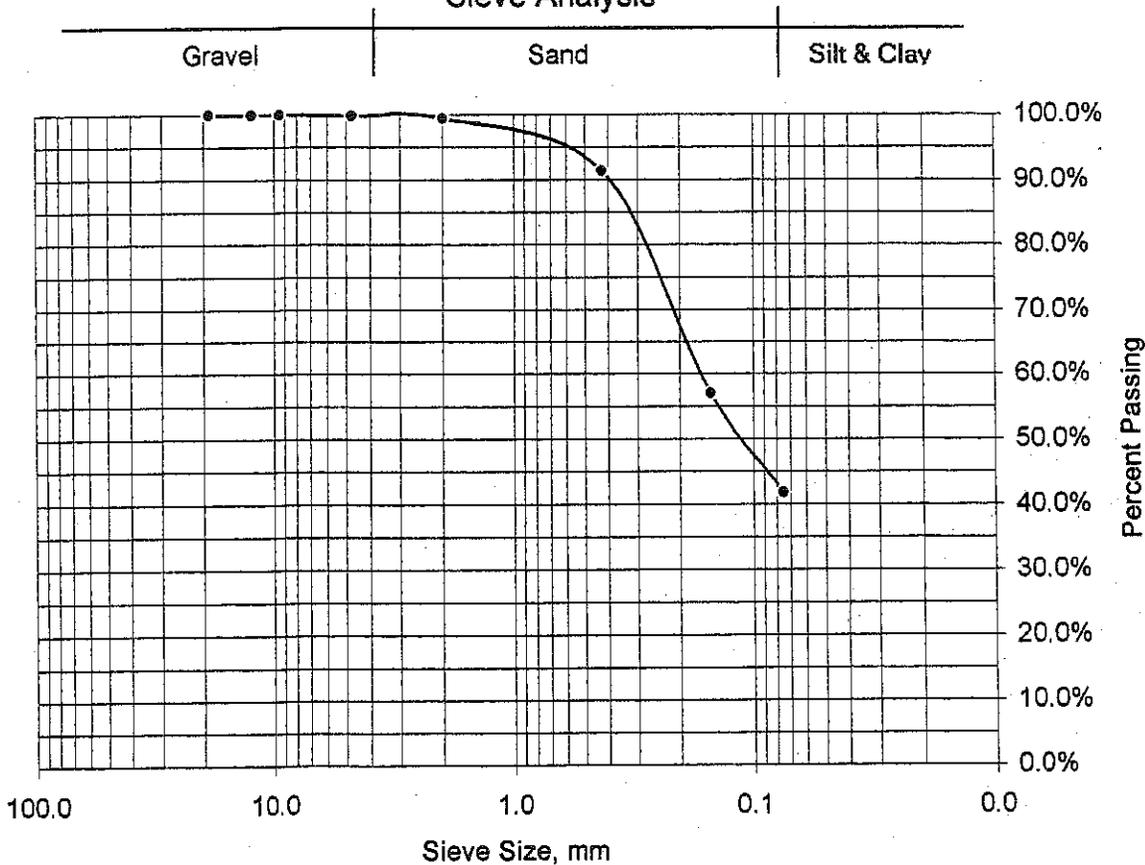
Sample ID B-5

Sample Depth 0-5'

**Mechanical Sieve Analysis**

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	0.37	0.2%	4.75	99.8%
No. 10	0.70	0.4%	2.0	99.4%
No. 40	15.00	8.0%	0.425	91.4%
No. 100	64.00	34.3%	0.15	57.0%
No. 200	28.41	15.2%	0.075	41.8%
Pan	1.33	0.7%		
<b>Total</b>	<b>109.81</b>	<b>58.2%</b>		

**Sieve Analysis**



**Proctor Test Report**  
 Greenville Government Complex Geotech  
 DAA # R01407-01  
 Prepared by LTW

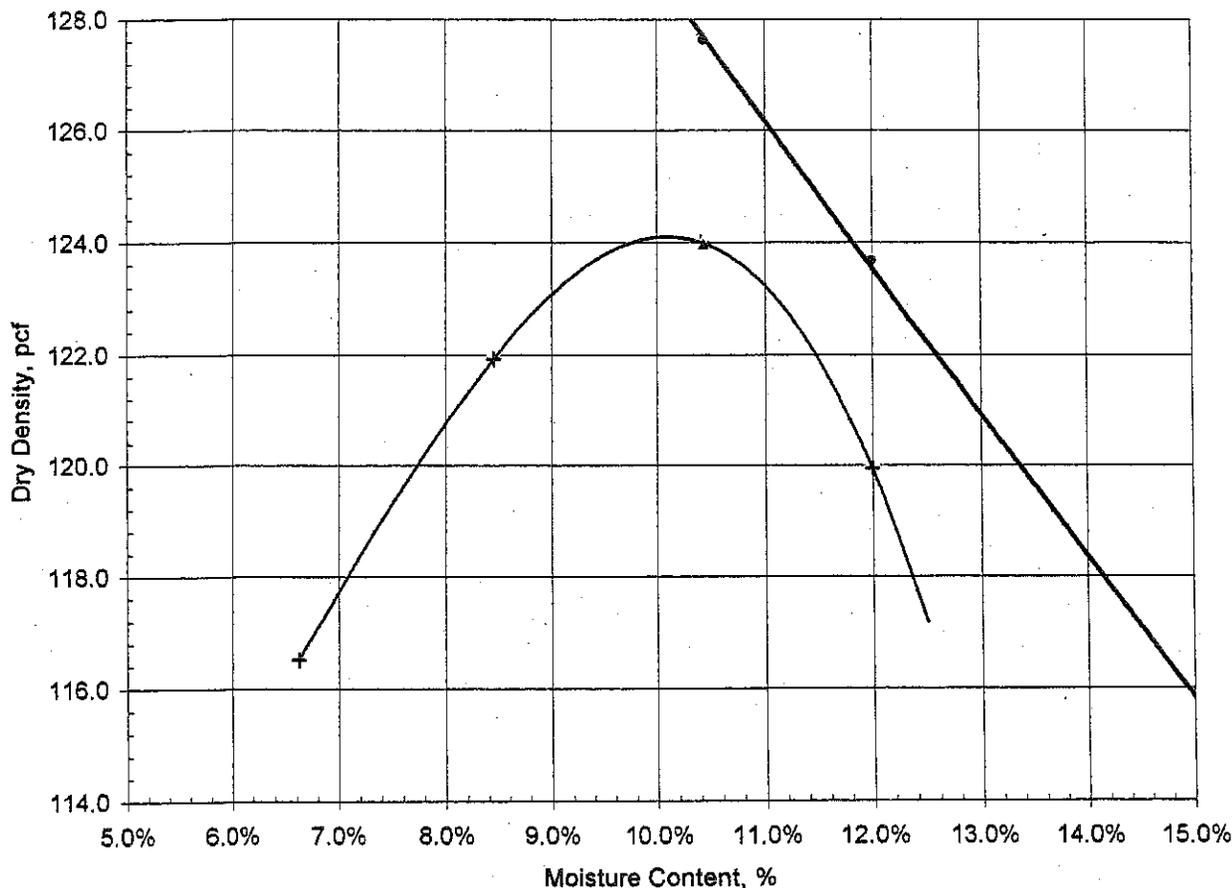


**Soil and Test Method Data**

Sample ID B-5  
 Sample Depth 0-5'  
 Sample Classification #DIV/0!  
 USCS Group Symbol #DIV/0!  
 Test Method ASTM D698, Method B, with mechanical hammer  
 Sample Preparation Air dried and sieved through a 3/8" sieve.  
 Mold Size, in 4.0

Test Data	#1	#2	#3	#4	#5
Moisture Content	6.6%	8.4%	10.4%	12.0%	
Dry Density, pcf	116.5	121.9	124.0	119.9	

**Moisture-Density Curve**



• Zero Air Voids + Proctor Points ▲ CBR Points

**CBR Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW

**Draper Aden Associates**Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services**Soil and Test Method Data**

Sample ID B-5

Sample Depth 0-5'

Visual Sample Description Red-brown Silty SAND

USCS Group Symbol n/a

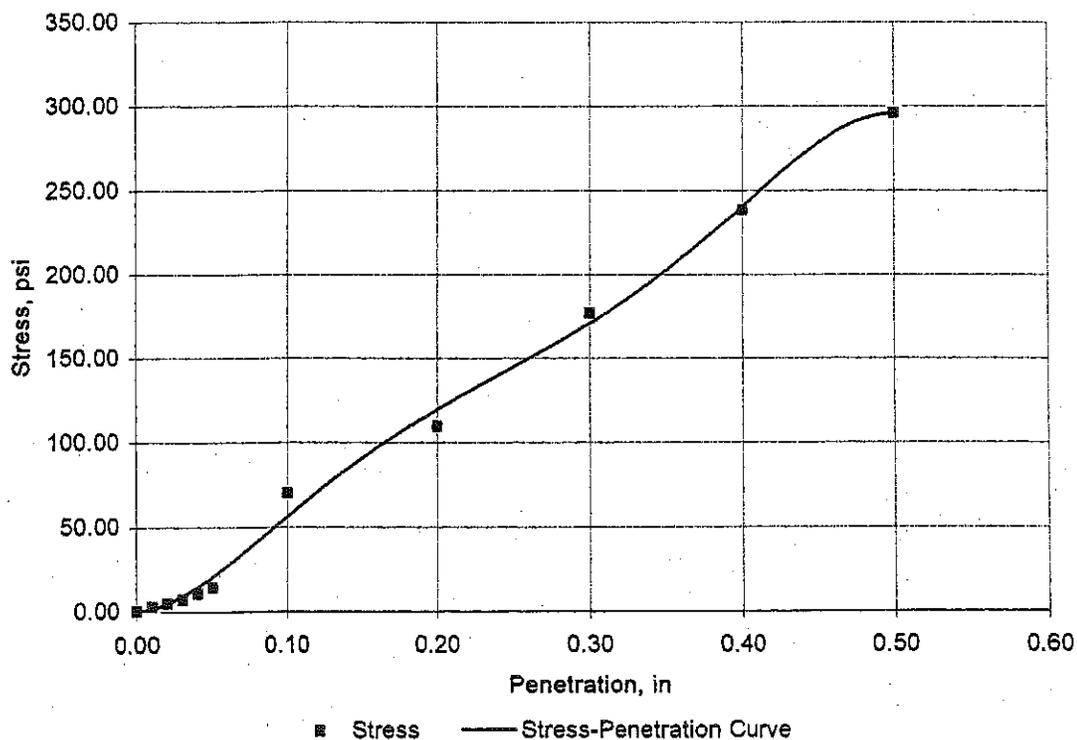
Test Method ASTM D1883, compacted with mechanical hammer

Sample Preparation Air dried, sieved through a 3/8" sieve and moisture conditioned.

Soak &gt;96 hours

**Test Data**

Compacted Moisture Content	10.4%
Compacted Dry Density	124.0
Percent Compaction	100%
Percent Swell	0.5%
CBR @ 0.1"	7.0
CBR @ 0.2"	7.3



## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-6

Sample Depth 0-5'

Visual Sample Description Brown Silty SAND

### Natural Moisture Content

Pan ID	28
Pan Wt	193.10 grams
Pan + Soil (wet)	403.20 grams
Pan + Soil (dry)	385.42 grams
<i>Natural Moisture Content</i>	<i>9.2%</i>

**Proctor Test Report**  
 Greenville Government Complex Geotech  
 DAA # R01407-01  
 Prepared by LTW

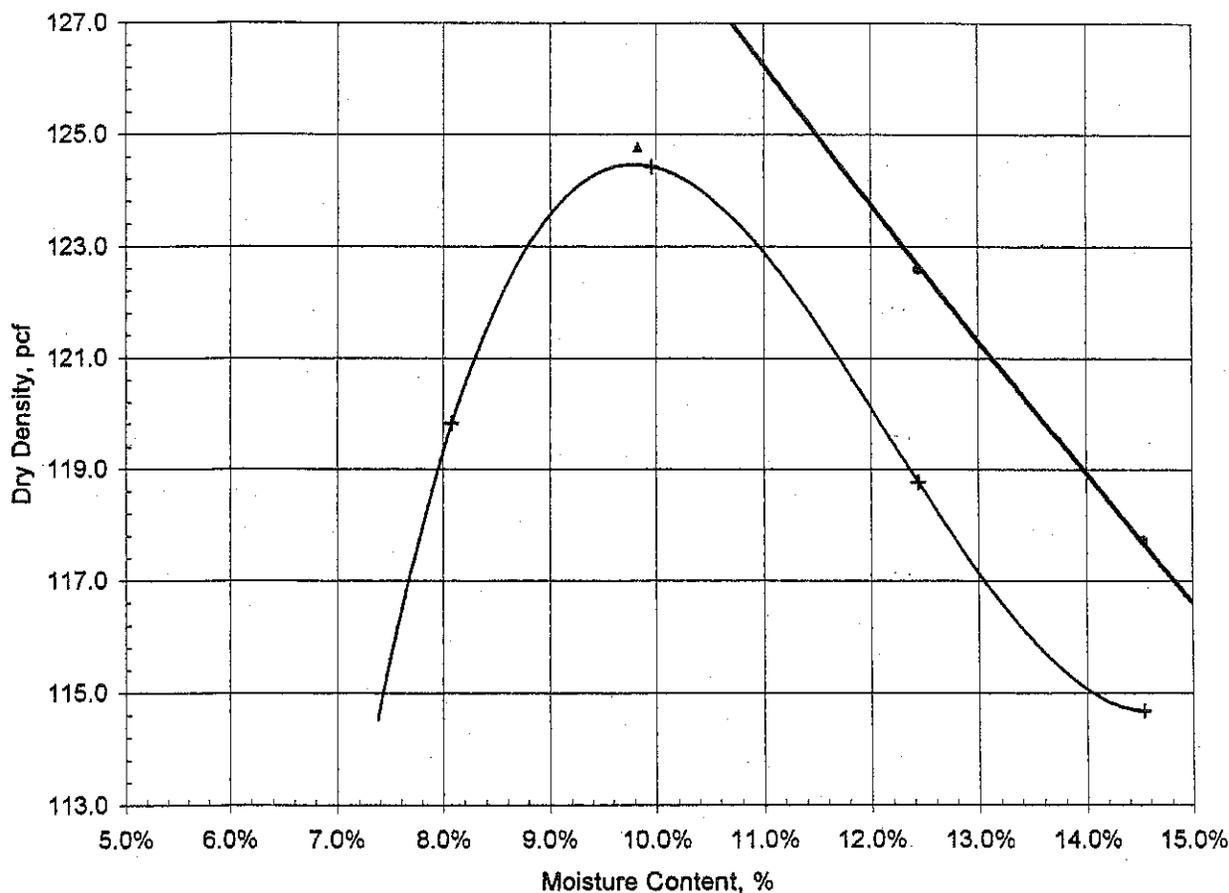


**Soil and Test Method Data**

Sample ID B-6  
 Sample Depth 0-5'  
 Visual Sample Description Brown Silty SAND  
 USCS Group Symbol n/a  
 Test Method ASTM D698, Method B, with mechanical hammer  
 Sample Preparation Air dried and sieved through a 3/8" sieve.  
 Mold Size, in 4.0

Test Data	#1	#2	#3	#4	#5
Moisture Content	8.1%	10.0%	12.4%	14.5%	
Dry Density, pcf	119.8	124.4	118.8	114.7	

**Moisture-Density Curve**



• Zero Air Voids + Proctor Points ▲ CBR Points

**CBR Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW

**Draper Aden Associates**Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services**Soil and Test Method Data**

Sample ID B-6

Sample Depth 0-5'

Visual Sample Description Brown Silty SAND

USCS Group Symbol n/a

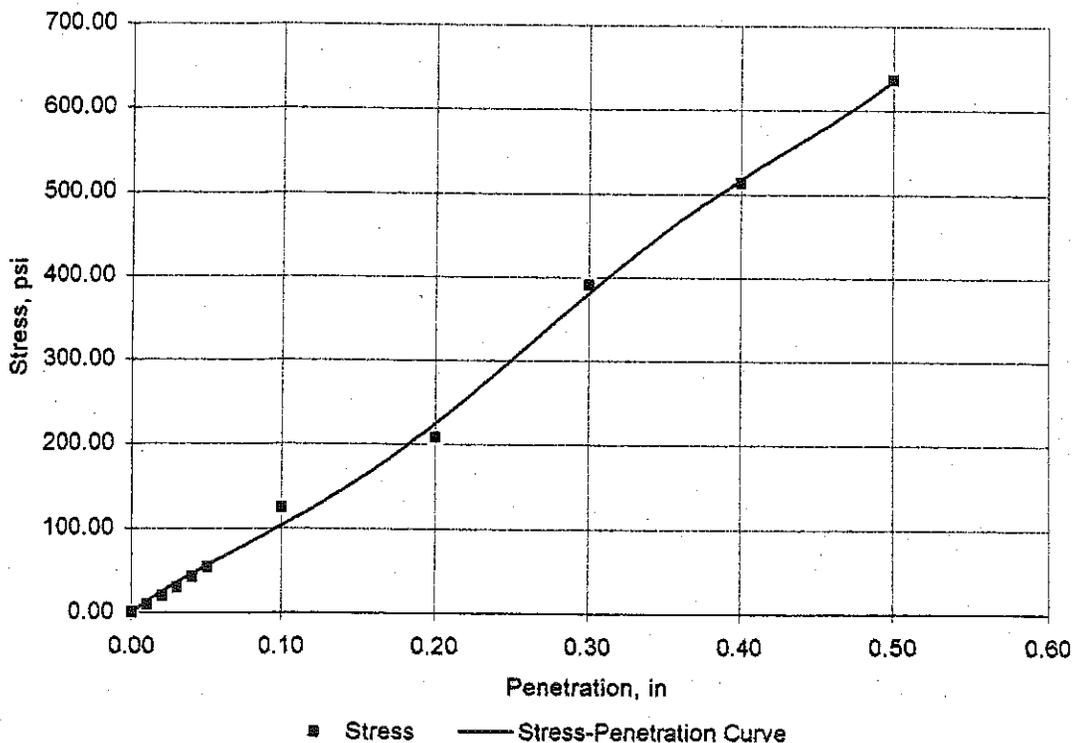
Test Method ASTM D1883, compacted with mechanical hammer

Sample Preparation Air dried, sieved through a 3/8" sieve and moisture conditioned.

Soak &gt;96 hours

**Test Data**

Compacted Moisture Content	9.8%
Compacted Dry Density	124.8
Percent Compaction	100%
Percent Swell	0.0%
CBR @ 0.1"	12.4
CBR @ 0.2"	13.9



**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-7  
Sample Depth 0-5'  
Visual Sample Description Brown Silty SAND

**Natural Moisture Content**

Pan ID	32
Pan Wt	191.70 grams
Pan + Soil (wet)	424.80 grams
Pan + Soil (dry)	396.61 grams
<i>Natural Moisture Content</i>	<i>13.8%</i>

**Proctor Test Report**  
 Greenville Government Complex Geotech  
 DAA # R01407-01  
 Prepared by LTW



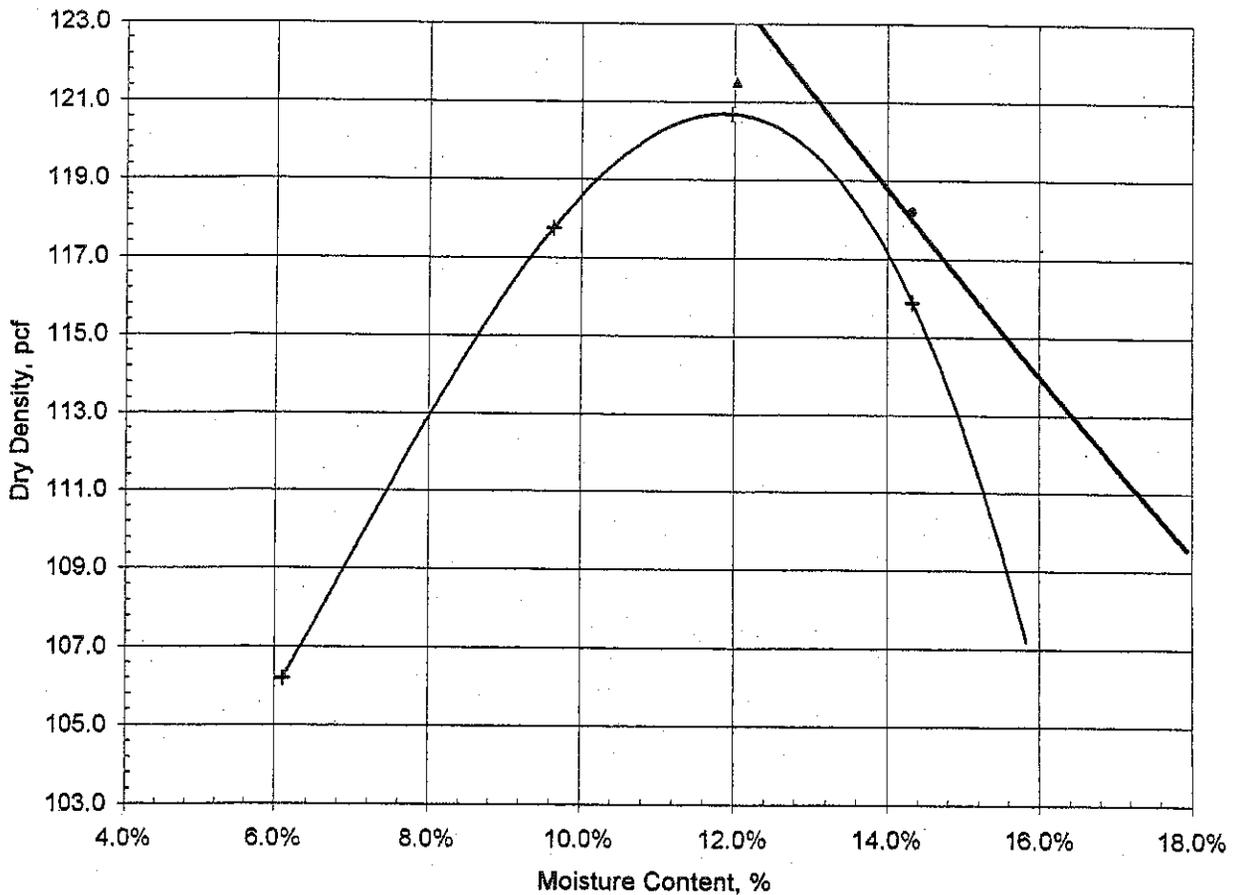
**Draper Aden Associates**  
 Blacksburg • Richmond, Virginia  
 Engineering • Surveying • Environmental Services

**Soil and Test Method Data**

Sample ID B-7  
 Sample Depth 0-5'  
 Visual Sample Classification Brown Silty SAND  
 USCS Group Symbol n/a  
 Test Method ASTM D698, Method B, with mechanical hammer  
 Sample Preparation Air dried and sieved through a 3/8" sieve.  
 Mold Size, in 4.0

Test Data	#1	#2	#3	#4	#5
Moisture Content	9.6%	12.0%	14.3%	6.1%	
Dry Density, pcf	117.8	120.7	115.9	106.2	

**Moisture-Density Curve**



● Zero Air Voids + Proctor Points ▲ CBR Points

**CBR Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW

**Draper Aden Associates**Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services**Soil and Test Method Data**

Sample ID B-7

Sample Depth 0-5'

Visual Sample Classification Brown Silty SAND

USCS Group Symbol n/a

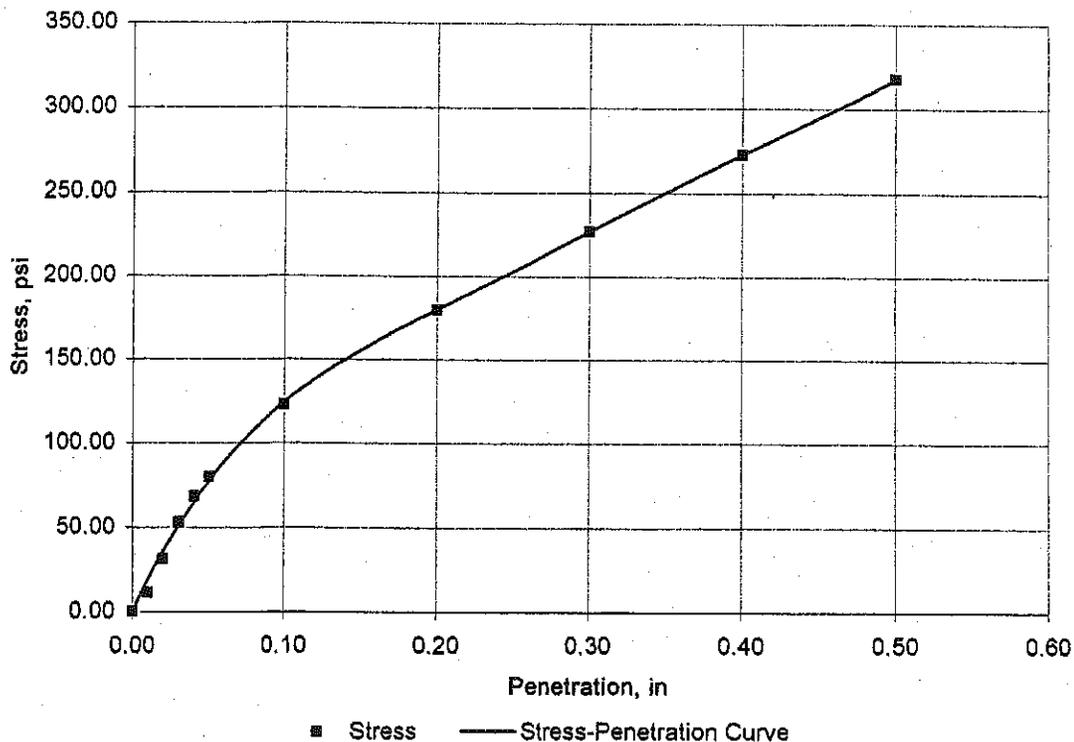
Test Method ASTM D1883, compacted with mechanical hammer

Sample Preparation Air dried, sieved through a 3/8" sieve and moisture conditioned.

Soak &gt;96 hours

**Test Data**

Compacted Moisture Content	12.0%
Compacted Dry Density	121.5
Percent Compaction	100%
Percent Swell	0.0%
CBR @ 0.1"	12.3
CBR @ 0.2"	12.0



**Soil Classification Calculations**  
Greenville Government Complex Geotech  
DAA # R01407-01  
Prepared By: LTW



**Draper Aden Associates**  
Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

Sample ID B-8  
Sample Depth 0-5'  
Visual Sample Description Brown Clayey SAND

**Natural Moisture Content**

Pan ID	36
Pan Wt	193.70 grams
Pan + Soil (wet)	413.60 grams
Pan + Soil (dry)	392.12 grams
<i>Natural Moisture Content</i>	<i>10.8%</i>

**Proctor Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

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**Draper Aden Associates**

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**Soil and Test Method Data**

Sample ID B-8

Sample Depth 0-5'

Visual Sample Classification Brown Clayey SAND

USCS Group Symbol n/a

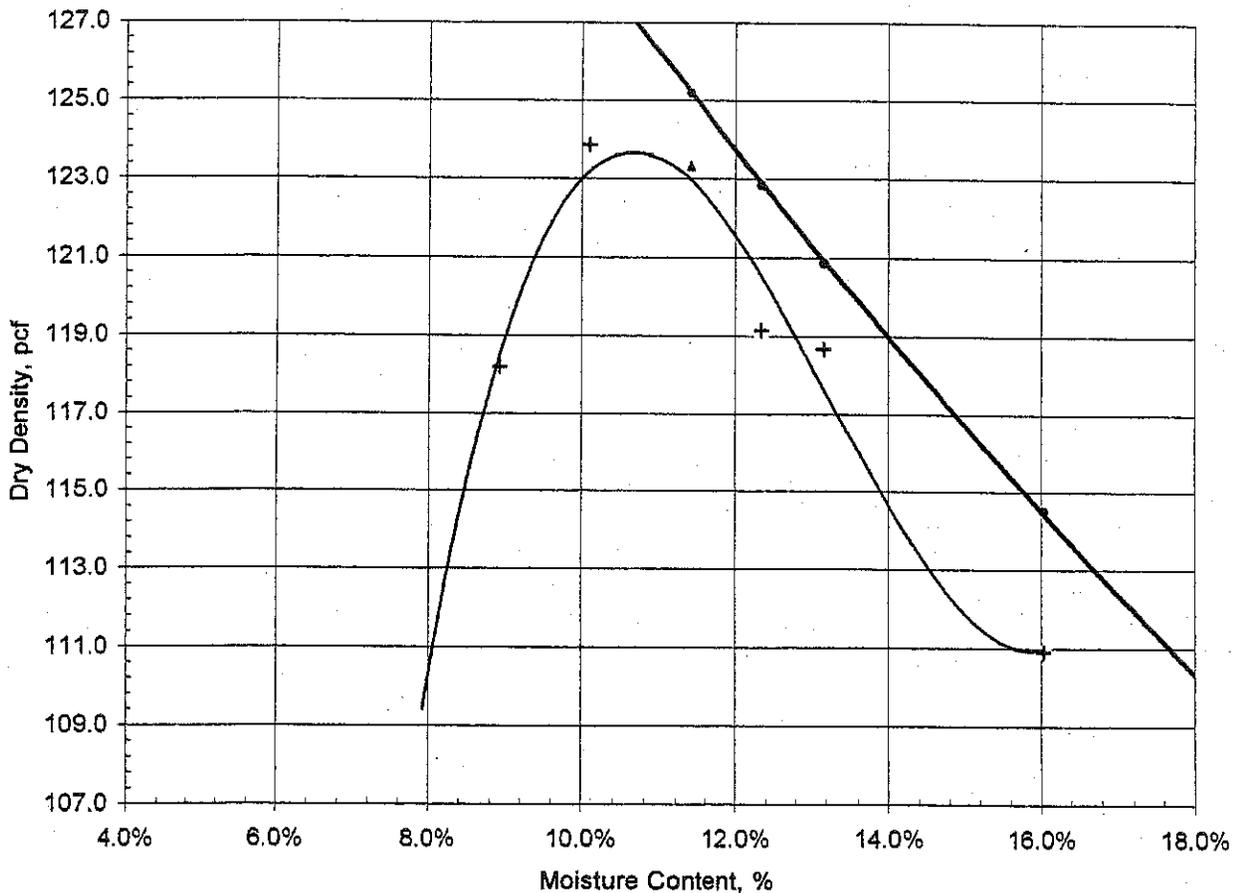
Test Method ASTM D698, Method B, with mechanical hammer

Sample Preparation Air dried and sieved through a 3/8" sieve.

Mold Size, in 4.0

Test Data	#1	#2	#3	#4	#5
Moisture Content	8.9%	10.1%	12.3%	13.2%	16.0%
Dry Density, pcf	118.2	123.9	119.1	118.7	110.9

**Moisture-Density Curve**



• Zero Air Voids + Proctor Points ▲ CBR Points

# CBR Test Report

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW



## Draper Aden Associates

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

### Soil and Test Method Data

Sample ID B-8

Sample Depth 0-5'

Visual Sample Classification Brown Clayey SAND

USCS Group Symbol n/a

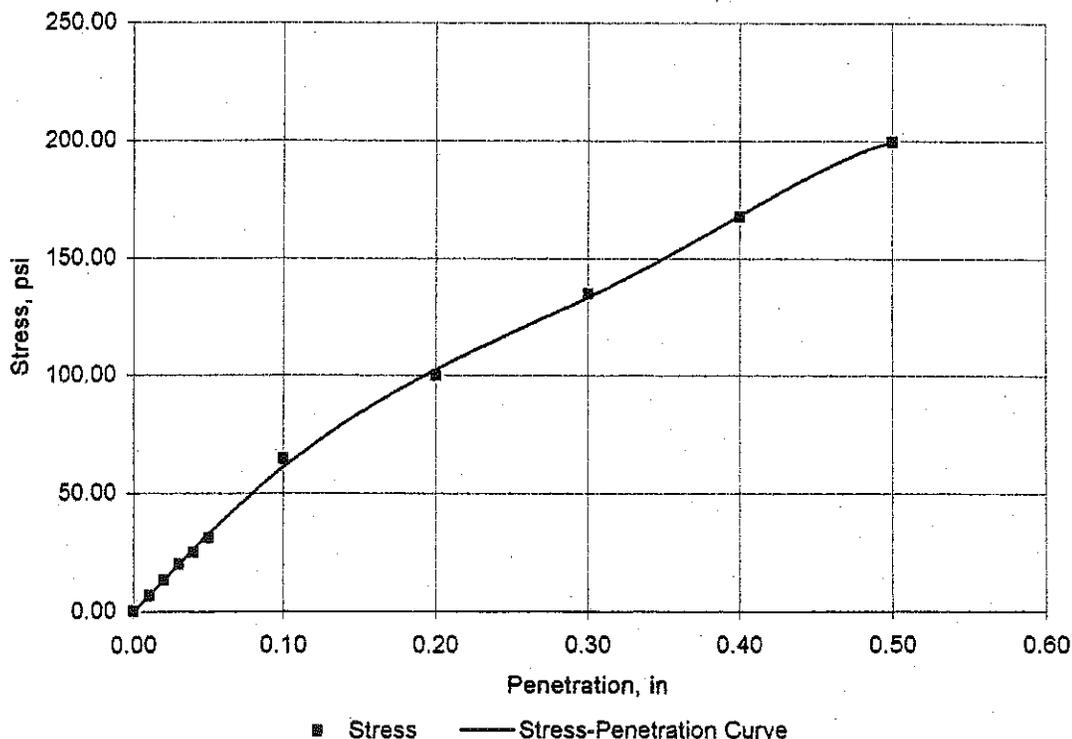
Test Method ASTM D1883, compacted with mechanical hammer

Sample Preparation Air dried, sieved through a 3/8" sieve and moisture conditioned.

Soak >96 hours

### Test Data

Compacted Moisture Content	11.4%
Compacted Dry Density	123.4
Percent Compaction	100%
Percent Swell	0.0%
CBR @ 0.1"	6.5
CBR @ 0.2"	6.7



## Soil Classification Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia

Engineering • Surveying • Environmental Services

Sample ID B-10

Sample Depth 0-5'

Visual Sample Description Brown Clayey SAND

### Natural Moisture Content

Pan ID	8
Pan Wt	187.10 grams
Pan + Soil (wet)	414.90 grams
Pan + Soil (dry)	390.44 grams
<i>Natural Moisture Content</i>	<i>12.0%</i>

### Coarse or Fine Grained

Pan + Soil retained on No. 200 sieve (dry)	310.06 grams
Percent Passing No. 200 Sieve	39.5%
Pan + Soil retained on No. 4 sieve (dry)	187.21 grams
Percent Passing No. 4 Sieve	99.9%

*Soil Classifies as Coarse-Grained Soil*

# Grain Size Distribution Calculations

Greenville Government Complex Geotech

DAA # R01407-01

Prepared By: LTW



## Draper Aden Associates

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

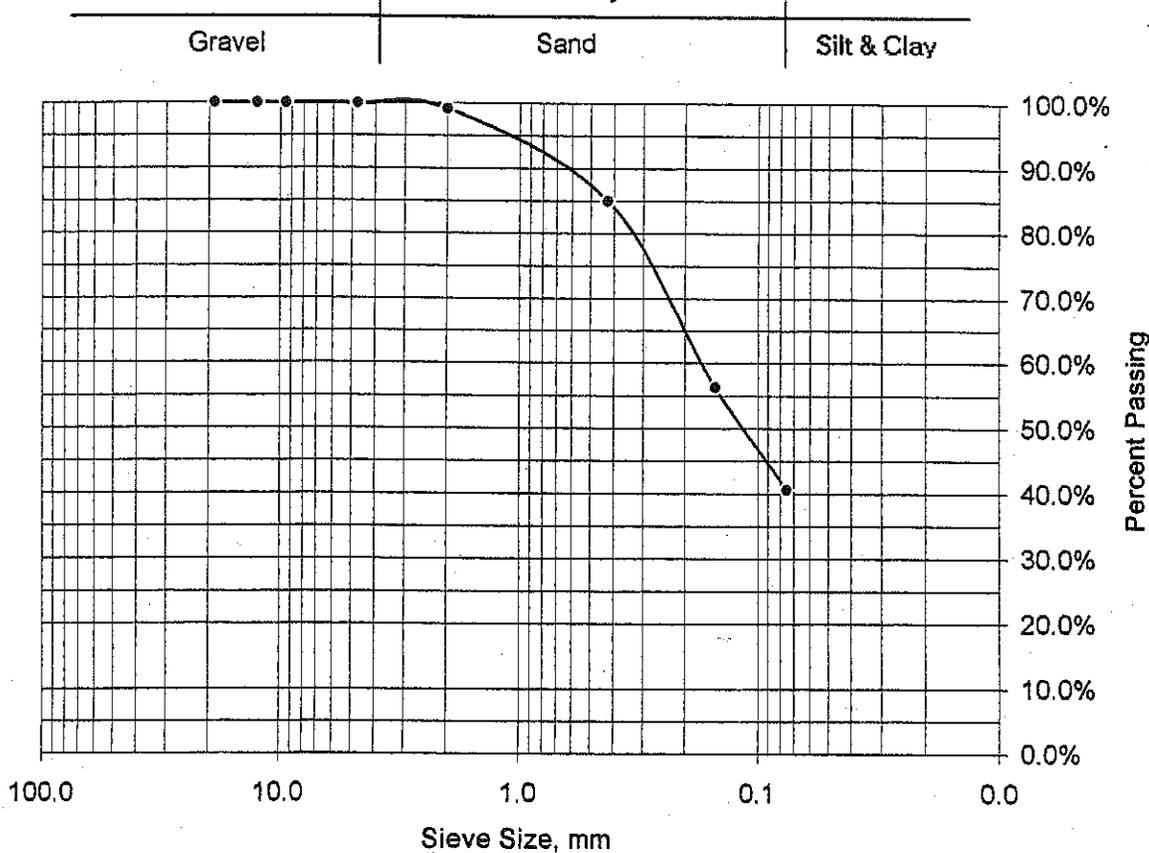
Sample ID B-10

Sample Depth 0-5'

### Mechanical Sieve Analysis

Sieve Size	Weight Retained	Percent Retained	Sieve Size, mm	Percent Passing
3/4"	0.00	0.0%	19.0	100.0%
1/2"	0.00	0.0%	12.5	100.0%
3/8"	0.00	0.0%	9.5	100.0%
No. 4	0.11	0.1%	4.75	99.9%
No. 10	1.78	0.9%	2.0	99.1%
No. 40	28.57	14.1%	0.425	85.0%
No. 100	58.46	28.7%	0.15	56.3%
No. 200	31.81	15.6%	0.075	40.6%
Pan	2.09	1.0%		
<b>Total</b>	<b>122.82</b>	<b>59.4%</b>		

Sieve Analysis



**Proctor Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW



**Draper Aden Associates**

Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services

**Soil and Test Method Data**

Sample ID B-10

Sample Depth 0-5'

Visual Sample Classification Brown Clayey SAND

USCS Group Symbol n/a

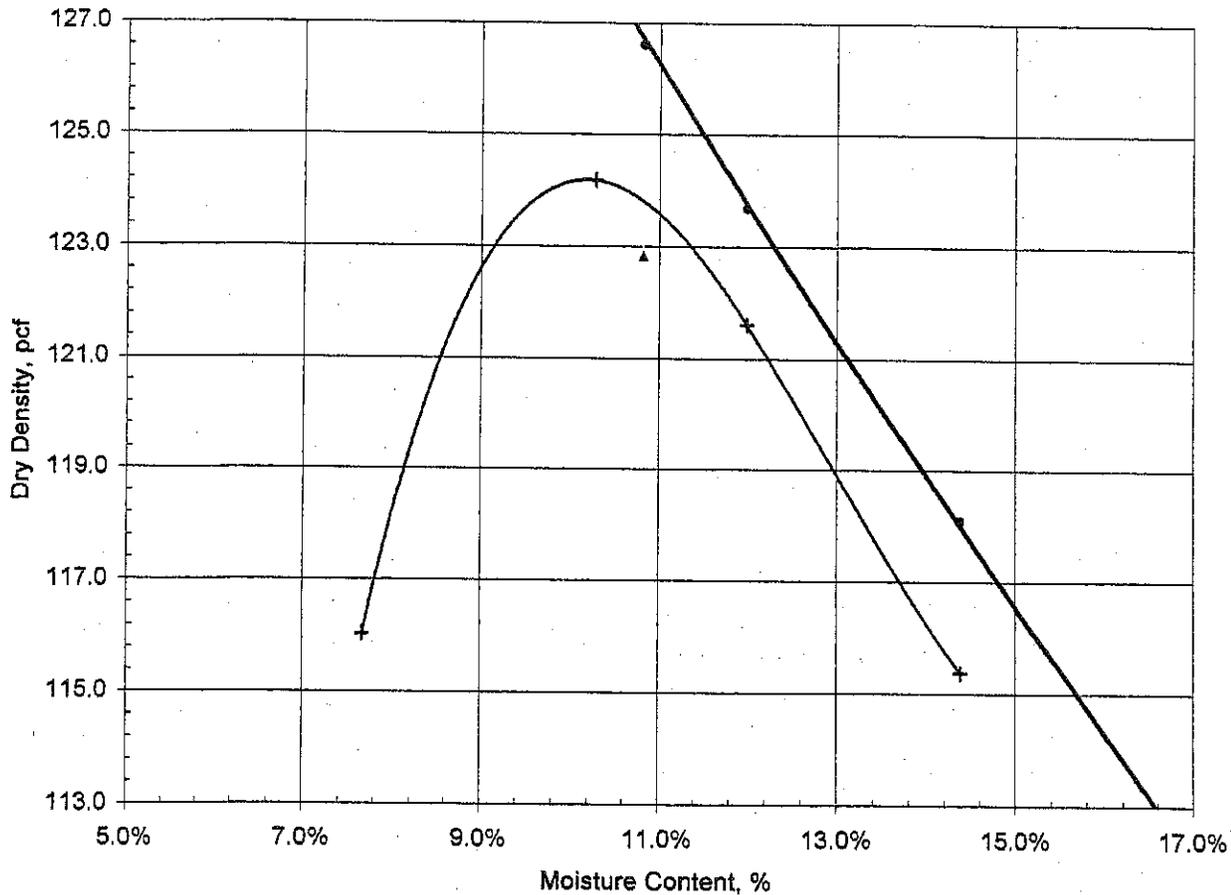
Test Method ASTM D698, Method B, with mechanical hammer

Sample Preparation Air dried and sieved through a 3/8" sieve.

Mold Size, in 4.0

Test Data	#1	#2	#3	#4	#5
Moisture Content	7.7%	10.3%	12.0%	14.4%	
Dry Density, pcf	116.0	124.2	121.6	115.4	

**Moisture-Density Curve**



• Zero Air Voids + Proctor Points ▲ CBR Points

**CBR Test Report**

Greenville Government Complex Geotech

DAA # R01407-01

Prepared by LTW

**Draper Aden Associates**Blacksburg • Richmond, Virginia  
Engineering • Surveying • Environmental Services**Soil and Test Method Data**

Sample ID B-10

Sample Depth 0-5'

Visual Sample Classification Brown Clayey SAND

USCS Group Symbol n/a

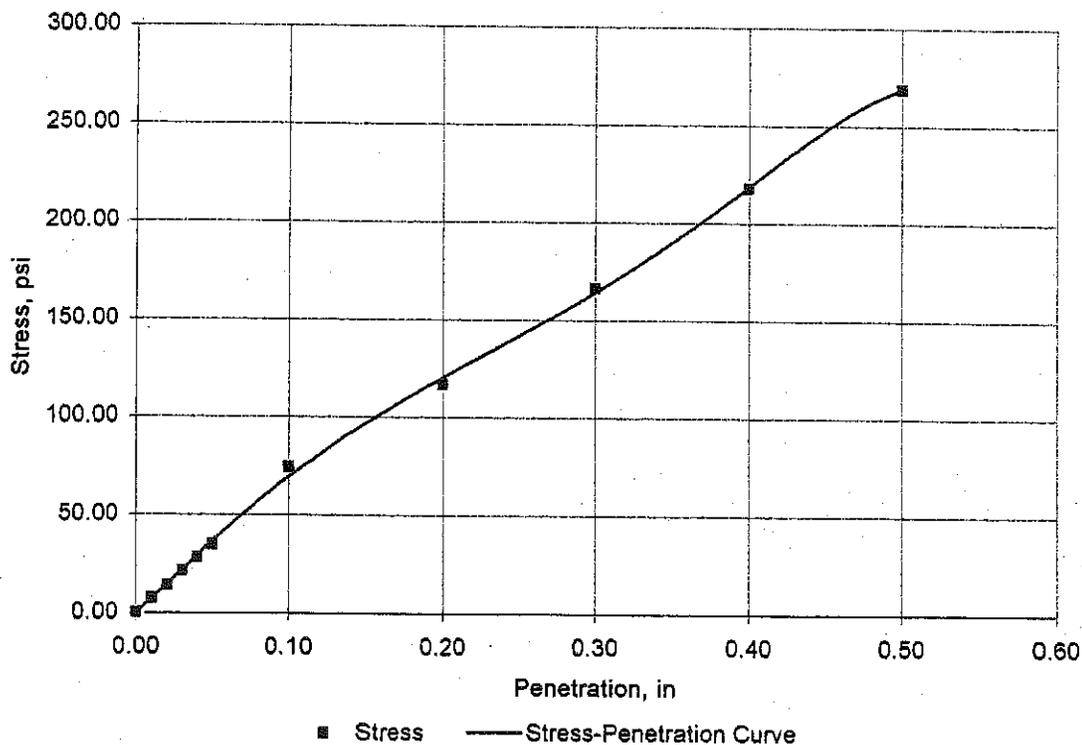
Test Method ASTM D1883, compacted with mechanical hammer

Sample Preparation Air dried, sieved through a 3/8" sieve and moisture conditioned.

Soak &gt;96 hours

**Test Data**

Compacted Moisture Content	10.8%
Compacted Dry Density	122.8
Percent Compaction	99%
Percent Swell	0.0%
CBR @ 0.1"	7.4
CBR @ 0.2"	7.8



## exhibit 3

### **Environmental Report**

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- Originally prepared by Enviro-Utilities as part of the Greenville County Government Center, Master Plan/ 2014; it is now here included in its entirety.
- This report is a full assessment of the entire Campus, of which the Sheriff's Office parcel is an individual part.