



US Army Corps  
of Engineers  
Savannah District

# Fort Gillem Georgia

---

**Solicitation Number**

**DACA21-02-R-0024**

**Battalion Headquarters and Admin (EOD)**

**Volume II of II**

**FY-02, Line Item 17620**

**June 2002**

**PHASE TWO OF TWO PHASE DESIGN/BUILD  
SUBMITTAL PROCEDURE**

**FOR THIS PROCUREMENT COMPETITION WILL BE LIMITED TO 8(A) FIRMS  
SERVICED BY SBA REGION IV DISTRICT OFFICES (GA, AL, NC, SC, TN, MS, FL,  
KY) OR MUST HAVE AN ESTABLISHED, VERIFIABLE FULL TIME BRANCH  
OFFICE (AS DEFINED BY SBA) WITHIN REGION IV WHICH HAVE 233320  
AMONG THEIR APPROVED NAIC CODES**

**U.S. ARMY ENGINEER DISTRICT, SAVANNAH  
CORPS OF ENGINEERS  
100 WEST OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3640**

**APPENDIX F  
ENVIRONMENTAL AND ASBESTOS  
INFORMATION**

## SECTION 02091

PCB BALLASTS, TRANSFORMERS AND HAZARDOUS WASTE LAMP AND OTHER MISCELLANEOUS  
HAZARDOUS BUILDING MATERIALS REMOVAL AND RECYLING

## PART 1 GENERAL

Buildings 710, 736 and 739 are scheduled for demolition. All hazardous building materials shall be removed from these buildings prior to demolition. Any material, which is encountered, that has not been identified by the Hazardous (Building) Materials Survey shall be brought to the attention of the Contracting Officer. Electrical fixtures, classed as 'Hazardous Waste Lamps' (HWL) found in these buildings include (but may not be limited to) fluorescent downlights with compact troffers. These fixtures are to be removed prior to demolition after all asbestos containing materials have been removed. Fixtures are regulated based upon the presence of PCB containing electrical equipment. HWLs are regulated due to the mercury contained in the lamps. All ballasts were assumed PCB ballast without inspection. Lighted exit signs, when found, were assumed to be fluorescent replacements, although some may be incandescent. Incidental spare bulbs found in utility rooms and closets are included in this estimate. Utility (streetlight) metal halide lamps are not included in this estimate. Quantities are listed in the Hazardous (Building) Materials Survey associated with each building.

The Contractor shall verify number and type of HWLs and ballasts to be removed and recycled. Estimated The State of Georgia and the Federal EPA considers unbroken mercury containing lamps as universal waste. Unbroken lamps shall be packed and shipped with applicable Department of Transportation Labeling. They do not need full hazardous materials manifesting. They do require a Universal Waste "Bill of Lading" and a state of Georgia "Universal Waste" (GAU) number. Broken HWL are considered "Hazardous Waste" and RCRA and DOT requirements apply.

Transformers, capacitors, electrical light ballasts, electromagnets, switches, and voltage regulators are considered PCB Articles, subclassed as PCB Equipment. They shall also be removed and recycled or disposed of as required by local, state and federal regulations. All capacitors are assumed to contain PCBs unless a label or chemical analysis states that they do not. PCB ballasts must be disposed of as hazardous wastes and may not be re-sold to subsequent users.

Mercury containing switches have been identified in the Hazardous (Building) Materials Survey of the buildings to be demolished. The Contractor shall remove all mercury containing switches prior to demolition activities, and dispose of as appropriate. Some switches may not have been accessible during the survey; the Contractor shall present the Contracting Officer with the actual number to be removed if they exceed the quantity in the survey table.

Refrigerants must be recovered and recycled. Refrigerant sources may include window air conditioning units, whole building HVAC systems and specialized coolant systems (i.e. electronic and computer rooms). Documentation of removed quantities must be supplied to the Contracting Officer.

Building 736 utilized a fuel-fired boiler. No evidence of an underground storage tank (UST) was found. It may have been removed or closed in place. Intact heating fuel USTs are to be removed under the Georgia Underground Storage tank (GUST) laws. Closed in place USTs must be addressed under GUST if they show evidence of staining, odor or spills. No closed-in-place USTs are to remain at the site.

## 1.1 WORK REQUIREMENTS

The Contractor shall provide all personnel, transportation, services, materials, equipment, technical and management support required to perform the requirements as defined in this specification. The Contractor shall document the results of all recycling efforts.

## 1.2 DEFINITIONS

### 1.2.1 Certified Recycling Facility (CRF)

A facility that can validate that recyclable materials received are manufactured into new materials for commercial sale or are reused onsite by the facility.

### 1.2.2 Georgia EPD

Georgia Environmental Protection Division of the Department of Natural Resources.

### 1.2.3 Hazardous Materials Transporter

A person engaged in the off-site transportation of waste mercury-containing lamps, or PCB ballasts and transformers by air, rail, highway or water.

### 1.2.4 PCB Ballasts

Light ballasts weighing less than 50 pounds that may contain polychlorinated biphenyls (PCBs).

### 1.2.5 Hazardous Waste Lamps (HWL)

Any type of high or low-pressure lighting device that is unprocessed, contains mercury, and generated light through the discharge of electricity either directly or indirectly through a fluorescing coating. Includes fluorescent lamps, mercury lamps, metal halide lamps and high-pressure sodium lamps.

### 1.2.6 Waste Mercury-Containing Lamp Transfer Facility

Any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of waste mercury-containing lamps are held during the normal course of transportation for 10 days or less.

## 1.3 REFERENCES, PUBLICATIONS AND FORMS

The Contractor shall comply with the issue or version (including all changes and amendments) of Federal, State and local environmental statutes and

regulations in effect on the day of issuance of this contract, including the applicable portions of the documents cited in the basic contract. References include but are not limited to the following.

Environmental Protection Agency 40 CFR Parts 260, 261, 264, 265, 268, 270 and 273

Environmental Protection Agency, Resource Conservation and Recovery Act (RCRA) (40 CFR 266).

Environmental Protection Agency, Disposal of Polychlorinated Biphenyls (PCBs) Federal Register vol. 63 29 June 1998, p. 25283 together with 40 CFR 761.

Hazardous Waste Management System: Modification of the Hazardous Waste Program; Hazardous Waste Lamps, Final Rule Federal Register Vol. 64 No. 128, July 6 1999 Rules and Regulations

Hazardous Waste and Emergency Responder 29 CFR 1926.65

### 1.3 SUBMITTALS

#### SD-09 Reports

PCB Articles and Hazardous Waste Lamps Disposition Report; GA|D.

Three separately bound copies of all logs, invoices, forms, notices, manifests, bills of lading or other shipping documents shall be submitted at the completion of the removal operations specified in this section.

#### SD-13 Certificates

Certification of Approved Recycling or Transfer Facility; GA|D.

To be submitted 30 days prior to the removal of recyclable from the site (reference paragraph 3.1.e. 3.1.f) and any time the Contractor changes facilities.

#### SD-18 Records

Receipt of Materials at Transfer or Recycling Facility or TSDF; GA|D.

To be submitted no later than 30 days from the date of shipment (reference paragraph 3.1.e. 3.1.f)..

Spill Prevention and Response Plan; GA|D.

Three separately bound copies including the names of workers responsible for handling of PCB articles and HWLs. Submittal shall include the requirements of 29 CFR 1926.65 Emergency Responders and all applicable training and certifications.

Underground Storage Tanks; GA

Three separately bound copies of the Closure and Assessment Plan (CAP) including disposal information for any residual sediment, sludge, or fuel remaining in the tank and ancillary piping.

## PART 2 PRODUCTS

### 2.1 GOVERNMENT-FURNISHED ITEMS AND SERVICES

The Government shall not provide any materials or services under this specification.

### 2.2 CONTRACTOR-FURNISHED ITEMS AND SERVICES

The Contractor shall furnish everything required to meet the conditions of this specification.

#### 2.2.1 Equipment, Materials and Tools

The Contractor shall furnish all labor, equipment, materials, supplies, containers, labels, tools, vehicles and supervision necessary to perform the work defined in this specification.

#### 2.2.2 Equipment

All equipment which is used by the Contractor to collect, transfer, transport, containerize and otherwise handle waste mercury-containing lamps, PCB ballasts and transformers shall meet all applicable federal and state requirements. Appropriate and permitted vehicles must be used to collect and transport the recyclable hazardous materials to the appropriate transfer and recycling/reclaim facilities.

#### 2.2.3 Materials

The Contractor shall provide appropriate collection containers for the safe collection and shipment of waste mercury-containing lamps that will accommodate the tube lengths as well as other sized and shaped lamps, and for the collection and shipment of small PCB ballasts and transformers. Containers provided by the Contractor shall meet the requirements of the receiving certified recycling facility and the Department of Transportation (DOT). The Contractor shall also provide appropriate shipping labels for these containers.

#### 2.2.4 Labeling Collection Containers

Logo decals and descriptive labels (i.e. "Used Mercury-Containing lamps" or "PCB Ballasts") shall initially be placed by the Contractor on all containers used to collect these materials respectively. Used Mercury-containing lamps shall not be considered hazardous waste while intact.

#### 2.2.5 Transportation

The Contractor shall provide permitted transportation for the collection, transfer, removal and transport of waste mercury-containing lamps, PCB ballasts and transformers from Fort Gillem to appropriate recycling and reclamation facilities.

#### 2.2.6 Forms and Notifications

It is the responsibility of the Contractor to determine which forms must be completed for compliance with State, Federal, and local requirements

complete and submit these forms. Copies of all notification forms shall be included in the PCB ARTICLES AND HAZARDOUS WASTE LAMPS DISPOSITION REPORT.

### PART 3 EXECUTION

#### 3.1 SPECIFIC TASKS

a. The Contractor shall perform mercury-containing fluorescent light, HID light, PCB ballast/transformer, refrigerant and other miscellaneous hazardous materials recycling and/or disposal. These materials are to be recycled within the United States.

b. The Contractor, along with the Contracting Officer or his designated representative, shall determine a fixed quantity of said materials to be removed from the buildings prior to commencement of work. Broken HWL shall be noted at this time. Estimates provided here are to be verified by the Contractor prior to bid submittal.

c. All waste mercury-containing lamps shall be delivered to a certified recycling facility (CRF), which has been approved prior to use by the Contracting Officer or his representative, where they shall be disassembled, reclaimed and prepared for marketing as a raw material in a manner that constitutes recycling as defined in the Resource Conservation and Recovery Act (RCRA) (40 CFR 266).

d. PCB ballasts and transformers shall be delivered to a certified recycling facility (CRF) that has been approved prior to use by the Contracting Officer, where they shall be disassembled. PCB-contaminated liquids shall be incinerated in accordance with 40 CFR 720. All other parts of the ballast shall be reclaimed, reused or prepared for marketing as a raw material in a manner that constitutes recycling as defined in RCRA (40 CFR 266).

e. The Contractor must submit copies of manifests, bills of lading and other receipts for every shipment transported off-site from Hunter Army Airfield, to a transfer facility or recycling facility. All copies must show name, address and phone number of receiving facility, as well as weight in pounds of materials being received. Receipts must be only for materials removed at Hunter Army Airfield under this contract. The Contractor, in accordance with RCRA regulations and the newly adopted State and Federal standards for mercury-containing lamps, must fulfill all applicable transportation and record keeping requirements.

f. The Contractor shall ensure that all mercury-containing lamps, PCB ballasts, and transformers are transported by a permitted hazardous materials transporter directly to a permitted transfer facility or permitted recycling facility, completing proper DOT shipping documentation and obtaining signature of transfer on shipping documentation from the Contracting Officer prior to leaving the site.

g. The Contractor shall take all precautions against breakage of mercury-containing lamps. If any mercury-containing lamps are broken during handling by the Contractor, they are considered to be hazardous waste and handled in accordance RCRA regulation. The Contractor shall be responsible for all costs associated with the cleanup and disposal of hazardous waste generated by the Contractor's employees if intact lamps are broken while being collected and transported.

h. It is the Contractor's responsibility to clean up any pre-existing broken HWL. This material is to be treated, shipped and disposed of as hazardous waste and shall meet all of the requirements (personal protective equipment, hazard posting, site control, emergency responder training, medical clearance to wear a respirator, etc., as stated in OSHA's Hazardous Waste Site and Emergency Responder, 29 CFR 1926.65). Prior to removal activities, the Contractor shall walk the buildings scheduled for demolition with the Contracting Officer to determine the number of broken HWLs. The Contractor shall submit an estimate for the clean up and disposal costs of broken HWL and will be reimbursed by the Government. All other breakage caused by the removal and handling of the HWLs shall be the Contractor's responsibility and will not be reimbursable.

SPECIFIC INSTRUCTIONS  
FOR

EOD Group Headquarter and Company Ops Facilities, FORT GILLEM, GEORGIA  
FY: 02    PN 1762:

ASBESTOS, LEAD-BASED PAINT, HAZARDOUS AND/OR REGULATED BUILDING MATERIALS,  
HAZARDOUS BUILDING MATERIALS AND/OR WASTES  
PREPARED BY: K.CAMPBELL-MILES      DATE: 6 May 2002

12.1. GENERAL. The instructions given herein supplement and modify the requirements given in Chapter A-12, Asbestos and Other Hazardous Materials (Identification, Handling and Removal) of the Savannah District Design Manual for Military Construction. Except where modified, all pertinent instructions found in Chapter A-12 of the Design Manual shall be complied with for this project. These instructions are written and numbered so as to "parallel" the text of Chapter A-12. Where the actual design submittal stages identified in section 01030 differ from the submittal stages herein, the design-build contractor will ensure that all requirements herein are submitted at the most appropriate stage.

In addition to the instructions covered here, the Contractor shall address requirements for the identification, removal and recycling/recovery of miscellaneous hazardous building materials such as High Intensity Direct lighting (HID), fluorescent light tubes (lamps) containing mercury, mercury containing thermostats, manometers and related sensing equipment, PCB containing ballasts and transformers, and lead items such as roofing anchors, flashing, window weights, tub and sink noise dampers, etc. At this time lead based paint (LBP) may be left on and in buildings 710, 736, and 739 as the (potential) debris has been tested and does not exceed regulatory limits of 5mg/L by Toxicity Characteristic Leaching Process (TCLP). Painted debris from the structures may go directly to a construction and debris (C&D) landfill. Individual surface testing of LBP need not be performed under these circumstances. LBP need not be removed under these circumstances.

12.2 APPLICABLE PUBLICATIONS. Include Georgia's asbestos, lead-based paint (LBP) and other applicable Georgia regulations in all specifications, which shall be used in the development of all design specifications.

The AE/Contractor shall comply with the issue or version (including all changes and amendments) of Federal, State and local environmental statutes and regulations in effect on the day of issuance of this contract, including the applicable portions of the documents cited in the basic contract. References include but are not limited to the following.

Environmental Protection Agency, Resource Conservation and Recovery Act (RCRA) (40 CFR 266).

Environmental Protection Agency 40 CFR Parts 260, 261, 264, 265, 268, 270 and 273

Environmental Protection Agency, Disposal of Polychlorinated Biphenyls (PCBs) Federal Register vol. 63 29 June 1998, p. 25283 together with 40 CFR 761.

Hazardous Waste Management System: Modification of the Hazardous Waste Program; Hazardous Waste Lamps, Final Rule Federal Register Vol. 64 No. 128, July 6 1999 Rules and Regulations

Hazardous Waste and Emergency Responder 29 CFR 1926.65

Georgia Department of Natural Resources, Environmental Protection Division's web site for regulations is: [www.dnr.state.ga.us/dnr/environ](http://www.dnr.state.ga.us/dnr/environ)

Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-1, Rules for Air Quality Control

Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-14, Rules for Asbestos Encapsulation

Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-4, Rules of Solid Waste Management

Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-24, Lead-based Paint Abatement, Certification, and Accreditation

12.3 PRECONCEPT SUBMITTAL REQUIREMENTS. No changes.

12.4 CONCEPT/EARLY PRELIMINARY (35%) DESIGN SUBMITTAL REQUIREMENTS.

Because an asbestos and hazardous materials survey has been conducted, no further surveys of these items are expected to be needed. Should unexpected hazardous building materials be encountered during demolition the requirements in Design Manual A-12 section 12.4 and the following requirements will also be met. The report of findings shall be stand-alone chapters in one volume. "Negative findings" reports shall be included. The AE/Contractor shall address all USACE comments in writing and make all changes necessary to bring the report into compliance with federal, state, local, USACE, and Army requirements. The reports shall be included as a permanent part of the project files.

**Lead-based Paint.** The buildings to be demolished are circa WW II era, wood-sided structures with 1970's era aluminum siding upgrade. Lead-based Paint must be addressed on two aspects, environmental disposal and worker safety and health. A composite-debris test, using the Toxicity Characteristic Leaching Process (TCLP) has been performed by the government and the results are included in the Hazardous (Building) Materials Survey Report for each building. Debris from these shall be placed in a C&D landfill. Worker protection, such as required under the OSHA Lead in Construction Standard and the Hazard Communication Standard, is to be addressed in the specifications regardless of TCLP results as demolition activities may produce hazardous lead dust situations. It is the Contractor's responsibility to control all dusts generated by demolition activities.

**Lead Items.** All lead items such as pipe and venting systems (hot pour), flashing, noise deadening pastes, and medical/dental x-ray protection panels must be removed prior to demolition to prevent lead items from entering the landfill. If at all possible these items should be recovered or recycled. Lead items as described herein cannot be disposed of in a C&D landfill. See the Hazardous (Building) Materials Survey Report for type, quantity and location.

**Asbestos.** An Asbestos Survey has been conducted by USACE. An estimate of the location, type and quantity of asbestos is presented in the attached ACM Survey Reports. The Contractor is encouraged to inspect the buildings for types and quantities of ACM and present any changes in his proposal. There are two issues of concern. Building 736 had been renovated with the ceiling dropped and new drywall systems

installed. The area above the ceiling was not renovated and contains the old asbestos-containing drywall system. The gypsum joint compound of the old system *only* has tested positive. Due to lighting and access into this area it was impossible to estimate drywall quantities. Quantities found in Table 2 are estimated from the entire ceiling and wall remnants. Actual ACM joint compound will be less than this quantity. The crawl space of Building 736 included thermal insulation system (TSI) that was extremely friable. It is badly damaged and pieces have dropped into the soil, mixing with it overtime. The friable TSI and fragmented debris plus the top two inches of soil must be removed.

Should suspected ACM be encountered, the material must be sampled by the Contractor and reported in accordance with Chapter 12A and this instruction. The findings from any additional bulk sampling shall be collated into a brief report (Asbestos Sampling and Survey Supplemental Report) that shall be included as a permanent part of the project file. The sampling report shall be prepared in such a way as to include: location and specific area, quantity, condition and whether it can be demolished in place without becoming friable. All completed sampling forms, custody forms, and drawings shall be included. Sampling locations shall be marked on the drawings. The Asbestos Sampling and Survey Supplemental Report shall include copies of all licenses and certifications and shall be signed by the licensed asbestos inspector. Suspected asbestos containing materials (ACM) shall not be called negative (or <1%) based upon one sample. A minimum of three asbestos samples shall be analyzed unless the homogeneous material is less than 10 linear ft.

The Contractor must produce an asbestos abatement specifications and associated drawings. The Specification must include the submission of an Asbestos Hazard Control Plan (Means & methods, Safety & health, Certifications & documentation). USACE requires that all Asbestos Hazard Control Plans be submitted and accepted by the District's (Savannah) Safety and Occupational Health Office.

**Mercury.** Mercury containing materials and hazardous waste lamps (HWL): A visual survey of all mercury containing building materials was done and a brief report submitted describing the number and type of materials present. All fluorescent tubes and metal halide 'bulbs' that are not marked 'mercury free' shall be considered 'mercury-containing' and disposed of as Universal Waste. The quantities of fluorescent light tubes and fixtures and mercury containing items are listed in each Hazardous (Building) Materials Survey Report. Materials such as electrical switches, thermostats, and thermometers containing liquid mercury must be accounted for. These items may be recycled, recovered, or disposed of as a hazardous waste product as deemed necessary by the AE/Contractor. The AE/Contractor shall contact the Ft Gillem environmental coordinators as to their preference in disposal methods.

**PCBs.** The AE/Contractor shall use the inventory of fluorescent light fixtures that is found in the Hazardous (Building) Materials Survey Report on each building to determine the number of PCB containing ballasts. The AE/Contractor shall contact the Ft. Gillem environmental coordinators as to their preference in disposal methods.

**Miscellaneous Hazardous Building Materials.** All fluorocarbon refrigerants and coolants must be removed and recovered or recycled prior to building demolition. All residual fuels in abandoned pipelines and (USTs) must be removed and disposed of in accordance with Georgia underground storage regulations (GUST). See the Hazardous (Building) Materials Survey Report for more details on these materials. All USTs, regardless of use must be removed in accordance with GUST. Coordination with Ft. Gillem environmental and real property departments is required should these be encountered.

The Contractor shall prepare a specification for the removal and disposal of all Universal Wastes. The AE/Contractor shall assume that the installation will accept no Universal or Hazardous Wastes and all such materials must be removed from the installation for proper disposal.

## 12.5 SIXTY PERCENT (60%) SUBMITTAL REQUIREMENTS. No changes.

The AE/Contractor shall utilize the information presented in the Asbestos Survey Reports, the Hazardous (Building) Materials report and the knowledge that the buildings contain lead-based paint to create a minimum of two specifications, an Asbestos Abatement and Control Specification and a separate Hazardous Building Materials Removal Specification. The Hazardous Building Materials Removal specification shall not be combined with a general demolition specification, although the Demolition Specification shall reference it. The specifications shall address all applicable environmental, worker safety and health regulations, and the methods for removing, recycling/recovering and/or disposal of the hazardous materials that have been identified. Sample guide specifications can be viewed from TECHINFO on the USACE Huntsville District website or a sample version of a Hazardous Building Materials Specification 02081 can be obtained from Savannah District. As these materials are either hazardous or universal wastes, record keeping and disposition documentation must be included as submittal items (FIO).

## 12.6 PRELIMINARY (60%) DESIGN SUBMITTAL REQUIREMENTS.

12.6.1 The format shall match the rest of the project's drawings and style.

12.6.2 Generally, guide specifications must be edited and tailored by the A/E to satisfy the requirements of the particular project being designed. The drawings and specifications must complement each other. All extraneous and irrelevant information contained in the guide specifications must be eliminated. Likewise, information not originally contained in the guide specifications must be added to ensure a complete specification. Furthermore, functional or descriptive specifications must be developed as necessary to fully specify the requirements of the project being designed.

12.6.3 All *Set-up* and *Detail Sheets* referenced in the final specification shall be included as an addendum or attachment to the asbestos specification (13280) or the web site shall be listed.

12.6.4 The Asbestos Sampling and Survey Supplemental Report shall be included as an addendum.

12.6.5 Contractor Submittal Requirements. The specifications shall require the Contractor to submit shop drawings, samples, manufacturer's data, personnel and equipment certificates, test reports, an abatement plan, etc. as appropriate. The AE shall be required to furnish a listing of the Contractor's submittal requirements. The AE shall add submittal items as needed to supply all relevant information.

12.6.6 Provide a minimum 1-inch margin at all four edges of each page.

12.6.7 All abatement and removal drawings/plates shall be labeled. Drawings shall be specific as to the type and location of the asbestos or hazardous materials. General descriptions and hatch markings shall be avoided. Textual descriptions must be accompanied by hatching or other markings on the drawing. Drawings shall contain material descriptions and approximate quantities, based upon the inspection report. Drawings shall contain sufficient exterior landscaping and details so as to assist the Contractor in locating suitable areas for decontamination units and material load-out centers. The Asbestos Survey drawings may be edited for this purpose.

## 12.7 CORRECTED FINAL (100%) DESIGN SUBMITTAL REQUIREMENTS. No changes.

12.8 ESTIMATE. No changes.

12.9 FEE PROPOSAL. No changes.

12.10 PROJECT REVIEW COMMENTS. The AE/Contractor shall submit specific annotated responses to all review comments. Responses shall state the specification section or the drawing /plate number where the change was made. Changes include deletions as well as additions. Revised submittals shall be legibly typed and not marked by hand.

-End-



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

## ASBESTOS SURVEY

**BUILDING NO. 710  
FORT GILLEM, GEORGIA**



**ASBESTOS INSPECTION REPORT  
FORT GILLEM, GEORGIA  
BUILDING NO. 710**

**INTRODUCTION**

1. This report documents the asbestos inspection and survey of Building No. 710 at Fort Gillem, Georgia conducted on September 13-17, 2001 by USACE employees Tim Jones and Jack Ford. The survey was conducted in general accordance with the regulatory guidelines in the Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763 Subpart E Sections 763.80-763.88) and "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Purple Book) (EPA publication number 560/5-85-024). Although not required by the AHERA guidelines, roof and other exterior miscellaneous materials were also inspected and sampled.
2. Building No. 710 is a two-story wood frame structure with wood siding covered with newer vinyl siding, a shingle roof system and a floor system that is part wood frame and part concrete slab on grade. The buildings current primary use is as an office building.
3. All accessible areas of Building No. 710 were visually inspected for suspected asbestos containing materials (ACM) by an accredited inspector. Bulk samples of all suspected ACM's were collected. This report details ACM as identified at the time of inspection only.
4. The bulk samples were analyzed by Hygeia Laboratories, Inc. Hygeia is accredited by the National Voluntary Laboratory Accredited Program (NVLAP Accreditation sponsored by the National Institute of Standards and Technology (NIST)). The samples were analyzed by the accepted method of polarized light microscopy (PLM) using EPA's "Method For the Determination of Asbestos In Bulk Building Materials", EPA/600/R-93/116. Hygeia's analytical report is included in Appendix 1.
5. In compliance with the AHERA regulations, material is considered an Asbestos Containing Material (ACM) when it contains greater than 1 (one) percent asbestos. Likewise, in this report, any material containing in concentrations greater than 1 percent asbestos will be considered "positive". A narrative discussion of the AHERA ACM types (i.e., thermal systems insulation, miscellaneous and surfacing materials,) found in Building No. 710 is included in this report when relevant. Bulk sample information appears on Table 1. Estimated quantities of individual asbestos containing materials and their characterizations appear on Table 2. Photographs of the positive materials, when available, appear as Figures. The specific location where each bulk sample was obtained is shown on the building floor plans, which appear as Plates. Positive ACM samples are highlighted on the floor plan Plates and, where possible, locations of positive ACM are identified. It is reasonable to assume that all

materials similar to those testing positive, also contain positive amounts of asbestos and should be treated as such.

## DISCUSSION

6. **Miscellaneous Materials** – Miscellaneous materials include building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing or TSI.

In the past, there were a great number of miscellaneous building materials that had asbestos fibers added to them during the manufacturing process to increase durability and fireproofing qualities. The following suspect miscellaneous materials were sampled at Building No. 710 and found to contain asbestos.

Heat shield board applied to the wall and the ceiling in the Mechanical Room contains asbestos. This material is limited to a small area of the room (See floor plan).

Canvas flex joints in the ductwork near the air-handling units in the Mechanical Room contain asbestos.

Troweled on roofing cement around roof vents and applied to the brick chimney above the roof under the rubberized canvas contains asbestos.

Caulking material on the exterior of Building 710 at the joints between window and door trim and the siding contains asbestos.

## SUMMARY

7. In summary, the following material found at Building No. 710 contains positive amounts of asbestos:

Troweled on roofing cement contains asbestos.

Duct flex joints contain asbestos.

Heat shield board contains asbestos.

Exterior caulking contains asbestos.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Figures



**Figure 1.** Silver fibrous heat shield material in the Mechanical Room contains asbestos.



**Figure 2.** Canvas flex joints in the ductwork near the air-handling units in the Mechanical Room contain asbestos.



**Figure 3.** Silver painted troweled on roofing cement on the base of the roof vents contains asbestos.



**Figure 4.** Troweled on roofing cement applied to bricks behind rubberized canvas coating on chimney contains asbestos.

# Tables

**Table 1**  
**Sampled Suspect ACM**

FIELD ID	DESCRIPTION	LOCATION	ASBESTOS TYPE(%)
710-M-1	Heat shield board	Mechanical Room wall	6% chrysotile
710-M-2	Heat shield board	Mechanical Room ceiling	20% chrysotile
710-M-3	Drywall	Mechanical Room ceiling	None
710-M-4	Duct flex joint material	Mechanical room, at air-handlers	10% chrysotile
710-M-5	Duct flex joint material	Mechanical room, at air-handlers	10% chrysotile
710-M-6	Drywall	Mechanical Room walls	None
710-E-7	Window glazing compound	Exterior, Mechanical Room window	None
710-E-8	Caulking material	In joint between window frame and siding	4% chrysotile
710-E-9	Window glazing compound	Exterior, west facing window	None
710-E-10	Caulking material	Exterior, west facing window, in joint between window frame and siding	4% chrysotile
710-R-11	Silver Cool Seal coating	On metal roof vents	None
710-R-12	Silver coated troweled on roofing cement	On metal roof vent bases	3% chrysotile total in sample, 6% in black portion, None in silver portion
710-R-13	Silver coated rubberized canvas chimney covering material	Wrapped over brick chimney	None
710-R-14	Troweled on roofing cement	Applied to brick chimney, under rubberized canvas cover	20% chrysotile
710-R-15	Roofing cement	At joint of chimney and roof line	Assumed positive
710-R-16	Roofing shingle	Roof field	None
710-R-17	Roofing felt	Roof field	None
710-1-18	Brown mottled 12" X 12" floor tile	Entry hall	<1% chrysotile
710-1-19	Cloth backed sheet vinyl floor covering	Entry hall, under 12" X 12" floor tile	None
710-1-20	Cloth backed sheet vinyl floor covering	Entry hall, on raised portion of floor	None
710-1-21	Black stair tread	Stairwell	None
710-1-22	Drywall joint compound	Entry hall	None
710-1-23	Drywall	Entry hall	None
710-1-24	Felt paper	Entry hall, under sheet vinyl flooring	None
710-1-25	Brown mottled 12" X 12" floor tile	Men's restroom	<1% chrysotile
710-1-26	Black cove base	Men's restroom	None
710-1-27	2' X 4' ceiling tile	Men's restroom	None
710-1-28	Brown mottled 12" X 12" floor tile	Women's lounge	<1% chrysotile

**Table 1**  
**Continued**

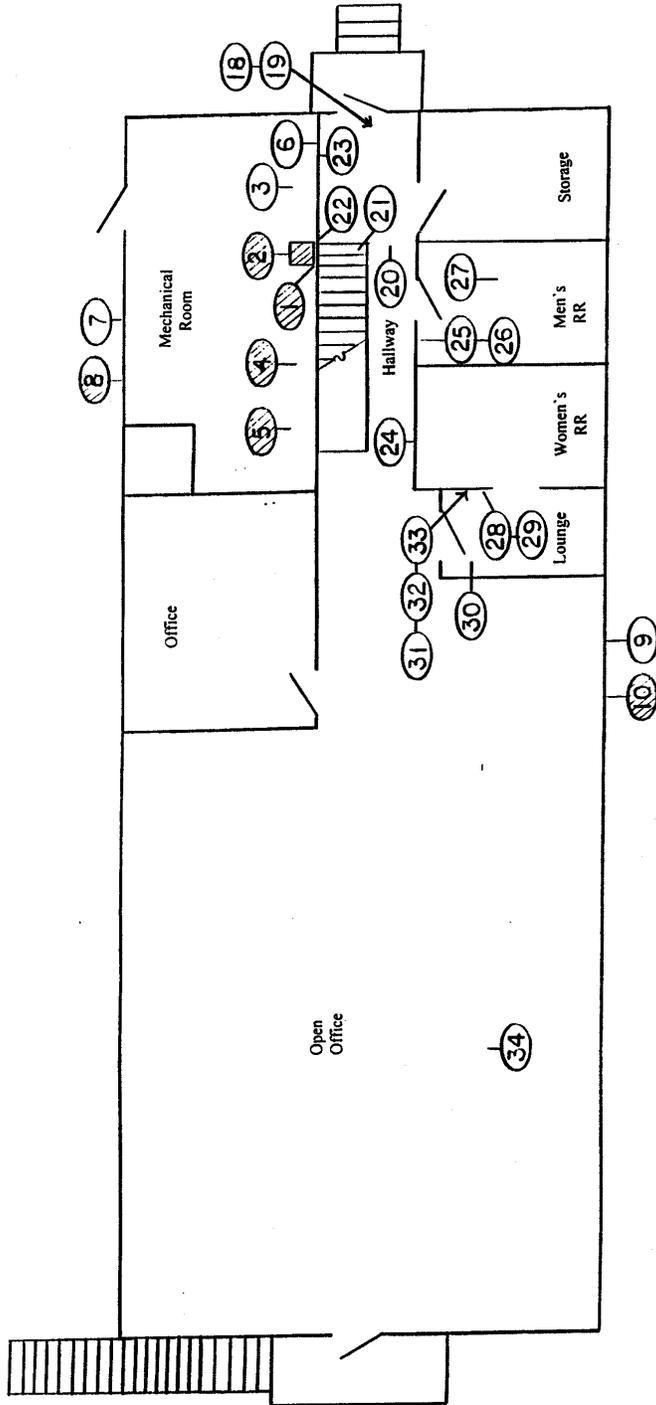
FIELD ID	DESCRIPTION	LOCATION	ASBESTOS TYPE(%)
710-1-29	Cloth backed sheet vinyl floor covering	Women's lounge, under 12" X 12" floor tile	None
710-1-30	2' X 4' ceiling tile	Women's restroom	None
710-1-31	Drywall	Women's lounge	None
710-1-32	Drywall joint compound	Women's lounge	None
710-1-33	Fiberboard wall covering	Women's lounge, behind drywall	None
710-1-34	Drywall & joint compound	Open Office first floor ceiling, above suspended ceiling	None
710-2-35	Cloth backed sheet vinyl floor covering	Open Office, second floor	None
710-2-36	Felt paper	Open Office, second floor, between layers of sub-flooring	None
710-2-37	Fiberboard ceiling	Open Office, second floor, above suspended ceiling	None

Samples testing positive for asbestos in **BOLD** type

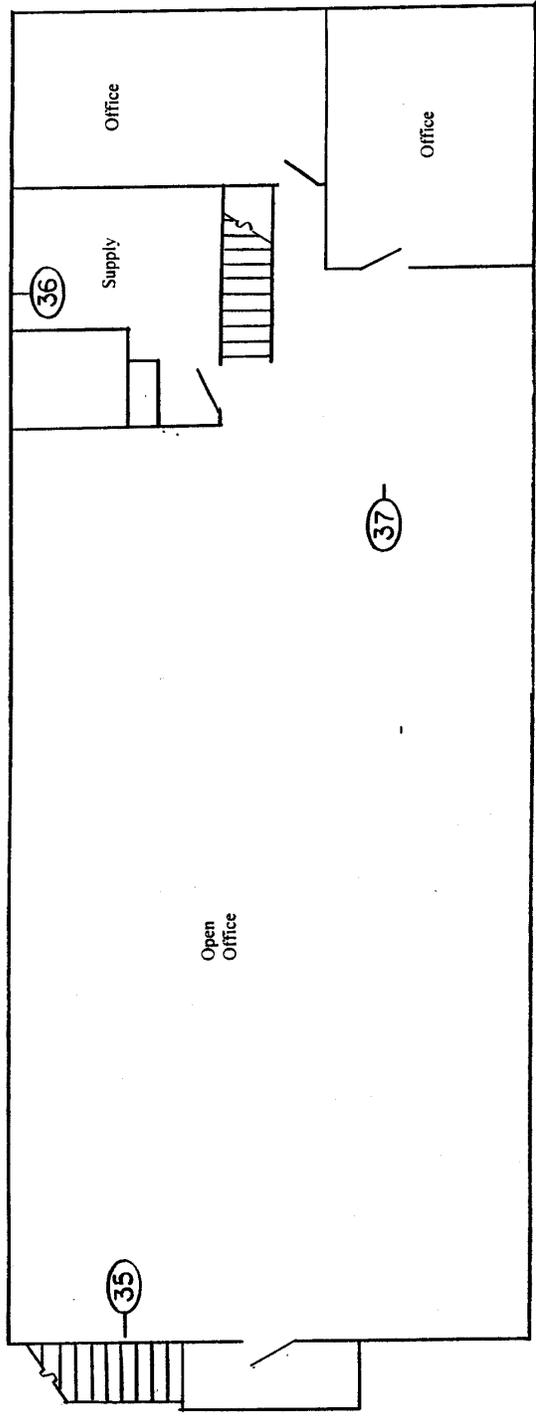
**TABLE 2**  
**MATERIAL QUANTITY AND CHARACTERIZATION**

MATERIAL		CHARACTERISTICS			ASSESSMENT	
Type	Description	Asbestos yes/no/ assumed	Quantity (If ACM)	Friable Non-Friable	Condition	Disturbance Potential
Miscellaneous	Heat shield board	Yes 6-20%	16 S.F.	Friable Non-Friable	Damaged	Low
Miscellaneous	Canvas duct flex joint	Yes 10%	40 L.F. of 4" wide material	Non-friable	Good	Low
Miscellaneous	Troweled on roofing cement	Yes 6-20%	25 S.F.	Non-friable	Damaged	Low
Miscellaneous	Exterior caulking material	Yes 4%	580 L.F.	Non-friable	Damaged	Low

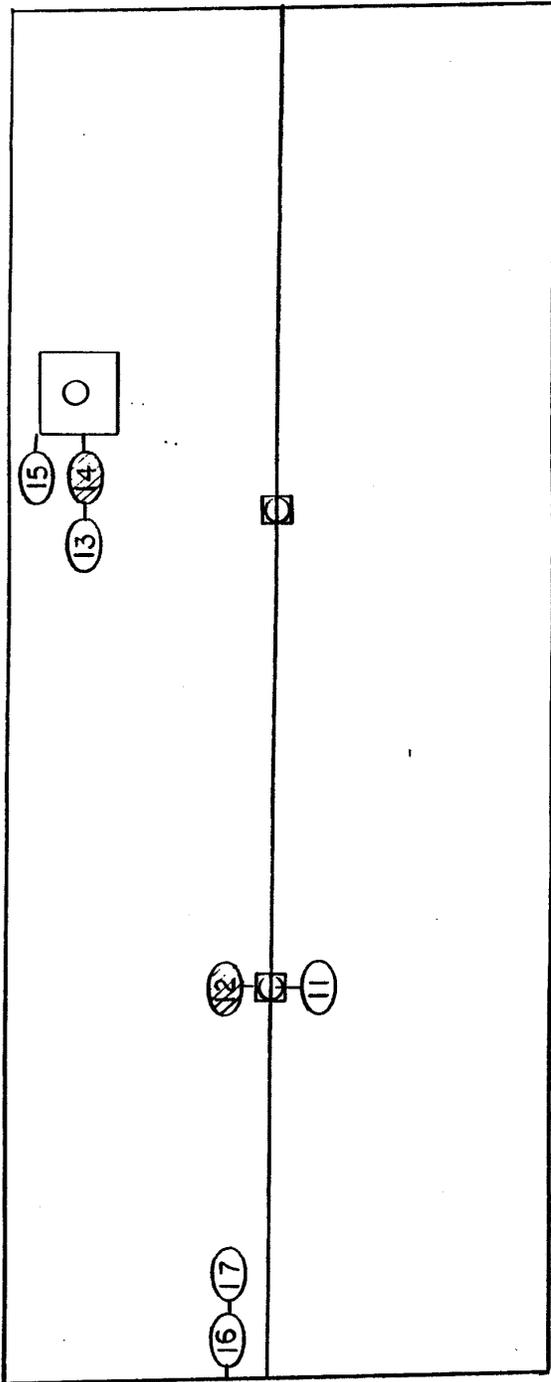
# Plates



<i>Asbestos Survey</i>	
BUILDING 710, Ft. GILLEM, GEORGIA	
PLATE NO.	<b>1</b>
FIRST FLOOR	
MISCELLANEOUS	
Positive Samples 	



<i>Asbestos Survey</i>	
BUILDING 710, Ft. GILLEM, GEORGIA	
PLATE NO.	2
SECOND FLOOR	
MISCELLANEOUS	
Positive Samples 	



<i>Asbestos Survey</i>	
BUILDING 710, Ft. GILLEM, GEORGIA	
PLATE NO.	ROOF
3	MISCELLANEOUS
	Positive Samples 



# Appendix 1

**HYGEIA LABORATORIES, INC.**

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

USArmy Corps of Engineers  
Environmental & Materials  
200 N. Cobb Pkwy. Bldg. 400  
Ste. 404 Marietta, GA 30062

10/02/01

Subject: PLM Analysis of Bulk Samples  
HYGEIA Project Number: 40449  
Client Reference: Ft. Gillem Bldg. 710 #7313

Dear Mr. Jones :

Enclosed are the analytical results of bulk samples submitted by you to this laboratory on 09/18/01. All analyses were performed by polarized light microscopy (PLM) in accordance with the EPA method as defined in Perkins and Harvey, July 1993, "Methods for the Determination of Asbestos in Bulk Materials" 61 pp. (EPA/600/R-93/116). The reported percentages are volume estimates obtained by calibrated visual estimation. The results in this report apply only to the items tested.

The EPA defines an asbestos containing material (ACM) as a material that is reported to contain greater than one percent asbestos. HYGEIA is only responsible for the accuracy of the analytical results provided in this report and cannot be held responsible for errors resulting from improper sample collection techniques. This report may not be used to claim product endorsement by NVLAP or any other U.S. Government agency.

For nonhomogeneous samples, each layer was analyzed separately and the results combined to form the reported value except where otherwise noted. Vinyl floor tile samples with negative results by PLM should be submitted for confirmation by transmission electron microscopy (TEM). Friable samples containing less than 10% asbestos as determined by PLM may be resubmitted for point counting at your discretion.

Thank you for using our analytical services. HYGEIA Laboratories has been NVLAP accredited since 1988. Our current NVLAP code is 102087-0. We will keep a copy of this report on file for three years. We will dispose of your samples in sixty days unless you request that we return them. If you have any questions, please call us at (770) 514-6933.

Sincerely,

Clayton Call  
Manager, Asbestos Laboratory

NVLAP # 102087-0  
Texas Dept. of Health # 30-0232  
Commonwealth of Virginia # 3333-000210

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449 Analyzed 09/21/01 by JTC Page: 1  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Client#	HYGEIA#	Sample Description		Asbestos Percent			Other Fibers %		Non-Fibers %				
		Color	Texture	Chr.	Am.	Cro.	An.	T/A	Cell	Glass	Other	B/F	Other
710-M-1	296312	Tan	Fibrous	No	6%				24%				70%

Comments: .

710-M-2 296313 Gray Consolid. No 20% 80%

Comments: .

710-M-3 296314 Gray Powdery No 10% 90%

Comments: No asbestos detected.

710-M-4 296315 White Fibrous Yes 10% 10% Syn. 80%

Comments: .

710-M-5 296316 White Fibrous Yes 10% 10% Syn. 80%

Comments: .

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449 Analyzed 09/21/01 by JTC Page: 2  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Client#	HYGEIA#	Sample ID	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Asbestos Percent	Other Fibers %	Cell	Glass	Other	Non-Fibers %
710-M-6	296317	Gray	Powdery	No								10%					90%

Comments: No asbestos detected.

710-E-7	296318	White	Powdery	Yes													100%
---------	--------	-------	---------	-----	--	--	--	--	--	--	--	--	--	--	--	--	------

Comments: No asbestos detected.

710-E-8	296319	Gray	Caulk	Yes			4%										96%
---------	--------	------	-------	-----	--	--	----	--	--	--	--	--	--	--	--	--	-----

Comments: .

710-E-9	296320	White	Powdery	No													100%
---------	--------	-------	---------	----	--	--	--	--	--	--	--	--	--	--	--	--	------

Comments: No asbestos detected.

710-E-10	296321	Gray	Caulk	Yes			4%										96%
----------	--------	------	-------	-----	--	--	----	--	--	--	--	--	--	--	--	--	-----

Comments: .

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449 Analyzed 09/21/01 by JTC Page: 3  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Client#	HYGEIA#	Sample ID	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Cell	Glass	Other	Asbestos Percent	Other Fibers %	Non-Fibers %
710-R-11	296322		Silver Gummy			Yes											100%

Comments: No asbestos detected.

710-R-12	296323		Black Gummy			No											97%
----------	--------	--	-------------	--	--	----	--	--	--	--	--	--	--	--	--	--	-----

Comments: Black Layer 6% Chrysotile. Silver Layer NAD.

710-R-13	296324		Black Rubbery			No											70%
----------	--------	--	---------------	--	--	----	--	--	--	--	--	--	--	--	--	--	-----

Comments: No asbestos detected.

710-R-14	296325		Black Gummy			Yes											80%
----------	--------	--	-------------	--	--	-----	--	--	--	--	--	--	--	--	--	--	-----

Comments: .

710-R-15	296326		Silver Gummy			Yes											80%
----------	--------	--	--------------	--	--	-----	--	--	--	--	--	--	--	--	--	--	-----

Comments: No asbestos detected.

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Analyzed 09/21/01 by JTC Page: 4

Client#	HYGEIA#	Sample ID	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Cell	Glass	Other	Asbestos Percent	Other Fibers %	Non-Fibers %
710-R-16	296327		Black Gummy	Black	Gummy	No									10%		90%

Comments: No asbestos detected.

710-R-17	296328		Black Fibrous	Black	Fibrous	Yes									60%		40%
----------	--------	--	---------------	-------	---------	-----	--	--	--	--	--	--	--	--	-----	--	-----

Comments: No asbestos detected.

710-1-18	296329		Red Consolid.	Red	Consolid.	No	<1%								5%		95%
----------	--------	--	---------------	-----	-----------	----	-----	--	--	--	--	--	--	--	----	--	-----

Comments: Tile <1% Chrysotile. Mastic NAD.

710-1-19	296330		Brown Layered	Brown	Layered	No									25%		75%
----------	--------	--	---------------	-------	---------	----	--	--	--	--	--	--	--	--	-----	--	-----

Comments: No asbestos detected.

710-1-20	296331		Red Layered	Red	Layered	No									25%		75%
----------	--------	--	-------------	-----	---------	----	--	--	--	--	--	--	--	--	-----	--	-----

Comments: No asbestos detected.

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number:40449 Analyzed 09/21/01 by JTC Page: 5  
 Client Project ID:Ft. Gillem Bldg. 710 #7313

Client#	Sample ID	HYGEIA#	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Asbestos Percent	Other Fibers %	Cell	Glass	Other	Non-Fibers %
710-1-21	296332		Black Rubbery	Yes													100%
Comments:No asbestos detected.																	
710-1-22	296333		White Powdery	Yes													100%
Comments:No asbestos detected.																	
710-1-23	296334		Gray Powdery	Yes								2%					98%
Comments:No asbestos detected.																	
710-1-24	296335		Black Fibrous	Yes								60%					40%
Comments:No asbestos detected.																	
710-1-25	296336		Brown Consolid.	No			<1%										100%
Comments:Mastic <1% Chrysotile. Tile NAD.																	

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449 Analyzed 09/21/01 by JTC Page: 6  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Client#	HYGEIA#	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Cell	Glass	Other	Asbestos Percent	Other Fibers %	Non-Fibers %
710-1-26	296337	Black Rubbery	Yes													100%

Comments: No asbestos detected.

710-1-27 296338 White Fibrous No 40% 10% 5% Per. 45%

Comments: No asbestos detected.

710-1-28 296339 Brown Consolid. No <1% <1% 100%

Comments: Tile <1% Chrysotile. Mastic <1% Chrysotile.

710-1-29 296340 Red Rubbery No 10% 10% 5% Per. 90%

Comments: Vinyl and Mastic MAD.

710-1-30 296341 White Fibrous No 40% 10% 5% Per. 45%

Comments: No asbestos detected.

abbreviations:

Chr. = chrysotile cell = cellulose per = perlite  
 Am. = amosite glass = fibrous glass ver = vermiculite  
 Cro. = crocidolite syn = synthetic MF = Mineral filler  
 An. = anthophyllite sty = styrene foam B/F = Binder/filler  
 T/A = tremolite/actinolite det = detected NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number:40449  
 Client Project ID:Ft. Gillem Bldg. 710 #7313

Analyzed 09/21/01 by JTC Page: 7

Client#	HYGEIA#	Sample ID	Sample Description	Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Asbestos Percent	Other Fibers %	Cell	Glass	Other	Non-Fibers %	B/F	Other
710-1-31	296342	Gray	Powdery	Yes								2%					98%		

Comments:No asbestos detected.

710-1-32	296343	White	Powdery	No								7%					93%		
----------	--------	-------	---------	----	--	--	--	--	--	--	--	----	--	--	--	--	-----	--	--

Comments:Joint compound NAD. Rest NAD.

710-1-33	296344	Tan	Fibrous	No								85%					15%		
----------	--------	-----	---------	----	--	--	--	--	--	--	--	-----	--	--	--	--	-----	--	--

Comments:No asbestos detected.

710-1-34	296345	Gray	Layered	No								10%					90%		
----------	--------	------	---------	----	--	--	--	--	--	--	--	-----	--	--	--	--	-----	--	--

Comments:Joint compound NAD. Rest NAD.

710-2-35	296346	Brown	Layered	No								15%					85%		
----------	--------	-------	---------	----	--	--	--	--	--	--	--	-----	--	--	--	--	-----	--	--

Comments:Vinyl and Mastic NAD.

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

HYGEIA Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM ANALYSIS SUMMARY

HYGEIA Project Number: 40449  
 Client Project ID: Ft. Gillem Bldg. 710 #7313

Analyzed 09/21/01 by JTC Page: 8

Client#	HYGEIA#	Sample ID	Sample Description	Color	Texture	Homog.	Chr.	Am. Cro.	An.	T/A	Asbestos Percent	Other Fibers %	Cell	Glass	Other	Non-Fibers %	B/F	Other
710-2-36	296347		Black Fibrous	Black	Fibrous	Yes					55%					45%		

Comments: No asbestos detected.

710-2-37 296348 Tan Fibrous Yes 80%

Comments: No asbestos detected.

abbreviations:

Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder/filler  
 NAD = No asbestos detected

This report may be reproduced only in its entirety with the consent of Hygeia Laboratories Inc.

# **Chain of Custody**

ABESTOS CHAIN OF CUSTODY - US ARMY CORPS OF ENGINEERS

Project:	Ft. Gillem Bldg. 710	EMU Job No.:	
Sampler:	Tim Jones	Analysis:	PLM

DATE	FIELD ID	EMU ID	COMPONENTS / NOTES
9-13-01	710-M-1	42433	Heat shield
	710-M-2	34	" "
	710-M-3	35	Drywall
	710-M-4	36	Duct Flex Joint
	710-M-5	37	" " "
	710-M-6	38	Drywall
	710-E-7	39	Window Glazing
	710-E-8	40	Caulking material
	710-E-9	41	Window Glazing
	710-E-10	42	Caulking material
<del>9-17-01</del>	710-R-11	43	Cool Seal Coating
9-17-01	710-R-12	44	Roofing Cement
	710-R-13	45	Rubberized Canvas
	710-R-14	46	Asphalt Cement
	710-R-15	47	Roofing cement
	710-R-16	48	Roofing Shingle
	710-R-17	49	Roofing Felt
	710-1-18	50	Floor Tile
	710-1-19	51	Sheet Vinyl
	710-1-20	52	Sheet Vinyl
	710-1-21	53	Stair Tread
↓	710-1-22	↓ 54	Drywall Joint Compound

Relinquished By	Date	Time	Received By	Date	Time
Tim Jones	9-18-01	1340	C. Cell	9/18/01	13:40

Comments:



# Certifications

---

---

**The Environmental Institute**

---

---

---

*Tim Jones*

---

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA / AHERA (TSCA Title II) Approved Accreditation  
and NESHAP Regulations Training*

*Asbestos in Buildings: Inspection and Assessment*

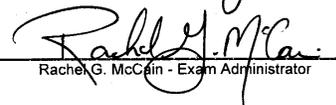
February 10-12, 1997  
Course Date

2360  
Certificate Number

February 12, 1997  
Examination Date

February 11, 1998  
Expiration Date

  
William H. Spain - Course Director

  
Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

**The Environmental Institute**

*Timothy A. Jones*

Social Security Number - 411-04-8826

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation  
and NESHAP Regulations Training*

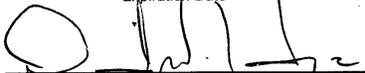
*Asbestos in Buildings: Inspector Refresher*

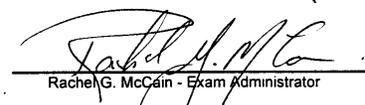
February 28, 2001  
Course Date

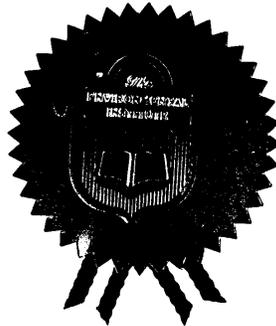
6872  
Certificate Number

February 28, 2001  
Examination Date

February 27, 2002  
Expiration Date

  
David W. Hogue - Course Director

  
Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

# Scope of Accreditation



Page: 1 of 1

**BULK ASBESTOS FIBER ANALYSIS**

**NVLAP LAB CODE 102087-0**

**HYGEIA LABORATORIES, INC.**

1300 Williams Drive, Suite A  
Marietta, GA 30066-6299

Mr. Clayton Call

Phone: 770-514-6933 Fax: 770-514-6966

E-Mail: call67@atc-enviro.com

***NVLAP Code***

***Designation***

18/A01

EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

March 31, 2002

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology

United States Department of Commerce  
National Institute of Standards and Technology



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

Certificate of Accreditation

**HYGEIA LABORATORIES, INC.**  
MARIETTA, GA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

**BULK ASBESTOS FIBER ANALYSIS**

March 31, 2002

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology

NVLAP Lab Code: 102087-0



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

# HAZARDOUS MATERIAL REPORT

**BUILDING NO. 710  
FORT GILLEM, GEORGIA**



**HAZARDOUS MATERIAL REPORT  
Ft. GILLEM, GEORGIA  
BUILDING 710**

**INTRODUCTION**

1. This report documents the hazardous material survey of Building No. 710 at Ft. Gillem, Georgia conducted between 29 April and 1 May 2002 by USACE Savannah District employees Tim Jones and Jack Ford. This survey was conducted in general accordance with the Statement of Services developed by Ray Willingham, USACE Savannah District, which includes the USAEHA guidance for demolition debris characterization by TCLP sampling.
2. The survey consists of a count of florescent and metal halide lights, a search for mercury containing equipment, a search for lead building components, a search for evidence of past or present underground storage tanks and a search for any other hazardous building materials excluding asbestos. The report also documents results of composite sampling of building materials for demolition debris characterization by analysis of TCLP lead.
3. Building No 710 was built in the 1940s time frame and is of wood frame construction. The roof system is wooden framing with wood decking covered by asphalt shingles. The floor system is mostly wood with some small area of concrete. Due to the construction of the building, the TCLP sampling was performed in accordance with composite sample estimated percentages for Wood structures in the USAEHA guidance. No physical sampling of other hazardous components was performed, only a visual counting was performed.
4. The sampled components for identification of TCLP lead, in their proper percentages, were analyzed by Hygeia Laboratories using EPA methods 1311 for extraction followed by 6010B analysis. Hygeia's analytical report is included in Appendix 1.

## SUMMARY

5. The florescent and metal halide light count results are presented in Table 1.
6. Sampling of building components was performed as required and components were processed and mixed in the proper percentages and given a sample identification of FGB 710 TCLP. TCLP analysis by Hygeia Laboratories indicates that lead is not present above the regulatory limit of 5mg/L. Field sampling data including component type, color, TCLP mix percentage and approximate sampling location is presented in Table 2. Approximate locations of material sub-samples are indicated in the floor plan.
7. Inspection of the building turned up lead in the plumbing drain and vent piping system. Details are included in Table 3.
8. No mercury containing thermostats or switches were found in Building 710.
9. No evidence of the existence of an underground storage tank was found.
10. Refrigerant from one central air conditioning system should be recovered prior to building demolition. One window air conditioning unit should be removed and refrigerant recovered prior to demolition.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Tables

**TABLE 1**  
**Ft. GILLEM BLDG. 710**  
**FLORESCENT LIGHT FIXTURES**

<b>AREA IDENTIFICATION</b>	<b># &amp; TYPE LIGHTS PRESENT</b>	<b>DESCRIPTION OF LIGHTS</b>
Interior	3	1 foot square, 1 bulb exit lights
Interior	63	4 foot long, 4 bulb florescent fixtures
Interior	1	8 foot long, 2 bulb florescent fixtures
Interior	5	4 foot long, 2 bulb florescent fixtures
Interior	1	Battery back-up emergency fixtures

**TABLE 2**  
**Ft. GILLEM BLDG. 710**  
**TCLP COMPOSITE SAMPLE COMPONENTS**

<b>BUILDING COMPONENT</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>PERCENTAGE OF SAMPLE</b>
Unpainted Wood	Wall framing	Mechanical Room	42%
Interior wall covering	White drywall	Women's Restroom	23%
Roofing Components	Roof shingle	Roof	7%
Interior Floor Coverings	Brown Floor tile	Women's Restroom	8%
Block, Brick, Concrete	Gray painted block	Foundation	7%
Ceiling Material	White ceiling tile	Break Room	7%
Painted Wood-Interior	Gray window molding	Mechanical Room	1%
Painted Wood-Exterior	White ladder	Exterior	5%

**TABLE 3**  
**Ft. GILLEM BLDG. 736**  
**LEAD BUILDING COMPONENTS**

<b>BUILDING COMPONENT</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ESTIMATED NUMBER</b>
Hot poured lead pipe joint	In plumbing drainage, waste and vent piping	Remnants in crawl space	25-50

# Appendix 1



# HYGEIA LABORATORIES, INC.

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

Lab Project No. **M0204293**

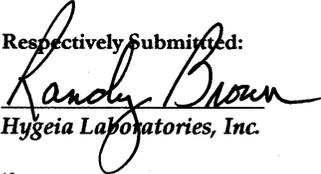
Report Date: 5/02/02 1 of 4

Client Name: **US Army Corp of Engineers**  
 Contact: **Tim Jones**  
 Address: Environmental & Materials Unit  
 200 North Cobb Parkway  
 Bldg. 400, Ste. 404  
 Marietta, GA 30062  
 Project Name: **Fort Gillem EOD Group HQ**  
 Project ID: 7482  
 Receipt Date: 4/30/2002

### Case Narrative

1. The sample holding times were met for all analyses.
2. Where applicable, results & reporting limits are based on wet weight; dry weight calculations available.
3. The temperature of the sample cooler as received by the laboratory was 4° C.

Reviewed By: AWS

Respectively Submitted:  
  
 Randy Brown  
 Hygeia Laboratories, Inc.

### Sample Identification

<u>Lab Sample #</u>	<u>Client Sample ID</u>	<u>Sample Supply</u>	<u>Collected</u>
M0204293-01	FGB 736 TCLP	Bulk	4/29/02
M0204293-02	FGB 710 TCLP	Bulk	4/29/02
M0204293-03	FGB 739 TCLP	Bulk	4/29/02

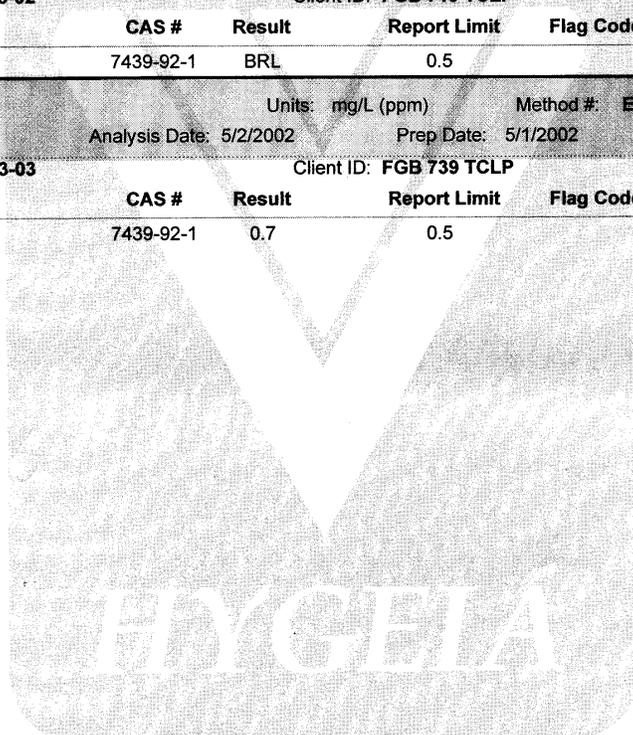
Lab Project No. **M0204293**

Report Date: 5/02/02 2 of 4

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-01		Client ID: FGB 736 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-02		Client ID: FGB 710 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-03		Client ID: FGB 739 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	0.7	0.5	



Lab Project No. **M0204293**

Report Date: 5/02/02 3 of 4

**BatchID:** H020502013  
**Department:** Metals  
**Prep Method:** EPA\_1311/7420A  
**Analysis Method:** EPA\_1311/7420A

**Prep Analyst:** GK  
**Prep Date:** 5/1/02 12:00  
**Analyst:** GK  
**Analysis Date:** 5/2/02 10:40

Quality Control Summary							
<b>M0204293-01A</b>							
AnalyteName	Result	Unit					
Lead	BRL	mg/L (ppm)					
<b>H020502013-MB</b>							
AnalyteName	Result	Unit	RL				
Lead	BRL	mg/L (ppm)	0.500				
<b>H020502013-LCS</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits			
Lead	5.02	mg/L (ppm)	100	80 - 120			
<b>H020502013-LCSD</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits	
Lead	5.14	mg/L (ppm)	103	80 - 120	2	0 - 20	
<b>M0204293-01A-DUP</b>							
AnalyteName	Result	Parent Result	Unit			RPD	RPD Limits
Lead	BRL	BRL	mg/L (ppm)			11	0 - 20
<b>M0204293-01A-MS</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits		
Lead	5.54	BRL	mg/L (ppm)	105	75 - 125		
<b>M0204293-01A-MSD</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits
Lead	5.57	BRL	mg/L (ppm)	106	75 - 125	1	0 - 20

Lab Project No. **M0204293**

Report Date: 5/02/02 4 of 4

**NOTES:**

- Results relate only to the samples tested as received (See Chain-of-Custody).
- BRL = "Below Reporting Limit"
- RL = "Reporting Limit"
- E = "Estimated Result"
- Dates are presented in the format "month/day/year"

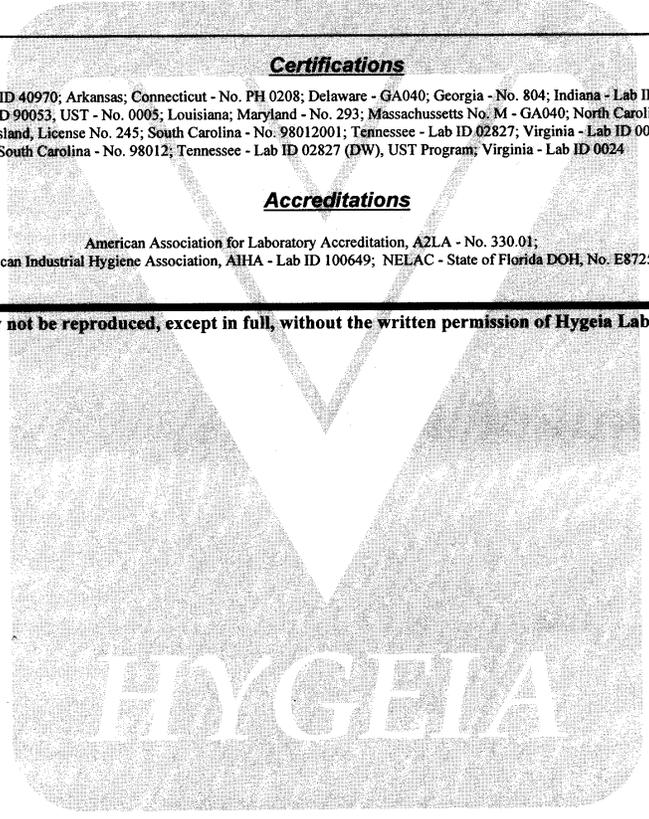
**Certifications**

Alabama - Lab ID 40970; Arkansas; Connecticut - No. PH 0208; Delaware - GA040; Georgia - No. 804; Indiana - Lab ID C-GA-01  
Kentucky - Lab ID 90053; UST - No. 0005; Louisiana; Maryland - No. 293; Massachusetts No. M - GA040; North Carolina - No. 409  
Rhode Island, License No. 245; South Carolina - No. 98012001; Tennessee - Lab ID 02827; Virginia - Lab ID 00024  
South Carolina - No. 98012; Tennessee - Lab ID 02827 (DW), UST Program; Virginia - Lab ID 0024

**Accreditations**

American Association for Laboratory Accreditation, A2LA - No. 330.01;  
American Industrial Hygiene Association, AIHA - Lab ID 100649; NELAC - State of Florida DOH, No. E87257

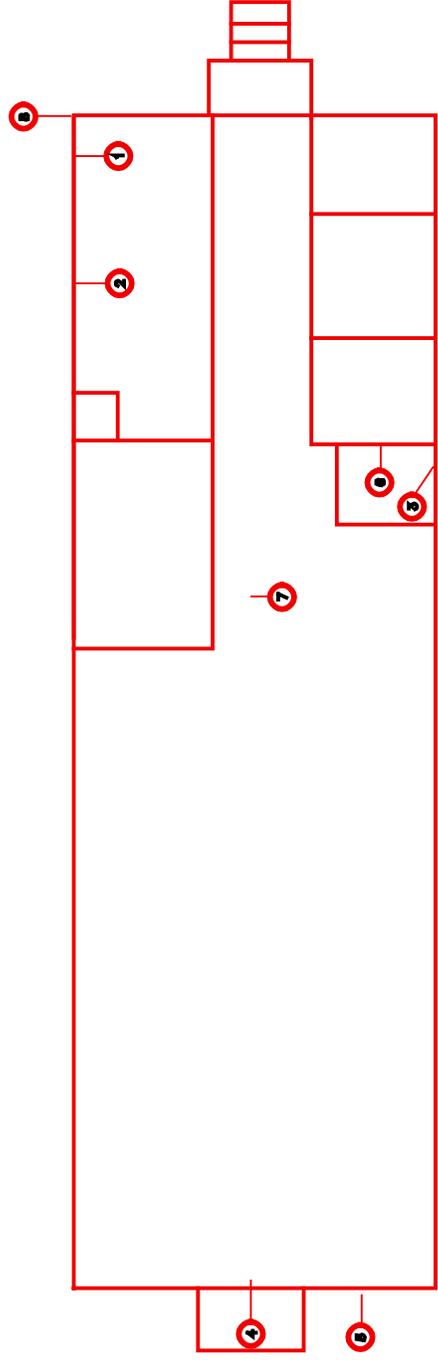
**This report may not be reproduced, except in full, without the written permission of Hygeia Laboratories, Inc.**



HYGEIA



# **Floor Plan And Sampling Locations**



- SAMPLE DESCRIPTIONS**
- ① UNPAINTED WOOD
  - ② PAINTED INTERIOR WOOD
  - ③ FLOORING MATERIALS
  - ④ ROOFING MATERIALS
  - ⑤ UNPAINTED WOOD
  - ⑥ PAINTED EXTERIOR WOOD
  - ⑦ WALL COVERING MATERIALS
  - ⑧ CEILING MATERIALS
  - ⑨ CONCRETE BLOCK

HELP SAMPLE LOCATIONS

- 1. DRAWING NOT TO SCALE
- 2. SAMPLE LOCATIONS ARE APPROXIMATE



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

## ASBESTOS SURVEY

BUILDING NO. 736  
FORT GILLEM, GEORGIA



**ASBESTOS INSPECTION REPORT  
FORT GILLEM, GEORGIA  
BUILDING NUMBER 736**

**INTRODUCTION**

1. This report documents the asbestos inspection and survey of Building No. 736 at Fort Gillem, Georgia conducted between 29 April and 1 May 2002 by USACE Savannah District employees Tim Jones and Jack Ford. The survey was conducted in general accordance with the regulatory guidelines in the Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763 Subpart E Sections 763.80-763.88) and "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Purple Book) (EPA publication number 560/5-85-024). Although not required by the AHERA guidelines, roof and other exterior miscellaneous materials were also inspected and sampled.
2. Building No. 736 was built in the 1940s time frame and is a single story structure of wood frame construction with vinyl siding and soffit covering the old wood exterior. The floor system is wood covered generally with multiple layers of vinyl tile topped with carpet. The roof is wood frame with a single layer of asphalt shingles. Building 736 appears to have been recently renovated with the installation of all new gypsum wallboard and cellulose suspended ceilings. Above the suspended ceilings the older wallboard and hard ceilings still remain.
3. All accessible areas of Building No. 736 were visually inspected for suspected Asbestos Containing Materials (ACM) by an accredited inspector. One small room housing the computer server system was inaccessible at the time of inspection. Bulk samples of all suspected ACM's were collected. Samples were taken from inconspicuous locations when possible. This report details ACM as identified at the time of inspection only.
4. The bulk samples were analyzed by Hygeia Laboratories, Inc. Hygeia is accredited by the National Voluntary Laboratory Accredited Program (NVLAP Accreditation sponsored by the National Institute of Standards and Technology (NIST)). The samples were analyzed by the accepted method of polarized light microscopy (PLM) using EPA's "Method for the Determination of Asbestos in Bulk Building Materials", EPA/600/R-93/116. Hygeia's analytical report is included in Appendix 1 and their NVLAP accreditation is in the Certifications section.
5. In compliance with the AHERA regulations, material is considered an Asbestos Containing Material when it contains greater than 1 (one) percent asbestos. Likewise, in this report, any material containing concentrations greater than 1 percent asbestos will be considered "positive". A narrative discussion of the AHERA ACM types (i.e., thermal systems insulation, miscellaneous and

surfacing materials) found in Building No. 736 is included in this report when relevant. Bulk sample information appears on Table 1. Estimated quantities of individual asbestos containing materials appear on Table 2. Material characterization of samples identified as asbestos containing appears as Table 3. Photographs of the positive materials, when available, appear as Figures. The specific location where each bulk sample was obtained is shown on the building floor plans, which appear as Plates. Positive ACM samples are highlighted on the floor plan Plates and, where possible, locations of similar positive ACM are identified. It is reasonable to assume that all materials similar to those testing positive, also contain positive amounts of asbestos and should be treated as such.

## DISCUSSION

- 6. Thermal Systems Insulation (TSI)** – TSI is insulation material applied to pipes, fittings, boilers, tanks, ducts, or to other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes (Refer to Tables 1-3 and Plates 3 & 6 for specific information and sample locations).

TSI throughout building 736 is fiberglass with the exception of duct wrap on old ductwork and debris in the attic of the western portion of the building and duct or pipe wrap debris in the crawlspace. Those materials are a white corrugated friable asbestos containing insulation (see figures 1, 2, 5 and 6). The debris in the crawlspace litters the floor and is ground into the soil in places.

- 7. Miscellaneous Materials** – Miscellaneous materials include building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and do not include surfacing or TSI.

In the past, there were a great number of miscellaneous building materials that had asbestos fibers added to them during the manufacturing process to increase durability and fireproofing qualities. The following suspect miscellaneous materials were sampled at Building No. 736 and found to contain asbestos.

Floor Materials – (Refer to Tables 1-3 and Plates 2 & 5 for specific information and sample locations).

Thirty-three samples of floor covering were analyzed. Of those, thirty were determined to be asbestos containing. The floors of the entire building other than four small rooms are covered with asbestos containing materials in at least one of the layers of floor covering.

Roofing Materials – (Refer to Tables 1-3 and Plate 4 for specific information and sample locations).

Troweled on roofing cement used as patching and flashing material around metal roof vents was found to contain positive amounts of asbestos.

Asbestos Cement Board - (Refer to Tables 1-3 and Plates 3 & 6 for specific information and sample locations).

Asbestos cement board is used as wall covering on a chase wall surrounding the boiler flue stack through the attic. A similar but softer material is found covering two small chases through the attic near the southwestern corner of the building. One piece of loose board was located in the attic above the men's restroom at the eastern end of the building. Other debris may be located under the pink blown in attic insulation.

Gypsum Joint Compound - (Refer to Tables 1-3 and Plate 2 for specific information and sample locations).

Gypsum joint compound (drywall mud) found on the older fiberboard ceilings attached to the ceiling joists and wall covering remnants above the suspended ceiling contains positive amounts of asbestos. The joint compound on the newer walls does not contain positive amounts of asbestos.

Duct Flex Joint -(Refer to Tables 1-3 and Plate 2 for specific information and sample locations).

Cloth flex joint material between each end of the air handling unit and ductwork in the ceiling of the mechanical room contains asbestos.

#### Gasket material

Gasket material between the flanges in the mechanical piping and gaskets between the sections of the boiler are assumed to contain asbestos.

8. **Surfacing** – Surfacing material is friable material that is sprayed on, troweled on, or otherwise applied to surfaces for decorative or other purposes.

No surfacing materials were identified.

### Summary

9. In summary, the following materials in building 736 were found to contain or are assumed to contain asbestos:

Floor tiles and associated mastic in nearly all of the building contain asbestos (See floor plan plates).

Troweled on roofing cement used for flashing and patching contains positive amounts of asbestos.

Asbestos cement board used as chase wall covering through the attic contains asbestos, as does debris of this material.

TSI duct wrap insulation in the attic of the western portion of the building contains asbestos, as does the debris.

TSI duct or pipe wrap debris in the crawl space contains positive amounts of asbestos.

Gypsum joint compound applied to the old hard ceilings and wall covering remnants contains asbestos.

Gasket materials in the mechanical piping and boiler are assumed to contain asbestos.

Cloth duct flex joint in the mechanical room contains asbestos.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Tables

- Table 1** Suspect ACM Samples
- Table 2** ACM Quantity Summary
- Table 3** Material Characterization and Assessment

**TABLE 1**  
**SUSPECT ACM SAMPLES**  
**Ft. GILLEM BUILDING 736**

<b>FIELD ID</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ASBESTOS TYPE &amp; %</b>
736-R-1	Roof shingle	Roof field	None
736-R-2	Roof felt	Roof field	None
736-R-3	Roof felt and cement	Roof field	None
736-R-4	Roofing cement	Vent pipe flashing	None
736-R-5	Roof shingle	Roof field	None
736-R-6	Roof felt	Roof felt	None
736-R-7	Roof shingle	Roof field	None
736-R-8	Roof felt	Roof field	None
<b>736-R-9</b>	<b>Roofing cement</b>	<b>Roof vent flashing</b>	<b>4 % chrysotile</b>
<b>736-1-10</b>	<b>Brown fiberboard and joint compound</b>	<b>Ceiling, Office 2</b>	<b>3% chrysotile in joint compound, rest NAD</b>
<b>736-1-11</b>	<b>Tan 9" X 9" floor tile and felt backing</b>	<b>Floor, Office 1</b>	<b>8% chrysotile in tile, rest NAD</b>
736-1-12	Felt paper	Floor, between layers of wood, Office 1	None
<b>736-1-13</b>	<b>Dark brown 9" X 9" floor tile and mastic</b>	<b>Floor, Office 2</b>	<b>5% chrysotile in tile, 10% chrysotile in mastic</b>
736-1-14	Felt paper	Floor, between layers of wood, Office 2	None
736-1-15	Brown blown in insulation	Attic, above hard ceiling	None
736-1-16	Fiberboard and joint compound	Ceiling, Office 2	None
736-1-17	Gypsum joint compound	Newer gypsum wall covering, Office 2	None
736-1-18	Gypsum wall board	Newer gypsum wall covering, Office 2	None
736-1-19	Floor leveling compound	Floor, Open Room 2	None
<b>736-1-20</b>	<b>Tan 9" X 9" floor tile</b>	<b>Floor, Open Room 2</b>	<b>2% chrysotile</b>
<b>736-1-21</b>	<b>Blue 9" X 9" floor tile</b>	<b>Floor, Open Room 2</b>	<b>3% chrysotile</b>
<b>736-1-22</b>	<b>Red-brown floor tile &amp; mastic</b>	<b>Floor, under sample 736-1-21</b>	<b>4% chrysotile in tile, 5% chrysotile in mastic</b>
736-1-23	Felt paper	Floor, between layers of wood, under sample 736-1-22	None

<b>FIELD ID</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ASBESTOS TYPE &amp; %</b>
<b>736-1-24</b>	<b>Dark brown floor tile and felt backing</b>	<b>Floor, Office 5</b>	<b>5% chrysotile in tile, rest NAD</b>
736-1-25	Felt paper	Wall, under wall board, Office 5	None
<b>736-1-26</b>	<b>Dark brown floor tile and felt backing</b>	<b>Floor, Waiting room</b>	<b>5% chrysotile in tile, rest NAD</b>
<b>736-1-27</b>	<b>Gypsum drywall and joint compound</b>	<b>Ceiling, Office 6</b>	<b>2% chrysotile in joint compound, rest NAD</b>
736-1-28	2' X 4' RP ceiling tile	Suspended ceilings, Open Room 2	None
<b>736-1-29</b>	<b>Blue 9" X 9" floor tile and mastic</b>	<b>Floor, Office 4, intermixed with 736-1-30</b>	<b>2% chrysotile in tile, 3% chrysotile in mastic</b>
<b>736-1-30</b>	<b>Tan 9" X 9" floor tile and mastic</b>	<b>Floor, Office 4, intermixed with 736-1-29</b>	<b>2% chrysotile in tile, 3% chrysotile in mastic</b>
<b>736-1-31</b>	<b>Red-brown floor tile &amp; mastic</b>	<b>Floor, Office 4, under sample 736-1-30</b>	<b>7% chrysotile in tile, 6% chrysotile in mastic</b>
<b>736-1-32</b>	<b>Dark brown floor tile and mastic</b>	<b>Floor, Office 4, under sample 736-1-31</b>	<b>6% chrysotile in tile, 4% chrysotile in mastic</b>
<b>736-1-33</b>	<b>Dark brown floor tile and mastic</b>	<b>Floor, Office 4, under sample 736-1-32</b>	<b>6% chrysotile in tile, mastic NAD</b>
736-1-34	Felt paper	Floor, Office 4, under sample 736-1-33	None
736-1-35	Gypsum joint compound	On fiberboard ceiling, Open Room 2	None
<b>736-1-36</b>	<b>Brown 12" X 12" floor tile and mastic</b>	<b>Floor, Men's Restroom</b>	<b>3% chrysotile in tile, 4% chrysotile in mastic</b>
<b>736-1-37</b>	<b>Tan floor tile and mastic</b>	<b>Floor, Men's Restroom, under sample 736-1-36</b>	<b>4% chrysotile in tile, 5% chrysotile in mastic</b>
<b>736-1-38</b>	<b>Tan floor tile and mastic</b>	<b>Floor, Men's Restroom, under sample 736-1-37</b>	<b>4% chrysotile in both tile and mastic</b>
<b>736-1-39</b>	<b>Tan floor tile and mastic</b>	<b>Floor, Men's Restroom, under sample 736-1-38</b>	<b>4% chrysotile in tile, mastic NAD</b>
736-1-40	Felt paper	Floor, Men's Restroom, under sample 736-1-39	None
736-1-41	Felt paper	Floor, Men's Restroom, between layers of wood	None
736-1-42	Brown 12" X 12" patch tile	Floor, Women's Restroom	None

<b>FIELD ID</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ASBESTOS TYPE &amp; %</b>
<b>736-1-43</b>	<b>Blue 9" X 9" floor tile and mastic</b>	<b>Floor, Open Room 2, intermixed with 736-1-44</b>	<b>5% chrysotile in tile, 5% chrysotile in mastic</b>
<b>736-1-44</b>	<b>Tan 9" X 9" floor tile and mastic</b>	<b>Floor, Open Room 2, intermixed with 736-1-43</b>	<b>2% chrysotile in tile, 10% chrysotile in mastic</b>
<b>736-1-45</b>	<b>Tan floor tile</b>	<b>Floor, Open Room 2, under samples 736-1-43 &amp; 44</b>	<b>5% chrysotile in tile, 3% chrysotile in mastic</b>
736-1-46	Felt paper	Floor, Open Room 2, under sample 736-1-45	None
736-1-47	Felt paper	Floor, Open Room 2, between layers of wood	None
<b>736-1-48</b>	<b>12" X 12" brown floor tile and mastic</b>	<b>Floor, Kitchen</b>	<b>&lt;1% chrysotile in tile, 4% chrysotile in mastic</b>
<b>736-1-49</b>	<b>Brown floor tile and mastic</b>	<b>Floor, Kitchen, under sample 736-1-48</b>	<b>2% chrysotile in tile, 3% chrysotile in mastic</b>
736-1-50	Tan 12" X 12" floor tile	Floor, Break Room, uppermost layer	None
<b>736-1-51</b>	<b>Brown floor tile</b>	<b>Floor, Break Room, under sample 736-1-50</b>	<b>&lt;1% chrysotile in tile, 2% chrysotile in mastic</b>
<b>736-1-52</b>	<b>Brown floor tile</b>	<b>Floor, Break Room, under sample 736-1-51</b>	<b>2% chrysotile in tile, 2% chrysotile in mastic</b>
736-1-53	Blown in insulation	Attic, above hard ceiling	None
<b>736-1-54</b>	<b>Hard ACM board</b>	<b>Attic, chase wall, around boiler vent stack</b>	<b>30% chrysotile</b>
<b>736-1-55</b>	<b>TSI, white corrugated duct wrap</b>	<b>Attic, applied to air duct</b>	<b>40% chrysotile</b>
<b>736-M-56</b>	<b>Duct flex joint material</b>	<b>Mechanical room, at joint between air handling unit and ductwork, 2 locations</b>	<b>40% chrysotile</b>
736-M-57	Gypsum wall board	Mechanical room walls and ceiling	None
<b>736-1-58</b>	<b>Tan floor tile and mastic</b>	<b>Floor, Open Room 2</b>	<b>5% chrysotile in tile, 10% chrysotile in mastic</b>
<b>736-1-59</b>	<b>Red-brown floor tile &amp; mastic</b>	<b>Floor, Open Room 2, under sample 736-1-58</b>	<b>5% chrysotile in tile, 5% chrys. in mastic</b>

<b>FIELD ID</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ASBESTOS TYPE &amp; %</b>
<b>736-1-60</b>	<b>Dark brown floor tile and mastic</b>	<b>Floor, Open Room 2, under sample 736-1-59</b>	<b>5% chrysotile in tile, 4% chrysotile in mastic</b>
<b>736-1-61</b>	<b>Gray floor tile and mastic</b>	<b>Floor, Office 7</b>	<b>5% chrysotile in tile, 2% chrysotile in mastic</b>
736-1-62	Felt paper	Floor, Office 7, under sample 736-1-61	None
736-1-63	Gypsum joint compound	On gypsum board ceiling covering, Entryway	None
736-1-64	Gypsum board	Ceiling, Entryway	None
<b>736-1-65</b>	<b>Red 9" X 9" floor tile and mastic</b>	<b>Floor, Office 9</b>	<b>6% chrysotile in tile, mastic NAD</b>
736-1-66	2' X 4' RP ceiling tile	Suspended ceiling, Corridor	None
736-1-67	Gypsum joint compound	On newer gypsum board wall covering, Corridor	None
<b>736-1-68</b>	<b>12" X 12" brown floor tile</b>	<b>Floor, Women's Small Restroom</b>	<b>4% chrysotile in tile, 4% chrysotile in mastic</b>
736-1-69	Vinyl cove base and mastic	Walls, Women's Small Restroom	None
<b>736-1-70</b>	<b>Heat shield board</b>	<b>Attic, applied to chase walls, above Women's Small Restroom</b>	<b>70% chrysotile</b>
<b>736-1-71</b>	<b>Gypsum joint compound</b>	<b>Applied to fiberboard ceiling above suspended ceiling, Open Room 1</b>	<b>2% chrysotile</b>
<b>736-1-72</b>	<b>TSI white corrugated duct wrap</b>	<b>Attic, applied to air duct</b>	<b>40% chrysotile</b>
<b>736-1-73</b>	<b>TSI white corrugated duct wrap</b>	<b>Attic, applied to air duct</b>	<b>30% chrysotile</b>
736-1-74	Blown in insulation	Attic, above hard ceiling	None
<b>736-1-75</b>	<b>Dark brown 9" X 9" floor tile</b>	<b>Floor, Office 14</b>	<b>5% chrysotile in tile, rest NAD</b>
736-1-76	Floor leveling compound	Floor, Office 14	None
736-1-77	Red-brown 12" X 12" floor tile	Floor, Office 11	<1% chrysotile
<b>736-1-78</b>	<b>Heat shield board</b>	<b>Attic, applied to chase walls</b>	<b>50% chrysotile</b>
<b>736-1-79</b>	<b>TSI corrugated duct or pipe wrap debris</b>	<b>Crawlspace, on floor and ground into dirt</b>	<b>30% chrysotile</b>

Samples testing positive for asbestos in **BOLD** type

**TABLE 2  
ACM QUANTITY SUMMARY  
Ft. GILLEM BUILDING 736**

Material Descriptions	Units	Area Descriptions							Totals
		ROOF	MECHANICAL ROOM	FIRST FLOOR	CRAWLSPACE	ATTIC			
Roofing Cement	S.F.	25							25
Gypsum Joint Compound *	S.F.			8500*					8500*
Floor Tile and Mastic	S.F.			8000					8000
ACM Board Chase Covering	S.F.					120			120
TSI Duct Wrap and Debris	S.F.					1000			1000
TSI Debris, In Soil 2" deep	S.F.				8500				8500
Duct Flex Joint, 4" Wide	L.F.		40						40
Gasket Material	S.F.		10						10

**S.F. = Square Foot, L.F. = Linear Foot.**

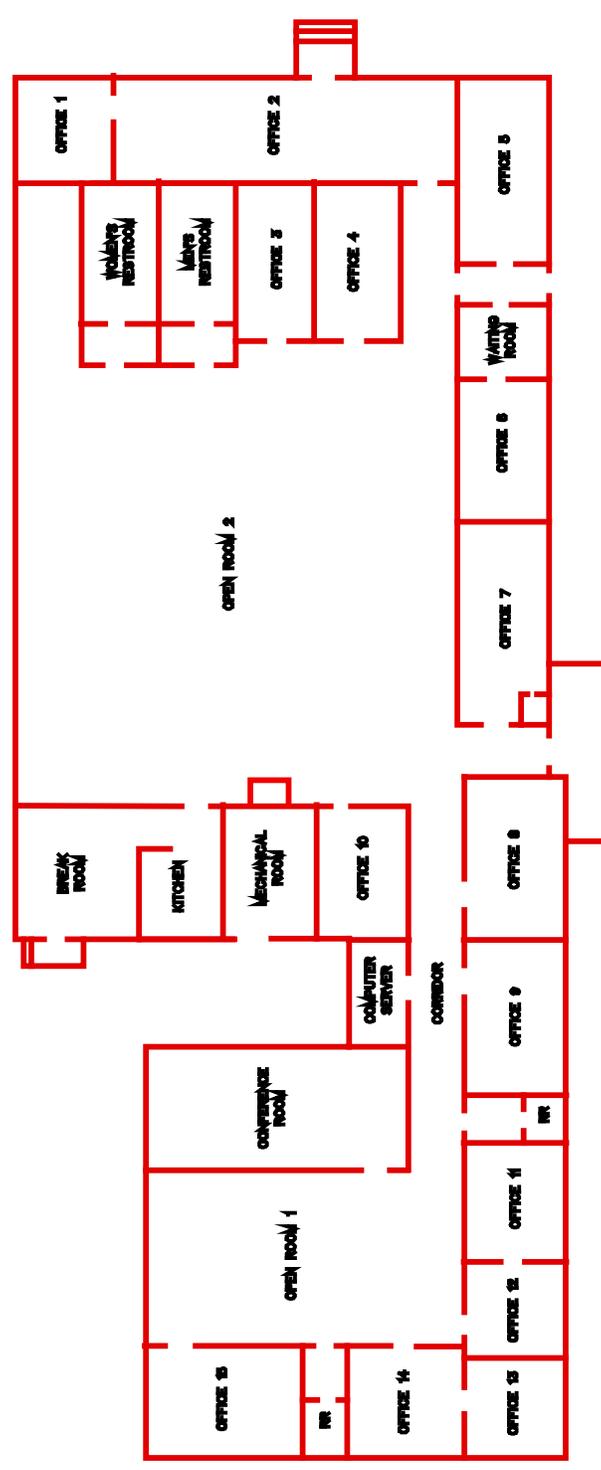
**\* Unable to estimate only joint compound, estimate is of ceiling area and wall remnants.**

**TABLE 3**  
**MATERIAL CHARACTERIZATION AND ASSESSMENT**  
**Ft. GILLEM BUILDING 736**

MATERIAL		CHARACTERISTICS			ASSESSMENT	
Type	Description	Asbestos Yes/no/assumed	Quantity (If ACM)	Friable / Non- friable	Condition	Disturbance Potential
Miscellaneous	Roofing cement	Yes 4 %	25 S.F.	Non-friable	Good	Low
Miscellaneous	Gypsum joint compound	Yes 2-3%	8500 S.F.	Friable	Damaged	Low
Miscellaneous	Floor tile and mastic	Yes 2-10%	8000 S.F.	Non-friable	Good	Moderate disturbance potential in exposed areas
Miscellaneous	Hard ACM board chase covering	Yes 30%	100 S.F.	Non-friable	Good	Low
Miscellaneous	Soft ACM board chase covering	Yes 50-70%	20 S.F.	Friable	Good	Low
Miscellaneous	Duct flex joint	Yes 40%	40 L.F.	Non-friable	Good	Moderate disturbance from vibration and air erosion
Miscellaneous	Gasket material	Assumed	10 S.F.	Unknown	Unknown	Low
TSI	Duct wrap and debris in attic	Yes 30-40%	1000 S.F.	Friable	Damaged	Low, nearly inaccessible
TSI	Duct or pipe wrap debris in crawl space	Yes 30%	8500S.F.	Friable	Significantly damaged	High

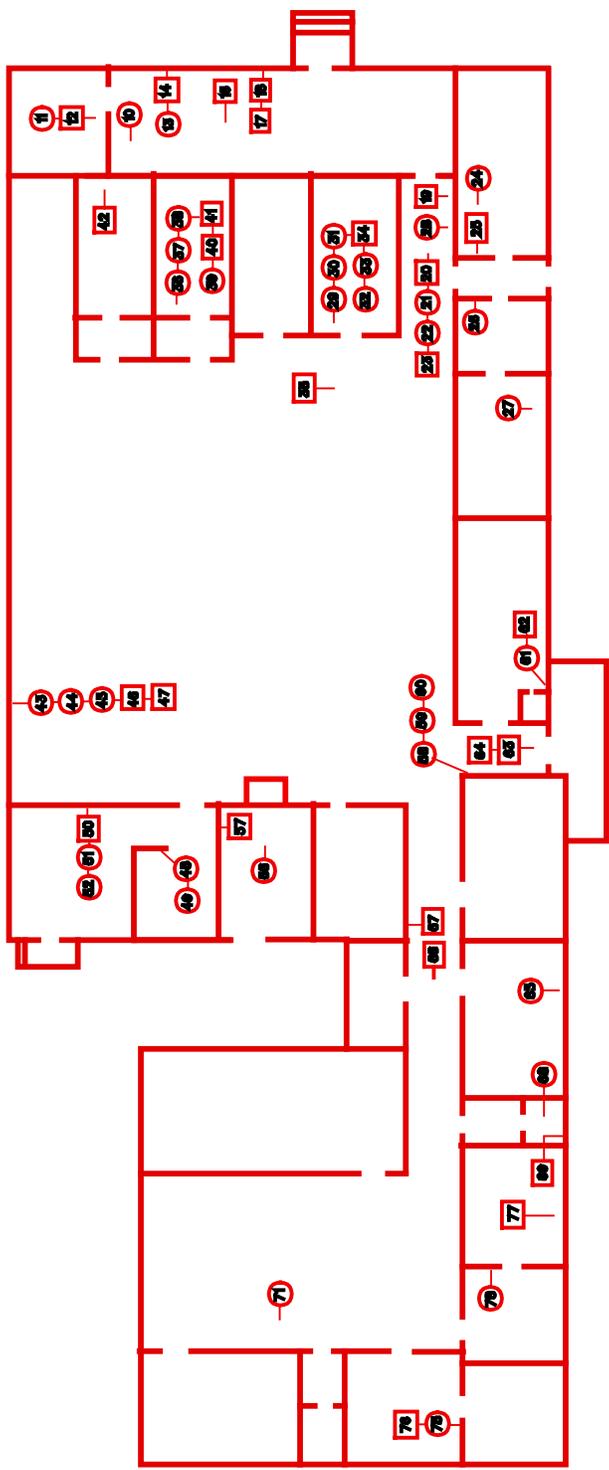
# Plates

<b>Plate 1</b>	736a.dgn	Room designations
<b>Plate 2</b>	736b.dgn	First floor sample locations
<b>Plate 3</b>	736c.dgn	Attic sampling locations
<b>Plate 4</b>	736d.dgn	Roof sample locations
<b>Plate 5</b>	736e.dgn	Asbestos containing flooring materials locations
<b>Plate 6</b>	736f.dgn	TSI and miscellaneous ACM materials in attic



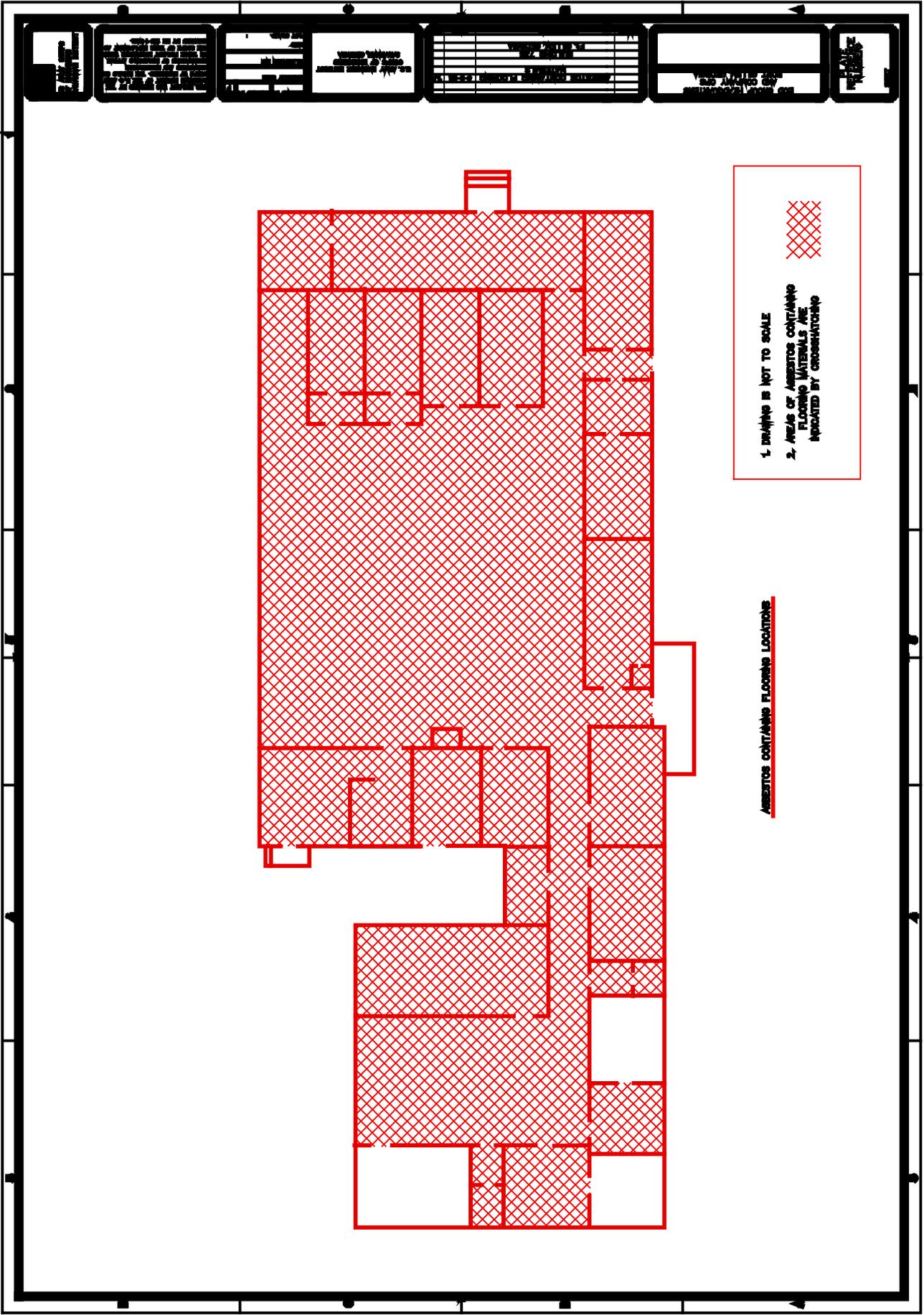
1. DRAWING IS NOT TO SCALE  
2. ROOM DESIGNATIONS ARE APPROXIMATE  
FOR THIS REPORT ONLY

ROOM DESIGNATION DRAWING



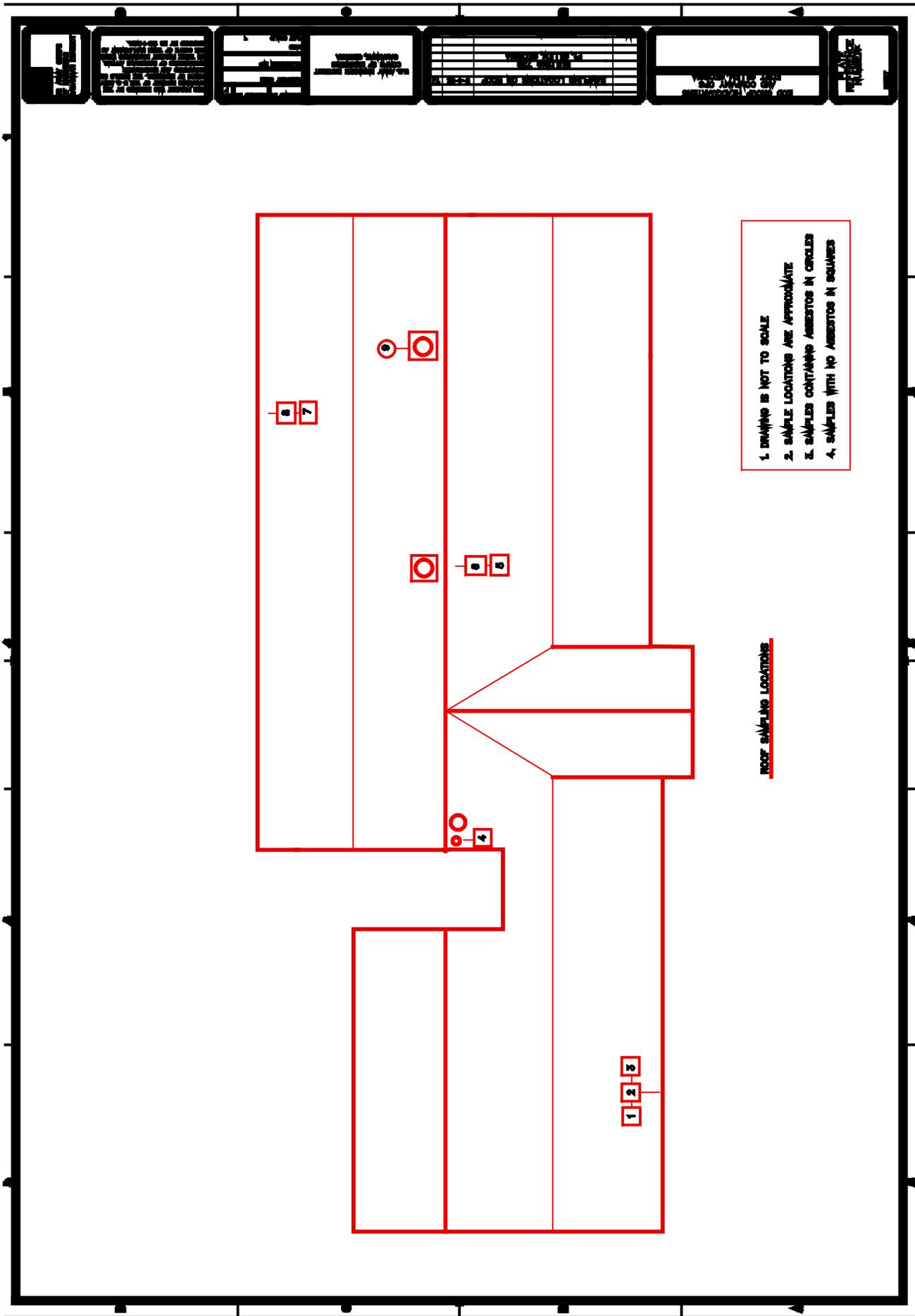
- 1. DRAWING IS NOT TO SCALE
- 2. SAMPLE LOCATIONS ARE APPROXIMATE
- 3. SAMPLES CONTAINING ASBESTOS IN CIRCLES
- 4. SAMPLES WITH NO ASBESTOS IN SQUARES

FIRST FLOOR SAMPLING LOCATIONS



1. DRAWING IS NOT TO SCALE
2. AREAS OF ASBESTOS CONTAINING FLOORING MATERIALS ARE INDICATED BY CROSSHATCHING

ASBESTOS CONTAINING FLOORING LOCATIONS



- 1. DRAWING IS NOT TO SCALE
- 2. SAMPLE LOCATIONS ARE APPROXIMATE
- 3. SAMPLES CONTAINING ASBESTOS IN CIRCLES
- 4. SAMPLES WITH NO ASBESTOS IN SQUARES

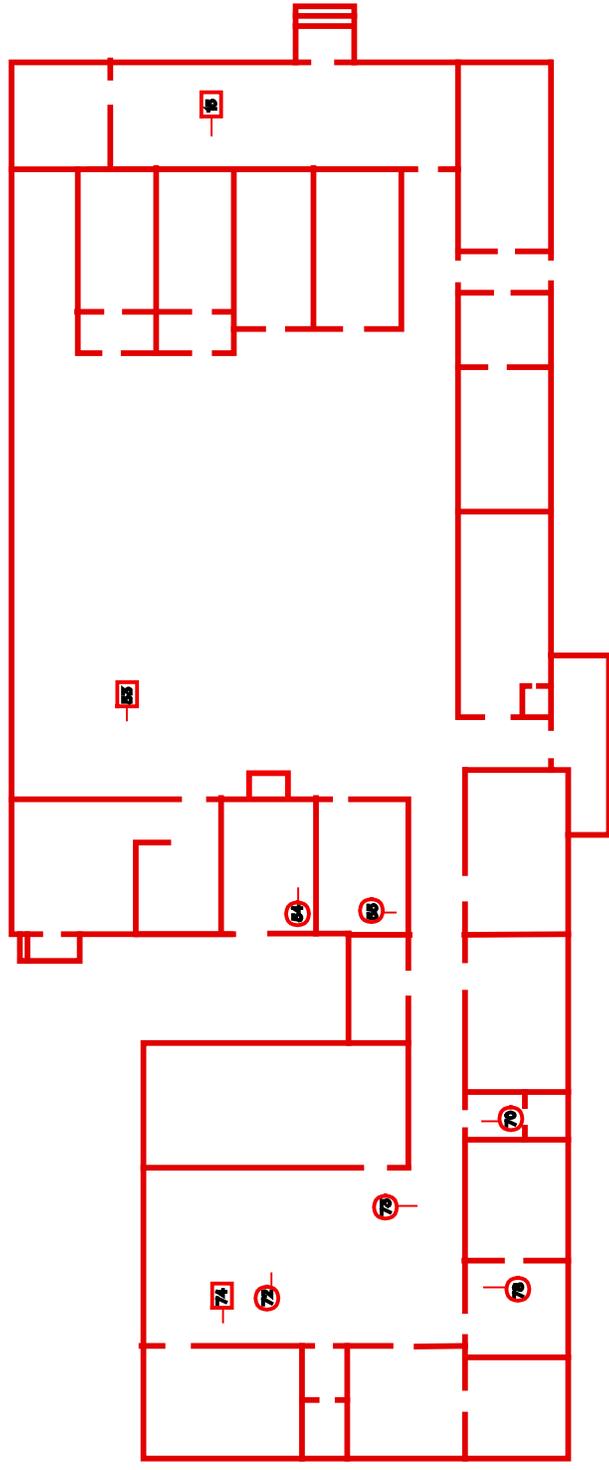
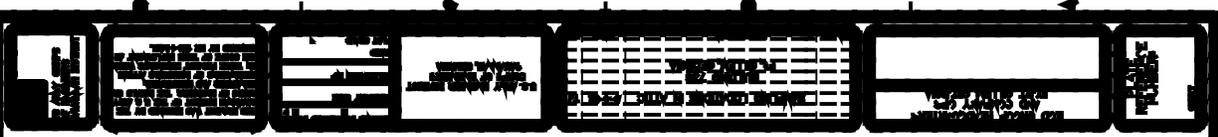
ROOF SAMPLING LOCATIONS

1 2 3

4

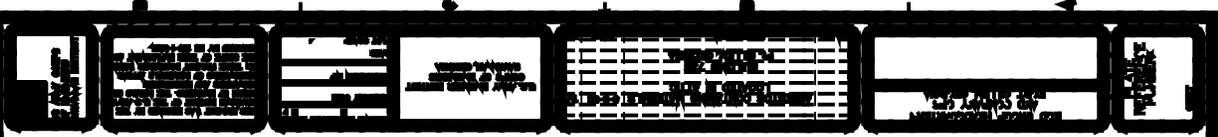
5 6

7

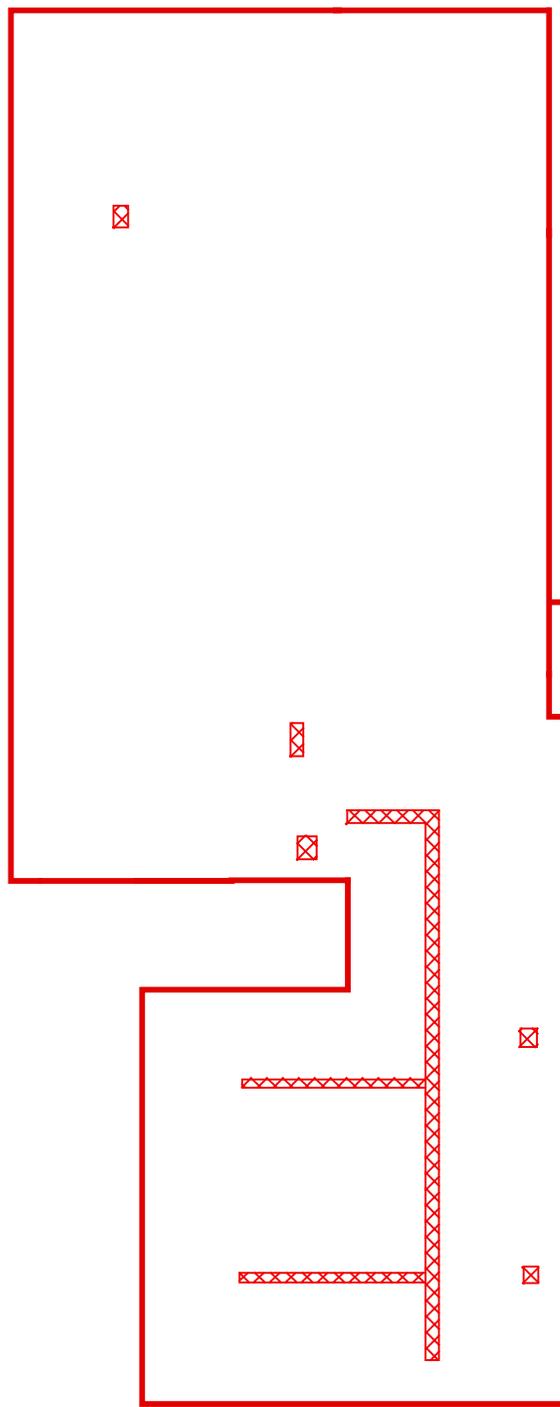


- 1. DRAWING IS NOT TO SCALE
- 2. SAMPLE LOCATIONS ARE APPROXIMATE
- 3. SAMPLES CONTAINING ASBESTOS IN CIRCLES
- 4. SAMPLES WITH NO ASBESTOS IN SQUARES

ATTIC SAMPLING LOCATIONS



1. DRAWING IS NOT TO SCALE  
2. AREAS OF ASBESTOS CONTAINING MATERIALS ARE INDICATED BY CROSS-HATCHING  
3. LOCATIONS ARE APPROXIMATE



Asbestos Located in Attic

# Figures

- Figure 1.** TSI duct wrap
- Figure 2.** TSI duct wrap debris
- Figure 3.** Asbestos cement board
- Figure 4.** Asbestos cement board
- Figure 5.** TSI duct wrap
- Figure 6.** TSI debris



**Figure 1.** TSI corrugated duct wrap insulation and its debris contains asbestos.



**Figure 2.** TSI corrugated duct wrap debris in locations in the attic contains asbestos.



**Figure 3.** Cement board used as boiler flue stack chase wall covering contains asbestos, as does softer covering on smaller chases at the southwest end of the building.



**Figure 4.** Another photo of the asbestos cement board covering the boiler stack chase wall.



**Figure 5.** TSI corrugated duct wrap and debris in the western attic contains asbestos.



**Figure 6.** TSI pipe or duct wrap debris littering the floor of the crawlspace contains asbestos.

# Appendix 1



## HYGEIA LABORATORIES, INC.

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

US Army Corp of Engineers  
Environmental & Materials Unit  
200 North Cobb Parkway  
Bldg. 400, Ste. 404  
Marietta, GA 30082

5/2/2002

Subject:

Hygeia Project Number: A0205006  
Client Project Number/Name: 7483 /Fort Gillem - Building 736

Dear Mr. Tim Jones:

Enclosed are the analytical results of bulk samples submitted by you to this laboratory on 5/1/2002. All analyses were performed by polarized light microscopy (PLM) in accordance with the EPA method as defined in Perkins and Harvey, July 1993, "Methods for the Determination of Asbestos in Bulk Materials" 61pp. (EPA/600/R-93/116). The reported percentages are volume estimates obtained by calibrated visual estimation. The results in this report apply only to the items tested.

The EPA defines an asbestos containing material (ACM) as a material that is reported to contain greater than one percent asbestos. HYGEIA is only responsible for the accuracy of the analytical results provided in this report and cannot be held responsible for the errors resulting from improper sample collection techniques. This report may not be used to claim product endorsement by NVLAP or any other U.S. Government agency.

For nonhomogeneous samples, each layer was analyzed separately and the results combined to form the reported value except where otherwise noted. Vinyl floor tile samples with negative results by PLM should be submitted for confirmation by transmission electron microscopy (TEM). Friable samples containing less than 10% asbestos as determined by PLM may be resubmitted for point counting at your discretion.

Thank you for using our analytical services. HYGEIA Laboratories has been NVLAP accredited since 1988. Our current NVLAP code is 102087-0. We will keep a copy of this report on file for three years. We will dispose of your samples in 60 days unless you request that we return them. This report may be reproduced only in its entirety with the consent of Hygeia Laboratories, Inc. If you have any questions, please call us at (770) - 514-6933.

Sincerely,

Clayton Call  
Asbestos Laboratory Manager

NVLAP# 102087-0  
Texas Dept. of Health # 30-0232  
Commonwealth of Virginia # 3333-000210

---

An ATC Group Services Inc. Company

Hygeia Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 614-6933

PLM Analysis Summary

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gilliam - Building 736

Page: 1 of 12  
 Analyzed: 5/1/2002 by WAS

Sample ID	Sample Description				Asbestos Percent				Other Fibers				Non - Fibers			
Client #	Hygeia #	Color	Texture	Homod.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE		
736-1-1	A0205006-01	Brown	Fibrous	Yes												
Comment: No Asbestos Detected.																
736-1-2	A0205006-02	Brown	Fibrous	Yes						80%			20%			
Comment: No Asbestos Detected.																
736-1-3	A0205006-03	Brown	Fibrous	Yes						30%			70%			
Comment: No Asbestos Detected.																
736-1-4	A0205006-04	Black	Gummy	Yes						30%			70%			
Comment: No Asbestos Detected.																
736-1-5	A0205006-05	Black	Fibrous	Yes									100%			
Comment: No Asbestos Detected.																

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 2 of 12  
 Analyzed: 5/1/2002 by WAS

Sample ID		Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-6	A0205006-06	Brown	Fibrous	Yes						80%			20%		
<b>Comment: No Asbestos Detected.</b>															
736-1-7	A0205006-07	Brown	Fibrous	Yes									100%		
<b>Comment: No Asbestos Detected.</b>															
736-1-8	A0205006-08	Brown	Fibrous	Yes						80%			20%		
<b>Comment: No Asbestos Detected.</b>															
736-1-9	A0205006-09	Mult	Corn.	Yes	4%					30%			66%		
<b>Comment:</b>															
736-1-10	A0205006-10	Mult	Corn.	Yes	2%								98%		
<b>Comment: White powder layer: 3% Chrysotile. Rest: NAD.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 3 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description				Asbestos Percent					Other Fibers			Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-11	A0205006-11	Multi	Cons.	Yes	4%					11%			85%		
<b>Comment: Tile: 8% Chrysotile, Felt: NAD.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-12	A0205006-12	Black	Gummy	Yes						30%			70%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-13	A0205006-13	Brown	Cons.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile, Mastic: 10% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-14	A0205006-14	Black	Gummy	Yes						30%			70%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-15	A0205006-15	Brown	Fibrous	Yes						90%			10%		
<b>Comment: No Asbestos Detected.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 3 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-11	A0205006-11	Multi	Cons.	Yes	4%					11%			85%		
<b>Comment: Tile: 8% Chrysotile, Felt: NAD.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-12	A0205006-12	Black	Gummy	Yes						30%			70%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-13	A0205006-13	Brown	Cons.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile, Mastic: 10% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-14	A0205006-14	Black	Gummy	Yes						30%			70%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-15	A0205006-15	Brown	Fibrous	Yes						90%			10%		
<b>Comment: No Asbestos Detected.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 4 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID	Sample Description				Asbestos Percent				Other Fibers				Non - Fibers		
Client #	Hygeia #	Color	Texture	Homog.	Chk.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-16	A0205006-16	Gray	Plastery	Yes						10%			90%		
<b>Comment: No Asbestos Detected.</b>															

Client #	Hygeia #	Color	Texture	Homog.	Chk.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-17	A0205006-17	Gray	Powdery	Yes									100%		
<b>Comment: No drywall present.</b>															

Client #	Hygeia #	Color	Texture	Homog.	Chk.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-18	A0205006-18	Gray	Powdery	Yes						10%			90%		
<b>Comment: No joint mud present.</b>															

Client #	Hygeia #	Color	Texture	Homog.	Chk.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-19	A0205006-19	Gray	Layered	No									100%		
<b>Comment: Brown mastic: NAD. Compound: NAD.</b>															

Client #	Hygeia #	Color	Texture	Homog.	Chk.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-20	A0205006-20	Brown	Conc.	No									98%		
<b>Comment: Tile: 2% Chrysothle. Brown mastic and compound: NAD.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 5 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description					Asbestos Percent					Other Fibers					Non - Fibers			
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	Cell.	Glass	OE	B/E	ONE	
736-1-21	A0205006-21	Green	Cons.	No	3%								97%							
Comment: Tile: 3% Chrysotile. Leveling compound: NAD. No mastic present.																				
736-1-22	A0205006-22	Red	Cons.	No	4%								96%							
Comment: Tile: 4% Chrysotile. Mastic bottom: NAD. Mastic top: 5% Chrysotile.																				
736-1-23	A0205006-23	Black	Gummy	Yes						20%			80%							
Comment: No Asbestos Detected.																				
736-1-24	A0205006-24	Brown	Cons.	No	4%					11%			85%							
Comment:																				
736-1-25	A0205006-25	Black	Gummy	No						40%			60%							
Comment: No Asbestos Detected.																				

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 6 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-28	A0205006-28	Red	Corn.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile. Felt: NAD.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-27	A0205006-27	Gray	Powdery	No	<1%					20%			80%		
<b>Comment: Joint mud: 2% Chrysotile. Rest: NAD.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-28	A0205006-28	Gray	Fibrous	Yes						30%	10%	20%	40%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-29	A0205006-29	Blue	Corn.	No	2%					<1%			98%		
<b>Comment: Tile: 2% Chrysotile. Brown mastic: &lt;1% Chrysotile. Black mastic: 3% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-30	A0205006-30	Tan	Corn.	No	2%					<1%			98%		
<b>Comment: Tile: 2% Chrysotile. Brown mastic: &lt;1% Chrysotile. Black mastic: 3% Chrysotile.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 7 of 12  
 Analyzed: 5/1/2002 by WAS

Sample ID		Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Hemog.	CHR	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-31	A0205006-31	Brown	Cons.	Yes	7%								93%		
<b>Comment: Tile: 7% Chrysotile, Mastec: 6% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Hemog.	CHR	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-32	A0205006-32	Brown	Cons.	Yes	6%								94%		
<b>Comment: Tile: 6% Chrysotile, Mastec: 4% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Hemog.	CHR	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-33	A0205006-33	Brown	Cons.	Yes	6%								94%		
<b>Comment: Tile: 6% Chrysotile, Mastec: NAD.</b>															
Client #	Hygeia #	Color	Texture	Hemog.	CHR	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-34	A0205006-34	Brown	Fibrous	Yes						80%			20%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Hemog.	CHR	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-35	A0205006-35	White	Cons.	Yes						40%			60%		
<b>Comment: No Asbestos Detected.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 8 of 12  
 Analyzed: 5/1/2002 by WAS

Sample ID	Sample Description				Asbestos Percent				Other Fibers				Non - Fibers		
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Sio.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-36	A0205006-36	Brown	Cons.	Yes	3%								97%		
<b>Comment: Tile: 3% Chrysotile. Mastic: 4% Chrysotile.</b>															
736-1-37	A0205006-37	Brown	Cons.	Yes	4%								96%		
<b>Comment: Tile: 4% Chrysotile. Mastic: 5% Chrysotile.</b>															
736-1-38	A0205006-38	Brown	Cons.	Yes	4%								96%		
<b>Comment: Tile and mastic: 4% Chrysotile.</b>															
736-1-39	A0205006-39	Brown	Cons.	Yes	4%								96%		
<b>Comment: Tile: 4% Chrysotile. Mastic: 5% Chrysotile.</b>															
736-1-40	A0205006-40	Black	Cons.	Yes						40%			60%		
<b>Comment: No Asbestos Detected.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 9 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description				Asbestos Percent					Other Fibers			Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-41	A0205006-41	Black	Fibrous	Yes						40%			60%		
<b>Comment: No Asbestos Detected.</b>															
736-1-42	A0205006-42	Brown	Cons.	Yes									100%		
<b>Comment: No mastic present.</b>															
736-1-43	A0205006-43	Blue	Cons.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile. Black mastic: 5% Chrysotile.</b>															
736-1-44	A0205006-44	Tan	Cons.	No	2%								98%		
<b>Comment: Tile: 2% Chrysotile. Black mastic: 10% Chrysotile.</b>															
736-1-45	A0205006-45	Tan	Cons.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile. Black mastic: 3% Chrysotile.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 10 of 12  
 Analyzed: 5/1/2002 by WAS

Sample ID		Sample Description				Asbestos Percent					Other Fibers			Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Sro.	An.	T/A	Cell	Glass	OE	B/E	ONE	
736-1-46	A0205006-46	Black	Fibrous	Yes						60%			40%		
<b>Comment: No Asbestos Detected.</b>															
736-1-47	A0205006-47	Black	Fibrous	Yes						60%			40%		
<b>Comment: No Asbestos Detected.</b>															
736-1-48	A0205006-48	Brown	Cons.	Yes	<1%								100%		
<b>Comment: Title: &lt;1% Chrysotile. Mastic: 4% Chrysotile.</b>															
736-1-49	A0205006-49	Brown	Cons.	Yes	2%								98%		
<b>Comment: Title: 2% Chrysotile. Mastic: 3% Chrysotile.</b>															
736-1-50	A0205006-50	Brown	Cons.	Yes									100%		
<b>Comment: Tile and mastic: NAD.</b>															

Hygeia Project Number: A0205006  
 Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 11 of 12  
 Analyzed: 5/1/2002 by CC

Sample ID		Sample Description				Asbestos Percent					Other Fibers					Non - Fibers		
Client #	Hygeia #	Color	Texture	Homog.	Chl.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	OE	B/E	ONE	
736-1-51	A0205006-51	Brown	Cons.	No	<1%								100%					
Comment: Tile: <1% Chrysotile, Black mastie: 2% Chrysotile.																		
736-1-52	A0205006-52	Brown	Cons.	No	2%								98%					
Comment: Tile: 2% Chrysotile, Black mastie: 2% Chrysotile.																		
736-1-53	A0205006-53	Brown	Fibrous	Yes						90%			10%					
Comment: No Asbestos Detected.																		
736-1-54	A0205006-54	Grey	Cons.	Yes	30%								70%					
Comment:																		
736-1-55	A0205006-55	Green	Fibrous	Yes	40%								10%					
Comment:																		

Hygeia Project Number: A0205006  
Client Project Number/Name: 7483 / Fort Gillern - Building 736

Page: 12 of 12  
Analyzed: 5/1/2002 by WAS

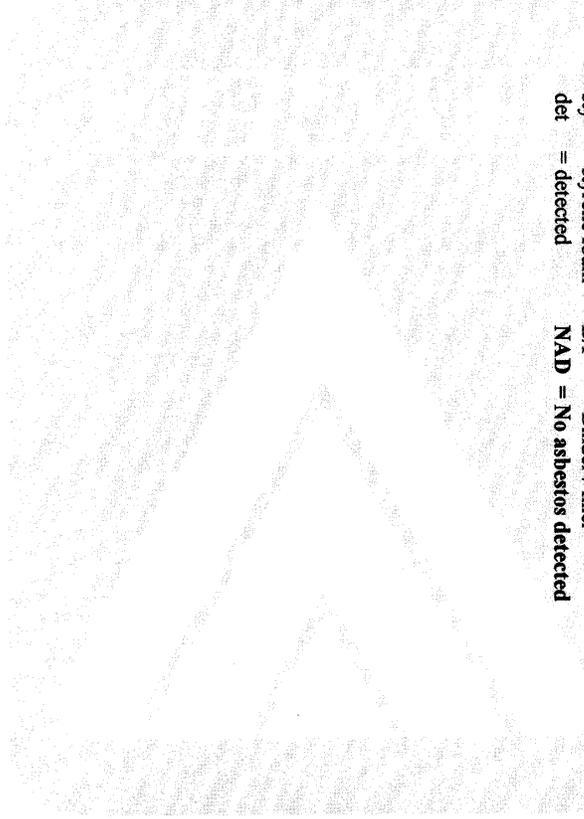
abbreviations:

Chr. = chrysotile  
Am. = amosite  
Cro. = crocidolite  
An. = anthophyllite  
T/A = tremolite/actinolite

cell = cellulose  
glass = fibrous glass  
syn = synthetic  
sty = styrene foam  
det = detected

per = perite  
ver = vermiculite  
MF = Mineral filler  
B/F = Binder / filler  
NAD = No asbestos detected

OF = Other Fibers  
ONF = Other Non-Fibers  
Cons = Consolidated





## HYGEIA LABORATORIES, INC.

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

US Army Corp of Engineers  
Environmental & Materials Unit  
200 North Cobb Parkway  
Bldg. 400, Ste. 404  
Marietta, GA 30062

5/3/2002

Subject:

Hygeia Project Number: A0205009  
Client Project Number/Name: 7487 /Fort Gillem - Building 736

Dear Mr. Tim Jones:

Enclosed are the analytical results of bulk samples submitted by you to this laboratory on 5/2/2002. All analyses were performed by polarized light microscopy (PLM) in accordance with the EPA method as defined in Perkins and Harvey, July 1993, "Methods for the Determination of Asbestos in Bulk Materials" 61pp. (EPA/600/R-93/116). The reported percentages are volume estimates obtained by calibrated visual estimation. The results in this report apply only to the items tested.

The EPA defines an asbestos containing material (ACM) as a material that is reported to contain greater than one percent asbestos. HYGEIA is only responsible for the accuracy of the analytical results provided in this report and cannot be held responsible for the errors resulting from improper sample collection techniques. This report may not be used to claim product endorsement by NVLAP or any other U.S. Government agency.

For nonhomogeneous samples, each layer was analyzed separately and the results combined to form the reported value except where otherwise noted. Vinyl floor tile samples with negative results by PLM should be submitted for confirmation by transmission electron microscopy (TEM). Friable samples containing less than 10% asbestos as determined by PLM may be resubmitted for point counting at your discretion.

Thank you for using our analytical services. HYGEIA Laboratories has been NVLAP accredited since 1988. Our current NVLAP code is 102087-0. We will keep a copy of this report on file for three years. We will dispose of your samples in 60 days unless you request that we return them. This report may be reproduced only in its entirety with the consent of Hygeia Laboratories, Inc. If you have any questions, please call us at (770) - 514-6933.

Sincerely,

Clayton Call  
Asbestos Laboratory Manager

NVLAP# 102087-0  
Texas Dept. of Health # 30-0232  
Commonwealth of Virginia # 3333-000210

— An ATC Group Services Inc. Company —

Hygeia Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

PLM Analysis Summary

Hygeia Project Number: A0205009  
 Client Project Number/Name: 7487 / Fort Gillem - Building 736

Page: 1 of 5  
 Analyzed: 5/2/2002 by CC

Sample ID	Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-M-56	A0205009-01	Green	Fibrous	Yes	40%								80%	
Comment:														
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-M-57	A0205009-02	Gray	Powdery	Yes						10%			90%	
Comment: Silver layer NAD. Rest: NAD.														
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-58	A0205009-03	Tan	Cons.	No	5%								95%	
Comment: Title: 5% Chrysotile. Black mastic: 10% Chrysotile.														
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-59	A0205009-04	Red	Cons.	Yes	5%								95%	
Comment: Title: 5% Chrysotile. Black mastic: 5% Chrysotile.														
Client #	Hygeia #	Color	Texture	Homog.	Chr.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-60	A0205009-05	Red	Cons.	No	5%								95%	
Comment: Title: 5% Chrysotile. Black mastic: 4% Chrysotile.														

Hygeia Project Number: A0205009  
 Client Project Number/Name: 7487 / Fort Gillem - Building 736

Page: 2 of 5  
 Analyzed: 5/2/2002 by WAS

Sample ID		Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
Client #	Hygeia #	Color	Texture	Homog.	Chc.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	
736-1-61	A0205009-06	Green	Cons.	No	5%								95%		
<b>Comment: Tile: 5% Chrysotile, Mastic: 2% Chrysotile.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chc.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	
736-1-62	A0205009-07	Brown	Fibrous	Yes						60%			40%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chc.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	
736-1-63	A0205009-08	Tan	Fibrous	Yes						70%			30%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chc.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	
736-1-64	A0205009-09	Md/lt	Cons.	Yes						40%			60%		
<b>Comment: No Asbestos Detected.</b>															
Client #	Hygeia #	Color	Texture	Homog.	Chc.	Am.	Cr.	An.	T/A	Cell.	Glass	OE	B/E	ONE	
736-1-65	A0205009-10	Purple	Cons.	Yes	6%								94%		
<b>Comment: Tile: 6% Chrysotile, Mastic: NAD.</b>															

Hygeia Project Number: A0205009  
 Client Project Number/Name: 7487 / Fort Gillem - Building 736

Page: 3 of 5  
 Analyzed: 5/2/2002 by WAS

Sample ID		Sample Description					Asbestos Percent					Other Fibers			Non - Fibers	
Client #	Hygeia #	Color	Texture	Horned	Chl.	Am.	Cr.	Al.	T/A	Cell	Glass	OE	B/E	ONE		
736-1-66	A0205009-11	Tan	Fibrous	Yes						80%	20%		20%			
<b>Comment: No Asbestos Detected.</b>																
736-1-67	A0205009-12	White	Cons.	Yes									100%			
<b>Comment: No Asbestos Detected.</b>																
736-1-68	A0205009-13	Brown	Cons.	Yes	4%								96%			
<b>Comment: Tile: 4% Chrysotile, Mastie: 4% Chrysotile.</b>																
736-1-69	A0205009-14	Black	Cons.	Yes									100%			
<b>Comment: Tile and mastie: NAD.</b>																
736-1-70	A0205009-15	White	Fibrous	Yes	70%								30%			
<b>Comment:</b>																

Hygeia Project Number: A0205009  
 Client Project Number/Name: 7487 / Fort Gillem - Building 736

Page: 4 of 5  
 Analyzed: 5/2/2002 by CC

Sample ID	Sample Description	Asbestos Percent						Other Fibers			Non - Fibers			
Client #	Hygeia #	Color	Texture	Hemoid	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE
736-1-71	A0205009-16	Gray	Powdery	Yes	2%					8%			90%	
<b>Comment:</b>														
Client #	Hygeia #	Color	Texture	Hemoid	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE
736-1-72	A0205009-17	Gray	Fibrous	Yes	40%					10%			50%	
<b>Comment:</b>														
Client #	Hygeia #	Color	Texture	Hemoid	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE
736-1-73	A0205009-18	Gray	Fibrous	Yes	30%					20%			50%	
<b>Comment:</b>														
Client #	Hygeia #	Color	Texture	Hemoid	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE
736-1-74	A0205009-19	Brown	Fibrous	Yes						90%			10%	
<b>Comment: No Asbestos Detected.</b>														
Client #	Hygeia #	Color	Texture	Hemoid	Chl.	Am.	Cr.	An.	T/A	Cell	Glass	OE	B/E	ONE
736-1-75	A0205009-20	Red	Cons.	No	4%					11%			85%	

**Comment: Tile: 5% Chrysotile, Felt: NAD. Not enough Brown mastic to analyze.**

Hygeia Project Number: A0205009  
 Client Project Number/Name: 7487 / Fort Gillem - Building 736

Page: 5 of 5  
 Analyzed: 5/2/2002 by CC

Sample ID	Sample Description	Asbestos Percent					Other Fibers					Non - Fibers		
Client #	Hygeia #	Color	Texture	Hemod.	Chl.	Am.	Cro.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-76	A0205009-21	Gray	Pastery	No									100%	
Comment: Leveling compound and brown mastic: NAD.														

Client #	Hygeia #	Color	Texture	Hemod.	Chl.	Am.	Cro.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-77	A0205009-22	Gray	Cons.	No	<1%					10%			90%	
Comment: Tile: <1% Chrysotile. Felt: NAD.														

Client #	Hygeia #	Color	Texture	Hemod.	Chl.	Am.	Cro.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-78	A0205009-23	Gray	Fibrous	Yes	50%								50%	
Comment:														

Client #	Hygeia #	Color	Texture	Hemod.	Chl.	Am.	Cro.	An.	T/A	Cell.	Glass	OE	B/F	ONF
736-1-79	A0205009-24	Gray	Fibrous	Yes	30%					10%			60%	
Comment:														

abbreviations:  
 Chr. = chrysotile  
 Am. = amosite  
 Cro. = crocidolite  
 An. = anthophyllite  
 T/A = tremolite/actinolite

cell = cellulose  
 glass = fibrous glass  
 syn = synthetic  
 sty = styrene foam  
 det = detected

per = perlite  
 ver = vermiculite  
 MF = Mineral filler  
 B/F = Binder / filler  
 NAD = No asbestos detected

OF = Other Fibers  
 ONF = Other Non-Fibers  
 Cons = Consolidated

MAY-03-2002 FRI 03:35 PM ATC ASSOCIATES

FAX NO. 7704271907

P. 03

Hygeia Laboratories Inc.  
1330 Williams Drive, Suite A  
Marietta, GA 30066  
(770) 514-8933

Point Count Summary

5/3/2002

Hygeia Project Number: A0265006  
Client Project Number/Name: 7483 / Fort Gillem - Building 736

Page: 1 of 1

Client Sample #	Hygeia #	Chryso	Amosite	Crocid	Antho	Trem Actin	Binder Matrix
736-1-27	A0205006-27	<1%					100%

Comments: 3 points counted.

Percentages derived by point counting using the following formula:  
A/400 X 100% Where A = the total asbestos points counted  
Detection Limit is 1% total asbestos.

Hygeia Laboratories Inc.  
1300 Williams Drive, Suite A  
Marietta, GA 30066  
(770) 514-6933

Point Count Summary

5/3/2002

Hygeia Project Number: A0205009  
Client Project Number/Name: 7497 / Fort Gillem - Building 736

Page: 1 of 1

Client Sample #	Hygeia #	Chyso	Amosite	Crocid	Antho	Trem Actin	Binder Matrix
736-1-71	A0205009-16	1.50%					98.50%

Comments: 6 points counted.

Percentages derived by point counting using the following formula:  
A/400 X 100% Where A = the total asbestos points counted

Detection Limit is 1% total asbestos.

# **Sample Chain of Custody**

**ASBESTOS CHAIN OF CUSTODY - US ARMY CORPS OF ENGINEERS**

Project: <b>Ft. Gillem Bldg. 736</b>	Job No.: <b>7483</b>
Sampler: <b>Tim Jones</b>	Analysis: <b>PLM</b>

DATE	FIELD ID	EMU ID	COMPONENTS/NOTES
4/29/2002	736-R-1	43658	Roof shingle
4/29/2002	736-R-2	43659	Roof felt
4/29/2002	736-R-3	43660	Roof felt with cement
4/29/2002	736-R-4	43661	Roofing cement
4/29/2002	736-R-5	43662	Roof shingle
4/29/2002	736-R-6	43663	Roof felt
4/29/2002	736-R-7	43664	Roof shingle
4/29/2002	736-R-8	43665	Roof felt
4/29/2002	736-R-9	43666	Roofing cement
4/30/2002	736-1-10	43667	Brown fiberboard
4/30/2002	736-1-11	43668	Floor tile
4/30/2002	736-1-12	43669	Felt paper
4/30/2002	736-1-13	43670	Floor tile
4/30/2002	736-1-14	43671	Felt paper
4/30/2002	736-1-15	43672	Ceiling insulation
4/30/2002	736-1-16	43673	Brown fiberboard
4/30/2002	736-1-17	43674	Drywall joint compound
4/30/2002	736-1-18	43675	Drywall
4/30/2002	736-1-19	43676	Floor leveling compound
4/30/2002	736-1-20	43677	Floor tile
4/30/2002	736-1-21	43678	Floor tile
4/30/2002	736-1-22	43679	Floor tile

Relinquished By	Date	Time	Received By	Date	Time
<i>Tim Jones</i>	<i>5/1/02</i>	<i>9:00am</i>	<i>C. Cell</i>	<i>5/1/02</i>	<i>9:00am</i>

Comments:

**ASBESTOS CHAIN OF CUSTODY - US ARMY CORPS OF ENGINEERS**

Project: <b>Ft. Gillem Bldg. 736</b>	Job No.: <b>7483</b>
Sampler: <b>Tim Jones</b>	Analysis: <b>PLM</b>

DATE	FIELD ID	EMU ID	COMPONENTS/NOTES
4/30/2002	736-1-23	43680	Felt paper
4/30/2002	736-1-24	43681	Floor tile
4/30/2002	736-1-25	43682	Felt paper
4/30/2002	736-1-26	43683	Floor tile
4/30/2002	736-1-27	43684	Drywall joint compound
4/30/2002	736-1-28	43685	2' X 4' RP ceiling tile
4/30/2002	736-1-29	43686	Floor tile
4/30/2002	736-1-30	43687	Floor tile
4/30/2002	736-1-31	43688	Floor tile
4/30/2002	736-1-32	43689	Floor tile
4/30/2002	736-1-33	43690	Floor tile
4/30/2002	736-1-34	43691	Felt paper
4/30/2002	736-1-35	43692	Drywall joint compound
4/30/2002	736-1-36	43693	Floor tile
4/30/2002	736-1-37	43694	Floor tile
4/30/2002	736-1-38	43695	Floor tile
4/30/2002	736-1-39	43696	Floor tile
4/30/2002	736-1-40	43697	Felt paper
4/30/2002	736-1-41	43698	Felt paper
4/30/2002	736-1-42	43699	Floor tile
4/30/2002	736-1-43	43700	Floor tile
4/30/2002	736-1-44	43701	Floor tile

Relinquished By	Date	Time	Received By	Date	Time
<i>Tim Jones</i>	<i>5/1/02</i>	<i>9:00AM</i>	<i>C. Cell</i>	<i>5/1/02</i>	<i>9:00AM</i>

Comments:



**ASBESTOS CHAIN OF CUSTODY - US ARMY CORPS OF ENGINEERS**

Project: <b>Ft. Gillem Bldg. 736</b>	Job No.: <b>7487</b>
Sampler: <b>Tim Jones</b>	Analysis: <b>PLM</b>

DATE	FIELD ID	EMU ID	COMPONENTS/NOTES
5/1/2002	736-1-56	43722	Flex joint
5/1/2002	736-1-57	43723	Drywall
5/1/2002	736-1-58	43724	Floor tile
5/1/2002	736-1-59	43725	Floor tile
5/1/2002	736-1-60	43726	Floor tile
5/1/2002	736-1-61	43727	Floor tile
5/1/2002	736-1-62	43728	Felt paper
5/1/2002	736-1-63	43729	Drywall joint compound
5/1/2002	736-1-64	43730	Drywall
5/1/2002	736-1-65	43731	Floor tile
5/1/2002	736-1-66	43732	2' X 4' RP ceiling tile
5/1/2002	736-1-67	43733	Drywall joint compound
5/1/2002	736-1-68	43734	Floor tile
5/1/2002	736-1-69	43735	Cove base and mastic
5/1/2002	736-1-70	43736	ACM board
5/1/2002	736-1-71	43737	Joint compound
5/1/2002	736-1-72	43738	TSI duct wrap
5/1/2002	736-1-73	43739	TSI duct wrap
5/1/2002	736-1-74	43740	Ceiling insulation
5/1/2002	736-1-75	43741	Floor tile
5/1/2002	736-1-76	43742	Floor leveling compound
5/1/2002	736-1-77	43743	Floor tile

Relinquished By	Date	Time	Received By	Date	Time
<i>Tim Jones</i>	5-2-02		<i>C. O'Connell</i>	5/2/02	

Comments:



# Certifications

***The Environmental Institute***

***Tim Jones***

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA / AHERA (TSCA Title II) Approved Accreditation  
and NESHAP Regulations Training*

***Asbestos in Buildings: Inspection and Assessment***

***February 10-12, 1997***  
Course Date

***2360***  
Certificate Number

***February 12, 1997***  
Examination Date

***February 11, 1998***  
Expiration Date

*William H. Spain*  
William H. Spain - Course Director

*Rachel G. McCain*  
Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

***The Environmental Institute***

***Tim Jones***

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation  
and NESHAP Regulations Training*

***Asbestos in Buildings: Inspector Refresher***

***February 26, 2002***

Course Date

***7283***

Certificate Number

***February 26, 2002***

Examination Date

***February 25, 2003***

Expiration Date

*Thomas G. Maubenthal*

Thomas G. Maubenthal - Course Director

*Rachel G. McCain*

Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

United States Department of Commerce  
National Institute of Standards and Technology



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

**Certificate of Accreditation**

**HYGIEIA LABORATORIES, INC.**  
MARIETTA, GA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

**BULK ASBESTOS FIBER ANALYSIS**

March 31, 2003

Effective through

*David T. Alderman*

For the National Institute of Standards and Technology  
NVLAP Lab Code: 102087-0

NVLAP-01C (11-95)



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

# Scope of Accreditation



Page: 1 of 1

**BULK ASBESTOS FIBER ANALYSIS**

**NVLAP LAB CODE 102087-0**

**HYGEIA LABORATORIES, INC.**

1300 Williams Drive, Suite A  
Marietta, GA 30066-6299

Mr. Clayton Call

Phone: 770-514-6933 Fax: 770-514-6966

E-Mail: call67@atc-enviro.com

***NVLAP Code***

***Designation***

18/A01

EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

March 31, 2003

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

# HAZARDOUS MATERIAL REPORT

**BUILDING NO. 736  
FORT GILLEM, GEORGIA**



**HAZARDOUS MATERIAL REPORT  
Ft. GILLEM, GEORGIA  
BUILDING 736**

**INTRODUCTION**

1. This report documents the hazardous material survey of Building No. 736 at Ft. Gillem, Georgia conducted between 29 April and 1 May 2002 by USACE Savannah District employees Tim Jones and Jack Ford. This survey was conducted in general accordance with the Statement of Services developed by Ray Willingham, USACE Savannah District, which includes the USAEHA guidance for demolition debris characterization by TCLP sampling.
2. The survey consists of a count of florescent and metal halide lights, a search for mercury containing equipment, a search for lead building components, a search for evidence of past or present underground storage tanks and a search for any other hazardous building materials excluding asbestos. The report also documents results of composite sampling of building materials for demolition debris characterization by analysis of TCLP lead.
3. Building No 736 was built in the 1940s time frame and is of wood frame construction. The roof system is wooden framing with wood decking covered by asphalt shingles. The floor system is mostly wood construction with vinyl tile covered with carpet. Due to the construction of the building, the TCLP sampling was performed in accordance with composite sample estimated percentages for Wood structures in the USAEHA guidance. No physical sampling of other hazardous components was performed, only a visual counting was performed.
4. The sampled components for identification of TCLP lead, in their proper percentages, were analyzed by Hygeia Laboratories using EPA methods 1311 for extraction followed by 6010B analysis. Hygeia's analytical report is included in Appendix 1.

## SUMMARY

5. The florescent and metal halide light count results are presented in Table 1.
6. Sampling of building components was performed as required and components were processed and mixed in the proper percentages and given a sample identification of FGB 736 TCLP. TCLP analysis by Hygeia Laboratories indicates that lead is not present above the regulatory limit of 5mg/L. Field sampling data including component type, color, TCLP mix percentage and approximate sampling location is presented in Table 2. Approximate locations of material sub-samples are indicated in the floor plan.
7. Inspection of the building turned up lead in the plumbing drain and vent piping system. Details are included in Table 3.
8. One confirmed and several suspected mercury-containing switches were located on the boiler. No suspect mercury-containing thermostats were located in Building 736.
9. Evidence (fuel fired boiler) of the existence of an underground storage tank was found, however, no tank could be located.
10. Refrigerant from one central air conditioning system should be recovered prior to building demolition. One window air conditioning unit should be removed and refrigerant recovered prior to demolition.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Tables

**TABLE 1**  
**Ft. GILLEM BLDG. 736**  
**FLORESCENT LIGHT FIXTURES**

<b>AREA IDENTIFICATION</b>	<b># &amp; TYPE LIGHTS PRESENT</b>	<b>DESCRIPTION OF LIGHTS</b>
Interior	4	1 foot square, 1 bulb exit lights
Interior	5	2 foot square, 2 bulb florescent fixtures
Interior	120	4 foot long, 4 bulb florescent fixtures
Interior	1	8 foot long, 2 bulb florescent fixtures
Interior	2	Battery back-up emergency fixtures
Exterior	1	1 foot square mercury vapor lamp

**TABLE 2**  
**Ft. GILLEM BLDG. 736**  
**TCLP COMPOSITE SAMPLE COMPONENTS**

<b>BUILDING COMPONENT</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>PERCENTAGE OF SAMPLE</b>
Unpainted Wood	Wall framing	Corridor	42%
Interior wall covering	Tan drywall	Open Room	23%
Roofing Components	Roof shingle	Roof	7%
Interior Floor Coverings	Brown carpet	Corridor	8%
Block, Brick, Concrete	Unpainted block	Foundation	7%
Ceiling Material	White drywall and ceiling tile	Break Room	7%
Painted Wood-Interior	Light green molding	Corridor	1%
Painted Wood-Exterior	Brown and white trim	Exterior soffit	5%

**TABLE 3**  
**Ft. GILLEM BLDG. 736**  
**LEAD BUILDING COMPONENTS**

<b>BUILDING COMPONENT</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ESTIMATED NUMBER</b>
Hot poured lead pipe joint	In plumbing drainage, waste and vent piping	Restrooms and in crawl space	100-150
Lead Flashing	On plumbing vent pipe system	Roof	6

# Appendix 1



# HYGEIA LABORATORIES, INC.

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

Lab Project No. **M0204293**

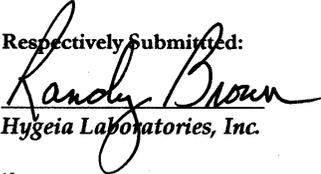
Report Date: 5/02/02 1 of 4

Client Name: **US Army Corp of Engineers**  
 Contact: **Tim Jones**  
 Address: Environmental & Materials Unit  
 200 North Cobb Parkway  
 Bldg. 400, Ste. 404  
 Marietta, GA 30062  
 Project Name: **Fort Gillem EOD Group HQ**  
 Project ID: 7482  
 Receipt Date: 4/30/2002

### Case Narrative

1. The sample holding times were met for all analyses.
2. Where applicable, results & reporting limits are based on wet weight; dry weight calculations available.
3. The temperature of the sample cooler as received by the laboratory was 4° C.

Reviewed By: AWS

Respectively Submitted:  
  
 Randy Brown  
 Hygeia Laboratories, Inc.

### Sample Identification

<u>Lab Sample #</u>	<u>Client Sample ID</u>	<u>Sample Supply</u>	<u>Collected</u>
M0204293-01	FGB 736 TCLP	Bulk	4/29/02
M0204293-02	FGB 710 TCLP	Bulk	4/29/02
M0204293-03	FGB 739 TCLP	Bulk	4/29/02

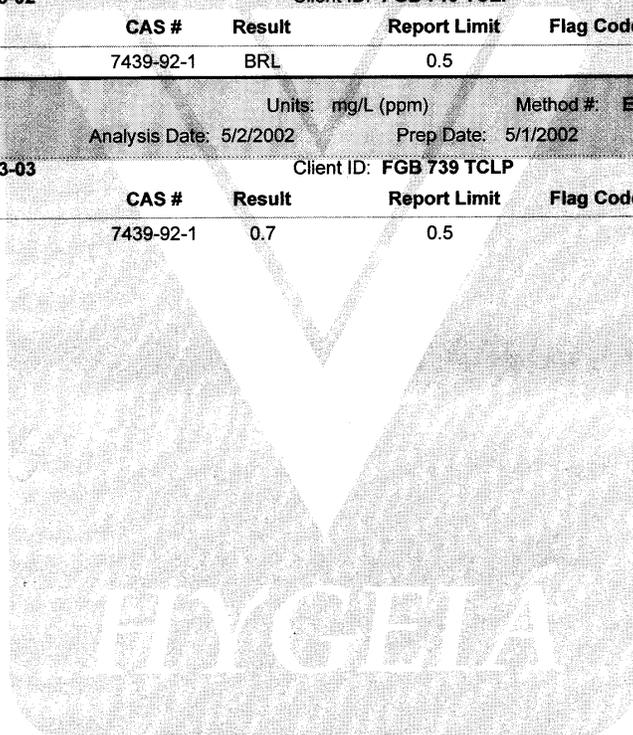
Lab Project No. **M0204293**

Report Date: 5/02/02 2 of 4

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-01		Client ID: FGB 736 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-02		Client ID: FGB 710 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-03		Client ID: FGB 739 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	0.7	0.5	



Lab Project No. **M0204293**

Report Date: 5/02/02 3 of 4

**BatchID:** H020502013  
**Department:** Metals  
**Prep Method:** EPA\_1311/7420A  
**Analysis Method:** EPA\_1311/7420A

**Prep Analyst:** GK  
**Prep Date:** 5/1/02 12:00  
**Analyst:** GK  
**Analysis Date:** 5/2/02 10:40

Quality Control Summary							
<b>M0204293-01A</b>							
AnalyteName	Result	Unit					
Lead	BRL	mg/L (ppm)					
<b>H020502013-MB</b>							
AnalyteName	Result	Unit	RL				
Lead	BRL	mg/L (ppm)	0.500				
<b>H020502013-LCS</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits			
Lead	5.02	mg/L (ppm)	100	80 - 120			
<b>H020502013-LCSD</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits	
Lead	5.14	mg/L (ppm)	103	80 - 120	2	0 - 20	
<b>M0204293-01A-DUP</b>							
AnalyteName	Result	Parent Result	Unit			RPD	RPD Limits
Lead	BRL	BRL	mg/L (ppm)			11	0 - 20
<b>M0204293-01A-MS</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits		
Lead	5.54	BRL	mg/L (ppm)	105	75 - 125		
<b>M0204293-01A-MSD</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits
Lead	5.57	BRL	mg/L (ppm)	106	75 - 125	1	0 - 20

Lab Project No. **M0204293**

Report Date: 5/02/02 4 of 4

**NOTES:**

- Results relate only to the samples tested as received (See Chain-of-Custody).
- BRL = "Below Reporting Limit"
- RL = "Reporting Limit"
- E = "Estimated Result"
- Dates are presented in the format "month/day/year"

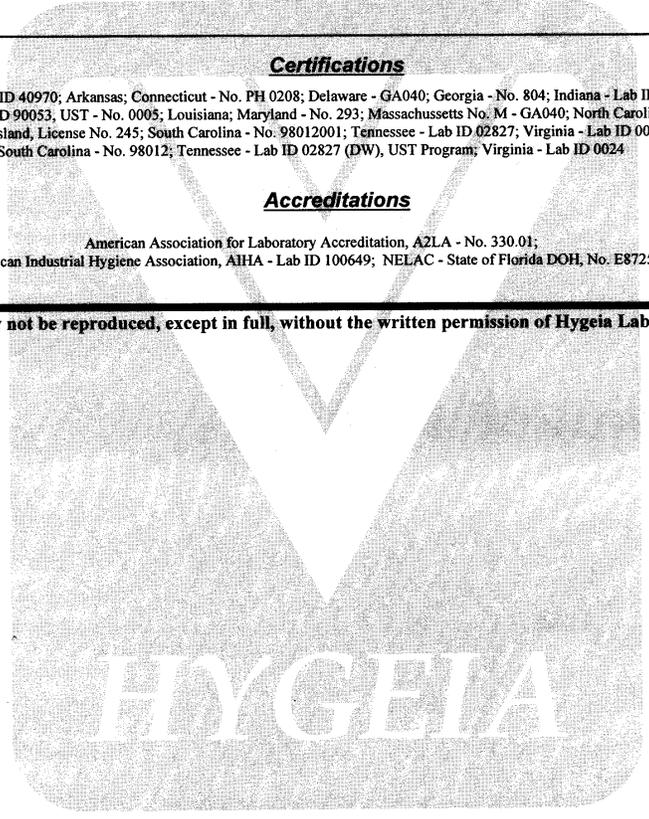
**Certifications**

Alabama - Lab ID 40970; Arkansas; Connecticut - No. PH 0208; Delaware - GA040; Georgia - No. 804; Indiana - Lab ID C-GA-01  
Kentucky - Lab ID 90053; UST - No. 0005; Louisiana; Maryland - No. 293; Massachusetts No. M - GA040; North Carolina - No. 409  
Rhode Island, License No. 245; South Carolina - No. 98012001; Tennessee - Lab ID 02827; Virginia - Lab ID 00024  
South Carolina - No. 98012; Tennessee - Lab ID 02827 (DW), UST Program; Virginia - Lab ID 0024

**Accreditations**

American Association for Laboratory Accreditation, A2LA - No. 330.01;  
American Industrial Hygiene Association, AIHA - Lab ID 100649; NELAC - State of Florida DOH, No. E87257

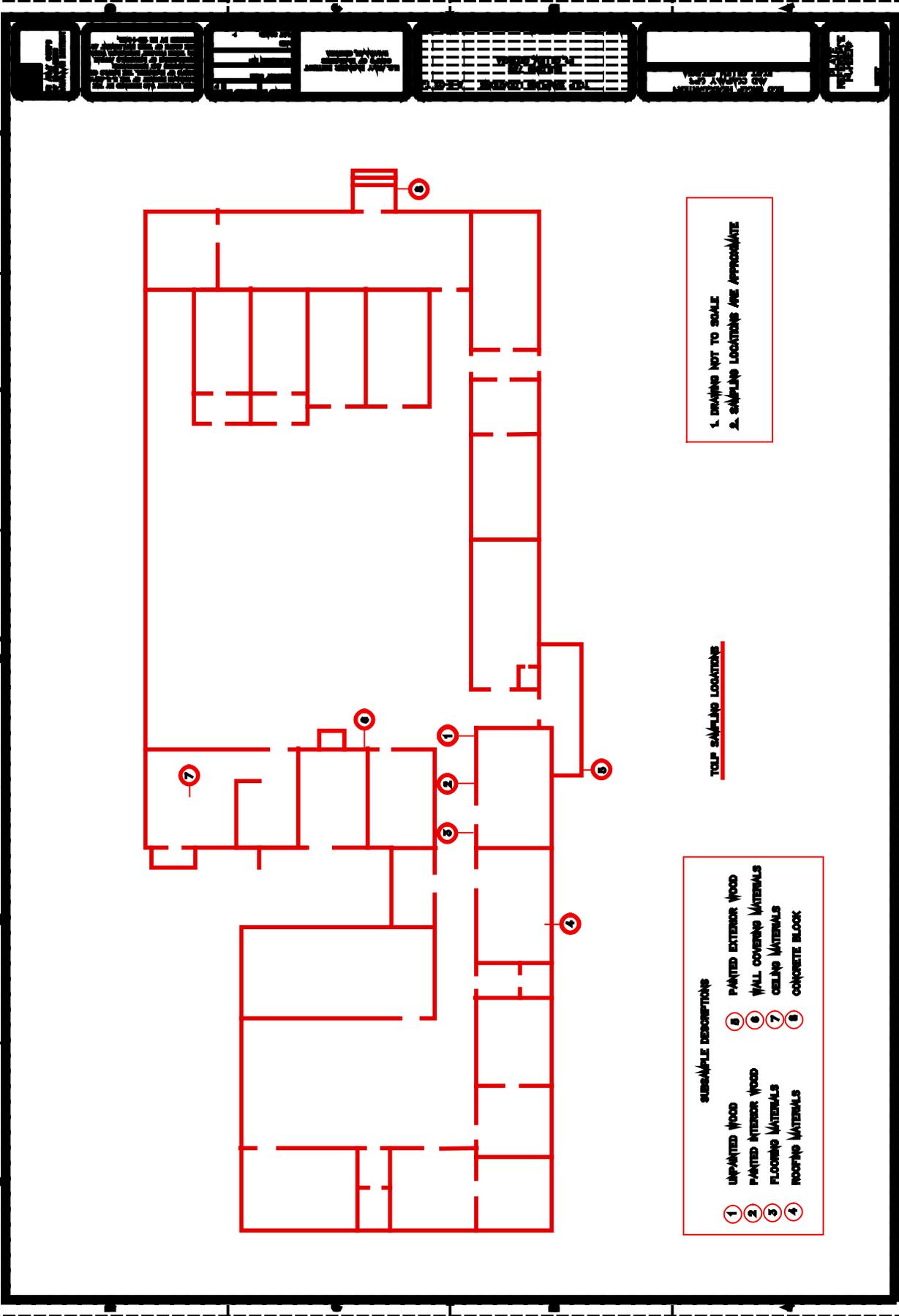
**This report may not be reproduced, except in full, without the written permission of Hygeia Laboratories, Inc.**



HYGEIA



# **Floor Plan And Sampling Locations**



1. DRAWING NOT TO SCALE  
 2. SAMPLING LOCATIONS ARE APPROXIMATE

- SAMPLING DESCRIPTIONS**
- ① UNPAINTED WOOD
  - ② PAINTED INTERIOR WOOD
  - ③ FLOORING MATERIALS
  - ④ ROOFING MATERIALS
  - ⑤ PAINTED EXTERIOR WOOD
  - ⑥ WALL COVERING MATERIALS
  - ⑦ CEILING MATERIALS
  - ⑧ CONCRETE BLOCK

TRAIL SAMPLING LOCATIONS



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

## ASBESTOS SURVEY

**BUILDING NO. 739  
FORT GILLEM, GEORGIA**



**ASBESTOS INSPECTION REPORT  
FORT GILLEM, GEORGIA  
BUILDING NUMBER 739**

**INTRODUCTION**

1. This report documents the asbestos inspection and survey of Building No. 739 at Fort Gillem, Georgia conducted on 29 April 2002 by USACE Savannah District employees Tim Jones and Jack Ford. The survey was conducted in general accordance with the regulatory guidelines in the Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763 Subpart E Sections 763.80-763.88) and "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Purple Book) (EPA publication number 560/5-85-024). Although not required by the AHERA guidelines, roof and other exterior miscellaneous materials were also inspected and sampled.
2. Building No. 739 was built in the 1940s time frame and is a single story single room structure of wood frame construction with vinyl siding covering the old wood exterior. The floor system is concrete slab on grade. The roof is wood frame with a single layer of asphalt shingles.
3. All accessible areas of Building No. 739 were visually inspected for suspected Asbestos Containing Materials (ACM) by an accredited inspector. Bulk samples of all suspected ACM's were collected. Samples were taken from inconspicuous locations when possible. This report details ACM as identified at the time of inspection only.
4. The bulk samples were analyzed by Hygeia Laboratories, Inc. Hygeia is accredited by the National Voluntary Laboratory Accredited Program (NVLAP Accreditation sponsored by the National Institute of Standards and Technology (NIST)). The samples were analyzed by the accepted method of polarized light microscopy (PLM) using EPA's "Method for the Determination of Asbestos in Bulk Building Materials", EPA/600/R-93/116. Hygeia's analytical report is included in Appendix 1 and their NVLAP accreditation is in the Certifications section.
5. In compliance with the AHERA regulations, material is considered an Asbestos Containing Material when it contains greater than 1 (one) percent asbestos. Likewise, in this report, any material containing concentrations greater than 1 percent asbestos will be considered "positive". A narrative discussion of the AHERA ACM types (i.e., thermal systems insulation, miscellaneous and surfacing materials) found in Building No. 739 is included in this report when relevant. Bulk sample information appears on Table 1. The specific location where each bulk sample was obtained is shown on the building floor plans, which appear as Plates.

## **DISCUSSION**

6. Samples were taken from the window glazing, roofing and gypsum wall covering. None were found to contain asbestos.

## **Summary**

7. No materials in Building 739 were found to contain asbestos.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Tables

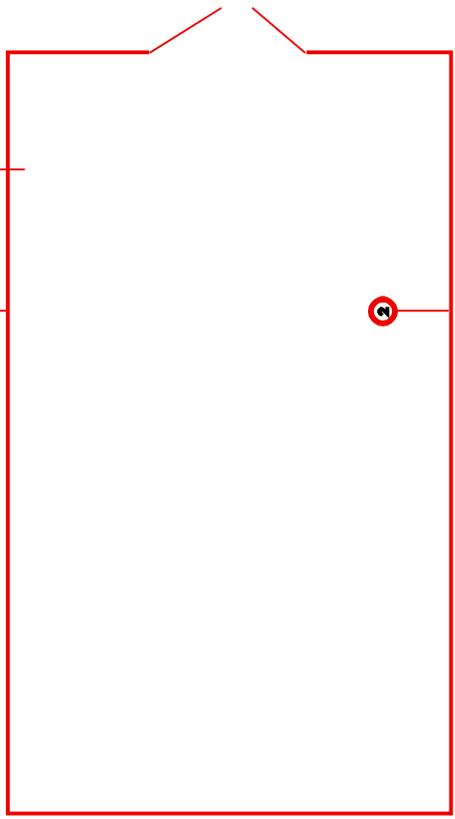
**TABLE 1  
SUSPECT ACM SAMPLES  
Ft. GILLEM BUILDING 739**

<b>FIELD ID</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>ASBESTOS TYPE &amp; %</b>
739-E-1	Window Glazing Compound	Window frame	None
739-1-2	Gypsum Wall Board	Wall	None
739-R-3	Roof Shingle	Roof field	None

Samples testing positive for asbestos in **BOLD** type

# Plates

**Plate 1** 739a.dgn Sample Locations



- 1. DRAWING NOT TO SCALE
- 2. SAMPLING LOCATIONS ARE APPROXIMATE

ASBESTOS SAMPLING LOCATIONS

# Appendix 1



## **HYGEIA LABORATORIES, INC.**

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

US Army Corp of Engineers  
Environmental & Materials Unit  
200 North Cobb Parkway  
Bldg. 400, Ste. 404  
Marietta, GA 30062

5/3/2002

Subject:

Hygeia Project Number: A0205003  
Client Project Number/Name: 7484 /Fort Gillem - Building 739

Dear Mr. Tim Jones:

Enclosed are the analytical results of bulk samples submitted by you to this laboratory on 5/1/2002. All analyses were performed by polarized light microscopy (PLM) in accordance with the EPA method as defined in Perkins and Harvey, July 1993, "Methods for the Determination of Asbestos in Bulk Materials" 61pp. (EPA/600/R-93/116). The reported percentages are volume estimates obtained by calibrated visual estimation. The results in this report apply only to the items tested.

The EPA defines an asbestos containing material (ACM) as a material that is reported to contain greater than one percent asbestos. HYGEIA is only responsible for the accuracy of the analytical results provided in this report and cannot be held responsible for the errors resulting from improper sample collection techniques. This report may not be used to claim product endorsement by NVLAP or any other U.S. Government agency.

For nonhomogeneous samples, each layer was analyzed separately and the results combined to form the reported value except where otherwise noted. Vinyl floor tile samples with negative results by PLM should be submitted for confirmation by transmission electron microscopy (TEM). Friable samples containing less than 10% asbestos as determined by PLM may be resubmitted for point counting at your discretion.

Thank you for using our analytical services. HYGEIA Laboratories has been NVLAP accredited since 1988. Our current NVLAP code is 102087-0. We will keep a copy of this report on file for three years. We will dispose of your samples in 60 days unless you request that we return them. This report may be reproduced only in its entirety with the consent of Hygeia Laboratories, Inc. If you have any questions, please call us at (770) - 514-6933.

Sincerely,

Clayton Call  
Asbestos Laboratory Manager

NVLAP# 102087-0  
Texas Dept. of Health # 30-0232  
Commonwealth of Virginia # 3333-000210

— An ATC Group Services Inc. Company —

PLM Analysis Summary

Page: 1 of 1  
 Analyzed: 5/1/2002 by CC

Hygeia Laboratories Inc.  
 1300 Williams Drive, Suite A  
 Marietta, GA 30066  
 (770) 514-6933

Hygeia Project Number: A0205003  
 Client Project Number/Name: 7484 / Fort Gillem - Building 739

Client #	Hygeia #	Sample Description				Asbestos Percent				Other Fibers				Non - Fibers	
		Color	Texture	Homog.	Chr.	Am.	Cro.	An.	T/A	Cell	Glass	OE	B/E	ONF	
739-E-1	A0205003-01	Gray		Yes											100%
Comment: No Asbestos Detected.															
739-1-2	A0205003-02	Gray	Powdery	No											
Comment: Silver layer: NAD. Black layer: NAD Rest: NAD															
739-R-3	A0205003-03	Black	Gummy	Yes											
Comment: No Asbestos Detected.															

abbreviations:

- Chr. = chrysotile
- Am. = amosite
- Cro. = crocidolite
- An. = anthophyllite
- T/A = tremolite/actinolite

- per = perlite
- ver = vermiculite
- MF = Mineral filler
- B/F = Binder / filler
- NAD = No asbestos detected

- OF = Other Fibers
- ONF = Other Non-Fibers
- Cons = Consolidated

# **Sample Chain of Custody**



# Certifications

**The Environmental Institute**

*Tim Jones*

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA / AHERA (TSCA Title II) Approved Accreditation  
and NESHAP Regulations Training*

**Asbestos in Buildings: Inspection and Assessment**

February 10-12, 1997  
Course Date

2360  
Certificate Number

February 12, 1997  
Examination Date

February 11, 1998  
Expiration Date

*William H. Spain*  
William H. Spain - Course Director

*Rachel G. McCain*  
Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

***The Environmental Institute***

***Tim Jones***

*Has completed coursework and satisfactorily passed  
an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation  
and NESHAP Regulations Training*

***Asbestos in Buildings: Inspector Refresher***

***February 26, 2002***

Course Date

***7283***

Certificate Number

***February 26, 2002***

Examination Date

***February 25, 2003***

Expiration Date

*Thomas G. Aubenthal*

Thomas G. Aubenthal - Course Director

*Rachel G. McCain*

Rachel G. McCain - Exam Administrator



TEI - 1300 Williams Drive, Suite E - Marietta, Georgia 30066 - (770) 427-3600

United States Department of Commerce  
National Institute of Standards and Technology



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

Certificate of Accreditation

**HYGELA LABORATORIES, INC.**  
MARIETTA, GA



is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

**BULK ASBESTOS FIBER ANALYSIS**

March 31, 2003

Effective through

*David T. Alderman*

For the National Institute of Standards and Technology  
NVLAP Lab Code: 102087-0

NVLAP-01C (11-95)



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

# Scope of Accreditation



Page: 1 of 1

**BULK ASBESTOS FIBER ANALYSIS**

**NVLAP LAB CODE 102087-0**

**HYGEIA LABORATORIES, INC.**

1300 Williams Drive, Suite A

Marietta, GA 30066-6299

Mr. Clayton Call

Phone: 770-514-6933 Fax: 770-514-6966

E-Mail: call67@atc-enviro.com

***NVLAP Code***

***Designation***

18/A01

EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

March 31, 2003

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology



U.S. Army Corps  
of Engineers  
Savannah District

---

U.S. ARMY CORPS OF ENGINEERS  
ENVIRONMENTAL & MATERIALS UNIT  
200 NORTH COBB PARKWAY  
BUILDING 400, SUITE 404  
MARIETTA, GA 30062

# HAZARDOUS MATERIAL REPORT

**BUILDING NO. 739  
FORT GILLEM, GEORGIA**



**HAZARDOUS MATERIAL REPORT  
Ft. GILLEM, GEORGIA  
BUILDING 739**

**INTRODUCTION**

1. This report documents the hazardous material survey of Building No. 739 at Ft. Gillem, Georgia conducted on 29 April 2002 by USACE Savannah District employees Tim Jones and Jack Ford. This survey was conducted in general accordance with the Statement of Services developed by Ray Willingham, USACE Savannah District, which includes the USAEHA guidance for demolition debris characterization by TCLP sampling.
2. The survey consists of a count of florescent and metal halide lights, a search for mercury containing equipment, a search for lead building components, a search for evidence of past or present underground storage tanks and a search for any other hazardous building materials excluding asbestos. The report also documents results of composite sampling of building materials for demolition debris characterization by analysis of TCLP lead.
3. Building No 739 was built in the 1940s time frame and is of wood frame construction. The building is a single room that appears to have at one time housed a boiler. It is now used as general storage. The roof system is wooden framing with wood decking covered by asphalt shingles. The floor system is concrete slab on grade. Due to the construction of the building, the TCLP sampling was performed in accordance with composite sample estimated percentages for Wood structures in the USAEHA guidance. No physical sampling of other hazardous components was performed, only a visual counting was performed.
4. The sampled components for identification of TCLP lead, in their proper percentages, were analyzed by Hygeia Laboratories using EPA methods 1311 for extraction followed by 6010B analysis. Hygeia's analytical report is included in Appendix 1.

## SUMMARY

5. No florescent lights were found in Building 739.
6. Sampling of building components was performed as required and components were processed and mixed in the proper percentages and given a sample identification of FGB 739 TCLP. TCLP analysis by Hygeia Laboratories indicates that lead is not present above the regulatory limit of 5mg/L. Field sampling data including component type, color, TCLP mix percentage and approximate sampling location is presented in Table 1. Approximate locations of material sub-samples are indicated in the floor plan.
7. Inspection of the building turned up no lead building components.
8. No mercury containing thermostats or switches were found in Building 739.
9. No evidence of the existence of an underground storage tank was found.

Prepared by: \_\_\_\_\_  
TIMOTHY A. JONES

# Tables

**TABLE 1**  
**Ft. GILLEM BLDG. 739**  
**TCLP COMPOSITE SAMPLE COMPONENTS**

<b>BUILDING COMPONENT</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>PERCENTAGE OF SAMPLE</b>
Unpainted Wood	Wall framing	Interior	42%
Interior wall covering	Silver drywall	Interior	23%
Roofing Components	Roof shingle	Roof	7%
Interior Floor Coverings	Unpainted concrete	Interior	8%
Block, Brick, Concrete	Unpainted concrete	Foundation	7%
Ceiling Material	Silver drywall	Interior	7%
Painted Wood-Interior	Silver window molding	Interior	1%
Painted Wood-Exterior	White siding	Exterior	5%

# Appendix 1



# HYGEIA LABORATORIES, INC.

1300 Williams Drive, Suite A - Marietta, Georgia 30066-6299 - (770) 514-6933, FAX (770) 514-6966

Lab Project No. **M0204293**

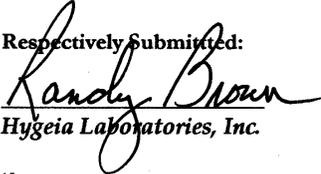
Report Date: 5/02/02 1 of 4

Client Name: **US Army Corp of Engineers**  
 Contact: **Tim Jones**  
 Address: Environmental & Materials Unit  
 200 North Cobb Parkway  
 Bldg. 400, Ste. 404  
 Marietta, GA 30062  
 Project Name: **Fort Gillem EOD Group HQ**  
 Project ID: 7482  
 Receipt Date: 4/30/2002

### Case Narrative

1. The sample holding times were met for all analyses.
2. Where applicable, results & reporting limits are based on wet weight; dry weight calculations available.
3. The temperature of the sample cooler as received by the laboratory was 4° C.

Reviewed By: AWS

Respectively Submitted:  
  
 Randy Brown  
 Hygeia Laboratories, Inc.

### Sample Identification

<u>Lab Sample #</u>	<u>Client Sample ID</u>	<u>Sample Supply</u>	<u>Collected</u>
M0204293-01	FGB 736 TCLP	Bulk	4/29/02
M0204293-02	FGB 710 TCLP	Bulk	4/29/02
M0204293-03	FGB 739 TCLP	Bulk	4/29/02

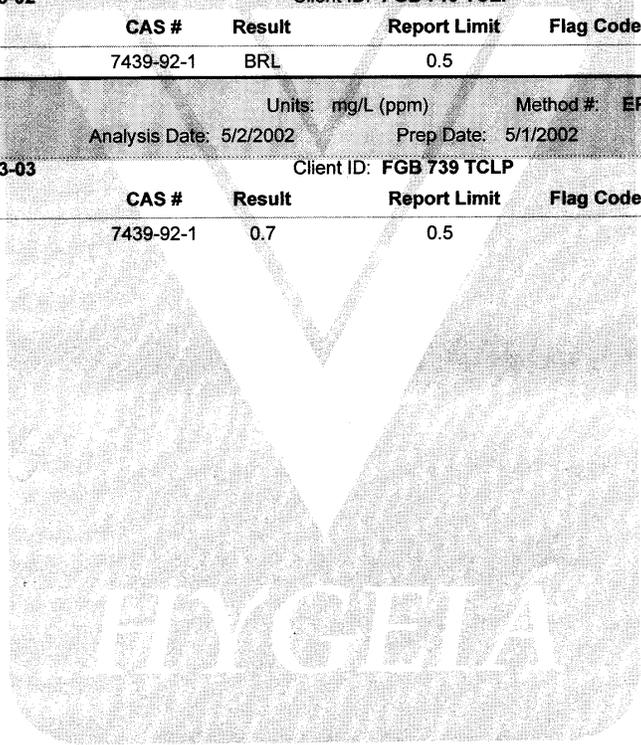
Lab Project No. **M0204293**

Report Date: 5/02/02 2 of 4

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-01		Client ID: FGB 736 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-02		Client ID: FGB 710 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	BRL	0.5	

<b>TCLP Lead</b>		Units: mg/L (ppm)	Method #: EPA_1311/7420A	
Matrix: Leachate	Analysis Date: 5/2/2002	Prep Date: 5/1/2002	Analyst: GK	
Lab Sample #: M0204293-03		Client ID: FGB 739 TCLP		
<b>Analyte(s)</b>	<b>CAS #</b>	<b>Result</b>	<b>Report Limit</b>	<b>Flag Code</b>
Lead	7439-92-1	0.7	0.5	



Lab Project No. **M0204293**

Report Date: 5/02/02 3 of 4

**BatchID:** H020502013  
**Department:** Metals  
**Prep Method:** EPA\_1311/7420A  
**Analysis Method:** EPA\_1311/7420A

**Prep Analyst:** GK  
**Prep Date:** 5/1/02 12:00  
**Analyst:** GK  
**Analysis Date:** 5/2/02 10:40

Quality Control Summary							
<b>M0204293-01A</b>							
AnalyteName	Result	Unit					
Lead	BRL	mg/L (ppm)					
<b>H020502013-MB</b>							
AnalyteName	Result	Unit	RL				
Lead	BRL	mg/L (ppm)	0.500				
<b>H020502013-LCS</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits			
Lead	5.02	mg/L (ppm)	100	80 - 120			
<b>H020502013-LCSD</b>							
AnalyteName	Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits	
Lead	5.14	mg/L (ppm)	103	80 - 120	2	0 - 20	
<b>M0204293-01A-DUP</b>							
AnalyteName	Result	Parent Result	Unit			RPD	RPD Limits
Lead	BRL	BRL	mg/L (ppm)			11	0 - 20
<b>M0204293-01A-MS</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits		
Lead	5.54	BRL	mg/L (ppm)	105	75 - 125		
<b>M0204293-01A-MSD</b>							
AnalyteName	Result	Parent Result	Unit	%Recovery	Ctl Limits	RPD	RPD Limits
Lead	5.57	BRL	mg/L (ppm)	106	75 - 125	1	0 - 20

Lab Project No. **M0204293**

Report Date: 5/02/02 4 of 4

**NOTES:**

- Results relate only to the samples tested as received (See Chain-of-Custody).
- BRL = "Below Reporting Limit"
- RL = "Reporting Limit"
- E = "Estimated Result"
- Dates are presented in the format "month/day/year"

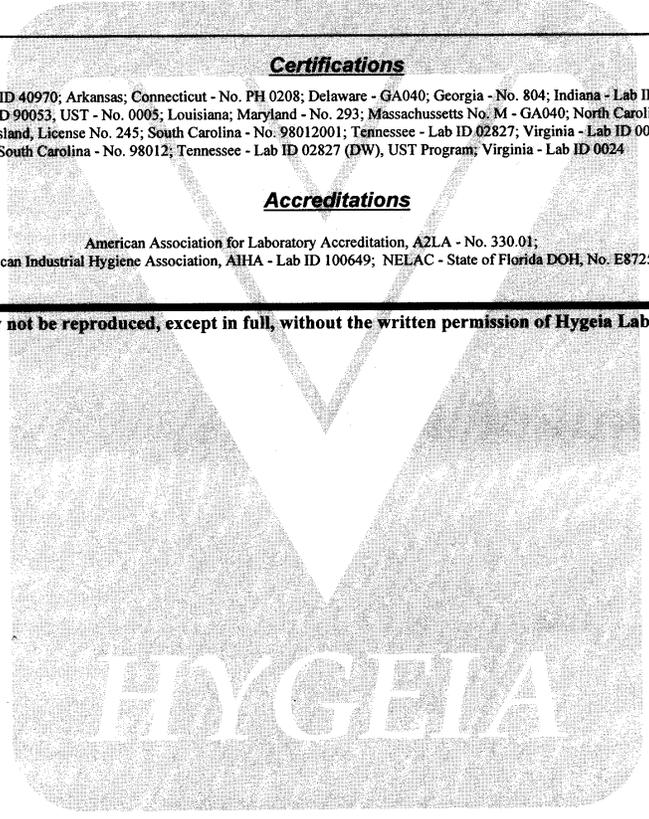
**Certifications**

Alabama - Lab ID 40970; Arkansas; Connecticut - No. PH 0208; Delaware - GA040; Georgia - No. 804; Indiana - Lab ID C-GA-01  
Kentucky - Lab ID 90053; UST - No. 0005; Louisiana; Maryland - No. 293; Massachusetts No. M - GA040; North Carolina - No. 409  
Rhode Island, License No. 245; South Carolina - No. 98012001; Tennessee - Lab ID 02827; Virginia - Lab ID 00024  
South Carolina - No. 98012; Tennessee - Lab ID 02827 (DW), UST Program; Virginia - Lab ID 0024

**Accreditations**

American Association for Laboratory Accreditation, A2LA - No. 330.01;  
American Industrial Hygiene Association, AIHA - Lab ID 100649; NELAC - State of Florida DOH, No. E87257

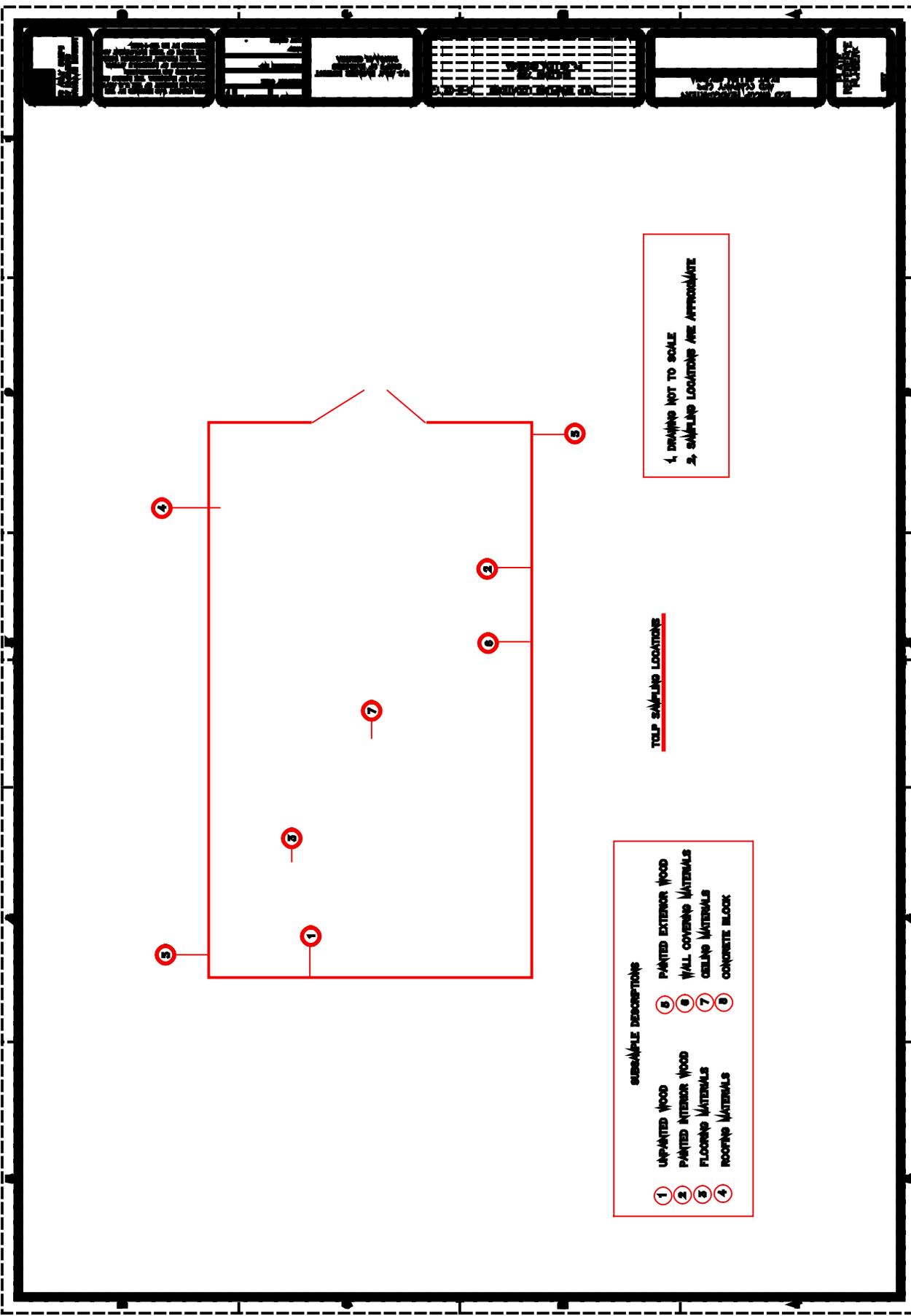
**This report may not be reproduced, except in full, without the written permission of Hygeia Laboratories, Inc.**



HYGEIA



# **Floor Plan And Sampling Locations**



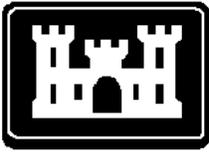
1. SAMPLE NOT TO SOLID  
 2. SAMPLE LOCATIONS ARE APPROXIMATE

TOP SAMPLE LOCATIONS

SUBSAMPLE DESCRIPTIONS	
1	UNPAINTED WOOD
2	PAINTED INTERIOR WOOD
3	FLOORING MATERIALS
4	ROOFING MATERIALS
5	PAINTED EXTERIOR WOOD
6	WALL COVERING MATERIALS
7	CERAMIC MATERIALS
8	CONCRETE BLOCK

## **APPENDIX G**

# **INTERIOR DESIGN PRESENTATION FORMAT**



**US Army Corps  
of Engineers  
Savannah District**

---

# Interior Design Presentation Format

**February 1999**

**U.S. ARMY ENGINEER DISTRICT, SAVANNAH  
CORPS OF ENGINEERS  
100 WEST OGLETHORPE AVENUE  
SAVANNAH, GEORGIA 31401-3640**

**THE SAVANNAH DISTRICT'S MANUAL  
FOR INTERIOR DESIGN PRESENTATION**

<b>SECTION</b>	<b>TITLE</b>	<b>PAGE</b>
	<b>PREFACE</b>	<b>2</b>
	<b>GOVERNMENT CONTRACTING TERMS</b>	<b>3-7</b>
	<b><u>PRESENTATION FORMAT</u></b>	
<b>1.</b>	<b>GENERAL NOTES</b>	<b>8</b>
<b>2.</b>	<b>TECHNICAL NOTES</b>	<b>9</b>
<b>3.</b>	<b>SIGNAGE</b>	<b>9-11</b>
<b>4.</b>	<b>SID/CID SUBMITTAL REQUIREMENTS</b>	<b>12-13</b>
<b>5.</b>	<b>SUBMITTAL MATRIX SUMMARY</b>	<b>14-16</b>
<b>6.</b>	<b>CID FURNISHINGS AND COST GUIDELINES</b>	<b>17-19</b>
<b>7.</b>	<b>PREWIRED AND SYSTEMS FURNITURE</b>	<b>19</b>
<b>8.</b>	<b>MANUFACTURER'S SUMMARY LIST</b>	<b>19</b>
<b>9.</b>	<b>FURNITURE LOCATION CODES</b>	<b>20</b>
<b>10.</b>	<b>FURNITURE ILLUSTRATION SHEET</b>	<b>20</b>
<b>11.</b>	<b>FURNITURE PLACEMENT PLAN</b>	<b>20</b>
<b>12.</b>	<b>ARTWORK SHEETS</b>	<b>21</b>
<b>13.</b>	<b>FURNITURE COST ESTIMATE</b>	<b>21</b>
<b>14.</b>	<b>ORDER FORMS</b>	<b>21</b>
<b>15.</b>	<b>LETTER OF WAIVER</b>	<b>22</b>
<b>16.</b>	<b>HEALTH AND SAFETY</b>	<b>22</b>
<b>17.</b>	<b>CHECKLIST FOR SID</b>	<b>24-28</b>
<b>18.</b>	<b>CHECKLIST FOR CID</b>	<b>28-29</b>
<b>19.</b>	<b>LESSONS LEARNED</b>	<b>29-36</b>
<b>20.</b>	<b>SID/CID ILLUSTRATIONS</b>	
	<b>APPENDICES</b>	
	<b>A: ADA REQUIREMENTS</b>	
	<b>B: COMMANDERS' POLICY</b>	
	<b>C: UNICOR WAIVER</b>	

## **THE SAVANNAH DISTRICT'S MANUAL FOR INTERIOR DESIGN PRESENTATION FORMAT**

- A. This format is required in accordance with THE SAVANNAH DISTRICT DESIGN MANUAL section 10.8.9. and is developed in accordance with Air Force and Army interior design requirements for SID/CID submittals.
- B. SID/CID PACKAGES RUN CONCURRENT WITH THE ARCHITECTURAL SUBMITTALS.
- C. "Checklists for Reviews" and "Lessons Learned" are to be used to ensure all required information is included in the Contract Documents, the SID/CID presentation binders and to achieve customer satisfaction.
- D. The General Contractor will not be receiving the 8 ½" X 11" SID/CID binders. Verify that all graphic illustrations such as carpet borders, ceramic tile patterns, accent color placement, millwork details and prewired furniture finished and details are on the contract drawings.
- E. DO NOT REFERENCE THE SID/CID BINDERS IN THE CONTRACT DOCUMENTS.
- F. THIS INFORMATION IS NOT OPTIONAL WHEN PRESENTING A SID/CID SUBMITTAL FOR REVIEW and FINAL DESIGN.
- G. The Interior Design Point of Contact for the Savannah District is:

U.S. Army Corps of Engineers  
ATTN: EN-DA/Peggy Roberson  
100 W. Oglethorpe Avenue  
Savannah, GA 31402-0889  
COMM (912) 652-5544 FAX (912) 652-5891

**GOVERNMENT CONTRACTING TERMS**

ARMY	AIR FORCE	DEFINITION
<b>MCA</b>	<b>MILCON</b>	<b>MILITARY CONSTRUCTION</b> funds appropriated by Congress for new construction-fixed price contracts.
<b>OMA</b>	<b>O &amp; M</b>	<b>OPERATION AND MAINTENANCE</b> funds provided to each installation by the Major Command and used for the day to day operations of the installation. These funds may be used for the renovation of existing buildings or for the purchase of furniture. Funds not spent to award a contract disappear at the end of the FY and cannot be recovered.
<b>FY</b>	<b>FY</b>	<b>FISCAL YEAR:</b> (A) October 1 through September 30 per the calendar. (B) If the project title begins with "FY-...." This identifies the year Congress will fund the Construction Contract Award.
<b>PD</b>	<b>PD</b>	<b>PROJECT DEFINITION:</b> A conceptual design of the proposed project (floorplans, elevations, cost estimate).
<b>DD FORM 1391</b>	<b>DD FORM 1391</b>	A programming document initiated by the installation; passed through the Major Command on to Congress for funding. The 1391 outlines basic needs for a proposed facility and an estimated cost to reach those needs.
<b>JOC</b>	<b>SABER</b>	<b>JOB ORDER CONTRACT OR SIMPLIFIED ACQUISITION OF BASE ENGINEERING REQUIREMENTS:</b> The installation's method to contract for repair work. Unit prices are agreed upon with a Contractor then individual job orders are negotiated for specific scopes of repair work.

**GOVERNMENT CONTRACTING TERMS**

ARMY	AIR FORCE	DEFINITION
CBD	CBD	<b>COMMERCE AND BUSINESS DAILY:</b> The federal government's "want ads". Advanced notice of contracting actions & requests for A-E Services.
IFB	IFB	<b>INVITATION FOR BID:</b> Standard contract procedures with clearly defined requirements, specifications and terms that are not negotiated. Any proposal prepared in response to an IFB must strictly adhere to the terms. Award is based on the lowest bid meeting the requirements and specifications.
RFP	RFP	A <b>REQUEST FOR PROPOSAL</b> is flexible in contrast to an IFB. It usually defines a problem and allows those who respond to the RFP to suggest a solution. A <b>REQUEST FOR QUOTES</b> is an informal request for price for standard item.
RFQ	RFQ	
DESIGN BUILD	DESIGN BUILD	Using the RFP format, performance requirements are outlined; the Construction Contractor and A-E subcontractor are responsible for the design of specifics to meet performance requirements.
APPENDIX A	APPENDIX A	The contractual scope of work for A-E contracts which outlines basic requirements including specific deliverables and the schedule of design submittals.
SF 254 & 255	SF 254 & 255	<b>STANDARD FORMS</b> to provide resume information to the government regarding the qualifications of A-E's responding to a CBD announcement.

**GOVERNMENT SID/CID TERMS**

ARMY	AIR FORCE	DEFINITION
<b>SID</b>	<b>SID</b>	<b>STRUCTURAL INTERIOR DESIGN:</b> Building related finishes; funded with MCA or MILCON dollars; Building Materials and finishes are purchased and installed by the General Contractor; a submittal with samples of proposed building materials being used on a particular project.
<b>CID</b>	<b>CID</b>	<b>COMPREHENSIVE INTERIOR DESIGN:</b> Furniture related; funded with OMA or O & M dollars: a submittal with furniture illustrations, fabric & finish samples, footprint plans, and furniture ordering information. Purchased by the installation and not by the General Contractor.
<b>PREWIRED WORKSTATIONS</b>	<b>PREWIRED WORKSTATIONS</b>	<b>PREWIRED WORKSTATION</b> is the term used to identify systems furniture purchased with MCA or MILCON funds. The designers will coordinate the footprint plans with the buildings systems and provide the plans and specifications in the contract documents. The General Contractor will purchase and install this furniture.
<b>SYSTEMS FURNITURE</b>	<b>SYSTEMS FURNITURE</b>	<b>SYSTEMS FURNITURE</b> is the term used to identify systems furniture purchased with OMA or O & M dollars. The designer will coordinate the footprint plans with the building systems and provide the plans in the contract documents for "information only." Procurement information will appear in the CID and will be purchased by the installation.

**GOVERNMENT CID TERMS**

ARMY	AIR FORCE	DEFINITION
<b>FAR</b>	<b>FAR</b>	<p><b>FEDERAL ACQUISITION REGULATIONS:</b>                      The laws outlining how the government buys products and services. Title 18 of the U.S.Code allows for direct purchase from UNICOR without competitive bids. (FAR) 8.6 identifies UNICOR as a mandatory procurement source to all federal agencies for products that meet the requirements of the ordering office.</p>
<b>FSS</b>	<b>FSS</b>	<p><b>FEDERAL SUPPLY SCHEDULES</b>                      provides indefinite quantity contracts for commercial items at established prices for direct ordering use by government agencies. Address: Furniture Commodity Center (3FN-CO); Crystal Mall 4, RM 403, Washington DC 20406 (703) 305-5056.</p>
<b>UNICOR</b>	<b>UNICOR</b>	<p><b>UNICOR</b> is the trade name for the Federal Prison Industries Inc (FPI) a wholly owned government corporation est. in 1934. UNICOR provides a variety of products and services to the Federal Government.</p>
<b>GSA FSC/FSG</b>	<b>GSA FSC/FSG</b>	<p><b>GENERAL SERVICES ADMINISTRATION</b>  <b>FEDERAL SUPPLY CLASSES</b>  <b>FEDERAL SUPPLY GROUPS</b> are government contracts with private manufacturers that are fixed price, fixed MOL and fixed dates of expirations.                      GSA CENTRALIZED MAILING LIST SERVICE (7CAFL); PO BOX 6477 FT. WORTH, TX 76115                      (817) 334-5215</p>

**TYPICAL GOVERNMENT TERMS**

ARMY	AIR FORCE	DEFINITION
<b>MOL</b>	<b>MOL</b>	<b>MAXIMUM ORDER of LIMITATION:</b> GSA FSC/FSC contracts have a ceiling contract dollar amount that can be purchased from a vendor.
<b>OPEN MARKET</b>	<b>OPEN MARKET</b>	<b>OPEN MARKET</b> is the term indicating products that are not on a GSA contract.
<b>ENVIRONMENTAL PRODUCTS GUIDE</b>	<b>ENVIRONMENTAL PRODUCTS GUIDE</b>	GSA CATALOG SUPPLY ITEMS GSA CENTRALIZED MAILING LIST SERVICE (7CAFL); PO BOX 6477 FT. WORTH, TX 76115 (817) 334-5215
<b>FSN 595B</b>	<b>FSN 595B</b>	<b>FEDERAL STANDARD NUMBER 595B</b> A collection of standard colors used by the various departments or agencies. Colors have been classified in three categories: 1 is full gloss, 2 is semigloss and 3 is flat.
<b>FSN 595B FAN DECK</b>	<b>FSN 595B FAN DECK</b>	Standard colors are available in a booklet for under \$10.00. Order number NSN 7690-01-162-2210 GSA Specification Unit (3F-BP-W) Seventh and D Sts SW Washington DC 20407

# INTERIOR DESIGN PRESENTATION FORMAT

## GENERAL NOTES

### 1. DEFINITIONS:

1.1 STRUCTURAL INTERIOR DESIGN (SID): Structural Interior Design is the term referring to the building related finishes. A SID shall involve the selection and sampling of all applied finishes necessary to complete the buildings' interior and exterior architectural features. If required, the SID shall also include all prewired workstation drawings and specifications. All SID information shall be presented in a 3-ring Binder, 8 1/2" x 11" format. The products sampled in the SID are to be purchased by the General Contractor and are MCA or MILCON funded.

1.2 COMPREHENSIVE INTERIOR DESIGN (CID): Comprehensive Interior Design is the term referring to the furniture related finishes. A CID shall involve the selection and sampling of all the furnishings components necessary to complete the interior environment. The CID shall generally include all free standing furnishings, accessories, Furniture Cost Estimate and generic Order Forms. The products illustrated in the CID are purchased by the installation and are OMA or O&M funded.

1.3 When a "CID Package" is required in the DD Form 1391 and/or the Appendix A, the A/E shall provide to the Government both the SID/ CID illustrated information in the required 8 1/2" x 11" format.

### 2. TECHNICAL NOTES:

2.1 SPECIAL REQUIREMENTS: The Interior Designer shall identify items in the SID or CID that require attachment to the building either by cutting or fitting. The Designer must prepare specifications and drawings for this service to be performed.

2.2 DISCLAIMER: Guide Specification 09915 Exterior/Interior Finish Schedule indicates all product trade names and colors used for the project. The nonproprietary disclaimer indicated within this Guide Specification may also be located on the Finish Schedule of the Contact Drawings.

2.3 FEDERAL STANDARD 595b COLORS (FSN 595b): The use of the Federal Standard Colors is required when indicating exterior colors used on roofs and trim. The use of Federal Standard Colors is not required when indicating interior colors. EXCEPTION: Hurlburt Field, FL requires both exterior and interior paint colors to be indicated with the FSN 595b code.

2.4 CID FURNITURE RESOURCE: Every effort should be made to use UNICOR, GSA Stock or Federal Supply Schedule items. However, when the Interior

Designer determines CID items available on FSS/GSA contract or from UNICOR-do not meet the functional requirements, or there is no current FSS/GSA/ UNICOR resource for a furniture requirement, a waiver to use an Open Market source is required. The Designer shall write a waiver/justification letter (Paragraph 15).

This letter shall be included in the CID Binder; attached to the required Order Form. The Government will process the waiver.

### 3. SIGNAGE:

Signage is critical to "pathway finding" and is to meet the requirements indicated in the American With Disabilities Act unless directed by the client to do otherwise.

Indicate on separate signage drawings the typical plaque sizes, types locations, and the message for all signage. Submit a sample of the signage color in the SID.

### 4. SID/CID SUBMITTAL REQUIREMENTS

4.1 The Interior Designer shall be involved in all phases of the design in order to ensure customer satisfaction.

4.2 REVIEWS: During each phase of the project all SID/CID Binders shall be reviewed by the Government with written and annotated comments being issued back to the A/E. These annotated comments are to be incorporated into the next SID/CID Binder update. Written responses from the Interior Designer are to be included in the front inside pocket of the first volume of the SID Binder.

4.3 FORMAT: Submit all SID/CID information and samples on 8 1/2"x 11" color boards with a maximum spread of 25 1/2" for foldouts.

Each binder shall be labeled on the outside spine and front cover with the Phase #, SID or CID, Project title, Location, Date, and A/E firm. Indicate the volume number (example: Vol 1 of 3).

Each sheet shall be labeled with the Date, Project Title, Location, A/E firm.

4.3.1 The color boards shall support and anchor all samples. Anchor large or heavy samples with mechanical fasteners or with velcro. Rubber cement or glue will not be acceptable.

4.3.2 Assemble the 8 1/2" x 11" pages and color boards in a 3-ring binder.

4.3.3 Material and finish samples must indicate true pattern, color and texture. Carpet samples must be large enough to indicate a complete pattern or design.

4.3.4 Photographs or colored photocopies of SID materials or CID fabrics will be disapproved.

Color photocopies of artwork are accepted.

4.4 REVISIONS: The Interior Designer shall revise the binders after each review to satisfy review comments. Printed information on existing pages can be updated with "white-out" for cost effective reasons. If the binders are not returned to the A/E for in-house update, the A/E may provide updated inserts to the Government.

4.5 RENDERINGS: Verify that renderings are a contract requirement. All renderings shall be provided by a professional illustrator.

4.6 BLACK AND WHITE SKETCHES: Verify that B&W Sketches are a contract requirement. If they are required, emphasize space relationships, furnishings, patterns and texture. One major area is to be illustrated and possibly used as a basis for the interior color rendering for the final design.

4.7 SEQUENCE: Organize the SID/CID Binder presentation according to the following sequence:

#### SEQUENCE OF SID SUBMITTAL

1. TITLE PAGE
2. TABLE OF CONTENTS
3. NARRATIVE OF INTERIOR DESIGN OBJECTIVES
4. EXTERIOR ELEVATION
5. EXTERIOR BUILDING MATERIAL LEGEND
6. EXTERIOR BUILDING MATERIAL COLOR BOARD
7. INTERIOR COLOR PLACEMENT PLAN  
(half size drawing or 8 1/2" X 11")
8. INTERIOR COLOR BOARDS (according color placement plan)
9. INTERIOR SIGNAGE COLOR BOARDS
10. PREWIRED WORKSTATION COLOR BOARDS
11. INTERIOR FLOOR PLANS
12. ROOM FINISH SCHEDULES
13. SIGNAGE PLANS

14. PREWIRED WORKSTATION COMPOSITE FLOOR PLANS
15. PREWIRED WORKSTATION PANEL PLANS
16. PREWIRED WORKSTATION ELECTRICAL/VOICE/DATA PLANS
17. PREWIRED WORKSTATION ELEVATION AND INVENTORY DRAWINGS

#### SEQUENCE OF CID SUBMITTAL

18. TITLE PAGE
19. TABLE OF CONTENTS
20. NARRATIVE OF INTERIOR DESIGN OBJECTIVES
21. PHOTO OF INTERIOR COLOR RENDERING (only if required by contract)
22. BLACK AND WHITE SKETCH PERSPECTIVE (only if required by contract)
23. COMPOSITE FURNITURE PLANS WITH CONVENTIONAL AND SYSTEMS FURNITURE (full size sheet 1/8" scale. Note: provide all systems furniture plans in the contact drawings and indicate "for information only." This is only if the user is buying and installing the systems furniture. Drawing requirements are the same as indicated in items 11-15 of the SID Sequence.
24. MANUFACTURE'S SUMMARY LISTS
25. FURNITURE LOCATION CODE INDEX
26. CONVENTIONAL FURNITURE PLACEMENT PLANS (1/4" scale)
27. CONVENTIONAL FURNITURE ILLUSTRATION SHEETS
28. ARTWORK ILLUSTRATION SHEETS AND PLACEMENT PLAN
29. ITEMIZED FURNITURE COST ESTIMATE
30. INTERIOR FURNISHING ORDER FORMS
31. LETTER OF JUSTIFICATION FOR WAIVER

5.

## SID/CID SUBMITTAL MATRIX SUMMARY

INTERIOR DESIGN SUBMITTALS RUN CONCURRENT WITH ARCHITECTURAL SUBMITTALS.  
DESIGN PHASE

ITEM	DESCRIPTION	35%	65%	95%	100% RTA
1.	TITLE PAGE	X	X	X	X
2.	TABLE OF CONTENTS (SID)	X	X	X	X
3.	NARRATIVE (SID)	X	X	X	X
4.	EXTERIOR ELEVATION	X	X	X	X
5.	EXTERIOR MATERIAL LEGEND	X	X	X	X
6.	EXTERIOR COLOR BOARDS	X	X	X	X
7.	INTERIOR COLOR PLACEMENT PLAN	X	X	X	X
8.	INTERIOR COLOR BOARDS	X	X	X	X
9.	SIGNAGE COLOR BOARD	X	X	X	X
10.	WORKSTATION COLOR BOARDS	X	X	X	X
11.	INTERIOR FLOOR PLANS	X	X	X	X
12.	ROOM FINISH SCHEDULE	X	X	X	X
13.	SIGNAGE PLANS			X	X
14.	PREWIRED WORKSTATIONS COMPOSITE FLOOR PLANS	X	X	X	X
15.	PREWIRED WORKSTATION PANEL PLANS	X	X	X	X
16.	PREWIRED WORKSTATION ELECTRICAL/VOICE/DATA PLANS	X	X	X	X
17.	WORKSTATION ELEVATIONS AND INVENTORY DRAWINGS			X	X
18.	TITLE PAGE (CID)	X	X	X	X
19.	TABLE OF CONTENTS	X	X	X	X
20.	NARRATIVE	X	X	X	X
21.	PHOTO OF PROPOSED RENDERING TECHNIQUE (APPROVAL NEEDED)	X			
21a.	FINAL INTERIOR RENDERING			X	X

INTERIOR DESIGN SUBMITTALS RUN CONCURRENT WITH ARCHITECTURAL SUBMITTALS.  
DESIGN PHASE

ITEM	DESCRIPTION	35%	65%	95%	100% RTA
22.	BLACK AND WHITE SKETCHES (ONE SHALL BE APPROVED FOR THE INTERIOR RENDERING).		X	X	X
23.	COMPOSITE AND SYSTEMS FURNITURE PLANS	X	X	X	X
24.	MANUFACTURER'S SUMMARY LIST			X	X
25.	FURNITURE LOCATION CODE (ONE MAJOR AREA)	X			
25A.	FURNITURE LOCATION CODES (ALL AREAS)		X	X	X
26.	FURNITURE PLACEMENT PLANS (ONE MAJOR AREA)	X			
26A.	FURNITURE PLACEMENT PLANS (ALL AREAS)		X	X	X
27.	FURNITURE ILLUSTRATION SHEETS (ONE MAJOR AREA)	X			
27A	FURNITURE ILLUSTRATION SHEETS (ALL AREAS)		X	X	X
28.	ARTWORK ILLUSTRATION SHEETS (PUBLIC AREAS ONLY, ARTWORK NOT REQUIRED IN PRIVATE OFFICES).			X	X
29.	ITEMIZED COST ESTIMATE		X	X	X
30.	FURNITURE ORDER FORMS (ONE MAJOR AREA)	X			
30A.	FURNITURE ORDER FORMS (ALL AREAS)			X	X
31.	LETTERS OF JUSTIFICATION.		X	X	X

## 6. TYPICAL CID FURNISHINGS AND COST GUIDELINES

### 6.1 CID FURNISHINGS

ADP tables/printer stands  
Acoustical Partial Height Partitions 6' of less in height - freestanding  
Artwork  
Beds/wall units/ night stands/ chests/ refrigerators  
Bedspreads/bedding  
Bookcases  
Bulletin board/ projection screens(If NOT attached to structure.)  
Carts  
Chairs - all kinds, including stools  
Desks - freestanding  
Drafting tables  
Draperies  
Files - all kinds  
Library furniture - book stacks/card files/ study carrels  
Modular desk units  
Podium/ lecture stands  
Systems furniture workstations (If not in SID)  
Planters/art/waste & ash receptacles  
Storage - all kinds  
Tables - all kinds  
Upholstered lounge seating ( sofas, etc.)  
Wardrobes

### 6.2 FURNISHINGS COST GUIDELINES

The figures are based on an Air Force FY 88 Costs Guide and an inflation factor of 5% per year should be included for subsequent years. These guidelines are for actual items (furniture, window treatments, accessories, etc. ) and they do not include other associated cost such as contractor's overhead, profit and shipping.

Overseas Consideration: If local items are used prices may vary from country to country and may vary depending on the current exchange rates.

<u>FACILITY TYPE</u>	<u>\$/SQUARE FEET</u>
Administration Space (Conventional Furn)	\$ 7.00- \$15.00
Administration Space (Systems Furn)	\$33.00- *
Airmen Club (Not incl kitchen equip)	\$14.00
Alert Facilities	\$12.00
Auditorium	\$35.00
Base Ops DV Lounge	\$18.00

<u>FACILITY TYPE</u>	<u>\$/SQUARE FEET</u>
Billeting Office	\$15.00
Chief Suite (Billeting)	\$17.00
Child Development Center	\$13.00
Classroom	\$20.00
Clinic/Dental Clinic (not incl equip)	\$35.00
Conference Room	\$18.00
Dining Facility (incl kitchen equip)	\$35.00-\$45.00
Dining Facility (not inclu kitchen equip)	\$15.00
DV Suite (Billeting)	\$24.00
Flight Training Center	\$30.00
Family Housing Office	\$14.00
Golf Clubhouse	\$12.00
Intelligence Training Center	\$30.00
Medical Training Center	\$30.00
Package Store	\$28.00
NC Officer Mess (Not incl Kitchen equip)	\$17.00
Officer Open Mess (Not incl Kitchen equip)	\$17.00
Recreation Center	\$11.00
Transient Living Facility	\$15.00
Unenlisted Personnel Housing	\$16.00*
Visiting Airman Quarters	\$13.00
Visiting Officers Quarters	\$16.00*
Yacht Clubhouse	\$12.00
Youth Center	\$12.00

FACILITY TYPE\$/SQUARE FEET\*UNIT BUDGET GUIDES

Admin Space (Systems Furn) 1994 price (\$4,000/per workstation  
incl instal(ergo chair \$350.00)

1988 Price

Billeting Office/Lobby \$14,000-\$16,000 refinish existing.  
\$35.0000-50,000 for new

Distinguished Visitor Suite  
\$15,000 per one bedroom suite  
\$20,000 per two bedroom suite  
\$37,000 per 2/3 bedroom apartment

Transient Living Facility \$15,000 per standard unit  
One Bedroom, Living/Dining  
525 sq feet (new construction)

Dorms

Unaccompanied Enlisted Personnel Housing \$2,500-\$3,500 Per person

UOPH \$ 7,000 per single unit

VAQ \$ 6,000 per double occupancy.

VOQ \$ 5,000 per single occupancy  
\$ 8,000 per single Suite.  
\$11,000 per double Suite.

PARAGRAPHS 7-15 EXPLAIN THE FORMAT REQUIRED FOR THE FOLLOWING:

7. PREWIRED AND SYSTEMS FURNITURE WORKSTATIONS
8. MANUFACTURE'S SUMMARY LIST
9. FURNITURE LOCATION CODES
10. FURNITURE ILLUSTRATION SHEETS
11. FURNITURE PLACEMENT PLANS
12. ARTWORK
13. FURNITURE COST SUMMARY
14. ORDER FORMS
15. LETTER OF WAIVER JUSTIFICATION

## 7. PREWIRED AND SYSTEMS FURNITURE

### 7.1 General

Prewired and or systems furniture workstations shall be designed with generic components and work surfaces that are typically sold by various manufacturers of systems furniture. Indicate on the contract drawings one manufacture's name and finishes as a bases for design. This will provide a general of range colors for competitive bid purposes.

Indicate in the Guide Specifications 12640 Prewired Workstations, the fabric width, fiber content, and construction method. DO NOT INDICATE A VENDOR IN THE SPECIFICATIONS. INDICATE A VENDOR ONLY ON THE DRAWINGS.

### 7.2. COMPOSITE FLOOR PLAN

A Composite floor plan shall show the all panels, components and free-standing furniture in relationship to the building and the building systems such as light switches and mechanical devices.

### 7.3. PANEL PLAN

The panel plan shall indicate a panel symbol legend, all panel placements, critical dimensions of aisles widths and critical dimensions in relation to the building's structure and the building's electrical/mechanical system devices and the panels. Each panel shall be noted as follows:

N (non-power)	Width (in feet)	Height (in inches)
or		
P (power)		

Example: a non-powered panel 2 feet wide and 68 inches high will be noted on the plan N 2 68

### 7.4 ELECTRICAL, VOICE AND DATA PLAN

The Electrical, voice and data plans shall indicate all panel placements, a symbol legend, and all receptacles used in each workstations. This plan shall also indicate the height and location of the building's light switches and building's mechanical control devices like thermostats. Provide a general note that on the "PREWIRED WORKSTATION plans" are to be coordinated with the Communication and Mechanical Engineering Plans.

### 7.5 ELEVATION AND INVENTORY PLAN

The Elevation and inventory drawings shall illustrate each typical workstation in elevation form with a related inventory list of all panels and components used to build the typical. The inventory list shall be generic in description.

## 7.6 FINISHES

It is suggested when selecting finishes for prewired workstations that only two (2) fabric colors be used: one color for all panels and one color for tackboards. A third color can be used as a means of "wayfinding" for large open office projects.

## 7.7 COST

The average cost of a prewired workstation is \$4000.00. Do not exceed this average cost figure or the project will be rejected. Verify line item 10 in the 1391 for a line item total cost of the prewired workstations appropriated for the project.

## 7.8 WORKSTATION LOCATION CODE

Each and every workstation will be identified on each plan with a single alpha identification code to indicate the "Typical". For example all like reception stations are "A" and like offices are "B". Every workstation shall have a "room number" that is separate and apart from the fixed room numbering system. This is to provide consistent workstation identification throughout all drawings. An example would be "A-100" "B-101" "B-102" "B-103".

## 7.9 PREWIRED WORKSTATION PACKAGE ITEMS

### 1. Panels

- 1.1 Acoustical/nonacoustical
- 1.2 Powered/nonpowered
- 1.3 Connecting hardware

### 2. Components

- 2.1 Work surfaces
- 2.2 Drawers
- 2.3 Shelves( with doors/ without doors)
- 2.4 Files (lateral, panel hung/ bins)
- 2.5 Task Lights/special purpose
- 2.6 Counter tops
- 2.7 Drafting surface

### 3. Accessories

- 3.1 Tackboards
- 3.2 Locks
- 3.3 Shelf dividers
- 3.4 Reader Stand
- 3.5 Paper flow devices
- 3.6 Marker boards

- 3.7 Computer turntable
- 3.8 Printer stand
- 3.9 Coat rack
- 3.10 Wire guides

#### 4. Signage

- 4.1 Organization signs
- 4.2 Workstation name signs

#### 8. MANUFACTURER'S SUMMARY LIST

Provide a summary of all the manufactures' used in the CID package. Manufactures name, address, phone, fax and Point of Contact is to be included.

#### 9. FURNISHINGS LOCATION CODE

This CODE is assigned by the interior designer to each conventional furnishing item indicated in the CID. Use of this code is important for quick reference between Order Forms, Furniture Illustrations, and Placement Plans.

The first letter of the code is a GENERAL CATEGORY

EXAMPLE:

- A - Accessories
- B - Book storage
- C - Chairs

The second number of the code is a SPECIFIC CATEGORY

- 1 - Plant ( 7' height in brass container)
- 2 - Clocks, Peter Pepper, #0000 Color Blue
- 3 - Wastebaskets, FSS, Color Black
- 4 - Chalkboard: Egan Visual, Oak

OVERALL EXAMPLE: C1, C2 and C3

#### C - CHAIRS

- 1 - Guest chair, Knoll, #1234, Color: #12 Red
- 2 - Ergo Chair, Knoll Bulldog, 1233, Color: #34 Blue
- 3 - Stacking Chair, Fixtures, Bola, 1234, Color #12 Multi

#### 10. FURNITURE ILLUSTRATION SHEET

A Furniture Illustration Sheet is a pictorial example with finish samples of a single product specified for the CID. Only one product is illustrated per page.

The Furniture Illustration Sheet shall have the following information:

1. A Picture or line drawings of the product specified.
2. A Location Code to Key the specified product to the Footprint Plan and the Furniture Placement Plan.
3. A Sample of the product's finishes.
4. Recap quantity of illustrated item listed by room number  
(e.g. 4 ea. Room 104 Commander  
3 ea. Room 103 Receptionist)
5. Job name, Job Location, Date.

#### 11. FURNITURE PLACEMENT PLAN

A Furniture Placement Plan consist of one room broken out from the Composite Furniture Plan which identifies each furniture component placed in that room. All rooms shown on the Composite Furniture Plan shall be illustrated in the Furniture Placement Plan section. The Furniture Placement Plans shall be drawn at a 1/4" scale. Large rooms/areas shall be drawn at 1/8" scale.

Each Furniture Placement Plan shall contain the following:

1. 1/4" Scale Drawing showing room and furniture.
2. Location Code and quantity of each item specified per room.
3. Name and Number of Room
4. Job Name , Job Location, Date.

The Composite Furniture Plan shall be a full size contract drawing with location codes. Half sizes will not be acceptable for review.

## 12. ARTWORK ILLUSTRATIONS SHEETS AND PLANS

The Artwork Illustrations Sheets shall have a pictorial example of the artwork with mat colors. Color photos copies are accepted.

Full size drawings of the Artwork Plan are to show plan placement of artwork and an elevation for all the artwork showing placement height and installation instructions.

Each Artwork sheet shall have the following:

1. A Picture of the proposed artwork.
2. Location Code
4. Room Name and Number that artwork will be displayed in.
5. Job name, Job Number, Date.
6. Mounting height and installation instructions.

## 13. ITEMIZED FURNITURE COST ESTIMATE

The itemized furniture cost estimate sheets list all furnishings, indicate quantities, unit costs and grand totals. The Cost Estimate is organized according to UNICOR and GSA Source/Schedules. The Cost estimate will also include a general 10% contingency and 7% installation. Because some items will include freight in the price, note that freight charges are not included.

## 14. FURNITURE ORDER FORM

The Furniture Order Forms indicate all information necessary to order products specified in the CID. Only one product shall be listed per page.

Organize and separate the Order Forms according to the Sources and GSA Schedules to coordinate with the Itemized Furniture Cost Estimate. Do not organize forms according to the Locations codes.

15. LETTER FOR WAIVER/JUSTIFICATION

FOR CID ITEMS THAT REQUIRE A JUSTIFICATION, SUCH AS OPEN MARKET ITEMS FOLLOW THE FORMAT EXAMPLE AND ATTACH IT TO THE APPROPRIATE ORDER FORM. See Appendix "C" for UNICOR Waiver information.

JUSTIFICATION FOR ACOUSTICAL PANELS

December 15, 1994

1. REQUESTING ACTIVITY: U.S. Army Corps of Engineers  
EN-DA/Peggy Roberson  
100 W. Oglethorpe Avenue  
Savannah, GA 31402-0889
2. POINT OF CONTACT: Peggy Roberson  
(912) 652-5144
3. REQUIREMENTS: To provide acoustical and visual control through a cost effective and timely means. The panels will separate and define workstations for 7 individuals representing 5 engineering disciplines. These individuals are located in 1,470 sq. ft. of open area.
4. PROPOSED SOLUTION: To purchase portable, acoustical panels 62 inches high and various widths from XYZ manufacture. This manufacturer delivers and installs within 30 days from the date they received the order. See the attached order form for stock number, dimensions, colors and manufacturers.
5. UNICOR WAIVER: Market research indicates that the Federal Prison Industry does not supply this type of portable panel.
6. TRIANGLE/INTANGIBLE BENEFITS: The tangible benefits to be gained from this purchase will be an enhancement of employee morale and productivity due to the reduction of sound and visual disturbances currently found in this open space.
7. IMPACT IS REQUEST IS NOT APPROVED: Employee morale will drop, which could impact performance.
8. ESTIMATED DATE ITEMS ARE REQUIRED: ASAP but no later than 30 days.

16. HEALTH AND SAFETY CRITERIA

16.1 PROVIDE PROTECTION AGAINST PERSONAL INJURY AND DEATH FROM:

16.1.1 FALLS

\* ASTM D-2047-Test for Slip Resistance of Hard Surfaces

16.1.2 CHEMICAL EMISSIONS

16.1.3 ELECTRONIC EMISSIONS

16.1.4 MICROBIAL CONDITIONS

NOTE: 16.1.2, 16.1.3, and 16.1.4 are not defined by code at the present. OSHA has a proposed regulation in relation to indoor air quality standards. It is currently in the review phase. It is not in

#### 16.1.5 FIRE (Interior Finishes and Furnishings)

- \* ASTM-E-84-Steiner Tunnel Test.
- \* NFAP-701-Standard method of Fire Test for Flame Resistant Textiles and Films.
- \* NFPA-705-Field flame Test for Textiles and Films
- \* FF 1-70-Standard for the Surface Flammability of Carpet and Rugs (Methenamine Pill Test)
- \* NFPA 80-Fire Test of Door and Windows
- \* NFPA 253-Flooring Radiant Panel Test
- \* NFPA 258-Research Test method for Determining Smoke Generation of Solid Materials.
- \* NFPA 259-Potential Heat of Building Materials
- \* NFPA 260 Methods of Tests and Classification System for Cigarette Ignition Resistance of Components
- \* NFPA 261- Method of Test for Determining Resistance of Mock-up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes.
- \* NFPA 264- A Standard Test Method of Test for Heat Release Rates for Upholstered Furniture Components or Composites and Mattresses Using an Oxygen Consumption Calometer.
- \* NFPA 267- Standard on Mattress, subjected to Open Flame Ignition, Using a Large-Scale Oxygen Consumption Calorimeter.
- \* UL-1056- Fire Test of Upholstered Furniture
- \* TB 133- Flammability Test Procedure For Seating Furniture for Use in Public Occupancies. State of California Bureau Home Furnishings.
- \* TB 117- (Section A though E) Test Procedures for Testing the Flame Retardance of Resilient Filling Materials used in Upholstered Furniture.

#### 16.2 PROVIDE FURNISHINGS AND EQUIPMENT WITH ANTHROPOMORPHIC FIT AND STABILITY

- \* ANSI/BIFMA X5.6-86 Standard for office Furnishings.

#### 16.3 PROVIDE GLARE-FREE ILLUMINATION OF WORK SURFACES

- \* ANSI E-97

16.4 PROVIDE ACCEPTABLE REFLECTANCE LEVELS

- \* ASTM E-97-IES

16.5 PROVIDE FOR USE AND MAKE ACCESSIBLE TO PHYSICALLY DISABLED

- \* American Disabilities Act: ASTM 117.1
- \* Uniform Federal Accessibility Standards

16.6 PROVIDE SAFE AND SWIFT EGRESS FROM INTERIOR SPACES

- \* NFPA 101 Fire Safety Code-94
- \* National Building Code, BOCA
- \* Standard Building Code
- \* Uniform Building Code, ICBO

16.7 PROVIDE ACOUSTIC CONTROL

- \* Airborne sound: ASTM C 423, PBS C.1
- \* Speech Privacy: SPP, Speech Privacy Potential
- \* Impact sound transmission: ASTM C 423-66, PBS C-2

17 CHECKLIST FOR SID REVIEWS

17.1 GENERAL

The Checklists are used to ensure that SID/CID binders and all contact drawings and specifications are complete and will meet customer approval.

17.2 CHECKLISTS FOR SID BINDERS

The correct organization of the SID Binder is important to ensure a rapid and accurate evaluation of the submittal and to ensure all the information provided in the binders appears in the contract documents. The SID binder shall include the information in the order indicated in paragraphs 4 and paragraph 5 Submittal Matrix Summary 1-17.

17.2.1 CHECKLIST FOR SID NARRATIVE

Review the statement of DESIGN OBJECTIVES. Design Objectives are to indicate the proposed building materials, color scheme and the philosophy for the selection each. When applicable the design narrative shall discuss Energy Efficiency, Safety, Maintenance, Durability, Image and Occupant Morale.

17.2 CHECKLIST FOR EXTERIOR COLOR LEGEND AND COLOR BOARDS

Exterior Colors are often dictated by the Installation's Design Guidance. In these instances, the Federal Standard 595b paint colors may be referenced for factory finished items. See examples below.

Metal Roof                      Federal Standard 595b 0000

## 17.2.2 REVIEW QUESTIONS

1. Are all exterior materials labeled and properly identified?
2. Do all exterior materials and finishes meet standard Installation Design Guidance requirements?
3. Are there any miscellaneous exterior materials and finishes that need to be listed and sampled in the SID Binder OR indicated in Guide Specifications OR contract drawings?
4. Are all the exterior materials sampled in SID Binder and indicated on Finish Schedule?
5. Are all exterior materials indicated on Finish Schedule sampled in SID Binder?

17.3 CHECKLIST FOR SID INTERIOR COLOR SCHEME AND COLOR BOARDS: Review the architectural finish samples for an orderly arrangement on 8 1/2" x 11" color boards according to like rooms/areas receiving like finishes. Each color board will be noted as a COLOR SCHEME. Each Color Board shall consist of a material sample board and a material legend board.

17.3.1 Each Color Scheme shall be properly identified:  
[The following information should be on the lower portion of each sheet]

- a. Project title
- b. Location
- c. Date
- d. A/E Firm

17.3.2 Each material legend shall have written identification of materials in the order as follows:

1. Alpha Code
2. Material
3. Manufacturer
4. Color name
5. Color Number

The material legend identification shall be consistent with the material legend found in the Exterior and Interior Finish Guide Specification or in the contract drawings. Without exception all rooms and areas shall be identified and their finishes shown.

\* The general contractor will not be receiving the SID binders therefore all finishes and their placement must be on the contract drawings or in the Guide Specifications.

## 17.4 CHECKLIST FOR INTERIOR COLOR SCHEME

### 17.4.1 SID REVIEW QUESTIONS

#### COLOR SCHEME

1. What basic color scheme is used?
  - a. Monochromatic
  - b. Analogous plus complement accent
  - c. Complementary
  - d. Split Complementary
  - e. Triadic
2. Is there a basic neutral color for all walls?
3. Does the color scheme create a sense of order?
4. Are accent colors appropriate in hue value and intensity to create interest? Do they overpower the space?
5. Are Accent Colors clearly indicated on the contract drawings?
6. Are the colors placed to create a "visual balance" throughout the building?
7. Do the Accent colors assist with "pathway finding"?

#### GENERAL FINISHES

1. Do finishes offer variety in appearance? ( soft, hard, smooth, rough, dull, gloss, matte)
2. Do selected finishes enhance the architectural lines of the building?
3. Are materials, finishes, and colors appropriate for the surfaces they will be covering?
4. Are walls painted [Gloss] [Semi-Gloss] [eggshell]?  
(Flat Latex wall paint is not durable for interior walls.)
5. Do the interior finishes reflect and reinforce the appropriate image for the facility?
6. Is the flooring selected for all areas appropriate in color pattern, texture and scale?
7. Does color and pattern in Carpet/Carpet Tile relate to scale and size of room?

8. Will Carpet/ Carpet Tile color and pattern hide soil and wear path?
9. Are window treatments compatible with architectural detailing?
10. Will window treatment and its installation cause unnecessary wear or abrasion?
11. Are finishes selected creative in use and placement?
12. Will there be acoustical problems because of the materials selected? (A balance of Reflective and Absorptive surfaces is necessary)
13. Will all colors, materials, and finishes retain their appearance long-term?
14. Are all interior finishes labeled and properly identified?
15. Do all interior finishes meet standard codes requirements?
16. Are there any miscellaneous interior finishes and materials that need to be listed, sampled and specified?
17. Are all interior materials sampled in SID Binder listed on the Finish Schedule?
18. Are all materials listed on the Finish Schedule sampled in the SID Binder?
19. Are there any treatments such as bordered carpets, or multi-color ceramic tile borders that need to be illustrated in plans but are not?
20. Are all SID finishes specified according to the quality to ensure quality and performance?

#### PREWIRED WORKSTATIONS

1. Do the prewired workstations and specifications coordinate to fully cover all the information required for bidding, and installation of the product?
2. Have all the required contract drawings as indicated in paragraph 5 of the Submittal Summary Matrix been provided?

#### 17.4.2 CHECKLIST FOR SAFETY:

Do all finishes selected shall meet code requirements and are appropriate in color, texture, and pattern to insure the well being of the inhabitants?

#### 17.4.3 FACILITY SIGNAGE REVIEW QUESTIONS

1. Is the signage listed on a separate plan and indicated correctly in the specifications?
2. What type face is specified? Does it meet approved standards?
3. Is Symbol Signage used in lieu of Printed identification for restrooms?
4. Are Signs flexible so that names and rooms can be changed easily?
5. Are Signage colors and samples in the SID?

For additional reference on signage refer to Sign Standards relative to the Department of Defense.

#### 18.5. CHECKLIST FOR CID BINDER LAYOUT

The CID Binder is the most detailed of all binders submitted because of the numerous components specified, priced, and illustrated. The correct organization of the CID Binder is important to insure a rapid and accurate review of the building's furniture components and their relationship to the architecture and it's finishes. The CID Binder shall include the information in the order indicated in paragraph 5 Submittal Matrix Summary items 18-31.

18.5.1 CHECKLIST FOR CID NARRATIVE: Review the statement of DESIGN OBJECTIVES explaining the CID interior design philosophy of the facility. Design Objectives and the proposed method of accomplishing the objectives shall cover, when applicable, the furnishings and their relationship to the building and it's inhabitants, energy, efficiency, safety, health, maintenance, image, personal performance of occupants and functional flexibility.

#### 18.5.2 CID REVIEW QUESTIONS

1. Does the layout of the CID Binder follow the TABLE OF CONTENTS format indicated in paragraph 4.7 and 5?
2. Are all pages properly identified?
3. Are all samples labeled and identified?
4. Are there any miscellaneous components shown on the Footprint Plan that are not shown in the CID Binder?
5. Are there any miscellaneous components shown in the CID Binder that are not reflected on the FURNITURE PLACEMENT PLANS?

### CHAIRS

1. Is the chair appropriate for the task?
2. Is the style of the chair in keeping with the overall theme of the building and other components selected?
3. Is the chair scaled correctly for the space it occupies?
4. Are chair costs appropriate for the project? (ERGO \$300-350)
5. Is the finish of the chair interesting and in harmony with the elements surrounding it?
6. Are all chairs listed on the composite Footprint Plan, Furniture Placement Plans, Illustration Sheets, Location Code and Order Forms?

### DESK

1. Is the desk appropriate for the task?
2. Is the style of the desk in keeping with the overall theme of the building and other components selected?
3. Is the desk too large for the space it occupies?
4. Are the desk costs appropriate for the project?
5. Is the finish of the desk interesting and in harmony with the elements surrounding it?
6. Are all desks listed on the composite Footprint Plan, Furniture Placement Plan, Location Code and Cost Estimate, Furniture Illustration Sheet, and Order Form?

### COST ESTIMATES and ORDER FORMS

1. Are cost estimates correct?
2. Are Order Forms completed and accurate?

#### 18.5.3 CHECKLIST FOR SAFETY

1. In the placement of furniture, is emergency egress considered?
2. In the placement of furniture, is consideration given to the requirements for the handicapped. (Reference: Uniform Federal Accessibility Standards and ADA).

## 19. LESSONS LEARNED

Lessons Learned are for information only and to eliminate lost effort in the development of SID/CID submittals. Lessons learned are from both Air Force and Army projects.

Experience has taught that generally neutral interior environments with color accents used appropriately in SID finishes and all CID finishes provide the best "look" for a government facility. The common sense approach to all projects is the most cost effective way to achieve customer satisfaction.

Interior Design Solutions are important to the treatment and housing of a personnel. If leaders expect excellence in people, the environment in which they are housed should not be created on a whim or by individuals not technically educated and experienced in creating such environments.

Although interior environments cannot motivate people to excel they can provide a background that creates a functional opportunity for them to excel.

The Mobile District considers a quality interior design environment to be one that meets the followings ten (10) objectives:

1. COMPLETE COORDINATION BETWEEN CONTACT DRAWINGS AND SPECIFICATIONS. THE LACK THEREOF IS A POTENTIAL SOURCE OF LIABILITY.
2. The use of durable, easily maintained finishes that support "good housekeeping".
3. Appropriate use of accents colors that are easy to "live with" and cost effectively removed when updating the "look".
4. Spaces that are planned to support life safety.
5. Spaces that meet the functional needs of the user. Maximize flexibility for future change in both SID and CID plans.
6. Furnishing selected that support personal performance and personal health.
7. Appropriate use of All the design elements (Landscape, Architecture and Interior Design) to support "path wayfinding" "up to" and within the facility.
8. Accurate documentation of all the contract documents (SID) and procurement documents (CID).
9. Finishes and furniture selected that meet government procurement regulations.
10. Customer satisfaction.

### 19.1 EXTERIOR FINISHES

1. Exterior SID: The Exterior building finish materials, colors and signage shall be in accordance with the Master Plan/Installation Design Guide of the installation on which the project is being constructed.
2. Verify with each installation what their current standard exterior finishes are.
3. Use the Federal Standard Number 595B to indicate the range of exterior finish colors.

### 19.2 INTERIOR DESIGN PHILOSOPHY

1. Interiors building finishes, furnishings and colors schemes are to be appropriate and support the function of the facility.
2. Interior design objectives are to create an environment that enhances public image, employee morale, provide building finishes that are durable, easy to clean, cost effective to maintain and support life safety.
3. Appropriate accent colors are easy to "live with" and can be easy and cost effectively removed when updating the "look" is the objective.
4. Accurate documentation of finishes and furnishings in both the SID and the CID.
5. Talk to the customer. Let them know what you are planning before you submit the color boards. Do more in-process design and review communication with the customer before formal submittals.

### 19.3 INTERIOR FINISHES

1. Non-slip surfaces at entryway.
2. Semi-gloss for trim only
3. Egg-shell finish for walls if possible.

### 19.4 INTERIOR COLORS

1. Generally the exterior color scheme should transition and continue into the interior color scheme.
  1. A neutral warm or cool color palette with accent colors used in furnishings has generally been the most successful for most interior projects.
  2. Colors in a mid-tone range used for door trim and matching base is generally approved.

3. Light colored carpets shows soil easily and will be disapproved.
4. Painted doors, trim and walls to blend (do not use extreme contrast colors for doors and walls).
5. Because the general contractor can substitute colors, textures and patterns during the construction process "permanent interior building finishes" are most successful if they are neutral colors.  
The most typical finishes substituted during construction are  
\* Plastic laminates, vinyl wall coverings, ceramic tile, toilet partitions, wood stains.

#### 19. 5 ACCENT COLORS

1. Ceramic tile accent borders on floors and walls in restrooms (one or two colors on a neutral field.)
2. Multi-colored graphic pattern carpet with solid or fleck colors used as accent borders.
3. Accent vinyl wall covering colors used a visual "pathway finding" guide through a facility.
4. Colorful fabrics with small pattern designs used on guest chairs.

#### 19.6 WALL COVERING

1. Use Type II for all areas. Type III only in heavy use corridors. The additional satin resistant coatings used for health care environments.
2. The architect is to design walls with a correct vapor barrier. Wall covering can be used on both exterior and interior perimeter walls.
3. Must meet NFPA Class A Flame Spread rating.
4. Use chair rail when walls are subject to frequent furniture movement and scarring. eg. conference rooms and waiting areas.
5. Fabric wall covering can only be used in a sprinkled buildings according to NFPA.

#### 19.7 CARPET

1. Primary interior finish and should be the bases for the overall color scheme.
2. Graphic Patterns with random pattern is the best. Avoid large geometric or rigid patterns. They look askew if adjacent to a wall that is not plumb,
3. Avoid bright or light colors which soil easily.

4. Carpet tile is recommended when power and communications are installed in floor raceways.

5. Carpet tile is best for corridors: use patterned fields and solid-colored borders for "pathway finding".

#### 19.8 SIGNAGE

1. Use the Installations' Design Guidance or the appropriate design guide for the Department of Defence agency.

2. Coordinate the signage color with the interiors color scheme.

3. Specify a flexible sign that allows for easy personnel name change or room name change.

4. Signage changes. It is helpful when ordering additional signage that signage specified be on a GSA schedule.

5. Bulletin Boards and fire exit plans are to be included in facility signage package.

#### 19.9 UPHOLSTERY

1. Tweeds and small scaled patterns retain their appearance longer.

2. Avoid solid colors because they show dirt, lint and fade faster than patterns and tweeds.

3. Vinyls are used for wet areas such as labs.

4. Avoid vinyls fabrics in administrative areas or for general use seating.

5. Leather seating is used for only high ranking officers and directors.

6. Use Nylon and Nylon blends seating fabrics that are easy to maintain.

#### 19.10 FURNITURE

1. Black and wood veneer horizontal surfaces are discouraged in general public use areas. A plastic laminate table surface in public areas retains it's appearance longer.

2. Mid-tone range colors for work surfaces are recommended because it will not add to eye fatigue. Light oaks, beige, and grays work best.

3. Black finishes are discouraged for case goods because it is a housekeeping problem.

4. Oak is an acceptable color range for woods and laminated wood surfaces and frames. Darker woods are traditionally accepted for those of higher rank.
5. Use commercial grade, performance tested GSA contracts
6. Laminate tops are recommended for all work surfaces other than executive suite areas (wood veneer may be used).
7. Systems furniture plans require Air Force HQ Interior Design Review and approval.
8. Acoustical panels over 65" in height may restrict light and air distribution. 62-64" high panels are generally the best.
9. Fabric finishes on flipper doors will not be approved.

#### 19.11 ARTWORK

1. Only use in public areas; not in private personnel offices.
2. Use to assist occupants in "pathway finding"
3. Hang artwork at 5'-6" with security type devices.
4. Choose mats and frames which complement other accessories and interior color scheme.
5. Art should be large enough to fill the space.

#### 19.12 PLANTS AND ACCESSORIES

1. Plants help soften the space
2. Do not specify live plants. This type of specification requires a maintenance contract.
3. Use quality artificial plants such as with real trucks, bark etc.
4. Specify sturdy containers. Limit the use of wicker baskets.

#### 19.13 Window Treatments

1. Use doubled return hems and doubled bottom hems.
2. Draperies are not encouraged in areas other than executive suites and living areas.
3. Mini blinds that match the window frame are recommended for admin space.
4. Vertical blinds are accepted and can have fabric inserts. Do not

specify any fabric vertical blinds without using a PVC insert vain.

5. Specify blackout lining in sleeping areas
6. Fabric valances maybe used over mini blinds.
7. Use decorative rods or top treatments to give draperies a finished appearance.
8. Draperies are to be 2.5 fullness.
9. Ripple fold over pinched pleats recommended.
10. Draperies are to have minimum 4 inch returns and 2 inch overlaps with a 4 inch heading. Weighted at the corners and all seams.

#### 19.14 BEDSPREADS

1. Use a fitted style bedspread.
2. Pattern is recommended.
3. Minimum 5 oz 100% polyester fill
4. Fabric must have dimensional stability with less than 2% shrinkage after washing at 160 F degrees.

#### 19.15 THE DISTINGUISHING CHARACTERISTICS OF SUCCESSFUL INTERIORS

The Mobile District holds firmly to the position that a successful interior design solution consistently incorporates typical finishes, colors and features to obtain quality interior design solutions. The following guidelines shall be the basis from which all projects will be reviewed and judged for their success.

When planning for the interior environment emphasizes of one from each of the following groups will hopefully achieve good design:

1. Architectural Emphasis or Component Emphasis
2. Color System in Contrast or Color System in Continuity
3. Directional Reinforcement or Directional Change
4. Value Contrast or Value similarity
5. Surface/Texture Emphasis or Surface/Pattern Emphasis
6. Contemporary/Traditional Emphasis or Eclectic Emphasis

Interior SID: Permanent interior building finishes are to be neutral in color. "Permanent finishes" are considered:

1. Plastic Laminates
2. Vinyl Composition Tile
3. Ceramic Tile or other hard tiles
4. Wood doors (stained wood finish)

\*3

5. Metal Doors and Metal Trim
6. Toilet Partitions
7. The majority of walls and ceilings.

The appropriate placement of accent hues and patterns for a government project are considered to be:

1. Accent borders on floors and walls in restrooms.
2. Multi-colored graphic patterned carpet used throughout the facility.
3. Accent colors on vertical surfaces used as visual assistant in "path wayfinding".
4. Artwork
5. Upholstery fabric

Although cost constraints can limit complex design details throughout the facility, there are areas where cost effective use of accents hues and identifying architectural features should be considered and used to create an image. The following areas are ranked according to importance:

1. Lobby Areas
2. Main Conference rooms
3. Command Areas
4. Employee Break rooms and Toilet Rooms
5. General Office Areas

Successful "Path wayfinding" is achieved when users and visitors easily find their way "up to" a building and throughout it's interiors. The District's position is that "path wayfinding" can successfully be obtained by incorporating reason and experience offered by a multi-disciplined team of the Landscape Architect, the Architect and the Interior Designer.

20. SID/CID

ILLUSTRATIONS

30% STRUCTURAL  
INTERIOR DESIGN

FY-95

UEPH DORMS

EGLIN AIR FORCE BASE

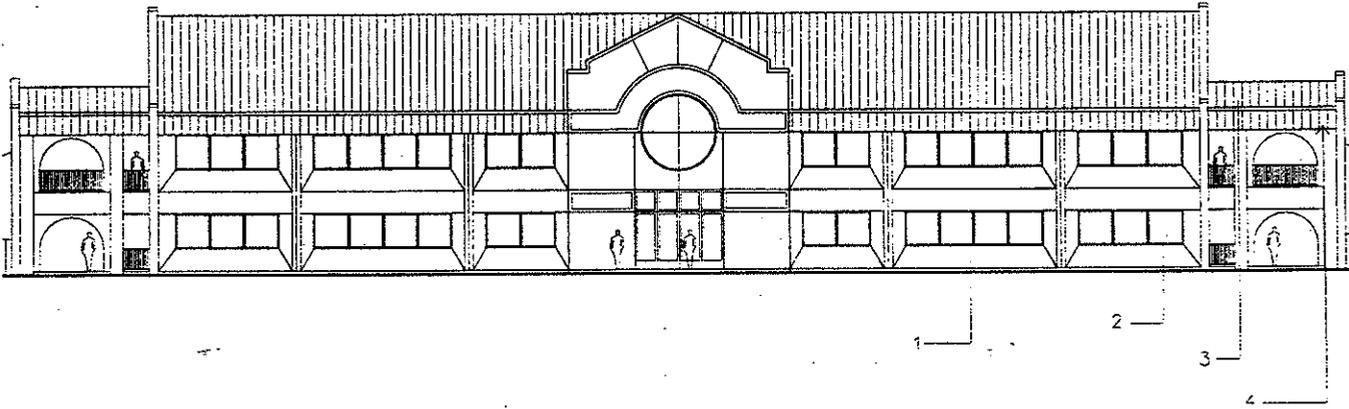
FLORIDA

U.S. ARMY CORPS OF ENGINEERS

MOBILE DISTRICT

MOBILE, ALABAMA

APRIL 1994



1. SMOOTH FACE BLOCK, LT. TAN
2. GLAZING, PPG, SOLARBRONZE TINT
3. METAL ROOF, FEDERAL STANDARD 595B 000000
4. METAL GUTTER, FEDERAL STANDARD 595B 000000

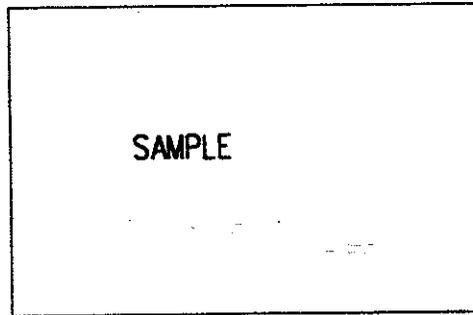
FRW  
DATE

EXTERIOR ELEVATIONS

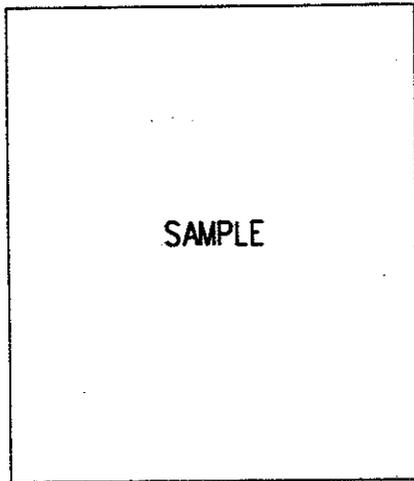
PROJECT NAME  
LOCATION



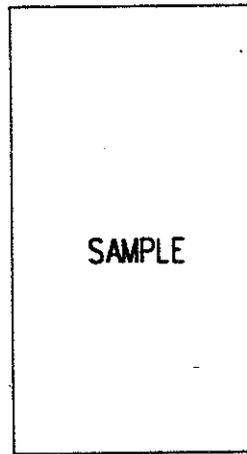
1



2



3

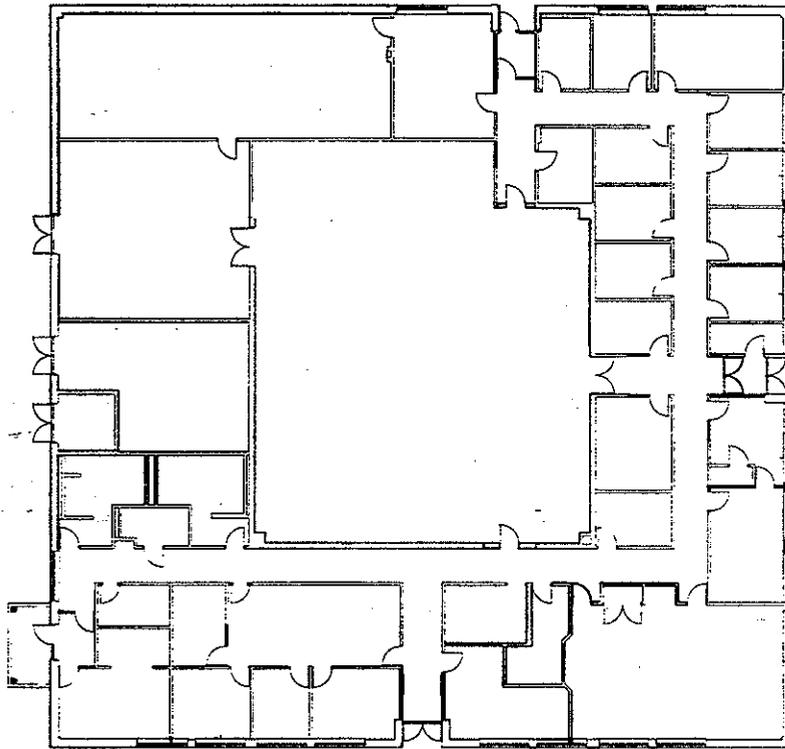


4

FROM  
DATE

EXTERIOR MATERIAL SAMPLES

PROJECT NAME  
LOCATION



COLOR SCHEME "A"- GENERAL OFFICE AREAS

COLOR SCHEME "B" TOILET ROOMS

COLOR SCHEME "C" MISCELLANEOUS AREAS

---

FIRM  
DATE

INTERIOR COLOR PLACEMENT

PROJECT NAME  
LOCATION

# INTERIOR COLOR BOARDS

---

FRW  
DATE

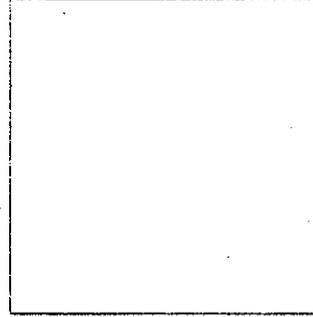
PROJECT NAME  
LOCATION



SAMPLE

FIELD

ACCENT



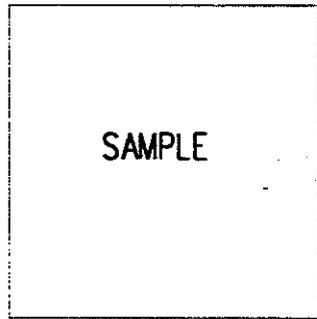
CT-2

CT-1



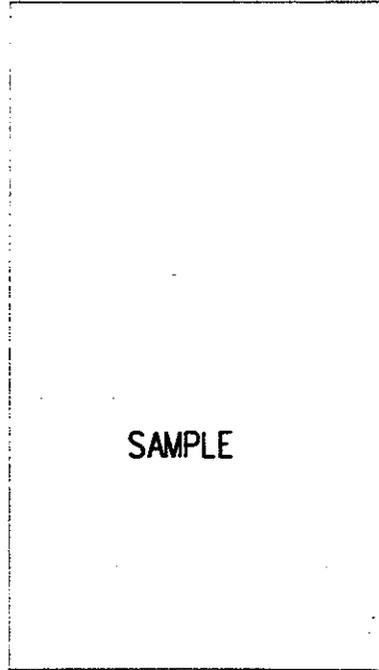
SAMPLE

GROUT-1



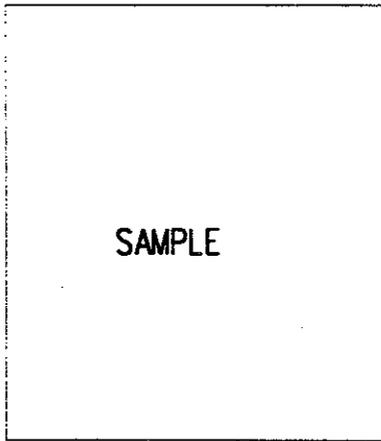
SAMPLE

CT-3  
FLOOR TILE



SAMPLE

TP-1  
PL-1



SAMPLE

P-2  
CEILING

FIRM  
DATE

COLOR SCHEME "C"

PROJECT NAME  
LOCATION

CT-1: CERAMIC TILE, AMERICAN OLEAN, 153 ALMOND. 4" X 4"

CT-2: CERAMIC TILE, AMERICAN OLEN, 2" X 2" TEAL

CT-3: CERAMIC TILE, AMERICAN OLEN, 2" X 2" A 20 BEACH TAN

GROUT-1: AMERICAN OLEAN, BROWN

P-2: EPOXY PAINT, WHITE (FOR CEILINGS)

PL-1: PLASTIC LAMINATE, WILSONART, ALMOND, 513 COUNTER TOPS

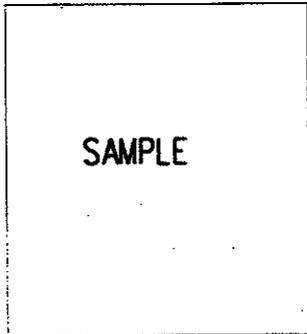
TP-1: PLASTIC LAMINATE, WILSONART, ALMOND 513 TOILET PARTITIONS

---

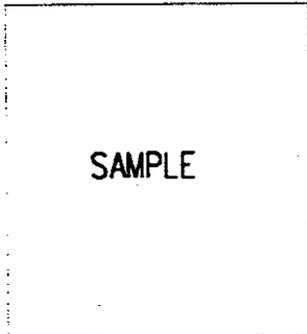
FIRM  
DATE

COLOR SCHEME "C"

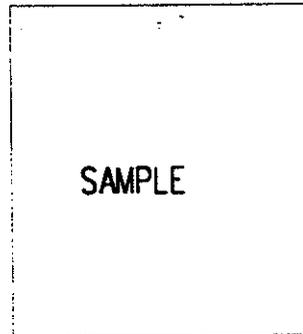
PROJECT NAME  
LOCATION



APCO WHITE (PLAQUE HOLDER)



APCO CLEAR (INSERT)



LETTERING  
APCO BLACK

---

FIRM  
DATE

SIGNAGE

PROJECT NAME  
LOCATION

XYZ SYSTEMS MFG.

SAMPLE

PANELS FABRIC  
466 TAN

SAMPLE

TACKBOARD  
033 TEAL

SAMPLE

FLIPPER DOOR AND TRIM  
PUTTY

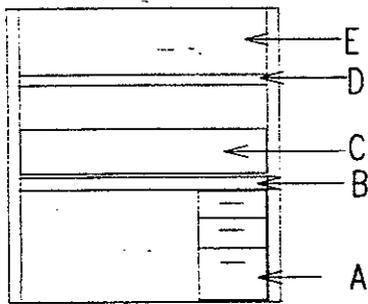
COMPONENTS

WORKSURFACES

FIRM  
DATE

PREWIRED WORKSTATION COLOR BOARD

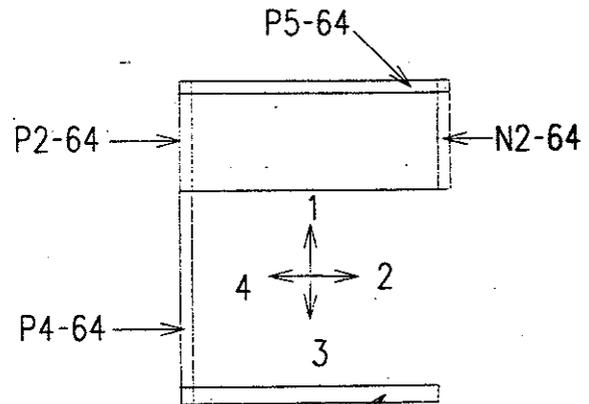
PROJECT NAME  
LOCATION



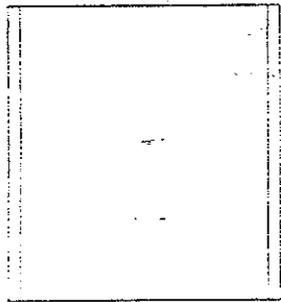
ELEV 1



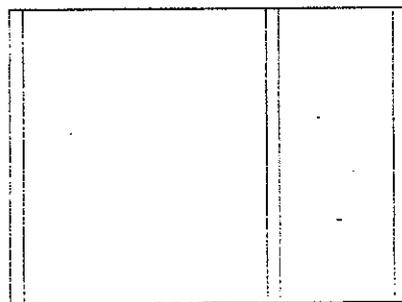
ELEV 2



PLAN VIEW  
6'-0" X 5'-0"



ELEV 3



ELEV 4

QTY.	CODE	DESCRIPTION
2	P5-64	2' W X 64"H POWERED ACOUSTICAL PANEL
1	N2-64	2' W X 64"H NON-POWERED ACOUSTICAL PANEL
1	A	3", 3", 12" DRAWER PEDESTAL
1	B	23"D X 60" W HANGING WORK SURFACE

10 EACH TYPICAL "A"

FIRM  
DATE

PREWIRED WORKSTATION  
TYPICAL "A"

LOCATION

INSERT CONTRACT DRAWINGS OF:

FLOOR PLANS

FINISH SCHEDULE

SIGNAGE PLAN

PREWIRED WORKSTATIONS DRAWINGS

---

FIRM  
DATE

PROJECT NAME  
LOCATION

100%

COMPREHENSIVE  
INTERIOR DESIGN

FY-95

UEPH DORMS

EGLIN AIR FORCE BASE  
FLORIDA

U.S. ARMY CORPS OF ENGINEERS

MOBILE DISTRICT

MOBILE, ALABAMA

APRIL 1994

MANUFACTURER ABC  
109 MAIN STREET  
ANYWHERE, USA 00000  
POINT OF CONTACT:  
1-800-000-0000

MANUFACTURER XYZ  
109 MAIN STREET  
ANYWHERE, USA 00000  
POINT OF CONTACT:  
1-800-000-0000

MANUFACTURER XXX  
109 MAIN STREET  
ANYWHERE, USA 00000  
POINT OF CONTACT:  
1-800-000-0000

---

FIRM  
DATE

MANUFACTURER'S SUMMARY SHEET

PROJECT NAME  
LOCATION

INSERT COMPOSITE FURNITURE PLANS

---

FIRM  
DATE

PROJECT NAME  
LOCATION

A- ACCESSORIES

B- BOOKCASES

C- CHAIRS

D- DESKS

---

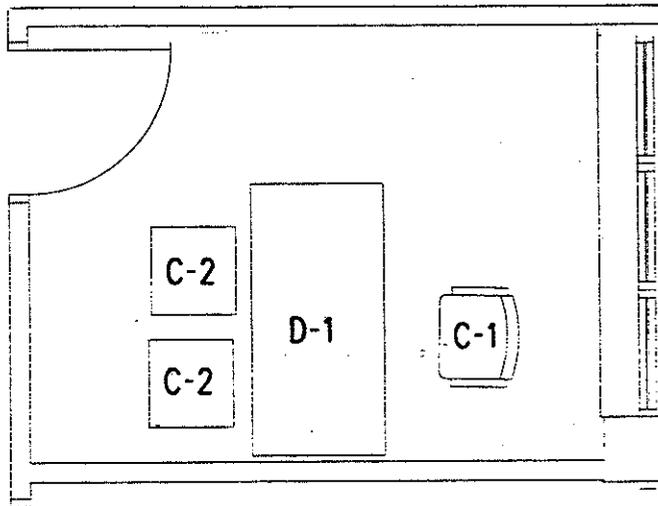
FIRM

DATE

LOCATION CODE INDEX

PROJECT NAME

LOCATION



ROOM:123

QTY. LOCATION CODE

DESCRIPTION

1 EA. C-1 KNOLL BULL DOG , BLACK FRAME, COLOR: TEAL

2 EA. C-2 KRUGER, "VERSA" BLACK FRAME, TEAL

1 EA. D-1: XYZ , WOOD: WALNUT

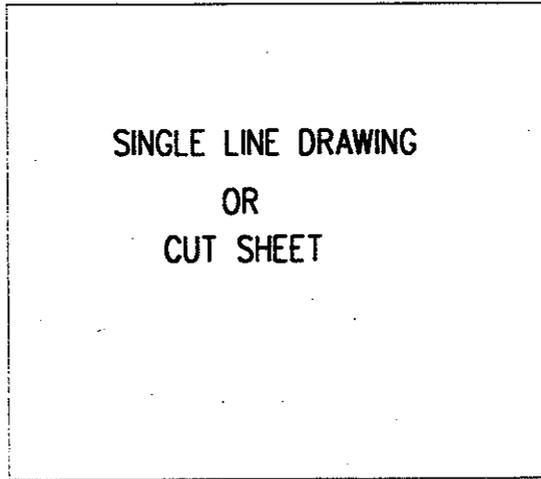
FIRM  
DATE

FURNITURE PLACEMENT PLAN

PROJECT NAME  
LOCATION

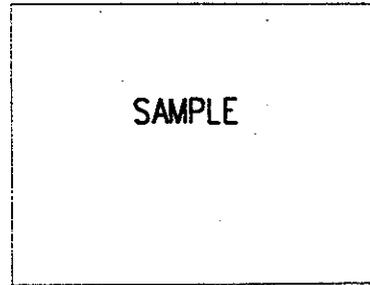
FURNITURE ILLUSTRATION.

C-2



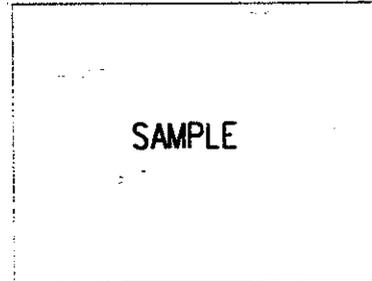
SINGLE LINE DRAWING  
OR  
CUT SHEET

FABRIC:  
002 BLUE



SAMPLE

FRAME  
BLACK



SAMPLE

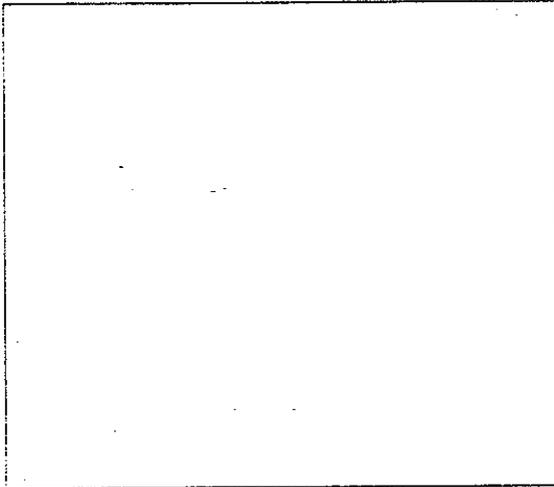
ROOM	QTY	TOTALS
123	2	8
124	2	
125	2	
126	2	

FIRM  
DATE

FURNITURE ILLUSTRATION SHEET

PROJECT NAME  
LOCATION

ARTWORK ILLUSTRATION

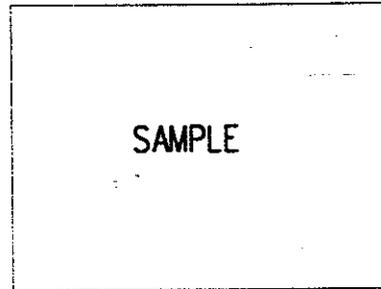
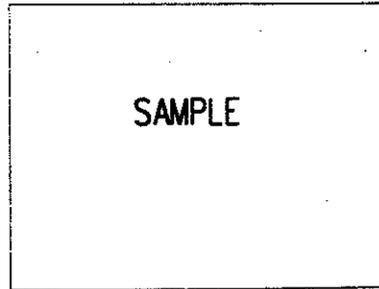


A-1

MAT  
002 BLUE

FRAME  
BLACK

A-1



MOUNTING INSTRUCTIONS:

PLACE CENTER OF WALL WITH TOP OF FRAME 64"  
ABOVE THE FINISHED FLOOR

ROOM	QTY	TOTALS
123	1	1

FIRM  
DATE

ART ILLUSTRATION SHEET

PROJECT NAME  
LOCATION

SOURCE: FSC GROUP 71, PART X CONFERENCE TABLES

CODE	MFG.	ITEM	QT.	UNIT PRICE	TOTAL
T-1	KRUGER	TABLE	04	\$ 350.00	1,400.00
T-2	KRUGER	TABLE	01	\$ 350.00	350.00
T-3	KRUGER	TABLE	04	\$ 350.00	1,400.00

TOTAL: \$5,4350.00

T-5	VECTA	TABLE	04	\$1,000.00	\$4,000.00
T-6	VECTA	TABLE	04	\$1,000.00	\$4,000.00

TOTAL: \$8,000.00

TOTAL OF ALL CID SOURCES:

10% CONTINGENCY:

7% INSTALLATION:

MISCELLANEOUS FEES:

GRAND TOTAL:

FIRM  
DATE

COST ESTIMATE

PROJECT NAME  
LOCATION

**FURNITURE ORDER FORM SAMPLE**  
**PROJECT TITLE**

1. LOCATION CODE:	
2. DIRECTORATE:	
4. DEPARTMENT	
5. ACTIVITY:	
6. FSC GROUP: 71 PART III SECTION: L CLASS 7110 SIN 499-1 CONTRACT EXPIRATION DATE: MOL:	
7. SOURCE: Manufacturer's name etc....	
8. PRODUCT NAME:	
9. PRODUCT STOCK NUMBER:	
10. PRODUCT FABRIC NAME AND COLOR NUMBER:	
11. PRODUCT FINISH NAME AND COLOR NUMBER:	
12. DIMENSIONS:	WEIGHT:
13. DESCRIPTION: (Include construction information; fabric content, finish application)	
14. JUSTIFICATION: These guest chairs are coordinated to match the tasks seating at each workstation. The size of the guest chair was critical because of the limited space where they were to be placed. If this company is not selected coordinate the newly proposed finishes with Location Codes: C3, C4 and C5.	
15. ROOM LOCATION	QUANTITY PER ROOM
16. TOTAL QUANTITY:	
17. UNIT PRICE:	
18. TOTAL PRICE:	
19. FREIGHT CHARGES: FOB DESTINATION (Note if freight charges are included in the price of the CID item.)	
20. Additional remarks or justification.	

# 21. APPENDICES

A. ADA REQUIREMENTS

B. COMMANDER'S POLICY

C. UNICOR WAIVER

02/08/94

04:41

202 272 8815

HQ USACE(CEMP-E) --- CESPK-ED-T

008/011



DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

REPLY TO  
ATTENTION OF:

CEMP-EA/CECW-EP

25 JAN 1994

## MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Access for People with Disabilities

1. Reference Secretary of Defense memorandum dated 20 October 1993, subject as above (enclosure 1).
2. In accordance with the referenced memorandum, the Department of Defense (DoD) has implemented a new policy concerning accessibility standards. In the past, USACE was required to meet the requirements of the Uniform Federal Accessibility Standards (UFAS) and not the Americans with Disabilities Act Accessibility Guidelines (ADAAG). The new policy requires that, in addition to meeting UFAS requirements as required by 42 U.S.C. 4151-4157 and consistent with 29 U.S.C. 794, the requirements of the ADAAG that provide equal or greater accessibility than the requirements of the UFAS must also be met in those facilities subject to UFAS. The facilities excluded under UFAS (such as unaccompanied personnel housing) are still excluded under this new policy, even though the ADAAG has no such exclusions. The implementation of this new policy is considered to have *routine application* as defined by ER 1110-345-100.
3. Copies of UFAS and ADAAG criteria are available from the Architectural and Transportation Barriers Compliance Board, telephone (202) 272-5434. Copies of the Title II Technical Assistance Manual which explains differences between the two standards are available from the Department of Justice, (202) 514-0301.
4. The Directorate of Military Programs POC is Mr. D. S. Gim, CEMP-EA, (202) 272-0440, and the Directorate of Civil Works POC is Mr. Douglas J. Kamien, CECW-EP, (202) 272-8894.

FOR THE DIRECTORS OF MILITARY PROGRAMS AND CIVIL WORKS:

Encl

  
RICHARD C. ARMSTRONG, P.E.  
Chief, Engineering Division  
Directorate of Military Programs

  
PAUL D. BARBER, P.E.  
Chief, Engineering Division  
Directorate of Civil Works



DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

REPLY TO  
ATTENTION OF:

CEMP-EA

31 MAR 1993

COMMANDER'S POLICY MEMORANDUM #7

SUBJECT: Comprehensive Interior Designs

1. The Vice Chief of Staff, Army has placed priority on providing quality living conditions for our soldiers wherever stationed. While this initial thrust to improve the quality of interior environments is directed at barracks facilities, my overall concern is that we ensure quality interior living, working, and training conditions for all of our customers.
2. In order for the Army and our other customers to recruit and retain dedicated career professionals, excellent environments are needed to provide a high quality of life. Our customers and our own personnel spend a majority of their time in interior environments. Excellence in building interiors and furnishings is critical in meeting our customer's and our own functional and operations requirements. Excellent comprehensive interior design must be given high priority in the planning, programming, design, and implementation of our construction projects.

*Arthur E. Williams*  
ARTHUR E. WILLIAMS  
Lieutenant General, USA  
Commanding

DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

ER 1110-345-122

CEMP-EA

Regulation  
No. 1110-345-122

15 April 1994

Engineering and Design  
INTERIOR DESIGN

1. **Purpose.** This regulation establishes policy, requirements, and responsibilities to be followed in the planning, design, approval, and procurement of interior designs for military construction projects and improvement programs.

2. **Applicability.** This regulation applies to HQUSACE/OCE elements, major subordinate commands (MSC), district commands and technical centers, laboratories, and field operating activities (FOA) having military construction (MILCON) responsibilities.

3. **References.** References and additional information resources are listed at Appendix A.

4. **Projects Requiring Interior Design.** Interior design is required on all new building construction and renovation projects regardless of funding source. Interior design guidance for most facility types is provided by Design Guide (DG) 1110-3-122. Interior design guidance for medical facilities is furnished by Architectural and Engineering Instructions, Medical Design Standards. Interior design for family housing will be in accordance with Architectural and Engineering Instructions, Army Family Housing.

5. **Interior Design Services.** Two types of interior design services are offered.

a. **Building-Related Interior Design.** Building-related interior design service will be provided for all facilities. This service requires the accommodation of needed furniture and equipment within the building, and the design or selection of items normally provided as part of the building construction project in accordance with AR 415-15. These services will be provided as an integral part of the project design and shall include:

(1) Basic space planning for anticipated furniture and equipment requirements in conjunction with the functional layout of the building design and such requirements as life safety, privacy, lighting, ventilation, and accessibility.

(2) Design, selection, and coordination of surface materials and colors that are applied to or compose walls, floors, ceilings, trims, doors, windows, window treatments, built-in furniture and installed building equipment, lighting, signage and other items which are permanently attached to, or are integral to the building. Appendix B further defines interior design elements that are building-related and furniture-related.

b. **Furniture-Related Interior Design.** Furniture-related interior design should be provided for all facilities where the arrangement of furniture and furnishings is important to building functionality. Furniture-related interior design services relate to the accommodation and selection of items that will be provided or procured by the Government. This service will be provided when requested by the using activity and will normally include:

(1) Selection, and color coordination of furniture and equipment drawn from existing inventory, procured from Government supply sources (see Appendix C), or procured by competitive bid. These items normally include such things as ergonomic chairs, freestanding and mobile furniture, draperies, lamps, rugs, plant materials, planters, and free standing or wall hung art.

(2) Detailed space design, placement planning, and procurement documentation for the selected furniture, furnishings, and equipment.

15 Apr 94

(3) Coordination of furniture-related items with the building design.

#### 6. General Requirements.

a. **Building-Related Interior Design.** General requirements for building-related interior design are as follows:

(1) Preparation of the basic space layout plans for furniture and equipment, in coordination with the functional layout of the building design.

(2) Specification of the material and color applications for interior component surfaces, and preparation of color and finish schedules.

(3) Design and specification of permanent features such as signage, graphics, casework, and built-in equipment; and the preparation of appropriate schedules.

(4) Coordination of finishes, interior components, lighting, acoustical treatment, electrical, information systems, and mechanical elements.

(5) Preparation of display books or boards showing layout diagrams, special details, and material and color samples, for the purpose of obtaining approval of the design scheme and for facilitating the execution of the design intent through the construction contract or other procurement.

(6) Description of interior design intentions for enhancement of energy efficiency, safety, health, functional flexibility, maintenance, increased personnel performance, and projecting the proper image.

b. **Furniture-Related Interior Design.** General requirements for furniture-related interior design are:

(1) Coordination with all the tasks identified in paragraph 6a above, so that the furniture-related and building-related design schemes reflect a single, coordinated design theme.

(2) Selection and description of furniture and equipment from available Government sources of supply (see Appendix C). Selection will be based on factors indicated in DG 1110-3-122. When

Government source items do not meet requirements, purchase specifications to include materials testing and/or rating requirements to meet minimum Federal standards, and any other data necessary for procurement on the open market will be provided.

(3) Preparation of detailed furniture arrangement and placement plans, and coordination with electrical, information systems, and mechanical elements.

(4) Preparation of procurement documents with source data, item identification, color and finish schedules, and cost estimates. Documents will reflect current source data for procurement.

(5) Preparation of display books or boards showing layout diagrams, selected furniture and equipment, material and color samples. Perspectives or sketches may also be necessary to obtaining approval of the design scheme.

(6) Technical consultation during procurement, delivery, and placement, to assure receipt of specified and selected items, and completion and coordination of the overall design scheme.

7. Design Requirements. Preparation of project interior designs will coincide with the project design process described in AR 415-15. An interior design analysis will be prepared as part of the project design analysis required by ER 1110-345-700. Interior design drawings will likewise be prepared as part of the project drawings required by ER 1110-345-710.

a. **Concept Design.** During the concept design phase, those responsible for interior design will meet with representatives of the using activity and the building design team to determine the design concept. The design concept should meet the users functional, physical, and aesthetic needs as defined below.

(1) **Functional.** Achieve space planning layout which considers all furniture and equipment required to support the users operation. Related design issues include accessibility, privacy, safety, and health.

(2) **Physical.** Assure that environmental support systems such as electrical, lighting, mechanical,

information systems, and structure meet the users physical requirements.

(3) **Aesthetic.** Meet the users needs for aesthetic expression. Aesthetic needs are the physical interpretations of the users sociological and psychological needs. Design issues related to these needs include the use of light, color, and texture.

b. **Final Design.** Upon approval of the concept design, those responsible for design will develop the design concept in sufficient detail to assure successful execution. Building-related interior design is the detailed design and specification of building-related elements in the contract documents. Furniture-related interior design includes the detailed design and preparation of procurement documents.

## 8. Responsibilities.

### a. **Planning Phase.**

(1) The using activity and installation will:

(a) Provide design and design review funds for furniture-related design, as indicated in paragraphs 10 and 11 of this regulation.

(b) Provide funds for procurement of furniture and equipment, and indicate these funds on DD Form 1391, as required by AR 415-15.

(c) Identify unique functional requirements related to the interior design of the facility.

(d) Identify existing furniture and equipment to be reused in addition to new furniture and equipment required.

(2) USACE MSC and district commands responsible for design will assist, on a reimbursable basis, in determining preliminary design requirements, indicated in paragraphs 8a(f)(c) and (d) above, during development of the planning and programming documents.

### b. **Design Phase.**

(1) The designated representative of the using activity, having final approval authority for the project

will review and approve interior design in a manner that is compatible with the provisions of AR 415-15.

(2) USACE MSC and district commands will:

(a) Accomplish interior design services within the scope and methods described herein, and as stated in the programming documents and design directives.

(b) Assure that interior design services are coordinated with the architectural design and reflect the requirements of the using activity.

(c) Verify and validate the technical adequacy and professional quality of the interior design.

### c. **Construction and Procurement Phases.**

(1) The using activity and installation have the following responsibilities regarding interior design:

(a) Procurement of furniture and equipment for delivery to coincide as closely as possible with beneficial occupancy of the building.

(b) Tracking of procurement to assure timely receipt of required furniture and equipment.

(c) Warehousing of furniture and equipment until it is required for placement in the building.

(d) Delivery, assembly, and placement of furniture and furnishings at the project site.

(e) Verification that furniture and equipment received meet specifications requirements.

(f) Establishment of a move in date for the user. This date should be coordinated with the USACE MSC or district command to assure adequate time to furnish the facility after it is released for beneficial occupancy.

(2) USACE MSC and district commands have the following responsibilities:

(a) Assure that appropriate information is provided to the using activity to fully describe the interior design intentions, and the maintenance and operational aspects of the building.

15 Apr 94

(b) Establish beneficial occupancy date so that procurement of furniture and equipment by the using activity or by USACE may be scheduled for a timely delivery.

(3) When USACE provides furniture-related interior design services, the using activity or installation may request the following execution services from USACE on a reimbursable basis:

(a) Technical consultation during procurement, delivery and placement of furniture and equipment.

(b) Assistance in evaluating deviations from specified furniture and equipment to avoid installation of inferior or inappropriate furniture and equipment.

(c) Services in support of the using activities responsibilities indicated in paragraphs 8c(l)(a), (b), and (e) above including supervision of assembly and placement.

**9. Methods of Accomplishment.** Design and design work shall be accomplished by, or in consultation with professional interior designers and architects. Qualification of designers will be based on completion of a recognized program of academic training in interior design and demonstrated interior design

experience. When furniture-related services are provided, those services should be accomplished by the same designer providing the building-related services if possible. Methods for accomplishment of interior design may include in-house capability, Architect Engineer (A-E) contract, separate interior design service contract, or indefinite delivery contract for interior design services.

**10. Funding.** Project design funds will be used for building-related interior design services. Funds for furniture-related interior design services, including design reviews, will be provided separately by the using activity, except as indicated in paragraph 11 of this regulation.

**11. Exception.** Because the furniture-related interior design is critical to the operational effectiveness of living, administrative, and operational facilities, USACE encourages the use of furniture-related interior design services. USACE will provide furniture-related interior design services as an integral part of the building design without additional cost to the using activity for Category Codes 610, 310 & 171 and for DA Standard Design Packages with comprehensive interior designs. The using activity, however, must commit funds for the procurement of the furniture on the DD Form 1391 and request this additional service.

FOR THE COMMANDER:

3 Appendices  
APP A - References  
APP B - Definitions  
APP C - Government Sources of Supply



**WILLIAM D. BROWN**  
Colonel, Corps of Engineers  
Chief of Staff

**APPENDIX A**  
**REFERENCES**

**1. Federal Acquisition Regulations (FAR).**

a. Part 8, Required Sources of Supplies and Services.

b. Part 10, Specifications, Standards, and Other Purchase Descriptions.

**2. Department of the Army.**

a. AR 415-15, Military Construction, Army (MCA) Program Development.

b. AR 415-17, Cost Estimating for Military Programming.

**3. U.S. Army Corps Of Engineers.**

a. ER 1110-345-700, Engineering and Design, Design Analyses.

b. ER 1110-345-710, Engineering and Design, Drawings.

c. DG 1110-3-122, Design Guide for Interiors.

d. Architectural and Engineering Instructions (AEI), Design Criteria Issued by HQUSACE (CEMP-EA). Additional copies are available from HQUSACE (CEMP-EA), 20 Massachusetts Ave., N.W., Washington, DC 20314-1000.

e. Architectural and Engineering Instructions (AEI), Medical Design Standards, Issued by HQUSACE (CEMP-EM). Additional copies are available from HQUSACE (CEMP-EM), 20 Massachusetts Ave., N.W., Washington, DC 20314-1000.

## APPENDIX B

### DEFINITIONS

**1. Building-related Interior Design.** Design in support of installed building equipment and personal property fixed are an integral part of building-related interior design.

**a. Installed Building Equipment.** Construction elements of building-related interior design are defined as installed building equipment by Appendix H, Equipment Installation, of AR 415-15. They consist of items that are affixed or built into the facility and become an integral part of the facility. Installed building equipment is MILCON funded and is provided as part of the construction contract. Examples of installed building equipment associated with building-related interior design are listed in paragraph H-1 of AR 415-15.

**b. Personal Property Fixed.** Personal property fixed is defined by AR 415-15, Appendix H as capital equipment and other equipment of a movable nature that has been fixed in place or attached to real property, but may be severed or removed from buildings without destroying the usefulness of the facilities. Personal property fixed is normally funded as Other Procurement, Army (OPA), however, the utility support for this equipment is MILCON funded. Equipment installation may be funded by either fund source, and installation responsibilities must be defined in the contract documents.

**c. Pre-wired Work Stations.** Pre-wired work stations are a special area within personal property fixed.

**(1) Physical Definition.** The physical characteristics of a pre-wired work station should include posts, panels, partitions, wiring for electrical and information systems, task lighting, and partition hung components to support individual or group work efforts. Both panel to panel and post and panel systems are acceptable. Additional system components are ambient lighting and partition-supported files. Pre-wired work stations do not

include movable furniture and furnishings such as chairs, stand alone file cabinets, coat hooks, file trays, or similar accoutrements.

**(2) Functional Definition.** A pre-wired work station should, at a minimum, provide for the following functions:

**(a)** An acoustically treated enclosure defining the limits of an individual or a shared use work station.

**(b)** Adequate work surfaces to accommodate the individual's equipment, writing surface, and work layout surface.

**(c)** Storage space for individual files and supplies.

**(d)** Task lighting and electrical and information systems outlets to support the individual's equipment.

**(3) Planning and Design.** When pre-wired work stations are planned as an integral part of new construction or MILCON funded renovation they may be MILCON funded. To obtain MILCON funded pre-wired work stations, they must be justified and itemized on programming documents. Indicate number of work stations, unit cost and total cost as a line item under primary facility. Pre-wired work stations must also be itemized in Government estimates, and contractor pricing.

**(4) Construction.** MILCON funded pre-wired work stations will be provided by the construction contractor based on project drawings and specifications. When the contractor provides pre-wired work stations, the provisions of the FAR that apply to construction are applicable.

**2. Furniture-related Interior Design.** Elements associated with furniture-related interior design are defined as personal property moveable by Appendix H of AR 415-15. Elements associated with furniture-

15 Apr 94

related interior design consist of capital equipment and other equipment of a movable nature. Personal property is generally mission specific and can be separated from the building without destroying its use for another function. Personal property should be financed from Operations and Maintenance, Army (OMA) or Other Procurement, Army (OPA) funds, depending on the investment threshold.

**a. Physical Definition.** Items associated with furniture-related interior design include, but are not limited to, the following items:

(1) **Furniture.** Including Desks, Tables, Chairs, Sofas, Ergonomic Seating, Free Standing and Mobile Storage, Free Standing Acoustical Screens, and Modular and Automated Data Processing (ADP) Furniture.

(2) **Furnishings.** Including Art Work, Curtains, Draperies, and Rugs.

(3) **Mission Equipment.** Including Computers, ADP, Medical and Dental, Organs and Pianos, Simulators and Training Aids, Printing, Photographic, and Shop Equipment.

**b. Planning and Design.** Users should provide OMA or OPA funding for furniture, furnishings, equipment and for the associated installation costs. When furniture-related interior design is requested as part of a MILCON project, furniture and furnishings should be itemized on DD Form 1391 and Government estimates. DD Form 1391 should indicate furniture requirements in Section 13, and furniture cost itemized in Section 2G.

**c. Procurement.** Procurement of furniture and furnishings is considered Government procurement, and the provisions of FAR Parts 8 and 10 apply. See Appendix C for Government Sources of Supply. When systems furniture is provided as part of an OMA funded renovation project or a reconfiguration, it is to be procured as furniture.

## PROCUREMENT PROCEDURES FOR FURNITURE

- A. THE MISSION-COMPREHENSIVE INTERIOR DESIGN PACKAGE
- B. PRIORITIES FOR USE OF GOVERNMENT SUPPLY SOURCES IN ACCORDANCE WITH FEDERAL ACQUISITION REGULATION 8.001.
  - AGENCY INVENTORIES
  - EXCESS FROM OTHER AGENCIES
  - FEDERAL PRISON INDUSTRIES
  - COMMITTEE FOR PURCHASE FROM THE BLIND AND OTHER SEVERELY HANDICAPPED
  - GSA STOCK PROGRAMS (DEFENSE LOGISTICS AGENCY, DEPARTMENT OF VETERANS AFFAIRS, MILITARY INVENTORY CONTROL POINTS.
  - MANDATORY FEDERAL SUPPLY SCHEDULES
  - OPTIONAL USE OF FEDERAL SUPPLY SCHEDULES
  - COMMERCIAL SOURCES
- C. PROCURING FROM THE FEDERAL PRISON INDUSTRIES, REQUESTS FOR WAIVER.
- D. GSA STOCK PROGRAMS
- E. PROCUREMENT FROM FEDERAL SUPPLY SCHEDULES
  - COMPETITION REQUIREMENTS
  - MAXIMUM ORDER LIMITATIONS
- F. PROCUREMENT FROM OPEN MARKET SOURCES
  - UNDER \$25,000, REQUEST FOR QUOTATIONS
  - OVER \$25,000, INVITATION FOR BID (IFB'S)
- G. SPECIFICATIONS
- H. COMMUNICATION

## APPENDIX C

## GOVERNMENT SOURCES OF SUPPLY

1. **Priority of Sources.** FAR, Part 8.001, indicates the order of preference for acquisition of supplies and services for the Federal Government.

2. **Federal Prison Industries (FPI).** FPI is a mandatory source of supply and should be considered in accordance with the requirements of FAR, Part 8.6. A furniture catalog and other product information are available from UNICOR, Federal Prisons Industries, Inc., 320 1st Street, N.W., Washington, DC 20534.

3. **General Services Administration (GSA).** The use of Federal Supply Schedules is optional for Department of Defense agencies. GSA schedules do provide a wide selection of furniture and furnishing products. GSA Federal Supply Service source information is available through the Centralized Mailing Lists Services (CMLS), P.O. Box 6477, Fort Worth, TX 76115.

## WAIVER REQUEST PROCEDURE

In accordance with Title 18, U.S.C., Sec. 4124(a) and Federal Acquisition Regulations subpart 8.6, Federal Prison Industries, Inc. (UNICOR) has a mandatory preference for supplies listed in its "Schedule of Products." When an ordering office wishes to purchase supplies listed in the "Schedule" from sources other than UNICOR, it will submit a request for waiver to the Customer Service Manager, Federal Prison Industries, Inc. (UNICOR). The request will be directed as follows:

Federal Prison Industries, Inc.  
320 First St., N. W. (ACACIA)  
Washington, DC 20534  
Attn: Customer Service Manager  
  
Telephone: 1-800-827-3168  
Facsimile: 202-628-1597

Federal Prison Industries, Inc. (UNICOR) will consider requests for waivers based on documented disparities in price, inability to meet reasonable delivery dates, and disqualifying variations in function and "match." Requests will be considered in connection with the standards set out in its Waiver Policy. UNICOR has attempted to set out with the greatest degree of objectivity the standards that it applies in making decisions on waivers. While there must inevitably be some discretion exercised in these decisions, UNICOR will always give careful consideration to a customer's request. It is guided in all its decisions by its commitment to "Total Customer Satisfaction."

**A. Requests shall contain the following information:**

1. As complete a description as possible of the required items: e.g., National Stock Number, descriptive literature such as cuts, illustrations, drawings, and brochures that explain the characteristics and/or the construction. When applicable, e.g., items built to a military or Federal specification, a complete technical data package should be submitted.
2. Quantity required, price of preferred item and required delivery date.
3. In situations where the waiver request is based on functional differences, a comparison of the functional differences between the requested item and the "schedule" item should be provided identifying as a minimum:
  - (a) inadequacies of the "schedule" item to perform the required functions; and
  - (b) economic, or other advantages of the item requested.
4. Estimated annual usage or future need for similar items or a statement that the requirement is nonrecurring and no future need is anticipated. Indicate if this or similar items have previously been purchased from UNICOR.

**B.** UNICOR delivery schedules are consistent with delivery schedules for comparable items appearing on General Services Administration Federal Supply Schedules (FSS). Where schedules for comparable items do not exist, deliveries are consistent with good commercial practices. In the event that delivery times shorter than normally available from the FSS or commercial sources are required, certification, in writing from the contracting officer must be provided stating the reason for the shorter delivery requirement.

**C.** All factors are considered when a determination is made. This includes customer needs, current factory loading and future requirements. Each request is evaluated on its own merits. UNICOR policy does not permit blanket waivers but evaluates each request on a case-by-case basis considering, primarily, the needs of the customer.

**D.** Appeals to waiver denials can be made by forwarding reasons for the appeal to the Customer Service Manager by letter. Please note in your transmission that this is an appeal and reference the original waiver identification number. Appeals should be transmitted no later than 30 days after receipt of the original decision.

**E.** Every attempt will be made to respond to waiver requests and appeals within five (5) working days of receipt.

**F.** Ordering offices should not initiate action to acquire similar items from sources other than UNICOR until a request for waiver is approved.

To check the status of your request or to inquire about prices, delivery, order status or other concerns please call the UNICOR Customer Service Hotline:

1-800-827-3168

## FAC 90—7 SEPTEMBER 23, 1991

## PART 8—REQUIRED SOURCES OF SUPPLIES AND SERVICES

8.404-1

## 8.403 Types of Federal Supply Schedules.

## 8.403-1 Single-award schedules.

Single-award schedules cover contracts made with one supplier at a stated price for delivery to a geographic area as defined in the schedule. Most schedules contain all information necessary for placing orders. Some schedules specify that contractor catalogs must be used for additional ordering information to aid in the selection of fabrics, colors, and similar variables.

## 8.403-2 Multiple-award schedules.

Multiple-award schedules cover contracts made with more than one supplier for comparable supplies and services. Contracts are awarded to suppliers of the same generic types of items at varying prices for delivery within the same geographic area. Contractor catalogs and pricelists must be used with the schedules to prepare delivery orders. The catalogs and pricelists contain information such as item descriptions, prices and discounts, order limitations, and delivery.

## 8.403-3 New Item Introductory Schedule.

The New Item Introductory Schedule (NIIS) provides the means to introduce new or improved products into the Federal Supply System. The schedule lists brand names of products available from various suppliers. With the exception of GSA, the only mandatory user of this schedule, Federal agencies and agencies authorized by law or agreement may use the NIIS on an optional basis. Ordering offices must use contractor catalogs and pricelists with the schedule to prepare delivery orders.

## 8.403-4 International Federal Supply Schedule.

(a) The International Federal Supply Schedule (IFSS) provides sources of supply (supplies and services) at reasonable prices to U.S. Government activities located overseas. The use of the schedule is mandatory only on GSA.

(b) The schedule is divided into two sections. Section A includes those items which were awarded under sealed bid procedures, while Section B covers items that were awarded under negotiated procedures.

(c) Ordering offices need to review the information in the schedule and any applicable contractor's catalogs/price lists to ensure the proper placement of orders. Orders are placed directly with the contractors.

(d) Ordering offices shall forward copies of any orders (at the time the orders are issued) to the contracting office designated in the IFSS.

## \* 8.404 Using schedules.

(a) The planning, solicitation, and award phases of Federal Supply Schedules comply with FAR requirements.

Consequently, contracting officers need not seek further competition, synopses the solicitation or award, determine fair and reasonable pricing, or consider small business-small purchase set-aside procedures when placing an order under a Federal Supply Schedule.

(b) Before soliciting commercial sources, executive agencies shall determine if the required supplies or services, or similar supplies or services fulfilling the same purpose, are available from schedules (see FPMR 101-26.4). If so, the ordering office shall proceed in accordance with the procedure of 8.404-1 or 8.404-2, as appropriate.

(c) In the case of mandatory schedules, ordering offices shall not (1) solicit bids, proposals, quotations, or otherwise test the market solely for the purpose of seeking alternative sources to Federal Supply Schedules; or (2) request formal or informal quotations from Federal Supply Schedule contractors for the purpose of price comparisons.

## 8.404-1 Mandatory use. See Deviation per AL-91-7

Schedules identify executive agencies required to use them as mandatory sources of supply. The single-award schedule shall be used as a primary source and the multiple-award schedule as a secondary source. The following are exceptions to the mandatory-use requirement:

(a) *Urgent requirements.* When an ordering office requires supplies or services with a shorter delivery time than specified in the schedules, and time permits, the ordering office shall request the contractor by letter, telegram, mailgram, or telephone conversation (confirmed in writing) to state the best delivery time that can be met under the circumstances and subject to all other terms and conditions of the schedule contract. The contractor shall be instructed to reply to the inquiry within not more than 3 workdays after receipt, by the same or a faster communications medium than the one by which the inquiry was received. If the contractor offers accelerated delivery acceptable to the ordering office, orders shall obligate the contractor to make the shorter delivery under all other terms and conditions of the contract. When the contractor fails to reply, or the best delivery time does not meet the ordering office's requirements, use of the schedule is not mandatory.

(b) *Small requirements.* Dollar or quantity minimums are established for most schedules, below which ordering offices are not obligated to order and contractors are not obligated to accept orders. Ordering offices may submit orders below established minimums, subject to the contractor's acceptance. Once an order is accepted, the contractor is obligated to perform according to all the terms and conditions of the contract. Some schedules require the contractor to accept orders below the dollar or quantity minimum, but authorize the contractor to include a service charge up to a certain dollar amount. In these cases, the

## FAC 90—5 JULY 25, 1991

## PART 8—REQUIRED SOURCES OF SUPPLIES AND SERVICES

8.405-4

**8.405 Ordering office responsibilities.**

Ordering offices shall place orders directly with contractors and shall perform contract administration on individual orders. Ordering offices should deal directly with contractors concerning contract performance (see 41 CFR 101-26.403-1).

\* **8.405-1 Ordering from multiple-award schedules.**

When ordering from multiple award schedules, ordering offices shall use the procedures set forth below. When these procedures are followed, orders placed against schedules will result in the lowest overall cost alternative to meet the needs of the Government. —

(a) Orders should be placed with the schedule contractor offering the lowest delivered price available. The ordering office shall review the schedule price lists that are reasonably available at the ordering office. Where the ordering office has available fewer than three price lists from current schedule contractors that offer the required items, the ordering activity shall obtain additional price lists from schedule contractors listed in the GSA schedule for the required items. The ordering office shall fully justify in the contract file orders for a line item exceeding the price reasonableness verification threshold at 13.106 placed at other than the lowest price identified in its review. Justification for ordering a higher priced item may be based on such considerations as—

- (1) Delivery time in terms of actual need that cannot be met by a contractor offering a lower price;
- (2) Specific or unusual requirements such as differences in performance characteristics;
- (3) Compatibility with existing equipment or systems;
- (4) Trade-in considerations that favor a higher priced item and produce the lowest net cost; and
- (5) Special features of one item not provided by comparable items that are required in effective program performance.

(b) When two or more items at the same delivered price will meet an ordering office's needs, the ordering office shall give preference to the items of small business and/or labor surplus area concerns by following the order of priority in 14.407-6 for equal low bids.

(c) When a schedule lists both foreign and domestic items that will meet the ordering office's needs, the ordering office shall apply the procedures of Part 25, Foreign Acquisition.

(d) If an item available from a multiple-award schedule is ordered from the schedule contractor at a price lower than the schedule price, the ordering office shall notify the schedule contracting office within 10 days.

**8.405-2 Order placement.**

Ordering offices may use Optional Form 347, or an agency-prescribed form, to order items from schedules and

shall place orders directly with the contractor within the limitations specified in each schedule. Orders shall include, at a minimum, the following information in addition to any information required by the schedule:

- (a) Complete shipping and billing addresses.
- (b) Contract number and date.
- (c) Agency order number.
- (d) F.o.b. delivery point; i.e., origin or destination.
- (e) Discount terms.
- (f) Delivery time.
- (g) Special item number or national stock number.
- (h) Brief, complete description of each item (when ordering by model number, features and options such as color, finish, and electrical characteristics, if available, must be specified).
- (i) Quantity and any variation in quantity.
- (j) Number of units.
- (k) Unit price.
- (l) Total price of order.
- (m) Points of inspection and acceptance.
- (n) Other pertinent data; e.g., delivery instructions or receiving hours and size-of-truck limitation.
- (o) Marking requirements.
- (p) Level of preservation, packaging, and packing.

**8.405-3 Inspection and acceptance.**

(a) Consignees shall inspect supplies at destination except when—

- (1) The schedule provides for the schedule contracting agency to perform source inspection (in this case, the schedule will indicate that mandatory source inspection is required); or
- (2) A schedule item is covered by a product description, and the ordering office determines that the schedule contracting agency's inspection assistance is needed (inspection assistance may be based on the ordering volume, the complexity of items, or the past performance of the supplier).

(b) When the schedule contracting agency performs the inspection, as specified in the schedule, the ordering office will provide two copies of the order specifying source inspection to the schedule contracting agency. The schedule contracting agency will notify the ordering office of acceptance or rejection of the supplies.

(c) Material inspected at source by the schedule contracting agency, and determined to conform with the product description of the schedule, shall not be reinspected for the same purpose. The consignee shall limit inspection to quantity and condition on receipt.

(d) Unless otherwise provided in the schedule, acceptance shall be conclusive except as regards latent defects, fraud, or such gross mistakes as amount to fraud.

**8.405-4 Delinquent performance.**

When the contractor fails to perform on the order, the

## **APPENDIX H**

# **SUSTAINABLE PROJECT RATING TOOL (SPiRiT)**

# **Sustainable Project Rating Tool (SPiRiT)**

**Version 1.4**

**U. S. Army Corps of Engineers  
U. S. Army Assistant Chief of Staff for Installation Management**

April 2001

### **U. S. Army Corps of Engineers Disclaimer**

The contents of this document are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products. All product names and trademarks cited are the property of their respective owners.

The findings of this document are not to be construed as an official Department of the Army position unless so designated by other authorized documents. The U. S. Army Corps of Engineers does not guarantee, certify, or ensure performance of any products, systems, strategies, or technologies described in the Sustainable Project Rating Tool (SPiRiT).

### **U. S. Green Building Council Disclaimer**

The LEED Green Building Reference Guide™ 2.0 is the second edition, support document for the LEED Green Building Rating System™. These LEED™ documents were developed by the U.S. Green Building Council, under contract number DE-FG36-97GO10268, for the U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Building Technology, State, and Community Programs, and are intended for use by commercial building project stakeholders or project team members as a guide for green and sustainable design. They were prepared with the assistance and participation of representatives from many organizations. The views and opinions expressed represent general consensus and available information, but unanimous approval by all organizations is not implied. The views and opinions expressed also do not necessarily state or reflect those of the United States government.

Together, the LEED™ documents represent the U.S. Green Building Council's efforts to develop a standard that improves environmental and economic performance of commercial buildings using established and/or advanced industry principles, practices, materials and standards. They are subject to change from time to time in the future.

The U.S. Green Building Council authorizes you to view the LEED Green Building Reference Guide™ 2.0 for your individual use. In exchange for this authorization, you agree to retain all copyright and other proprietary notices contained in the original LEED Green Building Reference Guide™ 2.0. You also agree not to sell or modify the LEED Green Building Reference Guide™ 2.0 or to reproduce, display or distribute the LEED Green Building Reference Guide™ 2.0 in any way for any public or commercial purpose, including display on a web site or in a networked environment. Unauthorized use of the LEED Green Building Reference Guide™ 2.0 violates copyright, trademark, and other laws and is prohibited.

Please note that the text of the federal and state codes, regulations, voluntary standards, etc. reproduced in the LEED Green Building Reference Guide™ 2.0 is either used under license to the U.S. Green Building Council or, in some instances, is in the public domain. All other text, graphics, layout, and other elements of content contained in the LEED Green Building Reference Guide™ 2.0 are owned by the U.S. Green Building Council and are protected by copyright under both United States and foreign laws.

Also please note that none of the parties involved in the funding or creation of the LEED Green Building Reference Guide™ 2.0, including the U.S. Green Building Council, its members or the United States government make any warranty (express or implied) or assume any liability or responsibility, to you or any third parties for the accuracy, completeness or use of, or reliance on, any information contained in the LEED Green Building Reference Guide™ 2.0, or for any injuries, losses or damages (including, without limitation, equitable relief) arising out of such use or reliance.

As a condition of use, you covenant not to sue, and agree to waive and release the U.S. Green Building Council, its members and the United States government from any and all claims, demands and causes of action for any injuries, losses or damages (including, without limitation, equitable relief) that you may now or hereafter have a right to assert against such parties as a result of your use of, or reliance on, the LEED Green Building Reference Guide™ 2.0.

Copyright © 2000 by the U.S. Green Building Council. All rights reserved.

NOTES .....	iii
1.0 Sustainable Sites .....	1
<input type="checkbox"/> 1.R1 Erosion, Sedimentation and Water Quality Control	
<input type="checkbox"/> 1.C1 Site Selection	
<input type="checkbox"/> 1.C2 Installation/Base Redevelopment	
<input type="checkbox"/> 1.C3 Brownfield Redevelopment	
<input type="checkbox"/> 1.C4 Alternative Transportation	
<input type="checkbox"/> 1.C5 Reduced Site Disturbance	
<input type="checkbox"/> 1.C6 Stormwater Management	
<input type="checkbox"/> 1.C7 Landscape and Exterior Design to Reduce Heat Islands	
<input type="checkbox"/> 1.C8 Light Pollution Reduction	
<input type="checkbox"/> 1.C9 Optimize Site Features	
<input type="checkbox"/> 1.C10 Facility Impact	
<input type="checkbox"/> 1.C11 Site Ecology	
2.0 Water Efficiency .....	5
<input type="checkbox"/> 2.C1 Water Efficient Landscaping	
<input type="checkbox"/> 2.C2 Innovative Wastewater Technologies	
<input type="checkbox"/> 2.C3 Water Use Reduction	
3.0 Energy and Atmosphere .....	6
<input type="checkbox"/> 3.R1 Fundamental Building Systems Commissioning	
<input type="checkbox"/> 3.C3 Additional Commissioning	
<input type="checkbox"/> 3.R2 Minimum Energy Performance	
<input type="checkbox"/> 3.R3 CFC Reduction in HVAC&R Equipment	
<input type="checkbox"/> 3.C1 Optimize Energy Performance	
<input type="checkbox"/> 3.C2 Renewable Energy	
<input type="checkbox"/> 3.C4 <<Deleted>>	
<input type="checkbox"/> 3.C5 Measurement and Verification	
<input type="checkbox"/> 3.C6 Green Power	
<input type="checkbox"/> 3.C7 Distributed Generation	
4.0 Materials and Resources .....	10
<input type="checkbox"/> 4.R1 Storage & Collection of Recyclables	
<input type="checkbox"/> 4.C1 Building Reuse	
<input type="checkbox"/> 4.C2 Construction Waste Management	
<input type="checkbox"/> 4.C3 Resource Reuse	
<input type="checkbox"/> 4.C4 Recycled Content	
<input type="checkbox"/> 4.C5 Local/Regional Materials	
<input type="checkbox"/> 4.C6 Rapidly Renewable Materials	
<input type="checkbox"/> 4.C7 Certified Wood	
5.0 Indoor Environmental Quality (IEQ) .....	13
<input type="checkbox"/> 5.R1 Minimum IAQ Performance Control	
<input type="checkbox"/> 5.R2 Environmental Tobacco Smoke (ETS) Control	
<input type="checkbox"/> 5.C1 IAQ Monitoring	
<input type="checkbox"/> 5.C2 Increase Ventilation Effectiveness	
<input type="checkbox"/> 5.C3 Construction IAQ Management Plan	
<input type="checkbox"/> 5.C4 Low-Emitting Materials	
<input type="checkbox"/> 5.C5 Indoor Chemical and Pollutant Source	
<input type="checkbox"/> 5.C6 Controllability of Systems	
<input type="checkbox"/> 5.C7 Thermal Comfort	
<input type="checkbox"/> 5.C8 Daylight and Views	
<input type="checkbox"/> 5.C9 Acoustic Environment /Noise Control	
<input type="checkbox"/> 5.C10 Facility In-Use IAQ Management Plan	
6.0 Facility Delivery Process.....	17
<input type="checkbox"/> 6.C1 Holistic Delivery of Facility	
7.0 Current Mission.....	18
<input type="checkbox"/> 7.C1 Operation and Maintenance	
<input type="checkbox"/> 7.C2 Soldier and Workforce Productivity and Retention	
8.0 Future Missions.....	19
<input type="checkbox"/> 8.C1 Functional Life of Facility and Supporting Systems	
<input type="checkbox"/> 8.C2 Adaptation, Renewal and Future Uses	
Facility Points Summary .....	20

SPiRiT Comment Sheet ..... 22

## NOTES

1) This Sustainable Project Rating Tool (SPiRiT) is derived from The U. S. Green Building Council LEED 2.0 (Leadership in Energy and Environmental Design) Green Building Rating System™.

2) The SPiRiT numbering scheme parallels, but does not match LEED 2.0. LEED does not number major sections, which it calls 'Credit Categories,' ex. 'Sustainable Sites,' rather it numbers criteria or 'credits' within each major section. SPiRiT credit numbers match those of LEED where there is a 1:1 comparison. Where additional credits have been added they fall at the end of major sections.

3) The SPiRiT Credits all follow the format: Intent, Requirement and Technologies/Strategies.

Intent: A statement of the primary goal for the credit;  
Requirement: Quantifiable conditions necessary to achieve stated intent;  
Technologies/Strategies : Suggested technologies, strategies and referenced guidance on the means to achieve identified requirements.

4) Projects are evaluated for each SPiRiT credit which are either 'Prerequisites' or result in a point score:  
Prerequisites: These credits are a statement of minimum requirements and must be met. No further points will be awarded unless the minimum is achieved. These credits are recognizable by an 'R' in the number scheme, ex. 1.R1, and a 'Reqd.' in the score column.  
Point Score: These credits are evaluated and result in a point score. Where the potential score is greater than 1, no partial points are granted.

5) SPiRiT Sustainable Project Certification Levels:

SPiRiT Bronze	25 to 34 Points
SPiRiT Silver	35 to 49 Points
SPiRiT Gold	50 to 74 Points
SPiRiT Platinum	75 to 100 Points

6) SPiRiT credits have been developed to address facility life cycle phases including programming, design, construction, and commissioning. Additional rating tools will be developed to address installation/base master planning and facilities operations and maintenance, rehabilitation, recycling, and disposal.

<u>7) POC for U. S. Army Corps of Engineers:</u> Mr. Harry Goradia U. S. Army Corps of Engineers ATTN: CEMP-ET 7701 Telegraph Road Alexandria, VA 22315-3862 Phone 703-428-6460, FAX 703-428-7903 Email <a href="mailto:harry.goradia@hq02.usace.army.mil">harry.goradia@hq02.usace.army.mil</a>	<u>POC for U. S. Army Installations:</u> Mr. John Scharl U. S. Army Assistant Chief of Staff for Installation Management, Directorate of Facilities & Housing ATTN: DAIM-FDF 7701 Telegraph Road, Bldg #2594 (Room 146B), Alexandria, VA 22315-3800 Phone (703) 428-7614, FAX (703) 428-0197 Email <a href="mailto:scharja@hqda.army.mil">scharja@hqda.army.mil</a>
---	---

8) Sustainable Project Rating Tool (SPiRiT) Authors are:  
Stephen N. Flanders (Lead), U. S. Army Engineering Research & Development Center (ERDC-CRREL)  
Richard L. Schneider, U. S. Army Engineering Research & Development Center (ERDC-CERL)  
Donald Fournier, U. S. Army Engineering Research & Development Center (ERDC-CERL)  
Annette Stumpf, U. S. Army Engineering Research & Development Center (ERDC-CERL)

9) Army/USACE employees are members of the USGBC with membership privileges accessible via the USGBC web site, <http://www.usgbc.org/>. For information on membership and access to available LEED resources to support use of SPiRiT and sustainable design in your projects, contact Richard Schneider at (217) 373-6752 or [richard.l.schneider@erdc.usace.army.mil](mailto:richard.l.schneider@erdc.usace.army.mil) (Annette Stumpf at (217) 352-6511 ext. 7542 or [annette.l.stumpf@erdc.usace.army.mil](mailto:annette.l.stumpf@erdc.usace.army.mil) alternate).

10) For the latest information on SPiRiT and for access to guidance, tools and resources supporting sustainable design initiatives, visit the CERL 'Sustainable Design and Development Resource' website, <http://www.cecer.army.mil/SustDesign>. There you may also join the CERL Sustainable Design ListServ to be directly notified of information pertinent to sustainable design.

# Sustainable Sites

Reqd.

## 1.R1 Erosion, Sedimentation, and Water Quality Control <sup>(1)</sup>

Intent: Control erosion and pollutants to reduce negative impacts on water and air quality.

Requirement:  Design a site sediment and erosion control plan and a pollution prevention plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
- Prevent hazardous material discharge into storm water systems.
- Prevent petroleum oils and lubricants (POL) discharge into storm water systems.

Technologies /Strategies: The EPA standard lists numerous measures such as silt fencing, sediment traps, oil grit separators, construction phasing, stabilization of steep slopes, maintaining vegetated ground cover and providing ground cover that will meet this prerequisite.

## 1.C1 Site Selection <sup>(1)</sup>

Intent: Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site. Select site based on functional adjacencies/relationships and land use compatibility.

Requirement:  Do not develop buildings on portions of sites that meet any one of the following criteria: **1**

- Prime training or maneuver land.
- Land whose elevation is lower than 5 ft. above the 100-year flood elevation as defined by FEMA.
- Land that provides habitat for any species on the Federal or State threatened or endangered list.
- Within 100 feet of any wetland as defined by 40 CFR, Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent.

Select site based on functional adjacencies/relationships and land use compatibility. **1**

- Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.
- Select site in area of high density.
- Site facilities based on the strength of their relationships to other facilities/land-uses to limit travel distances. The stronger the relationship/functional interaction, the closer the distance between two facilities.
- Select for distance to installation/base transit systems and access to pedestrian ways and bike paths.
- Select for development previously used or developed suitable and available sites.

Technologies /Strategies: Screen potential building sites for these criteria and/or ensure that these criteria are addressed by the designer during the conceptual design phase. Utilize landscape architects, ecologists, environmental engineers, civil engineers, and similar professionals for the screening process. New wetlands constructed as part of stormwater mitigation or other site restoration efforts are not affected by the restrictions of this prerequisite.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

## Sustainable Sites (Continued)

### 1.C2 Installation/Base Redevelopment (1)

Intent: Channel development to installation/base cantonment areas with existing infrastructure, protecting greenfields and preserving habitat and natural resources.

Requirement:  Increase localized density to conform to existing or desired density goals by utilizing sites that are located within existing cantonment areas of high development density. **1**

Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure. **1**

Technologies /Strategies: During the site selection process give preference to previously developed sites with installation/base cantonment redevelopment potential such as facility reduction program cleared sites.

### 1.C3 Brownfield Redevelopment (1)

Intent: Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

Requirement:  Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield

Redevelopment program requirements OR Develop a brownfield site (a site that has been contaminated by previous uses). **1**

Technologies /Strategies:

Screen potential damaged sites for these criteria prior to selection for rehabilitation.

Utilize EPA OSWER Directive 9610.17 and ASTM Standard Practice E1739 for site remediation where required.

### 1.C4 Alternative Transportation (1)

Intent: Reduce pollution and land development impacts from automobile use.

Requirement:  Locate building within ½ mile of installation/base transit systems. **1**

Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants. **1**

Locate building within 2 miles of alternative-fuel refueling station(s). **1**

Size parking capacity not to exceed minimum installation/base cantonment requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants. **1**

Technologies /Strategies: Select sites near public installation/base transit served by safe, convenient pedestrian pathways.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

### 1.C5 Reduced Site Disturbance (1)

Intent: Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirement:  On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation. 1

Reduce the development footprint (including building, access roads and parking) to exceed the installation/base's/master plan local zoning's open space requirement for the site by 25% or in accordance with installation/base policy on open space set asides, whichever is greater. 1

Technologies /Strategies: Note requirements on plans and in specifications. Establish contractual penalties for destruction of trees and site areas noted for protection. Reduce footprints by tightening program needs and stacking floor plans. Establish clearly marked construction and disturbance boundaries. Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas. Work with local horticultural extension services, or native plant societies, or installation/base agronomy staff to select indigenous plant species for site restoration and landscaping.

### 1.C6 Stormwater Management (1)

Intent: Limit disruption of natural water flows by minimizing storm water runoff, increasing on-site infiltration and reducing contaminants.

Requirement: Implement a stormwater management plan that results in:

No net increase in the rate or quantity of stormwater runoff from undeveloped to developed conditions; OR, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff. 1

Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA -840-B-92-002 1/93). 1

Technologies /Strategies: Significantly reduce impervious surfaces, maximize on-site stormwater infiltration, and retain pervious and vegetated areas. Capture rainwater from impervious areas of the building for groundwater recharge or reuse within building. Use green/vegetated roofs. Utilize biologically-based and innovative stormwater management features for pollutant load reduction such as constructed wetlands, stormwater filtering systems, bioswales, bio-retention basins, and vegetated filter strips. Use open vegetated swales to reduce drainage velocity and erosion, reduce system maintenance, increase vegetative variety and support wildlife habitat where space permits.

### 1.C7 Landscape and Exterior Design to Reduce Heat Islands (2)

Intent: Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirement:  Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored/ high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space under-ground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area. 1

Use ENERGY STAR Roof compliant, high-reflectance AND low emissivity roofing (initial reflectance of at least .65 and three-year-aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area. 1

Technologies /Strategies: Employ design strategies, materials, and landscaping designs that reduce heat absorption of exterior materials. Note albedo/reflectance requirements in the drawings and specifications. Provide shade (calculated on June 21, noon solar time) using native or climate tolerant trees and large shrubs, vegetated trellises, or other exterior structures supporting vegetation. Substitute vegetated surfaces for hard surfaces. Explore elimination of blacktop and the use of new coatings and integral colorants for asphalt to achieve light colored surfaces.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

(2) © U. S. Green Building Council. Used by permission.

**1.C8 Light Pollution Reduction (1)**

Intent: Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.

Requirement:  Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.

1

Technologies  
/Strategies:

Consult IESNA Recommended Practice Manual: Lighting for Exterior Environments for Commission Internationale de l'Eclairage (CIE) zone and pre and post curfew hour descriptions and associated ambient lighting level requirements. Ambient lighting for pre-curfew hours for CIE zones range between .01 footcandles for areas with dark landscapes such as parks, rural, and residential areas, and 1.5 footcandles for areas with high ambient brightness such as installation/base areas with high levels of nighttime activity. Design site lighting and select lighting styles and technologies to have a minimal impact off-site and minimal contribution to sky glow. Minimize lighting of architectural and landscape features. Exterior lighting should be consistent with security lighting requirements.

**1.C9 Optimize Site Features**

Intent: Optimize utilization of the site's existing natural features and placement of man-made features on the site.

Requirement:  Perform both of the following:  
▪ Maximize the use of free site energy.  
▪ Plan facility, parking and roadways to "fit" existing site contours and limit cut and fill.

1

Technologies  
/Strategies:

Evaluate site resources to ascertain how each can enhance the proposed project and visa versa. Work to maximum advantage of the site's solar and wind attributes. Use landscaping to optimize solar and wind conditions and to contribute to energy efficiency; Locate and orient the facility on the site to optimize solar and wind conditions.

**1.C10 Facility Impact**

Intent: Minimize negative impacts on the site and on neighboring properties and structures; avoid or mitigate excessive noise, shading on green spaces, additional traffic, obscuring significant views, etc.

Requirement:  Cluster facilities to reduce impact, access distance to utilities and sufficient occupant density to support mass transit.

1

Collaborate with installation/base and community planners to identify and mitigate potential impacts of the project beyond site boundaries, and transportation planners to insure efficient public transport.

1

Technologies      Involve local/regional planners and community members in installation/base master planning processes.  
/Strategies:      Recognize the context and the impact of a project beyond site boundaries, and integrate it with the larger installation/base/community context/land use.

**1.C11 Site Ecology**

Intent: Identify and mitigate all existing site problems including contamination of soil, water, and air, as well as any negative impacts caused by noise, eyesores, or lack of vegetation, enhancing or creating new site habitat.

Requirement:  Develop site environmental management and mitigation plan.

1

Technologies  
/Strategies:

Understand site and surrounding ecosystem interdependence and interconnectivity. Plan landscaping scheme to incorporate biodiversity. Preserve/enhance existing trees, hydrological features, ecosystems, habitats, and cultural resources. Increase the existence of healthy habitat for native species. Reintroduce native plants and trees where they have been destroyed by previous development.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

**2.C1 Water Efficient Landscaping (2)**

Intent: Limit or eliminate the use of potable water for landscape irrigation.

Requirement:  Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

1

Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems.

1

Technologies

/Strategies:

Develop a landscaping water use baseline according to the methodology outlined in the LEED Reference Guide. Specify water-efficient, native or adapted, climate tolerant plantings. High efficiency irrigation technologies include micro irrigation, moisture sensors, or weather data based controllers. Feed irrigation systems with captured rainwater, gray water, or on-site treated wastewater.

## 2.C2 Innovative Wastewater Technologies (2)

Intent: Reduce generation of wastewater and potable water demand, while increasing local aquifer recharge.

Requirement:  Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards.

1

Technologies

/Strategies:

Develop a wastewater baseline according to the methodology outlined in the LEED Reference Guide. Implement decentralized on-site wastewater treatment and reuse systems. Decrease the use of potable water for sewage conveyance by utilizing gray and/or black water systems. Non-potable reuse opportunities include, toilet flushing, landscape irrigation, etc. Provide advanced wastewater treatment after use by employing innovative, ecological, on-site technologies including constructed wetlands, a mechanical recirculating sand filter, or aerobic treatment systems.

## 2.C3 Water Use Reduction (1)

Intent: Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirement:  Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act (EPACT) of 1992 fixture performance requirements.

1

Exceed the potable water use reduction by an additional 10% (30% total efficiency increase).

1

Technologies

/Strategies:

Develop a water use baseline including all water consuming fixtures, equipment, and seasonal conditions according to methodology guidance outlined in the LEED Reference Guide. Specify water conserving plumbing fixtures that exceed Energy Policy Act (EPACT) of 1992 fixture requirements in combination with ultra high efficiency or dry fixture and control technologies. Specify high water efficiency equipment (dishwashers, laundry, cooling towers, etc.). Use alternatives to potable water for sewage transport water. Use recycled or storm water for HVAC/process make up water. Install cooling tower systems designed to minimize water consumption from drift, evaporation and blowdown.

(2) © U. S. Green Building Council. Used by permission.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

### 3.0 Energy and Atmosphere Score 28

#### 3.R1 Fundamental Building Systems Commissioning <sup>(1)</sup>

Reqd.

Intent: Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

- Requirement:  Implement all of the following fundamental best practice commissioning procedures.
- Engage a commissioning authority.
  - Develop design intent and basis of design documentation.
  - Include commissioning requirements in the construction documents.
  - Develop and utilize a commissioning plan.
  - Verify installation, functional performance, training and documentation.
  - Complete a commissioning report.

Technologies

/Strategies:

Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Perform additional commissioning in accordance with the DOE Building Commissioning Guide, Version 2.2. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional commissioning guides. Specify pre-occupancy baseline IAQ testing at time of commissioning. Test for indoor air concentrations of CO, CO<sub>2</sub>, total VOCs and particulates. Test to assure that adequate ventilation rates have been achieved prior to initial occupancy.

#### 3.R2 Minimum Energy Performance <sup>(1)</sup>

Reqd.

Intent: Establish the minimum level of energy efficiency for the base building and systems.

Requirement:  Design to meet building energy efficiency and performance as required by TI 800-01 (Design Criteria).

Technologies

/Strategies:

Use building modeling and analysis techniques to establish and document compliance. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Refer to the LEED Reference Guide for a wide variety of energy efficiency strategy resources.

Use a professionally recognized and proven computer program or programs that integrate architectural features with air-conditioning, heating, lighting, and other energy producing or consuming systems. These programs will be capable of simulating the features, systems, and thermal loads used in the design. Using established weather data files, the program will perform 8760 hourly calculations. BLAST, DOE-2 or EnergyPlus are acceptable programs for these purposes.

#### 3.R3 CFC Reduction in HVAC&R Equipment <sup>(2)</sup>

Reqd.

Intent: Reduce ozone depletion.

Requirement:  Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Technologies

/Strategies:

Specify only non-CFC-based refrigerants in all base building HVAC&R systems.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

(2) © U. S. Green Building Council. Used by permission.

### 3.C1 Optimize Energy Performance <sup>(1)</sup>

Intent: Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirement:  Reduce design energy usage (DEU) compared to the energy use budget (EUB) in joules per square meter per year for regulated energy components as described in the requirements of Chapter 11 of the TI 800-01 (Design Criteria), as demonstrated by a whole building simulation.

▪ 1 Point will be awarded for every reduction in design energy use of 2.5% for both new and existing facilities for a maximum score of 20 points.

20

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

Technologies

/Strategies:

Develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Perform interactive energy use analysis for selected design elements that affect energy performance and document compliance.

Unit of measure for performance shall be annual energy usage in joules per square meter. Life-Cycle energy costs shall be determined using rates for purchased energy, such as electricity, gas, oil, propane, steam, and chilled water and approved by the adopting authority. Refer to the LEED Reference Guide or Whole Building Design Guide for a wide variety of energy efficiency resources and strategies including conservation measures, electromechanical energy efficiency technologies (for example ground-source heat pumps), passive heating and cooling strategies, solar hot water, and daylighting.

Life-Cycle costing will be done in accordance with 10 CFR 436.

Consider installation of an Energy Management and Control System (EMCS), which is compatible with existing installation systems to optimize performance. Use sensors to control loads based on occupancy, schedule and/or the availability of natural resources use (day light or natural ventilation).

### 3.C2 Renewable Energy <sup>(1)</sup>

Intent: Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirement:  Supply a net fraction of the building's total energy use through the use of on-site renewable energy systems.

% of Total Annual Energy Usage in Renewables

5%

1

10%

2

15%

3

20%

4

Technologies

/Strategies:

Employ the use of on-site non-polluting-source renewable technologies contributing to the total energy requirements of the project. Consider and use high temperature solar and/or geothermal, photovoltaics, wind, biomass (other than unsustainably harvested wood), and bio-gas. Passive solar, solar hot water heating, ground-source heat pumps, and daylighting do not qualify for points under this credit. Credit for these strategies is given in Energy & Atmosphere Credit 1: Optimizing Energy Performance.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 3.0 Energy and Atmosphere (Continued)

### 3.C3 Additional Commissioning (2)

Intent: Verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.

Requirement:  In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks:

1. Conduct a focused review of the design prior to the construction documents phase.
2. Conduct a focused review of the construction documents when close to completion.
3. Conduct a selective review of contractor submittals of commissioned equipment.
4. Develop a system and energy management manual.
5. Have a contract in place for a near-warranty end or post occupancy review.

1

Items 1, 2, and 3 must be performed by someone other than the designer.

Technologies

/Strategies:

Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional guidelines.

### 3.C4 << Deleted >> (1)

### 3.C5 Measurement and Verification (1)

Intent: Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement:  Comply with the installed equipment requirements for continuous metering as stated in selected Measurement and Verification Methods - Option B: Retrofit Isolation of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following:

- Lighting systems and controls.
- Constant and variable motor loads.
- Variable frequency drive (VFD) operation.
- Chiller efficiency at variable loads (kW/ton).
- Cooling load.
- Air and water economizer and heat recovery cycles.
- Air distribution static pressures and ventilation air volumes.
- Boiler efficiencies.
- Building specific process energy efficiency systems and equipment.
- Indoor water risers and outdoor irrigation systems.

1

Technologies

/Strategies:

Design and specify equipment to be installed in base building systems to allow for comparison, management, and optimization of actual vs. estimated energy and water performance. Employ building automation systems to perform M&V functions where applicable. Tie contractor final payments to documented M&V system performance and include in the commissioning report. Provide for ongoing M&V system maintenance and operating plan in building operations and maintenance manuals. Consider installation/base of an Energy Management and Control System (EMCS), which is compatible with existing installation/base systems to optimize performance.

(2) © U. S. Green Building Council. Used by permission.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

### 3.0 Energy and Atmosphere (Continued)

#### 3.C6 Green Power <sup>(1)</sup>

Intent: Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.  
Requirement:  Engage in a two year contract to purchase the amount of power equal to projected building consumption generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements.

1

Technologies

/Strategies:

Purchase power from a provider that guarantees a fraction of its delivered electric power is from net nonpolluting renewable technologies. Begin by contacting local utility companies. If the project is in an open market state, investigate Green Power and Power Marketers licensed to provide power in that state. Grid power that qualifies for this credit originates from solar, wind, geothermal, biomass, or low-impact hydro sources. Low-impact hydro shall comply with the Low Impact Hydropower Certification Program.

#### 3.C7 Distributed Generation

Intent: Encourage the development and use of distributed generation technologies, which are less polluting than grid-source energy.

Requirement:  Reduce total energy usage and emissions by considering source energy implications and local cogeneration and direct energy conversion. Generate at least 50% of the building's projected annual consumption by on-site distributed generation sources.

1

Technologies

/Strategies:

Investigate the use of integrated generation and delivery systems, such as co-generation, fuel cells, micro-turbines and off-peak thermal storage.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

**4.R1 Storage & Collection of Recyclables (1)**

**Reqd.**

Intent: Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.  
Requirement:  Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.

Technologies  
/Strategies:

Establish a waste management plan which meets requirements of the installation/base environmental and/or solid waste management plans in cooperation with users to encourage recycling. Reserve space for recycling functions early in the building occupancy programming process and show areas dedicated to collection of recycled materials on space utilization plans. Broader recycling support space considerations should allow for collection and storage of the required elements and newspaper, organic waste (food and soiled paper), and dry waste. When collection bins are used, bin(s) should be able to accommodate a 75% diversion rate and be easily accessible to custodial staff and recycling collection workers. Consider bin designs that allow for easy cleaning to avoid health issues.

**4.C1 Building Reuse (1)**

Intent: Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirement: Reuse large portions of existing structures during renovation or redevelopment projects.

Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies).

1

Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies).

1

Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems).

1

Technologies  
/Strategies:

Evaluate retention of existing structure. Consider facade preservation, particularly in installation/base areas. During programming and space planning, consider adjusting needs and occupant use patterns to fit within existing building structure and interior partition configurations. Identify and effectively address energy, structural, and indoor environmental (lead & asbestos) issues in building reuse planning and deconstruction documents. Percentage of reused non-shell building portions will be calculated as the total area (s.f.) of reused walls, floor covering, and ceiling systems, divided by the existing total area (s.f.) of walls, floor covering, and ceiling systems.

**4.C2 Construction Waste Management (1)**

Intent: Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.

Requirement: Develop and implement a waste management plan, quantifying material diversion by weight:

Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste.

1

Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris.

1

Technologies  
/Strategies:

Develop and specify a waste management plan which meets requirements of the installation/base environmental and/or solid waste management plans that identifies licensed haulers and processors of recyclables; identifies markets for salvaged materials; employs deconstruction, salvage, and recycling strategies and processes, includes waste auditing; and documents the cost for recycling, salvaging, and reusing materials. Source reduction on the job site should be an integral part of the plan.

The plan should address recycling of corrugated cardboard, metals, concrete brick, asphalt, land clearing debris (if applicable), beverage containers, clean dimensional wood, plastic, glass, gypsum board, and carpet; evaluate the cost-effectiveness of recycling rigid insulation, engineered wood products and other materials; hazardous materials storage and management; and participation in manufacturers' "take-back" programs to the maximum extent possible. Refer to the LEED Reference Guide for guidelines and references that provide waste management plan development and implementation support including model bid specifications.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

#### 4.C3 Resource Reuse (2)

Intent: Extend the life cycle of targeted building materials, reducing environmental impacts related to materials manufacturing and transport.

- Requirement:  Specify salvaged or refurbished materials for 5% of building materials. 1  
 Specify salvaged or refurbished materials for 10% of building materials. 1

Technologies  
/Strategies:

Commonly salvaged building materials include wood flooring/ paneling/cabinets, doors and frames, mantels, iron work and decorative lighting fixtures, brick, masonry and heavy timbers. See the LEED Reference Guide for calculation tools and guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars\* (see exclusions) of the salvaged or refurbished material.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: In total dollar calculations, exclude; labor costs; all mechanical and electrical material and labor costs; and project overhead and fees. \*If the cost of the salvaged or refurbished material is below market value, use replacement cost to estimate the material value, otherwise use actual cost to the project.

#### 4.C4 Recycled Content (1)

Intent: Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.

Requirement:  Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. 1

Specify an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. 1

Technologies  
/Strategies:

Specify building materials containing recycled content for a fraction of total building materials. Select products and materials with supporting information from the AIA Resource Guide or the EPA Environmentally Preferable Purchasing (EPP) Program. Common building materials and products with recycled content include; wall, partition, and ceiling materials and systems; insulation; tiles and carpets; cement, concrete, and reinforcing metals; structural and framing steel. For products/materials not listed, selection should be made on the basis of EPP criterion and/or:

- Toxicity;
- Embodied energy;
- Production use of water, energy and ozone depleting substances (ODSs);
- Production limits on toxic emissions and effluents;
- Minimal, reusable or recycled/recyclable packaging;
- Impact on indoor environmental quality (IEQ);
- Installation that limits generation of waste;
- Materials that limit waste generation over their life;
- EPA guideline compliance; and
- Harvested on a sustainable yield basis.

See the LEED Reference Guide for a summary of the EPA guidelines and calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of the material that contain recycled content.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees)

(2) © U. S. Green Building Council. Used by permission.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

## 4.0 Materials and Resources (Continued)

### 4.C5 Local/Regional Materials <sup>(2)</sup>

Intent: Increase demand for building products that are manufactured locally, reducing the environmental impacts resulting from transportation, and supporting the local economy.

Requirement:  Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles. **1**  
 Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles. **1**

Technologies

/Strategies:

Specify and install regionally extracted, harvested, and manufactured building materials. Contact the state and local waste management boards for information about regional building materials. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of material that is locally or regionally manufactured.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

### 4.C6 Rapidly Renewable Materials <sup>(2)</sup>

Intent: Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly renewable materials.

Requirement:  Specify rapidly renewable building materials for 5% of total building materials. **1**

Technologies

/Strategies:

Rapidly renewable resources are those materials that substantially replenish themselves faster than traditional extraction demand (e.g. planted and harvested in less than a 10 year cycle) and do not result in significant biodiversity loss, increase erosion, air quality impacts, and that are sustainably managed. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of materials that are considered to be rapidly renewable.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

### 4.C7 Certified Wood <sup>(2)</sup>

Intent: Encourage environmentally responsible forest management.

Requirement:  Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers. **1**

Technologies

/Strategies:

Refer to the Forest Stewardship Council guidelines for wood building components that qualify for compliance to the requirements and incorporate into material selection for the project.

---

<sup>(2)</sup> © U. S. Green Building Council. Used by permission.

## 5.0 Indoor Environmental Quality (IEQ) Score 17

### 5.R1 Minimum IAQ Performance <sup>(1)</sup>

Reqd.

Intent: Establish minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.

Requirement:  Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Technologies

/Strategies:

Include proactive design details that will eliminate some of the common causes of indoor air quality problems in buildings. Introduce standards into the design process early. Incorporate references to targets in plans and specifications. Ensure ventilation system outdoor air capacity can meet standards in all modes of operation. Locate building outdoor air intakes (including operable windows) away from potential pollutants/contaminant sources such as sporulating plants (allergens), loading areas, building exhaust fans, cooling towers, sanitary vents, dumpsters, vehicular exhaust, and other sources. Include operational testing in the building commissioning report. Design cooling coil drain pans to ensure complete draining. Include measures to control and mitigate radon buildup in areas where it is prevalent. Limit humidity to a range that minimizes mold growth and promotes respiratory health.

### 5.R2 Environmental Tobacco Smoke (ETS) Control <sup>(2)</sup>

Reqd.

Intent: Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirement:  Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Technologies

/Strategies:

Prohibit smoking in the building and/or provide designated smoking areas outside the building in locations where ETS cannot reenter the building or ventilation system and away from high building occupant or pedestrian traffic.

### 5.C1 IAQ Monitoring <sup>(1)</sup>

Intent: Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.

Requirement:  Install a permanent carbon dioxide (Co<sub>2</sub>) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.

1

Technologies

/Strategies:

Install an independent system or make Co<sub>2</sub> monitoring a function of the building automation system. Situate monitoring locations in areas of the building with high occupant densities and at the ends of the longest runs of the distribution ductwork. Specify that system operation manuals require calibration of all of the sensors per manufacturer recommendations but not less than one year. Include sensor and system operational testing and initial set point adjustment in the commissioning plan and report. Also consider periodic monitoring of carbon monoxide (CO), total volatile organic compounds (TVOCs), and particulates (including PM<sub>10</sub>).

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

### 5.C2 Increase Ventilation Effectiveness (2)

Intent: Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety, and comfort.

Requirement:  For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.

1

Technologies

/Strategies:

Employ architectural and HVAC design strategies to increase ventilation effectiveness and prevent short-circuiting of airflow delivery. Techniques available include use of displacement ventilation, low velocity, and laminar flow ventilation (under floor or near floor delivery) and natural ventilation. Operable windows with an architectural strategy for natural ventilation, cross ventilation, or stack effect can be appropriate options with study of inlet areas and locations. See the LEED Reference Guide for compliance methodology guidelines.

### 5.C3 Construction IAQ Management Plan (2)

Intent: Prevent indoor air quality problems resulting from the construction/renovation process, to sustain long term installer and occupant health and comfort.

Requirement: Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999).

1

Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.

1

Technologies

/Strategies:

Specify containment control strategies including protecting the HVAC system, controlling pollutant sources, interrupting pathways for contamination, enforcing proper housekeeping and coordinating schedules to minimize disruption. Specify the construction sequencing to install absorptive materials after the prescribed dry or cure time of wet finishes to minimize adverse impacts on indoor air quality. Materials directly exposed to moisture through precipitation, plumbing leaks, or condensation from the HVAC system are susceptible to microbial contamination. Absorptive materials to protect and sequence installation include; insulation, carpeting, ceiling tiles, and gypsum products. Appoint an IEQ Manager with owner's authority to inspect IEQ problems and require mitigation as necessary.

### 5.C4 Low-Emitting Materials (2)

Intent: Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.

Requirement: Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:

Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51.

1

Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.

1

Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.

1

Composite wood or agrifiber products must contain no added urea-formaldehyde resins.

1

Technologies

/Strategies:

Evaluate and preferentially specify materials that are low emitting, non-irritating, nontoxic and chemically inert. Request and evaluate emissions test data from manufacturers for comparative products. Ensure that VOC limits are clearly stated in specifications, in General Conditions, or in each section where adhesives, sealants, coatings, carpets, and composite woods are addressed.

(2) © U. S. Green Building Council. Used by permission.

### 5.C5 Indoor Chemical and Pollutant Source Control (1)

Intent: Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

Requirement:  Design to minimize cross-contamination of regularly occupied areas by chemical pollutants:

1

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

Technologies

/Strategies:

Design to physically isolate activities associated with chemical contaminants from other locations in the building, providing dedicated systems to contain and remove chemical pollutants from source emitters at source locations. Applicable measures include eliminating or isolating high hazard areas; designing all housekeeping chemical storage and mixing areas (central storage facilities and janitors closets) to allow for secure product storage; designing copy/fax/printer/printing rooms with structural deck to deck partitions and dedicated exhaust ventilation systems; and including permanent architectural entryway system(s) to catch and hold particles to keep them from entering and contaminating the building interior.

Consider utilization of EPA registered anti-microbial treatments in carpet, textile or vinyl wall coverings, ceiling tiles or paints where microbial contamination is a concern. Utilize "breathable" wall finishes where circumstances require, to reduce moisture build-up and prevent microbial contamination. Minimize selection of fibrous materials, e.g. insulation, carpet and padding and flexible fabrics, whose exposed surfaces when exposed to the air stream or occupied space can contribute significant emissions and absorb and re-emit other contaminants over time.

### 5.C6 Controllability of Systems (2)

Intent: Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.

Requirement:  Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall.

1

- Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas.

1

Technologies

/Strategies:

Provide individual or integrated controls systems that control lighting, airflow, and temperature in individual rooms and/or work areas. Consider combinations of ambient and task lighting control and operable windows for perimeter and VAV systems for non perimeter with a 1:1: 2 terminal box to controller to occupant ratio.

### 5.C7 Thermal Comfort (2)

Intent: Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.

Requirement:  Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.

1

- Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building.

1

Technologies

/Strategies:

Integrated envelope and HVAC system design strategies that achieve thermal comfort conditions based on mean radiant temperature, local air velocity, relative humidity, and air temperature. Install and maintain a temperature and humidity monitoring system for key areas of the building (i.e., at the perimeter, and spaces provided with humidity control). This function can be satisfied by the building automation system. Specify in system operation manuals that all sensors require quarterly calibration. Include criteria verification and system operation in commissioning plan and report.

(1) Adapted material not reviewed or endorsed by U. S. Green Building Council.

(2) © U. S. Green Building Council. Used by permission.

## 5.0 Indoor Environmental Quality (IEQ) (Continued)

### 5.C8 Daylight and Views <sup>(2)</sup>

Intent: Provide a connection between indoor spaces and the outdoor environment through the introduction of sunlight and views into the occupied areas of the building.

Requirement:  Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight.

1

Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas.

1

Technologies

/Strategies:

Implement design strategies to provide access to daylight and views to the outdoors in a glare-free way using exterior sun shading, interior light shelves, and /or window treatments. Orient buildings to maximize daylighting options. Consider shallow or narrow building footprints. Employ courtyards, atriums, clerestory windows, skylights, and light shelves to achieve daylight penetration (from other than direct effect or direct rays from the sun) deep into regularly occupied areas of the building.

### 5.C9 Acoustic Environment /Noise Control

Intent: Provide appropriate acoustic conditions for user privacy and comfort.

Requirement:  Minimize environmental noise through appropriate use of insulation, sound-absorbing materials and noise source isolation.

1

Technologies

/Strategies:

Evaluate each occupied environment and determine the appropriate layout, materials and furnishings design.

### 5.C10 Facility In-Use IAQ Management Plan

Intent: Insure the effective management of facility air quality during its life.

Requirement:  Perform all of the following:

1

- Develop an air quality action plan to include scheduled HVAC system cleaning.
- Develop an air quality action plan to include education of occupants and facility managers on indoor pollutants and their roles in preventing them.
- Develop an air quality action plan to include permanent monitoring of supply and return air, and ambient air at the fresh air intake, for carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), total volatile organic compounds (TVOCs), and particulates (including PM<sub>10</sub>).

Technologies

/Strategies:

Provide action plan for periodic system maintenance, monitoring, occupant/manager training.

(2) © U. S. Green Building Council. Used by permission.

### 6.C1 Holistic Delivery of Facility

Intent: Encourage a facility delivery process that actively engages all stakeholders in the design process to deliver a facility that meets all functional requirements while effectively optimizing tradeoffs among sustainability, first costs, life cycle costs and mission requirements.

Requirement:

- Choose team leaders that are experienced in holistic delivery of facilities. 1
- Train the entire team in the holistic delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and design/engineering team members. 1
- Identify project goals and metrics. 1
- Plan and execute charrettes with team members at critical phases of the facility delivery. 1
- Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charrettes and other collaborative processes. 2
- Document required results for each phase of project deliverables that achieve the project goals and are measurable throughout the facility life span. 1

Technologies

/Strategies:

Develop performance specifications or choose competitive range of products that meet environmental criteria.

Use automated modeling and analysis tools to assess site and facility design alternatives.

Conduct life-cycle cost analysis (LCCA) in the design process according to the Federal Facilities Council Technical Report, Sustainable Federal Facilities: A Guide To Integrating Value Engineering, Life Cycle Costing, and Sustainable Development, FFC # 142, 2000.

Conduct a full ecological assessment to include soil quality, water resources and flows, vegetation and trees, wildlife habitats and corridors, wetlands, and ecologically sensitive areas to identify the least sensitive site areas for development. Evaluate space utilization/functions to reduce overall space requirements, considering networking, flextime, flexi-place, dual-use, and other strategies to reduce space requirements/optimize facility size.

## 7.C1 Operation and Maintenance

Intent: Encourage the development of a facility delivery process that enhances efficient operation and maintenance of the facility.

- Requirement:  Develop a facility operations and maintenance program to include: 2
- Commissioning instructions for all facility systems.
  - Comprehensive facility operations and maintenance instructions for system operation, performance verification procedures and results, an equipment inventory, warrantee information, and recommended maintenance schedule. The instructions should include a comprehensive, preventive maintenance program to keep all facility systems functioning as designed.
  - A periodic training program for occupants, facilities managers, and maintenance staff in all facility operations and maintenance activities.
  - Instructions on sustainable cleaning and pest control practices.
  - Develop a comprehensive site/facility recycling/waste management plan.

- Provide surfaces, furnishings, and equipment that are appropriately durable, according to life cycle cost analysis. 1

Technologies

/Strategies:

Maintain facility elements, systems and subsystems on a routine maintenance schedule to ensure integrity and longevity.

Perform scheduled cleaning and maintenance activities with nontoxic environmentally preferable cleaning products and procedures. Keep air ducts clean and free of microorganisms through a structured program of preventive maintenance. Clean lighting systems following a regular maintenance schedule to ensure optimum light output and energy efficiency.

Use pesticides and herbicides sparingly and only when necessary with preference to natural methods and materials over poisons and toxic agents.

Use automated monitors and controls for energy, water, waste, temperature, moisture, and ventilation monitors and controls. Turn off the lights, computers, computer monitors, and equipment when not in use. Enable power-down features on office equipment.

## 7.C2 Soldier and Workforce Productivity and Retention

Intent: Provide a high-quality, functional, healthy and safe work environment to promote soldier and workforce productivity and retention.

Requirement:

- Provide a high quality indoor environment to enhance user/occupant quality of life (QOL). 1
- Provide a highly functional work environment to promote user/occupant work productivity. 1
- Provide a healthy and safe work environment to sustain QOL and productivity. 1

Technologies

/Strategies:

Use a registered/certified interior designer to provide stimulating interior environments with pleasant colors, surface treatments, room proportions and ceiling heights, external views, natural lighting, and quality detailing for interior furnishings, equipment, materials and finishes. Use IES standards to provide light to occupied space with variations in level, comfortable contrasts, natural color rendition, natural/man-made, and adequate controls to optimize light aesthetic qualities. Provide occupant control of individual work areas configuration, and lighting, thermal and ventilation systems.

Collaborate with end users to identify functional and technical requirements and to perform adjacency studies.

Configure occupied space to address the specific workers/occupants functions and activities that will be carried out there. Meet TI 800-01 Design Guide requirements. Design and configure occupied space, and select furniture and equipment using human ergonomics. Identify existing user amenities, such as dining, recreation, socialization, shopping and child care facilities. Identify what amenities should be incorporated into the project or provided in the future, nearby facility. Provide ventilation air in sufficient volume free from natural and man made contaminants.

### 8.C1 Functional Life of Facility and Supporting Systems

Intent: Assess the functional life of a facility and its supporting systems to optimize the infrastructure investment.

Requirement:

- Identify how long the designed function is likely to occupy the current facility. 1
- Identify how long the envelope, structure, HVAC, plumbing, communications, electrical, and other systems are likely to last before requiring replacement or upgrade. Consider economic, functional and physical obsolescence. 1

Technologies

/Strategies:

Assess the typical or likely lifespan of the function(s) to be accommodated to forecast eventual adaptation to a different use(s). Assess the life spans of the various building systems/components to forecast their revision/replacement during the facility lifespan and design in a manner that facilitates revision/replacement.

Consider the life span of the weapon systems, doctrines, or other programs supported by the facility.

Use life cycle data and other sources to identify the life span of the embodied systems.

### 8.C2 Adaptation, Renewal and Future Uses

Intent: Encourage facility design that is responsive to change over time to maximize accommodation of future uses without creating waste and insuring maximum useful life of products.

Requirement:

- Identify possible future uses for the facility; consider alternatives that expand the list of possible future uses. AND Design the building to accommodate as wide a range of future uses, as practical. AND Design the installation of building systems to accommodate foreseeable change with a minimum amount of disruption, cost, and additional materials. 1
- Build the smallest facility necessary to meet current mission functional requirements, using the most efficient shape and form, while taking into consideration expansion capabilities and potential future mission requirements. AND Design the facility for recycling of materials and systems. 1

Technologies

/Strategies:

Create durable, long-lasting and adaptable facility shell and structural system. Create an adaptable, flexible facility design using open planning, service corridors, interstitial space, access floors, demountable walls/partitions, modular furniture and other adaptable space configuration/utilization strategies.

Select materials that are recyclable, avoiding composite materials, such as reinforced plastics and carpet fibers and backing. Consider selecting materials and labeling construction materials with identification information to facilitate recycling. Use pre-cut/pre-fabricated materials and use standard lengths and sizes (dimensional modularity) in design. Design facility systems and subsystems for reconfiguration and/or disassembly/recycling using reversible/reusable connectors.

### Facility Point Summary

<b>1.0</b>	<b>Sustainable Sites (S)</b>	<b>Score</b>	<b>0</b>	<b>Max 20</b>
1.R1	<input type="checkbox"/> Erosion, Sedimentation and Water Quality Control			[Required]
1.C1	<input type="checkbox"/> Site Selection			2
1.C2	<input type="checkbox"/> Installation/Base Redevelopment			2
1.C3	<input type="checkbox"/> Brownfield Redevelopment			1
1.C4	<input type="checkbox"/> Alternative Transportation			4
1.C5	<input type="checkbox"/> Reduced Site Disturbance			2
1.C6	<input type="checkbox"/> Stormwater Management			2
1.C7	<input type="checkbox"/> Landscape and Exterior Design to Reduce Heat Islands			2
1.C8	<input type="checkbox"/> Light Pollution Reduction			1
1.C9	<input type="checkbox"/> Optimize Site Features			1
1.C10	<input type="checkbox"/> Facility Impact			2
1.C11	<input type="checkbox"/> Site Ecology			1

<b>2.0</b>	<b>Water Efficiency (W)</b>	<b>Score</b>	<b>0</b>	<b>Max 5</b>
2.C1	<input type="checkbox"/> Water Efficient Landscaping			2
2.C2	<input type="checkbox"/> Innovative Wastewater Technologies			1
2.C3	<input type="checkbox"/> Water Use Reduction			2

<b>3.0</b>	<b>Energy and Atmosphere (E)</b>	<b>Score</b>	<b>0</b>	<b>Max 28</b>
3.R1	<input type="checkbox"/> Fundamental Building Systems Commissioning			[Required]
3.R2	<input type="checkbox"/> Minimum Energy Performance			[Required]
3.R3	<input type="checkbox"/> CFC Reduction in HVAC&R Equipment			[Required]
3.C1	<input type="checkbox"/> Optimize Energy Performance			20
3.C2	<input type="checkbox"/> Renewable Energy			4
3.C3	<input type="checkbox"/> Additional Commissioning			1
3.C4	<input type="checkbox"/> <<Deleted>>			
3.C5	<input type="checkbox"/> Measurement and Verification			1
3.C6	<input type="checkbox"/> Green Power			1
3.C7	<input type="checkbox"/> Distributed Generation			1

<b>4.0</b>	<b>Material and Resources (M)</b>	<b>Score</b>	<b>0</b>	<b>Max 13</b>
4.R1	<input type="checkbox"/> Storage & Collection of Recyclables			[Required]
4.C1	<input type="checkbox"/> Building Reuse			3
4.C2	<input type="checkbox"/> Construction Waste Management			3
4.C3	<input type="checkbox"/> Resource Reuse			3
4.C4	<input type="checkbox"/> Recycled Content			3
4.C5	<input type="checkbox"/> Local/Regional Materials			3
4.C6	<input type="checkbox"/> Rapidly Renewable Materials			1
4.C7	<input type="checkbox"/> Certified Wood			1

<b>5.0</b>	<b>Indoor Environmental Quality (IEQ) [Q]</b>	<b>Score</b>	<b>0</b>	<b>Max 17</b>
5.R1	<input type="checkbox"/> Minimum IAQ Performance			[Required]
5.R2	<input type="checkbox"/> Environmental Tobacco Smoke (ETS) Control			[Required]
5.C1	<input type="checkbox"/> IAQ Monitoring 1			1
5.C2	<input type="checkbox"/> Increase Ventilation Effectiveness 1			1
5.C3	<input type="checkbox"/> Construction IAQ Management Plan 2			2
5.C4	<input type="checkbox"/> Low-Emitting Materials 4			4
5.C5	<input type="checkbox"/> Indoor Chemical and Pollutant Source Control 1			1
5.C6	<input type="checkbox"/> Controllability of Systems 2			2
5.C7	<input type="checkbox"/> Thermal Comfort 2			2
5.C8	<input type="checkbox"/> Daylight and Views 2			2
5.C9	<input type="checkbox"/> Acoustic Environment /Noise Control 1			1
5.C10	<input type="checkbox"/> Facility In-Use IAQ Management Plan 1			1

### Facility Point Summary (Continued)

<b>6.0</b>	<b>Facility Delivery Process (P)</b>	<b>Score</b>	<b>0</b>	<b>Max 7</b>
6.C1	?? Holistic Delivery of Facility			7
<b>7.0</b>	<b>Current Mission</b>	<b>Score</b>	<b>0</b>	<b>Max 6</b>
7.C1	<input type="checkbox"/> Operation and Maintenance			3
7.C2	<input type="checkbox"/> Soldier and Workforce Productivity and Retention			3
<b>8.0</b>	<b>Future Missions</b>	<b>Score</b>	<b>0</b>	<b>Max 4</b>
8.C1	<input type="checkbox"/> Functional Life of Facility and Supporting Systems			2
8.C2	<input type="checkbox"/> Adaptation, Renewal and Future Uses			2
<b>Total Score</b>			<b>0</b>	<b>Max 100</b>

<b>SpiRiT Sustainable Project Certification Levels</b>		
	<b>SPiRiT Bronze</b>	<b>25 to 34 Points</b>
	<b>SPiRiT Silver</b>	<b>35 to 49 Points</b>
	<b>SPiRiT Gold</b>	<b>50 to 74 Points</b>
	<b>SPiRiT Platinum</b>	<b>75 to 100 Points</b>

Please forward any comments that you may have on this Sustainable Project Rating Tool, preferably by Email, to:  
Mr. Harry Goradia  
U. S. Army Corps of Engineers  
ATTN: CEMP-ET  
7701 Telegraph Road  
Alexandria, VA 22315-3862  
Phone 703-428-6460  
FAX 703-428-7903  
Email [harry.goradia@hq02.usace.army.mil](mailto:harry.goradia@hq02.usace.army.mil)  
SPiRiT Para.

**APPENDIX I**

**DEPARTMENT OF DEFENSE  
ANTI-TERRORISM STANDARDS  
FOR BUILDINGS  
(DRAFT)**

**25 JANUARY 2002**

**DRAFT**



---

---

*Department of Defense Antiterrorism  
Standards for Buildings*

*XX, 2002*

*Supersedes 16 December 1999 Interim Department of Defense Antiterrorism /  
Force Protection Construction Standards*

*The Under Secretary of Defense (Acquisition, Technology, and Logistics)*

**FOR OFFICIAL USE ONLY**

**DRAFT**

# **DRAFT**

## **FOREWORD**

**This document is issued under the authority of DoD Instruction Number 2000.16, "DoD Combating Terrorism Program Standards," which requires DoD Components to adopt and adhere to common criteria and minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats.**

**This document applies to the Office of the Secretary of Defense (OSD); the Military Departments (including their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint Staff; the Combatant Commands; the Office of the Inspector General of the Department of Defense; the Defense Agencies; the Department of Defense Field Activities; and all other organizational entities within the Department of Defense (hereafter referred to collectively as "the DoD Components").**

**The standards established by this document are minimums set for DoD. Each DoD Component may set more stringent antiterrorism construction standards to meet the specific threats in its areas of responsibility.**

**This document is effective immediately and is mandatory for use by all the DoD Components.**

**This document supersedes "Interim Department of Defense Antiterrorism/Force Protection Construction Standards," 16 December 1999, except that the Interim Standards will remain in effect for the Fiscal Year 2002 and 2003 Military Construction programs.**

**Users in the field are highly encouraged to submit comments on this document. Send recommended changes to:**

**Deputy Under Secretary of Defense (Installations and Environment)  
3400 Defense Pentagon  
Washington, DC 20301-3400**

**These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.**

**The DoD Components may obtain copies of this document through the U.S. Army Engineer District, Omaha, ATTN: CENWO-ED-ST, 12565 West Center Road, Omaha, NE 68144-3869. Other Federal Agencies may obtain copies from Department of the Army, U.S. Army Corps of Engineers, ATTN: CECW-EI, Washington, DC 20314-1000. Information in this document is exempt from mandatory public disclosure under provisions of FOIA, para. 5 USC 552(b)(2). Distribution of this document is restricted to U.S. Government agencies and their contractors only.**

**DRAFT**  
**TABLE OF CONTENTS**

	<u>Page</u>
Foreword	1
Table of Contents	2
References	3
Definitions	4
<b>CHAPTER 1 – INTRODUCTION</b>	
C1.1. General	7
C1.2. Standards and recommendations	7
C1.3. Intent	8
C1.4. Levels of protection	8
C1.5. Applicability	8
C1.6. Programming	11
C1.7. Information sensitivity	11
<b>CHAPTER 2 – PHILOSOPHY, DESIGN STRATEGIES, AND ASSUMPTIONS</b>	
C2.1. General	13
C2.2. Philosophy	13
C2.3. Design strategies	13
C2.4. Assumptions	14
<b>APPENDICES</b>	
AP1. DoD Antiterrorism Standards for New and Existing Buildings	22
AP2. Recommended Additional Antiterrorism Measures for New and Existing Buildings	32
AP3. DoD Antiterrorism Standards for Expeditionary and Temporary Structures	34
<b>FIGURES</b>	
<u>Figure</u>	<u>Page</u>
AP1.1. Standoff Distances and Building Separation – Controlled Perimeter	27
AP1.2. Standoff Distances and Building Separation – No Controlled Perimeter	27
AP3.1. Standoff Distances and Structure Separation for Expeditionary Structures	38
<b>TABLES</b>	
<u>Table</u>	<u>Page</u>
C2.1. Levels of Protection – New Buildings	18
C2.2. Levels of Protection – Existing Buildings	19
C2.3. Levels of Protection – Expeditionary and Temporary Structures	20
AP1.1. Minimum Standoff Distances and Building Separation for New and Existing Buildings	26
AP3.1. Minimum Standoff Distances and Separation for Expeditionary and Temporary Structures	37

**DRAFT**  
**REFERENCES**

- (a) Department of Defense Interim Antiterrorism / Force Protection Construction Standards, December 16, 1999 (hereby cancelled).
- (b) DoD Instruction 2000.16, DoD Antiterrorism Standards, June 14, 2001.
- (c) DoD Handbook 2000.12-H, Protection Of DoD Personnel and Activities Against Acts of Terrorism and Political Turbulence, February 1993.
- (d) American Society of Civil Engineers Standard (ANSI/ASCE) 7-98, Minimum Design Loads for Buildings and Other Structures, January 2000.
- (e) Unified Facility Criteria (UFC) 4-010-01. DoD Security Engineering Manual (Draft)
- (f) Sections 2805(a)(1) and 2805(c)(1) of Title 10, US Code
- (g) Security Engineering Working Group web site (<http://sewg.nwo.usace.army.mil>)
- (h) DoD 6055.9-STD, DoD Ammunition and Explosive Safety Standards, July 1999.

**DRAFT**  
**DL1. DEFINITIONS**

**DL1.1. Access control.** For the purposes of these standards, any combination of barriers, gates, electronic security equipment, and/or guards that can deny entry to unauthorized personnel or vehicles.

**DL1.2. Access road.** Any roadway such as a maintenance, delivery, service, emergency, or other special limited use road that is necessary for the operation of a building or structure.

**DL1.3. Billeting.** Any building or portion of a building in which 5 or more unaccompanied DoD personnel are routinely housed, including Temporary Lodging Facilities and military family housing permanently converted to unaccompanied housing. Billeting also applies to expeditionary and temporary structures with similar population densities and functions.

**DL1.4. Building hardening.** Enhanced conventional construction that mitigates threat hazards where standoff distance is limited. Building hardening may also be considered to include the prohibition of certain building materials and construction techniques.

**DL1.5. Building separation.** The distance between closest points on the exterior walls of adjacent buildings or structures.

**DL1.6. Collateral damage.** Injury to personnel or damage to buildings that are not the primary target of an attack.

**DL1.7. Container structures.** Structures built using shipping containers that are designed to withstand structural loadings associated with shipping, including Container Express (CONEX) and International Organization for Standardization (ISO) containers. Testing has shown that these structures behave similarly to buildings for the purposes of these standards.

**DL1.8. Controlled perimeter.** A physical boundary at which personnel and vehicle access is controlled at the perimeter of an installation, an area within an installation, or another area with restricted access. Where the controlled perimeter includes a shoreline and there is no defined perimeter beyond the shoreline, the boundary will be at the mean high water mark. At a minimum, access control at a controlled perimeter requires the demonstrated capability to search for and detect explosives.

**DL1.9. Conventional construction.** Building construction that is not specifically designed to resist weapons or explosives effects. Conventional construction is designed only to resist common loadings and environmental effects such as wind, seismic, and snow loads.

**DL1.10. Design Basis Threat.** The threat (aggressors, tactics, and associated weapons, tools, or explosives) against which assets within a building must be protected and upon which the security engineering design of the building is based.

**DL1.11. DoD building.** Any building or portion of a building (permanent, temporary, or expeditionary) owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD. DoD buildings are categorized within these standards as uninhabited, inhabited, primary gathering and billeting.

**DL1.12. DoD Components.** The Office of the Secretary of Defense (OSD); the Military Departments (including their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint Staff; the Combatant Commands; the Office of the Inspector General of the Department of Defense; the Defense Agencies; the DoD Field Activities; and all other organizational entities within DoD.

**DRAFT**

**DL1.13. DoD personnel.** Any U.S. military, DoD civilian, or family member thereof, host-nation employees working for DoD, or contractors occupying DoD buildings.

**DL1.14. Expeditionary structures.** Those structures intended to be inhabited for no more than 1 year after they are erected. This group of structures typically include tents, Small and Medium Shelter Systems, Expandable Shelter Containers (ESC), ISO and CONEX containers, and General Purpose (GP) Medium tents and GP Large tents, etc.

**DL1.15. Fabric covered/metal frame construction.** A construction type that can be identified by a metal, load-bearing frame (usually aluminum) with some type of fabric (such as canvas) stretched or pulled over the frame. Examples of the types of structures that should be considered under this classification of structures include Frame-Supported Tensioned Fabric Structures (FSTFS); Tent, Extendable, Modular, PERSONNEL (TEMPER Tents); and Small and Medium Shelter Systems (SSS and MSS); and air supported fabric structures. Testing has shown that for these fabric structures, the frame is what causes hazards.

**DL1.16. Family housing.** DoD buildings used as quarters for DoD personnel and their dependents.

**DL1.17. Glazing.** The part of a window or door assembly that normally transmits light, but not air.

**DL1.18. Inhabited building.** Buildings or portions of buildings routinely occupied by five or more DoD personnel and with a population density of greater than one person per 40 gross square meters (430 gross square feet). This density generally excludes industrial, maintenance, and storage facilities, except for more densely populated portions of those buildings such as administrative areas. The inhabited building designation also applies to expeditionary and temporary structures with similar population densities. In a building that meets the criterion of having five or more personnel, with portions that do not have sufficient population densities to qualify as inhabited buildings, those portions that have sufficient population densities will be considered inhabited buildings while the remainder of the building may be considered uninhabited, subject to provisions of these standards. An example would be a hangar with an administrative area within it. The administrative area would be treated as an inhabited building while the remainder of the hangar could be treated as uninhabited. (Note: This definition differs significantly from the definition for inhabited building used by reference h and is not construed to be authorization to deviate from criteria of reference h.)

**DL1.19. Laminated glass.** Multiple sheets of glass bonded together by a bonding interlayer.

**DL1.20. Level of protection.** The degree to which an asset (person, equipment, object, etc.) is protected against injury or damage from an attack.

**DL1.21. Mass notification.** Capability to provide real-time information to all building occupants or personnel in the immediate vicinity of a building during emergency situations.

**DL1.22. Medical transitional structures and spaces.** Structures that are erected or leased for temporary occupancy to maintain mission-critical medical care during construction, renovation, modification, repair or restoration of an existing medical structure. Examples include urgent, ambulatory, and acute care operations.

**DL1.23. Parking.** Designated areas where vehicles may be left unattended.

**DL1.24. Primary gathering building.** Inhabited buildings routinely occupied by 50 or more DoD personnel and family housing with 13 or more family units per building. This designation applies to the entire portion of a building that meets the population density requirements for an inhabited building. For

## DRAFT

example, an inhabited building that has an area within it with 50 or more personnel is a primary gathering building in its entirety. The primary gathering building designation also applies to expeditionary and temporary structures with similar population densities.

**DL1.25. Progressive collapse.** A chain reaction failure of building members to an extent disproportionate to the original localized damage. Such damage may result in upper floors of a building collapsing onto lower floors.

**DL1.26. Roadways.** Any surface intended for motorized vehicle traffic.

**DL1.27. Routinely occupied.** For the purposes of these standards, an established or predictable pattern of activity within a building that terrorists could recognize and exploit.

**DL1.28. Security engineering.** The process of identifying practical, risk managed short and long-term solutions to reduce and/or mitigate dynamic manmade hazards by integrating multiple factors, including construction, equipment, manpower, and procedures.

**DL1.29. Specific threat.** Known or postulated aggressor activity focused on targeting a particular asset.

**DL1.30. Standoff distance.** A distance maintained between a building or portion thereof and the potential location for an explosive detonation.

**DL1.31. Structure group.** A cluster of expeditionary or temporary structures consisting of multiple rows of individual structures with 200 or fewer DoD personnel.

**DL1.32. Structural glazed window systems.** Window systems in which glazing is bonded to the window frame using an adhesive such as a high-strength, high-performance silicone sealant.

**DL1.33. Superstructure.** The supporting elements of a building above the foundation.

**DL1.34. Temporary structures.** Those structures that are erected with an expected occupancy of 3 years or less. This group of structures typically includes wood frame and rigid wall construction, but is not limited to such things as Southeast Asia (SEA) Huts, hardback tents, ISO and CONEX containers, pre-engineered buildings, trailers, stress tensioned shelters, Expandable Shelter Containers (ESC), and Aircraft Hangars (ACH).

**DL1.35. TNT equivalent weight.** The weight of TNT (trinitrotoluene) that has an equivalent energetic output to that of a different weight of another explosive compound.

**DL1.36. Transitional structures and spaces.** Structures or spaces within buildings that are used to temporarily relocate occupants of another building while that building undergoes renovations, modifications, repairs, or restorations.

**DL1.37. Unobstructed space.** Space within 10 meters (33 feet) of an inhabited building that does not allow for concealment from observation of explosive devices 150 mm (6 inches) or greater in height.

# DRAFT

## C1. CHAPTER 1

### INTRODUCTION

**C1.1. GENERAL.** This document represents a significant commitment by DoD to seek effective ways to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel in the buildings in which they work and live.

**C1.1.1. Dynamic threat environment.** Terrorism is real, evolving, and continues to increase in frequency and lethality throughout the world. The unyielding, tenacious, and patient nature of the terrorists targeting DoD interests forces us to closely examine existing policies and practices for deterring, disrupting, and mitigating potential attacks. Today, terrorist attacks can impact anyone, at any time, at any location, and can take many forms. Deterrence against terrorist attacks begins with properly trained and equipped DoD personnel employing effective procedures. While terrorists have many tactics available to them, they frequently use explosive devices when they target large numbers of DoD personnel. Most existing DoD buildings offer little protection from terrorist attacks. By applying the DoD Antiterrorism Standards for Buildings described in this document, we become a lesser target of opportunity for terrorists.

**C1.1.2. Responsibility.** The heads of the DoD Components shall ensure compliance with these standards, but it is ultimately the commanders' responsibility to manage and mitigate the risk of DoD personnel being killed or injured in a terrorist attack. All DoD personnel have an inherent responsibility to minimize opportunities for terrorists to target them, their co-workers, and their families. Other critical DoD assets must also be identified and similarly safeguarded, but protection of those assets is beyond the scope of these standards. Within the range of potential threats and site-specific issues and constraints, available personnel and resources must be properly focused, synchronized, and integrated before effective measures can be identified, implemented, and refined for each installation and activity.

**C1.1.3. Planning and integration.** When the best procedures, proper training, and appropriate equipment fail to deter terrorist attacks, adherence to these standards goes far in mitigating the possibility of mass casualties from terrorist attacks against DoD personnel in the buildings in which they work and live. Although predicting the specific threat to everyone is not possible, proper planning and integration of those plans provides a solid foundation for preventing, and if necessary reacting, when terrorist incidents or other emergencies unfold. An effective planning process facilitates the necessary decision making, clarifies roles and responsibilities, and ensures support actions generally go as planned. This planning process is executed by a team consisting of people from the chain of command and key personnel from all appropriate functional areas who have an interest in the building and its operation. The team should include, as a minimum, antiterrorism/force protection, intelligence, security, and facility engineering personnel. This team is responsible for identifying requirements for the project, facilitating the development of supporting operational procedures, obtaining adequate resources, and properly supporting all other efforts needed to prudently enhance protection of the occupants of every inhabited DoD building. For further information on planning and integration, refer to the DoD Security Engineering Manual.

**C1.2. STANDARDS AND RECOMMENDATIONS.** Mandatory DoD antiterrorism standards for new and existing inhabited buildings are contained in Appendix AP1. Additional recommended measures for new and existing inhabited buildings are included in Appendix AP2. Mandatory DoD antiterrorism standards for expeditionary and temporary structures are contained in Appendix AP3.

**C1.3. INTENT.** The intent of these standards is to minimize the possibility of mass casualties in buildings or portions of buildings owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD. These standards provide appropriate, implementable, and enforceable measures

## DRAFT

to establish a level of protection against terrorist attacks for all inhabited DoD buildings where no known threat of terrorist activity currently exists. While complete protection against all potential threats for every inhabited building is cost prohibitive, the intent of these standards can be achieved through prudent master planning, real estate acquisition, and construction practices. Where the minimum standoff distances detailed in these standards are met, most conventional construction techniques can be used with only marginal impact on the total construction or renovation cost. The financial impact of these standards will be significantly less than the economic and intangible costs of a mass casualty event.

**C1.4. LEVELS OF PROTECTION.** The levels of protection provided by these standards meet the intent described above and establish a foundation for the rapid application of additional protective measures in a higher threat environment. These standards may be supplemented where specific terrorist threats are identified, where more stringent local standards apply, or where local commanders dictate additional measures. Detailed descriptions of the levels of protection are provided in Chapter 2 and the DoD Security Engineering Manual.

**C1.4.1. DoD Component standards.** Where DoD Component standards such as geographic Commander in Chief (CINC) standards address unique requirements, those standards will be incorporated in accordance with their implementing directives, but not to the exclusion of these standards.

**C1.4.2. Threat-specific requirements.** Where a design basis threat is identified whose mitigation requires protective measures beyond those required by these standards or DoD Component standards, those measures will be developed in accordance with the provisions of the DoD Security Engineering Manual. The provisions of the DoD Security Engineering Manual include the design criteria that will be the basis for the development of the protective measures, estimates of the costs of those measures, and detailed guidance for developing the measures required to mitigate the identified threat. The design criteria include the assets to be protected, the threat to those assets, and the desired level of protection. Use of the DoD Security Engineering Manual will ensure uniform application, development, and cost estimation of protective measures throughout DoD.

**C1.4.3. Critical facilities.** Buildings that must remain mission operational during periods of national crisis and/or if subjected to terrorist attack should be designed to significantly higher levels of protection than those provided by these standards.

**C1.4.4. Explosive Safety Standards.** These antiterrorism standards establish criteria to minimize the potential for mass casualties and progressive collapse from a terrorist attack. The DoD Explosive Safety Standards (reference h) as implemented by Service component explosive safety standards, establish acceptable levels of protection for accidental explosions of DoD-titled munitions. The explosive safety and antiterrorism standards address hazards associated with unique events; therefore, they specify different levels of protection. Compliance with both standards is required. Where conflicts arise, the more stringent criteria will govern.

**C1.5. APPLICABILITY.** These standards apply to all DoD Components, to all DoD inhabited buildings, and to all DoD expeditionary and temporary structures in accordance with the following:

**C1.5.1. New construction.** Implementation of these standards is mandatory for all new construction regardless of funding source in accordance with the following:

**C1.5.1.1. Military Construction (MILCON).** These standards apply to MILCON projects starting with the Fiscal Year 2004 Program. Projects programmed or designed under the DoD Interim Antiterrorism / Force Protection Construction Standards do not have to be reprogrammed or redesigned to meet the requirements of these standards. The provisions of the Interim Standards will

**DRAFT**

apply to those projects. Due to minor changes between these standards and the Interim Standards, projects prior to the Fiscal Year 2004 Program should comply with these standards where possible.

**C1.5.1.2. Host-nation and other foreign government funding.** These standards apply to new construction funded under host-nation agreements or from other funding sources starting in Fiscal Year 2004 or as soon as negotiations with the foreign governments can be completed.

**C1.5.1.3. Other funding sources.** These standards apply to all new construction projects funded by sources other than MILCON (such as Non-Appropriated Funds, Operations and Maintenance, and Working Capital Funds) starting with Fiscal Year 2004. Projects funded prior to that fiscal year should comply with these standards where possible.

**C1.5.2. Existing buildings.** These standards will apply to existing facilities starting with the Fiscal Year 2004 program when triggered as specified below, regardless of funding source. Projects funded prior to that fiscal year should comply with these standards where possible.

**C1.5.2.1. Major investments.** Implementation of these standards to bring an entire building into compliance is mandatory for all DoD building renovations, modifications, repairs, and restorations where those costs exceed 50% of the replacement cost of the building except as otherwise stated in these standards. The 50% cost is exclusive of the costs identified to meet these standards. Where the 50% threshold is not met, compliance with these standards is recommended.

**C1.5.2.2. Conversion of use.** Implementation of these standards is mandatory when any portion of a building is modified from its current use to that of an inhabited building, billeting, or a primary gathering building for one year or more. Examples would include a warehouse (uninhabited) being converted to administrative (inhabited) use and an uninhabited administrative building being converted to a primary gathering building or billeting.

**C1.5.2.3. Glazing replacement.** Because of the significance of glazing hazards in a blast environment, implementation of the glazing provisions of these standards is mandatory for existing inhabited buildings within any planned window or door glazing replacement project. Such replacements may require window frame modification or replacement.

**C1.5.3. Building additions.** Additions to existing inhabited buildings shall comply with the standards for new construction. If the addition is 50% or more of the gross area of the existing building, the existing building shall comply with the standards for existing buildings.

**C1.5.4. Leased buildings.** DoD personnel occupying leased buildings deserve the same level of protection as those in DoD-owned buildings. Implementation of these standards is therefore mandatory for all facilities leased for DoD use and for those buildings in which DoD receives a space assignment from another government agency. This requirement is intended to cover all situations, including General Services Administration space, privatized buildings, and host-nation and other foreign government buildings. This requirement is applicable for all new leases executed after 1 October 2005 and to renewal or extension of any existing lease after 1 October 2009. Leases executed prior to the above fiscal years will comply with these standards where possible.

**C1.5.4.1. Partial occupancy.** These standards only apply where DoD personnel occupy leased or assigned space constituting at least 25% of the net interior useable area or the area as defined in the lease, and they only apply to that portion of the building that is occupied by DoD personnel.

**C1.5.4.2. New buildings.** Buildings that are built to lease to DoD as of the effective date established above shall comply with the standards for new construction.

## DRAFT

**C1.5.4.3. Existing buildings.** For new leases of existing buildings or renewals of leases, the standards for existing buildings shall apply in accordance with the effective dates established above. For those existing buildings, protective measures other than those specified in this standard may be used if they provide equivalent levels of protection to those required by this standard. Refer to the DoD Security Engineering Manual for guidance on mitigating measures.

**C1.5.5. Expeditionary and Temporary Structures.** Implementation of these standards is mandatory for all expeditionary and temporary structures that meet the occupancy criteria for inhabited or primary gathering buildings or billeting. See Appendix AP3 for structure types that meet the expeditionary and temporary structures criteria.

**C1.5.5.1. New structures.** These standards apply to all new expeditionary sites effective immediately.

**C1.5.5.2. Existing structures.** These standards will apply to all existing expeditionary activities beginning in Fiscal Year 2004. Prior to that fiscal year, existing expeditionary structures should comply with these standards where possible.

**C1.5.6. National Guard Buildings.** Any National Guard building that uses Federal funding for new construction, renovations, modifications, repairs, restorations, or leasing and that meets the applicability provisions above, will comply with these standards.

**C1.5.6. Exemptions.** Unless DoD Components dictate otherwise, the following buildings are exempt from requirements of these standards as specified below. However, compliance with these standards for those buildings is recommended where possible. Exemptions to elements of individual standards are included in the text of those standards in appendix AP1. The rationale for all exemptions is detailed in chapter 2.

**C1.5.6.1. Family housing with 12 units or fewer per building.** These buildings are exempt from all provisions of these standards.

**C1.5.6.2. Stand-alone franchised food operations.** These buildings are exempt from standoff distances to parking and roadways. All other standards apply.

**C1.5.6.3. Stand alone shoppettes, mini marts and similarly sized commissaries.** These buildings are exempt from standoff distances to parking and roadways. All other standards apply.

**C1.5.6.4. Gas stations and car care centers.** These facilities are exempt from all provisions of these standards.

**C1.5.6.5. Medical transitional structures and spaces.** These structures are exempt from standoff distances to parking and roadways. All other standards apply.

**C1.5.6.6. Other transitional structures and spaces.** Transitional structures and spaces that will be occupied for less than one year and that are not billeting, primary gathering buildings, or medical transitional structures, are exempt from standoff distances to parking and roadways. All other standards apply.

**C1.5.6.7. Recruiting stations in leased spaces.** Recruiting stations located in leased spaces are exempt from all provisions of these standards.

**DRAFT****C1.6. PROGRAMMING.**

**C1.6.1. Documentation.** The inclusion of these standards into DoD construction or the inclusion of protective measures above the requirements of these standards will be incorporated into the appropriate construction programming documents (such as the DD Form 1391) in accordance with DoD Component guidance. Refer to the DoD Security Engineering Manual for guidance on the costs for implementing these standards and for providing protective measures beyond these standards.

**C1.6.2. Funding Thresholds.** For existing buildings, the DoD AT Standards for Buildings are intended solely to correct design deficiencies to appropriately address emergent life-threatening terrorist risks. As a result, funding thresholds for Unspecified Minor Military Construction and Operations and Maintenance funding may be increased in accordance with 10 USC Sections 2805(a)(1) and 2805 (c)(1).

**C1.7. INFORMATION SENSITIVITY.** Some information in this standard is exempt from mandatory disclosure under the Freedom of Information Act. The sensitive information that is exempt is the explosive weights upon which the minimum standoff distances are based. Allowing potential aggressors to know the minimum explosive weights that all DoD inhabited buildings are designed to resist could constitute a vulnerability. To minimize the possibility of that information being used against DoD personnel, the following provisions apply:

**C1.7.1. Distribution.** Follow governing DoD and Component guidance for specific requirements for handling and distribution of For Official Use Only information. In general, distribution of this document is authorized only to U.S. Government agencies and their contractors, although portions of the document that are not indicated to be For Official Use Only can be removed from the document and may be distributed to the public without limitation. In addition, where it is within Status of Forces Agreements (SOFA) or other similar information exchange agreements, the information in this standard may be distributed to host-nation elements for the purposes of their administration and design of host-nation funded or designed construction.

**C1.7.2. Posting to the Internet.** Because this document is For Official Use Only it cannot be posted in its entirety to any web site that is accessible to the general public. It can, however, be posted if the For Official Use Only information is removed (Tables AP1.1 and AP3.1) In addition, other documents that include information from this standard that is identified as For Official Use Only cannot be posted to web sites accessible to the general public. For Official Use Only information may be posted to protected, non-publicly accessible web sites that comply with standards established by DoD for administration of web sites.

**C1.7.3. Plans and specifications.** Construction plans and specifications should include only that information from this document that is necessary for a contractor to develop a bid on a project. The explosive weights used in these standards shall not be entered into the plans and specifications unless the plans and specifications are properly safeguarded. Plans and specifications may be posted to the Internet in accordance with existing DoD Component guidance, but such documents will not include For Official Use Only information. All plans and specifications for inhabited buildings shall include an annotation that cites the version of this standard that was used for design.

**C1.7.4. Design – build contracts.** Where design – build contracts are employed, prospective contractors will be responsible for developing a design proposal for that project that may be impacted by provisions of these standards. Where that is the case, consider alternate means to provide sufficient information to support their proposals. Consider for example, either specifying specific design loads or specifying the required standoff distance and providing candidate structural systems that would allow for mitigation of the applicable explosive if that standoff was less than the minimum. Once the design – build contract is awarded the contractor will be eligible to receive this complete document for use in the

**DRAFT**

development of the final design package, but that contractor will be responsible for protecting the integrity of the information throughout the contract and through any subcontracts into which that contractor might enter.

**DRAFT**  
**C2. CHAPTER 2**

**PHILOSOPHY, DESIGN STRATEGIES, AND ASSUMPTIONS**

**C2.1. GENERAL.** The purpose of this chapter is to clarify the philosophy on which these standards are based, the assumptions inherent in their provisions, and the design strategies that are their foundation. Effective implementation of these standards depends on a reasonable understanding of the rationale for them. With this understanding, engineers and security and antiterrorism personnel can maximize the efficiency of their solutions for complying with the standards while considering site-specific issues and constraints.

**C2.2. PHILOSOPHY.** The overarching philosophy upon which this document is based is that comprehensive protection against the range of possible threats may be cost prohibitive, but that an appropriate level of protection can be provided for all DoD personnel at a reasonable cost. That level of protection is intended to lessen the risk of mass casualties resulting from terrorist attacks. Full implementation of these standards will provide some protection against all threats and will significantly reduce injuries and fatalities for the threats upon which these standards are based. The costs associated with those levels of protection are assumed to be less than the physical and intangible costs associated with incurring mass casualties. Furthermore, given what we know about terrorism, all DoD decision makers must commit to making smarter investments with our scarce resources and stop investing money in inadequate buildings that DoD personnel will have to occupy for decades, regardless of the threat environment. There are three key elements of this philosophy that influence the implementation of these standards.

**C2.2.1. Time.** Protective measures needed to provide the appropriate level of protection must be in place prior to the initiation of a terrorist attack. Incorporating those measures into DoD buildings is least expensive at the time those buildings are either being constructed or are undergoing major renovation, repair, restoration, or modification.

**C2.2.2. Master planning.** Many of these standards significantly impact master planning. The most significant such impact will be in standoff distances. If standoff distances are not “reserved” they will be encroached upon and will not be available should they become necessary in a higher threat environment. The master planning implications of these standards are not intended to be resolved overnight. They should be considered to be a blueprint for facilities and installations that will be implemented over decades as those facilities and installations evolve.

**C2.2.3. Design practices.** The philosophy of these standards is to build greater resistance to terrorist attack into all inhabited buildings. That philosophy affects the general practice of designing inhabited buildings. While these standards are not based on a known threat, they are intended to provide the easiest and most economical methods to minimize injuries and fatalities in the event of a terrorist attack. The primary methods to achieve this outcome are to maximize standoff distance, to construct superstructures to avoid progressive collapse, and to reduce flying debris hazards. These and related design issues are intended to be incorporated into standard design practice in the future.

**C2.3. DESIGN STRATEGIES.** There are seven major design strategies that are applied throughout these standards. They do not account for all of the measures considered in the standards, but they were the most effective and economical in protecting DoD personnel from terrorist attacks. These strategies are summarized below.

**C2.3.1. Maximize standoff distance.** The primary design strategy is to keep terrorists as far away from inhabited DoD buildings as possible. The easiest and least costly opportunity for achieving the appropriate levels of protection against terrorist threats is to incorporate sufficient standoff distance

## DRAFT

into project designs. While sufficient standoff distance is not always available to provide the minimum standoff distances required for conventional construction, maximizing the available standoff distance always results in the most cost-effective solution. Maximizing standoff distance also ensures that there is opportunity in the future to upgrade buildings to meet increased threats or to accommodate higher levels of protection.

**C2.3.2. Prevent building collapse.** Provisions relating to preventing building collapse and building component failure are essential to effectively protecting building occupants, especially from fatalities. Designing those provisions into buildings during new construction or retrofitting during major renovations, repairs, restorations, or modifications of existing buildings is the most cost effective time to do that. In addition, structural systems that provide greater continuity and redundancy among structural components will help limit collapse in the event of severe structural damage from unpredictable terrorist acts.

**C2.3.3. Minimize hazardous flying debris.** In past explosive events where there was no building collapse, a high number of injuries resulted from flying glass fragments and debris from walls, ceilings, and fixtures (non-structural features). Flying debris can be minimized through building design and avoidance of certain building materials and construction techniques. The glass used in most windows breaks at very low blast pressures, resulting in hazardous, dagger-like shards. Minimizing those hazards through reduction in window numbers and sizes and through window construction has a major effect on limiting mass casualties. Window and door designs must treat glazing, frames, connections, and the structural components to which they are attached as an integrated system. Hazardous fragments may also include secondary debris such as those from barriers and site furnishings.

**C2.3.4. Provide effective building layout.** Effective design of building layout and orientation can significantly reduce opportunities for terrorists to target building occupants or injure large numbers of people.

**C2.3.5. Limit airborne contamination.** Effective design of heating, ventilation, and air conditioning (HVAC) systems can significantly reduce the potential for chemical, biological, and radiological agents being distributed throughout buildings.

**C2.3.6. Provide mass notification.** Providing a timely means to notify building occupants of threats and what should be done in response to those threats reduces the risk of mass casualties.

**C2.3.7. Facilitate future upgrades.** Many of the provisions of these standards facilitate opportunities to upgrade building protective measures in the future if the threat environment changes.

**C2.4. ASSUMPTIONS.** Several assumptions form the foundation for these standards.

**C2.4.1. Baseline threat.** The location, size, and nature of terrorist threats are unpredictable. These standards are based on a specific range of assumed threats that provides a reasonable baseline for the design of all inhabited DoD buildings. Designing to resist baseline threats will provide general protection today and will establish a foundation upon which to build additional measures where justified by higher threats or where the threat environment increases in the future. While those baseline threats are less than some of the terrorist attacks that have been directed against U.S. personnel in the past, they represent more severe threats than a significant majority of historical attacks. It would be cost prohibitive to provide protection against the worst-case scenario in every building. The terrorist threats addressed in these standards are further assumed to be directed against DoD personnel. Threats to other assets and critical infrastructure are beyond the scope of these standards, but they are addressed in the DoD Security Engineering Manual. The following are the terrorist tactics upon which these standards are based:

## DRAFT

**C2.4.1.1. Explosives.** The baseline explosive weights are identified in Tables AP1.1 and AP3.1 as explosive weights I, II, and III. Their means of delivery are discussed below.

**C2.4.1.1.1. Vehicle bombs.** For the purposes of these standards, the vehicle bomb is assumed to be a stationary vehicle bomb. The sizes of the explosives in the vehicle bombs associated with explosive weight I (in equivalent weight of TNT) are likely to be detected in a vehicle during a search. Therefore, explosive weight I is the basis for the standoff distances associated with the controlled perimeter. The quantity of explosives associated with explosive weight II is assumed to be able to enter the controlled perimeter undetected; therefore, explosive weight II is the basis for the standoff distances for roadways and parking. Explosive weight II was selected because it represents a tradeoff between likelihood of detection and the risk of injury or damage.

**C2.4.1.1.2. Waterborne vessel bombs.** For the purposes of these standards, waterborne vessels will also be assumed to contain quantities of explosives associated with explosive weight I. That weight was selected because areas beyond the shoreline are assumed not to be controlled perimeters.

**C2.4.1.1.3. Placed bombs.** Hand-carried explosives placed near buildings can cause significant localized damage, potentially resulting in injuries or fatalities. It is assumed that aggressors will not attempt to place explosive devices in areas near buildings where those devices could be visually detected by building occupants casually observing the area around the building. It is also assumed that there will be sufficient controls to preclude bombs being brought into buildings. Explosive weight II is assumed to be placed by hand either in trash containers or in the immediate vicinity of buildings. That quantity of explosives is further assumed to be built into a bomb 150 millimeters (6 inches) or greater in height.

**C2.4.1.1.4. Mail bombs.** Explosives in packages delivered through the mail can cause significant localized damage, injuries, and fatalities if they detonate inside a building. No assumption as to the size of such explosives is made in these standards. Provisions for mail bombs are limited to locations of mailrooms so that they can be more readily hardened if a specific threat of a mail bomb is identified in the future.

**C2.4.1.2. Indirect fire weapons.** For the purpose of these standards, indirect fire weapons are assumed to be military mortars with fragmentation rounds containing explosives equivalent to explosive weight III in Tables AP1.1 and AP3.1. Protection against the effects of such rounds on an individual building is not considered practical as a minimum standard; therefore, these standards are intended to limit collateral damage to adjacent buildings from these weapons.

**C2.4.1.3. Small arms.** Small arms include weapons that fire rounds of a wide variety of calibers. Some standards in this document are predicated on a small arms threat. Provisions of those standards are based on the assumption that those weapons will be fired from vantage points outside the control of an installation or facility. Obscuration or screening that minimizes targeting opportunities is assumed to be the primary means of protecting DoD personnel from these weapons in these standards.

**C2.4.1.4. Chemical, biological, and radiological weapons.** For the purposes of these standards, these weapons are assumed to be improvised weapons containing airborne agents employed by terrorists. These standards do not assume comprehensive protection against this threat. They provide means to reduce the potential for widespread dissemination of such agents throughout a building in the event of an attack.

**C2.4.2. Controlled perimeter.** These standards assume that procedures are implemented to search for and detect explosives to limit the likelihood that a vehicle carrying quantities of explosives

## DRAFT

equivalent to explosive weight I in Tables AP1.1 and AP3.1 could penetrate a controlled perimeter undetected. It is further assumed that access control will include provisions to reject vehicles without penetrating the controlled perimeter.

**C2.4.3. Levels of protection.** The potential levels of protection are described in Tables C2.1, C2.2, and C2.3. These standards provide a **Low** level of protection for billeting and primary gathering buildings and a **Very Low** level of protection for other inhabited buildings. Greater protection is provided for primary gathering buildings and billeting because of the higher concentration of personnel and the more attractive nature of the target. If the minimum standoff distances are provided, or if mitigating measures are provided to achieve an equivalent level of protection, and if the threats are no greater than those indicated in Tables AP1.1 and AP3.1, the risk of injuries and fatalities will be minimized. Threats higher than those envisioned in Tables AP1.1 and AP3.1 will increase the likelihood of injuries and fatalities regardless of the level of protection. Refer to the DoD Security Engineering Manual for detailed guidance on levels of protection and how to achieve them for a wide range of threats.

**C2.4.4. Minimum standoff distances.** The minimum standoff distances identified in Tables AP1.1 and AP3.1 were developed to provide survivable structures for a wide range of conventionally constructed buildings and expeditionary/temporary structures. These buildings range from tents and wood framed buildings to reinforced concrete buildings. For a more detailed discussion of this issue, refer to the DoD Security Engineering Manual.

**C2.4.4.1. Conventional construction without analysis.** The standoff distances in the “Conventional Construction Without Analysis” column in Table AP1.1 are based on explosive safety considerations that have been developed based on years of experience and observation. Those standoff distances may be conservative for heavy construction such as reinforced concrete or reinforced masonry; however, they may be just adequate for lighter-weight construction.

**C2.4.4.2. Conventional construction with analysis.** Because standoff distances from the “Conventional Construction Without Analysis” column of Table AP1.1 may be overly conservative for some construction types, these standards allow for the adjustment of standoff distances based on the results of a structural analysis considering the applicable explosive weights in Table AP1.1. Even if such an analysis suggests a standoff distance of less than those shown in the “Conventional Construction With Analysis” column of Table AP1.1, standoff distances of less than those in that column are not allowed to ensure there is a minimal standoff distance “reserved” to accommodate future upgrades that could be necessitated by an emerging threat. In addition, the 10 meter (33 feet) minimum is established to ensure there is no encroachment on the unobstructed space.

**C2.4.4.3. Temporary and expeditionary construction.** The standoff distances in Table AP3.1 are based on blast testing conducted against TEMPER Tents, SEA Huts, General Purpose Shelters, and Small Shelter Systems. With adequate analysis those distances may be able to be reduced without requiring mitigating measures.

**C2.4.5. Exempted building types.** Even though personnel in these buildings deserve a level of protection equivalent to that provided for other DoD personnel, for the reasons below some building types are exempted from some or all of these standards. The standards should be applied to the exempted building types where possible.

**C2.4.5.1. Family housing.** The exemption of family housing with 12 units or fewer in a single building acknowledges that the density of such units is generally low, reducing the likelihood of mass casualties. It also acknowledges the fact that family housing has rarely been directly targeted by terrorists. A further assumption for existing family housing with 13 or more units per building is that by

## DRAFT

designating parking spaces for specific residents or residences, the risk of parking vehicle bombs in those parking areas is reduced due to increased awareness of the vehicles that are authorized to park there.

**C2.4.5.2. Shoppettes, mini marts, similarly sized commissaries and stand-alone franchised food operations.** These facilities by the nature of their smaller size and their operation require parking in close proximity; therefore, they are exempted from the minimum standoff distances for parking and roadways. Applying other upgrades required by these standards is feasible, however, and will lessen the risk of mass casualties.

**C2.4.5.3. Gas stations and car care centers.** These facilities are exempted from these standards because, by the nature of their operation, cars must be allowed to be in close proximity to them. Other measures included in these standards would be ineffective in the absence of any control on vehicles. In addition, these facilities are not routinely occupied by five or more personnel.

**C2.4.5.4. Medical transitional structures and spaces.** These structures and spaces may be required for limited durations to maintain mission-critical operations during construction that require close proximity or physical connection to the existing building undergoing construction. This may make compliance with some of the standoff distance provisions of these standards impractical during the limited construction duration.

**C2.4.5.5. Other transitional structures and spaces.** These structures and spaces are exempted from some of the standoff distance provisions of these standards because it would be impractical to apply them considering the limited less-than-1-year duration of occupancy.

**C2.4.5.6. Recruiting stations in leased spaces.** These facilities are exempted because their visibility and accessibility necessitate their being located in public spaces, which makes requiring them to comply with these standards impractical. In addition, the majority of these facilities do not have a sufficient population and population density to meet the inhabited building standard.

**C2.4.6. Policies and procedures.** Policies and procedures are a critical adjunct to building standards. It is assumed that there are means to control access to controlled perimeters, underground parking, and other locations where vehicle access needs to be limited. It is further assumed that unusual packages or containers or improperly parked vehicles will be recognized as potential terrorist threats and appropriate reactive measures will be implemented to reduce the potential for casualties. Finally, it is assumed that policies and procedures will be developed to support these and other related issues and that those policies and procedures will be incorporated into antiterrorism plans, training, and exercises.

**C2.4.7. Design codes.** It is assumed that the provisions of these standards will be coordinated with all other applicable building and design codes and Federal building policies. Nothing in these standards should be interpreted to supercede the provisions of any other applicable building or design code. Where other codes mandate more stringent requirements, it is assumed that the provisions of those codes will be followed.

**DRAFT**

Table C2.1 Levels of Protection – New Buildings

<b>Level of Protection</b>	<b>Potential Structural Damage</b>	<b>Potential Door and Glazing Hazards</b>	<b>Potential Injury</b>
<b>Below AT standards</b>	Severely damaged. Frame collapse/massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
<b>Very Low</b>	Heavily damaged - onset of structural collapse: Major deformation of primary and secondary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
<b>Low</b>	Damaged – unrepairable. Major deformation of non-structural elements and secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely.	Glazing will break, but fall within 1 meter of the wall or otherwise not present a significant fragment hazard. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
<b>Medium</b>	Damaged – repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
<b>High</b>	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

**DRAFT**

Table C2.2 Levels of Protection – Existing Buildings

<b>Level of Protection</b>	<b>Potential Structural Damage</b>	<b>Potential Door and Glazing Hazards</b>	<b>Potential Injury</b>
<b>Below AT standards</b>	Severely damaged. Frame collapse/massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
<b>Very Low</b>	Heavily damaged - onset of structural collapse: Major deformation of primary structural members, but progressive collapse is unlikely. Collapse of secondary structural members and non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
<b>Low</b>	Damaged – unrepairable. Major deformation of secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, but should result in survivable glazing fragment injuries. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
<b>Medium</b>	Damaged – repairable. Minor deformations of secondary structural members and no permanent deformation in primary structural members. Major deformation of non-structural elements.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
<b>High</b>	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

**DRAFT**

<b>Table C2.3 Levels of Protection – Expeditionary and Temporary Structures</b>		
<b>Level of Protection</b>	<b>Potential Structural Damage</b>	<b>Potential Injury</b>
<b>Below AT Standards</b>	Severely damaged. Frame collapse/massive destruction. Little left standing.	Majority of personnel suffer fatalities.
<b>Very Low</b>	Heavily damaged. Major portions of the structure will collapse (over 50%). A significant percentage of secondary structural members will collapse (over 50%).	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
<b>Low</b>	Damaged – unrepairable. Some sections of the structure may collapse or lose structural capacity (10 to 20% of structure).	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
<b>Medium</b>	Damaged – repairable. Minor to major deformations of both structural and non-structural. Some secondary debris will be likely, but the structure remains intact with collapse unlikely.	Some minor injuries, but no fatalities are likely.
<b>High</b>	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Only superficial injuries are likely.

## DRAFT

**C2.4.8. Training.** It is assumed that key security and facility personnel will receive training in security engineering, antiterrorism, and related areas. Refer to the Security Engineering Working Group web site for available training and to DoD 2000.12-H for additional information on training issues. It is further assumed that all DoD personnel have been trained in basic antiterrorism awareness in accordance with DoDI 2000.16, that they are able to recognize potential threats, and that they know the proper courses of action should they detect a potential threat. See references.

**C2.4.9. Expeditionary and temporary structures.** Expeditionary and temporary structures are commonly built of either combinations of metal frames and fabric or wood frames and rigid walls. It is assumed that most expeditionary and temporary structures cannot be retrofitted or hardened sufficiently for higher threats; therefore, unless adequate planning is done to obtain the needed space to achieve appropriate standoff, DoD personnel will be highly vulnerable to terrorist attack.

**C2.4.10. Leased buildings.** DoD personnel occupying leased buildings deserve the same level of protection as those in DoD-owned buildings; therefore, they should meet the requirements of these standards wherever possible. They must meet the requirements when the DoD occupancy meets the criteria in these standards. The thresholds in those criteria reflect the significance of higher populations of DoD personnel as targets versus the inherent risk reduction associated with dispersing DoD personnel.

**DRAFT**  
**AP1. APPENDIX 1**

**DOD ANTITERRORISM STANDARDS  
FOR NEW AND EXISTING BUILDINGS**

**AP1.1. SITE PLANNING.** Operational, logistic, and security requirements must be integrated in the overall design of buildings, equipment, landscaping, parking, roads, and other features. The most cost-effective solution for mitigating explosive effects on buildings is to keep explosives as far as possible from them. Standoff distance must be coupled with appropriate building hardening to provide the necessary level of protection to DoD personnel. The following standards detail minimum standoff distances that when achieved will allow for buildings to be built with minimal additional construction costs. Where these standoff distances cannot be achieved because land is unavailable, the standards allow for building hardening to mitigate the blast effects. Costs and requirements for building hardening are addressed in the DoD Security Engineering Manual.

**AP1.1.1. Standard 1. Minimum Standoff Distances.** The minimum standoff distances apply to all new and existing (when triggered) DoD buildings covered by these standards. The minimum standoff distances are presented in Table AP1.1 and illustrated in Figures AP1.1 and AP1.2. Where the standoff distances in the “Conventional Construction Without Analysis” column of Table AP1.1 can be met, conventional construction may be used for the buildings without a specific analysis of blast effects, except as otherwise required in these standards. Where those distances are not available, the building must be analyzed by an engineer experienced in blast-resistant design and hardened as necessary to mitigate the effects of the explosives indicated in Table AP1.1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each building category are shown in Table AP1.1 and are described in Tables C2.1 and C2.2 and in the DoD Security Engineering Manual. Standoff distances of less than those shown in the “Conventional Construction With Analysis” column in Table AP1.1 are not allowed.

**AP1.1.1.1. Controlled perimeter.** The standoff distance will be measured from the controlled perimeter to the closest point on the building exterior or inhabited portion of the building.

**AP1.1.1.2. Parking and roadways.** Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with parking and roadways in Table AP1.1 apply. If there is no controlled perimeter, it must be assumed that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table AP1.1) can access parking and roadways near buildings. Therefore, where there is no controlled perimeter, standoff distances from parking and roadways will be in accordance with the distances and the explosive weight associated with controlled perimeters in Table AP1.1. In addition, the following apply:

**AP1.1.1.2.1. All inhabited buildings.** The standoff distance will be measured from the closest edge of parking areas and roadways to the closest point on the building exterior or inhabited portion of the building. The minimum standoff for all buildings regardless of hardening or analysis will be 10 meters (33 feet) for both parking areas and roadways.

**AP1.1.1.2.2. Existing inhabited buildings.** Where possible, move parking and roadways away from existing buildings in accordance with the standoff distances and explosive weights in Table AP1.1. It is recognized, however, that moving existing parking areas and roadways or applying structural retrofits may be impractical; therefore, the following operational options are provided for existing inhabited buildings:

## DRAFT

**AP1.1.1.2.2.1. Parking areas.** Establish access control to portions of parking areas that are closer than the required standoff distance to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary gathering buildings and billeting, if access control is provided to prevent unauthorized parking within the required standoff distance, controlled parking may be permitted as close as 10 meters (33 feet) without hardening or analysis.

**AP1.1.1.2.2.2. Parking on roadways.** Eliminate parking on roadways within the required standoff distances along roads adjacent to existing buildings covered by these standards.

**AP1.1.1.2.2.3. Parking for family housing.** For existing family housing with 13 or more units per building within a controlled perimeter or where there is access control to the parking area, parking within the required standoff distances may be allowed where designated parking spaces are assigned for specific residents or residences. Assigned parking spaces will not be labeled with names or ranks of the residents. Where there are existing standoff distances less than the required standoff distances, those existing distances shall not be encroached upon. For example, existing designated parking that is only 8 meters from existing family housing may be retained, but additional parking will not be allowed closer than 8 meters.

**AP1.1.1.3. Parking and roadway projects.** Where practical, all roadway and parking area projects should comply with the standoff distances from inhabited buildings in Table AP1.1. Where parking or roadways that are within the standoff distances in Table AP1.1 from existing buildings are being constructed, expanded, or relocated, those parking areas and roadways shall not be allowed to encroach on the existing standoff distances of any existing inhabited building. That applies even where such projects are not associated with a building renovation, modification, repair, or restoration requiring compliance with these standards.

**AP1.1.1.4. Trash containers.** The standoff distance will be measured from the nearest point of the trash container or trash container enclosure to the closest point on the building exterior or inhabited portion of the building. Where the standoff distance is not available, hardening of trash enclosures to mitigate the direct blast effects and secondary fragment effects of the explosive on the building is acceptable if the applicable level of protection can be proven by analysis. If trash enclosures are secured to preclude introduction of objects into the enclosures by unauthorized personnel, they can be located closer to the building as long as they do not violate the unobstructed space provisions of Standard 3. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 150 mm (6 inches).

**AP1.1.2. Standard 2. Building separation.** Building separation requirements apply to new buildings and are established to minimize the possibility that an attack on one building causes injuries or fatalities in adjacent buildings. The separation distance is predicated on the potential use of indirect fire weapons.

**AP1.1.2.1. Billeting and primary gathering buildings.** For all new billeting and primary gathering buildings, ensure that adjacent inhabited buildings are separated by at least the distances in Table AP1.1. Where it is necessary to encroach on those building separations, analyze the structure and provide hardened building components as necessary to mitigate the effects of the explosive indicated in Table AP1.1 to the appropriate level of protection shown in Table AP1.1. Levels of protection are described in Table C2.1 and in the DoD Security Engineering Manual.

**AP1.1.2.2. Other inhabited buildings.** There are no minimum separation distances required for antiterrorism purposes for inhabited buildings other than billeting and primary gathering buildings.

## DRAFT

**AP1.1.3. Standard 3. Unobstructed space.** It is assumed that aggressors will not attempt to place assets in areas near buildings where their explosive devices could be visually detected by building occupants observing the area around the building. Therefore, ensure that obstructions within 10 meters (33 feet) of inhabited buildings or portions thereof do not allow for concealment from observation of explosive devices 150 mm (6 inches) or greater in height. This does not preclude the placement of site furnishings or plantings around buildings. It only requires conditions such that any explosive devices placed in that space would be observable by building occupants.

**AP1.1.3.1. Electrical and mechanical equipment.** The preferred location of electrical and mechanical equipment such as transformers, air cooled condensers, and packaged chillers is outside the unobstructed space or on the roof, but this standard does not preclude placement within the unobstructed space as long the equipment provides no opportunity for concealment of explosive devices.

**AP1.1.3.2. Equipment enclosures.** If walls or other screening devices with more than two sides are placed around electrical or mechanical equipment within the unobstructed space, the equipment will be enclosed on all four sides and the top. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 150 mm (6 inches). Any surfaces of the enclosures that can be opened will be secured so that unauthorized personnel cannot gain access through them.

**AP1.1.4. Standard 4. Drive-up/drop-off areas.** Some facilities require access to areas within the required standoff distance for dropping off or picking up people or loading or unloading packages and other objects. Examples that may require drive-up/drop-off include, but are not limited to, medical facilities, exchanges and commissaries, child care centers, and schools.

**AP1.1.4.1. Marking.** Where operational or safety considerations require drive-up or drop-off areas or drive through lanes near buildings, ensure those areas or lanes are clearly defined and marked and that their intended use is clear to prevent parking of vehicles in those areas.

**AP1.1.4.2. Unattended vehicles.** Do not allow unattended vehicles in drive-up or drop-off areas or drive through lanes.

**AP1.1.4.3. Location.** Do not allow drive-through lanes for drive-up/drop-off to be located under any inhabited portion of a building.

**AP1.1.5. Standard 5. Access roads.** Where access roads are necessary for the operation of a building (including those required for fire department access), ensure that access control measures are implemented to prohibit unauthorized vehicles from using access roads within the applicable standoff distances in Table AP1.1.

**AP1.1.6. Standard 6. Parking beneath buildings or on rooftops.** Eliminate parking beneath buildings or on rooftops. Where very limited real estate makes such parking unavoidable, the following measures must be incorporated into the design for new buildings or mitigating measures must be incorporated into existing buildings to achieve an equivalent level of protection.

**AP1.1.6.1. Access control.** Ensure that access control measures are implemented to prohibit unauthorized vehicles and personnel from entering parking areas.

**AP1.1.6.2. Floors and roofs.** Ensure that the floors beneath or roofs above inhabited areas will not fail from the detonation in the parking area of an explosive equivalent to explosive weight II in Table AP1.1.

## DRAFT

**AP1.1.6.3. Superstructure.** All structural elements within and adjacent to the parking area will be subject to the progressive collapse provisions of Standard 6, including the provision for loss of lateral support for vertical load carrying columns and walls. Application of those provisions will be based on an explosive equivalent to explosive weight II in Table AP1.1.

**AP1.2. STRUCTURAL DESIGN.** If the minimum standoff distances are achieved, conventional construction should minimize the risk of mass casualties from a terrorist attack. Even if those standoff distances can be achieved, however, there are some additional structural issues that must be incorporated into building designs to ensure that buildings do not experience progressive collapse.

**AP1.2.1. Standard 7. Progressive collapse avoidance.** Progressive collapse is considered to be significant risk for buildings of three or more stories. Basements will be considered stories if they have one or more exposed walls. For all new and existing inhabited buildings of three stories or more, design the superstructure to sustain local damage with the structural system as a whole remaining stable and not being damaged to an extent disproportionate to the original local damage. This shall be achieved through an arrangement of the structural elements that provides stability to the entire structural system by transferring loads from any locally damaged region to adjacent regions capable of resisting those loads without collapse. This shall be accomplished by providing sufficient continuity, redundancy, or energy dissipating capacity (ductility, damping, hardness, etc.), or a combination thereof, in the members and connections of the structure. For further guidance, refer to American Society of Civil Engineers Standard 7-98 and to detailed guidance in the DoD Security Engineering Manual. In addition, the measures below apply.

**AP1.2.1.1. Columns and walls.** Design all exterior vertical load-carrying columns and walls to sustain a loss of lateral support at any of the floor levels by adding one story height to the nominal unsupported length. While this standard is based on the assumption of an external threat, where parking beneath buildings is unavoidable, this provision will also apply for internal vertical load carrying columns and walls.

**AP1.2.1.2. Exterior member removal.** Analyze the structure to ensure it can withstand removal of one primary exterior vertical or horizontal load-carrying element (i.e., a column or a beam) without progressive collapse.

**AP1.2.1.3. Floors.** Design all floors with improved capacity to withstand load reversals due to explosive effects by designing them to withstand a net uplift equal to the dead load plus one-half the live load.

### **AP1.2.2. Standard 8. Structural isolation.**

**AP1.2.2.1. Building additions.** All additions to existing buildings shall be designed to be structurally independent from the adjacent existing building. This will minimize the possibility that collapse of one part of the building will affect the stability of the remainder of the building. Alternatively, verify through analysis that collapse of either the addition or the existing building will not result in collapse of the remainder of the building.

**DRAFT****FOR OFFICIAL USE ONLY**Table AP1.1 (FOUO) Minimum Standoff Distances and Separation  
for New and Existing Buildings

Location	Building Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Conventional Construction without Analysis	Conventional Construction with Analysis <sup>(1)</sup>	Applicable Explosive Weight (TNT) (FOUO) <sup>(2)</sup>
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	45 m <sup>(4)</sup> (148 ft.)	25 m <sup>(4)</sup> (82 ft.)	<b>I</b> 100 kg (220 lbs.)
	Primary Gathering Building	Low	45 m <sup>(4)(5)</sup> (148 ft.)	25 m <sup>(4)(5)</sup> (82 ft.)	<b>I</b> 100 kg (220 lbs.)
	Inhabited Building	Very Low	25 m <sup>(4)</sup> (82 ft.)	10 m <sup>(4)</sup> (33 ft.)	<b>I</b> 100 kg (220 lbs.)
Parking and Roadways within a Controlled Perimeter	Billeting	Low	25 m <sup>(4)</sup> (82 ft.)	10 m <sup>(4)</sup> (33 ft.)	<b>II</b> 25 kg (55 lbs.)
	Primary Gathering Building	Low	25 m <sup>(4)(5)</sup> (82 ft.)	10 m <sup>(4)(5)</sup> (33 ft.)	<b>II</b> 25 kg (55 lbs.)
	Inhabited Building	Very Low	10 m <sup>(4)</sup> (33 ft.)	10 m <sup>(4)</sup> (33 ft.)	<b>II</b> 25 kg (55 lbs.)
Trash containers	Billeting	Low	25 m (82 ft.)	10 m (33 ft.)	<b>II</b> 25 kg (55 lbs.)
	Primary Gathering Building	Low	25 m (82 ft.)	10 m (33 ft.)	<b>II</b> 25 kg (55 lbs.)
	Inhabited Building	Very Low	10 m (33 ft.)	10 m (33 ft.)	<b>II</b> 25 kg (55 lbs.)
Building Separation  (for new buildings only)	Billeting	Low	10 m (33 ft.)	No antiterrorism minimum	<b>III</b> 1 kg <sup>(3)</sup> (2.2 lbs.)
	Primary Gathering Building	Low	10 m (33 ft.)	No antiterrorism minimum	<b>III</b> 1 kg <sup>(3)</sup> (2.2 lbs.)
	Inhabited Building	Very Low	No antiterrorism minimum	No antiterrorism minimum	Not applicable

(1) Standoff distances less than those in this column are not allowed even with analysis.

(2) When the explosive weights in this column are moved from this table, the table is no longer For Official Use Only

(3) Explosive for building separation is an indirect fire (mortar) round.

(4) For existing buildings, see paragraph AP1.1.1.2.2.

(5) For existing family housing, see paragraph AP1.1.1.2.2.3.

**FOR OFFICIAL USE ONLY****DRAFT**

DRAFT

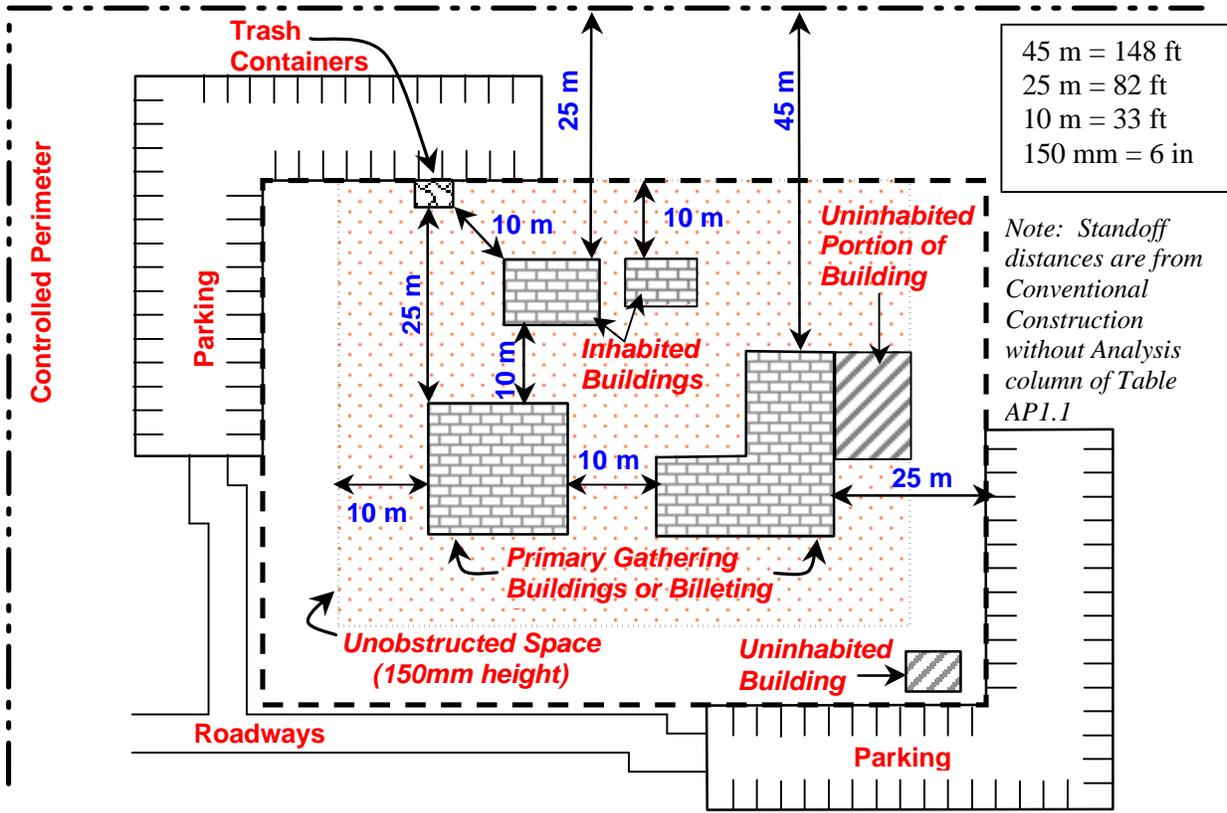


Figure AP1.1. Standoff Distances and Building Separation - Controlled Perimeter

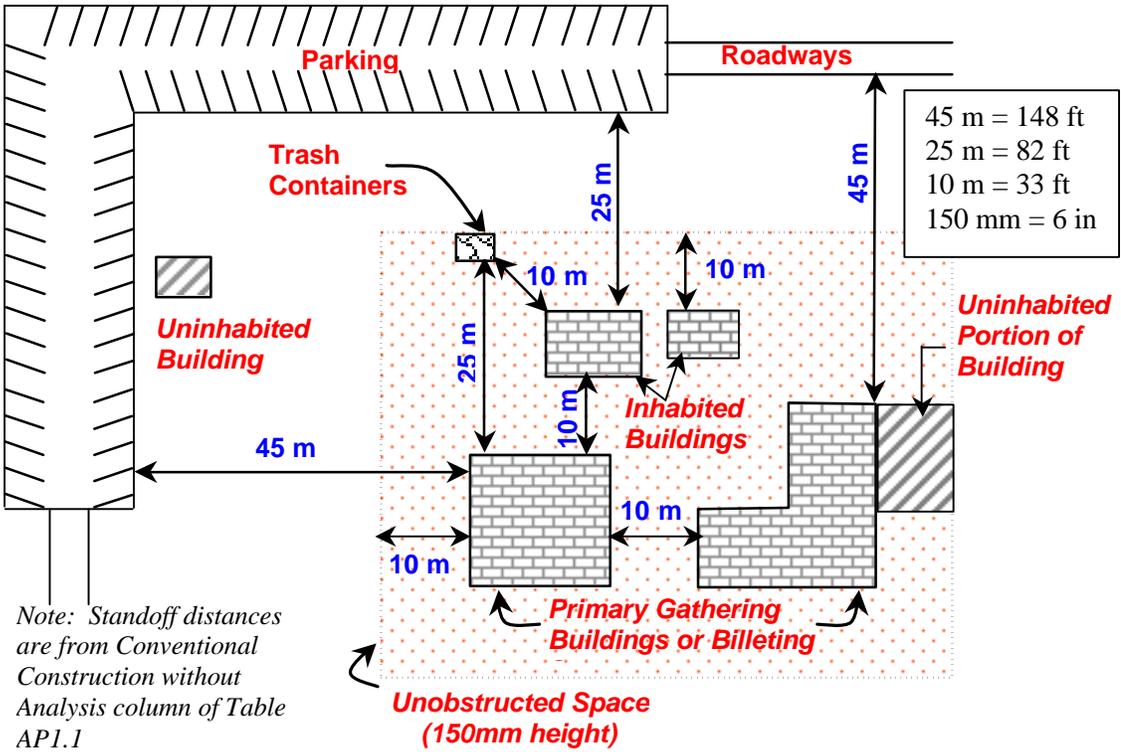


Figure AP1.2. Standoff Distances and Building Separation - No Controlled Perimeter

DRAFT

## DRAFT

**AP1.2.2.2. Portions of buildings.** Where there are areas of buildings that do not meet the criteria for inhabited buildings, design the superstructures of those areas to be structurally independent from the inhabited area. This will minimize the possibility that collapse of the uninhabited areas of the building will affect the stability of the superstructure of the inhabited portion of the building. Alternatively, verify through analysis that collapse of uninhabited portions of the building will not result in collapse of any portion of the building covered by this standard. This standard is not mandatory for existing structures, but it should be implemented where possible.

**AP1.2.3. Standard 9. Building overhangs.** Avoid building overhangs with inhabited spaces above them where people could gain access to the area underneath the overhang. Where such overhangs must be used, the following measures must be incorporated into the design for new buildings or mitigating measures must be incorporated into existing buildings to achieve an equivalent level of protection.

**AP1.2.3.1. Parking and roadway restrictions.** Ensure that there are no roadways or parking areas under overhangs.

**AP1.2.3.2. Floors.** Ensure that the floors beneath inhabited areas will not fail from the detonation underneath the overhang of an explosive equivalent to explosive weight II in Table AP1.1.

**AP1.2.3.3. Superstructure.** All structural elements within and adjacent to the overhang will be subject to the progressive collapse provisions of Standard 6, including the provision for loss of lateral support for vertical load carrying elements.

**AP1.2.4. Standard 10. Exterior masonry walls.** Unreinforced masonry walls are prohibited for the exterior walls of new buildings. A minimum of 0.05 percent vertical reinforcement with a maximum spacing of 1200 mm (48 in) will be provided. For existing buildings, implement mitigating measures to provide an equivalent level of protection.

**AP1.3. ARCHITECTURAL DESIGN.** Even where the minimum standoff distances are achieved, many aspects of building layout and other architectural design issues must be incorporated to improve overall protection of personnel inside buildings.

**AP1.3.1. Standard 11. Windows and glazed doors.** To minimize hazards from flying glass fragments, apply the provisions for glazing and window frames below for all new and existing inhabited buildings covered by these standards. Windows and frames must work as a system to ensure that their hazard mitigation is effective. These provisions apply even if the minimum standoff distances are met.

**AP1.3.1.1. Glazing.** Use a minimum of 6-mm (1/4-in) nominal laminated glass for all exterior windows and glazed doors. The 6-mm (1/4-in) laminated glass consists of two nominal 3-mm (1/8-in) glass panes bonded together with a minimum of a 0.75-mm (0.030-inch) polyvinyl-butylal (PVB) interlayer. For insulated glass units, as a minimum the inner pane must be 6-mm laminated glass. For alternatives to the 6-mm (1/4-in) laminated glass that provide equivalent levels of protection, refer to the DoD Security Engineering Manual.

**AP1.3.1.2. Window frames.** Provide frames and mullions of aluminum or steel. To ensure that the full strength of the PVB inner layer is engaged, frames, mullions, and window hardware shall be designed to resist a static load of 7 kilopascals (1 lb per square in) applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of the unsupported member lengths. The glazing shall have a minimum frame bite of 9.5-mm (3/8-in) for structural glazed window systems and 25-mm (1-in) for window systems that are not structurally glazed. Frame connections to surrounding

## DRAFT

walls shall be designed to resist a combined loading consisting of a tension force of 35-kN/m (200-lbs/in) and a shear force of 13-kN/m (75 lbs/in). Alternatively, use frames that provide an equivalent level of performance. For existing buildings, this may require replacement or significant modification of window frames, anchorage, and supporting elements.

**AP1.3.1.3. Mitigation.** Where the minimum standoff distances cannot be met, provide glazing and frames that will provide an equivalent level of protection to that provided by the glazing above as described in Tables C2.1 and C2.2 for the applicable explosive weight in Table AP1.1.

**AP1.3.1.4. Window replacement projects.** Whenever window or door glazing is being replaced in existing inhabited buildings as part of a planned window or glazing replacement project, whether or not the building meets the triggers in paragraph C1.5.2, install glazing that meets the requirements above.

**AP1.3.2. Standard 12. Building entrance layout.** The areas outside of installations are commonly not under the direct control of the installations. Where the main entrances to buildings face installation perimeters, people entering and exiting the buildings are vulnerable to being fired upon from vantage points outside the installations. To mitigate those vulnerabilities apply the following measures:

**AP1.3.2.1. New buildings.** For new inhabited buildings, ensure that the main entrance to the building does not face an installation perimeter or other uncontrolled vantage points with direct lines of sight to the entrance.

**AP1.3.2.2. Existing buildings.** For existing inhabited buildings where the main entrance faces an installation perimeter, either use a different entrance as the main entrance or screen that entrance to limit the ability of potential aggressors to target people entering and leaving the building.

**AP1.3.3. Standard 13. Exterior doors.** For all new and existing buildings covered by these standards, ensure that all exterior doors into inhabited areas open outwards. By doing so, the doors will seat into the door frames in response to an explosive blast, increasing the likelihood that the doors will not enter the buildings as hazardous debris.

**AP1.3.4. Standard 14. Mailrooms.** The following measures address the location of rooms to which mail is delivered or in which mail is handled in new and existing inhabited buildings. The measures involve limiting collateral damage and injuries and facilitating future upgrades to enhance protection should they become necessary.

**AP1.3.4.1. Location.** Where a new or existing building covered by these standards must have a mailroom, that mailroom will be on the perimeter of the building. By locating the mailroom on the building perimeter there is an opportunity to modify it in the future if a mail bomb threat is identified. Where mailrooms are located in the interior of buildings, few retrofit options are available for mitigating the mail bomb threat.

**AP1.3.4.2. Proximity.** Mailrooms should also be located as far from heavily populated areas of the building and critical infrastructure as possible. This measure will go far toward minimizing injuries and damage if a mail bomb detonates in the mailroom. Further, it will reduce the potential for wider dissemination of hazardous agents. These apply where the mailroom is not specifically designed to resist those threats.

**AP1.3.5. Standard 15. Roof access.** For all new and existing inhabited buildings covered by these standards, control access to roofs to minimize the possibility of aggressors placing explosives or

**DRAFT**

chemical, biological, or radiological agents there or otherwise threatening building occupants or critical infrastructure.

**AP1.3.5.1. New buildings.** For new buildings eliminate all external roof access by providing access from internal stairways or ladders, such as in mechanical rooms.

**AP1.3.5.2. Existing buildings.** For existing buildings, eliminate external access where possible or secure external ladders or stairways with locked cages or similar mechanisms.

**AP1.3.6. Standard 16. Overhead mounted architectural features.** For all new and existing buildings covered by these standards, ensure that all suspended ceiling systems and other overhead mounted architectural features are mounted to minimize the likelihood that they will fall and injure building occupants. All such systems will be mounted so that they resist forces of 0.5 times the component weight in any direction and 1.5 times the component weight in the downward direction. This standard does not preclude the need to design architectural feature mountings for forces required by other criteria such as seismic standards.

**AP1.4. ELECTRICAL AND MECHANICAL DESIGN.** Electrical and mechanical design standards address limiting damage to critical infrastructure, protecting building occupants against chemical, biological, and radiological threats, and notifying building occupants of threats or hazards.

**AP1.4.1. Standard 17. Air intakes.** Air intakes to heating, ventilation, and air conditioning (HVAC) systems that are designed to move air throughout a building that are at ground level provide an opportunity for aggressors to easily place contaminants that could be drawn into the building.

**AP1.4.1.1. New buildings.** For all new inhabited buildings covered by this document locate all air intakes at least 3 meters (10 feet) above the ground.

**AP1.4.1.2. Existing buildings.** The above requirement is recommended, but not mandatory, for existing inhabited buildings covered by these standards.

**AP1.4.2. Standard 18. Emergency air distribution shutoff.** For all new and existing inhabited buildings, provide an emergency shutoff switch in the HVAC control system that can immediately shut down air distribution throughout the building. The switch (or switches) must be located to be easily accessible by building occupants. Providing such a capability will allow building occupants to limit the distribution of airborne contaminants that may be introduced into the building.

**AP1.4.3. Standard 19. Utility distribution and installation.** Utility systems can suffer significant damage when subjected to the shock of an explosion. Some of these utilities may be critical for safely evacuating personnel from the building or their destruction could cause damage that is disproportionate to other building damage resulting from an explosion. To minimize the possibility of the above hazards, apply the following measures:

**AP1.4.3.1. Utility routing.** For all new inhabited buildings, route critical or fragile utilities so that they are not on exterior walls or on walls shared with mailrooms. This requirement is recommended, but not mandatory, for existing buildings.

**AP1.4.3.2. Redundant utilities.** Where redundant utilities are required in accordance with other requirements or criteria, ensure that the redundant utilities are not collocated or do not run in the same chases. This minimizes the possibility that both sets of utilities will be adversely affected by a single event.

## DRAFT

**AP1.4.3.3. Emergency backup systems.** Where emergency backup systems are required in accordance with requirements or criteria, ensure that they are located away from the system components for which they provide backup.

**AP1.4.4. Standard 20. Equipment bracing.** Mount all overhead utilities and other fixtures to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

**AP1.4.5. Standard 21. Under building access.** To limit opportunities for aggressors placing explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of under building access is controlled.

**AP1.4.6. Standard 22. Mass notification.** All inhabited buildings must have a timely means to notify occupants of threats and instruct them what to do in response to those threats.

**AP1.4.6.1. New buildings.** All new inhabited buildings must have a capability to provide real-time information to building occupants or personnel in the immediate vicinity of the building during emergency situations. The information relayed must be specific enough to determine the appropriate response actions. Any system, procedure, or combination thereof that provides this capability will be acceptable under this standard.

**AP1.4.6.2. Existing buildings.** For existing buildings, the above requirement is mandatory for primary gathering buildings and billeting, but recommended for all inhabited buildings.

# DRAFT

## AP2. APPENDIX 2

### RECOMMENDED ADDITIONAL ANTITERRORISM MEASURES FOR NEW AND EXISTING BUILDINGS

**AP2.1. SITE PLANNING.** The following additional measures, if implemented, will significantly enhance site security with little increase in cost and should be considered for all new and existing inhabited buildings.

**AP2.1.1. Recommendation 1. Vehicle access points.** The first line of defense in limiting opportunities for aggressors to get vehicles close to DoD buildings is at vehicle access points at the controlled perimeter, in parking areas, and at drive-up/drop-offs points. Keep the number of access points to the minimum necessary for operational or life safety purposes. This will limit the number of points at which access may have to be controlled with barriers and/or personnel in increased threat environments or if the threat increases in the future.

**AP2.1.2. Recommendation 2. High-speed vehicle approaches.** The energy of a moving vehicle increases with the square of its velocity; therefore, minimizing a vehicle's speed allows vehicle barriers to be lighter and less expensive should vehicle barriers ever become necessary. To facilitate reductions in vehicle speeds in the future, ensure there are no unobstructed vehicle approaches perpendicular to inhabited buildings at the required parking and roadway standoff distances.

**AP2.1.3. Recommendation 3. Vantage points.** Vantage points are natural or man-made positions from which potential aggressors can observe and target people or other assets in and around a building. Identify vantage points outside the control of personnel in the targeted building and either eliminate them or provide means to avoid exposure to them. Means to avoid exposure may include actions such as reorienting the building or shielding people or assets in and around the building using such measures as reflective glazing, walls, privacy fencing, or vegetation.

**AP2.1.4. Recommendation 4. Drive-up/drop off.** Locate these points away from large glazed areas of the building to minimize the potential for hazardous flying glass fragments in the event of an explosion. For example, the lane may be located at an outside corner of the building or otherwise away from the main entrance. The drive-up/drop-off point should be coordinated with the building geometry to minimize the possibility that explosive blast forces could be increased due to being trapped or otherwise concentrated. For further discussion of this issue, refer to the DoD Security Engineering Manual.

**AP2.1.5. Recommendation 5. Building location.** Activities with large visitor populations provide opportunities for potential aggressors to get near buildings with minimal controls, and therefore, limit opportunities for early detection. Maximize separation distance between inhabited buildings and areas with large visitor populations.

**AP2.1.6. Recommendation 6. Railroad location.** Avoid sites for inhabited buildings that are close to railroads. Where railroads are in the vicinity of existing buildings, standoff distances between the railroad and any inhabited buildings should be provided based on the standoff distances and explosive weight associated with controlled perimeters in Table AP1.1. Where those standoff distances are not available, and since moving existing railroads may be difficult and prohibitively expensive, ensure that there are procedures in place to prohibit trains from stopping in the vicinity of inhabited structures.

## DRAFT

**AP2.1.7. Recommendation 7. Access control for family housing.** For new family housing areas, provide space for controlling access at the perimeter of the housing area so that a controlled perimeter can be established there if the need arises in the future.

**AP2.1.8. Recommendation 8. Standoff for family housing.** For new family housing construction, maintain a minimum standoff distance of 25 meters from installation perimeters and roads, streets, or highways external to housing areas.

**AP2.1.9. Recommendation 9. Minimize secondary debris.** To reduce the hazard of flying debris in the event of an explosion, eliminate unrevetted barriers and site furnishings in the vicinity of inhabited structures that are accessible to vehicle traffic. Revet exposed barriers and site furnishings near inhabited buildings with a minimum of 1 meter (3 feet) of soil or equivalent alternative techniques to prevent fragmentation hazards in the event of an explosion.

**AP2.2. STRUCTURAL AND ARCHITECTURAL DESIGN.** The following additional measures, if implemented, will significantly enhance building occupants' safety and security with little increase in cost. These measures should be considered for all new and existing inhabited buildings.

**AP2.2.1. Recommendation 10. Structural redundancy.** Unexpected terrorist acts can result in local collapse of building structural components. To limit the extent of collapse of adjacent components, utilize highly redundant structural systems such as moment resisting frames, detail connections to provide continuity across joints equal to the full structural capacity of connected members, and detail members to accommodate large displacements without complete loss of strength. This recommendation is consistent with AP1.2.1 (Standard 7) for preventing progressive collapse, but recommends selection of certain structural systems and greater attention to structural details.

**AP2.2.2. Recommendation 11. Internal circulation.** Design circulation within buildings to provide visual detection and monitoring of unauthorized personnel approaching controlled areas or occupied spaces.

**AP2.2.3. Recommendation 12. Visitor control.** Controlling visitor access maximizes the possibility of detecting potential threatening activities. Keep locations in buildings where visitor access is controlled away from sensitive or critical areas, areas where high-risk or mission-critical personnel are located, or other areas with large population densities of DoD personnel.

**AP2.2.4. Recommendation 13. Asset location.** To minimize exposure to direct blast effects and potential impacts from hazardous glass fragments and other potential debris, locate critical assets and mission-critical or high-risk personnel away from the building exterior.

**AP2.2.5. Recommendation 14. Room layout.** In rooms adjacent to the exterior of the building, position personnel and critical equipment to minimize exposure to direct blast effects and potential impacts from hazardous glass fragments and other potential debris.

**AP2.2.6. Recommendation 15. External hallways.** Since doors can become hazardous debris during explosive blast events, doors designed to resist blast effects are expensive, and external hallways have large numbers of doors leading into inhabited areas, avoid exterior hallway configurations for inhabited structures.

**AP2.2.7. Recommendation 16. Windows.** To minimize the potential for glazing hazards, minimize the size and number of windows for new construction.

**DRAFT****AP3. APPENDIX 3****DOD ANTITERRORISM STANDARDS  
FOR EXPEDITIONARY AND TEMPORARY STRUCTURES**

**AP3.1. SITE PLANNING STANDARDS.** All the standards that are unique to expeditionary and temporary structures pertain to site planning. Operational, logistic, and security requirements must be integrated in the overall configuration of structures, equipment, landscaping, parking, roads, and other features. The most cost-effective solution for mitigating explosive effects on expeditionary and temporary structures is to keep explosives as far away as possible. This is especially critical for these types of structures because hardening may or may not be possible. Dispersed layouts reduce risks from a variety of threats by taking full advantage of terrain and site conditions; therefore, nothing in these standards is intended to discourage dispersal. Costs and requirements for expeditionary and temporary structure hardening are addressed in the DoD Security Engineering Manual.

**AP3.1.1. Standard 1. Minimum Standoff Distances.** The minimum standoff distances apply to all new and existing DoD expeditionary and temporary structures covered by these standards except as otherwise stated below. The minimum standoff distances are presented in Table AP3.1. Except as otherwise required in these standards, where the standoff distances in Table AP3.1 can be provided, conventional expeditionary and temporary structures may be used without a specific analysis of blast effects. Where those distances are not available, the structure must be analyzed by an engineer experienced in blast-resistant design and hardened as necessary (in those cases which permit structure hardening) to mitigate the effects of the explosives indicated in Table AP3.1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each structure category are shown in Table AP3.1 and are described in Table C2.3 and in the DoD Security Engineering Manual. The two structure types in Table AP3.1 respond in fundamentally different ways to explosive effects. Standoff distances in Table AP3.1 reflect those differences.

**AP3.1.1.1. Controlled perimeter.** The standoff distance will be measured from the closest point on the structure exterior to the controlled perimeter.

**AP3.1.1.1.1. Container structures.** For these structures, apply the guidance in Appendix AP1.

**AP3.1.1.1.2. Fabric covered/metal frame construction and other expeditionary or temporary structures.** Provide the standoff distance from Table AP3.1 for the applicable structure category.

**AP3.1.1.2. Parking and roadways.** Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with parking and roadways in Table AP3.1 apply unless otherwise stated below. If there is no controlled perimeter, it must be assumed that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table AP3.1) can access parking and roadways near buildings. Therefore, where there is no controlled perimeter, standoff distances from parking and roadways will be in accordance with the distances and the explosive weight associated with controlled perimeters in Table AP3.1.

**AP3.1.1.2.1. Container structures.** For these structures, apply the guidance in Appendix AP1.

## DRAFT

**AP3.1.1.2.2. Fabric covered/metal frame construction and other expeditionary or temporary structures.** The standoff distance will be measured from the closest point on the structure exterior to the closest edge of parking areas and roadways. The minimum standoff for all structures regardless of hardening or analysis will be 10 meters (33 feet).

**AP3.1.1.2.3. Existing fabric covered/metal frame construction and other expeditionary or temporary structures.** Moving existing parking areas and roadways may be difficult to achieve and structural retrofits to existing structures may be prohibitively expensive or technically impossible; therefore, the following operational options are provided for existing inhabited structures where the standoff distances in Table AP3.1 are impractical to achieve.

**AP3.1.1.2.3.1. Parking areas.** Establish access control to portions of parking areas to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary gathering structures and billeting, if access control is provided to prevent unauthorized parking within the required standoff distance, controlled parking may be permitted as close as 10 meters (33 feet) without hardening or analysis.

**AP3.1.1.2.3.2. Roadways.** Eliminate parking within the required standoff distances along roads adjacent to existing structures covered by these standards.

**AP3.1.1.3. Trash containers.** The standoff distance will be measured from the nearest point of the trash container or trash container enclosure to the closest point on the structure exterior. Where the standoff distance is not available, hardening of trash enclosures to mitigate the direct blast effects and secondary fragment effects of the explosive on the structure is acceptable if the applicable level of protection can be proven by analysis. If trash enclosures are secured to preclude introduction of objects into the enclosures by unauthorized personnel, they can be located closer to the structure as long as they do not violate the unobstructed space provisions of Standard 3 below. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 150 mm (6 inches).

**AP3.1.1.3.2. Container structures.** For these structures, apply the guidance in Appendix AP1.

**AP3.1.1.3.2. Fabric covered/metal frame construction and other expeditionary or temporary structures.** Provide the standoff distance from Table AP3.1 for the applicable structure category.

**AP3.1.2. Standard 2. Structure separation.** Structure separation requirements are established to minimize the possibility that an attack on one structure causes injuries or fatalities in adjacent structures. The separation distance is predicated on the potential use of indirect fire weapons.

### **AP3.1.2.1. Billeting and primary gathering structures.**

**AP3.1.2.1.1. Container structures.** For these structures, apply the guidance in Appendix AP1.

**AP3.1.2.1.2. Fabric covered/metal frame construction and other expeditionary or temporary structures.** For all new billeting and primary gathering structures, ensure that adjacent structures are separated by at least the distances in Table AP3.1. Where it is necessary to encroach on those structure separations, analyze the structure and provide hardened structure components as necessary to mitigate the effects of the explosive indicated in Table AP3.1 to the appropriate level of

## DRAFT

protection as shown in Table AP3.1. Levels of protection are described in Table C2.3 and in the DoD Security Engineering Manual.

**AP3.1.2.2. Other inhabited structures.** There are no minimum separation distances required for antiterrorism for inhabited buildings other than billeting and primary gathering structures.

**AP3.1.3. Standard 3. Unobstructed space.** Keep areas within 10 meters (33 feet) of all expeditionary and temporary structures free of items other than those that are part of the infrastructure.

**AP3.2. ADDITIONAL STANDARDS.** In addition to the specific standards detailed in this appendix, standards from Appendix AP1 shall apply to expeditionary and temporary structures as follows:

**AP3.2.1. Fabric covered/metal frame construction and other expeditionary or temporary structures.** The following standards from Appendix AP1 shall be applied to these structures:

**AP3.2.1.1. Standard 4. Drive-up/drop off areas.**

**AP3.2.1.2. Standard 5. Access roads.**

**AP3.2.1.3. Standard 11. Windows and glazed doors.**

**AP3.2.1.4. Standard 12. Building entrance layout.**

**AP3.2.1.5. Standard 20. Equipment bracing.**

**AP3.2.1.6. Standard 22. Mass notification.**

**AP3.2.2. Container structures.** For these structures, all standards in Appendix AP1 apply.

**AP3.3. ANTITERRORISM RECOMMENDATIONS.** All recommendations except for Recommendation 7 (Access control for family housing) and Recommendation 8 (Standoff for family housing) from Appendix AP2 should be applied to all expeditionary and temporary structures.

**DRAFT****FOR OFFICIAL USE ONLY**

Table AP3.1 (FOUO) Minimum Standoff Distances and Separation for Expeditionary and Temporary Structures

Location	Structure Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Fabric Covered/Metal Frame Structures <sup>(1)</sup>	Other Expeditionary and Temporary Structures <sup>(1)(2)</sup>	Applicable Explosive Weight (TNT) (FOUO) <sup>(3)</sup>
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	31 m (102 ft.)	71 m (233 ft.)	<b>I</b> 100 kg (220 lbs.)
	Primary Gathering Structure	Low	31 m (102 ft.)	71 m (233 ft.)	<b>I</b> 100 kg (220 lbs.)
	Inhabited Structure	Very Low	24 m (79 ft.)	47 m (154 ft.)	<b>I</b> 100 kg (220 lbs.)
Parking and Roadways within a Controlled Perimeter	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	<b>II</b> 25 kg (55 lbs.)
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	<b>II</b> 25 kg (55 lbs.)
	Inhabited Structure	Very Low	10 m (33 ft.)	23 m (75 ft.)	<b>II</b> 25 kg (55 lbs.)
Trash containers	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	<b>II</b> 25 kg (55 lbs.)
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	<b>II</b> 25 kg (55 lbs.)
	Inhabited Structure	Very Low	10 m (33 ft.)	23 m (75 ft.)	<b>II</b> 25 kg (55 lbs.)
Structure Separation <sup>(4)</sup>	Separation between Structure Groups	Low	18 m (59 ft.)	18 m (59 ft.)	<b>III</b> 1 kg <sup>(5)</sup> (2.2 lbs.)
	Separation between Structure Rows	Low	9 m (30 ft.)	9 m (30 ft.)	<b>III</b> 1 kg <sup>(5)</sup> (2.2 lbs.)
	Separation between Structures in a Row	Very Low	3.5 m (12 ft.)	3.5 m (12 ft.)	<b>III</b> 1 kg <sup>(5)</sup> (2.2 lbs.)

(1) See Definitions for a complete description of these structure types.

(2) For container structures, Appendix AP1 applies.

(3) When the explosive weights in this column are moved from this table, the table is no longer For Official Use Only

(4) Applies to Billeting and Primary Gathering Structures only. No minimum separation distances for other inhabited structures.

(5) Explosive for building separation is an indirect fire (mortar) round.

DRAFT

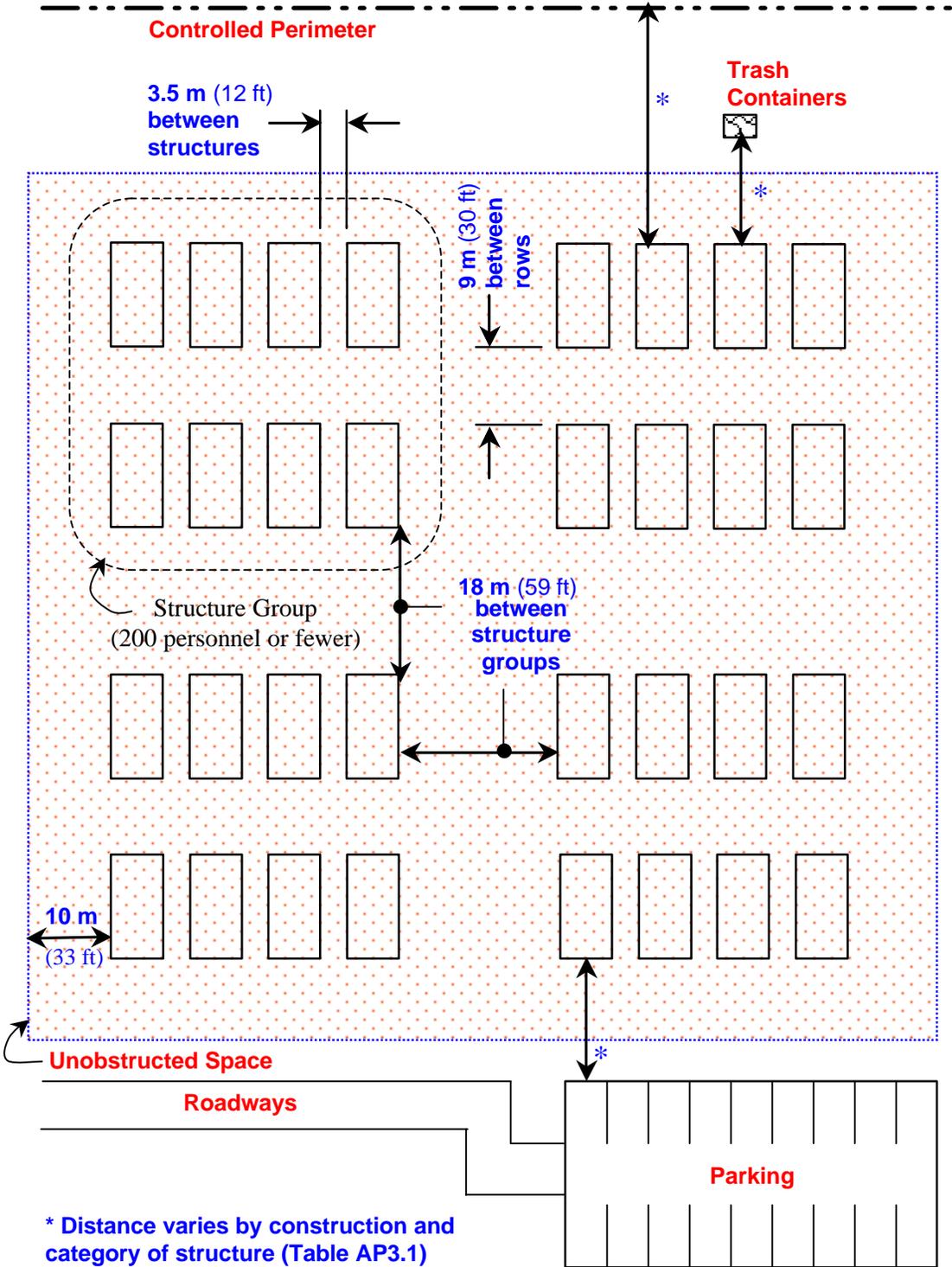


Figure AP3.1. Standoff Distances and Separation for Expeditionary and Temporary Structures (except container structures)