

**ASBESTOS CONTAINING BUILDING MATERIALS  
SURVEY REPORT**

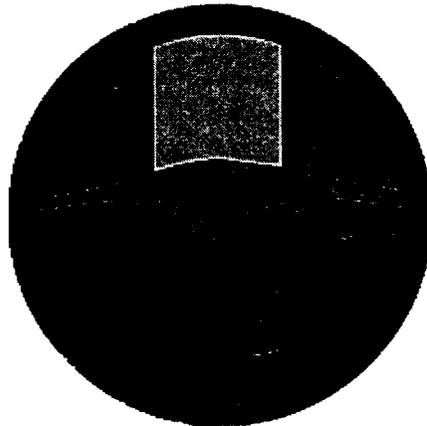
**BUILDING(S): 3220 - 3244**

**ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
BUILDINGS 3220-3244**

**FORT McCLELLAN, ALABAMA**

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Fort McClellan*



*Staying Beautiful*

*Conducted and Prepared by:*

**REISZ ENGINEERING**  
P.O. BOX 1349

HUNTSVILLE, ALABAMA 35807  
ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
BUILDINGS 3220-3244

**FORT McCLELLAN, ALABAMA**

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Prepared For:*

DIRECTORATE OF ENVIRONMENT  
FORT McCLELLAN

---

APPROVED FOR TRANSMITTAL BY  
JAMES R. WRIGHT

*Conducted and Prepared by:*

**REISZ ENGINEERING**

June, 1998

## TABLE OF CONTENTS

|     |   |   |
|-----|---|---|
| 1.0 | PURPOSE AND SCOPE OF SERVICES.....            | 1 |
| 2.0 | REGULATORY STANDARDS.....                     | 2 |
| 3.0 | PROJECT CHARACTERISTICS.....                  | 3 |
| 4.0 | SURVEY METHODOLOGY.....                       | 4 |
| 5.0 | LABORATORY ANALYSIS .....                     | 5 |
| 6.0 | SUSPECT MATERIALS.....                        | 5 |
| 7.0 | ASBESTOS INSPECTION AND SAMPLING RESULTS..... | 6 |
|     | FRIABLE ACM.....                              | 7 |
|     | NON FRIABLE ACM.....                          | 7 |
|     | INACCESSIBLE MATERIAL.....                    | 8 |
| 8.0 | CONCLUSIONS AND RECOMMENDATIONS.....          | 8 |
| 9.0 | ASSUMPTIONS AND LIMITATIONS.....              | 8 |

### APPENDICES

APPENDIX A - REPORT OF LABORATORY ANALYSIS

APPENDIX B - SUMMARY TABLE OF ACM

APPENDIX C - SAMPLE LOCATIONS PLANS

APPENDIX D - SELECTED ACM LOCATIONS PLANS

D

## **1.0 PURPOSE AND SCOPE OF SERVICES**

The purpose of this survey was to locate and identify asbestos containing building materials in Buildings 3220 through 3244 located at Fort McClellan, Alabama. Pursuant to the Contract, REISZ Engineering was required to provide the survey in accordance with AHERA (40 CFR Part 763 Subpart E) protocol. AHERA is applicable to interior building products installed prior to October 12, 1988. AHERA does not apply to the exterior of buildings and does not apply to non-building materials (e.g. cabinetry, special equipment and chalkboards). REISZ Engineering has included as part of the survey those readily accessible, suspect friable interior non-building materials (e.g. vibration dampers); but has not included certain items (e. g. interior linings of equipment and special supplies, some non-friable materials such as transite, etc.). Exterior building materials were not sampled as part of this contract unless those materials were suspected to be of friable nature and continuous with indoor materials (e.g. piping insulation). Specifically, REISZ Engineering was contracted to provide the following services:

1. Identify and collect samples of accessible suspect friable building materials within the referenced project area.
2. Perform a visual inspection to provide information on material condition, material quantities, material locations, and building use.
3. Analysis of all bulk samples for asbestos content utilizing Polarized Light Microscopy and Dispersion Staining Techniques performed in accordance with EPA Bulk Analysis Method  
EPA 600/M4-82-020.
4. Make recommendations as to response actions pertaining to those materials identified as asbestos containing.

5. Compilation of a final report (contained herein) which details all sample results, identifies sample locations, and provides recommendations based upon the results.
  
6. Preparation of a Building specific Operations & Maintenance (O&M) Plan for buildings containing friable asbestos materials.

## 2.0 REGULATORY STANDARDS

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires the Owner or Operator of a facility to determine the presence or non-presence of asbestos containing materials prior to conducting renovation or demolition activities. The NESHAP Standard for asbestos (40CFR Part 61 Sub-part M) requires the use of engineered control procedures for removal of asbestos materials that are or will become friable during renovation or demolition. The removal must occur before renovation or demolition activities impact those materials.

On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to the Standard, to notify employees, tenants and prospective employers (contractors) of the presence, location and quantities of ACM in the building. Implementation of the "communication of hazards" provisions in the Standard were originally to be not later than April 10, 1995 but was extended to July 10, 1995 and is now in effect. The OSHA Standard does not apply to work performed by employees of State agencies in states without state run OSHA programs (e.g. Alabama).

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing E.P.A. to establish rules and regulations

(40CFR Part 763) addressing asbestos-containing materials in schools. Specifically, the E.P.A. was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling asbestos containing materials (ACM) in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. Although the AHERA regulation does not specifically apply to this project it is generally accepted as the industry standard and was cited by Fort McClellan in the Asbestos Survey Request as the basis of survey methodology. The AHERA inspections must be conducted using specific guidelines that include a minimum number of samples per material type. This survey was conducted in accordance with those guidelines per the Contract requirements.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan to all public and commercial buildings. Currently the rule extends the accreditation requirements of persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA accredited personnel.

### 3.0 PROJECT CHARACTERISTICS

During the month of January 1998, Reisz Engineering accredited Asbestos Inspectors performed inspections of Buildings 3220 through 3244 for the purpose of identifying building materials suspected to contain asbestos. The buildings are constructed of cement blocks and are used as enlisted barracks and instructional buildings. Based on information provided by Fort McClellan representatives the buildings were originally constructed in 1953 and contain approximately 6,063 sq. ft. of floor space. Various renovations may have taken place since the buildings were originally constructed but no building plans have been found which can be used to verify specific dates and activities.

The two dominant flooring conditions existing in the buildings are 1) 12x12 vinyl floor tile, 2) 9x9 vinyl floor tile and 3) cement. Building 3226 was found to contain one pipe run consisting of suspect aircel type TSI. The remaining pipes in all buildings were either bare, fiber-glass or rubber insulated. All buildings were found to have a suspect transite-like material located around the flue for the hot water heater in each building.

#### 4.0 SURVEY METHODOLOGY

The buildings were visually inspected for the presence of material suspected to contain asbestos. Those suspect materials were identified, bulk samples were obtained and placed into individual vials for transportation to the University of Alabama in Huntsville. General areas for sample locations were selected on a random basis with a preference for exact positioning at existing damage. Each sample location is represented by a number on the plans in Appendix C. Those numbers directly correspond with the numbers listed elsewhere in this report.

If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. Materials installed after October 12, 1988 (as reported by Fort McClellan staff) were not sampled.

#### Hazard Assessment Factors

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current

condition of all ACM identified was noted. Evidence of deterioration, physical damage, water damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

## 5.0 LABORATORY ANALYSIS METHODOLOGY

All bulk samples were analyzed at UAH by polarized light microscopy utilizing dispersion staining or Becke line techniques, in accordance with the EPA's "Interim Method for Determination of Asbestos in Bulk Insulation Samples" (EPA 600/m4-82-020). Quality control samples were taken as duplicates at a rate of 1 to 10 and were sent to a second accredited laboratory. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA regulations if disturbed during maintenance, renovation, demolition or removal.

The UAH laboratory participates in the American Industrial Hygiene Association (AIHA) quality assurance program for polarized light microscopy and is accredited by the AIHA through their voluntary program.

## 6.0 SUSPECT MATERIALS

The following is a general list of building materials that were suspected to contain asbestos. A complete and more detailed description of these substances can be found in Appendix B.

#### Surfacing

- None

#### Thermal System Insulation

- Brown aircel type insulation on one pipe run in building 3226

#### Miscellaneous Material

- Vinyl floor tile 12x12
- Vinyl floor tile 9x9
- Vinyl flooring mastics
- Transite at flue for hot water heater of each building

### 7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

A total of 3 bulk samples were collected and analyzed. Details of all laboratory results can be found in Appendix A. A listing of all suspect materials, their corresponding sample numbers, general location, and approximate quantity are indicated in Appendix B. A narrative description of all "Friable Asbestos Containing Material" and "Non-Friable ACM" identified during the survey, is given below.

#### FRIABLE ACM

Laboratory analysis determined asbestos is present in one type of friable material: 1) brown aircel type insulation on a single pipe run in Building 3226.

- 1) A friable, aircel type insulation is found on approximately 14 linear feet of pipe located in Building 3226. The materials was found to be in Good condition.

#### NON FRIABLE ACM

Two types of non-friable ACM was found to be present in the building: 1) mastic associated with 12x12 inch floor tile, and 2) transite associated with flue of hot water heaters in all buildings. In addition, two types of non-friable Presumed ACM were found to be present in the building: 1) 9x9 inch floor tile, and 2) mastics associated with 9x9 inch vinyl floor tile.

- 1) Asbestos containing mastic associated with 12x12 inch floor tile is present in all of the buildings.
- 2) Asbestos containing transite associated with the flues of hot water heaters is present in all of the buildings.
- 3) A suspect 9x9 inch vinyl floor tile is found in all of the buildings.
- 4) A suspect black mastic is found below 9x9 inch floor tile in all of the buildings.

#### INACCESSIBLE MATERIAL,

Insulation and spray-on compounds associated with inaccessible crawl-space and tunnel areas may should be assumed as “like” materials corresponding to materials sampled within the building.

#### 8.0 CONCLUSIONS AND RECOMMENDATIONS

None of the materials identified within this report are damaged to the extent that significant asbestos fiber release may be likely under normal conditions. Proper management of the material in-place may be acceptable assuming the proper precautions are taken to eliminate exposure of personnel to any airborne asbestos. Reisz Engineering has written a Building Operations & Maintenance Plan for Buildings 3220 through 3244 and we suggest that recommendations included in this plan be followed.

## 9.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions that were observed during the inspections of the buildings during January, 1998. Reisz Engineering and this report make no representation or assumptions as to past conditions or future occurrences.

Our inspection was generally non-destructive in nature. Any conditions or materials that were not visible on the surface were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials that may lay beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that all materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos abatement contractors in locating ACM. Under no circumstances is this report to be utilized as a bidding document or as a project specification document.

**APPENDIX A**

**REPORT OF LABORATORY ANALYSIS FOR ASBESTOS**



**APPENDIX B**

**ASBESTOS CONTAINING MATERIALS**

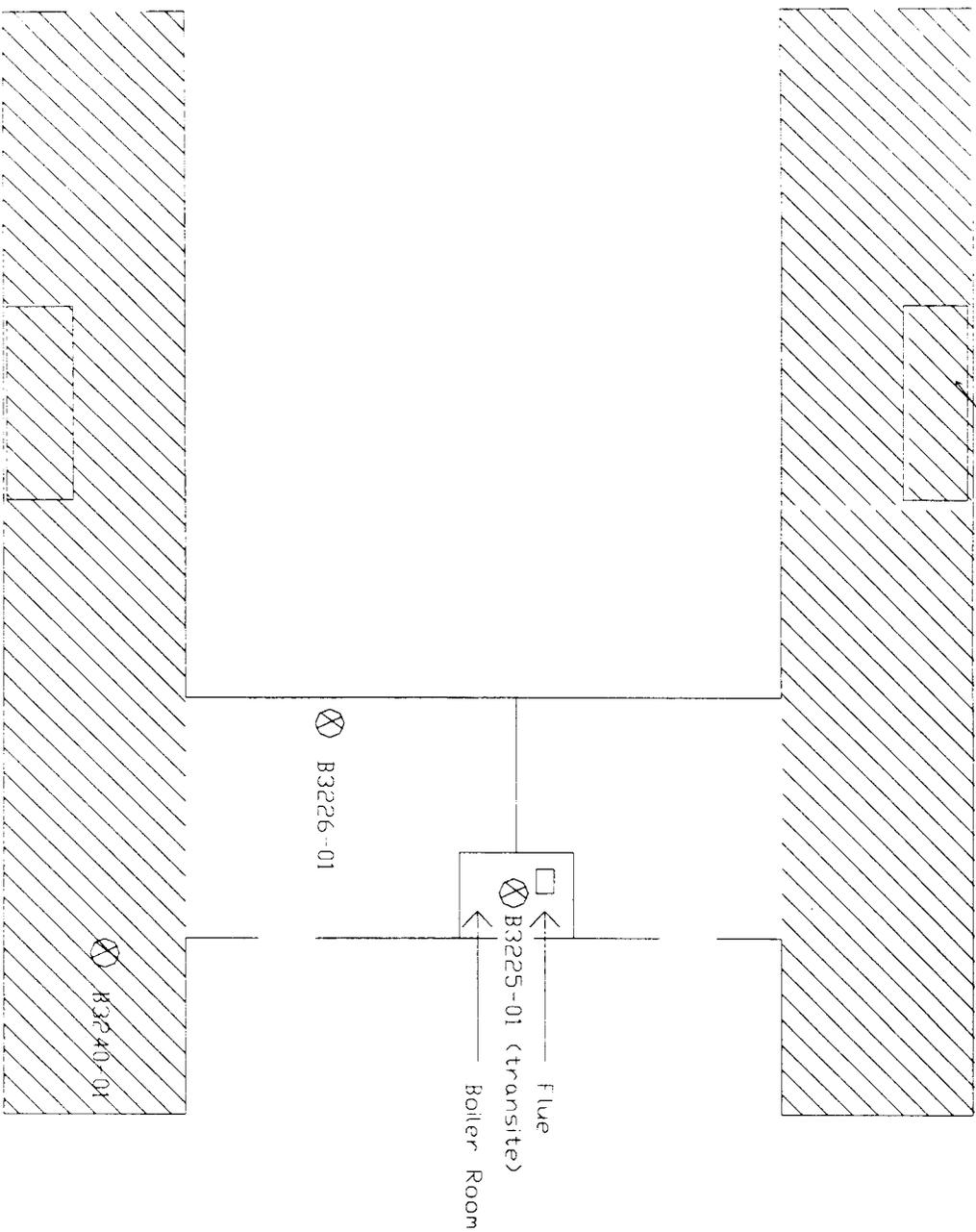
**SUMMARY TABLE  
 ASBESTOS CONTAINING MATERIALS  
 BUILDINGS 3220-3244  
 FORT McCLELLAN, ALABAMA**

| <b>SAMPLE #(S)</b>                    | <b>Description of Materials</b>         | <b>General Location of Material</b>       | <b>Quantity (approx.)</b>  |
|---------------------------------------|---|---|--|
| B3225-01                              | Transite around flue                    | Boiler room hot water tank, all buildings | 8 sq. ft. per building   |
| B3226-01                              | Brown aircel type TSI Building 3226     | One pipe run in latrine                   | 14 linear ft.  |
| B3240-01b                             | Mastic associated with 12x12 floor tile | All buildings                             | 3500 ft <sup>2</sup> per bldg. in 3220-3243: 400 ft <sup>2</sup> in 3244 |
| Presumed Asbestos Containing Material | 9x9 inch vinyl floor tile and mastic    | All buildings                             | 400 ft <sup>2</sup> per bldg. In 3220-3243: 4100 ft <sup>2</sup> in 3244 |

**APPENDIX C**

**SAMPLE LOCATIONS PLANS**

Mechanical Rooms (Both Sides)  
 \* Note: Buildings 3233 - 3237  
 have no side mechanical rooms



- ⊗ - Positive Sample Locations
- ⊗ - Negative Sample Locations
- ▨ 9 x 9 Floor Tile
- ▨ 12 x 12 Floor Tile

SCALE: 1"=30'

BUILDING: 3220  
 3243

ASBESTOS SURVEY  
 DAB102-96-D-0005  
 FM705

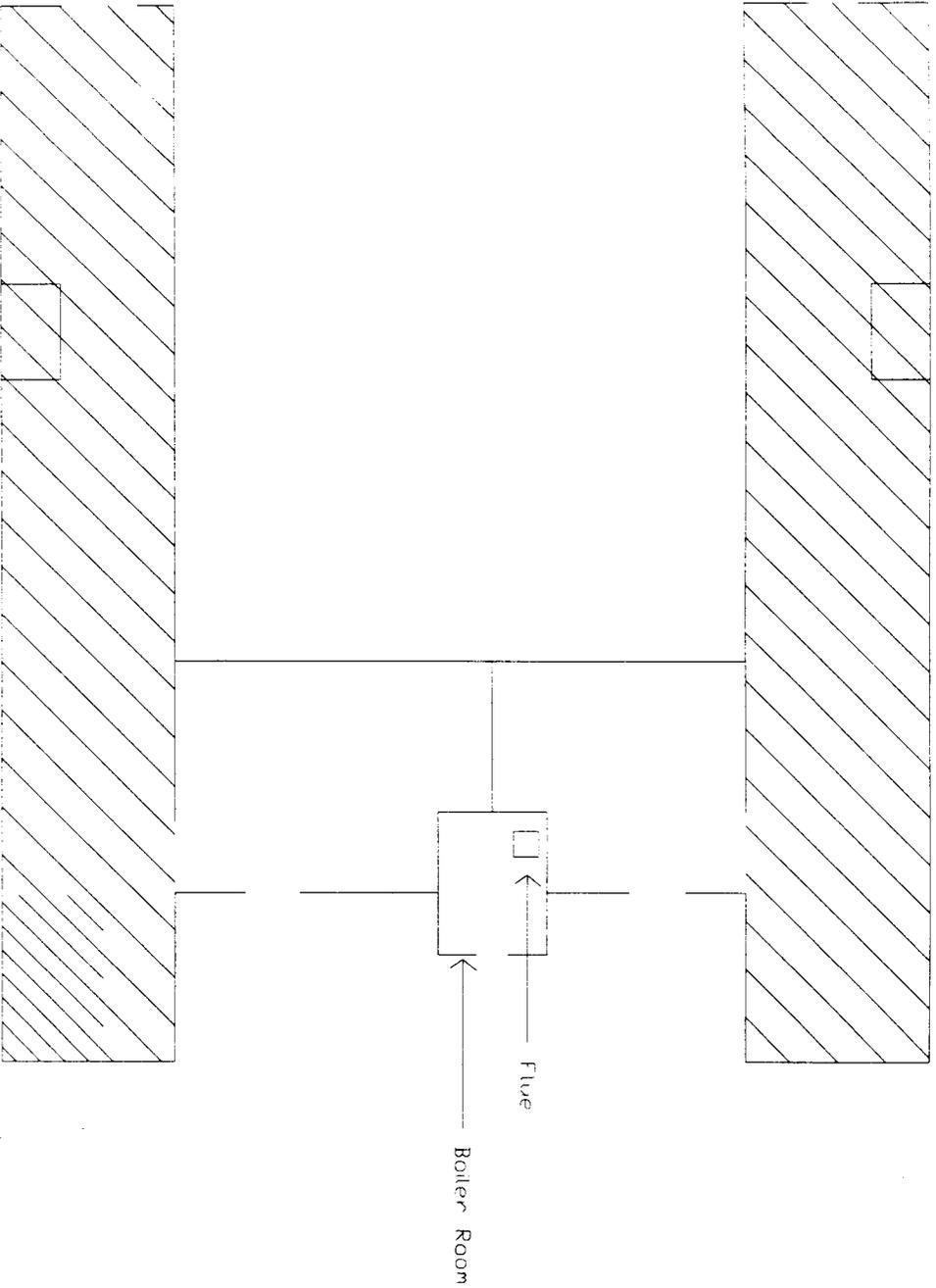
**REISZ ENGINEERING**

**APPENDIX D**

**SELECTED ACM LOCATION PLANS**

BUILDING 32244

ASBESTOS SURVEY  
DAB102-96-D-0005  
FM705



SCALE: 1"=30'

- ▨ - 9 x 9 Floor Tile
- ▨ - 12 x 12 Floor Tile

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**ASBESTOS CONTAINING BUILDING MATERIALS  
SURVEY REPORT**

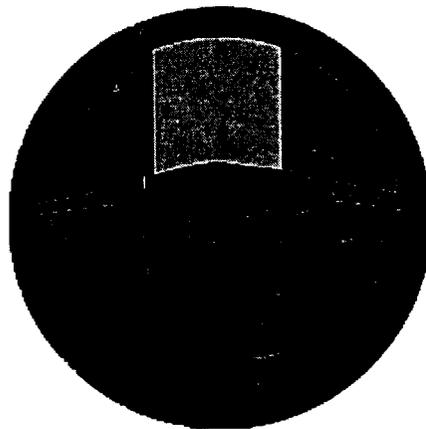
**BUILDING: 3250**

**ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
RELIGIOUS EDUCATION FACILITY  
BUILDING 3250**

**FORT McCLELLAN, ALABAMA**

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Fort McClellan*



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ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
RELIGIOUS EDUCATION FACILITY  
BUILDING 3250

FORT McCLELLAN, ALABAMA

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Prepared For:*

DIRECTORATE OF ENVIRONMENT  
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JAMES R. WRIGHT

*Conducted and Prepared by:*

**REISZ ENGINEERING**

June, 1998

## TABLE OF CONTENTS

|     |   |   |
|-----|---|---|
| 1.0 | PURPOSE AND SCOPE OF SERVICES.....            | 1 |
| 2.0 | REGULATORY STANDARDS.....                     | 2 |
| 3.0 | PROJECT CHARACTERISTICS.....                  | 3 |
| 4.0 | SURVEY METHODOLOGY.....                       | 4 |
| 5.0 | LABORATORY ANALYSIS .....                     | 5 |
| 6.0 | SUSPECT MATERIALS.....                        | 5 |
| 7.0 | ASBESTOS INSPECTION AND SAMPLING RESULTS..... | 6 |
|     | FRIABLE ACM.....                              | 7 |
|     | NON FRIABLE ACM.....                          | 7 |
|     | INACCESSIBLE MATERIAL.....                    | 8 |
| 8.0 | CONCLUSIONS AND RECOMMENDATIONS.....          | 8 |
| 9.0 | ASSUMPTIONS AND LIMITATIONS.....              | 8 |

### APPENDICES

APPENDIX A - REPORT OF LABORATORY ANALYSIS

APPENDIX B - SUMMARY TABLE OF ACM

APPENDIX C - SAMPLE LOCATIONS PLANS

APPENDIX C - SELECTED ACM LOCATIONS PLANS

## **1.0 PURPOSE AND SCOPE OF SERVICES**

The purpose of this survey was to locate and identify asbestos containing building materials at Building 3250 located at Fort McClellan, Alabama. Pursuant to the Contract, REISZ Engineering was required to provide the survey in accordance with AHERA (40 CFR Part 763 Subpart E) protocol. AHERA is applicable to interior building products installed prior to October 12, 1988. AHERA does not apply to the exterior of buildings and does not apply to non-building materials (e.g. cabinetry, special equipment and chalkboards). REISZ Engineering has included as part of the survey those readily accessible, suspect friable interior non-building materials (e.g. vibration dampers); but has not included certain items (e. g. interior linings of equipment and special supplies, some non-friable materials such as transite, etc.). Exterior building materials were not sampled as part of this contract unless those materials were suspected to be of friable nature and continuous with indoor materials (e.g. piping insulation). Specifically, REISZ Engineering was contracted to provide the following services:

1. Identify and collect samples of accessible suspect friable building materials within the referenced project area.
2. Perform a visual inspection to provide information on material condition, material quantities, material locations, and building use.
3. Analysis of all bulk samples for asbestos content utilizing Polarized Light Microscopy and Dispersion Staining Techniques performed in accordance with EPA Bulk Analysis Method  
EPA 600/M4-82-020.
4. Make recommendations as to response actions pertaining to those materials identified as asbestos containing.

5. Compilation of a final report (contained herein) which details all sample results, identifies sample locations, and provides recommendations based upon the results.
6. Preparation of a Building specific Operations & Maintenance (O&M) Plan for buildings containing friable asbestos materials.

## 2.0 REGULATORY STANDARDS

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires the Owner or Operator of a facility to determine the presence or non-presence of asbestos containing materials prior to conducting renovation or demolition activities. The NESHAP Standard for asbestos (40CFR Part 61 Sub-part M) requires the use of engineered control procedures for removal of asbestos materials that are or will become friable during renovation or demolition. The removal must occur before renovation or demolition activities impact those materials.

On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to the Standard, to notify employees, tenants and prospective employers (contractors) of the presence, location and quantities of ACM in the building. Implementation of the "communication of hazards" provisions in the Standard were originally to be not later than April 10, 1995 but was extended to July 10, 1995 and is now in effect. The OSHA Standard does not apply to work performed by employees of State agencies in states without state run OSHA programs (e.g. Alabama).

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing E.P.A. to establish rules and regulations

(40CFR Part 763) addressing asbestos-containing materials in schools. Specifically, the E.P.A. was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling asbestos containing materials (ACM) in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. Although the AHERA regulation does not specifically apply to this project it is generally accepted as the industry standard and was cited by Fort McClellan in the Asbestos Survey Request as the basis of survey methodology. The AHERA inspections must be conducted using specific guidelines that include a minimum number of samples per material type. This survey was conducted in accordance with those guidelines per the Contract requirements.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan to all public and commercial buildings. Currently the rule extends the accreditation requirements of persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA accredited personnel.

### 3.0 PROJECT CHARACTERISTICS

During the month of January 1998, Reisz Engineering accredited Asbestos Inspectors performed inspections of Building 3250 for the purpose of identifying building materials suspected to contain asbestos. Building 3250 is a single story Religious Education Facility containing approximately 5,554 sq. ft. of floor space. Based on information provided by Fort McClellan representatives the building was originally constructed in 1953. Various renovations may have taken place since the building was originally constructed but no building plans have been found which can be used to verify specific dates and activities.

The two dominant flooring conditions existing in the facility are 1) 12x12 vinyl floor tile, and 2) 9x9 vinyl floor tile. A small amount of suspect aircel type TSI was found on pipes in the mechanical room. The remaining pipes were either fiber-glass or rubber insulated.

#### 4.0 SURVEY METHODOLOGY

The building was visually inspected for the presence of material suspected to contain asbestos. Those suspect materials were identified, bulk samples were obtained and placed into individual vials for transportation to the University of Alabama in Huntsville. General areas for sample locations were selected on a random basis with a preference for exact positioning at existing damage. Each sample location is represented by a number on the plans in Appendix C. Those numbers directly correspond with the numbers listed elsewhere in this report.

If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. Materials installed after October 12, 1988 (as reported by Fort McClellan staff) were not sampled.

#### Hazard Assessment Factors

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current condition of all ACM identified was noted. Evidence of deterioration, physical damage, water

damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

## 5.0 LABORATORY ANALYSIS METHODOLOGY

All bulk samples were analyzed at UAH by polarized light microscopy utilizing dispersion staining or Becke line techniques, in accordance with the EPA's "Interim Method for Determination of Asbestos in Bulk Insulation Samples" (EPA 600/m4-82-020). Quality control samples were taken as duplicates at a rate of 1 to 10 and were sent to a second accredited laboratory. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA regulations if disturbed during maintenance, renovation, demolition or removal.

The UAH laboratory participates in the American Industrial Hygiene Association (AIHA) quality assurance program for polarized light microscopy and is accredited by the AIHA through their voluntary program.

## 6.0 SUSPECT MATERIALS

The following is a general list of building materials that were suspected to contain asbestos. A complete and more detailed description of these substances can be found in Appendix B.

#### Surfacing

- None

#### Thermal System Insulation

- Brown aircel type insulation on pipe in mechanical room.

#### Miscellaneous Material

- Vinyl floor tile 12x12
- Vinyl floor tile 9x9
- Vinyl flooring mastics

### 7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

A total of 1 bulk sample was collected and analyzed. Details of all laboratory results can be found in Appendix A. A listing of all suspect materials, their corresponding sample numbers, general location, and approximate quantity are indicated in Appendix B. A narrative description of all "Friable Asbestos Containing Material" and "Non-Friable ACM" identified during the survey, is given below.

#### FRIABLE ACM

Laboratory analysis determined asbestos is present in one type of friable material: 1) brown aircel type insulation on pipe in mechanical room.

- 1) A friable, aircel type insulation is found on approximately 14 linear feet of pipe located in a mechanical room of Building 3250.

#### NON FRIABLE ACM

Three types of non-friable Presumed ACM were found to be present in the building: 1) 12x12 inch vinyl floor tile, 2) 9x9 inch floor tile, and 3) mastics associated with 12x12 and 9x9 inch vinyl floor tile.

- 1) A suspect 12x12 inch vinyl floor tile is found throughout the building excluding the mechanical room.
- 2) A suspect 9x9 inch vinyl floor tile is found under a counter/desk in one room.
- 3) Black, suspect mastics are present below vinyl floor tiles throughout the building.

#### INACCESSIBLE MATERIAL,

Insulation and spray-on compounds associated with inaccessible crawl-space and tunnel areas may should be assumed as “like” materials corresponding to materials sampled within the building.

#### 8.0 CONCLUSIONS AND RECOMMENDATIONS

None of the materials identified within this report are damaged to the extent that significant asbestos fiber release may be likely under normal conditions. Proper management of the material in-place may be acceptable assuming the proper precautions are taken to eliminate exposure of personnel to any airborne asbestos. Reisz Engineering has written a Building Operations & Maintenance Plan for Building 3250 and we suggest that recommendations included in this plan be followed.

## 9.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions that were observed during the inspections of Building 3250 during January, 1998. Reisz Engineering and this report make no representation or assumptions as to past conditions or future occurrences.

Our inspection was generally non-destructive in nature. Any conditions or materials that were not visible on the surface were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials that may lay beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that all materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos abatement contractors in locating ACM. Under no circumstances is this report to be utilized as a bidding document or as a project specification document.

**APPENDIX A**

**REPORT OF LABORATORY ANALYSIS FOR ASBESTOS**



**APPENDIX B**

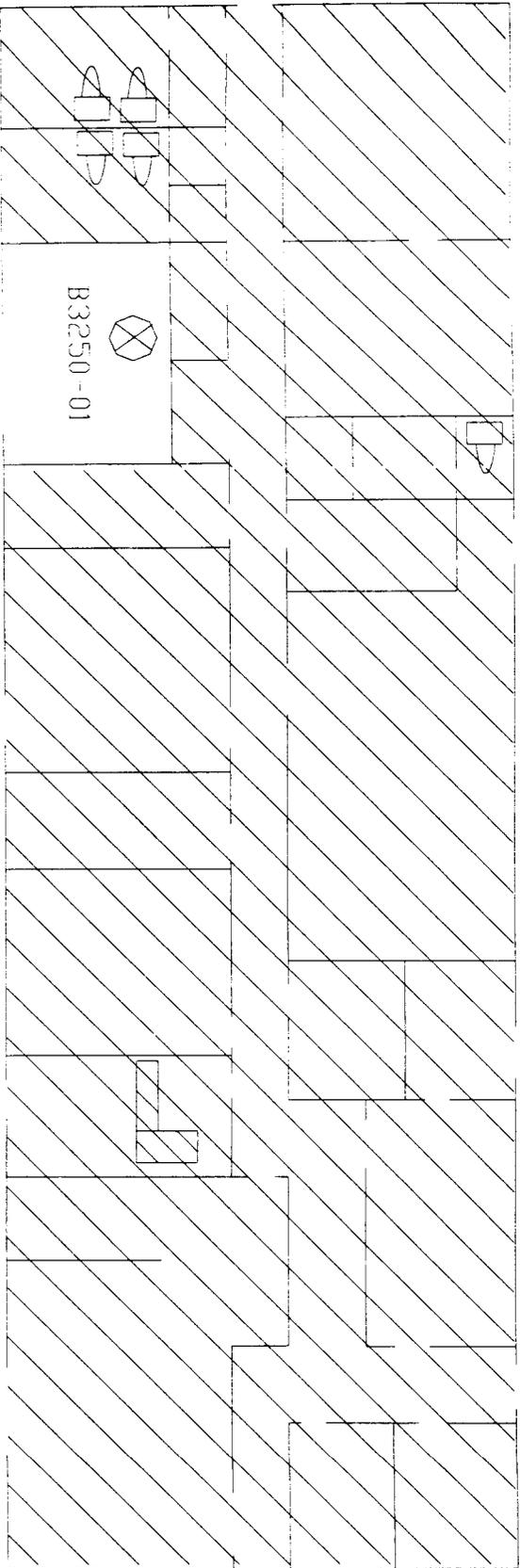
**ASBESTOS CONTAINING MATERIALS**

**SUMMARY TABLE  
 ASBESTOS CONTAINING MATERIALS  
 RELIGIOUS EDUCATION FACILITY  
 BUILDING 3250  
 FORT McCLELLAN, ALABAMA**

| SAMPLE #(S)                           | Description of Materials               | General Location of Material             | Quantity (approx.) |
|---------------------------------------|--|--|--------------------|
| B3250-01                              | Brown aircel type Pipe Insulation      | Mechanical room                          | 14 linear ft.      |
| Presumed Asbestos Containing Material | 9x9 inch vinyl floor tile and mastic   | Under counter in one room                | 34 sq. ft.         |
| Presumed Asbestos Containing Material | 12x12 inch vinyl floor tile and mastic | Throughout building excluding mech. room | 5,000 sq. ft.      |

**APPENDIX C**

**SAMPLE LOCATIONS PLANS**



-  - 9 x 9 Floor Tile
-  - 12 x 12 Floor Tile

 - Positive Sample Locations

SCALE: 1"=30'

BUILDING: 3250

ASBESTOS SURVEY  
DAB102-96-D-0005  
FM705

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**APPENDIX D**

**SELECTED ACM LOCATION PLANS**

**APPENDIX E**

**SELECTED ACM PHOTOGRAPHS**

**ASBESTOS CONTAINING BUILDING MATERIALS  
SURVEY REPORT**

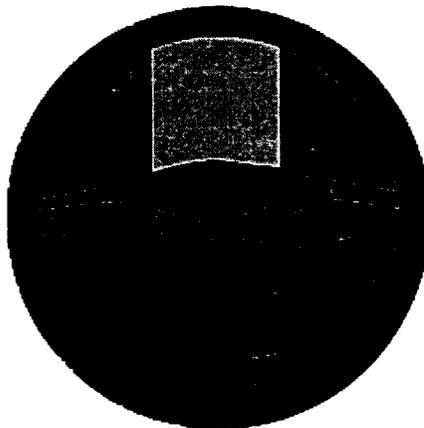
**BUILDING: 3290**

**ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
HEALTH CLINIC  
BUILDING 3290**

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BUILDING 3290

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DELIVERY ORDER 0005

*Prepared For:*

DIRECTORATE OF ENVIRONMENT  
FORT McCLELLAN

---

APPROVED FOR TRANSMITTAL BY  
JAMES R. WRIGHT

*Conducted and Prepared by:*

**REISZ ENGINEERING**

June, 1998

## TABLE OF CONTENTS

|     |   |   |
|-----|---|---|
| 1.0 | PURPOSE AND SCOPE OF SERVICES.....            | 1 |
| 2.0 | REGULATORY STANDARDS.....                     | 2 |
| 3.0 | PROJECT CHARACTERISTICS.....                  | 3 |
| 4.0 | SURVEY METHODOLOGY.....                       | 4 |
| 5.0 | LABORATORY ANALYSIS .....                     | 5 |
| 6.0 | SUSPECT MATERIALS.....                        | 5 |
| 7.0 | ASBESTOS INSPECTION AND SAMPLING RESULTS..... | 6 |
|     | FRIABLE ACM.....                              | 7 |
|     | NON FRIABLE ACM.....                          | 7 |
|     | INACCESSIBLE MATERIAL.....                    | 8 |
| 8.0 | CONCLUSIONS AND RECOMMENDATIONS.....          | 8 |
| 9.0 | ASSUMPTIONS AND LIMITATIONS.....              | 8 |

### APPENDICES

APPENDIX A - REPORT OF LABORATORY ANALYSIS  
APPENDIX B - SUMMARY TABLE OF ACM  
APPENDIX C - SAMPLE LOCATIONS PLANS  
APPENDIX D - SELECTED ACM LOCATIONS PLANS

## **1.0 PURPOSE AND SCOPE OF SERVICES**

The purpose of this survey was to locate and identify asbestos containing building materials at Building 3290 located at Fort McClellan, Alabama. Pursuant to the Contract, REISZ Engineering was required to provide the survey in accordance with AHERA (40 CFR Part 763 Subpart E) protocol. AHERA is applicable to interior building products installed prior to October 12, 1988. AHERA does not apply to the exterior of buildings and does not apply to non-building materials (e.g. cabinetry, special equipment and chalkboards). REISZ Engineering has included as part of the survey those readily accessible, suspect friable interior non-building materials (e.g. vibration dampers); but has not included certain items (e. g. interior linings of equipment and special supplies, some non-friable materials such as transite, etc.). Exterior building materials were not sampled as part of this contract unless those materials were suspected to be of friable nature and continuous with indoor materials (e.g. piping insulation). Specifically, REISZ Engineering was contracted to provide the following services:

1. Identify and collect samples of accessible suspect friable building materials within the referenced project area.
2. Perform a visual inspection to provide information on material condition, material quantities, material locations, and building use.
3. Analysis of all bulk samples for asbestos content utilizing Polarized Light Microscopy and Dispersion Staining Techniques performed in accordance with EPA Bulk Analysis Method  
EPA 600/M4-82-020.
4. Make recommendations as to response actions pertaining to those materials identified as asbestos containing.

5. Compilation of a final report (contained herein) which details all sample results, identifies sample locations, and provides recommendations based upon the results.
6. Preparation of a Building specific Operations & Maintenance (O&M) Plan for buildings containing friable asbestos materials.

## 2.0 REGULATORY STANDARDS

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires the Owner or Operator of a facility to determine the presence or non-presence of asbestos containing materials prior to conducting renovation or demolition activities. The NESHAP Standard for asbestos (40CFR Part 61 Sub-part M) requires the use of engineered control procedures for removal of asbestos materials that are or will become friable during renovation or demolition. The removal must occur before renovation or demolition activities impact those materials.

On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to the Standard, to notify employees, tenants and prospective employers (contractors) of the presence, location and quantities of ACM in the building. Implementation of the "communication of hazards" provisions in the Standard were originally to be not later than April 10, 1995 but was extended to July 10, 1995 and is now in effect. The OSHA Standard does not apply to work performed by employees of State agencies in states without state run OSHA programs (e.g. Alabama).

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing E.P.A. to establish rules and regulations

(40CFR Part 763) addressing asbestos-containing materials in schools. Specifically, the E.P.A. was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling asbestos containing materials (ACM) in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. Although the AHERA regulation does not specifically apply to this project it is generally accepted as the industry standard and was cited by Fort McClellan in the Asbestos Survey Request as the basis of survey methodology. The AHERA inspections must be conducted using specific guidelines that include a minimum number of samples per material type. This survey was conducted in accordance with those guidelines per the Contract requirements.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan to all public and commercial buildings. Currently the rule extends the accreditation requirements of persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA accredited personnel.

### 3.0 PROJECT CHARACTERISTICS

During the month of January 1998, Reisz Engineering accredited Asbestos Inspectors performed inspections of Building 3290 for the purpose of identifying building materials suspected to contain asbestos. Building 3290 is a single story building serving as a health clinic. The building contains approximately 2,250 sq. ft. of floor space. Based on information provided by Fort McClellan representatives the building was originally constructed in 1953. Various renovations may have taken place since the building was originally constructed but no building plans have been found which can be used to verify specific dates and activities.

The dominant flooring condition existing in the facility are 1) cement, and 2) 12x12 vinyl floor tile. A small amount of suspect air-cell type insulation was found on 3 inch piping in the building.

#### 4.0 SURVEY METHODOLOGY

The building was visually inspected for the presence of material suspected to contain asbestos. Those suspect materials were identified, bulk samples were obtained and placed into individual vials for transportation to the University of Alabama in Huntsville. General areas for sample locations were selected on a random basis with a preference for exact positioning at existing damage. Each sample location is represented by a number on the plans in Appendix C. Those numbers directly correspond with the numbers listed elsewhere in this report.

If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. Materials installed after October 12, 1988 (as reported by Fort McClellan staff) were not sampled.

#### Hazard Assessment Factors

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current condition of all ACM identified was noted. Evidence of deterioration, physical damage, water

damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

## 5.0 LABORATORY ANALYSIS METHODOLOGY

All bulk samples were analyzed at UAH by polarized light microscopy utilizing dispersion staining or Becke line techniques, in accordance with the EPA's "Interim Method for Determination of Asbestos in Bulk Insulation Samples" (EPA 600/m4-82-020). Quality control samples were taken as duplicates at a rate of 1 to 10 and were sent to a second accredited laboratory. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA regulations if disturbed during maintenance, renovation, demolition or removal.

The UAH laboratory participates in the American Industrial Hygiene Association (AIHA) quality assurance program for polarized light microscopy and is accredited by the AIHA through their voluntary program.

## 6.0 SUSPECT MATERIALS

The following is a general list of building materials that were suspected to contain asbestos. A complete and more detailed description of these substances can be found in Appendix B.

#### Surfacing

- None

#### Thermal System Insulation

- Brown air-cell type pipe insulation on 3 inch pipe in mechanical room and other areas.

#### Miscellaneous Material

- Vinyl floor tile 12x12
- Vinyl flooring mastic

### 7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

A total of 2 bulk sample were collected and analyzed. Details of all laboratory results can be found in Appendix A. A listing of all suspect materials, their corresponding sample numbers, general location, and approximate quantity are indicated in Appendix B. A narrative description of all "Friable Asbestos Containing Material" and "Non-Friable ACM" identified during the survey, is given below.

#### FRIABLE ACM

Laboratory analysis determined asbestos is present in one type of friable material: 1) brown air-cell type pipe insulation on 3 inch pipes.

- 1) A friable, asbestos containing insulation is found on 3 inch pipes located in the mechanical room and other areas of Building 3290.

### NON FRIABLE ACM

Two types of non-friable Presumed ACM was found to be present in the building: 1) 12x12 inch vinyl floor tile, and 2) mastics associated with 12x12 inch vinyl floor tile.

- 1) A suspect 12x12 inch vinyl floor tile is found throughout the building.
- 2) Black, suspect mastic is present below 12x12 inch vinyl floor tile.

### INACCESSIBLE MATERIAL,

Insulation and spray-on compounds associated with inaccessible crawl-space and tunnel areas may should be assumed as “like” materials corresponding to materials sampled within the building.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

None of the materials identified within this report are damaged to the extent that significant asbestos fiber release may be likely under normal conditions. Proper management of the material in-place may be acceptable assuming the proper precautions are taken to eliminate exposure of personnel to any airborne asbestos. Reisz Engineering has written a Building Operations & Maintenance Plan for Building 3290 and we suggest that recommendations included in this plan be followed.

## 9.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions that were observed during the inspections of Building 3290 during January, 1998. Reisz Engineering and this report make no representation or assumptions as to past conditions or future occurrences.

Our inspection was generally non-destructive in nature. Any conditions or materials that were not visible on the surface were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials that may lay beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that all materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos abatement contractors in locating ACM. Under no

circumstances is this report to be utilized as a bidding document or as a project specification document.

## **APPENDIX A**

### **REPORT OF LABORATORY ANALYSIS FOR ASBESTOS**



**APPENDIX B**

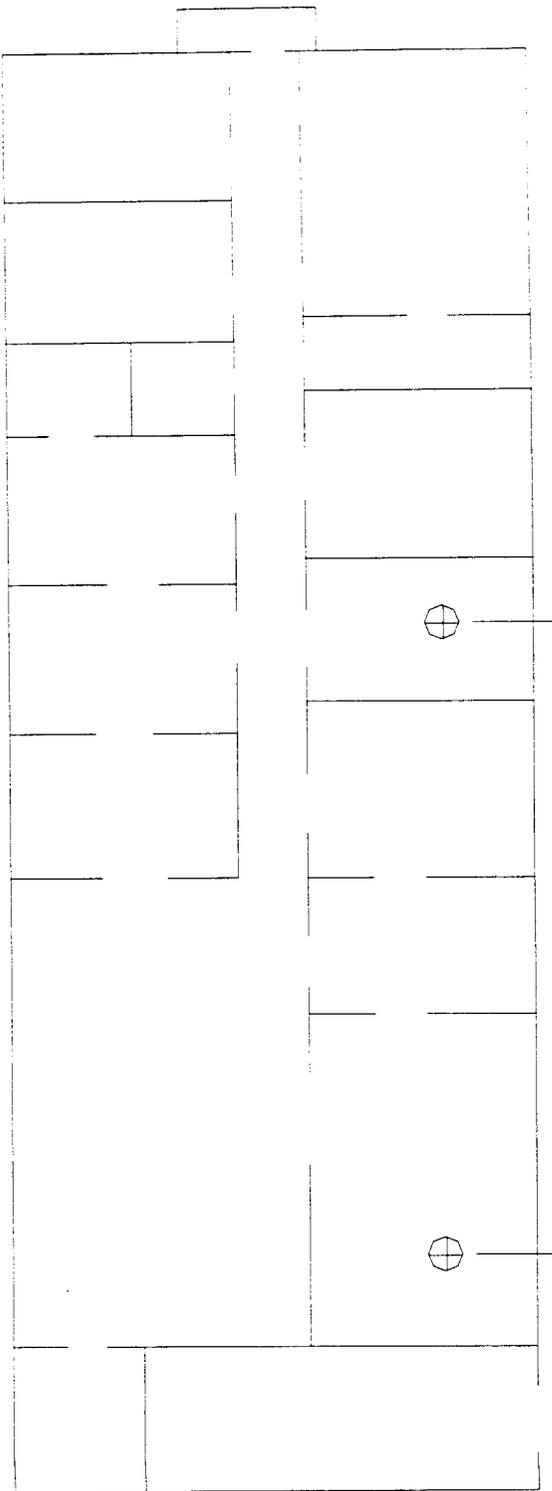
**ASBESTOS CONTAINING MATERIALS**

**SUMMARY TABLE  
ASBESTOS CONTAINING MATERIALS  
HEALTH CLINIC  
BUILDING 3290  
FORT McCLELLAN, ALABAMA**

| <b>SAMPLE #(S)</b> | <b>Description of Materials</b>        | <b>General Location of Material</b>         | <b>Quantity (approx.)</b> |
|--------------------|--|---|---------------------------|
| B3290-01,02        | Brown air-cell type<br>Pipe insulation | Latrine and various<br>Locations throughout | 90 linear ft.             |

**APPENDIX C**

**SAMPLE LOCATIONS PLANS**



B3290-02

B3290-01

⊕ Positive Sample Location

SCALE: 1"=30'

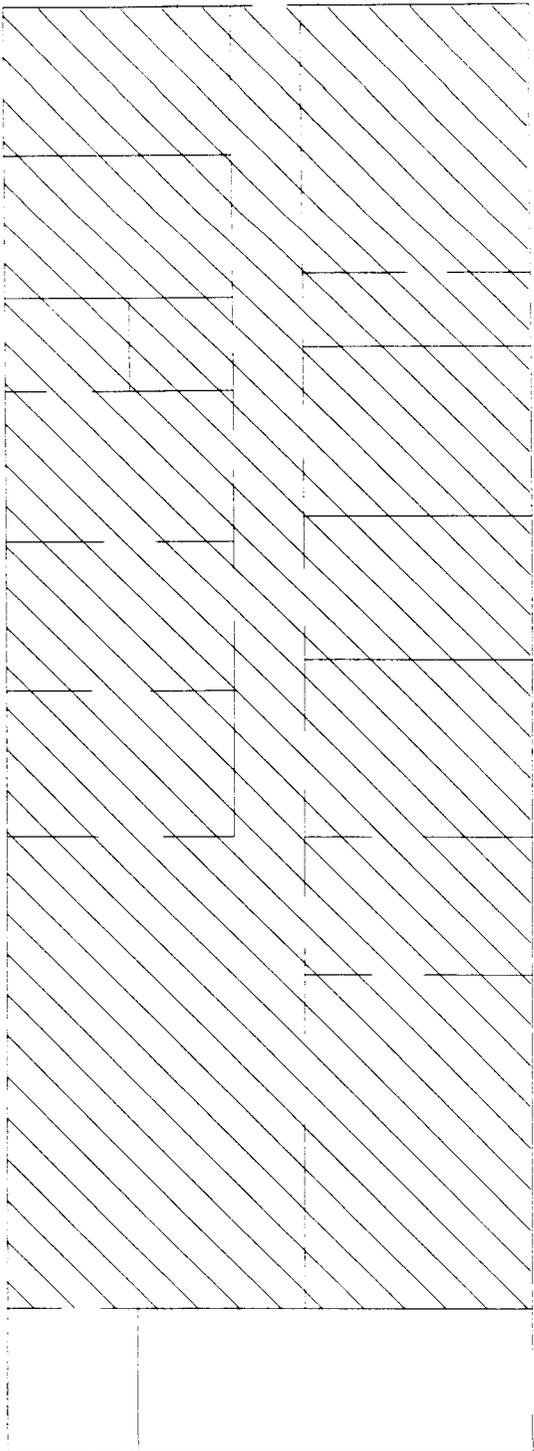
BUILDING 3290

ASBESTOS SURVEY  
DAB102-96-D 0005  
FM705

**REISZ ENGINEERING**

**APPENDIX D**

**SELECTED ACM LOCATION PLANS**



12x12 Floor Tile  
(Assumed ACM)

SCALE: 1"=30'

BUILDING 3290

ASBESTOS SURVEY  
DAB102 96-D-0005  
1M705

**REISZ ENGINEERING**

**APPENDIX E**

**SELECTED ACM PHOTOGRAPHS**

**ASBESTOS CONTAINING BUILDING MATERIALS  
SURVEY REPORT**

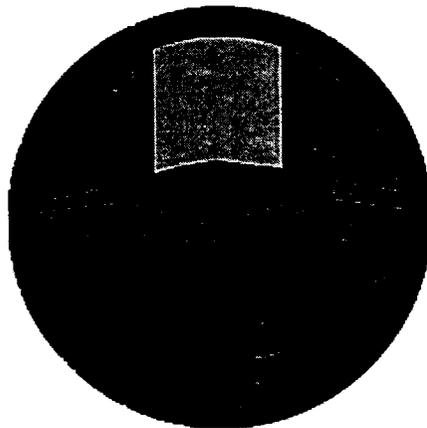
**BUILDING: 3293**

**ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
CHAPEL  
BUILDING 3293**

**FORT McCLELLAN, ALABAMA**

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Fort McClellan*



*Staying Beautiful*

*Conducted and Prepared by:*

**REISZ ENGINEERING**  
P.O. BOX 1349

HUNTSVILLE, ALABAMA 35807  
ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
CHAPEL  
BUILDING 3293

FORT McCLELLAN, ALABAMA

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
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*Prepared For:*

DIRECTORATE OF ENVIRONMENT  
FORT McCLELLAN

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APPROVED FOR TRANSMITTAL BY  
JAMES R. WRIGHT

*Conducted and Prepared by:*

**REISZ ENGINEERING**

June, 1998

## TABLE OF CONTENTS

|     |   |   |
|-----|---|---|
| 1.0 | PURPOSE AND SCOPE OF SERVICES.....            | 1 |
| 2.0 | REGULATORY STANDARDS.....                     | 2 |
| 3.0 | PROJECT CHARACTERISTICS.....                  | 3 |
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| 6.0 | SUSPECT MATERIALS.....                        | 5 |
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## **1.0 PURPOSE AND SCOPE OF SERVICES**

The purpose of this survey was to locate and identify asbestos containing building materials at Building 3293 located at Fort McClellan, Alabama. Pursuant to the Contract, REISZ Engineering was required to provide the survey in accordance with AHERA (40 CFR Part 763 Subpart E) protocol. AHERA is applicable to interior building products installed prior to October 12, 1988. AHERA does not apply to the exterior of buildings and does not apply to non-building materials (e.g. cabinetry, special equipment and chalkboards). REISZ Engineering has included as part of the survey those readily accessible, suspect friable interior non-building materials (e.g. vibration dampers); but has not included certain items (e. g. interior linings of equipment and special supplies, some non-friable materials such as transite, etc.). Exterior building materials were not sampled as part of this contract unless those materials were suspected to be of friable nature and continuous with indoor materials (e.g. piping insulation). Specifically, REISZ Engineering was contracted to provide the following services:

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## 2.0 REGULATORY STANDARDS

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On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to the Standard, to notify employees, tenants and prospective employers (contractors) of the presence, location and quantities of ACM in the building. Implementation of the "communication of hazards" provisions in the Standard were originally to be not later than April 10, 1995 but was extended to July 10, 1995 and is now in effect. The OSHA Standard does not apply to work performed by employees of State agencies in states without state run OSHA programs (e.g. Alabama).

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing E.P.A. to establish rules and regulations

(40CFR Part 763) addressing asbestos-containing materials in schools. Specifically, the E.P.A. was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling asbestos containing materials (ACM) in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. Although the AHERA regulation does not specifically apply to this project it is generally accepted as the industry standard and was cited by Fort McClellan in the Asbestos Survey Request as the basis of survey methodology. The AHERA inspections must be conducted using specific guidelines that include a minimum number of samples per material type. This survey was conducted in accordance with those guidelines per the Contract requirements.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan to all public and commercial buildings. Currently the rule extends the accreditation requirements of persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA accredited personnel.

### 3.0 PROJECT CHARACTERISTICS

During the month of June 1997, Reisz Engineering accredited Asbestos Inspectors performed inspections of Building 3293 for the purpose of identifying building materials suspected to contain asbestos. Building 3293 is a single story building serving as a Chapel. The building contains approximately 9,500 sq. ft. of floor space. Based on information provided by Fort McClellan representatives the building was originally constructed in 1953. Various renovations may have taken place since the building was originally constructed but no building plans have been found which can be used to verify specific dates and activities.

The dominant flooring condition existing in the facility are 1) carpet, and 2) ceramic tile. A 9x9 inch vinyl floor tile is found underneath all carpet in the facility.

#### 4.0 SURVEY METHODOLOGY

The building was visually inspected for the presence of material suspected to contain asbestos. Those suspect materials were identified, bulk samples were obtained and placed into individual vials for transportation to the University of Alabama in Huntsville. General areas for sample locations were selected on a random basis with a preference for exact positioning at existing damage. Each sample location is represented by a number on the plans in Appendix C. Those numbers directly correspond with the numbers listed elsewhere in this report.

If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. Materials installed after October 12, 1988 (as reported by Fort McClellan staff) were not sampled.

#### Hazard Assessment Factors

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current condition of all ACM identified was noted. Evidence of deterioration, physical damage, water

damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

## 5.0 LABORATORY ANALYSIS METHODOLOGY

All bulk samples were analyzed at UAH by polarized light microscopy utilizing dispersion staining or Becke line techniques, in accordance with the EPA's "Interim Method for Determination of Asbestos in Bulk Insulation Samples" (EPA 600/m4-82-020). Quality control samples were taken as duplicates at a rate of 1 to 10 and were sent to a second accredited laboratory. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA regulations if disturbed during maintenance, renovation, demolition or removal.

The UAH laboratory participates in the American Industrial Hygiene Association (AIHA) quality assurance program for polarized light microscopy and is accredited by the AIHA through their voluntary program.

## 6.0 SUSPECT MATERIALS

The following is a general list of building materials that were suspected to contain asbestos. A complete and more detailed description of these substances can be found in Appendix B.

#### Surfacing

- None

#### Thermal System Insulation

- Cementitious pipe fitting and straight run insulation
- Air-cell type pipe insulation

#### Miscellaneous Material

- Vinyl floor tile 9x9
- Vinyl flooring mastic

### 7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

A total of 14 bulk sample were collected and analyzed. Details of all laboratory results can be found in Appendix A. A listing of all suspect materials, their corresponding sample numbers, general location, and approximate quantity are indicated in Appendix B. A narrative description of all "Friable Asbestos Containing Material" and "Non-Friable ACM" identified during the survey, is given below.

#### FRIABLE ACM

Laboratory analysis determined asbestos is present in three types of friable material: 1) brown air-cell type pipe insulation, 2) cementitious pipe fitting insulation, and 3) cementitious straight run pipe insulation.

- 1) A friable, asbestos containing air-cell type insulation is found on pipes in the crawlspace and other areas of Building 3293. Some pipes are insulated with fiberglass.
- 2) A friable, cementitious pipe fitting insulation is found on pipes in various locations in the building.
- 3) A friable, cementitious straight run pipe insulation is found on pipes in various locations in the building.

#### NON FRIABLE ACM

Two types of non-friable ACM were found to be present in the building: 1) 9x9 inch vinyl floor tile, and 2) mastics associated with 9x9 inch vinyl floor tile.

- 1) An asbestos containing 9x9 inch vinyl floor tile is found below carpet in the building.
- 2) Black, asbestos containing mastic is present below 9x9 inch vinyl floor tile in the building.

#### INACCESSIBLE MATERIAL

Insulation and spray-on compounds associated with inaccessible crawl-space and tunnel areas may should be assumed as "like" materials corresponding to materials sampled within the building.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

None of the materials identified within this report are damaged to the extent that significant asbestos fiber release may be likely under normal conditions. Proper management of the material in-place may be acceptable assuming the proper precautions are taken to eliminate exposure of personnel to any airborne asbestos. Reisz Engineering has written a Building Operations & Maintenance Plan for Building 3293 and we suggest that recommendations included in this plan be followed.

## 9.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions that were observed during the inspections of Building 3293 during June, 1997. Reisz Engineering and this report make no representation or assumptions as to past conditions or future occurrences.

Our inspection was generally non-destructive in nature. Any conditions or materials that were not visible on the surface were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials that may lie beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that all materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos abatement contractors in locating ACM. Under no circumstances is this report to be utilized as a bidding document or as a project specification document.

**APPENDIX A**

**REPORT OF LABORATORY ANALYSIS FOR ASBESTOS**

# UAH

Environmental Laboratory  
Kenneth E. Johnson Research  
Center

The University of Alabama in Huntsville

Huntsville, Alabama 35899  
Phone: (205) 890-6391  
Fax: (205) 890-6376

Re : Bulk Asbestos  
Analysis EPA  
600/R-93/116  
AIHA: 023601

Receipt Date: 06/27/97

Sample Date : 06/23/97

Client: Reisz Engineering  
Building 32 Suite, A2  
3322 Memorial Parkway South  
Huntsville, AL 35801

Microscopist: Tom Carrington

| Sample/Description                          | Asbestos Fibers (%) |      |      |      | Non-Asbestos Material (%) |      |    |       |      |
|---|---------------------|------|------|------|---------------------------|------|----|-------|------|
|   | Chry                | Amos | Croc | Othr | Cell                      | Fbgl | MW | CaSO4 | Othr |
| B3293-01/ pipe insul crawl space            |                     |      |      |      | 85                        |      |    |       | 15   |
| B3293-02/ pipe insul crawl space            | 15                  |      |      |      | 75                        |      |    |       | 10   |
| B3293-03/ pipe insul crawl space            | 8                   |      |      |      | 92                        |      |    |       |      |
| B3293-04/ ceiling tile #6                   |                     |      |      |      | 75                        |      |    |       | 25   |
| B3293-05/ 9" floor tile closet #7           | 10                  |      |      |      |                           |      |    |       | 90   |
| B3293-06/ 9" floor tile mastic              | 10                  |      |      |      | 10                        |      | 30 |       | 80   |
| B3293-07/ 9" floor tile                     |                     |      |      |      | 5                         |      |    |       | 95   |
| B3293-08/ 9" floor tile mastic              |                     |      |      |      | 10                        |      |    |       | 90   |
| B3293-09/ white powder insul<br>(very hard) | 10                  | 50   |      |      |                           | 5    | 5  |       | 30   |
| B3293-10/ pipe insul<br>Paper-looking       |                     |      |      |      | 90                        |      |    |       | 10   |
| B3293-11/ white powder<br>Insul hard        | 15                  | 35   |      |      |                           |      | 30 |       | 20   |
| B3293-12/ white powder<br>Insul hard        |                     |      |      |      | 10                        |      | 60 |       | 30   |
| B3293-13/ white powder<br>Insul hard        | 5                   | 20   |      |      |                           | 10   | 30 |       | 35   |
| B3293-14/ pipe insul<br>Paper-looking       |                     |      |      |      | 85                        |      |    |       | 15   |

Chry = Chrysotile  
Amos = Amosite  
Croc = Crocidolite

Othr = Other  
Cell = Cellulose

MW = Mineral Wool  
Ca S04= Calcium Sulfate  
Fbgl = Fiberglass

**APPENDIX B**

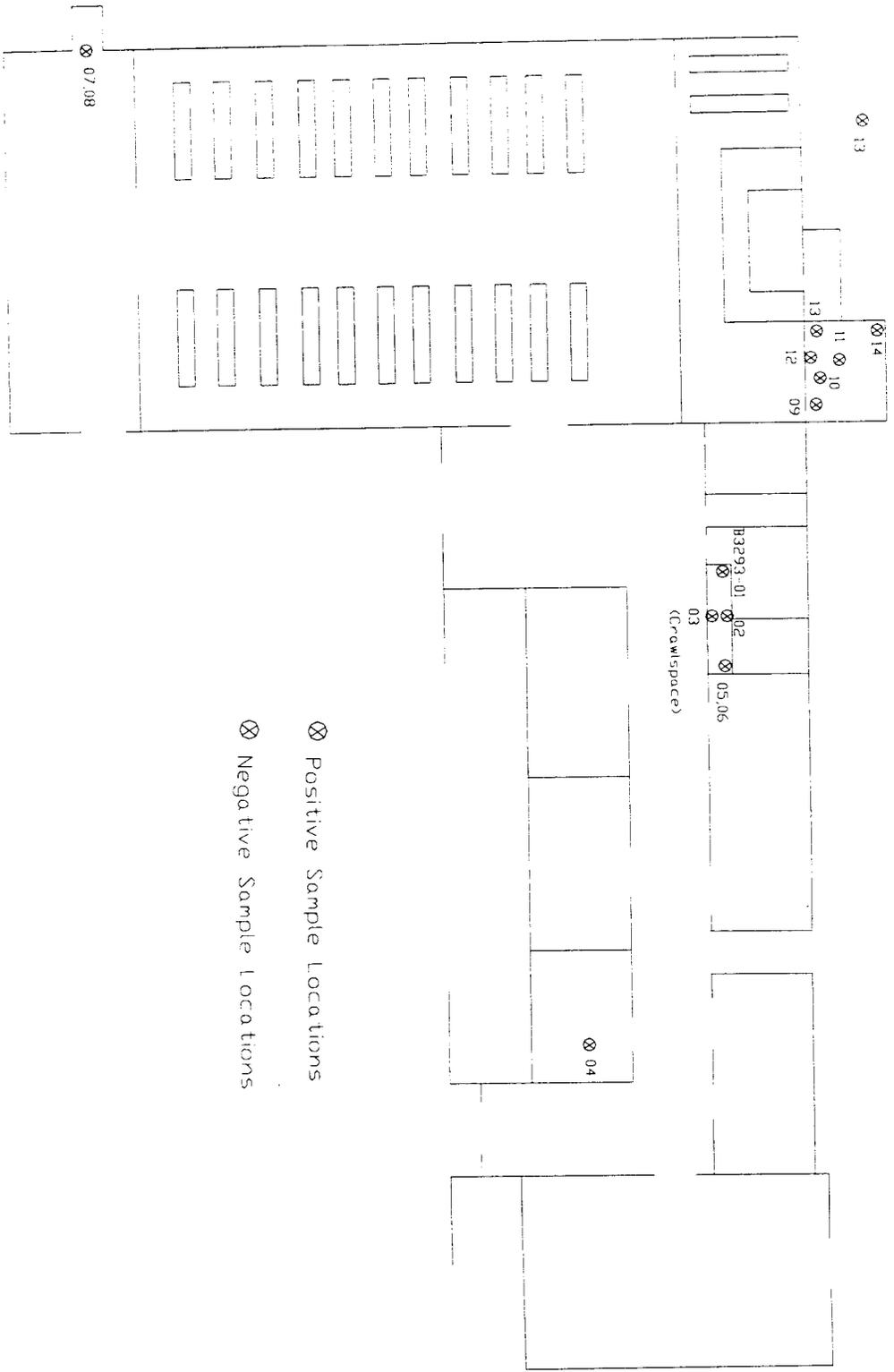
**ASBESTOS CONTAINING MATERIALS**

**SUMMARY TABLE  
ASBESTOS CONTAINING MATERIALS  
CHAPEL  
BUILDING 3293  
FORT McCLELLAN, ALABAMA**

| <b>SAMPLE #(S)</b> | <b>Description of Materials</b>  | <b>General Location of Material</b>      | <b>Quantity (approx.)</b> |
|--------------------|----------------------------------|--|---------------------------|
| B3293-02,03        | Pipe insulation on Straight runs | Crawlspace                               | 1000 linear ft.           |
| B3293-05,06        | 9x9 floor tile & mastic          | Under carpet in office Areas of building | 4,000 sq. ft.             |
| B3293-09,11,13     | Cementitious pipe Insulation     | Mechanical room                          | 50 linear ft.             |

**APPENDIX C**

**SAMPLE LOCATIONS PLANS**



- ⊗ Positive Sample Locations
- ⊗ Negative Sample Locations

BUILDING

3293

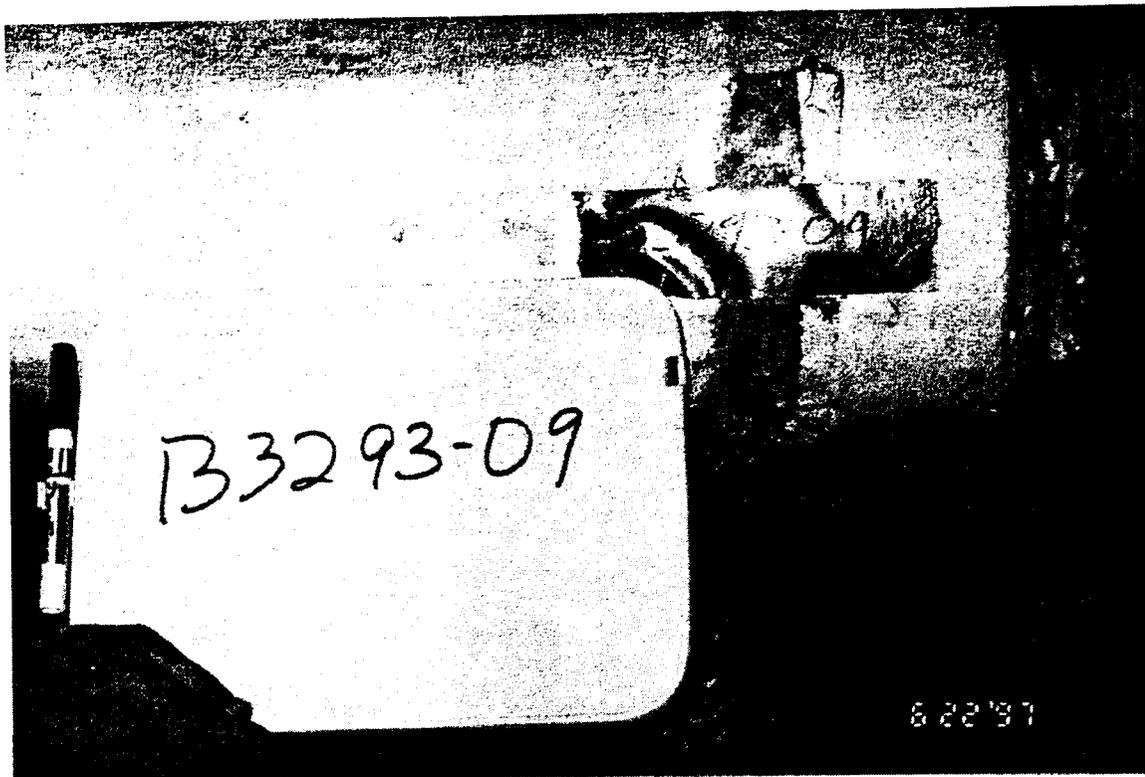
FIG. 1 LAYOUT

ASBESTOS SURVEY  
 DAB102-96-D 0005  
 FM/05

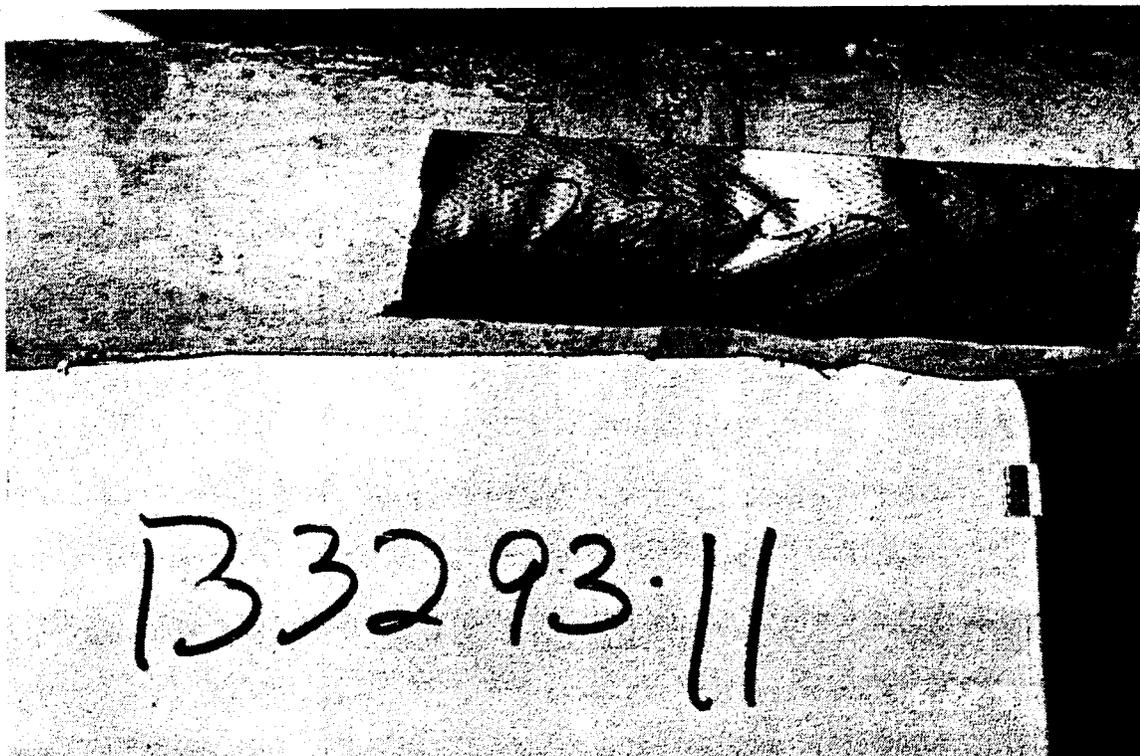
**REISZ ENGINEERING**

**APPENDIX D**

**SELECTED ACM PHOTOGRAPHS**



B3293-09: White powdery asbestos containing pipe insulation.



**B3293-11:** White powdery asbestos containing pipe insulation.

**ASBESTOS CONTAINING BUILDING MATERIALS  
SURVEY REPORT**

**BUILDING(S):**

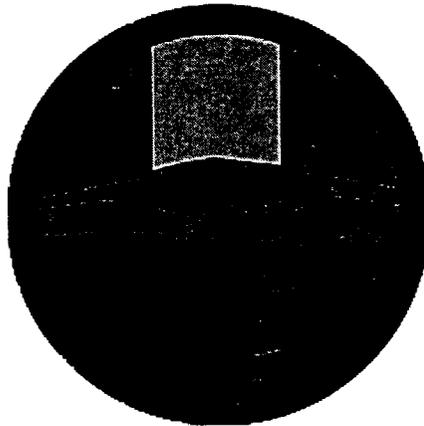
**66, 184, 793, 891, 1108, 1919, 1920, 2020, 2090, and  
3136**

**ASBESTOS CONTAINING BUILDING MATERIALS SURVEY  
MISCELLANEOUS BUILDINGS  
PACM**

**FORT McCLELLAN, ALABAMA**

U.S. ARMY CONTRACT NO. DABT02-96-D-0005  
DELIVERY ORDER 0005

*Fort McClellan*



*Staying Beautiful*

*Conducted and Prepared by:*

**REISZ ENGINEERING**  
P.O. BOX 1349  
HUNTSVILLE, ALABAMA 35807

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*Prepared For:*

**DIRECTORATE OF ENVIRONMENT  
FORT McCLELLAN**

---

**APPROVED FOR TRANSMITTAL BY  
JOSEPH L. HILLERICH**

*Conducted and Prepared by:*

**REISZ ENGINEERING**

**P.O. BOX 1349**

**HUNTSVILLE, ALABAMA 35807**

## TABLE OF CONTENTS

|     |   |   |
|-----|---|---|
| 1.0 | PURPOSE AND SCOPE OF SERVICES.....            | 1 |
| 2.0 | REGULATORY STANDARDS.....                     | 2 |
| 3.0 | PROJECT CHARACTERISTICS.....                  | 3 |
| 4.0 | SURVEY METHODOLOGY.....                       | 4 |
| 5.0 | LABORATORY ANALYSIS .....                     | 4 |
| 6.0 | SUSPECT MATERIALS.....                        | 5 |
| 7.0 | ASBESTOS INSPECTION AND SAMPLING RESULTS..... | 6 |
|     | FRIABLE ACM.....                              | 6 |
|     | NON FRIABLE ACM.....                          | 7 |
|     | INACCESSIBLE MATERIAL.....                    | 7 |
| 8.0 | CONCLUSIONS AND RECOMMENDATIONS.....          | 8 |
| 9.0 | ASSUMPTIONS AND LIMITATIONS.....              | 8 |

### APPENDICES

- APPENDIX A - REPORT OF LABORATORY ANALYSIS
- APPENDIX B - LIST OF MISCELLANEOUS BUILDINGS WITH PACM
- APPENDIX C - SELECTED PACM LOCATIONS PLANS
- APPENDIX D - SUMMARY TABLE OF PACM AND COST ESTIMATES

## **1.0 PURPOSE AND SCOPE OF SERVICES**

The purpose of this survey was to locate and identify asbestos containing building materials at miscellaneous buildings located throughout Fort McClellan, Alabama. (See Appendix B for a complete list of buildings included in this document). Pursuant to the Contract, REISZ Engineering was required to provide the survey in accordance with AHERA (40 CFR Part 763 Subpart E) protocol. AHERA is applicable to interior building products installed prior to October 12, 1988. AHERA does not apply to the exterior of buildings and does not apply to non-building materials (e.g. cabinetry, special equipment and chalkboards). REISZ Engineering has included as part of the survey those readily accessible, suspect friable interior non-building materials (e.g. vibration dampers); but has not included certain items (e.g. interior linings of equipment and special supplies, some non-friable materials such as transite, etc.). Exterior building materials were not sampled as part of this contract unless those materials were suspected to be of friable nature and continuous with indoor materials (e.g. piping insulation). Specifically, REISZ Engineering was contracted to provide the following services:

1. Identify and collect samples of accessible suspect friable building materials within the referenced project area.
2. Perform a visual inspection to provide information on material condition, material quantities, material locations, and building use.
3. Analysis of all bulk samples for asbestos content utilizing Polarized Light Microscopy and Dispersion Staining Techniques performed in accordance with EPA Bulk Analysis Method EPA 600/M4-82-020.
4. Make recommendations as to response actions pertaining to those materials identified as asbestos containing.
5. Compilation of a final report (contained herein) which details all sample results, identifies sample locations, and provides recommendations based upon the results.

6. Preparation of a Building specific Operations & Maintenance (O&M) Plan for buildings containing friable asbestos materials.

## 2.0 REGULATORY STANDARDS

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires the Owner or Operator of a facility to determine the presence or non-presence of asbestos containing materials prior to conducting renovation or demolition activities. The NESHAP Standard for asbestos (40CFR Part 61 Sub-part M) requires the use of engineered control procedures for removal of asbestos materials that are or will become friable during renovation or demolition. The removal must occur before renovation or demolition activities impact those materials.

On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to the Standard, to notify employees, tenants and prospective employers (contractors) of the presence, location and quantities of asbestos-containing materials (ACM) in the building. Implementation of the "communication of hazards" provisions in the Standard were originally to be not later than April 10, 1995 but was extended to July 10, 1995 and is now in effect. The OSHA Standard does not apply to work performed by employees of State agencies in states without state run OSHA programs (e. g. Alabama).

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing EPA to establish rules and regulations (40CFR Part 763) addressing ACM in schools. Specifically, the EPA was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling ACM in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. Although the AHERA regulation does not specifically apply to this project it is generally accepted as the industry standard and was cited by Fort McClellan in the Asbestos Survey

Request as the basis of survey methodology. The AHERA inspections must be conducted using specific guidelines that include a minimum number of samples per material type. This survey was conducted in accordance with those guidelines per the Contract requirements.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan to all public and commercial buildings. Currently the rule extends the accreditation requirements of persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA's accredited personnel.

### 3.0 PROJECT CHARACTERISTICS

Reisz Engineering's accredited asbestos inspectors performed inspections of presumed asbestos containing material (PACM) buildings for the purpose of identifying building materials suspected to contain asbestos. Based on information provided by our observations and tests results it appears that all buildings referenced in this survey contain only non-friable materials. None of the buildings within this survey were found to have any friable ACM. Although, various renovations may have taken place since the building was originally constructed but no building plans have been found which can be used to verify specific dates and activities.

The three dominant flooring conditions existing in the PACM buildings are 1) carpet, 2) vinyl floor tile and 3) concrete. Other materials include ceramic and brick tile, wood flooring, cement, linoleum, and terrazzo. Also carpet has been installed over vinyl tiles in some locations of the buildings.

### 4.0 SURVEY METHODOLOGY

The buildings were visually inspected for the presence of material suspected to contain asbestos. The suspect materials were identified and bulk samples were obtained and placed into

individual vials for transportation to the University of Alabama in Huntsville (UAH). General areas for sample locations were selected on a random basis with a preference for exact positioning at existing damage. Each sample location is represented by a number on the plans in Appendix C. Those numbers directly correspond with the numbers listed elsewhere in this report.

If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. Materials installed after October 12, 1988 (as reported by Fort McClellan staff) were not sampled.

#### Hazard Assessment Factors

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current condition of all ACM identified was noted. Evidence of deterioration, physical damage, water damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

#### 5.0 LABORATORY ANALYSIS METHODOLOGY

All bulk samples were analyzed at UAH by polarized light microscopy utilizing dispersion staining or Becke line techniques, in accordance with the EPA's "Interim Method for Determination of Asbestos in Bulk Insulation Samples" (EPA 600/m4-82-020). Quality control samples were taken as duplicates at a rate of 1 to 20 and were sent to a second accredited laboratory. This type of analysis requires the microscopist to take a portion of the bulk sample

and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA regulations if disturbed during maintenance, renovation, demolition or removal.

The UAH laboratory participates in the American Industrial Hygiene Association (AIHA) quality assurance program for polarized light microscopy and is accredited by the AIHA through their voluntary program.

## 6.0 SUSPECT MATERIALS

The following is a general list of building materials that were suspected to contain asbestos.

### Surfacing

- None

### Thermal System Insulation

- Rear wall gas heater reflectors in building 4437

### Miscellaneous Material

- Vinyl surfaced sheet flooring
- Vinyl flooring mastics
- Drywall joint compound
- Asbestos siding
- Transite siding
- Transite piping

## 7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

A total of three bulk samples were collected and analyzed. Details of all laboratory results can be found in Appendix A. A narrative description of all "Friable Asbestos Containing Material" and "Non-Friable ACM" identified during the survey, is given below.

### FRIABLE ACM

None

### NON FRIABLE ACM

Five types of non-friable ACM's were found in various buildings: 1) 12x12 inch vinyl floor tile, 2) 9x9 inch vinyl floor tile, 3) asbestos siding is located on the exterior of B793, 4) transite piping in B1920 and 5) thermal system insulation in B4437.

- 1) Presumed asbestos containing 12x12 inch vinyl floor tile and mastic is found in the following buildings:

B66 B184 B698 B793 B888 B891 B900 B992 B1012 B1800 B1920 B1928  
B2090 B2116 B2202 B3136 B3189 B3600 B4434

Generally, the tiles were found to be in good condition.

- 2) Presumed asbestos containing 9x9-inch vinyl floor tile and mastic is found in the following buildings:

B1108 B1919 B2020 B2115 B2116

- 3) Asbestos siding can be found on the exterior walls of the building:

B793

- 4) The hot water heater vent pipe contains a transite pipe extending into the attic of the following building:

B1920

- 5) Thermal system insulation is located in the gas heater reflectors and is assumed to contain possible ACM. The gas heater is located in the rear wall of the following building:

B4437

#### INACCESSIBLE MATERIAL,

Insulation and spray-on compounds associated with inaccessible crawl-space and tunnel areas may be assumed as "like" materials corresponding to materials sampled within the building.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

None of the materials identified within this report are damaged to the extent that significant asbestos fiber release is likely under normal conditions. However, some of the asbestos containing materials, is subject to routine maintenance activities that could involve significant disturbance. As concluded by this survey, the buildings within this report were found to contain non-friable asbestos containing materials. Proper management of the material in-place may be acceptable assuming the proper precautions are taken to eliminate exposure of personnel to any airborne asbestos.

## 9.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions which were observed during the inspections of the PACM Buildings during 1997. Reisz Engineering and this report make no representation or assumptions as to past conditions or future occurrences.

Our inspection was generally non-destructive in nature. Any conditions or material, which were not visible on the surface, were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials that lay beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that all materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractor, and potential asbestos abatement contractors in locating ACM. Under no circumstances is this report to be utilized as a bidding document or as a project specification

document.

## **APPENDIX A**

### **REPORT OF LABORATORY ANALYSIS FOR ASBESTOS**

# UAH

The University of Alabama in Huntsville

Environmental Laboratory  
 Kenneth E. Johnson Research  
 Center

Huntsville, Alabama  
 35899  
 Phone: (256)  
 890-6391 Fax:  
 (256) 890-6376

: Bulk Asbestos Analysis  
 EPA 600/R-93/116

Receipt Date: 06-13-97

AIHA: 023601

Sample Date : 06/10/97

Client: Reisz Engineering  
 Building 32 Suite A2  
 3322 S. Memorial Parkway  
 Huntsville, AL 35801

Microscopist : Tom Carrington

Sample/Description

Asbestos Fibers (%)  
 Non-Asbestos Material (%)  
 Chry Amos Croc Othr Cell Fbgl NIW CaSO4 Othr

B 1928-01 / 12 x 12 floor tile  
 brown rock-type

1

99

Chry = Chrysotile  
 Amos = Amosite  
 Croc = Crocidolite

Othr = Other  
 Cell = Cellulose

MW = Mineral Wool  
 Ca s04= Calcium Sulfate  
 Fbgl = Fiberglass

# UAH

Environmental Laboratory  
Kenneth E. Johnson Research  
Center

Huntsville, Alabama 35899  
Phone: (256) 890-6391  
Fax: (256) 890-6376

Re : Bulk Asbestos  
Analysis EPA  
600/R-93/116

AIHA:  
023601

Client: Reisz Engineering  
Building 32 Suite, A2  
3322 Memorial Parkway South  
Huntsville, AL 35801

Receipt Date : 06-20-97

Sample Date : 06/18/97

Microscopist: Tom Canington

| Sample/Description                        | Asbestos Fibers (%) |      |      | Non-Asbestos Material (%) |      |
|---|---------------------|------|------|---------------------------|------|
|   | Chry                | Amos | Croc | Othr                      | Cell |
| <u>Fbgl MW CaSO4 Othr</u>                 |                     |      |      |                           |      |
| B3136-01 / run of TSI chalk-like<br>insul |                     |      | 55   | 20                        | 25   |
| B3136-02 / elbow-putty<br>material        |                     |      | 40   | 60                        | —    |

Chry = Chrysotile  
Amos = Amosite  
Croc = Crocidolite

Othr = Other  
Cell = cellulose

MW = Mineral Wool  
Ca SO4 = Calcium Sulfate  
Fbgl = Fiberglass

**APPENDIX B**

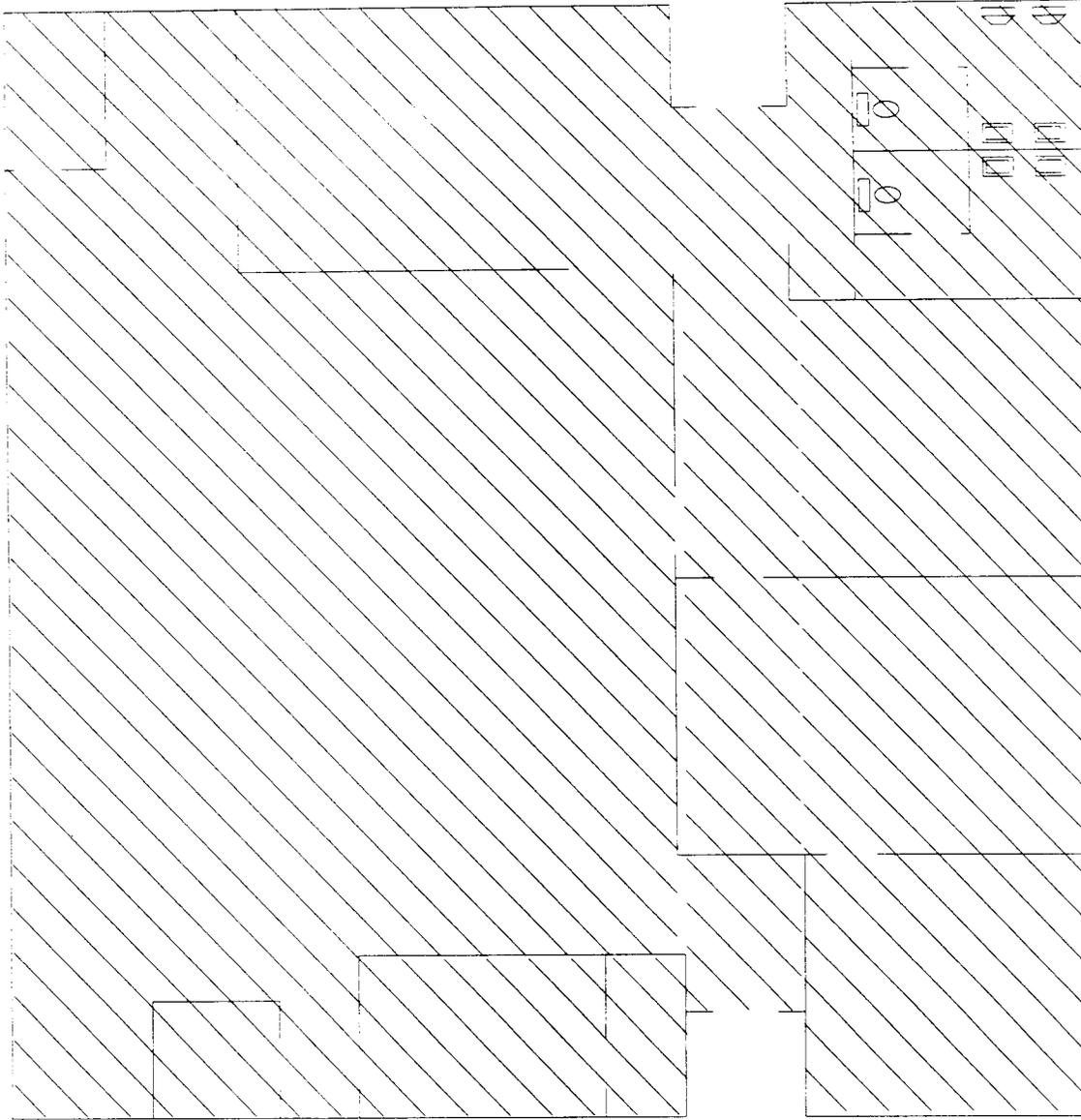
MISCELLANEOUS BUILDINGS WITH PACM

BUILDING NUMBERS

66  
184  
698  
793  
888  
891  
900  
992  
1012  
1108  
1800  
1919  
1920  
1928  
2020  
2090  
2115  
2116  
2202  
3136  
3189  
3600  
4434  
4437

**APPENDIX C**

**SELECTED ACM LOCATIONS PLANS**



SCALE: 1" = 10'

▨ CERAMIC TILE

LAYOUT PLAN

FIG 1

▨ 12X12 TILE

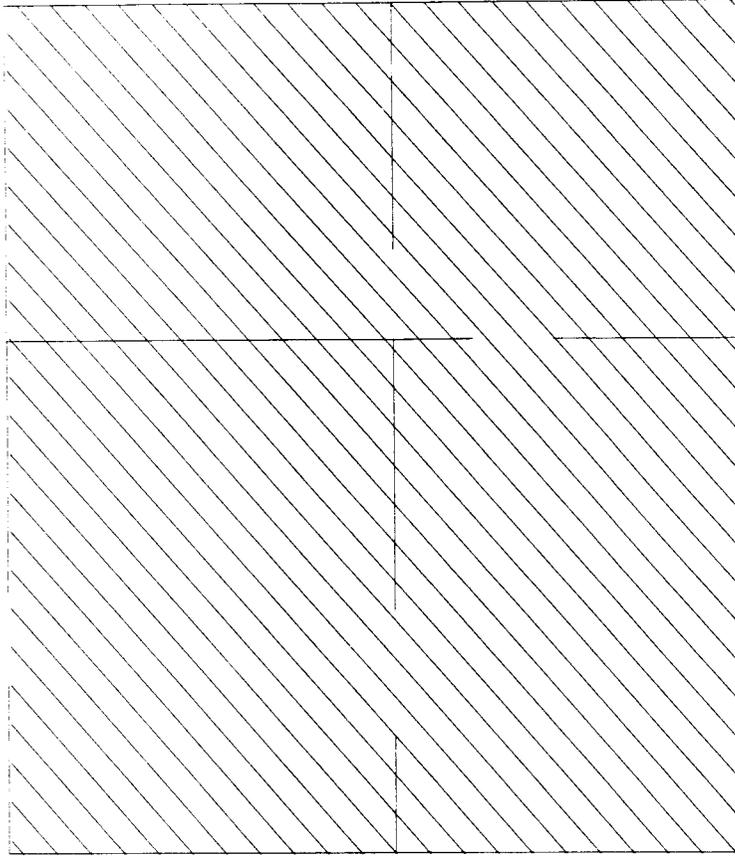
ASBESTOS SURVEY  
DABT02-96-D-0005  
FM705

FIG. 1 LAYOUT

BUILDING: 66

**REISZ ENGINEERING**

(



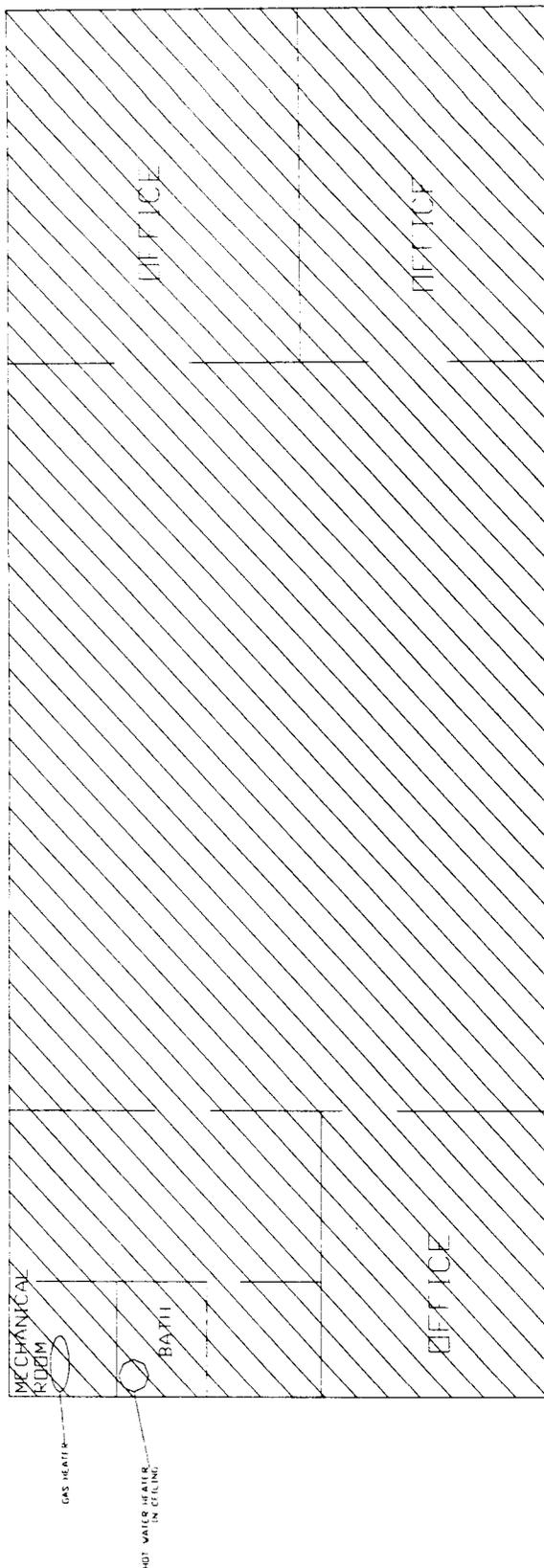
12X12 FLOOR TILE (CARPET LAID OVER IN MOST AREAS)

ASBESTOS SURVEY  
DAB102-96-D-0005  
FM705

BUILDING: 184

FIG 1 LAYOUT

**REISZ ENGINEERING**



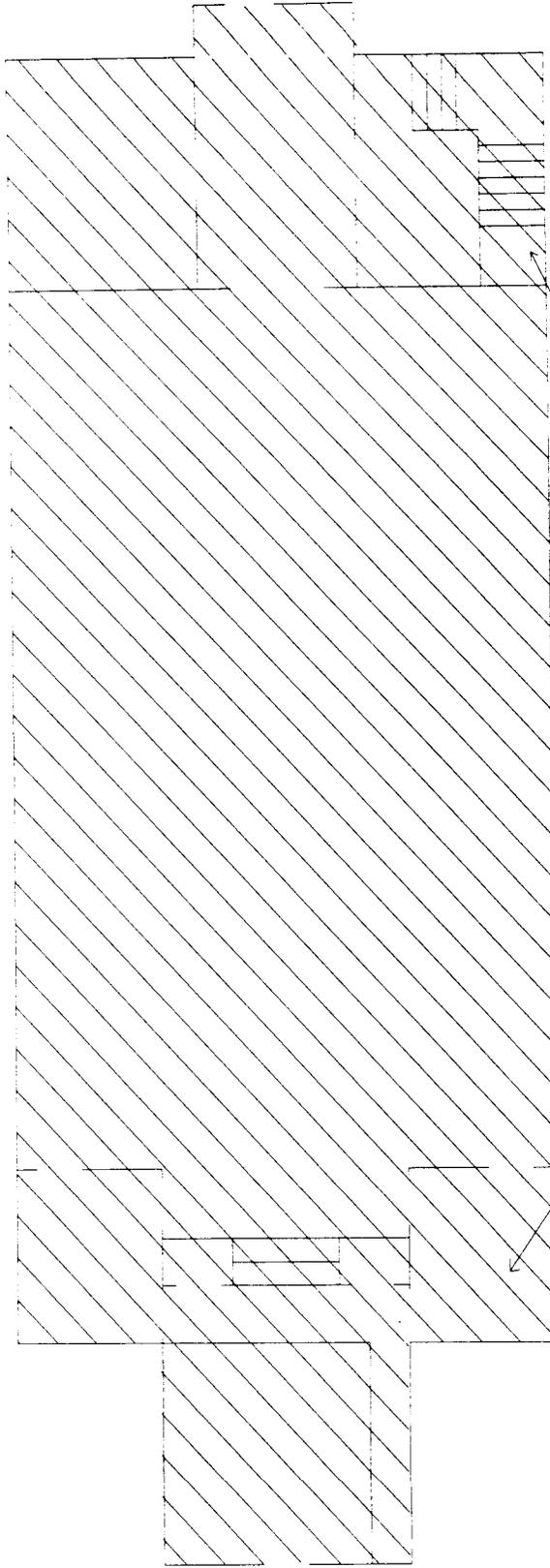
SCALE: 1"=10'

LAYOUT PLAN

FIG. 1

12X12 TILE

|               |               |  |                          |
|---------------|---------------|--|--------------------------|
| BUILDING: 698 | FIG. 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|---------------|---------------|--|--------------------------|



BATH WITH BARE WATER PIPES

SCALE: 1"=10'

LAYOUT PLAN

FIG. 1

ASBESTOS SIDING



12X12 TILE



**REISZ ENGINEERING**

ASBESTOS SURVEY  
DAB102-96-D-0005  
FM705

FIG. 1 LAYOUT

BUILDING: 793

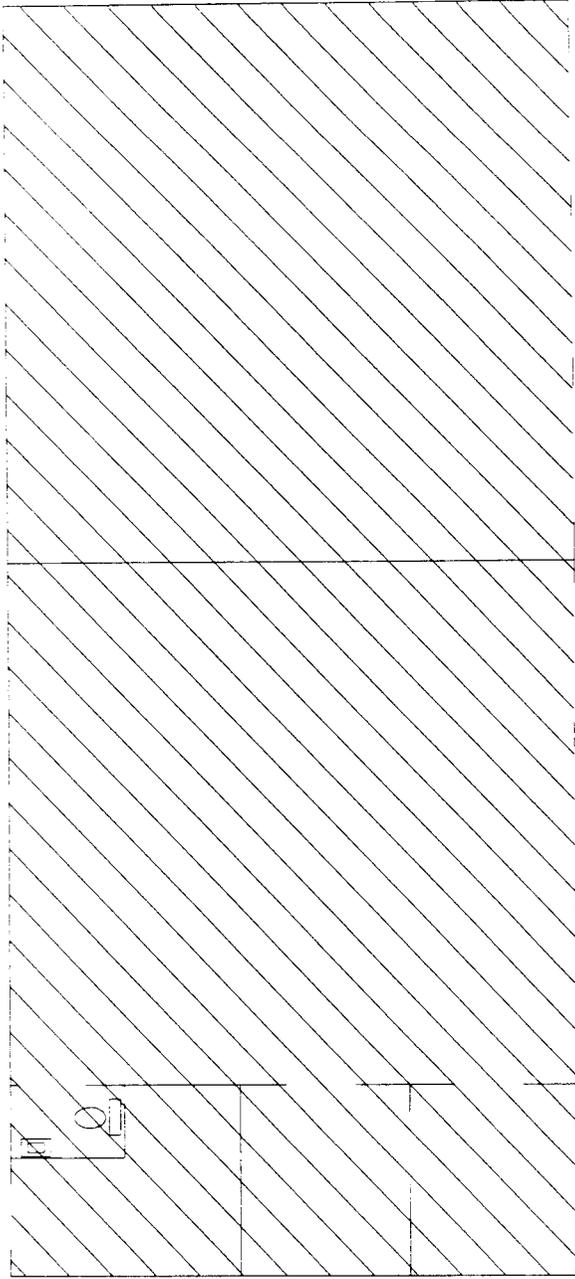
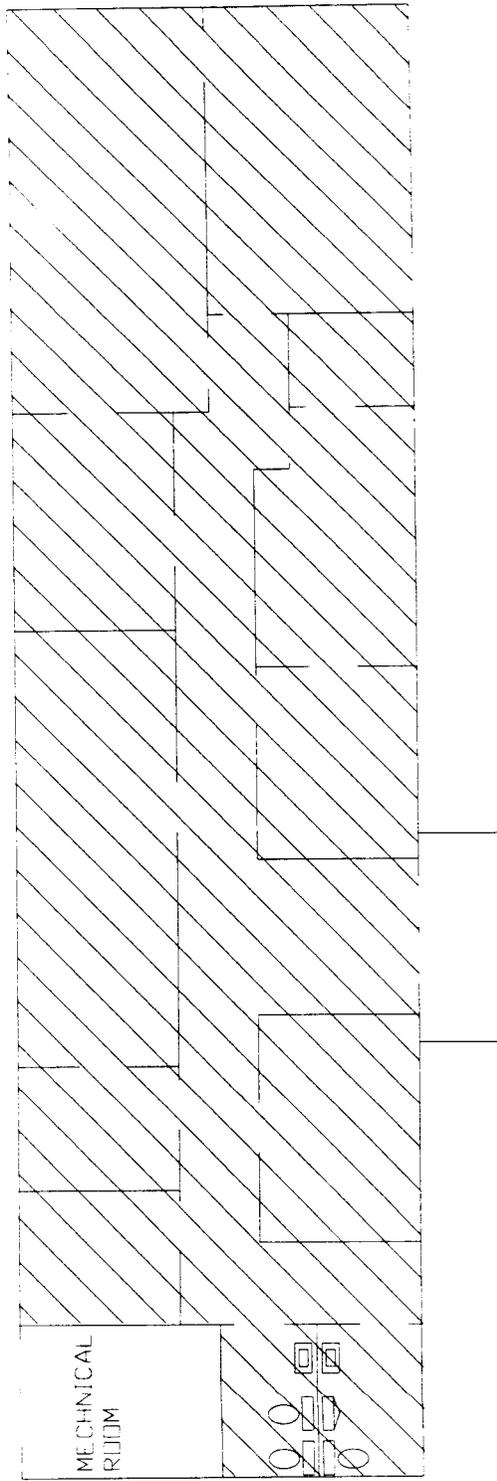


FIG 1 LAYOUT PLAN

-  12X12 TILE
-  CONCRETE

|               |               |  |
|---------------|---------------|--|
| BUILDING: 888 | FIG. 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 |
|---------------|---------------|--|



SCALE 1" = 10'

LAYOUT PLAN

FIG. 1

CERAMIC TILE

12X12 TILE

**REISZ ENGINEERING**

ASBESTOS SURVEY  
 DABT02-96-D-0005  
 FM705

FIG. 1 LAYOUT

BUILDING: 891

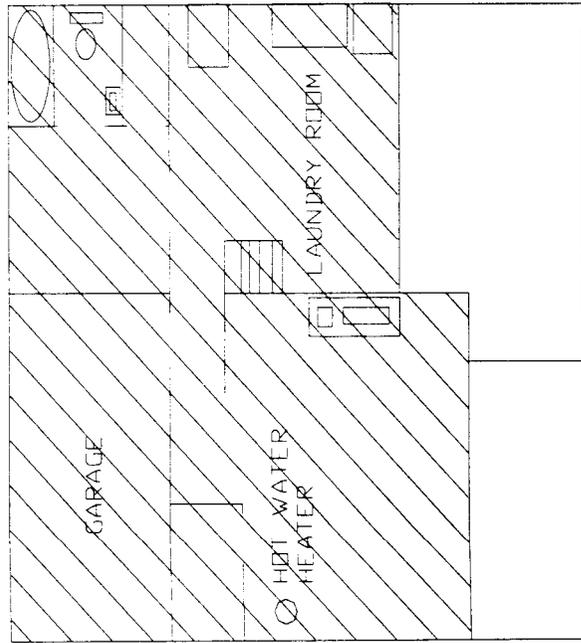


FIG. 1 BASEMENT PLAN

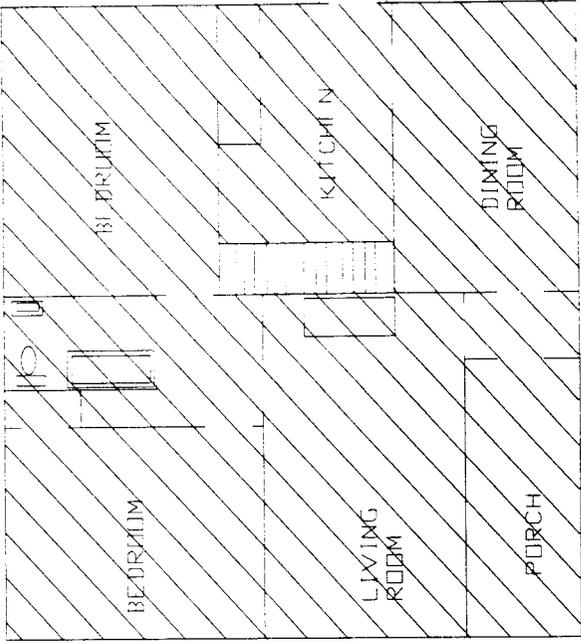
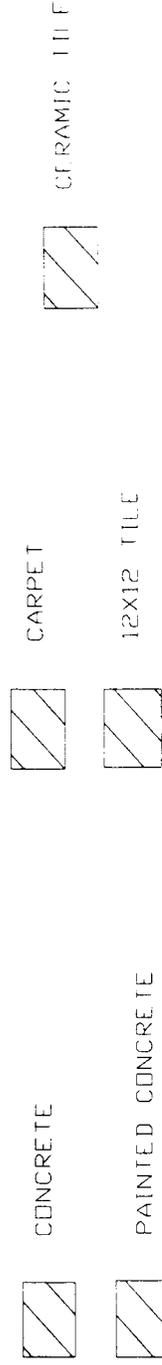
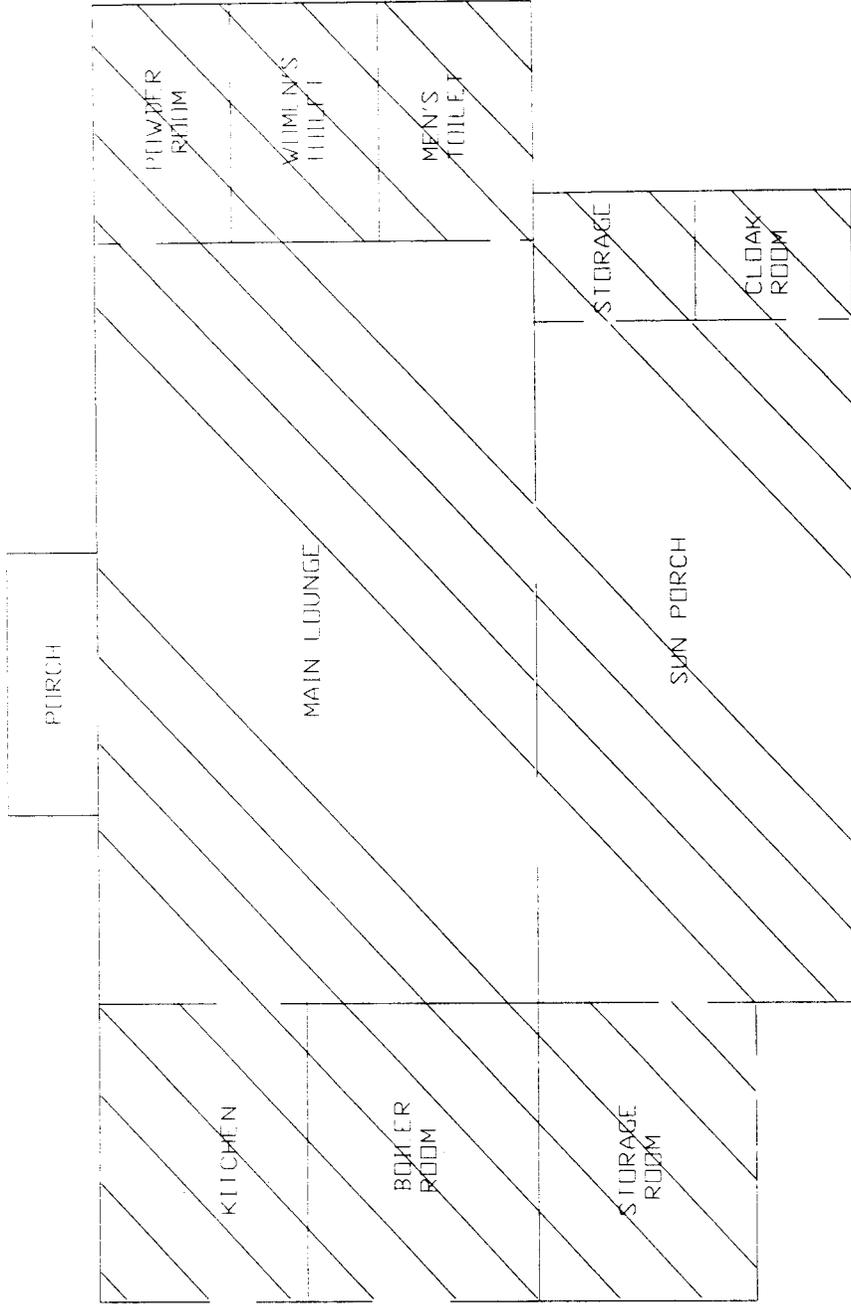


FIG. 2 FLOOR PLAN

SCALE: 1" = 10'

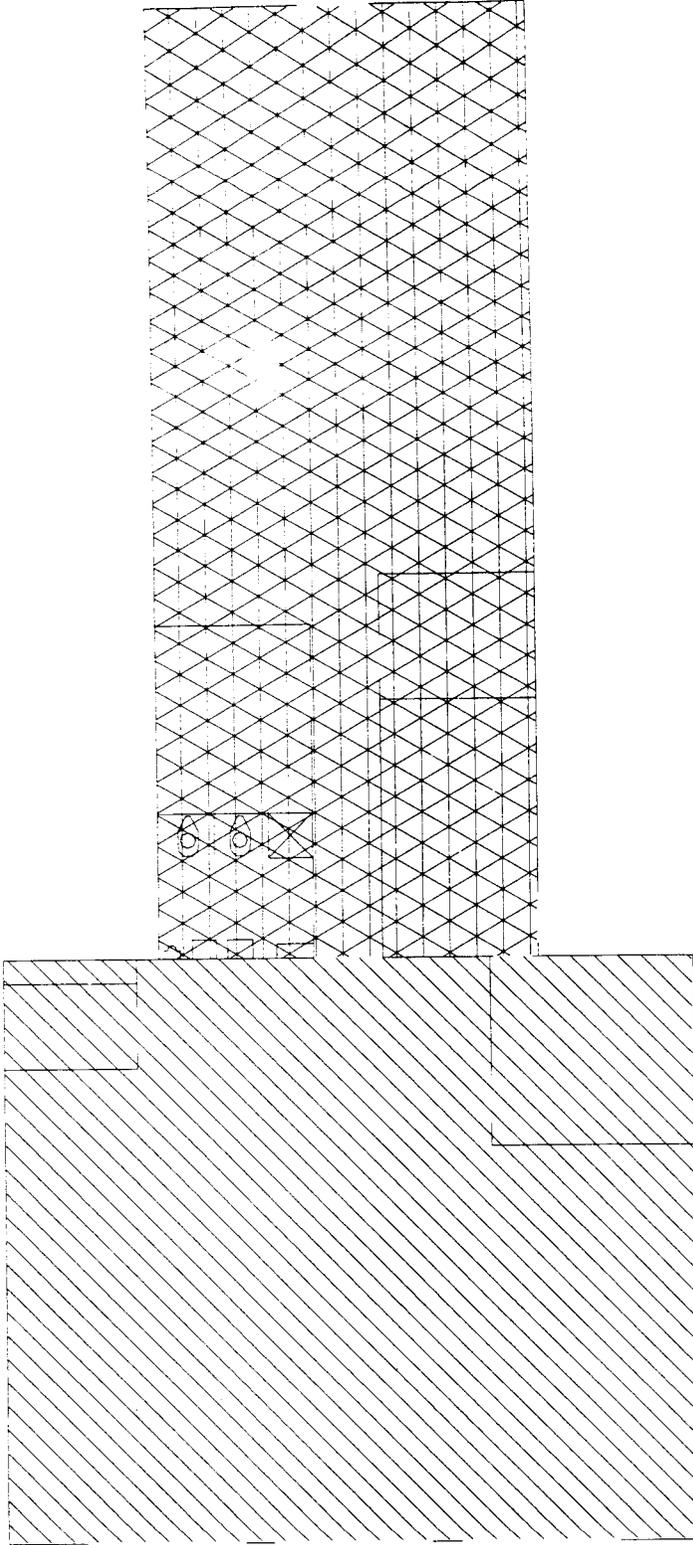


|               |                                     |  |                          |
|---------------|-------------------------------------|--|--------------------------|
| BUILDING: 900 | FIG. 1 BASEMENT<br>FIG.2 FLOOR PLAN | ASBESTOS SURVEY<br>DAB102-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|---------------|-------------------------------------|--|--------------------------|



-  WOOD FLOOR
-  12X12 FLOOR TILE
-  CONCRETE FLOOR
-  CERAMIC TILE

|               |               |  |                          |
|---------------|---------------|--|--------------------------|
| BUILDING: 992 | FIG. 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|---------------|---------------|--|--------------------------|



 CONCRETE

 12 X 12 TILE OVER  
9 X 9 TILE

SCALE: 1" = 40'

LAYOUT PLAN

FIG. 1

|                                 |   |                      |                       |
|---------------------------------|---|----------------------|-----------------------|
| <p><b>REISZ ENGINEERING</b></p> | <p>ASBESTOS SURVEY<br/>DAB102-96-D-0005<br/>FM705</p> | <p>FIG. 1 LAYOUT</p> | <p>BUILDING: 1108</p> |
|---------------------------------|---|----------------------|-----------------------|

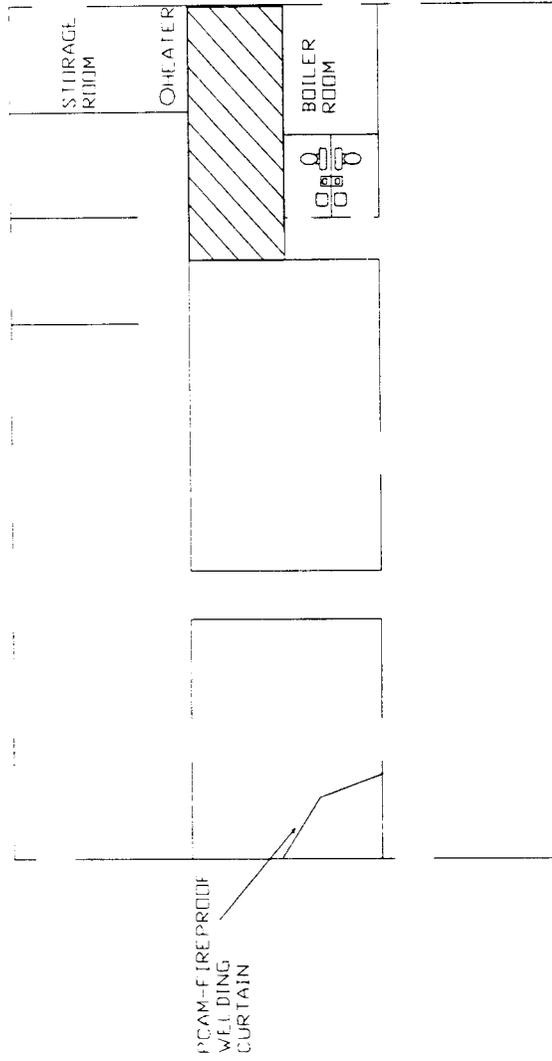
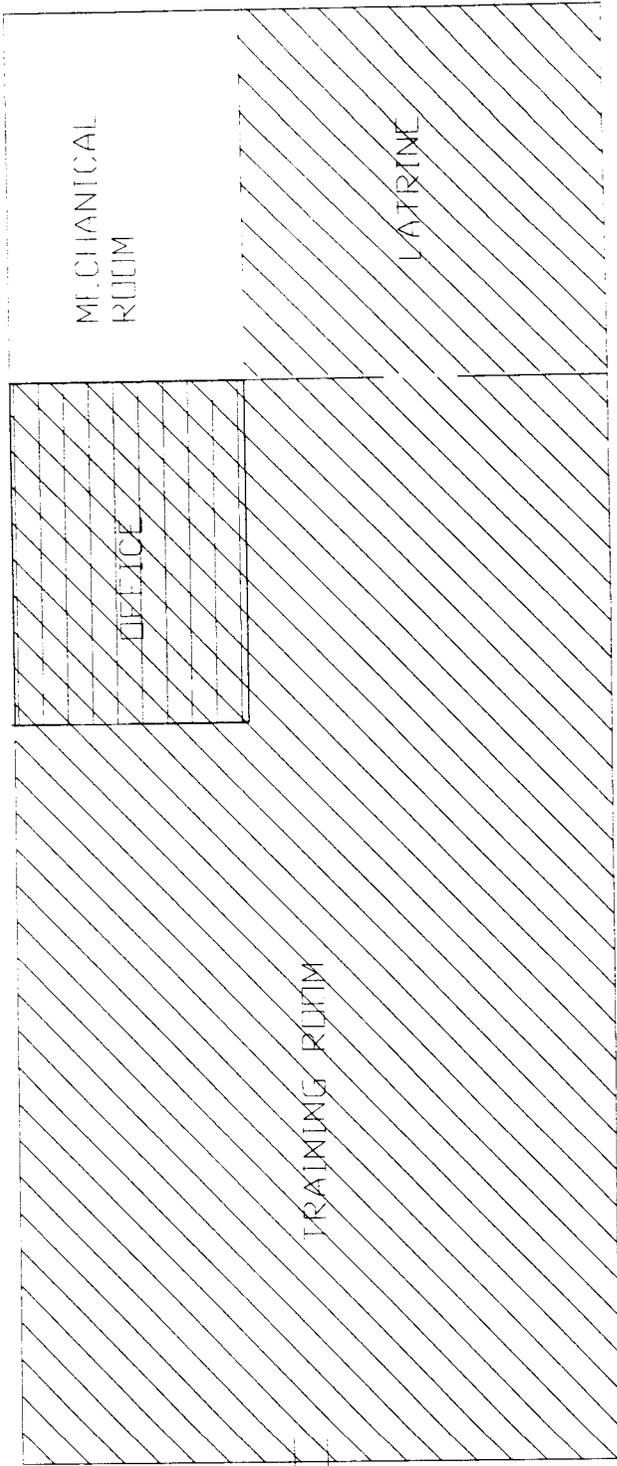


FIG 1  
LAYOUT PLAN

|                |              |  |                          |
|----------------|--------------|--|--------------------------|
| BUILDING: 1800 | FIG 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|----------------|--------------|--|--------------------------|



9X9 TILE



ACOUSTIC TILE ON CEILING



12X12 ACOUSTIC TILE

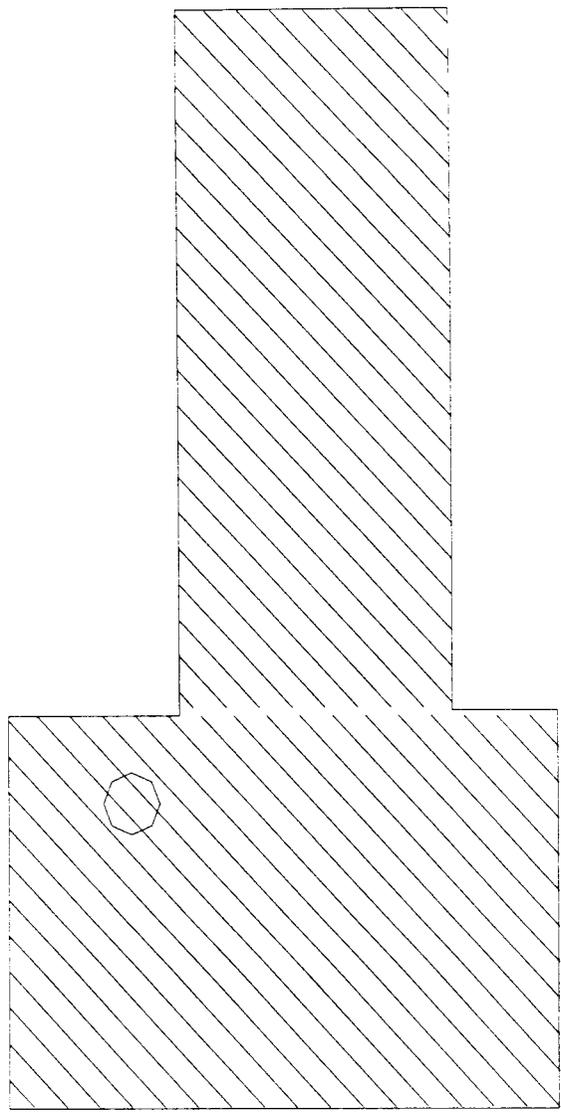


**REISZ ENGINEERING**

ASBESTOS SURVEY  
 DABT02-96-D-0005  
 FM705

FIG. 1 LAYOUT

BUILDING: 1919



 12X12 TILE

 ACOUSTIC TILE ON CEILING AND WALLS THROUGHOUT

 HOT WATER HEATER (HAS TRANSITE PIPE LEADING INTO THE ATTIC)

BUILDING: 1920

FIG. 1 LAYOUT

ASBESTOS SURVEY  
DABT02-96-D-0005  
FM705

**REISZ ENGINEERING**

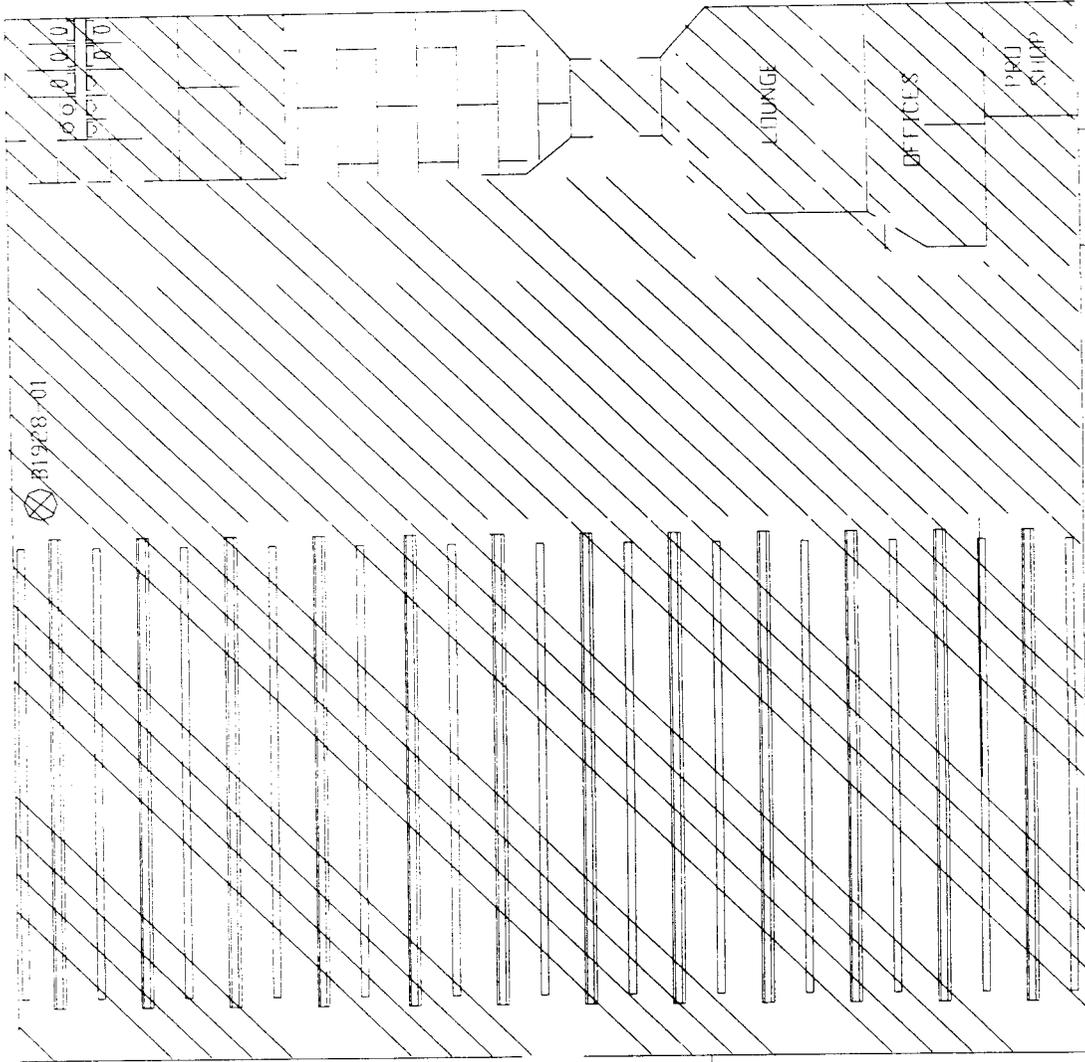


FIG. 1 LAYOUT PLAN

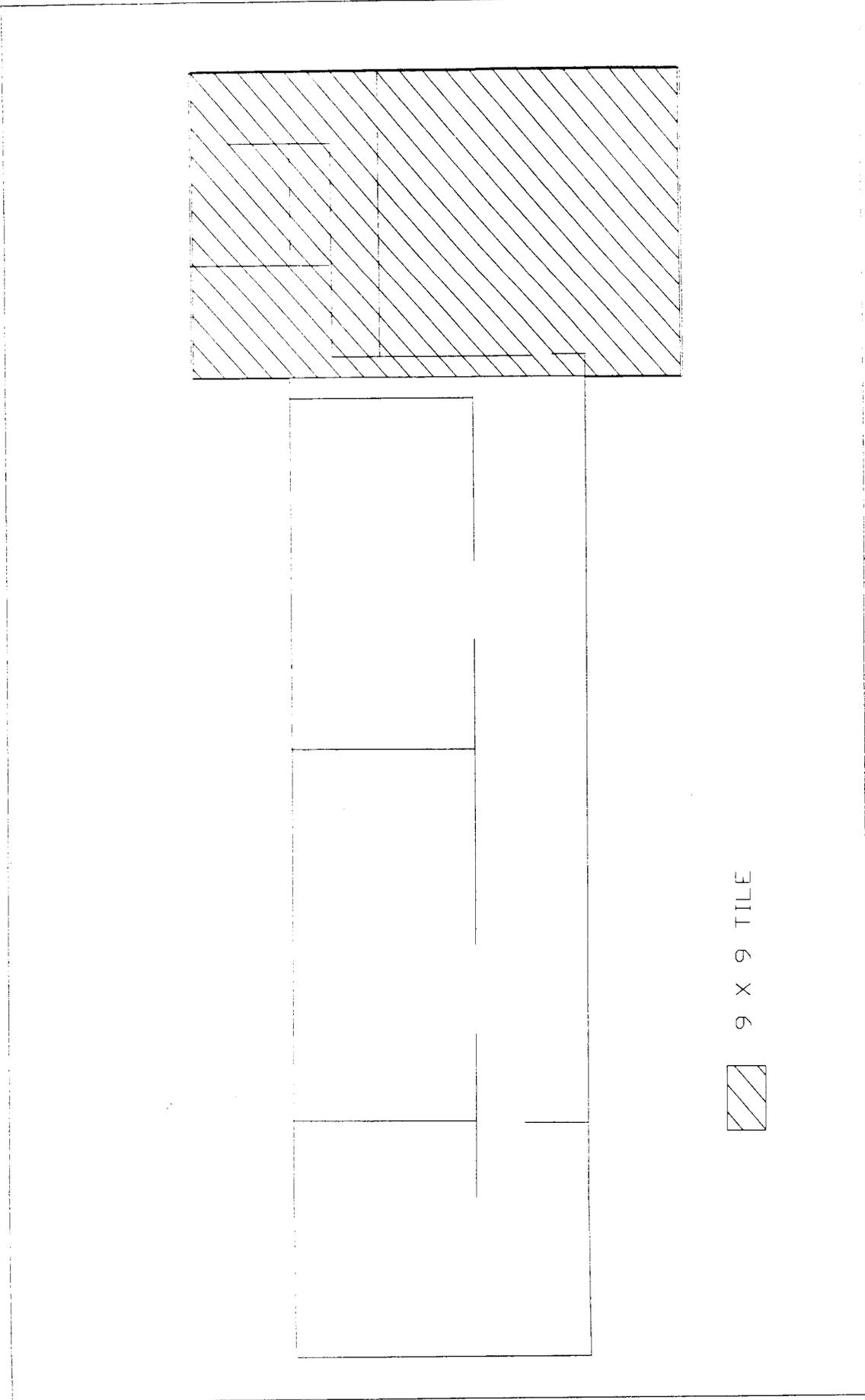
-  WOOD
-  BROWN ROCK 12X12 TILE
-  REGULAR 12X12 TILE
-  CARPET
-  CERAMIC TILE
-  BRICK TILE

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BUILDING: 1928

FIG. 1 LAYOUT

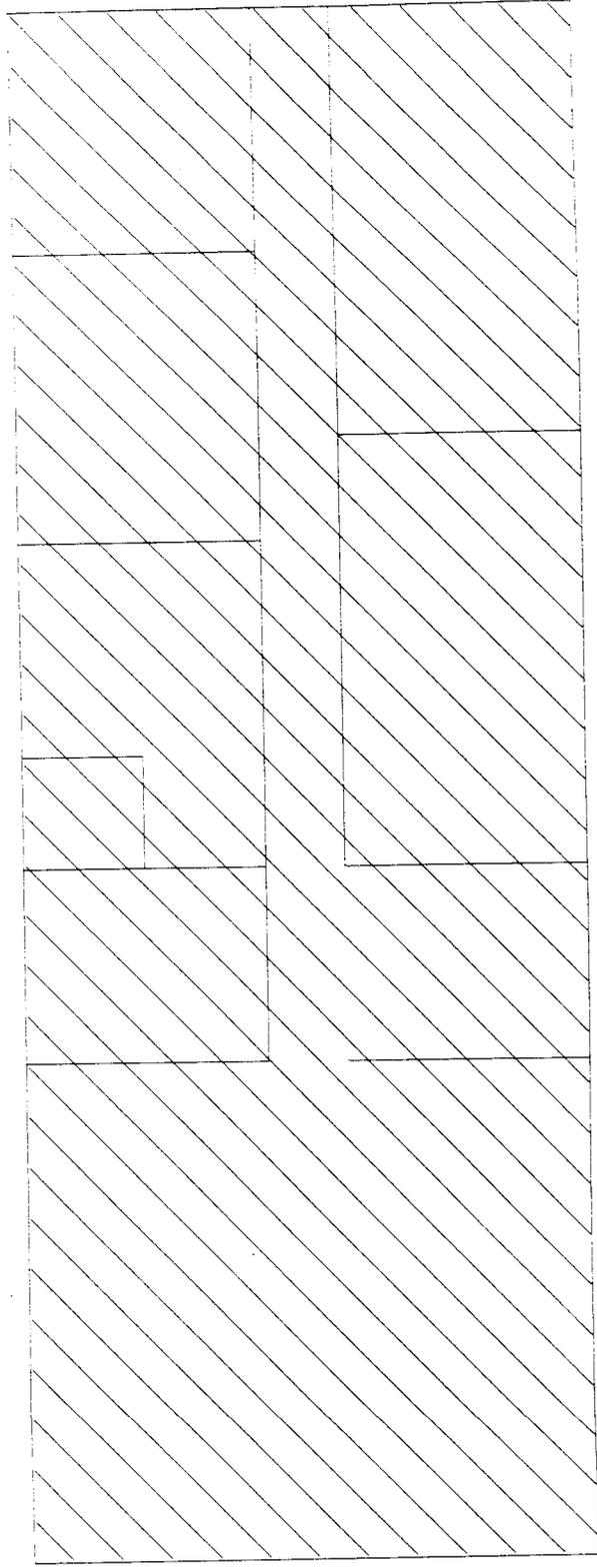
ASBESTOS SURVEY  
 DABT02-96-D-0005  
 FM70



9 X 9 TILE

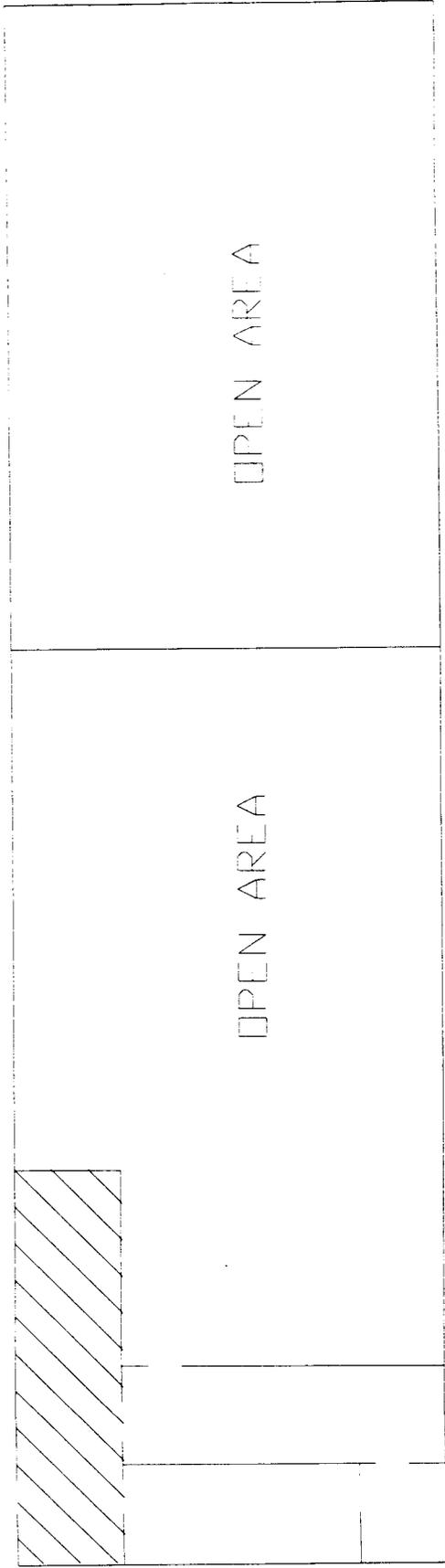
|                |              |   |
|----------------|--------------|---|
| BUILDING: 2020 | FIG 1 LAYOUT | ASBESTOS SURVY<br>DABT02-96-D-0005<br>FM705 |
|----------------|--------------|---|

**REISZ ENGINEERING**



12X12 FLOOR TILE

|                |               |  |                          |
|----------------|---------------|--|--------------------------|
| BUILDING: 2090 | FIG. 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|----------------|---------------|--|--------------------------|



SCALE: 1"=40'

LAYOUT PLAN

FIG. 1



9X9 TILE

BUILDING: 2115

FIG. 1 LAYOUT

ASBESTOS SURVEY  
DABT02-96-D-0005  
FM705

**REISZ ENGINEERING**

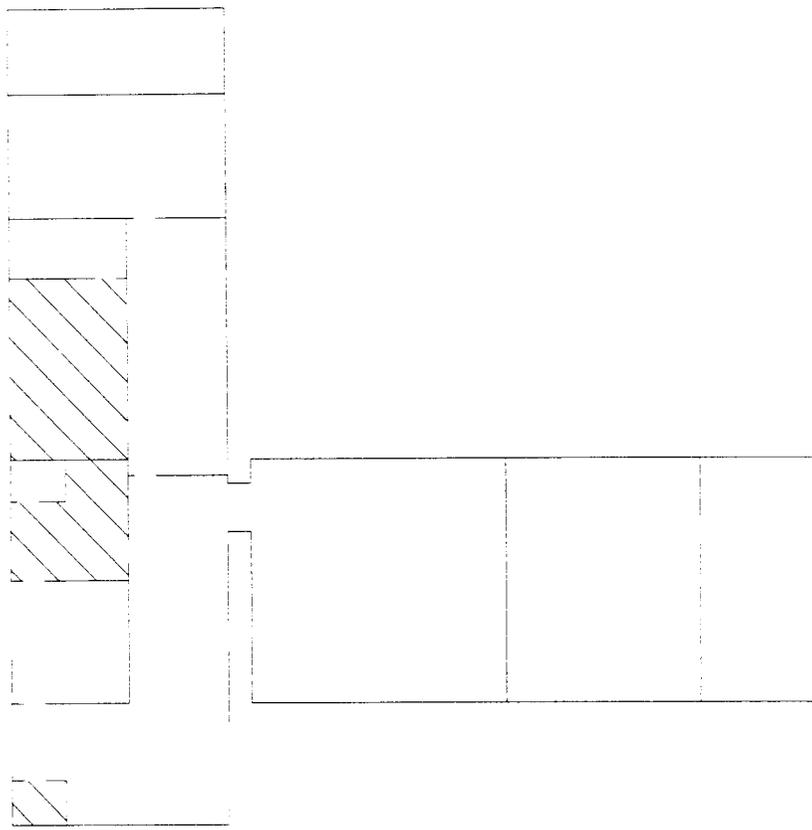
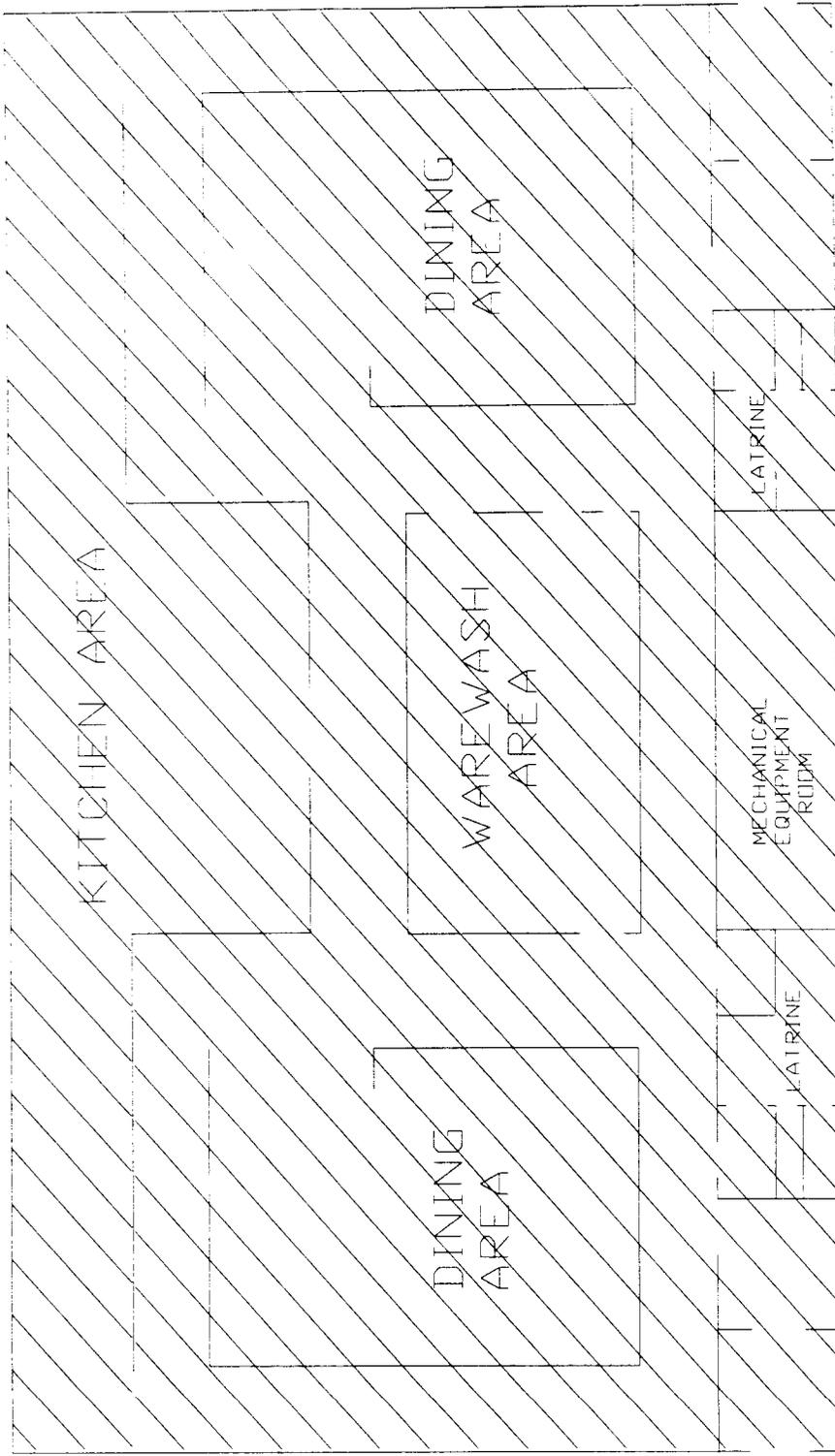
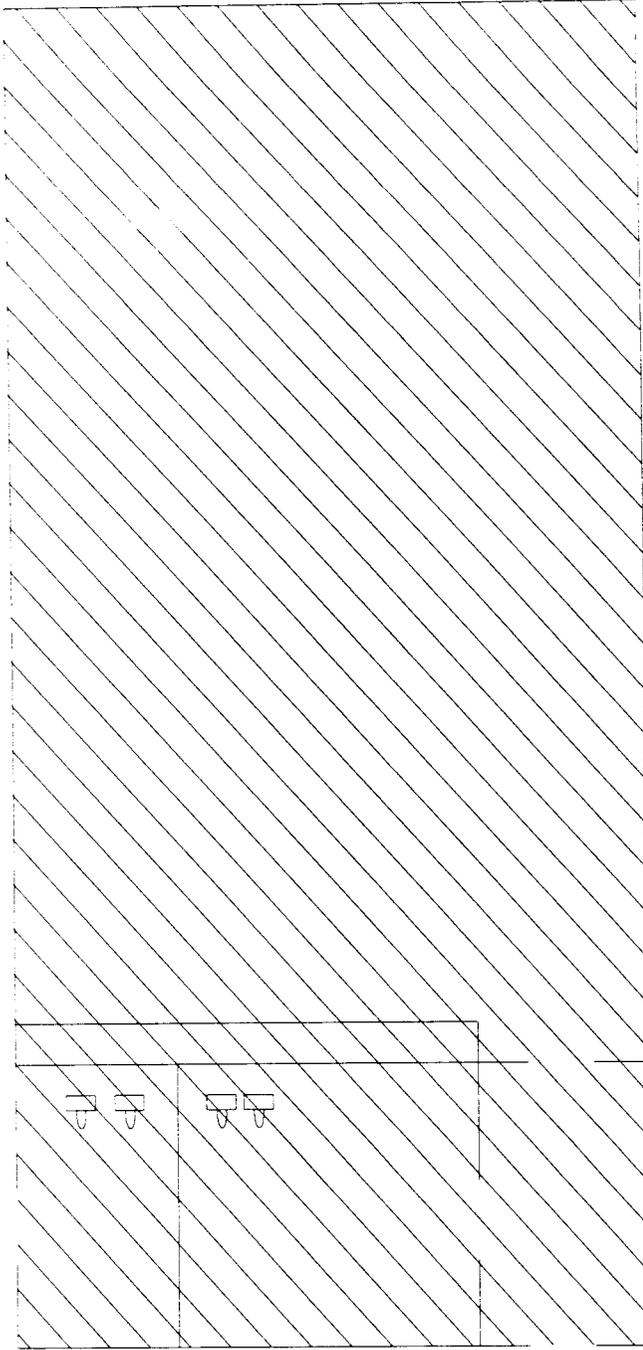


FIG 1  
LAYOUT PLAN

|               |               |  |                          |
|---------------|---------------|--|--------------------------|
| BUILDING 2116 | FIG. 1 LAYOUT | ASBESTOS SURVEY<br>DABT02-96-D-0005<br>FM705 | <b>REISZ ENGINEERING</b> |
|---------------|---------------|--|--------------------------|



|                       |                     |   |                                 |
|-----------------------|---------------------|---|---------------------------------|
| <p>BUILDING: 2202</p> | <p>FIG 1 LAYOUT</p> | <p>ASBESTOS SURVEY<br/>DABT02-96-D-0005<br/>FM705</p> | <p><b>REISZ ENGINEERING</b></p> |
|-----------------------|---------------------|---|---------------------------------|



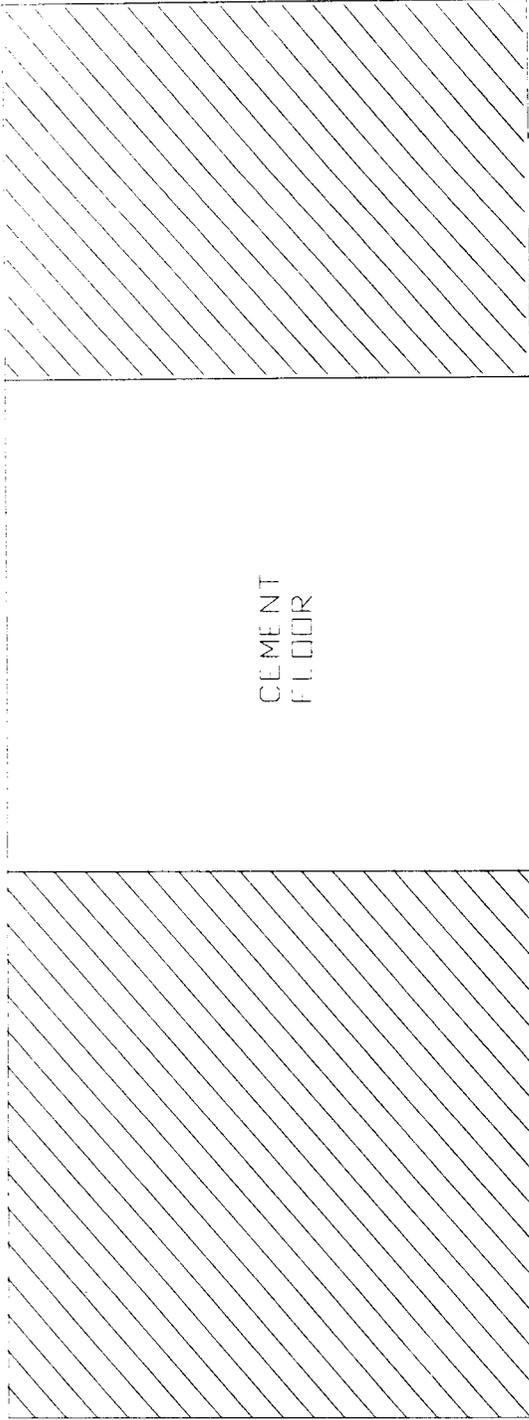
 CONCRETE

 12X12 III E

BUILDING: 3189

ASBESTOS SURVEY  
DABT02-96-D-0005  
FM705

**REISZ ENGINEERING**



12X12 TILE



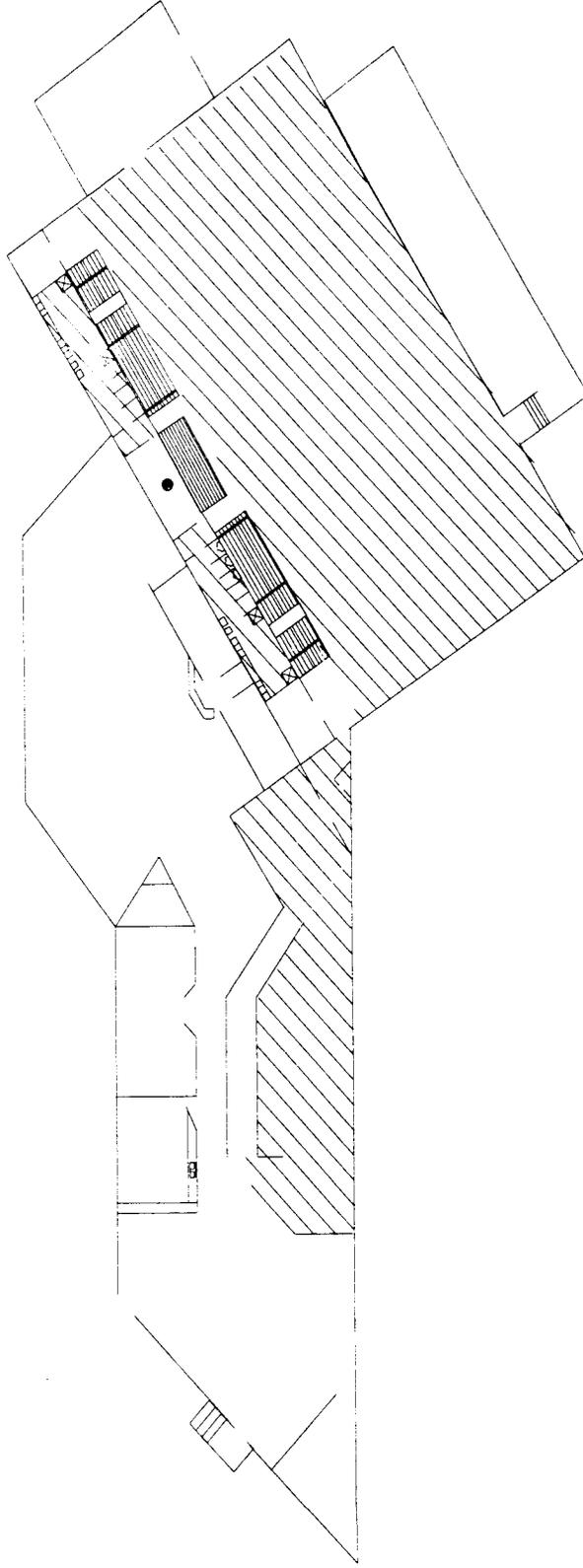
9X9 TILE

BUILDING: 3297

FIG. 1 LAYOUT

ASBESTOS SURVEY  
DABT02-96-D-0005  
FM705

**REISZ ENGINEERING**



▨ 12 X 12 Floor Tile

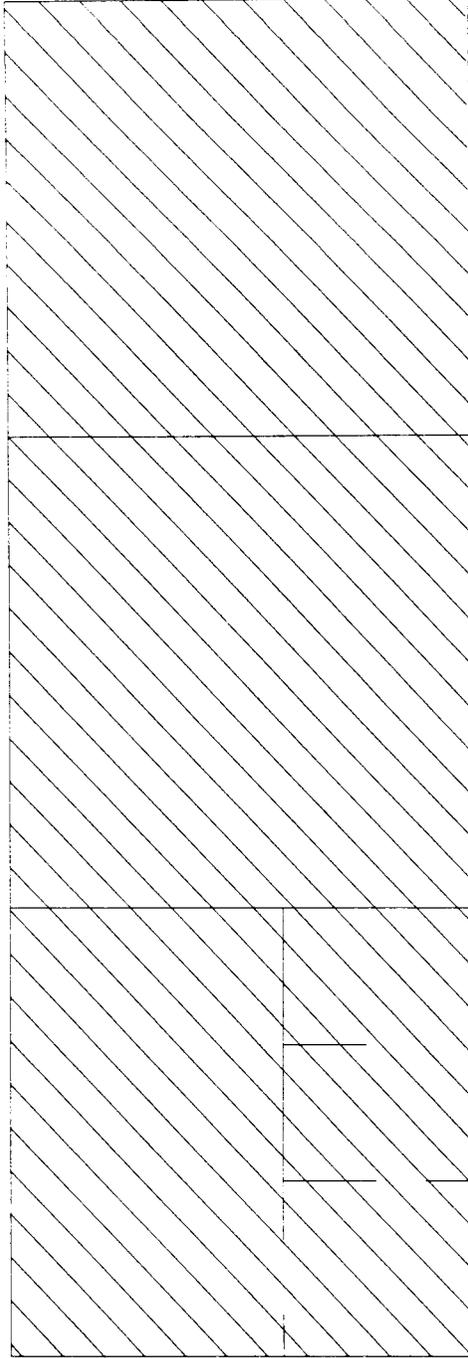
▩ Ceramic Tile

SCALE 1" = 30'

ASBESTOS SURVEY  
 DABT02-96-D-0005  
 FM705

BUILDING 3600

**REISZ ENGINEERING**



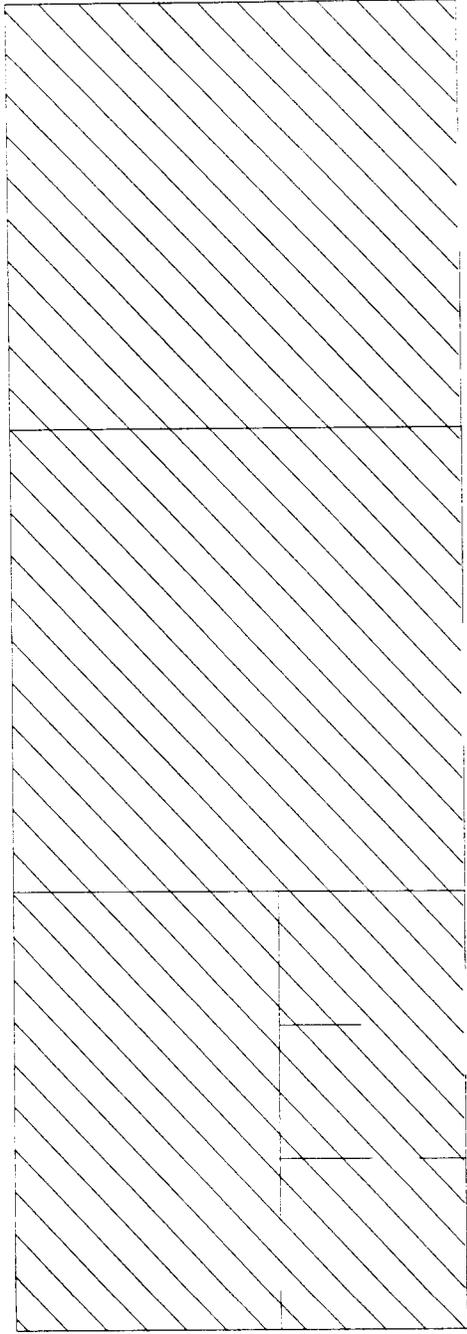
 12X12 TILE

SCALE 1" = 30'

ASBESTOS SURVEY  
DABT02--96--D--0005  
FM705

BUILDING: 4434

**REISZ ENGINEERING**



 CEMENT

SCALE: 1" = 30'

ASBESTIUS SURVEY  
DABT02-96-D-0005  
FM705

**REISZ ENGINEERING**

BUILDING: 4437

**APPENDIX D**

**SUMMARY TABLE OF PACM AND COST ESTIMATES**

| Building Number | PACM Material                     | Quantity               | Estimated Abatement Cost* |
|-----------------|-----------------------------------|------------------------|---------------------------|
| B66             | 12x12 vinyl floor tile and mastic | 6446 ft <sup>2</sup>   | \$14,825.00               |
|                 |                                   | <b>Total</b>           | <b>\$14,825.00</b>        |
| B184            | 12x12 vinyl floor tile and mastic | 576 ft <sup>2</sup>    | \$1,400.00                |
|                 |                                   | <b>Total</b>           | <b>\$1,400.00</b>         |
| B698            | 12x12 vinyl floor tile and mastic | 3108 ft <sup>2</sup>   | \$7,150.00                |
|                 |                                   | <b>Total</b>           | <b>\$7,150.00</b>         |
| B793            | 12x12 vinyl floor tile and mastic | 3,700 ft <sup>2</sup>  | \$8,510.00                |
|                 | Asbestos Siding                   | 5890 ft                | \$10,315.00               |
|                 |                                   | <b>Total</b>           | <b>\$18,825.00</b>        |
| B888            | 12x12 vinyl floor tile and mastic | 168 ft <sup>2</sup>    | \$525.00                  |
|                 |                                   | <b>Total</b>           | <b>\$525.00</b>           |
| B891            | 12x12 vinyl floor tile and mastic | 2000 ft <sup>2</sup>   | \$4,600.00                |
|                 |                                   | <b>Total</b>           | <b>\$4,600.00</b>         |
| B900            | 12x12 vinyl floor tile and mastic | 216 ft <sup>2</sup>    | \$650.00                  |
|                 |                                   | <b>Total</b>           | <b>\$650.00</b>           |
| B992            | 12x12 vinyl floor tile and mastic | 432 ft <sup>2</sup>    | \$1,080.00                |
|                 |                                   | <b>Total</b>           | <b>\$1,080.00</b>         |
| B1012           | 12x12 vinyl floor tile and mastic | 10,000 ft <sup>2</sup> | \$23,000.00               |
|                 |                                   | <b>Total</b>           | <b>\$23,000.00</b>        |
| B1108           | 9x9 vinyl floor tile and mastic   | 1420 ft <sup>2</sup>   | \$3,550.00                |
|                 |                                   | <b>Total</b>           | <b>\$3,550.00</b>         |
| B1800           | 12x12 vinyl floor tile and mastic | 240 ft <sup>2</sup>    | \$725.00                  |
|                 |                                   | <b>Total</b>           | <b>\$725.00</b>           |
| B1919           | 9x9 vinyl floor tile and mastic   | 1080 ft <sup>2</sup>   | \$2,700.00                |
|                 |                                   | <b>Total</b>           | <b>\$2,700.00</b>         |
| B1920           | 12x12 vinyl floor tile and mastic | 2136 ft <sup>2</sup>   | \$4,925.00                |
|                 | Transite pipe                     | 10 ft                  | \$100.00                  |
|                 |                                   | <b>Total</b>           | <b>\$5,025.00</b>         |
| B1928           | 12x12 vinyl floor tile and mastic | 1900 ft <sup>2</sup>   | \$4,750.00                |
|                 |                                   | <b>Total</b>           | <b>\$4,750.00</b>         |

| Building Number | PACM Material                     | Quantity             | Estimated Abatement Cost* |
|-----------------|-----------------------------------|----------------------|---------------------------|
| B2020           | 9x9 vinyl floor tile and mastic   | 651 ft <sup>2</sup>  | \$1,650.00                |
|                 |                                   | <b>Total</b>         | <b>\$1,650.00</b>         |
| B2090           | 12x12 vinyl floor tile and mastic | 1716 ft <sup>2</sup> | \$3,950.00                |
|                 |                                   | <b>Total</b>         | <b>\$3,950.00</b>         |
| B2115           | 9x9 vinyl floor tile and mastic   | 500 ft <sup>2</sup>  | \$1,250.00                |
|                 |                                   | <b>Total</b>         | <b>\$1,250.00</b>         |
| B2116           | 12x12 vinyl floor tile and mastic | 300 ft <sup>2</sup>  | \$750.00                  |
|                 | 9x9 vinyl floor tile and mastic   | 920 ft <sup>2</sup>  | \$2,300.00                |
|                 |                                   | <b>Total</b>         | <b>\$3,050.00</b>         |
| B2202           | 12x12 vinyl floor tile and mastic | 7800 ft <sup>2</sup> | \$17,940.00               |
|                 |                                   | <b>Total</b>         | <b>\$17,940.00</b>        |
| B3136           | 12x12 vinyl floor tile and mastic | 675 ft <sup>2</sup>  | \$1,690.00                |
|                 |                                   | <b>Total</b>         | <b>\$1,690.00</b>         |
| B3189           | 12x12 vinyl floor tile and mastic | 200 ft <sup>2</sup>  | \$600.00                  |
|                 |                                   | <b>Total</b>         | <b>\$600.00</b>           |
| B3600           | 12x12 vinyl floor tile and mastic | 300 ft <sup>2</sup>  | \$750.00                  |
|                 |                                   | <b>Total</b>         | <b>\$750.00</b>           |
| B4434           | 12x12 vinyl floor tile and mastic | 800 ft <sup>2</sup>  | \$2,000.00                |
|                 |                                   | <b>Total</b>         | <b>\$2,000.00</b>         |
| B4437           | Thermal system insulation         | 6 ft <sup>2</sup>    | \$75.00                   |
|                 |                                   | <b>Total</b>         | <b>\$75.00</b>            |
|                 |                                   | <b>Grand Total</b>   | <b>\$184,790.00</b>       |

\*Includes all air monitoring and design fees