Physical Security

Paul Troncone
CS 996
• Building Construction
• Alarms
• Access Controls
• Information Systems Centers
• Personnel Security
• Tamper Resistance
Goals of Physical Security

- Safeguard personnel
- Prevent unauthorized access to facilities, data, or equipment
- Safeguard against espionage, sabotage, damage, or theft
Building Construction

• Exterior Doors
  • Windowless, metal-clad or solid wood
  • Open out, non-removable pin hinges
  • Lockpick resistant

• Exterior Windows
  • Should be barred or bricked over
Building Construction

• Roof Openings
  • Should be covered with steel screening or barred if greater than 96 square inches

• Fire Escapes
  • One way open outward, alarmed
  • No locks or handles on the outside of door
Building Construction

Open Out Door

Open In Door
## Building Construction

**Vault Construction AR 380-5**

<table>
<thead>
<tr>
<th>Vault Class</th>
<th>Storage Level</th>
<th>Floor</th>
<th>Walls</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Top Secret</td>
<td>8” RC</td>
<td>8” RC</td>
<td>8” RC</td>
</tr>
<tr>
<td>B</td>
<td>Secret</td>
<td>4” RC</td>
<td>8” RC</td>
<td>4” RC</td>
</tr>
<tr>
<td>C</td>
<td>Confidential</td>
<td>4” C</td>
<td>8” RC</td>
<td>4” RC</td>
</tr>
</tbody>
</table>
• Vault Construction (con’t)

• Concrete compression strength of 3,000 PSI after 28 days

• 5/8 inch rebar laid 6 inches on center

• 3 position spy-proof combination lock

• ¼ inch steel plate cover
Building Construction

• Storage Rooms
  • Solid 2x4 beams covered by plaster, gypsum board, metal, or wood (1/2 inch thick)
  • Provide evidence of unauthorized entry or tampering
  • Windowless, solid wood doors
  • Combination lock or padlock
Alarms

• Requirements
  • Hardwired sensors
  • Six hour emergency power backup
  • Alarm panel board at main guard station
  • Audible and visual alarms
  • False alarm rate does not exceed more than 1 per 30 days for each sensor
Alarms

• Types of Protection
  • Point/Spot
    • Storage cabinets, small areas
  • Area/Space
    • Interior spaces
  • Perimeter
    • Exterior spaces
Alarms

• Sensor Types
  • Window Foil
  • Wire Lacing and Screening
  • Taut Wire
• Contact Switches
• Vibration Detector
Alarms

• Sensor Types (continued)
  • Photoelectric Detector
  • Proximity Detector
  • Motion Detector
  • Acoustical System
Alarms

• Sensor Applications
  • Doors, walls, floors, ceilings, windows, ventilation, construction openings
Alarms

• Vault Requirements
  • Magnetic Switch on door
  • Interior volumetric detector
  • Proximity detector
  • Ultrasonic motion detector
  • Vibration sensors
Access Controls

• Admittance Policy
  • Site-issued identification
  • General work hours
  • Security work hours
  • Escort requirements
Access Controls

- Key Control
- Key accounting
- Scheduled rotation of keyed locks
- Policy for misplaced keys or employee discharge
Access Controls

• Vehicle Access
  • Use parking passes and guard stations
  • Visitor parking
  • Should be placed outside controlled area and security fence/wall
  • Random exit inspections
Access Controls

• Electronic Access Control
  • Local non-programmable
  • Local programmable
  • Remotely programmable
Access Controls

• Functional Elements of EAC
  • Encoding element: ID information is entered
  • Control element: ID information is stored and compared
  • Action element: Results
Access Controls

- Locks
- Cypher Lock
Access Controls

• Locks

• Combination Lock
Information Systems Centers

• Site Selection
  • Should not be easily accessible to general public
  • Should be in the center of building
  • Provide protection to utilities and environmental support equipment
Information Systems Centers

- Infrastructure
  - Servers, switches, hubs, etc should be placed in locked locations
  - Wiring should be routed through walls, floors, or ceilings to avoid tampering
  - Power backups should exist for all network infrastructure
Information Systems Centers

- **Access Control**
  - Designate as controlled area
  - Access by authorized personnel only
  - Buffer area before access
  - Accounting for keys, combinations, no master key
  - Visitor controls and policy
Information Systems Centers

Dimensions:
- 11'-0"
- 6'-9 5/8"
- 5'-0"
- 16'-0"
- 12'-9 5/8"
- 2'-6"
- 5'-0"
- 6'-9"
Information Systems Centers

- Media Storage
  - Should be located in controlled area
  - Metal, alarmed door
  - Few authorized people
  - Fire suppression and water alarms
Personnel Security

- Minimize damage that can be caused by an employee
- Through background checks
- Need to know
- Principle of least privilege
- Secure personnel termination procedures
Personnel Security

• Be aware of:
  • Employee grievances
  • Job satisfaction
  • Changes in living habits
  • Changes in attitude towards organization
Tamper Resistance

- **Goals**
  - Prevent unauthorized access
  - Provide evidence of tampering

- **Time**
  - Tamper resistant if attack time greater than 30 minutes
Tamper Resistance

- Hardened steel casing
- Secure to unmovable object if possible
- Use tamper resistant hardware such as Torx
- Design so tampering is evident
  - Tamper evident seals
  - Paint
Resources

• Roper, C.A. *Physical Security and the Inspection Process*

• Government Services Administration *GSA.gov*

• AR 380-5