Physical Security Description

- **To address the threats, vulnerabilities, and countermeasures**
  - Which can be utilized to physically protect an enterprise’s resources and sensitive information
  - Including people, facilities, data, equipment, support systems, media, and supplies
- **To discuss considerations for choosing**
  - A secure site, its design and configuration
  - The methods for securing the facility against unauthorized access, theft of equipment and information
  - The environmental and safety measures needed to protect people, the facility, and its resources

Physical Security Threats

- **Natural / environmental**
  - Earthquakes, Rain, Floods, Mudslides
  - Tornados, Hurricanes, Tsunami
  - Insect Damage, Materials Degradation
  - Heat, Humidity, Moisture
- **Supply systems**
  - Communication Outages
  - Power Distribution
  - Bursting Pipes
  - Gas Leaks

Physical Security Threats

- **Man-made**
  - Sabotage / Fraud
  - Mistakes, Disgruntled Workers
  - Chemical Spills, Explosions
  - Construction Failures / Building Collapse
- **Political Events**
  - Bombings, Terrorist Attacks, Civil Disturbances, Strikes, Espionage

Designing a Physical Security Program

- **Deterrence**
  - Fences, warning signs, guards, dogs
- **Detection**
  - Intruder sensors, video surveillance
- **Delay tactics**
  - Locks, access controls
- **Situational Assessments**
  - Guard procedures, call trees
- **Response to intrusions/disruptions**
  - Response team/procedures, authorities

Crime Prevention through Environmental Design (CPTED)

- Physical Environment of a building can be managed to produce behavioral effects that reduce the incidence of crime
- Territoriality Reinforcement: People protect territory that they feel they own and respect territory of others
- Natural Surveillance: Intruders do not want to be seen
- Natural Access Control: Properly located entrances, exits, and landscaping can control flow of people and help identify intruders

Facility Planning

- **“Low visibility”**
  - Surrounding terrain
  - Building markings and signs
  - Neighborhood
- **Surrounding area and external entities**
  - Crime Rate
  - Proximity to Police/Fire/Medical
  - Possible hazards from surrounding areas

Facility Planning

- **Accessibility**
  - Road access
  - Traffic
  - Proximity to airports, train stations, and highways
- **Natural Disasters**
  - Likelihood of floods, tornados, earthquakes, or hurricanes
  - Hazardous terrain

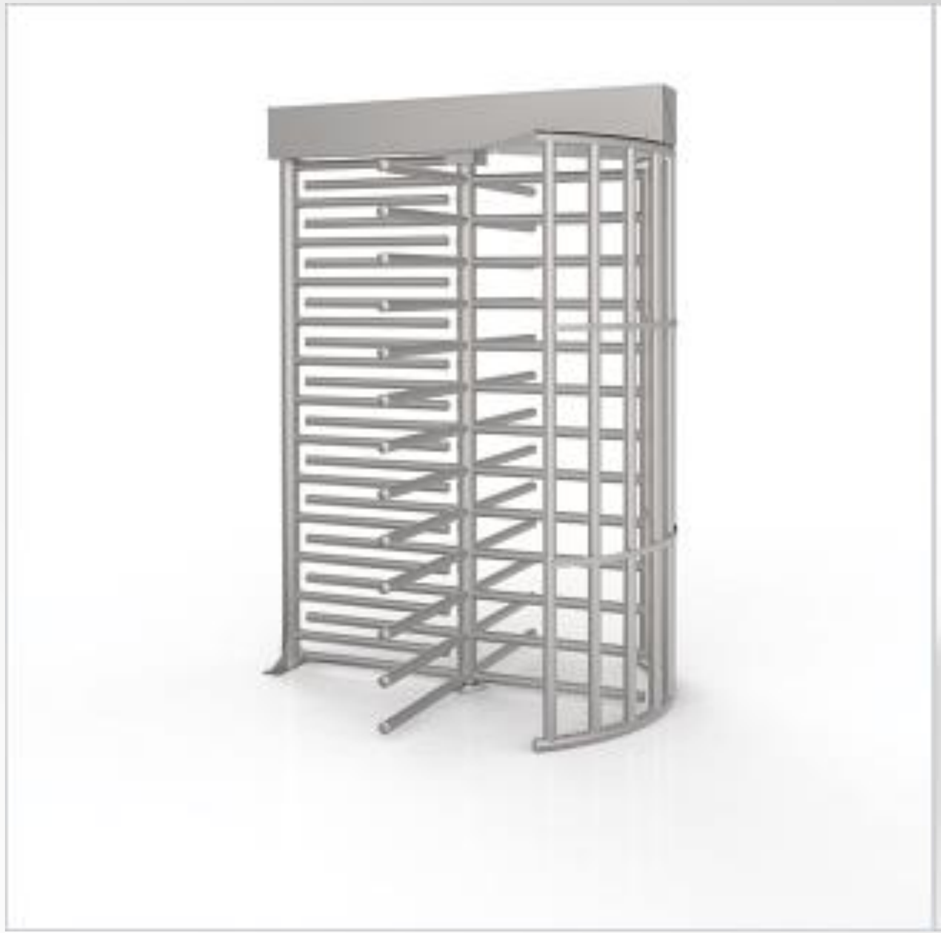
Data Center Cage Examples

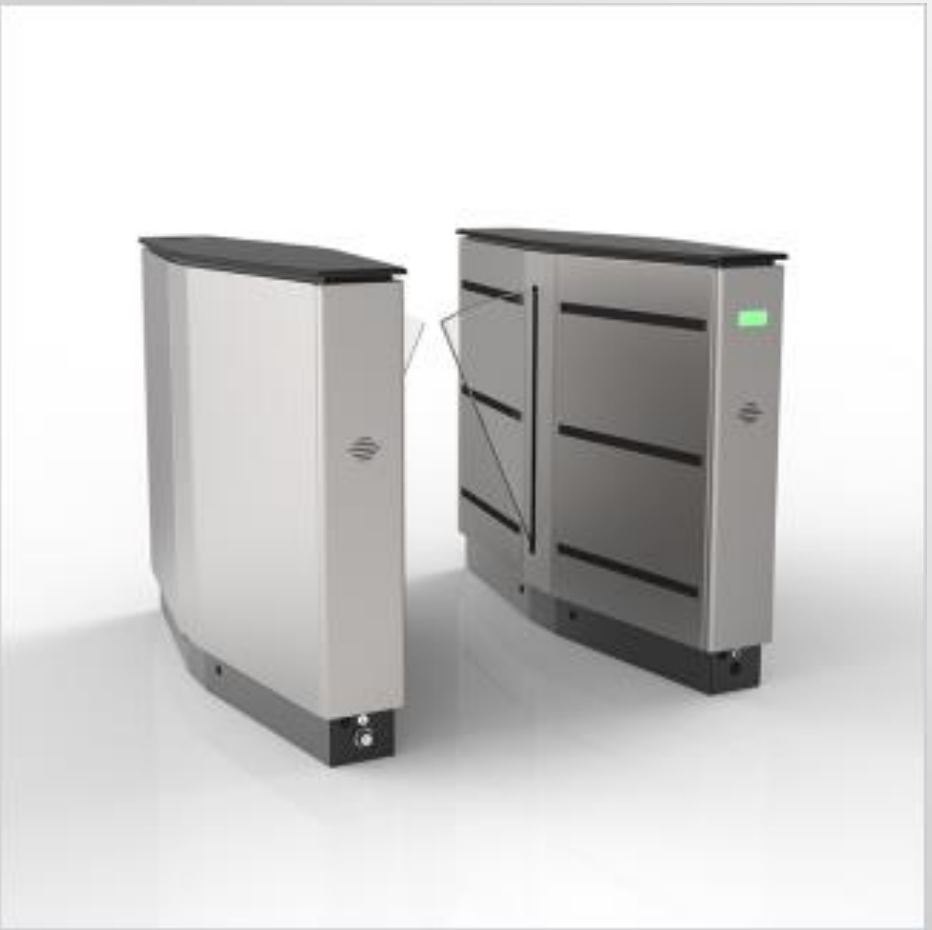
Data Center Wiring

Personnel Access Controls

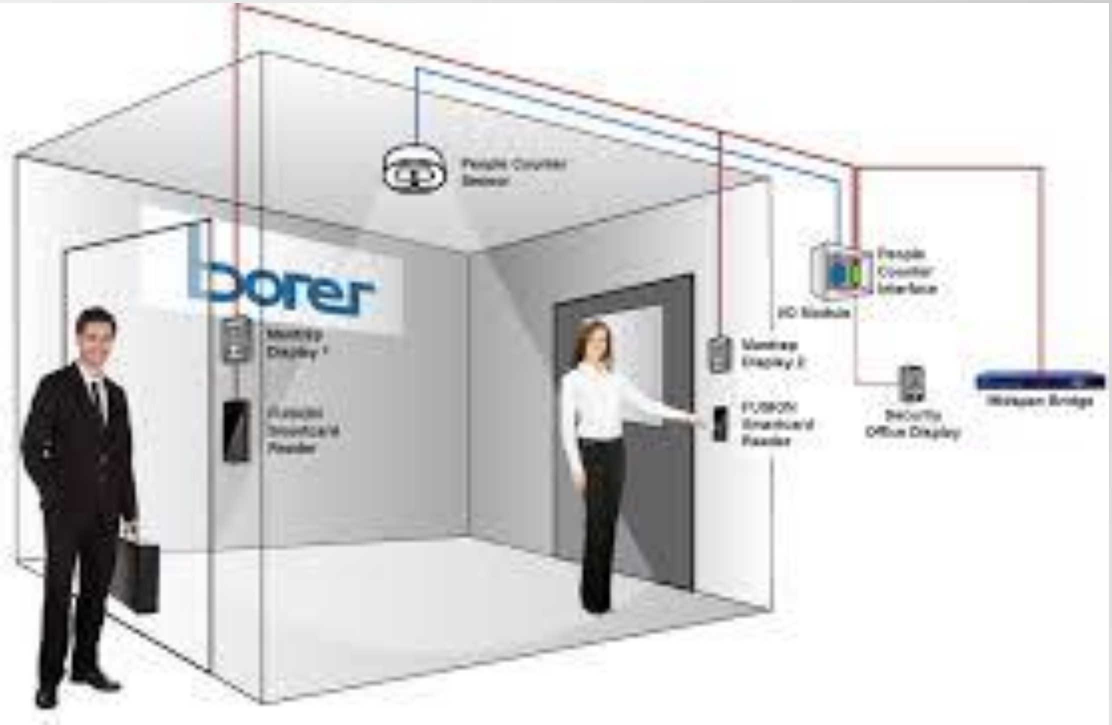
- **Facility**
  - Turnstiles
  - Man traps
  - Guards
- **Identification**
  - Photo IDs
  - Magnetic ID cards
  - Biometric devices
  - CCTV
  - IP Cameras

Turnstiles





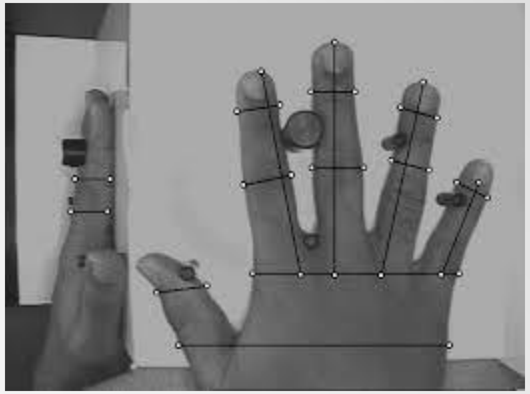
Mantraps


People Counter Sensor
borer
People Counter Interface
I/O Module
Mantrap Display 1
Mantrap Display 2
FUSION Smartcard Reader
FUSION Smartcard Reader
Security Office Display
Netspan Bridge

Personnel Access Controls

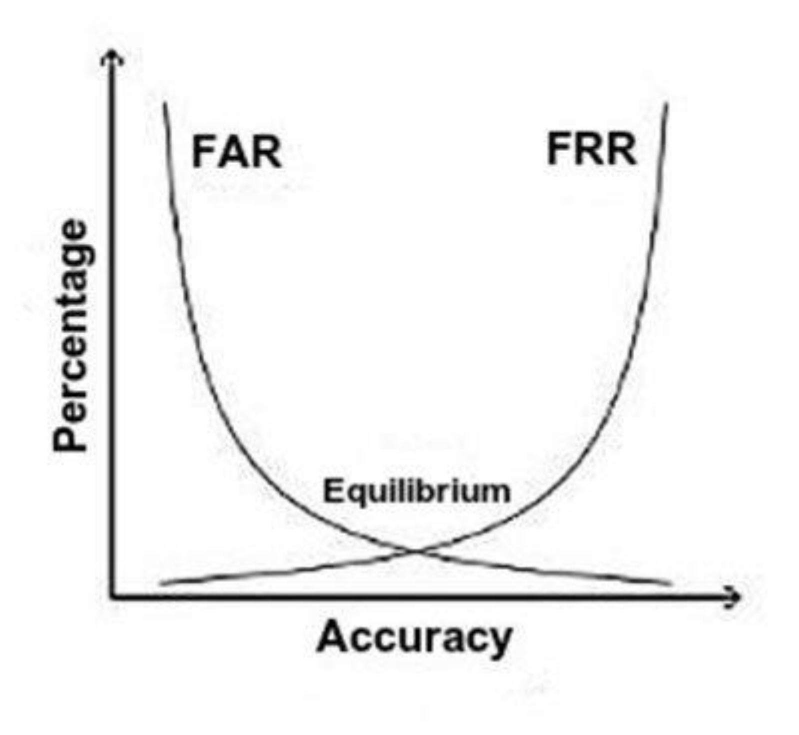
- **Proximity Readers**
  - User Activated – User swipes card, system lets person in
  - System Sensing – Sensor can detect badges in proximity to sensor
  - Two-factor (or multi-factor):
    - Proximity reader /numeric keypad
    - Hand geometry reader w/proximity or keypad or both
- **Card badge readers**
  - Transponders - Card and Reader have receiver, transmitter, and battery
  - Passive Devices - Device is powered by reader

Bio / 2-factor Access Controls



Iris & Retina Scanning

Biometric Accuracy

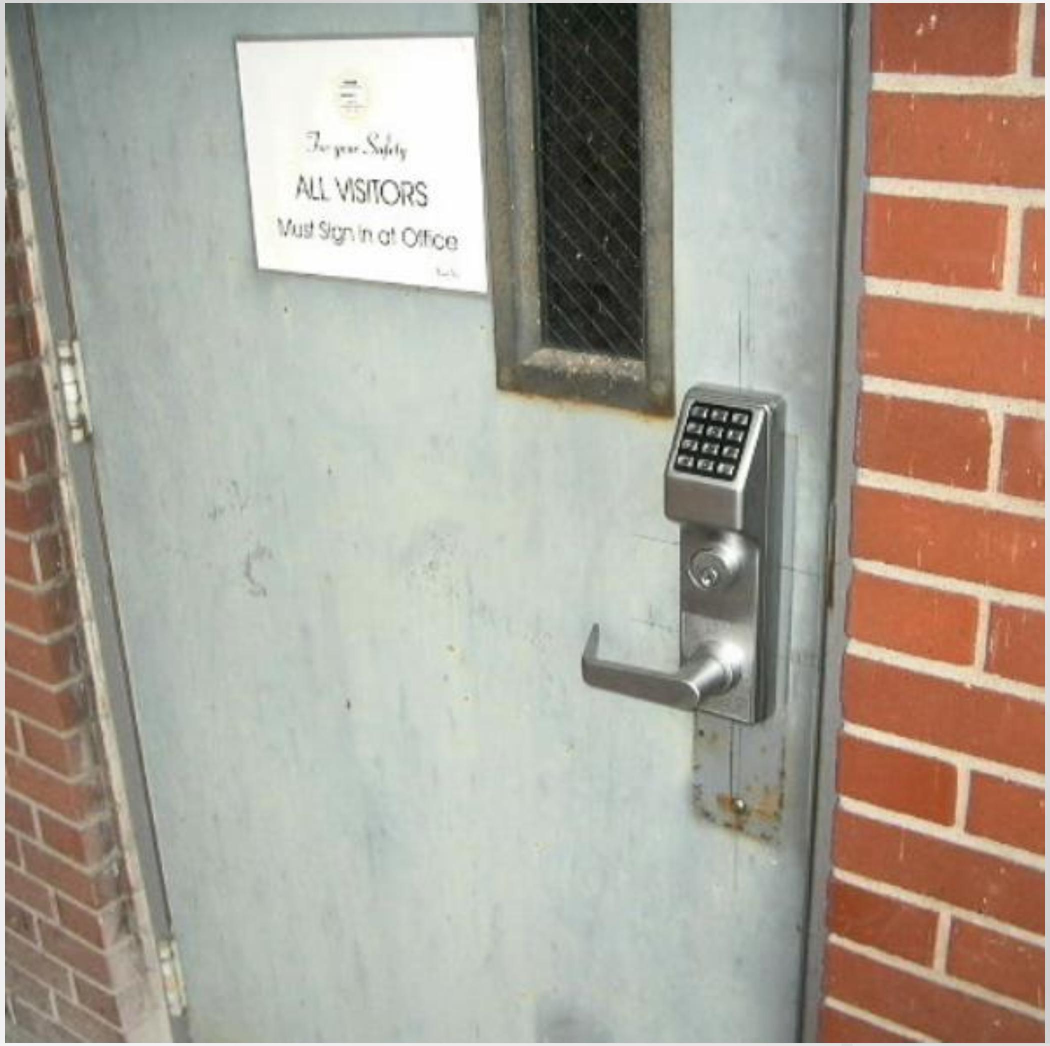


- **False Reject Rate (FRR)**
  - Type I error – rejects valid user
- **False Accept Rate (FAR)**
  - Type II error – allows invalid user
- **Crossover Error Rate (CER)**
  - Measurement between FRR and FAR
  - Lower CER means a more accurate biometric system

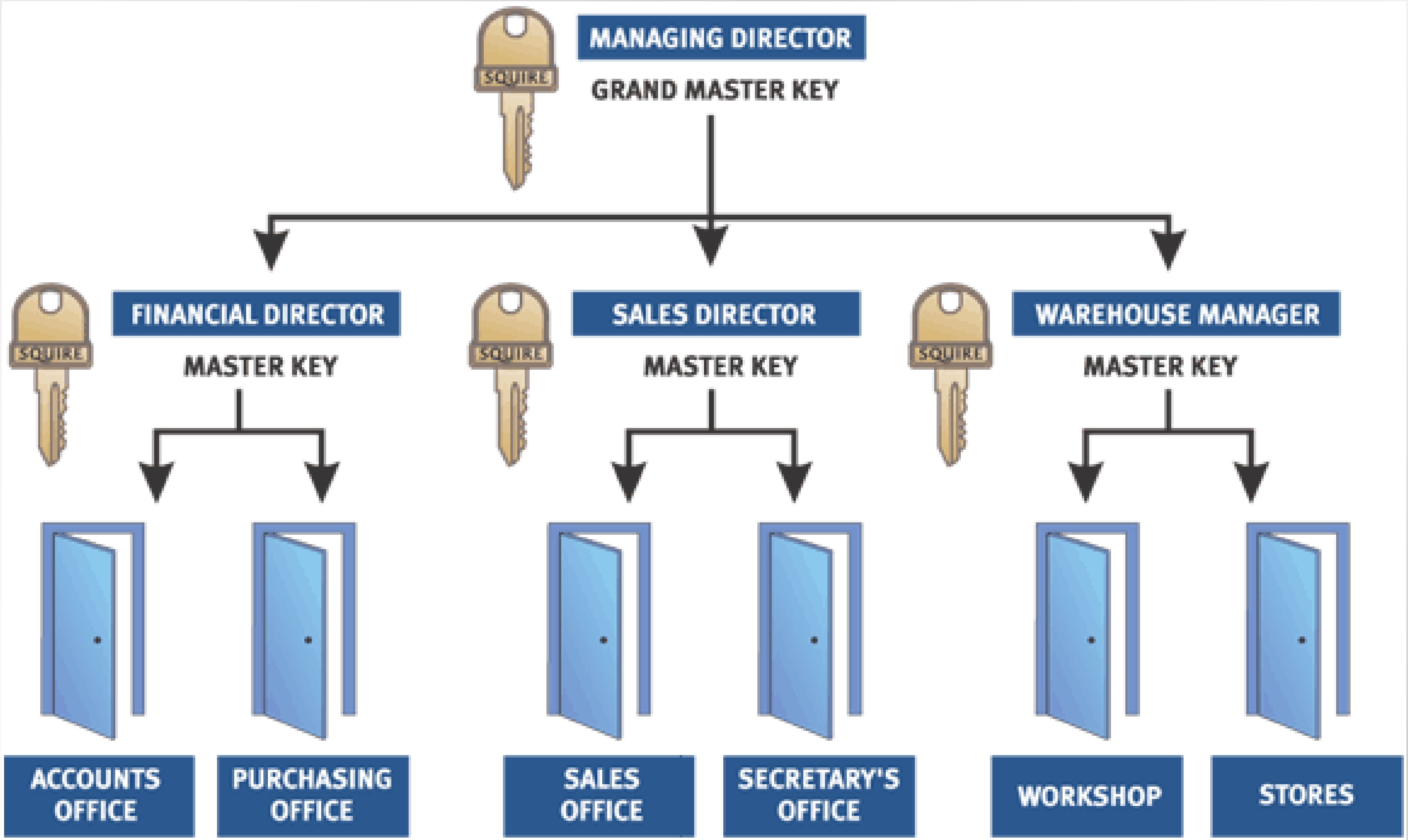
Auditing Physical Access

- **Processes & Logs (lots and lots of logs!)**
  - Date/time
  - Location
  - ID(s) used
  - Access logs are a detective tool, not preventative!

Cipher Locks (What’s wrong with the picture on the right?)



Master Keying



External Boundary Protection

- Fencing & other physical barriers
- Lighting
- Intrusion detection
- CCTV / IP Cameras
- Patrol Force

Fencing

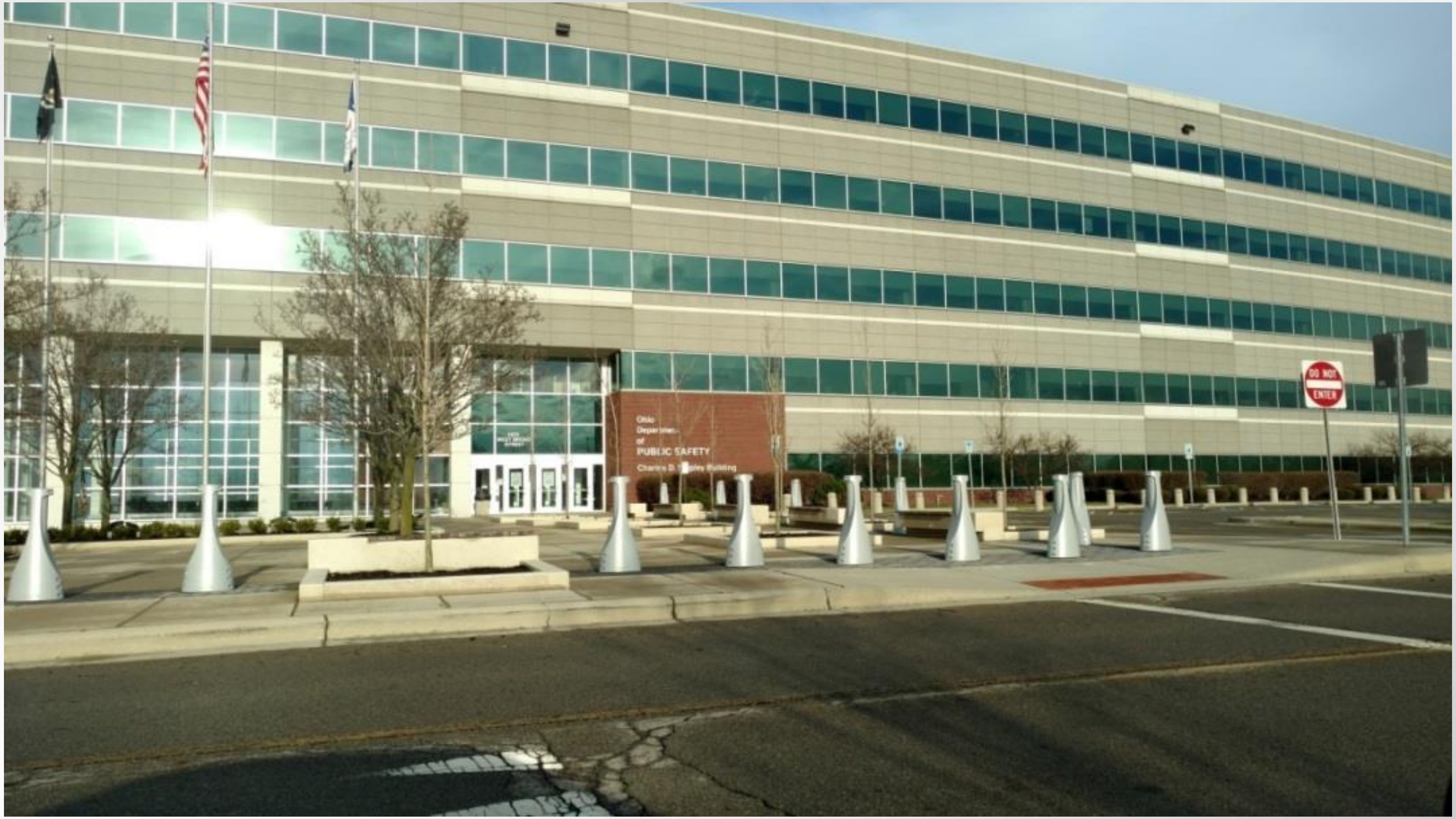
- **Varying heights provide varying levels of protection**
  - 3 -4 ft /1meter (deters casual trespasser)
  - 6 -7 ft/2meters (too high to climb easily)
  - 8 ft/2.4meters + 3 strands of barbed wire (deter determined intruder)
- **Grades of Fence**
  - Wire gauge (lower number = larger, heavier wire)
  - Mesh size (2 in normal, 3/8 in is highest security)
  - Can be costly
  - May be unsightly, zoning considerations
- **Perimeter Intrusion Detection and Assessment System (PIDAS) can detect cutting or climbing**

Fence Examples

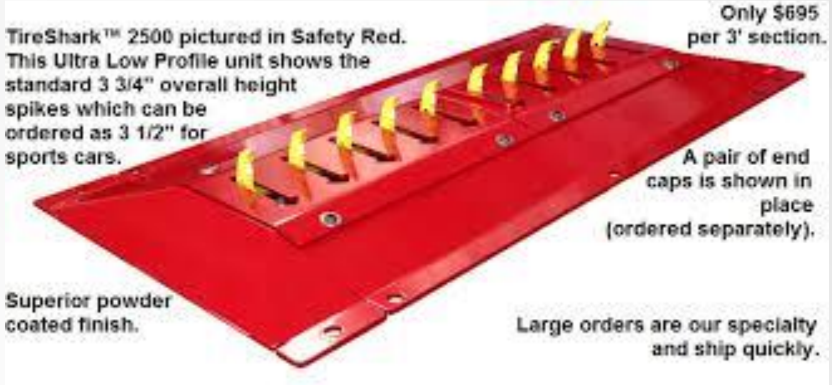
Other Physical Barriers

- **Landscaping**
  - Shrubs can provide an alternative to fencing
  - However tall trees can provide a shelter for intruders
- **Gates**
  - A movable barrier
  - Entrapment – Condition where an object could get caught that may result in injury
- **Bollards / Vehicle (Physical) Barriers**
  - Heavy duty post to restrict vehicle traffic

Physical Barriers / Bollards



Other Vehicle Barriers



TireShark™ 2500 pictured in Safety Red. This Ultra Low Profile unit shows the standard 3 3/4" overall height spikes which can be ordered as 3 1/2" for sports cars.

Only $695 per 3' section.

A pair of end caps is shown in place (ordered separately).

Superior powder coated finish.

Large orders are our specialty and ship quickly.

‘K' rating Crash Test Certification

A ‘K' rating is a Crash Test Certification issued by the Department of State (DoS) to a fence, gate, barrier or bollard indicating the perpendicular impact penetration of a vehicle of a specific weight at a specific speed. In other words, it measures the particular stopping power of a barrier in relation to the speed and weight of an incoming vehicle. The K-rating weight of the vehicle is standard at 15,000 lbs. These DoS standard barriers only allow the truck to penetrate no more than 36 inches past the bed.

- **K4 rating is for a vehicle traveling 30mph**
- **K8 rating is for a vehicle traveling 40mph**
- **K12 rating is for a vehicle traveling 50mph**

Physical Intrusion Detection

- **Intrusion detection/monitoring**
- **Optical/light beams**
- **Vibration sensors**
- **Closed circuit TV**
- **Motion detection**
  - Infrared
  - Microwave

Physical Intrusion Detection

- **Considerations:**
  - Expensive to install and monitor
  - Requires human response
  - Practical if fence not possible
  - Subject to nuisance alarms (false positives)
  - Can be penetrated

Video Surveillance

Patrol Forces

- **Guards**
  - Can provide flexible security & safety response
  - Good deterrence
  - May be effective for protecting group of buildings
  - Costly
- **Guard Dogs**

Types of Alarms

- **Deterrent**: Triggers deterrents such as locks, close doors, etc. – meant to contain or make further intrusion more difficult
- **Repellant**: Sound an audio device, turn on / flash lights, etc. – used to discourage intruders or attackers from continuing or force off premises
- **Notification**: Often silent, notifying others of the event, triggering recording (video, physical location, etc.) – used to bring authorities to the perpetrator in the hopes of catching them
- **Local System**: Broadcast an alarm up to 120db that can be heard up to 400ft away – used to notify security or guards who can respond (similar to repellant)
- **Central Station**: Usually silent locally, but alerting off-site agents who can respond – examples include Brinks, ADT, etc.
- **Auxiliary Station**: Automatic notification added to local or central station – used to alert emergency services such as police, fire, medical, etc. (could result in fees for false alarms)
- **Combined**: Two or more of the alarms can be incorporated in a single solution

Power Terminology

- **Fault**: A momentary loss of power
- **Blackout**: A complete loss of power
- **Sag**: Momentary low voltage
- **Brownout**: Prolonged low voltage
- **Spike**: Momentary high voltage
- **Surge**: Prolonged high voltage
- **Inrush**: An initial surge of power usually associated with connecting to a power source, whether primary or alternative / secondary
- **Noise**: A steady interfering power disturbance or fluctuation
- **Transient**: A short duration of line noise disturbance
- **Clean**: Non-fluctuating pure power
- **Floating Ground**: The wire in an electrical circuit that is grounded

Uninterrupted Power (UPS)

Static voltage damage levels

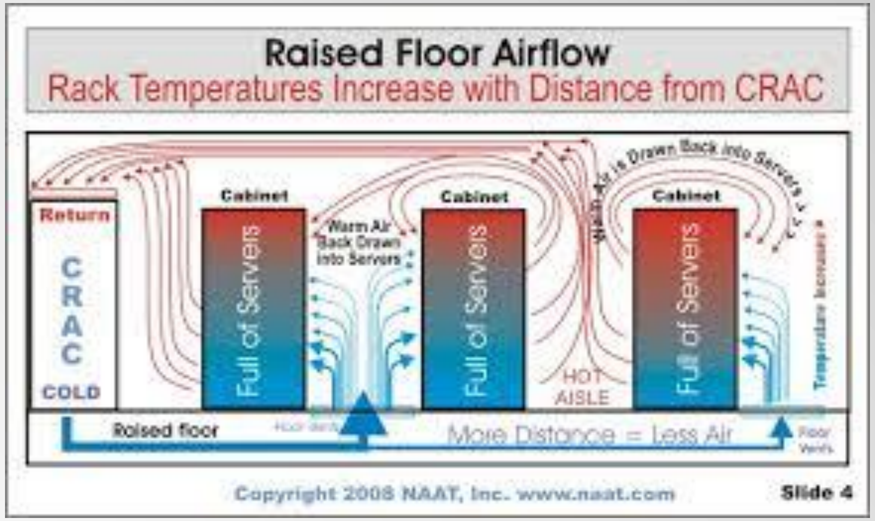
- 40: Destruction of sensitive circuits
- 1,000: Scrambling of monitor displays
- 1,500: Destruction of data stored on hard drives
- 2,000: Abrupt system shutdown
- 4,000: Printer jam or component damage
- 17,000: Permanent circuit damage

Power sub-stations

HVAC Environmental Conditioning

- Freon
- Glycol
- Water
- Positive pressure
- What’s the right temperature?

Computer Room Air Conditioners



Raised Floor Airflow

Rack Temperatures Increase with Distance from CRAC

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Slide 4

Google data center: Traditional cooling

Fire

- **Combustion elements**
  - Fuel, Oxygen, Temperature
- **Suppression methods versus combustion elements**
  - Remove fuel / oxygen (CO2/soda acid)
  - Reduce temperature (water)
  - Interference with chemical reaction (Halon)

Fire Suppression - Classes

- **A - Common combustibles**
  - Suppress with water/soda acid
- **B - Liquid**
  - Suppress with CO2/soda acid/Halon (Dry Chemical)

deadly! Hazardous to humans

Bad for environment

- **C -Electrical**
  - Suppress with CO2/Halon (Dry Chemical)
- **D –Combustible Materials (Magnesium, Sodium, Potassium)**
  - Dry Powder (NaCl, Graphite, Cu)
- **K – Cooking oils and fats (Grease)**

Fire Suppression Agents

- **Water**
  - Bad for electronics and buildings
- **CO2**
  - colorless, odorless, and potentially lethal in that it removes oxygen
  - Bad for people
  - Use built-in delay in manned areas
  - Emergency shut off override
- **Halon**
  - Better for people
  - Bad for environment (Ozone-depleting)
  - Use built-in delay in manned areas
  - Emergency shut off override

Halon

- **Halogenated extinguishing agent**
  - Must be thoroughly mixed with air
  - Montreal protocol (1987)

    stopped Halon production as of 01/01/94 due to agent releasing ozone-depleting substances
  - Halon 1301 requires expensive pressurized flooding system
  - Halon 1211 self-pressurizes (used in portable extinguishers)
- **FM-200 most effective alternative to Halon**
- **Other Alternatives are NAFS-III, CEA-410, FE-13, Argon, Water, Inergon, or Argonite**

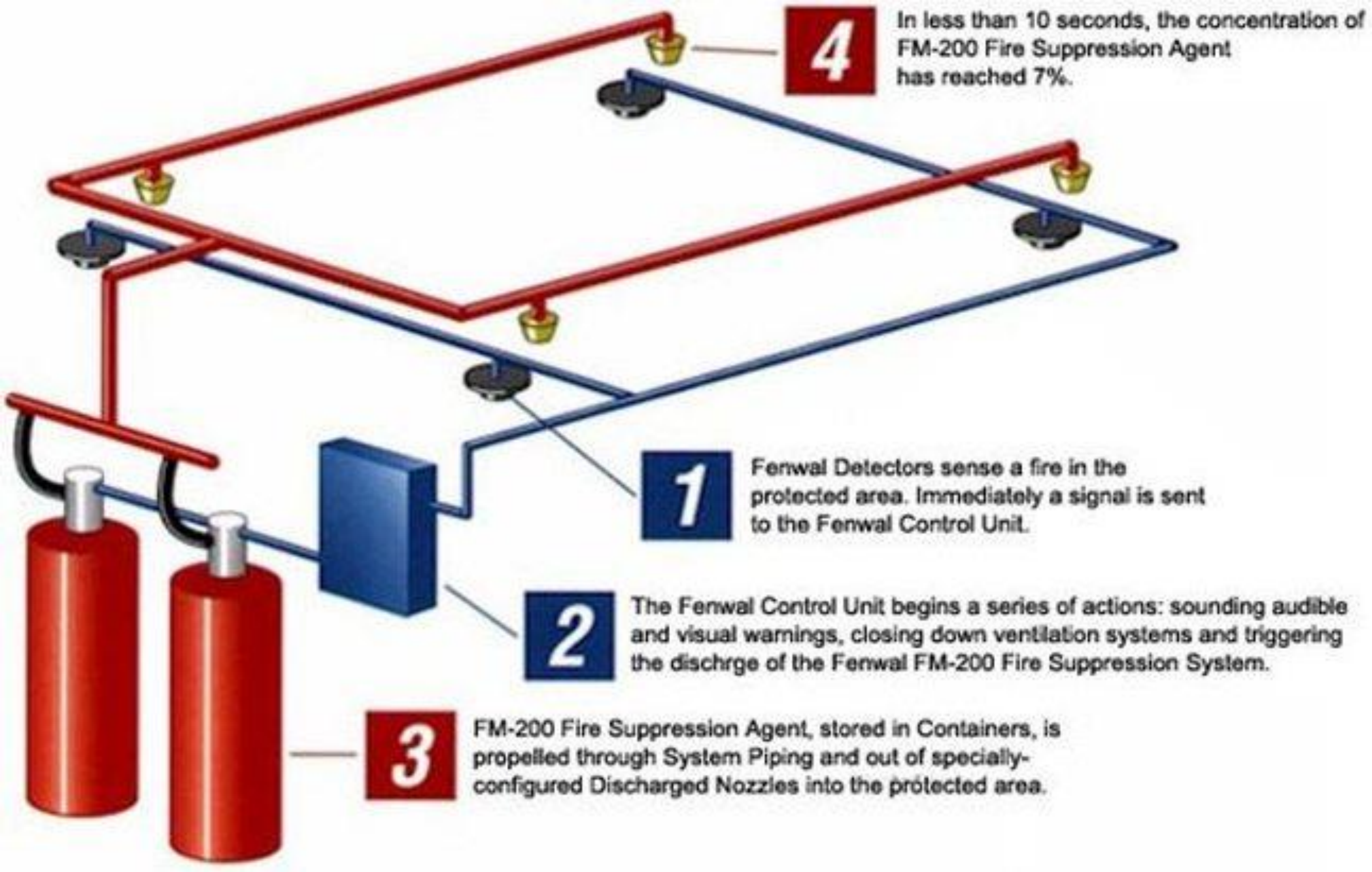
Types of systems

- **Wet pipe**
  - Always contain water
  - Discharged by temperature control sensors
  - Could cause damage in the event of a pipe break
- **Dry pipe**
  - Water is not in the pipe until a temperature is reached
  - Typically a delay between detection and release of water
- **Pre-action**
  - Combination of Dry and wet pipe
  - Water is release based on temperature, but sprinkler head doesn’t release water until a link is melted away
- **Deluge**
  - Dry pipe system with large volumes of water

Fire Detection

- **Smoke Activated**
  - Photoelectric device detects changes in air particles
  - Prone to false alarms
- **Heat activated**
  - Detect heat (fixed-temperature or rate of rise)
- **Flame activated**
  - Senses the pulsations of flames or infrared flame energy
  - Expensive

Fire prevention systems



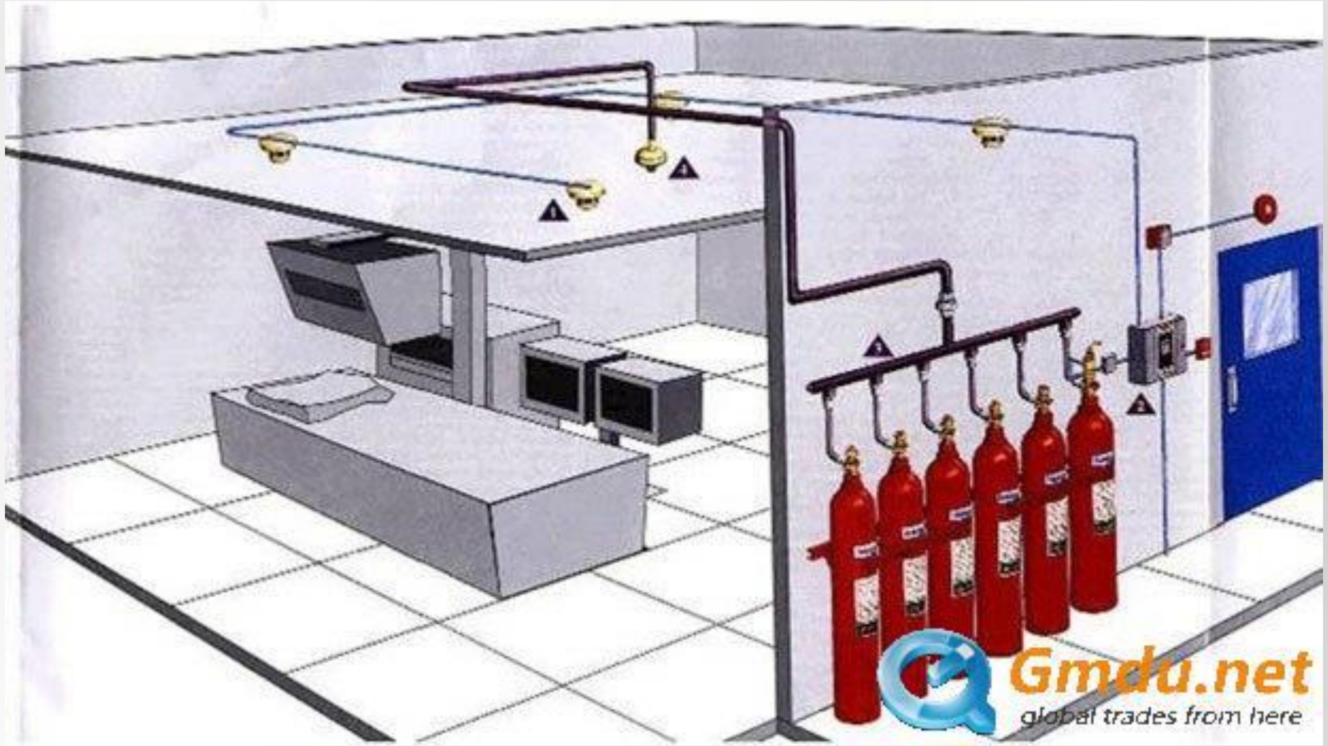
4 In less than 10 seconds, the concentration of FM-200 Fire Suppression Agent has reached 7%.

1 Fenwal Detectors sense a fire in the protected area. Immediately a signal is sent to the Fenwal Control Unit.

2 The Fenwal Control Unit begins a series of actions: sounding audible and visual warnings, closing down ventilation systems and triggering the dischrge of the Fenwal FM-200 Fire Suppression System.

3 FM-200 Fire Suppression Agent, stored in Containers, is propelled through System Piping and out of specially-configured Discharged Nozzles into the protected area.

Fire prevention systems


Gmdu.net
global trades from here