Fire Department Operations in Vacant and Abandoned Buildings

Support Slides

Developed by the Massachusetts Department of Fire Services as part of the

IAAI/USFA Abandoned Building Project


Operations in
Abandoned / Vacant Buildings
are Inherently
More Dangerous

Abandoned Buildings

Commercial

- Usually heavier construction
- Usually larger open areas
- May have storage
- Less likely to be occupied

Residential

- Usually lighter construction (wood)
- Generally smaller areas, more spaces and confinements
- Likely to be occupied

Commercial

Residential


Churches

Common Problems

- Known or suspected abandoned
- Length of time abandoned
- Known to fire department
- Systems in place or disconnected
- Building Contents, equipment / machinery / storage
- Deterioration due to weather exposure
- Unsecured buildings

Known Abandoned

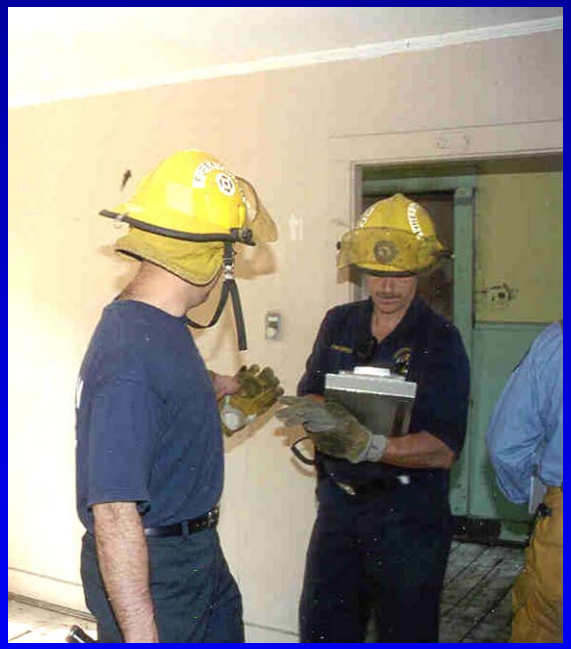
- Pre-fire planning by companies
- Records from city or town offices
- Fire prevention inspection records
- Request for termination and shut down of systems and equipment

Length of Time Abandoned

- Will have an impact on structural deterioration
- Will have an impact on the accessibility and frequency of vandalism
- Security measures will begin to fail
- Economic incentives for the building may shift and change

Known to the Fire Department

- Officially
- Unofficially
- Subject to compliance regulations
- Walk through tour conducted
- Pre fire plan diagram in place?
- Tactical operations pre-fire plan in place?

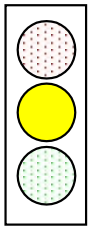


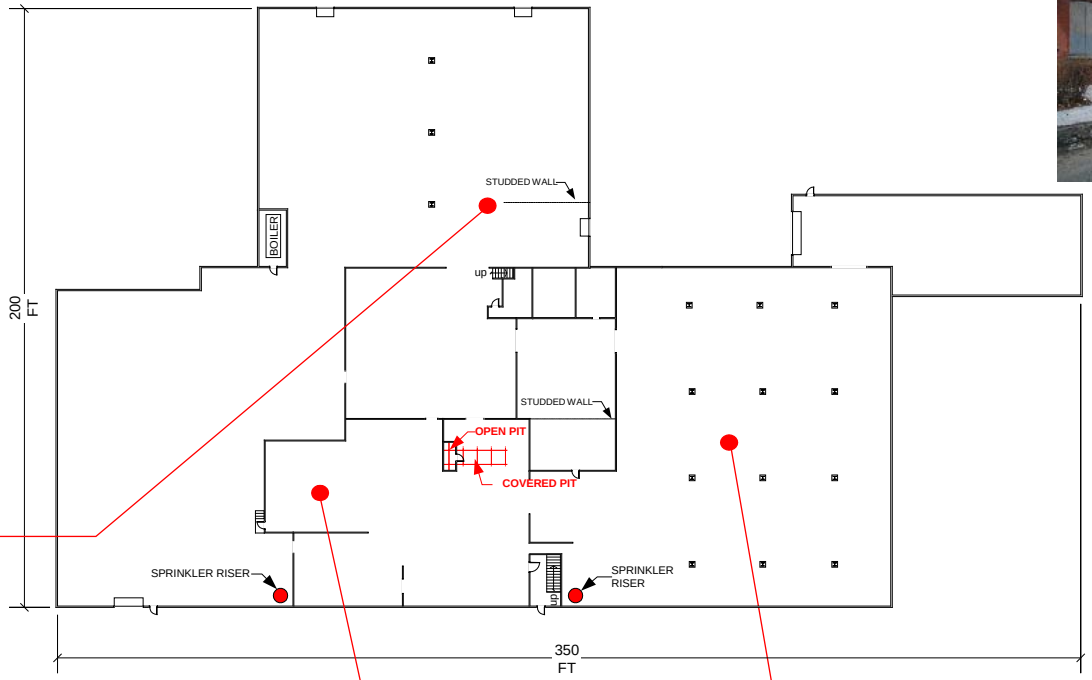
Pre-Fire Plan

MARKING

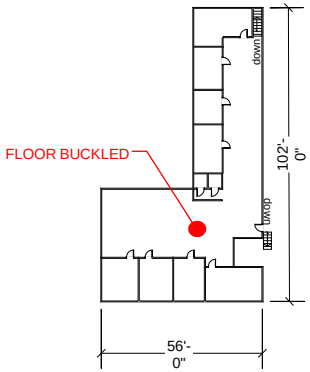
DOUBLE DOORS
SINGLE DOOR
OVERHEAD DOOR
WOOD STEEL
COLUMNS
ELEVATOR SHAFT
HAZARD
STAIRS

10 MANN STREET





GROUND LEVEL



SECOND LEVEL

NOTES:
- BUILDING HAS ELECTRIC SERVICE
- NO FDC, INOPERATIVE SPRINKLER SYSTEM
- OPEN PITS FILLED WITH WATER IN CENTER OF BUILDING
- MOSTLY ONE STORY, SMALL OFFICE SPACE ON SECOND STORY
- POOR HOUSE KEEPING, NUMEROUS LARGE PILES OF RUBBISH
- CEILING DETERIORATED IN SOME LOCATIONS
- PRIMARILY STEEL STRUCTURAL MEMBERS, MOST EXPOSED
- PARTIAL TRUSS ROOFING
- CONCRETE FLOORS
- OCCUPIED EXPOSURES


Urban Mining & Exploring


What is left behind?

Abandoned but has Storage

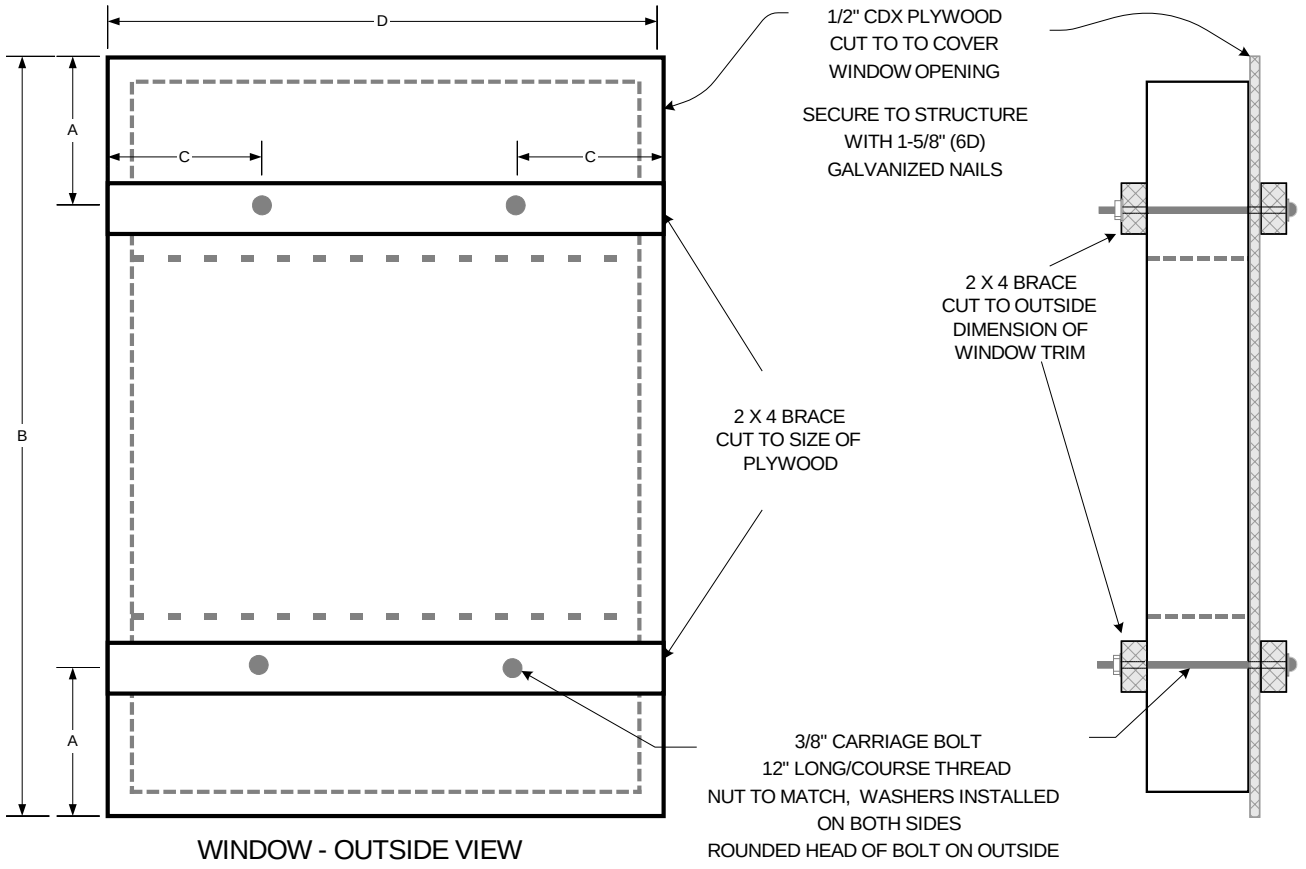
- Are large pieces of machinery and equipment still in place?
- Are there large open holes where machinery once was?
- Is there neglected material storage still in place?
- Was the structural integrity compromised during the removal of large machinery?


What are the conditions?

Secured or Unsecured

- What method was used to secure the building?
- Are security measures monitored periodically and repaired when necessary?
- Has the fire department pre-planned the building and its access points?
- Does the security inhibit detection and discovery of the fire?
- Once inside can fire department escape?

Proper Security



WINDOW - OUTSIDE VIEW

NOTES:

1. FOR DOUBLE HUNG WINDOWS, SLIDE SASH TO CENTER OF UNIT AND PASS BOLTS THROUGH OPENINGS AT TOP AND BOTTOM.
2. STORM WINDOWS SHOULD BE REMOVED AND STORED INSIDE STRUCTURE.
3. OUTSIDE TRIM MAY HAVE TO BE REMOVED TO ACCOMMODATE A FLUSH AND TIGHT FIT.
4. TIGHTEN NUTS FROM INSIDE ENOUGH TO SLIGHTLY COMPRESS 2X4 BRACE.
5. BRACE LOCATIONS: A = 1/3 B (SEE DIMENSION LOCATIONS ON DRAWING)
6. LOCATION OF BOLT HOLES: C = 1/3D (SEE DIMENSION LOCATIONS ON DRAWING)

USFA National Arson Prevention Initiative
Board Up Procedures

Window Detail

IAAI/USFA Abandoned Building Project

HUD Board up Methods

Standard

Reinforced

Know the System

Training should involve understanding how the components are assembled


NO
PARKING
THIS SIDE
OF STREET
NOVEMBER 15
TO APRIL 15

Size-Up

The decision to commit fire forces into vacant or abandoned buildings should not be automatic as it normally is. The decision to make an entry should be made after the size-up has been conducted.

Considerations on Arrival

- How much smoke upon arrival?
- How much fire upon arrival?
- What is burning?
  - ✓ Contents Only?
  - ✓ Structural components?
- Length of burning time – Was there a delay in alarm?
- How difficult to make entry or access points
- What rate of flow do you need, what rate of flow can you support?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Additional Considerations

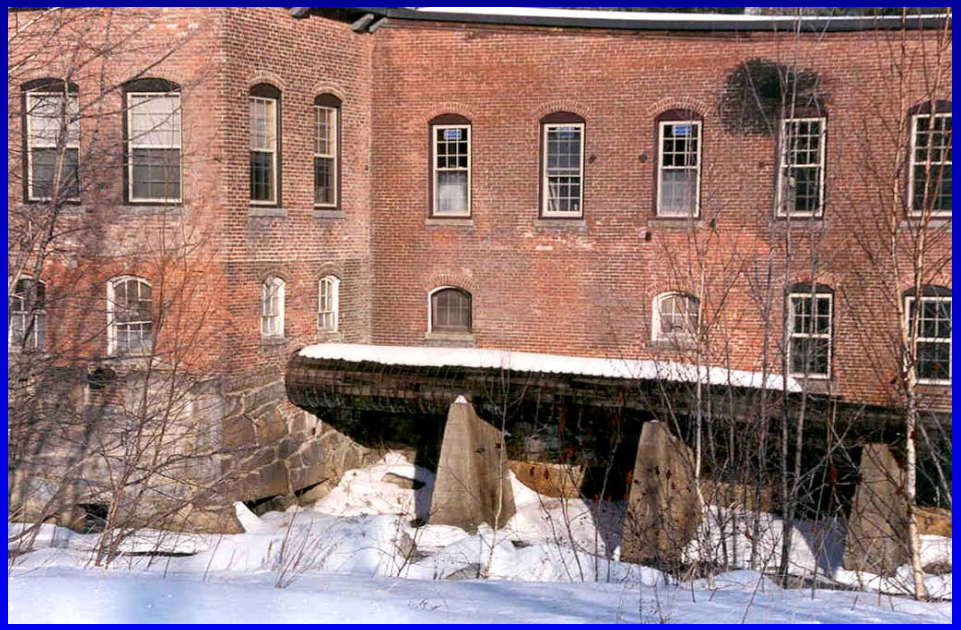
- Life safety
- Special considerations/Hazards
- The building
- Security measures
- Exposures
- Weather
- What is burning
- Location of the fire
- Fire fighting operations

Life Hazard

- The most critical life hazard factor in an abandoned building are the lives of the attacking fire forces
- Before committing resources to possible life hazard scenarios, the incident commander should clearly assess the risk to fire fighting personnel

Special Considerations

- **Extensive deterioration.**
- **No access or limited access on one side.**
- **High tension wires.**
- **Multiple or split level buildings.**
- **Weather**
- **Time of day**



Weather Conditions

- **Current weather conditions could lead to delay in apparatus arrival and operating.**
- **Any extreme weather *could* indicate persons seeking shelter.**
- **Weather can clearly deteriorate building conditions.**

Time of Day

- This should have a minimal impact on a properly secured vacant building as the civilian life hazard should be non existent
- Late night/early morning fires may not be discovered as fast as others

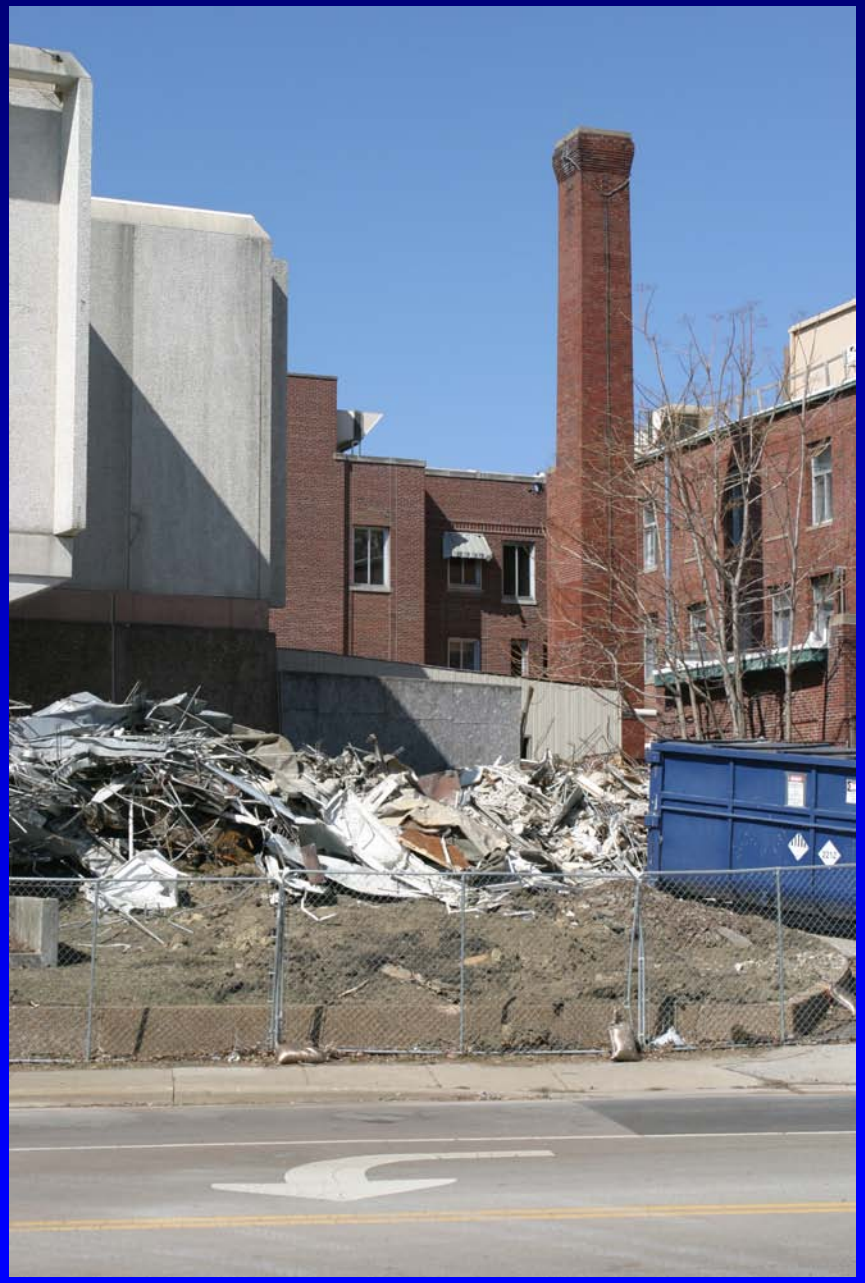
The Building

Construction Features

- **In addition to all normal construction considerations consider**
  - ✓ **Deterioration**
  - ✓ **due to vandalism and weather exposure**
  - ✓ **Openings or holes in structural elements that will allow abnormal fire travel**
  - ✓ **Removal of structural elements that reduce stability and create fall hazards**

Occupancy

- What was the occupancy used for prior to its abandonment?
- Has the occupancy now been used for storage?



Height & Area

- Consider the fire flow required for the area involved.
- A properly boarded building will be difficult to open up for stream placement, causing an increase in fire spread.
- Access with ladders and aerial streams may be required.

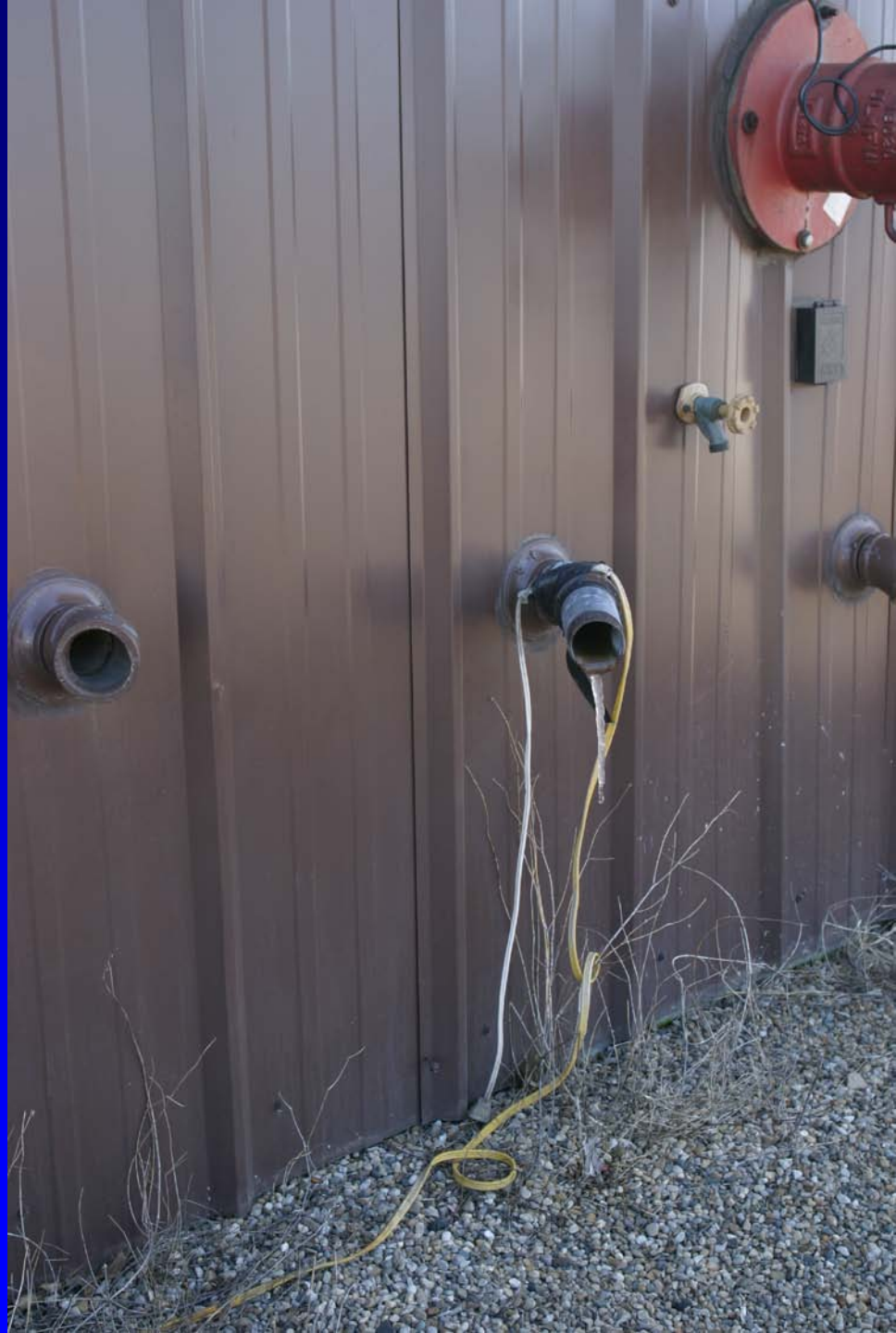
Open to Weather Conditions

- Excessive water in wooden structural members
- Water openings that have frozen, thawed and re-frozen causing structural cracks and possible failures.
- Snow loading and ice loading.
- Wind conditions and small flying fragments


System Conditions


GORA


FOR
FIRE
HOOK
POLICE OR
MEDICAL AID



Location of Fire

- Lower floors or upper floors?
- Near shafts openings, voids?
- Exterior and has now spread to interior?
- What is the fire growth potential?
- How will it travel through the building?

Exposures

- If no offensive attack is planned or anticipated, then plan for extensive exposure protection due to radiant heat, embers, etc.
- Consider this exposure protection early on.

Collapse

- Not risking personnel for interior operations may lead to greater fire involvement
- If only defensive operations are to take place, prepare for collapse in the operational plan
- Initial placement of apparatus is an important factor

Fire Fighting Operations

Apparatus & Manpower

If no manpower is to be committed to interior operations, then additional resources may still be needed to compensate for

- ✓ **heavy fire conditions**
- ✓ **large water supplies**
- ✓ **exposure protection**
- ✓ **access issues**

Water Supply

- **Expect rapid fire spread and extensive involvement.**
- **Usually will require large caliber streams from a distance.**

Streams

- **Heavy large caliber streams should be operated from flanking positions.**
- **Large streams add a tremendous amount of weight and impact loading to a building.**
- **Adequate drain time should be given after operating heavy streams**

Systems in Place

- What system were in place while occupied?
- Were systems shut down?
- Was one system shut and another not?
  - ✓ Suppression v. detection
- If sprinklers are in place
  - ✓ Has piping been removed or broken?
  - ✓ Can system be pumped?

Scenarios

What would you do?

Interior / Exterior

The decision to commit interior firefighting personnel should be made on a case by case basis with proper risk benefit decisions being made by the incident commander.

The commitment of firefighters' lives for saving of property and an unknown or marginal risk of civilian life must be balanced appropriately.

Consider the Risks

“Interior operations are not mandated at vacant buildings. Entry into a vacant building is an option, not an obligation.”

Michael M. Dugan, Firehouse, June 2001

Alternatives

- Consider the use of thermal imaging cameras to conduct primary searches of vacant/abandoned structures from the exterior or just inside of door openings
- If the building is secure, what is the potential of it being occupied?

Use of Thermal Imagers

Use of Thermal Imagers

- Doors, windows, basement windows and bulkheads can be used to conduct an exterior search.
- Glass must be removed or imager will be ineffective.
- Walls and other obstructions may reduce effectiveness of imager.

Gaining Access

- If unsecured there is no significant issue other than standard firefighter forcible entry operations.
- If marginally secured additional companies may be required with sledge, axe, and halligans.
- If secured as recommended power saws and multiple cuts will be needed.

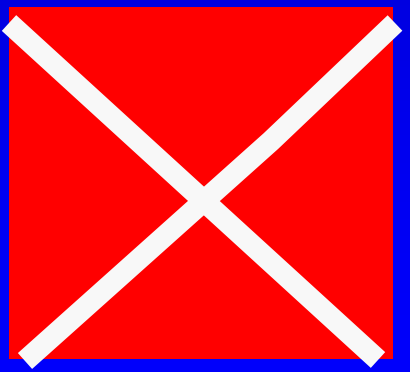
Gaining Access

Fire departments should train regularly to determine the most efficient methods they will use to gain access to secured buildings

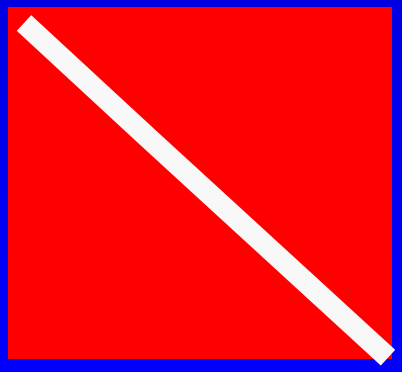
Marking Buildings

- Used to alert fire fighters of the potential hazards in a vacant/abandoned building
- Makes public aware of problem properties
- Allows for increased surveillance

Vacant Building Markings



Exterior operations Enter for known life hazard



Interior operations with extreme caution

Marking Buildings

- Severe structural or interior deficiencies
- Operations should be conducted from outside except for life safety
- If interior operations are required:
  - Approved by Incident Commander
  - Tactics modified
  - Examined before units are committed
- Time of any interior operations must be limited

Operations in vacant/abandoned buildings are inherently more dangerous

Summary

- Identify abandoned buildings in your area.
- Monitor buildings' condition over time.
- Do not risk firefighters' lives needlessly.
- Prepare for defensive operations early.
- Expect rapid fire spread and early collapse potential.
- These buildings are inherently more dangerous!

The assistance provided by Massachusetts State Fire Marshal Stephen D. Coan and the staff at the Massachusetts Department of Fire Services in the production of this presentation is greatly appreciated.

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