

Securing Vacant and Abandoned Buildings



IAAI/USFA Abandoned Building Project



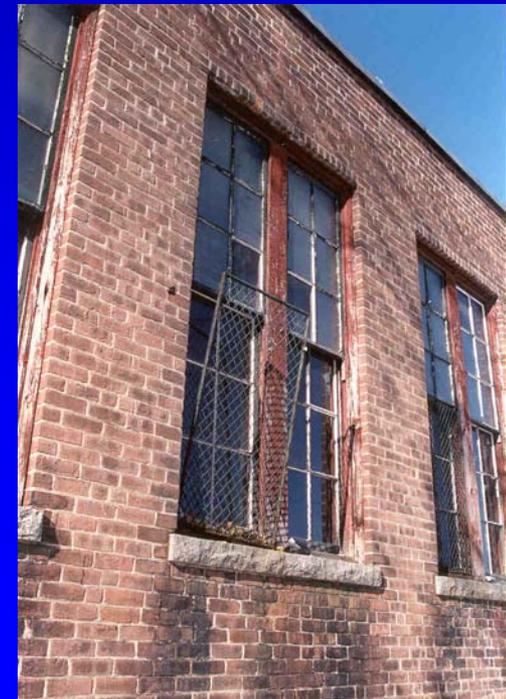
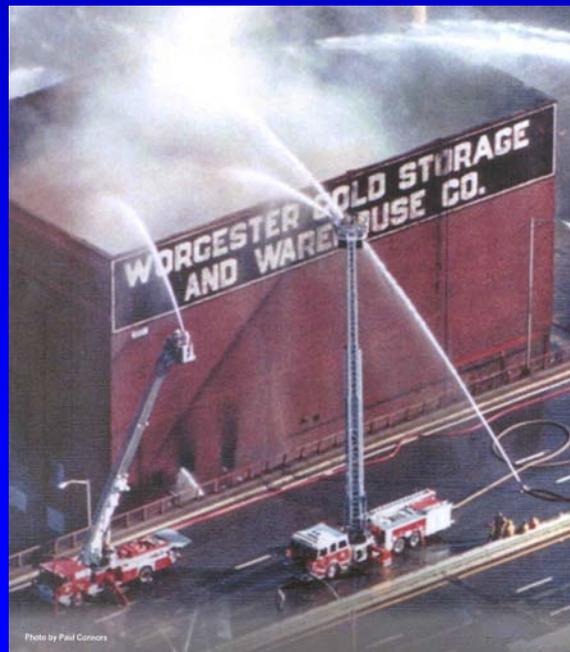
The "Broken Windows" Theory of Social Disorder



***From one broken window, you
can lose a street***

Target Properties

- **Secure and well maintained properties are not the problem**
- **Problem properties**
 - ✓ Vacant
 - ✓ No viable owner
 - ✓ Unsecured
 - ✓ Accessible



Vacant Properties



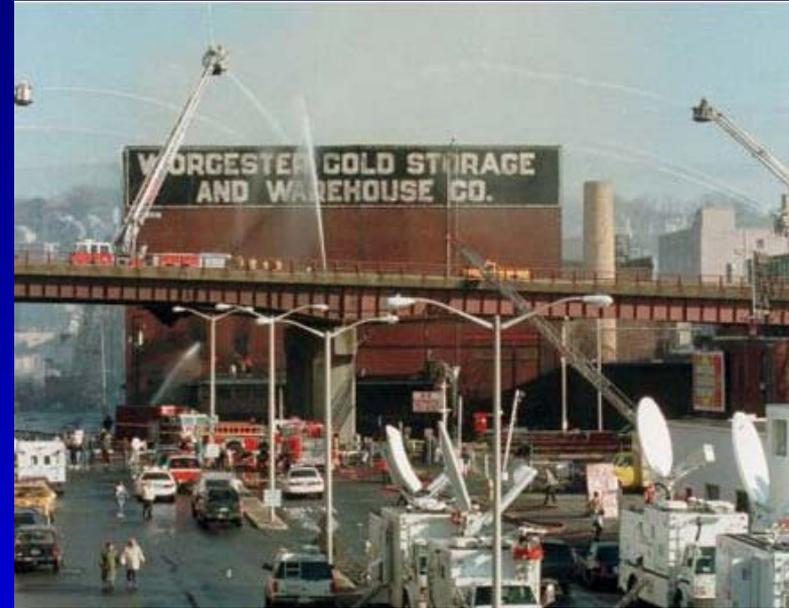
It is estimated that 18% of urban structures in the United States are unused

The ISO estimates that there are more than 21000 idle properties of over 15000 square feet in the United States



The Problem

- Thousands of fires annually
- Civilian injuries and deaths
- Fire Fighters are more likely to be injured fighting fires in vacant properties than any other property type
 - ✓ More than 6000 fire fighter injuries every year
 - ✓ From 1990 to 1999 - 23 fire fighters died while operating at fires in vacant/idle properties



The Vacancy Progression



Owner: Responsive
Uninhabited
Secure



Owner: Unresponsive
Uninhabited
Open to Unauthorized Entry



Owner: Absentee or Unknown
Building Deteriorating
Open to Unauthorized Entry

Least



Greatest

The Impact on the Community

- **Crime**
- **Safety**
- **Community image**

**Abandonment is a
contagious
phenomenon**



Why Building Security is Essential

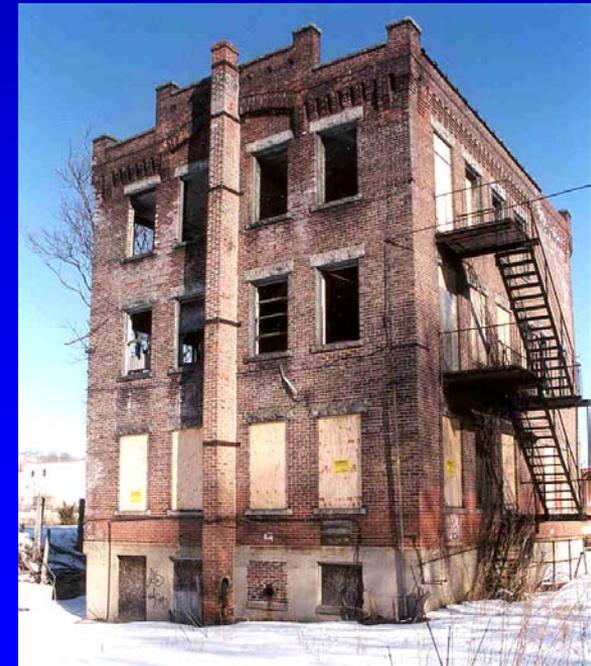
- **Of the more than 12000 fires in vacant structures every year**
 - ✓ **Nearly 72% are of incendiary or suspicious origin**
 - ✓ **More than 5% are caused by children playing with matches**



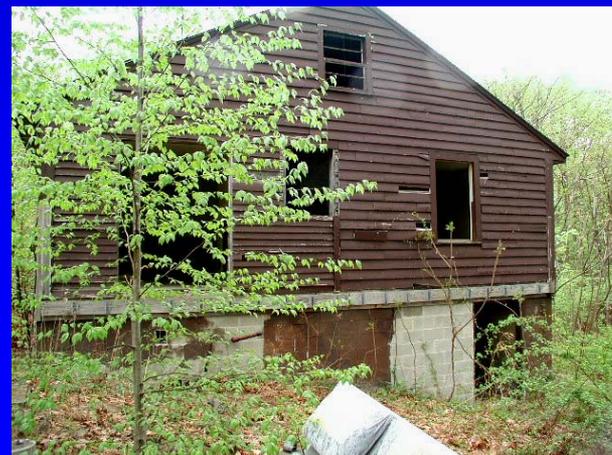
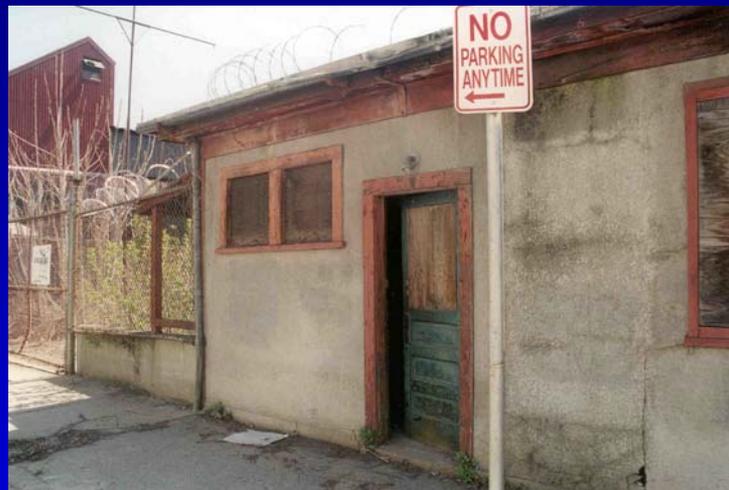
Securing Buildings

- Prevents unauthorized access
- Reduces exposure to elements
- Must be done well
- Requires regular monitoring to make sure security measures are not breached
- Slowing down deterioration of the structure from weather and vandalism

Security is a temporary measure



Is This Security?



Security = Crime Prevention Fire Prevention





The Process

- **Identification – What buildings in your jurisdiction are vacant?**
- **Evaluation – Determine the potential hazards to public safety**
- **Preparation – What must be done prior to securing the building and what materials will be needed?**
- **Action – Securing the building**



Building Security Methods

- **Normal – Locks on windows and doors**
- **Board Up**
 - ✓ **Simple**
 - ✓ **HUD**
 - ✓ **HUD Reinforced** (USFA National Arson Prevention Initiative method)
- **Fencing**
- **Intensive Surveillance**
- **Security Guards**
- **Intrusion Alarm**

Normal Security

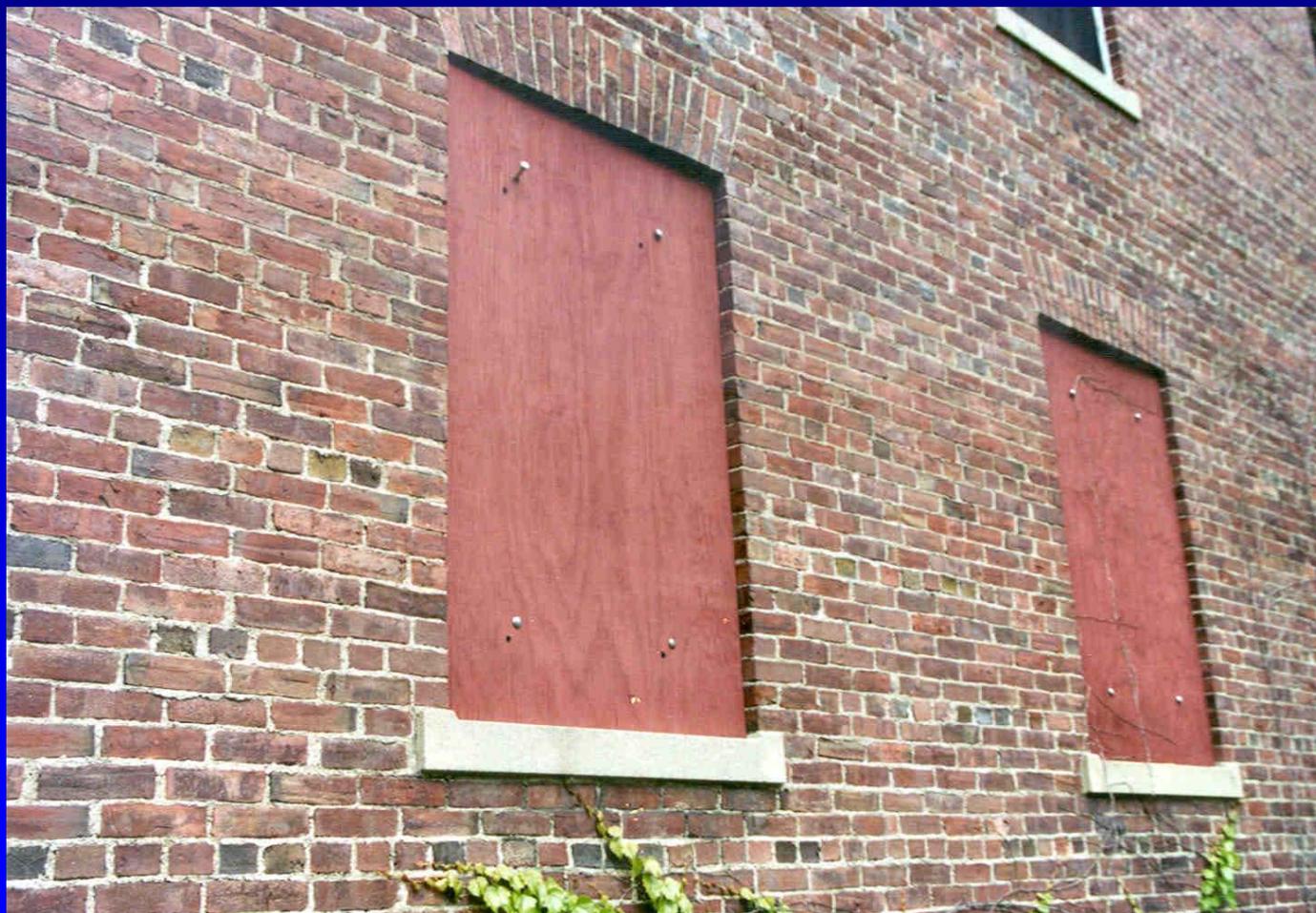


Simple Board Up

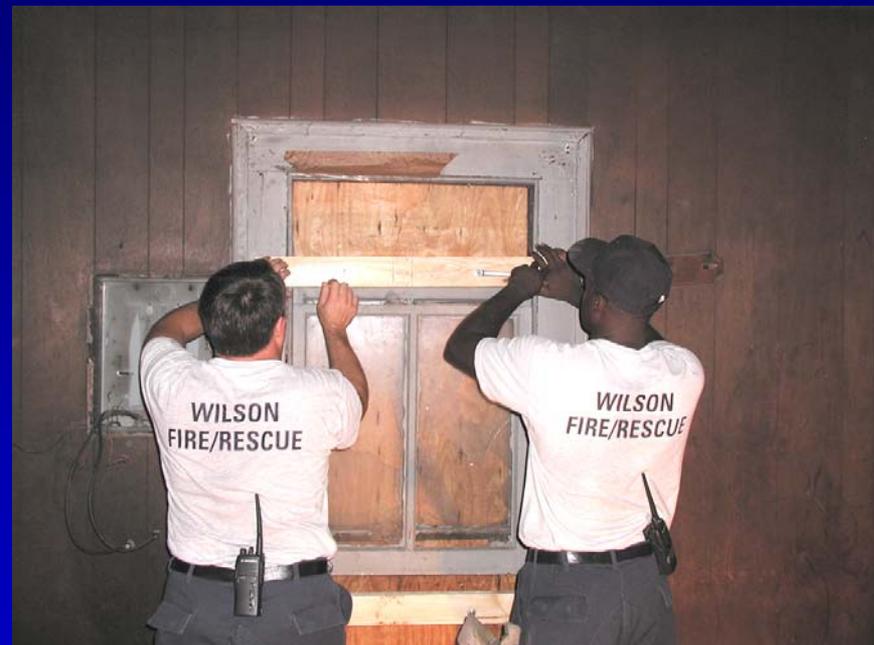




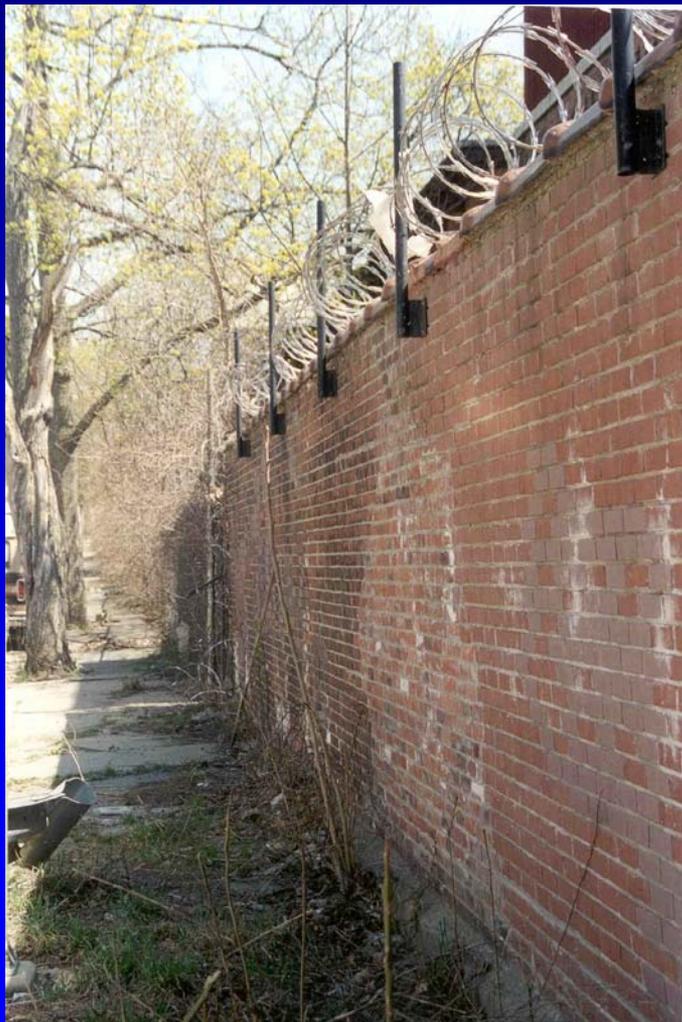
HUD Board Up



HUD Reinforced Board Up



Fencing for Security





Other Methods

- **Intensive Surveillance by police and fire department**
 - ✓ Regular building sweeps to remove occupants
- **Security Guards**
 - ✓ 24 hour guard service on premises
- **Intrusion Alarm**
 - ✓ Monitored and supervised alarm system
 - ✓ Police or guard service response to alarms

Pros and Cons of Board Up

➤ Pros

- ✓ Provides a high level of security
- ✓ Reduces criminal activity
- ✓ Reduces fires
- ✓ Is easily monitored

➤ Cons

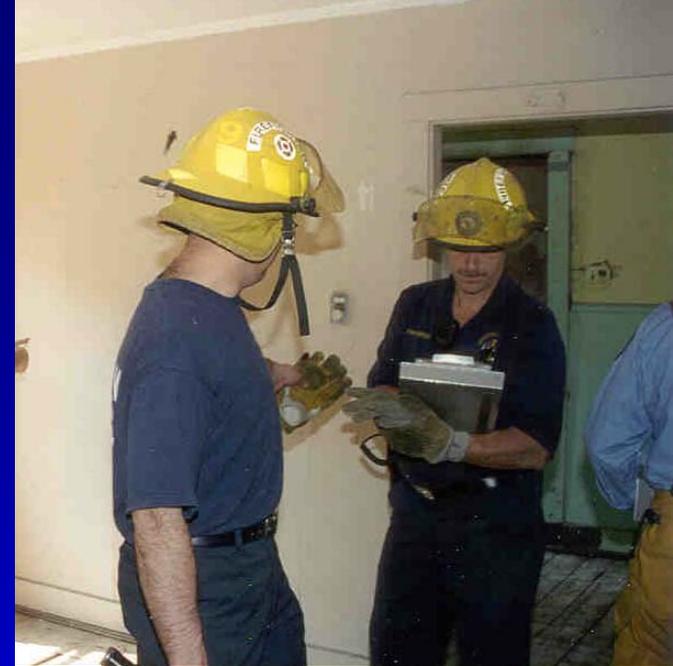
- ✓ Expensive materials
- ✓ Complex installation
- ✓ Difficult for fire department to gain access



Building Evaluation

Objectives

- ✓ Determine that the building is secure
- ✓ Identify hazards that require immediate corrective action
- ✓ Evaluate the fire growth potential
 - Exposure fires
 - Available fuel packages
 - Compromised fire barriers
 - Location and type of hazardous materials on site
- ✓ Evaluate the potential for structural collapse
- ✓ Identify conditions that will be hazardous to fire fighters in the event of a fire



Is the Building Secure?

- **Secure means not open to unauthorized access**
- **Do the security measures meet the requirements of the jurisdiction?**



Hole in
outside
wall



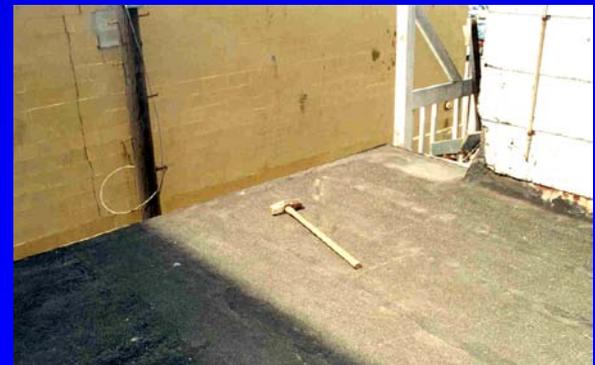
Signs of Recent Entry

- **Trash/litter**
- **Furnishings in an otherwise empty building**
- **Signs of recent fires for heat or cooking**





The building was boarded well on street level. On the 2nd floor, wood was easily pulled away without tools.



Fix it Now

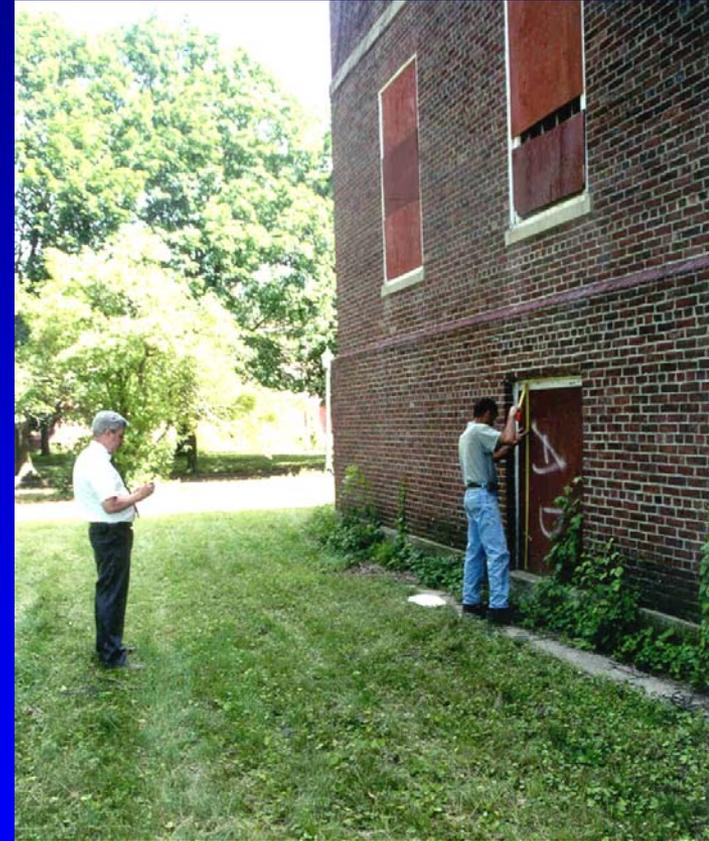
Are there conditions that should be remedied immediately?

- ✓ **Significant fire hazards**
- ✓ **Lack of security**
- ✓ **Trash accumulations**
- ✓ **Life safety hazards**
- ✓ **Potential for collapse**

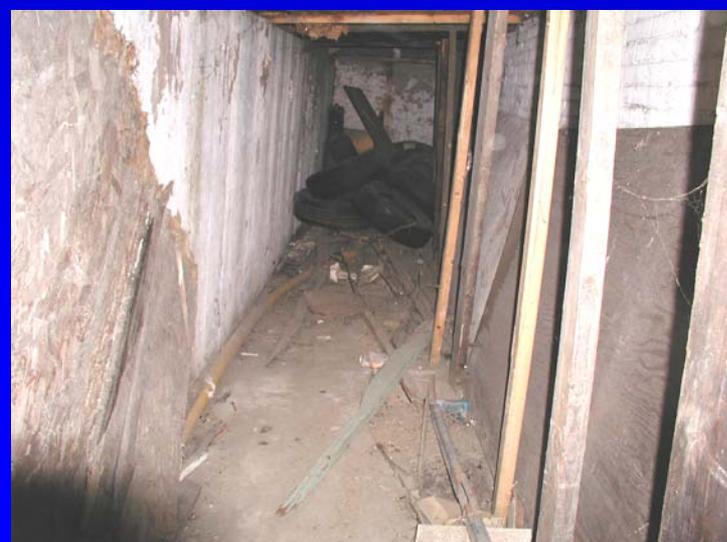
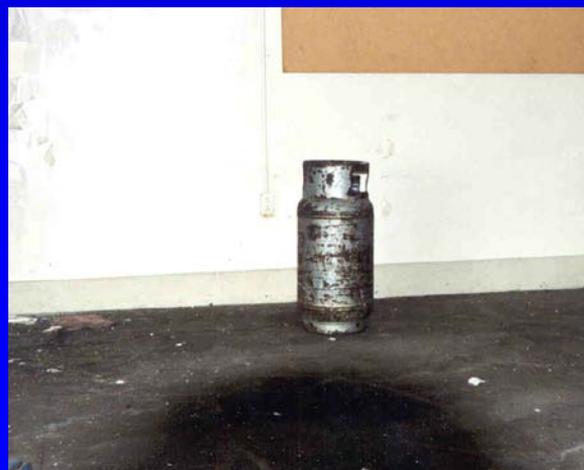


Preparation

- **Remove combustibles and hazardous materials**
- **Disconnect utilities**
- **Determine what materials are needed for board-up**



Remove Combustibles



Utilities

- **Turn off water and drain plumbing system**
 - ✓ **Open all faucets**
 - ✓ **Put anti-freeze in traps**
- **Arrange for power company to disconnect electricity**
- **Arrange for natural gas shut off or disconnect and remove LPG tanks**
- **Empty fuel oil tanks**



What is Needed for Board-Up?

- **Count and measure openings that require board-up**
- **Determine the quantity of materials required to accomplish the job**
- **Order materials**
- **Pre-cut and drill if possible**



Board-Up Materials

WINDOW ASSEMBLY

MATERIALS REQUIRED PER WINDOW

- 1 1/2" CDX PLYWOOD SHEET - CUT TO DIMENSIONS OF WINDOW FRAME (WEATHER SIDE)
- 4 2X4 BRACES - CUT TO WIDTH OF PLYWOOD
- 4 CARRIAGE BOLT ASSEMBLIES

NUMBER OF WINDOWS TO BE SECURED (N_w): _____

NUMBER OF WINDOWS BRACES REQUIRED: ($N_w \times 4$) _____

CARRIAGE BOLT ASSEMBLIES REQUIRED (B_w): ($N_w \times 4$) _____

DOOR ASSEMBLIES

MATERIALS REQUIRED PER DOOR

- 1 1/2" CDX PLYWOOD SHEET - CUT TO DIMENSIONS OF DOOR FRAME (WEATHER SIDE)
- 1 1/2" CDX PLYWOOD SHEET - CUT TO OUTSIDE DIMENSIONS OF DOOR FRAME TRIM (INSIDE)
- 6 2X4 BRACES - 3 CUT TO WIDTH OF OUTSIDE PLYWOOD, 3 CUT TO WIDTH OF INSIDE PLYWOOD
- 1 2X4 BOTTOM BRACE - CUT TO WIDTH OF DOOR TRIM (OPTIONAL)
- 6 CARRIAGE BOLT ASSEMBLIES

NUMBER OF DOORS TO BE SECURED (N_d): _____

NUMBER OF DOOR BRACES REQUIRED: ($N_d \times 6$) _____

NUMBER OF BOTTOM BRACES REQUIRED: (N_d) _____

CARRIAGE BOLT ASSEMBLIES REQUIRED (B_d): ($N_d \times 6$) _____

CARRIAGE BOLT ASSEMBLY

- 1 12' X 3/8" CARRIAGE BOLT - COURSE THREAD
- 1 1/2" USS STANDARD FLAT WASHER (WEATHER SIDE)
- 1 3/8" USS STANDARD FLAT WASHER (INSIDE)
- 1 3/8" CONSTRUCTION GRADE NUT - COURSE THREAD

TOTAL CARRIAGE BOLT ASSEMBLIES REQUIRED: ($B_w + B_d$) _____

USFA National Arson Prevention Initiative

Board Up Procedures

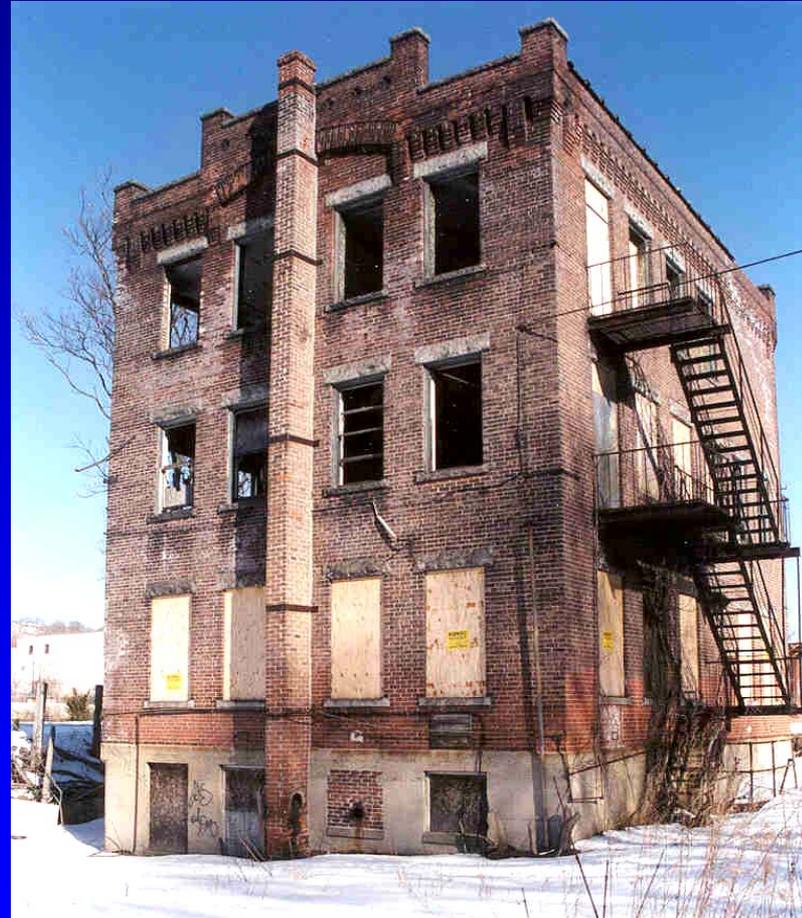
MATERIALS LIST

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Which Openings Need Securing?

- **Within 10' of grade**
- **Accessible from porch, fire escape, roof, or climbing point**



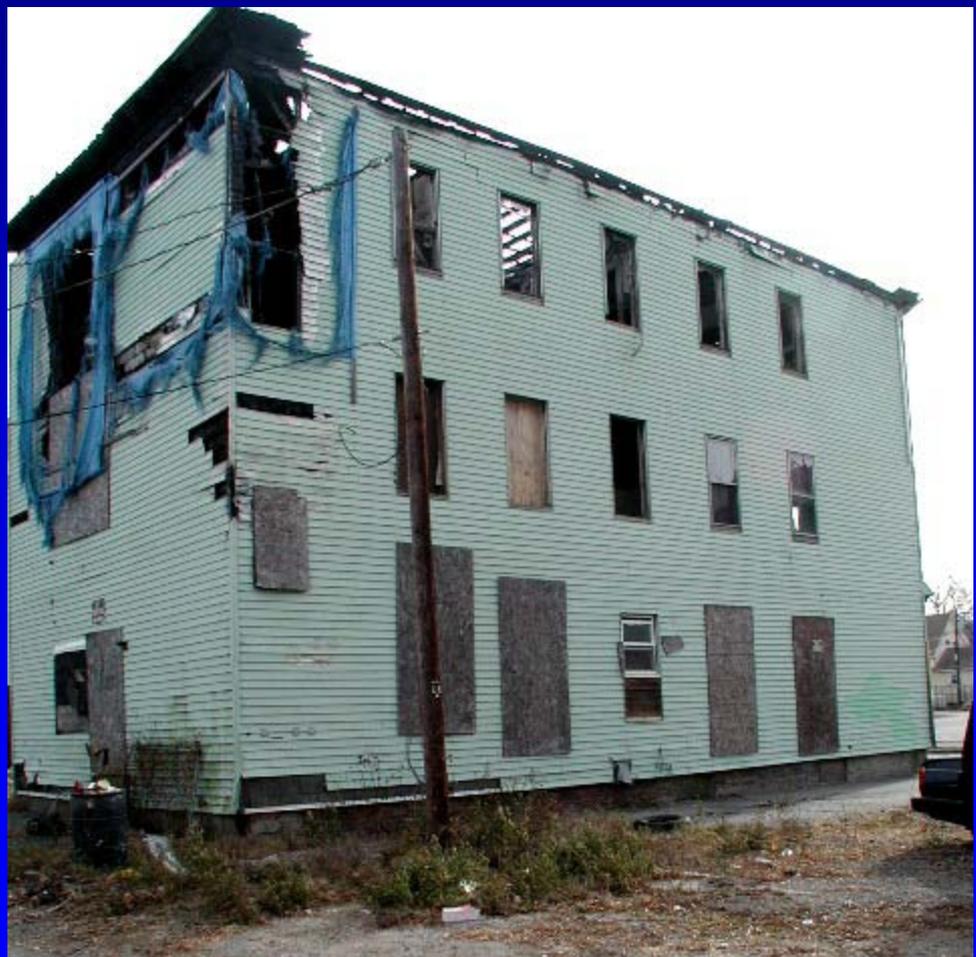
Board Up Materials

- **1/2" CDX plywood to cover openings**
- **2" X 4" construction grade lumber for braces**
- **3/8" X 12" carriage bolts with nuts and washers**
- **Nails or deck screws to secure plywood covers**





Particle Board Doesn't Work!



Securing the Building

- Search Building
- Remove doors and storm windows
- Post the building with “No Trespassing” signs
- Install barriers
- Mark the building for firefighting operations

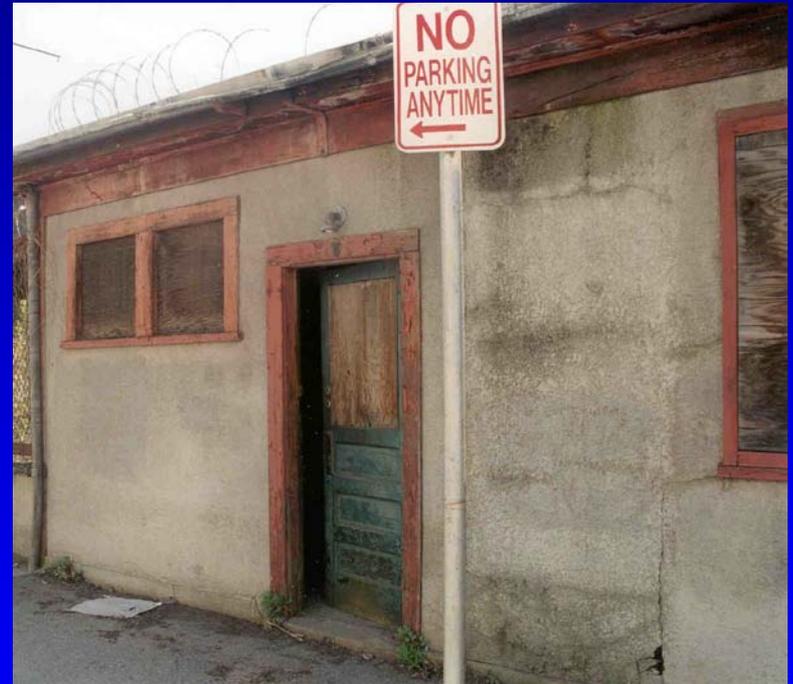


Search Building



Preparation

- **Remove doors**
- **Remove window screens**
- **Position double hung windows in center of opening to allow bolts to be passed through**





Interior Crew



Exterior Crew



Monitor installation and avoid pry points on braces and bolt assemblies

Reinforced Board-Up



Installation Details

Carriage Bolt Assembly

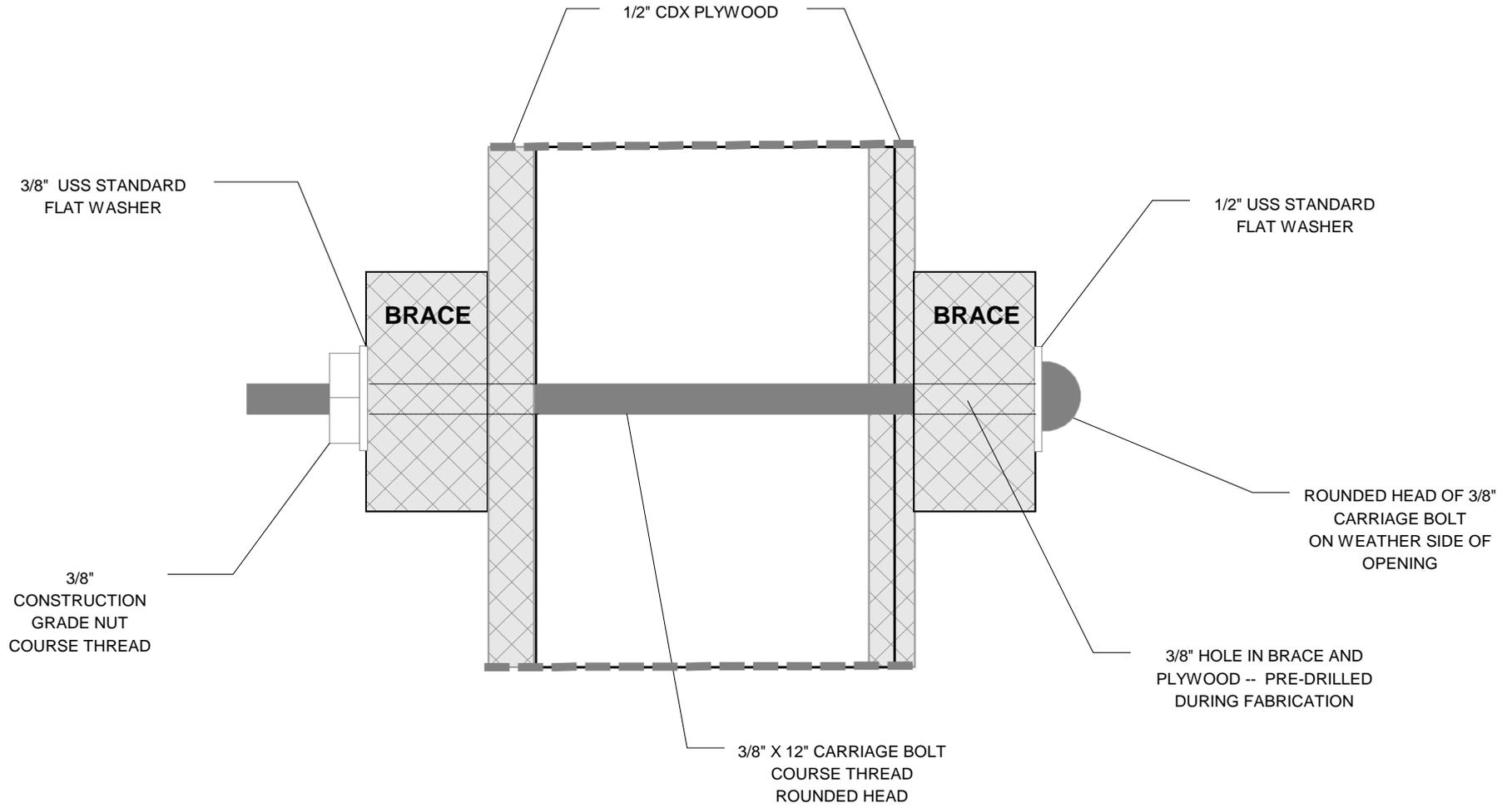


1 – 12" X 3/8" Carriage bolt – coarse thread

1 – 1/2" USS Standard flat washer – weather side

1 – 3/8" USS Standard flat washer – inside

1 – 3/8" Construction grade nut – coarse thread



- NOTES:**
1. USE 3/8" X 12" CARRIAGE BOLTS - ROUNDED HEAD ON OUTSIDE OF BUILDING
 2. TIGHTEN NUTS FROM INSIDE ENOUGH TO SLIGHTLY COMPRESS WASHER INTO 2X4 BRACE.
 3. USE 1/2" WASHER ON WEATHER SIDE TO ACCOMMODATE THE THE WRENCH NECK OF BOLT AND ELIMINATE PRY POINTS.

USFA National Arson Prevention Initiative
 Board Up Procedures
Bolt Assembly Detail
 IAAI/USFA Abandoned Building Project



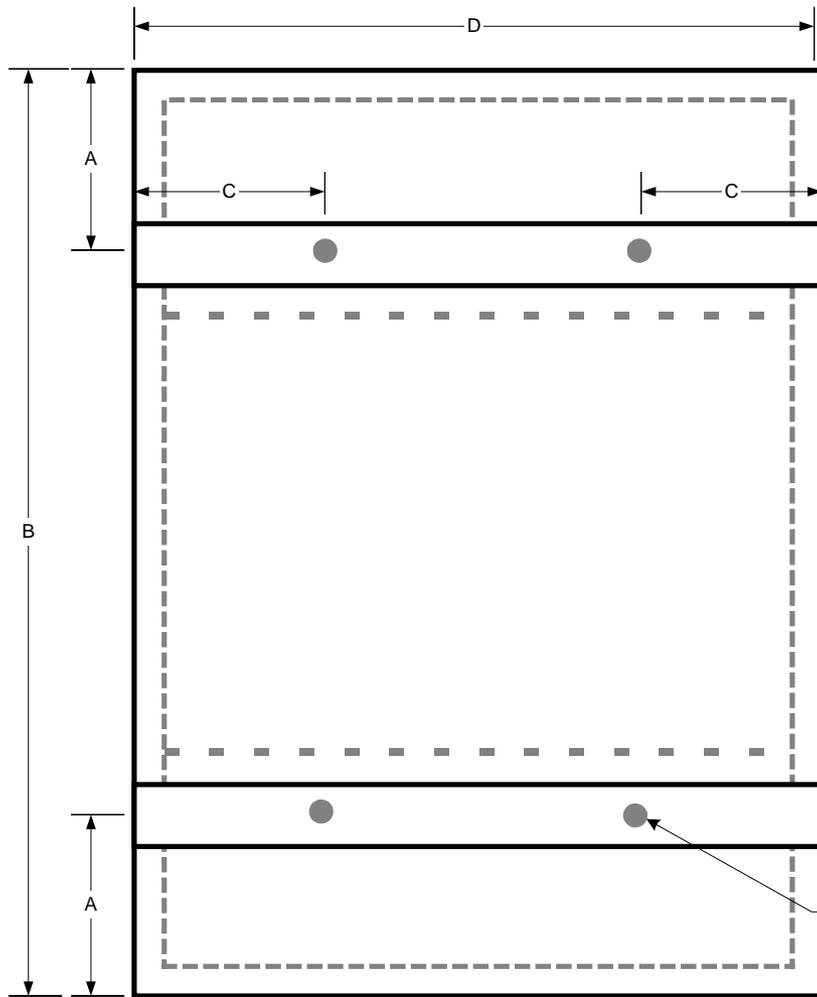



Window Assembly

Materials Required per Window

- 1 – 1/2" CDX Plywood sheet cut to dimensions of window frame installed on weather side
- 4 – 2 X 4 Braces cut to width of plywood
- 4 – Carriage bolt assemblies





WINDOW - OUTSIDE VIEW

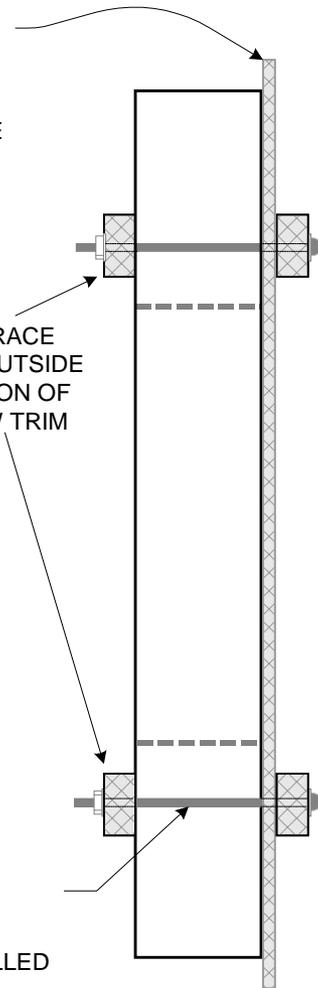
1/2" CDX PLYWOOD
CUT TO TO COVER
WINDOW OPENING

SECURE TO STRUCTURE
WITH 1-5/8" (6D)
GALVANIZED NAILS

2 X 4 BRACE
CUT TO OUTSIDE
DIMENSION OF
WINDOW TRIM

2 X 4 BRACE
CUT TO SIZE OF
PLYWOOD

3/8" CARRIAGE BOLT
12" LONG/COURSE THREAD
NUT TO MATCH, WASHERS INSTALLED
ON BOTH SIDES
ROUNDED HEAD OF BOLT ON OUTSIDE



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

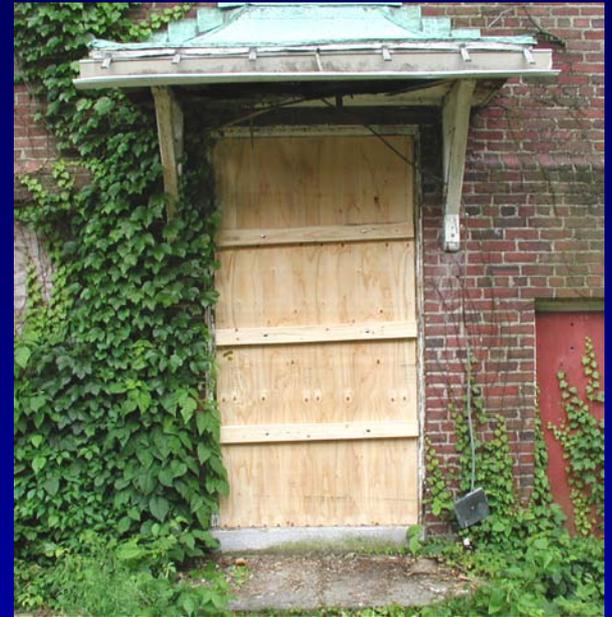
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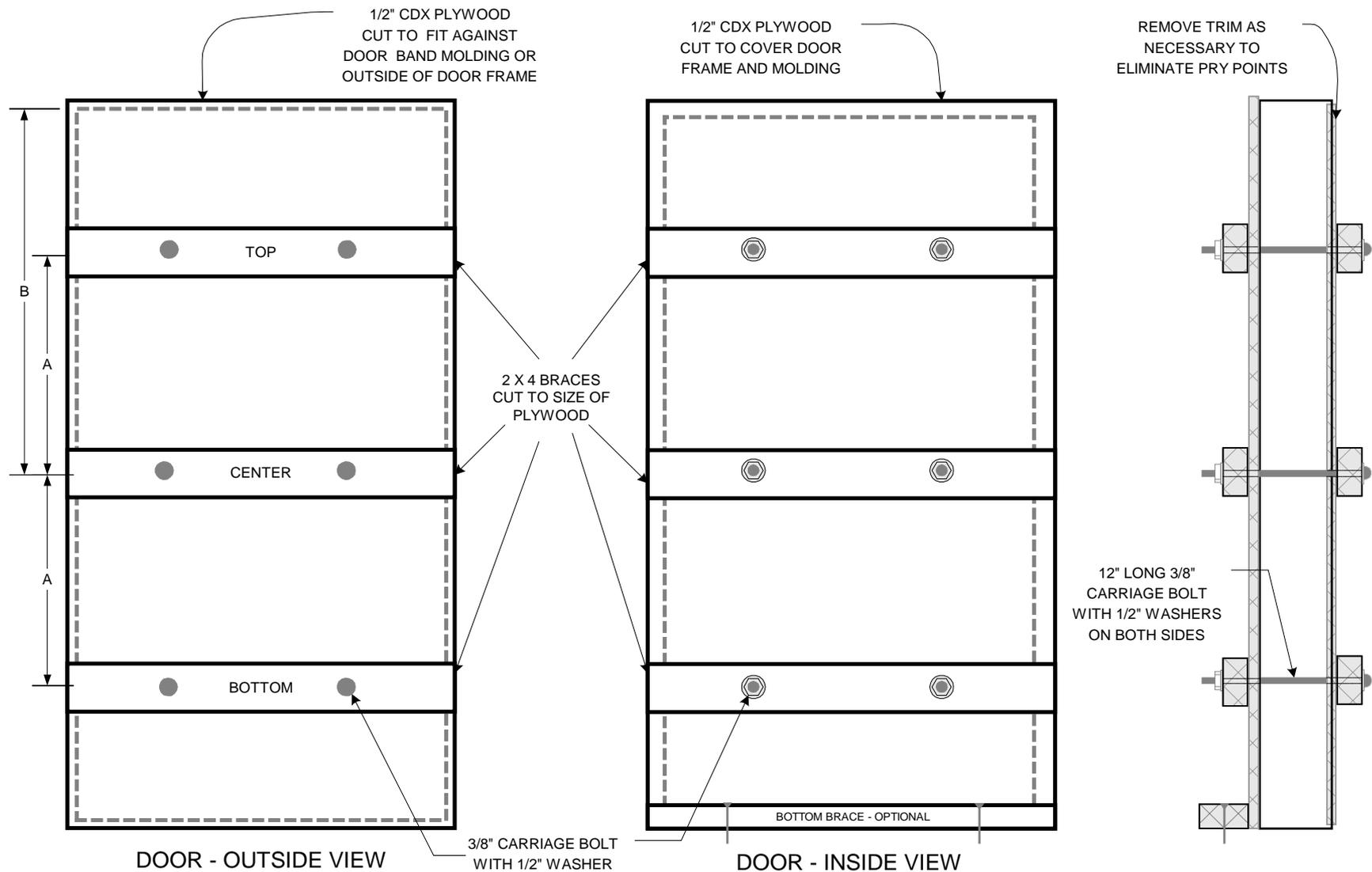


Door Assembly

Materials Required per Door

- 1 – ½” CDX plywood sheet cut to dimensions of weather side of door frame
- 1 – ½” CDX plywood sheet cut to outside dimensions of interior door frame
- 6 – 2 X 4 Braces – 3 cut to width of plywood of each sheet of plywood
- 6 – Carriage bolt assemblies
- 1 – 2 X 4 bottom brace – cut to dimension of interior door frame (Optional)





NOTES:

1. DOOR IS REMOVED AND STORED INSIDE BUILDING.
2. USE 3/8" X 12" CARRIAGE BOLTS - ROUNDED HEAD ON OUTSIDE OF BUILDING
3. TIGHTEN NUTS FROM INSIDE ENOUGH TO SLIGHTLY COMPRESS 2X4 BRACE.
4. IF PLYWOOD CAN NOT BE BUTTED AGAINST BAND MOLDING, CUT TO COVER OUTSIDE EDGE OF DOOR FRAME.
5. BOLT HOLES ARE LOCATED AS THEY ARE FOR WINDOWS (SEE WINDOW DETAIL)
6. CENTER BRACE LOCATED IN CENTER OF DOORWAY OPENING. TOP AND BOTTOM BRACES ARE POSITIONED WHERE $A = 1/2B$ (SEE DIMENSION LOCATIONS ON DRAWING)

USFA National Arson Prevention Initiative
Board Up Procedures

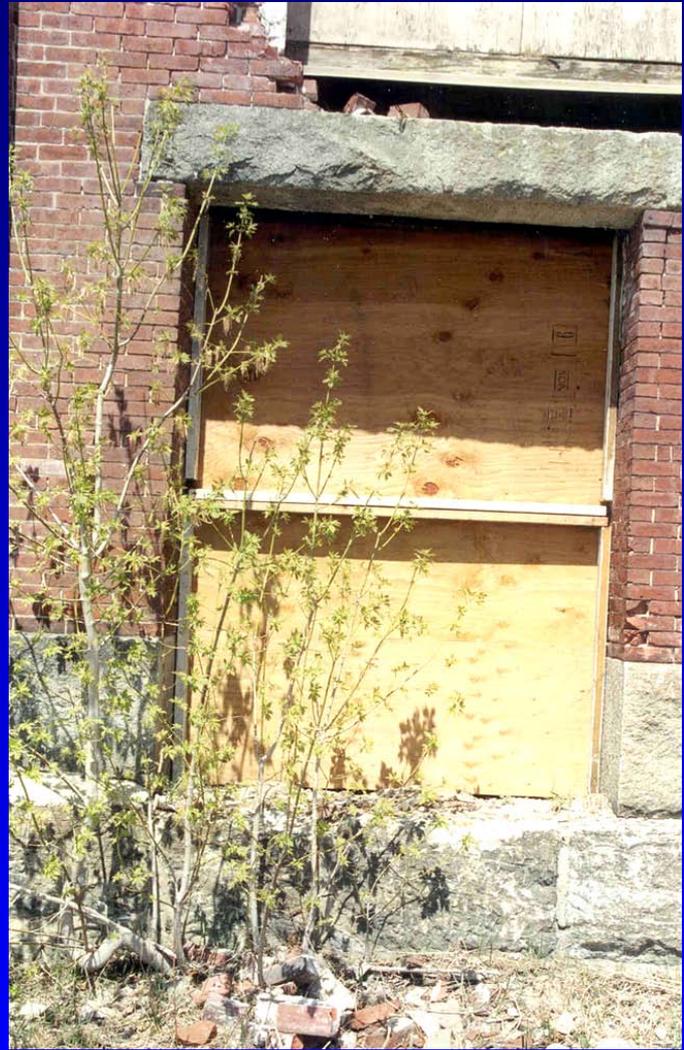


Door Detail
IAAI/USFA Abandoned Building Project



Large Openings





Allowing Authorized Entry



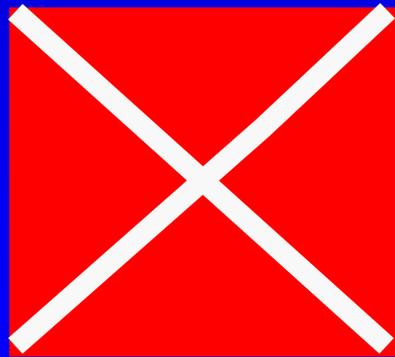
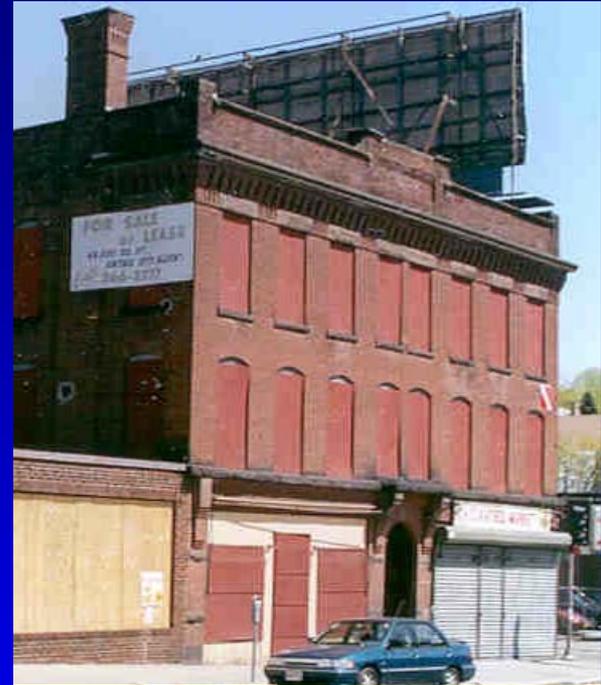
- Utilize a solid core door of wood or metal construction
- There should be NO openings in the door
- Secure using padlock and hasp
- Hasp should be installed using bolts that pass through the door

Precautions for Doors

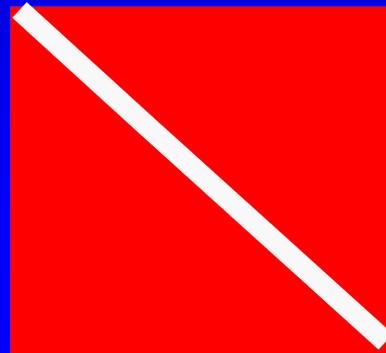
- **Openings in security doors allow devices to be dropped into the building**
- **Flammable liquids could also be poured through them**



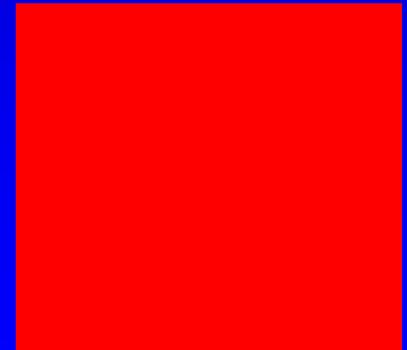
Vacant Building Markings



Exterior operations enter only for known life hazard



Interior operations with extreme caution



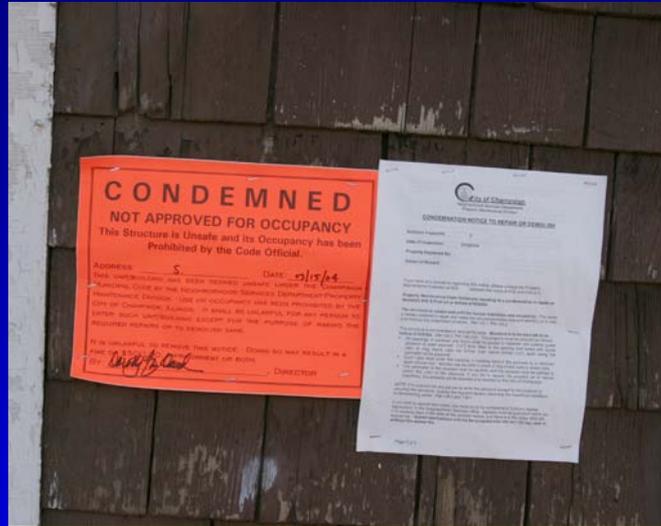
Normal stability at time of marking

Marking Buildings



- **Severe structural or interior deficiencies**
- **Operations should be conducted from outside except for life safety**
- **If interior operations are required**
 - ✓ Approval of Incident Commander
 - ✓ Modification of tactics
 - ✓ Examination before units are committed
- **Time of any interior operations must be limited**

Legal Posting on Buildings



No Trespassing

- Secured buildings should be posted with **NO TRESSPASSING** signs
- This assists the police in taking action against individuals who enter buildings without authority



When Do You Placard?

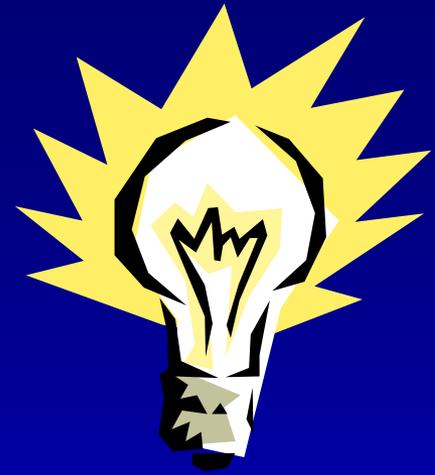




Questions



Activity



- **Assess the assigned building**
 - ✓ Identify all openings that require boarding up using the HUD Reinforced method
 - ✓ Develop a materials list for boarding up the building using the HUD reinforced method
- **Complete a reinforced board-up of the assigned opening using the materials provided**



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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