GARDEN APARTMENTS
SIMULATION FRONTLOAD
INTRODUCTION

A garden apartment is a three- or four-story residential structure. Usually, there is only one exterior entrance with a common set of stairs to the upper floors. The norm is four apartments per floor.

A number of construction types are used in garden apartments, including wood frame with vinyl or aluminum siding or a brick veneer; ordinary (masonry, wood-joist) construction, and the seldom-used noncombustible using steel bar-joists.

The cues found in garden apartments also are applicable, in varying degrees, to:

- center-corridor apartment buildings;
- rooming houses;
- motels;
- townhouses; and
- condominiums.

OCCUPANCY-SPECIFIC CUES

Wall Construction

The bearing walls in garden apartments are constructed of one of two basic construction materials.

Masonry--Concrete block with stucco, vinyl or aluminum siding or brick veneer.

Wood frame with vinyl or aluminum siding or brick veneer.

There are usually four apartments per floor. We'll call this package of 12 apartments a section. Often two or more sections adjoin one another. New codes usually require firewalls or fire division walls where they join.

The partition walls are usually 1/2" drywall (gypsum board) on wood or metal studs placed from 16" to 24" apart. Remember, you can go through a flimsy wall very quickly to get on the opposite side of a fire area.
Roof Assemblies

Flat

- Beam and rafter with sheathing. This is normal for flat roof construction.
- Steel bar-joist. Found in newer complexes where noncombustible construction is used.
- Parallel-chord wood truss or plywood I-beams. Found in modern construction.

Pitched

- Ridgepole and rafter is used where a usable attic space is desired, but more so is an indicator of older construction.
- Wood truss is the modern roof assembly base. Wood truss can be nailed at the joints. Toe-nailing the joint was the original method of truss assembly. In order to reduce labor costs, to speed truss construction, and to build a stronger truss, the manufacturers started using gusset plates. A gusset plate is simply a piece of plywood or sheet metal that is laid over the truss joints. Nails then are driven through the gusset plate into the truss members.

The latest technique for truss assembly is the use of the gang-nailer. This is a sheet of thick sheet metal that has been punched. The punching produces a large number of 1/4" or 3/8" points protruding from one side. The gang-nailer is laid on the truss joint and the points are pressed into the truss members to hold them together.

When there are no firewalls or division walls there is normally a common attic or cockloft over the entire structure, which typically includes two or more sections.

Even when there are firewalls, there is a common attic over the top four apartments in a section.

Access

It may be difficult or impossible to drive fire apparatus to the sides or rear, or to even get close from the front. Resident parking may block parking lot entrances or preclude the movement of fire apparatus through the parking lot.
Front Entry

Usually a single front access door serves the common open stairwell of each section. Each apartment has a single entrance door from the common stair and vestibule area. The door is usually steel or steel clad; however, many are wooden. The stairs often are made of metal and are self-standing. However, they also may be made of wood. There may be balconies served by sliding glass doors in the front on the second and higher floors.

Rear Entry

Windows are plentiful. Sliding glass doors may or may not be present at the ground level. Most garden apartments have the first-floor level partly underground. Many times the land is contoured and there is a patio area served by sliding glass doors in the rear first floor units. There may be balconies served by sliding glass doors in the rear on the second and higher floors.

Floor Assemblies

The older garden apartments have beam and rafter with plywood sheathing. Apartments built of noncombustible construction typically have steel bar-joists with poured concrete floors. Parallel chord wood-truss or wood I-beam with plywood sheathing is found in modern construction.

Storage Rooms

A ground-level apartment space may be used as a storage area for one or more sections of apartments. These storage areas provide a small cubicle for each apartment owner. Normally they are constructed of plywood and may have chicken wire roofs. It is possible to find anything in these cubicles, from flammable liquids to motorcycles to pesticides and gunpowder.

Common Problems to Identify

Always assume that every apartment is occupied 24 hours a day. We must be aware that there may be unattended children left in any apartment. Some garden apartment complexes cater to the elderly and these need to be identified.
Roof or Floor Assembly Construction Type

Whether or not a specific complex has wood-truss roof and/or floor assemblies MUST be identified ahead of time during a prefire plan. There is no time on arrival at a fire incident for a Command Officer to determine the exact type of roof or floor construction.

Truss roof assemblies tend to be more stable in these structures than in structures without partition walls. Partition walls are not considered "bearing" members, but they do support the bottom truss chord and reduce collapse potential.

This affects the Command Officer's risk-benefit evaluation for roof and interior tactical operations.

Fire Involvement Considerations

Has the fire extended to the roof assembly area? What are the signs of probable roof assembly involvement?

- major fire involvement in one top-floor apartment;
- fire involvement in two or more top-floor apartments;
- hot, rising smoke from attic vents; and
- fire has vented through the roof.

Is the fire likely to spread to the roof assembly in the near future? What are the signs that the fire likely will spread to the roof or ceiling assembly?

- A well-involved single occupancy on the top floor.

Structural Deterioration and Collapse

These structures are not prone to early collapse. However, should fire gain a good foothold in a combustible floor or roof assembly, the likelihood of failure or collapse is increased proportionally. Older buildings may have structural deficiencies before the fire.

CUE-BASED PREDICTIONS

Given the cues just presented, and adding a fire situation, we can make predictions:

- The life hazard could be severe and a thorough primary search must be done. This occupancy requires a specific assignment for search and rescue.
• Smoke conditions in the stairwell and corridor may be heavy and prevent occupants from exiting.

• Fire travel in attic spaces could involve an entire section.

• Fire in a storage area may spread rapidly to the floor above and may involve unsuspected materials.

INCIDENT MANAGEMENT CUES

Coordinated Operations

Rescue and primary search must be coordinated with ventilation. Life safety is the highest priority, and early ventilation efforts should support rescue. Rescue and primary search teams must take handlines with them, or have appropriately placed lines staffed by other crews.

Confinement efforts, specifically the reduction of "mushrooming," need vertical ventilation support in attic areas.

Incident Command System Organization Cues

Each function (e.g., ventilation and rescue) needs to be supervised. Each geographic area where personnel are operating needs supervision. At working incidents you may need a Safety Officer and a Public Information Officer.

STRATEGY AND TACTICS

Any Fire Situation--Primary Search and Rescue

• Immediately begin a primary search of the occupancy or occupancies involved in fire, if it is possible enter the area.

• Next, primary search the rest of the apartments on the same floor where the fire started. Start from the fire apartment and work out and away from the fire area.

• Third, primary search the floors above, starting with the apartment over the fire and working outward.

• Be sure to check the rear of the building immediately after arrival. The life safety problem may be greater there than in the front. This can be very true when there are rear balconies.
Fires Not Involving the Roof Assembly

- An aggressive interior attack on the fire with horizontal ventilation. Positive-pressure ventilation may be appropriate here.
- Assign personnel to check for extension:
  - Other apartments on the same floor.
  - Apartments on floors above (or attic space, if that is above) and below, in that order.

Fire in a Storage Area

- Rapidly ventilate the storage area by removing window panes. Positive-pressure ventilation may be effective.
- Aggressively attack fire with at least two handlines (one backup line).
- Check for extension in the apartments next to and above the involved area.

Fire in an Attic Space over a Single Section Separated From Other Occupancies by Firewalls or Division Walls

- If roof construction type is unknown, assume lightweight.
- When the risk is acceptable the following tactics are recommended.
  - Interior fire attack--several handlines to the top floor; pull ceiling and attack the fire.
  - Vertical and horizontal ventilation.
  - Check interior exposures for extension.
  - Check exposed attic areas in adjoining sections for extension.
- When the risk is unacceptable to attack the attic fire from the floor below, the following tactics are recommended.
  - Vertical ventilation only if it can be done safely away from the intensity of the fire.
  - Do not put a ladder pipe or other exterior stream into any ventilation hole.
- Exterior fire attack--heavy streams from front and rear. Use aerial devices to apply streams to upper floors and attic space.

- Check interior exposures and attic areas on the far side of the firewalls for extension.

Well-Involved Fire in a Roof Assembly That Serves More Than One Occupancy (Common Attic or Common Cockloft)

- Roof construction MUST be known before an interior attack or vertical ventilation is initiated.

- If construction type is unknown, assume lightweight.

- Risk/Benefit must be assessed before personnel are placed on or under a roof or floor assembly of truss construction that is well-involved in fire.

- Recommended tactics:
  
  - Vertically ventilate as close to the fire as safety permits. When possible, the vent hole should be on the side with the shortest roof span. Start by trying to draw the fire toward the least amount of building.

  - DO NOT put a ladder pipe into any ventilation hole.

  - Fire attack with handlines from beneath must be aggressive. Confinement of the fire to prevent spread to the longest portion of the structure is a high priority.

- Check interior exposures for extension.

  Pull ceilings to check exposed roof areas for extension and provide a path for water to reach the fire.
Students attending the National Fire Academy (NFA) represent a cross-section of fire departments, from very small, all volunteer, to large metropolitan departments. The organizations represented often vary greatly in training and staffing levels, as well as apparatus and other resources.

Recognizing this, the NFA has developed a "standard" fire department that will be used during simulations.

- Each alarm will consist of four engines, one truck, and one battalion-level chief with an Aide, one medic unit and a safety officer.
- Additional alarms will bring three engines, one truck and one or more command officers, with or without an aide.
- A Deputy Chief and Aide will respond with the second-alarm assignment.
- Other resources, within reason, may be special-called by the Incident Commander (IC) (i.e., hazardous materials unit, medics, tenders, aircraft, etc.).
- Staffing will consist of four on first engine, three on all other engines and trucks. That includes the officer.
- Multi-channel radios will be used. The primary channel will be used for dispatch, and there will be at least one tactical channel.
- All communications will be to receiver from sender (i.e., "Engine 12 from Operations, report to Division 6").

### RESPONSE CARD

**All Simulations Except Highrise**

<table>
<thead>
<tr>
<th>Alarm</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
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<tbody>
<tr>
<td></td>
<td>E 1</td>
<td>E 4</td>
<td>E 7</td>
<td>E 10</td>
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<td>E 3</td>
<td>E 6</td>
<td>E 9</td>
<td>E 51</td>
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<td></td>
<td>T-2/Wt-1</td>
<td>T-5/Wt-4</td>
<td>T-7/Wt-6</td>
<td>T-10</td>
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<tr>
<td></td>
<td>PM 1</td>
<td>BC 2 &amp; DC-1</td>
<td>BC 3</td>
<td>BC 4</td>
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**Note:** Dispatch a water tender in lieu of a truck in a nonhydrant area. Replace last-due staffed engine with HM 9 on incidents involving hazardous materials.

**Other Units**

<table>
<thead>
<tr>
<th>Engines</th>
<th>E 61, E 71, E 81, E 91, E 101</th>
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<tbody>
<tr>
<td>Rescue</td>
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<tr>
<td>Ambulance</td>
<td>A 2, A 4, PM 5, A 6, PM 7, A 8, A 10</td>
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<tr>
<td>Haz Mat</td>
<td>HM 9</td>
</tr>
<tr>
<td>Air Unit</td>
<td>AU 8</td>
</tr>
<tr>
<td>Mutual Aid</td>
<td>5 engines, 3 trucks, 2 paramedics, 2 ambulances, 1 rescue, 1 HM, 2 medical evacuation copters</td>
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CENTRAL CITY FIRE DEPARTMENT RESOURCE AND SITUATION STATUS

For the purpose of simulation activities during the hands-on portion of this course students will use the Command Chart provided by the NFA for Central City Fire Department.

During simulations Battalion Chief 1’s aide will maintain the resource chart. The initial IC will take over duties of maintaining situation status. Both are responsible for keeping the IC apprised of resource in incident status information.