

MADISON VOLUNTEER FIRE DEPARTMENT

Uniform Company Refresher Training Program

Lessen Plan - Portable Ladders

<u>Estimated Time Required</u>	Classroom - 2 hours	Drills - 2 hours
<u>Required Materials</u>	Text – <i>Fundamentals Of Firefighter Skills</i> by Jones & Bartlett Powerpoint or slides to accompany text Computer and projector or slide projector White Board and / or flip charts Ladder exemplars	
<u>References</u>	NFPA 1001 - Firefighter Professional Qualifications NFPA 1901 - Automotive Fire Apparatus NFPA 1931 - Design & Verification Testing Of Fire Service Ground Ladders NFPA 1932 - Use, Maintenance & Service Testing Of Fire Service Ground Ladders IDHS Mandatory Firefighter Training Curriculum Madison Fire Department SOPs – Fireground Operations	
<u>Learning Objectives</u>	This class is intended for firefighters who have completed as a minimum the mandatory ladder training required for beginning firefighters <ol style="list-style-type: none">1. List and describe ladder parts and features2. List and describes types of fire service ladders3. Describe the various uses of ground ladders4. Describe ground ladder cleaning and maintenance5. Be able to select the appropriate ladder for the task6. Describe how to safely carry and raise ground ladders7. Identify hazards to avoid when using ground ladders8. Describe how to safely work from ground ladders	

Lesson Plan

<u>Ladder Types</u>	Aerial	<ul style="list-style-type: none">- ladders and platforms that are permanently mounted on fire apparatus and power operated (aerials, platforms, articulating booms)
	Portable	<ul style="list-style-type: none">- removable ladders carried on apparatus also referred to as ground ladders
<u>Ground Ladder Functions</u>	Primary	<ul style="list-style-type: none">- access or egress from an area above or below grade- work positions for fire attack, ventilation, or overhaul- bridge between structures or across openings
	Secondary	<ul style="list-style-type: none">- ladder gin- mounts for hose lines, vent fans, etc.- water chutes
<u>Ladder Construction</u>	Wood	<ul style="list-style-type: none">- heavier than aluminum or fiberglass- require more maintenance- can break with overload- not a good electric conductor
	Aluminum	<ul style="list-style-type: none">- lighter than wood or fiberglass- requires less maintenance- doesn't break, will bend, collapse- good conductor of electricity- don't stick your tongue on it in cold weather

Ladder Terms

- Fiberglass - often used by utilities because not a conductor
- BUT utility ladders rated much lower than fire service ladders of the same length
- to achieve the same weight rating as a fire service ladder, a fiberglass ladder would be much heavier than wood or aluminum
- Beams - trussed (explain principle)
- solid (for shorter lengths)
- "I" beams and channels
- Rails - top or bottom components of trussed beam
- Dogs - also called locks or pawls used to secure fly sections of extension ladders
- Halyards - ropes or cables used to raise fly sections
- Rungs - mostly aluminum, some wood
- Tie Rods - wood and fiberglass ladders
- Tip - top end of portable ladder
- Butt - bottom end of portable ladder
- Butt Spurs - spikes on butt end to prevent slipping
- Foot Plate - swivel plate with rubber sole at ladder butt
- Roof Hooks - hooks on tips of roof ladders
- Heat Sensors - labels on ladders that change color when exposed to excessive heat (discuss locations; why is there one on the bottom ?)
- Chaffing Plates - small plates on ladders at wear points

Ground Ladder Cleaning
Inspection / Maintenance
In – Service Testing

- Cleaning - clean before inspection and after use with soft bristle brush and mild detergent
- Inspection - should inspect monthly and after each use
- Maintenance - clean and lubricate dogs, slides, hooks
 - replace worn halyards
 - remove ladders from service where heat sensors indicate exposure to high temps
- Testing - annually or following overload, shock load, damage or exposure to heat
 - testing should conform to NFPA 1932
 - horizontal bending tests

Ground Ladder Types

- Straight - single section, fixed length
- Roof - straight ladder with hooks at tip to secure to roof ridge
- Extension - adjustable length with multiple sections, heavier than straight ladder, but more flexible
- Bangor - extension ladders 40' in length or greater with stay poles or "tormentor" poles to assist in raising
- Combination - extension ladder 14' – 16' in length that can be converted to an A – frame ladder
- Folding - a/k/a attic ladder 10' in length which folds to allow easier access to hallways, attic hatches
- Fresno - small extension ladder which is narrow for use in entering attic hatches, etc.
- Pompier - pompier is French for fireman; it is a scaling ladder no longer used

2006 NFPA 1901
Apparatus Ground
Ladder Compliments

- Pumpers - 24' extension 14' roof 10' folding
- Ladder Trucks - 35' extension 28' extension 28' extension
 - 20' roof 16' roof 14' combination
 - 10' attic

MFD Ground Ladder
Compliments

Engine 1	24' fiberglass extension 14' fiberglass roof 10' aluminum folding (hydraulic system)
Engine 2	24' aluminum extension 14' aluminum roof 10' aluminum roof (manual release)
Engine 3	24', 3-section, aluminum extension 14' aluminum roof 10' aluminum folding (extension and roof mounted over hose bed)
Quint 4	40', 3-section aluminum Bangor 35' and 28' 2-section aluminum extensions 20' aluminum roof 16' aluminum roof 14' aluminum combo 10' aluminum folding 6' aluminum folding step
Engine 5	hydraulic lowering device 24', 2-section aluminum extension 14' aluminum roof 10' folding
Engine 6	24', 2-section aluminum extension 14' aluminum roof 10' folding

Ladder Selection

- emphasize importance of selecting the right ladder for the job
- straight and roof ladders have fixed lengths that limit uses
- straight and roof ladders should be limited to single story roof access and for roof operations
- extension ladders have a range of lengths, are more versatile for easier access to various roof heights and windows

Lifting

- ladders are awkward to lift and are heavy, many weigh more than 200 pounds
- firefighters should lift with legs to avoid back injuries
- Butt or Heel Man is leader who gives commands for lifting, carrying and raising the ladder
- commands must be loud and clear to avoid confusion

Carrying Ground Ladders

(discuss advantages and disadvantages of each carry)

- the first number of the length of a ladder is rule of thumb for the minimum number of firefighters needed to carry the ladder
e.g. 14 ft = 1 person 24 ft = 2 persons 35 ft = 3 persons
- describe the one – firefighter high shoulder carry
- describe the one – firefighter low shoulder carry
- describe the one – firefighter arms length or suitcase carry
- describe the two – firefighter shoulder carry
- describe the two – firefighter under arm carry
- describe the two – firefighter arms length or suitcase carry
- describe the three – firefighter shoulder carry (not preferred because of height variations of firefighters
- describe the three – firefighter arms length or shoulder carry (similar problems as with shoulder carry)
- describe the three – firefighter flat shoulder carry (preferred)
- describe the three – firefighter arms length or suitcase carry
- describe the four – firefighter flat shoulder carry (preferred)
- describe the four – firefighter arms length or suitcase carry
- describe the six – firefighter carry of the Bangor ladder
- describe carrying the aerial ladder (just wanted to know if you were paying attention

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