



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

FIREFIGHTER SAFETY

**TOPIC:** DOWNHILL FIRELINE CONSTRUCTION

**TIME FRAME:** 1:00

**LEVEL OF INSTRUCTION:** Level I

**BEHAVIORAL OBJECTIVE:**

*Condition:* Given a written quiz

*Behavior:* The student will confirm knowledge of the contraindications of, and proper safety precautions during downhill fireline construction

*Standard:* With a minimum 80% accuracy according to the information contained in this lesson

**MATERIALS NEEDED:**

- Writing board with markers/erasers
- Appropriate audio visual material and equipment
- Fireline Handbooks or Incident Response Pocket Guides, if available

**REFERENCES:**

- Fireline Handbook, NWCG, March 2004
- Incident Response Pocket Guide, PMS #461, Jan 2006
- Case Studies:
  - Inaja Fire, 1956, Cleveland NF, CA
  - Silver Creek Fire, 1961, Nez Perce NF, Idaho
  - Loop Fire, 1966, Angeles NF, CA
  - Tuolumne Fire, 2004, Stanislaus NF, CA

**PREPARATION:**

Over the years there have been numerous fatal and near-fatal incidents involving terrain features such as slopes and chimneys, and the building of downhill fireline. Downhill fireline construction can be extremely hazardous, especially where terrain is steep. Fast-burning fuels and rapidly changing weather conditions can compound this inherent danger. Under any conditions, downhill fireline construction should only be attempted as a last resort tactic. If such fireline is to be built, all precautions covered in this lesson should be considered.



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

## DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<p><b>I. FACTORS TO CONSIDER PRIOR TO ATTEMPTING DOWNHILL FIRELINE CONSTRUCTION</b></p> <p>A. Conditions</p> <p>1. Weather/wind</p> <p>a) Increase in wind speed and/or change in direction</p> <p>1) Approach of a front</p> <p>2) Surfacing of upper level winds</p> <p>3) Breaking of an inversion</p> <p>4) Time of day</p> <p>5) Topographical features</p> <p>6) Fire in-draft</p> <p>7) Effect of aircraft</p> <p>b) "Predictability" – assume the wind may change and plan for the possibilities</p> <p>2. Topographical features</p> <p>a) Percent of slope</p> <p>b) Chutes/chimneys/saddles</p> <p>1) Sometimes unrecognizable</p> <ul style="list-style-type: none"><li>• Vegetation surrounding and/or within</li><li>• Lack of visibility due to darkness or smoke</li></ul>	<p>How steep is too steep for effective escape?</p>



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>• Subtleness of features</li><li>c) Drainages<ul style="list-style-type: none"><li>1) Wind effects</li><li>2) Fire behavior as fire crosses to opposing slope</li><li>3) Intersecting (confluence of) drainages<ul style="list-style-type: none"><li>• Often creates erratic wind patterns</li></ul></li></ul></li><li>d) Footing<ul style="list-style-type: none"><li>1) Soil type<ul style="list-style-type: none"><li>• Rocky</li><li>• Sandy</li><li>• Loose and unconsolidated</li><li>• Slippery vegetation</li></ul></li></ul></li><li>e) Fuels<ul style="list-style-type: none"><li>1) Type</li><li>2) Density</li><li>3) Configuration</li></ul></li></ul> <p>B. Risk vs. benefit</p> <ol style="list-style-type: none"><li>1. Balancing risk and the values protected must be considered in your planning</li><li>2. If the risk outweighs the benefit(s), change your plan</li></ol>	





# FIRE PROTECTION TRAINING

Procedures Handbook 4300

DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<p><b>NOTE:</b> The following guidelines can be found in the <u>Fireline Handbook</u> and <u>Incident Response Pocket Guide</u>, NWCG</p> <ol style="list-style-type: none"><li>1. Look Up, Look Down, Look Around<ol style="list-style-type: none"><li>a) Slope and chutes sited in Terrain section<ol style="list-style-type: none"><li>1) Steep slopes &gt; 50%</li><li>2) Chutes – Chimneys</li></ol></li></ol></li><li>2. Common Denominators of Fire Behavior on Tragedy Fires, Look Up, Look Down, Look Around<ol style="list-style-type: none"><li>a) #4 When fire responds to topographic conditions and runs uphill</li></ol></li><li>3. Tactical Watch Outs<ol style="list-style-type: none"><li>a) Four of the five Tactical Watch Outs are slope related<ol style="list-style-type: none"><li>1) Building fireline downhill</li><li>2) Building underslung or mid-slope fireline</li><li>3) Attempting frontal assault on the fire, or you are delivered by aircraft to the top of the fire</li><li>4) Terrain and /or fuels make escape to safety zones difficult</li></ol></li></ol></li></ol>	<p>Are any of the Common Denominators applicable?</p> <p>Information Sheet #1</p>





# FIRE PROTECTION TRAINING

Procedures Handbook 4300

## DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>1) Structures in chimneys, box canyons, narrow canyons, or on steep slopes (30% or greater)</li><li>7. Structure Assessment Checklist<ul style="list-style-type: none"><li>a) Road Access – Grade (greater than 15%?)</li><li>b) Clearances/Exposures/Defensible Space<ul style="list-style-type: none"><li>1) Structure location (narrow ridge, canyon, mid-slope, chimney)</li><li>2) Steep slopes = more clearance</li></ul></li><li>8. Last Resort Survival<ul style="list-style-type: none"><li>a) Escape if you can<ul style="list-style-type: none"><li>1) If you are on the flank of the fire, try to get below the fire</li></ul></li><li>b) Find a survivable area<ul style="list-style-type: none"><li>1) Stay out of hazardous terrain features</li></ul></li><li>c) Pick a shelter deployment site<ul style="list-style-type: none"><li>1) Find the lowest point available</li></ul></li></ul></li></ul></li><li>C. Guidelines that specifically mention downhill fireline construction<ul style="list-style-type: none"><li>1. Downhill Checklist</li></ul></li></ul>	<p>Can you think of any guidelines that relate directly to downhill line construction?</p>



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

## DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> <li>2. Downhill Checklist sited as a Hazard Control in the Risk Management Process</li> <li>3. Tactical Watch Out               <ul style="list-style-type: none"> <li>a) #1 - Building fireline downhill</li> </ul> </li> <li>4. 18 Situations That Shout Watch Out!               <ul style="list-style-type: none"> <li>a) #9 - Building fireline downhill with fire below</li> </ul> </li> </ul>	
<p><b>III. DOWNHILL CHECKLIST</b></p> <ul style="list-style-type: none"> <li>A. Downhill fireline construction is hazardous in steep terrain, fast-burning fuels, or rapidly changing weather</li> <li>B. Downhill fireline construction should not be attempted unless there is no tactical alternative</li> <li>C. When building downhill fireline, the following is required           <ul style="list-style-type: none"> <li>1. Crew supervisor(s) and fireline overhead will discuss assignments prior to committing crew(s)               <ul style="list-style-type: none"> <li>a) Responsible overhead individual will stay with job until completed                   <ul style="list-style-type: none"> <li>1) Any CAL FIRE company officer is considered to be qualified</li> </ul> </li> </ul> </li> <li>2. Decision will be made after proposed fireline has been scouted by supervisor(s) of involved crew(s)</li> <li>3. LCES will be coordinated for all personnel involved</li> </ul> </li> </ul>	<p>Information Sheet #2</p>



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

## DOWNHILL LINE CONSTRUCTION

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>a) This is a good time to conduct a safety briefing</li><li>b) Crew supervisor(s) in direct contact with lookout who can see the fire</li><li>c) Communication is established between all crews</li><li>d) Rapid access to safety zone(s) in case fire crosses below crew(s)</li></ul> <ol style="list-style-type: none"><li>4. Direct attack will be used whenever possible; if not possible, the fireline should be completed between anchor points before being fired out</li><li>5. Fireline will not lie in or adjacent to a chute or chimney</li><li>6. Starting point will be anchored for crew(s) building fireline down from the top</li><li>7. Bottom of the fire will be monitored; if the potential exists for the fire to spread, action will be taken to secure the fire edge</li></ol>	<p>Administer topic quiz</p>



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

DOWNHILL LINE CONSTRUCTION

---

## ***SUMMARY:***

Fire history has illustrated that slope plays a significant role in wildland fire behavior and has been a factor in numerous near miss and fatal incidents. Many guidelines caution personnel regarding firefighting operations on slopes and in chimneys. One such guideline is the Downhill Checklist, specific to the construction of downhill fireline. Downhill fireline construction can be especially hazardous in steep terrain, fast-burning fuels, or rapidly changing weather, and should only be attempted in the absence of all other tactical alternatives. When building downhill fireline, all seven guidelines in the Downhill Checklist should first be considered.

## ***EVALUATION:***

The student will complete a written quiz at a time determined by the instructor.

## ***ASSIGNMENT:***

Review your notes in preparation for the upcoming quiz. Study for the next session.