



**METROLINK®**

# **Fire Prevention Plan**

**Track Department**

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# Fire Prevention Plan

## Table of Contents

1. General Statement of Fire Safety
2. Job Briefings
3. Fire Suppression
4. Fire Risk Assessment
5. Preventive Measures
6. Fire-Sensitive Areas
7. Rule References

- Attachment 1A: Fire Risk Assessment
- Attachment 1B: Fire Prevention Actions Table
- Attachment 2: Beaufort Wind Scale
- Attachment 3: Hand Tools for Fire Fighting
- Attachment 4: USFS Fire Danger Adjective Class Rating

## 1. GENERAL STATEMENT OF FIRE SAFETY

- 1.1 The purpose of this plan is to prevent loss of life, property, and natural resources, and to prevent disruption of train operations as a result of fires caused by activities involving hot work that are performed within the SCRRRA right-of-way by Metrolink employees or employees of contractors.

- Hot work is considered any work activity that produces sparks or open flame. This work includes, but is not limited to, cutting or grinding with abrasive wheels, wire wheel rail cleaning, thermite welding, flash-butt welding, arc welding, Cadweld bonding, air-arc torch, and the use of an oxygen – acetylene fuel torch. All work operations involving hot work must be planned to include fire prevention and response.

- 1.3 All maintenance engineering personnel and contractors must be familiar and comply with the instructions contained in this plan, and they must successfully complete a formal training course covering the requirements and application of these instructions. They must also be familiar and comply with state and local fire control regulations within the area in which they are working. State and local regulations may require dedicated fire-fighting equipment, spark arrestors on work equipment, or other restrictions in addition to what is required in this instruction.

- 1.4 Maintenance Managers must know the Fire Danger Rating and Color Code assigned by the US Forest Service Wildland Fire Assessment system for the territory under their supervision, be aware of burn bans in effect, and ensure compliance with any permitting necessary. This information must be given to their employees who perform hot work.

- 1.5 Each work crew must also have an Emergency Response Plan in their possession that provides instructions and phone numbers for contacting local fire and emergency personnel, the train dispatcher, and the Assistant Director, Track and Structure Rehabilitation. The Emergency Response Plan must be site specific and include the following information:

- The location of the work site with a reference to SCRRRA mile post, and the nearest public highway intersection or a public landmark, and the nearest grade crossing and access point. The latitude and longitude from GPS device should also be provided if available.

- Emergency contact information including the phone numbers and instructions for contacting local fire and emergency personnel, train dispatcher, and the Assistant Director, Track and Structure Rehabilitation.
- Location of points of ingress and egress
- Method of identifying location of work to emergency responders
- Steps each person is to take in response if fire breaks out
- Specific person assigned to guide fire and emergency personnel to site from nearest public access.
- The route to be followed in the event that an evacuation is required
- The name of any adjacent facilities or public highways in the vicinity of the work.

1.6 Any questions about the application of these instructions should be directed to the District Track Maintenance Manager or the District Signal Maintenance Manager.

## **2. FIRE RISK ASSESSMENT AND JOB BRIEFINGS**

- 2.1. A Fire Risk Assessment must be performed before conducting any hot work (see Section 4 – Fire Risk Assessment). This Fire Risk Assessment will determine the specific restrictions and precautions that employees must follow. The Fire Risk Assessment must be performed at the time and location at which the work is to be performed, and the results of the Fire Risk Assessment must be included in a Job Briefing prior to beginning work.
- 2.2. The procedure for determining the Fire Danger Class (see Section 4 – Fire Risk Assessment) must be included in the job planning activities and communicated to each work crew through the job briefing at the start of each day when the work activities planned for the day involve hot work, or when the activity is changed to include hot work.
- 2.3. A job briefing must be conducted to discuss the risk factors and fire preventive measures to be taken in accordance with these instructions, and the fire suppression methods to be utilized in case of a fire. This job briefing must include a review of the Emergency Response Plan in effect for the specific work location. Each work crew must have a copy of the Emergency Response Plan in their possession.

### 3. FIRE SUPPRESSION

- 3.1. All employees must attempt to extinguish a fire when started and prevent the spread of the fire without endangering their own safety. Any fire started by SCRRRA maintenance personnel must be reported to Assistant Director, Track and Structure Rehabilitation if the employees present cannot put out the fire without calling for assistance regardless of the size of the fire.
- 3.2. If a fire gets out of control:
  1. Contact Metrolink Dispatching Operations Center (DOC), local fire personnel through the 911 emergency number, and Assistant Director, Track and Structure Rehabilitation. DOC will contact the Sheriff's Department. Be prepared to give your location information detailed in the Emergency Response Plan, and be prepared to tell the 911 emergency dispatcher the compass direction that the fire is moving. (NOTE: Remember that local agencies responsible for emergency response will not likely have access to Metrolink's geographic references such as mile posts, control points, etc.)
  2. If possible, send someone to the nearest highway or road to direct responding fire departments to the location of the fire. If fire is quickly moving up a steep slope towards a roadway tell the 911 emergency dispatcher the name and approximate location of that road so the fire department can respond to that location. (NOTE: The best location to fight a quick moving fire traveling uphill may not be the point of origin.)
  3. Evacuate the area using the route detailed in the job briefing.
  4. Contact others in the immediate area to alert them to the fire danger.
  5. Stop trains if there is a danger from the fire to trains, or if the turbulence from passing trains may accelerate the spread of the fire.
- 3.3. Engineering and maintenance personnel involved in hot work must carry the required levels of water as prescribed in Section 5 for fire suppression. Any water used for saturating vegetation prior to performing hot work must be in addition to the minimum levels. When fire risk is low and temperature is below 25°F or the ground is snow covered, chemical fire extinguishers may be used in lieu of water for those operations prescribed in the following sections:

- 5.2 – Flash-Butt and Thermite Welding;
  - 5.4 – Welding, Grinding, Cutting, or Using a Torch;
  - 5.5 – Applying Cadweld Bonds; and
  - 5.7 – Track Inspectors.
- 3.4. A minimum of two 20 lbs. chemical fire extinguishers must be available for fire suppression for flash-butt welding, thermite welding, and general cutting, welding, grinding, or use of a torch. A minimum of one 20 lbs. chemical fire extinguisher must be available for applying cadweld bonds and inspecting track.
- 3.5. When working over or around waterways, water supply used for fire prevention should not contain any chemicals or other treatments such as Class A foam. Foam-treated water, if used, must not be applied in a manner where it will enter waterways, i.e. on bridges, over water, near shorelines, etc. It also should not be applied in areas where the residue from the foam might wash into waterways.

#### 4. FIRE RISK ASSESSMENT

**ASSESSMENT FORM:** A Fire Risk Assessment Form (Attachment 1A and 1B) must be completed before any hot work is performed. This assessment is comprised of 13 factors, each weighted for its importance in determining the risk of a wildfire. The first 6 factors are relatively fixed – meaning that these factors change very little, if at all, over time at a given location. These consist of elevation, angle of slope, direction of slope, emergency access, fuel (vegetation) type and adjacent property. The other 7 factors can vary widely from one day to the next. They are fire danger class, time of day, distance to vegetation, wind speed, temperature, humidity, and precipitation.

The following paragraphs discuss each of the 13 factors in detail:





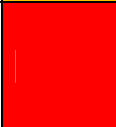
1. **ELEVATION:** For every 2,000 feet of elevation increase, the risk of fire increases by a factor of five. This is due primarily to the differences in temperature and relative humidity, the effect of temperature and humidity patterns on plant characteristics, and to some degree the effect of wind associated with daytime heating and wildfire behavior on long slopes. Elevations may be determined from the top of rail elevations provided at intervals on the SCRRRA Track Charts.

2. **ANGLE OF SLOPE:** Fires burn up a steep slope faster than on a gradual slope or down-slope, because the flames are closer to the unburned vegetation ahead of it – heating and drying it out before ignition. When a fire burns down-slope, the flames are angled away from the unburned vegetation. (NOTE: During high wind conditions fire can move down-slope as fast as traveling up-slope.)
3. **DIRECTION OF SLOPE:** Because we're in the Northern Hemisphere, south-facing slopes are exposed to the sun earlier in the day and for longer periods of time. West-facing slopes are exposed later in the day – when temperatures are normally higher and humidity is lower.
4. **EMERGENCY ACCESS:** If a fire gets out of our control, off-track access to the area for emergency fire responders is critical. (NOTE: Ensure that at all times all unattended vehicles are parked in such a manner as not to block emergency vehicle access.)
5. **FUEL TYPE:** Surface vegetation, such as grasses, plants or brush, is normally the ignition source for wildfires. Dry or dead vegetation on our right-of-way ignites easily and spreads quickly. New leafing, wetland plants, freshness of cuttings, drought, frost and other factors can also affect fuel characteristics.
6. **ADJACENT PROPERTY:** From a risk standpoint, the consequences of a fire – particularly as it affects the safety of people, their homes and our National Forests – must be taken into account.
  - A. Farmland, sparsely vegetated, sparsely populated areas are the lowest risk.
  - B. Residential or commercial development is located within combustible vegetation or forest is moderate risk.
  - C. High density residential structures constructed from timber, heavily-traveled roadway less than 1/4 mile downwind of work area, areas representing large capital investments are considered high risk.
7. **FIRE DANGER RATING AND COLOR CODES:**

A Fire Danger Rating level takes into account current and antecedent weather, fuel types, and both live and dead fuel moisture. Five classes of fire danger are defined by the United States Forest Service Wildland Fire Assessment System (WFAS).



These are low, moderate, high, very high, and extreme.<sup>1</sup> The color codes and risk assessment score corresponding to each class are shown in the table below:

FIRE DANGER CLASS RATING and COLOR CODE				
Fire Danger Rating	Color Name	Color	Risk Assessment Score	SCRRA Seasonal Fire Danger Class Assessment
Low (L)	Dark Green		5	-none-
Moderate (M)	Blue (or Light Green)		10	January / February / March
High (H)	Yellow		15	April or December
Very High (VH)	Orange		15	June or November
Extreme (E)	Red		15	July / August / September / October

There are two methods of determining the Fire Danger Rating. A description of each method follows:

- A. Wildland Fire Assessment Service Point Based Mapping: The WFAS offers point-based map data in a Google Earth compatible format. The files are updated daily and include current weather, fire danger, and fuel moisture observations as well as forecast weather conditions when available. The maps are available on their website at <http://www.wfas.net/>.
- B. Seasonal Fire Danger Class Assessment: If areas on the WFAS map indicate that the required data was not received from remote reporting stations, or if specific fire danger information is not available for a given area, or in the absence of access to the WFAS service website, determine the fire danger class rating as follows:
  - Assume the fire danger class is **Moderate** for work performed during the month of January, February or March. Fire Assessment Risk Score = 10
  - Assume the fire danger class is **High** for work performed during the month of April or December. Fire Assessment Risk Score = 15

<sup>1</sup> Attachment 4 gives a description of the condition of the potential fuel and the characteristics of a fire ignited in the fuel for each fire danger class rating. This is provided for information only and should not be used to assign a fire danger class rating.

- Assume the fire danger class rating is **Very High** for work performed during the month of June or November. Fire Assessment Risk Score = 15
  - Assume the fire danger class rating is **Extreme** for work performed during the month of July, August, September, or October. Fire Assessment Risk Score = 15
  - The Fire Assessment Risk Score may be reduced by 5 points if a significant rain has occurred in the two (2) days before the work is performed, and there have been no prolonged winds such as Santa Ana conditions that would rapidly remove moisture from combustible material.
8. **TIME OF DAY:** This is closely related to two other factors – temperature and humidity. To the extent practical and safe to do so, it is usually better to perform hot work late at night or early in the morning when the temperatures are cooler and the humidity is higher.
9. **DISTANCE TO VEGETATION:** The closer combustible vegetation is to our hot work, the greater the chance of a fire. High winds can carry sparks from grinders or rail saws more than 50 feet from the work location.
10. **WIND SPEED:** Wind speeds in excess of 10 mph can carry sparks from the hot work to the combustible vegetation along our right-of-way. High winds will also accelerate the burn rate and intensity of a fire. Wind speed is measured with an anemometer.<sup>2</sup>
11. **TEMPERATURE:** As ambient (air) temperature increases, the air will draw moisture away from the vegetation (evaporation) and lower the temperature needed to ignite the vegetation. Temperature is measured with a thermometer. A rail thermometer may be used if exposed only to the ambient air.\*
12. **RELATIVE HUMIDITY:** RH is an indicator of the amount of moisture in the air and directly affects the moisture content of the vegetation. The higher the humidity, the less chance of a wildfire. When relative humidity is less than 25%, the chances of a wildfire increase substantially. Humidity is measured with a hygrometer.<sup>3</sup>

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<sup>2</sup> If an anemometer is not available the Beaufort Wind Scale may be used – see Attachment 2.

<sup>3</sup> Several companies make instruments that combine a thermometer, anemometer, and hygrometer. See Attachment 3 for an example of one made by Kestrel Meter.

13. **PRECIPITATION:** If there is ample moisture present, the danger of fire is reduced. Snow cover or recent rains are examples.

## 5. PREVENTIVE MEASURES

The preventive measures to be taken are determined by the Fire Risk Assessment completed prior to the hot work. The employee in charge of the work may determine that additional measures must be taken during periods of extreme dryness or high winds. These additional measures may include shutting down the hot work operations. No hot work may be performed when wind speed is 30 mph or greater except in an emergency. Any emergency work must be approved by the Assistant Director, Track and Structure Rehabilitation.

Observe the following general precautions when working around combustible materials:

- Plan your work in advance and make sure that all required preventive tools are in place on the work vehicles.
- Park vehicles in areas clear of vegetation. Tall, dry, vegetation may be ignited by the exhaust system or other hot components of the engine.
- Make sure that all equipment complies with the provisions for spark arrestors required by Section 4442 et seq. of the California Public Resources Code, and Section 38366 of the California Vehicle Code.
- Do not allow employees to smoke in areas of combustible material, and ensure that the all cigarette or cigar butts are fully extinguished and properly discarded in a container. Do not litter, and do not toss a burning cigarette on the ground. It may land in a patch of dried grass, starting a fire.
- Wet areas in the vicinity of hot work or clear the ground of combustible material before performing hot work.
- Test radio, cell phone, or other communication devices at each work location to ensure that help may be summoned if needed. Do not leave watch personnel in the field without an effective means of communication.
- Fuel equipment away from any sources of heat and at least 10 feet from any combustible vegetation. Engine must be stopped while refueling. Restart portable equipment away from the fueling site.

- Conduct thorough roll-by inspections of trains, watching closely for exhaust sparks from the locomotives, smoke or sparks from brake shoes and hot journals.
- Keep access roads cleared of brush and other obstructions that may restrict fire-fighting and emergency vehicles responding to an emergency.
- Carry extra tools to ensure an adequate supply for all members of the work crew or gang.

## **5.6 FLASH-BUTT AND THERMITE WELDING**

Employees or contractors involved with flash-butt and thermite welding are governed by the following instructions. Support gangs must comply with the instructions specific to their work activities (e.g. rail cutting). A minimum of 3 employees are required for thermite welding and flash-butt welding.

### **5.1.1 When risk is low (dark green), apply the following preventive measures:**

- A. Gangs must have available a minimum of 40 gallons of water with at least 2 fire pump sprayers filled with water.
- B. Gangs must also carry enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes). Shovels and fire rakes must have a minimum overall length of 46 inches and be in good working order.
- C. Spark shields or curtains must be used.

### **5.1.2 When risk is moderate (blue or light green), apply the following preventive measures:**

- A. The gang must have available a minimum of 40 gallons of water with at least 2 fire pump sprayers filled with water. They must also carry enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes). Shovels and fire rakes must have a minimum overall length of 46 inches.
- B. Spark shields or curtains must be used.
- C. All combustible vegetation within 30 feet of any hot work must be

cleared or saturated with water and monitored during the work for evaporation.

- D. One person must be assigned as a fire watcher. Each fire watcher must be equipped with at least 5 gallons of water in a fire pump sprayer, a round-nose shovel, and a McLeod-type rake, (or alternatively, a Council-type fire rake). The fire watcher must continually observe both sides of the track for indications that brush or other fuel has ignited. The fire watcher may not perform on-track safety duties such as watchman or lookout.
- E. After final hot work is performed, the crew must monitor area for fire ignition for 30 minutes.

**5.1.3 When risk is high, very high, or extreme (yellow, orange, or red), apply the following preventive measures:**

- A. Flash-butt welding operations not associated with system gang operations must be discontinued.
- B. Flash-butt welding operations that are part of a system gang operation must be authorized by the Assistant Director, Track and Structure Rehabilitation.
- C. The gang must have available a minimum of 40 gallons of water with at least 2 fire pump sprayers filled with water.
- D. The gang must also carry enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes). Shovels and fire rakes must have a minimum overall length of 46 inches and be in good working order.
- E. Spark shields or curtains must be used.
- F. All combustible vegetation within 30 feet of any hot work must be cleared or saturated with water and monitored during the work for evaporation.
- G. One person must be assigned as a fire watcher. Each fire watcher must be equipped with at least 5 gallons of water in a fire pump sprayer, a round-nose shovel, a McLeod-type rake, (or alternatively, a

Council-type fire rake). The fire watcher must observe both sides of the track for indications that brush or other fuel has ignited. The fire watcher may not perform on-track safety duties such as watchman or lookout.

- H. One person must remain at the job site for at least 1 hour after the hot work is completed (2 hours when protecting timber structures) to watch for signs of smoke or fire. This person must have at least two full fire pump sprayers, two round-nose shovels, a McLeod-type rake, (or alternatively, a Council-type fire rake), and communications capable of calling for help.

## **5.2 OPEN-FLAME RAIL HEATERS**

Rail gang employees are governed by the following instructions when operating an open-flame rail heater.

### **5.2.1 When risk is low (dark green), apply the following preventive measures:**

- A. Each rail gang must have available a minimum of 200 gallons of water with at least 4 fire pump sprayers filled with water.
- B. Each gang must also have enough round-nose shovels for every person involved in the work, plus 4 McCleod rakes (or alternatively, 4 Council-type fire rakes). Shovels and fire rakes must have a minimum overall length of 46 inches and be in good working order.
- C. A sufficient quantity of water must be available near the work to douse all wood ties in the vicinity of the work when required. On rail gangs, a second water tank must be positioned at the rear of the gang to ensure that any smoldering wood ties are again doused.
- D. One person must walk behind the rail heater to immediately douse any wood ties or other material that is ignited by the rail heater.

### **5.2.2 When risk is moderate (blue or light green), apply the following preventive measures:**

- A. Each rail gang must have available a minimum of 200 gallons of water with at least 4 fire pump sprayers filled with water.

- B. Each gang must also have enough round-nose shovels for every person involved in the work, plus 4 McLeod-type rakes, (or alternatively, 4 Council-type fire rakes). Shovels and fire rakes must have a minimum overall length of 46 inches and be in good working order.
- C. A sufficient quantity of water must be available near the work to douse all wood ties in the vicinity of the work when required. On rail gangs, a second water tank must be positioned at the rear of the gang to ensure that any smoldering wood ties are again doused.
- D. One person must walk behind the rail heater to immediately douse any wood ties or other material that is ignited by the rail heater. When the water volume reaches 75 gallons, work must stop until the water tank is refilled.

**5.2.3 When risk is high, very high, or extreme (yellow, orange, or red), apply the following preventive measures:**

- A. The Assistant Director, Track and Structure Rehabilitation must authorize any open-flame rail heating operations.
- B. Each rail gang must have available a minimum of 200 gallons of water with at least 4 fire pump sprayers filled with water.
- C. Each gang must also have enough round-nose shovels for every person involved in the work, plus 4 McLeod-type rakes, (or alternatively, 4 Council-type fire rakes).
- D. A sufficient quantity of water must be available near the work to douse all wood ties in the vicinity of the work when required. On rail gangs, a second water tank must be positioned at the rear of the gang to ensure that any smoldering wood ties are again doused.
- E. One person must walk behind the rail heater to immediately douse any wood ties or other material that is ignited by the rail heater. When the water volume reaches 75 gallons, work must stop until the water tank is refilled.
- I. One person must remain at the job site for at least 1 hour after the hot

work is completed (2 hours when protecting timber structures) to watch for signs of smoke or fire. This person must have at least two full fire pump sprayers, two round-nose shovels, a McLeod-type rake, (or alternatively, a Council-type fire rake), and communications capable of calling for help.

### **5.3 GENERAL WELDING, GRINDING, CUTTING, OR TORCH WORK**

Employees or contractors are governed by the following instructions when performing work involving welding, grinding (including grinding, buffing, or sanding for electrical continuity), abrasive wheel cutting, brush cutting, or using an oxy-acetylene torch.

#### **5.3.1 When risk is low (dark green), apply the following preventive measures:**

- A. The following personnel must have the minimum amounts of water listed below and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes).
- Track welders and grinders - 10 gallons of water with at least 2 fire pump sprayers filled with water.
  - Track gangs - 5 gallons of water and at least 1 fire pump sprayer filled with water.
  - Work equipment mechanics – 5 gallons of water and at least 1 fire pump sprayer filled with water.
  - Bridge welders working over timber structures or flammable vegetation - 10 gallons of water with at least 2 fire pump sprayers filled with water.
  - Brush-cutter operators - 10 gallons of water with at least 1 fire pump sprayer filled with water.
- B. A spark shield must be used when sparks will not be confined to the ballast section, when working over or near timber bridges or structures, and when working on open deck bridges. In addition, means must be provided when working on open deck bridges, to prevent sparks, slag and other hot material from falling through the deck onto vegetation or



other flammable substances below the structure.

- C. Mechanized brush cutting operations must provide a 2000 gallon water truck in addition to any required fire pump sprayers for wetting brush prior to cutting, and for minimizing fugitive dust.

**5.3.2 When risk is moderate (blue or light green), apply the following preventive measures:**

- A. The following personnel must have the minimum amounts of water listed below and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes).
- Track welders and grinders - 10 gallons of water with at least 2 fire pump sprayers filled with water.
  - Track gangs - 5 gallons of water and at least 1 fire pump sprayer filled with water.
  - Work equipment mechanics – 5 gallons of water and at least 1 fire pump sprayer filled with water.
  - Bridge welders working over timber structures or flammable vegetation - 10 gallons of water with at least 2 fire pump sprayers filled with water.
  - Brush cutter operators - 10 gallons of water with at least one fire pump sprayer.
- B. Spark shields must be used.
- C. Mechanized brush cutting operations must provide a 2000 gallon water truck in addition to any required fire pump sprayers for wetting brush prior to cutting, and for minimizing fugitive dust.
- D. All combustible vegetation within 30 feet of any hot work must be cleared, or saturated with water every 30 minutes unless a welding tent is used. A welding tent may not be used for cutting, grinding or welding on track components containing more than 2% manganese.

- E. One person must be assigned as a fire watcher. The Fire watcher must be equipped with at least 10 gallons of water at the work site, and a fire pump sprayer, a round-nose shovel, plus a McCleod Rake (or alternatively, a Council-type fire rake). The fire watcher must observe both sides of the track for indications that brush or other fuel has ignited. The fire watcher must not perform any on-track safety duties such as watchman or lookout.

**5.3.3 When risk is high, very high, or extreme (yellow, orange, or red), apply the following preventive measures:**

- A. The Assistant Director, Track and Structure Rehabilitation must authorize any cutting, welding or grinding operations.
- B. The following personnel must have the minimum amounts of water listed below and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes).
- Track welders and grinders - 10 gallons of water with at least 2 fire pump sprayers filled with water
  - Track gangs - 10 gallons of water and at least 1 fire pump sprayer filled with water
  - Work equipment mechanics – 10 gallons of water and at least 1 fire pump sprayer filled with water
  - Bridge welders working over timber bridges or flammable vegetation - 40 gallons of water with at least 2 fire pump sprayers filled with water
  - Brush cutter operators - 40 gallons of water with at least 2 fire pump sprayers filled with water. .
- C. Mechanized brush cutting operations must provide a 2000 gallon water truck (in addition to any required fire pump sprayers) for wetting brush prior to cutting, and for minimizing fugitive dust.
- D. Spark shields must be used.

- E. A welding tent must be used if possible. If welding tent cannot be used, all combustible vegetation within 30 feet of any hot work must be cleared, or saturated with water every 30 minutes. *A welding tent must not be used for cutting, grinding or welding on track components containing more than 2% manganese.*
- F. A minimum of 3 employees are required for rail cutting or grinding operations.
- G. One person must be assigned to fire watch. The Fire watcher must be equipped with at least 10 gallons of water at the work site, and 2 fire pump sprayers filled with water, a round-nose shovel, and a McLeod-type rake (or alternatively, a Council-type fire rake) during the time that the cutting or grinding operations are underway. The fire watcher must observe both sides of the track for indications that brush or other fuel has ignited.
- H. Fire watch must not perform any on-track safety duties such as watchman/lookout.
- J. One person must remain at the job site for at least 1 hour after the hot work is completed (2 hours when protecting timber structures) to watch for signs of smoke or fire. This person must have at least two fire pump sprayers filled with water, two round-nose shovels, a McLeod-type rake, (or alternatively, a Council-type fire rake), and communications capable of calling for help.

## 5.4 BRUSH CLEARING

Employees or contractors are governed by the following instructions when performing work involving brush cutting.

### 5.4.1 When risk is low (dark green), apply the following preventive measures:

- A. The brush-cutter crew must have 10 gallons of water at the site of the work with at least 1 fire pump sprayer filled with water and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes).
- B. Mechanized brush cutting operations must provide a 2000 gallon water

truck in addition to any required fire pump sprayers for wetting brush prior to cutting, and for minimizing fugitive dust.

**5.4.2 When risk is moderate (blue or light green), apply the following preventive measures:**

- A. The brush-cutter crew must have 10 gallons of water at the site of the work with at least 1 fire pump sprayer filled with water and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes)
- B. Mechanized brush cutting operations must provide a 2000 gallon water truck in addition to any required fire pump sprayers for wetting brush prior to cutting, and for minimizing fugitive dust.
- C. One person must be assigned as a fire watcher. The fire watcher must be equipped with at least 10 gallons of water at the work site, and a fire pump sprayer, a round-nose shovel, plus a McCleod Rake (or alternatively, a Council-type fire rake). The fire watcher must observe both sides of the track for indications that brush or other fuel has ignited. The fire watcher must not perform any on-track safety duties such as watchman or lookout.

**5.4.3 When risk is high, very high, or extreme (yellow, orange, or red), apply the following preventive measures:**

- A. The brush-cutter crew must have 40 gallons of water at the site of the work with at least 2 fire pump sprayer filled with water and enough round-nose shovels for every person involved in the work, plus 2 McCleod rakes (or alternatively, 2 Council-type fire rakes).
- B. Mechanized brush cutting operations must provide a 2000 gallon water truck (in addition to any required fire pump sprayers) for wetting brush prior to cutting, and for minimizing fugitive dust.
- C. One person must be assigned to fire watch. The Fire watcher must be equipped with at least 10 gallons of water at the work site, and 2 fire pump sprayers filled with water, a round-nose shovel, and a

McLeod-type rake (or alternatively, a Council-type fire rake) during the time that the cutting or grinding operations are underway. The fire watcher must observe both sides of the track for indications that brush or other fuel has ignited. The fire watcher must not perform any on-track safety duties such as watchman or lookout.

- K. One person must remain at the job site for at least 1 hour after the hot work is completed (2 hours when protecting timber structures) to watch for signs of smoke or fire. This person must have at least two fire pump sprayers filled with water, two round-nose shovels, a McLeod-type rake, (or alternatively, a Council-type fire rake), and communications capable of calling for help.

## **5.5 APPLYING CADWELD BONDS**

Signalmen applying cadweld bonds must carry 5 gallons of water and at least 1 fire pump sprayer filled with water. When risk is high, very high or extreme (yellow, orange, or red), cadweld bonding must be authorized by the Signal Supervisor. When cadweld bonding is authorized, spark shields must be used to contain sparks or other hot material. Grinding may not begin until all bonding operations are complete, and grinding operations must follow the requirements described in Section 5.3.

## **5.6 PRODUCTION RAIL GRINDERS**

Employees and contractors operating or working with production rail grinders will be governed by the following instructions.

### **5.6.1 When risk is low (dark green), apply the following preventive measures:**

- A. Grinders must be equipped with spark guards.
- B. A 2000 gallon hi-rail water truck must accompany the grinder. The water truck must carry 100 feet of 1½" fire hose. If the water truck is equipped with a nozzle on top of the tank, capable of projecting a stream of water 100 feet from the truck, only 50 feet of fire hose is required.
- C. Each production rail grinder or a support vehicle (support vehicle is required if tools are not carried on the production rail grinder) must

carry a minimum of 200 feet of 1½” fire hose and two nozzles in addition to the hose carried on the water truck, along with hand tools suitable for fire fighting. The support truck or production rail grinder must carry an adequate supply of hand tools to equip every employee working at the site. See Attachment 3 for a list of hand tools to carry on the truck.

- D. Grinding will cease when the grinder's, or water truck's, water reserve falls below 750 gallons. Grinding may not restart until the water truck is refilled to its capacity.
- E. The District Track Maintenance supervisor must notify the local bridge or track forces prior to grinding the rail on timber structures. Bridge or track personnel must be on site during the grinding operations and protect the structure for four (4) hours after the last grinding pass has been made.
- F. Grinders equipped with thermal imaging equipment must use the equipment to ensure no danger of fire exists before leaving the work site.

#### **5.6.2 When risk is moderate (blue or light green):**

- A. Grinders must be equipped with spark guards.
- B. A 2000 gallon hi-rail water truck must accompany the grinder. The water truck must carry 100 feet of 1½” fire hose. If the water truck is equipped with a nozzle on top of the tank, capable of projecting a stream of water 100 feet from the truck, only 50 feet of fire hose is required.
- C. Each production rail grinder or a support vehicle (support vehicle is required if tools are not carried on the production rail grinder) must carry a minimum of 200 feet of 1½” fire hose and two nozzles in addition to the hose carried on the water truck, along with hand tools suitable for fire fighting. The support truck or production rail grinder must carry an adequate supply of hand tools to equip every employee working at the site. See Attachment 3 for a list of hand tools to carry on the truck or production rail grinder.
- D. Grinding will cease when the grinder's, or water truck's water reserve

falls below 750 gallons. Grinding may not restart until the water truck is refilled to its capacity.

- E. The District Track Maintenance supervisor must notify the local bridge or track forces prior to grinding the rail on timber structures. Bridge or track personnel must be on site during the grinding operations and protect the structure for four (4) hours after the last grinding pass has been made.
- F. Grinders equipped with thermal imaging equipment must use the imaging equipment to ensure no danger of fire exists before leaving the work site. If thermal imaging is not available then area surrounding ground rail must be patrolled by a vehicle or high rail carrying no less than 500 gallons and 150 feet of minimum  $\frac{3}{4}$  inch hose, with communication capability to call for assistance if fire is discovered.
- G. A second 2000 gallon hi-rail water truck must follow the grinder. The water truck must carry 100 feet of 1½" fire hose. (If the water truck is equipped with a nozzle on top of the tank, capable of projecting a stream of water 100 feet from the truck, only 50 feet of fire hose is required.) To ensure an adequate water supply, a second off-track, fire-fighting vehicle or water tank truck must follow the grinding operation for the purpose of refilling the hi-rail water trucks or providing water

**5.6.3 When risk is high, very high, or extreme (yellow, orange, or red), apply the following preventive measures:**

- A. Discontinue all grinding operations.

**5.7 OTHER WORK ACTIVITIES**

Employees or contractors must take all precautions necessary to prevent fires from other work activities not specifically mentioned in these instructions. In addition, employees must plan all work activities to include fire prevention.

**5.8 TRACK INSPECTORS**

Track inspectors must keep a lookout for right-of-way fires during the course of their normal inspections. Each track inspector must carry a minimum of 10 gallons of

water, a fire pump sprayer filled with water, two round-nose shovel, and a McLeod-type rake (or alternatively, a Council-type fire rake). Shovels and fire rakes must have a minimum overall length of 46 inches in good working order.

When temperatures are below freezing, chemical fire extinguishers may be carried in lieu of water.

## **6. FIRE SENSITIVE AREAS**

All subdivisions within the Metrolink Service Area traverse fire sensitive areas.

## **7. RULE REFERENCES**

The instructions contained in this Fire Prevention Plan complement the following rules in effect:

- 7.1 Maintenance of Way Operating Rules**
- 7.2 Safety Rules**
- 7.3 Welding Rules**
- 7.4 Environmental Laws, Policies and Procedures**



Type of Risk	Level of Risk						Score
	Low Risk	Score	Moderate Risk	Score	HIGH RISK	Score	
Elevation	< 2,000 ft	1	2,000-4,000 ft	2	> 4,000 ft	3	
Slope	Level or On a Fill	3	Upslope < 45°	6	Upslope ≥ 45°	9	
Slope Facing	North or No Slope	1	East	2	SouthWest	3	
Emergency Access	Road/ROW Access	1	Off-Road Access	2	Only Accessible by Rail	3	
Fuel Type	Sparse/green vegetation: new cuttings/slash/brush and hardwood species, if summer/green/fully leafed; marsh grasses; green wetland/meadow/swamp	3	Moderate vegetation: dried cuttings/slash/brush; brush mixed with dead fine fuels or leaf drop; hardwoods or brush without leaves (except when leaves have just fallen, or in early spring thaw) or if dried out; new and growing perennial grasses; green wetland/meadow/marsh or swamp vegetation after drought.	6	Dry or dead vegetation; very dry slash; dead grass that is high and has brush growing in it, dry hardwoods and leaves; any matured grasses or low-growing plant, weeds or small vegetation after a killing frost	9	
Adjacent Property	Farmland and sparsely vegetated & sparsely populated areas	5	Residential/commercial areas among combustible vegetation or forest.	10	High density residential structures constructed from timber, heavily-traveled roadway less than 1/4 mile downwind, areas of large capital investment	15	
Fire Danger Class	Low	5	Moderate	10	High-Very High-Extreme	15	
Time of Day	8 PM to 10 AM	1	10 AM to 3 PM	2	3 PM to 8 Pm	3	
distance to Vegetation	> 100 ft	5	50 - 100 ft	10	< 50 ft	15	
Wind Speed	0-10 MPH	3	11 MPH - 15 MPH	6	> 15 MPH	9	
Temperature	< 60 ° F	1	61° F - 70° F	2	> 70 ° F	3	
Humidity	> 50 %	2	25% - 50%	2	< 25 %	3	
Precipitation**	Precipitation or Heavy Fog	3	Moisture Within Last 3 Days	6	No Moisture Within Last 3 Days	9	
<b>Total</b>	<b>33-54</b>		<b>55-69</b>		<b>70-99</b>		

\*\* A Fire Risk Assessment must be completed prior to conducting any hot work unless on fo the conditions below exists at the site.

When any of the conditions below does exist, the fire risk is low (green). Check the box that applies:

- Ground is covered by snow
- Ground is covered by a heavy frost
- Rain, snow, or sleet is currently falling (at time work is to be performed)
- Ground is saturated as evidence by standing water and no dry vegetation (e.g. reeds, weeds, dead wood) is present

		Preventive Actions Based on Level of Risk			Indicate Selection
Type of Work		33-54 or No Vegetation Within 100'	55-69	70-99	
	Production Rail Grinding	A+F	A+F+H	X	
	Flash-Butt Welding	A+B	A+B+C+E	(A+B+C+E+F+I) or X	
	Open Flame Rail Heating	A	A	(A+F+I) or X	
	Thermite Welding <sup>1</sup>	A+B	A+B+(C or D)+E	(A+B+D+E+F+G+I) or X	
	Arc Welding or Arc Cutting	A+B	A+B+(C or D)+E	(A+B+(D *or C)+E+F+G+I) or X	
	Rail Cutting or Grinding	A+B	A+B+(C or D)+E	(A+B+(D *or C)+E+F+G+I) or X	
	Oxy-Acetelyne Torch	A+B	A+B+(C or D)+E	(A+B+(D *or C)+E+F+G+I) or X	
	Cadweld Bonding	A	A	(A+B+I) or X	

Notes:

<sup>1</sup> Includes all operations associated with Thermite welding such as cutting and grinding

<sup>2</sup> Provide fire watch for areas below open deck bridges. (For rail grinding fire watch is to continue 4 hours, all other work fire watch must continue for 2 hours)

**A** Normal operations

**B** Use spark shields to protect all hot work

**C** Saturate with water or clear vegetation within 30 feet of the hot work

**D** Use a welding tent to protect hot work

**E** Post a fire watcher or fire watchers to watch for signs of smoke or fire during hot work

**F** Leave one employee at the job site for 1 hour after hot work (2 or 4 hours for timber structures)<sup>2</sup>

**G** A minimum of three (3) employees will be required for thermite welding, rail cutting, or grinding operations

**H** Hi-rail water truck must follow grinding operations

**I** Hot work must be authorized by Director of Track and Structure Maintenance (or a Manager of Track, Signals, or Bridge & Structures)

**X** Shut down hot work operations

\* When fire risk is high, tent must be used if it can be used ( **D** ). If tent cannot be used, saturate or clear vegetation ( **C** )

**Comply with All requirements of the Fire Prevention Plan Whether or Not Summarized Above**

Fire Risk Assessment Form completed by: \_\_\_\_\_ Verified by: \_\_\_\_\_

Subdivision (circle): OL OR PA SG RI VE VY MP: \_\_\_\_\_ Gang: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_





**Attachment 2: Beaufort Wind Scale**

<b>Force</b>	<b>Wind (Knots)</b>	<b>WMO Classification</b>	<b>Appearance of Wind Effects On Land</b>
<b>0</b>	Less than 1	Calm	Calm, smoke rises vertically
<b>1</b>	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
<b>2</b>	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
<b>3</b>	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
<b>4</b>	11-16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
<b>5</b>	17-21	Fresh Breeze	Small trees in leaf begin to sway
<b>6</b>	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
<b>7</b>	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
<b>8</b>	34-40	Gale	Whole trees in motion, resistance felt walking against wind
<b>9</b>	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
<b>10</b>	48-55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"

**Attachment 3: FIRE FIGHTING HAND TOOLS**

Hand tools are non-mechanical tools used by firefighters to build and hold a fire-line. Hand tools are used to clean fuels on a fire-line, which is a pathway around the perimeter of a fire. When a flaming fire reaches a fire-line it runs out of fuel to burn and, under the right conditions, is reduced to a smoldering phase until all available fuel burns up or firefighters cool and/or smother the remaining flames. It is not expected that SCRRRA employees and contractors will engage in fighting a large fire. However, these tools are to be used to clear areas prior to performing hot work, and to immediately extinguish brush or other fuel that has been ignited by sparks or flames from SCRRRA hot work operations.

Hand tools have various uses and many have multiple functions. The general categories of hand tools are: burning, swatting, scraping, chopping, or grubbing. Below are brief descriptions of the hand tools listed in the following table. An asterisk (\*) indicates required equipment. A double asterisk (\*\*) indicates alternative to required equipment.

<u>Description</u>	<u>Photo</u>	<u>Description</u>	<u>Photo</u>
Firefighting Shovel*		Council-type Fire Swatter Flap	
Firefighting Broom		McLeod-type rake*	
Council-type Rake** (Alternate to McLeod Rake)		Fire Rake	
Pulaski		Brush Axe	
Double Bit Axe		Single Bit Axe	
Hazel Hoe		Bush Hook	
Smith Indian Fire Pump 5 gallon*		Kestrel 4300 Construction Weather Tracker* (or equal)	

**ATTACHMENT 4: USFS FIRE DANGER ADJECTIVE CLASS RATING**

The adjective class rating is a method of normalizing rating classes across different fuel models, indexes, and station locations. It is based on the primary fuel model cataloged for the station, the fire danger index selected to reflect staffing levels, and climatological class breakpoints. This information is provided by local weather station managers.

Several factors in this Fire Risk Assessment are also part of the fire danger class rating, including elevation, temperature, wind speed and humidity. The fire danger class rating is also considered independently in determining the overall Fire Risk Assessment.

<i>Fire Danger Rating and Color Code</i>	<i>Description</i>
Low (L) (Dark Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands will burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Light Green or Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.