



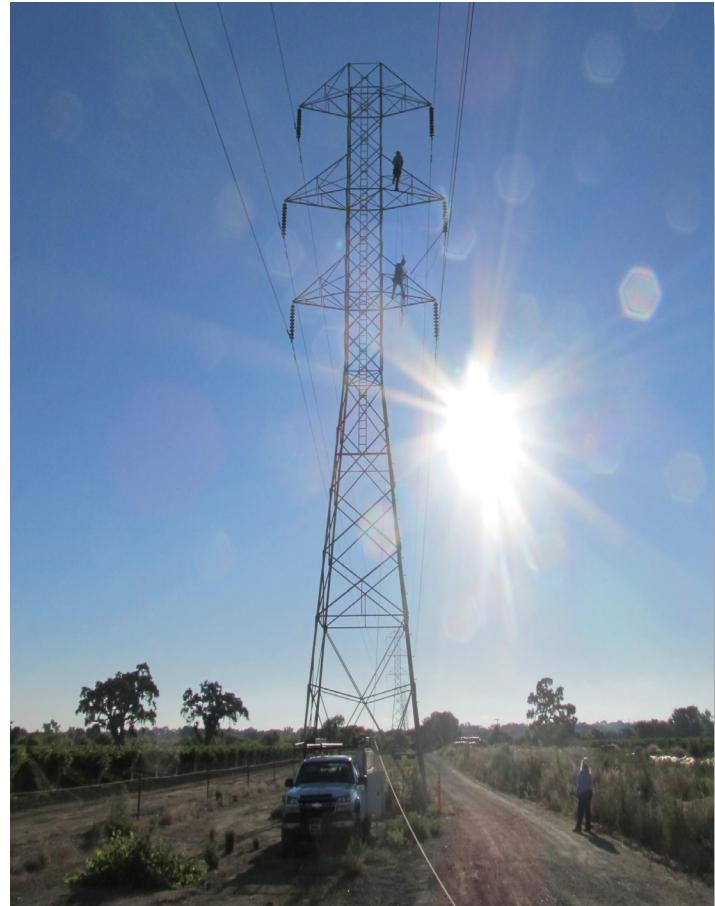
# High Voltage Power Line and Facility Right-of-Way Safety Guide

The San Francisco Public Utilities Commission (SFPUC), operator of the Hetch Hetchy Regional Water System, is a regional water and power provider. The SFPUC owns and operates transmission lines adjoining or adjacent to your property. The property occupied by this transmission line is held in fee or in some cases by easement and is referred to as the SFPUC right-of-way (ROW). Within this ROW, the SFPUC constructs, operates and maintains system facilities. Hetch Hetchy Water and Power (HHWP), a division of the SFPUC, is required to keep the ROW clear of all structures, fire hazards, vegetation and any other use that may interfere with the reliable operation and maintenance of our facilities.

## General Safe Practices

We are providing information on safe practices in order to help avoid serious accidents involving power lines and other facilities. There are many elements to consider when determining safe practices, therefore the following should not be regarded as all-inclusive but rather as addressing typical conditions.

Electrical contact between an object on the ground and an energized power line can occur even though there is no direct contact. **The best practice is to avoid bringing yourself, or any object you are holding, too close to an overhead power line.** In other words, do not lift, elevate, build or pass under a power line with any object, large equipment (harvesting combines, cranes, derricks and booms) or vehicle that could come close to the energized wires. Minimum "Safe Clearances", organized by operating voltage, are specified by Cal/OSHA, California Public Utilities Commission General



Order 95 and the National Electrical Safety Code (NESC). For the appropriate clearances related to HHWP facilities, it is best to assume you are working near energized 230,000 volt transmission lines.

## Possible Shock Hazards

Electrical shock hazards can occur when touching transmission towers or metallic objects such as vehicles, fences, metal buildings or roofs and nearby irrigation systems near the high voltage power line. The risk of an electrical shock can be minimized by using proper grounding methods and/or relocating objects away from the high voltage power lines and facilities.

The severity of electrical shocks can vary in sensation from something similar to a shock you might receive when you cross a carpet and then touch a door knob to touching the spark-plug ignition wires on your lawnmower or car. The electrical shocks, however, would be continuous as long as you are touching the metallic object.



If you cannot meet the restrictions listed in this safety guide or if you have any questions, please call us at 209-989-0618.

## Tower and Power Line Safety

- Do not climb or allow children to climb on towers, utility poles, power lines, or trees near power lines.
- Stay away from towers, power lines and substations during extreme windstorms, thunderstorms, ice storms or under other extreme conditions.
- NEVER touch or go near a fallen power line or try to rescue someone in contact with a power line.

## Underground Pipes, Telephone Cables and Electrical Cables

Underground pipes and cables may be compatible with power lines provided installation and maintenance are done properly. Though not visible above ground, HHWP has grounding systems that run both parallel and/or perpendicular to the power lines within the ROW. Dangerous voltage can be induced on underground piping or cable system, thus proper location and positioning of underground facilities is required to avoid serious accidents. **Contact HHWP to submit an application for installing underground utilities within the ROW.**

## Irrigation Systems



All types of irrigation systems have been operated safely near HHWP power lines for years. Nonetheless, caution should be used in storing, handling and installing irrigation pipe, and operating spray irrigation systems near power lines. To avoid electrical contact with power lines, two very important safety practices should be observed at all times:

- Maintain equipment in a horizontal position to keep it away from overhead wires.
- Electricity can be conducted through water so never allow the irrigation system to spray onto towers, power lines and other facilities.

In addition, central pivot circular irrigation systems installed near or under power lines can develop hazardous shock potential during operation and maintenance. To minimize these hazards:

- Provide an appropriate electrical ground for the pivot point.

- Do not touch the sprinkler pipe or its supporting structures when the system is operating under, parallel to, or near a tower or power line.
- Always perform repairs/maintenance of the system with the sprinkler pipe perpendicular to the power line.

**Contact HHWP to submit an application for installing new underground irrigation systems within the ROW.**

## Buildings

HHWP prohibits buildings within the ROW. This voltage often travels through the building's plumbing, electrical service, metal sheeting or metal frame. Electrical shocks are possible if the building does not have appropriate grounding. It is highly recommended that the appropriate grounding be designed and installed by qualified individuals on buildings near a power line when:

- The building is within 100 feet of the outside wire;
- The building has more than 2,000 square feet of metal surface and is within 100 to 150 feet of the outside wire; or
- The building is used to store flammable materials and is within 250 feet of the outside wire.

**HHWP can provide information to assist with this design.**

## Fences

HHWP strongly discourages locating fences within the ROW as they can cause a potential safety hazard and an access problem (particularly in high-density subdivisions). Barbed wire and woven wire fences on wood posts can assume an induced voltage when located near power lines. The risk of electrical shock can be minimized using proper grounding methods and/or relocating fences away from high voltage power lines and facilities. It is highly recommended that the appropriate grounding be designed and installed by qualified individuals. **Contact HHWP to submit an application to place a fence on the ROW.**

## Vehicles

Under some high voltage lines, vehicles can collect an induced voltage. This is particularly true if the vehicle is parked on a nonconductive surface such as asphalt or dry rock. To minimize damage or injury by this induced voltage, park your vehicle away from the high voltage power line. HHWP has specific restrictions for roads within the ROW and for parking near high voltage power lines to minimize possible shocks. **Contact HHWP to submit an application before locating roads and parking areas within the ROW.**

Due to the fire hazard from sparks, storage of fuel tanks and refueling vehicles is never allowed within the ROW.

## Lightning

Lightning will usually strike the highest nearby object, which might be a tower or power line. Transmission facilities are designed to withstand lightning strikes by channeling them to ground at the tower. Lightning is dangerous if you are standing near where it enters the ground. Play it safe and stay away from power lines and other tall objects during electrical storms.

## Fires



*Burning on the ROW is not allowed.*

If you obtain a burn permit for your property, this permit does not authorize you to burn on HHWP fee owned land. HHWP does not permit burning within the ROW. A fire burning under a power line can create a dangerous situation. Smoke and hot gases from a large fire can create an electric path between the power line and nearby objects, endangering you and your property. Stay away from power lines if a fire is nearby. Field burning and other large fires in and around power lines can damage power lines and cause power outages. Water and other chemicals used to extinguish those fires should never be directed toward a power line. **Contact HHWP if you need to burn near a ROW.**

## Climbing

Climbing on power line towers or guy wires can be extremely hazardous. Do not do it under any circumstance. It is dangerous and illegal.

## Tall Objects

Temporary or permanent facilities within the ROW such as light standards, signs, above-ground utilities, etc., can create unsafe situations when constructed too close to HHWP power lines and structures. In addition, large equipment or tall vehicles could exceed Safe Clearance and come close to energized wires (such as harvesting combines, cranes, derricks, booms, dump trucks, etc.).

Permissible heights for such facilities can vary depending on site specific conditions. If you plant, dig or build within the ROW an application is required. **Contact HHWP to apply for these uses.**

## Pools

HHWP does not permit the building of swimming pools within the ROW because it impedes our ability to operate and maintain the power line and presents a potential safety hazard to the public. Hazards range from possible electrical contact with the wires (with pool skimmers or rescue poles, for example) to dangers that can be encountered during and after lightning strikes on transmission facilities.

## Pacemakers

Under some circumstances, voltages and currents from power lines and electrical devices can interfere with the operation of some implanted cardiac pacemakers. However, we know of no case where a HHWP line has harmed a pacemaker patient.

As a precaution, people who may have reason to be near high voltage facilities should consult with a physician to determine whether their particular implant may be susceptible to power line interference. If a person with a pacemaker is in an electrical environment and the pacemaker begins to produce a regularly spaced pulse that is not related to a normal heartbeat, the person should leave the environment and consult a physician.

## Trees

No tree cutting should be done within any ROW except by qualified individuals, following state and federal minimum safe clearance guidelines. Tree cutting near power lines can be very hazardous and requires special caution. Since trees conduct electricity, if one should fall into or close to a power line, the current could follow the tree trunk to the ground and endanger anyone standing near its base. Here are two simple rules:

- NEVER touch a tree that has fallen into a power line.
- If you accidentally cause a tree to fall into a power line, run for your life! Do not go back to retrieve your saw or equipment. Call HHWP or your local fire department immediately. If you have trees either on or close to the ROW that need to be cut, **contact HHWP**. It is unsafe to do it yourself.

**Contact HHWP if you plan to plant any trees in the ROW.**



*A dangerous situation to be avoided.*

## Explosives

Explosives can not be detonated within the ROW. Do not use electric detonating devices when blasting within 1,000 feet of a power line. Use of non-electric methods of detonation will avoid the danger of accidentally discharging an electric blasting cap due to induced voltages from energized transmission facilities.

## Kite Flying and Model Airplanes

HHWP strongly discourages anyone from flying a kite, mylar balloon or model airplane anywhere near a power line. The electricity from the line can travel through the string or hand line and electrocute the person on the other end. If your kite or model airplane is about to touch a power line, drop the string or hand line instantly before it touches the line. Do not try to pull the kite or airplane down or climb up after it. Call the nearest fire department or HHWP at 209-989-2199.

## Vandalism, Shooting and Trespassing

People entering high voltage electrical facilities, such as substations and power line ROWs, with the intent of vandalism or theft, run the risk of serious injury or death. Discharging a firearm at or near a transmission facility is illegal and can cause flashovers and subsequent damage, risking injury to anyone nearby.

Removal of equipment from substations or power line facilities can result in unsafe operating conditions and put people nearby at risk of serious injury or death. Those who cause willful damage to HHWP transmission facilities or associated property can be prosecuted by the federal government, the property owner, or both. Willful damage includes:

- Discharging a firearm at or near power lines, transmission towers or substation equipment.
- Dumping any waste or material on HHWP property.
- Vandalism to HHWP property, buildings and vehicles.
- Theft of HHWP equipment, supplies, tools or materials.

**Please report emergencies to HHWP facilities at  
209-989-2199.**

## Contact HHWP

For all permits, applications and questions, call **209-989-0618**.

For emergencies and to report suspicious activities, **broken, damaged transmission facilities or abnormally low-hanging power lines** call **209-989-2199**.



*Storing or dumping material on the ROW is not allowed.*

**Acknowledgements:** HHWP would like to thank Bonneville Power Administration for providing many contributions to this document.



Services of the San Francisco Public Utilities Commission

**Please call the HHWP ROW Group at (209) 989-0618 before using or working on SFPUC Lands or ROW.**