



SFMTA Electrical Work Review

(THIS IS NOT A CLEARANCE PERMIT. CLEARANCES ARE ISSUED BY TMC)

	Yes	No
Will any personnel, vehicle, structure, crane, or equipment be within ten feet or have the potential to be within ten feet of the SFMTA Overhead Lines/ Overhead Contact System (OCS)?		
Are you organizing a Public Event such as parade or protest that will be under or near the OCS? If yes, what is the expected crowd size?		
Will you be constructing tents, booths, banners or other structures underneath Overhead Lines that are higher than seven feet off the ground?		
Will this work require grounding the overhead? If yes, see question below.		
Who will be placing the grounds? Write "N/A" if not applicable. X _____		
Is the Worker-in-Charge electrically qualified to establish a safe work space in accordance with NFPA 70E, or will they be working with an electrically qualified worker?		
Is the Worker-in-Charge aware of SFMTA Electrical Clearances procedure and the rules regarding establishing working limits?		
Will the Worker-in-Charge be on-site and available at the number listed for contact while the electrical clearance is active?		
Will crew members be made aware of the electrical hazards and trained on procedures for working near the OCS?		
Will you be excavating, digging, or potholing into the street or rail side surface?		
Will you be or have you requested an 811 North USA Ticket?		
Will you be cutting into SFMTA railway track?		
Will you be accessing an SFMTA manhole or shared Manhole with SFMTA Traction Power Cables? If yes, please fill out a Manhole Access Notification		
Will the Worker-in-Charge verify all personnel, equipment, structures and grounds are clear of the overhead before 'Reporting Off' the clearance to the Power Control Center?		
Will you be paving on or near SFMTA manholes?		
Will you be using SFMTA poles or catenary wires to support a new weight bearing permanently installed equipment or wires?		
Have you received approval for a modification to Transit Service such as a Diesel Bus Substitution or early transit line shutdown? If yes, please provide the details.		
Will you be installing or replacing OCS components or otherwise working directly on the OCS system?		



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Are you requesting a portion of the OCS or its support structure be modified or removed?		
Will you be adding, removing or reconfiguring the OCS in a way that will change the feeder layout?		

SFMTA Electrical Clearance Reference Information

This information contained here is specific to SFMTA electrical clearance procedures. It is not intended or sufficient to qualify a worker as 'electrically qualified' to operate near hazardous energy. Nor does it supersede or replace any city, state or federal safety restriction or procedure.

Clearances are dictated by SOP R.OC.PR.003 Permit and Clearance. Permit holder should have reviewed and be familiar with these contents.

Traction Power Electrical Hazards

- The Traction Power System has hazardous energy in the form of more than 600 Volts Direct Current (DC) that travels on uninsulated copper wires suspended from an Overhead Catenary System (OCS).
- More than 600 Volts DC is also present in 'risers' that connect underground cable to the overhead, underground feeder cable in duct banks and service manholes throughout the city.
- SFMTA Traction Power Substations are powered by primary 12,000 Volt AC feeds from PG&E that are contained in underground duct work and on PG&E overhead wires.

Catenary Systems

- Only qualified electrical workers can safely determine what portion of the OCS contains hazardous energy. Until that determination has been made, assume all wires and conductors are energized.
- All sections of the overhead, risers, switchgear and underground feeder cables, and negative returns should be assumed to contain hazardous energy until measured dead by a calibrated, verified and properly rated voltmeter and grounded by a qualified electrical worker wearing proper PPE. This is true both before and after an Electrical Clearance has been given by Power Control.

Electrical Clearances

- An approved Electrical Clearance is the official request to kill power to a section of the SFMTA Overhead Catenary System. Electrical Clearances are issued by the Transit Management Center (TMC).

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- The Traction Power Group (TPG) uses the electrical clearance procedure to disconnect the overhead catenary from its normal power source. These procedures do not remove all electrical hazards from a work site. The worker-in-charge is responsible for the safety of their work crews.
- Electrical Clearances must be implemented completely as written or not at all. For safety, Power Control will not issue a portion of or a partial clearance.

When do I need an Electrical Clearance?

- An electrical clearance is required anytime that a portion of the SFMTA Traction Power System will be de-energized. This could be to remove an electrical hazard to workers for planned maintenance or to the public for a special event.
- An electrical clearance is required when SFMTA employees and contractors are working within ten feet of the overhead, unless employees are qualified, authorized by SFMTA and properly equipped and trained to perform work on energized systems.
- This ten-foot restriction includes rotating construction equipment that has the potential to be operated within ten feet of the overhead.

What does an Electrical Clearance do?

- An activated electrical clearance is the official notification that a section of overhead catenary has been disconnected from its normal traction power source and will remain off as long as the clearance is in effect.

What does an Electrical Clearance not do?

- An electrical clearance does not remove all electrical hazards from the work site. (adjacent SFMTA feeder sections, underground cables, detached risers, PG&E wires, extension cords from work crews, negative return current, lightning, trains bridging overhead breakers, electrical induction, bleed-over through surface water layers, etc...). Workers in Charge must be electrically qualified, or working with an electrically qualified employee to identify and control all forms of electrical hazards.
- Workers in Charge have no guarantee of feeders being open unless the clearance is 'Reported On' and safe clearance from the Power Control Center is given.
- Electrical clearances do not replace electrical safety best practices and good work site hygiene.
- Unless grounds are applied, there may be residual voltage in the overhead lines. Power Control will issue clearances with as many as 50 volts residual voltages on the line. Voltage spikes higher than this may occur for a variety of reasons. If this presents an unacceptable hazard, breakers must be locked out and grounds must be applied.
- If you have not racked-out, tested and grounded the overhead, you must wear PPE as if the lines were energized.



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What is a Rack-out/ When do I need a Rack-out?

- A 'Rack-Out' is a process where a SFMTA technician mechanically separates contacts on a feeder breaker so that they cannot be close remotely.
- If you are grounding the overhead/underground, you are required to rack-out the breaker(s).
- If you are entering into a Lock-out Tag-out (LOTO) that requires an open breaker, you are required to rack-out the breaker(s).
- If you think you want a rack-out for some other reason, call 415 565-3140 for more information.

Can the SFMTA Traction Power Group do a LOTO for me?

- By definition, a LOTO can only be placed by the employees working near the potentially hazardous energy. SFMTA Traction Power can help identify sources of hazardous energy, rack out breakers and switches with an approved electrical clearance, and provide locking points on distribution equipment, but we cannot provide LOTO.

Coordinating a Rack-out

- If you have an approved electrical clearance that states 'Open With Rack-out', please call the Power Control Center (415) 554-9204 roughly 60 minutes before you will be 'reporting on' and 'reporting off' your clearance to confirm your clearance and to coordinate timing. This will ensure you have the longest work window possible.

'Reporting on' and Activating an Electrical Clearance

- The Worker-in-Charge (or Permit Holder) must 'report on' to the clearance AND be notified by the Power Control Center that the 'Safe Clearance' has been given. Until this happens assume the normal power source is still connected.
- When Activating an Electrical Clearance, the Worker in Charge should first call the TMC Clearance Desk (415) 565-3137. The permit holder will verify the clearance number and effected feeders.
- After calling TMC, the Worker in Charge calls Power Control at (415) 554-9204. The Worker in Charge verifies clearance numbers and effected feeders.
- If TMC and Power Control both approve the clearance, feeders will be opened without rackout or open with rack-out as indicated on an approved clearance from TMC. (no additions, subtractions or substitutions).
- Once the feeders are open, Power Control will issue 'Safe Clearance' to the Worker in Charge and ask for a four digit code. Assume all feeders are closed until power control requests and you give your four digit code.

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- After 'safe clearance' is given, the Worker in Charge will give Power Control their 'Four Digit Code'. This is a code created by the Worker in Charge to uniquely identify them. This cannot be repeating (4444) or sequential (5678)
 - A four-digit code gives the Worker in Charge confidence the feeders will not be closed until they have determined it is safe to do so. Power Control will not restore the feeders until the Worker in Charge calls with that specific four-digit code calls to report off.
 - If the Worker-in-Charge leaves, a new electrically qualified Worker-in-Charge must take over the new Worker-in Charge and hand off with the Power Control Center.
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- 'Reporting off' and Restoring an Electrical Clearance (when the work is done)
 - The Permit Holder must remove all LOTO equipment and verify all workers, equipment and grounds are removed from the work site prior to beginning the restoral process.
 - All workers should be notified that the clearance is no longer in effect before giving the four-digit code to Power Control. Once they have given Power Control their four-digit code, they should assume the Overhead may be energized at any time.
 - When 'Reporting Off' an electrical clearance, the Worker in Charge should first call TMC (415) 565-3137 to verify clearance number and effected feeders.
 - After talking to TMC, the Worker in Charge should call Power Control at (415) 554-9204 to 'report off'. They will verify clearance numbers and effected feeders. It must be the same person who reported on the clearance. Only the Worker in Charge with their four-digit code may report off. Do not give your four-digit code until all workers, equipment and grounds are removed and it is safe to restore power.
 - Power Control will notify Worker in Charge when system has been restored. Permit Holder should remain at the worksite until notified the system has been restored.

Grounds

- Regardless of who physically applied the grounds, the WIC is responsible to make sure they are removed before 'Reporting Off' the clearance. Leaving grounds on can create a public safety hazard or damage equipment and disrupt service. This is treated very seriously.
- Getting an electrical clearance approved does not mean a crew will be on-site to ground your circuit for you. The Permit Holder needs to coordinate who will be applying the grounds ahead of time.
- If a WIC has a question as to what are the procedures of the Power Control Center, or what steps Traction Power will be taking, it is their responsibility to request that information. Do not assume a step or procedure is taking place, especially if your crew's safety is on the line.



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- PCC is available to answer questions regarding the electrical clearance procedure at 415 565-3140 from 0630 to 1430 Monday to Friday.

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Maps

- Maps are representational in nature. They are not to scale, nor are connection points exact. They may not always reflect conditions in the field, and good electrical work practices should always be followed.

Workers-in-Charge

- Worker-in-Charge are responsible for the safety of their crews. If crews will be working near Overhead Lines, the WIC must be electrically qualified, or they must have someone onsite who is electrically qualified. WIC are responsible for establishing work limits, making sure crews are aware of electrical hazards, communicating with crews when safe clearance has been issued and removed, following safe electrical work practices, and are responsible for verifying grounds are removed before reporting off on a clearance.