Touch and Step Potential Testing
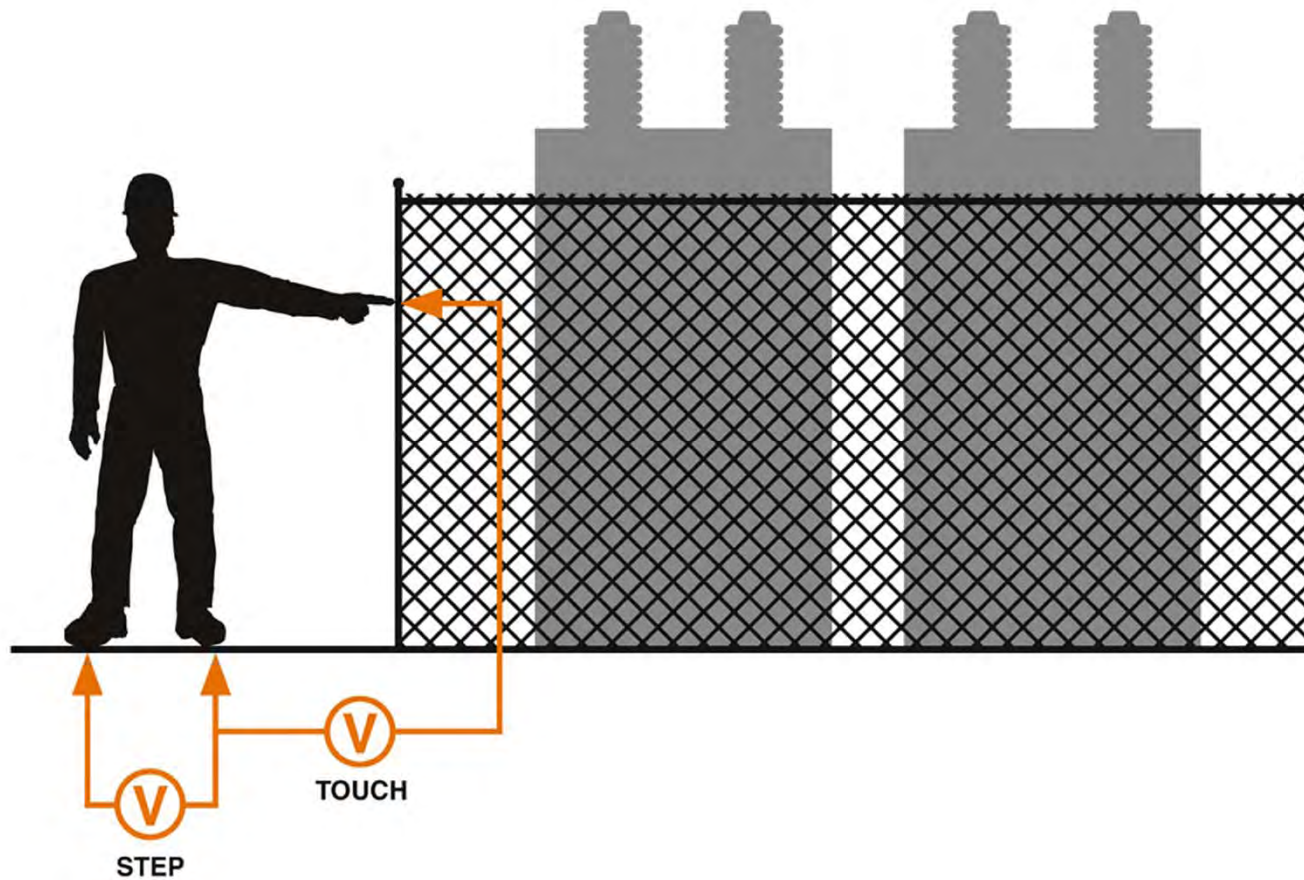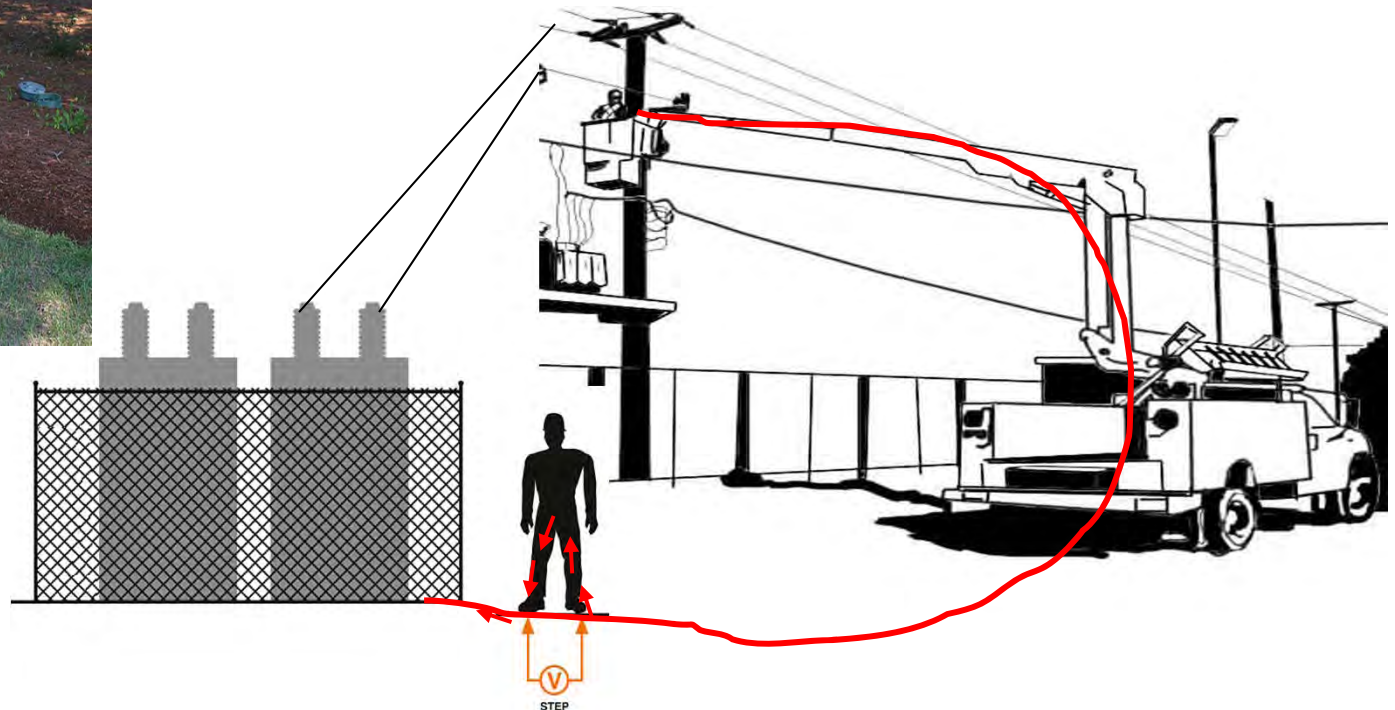

Step Potential

Touch Potential

The importance of testing and designing a low resistance grounding system
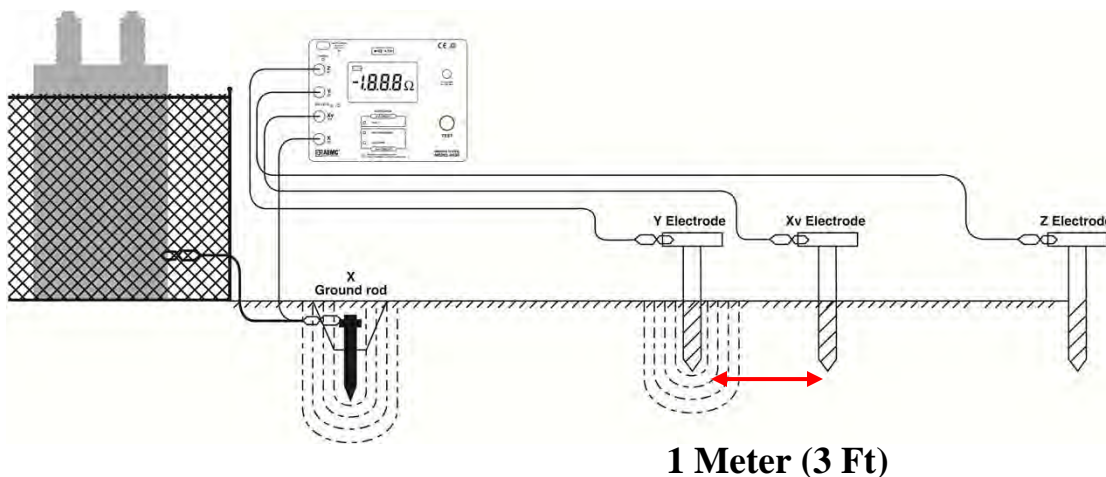
Touch and Step Potential

The importance of testing and designing a low resistance grounding system

Step Potential: Difference in surface potential experienced by a person's feet bridging a distance of 1 meter (3 feet) without contacting any other grounded surface.

Step Potential Test

1. **Connect the X lead to the grounding system**

2. **Insert the injector electrode at the approximate distance of the projected fault away from the grounding system and connect the Z lead to it**

3. **Insert two electrodes 3 feet apart (the distance of a human step) at the approximate location of the expected position of the person. All electrodes should be in a straight line.**

4. **Attach the Xv lead to the electrode closest to Z and the Y lead to the other electrode**

5. **Start the test and record the resistance reading**

6. **Determine the expected fault current and multiply it by the resistance reading to get the step potential voltage**

Example:

Resistance reading (R) = 0.5 ohms

Fault current (I) = 4000 Amps

Step potential (E) = R*I = 0.5*4000 = 2,000 Volts

-18.88 Ω

Y Electrode   Xv Electrode   Z Electrode

X
Ground rod

1 Meter (3 Ft)

# The importance of testing and designing a low resistance grounding system

Touch Potential: Potential difference between grounded metallic structure and the surface potential at the point where a person is standing, while at the same time having hands in contact with a grounded structure

Most Dangerous
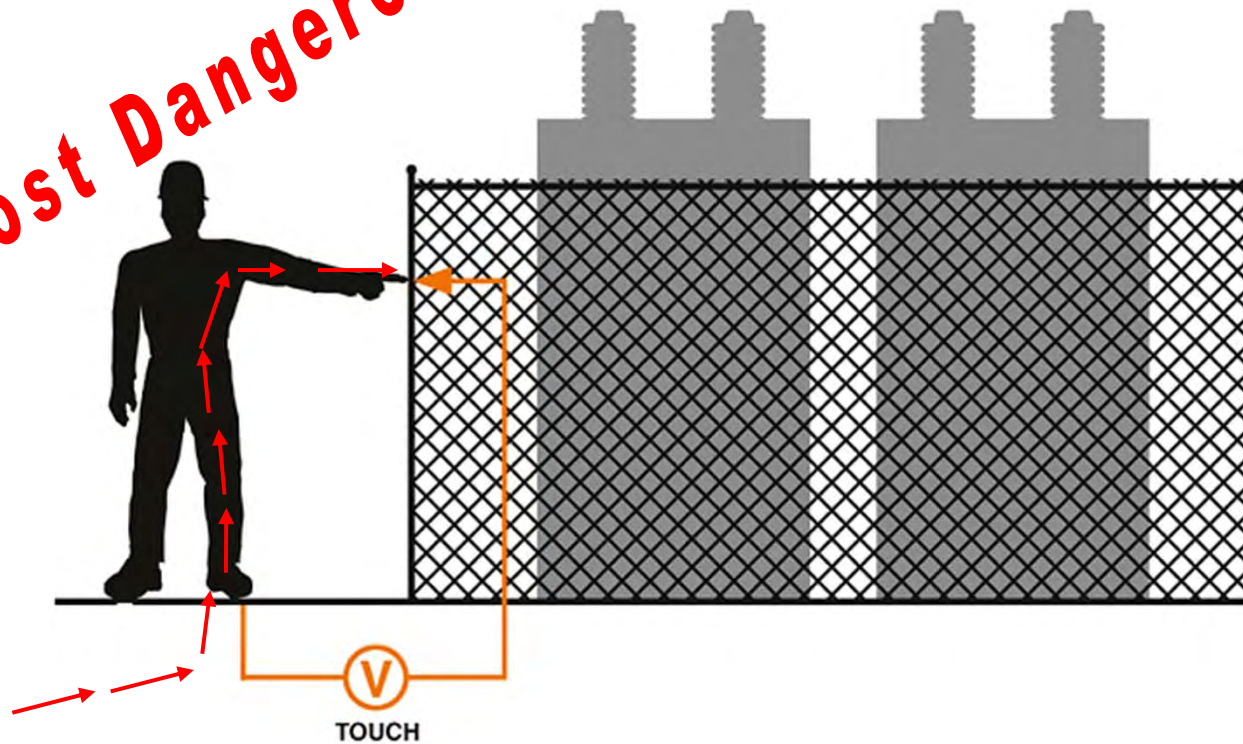
TOUCH

Touch Potential Test

1. **Connect the X and Xv leads to the metal object that would be touched**

2. **Insert an electrode approximately 1 meter (3 ft) from the object and connect the Y lead to it**

3. **Insert an electrode at the approximate location of the expected fault and connect the Z lead to it**

4. **Start the test and record the resistance reading**

5. **Determine the expected fault current and multiply it by the resistance reading to get the touch potential voltage**

Y Electrode

Z Electrode

1 Meter (3 Ft)
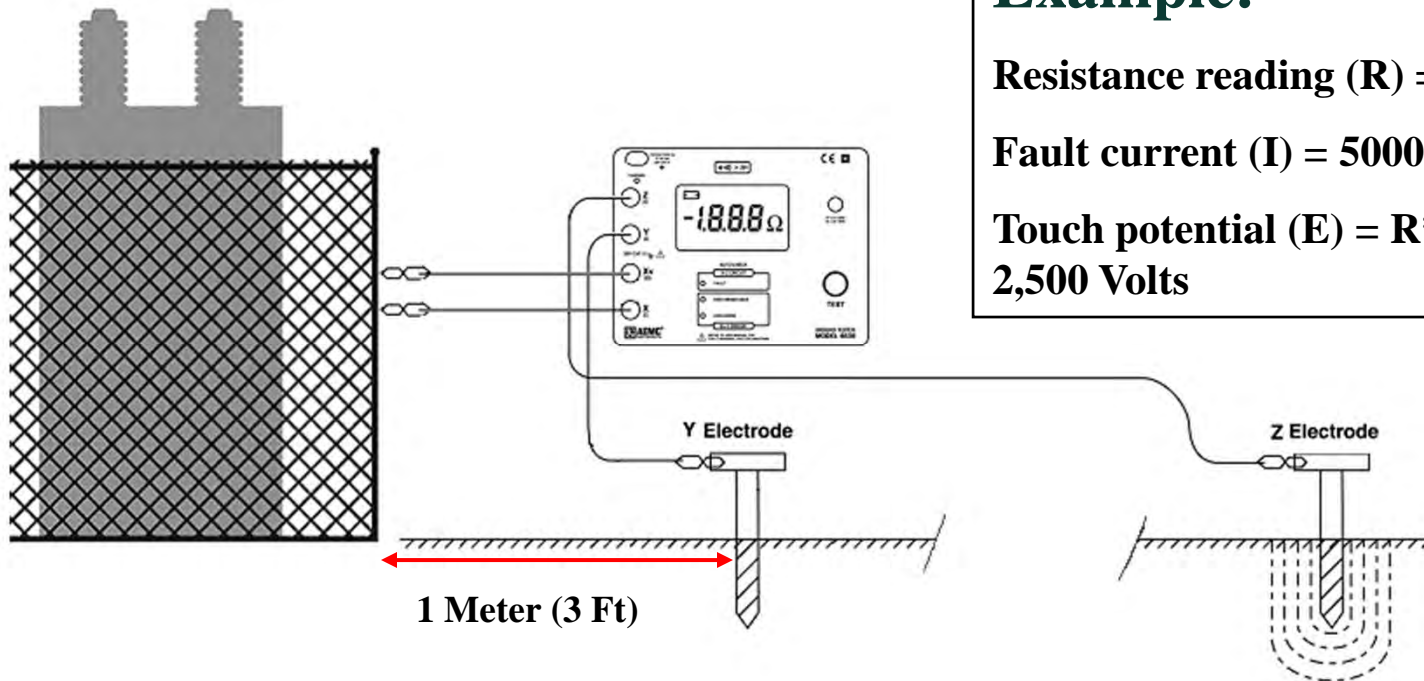
Example:

Resistance reading (R) = 0.5 ohms

Fault current (I) = 5000 Amps

Touch potential (E) = R*I = 0.5*5000= 2,500 Volts