

Job Hazard Analysis (JHA)

Task: Bonding and Grounding of Enclosures in the Telecom Industry

Risk Assessment Code (RAC) Legend

- **☒ Red (High Risk):** Unacceptable—stop work and implement controls before proceeding.
- **☑ Yellow (Moderate Risk):** Proceed with caution—implement and verify controls.
- **☐ Green (Low Risk):** Acceptable—maintain controls and continuous monitoring.

Overall Initial RAC for Bonding and Grounding of Enclosures Task: ☑ High Risk

Job Steps, Hazards, and Controls

Step No.	Task Description	Potential Hazards	Controls / Safe Work Practices	Initial RAC
1	Pre-job planning & scope review	Missing permits; incomplete prints; improper grounding plan	Conduct tailboard/JSA meeting; review grounding diagrams and prints; verify work area clearance with utility owners; assign stop-work authority.	☑
2	Material staging (ground rods, clamps, bonding straps, exothermic kits, PPE)	Struck-by shifting materials; trip hazards; improper storage	Store materials on stable ground; keep walkways clear; segregate conductive materials; maintain housekeeping.	☑
3	Traffic control setup (if roadside or aerial enclosures)	Vehicle strikes; inadequate signage; pedestrian exposure	Implement MUTCD-compliant traffic control; cones, barricades, signage; certified flaggers; ANSI/ISEA 107 high-visibility garments.	☑
4	Locating underground utilities before driving ground rods	Utility strike (gas, electric, telecom); electrocution	Contact 811/One-Call; pothole or vacuum-expose utilities before driving rods; maintain OSHA/NESC approach distances; stop work if unknown utilities are present.	☑
5	Driving ground rods (manual or powered driver)	Struck-by falling rods; noise/vibration; ergonomic strain	Use mechanical driver when possible; wear hearing protection; anti-vibration gloves; maintain exclusion zone around driving area.	☑

Step No.	Task Description	Potential Hazards	Controls / Safe Work Practices	Initial RAC
6	Exothermic welding or mechanical bonding	Burns; fire hazard; chemical exposure from welding materials	Use fire-resistant gloves and face shield; follow manufacturer instructions; have fire extinguisher on site; ventilate area; review SDS.	?
7	Connecting ground wire to enclosure	Electrical shock if enclosure is energized; pinch points	Test for voltage before contact; use insulated tools; wear gloves; follow NESC grounding standards.	?
8	Bonding metallic cable components (armor, shield, messenger)	Electrical shock; arc flash; improper bonding	Only qualified personnel bond cables; verify de-energization; wear arc-rated PPE if required; follow NEC/NESC guidelines.	?
9	Routing and securing grounding conductors	Trip hazards; loose conductors causing failures	Secure with approved clamps, staples, or brackets; avoid creating tripping hazards; keep away from sharp bends.	?
10	Verifying ground resistance	Exposure to energized testing equipment; inaccurate readings	Use calibrated ground resistance testers; wear insulated gloves; follow test procedures; record results.	?
11	Sealing and restoring enclosure after bonding	Pinched fingers; improper sealing	Use proper tools to tighten bolts/latches; wear gloves; ensure weather-tight seal.	?
12	Backfilling around ground rod (if excavation performed)	Cave-in; struck-by compaction equipment	Backfill in lifts; compact soil properly; use spotter when compacting with machinery.	?
13	Weather/environmental hazards	Lightning strikes during rod installation; heat/cold stress	Suspend work during storms/lightning; hydration/shade in hot weather; insulated PPE in cold.	?
14	Housekeeping and cleanup	Cuts from wire scraps; slips/trips from debris	Collect bonding wire scraps; coil unused cables; dispose of exothermic materials properly; sweep/clean site.	?
15	Removing traffic control & demobilization	Vehicle strikes during removal	Remove devices in reverse order; maintain flaggers until last cone is removed; final site walkdown inspection.	?
16	Documentation & turnover	Missing resistance test records; improper grounding logs	Record resistance measurements, enclosure ID, and bond locations; photograph installations; update as-builts; submit QC documentation.	?

PPE Requirements

- **Head/Face/Eye:** Hard hat (ANSI Z89.1); safety glasses (ANSI Z87.1); face shield when exothermic welding.

- **Hearing:** Hearing protection when driving rods or near noisy equipment (>85 dBA).
 - **Hands:** Cut-resistant gloves for cable/strap handling; fire-resistant gloves for exothermic welding; insulated gloves when near energized equipment.
 - **Feet:** Safety-toe boots with slip-resistant soles.
 - **High-Visibility Apparel:** ANSI/ISEA 107 Type R, Class 2 (day) or Class 3 (night/high-speed).
 - **Fall Protection:** Required if working at heights (aerial enclosures or pedestals on poles); use 100% tie-off.
 - **Respiratory:** Dust mask when excavating in dry soil; respirator if fumes from welding in confined space.
 - **Weather-Specific:** Rain gear, thermal PPE, UV/sun protection as applicable.
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Regulatory & Industry Practice Alignment (summary)

- **OSHA:** 29 CFR 1926 Subpart E (PPE), Subpart K (Electrical), Subpart N (Cranes/Hoists/Rigging when lifting rods/equipment), Subpart P (Excavations if trenching), Subpart M (Fall Protection), Subpart Z (Hazardous Substances—welding materials, fumes).
- **NIOSH:** Best practices for electrical hazard prevention, noise/vibration exposure from driving rods, and chemical exposure controls for exothermic welding.
- **ANSI/ISEA:** ANSI/ISEA 107 (high-visibility apparel), ANSI Z87.1 (eye protection), ANSI Z89.1 (head protection), ANSI Z359 (fall protection).
- **NESC:** Requirements for bonding/grounding metallic cable sheaths, messenger strands, and enclosures; separation from power utilities.
- **MUTCD:** Traffic control standards for roadside grounding/bonding operations.
- **NEC (NFPA 70):** Compliance for grounding/bonding methods and testing.