

The
Job Description
* **for** *
Journeyman (Outside) Lineman

**ESSENTIAL DUTIES AND TASKS
PERFORMED BY
JOURNEYMEN (OUTSIDE) LINEMEN**

S169/496

Job Description for Outside Linemen

The duties of an outside lineman are listed below. The number in brackets next to the duty is the average of the percentage of journeymen reporting that they perform each task within the duty. Tasks within each of the duties are included in the job description if they were performed by at least 10 percent of the journeymen surveyed. Tasks are described as *daily*, *weekly*, *monthly* or *occasionally* based upon the responses of a majority of journeymen in the position. Tasks that were rated between *very and extremely* important by both journeymen and training directors and instructors have an asterisk.

I. Planning and Initiating Project [87%]

- Daily* When planning a new project, an outside lineman must study blueprints and specifications.* The lineman establishes work areas. He or she assembles tools and equipment. Materials must be loaded, hauled and unloaded at the job site.
- Weekly* Materials and supplies must be ordered to complete the job. It may be necessary to obtain clearances, such as for digging.*
- Monthly* The lineman coordinates tool requirements with the contractor and the job schedule with other crafts. At times, the lineman establishes timetables and/or progress charts for completion of the work.
- Occasionally* A lineman may be required to set up a temporary construction trailer or other control center at the site.

II. Establishing OSHA and Customer Safety Requirements [81%]

- Daily* A lineman must use proper tools and equipment in order to perform work safely.* The lineman must inspect and maintain personal protective equipment.* The lineman installs protective devices when working with live conductors.* A lineman may need to keep the public away from the working area.*
- Weekly* A lineman must review customer safety requirements in order to develop an on-site safety program.* Job-site safety meetings are conducted at least once a week.* A traffic control plan may need to be set up and maintained.*
- Monthly* A lineman must review applicable OSHA safety standards.* Materials data safety sheets must be reviewed for materials used on the job.
- Occasionally* At times a lineman is required to administer first aid to an injured victim.* The lineman may need to perform an emergency rescue or administer CPR to a victim.*

III. Setting of Towers, Poles and Construction of Other Devices to Hold Electrical Wiring [81%]

Daily A lineman frequently digs holes for poles or towers using power equipment, such as an auger or power borer.* The pole must be set at the proper depth.* After the pole is set, the lineman must determine if the pole is properly aligned.* If it is, the lineman will backfill the hole with dirt and tamp the ground around the pole. The lineman must frequently install ground wires on poles and/or ground rods. When installing a new crossarm, the lineman must measure and mark the correct place for drilling holes, drill the holes to place the crossarm and then place the crossarm in the correct position. The lineman may install a brace for the crossarm if needed.

Weekly A pole or tower needs to be transported to the site. The pole is moved to the hole where it will be set. The lineman must determine whether a guy wire is needed. If so, the length and location of the guy wire is determined.* The lineman constructs the guy wire. The guy wire is secured by digging it in with a power-drive screw. A structure for a tower must frequently be assembled on the ground before being raised for installation. Before installing new equipment, a linemen must frequently remove the old or damaged pole or crossarm.

Monthly At times a lineman may need to dig a hole with a shovel or other hand tools, rather than using power equipment.

Occasionally Journeymen linemen may need to perform a number of tasks before a pole or tower can be set or built. These include: locating and staking lines for new tower construction, clearing right of way for the line, building right of way roads to the work site, building stream crossings, and/or building a landing at the site to accommodate digging and setting equipment. Sometimes a lineman may secure the guy wire for a pole by digging in the anchor by hand.

Lineman may need to perform the following steps for preparing footings for a tower: building rebar cages for footings, prefabricating lattice footings, and building wood or metal forms for the above ground part of the concrete footer. When complete, the lineman installs footings for the tower. The linemen erect the tower and secure it to the footing,* pouring cement for the foundation if needed. *Occasionally*, the lineman must ream or drill holes that may be misaligned. *Occasionally*, the lineman may install push poles or pole keys. Lineman may need to erect a reinforcing steel or wooden structure. A steel tower may need to be put together using a hydraulic press. When the structure is complete, the lineman may paint the towers and/or other equipment. When a pole is set, the lineman may roof it.

IV. Establishing Work Position for Maintaining and Repairing Overhead Distribution or Transmission Lines [91%]

Daily Before climbing, a lineman should inspect a pole for unsafe conditions, such as rotted places, knots, and loose steps.* The lineman climbs poles to reach distribution or transmission lines.* A bucket truck may be used to reach the lines instead of climbing.* The lineman sets up a hand line for tools and equipment. Grounds and insulating devices are installed on the line before beginning work.*

- Weekly* In an urban area, a lineman may need to establish a traffic control system. He or she may operate a platform to reach distribution or transmission lines. It may be necessary to float wire out with hot sticks or hot arms to establish a work area.*
- Occasionally* At times, a lineman is required to climb a metal or concrete tower to reach distribution or transmission lines. The lineman may have to position a hook ladder to work on transmission lines.

V. Stringing New Wire or Maintaining Old Wire [93%]

- Daily* A lineman installs ground wires.
- Weekly* Old wire must be inspected for problems that might require new wire. Travelers or stringing blocks are put up to prepare for stringing wire.* A lineman runs an initial rope line through the travelers or blocks. Traveling grounds must be installed, as well as truck and equipment grounds.* Insulated protective devices are positioned on energized conductors close to the new conductor being installed.* Temporary jumpers may be put on the wire in order to maintain service while working.* New wire is pulled in.* The lineman sets the proper sag on the wire.* The wire is secured by deadening or clipping.* The lineman splices wire if necessary.* Permanent jumpers may be installed.*
- Monthly* Travelers may be secured where wire may float. The lineman determines the length of wire pulls,* sets up pulling and tensioning devices,* and checks the tension. Communication must be established between the puller, the tensioner and others involved in pulling in new wire.*
- Occasionally* Guard structures may be established around roads, railroads and power lines.* The lineman may install dampers on the wire or spacers between the conductors. The lineman checks for low ground resistance. A "deadman" may be installed as an anchor for the transmission wire.

VI. Installing and Maintaining Insulators [91%]

- Daily* A lineman inspects insulators for defects. New insulators are installed to replace old or damaged ones. The conductor is secured to the new insulator using tie wire, armor rods, and/or shoes.* A lineman selects the appropriate insulator for the voltage.* The conductor must be removed from the insulator and secured while cleaning is being done.*
- Weekly* The lineman prepares the insulator for installation by cleaning. The lineman removes the defective insulator.
- Monthly* After installation a shoe may be installed on the bottom of the insulator.
- Occasionally* A lineman may wash insulators on existing lines.

VII. Installing and Maintaining Transformers and Other Equipment [96%]

Weekly A lineman selects the transformer based on the proper primary and secondary voltage rating, kVA rating, polarity, and impedance.* The lineman must also determine the correct transformer connection* and the proper fuse rating.* The lineman drills holes in the pole or crossarm for securing the transformer. The old transformer is removed and returned to the ground. A new transformer is hoisted into position. The new transformer is installed by the lineman.* Lightning protection devices are positioned to protect the transformer.* Disconnects are installed.*

Occasionally A lineman may install voltage regulators, capacitors or sectionalizers.*

VIII. Supervising Journeymen and Apprentices [92%]

Daily On a daily basis, a lineman assigns tasks to personnel, including apprentices.* Tasks must be reviewed to determine personnel scheduling.* A journeyman is required to supervise worker performance and provide feedback.* The journeyman may need to teach an apprentice a new task by explaining or demonstrating.* The apprentice's performance must then be observed and feedback given.*

The following duties are an important part of the work of a lineman, but are not performed as frequently as those duties already described. The duties are listed in order of the frequency with which they are performed.

IX. Installing, Repairing and Maintaining an Underground Electrical Distribution System [69%]

Occasionally A lineman designs the distribution layout of the underground system. Previously buried cable must be located if present.* A lineman builds manholes for present and future needs. A lineman lays out trenches to hold the conduit. The lineman must calculate the necessary bends, saddles and offsets needed to install the conduit. The conduit is cut to fit and bent to the necessary shape. The inside is filed to make it smooth and threaded if necessary. The lineman digs trenches for the conduit or coordinates trench excavation performed by others. The trenches must be graded and leveled. The lineman installs raceway supports and lays the conduit in the trenches with spacers if needed. The conduit is connected by screwing pieces together or using connectors. If necessary, the conduit is swabbed to clean it. The conduit must be secured and reinforced. The lineman pours concrete over the conduit in the trenches and backfills the trench with dirt or other materials.

Sectionalizing vaults and switches may be placed to meet load interruption needs.* Buss bars can be installed in the vault. The lineman installs fault indicators. Transformers may be installed on a pad or below the ground. Vaults and cabinets may be rigged for cable pulls. The cable is pulled by hand or machine.* Cable is spliced if necessary* and the necessary terminations made.* The cable is tagged for identification* and grounded.* The lineman may install stress cones,* pothead,* or anodes. After installation is complete, the cable must be tested and hipoted.*

If an outage occurs, the lineman troubleshoots the system to determine the location of the problem.* A faulted cable may be located by radar, thumper or arc reflection.*

X. Assembly and Erection of Substations [65%]

Occasionally A lineman reads blueprints to determine plans for the substation.* The location of grounding conductors and connections must be laid out. The lineman digs trenches for the grounding conductors or coordinates trench excavation by others. After placing the ground conductors and connections, the lineman welds or mechanically connects the conductors.* The grounding system is tested.* If successful, the area is backfilled with dirt.

A lineman lays out trenches for the conduit for the substation. The lineman must calculate the necessary bends, saddles and offsets needed to install the conduit. The conduit is cut to fit and bent to the necessary shape. The inside is filed to make it smooth and threaded if necessary. The lineman digs trenches for the conduit or coordinates trench excavation performed by others. The trenches must be graded and leveled. The lineman installs raceway supports and lays the conduit in the trenches with spacers if needed. The conduit is connected by screwing pieces together or using connectors. If necessary, the conduit is swabbed to clean it. The conduit must be secured and reinforced. The lineman pours concrete over the conduit in the trenches and backfills the trench with dirt or other materials.

Before building the substation structure, the lineman prepares concrete footings. The steel, aluminum or wood parts to the structure are assembled and welded together. Buss bars are built as needed.* The lineman may install a large transformer, including setting the transformer and making the necessary terminations.* Oil or gas may be added to the transformer.* Other equipment may be installed in the substation, including: insulators, circuit breakers,* capacitors,* circuit switches,* disconnect switches,* high-voltage fuses,* and voltage regulators.* All structures must be grounded to the grounding field.* The lineman hipots the conductors and equipment.*

When the substation is complete the lineman grades the yard and covers it with gravel. Fences, gates and warning signs can then be established.

XI. Installing, Maintaining and Repairing Traffic or Train Signals and Outdoor Lighting [56%]

Occasionally When installing outdoor lighting and signals, the lineman must follow blueprints that show where equipment is to be located.* A lineman lays out trenches for the conduit. The lineman digs trenches or coordinates trench excavation performed by others. The trenches must be graded and leveled. The lineman installs raceway supports and lays the conduit in the trenches with spacers if needed. The conduit must be secured and reinforced. A hole must be dug for the lighting base. A lineman may form the base for the pole, including assembly of reinforcing steel. The base may then be poured with concrete and finished. When the base is finished it may be backfilled and compacted.

The lineman may assemble poles and other hardware, as well as the lighting fixture or traffic light. After the fixture is attached to the pole, the pole can be set and leveled. When the pole is set, it is attached with anchor bolts. Cable can then be pulled and terminated.

For traffic signals, the lineman must cut sensor loops in the asphalt and place sensors in the road. Control cabinets must be established and the traffic or signal controller programmed.* After installation is complete, power can be connected and tested.*

XII. Tree Trimming [50%]

Occasionally The lineman examines the tree to be trimmed to decide how pruning will be done. The position to trim may be achieved through climbing the tree using a safety belt* or positioning the bucket truck to reach the tree. Branches are cut. The lineman may apply paint and/or herbicides, fungicides and pesticides to protect the tree wound. After trimming is complete, the lineman disposes of brush and branches.

Use of Tools

Outside linemen use a broad array of tools. Using the same procedures as above, we classified tools by frequency in the same manner.

Daily **Hand tools:** plumb bob, pliers, needle nose pliers, slip joint pliers, hammer, wire cutters, screw driver, measuring tape, ruler, socket set, wrench, crimping tools, hand drill, shovel, ladder, knife, tamp tool, hoist cum-a-long.

Power-assisted tools: hand drill.

Meters: voltmeter.

Heavy equipment: bucket truck, auger.

Climbing tools: gaffs, safety belt, body belt.

Hot sticks: switch stick, universal "gripall" stick (shot gun).

Weekly **Hand tools:** file, allen wrench, hacksaw, handsaw, block and tackle, ladder.

Power-assisted tools: electric saber saw, electric roto hammer drill.

Meters: ammeter.

Monthly **Hand tools:** level, fish tape, pipe wrench, wire stripper.

Power-assisted tools: roto stripper, wire tugger.

Heavy equipment: crane.

Hot sticks: auxiliary arm, insulated tension link, tie stick, link stick.

Occasionally **Hand tools:** punch, fuse pullers, clamps, torque wrench, architect scale, keyhole saw, wood chisel, hand bender, transit, adapter cables, hand reamer, knock out sets, awl vise, caliper.

Power-assisted tools: soldering iron, drill press, gas-operated auger, air hammer, coring machine to drill through concrete, hydraulic bender, power cutting and threading machine, roto stripper, water pump, electric screw gun, electric saber saw, fiber optic fusion splicer, electric roto hammer drill.

Meters: oscilloscope, wattmeter, optical power meter, MEGGER, dielectric test set to hipot cable, dynamometer, optical time-domain reflectometers

Heavy equipment: trencher, electric lift, power borer, derrick, dozer, back hoe, caterpillar.

Climbing tools: skates.

Hot sticks: wire tongs, wire tong supports, strain carrier, platform, saddle, lever lift, gin pole.