

The Service Entrance, Overhead and Underground

YES Electric • NEC 2026 with NEC 2023 numbers in parentheses

Draft 1 (October 2026). This chapter is under review. Code numbers are NEC 2026. Your local inspector may use an earlier edition, so ask your journeyman which one applies. Boxes marked "Picture coming" will get drawings and photos in a later version.

YES Electric Residential Course • Masterclass • Read after R1.2 and R1.5

Code edition. This masterclass cites NEC 2026. Where a section moved, the NEC 2023 number is in parentheses. The local inspector (the AHJ, "authority having jurisdiction") may still enforce an earlier edition, so ask your journeyman which one applies before your first inspection.

How this masterclass fits with R1.5. R1.5 teaches the panel change: setting the load center, landing conductors, the main bonding jumper, the grounding electrode system, and labeling. This masterclass covers everything from the utility's wires to the line side of the service disconnect: the drop or lateral, the mast or riser, the weatherhead and drip loops, the meter base, the outdoor disconnect, the underground conduit, and the order of phone calls that gets the power cut and turned back on. When a step belongs to R1.5, this chapter points there.

Learning Objectives

When you finish this masterclass you will be able to:

1. Build an overhead service: pick a through-the-roof mast or a wall riser, set the weatherhead, form drip loops, place the point of attachment, and check every clearance over roofs, driveways, yards, windows, and doors.
2. Set a meter base at the right height and in the right spot for Alabama Power.
3. Build an underground service stub-up: conduit size, depth, the bend at the footing, riser protection, and the meter base.
4. Say what Alabama Power provides, what YES provides, and what the customer provides on a service job.
5. Put the calls for a service change in the right order: permit, utility disconnect, work, inspection, release, reconnect.
6. Explain the outdoor emergency disconnect rule and the outdoor service disconnect rule in NEC 2026, and handle meter-main combinations.
7. Lay out a duplex with two meters and two disconnects.
8. Size the service-entrance conductors for a house with the dwelling rule.

Plain-Language Background

What "the service" means

The **service** is the set of wires and equipment that brings power from the utility to the house's main shutoff. Three words get mixed up, so learn them now.

Word	What it is	Who usually owns it here
Service drop	The overhead wires from the utility pole to the house	Alabama Power
Service lateral	The underground wires from the utility transformer or pole to the house	Alabama Power (see the who-does-what table below)
Service-entrance conductors	The wires from the point where the utility's wires end to the service disconnect	The customer, installed by YES
Point of attachment	The spot on the house where the drop is clamped	YES places the hardware; the utility hangs the drop
Service point	Where the utility's ownership stops and the customer's starts	Set by the utility
Meter base (meter socket)	The box the utility's meter plugs into	Installed by YES (see the table for who furnishes it)
Service disconnect	The switch or breaker that shuts off all power to the house	Customer-owned, installed by YES

The NEC covers the customer's side. It does not cover installations under the exclusive control of the utility, including service drops and laterals the utility owns (NEC 90.2(A)(2)(5); the OCR text of that item is damaged; still being checked against the printed code book). The utility's own rules cover its side, and they sometimes ask for more than the NEC does. You must meet both.

Why the service is the most dangerous part of the house

Everything inside the house has a breaker in front of it. The service-entrance conductors do not. The only thing that limits the current on them is the utility transformer and the length of wire back to it. If you short the line side of a meter base with a screwdriver, nothing trips. The fault keeps burning until the wire melts open or the utility's fuse on the pole blows. That is why this chapter tells you, at every step where it matters, that the line side stays hot until Alabama Power cuts it.

Overhead vs underground

An **overhead service** uses a service drop. YES builds a mast (a pipe through the roof) or a riser (a pipe or cable up the side of the wall) with a weatherhead on top. The utility's lineman clamps the drop to the house and splices it to the conductors that hang out of the weatherhead.

An **underground service** uses a service lateral. YES sets a conduit from the meter base down into the ground. Alabama Power installs, owns, and maintains its underground service cable in that conduit (Alabama Power Residential Electric Service and Meter Installation Handbook, Plate R-06-1, Note 3).

What changed in NEC 2026 for houses

NEC 2023 added the outdoor emergency disconnect for one- and two-family dwellings at 230.85. NEC 2026 moved that rule to **225.41** and added a second rule at **230.70(A)(1)**: the service disconnect for a one- or two-family dwelling must be in a readily accessible outdoor location, on the house or within sight of it. "Within sight" means visible and not more than 50 ft away (110.29). There is an exception: the service disconnect can stay inside if an emergency disconnect meeting 225.41 is installed outside.

Alabama Power has its own rule that points the same way. Since January 1, 2022, it has required an external disconnect on the load side of every new residential meter base, across its whole territory, whether or not the town has inspections (Alabama Power, Builder's Guide to Working with Alabama Power, "Important Update to Residential Metering Procedure").

In practice, almost every YES service change now ends with a disconnect on the outside wall next to the meter. That changes the panel inside: it becomes a **subpanel** fed by a four-wire feeder, with neutrals and grounds separated. Section 6 walks through it.

The two documents you need besides the code book

1. **Alabama Power, Residential Electric Service and Meter Installation Handbook, revised May 2023.** <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/Residential%20Meter.pdf>. Sections I through V are text; the plates (R-01, R-02, R-06, R-08) are drawings with notes. This chapter cites it as "APC Handbook."
2. **Alabama Power, Builder's Guide to Working with Alabama Power.** <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/builders-guide-web.pdf>. Four pages: account setup, trenching, meter height, inspection, and the external-disconnect drawing. This chapter cites it as "APC Builder's Guide."

A third document lists the customer-owned meter sockets Alabama Power will put a meter in: Customer-Owned Meter Equipment, <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/customer-owned-meter-equipment.pdf> ("APC Socket List").

If the house is served by a city utility or a co-op instead of Alabama Power, its rules replace the Alabama Power ones in this chapter. Ask the office which utility serves the address before you build anything.

Who Does What

This table comes from the APC Handbook and the APC Builder's Guide. Where the two documents say different things, the table says so.

Item	Alabama Power	YES (the customer's contractor)	Source
Decide where the service will come in	Agrees on the point of delivery with the customer before work starts	Asks for the point of delivery; does not pick it alone	APC Handbook §II.B.3, §III.A.2
Pole, transformer, overhead drop	Provides, owns, connects	Nothing	APC Handbook Plate R-01; Builder's Guide drawing
Underground service cable (lateral)	Furnishes, installs, owns	Nothing	APC Handbook Plate R-06-1 Note 3; §III.D. 2.a
Underground service conduit from the meter base down to 24 in. below grade	Nothing	Furnishes and installs	APC Handbook Plate R-06-1 Note 3; Builder's Guide
Mast, riser, weatherhead, SE cable, straps	Nothing	Furnishes and installs	APC Handbook Plate R-01-1 Notes 1-3
Eye bolt or attachment on vinyl, Dryvit, or stucco	Nothing	Furnishes and installs	APC Handbook Plate R-01-1 Note 8
Meter base	Handbook §IV.A: "The Company shall provide and the Customer shall install." Builder's Guide drawing labels the meter socket "Builder Responsibility." APC also publishes a list of customer-owned sockets it accepts.	Installs it in every case. Confirm with APC at application who furnishes it on this job.	APC Handbook §IV.A; Builder's Guide; APC Socket List
Meter	Furnishes and sets	Never pulls or sets a meter	APC Handbook §II.F.1, §II.G.3
External disconnect on the load side of the meter	Nothing	Furnishes and installs	Builder's Guide; APC Handbook §IV.A.8
Grounding electrode conductor and ground rod	Nothing	Furnishes and installs (#6 copper minimum per APC)	APC Handbook Plate R-01-1 Note 5; Plate R-06-1 Note 4
	Nothing	Everything	NEC

Item	Alabama Power	YES (the customer's contractor)	Source
Everything from the disconnect into the house			
Inspection	Nothing	YES calls for it; the AHJ inspects	APC Handbook §II.E.2
Reconnect after inspection	Connects only after the inspector approves, where inspection exists	Gives APC the address and wait	APC Handbook §II.E.2; Builder's Guide

Picture coming: A "who does what" picture of a house wall and the utility pole. Color everything Alabama Power owns in blue (pole, transformer, service drop or lateral cable, meter). Color everything YES installs in orange (mast or riser, weatherhead, SE conductors, meter base, outdoor disconnect, underground conduit, ground rod and #6 copper GEC, panel). Put a dashed line at the point of attachment and a second dashed line at the bottom of the underground conduit, each labeled "ownership changes here." A small legend in the corner: blue = Alabama Power, orange = YES.

Numbered Step-by-Step Procedures

Procedure 1. Before you build: the survey and the utility request

- 1. Find out who serves the address.** Look at the meter face or the customer's bill. If it is not Alabama Power, stop and get that utility's rules from the office.
- 2. Photograph the existing service.** Take a wide shot of the wall from 20 ft back, then close shots of the weatherhead, the point of attachment, the meter base, the ground rod clamp, and the panel. These go in the job file and on the permit if asked.
- 3. Measure what is there.** Record the height of the meter center above grade, the height of the point of attachment above grade, the height of the lowest point of the drip loop, and whether the drop crosses a driveway, a roof, or a deck. Use a fiberglass measuring stick, never a metal tape near the drop.
- 4. Look up.** Note any window, door, porch, or deck within 3 ft of the drop or the open conductors at the weatherhead (230.9(A)).
- 5. Look for the gas meter.** Alabama Power wants at least 3 ft of horizontal clearance between the meter base and any gas meter or gas regulator vent (APC Handbook §IV.B.10). If the new meter base cannot stay 3 ft from the gas meter, you have to move the service, and that is a different job and price.
- 6. Check the working space in front of the meter.** Alabama Power wants a clear space at least 60 in. deep, 30 in. wide, and 7 ft high in front of every meter socket (APC Handbook §IV.B.9). The NEC working space in front of the disconnect and panel is 3 ft deep (Table

110.26(A)(1), 0–150 V to ground), 30 in. wide or the width of the equipment (110.26(A)(2)), and 6½ ft high (110.26(A)(3)). Shrubs, AC units, and fences are the usual problems.

7. **Decide overhead or underground with the customer and Alabama Power.** In some subdivisions Alabama Power only offers underground service (APC Handbook §III.D.1.b). Changing an overhead service to underground has a cost the customer pays to Alabama Power (APC Handbook §III.D.2.b).
8. **Get the point of delivery agreed with Alabama Power before any work.** The handbook says the customer and the company "shall agree on a point of delivery, and the appropriate load data" before construction starts (APC Handbook §II.B.3). The office makes the request; you supply the measurements and photos.
9. **Do the load calculation** (R-LOAD) and pick the service size. The minimum service disconnect for a one-family dwelling is 100 A (230.79(C); APC Handbook Plate R-01-1 Note 2A).

Procedure 2. Build an overhead mast service (through the roof)

Use a mast when the eave is too low to get the point of attachment high enough with a wall riser. This is the most common case on one-story houses.

Material for a typical 200 A mast service

Item	Size or spec	Why
Mast pipe	2 in. minimum I.D. rigid galvanized steel or IMC where it extends above the roof	APC Handbook Plate R-01-1 Note 2B. A smaller pipe or EMT bends when the drop pulls on it.
Weatherhead	2 in. minimum, listed for wet locations	APC Note 2B; NEC 230.54(A)
Roof flashing (roof jack)	Sized to the mast, matched to the roof type	Keeps water out of the attic
Point-of-attachment fitting	Mast clamp or service attachment fitting identified for the use	NEC 230.27; 230.28(A)
Guy kit	For any mast that stands more than 36 in. above the roof	APC Handbook Plate R-01-1 Note 1C
Service-entrance conductors	2/0 copper or 4/0 aluminum for 200 A (see Worked Example 2)	NEC 310.12; APC Note 2A
Conduit straps	Two-hole straps, brass or non-rusting screws	APC Note 3
Meter base	From the APC Socket List, or APC-furnished	APC Handbook §IV.A; Note 4
Outdoor disconnect	200 A, service-rated, NEMA 3R	NEC 230.70(A)(1), 225.41; APC §IV.A.8

Steps

1. **Mark the mast location on the roof.** Put the mast not more than 2 ft back from the roof edge, so that not more than 6 ft of the drop passes over the overhang (APC Handbook Plate R-01-1 Note 1A). The NEC sets the same limit as an exception to the 8 ft 6 in. roof clearance (230.24(A) Exception No. 3, see below).
2. **Plumb down from the mark to the meter location.** The mast must run straight down the wall to the meter base, so pick a spot where the meter center will land 4 to 5 ft above final grade (APC Handbook §IV.B.5; APC Socket List p. 1, from Rule E-2 of the Alabama Public Service Commission Special Electric Rules).
3. **Cut the roof hole** from above, just big enough for the pipe. Keep the cut inside the flashing footprint.

SAFETY: You are on a roof near an energized drop. OSHA 1910.333(c)(3)(i)(A)(1) keeps an unqualified person and anything conductive they hold at least 10 ft from an unguarded energized overhead line at 50 kV or less to ground. On an existing service, the old drop is still hot until Alabama Power cuts it. Plan the work so the new mast goes up while the old drop is either de-energized or more than 10 ft away from you and your pipe. Ask your journeyman before you go near it.

1. **Set the meter base first, then the mast.** Mount the meter base plumb and level with screws into the framing, or screws into anchors or toggle bolts on masonry. Do not use nails (APC Handbook §IV.B.4; Plate R-01-1 Note 4).
2. **Drop the mast through the roof hole and into the meter base hub.** Use the hub size that matches the mast. Thread or tighten it watertight.
3. **Strap the mast.** Alabama Power wants conduit strapped within 3 ft of the meter socket, at 10 ft intervals, and near the top (APC Handbook Plate R-01-1 Note 3). Use brass or non-rusting screws. Inside the attic, strap the mast to framing so it cannot twist.
4. **Set the height above the roof.** The mast must extend at least 3 ft above the roof (APC Note 1A). The drop and its drip loop must clear the roof by at least 18 in. (APC Note 1A; 230.24(A) Exception No. 3). If the mast stands more than 36 in. above the roof, it must be guyed (APC Note 1C). Worked Example 1 shows how to figure the height.
5. **Install the flashing and seal it.** Slide the roof jack down over the mast, slip it under the upper shingles, and seal the collar. A leaking roof jack is a callback.
6. **Install the point-of-attachment fitting.** It goes below the weatherhead (230.54(C)). Only power service-drop conductors may be attached to the mast; never let the cable or phone company tie to it (230.28).
7. **Install the guy** if the mast is taller than 36 in. above the roof. The guy runs from the mast, on the side opposite the pull of the drop, down to a lag eye in a rafter or a listed roof bracket.

8. **Pull in the service-entrance conductors.** Leave at least 2 ft of each conductor sticking out of the weatherhead so the lineman can make up the drip loop and the splice (APC Handbook §III.C.1). Mark the neutral with white tape at both ends if it is not white.
9. **Form the drip loops.** Bend each conductor down below the weatherhead and back up to the splice point, so water runs down to the bottom of the loop and drips off instead of following the wire into the pipe (230.54(F)). The lowest point of the drip loop must be at least 10 ft above final grade (230.24(B)(1); APC Plate R-01-2).
10. **Install the meter-base-to-disconnect nipple and the outdoor disconnect.** See Procedure 5.
11. **Install the grounding electrode conductor.** Alabama Power wants at least #6 copper from the meter socket, stapled to the house, to a listed clamp on the ground rod (APC Plate R-01-1 Note 5). The ground rod is 8 ft long: $\frac{3}{4}$ in. galvanized pipe, $\frac{5}{8}$ in. galvanized rod, or $\frac{1}{2}$ in. copper-clad rod (APC Note 5). The NEC requirements for the electrode system, the second rod, and conductor sizes are in R1.5 and R1.6.
12. **Leave the line side dead and open for the utility.** Do not splice to the drop. The lineman does that.

Picture coming: Side elevation of a one-story house with a through-the-roof mast service. Label: mast 2 in. rigid galvanized; mast not more than 2 ft from roof edge; not more than 6 ft of drop over the overhang; 18 in. minimum from drop and drip loop to the roof; mast at least 3 ft above the roof; guy wire shown with the note "required if more than 36 in. above roof"; weatherhead above the point of attachment; 2 ft of conductor out of the weatherhead; drip loop low point 10 ft minimum above grade; 12 ft minimum over the yard (NEC); 15 ft minimum over the driveway (Alabama Power); meter center 4 ft to 5 ft above final grade; straps within 3 ft of the meter, every 10 ft, and near the top; outdoor disconnect beside the meter; #6 copper GEC to an 8 ft rod.

Procedure 3. Build an overhead wall riser or SE cable service

Use a riser on a two-story house, or wherever the eave is high enough that the point of attachment can be on the wall and still meet clearances.

1. **Find the point of attachment height.** It must be at least 10 ft above finished grade (230.26) and high enough that the drop clears 12 ft over the yard and driveway (230.24(B)(2)) and 15 ft over a driveway for Alabama Power (APC Plate R-01-2).
2. **Choose conduit or SE cable.** With a conduit riser, use at least 2 in. conduit and a 2 in. weatherhead, and if the conduit extends above the roof it must be rigid galvanized or IMC (APC Plate R-01-1 Note 2B). With SE cable and no conduit, install a weatherhead on the top of the cable, or leave a 2 ft loop to form a gooseneck (APC Note 2C).
3. **Keep the weatherhead or gooseneck above the point of attachment.** If that is impractical, the code allows it within 24 in. of the point of attachment (230.54(C) and its exception; APC Note 2D).
4. **Strap it.** SE cable needs a strap within 12 in. of every service head, gooseneck, and connection to a raceway or enclosure, and at intervals not over 30 in. (230.51(A)). Alabama

Power says the same for SE cable: within 12 in. of the meter socket and the gooseneck, and every 30 in. (APC Note 3).

5. **Protect SE cable where it can be hit.** Where SE cable is subject to physical damage, protect it with rigid metal conduit, IMC, Schedule 80 PVC, EMT, RTRC, or another approved means (230.50(B)(1)). The bottom 8 ft beside a driveway or walkway is the usual place.
6. **Seal the cable where it enters the meter base** with a watertight connector, and make sure water cannot run along the cable into the equipment (230.54, last paragraph, "arranged that water will not enter").
7. **On vinyl siding, Dryvit, or stucco,** install a solid attachment such as an eye bolt into framing behind the siding. The siding cannot hold the drop (APC Plate R-01-1 Note 8).
8. **Do not hide it.** SE cable and conduit between the weatherhead and the meter socket must not be concealed (APC Handbook §III.A.5). Conduit fittings with removable covers should be avoided in the service run, and if one is used it must not be concealed (§III.A.4).
9. Finish with steps 11–15 of Procedure 2.

Picture coming: Side elevation of a two-story house with SE cable up the wall to a gooseneck, and a second version with a 2 in. conduit riser and weatherhead. Label: point of attachment 10 ft minimum above finished grade; gooseneck or weatherhead above the point of attachment, or within 24 in.; straps within 12 in. of the gooseneck, every 30 in., and within 12 in. of the meter socket; Schedule 80 PVC sleeve over the SE cable in the bottom 8 ft beside the driveway; 3 ft clearance from the edge of an openable window.

Procedure 4. Build an underground service stub-up

1. **Confirm underground with Alabama Power and get the point of delivery.** APC's underground coordinator handles trenching requests. The electrical inspection does not have to be done before the trenching request, but the conduit must be in first (APC Builder's Guide, "Permanent Underground Service").
2. **Pick the conduit.** Alabama Power wants a 3 in. minimum service conduit for a 200 A service and for a 400 A (320 A meter socket) service (APC Handbook Plate R-06-1, Table 1). Use PVC Schedule 40 with a bushing, or Schedule 80 with a bushing where subject to physical damage, or rigid galvanized steel with a bushing (Plate R-06-1 Note 3).
3. **Set the meter base** 4 to 5 ft to meter center above final grade, plumb and level (APC Plate R-06-1). Use a meter base listed for underground on the APC Socket List. Some sockets on that list have only a 2½ in. knockout and need field modification for 3 in. conduit; the list marks them (APC Socket List p. 5).
4. **Run the conduit straight down from the meter base** to at least 24 in. below grade (APC Builder's Guide; Plate R-06-1). The NEC minimum cover for PVC in "all locations not specified" is 18 in. (Table 300.7(A), Column 3), so Alabama Power's 24 in. governs.
5. **Get past the footing.** Alabama Power allows two ways (APC Builder's Guide; Plate R-06-1): - Preferred: notch the footing so the conduit goes straight down. - Alternate: use one 45° bend to go around the footing.
6. **Strap the conduit** with at least three straps (APC Builder's Guide).

7. **Compact the soil.** The area under the cable and conduit, extending at least 36 in. from the building, must be undisturbed or re-compacted soil. Loose fill settles and pulls the conduit out of the meter base (APC Plate R-06-1 Note 1).
8. **Under a future concrete or asphalt drive** between the meter and the transformer, install a 3 in. minimum PVC conduit 24 in. to 48 in. under the surface, in line with the meter and the transformer, with end caps, and flag one end (APC Plate R-06-1 Note 2).
9. **Install the bushing** on the bottom end. A conduit that ends underground where cables come out as direct burial needs a bushing or a terminal fitting with a bushed opening (300.7(H)).
10. **Seal the conduit** where it enters the building or the equipment, so ground water and air cannot get in (230.8; 300.7(G)).
11. **Ground rod and GEC.** Same as Procedure 2 step 14. On new construction, if the inspector has approved the rebar in the footing as the electrode, Alabama Power does not require a rod, but a #6 copper minimum must connect the rebar to the neutral bar in the meter socket or another approved point (APC Plate R-01-1 Note 6). R1.5 covers the concrete-encased electrode.
12. **Call for the trench** only when the stub-up is complete. Alabama Power wants the breakers off and the installation able to pass its meter check-out procedure (APC Builder's Guide).

SAFETY: Call 811 (Alabama 811) before any digging. The existing lateral, gas, water, and communication lines are in the ground next to the meter. A shovel through a live lateral is an arc-flash event with no breaker to stop it.

When YES digs a customer-owned underground run. Sometimes the meter is on a pole or pedestal and YES runs the service-entrance conductors or a feeder underground to the house. Then the NEC burial depths are ours to meet:

Wiring method (Table 300.7(A) column)	General	Under a 1- or 2-family driveway	Under 4 in. exterior slab, no vehicles
Direct-buried cable, e.g., USE or UF (Column 1)	24 in.	18 in.	18 in. direct, 4 in. in raceway
Rigid metal or IMC (Column 2)	6 in.	18 in.	4 in.
PVC or other raceway listed for burial (Column 3)	18 in.	18 in.	4 in.
Under streets, roads, alleys, parking lots (all columns)	24 in.	—	—

Cover is measured from the top of the cable or conduit to the top of finished grade (Table 300.7(A), Note 1).

Three more underground rules apply to that run:

1. **Warning ribbon.** Direct-buried service conductors, and raceways with service conductors, that are not concrete-encased and are buried 18 in. or more must have a warning ribbon in the trench at least 12 in. above them (300.7(D)(3)).
2. **Protection where it comes up.** Direct-buried cable coming out of the ground must be in a raceway or enclosure from the required cover depth (no more than 18 in. required) up to at least 8 ft above finished grade (300.7(D)(1)).
3. **Backfill.** No large rocks, paving, cinders, or sharp material against the conduit or cable (300.7(F)).

Picture coming: Two side-by-side sections of a house wall with an underground service, labeled "Preferred" and "Alternate." Preferred: footing notched, 3 in. PVC straight down from the meter base to 24 in. below grade, bushing on the end, three straps on the wall, meter center 4 ft to 5 ft above final grade, crosshatched compacted soil extending 36 in. out from the wall. Alternate: footing not notched, one 45° elbow taking the conduit out around the footing, same 24 in. depth and 36 in. compacted zone. Add the outdoor disconnect beside the meter, the #6 copper GEC down the wall, and an 8 ft ground rod. Add a dashed line at the conduit end: "Alabama Power cable from here."

Procedure 5. Set the meter base and the outdoor disconnect

1. **Pick the meter base.** Use a socket from the APC Socket List or one Alabama Power furnishes. Single-family meters always go outdoors (APC Handbook §IV.B.6). Every socket must accept an Alabama Power high-security lock (APC Socket List p. 1). Do not use a socket with a lift-off cover heavier than 40 lb (APC Socket List p. 2). A 320/400 A socket needs an anti-inversion clip in the right line-side jaw (APC Socket List p. 6).
2. **Pick the location.** The meter must be protected from damage and clear of shrubs that block reading (§IV.B.3). Do not put it in a carport, open porch, or near a pool, or any place likely to be enclosed later (§IV.B.7). Keep it away from moving machinery (§IV.B.8). Keep 3 ft horizontally from the gas meter or regulator vent (§IV.B.10).
3. **Mount it 4 to 5 ft to meter center above final grade.** "Final grade" means the finished dirt or slab, not the dirt the day you mount it. If the landscaper will add 6 in. of mulch bed, plan for it.
4. **Land the line-side conductors.** One conductor per terminal. All strands must go into the terminal; do not cut strands or fold them back to make a wire fit (APC Handbook §IV.A.4). Torque to the label value with a torque tool (110.14(D)). Leave the space reserved for the company's conductors clear; on underground sockets the left side and top are for the company only (§IV.A.5).
5. **Bond the meter base.** Service enclosures, including meter fittings, are bonded (250.92(A)(2)). The neutral lug in the socket is bonded to the enclosure. Do not use standard locknuts alone for service bonding; use a bonding locknut, bonding bushing, threaded hub, or another method listed in 250.92(B).
6. **Install the intersystem bonding termination (IBT).** The NEC requires one, external to the enclosures, with room for at least three intersystem bonding conductors (250.94(A)).

Alabama Power says do not drill or damage the meter socket to mount it, and it must not block opening the meter enclosure (APC Handbook §IV.A.7). Mount it on the wall or on the disconnect, not through the meter can.

7. **Mount the outdoor disconnect** next to the meter, on a short nipple out of the meter base load side. Use a service-rated enclosure if it is the service disconnect.
8. **Mark it.** For a one- or two-family dwelling, the disconnect enclosure must be marked "EMERGENCY DISCONNECT" on the outside front, red background with white letters, letters at least ½ in. (13 mm) high, and the marking must meet 110.21(B) (230.70(B)(2); still being checked against the printed code book). It must also say "SERVICE DISCONNECT" if it is the service disconnect (230.70(B)(1)). If a generator or solar disconnect is not next to it, post a plaque or directory showing where the other source disconnects are (225.41(B); 230.70(D)).
9. **Check the SCCR.** The equipment the emergency disconnect sits in must have a short-circuit current rating at least equal to the available fault current (225.41(A)(2)).
10. **Install the SPD.** Every dwelling service, including replaced service equipment, needs a Type 1 or Type 2 surge-protective device as part of the service equipment or right next to it, rated at least 10 kA nominal discharge current (230.67). R1.9 covers this.
11. **Post the 911 address.** Alabama Power wants the address shown on the meter socket and in the front window for permanent service, and it must match the inspection release exactly (APC Builder's Guide, "Inspection Considerations").

Field photo coming: A finished YES exterior service: meter base and a 200 A outdoor disconnect side by side on a nipple, the red "EMERGENCY DISCONNECT" label with white letters on the front of the disconnect, the "SERVICE DISCONNECT" label, the IBT mounted on the wall beside the meter (not through the can), the #6 copper GEC stapled down the wall to the rod clamp, the 911 address stenciled on the meter base. Shoot from 6 ft back with a tape measure held from grade to meter center.

Procedure 6. Meter-main combos and what happens to the inside panel

When the service disconnect moves outside, the inside panel stops being service equipment. That changes how it is wired. NAVEDTRA 14027, Chapter 7, pp. 7-8 to 7-10 (Figures 7-7 to 7-9) explains the reason: if the neutral is bonded to equipment on the load side of the service and the neutral comes loose, every metal part on that neutral becomes energized.

Two ways to build it

Arrangement	Outside	Inside panel	Conductors between them
Meter-main combo (meter and main breaker in one can) or meter base plus a separate service-rated disconnect	Service disconnect. Neutral bonded to the enclosure here with the main bonding jumper. GEC lands here.	Subpanel. Bonding screw or strap removed. Neutral bar isolated. Separate ground bar bonded to the can.	Four-wire feeder: two hots, an insulated neutral, and an equipment grounding conductor
Meter base outside, service disconnect still inside, plus a separate emergency disconnect outside (225.41 path)	The emergency disconnect. It is not the service disconnect.	Service panel. Neutral bonded here. GEC lands here.	Service-entrance conductors, three-wire

The first row is what YES builds on almost every change, because it meets 230.70(A)(1), 225.41, and Alabama Power's external disconnect rule with one piece of equipment.

Steps for a meter-main or meter-plus-disconnect change

1. At the outside disconnect: land the service-entrance conductors on the line lugs, install the main bonding jumper (250.24(C), 250.28), and land the grounding electrode conductor (250.24(A)(1)). R1.5 covers these in detail.
2. Run a four-wire feeder to the inside panel. Size the feeder conductors with 310.12(B), which lets a feeder carrying the entire dwelling load be 83 percent of the feeder rating, the same as the service. The equipment grounding conductor size comes from 250.122; see R1.6.
3. At the inside panel: remove the bonding screw or strap, isolate the neutral bar, add a ground bar if the panel does not have one, and move every bare and green conductor to the ground bar. The grounded conductor may not be connected to equipment grounding conductors or metal parts on the load side of the service disconnect (250.24(B)).
4. Protect the feeder. On a meter-main the feeder leaves the outside can and enters the house. Use a raceway or a cable method allowed for the location, and seal the wall penetration.
5. Label the inside panel as a subpanel fed from the outside disconnect, and label the outside disconnect with the circuits it feeds.

When the panel is replaced but the service conductors are not. NEC 2026 230.70(E) says that replacing service equipment for a one- or two-family dwelling triggers the outdoor-disconnect rules. If only the meter socket, service-entrance conductors, or related raceways and fittings are replaced, 230.70(A)(1) and 230.70(B)(2) do not apply. So a meter base swap after storm damage does not by itself force an outdoor disconnect under the NEC, but a panel change does. Alabama Power's own rule still applies to any new meter base set; ask the office how APC treats a storm-damage meter base replacement.

Picture coming: Two panels side by side. Left: outdoor meter-main combo with a green main bonding jumper between the neutral bar and the can, a #6 copper GEC to the rod, and a four-wire feeder (black, red, white, green) leaving the bottom. Right: inside panel labeled "SUBPANEL" with the bonding screw shown removed and set aside, the neutral bar isolated on insulators, a separate ground bar bonded to the can, all whites on the neutral bar and all bare and green on the ground bar.

Procedure 7. Service-change day: the order of calls

The order matters because only Alabama Power may remove a meter or break a seal. The APC Handbook says service connections, metering, and metering equipment "shall not be removed or relocated except by employees of the Company authorized to do such work," and the customer is held responsible for broken seals or tampering (APC Handbook §II.F.1 and §II.G.3).

1. **Office pulls the permit** from the AHJ for the address. The AHJ is the city's inspection department inside city limits or the county outside. Birmingham and Jefferson County procedures are not yet in this course. This is still being checked against the printed code book.
2. **Office calls Alabama Power** (Business Service Center 1-888-430-5787, per the APC Builder's Guide) to schedule the disconnect. Give the 911 address, the meter number, or the account number. Allow up to three business days for a disconnect or reconnect (APC Builder's Guide, "Disconnects & Reconnects"). Tell Alabama Power if the meter socket will move (Builder's Guide, "Remodel/Renovations").
3. **Tell the customer** the power-off window, in writing. Ask about medical equipment, sump pumps, freezers, and well pumps.
4. **Utility cuts power.** The lineman pulls the meter or opens the drop. Do not start until you have seen it and tested.

SAFETY: Before you touch anything on the service, test the line side of the meter base with a meter rated for the location (CAT IV at the service), both hots to neutral, hot to hot, and each hot to the can. Test your meter on a known live source before and after. If the lineman only pulled the meter, the line jaws in the socket are still hot. Treat them as live and do not put tools in the socket.

1. **Do the work.** Demo, set the new meter base and disconnect, build the mast or riser or stub-up, set the panel (R1.5), drive rods and bond, install the SPD, and label everything.
2. **Call for inspection.** The inspector checks the work. Where inspections exist, Alabama Power connects only after the inspector approves (APC Handbook §II.E.2).
3. **Inspector sends the release to Alabama Power.** The release must match the 911 address exactly (APC Builder's Guide).
4. **Alabama Power reconnects** and sets the meter. If the meter is not set within two business days after inspection, call the Business Service Center (APC Builder's Guide).

5. **Energize in order.** With all branch breakers off, close the main. Measure L1-N, L2-N, L1-L2 at the main lugs. Expect about 120 V, 120 V, and 240 V. Then turn on branch breakers one at a time and walk the house (R1.5 commissioning).
6. **Photograph the finished job** and the label, and file the photos.

Picture coming: Service-change day as a horizontal timeline with seven boxes and arrows: "Permit pulled (office)" → "APC disconnect scheduled, up to 3 business days (office)" → "APC cuts power (lineman)" → "YES builds and tests dead (crew)" → "Inspection (AHJ)" → "Release sent, must match 911 address (AHJ)" → "APC reconnects, call if not set in 2 business days (lineman)". Under each box, a small icon for who does it.

Procedure 8. A duplex with two meters

A duplex has two dwelling units. Each unit normally has its own meter and its own service disconnect.

1. **Ask Alabama Power for the meter arrangement.** For more than one meter, Alabama Power provides ganged sockets in 2- to 6-position horizontal arrangements, installed by the customer (APC Handbook §IV.A.3.a).
2. **Mark every socket and its disconnect** with the unit it serves, stenciled in black paint numbers at least 1 in. high (APC Handbook §IV.A.3.b). The NEC also requires each disconnect to be marked to show the load served (230.72(A)).
3. **Group the disconnects.** Where two to six disconnects are allowed, they must be grouped (230.72(A)). In NEC 2026, two to six service disconnects must each be in a separate enclosure or a separate compartment; the old "six breakers in one panel" arrangement is allowed only for existing equipment (230.71(B) and its exception).
4. **Give each tenant access to their own disconnect** (230.72(C)).
5. **Emergency disconnect.** 225.41 applies to two-family dwellings too. If more than one emergency disconnect is installed, group them (225.41(A)(3)).
6. **Bond separate grounding conductors together** when ganged meter sockets are within 6 ft of each other (APC Handbook §IV.A.6).
7. **Directory.** Where a building is supplied by more than one service, post a permanent plaque at each service disconnect showing all the other services and what each one serves (230.4(E)).
8. **Working space.** The 30 in. width in front of meters becomes the greater of 30 in. or the total width of the meter sockets (APC Handbook §IV.B.9).

Picture coming: Front elevation of a duplex end wall: a two-position horizontal ganged meter socket, two 200 A outdoor disconnects grouped beside it, each with the red EMERGENCY DISCONNECT label and stenciled "UNIT A" and "UNIT B" in 1 in. black numbers, a plaque reading "This building is supplied by two services. Unit A disconnect left, Unit B disconnect right." Working space shown as a dashed box the full width of both sockets, 60 in. deep, 7 ft high.

Worked Examples

Worked Example 1. How tall does the mast need to be?

The house. One story, 4/12 roof pitch, eave edge 11 ft above grade on the meter side. The drop comes from a pole across the street and crosses the customer's driveway. Alabama Power wants 15 ft over a driveway (APC Plate R-01-2). The NEC wants 12 ft over residential driveways (230.24(B)(2)).

Step 1. Place the mast. Put it 2 ft back from the roof edge, the most APC allows (Plate R-01-1 Note 1A).

Step 2. Find the roof height at the mast. A 4/12 roof rises 4 in. for every 12 in. of run. Two feet back is 24 in. of run, so the roof rises $24 \times 4 \div 12 = 8$ in. The roof surface at the mast is 11 ft + 8 in. = 11 ft 8 in. above grade.

Step 3. Check the APC minimum. The mast must stand at least 3 ft above the roof (Note 1A). That puts the top at 14 ft 8 in. above grade.

Step 4. Check the driveway. The drop sags between the pole and the house. The lineman sets the sag, but the point of attachment has to start high enough for the lowest point over the driveway to stay at 15 ft. With the point of attachment just under the weatherhead at about 14 ft 4 in., the drop starts below 15 ft and can only go down from there. That fails.

Step 5. Raise the mast. Make the mast stand 5 ft above the roof. The top is now 16 ft 8 in. above grade, and the point of attachment about 16 ft 4 in. That leaves room for sag over the driveway. Ask the APC engineer to confirm when they design the drop, because the handbook says the minimum includes sag (APC Handbook §III.C.2).

Step 6. Guy it. At 5 ft above the roof, the mast is taller than 36 in., so it must be guyed (Note 1C).

Step 7. Check the overhang. The drop passes over 2 ft of overhang, which is under the 6 ft limit, and stays at least 18 in. above the roof (230.24(A) Exception No. 3; APC Note 1A).

Worked Example 2. Service-entrance conductors for a 200 A house

Given. One-family dwelling, 120/240 V single phase, 200 A service disconnect. Conductors are in free air on the wall or in a raceway with no more than three current-carrying conductors, and no ambient correction or bundling adjustment applies.

1. **Use 310.12(A).** For a one-family dwelling service rated 100 A through 400 A, the service conductors may have an ampacity of 83 percent of the service rating. $200 \text{ A} \times 0.83 = 166 \text{ A}$.
2. **Use Table 310.12(A) directly** since no adjustment or correction applies: $200 \text{ A} = 2/0$ copper or 4/0 aluminum.

3. **Check it against Table 310.16, 75°C column.** 2/0 copper is 175 A. 4/0 aluminum is 180 A. Both are at least 166 A.
4. **Check Alabama Power.** APC Plate R-01-1 Note 2A lists 200 A = 2/0 copper or 4/0 aluminum. Same answer.
5. **Neutral.** The grounded conductor can be smaller than the hots if the calculated neutral load allows it (310.12(D)), but it can never be smaller than 250.24(D) requires. On a residential service YES runs a full-size neutral or uses standard SE-R cable, which has a reduced neutral sized by the manufacturer. Do not reduce it yourself.

Service rating	Copper	Aluminum	Source
100 A	4 AWG	2 AWG	Table 310.12(A); APC Note 2A
150 A	1 AWG	2/0 AWG	Table 310.12(A); APC Note 2A
200 A	2/0 AWG	4/0 AWG	Table 310.12(A); APC Note 2A
400 A	400 kcmil	600 kcmil	Table 310.12(A); APC Note 2A

Worked Example 3. Is the drop too close to the window?

Given. A two-story house. The drop runs along the side wall to a point of attachment at the corner. A bedroom window that opens is 2 ft below the drop and 18 in. to the side.

1. The drop is open conductors (triplex with a bare messenger counts as conductors "without an overall outer jacket"). 230.9(A) requires 3 ft from windows designed to be opened.
2. The window is 2 ft below and 18 in. to the side. Both distances are under 3 ft, so it fails.
3. The exception lets conductors run above the top level of a window with less than 3 ft (230.9(A) Exception). Here the drop is above the window, so it is allowed by the exception, as long as the bottom of the drip loop and the drop itself stay above the top of the window frame.
4. If the drip loop hangs below the top of the window, it fails. Move the point of attachment up or over.

Worked Example 4. Underground depths on one job

Given. The meter is on the house. Alabama Power brings its lateral to the meter in YES's conduit. The customer also wants a 60 A feeder to a detached shop, in PVC, crossing the gravel driveway, and a 20 A GFCI-protected 120 V circuit in UF to a yard light.

Run	Rule	Minimum cover
Service conduit at the house	APC Builder's Guide; Plate R-06-1	24 in. to the meter socket, 3 in. PVC
Shop feeder in PVC, yard	Table 300.7(A), Column 3, all other locations	18 in.
Shop feeder in PVC, under the dwelling driveway	Table 300.7(A), Column 3, one- and two-family driveways	18 in.
Yard-light branch circuit, UF, 120 V, GFCI, 20 A max	Table 300.7(A), Column 4	12 in.
Same circuit under the driveway	Table 300.7(A), Column 4, driveways	12 in.

The feeder is not a service conductor, so 300.7(D)(3) warning ribbon does not apply to it, but YES lays ribbon over every buried run anyway so the next person with a shovel finds it.

Worked Example 5. Meter height after grading

Given. You set the meter base on a new house with the center at 4 ft 2 in. above the dirt. The landscaper then builds a planting bed 6 in. high under it.

1. Final grade is now 6 in. higher. The meter center is 4 ft 2 in. – 6 in. = 3 ft 8 in. above final grade.
 2. Alabama Power's minimum is 4 ft (APC Socket List p. 1). It fails, and Alabama Power can refuse to set the meter.
 3. Ask the builder for the final grade at the wall before you mount. Mount to 4 ft 6 in. above final grade so a few inches of mulch does not push it out of range.
-

Common Mistakes

Mistake	What goes wrong	Rule
Pulling the meter yourself	The utility owns it and seals it; tampering is the customer's liability, and the jaws are live	APC Handbook §II.F.1, §II.G.3
Mast less than 2 in. or in EMT above the roof	The drop bends it; the inspector or the lineman refuses it	APC Plate R-01-1 Note 2B; NEC 230.28(A)
Mast over 36 in. above the roof with no guy	Mast bends in the first ice or wind load	APC Note 1C
Point of attachment above the weatherhead	Water runs down the conductors into the pipe	230.54(C), (F)
Drip loop lower than 10 ft	Fails clearance; reachable from a ladder or a truck bed	230.24(B)(1)
Drop over a driveway under 15 ft	Alabama Power will not hang it	APC Plate R-01-2
Meter center below 4 ft after landscaping	Alabama Power will not set the meter	APC Socket List p. 1
Meter base within 3 ft of the gas meter or regulator vent	APC refuses; gas regulators vent gas	APC §IV.B.10
IBT screwed through the meter can	APC holds the owner responsible for damage to the socket	APC §IV.A.7
Neutral still bonded in the inside panel after a meter-main is installed	Neutral current on the ground wires and metal parts; shock hazard on a lost neutral	250.24(B); NAVEDTRA 14027 Ch. 7
Three-wire feeder from the meter-main to the inside panel	No separate equipment ground; same hazard as above	250.24(B); R1.6
No red EMERGENCY DISCONNECT label	Fails inspection	230.70(B)(2)
Cable or phone line tied to the mast	Extra load on the mast and mixed systems on one support	230.28
Loose fill under the underground conduit	Settling pulls the conduit out of the meter base	APC Plate R-06-1 Note 1
Folding back strands to fit a lug	Hot spot and a failed connection	APC §IV.A.4; 110.14
Starting work before the utility cut is confirmed with a meter	Contact with the unprotected line side	OSHA 1910.333; this chapter Procedure 7
Single-family meter put inside a garage	Single-family meters are always outdoors for APC	APC §IV.B.6

Field Exercise (from the outline, written out in full)

You need a mock roof (a 4 ft × 8 ft sheet on a frame at a 4/12 pitch, edge about 8 ft off the floor), a mock wall (plywood on studs), and a mock driveway marked on the shop floor with tape. A journeyman watches the whole exercise and signs the checklist.

Part A. Mast service on the mock roof

1. Mark the mast location 2 ft or less from the roof edge.
2. Mount a meter base on the mock wall with the center 4 ft 6 in. above the floor. Use screws into the studs.
3. Cut the roof hole, drop a 2 in. rigid galvanized mast through it into the meter hub, and tighten the hub.
4. Strap the mast within 3 ft of the meter base, at the top of the wall, and at 10 ft spacing if the wall is that tall. Use non-rusting screws.
5. Install the roof flashing and seal the collar.
6. Set the mast so it stands at least 3 ft above the mock roof. If you go higher than 36 in., install a guy to a lag eye on the frame.
7. Install the point-of-attachment fitting below the weatherhead.
8. Install the weatherhead. Pull in three conductors sized for 200 A (2/0 copper or 4/0 aluminum, or a short training length). Leave 2 ft out of the weatherhead.
9. Form drip loops on each conductor.
10. Measure with a fiberglass stick and write down: the height of the drip-loop low point above the floor, the clearance from the drip loop to the roof surface, the mast height above the roof, and the meter center height.
11. Measure the horizontal distance from the drip loop to the taped "driveway." Pretend a drop runs from a pole 60 ft away across the driveway. Using Worked Example 1, write whether the point of attachment is high enough for 15 ft over the driveway.
12. Install a nipple and a 200 A outdoor disconnect beside the meter base. Apply the EMERGENCY DISCONNECT label (red background, white letters) and the SERVICE DISCONNECT label.
13. Run SE cable or conduit from the disconnect to a mock panel on the inside face of the wall, as a four-wire feeder. At the mock panel, remove the bonding screw and show the journeyman the isolated neutral bar and separate ground bar.
14. Run a #6 copper GEC down the wall, stapled, to a clamp on a short rod stub in a bucket of sand.
15. Mount an IBT on the wall beside the meter, not through the can.

Part B. Underground stub-up on the second mock

1. Mount a second meter base on the other side of the wall, center 4 ft 6 in. above a mock "final grade" line.

2. Run 3 in. Schedule 40 PVC straight down from the meter base. If the mock has a footing block, run the alternate route with one 45° bend.
3. Mark the 24 in. depth line on the conduit and on the mock, and show the journeyman the conduit end is at or below it.
4. Install a bushing on the bottom end.
5. Install three straps on the conduit above grade.
6. Show where Schedule 80 would be required instead (any spot where a mower, car, or cart could hit it).
7. Show the 36 in. zone in front of the wall that must be compacted.
8. Seal the conduit entry at the meter base.

Part C. Paperwork

1. Fill out the who-does-what table for a made-up address, naming who furnishes the meter base on this job and how you confirmed it.
2. Write the service-change day sequence (Procedure 7) on one card in your own words.
3. List every clearance you measured and the rule for each.

Pass: every measurement meets the numbers in this chapter, the inside panel is correctly converted to a subpanel, and you can explain each rule to the journeyman in one sentence.

NEC 2026 Cross-References

Section	Topic	Notes
90.2(A)(2)(5)	Utility installations not covered	Service drops and laterals under utility control
110.14(D)	Terminal torque	Same letter as NEC 2023
110.21(B)	Field-applied hazard markings	The EMERGENCY DISCONNECT label must comply
110.26(A)	Working space	3 ft deep (0–150 V to ground, all conditions), 30 in. wide, 6½ ft high
110.29	"Within sight"	Visible and not more than 50 ft
225.41 (2023: 230.85)	Emergency disconnect, one- and two-family dwellings	Readily accessible outdoors, on or within sight of the dwelling; SCCR; grouping; other-source plaque
230.2	Listing	Meter sockets must be listed unless utility-furnished and controlled
230.4(E)	More than one service	Plaque at each service disconnect
230.6	Conductors considered outside	2 in. concrete, 18 in. earth under the building, etc.
230.7	Other conductors	No other circuits in service raceways or cables
230.8	Raceway seal	Seal service raceways entering the building
230.9	Clearances on buildings	3 ft from openable windows, doors, porches; exception above windows
230.10	Vegetation	Never support service conductors on a tree
230.23	Overhead service conductor size	8 AWG Cu or 6 AWG Al minimum
230.24(A)	Clearance above roofs	8 ft 6 in.; exceptions for slope, overhang (18 in.), wall attachment
230.24(B)	Clearance from grade	10 ft at entrance and drip loop (messenger cable, ≤150 V to ground); 12 ft over residential property and driveways; 18 ft over public streets
230.26	Point of attachment	At least 10 ft above finished grade
230.27	Means of attachment	Fittings identified for the use
230.28	Service masts	Strength, braces or guys, only power drop on the mast
230.42	Service-entrance conductor size	Not less than the load; 230.42(B) ties to 230.79
230.43	Wiring methods for service-entrance conductors	List includes SE cable, RMC, IMC, EMT, PVC, MC
230.50	Protection against damage	SE cable subject to damage in RMC, IMC, Sch 80 PVC, EMT, RTRC

Section	Topic	Notes
230.51	Supports	SE cable within 12 in. of heads and connections, every 30 in.
230.53	Raceways to drain	Wet-location raceways arranged to drain
230.54	Overhead service locations	Weatherhead listed for wet locations; above the point of attachment or within 24 in.; drip loops
230.66	Marking	Service equipment marked suitable for service equipment
230.67	Surge protection	Type 1 or 2 SPD at every dwelling service, including replacements; $I_n \geq 10$ kA
230.68	Meter sockets	Not service equipment; rated for the service voltage and current
230.70(A)(1)	Service disconnect location, one- and two-family dwellings	Readily accessible outdoors, on or within sight; exception with 225.41 disconnect
230.70(B)(2)	EMERGENCY DISCONNECT marking	Red background, white letters
230.70(E)	Replacement	Replacing service equipment triggers 230.70(A)(1) and (B)(2); meter socket or SE conductor replacement alone does not
230.71	Number of disconnects	One, or two to six in separate enclosures or compartments
230.72	Grouping	Group the two to six; mark the load served; occupant access
230.79(C)	One-family dwelling	Service disconnect at least 100 A
230.82	Supply side equipment	Meter sockets, Type 1 SPDs, meter disconnects, and others allowed ahead of the disconnect
230.90	Overcurrent protection	Exception No. 5 allows 310.12 ampacities for single-phase dwelling services
250.24	Grounding the service	GEC at the service; no neutral-to-ground on the load side; main bonding jumper
250.50–250.66	Grounding electrode system and GEC	See R1.5 and R1.6
250.53(A)	Rod electrodes	8 ft in contact with soil; a second electrode unless one rod is 25 ohms or less; 6 ft apart
250.64	GEC installation	#6 or larger may run on the building surface where not exposed to damage; protect if exposed
250.92	Bonding at the service	Standard locknuts alone are not enough

Section	Topic	Notes
250.94(A)	Intersystem bonding termination	Outside enclosures; at least three terminals
300.7 (2023: 300.5)	Underground installations	Table 300.7(A) cover depths; ribbon; protection rising from grade; seals; bushings
310.12	Dwelling services and feeders	83 percent rule and Table 310.12(A)

End-of-Chapter Checklist

Use this on every service job before you call for inspection. Every box must be checked or explained to the journeyman.

Survey - ☐ Utility identified; if not Alabama Power, that utility's rules are in hand. - ☐ Point of delivery agreed with the utility before work started. - ☐ Load calculation done; service size picked (100 A minimum). - ☐ 811 called if any digging.

Overhead - ☐ Mast 2 in. minimum rigid galvanized or IMC above the roof. - ☐ Mast within 2 ft of the roof edge; no more than 6 ft of drop over the overhang. - ☐ Mast at least 3 ft above the roof; guyed if over 36 in. - ☐ 18 in. minimum from drop and drip loop to the roof. - ☐ Weatherhead above the point of attachment, or within 24 in. - ☐ 2 ft of conductor out of the weatherhead; drip loops formed. - ☐ Drip-loop low point at least 10 ft above final grade. - ☐ Drop will clear 12 ft over yard (NEC) and 15 ft over driveway (APC). - ☐ 3 ft from openable windows, doors, porches, unless above the window. - ☐ Point of attachment at least 10 ft above finished grade. - ☐ Only the power drop on the mast. - ☐ Straps: conduit within 3 ft of the meter, every 10 ft, near the top; SE cable within 12 in. and every 30 in. - ☐ SE cable protected where subject to damage. - ☐ Nothing concealed between weatherhead and meter.

Underground - ☐ 3 in. conduit, Schedule 40 with bushing (Schedule 80 where exposed to damage). - ☐ Conduit 24 in. below grade at the meter. - ☐ Footing notched or one 45° bend. - ☐ Three straps on the conduit. - ☐ Compacted soil 36 in. out from the wall. - ☐ Raceway sealed. - ☐ Any customer-owned buried run meets Table 300.7(A), with ribbon where required.

Meter base and disconnect - ☐ Socket on the APC list or APC-furnished; high-security lock fits. - ☐ Meter center 4 ft to 5 ft above final grade. - ☐ Mounted plumb and level with screws, not nails. - ☐ 3 ft from gas meter or regulator vent. - ☐ Clear space 60 in. deep, 30 in. wide, 7 ft high in front of the meter. - ☐ One conductor per terminal; no cut or folded strands; torqued to label. - ☐ Service enclosures bonded with listed bonding methods. - ☐ IBT mounted outside the meter can with at least three terminals. - ☐ Outdoor disconnect installed; EMERGENCY DISCONNECT label red with white letters; SERVICE DISCONNECT label if it is the service disconnect. - ☐ Plaque for any other-source disconnect not next to it. - ☐ SPD installed (R1.9). - ☐ GEC #6 copper minimum stapled to the house; rod 8 ft; listed clamp. - ☐ Inside panel converted to a subpanel with a four-wire feeder if the disconnect is outside.

Paperwork and power - [] 911 address on the meter socket and in the front window. - [] Inspection passed; release matches the 911 address. - [] Utility reconnected; voltages read and recorded. - [] Before and after photos filed.

Sources

- NEC 2026 text: 90.2, 110.26, 110.29, 225.41, 230.2-230.95, 250.24, 250.53, 250.64, 250.92, 250.94, 300.7 and Table 300.7(A), 310.12 and Table 310.12(A), Table 310.16.
 - Alabama Power, Residential Electric Service and Meter Installation Handbook, revised May 2023, Sections II-IV and Plates R-01-1, R-01-2, R-06-1. <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/Residential%20Meter.pdf>
 - Alabama Power, Builder's Guide to Working with Alabama Power. <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/builders-guide-web.pdf>
 - Alabama Power, Customer-Owned Meter Equipment, last updated August 12, 2026, pp. 1-6. <https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/business/customer-owned-meter-equipment.pdf>
 - OSHA 29 CFR 1910.333(c)(3)(i). <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.333>
 - NAVEDTRA 14027, Construction Electrician Intermediate, Chapter 7, pp. 7-8 to 7-10, Figures 7-7 to 7-9 (neutral bonding on the line side vs load side).
 - ERICO, Practical Guide to Electrical Grounding, Chapter 1, "Building and Service Entrance Grounding," pp. 1-19.
 - Kuhlman, Residential Electrical Troubleshooting (2019), "Neutral wire in electrical service," pp. 45-47. On p. 45 he also notes that a main-lug subpanel is fed with four-wire SER cable and its neutral bar floats, which matches Procedure 6. He describes clamping an amp probe on the water-pipe grounding conductor: it should read near zero, and several amps there points to a bad service neutral, often at the overhead drop splice. R2.5 uses this test.
 - Arc Guide, Part 10, "Lost / Floating Neutral — The Most Dangerous Residential Fault." Read it with R2.5.
 - Commercial 1.7 (grounding and bonding) and 1.8 (underground and site distribution) for depth.
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Videos to watch

These videos are made by other electricians and companies, not YES Electric. Watch each one after you read the section it goes with. Where a video does something differently from this module, the caution line says so. Follow this module and your journeyman, not the video. Click a title to open it on YouTube.

Section	Video
Overhead vs underground, and who does what (utility vs electrician)	Overhead & Underground Electrical Utility Service Electric Pro Academy • 15:52 A master electrician assembles a meter can, riser, and weatherhead on the bench and explains where the customer's work ends and the utility's begins, the two kinds of drop attachment (P-knob into framing, clamp on a mast), and a real lost-neutral story. Caution: His riser is PVC because it is not the point of attachment; when the drop attaches to the mast it must be rigid galvanized or IMC (he says so). Alabama Power also wants 2 in. minimum and 2 ft of conductor out of the head.
Procedures 2 and 3, Worked Examples 1 and 3: Clearances, point of attachment, PVC vs rigid through the roof	Rigid Metal or PVC Thru Roof? Article 230 Overhead Service Drops Electrical Code Coach • 12:04 A code instructor explains the service point, why the drop clearances still matter, 230.26 (10 ft minimum attachment), 230.9 (3 ft from windows and doors), and the 230.24(B) heights, and when a wall attachment with PVC is fine versus when you need a rigid mast through the roof. Caution: Talks only NEC. Alabama Power adds its own numbers (15 ft over driveways, mast not more than 2 ft from the roof edge, guy above 36 in.); use the module's APC table.
Procedure 2. Build an overhead mast service (through the roof)	NEW 200 AMP MAST SERVICE METER/ MAIN COMBINATION PSEG Electrician Ron • 36:09 A New Jersey contractor builds a 2 in rigid galvanized mast through a stucco wall and roof into a meter-main, straps it into framing with lag screws, has to add 2 ft so the drop clears the roof by 3 ft, installs the weatherhead and clevis, leaves 2 to 3 ft of conductor out of the head, and installs two ground rods and the water bond. Caution: Over 30 minutes; it is the best start-to-finish mast build found. PSE&G rules differ from Alabama Power: he sets the meter 6 ft to center (APC wants 4 to 5 ft), and the guy wire is left for later (APC requires it above 36 in.). He forgot to mark the neutral white at the head; do it before inspection.
Procedure 4. Build an underground service stub-up	200 Amp underground service install. "KISS" Electrical • 19:56 A crew glues Schedule 80 PVC with a sweep 90 up into the meter base and runs conduit in an open trench to the utility pole, keeping it plumb, backfilling to keep it from floating, and turning the label out for the inspector. Caution: He uses 2 in conduit; Alabama Power requires 3 in. minimum for 200 A and 24 in. of cover (module Procedure 4). This job runs to a pole riser that the utility finishes; on most APC jobs the utility trenches from its transformer. Call Alabama 811 before digging. No expansion fitting or footing notch is shown.