

Remodel Scopes and Changes in Occupied Homes

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.

Phase 3, Estimating and Scoping Residential Service Work. Read R3.1 and R3.2 first. This module scopes the larger room-by-room jobs: kitchens, bathrooms, basements, and additions. It also teaches how to write a change when the customer adds something after the work has started.

Before this module: R3.1 (scope sheet, factors, options, hand-off) and R3.2 (count checklists, missed-items sweep). Read commercial Module 3.3 first, as the curriculum says: its Part A (factors that eat labor) and Part C (change orders) are the base of this chapter. R1.12 (remodel and old-work wiring) teaches the install work you are counting here.

What this module does not teach. No prices, rates, or margins. You produce counts, hours, factors, and the change write-up. The office prices in its estimating program under the service job class and gets the customer's written approval. Techs never quote prices, never agree to a price for a change, and never collect payment.

Code edition. Code references are NEC 2026. Where a section moved, the NEC 2023 number is in parentheses. The local inspector (the AHJ) may enforce an earlier edition, and kitchen and bath requirements change a lot between editions. Ask your journeyman which edition applies before you write a code requirement into a remodel scope.

Learning Objectives

When you finish this module you will be able to:

1. Scope a kitchen, bathroom, basement, or addition wiring job from a walk-through and a sketch, room by room and device by device.
 2. Apply the finished-space factors and the occupied-house factors to the hours.
 3. Write a change when the customer adds something in the middle of the job, with scope, material, hours, and the effect on the schedule.
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Background: Remodels Are Different from Service Calls

A service call fixes one thing. A remodel rewires a room or adds new rooms, often with a general contractor (GC) or the homeowner running other trades at the same time. Three things make remodels harder to scope:

1. **The code minimums decide much of the count.** A kitchen has to have a certain number of receptacles in certain places on certain circuits. You count to the code first, then add what the customer wants.
2. **The space changes while you work.** Walls get opened, framing moves, cabinets arrive late, and the customer changes their mind. Each change costs hours beyond the new device itself.
3. **The family usually still lives there.** Commercial Module 3.3 calls working around occupants one of the conditions that eat labor. The MCAA productivity table names it "Beneficial Occupancy" and rates it 15 percent minor, 25 percent average, and 40 percent severe (MCAA, Change Orders, Productivity, Overtime: A Primer for the Construction Industry, p. 99).

Commercial Module 3.3 gives two rules for changes that apply here without change: price the full impact of a change, not just the new parts, and get it approved in writing before you do the work. At YES, the office does the pricing and gets the approval. Your job is to write the change so the office can do both the same day.

Words used in this module

Word	Meaning here
Rough-in	The stage when boxes are set and cable is run, before insulation and drywall. Inspected before the walls close.
Trim-out (finish)	The stage after drywall and paint when devices, plates, and fixtures go in. Inspected at the end.
Home run	The cable from the panel to the first box on a circuit
Finished space	A room with drywall or plaster on the walls and ceiling, where new wiring must be fished
Open framing	Walls and ceilings with studs and joists exposed
Change	Any work added, removed, or moved after the customer approved the scope
Change write-up	The tech's scope for a change: what, where, material, hours, schedule effect
Out-of-sequence work	Work done after the stage it belongs to, such as adding a box after the drywall is up

Part A: The Remodel Walk-Through, Step by Step

Step A1. Get the plan, or make one

1. Ask the customer or the GC for any drawing: architect's plans, a kitchen designer's layout, or the cabinet supplier's drawing. Cabinet drawings are the most useful for kitchens because they show every counter run, appliance, and opening with dimensions.
2. If there is no drawing, make one. Measure each wall and draw the room on graph paper or in a phone app. Show doors, windows, cabinets, appliances, and the sink.
3. Write the ceiling height and what is above the ceiling (attic, second floor, flat roof) and below the floor (crawl, basement, slab).
4. Mark north and the location of the panel relative to the room.

Step A2. Find out what stage the job is in

Stage	What it means for your count
Not started, walls still finished	You will be fishing unless the GC opens the walls. Ask whether demo is planned and who does it.
Demo done, open framing	Rough-in is fast. This is the cheapest time to add anything.
Drywall up	Anything new is fishing and patching.
Cabinets in	Countertop and under-cabinet work is harder; access to walls behind cabinets is gone.

Write the stage on the scope. A kitchen scope written for open framing is wrong if the GC hangs drywall the day before you start.

Step A3. Ask the customer and GC these questions

#	Question	Why
1	What appliances are going in? Brand and model if chosen. Gas or electric range?	Each one sets a circuit size and, in NEC 2026, GFCI protection (Part B).
2	Where does each appliance go?	Receptacle and circuit locations depend on it.
3	Is there an island or peninsula? Do you want receptacles on it?	NEC 2026 requires either receptacles or provisions for adding them later (210.52(C)(2)).
4	What lighting do you want? Recessed, pendants, under-cabinet, toe-kick, inside-cabinet?	Each is a separate count. Under-cabinet and pendants are the most common mid-job additions.
5	Any special items? Wine fridge, warming drawer, second dishwasher, instant-hot faucet, pot filler lighting, TV, USB receptacles, floor heat?	Each one is a circuit or an outlet.
6	Who does demo, drywall, patching, and paint?	"By others" items
7	What is the schedule? When does the drywall go up?	Your rough-in must be done and inspected before that date.
8	Will the family live in the house during the work? Pets? Someone working from home? Medical equipment on any circuit?	Occupied-house factor and shutdown planning (R3.1, Part F5)
9	What is the budget priority?	Helps you write options (R3.1, Part C)

Step A4. Check the panel and service

A remodel almost always adds circuits. Before you count devices:

1. Count open spaces in the panel and check the label for tandem rules.
2. Note the service size and the main breaker.
3. Note what the kitchen, bath, or addition currently draws from: which breakers, and what else is on them.
4. If the new circuits do not fit, or the load calculation fails (R-LOAD), the remodel needs a panel or service job. Count it with R3.2, Part B, and note that the remodel depends on it.

Step A5. Count room by room, device by device

Use the count sheet in Part C. Walk each room in the same order every time: start at the door, go clockwise around the walls, then the counters, then the island, then the ceiling, then the floor. Mark each device on the plan with a number as you count it. The number on the plan matches the line on the count sheet.

Picture coming: Room-by-room count sheet for a kitchen remodel, shown as a printed form on a clipboard. Top: "Room: Kitchen. Stage: open framing. Plan sheet K-1." A table with columns: "#", "Device or item", "Location (wall/counter/ceiling)", "Circuit", "Box type", "Notes." Rows filled in: 1 Duplex 20 A TR GFCI-protected, Wall A counter, SA-1, new-work 1-gang; 2 Duplex 20 A TR, Wall A counter, SA-1; 3 Dishwasher receptacle, under sink, DW, GFCI breaker; 4 Disposal receptacle, under sink, DISP; 5 Range 50 A 2-pole, Wall B, RANGE, GFCI 2-pole; 6 Microwave/hood, above range, MW; 7 Refrigerator, Wall C, SA-2; 8 Island receptacle, island end panel, SA-2; 9-14 Recessed cans 1-6, ceiling, LT-1; 15 Pendant boxes ×3, over island, LT-1; 16 3-way switch pair, door + dining, LT-1. A circuit summary box at the bottom lists each circuit with breaker type and home-run length. A small sketch of the kitchen in the corner with the device numbers circled at their spots.

Part B: The Code Minimums You Count First

Count to these minimums before you add anything the customer asks for. These rules set the bare count; the customer's wishes add to it.

B1. Kitchen

Requirement	Rule	NEC 2026
Small-appliance circuits	Two or more 20 A small-appliance branch circuits for the kitchen, pantry, breakfast room, dining room, and similar areas. They serve the wall, floor, and countertop receptacles and the refrigerator receptacle, and have no other outlets. Countertop receptacles must be on at least two of them. No small-appliance circuit may serve more than one kitchen.	210.11(C)(1), 210.52(B)
Small-appliance circuit exceptions	A receptacle for a specific appliance may be on its own individual circuit of 15 A or more. A receptacle for a gas range's igniter and clock may be on a small-appliance circuit.	210.52(B)(1) Exception No. 2, 210.52(B)(2) Exception No. 2
Countertop spacing	Counter spaces 12 in. or wider get receptacles so that no point along the wall line is more than 24 in. from a receptacle. In practice, that means no more than 48 in. between receptacles and no more than 24 in. from the end of a counter.	210.52(C)(1)
Behind a sink or range	Not required directly behind a range, counter-mounted cooking unit, or sink in the arrangements shown in Figure 210.52(C)(1).	210.52(C)(1) Exception No. 1
Height	On or above the counter, not more than 20 in. above it, or in the countertop using assemblies listed for countertops	210.52(C)(3)
Island and peninsula	If receptacles are provided to serve an island or peninsula, they follow 210.52(C)(3) and (C)(4). If none are provided, electrical provisions for adding one later must be installed at the island or peninsula.	210.52(C)(2)
Below-counter locations	Receptacles on the walls extending from base cabinets, and beneath countertops, may not be within 24 in. of the countertop	210.52(C)(4)
GFCI, receptacles	All 125 V through 250 V receptacles in kitchens on single-phase circuits within the 210.8(A) limits	210.8(A)(7)
GFCI, appliances	GFCI protection for the branch circuit or outlet supplying dishwashers, electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and microwave ovens, rated 150 V or less to ground and 60 A or less	210.8(D)
AFCI	Kitchen branch circuits within the 210.12 scope	210.12
Tamper-resistant	15 A and 20 A, 125 V and 250 V receptacles in dwellings	406.26 (2023: 406.12)

Why 210.8(D) changes kitchen counts. In NEC 2026, the range, wall oven, cooktop, microwave, and dishwasher circuits all need GFCI protection. A 50 A range circuit needs a 2-pole GFCI breaker made for the panel. These breakers cost more and are not available for every older panel. Check the panel brand before you write the count, and ask your journeyman which edition the AHJ is enforcing, because earlier editions did not include all of these.

B2. Bathroom

Requirement	Rule	NEC 2026
Bathroom circuit	One or more 20 A circuits for bathroom receptacles and countertop receptacles, with no other outlets, except that a 20 A circuit serving a single bathroom may also feed other equipment in that bathroom under 210.23	210.11(C)(3) and its exception
Receptacle near each sink	At least one receptacle within 3 ft of the outside edge of each sink, on an adjacent wall, on the countertop (listed assembly), or on the side or face of the sink cabinet, not more than 12 in. below the top of the sink or countertop	210.52(D)
GFCI	All bathroom receptacles; also receptacles within 6 ft of a tub or shower	210.8(A)(1), (A)(11)
Lighting outlet	A wall-switch-controlled lighting outlet in every bathroom	210.70
Tamper-resistant	Yes	406.26

The exhaust fan, any heated floor, and a whirlpool tub each need their own count line. A jetted tub falls under Article 680 Part VII, which this course does not cover (curriculum open question 3). Flag it and escalate.

B3. Basement and addition

Requirement	Rule	NEC 2026
Wall receptacles in habitable rooms	No point along the floor line of any wall space more than 6 ft from a receptacle; a wall space is any space 2 ft or wider unbroken by doors, fireplaces, and similar openings	210.52(A)(1), (A)(2)
Lighting outlets	Wall-switch-controlled lighting outlets in habitable rooms, bathrooms, hallways, stairways, and other areas listed in 210.70	210.70
Neutral at switch locations	A neutral must be at switch locations that control lighting in habitable rooms, bathrooms, hallways, and stairways, with listed exceptions	406.30(C) (2023: 404.2(C))
GFCI	Basements, crawl spaces at or below grade, and the other 210.8(A) locations	210.8(A)
AFCI	The rooms in 210.12's scope	210.12
Smoke and CO alarms	Required by the building code the AHJ has adopted, not the NEC	AHJ

B4. Existing wiring that the remodel touches

When the remodel modifies, replaces, or extends existing branch circuits in AFCI areas, those circuits need AFCI protection, with an exception for extensions of 6 ft or less with no new outlets or devices (210.12(E); 2023: 210.12(D)). When you replace a receptacle in a GFCI location, the

replacement must be GFCI protected (406.12(D)(3); 2023: 406.4(D)(3)). Count these the same way R3.1, Part E describes.

Part C: Turn the Count into Circuits and Home Runs

Step C1. Group devices into circuits

1. Put each required dedicated circuit on its own line first: each small-appliance circuit, the dishwasher, the disposal, the range, the microwave, the refrigerator if it gets its own, the bathroom circuit, the laundry circuit.
2. Group lighting into lighting circuits. Count the lighting load from the fixture wattages, not the old incandescent equivalents.
3. Group general receptacles in other rooms into general-purpose circuits. YES's usual practice on how many receptacles per circuit is your journeyman's call. Write it on the count so the office sees it.
4. Give each circuit a short name: SA-1, SA-2, DW, DISP, RANGE, MW, LT-1, BATH-1.

Step C2. Write each circuit's breaker and cable

Circuit	Breaker (amps, poles, type)	Cable or conductors	Home run length	Device count
SA-1	20 A 1-pole, type per 210.8 and 210.12	12/2 NM-B	measured	count

For each circuit:

1. The breaker type must give the protection the code requires: GFCI, AFCI, or both (dual-function). Check that the panel brand makes it.
2. The cable size follows the breaker (240.4(D)) and the appliance's installation instructions.
3. The home run is measured from the panel to the first box using R3.1, Step B4. Then add the box-to-box lengths.

Step C3. Count boxes and the parts that go with them

Item	How to count
Device boxes	One per device location; size for box fill (314.16). Note new-work or old-work.
Gang count	1-gang, 2-gang, 3-gang
Ceiling boxes	One per fixture; fan-rated where a fan may go
Recessed fixtures	Count; IC-rated if insulation contact (410.116)
Junction boxes	Count, and each must stay accessible
Nail plates	One per stud or plate where the cable is less than 1¼ in. from the face (R1.3)
Staples	Estimate per run, or use YES's standard allowance
Wire connectors	Per box, by size and count
Plates	One per device location, by gang and type (decora, toggle, blank)
Devices	Count by type: TR duplex 15 A, TR duplex 20 A, GFCI, switch, 3-way, 4-way, dimmer, smart device

Step C4. Note the stages

Split hours and material into rough-in and trim-out. The office uses this for scheduling and for billing stages. A typical split:

Stage	Tasks
Rough-in	Panel work for new breakers, home runs, setting boxes, running cable, recessed housings, nail plates, rough inspection
Trim-out	Devices, plates, fixtures, appliance connections, testing, final inspection, labeling

Part D: Factors for Finished Space and Occupied Houses

R3.1, Part B6 gives the starting factor table. Remodels add two points.

D1. Finished-space factors apply per device, not per room

If half the kitchen is open framing and half is finished (for example, an exterior wall left closed), apply the finished-wall factor only to the devices on the finished wall. Write which devices it covers.

Condition	Starting factor (R3.1)	What it covers
Open framing	1.0	Normal rough-in
Finished wall, access above or below	1.25–1.50	Fishing one wall with an easy path
Finished wall, no easy access, fire blocking likely	1.50–2.0	Access holes, drilling blocks, patch prep
Plaster and lath	add 0.25 to the finished-wall factor	Slower cutting, cracking, dust
Cabinets already set	1.25–1.50 for devices behind or under cabinets	Working inside cabinets, protecting finishes

These ranges are starting points from R3.1, not YES standards. Write the reason each time.

D2. Occupied-house factors apply to the whole job

When the family lives in the house during a remodel, the impact spreads across every day of the job: moving furniture, dust control, shutdowns around the family's schedule, cleaning at the end of each day, and working around kids and pets. MCAA's Beneficial Occupancy factor (15 to 40 percent, p. 99) describes this. R3.1 uses 1.15 to 1.40 as a starting range.

Occupancy	Starting factor
Family has moved out for the remodel	1.0
Family lives there; remodel area closed off with plastic; separate entrance	1.10–1.15
Family lives there; remodel area is the kitchen they still use or the only bathroom	1.25–1.40

D3. Other trades in the same room

If the GC has the plumber, HVAC tech, and drywall crew in the same small room as you, MCAA's "Stacking of Trades" factor applies: 10 percent minor, 20 percent average, 30 percent severe (p. 99). Note it on the scope if the schedule shows trades overlapping, and let the office decide whether to apply it.

Do not stack factors that describe the same problem (MCAA, p. 109). "Occupied" and "stacking of trades" describe different problems. "Finished wall" and "cabinets set" can overlap for the same device; pick the larger.

Part E: Changes in the Middle of the Job

E1. What counts as a change

A change is any of these after the customer approved the scope:

- Adding a device, fixture, or circuit.
- Moving a device that is already roughed in.
- Removing something from the scope.
- Changing a product in a way that changes the work (for example, switching from a gas range to an electric range, which adds a 240 V circuit).
- A condition you could not see that changes the work (for example, rotted framing behind a wall, or aluminum branch wiring found inside a wall the scope assumed was copper).

E2. What a change really costs in hours

Commercial Module 3.3 says a change is not just the new material and labor. It also costs the impact on the work already planned: rework, out-of-sequence work, and the schedule. MCAA lists factors that apply when changes disrupt a crew, including Reassignment of Manpower (5 to 15 percent), Dilution of Supervision (10 to 25 percent), Learning Curve (5 to 30 percent), and Errors and Omissions (1 to 6 percent) (pp. 99–100). MCAA also says a change of very limited scope, affecting only a small crew in a distinct area, may have little or no measurable impact, but that such changes are rare (p. 108).

For a residential change, count these hours:

Hours line	What it covers
Direct work	Installing the added item: box, cable, device, fixture
Rework	Undoing or redoing anything already done: moving a box, re-pulling a cable, re-terminating at the panel
Out-of-sequence	Extra time because the work is happening at the wrong stage: fishing through new drywall, working around set cabinets, patching
Inspection	An extra inspection trip if the change happens after the rough inspection and the AHJ needs to see it
Coordination	Time to stop, re-plan, get material, and talk to the GC or customer

E3. The schedule effect

Write how the change affects the finish date:

1. Does it need material that is not on the truck? How long does it take to get?
2. Does it need another inspection?
3. Does it hold up another trade (for example, the drywall crew cannot close a wall until the new cable is in and inspected)?

4. How many extra days, if any?

E4. Step by step: writing a change

1. **Stop and ask before you do any of the work.** If the customer or GC asks for something new, say: "I can write that up right now so the office can get you a price. We'll do it as soon as you approve it." Do not start the added work, even if it is small.
2. **Look at the actual condition.** Is the wall still open? Are cabinets in? Is the drywall up? Photograph it.
3. **Write what, where, and why.** "Add under-cabinet LED lighting on Wall A (8 ft run) and Wall B (5 ft run), switched from a new switch at the end of Wall A. Customer request, 10/2."
4. **Write the material with counts.** Same rules as R3.1, Step B3.
5. **Write the hours on the E2 lines.** Direct, rework, out-of-sequence, inspection, coordination.
6. **Write the schedule effect.**
7. **Write the code items the change brings.** For example, an island receptacle added after rough-in is still a countertop receptacle on a small-appliance circuit with GFCI protection.
8. **Hand it to the office right away** and tell the customer: "The office will send you the price for this change today. Once you approve it in writing, we'll add it."
9. **Wait for the office to confirm written approval before you do the work.**
Commercial Module 3.3's rule: approved in writing before you do the work.
10. **Record it on the job board** when it is done, with photos.

Techs never agree to a price for a change. If the customer says "just add it and put it on the bill," answer: "I want to make sure you know the cost before we do it. The office will send it today." If your journeyman decides a small change can go ahead before approval, that decision is the journeyman's and the office's, not yours.

Picture coming: Residential change form, filled in, shown as a phone screen. Header: "Change #2 — 123 Example St kitchen — 10/2." Fields: "Requested by: homeowner." "Stage when requested: drywall hung, not taped; cabinets set on Wall A and B." "What: under-cabinet LED, Wall A 8 ft, Wall B 5 ft; 1 switch end of Wall A; island receptacle at island end panel." "Material" table with counts, no prices: LED tape kit ×2 lengths, driver ×1, low-voltage cable 30 ft, 1-gang old-work box ×2, switch ×1, 20 A TR receptacle ×1 (GFCI protected), 12/2 NM-B 22 ft. "Hours" table: direct 3.0, rework 0.5, out-of-sequence 1.5, inspection 0.5, coordination 0.25, total 5.75, one journeyman. "Schedule: +1 day; drywall finish on Wall A/B held until change inspected." "Code: island receptacle on SA-2, GFCI, TR (210.52(C)(2), 210.8(A)(7))." Two photo thumbnails: the open drywall seam and the island end panel. Status bar at bottom: "Sent to office 2:14 PM — awaiting customer written approval. DO NOT START."

Worked Example: Kitchen Remodel From a Plan

The plan

A 1960s ranch kitchen, 12 ft by 14 ft, being gutted. The family lives in the house and will use a temporary kitchen in the dining room. Demo is done by the GC; framing is open on all walls except Wall D (the shared wall with the living room, left finished). Attic above with pull-down stairs in the hall. Crawl space below. Panel in the garage, 200 A, 40 spaces, 9 open, brand makes dual-function and 2-pole GFCI breakers. It is October.

Wall	Length	What is on it (from the cabinet drawing)
A	12 ft	Base cabinets and counter full length; sink centered (sink base 36 in.); dishwasher right of sink
B	14 ft	Counter 8 ft from the corner with Wall A; then 30 in. electric range; then 3 ft counter; then refrigerator space 36 in.
C	12 ft	Doorway 3 ft to hall; 9 ft of wall with a window
D	14 ft	Finished wall, opening 4 ft to dining room; 10 ft of wall
Island	6 ft × 3 ft	In the center, no sink, no cooktop

Appliances: electric range (nameplate calls for a 40 A circuit), dishwasher, disposal, over-the-range microwave (needs a 20 A individual circuit per its instructions), refrigerator. Lighting: six 6 in. canless recessed, three pendants over the island, 3-way switching from the hall door and the dining room opening.

Step 1: Countertop receptacles (210.52(C)(1))

The rule: no point along the wall line more than 24 in. from a receptacle, for counter spaces 12 in. or wider. Spaces behind the sink and range are handled by Exception No. 1 and Figure 210.52(C)(1).

Counter space	Length	Receptacles	Reasoning
Wall A, left of sink	4 ft 6 in. (from the Wall B corner to the sink base)	2	One within 24 in. of the corner, one within 24 in. of the sink edge; spacing under 48 in.
Wall A, right of sink, over dishwasher and to end	4 ft 6 in.	2	Same reasoning
Wall B, corner to range	8 ft, sharing the corner with Wall A	2	The corner counts around (the Wall A left receptacle is within 24 in. of the corner); add receptacles so no point is beyond 24 in.: one at about 3 ft from the corner and one within 24 in. of the range edge
Wall B, range to refrigerator	3 ft	1	A 3 ft space needs one receptacle near its middle
Island	6 ft	1 or provisions	Customer wants one receptacle on the island end panel; listed for the location and placed per 210.52(C)(3) and (C)(4)
Total countertop		8	

Walk the counter with a tape and the 24 in. rule before you trust a table like this. Corners, appliance garages, and short counter pieces under 12 in. change the answer.

Step 2: Other kitchen receptacles

Item	Count	Circuit
Wall C wall receptacle (9 ft wall space)	1	SA-2 (210.52(A) spacing, served by small-appliance circuit per 210.52(B)(1))
Wall D wall receptacle (10 ft wall space, finished wall)	2	SA-2
Refrigerator receptacle	1	SA-2 (or its own 15 A or 20 A individual circuit under 210.52(B)(1) Exception No. 2)
Dishwasher receptacle or hard connection	1	DW, 20 A, GFCI (210.8(D))
Disposal receptacle, switched at the counter	1 receptacle + 1 switch	DISP, 20 A per appliance instructions
Microwave/hood receptacle above range	1	MW, 20 A individual per instructions, GFCI (210.8(D))
Range receptacle (NEMA 14-50) or hard connection	1	RANGE, 40 A 2-pole, GFCI (210.8(D))

Step 3: Circuits

Circuit	Breaker	Cable	Serves
SA-1	20 A 1-pole dual-function (GFCI for 210.8(A)(7), AFCI for 210.12)	12/2 NM-B	Wall A countertop (4)
SA-2	20 A 1-pole dual-function	12/2 NM-B	Wall B countertop (3), island (1), Wall C (1), Wall D (2), refrigerator (1)
DW	20 A 1-pole dual-function (GFCI for 210.8(D), AFCI because 210.12(B)(1) covers all 120 V, 15 A and 20 A kitchen circuits)	12/2 NM-B	Dishwasher
DISP	20 A 1-pole AFCI (210.12(B)(1)); GFCI if the AHJ or the disposal instructions require it	12/2 NM-B	Disposal
MW	20 A 1-pole dual-function (GFCI for 210.8(D), AFCI for 210.12(B)(1))	12/2 NM-B	Microwave
RANGE	40 A 2-pole GFCI	8/3 NM-B (8 AWG copper at 60°C is 40 A in Table 310.16; NM must use 60°C per 334.80)	Range
LT-1	15 A 1-pole AFCI	14/2 and 14/3 NM-B	6 recessed, 3 pendants, 3-way pair

Countertop receptacles are on two small-appliance circuits (SA-1 and SA-2), which meets 210.52(B)(3). Seven circuits, eight breaker spaces (the range is 2-pole). The panel has 9 open. Note that one space remains.

Step 4: Lighting

Item	Count
6 in. canless LED, IC rated	6
Pendant ceiling boxes over island, fixtures by customer	3
3-way switches (hall door, dining opening)	2; dimmer pair if the customer wants dimming, compatible with the LED fixtures
Switch for disposal at the counter	1
Neutral at switch locations	Yes, in the 3-way boxes (406.30(C))

Step 5: Boxes, cable, and small parts

Item	Count	Note
1-gang new-work boxes	13 (8 countertop + Wall C 1 + refrigerator 1 + MW 1 + DW/DISP under sink 2)	
1-gang old-work boxes	2	Wall D, finished
2-gang new-work box	1	Hall 3-way + spare
2-gang old-work box	1	Dining-opening 3-way on Wall D (finished)
Island receptacle box	1	Listed for the island location; floor feed through the crawl space
Range receptacle box or hard-wire box	1	
Pendant boxes	3	Ceiling, rated for the fixture weight
12/2 NM-B	measured per circuit	Home runs from garage panel through attic; island fed up from crawl
8/3 NM-B	measured	Range
14/2 and 14/3 NM-B	measured	Lighting
Nail plates	per R1.3	
Devices	8 countertop 20 A TR (GFCI protected by the breaker), 3 wall 20 A TR, 1 refrigerator TR, 1 island TR, 1 DW, 1 DISP, 1 MW, 1 range receptacle, 2 3-way, 1 single-pole	
Plates	per device and gang	

Step 6: Hours

Use YES job history for the per-device hours. The factors for this job:

Factor	Applies to	Value	Reason
Finished wall	Wall D devices (2 receptacles, 1 three-way box)	1.50	Finished wall, attic access above, plaster in a 1960s house
Crawl space	Island feed	1.25	24 in. clearance, vapor barrier, dry
Attic	Home runs	1.10	October, attic about 85°F
Occupied	Whole job	1.15	Family in the house with a temporary kitchen; kitchen closed off with plastic

Hours split by stage: rough-in (panel breakers and home runs, boxes, cable, recessed fixtures, rough inspection) and trim-out (devices, plates, fixtures, appliance connections, testing, final inspection).

Step 7: The change: under-cabinet lights and a second island receptacle

After rough-in is inspected and the drywall is hung (not yet taped), and the cabinets are set on Walls A and B, the customer asks for under-cabinet lighting on Walls A and B and a second receptacle on the other end of the island.

Change write-up:

Section	Content
Requested by and date	Homeowner, 10/2
Stage	Drywall hung, not taped. Cabinets set on Walls A and B.
What	Under-cabinet LED on Wall A (8 ft, excluding the sink window) and Wall B (8 ft left of the range plus 3 ft right of the range). One new switch at the end of Wall A. Second island receptacle at the other island end panel.
Material	Under-cabinet fixtures or tape kit to the customer's choice, driver(s) per the product, Class 2 cable per the product, 1 old-work 1-gang box for the switch, 1 single-pole switch or compatible dimmer, 1 plate; 1 island receptacle and box listed for the location, 12/2 NM-B from the existing island receptacle (about 8 ft through the island base).
Code	The new island receptacle is a countertop receptacle on SA-2: small-appliance circuit, GFCI and AFCI by the dual-function breaker, tamper-resistant (210.52(B), 210.52(C)(2) and (C)(3), 210.8(A)(7), 406.26). The under-cabinet power supply goes on a lighting circuit, not a small-appliance circuit (210.52(B)(2)).
Hours: direct	Under-cabinet fixtures and wiring, switch, island receptacle
Hours: rework	Cutting drywall for the switch box and driver location; re-pulling at the island
Hours: out-of-sequence	Working under set cabinets; fishing behind hung drywall; patch prep
Hours: inspection	One extra trip if the AHJ wants to see the added wiring before taping
Hours: coordination	Calling the GC to hold drywall taping on Walls A and B
Schedule effect	Plus 1 day. Drywall taping on Walls A and B held until the change is inspected or the AHJ releases it. Under-cabinet fixtures need ordering: 2 to 3 days.
Status	Sent to office. Do not start until the office confirms the customer's written approval.

Compare the same additions on the original scope during open framing: no drywall cuts, no work under set cabinets, no extra inspection, no held trades. The difference between the two is the out-of-sequence cost of the change, and it is why the change write-up has those separate hour lines.

Worked Example: Bathroom Remodel, Short Form

A hall bathroom gutted to the studs, family using a second bathroom. Single sink vanity, tub-shower, exhaust fan, one ceiling light, one vanity light.

#	Item	Count	Code
1	20 A bathroom circuit, GFCI	1 circuit; serves the vanity receptacle, and because it serves a single bathroom it may also serve the fan and lights under 210.11(C)(3) Exception	210.11(C)(3), 210.8(A)(1)
2	Vanity receptacle within 3 ft of the sink edge, not more than 12 in. below the counter top	1 GFCI receptacle, 20 A TR	210.52(D), 406.26
3	Vanity light over the mirror	1 box	210.70
4	Ceiling light, if within the tub and shower zone, listed for damp or wet location as required	1 box	410.10(D) (R1.7)
5	Exhaust fan	1, with duct by others or YES (ask)	
6	Switches: light, vanity light, fan	3-gang box, 3 devices, neutral present	406.30(C)
7	Existing hall circuit that passes through the bath wall	Re-route or protect; if extended in an AFCI area, 210.12(E)	210.12(E)

Factors: open framing 1.0; occupied 1.10 (second bathroom available). Hours split rough-in and trim-out.

Common Mistakes

- Counting what the customer asked for and not the code minimum.** Count to 210.52 and 210.11(C) first. The customer's list adds to it.
- Using a fixed number of countertop receptacles.** Walk every counter space with a tape and the 24 in. rule.
- Forgetting the island provision.** NEC 2026 requires receptacles or provisions for a future one at every island and peninsula (210.52(C)(2)).
- Missing 210.8(D) GFCI on the range, microwave, and dishwasher circuits.** In NEC 2026 these are GFCI. Check the panel brand makes the 2-pole GFCI breaker.
- Putting under-cabinet lights on a small-appliance circuit.** Small-appliance circuits have no other outlets (210.52(B)(2)).
- Writing a remodel scope without the stage.** Open framing and hung drywall are different jobs.
- Applying the finished-wall factor to the whole room.** Apply it to the devices on finished walls only.
- Skipping the panel check.** Seven new circuits need eight or more spaces.
- Starting a change before written approval.** Write it, send it, wait.

10. **Writing a change as only the new parts.** Count rework, out-of-sequence, inspection, and coordination hours.
 11. **Leaving out the schedule effect.** The GC needs to know if drywall must wait.
 12. **Agreeing to a price for a change.** Techs never quote or agree to prices.
 13. **Forgetting jetted tubs are Article 680.** This course does not cover them. Flag and escalate.
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Field Exercise: Kitchen Remodel Scope and a Mid-Job Change

Setup. Your journeyman gives you a kitchen plan: an architect's or designer's drawing, or a cabinet drawing with dimensions, plus the appliance list. If no real plan is available, use the worked example's kitchen with the journeyman changing at least three things (counter lengths, appliance types, island size).

Part 1. Scope the kitchen.

1. Mark the stage on the plan (the journeyman tells you: open framing, partial, or finished).
2. Count every countertop receptacle by the 24 in. rule, counter space by counter space. Show your reasoning in a table like Step 1 of the worked example.
3. Count every other receptacle, appliance outlet, switch, and lighting outlet.
4. Group everything into circuits. For each circuit write the breaker (amps, poles, GFCI/AFCI/ dual-function), the cable, and the home-run length.
5. Count boxes, devices, plates, cable by size, nail plates, and connectors.
6. Check the panel: open spaces, tandem rules, and whether the brand makes every breaker type you listed.
7. Write the hours split into rough-in and trim-out, with finished-space factors applied only to the devices they affect, the occupied-house factor, and a written reason for each factor.
8. Write the scope sheet in the R3.1 format, with options if they make sense (for example, standard receptacles versus countertop pop-ups on the island).

Part 2. The change. After you hand in Part 1, the journeyman tells you: "The customer added under-cabinet lights on all upper cabinets and a receptacle on the island after rough-in was inspected and the drywall was hung." Write the change:

1. What, where, and who asked, with the date.
2. The stage and a description of what is already closed up.
3. Material with counts.
4. Hours on the five lines: direct, rework, out-of-sequence, inspection, coordination.
5. The schedule effect, including which trade is held.
6. The code items the change brings, with sections.
7. The status line: "Sent to office. Do not start until written approval."

Part 3. Compare. Write one paragraph comparing the hours for the same additions if they had been on the original scope during open framing, and name which hour lines account for the difference.

Pass standard. You pass when your journeyman signs off that the countertop count follows 210.52(C) space by space, every circuit has the right breaker type for 210.8 and 210.12 and the right cable, the small-appliance circuits have no other outlets, the island is handled under 210.52(C)(2), the hours are split by stage with factors applied to the right devices and explained, and the change write-up has all seven parts and was not "started" before approval.

NEC 2026 Cross-References

Section	Topic
210.8(A)	GFCI for dwelling receptacles: bathrooms, garages, outdoors, crawl spaces, basements, kitchens, sinks, tubs and showers, laundry, damp and wet locations
210.8(D)	GFCI for specific appliances, including dishwashers, electric ranges, wall ovens, cooktops, clothes dryers, and microwave ovens
210.11(C)(1)–(C)(4)	Required dwelling circuits: small-appliance, laundry, bathroom, garage
210.12(B), 210.12(E) (2023: 210.12(D))	AFCI for dwelling circuits in kitchens, family rooms, dining rooms, living rooms, bedrooms, hallways, laundry areas, and the other listed rooms; modified or extended circuits
210.52(A)	General wall receptacle spacing, 6 ft rule, 2 ft wall space
210.52(B)	Small-appliance circuits and what they serve
210.52(C)	Countertops: 24 in. rule, islands and peninsulas, height, prohibited locations
210.52(D)	Bathroom receptacle within 3 ft of each sink
210.70	Required lighting outlets
240.4(D)	Small conductor protection
310.16, 334.80	Ampacity; NM at 60°C
314.16	Box fill
406.12(D) (2023: 406.4(D))	Replacement receptacle rules
406.26 (2023: 406.12)	Tamper-resistant receptacles
406.30(C) (2023: 404.2(C))	Neutral at switch locations
410.116	Recessed luminaire clearance and insulation
Article 680 Part VII	Hydromassage bathtubs (not covered in this course)

End-of-Chapter Checklist

Walk-through - [] Plan obtained or drawn with dimensions, cabinets, appliances, doors, windows. - [] Stage written on the scope. - [] Questions in Step A3 asked and answered. - [] Panel spaces, tandem rules, and breaker availability checked; load calc requested if circuits are added.

Count - [] Code minimums counted first: 210.11(C) circuits, 210.52(A) through (D) receptacles, 210.70 lighting. - [] Countertop receptacles counted space by space with the 24 in. rule. - [] Island or peninsula receptacle or provisions counted. - [] GFCI per 210.8(A) and 210.8(D), AFCI per 210.12, TR per 406.26 on every circuit and device. - [] Every device numbered on the plan and on the count sheet. - [] Circuits grouped, each with breaker type, cable, and home-run length. - [] Boxes, devices, plates, cable, nail plates, connectors counted.

Hours - [] Split into rough-in and trim-out. - [] Finished-space factors applied only to the affected devices, with reasons. - [] Occupied-house factor applied, with a reason. - [] Stacking-of-trades noted if the schedule overlaps trades.

Changes - [] Did not start any change before written approval. - [] Change write-up has: what and who, stage, material, five hours lines, schedule effect, code items, status. - [] Sent to the office the same day. - [] Recorded on the job board with photos when done. - [] No prices anywhere; no payment collected.

Sources

- Mechanical Contractors Association of America, Change Orders, Productivity, Overtime: A Primer for the Construction Industry (2016 printing),, pp. 99–100 (factor table: Stacking of Trades, Reassignment of Manpower, Dilution of Supervision, Learning Curve, Errors and Omissions, Beneficial Occupancy), p. 108 (limited-scope changes), p. 109 (avoid overlapping factors), p. 125 (how the percentages were gathered).
 - YES Electric commercial course, Module 3.3 (productivity factors, change orders priced for full impact and approved in writing first, job costing).
 - YES residential course, Modules R3.1 and R3.2.
 - NFPA 70, National Electrical Code, 2026 edition, sections listed above.
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