BOSTON AUTOMATIONS

CEILING INSTALLATION — SCOPE OF WORK

Project: Sun Porch / Ketra Showroom
Address: Boston Automations Show Home, 7 Harvey Ln., North Easton, MA 02356
Scope: Ceiling rough-in & fixture install — Ketra D2 downlights, Stealth Acoustics invisible speakers/subs, David Trubridge Kina pendant, Ketra LS0 cove, Lutron QS keypad
Ceiling: 9'-6" (114") finished · spray-foamed roof deck · 1x3 strapping perpendicular to joists (joists 16" O.C.) · 5/8" blueboard + veneer plaster · trimless round mud-in plates
Rev / Date: Rev 1 · for field installation · all dimensions to be field-verified

0 · HOW TO READ THIS DOCUMENT & GOLDEN RULES

This document tells the install crew exactly what goes in the ceiling, where it goes, how to cut/block the strapping, and how to get every fixture dead flush with the finished plaster. Work top to bottom. Anything marked “field-verify” must be confirmed against the physical room and the Forman 5.28.26 plan before cutting. When in doubt, stop and call the office.

- **Golden rule 1 — Reference plane is the FINISHED CEILING (bottom of the 5/8" blueboard + plaster), not the joists.** Because we strap in New England, the finished ceiling sits 1-3/8" below the joist bottoms (3/4" strapping + 5/8" blueboard). Every aperture and every speaker face is set to that lower plane.
- **Golden rule 2 — Cut the minimum strapping.** Cut a strap only where it physically crosses a hole/opening, then block the cut ends to the neighboring straps so the blueboard stays fully supported around every penetration.
- **Golden rule 3 — Dry-fit and check flush before plaster.** Once blueboard is up you cannot easily move a recessed housing or speaker. Verify flush with a straightedge before the plasterer touches it.
- **Golden rule 4 — All Ketra line-voltage power is CONSTANT (unswitched).** Never put a wall switch or line-voltage dimmer on the Ketra circuit — control is wireless. A switched circuit will break the system.

1 · CHANGES FROM THE LIGHTING RCP (REV 07)

The crew may have the earlier RCP. Apply these four changes — they govern over the old plan:

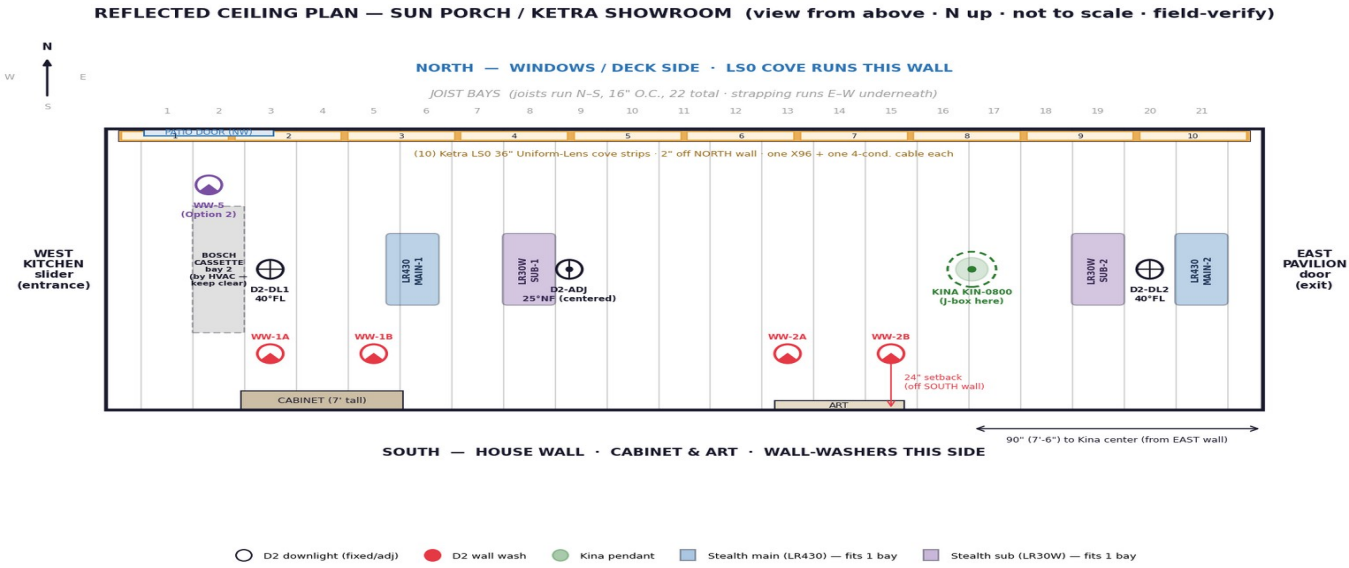
1. **TV lift removed.** The Future Automation CHR6 in-ceiling TV lift is OUT. Do NOT cut joists 7–11 and do NOT build the doubled trimmer joists or headers. The ceiling framing stays intact except for the minor strapping cuts noted per fixture.
2. **Adjustable downlight centered.** With the TV gone, the Ketra D2 Adjustable that was off-center now centers over the coffee table (room centerline, ~143-1/2" from the kitchen wall). Aim straight down.
3. **Cabinet lighting has two options.** Option 1 keeps two ceiling wall-washers over the cabinet. Option 2 replaces them with two wall sconces over the cabinet and relocates one wall-washer

above the patio door. Build whichever option the office confirms — both are detailed in Section 6.

4. **Bosch cassette added in bay 2.** A Bosch 12k one-way ceiling cassette (M# BMS500-AAU012-1AHZXD) is reserved for bay 2 (between joists 2 and 3, from the kitchen end). Bay 1 (the narrow end bay) will not accept it. Keep all lighting/speakers clear of bay 2, and the entrance Stealth main speaker moves toward center past the cassette (see Section 7).

2 · REFLECTED CEILING PLAN (VIEW FROM ABOVE)

Compass-oriented, viewed from above (north up): WEST / kitchen slider at the left, EAST / pavilion door at the right, NORTH / windows + deck along the top (the LS0 cove runs this wall), and SOUTH / house wall along the bottom (cabinet, art, and all wall-washers are on this side). The patio door is at the NW corner — north wall, kitchen end. Joists run N–S at 16" O.C.; the 1x3 strapping runs E–W underneath them. Stealth panel positions are recommended — field-coordinate exact bays to keep ≥6" between panels and clear of the Bosch cassette.



Revised reflected ceiling plan — not to scale. Full-resolution PNG is included in the project folder for printing.

3 · FIXTURE & DEVICE SCHEDULE

Positions are from the WEST / kitchen wall along the length unless noted. SOUTH wall = house wall (cabinet, art, all wall-washers); NORTH wall = windows / deck (LS0 cove); centerline = 60" off either long wall.

Tag	Fixture	Along-room location	Cross-room	Key notes
D2-DL1	Ketra D2 Fixed, 40° flood HO, frosted	51" from kitchen (bay 3)	Centerline (60")	General light, kitchen end
D2-DL2	Ketra D2 Fixed, 40° flood HO, frosted	35" from pavilion (323")	Centerline	General light, pavilion end
D2-ADJ	Ketra D2 Adjustable, 25° narrow flood HO,	143-1/2" (coffee table)	Centerline	Centered; aim straight down

Tag	Fixture	Along-room location	Cross-room	Key notes
	soft-focus			
WW-1A	Ketra D2 Wall Wash (855 lm)	~51" from kitchen	24" off SOUTH wall	Option 1 only — washes cabinet
WW-1B	Ketra D2 Wall Wash	~83" from kitchen	24" off SOUTH wall	Option 1 only — washes cabinet
WW-2A	Ketra D2 Wall Wash	~211" from kitchen	24" off SOUTH wall	Washes art wall
WW-2B	Ketra D2 Wall Wash	~243" from kitchen	24" off SOUTH wall	Washes art wall
WW-5	Ketra D2 Wall Wash (relocated)	~32" from kitchen (NW corner)	24" off NORTH wall	Option 2 only — above patio door; washes small wall right of slider
KINA	David Trubridge Kina KIN-0800, Ketra A-lamp	90" from pavilion (268")	Over table center	Pendant; J-box here; bottom at 7'-0" AFG
MAIN-1	Stealth LR430 invisible main	~95" from kitchen (field-coord.)	Centerline; fits 1 bay	Long axis N–S along joists; past Bosch
MAIN-2	Stealth LR430 invisible main	19" from pavilion (339")	Centerline; fits 1 bay	Long axis N–S along joists
SUB-1	Stealth LR30W invisible sub	~131" from kitchen (field-coord.)	Centerline; fits 1 bay	Long axis N–S; parallel-wired w/ SUB-2
SUB-2	Stealth LR30W invisible sub	51" from pavilion (307")	Centerline; fits 1 bay	Long axis N–S; parallel-wired w/ SUB-1
LS0 ×10	Ketra LS0 36" Uniform-Lens cove strip	Full length, NORTH wall	2" off NORTH wall	One X96 + one 4-cond. cable each
KP	Lutron Palladiom 4-button, dual-gang	Wall left of slider	2-gang box	QS-wired; back box this trade

Fixture count check: 7 × Ketra D2 (2 fixed + 1 adjustable + 4 wall wash), 1 Kina pendant, 2 Stealth LR430 mains, 2 Stealth LR30W subs, 10 LS0 cove strips, 1 Palladiom keypad. Order codes per the Lutron quote / RCP Rev 07 are carried forward unchanged.

4 · CEILING BUILD-UP & STRAPPING (NEW ENGLAND METHOD)

The roof deck is spray-foamed. Joists run one direction at 16" O.C.; 1x3 strapping runs perpendicular under the joists at ~16" O.C.; 5/8" blueboard fastens to the strapping; veneer plaster finishes the face. The finished ceiling plane is therefore ~1-3/8" below the joist bottoms.

Where things attach

- **Recessed D2 housings → to the JOISTS** via the supplied 14–24" adjustable hanger bars, then dropped/extended down to the finished plane (see Section 5).
- **Stealth speaker/sub frames, the Kina J-box, and sconce boxes → to BLOCKING set at the strapping/blueboard plane** (the same plane the blueboard fastens to), never to the joist bottoms — that would sit them 3/4" too high and recess the face.

Cutting strapping — the rule

1. Mark each fixture center on the strapping from the dimensions in Section 3.

2. Cut a strap ONLY where it crosses the hole/opening footprint (4.25" round for D2 apertures; the panel cut-out for Stealth).
3. Header the cut ends: add short 1x3 blocking between the two flanking straps so every blueboard edge around the penetration has backing. No unsupported blueboard edges.
4. Keep bay 2 (Bosch) and the LS0 cove zone clear of fixture blocking.

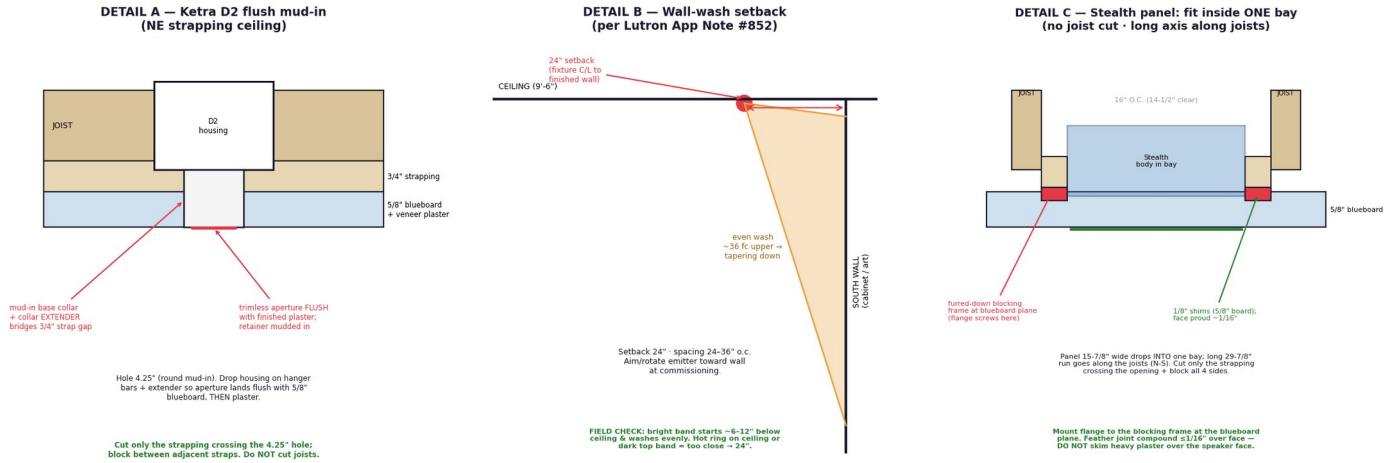
5 · KETRA D2 DOWNLIGHTS — MOUNTING & FLUSH MUD-IN

Applies to all 7 D2 fixtures (fixed, adjustable, wall wash). All use the round flangeless mud-in (trimless) trim, white, so the aperture finishes invisibly in the plaster.

Spec	Value
Ceiling hole (round mud-in)	4.25" (108 mm) diameter
Housing footprint	16.36" L × 10.07" W × 2.14" H (fixed) / 3.48" H (wall wash) · 5.7 lb
Hanger bars	Adjustable 14"–24-7/8" — span across two joists
Collar / ceiling thickness	Flangeless mud-in base collar + collar EXTENDER, set so the trim lands flush at the 5/8" blueboard face (≈ Thin/N at the finished plane after the 3/4" strap gap is bridged)
Trim	UN-D2 round, flangeless mud-in, white (with WW lens on wall-wash units)

Step-by-step

1. Confirm fixture center; cut/block the strapping per Section 4 so the 4.25" aperture is clear.
2. Mount the housing on its hanger bars across the two adjacent joists, centered on the mark.
3. **Drop to the finished plane:** lower the housing on the hanger-bar slots and add the mud-in collar extender so the aperture/retainer ring reaches DOWN through the 3/4" strapping gap and lands flush with the underside of the 5/8" blueboard. This is the single most important step — the aperture must finish flush with the PLASTER, not the strapping.
4. After blueboard is hung, install the mud-in trim retainer into the housing; verify the ring is flush to the board with a straightedge.
5. **Plaster:** the plasterer mud-in / feathers the trimless plate flush. Re-check with a straightedge across the ceiling — no proud lip, no recess.



Section details — A: D2 flush mud-in through strapping · B: wall-wash setback · C: Stealth flush. Full-res PNG in project folder.

6 · WALL-WASH AIMING & CABINET OPTIONS

6.1 How far off the wall (so it washes correctly)

Per Lutron's D2 Downlight Design Guide (Application Note #852), for our ~9-1/2 ft ceiling set the wall-wash fixture centerline 24" (2 ft) off the FINISHED wall, with fixtures 24–36" apart on center. At a 24" setback the wall reads about 36 fc near the top and washes evenly down the face; closer than 24" throws a hot scallop at the top with a dark band below, and farther than ~36" starves the top of the wall.

Field check — is it far enough off the wall?

- Power the fixture and look at the wall: the bright band should **start ~6–12" below the ceiling** and wash smoothly down to the cabinet/art.
- **Too close:** you see a bright ring/scallop on the CEILING or a dark band across the TOP of the wall → move the fixture out to 24".
- The wall-wash trim has a built-in directional (kick) lens. During commissioning, **rotate the emitter so the kick points at the wall** (365° emitter rotation, 95° collar). Confirm no light spills onto the windows.

6.2 OPTION 1 — Keep the two wall-washes over the cabinet

- **WW-1A and WW-1B** installed in the ceiling over the cabinet (kitchen end, house side), 24" off the house wall, ~32" apart, centered on the cabinet face (cabinet runs ~42"–92" from the kitchen wall). Rough-in both as standard D2 wall-wash housings.
- Total ceiling wall-washes in Option 1: **four (WW-1A, WW-1B, WW-2A, WW-2B).** No sconces.

6.3 OPTION 2 — Sconces over the cabinet + relocate one wall-wash

- **Delete WW-1A and WW-1B from the ceiling** over the cabinet (do not cut those two holes).
- **Install two wall sconces** on the wall above the cabinet, positioned to hang down and light the cabinet (per Forman elevation — typically one over each cabinet door; field-verify height above

the 7' cabinet). Provide a wall box at each sconce. Sconces take Ketra E26 A-lamps and tie into the same Ketra circuit (Section 7).

- **Relocate ONE freed wall-wash (WW-5)** into the ceiling above the patio door at the NW corner (north wall, kitchen end), 24" off the NORTH wall, aimed to wash the small return wall to the right of the slider. The second freed wall-wash housing is a spare/return.
- Total ceiling wall-washes in Option 2: **three (WW-2A, WW-2B, WW-5) plus two wall sconces.**

7 · KINA PENDANT — SIZE, HANG HEIGHT & JUNCTION BOX

7.1 Recommended size: David Trubridge KIN-0800 (31")

Over the 44" round table on a 9'-6" ceiling, the KIN-0800 is the right call:

KIN-0800 spec	Value
Diameter × height	31" (800 mm) dia × 15" (370 mm) H
Weight	3.3 lb — light; no suspension wire required
Lamp	1 × E26 — use the Ketra A-lamp (screw-in) so it joins the Ketra circuit
Cord	Ships 10' — cut to length on site

- **Proportion:** 31" over a 44" table is ≈70% of the table width — a true centerpiece without crowding the room. (39" KIN-1000 nearly equals the table width = too big; 24" KIN-0600 is the lighter, more restrained alternative if you prefer.)
- **Height rule honored:** on the 114" ceiling, hang the fixture so the BOTTOM sits at 7'-0" (84") above finished floor. That is a ~30" total drop from the ceiling; with the 15" body, ~15" of cord/canopy shows. Cut the 10' cord accordingly.

7.2 Junction box location (for the electrician)

- **Plan location:** centered over the 48"/44" round dining table at the PAVILION end — 90" (7'-6") from the pavilion end wall, on the table centerline. This lands near joist 17 (bay 17). Field-verify to the actual table center per the Forman 5.28.26 plan before cutting.
- **Box:** a 4" round/octagon ceiling box rated for the fixture, mounted on blocking set at the finished-ceiling (blueboard) plane so the canopy sits flush. The fixture is light (3.3 lb), but still mount to solid blocking, not just blueboard.
- **Power:** feed from the Ketra constant-hot circuit (Section 8) — the A-lamp is wirelessly controlled, so the box gets unswitched 120V.

8 · WIRING

8.1 Ketra lighting — ONE circuit, one Romex daisy-chain

- **All Ketra line-voltage loads on a single constant-hot circuit.** Run one line of Romex, daisy-chaining fixture to fixture: the 7 D2 downlights, the Kina A-lamp, and the cabinet lamps (the two wall-washes in Option 1, OR the two sconces in Option 2 — whichever option is built).

- **Constant power only — no wall switch, no line-voltage dimmer on this circuit.** Ketra fixtures and A-lamps are controlled wirelessly (Clear Connect Type X via the X96 / HQP7 system). A switched or dimmed feed will break control.
- Load is trivial (~7 × 18W + lamps ≈ 160W ≈ 1.4A) — a single 15A circuit is ample.

8.2 Stealth speakers & subwoofers — 14-gauge from the basement

- **Total 8 conductors of 14 AWG** pulled up from the basement: do either 2 runs of 14/4 OR 4 runs of 14/2. (14-ga is correct because these home runs exceed 50 ft; Stealth allows 16-ga only under 50 ft.)
- **Mains (LR430):** one dedicated pair to each of MAIN-1 and MAIN-2, from the AudioControl amp.
- **Subs (LR30W):** wire the two sub panels in PARALLEL (16Ω each → 8Ω system) to the Stealth SA255-MKII subwoofer amp; set the amp low-pass crossover ~50 Hz. One pair to each panel back to the parallel point.
- Leave generous service slack at each panel; attach wire to framing near the opening before the panel goes in.

8.3 Lutron Palladiom keypad — QS control wire

- **Pull one Lutron QS control cable (orange-jacket)** from the HomeWorks QSX HQP7-2 processor in the basement, up the wall to the LEFT of the slider, to a two-gang back box for the Palladiom 4-button dual-gang keypad. This is low-voltage control wiring — keep separated from line voltage. Confirm which slider with the office.

8.4 Ketra LS0 cove — dedicated Lutron 4-conductor cable

- **Wire type: Lutron QSH-CBL-M-500 4-conductor cable** (16 AWG power + 16 AWG common + 22 AWG MUX data pair + drain). This is NOT Romex and NOT speaker wire. Use plenum-rated QSH-CBLP-M-500 only if any run passes through an air-handling space.
- **One home run per strip:** each of the 10 LS0 strips gets its OWN 4-conductor cable back to its OWN X96 driver in the basement. Ten strips → ten X96 drivers → ten cables.
- **Do NOT wire LS0 strips in parallel.** Max cable length 50 ft per run (30 ft if plenum cable). Confirm each run is within length before pulling.
- **Routing (with the speaker wires):** from the X96 controllers by the basement panel → along the basement ceiling → up the basement wall → up the sun-porch wall behind the cabinet → along the ceiling toward the pavilion → down in the corner into the cove the carpenter builds. Land each cable at its strip and connect (flying-lead / Type-A adapter per the LS0 instructions).
- **Cove & strips:** (10) 36" LS0 Uniform-Lens strips run the full length along the backyard/window wall, set 2" off the wall in the cove; trim the final strip ~2" to fit the 358" length. Strips snap into the carpenter's cove shelf (~2-1/2" shelf, 0.65" lip).

9 · STEALTH INVISIBLE SPEAKERS — FLUSH MOUNTING

Mains LR430 and subs LR30W are the same panel size: 15-7/8" × 29-7/8" × 3-1/4" D (with back box).

- **ORIENTATION — critical: each panel fits INSIDE one stud bay. Do NOT cut joists.** Turn the panel so its 15-7/8" width drops into a single 16" O.C. bay (14-1/2" clear) and its 29-7/8" long run goes N–S, ALONG the joists. (The body fits the bay; only the perimeter flange laps the framing line.)

1. Lay out each panel from Section 3, centered in its bay. The 29-7/8" length runs along the joists (N–S); cut only the strapping (which runs E–W) where it crosses the opening — leave the joists intact.
2. **Build a blocking frame at the finished plane.** Add 1x blocking on all four sides of the opening, furred down to the strapping/blueboard plane — including ledger blocking against the lower inside faces of the two flanking joists. The speaker flange screws to THIS frame, not to the joist bottoms (joist bottoms sit 3/4" too high and would recess the face).
3. **Shim for 5/8" board:** apply the supplied 1/8" perimeter shims behind the flange so it finishes flush with the blueboard and the speaker FACE sits ~1/16" proud (this gives the tape a recess).
4. Connect speaker wire (polarity correct), then screw the flange to the blocking with the provided screws — all holes, no nails. Re-check flush with a 4-ft straightedge; the face should be ~1/16" proud evenly.
5. **Test before finishing:** play pink noise / music through the amp at the panel BEFORE any plaster. Fix any rattle now.
6. **Plaster carefully: feather joint compound ≤1/16" over the face, fanning out 16–20". DO NOT skim-coat heavy veneer plaster over the speaker face** — more than 1/16" of material kills the sound. Brief the plasterer specifically on this.

10 · INSTALL SEQUENCE & PRE-PLASTER VERIFICATION

1. Confirm Option 1 vs Option 2 with the office. Mark all fixture centers; mark bay 2 as Bosch — keep clear.
2. Pull all wiring: Ketra Romex daisy-chain (constant-hot), 8× 14-ga speaker conductors, QS keypad cable, 10× LS0 4-conductor cables. Label everything.
3. Cut/block strapping per fixture. Mount D2 housings; drop to finished plane with collar extenders. Mount Stealth blocking + panels (shimmed). Mount Kina J-box and (Option 2) sconce boxes on blocking.
4. Test every Stealth panel with the amp (pink noise). Confirm Ketra fixtures power up.
5. PRE-PLASTER CHECK (sign off before blueboard/plaster):

- Every D2 aperture reaches the finished plane and the retainer is flush to the blueboard.
- Every Stealth face is ~1/16" proud and flush-flange; panels tested good.
- Kina J-box centered on table (90" from pavilion wall, field-verified) and on solid blocking.
- Wall-wash housings at 24" setback; nothing aimed at the windows.
- Bay 2 clear for Bosch; LS0 cove clear and cables landed.

6. Hang blueboard. Install D2 mud-in retainers. Plaster — keep ≤1/16" over Stealth faces; trimless mud-in flush at every D2.

7. After finish: confirm flush at every aperture with a straightedge. Commissioning team aims wall-wash emitters, centers the adjustable on the coffee table, sets cord height on the Kina (bottom at 7'-0"), and addresses all Ketra/LS0 loads.

11 · FIELD-VERIFY / OPEN ITEMS

- Exact dining-table center (confirm against Forman 5.28.26 plan) → sets the Kina J-box.
- Bosch cassette footprint & exact bay-2 position (HVAC) → final clearance for MAIN-1 and WW-1A.
- Stealth MAIN-1 / SUB-1 final bays — confirm each panel fits its bay, keep ≥6" between panels and clear of the Bosch. No joist cutting.
- Patio-door location (NW corner) for the Option-2 relocated wall-wash (WW-5).
- Which slider the Palladiom keypad sits left of, and sconce mounting height (Option 2).
- Confirm LS0 = 10 × X96 drivers (one per strip) and Uniform-Lens, and that each cable run is ≤50 ft.
- Room dimensions vary slightly between the Forman plan (29'-9-5/8" × 9'-7-1/2") and the RCP (29'-10" × 10'-0") — field-verify before final layout.