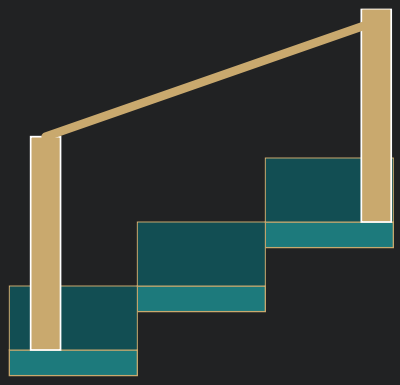
STAIR PARTS · POST-TO-POST SYSTEM

Handrail & *Newel*
Installation Guide

Code-compliant install for the wood handrail, box newel, and turned-newel system UWP supplies through the Tanner Rd yard — IRC R311.7.8 / R312, rail-bolt joinery, layout, fittings, and field troubleshooting.



READ THIS FIRST

Post-to-post — the *workhorse system.*

This guide covers the post-to-post wood handrail and newel system that UWP supplies through the NW Houston / Tanner Rd yard (special order) — square-top newels with the handrail butted into the post face and joined with a rail bolt. It is the IRC-friendliest system for residential stairs and the one most trim carpenters reach for first. Over-the-post (pin-top newel with continuous fittings) is a separate appendix and not covered here.

WHAT THIS GUIDE COVERS

- Post-to-post wood handrail joinery using rail-bolt hardware (Snug-Tite, Zipbolt, or equivalent).
- Box newels (4091 / 4075 / 4175 family) and turned newels (4045 / 4042 / 4015 family), special order through Tanner Rd.
- Handrail profiles 6010 / 6210 / 6710 — solid, finger-jointed, and plowed (P) for square balusters.
- IRC R311.7.8 handrail rules — height, graspability, returns, projection, continuity.
- IRC R312 guard rules — 34" guard on the stair, 36" at landings, 4" sphere (4-3/8" on the stair side), 6" at the tread triangle, 200-lb load.
- Layout with the pitch block, newel positioning, anchor methods, and code-load compliance.
- Returns, rosettes (UW-7017), and wall-mounted hand-rail brackets per R311.7.8.4.
- Field troubleshooting — the dozen things that actually go wrong on a real install.

WHAT THIS GUIDE DOES NOT COVER

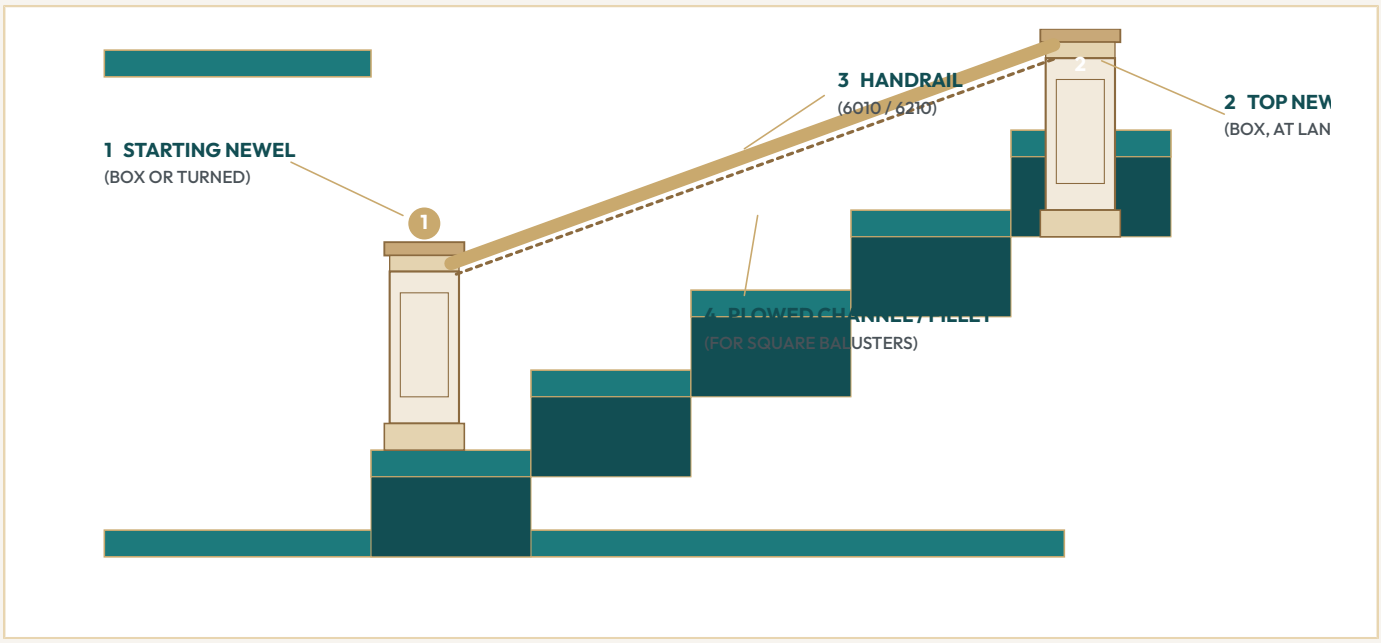
- Over-the-post systems — pin-top newels with continuous fittings (volutes, easings, turnouts) riding over the post.
- Iron handrails or iron newels — different fastening, different finish handling.
- Curved stair handrails — UWP fabricates these in-house; engineered as a custom job, not a stock install.
- Iron baluster install — see the UWP Iron Baluster Installation Guide for the epoxy-set UW M-series.
- Square wood baluster fillet sub-rail systems — a brief overview is included, full method is in a separate doc.
- Commercial / IBC stairs — different graspability, projection, and continuity rules. Consult the AHJ.

CODE REFERENCE: NOT LEGAL ADVICE

The IRC dimensions cited in this guide reflect the 2021 International Residential Code. Local amendments and your Authority Having Jurisdiction (AHJ) take precedence — always confirm at permit. UWP supplies the parts; the installer and owner are responsible for code compliance.

KNOW THE PIECES BEFORE YOU CUT

What goes *where.*



POST-TO-POST STAIR — SIDE ELEVATION SHOWING THE FOUR PRIMARY COMPONENTS

GLOSSARY

Starting newel — the bottom-of-stair newel; carries the lower end of the handrail and one side of the guard.

Landing / intermediate newel — used where the rail pitches change or at a landing turn. Same anchor logic as a top newel.

Top newel — at the upper end of the rake, butted to the second-floor framing. Carries the top of the rail.

Pitch / rake — the angle of the stair, set by rise-over-run. Captured with a pitch block (see page 9).

Plow — a square channel routed in the underside of the handrail to receive square wood balusters and fillet pieces.

Fillet — thin wood strips that fill the plow between balusters, set the spacing, and finish the underside.

Rosette — a small wood plate mounted on the wall to receive the end of a handrail terminating at the wall (UW-7017).

Rail bolt — the threaded stud + tee-nut hardware that pulls the handrail tight against the newel face.

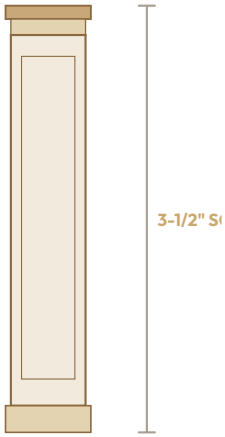
THE POSTS UWP CARRIES

Box newels and *turned newels.*

UWP carries the wood newel families most commonly specified on Houston-area residential stairs, in box and turned profiles. Newels are special order — profile, species and timing are confirmed at quote. Box newels are listed in red oak and poplar; turned newels in red oak.

BOX NEWELS — 4091 / 4075 FAMILY

UW-4091	Box newel, 5-1/2" sq.	55" · oak, maple, WO
UW-4091XL	XL box newel, 6-1/4" sq.	55" · oak, maple
UW-4091R	Box newel, reverse panel	55"
UW-4091F	Box newel, fluted	55" · XL also
UW-4075	Box newel, 3-1/2" sq.	56" · oak, maple, WO
UW-4075SL	Sleeve for the 4075	22-1/4"
UW-4000	Chamfered box newel, 3-1/4" sq.	56" · oak, maple, WO
UW-4002	Chamfered box newel, 3-1/2" sq.	56"
UW-4091PTOP	Pyramid cap for box newels	5-1/2" · 6-1/4" XL
UW-4091FTOP	Flat cap for box newels	5-1/2"





TURNED NEWELS — 4045 / 4042 / 4015 FAMILY

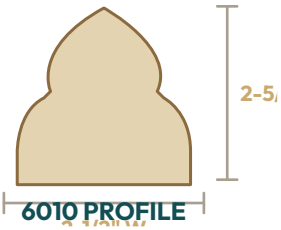
UW-4015	3" turned landing newel	58"
UW-4040	3" turned starting newel	47-5/8"
UW-4042	3" turned starting newel	57-5/8" · WO 54"
UW-4045	3" turned landing newel	57-5/8" · WO also
UW-4046	3" turned landing newel	62"
UW-4045BT	Sloped pin-top landing newel	57-5/8"
UW-4500	3-1/2" turned starting newel	48"
UW-4010	3" turned starting newel	43" · WO also

CAPS AND TOP TREATMENT

Box newels ship with a separate top cap to allow trimming to height. UW-4091PTOP (pyramid top) and UW-4091FTOP (flat top) match the 4091 family. Verify the cap matches the newel base profile — the chamfer and tape transition has to align.

TWO PROFILE FAMILIES DO MOST OF THE WORK

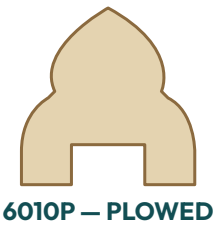
Pick the rail, *then pick the variant.*



UW-6010 · AMERICAN CLASSIC



UW-6210 · CLASSIC — SLIGHTLY WIDER, LOWER



UW-6010P · PLOWED FOR SQUARE BALUSTERS

HANDRAILS — SOLID & FINGER-JOINTED

UW-6010	6010 handrail, finger-joint oak	8–20 ft · most common
UW-6010SC	6010 white oak, solid cap	8 / 12 ft
UW-6010FJ1	6010 white oak, finger-joint	16 ft
UW-6010-16-P	6010 poplar	16 ft · paint grade
UW-6210	6210 handrail, oak	8–20 ft · wider profile
UW-6210SC	6210 white oak, solid cap	8–12 ft
UW-6210FJ1	6210 white oak, finger-joint	14 / 16 ft
UW-6710	6710 handrail, oak	8–20 ft · 2-3/4" stock

PLOWED & WALL RAILS

UW-6010P	6010 plowed (for sq. balusters)	8 / 12 / 16 ft
UW-6210P	6210 plowed	Oak and white oak
UW-6042	6042 plowed, flat top	8 / 12 / 16 ft
UW-6040	6040 round wall rail	8–20 ft

FILLETS

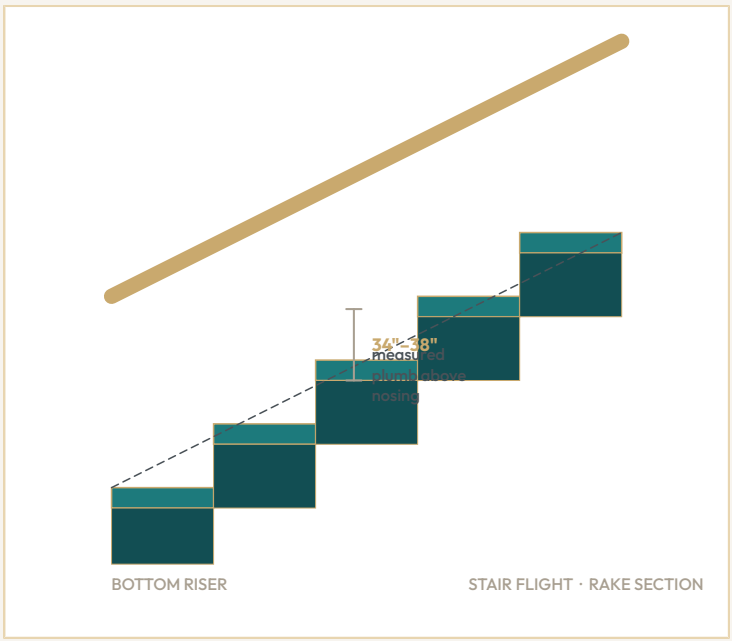
Cut from matching species to the plow width — 1-1/4" sq. for the standard 6010P plow. Comes in 8' and 12' lengths.

PROFILE FAMILY RULE

Stay within one profile family for any single stair (6010 OR 6210, not both). The fittings, returns, and rosettes are family-keyed — the cross-section has to match within a few thousandths for a clean joint. Mixing families causes a visible step at every transition.

CODE REFERENCE — HANDRAILS

Height, grasp, *and return.*



R311.7.8.1 — HANDRAIL HEIGHT (34"–38" PLUMB ABOVE NOSING)

R311.7.8.1 — HEIGHT

Handrail height is measured plumb (vertical) from the leading edge of the tread nosing up to the top of the handrail. The required range is **34" minimum and 38" maximum.**

For new construction, target 34-1/2" — gives ½" of trim margin at the top newel without losing code at the bottom.

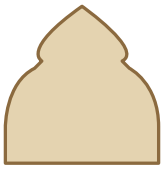
R311.7.8.2 — CONTINUITY

Handrails must be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser. Post-to-post systems satisfy this because the handrail butts into the newel face at each end — the newel itself counts as the termination.

R311.7.8.3 — GRASPABILITY

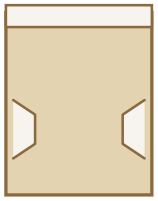
Type I: Circular cross-section 1¼"–2" outside diameter. Non-circular cross-section perimeter 4"–6¼", max cross-section dimension 2¼".

Type II: Perimeter > 6¼" must have a finger-recess on both sides starting within ¾" of the rail's widest point and at least [-" below the widest point. Recess depth ⅝", recess width ¼".



TYPE I
1-1/4"–2" PERIMETER

TYPE I · 6010 PROFILE



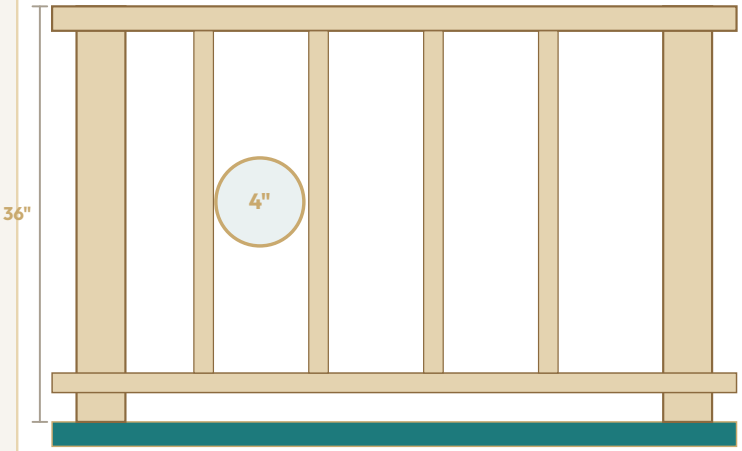
TYPE II
4"–6-1/4" PERIMETER

TYPE II · FINGER-RECESS

CODE REFERENCE — GUARDS & NEWELS

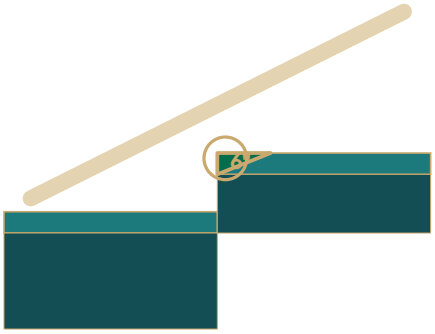
The newel *is the guard.*

On any open stair, the newel posts are structural guard supports. They must resist the same 200-lb concentrated load and 50-lb/ft linear load required of a guard rail under R301.5 — which drives the anchor method on page 10. Get the anchor right or the guard fails inspection.



4" SPHERE CANNOT PASS
— maximum baluster gap (R312.1.3)

R312.1.3 — 4" SPHERE RULE + R312.1.2 — 34" STAIR GUARD



TRIANGULAR OPENING AT THE BOTTOM
of the guard rail must not allow a 6" sphere to pass (R312.1.3 exception)

R312.1.3 EXCEPTION — 6" SPHERE AT THE TREAD TRIANGLE

R312.1.2 — GUARD HEIGHT

36" minimum at stairways, measured from the tread leading edge. 42" minimum at landings, balconies, and floor openings where the walking surface is more than 30" above grade.

R312.1.3 — SPHERE RULE

4" sphere maximum opening between balusters and at the bottom rail. Two exceptions (R312.1.3): on the open side of a stair the balusters may pass up to a 4-3/8" sphere, and the triangular space formed by the tread, riser and bottom rail must not pass a 6" sphere.

R301.5 — LOAD

Guard rails (incl. newels and handrails) must resist 200 lb concentrated load applied in any direction at any point along the top, plus 50 lb/ft linear load. The newel anchor must transfer that load to the structural framing.

SET THE BENCH BEFORE THE CUT

Tools and *hardware.*

LAYOUT

- 4-ft level (the long one — gets the newel plumb in two reads)
- 6-ft chalk line (snap the handrail line off the nosings)
- Combination square + bevel gauge (to capture the rake angle)
- Pitch block — made from 2x scrap (page 9)
- Tape measure, sharp pencil, dead-blow mallet

CUTTING

- Compound miter saw (12" preferred — handrails are 2-3/4" wide)
- Sharp 80T finish blade — chip-free cuts on stain-grade rail
- Hand saw / Japanese pull saw — for fillet trim cuts in place
- Block plane for fine fit at the rail-to-newel butt joint
- 1/16" cold chisel for the rail-bolt access mortise

DRILLING

- Cordless drill + impact driver
- 5/16" auger bit (rail-bolt access hole through handrail)
- 1/4" and 3/8" twist bits (rail-bolt pilot + tee-nut hole)
- Newel-bolt drill jig — sets bolt center on the newel face
- Forstner bits (3/4", 1") — bolt-cap recesses, plug counter-bores

RAIL-BOLT HARDWARE

- Snug-Tite / Zipbolt / standard handrail-bolt kit per joint — includes the threaded stud, tee-nut, and lock-washer
- 3/8" rail bolts are standard for 6010 / 6210 family rails
- Wood plug to cover the access hole (stock plug per species)

NEWEL ANCHORS

- Bolt-through (preferred) — 3/8" carriage bolt + nut + washer through floor blocking from below
- Lag-into-blocking — 3/8" lag screws into solid blocking under the subfloor
- Newel Fastener System (NFS) — surface lag with concealed plug cap, for retrofit where you cannot access from below
- Construction adhesive (PL Premium or equivalent) — gap-filling, structural

FINISH

- Wood glue (Titebond III or equivalent — slow-set for the rail-bolt joint)
- Color-matched putty stick (for nail holes in the fillet)
- 15-gauge finish nails (2") for fillet — set with a pin nailer for tighter fastening
- Sanding sponge — 220 grit for the rail-to-newel butt edge

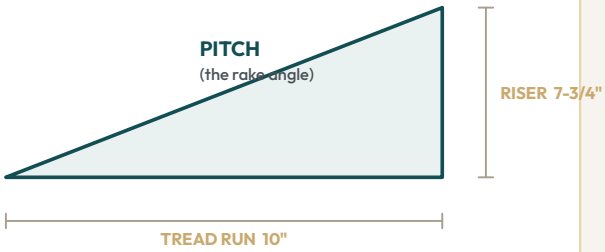
RAIL-BOLT BRANDS AT THE COUNTER

UWP stocks the Snug-Tite newel fastener (UW-STITE) at Tanner Rd. Traditional rail bolts and Zipbolt are special order. One rail-bolt kit per rail-to-newel joint — a typical stair with one starting newel, one top newel, and one landing turn uses three kits. Buy one extra; the access mortise is a wreck if a tee-nut gets cross-threaded.

LAYOUT METHOD

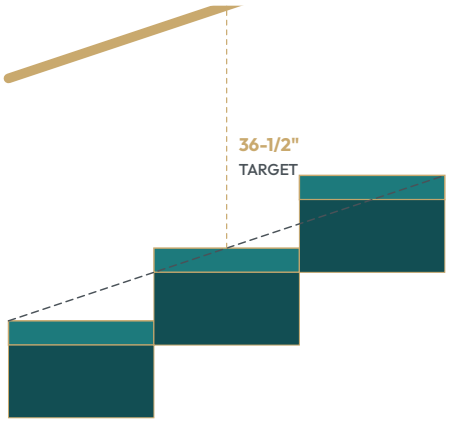
Pitch block *first.*

Before a single newel goes down, capture the actual stair geometry. The plans say 7-3/4" riser by 10" tread — the built stair may not. The pitch block lets you carry the real rake angle to the miter saw and the newel face. Get this right and every cut downstream lines up.



Cut a 2x scrap to the actual rise & run measured on the installed stair. Carry it to the miter saw and the newel layout — it captures the pitch exactly.

STEP 1 · CUT THE PITCH BLOCK FROM 2X SCRAP



CHALK A LINE 36-1/2" ABOVE EACH NOSING — STRING TO THE TOP NEWEL

STEP 2 · SNAP THE RAIL LINE OFF THE NOSINGS

1

Measure the real rise and run.

On the installed stair, measure one full tread run (front of one nosing to the front of the next nosing — typically 10"–11") and one full rise (top of tread to top of next tread — typically 7-1/4"–7-3/4"). Confirm at least three steps in the flight; if they vary, average. Mark these as the working rise and run.

2

Cut a pitch block.

On a piece of 2x scrap 10"–12" long, lay out a right triangle with the working rise as the short leg and the working run as the long leg. Cut on the bandsaw or with a circular saw. The hypotenuse is the rake angle — this block now carries it everywhere.

3

Snap the rail line.

On each tread nosing, mark a target rail height. The IRC range is 34"–38" plumb above the nosing — 36-1/2" centerline target gives ½" trim margin on a stain-grade rail. Pull a chalk line through all the marks to the top newel. Confirm the line is parallel to the nosing slope — if not, one of your nosing marks is off.

Set the newel positions.

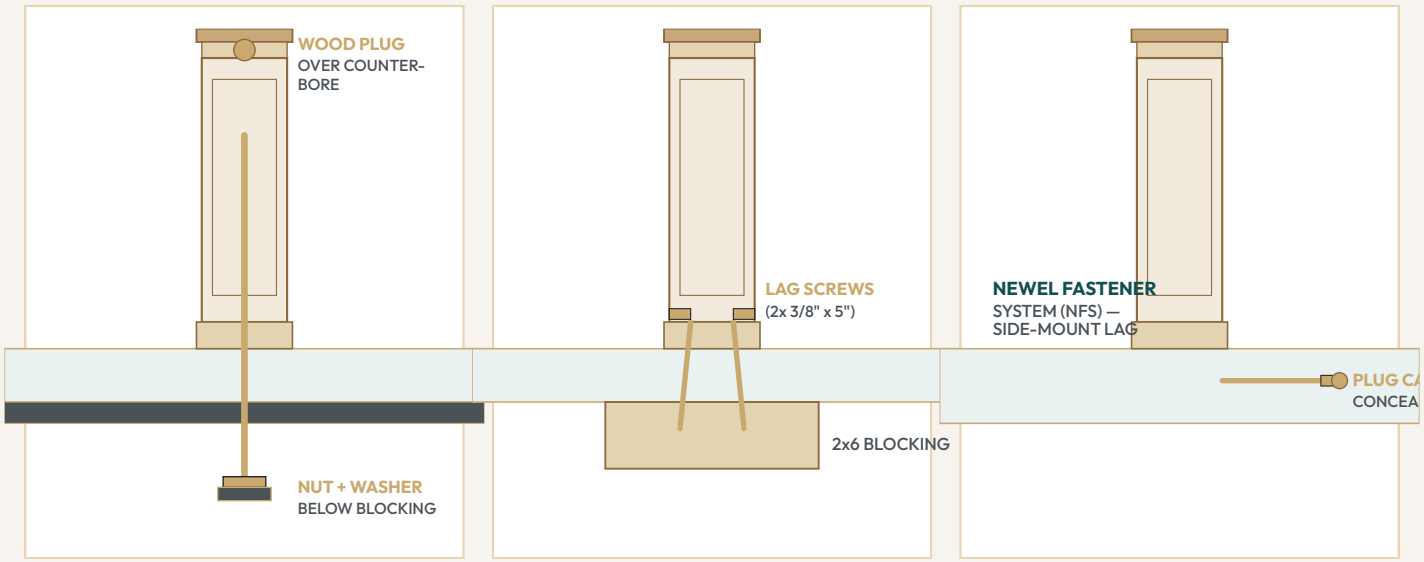
4

Starting newel: usually centered on or just behind the bullnose of the bottom step (depends on whether you have a starting step or a starting newel rosette block — verify from the plan). Top newel: face flush with the top riser, centered on the second-floor framing. Mark both positions.

NEWEL INSTALL

Three ways to *tie it down.*

Each anchor method has a place. Bolt-through is the structural gold standard and the one that survives a strong load test. Lag-into-blocking is the carpenter's default when you have a clean joist bay below. NFS is for retrofits where the ceiling below is finished and you cannot get above the floor.



A · BOLT-THROUGH (PREFERRED) B · LAG-INTO-BLOCKING C · NEWEL FASTENER SYSTEM (NFS)

1 *Bolt-through — preferred.*

Drill a 3/8" hole through the center of the newel base and through the subfloor. Counter-bore the top of the newel for a hex head + 3/4" wood plug. Pass a 3/8" carriage bolt through; the threaded end exits below into the joist bay. Add a fender washer and nut from below; pull the newel snug, plumb in two directions, then torque to a firm-not-stripped feel. Plug the top with matching species.

2 *Lag-into-blocking — common.*

Install solid 2x6 (or doubled-up) blocking under the floor at the newel position before drywall closes the ceiling. Set the newel and drive two 3/8" x 5" lag screws at opposing angles through the base into the blocking. Pre-drill 1/4" pilots to avoid splitting the newel base. Counter-bore for the hex heads if the screw line will be visible.

3 *Newel Fastener System (NFS) — retrofit.*

When the ceiling below is finished and you cannot reach the underside, NFS hardware lags through the side of the newel base into the rim joist or stringer. Cap holes with matching-species plugs. NFS is rated for residential code load when properly installed, but the bolt-through method is stronger if it's available.

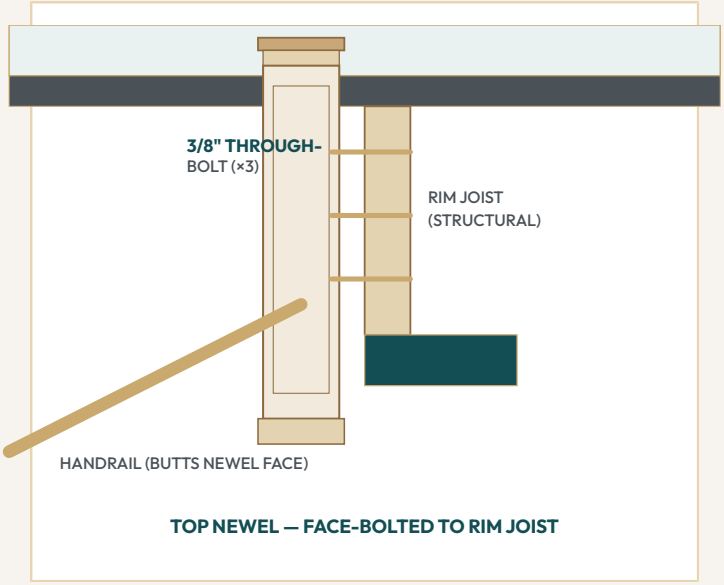
PLUMB CHECK, TWO READS

Before the bolt or lag is fully driven, plumb the newel in both directions (parallel and perpendicular to the stair) with the 4-ft level. A newel that's 1/16" out at the base will be 3/8" out at the top — visible in any side light. Adjust with shims under the base block before you finalize torque.

THE TWO TRICKIEST NEWELS

Top newel *and the turn.*

The starting newel is the easy one — open floor below for the bolt, clear sight lines for plumb. Top and landing newels carry the same load with less working room: the top newel butts against second-floor framing, and the landing newel takes the rail-line change. Get these two right and the rest follows.



TOP NEWEL · FACE-BOLTED TO RIM JOIST

TOP NEWEL HEIGHT MATH

Top of newel cap = handrail height + half the rail height.

For a 36-1/2" handrail target with a 6010 rail (2-5/8" tall, so 1-5/16" from top to centerline):

36-1/2" + 1-5/16" = 37-13/16" top-of-cap

Cut the newel shaft 1" shy of that and dry-fit the cap to finalize. The cap pulls the post to the target with a snug-fit shoulder.

LANDING NEWEL

On a landing turn (where the rail goes from rake to level or pitch changes), set one newel to take both rail sections. Anchor as bolt-through into landing framing if accessible, otherwise NFS into the rim. Drill the rail-bolt holes after the newel is dead-plumb — drilling them off the saw on the bench guarantees they will not line up in the field.

1 *Position top newel.*

Pre-drill the rim joist for three through-bolts at ~3" centers. Set the newel hard against the rim, plumb both directions, and drive the bolts. The newel face stays flush with the top riser.

2 *Trim newel height.*

Mark the top-of-cap height calculated above, transfer to the newel shaft, cut on the miter saw with the pitch block off-cut for a plumb cut. Dry-fit cap, sand any roughness, glue and pin-nail.

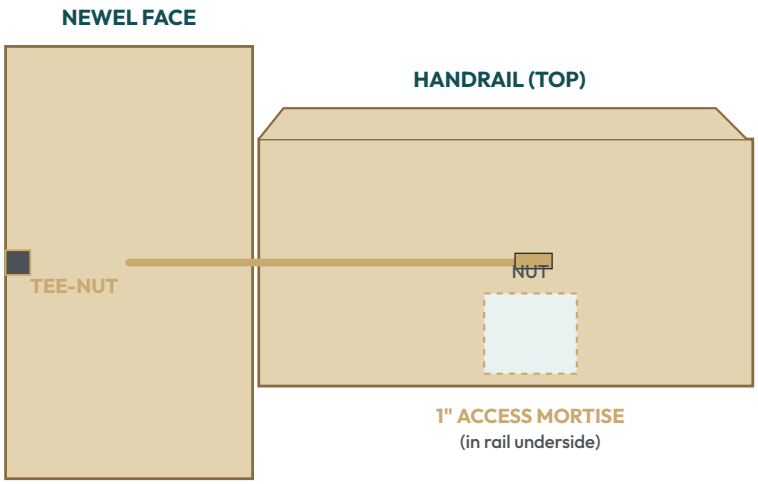
3 *Drill the rail-bolt access mortise.*

After the newel is plumb and final, drill the 3/8" rail-bolt pilot and the 1" access mortise on the underside of the handrail (page 12). Do this in place — bench drilling guarantees a mis-line.

THE POST-TO-POST KEY JOINT

Rail bolt *joinery.*

The rail bolt is what makes post-to-post possible. A threaded stud spans the joint — one end seats in the newel face via a tee-nut, the other end pulls the handrail tight through an access mortise routed in the rail underside. Done right, the joint is invisible from above and tighter than mortise-and-tenon.



RAIL-BOLT JOINT — CROSS-SECTION

RAIL-BOLT JOINT · NEWEL FACE LEFT, HANDRAIL RIGHT

1

Mark and drill the newel face.

Center the rail-bolt hole on the newel face at the working rail height (the centerline of the rail at the butt). Drill 3/8" through the newel, perpendicular to the face. Drive the tee-nut into the rear (back) of the newel with a few hammer taps — the prongs anchor it.

2

Thread the stud, dry-fit the rail.

Thread the rail-bolt stud into the tee-nut from the rear, leaving ~1-1/2" projecting from the newel face. Cut the handrail to the exact length with a plumb cut on the miter saw using the pitch block as a guide. Hold the rail to the stud, mark the stud-center on the rail end.

3

Drill rail pilot and access mortise.

On the rail end, drill a 3/8" hole to receive the stud, ~2-1/2" deep into the rail core. On the rail underside, ~2" back from the rail end, drill a 1" Forstner access mortise to expose the stud end for nut tightening.

4

Glue and torque.

Apply slow-set wood glue to the rail butt and newel face. Slide the rail onto the stud, work the nut and washer through the access mortise onto the stud end. Torque the nut snug — the joint pulls the rail tight against the newel face. Clean glue squeeze-out before it sets.

5

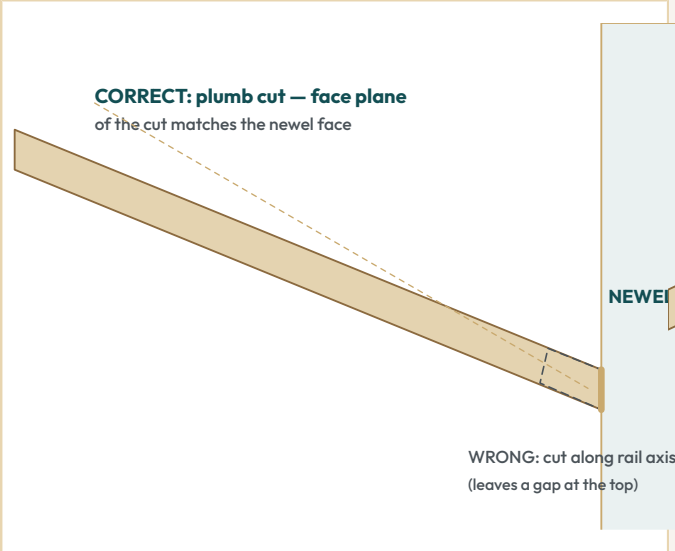
Plug the access mortise.

Cut a wood plug of matching species 1" diameter, 1/4" thick. Glue and tap into the access mortise. Pare flush with a chisel and sand to 220. On a stain-grade run, grain-match the plug.

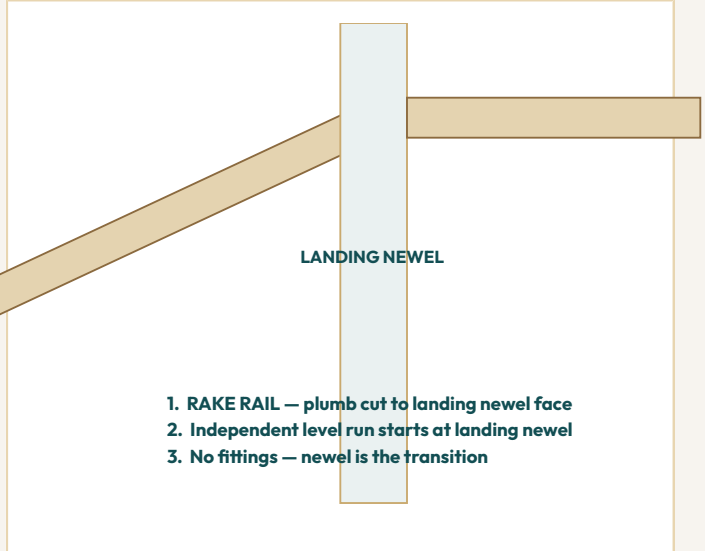
PITCH IS EVERYTHING

Plumb cuts *and transitions.*

A rake handrail meets the newel face on a vertical plane — not the rail axis. Cut the rail end plumb (using the pitch block on the miter saw fence) and the joint closes tight without a step. The same logic governs pitch transitions: keep cuts plumb, let the newel make the angle change.



PLUMB CUT · RAKE HANDRAIL MEETS NEWEL FACE



PITCH TRANSITION · RAKE TO LEVEL AT A LANDING

1

Set the miter saw to plumb.

With the pitch block on the saw fence (long leg flat against the fence, hypotenuse facing the blade), the rail end now cuts at exactly the rake angle. Hold the rail tight to the fence — the cut is plumb when the rail is installed on the rake.

2

Test fit, no glue.

Set the cut rail end against the newel face. The whole end should touch — no gap top, no gap bottom. If the top is open, the cut angle is too shallow. If the bottom is open, too steep. Adjust the pitch block, recut, retest.

3

Pitch transitions at landings.

Post-to-post does not run continuously through a landing change — each rail section terminates at the landing newel and a new section begins. No fittings needed. The landing newel makes the angle change visually and structurally.

4

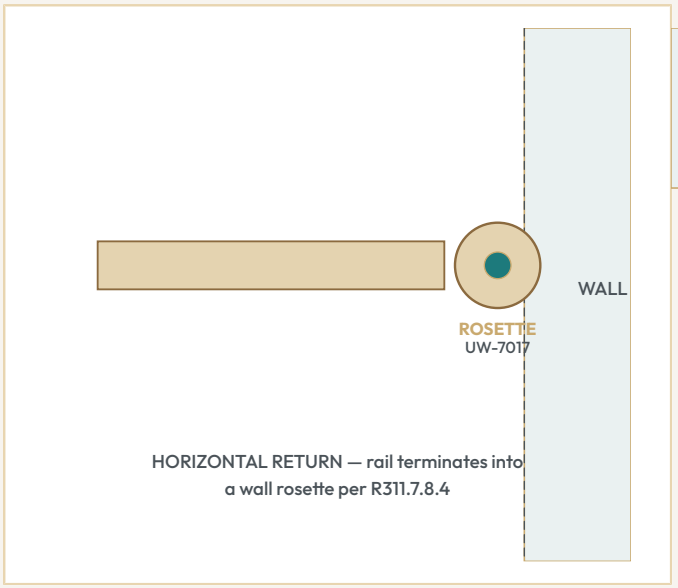
Fillet install (plowed rail only).

For plowed handrails (square balusters), the fillet sits in the plow between balusters. Cut to fit between baluster tops; pin-nail with 15-ga finish nails set just below the rail underside. The fillet should be flush with the rail bottom — pre-finish if possible.

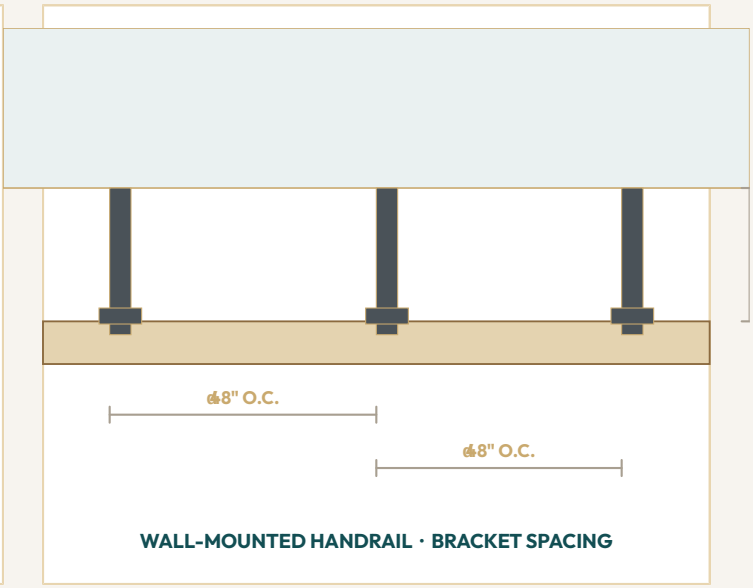
CLOSING THE RUN

Returns, rosettes *and wall rails.*

IRC R311.7.8.4 requires handrails to "return or terminate in newel posts or safety terminals." On a wall-side handrail or a section that doesn't end at a newel, the rail returns into the wall via a rosette. The opposite side terminates in a starting / top newel — the newel itself is the safety terminal.



WALL RETURN · RAIL + UW-7017 ROSETTE



WALL-MOUNTED HANDRAIL · BRACKET SPACING

R311.7.8.4 — RETURN RULE

Handrails adjacent to a wall must have a space of not less than 1-1/2" between the wall and the handrail. Handrails must return or terminate in newel posts or safety terminals. Handrails must be continuous between newel posts (no breaks in the middle of a flight).

1

Wall-side handrail termination.

Install the wall rosette (UW-7017) at the rail end. Center the rail height on the rosette — typical install is 36-1/2" centerline. Pre-drill the wall behind the rosette for the lag screw into framing; do not rely on drywall anchors. Fasten the rail end to the rosette face with two finish screws from the back side, or with rail bolts as on a newel joint.

2

Wall-mounted handrail brackets.

Brackets must be spaced no more than 48" on center. Each bracket must lag into framing — drywall anchors fail under the 200-lb load. Maintain 1-1/2" minimum clearance between the wall and the underside of the rail (R311.7.8.4). Round brackets must allow continuous hand travel.

3

Combination: newel + wall.

On a stair that runs from open guard at the bottom to a wall at the top, post-to-post handles both ends. Starting newel below; wall rosette + return at the top. Or the reverse. Either way, both ends are terminated per code.

LAST 10% IS THE VISIBLE 90%

Finishing & *touch-up.*

A clean install with a sloppy finish reads as a sloppy install. The good news: the joinery is the hard part; the finish is recovery. Two paths — pre-finish off-site for a controlled coat, or field-finish for a perfect color match to surrounding trim. Both work; pick based on the species and the rest of the millwork program.

PRE-FINISH (OFF-SITE)

Spray or wipe the handrail, newels, and fittings in the shop before install. Clean horizontal surfaces, controlled dust, even sheen. Touch up nail holes and joint plugs on-site after install.

Best for: dark stains and high-sheen finishes where a dust nib will be obvious. Worst for: matching unfinished site trim where the finished sample needs to be compared in place.

FIELD-FINISH (ON-SITE)

Install raw, finish in place after caulk and putty. Allows direct stain-match to floor and trim under installed lighting.

Best for: stain-grade jobs where the floor + rail color must match exactly. Worst for: tight schedules and active jobsites with dust or other trades.

1

Set and fill nail holes.

Set 15-ga finish nails just below the surface with a nail set. Fill with color-matched putty stick (for stain grade) or paintable spackle (for paint grade). Match the putty to the species — red oak putty pulls red, white oak pulls amber. Wipe excess with a clean rag immediately.

2

Pare and sand access plugs.

Plug the rail-bolt access mortises with grain-matched plugs (page 12). Pare flush with a sharp chisel — leave a tiny crown, then sand flush with 220 grit. Done right, you cannot find the plug under a stain.

3

Sand the butt joints.

At each rail-to-newel butt, the joint is line-tight from the rail-bolt tension but the wood surface may have a 0.005" misalignment. Block-sand the joint with 180 then 220 — light strokes parallel to the rail axis, both pieces at once. The joint becomes invisible to the hand.

4

Stain and topcoat.

Stain in even strokes along the grain, wipe back to set the color. Test on a scrap end-cut before committing — handrail wood and floor wood take stain differently. Topcoat with 2–3 coats of polyurethane (sanded between with 320). Allow full cure (24 hr) before the family uses the stair.

Final wax / polish.

5

For high-touch stain runs, finish with a clear wax or polish over the cured topcoat. The hand-feel is the difference between a custom rail and a contractor rail — the wax is part of how UWP's shop rails feel in showrooms.

BEFORE THE AHJ WALKS THE JOB

Final *inspection.*

CODE-COMPLIANCE CHECKLIST

- Handrail height 34"–38" plumb above nosing, full length of flight (R311.7.8.1)
- Handrail continuous from top to bottom riser line (R311.7.8.2)
- Handrail grasp meets Type I or Type II per R311.7.8.3
- Handrail terminates in newel or returns to wall via rosette (R311.7.8.4)
- 1-1/2" minimum clearance between handrail and wall
- Stair guard ≥34" measured from the tread nosings (R312.1.2)
- Landing / floor-opening guard ≥36" where the walking surface is more than 30" above the floor (R312.1.1, R312.1.2)
- 4" sphere cannot pass between balusters (R312.1.3)
- 6" sphere cannot pass at the triangular space at the bottom of the guard
- Newel anchors resist 200-lb concentrated load (R301.5)
- All rail-bolt access mortises plugged and finished

TROUBLESHOOTING

Newel rocks side-to-side.
Anchor isn't fully snug or blocking is undersized. Re-torque the bolt; if no resistance, blocking has split — pull and add a sister 2x.

Handrail dips at the joint.
Rail-bolt pilot drilled off-center or below the rail centerline. Loosen, drill an oversize pilot (7/16"), re-set with epoxy on the stud threads.

Fillet pulls free.
Pin nails alone won't hold over time. Use thin bead of construction adhesive in the plow before pin-nailing.

Baluster spacing off at landing.
Re-divide the run: total open length ÷ desired max spacing, rounded up to a whole-baluster count. Better one extra baluster than a sphere failure.

Rail too short between newels.
Can't make it longer; can move the newel. Loosen the newel anchor, slide 1/4" toward the short side, re-anchor, re-drill the rail-bolt. Don't shim the rail end — it telegraphs.

Finish bleeds at the butt joint.
Glue squeeze-out wasn't cleaned before set — it seals end grain and rejects stain. Re-sand the joint with 120, blow clean, re-stain. Pre-condition end grain on next job.

Rail height fails on an existing stair.
Cannot move the newel anchors. Cut and reinstall handrail at new height; trim newels longer with a taller cap. Or specify a Type II profile rail to gain height with the wider top.

SETTING A WOOD STAIR?

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