CODE ENFORCEMENT AGENCY
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RESIDENTIAL DECK CONSTRUCTION

How-To Reference Guide for Contractors & Homeowners

PA UCC • 2021 IRC • IRC Section R507 • CEA Jurisdiction

SECTION 1: Before You Start

Code References

- PA UCC & 2021 International Residential Code (IRC)
- IRC Section R507 — Deck-Specific Requirements
- IRC Section R403 — Footings
- IRC E3901.7 / NEC 210.52(E) — Exterior Electrical

Design Load Requirements

Load Type	Required Value
Live Load	40 psf
Dead Load	10 psf
Snow Load	40 psf

Permit Required

A PERMIT IS REQUIRED before any deck construction begins. No work may start without an approved permit. Material lists and contractor agreements are NOT sufficient for permit applications.

SECTION 2: What Your Plans Must Include

All permit applications must include a deck layout plan that is as detailed as possible. Plans must be LEGIBLE. Incomplete plans will not be reviewed and no permit will be issued without full details.

Category	What to Show on Plans
Deck Layout	Dimensions & footprint, height from grade, gross area including steps
Materials	Wood species, composite, or other; treated vs. untreated designation
Footings	Depth (min. 36"), material, backfill description for post supports
Framing	Type, height & span, joist span & connections, bridging if applicable

Category	What to Show on Plans
Ledger	Attachment method, fastener type/size/spacing, or PA Design Professional drawing number — 'per code' is not sufficient
Flashing	Method of flashing; how water & debris are diverted from ledger
Fasteners & Hardware	Type (NO screws unless approved), placement, lateral load connectors, hurricane ties
Posts & Beams	Beam type, material, span; beam-to-post and beam-to-joist connections
Rails & Guards	Affixation to deck/posts, rail height, material (treated & graspable)
Stairs	Rise & tread dimensions, handrail details, landing requirements
Electrical	Location and type of exterior outlet (see Section 6)

SECTION 3: Footings & Posts

Footing Requirements

- Minimum footing depth: 36 inches (Pennsylvania frost depth — IRC R403)
- Footing material must be specified on permit drawings
- Backfill description required for all post supports

Maximum Post Heights (IRC R507.6)

Post Size	Max Height
4x4	6'-9"
4x6	8'-0"
6x6	14'-0"
8x8	14'-0"

Beam Span Reference (IRC Table R507.5)

Beam sizing depends on joist span and supported tributary load. Always verify against full IRC Table R507.5 for your specific configuration.

Example: A 2x10 beam supporting an 18-ft joist span = 5-ft maximum beam span, 1-ft cantilever maximum.

SECTION 4: Ledger Board Connections (IRC R507.8)

The ledger connection is the single most critical — and most commonly failed — element of deck construction. A proper ledger must transfer both vertical gravity loads (dead + live) and lateral loads back into the house framing.

Step 1 — Identify Your Band Joist Before Selecting Fasteners

The prescriptive fastener table (R507.8.2) applies ONLY to a solid-sawn lumber band joist of at least 1-1/2" nominal thickness. Many homes built in the last 25 years do NOT have this. You must determine what is behind the wall before proceeding.

Ledger Path Decision Table

What You Find Behind the Wall	Compliance Path Required
Solid-sawn lumber band joist (confirmed, min. 1-1/2")	STANDARD: Use IRC Table R507.8.2 lag spacing — see fastener table below
Engineered lumber (LVL, LSL, I-joist rim) WITH manufacturer ledger detail	PATH 3C: Use listed connector hardware per manufacturer detail (R507.8.3)
Open web truss or I-joist floor with no solid rim board	PATH 3A (blocking), 3B (through-bolt), 1 (freestanding), or 2 (PA PE/RA stamp)
No band board (balloon frame, parallel joists) or SIP/masonry wall	PATH 2 (PA PE/RA stamp required) or PATH 1 (freestanding) — no prescriptive IRC path

The Three Compliance Paths

PATH 1 — Freestanding Deck (IRC R507.2)

No attachment to the house. Posts and footings on all four sides. The cleanest solution when the existing structure cannot be reliably connected to.

- Posts and footings required on ALL four sides
- Minimum 1" gap between deck structure and house wall — deck must not bear on house
- Lateral bracing within the deck frame required per R507.9 (cross-bracing, knee braces, or moment-frame connections)
- All beam, post, and footing sizing per IRC Tables R507.5, R507.6, R403

PATH 2 — PA Design Professional Stamped Drawing (IRC R301.1.3 / R507.8.3)

Required for SIP walls, engineered I-joist systems without a manufacturer-approved ledger detail, and any condition where the load path cannot be verified prescriptively.

- Wall must be opened to confirm framing type before design work begins (min. one bay)
- Licensed PA PE or RA stamps a site-specific connection drawing showing fasteners, blocking, and load path
- Stamped drawings must be on file at the AHJ BEFORE permit issuance
- Inspector must view the open wall before ledger is attached — rough framing and ledger inspection are simultaneous

PATH 3 — Prescriptive Alternatives

Alt.	When to Use	What the Contractor Does	What Inspector Must See
3A Blocking	Open web trusses or I-joist floors without solid rim	Install solid-sawn blocking between joist bays, flush with exterior framing face. Min. 2x material matching joist depth. Fasten per SDPWS. Attach ledger per Table R507.8.2.	Blocking correctly sized and fastened BEFORE ledger attachment and wall closure

Alt.	When to Use	What the Contractor Does	What Inspector Must See
3B Through-Bolt	I-joist floors with LVL/LSL rim, or where solid joists are reachable	Use 1/2" through-bolts (NOT lag screws) penetrating ledger, sheathing, rim, and solid joist/blocking. Space per Table R507.8.2. 3"x3"x0.229" bearing plate washer required on interior face.	Interior access to verify bearing plate and nut BEFORE interior finish closure
3C Listed Hardware	Engineered lumber rim WITH manufacturer-published connector detail	Install listed connector hardware (e.g., Simpson LCE4, LUS, or equivalent). Hardware and fastener count must match manufacturer load table. Document listing number on permit drawings.	Listing documentation on site. Hardware installed per manufacturer spec with correct fastener count and type
3D Foundation	Slab-on-grade or crawl space where foundation ledger can replace floor-framing attachment	Attach ledger to foundation wall or PT sill plate anchored to foundation with approved anchor bolts per R403.1.6. Deck loads transfer directly to foundation.	Anchor bolt installation and flashing BEFORE concrete cure or wall closure

Ledger Fastener Spacing — IRC Table R507.8.2 (1/2" Lag Screws, Standard Solid-Sawn Lumber)

Spacing in inches o.c. Assumes #2 or better lumber, minimum 1-1/2" band joist thickness. Column headers = supported joist span in feet.

Deck Joist Span	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft
6	36	34	29	24	21	18
8	34	29	24	21	18	16
10	29	24	21	18	16	14
12	24	21	18	16	14	12
14	21	18	16	14	12	11

LATERAL LOAD CONNECTORS ARE REQUIRED at each end of the ledger regardless of lag count. IRC R507.2.4 requires minimum 1,500 lb capacity at EACH END. Use DTT2Z, LDT, or equivalent listed hardware. This is one of the most commonly missed items at final inspection.

Ledger Flashing Sequence — IRC R507.8.4

Flashing MUST be installed BEFORE the ledger is attached. Flashing after ledger installation is a code violation. Correct sequence: (1) Remove siding → (2) Install flashing behind siding and over housewrap → (3) Attach ledger → (4) Lap siding over flashing. Inspector verifies flashing lap at rough framing inspection.

SECTION 5: Stairs, Guards & Handrails

Guards / Barriers (IRC R312)

- Required where deck surface is 30" or more above grade
- Minimum guard height: 36" for decks up to 8'-0" above grade; 42" above 8'-0"
- Openings must not allow passage of a 4" sphere
- Affixation details to deck and posts must be shown on plans

Handrails (IRC R311.7.8)

- Required on stairs with 4 or more risers
- Must be made of treated material
- Must be graspable or rounded — NO squared 2x4s, NO untreated wood
- Height: 34" to 38" above stair nosings

Stair Dimensions (IRC R311.7)

- Maximum riser height: 7-3/4"
- Minimum tread depth: 10"
- Landing required at top and bottom where a door opens onto the stair
- Stair dimensions and handrail details must be shown on permit drawings; include gross area with steps

SECTION 6: Exterior Electrical Outlet

An exterior-rated GFCI outlet is REQUIRED if none exists within 6'-6" of the deck surface. This requirement is not optional and cannot be waived. (IRC E3901.7 / NEC 210.52(E))

- Must be exterior-rated with a weatherproof in-use cover
- Must be GFCI protected
- Must be located within 6'-6" of the deck surface
- A separate electrical permit may be required — confirm with the AHJ

SECTION 7: Inspection Sequence & Hold Points

For any ledger attachment to an existing structure, a pre-ledger inspection is a mandatory hold point. Do NOT close any wall or cover any connection before the AHJ has inspected it.

Stage	What Must Be Visible	Documents Required
Permit Application	N/A — plans review only	Permit drawings with ledger method and fastener specs (or PA Design Professional drawing number); Proof of Workers Comp or Notarized Affidavit Waiver
Pre-Ledger / Rough Framing	Band joist / rim board condition; blocking or framing corrections complete (Path 3A/3B); flashing applied or staged	Path 2: PA Design Professional stamped drawings on file at AHJ. Path 3C: listing documentation on site.

Stage	What Must Be Visible	Documents Required
Final Deck Inspection	Ledger fastener spacing; lateral load connectors at each ledger end; flashing lapped and sealed; post/beam connections with hardware; guards and handrails; electrical outlet present	Approved permit drawings; any stamped engineering

STOP WORK CONDITION: If a ledger has been attached and the wall closed before pre-ledger inspection, the AHJ must require one of: (1) open the wall for inspection, (2) PA Design Professional-stamped as-built drawing, (3) demolish ledger and convert to freestanding, or (4) red-tag and stop work. Approval without verified connection is NEVER an option.

SECTION 8: Common Mistakes to Avoid

Mistake	The Problem	The Fix
Assuming all rim boards are the same	Contractor uses R507.8.2 spacing based on visual inspection. The actual rim board is LVL or an I-joist requiring manufacturer-specific details — a generic lag schedule does not apply.	Always identify rim board material before selecting fasteners. If there is any doubt, open the wall. The cost of one inspection is far less than the cost of a failed ledger.
Lag screws into open web truss chords	Lag screws driven into a 2x3 or 2x4 truss chord not designed for ledger withdrawal loads. No solid backing exists between trusses.	Use solid blocking first (Path 3A) or build a freestanding deck (Path 1). Lag screws into truss chords without blocking are non-compliant.
Flashing after ledger installation	Ledger is already tight against the wall. Proper lapping of flashing behind siding is impossible after the fact.	Install flashing BEFORE the ledger. Correct sequence: remove siding → install flashing → attach ledger → lap siding over flashing.
No lateral load connectors	Ledger gravity connection is correct but no end hardware is installed. R507.2.4 requires 1,500 lb capacity at each ledger end regardless of lag count.	Show lateral connectors (DTT2Z, LDT, or equivalent) on permit drawings. Install before final inspection.
Closing wall before inspection	Blocking installed, ledger attached, wall closed. Inspector cannot verify the connection behind the ledger.	Call for inspection after blocking is in place and BEFORE ledger attachment. Note as a hold point on the permit card.
Squared 2x4 handrails	A flat 2x4 does not meet the graspable profile requirements of the IRC.	Use a rounded or graspable handrail profile from treated material. No square-edge profiles.

SECTION 9: Pre-Submission Checklist

Before submitting your permit application, confirm every item below is addressed in your plans:

- ☐ Structure composition and wood species specified
- ☐ Deck attachment method clearly stated (ledger or freestanding)

- ☐ Fastener types, sizes, and spacing specified — or PA Design Professional drawing referenced
- ☐ Footing depth (min. 36"), material, and backfill description
- ☐ Gross area including steps
- ☐ Height from grade at all points shown
- ☐ Landing requirements addressed
- ☐ Handrail and guard details (material, height, graspable profile)
- ☐ Lateral load connector locations and hardware specified
- ☐ Flashing method and installation sequence described
- ☐ Hurricane ties / beam-to-joist connectors shown
- ☐ Exterior electrical GFCI outlet presence confirmed (or new outlet planned)
- ☐ Proof of Workers Compensation insurance OR Notarized Affidavit Waiver included
- ☐ Plans are legible and dimensioned
- ☐ If Path 2: PA Design Professional-stamped drawings included with application
- ☐ If Path 3C: Listed hardware product numbers identified on permit drawings

SECTION 10: Quick Code Reference

Code Section	Subject
R301.1.3	Engineered design — when a PA Design Professional is required
R312.1	Guards — when required and minimum height
R403	Footings — minimum depth, size, and bearing requirements
R403.1.6	Foundation anchor bolts
R507.2	Deck construction — general requirements; freestanding deck rules
R507.2.4	Lateral load connection — 1,500 lb minimum capacity at each end of ledger
R507.5	Deck beam spans (Table R507.5)
R507.6	Deck joist spans and post height limits
R507.8	Deck ledger connections — general requirements
R507.8.2	Ledger to solid-sawn band joist — prescriptive fastener spacing table
R507.8.3	Ledger to engineered lumber — manufacturer requirements govern; R507.8.2 does not apply
R507.8.4	Ledger flashing — required before ledger installation
R507.9	Deck lateral bracing requirements

Code Section	Subject
IRC E3901.7 / NEC 210.52(E)	Exterior electrical outlet — required within 6'-6" of deck surface
SDPWS	Special Design Provisions for Wind and Seismic — governs blocking connections

This guide is a combined reference based on CEA's 2026 Residential Deck Construction Guidelines and the CEA 2021 IRC R507.8 Deck Ledger Board Compliance Guide. It does not substitute for the adopted code text or the judgment of the Authority Having Jurisdiction. Always verify requirements against the locally adopted edition of the IRC and any local amendments. Registration in the Pennsylvania Attorney General's Database is NOT a license to perform construction in the Commonwealth of Pennsylvania.

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2021 IRC CHAPTER 5

Deck Ledger Board Compliance Guide

IRC Section R507.8 — Ledger Connections to Existing Structures

For Contractors, Designers & Building Officials

Purpose of This Guide

This guide addresses a critical field problem: the connection of deck ledger boards to existing structures where the primary band joist is absent, unverifiable, or consists of engineered lumber systems. Left unresolved, these conditions produce connections that **cannot be verified by inspection** and may fail under load.

This guide gives contractors and designers three code-compliant paths forward and tells inspectors exactly what documentation to require at each step.

PATH 1

Freestanding Deck

No attachment to house. Posts on all sides. Full inspector visibility.

PATH 2

PA Design Professional Sign-Off

Licensed PA Design Professional stamps a custom connection detail. Inspector reviews drawings.

PATH 3

Prescriptive Alternatives

Approved alternate methods — blocking, through-bolts, or listed hardware.

Published by Code Enforcement Agency • Based on 2021 IRC Chapter 5 • For use with AHJ-approved plans

SECTION 1

2021 IRC R507.8 — What the Code Requires

R507.8 — Deck Ledger Connections: Summary

Section R507.8 governs how a deck ledger board must be fastened to the band joist (rim joist) of the primary structure. The ledger connection must transfer both **vertical gravity loads** (dead load + live load) and **lateral loads** back into the house framing system. The 2021 IRC prescribes fastener type, size, and spacing through Table R507.8.2 for standard conditions, and establishes additional requirements when engineered lumber is present.

Code Section	Subject	Key Requirement
R507.8	General	Ledger must be fastened to the band joist of the primary structure with approved fasteners capable of transferring all imposed loads.
R507.8.2	Fastener spacing (standard lumber)	Table R507.8.2 gives minimum bolt/lag screw spacing based on deck joist span and supported joist span. Minimum 1-1/2" nominal band joist required.
R507.8.3	Engineered lumber band joists	Connections to engineered lumber (LVL, LSL, PSL, I-joist rim boards) must comply with the manufacturer's published requirements. Generic lag spacing from Table R507.8.2 does NOT apply.
R507.2.4	Lateral load connection	Minimum 1,500-lb lateral load connection required between deck and primary structure. Must be provided at each end of the deck ledger.

Table R507.8.2 — Fastener Spacing for 1/2" Lag Screws (Standard Lumber)

Spacing (inches o.c.) based on deck joist span and supported joist span. Values assume #2 or better lumber, minimum 1-1/2" band joist thickness.

Deck Joist Span (ft)	6	8	10	12	14	16	18
6	36	34	29	24	21	18	16
8	34	29	24	21	18	16	14
10	29	24	21	18	16	14	12
12	24	21	18	16	14	12	11
14	21	18	16	14	12	11	10

Column headers = Supported joist span (ft) • Source: 2021 IRC Table R507.8.2 (representative values — verify against AHJ-adopted edition)

SECTION 2

The Problem — When Ledger Connections Cannot Be Verified

The standard ledger connection in Table R507.8.2 assumes a continuous, solid-sawn lumber band joist of at least 1-1/2" nominal thickness that an inspector can visually confirm. On existing structures — especially those built in the last 25 years — this assumption frequently fails. Four conditions commonly trigger unverifiable or non-compliant ledger connections:

Condition 1 — Engineered I-Joist Rim Boards

The rim board is a wood I-joist turned on edge. The vertical web is OSB, typically only 3/8" thick. Lag screws driven into an I-joist web have minimal withdrawal capacity and can split the web under load. The face of the wall gives no indication of what lies behind it.

Inspection Risk: R507.8.3 requires manufacturer-specific connection details. Generic Table R507.8.2 spacing does NOT apply. Inspector cannot verify compliance without opening the wall or reviewing stamped manufacturer connection drawings.

Condition 2 — Open Web Floor Trusses

Open web trusses have no continuous rim board. The perimeter truss chord is a narrow 2x3 or 2x4 member with large gaps between trusses. There is no solid backing to receive ledger fasteners across the full ledger length.

Inspection Risk: Standard ledger attachment is not possible. Wall framing gives no visible indication of the truss configuration behind it. Attachment without proper blocking transfers loads to chord members not designed for that force.

Condition 3 — No Band Board (Balloon Framing or Parallel Joist Layout)

In balloon-framed buildings, or where floor joists run parallel to the deck wall, there is no perpendicular band joist at the ledger location. Fasteners driven through the ledger may land in wall sheathing, wall studs, or air — none of which provide the required connection.

Inspection Risk: No direct path for ledger load transfer exists. The exterior cladding hides the framing layout entirely. This is the single most common cause of ledger pull-out failures on existing structures.

Condition 4 — Engineered Panel or SIP Walls

Structural Insulated Panels (SIPs) and certain engineered wall systems have no conventional dimensional lumber band joist. The facing skins are structural but are not designed for the point-load withdrawal demands of ledger fasteners.

Inspection Risk: Connection must be designed by a PA Design Professional using load paths approved by the panel manufacturer. No prescriptive IRC path exists for this condition.

BUILDING OFFICIAL NOTICE

An inspector who cannot visually verify the ledger connection to a solid, code-compliant band joist MUST require one of the three compliance paths in Section 3 before issuing approval. Approval without verification is a liability.

SECTION 3

Three Compliance Paths — When Standard Ledger Attachment Is Not Possible

When any of the four conditions in Section 2 is present, the contractor or designer must choose one of the following three code-compliant paths. All three are acceptable under the 2021 IRC. The choice depends on site conditions, project scope, and budget.

PATH 1 — Freestanding Deck Structure

Code basis: *IRC R507.2; no attachment to primary structure*

A freestanding deck is supported entirely by its own post-and-beam framing on all sides. It does not rely on the house structure for any vertical or lateral support. This is the cleanest solution when the existing structure cannot be reliably connected to — and it eliminates the inspection problem entirely because no house-to-deck connection exists to verify.

Required	Posts and footings on all four sides of the deck.
Required	All gravity and lateral loads resolved within the freestanding frame. Beam sizing, post sizing, and footing design per IRC Tables R507.5, R507.6, and R403.
Required	A minimum 1" gap between the deck structure and the house wall to prevent moisture bridging and to make clear the deck is not bearing on the house.
Required	Lateral bracing within the deck frame itself (cross-bracing, knee braces, or moment-frame connections) per R507.9.
Recommended	A flexible flashing detail at the gap to prevent water infiltration behind siding while accommodating thermal movement.

INSPECTOR CHECKLIST — PATH 1

Inspector checklist: (1) Confirm posts/footings on all load-bearing sides. (2) Confirm minimum 1" gap at house wall. (3) Confirm lateral bracing is present. (4) No ledger fasteners into house structure.

PATH 2 — PA Design Professional-Stamped Connection Detail

Code basis: *IRC R301.1.3; engineered design per IRC R507.8.3*

When a ledger attachment to the house is desired but the framing condition falls outside the prescriptive scope of Table R507.8.2, a licensed PA Design Professional (PE or RA) must design and stamp a site-specific connection detail. This path is required for SIP walls, engineered I-joist systems without a manufacturer-approved ledger detail, and any condition where the load path cannot be verified prescriptively.

Step 1 — Pre-Design Investigation

Before the PA Design Professional can design the connection, the framing must be identified. This typically requires opening a section of the wall cavity (minimum one bay between framing members) to confirm joist/truss type, rim board material, and member spacing. Photographs must be taken and provided to the Design Professional.

Step 2 — Engineered Connection Drawing

The PA Design Professional produces stamped drawings showing: fastener type, size, quantity, and spacing; blocking requirements; load path from ledger through rim board or blocking to floor joists or wall framing; and any hold-down or tension-tie hardware required for lateral load transfer per R507.2.4.

Step 3 — Permit Submission

PA Design Professional-stamped drawings must be submitted with the permit application. The AHJ reviews the drawings for code compliance. The building permit is issued against the stamped design.

Step 4 — Inspection with Open Wall

The inspector must view the ledger connection with the wall cavity exposed before any insulation, sheathing, or cladding covers the connection. Rough framing inspection and ledger inspection occur simultaneously at this stage.

Step 5 — Final Inspection

Contractor certifies all fasteners installed per the PA Design Professional's drawing. Inspector signs off against the approved stamped drawing on file.

PLAN REVIEWER NOTICE — PATH 2

A permit submitted with only an architectural plan and no PA Design Professional stamp is NOT approvable under this path. The AHJ must reject the application and require stamped drawings before issuing the permit.

PATH 3 — Prescriptive Alternatives

Code basis: *IRC R507.8; IRC R507.9; listed hardware per IRC R507.8.2 Exception*

Where the framing condition can be corrected or supplemented to restore a compliant load path, several prescriptive alternatives exist. Each requires that the corrected condition be visually verified by the inspector before wall closure.

Alternative	When to Use	What the Contractor Does	Inspector Must See
3A — Solid Blocking Between Joists	Open web trusses or I-joist floors where rim is absent or inadequate	Open wall cavity. Install solid-sawn blocking between each joist/truss bay, flush with exterior face of framing. Minimum 2x material matching joist depth. Fasten per SDPWS. Ledger attaches to blocking per Table R507.8.2.	Blocking in place, correctly sized and fastened, before ledger attachment and wall closure.
3B — Through-Bolt to Floor Framing	I-joist floors with LVL or LSL rim board, or where solid joists are within reach of a through-bolt	Locate solid floor joists. Use 1/2" through-bolts (not lag screws) penetrating ledger, wall sheathing, rim board, and into solid joist or blocking. Spacing per Table R507.8.2. Bearing plate washer (3"x3"x0.229" min.) required on interior face.	Interior access to inspect bearing plate and nut before interior finish closure.
3C — Listed Ledger Connector Hardware	Engineered lumber rim board with a manufacturer-published ledger connector detail	Install connector hardware listed for the specific engineered product (e.g., Simpson Strong-Tie LCE4, LUS, or equivalent). Hardware selection, fastener type, and quantity must match manufacturer's load table for actual tributary load. Document listing number on permit drawings.	Listing documentation on site. Hardware installed per manufacturer spec with correct fastener count and type.
3D — Ledger to Foundation / Rim Extension	Slab-on-grade or crawl space where a foundation ledger can replace floor-framing attachment	Attach ledger directly to foundation wall or to a pressure-treated sill plate anchored to the foundation, using approved anchor bolts per R403.1.6. Deck loads transfer directly to foundation, bypassing floor framing. Verify no conflicts with waterproofing.	Anchor bolt installation and flashing before concrete cure or wall closure.

INSPECTOR CHECKLIST — PATH 3 (ALL ALTERNATIVES)

For ALL Path 3 alternatives: the corrected or supplemented framing condition must be inspected by the AHJ before any sheathing, insulation, siding, or ledger board covers the connection. Request a dedicated rough framing / ledger inspection on the permit card.

SECTION 4

Field Decision Tree — Which Path to Use

Use this sequence on site before submitting a permit or beginning framing. Answer each question in order and follow the indicated path.

Step	Question	Yes — Go To	No — Go To
1	Is the primary structure a new build where framing is fully exposed and a solid-sawn band joist of 1-1/2" min. is confirmed?	Standard R507.8.2 prescriptive table applies. No further action needed.	Step 2
2	Can the band joist type be positively identified without opening the wall (e.g., drawings on file, exposed framing in basement or crawl space)?	Step 3	Wall must be opened for inspection. Proceed to Step 3 after opening.
3	Is the band joist solid-sawn lumber (not engineered lumber, not open web truss, no gaps)?	Table R507.8.2 applies. Inspector to verify at rough framing inspection.	Step 4
4	Is the band joist engineered lumber (LVL, LSL, I-joist rim) with a published manufacturer ledger connection detail available?	Path 3C: Use listed hardware per manufacturer detail. Provide listing documentation with permit.	Step 5
5	Is the floor system an open web truss or I-joist with no rim, or is there no band board at the ledger location (parallel joists, balloon frame)?	Choose: Path 3A (install blocking), Path 3B (through-bolt), Path 1 (freestanding), or Path 2 (PA Design Professional design). Wall must remain open for inspection.	Step 6
6	Is the primary wall a SIP panel, concrete/masonry wall, or other non-wood engineered wall system?	Path 2 required (PA Design Professional stamp) or Path 1 (freestanding). No prescriptive IRC path exists.	Contact AHJ. Unanticipated condition — PA Design Professional review recommended.

SECTION 5

Inspector Reference — What to Require and When

The following inspection triggers and documentation requirements apply regardless of which compliance path is taken. These requirements protect the inspector, the homeowner, and the contractor from liability arising from unverifiable connections.

At Permit Application

- Ledger attachment method must be declared on the permit drawing. 'Per code' is not sufficient — contractor must specify fastener type, size, and spacing, or reference the PA Design Professional drawing number.
- If the existing framing type is unknown, the permit application must include a note that wall opening and pre-ledger inspection are required before deck framing begins.
- PA Design Professional-stamped drawings (Path 2) must be on file at the AHJ before permit issuance.
- Listed hardware product numbers (Path 3C) must be identified on permit drawings.

At Pre-Ledger / Rough Framing Inspection

- Inspector must physically view the band joist / rim board condition before ledger is attached. This is a mandatory hold point for all existing structures where framing was not previously exposed.
- If wall was opened, verify blocking or framing corrections are complete and correctly fastened before ledger is placed.
- Photograph the exposed framing condition for the permit file. Note framing type and member sizes on the inspection card.
- Verify flashing has been applied or staged — ledger cannot be installed without flashing per R507.8.4.
- For Path 2: verify that field conditions match the PA Design Professional drawing. Any discrepancy requires Design Professional notification before proceeding.

At Final Deck Inspection

- Confirm ledger fastener spacing matches the approved drawing or Table R507.8.2.
- Confirm lateral load connectors are installed at each end of the ledger per R507.2.4 (minimum 1,500 lb capacity each).
- Confirm ledger flashing is correctly lapped and sealed per R507.8.4.
- For Path 3A: verify blocking is not visible at ledger (confirming wall was closed after inspection, not before).
- For Path 3B: confirm interior bearing plates and nuts are visible and tightened.
- For Path 3C: confirm hardware is the listed product and fastener count matches the load table in the listing.

STOP WORK CONDITION

If a ledger has been attached to an existing structure and the wall has been closed before a pre-ledger inspection was performed, the inspector has four options: (1) require the contractor to open the wall for inspection, (2) require PA Design Professional-stamped drawings for the as-built condition (Path 2), (3) require demolition of the ledger and conversion to Path 1 (freestanding), or (4) red-tag the deck and stop work. Approval without verified connection is not an option.

SECTION 6

Common Field Mistakes and How to Avoid Them

Mistake 1 — Assuming all rim boards are the same

PROBLEM A contractor looks at the exterior siding, measures 1-1/2" of apparent wood at the ledger location, and proceeds with Table R507.8.2 lag spacing. The actual rim board is an LVL or I-joist product that requires manufacturer-specific connection details.

SOLUTION Always identify the rim board material before selecting fastener spacing. If in doubt, open the wall. The cost of one inspection is far less than the cost of a failed ledger and the resulting liability.

Mistake 2 — Using lag screws in open web truss chord

PROBLEM Contractor drives 1/2" lag screws through the ledger and into the top chord of an open web truss at each truss location. The chord is a 2x3 or 2x4 member not designed for ledger withdrawal loads, and there is no solid backing between trusses.

SOLUTION Open web truss floors require solid blocking before ledger attachment (Path 3A), or the deck must be freestanding (Path 1). Lag screws into truss chords without blocking are not code-compliant.

Mistake 3 — Flashing after ledger installation

PROBLEM The ledger is installed, fasteners are set, and then flashing is attempted. Because the ledger is already tight against the wall, proper flashing lapping behind the siding is impossible.

SOLUTION Flashing must be installed before the ledger per R507.8.4. Sequence: remove siding → install flashing behind siding and over housewrap → attach ledger → lap siding over flashing. Inspector verifies flashing lap at rough inspection.

Mistake 4 — No lateral load connectors

PROBLEM The ledger is correctly fastened for gravity loads but no lateral load connection hardware is installed at the ends of the ledger. R507.2.4 requires 1,500 lb lateral load capacity at each end regardless of ledger lag count.

SOLUTION Lateral connectors must be shown on the permit drawing and installed before final inspection. DTT2Z, LDT, or equivalent listed hardware — quantity and placement per IRC Table R507.2.4 or PA Design Professional design.

Mistake 5 — Path 3 work done before inspection

PROBLEM Contractor installs blocking, attaches ledger, and closes wall before requesting a rough framing inspection. Inspector arrives and cannot verify the blocking installation behind the ledger.

SOLUTION Call for inspection after blocking is installed and before ledger attachment. Schedule the ledger inspection as a separate point on the permit card, or combine with rough framing — but it must occur before the wall is closed.

SECTION 7

Quick Reference — Code Citations and Definitions

Key 2021 IRC Code Citations

R507.2	Deck construction — general requirements, freestanding decks
R507.2.4	Lateral load connection — 1,500 lb minimum each end of ledger
R507.5	Deck beam spans
R507.6	Deck joist spans
R507.8	Deck ledger connections — general
R507.8.2	Ledger to band joist — fastener table (solid-sawn lumber)
R507.8.3	Ledger to engineered lumber — manufacturer requirements
R507.8.4	Ledger flashing requirements
R507.9	Deck lateral bracing
R301.1.3	Engineered design — when required
R403.1.6	Foundation anchor bolts
SDPWS	Special Design Provisions for Wind and Seismic — blocking connections

Definitions

Band Joist / Rim Board

The outermost joist member running perpendicular to the floor joists at the perimeter of the floor system. In solid-sawn construction, typically a 2x lumber member matching the joist depth. Also called rim joist or header joist.

Engineered Lumber

Manufactured structural wood products including Laminated Veneer Lumber (LVL), Laminated Strand Lumber (LSL), Parallel Strand Lumber (PSL), and I-joists.

Open Web Floor Truss

A prefabricated structural member using top chord, bottom chord, and diagonal web members. No continuous solid web — no surface available for ledger attachment without supplemental blocking.

Freestanding Deck

A deck structure supported entirely by its own posts and footings with no reliance on the primary structure for gravity or lateral support. Permitted under IRC R507.2.

PA Design Professional

A licensed Pennsylvania Professional Engineer (PE) or Registered Architect (RA) authorized to design structural elements and affix a professional seal to construction documents under Pennsylvania law. Required under IRC R301.1.3 for conditions outside the prescriptive scope of the code.

Lateral Load Connection

A positive mechanical connection between the deck frame and the primary structure designed to resist horizontal forces. IRC R507.2.4 requires minimum 1,500 lb capacity at each end of the ledger.

AHJ

Authority Having Jurisdiction — the organization, office, or individual responsible for enforcing the requirements of the adopted building code.

This guide is an educational aid published by Code Enforcement Agency (CEA) for contractors, designers, and building officials operating in Pennsylvania. It does not substitute for the adopted code text or the judgment of the Authority Having Jurisdiction. Always verify requirements against the locally adopted edition of the IRC and any local amendments. Code section references are based on the 2021 International Residential Code (IRC) published by the International Code Council (ICC).