

Steel Frame Inspection Checklist

17-category checklist Adam Gates runs on every steel frame inspection. Fact-checked to NASH Standard + AS/NZS 4600 + QBCC S&T; Guide. For system-specific screw counts, refer to your frame supplier's install manual.

Job address:

Date:

Builder:

Wind class:

Frame system:

Home size (m2):

How to use: Walk the frame BEFORE sheeting or cladding starts. Cross-check against your engineer's frame plan, bracing plan, tie-down schedule, truss layout, AND your frame supplier's install manual (each proprietary system has its own screw counts). 3+ red flags = book an independent inspection before signing progress claim.

1. What Type of Steel Frame Is It?

- Frame manufacturer identifiable (label/docket/install manual on site)
- Design certified to NASH Standard Part 2 OR to engineer's AS/NZS 4600 design
- Heavy steel (portals/beams): AS 4100 design + AS/NZS 1554.1 welding compliance
- Wind classification stamped on drawings matches your site
- **Red flag:** No manufacturer install manual = no way to verify correct connectors, screws, tie-down capacities.

2. Steel Coating + Corrosion (AS/NZS 1397)

- Coating class matches site corrosion category (Z275 inland / Z350 coastal / Z450 severe)
- AM125 or AM150 (Zincalume/TrueCore) acceptable alternatives
- G550 high-tensile grade if specified
- No visible rust bloom on any steel member
- No bare metal at cut ends (cold galv touch-up applied)
- No damaged coating from handling
- Welded areas cold-galvanised or re-coated
- **Red flag:** Frame within 500m of coast with Z275 or lighter = will corrode inside cladding within years.

3. Bottom Plate to Slab Connection (Tie-Down)

- Every tie-down location on engineer's schedule has an anchor
- Anchor type matches spec (chemical / cast-in / proprietary bracket)
- Chemical anchors cured for manufacturer's specified time before load
- Anchor position accurate (typically max 300mm from corner - verify schedule)
- Correct washers/nuts per connector manufacturer data sheet
- Nuts tensioned per engineer's spec (not just spanner-tight)
- **Red flag:** ANY missing anchor at engineer-specified position = uplift concentrates on adjacent connections.

4. Stud Sizes + Grade

- Section depth matches engineer's frame plan (typical 63-90mm residential)
- BMT (base metal thickness) matches spec
- G550 high-tensile grade if specified (manufacturer stamp confirms)
- No damaged studs (kinks, dents, on-site drilled holes)
- No cracks at flanges or web
- Studs straight (no bow)
- **Red flag:** Studs with on-site drilled holes = cold-formed section capacity dramatically reduced.

5. Stud Spacing (per engineer's plan)

- Centres consistent + match engineer's frame plan (commonly 450 or 600mm)
- Extra studs at load points (under lintels, portal frame legs, corners)
- Jamb studs both sides of every opening (box studs common at wider openings)
- Double studs at all external corners
- No missing studs at intended positions
- **Red flag:** Stud spacing wider than plan = common shortcut, expensive to rectify after cladding.

6. Top Plate + Head Plate

- Top plate section matches engineer's frame plan
- Screws through top plate to every stud (min. count per manufacturer)
- Top plate splices per manufacturer's detail (splice plates + screws)
- Top plate level (QBCC max 4mm/2m plumb + straight)
- No cuts or notches at load points
- **Red flag:** Top plate butt-joined without splice plate = zero moment capacity at the joint.

7. Screw Fixings (AS 3566.2)

- Class 3 minimum for structural (Class 4 in severe coastal)
- Self-drilling Tek screws with formed hex heads
- Full-thread engagement (not just gripping surface)
- No stripped screws (shiny scarring around head, spins when tested)
- Screws driven to full depth (head flush)
- Screw size + gauge match install manual
- Screw COUNT per connection matches install manual
- **Red flag:** Stripped screws carry almost zero load - check every connection carefully.

8. Bracing - Types + Placement

- Bracing type + quantity matches engineer's bracing plan (bracing units, not m intervals)
- K-brace: full-depth studs each end, correct connectors
- X-strap: continuous strap, tensioners installed + functional, no kinks
- Sheet bracing: sheet edges aligned with framing, screws at install manual centres
- Bracing continuous top to bottom (not broken by openings)
- Portal frames engineer-designed per AS 4100 if used
- **Red flag:** X-strap with no tensioner OR loose tensioner = strap does nothing.

9. Openings - Lintels + Jamb Studs

- Lintel above every opening - size per engineer's schedule
- Cold-formed steel lintels: correct depth + gauge per schedule
- Heavy steel lintels hot-dip galvanised per AS/NZS 4680 after fabrication
- Lintel bearing on jamb studs both ends
- Jamb studs sized/doubled per engineer's spec
- Jamb-to-lintel connectors per manufacturer's install manual
- No site-cut lintels (unless engineer approves in writing)
- **Red flag:** Opening > 900mm with no engineered lintel visible, OR heavy lintel not hot-dip galvanised.

10. Portal Frames at Wide Openings

- Portal frame designed to AS 4100 (design certificate on site)
- Welded per AS/NZS 1554.1 (SP category typical)
- Hot-dip galvanised per AS/NZS 4680, all welds cold-galv touched up
- Column base plates: waterproof/bearing pad min. 3mm under
- Base plate fixed with M12/M16 chemical anchors per engineer's spec
- Full bolt count at every connection
- **Red flag:** *Garage door > 3m with no portal frame OR portal welded on site without engineer sign-off = #1 wind failure point.*

11. Roof Trusses (Steel or Timber)

- Trusses at correct centres per truss designer's layout (600 or 900mm)
- Each truss identifiable by number, matches layout
- Girder trusses at specified load-transfer positions
- Truss bearing on top plate per truss designer's spec
- Trusses straight + plumb - no leaning/twisting
- No damage to truss members
- Truss layout drawing on site
- **Red flag:** *Trusses wider than layout, OR site-cut without designer sign-off = require designer sign-off.*

12. Roof Truss Tie-Downs

- Every truss has tie-down to top plate (cyclone strap / bracket / bolted)
- Connector type matches engineer's schedule for wind class
- EVERY screw/nail hole on connector data sheet filled
- Screws driven to full depth (not stripped)
- Cyclone straps looped over truss + secured both sides
- Both flanges connected (not just one)
- No gap between connector and steel
- **Red flag:** *ANY truss without tie-down at either bearing = roof uplift concentrates there first.*

13. Frame Level + Plumb (QBCC S&T; Guide)

- Wall out-of-plumb: max 4mm within any 2m height (AND compromises structure/water/safety)
- Wall out-of-straight (bow): max 4mm in any 2m length within 12 months
- Pre-plasterboard substrate: 1.8m straight-edge test - max 4mm over 90% of area
- Pre-plasterboard substrate: max 5mm over remaining 10% of area
- Every external wall spot-checked with spirit level or 2m straight-edge
- Corners plumb (plumb bob or laser)
- **Red flag:** *Any of the three QBCC tests failed = defect. Pre-plasterboard 1.8m test is strictest.*

14. Frame Straightness (Individual Studs)

- Frame overall passes QBCC 4mm/2m bow test
- Frame overall passes 1.8m straight-edge pre-plasterboard test
- Individual studs bowed more than surrounding = flag as potentially damaged
- No dented or kinked studs (dents = major cold-formed section capacity loss)
- No twisted studs at corners/jamb
- Studs plumb (leaning stud = bottom plate not secured properly)
- **Red flag:** *Dented/kinked steel studs left in place = structurally compromised, must be replaced.*

15. Interface Connections (Junctions + Back-to-Back Studs)

- All wall junctions screw-fixed per install manual (full count top/mid/bottom)
- Back-to-back (box) studs fixed to each other per manufacturer's spec
- Internal K-braces secured to roof framing per manufacturer's bracket spec
- Wall panel junctions with correct connector count from install manual
- DEFLECTION SLOTS - slotted screws NOT tightened firm
- **Red flag:** *Slot screws tightened firm = roof can't move under wind = something else fails. Very common mistake.*

16. Termite Management + Timber Interfaces (AS 3660.1:2014)

- Physical or chemical termite barrier intact (verify from pre-pour)
- 75mm inspection zone clear around slab perimeter
- Any timber components (soffit framing, deck, feature beams) protected per AS 3660
- Timber bottom plates (some systems) inspected for treatment
- No timber in ground contact anywhere
- **Red flag:** *Damaged termite barrier at pipe penetrations, OR timber on slab without physical barrier underneath.*

17. Documentation On Site

- Engineer's structural drawings (current rev, all sheets)
- Frame manufacturer's install manual (THE reference for screw counts)
- Truss layout drawing from truss manufacturer
- Wind classification certificate
- Mill certificates for steel (coating class + grade + AS/NZS 1397 compliance)
- Design certificate NASH Standard Part 2 OR AS/NZS 4600
- AS 4100 + AS/NZS 1554.1 certs for heavy steel (portals/beams) if present
- Termite management certificate (post-pour)
- Working drawings (arch + electrical + plumbing)
- **Red flag:** *Missing install manual = no way to verify screw counts + connector requirements.*

30 Red Flags - If You See ANY, Don't Sign the Progress Claim

Any 3+ = book an independent inspection immediately. Any 10+ = withhold frame-stage payment until fixed.

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|---|--|
| ■ 1. No frame manufacturer install manual on site | ■ 16. Bracing type or quantity doesn't match engineer's plan |
| ■ 2. No engineering drawings on site | ■ 17. X-strap bracing with no tensioner OR loose tensioner |
| ■ 3. Coating < Z275, or Z275 within 500m of coast | ■ 18. Sheet bracing screws wider than install manual centres |
| ■ 4. Visible rust bloom on new steel | ■ 19. No lintel above opening > 900mm wide |
| ■ 5. Bare steel at cut ends or damaged coating not touched up | ■ 20. Heavy steel lintel not hot-dip galvanised |
| ■ 6. Missing tie-down anchor at engineer's specified position | ■ 21. Garage door opening > 3m with no portal frame |
| ■ 7. Chemical anchors loaded before manufacturer's cure time | ■ 22. Portal frame welded on site without engineer sign-off |
| ■ 8. Nuts finger-tight (not tensioned to engineer's spec) | ■ 23. Trusses wider centres than truss layout specifies |
| ■ 9. Studs with holes drilled on site through flanges | ■ 24. Truss missing tie-down at either bearing |
| ■ 10. Dented or kinked steel studs left in place | ■ 25. Any connector with fewer screws/nails than data sheet |
| ■ 11. Stud spacing wider than engineer's plan | ■ 26. Wall out-of-plumb > 4mm/2m height AND compromises structure/water/safety |
| ■ 12. Non-Class-3 (or lower) screws used structurally | ■ 27. Frame bow > 4mm in any 2m length (QBCC) |
| ■ 13. Stripped screws left in place (shiny head, spins when tested) | ■ 28. Pre-plasterboard substrate failing 1.8m straight-edge test |
| ■ 14. Screws driven only partway (not to full depth) | ■ 29. Slot screws fully tightened (should allow deflection) |
| ■ 15. Top plate butt-joined without splice plate | ■ 30. Back-to-back studs not connected to each other |
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Based on NASH Standard: Residential and Low-rise Steel Framing (Part 1 + Part 2), AS/NZS 4600:2018, AS 3566.2, AS/NZS 1397, AS/NZS 4680, AS 4100, AS/NZS 1554.1, AS 4055, AS 3660.1 + QBCC Standards & Tolerances Guide. Your engineer's structural drawings + your frame supplier's install manual are the primary references.