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 3mm over 90% of area
- ■ Pre-plasterboard substrate: max 4mm 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/jambs
- ■ 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.

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