

MASTER DECK BUILDING PLANNING & QC CHECKLIST

2021 IRC Building Code & Structural Engineering Compliance Guide | Homeowner & Contractor Audit

Project Address: _____	Contractor: _____	Date: _____
Permit #: _____	Inspector: _____	Status: ☐ Pre-Build ☐ Mid-Build ☐ Final

1. Credentials, Permitting & Site Logistics

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
☐	Licensing & Insurance	State Licensing & TX / Local Regs	Verify active contractor state/local licenses, general liability insurance, and worker's compensation coverage prior to contract execution.
☐	IRC Code Permitting	2021 IRC Section R105	Confirm building permits are properly filed and approved under 2021 International Residential Code (IRC) standards.
☐	Utility Clearance & Setbacks	811 Digess / IRC R301	Locate underground utilities via 811. Check ledger clearances for electrical meters, cables, and window safety glazing.
☐	Egress & Rescue Windows	2021 IRC Section R310	Verify deck footings, posts, and substructure framing do not obstruct basement emergency escape and rescue openings.

2. Substructure Framing & Material Selection

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
☐	Framing Material Evaluation	2021 IRC Section R507.5	Compare Pressure-Treated (PT) Yellow Pine vs. Cold-Formed G90 Galvanized Steel framing for long-term stability.
☐	Surface Flatness Guarantee	Manufacturer Specifications	Ensure substructure selection prevents joist crowning, twisting, or warping that causes 'wavy' composite board surfaces over time.
☐	Joist & Beam Spans	2021 IRC Tables R507.5/R507.6	Verify joist and beam span limits meet required 40 PSF live load / 10 PSF dead load specifications.
☐	Substructure Fire Rating	ASTM E84 / Class A Rating	In fire-sensitive regions, confirm non-combustible steel or fire-retardant treated substructure framing.

3. Deep Foundation & Footing Engineering

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
[]	Footing System Approval	2021 IRC Section R507.3	Confirm whether traditional poured concrete piers or engineered helical pile foundation systems (Techno Metal Post) are specified.
[]	Helical Pile Code Approvals	IAPMO ER-481 / ICC-ES ESR-3418	Verify helical piles hold active evaluation reports for prescriptive IRC replacement of concrete deck piers.
[]	Torque Capacity Measurement	IAPMO ER-481 / FS = 2.0	Ensure installer records real-time hydraulic installation torque to confirm allowable compression/tension load capacity with a 2.0 safety factor.
[]	Frost Heave & Corrosion	ASTM A123 / HDPE Sleeving	Confirm green High-Density Polyethylene (HDPE) sleeves protect against frost heave, and hot-dip galvanization meets ASTM A123.

4. Decking Board Performance & Trends

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
[]	Core Material Selection	IRC R507 / ASTM D7032	Select between capped composite, PVC, aluminum, or dassoXTR Fused Bamboo based on regional climate and UV exposure.
[]	Heat Mitigation Technology	TrexSunComfortable / Cool-Touch	Verify composite/PVC boards incorporate heat-mitigating technology to reduce surface temperature under direct sunlight.
[]	Structural Weight Optimization	Surestone® Technology	For elevated decks or heavy features, evaluate mineral-based composite boards that offer a 35% weight reduction over standard composites.
[]	Color & Palette Alignment	2026 Trend Palette	Align board choices with modern earth-tone trends (e.g., Trex Biscayne coastal brown) and verify multi-tone variegation.

5. Picture-Frame Borders & Fastening Systems

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
[]	Hybrid Fastening Strategy	Manufacturer Technical Manuals	Use hidden clips for grooved field boards; specify color-matched plugged face screws into solid blocking for picture-frame borders.
[]	Continuous Perimeter Blocking	TimberTech / Trex Installation Guides	Install continuous solid perimeter blocking framing beneath all picture-frame borders, miters, and breaker boards before field installation.
[]	Fastener Edge Distances	TimberTech Technical Specs	Enforce edge placement rules: PVC fasteners within 1/2" of board edge; composite fasteners at least 3/4" from any edge.

☐	Thermal Expansion Spacing	Trex / TimberTech Thermal Tables	Set board end-to-end expansion gaps based on installation temperature (e.g., 1/8" above 40°F; 3/16" below 40°F).
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6. Outdoor Kitchen & Heavy Feature Integration

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
☐	Dead & Live Load Calculations	2021 IRC R301 / R507 Engineering	Calculate total dead and live loads for integrated grills, stone countertops, and appliances; add sister joists or steel beams as required.
☐	Framing Weight Reduction	Deckorators Kitchen Guidelines	Replace heavy masonry blockwork with lightweight pressure-treated wood framing, structural aluminum, or Surestone composite boards.
☐	Thermal Protection Jackets	Manufacturer Safety Specs	Mandate an insulated stainless steel grill jacket around built-in grills to prevent heat transfer to adjacent decking/framing.
☐	Ventilation & Utility Prep	NFPA 54 / NEC GFCI Standards	Ensure vent hoods meet clearance specs under covered pergolas. Install GFCI outlets with weatherproof covers; add water line drain valves for winterization.

7. Wildfire Resilience & WUI Code Compliance

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
☐	Flame Spread Index Rating	ASTM E84 / Class A Standard	In wildfire hazard zones, specify decking and framing materials that achieve a Class A Flame Spread Index.
☐	WUI State Accreditation	California Chapter 7A / SFM 12-7A-4	Verify materials pass exterior wildfire exposure tests (e.g., dassoXTR Fused Bamboo or aluminum framing).
☐	Ember Entrapment Prevention	IWUIC / Firewise USA Guidelines	Enforce precise 3/16-inch board-gap spacing to prevent wind-blown flying embers from igniting organic debris trapped between boards.

8. Under-Deck Water Management (Two-Story Decks)

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
☐	Drainage Pitch Elevation	TimberTech DrySpace Specs	Establish a minimum 1/8-inch per foot slope pitch sloped away from the house ledger using snapped chalk reference lines.
☐	Flashing & Bracket Sealing	Trex RainEscape / DrySpace Guides	Confirm installation of Ledger F-Brackets and Combo Brackets with butyl rubber tape sealing all ledger seams and overlapping corners.

[]	Substructure Ventilation Gap	DrySpace Technical Guidelines	Maintain at least a 3-inch ventilation gap before the outer fascia board to ensure air circulation and prevent moisture buildup.
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9. Railings, Smart Lighting & Financial Sign-Off

Status	Inspection Item & Scope	Code / Engineering Standard	Verification Criteria & Action Steps
[]	Sightline Railing Systems	2021 IRC Section R312 Guards	Select aluminum, cable, or glass panel railings (e.g., Trex Signature) that maintain 200 lb concentrated load resistance while preserving views.
[]	3-Layer Smart Patio Lighting	OutdoorDesigns AI Guide	Incorporate Ambient (safety wash), Task (kitchen/dining clarity), and Accent (feature highlight) low-voltage LED lighting.
[]	Astronomical Sunset Automation	Smart Home Protocol (Alexa/HomeKit)	Program smart lighting controllers with ZIP-code astronomical timing to adjust automatically for daily sunset shifts.
[]	Itemized Billing & Warranty	Local Market Pricing (\$15k-\$35k)	Review final itemized billing line items against initial quotes; collect manufacturer material warranty and contractor labor warranty documents.

Homeowner Sign-Off:	Contractor Sign-Off:	Date Passed: