

TOOLBASESM

HOTLINE



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QUALITY

HOTSPOT INSPECTIONS

This package is companion information to the article "HotSpot Inspections," appearing in the March 2000 issue of *Professional Builder* magazine.

The HotSpot Inspection forms that follow are provided courtesy of the framing contractors and builders who generously share their best practices for the benefit of our industry including:

- All-tech Inc., Jamesburg, NJ (framing contractor)
- K. Hovnanian, Red Bank, NJ (builder)
- Schuck and Sons, Glendale, AZ (framing contractor)
- Del Webb, Sun City West, AZ (builder with contracted and in-house framing operations)

These HotSpot Inspection forms continue to evolve as participants implement and refine them in their operations as part of the ongoing PATH/NAHB Research Center ISO 9000 framing quality project.

This information is provided to you as a free service of the NAHB Research Center's ToolBase program. For answers to other quality-related questions call the ToolBase Hotline (800-898-2842).

If you have comments or suggestions, please contact Edward Caldeira at ecaldeira@nahbrc.org or 301-430-6310.

Thank you for your interest.

HOTSPOT INSPECTIONS

By Edward Caldeira, NAHB Research Center

Inspection forms are worthless if they don't help solve your current quality issues. Why use them if checking boxes is only a routine while the real problems are not even mentioned? "Typical builder checklists might as well be laminated," says Mark Hodges, VP of Operations, K. Hovnanian. "Complete with check marks!"



HotSpot Inspection forms change all that. HotSpot checkpoints are constantly adjusted to focus on current quality issues and related improvement efforts. When new problems are encountered, they are added as HotSpot checkpoints. When preventive actions get the problem under control, it comes off the HotSpot checklist. The HotSpot inspection forms change as needed, to bring attention to the issues that demand a response from field personnel. The forms also list key specifications, but only as reminders.

GETTING STARTED

Schuck and Sons, a Phoenix framing contractor, is changing from a traditional checklist format to HotSpot. They are part of an ISO 9000 framing quality assurance project, in partnership with Del Webb, the Partnership for Advancing Technology in Housing (PATH), and the NAHB Research Center. The reminder section of the form lists critical requirements from the old sheet for information purposes only.

On a daily basis, HotSpot forms are used like traditional inspection forms, except they are shorter and easier to use than before.

UPDATING HOTSPOT INSPECTION FORMS

Updating HotSpot Inspection forms is a central element of the quality improvement process for All-tech Construction, a New Jersey framing contractor participating in the ISO 9000 framing quality assurance demonstration project with their partner K. Hovnanian. Here's how they are using HotSpot forms in a six-step quality improvement process:

1. Quality issues are identified through job inspections by area superintendents, builder feedback, and comprehensive quality reviews.
2. HotSpot checkpoints are added to the inspection form to address quality improvement areas.
3. In weekly production meetings, production supers are trained on procedures to prevent problems. The training uses one-page diagrams that address specific problem areas. The new HotSpot Inspection forms are then distributed and discussed.
4. In toolbox talks, production supers use the training diagrams to train the framing crews with the superintendent monitoring the new use of the procedures.
5. HotSpot Inspection forms are used by superintendents on every job. Results provide feedback on the effectiveness of the improvements.
6. Finally, success is celebrated. When HotSpots are no longer an issue, the item is posted in the production meeting room as a quality success. The checkpoint comes off the HotSpot part of the form and gets put on the reminder section. In time, it may leave the inspection form altogether.

Everyone seems to like the HotSpot approach because it supports an inspection process that experienced construction superintendents use every day: keep all requirements in mind while paying special attention to the quality issues. It just helps them do it better.

Job Inspection Record-Schuck and Sons Construction

Date:	Release #:	Sequence #:	Production #:	Unit #:	Lot #:
Inspector/Date:					
Key Requirements (for review)			HotSpots (must be verified)		
Layout: <ul style="list-style-type: none"> ➤ Accurate foundation dimensions ➤ Square foundation ➤ Flat foundation ➤ Safe site conditions 			Supervisor: _____ <input type="checkbox"/> Back to front max deviation: _____ <input type="checkbox"/> Side max deviation: _____ <input type="checkbox"/> Square deviation: _____ <input type="checkbox"/> Flat max deviation: _____		
Exterior walls: <ul style="list-style-type: none"> ➤ Window size, level, and plumb ➤ Temporary power ➤ Header sizes ➤ Shear properly nailed ➤ Strap location and nailed properly ➤ Walls plumb ➤ Window margins even, level sill, & plumb trimmers ➤ Glass block opening size, plumb & level ➤ Backing for interior wall connections ➤ Swept out house 			Foreman: _____ <input type="checkbox"/> Studs flush with inside of bottom plates <input type="checkbox"/> Tower walls & patio columns strapped & srp4 on studs and fire stopped <input type="checkbox"/> Proper number of trimmer & king studs at openings		
Interior walls: <ul style="list-style-type: none"> ➤ Temporary power ➤ Walls plumb ➤ Skylights framed in and straight & plumb ➤ Wrapped openings plumb, sides straight, header level, and bottoms square ➤ Nitches level & plumb ➤ Drops lined & tied up ➤ Interior shear walls frames and tied ➤ Fire stop ➤ Ceiling backing ➤ Swept out house 			Foreman: _____ <input type="checkbox"/> Small bottom plates secured by glue <input type="checkbox"/> Closet openings plumb, level & double studs at opening [insert] <input type="checkbox"/> Garage door backing 99" sides, 119" center <input type="checkbox"/> Pony wall level top, plumb ends		
Trusses: <ul style="list-style-type: none"> ➤ Temporary power ➤ Hang backing installed ➤ Sway bracing installed with gable ties ➤ Gable vents ➤ Swept out house 			Foreman: _____ <input type="checkbox"/> Nailing of H-1's and H-2.5's		
Roof foreman: _____ <ul style="list-style-type: none"> ➤ Temporary power ➤ Overhangs proper length ➤ Face straight ➤ Pigeonhole size ➤ Nailing per layout marking ➤ Skylight opening with plumb trusses and curbs built ➤ OSB gapped on roof ➤ Fireplace stack built & installed (where necessary) ➤ Swept out house 			<input type="checkbox"/> OSB nailed where over-framing occurs		

Job Inspection Record-Schuck and Sons Construction**Trim:**

- Temporary power
- Soffit nailing
- Clean-up around house, swept house and driveway

Foreman: _____

-
- Vent locations and installed

Notable problems:**Builder punch-out items (even if corrected):****Notes:****Work to be completed at a later date:**

Job Inspection Record – All-tech Construction

Community:	Home:	Model:	Elevation:	Foundation:	
				<input type="checkbox"/> Slab	<input type="checkbox"/> Walkout
				<input type="checkbox"/> Full	<input type="checkbox"/> English <input type="checkbox"/> Daylight
Options:					
<input type="checkbox"/> 8' ceiling – 1 st fl	<input type="checkbox"/> Opt Garage door	<input type="checkbox"/> Ext. Family room	<input type="checkbox"/> # Bay wind ____	<input type="checkbox"/> Loft	
<input type="checkbox"/> 9' ceiling – 1 st fl	<input type="checkbox"/> 4 th bedroom	<input type="checkbox"/> Fireplace-gas	<input type="checkbox"/> # Box wind ____	<input type="checkbox"/> Ext. stairs	
<input type="checkbox"/> 10' ceiling – 1 st fl	<input type="checkbox"/> 5 th bedroom	<input type="checkbox"/> Fireplace-wood	<input type="checkbox"/> # Opt wind ____	<input type="checkbox"/> Porch	
<input type="checkbox"/> Tray ceiling	<input type="checkbox"/> Bonus room	<input type="checkbox"/> Greenhouse	<input type="checkbox"/> # Skylights	<input type="checkbox"/> Sundeck ____x____	
<input type="checkbox"/> Cathedral ceiling	<input type="checkbox"/> Conservatory	<input type="checkbox"/> Opt. Master bath	<input type="checkbox"/> Attic platform	<input type="checkbox"/> # Sundeck stair treads ____	
<input type="checkbox"/> 3 car garage	<input type="checkbox"/> Den	<input type="checkbox"/> Sitting room	<input type="checkbox"/> # Dormers ____	<input type="checkbox"/> Rear platform ____x____	
<input type="checkbox"/> garage stairs	<input type="checkbox"/> Exp. Nook	<input type="checkbox"/> Sunroom			
Other options/work orders:					
Key Requirements (for review)			HotSpots (must be verified)		
Job ready:			Crew: ____ Insp: ____ Date: ____		
<input type="checkbox"/> Foundation dimensions	<input type="checkbox"/> Foundation flat	<input type="checkbox"/> Back to front max deviation: ____			
<input type="checkbox"/> Foundation square	<input type="checkbox"/> Sill plate anchor spacing	<input type="checkbox"/> Side max deviation: ____			
	<input type="checkbox"/> Safe site conditions	<input type="checkbox"/> Square deviation: ____			
Layout:			Foundation		
<input type="checkbox"/> Wall lines snapped			Name: ____ Date: ____		
<input type="checkbox"/> Mark girder, window, door, point load locations			1 st floor		
<input type="checkbox"/> Mark header and liner sizes			Name: ____ Date: ____		
			2 nd floor		
			Name: ____ Date: ____		
			3 rd floor		
			Name: ____ Date: ____		
Floor deck(s):			1 st floor		
<input type="checkbox"/> Joists	<input type="checkbox"/> Sill seal continuous	Crew: ____ Insp: ____ Date: ____			
<input type="checkbox"/> Steel columns plumb	<input type="checkbox"/> Decking nailed and glued	<input type="checkbox"/> Steel column plumb deviation: ____			
<input type="checkbox"/> Beams	<input type="checkbox"/> Stair well covered and safety rails installed	2 nd floor			
<input type="checkbox"/> Straps nailed	<input type="checkbox"/> Bridging	Crew: ____ Insp: ____ Date: ____			
<input type="checkbox"/> Anchors secured to plate		3 rd floor			
		Crew: ____ Insp: ____ Date: ____			
		<input type="checkbox"/> Strongbacks to last floor truss – all floors			
Wall frame(s):			1 st floor		
<input type="checkbox"/> Walls installed per layout	<input type="checkbox"/> Walls braced and sited	Crew: ____ Insp: ____ Date: ____			
<input type="checkbox"/> Headers and liner nailed	<input type="checkbox"/> Nailers	<input type="checkbox"/> Number of 1 st floor point loads ____			
<input type="checkbox"/> Opening positions	<input type="checkbox"/> Safety rails	2 nd floor			
	<input type="checkbox"/> Clean-up	Crew: ____ Insp: ____ Date: ____			
	<input type="checkbox"/> Hardhats worn	<input type="checkbox"/> Number of 2 nd floor point loads ____			
		3 rd floor			
		Crew: ____ Insp: ____ Date: ____			
		<input type="checkbox"/> Number of 3 rd floor point loads ____			
		<input type="checkbox"/> Header nail pattern – all floors			

Job Inspection Record – All-tech Construction

Roof system: <ul style="list-style-type: none"> ➤ Truss layout ➤ Permanent bracing ➤ Sheathing nailers ➤ Elevations and crickets ➤ Exterior chimney chases frames ➤ Corewall w/clips ➤ Hurricane clips ➤ Truss girder nailing ➤ Clean-up ➤ Hardhats worn 	Crew: _____ Insp: _____ Date: _____ <input type="checkbox"/> Truss strongback to plan
Sheathing, walls: <ul style="list-style-type: none"> ➤ Sheathing spacing ➤ Nailing depth and pattern ➤ Clean-up ➤ Hardhats worn 	Crew: _____ Insp: _____ Date: _____
Sheathing, roof: <ul style="list-style-type: none"> ➤ Plywood clips ➤ Nail pattern and depth ➤ Side guards in place ➤ Crickets ➤ Gables straight ➤ Trusses straight ➤ Roof vents ➤ Clean-up ➤ Hardhats worn 	Crew: _____ Insp: _____ Date: _____
Fascia: <ul style="list-style-type: none"> ➤ Rakes and fascia ➤ Returns and porkchops ➤ Frieze boards ➤ Framing of round windows ➤ Chimney wraps 	Crew: _____ Insp: _____ Date: _____
Windows and doors: <ul style="list-style-type: none"> ➤ All windows and doors installed ➤ Plumb and level W&D ➤ Hardware ➤ Screws and shims ➤ Flash windows and doors ➤ Caulk windows and doors ➤ Safety rails reinstalled ➤ Clean-up ➤ Hardhats worn 	Crew: _____ Insp: _____ Date: _____ <input type="checkbox"/> Window reveals even
Blockout: <ul style="list-style-type: none"> ➤ Stair platforms ➤ Bracing removed ➤ Bowed studs checked and replaced ➤ Garage jams ➤ Whirlpool platforms ➤ Attic access and platforms ➤ Safety rails installed ➤ Walls squared ➤ Bathtub firestopped ➤ Whirlpool draftstopped ➤ Medicine cabinets blocked ➤ Firestops installed ➤ Fire block mechanicals ➤ Knee walls secured ➤ Pin up in cathedral ➤ Cleanup ➤ Hardhats worn 	Crew: _____ Insp: _____ Date: _____
Final inspection: <ul style="list-style-type: none"> ➤ All corrections complete ➤ Builder punchlist complete ➤ HotSpots checked ➤ Cleanup 	Foreman: _____
Notable problems:	
Builder punch-out items (even if corrected):	
Work to be completed at a later date:	
Notes:	

PATH ISO 9000 FRAMING PROJECT PROMOTES QUALITY HOME CONSTRUCTION

The Partnership for Advancing Technology in Housing (PATH), the Wood Truss Council of America, and the NAHB Research Center are sponsoring a pilot project to integrate ISO 9000 practices for quality assurance in design, development, production, and servicing within the framing industry. Builders, manufacturers, framers, code officials, architects, and engineers will participate in the ten-month process of development, demonstration, and deployment.

ISO 9000 is a set of five universal standards for a Quality Assurance system that is accepted around the world. Currently 90 countries have adopted ISO 9000 as national standards. When a person purchases a product or service from a company that is registered to the appropriate ISO 9000 standard, that consumer has important assurances that the quality will be as expected. Framing currently accounts for 15 to 20 percent of the total cost of a house. It is one of the most critical construction factors -- affecting cost, cycle time, quality, and durability. Implementation of an ISO 9000-based quality management procedure for framing will lead to significant improvements.

If a house is framed correctly, the installation of windows and doors, cabinets, and floors is much quicker and easier. Correctly framed houses are much more likely to survive natural disasters. The improved quality of framing reduces rework and eases installation of other products (e.g., doors, windows, cabinets, etc.). The cost of correcting structural defects after the house is completed is also eliminated.

Quality practices proposed in the ISO 9000 project also include how to stack and store the materials to prevent damage. Methods to reduce the occurrence of rework and associated waste will be developed. An improved, more accurate construction process also reduces the need for custom fitting of building components (e.g. trusses, wall openings, cabinets, etc.) which, in turn, will reduce wasted time. Code approval processes both before and during construction will be significantly shortened.

In addition, quality framing through ISO 9000 management practices will reduce occurrences of cracking drywall, creaking floors, and similar problems typically attributed to faulty framing. The installer training and inspection process that is part of this project assures that roof sheathing, connectors and fastening systems, and floor, wall, and roof components are properly installed.

Under the PATH supported program, the NAHB Research Center will develop specific tools for the ISO 9000 framing project. The tools will include: a framing quality manual; use-of-materials documents for basic materials, connectors, and hardware; training materials; jobsite inspection procedures/lists; methods that track and monitor quality; and contract templates that assign responsibilities and acceptance. Builders will apply the quality procedures developed under the program to selected homes.

The pilot project's case study report and recommendations for builders and framing contractors will outline alternative strategies for deploying the ISO 9000 technology for the home building industry's framing sector; detail the business benefits of adopting an ISO 9000 quality management approach; describe the availability of tools developed under the program; note the ease and low cost of implementing a quality management system; and cite building code permit and inspection process advantages of the process. A short, benefits-oriented summary will be distributed to framing contractors and other trade contractors and builders.

The PATH is a voluntary initiative that seeks to accelerate the creation and widespread use of advanced technologies to radically improve the quality, durability, environmental performance, energy efficiency, and affordability of our nation's housing.