



Hotspot Implementation Guide & Tools

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Introduction

The goal of Building America is to develop energy efficient solutions for new and existing homes that meet increasing energy performance targets. In order to consistently deliver production scale new high performance homes, quality management is needed. The goal of implementing a quality management process is the prevention of problems, issues, and defects. While prevention is the ultimate goal, part of a quality management process includes managing issues that do occur. This report outlines how to address recurring problems within the context of a builder's management system for constructing new high performance homes.

The hotspot process is a quality management tool that was developed by the Home Innovation Research Labs (Home Innovation) under the NHQ Certified Trade Contractor Program to support quality efforts to prioritize and greatly reduce recurring problems. The intent of the Hotspot Implementation Guide and Tools is to provide a resource for builders and their trade contractors that allow them to take on a self-contained quality management process that is not dependant on having a formal quality management system in place.

Addressing Recurring Problems – Hotspots

A hotspot is a recurring problem or potential problem that a building company chooses to target for elimination or prevention because the leaders in the company have carefully analyzed the company's problems and concluded that one particular problem ranks as the most important one to address at this time. Eliminating a hotspot will require the use of time and company resources. Specific hotspots are selected because they are:

- A prioritized, important issue.
- A builder's problem, not that of another company
- An issue that is limiting a builder's effectiveness or efficiency.

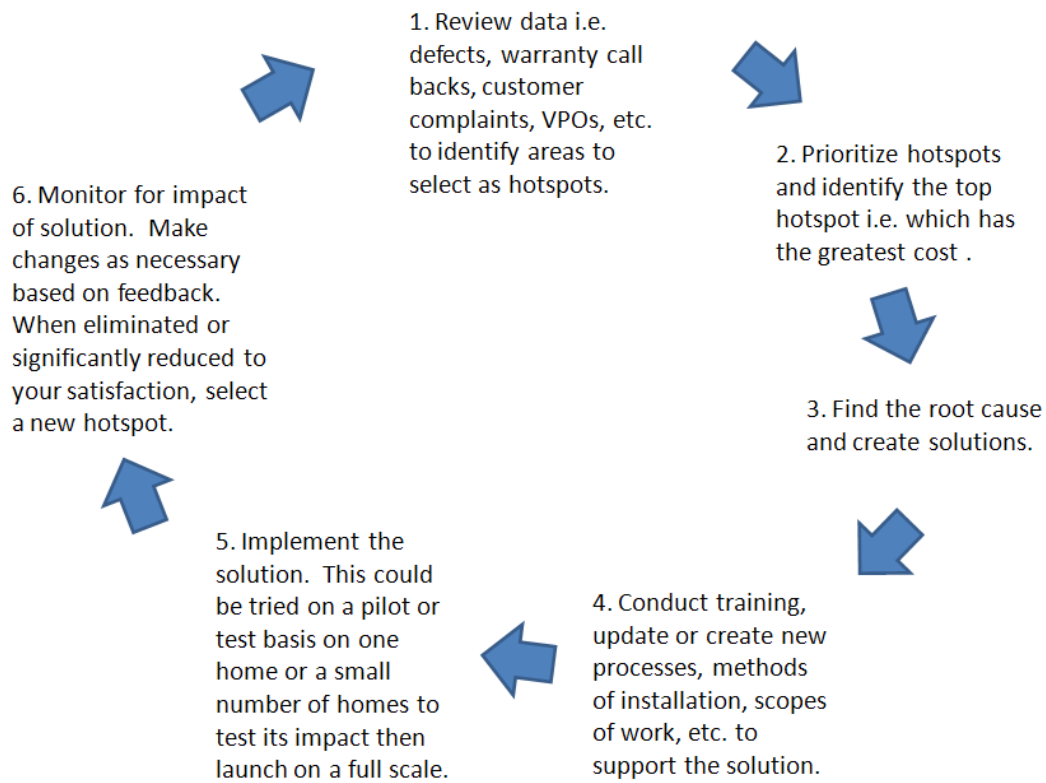
By eliminating hotspots, costs can be reduced, profits increased, and customer satisfaction improved, and ultimately the company is made stronger and more sustainable. This is of particular importance in high performance homes because the home must work as a system to achieve the desired energy performance without issues such as durability, moisture, indoor air quality, comfort, etc.

The chart below highlights some common hotspot categories, though it is not intended to be a comprehensive list of all possible hotspot types.

Jobsite Installation	Office Operations	Personnel / Company Culture
Material failure	Inventory control	Low morale
Product failure	Documentation	Culture of finger-pointing
Inefficient installation	Accounts payable/receivable	Lack of accountability
Safety issues	Maintenance of records	Lack of pride
Improper installation	Poor Communication (i.e., between office & the field)	Misinformation
Poor communication	Coordination/accountability of field personnel	

Hotspot Process

A hotspot is often found by reviewing data such as warranty data or customer complaints. Following this, the identified hotspots then need to be prioritized. Then the cause of the issue needs to be determined to create a solution. Next, the solution needs to be communicated, change implemented, and then monitored for impact. This process is shown in detail in the figure below and in the list following.



Six Steps to Eliminating Recurring Issues (Hotspots)

1. Review data from inspections, callbacks, code inspections, and customer feedback to choose hotspots.
(Responsibility: Quality Manager)
2. Prioritize hotspots and identify the top hotspot
(Responsibility: Quality Manager)
3. Perform a root cause analysis to determine why the hotspots occur and create a solution for the issue.
(Responsibility: Quality Manager)

4. Add the hotspot item to the inspection process and inspection form as a specific, stand-alone item.
(Responsibility: Office worker/Field supervisor)
Develop a training format (i.e., training sheet, video etc.) to address the root cause of the hotspot.
(Responsibility: Quality Manager)
5. Implement the hotspot training with all workers and inform them that there will be inspecting for and tracking of the success of the elimination of the hotspot item on every single job.
(Responsibility: Field supervisor who oversees field operations)
6. Inspect every job, every time, for the hotspot. Monitor for the impact of the solution.
(Responsibility: Inspector)
Review and tabulate the results periodically to evaluate hotspot success and provide feedback to the entire company.
(Responsibility: Quality Manager)

If the process is successful after one month of addressing the hotspot, the quality manager should recognize those who have contributed to its improvement. At this point, the hotspot is resolved and it can be removed from the inspection criteria or demoted to non-hotspot status, and repeat the process. However, if the hotspot improvement is not successful, the quality manager should repeat the process to determine why the condition was not corrected. The training may need improvement or a different root cause may need investigation.

A Hotspot Is Not!

There are occasionally some issues identified that are not actually a hotspot. These include:

- A problem that the company no longer has
- An external problem in which the company has no direct participation in causing
- A relatively unimportant issue
- An issue that is linked to just one individual or crew, unless its impact is so great that it affects the entire company and rises to the level of most important problem to be addressed at that time.

Actual Examples of Typical Hotspot Problems

When occurring frequently, the following are examples of what a hotspot can be including:

- Gaps and voids regularly found in the installation of batt insulation
- Improperly sealed penetrations
- Inconsistent or wrong nailing patterns
- Inspections not being completed, or not being documented
- Workers on the jobsite failing to follow safety procedures such as not wearing hardhats
- Workmanship defects that affect appearance
- A trade beginning work without the required conditions having been met
- Crews running out of or not having all of the needed materials at the jobsite

Why Do Hotspots Work?

Hotspots work because when implemented properly, they prioritize challenges within a company, focus training to those problems one at a time, and then track improvements resulting from the hotspot training. Improved knowledge and awareness of problems along with careful monitoring and tracking lead to increased accountability for all workers. Issues targeted by an effective hotspot process typically are virtually eliminated. Once individuals actively participate in eliminating some of what have often been on-going, frustrating problems, they are empowered, and begin to develop a greater sense of control over their workplace success. This can be an important step in the process for a company to begin to create or enhance a culture of quality across its entire operations.

Create Accountability with Workers

The principle of the hotspot process is to focus on what's most important, and to limit one's effort to a single issue at a time, and then to actually monitor the success in eliminating the problem. Focusing the efforts on a single issue creates accountability because after training on that issue, no installer can claim that he or she did not know how to do it correctly, or that they forgot, that they did not think it was important, or any other similar excuse. This creates bottom-line accountability with no room for excuses and successful results.

Identifying the Hotspot

Identifying hotspots can be simple. A builder documenting inspections of construction, supply, or installation, will have data to review in order to determine what problems are occurring, at what frequency, and at what cost to the company. If this kind of data is in place, then it can be reviewed for hotspots. Start with information already available and review the records of production callbacks, warranty callbacks, return trips, etc to identify recurring problems. If a builder has a database of inspection data, they may be able to simply print out a report that will indicate the frequency and type of callbacks.

If this data is not available, then a builder may have or choose to create a different approach. Some methods include something as easy as an Excel spreadsheet or even a simple manually recorded tick list of callbacks to indicate which of callbacks are most common. In addition, initial hotspots can be selected based on what is perceived to be the greatest need for improvement. This should be the only time that hotspots are identified based on perceptions rather than data. Perceptions are often misleading, whereas inspection data rarely deceives.

This also reflects just one reason why conducting inspections and keeping inspection forms is so important. Conducting inspections is a key way to avoid errors and to find out where the problems lie. It also allows a builder to monitor when such problems have been eliminated. Other sources of data may be available such as variance purchase orders (VPOs), customer complaints, warranty issues and customer survey results.

Consider These Questions to Identify Hotspots:

- What is the greatest area in need of improvement?
- Is there a particular installation issue, fabrication issue, supply issue or paperwork/office issue that is hurting the builder's operation?
- What is the leading cause for return trips to the jobsite? What are the most expensive reasons for callbacks?
- What is the leading cause for warranty callbacks? What is the most expensive warranty callback?
- What is the worst problem or bottleneck in the office?
- What are the greatest product inventory or fabrication issues?
- What are the areas of improvement that customers would most like to see?

Prioritize Hotspots

The next step following identifying hotspots is to prioritize which are the most important. The importance can be based on cost, the largest scheduling issue, or the item causing the most harm to a builder's business operation. Experience working with builders and trade contractors has demonstrated that individuals and companies often focus on too many problems or ones that simply do not rise to the top in terms of importance. This is why the hotspot process is most successful when hotspots are chosen not by what the owner or a manager thinks is a serious problem for the company, but rather what the analysis of inspection and other data indicate the company's most important challenge to be. Additional information on what data to collect, how to analyze it and how to select a hotspot is explained in more detail in the section on tips for selecting a hotspot.

There are two approaches to construction management issues that are guaranteed to fail; either to ignore all of the problems or to try to tackle them all at once. The most common point of failure from well-intentioned business owners is that they try to take on too many problems at once, and they end up solving none of the problems because their efforts are too diluted. Either the owner becomes overwhelmed, or, in many cases, the workers are not given any area of priority or focus in order to address the issues, resulting in none of the problems being eliminated.

Address One Topic at a Time

The impact of addressing a single problem is critical. By prioritizing a particular challenge within a company and only targeting that particular issue at that time, individuals at the company are empowered to focus their attention on that particular issue. Instead of being overwhelmed by trying to correct 10 issues at once, focusing on one issue allows a worker/installer to take on a manageable amount of learning and implement a bite-sized amount of change. Likewise, an onsite inspector can implement, inspect and track a manageable amount of change at a given time. This is important because the common management mistake at many companies is that they attempt to correct too many items at once, rather than prioritize and focus on one item. Calling too many problems very important all at the same time has the effect of making none of them important.

Root Cause Analysis of the Hotspot Problem & Creating a Solution

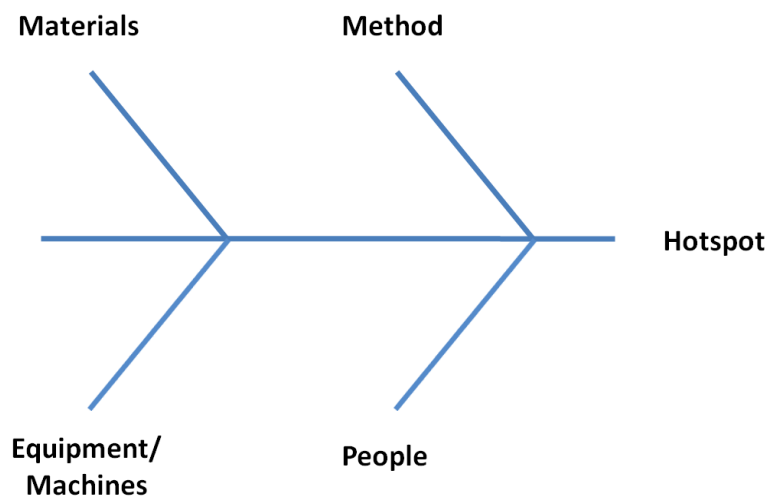
Once a builder has determined what the problems are, and prioritized them to decide which to address first, the next step is to consider what may be the actual root causes of the problems. Only after having done this analysis can a builder evaluate what the best possible solutions might be to effectively reduce or eliminate the problems.

Root Cause Analysis

There are a range of tools and techniques that can be used to find a root cause and create a solution. One is the 80/20 rule. This means that usually 20% of the issues cause 80% of the problem. This allows a builder to focus and determine solutions most effectively.

For example, assume that the hotspot is that a builder's warranty costs are too high. Remember in this example while the aim is to reduce costs, there will also be reductions of warranty complaints resulting in improving customer satisfaction and perhaps also increasing referral rates. The first step is for the builder to break down the warranty costs down into the component parts (the accounting department can help here, based on the builder's specific coding systems for costs). Next, rank the warranty cost issues from most expensive to least. The results will show that a few (20%) of the issues represent the majority of the costs (80%). Select the highest cost issues and consider which of these a builder can potentially impact easily and quickly.

This process can take time defining the problem. In addition, correctly identifying the problem is key to finding the true root cause. One tool that can help at this point is the fishbone chart show below.



Each 'bone' of the chart highlights an area to consider. Under each heading or bone, list what is already known about the problem. Note, for example, under people: list everyone involved in the aspect of the warranty problem. Then under Equipment/ Machines list what equipment is used. Do the same under Materials and then outline the Method of installation by listing the key steps in that process. This allows a thought process to review each of these issues and eliminate what is not contributing to the problem and therefore isolating what is causing the problem.

Another tool is process mapping or flowcharting. This can be very simple. Create a simple box for each step in a process with a note of what occurs, who is involved, and how long the step takes with an arrow connecting each box or step to the next box. This can help identify bottle-necks; find ways to eliminate steps and make improvements to the process. The result is an 'existing' process map and possibly a 'new improved' process map.

Creating a Solution

At this point it is important to talk with representatives from all the departments that have an impact on this hotspot area (for example: warranty service, construction, and design). It is also important to talk with the trades whose work is scheduled before and after the isolated construction activity pertinent to the hotspot. From these groups who know exactly what happens on a daily basis in this area, find out what the problems are, what the frustrations are, and even suggestions for potential solutions. By working with these groups a builder can get a clearer overall picture. Also consider talking with the customer (homeowners) view point also through customer complaints, completed satisfaction surveys and interviews.

When there is a clear perspective of the issues a builder may want to form a team with a representative from each group so that the problem can be clarified and potential solutions evaluated. In addition, there are outside resources for a builder and trades that can help including NAHB Builder 20 Club colleagues or members of the local Home Builders Association. These industry groups may have already experienced the same problem and be able to provide actionable solutions. The goal is to combine the suggestions into the actionable solutions to the issue in order to address the hotspot. Be sure that everyone involved in the process has been engaged in the root cause identification and the creation of the solution.

Add Hotspot to Documentation & Develop Hotspot Training

Hotspot Documentation

When a solution or set of solutions has been identified, ensure that they are documented. For example, test-drive a new improved process map so everyone can see and understand what the changes are and who is responsible for each step in the revised process. Develop revised scopes of work, revised specifications and drawings or details if needed. In addition, training on the new process and the new documents is essential as well as a schedule for launching the new process.

Hotspot Training Development

Based on the documentation for the hotspot solution, the next step is to develop training. The goal of the initial hotspot training session is to explain the hotspot so that all parties understand what the problem is, why it is important to avoid the problem, and the costs and problems that come out of the hotspot issue. For field crews, this can be done in the field on jobsites with workers as an efficient training approach that causes minimal interruption to the work. Many companies find it effective to deliver their field hotspots during their toolbox safety talks. Hotspot training for field crews can also be delivered in the office or yard as part of another meeting or when crews have a separate reason to be at

the office/yard. Hotspots that target office personnel or fabrication or supply yard workers can be delivered in the yard or office in conjunction with a safety talk or other meeting as is convenient and efficient for each company.

Hotspot Training Sheets

One important piece of the hotspot training is the development of a training sheet describing the hotspot and the solution. An effective hotspot training sheet should be relevant, focused on a specific issue, and should use graphics rather than language to communicate the message. A hotspot training sheet should target one specific problem, outline the primary cause of that problem, and depict the solution.

For example, a roofer's hotspot was torn felt. After some discussion, it was determined that there were three likely causes of the torn felt: 1) the roofers were stepping in the valleys, 2) the roofers were not lapping the felt properly, and 3) the roofers were not pressing the felt into the valleys. Rather than train the installers on all three possible causes of this issue, the roofer determined that the most important cause was improper lapping of the felt. The roofer reasoned that if the felt were lapped properly, that it would not matter much if workers stepped in the valleys or if the workers did not press the felt into the valleys, because the properly lapped felt would not likely tear. The roofer then just trained his installers on the one most important cause of his torn felt issue. If the issue were still not resolved after the roofer addressed what he thought to be the leading cause, then he would train his installers on the next most important cause, until the problem were essentially eliminated.

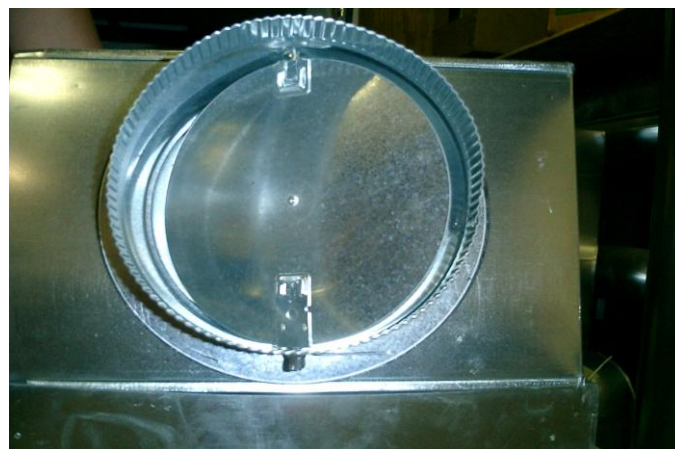
Using this information from the hotspot process, the next step is developing the training sheet to graphically depict the issue, the likely primary cause, and the proposed solution. An example hotspot sheet is shown in Figure 1. The example includes steps/suggestions for creating the hotspot training sheet. Figure 2 depicts a complementary effort to developing the hotspot training sheet – the sign-in sheet for the training to document the date and attendees of the training.



**Quality Assurance Program
Monthly Hot Spot 8/09**

Mechanical dampers are to be installed on all supply-air duct lines off the plenum.

Right



- 1) Use two identical pictures except for the issue being highlighted
- 2) Use symbols, NOT words to identify the right and wrong method
- 3) If you use any text, include it in both English and a second language as appropriate
- 4) Use arrows to focus attention directly on the issue being addressed

5) Only address one issue per training sheet

Wrong



6) Choose training topics by analyzing the frequency and importance of problems from documented inspections or other data

7) Use clear photographs drawings that are easy to understand without reading any text

Figure 1. Example of HVAC Installer's Hotspot Sheet

Training Instructions:

1. All crew members and all crew leaders must attend session.
2. Lead man explains the problem and the proposed solution.
3. Everyone examines both pictures and all notes.
4. Lead man answers any questions.
5. All crew members and crew leaders sign below.
6. Lead man signs and dates bottom of page.

TIME MEETING STARTED: _____ a.m./p.m. _____

ATTENDEES:

_____(PRINT NAME)_____ _____(SIGNATURE)_____

_____	_____
_____	_____
_____	_____
_____	_____

Figure 2. Hotspot Training Sign-in Documentation

Implement Hotspot Training & Solution

Following the development of the hotspot documentation and the hotspot training sheets, the next step is implementing the training itself. In order to maximize effectiveness of the hotspot training it is helpful to limit the training topic and the amount of time for the training. A typical hotspot training session should only last 5-10 minutes. During the training, make sure to cover the primary elements of a hotspot training session: what the problem is, why it is important, and the solution for the issue.

It is very important when delivering a hotspot training that the solution being trained actually addresses the root cause of the hotspot so that workers are empowered by the training to succeed in eliminating the hotspot. There are, of course, some hotspots whose root cause is simply to focus more carefully on a particular aspect of the work in order to achieve the desired outcome. However, always be sure to provide solutions to root causes of hotspots where possible.

Components of a Hotspot Training Session

There are six components to a hotspot training session including the following:

1. Summarize the results of the last hotspot that was trained. Use data as much as possible, such as the number of return trips or reworks that were reduced compared to the previous month. Whenever possible, define how much savings can be attributed to the hotspot improvement. If customer satisfaction has been affected, discuss that as well.
2. If a builder has achieved the desired results from implementing the hotspot, recognize the contributions of those who have helped the company improve in this area. Celebrate the successes with the participants. Sincere recognition and the expression of appreciation for a job well done can be a very effective means of reinforcing good results and new good habits
3. Explain exactly what the new problem (hotspot) is.
4. Discuss the impacts of this high-priority recurring issue. Discuss this in terms of number of return visits, estimated cost, or impact on customer satisfaction.

Hotspot Training Tips:

Hotspot training should be given to all crews or individuals who perform the task highlighted by the hotspot.

Hotspot training should *NOT* be targeted just to the problem crew(s) or individual(s), rather its implementation should be universal.

Done this way, hotspot training enables a company to eliminate specific challenges from all of their projects in a proactive manner, rather than by addressing them as they arise on a crew by crew or worker by worker basis.

This approach also builds on the culture of quality within the company, since the problem being addressed is not being blamed on specific workers, but is targeted to the entire operation.

Using this approach, the company has identified a quality challenge to eliminate, and it is everyone's responsibility to contribute to the elimination of that particular problem.

5. Discuss the cause of the recurring hotspot issue.
6. Explain exactly what workers need to do differently to solve the problem.

Solution Implementation

Following the training, the hotspot itself needs to be implemented. To this end, there are ways to continue to reinforce the initial hotspot training session and to encourage success. Three methods include:

1. The crew leader begins each and every day by reviewing the hotspot with the crew. This is not the full hotspot training, just a reminder about what to do or not to do. This keeps the current hotspot issue at the forefront of the minds of the crew.
2. Post a display showing the hotspot issue and its solution, for example, a photo of the correct and incorrect way of installation. This display of the hotspot should be in a place where it will be seen frequently by those to whom it is directed. A loading issue, for example, would be clearly posted on the loading area so that every time workers are loading they would likely see the hotspot and be reminded of proper procedures.
3. Include a specific hotspot item on the inspection form (delivery, fabrication, installation, etc) and require that it be verified on EVERY SINGLE job. Even better, include the right way/wrong way pictures on the inspection form so that there is a visual reminder for individual filling out the inspection form.

In many situations the broad-scale implementation of the solution will directly follow the hotspot training. However, there are also methods of implementing the solution incrementally to ensure that it works. One successful method is to conduct a trial run or pilot on a house or series of houses to test the new solution or process to ensure it works. Following this the solution would then be implemented on a broad scale.

Tracking & Monitoring Hotspot

The final step of the hotspot process is to track and monitor implemented hotspots. In order to be effective, hotspot compliance must be tracked on a regular basis by management and the results must be reported back to the crews so the crews know that management knows exactly how well each crew is performing related to that particular hotspot. Tracking data can be tabulated on a weekly or monthly basis with results posted in a public place for everyone to see. Table 1 (shown below) is an example of a simple spreadsheet hotspot/inspection log that a company can use to track and evaluate inspection results including the hotspot. Some companies may have more sophisticated databases from which they can print useful reports; other companies may use a simple hand-written list. What is important is that a company monitors and tracks its performance using whatever technology that company deems appropriate.

Table 1. Spreadsheet to Track Construction Callbacks by Issue and Location

HOTSPOT/INSPECTION LOG													
Builder/Lot	Numbered Inspection Items from the Job Complete Inspection Forms												
	Hotspot Item	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12
Smith Building			2										
Elders 23			1						1	2			
Elders 24	1											1	
Elders 25			1			1							
Elders 26													
The Meadows 12													
The Meadows 13													
The Meadows 14	1									1			
The Meadows 15													
The Meadows 16			1										
The Meadows 17						1							
R&R Custom Homes													
1002 Peaceful Way		1		1									1
1004 Peaceful Way			1							1			
1006 Peaceful Way	1							1					
1008 Peaceful Way			1										
Total	3	1	5	1	0	1	0	1	1	4	0	2	0

What to Do When the Hotspot Continues To Be a Problem?

If after tracking hotspot results for a month the problem remains, either the cause addressed was not the right one or not the only one, or the training process was ineffective. At this point, it is time to evaluate and determine whether it is necessary to address a different cause or retrain on the same cause more effectively, and proceed through the hotspot process accordingly.

If the hotspot is ineffective, perhaps the training message was unclear or ineffectively delivered such that the workers being trained did not understand. Or, consider that there may have been breakdowns in the inspection process such that accountability was not created for those individuals responsible for changing their practices and eliminating the hotspot. Always continue to work through the hotspot process until the hotspot occurrence is reduced to an acceptable level. For most builders, reducing a known recurring problem by 50% or more may seem like success, but for the hotspot process to work best, it is recommended that the threshold be significantly higher, more on the order of 80%-90%. Each builder must evaluate what threshold is appropriate for each type of hotspot, but management should be careful not to dwell on a single hotspot for several months just because the problem has not been completely eliminated in 100% of the time. The Hotspot Activities Schedule in Table 2 allows a company to monitor all of its activities associated with the hotspot and to retain a record of the hotspots addressed and the company's success in addressing them.

Table 2. Schedule of Hotspot Activities

Date	Hotspot Description	Reported By	Cause	Training / Other Planned Action	Follow-up	Date	Hotspot Results	Date Closed
1/5/2010	Ducts not sealed properly at air handler	Inspection Sheet analysis	Not pre-attaching the ductwork prior to setting the air handler	Train installers to attach and seal the ductwork to the boiler prior to setting the air handler	None	2/5/2010	Only one duct sealing problems on inspection forms	2/5/2010
2/6/2010	Missed sealing of some HVAC building envelope penetrations	Inspection Sheet analysis	Penetrations not sealed as made, some are missed when doing all sealings at the end of the job	Train installers to seal each penetration immediately after making the penetration, not at the end of the job.	None	3/5/2010	Better than 90% of the jobs have all penetrations sealed properly	3/5/2010
3/4/2010	Poorly sealed ducts at any connection point	Feedback from builder	Not using sufficient mastic to seal the ducts	Train installers to completely cover seams with mastic	None	4/5/2010	Better than 90% of the jobs have all ducts sealed properly	4/5/2010

9 Recommendations to Effectively Address Hotspots

Finally, based on the process outlined in this report and the experience of Home Innovation through the National Housing Quality program, there are some recommendations to increase success in effectively addressing hotspots. These nine recommendations include:

1. *Picking hotspots that are within the direct control of the company* – Picking hotspots that are within the direct sphere of influence of the company itself, (at least initially while establishing a culture of quality and a successful hotspot program), is important. A company should initially focus inwardly and become the best possible company it can before attempting to create change in other partner companies. This is because a company will have much greater credibility and success in addressing external problems in other companies only after it has established itself as a quality-oriented company.
2. *Prioritizing the hotspot selection process so important hotspots are addressed* – Addressing important issues will result in momentum for quality improvement and the quality efforts because successes will be, by design, important. This will also help a builder address one topic at a time and focus to address on hotspot before trying to improve another.
3. *Asking workers to correct a problem by addressing the underlying root cause to achieve the desired results* – It is the job of management to provide solutions for workers that addresses the underlying root cause of the issue. As a result, it is the role of management to provide the information, tools, and/or resources for workers to intentionally make an adjustment to address the root cause of the hotspot.
4. Developing effective training sheets/tools
 - a. *Use pictures* – Pictures allow passive learning and re-enforcement of the intended lesson to occur. The goal is that using pictures an individual can understand the message without having to extensively study sheet. In addition, a passerby can passively understand the hotspot from casually glancing at a paragraph explaining a construction concept. Hotspot training sheets that do not utilize pictures creates a language barrier for anyone who does not read English (or the language the training sheet is written in).
 - b. *Using photographs of good quality* – This is obvious: a good quality photograph or detail increases the effectiveness of the hotspot training.
 - c. *Show both the right and the wrong way with pictures* – Showing both right and wrong methods and clearly identifying right versus wrong makes it easier to understand the message.
 - d. *Use two identical pictures except for the specific item that is the hotspot* – As with showing the right and wrong way with pictures, this makes the message easier to grasp because it is not necessary to study the pictures to look for the issue at hand.

- e. *Show only one mistake in pictures* – This upholds the basic premise of a hotspot to clearly focus on one problem at a time.
 - f. *Address the root cause of what needs to be done* – Of course, the intent of a hotspot training sheet is to address the actual or root cause, so it will be effective in eliminating the issue.
5. *Train all of the workers who touch the hotspot* – Train all workers who may potentially make the mistake that is the hotspot, because the hotspot process is intended to focus on those individuals who have made the mistake, as well as to teach anyone who might make the mistake in the future the correct way to do the concept being trained in the hotspot. This also brings accountability to all of the workers since everyone receives the training and is expected to do that particular hotspot item correctly in the future.
 6. *Inspect every job for addressing the hotspot correctly* – The success of addressing the hotspot is increased when workers are accountable and know that every job is inspected to ensure that the hotspot is correctly addressed. In addition, inspecting for proper hotspot execution will significantly increase the effectiveness in eliminating the problem
 7. *Monitoring and tracking/evaluating the results of the hotspot and sharing those results with the entire company* – Tracking and monitoring provide accountability because in the eyes of workers, it matters. In addition, tracking and monitoring allows the builder to determine if the issue has been successfully eliminated.
 8. *Implementing the suggested practices so that adjustments can be made to customize the approach to best fit a company's existing procedures and culture* – It is helpful to recognize that they sometimes the hotspot process must be customized to the culture and existing practices of a company in order to be implemented effectively and efficiently.
 9. *Effectively communicating the importance of continuous improvement and the hotspot* – If the hotspot process and quality improvement are not obviously important to management as demonstrated by management's commitment and passion for quality improvement, it will not be important to workers. This is where senior management must clearly demonstrate a commitment to the principles of continuous improvement and quality management in general. Often this is best exemplified by recognizing the success in addressing a hotspot.

Summary

To consistently deliver production scale new high performance homes, quality management is needed. Since prevention is the ultimate goal, one focus of quality management is how to handle problems that do occur by addressing their root causes to prevent their recurrence. A hotspot is a recurring problem or potential problem that a building company chooses to target for elimination or prevention. This is of particular importance in high performance homes because the home must work as a system to achieve the desired energy performance without issues such as durability, moisture, indoor air quality, comfort, etc.

A hotspot is often found by reviewing data such as warranty data or customer complaints. Following this, the identified hotspots then need to be prioritized. Then the cause of the issue needs to be determined to create a solution. Next, the solution needs to be communicated, implemented, and then monitored for impact. By eliminating hotspots, costs can be reduced, profits increased, and customer satisfaction improved, and ultimately the company is made stronger and more sustainable.

The hotspot process is a quality management tool that was developed under the NHQ Certified Trade Contractor Program to support quality efforts to prioritize and greatly reduce recurring problems. The intent of the Hotspot Implementation Guide and Tools is to provide a resource for builders and their trade contractors that allow them to take on a very important element of a quality management system and to reap its benefits almost immediately. In addition, the Hotspot Implementation Guide and Tools is a self-contained quality management process and is not dependant on having a formal quality management system in place. Therefore, it can be used by high performance home builders as an incremental step to a formal quality management system.

Next Steps

The next step for hotspots for high performance home builders include working with a builder specifically through the hotspot process as a specific case study. This will serve as an example of the hotspot process and reducing recurring issues.

