QUALITY BUILT

The Next Generation of Quality Assurance®

# Substantial and Measureable Benefits:
## Integrating Trade Contractors into the Quality Assurance Process

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Between 1994 and 2012, Quality Built (QB) reported anomalies found during Quality Assurance (QA) inspections (designated by QB as "Open Items") directly to the superintendents. Until 2008, the most sophisticated process took the form of a report printed at construction sites and handed to superintendents. Superintendents were then responsible for distributing the information listed in the reports to the applicable trade partners. Some superintendents communicated to their trades by copying and distributing Open Items lists, others hung them in the trailer, or tacked the Open Item lists up in a designated spot within each unit. Many simply made phone calls to the trades informing them of the deficiencies. These practices still remain the standard operating procedure for many builders today.

In 2008 Quality Built's platform had evolved to allow direct communication to the trade partners. Each Checkpoint was linked to the trade responsible and each trade was registered in the system linking the trade company to the designated individual to oversee their work. Ever since then there has been an on-going debate as to whether communicating Open Items to the trades would improve quality or hinder construction.

After reviewing our most recent data we have concluded that there are compelling reasons to integrate the trades into the QA process. Integrating the trades creates efficiencies for the superintendents, auditable records of communication creating transparency and accountability and provides the ability to conduct targeted training based on each trade's performance on a specific project rather than industry trends.

## What does integration of trades into the QA process mean?

Integration of trades into the QA process means that each quality Checkpoint is connected to the trade partner responsible for the standard contained within the Checkpoint. Quality Built Account Coordinators then work with each trade to enroll a designated point-of-contact person to receive direct communication regarding Open Items. This person will be responsible for directing his/her crews to correct anomalies identified in their work and documenting the correction online or using their smart phone mobile devices. Trades may enroll multiple people to receive reports and weekly updates in addition to the primary designee.

The integration of the trades does not remove superintendents from the process, nor does it prevent a superintendent from verifying corrections; it simply automates the communication. Superintendents receive notifications of Open Items at the end of each inspection and receive weekly QA reports showing the count and aging of all Open Items. Additionally, superintendents are notified immediately via email when a trade contractor indicates he/she has corrected an item. Ideally, the trade contractor will also submit a photograph showing the corrected item. Upon receipt of this email, superintendents can re-inspect the trade's work.

## Sampling Size

*The data used to form the opinions within this paper spans over 6 years, 2,000 projects and 38,467 modules (units/homes). However, between 2008 and September 2012, only partial integration of trades was available.[1] Full integration is defined as the trades having the ability to both receive Open Item notifications and to close them. Partial integration is defined as the trades having the ability to receive Open Item notifications but not the ability to close them. Closure is instead performed by either the builder or through re-inspections by Quality Built Field Consultants. In 2008, only 4 projects (24 total units) out of 1,790 active projects (33,301 total units) integrated the trades directly into the QA process.*

| BUILDER LINK INSPECTIONS | | |
|---|---|---|
| PROJECTS | MODULES | YEAR |
| 4 | 24 | 2008 |
| 27 | 327 | 2009 |
| 64 | 1,291 | 2010 |
| 83 | 1,414 | 2011 |
| 257 | 4,623 | 2012 |
| 422 | 10,316 | 2013 |
| 827 | 18,472 | 2014 |
| 571 | 5,655 | 2015 |

| TOTAL INSPECTIONS | | |
|---|---|---|
| PROJECTS | MODULES/ UNITS | YEAR |
| 1,790 | 33301 | 2008 |
| 819 | 15,077 | 2009 |
| 485 | 7,526 | 2010 |
| 324 | 5,708 | 2011 |
| 451 | 7,522 | 2012 |
| 747 | 16,687 | 2013 |
| 1,073 | 22,998 | 2014 |
| 681 | 6,757 | 2015 |

## Reduced Cycle Time for Closure of Open Items

Projects with integrated trades have significantly shorter cycle times for documenting the closure of Open Items. Cycle time is the amount of time which passes between the reporting of an Open Item until the time it is designated as corrected in the Quality Built® Information Network (QBIN). When we studied the various methods of closure, we found some interesting trends.

For projects without any integration of trades between 2000 and 2010, the average cycle time for closing Open Items was 46 days. This number may seem alarming to many, but the primary cause for delay was "batching". Superintendents universally developed a process of collecting the paper Open Item lists distributed back from the trade contractors and would pile them on their desks until they had enough that they felt it was productive to go into the QBIN and sign them off. It is not uncommon to find a project lasting 2 years in construction with only 8 to 10 dates of signing off. The detailed documentation was the sign off sheets which were often scanned and saved for future use, but which were completely unsearchable and robbed builders of valuable data.

With partial integration of the trades we saw an immediate improvement in the cycle time, but not as significant as we had hoped. If we isolate the projects from 2008 through 2012 (remember, these have the Open Items reported to the trades but are still being closed out of the system by superintendents) the cycle time drops from 46 days to 31 days.

However, with full integration of the trades we saw the drop to be even greater than we expected. The cycle time dropped from an average of 31 days to 11 days. When looking at an individual project where the builder drives cycle time we see averages of 1 to 2 days. We hope to see the cycle times across all projects drop to 1 to 2 day averages and believe it is possible as more and more of the trades become more comfortable with technology and are driven by the data to promote continual process improvement in their own organizations.

1 Distinction between data derived from partial integration and full integration will be made clear when relevant.

## Time Efficiencies

Much of the data we have on the time efficiencies created by integrating the trades into the QA process comes from estimates given to us by the superintendents. When asked if using technology to communicate Open Items to the trades saved time, 7 out of 10 superintendents replied, "Yes." When asked how much time was saved per inspection the average answer was 20 minutes per inspection. This may not sound like a significant amount of time, but when multiplied by 3 inspections per home for just 50 homes, the time savings amounted to 50 hours.

For larger, more complex projects which have more inspections and typically more trades to communicate with, the time saved averaged over 300 hours. (Based on a project with 250+ units and inspections from below grade through drywall.) We believe the time savings is much more significant but see no need to argue when there are so many other less subjective benefits to present.

## Reduction in the Number of Open Items/ Emergence of Targeted Training Tools[2]

Quality Built, LLC released the Trade's Quality Performance Review Report to builder clients in late 2012. The report was intended to help the superintendents identify the trades which needed more support and training as they ramped up for more production. Many builders incorporated the report into their weekly or monthly trade meetings. It is interesting that it was at the request of a trade contractor we began sending the reports directly to the trades for their scopes of work.

The Trade's Quality Performance Review Report provides detailed information regarding the work performed by each trade and their specific scopes of work. The report details each Checkpoint answered which pertains to the trade; the number of times each Checkpoint was identified as Acceptable and the number of times that the Checkpoint was identified as Unacceptable and is weighted by a Risk Factor. The higher the risk of causing either structural failure, allowing water intrusion into a building or creating a life-safety situation the fewer times a trade can get it wrong before their performance rating is impacted. Performance Ratings of 1 to 3 are considered failing and require immediate improvement. You can see in ***Figure A*** (next page) that these items show in red. Performance Ratings of 4 to 7 are considered average and 8 to 10 is considered above average. Reviewing this report only 1 time per month and providing QA counseling to the trades had a very impressive return on investment. **On average, project superintendents that utilized the data in the report on a regular basis showed a 75% reduction in the number of Open Items tagged within 90 days!**

[2] The sampling size for this section is 212 projects totaling just over 2,000 units. All of the projects which provided this data had to have started construction after September 1, 2012 and completed the project by December 31, 2014. These projects were isolated because our more general data analysis clearly shows that the high quality of construction enjoyed during the recession began to decline after the experienced tradesmen began to leave the field and return to rebuilding their businesses. Builders and trade contractors alike were suddenly faced with a shortage in experienced site supervisors and skilled laborers. Most educational programs folded up during the recession and margins were still thin enough that employers still did not have an appreciable amount of money to spend on training. Reports are an obvious by-product of data collection. However the potential effect the data has on promoting continual process improvement will vary with the commitment of the recipients and the sustainability of the effort; in other words the return on investment.

*Figure A.*

| Trade Company: Total Lath and Plastering<br>Trade Assignment: Lathing/Plastering<br>Performance Rating: 6.0 | | | | |
|---|---|---|---|---|
| **Checkpoint Standard** | **Risk Factor** | **Acceptable Count** | **Unacceptable Count** | **Performance Rating** |
| Expanded metal lath is installed at corners or all exterior openings where required per plan and project documents. | Durability | 14 | 12 | 2 |
| Unsupported staple legs and fasteners are clipped/removed and then fully sealed at the weather resistive barrier. | Durability | 9 | 6 | 2 |
| All holes, tears and other penetrations in the weather resistive barrier are sealed prior to scratch coat application. | Durability | 9 | 5 | 3 |
| Exterior window/doors and penetrations are sealed per plan and manufacturer's documentation. | Durability | 11 | 8 | 3 |
| Lath wire does not touch copper pipes or aluminum components. | Major | 8 | 3 | 4 |
| Lath is secured to framing or backing. | Durability | 7 | 2 | 6 |
| Quick Flash panels are integrated into weather resistive barrier in a weatherboard fashion. | Durability | 7 | 1 | 7 |
| Foam board joints are taped per plan and manufacturer's specifications. | Durability | 11 | 1 | 8 |
| Exterior lath covers and terminates over the attachment flange or the weep screed. | Major | 9 | 0 | 10 |

For projects that did not have a formal process for reviewing the data with the trades but the trades received the monthly report, the results varied greatly indicating that some trade partners adopted a similar approach to utilizing the data to perform targeted training. Those trades saw similar improvement. Other trades ignored the data and showed little to no improvement throughout the project but did document the correction of each Open Item.

## Reduced Change Orders

Besides providing a sustainable way to promote continual process improvement and measure quality of construction, we have discovered that full integration of trade contractors into the QA process can also reduce change orders.

As a part of the integration process, trade contractors were given the opportunity to review the QA Checkpoints for each project in advance of construction. The designated responsible representative for each trade was asked to review the proposed Checkpoints and to verify two things:

1. Each of the Checkpoints assigned to them is included in their scope of work. If the item is not included in their scope of work, then they are to report it in writing to the builder immediately.

2. The trade contractor agrees to the standards contained within the Checkpoints. If they do not agree to the standards then they are to report it in writing to the builder immediately.

This simple review process has brought many issues to light early on in construction and allowed for resolutions to be determined prior to causing delays. Only two contractors were willing to give us an estimate of savings through reduced change orders. One indicated there were 10% fewer change orders on the project with the Quality Built QA program with integrated trade contractors and the other only estimated it at 4%. We hope to obtain more data on this benefit over the coming years.

## Insure Risk / Mitigate / Transfer Risk

There are three common risk management strategies in construction: 1) purchase insurance to cover potential risk. We all buy insurance but insurance companies want to ensure that their customers also adopt the other two strategies 2) mitigate risk and 3) transfer risk. Ways to mitigate risk on construction sites include certain management practices, comprehensive reviews of construction documents and, yes, quality assurance inspections during the course of construction. When a project is covered with a wrap insurance policy the most important strategy becomes risk mitigation and that is why most insurance carriers will mandate some level of third-party QA.

Risk Transfer is a critical component for builders or projects covered by traditional liability policies. By integrating the trades into your quality assurance process, and using technology to track the identification of unacceptable items, the communication of those items to the trade partner's identified responsible party, and further documenting the trade's verification that each item was corrected, you have created an auditable risk transfer tool.

## Trade Acceptance?

The primary concern of builders has been that trade contractors will push back if asked to sign off Open Items. Quality Built has found that trade acceptance ranges from embracing the concept down to tolerating it.

From our experience in training hundreds of trade contractors across the United States, we have identified the following actions that help in a more successful launch of the QA process at the trade level:

- Training should be provided in person. The objectives of the program (improve quality and reduce cycle time) are explained and the process is fully demonstrated.

- Technical Support must be readily available if a trade has questions. Contact information is distributed.

- The direct benefits to the trade contractor are clearly presented.

## Benefits to the Trade Contractors

There are many benefits to trade contractors including a reduction in rework or pick-up work which results in larger profits for the company. Fewer claims and proof of consistent quality will also result in lower insurance rates. Trade Performance Scores can also be used for marketing. Data can be monitored to ensure consistency of work on all projects. Liability is limited to the trade's scope of work which is documented down to the unit.

## What is the Next Generation of QA?

Once again, the answer came unexpectedly from the trades themselves. Mr. Rick Wylie is the President of the Beutler Corporation (now Villara Corporation) in Sacramento, CA. Mr. Wylie serves as the committee lead at the local BIA office, as part of their Trade Builder's Alliance Council. Last year Mr. Wylie sent this email to Quality Built:

> *"Integrating trade contractors into quality assurance programs provides immediate, measurable benefits to both the builder and trade contractors."*

*"I lead a committee of the local BIA office, as part of their Trade Builder's Alliance Council. Our committee is called "The Redevelopment Committee", and our goal is to help rebuild the infrastructure of our industry following "The Great Recession" that so decimated our companies. Our first major project is the "Quality by Craftsmen" Quality Management Program."*

Quality by Craftsmen is a program to promote quality assurance inspections down to the trade level, embracing transparency and accountability. The Quality by Craftsmen program is based on the belief that each trade contractor should be able to make the following statement pertaining to their work:

*"I affirm that I have reviewed the work related to the specific phase of my trade, and that our installation complies with all code and contract specifications, and is of the highest quality."*

Quality Built, LLC has proudly partnered with Villara and the Trade Builder's Alliance Council to bring technology down to the trade level. Villara and a few other trades have already begun a pilot program in conjunction with several of the top builders in Northern California to perform "hot spot" or quality assurance inspections. With their feedback and support, Quality Built is currently releasing an iPad app and will soon be releasing a smartphone mobile app that not only allows for data collection, but will further integrate the trades into the job-ready, job-complete process. The smartphone mobile app will make the technology affordable and we expect many more trades will then join the program.

## Conclusion

Integrating trade contractors into quality assurance programs provides immediate, measurable benefits to both the builder and trade contractors. It creates a sustainable platform for achieving continual process improvement and promoting transparency and accountability. With the analysis of over 6 years of data on more than 2,000 projects, the simple conclusion was very easy to reach: There is no known downside to integrating trades into the QA process and an awful lot of upside for builders and trade contractors.


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