

Green Building for Small Residential Contractors
“Perspectives of the EarthCraft House program from residential homebuilders”

Taylor S. Neal*

Master of Science
Department of Building Construction
Myers-Lawson School of Construction
Virginia Polytechnic Institute & State University

Committee:
Dr. Annie R. Pearce
Dr. Christine M. Fiori
Dr. Kihong Ku

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* Graduate Student, Myers-Lawson School of Construction, Department of Building Construction, Virginia Tech. E-mail: nealt@vt.edu

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Executive Summary

The EarthCraft House program in the Commonwealth of Virginia has been established for nearly five years. Contractors who engage in the construction of EarthCraft homes are taking part in the expansion of a green building industry that has grown significantly in recent years. The implementation of future green building is rapidly becoming a more mainstream facet, as contractors become formally certified in green building programs, including that of EarthCraft. Virginia's EarthCraft contractors are doing their part to promote the design and construction of homes that are healthy, energy efficient, and reduce the physical impact on the local environment. This study observes the perspectives of five (5) Virginia contractors, who engage in various levels of EarthCraft House projects, as well as the perspectives of two (2) traditional Virginia contractors, who are not certified in the EarthCraft program, but have begun incorporating green building practices into their own company structures. Questions are asked of each participating contractor relating to its initial discovery of EarthCraft, methods used for education of the program and training utilized within the company, advantages and disadvantages of affiliation, and finally, marketing techniques used to advertise the company's EarthCraft services. Potential benefits of this research include the future certification of EarthCraft-interested homebuilders and the promotion and growth of the green homebuilding sector.

Introduction

The expansion and adoption of green building programs throughout the country is a necessary and inevitable change that residential contractors will undoubtedly face if they wish to remain successful within the residential housing sector. The era during which national green building certification programs did not exist (Teague 2009) is coming to an end. With the aspect of green building programs in mind, the aim of this research is to explore the expansion and utilization of the Atlanta-based green homebuilding program known as EarthCraft (EarthCraft.org), as it relates to and is developed within small residential homebuilding companies, more specifically within the Commonwealth of Virginia.

It is important to understand the factors that cause companies to look into green building programs such as EarthCraft. Under the current condition of the economy, it is the opinion of the researcher that any option to “go green” may initially be seen as an expense that small homebuilders are simply not able to afford due to insufficient company resources. However, there are other elements that contribute to the value of a program such as EarthCraft and an accurate understanding of these elements is necessary for successful growth of green homebuilding. Through a study of contractor adoption and utilization methods of EarthCraft, including program discovery, education and training, affiliation benefits, and marketability of the program, an informed perspective can thus be made as companies and organizations look to develop and differentiate themselves in the future. Growth in the residential sector has been slow (Sawhney, Mund, and Syal 2002), and perhaps for that reason it is important for small residential contractors to learn a new approach to the business that very may well separate them from the competition.

Based on a surveyed population of EarthCraft Virginia contractors that meet the researcher’s definition of small residential homebuilders, first-hand knowledge and perspective has been gained of the aforementioned aspects of the EarthCraft program. For the purposes of this study, “small-sized” is defined as companies of twelve (12) employees or less who engage in up to fifteen (15) projects per calendar year. Responses generated from each contractor have been compared and analyzed to make both specific and general assumptions as to the direction in

which the EarthCraft Virginia program is moving. Such information may allow future-interested contractors the ability to determine how their company or organization might become involved in this green building program. This study does not provide a method or process by which such contractors may become EarthCraft certified; however, it is the hope that such data may be used by interested parties to determine their company's EarthCraft program.

Background/Literature Review

For many potential homeowners, the motivation and desire to live in a house designed with efficiency and sustainability are forefront ideals that are met with the issue of finding a qualified contractor to take on the project, and can do so within a reasonable budget. In the last decade, building green has become more economical and more mainstream (Teague 2009), but the problem still remains in locating homebuilders that have the capacity to engage in such green projects. In the building industry, many contractors are claiming to be green (Groom 2008). The inherent problem associated with this fact is that unless homeowners take the time to carefully research particular green building programs and local contractors who claim to be “green”, it remains the word of the contractor that he or she is in fact a “green” builder.

What is EarthCraft?

The EarthCraft program is new to the Commonwealth of Virginia as it was established in 2005 (EarthCraftVirginia.org). The program was first conceived in 1999 between the Greater Atlanta Homebuilders Association and Southface Energy Institute (EarthCraftVirginia.org). The basis of the program serves as a “blueprint for healthy, comfortable homes that reduce utility bills and protect the environment” (EarthCraftVirginia.org). Contractors interested in obtaining certification must complete the EarthCraft House™ Application and submit it along with a check for \$150 to the Greater Atlanta Homebuilders Association. Contractors must also attend a day-long training session. Only after completion of their first EarthCraft home will they then receive their formal EarthCraft certification.

EarthCraft House guidelines offer builders more flexibility in achieving optimal energy and environmental performance during the construction of an EarthCraft home. In addition to meeting the requirements of ENERGY STAR certification criteria, EarthCraft homes must earn passing scores from diagnostic tests for air filtration and duct leakage. EarthCraft Virginia has created its own handbook that lists and outlines various pre-construction and construction procedures required throughout the duration of an EarthCraft project. Such guidelines include Site Planning, Energy Efficient Building Envelope and Systems, Resource Efficient Design, Resource Efficient Building Materials, Waste Management, Indoor Air Quality, Water Conservation (Indoor & Outdoor), Homeowner Education, Builder Operations, and Bonus/Innovation points. Based upon each of these factors, EarthCraft raters assign points to individual projects which in-turn is used to calculate a home's rating. To meet EarthCraft certification requirements, an EarthCraft home must earn a minimum of 150 points on the EarthCraft scoring sheet. Point totals that exceed the minimum requirements have the opportunity to receive "Select" and "Premium" status ratings.

The 2007 Process for Certifying EarthCraft Houses lists four requirements that a builder must complete. These requirements include:

1. Choose how to achieve ENERGY STAR
2. Submit House Plan, Load Calculation and ARI certificate
3. Schedule Pre-sheetrock Inspection
4. Schedule Final Inspection

The EarthCraft website (www.EarthCraft.org) provides details on all information relating to the aforementioned requirements, as well as resources a builder might use to aid in the certification process of new EarthCraft homes.

Why Engage in an EarthCraft Project?

The aspects of sustainable building and green construction have grown much more significantly in the most recent decade. Growth of green construction is now being seen in other areas including that of commercial and residential real estate (Nalewaik and Venters 2008). Real estate agents and developers are becoming affiliated with green building within all sectors of construction. In the next two years, according to a survey released by McGraw-Hill Construction and the National Association of Homebuilders, it is projected that green contractors have the potential to capture nearly 10% of new home construction. This 10% represents a staggering \$38 billion, a number that in 2007 barely totaled \$8 billion (McGee 2007). A similar study conducted by McGraw-Hill Construction for the US Green Building Council estimates that in the next five years, 10-12% of all new homes will have had green building practices incorporated into their construction (Teague 2009). The road for homeowners to actually implement these “green” features into their current homes or future projects rests on the capabilities of the contractors available to perform the work. Traditional methods of construction have been found to create a greater impact on the environment as problems such as site disturbance, abundance of waste, and overuse of natural resources are issues that must be changed in order for green construction to be successful (Nalewaik and Venters 2008). Residential homebuilders who are eager, willing, and able to learn a new way of building homes can significantly benefit from implementing the EarthCraft House program within their company in a number of ways. For example, homes demonstrating 50% improvement over code for heating and cooling are eligible for a \$2000 Federal Tax Credit (EarthCraftVirginia.org). Other benefits might include increased customer traffic as a result of becoming known as a contractor who builds quality, efficient homes.

Growth of the Residential Construction Industry

In 2003, the United States construction industry had reached spending levels of \$505 billion and accounted for nearly 5% of the nation’s Gross Domestic Product (GDP) (O’Neal and Berning 2004). Within the residential housing market, including that of single and multifamily homes, the industry accounts for \$249 billion, or 37.9% of the construction industry private sector (United States Census Bureau 2009b). A significant portion of the residential housing industry is

dedicated to building new, single family homes. That portion creates nearly 2.6 times more value than the new multi-family home industry. With that being said, it appears the majority of the growth in the residential housing market is due to the construction of single family homes (USCB 2009c). The largest U.S. market for single family homes is in the South, where 51% of new, single family home construction occurred in 2008. (USCB 2009c). In the first half of 2008, of new single family home construction, 231,000 spec homes were constructed. Within the same time frame, the residential housing industry saw the construction of 57,000 custom homes (USCB 2009).

Growth of Green Building Programs

In 2007 a study published by the University of Michigan was completed that attempted to identify the demand and key drivers for growth in the residential sector. The project challenge stated that most residential contractors and developers became engaged in green projects without a true sense of consumer demand for green homes. Such a challenge alludes to the need for programs, such as EarthCraft, that offer third party verification of projects. This problem is linked to the fact that homebuyers are not necessarily knowledgeable in this new area of construction, and often rely on the word of the contractor that he or she is capable of building a green home. (Swett et al. 2007). This study insists that the green construction industry is on the verge of becoming a full-scale sector of its own as residential and commercial construction have both begun to undertake green construction projects (Swett et al. 2007). It seems clear that green construction is becoming much more popular across the board; however, there is plenty of room for growth of contractors who wish to undertake projects of this sort.

Comparison of Green Building Programs

Throughout this study, references will be made to various green building programs other than EarthCraft. It is necessary for the reader to have a general understanding of each green building program and an idea of what is required when implementing such programs.

LEED for Homes

The LEED-H program sets basic requirements for homes to be green and then awards points of extra credit for homes that go above and beyond such requirements. Similar to LEED's commercial certification program, LEED-H offers basic LEED certification in addition to Silver, Gold, and Platinum certification ratings. Aspects found on the credit checklist include Home Size Adjuster, Innovative Design Process, Locations and Linkages, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Awareness and Education. Developed by the United States Green Building Council, in January 2009 LEED-H had certified 1,304 houses, with another 13,836 registered for certification (greenbuildingadvisor.com)

National Green Building Standard

This program includes a number of mandatory practices, none of which are worth any points toward certification. Many are in the energy efficiency area and include requirements for caulking or otherwise sealing windows and doors, insulating skylight shafts and kneewalls, using airtight, IC-rated recessed lighting fixtures, and running Manual J calculations. There are three certification levels available, those being Bronze, Silver, and Gold. An additional level within residential housing includes Emerald. These levels of certification address key construction areas including Lot & Site Development, Resource Efficiency, Energy Efficiency, Water Efficiency, Indoor Environmental Quality, and Homeowner Education. Certification is available for most types of residential construction projects (nahbgreen.org).

ENERGY STAR

For projects to earn ENERGY STAR rating, strict guidelines for energy efficiency must be met. These guidelines are set by the United States Environmental Protection Agency. ENERGY STAR homes are at least 15% more efficient than homes which are built to the 2004 International Residential Code (IRC). Such homes are to include additional energy-saving features that serve to improve their efficiency by 20-30% as compared to standard homes. Features that ENERGY STAR utilizes include Effective Insulation, High-Performance Windows, Tight Construction & Ducts, Efficient Heating & Cooling Equipment, Efficient Products, and Third Party Verification. In order to maintain partnership with ENERGY STAR, contractors are required to build at least one

ENERGY STAR home every 12 months. ENERGY STAR homes require the selection of a Home Energy Rater (HERs) who provides the verification of the efficiency of systems within the home (energystar.gov).

Building America

This program is an industry-driven research based initiative that is sponsored by the United States Department of Energy. It serves to accelerate the development of advanced building energy technology in both new and existing homes (www.1.eere.energy.gov). Areas that Building America has designated as program goals include producing homes that consume 40-100% less source energy, integrating onsite power systems, improving indoor air quality, improving builder profitability, and provide new product opportunities to manufacturers and suppliers (www.1.eere.energy.gov). The program claims that as a builder or developer, the construction of homes that are better designed and more energy-efficient will help business through enhanced competitive advantage in the marketplace, cost savings from making the best material and equipment choices, reduced risks, increased productivity, fewer callbacks, and improved building performance.

Research Question

The predicted growth of the green housing market coupled with the expansion of green building programs leads to a need to further understand contractor perspectives on the EarthCraft program in Virginia. The primary focus of this research project is to determine the effect of the EarthCraft Virginia program on residential contractors who have become involved with this green building organization. Areas of exploration include the challenges faced, difficulties overcome, and adjustments made as a result of company affiliation with EarthCraft. How has EarthCraft affected these residential homebuilders and what difficulties or challenges are inherent with the undertaking of such an endeavor? As a method of better-organizing the research data, research has been divided into two segments that will each seek specific information about residential green building. Segment 1 contains data collected from EarthCraft-certified homebuilders. Data within Segment 2 identifies perspectives of green

building and construction from contractors who are not formally involved with the EarthCraft program.

Segment 1: Perspectives of EarthCraft Contractors

The researcher has established four survey objective areas that will offer explanations and first-hand observations regarding the EarthCraft program from contractors formally certified under the EarthCraft name.

Objective 1: Initial Discovery of EarthCraft

The first of these objectives is the Discovery of EarthCraft. For interested companies, it is imperative to understand how and why a residential homebuilder becomes involved in the EarthCraft program. Information and data obtained within this category will specifically explore the methods through which the program was learned of, as well as the reasons why companies chose to engage with the program.

Objective 2: EarthCraft Education & Training

The second objective seeks to learn the aspects of EarthCraft involving company Education and Training of the program and how each is implemented into company structures. If companies are currently practicing green construction within their own organizations, how difficult has the transition been to the guidelines involved with EarthCraft? Will these new guidelines require companies to hold training sessions on a periodic basis or is the program simple enough that initial EarthCraft orientation is all that is needed? Education of customers is another aspect that requires some investigation as it will be important for contractors to teach new homebuyers the specifics of the EarthCraft program.

Objective 3: EarthCraft Affiliation

Thirdly, this research will observe information on contractor Income and Affiliation associated with EarthCraft Projects. Is it financially practical to undertake a program that is relatively new to a residential homebuilding industry that has been around for decades? An accurate understanding of monetary inputs and outputs associated with EarthCraft homes is absolutely necessary. Also, are these costs affordable to homebuyers who are likely feeling the same

effects of the static economy? These questions could very well be the driving factors behind company decisions to become involved with a green building program.

Objective 4: EarthCraft Marketability

The fourth and final objective will study the Marketability of EarthCraft and how contractors are using the program to differentiate themselves from the competition. Is the EarthCraft name and logo a simple method of attracting potential customers, or is it truly a better way to build a home that is energy efficient and results in a lower environmental impact? Companies who participate in this endeavor will be questioned as to what the best methods are of acquiring new business, as well as how to acquire the latest information on industry design and technology.

By obtaining information related to these four areas of the EarthCraft program and the experiences of each within the surveyed pool of residential homebuilders, the researcher will gain a more thorough understanding of how this green building program can be implemented within forward-looking companies.

Segment 2: Perspectives of Non-EarthCraft Contractors

This segment provides a basic understanding of how traditional contractors, who are not formally certified within a green building program, perceive the aspect of green building, and more importantly, what methods of green design and construction they choose to implement.

Questions within Segment 2 primarily focus on the contractor's experience with and implementation of green building techniques and general thoughts on potential plans to become involved with a green program.

Methodology

In an effort to better understand the impact EarthCraft has had on certified homebuilders, it was necessary to acquire first-hand perspectives from contractors certified under the EarthCraft name. In addition, first-hand perspectives from traditional contractors are necessary in order to make observations as to how these traditional contractors may or may not shift

their company direction to become affiliated with a green building program. In order to facilitate accessibility during the research, both sets of contractors were chosen based upon their location within the Commonwealth of Virginia. The researcher chose to investigate and analyze homebuilders from two separate Virginia towns/cities, Fredericksburg and Blacksburg.

Selection of EarthCraft Contractors

The EarthCraft contractors selected to participate within this study were chosen from the *Find a Builder* link on the EarthCraft program website (EarthCraftVirginia.org) based upon their locality. They were then requested via electronic mail to participate in a study that would serve to enlighten the building community on the issue of the EarthCraft Home program. Five (5) EarthCraft contractors agreed to participate in the study. Those who were willing and could afford the time were subjected to personal interviews in which the researcher proposed a series of questions aimed at the specifics of that company's involvement and experiences within the program. The remaining companies that were willing to participate, but could not schedule an interview in the provided timeframe, were asked to respond to a similar series of questions via electronic questionnaire. Questions posed in both the personal interviews as well as the electronic questionnaires were identical. Such questions were designed within the four survey objective areas. It is to be noted that in the opinion of the researcher, the questions posed in this investigation were basic and straightforward, minimizing the potential for the researcher to misinterpret responses acquired via personal interview. Questions were also designed to be free-response questions such that contractors were not limited in any way to the length or specificity of information in each response. Upon receipt of the completed questionnaires and interview responses, the researcher compiled all data into a collection of spreadsheets that was then tabulated and used to easily compare and make assumptions to responses from similar questions. Data that was quantifiable was used to create visual representations that further aided in the comparison of collected information.

Selection of Traditional Contractors

In an effort to discover why traditional homebuilders in Virginia may or may not choose to engage in green building practices, two (2) contractors, who engage in custom-home projects,

were selected to provide information as to their specific involvement with green building techniques and thoughts on potential affiliation with a green building program. These contractors maintain a personal relationship with the researcher and agreed to serve as participants within this study. It was the hope of the researcher to have had a more significant base of traditional contractors, but time constraints prevented further acquisition of such homebuilders. Despite the limited sample of traditional homebuilders, the researcher still felt it necessary and worthwhile to acquire and share responses from the traditional contractor perspective.

Questions asked of the traditional contractors were geared more towards their familiarity with green building techniques as well as personal thoughts on the importance of green building as well as its applicability to their specific company. Information was gained through similar means of electronic survey and personal interviews.

Representativeness of Population Sample

For the purposes of this study, small-sized contractors were selected in an effort to narrow the representation of the survey sample. The residential sector is vast and it would be difficult to accurately portray the entire homebuilding industry without limiting the surveyed population scope. “Small-sized” is a term chosen and established by the researcher to more specifically define the sample of this particular study. Small-sized companies are defined as those employing no more than twelve (12) employees, who engage in up to fifteen (15) projects per calendar year.

Data Collection & Analysis

Responses and recordings of the researcher’s questionnaires and interviews were collected and organized into appropriate summary tables by means of Microsoft Excel. Spreadsheets were created for each of the two segments of the research, including a table for general characteristics regarding both survey populations. In an effort to protect the identity of the survey participants, individual contractor names have not been used, but rather a uniform system of identifying the seven participants as Contractor A, Contractor B, Contractor C, etc.

Data was organized such that the researcher could easily view a particular question along with the appropriate responses given by each contractor. This method allowed the researcher to quickly observe each objective and its associated data, and then make reasoned assumptions based on the responses given by the surveyed population. Objective data has been presented in the order in which it was organized, beginning with information obtained pertaining to the populations' general characteristics. Summary tables of data collected within both research segments can be found in the Appendix.

Findings and Conclusions

The researcher referred to both the summary tables and actual contractor responses throughout the analysis of the collected data. Doing so allowed for the development of reasoned conclusions within both research segments. General Company Characteristics of the survey population will be explained first in order to better describe the population sample.

General Company Characteristics

The researcher found it necessary to obtain information regarding each construction firm relating to the basic generalities of the company itself, not simply regarding the level to which each is involved with the EarthCraft Home program. These basic company characteristics helped the researcher verify the size of the individual companies, the type of construction they are involved with, and the amount of work actually performed versus the amount of work subcontracted out. The survey population contains seven residential construction companies located within the Commonwealth of Virginia. Of those firms surveyed, two (2) serve the Blacksburg locality, while the remaining five (5) are centered on the Fredericksburg area. All companies have been in business from five (5) to twenty-five (25) years. See Table 2 below or in the Appendix for more detailed findings on the surveyed company characteristics.

These general facts about each of the surveyed companies were collected in order for the researcher to provide reasoned conclusions, if necessary, about why certain contractors differed or agreed on questions pertaining to the EarthCraft program. For example, differing responses to various questions might be due to the size of the company or the lack or

abundance of jobs per calendar year. Having such data will provide the researcher with possible suggestions as to why certain aspects of EarthCraft are not applicable to the surveyed traditional contractors.

Table 1: General Company Characteristics of Survey Population

General Company Characteristics of Survey Population							
Company	Contractor A	Contractor B	Contractor C	Contractor D	Contractor E	Contractor F	Contractor G
Locality	Blacksburg	Fredericksburg	Fredericksburg	Blacksburg	Fredericksburg	Fredericksburg	Fredericksburg
Initial Year in Business	1997	2002	1999	1988	1993	1986	2005
Construction Type	New	New	New	New, Renovations	New, Renovation, Commercial	New, Renovations, Commercial	New
EarthCraft Certified?	Yes	Yes	Yes	Yes	Yes	No	No
Number of Employees	3	1	3	12-15	5	12	1
Jobs Per Year	5 to 7	3 to 4	10+	10+	4	7 to 8	4 to 5
Jobs @ Once	1 to 3	1 to 2	1 to 10	6 to 10	1 or 2	2 to 4	1 or 2
% of In-House Work	10%	0%	5%	20%	5%	40%	2%
% of Subcontracted Work	90%	100%	95%	80%	95%	65%	98%

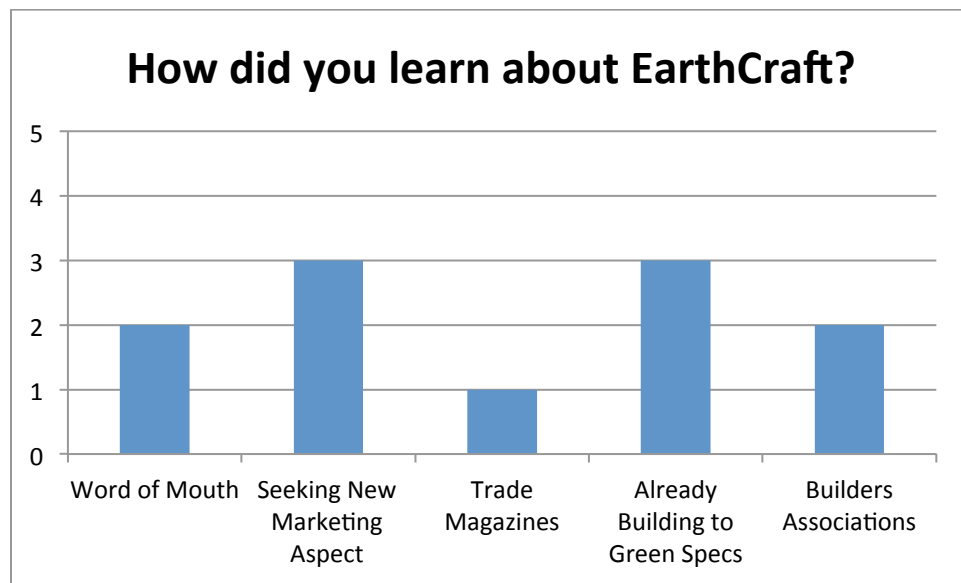
Segment 1

It is to be understood that the data collected within Segment 1 has been acquired solely through the responses of five companies affiliated with the EarthCraft Virginia program.

Initial Discovery of EarthCraft

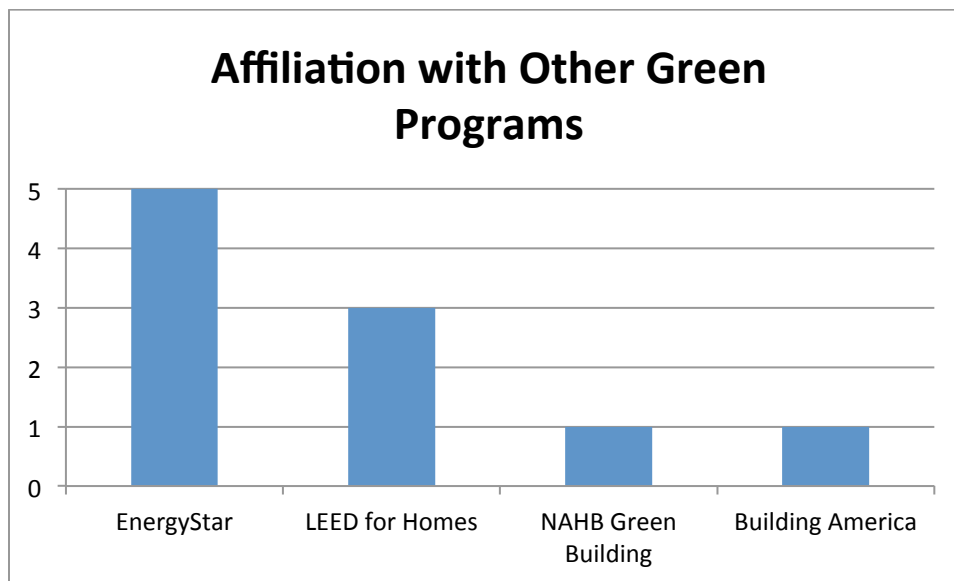
This objective may truly be one of the more important aspects of the study. As EarthCraft is still relatively new to the state of Virginia, how is it that the surveyed population came to learn of the program and thus began to implement it into their company structure? What were the main issues faced once the decision was made to go forth with the EarthCraft program? The majority of those surveyed indicated Word of Mouth as a key method of initially learning of EarthCraft. Contractors also noted that they were looking for new ways of diversifying their companies. All of the five EarthCraft companies polled had previously been engaged in sustainable or green construction practices, many of which matched the guidelines set by the EarthCraft Home program. Such practices include insulated concrete forms (ICF's), high-performance energy efficient windows, tightly sealed building envelopes, EnergyStar appliances, etc. Other methods of discovery include observing advertisements in building trade magazines and local homebuilders associations. Figure 3 below highlights the responses given by the survey population when asked about how the EarthCraft program was learned of initially. It must be noted that this question allowed contractors to list multiple sources of initial discovery.

Figure 2: Methods of Discovery as Indicated by EarthCraft Contractors



A determining factor for companies interested in becoming EarthCraft certified is the degree to which sustainable practices and principles have been utilized previously within that particular company. The inherent success and transitional ease experienced by the surveyed population are significant factors that display the ability of firms to adopt the guidelines of the EarthCraft program, and implement them throughout the company structure. All companies were requested to indicate affiliations with other green building programs. See Figure 4 below for the results of this free-response question.

Figure 3: Contractor Affiliations with Other Green Building Programs



Several of the surveyed contractors commented that the goals and aspirations of EarthCraft meshed very well with their own company’s overall mission, and therefore it was a simple matter to shift the structure of the organization such that it adhered to the standards of EarthCraft. Based on such a statement, it appears to be an unwritten rule of thumb that companies looking to differentiate themselves from local competition look for ways in which small, yet effective, adjustments can be made to current practices. For those companies who have made such adjustments as shown by the surveyed population, shifting to standards as required by EarthCraft has been an easy transition.

Based on Figure 3, 60% of the surveyed contractors have previously been engaged in green construction methods. Contractors A and D stated that the most significant issue occurred over instances in which homeowners did not fully understand EarthCraft. Such cases might be attributed to a homeowner’s misunderstanding of a particular green system within a new home. Other issues of a questioned “learning curve” led more to difficulties in getting subcontractors to buy-in to the process. Within their own companies, however, three firms agreed that the EarthCraft guidelines fit in well with the current goals and quality standards of their company, and the use of a “streamlined” process helped future EarthCraft projects move more quickly from drawing board to reality.

It has been this streamlined process that several contractors to which have given credit for their continued success with the EarthCraft program. A combination of past experiences involving green construction techniques and the ability to mesh current company goals and missions with that of EarthCraft, has really helped these organizations turn-out projects in a timely manner. Contractors A, B, C, and E stated that typical EarthCraft projects within their company took between 4 and 6 months to complete. Contractor D noted that typical projects took 4 months, but depending on the level of work within an EarthCraft project, durations could range all the way to 14 months.

All contractors were asked whether they had ever had an unsatisfied customer at the completion of a new EarthCraft home. There was not a single instance in which any customer was left unsatisfied with his or her new home, however, Contractors D and E both experienced situations in which homeowners were willing to spend money on upgrades to their home (larger front porch, extra fireplace, etc.), but were not always agreeable to the added expense associated with certifying the residence as an EarthCraft Home. Contractor E also found this to be part of the “learning curve” problem. The fact that certifying a house entailed an added expense has made it difficult to make EarthCraft homes appealing to interested homebuyers.

EarthCraft Education & Training

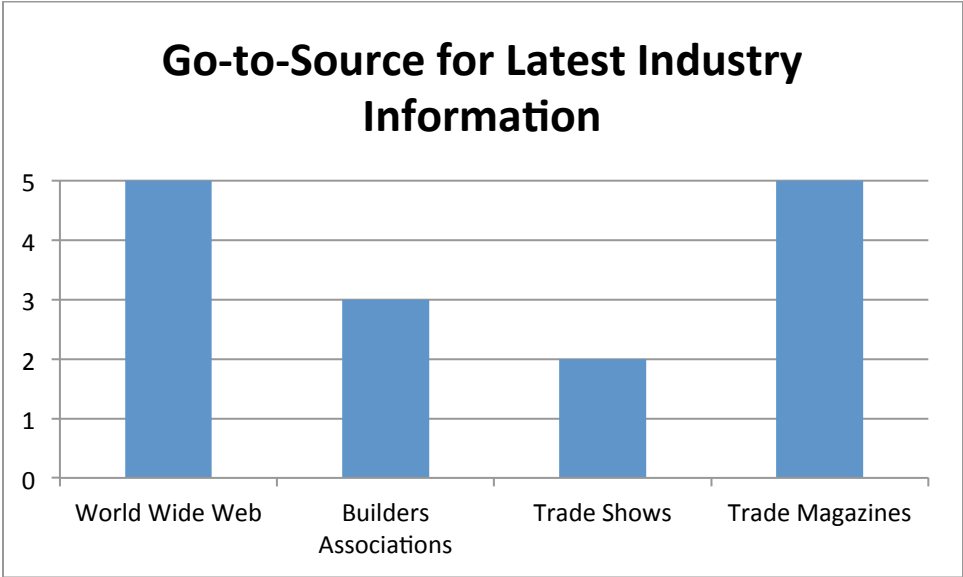
As displayed in Figure 3, 60% of EarthCraft-surveyed contractors indicated previous experiences with green building and its alternative techniques and methods of construction. Of the 60%, 40% admitted that they attempted several new methods before choosing a practice that best fit with the company. Contractor E stated that it preferred to use whatever method was most affordable to both the company and the customer. If a less sustainable method of a certain construction process was more affordable, that is the route which was taken. The most common response to previous experience with green building was that it made the transition to EarthCraft so much simpler. Contractors A, B, and C stated that the transition was an easy one mainly because they had already been building to specifications similar to the guidelines set forth by EarthCraft. Contractor B stated that “homes SHOULD be built this way”.

Once an organization has made the commitment to become affiliated with EarthCraft, it is absolutely critical to develop a system or method for ensuring that subcontractors and customers understand the EarthCraft process as the contractor does. Contractor B mentioned that the educational aspects of EarthCraft have become an integral part of the company's business of building and selling quality homes. A streamlined system is necessary for any contractor looking to be successful in this arena. Contractor A admitted that it did take a few EarthCraft jobs for the company to become familiar and efficient with the EarthCraft program, but nonetheless they perceived it to be a relatively simple process. Another important factor, as a perception of some contractors, is that customers are not fully interested and are less likely to buy-in to an idea if they do not entirely understand on what their money is being spent. Once again, previous experience in the realm of green building is an added bonus for companies looking to establish simple methods of educating their customers. As many surveyed contractors pointed out, this education orientation should become an important aspect of the overall process of building and selling an EarthCraft home. The same aspect goes for a company's network of subcontractors. In the opinion of the researcher, an advantage of serving as a hometown contractor is that organizations are able to establish solid foundations and networks of subcontractors who know and understand what to expect from those that hire them. This more-personal relationship can enhance the likelihood of this educational-challenge process moving a bit smoother.

The EarthCraft Home program does not currently require recurring training sessions and it was observed that upon receiving their official certification, most of the surveyed EarthCraft contractors obtained new industry information from a variety of sources. Resources such as *The Journal of Light Construction*, trade magazines, and local homebuilder associations appeared on most responses to this question. All contractors stated that attendance at industry seminars and "green" construction talks was an absolute must and a great place to learn information on new techniques and design. Contractor C has even appeared several times as a speaker and guest lecturer for different home and trade shows. The World Wide Web was also attributed as a great source for tricks of the trade. These online sources include FineHomeBuilding.com, BuildingScience.com, and HomeEnergy.com. Figure 5 below offers a visual representation of

sources indicated by the survey population. As with previous questions, the responses in Figure 5 are results of a free-response question.

Figure 4: Contractor Sources for the Latest Industry Information



When asked about the level of education that must take place within a firm newly-oriented around the EarthCraft program, the response was that education of the program within the company was simple. On the other hand, the aspect of training subcontractors and educating homeowners presented the biggest challenges. Contractors C and D found the most difficulty in ensuring the proper adjustment of subs to meet specified EarthCraft guidelines. However, most subcontractors appear to have been receptive to the idea of learning a new and more efficient way of various construction techniques. For each of the remaining contractors, the major issue has been the education of new homeowners. Contractor B noted that this sort of education was a huge portion of the business and it was looked at more as a required process than as a distraction. Contractor A stated that each homeowner is supplied with a new-home binder that includes the EarthCraft Manual. This manual specifically describes each of the systems to be installed within the new home. All contractors agree that some form of homeowner education is likely on any EarthCraft project. Some homeowners have religiously read-up on the program, while some simply think they are just getting a “green” home.

EarthCraft Affiliation

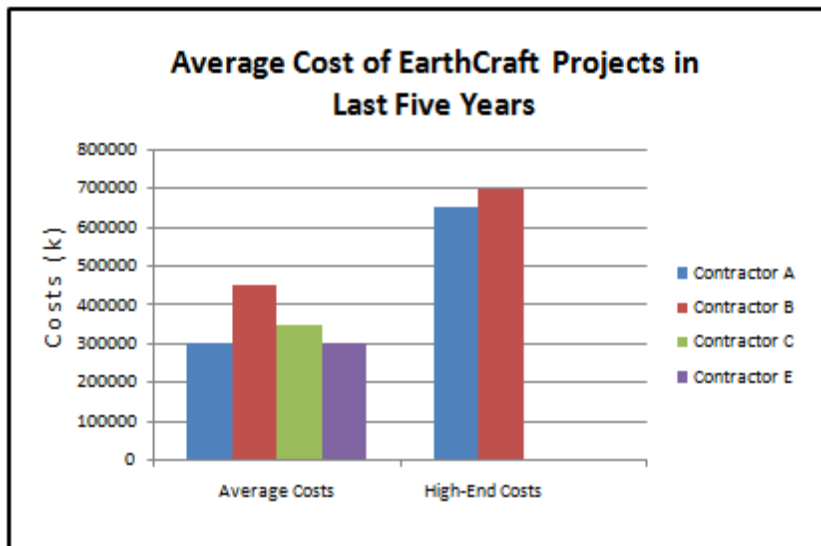
Although the majority of the surveyed population has maintained sufficient levels of work throughout their involvement with the EarthCraft program, as perceived by the researcher, only two contractors explicitly stated that such success was attributed directly to involvement with the program. Contractor C stated that most of its new customers are looking to build green in some aspect. With such a high level of satisfaction among its customers, word of mouth has been a key contributor for Contractor C's success under the EarthCraft name. Contractor A has experienced much of the same recognition for its involvement with EarthCraft and has therefore also enjoyed the benefits of working as an EarthCraft contractor.

Contractors B and D reported no loss or gain of profit as a result of involvement with EarthCraft. Contractor B specializes in a particular type of green construction and credits that facet as the primary reason the company is selected to build a new home. The EarthCraft affiliation, as Contractor B states, is a complement to a service in which the company currently specializes in. It can be assumed that the definition of "success" within the considerations of each company may slightly differ. For example, Contractors A and C would likely agree that continual business as a result of the EarthCraft name and program is success in itself. Contractors B and D may view success with the EarthCraft program as an aspect that would place the company on a higher pedestal than currently experienced. Further investigation is required into the aspects each company would use to define "success" within the organization.

Contractors were also questioned on the levels of income associated with EarthCraft projects. All contractors responded that their homes were priced in the middle range and that showed as most responded that \$300K was usually what a typical job could be expected to cost. Within that range, prices fluctuated to as much as \$700K for higher-end homes. Contractor A stated that the majority of its projects were in the \$300-\$500K range, but there had been a few new homes totaling in around the \$650-\$700K range. Only three contractors responded to questions regarding company earnings on these jobs. The response was unanimous as all stated that 10% was what was usually expected. See Figure 6 below for average costs of EarthCraft projects as

indicated by the surveyed contractors. It should be noted that Contractor D chose not to provide such data.

Figure 5: Average Costs of EarthCraft Projects in the Last Five Years



All contractors were requested to weigh in on how they felt their company had benefitted positively or negatively from the EarthCraft program. Contractors A and C were the only two that indicated they have thus far seen positive success due to involvement with the program. Contractor C stated that the EarthCraft program has resulted in more customer traffic, which has then resulted in more business. Contractors B and D noted that no real change had been noticed, but that business had definitely remained constant. Contractor E responded with the only neutral outlook thus far in regards to EarthCraft. The response attributed the down economy and the lack of information/advertisement about EarthCraft as main issues faced with potential homebuyers considering an EarthCraft home. Its limited involvement with EarthCraft could possibly be the main reason that this contractor has not seen an increase in business in the EarthCraft arena, or perhaps, as Contractor E stated in its questionnaire response, potential homeowners are not always aware that such a program even exists. Contractor B agrees that more advertising from EarthCraft would be one method of letting people know what an EarthCraft home entails.

The researcher believes that the depressed economy has certainly played a role in the mix of experiences of each contractor. Until the market picks back up and the EarthCraft “secret” gets out, all contractors agreed that there was no foreseeable expansion of their company within the immediate future.

EarthCraft Marketability

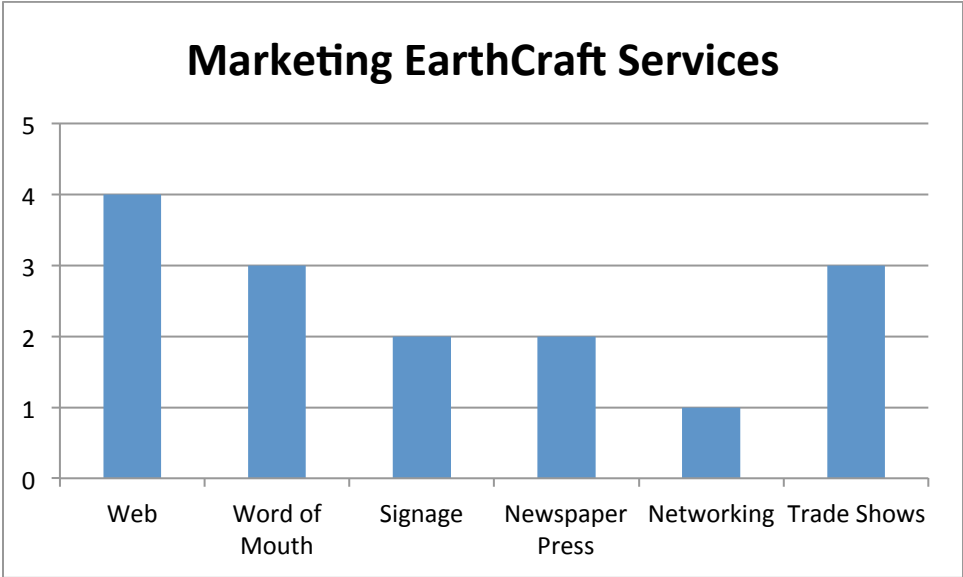
In most cases, contractors agreed upon the marketability aspect that the EarthCraft name provides. Perhaps the current economic downturn offers a valid reason for homeowners to implement green and sustainable features within their new dwelling. The general consensus of the survey population insisted that most people were in fact looking to build a new home with added benefits of energy efficiency and environmental impact in mind. When asked if customers ask the contractor for an EarthCraft specific home, or a home that is simply “green”, 3 out of 5 contractors stated that “customers are not always sure what 100% green is”, which alludes to the notion that if confusion exists on what exactly “green” means, it is most likely the case that homeowners have never heard of EarthCraft.

However, on the other hand, 4 of the 5 contractors believed that the EarthCraft name and service they provide does in fact give them a competitive edge in this market. Contractor B agreed that when the market is seeking an EarthCraft product, the business is good. This company went on to mention that further advertisement of the program would certainly be an added benefit. Contractor C responded that customers should hold contractors accountable for providing the latest services that the industry has to offer and should expect them to do so in a manner that results in a quality, well designed and constructed product. Contractor E has completed its initial EarthCraft home, but has yet to receive any further business due to its EarthCraft affiliation.

Successful contractors are privy to the fortune of repeat business from customers who have previously been left with a project or product that meets or exceeds the level of quality originally expected. The surveyed contractors all require new projects to sustain their business and by maintaining a significant level of professionalism coupled with that hometown personal touch. Satisfied customers are likely to discuss the satisfaction associated with a new home and

it’s not long before word reaches the ears of another interested homebuyer. Just as most of the surveyed contractors discovered the program, word of mouth is likely to be the best bet when it comes down to creating increased levels of business. See Figure 7 below for results from this free-response question of how the surveyed population markets its EarthCraft services. It should be noted that the response of “Trade Shows” includes both industry trade shows as well as home shows.

Figure 6: Contractor Methods of Marketing EarthCraft Services



It does appear that EarthCraft could benefit from more advertisement as a few contractors noted that there simply is not a current market for interested EarthCraft homeowners. The program is already heavily discussed at local homebuilding associations, but perhaps the focus of EarthCraft should be oriented more towards potential homebuyers, rather than homebuilders. It is likely that a more thorough understanding of the program and what it entails would be a better method of convincing customers that an EarthCraft house is a realistic option for them and their family. In the opinion of the researcher, maintaining commitment to customers and ensuring the highest levels of quality are key areas that small, hometown companies must always abide by. Past customer satisfaction is certain to eventually bring about increased levels of business and companies that have done everything possible to maintain company standards will certainly benefit from this.

Segment 2

Responses from Traditional Contractors

The two traditional contractors responded to questions regarding their levels of experience with green building, as well as to questions regarding methods of company education and marketing. Many responses from each of these contractors showed similarities to responses from the EarthCraft contractors. See Table 3 below for a summary of responses given by each of the surveyed traditional contractors.

Methods of Education and Training were quite similar, as traditional contractor responses indicated that trade magazines and the internet were prime sources of acquiring the latest company information. Only one traditional contractor stated that industry seminars were also methods of education within the company.

Both companies have previously engaged in the use of green building design and techniques during various construction projects. They indicated that finding new ways to build healthier, more efficient homes was of the utmost importance; however, many green techniques are more expensive than traditional means and therefore are often decided against when working within a limited budget.

Summary

EarthCraft Applicability to Traditional Contractors

The limited survey population of traditional contractors makes it difficult to draw specific conclusions as to the general likelihood of traditional contractors becoming certified with the EarthCraft program. Nonetheless, the researcher has drawn conclusions of EarthCraft applicability based solely on the two traditional contractors who participated in this study. Both traditional contractors indicated that green building techniques have been used on previous projects. 60% of EarthCraft contractors stated that due to their previous implementation of green building techniques, adoption and use of the guidelines of the EarthCraft program were easy tasks. The researcher believes that based only on each company's organizational structure

and not financial capacity, the EarthCraft program could easily be adopted into both traditional organizations. The fact that each traditional contractor has tried a variety of green building methods and recognizes the importance of building with health or efficiency in mind (or both) displays their functional capability to take-on a certification project with EarthCraft.

The EarthCraft contractors stated that attention to detail and adherence to quality of project delivery were reasons why Word of Mouth contributed greatly to the influx of customer traffic. The same case appears in the situation of the two traditional contractors as each indicated that customer satisfaction is what eventually led to the next new project. That being said, company success is not solely based upon company certification with EarthCraft, or any other green building program for that matter. Green building program affiliation is simply a complement to a process that is already a part of the company structure. Traditional contractors must be equally concerned about their attention to quality and efficiency in all aspects of their work – whether they choose to affiliate with a program such as EarthCraft would mainly be a complement to the level of quality already given to their projects.

EarthCraft, or any other green building program for that matter, does require additional company resources that may not be available during a depression in the economy. Initial costs of certification and time spent learning the process are the main resources a company can expect to devote at the onset. However, as shown with several of the surveyed EarthCraft contractors, the guidelines of the program have easily been incorporated into existing company structures. If a traditional company that has begun to implement green construction practices can afford the time and additional expense of the EarthCraft training and certification process, it has been shown through several examples of current EarthCraft contractors that the program offers a method of differentiating a homebuilding company and the services it provides.

Impacts

As previously mentioned, green homebuilding is quickly becoming a full-scale sector of its own. Contractors are doing their part in providing services that result in the construction of homes designed and built with health, efficiency, and the environment in mind. As predicted, 10-12% of new homes in the next five years will have green features implemented into their

construction (Teague 2009). Homebuilders who understand the green building process will certainly be able to acquire such new work as the growth of the green building sector is gaining in popularity. It is possible that knowledge of this study will lead to broader adoption of EarthCraft as organizations and companies seek new methods of differentiation. This newfound adoption has the potential to result in the future certification of contractors who know and understand the importance of building homes that meet such specific guidelines regarding indoor health and energy savings.

It is also possible that this work will provide a solid foundation for increasing homebuyer awareness of what EarthCraft is and how individuals and families can get involved in making their next home an EarthCraft home. As more contractors increasingly become involved in EarthCraft, it seems that they would begin to more heavily advertise their abilities to provide and construct green homes. It is possible that more widespread advertisement would increase homebuyer awareness of EarthCraft. Through aspects such as local homebuilding associations and trade magazines, the EarthCraft name is advertised quite heavily, however, people looking to build a green home are not necessarily sure what EarthCraft is or even where to start looking for a contractor that is qualified in such a niche.

Future Research

After a thorough review and analysis of the data collected from the surveyed population of contractors, a few issues of further research are required to more fully understand the expansion and development of the EarthCraft Home program within the Commonwealth of Virginia.

The first of these areas is the issue of advertisement of the EarthCraft program. It appears that residential contractors and homebuilders who are involved in local homebuilding associations and are regular attendees at industry seminars are privy to much information regarding the EarthCraft program itself. As many contractors indicated, education of EarthCraft is a necessary aspect of the business in regards to new customers. Perhaps more information should be made available to customers about the EarthCraft program, and such information should be easily located, not necessarily in locations that only homebuilders or contractors would know to look.

This begs the question, “Is EarthCraft doing enough to advertise its program to potential new homebuyers?” Further research and investigation is required into the ways in which EarthCraft advertises the program to potential new homebuyers, rather than contractors.

This study also prompted thoughts for additional areas of research and exploration into the EarthCraft program. The lone neutral response regarding the EarthCraft program came from a contractor who believed that the program simply is not an affordable option to potential homebuyers. The current depression of the economy is mainly responsible for such an issue, but one must inquire as to how EarthCraft could possibly become a viable option for individuals and families that might wish to live in a certified green home, but cannot necessarily afford to do so. The question of EarthCraft affordability is an aspect of the program that could provide added benefit to the results of this study.

It is to be expected that certain aspects of this study will generate more questions about EarthCraft than the researcher had initially expected. Aspects such as methods of advertising EarthCraft, as well as ways in which the program can be made more affordable, are main issues on which the researcher has wished for more information on. It is very likely that such further studies regarding EarthCraft marketing and affordability could significantly benefit the current findings of this study. The researcher believes that similar perspectives from additional EarthCraft and traditional contractors would further develop this study and provide more reasoned conclusions as to the effects and impacts of the program.

The representativeness of small-sized contractors is an area of investigation that might benefit from further study. The researcher understood that a type of contractor had to be defined within the realm of residential construction, as there are many contractors of all sizes and designations involved in the industry. However, the description of “small-sized” contractors is a definition coined by the researcher in an effort to better describe the limited population used within this study. Future research that involves a more specific definition of contractors or companies that might fit into this category of small-sized homebuilders will provide a means of further designating the sectors of the homebuilding industry that EarthCraft might be more applicable to.

It is hoped and encouraged that this research may be used as a catalyst or starting point for future researchers to use and undertake such further studies.

Lessons Learned

When performing a study that requires the perspectives of those currently within an industry, it is important to define the type of company or individual from which a researcher expects to acquire data from. Time spent in defining such variables will provide greater ease when drawing conclusions about analyzed data, as a more specific population allows a researcher to make observations that are more precise rather than general. Aspects of this data could possibly have been more useful had the researcher determined a more specific target to be used in collecting the necessary data.

The researcher also found various issues within the course of this research that did not directly affect the outcome of the findings, but may have had an impact on the timely collection of such data. The level of effort with which many of the surveyed participants reached within their individual questionnaires and interviews was obvious and much appreciated. However, the researcher believes that had the surveyed population be given more time to reflect on and offer more thoughtful responses to the imposed questions, it is possible that additional significant data might have been collected. Perhaps additional time might have warranted the selection of more contractors to participate in the study. This could have been achieved through better initial organization and more timely creation of survey material, as well as requests for additional survey participants.

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Briley, C. (2006). "A High-Performance Spec House" *Fine Homebuilding*, Spring/Summer 2006, 68-73.

This article explains a joint venture between a real estate broker and contractor to form a green homebuilding company. The focus of the article is on the initial project of the company, which was to build a healthful efficient home in the Portland, Oregon area.

Groom, S. (2008). "Making the Green building Dean's List" *Fine Homebuilding*, Spring/Summer 2008, 94-101.

This article highlights three homes recently certified under the LEED for Homes program. It explores three very different homes and the green features that have gone into the construction of each. A break-down of possible points that can be awarded on various projects is displayed and the three highlighted homes are compared to it.

Nalewaik, A., and Venters, V. (2008). "Costs and Benefits of Building Green." *AACE International Transactions*, 1-9.

This article, presented by the Women in Project Controls Task Force of AACE International, observes the object of sustainable development and various methods that can result in the "savings of 'green' while building green."

Picton, J., Picton, M. (2009). "From Luxury to LEED". *Fine Homebuilding*, October/November 2009, 48-51.

This article focuses on a LEED for Homes project in which two contractors, experienced in residential construction, take on a new LEED home. The article highlights their initial struggles with the program and eventually offers some perspectives on LEED for Homes and building green in general.

Swett, B., Wein, D., Martin, J. (2007) "Residential Green Building: Identifying Latent Demand and Key Drivers for Sector Growth" University of Michigan.

This study undertakes a comprehensive plan for developers to understand the changing needs of the residential market and how best to understand various markets, clients, etc.

Teague, M. (2009). "Green Building Programs: Isn't it about time you got recognized for building right?" *Fine Homebuilding*, December 2009/January 2010, 42-46.

This article focuses on several green building programs and the fact that green building is becoming a widespread practice that is economical and mainstream. It advocates the predominance of certified green homes in areas of the country and emphasizes the need to more builders to become involved.

Appendix A

Questionnaire for EarthCraft Contractors

Location:

Contact:

General Company Characteristics

1. How long have you been in business?
2. What is the size of your company (# of employees):
 - a. Do you find that number adequate for the completion of daily activities?
3. How much actual construction does your company self perform?
4. How much actual construction is subbed out?
5. What type of construction does your company perform? New construction? Renovation?
6. What construction services, if any, does your company perform in-house?
7. Per year, how many jobs does your company undertake?
 - a. At once?

Initial Discovery of EarthCraft

8. How did your company become involved with the EarthCraft program?
9. Has your company had difficulty adjusting to the differences of the EarthCraft program vs. traditional methods of construction?
10. Is your company certified or affiliated with a green building program other than EarthCraft?
11. If not, does your company have plans to become involved with a green building program other than EarthCraft?
12. What is the typical duration of an EarthCraft project?
13. Has there ever been an instance in which a customer was not pleased with his or her new EarthCraft home?

Education & Training

14. Has your company always practiced "green" methods of construction?
 - a. If not, at what point did your company decide to change gears?
15. Do your customers typically understand the EarthCraft program?
16. What, if any, has been your go-to-source for the latest information in green building design and technology? (Journal of Light Construction, Finehomebuilding.com, This Old House, U.S. HUD, NAHB, Local Builders Associations, etc.)
17. Does your company attend industry seminars on the subject of green building?
18. Does your company utilize in-house training of green building techniques?

Affiliation with EarthCraft

19. Has the shift to the EarthCraft program been beneficial for your company?
20. Do you feel that your company's EarthCraft certification gives you a competitive advantage over traditional homebuilding contractors?
21. Even if a shift to a more sustainable way of construction requires a higher cost (to both the customer and the contractor) is it worth the extra effort?
22. Has the level of paperwork within the company increased as a result of EarthCraft projects?
23. How has the EarthCraft program financially affected your company? Loss/gain in profit?
24. Can you provide a monetary range of what your company might expect to earn on a typical EarthCraft project?
 - b. During a typical year?
25. Would you consider your homes affordable or more on the high-end of the spectrum?

Marketing of Company Services

26. How does your company market its services? (Web, Newspaper, Advertisements, Green Program Affiliation)
27. Do customers approach you and your company because they desire an EarthCraft home or simply a home that is energy efficient and reduces the impact on the local environment?
28. Do you foresee the need to expand the company in the near future for any reason?

Appendix B

Questionnaire for **Traditional Contractors**

Location:

Contact:

General Company Characteristics

1. How long have you been in business?
2. What is the size of your company (# of employees):
 - a. Do you find that number adequate for the completion of daily activities?
3. How much actual construction does your company self perform?
4. How much actual construction is subbed out?
5. What type of construction does your company perform? New construction? Renovation?
6. Per year, how many jobs does your company undertake?
 - a. At once?
7. Can you provide a monetary range of what your company might expect to earn on a typical project?
 - a. During a typical year?
8. Would you consider your projects affordable or more on the high-end of the spectrum?

Green building Experience

9. Has your company previously practiced “green” methods of construction?
10. Is your company certified or affiliated with a green building program? (LEED-H, EnergyStar, Indoor Air Plus, etc.)
 - a. If not, does your company have plans to become involved with a green building program?
11. Can you list a few green practices your company has previously utilized?
12. If applicable, has your company had difficulty adjusting to the differences of green building vs. traditional methods of construction?
13. Has the shift to green construction methods been beneficial for your company?
14. Even if a shift to a more sustainable way of construction requires a higher cost (to both the customer and the contractor) is it worth the extra effort?

15. Do customers approach you and your company looking for ways to improve energy efficiency or reduce the impact on the local environment?
16. Has the level of paperwork within the company increased as a result of projects with more green elements?

Education & Training

17. What, if any, has been your go-to-source for the latest information in green building design and technology? (Journal of Light Construction, Finehomebuilding.com, This Old House, US HUD, NAHB, etc.)
18. Does your company attend industry seminars on the subject of green building?

Marketing of Company Services

19. How does your company market its services? (Web, Newspaper, Advertisements, Green Program Affiliation, etc?)
20. What is your main method of acquiring new work?
21. Do you foresee the need to expand the company in the near future for any reason?

Appendix C

Perspectives of Traditional Contractors		
Company	Contractor F	Contractor G
Has your company previously practiced green methods of construction?	Yes.	Yes.
What green building techniques (if any) has your company used?	Icynene insulation, larger wall cavities, some solar, day-lighting, EnergyStar windows	EnergyStar windows, icynene insulation, geo-thermal heat pumps and wells, cork flooring, low-VOC paints and finishes, engineered lumber
Is your company involved with any green building program?	EnergyStar	EnergyStar
Does your company plan to become involved in a green building program?	Unless it is affordable, no	Open to anything within limitations of company
What is your main method of acquiring work?	Word of Mouth, Signage	Only Word of Mouth
Is green building worth the added expense to homeowners and contractors?	In this current economy, no	Not for the contractor
What is your Go-To-Source for the latest industry information?	Trade Magazines	Building Products, Finehomebuilding.com, <i>Journal of Light Construction</i>
Does your company attend green industry seminars?	Yes.	No.

Appendix D

Initial Discovery of EarthCraft by Survey Population					
Company	Contractor A	Contractor B	Contractor C	Contractor D	Contractor E
How did you learn about EarthCraft?	Word of Mouth: Already moving in sustainable direction; wanted 3rd party verification system. Good Marketability	Wanted new marketing designation to differentiate from competition	Client wanted high-performance house. Home built to EarthCraft standards and was soon certified. More efficient option than LEED for Homes.	Always involved in energy savings. Immediately became involved in EarthCraft once it was created.	Program advertised in trade magazines. Mentioned in local builders association. Thought it would be a good way to market company.
Was there a learning curve?	Not much. Self explanatory. Created a streamlined system after completion of several projects.	Very little. This is the way a home SHOULD be built.	Slightly, but goals of EarthCraft fit in well with goals of company. Streamlined process soon becomes less of a burden.	Not much. Had to tweak a few in-house procedures and train subcontractors.	Difficulty in finding customers willing to spend more money on certification. Only completed one EC house to-date.
Green Program Certifications?	EnergyStar, LEED for Homes	EnergyStar. Looking to participate in USGB program.	EnergyStar and Build America. Plans to affiliate with NAHB's Green Building Program and LEED for Homes.	EnergyStar, Build America. Open to new programs.	EnergyStar
Duration of average EarthCraft Project?	6 months	4 months	6 months	4-14 months	4-6 months
Instances in which customers have not been pleased with new EC home?	No. Any problems that arise are results of homeowner not fully understanding EarthCraft Program	So far, no.	No.	No, however some homeowners chose to spend more money on upgrading aspects of a new home, but declined to pay for EarthCraft certification.	No

Appendix E

EarthCraft Education & Training from Survey Population					
Company	Contractor A	Contractor B	Contractor C	Contractor D	Contractor E
Have you always practiced "green" construction?	Yes. Main reason for joining with EarthCraft program.	Specialize in high-performance ICF. Have been practicing green methods for a while.	No. First EnergyStar home was in 2006. Joined green programs as soon as they were made available.	Engaged in green practices as they came about.	Practiced methods that have been the most affordable for customers.
Was there difficulty transitioning to EarthCraft standards?	No. Were already building to EarthCraft specs.	Very little. Homes should be built this way.	Had already incorporated many green items into building specs. Slight difficulty in transitioning subs.	Challenge lies with training subs.	Haven't really had a positive experience with program thus far.
In-house Training?	No.	If company were larger, yes. Training revolves around single ownership.	No.	Do best to stay current with industry.	No.
Do customers understand the EarthCraft program?	Some do, some don't. Provide new homeowners with EarthCraft Manual that explains everything.	Most don't. However, this education is looked at more as a part of the selling process, not as a distraction.	Most don't. Must spend time with them to teach ins and outs of EarthCraft program.	Education major part of process.	No one really understands program, nor can they afford extra expense of a green house.
Go-to-Source for industry information?	Web, Journal of Light Construction, VAHBA, Trade shows.	Trade magazines offer things which are then researched on the web.	Web, Builder Magazine, Prof. Builder, Green Source, Amer. Builders Qtly.	FineHomebuilding.com, JOLC, Home Energy. Consultants. Building Science.com	Trade Magazines, Web
Do you attend "green" seminars?	Yes. New industry information often learned there.	Yes.	Yes. Have also spoken at various seminars.	Yes. Green Building and Building Science seminars.	Yes. Seminars encouraged w/in local HBA

Appendix F

EarthCraft Affiliation of Survey Population					
Company	Contractor A	Contractor B	Contractor C	Contractor D	Contractor E
Typical cost of EarthCraft project?	\$ 299 - 500,000	\$ 200-700,000	\$ 300 - 400,000	n/a	\$300,000.00
What percentage do you earn?	Aim for 15-25%, settle with 10%	15-20% gross profit	10% after overhead	n/a	n/a
How would you classify your EarthCraft projects?	Middle to Upper price range	Starter & High End	High-end	Mid to High-End	Mid-range
Has EarthCraft positively or negatively affected your company?	Positively	Have not seen a change.	EarthCraft program has created more customer traffic resulting in more business.	Not much difference from typical work. Standards are already set high - additional fees should only be cost of EC certification.	Not good experience thus far. Only EC project was \$2500 more than traditional. Difficulty getting customers to by in to EarthCraft.
Do you foresee expansion of your company?	Depends on economy.	If more work picks up, yes.	Yes, if market picks up and work load increases.	Not until market picks back up	No. EarthCraft just not affordable right now.

Appendix G

EarthCraft Marketability of Survey Population					
Company	Contractor A	Contractor B	Contractor C	Contractor D	Contractor E
Do customers want an EarthCraft home, or a home that is simply "green"?	Homeowners want homes that are energy efficient and provide healthy indoor environments for their families.	Company specialty is ICF - high performance insulated concrete walls. EarthCraft is complement to that.	Customers are not always 100% sure what "green" is. EC program breaks everything down so that customers can more easily understand what they're getting	Hard to distinguish	Customers do not know what EarthCraft is. If green features are affordable, then yes the customer will want them. If not affordable, customers not interested.
How do you market your construction services?	Web, Word of Mouth, Signage, Articles in local newspaper	Web, Newspaper, Home Shows, Green Programs	Word of Mouth, Newspaper, Website, Realtor Community, Trade Shows, Networking, Radio Advertising, fact that J Hall is a niche builder.	Variety of Methods. Word of Mouth is key.	Web, Signage
Does EarthCraft give you a competitive advantage in this market?	Yes and no.	Only when the market is looking for EarthCraft Builders. More EarthCraft advertising is required.	Customers should expect builders to engage and offer current practices. Being EarthCraft certified shows to the customer that J Hall is able to build a quality home.	In certain cases, it does. Company quality and process seem to be primary drivers for business.	So far, no. Have not gotten any business due to EarthCraft affiliation.
Have any homeowners NOT been pleased with their new EarthCraft Home?	No. However there have been cases in which homeowners have not fully understood the green/EarthCraft features of their new home.	No.	No.	No, but initially there were cases in which homeowners would spend extra money on various items, but not on the cost of certification. Now it is not an option.	No.

