Promoting Best Design and Product Selection Practices in Florida's Residential Construction Industry

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Abstract

The Florida Energy Extension Service (FEES) produces, markets and delivers educational materials and programs concerned with construction of resource-efficient homes. A key product is *Build Green & Profit* (*BG&P*), a 14-hour continuing education program for licensed Florida building contractors. Since its first presentation in 1996 over 3,000 registrants have attended *BG&P* programs. Through cooperative research agreements FEES is constructing homes built to very high energy-efficiency standards (HERS > 90), the first of which will serve as a sales and design center for *Madera*, an 88 home environmentally friendly community. Experience gained from both of these activities has provided an appreciation of the role of the developer in the homebuilding process. In essence the choice to implement best design, product selection and construction processes is only partially under the homebuilders control. The position of this paper is that a systems research approach to the homebuilding process needs to be applied at the master planned community level with emphasis on the sales, financing and insurance processes as well as to the potential for performance-based, third-party verified certification programs.

Keywords: master planned communities, certification, resource-efficiency, homebuilding, energy

Introduction

Situation: Over the last decade approximately 100,000 new single-family, detached homes have been built annually in Florida, making it one of the most active areas of new residential community development in the United States. At this rate of construction the blended characteristics of Florida's built environment are changing rapidly with a full range of associated unintended consequences. Most famously, Hurricane Andrew revealed many failures in Florida's construction and quality assurance practices. Less dramatically, termites and indoor environmental quality are persistent problems in Florida housing. In the aggregate Florida's housing boom has led to a full range of infrastructure problems: transportation, landfill, storm water and so on. Finally, south Florida's rapid growth has created a wide range of environmental stresses the most prominent of which is the declining reservoir of potable water.

Although many recognized resource efficient designs, products and installation techniques are available; they are being adopted slowly and inconsistently in the construction of homes in Florida. This paper addresses the issue of how to shift residential building practices toward adoption of more energy-efficient, water-efficient, and durable building practices. In particular

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this paper considers homebuilding in the context of associated sales, mortgage lending and insurance processes. It also considers the role of certification programs (such as ENERGY STAR?). Finally, it looks at the role of developers. All of these are considered in the context of the homebuyer.

Master Planned Communities: The majority of homes being built in Florida are in Master Planned Communities that can range in size from a few acres to tracts that are many square miles in area, such as Lakewood Ranch (http://www.lakewoodranch.com/home.html) (~28,000 acres and a business plan thru 2035). Developers are responsible for the physical design and construction of a community's infrastructure. This includes optional amenities such as golf courses, clubhouses and marinas as well as required infrastructure such as roads and utilities. Each of these communities operates under a set of Conditions, Covenants and Restrictions (CCRs) that establish ground rules for the types of homes (and homeowner behaviors) permitted. Most often control of individual communities and responsibility for the CCRs shift to a homeowners association at some point.

Single-family detached homes in master planned communities are constructed on finished lots in compliance with the CCRs by building contractors. In some cases developers and building contractors are part of the same entity as is the case with Florida's largest master planned community developer, WCI (http://wci.wcicommunities.com/). In other cases the developer only creates the finished lots and negotiates contracts with a selected group of builders, a good example of this model is The Bonita Bay Group (http://bonitabaygroup.com). In both cases the developer generally operates a sales center staffed by sales associates (employed by or under contract to the developer) where potential homebuyers are offered pre-approved house plans that comply with the CCRs and are consistent in terms of price points. The sales center is designed to convey the community's style both architectural and in terms of its amenities. The sales center also serves as a lynch pin of the developers marketing plan by physically projecting the image of the community that the developer wants to portray to the targeted homebuyer demographic.

Sometimes sales centers are in model homes that feature popular floor plans and display upgraded kitchens and bathrooms. In larger developments there are often directly or indirectly affiliated design centers where flooring, lighting, kitchen and bathrooms fixtures are selected. Design centers generally operate independently; however in some cases builders and developers (WCI) operate their own centers.

Financing: Master planned communities are carefully designed to create an enclave (or grouped enclaves) of consistent perceived home values. A practical benefit of this practice is the maintenance of reliable appraised values for the built homes, which reduces risk from the lender perspective. On the front end, this facilitates builders easily obtaining construction financing to build homes that fall within enclave price points. On the back end it facilitates quick approval of permanent mortgage loans for homebuyers in the targeted demographic. Of course, home value dictates the value of finished lots, which in turn establishes a development's appraised value and underpins the financing for the developer to acquire land and build the infrastructure. There is research to indicate that buyers value energy efficiency as expressed in reduced utility bills and that this should be recognized in appraisals (Nevin & Watson, 1998).

Another practical value of establishing consistent perceived home values in enclaves is helping sales associates steer potential buyers toward the homes that maximize affordable features for the buyer and profits for the development team. Often a developer will establish a working relationship with specific primary mortgage lenders referred to as preferred lenders. Essentially, these lenders agree to become especially familiar with the community and fast track loan applications in exchange for the sales team steering customers their way. Occasionally, developers are able to negotiate some preferences into the mortgage products offered by preferred lenders for their communities.

Certification Programs: Marketing teams look for opportunities to distinguish their master planned communities, which makes the phrase "award winning community" so familiar to us all. Unfortunately, homebuyers are seldom aware of how community/home awards are judged or who does the judging. In recent years several award and certification programs have been created with more emphasis on measurable performance and with third-party certification. Probably the most noteworthy is the ENERGY STAR? program developed jointly by the US Department of Energy (DOE) and Environmental Protection Agency (EPA). In Florida some developers are starting to adopt these programs and incorporate required compliance into their CCRs. A good example is the 11,000-acre Harmony project (http://harmonyfl.com/) in St. Cloud, Florida, which requires that all of the 7,000 homes to be built in phase I qualify for the ENERGY STAR? designation.

Position: The purpose of the foregoing discussion is to emphasize the causative chain of relationships that prescribe how houses are actually being built in Florida. The DOE Building America program (http://buildingamerica.gov) is a premier housing research program that "conducts systems research to improve overall housing performance", but is largely restricted to the physical structure of homes. Likewise, the PATH program (http://www.pathnet.org/) is publicizing many excellent technologies, but the adoption rate of these ideas remains tepid. The position of this paper is that a systems research approach to the homebuilding process needs to be applied at the master planned community level with emphasis on the sales, financing and insurance processes as well as to the potential for performance-based, third-party verified certification programs.

Current State of the Art

Background: The Florida Energy Extension Service (FEES) is a unit within the Cooperative Extension Service at the University of Florida that produces, markets and delivers educational materials and programs concerned with the construction of resource-efficient homes. FEES' educational materials are all designed to promote understanding of the connection between building designs, construction processes, and materials (products) as they relate to durability, resource efficiency and profitability. Our primary product is *Build Green & Profit* (*BG&P*), a 14-hour, modular, highly interactive, continuing education program approved for presentation to licensed Florida building professionals, primarily contractors, architects and building inspectors.

From 1996 through 2002, the program was presented to over 3,000 registrants, delivering more than 40,000 continuing education units.

Certification Programs: One of the original *BG&P* modules written in 1995 was titled *Green & Profitable Marketing* and laid out a rationale for selling "green" features to homebuyers. Participant evaluations during our first two years of presenting the programs clearly indicated that builders were skeptical. In 1997 we integrated the new ENERGY STAR? home program (http://www.energystar.gov) into the marketing module and builders responded well. Since then, ENERGY STAR? has steadily gained recognition and has become a springboard to more expansive programs. There is direct evidence that the program does reduce energy consumption (Smith and Jones, 2003).

In 2000 we beta-tested *Green Advantage*, a professional certification program as part of a research project supported by an EPA Sustainable Development Challenge Grant. In essence *Green Advantage* (www.greenadvantage.org) tested the idea of a voluntary professional certification program in green design and construction concepts. To receive "First Level Professional Certification" under *Green Advantage*, participants were required to pass an exam covering materials normally presented in 12 hours of classroom instruction. In the Florida beta-test, the exam was based on *Build Green & Profit* continuing education modules. During the summer of 2000, *BG&P* participants were given the option to take the exam. Of ~800 attendees about 400 opted for the exam and 300 passed. As an interesting side note, the Bonita Bay Group, a master planned community developer in southwest Florida, required all of the General Contractors building in their *Mediterra* community to not only to attend *Build Green & Profit*, but also to pass the associated *Green Advantage* exam. In November 2003 at its national conference and trade show, the US Green Building Council (www.usgbc.org) announced a collaborative partnership with *Green Advantage*.

The *Madera* Project: The Florida Energy Extension Service (FEES) is also involved in applied building sciences research, such as the construction of houses built to very high energy-efficiency standards (HERS > 90), the first of which will serve as a sales and design center for *Madera*, an 88 home environmentally friendly community in Gainesville, Florida. The model center was designed and constructed to meet the ENERGY STAR? home standard (http://www.energystar.gov) and to comply with the Florida Green Building Coalition (FGBC) Green Home Designation standard (http://floridagreenbuilding.org/). It is also serving as a PATH Field Evaluation site (http://www.pathnet.org/sp.asp?id=9995). Unlike many University demonstration projects, the model center and the seven other homes that FEES will build in *Madera* will all be built with the intention of selling at a profit.

FEES became involved with *Madera* at its inception in 2001. Since then we have actively participated in the full range of design, approval and construction processes involved in creating a master planned community development. Although our interest was initially focused solely on constructing homes on *Madera*'s finished lots, it wasn't possible to avoid the connection between the development's overall design (physical and organizational) and the homes that would later be built. There were the obvious physical interactions such as setbacks, and conserved community areas that directly effected lot sizes and effect allowable footprint area. In

addition, there were road and associated storm water infrastructure design decisions that directly impacted lots.

Of more direct interest to the development's homebuilders were the Conditions, Covenants and Restrictions (CCRs) and the organizational structure of the homeowners. *Madera*'s developers wanted to create an environmentally friendly community and relied on the Florida Energy Extension Service to help specify minimum standards for the community's homes. In addition to the ENERGY STAR® home and FGBC standards mentioned above, the CCRs included several explicit requirements, the most important of which mandated that each home's air handler and ductwork be in conditioned space.

FEES is building *Madera*'s design/sales center that will operate during the community's three-year build-out. Design control offered the opportunity to work with the full range of "green" product manufacturers to build a highly resource efficient home. Although there has been considerable product donation to the model, the house was designed under the constraint of not creating product expectations that were inconsistent with the price points of homes in the community. Specifying products has also revealed the full range of problems associated with distribution and supply of non-standard products along with the additional problem of a workforce often unfamiliar with new products.

Both the ENERGY STAR® home and FGBC standards require independent, third party raters to certify that the homes comply with the standards. These ratings along with product upgrades represent increases to the cost of construction. Serendipitously, the City of Gainesville adopted an Ordinance in October 2002 establishing a green building program based on compliance with the FGBC Green Home Designation standard. As an incentive the program offers reductions in building permit fees that more than compensate for the cost of ratings. Several Florida Energy Extension Service staff are certified raters for both the ENERGY STAR® and FGBC programs and are working directly with the builders to qualify their homes for the two programs.

The model will serve as a sales center and FEES will work directly with the broker to support sales of recommended "green" upgrades. Upgrades are recommended in groups of products that are related to energy efficiency, water efficiency, termite resistance, and indoor environmental quality. A key aspect of defining the upgrade products is pricing. Most "green" products cost more and builders need to be compensated with a built-in profit factor. Once again there are incentives that can defray the increased cost and help the sales process. A key example is the Energy Efficient Mortgage (EEM) product offered by Fannie Mae and others. We are working with primary lenders to ensure that the EEM product is available to *Madera* homebuyers.

A second initiative is underway with a major Florida homeowners insurance group. FEES has developed a set of prescriptive design, product selection and construction standards that reduce the potential for moisture problems in the home. Correspondingly, compliance with the standard reduces the potential for the occurrence of mold and qualifies a home for a discounted homeowners premium. The *Madera* model and other homes built by the University of Florida will meet the standard and become the first homes to receive the discounted premium.

Future Research Directions

This paper is concerned most closely with two of the identified workshop sub-areas: *R&D and Diffusion* and *Regulations/Finance/Insurance*. The overall position of this paper is that a systems research approach to the homebuilding process needs to be applied at the master planned community level – meaning that it's not sufficient to identify design, product selection and construction process enhancements at the organizational level of the house. More specifically, it is necessary to understand the relationship between design, product selection and construction processes that enhance a home's resource performance and the appraisal, sales, financing and insurance processes. Finally, the potential for organizing and integrating independent, performance-based, third-party verified certification programs into the homebuilding process deserves attention. Recommended specific areas of expanded research are as follows:

Certification Programs: Prescriptive summaries of best design, product selection and construction practices can be structured into certification programs that are more easily understood by everyone in the homebuilding and home buying processes. As such they can be very useful tools in promoting adoption of resource efficiency. The larger question is how certification programs should be structured, marketed, sustained and evaluated. As with building codes and any other product approval process, certification programs can become intensely competitive. Current building research programs (such as PATH and Building America) have the potential to help evaluate the relative merits of elements within certification programs.

Insurance: Data from insurance companies on claims (for instance in the area of water damage) have the potential to reveal the relative severity of various types of failures. Historically, insurance companies have relied on actuarial data, but under certain circumstances have relied on analytical studies. Where design, product selection and construction processes can be combined to reduce risk associated with certain failures then insurance companies have the capacity to establish incentives.

Appraisals: Like insurance rates, appraisals generally look backwards to establish precedents or "comps" to predict the value of a home. Furthermore, the "comps" considered to be most trustworthy are physically local. So, establishing increased value associated with enhanced housing performance currently requires locally acknowledged experience. Fannie Mae has an enormous dataset on appraised values of homes nationwide. Among the homes in the database there are thousands of homes built to qualify for the ENERGY STAR? designation, which should create opportunities for statistical analysis.

Mortgages: Fannie Mae and others have worked to establish logical frameworks for Energy Efficient Mortgage (EEM) products that provide incentives for increased investments in the home that relate proportionately to decreases in utility bills. None of the programs have been very successful. Although the logical bases of differing versions of EEMs have been generally sound, there is the simple competition with the wide range of mortgage products (with which mortgage lenders are more familiar) and additional complications (reporting requirements) associated with EEMs. So, the level of increased benefits simply hasn't matched up adequately with the complications.

Sales Process: Brokers and sales associates have a very short window when meeting a potential homebuyer and require skills more in the realm of making a client comfortable than providing analytical information. Under this constraint, sales associates need tools that can passively initiate a dialogue about the benefits of improved housing performance.

Master Planned Communities: Many of the research topics mentioned above relate to the apparently somewhat imperfectly connected nature of the various aspects of the homebuilding and home buying processes. Master planned communities exert centralized and direct control over both processes, which offers an opportunity to apply leverage much more effectively. The problem is understanding the process from the developer's perspective.

For maximum effect all of the topics specified above should be jointly considered. Naturally, integration of a community certification program (based on resource-efficient housing) into a developer's business plan for a master planned community has tremendously improved potential for success compared to attacking the problem one piece at a time. For this to happen the developer must perceive that a certification program has sufficient positive marketing benefits and must see the path to certification as being unambiguous, as having minimum risk and requiring only acceptable additional management. It is the position of this paper that if these critical conditions can be met then the housing market can be rapidly transformed with respect to specific sets of best design, product selection and construction practices.

References

Nevin, R. and G. Watson (1998). "Evidence of rational market valuations for home energy efficiency" *The Appraisal Journal*, 66, 401-408.

Smith, M.T. and P. Jones (2003). "The impact of energy efficient house construction on homeownership costs: a comparative study in Gainesville, Florida" *Family and Consumer Sciences J.*, AAFCS, 32(1), 76-97.