

## **Section 2 - Business model and relationships**

Under their agreement with Forest City, Hunt is responsible for design, construction, and selection of all trade contractors. Thus, Forest City is not directly involved in the business relationship relative to how steel is used in the homes. This is primarily between Hunt and the framer, Worthington Military Construction LLC.

A key to the successful relationship between Worthington and Hunt is the comprehensive framing service provided by Worthington. Worthington is responsible for all framing activities including fabricating, designing, and erecting steel wall panels, and installing roof and floor trusses, interior partitions, all sheathing, and windows. They are not responsible for roofing paper, house wrap or siding. Worthington is also the steel stud supplier for partition walls. Worthington is responsible for completing at least seven homes a week to maintain the production schedule.

The steel studs are roll-formed at Worthington's Hawaiian steel processing facility and shipped to the fabrication plant. Wall panels are assembled at the plant and shipped to the job site.

Worthington is responsible for all inventory and supply issues related to fabrication and framing, including purchasing tools, screws and power generators. In the past, the builder purchased screws for the framer but this agreement ended because the framing crew and Worthington had no incentive to reduce lost screws.

Worthington works closely with the designer to create at least one model home. The model home serves as a check against contract requirements and identifies construction issues that could arise.

Unlike most framing operations, Worthington has adopted a production process that brings in components of assembly line methods used in manufacturing. They employ what could be termed an "even-flow" process where a crew or person is responsible for specific tasks rather than one crew framing the entire home. Thus, they have multiple crews who work on different parts of the framing on each home on a predictable schedule.

One major factor in deciding to use the even-flow construction method was the size of the building project. The builder stated that their business model, which includes contracting out the entire design, fabrication, and framing package, works very well for projects over 100 homes.

In the traditional approach with one crew doing the entire home, Worthington and Hunt realized that the tradesmen were interfering with each other, frequently causing delays and cost overruns. The task orientated, even-flow process ensures that only one trade is working inside a home at any given time.

The siding and wrapping crew, who operate outside of the home, are the only crews working on a home while other sub-contractors are present. There was a siding crew working on at least four homes during the framing stage.

## **Land sharing**

Availability of land for a panel fabrication plant is critical to the success of this project. Land is an expensive part of the equation in most locations, but even more so in the Hawaiian Islands where land is at a premium. Hunt has a unique land sharing relationship with Worthington to enable both parties to achieve efficiencies and profits that would be harder to achieve with a conventional contractor-supplier relationship.

Worthington's panel plant is located on land owned by Hunt. The panels are built and stored there until being transported to the construction site. The use of Hunt's land for fabrication and storage is negotiated in the contract between the two parties and reduces the steel panel costs to Hunt. Worthington can offer lower prices to Hunt since they do not have to lease or purchase land for a facility. Hunt and Worthington would prefer to locate the fabrication plant at the construction site to further reduce transportation costs and take advantage of inventory storage. However, land constraints did not allow for on-site location of the plant at Radford Terrace. On their next project, Worthington and Hunt will fabricate panels at the construction site.

## **Financing**

Worthington is responsible for financing and purchasing all equipment, materials and supplies necessary to frame the home. Since homes in this project are constructed by tasks rather than one home at time, the payment schedule is based on these tasks. There are eleven tasks per home (see Section 5 for more detail). The framer submits a bill to the builder detailing how many completed tasks were finished in a one month period.

## **Insurance**

Hunt purchases insurance through Zurich, based out of Europe. They receive a twenty percent discount on builder's risk insurance for each part of the home made from steel. Hunt has explored local insurance companies but the firms are unable to offer similar discounts. The builder attributes this discrepancy to the fact Europeans have used steel for a long time in residential construction and recognize that steel won't burn. The framer and other trade contractors do not receive any insurance reductions or increases when working with steel.

## Training

The construction labor market is tight in Hawaii and is union dominated. Workers are compensated according to union pay schedules. Moving from apprentice to journeyman is a four year process, accompanied with eight pay raises and advancements, one every six months. The union program requires training to advance but offers little in way of specific classes besides safety training. Thus, Worthington often trains people on the job.

A benefit of the union presence is that they provide a labor pool from which to draw workers. This helps Worthington find some workers who are already qualified without having to advertise and limits the amount of resources expended on hiring.

## Lessons learned form trade contractor experience

Hunt originally adopted a conventional approach to working with steel that included separate bids for the panels, windows and framing. This process resulted in multiple firms involved in the total framing process who didn't talk to or cooperate with each other. When an issue would arise one firm would blame another firm and no real solution was developed to prevent problems from recurring. Under the current arrangement with Worthington, Hunt awards the total framing package to one company in hopes of providing an incentive to the framer to cut costs and look for time-saving strategies.

The approach with other subcontractors is still very traditional. Bids for each trade are on a per house basis. However, Hunt and Worthington have developed a close working relationship with their trade contractors, leading to improvements as everyone has become more experienced with steel. Issues raised by other trades include the following:



The electrician for the Radford Terrace homes has found working with a hybrid frame that includes steel and wood can require extra effort to run wiring. Although steel wall panels have standardized holes punched in the studs, they do not always end up in a location where the electrician needs to run the wiring. The electrician thus has to cut or drill some studs.

The electrician needs to drill or cut track sections when wiring runs through the floor. In this wood-steel hybrid situation, electricians need to switch drill bits depending on whether they are drilling through wood, steel, or a combination of the two materials. Besides having to switch drill bits, steel is perceived to be harder to drill than wood. The electrician noted the ease of installation that pre-cut holes provide over wood, but still perceived that steel was more difficult to

drill than wood. This reaction may not be the same on projects where steel floors and walls are used and the need to switch between differing bits is minimized or eliminated.

The extra time and materials (grommets, screws, drill bits) required for the electrician has resulted in an up-charge compared to a home built completely from wood framing. The electrician estimated an 8% to 10% up-charge when working with a steel home over a wood home. The range depends on the configuration and the number of electrical boxes in the home.

The plumber encounters similar problems as the electrician with drill bit changes, but does not charge more to work with steel compared to a wood framed home. The plumber recommended a bi-metal drill bit to avoid time delays associated with changing drill bits. They also use a plasma cutter when cutting steel.

The drywall contractor also claims that working with steel takes longer than with wood because they have to use screws. Screwing into heavy gauge steel is more difficult than wood, especially if it is overhead. The increased application time results in an up-charge in the range of 7% to 15%.

The other trade contractors operate in a very traditional approach. None indicated that working with steel wall panels resulted in increased costs or other changes that impact the way Hunt does business with them. The perceptions of steel, issues they encountered, and solutions they employ in dealing with issues specific to steel are covered in Section 3 of this case study.