



## BEACON BAY HOMES - RIVER OAKS SUBDIVISION OAKVILLE, ONTARIO

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ArcelorMittal Dofasco Steel Design, 2002)

### DESIGN AND CONSTRUCTION TEAM

**DEVELOPER:**  
Beacon Bay Homes and River Oak  
Developments

**ENGINEER:**  
Atkins + Van Groll Inc.

**LIGHT STEEL FRAMING INSTALLER:**  
Sungate Construction

## A Beacon of Light Steel in Residential Construction



Beacon Bay Homes is bringing what they consider to be "the technology of the future" to the average home purchaser.

Beacon Bay Homes of Toronto is shining new light on the residential construction industry by using steel to help build more environmentally efficient homes. Although steel has been used for many years in the custom-built home market, Beacon Bay is bringing what they consider to be "the technology of the future" to the average home purchaser. Beacon Bay is developing innovative design and construction approaches to light steel framing. They recently completed three "prototype" all-steel homes that meet R2000 technical standards and are continuing with construction of a 37-home subdivision, many of which will include light steel framing, in the popular River Oaks neighborhood in Oakville, Ontario.

Beacon Bay Homes are "the new kids on the block" in terms of building with steel, but they began researching light steel framing and developing design concepts about two years ago. After considerable discussions with Dofasco and Bailey Metal Products, and visiting Texas (a state where many builders are using steel framing) to investigate how builders there work with the product, they were ready for some hands-on experience.

Construction began in October 2001 on a project that Darren Cooper, President, Beacon Bay Homes, says was strictly intended as a learning experience to test different steel systems and building techniques. "Our concept is not to substitute steel for lumber. We're developing different types of steel designs and working towards what we believe to be the best steel solution. It might be four-foot centres on

some walls or a certain type of flooring or roof system, but in working through this, eventually you come to a point where you've got a steel design that you feel is steel for steel's sake." Darren continues, "We wanted to be able to experiment and build at a steady pace without rushing to meet closing dates."

All of the homes are certified R2000 according to standards established by the Office of Energy Efficiency of Natural Resources Canada. R2000 homes are more energy-efficient, offer better indoor air quality and are constructed with the most environmentally responsible products. Steel is Beacon Bay's product of choice to meet these requirements. "The program also advocates minimizing waste during construction and addresses the recycling issue - both of which steel is great for," emphasizes Darren.

The light steel framing was supplied in thicknesses ranging from 0.075" to 0.018" for all the houses, which have different combinations of floor joists, roof trusses and wall systems. "We built some loadbearing walls at two-foot centres and some non-loadbearing walls at four-foot centres with horizontal bracing. We used steel roof trusses on two of the houses and conventionally put a hand-cut roof with light-gauge steel on the third to compare building on site versus using trusses. We have already seen that there are benefits to the steel, such as the four-foot spacing on walls," says Darren.

One of the houses featured four-foot spacing of the framing members on two of their exterior side walls. Two-foot spacing was used for the

front and rear loadbearing walls with the floor joists running front to back in-line with the framing. After installation of the second-floor floor joists, the exterior side walls were constructed using a balloon framing approach. "We built these side walls 18 feet high so that they would span from the foundation to the eaves of the roof, and then stood them up over the edge of the second floor," explains Darren. "The walls went up very quickly because they were 18 feet high. The advantage with steel is that it's light and we were able to construct them in 20-foot-long sections. It would have been much more difficult to manipulate the 18-foot-high wall sections by hand if it was wood because of the weight difference. Handling bigger sections of completed wall with the same number of workers sped up the overall construction as well."

"It's a big bonus having one company doing the framing whose crews are prepared and willing to work with steel," says Darren. "The more familiar framing crews become with the product, the easier it will be to introduce different techniques."

All in all, Darren says steel outperforms lumber. "Steel does give you a better house. You don't have any nail pops or any shrinkage problems. It's square and true. Generally, it's a better product to use. When more builders get into using it and developing better techniques, it will definitely be the material of the future. I believe we're going to see it being used on a much wider basis over the next 10 years."



The homes are certified R2000, which means they are more energy-efficient than conventionally built homes, offer better indoor air quality and are constructed with the most environmentally responsible products.



Light steel framing won't rot, shrink, swell, split, or warp, is not affected by insects and, of course, does not add fuel to a fire. As well, steel's high strength-to-weight advantage means that it can span greater distances and thus provide greater design flexibility with larger open spaces minus intermediate columns or loadbearing walls.

Light steel framing, in thicknesses 0.075", 0.060" and 0.048" through 0.018", was used for all the houses.

One of the houses featured four-foot spacing on two of the exterior walls with joists running front to back.



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