Will Steel Ever Steal First Place from WooD? It Would If Conditions Were Right

AWCI's Technical Director Examines the Apparent Resurgence of Steel Framing in Residential Housing: Is It Just Another Fad, or Is It a Trend?

By Michael A. Gardner

Assuming you encounter favorable traffic—always a gamble in the Nation's Capital—one of the most prominent clusters of early 1970s steel framed housing can be reached in about a 20-minute drive from AWCI's Falls Church, Va., headquarters.

Head west on Virginia Route 7, past the office canyons of Tysons Corner and through the rolling Blue Ridge foothills that have become the planned community of Reston, and just across the Loudoun County line you come to the suburban community of Sterling Park.

The older part of the community—older only in comparison to the development that seems to be a constant in Northern Virginia—is a tidy collection of one-story, single-family tract homes dating back to the Nixon presidency.

Built by US Steel (now USX) Corporation, the houses were constructed using steel panels fabricated at a plant in Indiana and trucked to the site for erection. Most of the homes in Sterling Park were built using this method, as were two similar communities near Allentown, Pa., that were constructed by Bethlehem Steel Corporation.

However, lest you believe that this was only an East Coastphenomenon, a 1970 article in ***Walls and Ceilings*** *magazine trumpets the use of metal studs in residential housing for a development in the Bellwood subdivision in Huntington Beach (Calif). Metal framing systems were fabricated by Angeles Metal Systems of Los Angeles, Calif., for use by builder William Lyon, a subsidiary of American Standard, Inc. of New York*

Of interest in the 1970 article is a section that describes Angeles' efforts in gaining building code approval for use of their material. According to the article, prior to the effort by Angeles, all of the attempts at using steel studs in residential housing "never passed beyond the experimental stage because each unit had to be individually engineered andpassed by code authorities." Angeles apparently was successful in gaining approval for their system from the International Conference of Building Officials.

A quarter of a million pieces of literature given away at a homeshow. Predictions of 75,000 steel framed units to be built in 1994. Magazines. Videos. Seminars. House tours. What's the excitement?

Steel-framed single-family homes.

Skeptics say they've seen and heard it before.. Advocates believe it can account for 25 percent of the residential market by 1997.

Who's right?

While conducting unscientific interpretations of statistics and information relating to the homebuilding industry carries a risk akin to chainsaw juggling, a briefanalysis may provide sonic interesting insight into the current situation regarding steel framed dwelling units.

History of the Steel Trend

A graphical analysis of the past 25 years (see chart, page 19) shows three periods of intense activity in privately owned housing starts: 1970-1973, 1977--1978 and 1983-1987. All three growth spurts were immediately preceded by one or more years of lackluster or declining growth.

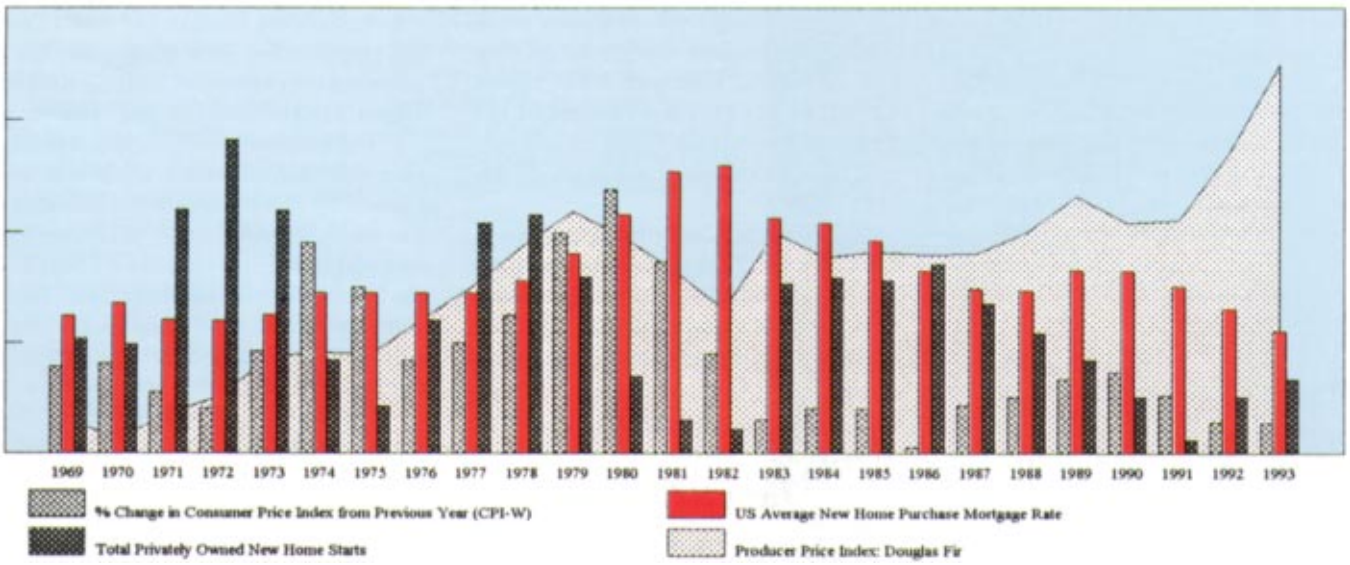
The period 1970 through 1973 was characterized by a dramatic increase in housing starts and a significant increase in the price of lumber. Mortgage rates gradually declined through the early years of the decade. Builders constructed suburban tract-type housing at a frantic pace.

Price increases in lumber appear to have been caused by a number of factors, not the least of which was an apparent lack of capacity within the timber industry. A January 1972 New York Times article noted that the industry was expected to expand production capacity only 2 percent per year when 4 percent per year was necessary to meet demand. New pollution controls and antiquated equipment had made a number of mills inadequate. Replacement was both expensive and done at "a very low rate of return."

In addition, in the decades prior to the 1970's restrictions had been placed on logging of federal lands.

The unprecedented surge in housing starts during this period, coupled with an undercapacity within the lumber industry, suggest that a difficult supply/demand equation for purchasers of residential lumber may have led many to explore possible alternative materials.

Historical information seems to indicate that a few metal stud manufacturers made inroads into the housing industry during this period, primarily through the creation of panelized system that readily



Note: Data is displayed in relative terms only. All data is displayed to denote trends only.

lent themselves to the repetitious product that predominated home building at the time. (See sidebar, page 17.) Indeed, a January 14, 1973, **New York Times** article quotes a Charles Sweet, vice president of (builder) Levitt & Sons Inc.: "Major builders are being driven toward the use of steel and aluminum in home building."

It appears, however, that interest in metal dwelling framing evaporated when housing starts fell dramatically in 1974.

We find no evidence to suggest that a similar movement toward wood framing alternatives occurred during the latter part of the decade, when housing starts took a temporary two-year upsurge. It is possible that dramatic increases in lumber pricing were both compensated for and caused by the general increase in the price of tangible goods experienced throughout the latter portion of the decade.

Some evidence does exist to suggest that renewed interest in metal housing framing did occur during the middle portion of the 1980s, but much of that interest was largely snuffed out by the adverse economic conditions that began in 1987.

The current surge in interest relating to metal framing is unique in that it occurs during a period of comparatively flat housing demand and historically high lumber pricing. What, therefore, would cause one to believe that if lumber prices dramatically decline, the use of metal framing in residential construction won't disappear?

Lumber Supply

During the previous lumber pricing crisis of the early 1970s, pressure to relieve the upward orientation on wood pricing was created through the release of more federal lands to timber harvesting. Restrictions on harvesting of logs from federal lands were gradually lifted by President Nixon and Secretary of Agriculture Butz during 1972-1973.

Twenty years later, adept use by environmental and citizens action groups of the National Forest Management Act of 1976 has both limited the ability of federal and local officials to release public land for logging purposes and significantly reduced the amount of public acreage controlled by harvesters. According to a March 22, 1993, article in **Business Week** magazine, "Since 1990 ... the sale of timber on federal land, which accounts for nearly half of all softwood timber stock, has declined by over 50 percent. As a result over 100 lumber mills have closed. Meanwhile, timber harvesting in Canada, the major source of imported lumber, is also being cut back for environmental reasons."

Guidelines proposed by the current federal administration don't promise much relief. President Clinton's July 1, 1993, proposal to the timber industry, for example, requests a total annual production of approximately 1.2 billion board feet from areas that had an equivalent output of approximately 5 billion board feet per year in the 1980s.

Some environmental groups have predicted that timber harvesting on federal land in the Pacific Northwest could effectively cease by 1995 when most land contracts let before the most recent round of court orders barring new timber foresting expire. Additional recent studies, such as the one conducted by the University of Montana, also indicate private land stocks that are dwindling due to overcutting and lackadaisical replanting methods.

In addition, tax subsidies that encourage logging companies to export raw logs have increased demand internationally for North American timber and allowed domestic producers to seek more profitable markets overseas. U.S. duties on Canadian imports have also had the effect of driving goods formerly imported to the United States elsewhere.

"The timber pipeline, which traditionally has held a four- to five-year supply of raw materials for the lumber industry, is empty," according to a March 28, 1994, article in **Engineering News-Record** magazine. The same article quotes Timothy Locke, a spokesman for the Western Wood Products Association: "The timber industry can't gear up and

manufacture itself out of this situation as it has in the past."

Unlike the early 1970s, it does not appear that the supply of lumber can be rapidly be increased through augmenting the availability of usable harvesting land. With a strangled supply mechanism it is unlikely that lumber prices will return to previous levels, and it logically follows that product availability will be constrained.

Engineering Changes

Previous efforts at promoting the use of metal framing were largely centered around its use as a component of pre-fabricated or panelized residential construction. Lacking favorable building codes and engineering standards, builders tended to use steel on a one-to-one basis as a straight substitute for wood. If a partition required 25 wood studs for construction, its steel equivalent "obviously" required the same.

Improved engineering techniques and the development of the light-gauge steel commercial market over the past 15 years have now created an environment where steel-frame residential builders don't have to compare their product on a "stick-for-stick" basis with lumber.

Writing in the July 1993 issue of **Construction Dimensions** magazine Alan MacQuoid, chief executive officer of California Building Systems, states: "... The typical house requires 11,000 feet of wood, but only 4,000 feet of steel framing ... . When you're accustomed to seeing two-by-fours set 16 to 20 inches apart, it takes a couple of days to adjust to the fact that steel studs may be set as much as 48 inches apart."

Removal of excess metal components from individual dwellings has had the dual effect of decreasing overall material cost and improving delivery time. These product upgrades are indicative of betterments created by the steel-framed housing industry that will not have to be "given back" regardless of the price fluctuations of competing alternative products.

Manufacturing Changes

A perusal of any construction trade magazine during the early 1970s showed few, if any, manufacturers actively promoting products used in metal residential framing. Peripheral framing products (like fasteners, tools, equipment) were either not existent or not marketed toward the fledgling industry.

Today's attitude is markedly different.

Framing products that would make Buckminster Fuller proud dominate the pages of residentially oriented journals. Fastening devices that drive nails into metal studs have appeared, and manufacturers of products that interface with steel structures have begun to market and modify their materials to satisfy a change in demand.

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In addition, according to Engineering News-Record, "... big name tool and connector manufacturers ... are supplementing their lines and expanding still sketchy steel frame catalog ... ." Those who feed on the industry are creating products unique to its demands.

Industry Attitude

It's not often that you can see *through* the exterior wall of the winning entry in a homebuilding contest, but that's exactly the situation in the photo essay that promotes the champion of Metal Home Digest's Residential Framing Awards.

"The home was purposely left in its bare steel-framed state to allow it to be viewed by those who are interested in this emerging technology," according to editorial comments by Shawn Zuver in the Spring issue of the magazine. "Despite not having been completed ... our editorial staff selected the Palmer residence."

That attitude seems to sum up a dramatic shift in industry approach from metal framing ventures of previous years. If nothing else, it's indicative of an industry that has enough momentum behind it to support the birth of a publication devoted solely to the promotion of its product. Where in previous years steel-framing ventures were apparently characterized by their clandestine nature, they now seem to be more inclined toward the opposite end of the spectrum, and participants are very eager to promote the use of the material on an industry-wide basis.

The recent creation of an organization devoted to residential steel engineering and the drafting of uniform building codes—the Light Gauge Steel Engineers Association—seems to provide further testimony to the desire of individuals to create an industry that will survive independent of the economic influences that partially spawned its birth.

It would be foolhardy to believe that some portion of the recent interest in steel-framed residential construction is not entirely a result of the economic impact of recent steep price increases in lumber and timber. If lumber pricing does erode, it is probably a safe assumption that some portion of the recent converts to steel will return to their previous method of residential framing.

It would appear, however, that the supply of raw timber will continue to be constrained in the foreseeable future. In general, a difficult supply situation for a traditional building component oftentimes affords a fledgling industry enough time to create methods and systems that allow it to continue to gain a toehold within a defined segment of a vast marketplace. By all appearances, the metal

framed residential housing industry is well on its way to establishing that toehold with an eye toward creating a much larger presence. ❑

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