

# HSS: DESIGNS FOR THE 21<sup>st</sup> CENTURY



*Canadian Mill/Office Complex*

# CANADIAN PLANT EXPANSION BECOMES A SHOWCASE FOR THE MANY USES OF HSS

## Project Demonstrates HSS's Unique Blend of Strength, Beauty

When a major Canadian tubular producer was planning two sizable plant additions in the 1990s, it wanted them to be show-cases for the utility, versatility and looks of Hollow Structural Sections (HSS).

The company's original plant was opened in a former cannery building in Harrow Ontario, near Windsor, that offered about 110,000 square feet of production and warehouse space. Its two ambitious expansion projects in the 90s have roughly tripled that area.

In the early 90s, the HSS producer added two new bays totaling about 140,000 square feet. Now, moving into a new century, it's added nearly 200,000 square feet more in two phases. Phase 1 provided another 138,000 square feet of production area, and the recently-completed Phase 2 created another 60,000 square feet of warehouse space.



In both of these expansions, the company wanted to show the variety of ways in which HSS can be used in building projects. In the first expansion, however, its architect wasn't totally familiar with the product and its uses, so it ended up as a combination of wide-flange structurals and HSS, with the HSS serving primarily as roof trusses.

## Current Expansion Makes Maximum Use of HSS

"In the current expansion," says Dr. M. Ghobrial, PE, Vice President of the architectural firm Hanna, Ghobrial and Spencer Ltd., Windsor, Ontario and Deerfield, Michigan, "we have used HSS almost exclusively—for the structure's columns, bracing, secondary trusses, walkways and even stairways, an unusual application.



About the only parts of the structure not formed by HSS are the beams that carry the overhead cranes."

Dr. Ghobrial notes several benefits which his firm achieved through the use of HSS. "HSS is a high-density structural," he says. "So it can carry heavier loads and, equally important, it has very strong torsion resistance because the sections are closed squares or rectangles rather than open, as in the case of wide-flange structurals."

Dr. Ghobrial said that the design incorporated square and rectangular HSS in various sizes and wall thicknesses throughout the structure. In all, more than 750 tons of HSS were used in the construction of the current expansion.

### **High Strength of HSS Allows Smaller Columns**

Another advantage, he points out, is that the high strength-to-weight ratio of HSS permits the use of fewer columns, and smaller columns. "It basically gives you more space," he says.

Dr. Ghobrial feels that methods for connecting sections of HSS to itself and to other structurals are becoming simpler and more commonplace, as more and more fabricators and erectors gain experience working with it. He believes the Steel Tube Institute's recently published Connections Manual, compiled in conjunction with the American Institute of Steel Construction, is a major step in advancing the education process.

In the current project, he notes that sections are bolted together using connection plates shop-welded to the HSS sections by the steel fabricator.

### **Aesthetic Value of HSS Helps Create a Spectacular Entrance**

While industrial plants generally aren't recognized for their beauty, Dr. Ghobrial says that the inherent pleasing visual appearance of HSS let his firm create an attractive entrance

for the expanded facility. "I've learned to love HSS for this reason," he says. "Used as exposed structural elements, it adds real visual appeal to a project."

The architect notes that the new entrance to the company's offices will be part of the new addition. The entrance facade will be a combination of exposed HSS framing and low-E glass. The glass will be tinted blue, with the HSS painted a contrasting blue or gray.

Others participating in the expansion project, in addition to the architect, include Elmara Construction, the general contractor, and AGIP, the steel fabricator.

