



# Managing the Roller Coaster

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Material volatility can turn a construction project into a bumpy ride, but a thorough understanding of HSS can help smooth things out.

**DESIGN AND CONSTRUCTION PROFESSIONALS HAVE EXPERIENCED THE ROLLER-COASTER RIDE OF CONSTRUCTION MATERIAL VOLATILITY SINCE EARLY 2004.** Every material has experienced the ups and downs of availability and pricing. And for the time being, it looks like we'll all have to stay buckled in and continue this dynamic ride.

But as experienced riders, we have an edge. We recognize that the best approach to handling the challenges of material pricing and availability is to understand the supply chain for every type of construction material.

This is especially true for structural steel. If we are going to effectively manage the ride, it is necessary to broaden our perspective, look around, and consider all types of structural steel—not just wide-flange, but also steel joists and hollow structural sections (HSS). We will never be able to overcome all the twists and turns of the roller coaster, but with the right information, we can anticipate and manage them. Instead of fear, the result will be an enjoyable ride resulting in a successful structural steel project. And HSS can help us get there. But first, we need to gain a clear understanding of HSS by asking What, Who, Why, Where, and When.

## What?

What is HSS? How is it different than our standard image of “steel” or “structural steel”? When considering whether HSS is a viable option for a specific project, you should evaluate the following HSS characteristics, among others, to determine if HSS can

assist in achieving the desired structural and architectural needs of your project—and in turn, address the current market volatility concerns:

- **Strength.** HSS has high strength-to-weight ratios, excellent compression-support characteristics, and excellent torsional resistance.
- **Appearance.** In exposed applications—such as architecturally exposed structural steel (AESS)—round, square, and rectangular HSS becomes an exciting, attractive part of a structure. HSS, along with wide-flange sections, can be readily bent, formed, punched, and drilled for particular architectural needs and finishes.
- **Uniformity.** HSS provides a uniformity of size, shape, strength, and tolerance that makes its use totally predictable.
- **Cost-effectiveness/fabrication.** HSS is competitive in cost with other structural materials. Lighter sections can often be specified when choosing HSS over other steel options, particularly in column applications. And today, with increased material costs but steady labor costs, HSS may prove more cost-competitive than in the past. However, in terms of connections to other HSS, it can become more costly to fabricate over standard steel sections due to its increased labor requirements, as HSS-to-HSS connections can sometimes be complex. It is always best to speak with a fabricator early in the project to discuss these fabrication issues and get their recommendations on best practices.



Bill Trent Photography

The glass walkway of the Cleveland Heights – University Heights Public Library features HSS prominently in its exterior trusses.

In addition, there are now large amounts of ready-to-ship domestic inventories of HSS. With a current domestic capacity of nearly 5 million tons and a consumption of around 3.2 million tons, HSS is a readily available option to help smooth out the ride of volatility. Relying heavily on the scrap market for its high recycled content make-up, HSS has seen price fluctuations similar to those of other structural steel shapes. Since December 2007, HSS is up over 50% on average, whereas wide-flange sections are up a little over 30% in the same period. However, in the last two quarters of 2007, the price-per-ton of HSS actually dropped slightly lower than that of wide-flange material.

### Who?

HSS has become increasingly popular domestically, taking the lead in many countries in Europe, as well as in Japan. In a recent survey of structures currently in the conceptual study phase in AISC's Steel Solutions Center, it was found that approximately 12% of all steel in these structures was HSS. In fact, it has been estimated that over the last five to seven years, domestic HSS consumption has grown 5% to 7% each year, with a predicted increase of 10% in 2008 alone.

### Why?

All this information begs the question "Why?" Why are so many people looking to HSS for structures that would normally not have even considered structural steel?

First of all, let's look at rolling cycles. Many tube producers domestically roll

tube on a four- to six-week rolling schedule. With turnaround time this quick, fabricators and service centers can navigate the volatility roller coaster a bit more comfortably, since the material price that is being paid is only a few weeks out from when the material is ordered. In a global market, this affects our domestic roller coaster in a more diverse way than ever before, as these ups and downs can be harder to handle. The more you can "crunch" your window to minimize the risk of the next major price fluctuation, the more you can "grease the wheels" to make it a less bumpy ride.

### Where?

HSS producers are located all across North America and produce shapes to the specification of ASTM A500. Again, the domestic market is also being impacted by

international players today more than ever. The importance of knowing your supplier and asking questions about where the steel is originating (in order to ensure a high-quality ASTM A500 product) cannot be stressed enough. The same applies when working with a steel service center. Nearly 90% of all HSS used in the building sector now is channeled through service centers, where it is readily stocked and available for shipment.

### When?

As a matter of fact: Now! As the roller coaster is never predictable and you never know where that next dip, dive, or climb may be, working with a steel fabricator, HSS producer, steel service center, and the AISC Steel Solutions Center ([www.aisc.org/solutions](http://www.aisc.org/solutions)) early in the project is a top priority. "Not all steel sizes are created equal" is an understatement. Steel availability should always be referenced at the beginning of the job to ensure that the desired sizes are readily available ([www.aisc.org/steelaavailability](http://www.aisc.org/steelaavailability)). Just because the size appears in the *Steel Construction Manual* does not ensure it can be ready for your next project. As always, look to AISC's one-stop-shop for any and all issues related to HSS: [www.aisc.org/hss](http://www.aisc.org/hss). **MSC**



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