

HSS

HOLLOW STRUCTURAL SECTIONS

**CASE STUDY:
BRIDGES**

Pedestrian Bridge





HSS FOR PEDESTRIAN BRIDGES: LOWER FABRICATING COSTS, MORE AESTHETIC APPEAL

When you build a pedestrian bridge, you're usually just as interested in aesthetics as you are in strength. And when you build low-weight bearing bridges with steel hollow structural sections (HSS) in square or rectangular shapes, you don't have to sacrifice beauty for brawn.

To learn how valuable HSS is in the design and construction of these structures, just ask Big R Manufacturing of Greeley, Colorado. Big R designs and builds between 150 and 200 bridges a year. About 40% of these are pedestrian bridges used as walkways on golf courses and recreational trails; others are used for industrial pipe support bridges and catwalk systems. Typically, they're fabricated from HSS square or rectangular tubing that seldom exceeds 6" per face. Dave Rogers, Big R's Head of Engineering, explained why square or rectangular HSS is the ideal material and shape for pedestrian bridges ... and it comes down to an ideal blend of beauty and function.

That's because pound-for-pound, HSS has a greater strength-to-weight ratio than wide-flange W or HP shapes. And when you combine this ratio with exceptional compression and torsional resistance, it's easy to see why HSS is the material of choice among pedestrian bridge-building experts like Big R.

EASE OF FABRICATION

"First of all, we construct our bridges by welding," said Rogers. "And when you look at all the other shapes you could use to put together a truss system, you end up with all kinds of corners, edges, wraparounds and dimensional tolerances which, taken as a whole, make welding really difficult. But with square or rectangular shapes, these problems virtually disappear." He continued, "The second reason for using HSS is that most of the tonnage is straight - no warps or bends in the material. This gives it great torsional resistance."



"Then, there are the aesthetics. When you put HSS in the field, there are smooth edges, without the troughs that can catch debris. There's a nice, clean look to the structure," he added. "Furthermore, there are fewer angles and corners. Though the surface area is roughly the same as flange materials, painters like HSS because you don't have to worry about those crevices ... and, as one painter said, you don't have all those different shadows to deal with." Rogers continued, "The biggest problem in painting is the right lighting, and it's a lot easier to see what you're doing when you're dealing with flat surfaces."

HSS HELPS CUT COSTS

HSS offers fabricators a variety of cost-cutting opportunities, with no sacrifice in beauty or strength.

Among them:

- Welding set-up is easier. There's very little preparation necessary, and the square and miter cuts that are usually used in bridge structures are easily made.
- Unlike wide-flange structurals, which have six faces, HSS has just four. This means there's less area (and fewer surfaces) to paint, and no edges or sharp corners to fire proof.
- Shipping costs are reduced because of HSS's strength-to weight ratio. Heavier wide-flange steel structurals can add to shipping costs, require larger equipment to move, and can even require overweight permits.
- Erection costs are typically lower. Because HSS weighs less, you can use lighter-capacity cranes and equipment during construction. Rogers summed it up neatly. "As a structural engineer, I like HSS from the design and fabrication standpoint. My customers like the aesthetics."

