Shape Sense

BY KEITH A. GRUBB, P.E., S.E.

Selecting the right shapes for a project involves a careful balance of **strength**, **serviceability**, and **availability**.

CHOOSING THE RIGHT SHAPE for a beam, column, or other component involves more than simply selecting a structurally adequate shape that meets serviceability requirements. Experienced engineers develop their intuition—their "shape sense"—that allows them to examine a set of plans and make sense of the myriad beam and column sizes.

How do you develop your shape sense? A few years of design and construction experience helps, but here are a few tips to get you started.

It Bears Repeating

Using more of the same shape in a project reduces structural costs by making it easier to purchase, detail, fabricate, and erect structural steel. Fewer beam and column sizes maximize the tonnage of those shapes, resulting in larger (and more economical) mill orders. Fewer shapes may simplify your designs and drawings by allowing you to standardize connections. In the shop, fewer shapes mean reduced storage and material handling costs. And in the field, repetitive members speed erection and can help other trades complete their work faster (for example, think about the benefits of uniform beam depths for the mechanical equipment installers).

Remind yourself, as well as your clients, that least weight does not equate to least cost. Far too often we get caught up in the game of reaching a targeted steel weight in pounds per square foot. Yes, steel tonnage is certainly a factor in structural costs, but it's not the only factor. Fabrication and erection are significant components too. A few extra pounds of steel can save a lot of labor costs in the shop and in the field.

Rolling Along

Choosing shapes that are readily available will make your project go more smoothly. That's where AISC's shape availability data can help. If you visit **www.aisc.org/steelavailability**,

Contact Information for Rolled Shape Producers

ArcelorMittal
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Phone: 312.899.3960
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www.arcelormittal.com

Bayou Steel
Jim Howe
jhowe@bayousteel.com
Phone: 800.535.7692
Fax: 504.652.8450
www.bayousteel.com

CMC Steel - Alabama
Ashley Robinson
ashley.robinson@cmc.com
Phone: 205.599.7766
Fax: 205.591.4554
www.cmcsteel-al.com

Corus
Pete Joyce
pete.joyce@corusgroup.com
Phone: 800.542.6244
Fax: 847.619.0468
www.corusgroup.com

Gerdau AmeriSteel
Paul Pickett
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Phone: 800.237.0230
Fax: 800.628.9931
www.gerdauameristeel.com

Nucor Bar Mills
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Phone: 704.972.1823
Fax: 704.362.4208
www.nucor.com

Nucor-Berkeley
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www.nucorsteel.com

Nucor Steel Kankakee
Mark Petitgoue
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Phone: 800.866.3131
www.nucorbar.com

Nucor-Yamato Steel Co.
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Fax: 870.763.9107
www.nucoryamato.com

Steel Dynamics
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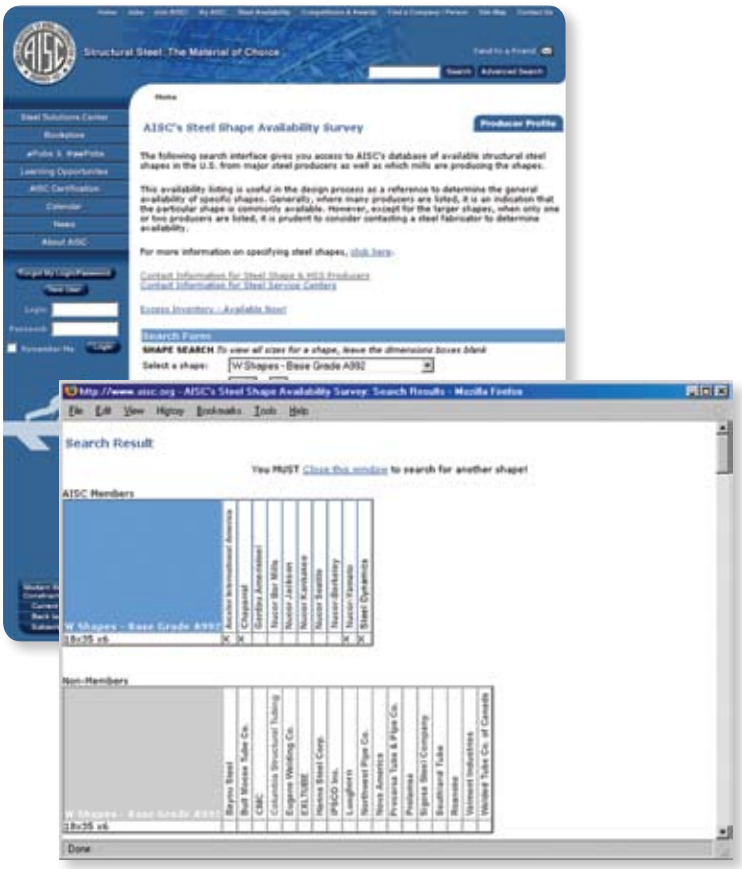

you'll find an online database of shape producers and their products. A shape produced by several mills is more likely to be readily available than a shape produced by only one mill.

For example, if you select W-shapes (noting that the base grade W-shape produced in the U.S. today is ASTM A992 Gr. 50), and then select a W18×35, the results indicate that W18×35s are produced by four mills. Similarly, a W18×311 is produced by only one mill. So, the W18×35 is much more readily available.

If you have questions on availability, feel free to contact a local fabricator. Also, contact information for AISC-member shape producers is listed on the previous page. Feel free to contact them with availability questions as well.

Special Shapes and More

Steel service centers are part of the steel supply chain that most engineers are still unfamiliar with. Service centers purchase bulk quantities of steel from the mills, stocking a wide range of shapes and sizes. For special shapes in small quantities, steel is often available with little or no wait. And for larger projects, service centers can provide most, if not all, of the structural steel required. For example, service centers supply approximately 70% of the structural steel for all buildings (a higher percentage on small projects and a lower percentage on larger projects).

AISC Member steel service centers are willing to help engineers with material selection issues on their upcoming building projects. Contact information for AISC Member steel service centers is listed below. MSC

Contact Information for AISC Member Steel Service Centers

Alro Steel Corporation	www.alro.com	517.787.5500
Delta Steel, LP	www.deltasteel.com	713.623.8080
DuBose Steel Inc. of NC	www.dubosesteel.com	910.525.4161
INFRA-Metals Co.	www.preussag.com	770.641.6460
Lampros Steel	www.lamprossteel.com	503.285.6667
Macsteel Service Centers USA	www.macsteelusa.com	219.933.1000
Metals Supply Company, Ltd.	www.metalssupply.com	713.330.8080
Metals USA - Plates and Shapes Group	www.metalsusa.com	800.523.3340
Namasco Corporation	www.namasco.com	678.259.8863
O'Neal Steel	www.onealsteel.com	205.599.8000
Reliance Steel & Aluminum Co.	www.rsac.com	323.582.2272
Saginaw Pipe Co.	www.saginawpipe.com	205.664.3670
Triad Metals International	www.triadmetals.org	215.784.0240
Triple-S Steel Supply & Subsidiaries	www.sss-steel.com	713.697.7105