

AISC PLANS A SINGLE SPECIFICATION

by 2005

After completing the 1999 Load and Resistance Factor Design (LRFD) Specification for Structural Steel Buildings (the basis for the 3rd Edition AISC LRFD Manual), the AISC Committee on Specifications set its sights on future goals. A major issue to be addressed is the current dichotomy between the 1989 Allowable Stress Design (ASD) Specification and its LRFD counterpart. Countless discussions and debates on the differences, future, and relative attributes of each steel design specification—both within and outside of AISC—have led to one inescapable conclusion: a unified AISC design specification is necessary to capture the most current knowledge and practices of both methods.

In November 2000, the ANSI-accredited AISC Committee on Specifications agreed to develop "The AISC Specification" with the full support of the AISC Board of Directors. This landmark decision means that by approximately 2005, a single specification will provide design alternatives for both factored and service load requirements. This future specification, when adopted by building codes, will replace previous AISC specifications.

Along with the merging of allowable stress and limit states design criteria into one, the new specification will incorporate appropriate simplifications and usability features to increase design efficiency. These improvements

are in line with the stated mission of the AISC Committee on Specifications:

Develop the practice-oriented specification for structural steel buildings that provides for

- life safety
- economical building systems
- predictable behavior and response
- efficient use

To expedite development of the specification, the Committee on Specifications has established a new Ad Hoc Development Task Committee, headed by James Fisher of Computerized Structural Design, S.C., Milwaukee, WI. The ad hoc committee will solicit, discuss, and prepare new revised specification provisions for review and ballot by the full Committee on Specifications. Work items already under consideration include overall format, nomenclature and organization of the document, and the placement and determination of equivalent ASD factors of safety for all limit states. Adjustments to aspects of column and beam design are also being considered.

By focusing industry efforts upon the creation of a single specification, the best technical information and usability factors will be brought under the umbrella of a single document. The design of steel structures will return to the seemingly "simpler" times of AISC's first 70 years.

To bridge the gap between now and the single steel specification, the Com-

mittee on Specifications will develop a supplement to the 1989 ASD Specification, tentatively due out by late 2001. This short supplement will update the 1989 ASD Specification to include the current versions of other referenced standards and codes together with related major design developments.

AISC and its Committee on Specifications have made a serious commitment towards this objective, and we recognize that you, the user, have important input to be considered. With this in mind, we welcome and encourage your input. Please submit any specific ideas for specification improvements, simplifications, or problems to:

American Institute of Steel Construction
Committee on Specifications
c/o Cynthia J. Lanz

Director of Specifications
One E. Wacker Drive, Ste. 3100
Chicago, IL 60601

Email: newspec@aiscmail.com
Fax: (312) 644-4226

Nestor R. Iwankiw, P.E., is Vice President, Engineering and Research at AISC.

Cynthia J. Lanz is Director of Specifications and Secretary to the AISC Committee on Specifications.

THE UNIFIED SPECIFICATION **AISC**

To better understand what AISC means by a “unified specification,” Charlie Carter, AISC’s Director of Engineering and Continuing Education, answers a few frequently-asked-questions about the AISC unified specification effort.

Q • AISC has announced that the next AISC Specification will combine the LRFD and ASD Specifications into a single document. What does this mean?

A • The AISC Committee on Specifications has begun work on the next AISC Specification – a unified document that provides for design at both the factored-load level and the service-load level with a single set of strength provisions. Essentially, this means that no matter at which load level an engineer chooses to calculate loads in ASCE 7, there will be one set of strength equations in the AISC Specification with a resistance factor for LRFD and a factor of safety for ASD. As a result, future discussions about whether LRFD or ASD is better should amount to nothing more than a debate over whether ASCE’s factored-load combinations are easier or more difficult to apply than ASCE’s service-load combinations.

Q • Will serviceability requirements be unified as well?

A • Neither the ASD Specification nor the LRFD Specification currently prescribes serviceability limits because they vary so widely by application. Instead, it is generally required in the AISC Specification that buildings be serviceable. Some requirements can be found in the applicable building code. Many recommendations can be found in various references, including a few AISC Design Guides.

Nonetheless, the treatment required to ensure the serviceability of a steel structure is (and has always been) identical in LRFD and ASD. Therefore, serviceability requirements, such as deflection and drift limitations and floor vibration criteria, will actually be

the easiest to unify since they’re already unified.

Q • After 15 years in a dual-specification system, what prompted AISC to launch such a bold initiative now?

A • It was originally believed that there would be a natural transition from ASD to LRFD. For 15 years, all new information has been incorporated into LRFD, whereas little attention has been paid to ASD. Consequently, there is now too great a disparity in the requirements between the two methods, which really are not all that different anyway.

I also believe that far too great a divisiveness has developed (particularly between those who have willingly placed themselves at one end of the spectrum or the other) promising they will continue to advocate that only their preferred method, LRFD or ASD, is at all acceptable no matter what. I estimate that 15 percent of people are at each of the two extremes. Between them – the “middle 70” percent – are people who want a positive solution they can accept, not continued rhetoric and divisiveness. In all of the discussions and debates, it was the concerns and comments of this segment that were most telling of the need to find a way to all move forward and come back together at the same time.

The “bold initiative” as you call it was born of an objective assessment of the beliefs and biases of the “middle 70” as well as the hardened proponents of each method. It also grew from the search for a solution that would give all the best and most usable criteria for steel design and construction.

As with all good ideas, the idea of unification came quickly. Despite the obvious technical and emotional obstacles, it was clear that unification – bringing the best of both together – would represent the positive and natural progression that must occur for the design community and steel construction industry to all move forward together.

Q • What can you tell us about the process and time line for achieving a unified AISC Specification?

A • The development process will be a consensus committee process. This is how AISC does all its work on specifications.

To get things started and headed in the right direction, an ad-hoc task committee of the AISC Committee on Specifications has been assembled with very good balance of interests and a practical focus to develop a draft for the unified specification. Their charge is to integrate the two similar specifications and produce a single proposed draft that they believe represents the best of both in terms of safety, practicality, economy and efficiency. Once the ad-hoc task committee has completed their work, the remainder of the Committee on Specifications will put it to the test. Once finalized, the AISC Committee on Specifications and all of its formal task committees will use that single proposed draft for all subsequent development, including consensus review and approval.

The people serving on the ad-hoc task committee are all top-notch individuals – proven innovators who have a solutions-oriented attitude and an ability to work effectively and objectively with others to solve problems. I expect that the ad-hoc task committee will jump-start the pursuit of design-office practicality in the provisions in the AISC Specification. And interestingly enough, I think it will be the unification effort itself that perpetuates this pursuit in the subsequent and ongoing activities of the AISC Committee on Specification.

Approximately two-thirds of the membership of the AISC Committee on Specifications works in a design office or the steel construction industry. With two parallel specifications and only one of them under active development, those people could comfortably sit back and not speak up. All too often, I would hear later at the dinner after a committee meeting “that new provision we just voted into the LRFD

Specification is really elegant, but it seems too complex and I'll probably just continue to use the simple old ASD approach that I already know well." However, with a unified AISC Specification that replaces both the 1999 LRFD and 1989 ASD Specifications, I expect to see the entire Committee regularly and actively participating to make every provision that gets into the AISC Specification as good and practical as it can possibly be. And that is exactly the way it should be. Have you ever heard of a specification becoming simpler in a new edition?

As far as the time line for this work, the original estimates pegged it for release as the 2005 AISC Specification for Structural Steel Buildings. That release date will be adjusted (forward or backward) as the scope of work is better defined by the ad-hoc task committee and AISC Committee on Specifications.

Q • Is there any one aspect of the unified AISC Specification that excites you the most?

A • No. Every aspect of it excites me. Everything I see about it makes me think it is history in the making.

This effort is all about merging two similar but different specifications into a unified specification that is the best of both. And the discussions of the ad-hoc task committee to date have been extremely promising.

Everything is on the table. Nothing is out of bounds. Potential specification provisions are standing on their merits in terms of safety, practicality, economy and efficiency. And the members of the ad-hoc task committee are working in as genuine and dedicated a fashion as anyone could have hoped.

I was privileged to serve as the Secretary of the AISC Committee on the Code of Standard Practice during the development of the 2000 AISC Code of Standard Practice for Steel Buildings and Bridges. That diverse and broadly representative group came together in good faith to improve upon an AISC Code that had fallen into a state of mixed acceptance. And through hard

work and genuine participation, I believe they revitalized it into the best AISC Code ever.

I'm most excited again because I see the same positive spirit and genuine cooperation at work as the ad-hoc task committee has begun the creation of the draft unified AISC Specification that the AISC Committee on Specifications will use for subsequent development. I'm confident we will look back upon the initial work of the ad-hoc task committee and subsequent work of the AISC Committee on Specifications as a model for others responsible for the development of specifications and standards to follow.

Q • You have personally been a strong advocate for LRFD in the past. Have you changed your mind?

A • No, I don't think so. In the two-specification era, I advocated that the LRFD Specification as a whole was better than the ASD Specification as a whole. With the unification effort underway, I'm confident that good things will be maintained. Said another way, I think the unified specification as a whole will be better than I thought the LRFD Specification was.

I see the unified AISC Specification as a positive step forward for everyone. It must be recognized that, to some extent, the unified AISC Specification will represent change for everybody. But I think that change will be worth it for everybody to make.

Q • Will the current AISC Committee on Specifications be able to accomplish this endeavor?

A • Absolutely! The AISC Committee on Specifications, the ANSI-accredited consensus committee with expertise in structural steel building design and construction, charted this course. With essentially equal representation of the three areas of interest (user, producer and general interest entities), the committee membership includes structural engineers, steel fabricators, steel erectors, steel produc-

ers, educators and code officials. There is no more credible, authoritative or broadly diversified group representing the design community and steel construction industry anywhere.

Furthermore, the internal support of this effort by the AISC's staff and AISC Board of Directors is strong. With everyone's good will and cooperation, this effort will be successful.

Q • What will happen in the interim?

A • In the interim, the 1999 LRFD Specification for Structural Steel Buildings will become applicable as it is referenced in the applicable building code. Similarly, the 1989 ASD Specification for Structural Steel Buildings will remain applicable as it is referenced in the applicable building code.

An abbreviated supplement to the 1989 ASD Specification will be provided to address the safety-related disparities between it and the 1999 LRFD Specification. Although a full description of the supplement being developed is beyond the scope of this article, a few things are worthy of note. Treatment of service loads and service-load combinations will be updated to conform to the provisions in ASCE 7-98. References to other specifications, codes and standards (such as those from ASCE, ASTM, RCSC, AWS, etc.) will be updated to their most current editions. Filler-metal notch toughness requirements will be added in ASD as they have been in LRFD.

When available, this supplement will bring ASD more into line with the current reference standards and requirements for design and construction in LRFD. Looking further ahead, though, the unified AISC Specification will minimize the potential for disparity in provisions for steel design and construction.

Q • Are you saying that people should just wait for the unified AISC Specification and do what they are doing now until then?

A • No, not at all. I believe there is a reason for designers to get into the 1999 LRFD Specification now. It contains many newly developed provisions for real-life issues that designers regularly face. For example, there are new provisions that will address the strength and stiffness required for stability bracing for beams, columns and frames; a new section on evaluation of existing structures and treatment of design for fatigue has been significantly expanded and improved. Another item of note is the addition of filler-metal notch-toughness requirements.

I should also mention that the 3rd Edition LRFD Manual of Steel Construction will be a Manual unlike any other in recent memory. It will be condensed back into a thinner and lighter single volume. It will have new design aids, including tables for tension members and beam-columns. It will have improved guidance on material selection, fire protection, corrosion protection, consideration of thermal effects, and many other issues in the design and construction of steel buildings. This may just be like your Father's AISC Manual.

Charles J. Carter, S.E., P.E., is Director of Engineering and Continuing Education at the American Institute of Steel Construction, Inc. in Chicago, IL.