

UPDATE ON SAC ACTIVITY

To help mitigate hazards during future earthquakes and to facilitate post-disaster recovery, the Federal Emergency Management Agency has initiated a Program to Reduce Earthquake Hazards in Steel Moment Frame Structures. This broad-based and coordinated program of research, guideline development and training is administered and managed by the SAC Joint Venture (Structural Engineers Association of California, Applied Technology Council and California Universities for Research in Earthquake Engineering) under contract to FEMA.

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COST IMPACT OF SAC SEISMIC RECOMMENDATIONS

A series of model buildings have been designed to form a basis for analytical and cost impact investigations as part of the SAC Phase 2 Project. These buildings, which are assumed to be located on firm soil sites, consist of simple framing configurations with commonly used bay spacings, and heights of three, nine and twenty stories. Three buildings have been designed in each of three typical cities intended to represent areas of high, moderate and low seismicity (Los Angeles, Seattle and Boston).

Practicing structural engineering consultants with significant experience in this form of construction in each city participated in this activity, including Brandow & Johnston Associates (Los Angeles), KPFF Consulting Engineers (Seattle), and Lemessurier Consultants (Boston). Stanley Lindsey and Associates (Atlanta) has performed trial designs of these buildings using partially restrained connections. The buildings were first designed to meet the code

requirements and standards of practice that existed prior to the 1994 Northridge Earthquake. Subsequently, all of the buildings were re-designed to meet the recommendations presented in the FEMA 267. Finally, several different parameters (e.g., moment connection details, material strength, and designs as close to the maximum allowed interstory drift) were varied, and individual "post-Northridge" buildings were redesigned.

These model designs serve as a basis for a number of studies in the SAC Steel Project, by providing the following:

1. A means of cost comparison between pre-Northridge and post Northridge designs and a means of cost comparison between various post-Northridge alternatives.
2. A means of understanding the various design and construction implications of incorporating the FEMA 267 Interim Guidelines.
3. Information on areas of the Interim Guidelines that may require clarification or further information.
4. A basis for conducting detailed system performance investigations and performance prediction studies.
5. A basis for future trial applications of the draft Seismic Design Criteria document.

Some of the general initial conclusions resulting from these designs include the following:

- The moment frame member sizes did not change significantly between the pre Northridge and FEMA 267 designs, although column sizes tend to increase slightly in order to maintain the same ratio of beam-to-column strength.
- The use of continuity plates and the size of web doubler plates

increased.

- Moment connection welding procedures became significantly more expensive in terms of materials, labor and inspection.
- Wind-induced drift limits controlled the design of some members in the FEMA 267 designs in buildings in regions of high seismicity.

To assess the economic impact of various design approaches, Adamson Associates of San Francisco has been working closely with fabricators to develop cost estimates for the model building designs.

Significantly, the cost implications of incorporating the FEMA 267 guidelines are relatively small (on the order of few per cent) in relation to the total building cost. It is expected that reductions in the additional costs will occur as more definitive guidance is provided, causing more consistent construction requirements on different projects.

NEW SAC PUBLICATIONS TO BE RELEASED

In the coming months, several publications are being used by FEMA and the SAC Joint Venture to provide additional guidance for the design of steel moment resisting frames. The SAC web site (quiver.eerc.berkeley.edu:8080) can be consulted to find the latest information.

Scheduled to be published in the first quarter of 1998 is a comprehensive database of publicly available connection tests performed in the U.S. and Canada since the 1994 Northridge Earthquake. This document has been assembled by David Bonowitz (consultant) under SAC funding and categorizes test results through a wide range of variables such as material characteristics,

beam and column size, connection type, and ultimate rotation capacity. This information will be published in concise form as a FEMA report and will also be available as a database on the SAC WWW site.

A complete update of the Interim Guidelines (FEMA 267), originally published in Phase 1 of the FEMA-funded SAC effort, is scheduled to be prepared in the second half of 1998. After Supplement No. 1 to the Interim Guidelines (FEMA 267A) was published in April 1997, ongoing technical investigations both within and outside the SAC project are providing additional understandings and clarification of a number of issues of importance to the design and construction community. Publication later in 1998 or early 1999 of an up-to-date revision of the Interim Guidelines will ensure that such information is disseminated in a timely manner. It is likely that this revision will represent the last major change in existing recommendations until the final Seismic Design Criteria are published in the fourth quarter of 1999. Brief Design Advisories will be issued as warranted. Individuals or organizations that would like to suggest non-proprietary technical issues to be considered in the upcoming revision or Advisories are encouraged to contact the SAC Technical Office and to provide any supporting documentation for consideration by the guidelines development team.

A separate series of publications is being prepared to disseminate results from technical investigations and other activities in the SAC project. Known as Background Documents, these reports generally reflect interim findings of narrowly focused activities, do not provide general design guidance, and are not subjected to review prior to release. As such, a strong disclaimer appropriately accompanies these documents. Workshop proceedings, non-published

research materials from outside of the SAC project, and the final reports from the topical investigations and testing programs are examples of the documents included in this series. These are distributed upon request at a cost set to cover printing and shipping (call 800/480-2520).



New Regional Engineer

AISC Marketing, Inc., has hired a new New England Regional Engineer. Prior to joining AISC, Brian Miller spent 10 years as a structural engineer with Bath Iron Works, a major shipbuilder in Bath, ME.

His territory includes: Maine, New Hampshire, Massachusetts, Rhode Island, Vermont and New York (except: New York City, Long Island and Putnam, Rockland, Orange and Westchester counties).

He can be reached at 978/742-4916 (email: miller@aiscmail.com).

New EDI Standardization Underway

For more than a decade, software vendors and users have been discussing the possibility of creating an electronic data interchange (EDI) standard. Such a standard would greatly ease the transfer of information—such as project drawings, design calculations and connection designs—between all members of the design and construction team, including engineers, fabricators, detailers and erectors. In addition to increasing accuracy (there would no longer be any “oops, we incorrectly keyed some critical data”), it would reduce the cost involved with each project team reproducing drawings. Finally, an EDI standard will tighten project schedules and reduce project time.

While the creation of an EDI standard seems simple, in reality it faces numerous obstacles: Different vendors require different types of information; this information is stored in different fields of a database and there have been questions of liability responsibility in relation to any data corrupted during transfer. Still another difficulty is the large number of translators required to extract data from neutral files—an added expense for both engineers and fabricators and a difficulty which would be readily overcome through the use of a single EDI standard.

During the past few years, several EDI standards have been developed or announced (ranging from Fabtrol's KISS (Keep It Simple, Steel) standard to the European CIMSTEEL initiative. However, no EDI standard has been generally accepted by vendors or users.

AISC has determined that the development of an EDI standard is critical to the advancement of the

use of structural steel. Therefore, AISC has resolved to expedite the implementation of a commonly accepted EDI standard. However, rather than developing their own, AISC will investigate already existing standards and pick one. AISC will then endorse and promote that standard.

“Since AISC has chosen not to develop its own EDI standard, we’ve decided to provide all companies having developed their own EDI standards an opportunity to submit their EDI standards for review,” explained Steven Hamburg, P.E., AISC’s Software/Electronic Communication Director. Submitted standards will then be examined by an EDI Review Team, which will then make a recommendation to the AISC Board of Directors.

Those wishing to submit a proposed standard must do so prior to Oct. 30, 1998. “We hope to be able to announce and publish information about an AISC-endorsed EDI standard early in 1999,” Hamburg noted.

For more information on submitting an EDI standard, contact Hamburg at 312/670-5413 (email hamburg@aiscmail.com).