



## List of FEMA Reports Prepared for SAC CD01-01; a SAC Steel Project CD

- FEMA-350** Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings
- FEMA-351** Recommended Seismic Evaluation and Upgrade Criteria for Existing Welded Steel Moment-Frame Buildings
- FEMA-352** Recommended Postearthquake Evaluation and Repair Criteria for Welded Steel Moment-Frame Buildings
- FEMA-353** Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications
- FEMA-354** A Policy Guide to Steel Moment-Frame Construction
- FEMA-355A** State of the Art Report on Base Materials and Fracture
- FEMA-355B** State of the Art Report on Welding and Inspection
- FEMA-355C** State of the Art Report on Systems Performance of Steel Moment Frames Subject to Earthquake Ground Shaking
- FEMA-355D** State of the Art Report on Connection Performance
- FEMA-355E** State of the Art Report on Past Performance of Steel Moment-Frame Buildings in Earthquakes
- FEMA-355F** State of the Art Report on Performance Prediction and Evaluation of Steel Moment-Frame Structures

All reports are in PDF (Portable Document Format), readable with Adobe Acrobat™ or Adobe Acrobat Reader™. Adobe Acrobat Reader™ is available free from Adobe at [www.adobe.com/products/acrobat/readstep.html](http://www.adobe.com/products/acrobat/readstep.html).

To facilitate the use of these reports, each is bookmarked by chapter in the left column. Simply clicking on the title takes you to the appropriate section, which then appears on the right. In the table of contents, the list of figures and the list of tables, all entries are similarly linked to their respective locations in the document.

In the above list, the bold FEMA document numbers are linked to each report. The titles are linked to a more detailed description of each report.

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SAC is a joint venture of three nonprofit organizations: Structural Engineers Association of California, Applied Technology Council, and California Universities for Research in Earthquake Engineering. The SAC Steel Project is funded by the Federal Emergency Management Agency (FEMA).



The *Recommended Criteria* are primarily intended as resource documents for organizations engaged in the development of building codes and consensus standards for regulation of the design, construction, repair and upgrading of steel moment-frame structures that may be subject to, or have been subjected to, the effects of earthquake ground shaking. The set of publications includes:

- *FEMA-350 – Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings.* This publication provides recommended criteria, supplemental to *FEMA-302 – 1997 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures*, for the design and construction of steel moment-frame buildings and provides alternative performance-based design criteria.
- *FEMA-351 – Recommended Seismic Evaluation and Upgrade Criteria for Existing Welded Steel Moment-Frame Buildings.* This publication provides recommended methods to evaluate the probable performance of existing steel moment-frame buildings in future earthquakes and to retrofit these buildings for improved performance.
- *FEMA-352 – Recommended Postearthquake Evaluation and Repair Criteria for Welded Steel Moment-Frame Buildings.* This publication provides recommendations for performing postearthquake inspections to detect damage in steel moment-frame buildings following an earthquake, evaluating the damaged buildings to determine their safety in the postearthquake environment, and repairing damaged buildings.
- *FEMA-353 – Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications.* This publication provides recommended specifications for the fabrication and erection of steel moment frames for seismic applications. The recommended design criteria contained in the other companion documents are based on the material and workmanship standards contained in this document, which also includes discussion of the basis for the quality control and quality assurance criteria contained in the recommended specifications.

The information contained in these recommended design criteria is presented in the form of specific design and performance evaluation procedures together with supporting commentary, explaining part of the basis for these recommendations. Detailed derivations and explanations of the basis for these design and evaluation recommendations may be found in a series of State of the Art Reports prepared in parallel with these recommended criteria. These reports include:

- *FEMA-355A – State of the Art Report on Base Metals and Fracture.* This report summarizes current knowledge of the properties of structural steels commonly employed in building construction, and the production and service factors that affect these properties.
- *FEMA-355B – State of the Art Report on Welding and Inspection.* This report summarizes current knowledge of the properties of structural welding commonly employed in building construction, the effect of various welding parameters on these properties, and the effectiveness of various inspection methodologies in characterizing the quality of welded construction.
- *FEMA-355C – State of the Art Report on Systems Performance of Steel Moment Frames Subject to Earthquake Ground Shaking.* This report summarizes an extensive series of analytical investigations into the demands induced in steel moment-frame

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buildings designed to various criteria, when subjected to a range of different ground motions. The behavior of frames constructed with fully restrained, partially restrained and fracture-vulnerable connections is explored for a series of ground motions, including motion anticipated at near-fault and soft-soil sites.

- *FEMA-355D – State of the Art Report on Connection Performance.* This report summarizes the current state of knowledge of the performance of different types of moment-resisting connections under large inelastic deformation demands. It includes information on fully restrained, partially restrained, and partial strength connections, both welded and bolted, based on laboratory and analytical investigations.
- *FEMA-355E – State of the Art Report on Past Performance of Steel Moment-Frame Buildings in Earthquakes.* This report summarizes investigations of the performance of steel moment-frame buildings in past earthquakes, including the 1995 Kobe, 1994 Northridge, 1992 Landers, 1992 Big Bear, 1989 Loma Prieta and 1971 San Fernando events.
- *FEMA-355F – State of the Art Report on Performance Prediction and Evaluation of Steel Moment-Frame Buildings.* This report describes the results of investigations into the ability of various analytical techniques, commonly used in design, to predict the performance of steel moment-frame buildings subjected to earthquake ground motion. Also presented is the basis for performance-based evaluation procedures contained in the design criteria documents, *FEMA-350*, *FEMA-351*, and *FEMA-352*.

In addition to the recommended design criteria and the State of the Art Reports, a companion document has been prepared for building owners, local community officials and other non-technical audiences who need to understand this issue. *A Policy Guide to Steel Moment Frame Construction (FEMA-354)* addresses the social, economic, and political issues related to the earthquake performance of steel moment-frame buildings. *FEMA-354* also includes discussion of the relative costs and benefits of implementing the recommended criteria.

An ERRATA folder has also been included, containing corrected pages in PDF format for the published (hard copy) versions of FEMA-350 and FEMA 353. These may be printed out and inserted in the documents.

The errata have already been incorporated into the PDF version of the documents on the CD.