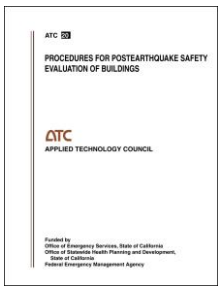
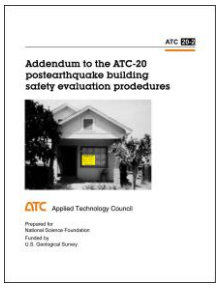
ATC-20 Series, Preparation of Procedures for Postearthquake Safety Evaluation of Buildings

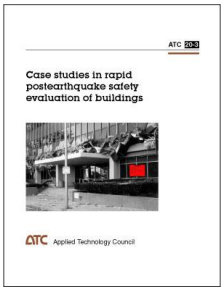
Two weeks prior to the damaging Loma Prieta earthquake near San Francisco in 1989, ATC released the first in a series documents containing guidance for rapid and detailed evaluation of earthquake-damaged buildings (of all types) to determine if they can be safely occupied (the ATC-20 project series). Included are the basic procedures manuals (ATC-20 and ATC-20-2), a field manual (ATC-20-1), a manual containing case studies of rapid evaluation (ATC-20-3), a training slide set (ATC-20-T), and a TechBrief concerning earthquake aftershocks and building safety evaluation (TechBrief 2).



ATC-20 Report, *Procedures for Postearthquake Safety Evaluation of Buildings* (1989): The ATC-20 report (initial document in this series) provides procedures and guidelines for making on-the-spot evaluations and decisions regarding continued use and occupancy of earthquake damaged buildings. Written specifically for volunteer structural engineers and building inspectors, the report has become the de-facto national standard for safety evaluation of earthquake-damaged buildings. The report includes rapid and detailed evaluation procedures for inspecting buildings and posting them as INSPECTED (apparently safe, green placard), LIMITED ENTRY (yellow placard) or UNSAFE (red placard). Also included are special procedures for evaluation of essential buildings (e.g., hospitals), evaluation procedures for nonstructural elements and geotechnical hazards, and guidance on human behavior following earthquakes.



ATC-20-2 Report, *Addendum to the ATC-20 Postearthquake Building Safety Evaluation Procedures* (1995): The report, published in 1995, provides updated assessment forms, placards, and procedures that are based on an in-depth review and evaluation of the widespread application of the ATC-20 procedures following five earthquakes occurring after the initial release of the ATC-20 report in 1989. One of the principal recommendations is the replacement of the yellow LIMITED ENTRY posting placard with a revised yellow placard entitled, RESTRICTED USE. Also included are procedures for conducting initial wind-shield surveys of damaged areas, guidance on estimating the cost to repair earthquake damage, and updated guidance on human behavior following natural disasters, including a concise handout for owners and occupants of damaged buildings.



ATC-20-3 *Case Studies in Rapid Postearthquake Safety Evaluation of Buildings* (1996): The ATC-20-3 report contains 53 case studies of specific buildings evaluated using the ATC-20 Rapid Evaluation procedure, including updates described in the ATC-20-2 Addendum. The 53 case studies include 21 from the 1989 Loma Prieta earthquake and 12 from the 1994 Northridge event. Rapid Evaluation is the first, and many times the only, safety evaluation performed. Each case study is illustrated with photos and describes how a building was inspected and evaluated for life safety, and includes a completed safety assessment form and placard (INSPECTED, RESTRICTED USE, OR UNSAFE). The report is intended to be used as a training and reference manual for building officials, building inspectors, civil and structural engineers, architects, disaster workers, and others who may be asked to perform safety evaluations after an earthquake.

ATC-20-1 *Field Manual, Postearthquake Safety Evaluation of Buildings, Second Edition* (2005): In 2005, sixteen years after ATC introduced the first edition of the ATC-20-1 report, *Field Manual: Postearthquake Safety Evaluation of Buildings* (companion document to the above described ATC-20 Report), ATC published the second edition, which has been updated to include:

- the RESTRICTED USE placard, which was introduced in 1995 (replacing the LIMITED ENTRY placard),
- updated evaluation forms, which were also introduced in 1995,
- new examples,
- more information on steel moment-frame buildings,
- a chapter on mobile homes and manufactured housing,
- guidance on aftershocks and entering damaged buildings,
- new information on barricading, and
- resources available on the internet pertaining to postearthquake safety evaluation.

The pocket-sized field manual summarizes the postearthquake safety evaluation procedures in brief concise format designed for ease of use in the field. Updated forms for rapid and detailed evaluation, and posting placards, can be downloaded from www.ATCouncil.org.

ATC-20-T *Postearthquake Safety Evaluation of Buildings Training CD* (2002). This Training CD is intended to facilitate the presentation of the contents of the ATC-20 and ATC-20-2 reports in a 4½,-hour training seminar. The Training CD contains 230 slides of photographs, schematic drawings and textual information, with speaker's notes. Topics covered include: posting system, evaluation procedures, structural basics, wood frame, masonry, concrete, and steel frame structures, nonstructural elements, geotechnical hazards, hazardous materials, and field safety. (Note: the CD has not yet been updated to include information on the second edition of the ATC-20-1 Field Manual).

ATC TechBrief 2, *Earthquake Aftershocks — Entering Damaged Buildings* (1996) is a brief, concise report containing guidance on how long inspection teams should occupy damaged buildings, as a function of time since the main shock, the magnitude of the main shock, and the stability of the damaged building. The guidance (downloadable from www.ATCouncil.org) pertains to the ATC-20 procedures, as updated in the ATC-20-2 Addendum, and is based on aftershock research conducted by the U. S. Geological Survey.