Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

Post-Disaster Safety Assessment Program (SAP) Coordinator Student Manual

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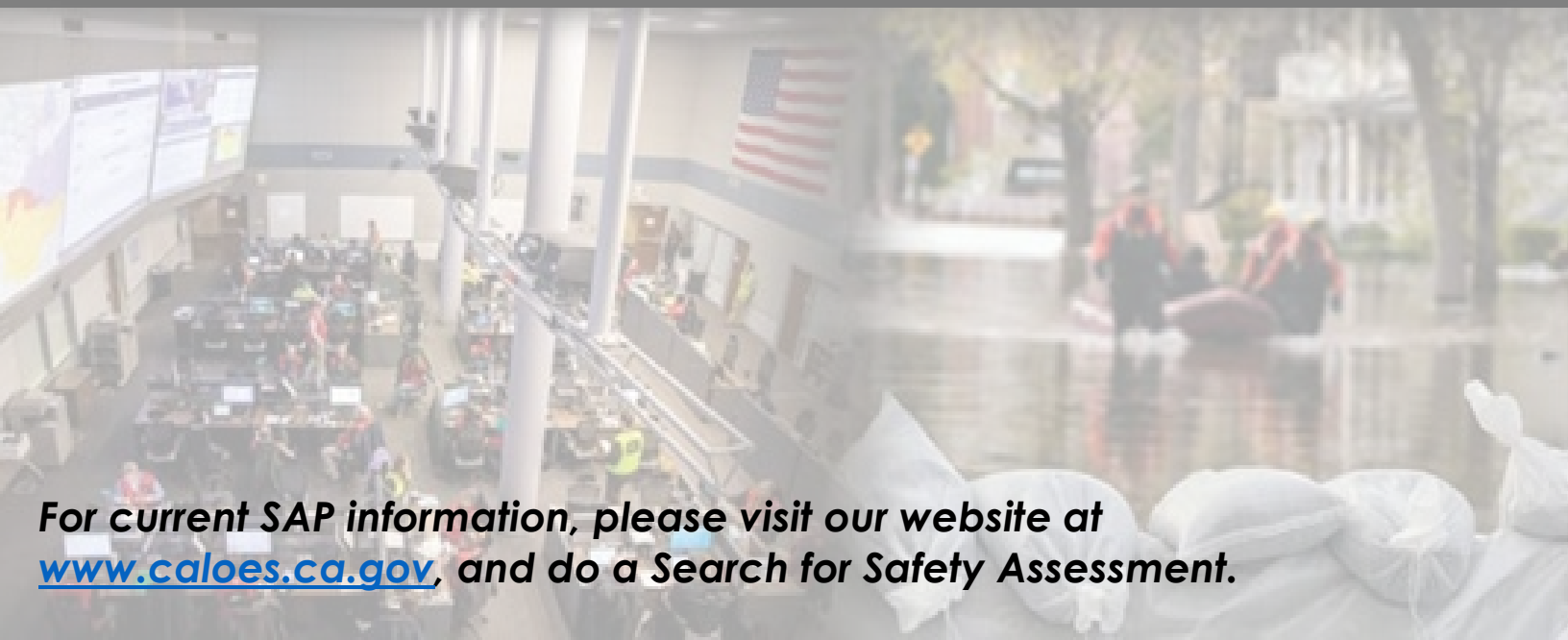

For current SAP information, please visit our website at www.caloes.ca.gov, and do a Search for Safety Assessment.

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EMERGENCY MANAGEMENT OVERVIEW

Unit 1 Training Guidance

Overview

This section is a basic overview of the Incident Command System (ICS), the California Standardized Emergency Management System (SEMS), and a review of the National Incident Management System (NIMS).

Training Goal

This course will provide participants with a basic understanding of ICS, SEMS, and NIMS, as well as their descriptions and use.

Objectives

At the end of this unit, participants will be able to:

- Explain the features of ICS.
- Understand how the Safety Assessment Program fits within the ICS functions.
- Be aware of the use of ICS within SEMS.
- Understand the features and components of SEMS.
- Understand the five levels of government within SEMS.
- Relate the additional requirements of NIMS over SEMS.

Unit 1.0: Emergency Management Overview

1.1 - Incident Command System

The Incident Command System (ICS) was developed for emergency management as a part of the FIRESCOPE (Firefighting Resources of California Organized for Potential Emergencies) program during the 1970s. Fire conflagrations in Southern California caused property losses that ran into the millions of dollars, with much loss of life. These losses prompted a case study that revealed that inadequate emergency management was the single largest contributor to response problems, requiring an effective solution.

Weaknesses in incident management at the time included:

- Lack of accountability
- Poor communication
- Lack of a planning process
- Overwhelmed Incident Commanders
- No useful method to integrate inter-agency requirements

The massive mutual aid responses needed for major disasters often require the combined efforts of scores of responding agencies. However, at the time, local emergency response agencies often had unique methods that impaired or prevented integration with other agencies under mutual aid response.

As a result, ICS was developed to provide an integrated and consistent framework for disaster response. ICS eventually became one of the foundation elements of the Standardized Emergency Management System (SEMS) in California, and is now at the heart of the National Incident Management System (NIMS). ICS is recognized worldwide as the preferred approach for managing incidents and disasters.

1.1.1 - ICS Features

ICS allows for a consistent approach for responding agencies to work together to attack the incident or disaster. The primary features of ICS are:

1. **Five Functions:** ICS divides the workload into five functions, these being: management/command; operations; logistics; planning/intelligence; and finance/administration. This allows each of the workload items to be handled by persons who are experienced in these fields.

2. **Span of Control:** ICS also defines an effective "span of control" by restricting the number of staff under an incident commander or a manager to a maximum ratio of one to seven, and an ideal ratio of one to five.
3. **Chain of Command:** ICS establishes that there will be a single authority who is completely responsible for the outcome of the incident management. This can either be a Single Command, where one agency is involved, or a Unified Command, which unites multiple jurisdictions. In a Unified Command, a single coordinated Action Plan will direct all activities.
4. **Unity of Command:** In ICS, a staff member reports to only one supervisor or commander. This eliminates the possibility of conflicting staff direction from multiple managers.
5. **Management by Objective:** The Management/Command and Planning/Intelligence functions are responsible for developing a set of Strategic Objectives in an Action Plan that will be carried out during the next Operational Period. The Operational Period can vary in length from an hour to twelve hours or longer, depending on the nature of the incident. In practice, Operational Periods are most often twelve hours long.
6. **Common Terminology:** The use of "plain language" terminology is essential for interagency cooperation. A common set of mutually understandable terms is critical for disaster communications and team building.
7. **Integrated Communications:** Communications must occur in such a manner so that mutual aid agencies can freely speak to one another. This element is also called "interoperability," and consists of the necessary hardware for communications, the planning effort for using all available communication resources, and the networks for transferring information internally and externally.
8. **Comprehensive Resource Management:** ICS requires the tracking and accounting of all assets and personnel during an incident response, from mobilization to demobilization.

1.1.2 - ICS Functions

The following provides a brief summary of the titles and definitions of the activities associated with ICS functions. The Safety Assessment Program fits under the "Construction and Engineering Branch" of the Operations function.

Command/Management

- **Field Response Level:** Command is responsible for the directing, ordering, and/or controlling of resources.
- **Emergency Operations Center Level:** Management is responsible for overall emergency coordination and policies.

Operations

- **Field Response Level:** Responsible for the coordinated tactical response of all field operations as per the Incident Action Plan.
- **Emergency Operations Center Level:** Responsible for the coordination of all jurisdictional operations in support of the emergency response as per the Emergency Operations Center Action Plan.

Planning/Intelligence

- **Field Response Level:** Responsible for the collection, evaluation, documentation, and use of information related to the incident. Responsible for organizing the Action Plan for the next Operational Period.
- **Emergency Operations Center Level:** Responsible for the collection, evaluation, dissemination, and documenting information related to all jurisdictional response activities. Responsible for organizing the Action Plan for the next Operational Period.

Logistics

- **Field Response Level:** Responsible for providing personnel, equipment, services, materials, and facilities in support of the incident.
- **Emergency Operations Center Level:** Responsible for providing personnel, equipment, services, materials, and facilities in support of jurisdictional response activities as required.

Finance/Administration

- **Field Response Level:** Responsible for financial and cost analysis, and administrative aspects not handled by the other functions.
- **Emergency Operations Center Level:** Responsible for broad fiscal and recovery responsibility, and overall fiscal accountability.

1.2 - Standardized Emergency Management System (SEMS)

As a result of the 1991 East Bay Hills Fire in Oakland, California, State Senate Bill 1841 was passed by the California legislature and made effective January 1, 1993. The law is found in Section 8607 of the California Government Code. The intent of this law is to improve the coordination of state and local emergency response in California.

The statute directed the California Governor's Office of Emergency Services (Cal OES), in coordination with other state agencies and interested local emergency management agencies, to establish by regulation the Standardized Emergency Management System (SEMS). The SEMS regulations took effect in September of 1994.

1.2.1 - Purpose and Scope of the SEMS Law

The basic framework of SEMS includes the following:

- The Incident Command System (ICS).
- Interagency coordination.
- The State's Master Mutual Aid Agreement (established in 1950) and mutual aid program.
- The Operational Area structure.
- A five-level emergency management response organizational structure, activated as needed.

More information on each of these is found later in this discussion.

The use of SEMS includes the following:

- The flow of emergency information and resources within and between involved agencies at all SEMS organizational levels.
- The process of coordination between responding agencies.
- The rapid mobilization, deployment, use, and tracking of resources.

SEMS is designed to be flexible and adaptable to the various sorts of emergencies that can occur in California, and to meet the emergency management needs of all responders. SEMS is therefore an all-hazards approach to managing emergencies.

By law, State agencies must use SEMS when responding to emergencies involving multiple jurisdictions or agencies.

Local governments are strongly encouraged to use SEMS; they must use SEMS to be eligible for state funding of eligible response-related personnel costs. While local governments are not required to take the SEMS Approved Course of Instruction (ACI), they are required to ensure that responders can successfully implement SEMS through their training.

SEMS is a management system based on a proven approach that has been in use for nearly thirty years. SEMS provides an organizational framework and guidance for operations at each level of the State's emergency management system. It provides the umbrella under which all response agencies may function in an integrated fashion.

1.3 - Need for SEMS Training

Training is essential for the effective use of SEMS at all levels. The State of California developed and provides an Approved Course of Instruction (ACI) for SEMS. Agencies may use the ACI developed by the State, or use an internal training program to meet training requirements and obtained necessary competencies. Training competencies are described in the State's training curriculum as performance objectives. This training is available through the training arm of Cal OES, the California Specialized Training Institute (CSTI). More information on this is available at the Cal OES website, www.caloes.ca.gov, under the "Cal OES Divisions" header, then the "CSTI" link.

There are four courses within the SEMS Approved Course of Instruction:

- *Introductory Course* – A self-study or instructor-based course.
- *Field Level Course* – Seventeen modules of instruction on the Incident Command System are available for the Field Response Level course.
- *Emergency Operations Center (EOC) Course* – This course consists of three chapters that can be adapted for use by all agencies or organizations utilizing emergency operations centers.
- *Executive Course* – An executive overview of SEMS, provided as a self-study or instructor-based course.

The Approved Course of Instruction includes participant reference materials, instructor guidelines, visual materials, and tests and exercises.

1.4 - SEMS Components and Features

1.4.1 - Four Components of SEMS

SEMS integrates several of the State's primary emergency response programs. The primary components of SEMS are:

Incident Command System (ICS) – As stated earlier, this was developed as a part of the FIRESCOPE program during the 1970s by an interagency working group representing local, state, and federal fire services in California.

After field tests, ICS was adopted by the fire services in California as the standard all-hazards response system. ICS was also adopted nationally by federal land management agencies as the standard for response to all wild land fires.

A national generic version of ICS was developed by a multi-discipline working group which is used in the SEMS Field Response Level course. Modules on Mutual Aid that address coordination between the field and other SEMS levels have been added to that curriculum.

Interagency Coordination – As it applies to SEMS, this means the participation of various agencies and disciplines involved at any level of the SEMS organization working together in a coordinated effort to facilitate decisions for overall emergency response activities, including the sharing of critical resources and the prioritization of incidents for management.

The cooperative and collaborative working relationship between police, fire, public works, and parks departments in an EOC is an example of the interagency coordination intended under SEMS. Another such example would the collaborative operational coordination that might occur between municipal police, county sheriff, California Highway Patrol, and California National Guard elements that are involved in the same response.

Master Mutual Aid Agreement – This was originally signed in 1950. Under this agreement, the State of California joined together with all its cities and counties to provide for a comprehensive program of voluntarily providing services, resources, personnel, and facilities to jurisdictions when local resources prove to be inadequate to cope with a disaster or situation.

Written mutual aid plans and operating procedures were developed for several discipline-specific mutual aid systems that function on a statewide basis within the Master Mutual Aid Agreement, including fire response and law enforcement.

The current and planned mutual aid systems form essential links within SEMS. A comprehensive discussion of mutual aid is contained in the SEMS Guidelines, and Module 16 of the Field Level Course of Instruction is devoted to Mutual Aid.

Lake County Operational Area

<u>*Operational Areas*</u> – This constitutes one of the five organizational levels in SEMS. An Operational Area consists of a county government with its resources, and all the political subdivisions within the county's borders and their resources. The governing bodies of each county and of the political subdivisions in the county organize and structure their Operational Area. The county will be the lead agency for the Operational Area unless another arrangement is established by agreement.

The lead agency in the Operational Area is responsible for:

- Coordinating information, resources, and priorities among the local governments within the Operational Area.
- Coordinating information, resources, and priorities between the regional level and the local government level.
- Using interagency coordination to facilitate decisions for overall Operational Area level emergency response activities.

Overall responsibility for the formation of the Operational Area rests with the Chairman of the Board of Supervisors for each county.

The Operational Area is used:

- For coordination of emergency activities within the geographic area of the county.
- To serve as a link in the system of coordination between the Cal OES Regional EOC (REOC), and the EOCs of the political subdivisions within the Operational Area.

1.4.2 – Organizational/Response Levels & Activation Requirements

SEMS regulations describe five organizational response levels, with ICS used at each level. The levels are:

- Field or incident

- Local government where the incident is occurring
- Operational Area of that local government
- Region of that operational area
- State

The following is a brief description of each level.

Field or Incident Response Level – This is the level where emergency response personnel and resources are used to carry out tactical decisions under the command of an appropriate authority in direct response to an incident or threat. SEMS regulations require the use of ICS at the field response level of an incident. The Field Response level is described in the SEMS Guidelines, and in the Field Level Approved Course of Instruction.

Local Government Level – Includes counties, cities, and special districts. Local governments manage and coordinate the overall emergency response and recovery activities within their jurisdiction. In SEMS, the local government emergency management organization, and its relationship and connections to the Field Response level, may vary depending on factors related to the local government's geographical size, population, function, or complexity. The Local Government level is described further in the SEMS guidelines.

Operational Area Level – This is the intermediate level of the State of California's emergency management organization. The Operational Area encompasses the particular county involved and all of its cities and special districts located within that county. The Operational Area manages and/or coordinates information, resources, and priorities among local governments within the Operational Area, and serves as the coordination and communication link between the local government level and the Cal OES Region level.

It is important to note that the Operational Area concept does not mean that the county government itself is managing and coordinating the response and recovery activities within the county, even though the Operational Area encompasses the entire county area. In most cases, the county EOC will function as both the Operational Area EOC and the EOC for the county organization.

Cal OES Mutual Aid Regions Map

Regional Level – The State of California has been divided into six mutual aid regions. The purpose of a mutual aid region is to provide for the more effective application and coordination of mutual aid and other emergency-related activities. Cal OES provides administrative oversight over the mutual aid regions through three Administrative Regional Offices (Coastal, Inland, and Southern). In SEMS, the Regional Level manages and coordinates information and resources among Operational Areas within the mutual aid region, and also between the Operational Areas and the State level. The Regional Level also coordinates overall state agency support for emergency response activities within the region. The Regional Level is described further in the SEMS Guidelines.

State Level – This is managed at the State Operations Center (SOC) at Cal OES Headquarters in Mather, CA, near Sacramento. Cal OES is responsible for oversight of the SOC per the California Emergency Services Act (California Government Code Sections 8585 through 8589.7, notably Section 8587), as well as the SEMS Regulations. Cal OES is responsible for coordinating resource requests and resolving priority issues that might arise in at the Regional Level, or between the three Cal OES Administrative Regions.

The SOC is also responsible for coordinating with FEMA and other federal agencies involved in the implementation of the Federal Response Plan (FRA) in California. The State Level is described further in the SEMS Guidelines.

1.4.3 - SEMS Concept of Teamwork, Coordination and Effectiveness

SEMS, as an emergency management system, provides for a fully integrated and coordinated response to emergencies involving multiple agencies and jurisdictions at all SEMS levels.

1.4.4 - SEMS Implementation

The SEMS Statute requires all state agencies to implement and use SEMS when responding to emergencies involving multiple agencies and jurisdictions at all SEMS levels.

Local governments are encouraged to use SEMS when responding to emergencies, but are not required to do so. They are encouraged to use SEMS so they can obtain state reimbursement for eligible response-related personnel costs. Nevertheless, SEMS has enjoyed widespread acceptance and use in California by local governments.

The following material was developed by an interagency working group to assist state and local agencies in implementing and maintaining SEMS.

- SEMS Statute: California Government Code Section 8607.
- SEMS Regulations: California Code of Regulations Title 19, Division 2, Chapter 1, Sections 2400 – 2450.
- SEMS Guidelines (in three parts).
- SEMS Approved Course of Instruction:
    - Introductory Course
    - Field Course
    - Emergency Operations Center Course
    - Executive Course

1.5 - Emergency Management Assistance Compact (EMAC)

If California's resources are overwhelmed in an emergency and assistance is needed from other states, Cal OES can request aid through the Emergency Management Assistance Compact (EMAC). EMAC is a direct state-to-state

mutual aid arrangement. Cal OES can also send aid to other states through EMAC.

Immunity from liability and workers compensation, both features of the California Safety Assessment Program (SAP), go with SAP personnel who are sent to other states under EMAC. Also, professional licenses and certifications recognized in California are also accepted in receiving states under Article 5 of EMAC, and vice versa, which is why the California Safety Assessment Program accepts professional licenses from states other than California.

There are now thousands of persons trained in the California Safety Assessment Program who reside outside California, along with numerous SAP-certified trainers. The State of California sent many resources under EMAC to Louisiana and Mississippi in 2005 to help with the aftermath of Hurricane Katrina, including 86 SAP personnel. Four SAP personnel were also sent under EMAC to Alaska in response to the November 2018 Anchorage Earthquake. Most recently SAP Mission Tasked 10 SAP personnel, under EMAC, to aid in the recovery of the 2023 Maui Fires.

1.6 - Federal Agency Resources

Cal OES must request Federal resources on behalf of the State through the Federal Emergency Management Agency (FEMA). Federal resources would include personnel and equipment from the Department of Defense (including the U.S. Army Corps of Engineers), U.S. Forest Service, Centers for Disease Control, and other federal agencies. A FEMA liaison is often present at the SOC during emergencies involving State agency response.

1.7 - National Incident Management System (NIMS)

NIMS (released in 2004) is a federal arrangement that seeks to implement ICS into the emergency management structures of all fifty states, all U.S. territories, and all U.S. tribal governments. It also seeks to unify these systems into a single approach to emergency management.

Because NIMS was modeled after California's ICS structure, the integration of NIMS into SEMS has not required any profound adjustments of SEMS. The changes so far are in the form of add-ons or simple adjustments to the SEMS processes. These have mostly occurred with regards to:

- After Action/Corrective Action Reports

- Resource management (equipment and personnel typing)
- Training

1.7.1 - NIMS After Action/Corrective Action Reports

An After Action Report is a post-event report of what went well in the handling of the disaster response, what didn't go well, and the proposed activities for correcting the deficiencies or problems.

California's SEMS Statute requires that Cal OES prepare a statewide After Action Report after each declared disaster within 120 days of the incident. The After Action Report compiles the efforts of state agencies and local governments with respects to the response and recovery efforts of declared disasters, identifying as well the corrective actions that should be carried out to improve efforts for the future.

NIMS requires After Action Reports for all sorts of public events as well as disasters, large and small.

NIMS also requires accountability for corrective actions. Agencies and local governments must agree to carry out corrective actions, and must report the date that the corrective action was completed.

1.7.2 - NIMS Resource Typing

NIMS requires that resources such as personnel, equipment, and teams are identified and accounted for. There are 120 resource types identified in NIMS. FEMA has a free inventory database called the Incident Resource Inventory System (IRIS), which allows state and local governments to identify their available resources in such a way that these will be shared nationally and housed locally. The Tier 1 Resource Typing definitions are broken into the following categories:

1. Animal Health Emergency
2. Incident Management
3. Emergency Medical Services
4. Fire and Hazardous Materials
5. Communications
6. Law Enforcement
7. Public Works
8. Search and Rescue

9. Mass Care
10. Emergency Management (SAP resources are found here)
11. Logistics
12. Medical and Public Health

The four SAP resource types available through IRIS are:

- Post-Disaster Building Safety Evaluator (ID# 10-509-1448)
- Post-Disaster Building Safety Evaluation Team (ID# 10-509-1261)
- Post-Disaster Building Safety Evaluation Strike Team Leader (ID# 10-509-1447)
- Post-Disaster Building Safety Evaluation Strike Team Technical Supervisor (ID# 10-509-1445)

More information on this can be found at www.fema.gov/emergency/nims.

1.7.3 - NIMS Training Requirements

Agencies and local governments seeking NIMS compliance must have their employees trained appropriately. Please refer to the Five-Year NIMS Training Plan to determine the level of training necessary for particular individuals (again, at the FEMA NIMS website shown above). The following NIMS courses are available, both through FEMA's Emergency Management Institute in Emmitsburg, MD, and with the California Specialized Training Institute (CSTI):

- FEMA ICS-100, Introduction to the Incident Command System
- FEMA ICS-200, ICS for Single Resources and Initial Action Incidents
- FEMA ICS-300, Intermediate ICS
- FEMA ICS-400, Advanced ICS
- FEMA IS-700, National Incident Management System (NIMS), An Introduction
- FEMA IS-800, National Response Framework (NRF), An Introduction

As stated earlier, this training is available through CSTI. More information on this is available at the Cal OES website, www.caloes.ca.gov, under the "Cal OES Divisions" header, then the "CSTI" link.

1.7.4 - NIMSCAST

The NIMS Compliance Assistance Support Tool (NIMSCAST) is a web-based system for measuring compliance with NIMS and overall emergency

readiness. The NIMS Integration Center, or NIC, has arranged a series of questions, or "metrics," to measure these.

Any government entity receiving preparedness grants must be NIMS compliant, so there is a strong incentive for cities and special districts to examine their own compliance status by completing NIMSCAST.

UNIT 2:

SAFETY ASSESSMENT OPERATIONS

Unit 2: Training Guidance

Overview

This section provides guidance on planning for and performing a successful Safety Assessment Program (SAP) response operation based on best practices in California, U.S.A., and New Zealand. Certain building safety related issues such as cordoning and shoring will also be discussed.

Training Goal

This course will provide participants with a basic understanding of how to prepare for and conduct a successful SAP response operation.

Objectives

At the end of this unit, participants will be able to:

- Identify key personnel for the operation.
- Assemble resources in preparation for the event.
- Identify locations to set up the SAP operations in.
- Identify facilities essential to managing the disaster and buildings most at risk.
- Pre-determine monitor buildings to watch for aftershock damage.
- Set up specialized strike teams to focus on sectors of building stock.
- Prepare for community sheltering in place and securing possessions from unsafe buildings.
- Prepare press releases for SAP and for public media.
- Explain steps needed in times of catastrophic disaster.
- Prepare a needs assessment for number and type of SAP evaluators.
- Perform intake and assignment of SAP evaluators.
- Perform documentation of results and manage call center.
- Demobilize teams and hand off role to next SAP Coordinator.
- Understand issues related to cordoning, barricades, shoring, and repair vs. demolition.

Unit 2: Safety Assessment Operations

2.1 - Introduction

This section of the SAP Coordinator manual is the result of much research into how safety assessment operations are conducted around the world. An examination was made into how ATC-20 is used in Europe, Japan, and New Zealand to compile what the best practices are. The purpose of this chapter is to convey these best practices in such a way that local building departments can use them in a flexible manner to best meet the needs of the local disaster response.

In Italy and Japan, a very detail-oriented approach is used to evaluate potentially damaged buildings for post-disaster use. These methods require a degree of care and explanation of damage that would most certainly be best managed by large numbers of experienced structural engineers. These approaches are also time-consuming. For these reasons, although the depth of information obtained is laudable, the swift clearing of usable building stock using these methods is not as rapidly obtained as either the public in the U.S. would expect, or as the current methods found in ATC-20 would allow.

It is interesting to note that the ATC-20 program in Greece once was as detail-oriented as Italy's program is. However, in 1996, Greek authorities decided to change their ATC-20 based program to a more streamlined version. Greece historically experiences about half of all of Europe's earthquakes.

The island nation of New Zealand suffered catastrophic damage in Christchurch, on the South Island in a series of earthquakes that began in September of 2010, culminated in the deadly February 22, 2011 M6.3 earthquake. New Zealand authorities launched their ATC-20 based program with little time for preparation or training, and courageously dealt with a very difficult state of emergency. In the process, they developed a number of innovations that are captured as best practices in this publication.

As a clarification, the terms "local government" and "jurisdiction" are used synonymously in this manual.

2.1.1 - Coordinator Training and Background

A SAP Coordinator must be already trained in the SAP Evaluator course material. This is essential, otherwise many of the subjects and issues covered in this chapter will not be understood.

If possible, the SAP Coordinator should be the building official, or a lead building inspector, in their jurisdiction. The Coordinator may also be someone who is in an emergency management role in the jurisdiction, who will be standing in for the building official for this particular purpose.

2.2 - Planning Before an Event

2.2.1 - Designating Key Personnel

There should be at least two persons trained as SAP Coordinators for every local government. This provides a backup arrangement in case one person is absent. More trained personnel is better than less, since that would also provide a depth of field to allow for replacements as the disaster response continues, especially in the case of catastrophic disasters.

Emergency managers who could be trained as SAP Coordinators could include, but not be restricted to, the city manager, fire chief, emergency services coordinator, or public works director. In addition, staff should be identified to take care of data entry and call center activity.

School districts usually do not have building department or engineering staff. Nevertheless, school districts can have trained SAP Coordinators on staff, who can then request SAP Evaluators from the Operational Area as any jurisdiction can. School districts can also enter into a Memorandum of Understanding (MOU) with adjacent local governments for SAP evaluators, or can sign contracts with engineering or architectural firms to have SAP evaluation services performed after a disaster.

It is good practice to include these roles as part of the continuation of operations/continuation of government (COOP/COG) plan for the jurisdiction. Moreover, all those who are identified as part of the SAP coordination effort should practice their roles with exercises on a regular basis, at least annually.

2.2.2 - Placard Adoption

Jurisdictions may consider formally adopting official ATC-20 based placards with appropriate penalties for unlawful removal or violation. The placards available at the SAP website (under "SAP Forms") are in both pdf and jpg formats. The jpg forms can be downloaded and altered with image manipulation software to create placards with local government seals and legal citations, so the jurisdiction can use these official placards in their adoption process.

Without formally adopted placards, jurisdictions are not in a position to enforce compliance with "Unsafe" or "Restricted Use" placards, since unofficial placards, such as the pdf versions found at the SAP website, are only recommendations and have no force of law in themselves. Historically, the public tends to respect these placards, but local governments may choose instead to have the ability to enforce the placard restrictions in the interests of public safety.

Jurisdictions may also choose to adopt placards in other languages besides English. Some communities have large populations who speak Spanish, Chinese, or other languages, and it may be in the interests of public safety to have official placards that are multi-lingual. Some cities have simply made a placard that reads in the second language after the English lines; others have made a placard that is double in size, with the second language placard after the English one. These double placards are printed on 11" by 17" card stock instead of the standard 8 ½" by 11" size.

Placards must be attached to buildings on windows, walls, or doors. It is common to use clear packing tape or even duct tape to do this. Some have used staple guns to attach them to wooden walls. Another idea is to buy placards on peel-and-stick paper, which will stick very well to most surfaces. As a comment, stucco walls may prove to be difficult to attach anything to, and the window or door may be the only reliable location for the placard.

Sample placard adoption language offered by the California Building Officials organization (CALBO) for possible use by local governments can be found on the SAP website, and in the appendix of this publication.

2.2.3 - Assemble Resources

Jurisdictions will need to assemble the materials used by SAP evaluators in the field, and have these positioned in a location where they will be accessible after

a disaster. One suggestion is to store these supplies in a small outbuilding that can be accessed after an earthquake. Another suggestion is to store them in the official vehicles of building inspectors. What should never be done is to store them inside a public building that could be tagged "Unsafe;" then the supplies would be inaccessible just when they are needed most.

One interesting idea is to organize the supplies into sets for backpacks, so that there are enough supplies in the backpack for a team of two to work for five days, a standard deployment period. This list assumes a standard damage distribution pattern for the placard types, and 26 inspections per team per day. The backpacks could be identified with a number, and teams be issued the set of supplies as an equipment check-out for the duration of their deployment period. The teams may find that their particular placard needs are different from what is in the set, and can obtain needed placards on the second day, and so on. Then the backpacks are checked back in at the end of the team's deployment, and the set of supplies restocked for the next deployment. Below is a suggested list of the supplies in one backpack:

90	"Inspected" green placards
20	"Restricted Use" yellow placards
20	"Unsafe" red placards
130	Rapid Evaluation forms
1	1000 ft. roll Caution tape
3	500 ft. rolls clear package tape (preferred) or duct tape (keep either kind of tape in sealed bags)
2	Clip boards
2	Chisel point or fine point permanent ink felt markers (for marking placards)
2	Ultra fine point permanent ink markers (for completing evaluation forms)
1	Tape measure
1	Flashlight with batteries
2	Reflective safety vests
1	Staple gun w/staples (for when tape runs out, or is ineffective)
1	Small first aid kit

Be certain that only permanent ink markers are used on placards. If ball point pens are used, the ink will fade in a short period of time, and the writing on the placard will disappear!

With the advent of 'smart phones,' applications are available that can be used to input the Rapid Evaluation form data in the field, along with a photo of the building, and sent electronically to a computer at the Disaster Operations Center. If cell towers are not operational or available, the 'smart phone' can

be uploaded once the team returns to the Disaster Operations Center. This advanced methodology removes much of the need for paper Rapid Evaluation forms and data entry, with its inherent and sometimes unavoidable mistakes. It also allows the local government to have a real-time status update on the current SAP response effort.

Some of these applications are free, while others are not.

2.2.4 - SAP MOU and Reimbursable Expenses

The experiences from the 2014 Napa Earthquake made clear the need to solidify the mutual aid agreements regarding safety assessment so all parties are aware of their responsibilities, and so eligible reimbursements from state and federal disaster programs for SAP expenses can proceed. This is necessary because the California Master Mutual Aid Agreement says that mutual aid is to be provided without compensation. This creates problems for FEMA reimbursement, since FEMA will not reimburse for a free service.

Therefore, Cal OES created a Safety Assessment Program Memorandum of Understanding (MOU) that spells out the terms of mutual aid for the Safety Assessment Program, and that also supplies some operational framework for implementing this mutual aid. A copy of the SAP MOU can be found in the Appendix.

Cal OES strongly recommends that local governments have a SAP MOU in place before an emergency happens that requires safety assessment assistance! If no signed agreement is in place when a request for SAP assistance is made, Cal OES will attempt to have the document signed by the Receiving Agency before dispatching SAP personnel.

With many jurisdictions, SAP evaluators pay for the travel, room and board expenses up front, and complete a travel expense claim form with receipts to get reimbursed. This tracks the costs in such a way that they are easily reimbursed. Cal OES urges local governments to reimburse these claims as soon as possible.

Some local governments set up arrangements with hotels and restaurants so that all the SAP evaluators have to do is show their SAP ID cards to the hotel front desk or the restaurant, who writes down the SAP ID number on the bill, and then the hotel or restaurant bills the jurisdiction directly. This is a very simple way

to manage the expenses, and relieves the SAP evaluator of many of the personal out-of-pocket expenses they would otherwise face.

2.2.5 - Identify Department Operations Centers (DOCs)

The SAP coordination activity is an intense effort that could interfere with the operations in either the Emergency Operations Center (EOC) or the building department office. Therefore, this effort is best conducted in an entirely separate location. So, a Department Operations Center (DOC) must be identified that is neither in the EOC nor at the building department.

The ideal DOC would be in a building likely to survive the earthquake or other disaster, where there is backup power and a large room where the SAP coordination could take place. In case the primary location is not usable, a backup site should be selected. The backup site could be as simple as a large tent erected in a park or a parking lot.

The DOC should have power for computers and lighting, and for presenting the SAP refresher video to the SAP evaluators. There should also be room for an information board, tables and phones, and chairs for daily briefings.

2.2.6 - Identify and Locate Essential Facilities

'Essential facilities' usually means buildings that have essential government roles, such as police and fire stations. While the use of the term in this instance does include those buildings, 'essential facilities' in safety assessment coordination means *any building or facility that is essential for the management of the disaster.* This definition would include the following:

- Emergency services (police and fire stations, Emergency Operations Center)
- Key administrative buildings (City Hall, county government or district office, building department)
- Shelters
- Pharmacies, grocery stores, hardware stores
- Water and wastewater treatment plants

The first two bullets above seem obvious, but it is not unusual for these facilities to be badly damaged and still continue to be in use. If the SAP evaluators find that these buildings have been rendered Unsafe, their operations will need to be moved elsewhere.

Many school districts may have an MOU with the Red Cross for use of their gymnasium or other facility as a shelter. These buildings need to be cleared for safe use before they can be opened as a public shelter. The same is true for other public buildings that are planned for shelter use. Effective planning would locate these facilities for early safety assessment.

Obtaining basic supplies such as water, food, diapers, first aid supplies, medicine, plywood, and nails may be extremely difficult after a disaster. A simple way to overcome this is to have pharmacies, grocery stores, and hardware stores cleared for use if they can be opened. SAP teams can be sent early on to these stores for evaluate them.

Hospitals will generally be assessed for use by the California Department of Health Care Access and Information (HCAI).

Water and wastewater treatment plants are essential in order to keep potable water available, and to reduce the risk of cholera and other water-borne illnesses. These need to be reviewed for usability as soon as possible after an event so necessary repairs can start at once, or so alternative resources can be established.

2.2.7 - Identify Buildings at Risk

It is important for the jurisdiction to pre-identify the buildings that are most at risk from a given event. This can provide an awareness of the degree of risk in the community, and help with targeting certain areas for cordoning or barricading, if warranted. It can also help with identifying potential mitigation projects.

Those buildings that are situated in flood plains are at high risk for flood events. Buildings in tsunami inundation zones or dam inundation zones will face peril from those events. For earthquakes, the following buildings would be considered 'at risk':

- Unreinforced masonry buildings
- Historic buildings
- Non-ductile concrete buildings
- Concrete tilt-up buildings
- Soft-story buildings
- Mobile homes
- Buildings containing hazardous materials
- Buildings in liquefaction zones

Currently in California, there are thousands of unreinforced masonry buildings (URMs). Many have had at least some seismic upgrade, by bracing parapet walls and tying the walls to the roof diaphragms with steel tie rods. Others may have had a more complete seismic retrofit. These may come through their next earthquake without collapsing. URMs without such mitigations are a serious threat to their occupants and neighbors in an earthquake.

Historic buildings built before 1927 in California were built using craftsman skills and principles without the benefit of a uniform building code. Many of these are now very vulnerable. Some historic buildings were seismically retrofitted, and so will be better prepared for the next earthquake. Examples of these include Los Angeles City Hall, Oakland City Hall, and San Francisco City Hall, which all have seismic base isolation as part of their retrofit scheme.

Concrete buildings built before 1972 are likely non-ductile in design, meaning that they will perform in a brittle fashion in response to earthquakes rather than in a flexible, or ductile, fashion. Even among these, the more dangerous buildings are those with weak columns and strong beams or inadequate walls. Jurisdiction engineering staff can assist with identifying which buildings in the jurisdiction fit these descriptions. The Concrete Coalition (www.concretecoalition.org) is a good source of assistance also.

Concrete tilt-up buildings built before 1972 will not have adequate wall to roof connections (unless they have been retrofitted) and are subject to separation between the wall and the roof diaphragm. This can lead to catastrophic roof collapse. Safety assessments of these structures are not finished until the roof-wall connections have been examined.

Soft-story buildings are subject to collapse at the soft story. Most of these are buildings with understory parking at the street level and that have not been retrofitted to resist seismic forces.

Mobile homes placed into service before 1995 may not be anchored to the ground with permanent foundations or with any seismic bracing. A strong earthquake can move these off their foundations with no difficulty.

The jurisdiction should have a good list of those buildings that contain hazardous materials, and what those materials are. If there are a large number of these, it may be best to have SAP evaluator teams identified as strike teams that focus

on clearing these buildings and/or identifying which buildings are safe for cleanup, or which need shoring before cleanup (see Section 2.2.9).

Buildings sited in liquefaction zones can end up sinking into the soil, or tilting badly. The ground can also subside around them, leaving pile foundation buildings higher than the soil is. Buildings that are not well constructed can end up destabilized and collapse. The liquefaction itself can lead to minor flooding and great quantities of sand boiling up, which will need to be cleared away. If the site faces a body of water, the ground can suffer lateral spreading, leaving cracks in the ground that run parallel to the shoreline.

Naturally, if any of these have had proper mitigation against the threat, then they are more likely to hold up better in an event than those buildings without mitigation. For example, it seems to be the case that *some* seismic retrofit of vulnerable buildings is better than no retrofit.

Photo courtesy Jim C. Barnes
Figure 2-1 - Monitor building in Christchurch, New Zealand (note container barricade in front of the building which protects the roadway from falling hazards).

2.2.8 - Identify Potential Monitor Buildings

Aftershocks pose a continuing threat to damaged buildings. When a significant aftershock occurs, it can cause additional damage to already fragile buildings,

turning a building that was formerly usable (tagged "Inspected") into one with limitations ("Restricted Use") or even unusable ("Unsafe").

In the past, the way post-aftershock damage was managed by the building official sending out SAP evaluators to all the previously tagged buildings to look at them again. This can mean a great deal of duplicate work for SAP evaluators, putting more strain on an already scarce resource.

In New Zealand, officials identified in Christchurch nine *monitor buildings.* These were buildings that were selected as examples of common buildings. The officials would have these buildings examined periodically or after a strong aftershock, and if significant additional damage was found, all the buildings of that type in the city would be re-evaluated.

The use of monitor buildings is a fine idea, and can save a great deal of unnecessary work if used properly. Care should be taken, however, to select buildings that are typical of many of the buildings in the community, as well as with typical soil conditions. A mid-rise concrete frame building constructed after 1972 sited on stiff soil can be compared to like structures, but a different monitor building should be chosen for concrete buildings built earlier, or that are sited in a liquefaction zone. Monitor buildings are useful when there are many buildings of certain sorts in the community, but the number of monitor buildings may increase if there are numerous types of buildings in the building stock, if the impacted region is larger, and/or if there are large liquefaction zones.

As an example, a building official might select the following buildings as monitor buildings, due to these being common in the local building stock:

- Three story steel frame building built in 1990 on stiff soil.
- Four story concrete frame building built in 1984 on stiff soil.
- Eight story concrete frame building built in 1994 on stiff soil.
- Two story wood frame apartment building built in 1975 on stiff soil.
- One story wood frame house built in 1963 with cripple wall on stiff soil.
- Two story URM with moderate seismic upgrade built in 1934 on liquefiable soil (old part of town by the river).

In practice, the SAP Coordinator could designate SAP evaluators to check these buildings on a routine basis, unless there is a strong aftershock, in which case the SAP Coordinator can direct that these buildings be checked out at once.

Ideally, the SAP teams that assessed these monitor buildings originally would be sent out to examine them later, so additional damage can be quickly identified.

2.2.9 - Planning for Use of Strike Teams

A *strike team* is a focused team of a single discipline. Fire fighters engaged in combating wild land fires are often organized into strike teams with many pieces of equipment. The opposite of this is a *task force*, which is a multi-disciplinary team assigned to a single task. Urban Search and Rescue teams are task forces.

In New Zealand, SAP evaluators were organized into strike teams that focused on particular sectors of the building stock. This opened up usable buildings such as grocery stores and pharmacies soon after the earthquake, and allowed highly skilled specialists to focus on where their background could accomplish the most good.

Strike teams in the Safety Assessment Program can be organized according to the following suggestions; there may be other types of building stock or issues that a SAP Coordinator may establish strike teams to handle.

SAP strike teams must <u>not</u> be used to estimate costs of repairs, as this activity will render all their efforts ineligible for federal and state disaster recovery funding. They can supply information (percentage of damage, type of structure, square footage) which the jurisdiction can use to estimate these costs.

Typically, the standard team structure (minimum two SAP evaluators, usually a building inspector and an engineer or architect) used in the Safety Assessment Program can continue for the strike team format, with any exceptions noted below.

- *Essential Facilities Strike Teams* – These teams would focus on, clearing for use, all the facilities described in Section 2.2.6 above. This activity should take place very early in the SAP response timetable. Since these facilities are not next door to each other most of the time, local drivers added to the teams would be very helpful, if it is possible to arrange this. The teams that are assigned to look at the water treatment and wastewater treatment plants must include civil engineers who have a background in these types of facilities. If any of the essential facilities happen to be mid-rise or high rise buildings, the teams for these should be made up of structural engineers. SAP Coordinators can include the number of such persons needed when they make their request to the Operational Area.

- *Hazardous Materials Buildings Strike Teams* – It is very important that buildings which contain large quantities of hazardous materials be looked at for their viability soon after an event. These strike teams would focus on clearing these buildings and/or identifying which buildings are safe for cleanup, or which need shoring before cleanup. An experienced hazardous materials advisor is recommended to be on these teams as well.
- *Mid-Rise and High-Rise Building Strike Teams* – If there are high rise structures in a jurisdiction's building stock, this sort of strike team will be very useful. For the purpose of this strike team discussion, mid-rise buildings are those structures which are over three stories and under ten stories high, while high rises exceed ten stories in height. The strike teams for mid-rise and high-rise buildings must be made up of structural engineers. SAP Coordinators can include the number of such persons needed when they make their request to the Operational Area. Having the high-rise buildings evaluated as a group can clear those buildings which are useable, which may allow businesses or large apartments to reopen. This activity may also be useful to identify serious collapse hazards among these buildings, leading to decisions regarding cordoning. Again, it may be useful to have local drivers as part of the team.
- *Low Rise Building Strike Teams* – Strike teams to examine buildings three stories high, such as apartments or office buildings, can be made up of building inspectors, civil engineers, and/or architects. By having strike teams focus on these buildings, they can be readily cleared if useable and opened for businesses or residents to return. This can have a strong effect on shelter demands and businesses. Of course, this sort of strike team is needed only if there are large numbers of such buildings in the community
- *Dwelling Strike Teams* – These teams will usually form the largest group, and will be focused on clearing one- and two-family residences. Building inspectors, civil or structural engineers, and architects can make up these teams.
- *School Strike Teams* – For school districts, it is best if the teams are made up of architects, structural engineers, and CA Division of the State Architect (DSA) Class 1 or 2 inspectors.
- *Infrastructure Strike Teams* – These teams will be made up of civil engineers who are experienced in the types of infrastructure being examined. Detailed evaluation forms are available to assist with the review of local

roads and bridges, airports, pipelines, pumping stations, and tank reservoirs.

- *Geotechnical Strike Teams* – These teams will be made up of geotechnical engineers, geologists, and/or engineering geologists. They are available to examine landslides, lateral spreading, liquefaction, settlement, differential settlement, expansive soils, and all other sorts of geologic issues.

Once a group of strike teams has finished its work, the teams can be redirected into another strike team group that has not finished. It is possible that strike teams may complete their first responsibilities and be folded into the dwelling strike teams, since these will have the largest workload in most cases.

2.2.10 - Planning for Shelter-in-Place

One of the major issues in large-scale disaster planning is the subject of having enough shelters to assist those whose homes are no longer livable. In many cases, it may be that the homes are not collapse hazards or otherwise dangerous, but simply lack running water and sanitary sewer utilities. This makes these homes unlivable per the California Health and Safety Code. Jurisdictions are often left with the prospect of trying to find large amounts of building space in order to meet the needs of all those who need a temporary place to stay. These shelters have to be properly managed with food, medical, and security staff, and the overall effect on the survivors of staying warehoused in a shelter is rather dehumanizing. They might also not be able to keep their pets with them, which for some may mean the difference between staying in a shelter, or trying to survive on the street with their pets.

The SAP Evaluator Student Manual has long pointed to the option of shelter-in-place for local governments to consider. This works when the major problem with the homes is that they have fallen on their cripple walls, which breaks the water and sewer lines; or the home is relatively unscathed, but the water and sewer system in the street is compromised. In such instances, if the jurisdiction provided portable toilets, potable water stations, and temporary showers, the affected populace could remain in their homes. The homes would be tagged "Restricted Use" with occupancy allowed as long as the temporary utility arrangements remain.

Photo courtesy Jim C. Barnes
Figure 2-2 - Temporary shower facilities (in renovated shipping container). Security guard shack is to the right. Christchurch, New Zealand.

Shelter-in-place was used with great success in Christchurch, NZ after tens of thousands of homes were left without water or sewer utilities after the February 22, 2011 earthquake struck. Officials placed portable toilets at routine intervals in these neighborhoods, and placed portable shower facilities in key locations with attendant security. In many cases when the water mains themselves were somewhat functional, temporary water lines were run in flexible plastic piping to the homes, so there was water to drink and cook with. Without these measures, managing the thousands who would have been rendered homeless otherwise would have been very difficult.

Shelter-in-place has the added benefits that the survivors can remain in familiar surroundings, have their clothes and other possessions nearby, can more easily prepare for work, school, and other responsibilities, take care of their pets, and more easily plan for the repair of their dwellings.

In order to plan for shelter-in-place, jurisdictions need to consider potential sources of portable toilets and portable showers. They must also consider using potable water stations, possibly with delivery using water tenders or similar vehicles. They can also plan to run temporary water lines from working water mains when that is possible in the affected areas.

2.2.11 - Planning for Securing Possessions from Unsafe Buildings

SAP evaluators are on scene to post buildings, and are not in a position to help residents or businesses retrieve belongings from unsafe buildings. However, an effective disaster plan would include identifying those who could help residents or businesses retrieve important belongings from unsafe buildings, and providing information on how to get this help. It would also be good to consider the timing of entering such properties in regard to the overall aftershock pattern. Finally, if there are many unsafe structures in a neighborhood, the jurisdiction may consider cordoning off the area or otherwise providing security so as to reduce the risk of looting (see Section 2.4.2).

SAP evaluators could be given a small stack of flyers to hand off or post at buildings that receive "Unsafe" placards. The flyers could be small, just large enough to state where help can be obtained, with phone numbers and addresses to contact for assistance.

The jurisdiction should decide who will be helping residents and businesses with this task. Local police or fire personnel can supervise persons who enter unsafe structures to make sure that they only spend a brief amount of time inside. If local first responders are too busy with more pressing duties, then mutual aid can be requested to provide assistance. CALBO has offered to bring in mutual aid building inspectors who are not working in the Safety Assessment Program to help with this. Another option is using law enforcement or fire mutual aid to bring in first responders to help.

The jurisdiction must also decide exactly how this should be done. Some local governments decide upon a set amount of time, such as ten or fifteen minutes, to allow for possession retrieval from unsafe buildings. Another issue to be settled is the arrangements and the timing. Some jurisdictions set up a schedule for persons to enter unsafe buildings, so a neighborhood can be worked all at once. The timing after the main earthquake is also important, as strong aftershocks are most likely in the first few days of the main shock, and the likelihood of such usually diminishes with time. ATC-20-1 offers guidance on this in its Appendix D. The SAP coordinator can also check with the California Geological Survey at their website (www.consrv.ca.gov/cgs) for post-event aftershock expectations.

2.2.12 - SAP and the Media

It will be important to communicate to the public information about the Safety Assessment Program, and the news media is a fine way to convey that. Information can also be posted at jurisdictional websites and Facebook pages.

Key points that can be included in these press releases may include the following:

- *Identification of SAP Evaluators* – SAP evaluators always have a photo identification card that is issued from Cal OES. The card may be a digital card that is on the evaluator's cellphone, or it may be a plastic ID card. Persons bearing ID cards of a different sort than these, or who don't have any ID card, and who assert that they are doing safety assessment are likely committing fraud, and need to be introduced to law enforcement. Their aim may be to scope out the property for theft later, or for some other purpose.
- *Free Service* – The work of SAP evaluators is always free to the public. If someone approaches a resident or business owner and wants to charge a fee for evaluating the building, they are committing fraud, and a phone call to law enforcement would be appropriate.
- *Meaning and purpose of the placards* – This can be released with pictures of what the official jurisdiction placards look like, and a simple explanation of what they mean.
    - *Unsafe (red) placard* – This building is unsafe to enter or use, severe injury or death could result. Building is a collapse hazard, may be crushed by an adjacent building, or has a hazardous condition such as a toxic chemical release. The Unsafe placard is not a demolition order. Permission to enter can only be obtained from the Building Official. Building may or may not be repairable, consult with a licensed engineer or architect to determine next steps.
    - *Restricted Use (yellow) placard* – Building can be used per the noted restrictions. Parts of the building may be usable, or the building can be entered briefly to obtain important possessions. Parts of the building might be hazardous and use of these sections may not be allowed. The building might also be usable in its entirety if certain restrictions are observed.
    - *Inspected (green) placard* – The building has had a visual assessment by a building professional and appears to be usable as

of the date and time of the assessment. Minor repairs may still be necessary.

Note that the Inspected placard does not say "safe," only that the building was "inspected." Building safety is the responsibility of the building owner, who must make the building as safe as he or she can afford by retrofitting the structure to current code (the life safety minimum), or better yet, by upgrading the building beyond code standards so the building is entirely usable after an event, rather than being something to be evacuated from. There are also buildings which may survive one earthquake just fine, but that may not do well at all in the next one. The Inspected placard is not a guarantee of performance, only a statement that the building seems to be usable as of the time the assessment was done.

The same would hold true of those sections of usable building where the yellow "Restricted Use" placard has been posted on the building. Just as the Inspected placard is not a guarantee of future performance against earthquakes, likewise the usable portions of the Restricted Use placard are not immune to future damage.

Social media has grown in importance in recent years, and it would make good sense to plan for using it to gain informal information on damages in the community. The jurisdiction could create a link at its website for individual citizens to send Twitter reports on damages or issues they see in the community. 'Smart phone' use by these persons could include camera phone images, which the SAP coordinator could use to help with coordination efforts. The website should also carry a warning for citizens not to endanger themselves in taking these photos, but to keep safe, and let professionals examine the sites in greater detail when they arrive.

Photos courtesy Raymond Lui
Figures 2-3 & 2-4 : SAP evaluators from California respond to Hurricane Katrina, 2005.

2.2.13 - Planning for Catastrophic Events

In 2005, Hurricane Katrina raised awareness regarding the importance of planning for catastrophic events. In California, the first thing that comes to mind for catastrophic disaster planning would be a major earthquake, but a massive statewide flood disaster, or a large locally generated tsunami, could also create a catastrophic event. Responding to catastrophic events will require courage, ingenuity, and adaptability.

All local governments should have a Continuation of Operation/Continuation of Government (COOP/COG) plan. This includes a succession plan that allows for replacement personnel to take over responsibilities in the event that the primary individual is unavailable. In the very unlikely event that a local government becomes non-responsive due to catastrophic damage, the Operational Area could be asked by Cal OES to temporarily step in for the coordination of safety assessment and other emergency functions in that jurisdiction until the local government can stand up again.

The number of SAP evaluators that can deploy to a jurisdiction can be limited by the available facilities needed to care for them. In a catastrophic event, all the affected communities will be requesting SAP evaluators to one extent or another, and the number of SAP evaluators available may be less than what the affected communities are requesting. In such cases, it becomes necessary to spread out the assistance over time. Evaluators would be deployed by Cal OES on one-week rotations so the individuals don't become exhausted and can make good decisions. More SAP Coordinators can also be sent in to help manage the SAP evaluators, and the coordinator schedules would overlap so

the previous coordinator could brief the next coordinator on logistics and other important details.

The local government SAP coordinator may find that the community is best served by sending out available SAP evaluators into essential facility strike teams only, then moving them on to high rise strike teams, low rise strike teams, and finally the one- and two-family dwelling strike teams. This triage might be necessary in order to accomplish the most good in the shortest period of time with the limited resources available.

Photo courtesy Raymond Lui
Figure 2-5 - SAP evaluators obtain supplies for Katrina response in Baton Rouge. 2005.

It might be necessary, early in the emergency, to see if supplies can be obtained from nearby locations, or if the SAP coordinator must send staff outside of the area in order to get supplies. This was the case in the SAP response to Hurricane Katrina, when SAP evaluators had to get supplies from Baton Rouge, well outside the area affected by Hurricane Katrina.

Hotels in the area may be nonexistent or in short supply, so the local government may have to make some extraordinary arrangements to house and feed the SAP evaluators. In such cases, SAP evaluators may be asked to bring their own sleeping bags! Buildings that might otherwise serve as shelters could be used to house them. In response to Hurricane Katrina, some SAP evaluators were housed in a large bivouac tent, and some were housed and fed in a cruise ship. When housing options are not readily available, a SAP coordinator might spend

most of his or her time seeking to line up where the evaluators are going to spend the night, and how they will eat! It can get difficult.

Photos courtesy Raymond Lui
Figures 2-6, 2-7 - Various sleeping arrangements used in the 2005 Hurricane Katrina SAP response.

Catastrophic disasters often bring out very willing but untrained individuals who want to help. Cal OES may be able to arrange for on-site SAP evaluator training of building inspectors, engineers, and architects so they could go out the following day after their training to assist. Cal OES would coordinate these efforts with the Operational Area and with the affected local governments.

2.2.14 - Arrange for Ongoing Training and Exercises

A local government needs to have as many of its building inspectors, licensed civil engineers and architects trained in safety assessment as possible. Therefore, part of the planning and preparation for future disasters must include getting staff trained in the Safety Assessment Program.

Local governments are strongly urged to train their building professional staff, and to open up such training to licensed civil engineers and architects in the community when possible. Local governments may also train their own non-credentialed employees, solely for deployment within their own jurisdiction. However, it is in the jurisdiction's best interests to keep this use of non-credentialed staff to a minimum, and only to use those with considerable experience and training in construction. Non-credentialed staff will not be used in the statewide cadre in California.

It would be good to arrange annually for a jurisdiction's SAP evaluators to participate in an exercise where deployment, reporting, and field evaluation

can be done. This could be arranged with other local jurisdictions and with the Operational Area with good effect.

2.3 - Responding to Disaster

2.3.1 - Key Personnel and SEMS

As stated earlier, the Building Official or his/her designee should be the SAP coordinator for the jurisdiction. They report under SEMS to the Operations Chief. The SAP coordinator can provide useful information to the EOC as to the situation status on the safety assessment response and other particulars within the jurisdiction.

If the EOC is also for the Operational Area, the SAP coordinator may also be acting on behalf of the Operational Area. Requests from cities and districts within the Operational Area may be coming in and would be fielded by the Operational Area SAP coordinator, who in turn can request SAP evaluators from cities and districts within the Operational Area. Once these resources are exhausted, the Operational Area SAP coordinator would make a request for additional resources from the Cal OES Regional EOC, who would forward this request to the statewide SAP coordinator at the State Operations Center for completion.

2.3.2 - Needs Assessment

The local government SAP coordinator must conduct a 'needs assessment' as soon as possible. This initial damage review will result in the number of heavily damaged and destroyed buildings, which can be used to estimate the number of SAP evaluators needed in the field.

This initial damage review is done by means of a 'windshield survey'. The 'old school' way of doing this involves at least two local government employees in a vehicle; one to drive the vehicle, and the other to do a count of the heavily damaged or destroyed buildings. A city or county would need several teams in the field doing these. They would need to make sure that their work does not overlap. If forms are used, they should be simple and not require a lot of detail.

More modern methods include the use of drones to do a quick aerial scan of the jurisdiction, which rapidly gathers the number of obviously damaged or destroyed buildings. Other methods can include LIDAR scans or photos done from aircraft, or satellite photos. These can be compared with pre-disaster scans

or photos to identify the heavily damaged or destroyed buildings. It is possible to use a computer algorithm to do a digital comparison and very rapidly arrive at these damaged building counts.

The Northridge Earthquake provides historical information that helps with estimating the number of persons needed to respond to a disaster. This is dependent on the number of red and yellow tagged buildings, and the number of days needed to complete the work.

Jurisdiction	Days Per City	Total Assigned Evaluators by City	Avg # of Evaluators Assigned Per Day
Fillmore, City of	5	50	10
Santa Monica, City of	9	96	10.7
Santa Clarita, City of	8	130	16.3
Los Angeles, City of	12	2112	176
Totals	**n/a**	**2388**	**213**

Table 2-1 – Assigned Resources in the Northridge Earthquake

Jurisdiction	Red Placards	Yellow Placards	Green Placards	Total Placards
Fillmore, City of	198	319	1532	2049
Santa Monica, City of	131	382	1835	2348
Santa Clarita, City of	15	66	674	755
Los Angeles, City of	1690	5715	17742	25147
Culver City, City of	30	124	484	638
Totals	**2064**	**6606**	**22267**	**30937**

Table 2-2 – Placard Distribution, Northridge Earthquake

Jurisdiction	Percentage of Red & Yellow Placards (By City)
Fillmore, City of	25.23
Santa Monica, City of	21.85
Santa Clarita, City of	10.73
Los Angeles, City of	29.45
Culver City, City of	24.14
Totals	**28.02**

Table 2-3 – Percentage of Red + Yellow Placards by City

The calculation to find the number of SAP evaluations per person per day is as follows, using the information from the cities of Fillmore, Santa Monica, Santa Clarita, and Los Angeles:

Jurisdiction	Days per City	Evaluations per City	Evaluations per City (Per Day)
Fillmore, City of	5	2049	410
Santa Monica, City of	9	2348	261
Santa Clarita, City of	8	755	94
Los Angeles, City of	12	25147	2096
Total	**n/a**	**30299**	**2861**

Table 2-4 – Evaluations Per City per Day

Number of evaluation days in deployment from 1/18/94 to 1/29/94: **11**
Average number of evaluators assigned per day: **213** (from Table 2-1)
Number of evaluations done per person per day: 2861/213 = **13.4**

When doing the windshield survey, identify damaged buildings that will most likely receive an Unsafe or Restricted Use placard. Northridge historical records show that the percentage of these placards came to 28.2 percent, or about **30 percent** of the total number of inspections performed.

Based on the available data, **approximately 13 inspections per person per day** were accomplished. (All inspections took place during daylight hours. This continues to be policy for this program, and is due to a variety of safety concerns.)

The last item that is needed is an **estimate of the number of days the inspections will take**. This is a reasonable number that makes sense based upon the scale of the disaster. The Northridge earthquake took a total of 12 days for SAP

evaluators to do their work, although the number of assessment days came to 11 by calculation due to most jurisdictions not working part of that period.

The two factors of 'number of SAP evaluators' and 'number of days for inspections' have an inverse relationship in the estimate calculations. If not enough inspectors are available, the 'number of days for inspections' increases. If more inspectors are available, the 'number of days for inspections' decreases.

The estimate calculations are:

'Estimated number of Unsafe + Restricted Use placards' divided by 0.30 = 'number of inspections needed.'

(0.30 is 30%)

'Number of inspections needed' divided by 'number of days for inspections' divided by '13 inspections per person per day' = number of SAP evaluators needed.

With a team of two, the number of inspections per team comes to 26. If 20 minutes is allowed per house (the most common structure), this calculates to 8 hours 40 minutes of inspection time. It is not uncommon for teams to be in the field for ten hours a day, which gives time for lunch and breaks.

Example:

The City of Rosebud, CA has finished its windshield survey and found that there were 1,200 damaged buildings that would probably receive an Unsafe or Restricted Use placard. They have decided to have the work completed in 14 days. Calculating:

1,200 'red and yellow tags' / 0.30 = 4,000 inspections needed.

4,000 inspections needed / 14 days for inspections / 13 inspections per person per day = 21.9, use 22 SAP evaluators needed.

Always round up to the nearest even number, so there are teams of two allocated for the work.

Example:

The City of Alta Vida, CA also has 1,200 damaged buildings worthy of an Unsafe or Restricted Use placard, but they want to get the work done in 10 days, if there are enough SAP evaluators to go around.

1,200 'red and yellow tags' / 0.30 = 4,000 inspections needed

4,000 inspections needed / 10 days for inspections / 13 inspections per person per day = 30.8, use 32 SAP evaluators needed.

Example:

The City of Mount Gabriella, CA, which is closer to the epicenter, has counted 3,756 damaged buildings that would probably get tagged Unsafe or Restricted Use. They would like to get the work done in 14 days. Calculating:

3,756 'red and yellow tags' / 0.30 = 12,520 inspections needed

12,520 inspections needed / 14 days for inspections / 13 inspections per person per day = 68.8, use 70 SAP evaluators needed.

Example:

The City of Timberlane, CA has 2,350 damaged buildings that could receive an Unsafe or Restricted Use placard, but needs to be limited to only 30 SAP evaluators because of available city vehicles. They need to calculate how long it will take to complete the work. Calculating:

2,350 'red and yellow tags' / 0.30 = 7,833 inspections needed.

Solving for 'days for inspections:'

7,833 inspections needed / (13 inspections per person per day x 30 SAP evaluators) = 21.75, or 22 days.

Example:

The City of Resolute has only 850 damaged buildings that might get tagged Unsafe or Restricted Use, but has the means to provide for only 12 SAP evaluators for rooms and food. They need to calculate how long it will take to complete the work in their community. Calculating:

850 'red and yellow tags' / 0.30 = 2,833 inspections needed

Solving for 'days for inspections:'

2,833 inspections needed / (13 inspections per person per day x 12 SAP evaluators) = 18.16, or 19 days.

The above examples apply when a jurisdiction is going to perform all Rapid Assessments in its community, which is by far the most common approach. There may be a need for some Detailed Assessments of buildings, but these efforts can usually be absorbed using the SAP evaluator forces at hand. The actual time may take longer as well, due to time spent on the first day with intake activities, and if aftershocks cause more damage to buildings, requiring re-assessments.

If a jurisdiction has had minimal damage to structures and wants to have only Detailed Assessments done, then the calculation for estimating forces would change. Assuming no other changes, the Detailed Assessment can take three to five times longer than the Rapid Assessment does. One might use a constant of 3 detailed inspections per person per day instead of 13, if only Detailed Assessments will be done. Naturally, in such a case there will be fewer damaged structures, so there will be fewer inspections required.

2.3.3 - Requesting SAP Resources

After roughing out an estimate of the total number of SAP evaluators needed, the makeup of the strike teams needs to be looked at. After determining the number and type of strike teams proportioned among the total number of SAP evaluators needed, the SAP coordinator can arrive at the makeup of the request. Then the request is forwarded to the Operational Area.

Example:

The SAP coordinator for the City of Timberlane, from the above example, has decided to have strike teams as follows:

2 – Essential Services strike teams (civil engineers)

1 – High-rise strike team (structural engineers)

2 – Low-rise strike teams (civil engineers, architects or building inspectors)

10 – Dwelling strike teams (civil engineers, architects, or building inspectors)

This makes for a total of 15 teams made up of 2 persons each, total of 30 persons, working a single day shift each day. No night shifts! Not only is it not feasible to observe all the building conditions well at night, working at night in a neighborhood affected by disaster is not safe. There may be dangers caused by the disaster that are hard to see, and the authorities may have a curfew in place after dark due to looting or other problems.

So, a request for the City of Timberlane will need a minimum of four civil engineers, two structural engineers, and the 24 others can be mixed. The SAP coordinator has decided it needs six civil engineers, two structural engineers, four architects, and 18 building inspectors. Four of the 18 building inspectors come from the City's own building department, so the request to the Operational Area will be for 14 building inspectors. The architects will help round out the request, as they can provide assistance in some of the more historic neighborhoods in the city, as well as similar technical expertise to what the civil and structural engineers can bring.

The City of Timberlane also has two SAP coordinators in-house. The Incident Command System span of control principle encourages optimum management of 5 teams and maximum of 7 by a single coordinator. So, managing all 15 teams with two coordinators would exceed this standard. The SAP coordinator taking the lead will also ask for an additional SAP coordinator under mutual aid to assist; that will result in three SAP coordinators managing five teams each.

The City of Timberlane has to also provide a location for the SAP evaluators to arrive at. The SAP coordinator determined that the Department Operations Center (DOC), at 12253 Hasbro Lane in Timberlane, is usable with minor damage from the earthquake, so the SAP evaluators can report there.

The SAP coordinator for the City of Timberlane makes the following request to the Operational Area:

"26 SAP evaluators, made up of six civil engineers, two structural engineers, four architects, and 14 building inspectors, along with one SAP coordinator, to report to 12253 Hasbro Lane, Timberlane, CA on the next day or day after, as practical."

The Operational Area now has the choice to see if these resources are available through mutual aid within the county, the cities, and the special

districts of the Operational Area. If these can be found and dispatched to the City of Timberlane, then the request process is complete.

However, if the earthquake has damaged cities throughout the Operational Area, and mutual aid resources are already fully utilized, the Operational Area forwards the City of Timberlane's request to the Cal OES Regional Emergency Operations Center (REOC). The REOC then acts as a pass-through to forward the request to the Cal OES State Operations Center (SOC).

The statewide SAP coordinator activates the call-down procedure to fill the requests of the City of Timberlane and the requests of other jurisdictions. He or she hears back from the partner organizations responsible for the call-downs, and reports back, through the REOC through the Operational Area to the City of Timberlane, that 26 SAP evaluators and one SAP coordinator are on their way.

2.3.4 - SAP Evaluator Intake

The SAP evaluators are to arrive at the Department Operations Center (DOC) and sign in with their name, SAP ID number, cell phone number, and date and time of arrival. A form for this purpose is in the Appendix of this manual.

Photo courtesy David Karina
Figure 2-8 - Deputizing of SAP evaluators, 2010 Baja Earthquake.

The SAP evaluators need to be deputized so they can post official placards of the jurisdiction and otherwise represent the jurisdiction. This can be done by a

jurisdictional clerk; in some jurisdictions, the Building Official can administer the oath. A SAP coordinator can verify who can do this by asking the jurisdiction's legal counsel if there are questions.

There must be a morning briefing each day. The briefing on the first day of the work will be different from the others in several ways: the SAP evaluators will be assigned into strike teams, they will all receive a briefing packet, hear an overview of the situation status by the SAP coordinator, and watch the SAP refresher video. Then they will be assigned their equipment and given their field assignments.

Photo courtesy Raymond Lui
Figure 2-9 - Team 'grounding,' 2005 Hurricane Katrina response.

It is recommended on the first day that the coordinator also takes the entire group out to a nearby damaged building and go over how the building could be evaluated, so all can hear the same information. This method, called 'grounding,' was used with success in the response to Hurricane Katrina.

The briefing packets will have critical phone numbers for the Building Official, law enforcement, fire, hazardous materials response, utilities, and animal control. (If anyone's phone number should be on the placards, it would be the building department's office number.) The SAP coordinator's desk and cell phone numbers will also be in the packet, if the coordinator is someone different from the Building Official. The briefing packet will also contain any necessary travel expense claim forms, and a map of the area.

The SAP refresher video can be shown on a flat screen TV, by means of an LCD projector, or on a computer screen, if necessary. It serves to remind the SAP evaluators of their responsibilities in the field, and also of what they should be careful to avoid. The SAP refresher video is available from Cal OES upon request.

The DOC should have a seating arrangement so all can be seated during briefings. There should be an information board, as well as a 'white board' or chalk board so assignments can be shown. The information board can be where the progress map can be displayed, or that can be set up separately, such as on a tripod or another wall in the room.

2.3.5 - SAP Evaluator Coordination

The SAP coordinator must make assignments for the various strike teams. If damage in the jurisdiction is widespread, then the Dwelling strike teams can be given a series of city or community blocks or roads to work. If damage is scattered, then Dwelling strike teams can be given lists of addresses reporting damage, along with a local driver. If any of the teams has a working GPS device with them, a local driver may not be necessary.

The SAP coordinator must make sure that the teams all have enough work to do to carry them through the day.

Before sending the teams out, they must be assigned a backpack containing equipment, including placards, assessment forms, caution tape, etc. A suggested list of this equipment can be found in Section 2.2.3 of this manual. The equipment needs to be tracked so the individual sets can be received back after the activation and restocked.

If the teams are going into dangerous areas in the community, or if there have been reports of efforts to bribe or physically confront SAP evaluators, then it would be a good idea to include a uniformed law enforcement officer to accompany the strike teams as necessary.

The jurisdiction can arrange for transportation in several ways. Jurisdiction vehicles can lend official presence to the process, and will be especially useful if these are equipped with communications equipment. The jurisdiction may also use a van to drop off teams in key locations for the day, if there is a lot of work to be done in the area. Or, the teams can travel to the affected areas using some of the vehicles they came in.

The teams need to check in with the SAP coordinator every 90 minutes to 2 hours. This is to confirm that the teams are not in any trouble in the field, and to quickly discuss any problems that they may be having. If such can be quickly handled over the phone or by text messaging, it will help speed progress along. These routine call-ins are also an opportunity to update the SAP coordinator on progress.

Photo courtesy David Karina
Figure 2-10: Building official conducting daily briefing with SAP evaluators, 2010 Baja Earthquake.

There needs to be a briefing in the morning each day of the deployment. The morning briefing will review at least the following:

- Accounting for all SAP evaluators.
- Safety issues are reviewed.
- Situation status of the disaster and the SAP response progress are reviewed, including status of monitor buildings.
- Action plan objectives for the next 24 hour period, with a review of long-term objectives.
- Review of assignments and new assignments.
- Brief questions from SAP evaluators.

As discussed previously in Section 2.2.8, the Building Official can identify a number of buildings as monitor buildings to observe the effects of aftershocks on common types of structures in the community. The SAP coordinator needs to

arrange for evaluation of these structures after major aftershocks, and to do routine monitoring during the early periods of daily lower magnitude aftershocks. Of course, a weather pattern of strong winds after a major earthquake can do much of the same damage to weakened structures as aftershocks can, so this can be taken into consideration by the SAP coordinator.

As the safety assessment work progresses, or as repairs commence after the SAP evaluation work is done, some of the placards may need to be changed out. SAP evaluators are acting on behalf of the local building department if they are deputized, and they can replace placards if conditions become either more dangerous or less so. (For an example of the latter, a building may initially be found with a hazardous materials spill inside, warranting an Unsafe placard. Then, a few days later, cleanup of the spill has taken place, and the building otherwise has no other issues, so the placard could be changed to Inspected.) SAP evaluators, and the local building inspectors who continue their work after the SAP deployment is done, need to make sure that the old, obsolete placards *are removed* before the new ones are put up. Otherwise, the building occupants and the public at large will be confused as to the intent of the placards. This can lead to a dangerous, dismissive attitude by the public towards the placards if the intent of the placards is not clear due to two or more different placards being posted on the same building.

Photo courtesy David Karina
Figure 2-11 - SAP Coordinator conducting daily debriefing, 2010 Baja Earthquake.

The SAP evaluators need to return to the DOC at the end of each day to be debriefed. If paper Rapid or Detailed Assessment Forms are being used, these need to be handed in, and the SAP coordinator and/or assistants need to review them with the individual evaluators to make sure that all the pertinent information is on the forms. If electronic versions such as those available for 'smart phones' are being used, the forms will be either sent to the DOC throughout the day, or will be uploaded when the SAP evaluators return to the DOC in the evening. In either case, the electronic forms will still need to be reviewed by the SAP coordinator, and the SAP evaluator responsible for preparing them must be available in the evening to answer questions about the forms. This needs to be done each day, while the SAP evaluator is still able to remember what was done in the field that day. Whatever approach is used to facilitate this, the focus should be on speedily performing the assessment form review for accuracy so the SAP evaluators can be dismissed after working long days.

In addition, there may be other things that can be discussed. So, a daily debriefing might cover the following:

- Review of the Rapid Assessment or Detailed Assessment forms.
- Discussion of any questions or safety issues that came up through the day.

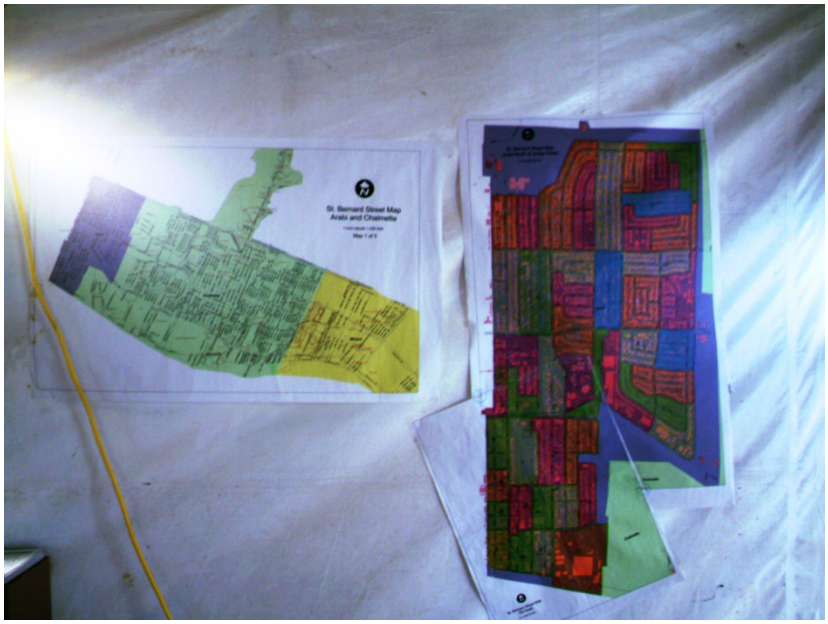


Photo courtesy Raymond Lui
Figure 2-12: Highlighted safety assessment progress map, 2005 Hurricane Katrina response.

The use of a highlighted progress map was first used in the response to Hurricane Katrina with great success. If paper Rapid Assessment forms are being used, the areas covered by the previous day's work can be highlighted on the map. This map will help avoid duplication of effort as the work progresses. This process also shows to all that progress is being made, and can not only encourage the SAP evaluators with an *esprit du corps*, but will encourage others as they see the community's problems being managed.

If the Rapid Assessment Forms are being transmitted electronically from the field or uploaded to a computer at the DOC on a daily basis, it is possible to put together a Geographic Information System (GIS) map that populates highlighting automatically. In this case, daily printing the map and posting it on the information board would accomplish the same things. Of course, if a flat screen TV or a projector is used, the updated highlighted GIS map can be shown that way without printing anything.

The SAP coordinator must be on guard against efforts by well-meaning jurisdictional executives to shortcut the safety assessment process. One such mistake made on rare occasions is the direction that all remaining buildings that are cleared for use *not be placarded with the green Inspected placard.*

The primary purpose of the Safety Assessment Program is to help people return to their usable structures as quickly and safely as possible. If the building is not identified as having been evaluated and found to be usable, how will the public know if they can use the building?

Moreover, there have been times, such as in the Nisqually earthquake response in Washington State, when such a policy was used, and the evaluators there ended up duplicating efforts by evaluating the same buildings several times because there was no placard on them!

If a SAP coordinator is facing this sort of short-cutting effort in his or her jurisdiction, and is unsuccessful in persuading the executives there to continue tagging Inspected buildings, a call or email to the statewide SAP coordinator may be helpful. Contact information is available at the SAP Website.

2.3.6 - Record Keeping

All of the assessment forms generated by the SAP evaluators are the property of the jurisdiction. They are essential for the following reasons:

- They constitute a record of what was accomplished in the field to clear buildings for use and to identify the need for repairs.
- They are necessary for follow up by the building department to make sure that required repairs are done before occupancy of Unsafe-posted buildings, or unsafe parts of Restricted Use-posted buildings, are allowed.

Once paper assessment forms are received at the end of each day, they are entered the following day into an appropriate database. If no such database is available, a spreadsheet can be used to capture the information. There is an Excel spreadsheet for that purpose at the SAP website at the "SAP Forms" link.

The SAP coordinator will need to arrange for local staff to assist with data entry. This information can also be highlighted on the progress map.

If the forms are being produced electronically, then it is possible that the information might be set up so it fills into the database automatically as it downloads to the computer at the DOC. The SAP coordinator can discuss this with jurisdiction IT people to see if this is feasible. Otherwise, the electronically produced forms will need to be entered into the database like the paper forms are.

The jurisdiction may choose to scan the paper forms into pdf format so they can be kept in an electronic file for convenient future use.

Once the SAP deployment is over and all the information has been entered into the database, Cal OES needs to receive a copy of it. This will be used primarily for historical and research purposes; for example, there are agencies such as the State of California Seismic Safety Commission that will be interested in seeing how the structures performed in the earthquake as a whole, which will help with their mandate to improve the seismic safety of structures in California.

2.3.7 - Call Center and Public Input

There will be a need for local government to staff a call center even before the SAP evaluators are requested. Affected citizens will have many issues, from building damage to compromised utilities to roaming packs of large dogs. Naturally, these will not be the emergency calls that should go to 911 and be handled by first responders, but will nevertheless need to be managed by the jurisdiction in one way or another.

A call center for issues related to building damage and safety assessment can be arranged at the DOC if it is convenient to do so. (If the DOC does not have the capacity to house this operation there, the call center for building department issues will need to be where it best serves the public need.) The number of people to staff this will depend on the size of the community and the degree of damage.

The building department call center should receive calls about building safety, requesting safety evaluations, questions on how to get placards changed, permits for earthquake repair, and so on. It could be that at least some of the buildings needing safety assessment will be identified by a phone call from the public, so the call center should work closely with the SAP coordinator so these can be assigned.

If a link at the local government website allows for social media input by Twitter or other methods, that will help a good deal with input on where there is damage requiring attention. The call center may be assigned to watch for input from the public in this manner and relay the information to the SAP coordinator.

2.3.8 - Workers Compensation

The SAP Coordinator is responsible to take care of any CA workers compensation claims made by volunteer SAP evaluators who become injured while deployed for safety assessment activity. (Local government and state of CA workers who are deployed to assist with safety assessment are covered by their home jurisdiction's workers compensation, and report any injuries while deployed to their direct supervisors. They should also report such injuries to the SAP Coordinator.)

Upon learning of an injury to a SAP volunteer, the CA State Fund 3301 Claim Form must be completed by the injured volunteer and the SAP Coordinator *within 24 hours of the SAP Coordinator knowing about the injury*. This time limit is critical, as serious penalties come into play if this deadline is not met. A copy of the 3301 Claim Form is provided to the injured volunteer, and the SAP Coordinator mails the original form to the CA State Compensation Fund within 5 calendar days after receiving it from the injured volunteer.

The SAP Coordinator also completes the CA State Fund 3267 Employers Report and mails it within 5 calendar days to the CA State Compensation Fund. The

Employers Report can also be called in to the 24-hour Claims Reporting Center at 1-(888) 222-3211. The Employer's Report is not provided to the injured volunteer.

A written Incident Report on local government letterhead, which includes a brief account of the incident, must be faxed to the CA State Compensation Fund.

Cal OES must also receive copies of all of these documents from the SAP Coordinator.

2.3.9 - Demobilization and Handoff

Once the SAP evaluators have finished their five-day assignment, or when the work is done, the SAP evaluators need to meet back at the DOC to demobilize. At that time, the SAP coordinator needs to see to it that the following takes place:

- Account for all the SAP evaluators.
- Obtain all remaining assessment forms, and review them with the appropriate SAP evaluators.
- Retrieve all the backpacks that were assigned to the SAP teams.
- Accept any travel expense claim forms and receipts, if these are available from the evaluators (otherwise, they will need to mail these to the jurisdiction).
- Brief the SAP evaluators on safety issues regarding leaving the jurisdiction. If the meeting is held in the evening, it would be safest to have the evaluators travel home the following morning.
- Thank them all for coming to assist!

In addition to thanking the SAP evaluators for their assistance, the jurisdiction needs to send a letter to each of them doing the same thing. The jurisdiction also needs to reimburse them as quickly as possible for their expenses.

If the SAP deployment is necessary for a longer period than five days (which is not unusual), then another group, or 'wave,' of SAP evaluators will come in to replace the ones that just finished up. There should also be replacement SAP coordinators to come in with the next group as well. There needs to be an effective handoff of information between the first SAP coordinator and the next.

In order for this to take place, the first SAP coordinator needs to stay long enough to meet with the next SAP coordinator to inform him or her of the

situation and other necessary issues. The following are examples of what should be discussed, though there may be more subjects than these:

- SAP response situation status (including strike team status).
- Tasks remaining to be done.
- Equipment and supplies status.
- Transportation status.
- Communication systems in place, including phone lists, computer access, and any local government radios being used.
- DOC facilities.
- Arrangements for rooming and food for the next wave of SAP evaluators.

Once all the SAP evaluations are done, then the work is complete, and the SAP coordinators can demobilize.

2.4 - Building Safety Related Issues

2.4.1 - Structural Collapse Hazard Zones

A difficult question that faces building officials is: how far back should a barricade or cordon be placed around an unstable building? There are good examples to consider for general public safety which were learned from the fire service.

Fire fighters face grave danger from weakening structures when fighting structure fires. Structures have often collapsed while fires are being fought. Incident Safety Officers are trained to watch for signs of imminent building collapse so as to advise the Incident Commander to fall back to a defensive posture and establish a collapse hazard zone from which to work. (Defensive firefighting means that the building is lost, and fire fighters are protecting structures around the burning structure from being lost as well.)

Buildings may collapse in several ways, but the most common observed by fire fighters is a 90-degree collapse, where the external wall, or even the building, rotates and lays flat. Incident Commanders know that it is too late to plan for this worst-case scenario once the structure starts to fall, so the collapse hazard zone is established to protect fire fighters and others on the scene from certain death or injury.

In 1999, the National Institute for Occupational Safety and Health (NIOSH) published "Preventing Injuries and Deaths of Fire Fighters due to Structural

Collapse." This publication said that the collapse hazard zone should be at lease the height of the structure, plus some room for the debris to scatter.

In considering a collapse hazard zone for World Trade Center Building 7 in 2001, the Incident Commander established the approximate height of the 47-story building, or 600 feet, as the radius for the collapse hazard zone.

Starting in 2002, in its Fire Fighter Fatality Investigations, NIOSH began recommending that Incident Commanders use a standard of 1.5 times the building height to establish the collapse hazard zone. This radius allows room for the structure to collapse, and the high velocity debris broken loose by the collapse (such as bricks, parapet pieces, gargoyles) from hurting others. (The example NIOSH uses is that of a 20-foot-high structure needing a collapse zone of 30 feet.) NIOSH continues to advocate this recommendation to this day.

Fire fighting forces around the U.S. now regard this standard as the definition of a collapse hazard zone. One example is that of the Los Angeles Fire Department, which at its website posts the definition of a collapse zone as 1.5 times the height of the building. Other references found in firefighting training from around the country consider this to be the standard definition of a collapse hazard zone.

One reference, *Safe and Effective Fireground Operations* by Ben Klaene, states that "any collapse zone that is closer than the building's height plus an allowance for debris scatter – usually one and a half times the building's height – is a calculated risk and the IC [Incident Commander] must ask whether the expected benefit is worth the risk." (Mr. Klaene is the co-author of the book *Structural Firefighting: Strategy and Tactics*.)

The 2009 NIOSH publication *Preventing Deaths and Injuries of Fire Fighters When Fighting Fires in Unoccupied Structures* notes "NIOSH recommends that a collapse zone be equal to the height of the building plus allowance for scattering debris – usually, at least 1.5 times the height of the building [Fire Fighter's Handbook 2000]".

It is clear from this history that the NIOSH standard for collapse hazard zones is well established.

It is observed that some buildings weakened by earthquake forces, notably base shear, and overturning forces, have not collapsed immediately, but have failed structurally after several days of damage from ongoing aftershocks.

Communities with earthquake damaged structures face similar threats to that of fire fighters from collapsing structures.

Building officials are in the position to protect lives from those buildings threatening collapse by cordoning a collapse hazard zone around them. The California Safety Assessment Program identifies buildings that are unsafe due to various reasons, including the threat of a building, landslide or another object falling on them. This approach was used successfully in response to a damaged water tower in El Centro after the April 4, 2010 Baja Earthquake.

It is strongly recommended to follow the proven example of fire fighters in cordoning a collapse hazard zone that protects the public in the same manner that fire fighters are protected, with a collapse hazard zone of 1.5 times the height of the building. History has shown that this standard provides the best protection against injury and death from collapsing structures.

Cal OES recommends that the NIOSH standard of a collapse hazard zone and cordoning radius of 1.5 times the building height continues to be used in the Safety Assessment Program with respects to unsafe buildings in danger of collapse. It may be true that some buildings may fail in other ways, but this approach provides the best method of securing the safety of the public at large. This standard is also honored by practical use, as opposed to other methods proposed by various entities.

Photo courtesy David Karina
Figure 2-13 - Barricades in Calexico after the 2010 Baja Earthquake.

2.4.2 - Barricades

Barricades are often installed to keep the public away from localized dangerous conditions, such as a building overhang or parapet that is in danger of falling. Such barricades may consist of wooden sawhorse-type barricades with caution tape run between them. Other barricades may be more formidable, such as those designed to hold back falling rocks or building debris from public right-of-way.

SAP evaluators can call for barricades on their Rapid Assessment Forms. They can also barricade off hazards to some degree themselves by using the yellow caution tape provided by the local government.

Barricades can be installed to define the collapse zones of tall structures that have been weakened by an earthquake or other event. They may end up being replaced by a cordon fence if the hazard warrants it. It can be advisable to mark the location of the barricades with spray paint, so the public is discouraged from moving the barricades unsafely.

Cal OES recommends the collapse zone distance described in Section 2.4.1 and recommended by NIOSH as the distance from a dangerous building to place a barricade.

Photos courtesy Jim C. Barnes
Figures 2-14 & 2-15: Shipping containers used as barricades in parking lot, New Zealand.

Photo courtesy Jim C. Barnes
Figure 2-16: Containers used to protect coastal highway from rock falls, New Zealand.

In New Zealand, authorities used steel shipping containers to form sturdy barricades to prevent rocks from falling into roadways, or to hold back falling debris from buildings. This is an interesting and useful innovation worth copying, as they were very effective. Several examples are shown in the photos. The containers lock together at the corners with steel pins, so the overall construction is very sturdy.

Photo courtesy Jim C. Barnes
Figure 2-17: Shipping container retrofitted to serve as a debris shed. Christchurch, New Zealand.

Shipping containers were also used as debris sheds so buildings with damaged masonry could be entered through them. These particular containers had interior braces installed, and were topped with bales of hay so as to cushion the blow of the falling masonry. The debris sheds were then hoisted by crane and placed so someone could walk through them to the building doorway without the danger of being struck by falling debris.

Each jurisdiction will need to decide what sort of barricade system is best for their community, how many, and for how long. Some communities would prefer to have reminders of the earthquake removed as quickly as possible, once the safety hazards are abated. Some barricade systems could become targets of graffiti as well.

Photo courtesy Jim C. Barnes
Figure 2-18: Cordon fence near collapsed CTV Building, Christchurch, New Zealand.

2.4.3 - Cordoning Unsafe Structures

The local government building department is often in the position of advising on when to cordon off sections of a jurisdiction from the public. Safety assessment decisions lead directly to decisions on cordoning and stabilization.

Powerful earthquakes, tsunamis, and other natural and man-made disasters can render large sections of building stock dangerous to be around. Those who used these buildings in the past, and the public at large, need to be protected from the dangerous conditions caused by debris and unstable structures.

Cordoning was used:

- In downtown Santa Cruz after the 1989 Loma Prieta earthquake.
- In the Marina district in San Francisco after the 1989 Loma Prieta earthquake.
- In Oklahoma City at the Murrah Federal Building after the 1995 terrorist bombing.
- In New York at the World Trade Center site after the 2001 terrorist attack.
- In downtown Paso Robles after the 2003 San Simeon earthquake.

- In Christchurch, New Zealand after the 2010 and 2011 Canterbury earthquakes.
- In Santa Cruz Harbor after the 2011 tsunami.

Cordoning can take several forms. In most cases, a temporary fence is installed around the perimeter of the unsafe area, with guarded gates if access will be allowed for some. In the case of Santa Cruz Harbor after the March 2011 tsunami from the Northern Japan earthquake, the existing gates to the damaged boat docks were simply locked, with signs installed that warned of criminal penalties for violation of the denied access.

Of course, the decision to cordon off parts of a jurisdiction may not be easy. Businesses within the cordon area will simply be closed, with their future uncertain. Roadways that the public uses to gain access to other parts of town will be closed off. This decision could lead to economic difficulties that will take time to recover from. The overriding issue of the safety of human lives is the key point to warrant the closure of a section of a city or town.

Observations of disasters points to the following conditions that would warrant cordoning:

- Dire collapse hazards from single or multiple buildings. This includes potential multiple collapses started by the potential collapse of one or more severely damaged buildings.
- Demolition activities.
- Extensive debris in public streets that require the use of large equipment to remove.
- Extensive shoring that encroaches into the public right-of-way.
- Necessary security to prevent looting, vandalism, and the setting of fires.
- Non-structural hazards that present a danger to the public, such as hazardous materials or damaged utility systems.
- Unsafe and/or unstable geological issues, such as a threatening landslide or growing sinkhole.

There may be other reasons that would warrant restricting access to an area by cordon.

Detour signage must conform to local ordinances and/or to the latest Manual for Uniform Traffic Control Devices (MUTCD).

A useful method used in Christchurch by New Zealand authorities was to cordon off a relatively large section of downtown Christchurch after the February 22, 2011 earthquake. Then, as repair or mitigation work created usable structures within the fringes of the cordoned area, these were opened up as soon as possible, leaving fewer and fewer blocks cordoned off in the interest of public safety. By clearing sections of the formerly cordoned area for use, the community has done what it can to recover rapidly and safely.

Photo courtesy Jim C. Barnes
Figure 2-19: Steel shoring, Christchurch, New Zealand.

2.4.4 - Shoring

Shoring of damaged buildings may become necessary early in the disaster response for a variety of reasons. For example, a weakened building may threaten a public right-of-way or a nearby building, so shoring may be required at once. There may be interest in preventing an historic building from collapsing so it can be repaired in-place. Entry into a building tagged Unsafe may not be possible until shoring is done. Shoring may also be necessary in order to give the owners time to develop a workable repair plan with their engineers or architects.

There is a saying that 'a little knowledge can be dangerous,' and that is certainly the case with shoring. Proper shoring design requires professional skill and understanding in order to carry it out with success. It is not a subject to consider casually. Shoring design is and always must be individually composed

to handle the particular situation and circumstances of the structure being shored. It is as individual a design as that of the building structure itself.

Emergency shoring in order to conduct search and rescue operations is generally exempt from design review; U.S. Urban Search and Rescue teams have a professional engineer as part of their task force in order to design and oversee such shoring operations. Even the design parameters for this activity are daunting. The material found at FEMA's website on this subject at http://www.fema.gov/pdf/emergency/usr/usr_23_20080205_rog.pdf emphasizes this. A great deal of expertise is involved regarding estimating the weight of construction materials being shored, the capacity and configuration of wood and steel members, beam slenderness ratios of no more than 1 to 25, and bearing capacities of surfaces. Shoring to resist horizontal forces of 10% gravity is also recommended.

However, the case of the emergency shoring needed to keep rubble from collapsing while a search for survivors is done is not the same situation as shoring a building to prevent collapse while being repaired, and a higher standard is needed. The degree of design review required also depends on if the building will only be occupied by construction workers, or if a wider use is anticipated that requires a temporary occupancy permit while the repairs are completed.

When no occupancy is expected while detailed evaluations or engineering evaluations are being done, the jurisdiction may allow qualified general engineering, shoring contractors, and building moving contractors to design and construct shoring as they would be permitted in the staging of a construction project (see CA Business and Professions Code Section 5537.2).

If construction workers will be on site, and when such shoring involves work of 36 feet or more in height, Cal OSHA requires plans sealed by a licensed California civil engineer and a Cal OSHA permit before work can commence. Cal OSHA regulations (Title 8, Subchapter 4, Article 29, Section 1717(b)(1)) says that calculations and working drawings shall be approved and signed by a California civil engineer for all falsework or vertical shoring installations when any of the following conditions exist:

- The height from the sill plate to the soffit of the superstructure exceeds 14 feet.
- Individual horizontal spans exceed 16 feet.

- Provisions for vehicular traffic through the falsework or vertical shoring are made.

For all falsework and vertical shoring installations not covered by the above provisions, the falsework or shoring layout shall be approved and signed by one of the following:

- A civil engineer currently registered in California.
- A (shoring) manufacturer's authorized representative.
- A license contractor's representative qualified in the usage and erection of falsework and vertical shoring.

A jurisdiction may handle a request for a temporary occupancy permit of a building with shoring by viewing the shoring as a temporary structure, therefore subject to Section 108 of the California Building Code. In that case, a review of the shoring structural design by a California licensed civil engineer would invariably be a requirement. The repairs would have to be completed within the 180 days allowed by the temporary structure permit, unless an extension is granted by the jurisdiction.

In the face of an ongoing emergency response, local governments may find they need to do stabilization measures themselves to protect the public and publicly owned structures. Property owners may also want to take some limited shoring measures themselves to stabilize threats and minimize additional losses or casualties. Since local governments will be taxed trying to apply limited resources to the emergency situation, they may decide to oversee the designs of just those shoring efforts with the greatest risk, while using their discretion with the rest of the public efforts.

Jurisdictions may find it expedient to provide permit exemptions by class or dollar value for disaster related permitting, and retroactive permits and inspections may also be part of a jurisdiction's compromise response to a difficult situation.

An interesting use of steel shipping containers in New Zealand was to use them to shore up the side of a masonry structure. This is an interesting ideal that could be used for low-rise buildings in California with the room to stack the containers.

There are many fine guides on shoring practice and principles. One public document is *Temporary Shoring & Stabilization of Earthquake Damaged Historic*

Buildings by Roy W. Harthorn, from which many of the previous observations are derived.

Photo courtesy Jim C. Barnes
Figure 2-20: Shipping containers used to shore up masonry building in Christchurch, New Zealand.

2.4.5 - Repair versus Demolition and Replacement

Demolition is a process that normally involves permission from the building owner, and various 'hold harmless' and other legal documents must be finalized before the demolition contractor can be turned loose on the project.

Unless a weakened structure is a clear and present danger to the public, the decision to repair or demolish a building is usually an economic one. There are many ways to repair a structure, and various cost-effective designs may be considered. When it is more cost-effective to demolish the building, haul the debris away or recycle it, and build a new building to replace it, demolition of the building becomes attractive.

Most buildings in California that are tagged Unsafe end up being repaired rather than demolished and replaced.

2.5 - Conclusion

There is a great deal of information contained in this manual. It is hoped that most of it will prove to be useful for those who are involved in safety assessment planning and response. Some of the recommendations will be easier to accomplish in some communities than in others. Local governments will need to determine what is most useful for them to apply. Nevertheless, this overview of safety assessment coordination practices should be a useful resource for building officials and emergency managers who have the responsibility to identify usable or dangerous buildings in their communities.

The following Appendix contains basic forms for managing the SAP coordination. It also has the CALBO sample placard adoption ordinance, and a suggested "Useful Information for Survivors" that could be used in a jurisdiction, which are included for reference. There is also the SAP Coordinator Job Aid, a checklist approach to preparing for, responding to, and demobilizing from an event. The SAP MOU is also attached.

APPENDIX

SAP Evaluator Intake Tracking Form

Jurisdiction: _____ Phone #: _____

Address: _____ Fax #: _____

Contact Name: _____ E-mail: _____

Name	Specialty	Organization	SAP ID#	Date	Time Signed In	Time Signed Out

SAP Field Information Form

Jurisdiction: ______________________________ Phone #: __________________

Address: _________________________________ Fax #: ____________________

Contact Name: ___________________________ E-mail: ___________________

Type (R=Res, C=Comm)	Address	City or Town	Damage Description	Posted Placard (G,Y,R)	Comments	% Est. Loss

ATC-20 Rapid Evaluation Safety Assessment Form

Inspection

Inspector ID_____ Inspection date & time_____

Affiliation_____ ___ Inspected exterior only

___ Inspected exterior and interior

Building Description

Building name: _____

Building Area: _____ Address: _____

Building contact & phone: _____

Number of stories above ground: _____ below ground: _____

Approximate footprint area in square feet: _____

Number of residential units: _____

Number of residential units not inhabitable: _____

Type of construction (check the appropriate space):

___ Wood frame ___ Concrete shear wall ___ Steel frame

___ Concrete frame ___ Tilt-up concrete ___ Reinforced masonry

___ Unreinforced masonry Other: _____

Primary Occupancy (check the appropriate space):

___ Dwelling ___ Commercial ___ Government

___ Other residential ___ Offices ___ Historic

___ Public assembly ___ Industrial ___ School

___ Emergency services Other: _____

Evaluation

Investigate the building for the conditions below and check the appropriate column.

Observed Conditions:	Minor/None	Moderate	Severe
Collapse, partial collapse	_____	_____	_____
Building off foundation	_____	_____	_____
Building or story leaning	_____	_____	_____
Racking damage to walls	_____	_____	_____
Other structural damage	_____	_____	_____
Falling hazard (chimney, parapet, etc.)	_____	_____	_____
Ground slope movement/cracking	_____	_____	_____
Other:_____	_____	_____	_____

Comments: _____

_____

Estimated Building Damage (excluding contents):

___ None

___ 0 to 1%

___ 1 to 10%

___ 10 to 30%

___ 30 to 60%

___ 60 to 100%

___ 100%

Posting

Choose a posting based on the evaluation and team judgment. *Severe* conditions endangering the overall building are grounds for an Unsafe posting. Localized *Severe* and overall *Moderate* conditions may allow a Restricted Use posting. Post INSPECTED placard at main entrance. Post RESTRICTED USE and UNSAFE placards at all entrances. Each building gets only one type of placard.

___ INSPECTED (Green placard)

___ RESTRICTED USE (Yellow placard)

___ UNSAFE (Red placard)

Record any use and entry restrictrions for RESTRICTED USE placard exactly as written on the placard: _____

_____

_____

Further Action

___ Barricades needed in the following areas:_____

_____

___ Detailed Evaluation recommended: ___ Structural ___ Geotechnical

Other recommendations: _____

Comments: _____

_____

ATC-20 Rapid Evaluation Printable Form

ATC-20 Rapid Evaluation Safety Assessment Form

Inspection

Inspector ID: _____ Inspection date and time: _____ ☐ AM ☐ PM

Affiliation: _____ Areas inspected: ☐ Exterior only ☐ Exterior and interior

Building Description

Building name: _____

Address: _____

_____

Building contact/phone: _____

Number of stories above ground: _____ below ground: _____

Approx. "Footprint area" (square feet): _____

Number of residential units: _____

Number of residential units not habitable: _____

Type of Construction

☐ Wood frame ☐ Concrete shear wall

☐ Steel frame ☐ Unreinforced masonry

☐ Tilt-up concrete ☐ Reinforced masonry

☐ Concrete frame ☐ Other: _____

Primary Occupancy

☐ Dwelling ☐ Commercial ☐ Government

☐ Other residential ☐ Offices ☐ Historic

☐ Public assembly ☐ Industrial ☐ School

☐ Emergency services ☐ Other: _____

Evaluation

Investigate the building for the conditions below and check the appropriate column.

Observed Conditions:	Minor/None	Moderate	Severe
Collapse, partial collapse, or building off foundation	☐	☐	☐
Building or story leaning	☐	☐	☐
Racking damage to walls, other structural damage	☐	☐	☐
Chimney, parapet, or other falling hazard	☐	☐	☐
Ground slope movement or cracking	☐	☐	☐
Other (specify) _____	☐	☐	☐

Estimated Building Damage (excluding contents)

☐ None

☐ 0–1%

☐ 1–10%

☐ 10–30%

☐ 30–60%

☐ 60–100%

☐ 100%

Comments: _____

_____

Posting

Choose a posting based on the evaluation and team judgment. *Severe* conditions endangering the overall building are grounds for an Unsafe posting. Localized *Severe* and overall *Moderate* conditions may allow a Restricted Use posting. Post INSPECTED placard at main entrance. Post RESTRICTED USE and UNSAFE placards at all entrances.

☐ **INSPECTED** (Green placard) ☐ **RESTRICTED USE** (Yellow placard) ☐ **UNSAFE** (Red placard)

Record any use and entry restrictions exactly as written on placard: _____

_____

_____

Further Actions Check the boxes below only if further actions are needed.

☐ Barricades needed in the following areas: _____

_____

☐ Detailed Evaluation recommended: ☐ Structural ☐ Geotechnical ☐ Other: _____

☐ Other recommendations: _____

Comments: _____

_____

ATC-20 Detailed Evaluation Safety Assessment Form

Inspection

Inspector ID_____ Inspection date & time_____

Affiliation_____ ___ Inspected exterior only

___ Inspected exterior and interior

Building Description

Building name: _____

Building Area: _____ Address: _____

Building contact & phone: _____

Number of stories above ground: _____ below ground: _____

Approximate footprint area in square feet: _____

Number of residential units: _____

Number of residential units not inhabitable: _____

Type of construction (check the appropriate space):

___ Wood frame ___ Concrete shear wall ___ Steel frame

___ Concrete frame ___ Tilt-up concrete ___ Reinforced masonry

___ Unreinforced masonry Other: _____

Primary Occupancy (check the appropriate space):

___ Dwelling ___ Commercial ___ Government

___ Other residential ___ Offices ___ Historic

___ Public assembly ___ Industrial ___ School

___ Emergency services Other: _____

Evaluation

Investigate the building for the conditions below and check the appropriate column.

Overall Hazards	Minor/None	Moderate	Severe

Collapse/partial collapse	_____	_____	_____
Building or story leaning	_____	_____	_____
Other _____	_____	_____	_____
<u>Structural Hazards</u>			
Foundations	_____	_____	_____
Roofs, floors re: vertical loads	_____	_____	_____
Columns, pilasters, corbels	_____	_____	_____
Diaphragms, lateral bracing	_____	_____	_____
Walls, vertical bracing	_____	_____	_____
Precast connections	_____	_____	_____
Other_____	_____	_____	_____
<u>Nonstructural hazards</u>			
Parapets, ornamentation	_____	_____	_____
Cladding, glazing	_____	_____	_____
Ceilings, light fixtures	_____	_____	_____
Interior walls, partitions	_____	_____	_____
Elevators	_____	_____	_____
Stairs, exits	_____	_____	_____
Electric, gas	_____	_____	_____
Other_____	_____	_____	_____
<u>Geotechnical hazards</u>			
Slope failure, debris	_____	_____	_____
Ground movement, fissures	_____	_____	_____
Other_____	_____	_____	_____

<u>General Comments:</u> _____

_____

Estimated Building Damage (excluding contents)

___ None

___ 0 to 1%

___ 1 to 10%

___ 10 to 30%

___ 30 to 60%

___ 60 to 100%

___ 100%

Posting

If there is a posting from a previous evaluation, check the appropriate placard:

Previous posting: ___ INSPECTED ___ RESTRICTED USE ___ UNSAFE

Inspector ID number _____ Date _____

If necessary, revise the posting based on the new evaluation and team judgment. *Severe* conditions endangering the overall building are grounds for an Unsafe placard. Local *Severe* and overall *Moderate* conditions may allow a Restricted Use posting. Indicate the current posting below and at the top of page one of this form.

___ **INSPECTED** (Green placard) ___ **RESTRICTED USE** (Yellow placard)
___ **UNSAFE** (Red placard)

Record any use and entry restrictions exactly as written on the Restricted Use placard. _____

_____

_____

Further Actions Check the subjects below only if further actions are needed.

___ Barricades needed in the following areas: _____

_____

Other recommendations: _____

_____

_____

Comments: _____

_____

There is a place on the second page of the 2-page form for a sketch, if needed.

ATC-20 Detailed Evaluation Printable Form

ATC-20 Detailed Evaluation Safety Assessment Form

Inspection

Inspector ID: _____

Affiliation: _____

Inspection date and time: _____ ☐ AM ☐ PM

Final Posting
from page 2

☐ Inspected
☐ Restricted Use
☐ Unsafe

Building Description

Building name: _____

Address: _____

_____

Building contact/phone: _____

Number of stories above ground: _____ below ground: _____

Approx. "Footprint area" (square feet): _____

Number of residential units: _____

Number of residential units not habitable: _____

Type of Construction

☐ Wood frame
☐ Steel frame
☐ Tilt-up concrete
☐ Concrete frame
☐ Concrete shear wall
☐ Unreinforced masonry
☐ Reinforced masonry
☐ Other: _____

Primary Occupancy

☐ Dwelling
☐ Other residential
☐ Public assembly
☐ Emergency services
☐ Commercial
☐ Offices
☐ Industrial
☐ Other: _____
☐ Government
☐ Historic
☐ School

Evaluation

Investigate the building for the conditions below and check the appropriate column. There is room on the second page for a sketch.

	Minor/None	Moderate	Severe	Comments
Overall hazards:				
Collapse or partial collapse	☐	☐	☐	_____
Building or story leaning	☐	☐	☐	_____
Other _____	☐	☐	☐	_____
Structural hazards:				
Foundations	☐	☐	☐	_____
Roofs, floors (vertical loads)	☐	☐	☐	_____
Columns, pilasters, corbels	☐	☐	☐	_____
Diaphragms, horizontal bracing	☐	☐	☐	_____
Walls, vertical bracing	☐	☐	☐	_____
Precast connections	☐	☐	☐	_____
Other _____	☐	☐	☐	_____
Nonstructural hazards:				
Parapets, ornamentation	☐	☐	☐	_____
Cladding, glazing	☐	☐	☐	_____
Ceilings, light fixtures	☐	☐	☐	_____
Interior walls, partitions	☐	☐	☐	_____
Elevators	☐	☐	☐	_____
Stairs, exits	☐	☐	☐	_____
Electric, gas	☐	☐	☐	_____
Other _____	☐	☐	☐	_____
Geotechnical hazards:				
Slope failure, debris	☐	☐	☐	_____
Ground movement, fissures	☐	☐	☐	_____
Other _____	☐	☐	☐	_____

General Comments: _____

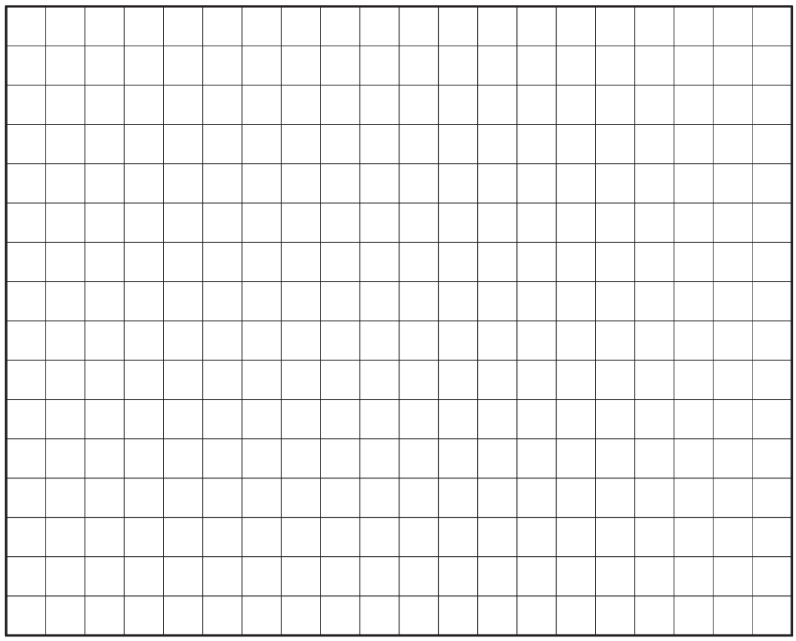
_____

Continue on page 2

ATC-20 Detailed Evaluation Safety Assessment Form Page 2

Building name: _____ Inspector ID: _____

Sketch (optional)
Provide a sketch of the building or damaged portions. Indicate damage points.



Estimated Building Damage
If requested by the jurisdiction, estimate building damage (repair cost ÷ replacement cost, excluding contents).

- ☐ None
- ☐ 0–1%
- ☐ 1–10%
- ☐ 10–30%
- ☐ 30–60%
- ☐ 60–100%
- ☐ 100%

Posting
If there is an existing posting from a previous evaluation, check the appropriate box.

Previous posting: ☐ INSPECTED ☐ RESTRICTED USE ☐ UNSAFE Inspector ID: _____ Date: _____

If necessary, revise the posting based on the new evaluation and team judgment. *Severe* conditions endangering the overall building are grounds for an Unsafe posting. Local *Severe* and overall *Moderate* conditions may allow a Restricted Use posting. Indicate the current posting below and at the top of page one.

☐ **INSPECTED** (Green placard) ☐ **RESTRICTED USE** (Yellow placard) ☐ **UNSAFE** (Red placard)

Record any use and entry restrictions exactly as written on placard: _____

_____

_____

Further Actions Check the boxes below only if further actions are needed.

☐ Barricades needed in the following areas: _____

_____

☐ Engineering Evaluation recommended: ☐ Structural ☐ Geotechnical ☐ Other: _____

☐ Other recommendations: _____

_____

_____

Comments: _____

_____

ADOPTION OF PLACARDS

One of the functions of the ATC-20 publication was the development of placards that clearly identified the condition of buildings to owners and occupants. These placards were first used after the Loma Prieta earthquake in 1989. A panel was convened by the Applied Technology Council to review ATC-20 and update the document based on the Loma Prieta experience. One of the major revisions to come from that panel was to revise the three placards. These revised placards have been included in the ***Post-Disaster Safety Assessment Program*** and in this document.

Placards have been widely used in past earthquakes to denote the condition of buildings and structures. In many cases, the placards have been those recommended in the ATC-20 publication. Unfortunately, most jurisdictions have not officially adopted placards. Technically, these unofficial placards represent only a recommendation from those who perform the evaluation. As a recommendation, the placards do not carry the weight of law and cannot be enforced. Adopting the placards by ordinance makes them official and enforceable. Once the placards have been adopted and before they are printed, the jurisdiction seal, ordinance number, and the responsible department's name, address, and phone number should be added.

In past events, there have been a number of reports of placards being removed from buildings by owners or tenants. In other cases, there have been reports of the unauthorized change of placards, usually from UNSAFE to one of the other categories. In both cases, adopting placards by ordinance allows the jurisdiction to enforce the posting with local police or sheriffs if necessary. Placards are placed on a building to promote the owner, tenant, and the general public. No action should be permitted that would compromise such protection.

It should be remembered that only authorized representatives of the jurisdiction may place official placards. For this reason, the ***Post-Disaster Safety Assessment Program*** recommends that the safety assessment evaluators be deputized. If this is done, evaluators can place official jurisdiction placards when they complete their evaluations. If evaluators are not deputized, the jurisdiction must send out its personnel to post the buildings.

Some jurisdictions have become concerned that they will become financially responsible for providing worker's compensation coverage if they deputize

volunteers. In accordance with Article 17, Section 8657(b) of the ***California Emergency Services Act,*** local government is **not** financially responsible for providing the volunteers with worker's compensation coverage if the jurisdiction deputizes volunteers. The volunteering Safety Assessment Evaluators are registered with OES as Disaster Service Worker Volunteers and are provided worker's compensation by the State of California. Evaluators who are State or local government employees are covered by their respective jurisdiction and respond under mutual aid agreements.

CALBO and OES encourage all jurisdictions to adopt the revised ATC-20 placards in order to have a uniform placard system in place throughout the state. To assist jurisdictions in this process, CALBO and OES have developed the following **model ordinance template** as a guide in adopting these revised placards. Please review the template and placards with your agency attorney. Once the placards have been adopted, these copies can have the necessary information added and be used to create reproducible masters.

We hope this document provides you with the assistance you need to accomplish this important task.

2003/04 Emergency Preparedness Committee (CALBO)

ORDINANCE NO: _____

AN ORDINANCE OF THE CITY OF (TOWN OF, COUNTY OF, CITY AND COUNTY OF) _____ STATE OF CALIFORNIA, ADDING A NEW CHAPTER ____ TO DIVISION _____ OF THE _____ MUNICIPAL CODE (COUNTY CODE), RELATING TO PLACARDS USED TO DENOTE CONDITIONS RELATING TO CONTINUED OCCUPANCY OF BUILDINGS.

The City Council (County Board of Supervisors) of the City of (County of, City and County of) _____, State of California, ordains as follows:

Section 1. Chapter _____ is added to Division ____ of Title _____ of the City of (County of, City and County of) _____ municipal (county) code, to read:

Chapter _____, Safety Assessment Placards.

Sections:

_____ Intent

_____ Application of Provisions

_____ Definitions

_____ Placards

Section _____ Intent.

This chapter establishes standard placards to be used to indicate the condition of a structure for continued occupancy. The chapter further authorizes the Building Official and his or her authorized representatives to post the appropriate placard at each entry point to a building or structure upon completion of a safety assessment.

Section _____ Application of Provisions.

(a) The provisions of this chapter are applicable to all buildings and structures of all occupancies regulated by the City (Town, County, City and County) of _____. The Council (Board) may extend the provisions as necessary.

Section _____ Definitions.

(a) **Safety assessment** is a visual, non-destructive examination of a building or structure for the purpose of determining the condition for continued occupancy.

Section _____ Placards.

(a) The following are verbal descriptions of the official jurisdiction placards to be used to designate the condition for continued occupancy of buildings or structures. Copies of actual placards are attached.
   (1) **INSPECTED – Lawful Occupancy Permitted** is to be posted on any building or structure wherein no apparent structural hazard has been found. This placard is not intended to mean that there is no damage to the building or structure.
   (2) **RESTRICTED USE** is to be posted on each building or structure that has been damaged wherein the damage has resulted in some form of restriction to the continued occupancy. The individual who posts this placard will note in general terms the type of damage encountered and will clearly and concisely note the restrictions on continued occupancy.
   (3) **UNSAFE – Do Not Enter or Occupy** is to be posted on each building or structure that has been damaged such that continued occupancy poses a threat to life safety. Buildings or structures posted with this placard shall not be entered under any circumstances except as authorized in writing by the Building Official, or his or her authorized representative. Safety assessment teams shall be authorized to enter these buildings at any time. This placard is not to be used or considered as a demolition order. The individual who posts this placard will note in general terms the type of damage encountered.

(b) This ordinance number, the name of the jurisdiction, its address, and phone number shall be permanently affixed to each placard.

(c) Once it has been attached to a building or structure, a placard is not to be removed, altered, or covered until done so by an authorized representative of the Building Official. It shall be unlawful for any person, firm, or corporation to alter, remove, cover, or deface a placard unless authorized pursuant to this section.

Inspected "Green" Placard

INSPECTED

LAWFUL OCCUPANCY PERMITTED

This structure has been inspected (as indicated below) and no apparent structural hazard has been found.

☐ **Inspected Exterior Only**

☐ **Inspected Exterior and Interior**

Report any unsafe condition to local authorities; reinspection may be required.

Inspector Comments:

_____

_____

_____

_____

Facility Name and Address:

_____

_____

_____

Date _____

Time _____

(**Caution:** Aftershocks since inspection may increase damage and risk.)

This facility was inspected under emergency conditions for:

_____

(Jurisdiction)

Inspector ID / Agency

_____

_____

_____

Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

The above is a pdf version of the green INSPECTED placard.

Restricted Use "Yellow" Version 1

RESTRICTED USE

Caution: This structure has been inspected and found to be damaged as described below:

_____
_____
_____
_____

Entry, occupancy, and lawful use are restricted as indicated below:

_____
_____
_____
_____
_____
_____

Facility Name and Address:

_____
_____
_____

Date _____

Time _____

(**Caution:** Aftershocks since inspection may increase damage and risk.)

This facility was inspected under emergency conditions for:

_____
(Jurisdiction)

Inspector ID / Agency

_____
_____
_____

Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

The above is a pdf version of one of the yellow RESTRICTED USE placard types.

Restricted Use "Yellow" Version 2

RESTRICTED USE

Caution: This structure has been inspected and found to be damaged as described below:

_____
_____
_____
_____

Entry, occupancy, and lawful use are restricted as indicated below:

☐ Do not enter the following areas: _____
_____

☐ Brief entry allowed for access to contents: _____
_____

☐ Other restrictions: _____
_____

Facility name and address:

_____
_____
_____

Date _____

Time _____

(**Caution:** Aftershocks since inspection may increase damage and risk.)

This facility was inspected under emergency conditions for:

_____
(Jurisdiction)

Inspector ID / Agency

_____
_____
_____

Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

The above is a pdf version of one of the RESTRICTED USE placard types.

Unsafe "Red" Placard

UNSAFE

DO NOT ENTER OR OCCUPY
(THIS PLACARD IS NOT A DEMOLITION ORDER)

This structure has been inspected, found to be seriously damaged and is unsafe to occupy, as described below:

_____
_____
_____
_____
_____
_____

Do not enter, except as specifically authorized in writing by jurisdiction. Entry may result in death or injury.

Facility Name and Address:

_____
_____
_____

Date _____

Time _____

This facility was inspected under emergency conditions for:

_____
(Jurisdiction)

Inspector ID / Agency

_____
_____
_____

Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

The above is a pdf version of the red UNSAFE placard.

Placard Posting Notices

(CITY OR COUNTY) OF _____

BUILDING DEPARTMENT

NOTICE TO OWNER/TENANT/FACILITY MANAGER

To whom it may concern:

On (date)_____, your house/building at _____

was damaged by (fire) / (vehicles) / (water) / (earthquake) / (other – specify _____).

IMMEDIATE AID

If you require temporary shelter, food, clothing, and information referral as a result of a fire, flood, or other natural disaster, you can contact the American Red Cross at the contact information below:

_____

_____

The structure is posted with (red) / (yellow) / (green) placard. This notice is to explain what these placards mean and to assist you, and if applicable, your insurance company and contractor, to get the structure repaired or restored, and if permits are required. After a fire, danger and injury are still possibilities. It is extremely important to keep the following information and safety standards in mind:

1. **Placards:** The restrictions and the placards are based on the limited visual observations of part of the damaged condition. It is not an in-depth or comprehensive assessment of the entire structure. It is the responsibility of the property owner or his/her agent to prevent further loss or damage to the site, and to execute the restrictions.

a. **Red (UNSAFE) –** Entry is not allowed except at the permission of the building department, and otherwise restricted only to trained emergency response personnel, or qualified construction and inspection professionals hired by the property owner, including insurance adjusters, at their own risk.
b. **Yellow (RESTRICTED USE) –** Entry or use of the building is restricted to what is stated on the placard. Portions of the building where entry is not allowed are subject to the same restrictions for buildings with the Unsafe placard.
c. **Green (INSPECTED) –** Entry is not limited, building appears usable as of the date and time when the inspection was made.
d. The owner/agent shall employ a qualified registered professional to provide an in-depth evaluation of the damage and submit a report to the Building Department to request a different placard and/or use of building if desired.

2. Repair or reconstruction will require building permits in accordance with the current edition of the California Building Code as amended and adopted by this jurisdiction, and any other local ordinances as applicable.
3. Utilities may be disconnected at the request of this jurisdiction for safety reasons. Do not attempt to reconnect any utilities yourself!
4. For more information contact the Building Department at the following:

_____
_____
_____
_____

I, _____(print name), am the property owner / agent _____(company name if agent), and I acknowledge the receipt of this notice.

Cell number _____ email _____

Information Flyers after Evaluation Posting

Useful Information for Survivors

Insurance

1. Contact your insurance agent immediately after the fire or natural disaster. Your insurance agent can assist you in making arrangements to secure your property from additional damage or loss through theft.
2. If you are a tenant, contact the resident manager, owner of property, or the owner's insurance agent. It is the owner's responsibility to prevent further loss to the site. You should see that your personal belongings are secure or removed to a safe location, such as a relative or friend's house.
3. If you do not have insurance, or your insurance is not adequate to cover your losses, any uninsured or underinsured portion may be deductible from your income tax. You should contact a qualified tax attorney, accountant, or the Internal Revenue Service for assistance on claiming fire/natural disaster loss. Keep receipts for any money you spend. These receipts are important in showing your insurance company what expenses you have incurred due to your fire/natural disaster loss, and for verifying your losses on your income tax return.
4. A good idea is to use a camera and/or a video recorder, such as what many of us have on our cellphones, to document your fire/natural disaster damage with still photos and/or video. This should be done as soon as possible after the loss, but if the loss is at night, you may have to wait until daylight to get quality photos and/or video.

Cash and Securities Replacement

1. Damaged or melted coins must be returned to the U.S. Mint. You may contact the Mutilated Coin Redemption Office by calling 1 (202) 354-7760 for details.
2. Damaged currency must be taken to the nearest Federal Reserve Bank. Currency that is at least 50% or more intact is automatically replaced. The Federal Reserve Bank decides if currency is more than 50% damaged will be replaced. If your currency is more than 50% damaged, contact your local fire department to obtain a copy of our fire report for your incident before you go to the Federal Reserve Bank. The Federal Reserve Bank does not normally replace currency that is more than 50% damaged, but

may make an exception if there is supporting evidence for the cause of currency damage.

3. Damaged U.S. Savings Bonds: Go to any bank that issues Savings Bonds and request Public Debt Form 1048. You may also find this form online. Complete and mail this form to the address indicated. It will take approximately two to three months to replace your Savings Bonds.
4. Damaged Stocks and Bonds: For information on your damaged stock certificates or bonds, contact either your broker that sold the stocks and bonds to you, or the company responsible for issuing the certificates.
5. Personal Documents: If you receive AFDC or welfare benefits, notify your case worker if your ID cards are destroyed or lost in the fire/natural disaster. For loss of all other personal documents, such as birth certificates, marriage license, death certificates, etc., contact the County Clerk in the county where the birth, marriage, death, etc., took place.

Property Repair and Restoration

Clothing: Smoke and water damage requires special cleaning techniques; do not send your damaged items to ordinary dry cleaners. Improper cleaning will cause stains and odor to become permanent. Your insurance agent should be able to recommend an experienced dry cleaner.

When taking your items to a dry cleaner, be sure to explain that these items were damaged in a fire/natural disaster so that they can be treated properly.

If the items can be washed, smoke and water stains can be removed by pre-treating. If items can be bleached, a possible mix is:

4 to 6 tablespoons of tri-sodium phosphate (TSP)

1 cup Lysol or household bleach

I gallon of water

Mix the ingredients. Spot-test the items before treating. If successful, soak the items in the mix. Remove the items, rinse them thoroughly with clear water, and air dry.

Mildew: To help prevent mildew, remove wet or damp items from house as soon as possible and allow items to air dry, preferably in the sunshine. To remove mildew, you can wash the stain with warm, soapy water, rinse well, and allow to

air dry in the sunshine. Difficult stains can also be removed by trying to wash items with lemon juice, or a diluted solution of chlorine bleach. It is a good idea to spot-test items before treating.

Interior Surfaces: Allow soot to dry for at least 24 hours. Trying to remove soot before it dries will only spread the stain, and possibly cause it to become permanent. After the soot has dried, try cleaning the surfaces with the previously mentioned TSP and Lysol mix described above for cleaning clothes.

There are commercial cleaning products available at most hardware, home centers, and paint stores. Commercial cleaners can be very powerful; read and follow all directions and warnings. Remember when using any cleaning solution to use Personal Protection Equipment (PPEs) such as gloves, eye goggles, mask, and old clothing. After cleaning, rinse with clear water and allow to air dry. Washable wallpaper can be cleaned in the same manner using caution not to soak the paper.

To avoid streaking, start at the base of the surface and work upwards. Do the top surface or ceiling last. Allow surfaces to air dry completely before repainting. If your HVAC system is operational, your air conditioner can be used to promote drying. Remember to change the filters before use, and at frequent intervals.

Wood Furniture and Fixtures:

1. Clean off all mud, ash, and dirt.
2. Remove all drawers and allow to air dry.
3. Wet wood decays and molds easily. Ventilate the room to allow air drying. If furniture is moveable, it can be allowed to air dry outside of direct sunlight.
4. Surfaces can be scrubbed with a stiff brush and the TSP/Lysol mixture mentioned above. It is a good idea to spot-test items before cleaning.
5. Mold on furniture can be removed with a clean cloth using a mixture of water and Borax.
6. To remove white water spots or other stains from wood surfaces, try rubbing the area with 4/0 steel wool polishing dipped in liquid furniture wax. Wipe and buff with a dry, clean, soft cloth.
7. **There are commercial cleaning products available for restoring and cleaning wood. Many of these products have flammable and harmful vapors, and must be used with caution. Please read and follow all precautions and directions.**

Water Damage

1. Remove all excess water possible by mopping, pumping, vacuuming with a wet vacuum, etc.
2. Area rugs should be removed, cleaned, and allowed to air dry.
3. Carpets should be vacuumed with a wet vacuum to remove as much water as possible, then cleaned and allowed to air dry. If stains or odors remain, the carpet and pad will have to be removed and replaced.
4. Vinyl floor covering cleanup is a challenge. If water gets under it, odors can result, and the subfloor can warp. Check with an experienced floor installer for assistance on this type of floor covering.
5. Luggage and suitcases should be opened and allowed to air dry, placing them outdoors in the sunlight.
6. Remove paintings and other objects of art to a safe and secure place until they can be repaired or restored.

Miscellaneous Things to Do

1. Dispose of all food, beverages, and medicines exposed to fire, smoke, or water.
2. Contents of refrigerators and freezers should be discarded if power supply was interrupted.
3. Have all wiring, gas lines, and plumbing checked by a qualified person before restoring utilities such as electric, gas, or water.
4. Have your HVAC checked by a service technician before using. Remember to change filters before using, and at frequent intervals, to remove all air-borne soot and contaminants.
5. Wash house plants with clean, clear water, taking care to wash both sides of the leaves and stem.
6. Clean and protect chrome and metal trim with Vaseline or other light oil.
7. Pets that were exposed to smoke, fire, or heat, should be examined by a veterinarian.
8. If you must relocate, the following parties should be notified:
    a. Family and Friends
    b. Employers
    c. Children's Schools
    d. Mortgage Companies
    e. Post Office

   f. Utility Companies
   g. Insurance Agents
9. Remain watchful for signs of heat or smoke, as a fire can rekindle from hidden, smoldering remains.
10. Be watchful for structural damage from the fire/natural disaster.
11. Hang furs and leather goods separately at room temperature to air dry. If serious smoke or water damage has occurred, consult an expert on the best way to clean and treat damage.
12. Ask your neighbors to watch your property. Inform police for extra patrols.

Miscellaneous Things <u>Not</u> to Do

1. Do not enter any areas with sagging floors or ceilings.
2. Do not throw away any damaged items without taking inventory and providing documentation.
3. Do not operate any DVD player, video equipment, TV, stereo, computer, or electrical appliance, until it has been cleaned and checked. If a dry chemical fire extinguisher was used, vacuum any residue to prevent damage to the appliance.
4. Do not open your safe or lock box for several hours after a fire, as they can hold heat and potentially ignite with the introduction of fresh air.
5. Do not use a household vacuum cleaner to pick up water, only use a wet vacuum.
6. Do not leave wet books, magazines, or other colored items on wet carpet, floors, or other surfaces, as they can transfer the ink and stain these surfaces.

Fire Department Activity

Some of your property damage may have happened as a result of firefighting efforts. When a fire occurs in a building, it creates a large amount of very hot gases and smoke. The fire department may open or break windows, and/or cut holes in the roof or walls, in order to vent these hot gases and smoke from the building. This action prevents further damage from occurring, and allows fire fighters to locate the fire and extinguish it more quickly.

You may find openings made in the walls and ceilings made by fire fighters. These were made so hidden pockets of fire and smoldering embers can be discovered and extinguished. Otherwise, these hidden pockets could smolder

for hours and suddenly burst into flames, destroying what is left of your home or business.

As soon as the fire is out, fire fighters must get their equipment and manpower back into service so they can prepare to respond to their next call. Often, people want to go inside their house or business immediately after the fire is out, even if it is to just look around. Usually, it is not safe to do this.

Fire investigators need to be thorough in determining the origin and cause of the fire. After a fire, they will meticulously look through your damaged home or business in order to figure this out. Because of this, most fire reports are not completed in a single day.

If you have insurance, your insurance company will request a copy of the fire investigator's report.

MOU

MEMORANDUM OF UNDERSTANDING
BETWEEN
[REQUESTING JURISDICTION]
AND
THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES OF THE STATE OF CALIFORNIA OF THE UNITED STATES OF AMERICA

The [Requesting Jurisdiction ("Requesting Jurisdiction")] and the California Governor's Office of Emergency Services (Cal OES) of the State of California of the United States of America, hereinafter referred to as "the Participants";

WHEREAS, the safety of the people of the State of California is of the utmost importance at all levels of state and local government;

WHEREAS, the State of California and the Federal Emergency Management Agency (FEMA) recognize the importance of written mutual aid agreements to facilitate response, recovery, and reimbursement;

WHEREAS, the Safety Assessment Program (SAP) utilizes volunteers and mutual aid personnel to provide licensed professional engineers, architects, geologists, certified building inspectors, certified public works inspectors, and SAP Coordinators, hereinafter referred to as "SAP personnel", to assist local governments in safety evaluation of their built environment in the aftermath of a disaster;

WHEREAS, SAP is intended to help local governments perform facility safety evaluations as quickly as possible; and

WHEREAS, the Participants seek to enter into this Memorandum of Understanding to request or provide SAP resources and personnel from each other in the event of a disaster.

Therefore, the Participants have reached the following understanding:

SECTION I
Objective

To establish a framework between the Participants for the provision of SAP personnel, managed by Cal OES, to be provided to [the requesting jurisdiction] for the purpose of conducting safety assessments.

SECTION II
Specific Activities

Responsibilities of each Participant and specific provisions regarding worker's compensation and immunity are set forth as follows.

A. Requesting Jurisdiction Responsibilities

1. Provide Cal OES with the number of SAP evaluators Cal OES is requesting and their preferred expertise, such as the number of licensed civil, structural, or geotechnical engineers, licensed architects, or certified building inspectors being requested;
2. Provide Cal OES with the number of days the SAP personnel will be needed, the date and time of arrival, and reporting location
3. Be responsible for reasonable lodging, travel, and per diem costs for meals not provided of the volunteer SAP personnel deployed by Cal OES in response to the disaster or emergency, if applicable;
4. Be responsible for the hourly wages and overtime of local government SAP personnel deployed by Cal OES in response to the disaster or emergency, in addition to their reasonable lodging, travel, and per diem costs, if applicable;
5. Not be required to reimburse State SAP personnel;
6. The SAP personnel will be under the authority of the Requesting Jurisdiction once deputized by the Requesting Jurisdiction as deputy building inspectors, after which time the SAP personnel will be permitted to post official placards under the authority of the local jurisdiction;
7. Utilize SAP personnel only to evaluate building and/or infrastructure viability;
8. Maintain daily activity of all who participate in the SAP deployment on an ICS 214 Activity Log, including time of arrival and time of departure for the duration of the deployment and to provide copies of the ICS 214's to the state and federal disaster recovery specialists upon request;
9. Track and document costs to conduct safety assessments and support SAP personnel;

10. Upon completion of the SAP mobilization, all SAP personnel will be safely demobilized in accordance with standard emergency management best practices;
11. Upon completion of the SAP mobilization, pay all outstanding costs;
12. Not use SAP personnel to estimate building damage repair costs;
13. Not use SAP personnel for retrieval of possessions from privately or publicly owned buildings;
14. Keep records of the hours that the volunteers spent in the field, the normal hourly wage of each volunteer, and the volunteers' names, if it chooses to use the donated labor of SAP volunteers to offset their non-federal cost share; and
15. Will immediately report any injuries of SAP personnel to the Statewide Safety Assessment Program Coordinator.

B. Cal OES Responsibilities

1. Make reasonable efforts to provide SAP personnel to the Requesting Jurisdiction;
2. Coordinate contacting SAP personnel and consolidating names to provide to the [Requesting Jurisdiction]; and
3. For the purpose of deploying SAP personnel, provide all deployment information furnished by the [Requesting Jurisdiction] to SAP personnel, including but not limited to [Requesting Jurisdiction] Points of Contact, lodging location(s), and initial location to report for work.

B. Worker's Compensation and Immunity

1. To the extent permitted under California law, State SAP personnel and volunteers will be covered for worker's compensation by the State of California worker's compensation law, and local jurisdiction SAP personnel will be covered for worker's compensation through their own jurisdiction.
2. To the extent permitted by law, SAP personnel may have immunity from liability in accordance with the California Emergency Services Act Government Code section 8657(a), and the California Business and Professions Code sections 5536.27 and 6706. SAP personnel will also obtain immunity from liability by virtue of being deputized by the

Requesting Jurisdiction. Nothing in this section shall provide immunity for intentional acts, gross negligence or willful misconduct, or any conduct outside the course and scope of official duties, or wherever else immunity is prohibited under California law.

SECTION III
Points of Contact

The [Requesting Jurisdiction] and Cal OES will also serve as the respective contact points for communication and information exchange, as well as any notice required to be submitted under this Memorandum of Understanding.

Cal OES: Alora Franco, Statewide Safety Assessment Program Coordinator
Email: SAP@CalOES.ca.gov
Phone: (916) 328-7711 OR Mobile: (916) 539-5245

Gurbir Singh, Statewide Safety Assessment Program Coordinator
Email: SAP@CalOES.ca.gov or Gurbir.Singh@caloes.ca.gov
Mobile: (916) 823-6790

Jim Barnes, Statewide Safety Assessment Program Coordinator
Email: Jim.Barnes@CalOES.ca.gov Mobile: (916) 856-9922

[Requesting Jurisdiction]: [Specific Point of Contact]

SECTION IV
No Legal Obligations, Rights, or Remedies

This Memorandum of Understanding is a voluntary initiative. It does not create any legally binding rights or obligations and creates no legally cognizable or enforceable rights or remedies, legal or equitable, in any forum whatsoever. In addition, the pledges in this Memorandum of Understanding are not conditioned upon reciprocal actions by other Participants; each Participant retains full discretion over implementation of its pledges in light of the Participant's individual circumstances, laws, and policies; and each Participant is free to withdraw from the Memorandum.

SECTION V
Availability of Personnel and Resources

This Memorandum of Understanding does not involve the exchange of funds, nor does it represent any obligation of funds by either Participant. All costs that may arise from activities covered by, mentioned in, or pursuant to this Memorandum

of Understanding will be assumed by the Participant who incurs them, unless otherwise stipulated and decided pursuant to a future written arrangement. All activities undertaken pursuant to this Memorandum of Understanding are subject to the availability of funds, personnel, and other resources of each Participant.

The personnel designated by a Participant for the execution of this Memorandum of Understanding will work under the orders and responsibility of the Participant and any other organization or institution to which they belong, at all times maintaining any preexisting employment relationship with the Participant and such organization or institution. Their work will not create an employer-employee relationship with another Participant or any other organization or institution, so in no case will that other Participant, or other organization or institution, be considered as a substitute or joint employer of the designated personnel.

SECTION VI
Compliance with Applicable Laws

All activities undertaken pursuant to this Memorandum of Understanding, and all personnel designated by the Participants for the execution of those activities undertaken pursuant to this Memorandum of Understanding are subject to all laws applicable in the jurisdiction where the activities are performed. Such personnel, if visiting the other Participant to participate in an activity pursuant to this Memorandum of Understanding, will not engage in any activity detrimental to this Memorandum of Understanding.

SECTION VII
Interpretation and Application

Any difference that may arise in relation to the interpretation or application of this Memorandum of Understanding will be resolved through consultations between the Participants, who will endeavor in good faith to resolve such differences.

SECTION VIII
Final Provisions

This Memorandum of Understanding is effective from the date of its signature, for a two (2) year period, unless renewed or extended by the Participants in the same manner that the Participants may otherwise modify this Memorandum of Understanding.

This Memorandum of Understanding may be modified at any time by mutual consent of the Participants. Any modification shall be made in writing and specify the date on which such modification is to become effective.

Any of the Participants may at any time, withdraw from this Memorandum of Understanding by providing a written notice to the other Participant 30 days in advance.

The termination of this Memorandum of Understanding shall not affect the conclusion of the cooperation activities that may have been initiated during the time this Memorandum of Understanding is in effect, unless the Participants mutually decide otherwise.

Signed in [Location] on [Date], in two original copies English. Both texts are equally valid.

FOR THE [AGENCY NAME] OF [PARNTER NAME]	**FOR THE CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES OF THE STATE OF CALIFORNIA OF THE UNITED STATES OF AMERICA (CAL OES)**
[Name] **[Title]**	**[Name]** **[Title]**

JOB AID – Safety Assessment Program (SAP) Coordinator

PLANNING FOR SAP DISASTER RESPONSE

- Review the Safety Assessment Program Emergency Plan.
- Confirm that all legal authorities exist locally for the Safety Assessment Program to be used.
- Confirm that the Cal OES SAP Memorandum of Understanding (MOU) has been signed and forwarded to Cal OES. (Contact sap@caloes.ca.gov for more information.)
- Determine the method for per diem reimbursement for evaluators; whether a travel expense claim form will be used, or if arrangements will be made with hotels and restaurants (so the evaluators simply present their SAP ID to the hotel or restaurant, and the business captures their SAP ID number and bills the jurisdiction).
- Make alternative plans in case hotels and restaurants are not available post-disaster, such as tents, cots, food arrangements, etc.
- Determine what sort of transportation arrangements will be made for the evaluators in the field. These could include: jurisdiction vehicles with local drivers, equipped with radios; rented vehicles; or the evaluators' own personal vehicles. Include in your planning the arrangements that will be used for obtaining fuel.
- Identify the Department Operations Center (DOC), which SAP evaluators will report to, and from which the SAP Coordinator will manage the response.
- Determine the arrangement for deputizing evaluators, and if local building department identification will be necessary.
- Determine if formally adopted local placards with legal consequences for disregarding or removing placards are available.
- Arrange for responsible individuals to have SAP Coordinator training so there is adequate coverage of this responsibility during a disaster.
- Identify essential facilities in the jurisdiction so these can be targeted first in the SAP evaluator response.
- Identify the locations of buildings at risk so these more fragile structures can be kept in mind as potential issues.
- Identify potential monitoring buildings if there are a large number of a certain type of building in the jurisdiction.

- Plan for the use of SAP evaluator strike teams based on the type of building stock in the community.
- Make appropriate plans for shelter-in-place of affected populations.\
- Plan to assist with the removal of personal or business property from UNSAFE structures.

PREPARING FOR SAP DISASTER RESPONSE

- Prepare for the DOC the following items(to be kept in a secure location, as with the other SAP supplies):
    - Laptop computer with wireless access to the internet.
    - Flat-screen TV with video capability, or an LCD projector and screen.
    - White board or chalk board to post assignments on.
    - Large map of the jurisdiction that can be highlighted to show completed areas as the SAP evaluator work progresses.
- One way to prepare assignments for SAP evaluators is to break down the jurisdiction into smaller maps that can be assigned to SAP evaluator teams.
- Place in secure locations the SAP supplies needed for the evaluator teams. As described in this Coordinator manual, these can be in numbered backpacks, ready for use. Do not store them in buildings, as these can be tagged UNSAFE, and then the supplies will not be available. They can be stored in building inspector's vehicles and/or in an outbuilding or container, away from falling hazards.
- A backup option for placards and other forms is to have these on a cloud server, so they can be printed from any computer or electronic device.
- Prepare a suitable number of evaluator briefing packets, which should include at least the following:
    - Important phone numbers:
        - Hazardous materials
        - Fire department'
        - Law enforcement
        - Utilities
        - Animal control
        - Building department
    - Travel expense claim forms with instructions.
    - A general map of the jurisdiction.

DURING DISASTER RESPONSE

- Start a daily log of events.
- Perform a 'windshield survey' of the jurisdiction as soon as possible. Drones or other more advanced methods can be used, it does not have to be done with a vehicle. The objective is to count the total number of heavily damaged or destroyed buildings.
- Estimate the number of SAP evaluators and coordinators you will need based on your survey, and based on local issues such as housing limitations that may exist locally.
- Subtract from your estimate the number of local SAP-trained personnel you have available.
- Request SAP evaluators and coordinators from the Operational Area (county). If the Operational Area does not have enough SAP resources to complete your request, they will send the request to Cal OES.
- At the same time, begin using your local SAP evaluators to look at the essential facilities in your jurisdiction (law, fire, EOC, essential government, shelters, grocery stores, hardware stores, pharmacies, water & wastewater treatment plants).
- Prepare the Department Operations Center (DOC) for the incoming SAP evaluators.
- Obtain from the Operational Area the names and cellphone numbers of the SAP evaluators who are responding to your request, and when they will arrive.
- Make any necessary last-minute arrangements for room and board expenses for the SAP evaluators.
- When the SAP evaluators arrive:
    - Have them sign in at the staging area
    - Hand out the briefing packets
    - Brief them on the nature and extent of the disaster, and include any hazards or other issues that they should be aware of
    - Show them the SAP Evaluator Refresher Video
    - Deputize them as representatives of your jurisdiction.
    - Assign them into teams of at least two. (If credentialed staff are stretched, you can assign a SAP-trained non-credentialed person as the safety watch for the team of two. The credentialed person will be doing all the evaluations, and the safety watch will remain in a safe location to make sure their partner returns.)

    - Assisting a local driver who knows the area to drive them, if this is your preferred arrangement.
    - Give the teams their geographical assignments, whether a map section or a list of properties.
    - Provide each team one of the backpacks of field supplies.
    - Take the teams all together to a building and walk them through how that building should be tagged. This is called 'grounding,' and will help everyone be on the same page regarding evaluations.
    - Tell the teams to return to the DOC at the end of the day for team debriefings. Otherwise, they may be presumed lost and will have to be searched for.
    - Send the SAP evaluator teams out to the field.
- During the day, coordinate responses to SAP issues as they arise.
- At the end of the day, the daily team debriefing occurs:
    - Meet with each team to review the assessments for completeness, while they can still remember what they did.
    - Discuss any unusual issues that came up.
    - Use the information gathered to improve local arrangements and/or processes.
    - Gather the completed assessment forms, or upload the forms, from the teams.
    - Highlight the work progress on the wall map at the DOC.
    - Have them sign out at the staging area.
- If paper forms are used, turn them over to office staff for entering into local database, and spreadsheet forms from Cal OES (unless the information is couched in a GIS database that can be shared).
- Repeat the next day the cycle of signing in SAP evaluators, issuing supplies as needed, assigning work, and debriefing/signing out SAP evaluators at end of day until the work or the tour of deployment is over.
- Demobilize SAP evaluators who complete their tour of deployment in accord with protocols in this manual.
- Request replacement SAP evaluators in a timely fashion as needed until the work is finished.

AFTER THE DISASTER RESPONSE

- Demobilize the SAP evaluators.
    - Collect any unused supplies and equipment from them.
    - Discuss any final issues with them regarding their deployment.

    - Collect any completed travel expense claim forms with receipts, and notify those with unfinished paperwork where to send the completed travel expense claim forms with receipts.
- Have office staff do the final update to the local database and the Cal OES spreadsheet with the final set of assessment form information.
- Forward the completed SAP Information spreadsheet to the Cal OES Statewide SAP Coordinator by email. If the information is couched in a GIS format, that is better.
- Forward copies of the daily sign-in sheets to the Cal OES Statewide SAP Coordinator.
- Receive bills from assisting local governments for mutual aid work related to the Safety Assessment Program and pay them.
    - Retain the records of bills and payments for potential compensation through Cal OES.
- As you receive the travel expense claim forms from the SAP evaluators:
    - Review them for compliance with your local travel expense claim rules.
    - Pay at once the eligible travel expenses of the SAP evaluators.
    - Retain records of the travel expense claim forms and the payments for potential reimbursement through Cal OES.
- Participate in After Action Report meetings using your notes from the daily written log. Discuss with the Cal OES Statewide SAP Coordinator any unusual issues that came up in the safety assessment work which requires a response or correction, and any success stories or innovations that arose out of the local efforts.
- Restock the placards, forms, and other supplies in the backpacks in preparation for the next disaster.
- Make improvements as required from the findings of the After-Action Report.