Building Occupancy Resumption Program

for

Nevada Earthquake Safety Council

University of Nevada at Reno

November 16, 2001

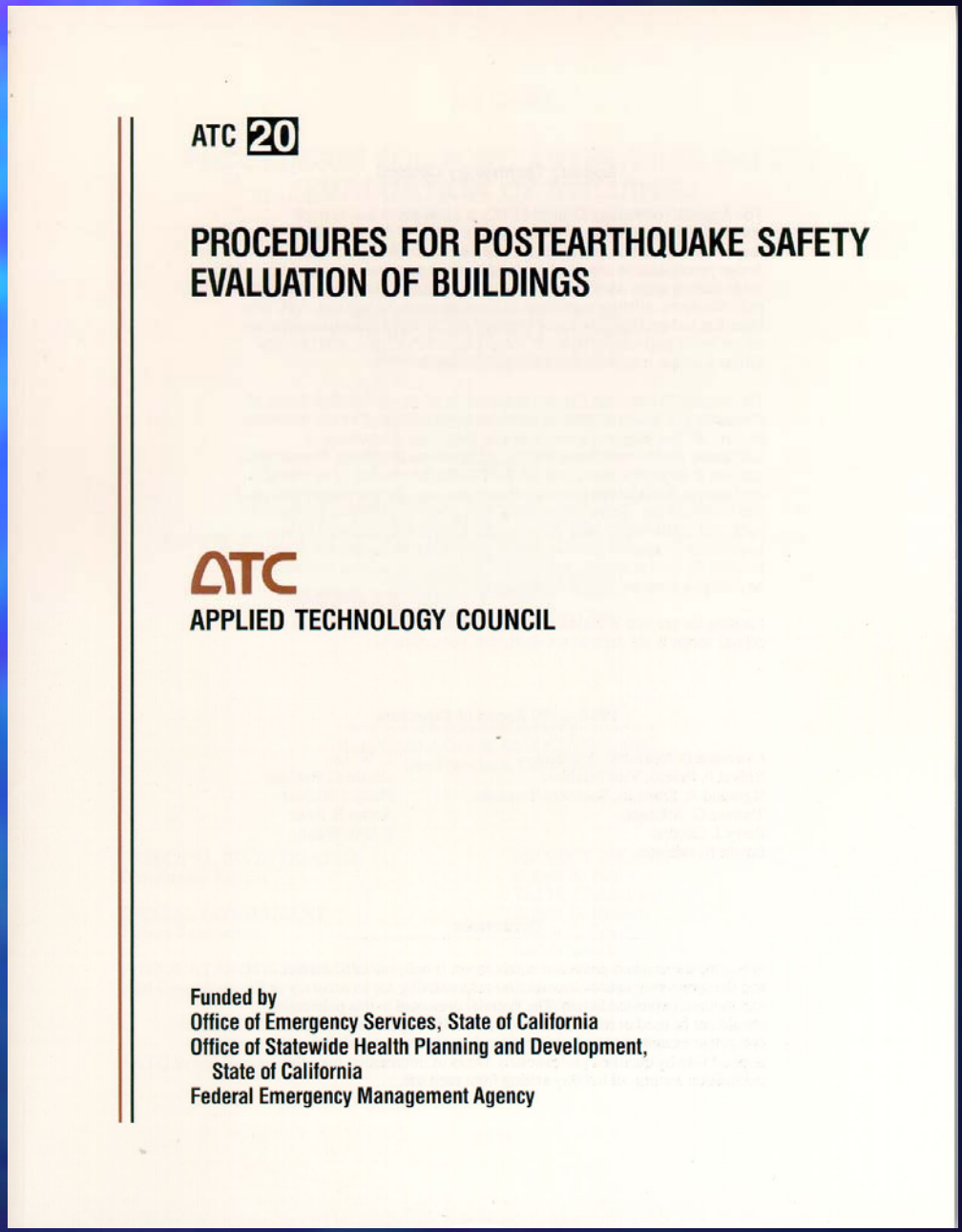
presented by Zan Turner , City & County of San Francisco , Dept. of Building Inspection

Loma Prieta Earthquake - 1989

- City Emergency Plan was not tested
- Building inspectors were not trained for response
- Building Dept had no post-earthquake procedures

ATC 20

Shortly before Loma Prieta, a new post-earthquake building inspection standard was released and a few DBI inspectors were trained in ATC 20 procedures.



ATC 20

PROCEDURES FOR POSTEARTHQUAKE SAFETY EVALUATION OF BUILDINGS

ATC

APPLIED TECHNOLOGY COUNCIL

Funded by
Office of Emergency Services, State of California
Office of Statewide Health Planning and Development, State of California
Federal Emergency Management Agency

ATC 20 Inspection

DBI inspectors and Mutual Aid volunteers performed rapid safety assessments of buildings using the ATC 20 procedure, reporting their findings on this inspection 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 Posting Placards

Buildings were inspected and posted with one of the following placards:

- **Inspected** - OK to Occupy

  Green tag

- **Restricted Use** - Area(s) unsafe

  Yellow tag

- **Unsafe** - Do not enter or Occupy

  Red tag

Reclassification of Red-Tagged and Yellow-Tagged Buildings

- Reclassification process was slow
- An engineer's letter certifying that repair work was complete was required
- Engineers were busy with other clients or with personal recovery
- Average time to engage a structural engineer after Loma Prieta was 3 weeks

Public/Private Partnership

- SF Dept. of Building Inspection
- Structural Engineers Association
- Building Owners & Managers Assn.
- American Institute of Architects

The Dichotomy

- Building owners wanted engineers to certify whether or not buildings were safe to occupy.
- Engineers refused to certify safe occupancy based on only an ATC 20 Rapid Evaluation.

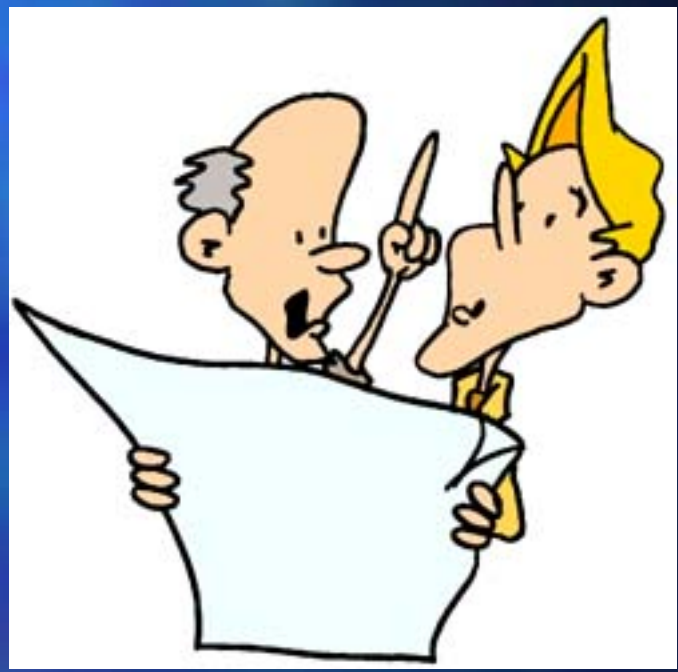
Building Occupancy Resumption Program (BORP)

- Evaluate building(s)
- Select inspection team
- Develop inspection plan
- Obtain program approval
- Update annually

Owner/Tenant Participation

- Building owner may initiate
- Tenant may obtain owner approval
- Tenant may include requirement for participation in lease agreements

Engineer Approach



- Be proactive in your area
- Assist with local BORP development
- Encourage client participation

Building Evaluation

- Consider underlying soil conditions
- Assess building use and occupancy
- Determine age and type of construction
- Obtain construction/remodel drawings
- Employ engineers for inspection plan

Inspection Team

Team members: at least two for each position

- Engineer as lead structural inspector
- Architect for architectural details
- Life/safety system inspector, if applicable
- Elevator inspector, if applicable

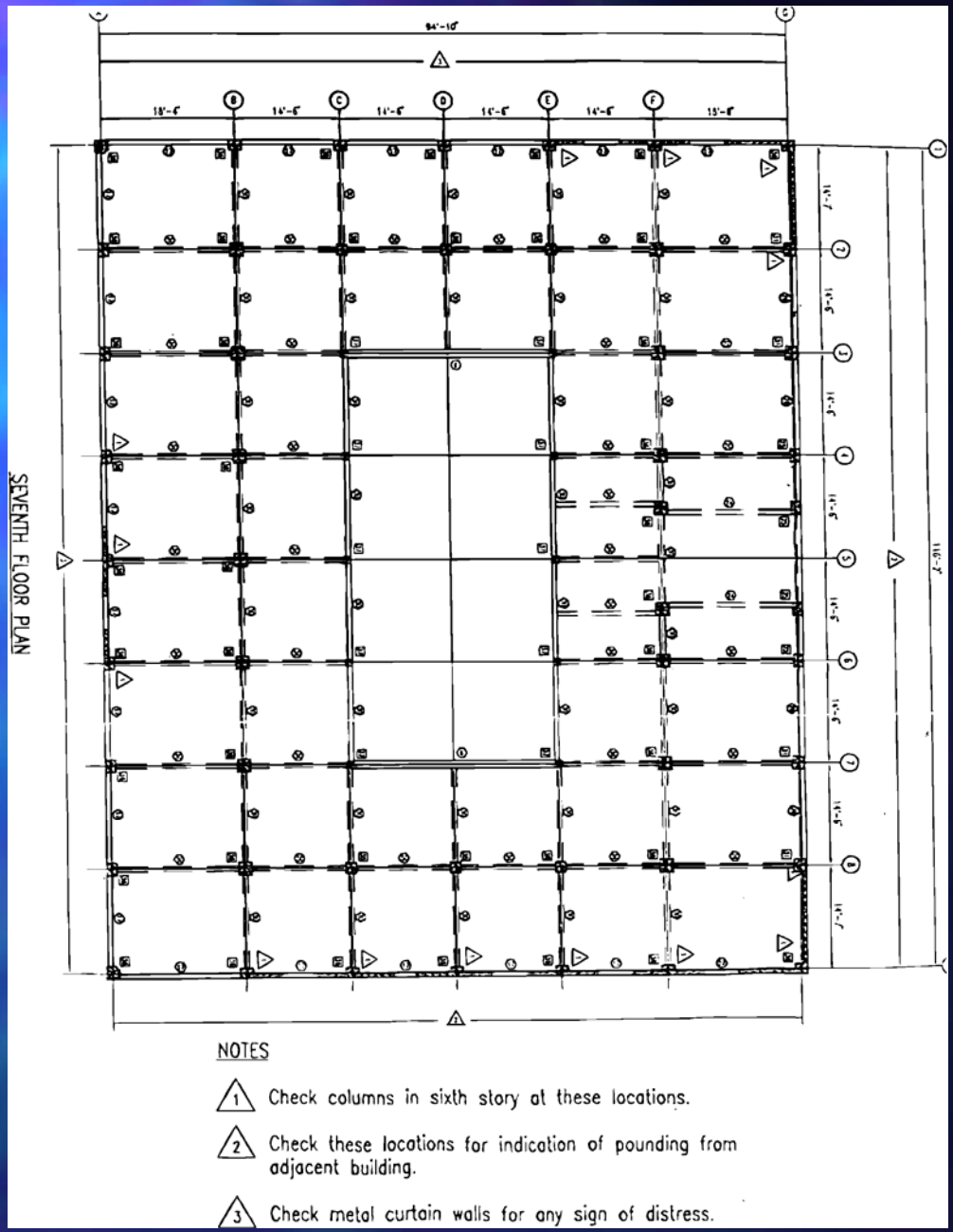
Plan Components

- List of qualified inspectors
- Building description
- Emergency response information
- Inspection plan
- List and location of documents, equipment, and supplies

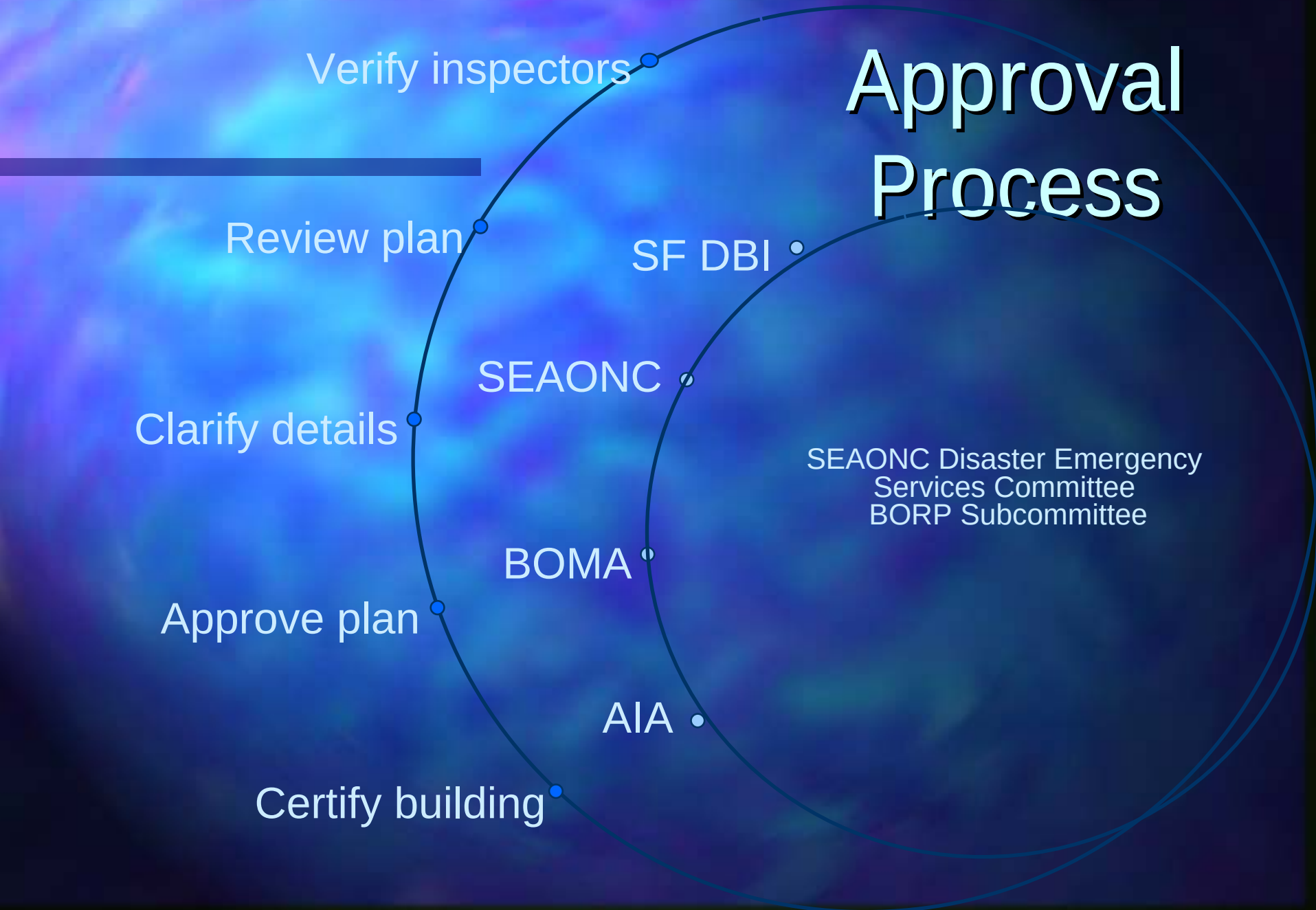
Inspection Plan

Simplicity is the key

Minimum standard: ATC 20 Detailed Evaluation



Approval Process



Certificate Example

This is to certify that the building at

100 Barbary Coast

San Francisco, California

has been accepted into the Department of Building Inspection
Building Occupancy Resumption Program

After declaration of an emergency following an earthquake or other major disaster, this building will be inspected within 8 daylight hours by inspectors approved by the Department of Building Inspection and will be posted with official placards stating the building's condition in accordance with ATC 20 Postearthquake Detailed Evaluation Procedure

Signed by
[Building Official Signature]

Approval Date: xx/xx/xx
(Annual Renewal Required)

Annual Renewal

Submit one-page form if no changes. Supply additional information for any changes that have been made to the:

- Inspection personnel or contact info
- Building - for renovation or remodeling
- Inspection plan - to reflect changes

BORP Cost Factors

Average plan cost for major building

$8,900

- Engineer familiarity
- Building complexity
- Building size
- Drawing availability
- Inspection plan detail

Vacancy Costs

- Cost in loss of production
- Loss of employee, tenant, and client confidence
- Average loss per day of rental fees (San Francisco highrise, about $60,000

BORP Benefits

- Assure prompt post-earthquake inspection
- Avoid unnecessary building evacuation
- Inspire employee, tenant, and client confidence

Who has BORP?

The following jurisdictions have created or are developing their own programs similar to BORP:

- City of Anchorage, Alaska
- City of Berkeley, California
- City of Oakland, California
- City of Long Beach, California
- City of Palo Alto, California*
- City of Seattle, Washington
- Stanford University
- University of California at Berkeley

*Accepts San Francisco program approvals

BORP on the Internet

You can download BORP from http:www.seaonc.org/member/committees/des_build.html, and can obtain ATC 20 documents from the Applied Technology Council, 555 Twin Dolphin Drive, Redwood City, CA 94065, phone 650-595-1542.

Corporate Support for a New BORP Program

- Inform and enlist other building owners
- Urge support of elected officials for a program like BORP
- Encourage local building departments to establish similar programs
- Offer information and assistance from the San Francisco program

Jurisdiction Steps for New Program

- Adapt BORP for your local jurisdiction
- Assign building inspection staff to administer program & maintain list
- Recruit local engineers for review committee
- Solicit submittals from building owners
- Review and approve complying submittals
- Supply posting placards & building certificates
- Maintain list of pre-approved buildings

In the meantime...

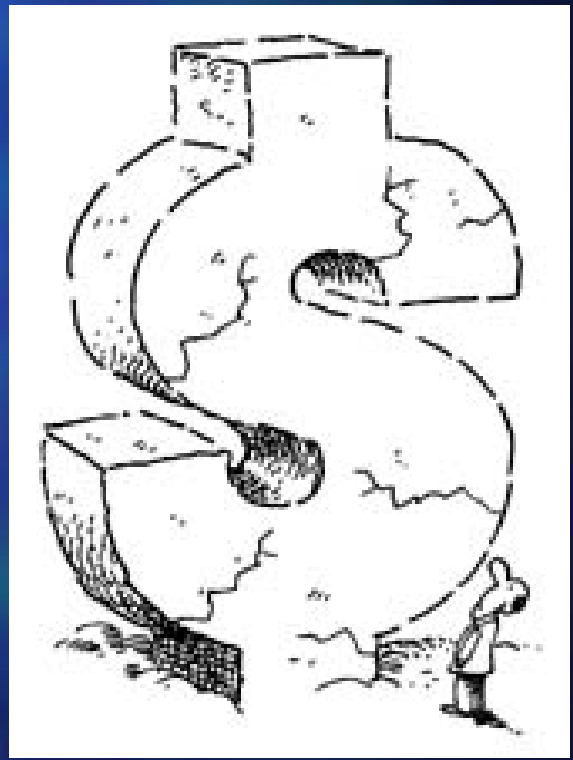
If you can't get a BORP program where you need it, you can still take effective steps for earthquake preparedness.

Evaluate Buildings

Assess buildings in the same way as you would for a BORP plan

Consider Seismic Strengthening

- Decide level of performance desired
- Determine extent of retrofit
- Evaluate costs and benefits
- Arrange for retrofit, or...
- Choose other options



Include Post-earthquake Consequences

- Engineer and contractor availability
- Competitive bidding opportunities
- Repair delays
- Material/equipment limits
- Inspection priorities
- Approval constraints

If retrofit is impractical...

Develop a good evacuation plan!

Explore Insurance Alternatives

- Check earthquake insurance availability
- Contrast insurance rates with retrofit costs and vacancy expenses
- Include insurance deductible in evaluation

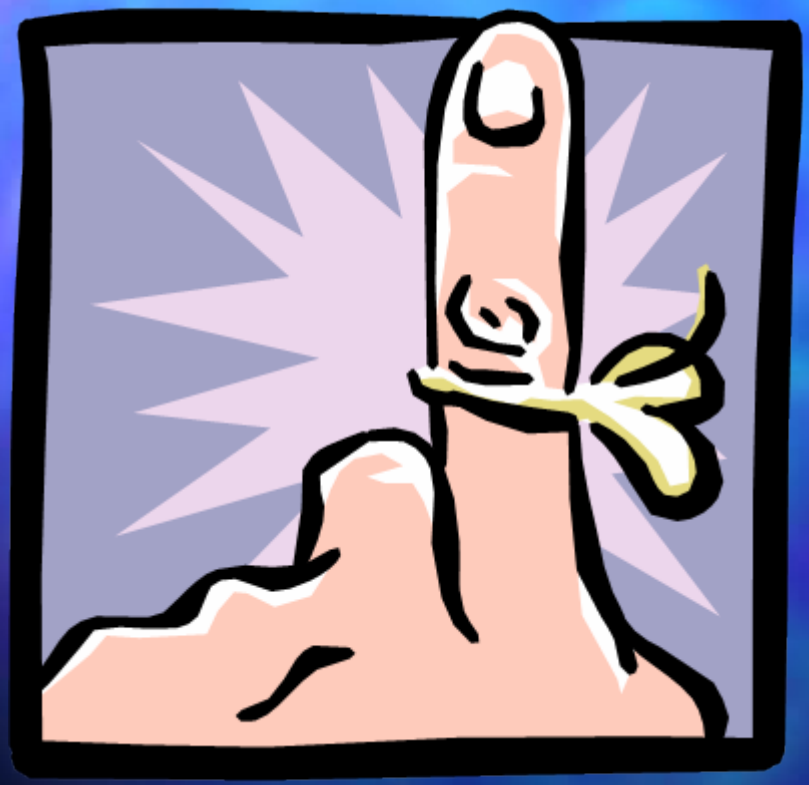
Develop a Building Emergency Plan

- Address all significant hazards
- Be specific about what to do and where to go
- Give emergency contact phone numbers
- Provide relevant safety information
- Present written plan to all employees and/or tenants
- Establish periodic drills
- Evaluate and update plan regularly

Encourage Employee and Tenant Preparedness

- Inform employees & tenants about the expected seismic performance of their building
- Provide information about post-earthquake procedures, property retrieval, and re-occupancy
- Promote sharing of resources and ideas
- Recommend local emergency training if available, e.g. NERT (http://www.nertnews.com) in San Francisco.

Remind Yourself...



- Make preparedness a realistic priority
- Set disaster anniversary dates as reminders for action
- Do SOMETHING!

Thanks!

Nevada Earthquake Safety Council

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Technical Services Division