

Massachusetts
State Building Code
7th Edition
Section 3408

Structural Requirements for
Alterations, Repairs, Additions & Changes of Use
for Existing Buildings

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BASIC CONCEPTS

- Public policy is to try to save good old buildings
- Old buildings have deteriorated and many lateral load resisting elements have been removed or modified
- Allowing a rehab without a structural upgrade is a danger to the public safety
- A minimum lateral load resistance is necessary



7th Edition of 3408

- Reorganized
- Rewritten
- Simplified



LEVELS OF WORK

Level 1	Qualitative triggers for each level of work
Level 2	
Level 3	Increasing requirements for lateral load resistance for increasing level
Level 4	
Level 5	



Level 1 Work

- Minor work
- Work that does not trigger Level 2 Work (Significant amount of work)
- No lateral load resistance requirements



Level 2 Work – Primary Trigger

- For Pre-1975 buildings, architectural/MEP work affecting 20,000 sf or 50% of total floor area triggers Level 2
- Required minimum lateral load resistance:
 - 2/3 Code wind
 - 1% (DL + 0.5 Snow)



Level 2 Work – Other Triggers

- Change of use for over 35% of floor area
- Increase in framed floor and roof area up to 10% since 2-28-97
- Increase in effective seismic weight up to 10% since 2-28-97
- A number of liberal structural triggers



Level 3 Work

- Same as Level 2, but triggered when there is substantial demolition or relocation of shear walls and vertical frames
- Required lateral load resistance:
 - 100% Code wind load
 - 35% of code seismic load
- Low seismic requirement – results in configuration for good seismic behavior
- Low seismic requirement not significant penalty due to extensive demolition



Level 4 Work - Additions

- Additions for 10% to 100% increase in total framed floor and roof area
- Additions for 10% to 100% increase in seismic weight
- Sliding scale of 50% to 100% Code seismic load for 10% to 60% increase in area or seismic weight



Level 5 Work

Extensive Alterations or Additions

- Removal or reconstruction of $>40\%$ of total framed floor and roof area
- Additions $> 100\%$ of area or seismic weight
- Full Code wind and seismic load



Historic Buildings

Wind and Seismic Load

- Exemption for fully preserved
- No exemption for partially preserved



Restricted Uses

- Uses are designated restricted on basis of:
 - Hazard to public safety of use itself
 - Total number of occupants
- Change to restricted use – requires full Code seismic design
- Only Level 1 and 2 Work permitted for existing restricted use; otherwise full Code seismic design



Restricted Uses

- A1, A2, A4, A5 with more than 600 people
- A3 with more than 1200 people
- H
- I2 (hospitals and nursing homes) with more than 400 people
- I3 (restrained)
- Seismic Use Group III (post-earthquake operational)



Structural Investigation

- Level 1 limited to areas where work is done
- Level 2 No geotechnical exploration required if no shear walls nor vertical frames are added and no visual distress to foundations
- Otherwise, similar to 6th edition

