

2020 NEHRP PROVISIONS ISSUES





**ISSUES and RESEARCH NEEDS
IDENTIFIED DURING DEVELOPMENT OF THE 2015
*NEHRP RECOMMENDED SEISMIC PROVISIONS
FOR NEW BUILDINGS AND OTHER STRUCTURES***

Prepared by the Building Seismic Safety Council
Provisions Update Committee

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Areas of Recommendation

- Design and Analysis
- Geotechnical/Ground Motion Considerations
- Concepts for Revision of Analysis Requirements in Chapter 12 of ASCE 7
- Concrete Structures
- Masonry Structures
- Steel Structures
- Wood Structures
- Nonbuilding Structures and Nonstructural Components



1. Seismic Performance Objectives

- Acceptable Collapse Risk
- Functional and Economic Risks
- RC IV/SDC A Considerations
- Global vs component failure of collapse
- Implicit risk objectives of Chaps 12, 16, 17 & 18
- Financial loss
- Nonstructural components



2. Geotechnical, Ground Motion and Mapping Issues

- USGS Maps Update P17
- MCE Hazard Level? P17
- Uncertainty and Precision P17
- Deterministic Values P17
- Basin Effects
- Near Fault Directivity P17



2. (Contd.) Geotechnical, Ground Motion and Mapping Issues

- Shallow Soils Sites and Profiles with Sharp Velocity Contrasts
- Ground motion selection and scaling
- Ground motion scaling inconsistencies between Chaps 12, 16, 17, and 18
- GMPEs vs. physics-based simulations P17
- Zones vs. contours - step function vs. the continuum P17



2. (Contd.) Geotechnical, Ground Motion and Mapping Issues

- Induced seismicity – explain in the Commentary why consideration is not included P17
- Duration of ground motion



3. Multi-Period Spectrum and Site Coefficients

- Improvement of T_L map with multi-period spectrum P17



4. Seismic-Force Resisting Systems and Design Coefficients

- Table 12.2-1 Simplification M
- Process for addressing additions to Table 12.2-1 M
- SDC Ranges, Height Limits M
- General systems-related issues, including steel, concrete, masonry and wood that are outside of material properties L
- Self-centering systems L
- Simplified essentially elastic approach; Possible alternatives to P-695 L
- Short-period structures - ATC 116 M
- Hillside buildings – ATC 110 M
- Rammed earth L
- Direction of loading H
- $C_d = R?$ M



5a. Modal Response Spectrum Analysis Issues

- List of unfinished issues from 2015 Cycle



5b. Other Analysis and Modeling Issues

- Full-System Modeling (Charney writeup)
- System Irregularities (ATC-123)
- Reconcile safety factors in *Provisions* vs. geotech



6. Diaphragm and Shear Wall Design

- Diaphragm Force Reduction Factors – R_s
- Shear wall design recognizing flexure-controlled behavior
- Shear design of shear walls
- Rigid Wall – Flexible Diaphragm systems
(Separate?)
- Coupled shear walls



7. Nonstructural Components

- Reconsideration of F_p
- Anchorage to concrete
- ATC 120 Implementation



8. Nonbuilding Structures

- Thin-walled large metal tanks and attachments
- Large-bore piping



Possible Working Group

- Chapter 16 (Nonlinear Response History Analysis) Updates



Possible Working Group

- Chapter 19 (Soil-Structure Interaction) Updates



Possible Working Group

- Possible reworking of Chapters 17 and 18 in view of inconsistencies between 12, 16 and 17,18





FEMA



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