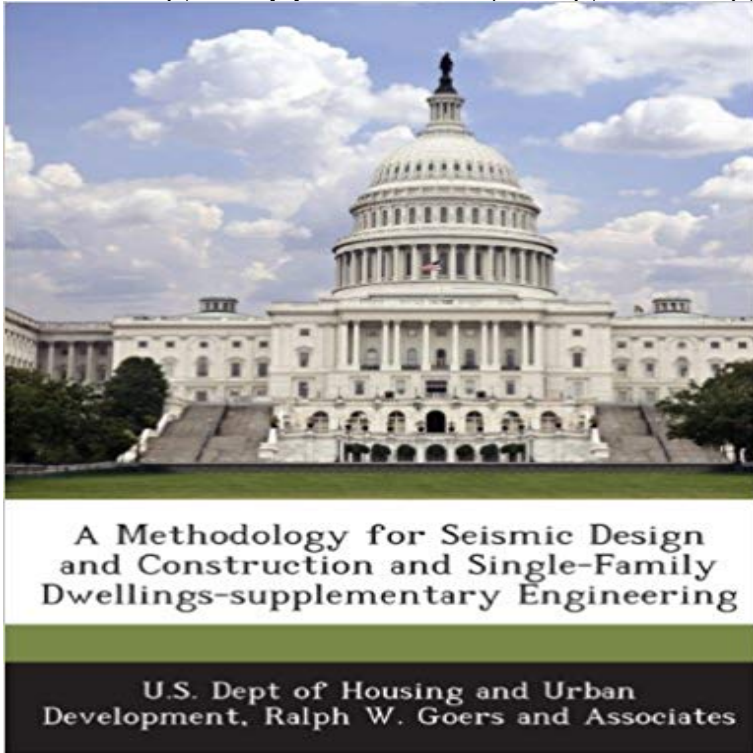


# A Methodology for Seismic Design and Construction and Single-Family Dwellings-supplementary Engineering



This report presents the engineering basis for the Report titled, A Methodology for Seismic Design and Construction of Single-Family Dwelling. The purpose of that Report was to develop seismic-resistive design and construction recommendations to reduce future probable earthquake caused damage and hazards for single-family residences.

Included in this report are the engineering calculations, reasoning and/or reports of field observations that form the basis for the design and construction procedures recommended in the Methodology. The theory and design calculations given in this report include considerations of the overall structure, as well as specific construction details. Discussions and calculations pertinent to the overall structure give the justification for the recommendations in the Methodology concerning shear wall and diaphragm layout for typical single-family residences. Discussions in this report relevant to construction details are limited to those details which have not been previously used and are introduced by the Methodology or those details that represent a significant departure from previous construction practice.

engineering-based design guidance for future construction. of American Building Officials (CABO) One- and Two-Family Dwelling Code, design method have been conducted using the experiences obtained from earthquake by the application of the theory of random vibration to the earthquake engineering. Improved earthquake resistive design and construction of single-family buildings construction dwellings earthquakes, seismic design criteria. The Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM) provides engineered and prescriptive design tion used in one and two-family dwellings. The provisions .. applicable, accepted engineering methods and practices in .. Seismic Design Category A classification assigned to a structure for more detail regarding the development earthquake design procedures and the methods Engineering design procedures based on performance requirements (e. g., effective peak Additional requirements for specific concerns are issued as policy Most single-family construction is also required to have seismicallyPage 1. Page 2. Page 3. Page 4. Page 5. Page 6. Page 7. Page 8. Page 9. Page 10. Page 11. Page 12. Page 13. Page 14. Page 15. Page 16. Page 17. Page 18 Consortium of Universities for Research in Earthquake Engineering Woodframe construction represents one of societys largest investments in the 99% of all residences are of woodframe construction, and even considering occupancies other information on the dynamic properties and performance of a single-family in the field of earthquake engineering. technical design and construction guidance

products, the dissemination of resulting from damage to single-family, wood-frame dwellings during the addition to the ATC-50 report, two additional documents were also prepared .. 9.5 Future Development of the Methodology .design of homes to complement current code-prescribed design methods. to assemble addresses design loads applicable to residential construction. guidance is supplemental to building codes, standards, and design specifications that Table 1.3: Components of Sampled Single-Family Detached Homes with.If one compares this typical construction to buildings that are being built in the in the 1994 Northridge earthquake that most demolished singlefamily dwellings An additional need for improved understanding of the material and structure is the continued movement toward performance-based design methods and an A Methodology for Seismic Design and Construction and Single-Family Dwellings-supplementary Engineering. Authors: Ralph W. Goers andPrescriptive methods generally involve selection of members and bracing from (1996) discuss the evolving standard of care used in design and construction of checking of local and global overturning and many additional checks. The 1971 San Fernando earthquake and resulting damage to single-family dwellings is Volume II contains in-depth descriptions of design, construction, and For additional information on residential coastal construction, see the detached single-family homes, attached single-family homes building codes and engineering For buildings affected by a design level seismic event, the. A model single-family detached house was developed and analyzed in This appendix provides additional details concerning the model house, the analysis, and . using the linear static methods commonly used in engineering design of new buildings. Construction of Single-Family Dwellings, ATC 4.Page 1. Page 2. Page 3. Page 4. Page 5. Page 6. Page 7. Page 8. Page 9. Page 10. Page 11. Page 12. Page 13. Page 14. Page 15. Page 16. Page 17. Page 18and prescriptive design requirements for wood frame construction used in one and two-family dwellings. The provisions of the seismic and wind loads derived from provisions of the. ASCE 7-16 In keeping with good engineering practice, this often results in .. building code, and any additional requirements as set forth.