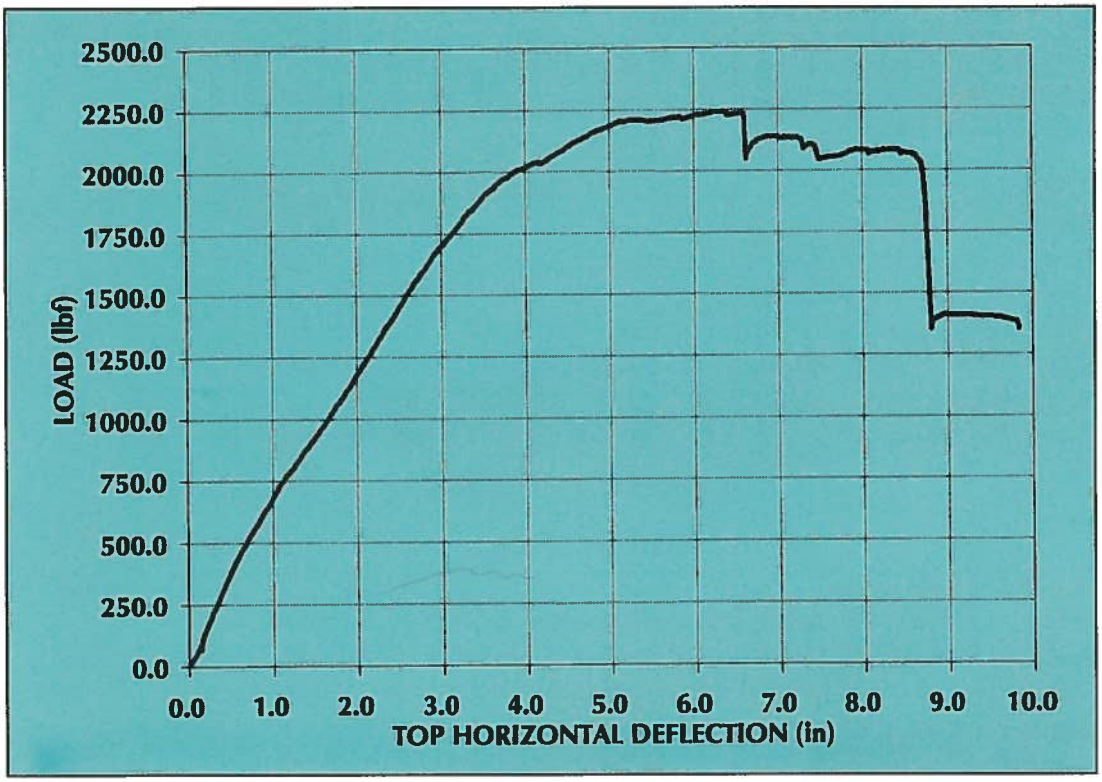
ATC R-1

Cyclic testing of narrow plywood shear walls



ATC Applied Technology Council

Applied Technology Council

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Cover Illustration:
Relationship of horizontal load to imposed horizontal deflection at top of panel. (Static Test #1)

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Cyclic Testing of Narrow Plywood Shear Walls

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Preface

This document presents the findings of the first self-directed research project to be funded from the Henry J. Degenkolb Endowment Fund of the Applied Technology Council (ATC). The project addresses the dynamic performance of narrow plywood-sheathed shear walls built with the maximum allowable 3.5-to-1 height-to-width ratio, as specified in the Uniform Building Code (ICBO, 1991). The study was initiated in 1993 based on the recommendation of members of the Structural Engineers Association of California (SEAOC), who were concerned about the strength and deflection characteristics of narrow plywood wall panels exposed to seismic forces. Panels of this type have been and continue to be used extensively in wood frame construction throughout California and other western states. For example, plywood sheathed shear walls utilizing the 3.5-to-1 aspect ratio are commonly found on one or both sides of garage doors. In many cases they are intended to provide seismic restraint for the garage and a living space above it.

ATC gratefully acknowledges the assistance and technical expertise provided by the key project participants. John Coil, a structural engineer from southern California with extensive experience in the seismic design of wood structures, served as Project Director. Professor Robin Shepherd of the University of California at Irvine (UCI) served as the project subcontractor and was responsible for all static and dynamic testing conducted at the UCI Structures Test Hall. He was assisted by graduate student Bryan Allred. Project Engineering Panel members Robert Bruce, Derek Ilott, Ben Schmid, Hans Strandgaard, John Tissell, Wade Younie, and Ed Zacher provided overview and guidance for the project. Panel members were selected from the membership of SEAOC, the Structural Engineers Association of Oregon, and the Structural Engineers Association of Washington. The affiliations of these individuals are provided in Appendix C.

ATC also gratefully acknowledges the assistance, support, and cooperation provided by other individuals involved in the project: UCI laboratory manager Robert Kazanjay, engineering aide Matt Heideman, and other UCI laboratory staff who helped carry out the tests; Patty Christofferson and Peter Mork of ATC, and RDD Consultants, Inc., Louisville, Colorado, who provided technical editing and publication preparation services; and Simpson Strong-Tie Company, who provided hardware for the tests, comparative study data, and advice and comment on the testing process.

Christopher Rojahn
Executive Director

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