REDESIGN OF THREE MULTISTORY BUILDINGS: A COMPARISON USING ATC-3-06 AND 1982 UNIFORM BUILDING CODE DESIGN PROVISIONS

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PREFACE

Seismic design codes in the United States were initiated in the late 1920's with some relatively simple equivalent static force formulas. The development of earthquake code provisions proceeded somewhat intermittently until the Structural Engineers Association of California (SEAOC) in 1959-60 published its "Recommended Lateral Force Requirements and Commentary" (Blue Book), which was applicable to California seismic conditions. The SEAOC provisions recognized that the seismic forces induced in a structure related to the structure's flexibility and periods of vibration. Seismic codes in the U.S. and in many other countries have since been patterned after the SEAOC provisions.

In 1970, SEAOC organized a committee to look at the "Blue Book" and earthquake codes in general. The committee recommended that a group be assembled to make an extensive survey of existing design practices, research data, and codes. The report, published in the Proceedings of the American Society of Civil Engineers, provided impetus for the Applied Technology Council (ATC) ATC-3 project.

In 1973 the National Science Foundation granted initial planning money to ATC. The planning effort evolved into a three-plus year effort by 85 participants representing engineers, architects, code officials, researchers and representatives from governmental agencies. The final document, report ATC-3-06, was published in June 1978 after extensive reviews by many professionals, professional organizations, and industry.

The ATC-3 project participants strongly recommended that the new provisions be thoroughly tested before adoption. As a result, the Building Seismic Safety Council (BSSC) and the National Bureau of Standards, utilizing nearly 100 individuals, reviewed and assessed the ATC-3-06 provisions. A number of proposed clarifications and changes were recommended by the group and approved by BSSC.

Meanwhile, ATC and three structural engineering firms were given National Science Foundation grants to study three existing buildings. ATC appointed a Project Engineering Panel to work with the three structural engineering firms and review the studies being made by them. The primary goal of these studies, as reported herein, was to evaluate the cost and technical impact of using the ATC-3-06 provisions, as amended by BSSC, versus those of the 1982 Uniform Building Code (UBC). The buildings were also redesigned to meet the 1982 UBC. It is believed that the studies presented herein meet this goal.

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)