

CONCLUSIONS AND RECOMMENDATIONS



ALTICOR

Conclusion:

After redesigning the JW Marriott for Monterey, CA it was evident significant structural, cost, and architectural changes accompany the relocation. The building was subjected to higher seismic loads and required a new lateral system. The new lateral system affected the choice of floor system, construction cost and duration, and interior architecture.

The lateral system achieved the desired nonlinear response. With plastic hinges located in the beams and flexural yielding in the walls, the system maintains its lateral force resistance through large displacements and deforms evenly over the entire height. The stringent standards imposed in the design process make certain the lateral system surpasses code required performance and would easily pass the required peer review.

The assumed thickness of the post tension slab was investigated and determined to be adequate. The lateral forces that were based on the assumed thickness and column layout have been proven correct. Code requirements approved of the average stresses and deflections present in the slab.

The construction costs and duration were significantly increased due to the higher skilled and timelier labor necessary to construct a post tension system. The direct capital losses are significant when compared to the cost and expeditiousness of the original flat plate system. The new, longer duration will cause secondary capital losses by delaying hotel occupancy and diminishing the interest from hotel revenues.

The architecture saw the greatest change in the atrium space. Elevators were moved out of the core in order to maintain a focus on the signature atrium. The new system uses observation elevators to match the architect's vision. Fire corridors, stairwells, and other interior spaces were rearranged to match original specifications with minimal aesthetic losses. The lateral system created several benefits, most notably the addition of restaurant bathrooms and reduced elevator interval times.

Recommendations:

Although the post tension system is a viable alternative to the original system, the change would raise construction costs significantly. In light of this, it is unlikely that the owner would choose a post tension floor system in place of the original system. Despite industry vertical wall area standards, it is more economical to use the original floor system with the new core. The original floor system should be used in the Monterey design.

The thinner original flat plate system would decrease the seismic forces on the structure considerably. The lateral system should be redesigned for these smaller forces. A smaller, thinner system may be sufficient to resist the lower forces. The reduction of shear wall size would reduce the vertical area closer to industry standards. The new lateral system design provides sufficient ductility and deformation capability essential to withstand Monterey seismic forces. Only size, not characteristics should be modified for lower seismic forces.

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