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Structural Option

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Structural Technical Report 3

Structural Concepts / Structural Existing Conditions Report

The 400 is a condominium complex located in Bremerton, Washington, right across the bay from Seattle. The building consists of two levels of structural concrete, both slabs and post-tensioned, parking below four stories of residential light gage metal frame construction. The majority of the parking is above ground. Ground has recently been broken for construction of The 400, and updated plans are in the process of being developed.

As discussed throughout this technical assignment, the lateral system of The 400 proves to be adequate. Methods of analysis used to come to this conclusion were lateral load distribution, drift, overturning moment, and horizontal reinforcement.

The forces distributed to each shear wall were input into ETABS to determine both story and overall drifts. When compared to industry standards as well as allowable story drift height of $0.02h$ from the IBC, actual story drifts due to lateral loads only clearly passed. The gravity forces, however, were not taken into consideration for the analysis of drift. A combination of gravity and lateral loads will be developed in preparation for the proposal.

Relative stiffnesses were calculated for each wall, and since the concrete topping of each floor acts as a rigid diaphragm, the lateral loads of the controlling seismic case were distributed according to their stiffnesses to their corresponding shear walls.

The horizontal reinforcement of a shear wall was then checked to determine adequate reinforcement. There was a slight increase in design when compared to required reinforcement, which was most likely to increase ease of erection.