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Structural Option

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Structural Technical Report 1

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 structured concrete parking below four stories of residential 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. No Mechanical, Electrical, or Plumbing designs are readily available, but they should be available by mid-November, 2005.

This technical assignment consists of an analysis of the existing structural system. Many aspects must be taken into consideration while designing a structural system, many of which are included in this assignment. The loading (dead, live, and snow) are calculated to be used for analysis. These calculations are followed by detailed explanations of the structural and foundation system as well as lateral system. The 400 consists of four stories of residential metal frame construction (condominiums) above two stories of structural concrete parking. The metal construction is a non-composite system of steel floor joists supported by girders; steel studs are used for the walls. The parking consist of slab on grade wherever possible and a post-tensioned slab wherever slab on grades are not possible.

The analysis of the lateral system, both wind and seismic, includes diagrams with supporting calculations in Appendix A. The controlling lateral case, seismic, is then evaluated, further explained in Appendix B.

Finally, a typical RAM floorplan was created. A simplified rectangular floorplan was used for analysis in spot checking several members. While the members were relatively close in size, variation in sizes is most likely due to length variation throughout the actual floorplan. The same codes used to design the building were used in this RAM analysis. Detailed calculations supporting these spot checks are located in Appendix C. Sketches of plans and details are included throughout the assignment and in the Appendix to help clarify design process.