

West View Residence Design Narrative

The calculations are broken up into discrete packages that deal with specific aspects of the project. The lateral package, titled Main Building Lateral Calculations, which is at the front of the overall package, starts with the title sheet on which my seal and signature can be found. In the following 10 sheets of this section, the design loads are developed on sheet L1. On the following two sheets, L2 and L3, the seismic and the wind loads are developed and the governing load cases are determined. In this case wind governs in the transverse direction while seismic loads govern in the longitudinal. The rest of this section of the calculations deal with distributing shear to the various shear walls and the moment frame on line A. The shear walls are designed in this section right after the shear is determined for each wall. There are key plans included in this section that show which wall is being considered and the lengths and location of each wall. The moment frame loads are applied in the following section which deals with the framing of the main building.

The next section is titled Main Building Risa Model Output. In this section the main building is modeled in Risa and the pertinent output has been provided. The framing plans have been enlarged and the stress checks have been printed in color to facilitate review. Each level is shown with the member sizes, the loading and the stress levels shown. In addition, a member label plan for each level has been added and the design check for a typical member has been provided. At the end of this section there is output specific to the moment frame on Line A. The seismic loads from the previous section are shown along with stress levels for the frame members when seismic is combined with dead load and dead load and live load.

The next section is titled TJI framing. The floor joists and roof rafters in the risa model are included as dummy members only to distribute load to the main members and walls. The design of the floor joists and roof rafters is shown in this section. Weyerhaeuser program Forte was used for the design of these elements.

The next section is titled Garage Risa Output. In this section the model for the garage mat slab and the concrete walls are modeled and the soil loads and the containment loads are applied. The western and southern garage walls are used as retaining walls with the west wall also acting as a containment wall for a future earth slide event. The reaction from the earth pressures including a load case in which the containment forces are applied is distributed through the mat slab to the battered piles supporting the mat slab and also to the permanent shoring with tiebacks along the west side of the garage. The horizontal reactions developed in this section are later applied to the tops of the piles in the area in the Pile design section. There are factored moment maps from which the design moments for the garage concrete walls and the mat slab are determined. These maps have been printed in color so that the reviewer will be more easily able to determine the moments used in the concrete design of these elements.

The next section is titled Garage Concrete Wall Design. In this section the reinforcement for the garage walls is determined by calculation.

The next section is titled Concrete Slab on Grade Calculations. In this section the thickness and the reinforcement for the basement pile supported slab on grade is determined and shown to be adequate for both strength and serviceability.

The next section is titled Retaining Wall Design. In this section the footing size and reinforcement for various heights of retaining wall are developed. There is a sketch on the first sheet that shows the position of the variables that are used in the calculations.

The next section is titled Garage Canopy and deals with the canopy framing that is above the garage doors. The canopy framing was designed using Risa 3D and the calculations consist of Risa graphical output. Since this model is relatively simple and the output easy to follow, I did not provide color output for this section. If there are any issues with understanding this model or interpreting the output please contact me and I will provide additional output in a format that is suitable for the reviewer.

The next section is titled Misc Calculations and covers calculations that do not naturally fall within one of the other categories listed.

The next section is titled Shoring Design Criteria in which the design criteria for the permanent and temporary shoring have been extracted from the Geotech report and shown in one location.

The last section is titled Shoring Calculations in which each soldier pile is designed including tiebacks where used.

Please let me know if there is any information that I can provide during your review to facilitate your review. I can be reached at 206-992-2728 and welcome an opportunity to assist you in understanding this project and my approach to it. Please don't hesitate to call.