Point O to compensate the resultant net active and passive pressure below point of rotation at Point O. The calculated depth, D, is determined by increasing D_O by 20% to approximate the total embedment depth of the vertical wall element. The 20% increase is not a factor of safety, it accounts for the rotation of the length of vertical wall element below Point O as shown in Figure 6-3.

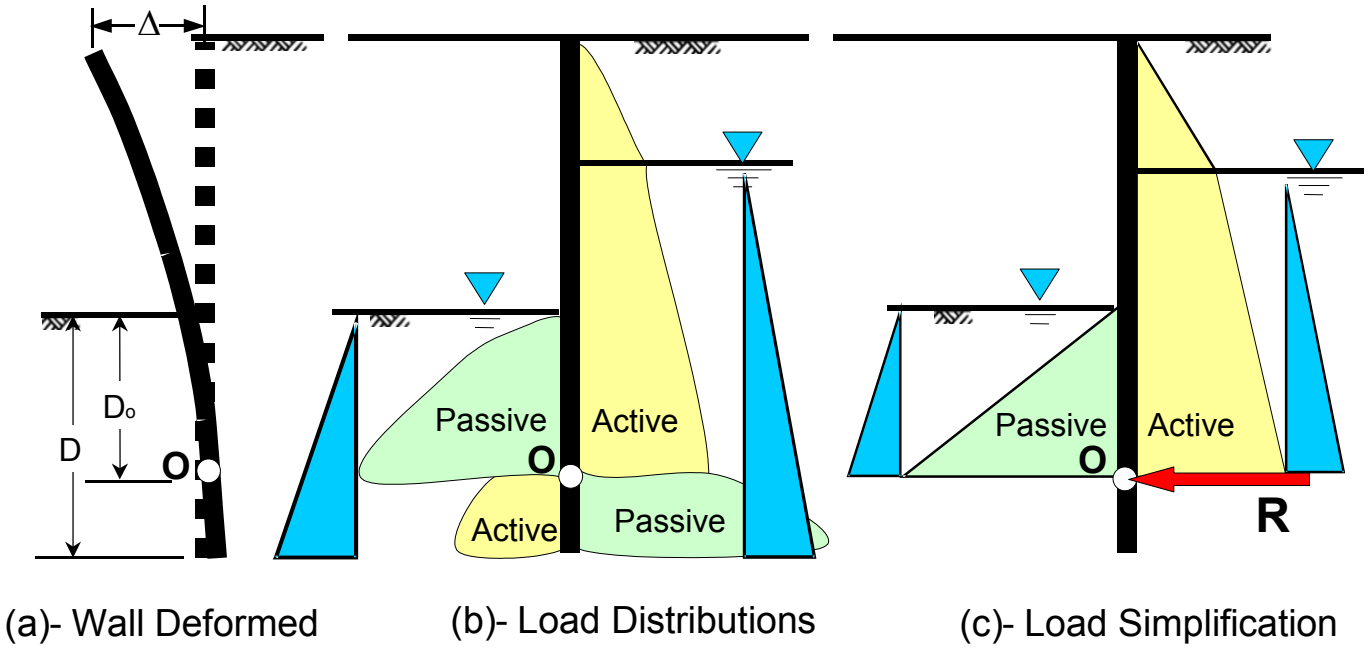

Figure 6-3. Cantilever Retaining Walls

For unrestrained shoring systems, depending on the site soil profile, the simplified lateral earth pressure distribution shown in Figure 6-4 through Figure 6-8 may be used.

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III. FLEXIBLE CANTILEVERED WALLS

A. General

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Sheeting is driven to a depth sufficient for the passive pressure exerted on the embedded portion to resist the lateral active earth pressures acting on the cantilevered section. To achieve the required passive earth pressure resistance, embedment depths can often be quite high. Therefore, due to limitations on the availability of certain section modulus and its associated costs, cantilevered sheeting walls are usually practical to a maximum height of approximately 15 ft. (4.6 m).

Soldier piles of a soldier pile and lagging wall system are vertical structural elements spaced at set intervals, typically 6 ft. to 10 ft. (1.8 m to 3.0 m). A soldier pile and lagging wall also derives its resistance from the embedded portion of the wall but, because of the higher available section modulus, greater excavation depths can be supported as compared to those supported by sheeting. Cantilevered soldier piles are usually practical for excavations up to approximately 20 ft. (6 m) in height.

The minimum timber lagging thickness for a soldier pile and lagging wall should be determined from the table in Appendix B, taken from Lateral Support Systems and Underpinning, Vol. 1. Design and Construction, FHWA-RD-75128, April 1976.

Additional design guidance for sheeting and soldier pile and lagging walls is provided and/or referenced in Appendix D.

B. Analysis

Use either the Simplified Method or the Conventional Method for the design of a cantilevered sheeting wall. To account for the differences between the two methods, the calculated depth of embedment, obtained using the Simplified Method, shall be increased by 20%. This increase is not a factor of safety. The factor of safety shall be applied to the passive pressure coefficient as stated in "II. Design Premise: B. Factor of Safety".

Use either the Simplified Method or the Conventional Method of analysis for the development of the lateral pressures on a soldier pile and lagging wall. However, as opposed to a sheeting wall which is analyzed per foot (meter) of wall, the calculations for the design of a soldier pile and lagging wall must account for the spacing of the individual soldier piles. To determine the active pressures above the dredgeline, include a factor equivalent to the spacing in the calculations. To determine the active pressures below the dredgeline, include a factor equivalent to the width of the soldier pile (for driven piles), or diameter of the hole (for piles installed in excavated holes) in the calculations. To determine the passive resistance of a soldier pile embedded in soil, assume that the net passive resistance is mobilized across a maximum of three times the soldier pile width (for driven piles), or three times the diameter of the hole (for piles installed in excavated holes).