

Current State of Practice for Deformation Criteria for SOE Wall Systems

To achieve the desired performance and project metrics for a constructed support of excavation (SOE) wall system, designers and contractors combine theoretical and empirical principles, practical knowledge, and feasibility considerations. Numerous published technical sources provide design methodologies, step-by-step procedures, and technical guidance for system design. However, the assessment of potential lateral wall and vertical ground movements is less well-defined, often relying on empirical correlations for idealized conditions or using specialized software for complex soil-structure interaction analysis. While there is technical guidance for strength and service limit states and for global stability concerns, practical acceptable deformations of constructed wall systems remain intentionally vague. The current guidance and technical information regarding deflections for SOE walls are not synthesized, not consistent, are quite variable and dated, and contain substantial discrepancies. Different standards, codes, and technical guidance documents contain arbitrary limits regardless of wall type, wall height, and/or ground conditions and may offer limited-to-no guidance on what is practical and achievable. A dedicated research effort was performed to synthesize the available existing design methodologies, case studies, prior research, and guidance documents. The more than 1,500 data sets compiled from the published case histories include information and reported values about ground conditions, wall characteristics, construction method, horizontal support system, maximum depth of excavation, maximum measured wall deformations, and maximum measured ground displacements behind the wall. This presentation will summarize the results of a research effort to present the current state of the practice for SOE wall systems to formalize practical criteria for deformation of SOE wall systems and to provide recommendations for acceptable wall deformation limits based on the obtained technical data and information.