ANALYSIS AND DESIGN - EARTH RETAINING STRUCTURES
PARTIAL LIST OF PROPRIETARY PARAMETRIC SOFTWARE TOOLS
NBSD STRUCTURAL ANALYSIS AND DESIGN REFERENCE TOOL LIBRARY

3. NBSD Software Tools - Earth Retaining Structures

Task	NBSD Software Tool	Code References	Description	Comment
Analysis and Design	**Drilled Piers**			
	Drilled Pier Design - Constrained at Surface	IBC2006 1805.7.2	Required depth of embedment of drilled pier for vertical and lateral loads is determined. Passive and active pressures are considered, as well as skin friction; end bearing is not.	
	Drilled Pier Design - Un-Constrained at Surface	"		
	Tied Back or Cantilevered Walls			
	Tie-back Wall Analysis		Shear, Moment, and Stress diragrams are provided for Sheetpile bulkhead; Data input includes Wall data, location of water table, 2 tiebacks, Rankine or saturated Soil unit weight, and surcharge loads.	Developed for a local project.
	SAP2000 Pre and Post Processors for Tied Back/Cantilevered Walls		Input Data on spreadsheet is used to create SAP2000 analytical model, and results extracted from program to be shown on spreadsheet for elements selected.	Software tool was developed for project consisting of 1,200 feet of 12'-35' of Cantilevered/Tied Back Walls.
			Parametric input data includes extensive Pile input data, Soil parameter and Rankine Lateral Pressures, Surcharge loads, Seismic loads, and Tieback input data. Output Data includes plots of geometry (wall, piles, tiebacks), Active and Passive Earth Pressures, Surcharge loads, Seismic loads (choice of 3 types); also included are Deflection, Rotation, and Settlement of Wall, as well as Axial, Shear, and Flexural demands.	Two types of analysis are possible: Service Loads and Seismic Loading.
	Retaining Walls			
	Retaining Walls with Spread Foundations	CALTRANS Bridge Design Specifications	User input defines wall cross-section, Soil Data (Rankine or Equiv. Fluid Pressure), Surcharge loads (point, uniform), Seismic loads, and RW reinforcement.	Software tool was developed for various Caltrans Projects; these consisted of Retaining Walls lenths exceeding 1,000', and Wall heights between 12'-36'.
			Output includes plot of cross-section w/ Active and Passive Earth pressures, Surcharge loads, Wall Stability checks, LRFD and ASD shear and flexural Demand to Capacity checks of Wall and Foundation Toe and Heel.	
	Retaining Walls with Piled Foundations	CALTRANS Bridge Design Specifications	User input defines wall cross-section, Pile Data (number, location, capacities, etc), Soil Data and Pressures (Rankine or Equiv. Fluid), Surcharge loads (point, uniform), Seismic loads, and Wall and Footing reinforcement.	Software tool was developed for various Caltrans Projects; these consisted of Retaining Walls lenths exceeding 1,000', and Wall heights between 12'-36'.
			Output includes plot of cross-section w/ location and size of piles, Active and Passive Earth pressures, Surcharge loads; calculations include Wall Stability checks, Pile Service and Ultimate Demand-to-Capacity (D/C) checks, LRFD and ASD shear and flexural D/C checks of Wall and Foundation Toe and Heel.	