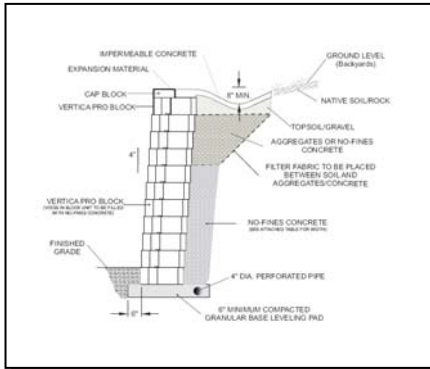


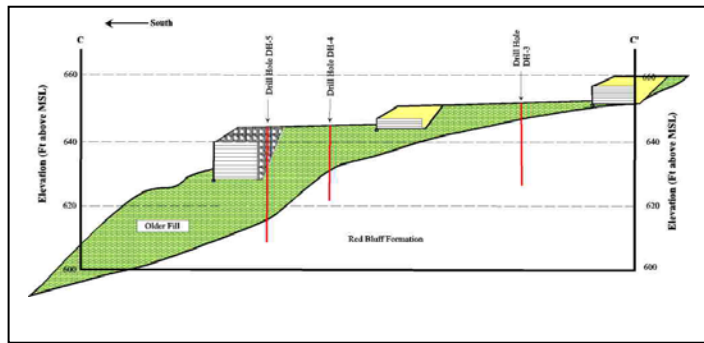
REPRESENTATIVE RETAINING WALL PROJECTS



CGI has performed numerous studies and provided design information or full design drawings for numerous types of retaining walls. Those walls include conventional AL concrete cantilevered, segmental block (Pavestone, Keystone, etc.), gravity (Ready Rock), Hilfiker, and other wall types (and manufacturers). The following are a few representative retaining wall projects in which we have provided design-level services.

MERCY MEDICAL CENTER REDDING – MSE WALL FAILURE STUDY **Geotechnical Engineering**

A large mechanically stabilized earth wall (MSE) built in 1983 that supports Mercy's south parking lot began failing in 2003 and CGI was retained to evaluate the causes of the failure. Through our exploration and forensic services, we found that up to 28 feet of uncertified fill had been placed beneath the wall many years prior to the wall's construction. The loose fill in conjunction with leaking utilities and excessive landscape irrigation created slope instability that led to the incipient failure of the wall and the slope beneath the wall. For this project, CGI performed extensive subsurface exploration and laboratory testing, installed and monitored slope inclinometers, performed finite element analyses to estimate seepage forces within the slope, and performed extensive slope stability analyses. Our analyses evaluated the causes of the failure and provided recommendations for five alternatives for stabilizing the site.



BOBBA RESIDENCE – MSE RETAINING WALLS **Geotechnical Engineering**

CGI was retained to provide geotechnical engineering and retaining wall design services for a custom home constructed in Redding, California. The residence is located on sloping ground with numerous geographical constraints limiting the areal extent of the proposed development. To allow suitable development around the residence, retaining walls were proposed and CGI was retained to assist in the design of those walls. A number of different retaining wall systems were evaluated for the site and the wall design was finally established as a segmental block wall system. The walls are up to 12 feet tall and extend for 60 lineal feet around the residence. Construction was performed in 2009.

STILLWATER BUSINESS PARK & JENNY CREEK LIFT STATION

Geotechnical Engineering

CGi was retained by the City of Redding to provide geotechnical services for the design of a number of sewer and water lift and pump stations. Two of those projects include the Stillwater Business Park and the Jenny Creek Lift Station projects. Both projects included cast-in-place buried concrete lift stations. The buried portions of the lift stations are 20 and 25 feet below grade for the Jenny Creek and Stillwater Business Park lift stations, respectively. CGI performed extensive subsurface exploration, sampling, and laboratory testing to develop recommendations for design and construction of the structures. Those evaluations included slope stability analyses for temporary construction slopes needed to safely build the improvements.

CHOLET RETAINING WALL - GRAVITY BLOCK WALL

Geotechnical Engineering

CGi was contracted to design a gravity block wall to retain a cut slope along an existing roadway. The site had space constraints that limited the ability to use segmental block walls with geosynthetic reinforcement. CGI, working closely with the property owner, narrowed the wall alternatives to concrete cantilever or gravity block systems. The gravity block system was evaluated to be the most cost effective and a Redi-Rock wall was designed and constructed at the site. The wall is 9 feet tall and 50 feet long and has performed as intended since constructed.



ADDITIONAL RECENT RETAINING WALL PROJECTS

The following table presents a summary of a few of the recent retaining wall projects that CGi has worked on:

Project	Location	Geotechnical Parameters	Full Design	Type ¹	Height (ft)	Length (ft)
Bobba Residence	Redding	✓	✓	SBW	12	60
Buckeye Pines Subdivision	Redding	✓	✓	SBW	6	120
Sonoma Street Medical Office	Redding	✓		CC	11	80
Stillwater Business Park Wet Well	Shasta County	✓		CC	18	80
Win River Offsite Improvements	Shasta County	✓		CC	8	60
Cholet Way	Shasta County	✓	✓	GB	9	50
Old Cow Creek Diversion	Shasta County	✓	✓	CC	11	25
Reddy Residence	Redding	✓		CMUCL	11	60
Chamber Residence	Yreka	✓		GB	8	40
Greenwood Dairy	Glenn County	✓		CC	15	80
Jenny Creek Lift Station	Redding	✓		CC	15	80
River Park Drive	Redding	✓	✓	CC	4	30
Wright Residence	Redding	✓		CMUCL	10	50

¹ - LEGEND

SBW - Segmental block wall (e.g., Pavestone, Ketstone); CC - Concrete cantilever wall;

GB - Gravity block wall (e.g., Ready Rock); CMUCL - Concrete masonry unit cantilever wall