

Project Summary



Lake Tulloch

Lake Tulloch is located in the western Sierra Nevada foothills, about 200 miles east of San Francisco, California. Its primary function is to supply water to several areas to the west in the San Joaquin Valley. In conjunction with several other lakes located on the Stanislaus River, Lake Tulloch acts as a flood control system and is overseen by the Army Corp Of Engineers.



PROJECT NAME & LOCATION

Lake Tulloch Lake Tulloch, CA

PRODUCT

AB Stones, AB Classic

PROJECT SIZE

10,500 square feet

OWNER

Army Corp of Engineers

LOCAL ENGINEER

Andre Mozzafari

GENERAL CONTRACTOR & WALL BUILDER

Keith Designs

ALLAN BLOCK MANUFACTURER

Calstone Company, Galt, CA

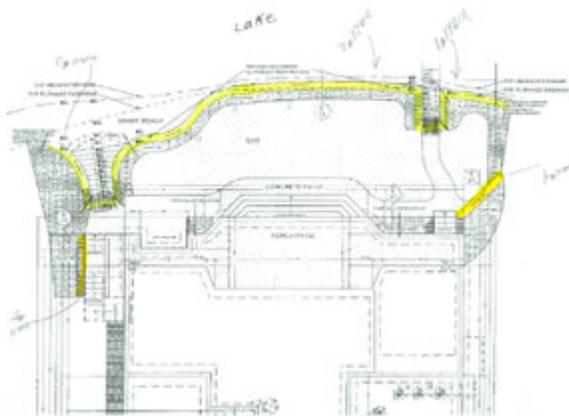
Over the years, several residential subdivisions have been established here, with properties located at waters edge and in the surrounding foothills. Because the terrain consists largely of steep slopes, multiple retaining walls are a necessity. Property owners in the first subdivision, which was built out long before the inception of segmental retaining walls, used several different materials and methods for their retaining walls. Most common materials used were redwood, stone, and conventional concrete masonry unit (CMU). In the developing subdivisions the local Allan Block producer, Calstone Company, has seen a huge surge in the use of Allan Block. Although some CMU is still being used, Allan Block seems to be the preferred product on the numerous walls, which vary from 300 to 1500 square feet

PLAN

Although several design-build firms have worked in the area surrounding Lake Tulloch, the most frequent is Keith Designs. Keith Designs submitted the site plans to Allan Block Corporation. The designs were created using a program that produced detailed three-dimensional drawings. These drawings show an example of a site plan used to design a homeowner's lakeside retaining walls. The site plans allowed for the determination of material and labor estimates and foresight into any design or construction challenges.



The prominent design challenge on these projects is that most of the walls are located near the shoreline. City requirements do not allow any walls to be built below the high water elevation of 510.0 feet (155 m). Therefore it was critical that each of the walls be laid out with careful consideration to the bottom of wall elevations and grading in order to receive a building permit.



Combined, the resident's site plans included terraces, patios, driveway, stairs, inlets, docks, curves, angles, slopes, and planters. By meeting with the homeowners and using state of the art software, Keith Designs was able to come up with fabulous layouts for retaining walls that allowed the homeowners to increase their outdoor living space.

DESIGN

Once Keith Design had completed their plan drawings they sent the plans and a soils report to Andre Mozzafari Engineering or Allan Block Corporation. Most of the engineering, when required, is done locally by Andre Mozzafari Engineering in Modesto, California, with the help of Allan Block Corporation.

Most of the soil around the lake is silty sand. Based on the soils evaluation a friction angle of 30 degrees and a unit weight of 120 pcf (19 kN/m³) were used. Most of the walls were designed using the gray AB Stones and a few of the walls used the gray AB Classic. Some of the future projects are expected to go up using the Abbey Blend collection.

Stones, with a setback of 12 degrees, was chosen most often to provide better leverage and use less cement than a 6-degree AB Classic block. Combined the designs called for both gravity walls and reinforced walls. Cases where there was a patio, slope or roadway above the wall more force is bearing on the wall, requiring these use more reinforcement than a wall with no slope or surcharge above.

When there is a slope at the toe of the wall the city required that there be at least 7 feet (2 m) horizontally between the block and the surface of the slope, this is referred to as the seven feet to daylight rule. This means that for a 3:1 slope the wall, 4 blocks need to be buried at the base of the wall. It was a big challenge to make sure that the block was still above the high water elevation.



BUILD

While building the walls on Lake Tulloch, Keith Design ran into and overcame numerous building challenges. Hilly, developing landscape meant detailed construction coordination. Construction curves, angles and stairs meant cutting block and knocking the wings off of the block. Creating inside corners required removing the front lip on the block with a chisel or a saw.

Peninsula Estates is the newest subdivision. It contains numerous houses under construction and even more lots to be developed. In one bay there will be at least seven Allan Block walls adorning the houses on both sides when construction is complete. The opposite side of the Lake has already seen plans for a minimum of five walls. Because Lake Tulloch allows all types of recreational activity, many people are able to view these walls; making it a great marketing tool for beauty, integrity and performance.