

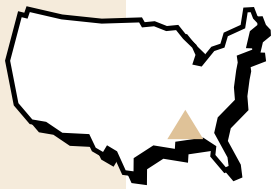


▶ CASE STUDY: GOVERNMENTAL APPLICATION

Keystone Saves Historic Homes From Failing Bluffs

The “bluff problem” has been a part of history in **Natchez, Mississippi**. There have been landslides along the bluffs for centuries. Within the past 100 years, “sliver” slides have been reported, along with resulting property loss, and in 1980 two lives were lost.

According to David Gardner, city engineer for Natchez, **Mayor Larry L. Brown** decided to appeal to the **National Resource Conservation Services (NRCS)**, part of the Department of Agriculture, for emergency assistance. City officials moved quickly when the funds came through, and **Hayward Baker Inc. (HBI)**, from Atlanta, was awarded a 3 phase contract. Phase 1 included a geotechnical investigation of the site along with the design and construction of a temporary access road for the residents at the bottom of the bluff. In Phase 2, the design/build team constructed the two lower Keystone Retaining Walls along Learned Mill Road, which had been undermined 4’ to 6’ (1.2 to 1.8 m) in some places. At the lowest level, the team constructed a 280’ (85.34 m) long wall, up to 32’ (9.75 m) high, about 6’ (1.6 m) off the edge of the road on the river side. Phase 3 involved solving the dilemma of extending the front yards of homeowners along the bluffs. This was accomplished by leaving a



- ▶ **PROJECT:** Natchez Bluff
- LOCATION:** Natchez, Mississippi
- PRODUCT:** Keystone Standard Units
- WALL DIMENSIONS:** 32’ (9.75 m) high X 280’ (85.34 m) long
- GENERAL CONTRACTOR:** Hayward Baker, Inc. Atlanta, Georgia
- ENGINEERING CONSULTANT:** Army Corps of Engineers Vicksburg, Mississippi
- KEYSTONE REPRESENTATIVE:** Keystone Southeast Baton Rouge, Louisiana



32’ High Keystone Wall solves the historic “Natchez Bluff” problem!

“bench” or shelf 25’ out toward the river from the stabilized wall. The section above this bench was cut back 10 ft. (3.0 m) and the remaining area was stabilized with geogrid soil reinforcement and filled with 6,000 lbs. of lightweight aggregate, topped with sod and plants. One sidewall of the section is the original bluff, and the back wall of the section is the shotcrete-covered soil-nailed wall.

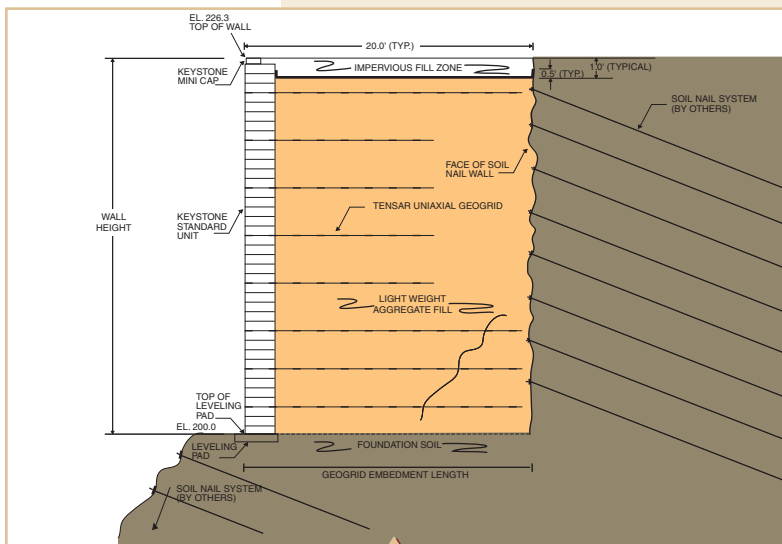
Conventional fill, such as sand, would have cost about \$5 per cubic yard placed, while the cost of the lightweight aggregate solution was approximately \$30 per cubic yard placed. This lightweight material was needed to solve the problem due to the inability of the underlying wall to carry the load of the conventional fill. Combining these various stabilization systems was an economical and yet ideal solution.



View of wall with soil nailed “bench” below.



The top of the Keystone wall provides new front yards for bluff homeowners.



Cross section shows soil nailed bluff below and geogrid soil reinforced Keystone above.

Construction began with a wire form faced temporary wall designed by the soil reinforcement supplier. Because the Keystone Retaining Wall uses bottom-up construction and the soil nail system uses top-down, the work proceeded simultaneously.

